SWEET'S ARCHITECTURAL CATALOGUE

TWENTIETH
ANNUAL
EDITION

SWEET'S CATALOGUE SERVICE
NEW YORK N.Y.

SWEET'S
ARCHITECTURAL
CATALOGUE

A Completely Indexed Catalogue Filing System
of
Building Materials, Supplies and Equipment

Twentieth Annual Edition

Compiled, Edited and Published Annually by

SWEET'S CATALOGUE SERVICE

DIVISION OF F. W. DODGE CORPORATION

119 West 40th Street, New York, N. Y.

Boston, Mass., Park Square Building
Philadelphia, Pa., 207 North Broad Street
Pittsburgh, Pa., Bessemer Building
Cleveland, Ohio, 1266-68 Hanna Building
Chicago, Ill., 131 North Franklin Street
Los Angeles, Calif., 309 California Building
Atlanta, Ga., Witt Building

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PRINTED IN THE UNITED STATES OF AMERICA BY W. B. CONKEY COMPANY, HAMMOND, IND.

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No. 2105

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Gabriel Steel Co.	678-679
Majestic Co.	682-685
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Peelle Co.	894-899
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Art Metal Construction Co.	829-837
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Babcock-Davis Corp.	890-891
Firecraft Corp.	888-889
Peelle Co.	894-899
Richmond Fireproof Door Co.	900-903
Security Fire Door Co.	904-905
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Peelle Co.	894-899
Richmond Fireproof Door Co.	900-903
Security Fire Door Co.	904-905
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Gorham Co.	760-761
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McCoy Bronze Co. Inc.	770
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Newark Sheet Metal & Kalamein Co.	875
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Cincinnati Mfg. Co.	868
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Kinnear Mfg. Co.	912-921
Peelle Co.	894-899
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—Shower Stall—Glass
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Everything for Architects and Draughtsmen

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PITTSBURGH, PA.

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Drafting Room Instruments, Supplies and Equipments; Blue Printing.

Blue Printing

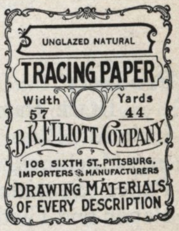
In both Pittsburgh and Cleveland we have modern plants for making blue, brown or black prints from customers' tracings; also photostat prints. Our printing, washing and drying apparatus can handle orders of any size, promptly. Prints up to 54 in. wide in one continuous sheet.

Blue Print, Drawing and Tracing Papers

Fulton Blue Print Paper—50% rag; a good strong low priced paper for shop use; has excellent printing qualities.

Superb Blue Print Paper—100% rag stock and chemically pure. Both Superb and Fulton are prepared in Wunminnit, Rapid and Extra Rapid. Sample, 5-yd. roll, will be sent on request.

Cecil Detail Drawing Paper—The best buff detail drawing paper; takes ink, pencil or color, and will stand many erasures. Original rolls, 30 to 40 lb.; 30, 36, 42, 54 and 60-in. widths. Furnished also in sheets or mounted on muslin.

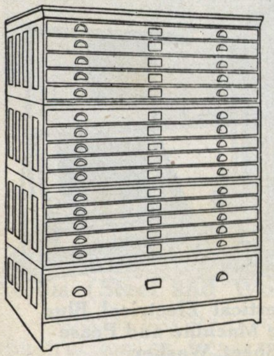


Brand Mark

Unglazed Tracing Paper No. 482—Imported unglazed natural paper; the kind that was sold before the World War. Easy to work with. 42 or 57 in. wide in 20 or 50-yd. rolls. Ask for sample.

Catalogue

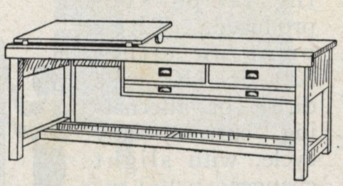
Write for the Elliott Catalogue, which shows a complete line of all the products illustrated below, in addition to a multitude of other articles for architects, draughtsmen, engineers and contractors.



Sectional Filing Case

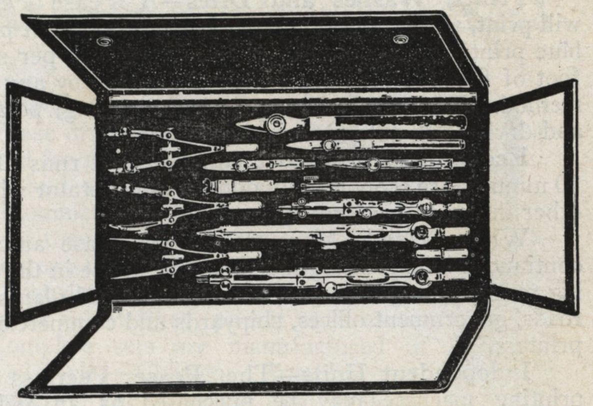
For flat filing of drawings. Made of seasoned oak, handsomely finished. Sections made in four styles.

Steel—Furnished also in steel



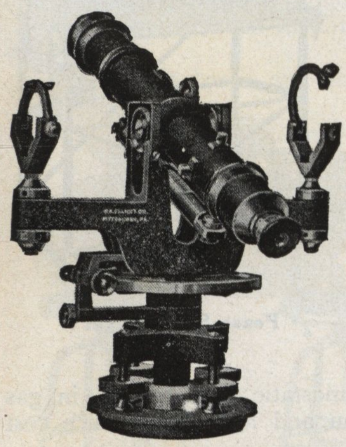
Drawing Table No. 100A

Oak, with soft pine top 39x84x1⅜ in.; 34 in. high. One large drawer 32x44x2 in. inside; two small drawers 21x24x5¼ in. inside. Raising blocks permit adjustment of 1, 2 or 3 in. in height of table. Many other styles in catalogue



Drawing Instruments

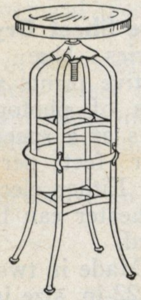
Our drawing instruments are of the world's finest makes, and stock is arranged to meet all requirements, from the very finest to low priced German instruments for school use



Convertible Level No. 11015

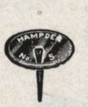
A level and transit combined. Magnifying power, 25 diameters, showing objects erect. Range, 5 ft. to 1 mile. Horizontal circle of 4½ in., numbered 0 to 90 in quadrants, vernier reading to 5 min. Weight, 8 lb.; with accessories, carrying case, plumb bob, tripod, sunshade and adjusting pins, 15 lb.; weight of tripod, 6 lb.

Also No. 11016, same as No. 11015, but fitted with Philadelphia arc



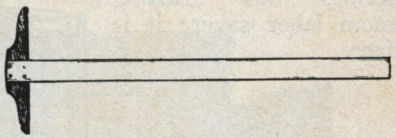
Steel Stool 2808A

Draftsman's steel stool with revolving wood seat, adjustable 26 to 30 in. and 30 to 34 in. Other wood and steel stools in stock



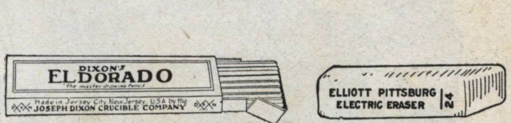
Thumb Tacks

Needle-point thumb tacks of one-piece tempered steel; 5 sizes. Many other styles



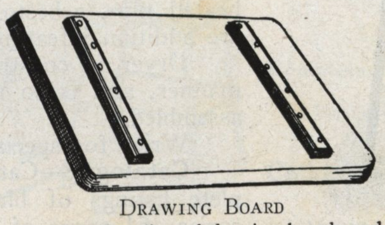
T-Square

Wooden or steel T-squares, single or double head; all lengths from 15 to 72 in.


DIXON'S ELDORADO
The master drawing pencil
Made in Jersey City, New Jersey, U.S.A. by the JOSEPH DIXON CRUCIBLE COMPANY
ELLIOTT PITTSBURG ELECTRIC ERASER
24

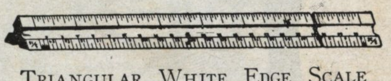
Pencils and Erasers

We carry in stock standard brands of pencils and erasers for architects and draughtsmen



Drawing Board

Complete line of drawing boards and drawing tables



Triangular White Edge Scale

U. S. standard, machine divided; from 6 to 24 in. in length. Any divisions required furnished on special order

THE C. F. PEASE COMPANY

Blue Printing Machines, Drafting Room and Architects' Supplies

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Superior 5860

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CHICAGO, ILL.

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Bentley and Private

Products

Blue Printing Supplies and Accessories, which include: Blue Printing Machines; Washing and Drying Machines, single sheets and continuous; Blue Print Paper Sensitizing Machines; Blue and Brown Print Paper and Cloth, sensitized and unsensitized; Blue Print Room Requisites.

Drafting Room Furniture and Supplies of all kinds; Drawing Instruments and Materials of every sort; all leading brands of Tracing Cloths.

Surveying Instruments and Field Supplies.

Pease Continuous Blue Printing Equipment

Saves Labor—One boy and a Pease Peerless automatic continuous blue printing equipment can print, wash and dry more and better blue prints in 1 hour than can be done in 4 hours with any other equipment using independent methods of washing and drying.

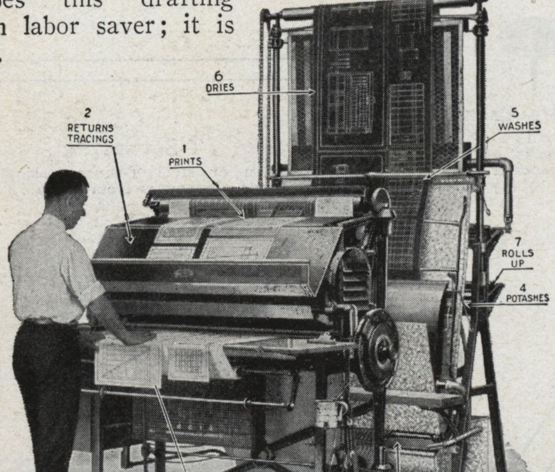
Prints, Washes and Dries—A Pease Peerless will print, wash, potash and dry up to 120 yds. of perfect blue prints an hour and do it at a lower cost per square foot of finished blue print than is possible by any other method. Each operation—printing, washing, potashing and drying—is automatic and continuous.

Economical for Short Runs—Short runs of 5 or 10 minutes are economically done by an operator who has other duties to perform.

Where Used—More than 1800 Pease automatic continuous blue printing machines are in use in the drafting rooms of engineers, architects, industrial plants, railroads, government offices, shipyards and commercial blue printers.

Independent Units—The Pease Peerless blue printing machine may be purchased as an independent unit, if desired, and the washing and drying machine added later, although the greatest economy is effected by installing the complete equipment.

Catalogue—Catalogue No. M-37 completely describes this drafting room labor saver; it is free.



Pease Automatic Continuous Blue Printing Machine

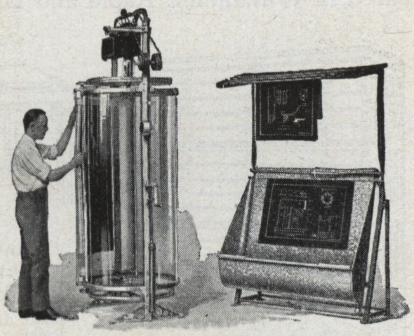
Pease Vertical Blue Printing Machine

In drafting rooms where the demand for blue prints does not warrant the purchase of a Pease Peerless automatic continuous blue printing equipment, the Pease Vertical blue printing machine and sheet washer will furnish perfect blue prints or negative prints of moderate size. The Pease Vertical is very compact and can be installed in a corner of the drafting room.

It is so rigidly constructed that it can be shipped anywhere, completely assembled, without danger of breakage.

Speed regulation is accomplished by means of a patented liquid cylindrical control, which is noiseless and gives absolutely uniform results. Pease Vertical machines are equipped with Pease U-V arc lamps which are the fastest blue printing lamps ever produced. They print on either 220 or 110 volts direct or alternating current, any cycle, with slight changes.

The five sizes and moderate prices are given in Catalogue No. M-37 which will be sent on request.

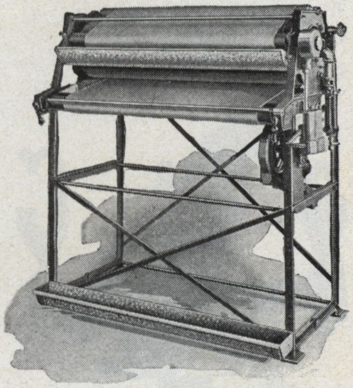


Pease Vertical Electrical Blue Printing Machine and Pease Sheet Washer

Pease Sheet Dryer

Dries blue prints, negative prints and all kinds of photographic prints at a speed of 8 linear feet per minute. Either electric or gas heater can be furnished.

Made in two sizes. The 22-in. size is especially adaptable for drying photographic prints while the 45-in. is equally adaptable for drying blue prints, negative prints or photographic prints.



Pease Sheet Dryer

Copper cylinder, thermostatic heat control in gas heated type, asbestos apron and low maintenance cost are additional features.

Dryer is constructed in a thoroughly mechanical manner, and is so rigid that it is shipped completely assembled.

Write for special pamphlet D-37.

Catalogue—Catalogue No. M-37, contains complete listings of blue printing machinery and accessories—64 pages of valuable data free. Ask for copy of this drafting room labor saver.

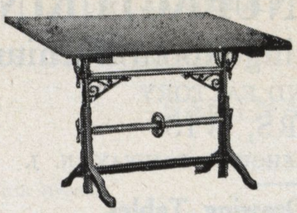
Continued on next page

Drafting Room Furniture

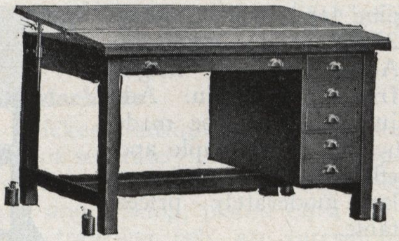
The Pease line of drafting room furniture and engineer's office equipment is very complete.

It includes both steel and wood sectional and vertical filing cabinets in several sizes; drawing tables with and without drawing boards and draftsmen's stools of steel or wood.

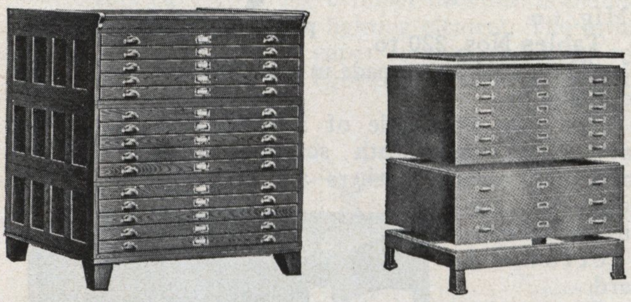
Write for Catalogue F-37 which illustrates the complete line of furniture, including drawing stands, drawing boards, ruling attachments, drafting machines and scales.



Pease Table No. 2253



Pease Table No. 2263B



Wood Cabinet Nos. 2270 and 2271

Steel Cabinet Nos. 2266 and 2267

Blue Print Filing Cabinets

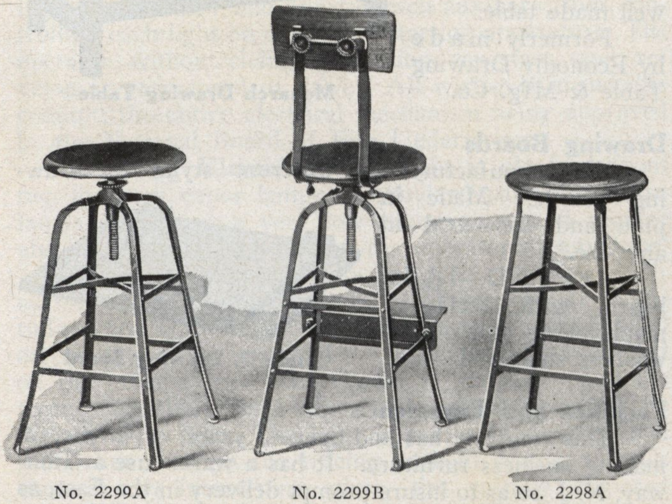
Stools (Steel and Wood)

Special attention has been given to the design and construction of Pease steel stools to make them indestructible and yet attractive as an economical piece of furniture.

Uprights are supported by two sets of braces instead of one, and an extra set of cross braces is set in to overcome the weakness found in stools of other makes.

All stools finished in olive green with 14½-in. oak seat.

Adjustable backs and foot rest furnished on No. 2299 stools.



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Drawing Papers and Cloths

Pease drawing, detail and tracing papers and cloths are unsurpassed. Sample books or working sample will be furnished on request. Every effort is made to meet detail requirements. Printed sheets of tracing paper and cloth (cut to required sizes) with customer's titles and appropriate borders are furnished on order.

Sensitized Papers and Tracing Cloths

"Veri-Strong," "Royal," "Puritan," and "Superior" blue print papers and "Perfection" blue print cloths are of highest quality stock and carefully sensitized in five different printing speeds. Coating is done only after receipt of customer's order and goods shipped same day.

"Perfection" brown process papers and cloths are also unexcelled. Every roll guaranteed freshly coated, full length and continuous. Full credit allowed on any goods found unsatisfactory and promptly returned.

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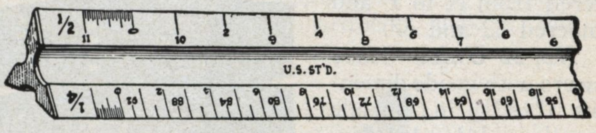
A complete line; plain boxwood and celluloid scales. Angles and T-squares carried in all sizes.

Slide rules for both the architect and engineer—all styles.

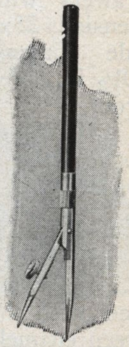


Pease Scale No. 1233

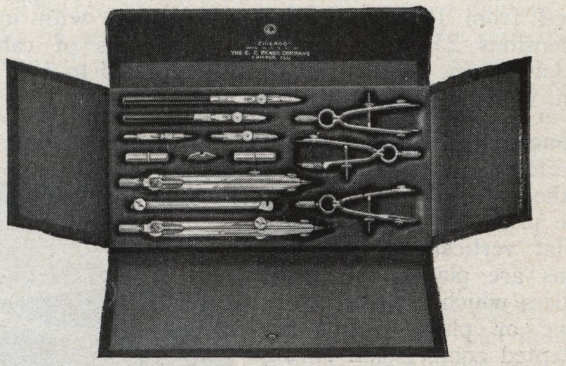
Drawing Instruments of Superior Quality

Pease drawing instruments are manufactured for discriminating users who place quality and accuracy before price. They are recommended for the most detailed work as they contain that proper balance and degree of precision only found in high grade instruments. Pease instruments are put up in velvet lined, pocket style cases.

Complete sets are manufactured in three styles—Chicago, Franklin and Schoenner. The Chicago and Franklin brands are manufactured in Chicago, while the Schoenner brand is manufactured in Germany and is recognized as the leading imported line offered at popular prices to engineers and professional draftsmen.



Spring Hinge Pen No. 506



Complete Set of Pease "Chicago" Drawing Instruments in Genuine Morocco Case

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Catalogue G-37 Complete

We will gladly send our general Catalogue G-37 containing complete line of blue printing machinery, drafting room requirements and engineers' supplies, free.

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Manufacturers of Drafting Room Furniture

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Oak and Steel Blue Print Sectional Cabinets; Adjustable Drawing Tables; Drawing Boards.

Also manufacturers of Collapsible Drawing Tables and Easels, Parallel Rule Attachments, Artists' Tables, Typewriter Tables, School Tables, etc.

Blue Print Sectional Cabinets in Wood

Built on the unit plan—add as requirements demand.

Thoroughly well made of seasoned oak and well finished. Each drawer is fitted with label holder, substantial pulls, and hood at back of the drawer.

Oak Blue Print Cabinet Units
Combination 29

Sizes—Carried in stock in two sizes. Units lettered from A to P and numbered 32 and 37.

No. 32 Units—Have drawers with inside dimensions 32x42½ in., outside dimensions 34½x45½ in.

No. 37 Units—Have drawers with inside dimensions 25x37½ in., outside dimensions 27¼x40½ in. Special sizes to order.

Bases—Bases for the above units are supplied in four different styles flush to the floor; or on legs, sanitary style.

Blue Print Sectional Cabinets in Steel

Built on the unit plan—add as requirements demand.

Substantially constructed of cold rolled furniture steel with joints electrically welded. Finished in olive green enamel, baked on. A beautiful and lasting finish that will harmonize with any surroundings.

Each drawer fitted with label holder, substantial pulls, patented paper weights, and hood at back of drawer.

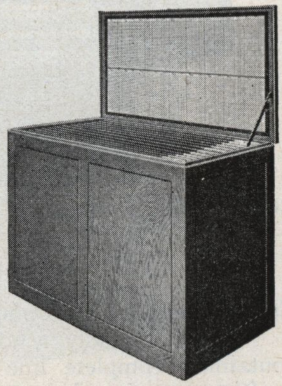
Sizes—Carried in stock in two sizes. Units numbered from 1825 to 1839 have drawers with inside dimensions 25x37 in., outside dimensions of cabinet 28½x40$\frac{13}{16}$ in. Units numbered from 1843 to 1857 are 6 in. wider and 7 in. deeper.

Economy-U-Planfile

Has a very successful method of holding tracings, blue prints, drawings, etc., in a flat vertical position. All plans are placed in indexed folders which are easy to remove or place in the file. Patented compression springs produce uniform pressure on the plans which can not crumple or break.

Substantially constructed of oak, well finished.

Formerly made by Economy Drawing Table & Mfg. Co.



Economy-U-Planfile

Drawing Tables

Perfection Adjustable Drawing Tables—These tables have white pine tops in sizes from 23x31 in. to 36x60 in. Adjustable in height from 31 to 41 in. Adjustments can be made by one man, simple and efficient. A very popular moderately priced table.

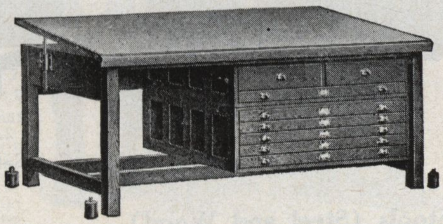
Formerly made by Economy Drawing Table & Mfg. Co.

Perfection Drawing Table

Tables Nos. 220 to 247—These tables are made in two different sizes, 34x72 and 39x84 in.

The tops are made of selected white pine with heavy cleats underneath screwed to underside of board with oblong washers and heavy screws which allow for expansion and contraction of board.

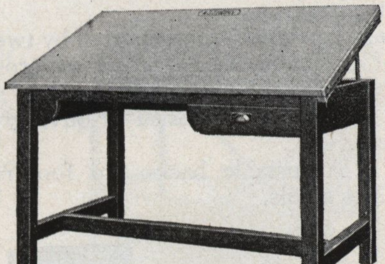
These tables will take any of our regular No. 32 or No. 37 units for filing purposes.



Drawing Table No. 234

Monarch Drawing Tables—Tops, white pine, in sizes 34x72 in., 36x72 in., 33x60 in. and 36x60 in. One drawer 13x26x4 in. with tool tray. Blue print tray under top 28¾x53x1¼ in. Frame of oak, well finished. Made and shipped knocked down. Construction very rigid. A very well made table.

Formerly made by Economy Drawing Table & Mfg. Co.

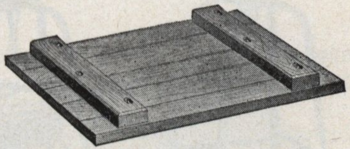


Monarch Drawing Table

Drawing Boards

We manufacture six different styles of drawing boards. Made in pine and basswood in any size.

Style D—1$\frac{1}{16}$-in. board with 3x1¼-in. maple cleats and oblong washers staggered.



Style D, Drawing Board

Facilities and Experience

This company has had over 40 years' experience in making business furniture. It has a warehouse at Rahway, N. J. so as to insure prompt delivery in the East, as well as in the West. Send for catalogue, H-S-E.

1856 WICKES BROTHERS 1925

Manufacturers of Continuous Electric Blue Printing Machines

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SALES OFFICES

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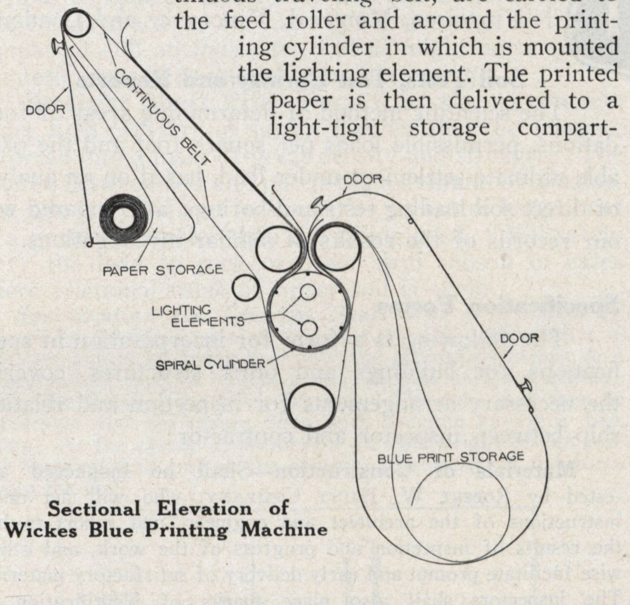
Products

Wickes Continuous Electric Blue Printing Machines.

Wickes Blue Printing Machines

Operation—The Wickes continuous electric blue printing machine will print separately cut sheets or continuous rolls in any length and in widths varying from 2 to 48 in. The paper and tracing, placed on a continuous traveling belt, are carried to the feed roller and around the printing cylinder in which is mounted the lighting element. The printed paper is then delivered to a light-tight storage compartment and the tracing is returned to the operator or carried to the storage compartment, as desired.



Sectional Elevation of Wickes Blue Printing Machine

The machine is entirely automatic, the only work required of the operator being the placing of the tracing and blue print paper on the traveling belt. The entire operating mechanism is controlled by three toggle switches conveniently located for the operator, one being for the motor and one for each auxiliary, thus controlling each light on a separate starting apparatus. The operator, without changing position, can start, stop, reverse or vary speed of drive. All wiring is in metallic conduit, the entire electrical mechanism being approved by the National Board of Fire Underwriters.

Lighting Elements—The light is obtained from two mercury vapor lamps of standard pattern. These lamps operate at a very low temperature and require absolutely no attention from the operator at any time.

Printing Cylinder—The printing cylinder which surrounds the lighting element is composed of longitudinal and spirally disposed wires, woven right-handed on one side of the center of the machine and left-handed on the other side. The cylinder is stationary and the tracing and blue print paper are carried around it by the traveling belt. The light is projected directly in a radial line through the tracing without having to pass through any intervening glass, the spirally disposed wires offering much less actual obstruction to the light than any glass cylinder would. The right and left-handed spirally woven wires impart a very desirable ironing and spreading effect to the entire surface of the tracing. The tracing and paper pass over 92% of the circumference of the cylinder.

Continuous Traveling Belt—The contact between the tracing and the paper is secured by means of a single, wide, continuous belt which passes around the feed rolls and the metallic printing cylinder. The tension of this belt is regulated automatically. Its life is guaranteed for three years' service.

Advantages of the Wickes Blue Printing Machine—Blue prints are made with an absolutely uniform tone throughout.

The operator is not required to work in a darkened room, the light-tight compartments making this unnecessary.

The operation of the machine is so simple that any person, however inexperienced, can make perfect prints with it.

There is no glass cylinder to clean, break or replace, our metallic cylinder being self-cleaning and unbreakable.

The power required is exceptionally low; the consumption when running at maximum capacity being but .015 kw. per sq. yd.

Wickes Continuous Electric Blue Printing Machine

Model 20 Blue Printing Machine

The Model 20 machine carrying two lighting elements on separate starting apparatus has a capacity of 550 sq. yd. per 8-hour day. With the improved variable speed, 4-step, quick change gear box and adjustment of motor on iron driving disc, the printing speed can be adjusted to suit any grade of paper, including Van Dyck's. The machine is entirely self-contained; is 30 in. high and requires a floor space of 2 ft. 6 in. x 5 ft.

Model 15 Blue Printing Machine

The Model 15 machine is constructed exactly like the Model 20 except that it carries only one lighting element, decreasing the printing speed about one-half. It is so constructed that another lighting element can be added at any time as required, thus changing it to a Model 20 machine.

Catalogues

Catalogues fully describing the Wickes blue printing machines will be sent on request.

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Inspection and Tests of Materials for Buildings and Structures

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General Engineering Service

Consultation Services in all Engineering Fields: Mechanical, Civil, Hydraulic, Electrical and Chemical.

The Supervision and Detail Inspection of Concrete Construction, including Examinations and Reports upon the Suitability of Aggregates.

Soil Tests, Test Borings and Reports upon the Same in Connection with Foundations.

Also, Reports on Permissible Floor Loads and on Existing Conditions of Buildings and other structures.

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Strength tests of materials and systems of construction—steel, iron, cement, brick; columns, beams, floor slabs, partitions and other members.

Chemical tests of all building materials, including steel, iron, cement, paint, oils, slags, limestones, marls and clays.

Duty and efficiency tests of entire plants—engines, boilers, pumps, compressors and other machinery.

Structural Steel Inspection

The inspection of structural material at the mills and foundries, including the identification and witnessing of physical tests.

The supervision and inspection of workmanship, checking the sections, dimensions and detail connections during the course of fabrication at the shops, insuring the proper handling of the material, first class workmanship, accurate construction, thorough painting and distinct marking, thus facilitating the erection at the site.

Estimation of weights from detail drawings, and checking shipped weights of finished work.

The supervision and detail inspection of the structure during erection.

Cement Inspection

The testing of cement, including the sampling in car load or bin lots, at the mills or warehouses or when delivered on the work, and the identifying of each lot with serially numbered blue tags.

Complete cement and chemical laboratories in connection with cement testing at Chicago, New York, Pittsburgh, St. Louis, Kansas City, San Francisco, Montreal, Vancouver and London.

Soil Tests, Test Borings and Reports

The scientific method of determining areas of foundations, permissible loads per square foot and the probable ultimate settlement under load, based on an analysis of direct soil loading tests and borings, as compared with our records of the results of similar investigations.

Specification Forms

The following is a form for incorporation in specifications for buildings and other structures, covering the necessary arrangements for inspection and relationship between inspector and contractor:

Materials of Construction—Shall be inspected and tested by Robert W. Hunt Company, who will act under instructions of the architect and engineer, and report to him the results of inspection and progress of the work, and otherwise facilitate prompt and early delivery of satisfactory materials. The inspectors shall also place marks of identification on accepted materials. Such inspection shall not relieve contractor from responsibility to furnish satisfactory material, but is a measure of precaution against oversights and errors. The cost of this inspection is to be borne by the contractor unless otherwise stipulated.

Structural Steel—Shall be inspected and tested at the rolling mills and also inspected at the shops during fabrication, in proper manner, to determine whether the material conforms with the plans and specifications. Contractor shall furnish inspector necessary facilities for inspecting, testing and labor for handling material.

Reinforcing Steel—Shall be inspected and tested at the mill or warehouse in proper manner, contractor furnishing, free of charge, testing apparatus and facilities for inspection.

Cement—Shall be sampled and tested before delivery to the work, in accordance with American Society for Testing Materials, or the special specifications attached.

Standard Specifications

For complete information write our nearest office and request a copy of our recent publication on "Inspection and Tests of Materials for Buildings and Structures."

Please address our Company on your own letterhead, giving title and position.

MacARTHUR CONCRETE PILE & FOUNDATION CO.

55 John Street, NEW YORK, N. Y.
BRANCH OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES
CANADIAN OFFICE, MONTREAL, QUE.

Products

MacArthur Cast-in-place Concrete Piles, Pedestal and Straight Shaft; Composite (Concrete and Wood) Piles.

Also Open and Closed-ended Steel Pipe Piles, Concrete Filled and Permanently Cased; Straight Shaft, Cylindrical Cast-in-place Piles.

A special pile for every condition—not one pile for all conditions.

MacArthur Compressed Concrete Piles

The compressed concrete in the MacArthur pile prevents distortion by soil pressure even when piles are driven on 2 ft. 6-in. centers; because in driving, the earth is compacted and forms an edge around the pile. The concrete acts as a centering for this edge and being compacted will obviously not fail as might uncompacted concrete, even if contained in a thin casing.

Straight Shaft Pile—Formed by placing concrete under high pressure in such a manner that the concrete is forced into a mass of great density and strength. The friction between soil and pile is the maximum obtainable, The pile is cylindrical in shape for its entire length and of a greater diameter than the casing used. Will safely carry the load to rock or other firm subsoil in cases where frictional value of upper soil is slight.

Specification for Straight Shaft Pile—Piles shall be formed by driving a steel casing of (14) (16) (18) inches in diameter and close fitting core into the ground by means of a steamhammer until it indicates the required carrying capacity under the Engineering News formula. The core shall then be withdrawn and the casing filled with concrete having a 1-in. slump. As the casing is withdrawn the full weight of the core and hammer shall rest on the concrete to compact it and force it into the soil.

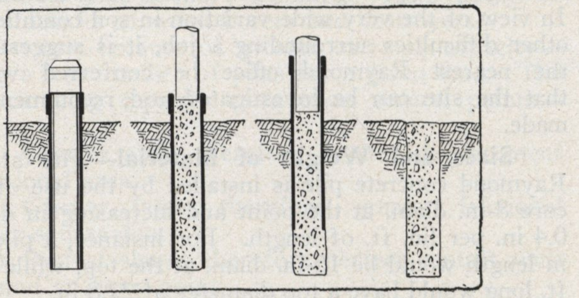

Fig. 1 Fig. 2 Fig. 3 Fig. 4

Compressed Concrete Straight Shaft Type

Fig. 1. Core and casing driven into ground.
Fig. 2. Core removed, casing filled with concrete and a pressure of about 7 tons applied.
Fig. 3. Casing slowly withdrawn—7-ton pressure remaining. Concrete forced into space occupied by casing or voids in ground.
Fig. 4. Finished cylindrical shaft of concrete.

Pedestal Piles—Similar to straight shaft pile except that a pedestal is formed by exerting pressure on a charge of concrete in the bottom of the shell. The enlarged base gives greatly increased bearing capacity.

Specification for Pedestal Piles—Piles shall be formed by driving a steel casing of [14] [16] [18] inches in diameter and close fitting core into the ground by means of a steamhammer until the resistance for a carrying capacity of —— tons as calculated by the E.N. formula shall be indicated.

The core shall then be withdrawn and a suitable charge of concrete placed in casing. The casing shall then be pulled up 18 in. to 3 ft. (depending on soil conditions).

The core shall then be replaced in the casing and the charge of concrete hammered out until about 6 in. remain in the casing.

Note: If the ground is very soft it may be necessary to use a second charge. In no instance shall concrete be compressed so that less than 6 in. of concrete is in the casing.

The core shall then be withdrawn and the casing filled with concrete (having a 1-in. slump) to a height above required elevation of top of finished pile. Core shall then be replaced and the casing withdrawn. Full weight of core and hammer shall rest on the concrete while casing is being withdrawn.

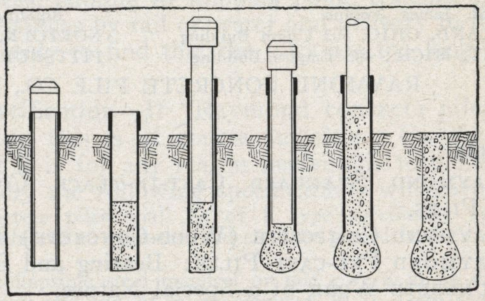

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

Compressed Concrete Pedestal Type

Fig. 1. Core and casing driven into ground.
Fig. 2. Core removed, charge of concrete dropped to bottom of casing.
Fig. 3. Casing pulled up 18 in. to 3 ft. with 7-ton pressure remaining on concrete.
Fig. 4. Charge of concrete rammed out.
Fig. 5. Core is removed, casing filled with concrete. Core replaced and casing slowly withdrawn while concrete is under pressure.
Fig. 6. Finished shaft with enlarged base.

MacArthur Composite (Concrete and Wood) Piles

Where piles of over 40 ft. are required, concrete piles become very expensive. On the other hand, wood piles may be very expensive, owing to a permanent water level necessitating considerable excavation and the cutting off of piles at a low level. For this condition, MacArthur uses a composite pile consisting of a wooden section below with a concrete section above. The MacArthur system assures perfect alignment and bond between wood and concrete by driving the pile in the manner illustrated below.

Specification for Composite Pile—Composite piles shall be formed by driving the core and casing below low water level. A wooden pile shall be driven through the casing, giving perfect alignment until the necessary bearing is indicated under the Engineering News formula.

Note: A standard pedestal pile shall then be formed on the wooden section as described under specifications for pedestal piles.

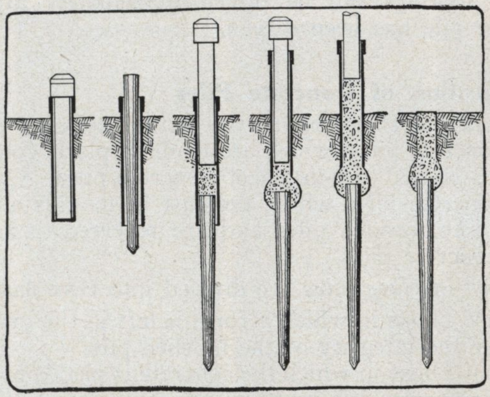

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

Composite Type (Concrete and Wood Pile)

Fig. 1. Core and casing driven into ground.
Fig. 2. Core withdrawn and wooden pile placed in casing.
Fig. 3. Wooden pile, guided by casing, driven down to meet necessary bearing. Butt of pile below ground water level. Core withdrawn, batch of concrete deposited in casing on top of wooden pile and core replaced.
Fig. 4. Casing lifted, pedestal formed around top of wooden pile insuring perfect juncture between wood and concrete.
Fig. 5. Core withdrawn, sufficient concrete deposited to provide for voids and space occupied by casing. Casing then carefully withdrawn while weight of core and hammer remain constant on concrete.
Fig. 6. Finished shaft well knitted and bonded to soil.

RAYMOND CONCRETE PILE COMPANY

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Raymond Standard Cast-in-place Concrete Piles.
Raymond Composite (Wood-Concrete) Piles.
Raymond Pre-cast Piles: Bearing and Sheet.
Concrete Work of a Special Nature.

Slogan

A form for every pile—
A pile for every purpose.

Concrete Piles vs. Wood Piles

There are certain fundamental advantages that concrete piles have over the use of wood piles. Wood piles must be driven so that the cut-off is below permanent water line, whereas concrete piles may be cut off at any level, irrespective of the permanent water line. Wood piles are often broomed or broken while being driven, thus reducing, if not eliminating their supporting power, whereas the Raymond type of concrete pile is not subject to distortion in driving.

In marine work, wood piles most frequently are creosoted for protection against marine borers, whereas concrete piles are not subject to such destruction. Wood piles very often require considerable shoring, underpinning, sheeting, pumping and deep excavation, whereas this can usually be eliminated partially, if not entirely, by the use of concrete piles. Furthermore, there is an important saving in time by the use of concrete piles, as the footings can be placed immediately after the concrete pile has been driven.

Classification of Concrete Piles

Concrete Piles are of two distinct types:

(1) Concrete piles, which are made in place, commonly referred to as "cast-in-place" concrete piles.

(2) Concrete piles which are cast in moulds and then driven like wooden piles and are referred to as "pre-cast" concrete piles.

Cast-in-place piles are divided into two classes:

(a) Those in which a form is left in the ground to preserve the integrity of the finished pile.

(b) Those in which the concrete is placed by means of a temporary driving form which is removed before the concrete hardens and leaves the pile confined only by the loose earth. The green concrete is then, obviously, subject to the admixture of foreign materials, excess of water and distortion due to strains set up by soil pressures and the driving of adjacent piles.

Pre-cast concrete piles are those which are cast in a mould and then driven like a wooden pile and are referred to frequently as "pre-cast concrete piles."

The Raymond Method

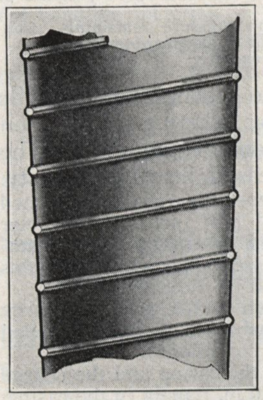
A collapsible steel core, usually 8-in. diam. at the point and increasing in diameter at the rate of 0.4 in. per lin. ft. of length, is incased by a spirally reinforced steel metal shell. The core, thus incased, is driven to a proper penetration in accordance with the Engineering News formula. It is then collapsed and withdrawn from the shell, the shell remaining in the ground and maintaining the resistance encountered in the driving. The shell is then inspected and if found perfect from tip to top is filled with concrete, making a perfect concrete pile.

Under certain conditions we use a core with a larger diameter at the point.

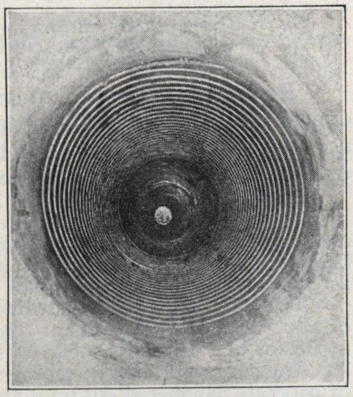
Loads and Spacing—Usually Raymond concrete piles are driven to carry a working load of 30 tons each, but in some cases, loads of from 35 to 40 tons are safely carried.

A working load of 30 tons per pile is accepted by all building departments. The usual spacing of Raymond concrete piles is 2 ft. 6-in. centers for piles less than 30 ft. in length, and for piles in excess of 30 ft. in length, a spacing of 3-ft. centers is more desirable. In view of the very wide variation in soil conditions and other difficulties surrounding a job, it is suggested that the nearest Raymond office be conferred with, so that the site can be investigated and recommendations made.

Sizes and Weight of Material—The standard Raymond concrete pile is installed by the use of a pile core 8-in. diam. at the point and increasing in diameter 0.4 in. per lin. ft. of length. For instance, a pile 20 ft. in length would be 16-in. diam. at the top, while one 37 ft. long would have a top diameter of 22.8 in.



Section of Spiral Shell



Looking Down Into a Driven Shell—30-ft. Long

Continued on next page

The present limit in length of a standard Raymond concrete pile is 37 ft. 6 in. Where conditions are such as to require piles of greater length, we call attention particularly to the Raymond composite pile, a description of which will be found on the next page.

Working Loads—In calculating the resistance to penetration, the Engineering News formula, based on using a steam hammer, has been found most satisfactory. This formula follows:

$$L=\frac{2\,W\,H}{S+0.1}\left\{\begin{array}{l}L=\text{Load in pounds}\\ W=\text{Weight of falling parts in pounds}\\ H=\text{Drop in feet of falling parts}\\ S=\text{Final penetration per blow in inches}\end{array}\right.$$

A No. 1 steam hammer has a weight of 5000 lb. falling 36 inches.

A No. 2 steam hammer has a weight of 3000 lb. falling 30 inches

Thus the carrying capacity of the Raymond concrete pile is not a matter of guesswork or speculation, but is susceptible of computation and demonstration.

Advantages of Taper—The Raymond concrete pile possesses an extreme taper and offers a maximum resistance for a given length. This has been proved by a comprehensive record of resistance encountered in driving plus an extensive series of loading tests, during which the real carrying power of the pile has been checked with the driving resistance.

Prices—The Raymond concrete pile is "made-in place" and not sold by the foot, f. o. b. cars, consequently it is impossible to quote prices without knowing the conditions under which the work is to be done and, for even approximate prices, it is necessary to have some knowledge of the number of piles, probable length, the approximate spacing, soil conditions, accessibility of the site, etc.

Points of Superiority of Raymond Concrete Piles—

(1) Absolute permanency: immunity from decay or from the attacks of wood borers and destroyers.

(2) Economy, because of greater carrying capacity—meaning a less number of piles for a given load. The greater carrying capacity rests upon several points—to wit:

(a) Greater size, therefore greater displacement and frictional area.

(b) Greater taper, therefore greater frictional value per square foot.

(c) Perfect shape, therefore perfect contact with the ground at every point.

(d) Possibility of inspection after driving, hence the ability to load to full capacity, instead of making a large allowance for inefficiency as in the case of wood piles subject to injury by overdriving, telescoping, departing from the vertical, and like defects, none of which are discernible at the moment when correction is possible.

(e) Decreased length of pile as a natural consequence of greater size and taper.

(3) Smaller and lighter footings, because of decreased number of piles.

(4) Decrease in total load to be carried, because of decreased weight of footings.

(5) Practical elimination of shoring, underpinning, sheeting, pumping and deep excavation and the reduction of masonry.

(6) Due to decreased number of piles and consequent reduction in width of wall footings, the center line of columns can be brought nearer to the building line.

(7) Important saving in time caused by:

(a) The smaller number of piles required.

(b) The reduction in the amount of excavation, shoring, sheeting and pumping.

(c) The reduction in quantities of footing or masonry.

(d) Manufacture of the pile in place, from materials readily procurable in all localities, and limit of manufacture to the actual number and exact length of piles required. There is no delay for cutting and trimming trees, hauling to shipping point, transporting for great distances by rail or water and delivery to the job, perhaps only to find that the piles are too long or too short.

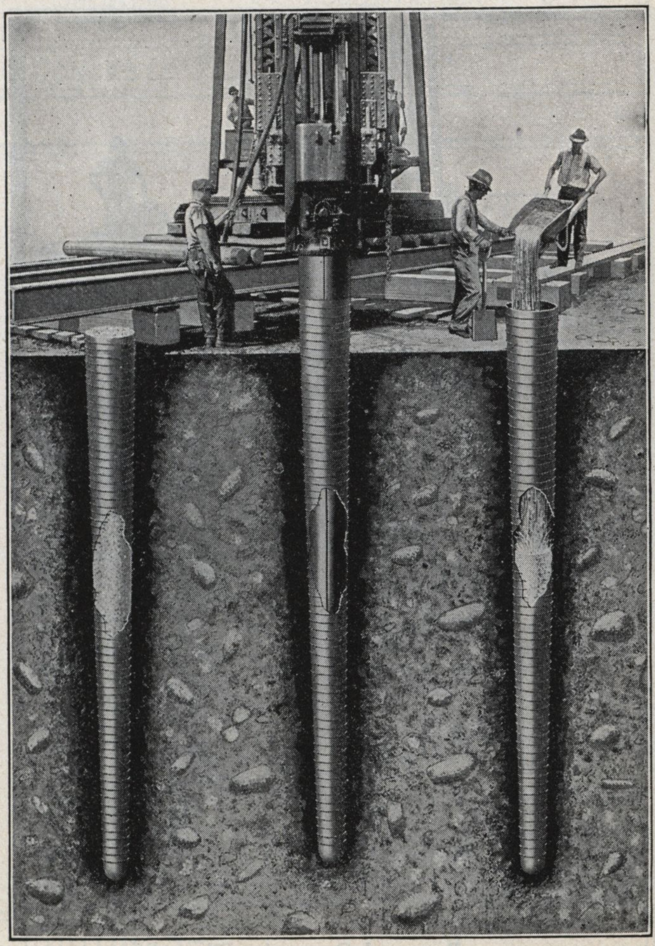
Specification—If "Raymond concrete piles" are called for, this is of course sufficient. On the other hand, if it is for any reason inadvisable to name them specifically the following specifications will cover:

"Concrete piles shall be of a type specifically approved by the architect or engineer, and shall be placed in the following manner:

"A collapsible steel mandrel or pile core 8 in. in diameter at the small end and 20 in. in diameter 30 ft. from that point shall be incased in a spirally reinforced steel shell and driven to a proper penetration. The pile core shall then be collapsed and withdrawn from the shell. Before placing the concrete, each shell shall be inspected and, being found perfect, shall thereupon be filled with concrete placed in accordance with the best practice,"

or

"Moulded-in-place piles shall be of a type suitable for the conditions and subject to the approval of the architect or engineer. They shall be formed in casings left in place, which shall be of sufficient strength to prevent distortion or bulging after mandrel has been withdrawn and while the cavity is being filled with concrete or during the driving of adjacent casings."



Essential Steps in the Making of a Raymond Concrete Pile

Continued on next page

More About the Raymond "Cast-in-place" Pile

The Raymond pile is the only concrete pile employing the spirally reinforced driven casing as a permanent form to remain in the ground. This feature is essential for perfect dependable results. The province of the form or shell is manifold:

(1) To serve as a form for the piles.
(2) To prevent the admixture of foreign substances.
(3) To retain the original moisture in the mixture until the concrete is thoroughly hardened.
(4) To prevent distortion by external pressure, due to the driving of adjacent piles or accumulated pressures from displacement by the pile itself.
(5) To perfectly retain the displaced earth forming the walls of the cavity, so that there may be no relaxation of the ground and therefore no loss of resistance when the displacing force (the core) is removed.
(6) To act as reinforcement of the pile until the concrete shall have attained its maximum strength.

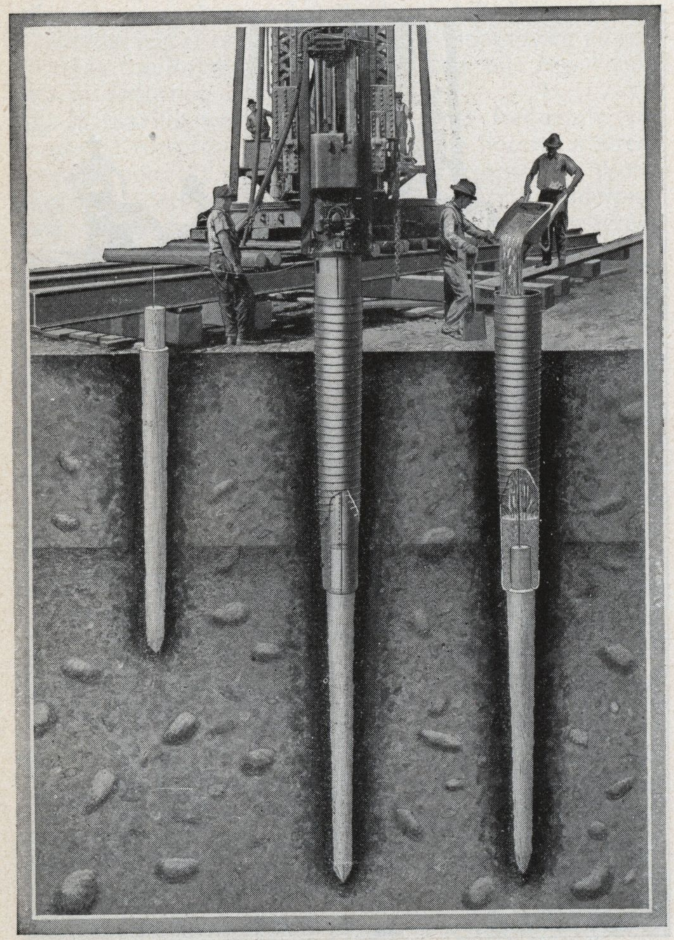
Raymond Composite Piles

For use where depths greater than 37 ft. 6 in. are encountered, we have developed a composite pile made up by superimposing a Raymond concrete section on a previously driven wooden pile.

The wood pile is ultimately driven so that its top is below the permanent water level and from that point to the bottom of the footing is a standard Raymond Concrete pile, as fully illustrated herewith.

Pre-cast Piles

Pre-cast piles have a large and useful field, particularly in marine structures, such as docks, bulkheads, etc.



Raymond Composite Pile

The Raymond Concrete Pile Company is prepared, through its experience, to give good advice upon the use of "pre-cast piles," and also to design and construct work in which a pre-cast pile can be used economically and advantageously.

Special Concrete Construction

In addition to the placing of standard Raymond concrete piles for foundation of structures on land, we construct and design permanent docks, piers, bulkheads, trestles, storage bins, retaining walls, bridges, heavy foundation, shipways, drydocks, etc.

Each problem requires special study for solution and our experienced organization is yours to command.

Services and Facilities

Our staff of experts is at your service, to assist in the designing and installation of concrete piles for all purposes and to meet all conditions.

Engineering—Our engineering department is available to architects and engineers at all times for investigation work and consultation, and we will gladly submit recommendations, designs and estimates covering any problem within the scope of our business.

Equipment—Every Raymond driver is built of structural steel, scientifically designed for the most rapid and economical construction, and the major portion of our equipment is built in our own machineshops.

References

Since 1901 when the first Raymond concrete pile was placed, we have placed up to December, 1924, more than 19,675,000 ft. of Raymond concrete piles throughout the United States, covered by over 1500 separate and individual contracts, and will be only too glad to have you refer to any of the many engineers, architects, owners, and general contractors with whom we have been associated.

A partial list follows:

McKenzie, Voorhees & Gmelin, New York, N. Y.
Helmle & Corbett, New York, N. Y.
Ballinger Co., New York, N. Y.
James Gamble Rogers, New York, N. Y.
Ernest Flagg, New York, N. Y.
William Higginson, New York, N. Y.
C. B. J. Snyder, New York, N. Y.
Maynicke & Franke, New York, N. Y.
Warren & Wetmore, New York, N. Y.
Cross & Cross, New York, N. Y.
Palmer, Hornbostel & Jones, New York, N. Y.
Trowbridge & Livingston, New York, N. Y.
Lockwood, Greene & Co., Chicago, Ill.
Jarvis Hunt, Chicago, Ill.
George C. Nimmons & Co., Chicago. Ill.
Mundie & Jensen, Chicago, Ill.
Pond & Pond, Chicago, Ill.
Perkins, Fellows & Hamilton, Chicago, Ill.
C. W. & George L. Rapp, Chicago, Ill.
Mauran, Russell & Crowell, St. Louis, Mo.
Albert B. Graves, St. Louis, Mo.
Eames & Young, St. Louis Mo.
Clyde N. Friz, Baltimore, Md.
Owens & Sisco, Baltimore, Md.
Albert W. Kelsey & Paul P. Cret, Philadelphia, Pa.
Harris & Richards, Philadelphia, Pa.
Smith, Hinchman & Grylls, Detroit, Mich.
Albert Kahn, Detroit, Mich.
Richards, McCarty & Bulford, Columbus, Ohio
D. A. Bohlen & Son, Indianapolis, Ind.
Proudfoot, Bird & Rawson, Des Moines, Iowa.
Gaggin & Gaggin, Syracuse, N. Y.
Supervising Architect, U. S. Treasury, Washington, D. C.
D. X. Murphy & Bros., Louisville, Ky.
Smith, Rea & Lovett, Kansas City, Mo.
T. R. Kimball, Omaha, Neb.
Esenwein & Johnson, Buffalo, N. Y.
Walker & Weeks, Cleveland, Ohio
Alden & Harlow, Pittsburgh, Pa.

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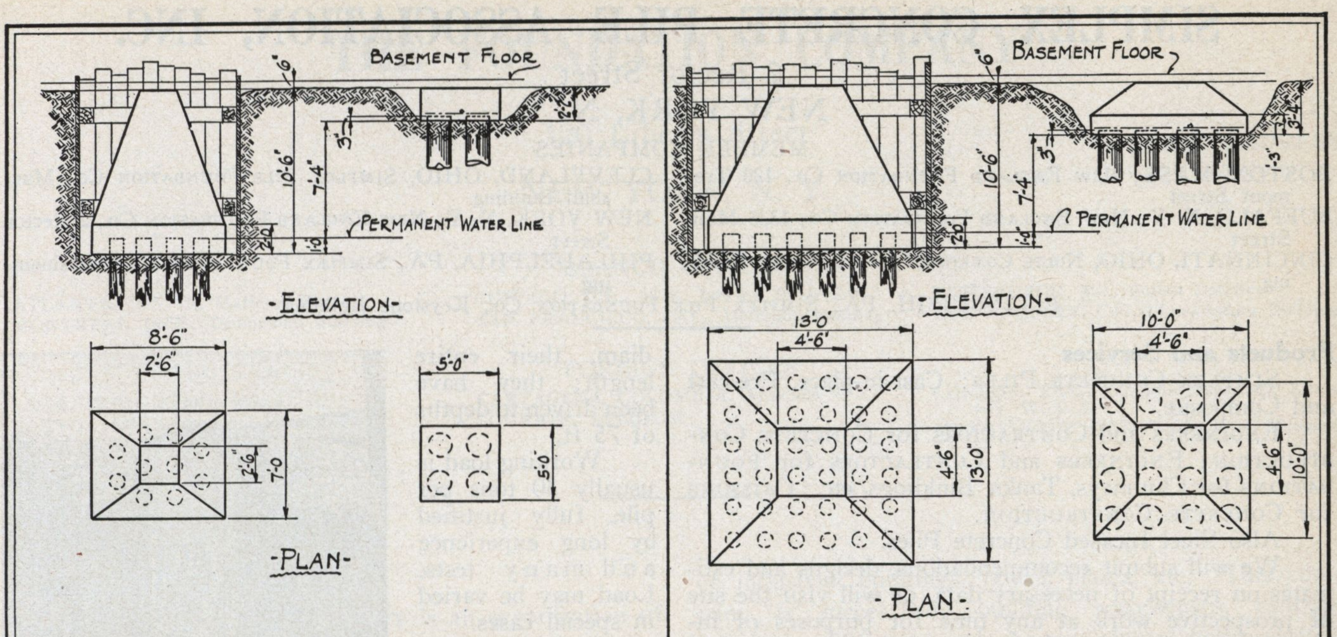

Basement Floor
6"
3"
10'-6"
7'-4"
2'-0"
Permanent Water Line
-Elevation-
8'-6"
2'-6"
7'-0"
5'-0"
-Plan-
Basement Floor
3'-4"
1'-3"
13'-0"
4'-6"
10'-0"
-Elevation-
-Plan-

-For Column Load of 116 Tons-

Wood Pile Load = 15 Tons. Concrete Pile Load = 30 Tons.

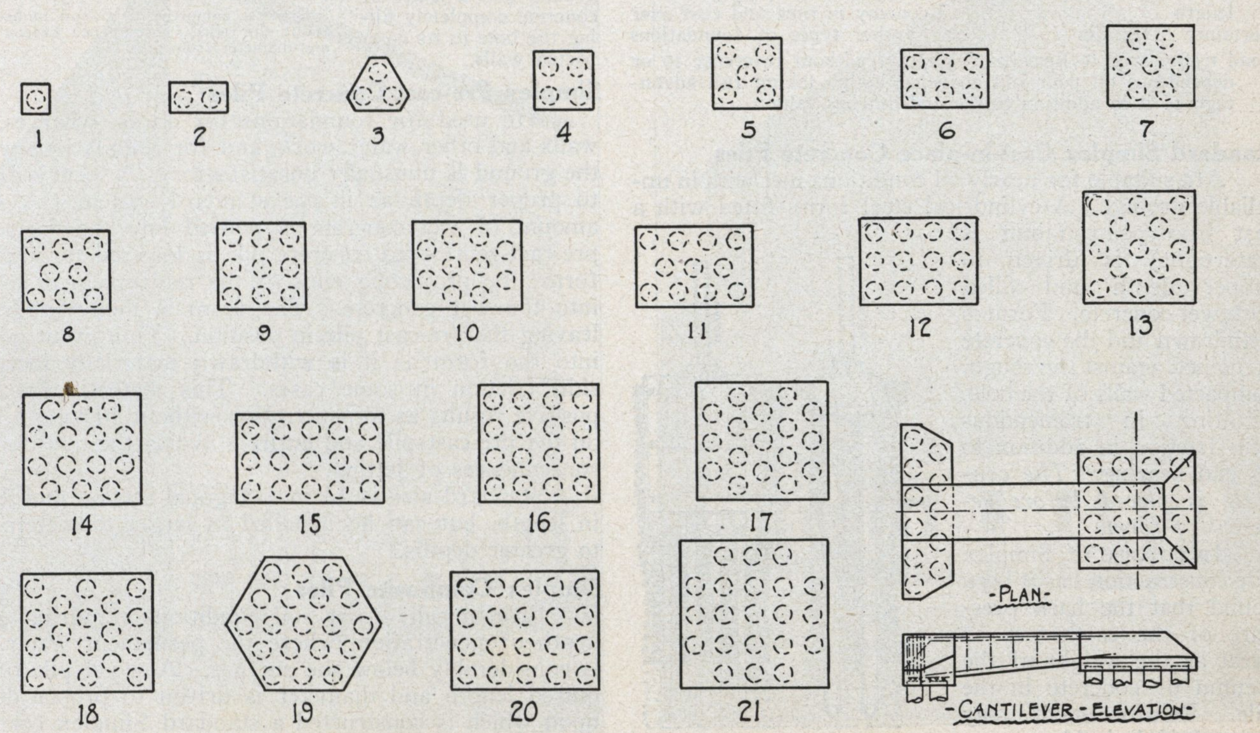
·Quantities·	Wood	Concrete
No of Piles	10.	4.
Concrete	15. Cu. Yds.	2.01 Cu. Yds.
Steel	0	121. Lbs.
Forms	237. Sq. Ft.	44. Sq. Ft.
Excavation	36. Cu. Yds.	3.94 Cu. Yds
Sheeting	39 Lin. Ft. 12 Ft. Deep	0

-For Column Load of 461 Tons-

-Wood Pile Load = 15 Tons.- Concrete Pile Load = 30 Tons-

Quantities	Wood	Concrete
No of Piles	36.	16
Concrete	38.5 Cu. Yds	8.9 Cu. Yds
Steel	0.	1230. Lbs.
Forms	419. Sq. Ft.	150. Sq. Ft.
Excavation	87.5 Cu. Yds	22. Cu. Yds.
Sheeting	60 Lin. Ft. 12 Ft. Deep	0.

~Wood Piles Vs Concrete Piles~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21
-Plan-
-Cantilever-Elevation-

~Typical Pile Footings~

SIMPLEX CONCRETE PILE ASSOCIATION, INC.

2 Rector Street
NEW YORK, N. Y.

MEMBER COMPANIES

BOSTON, MASS., New England Foundation Co., 120 Tremont Street
BUFFALO, N. Y., New England Foundation Co., 1335 Main Street
CINCINNATI, OHIO, Nolte Construction Co., Gerke Building
CLEVELAND, OHIO, Simplex Pile Foundation Co., Marshall Building
NEW YORK, N. Y., New England Foundation Co., 2 Rector Street
PHILADELPHIA, PA., Simplex Foundation Co., Wissinoming
PITTSBURGH, PA., Simplex Pile Foundation Co., Keystone Building

Products and Services

Simplex Concrete Piles: Cast-in-place, Pre-cast and Composite.

Engineers and Contractors for Concrete Construction; Engineers and Contractors for Foundations for Chimneys, Tanks, Buildings, etc.; Caissons for Concrete Construction.

Also Steel Incased Concrete Piles.

We will submit recommendations, designs and estimates on receipt of necessary data, or will visit the site of prospective work at any time for purposes of investigation and consultation, and without obligation.

Specific Types of Piles for Specific Conditions

No one type of concrete pile has as yet been designed that will economically and successfully meet all conditions of soils and loadings. We have developed several methods of installing concrete piles enabling us to meet successfully every condition.

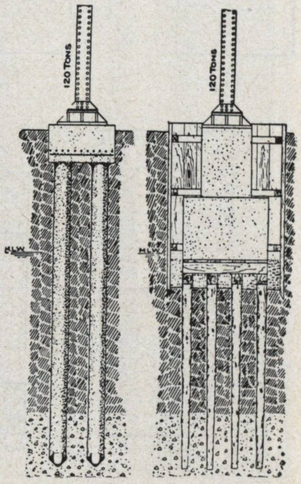
Simplex piles are of proved worth. They have been used extensively in the United States and Europe since 1903 for supporting buildings and other structures.

Advantages of Simplex Concrete Piles

Simplicity; easily and quickly installed
Constant sectional area of 201 sq. in.; equal bulk of concrete for each foot of length
Certainty of results
Durability equal to that of natural rock; renewals never required
Greatest frictional surface
Unsurpassed carrying power
Economy in time and cost over other types of foundations
Load transferred to firm bearing strata without reference to or dependence on poor soil above, although taking full advantage of it in addition to the end bearing value

Standard Simplex Cast-in-place Concrete Piles

Are suitable for nearly all conditions met with in unreliable ground. A cylindrical steel form, fitted with a cast iron point (joint is watertight) is driven to proper depth and filled with wet concrete. Form is withdrawn and the concrete is molded against the rough, compacted walls of the hole, resulting in tremendous skin friction in addition to its end bearing. *The concrete is placed before removal of form.*



Comparison of Concrete Pile and Wood Pile Foundations

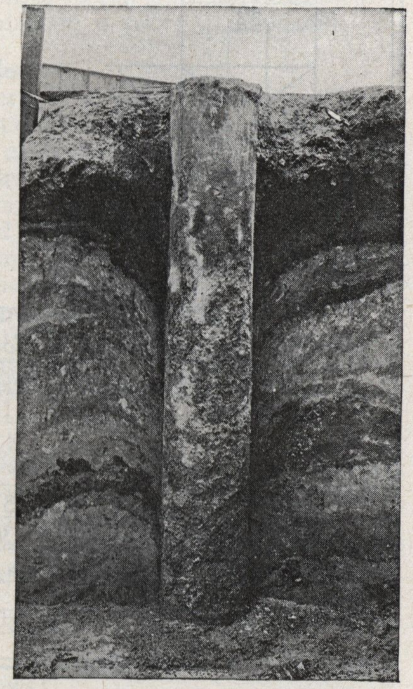
In no case of Simplex pile construction has it been found that the back pressure of the earth was as great as the weight of the column of concrete in the pile. Reinforcement may be used, if desirable.

Standard Simplex concrete piles are 16-in. diam. their entire length; they have been driven to depths of 75 ft.

Working load is usually 30 tons per pile, fully justified by long experience and many tests. Load may be varied in special cases.

Under average soil conditions, a spacing of 3 ft. on centers produces the best results.

Specification—Concrete piles shall be made-in-place by driving to proper penetration a 16-in. diameter steel pipe fitted at its lower end with a detachable cast iron point. This pipe shall be filled with concrete to the proper height and then it shall be pulled out of the ground, leaving the cast iron point in the ground and a shaft of concrete completely filling the hole to its compacted walls.



How a Simplex Pile Compresses Surrounding Soil

Greatest compression of soil immediately about the pile. Disturbance ceases about one diameter from pile

Simplex Pre-cast Concrete Piles

Are used for foundations for docks, wharves, sea walls and other water work, and for foundations where the ground is unusually unsatisfactory. A form is driven to proper depth as in the standard system. A small amount of wet concrete is poured into the form. A pre-cast reinforced concrete pile is lowered through the form; the projecting ends of the reinforcement extend into the wet concrete. The form is then withdrawn, leaving the pre-cast pile in position. Thin grout poured into the form as it is withdrawn materially increases skin friction in some cases. This method admits of positive results as to penetration without striking a blow on the pre-cast pile and entirely avoids the questionable consequences of jetting.

Standard size is 13 in. octagonal section and 40 ft. in length, but can be installed in larger diameters and to greater depths.

Simplex Composite Piles

Economically meet soil conditions requiring great depth of penetration, where the permanent water line is considerably below the surface. A wood pile of required length and diameter is driven to proper depth, upon which is constructed a standard Simplex concrete pile. This method lends itself to the modifications of the standard system and readily admits the use of a precast concrete pile on top of the wood pile.

THE FOUNDATION COMPANY

120 Liberty Street
NEW YORK, N. Y.

CABLE ADDRESS
"UNDERFOUND"

BRANCH OFFICES

ATLANTA, GA., 101 Marietta Street
MONTREAL, QUE., Drummond Building
CHICAGO, ILL., 28 E. Jackson Boulevard
SAN FRANCISCO, CAL., Holbrook Building
PITTSBURGH, PA., Fulton Building
LOS ANGELES, CAL., Lankershim Building

FOREIGN OFFICES

LIMA, PERU, Edificio Wiese
TOKYO, JAPAN, Imperial Hotel
CARTAGENA, COLOMBIA, Apartado 99
LOUVAIN, BELGIUM
LONDON, ENG., Windsor House, 83 Kingsway, W. C. 2
MEXICO CITY, MEXICO, D. F., 45 Uruguay

Services

THE FOUNDATION COMPANY is an organization of Construction Engineers widely experienced in BUILDING DIFFICULT SUPERSTRUCTURES and SUBSTRUCTURES in all parts of the world. The enviable reputation gained in its early history for trustworthy underground construction has followed it into the field of GENERAL CONTRACTING.

THE FOUNDATION COMPANY has built buildings of nearly every known type such as offices, banks, stores, hotels, club houses, dwellings, and also the whole range of industrial buildings, power plants, etc. This company is successfully building warehouses, railroad terminals, filtration and sewage plants, hydro-electric developments, highways, bridges and bridge piers, mine shafts and tunnels, river and harbor developments and complete industrial projects.

As its name would indicate, THE FOUNDATION COMPANY also specializes in underpinning and foundations. Most of the skyscrapers in New York City rest on foundations built by this Company.

Edwards Hotel, Jackson, Miss.
THE FOUNDATION COMPANY, General Contractor

Berkeley Apartment, Boston, Mass.
THE FOUNDATION COMPANY, General Contractor

AMERICAN ROOF TRUSS COMPANY

(INCORPORATED)

Engineers and Constructors of Roof Trusses

TELEPHONE
Franklin 1720, 1721

5 North La Salle Street
CHICAGO, ILL.

NEW YORK OFFICE, 7 West 42nd Street—Telephone, Longacre 10263

Products

Manufacturers and erectors of American Wood Bowstring Trusses.

Where Used

Public garages, service stations, machine shops, schools, banks, warehouses, gymnasiums, bowling alleys and other buildings where clear floor space is needed.

Span and Spacing

Trusses designed for 25 to 125-foot spans. Spacing is usually 16 to 20 feet on centers, depending on length of building.

Height at Center

One-eighth of the length of the truss is standard on all spans. On the end walls of the building joists can be brought down lower than truss curvature to save brickwork. Full saving of brickwork all around the building with our truss.

Information Required for Estimates

(1) Number of trusses needed.
(2) Distance out-to-out of walls.
(3) Spacing between trusses.
(4) Loads. Regular roof load in pounds per square foot, ceiling load or special loads.
(5) Address of job, nature of building, owner's and architect's names.
(6) Any other data that will help us to figure the job without delay.
(7) Unusual conditions—send plan or photostat of same.

Service

Details of truss furnished for each job. For building plans, consult your architect.

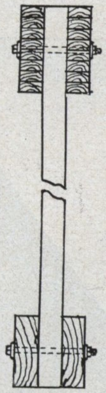
Trusses are built on the job or shipped knocked down as requested. Prompt service rendered at all times.

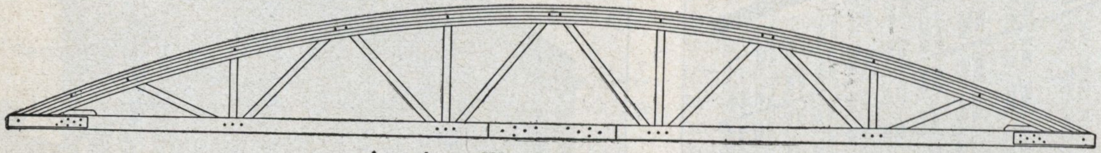
Specifications

Roof trusses shall be American Wood Bowstring Trusses furnished by American Roof Truss Company, 5 North La Salle Street, Chicago, Illinois.

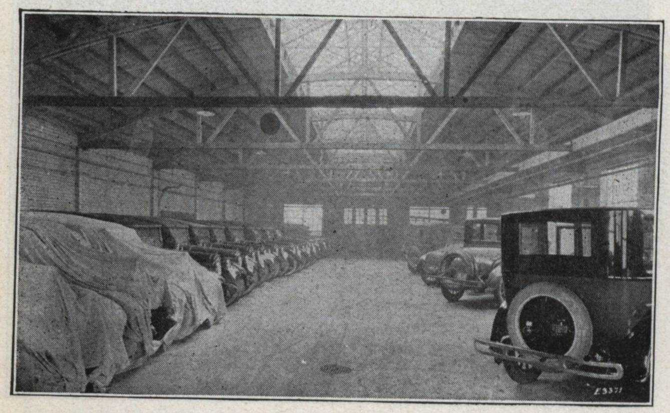
Literature

Send for illustrated folder and valuable suggestions covering economical layout and brick saving features.

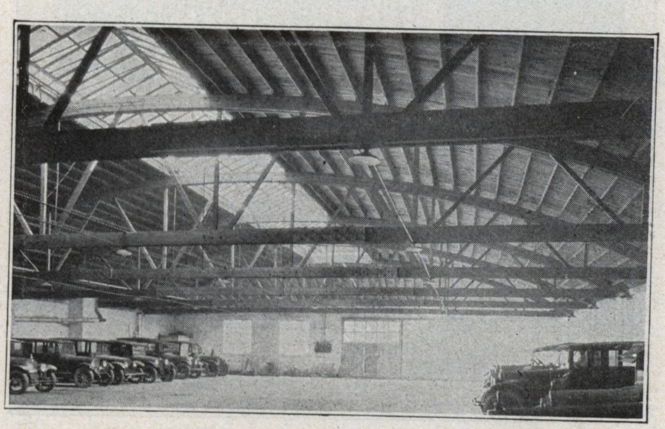




American Wood Bowstring Truss
Spans 25 to 125 ft.



50-ft. Trusses, Buick Service Station, Chicago, Ill.
Robert S. De Golyer, Architect



82-ft. Trusses, Senate Garage, Chicago, Ill.
Rawson & Eisenburg, Architects

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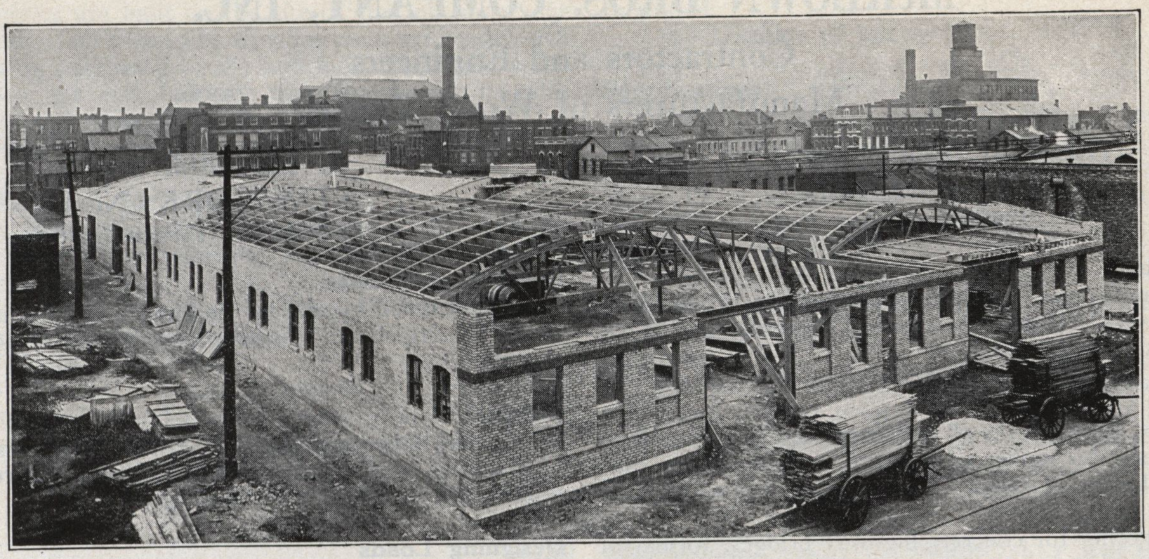
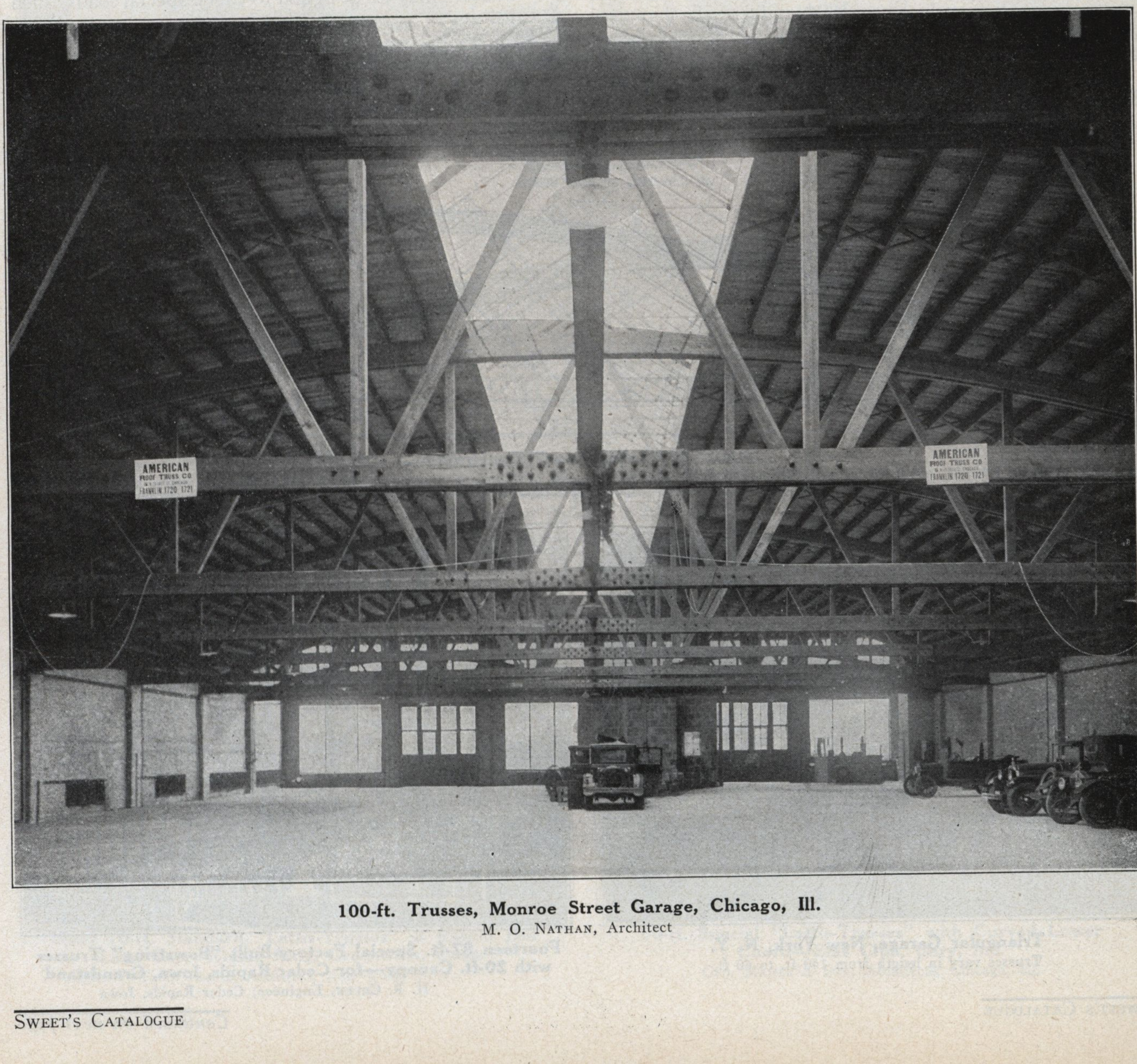


Eleven 72-ft. Trusses and Eleven 53-ft. Trusses, Throop Street Garage, Chicago, Ill.
A. F. Rusy, Architect


AMERICAN ROOF TRUSS CO FRANKLIN 1720 1721
AMERICAN ROOF TRUSS CO FRANKLIN 1720 1721

100-ft. Trusses, Monroe Street Garage, Chicago, Ill.
M. O. Nathan, Architect

ESTABLISHED 1894

McKEOWN BROS. COMPANY, INC.

Contractors and Engineers
Manufacturers of Wood Trusses

112 West Adams Street
CHICAGO, ILL.
TELEPHONE, CENTRAL 7950

21 East 40th Street
NEW YORK, N. Y.
TELEPHONE, VANDERBILT 10149

Products

Manufacturers of and contractors for WOOD "LATTIS-TRUSSES"; WOOD "BOWSTRING" TRUSSES and WOOD TRUSSES of other types.

Uses

Roof supports for all buildings requiring clear floor space, such as commercial garages, machine shops, storage buildings, assembly halls, gymnasiums, airplane hangars, etc.

Centering for concrete highway bridges, forms for concrete arches, etc.

Arch ribs for Gothic barns.

Experience

McKEOWN BROS. COMPANY, INC. have been in operation continuously since 1894 and are the pioneers in the construction and manufacture of circular upper chord wood roof trusses.

Spans

Built for spans from 30 to 150 ft.

Spacing of Trusses

Determined by size of building and building ordinance requirements. Usually spaced from 16 to 20 ft. on centers.

Material

Unless otherwise specified, trusses are constructed of material which will allow the greatest stress per square inch as specified in building codes.

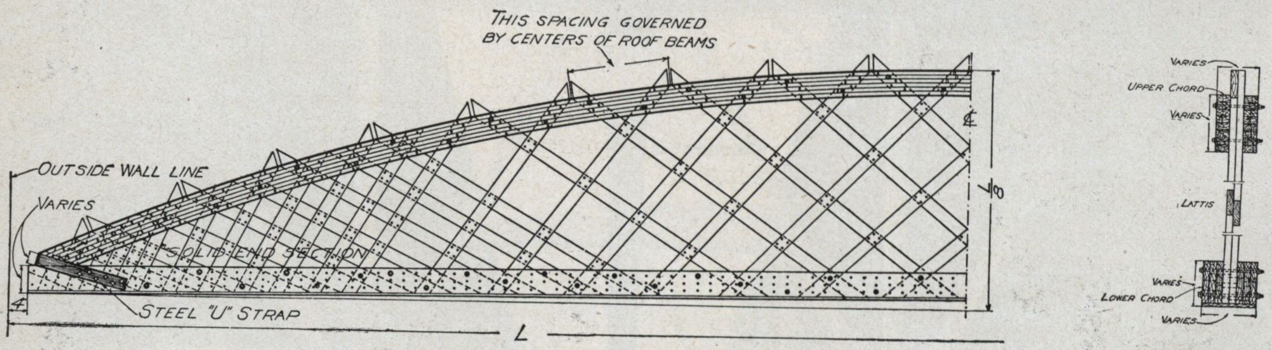
Designing Loads

Live load is governed by the building ordinance in the locality in which trusses are installed. Dead load is figured to meet the roof conditions of each structure.

Trusses may be designed to carry special loads, such as balconies or cranes.

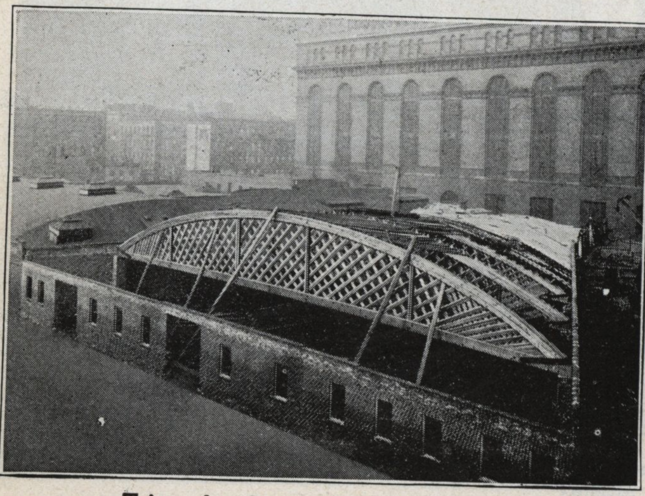
Drawings

Full detail drawings are furnished for each job. Height of trusses at center is standard—one-eight of length.

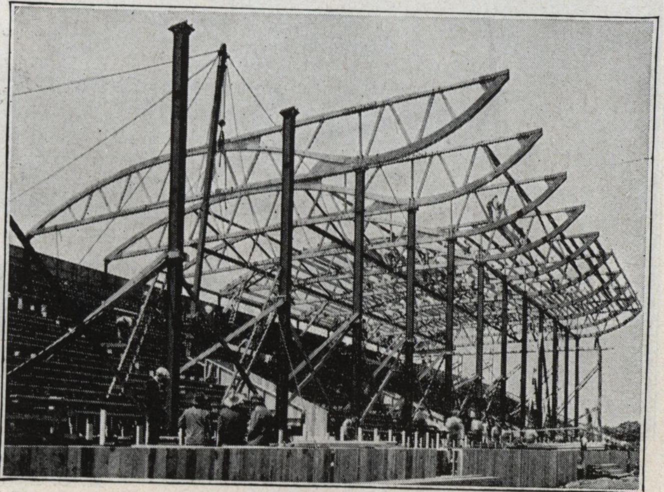


Details of "Lattis-Truss" Construction

"Lattis-Trusses" are built of material having a minimum thickness of 2 in. Trusses are blocked throughout in upper and lower chords where lattice cross to give a solid nailing surface. Special attention is given to nailing and bolting so that the strength in all members will be fully developed



Triangular Garage, New York, N. Y.
Trusses vary in length from 140 ft. to 60 ft.



Fourteen 87-ft. Special Factory-Built "Bowstring" Trusses with 20-ft. Canopy—for Cedar Rapids, Iowa, Grandstand
H. R. GREEN, Engineer; Cedar Rapids, Iowa

Continued on next page

Construction and Delivery

Trusses are built on the site of the job under our supervision and erected by us when piers are ready. All material is purchased locally and local labor used when possible. We also fabricate the "Bowstring" truss in Chicago and ship it in the knock-down ready for assembling and erection by others.

Data Required for Estimates

As practically every installation is different we should receive the following information before submitting estimates:

(1) Outside width of building, thickness of walls and number of trusses required.

(2) Spacing of trusses.

(3) Loading required in pounds per square foot; give required live and dead roof load, ceiling load if any. If trusses carry any concentrated loads such as balconies or cranes, estimates can not be given unless plans are submitted.

(4) Location of job.

Specifications

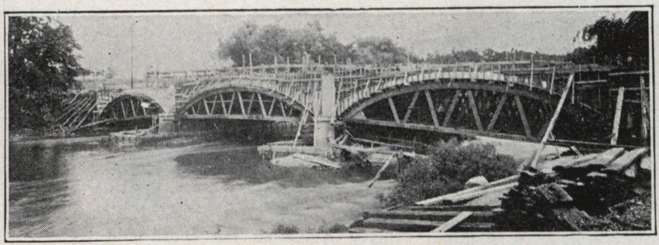
Roof trusses shall be "Lattis-Trusses" or "Bowstring" Trusses to be built and erected, or furnished, by McKeown Bros. Company, Inc., 112 West Adams Street, Chicago, or 21 East 40th Street, New York.

Engineering Service

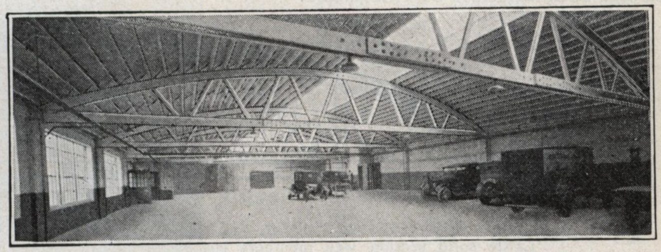
Our engineers will gladly work in conjunction with architects in securing an efficient and economical layout.

Literature

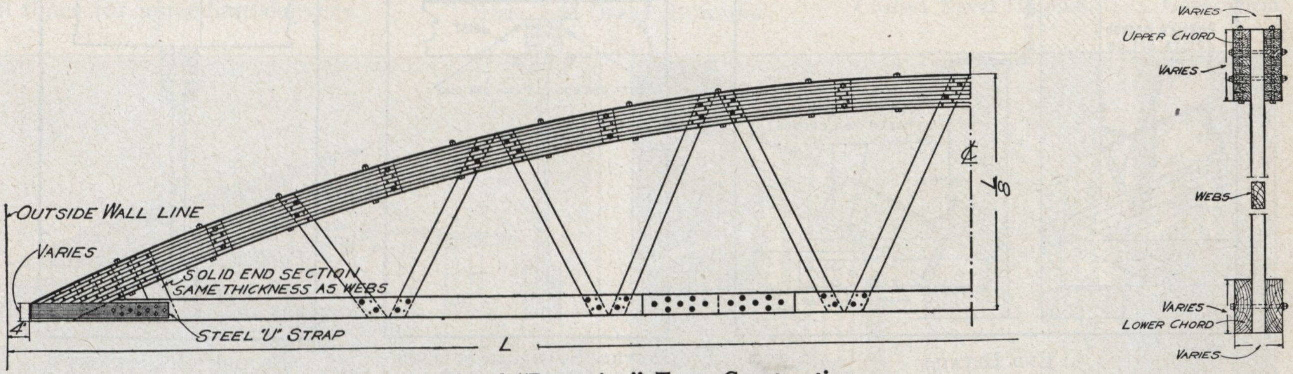
Folders illustrating installations and service sheets containing valuable information for design of buildings requiring roof trusses will be sent upon request.



Twenty-one 66-ft. Special Factory-Built "Bowstring" Trusses Used as Centering of Concrete Highway Bridge, Lansing, Mich.



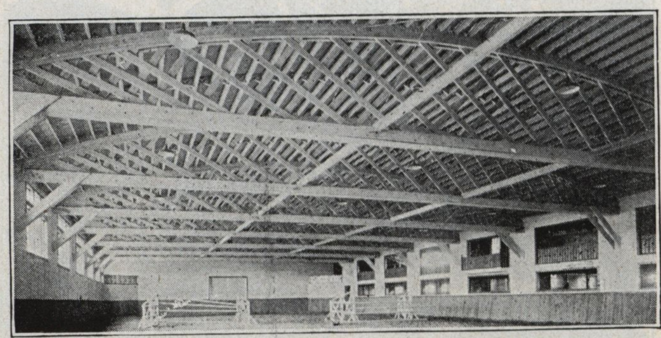
Typical Garage Interior—Standard "Bowstring" Trusses



Details of "Bowstring" Truss Construction

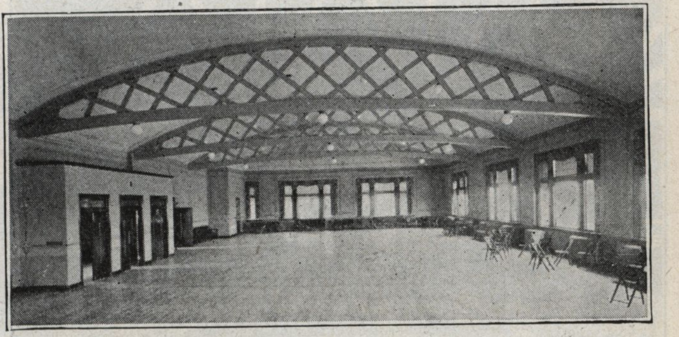
"Bowstring" trusses are built of material having a minimum thickness of 3 in. All stresses are transmitted through bolted connections. Web members have solid sections.

When desired, "Bowstring" trusses are furnished f.o.b. cars, location of job in our "Factory-Built" type, which we fabricate complete in Chicago and ship knockdown with full instructions for assembly and erection. In this type the pieces that form the upper chord are glued, nailed and bolted together.



Eight 70-ft. Standard "Lattis-Trusses" in Round Hill Land Corp. Riding Ring, Greenwich, Conn.

T. E. Blake, Architect, New York, N. Y.



60-ft. Special "Lattis-Trusses" with Curved Lower Chord—Elks Club, Gary, Ind.

Geo. Maher & Son, Architects, Chicago, Ill.

SUMMERBELL TRUSS COMPANY

Wood Roof Trusses

30 North La Salle Street
CHICAGO, ILL.
TELEPHONE, FRANKLIN 0590

756 East 29th Street
LOS ANGELES, CAL.
TELEPHONE, HUMBOLDT 8174

Products

Manufacturers and erectors of Wood Roof Trusses.

Wood Roof Trusses

Spans designed from 30 to 125 ft. in accordance with best standard engineering practice and to comply with various local ordinances.

Trusses can be erected at the building site anywhere. No delays due to inability in obtaining materials; local lumber yards carry in stock all sizes of materials used in the construction of this truss.

Information Required for Estimates

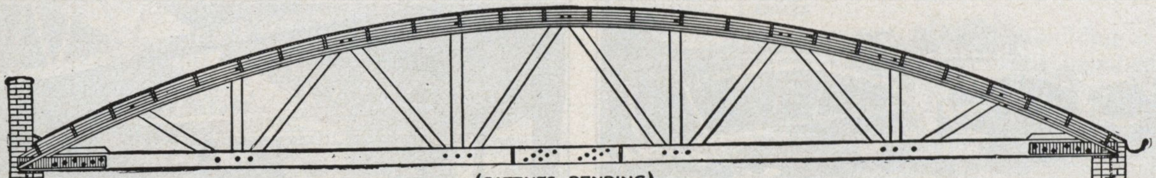
In requesting quotations the following information is necessary:

(1) Number of trusses required. (2) Span out-to-out of building walls. (3) Spacing of trusses. (4) Loads: roof, ceiling or special loadings. (5) Location of building, name of architect and owner's name.

Service

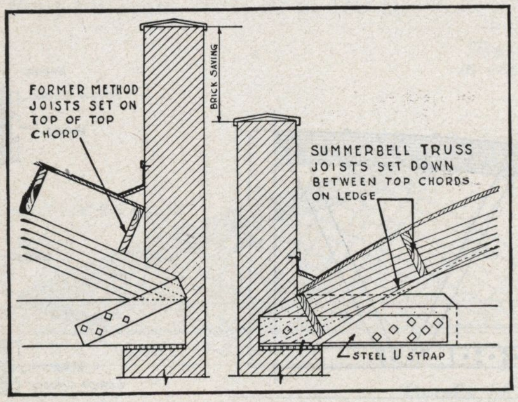
Estimates and details furnished on request.

It is suggested that architects avail themselves of our engineering service in any design calling for special types of roof trusses.

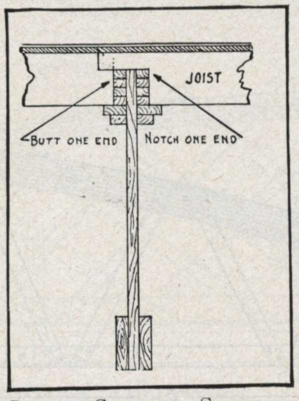

(PATENTS PENDING).

Summerbell Wood Roof Truss

Large solid section web members spaced far apart assure maximum light distribution. Heavy laminated top chord and bottom chord of two large solid sections reduce fire hazard. Note that the arch of the top chord is uniform from end to end and that there are no sharp breaks which cause rain to carry gravel to the gutters, or allow tar melted by the sun to run down

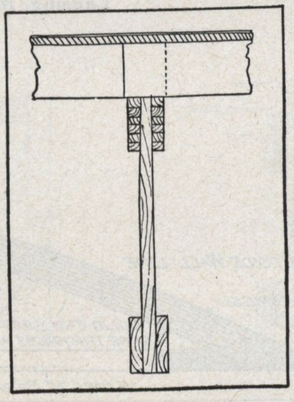

FORMER METHOD JOISTS SET ON TOP OF TOP CHORD
BRICK SAVING
SUMMERBELL TRUSS JOISTS SET DOWN BETWEEN TOP CHORDS ON LEDGE
STEEL U STRAP

End Details



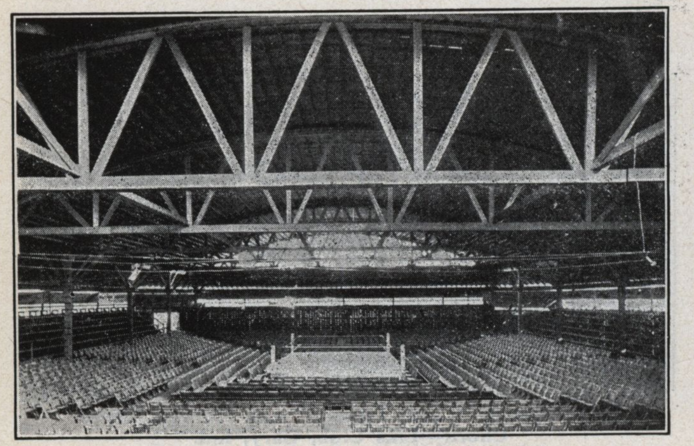
Section Standard Summerbell "Rigid-roof" Construction

Summerbell trusses save several courses of brick wall on all sides of the building in addition to making a rigid roof

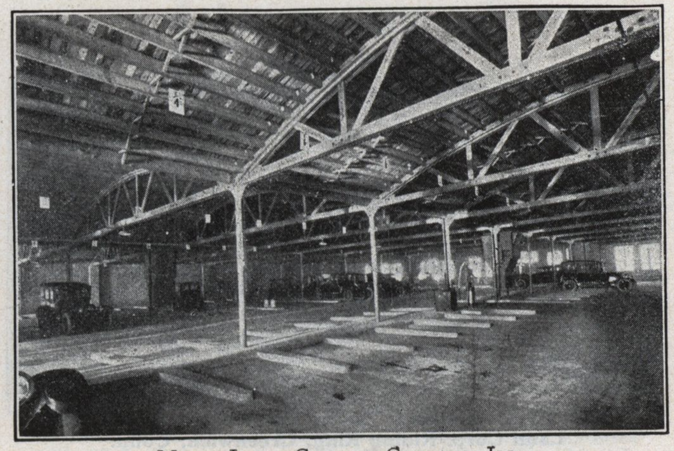


Section of Ordinary Construction

Roof joists set on top of top chord. Trusses of this type can be furnished, if desired



American Legion Stadium, Hollywood, Cal.
Eight trusses, 108-ft. span



Morse-Lake Garage, Chicago, Ill.
Twenty-seven 50-ft. trusses

EASTERN BRIDGE & STRUCTURAL CO.

Designers, Erectors, Fabricators

WORCESTER, MASS.

OFFICE AND FABRICATING SHOPS, 88 Crescent Street, WORCESTER, MASS.

Products and Services

Designers, erectors and fabricators of all classes of Steel Structures, particularly Buildings and Bridges.

This firm, one of the largest structural steel companies in New England, maintains an excellent designing and engineering department which is at the service of architects and contractors.

It will execute all the designing and engineering in connection with structural iron work on all classes of structures.

It is the only large concern in New England who are structural fabricators as well as manufacturers of ornamental iron work, and take complete contract for both branches of the business.

For Ornamental Iron, see page 754.

Facilities

A large and complete stock of structural shapes is carried on hand at all times for immediate delivery.

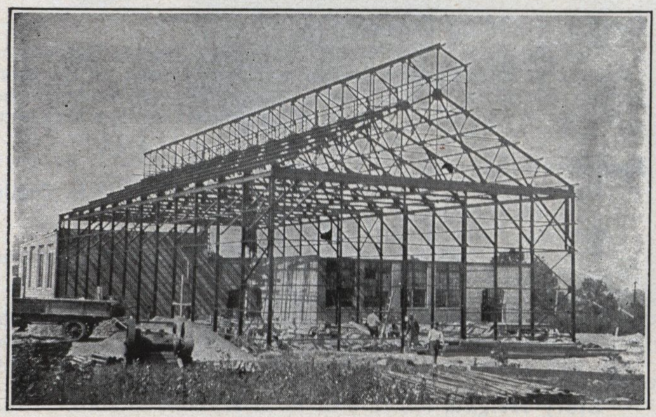
Steel for Office Building

The accessibility of the plant to three leading New England railroad lines insures prompt deliveries.

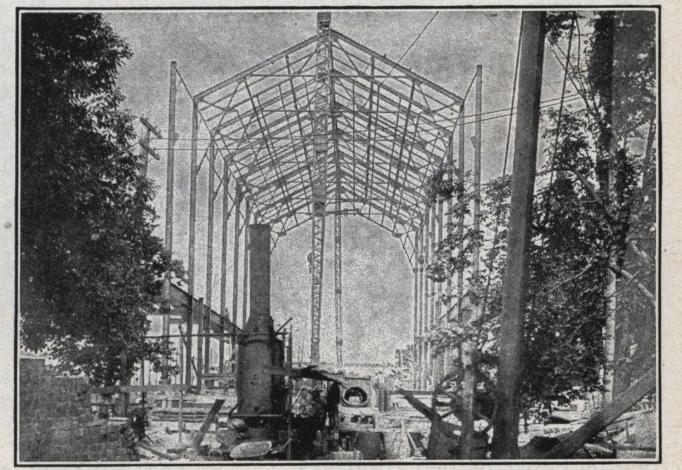
References

The following is a partial list of representative structures built by this company, with names of architects or engineers:

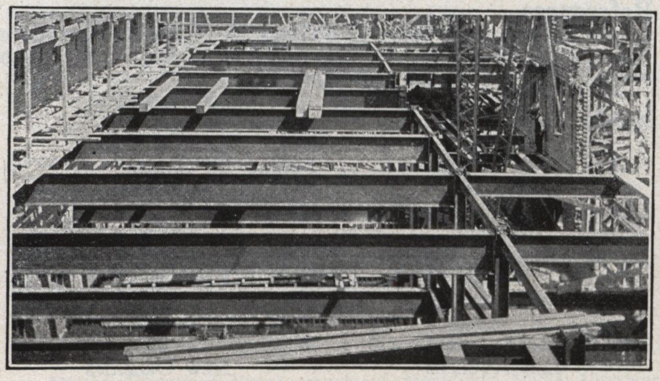
- Randall's Island Hospital Building, Donn Barber
- Windsor Print Works Boiler House, John A. Stevens
- Spring Perch Co. Building, Fletcher-Thompson, Inc.
- Fort Orange Paper Co. Machine Room, Chas. T. Middlebrook
- Aetna Mills Dye House, H. M. Haven and Wm. W. Crosby
- Falulah Paper Co. Building, S. M. Green Co.
- Winchendon Electric Light Co., Charles T. Main
- Crocker Burbank Machine Room, George F. Hardy
- Washburn & Heywood Powerhouse, Lee & Hewitt
- Maynard School, Edward B. McGirr
- Strong-Hewitt Dye House, Newton C. Bond
- Watertown Arsenal Administration Building, U. S. Government
- Chelsea Naval Hospital, U. S. Government



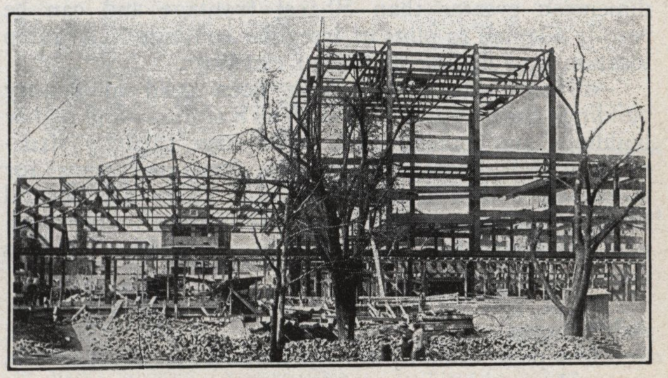
Steel for Forge Shop



Steel for Holy Cross Chapel



Steel for Dormitory



Steel for High School

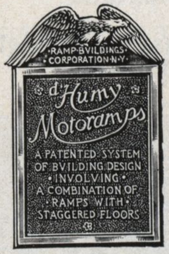
RAMP BUILDINGS CORPORATION

Consulting Garage Engineers

21 East 40th Street
NEW YORK, N. Y.

Product

d'Humy Motoramps, a patented System of Garage Design, involving a combination of ramps with staggered floor levels, the building being divided into two units.



Interfloor Travel in Multi-floor Garages

Car movement from floor to floor can be accomplished in three ways:

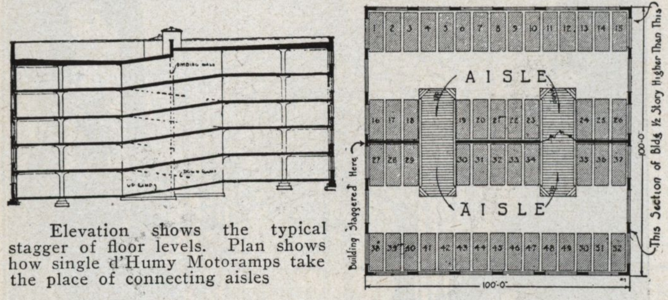
(1) By elevators which require a considerable investment and a yearly cost for upkeep, power and operating labor.

(2) By long ramps (straight, curved or spiral) which involve only construction cost, but which are wasteful of floor space which would otherwise yield car storage income.

(3) By d'Humy Motoramps which have all the service advantages of ordinary ramps and permit the storage of at least as many cars as with elevators, and 10 to 20% more than with common ramps.

d'Humy Motoramps

The basis of this system of building design is the arranging of a portion of the structure with floor levels midway between the floor levels of the rest of the building. The floors of the two sections are joined by short, inclined ramps, each rising one-half story at an easy grade.



Elevation shows the typical stagger of floor levels. Plan shows how single d'Humy Motoramps take the place of connecting aisles

The division line between the two units of the structure may extend across one dimension of the building or may be arranged in a rear corner so that the building will not show the staggered effect in its fenestration on either of two frontages.

d'Humy Motoramps are adaptable for plots of any dimension greater than 50-feet frontage and can be readily adapted to plots of irregular contour. The ramp location is as flexible as that of elevators.

d'Humy Motoramps have been used in 2-story buildings and in garages as high as 8 stories—and higher buildings are contemplated. For large capacity structures it is advisable to provide separate ramps for ascending and descending travel. There are several fundamental arrangements of Motoramps—which can not, however, be catalogued in the limits of this space.

Advantages

Complete visibility for the motorist on short length, open side ramps.

100% convenience in driving to or from any storage space—no congestion.

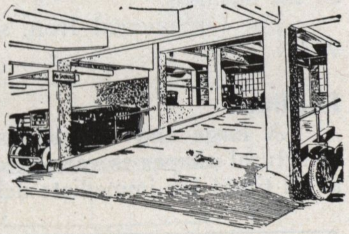
Maximum car storage and maximum net income for the owner.

Simple construction, no depreciation, no mechanical troubles, no after-expense.

Free Advisory Service to Architects

Ramp Buildings Corporation asks the privilege of sketch-planning comparative car storage layouts to demonstrate the most efficient plan for a building of given dimensions, and the opportunity of placing its specialized knowledge at your disposal in establishing the critical dimensions (ceiling heights, size of bays, ramp and aisle widths and location, column location, etc.) and in laying out the entrance, service and control facilities.

This consulting service is rendered to architects without charge.



Complete visibility is a feature of these open side, short length ramps. The driver can see the full turn ahead

Cost to Building Owner

For the use of the d'Humy Motoramp System and a continuation of our advisory service, a charge (based on the total number of square feet of garage floor area) is made to the owner of the building. There is no charge to the architect.

Specifications

Car Spaces—6 ft. 6 in. to 7-ft. width, 12 to 15-ft. depth.

Aisles—20-ft. width in the clear.

Car Bays—Three car bays are most efficient.

Columns—Outside face of column set back 1 ft. from line of car spaces.

Ramp Grade—Approximately 15%.

Ramp Width—13-ft. minimum clear width for single ramps; 23-ft. minimum for double ramps. Extend ramps 3 or 4 ft. past columns into aisle. Banking is advisable in some cases.

Story Heights—10 ft. 6 in. to 11 ft., floor to floor. Clear headroom should be a minimum of 8 ft.

Note: For complete data ask us for garage design data sheets.

References

In the last three years 47 d'Humy Motoramp garages have been erected, 16 are now building and a large number have been contracted for. Among these are:

New York
Arthur Brisbane Garage
Buffalo
Statler Hotel Garage
Detroit
Detroit Garages (3 buildings)
Boston
Jordan Marsh Co. Garage
Toledo
Municipal Garage
St. Louis
18th St. Garage (1250 cars)
Los Angeles
Mutual Garage

Washington
Carlton Garage
London, Eng.
Poland St. Garage
Montreal
Royal Garage
Seattle
Times Sq. Garage
Philadelphia
12th St. Garage
Denver
Autohotel Garage
New Orleans
Iberville Garage

R. GUASTAVINO COMPANY

INCORPORATED

Timbrel Arch Construction and Masonry Acoustical Installations

BOSTON, MASS.
40 COURT STREET

1133 Broadway
NEW YORK, N. Y.

FACTORY
WOBURN, MASS.

Products and Services

The business of this company is that of DESIGNING and INSTALLING the SYSTEM of TIMBREL ARCH CONSTRUCTION, and the installation of fireproof acoustic material known as AKOUSTOLITH.

Also Rumford Ceramic Acoustic Tile.

Facilities

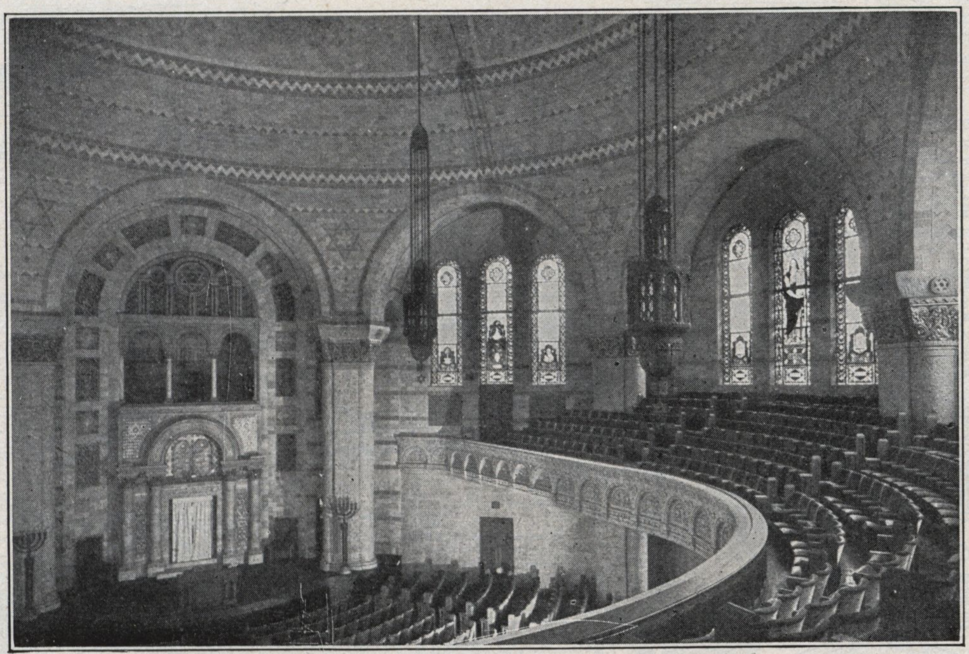
This company owns and operates for its sole use, as contractors, a factory for the manufacture of the better grades of glazed and unglazed tile and acoustic tile required in its exposed or finished work, thus having unexcelled facilities for prompt installation and the making of special pieces in connection with its contracting business.

Akoustolith Tile

Description—AKOUSTOLITH is an all-masonry material having a sound absorbing or acoustical value many times greater than that of ordinary plaster. Its value has been demonstrated by laboratory tests made by the late Prof. Wallace C. Sabine, of Harvard University, and by many important installations.

Adaptability—Owing to its light weight (about 4 lb. per board foot) and facility of manufacture, AKOUSTOLITH is easily adapted to plain or elaborate architectural forms.

Texture—AKOUSTOLITH is made in a variety of textures, usually of a fine granular appearance, and can be made to closely resemble the usual building stone employed for interiors.



Isaiah Temple, Chicago, Ill.

ALFRED S. ALSCHULER, INC., Architects

Dome, pendentives and vaults of Guastavino Timbrel Tile Construction. Soffit course of various shades of AKOUSTOLITH Sound Absorbing Artificial Stone. Part of wall surfaces of similar material

Some Acoustical Installations*

BUILDING AND LOCATION	ARCHITECT
B'Nai Jeshurun Synagogue, Newark, N. J.	Albert S. Gottlieb
Chapel of Incarnate Word, Houston, Tex.	Maurice J. Sullivan
Chizuk Amuno Temple, Baltimore, Md.	Joseph Evans Sperry
Federal Reserve Bank, Boston, Mass.	R. Clipston Sturgis
Federal Reserve Bank, New York, N. Y.	York & Sawyer
Federal Reserve Bank, Richmond, Va.	Sill, Buckler & Fennhagen
First Congregational Church, Montclair, N. J.	Bertram G. Goodhue
First M. E. Church, Asbury Park, N. J.	Lucian E. Smith, Harry E. Warren
Goodyear Theater, Akron, Ohio	Walker & Weeks
Hennepin Avenue M. E. Church, Minneapolis, Minn.	Hewitt & Brown
Hochelaga Church of the Nativity, Montreal, Que.	Viau & Venne
Leslie Lindsey Memorial Chapel, Boston, Mass.	Allen & Collens
Malden Savings Bank, Malden, Mass.	Monks & Johnson
Morgan Memorial, Church of all Nations, Boston, Mass.	Frank A. Bourne
National Academy of Sciences, Washington, D. C.	Bertram G. Goodhue
Nazareth Hall, St. Paul, Minn.	Maginnis & Walsh
Nebraska State Capitol, Lincoln, Neb.	Bertram G. Goodhue
Notre Dame Church, New York, N. Y.	Cross and Cross
Smith College Swimming Pool, Northampton, Mass.	Edwin S. Dodge
St. Bartholomew's Church, New York, N. Y.	Bertram G. Goodhue
St. Catherine's College Chapel, St. Paul, Minn.	H. A. Sullwold
St. Thomas' Church, New York, N. Y. (partial installation)	Cram, Goodhue & Ferguson
St. Vincent Ferrer Church, New York, N. Y.	Bertram G. Goodhue
Temple Meeting House, Cleveland, Ohio	Charles R. Greco
Trinity College Chapel, Washington, D. C.	Maginnis & Walsh
University of Pennsylvania, Philadelphia, Pa.	Wilson, Eyre & McIlvaine Day Bros. & Klauder Stewardson & Page
University of Saskatchewan, Saskatoon, Sask.	David R. Brown
Boston Fire Signal Station, Boston, Mass.	O'Connell & Shaw
St. George's Chapel, Newport, R. I.	Cram & Ferguson
North Woodward M. E. Church, Detroit, Mich.	W. E. N. Hunter
St. Vincent's Church, Buffalo, N. Y.	Comes, Perry & McMullen
St. Mary's Seminary, Cleveland, Ohio	Franz C. Warner
Newark Lodge of Elks, Newark, N. J.	Warren & Wetmore

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*Note: Comprised almost entirely of Akoustolith Sound Absorbing Tile—a few being of "Rumford" Acoustical Tile (an earlier development).

Continued on next page

Permanency—The permanency of AKOUSTOLITH, owing to its composition of masonry, is assured. It will not disintegrate nor warp; moisture has no effect on its structure. It is genuine masonry, and non-combustible.

Color—AKOUSTOLITH is manufactured in a wide range of colors, ranging from gray white through various shades of buff, brown, or any colors resembling those of building stones.

Stock Sizes—AKOUSTOLITH is manufactured in any size from the smaller tile dimensions—4x8, 5x10, 6x12, 8x16 and 10x20 in., all about 1 in. thick.

How It Is Installed—AKOUSTOLITH used on ceilings has primarily been installed in connection with our regular Guastavino arch construction, using it as a soffit course of tile and backing up the same with two or more layers of rough tile. It is, however, being largely used by applying it directly on the soffit of the concrete floor slabs, or wire lath and cement plaster ceilings.

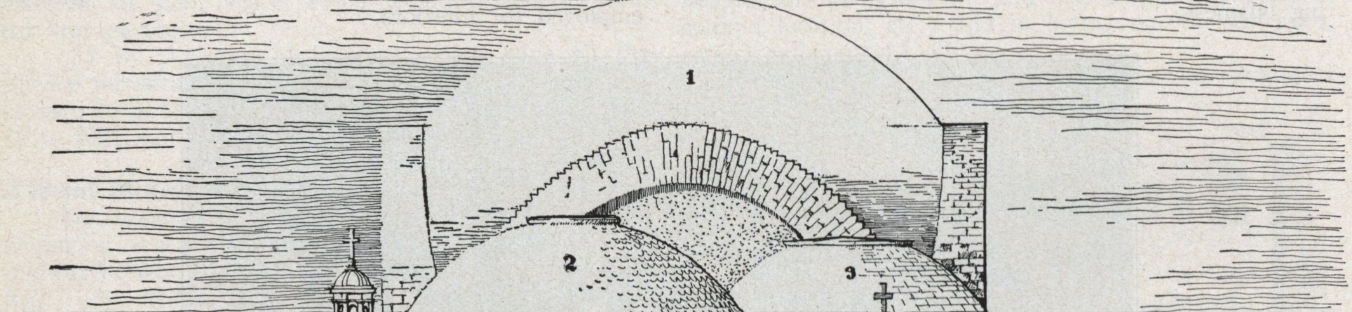
For inside walls the installation can be made directly on any of the many masonry surfaces without scratch coat, if surface is reasonably true, or applied on a wire lath backing as described for ceilings. In these cases the material can be purchased f.o.b. factory and set by either the general contractor or his tile layer.

Akoustolith Plaster

In the process of the development of its business and its manufacturing, this company many years since succeeded in creating a plaster of large acoustical efficiency. As this product has been thoroughly tried out in many buildings, it is now offered to the profession, and the company is prepared to make quotations on AKOUSTOLITH Sound Absorbing Plaster, sold at the factory, and installed by the general plastering contractor.

Co-operation

Owing to the varied uses of our construction, involving engineering and architectural features, the more satisfactory method is to send us, before the plans are fully drawn, a sketch outline of the requirements, which will enable us to indicate the most approved method of treatment and the approximate cost.



Some Domes Constructed by R. Guastavino Company up to 1910

	Building and Location	Span	Architect
1.	Cathedral, St. John the Divine, New York, N. Y.	135 ft. at base	Heins & La Farge
2.	National Museum, Washington, D. C.	80 “ “ “	Hornblower & Marshall
3.	Institute of Arts and Sciences, Brooklyn, N. Y.	64 “ “ “	McKim, Mead & White
4.	St. Francis de Sales Church, Philadelphia, Pa.	61 “ “ “	Henry D. Dagit
5.	Bank of Montreal, Montreal, Can.	69 “ “ “	McKim, Mead & White and A. T. Taylor
6.	Church of St. Barbara, Brooklyn, N. Y.	43 “ “ “	Helmle & Huberty
7.	Girard Trust Co., Philadelphia, Pa.	101 “ “ “	McKim, Mead & White and Allen Evans
8.	University of New York, N. Y.	70 “ “ “	McKim, Mead & White
9.	McKinley National Memorial, Canton, Ohio	56 “ “ “	H. Van Buren Magonigle
10.	St. Paul's Chapel, Columbia University, New York, N. Y.	52 “ “ “	Howells & Stokes
11.	Rodef Sholem Synagogue, Pittsburgh, Pa.	90 “ “ “	Palmer & Hornbostel
12.	University of Virginia, Charlottesville, Va.	70 “ “ “	McKim, Mead & White
13.	Elephant House, Bronx Park, New York, N. Y.	34 “ “ “	Heins & La Farge
14.	Madison Square Presbyterian Church, New York, N. Y.	46 “ “ “	McKim, Mead & White
15.	J. J. Jermain Memorial Library, Sag Harbor, N. Y.	30 “ “ “	Augustus N. Allen

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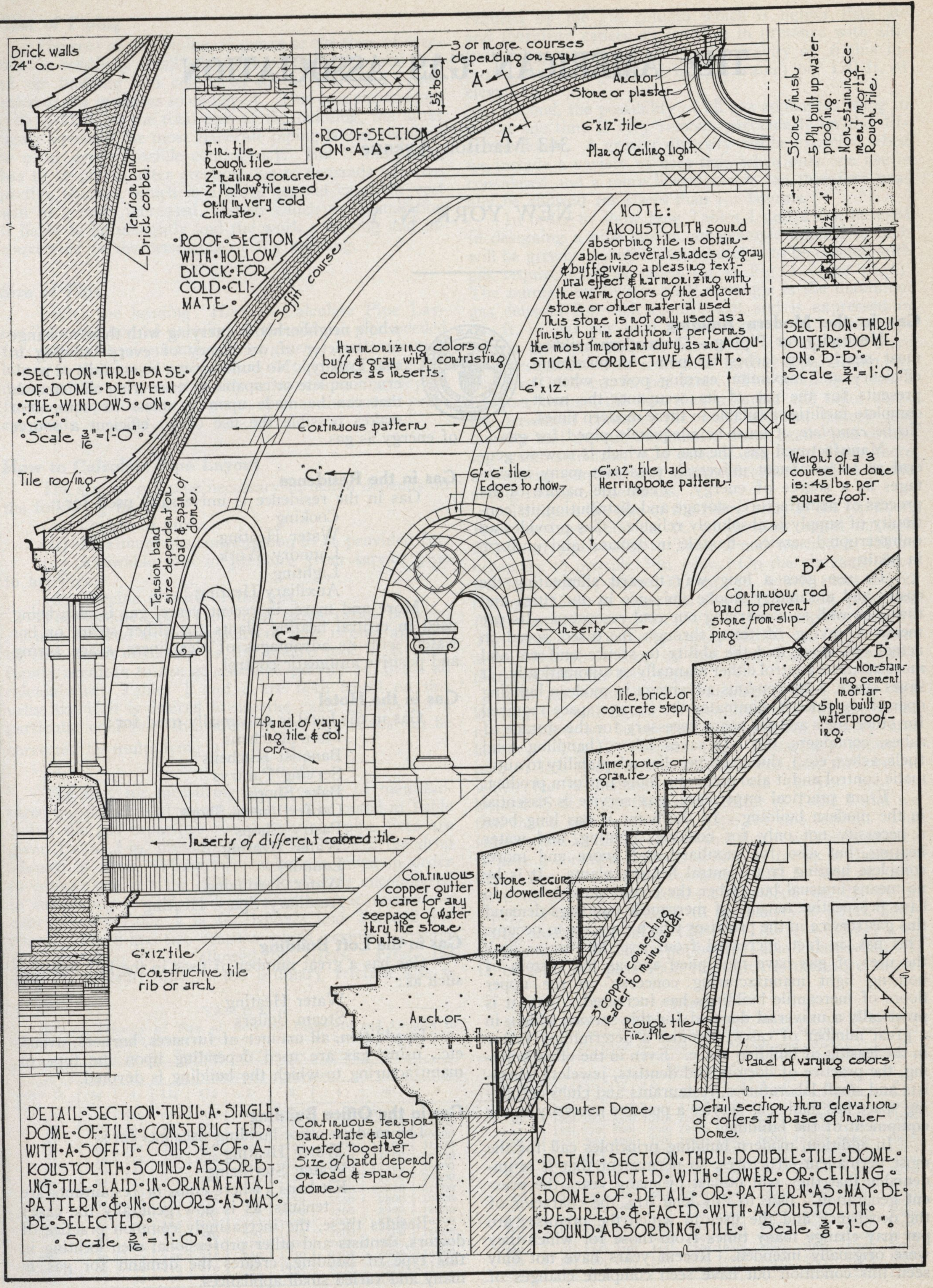
Brick walls 24" o.c.
3 or more courses depending on span
"A"
"A"
5½" to 6"
Anchor
Stone or plaster
•ROOF•SECTION •ON•A-A•
Fin. tile
Rough tile
2" nailing concrete.
2" Hollow tile used only in very cold climate.
6"x12" tile
Plan of Ceiling light
Stone finish
5 Ply built up waterproofing.
Non-staining cement mortar.
Rough tile.
Tension band
Brick corbel.
•ROOF•SECTION WITH•HOLLOW BLOCK•FOR COLD•CLIMATE•
Soffit course
NOTE:
AKOUSTOLITH sound absorbing tile is obtainable in several shades of gray & buff, giving a pleasing textural effect & harmonizing with the warm colors of the adjacent stone or other material used. This stone is not only used as a finish but in addition it performs the most important duty, as an ACOUSTICAL CORRECTIVE AGENT.
•SECTION•THRU•OUTER•DOME•ON•"B-B"•
Scale ¾"=1'-0"
Harmonizing colors of buff & gray with contrasting colors as inserts.
6"x12"
•SECTION•THRU•BASE•OF•DOME•BETWEEN•THE•WINDOWS•ON•"C-C"•
•Scale 3/16"=1'-0"•
Continuous pattern
℄
"C"
Weight of a 3 course tile dome is: 45 lbs. per square foot.
Tile roofing
6"x6" tile Edges to show
6"x12" tile laid Herringbone pattern
Tension band size dependent on load & span of dome.
"B"
Continuous rod band to prevent stone from slipping.
"C"
Inserts
"B"
Non-staining cement mortar.
5 ply built up waterproofing.
Tile, brick or concrete steps
Panel of varying tile & colors.
Limestone or granite
Inserts of different colored tile
Continuous copper gutter to care for any seepage of water thru the stone joints.
Stone securely dowelled
6"x12" tile
Constructive tile rib or arch
3" copper connecting leader to main leader
Anchor
Rough tile
Fin. tile
Panel of varying colors
Continuous tension band. Plate & angle riveted together. Size of band depends on load & span of dome.
Outer Dome
Detail section thru elevation of coffers at base of Inner Dome.

DETAIL•SECTION•THRU•A•SINGLE•DOME•OF•TILE•CONSTRUCTED•WITH•A•SOFFIT•COURSE•OF•AKOUSTOLITH•SOUND•ABSORBING•TILE•LAID•IN•ORNAMENTAL•PATTERN•&•IN•COLORS•AS•MAY•BE•SELECTED•
•Scale 3/16"=1'-0"•

•DETAIL•SECTION•THRU•DOUBLE•TILE•DOME•CONSTRUCTED•WITH•LOWER•OR•CEILING•DOME•OF•DETAIL•OR•PATTERN•AS•MAY•BE•DESIRED•&•FACED•WITH•AKOUSTOLITH•SOUND•ABSORBING•TILE• Scale 3/8"=1'-0"•

THE AMERICAN GAS ASSOCIATION

342 Madison Avenue

NEW YORK, N. Y.

Gas in the Modern Building

Necessity for Piping—The modern building most nearly approaches its point of maximum efficiency and maximum earning power when it presents for the use of its occupants the most complete facilities available in these modern times. To be *complete,* it must be adequately piped for gas.

Manufactured gas, the use of which is now so general as to be almost universal, possesses many advantages as a source of energy. From the nature of its process of manufacture, storage and distribution, its continuity of supply is absolutely reliable. Gas provides an uninterrupted service—flexible in demand and uniform in quality.

Its use goes a long way toward eliminating the costly and unsanitary smoke nuisance in our cities and towns as well as conserving our coal resources. Its use means a saving of time, through increased speed in actual operation, and the ability to secure uniform and more accurate control either manually or automatically. It saves space, a tremendous advantage in modern building operations, since it eliminates the storage space required for other fuels and the space necessary for the storage of ashes, containers, etc. It saves labor (handling solid fuels, ashes, etc.), due to its peculiar adaptability to automatic control and it also assures a more uniform product.

From practical experience, gas service is essential in the modern building. In the home it has long been a necessity not only for cooking, lighting, and water heating, but also for auxiliary and, more and more, complete heating from central heating plants. It is by no means unusual but rather the common experience to have prospective tenants of mercantile buildings demand this gas service in the premises which they are to occupy. This has, in fact, increased from year to year as both the uses of gas have multiplied and as the custom of housing light manufacturing concerns on the upper floors of mercantile buildings has increased. Now it is practically a universal demand for this service which, in a great number of cases, becomes a determining factor in the leasing of building space. Even in the office building, the practice of doctors and dentists, jewelers, chemists and small laboratories, restaurants and clubs occupying space has made gas service a positive necessity in the equipment of the building.

In addition, modern building principles call for the most permanent structures, so permanent that it is undeniable that they will outlast by many years the present generation. Due to this long life, the character of the occupancy and the uses to which the premises are put may change many times from those for which they were originally intended. Recent years have not only seen this condition but have seen complete changes of whole neighborhoods carrying with them a change in character of occupancy of every building in that locality. No building can be considered modern, complete or capable of answering all demands that can be made upon it unless its equipment makes possible the use of so efficient a source of energy as gas.

Gas in the Residence

Gas in the residence is universally used for:

Cooking
Water Heating
Laundry Work
Lighting
Auxiliary Heating

More and more, in recent years, gas is also being used in central heating plants for either steam or hot water, with its advantages of cleanliness, space saving and positive automatic control.

Gas in the Hotel

Gas in the hotel is universally used for:

Main Kitchens
Banquet Kitchens
Serving Pantrys
Bake Shops
Confectionery Shops
Pastry Shops
Water Heating
Laundry
Water Sterilizing
Auxiliary Space Heating

Gas in the Loft Building

Gas has a great number of uses in the loft building such as:

Water Heating
Steam Boilers

In addition, all manner of furnaces, burners, ovens, etc., using gas are used depending upon the type of manufacturing to which the building is devoted.

Gas in the Office Building

The modern office building uses gas for:

Water Heating
Water Sterilizing
Kitchens (where clubs or restaurants are tenants, as is now generally the case)

Besides these, the increasingly common practice of doctors, dentists and other professional men locating in this type of building, creates the demand for gas in many and varied small appliances.

Continued on next page

Cost of Piping

The cost of gas piping, if put in at the time of erection, is relatively small when compared to the total cost of the building and compared to the increased rental value of the premises so equipped. This cost varies from 0.10 to 1.0% of the total cost of the building, the latter figure covering the most elaborate piping layout required to cover every possible contingency. But if the piping has to be put in after erection due to demands of prospective tenants, which is a quite general case, the cost will be greatly increased, besides which the installation is liable to be unsightly and the work annoying and inconvenient to the occupants of the building.

Size of Pipe

Under the heading "How to Calculate Pipe Layout," the method of arriving at the size of pipe needed for various requirements will be given. It is essential, however, that ample provision as to pipe sizes should be made at the start, so that any unknown contingency of future occupation can be met as well as the known present needs.

How to Calculate Pipe Layout

The size of gas pipe necessary to install depends on the following factors:

(a) Length of pipe.

(b) Maximum gas consumption to be provided for.

(c) Allowable loss in pressure from service pipe to appliance.

(d) Specific gravity of the gas.

The specific gravity of most gases varies between .45 and .65, and as the capacity of pipe is only affected by this factor inversely as the square root, it is sufficiently accurate to use an assumed gravity of .6 for all calculations. Tables 1 and 2 are both based on this value but if it is desired to use the exact gravity for a particular condition, the values in the two tables can be corrected by multiplying by $\sqrt{\frac{0.6}{\text{Sp. gr.}}}$

The unit for measuring the pressure of manufactured gas is inches of water, and it will be noted in Table 1 that the gas capacities for the various pipe sizes are given for a .2-in. pressure drop. In Table 2 the drop allowed is .5 in. These two tables are given in order to compensate for the different conditions encountered in calculating lateral feed pipes as against vertical or riser pipes. Table 1 is for laterals and Table 2 for risers. There are two reasons which permit a greater pressure drop to be allowed on risers. First, the drop in pressure due to the ordinary friction loss is reduced by the gas column which is lighter than air and therefore causes an increase in pressure with altitude. For a gas with a specific gravity of .6 this increase is approximately 1 in. (of water) per 170 ft. of elevation.

Second, the possibility of all gas appliances being in use at one time is very remote, particularly on the different floors. A greater diversity can be expected when we include a variety of uses than when only one use is considered and a more liberal factor can therefore usually be allowed for risers than for laterals.

In order to show how Tables 1 and 2 can be used in designing a pipe layout, an example applied to each will be given. Assume that a hotel is to be erected with gas requirements as called for in Fig. 1 (next page). The number marked in each rectangle is the maximum gas demand for each requirement and is expressed in cu. ft. of gas per hour. The hotel is 16 stories high with a basement and sub-basement. On the roof there is a restaurant with a kitchen having a maximum demand of 1500 cu. ft. per hour. The tenth floor has a banquet kitchen, the first floor a barber and tailor shop, the basement contains the main kitchen, bakery and laundry and the sub-basement a water heater and drinking water sterilizer. On each of the room floors there are service pantries and radiant fireplace heaters in the sitting rooms of the suites.

To figure the size of the risers, start at the top floor. Here we have 1500 cu. ft. which must travel through 270 ft. of pipe; refer to Table 2 and we find it will be necessary to provide 3-in. pipe. On the sixteenth floor we have 1500+400=1900 cu. ft. which must travel through 255 ft. of pipe; this also calls for 3-in. pipe, etc. (See computation table on Fig. 1 for complete layout.) The service will have to supply 18,000 cu. ft. per hour and as it is 45 ft. long we find from Table 1 (laterals) that this calls for 6-in. pipe.

As an example for calculating pipe sizes for laterals we will figure the requirements for the basement where we have the main kitchen, bakery and laundry. Fig. 2 (second page following) shows a plan of this floor, and it will be noted that the kitchen which has a demand of 3000 cu. ft. per hour is located 45 ft. from the riser. Refer to Table 1 and we find that it will require 3-in. pipe for this section. The laundry and bakery are so located that it will be necessary to have a common lateral for both as far as to the laundry. The common run for both is 120 ft. long and will have to provide for 2000+1500=3500 cu. ft. (4-in. pipe). From the laundry to the bakery is 60 ft. additional, making a total of 120 ft. + 60 ft.=180 ft., with a demand of 1500 cu. ft. per hour. Table 1 shows that 180 ft. of 3-in. will pass 1600 ft., which is therefore ample.

TABLE 1

Showing Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. per Hour with Pressure Drop of 0.2 In. and Specific Gravity 0.60

To Be Used for Figuring Laterals and Service Pipes.

Length of pipe, ft.	Diameter of pipe, in.								
	¾	1	1¼	1½	2	3	4	6	8
15	168	350	620	960	2000	5400	11200	31000	63000
30	120	245	430	680	1400	3800	7900	21500	44000
45	98	200	355	530	1150	3200	6500	18000	36500
60	84	175	310	480	1000	2700	5600	15500	31500
75	76	155	275	430	890	2450	5000	13700	28000
90	70	145	250	395	810	2260	4550	12500	26000
105	64	132	232	370	750	2100	4200	11500	24000
120	60	125	215	340	700	1950	4000	11000	22000
150	54	110	195	310	630	1750	3550	9800	20000
180	49	100	175	280	570	1600	3200	8900	18000
210	44	94	165	260	530	1450	3000	8200	16500
240	43	88	155	240	500	1350	2800	7700	16000
270	40	83	145	230	470	1300	2650	7100	15000
300	38	79	138	215	440	1250	2500	6900	14000
450	31	64	112	176	360	1000	2050	5600	11500
600	27	56	97	152	315	860	1750	4900	10000

TABLE 2

Showing Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. per Hour with Pressure Drop of 0.5 In. and Specific Gravity 0.60

To Be Used for Figuring Verticals and Risers.

Length of pipe, ft.	Diameter of pipe, in									
	¾	1	1¼	1½	2	3	4	5	6	8
15	270	560	980	1540	3200	8600	17800	31000	49000	100000
30	190	390	680	1080	2200	6100	12500	22000	34500	71000
45	155	320	560	890	1800	5000	10300	18000	28000	58000
60	135	280	490	770	1600	4300	8900	15500	24500	50000
75	120	250	430	680	1400	3800	8000	14000	22000	45000
90	110	230	400	620	1300	3500	7300	12500	20000	41000
105	102	210	370	580	1200	3300	6800	11800	18500	38000
120	96	200	345	545	1100	3100	6300	11000	17400	36000
150	87	180	310	490	1000	2700	5600	9800	15500	32000
180	79	160	280	445	900	2500	5100	8900	14000	29000
210	73	150	260	410	840	2300	4800	8300	13000	27000
240	68	140	245	385	790	2150	4400	7700	12300	25000
270	65	130	230	365	740	2050	4200	7300	11500	23500
300	61	125	220	345	710	1950	4000	7000	11000	22500
450	50	100	180	280	570	1600	3200	5600	8900	18000
600	43	88	150	240	490	1350	2800	4800	7600	15500

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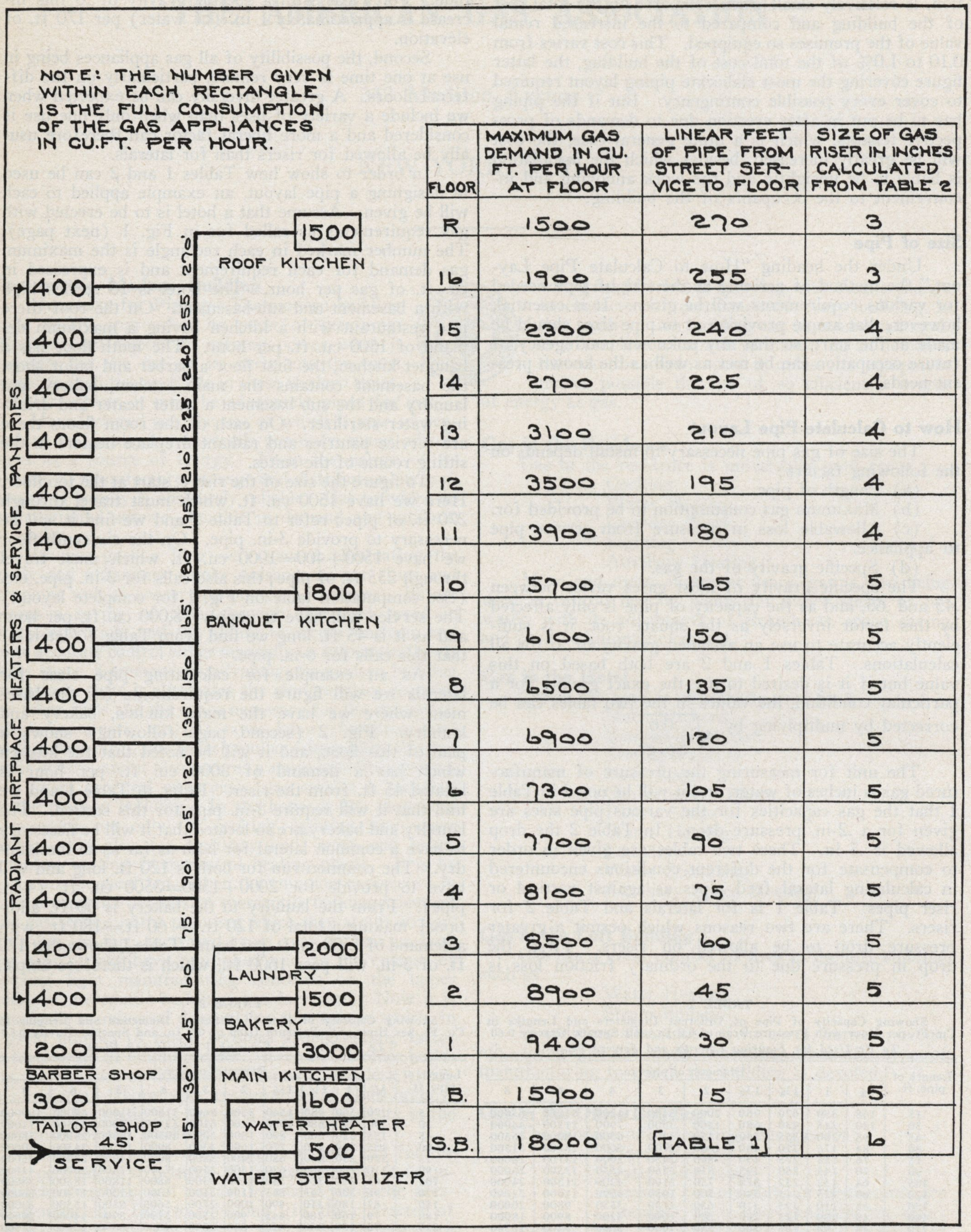

NOTE: THE NUMBER GIVEN WITHIN EACH RECTANGLE IS THE FULL CONSUMPTION OF THE GAS APPLIANCES IN CU.FT. PER HOUR.

FLOOR	MAXIMUM GAS DEMAND IN CU. FT. PER HOUR AT FLOOR	LINEAR FEET OF PIPE FROM STREET SERVICE TO FLOOR	SIZE OF GAS RISER IN INCHES CALCULATED FROM TABLE 2
R	1500	270	3
16	1900	255	3
15	2300	240	4
14	2700	225	4
13	3100	210	4
12	3500	195	4
11	3900	180	4
10	5700	165	5
9	6100	150	5
8	6500	135	5
7	6900	120	5
6	7300	105	5
5	7700	90	5
4	8100	75	5
3	8500	60	5
2	8900	45	5
1	9400	30	5
B.	15900	15	5
S.B.	18000	[TABLE 1]	6

1500
ROOF KITCHEN
400
400
400
400
400
400
RADIANT FIREPLACE HEATERS & SERVICE PANTRIES
1800
BANQUET KITCHEN
400
400
400
400
400
400
400
400
2000
LAUNDRY
1500
BAKERY
200
BARBER SHOP
3000
MAIN KITCHEN
300
TAILOR SHOP
1600
WATER HEATER
500
WATER STERILIZER
45'
SERVICE
270'
255'
240'
225'
210'
195'
180'
165'
150'
135'
120'
105'
90'
75'
60'
45'
30'
15'

Fig. 1. Diagram Showing the Gas Demand for the Various Floors of a Typical Hotel

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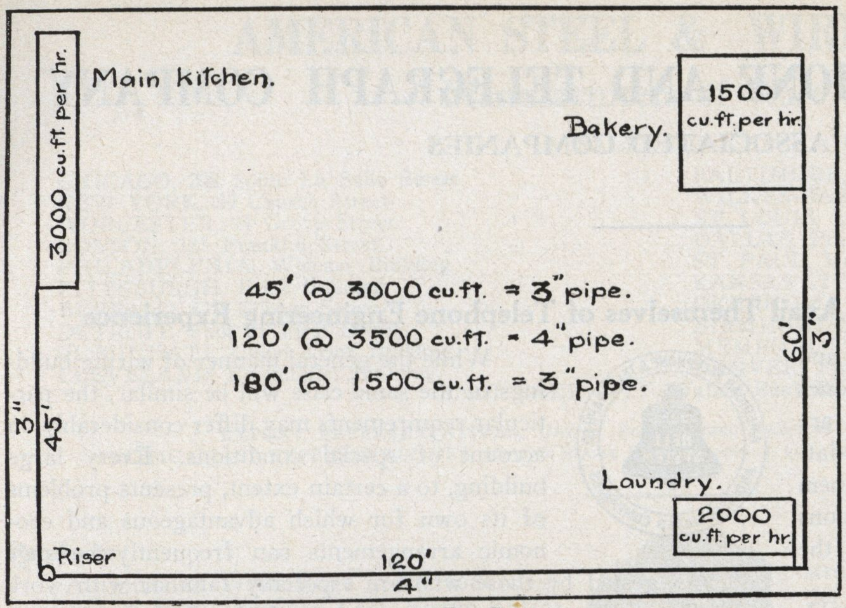


Fig. 2. Layout For Basement

Selecting Appliances

In selecting gas appliances for installation care should be taken that only the best appliances—quality merchandise—are selected. The American Gas Association through its Committee on Standard Gas Appliance Specifications, has drawn up specifications for the construction of gas appliances which insure the greatest efficiency, durability and service. These specifications have been adopted by the leading manufacturers of appliances and by the gas companies. Before selecting the appliances, therefore, consult with the local gas company to insure getting only standard appliances.

Installation of Gas Appliances

The most important factor that affects the safe and economical operation of gas appliances is the provision of adequate supply piping. This will assure constant and sufficient gas pressure and will result in the uniform operation of gas burners under conditions of proper combustion.

In the actual installation of gas appliances, the factor of ventilation must always be carefully considered. A properly designed appliance, operating under correct adjustment, will, when burning, produce only carbon dioxide and water vapor, both of which are absolutely harmless. It is necessary, however, in order that this condition be maintained, that sufficient ventilation be provided. If, therefore, large gas consuming appliances are to be installed in relatively small spaces, a flue or chimney connection is necessary. Further, gas appliances operating under automatic control should always be vented, as should all appliances installed in bathrooms. This practice should never be deviated from unless the room is very large and provided with exceptionally large window surface.

In the case of individual room heaters for use in the various rooms, they can be operated safely without vent connections provided that they do not exceed the correct heater capacity (equivalent square foot rating) for each room. If they do not exceed this heater capacity, the heater or heaters can burn indefinitely in a room having approximately three air changes per hour without ever raising the carbon dioxide content to a proportion that will be in the least measure harmful.

Where flues and flue connections are necessary, these chimneys or flues should be of the same size as required for solid fuel appliances of equivalent capacity. As for design and material, the specifications of the National Board of Fire Underwriters should be followed. Smooth tile lined flues are very satisfactory for venting gas appliances.

The cases quite frequently found where makeshift vents for gas appliances have been installed are due to the fact that sufficient flues to care for the various requirements are seldom provided in buildings. As an example, every cellar should have at least two flue outlets, one for the heating boiler or furnace and one for the hot water supply heater. The American Gas Association urgently recommends the more general provision of flues in buildings and homes.

The A.G.A.

The American Gas Association will be glad to consult with architects or builders and through its engineering staff at the headquarters office, advise on any questions relating to gas piping or selection or installation of appliances. In addition, the Association has printed from time to time complete information on such subjects as selection, design and installation of water heating installations, design and installation of central house heating installations and various books on the many industrial applications of gas which should prove of great value to the architect and builder.

They will always be glad to be consulted on any matters relating to the piping of buildings and to aid in the selection of the proper installations of gas appliances of all descriptions.

Summary

The observations and study given to building problems by engineers of the American Gas Association show conclusively that buildings where ample provision has been made for gas piping and flue outlets are those most easily rented.

If, therefore, ample gas piping is provided when buildings of all classes are erected, if adequate provision for flues is made, such structures will be thoroughly equipped to make use of gas, thereby assuring greater flexibility, enhanced revenue possibilities, greater comfort and economy for their tenants and the nearest approach to permanent efficiency as a whole which it is possible to attain.

If It's Done With Heat, You Can Do It Better With Gas.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

AND ASSOCIATED COMPANIES

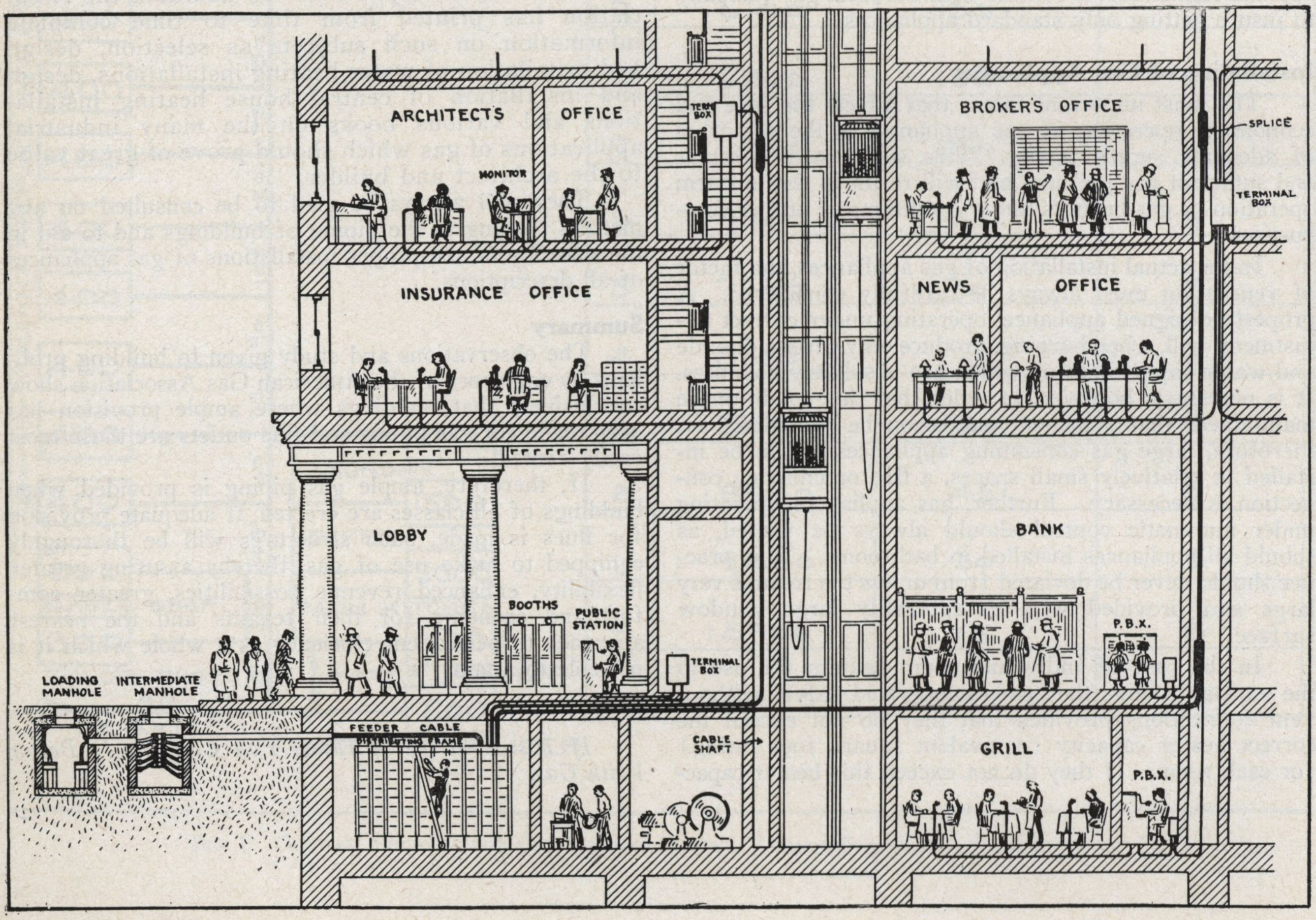
An Invitation to Architects to Avail Themselves of Telephone Engineering Experience

In modern office buildings, hotels and apartment houses, large numbers of telephones are required. Unless suitable facilities are provided during construction for accommodating the cables and wires and for running them through walls and floors, costly alterations may be required after the completion of the building.

It is, therefore, desirable that the probable needs of such buildings with respect to telephone service, be forecast as accurately as possible. It is also of great importance to owners and architects in preparing plans and specifications for buildings requiring extensive telephone service, that suitable arrangements be made for such telephone wiring and terminal boxes as the character and use of the building will demand.

While the general manner of wiring buildings of the same class will be similar, the particular requirements may differ considerably on account of special conditions. Every large building, to a certain extent, presents problems of its own for which advantageous and economic arrangements can frequently be suggested by those who are especially familiar with work of this kind. The engineers of the Bell System are always glad to place their experience in these matters at the disposal of architects, owners and builders, and to assist in planning the best system for each particular case. It is, therefore, suggested that architects, before completing building plans, communicate with the engineers of the Associated Bell Telephone Company operating in the locality of the building project.

Elevation Showing Telephone Feeder Cable to Building Terminals and Distribution to Subscribers' Telephones


ARCHITECTS
OFFICE
MONITOR
TERM. BOX
BROKER'S OFFICE
SPLICE
TERMINAL BOX
INSURANCE OFFICE
NEWS
OFFICE
LOBBY
BANK
BOOTHS
PUBLIC STATION
TERMINAL BOX
P.B.X.
LOADING MANHOLE
INTERMEDIATE MANHOLE
FEEDER CABLE
DISTRIBUTING FRAME
CABLE SHAFT
GRILL
P.B.X.

AMERICAN STEEL & WIRE COMPANY

Manufacturers of Wire Rope

SALES OFFICES

CHICAGO, 208 South La Salle Street
NEW YORK, 30 Church Street
WORCESTER, 94 Grove Street
BOSTON, 185 Franklin Street
PHILADELPHIA, Widener Building
PITTSBURGH, Frick Building
BUFFALO, 670 Ellicott Street
DETROIT, Foot of First Street
CINCINNATI, Union Trust Building
CLEVELAND, Rockefeller Building

BALTIMORE, 32 South Charles Street
WILKES-BARRE, PA., Miners Bank Building
ST. LOUIS, Liberty Central Trust Co. Building
DALLAS, Praetorian Building
ST. PAUL, Merchants National Bank Building
KANSAS CITY, MO., 417 Grand Avenue
OKLAHOMA CITY, First National Bank Building
BIRMINGHAM, ALA., Brown-Marx Building
MEMPHIS, TENN., Union and Planters Bank Building
DENVER, First National Bank Building

SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, United States Steel Products Co., Church Street, New York
PACIFIC COAST REPRESENTATIVES, United States Steel Products Co., San Francisco, Los Angeles, Portland, Seattle

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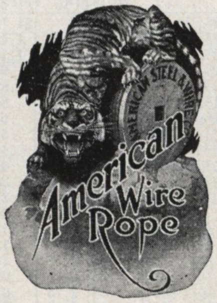
Products

All kinds of Wire Rope in the following qualities: Iron, Crucible Cast Steel, Extra Strong Crucible Cast Steel, Plow Steel and Monitor Steel or Tico Special.

Also a full line of Wire Rope Fittings: Slings, Thimbles, Clips, Clamps, Sockets, Hooks, Turnbuckles, Shackles, etc.

For Concrete Reinforcement, see pages 40-44; for Triangle Mesh for Stucco Base, see page 424; for Electrical Wires and Cables, see pages 2372-2383.



TRADE-MARK

Qualities of Wire Rope and Their Uses

Wire rope is made in the following 5 qualities:

Iron Rope—The wires are made from the best quality iron, being soft, tough and flexible. Iron hoisting rope is most generally used for elevator hoisting, where the strength is sufficient. It is almost universally employed for counterweight ropes, except on traction elevators. For traction elevators we recommend special traction rope.

Crucible Cast Steel Rope—This is a medium strength material, tough and pliable, of moderate cost and general utility. Weighs only about half as much as iron for same strength; is harder, and better resists external wear. This rope is applicable to a great variety of uses, among which may be noted mine hoisting, elevators, derricks, hay presses, dredges, cableways, inclined planes, coal hoists, conveyors, ballast unloaders, skip hoists and many other uses.

Extra Strong Crucible Cast Steel Rope—Of higher tensile strength than the crucible steel, and is tough, pliable, a little lighter for the same strength than crucible steel, and about two and one-half times the strength of iron. It has been found particularly useful for oil well drilling and tubing lines. Its other general uses are similar to those of the crucible steel, except that it may be used where loads are somewhat heavier.

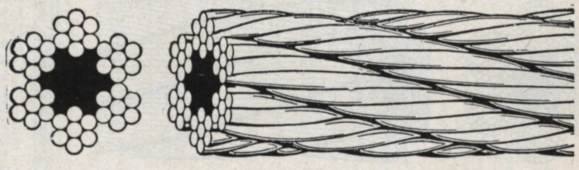
Plow Steel Rope—Combines lightness and great strength; is somewhat stiffer than crucible steel and nearly three times as strong. Used particularly for heavy mine hoisting, derricks, inclined planes, dredges, cableways, for heavy logging and similar uses. It is the most economical rope to use where the weight of the rope has to be considered, or where the capacity of the machinery is to be increased without a corresponding increase in sheaves and drums.

Monitor Steel Rope—This is the highest strength rope made. It is somewhat stiffer in the same diameter than the plow and crucible steel grades, but, strength for strength, it is equally flexible.

Very useful where great strength, lightness and abrasive resisting qualities are required.

Transmission, Haulage or Standing Rope

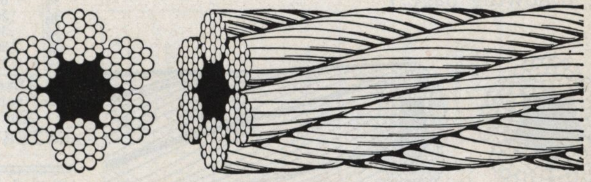
The coarsest rope, *i. e.*, 6 by 7 construction, a relatively stiff rope with large wires, capable of resisting external wear or abrasion; but it is the least flexible.



Transmission, Haulage or Standing Rope (6x7)

Hoisting Rope

Composed of 6 strands of 19 wires each, with hemp core. Used for elevators, mine hoisting, derricks, dredges, cableways, inclined planes, coal hoists, conveyors, ballast unloaders, skip hoist, oil well drilling and tubing lines.



Hoisting Rope (6x19)

Extra Flexible Hoisting Rope

This rope is composed of 8 strands of 19 wires each, laid around a hemp core. The addition of these 2 strands over the standard hoisting rope increases the flexibility and permits the rope being used over comparatively smaller sheaves and drums.

Adaptable for derricks, steam dredges, coal and ore handling machinery, pile drivers, and also for logging purposes, as well as tubing lines for oil wells.

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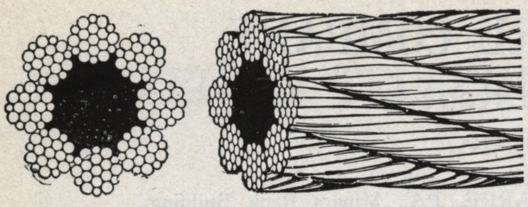
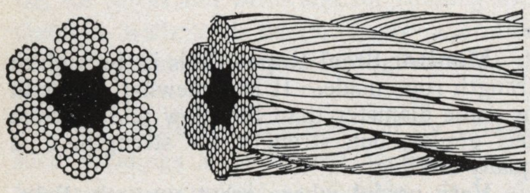


Extra Flexible Steel Hoisting Rope (8 x 19)

Special Flexible Hoisting Rope

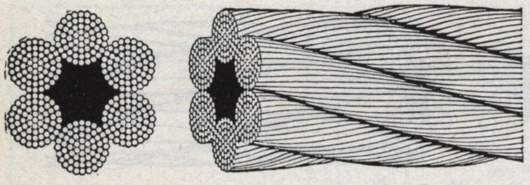
This rope is composed of 6 strands of 37 wires each, laid around a hemp core. This is a very flexible rope, and used largely on cranes and similar machinery where sheaves, of a necessity, are small.



Special Flexible Steel Hoisting Rope (6 x 37)

Extra Special Flexible Hoisting Rope

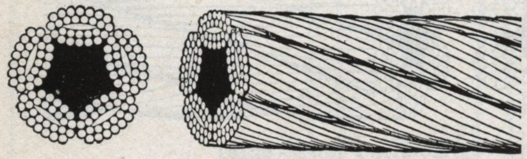
Composed of 6 strands of 61 wires each, with 1 hemp core, and recommended for dredging purposes, for which it is usually made with special wire center.



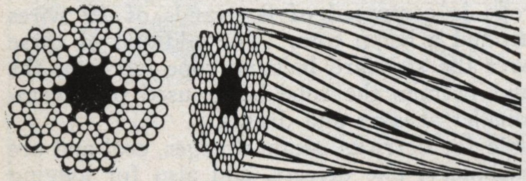
Extra Special Flexible Hoisting Rope (6 x 61)

Flexible Strand Hoisting Ropes

These ropes compare in flexibility with the standard hoisting rope, but possess about 150% greater wearing surface than the round strand ropes of same diameter, and have been used generally in the same places. (For data see following page.)



Type A (5x28)



Type B (6x25)

Flattened Strand Hoisting Ropes

VARIOUS CONSTRUCTIONS AND GRADES OF WIRE ROPE

Diameter in ins.	Weight per ft. in lbs.	IRON Proper working load in tons of 2000 lbs.	IRON Diameter of drum or sheave in ft. advised	IRON List price per ft.	CRUCIBLE CAST STEEL Proper working load in tons of 2000 lbs	CRUCIBLE CAST STEEL Diameter of drum or sheaves in ft. advised	CRUCIBLE CAST STEEL List price per ft.	EXTRA STRONG CRUCIBLE CAST STEEL Proper working load in tons of 2000 lbs.	EXTRA STRONG CRUCIBLE CAST STEEL List price per ft.	PLOW STEEL Proper working load in tons of 2000 lbs.	PLOW STEEL List price per ft.	MONITOR STEEL Proper working load in tons of 2000 lbs.	MONITOR STEEL List price per ft.
TRANSMISSION, HAULAGE OR STANDING ROPE—6 STRANDS, 7 WIRES TO STRAND, 1 HEMP CORE													
1½	3.55	6.4	16	$0.51	12.6	11	$0.60	14.6	$0.75	16.4	$0.90	18	$1.05
1⅜	3	5.6	15	.43	10.6	10	.51	12.6	.64	14.4	.76	16	.88
1¼	2.45	4.6	13	.36	9.2	9	.43	10.8	.53	12	.62	13	.72
1⅛	2	3.8	12	.30	7.4	8	.36	8.6	.44	9.4	.51	10	.58
1	1.58	3	10.5	.24	6.2	7	.29	7	.35	7.6	.41	8.4	.48
⅞	1.20	2.4	9	.18½	4.8	6	.22½	5.6	.27	6.2	.32	6.6	.37
¾	.89	1.7	7.5	.14	3.7	5	.17	4.2	.20	4.6	.24½	5	.28½
11/16	.75	1.5	7.25	.12	3.1	4¾	.14½	3.3	.17	3.6	.21	4	.24½
⅝	.62	1.2	7	.10	2.6	4½	.12	2.9	.14¼	3.2	.17½	3.5	.20½
9/16	.50	.96	6	.08¼	2	4	.10	2.2	.12	2.4	.14½	2.6	.17
½	.39	.74	5.5	.06½	1.5	3½	.08	1.8	.09½	2	.11½	2.2	.13½
7/16	.30	.52	4.5	.05½	1.1	3	.06½	1.25	.07½	1.4	.09	1.5	.11½
⅜	.22	.44	4	.04½	.92	2¾	.05½	1.05	.06	1.2	.06¾	1.3	.08¾
5/16	.15	.34	3.5	.03¾	.70	2¼	.04½	.79	.05½	.88	.06	......	....
9/32	.12½	.24	3	.03¼	.50	1¾	.04	.59	.05	.68	.05½	......	....
HOISTING ROPE—6 STRANDS, 19 WIRES TO STRAND, 1 HEMP CORE													
2¾	11.95	22.2	17	$1.70	42.2	11	$2.10	48.6	$2.55	55	$3.00	63	$3.45
2½	9.85	18.4	15	1.40	34	10	1.75	40	2.10	46	2.50	53	2.80
2¼	8	14.4	14	1.17	26.6	9	1.44	32	1.70	37	2.00	42	2.50
2	6.30	11	12	.95	21.2	8	1.16	24.6	1.34	28	1.58	33	1.85
1⅞	5.55	10	12	.88	19	8	1.02	22.4	1.25	25	1.46	30	1.75
1¾	4.85	8.8	11	.80	17	7	.90	19.8	1.10	22	1.30	27	1.60
1⅝	4.15	7.6	10	.65	14.4	6.5	.77	16.6	.94	19	1.08	22	1.30
1½	3.55	6.6	9	.57	12.8	6	.66	14.6	.80	16	.93	20	1.10
1⅜	3	5.6	8.5	.49	11.2	5.5	.56	12.8	.68	14	.79	17	.90
1¼	2.45	4.56	7.5	.40	9.4	5	.46	10.6	.56	12	.65	14	.75
1⅛	2	3.72	7	.33	7.6	4.5	.38	8.6	.46	9.4	.54	11	.62
1	1.58	2.90	6	.26	6	4	.31	6.80	.37	7.6	.43	9	.50
⅞	1.20	2.36	5.5	.20	4.6	3.5	.24	5.20	.29	5.8	.34	7	.39
¾	.89	1.70	4.5	.16	3.5	3	.19	4.04	.22	4.6	.26	5.3	.31
⅝	.62	1.20	4	.12	2.5	2.5	.14	2.80	.16½	3.1	.19	3.8	.22½
9/16	.50	.94	3.5	.10	2	2.25	.12	2.24	.14	2.4	.16	2.9	.19
½	.39	.78	3	.08½	1.68	2	.11	1.84	.12½	2	.14	2.4	.17
7/16	.30	.58	2.75	.07½	1.30	1.75	.10	1.45	.11½	1.6	.13	1.9	.15½
⅜	.22	.48	2.25	.07	.96	1.50	.09½	1.06	.11	1.15	.12½	1.35	.14½
5/16	.15	.30	2	.06¾	.62	1.25	.09¼	.70	.10¾	.76	.12¼	.9	.13½
¼	.10	.22	1.50	.06½	.44	1.00	.09	.49	.10½	.53	.12	.63	.13
EXTRA FLEXIBLE HOISTING ROPE—8 STRANDS, 19 WIRES TO STRAND, 1 HEMP CORE													
1½	3.19	......	......	....	11.6	3.75	$0.73	13	$0.88	14.8	$1.03	16	$1.19
1⅜	2.70	......	......	....	10.2	3.5	.62	11	.75	12.8	.87	13	.98
1¼	2.20	......	......	....	8.4	3.2	.51	9.4	.62	10.4	.72	11	.82
1⅛	1.80	......	......	....	6.8	2.83	.42	7.6	.51	8.6	.60	9.2	.68
1	1.42	3.1	6	$0.29	5.2	2.5	.34	5.9	.41	6.6	.48	7.2	.55
⅞	1.08	2.6	5.5	.22	4	2.16	.27	4.6	.32	5.2	.38	5.6	.43
¾	.80	1.9	4.5	.18	3.06	1.83	.21	3.5	.25	4	.29	4.4	.34
⅝	.56	1.4	4	.14	2.18	1.75	.16	2.5	.18½	2.8	.21	3	.25
9/16	.45	1.2	3.5	.11½	1.74	1.5	.14	2	.16	2.32	.18	2.4	.22
½	.35	1	3	.09½	1.46	1.33	.12	1.6	.14	1.74	.16	1.9	.19
7/16	.27	......	......	....	1.14	1.16	.11	1.26	.13	1.38	.15	......	....
⅜	.20	......	......	....	.84	1	.10½	.93	.12¼	1.02	.14	......	....
5/16	.13	......	......	....	.55	.83	.10¼	.61	.12	.67	.13½	......	....
¼	.09	......	......	....	.36	.75	.10	.40	.11¾	.45	.13¼	......	....
SPECIAL FLEXIBLE HOISTING ROPE—6 STRANDS, 37 WIRES TO STRAND, 1 HEMP CORE													
2¾	11.95	......	......	....	40	......	$2.30	47	$2.80	53	$3.30	55	$3.75
2½	9.85	......	......	....	32	......	1.92	37	2.35	43	2.75	45	3.15
2¼	8	......	......	....	25	......	1.60	30	1.90	35	2.20	37	2.50
2	6.30	......	......	....	21	......	1.35	23	1.55	26	1.80	27	2.10
1⅞	5.55	......	......	....	18.8	......	1.20	21.2	1.41½	23.8	1.65	25	1.92½
1¾	4.85	......	......	....	17	......	1.05	19	1.28	22	1.50	23	1.75
1⅝	4.15	......	......	....	14	......	.89	16	1.07	18	1.25	19	1.45
1½	3.55	......	......	....	12	3.75	.79	14	.95	16	1.10	17	1.25
1⅜	3	......	......	....	11	3.5	.65	12	.78	14	.91	14	1.05
1¼	2.45	......	......	....	9	3.2	.55	10	.65	11	.75	11	.86
1⅛	2	......	......	....	7	2.83	.46	8	.55	9	.64	9.2	.75
1	1.58	......	......	....	6	2.5	.37	6.4	.44	7	.51	7.4	.59
⅞	1.20	......	......	....	5	2.16	.28	5	.34	5	.40	5.8	.46
¾	.89	......	......	....	3.5	1.83	.23	3.8	.27	4	.31	4.6	.36
⅝	.62	......	......	....	2.2	1.75	.18	2.5	.21	3	.24	3.2	.27
9/16	.50	......	......	....	1.9	1.5	.15	2.1	.17½	2.3	.20	2.5	.23
½	.39	......	......	....	1.45	1.33	.13	1.65	.15	1.85	.17	1.9	.20
7/16	.30	......	......	....	1.1	1.16	.12½	1.27	.14	1.4	.16	1.5	.18½
⅜	.22	......	......	....	.84	1	.12	.93	.13	1	.15	1.06	.17½

Diameter of drum advised for extra strong crucible cast steel, plow steel and monitor steel ropes is same as for crucible cast steel,

The tensile strength is 5 times the proper working load given above.

EXTRA SPECIAL FLEXIBLE HOISTING ROPE—6 STRANDS, 61 WIRES TO EACH, 1 HEMP CORE

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	CRUCIBLE CAST STEEL Proper working load in tons of 2000 lbs.	CRUCIBLE CAST STEEL List price per ft.	EXTRA STRONG CRUCIBLE CAST STEEL Proper working load in tons of 2000 lbs.	EXTRA STRONG CRUCIBLE CAST STEEL List price per ft.	PLOW STEEL Proper working load in tons of 2000 lbs.	PLOW STEEL List price per ft.	MONITOR STEEL Proper working load in tons of 2000 lbs.	MONITOR STEEL List price per ft.
3¼	16.60	11	56	......	63	......	70	......	74	......
3	14.20	10	48	......	55	......	62	......	65	......
2¾	11.95	9	40	$2.53	47	$3.08	63	$3.63	56	$4.12
2½	9.85	8	32	2.11	37	2.58	43	3.02	45	3.46
2¼	8.00	7	25	1.76	30	2.09	35	2.42	37	2.75
2	6.30	6	21	1.48	23	1.70	26	1.98	27	2.31

Continued on next page

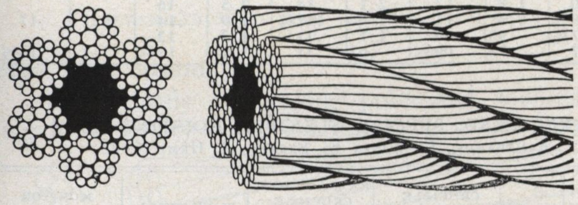
FLATTENED STRAND HOISTING ROPES

Diameter in ins.	IRON Type A: Proper working load in tons of 2000 lbs.	IRON Type A: Weight per ft. in lbs.	IRON Type A: Diameter of drum or sheave in ft. advised	IRON Type A: List price per ft.	CRUCIBLE CAST STEEL Type A: Proper working load in tons of 2000 lbs.	CRUCIBLE CAST STEEL Type B: Proper working load in tons of 2000 lbs.	CRUCIBLE CAST STEEL Type B: Weight per ft. in lbs.	CRUCIBLE CAST STEEL Types A and B: Diameter of drum or sheave in ft. advised	CRUCIBLE CAST STEEL Types A and B: List price per ft.	EXTRA STRONG CRUCIBLE CAST STEEL* Type A: Proper working load in tons of 2000 lbs.	EXTRA STRONG CRUCIBLE CAST STEEL* Type B: Proper working load in tons of 2000 lbs.	EXTRA STRONG CRUCIBLE CAST STEEL* Types A and B: List price per ft.	MONITOR STEEL Type A: Proper working load in tons of 2000 lbs.	MONITOR STEEL Type B: Proper working load in tons of 2000 lbs.	MONITOR STEEL Types A and B: Diameter of drum or sheave in ft. advised	MONITOR STEEL Types A and B: List price per ft.
2¼	14.4	8.00	11¼	$1.52	26.6	29.2	9.20	8½	$1.82	32	35.2	$2.20	42	46.2	12	$2.85
2	11	6.30	10¾	1.20	21.2	23.4	7.25	8	1.44	24.6	27	1.77	33.2	36.6	11	2.25
1¾	8.8	4.85	9	1.04	17.0	18.8	5.60	7¼	1.21	19.8	21.8	1.55	26.6	29.2	9	2.08
1⅝	7.6	4.15	7½	.82	14.4	15.8	4.75	6¼	.96	16.6	18.2	1.30	22	24.2	8½	1.56
1½	6.6	3.55	6¾	.74	12.8	14.0	4.00	5¾	.86	14.6	16	1.05	19.6	21.6	8	1.37
1⅜	5.6	3.00	6¼	.625	11.2	12.4	3.45	5½	.73	12.8	14	.90	16.8	18.4	7½	1.12
1¼	4.56	2.45	5¾	.52	9.4	10.4	2.80	5	.595	10.6	11.6	.70	13.8	15.2	7	.89
1⅛	3.72	2.00	5¼	.43	7.6	8.4	2.30	4½	.50	8.6	9.4	.59	11.2	12.4	6	.71
1	2.90	1.58	4¾	.34	6.0	6.6	1.80	4	.395	6.8	7.4	.48	9	10.0	5	.60
⅞	2.36	1.20	4	.26	4.6	5.0	1.38	3½	.30	5.2	5.8	.38	7	7.8	4½	.49
¾	1.70	.89	3½	.21	3.5	3.86	1.00	3	.24	4.04	4.44	.30	5.26	5.8	4	.375
⅝	1.20	.62	3	.155	2.5	2.76	.72	2¼	.18¼	2.80	3.08	.225	3.8	4.2	3½	.28
9/16	.94	.50	2½	.13	2	2.2	.58	1¾	.165	2.24	2.46	.195	2.9	3.2	3	.25
½	.78	.39	2	.105	1.68	1.86	.45	1½	.145	1.84	2.02	.175	2.42	2.7	2¾	.20¾
⅜	.48	.22	1	.095												

Weights for Types A and B respectively are the same for all constructions. Standard Plow Steel grade is also furnished if desired.
*Diameters of drums are the same as for Crucible Cast Steel.

American Special Hoisting Rope Type "P"

Six strands, 29 wires to a strand, 1 hemp core, made in 2 grades, plow steel and monitor steel.



American Special Hoisting Rope Type "P"

This is an excellent rope for clamshell buckets, steam shovels, and general hoisting purposes requiring a greater degree of flexibility than standard 6x19 construction.

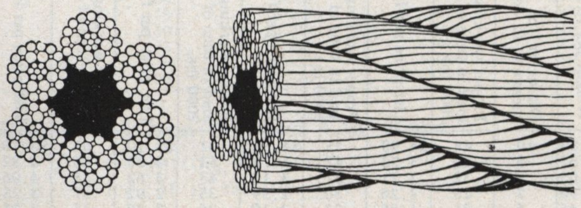
AMERICAN SPECIAL HOISTING ROPE TYPE "P"
6 Strands, 29 Wires to the Strand, 1 Hemp Core

Diameter in ins.	PLOW STEEL 1 Circumference in ins.	PLOW STEEL 2 Approx. weight per ft. in lbs.	PLOW STEEL 3 Approx. strength in tons of 2000 lbs.	PLOW STEEL 4 Proper working load in tons of 2000 lbs.	PLOW STEEL 5 Diam. of drum or sheave advised, ft.	PLOW STEEL 6 List price per ft.	MONITOR STEEL 1 Circumference in ins.	MONITOR STEEL 2 Approx. weight per ft. in lbs.	MONITOR STEEL 3 Approx. strength in tons of 2000 lbs.	MONITOR STEEL 4 Proper working load in tons of 2000 lbs.	MONITOR STEEL 5 Diam. of drum or sheave advised, ft.	MONITOR STEEL 6 List price per ft.
2¾	8⅝	11.95	265	53	......	$3.15	8⅝	11.95	278	55	......	$3.60
2½	7⅞	9.85	214	43	......	2.625	7⅞	9.85	225	45	......	2.98
2¼	7⅛	8	175	35	......	2.10	7⅛	8	184	37	......	2.50
2	6¼	6.30	130	26	......	1.69	6¼	6.30	137	27	......	1.98
1⅞	5¾	5.55	119	23.8	......	1.555	5¾	5.55	125	25	......	1.84
1¾	5½	4.85	108	22	......	1.40	5½	4.85	113	23	......	1.68
1⅝	5	4.15	90	18	......	1.165	5	4.15	95	19	......	1.38
1½	4¾	3.55	80	16	5.25	1.015	4¾	3.55	84	17	5.25	1.18
1⅜	4¼	3	68	14	4.81	.85	4¼	3	71	14	4.81	.975
1¼	4	2.45	55	11	4.37	.70	4	2.45	58	11	4.37	.905
1⅛	3½	2	44	9	3.93	.59	3½	2	46	9.2	3.93	.685
1	3	1.58	35	7	3.50	.47	3	1.58	37	7.4	3.50	.545
⅞	2¾	1.20	27	5	3.06	.37	2¾	1.20	29	5.8	3.06	.425
¾	2¼	.89	21	4	2.62	.285	2¼	.89	23	4.6	2.62	.335
⅝	2	.62	14	3	2.18	.215	2	.62	16	3.2	2.18	.25
9/16	1¾	.50	11.5	2.3	1.96	.18	1¾	.50	12.5	2.5	1.96	.21
½	1½	.39	9.25	1.85	1.75	.155	1½	.39	9.75	1.9	1.75	.185
7/16	1¼	.30	7.2	1.4	1.53	.145	1¼	.30	7.50	1.5	1.53	.17
⅜	1⅛	.22	5.1	1	1.31	.1375	1⅛	.22	5.30	1.06	1.31	.16

American Special Hoisting Rope Type "R"

Six strands, 33 wires to a strand, 1 hemp core, made in 2 grades, plow steel and monitor steel.

For use on coal cutting machines, this rope, ⅝-in. diameter, Monitor grade, will be found superior to other constructions. It will also give good service on cranes, where abrasion is too severe for 6x37 construction.



American Special Hoisting Rope Type "R"

AMERICAN SPECIAL HOISTING ROPE TYPE "R"
6 Strands, 33 Wires to the Strand, 1 Hemp Core

Diameter in ins.	PLOW STEEL 1 Circumference in ins.	PLOW STEEL 2 Approx. weight per ft. in lbs.	PLOW STEEL 3 Approx. strength in tons of 2000 lbs.	PLOW STEEL 4 Proper working load in tons of 2000 lbs.	PLOW STEEL 5 Diam. of drum or sheave advised, ft.	PLOW STEEL 6 List price per ft.	MONITOR STEEL 1 Circumference in ins.	MONITOR STEEL 2 Approx. weight per ft. in lbs.	MONITOR STEEL 3 Approx. strength in tons of 2000 lbs.	MONITOR STEEL 4 Proper working load in tons of 2000 lbs.	MONITOR STEEL 5 Diam. of drum or sheave advised, ft.	MONITOR STEEL 6 List price per ft
2¾	8⅝	11.95	265	53	......	$3.30	8⅝	11.95	278	55	......	$3.75
2½	7⅞	9.85	214	43	......	2.75	7⅞	9.85	225	45	......	3.15
2¼	7⅛	8	175	35	......	2.20	7⅛	8	184	37	......	2.50
2	6¼	6.30	130	26	......	1.80	6¼	6.30	137	27	......	2.10
1⅞	5¾	5.55	119	23.8	......	1.65	5¾	5.55	125	25	......	1.92½
1¾	5½	4.85	108	22	......	1.50	5½	4.85	113	23	......	1.75
1⅝	5	4.15	90	18	......	1.25	5	4.15	95	19	......	1.45
1½	4¾	3.55	80	16	4.50	1.10	4¾	3.55	84	17	4.50	1.25
1	4¼	3	68	14	4.12	.91	4¼	3	71	14	4.12	1.05
1¼	4	2.45	55	11	3.75	.75	4	2.45	58	11	3.75	.86
1⅛	3½	2	44	9	3.37	.64	3½	2	46	9.2	3.37	.75
1	3	1.58	35	7	3.00	.51	3	1.58	37	7.4	3.00	.59
⅞	2¾	1.20	27	5	2.62	.40	2¾	1.20	29	5.8	2.62	.46
¾	2¼	.89	21	4	2.25	.31	2¼	.89	23	4.6	2.25	.36
⅝	2	.62	14	3	1.87	.24	2	.62	16	3.2	1.87	.27
9/16	1¾	.50	11.5	2.3	1.68	.20	1¾	.50	12.5	2.5	1.68	.23
½	1½	.39	9.25	1.85	1.50	.17	1½	.39	9.75	1.9	1.50	.20
7/16	1¼	.30	7.2	1.40	1.31	.16	1¼	.30	7.50	1.5	1.31	.18½
⅜	1⅛	.22	5.1	1	1.12	.15	1⅛	.22	5.30	1.06	1.12	.17½

Add 10% to above list prices for Wire Center.

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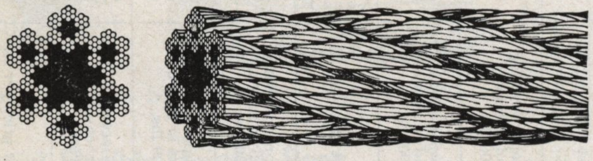
Tiller or Hand Rope

Used for starting and stopping elevators, and also for steering lines on yachts and motor boats.



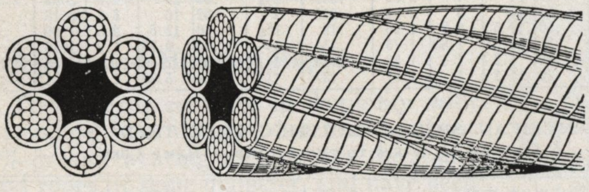
Tiller Rope or Hand Rope (6x42)

TILLER OR HAND ROPE
6 Strands of 42 Wires Each, 7 Hemp Cores

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	IRON		CRUCIBLE CAST STEEL	
			Breaking strength in lbs.	List price per ft.	Breaking strength in lbs.	List price per ft.
1	1.10	24	22000	$0.33	35000	$0.43
⅞	.84	21	15500	.27	26000	.36
¾	.62	18	11000	.22	18000	.30
⅝	.43	15	7000	.17	13500	.24
9/16	.35	13½	6300	.14	11000	.20
½	.28	12	5800	.11½	9000	.17
7/16	.21	10½	4000	.10	6500	.15
⅜	.16	9	3000	.09	4800	.14
5/16	.11	7½	1900	.08	3600	.12½
¼	.07	6	1300	.07½	2500	.11
3/16	.04	....	750	.07	1350	.10

Steel Clad Hoisting Rope

Each strand is spirally wound with flat steel strips, giving considerable wearing surface over the ordinary type. When the flat strips of a steel clad rope have worn through, there still remains the complete hoisting rope with unimpaired strength. Where ropes wear out quickly, this feature is a distinct advantage. Made in 3 constructions: 6 strands of 19 wires each; special flexible, 6 strands of 37 wires each; and extra special flexible, 6 strands of 61 wires each.



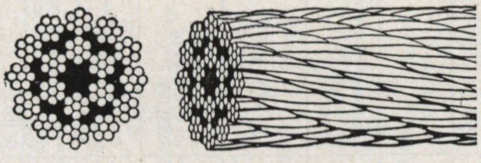
Steel Clad Hoisting Rope (6x19)

STEEL CLAD HOISTING ROPE
6 Strands, 19 Wires to Strand

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
2¼	8.45	8	21.2	$1.56	24.6	$1.74	28	$1.98	33	$2.25
2	6.70	7.5	19.2	1.29	22.4	1.52	25	1.73	30	2.02
1⅞	6.02	7	17.0	1.16	19.8	1.36	22	1.56	27	1.86
1¾	5.25	6.5	14.4	1.01	16.6	1.18	19	1.32	22	1.54
1⅝	4.62	6	12.8	.89	14.6	1.03	16	1.16	20	1.33
1½	3.95	5.5	11.2	.78	12.8	.90	14	1.01	17	1.12
1⅜	3.30	5	9.4	.67	10.6	.77	12	.86	14	.96
1¼	2.80	4.5	7.6	.57	8.6	.65	9.4	.73	11	.81
1⅛	2.12	4	6.0	.49	6.8	.55	7.6	.61	9	.68
1	1.72	3.5	4.6	.41	5.2	.46	5.8	.51	7	.56
⅞	1.30	3	3.5	.36	4.04	.39	4.6	.43	5.3	.48
¾	1.00	2.5	2.5	.30	2.80	.32	3.1	.35	3.8	.38
⅝	.70	2	1.68	.26	1.84	.27	2.0	.29	2.4	.32

Non-spinning Hoisting Rope

This type of rope is so constructed that it prevents the rotating of a free load suspended on the end of a single line. It is recommended for "back haul" or single line derricks.



Non-spinning Hoisting Rope (18x7)

NON-SPINNING HOISTING ROPE
18 Strands, 7 Wires Each, 1 Hemp Core

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	IRON		CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
1¾	5.50	7.00	9.1	$0.80	17.1	$0.90	20.2	$1.10	22.2	$1.30	24.0	$1.60
1⅝	4.90	6.50	7.9	.65	14.8	.77	17.5	.94	19.2	1.08		
1½	4.32	6.00	6.8	.57	12.7	.66	15.0	.80	16.5	.93	18.1	1.10
1⅜	3.60	5.50	5.6	.49	10.4	.56	12.4	.68	13.7	.79	15.1	.90
1¼	2.80	5.00	4.6	.40	8.7	.46	10.3	.56	11.3	.65	12.5	.75
1⅛	2.34	4.50	3.9	.33	7.3	.38	8.6	.46	9.5	.54	10.4	.62
1	1.73	4.00	2.9	.26	5.6	.31	6.6	.37	7.2	.43	7.8	.50
⅞	1.44	3.50	2.3	.20	4.5	.24	5.3	.29	6.3	.34	7.0	.39
¾	1.02	3.00	1.7	.16	3.3	.19	3.9	.22	4.9	.26	5.4	.31
⅝	.70	2.50	1.1	.12	2.2	.14	2.6	.16½	3.1	.19	3.4	.22½
9/16	.87	2.25	.97	.10	1.8	.12	2.1	.14	2.5	.16		
½	.42	2.00	.73	.08½	1.3	.11	1.6	.12½	1.9	.14	2.1	.17
7/16	.31	1.75	.52	.07½	.98	.10	1.1	.11½	1.3	.13		
⅜	.25	1.50	.42	.07	.78	.09½	.92	.11	1.1	.12½	1.2	.14½

STEEL CLAD, SPECIAL FLEXIBLE HOISTING ROPE
6 Strands, 37 Wires to Strand, 1 Hemp Core

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
2¾	12.05	8	32	$2.52	37	$2.95	43	$3.35	45	$3.75
2½	9.90	7	25	2.10	30	2.40	35	2.70	37	3.00
2¼	8.00	6	21	1.75	23	1.95	26	2.20	27	2.50
2	6.60	5.25	18.8	1.47	21.2	1.68	23.8	1.92	25	2.19
1⅞	5.90	4.75	17	1.31	19	1.54	22	1.76	23	2.01
1¾	4.90	4.25	14	1.13	16	1.31	18	1.49	19	1.69
1⅝	4.30	3.75	12	1.02	14	1.18	16	1.33	17	1.48
1½	3.75	3.5	11	.87	12	1.00	14	1.13	14	1.27
1⅜	3.05	3.2	9	.76	10	.86	11	.96	11	1.07
1¼	2.40	2.83	7	.65	8	.74	9	.83	9.2	.94
1⅛	2.00	2.5	6	.55	6.4	.62	7	.69	7.4	.77
1	1.75	2.16	5	.45	5	.51	5	.57	5.8	.63

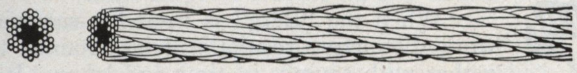
STEEL CLAD, EXTRA SPECIAL FLEXIBLE HOISTING ROPE
6 Strands, 61 Wires to Strand, 1 Hemp Core

Diameter in ins.	Weight per ft. in lbs.	Diameter of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLO W STEEL		MONITOR STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
3¼	16.80	10	48	$3.90	55	$4.55	62	$5.10	65	$5.70
3	14.35	9	40	3.23	47	3.78	53	4.33	55	4.82
2¾	12.05	8	32	2.71	37	3.18	43	3.62	45	4.06
2½	9.90	7	25	2.26	30	2.59	35	2.92	37	3.25
2¼	8.45	6	21	1.88	23	2.10	26	2.38	27	2.71

Continued on next page

Sash Cord

Made "dead soft" unless ordered to the contrary. Used principally for window weights, bell cords, automobile brakes and whistles. 3/32-in. diameter galvanized sash cord is used on electric open car curtain fixtures; 1/16-in. galvanized sash cord is used on car curtain fixtures.



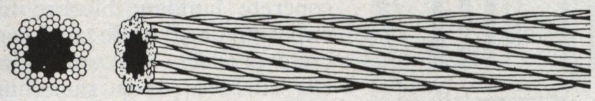
Sash Cord (6x7)

6 Strands of 7 Wires Each, 1 Cotton Core

Trade No.	Diam., in.	Weight per ft. in. lbs.		Approximate breaking strength in lbs.			List price per ft.		
		Iron	Copper	Bright iron	Annealed iron	Bright copper	Iron annealed or bright	Tinned or galvanized iron	Copper
26	¼	.101	.115	2200	1650	1320	$0.03	$0.04	$0.09
27	7/32	.077	.087	1800	1411	1080	.02¾	.03½	.07½
27½	3/16	.056	.064	1400	1100	840	.02¼	.03	.06
28	⅛	.025	.029	550	425	350	.01¾	.02¼	.04½
28½	3/32	.014	.016	320	250	200	.01½	.02	.03½
29	1/16	.006	.007	140	110	90	.01¼	.01¾	.03

Galvanized Mast Arm or Arc Light Ropes

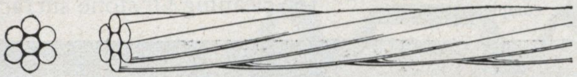
Furnished in sizes ¼ to ½-in. diameter.



Galvanized Mast Arm or Arc Light Rope

Steel Wire Strand

Used chiefly for guying poles and smokestacks, supporting trolley wire, and operating railroad signals.



Steel Wire Strand

7 Wires Twisted into a Single Strand, Galvanized or Extra Galvanized

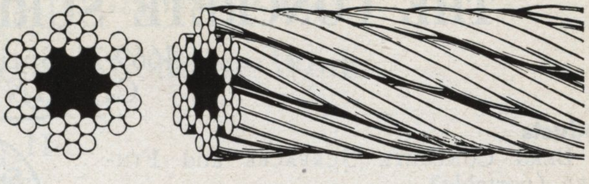
Diameter in ins.	Sizes of wire American Steel & Wire Co.'s steel wire gauge	Weight per 1000 ft. in lbs.	Strength in lbs.	List price per 100 ft.
¾	3	1200	16,700	$14.00
⅝	5	800	11,600	8.50
9/16	6	650	9,600	7.00
½	8	510	7,400	5.50
7/16	9	415	5,700	4.50
⅜	11	295	4,250	3.50
5/16	12	210	3,200	2.50
9/32	13	160	2,570	2.25
¼	14	125	1,900	1.75
7/32	15	95	1,540	1.50
3/16	16	75	1,150	1.25
5/32	17	55	870	1.15
9/64	18	40	700	1.10
⅛	19	32	540	1.00
7/64	20	25	450	.90
3/32	21	20	400	.80
5/64	22	13	300	.70

19 Wires Twisted into a Single Strand, Galvanized or Extra Galvanized

Diameter in ins.	Sizes of wire in ins.	Weight per 1000 ft. in lbs.	Strength in lbs.	List price per 100 ft.
1	.200	2100	32000	$26.00
⅞	.175	1610	24000	20.70
¾	.150	1200	18000	16.80
⅝	.125	800	14000	11.00
½	.110	650	11000	9.25
...	.100	510	8500	7.30

Galvanized Iron or Steel Guy Rope

For supporting derricks, and for general standing rope service; it is not designed to run over drums or sheaves.



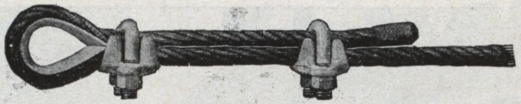
Galvanized Iron or Steel Guy Rope (6x7 or 6x12)

IRON			CRUCIBLE CAST STEEL		
6 Strands, 7 or 12 Wires Each, 1 Hemp Core			6 Strands, 7 Wires Each, 1 Hemp Core		
Diameter in ins.	Weight per ft. in lbs.	Strength in tons of 2000 lbs.	Diameter in ins.	Weight per ft. in lbs.	Strength in tons of 2000 lbs.
1¾	4.85	42	1¼	2.45	42
1 11/16	4.42	38	1 3/16	2.21	38
1⅝	4.15	35	1⅛	2	34
1½	3.55	30	1 1/16	1.77	31
1 7/16	3.24	28	1	1.58	28
1⅜	3	26	⅞	1.20	22
1¼	2.45	23	13/16	1.03	19
1 3/16	2.21	19	¾	.89	16.8
1⅛	2	18	⅝	.62	11.7
1 1/16	1.77	16.1	9/16	.50	9
1	1.58	14.1	½	.39	7
⅞	1.20	11.1	15/32	.34	6
13/16	1.03	9.4	7/16	.30	5
¾	.89	7.8	⅜	.22	4.2
⅝	.62	5.7	5/16	.15	3.2
9/16	.50	4.46			
½	.39	3.39			
7/16	.30	2.35			
⅜	.22	1.95			
5/16	.15	1.42			
5 Strands					
9/32	.125	1.20			
¼	.09	.99			
7/32	.063	.79			
3/16	.04	.61			

List prices furnished on application.

Tiger Wire Rope Clips

These are not recommended for permanent fastenings on hoist rope, but are universally used on ropes supporting screens, loading booms, etc.



Tiger Wire Rope Clips

Size clip corresponding to rope, diameter in ins.	Size of U-bolts (standard) in ins.	Approximate weight per 100 clips in lbs.	Size clip corresponding to rope, diameter in ins.	Size of U-bolts (standard) in ins.	Approximate weight per 100 clips in lbs.
3	1¼	2335	1⅛	¾	350
2¾	1¼	2100	1	¾	288
2½	1⅛	1570	⅞	¾	240
2¼	1⅛	1330	¾	⅝	140
2	1	1015	⅝	9/16	93
1¾	1	800	½	½	70
1⅝	⅞	680	7/16	½	65
1½	⅞	570	⅜	⅜	38
1⅜	⅞	510	5/16	⅜	32
1¼	⅞	450	¼	⅜	29

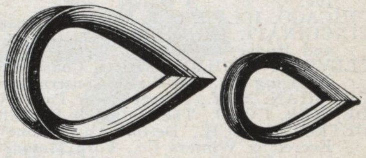
Hot galvanized finish (Western Union specifications) can also be furnished.

High Strength Bronze Tiger Wire Rope Clips

High strength bronze clips are designed for use in places where the life of galvanized steel clips is short, due to electrolysis or corrosion. They are much stronger than copper clips and because of their greater hardness are much more dependable. Their strength is approximately 75% that of steel so that four bronze clips may be used in place of three steel clips.

Galvanized Oval Thimbles

Our oval thimbles are heavily coated with zinc and made in various sizes.



Oval Thimbles

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THE CONCRETE SURFACING MACHINERY CO.

4669-71 Spring Grove Avenue
CINCINNATI, OHIO

BERG SURFACER WORLD-FAMED AND FINISHER
TRADE MARK

Products

Berg Concrete Surfacer and Finisher (portable).

Berg Electric Air Cushion Hammer (portable).

Berg Electric Multiple (Portable).

Also Berg Heavy-Duty Non-portable Concrete Surfacer and Finisher.

Berg Concrete Surfacer and Finisher

Consists of a cutting tool which is driven, through a specially constructed flexible, enclosed shaft, by a light weight electric motor carried by the operator. The cutting tool is a forged steel disc in which sixteen crucible steel, sharp toothed cutting wheels, hardened by a special process, are mounted. These wheels roll on the surface to be dressed and remove the material by a chipping process. A special carbo disc and grinding attachment plate is included as standard equipment and is interchangeable with the cutting tool.

Uses of Berg Concrete Surfacer and Finisher

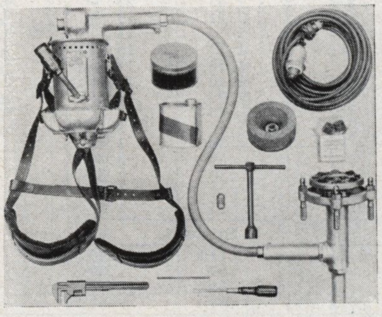
For the elimination of fins, board or form marks and all surface irregularities.

When the "Berg" is used for surfacing work distinctive results will be obtained together with savings in time and labor. It is estimated that the total cost per square foot of work, surfaced and finished by the "Berg" is 50% less than the cost of the work by hand.

It should always be specified that all surfacing and finishing of concrete work, exterior and interior, including walls, ceilings, columns, cement steps, porch floors and all stone surfaces, shall be done with the Berg Concrete Surfacer and Finisher.

Also wherever a perfect bond for float or other finish is required the surface should first be prepared with the "Berg" Surfacer.

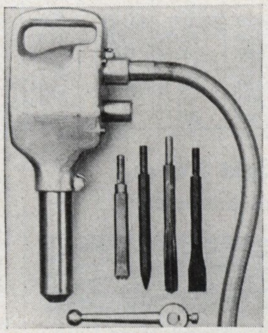
Other Uses—For producing special finishes on synthetic and imitation stone and concrete building blocks; for exposing aggregate on concrete products and smoothing the surfaces; for smoothing transverse expansion joints on highways, and with attachments for cutting brick walls in preparation for stucco, for grinding paint from bricks and for cleaning all stone surfaces.



"1925" Model Berg Surfacer and Finisher Complete

Driving motor is universal type (weight 20 lb.). Furnished for use with 110-125 volts or 220-250 volts a-c. or d-c. Generating unit supplied if necessary.

Aluminum used in all outer parts; weight complete with motor, 32 lb.

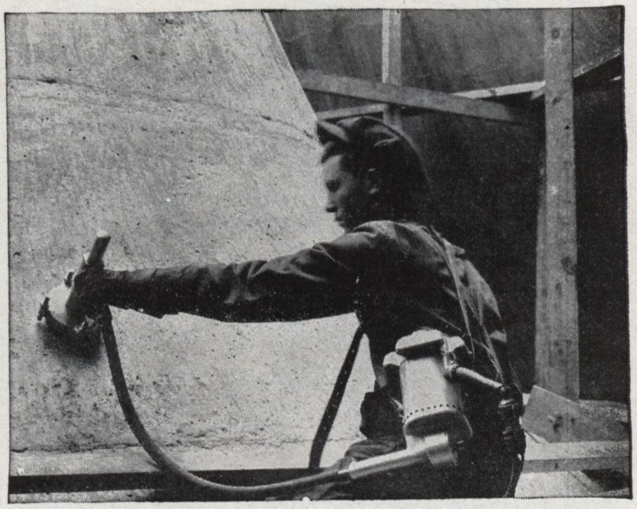


Berg Electric Air Cushion Hammer

A desirable tool to bush hammer, drill, score, chip, pick, chisel, etc. Can be purchased either as an attachment to the surfacer and finisher or as a separate complete tool

Two Berg Electric Multiples with Steel Brushes

Used to clean the entire Bedford stone exterior of the 10-story Atlas National Bank Building, Cincinnati, Ohio



Penstock of the Wilson Dam, Muscle Shoals, Ala.

Surfaced by a Berg. The concrete had been poured a year previous and the forms kept in place several months.

A Partial List of Recent Prominent Users

AMSTERDAM, HOLLAND, Hunkemoeller
BETHLEHEM, PA., Austin Electric Co.
BILTMORE, N. C., The Felstone Co.
BOSTON, MASS., Stone & Webster, Inc.
BUFFALO, N. Y., The Jno. W. Cowper Co., Inc.
CHICAGO, ILL., J. & F. Meyers Co.
CINCINNATI, OHIO, The Wm. Harig Co., and Hodges-Irwin Co.
CLEVELAND, OHIO, American Construction & Dredging Co., and Walsh Construction Co.
CROGHAN, N. Y., Beaver River Power Corp.
DENVER, COLO., The Dutton & Kendall Co.
DETROIT, MICH., Detroit Cast Stone Co., Everett & Winters Co., Ford Motor Company, The Lennane Co., Maxwell Motor Co., and Otto Misch Co.
EXCHEQUER, CAL. (Exchequer Dam), Bent Bros. Inc.
HARRISBURG, PA., Central Construction Co.
LITTLE ROCK, ARK. (Malvern Dam), Arkansas Light & Power Co.
LONDON, ENGLAND, Holloway Bros. Ltd., and Frank Bevis
LOS ANGELES, CAL., Stone & Webster, Inc.
MUSCLE SHOALS, ALA., United States Government
NAPA, CAL., Bordwell & Zimmerman
NEW HAVEN, CONN., Geo. A. Fuller & Co.
NEWPORT NEWS, VA., Cunningham Construction Co.
NEW YORK, N. Y., P. T. Cox Contracting Co., and The Foundation Co.
OSHKOSH, WIS., Badger Concrete Co.
PEORIA, ILL., Illinois Electric Power Co.
PHILADELPHIA, PA., Franklin W. Harris Construction Co., and Irwin & Leighton
PITTSBURGH, PA., McManus-Potter Co.
PORTO RICO, Ramon Carbia
PORTSMOUTH, ENGLAND, Frank Bevis, Ltd.
ROANOKE, VA., Atlantic Bridge Co.
SAN DIEGO, CAL., Requa & Jackson
ST. PAUL, MINN., Gauger-Korsmo Const. Co.
SOUTH BEND, IND., H. G. Christman Co.
TORONTO, CANADA, Canadian Elevator & Equipment Co., Ltd., and Hydro-Electric Power Commission
VANCOUVER, B. C., Hodgson, King & Marble
YOKAHAMA, JAPAN, T. K. S.

UNIVERSAL FORM CLAMP CO.

(INCORPORATED)

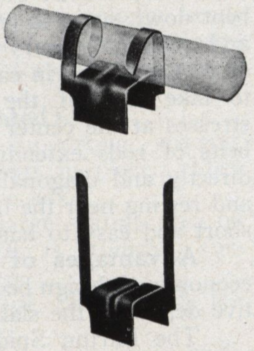
Manufacturers of Specialties for Concrete Work

972 Montana Street
CHICAGO, ILL.

Universal Chairs

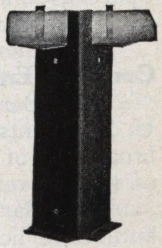
Bar Chairs—Strongly made of pressed steel and they are unrivaled under the conditions in which individual chairs are required. Universal bar chairs can be furnished with nailholes through the top, and when so punched, they are widely used to hold reinforcing steel away from the forms in retaining and foundation walls. These chairs are made in heights from ¾ to 2 in.

Screed Chairs—Made on the same principle as Universal high chairs and can be nailed to the form in the same manner. For the screed, a metal bar $\frac{5}{16}$x2 in. is used, resting in the top notches provided for it. From 2 to 4 chairs per screed are necessary, depending on its length. After the screed is no longer required, the bar is removed, leaving practically no depression in the slab, which is not the case when a wooden screed is used. The screed bars are used over and over, while the chairs remain in the slab.



Bar Chair

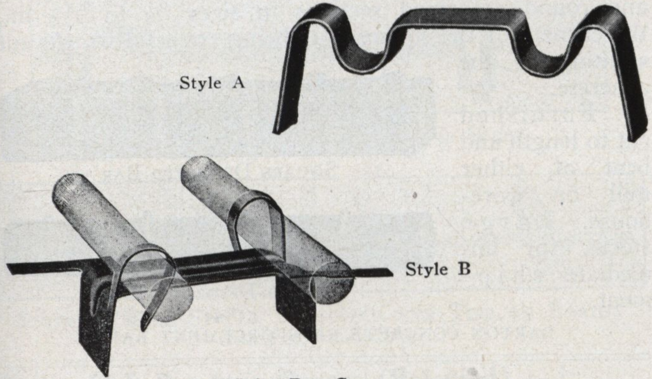
High Chairs—For the purpose of supporting bars around column heads and in the top of slabs. A single examination of the Universal high chair will convince you of their strength. The shelves at the bottom are provided with notches for nails, and there are holes for wiring the bars to the chair if it is desired. When Universal high chairs are nailed into position, they are there to stay. These chairs are furnished in any height above 2 in.



High Chair

Universal Spacers

Joist Bar Spacers—Furnished in two types. The Style A spacer is designed to support and space the bars without tying them in. Style B secures the bars in the joist spacers by means of a metal arm. Both types are excellently adapted to any design of ribbed floor construction and are exceptionally strong. They are furnished in heights from ½ to 1½ in. and from 4 to 6 in. wide to support one or two bars.



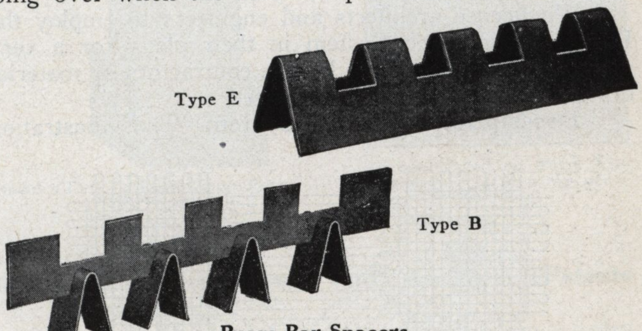
Style A

Style B

Joist Bar Spacers

Slab Bar Spacers—Space the bars the correct distance from the bottom of the form and from each other. They also tie every bar in its exact place. All Universal spacers are made up for the exact conditions provided for them in the plans. All spacers are tagged with designating marks to show the workmen in what portion of the work they are to be used. All Universal spacers will speed up steel laying. The double fold metal directly under the center of the bar prevents the bar from wedging its way down to the form when walked upon. The wire affords the quickest and best form of tie. There are no stiff metal arms to bend and no legs or supports to break off.

Beam Bar Spacers—Furnish a definite notch in which to lay the bars. The shelves under every bar are bent alternately and this feature adds to the stability of Universal beam bar spacers, preventing them from tipping over when the bars are pulled back and forth in the beams. The Style B spacer has no connection with the Style C spacer; it simply lays on top of the lower bars and can be placed in position anywhere along the top of the bottom bars.



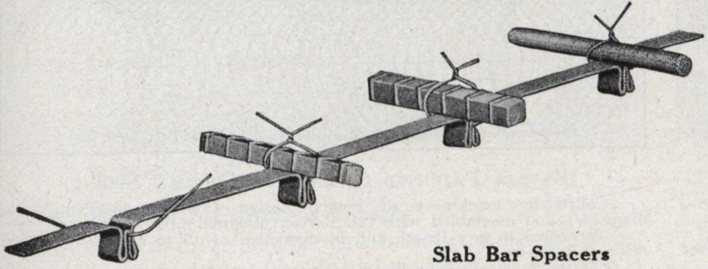
Type E

Type B

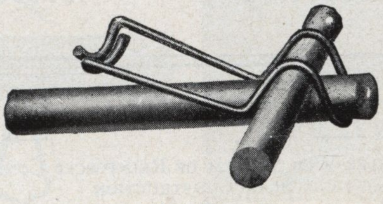
Beam Bar Spacers

Universal Bar Tie

Universal bar tie is the quickest and most economical method of tying together reinforcement. It is particularly well adapted for road work and for tying bars in retaining walls. Four sizes take combinations of bars varying from ¼x⅜ in. to 1x⅝ in.



Slab Bar Spacers



Bar Tie

BARTON SPIDER-WEB SYSTEM, INC.

Contracting Engineers and Manufacturers of Concrete Accessories

3426 South Kedzie Avenue
CHICAGO, ILL.

Products

CONCRETE REINFORCEMENT: Round and Square Bars and Collapsible Column Spirals.

CONCRETE REINFORCEMENT DEVICES and ACCESSORIES: Combination High and Screed Chairs, Bar Chairs, Slab Bar Spacers, Joist Bar Spacers, Beam Bar Spacers, Concrete-to-brick Anchors, Concrete Inserts.

Also manufacturers of Concrete Sleeper Anchors.

Concrete Engineering Service

The Barton Spider-Web System is the owner of U. S. Patents No. 1,335,780 and 1,217,645 covering the broad use of combination and two and four-way belts of rods in reinforced concrete flat slab construction.

The Barton Spider-Web System permits only its authorized licensees to incorporate this system in their designs. Infringers will be prosecuted.

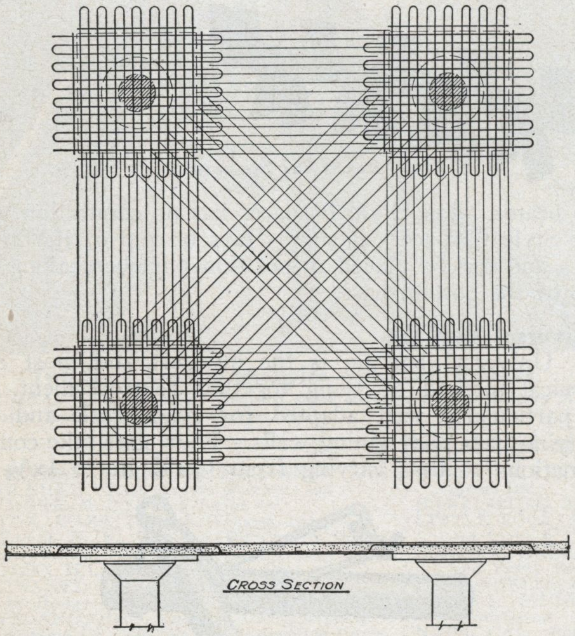
We also furnish complete engineering services for any type of reinforced concrete construction, for a nominal fee, whether or not the Barton Spider-Web System is used.

Barton Spider-Web System of Reinforced Concrete Flat Slab Construction

The combination of two-way and four-way belts of rods in reinforced concrete flat slab construction covered by the above mentioned patents is altogether distinctive.

We license architects and engineers to employ the Barton Spider-Web System in their plans for a very nominal fee. We do not license contractors or material dealers. Correspondence is invited.

Description of the System—The illustration shows the method of placing the reinforcing steel in the Barton Mat or Type A system. Factory-fabricated units (or mats) consist of continuous looped bars with ends bent down so as to regulate the exact height of the unit and to act as spacers for the lower bars. One such unit or mat is placed in each direction over the column head to take care of the negative stresses. The positive stresses at the center of the span are taken care of by belts of rods extending from column to column, both directly and diagonally, covering the entire panel area and resting near the bottom of the slab. These rods are short and easy to handle.



BARTON SPIDER-WEB SYSTEM OF REINFORCED CONCRETE FLAT SLAB CONSTRUCTION

Showing the mat or Type A system using fabricated mats over columns with four-way reinforcement in the slab

Advantages of the System—Insures maximum economy of design because it makes possible larger effective depths in the slab.

The Barton Spider-Web System results in a flat, level ceiling without the use of beams or girders.

This permits light to be diffused over the entire ceiling and allows sprinkler heads to be economically spaced so as to save up to 25% of the cost of the sprinkler equipment. Trolley beams can be placed flat against the ceiling instead of being hung on beams and hangers.

Barton Deformed Rib Bars

Rolled from new billet stock open hearth steel and conform to the specifications of the Association of American Steel Manufacturers. Made in square and round deformed sections in sizes 3/8 to 1¼ in., the corners of the square bars being rounded to prevent splitting of the concrete.

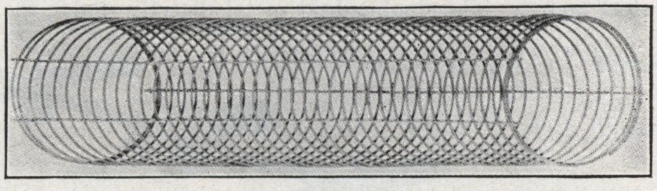
Furnished cut to length and bent at either mill or warehouse. Large stocks for immediate shipment.

SQUARE DEFORMED BAR

ROUND DEFORMED BAR

BARTON CONCRETE REINFORCEMENT BARS

Size, in.	Area, sq. in.		Weight per ft., lb.	
	Square	Round	Square	Round
3/8	.1420	.1115	.482	.379
½	.2525	.1982	.858	.674
5/8	.3945	.3098	1.341	1.054
¾	.5681	.4462	1.932	1.517
7/8	.7912	.6073	2.629	2.064
1	1.0100	.7932	3.434	2.696
1⅛	1.2782	1.0039	4.346	3.413
1¼	1.5781	1.2394	5.366	4.213



BARTON PATENTED COLLAPSIBLE COLUMN SPIRAL

Coiled by machinery of special design (assuring uniformity of diameter) and assembled with the Barton patented link spacer.

Furnished in any length and in diameters of 10 to 38 in., inclusive; pitch, 1 to 4 in.

Carried in stock; immediate shipments assured

Continued on next page

Barton Combination High and Screed Chairs

Used for accurately locating and holding top reinforcing rods over column heads, over indirect bands in two-way flat slab construction and over beams and girders. Also used for supporting screeds in connection with floor slabs. Locking prong to hold bars in place, also wire and rail holes. Extra large seating area giving maximum strength. Carried in stock in all sizes from 3 to 9 in. high.

Barton Bar Chairs

Furnished in place of the Barton combination high and screed chairs, where the bars over column heads are only 2 or 3 in. in height. Made of strip steel and furnished for exact height as called for on steel plans.

Barton Slab Bar Spacers (Patented)

These spacers are used for supporting, spacing, tying and holding reinforcement bars in place. They simplify the laying of bars and save labor.

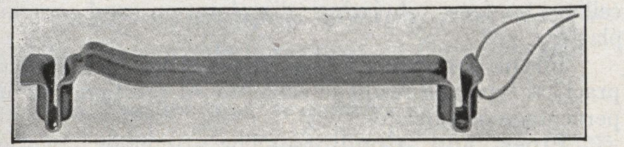
Briefly their advantages are: large seating area on forms; double yoke where strength is required; furnished with tie wires for tying bars.

General practice for spacing of Barton slab bar spacers is as follows:

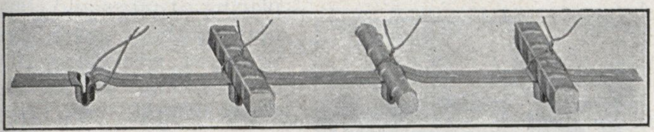
(1) For simple slabs and two-way slabs up to 16-ft. span, use 2 spacers; over 16-ft. span, use 3 spacers on each belt of rods.

(3) In general, Barton slab bar spacers should be set not over 8 ft. apart, but where accuracy is required, they should be spaced closer for small bars than for large bars.

Barton slab bar spacers are assembled either in the shop as called for on plans, or on the job to meet conditions. Large stocks for immediate shipment.



Bar Slab Bar Spacer with Tie Wire



Showing Bars Spaced, Supported and Tied on Barton Slab Bar Spacers

Barton Slab Bar Strip Spacer (Patented)

This strip spacer is well known and serves the same purpose as Barton slab bar spacer. It is made up special for each job.

Barton Joist Bar Spacers

Designed to carry either one or two bars and are adaptable to any type of ribbed floor construction. Carried in stock and furnished in any width or height to meet the requirements. Made of strip steel, a combination of strength and durability.

Barton Beam Bar Spacers

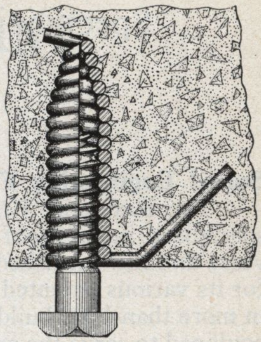
Made from strip steel with a large seating area for each bar. Will not tip. Carried in stock and furnished for exact height and width of beam and number of bars in each layer.

Barton Patented Concrete Inserts

Barton concrete inserts are used in concrete slabs, beams or columns for attaching shaft hangers, pipes, fixtures, sprinkler systems, etc. They are made of special drawn wire and are so coiled that the threads of standard lag bolts will mesh with them.

Their carrying capacity has been demonstrated by many years use and by Robert W. Hunt tests. They are the lowest priced inserts on the market because there is no unnecessary material used in their construction.

Furnished in ½, ⅝ and ¾-in. sizes, with or without lag bolts. Stocked for immediate shipment.



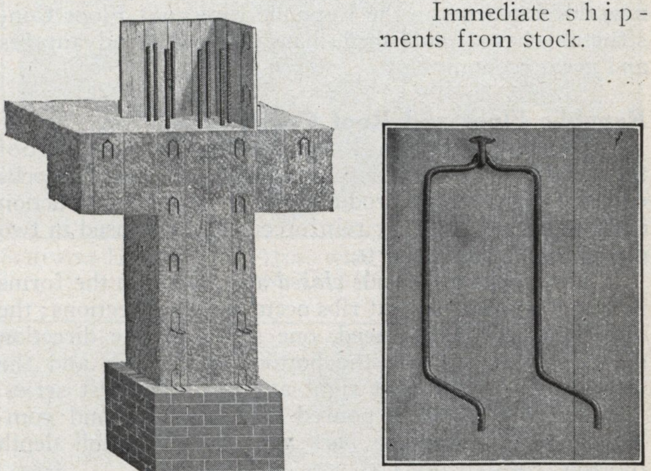
Barton Concrete Insert
Lag bolt in place

Barton Concrete-to-brick Anchors (Patented)

These devices are used for bonding brick veneer, stone, terra cotta or tile wainscoting to concrete surfaces. They are nailed to the inside of the form and left in place when the latter are removed.

Barton anchors are economical because no expensive drilling through forms is necessary to install them and because they do not mutilate the forms.

Immediate shipments from stock.



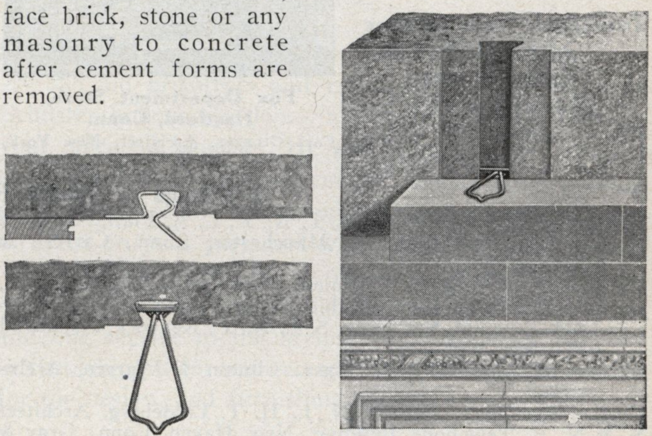
Anchors Left in Place Upon Removal of Forms

Anchor Nailed on Form Preparatory to Pouring of Concrete

Barton Concrete-to-brick Anchors

Barton Key Slot Forms and Anchors (Patents Pending)

A system of metal forms that are removable from a key-shaped channel in concrete construction. With this system key-shaped anchors are inserted to fasten veneer of terra cotta, face brick, stone or any masonry to concrete after cement forms are removed.



Barton Key Slot Forms and Anchors

REPUBLIC FIREPROOFING COMPANY, INC.

Specializing in Long Span Fireproof Floor and Roof Construction

MAIN OFFICE
31 Union Square
NEW YORK, N. Y.
REPRESENTATIVES THROUGHOUT THE UNITED STATES

Sound Engineering Floor Service

The Republic Fireproofing Company, Inc., has specialized in fireproof construction for the past fifteen years and has furnished material and engineering service for its various patented systems of floor construction used in more than 1000 buildings. It is, therefore, thoroughly equipped to serve the architect or his engineer with structural framing plans, floor construction design and cost data.

We render such service without charge in conjunction with the use of our materials as required for our patented construction systems, although the architect's plans and specifications using such systems may be strictly competitive according to established engineering standards for *other systems.*

Tests

Recent tests, directed by Columbia University, of new developments in the Republic Fireproof Floor Construction have established many structural advantages and great economy.

Republic Floor and Roof Construction

Description—The Republic long span fireproof floor and roof construction is based upon *fireproof* blocks of *compressive value* producing voids in the construction and permitting steel bar reinforcement to be used in two directions to the supports.

The blocks with ends *closed* are placed on the forms in true alignment so that ribs occur in two directions; the steel bars are then placed, one series in one direction about one inch above the bottom of the rib and the second series on top at right angles to the first series.

Concrete is then poured into the ribs and completely surrounding the bars and up to the full depth of the construction as designed.

With the sale of its material the Republic Fireproofing Company, Inc. furnishes complete detailed working drawings so that any practical contractor can install the system.

Technical Advantages of Republic Long Span Floors

Maximum Rigidity—A floor slab reinforced in two directions resting on four supports produces reactions at every point of its support, resulting in stresses set up in all directions.

By virtue of the support on four sides, a floor is restrained from deflecting as freely as a floor supported on only two sides.

Concrete, reinforced in two directions, produces double compression, resulting in greater stiffness, less deflection or greater resistance to bending and allowable higher bending moments. Such a construction must necessarily result in a greater capacity for concentrated or moving loads.

Additional Height and Space—Through distribution of the load in two directions, the supporting members may be reduced and column footings and foundations may be lighter than with other kinds of construction.

Furthermore, minimum depth for long spans results in greater ceiling height, light and air, or less building heights and lower cost, or additional stories to a given building height.

Solid and Uniform Ceilings—Ceilings produced by Republic blocks, are solid and uniform, so that only two coats of plaster are required, instead of three, as is generally necessary. Such construction, furthermore, permits flat ceilings for long spans between supports without the extra cost of metal lath and insures a uniform ceiling surface, obviating discoloration and cracking plaster.

Forms for construction purposes are the simplest, practical type and result in economy of erection and high percentage of salvage.

Pipes and Conduits—The Republic two-way load distribution results in a great latitude for the placing of pipes and conduits without extra expense or weakening the construction. It also affords simple, safe and economical framing around all openings.

Fireproof Construction—The Republic blocks and the concrete used in the Republic Systems are strictly fireproof, and protect the steel bar reinforcement so that *maximum fireproof* construction is assured.

Fox Department Store, Hartford, Conn.
Cass Gilbert, Architect, New York, N. Y.

Public Service Terminal Building, Newark, N. J.
Geo. B. Post & Sons, Architects, New York, N. Y.

Buildings in Which Republic System Is Used

- Ledyard Residence, Syosset, L. I., N. Y., C. A. Platt, Architect
- Cheney Bros. Building, So. Manchester, Conn., Carrere & Hastings, Architects
- University of Virginia, Chemical Laboratory, Charlottesville, Va., Walter D. Blair, Architect
- Sea View Hospital, Sea View, S. I., N. Y., Renwick, Aspinwall & Tucker, Architects
- Bankers Building, Boston, Mass., Clinton J. Warren, Architect
- Coppell Residence, Tenafly, N. J., H. T. Lindeberg, Architect
- S. & N. E. Telephone Building, New Haven, Conn., Gray & Lawrence, Architects
- American Insurance Building, Newark, N. J., Cass Gilbert, Architect
- High School No. 5, Paterson, N. J., Wm. T. Fanning, Architect
- Prescott School, Syracuse, N. Y., A. L. Brockway, Architect
- St. Judas Chapel, 19 West 99th Street, New York, N. Y., Ludlow & Peabody, Architects
- Suffolk Law School, Boston, Mass., Fay, Spofford & Thorndike, Architects
- Manhattan College, New York, N. Y., O'Connor & Delaney, Architects
- Hartford Rubber Works, Hartford, Conn., Lockwood, Greene & Co., Architects

THE WHITACRE ENGINEERING COMPANY

Schuster Hollow Tile Floors

706 Union Building
CLEVELAND, OHIO

Product

Schuster Hollow Tile Floors.

Description

Schuster hollow tile floor construction is a combination of hollow tile and concrete reinforced in two directions.

The tile are 12x12 special design clay blocks, capable of resisting shearing and compressive stresses. They are an integral part of the slab and are held securely in position by the key of concrete which is forced into the cells.

Each concrete joist between the rows of tile in each direction is reinforced with a straight bar, resisting positive moment; and, where continuity exists, with a short straight bar over the support, resisting negative moment. *No bent bars are used. No temperature bars are required. No concrete is required on top of the tile.*

Structural Feature and Economy

Small dead loads permit the use of small beams, columns and footings. This effects a saving in concrete and reinforcement in these members as compared with other types of construction.

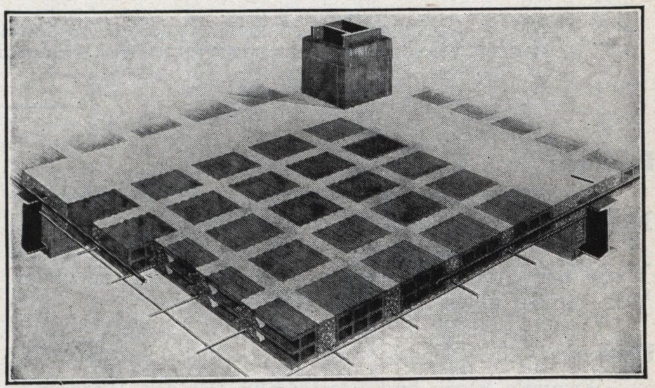
Tile used in shear and compression provides sufficient shearing area at the ends of each joist, and eliminates the top concrete required by other floor systems as compressive area to develop the reinforcement. The tile is not a mere filler adding useless dead weight but is a structural member of the slab.

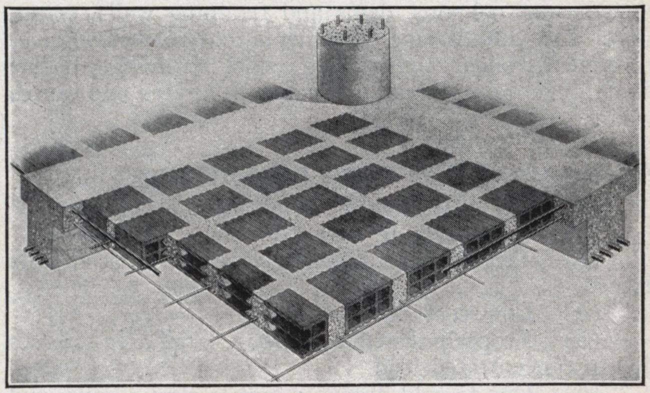
Load distribution equal to that obtained with flat slab construction is secured. Heavy concentrated loads distribute themselves over two or more joists in each direction. This means that substantially there is no such thing as a concentrated load with Schuster hollow tile floors.

Slab thickness from 3 to 7 inches less in depth than that required by a one-way type of construction permits a total saving often amounting to an entire story height of the building. This means a material saving in masonry, pipes, conduits, stairs, etc.

Openings in the slab are easily handled. In many cases, special framing is unnecessary.

Plaster applied directly on the tile requires 2 coats, whereas plaster on mesh requires 3 coats. If an all-tile ceiling is desired, soffit tile are used.


Schuster Hollow Tile Floors with Structural Steel Beams and Columns


Schuster Hollow Tile Floors with Concrete Beams and Columns

Service

To aid architects and engineers in the design of Schuster hollow tile floors, an engineer will be sent to your office on request. He will be prepared to furnish complete design data, information regarding tests, and previous use of the system without any obligation being incurred on your part, and without expense to you.

Schuster hollow tile floors are a patented type of construction. We control the sale and use of the floors and our service to the architect and engineer consists in furnishing them with complete information necessary for the design, and furnishing the tile for the floors.

AMERICAN STEEL & WIRE COMPANY

Triangle Mesh and Electrically Welded Wire Fabric for Concrete Reinforcement

SALES OFFICES

CHICAGO, 208 South La Salle Street
NEW YORK, 30 Church Street
WORCESTER, 94 Grove Street
BOSTON, 185 Franklin Street
PHILADELPHIA, Widener Building
PITTSBURGH, Frick Building
BUFFALO, 670 Ellicott Street
DETROIT, Foot of First Street
CINCINNATI, Union Trust Building
CLEVELAND, Rockefeller Building
BALTIMORE, 32 South Charles Street
WILKES-BARRE, PA., Miners Bank Building
ST. LOUIS, Liberty Central Trust Co. Building
DALLAS, Praetorian Building
ST. PAUL, Merchants National Bank Building
KANSAS CITY, MO., 417 Grand Avenue
OKLAHOMA CITY, First National Bank Building
BIRMINGHAM, ALA., Brown-Marx Building
MEMPHIS, TENN., Union and Planters Bank Building
DENVER, First National Bank Building
SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, United States Steel Products Co., 30 Church Street, New York
PACIFIC COAST REPRESENTATIVES, United States Steel Products Co., San Francisco, Los Angeles, Portland, Seattle

Products

Triangle Mesh and Electrically Welded Wire Fabrics for Concrete Reinforcement.

For Wire Rope, see pages 29-33; for Triangle Mesh for Stucco Base, see page 424; for Electrical Wires and Cables, see pages 2372-2383.

Uses

Triangle Mesh and Electrically Welded Wire Fabrics are used for the reinforcing of concrete floor and roof slabs, concrete walls and chimneys, arch construction, beams, columns, dams and retaining walls, water, sewer and culvert pipe, pavements and roadways, river revetment, silos, fireproofing steel framing, bridge floors, reservoirs, monolithic concrete sewers and stucco work.

Advantages of Wire Fabric Reinforcement

(1) Provides even distribution of steel.
(2) Reinforces in every direction.
(3) Tension or carrying members accurately spaced.
(4) Low cost of inspection.
(5) Properly distributes over a large area stresses due to concentrated load.
(6) Due to cold drawing, higher elastic limits and ultimate strengths with same quality of steel.
(7) Continuous action from one end of the structure to the other.
(8) Impossible to leave out or otherwise reduce the necessary steel if specific style number of fabric or area of steel is specified.
(9) Perfect mechanical bond.
(10) Easily handled and stored on the work.
(11) Minimum cost of installation.

Grade of Steel

A reduction of the required sectional area of steel is safely accomplished, within limits, by the use of a higher tensile strength steel. This high tensile strength may be secured by increasing the carbon content or by cold drawing of mild steel.

Cold drawing of mild steel produces a high ultimate strength and yield point, and the proportion of the yield point to the ultimate strength is increased to from 70 to 90%. Since the strength of a reinforced concrete structure, in so far as the reinforcement is concerned, depends on the yield point of the steel, the high yield point of cold drawn wire is of great importance.

Galvanizing

Triangle Mesh Reinforcement is furnished plain on orders unless otherwise specified.

American Electrically Welded Fabric is furnished plain or galvanized as ordered.

In general, the additional cost for galvanized fabric is not justified except in special cases where the steel will be inadequately protected, as in very thin slabs, etc.

Triangle Mesh Woven Wire Concrete Reinforcement

Triangle Mesh fabric is made from cold drawn mild steel having an ultimate strength of 70,000 to 85,000 lb. per sq. in. The longitudinal members are spaced 4 in., the diagonal cross wires either 2, 4, or 8 in. It is the only design of wire fabric having cross wires that assist the longitudinals in carrying the load.

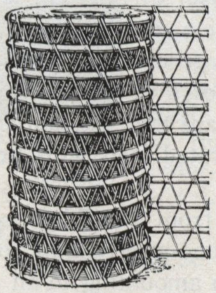


Fig. 1. Triangle Mesh Wire Fabric Reinforcement

For the light styles of fabric, the longitudinals consist of 1 wire; for the medium styles, 2 wires laid parallel; and for the heavy styles, 3 wires stranded. The sizes of the wires and the number per longitudinal are varied to obtain the desired cross-sectional area of steel per foot

Continued on next page

of width. Stranded longitudinals are used to reduce the stiffness of the finished product without affecting the tensile strength.

TRIANGLE MESH WOVEN WIRE CONCRETE REINFORCEMENT

* Style No.	Number and gauge of wires each, longitudinal, A. S. & W. Co.'s steel wire gauge	Sectional area longitudinals, sq. in. per ft. width	Effective sect. areas, sq. in. per ft. of fabric		Approx. weight, lb. per 100 sq. ft.
			Trans.	Longit.	
Longitudinals Spaced 4 in. Cross Wires No. 14 Gauge, Spaced 4 in.					
032	1—No. 12 gauge	.026	.022	.032	22
040	1—No. 11 gauge	.034	.022	.040	25
049	1—No. 10 gauge	.043	.022	.049	28
058	1—No. 9 gauge	.052	.022	.058	32
068	1—No. 8 gauge	.062	.022	.068	35
080	1—No. 7 gauge	.074	.022	.080	40
093	1—No. 6 gauge	.087	.022	.093	45
107	1—No. 5 gauge	.101	.022	.107	50
126	1—No. 4 gauge	.120	.022	.126	57
146	1—No. 3 gauge	.140	.022	.146	65
153	1—¼ in.	.147	.022	.153	68
168	1—No. 2 gauge	.162	.022	.168	74
180	2—No. 6 gauge	.174	.022	.180	78
208	2—No. 5 gauge	.202	.022	.208	89
245	2—No. 4 gauge	.239	.022	.245	103
267	3—No. 6 gauge	.261	.022	.267	111
287	3—No. 5½ gauge	.281	.022	.287	119
309	3—No. 5 gauge	.303	.022	.309	128
336	3—No. 4½ gauge	.330	.022	.336	138
365	3—No. 4 gauge	.359	.022	.365	149
395	3—No. 3½ gauge	.389	.022	.395	160
Longitudinals Spaced 4 in. Cross Wires No. 14 Gauge, Spaced 8 in.					
036P	1—No. 12 gauge	.026	.009	.036	17
044P	1—No. 11 gauge	.034	.009	.044	20
053P	1—No. 10 gauge	.043	.009	.053	24
062P	1—No. 9 gauge	.052	.009	.062	27
072P	1—No. 8 gauge	.062	.009	.072	31
084P	1—No. 7 gauge	.074	.009	.084	35
097P	1—No. 6 gauge	.087	.009	.097	40
Longitudinals Spaced 4 in. Cross Wires No. 12½ Gauge, Spaced 8 in.					
041R	1—No. 12 gauge	.026	.014	.041	21
049R	1—No. 11 gauge	.034	.014	.049	24
058R	1—No. 10 gauge	.043	.014	.058	28
067R	1—No. 9 gauge	.052	.014	.067	31
077R	1—No. 8 gauge	.062	.014	.077	35
089R	1—No. 7 gauge	.074	.014	.089	40
102R	1—No. 6 gauge	.087	.014	.102	44

Longitudinals Spaced 4 in. Cross Wires Nos. 14 and 12½ Gauge, Spaced 2 in.

(This material is used principally for cement gun work)

Style No.	Number of wires each, longitudinal	Gauge of wires each, longitudinal	Gauge of cross wires	Approx. weight, lb. per 100 sq. ft.
7A	1	12	14	31
6A	1	10	14	37
5A	1	8	14	44
4A	1	6	14	53
29A	1	12	12½	42
28A	1	10	12½	48
27A	1	8	12½	55
26A	1	6	12½	64

Rolls: Standard lengths 150, 200 and 300 ft.
Widths: Approximately 16, 20, 24, 28, 32, 36, 40, 44, 48, 52 and 56 in.
Finish: Plain or galvanized.
Tensile strength: Standard, 70,000 to 85,000 lb. per sq. in.

Electrically Welded Wire Fabric Reinforcement

A square or rectangular mesh made from cold drawn steel wire electrically welded at the intersections of the transverse and longitudinal wires. Various combinations of spacings and sizes of wires can be furnished.

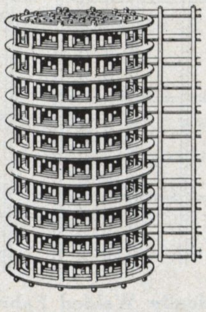


Fig. 2. Electrically Welded Wire Fabric Reinforcement

This material combines the same high quality of material and service that has given Triangle Mesh reinforcement its enviable reputation.

When embedded in concrete, this mesh yields the maximum of its steel strength.

AMERICAN ELECTRICALLY WELDED FABRIC

Spacing of wires, in		Gauge number		Sect. area, sq. in. per ft.		Weight per 100 sq. ft., lb.
Longit.	Trans.	Longit.	Trans.	Longit.	Trans.	
2	16	1	7	.377	.018	138.9
2	16	2	8	.325	.015	119.4
(*) 2	16	3	8	.280	.015	103.6
(*) 2	16	4	9	.239	.013	88.5
(*) 2	16	5	10	.202	.011	74.6
(*) 2	16	6	10	.174	.011	64.7
3	16	2	8	.216	.015	82.6
(*) 3	16	3	8	.187	.015	72.0
(*) 3	16	4	9	.159	.013	61.4
(*) 3	16	5	10	.135	.011	51.8
(*) 3	16	6	10	.116	.011	45.1
3	16	7	11	.098	.009	38.1
3	16	8	12	.082	.007	31.7
(*) 4	16	3	8	.140	.015	56.1
(*) 4	16	4	9	.120	.013	47.9
(*) 4	16	5	10	.101	.011	40.4
(*) 4	16	6	10	.087	.011	35.2
(*) 4	16	7	11	.074	.009	29.7
(*) 4	12	8	12	.062	.009	25.5
4	12	9	12	.052	.009	21.8
4	12	10	12	.043	.009	18.6
4	12	12	12	.026	.009	12.6
4	12	5	5	.101	.034	48.4
4	12	6	6	.087	.029	41.6
4	12	7	7	.074	.025	35.4
4	12	8	8	.062	.021	29.6
6	12	0	6	.148	.029	65.3
6	12	2	2	.108	.054	59.4
6	12	3	3	.093	.047	51.2
6	12	4	4	.080	.040	43.8
6	12	5	5	.067	.034	37.0
6	12	6	6	.058	.029	31.8
6	12	7	7	.049	.025	27.0
6	8	12	12	.017	.013	11.1
6	6	4	4	.080	.080	57.8
6	6	5	5	.067	.067	48.8
(*) 6	6	6	6	.058	.058	42.0
6	6	7	7	.049	.049	35.7
(*) 6	6	8	8	.041	.041	29.9
6	6	9	9	.035	.035	25.0
(*) 6	6	10	10	.029	.029	20.7
4	4	4	4	.120	.120	85.3
(*) 4	4	6	6	.087	.087	61.9
(*) 4	4	8	8	.062	.062	44.1
(*) 2	2	10	10	.086	.086	60.3
(*) 2	2	12	12	.052	.052	36.8
(*) 2	2	13	13	.039	.039	27.7
(*) 2	2	14	14	.030	.030	21.2

(*) Styles usually carried in stock.

Rolls: Standard lengths 150, 200 and 300 ft. For No. 2 gauge wires and larger, flat sheets only.

Widths: Multiples of the spacing of longitudinal wires up to a maximum width which varies with the size and spacing of the longitudinals. Approximate maximums 56 to 72 in. for 2-in. spacing, 84 to 96 in. for 3 or 4-in. spacing, and 96 to 120 in. for 6-in. spacing. All widths measured center to center of selvage longitudinals.

Extra charge made for widths narrower than 40 in.

Finish: Plain or galvanized.

Tensile Strength: Standard, 60,000 to 70,000 lb. per sq. in.; 70,000 to 80,000 lb. furnished when ordered.

Weights—All above weights are based on a width of 60 in. measured from center to center of the outside or selvage longitudinal wires.

STEEL WIRE GAUGE AND DIFFERENT SIZES OF WIRE

Diameter, in.	A. S. & W. Co.'s steel wire gauge	Diameter, in.	Area, sq. in.	Lb., per ft.	Lb., per mile	Ft. per lb.
	0	.3065	.073782	.2506	1323.	3.991
	1	.2830	.062902	.2136	1128.	4.681
9/32		.28125	.062126	.2110	1114.	4.74
	2	.2625	.054119	.1838	970.4	5.441
¼		.2500	.049087	.1667	880.2	5.999
	3	.2437	.046645	.1584	836.4	6.313
	4	.2253	.039867	.1354	714.8	7.386
7/32		.21875	.037583	.1276	673.9	7.835
	5	.2070	.033654	.1143	603.4	8.750
	6	.1920	.028953	.09832	519.2	10.17
13/16		.1875	.027612	.09377	495.1	10.66
	7	.1770	.024606	.08356	441.2	11.97
	8	.1620	.020612	.07000	369.6	14.29
5/32		.15625	.019175	.06512	343.8	15.36
	9	.1483	.017273	.05866	309.7	17.05
	10	.1350	.014314	.04861	256.7	20.57
⅛		.125	.012272	.04168	220.0	24.00
	11	.1205	.011404	.03873	204.5	25.82
	12	.1055	.0087147	.02969	156.7	33.69
3/32		.09375	.0069029	.02344	123.8	42.66
	13	.0915	.0065755	.02233	117.9	44.78
	14	.0800	.0050266	.01707	90.13	58.58

Continued on next page

AREA OF STEEL AND THICKNESS OF SLAB REQUIRED FOR GIVEN SPANS AND LOADS

Bending moment=$WL^2 \div 12$. Center of steel ¾ in. above bottom of slab.

Reinforcement in each case is sufficient for the live load shown plus the weight of the concrete slab. Any dead load of the floor exclusive of the concrete slab should be considered as part of the live load shown here.

Maximum stresses: Steel=18,000 lb., Concrete=700 lb.

Note: If not restricted by building code to a stress in the steel of 18,000 lb., a stress of 20,000 lb. can safely be used for wire mesh reinforcement. For a steel stress of 20,000 lb. reduce the areas of steel shown in the table by 10%.

After hundreds of tests of actual slabs made by the Testing Laboratory of Columbia University, the City of New York prepared a code covering slabs having spans of 8 ft. or less and decided on the use of an empirical formula that is equivalent to assuming a working stress in the steel in the standard formula for reinforced concrete design of approximately 32,000 lb. per sq. in. Millions of square feet of reinforced concrete floors have been built in accordance with this New York code.

Live load per sq. ft. lb.	Span of slab, center to center of supports, ft.-in.																				
	4-0	4-6	5-0	5-6	6-0	6-6	7-0	7-6	8-0	8-6	9-0	9-6	10-0	10-6	11-0	11-6	12-0	12-6	13-0	13-6	14-0	14-6
	Floor slab thickness and area of steel in sq. in. per foot width of slab required for spans and loads indicated																					
30	3" .027	3" .035	3" .043	3" .053	3" .064	3" .075	3" .086	3" .100	3" .116	3" .132	3" .148	3" .166	3½" .163	3½" .180	3½" .198	3½" .218	4" .216	4" .235	4" .255	4½" .255	4½" .276	4½" .297
40	3" .032	3" .040	3" .050	3" .061	3" .074	3" .087	3" .101	3" .117	3" .135	3" .153	3" .172	3½" .168	3½" .187	3½" .206	4" .205	4" .224	4" .245	4½" .245	4½" .266	4½" .288	5" .289	5" .311
50	4" .028	4" .035	4" .044	4" .054	4" .064	4" .076	4" .089	4" .102	4" .117	4" .133	4" .150	4" .168	4" .187	4" .208	4" .229	4" .251	4½" .250	4½" .273	4½" .295	5" .296	5" .320	5" .343
60	4" .030	4" .039	4" .049	4" .059	4" .071	4" .083	4" .098	4" .113	4" .130	4" .148	4" .166	4" .186	4" .207	4" .229	4" .253	4½" .251	4½" .275	4½" .300	5" .299	5" .324	5½" .326	5½" .351
80	4" .037	4" .047	4" .059	4" .071	4" .085	4" .100	4" .117	4" .135	4" .155	4" .176	4" .198	4" .223	4" .248	4½" .246	4½" .272	4½" .298	5" .297	5" .324	5½" .325	5½" .353	5½" .380	6" .382
100	4" .042	4" .054	4" .068	4" .083	4" .099	4" .117	4" .137	4" .158	4" .180	4" .205	4" .231	4" .259	4½" .257	4½" .285	5" .285	5" .313	5" .343	5½" .342	5½" .369	6" .373	6" .405	
125	4" .050	4" .064	4" .080	4" .097	4" .116	4" .137	4" .160	4" .185	4" .213	4" .242	4½" .241	4½" .270	4½" .302	5" .301	5" .333	5½" .333	5½" .365	6" .365	6" .399			
150	4" .0[illegible]8	4" .073	4" .092	4" .112	4" .135	4" .159	4" .185	4" .214	4" .245	4½" .246	4½" .277	5" .278	5" .310	5" .344	5½" .345	5½" .379	6" .382	6" .417				
175	4" .066	4" .083	4" .104	4" .127	4" .152	4" .180	4" .210	4" .243	4½" .244	4½" .278	5" .280	5" .314	5½" .317	5½" .352	6" .356	6" .391						
200	4" .073	4" .093	4" .116	4" .141	4" .170	4" .200	4" .234	4½" .237	4½" .272	5" .276	5" .312	5½" .316	5½" .352	6" .357	6" .394							
250	4" .088	4" .112	4" .140	4" .172	4" .205	4" .243	4½" .245	4½" .288	5" .292	5" .333	5½" .338	5½" .379	6" .386									
300	4" .103	4" .132	4" .165	4" .202	4" .242	4½" .249	4½" .292	5" .299	5" .343	5½" .350	6" .359	6" .403										

See tables on preceding page for styles of Triangle Mesh and American Electrically Welded Fabric that will give required areas.

Wire Fabric Reinforced Slabs

Supporting the Mesh Reinforcement—The correct location of the reinforcing mesh in the top portion of slabs over concrete beams can be easily and cheaply obtained by means of precast concrete blocks as shown in Fig. 3.

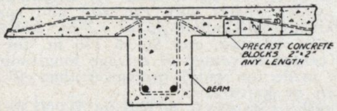


Fig. 3. Inexpensive Method of Supporting Wire Mesh Reinforcement Over Concrete Beams

Blocks should have a height about 1¼ or 1½ in. less than the full thickness of the slab. The length may be any convenient amount such as 1 or 2 ft. or such lengths as are readily formed by breaking long strips of the blocks. The mesh should be supported for at least one-third of its width. These blocks will stay in approximately correct position without any means of attachment to the reinforcing mesh or to the forms.

For short spans (about 8 ft. or less) these blocks will be required on one side only of the beams. For spans greater than 8 ft., use blocks on both sides.

Detailing Widths of Mesh—For estimating purposes where accuracy is unnecessary, provided the estimate is on the safe side, it is permissible to assume that the mesh required will equal in square feet the actual area of the floor slab. As a matter of fact, the amount of mesh needed will be less than that, and at the same time a more efficient and more economical layout is possible. In the first place, a 2-in. lap along the sides of the sheets of wire mesh reinforcement is sufficient to develop the full strength of the reinforcement; more

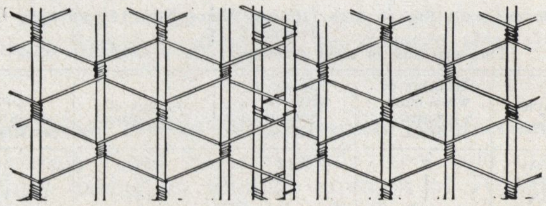


Fig. 4. Triangle Mesh Reinforcement As It Actually Appears with a Side Lap of 2 in.

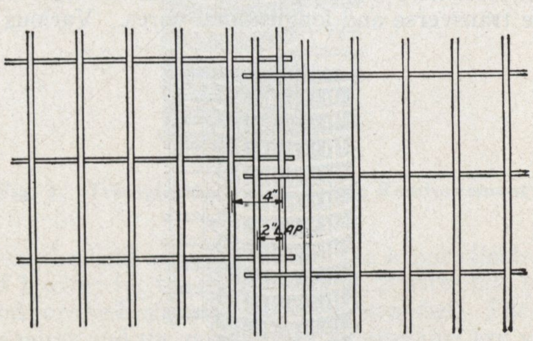


Fig. 5. Electrically Welded Fabric As It Actually Appears with a Side Lap of 2 in.

Continued on next page

than that is a waste of material. This 2-in. lap means a lap of the outside (or selvage) longitudinal wires and should not be assumed for those forms of mesh having a zigzag selvage edge.

A suggested detail for the amount and location of wire mesh reinforcement is shown in Fig. 6. Providing a short strip of light weight fabric is placed near the top of the slab over the girders with the main longitudinal wires at right angles to the direction of the girders, it is not only unnecessary but a waste of material to require that the main reinforcement of the slabs entirely cover the space between and over the girders. The distance between the center line of the girder and the edge of the reinforcing fabric can be any amount up to about 20 in. without reducing the strength of the structure.

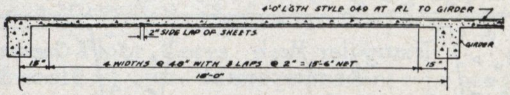

4'-0" LGTH STYLE 049 AT RL TO GIRDER
2" SIDE LAP OF SHEETS
GIRDER
15"
4 WIDTHS @ 48" WITH 3 LAPS @ 2" = 15'-6" NET
15"
18'-0"

Fig. 6. Detailing Widths of Mesh and Showing Extra Strip of Mesh Over the Girders

Other Uses of Wire Mesh Reinforcement

Concrete Joist Floors—Fig. 7 shows a typical section of such a floor. Here is a 2 or 3-in. slab having a clear span between the supporting ribs of 23 in., that must not only act as part of the compression portion of the beams and resist temperature stresses, but in addition act as a support of the loads that may come upon the floor.

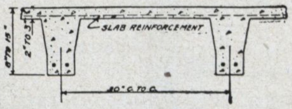


Fig. 7. Typical Section of Concrete Joist Floor

The most efficient type of reinforcement to take care of these various stresses is a fabricated mesh made from cold drawn high elastic limit wire with comparatively close spacing of members.

Top Layer of Concrete Finished Floors—It is often desirable for construction reasons to leave the ¾ or 1-in. top dressing until after the main part of the slab is completely hardened. In this case the slab should be thoroughly cleaned before applying the final course, and this course should be reinforced with wire mesh reinforcement to prevent destructive cracks.

Specify Style 032 Triangle Mesh or 4x4-in. mesh No. 12 by No. 12 gauge wires Electrically Welded wire fabric.

Basement and Other Floors that Rest Upon the Ground—As conditions vary with each job, it is impossible to make any definite suggestions regarding the proper weight of fabric to use, but millions of square feet of Style 049 Triangle Mesh have been successfully used for this purpose. Where heavy loads and questionable fill-foundations occur, it will be economy to use heavier mesh, such, for instance, as Style 153 Triangle Mesh or an equivalent weight of Electrically Welded wire fabric having spacings of wires that do not exceed 6 in.

Flat Slab Beamless Floors—Wire fabric reinforcement has been successfully used for this type of construction. It can be furnished in rolls or flat sheets.

This material is most desirable and it is highly recommended.

Cement Gun Work—Gunite (trade-name) is concrete applied by the cement gun process, which produces probably the densest and, therefore, the most waterproof concrete available by present known methods.

Gunite reinforced with wire fabric reinforcement has repaired successfully old crumbling bridge piers, tunnel linings and sea walls; old steel bridges, tanks and trusses; leaky reservoirs and irrigation ditches; even wooden structures that have been damaged by fire have been restored to usefulness by this method. And repair work is by no means the most important class of work produced. All kinds of new construction, especially those requiring waterproof qualities with light resulting weight, can be successfully executed.

Fireproofing of Steel Framing—Wrap all steel columns, girders and beams with Triangle Mesh, Style 032, or Electrically Welded fabric, 4x4-in. mesh, all No. 12 gauge wires.

Concrete Chimneys—Style 153 Triangle Mesh is standard for the circumferential reinforcement.

Stucco Reinforcement—See page 424.

Concrete Sewers—The close spacing of members of Triangle Mesh is largely responsible for the successful results obtained with precast sewer pipe. The weight of fabric varies with the diameter of pipe, thickness of shell and depth of fill.

Concrete Driveways, Streets and Highways—Wire fabric reinforcement is essential to prevent destructive cracks. The purpose of the reinforcement is to increase the structural strength of the concrete slab and also to bind it together as a unit. The high tensile strength and the close spacing of members of a wire fabric show decided advantages for these purposes. The weight of wire fabric used in pavement has varied on account of varying conditions, but the average practice calls for 35 to 50 lb. per 100 cu. ft.

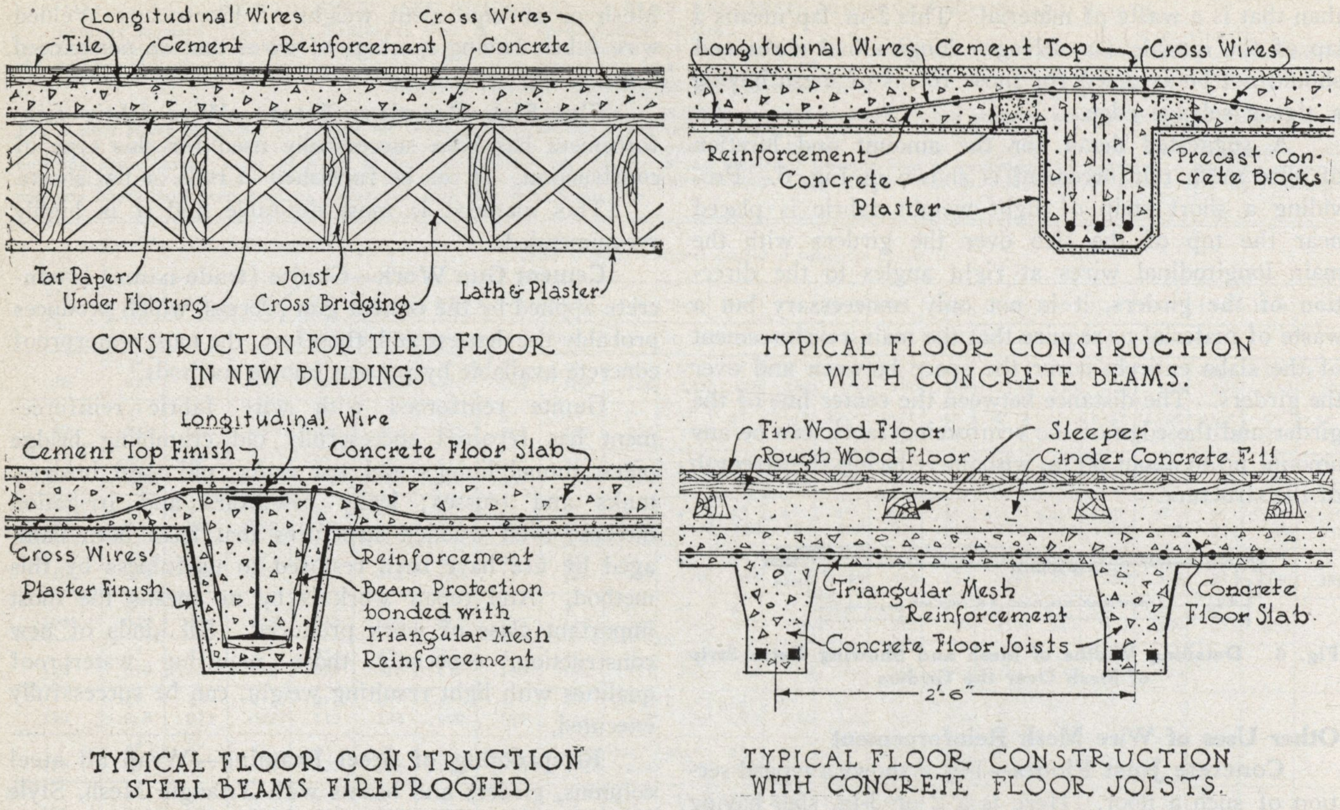
Suggested Specifications for Pavements—Reinforcement shall consist of steel wire fabric manufactured from cold drawn wire, finished members of which shall develop an ultimate tensile strength of at least 70,000 lb. per sq. in. and which shall bend cold 180° around a pin the diameter of which is equal to diameter of wire specimen without cracking on outside of bent portion.

All reinforcement shall be free from excessive rust, scale, paint or coating of any character which will tend to prevent proper bonding of the concrete.

The fabric reinforcement shall weigh not less than 40 lb. per 100 sq. ft.

The main or heavier wires of fabric shall be spaced not more than 6 in. apart. The secondary or lighter wires of fabric shall be spaced not more than 12 in. apart.

Continued on next page


Longitudinal Wires
Cross Wires
Tile
Cement
Reinforcement
Concrete
Tar Paper
Under Flooring
Joist
Cross Bridging
Lath & Plaster
Longitudinal Wires
Cement Top
Cross Wires
Reinforcement
Concrete
Plaster
Precast Concrete Blocks
Longitudinal Wire
Cement Top Finish
Concrete Floor Slab
Cross Wires
Plaster Finish
Reinforcement
Beam Protection bonded with Triangular Mesh Reinforcement
Fin Wood Floor
Rough Wood Floor
Sleeper
Cinder Concrete Fill
Triangular Mesh Reinforcement
Concrete Floor Slab
Concrete Floor Joists
2'-6"

CONSTRUCTION FOR TILED FLOOR IN NEW BUILDINGS

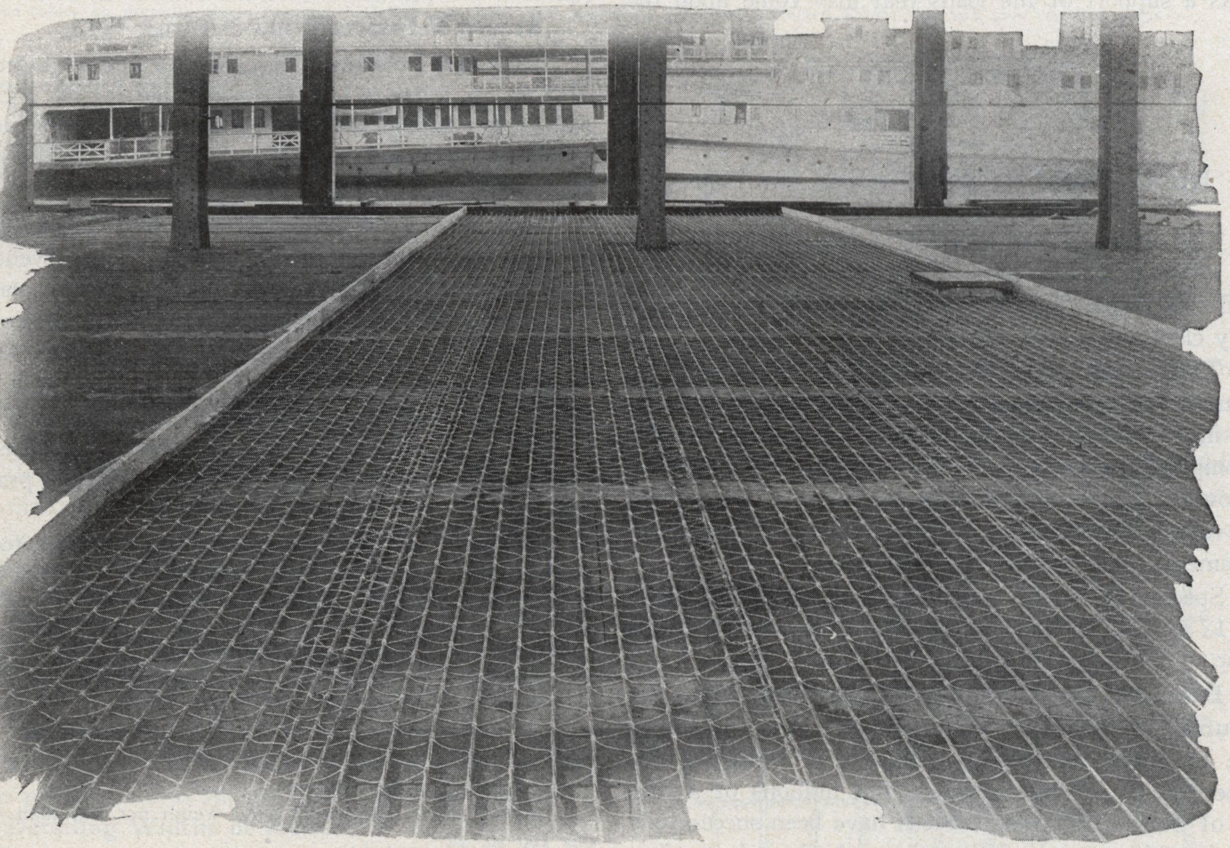
TYPICAL FLOOR CONSTRUCTION WITH CONCRETE BEAMS.

TYPICAL FLOOR CONSTRUCTION STEEL BEAMS FIREPROOFED.

TYPICAL FLOOR CONSTRUCTION WITH CONCRETE FLOOR JOISTS.

Triangle Mesh and Electric Weld Fabric Used for Reinforcement of Concrete Floor Construction

Scale: ¾ in. equals 1 ft. 0 in.



Pier 42, North River, 56,000 Square Feet, Style 40, Triangle Mesh Reinforcement Used

Note the large area of reinforcement with its heavy stranded longitudinals. Excellent results obtained with minimum installation cost

THE BERGER MANUFACTURING CO.

Berloy Steel Floor Cores

CANTON, OHIO

For Branches, see page 398

Products

Berloy Floor Cores, Floor Core End Caps.

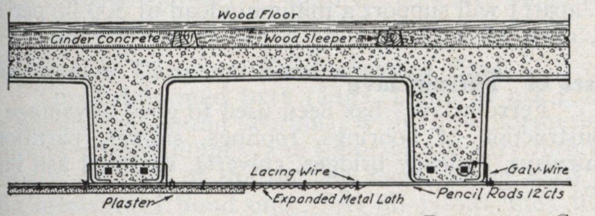
For Metal Building Material, see pages 398-401; for Metal Ceilings, see page 1205.

Use and Design

Berloy floor cores are metal forms for the construction of continuous slab T-beam concrete floors in steel or concrete framed buildings. They are made in such wide range of styles, sizes and weights that the construction can be adapted to any detail of design. End caps are made for use with all sizes and styles of floor cores. The end caps always remain in place as a permanent part of the construction.

Permanent Floor Cores

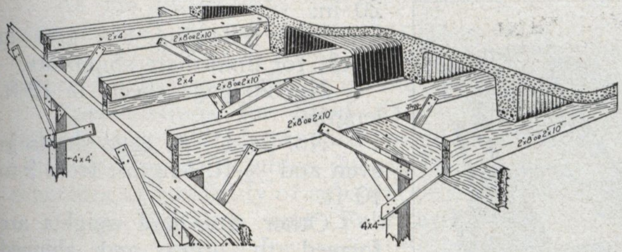
Berloy floor cores of the permanent type are usually made of No. 26 gauge metal and remain as a permanent part of the construction. Where this type is used, Berloy 3/8-in. Ribplex for the ceiling is first laid on the temporary shoring, and the forms on the Ribplex.



Attachment of Lath with Removable or Permanent Cores by Means of Wires Placed Before Concrete Is Poured

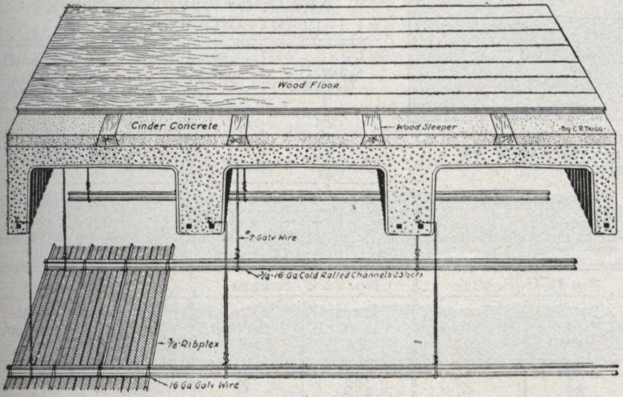
Removable Floor Cores

These are made of No. 22 or 20 gauge material and can be removed and reused several times.



Method of Shoring

This method of shoring permits the removal of the cores for further use as soon as the concrete has taken its initial set

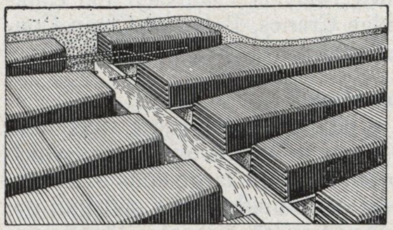


Suspended Ceilings

Details for either permanent or removable floor cores

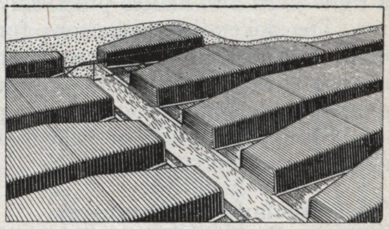
Special Floor Cores

Concrete joists formed by floor core construction are normally designed to be from 4 to 6 in. wide. To meet special conditions of load and shear Berloy single and double taper floor cores are provided in both permanent and removable types. The special width floor cores also meet special requirements.



Single Taper Floor Cores

These taper down from the normal width of 20 to 16 in. This increases the width of the joist 4 in. where it enters the concrete beam.



Double Taper Floor Cores

These taper in width from 20 to 16 in. and also 2 in. in height providing an additional 2 in. of thickness of slab at the top where it enters the beam.

Narrow Width Floor Cores

To complete a floor width where standard 20-in. width floor cores are not an exact multiple, standard depth floor cores, either permanent or removable, are made in several narrower widths, with end caps to fit.

25-inch Floor Cores

Wider spacing between joists sometimes provides a more economical design than is offered by the standard 20-in. cores; for such cases special cores 25 in. wide can be supplied. These will produce joists 29 to 30½ in. on centers instead of the standard 24 and 25½ in. on centers.

Sizes, Styles, etc.

Width—20 in. between sides at bottom is standard, 25, 16 and 12 are special. Single and double taper cores are 20 in. wide at one end and 16 in. at the other.

Length—36 in. and 30-in. covering lengths are standard for Berloy floor cores. Tapered cores are made only in 36-in. length.

Depth—4, 6, 8, 10, 12 and 14 in. are standard. Double tapered cores taper from standard height at one end to 2 in. lower at the other.

Gauge—No. 26 gauge steel is standard material for all permanent cores, No. 22 and 20 gauge for removable cores.

Weight

The weights of the floor cores vary from 1¾ lb. per lin. ft. for permanent floor cores 4 in. high, to 6 lb. per lin. ft. for 14-in. removable floor cores. The floor cores are shipped nested, which simplifies shipping and storage problems.

Engineering Service

Berloy Engineers experienced in designing this type of construction are at the service of architects ready to assist with layouts, suggestions and estimates. An illustrated bulletin A.I.A. Form No. 4d3 with complete load tables and illustrations of erection data will be sent promptly on request.

FOUNDED 1880

THE BROWN HOISTING MACHINERY CO.

Manufacturers of Sheet Steel Concrete Reinforcement
CLEVELAND, OHIO

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NEW ORLEANS, LA., Whitney-Central Building
SAN FRANCISCO, CAL., Monadnock Building
LONDON, ENGLAND, 25 Victoria Street, S. W. 1

Ferroinclave
TRADE-MARK

Products

Manufacturers of "FERROINCLAVE," a Patent Sheet Steel Reinforcement for concrete.

Also manufacturers of Concrete Coal and Ash Bins; all kinds of Material Handling Machinery, which includes Locomotive Cranes, Shovels, Clamshell and Link-type Grab Buckets, Bridge Cranes, Belt and Chain Conveyors, Electric Hoists, etc.

Description of "Ferroinclave"

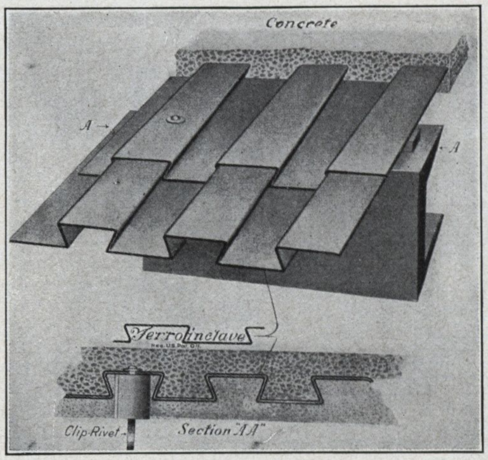
"Ferroinclave" is a box annealed sheet steel with dovetail corrugations, ½ in. in depth or height, which are inversely tapered, permitting the large ends of corrugations of one sheet to fit or "shingle" over and into the small ends of corrugations of another sheet. This forms a tight joint and makes practically one continuous sheet.

The dovetail corrugations form a key for concrete, making it possible to apply concrete to both sides without the use of centering or forms of any kind. This results in greater speed in erection and also greatly reduces the cost.

Sheets for ridges or valleys of roofs are made with non-tapering corrugations.

"Ferroinclave" Advantages

(1) Lightest reinforced concrete construction.
(2) Strongest for a given thickness and span.
(3) Erected without forms.
(4) Sheets are waterproof and building can be used before concrete is applied.
(5) Sheets are laid entirely from the upper side.
(6) Sheets easily handled.
(7) The under side is smooth and white and serves as a ceiling.



"Ferroinclave" Roof, Flat Floor or Siding, etc.

Details for Roofing with Concrete

"Ferroinclave" is laid in the same manner as ordinary corrugated iron roofing. The purlins, I-beams, channels or Z-bars may be spaced any distance up to 9 ft. 9 in.

The standard size "Ferroinclave" sheets are 10 ft. long, and purlins must be so spaced that the lap (usually 3 in. or more) of the sheets comes on one of them. A spacing of 4 ft. 10½ in. is most economical, as it allows the use of sheets 10 ft. long and requires a minimum of concrete and erecting labor.

"Ferroinclave" sheets should be laid on hardwood strips, ⅜ in. square, placed along the tops of the purlins, thereby preventing corrosion. As the sheets are laid they should be secured to the purlin at intervals of 10 in. with clips furnished with the sheets. The side laps are fastened with our special cross-ties, spaced about 2 ft. apart.

Mortar Mixture—When the "Ferroinclave" is secured in place, the upper side should be coated with a mixture of 1 part portland cement to 2 to 3 parts of sand, or 1 part portland cement, 2 parts sand and 4 parts of stone or gravel.

The coating should be ½ in. in thickness above tops of corrugations when purlin spacing does not exceed 5 ft.

Tables of safe loads will be furnished on application.

After cement on the upper side has set, the under side should be coated with mortar composed of 1 part portland cement to 2 or 3 parts sand, with small amount of hair.

Mortar to be ⅜ in. thick, applied in 3 consecutive coats—second and third applied before preceding one dries or sets. Waterproof covering should be used on top of roof.

Weight—Weight of complete roof (without waterproof covering), 1⅜ in. thick, is about 16 lb. per sq. ft.

This kind of roof (with purlins not more than 5 ft. apart) will support a minimum load of 300 lb. per sq. ft. after 10 days.

Uses of "Ferroinclave"

"Ferroinclave" has been used to good advantage in construction of floorings, roofings, sidings, partitions, stairways, highway bridges, culverts, coal and ash bins, etc.

Details of All Sizes

Sheets are made in any lengths up to 10 ft. and length is determined by spacing of the purlins.

Width, 20½ in.

Center to center of side laps, 20 in.

The following are kept in stock, for immediate shipments:

No. 26 gage sheets in 10-ft. lengths.

No. 24 U. S. gage sheets in even and ½-ft. lengths, from 5 to 10 ft.

Other sizes and weights are formed to order and shipped promptly.

WEIGHT AND CROSS-SECTIONAL AREAS OF "FERROINCLAVE" (NOT INCLUDING LAPS)

Gage No. U. S. G.	Weight, per sq. ft., lbs.	Cross-sectional area, sq. in. per ft. of width
28	.94	.274
26	1.13	.329
24	1.5	.439
22	1.88	.548

TABLE OF DEFLECTIONS
Sheets with Concentrated Loads at Middle and Without Cement or Plaster Covering—4-ft. Span

No. 26 U. S. gage		No. 24 U. S. gage		No. 22 U. S. gage	
Total load, lb.	Total deflection, in.	Total load, lb.	Total deflection, in.	Total load, lb.	Total deflection, in.
30	⅛	125	¼	170	1/32
80	⅜	150	¼	270	9/32
130	½	175	7/16	370	13/32
180	⅝	200	½	518	21/32

CONCRETE STEEL COMPANY

42 Broadway
NEW YORK, N. Y.

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Products

CONCRETE REINFORCEMENT BARS; COLLAPSIBLE COLUMN REINFORCEMENT; CONCRETE REINFORCEMENT DEVICES, including SUPPORTING, SPACING and TYING DEVICES for holding bars in place in forms; WIRE SOFFIT CLIPS; WALL ANCHORS and TIES; CONCRETE INSERTS; CURB BARS; SAFETY STAIR TREADS; SHEET LATH; EXPANDED METAL LATH (Plain and Self-furring); EXPANDED METAL REINFORCEMENT; RIB LATH; HOT ROLLED and COLD FORMED CHANNELS; CORNER BEADS; WIRE DEVICES.

Engineering Departments

Experienced and efficient engineering departments are maintained in our district sales offices. This organization, which includes the highest grade of engineering talent in its line, will lend every assistance in connection with all concrete reinforcement problems.

Havemeyer Concrete Reinforcement Bars

These deformed bars (Figs. 1 and 2) are rolled in square and round sections, with the deformations running longitudinally and entering directly into the tensile strength of the bar, no metal being used for the mechanical bond only. At all points they have constant uniform area of cross section exactly equal to the cross-sectional area of a plain bar of same size. Thus the purchaser secures all the advantages of a deformed bar with the same weight as a plain bar. He does not have to pay extra for the weight of the lugs.

As the projections and depressions are rolled longitudinally, there are no sharp angles to start a fracture when bar is bent. Tests prove the very superior bending qualities of Havemeyer bars.

Specifications for Steel—Havemeyer bars are rolled to any desired standard specification from new billet steel at mills which do not re-roll rails. This eliminates all possibility of substitution of inferior metal.

Shop Bending and Fabricating—Our warehouses are equipped for accurately bending and fabricating bars. This service eliminates a bending gang and bending machines on the job. Our warehouse charges for bending are less than it would cost the contractor if he did the work himself. Furthermore, shop bending assures the architect that every bar is bent accurately.

Fabricated units can be made up in our warehouses by using Havemeyer Beam-Saddles, Bar-Tys, etc., assuring proper spacing and placing of bars.

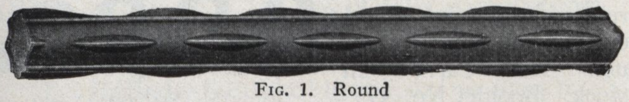


FIG. 1. Round

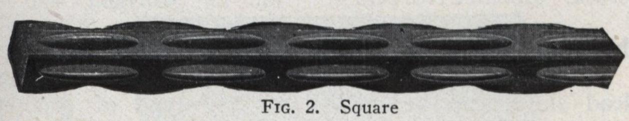


FIG. 2. Square

HAVEMEYER CONCRETE REINFORCEMENT BARS

HAVEMEYER CONCRETE REINFORCEMENT BARS
Ten Standardized Sizes Carried in Stock

Size . . . . .in.	1¼ sq.	1⅛ sq.	1 sq.	1 rd.	⅞ rd.	¾ rd.	⅝ rd.	½ sq.	½ rd.	⅜ rd.
Areas . . . .sq. in.	1.563	1.266	1.000	.785	.601	.442	.307	.250	.196	110
Weight per ft., lbs.	5.313	4.303	3.400	2.670	2.044	1.502	1.043	.850	.668	.376
Mill extra for size per 100 lbs. . . .	Base	Base	Base	Base	Base	Base	10c	20c	20c	40c

Havemeyer deformed bars have a uniform area of cross section and the same weight per foot as plain bars.

Above standardized sizes recommended by the War Industry Board and adopted by the American Concrete Institute and by the Distributors of Reinforcing Bars.

Collapsible Column Reinforcement

Havemeyer Collapsible Column Spiral—Wire is accurately coiled to proper diameter and correctly spaced with a rigid spacer. Shipped collapsed, ready to be opened up and placed in the form.

Havemeyer Collapsible Columns — Havemeyer bars used for longitudinal members and for bands, the latter being attached to longitudinal members by Bar-Tys. Shipped collapsed for convenience in shipping and handling. Readily opened and set in place. These can be fabricated in our warehouses or by the contractor on the job. The use of Bar-Tys constitutes the cheapest method of assembling column steel.

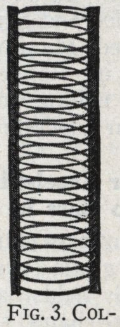


FIG. 3. COLLAPSIBLE SPIRAL

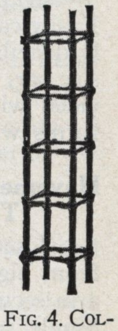


FIG. 4. COLLAPSIBLE COLUMN

Securo Bar-Spacers for Supporting, Spacing and Holding Slab Reinforcing Bars

Made from hoop steel. Locking prongs and legs self-contained. Facilitate inspection—a missing bar is detected by its absence from the chair seat.

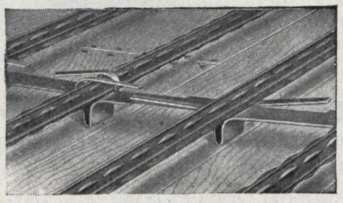


FIG. 5. BAR-SPACER

Standard height from underside of bar to form, ½, ¾ and 1 in. Minimum spacing between bars, 3 in. Booklet No. A8.

Havemeyer Bar-Tys for Tying Together Reinforcing Bars at Intersections

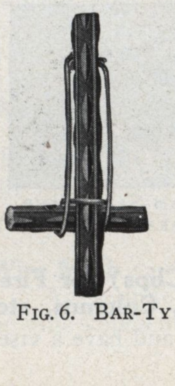


FIG. 6. BAR-TY

Used for tying together bars in walls, bent-up bars to supporting rods in slab, tying stirrups to beam bars, for fabricating columns, etc. More quickly attached than soft wire and much more secure.

Made from high grade spring steel wire in various sizes to accommodate any combination of bars.

Carried in stock.
Booklet No. A4.

Continued on next page

Havemeyer Ty-Chairs for Tying and Supporting Slab Reinforcing Bars

Quick, simple and economical. Made from high grade spring steel wire.

Standard distance from underside of bar to forms, 1 in.; special, ¾ to 2 in. Made in various sizes to accommodate any combination of bars used. Carried in stock. Booklet No. A4.

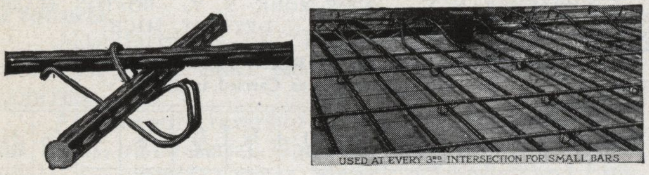


FIG. 7. TY-CHAIR

One Ty-Chair used at each intersection on large bars and at every third intersection on small bars

Havemeyer Hy-Chairs for Supporting Head Rods Over Columns and Bent-up Bars in Slabs

Cheaper and better than concrete blocks. Made from pressed steel, beaded for strength and punched with locking prong and nailing holes.

Shipped nested. Easily carried and quickly distributed. Maximum size bar, ¾ in. Range in height from 1½ to 8½ in. Provided with nailing holes to insure retaining position in forms when concrete is poured. Booklet No. A8.

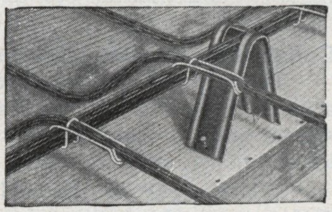


FIG. 8. HY-CHAIR

Havemeyer Easel-Chairs for Supporting and Spacing Two Bars in a Joist

Used in terra cotta and steel tile construction. Made from high grade spring steel wire. Spring of locking arm securely holds bars in place. Single easel-chairs support one bar and both arms lock on the bar; double easel-chairs support two bars, one arm locking on one bar and the other arm on the opposite.

Standard distance from underside of bar to forms, 1 in.; special, ¾ to 2 in. Carried in stock. Booklet No. A4.

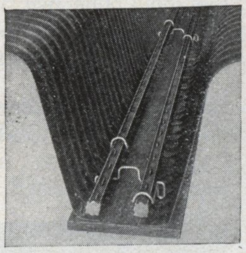


FIG. 9. EASEL-CHAIR

Havemeyer Beam-Saddles and Separators for Supporting, Spacing and Holding Reinforcing Bars in Beams, Girders, Lintels, etc.

Saddles space and support lower layer of bars; separators space and support the upper layer.

Standard height from underside of bar to forms, 1½ and 2 in. Made ½ in. short of beam widths. Standard clear distance between layers, 1 in. Made from hoop steel. Locking prongs hold bars in position. Booklet No. A8.

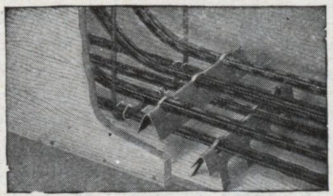


FIG. 10. BEAM-SADDLE AND SEPARATOR

Havemeyer X-Tension Clips (Soffit Clips) for Fireproofing Steel Beams, Girders, Columns, etc.

Quickly snapped on flange of beam and have a vise-like hold. Cost of applying is much less than with mesh. May be placed end to end or overlapped; may be applied on either end of beam and pushed along. Made of high grade spring steel wire. Size No. 1 for flanges 3 to 6 in.; No. 2 for flanges 7 to 10 in. Carried in stock. Booklet No. A4.

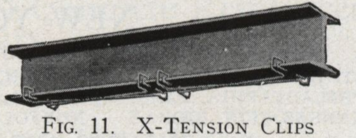
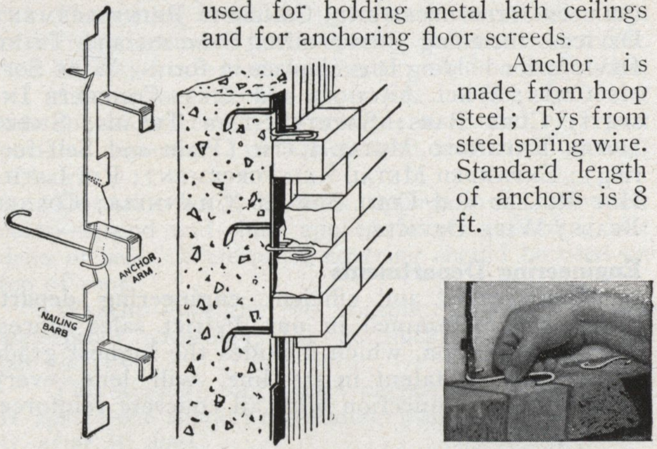


FIG. 11. X-TENSION CLIPS PLACED ON STEEL BEAM

Security Anchor and Wall-Tys

Used especially for bonding brick veneer, stone, terra-cotta or tile wainscoting to concrete surfaces. Also used for holding metal lath ceilings and for anchoring floor screeds.

Anchor is made from hoop steel; Tys from steel spring wire. Standard length of anchors is 8 ft.



Anchor Showing Nailing Barb, Anchor Arms and S-hooks

Anchor Embedded in Concrete Wall Holding Brick Veneer

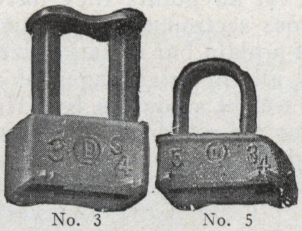
Inserting a Wall-Ty Through Loop in Anchor

FIG. 12. APPLICATIONS OF SECURITY ANCHOR AND WALL-TYS

Concrete Inserts

Dayton Adjustable-Inserts—Made from highest grade malleable iron, cast in one piece with keyhole slot for adjustment.

No. 3 is for ¼ to ⅞-in. standard bolts; No. 5 for ⅜ to ¾-in. standard bolts, inclusive. Carried in stock. Booklet No. A7.



No. 3 No. 5

FIG. 13. DAYTON ADJUSTABLE-INSERTS

Havemeyer "Y" Socket-Inserts—Made from highest grade malleable iron. Broad nailing base with four *nailing* holes insures against displacement. Accommodate ⅜ to ¾-in. bolts with standard thread, both inclusive. Carried in stock. Booklet No. A7.

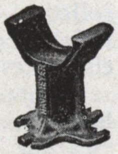


FIG. 14. "Y" SOCKET-INSERT

Havemeyer Slotted-Inserts—Made from high grade pressed steel. Standard lengths, 12, 18, 24 and 36 in. Accommodate ½, ⅝ and ¾-in. bolts; ⅞-in. bolt special. Have 6 nailing holes. Closed slot and removable end caps prevent seepage of concrete to inside. Can be used singly, or, with end caps removed, can be placed end to end for a continuous run. Carried in stock. Booklet No. A7.

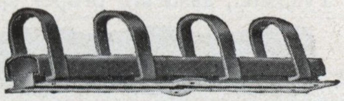


FIG. 15. SLOTTED-INSERT

Havemeyer Safety Stair Treads ("SaniTread")

"SaniTread," a combination of steel plate and lead slugs, can be applied to any type of concrete stairs. Cut to required lengths in multiples of 3 in. Carried in stock. Booklet No. A6.

Continued on next page

Havemeyer Round Nose Curb Bars

Staggered and flared anchors act as reinforcement. Absence of continuous web permits accurate and even bending without kinking. Stocked in 10 and 12-ft. lengths, galvanized. Booklet No. A6.

We also make angle nose curb bars for stair nosings and platform edges. Booklet No. A6.

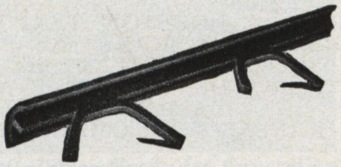


Fig. 16. Round Nose Curb Bar

Havemeyer Metal Lath

An ideal base for ceilings, walls, partitions and exterior stucco work.

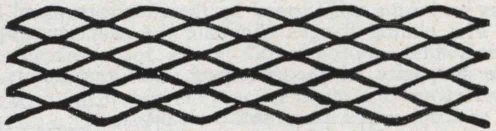


Fig. 17. Havemeyer Metal Lath

A stiff heavy product made of steel, plain or galvanized, or of iron alloy, especially well suited for overcoating or long spans.

WEIGHTS OF HAVEMEYER LATH

2.2 lb. per sq. yd.	*3.00 lb. per sq. yd.
*2.5 lb. per sq. yd.	*3.40 lb. per sq. yd.

*Asterisk indicates weights that are standard.

All sheets are 24x96 in.; 1$\frac{7}{9}$ sq. yd. per sheet; 9 sheets per bundle: 16 sq. yd. per bundle.

Stay-Rib Metal Lath

Has reinforcing ribs ½ in. wide, 1¾ in. apart center to center. A rigid, flat, strong lath, permitting wide spacing of studs, joists or channels, saving both labor and material.

Sheets are square and there is no loss in laps. They permit scratching in of the mortar and doubling back from same scaffold, practically two-coat work; a decided economy in both mortar and labor.

Weights per yard: painted, 2.75, 3.2 and 3.5 lb.; galvanized, 3.6 lb. Sheets are 24x96 in., 9 sheets to the bundle, covering 16 sq. yds.

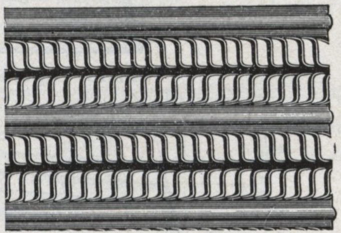


Fig. 18. Stay-Rib Metal Lath

Havemeyer Expanded Metal

Sizes with large diamonds are used for reinforcing, especially for culverts, sewers, bridges, tanks, etc. Smaller diamonds for machinery guards, enclosures, railings, lockers, etc.

Furnished in full range of sizes from 3x7 in. to ½x1¾ in.

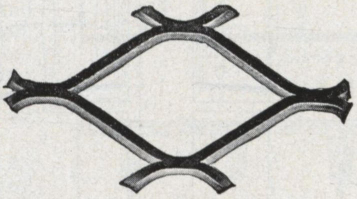


Fig. 19. Havemeyer Expanded Metal

Havemeyer Channels, Angles, Flats

Hot Rolled—Furnished in any size on short notice.

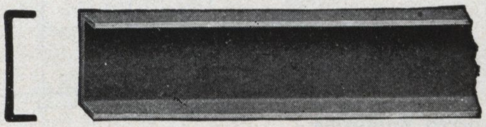


Fig. 20. Havemeyer Cold Formed Channel

Cold Formed—For suspended ceilings, furring, columns, false beams, cornice work, or for solid or hollow partitions. Stock lengths, 12, 14, 16, 18 and 20 ft.

STANDARD SIZES HAVEMEYER CHANNELS

Gauge No.	16	16	16	16
Width in.	¾	1	1½	2
Flange in.	⅜	⅜	⅜	⅜
Weight per 1000 ft lb.	276	332	456	580

Havemeyer Corner Beads

Wing Bead—No. 26 gauge special analysis galvanized sheet. Stock lengths, 6, 7, 8, 9, 10 and 12 ft.; 10 pieces to bundle; weight, 175 lb. per 1000 ft.

Curved Point Base Screed—Forms a permanent ground for plastering and secures a sanitary base with precisely true lines. Fabricated from tightcoat galvanized open-hearth sheets. Lengths 10 and 12 ft. Crated 1000 and 1008 ft. respectively. Weight 225 lb., crated, per 1000 ft.

Bull Nose Bead—No. 26 gauge galvanized steel, ¾-in. radius. Lengths, 6, 7, 8, 9 and 10 ft.; weight, 273 lb. per 1000 ft.

Havemeyer Base Bead—For cement base, No. 26 gauge galvanized sheets. 12 pieces per bundle; weight, 135 lb. per 1000 ft.

Expansion Corner Beads

Made of tightcoat, galvanized, open-hearth steel.

Takes much less time to erect than other types.

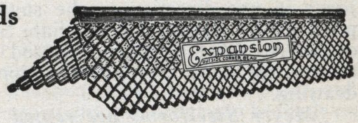


Fig. 21. Expansion Corner Beads

Furnished in 6, 7, 8, 9, 10 and 12-ft. lengths. Weight per 1000 ft., 240 lb. 500 or 1000 ft. to crate.

Also cut from pure copper or zinc for exterior use with stucco.

Havemeyer Diamond Rib Lath

An exceptionally stiff metal lath—A labor and material saver, therefore a money saver.

The V-shaped ribs are cold drawn, not folded, imparting a materially greater elastic limit to the steel. Sheets are 24x96 in.; 1.77 sq. yd. per sheet; ribs spaced 4.8 in. center to center; ribs ⅜ in. high. Wide strand diamond mesh between ribs takes plaster easily and rapidly without waste. Rapid erection results from using a smooth sheet. Economy results from perfect fit of interlocking ribs along sides and ends, from reduced number of fastenings to supports, and from saving in material by spacing supports further apart without sacrificing stiffness of plaster.

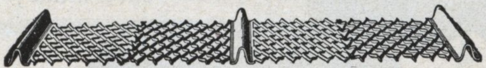


Fig. 22. Havemeyer Diamond Rib Lath

MAXIMUM SPANS RIB LATH

Weight lb. per sq. yd.	Ceilings		Partitions	
	Steel furring, in.	Wood joists, in.	Steel studs, in.	Wood Studs, in.
4.0	30	36	36	40
3.5	24	30	30	36
3.0	19	24	24	30

Wire Devices

Our wire shops are prepared to manufacture, on short notice, any type of wire device required for the installation of suspended ceilings or for securing lath. Tie wire staples, etc., carried in stock.

Wire Mesh

A. S. and W. Triangle and Electric welded stock or mill shipments.

CONCRETE ENGINEERING COMPANY

Fireproofing and Reinforcing Materials

DISTRICT OFFICES

OMAHA, NEB., Omaha National Bank Building
CHICAGO, ILL., 1926 South 52nd Avenue
MILWAUKEE, WIS., Bartlett Building
KANSAS CITY, MO., Walsix Building
MINNEAPOLIS, MINN., Builders Exchange Building

HOUSTON, TEX., West Building
ST. LOUIS, MO., Planters Building
DETROIT, MICH., Vinton Building
DES MOINES, IOWA, Hubbell Building
DALLAS, TEX., Interurban Building

WAREHOUSES: CHICAGO, KANSAS CITY, OMAHA

Ceco
TRADE-MARK

Products

Meyer Removable Steelforms for Concrete Floor Construction; Ceco Reinforcing Bars; Ceco Metal Lath.

Also manufacturers of Ceco Round Column Forms; Ceco Reinforcement Materials; including Column Spirals; Wire Mesh; Cold Rolled Channels; Beads and Picture Moulding; Ceco Bar Chairs and Spacers.

Service

The engineering service department will prepare complete designs on all types of reinforced concrete construction at a nominal charge. Preliminary estimates, layouts, etc., submitted without charge.

Meyer Removable Steelforms

Used as moulds for joists and intervening slabs in building form work for concrete joist floors, load being carried by the joists in one direction to the supports. Continuous joists are provided by lapping intermediate Steelforms, and ends of rows of intermediate forms are closed with Endforms. An added feature to Meyer Steelform equipment is the 30-in. form, note drawing.

Meyer Steelforms are rented to contractors, the labor of placing and removing them being handled by our contract department.

Save Concrete, Steel, Form Work, Time, Labor—Meyer Removable Steelforms are made in standard units and the most economical size of concrete joists for all conditions of loading and span may always be obtained. Full benefit of the tee-section of every joist is secured, eliminating all non-carrying concrete and effecting savings in dead loads throughout beams, columns and footings.

The sturdy strength of No. 16 gauge metal combined with the ingeniously designed stiffening ribs in Meyer Steelforms insures size of concrete members exactly as called for by the plans.

Only a bare skeleton of form work is required for Meyer Steelforms. Meyer Steelform double and single tapered endforms have wide flat flanges for nailing to centering which obviates the necessity of stripping the 2x6 joist bottom where joist widens at the support.

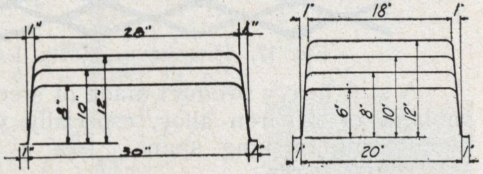
Tees on beams are formed by the Steelforms and not with wood. Flat nailing flanges eliminate the exact spacing of the 2x6 joist soffits.

The simplicity of the centering, 2x6 joist soffits, ledgers about 4 feet on centers and upright supports with bracing—there are no frills of any kind — reduces labor costs to a minimum and promotes speed of erection.

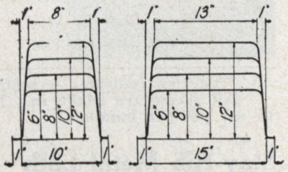
Always Available—They are always available in any quantity at several accessible warehouses.

Sizes—Standard intermediates furnished in 1, 2 and 3 ft. lengths. Special intermediates furnished only in 3-ft. lengths.

Straight Endforms furnished only in 1-ft. lengths, 10, 15 and 20 in. wide. Tapered Endforms furnished only in 3-ft. lengths, 20 in. wide at open end.

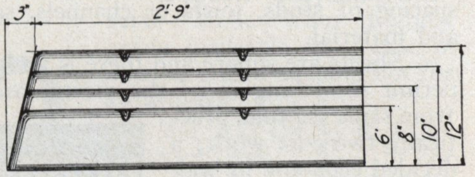


Standard Types

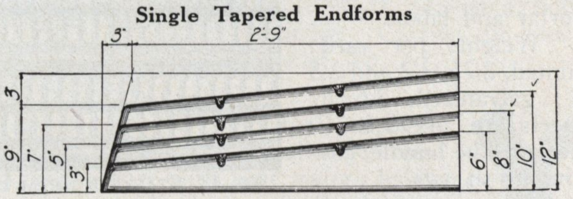


Special Types

Intermediate Steelforms



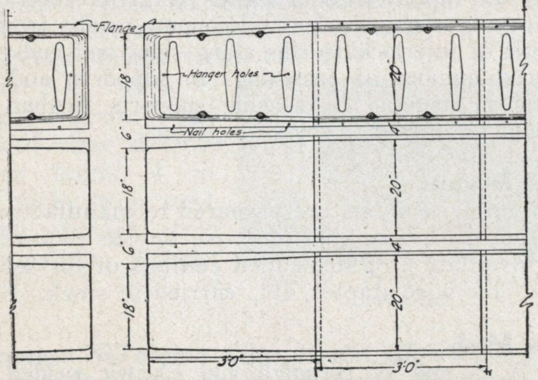
Single Tapered Endforms

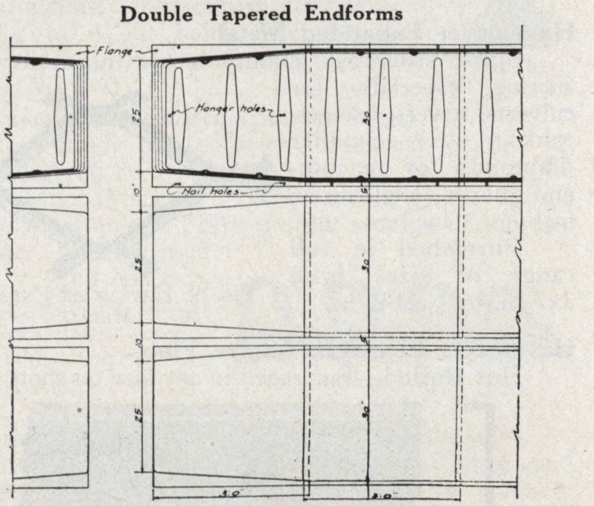


Double Tapered Endforms

MEYER STEELFORMS
for lower formwork costs
TRADE-MARK

Made of No. 16 gauge sheet steel, accurately shaped and reinforced. They are extremely rigid, thus maximum re-use is secured.





Plans Showing Application of Tapered Endforms

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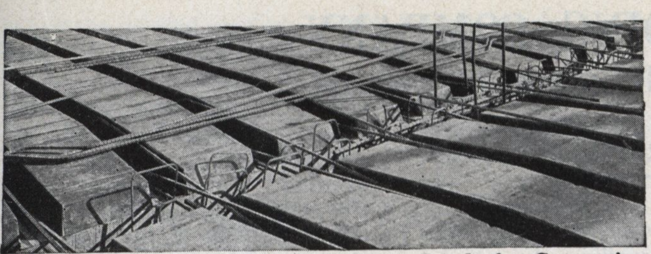


Steelforms with Reinforcement in Place Ready for Concreting

No extra centering is needed under Endforms for the reason that supporting flanges of both single tapered and double tapered Endforms flare out from their sides to the same width as intermediates—another advantageous and exclusive feature of this exceptionally economical method.

Economical Advantages—Besides the special features found only in Meyer Removable Steelforms, there are the additional advantages in securing everything in the way of materials from one source.

Specifications for Floor Construction—The floor construction in general to be Meyer Steelform construction, in accordance with the design and practice of the CONCRETE ENGINEERING COMPANY, Omaha, Neb. This construction involves the use of removable Steelforms in the floor slabs, forming a slab and joist construction, the Steelforms to be placed upon open wood centering. Steelforms shall remain in place for a period of 7 days after the pouring of concrete, and shall be removed only upon notification of the architect or engineer. Severe weather conditions may necessitate leaving the Steelforms in place for a longer period of time. Temporary braces, or supports, shall be erected after the removal of Steelforms to properly support the floor construction until the concrete has thoroughly set. The Steelforms shall be manufactured of No. 16 gauge sheet steel and shall have depressed ribs in the top surface to secure the necessary rigidity. They shall be provided with nailholes along the lower flange to permit nailing to the open wood centering, and shall have 3/16-in. round openings in the center of the top surface of each Steelform to receive wire hangers for lath ceilings when attached directly to concrete joists.

Specifications for Ceilings Attached Directly to Meyer Steelform Concrete Joist Floors—No. 10 gauge galvanized ceiling hangers shall be inserted in the concrete slab between joists at 3 ft. center to center through holes provided in the tops of Meyer Steelforms, to which apply ¾-in. Ceco Cold Rolled Channels running 2 ft. center to center parallel between joists. The ¾-in. channels shall be cross-furred at right angles with ¼-in. round steel pencil rods at 13½ in. center to center, to which 3.4 lb. Ceco Metal Lath, painted, shall be wired with No. 18 gauge soft galvanized wire. Metal lath shall be run down at least 4 in. where walls, beams and columns intersect plane of ceiling. (This ceiling construction may be suspended from joists to a distance not exceeding 6 in. and is recommended as an especially economical and efficient method of insulation. The air space thus provided between concrete floor and plaster ceiling is an effective insulation against the transmission of either sound or heat.)

Specifications for Suspended Ceilings—¼-in., round mild steel hangers shall be inserted in concrete joists before pouring, through holes bored in open wood centering at 4 ft. center to center both directions, to which apply 1½-in. Ceco Cold Rolled Carrying Channels running 4 ft. center to center parallel to joists, and at proper ceiling level. The carrying channels shall then be cross-furred with ¾-in. Ceco Cold Rolled Furring Channels at 13½ in. center to center, using No. 14 gauge soft galvanized wire. 3.4 lb. Ceco Metal Lath, painted, shall then be wired to furring channels, using No. 18 gauge soft galvanized wire.

Metal Lath

Ceco Metal Lath—Furnished corrugated, known as Ceco Self-furring Lath; galvanized, cut from galvanized sheets; also in copper iron alloy grade and in pure iron grade; and in the following weights: 3.4, 3.0, 2.5 and 2.2 lb.

Ceco Rib Lath—The ribs give the sheets extra strength, making the use of stiffening or furring channels and rods unnecessary. This added rigidity permits wider than ordinary spacing of studs or channel supports. The sheets are erected with the lath side out and the ribs running at right angles across supports. The sheets are locked together by nesting the side ribs, a method much superior to the old way of tying with wire.

The continuous diamond mesh between ribs presents a firm even surface for the plasterer's trowel. Weight per square yard: 3.0, 3.5 and 4.0 lb.

Plasta Saver—Expanded metal lath, provides builders with metal plastering base and reinforcement which (1) prevents plaster cracks and is fire resistive; (2) requires but a minimum of plaster; (3) is "foolproof."

Plasta Saver is unusually stiff, yet the diamond mesh connecting the ribs makes it so flexible that it can be readily formed to any desirable shape. The selvage edge nests or interlocks with the next sheet.

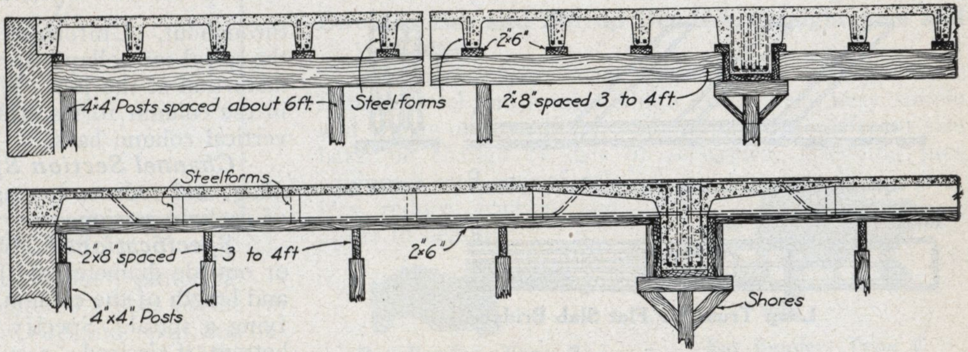
Height of rib ⅛ in.; width from center to center of rib 1 2/10 in. Furnished painted and copper-iron alloy. Weight per square yard: 3.4 lb.

Shipping Facilities

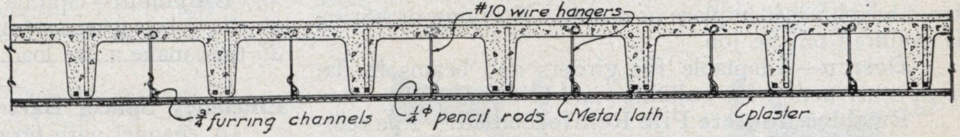
Adequate stocks of Meyer Removable Steelforms, Ceco Reinforcing Bars, Column Spirals, Metal Lath, etc., are always maintained in this company's warehouses at Omaha, Chicago and Kansas City. Prompt shipments of any size order can be made on any time notice. Meyer Steelforms are available at no other source. Also building supply dealers have stocks of these materials for convenience of contractors and builders.

Handbooks

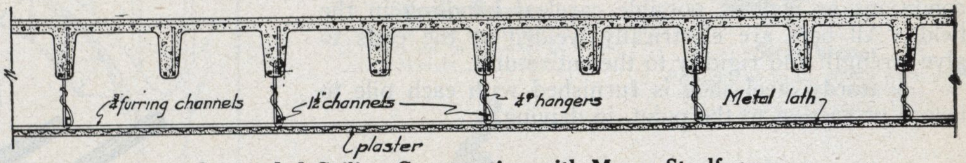
Write to nearest office for handbook containing detailed information. Book furnished on request, without obligation to inquirer.



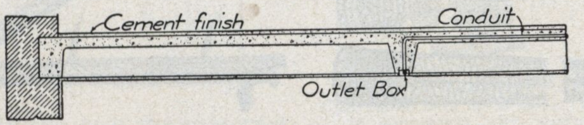
Meyer Steelforms in Place on Open Wood Centering



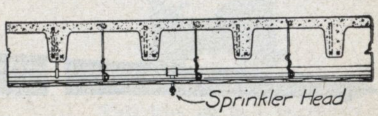
Attached Ceiling Construction with Meyer Steelforms



Suspended Ceiling Construction with Meyer Steelforms



Headers Between Joists for Installation of Pipes and Conduits



Installation of Sprinkler System (Showing Concealed Pipes)

ELECTRIC WELDING COMPANY

Steel and Devices for Reinforced Concrete

311 Ross Street
PITTSBURGH, PA.

Products

STEEL FOR REINFORCED CONCRETE: Bars and Rods; Wire Mesh and Fabric; Gagers; Fabricated Beam, Girder and Truss Units; Column Spirals; Concrete Pile and Pole Reinforcement.

CONCRETE REINFORCEMENT DEVICES: Bar Spacers, Chairs, Hoops, etc.

CENTERING, etc.

BAR and STIRRUP BENDERS, STRAIGHTENERS and CUTTERS.

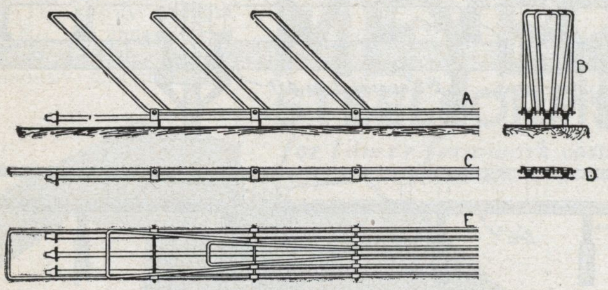
Also Floor Pans or Forms; Curb Bars; Scuppers; Corner Beads; Base Beads; Hot and Cold Rolled Channel Furring; Metal Lath, expanded and self-furring; Forms for Concrete Piles, etc.

Steel for Reinforced Concrete

Best grade reinforcing steel rolled from new billet steel in square or round sections of standard sizes. All sizes of deformed bars carried in stock. Quick service on straight bars cut to length or bent requirements. *Mill test reports furnished on request.*

Beam, Girder, and Truss Units—Shop assembled units for concrete beam or girder reinforcement, contain straight and bent bars rigidly held together by stout spacing bars. All loose bars are omitted and loop bars, welded together, substituted for shear bars.

Economical—They are more economical to handle than loose bars and do not suffer distortion in transit. This method will save 10% of steel, and still retain the same strength.



Loop Truss for Flat Slab Bridges

Each beam or girder contains one assembled loop truss which is set in place as a unit. No tying or wiring is required on the job.

Design—Adaptable for girders and beams in flat arch construction for buildings and bridges.

Eweldco Conrete Pile Reinforcement—Pile reinforcement is effectively designed to meet heavy driving conditions as well as possible careless handling in the field. All bars are electrically welded at the ends to give strength and rigidity to the entire unit.

A sturdy steel shoe is furnished with each pile to insure protection to the point, in driving.

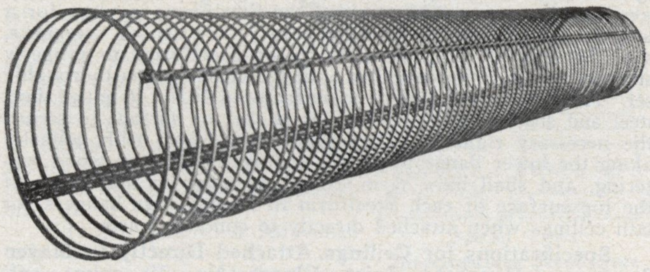
A special buffing cushion is placed at the head of each pile to prevent the upper portion of the pile from spalling during driving, or possible fracturing under the hammer blows.

Sizes—Pile reinforcement units are furnished in any length from 15 to 60 ft. Standard lengths are multiples of 5 ft.

Shipment—Shipped either set up ready to place in the forms for casting, or knocked down for assembly at the site. *Specify this point when inquiring, as different freight rates govern.*

Eweldco Concrete Pole Reinforcement—Pole reinforcement is essentially the same as pile reinforcement with the exception of the ends, which do not require the shoe and buffing cushion.

Eweldco Spiral Hooping for Reinforced Concrete Columns, Pipes, etc.—Spiral hooping is coiled on special machines which produce uniform curvature throughout. Uniformity is quite essential in order that the spiral can collapse for shipment and be set up without distortion at the job. When thus fabricated, they stand in the column forms straight and lie evenly against the vertical column bars.



Eweldco Spiral Hooping

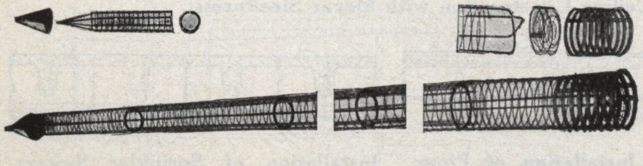
Channel Section Spacer—Insures rigidity in handling, and reduces tonnage of steel required on account of its light section.

Specifications—The size and kind of wire, inside or outside diameter of the spiral, the pitch of the wire and length of the column, are necessary data when specifying a spiral. Specify an extra turn of wire top and bottom, if desired.

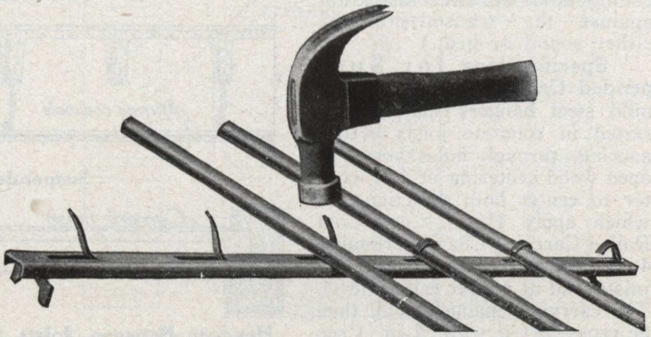
Shipment—Spirals are usually shipped collapsed to the job, to secure minimum freight rates. Usually 25 tons make a car load.

Efficiency Spacer Bars

A channel with prongs to hold any size reinforcing



Eweldco Concrete Pile and Pole Reinforcement



Efficiency Spacer Bars

Continued on next page

bar at the desired spacing. Small legs are welded to the underside of the spacer bar to keep the reinforcing bars in the correct position, ¾ in. from the forms, assuring full strength of slab and correct amount of fireproofing.

Furnished in 20-ft. lengths or any length desired. When specifying or ordering give number of pieces, length and spacing of reinforcing bars, also size and kind of bar that will be used.

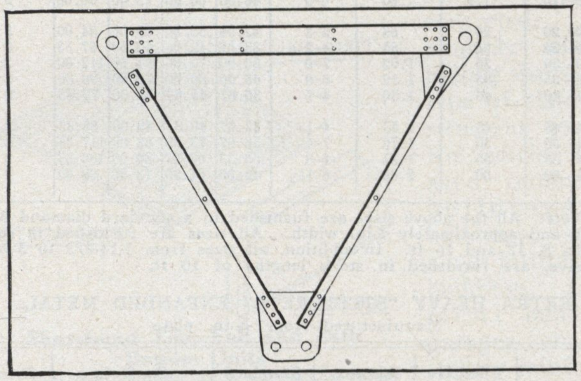
They stand up rigidly during construction operations, neither upset nor collapse when workmen walk upon the reinforcing bars. After forms are removed, the reinforcement will not be exposed.

They are frequently used as temperature bars and will be found more economical than other types of equal cross-sectional area.

Centering (Unitriangular) for Concrete Work

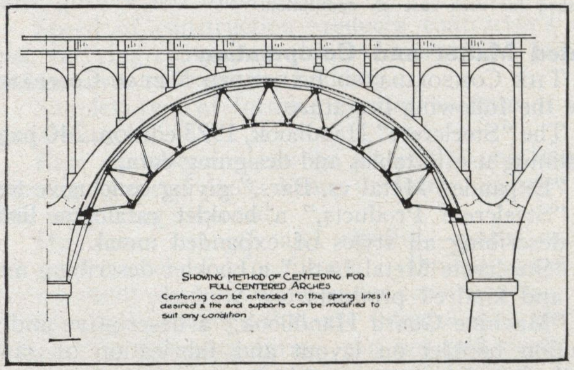
An adjustable steel falsework used in the construction of concrete arches, bridges, tanks, flumes, stacks and sewers. The service of this centering is not confined to the initial job, but may be used over and over again on arches of entirely different spans and curvatures. Maintains clear working space, waterway or road opening for traffic.

Construction—Consists of independent rigid triangles that are joined together by steel pins and an adjustable bottom chord to form a flat or curved steel truss. The bottom chord may be made of wood and adjustable rods, which may be cheaply and quickly varied in length. All unit frames are the same size and interchangeable. Light in weight and portable.



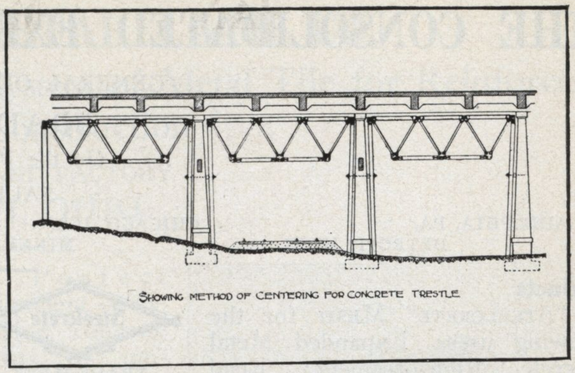
Typical Triangular Unit

Concrete Arches—Unitriangular centering is adapted to elliptical and multi-centered arches of the rib and barrel types. Variations in rise and span are obtained by adding or omitting unit frames and adjusting bottom chord for the correct length. Easily slid over on tracks for use on the next section or arch.


SHOWING METHOD OF CENTERING FOR FULL CENTERED ARCHES
Centering can be extended to the spring lines if desired & the end supports can be modified to suit any condition

Centering for Full Centered Arches

Adaptable to flat arches. In this case the centering takes the form of a Warren truss.



Centering for Concrete Trestle

Temporary Bridges—Unitriangular centering may be set up for temporary use to relieve traffic during construction of a new bridge or other operations. This offers an inexpensive method of diverting traffic.

Concrete Sewers—Unitriangular centering is unexcelled for use in egg shaped or elliptical sewer construction. Shortening the bottom chord permits contraction of the centering and the removal of the sheathing form.

Concrete Stacks—Unitriangular centering made in light steel frames, makes the cheapest method of stack construction.

Economical—Unitriangular centering is not scrapped after its first job, but becomes a permanent part of the construction plant equipment. Its first cost is modest and its maintenance is nil. Eventually cheaper than wooden posts and braces, and much more rigid and secure.

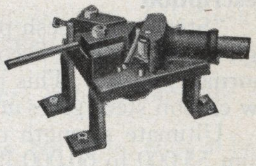
Specifications—When writing for quotations, give span, rise and thickness of arch ring, and delivery required. Submit blue prints of structure.

Eweldco Bar and Stirrup Benders, Straighteners and Cutters

Eweldco machines are made of best quality electric furnace steel and some of high grade steel, very simple and sturdy construction; easily adjusted to different size bars, no change of dies or setscrews. Bending pins equipped with special rollers reduce friction and effort in bending.

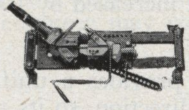
Bar Bender, Type B

Bends rods up to 1¼ in. square
Flats up to 2x⅝ in.
Weight, 70 lb.



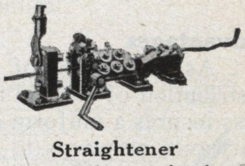
Bar Bender, Type C

Bends rods up to ⅝ in.
Flats up to 1½x¼ in.
Weight, 60 lb.



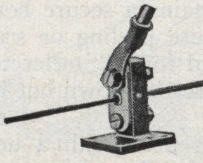
Stirrup Bender

Bends rods up to ⅝ in.
Flats up to 1½x¼ in.
Weight, 225 lb.



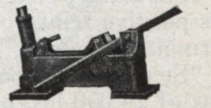
Straightener

Straightens ⅜-in. round rods. Operated by one or two men, or 2-hp. motor. Weight, 100 lb.



Bar Cutter, Junior Type

Cuts round bars up to ½ in. Used in connection with stirrup bender and straightener.
Weight, 40 lb.



Bar Cutter, Senior Type

Cuts bars up to 1 in. square
Flats up to 2x⅝ in.
Weight, 100 lb.

THE CONSOLIDATED EXPANDED METAL COMPANIES

GENERAL OFFICES AND WORKS
BRADDOCK, PA.
(In the Pittsburgh District)

SALES OFFICES
PHILADELPHIA, PA.
DETROIT, MICH.
CHICAGO, ILL.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
CLEVELAND, OHIO
PITTSBURGH, PA.

Products

Steelcrete
TRADE-MARK

"Steelcrete" Mesh for the following uses: Expanded Metal Concrete Reinforcement; Road Mesh for Highway Reinforcement; a Binder for Stucco; Reinforcement for Bank Vault Construction; Beam Wrapper.

Also Underwriters' Tested "Steelcrete" Mesh and Accessories for safety guard construction, for shop enclosures, window guards, lockers, etc.

For Plastering Lath, Corner Bead and Cold Rolled Channels, see page 405; for Expanded Metal for Armored Vaults, see page 1025.

Sectional Area

Expanded metal sheets up to 16 ft. in length are furnished with a sectional area of .60 sq. in. and under. The 12-ft. sheets, and shorter, may be had from a light temperature reinforcement up to more than double that of any other fabric, having a sectional area up to 1.00 sq. in.—far too heavy for ordinary floor or slab construction.

Scope of Use

"Steelcrete" mesh is the most widely used and oldest of concrete reinforcements for floor and roof slabs, sewers, conduits, tanks, roads, highway bridges, culverts, retaining walls, etc. There is no reinforcement service too severe for "Steelcrete."

In bank vault construction, the design provides a mass of steel embedded throughout the concrete; proof against the acetylene or electric torch and practically impenetrable to any drill.

Description

"Steelcrete" mesh possesses great unit strength and a high elastic limit. It is cold drawn to its mesh shape under enormous speed. This process, together with the use of low carbon steel, gives uniformity of quality and stiffness.

Ultimate strength of the open hearth steel used is from 55,000 to 60,000 lbs.; it has an elastic limit of not less than one-half its ultimate strength, an elongation of about 25% in 8 in., and cold bending test of 180°. Ultimate strength of finished product is raised to a value of 70,000 to 80,000 lbs. and elastic limit increased by 100%.

Advantages

As the design of "Steelcrete" provides a uniform distribution of steel in a horizontal direction, so its stiffness insures a uniform distribution vertically. There are no waves or warps to be hammered out or to offer an element of weakness.

The "Steelcrete" mesh shape attains a secure bond in concrete; heavy loads can not cause peeling or scaling; temperature stresses are provided for. "Steelcrete" gives positive reinforcement against these known but indeterminate stresses.

"Steelcrete" expanded metal, as used with a unit stress of 24,000 lbs. per sq. in., develops equal strength to bars at 16,000 lbs. per sq. in. This, together with the ease of handling and speed in placing the flat sheets, makes a substantial saving on every job.

"STEELCRETE" SPECIAL MESHES

Designation of mesh	Size of mesh, inches		Approximate weight per sq. ft., lb.	Size of standard sheets, ft. in. x ft. in.
	Width of diamond	Length of diamond		
½" No. 18	.43	1.2	.74	6–0x8–8
¾" No. 16	.95	2	.50	6–6x8–8
¾–13–25	.95	2	.80	6–0x8–0
1½–13–20	1.36	3	.60	4–0x8–0
¾"–No. 9	.95	2	1.80	4–0x8–0
1½"–No. 9	1.36	3	1.28	6–0x8–0
Binder	1.82	5.33	.18	5–0x8–8
Beam wrapper	3	8	.20	0–6x8–8

Note that in the decimal standard for "Steelcrete" the width is designated as the short way of the diamond and the length is designated as the long way of the diamond.

STANDARDS FOR "STEELCRETE" EXPANDED METAL

Designation of mesh	Effective sectional area sq. in. per ft. width	Approx. weight per sq. ft., lb.	Standard width of sheets, ft.-in.	Sq. ft. in a standard sheet of various lengths				Sheets in a standard bundle
				8 ft.	10 ft.	12 ft.	16 ft.	
3–13–075	.075	.25	6–4	50.67	63.33	76.00	101.33	10
3–13– 10	.10	.34	7–0	56.00	70.00	84.00	112.00	7
3–13–125	.125	.42	5–8	45.33	56.67	68.00	90.67	7
3– 9– 15	.15	.51	7–0	56.00	70.00	84.00	112.00	5
3– 9–175	.175	.60	6–0	48.00	60.00	72.00	96.00	5
3– 9– 20	.20	.68	5–3	42.00	52.50	63.00	84.00	5
3– 9– 25	.25	.85	4–2½	33.67	42.08	50.50	67.33	5
3– 9– 30	.30	1.02	7–0	56.00	70.00	84.00	112.00	2
3– 9– 35	.35	1.19	6–0	48.00	60.00	72.00	96.00	2
3– 4– 40	.40	1.36	4–7	36.67	45.83	55.00	73.33	2
3– 4– 45	.45	1.53	4–1	32.67	40.83	49.00	65.33	2
3– 4– 50	.50	1.70	7–4	58.67	73.33	88.00	117.33	2
3– 4– 55	.55	1.87	6–8	53.33	66.67	80.00	106.67	2
3– 4– 60	.60	2.04	6–1½	49.00	61.25	73.50	98.00	2

Note: All the above sizes are furnished in a standard diamond 8-in. length and approximately 3-in. width. All sizes are furnished in stock lengths 8, 12 and 16 ft. In addition, all sizes from 3-13-075 to 3-9-35, inclusive, are furnished in stock lengths of 10 ft.

EXTRA HEAVY "STEELCRETE" EXPANDED METAL

Manufactured from $\frac{5}{16}$-in. plate

Designation of mesh	Effective sectional area sq. in. per ft. width	Approx. weight per sq. ft., lb.	Standard width of sheets, ft.-in.	Sq. ft. in a standard sheet of various lengths			Sheets in a standard bundle
				8 ft.	10 ft.	12 ft.	
3–1– 75	.75	2.74	5–5	43.33	54.17	65.00	1
3–1–100	1.00	3.63	4–0	32.00	40.00	48.00	1

Note: The above sizes are furnished in a diamond 8-in. length and approximately 3-in. width. Both sizes are furnished in stock lengths of 8, 10 and 12 ft. In addition, intermediate sectional areas will be furnished from stock lengths of 8 and 12 ft. The standard width of sheets will be furnished for each case on application.

Printed Matter and Co-operation

The Consolidated Expanded Metal Companies issue the following literature:

The "Steelcrete" Handbook, 1923 edition, 240 pages, containing useful tables and designing data.

"Expanded Metal vs. Bars," giving conclusive tests.

"Steelcrete Products," a booklet catalogue listing and describing all styles of expanded metal.

"Steelcrete Metal Lath," a booklet describing metal lath and kindred products.

"Machine Guard Handbook," a descriptive and instruction booklet on layout and fabrication of safety guards for all purposes.

Representatives and estimators travel out of all the various offices. "Steelcrete" products can be obtained from warehouses or mill shipments.

THE GOLDSMITH METAL LATH CO.

Manufacturers of the Shurebond Unit System of Metal Tile for Reinforced Concrete Slab Construction

GENERAL OFFICE AND FACTORY
CINCINNATI, OHIO

Products

The Shurebond Unit System of Metal Tile.

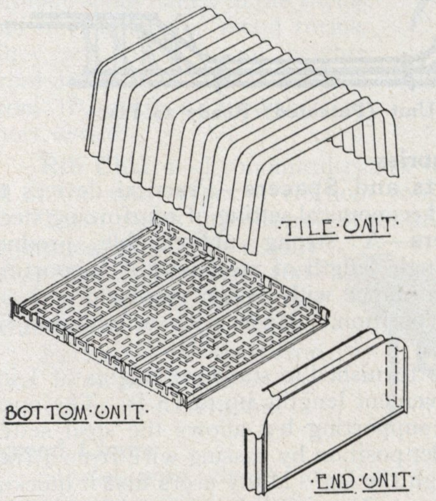
For Metal Lath, Inserts, Furring Channels, etc., see page 411.

Services

Catalogues, specifications, dead loads, concrete quantities, instructions for placing and installing, and other information on request.

The Shurebond Unit System (Patented)

A system of concrete rib or joist construction, combining quality with economy of construction. Manufactured of materials of sufficient weight properly treated to produce not only lasting construction, but also sufficient strength to stand up without distortion while being installed and concreted. Particularly adapted to long spans. The type of slab construction to use for hotels, office and commercial buildings, loft buildings, school and institutional buildings, apartment buildings, garages, etc. A strictly reinforced concrete system that can be designed and figured.



Shurebond Tile, End and Lath Bottom Units

Shurebond bottom units are tacked to the forms.

Shurebond tile units are placed in lath bottom units—no nailing.

Shurebond end units wedge on tile units—no nailing

Advantages of the Shurebond Unit System

Less dead load to carry a given live load—saves reinforcing, concrete, and forming, reducing size of columns, girders and foundations.

Speed of construction—reduces contractor's overhead, carrying charges on the investment, and produces quicker revenue from the building.

Simplest type of forming necessary—open or skeleton forming.

Ease of erection—can be placed by one man, no stripping of metal pans, domes or forms, no wire hangers, no furring required.

Maximum strength and rigidity—special analysis heat treated steel used for tile units, eliminating sags and bends without planking while under construction.

Flat, level ceilings that are integral with the concrete—when stripping forms, can not pull down, thus eliminating refurring. Sufficient weight of lath bottom units to insure rigidity and long life. As easy to plaster as wood lath.

No nails to clip before plastering.

Perfect alignment — assuring concrete joists of uniform width throughout entire length, as tile can not shift or spread while concreting.

A hard dense concrete—no concrete leakage, absorption or honeycombing.

The American Furniture Mart, Chicago

The largest building in the world. Shurebond Patented Unit System used throughout—completed and ready for plastering at the rate of one floor per week

No breakage — less storage, hauling and handling.

Simplicity of conduit installation.

Savings Effected by the Shurebond Unit System

Maximum concrete displacement.
Reduced cost of wood forming.
Lower cost of installation.
Reduced cost of plastering.

Shurebond Unit System Sizes

Standard width 20 in. at base.

Standard length 2 ft. and 1 ft. covering surface.

Standard depth 4 to 16 in., inclusive, varying 1 in.

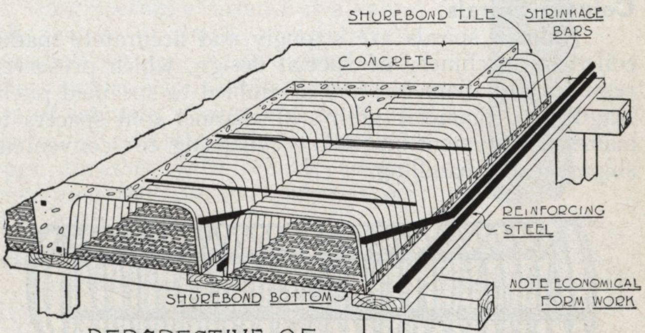
Beveled or tapered tile or both in 2-ft. lengths to any degree of bevel or taper within reasonable limits.

Flanged tile furnished where lath bottoms are not required.

Fill-in tile the same as above, but 12 in. wide at base.

Standard end units of sizes to fit various tile units.

While our standard width is 20 in., we make any width or depth of the Shurebond Unit System to meet any special proposition or any layout that an architect or engineer may consider economical.



PERSPECTIVE OF SHUREBOND UNIT SYSTEM INSTALLATION

KALMAN STEEL COMPANY

THE CORRUGATED BAR COMPANY IS NOW CONSOLIDATED WITH THIS COMPANY

Manufacturers of Concrete Reinforcement Products

DISTRICT SALES OFFICES

CHICAGO, ILL.
BOSTON, MASS.
ST. LOUIS, MO.
COLUMBUS, OHIO
NEW YORK, N. Y.
PITTSBURGH, PA.
ST. PAUL, MINN.
BALTIMORE, MD.
CLEVELAND, OHIO
SYRACUSE, N. Y.
MILWAUKEE, WIS.
ATLANTA, GA.
BUFFALO, N. Y.
DETROIT, MICH.
PHILADELPHIA, PA.
DAYTON, OHIO
MINNEAPOLIS, MINN.

WAREHOUSES AND FABRICATING SHOPS

CHICAGO, ILL.
BUFFALO, N. Y.
ATLANTA, GA.
YOUNGSTOWN, OHIO
ST. PAUL, MINN.
NEW YORK, N. Y.
MINNEAPOLIS, MINN.
BOSTON, MASS.
DETROIT, MICH.
PHILADELPHIA, PA.

Corrugated Bars
TRADE-MARK

Products

Corrugated Bars for concrete reinforcement; Column Spirals; Corr-Bar Units; Concrete Accessories: Spacers, Beam Chairs, etc.; Screed Chairs; Inserts; Sleeper Anchors.

Also Metal Lath; Steel Tile; Metal Column Forms; and related products.

Corrugated Bars

Deformed bars of highest grade steel, rolled from new billets exclusively, in square and round sections in accordance with the following schedule of standard sizes:

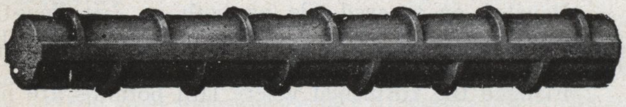
ROUND

Size, in.	Net area, in sq. in.	Weight per ft., lb.
3/8	.11	.38
1/2	.19	.66
5/8	.30	1.05
3/4	.44	1.52
7/8	.60	2.06
1	.78	2.69

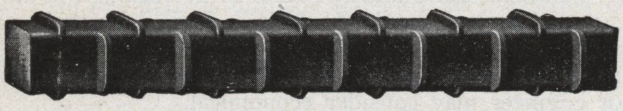
SQUARE

Size, in.	Net area, in sq. in.	Weight per ft., lb.
1/2	.25	.86
1	1.00	3.43
1 1/8	1.26	4.34
1 1/4	1.55	5.35

Information as to standard price extras for size, length, quantity, etc., furnished on request.



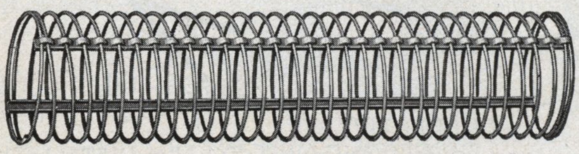
Corrugated Rounds (Patented)



Corrugated Squares (Patented)

Column Spirals

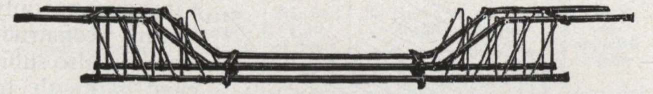
Kalman spirals are strongly and accurately made; coiled by machinery of special design, which preserves regularity of diameter, and assembled to specified pitch, length, and diameter with stiff channel iron spacers to maintain alignment and allow collapsing for convenient shipment and handling.



Column Spiral

Corr-Bar Units

Shop fabricated bar reinforcement for concrete beams and girders with dependable provision for proper positioning of all steel in the forms. Each unit represents complete reinforcement for a beam, is collapsible for shipment, and is set in the form as one piece.



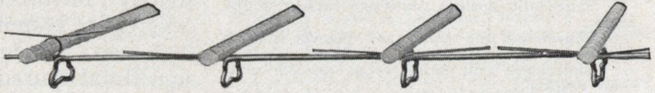
Corr-Bar Unit (Patented) Ready to Place

Concrete Accessories

Bar Supports and Spacers—Practical devices to aid in accurate and economical setting of reinforcing steel.

Slab Spacers—A strong unbreakable product formed from a single length of steel wire. Supporting legs spaced in accordance with design requirements. A leg at every bar position. Made with or without tie wires attached.

These spacers furnished in standard heights of 1 in. and 3/4 in., in convenient lengths up to 15 ft. The open formation of the supporting leg allows the steel setter to tie bars in correct position by passing wire from a free coil directly through the leg. Many users find it quicker to tie this way than with wires already attached to the spacer.

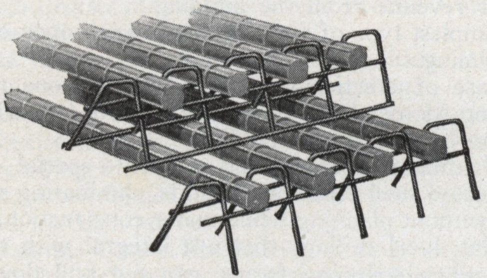


Kalman Slab Spacer

Beam Chairs—Stiff chairs of wire parts, electrically welded, trussed for lateral stiffness.

Made to order to fit requirements of detailed design.

Furnished in any height up to and including 2½ in., packed in strong fiber cartons.

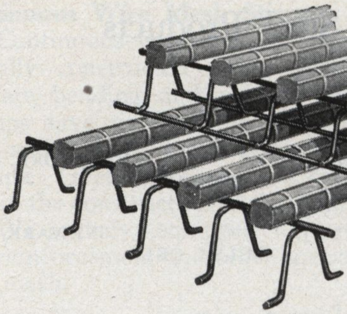


Kalman Beam Chair

Beam Bolster—A universal support for beam reinforcement, furnished in stock lengths of 4 or 5 ft. to be cut to shorter lengths on the job as required.

Continued on next page

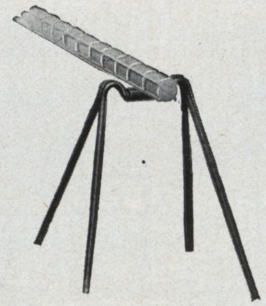
Furnished in heights from 1 to 4 in. Shipped in bundles of 100 ft., carried in stock for immediate shipment.



Beam Bolster

High Chairs—Very strong and stable supports for use on flat slab construction and on other work when heavy reinforcement is required to be held in place several inches above the forms.

Kalman high chairs work without being nailed to the forms and can be used on metal forms. They are made in all heights from 3 to 10 in. Special heights from 10 to 16 in. furnished on short notice.

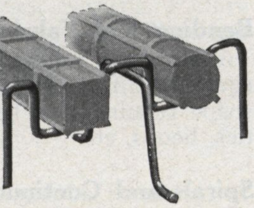


High Chair

Rib Chairs—Economical chairs for use in any and all of the many types of rib floor construction.

These chairs provide rod seats of ample depth and separation and will readily carry the larger size rods used in concrete joist construction.

Furnished in sizes for 4 or 5-in. rib width, in ½, ¾, or 1-in. rod elevation.



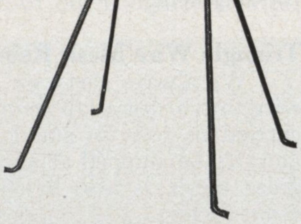
Rib Chair

Screed Chairs

Strong wire chairs to support pipe, used as a thickness gauge for pouring concrete slabs and as a screed or guide for the straightedge with which the concrete surface is struck to proper level. Made to correct height for specified slab thickness. Collapsible for convenient shipping and handling. Turned out feet allow ready fastening to the forms.

¾-in. pipe used in stock lengths.

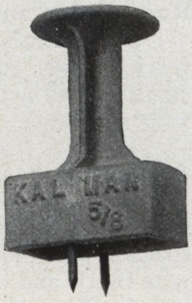
After screeding, the pipe is removed for re-use, chairs remaining in the concrete.



Screed Chair

Adjustable Inserts

Highest grade malleable iron castings to be embedded in concrete to provide positive and convenient means for suspending loads from concrete ceilings by the use of standard bolts. Exclusive setting and safety features. Standard inserts in three sizes for ½, ⅝, and ¾-in. bolts, respectively.



Adjustable Insert

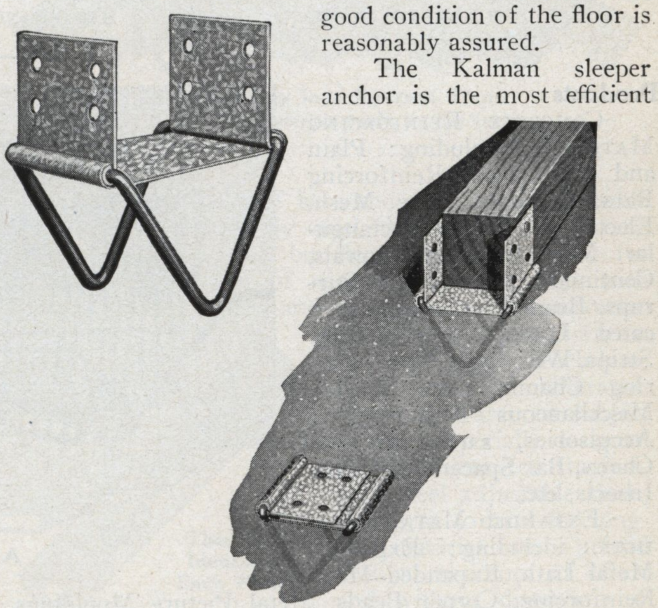
Sleeper Anchors

Devices for securely fastening nailing strips to the top surface of concrete slabs. Sleeper anchors are embedded in concrete while it is soft and, after the concrete is set, provide strong, positive, and permanent anchorage for sleepers.

Cinder fill and beveled sleepers are not necessary when sleeper anchors are used.

Finished floor construction is benefited by this direct mechanical anchorage to the structural concrete base.

Danger of creeping and bulging is reduced to a minimum and continuous good condition of the floor is reasonably assured.



Sleeper Anchor and Its Application

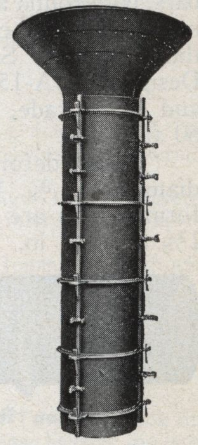
The Kalman sleeper anchor is the most efficient device so far developed for this important purpose. Its V-shaped loops readily penetrate to full embedment in concrete and provide a perfect mechanical bond which positively prevents loosening, once the concrete is set.

These anchors are made of No. 20 gauge metal, heavily galvanized to permanently resist rust. They are furnished in three sizes for 2x2, 2x3 and 2x4-in. sleepers, respectively.

All sizes carried in stock for immediate shipment.

Column Forms

Adjustable metal forms strongly and simply designed, producing truly round shafts with accurate and graceful lines where the flared head merges with the shaft. These forms furnished on a lease and erection basis.



Column Form

Engineering Service

Engineering assistance is a valuable feature of the KALMAN STEEL COMPANY service. At all district sales offices expert help is available on matters of estimate, design, and detail of reinforced concrete structures of all types, together with reliable advice concerning the use and purposes of all Kalman products.

Detailed Information

Complete information on prices, detailed uses and advantages concerning any and all Kalman products will be furnished promptly on inquiry directed to our nearest district sales office.

JOSEPH T. RYERSON & SON, INC.

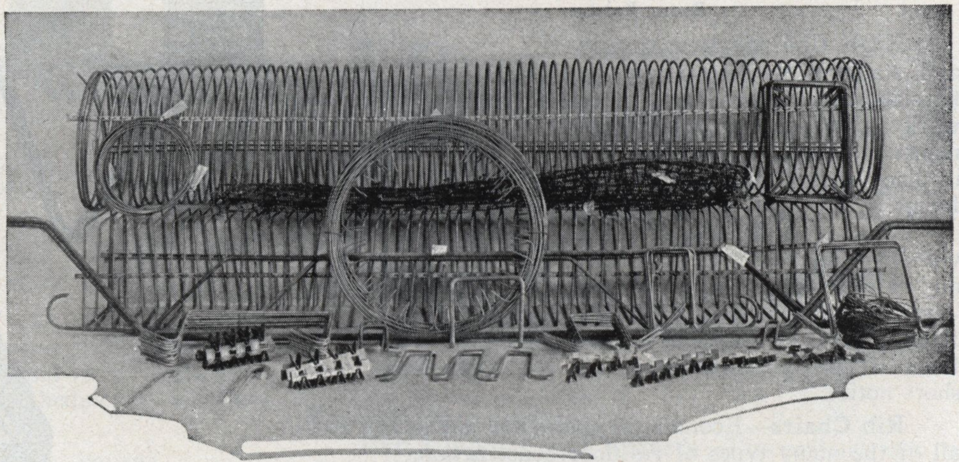
ESTABLISHED 1842

Reinforcing Steel, Metal Lath, Steel Sash and Steel Products

GENERAL OFFICES
CHICAGO, ILL.

PLANTS
CHICAGO, ILL. MILWAUKEE, WIS. ST. LOUIS, MO. CINCINNATI, OHIO DETROIT, MICH. BUFFALO, N. Y. NEW YORK, N. Y.

REPRESENTATION IN
DENVER, COLO. MINNEAPOLIS, MINN. HOUSTON, TEX. SAN FRANCISCO, CAL. JERSEY CITY, N. J. TULSA, OKLA. NEWARK, N. J.



A Few Ryerson Reinforcing Products

Products

CONCRETE REINFORCING MATERIALS, including: Plain and Deformed Reinforcing Bars, Triangle Wire Mesh, Electrically Welded Rectangular Mesh, Column Spirals, Continuous Wire Mesh Stirrups, Beam Wrapping, Fabricated Units, Road Center Strips, Wire Rods, Wire, Furring Channels and Angles, Miscellaneous Reinforcing Accessories, such as Bar Chairs, Bar Spacers, Bar Ties, Inserts, etc.

EXPANDED METAL PRODUCTS, including: Expanded Metal Lath, Expanded Metal Reinforcing, Corner Beads, Metal Picture Mouldings, Base Screed, Base Grounds, Rib Lath.

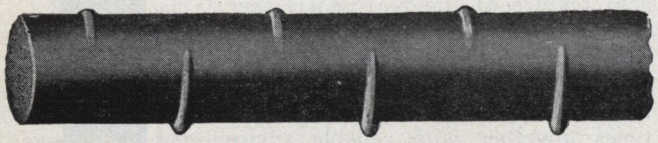
SAFETY TREADS AND PLATES, including: Mason Safety Treads, Firmtread Floor Plates and Treads, Sheet Steel Subtreads and Risers.

IRON AND STEEL PRODUCTS, including: Bars, Bar Shapes, Structurals, Rails, Plates, Sheets, Boiler Tubes and Fittings, Shafting, Chain, Rivets, Bolts, Nails, Refined Iron, Alloy Steel, Tool Steel, etc.

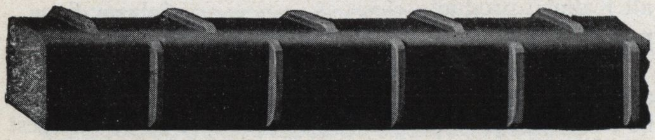
Bars

At our six warehouse plants located throughout the country, we carry a complete stock of plain and deformed bars, both round and square. These bars are rolled from new billet stock, conforming to standard specifications of the American Society for Testing Materials, Serial Designation A-15-14. Bars, of structural, intermediate and hard grade, are carried in stock in lengths up to 60 ft.

Round deformed bars are carried in the following diameters: ⅜, ½, ⅝, ¾, ⅞ and 1 in. Square deformed bars are carried in the following sizes: ½, 1, 1⅛ and 1¼ in.



Ryerson Round Deformed Reinforcing Bar



Ryerson Square Deformed Reinforcing Bar

Bending and Fabricating

We have the most up-to-date machinery and other equipment for fabricating, and can bend bars to any shape required for beam, joist and slab rods, stirrups, ties, hoops, etc.

Spirals and Continuous Hooping

On our spiral machines we manufacture spirals for round columns, continuous uniform hooping for square and rectangular columns, and continuous single unit stirrups for beams and girders. Spirals are made from new first quality wire rod in sizes from $\frac{3}{16}$ to $\frac{9}{16}$ in., inclusive.

Both round and square hooping can be collapsed for shipment.

Triangle Wire Mesh Reinforcement

We always carry on hand a large stock of triangle wire mesh for slab reinforcement. This material is carried in rolls in standard gauges and sizes of mesh and can be shipped at once. Electrically welded rectangular mesh, is also in stock, or can be shipped direct from factory.

Road Strips and Highway Construction Material

We furnish completely fabricated material for reinforcing roads, culverts and bridges, including metal road strips and all necessary reinforcing fabrics, supports and spacers.

Accessories

In addition to bars and spirals, we carry complete stocks of all accessories such as beam, joist and slab bar spacers, bar and screed chairs, bar ties, wire, etc., also wire fabric and expanded metal for reinforcing roadways and for floor slabs, concrete pipe, etc., angles, channels

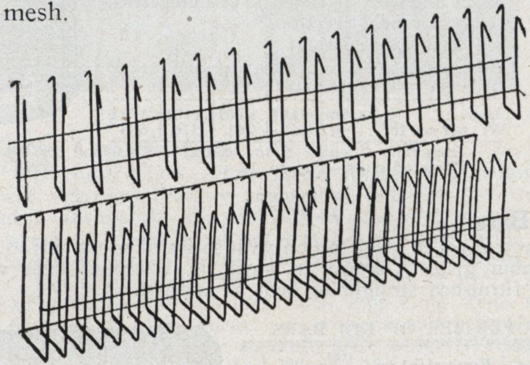
Continued on next page

and pencil rods for suspended ceilings, furring and similar purposes.

Continuous Wire Mesh Stirrups

Continuous wire mesh stirrups are formed on our specially constructed power machines, thus insuring accurate bending and perfect alignment. Continuous stirrups save time and money in the job, eliminating slow and tedious hand tying of bars and individual stirrups. Over 30,000 of these continuous stirrups were used in the construction of the Palmer House in Chicago.

We are also equipped to furnish beam wrapping, step reinforcement and other special pieces formed from wire mesh.



Continuous Stirrups Made from Electrically Welded Fabric

In the upper piece, the main wires are spaced 4 in. apart and in the lower, 2 in. apart.

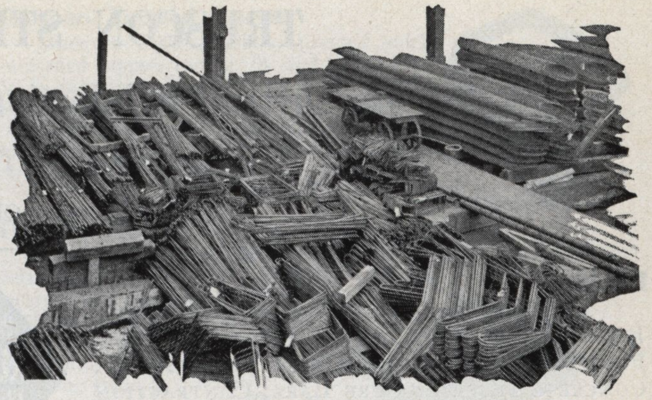
Expanded Metal Products

We carry in stock the most commonly required types of expanded metal products, including Diamond Mesh Metal Lath, Rib Lath, Corner Bead, Screeds, Picture Moulding, Expanded Metal Reinforcing, etc. These are available in all standard sizes and styles. Special styles or sizes can be furnished promptly from the factory. Send for catalogue.

Welded Steel Window Sash

Standard industrial sash units can be furnished at once from stock, either with or without ventilators. These sash are made of rolled sections, electrically welded at all intersections, giving the frame great rigidity and strength.

Continuous top hung sash with mechanical operators and architectural projected sash can be furnished to meet almost any requirement. Send your plans for prices and complete description of our complete service.



Shipping Bay in a Ryerson Plant

Reinforcing materials ready for loading

Delivery

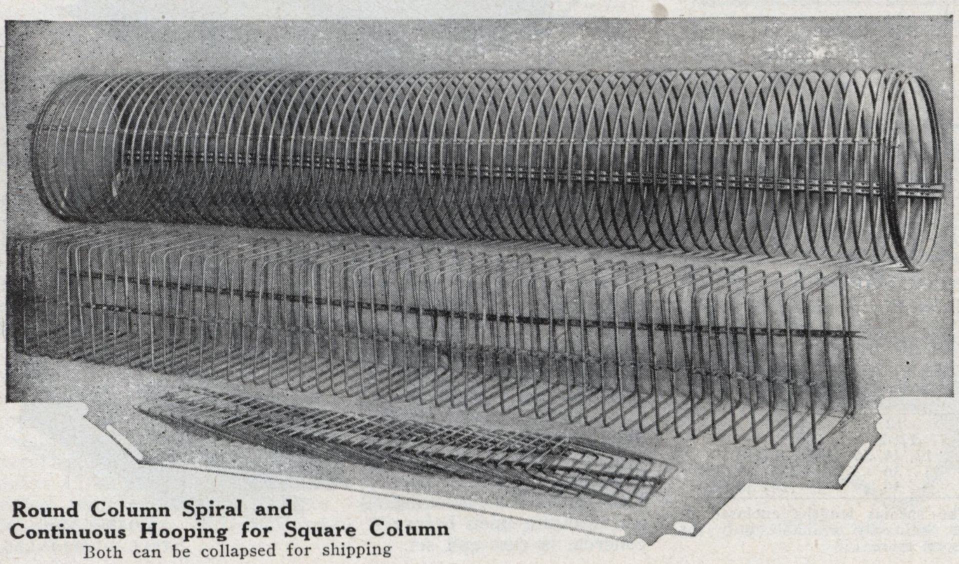
Our large stocks of bars and other material enable us to make exceptionally quick delivery on reinforcing material—all cut, bent, bundled and tagged ready for the forms. By use of special aluminum tags with stamped, raised letters and numerals, the identification marks showing the location in the building of each bundle can not be obliterated. These tags are not subject to rust. Specially designed 40-ft. trailers for tractors, with steel adjustable skids, enable us to haul the longest material and unload with a minimum of effort and without distortion or damage to the material. All of our Steel-Service Plants have private switch tracks connecting with trunk line railroads, affording exceptional service on freight shipments.

This Tag Identifies Each Piece

Ryerson Steel-Service

In addition to reinforcing materials we carry all kinds of steel products at each of our plants, thus giving the contractor a convenient source upon which to draw for such other steel as he may require on a job.

Bars
Shapes
Structurals
Rails
Shafting
Plates
Sheets
Rivets
Bolts
Chain
Babbitt
Wire
Turnbuckles
Corrugated Roofing and Siding
Stair Treads
Firmtread Plates
Boiler Tubes and Fittings
Refined Iron, etc.



Round Column Spiral and Continuous Hooping for Square Column

Both can be collapsed for shipping

Literature

"Reinforcing for Concrete," a catalogue of reinforcing material and accessories.

"Reinforcing for Concrete Highways," of interest to the road contractor.

"Ryerson Journal and Stock List" (bi-monthly), containing complete information on all iron and steel products.

"General Data," a compilation of tables and useful information.

"Structural Tables," a book of data on buildings, bridges, boilers and tanks.

"Safety Treads for Every Place and Purpose."

Any or all of these publications will be forwarded upon request.

TRUSCON STEEL COMPANY

Manufacturers of Reinforcing Steel and Building Specialties

YOUNGSTOWN, OHIO

For Branch Offices, see page 1007

Products

REINFORCING STEEL, KAHN TRUSSED BARS; RIB BARS; COLUMN HOOPING; STEEL FLORETYLES and FLOREDOMES; WIRE MESH; CONCRETE INSERTS; CURB BARS; CONTRACTION JOINTS.

For Metal Lath and Steel Joists, see pages 418-420; for Steel Sash, Windows, Doors and Casements, see pages 1007-1013.

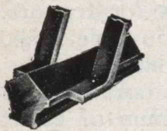
TRUSCON STEEL CO
TRUSCON
BUILDING PRODUCTS

TRADE-MARK

Service

Owing to the wide range of detail of these products and the value of the technical experience of the company, it is suggested that engineers and architects avail themselves of the service offered by our corps of engineers located in fifty-six branch offices in every part of the country.

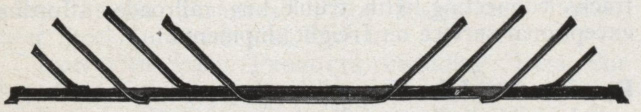
Twenty-one Truscon warehouses located at principal railway distributing centers carry large stocks of reinforcing steel with facilities for fabrication and immediate shipment.



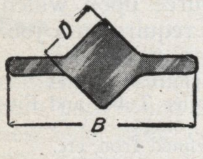
RIGID CONNECTION

Kahn Trussed Bars

Open hearth steel, concrete beam, girder, floor and arch reinforcement. Unit bars with 45° rigid diagonals formed from flanges on the main body producing 12 to 30% stronger beams than loose stirrups; save steel in design, labor in installation; safe; strong; fireproof and shockproof.

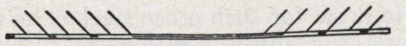


KAHN TRUSSED BAR

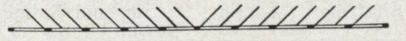


SECTION KAHN TRUSSED BAR

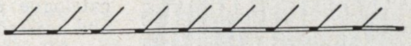
D & B, in.	Wt. per lin. ft.	Area, sq. in.
½x1½	1.4 lb.	0.41
¾x2³⁄₁₆	2.7 lb.	0.79



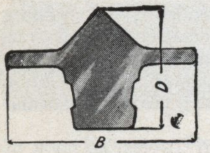
STANDARD SHEAR
Middle portion left unsheared



CENTER SHEAR
Entire bar sheared to center

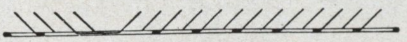


ONE-WAY SHEAR
All diagonals sheared, inclining in one direction



SECTION KAHN TRUSSED BAR

D & B, in.	Wt. per lin. ft.	Area sq.in.
1½x2¼	4.8 lb.	1.41
1¾x2¾	6.8 lb.	2.00
2 x3½	10.2 lb.	3.00



SPECIAL SHEARING
As directed by purchaser

LENGTH OF DIAGONALS

Size, in.	Standard lengths, in.	*Special lengths, in.
½x1½	12	(6) 8 (18)
¾x2³⁄₁₆	12, 24	8 (18) 30
1½x2¼	12, 24, 36	8 (18) 30
1¾x2¾	36	(24) 30 (48)
2 x3½	36	(24) 30 (48)

**Note:* The special lengths enclosed in parentheses are ordinarily available only for items of 5 tons or more

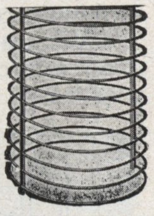
Collapsible Column Hooping

Accurately constructed column reinforcement, shipped flat in coils of exact diameter attached to spacing bars, ready for field erection.

Sizes as follows:

Diameter of wire, in.	¼	⁵⁄₁₆	⅜	½
Area . . . . sq. in.	.0491	.0767	.1105	.1963
Wt. per sq. ft. . . . . lb.	.167	.261	.376	.668

Diameter of coils—9 to 36 in.
Pitch of coils—1¼ to 12 in.



COLUMN HOOPING

Rib Bars

Special rolled steel section with series of cross ribs to secure maximum grip. Carried in stock in warehouses in various cities, furnished straight or bent as ordered.

PROPERTIES OF RIB BARS

Area, in.	Equivalent to	Wt. per ft., lb.
.110	⅜-in. Round	.379
.196	½-in. Round	.674
.250	½-in. Square	.86
.307	⅝-in. Round	1.054
.442	¾-in. Round	1.517
.601	⅞-in. Round	2.065
.785	1- in. Round	2.697
1.000	1- in. Square	3.46
1.266	1⅛-in. Square	4.38
1.563	1¼-in. Square	5.41

SQUARE RIB BAR

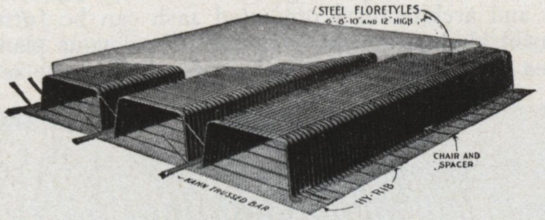
ROUND RIB BAR

Floretyles

Rows of specially formed steel tiles, separated by reinforced concrete joists and covered with thin layer of concrete, produce strong, deep, light weight, long span floor construction with flat ceilings; require but inexpensive centering and are soundproof. Accuracy of spacing assured by special spacer-chairs. ⅜-in. Hy-Rib metal lath used for ceilings.

Furnished in two types: ribbed and corrugated.

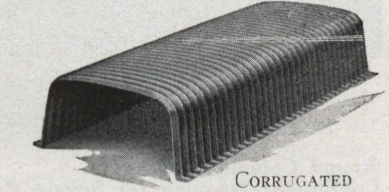
Ribbed Steel Floretyles—With deep stiffening ribs across top, corrugated sides, rounded corners, corrugated flanges. Approximate width at base, 20½ in.; standard lengths, 3 and 4 ft.; standard heights, 4, 6, 8, 10, 12, and 14 in.



RIBBED STEEL FLORETYLES

Corrugated Steel Floretyles—With deep corrugations extending completely around tile; corrugated flanges. Approximate width at base, 20½ in.; standard lengths, 2 ft. 4½ in. and 3 ft. 9 in.; standard heights, 4, 6, 8, 10, 12, and 14 in.

Placing Reinforcement—The reinforcing steel used in conjunction with Truscon Floretyles is handled in the same manner as other reinforced concrete construction. Spacer chairs not only insure correct placing of the Floretyles but also hold reinforcing bars in joists the correct distance above forms. Planks should be laid over top of the Floretyles for trucking and walking upon before concrete is cast and set.

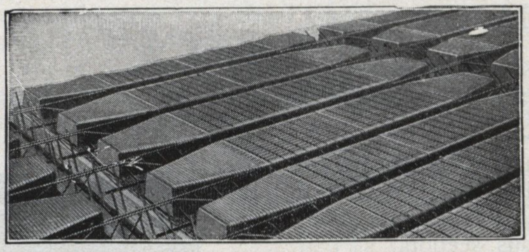


CORRUGATED STEEL FLORETYLES

Continued on next page

Cantilever Floretyles—The end Floretyles are tapered so as to provide a maximum width of joists at supports. The joist is reinforced to act as a cantilever for a considerable distance from support, assuring a longer span without increase of depth, as well as maximum economy of materials. Cantilever Floretyles are used with either the ribbed or corrugated types.

Properties of Cantilever Floretyles—Standard heights, 6, 8, 10 and 12 in.; approximate width at end, 20½ in.; at narrow end, 13¾ in.; lengths (nominal), 2, 3 and 4 ft.

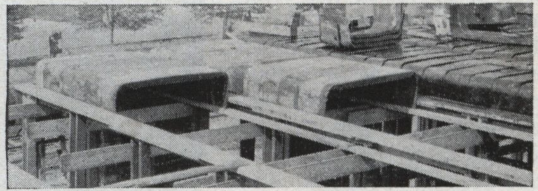


CANTILEVER FLORETYLES

Wydespan Construction

In this construction, heavy metal forms without corrugations, and therefore readily removable, are the basis of an economical formwork for reinforced concrete construction. Forms are 3 ft. 4½ in. wide and 4 ft. 4½ in. wide, while width of joists can be varied by the use of various widths of form lumber. Depth of joists can be varied from 5 to 15 in. by raising or lowering the 2x4-in. wooden supporting strips shown in the photograph. The forms are crowned and general practice is to provide a 2½-in. concrete slab, properly reinforced with wire mesh, between joists.

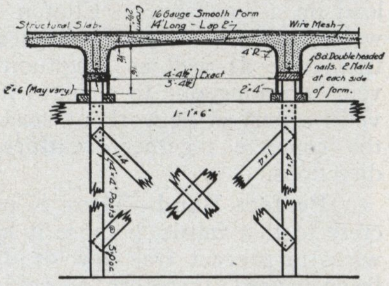
Wydespan construction is economical. Detail figures made in consultation with responsible contractors easily show a saving of 5c to 6c per sq. ft. of floor as contrasted with removable Tyle having joists 2 ft. on centers. Wydespan forms can be used time after time as standard formwork. Below is a reproduction of a Wydespan job, showing the method of framing used.



CARBORUNDUM CO., NIAGARA FALLS, N. Y.
KIRKPATRICK & CANNON, Arch. WRIGHT & KREMERS, INC., Con.

Forms are punched in the crown to allow for projecting wires needed where ceiling channels are to be suspended. Wires can also be left projecting from the joists, hooked around the Kahn bars which reinforce the joists. The forms provide a smooth job which does not require covering by suspended ceiling. Detail illustrates one very efficient centering method.

Properties of Wydespan Tyle—Made from No. 16 gauge sheet steel. Height, 16 in., adjustable for 5 to 15-in. joists. Width of base, 3 ft. 4½ in. or 4 ft. 4½ in. Length in row, 12 in.; actual, 14 in. End Tyle are furnished. Satisfactory tables can not be published owing to innumerable possibilities in design. Individual problems will be fully studied by our experienced engineers to secure the best design.

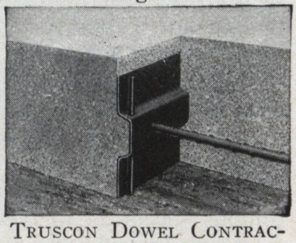


METHOD OF PLACING WYDESPAN TYLE

Truscon Contraction Joint

Provides a definite plane of weakness in pavement that forms a straight crack when concrete expands or contracts.

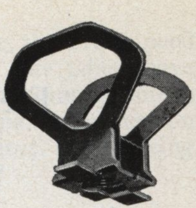
Made from No. 16 gauge metal punched for ⅜-in. steel stakes 15 in. long, which are furnished with every plate. Plate does not interfere with finishing machines.



TRUSCON DOWEL CONTRACTION JOINT

Truscon Tapped Inserts

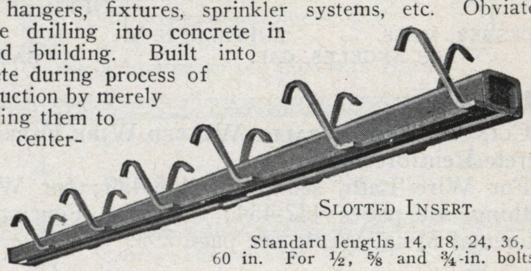
Made of highest quality pressed steel; furnished tapped for ½, ⅝ and ¾-in. bolts or ⅜-in. pipe. Used where exact location of attachment is known. This insert is especially designed for plumbers who require one which will accommodate pipe rather than standard bolts.



TAPPED INSERT

Truscon Slotted Inserts

Used in concrete slabs, beams or columns for attaching shaft hangers, fixtures, sprinkler systems, etc. Obviate expensive drilling into concrete in finished building. Built into concrete during process of construction by merely fastening them to wood centering.



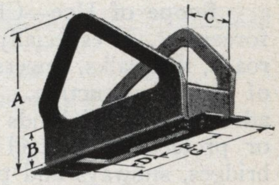
SLOTTED INSERT

Standard lengths 14, 18, 24, 36, 48 and 60 in. For ½, ⅝ and ¾-in. bolts.

Adjustable Inserts

DIMENSIONS OF TRUSCON ADJUSTABLE INSERTS (INCHES)

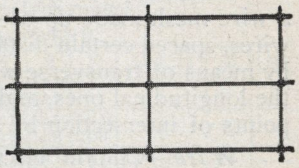
Size	A	B	C	D	E	G
½	2⅜	¾	⅞	1³⁄₁₆	1⁵⁄₁₆	3
⅝	2⅝	1	1⅛	1	1⅞	4
¾	2¾	1	1¼	1³⁄₁₆	1¹¹⁄₁₆	5



ADJUSTABLE INSERT

Truscon Wire Mesh

The ideal reinforcing for concrete floors, walls, concrete pavements, etc. Furnished with various sizes of wire to give any desired area of mesh, including mesh with equal areas in both directions. Furnished either in flat straight sheets saving uncoiling, or in rolls.



TRUSCON WIRE MESH

DIMENSIONS OF STANDARD TRUSCON WIRE MESH

Style	Wire spacing, in.		Wire sectional area, sq. in.		Weight, lb.	
	Main	Secondary	Main	Secondary	Per 100 sq. ft.	Per sq. yd.
135–10	6	6	.029	.029	20.7	1.86
*177–11	6	12	.049	.011	22.4	2.00
177–9	6	12	.049	.017	24.4	2.20
177–7	6	12	.049	.025	27.0	2.43
192–11	6	12	.058	.011	25.6	2.30
192–6	6	6	.058	.058	41.9	3.77
192–6	6	12	.058	.029	31.8	2.86
*207–11	6	12	.067	.011	29.1	2.62
207–9	6	12	.067	.017	31.2	2.80
207–7	6	12	.067	.025	33.7	3.03
*225–11	6	12	.08	.011	33.8	3.04
225–9	6	12	.08	.017	35.8	3.22
225–7	6	12	.08	.025	38.4	3.45
225–3	6	12	.08	.047	46.2	4.16
244–3	6	12	.094	.047	51.2	4.60
*250–11	6	12	.10	.011	40.4	3.63
250–9	6	12	.10	.017	42.5	3.82
250–7	6	12	.10	.025	45.0	4.05
250–4	6	12	.10	.04	50.4	4.53
250–¼	6	12	.10	.05	53.5	4.81
295–7	6	12	.14	.025	59.0	5.31
295–9	6	12	.14	.017	57.0	5.13
295–295	6	12	.14	.07	75.4	6.79
307–6	6	12	.148	.029	65.3	5.88
375–4	6	12	.206	.04	94.7	8.52

*Carried in warehouses in principal cities.

Truscon Curb Bars

Truscon curb bars are manufactured from the highest grade of open hearth steel and are heavily galvanized after forming. Furnished in either straight or curved bars.

1-IN. PROTECTION FOR EXPOSED CORNERS, COLUMNS, ETC.
Standard lengths, 6, 8, 10 and 12 ft.

WICKWIRE SPENCER STEEL COMPANY

Electrically Welded Wire Fabric for Concrete Reinforcement

GENERAL OFFICES
41 East 42nd Street
NEW YORK, N. Y.

OFFICES AND WAREHOUSES
WORCESTER, MASS. BUFFALO, N. Y. DETROIT, MICH. CLEVELAND, OHIO CHICAGO, ILL.
LOS ANGELES, CAL. SAN FRANCISCO, CAL. SEATTLE, WASH.

Product

Clinton Electrically Welded Wire Fabric for Concrete Reinforcement.

For Wire Lath, see pages 425-429; for Welded Sheathing, see pages 432-434; for Wire Fencing and Ornamental Metal Work, see page 793.

Clinton Electrically Welded Wire Fabric

Scope of Use—Clinton welded wire, a mesh reinforcement, is especially suited for floors, roofs, walls, roads, sidewalks, sewers, reservoirs, levees and all kinds of slab construction. The material is used to special advantage in all kinds of work involving the covering or protection of steel with concrete, as in buildings, bridges, subways and tunnels.

Material—Clinton electrically welded wire fabric is a wire mesh made up of a series of parallel longitudinal wires, spaced certain distances apart and held at intervals by means of transverse wires arranged at right angles to the longitudinal ones, and securely welded to them at the points of intersection by a patented electrical process.

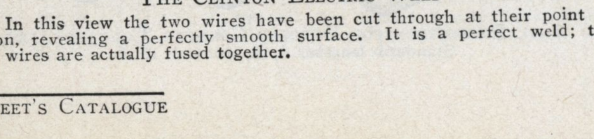
Wire—Clinton electrically welded wire fabric is fabricated from a special grade of good quality steel wire, possessing such strength, elasticity, and ductility as to render it especially suited to structural use.

The wire will develop an average ultimate strength of 70,000 to 80,000 lbs., with a maximum, in some cases, of 85,000 lbs. per sq. in.

Innumerable tests and investigations which have been made upon welded wire during the past 15 years have proved, beyond the shadow of a doubt, that the process of welding does not in any way lessen the tensile strength of the longitudinal wires. Specimens when tested, whether they break at or between the welds, will invariably show the full tensile strength of the longitudinal wire when compared with the strength of the plain wire before welding.

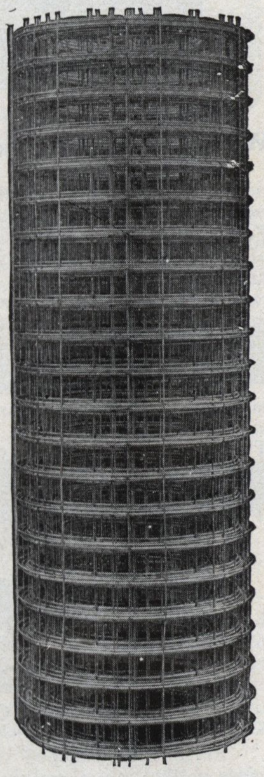
Electric Weld—In Clinton welded wire the transverse wires are welded to the longitudinal wires by means of an electric current. They are not in any way secured by winding, or by loops or clips, and for this reason the casual observer sometimes concludes that the wires are merely soldered together. This idea is wrong. The connection is made by an absolute and perfect weld, in which the two wires are actually fused into one homogeneous section.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.



THE CLINTON ELECTRIC WELD

In this view the two wires have been cut through at their point of union, revealing a perfectly smooth surface. It is a perfect weld; the two wires are actually fused together.



Roll of Clinton Electrically Welded Wire

Shipped also in sheets if desired

A great number of tests have been made upon the welded connections, and it has been shown that the shearing strength of the weld in many cases actually exceeds the tensile strength of the longitudinal wire.

Rectangular Mesh—Clinton welded wire is rectangular or square mesh. There are no zigzag or diagonal members in the material.

When used as reinforcement in floor slabs, the longitudinal members are thus located in the line of tension; while the transverse or secondary members, arranged at right angles to them, afford a most efficient means of distributing concentrated loads in a direction perpendicular to the main reinforcing members.

In floor slabs, designed and estimated on the basis of distributed loads, this is a most important factor in enabling a slab to receive a very heavy load on a small area. Clinton welded wire fabric, affording, as it does, an efficient transverse as well as longitudinal reinforcement, prevents cracking due to changes in temperature and provides a perfect network of steel which knits and binds the concrete together, reinforcing it securely in all directions.

Perfect Bond—There is perfect adhesion of concrete to this fabric, because it has no clips or wrapped wires to prevent free flow of the aggregate when it is being poured; therefore, no voids exist in the completed work. Transverse strands, which are of much heavier gauge than can be used in any other wire fabric, are securely welded to longitudinal strands at right angles to the latter, and provide absolute anchorage against movement of the fabric when subjected to strain.

Unbroken Continuity—By using Clinton welded wire in floor slabs it is possible to obtain a perfect continuity from span to span without any lapping or splicing of the members.

Fabric is delivered in rolls, and may be laid in continuous sheets up to 200 ft. in length. The result is no waste, no lapped ends, no weak points.

Continued on next page

Economy and Accuracy of Installation—The use of welded wire eliminates all cost and trouble involved in the spacing and wiring of loose members. Spacing is established by machinery, and it is impossible for the relative position of various members to become changed in the slightest degree.

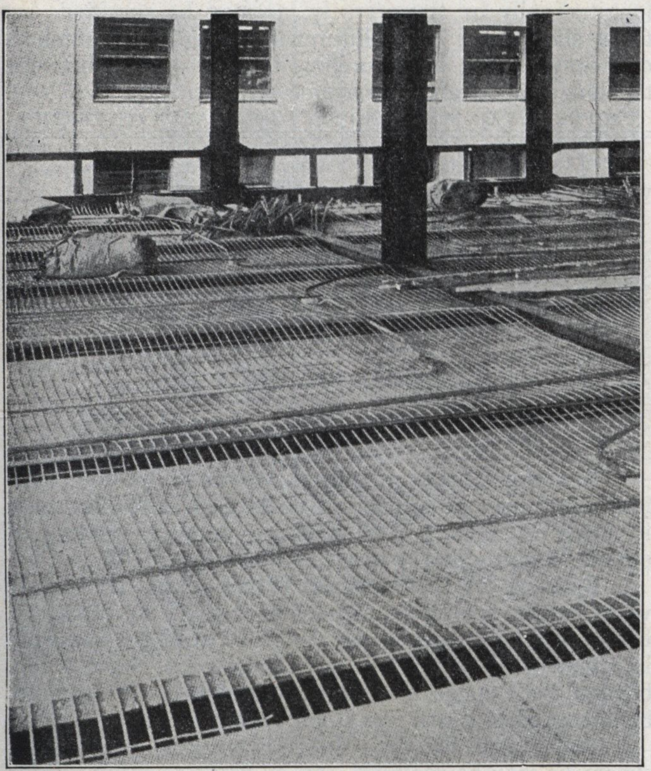
The fact that great quantities of material can be laid accurately in a very short time by unskilled labor, with absolute assurances that every strand of wire is in its proper position, renders welded wire the safest, simplest and most economical reinforcing material for all kinds of slab construction.

Finish—Unless otherwise ordered, Clinton electrically welded fabrics are furnished made with plain steel longitudinal and galvanized steel transverse strands. The price is lower than for fabrics galvanized throughout, the difference being controlled by the market price of spelter used in the galvanizing process.

Galvanizing—Clinton electrically welded fabrics are also made from steel wire, which is thoroughly galvanized before being welded. Galvanizing affords protection against the development of rust if the material is exposed to the weather by reason of delays in its use in the work, or if the concrete is of inferior quality and contains elements injurious to steel, or is so porous as to permit the entrance of moisture or destructive gases.

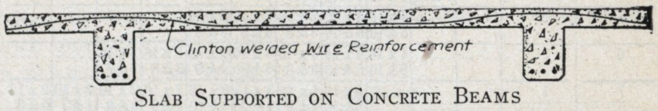
Reinforced Concrete Slab Tables

The tables following the illustrations of the arches are based on accepted formulæ. The loads given at heads of the varying tables cover customary roof and floor loads, and are the safe applied load in addition to the weight of the slab. No allowance, therefore, need be made for the weight of the slab. The tables have been compiled on a basis of a maximum compression in concrete of 650 lbs. per sq. in. with a maximum tension in the steel of 20,000 lbs. per sq. in.; spans being considered as continuous, i. e., $M = \frac{Wl^2}{12}$

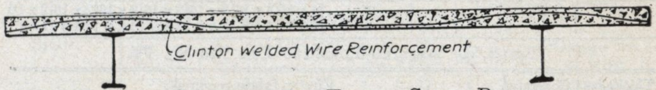


City Hall Annex, Boston, Mass.
Edward T. P. Graham, Architect

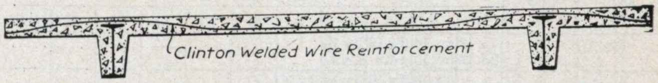
View during construction of floor, showing Clinton electrically welded wire in position, ready for pouring concrete; entire floor reinforced with drawn steel wire (the best known material for tensile reinforcement); every unit accurately spaced and securely held in its proper position—an unbroken continuity of reinforcement from one side of the building to the other



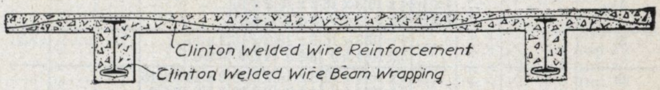
Slab Supported on Concrete Beams



Slab Supported on Top of Steel Beams



Steel Beams with Concrete Haunches


Clinton Welded Wire Reinforcement
Clinton Welded Wire Beam Wrapping

Steel Beams with Complete Concrete Fireproofing

REINFORCED CONCRETE SLAB TABLES
Reissued April 1, 1922

Table I. Applied Load 50 Lbs. per Sq. Ft.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 12 9&12	4 x 12 9&12	4 x 16 7&11	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	.....	.....	.....	.....	.....
4	¾	4 x 12 9&12	4 x 12 9&12	4 x 12 8&12	4 x 16 6&10	4 x 16 4&9	4 x 16 3&8	3 x 16 3&8	.....	.....	.....	.....
4½	¾	.....	.....	4 x 12 8&12	4 x 16 7&11	4 x 16 5&10	4 x 16 3&8	3 x 16 4&9	2 x 16 5&10	.....	.....	.....
5	1	.....	.....	.....	4 x 16 7&11	4 x 16 5&10	4 x 16 3&8	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	.....	.....
6	1	.....	.....	.....	4 x 16 7&11	4 x 16 6&10	4 x 16 4&9	4 x 16 3&8	3 x 16 3&8	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8
7	1	.....	.....	.....	.....	4 x 16 6&10	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8
8	1¼	.....	.....	.....	.....	.....	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	3 x 16 3&8	2 x 16 5&10	2 x 1 4&9

Table II. Applied Load 75 Lbs. per Sq. Ft.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 12 9&12	4 x 12 8&12	4 x 16 6&10	4 x 16 4&9	3 x 16 4&9	.....	.....	.....	.....	.....	.....
4	¾	4 x 12 9&12	4 x 12 9&12	4 x 16 7&11	4 x 16 5&10	4 x 16 3&8	3 x 16 3&8	.....	.....	.....	.....	.....
4½	¾	.....	4 x 12 9&12	4 x 16 7&11	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	.....	.....	.....	.....
5	1	.....	.....	4 x 16 7&11	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	.....	.....	.....
6	1	.....	.....	4 x 12 8&12	4 x 16 6&10	4 x 16 5&10	4 x 16 3&8	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8	.....
7	1	.....	.....	.....	4 x 16 7&11	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	3 x 16 6&8	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8
8	1¼	.....	.....	.....	.....	4 x 16 6&10	4 x 16 4&9	4 x 16 3&8	3 x 16 3&8	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8

Table III. Applied Load 100 Lbs. per Sq. Ft.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 12 9&12	4 x 16 7&11	4 x 16 5&10	3 x 16 4&9	.....	.....	.....	.....	.....	.....	.....
4	¾	4 x 12 9&12	4 x 12 8&12	4 x 16 6&10	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	.....	.....	.....	.....	.....
4½	¾	.....	4 x 12 8&12	4 x 16 6&10	3 x 16 6&10	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	.....	.....	.....	.....
5	1	.....	.....	4 x 16 6&10	3 x 16 6&10	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	2 x 16 2&8	.....	.....	.....
6	1	.....	.....	4 x 16 7&11	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	.....
7	1	.....	.....	.....	4 x 16 6&10	4 x 16 5&10	4 x 16 3&8	3 x 16 3&8	2 x 16 5&10	2 x 16 3&8	2 x 16 3&8	2 x 16 1&7
8	1¼	.....	.....	.....	.....	4 x 16 5&10	4 x 16 3&8	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8

Continued on next page

REINFORCED CONCRETE SLAB TABLES (Continued)

TABLE IV. APPLIED LOAD 125 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 12 8&12	4 x 16 6&10	3 x 16 5&10	3 x 16 3&8	.....	.....	.....	.....	.....	.....	.....
4	¾	.....	4 x 16 7&11	3 x 16 6&10	3 x 16 4&9	2 x 16 5&10	.....	.....	.....	.....	.....	.....
4½	¾	.....	4 x 16 7&11	4 x 16 5&10	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	.....	.....	.....	.....	.....
5	1	.....	.....	4 x 16 5&10	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	.....	.....	.....	.....
6	1	.....	.....	4 x 16 6&10	4 x 16 5&10	4 x 16 3&8	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	.....	.....
7	1	.....	.....	.....	4 x 16 5&10	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	2 x 16 0&6
8	1¼	.....	.....	.....	.....	4 x 16 4&9	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8	2 x 16 1&7

TABLE V. APPLIED LOAD 150 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 12 8&12	4 x 16 5&10	3 x 16 4&9	2 x 16 4&9	.....	.....	.....	.....	.....	.....	.....
4	¾	.....	4 x 16 6&10	4 x 16 4&9	3 x 16 3&8	2 x 16 3&8	.....	.....	.....	.....	.....	.....
4½	¾	.....	4 x 16 7&11	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	.....	.....	.....	.....	.....
5	1	.....	.....	4 x 16 5&10	3 x 16 4&9	3 x 16 3&8	2 x 16 4&9	2 x 16 0&6	.....	.....	.....	.....
6	1	.....	.....	4 x 16 6&10	4 x 16 4&9	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	2 x 16 2&8	.....	.....	.....
7	1	.....	.....	.....	4 x 16 5&10	4 x 16 3&8	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8	2 x 16 1&7	.....
8	1¼	.....	.....	.....	.....	4 x 16 3&8	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	2 x 16 2&8	2 x 16 1&7	2 x 16 0&6

TABLE VI. APPLIED LOAD 175 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab, in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 16 7&11	4 x 16 4&9	3 x 16 4&9	.....	.....	.....	.....	.....	.....	.....	.....
4	¾	4 x 12 8&12	4 x 16 5&10	3 x 16 5&10	2 x 16 5&10	.....	.....	.....	.....	.....	.....	.....
4½	¾	.....	4 x 16 6&10	4 x 16 4&9	2 x 16 6&10	2 x 16 4&9	.....	.....	.....	.....	.....	.....
5	1	.....	4 x 16 6&10	4 x 16 4&9	3 x 16 4&	2 x 16 4&9	2 x 16 2&8	.....	.....	.....	.....	.....
6	1	.....	.....	4 x 16 5&10	3 x 16 5&10	2 x 16 6&10	2 x 16 4&9	2 x 16 3&8	.....	.....	.....	.....
7	1	.....	.....	.....	3 x 16 6&10	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	.....	.....
8	1¼	.....	.....	.....	.....	4 x 16 3&8	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8	2 x 16 1&7	.....

TABLE VII. APPLIED LOAD 200 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 16 6&10	3 x 16 5&10	3 x 16 3&8	.....	.....	.....	.....	.....	.....	.....	.....
4	¾	4 x 16 7&11	3 x 16 6&10	3 x 16 4&9	2 x 16 4&9	.....	.....	.....	.....	.....	.....	.....
4½	¾	4 x 12 8&12	4 x 16 5&10	3 x 16 5&10	3 x 16 3&8	2 x 16 3&8	.....	.....	.....	.....	.....	.....
5	1	.....	4 x 16 6&10	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	2 x 16 0&6	.....	.....	.....	.....	.....
6	1	.....	.....	4 x 16 5&10	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	2 x 16 2&8	.....	.....	.....	.....
7	1	.....	.....	.....	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 2&8	2 x 16 0&6	.....	.....
8	1¼	.....	.....	.....	.....	3 x 16 4&9	2 x 16 5&10	2 x 16 4&9	2 x 16 2&8	2 x 16 1&7	2 x 16 0&6	.....

TABLE VIII. APPLIED LOAD 225 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 16 6&10	4 x 16 3&8	2 x 16 4&9	.....	.....	.....	.....	.....	.....	.....	.....
4	¾	4 x 16 7&11	4 x 16 4&9	3 x 16 3&8	2 x 16 2&8	.....	.....	.....	.....	.....	.....	.....
4½	¾	.....	4 x 16 5&10	3 x 16 4&9	2 x 16 4&9	2 x 16 1&7	.....	.....	.....	.....	.....	.....
5	1	.....	4 x 16 5&10	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	.....	.....	.....	.....	.....	.....
6	1	.....	.....	3 x 16 6&10	3 x 16 4&9	3 x 16 2&8	2 x 16 3&8	2 x 16 1&7	.....	.....	.....	.....
7	1	.....	.....	.....	4 x 16 3&8	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	.....	.....	.....
8	1¼	.....	.....	.....	.....	3 x 16 4&9	3 x 16 2&8	2 x 16 3&8	2 x 16 2&8	2 x 16 1&7	.....	.....

REINFORCED CONCRETE SLAB TABLES (Continued)

TABLE IX. APPLIED LOAD 250 LBS. PER SQ. FT.

Thickness of slab, in.	Concrete below steel, in.	Clinton fabric required										
		Span of slab in ft.										
		4	5	6	7	8	9	10	11	12	13	14
3½	¾	4 x 16 5&10	3 x 16 4&9	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	¾	4 x 16 6&10	3 x 16 5&10	3 x 16 3&8	.....	.....	.....	.....	.....	.....	.....	.....
4½	¾	4 x 16 7&11	3 x 16 6&10	3 x 16 4&9	2 x 16 4&9	.....	.....	.....	.....	.....	.....	.....
5	1	.....	3 x 16 6&10	3 x 16 4&9	2 x 16 4&9	2 x 16 1&7	.....	.....	.....	.....	.....	.....
6	1	.....	.....	3 x 16 5&10	3 x 16 3&8	2 x 16 4&9	2 x 16 2&8	.....	.....	.....	.....	.....
7	1	.....	.....	.....	3 x 16 4&9	2 x 16 5&10	2 x 16 3&8	2 x 16 2&8	.....	.....	.....	.....
8	1¼	.....	.....	.....	.....	3 x 16 3&8	2 x 16 4&9	2 x 16 3&8	2 x 16 1&7	.....	.....	.....

Note: Values in all these tables indicate size of mesh and gauge of wires in Clinton fabric. Thus, 4x16, 7&11 indicates a fabric having No. 7 gauge longitudinal wires on 4-in. centers welded to No. 11 gauge transverse wires on 16-in. centers.

Reinforcements below and to left of zigzag lines may also be safely used in cinder concrete without exceeding 300 lbs. per sq. in. compression in the concrete. In using cinder concrete, applied loads as given may be increased 3½ lbs. for each inch thickness of slab.

Wire

Size of Wire—The fabrics listed below are suggested as combinations which may be used to special advantage. While all of these fabrics are not actually carried in stock, the majority of them may usually be obtained upon short notice. When only a small quantity is desired it is sometimes less expensive to use a stock grade, even though it possesses greater strength than the work requires.

The longitudinal or transverse strands may be of Nos. 0 to 13 inclusive, Washburn & Moen gauge wire. When the same size of wire is not required in both members of the fabric, the heavier size can be placed longitudinally or transversely, as may be specified, but there should not be a difference exceeding 6 numbers on heavy grades, or 5 numbers in light grades, between the longitudinal and transverse strands.

PROPERTIES OF WIRE AND SECTIONAL AREA OF FABRICS

Size per W. & M. gauge	Diam. of 1 wire, in.	Sectional area of 1 wire, sq. in.	Weight per lin. ft. of 1 wire, lbs.	Sectional area (sq. in.) of longitudinal wires only in 1 ft. of fabric width when spaced as shown below				
				2 in.	3 in.	4 in.	5 in.	6 in.
No. 0	.3065	.07378	.2506	.4426	.2951	.2213	.1770	.1475
No. 1	.2830	.06290	.2136	.3774	.2516	.1887	.1509	.1258
No. 2	.2625	.05411	.1838	.3246	.2164	.1623	.1298	.1082
No. 3	.2437	.04664	.1584	.2798	.1865	.1399	.1119	.0932
No. 4	.2253	.03986	.1354	.2391	.1594	.1195	.0956	.0797
No. 5	.2070	.03365	.1143	.2019	.1346	.1009	.0807	.0673
No. 6	.1920	.02895	.0983	.1737	.1158	.0868	.0694	.0579
No. 7	.1770	.02460	.0835	.1476	.0984	.0738	.0590	.0492
No. 8	.1620	.02061	.0700	.1236	.0824	.0618	.0494	.0412
No. 9	.1483	.01727	.0586	.1036	.0691	.0518	.0414	.0345
No. 10	.1350	.01431	.0486	.0858	.0572	.0429	.0343	.0286
No. 11	.1205	.01140	.0387	.0684	.0456	.0342	.0273	.0228
No. 12	.1055	.00874	.0296	.0524	.0349	.0262	.0209	.0174

Spacing of Longitudinal Wires—The longitudinal wires may be spaced on centers of 2 in., or more, in steps of 1 in. The distance between centers of outside longitudinal wires can not exceed 100 in.

Spacing of Transverse Wires—The transverse wires can be spaced on centers of 2 to 10 in., inclusive, in steps of 1 in., and on centers of 10 to 18 in., inclusive, in steps of 2 in. They must project at least ½ in. beyond the outside longitudinals and may, if required, be extended to a maximum length of 102 in.

Rolls and Sheets—Special lengths of rolls or sheets, as may be required, can be made to order. Rolls may be of any desired length not exceeding 400 ft. in the light grades, depending upon the weight and convenience in handling. Sheets should not exceed 20x7½ ft. if shipped in box cars, or 32x8 ft. if shipped on flat cars.

Continued on next page

Special Designs in New York, N. Y.

In the city of New York the allowable capacities of floor slabs are no longer based on tested approvals, but may now be determined by a newly devised method of computation which applies to flat slabs of either stone or cinder concrete when cast between steel beams, and only when the span of slab does not exceed 8 ft. For these conditions a minimum thickness of 4 in. is required. While 4 in. is thus fixed as the minimum thickness of slab, still, a 4-in. thickness may be used on any span up to 8 ft., and for any load which does not exceed the computed capacity of the slab; the actual capacity in any case being determined by the thickness of slab, the conditions of continuity, and the amount and kind of reinforcement used.

Because of the unaccountable strength of short span slabs as shown by actual tests, the city of New York has adopted an empirical formula to be used in designing slabs of 8-ft. span and less when confined between steel beams. The tables below have been computed by this formula for the conditions of continuous wire mesh reinforcement.

ALLOWABLE CAPACITIES OF FLOOR SLABS IN NEW YORK, N. Y.

Cinder Concrete Slabs

Span	Applied load, lbs. per sq. ft.	Total load, lbs. per sq. ft.	Thickness of slab, in.	Required steel, sq. in. per ft. width	Required Clinton Fabric	
					Mesh, in.	Gauge No. of wire
4 ft. 0 in.	50	86	4	.0432	4 x 12	9 and 12
“	75	111	4	.0432	4 x 12	9 and 12
“	100	136	4	.0432	4 x 12	9 and 12
“	125	161	4	.0432	4 x 12	9 and 12
“	150	186	4	.0432	4 x 12	9 and 12
“	175	211	4	.0433	4 x 12	9 and 12
“	200	236	4	.0484	4 x 12	9 and 12
“	225	261	4	.0535	4 x 12	9 and 12
“	250	286	4	.0587	4 x 12	8 and 12
“	275	311	4	.0638	4 x 12	8 and 12
“	300	336	4	.0689	4 x 16	7 and 11
5 ft. 0 in.	50	86	4	.0432	4 x 12	9 and 12
“	75	111	4	.0432	4 x 12	9 and 12
“	100	136	4	.0436	4 x 12	9 and 12
“	125	161	4	.0516	4 x 12	9 and 12
“	150	186	4	.0597	4 x 12	8 and 12
“	175	211	4	.0677	4 x 16	7 and 11
“	200	236	4	.0757	3 x 12	8 and 12
“	225	261	4	.0837	3 x 12	8 and 12
“	250	286	4	.0917	3 x 16	7 and 11
“	275	311	4	.0998	3 x 16	7 and 11
“	300	336	4	.1078	3 x 16	6 and 10
6 ft. 0 in.	50	86	4	.0432	4 x 12	9 and 12
“	75	111	4	.0513	4 x 12	9 and 12
“	100	136	4	.0628	4 x 12	8 and 12
“	125	161	4	.0744	4 x 16	7 and 11
“	150	186	4	.0859	4 x 16	6 and 10
“	175	211	4	.0974	3 x 16	7 and 11
“	200	236	4	.1089	3 x 16	6 and 10
“	225	261	4	.1205	3 x 16	6 and 10
“	250	286	4	.1320	3 x 16	5 and 10
“	275	311	4	.1436	2 x 16	7 and 11
“	300	336	4	.1551	3 x 16	4 and 9
7 ft. 0 in.	50	86	4	.0540	4 x 12	8 and 12
“	75	111	4	.0697	4 x 16	7 and 11
“	100	136	4	.0855	4 x 16	6 and 10
“	125	161	4	.1011	3 x 16	7 and 11
“	150	186	4	.1168	3 x 16	6 and 10
“	175	211	4	.1325	3 x 16	5 and 10
“	200	236	4	.1481	2 x 16	7 and 11
“	225	261	4	.1639	2 x 16	6 and 10
“	250	286	4	.1796	3 x 16	3 and 8
“	275	311	4	.1953	2 x 16	5 and 10
“	300	336	4	.2110	2 x 16	4 and 9
8 ft. 0 in.	50	86	4	.0706	4 x 16	7 and 11
“	75	111	4	.0911	3 x 16	7 and 11
“	100	136	4	.1116	3 x 16	6 and 10
“	125	161	4	.1321	3 x 16	5 and 10
“	150	186	4	.1526	3 x 16	4 and 9
“	175	211	4	.1732	2 x 16	6 and 10
“	200	236	4	.1936	2 x 16	5 and 10
“	225	261	4	.2142	2 x 16	4 and 9
“	250	286	4	.2346	2 x 16	4 and 9
“	275	311	4	.2553	2 x 16	3 and 8
“	300	336	4	.2758	2 x 16	3 and 8

Stone Concrete Slabs

Span	Applied load, lbs. per sq. ft.	Total load, lbs. per sq. ft.	Thickness of slab, in.	Required steel, sq. in. per ft. width	Required Clinton Fabric	
					Mesh, in.	Gauge No. of wire
4 ft. 0 in.	50	100	4	.0432	4 x 12	9 and 12
“	75	125	4	.0432	4 x 12	9 and 12
“	100	150	4	.0432	4 x 12	9 and 12
“	125	175	4	.0432	4 x 12	9 and 12
“	150	200	4	.0432	4 x 12	9 and 12
“	175	225	4	.0432	4 x 12	9 and 12
“	200	250	4	.0445	4 x 12	9 and 12
“	225	275	4	.0489	4 x 12	9 and 12
“	250	300	4	.0534	4 x 12	8 and 12
“	275	325	4	.0578	4 x 12	8 and 12
“	300	350	4	.0622	4 x 12	8 and 12
5 ft. 0 in.	50	100	4	.0432	4 x 12	9 and 12
“	75	125	4	.0432	4 x 12	9 and 12
“	100	150	4	.0432	4 x 12	9 and 12
“	125	175	4	.0486	4 x 12	9 and 12
“	150	200	4	.0556	4 x 12	8 and 12
“	175	225	4	.0625	4 x 12	8 and 12
“	200	250	4	.0695	4 x 16	7 and 11
“	225	275	4	.0764	4 x 16	7 and 11
“	250	300	4	.0834	4 x 16	6 and 10
“	275	325	4	.0903	4 x 16	6 and 10
“	300	350	4	.0972	3 x 16	7 and 11
6 ft. 0 in.	50	100	4	.0432	4 x 12	9 and 12
“	75	125	4	.0500	4 x 12	9 and 12
“	100	150	4	.0600	4 x 12	8 and 12
“	125	175	4	.0700	4 x 16	7 and 11
“	150	200	4	.0800	4 x 16	6 and 10
“	175	225	4	.0900	4 x 16	6 and 10
“	200	250	4	.1000	3 x 16	7 and 11
“	225	275	4	.1100	3 x 16	6 and 10
“	250	300	4	.1200	3 x 16	6 and 10
“	275	325	4	.1300	3 x 16	5 and 10
“	300	350	4	.1400	4 x 16	3 and 8
7 ft. 0 in.	50	100	4	.0545	4 x 12	8 and 12
“	75	125	4	.0681	4 x 16	7 and 11
“	100	150	4	.0817	4 x 16	6 and 10
“	125	175	4	.0953	3 x 16	7 and 11
“	150	200	4	.1089	3 x 16	6 and 10
“	175	225	4	.1225	3 x 16	6 and 10
“	200	250	4	.1361	3 x 16	5 and 10
“	225	275	4	.1497	2 x 16	7 and 11
“	250	300	4	.1633	2 x 16	6 and 10
“	275	325	4	.1770	2 x 16	6 and 10
“	300	350	4	.1906	2 x 16	5 and 10
8 ft. 0 in.	50	100	4	.0711	4 x 16	7 and 11
“	75	125	4	.0889	4 x 16	6 and 10
“	100	150	4	.1067	3 x 16	7 and 11
“	125	175	4	.1244	3 x 16	6 and 10
“	150	200	4	.1422	4 x 16	3 and 8
“	175	225	4	.1600	3 x 16	4 and 9
“	200	250	4	.1778	2 x 16	6 and 10
“	225	275	4	.1956	2 x 16	5 and 10
“	250	300	4	.2133	2 x 16	4 and 9
“	275	325	4	.2311	2 x 16	4 and 9
“	300	350	4	.2489	2 x 1	3 and 8

STANDARD SIZES—CLINTON WELDED FABRIC

Style No.	Spacing of wires, in.		Size wires W & M gauge		Sec. area of steel sq. in. per ft. width		Weight per 100 sq. ft., lbs.	Standard, rolls, in.	
	Longitudinal	Transverse	Longitudinal	Transverse	Longitudinal	Transverse		Width	Length
*216–28	2	16	2	8	.325	.015	119.4	60	150
*216–38	2	16	3	8	.280	.015	103.6	60	150
*216–49	2	16	4	9	.239	.013	88.5	60	150
*216–510	2	16	5	10	.202	.011	74.6	60	150
*216–610	2	16	6	10	.174	.011	64.7	60	200
*316–28	3	16	2	8	.217	.015	82.6	84	150
*316–38	3	16	3	8	.187	.015	72.0	84	150
*316–49	3	16	4	9	.160	.013	61.4	84	150
*316–510	3	16	5	10	.135	.011	51.8	84	150
*316–610	3	16	6	10	.116	.011	45.1	84	200
*416–38	4	16	3	8	.140	.015	56.1	84	150
*416–49	4	16	4	9	.120	.013	47.9	84	150
*416–510	4	16	5	10	.101	.011	40.4	84	200
*416–610	4	16	6	10	.087	.011	35.2	84	200
*416–711	4	16	7	11	.074	.009	29.7	84	200
*412–812	4	12	8	12	.062	.009	25.5	84	200
*412–912	4	12	9	12	.052	.009	21.8	84	200
*412–1012	4	12	10	12	.043	.009	18.6	100	300
*412–1212	4	12	12	12	.026	.009	12.6	100	400
412–55	4	12	5	5	.101	.034	48.4	72	200
412–66	4	12	6	6	.087	.029	41.6	72	200
412–77	4	12	7	7	.074	.025	35.4	72	200
412–88	4	12	8	8	.062	.021	29.6	72	200
*59–1212	5	9	12	12	.021	.012	11.8	100	400
612–06	6	12	0	6	.148	.029	65.3	72	†
612–33	6	12	3	3	.093	.047	51.2	72	200
612–44	6	12	4	4	.080	.040	43.8	72	200
612–55	6	12	5	5	.067	.034	37.0	72	200
612–66	6	12	6	6	.058	.029	31.8	72	200
612–77	6	12	7	7	.049	.025	27.0	72	200
22–1010	2	2	10	10	.086	.086	60.3	56	200
*22–1212	2	2	12	12	.052	.052	36.8	56	300
44–44	4	4	4	4	.120	.120	85.3	84	150
44–66	4	4	6	6	.087	.087	61.9	84	150
44–88	4	4	8	8	.062	.062	44.1	84	200
66–44	6	6	4	4	.080	.080	57.8	84	200
66–55	6	6	5	5	.067	.067	48.8	84	200
*66–66	6	6	6	6	.058	.058	42.0	84	200
66–77	6	6	7	7	.049	.049	35.7	84	200
*66–88	6	6	8	8	.041	.041	30.0	84	200
*66–1010	6	6	10	10	.029	.029	20.7	96	300

*Denotes sizes ordinarily carried in stock. †Shipped only in flat sheets.

EDWARD A. TUCKER COMPANY

Contracting Engineers for Fireproof Floor Systems and Concrete Reinforcement

Converse Building, 101 Milk Street
BOSTON, MASS.
BRANCH OFFICES: HARTFORD and NEW HAVEN, CONN.

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MONOTYPE and DIAMOND DEFORMED BARS; SPIRALS.

FLOOR SYSTEMS: Metal Rib Long Span, Akme Flat Slab, Combination Tile.

Also, Marks System Gypsum Roof, Metal Frame Stirrup Units, Clips, Spacers, Chairs, Removable Metal Forms, Lath.

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The EDWARD A. TUCKER COMPANY has various systems of floor construction, each designed to meet a certain type of building and to combine economy and utility.

This company offers, also, in connection with the sale of its floor systems, complete structural designs and plans; and the fact that the company is regularly retained as engineers by architects and contractors is a guarantee that the designs offered in the sales propositions will be conservative and reliable.

Stock

In the company's warehouse at East Cambridge, Mass., is carried a large stock covering, in general, all sizes of bars. Any point in New England can be supplied at a day's notice.

The complete fabrication shop is equipped with power benders; also with two spiral machines for making spiral column hooping.

Monotype and Diamond Deformed Bars

Monotype bars are rolled by the Carnegie Steel Co. from new billet stock, to conform to the standard specifications of the Association of American Steel Manufacturers. Diamond bars are rolled for us by the Jones & Laughlin Steel Corporation.

MONOTYPE DEFORMED BAR

These bars are rolled to the same cross section for areas equivalent to round or square section.

Metal Rib Floors

Consist of reinforced concrete joists and slab, formed by removable metal pans or domes. This system reduces the waste of form material to the lowest point, saves on the amount of concrete and reinforcement, and is adapted to all classes of work. For garages, manufacturing plants and unfinished buildings, open joist construction is used. For schoolhouses, hospitals, etc., a metal lath ceiling is attached to the ribs, giving a level ceiling. Note this feature—lath is put up after all concrete work is done, thus avoiding the wavy ceiling effect, the rusting and breaking of lath through long exposure and the uncertainty of the quality of concrete obtained.

We supply forms in 31 and 20-in. widths.

For exposed ceilings, the 31-in. forms increase the diffusion of light and give a much more pleasing ceiling effect than the 20-in. spacing.

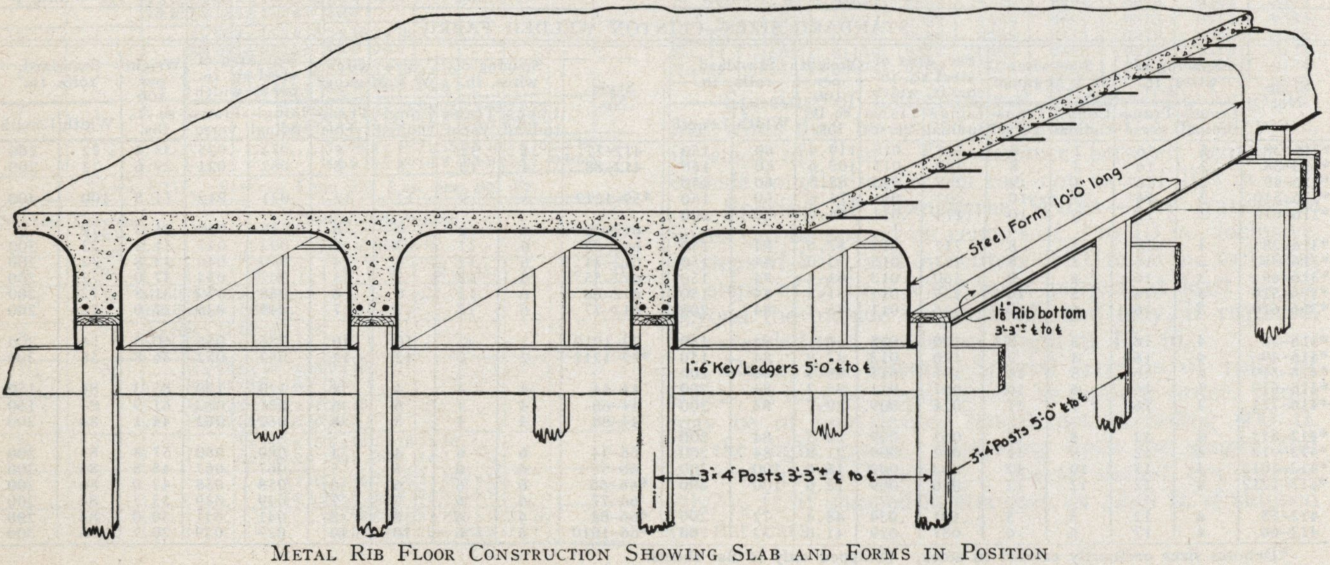
Metal forms are of No. 11 gauge (1/8 in. thick) and because of this thickness a form as rigid as wood centering is provided, giving also true alignment of the ribs. The standard lengths of 6, 8 and 10 ft., will support the loads with shores only at the ends, thus reducing requirements for shores to one for every 25 to 30 sq. ft.

The long lengths also mean few laps, reducing to one-third this labor item if joints are specified to be smoothed up.

Lumber for false work in metal rib construction, including waste, is reduced to one and one-quarter board feet per square foot, or a saving of one-half to three-quarters board feet as compared with usual pan systems; the number of pieces in the lumber for false work is one-half that of other systems.

Contractors state that progress is not dependent on form speed, as in other types of construction, but only on limits of good concrete pouring.

The quality of the work and the speed and economy of the construction depend on using a heavy gauge form —specify Metal Rib.


Steel Form 10'-0" long
1⅛" Rib bottom 3'-3"± ℄ to ℄
1"-6" Key Ledgers 5'-0" ℄ to ℄
3"-4" Posts 5'-0" ℄ to ℄
3"×4" Posts 3'-3"± ℄ to ℄

METAL RIB FLOOR CONSTRUCTION SHOWING SLAB AND FORMS IN POSITION

CONCRETE CLIP & WIRE CO.

Manufacturers of Wire and Flat Steel Products for Building Construction

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Wire Clip Reinforcement for Concrete Fireproofing; Hangers and Hairpins for Suspended Ceiling Construction.

Also Steel and Galvanized Mortar Boxes, Cinch Cleats for Tying Concrete Forms; Reinforcing Bar Cutters and Benders; Special Tools.

Wire Clip Reinforcement

In order to prevent concrete fireproofing from cracking and falling off, wire clips are used on the bottom of structural steel members. They are manufactured in several styles, and the choice of style is a matter of personal preference.

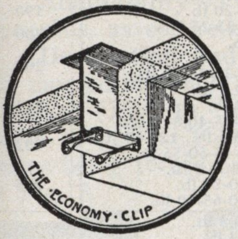


Fig. 1

Economy Clips—The Economy Clip (Fig. 1) has the longitudinal spacing member close up to the bottom of steel member to prevent interference with crosswise flow of concrete. The loops are under the flange, evenly spaced to provide adequate reinforcement. On extra wide flanges, two or more longitudinal wires are used with additional reinforcing loops.

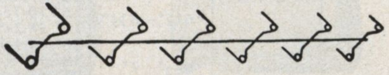


Fig. 2. Clips Welded to Spacing Wire

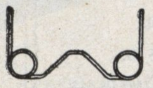


Fig. 3. Economy Clip

Master Clips—The Master Clip (Fig. 4) has the loops extending beyond the edges of flange of the structural member, thereby providing the reinforcing loops at the outside corners.

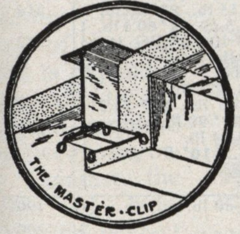


Fig. 4

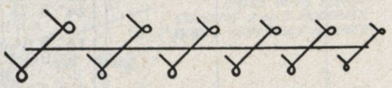


Fig. 6. Clips Welded to Spacing Wire

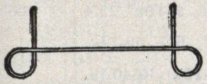


Fig. 5. Master Clip

Sizes—Both Master and Economy Clips are generally furnished electrically welded, 11½ in. apart, to a longitudinal spacing wire 5 ft. long; and packed 50 lengths (250 ft.) per bundle.

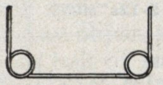


Fig. 7. Individual Clip

Either the Economy type, Master, or the clip shown (Fig. 7) may be furnished individually without being welded to a spacing wire. In this form they are used as concrete and *brick wall ties*. This spacing may be varied to meet special conditions.

The White Clip—The White Clip is furnished in straight lengths and is zigzagged across the beam flange very much like lacing up a shoe. The advantages of this clip are that it grips the flange very tightly, as each clip pulls hard on its neighbors; the flow of concrete is assisted by the diagonal direction of the wires. The clips proper extend beyond the flange reinforcing the corners of the soffit.

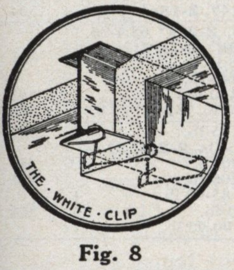


Fig. 8

Economy Beam Spacers

These are furnished to accurately space forms, giving an equal thickness of fireproofing at all points with a minimum of field labor.

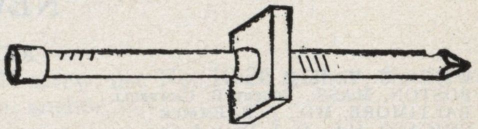


Fig. 9. Economy Beam Spacers

Economy Bar Benders

No. 1 Bender will bend up to 1¼-in. round bars while the No. 2 is for smaller bars, up to ⅝ in.

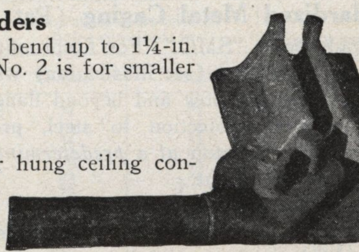


Fig. 10. No. 1 Bar Bender

Hung Ceilings

Usual practice for hung ceiling construction calls for ¾ or 1-in. cross furring channels 12 or 16 in. on centers, depending on type of metal lath used. These are fastened to main furring channels or angles, which are usually 4 ft. on centers, by means of wire hairpins which we manufacture in shape shown as Fig. 11. The top bend in Fig. 11 further reduces erection time on the job. Hairpins quickly and securely tie main furring and cross furring together more rigidly than loose wire.

Ceilings are usually hung from hangers embedded in the concrete construction or attached to structural steel or wood members.

Hanger shown (Fig. 12—usually called toggle hanger) is the standard type of hanger used for suspended ceilings in concrete construction. When wood joists, steel beams supporting wood construction, or other conditions are encountered, we manufacture various types of hangers to support the ceilings. Those shown below are typical.

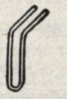


Fig. 11

Hairpin

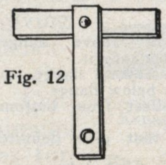


Fig. 12

Toggle Hanger

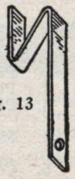


Fig. 13

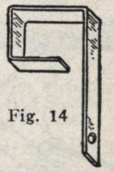


Fig. 14

Beam Hangers

Special Jobs—It is sometimes desirable to omit the main carrying or furring members. The hangers below are notched for either ¾ or 1-in. channels. Notice that some of these types are designed to hang from bottom of structural members.

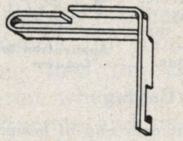


Fig. 15

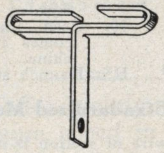


Fig. 16

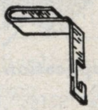


Fig. 17

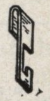
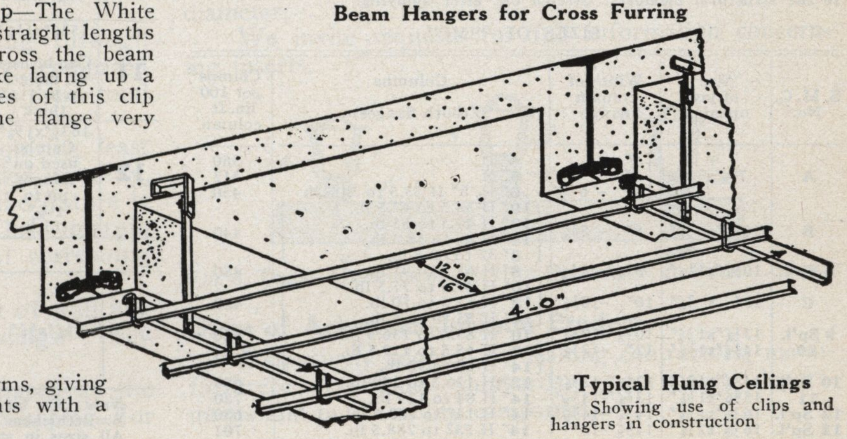


Fig. 18

Beam Hangers for Cross Furring



Typical Hung Ceilings

Showing use of clips and hangers in construction

MITCHELL-TAPPEN COMPANY

Standardized Metal Caging ("SMC")

15 John Street
NEW YORK, N. Y.

REPRESENTATIVES

UTICA, N. Y., H. H. Frey
BOSTON, MASS., Robert B. Campbell
BALTIMORE, MD., J. B. Embick
CHICAGO, ILL., O. J. Dean & Co.
LOS ANGELES, CAL., Stevens & Hammersley
SAN FRANCISCO, CAL., C. J. Waterhouse & Sons Co.
MONTREAL, QUE., C. G. Porter & Co.
TORONTO, ONT., H. A. J. Aldington

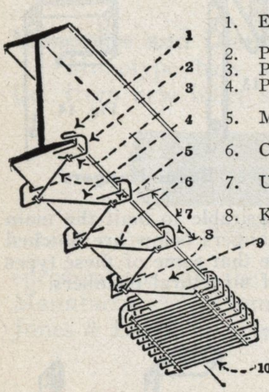
Standardized Metal Caging (Pat. Dec. 15, 1914)

Trade name "SMC." For fireproofing steel structures. A wire basket or cage (see illustration) which firmly grips beam flange extending below and beyond flange, which permanently locks concrete protection to steel, providing a continuous strengthening skeleton *at a predetermined or fixed offset distance from the flange.*

"SMC" cannot "bunch"; it pulls out like a camera bellows, maintaining equal spacing of about five in. under middle of beam. It clasps flange tightly at edges leaving a clear space for flow of concrete under flange. When used on girders, columns or deep beams, additional wires of special shape (see HS below) may be used to reinforce the side protection or haunches.

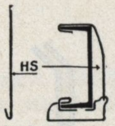
Exclusive features shown in illustration. "SMC" comes to job ready to use, and can be easily applied by inexperienced labor. Full printed directions furnished.

"SMC" is shipped in collapsed sections about 4 ft. long, each containing 250 clamps, and is easy and inexpensive to handle. Such a section of size A, B, or C when pulled out, is sufficient to cover about 120 ft. of beam flange, 30 pieces of substitute material 4 ft. long or 120 pieces 1 ft. long would have to be handled for the same length of beam, and then would only provide a more or less unsatisfactory substitute.

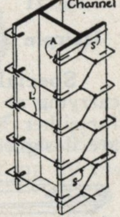


1. Enlargement above flange which anchors it.
2. Projection beyond flange.
3. Projection below flange.
4. Parallel offset from bottom of flange.
5. Members that give definite offset.
6. Continuous form giving automatic spacing.
7. Uniform spaces that never exceed 8 in.
8. Keys alternated on opposite sides.
9. Absence of longitudinal members or enclosed spaces which obstruct flow of concrete.
10. Used just as it comes from machine.

HS=Haunch stiffener.



Application to Channel



Application to Column

Application of Standardized Metal Caging

In applying "SMC," end wire of section is caught over end of beam, and workman easily holds and pulls out section, which automatically locks to the structural member. Stretch out after applying.

SIZES OF "SMC"

S. M. C. No.	Size of jaw opening	Width of column flange	Columns (both flanges)	Clamps per 100 lin. ft. column
A	7⅜″x⅝″	4″ 5″ 6″ – 6½″	**4″** H **5″** H **6″** H, 8″ H 23.5 to 34.5 lb	380 412 450
B	10¼″x ⅞″	8″ – 8¼″	**10″** H 33.5 to 47.5 lb. **12″** H 40.5 to 55 lb. **14″** H 43 to 58.5 lb. **8″** 32 to 62.5 lb.	440
B Sp'l.	10¼″x1¼″	8¼″– 8½″	**8″** H 67.5 to 91 lb.	450
C	13″ x ⅞″	10″ –10⅛″	**10″** H 49.5 to 77.5 lb. **12″** H 52.5 to 70 lb. **14″** H 55 to 73.5 lb.	420
9 Sp'l.	13¼″x1½″	10⅛″–10¾″	**10″** H 83.5 to 136.5 lb.	650
10	14⅛″x1⅛″	12″ –12¼″	**12″** H 65.5 to 119.5 lb. **14″** H 69 to 90 lb.	642
10 Sp'l.	14⅛″x1¾″	12¼″–12¾″	**12″** H 126.5 to 190 lb.	688
11	15⅜″x1⅛″	13¾″–14⅛″	**14″** H 84 to 139 lb.	730
12 Sp'l.	16½″x1⅞″	14¼″–14⅝″	**14″** H 147 to 228.5 lb.	650
12 Sp'l.	16½″x2¼″	14⅝″–15″	**14″** H 237 to 288.5 lb.	702

SIZES OF "SMC"

S.M.C. No.	Size of jaw opening	Width of beam flange	Beams To be used on	Approx. clamps to cover 100 lin. ft. of beam
A	7⅜″x⅝″ Can be used on flanges from smallest up to 6⅛″ x ⅝″ thick	3″ – 3½″	**4″** 7.7-8.5-9.5-10.5 lb. **5″** 10-12.25 lb. **6″** 12.5-14.75-17.25 lb.	182
		3½″– 4″	**7″** 15.3-17.5-20 lb.	190
		4″ – 4½″	**8″** 18.4-20.5-23-25.5 lb. **9″** 21.8-25 lb.	200
		4½″– 5″	**9″** 30-35 lb. **10″** 22.4-25.4-30-35-40 lb.	206
		5″ – 5½″	**8″** B 17.5-19.5 lb. **9″** B 20.5-24 lb. **12″** 27.9-31.8-35-40.8-50 lb.	214
		5½″– 6″	**10″** B 23.5-28.5 lb., **12″** 60 lb. **15″** 37.8-42.9-45-50-55 lb.	222
		6″ – 6¼″	**12″** B 28.5-32-36.5 lb. **15″** 60.8-65-70-75 lb. **18″** 48.2-55-60-65-70 lb.	235
B	10¼″x⅞″ Can be used on flanges from 6″ to 9″ wide x 13/16″ thick	6⅛″– 6½″	**12″** B 28.5-36.5 lb. **15″** 70-75-81.3 lb. **18″** 48.2-55-60-65-70 lb. **20″** 65.4-70-75 lb.	190
		6½″– 7″	**15″** B 38.5-41-46 lb. **21″** 57.5-60.4 lb.	200
		7″ – 7½″	**15″** B 54.5-64-71.5 lb. **18″** 75-80-85-90 lb. **20″** 81.4-85-90-95-100 lb. **24″** 69.5-75-79.9-85-90-95-100 lb.	206
		7½″– 8″	**18″** B 49-52-54.5-59, **24″** 105.9 110-115 lb., **27″** 83 lb.	214
		8″ – 8½″	**20″** B 59.5-64.5-69, **21″** 60.4 lb. **8″** BG 31-37 lb., **9″** BG 36-38.5 lb.	222
		8½″– 9″	**20″** B 73-82 lb. **22″** B 65.5-68.5-71.5 lb. **24″** B 73.5-84.5 lb., **24″** 74.2 lb., **27″** 90 lb. **18″** B 64.5-69-74 lb. **9″** BG 36-43.5, **10″** BG 41.5-50 lb. **2-8s″** 25.5 lbs.	235
C	13″x⅞″ Can be used on flanges 9 to 11¾″x 13/16″ thick	9″ – 9½″	**2-9s″** 21.8-25-30 lb.	190
		9½″–10″	**26″** B 91 lb. **24″** B 95.5-104.5 lb.	200
		10″ –10½″	**28″** B 106 lb., **2-9s″** 35 lb. **12″** BG 51.5-76.5, **2-10s″** 25.4 lb.	206
		10½″–11″	**30″** B 121, **15″** BG 69-74-80.5 lb. **2-8s″** B 17.5, **2-10s** 30-40 lb.	215
		11″ –11½″	**2-9s″** B 20.5 lb. **2-12s″** 31.8-35-40.8-45	222
		11½″–11¾″	**15″** BG 99-105-111 lb. **18″** BG 87.5-100, **2-12s″** 50-55 lb.	235
10	14¼″x1⅛″ Can be used on flanges up to 1 1/16″ thick	11¾″–12″	**15″** BG 135-147 lb.	308
		12″ –12¼″	**20″** BG 107-120 lb. **2-10s″** B 23.5, **2-15s″** 42.9-55 lb.	321
		12¼″–12½″	**24″** BG 114-129 lb. **2-12s″** B 28.5 lb.	337
		12½″–12¾″	**2-15s″** 60 lb.	351
		12¾″–13″	**20″** BG 135-149, **2-18s″** 55 lb.	364
11	15⅜″x1⅛″ Can be used on flanges up to 1 1/16″ thick	13⅛″–13½″	**2-15s″** 65-75, **2-20s″** 65.4-70, **2-18s″** 60-75 **2-12s″** B 36.5 lb. **24″** BG 133-149 lb.	321
		13½″–13¾″	**26″** BG 144-160 lb.	351
		13¾″–14⅛″	**2-15s″** B 38.5 lb., **2-20s″** 75 lb.	364
12	16½″x1⅛″ Can be used on flanges up to 1 1/16″ thick	14¼″–14½″	**28″** BG 165-175 lb.	321
		14½″–14¾″	**2-15s″** B 54.5 lb., **2-20s″** 81.4-85-90 lb.	330
		14¾″–15″	**30″** BG 181-200 lb.	351
		15″ –15¼″	**2-18s″** 75-80-85-90 lb. **2-20s″** 95-100 lb. **2-24s″** 80-85-90-95 lb.	364

Channel Material

	5¼″x⅝″	1.92″	6″ channel, H. S. size 12″	277
		2.09″	7″ channel, H. S. size 12″	286
		2.26″	8″ channel, H. S. size 14″	294
		2.43″	9″ channel, H. S. size 14″	303
		2.60″	10″ channel, H. S. size 18″	313
		2.94″	12″ channel, H. S. size 18″	329
		3.40″	15″ channel, H. S. size 21″	333

Note: On large beams use one haunch stiffener with each clamp.
B=Bethlehem Beams; BG=Bethlehem Girders.
All sizes in stock.

ACKERMAN-JOHNSON CO.

Expansive Screw Anchors, Expansion Bolts, Concrete Inserts

625 West Jackson Boulevard
CHICAGO, ILL.

Products

Ackerman-Johnson Expansive Screw Anchor; Expansion Bolts; Concrete Inserts. U. S. Patents: April 27, 1915, December 21, 1915, April 4, 1916, May 14, 1918; others pending. Patented in Canada, Great Britain, France, Belgium; others pending.

Ackerman-Johnson Expansive Screw Anchor

Adaptability—For attaching objects to hard materials, as concrete, brick, stone, tile, marble, etc.

Description and Operation—Consists of a doubly tapered internally threaded cone made of brass, iron or steel (Fig. 1), within a lead composition ductile sleeve (Fig. 2). These are assembled at the factory, the sleeve being forced on the cone to a normal position as at Fig. 3.

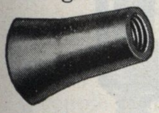


Fig. 1

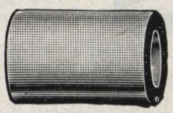


Fig. 2

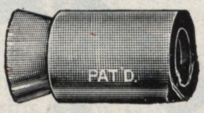


Fig. 3

Ackerman-Johnson Expansive Screw Anchor

When installed as illustrated, the sleeve is driven farther toward base of the cone and is expanded generally to any degree required to swedge tightly against the sides of hole, effecting perfect holding contact throughout the length and circumference of the anchor. Thus consolidated with the wall material, the anchor provides a machine threaded hole the same as an ordinary tapped hole in a machine part. Any object may then be attached with a standard screw or bolt of suitable diameter.

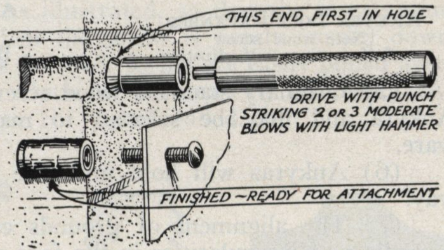

THIS END FIRST IN HOLE
DRIVE WITH PUNCH STRIKING 2 OR 3 MODERATE BLOWS WITH LIGHT HAMMER
FINISHED—READY FOR ATTACHMENT

Fig. 4. Manner of Installing Anchor
The piloted setting punch supplied without charge with all anchors

The heavier the load attached, the more forcible becomes the expansion, causing the anchor to resist effort to pull it out far beyond the tensile strength of any screw or bolt.

Distinctive Advantages—Time saving through the use of Ackerman-Johnson anchors compared with old methods more than compensates their total cost.

They save much of drilling cost, requiring least depth for any stated load. They are installed instantly, without the aid of the screw, and before the fixture is lifted into position to be fastened. Their margin of safety is equal to that of steel bolts of correlating size.

They necessitate the least displacement of wall material and consequently less injury to buildings. They effect the neatest possible workmanship.

Sizes—The size of anchor is designated as the size of the bolt or screw to be used. Example: For No. 10-24 screw, use No. 10-24 anchor; for 3/8-in. bolts use 3/8-in. anchor.

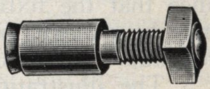
SIZES, EXPANSIVE SCREW ANCHORS

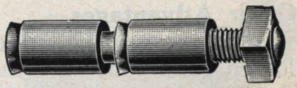
Screw or bolt size, in.	Threads per in.	Minimum dimension of holes required, in.		Specify anchor Size No.
		Diam.	Depth	
6	32	1/4	3/8	6-32
8	32	5/16	1/2	8-32
10	24	3/8	5/8	10-24
12	24	7/16	3/4	12-24
1/4	20	1/2	7/8	1/4-20
5/16	18	5/8	1	5/16-18
3/8	16	3/4	1 1/4	3/8-16
7/16	14	7/8	1 1/2	7/16-14
1/2	13	7/8	1 1/2	1/2-13
5/8	11	1 1/8	2	5/8-11

Packed 50 or 100 in box.

Stud Type Expansion Bolts

So great is the holding power of this anchorage, that when set in strong stone or concrete with only its one primary sleeve expanded, the bolt shank can be pulled in two, without the anchorage yielding.


Bolt with Primary Expansive Sleeve Only


Bolt with Primary and One Secondary Expansive Unit

Secondary Expansive Units—Made up of an expansive sleeve and a slip steel cone, giving additional anchorage equal to the primary unit. Calculate the minimum depth of holes for setting at twice the diameter of hole drilled.

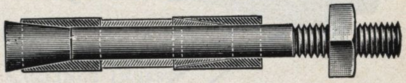

Sectional View Showing Bolt with Primary Expansion Sleeve, One Iron Spacing Sleeve, and One Secondary Expansive Unit

Fig. 5. Stud Type Expansion Bolt

Diam. of bolt, at thread ....in.	1/4	3/8	1/2	5/8	3/4
Diam. for hole ...in.	3/8	9/16	3/4	1	1 1/8
Length of bolt ..in.	1 1/4	1 3/4	2 1/2	3 1/2	5
	1 1/2	2	3	4	6
	1 3/4	2 1/2	3 1/2	5	7 1/2
	2	3	4	6	9
	2 1/2	3 1/2	4 1/2	7 1/2	10
	3	4	5	9	12
	3 1/2	4 1/2	6	10 1/2	15
	4	....	7	12	18
	....	....	8	15	....

Concrete Inserts

Ackerman-Johnson concrete inserts for moulding into the concrete when poured, afford minimum displacement of the concrete and maximum speed in setting. Can be furnished for all sizes of screws and bolts up to 5/8-in. diameter.

We invite requests for full information concerning inserts.

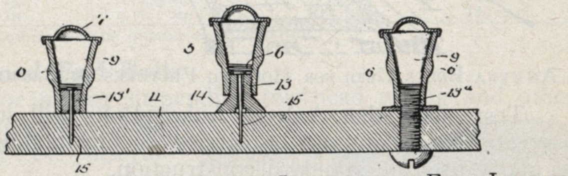


Fig. 6. Three Methods of Setting Inserts on to Form Lumber

Users of Ackerman-Johnson Products

Extensively adopted by leading contractors, manufacturers, railroads, shipyards, government departments and public utility companies.

ANKYRA MANUFACTURING CO.

Manufacturers of Expansion Bolts

149 Berkley Street, Wayne Junction
PHILADELPHIA, PA.

Product

Ankyra Ankor (Expansion) Bolts.

TRADE-MARK
(Reg. U. S. Pat. Off.)

Purpose

To provide a means of holding fixtures to *any* wall, whether hollow or solid, and so holding them that they shall never come loose.

Uses

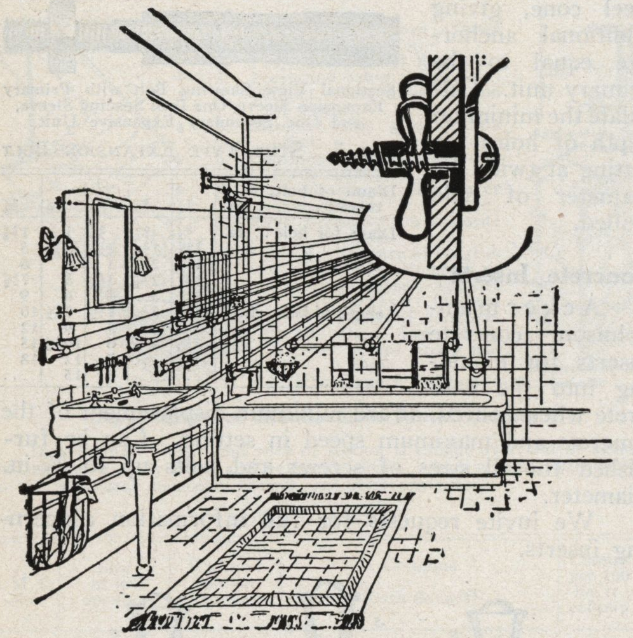
The uses for Ankyra Ankor Bolts are too many to permit of more than a description of typical cases.

Ankyra Ankor Bolts will fasten fixtures to lath and plaster, hollow tile, glazed tile, expanded metal lath, compoboard, sheet metal, brick or concrete walls—in fact they may be used in any sort of wall with assurance that the fixture will "stay put," and yet that it may be removed and replaced at will, if alterations or renewals are necessary.

The illustrations show some uses; but a booklet giving detailed information will be mailed on request.

Other Advantages

Unlike wooden or lead plugs which are prone to loosen quickly because they dry out or are so soft that the threads wear out rapidly, Ankyra Ankor Bolts remain in the wall—rivet themselves in it—and, being made of steel, last indefinitely.



Ankyra Bolts Used for Holding Fixtures in Bathroom

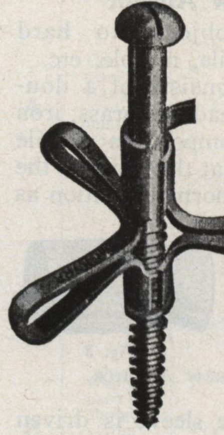
Tests show that Ankyra Ankor Bolts will support a greater load than can be carried on any hollow wall regularly used on standard construction.

(1) The Ankyra sleeve is a self-riveting wing nut.

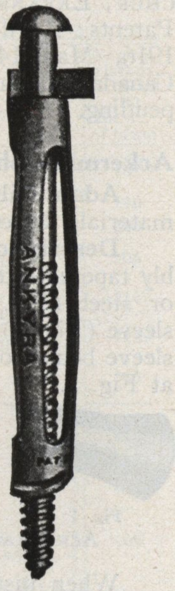
(2) Ankyras can be installed so quickly that the labor and time saved is an exceedingly important factor. Contractors and plumbers have reported that they saved as much as 90% over ordinary methods.

(3) Ankyras obviate the necessity of sounding for studding or making previous provision during construction for the location of fixtures.

(4) The fixture may be removed by taking out screw, but Ankyra nut will not drop down inside of wall as it is an integral part of sleeve or bolt.



Ankyra Bolt Expanded
Note wood screw
Self-riveting; self-adjusting



Ankyra Bolt with
Wood Screw
Before Expansion

(5) Ordinary standard wood screws are used with Ankyra and may be selected to match other hardware.

(6) Ankyras will hold until the wall itself gives way.

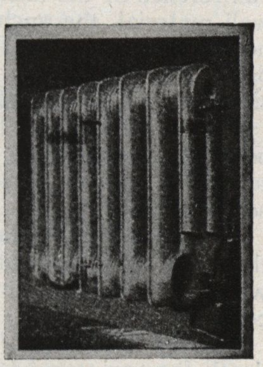
(7) The alignment of grounds can be controlled regardless of irregularities in the face of the wall.

(8) Ankyras are easily and quickly installed.

(9) The solution to many especially vexing problems.

Fastening wall radiators to nearly any kind of wall, but more particularly to tile walls, is usually a ticklish proposition. Ankyras hold the radiator hooks firmly to any kind of wall and are easy to install, as well as permanent.

Bathroom fixtures—especially in public places—break loose with annoying and expensive frequency. The remedy lies in Ankyras which not only hold permanently, but can be used without fear of cracking or breaking the tile.



Wall Radiator
Placed on Tile
Wall

References

Hundreds of thousands Ankyra Ankor Bolts have been used in many of the largest and best known buildings in this country and Canada. Among them are:

The Woolworth, Metropolitan, Equitable and Widener Buildings; Massachusetts Institute of Technology; the Ritz-Carlton, Bellevue-Stratford and Marlborough-Blenheim Hotels; Detroit Free Library.

KOHLER DIE & SPECIALTY CO.

Concrete Inserts and Metal Specialties

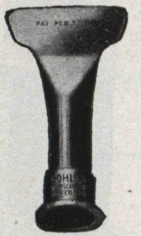
DEKALB, ILL.

Products

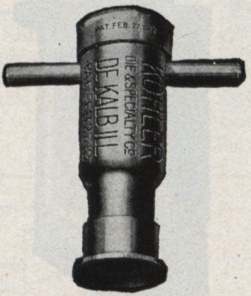
Kohler Threaded Concrete Inserts: Pressed Steel and Cast; Collings Slotted or Adjustable Concrete Inserts; Flattened End Bolts.

Kohler Threaded Concrete Inserts

Advantages—The easiest and quickest inserts on the market to set in the forms. No nails or pins required for their use. Adapted for use with either wood or steel forms.



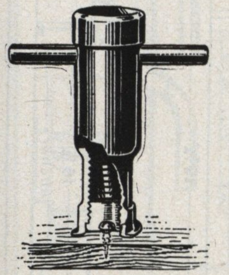
Pressed Steel Insert
Construction of ⅜- and ½-in. sizes


PAT. FEB. 27 1912
KOHLER DIE & SPECIALTY CO.
DE KALB ILL.

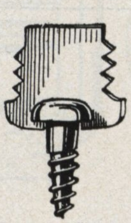
Insert Without Screw
Construction of ⅝- and ¾-in. sizes

The screw point, shown clearly in the illustration below, does the work. A blow with the hammer and a couple of turns with the hand sets this screw down so that the insert is held securely in a vertical position ready for the concrete to be poured.

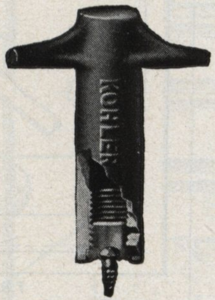
The bottoms of these inserts are squared accurately with the thread, as illustrated, so that the inserts must stand upright when the screw is firmly turned down. After the work is finished, forms are easily pulled away from the screws, which are then quickly removed, leaving the insert free for the threaded bolt.



Steel Insert in Form, with Screw Point in Place
Construction of ⅝- and ¾-in. sizes



Exact Size of Screw Point Used in ⅝-in. Insert
(Patented Feb. 27, 1912)



Cast Insert

Economy—These inserts, regularly spaced in the ceilings, floors or walls of reinforced concrete buildings mean a saving of time and heavy expense in attaching or rearranging shafting, piping or other interior equipment. A necessity in concrete construction.

Strength—Careful tests show that both the pressed steel and cast threaded inserts have an ample margin of safety over the working load of bolts to be used. At the University of Illinois the ½-in. steel inserts, constructed as shown in the small illustration in upper left-hand corner of page, supported an average load on five tests of 6070 lbs. Similar tests of ⅝-in. cast inserts showed a supporting strength of 9600 lbs.

How Shipped—The threaded inserts, both pressed steel and cast, are furnished regularly with the screw points as illustrated. These are put in place at the factory so that the insert as shipped is ready for use.

We also furnish the cast inserts with a wider flange at base and lugs for nailing to forms. The same list prices apply but the discount is greater, making this type of insert lower in cost than the regular line shown in cut.

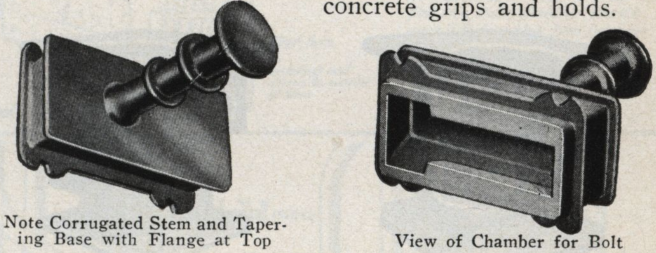
SIZES, WEIGHTS AND PRICES, KOHLER INSERTS

Size bolt	Height	Weight per 100	List price
	Pressed Steel Threaded Inserts		
⅜ in.	2½ in.	8 lbs.	10c each
½ in.	3 in.	13½ lbs.	13c each
⅝ in.	3¼ in.	42 lbs.	17c each
¾ in.	3½ in.	50 lbs.	20c each
	Cast Threaded Inserts		
⅜ in.	2⅜ in.	23 lbs.	13c each
½ in.	3¼ in.	45 lbs.	15c each
⅝ in.	3½ in.	75 lbs.	19c each
¾ in.	3⅝ in.	85 lbs.	22c each
⅞ in.	3¾ in.	110 lbs.	28c each

List prices are subject to discount which will be quoted on application.

Collings Adjustable or Slotted Insert

Made with a corrugated stem that extends up into the compression area of the concrete, the correct place to hang the load. The tapering, ribbed base is so shaped that it gives the greatest possible supporting strength to the concrete member. In this insert the fullest strength of the concrete is developed. The greater the load on the Collings insert the tighter the concrete grips and holds.



Note Corrugated Stem and Tapering Base with Flange at Top

View of Chamber for Bolt

Collings Insert
(Patented March 26, 1918)

The Collings insert, when placed in the form, is never in the way of the reinforcing bars, and is so designed that the concrete flows freely around it. There are no sharp corners and with the Collings insert less surface is exposed in the ceiling after the forms are removed than with any other—a very desirable feature.

The Collings insert may be used upside down in the floor for anchoring chairs, machinery or permanent fixtures but its greater field is in the ceiling for supporting shaft hangers, sprinkler systems, electric lights, piping and overhead rails. Either the head of the bolt or the nut may be used in the socket.

Information regarding our new loop type for use in the thin slab furnished on request.

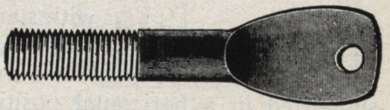
SIZES, WEIGHTS AND PRICES, COLLINGS INSERTS

Size bolt	Height	Weight per 100	List price
½ in.	3½ in.	76 lbs.	16c each
⅝ in.	3¾ in.	81 lbs.	19c each
¾ in.	4 in.	100 lbs.	23c each

Discounts will be quoted on application.

Flattened End Bolts

For use in suspending overhead piping and other work supported from concrete inserts. Flattened, punched and threaded one end as illustrated.



Flattened End Bolt

SIZES AND PRICES, FLATTENED END BOLTS

No. 3—Machine thread, bolt ends, ⅜ x 2 in	8c each
No. 4—Machine thread, bolt ends, ½ x 2½ in	10c each
No. 5—Machine thread, bolt ends, ⅝ x 2½ in	12c each

List prices are subject to discount, which will be quoted on application.

STERLING FOUNDRY CO.

Manufacturers of Concrete Inserts and Coal Chutes

STERLING, ILL.

Products

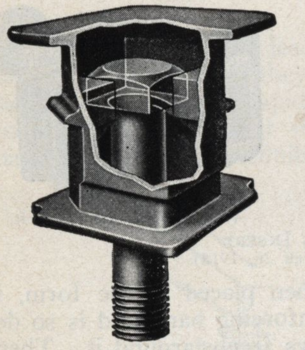
The "Best" Concrete Insert (patent pending); the "Star" Coal Chute.

Also Foundation Gratings; Flue Thimbles; Back Pressure and Bell Trap Floor Drains; Cistern and Coal-hole Covers and Rings; Patent Glass Door Fuel Chutes; Stud Sockets; Clean-out Doors; Foot Scrapers; Chimney Caps; Revolving Chimney Tops; Adjustable Ventilators.

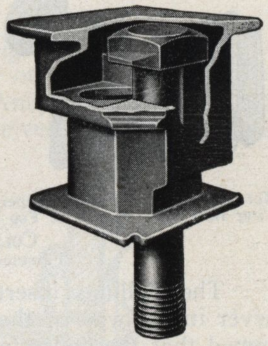
"Best" Concrete Insert

Very simple and compact in design; strong and rigid in construction. To place bolt in insert, bolt is held in vertical position with the threads down. In an instant with a slight hook motion, the head of the bolt is seated in a wrench-shaped socket. (See illustration below.)

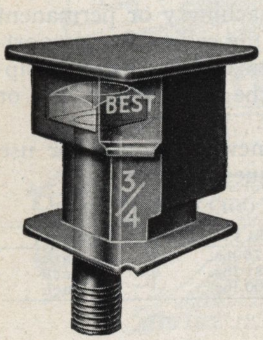
The design of the "Best" insert permits the head of the bolt to be placed in the insert while the nut is on the outside where any loosening can be seen at once and the slack taken up. The form and depth of the seat socket hold the bolt securely, while the nut is being put on or taken off.



Insert with Wall Broken Showing Bolt Seated in Socket



Insert with Wall Broken Showing Bolt Ready to Be Pushed Over Into the Seat Socket



Insert Showing Bolt in Position

With this insert there is no possibility of a nut becoming rusted-in, or the thread being "jimmed," so that the bolt can not be taken out of the insert.

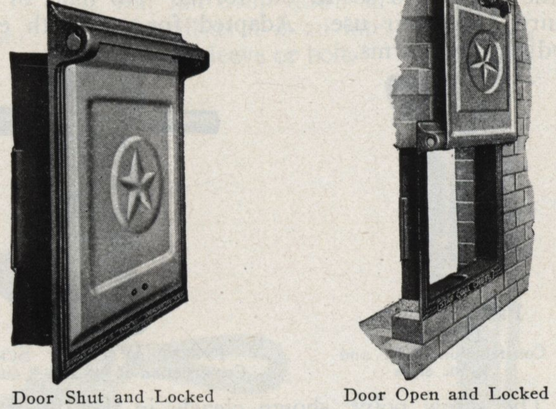
The insert is designed to take the full strength of the bolt. If desired, an eye bolt with standard head on the other end can be used for raising a load by means of a differential block. If used in a vertical wall, the bolt is supported in a horizontal position by the side of the insert.

Sizes—Made for ⅜, ½, ⅝, ¾, and ⅞-in. bolts with standard square heads.

Write for further information and prices.

"Star" Coal Chute

Simple, durable, attractive, built into the foundation, costing little more than an ordinary window.



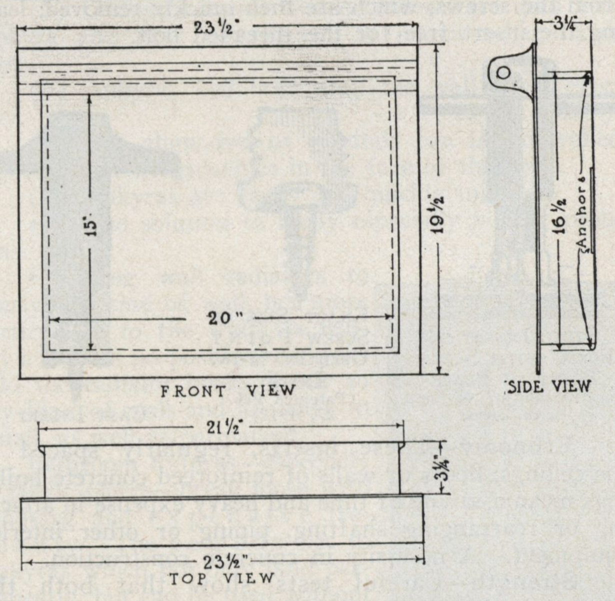
Door Shut and Locked

Door Open and Locked

"Star" Coal Chute

Frame—Cast iron, 24x19x5 in., clear opening 15x20 in. Lugs on all four sides for anchoring into masonry.

Watertight housing at top, gives absolute protection to door against weather. Hole in masonry should be 22x17 in., with bottom sloped to form concrete sill.



DETAILS OF "STAR" COAL CHUTE

Door—Stamped sheet steel galvanized, No. 18 gauge, embossed and rigid. Hinges concealed and protected by housing. Locks automatically open or shut. Extension chain may be used, making it unnecessary to climb over coal.

Painted 1 coat of gray iron filler. Packed singly in fiber carton for shipping by freight, express or parcel post. Total weight, 40 lb.

RAIL TRUING INSERT COMPANY

606 Marquette Building, DETROIT, MICH.

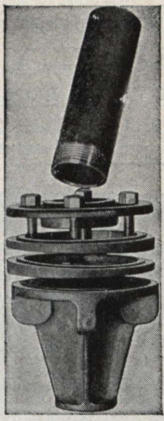
Products

RAIL-TRU INSERTS for anchoring pipe rails to concrete.

Rail-Tru Inserts

Concrete forms usually warp and the concrete surface to which the pipe railing is to be fastened is therefore out of true. By the use of Rail-Tru beveled adjustment rings, one or both of which may be turned, the pipe railing is immediately caused to assume a true vertical position. This adjustment may be made after the railing is in place.

No cutting of forms is necessary to set the Rail-Tru insert—*it is self-centering.* Simply locate the center point by driving a nail through the form. This nail fits into the centering hole in the face of the Rail-Tru insert, which is then "back nailed" to the form.



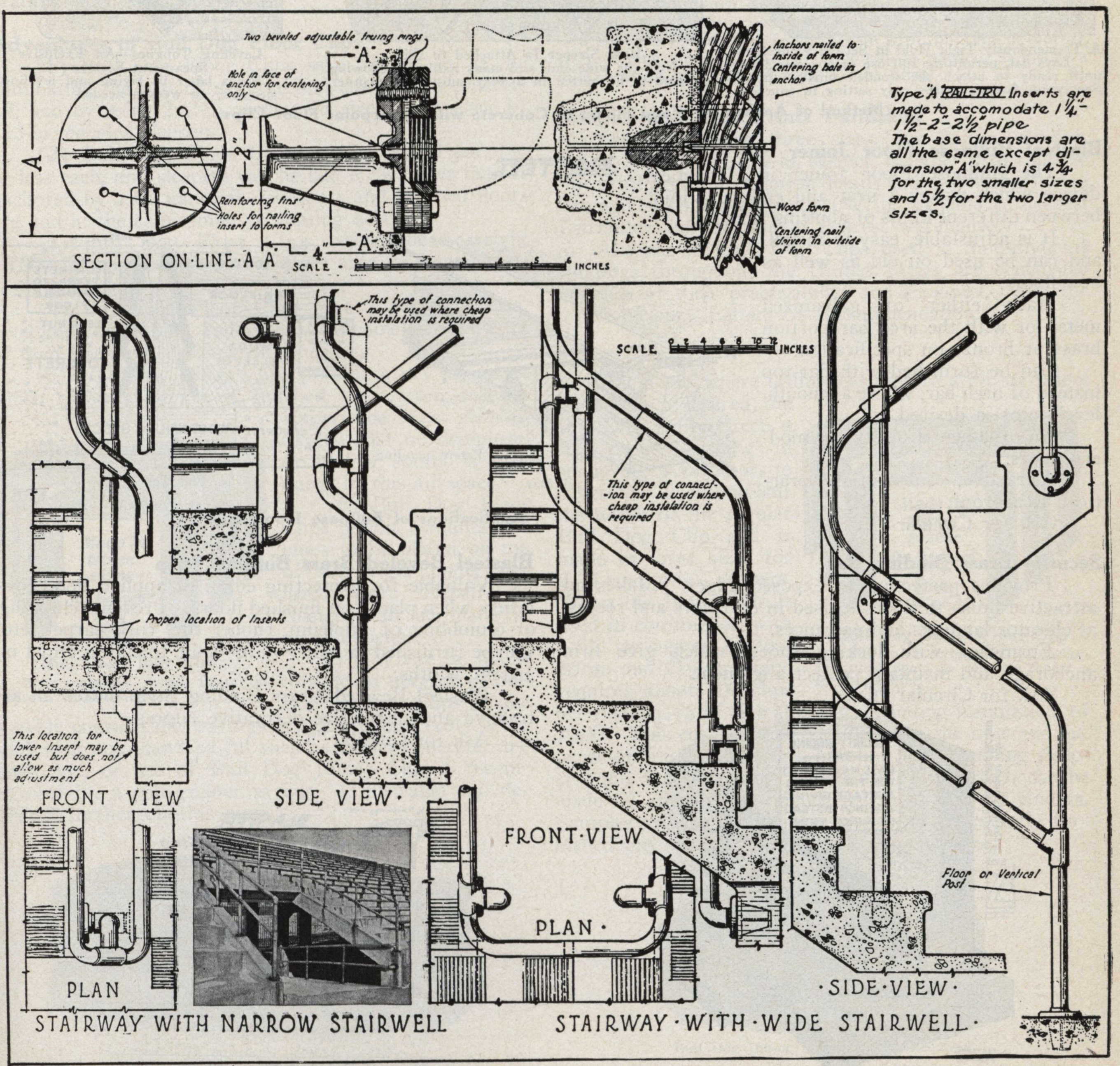
RAIL-TRU INSERT ASSEMBLY

Rail-Tru inserts do away with the need of shims which work out, expansion bolts which do not always hold the flanges securely, and pipe sleeve calking which often is only a makeshift.

Specifying Rail-Tru inserts offers the architect the only method we know of that will ensure permanently secure, rigid anchorage for pipe railings.

Specifications

Railing supports for all concrete stairs, ramps, platforms, area and retaining walls or wherever shown, shall be anchored with Rail-Tru adjustable self-centering inserts, as manufactured by the RAIL TRUING INSERT COMPANY, Detroit, Mich. All inserts shall have approved means of adjusting to true vertical position. The use of split pipe, sleeves and other devices requiring expansion bolts, shims or calking for anchoring and plumbing rail supports shall not be permitted.


Two beveled adjustable truing rings
"A"
Hole in face of anchor for centering only
A
2"
Reinforcing fins
Holes for nailing insert to forms
4"
SECTION ON·LINE·A A
SCALE - 0 1 2 3 4 5 6 INCHES
Anchors nailed to inside of form Centering hole in anchor
Wood form
Centering nail driven in outside of form
Type "A" RAIL-TRU Inserts are made to accomodate 1¼"-1½"-2"-2½" pipe
The base dimensions are all the same except dimension "A" which is 4¾ for the two smaller sizes and 5½ for the two larger sizes.
This type of connection may be used where cheap instalation is required
SCALE 0 2 4 6 8 10 12 INCHES
This type of connection may be used where cheap instalation is required
Proper location of Inserts
This location for lower Insert may be used but does not allow as much adjustment
Floor or Vertical Post
FRONT VIEW
SIDE VIEW·
PLAN
STAIRWAY WITH NARROW STAIRWELL
FRONT·VIEW
PLAN·
·SIDE·VIEW·
STAIRWAY·WITH·WIDE STAIRWELL·

Detail of Rail-Tru Insert, Adjustable and Self-Centering (Patent Pending)

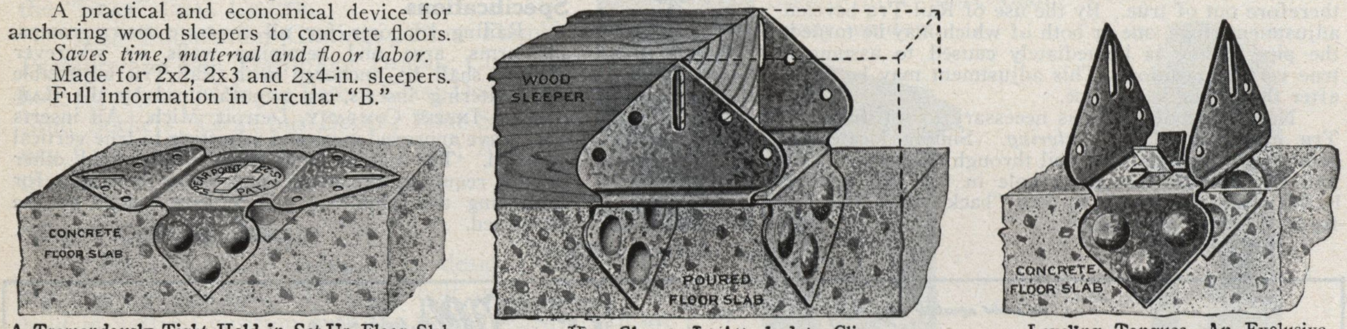
THE BLASTEEL MANUFACTURING COMPANY

Concrete Floor Devices

GENERAL OFFICE
KANSAS CITY, MO.
REPRESENTATIVES IN PRINCIPAL CITIES
For Metalback Cushion Cork Tack Strips, see page 2829

Spearpoint Floor Clips

A practical and economical device for anchoring wood sleepers to concrete floors. *Saves time, material and floor labor.* Made for 2x2, 2x3 and 2x4-in. sleepers. Full information in Circular "B."


CONCRETE
FLOOR SLAB
WOOD
SLEEPER
POURED
FLOOR SLAB
CONCRETE
FLOOR SLAB

A Tremendously Tight Hold in Set-Up Floor Slab
Lays flat, permitting full use of concrete floor until ready to attach the wooden finished floor. Spearpoint feature makes easy setting in concrete

How Sleeper Is Attached to Clip
Note the wide ends and many nailholes, allowing sleepers to be butted in a very substantial manner

Leveling Tongues—An Exclusive Spearpoint Feature
Saves labor in laying and leveling sleepers; no wedges needed

Method of Anchoring Wood Floors to Concrete with Spearpoint Floor Clips

Blasteel Bullnose Floor Joiner

The Bullnose Floor Joiner is a practical device which makes a neat and enduring joint between different kinds of abutting floors.

It is adjustable, easy to install, and can be used on old as well as new floors.

Made either of galvanized metal, or with the arch bar portion brass or bronze on specification.

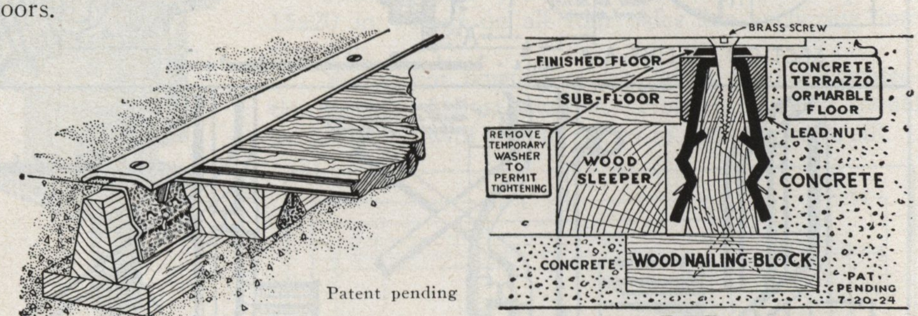
Can be furnished with flat top instead of arch bar, where a smooth, level joint is desired.

An ornamental utility for modern floors.

Attractive, substantial, practical, wearproof.

Ask for Circular "F."

BLASTEEL


Patent pending
BRASS SCREW
FINISHED FLOOR
SUB-FLOOR
REMOVE TEMPORARY WASHER TO PERMIT TIGHTENING
WOOD SLEEPER
CONCRETE TERRAZZO OR MARBLE FLOOR
LEAD NUT
CONCRETE
CONCRETE
WOOD NAILING BLOCK
PAT. PENDING 7-20-24

Arch Bar

Flat Top

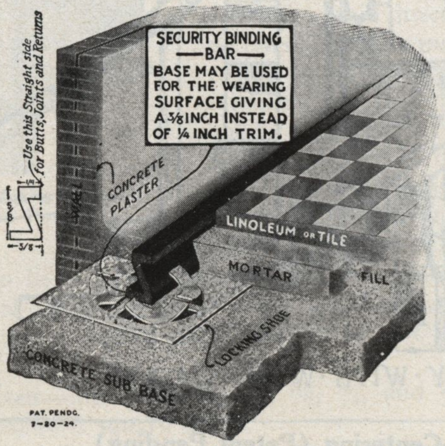
Applications of Bullnose Floor Joiner

Security Brass Binding Bar

Provides protection to exposed edges. Makes an attractive finish to floors. Used in corridors and rooms, at elevator landings and entrances.

Furnished with locking shoes, which give firm anchorage and maintain perfect alignment.

Ask for Circular "C."


SECURITY BINDING —BAR— BASE MAY BE USED FOR THE WEARING SURFACE GIVING A 3/8 INCH INSTEAD OF 1/4 INCH TRIM.
Use this Straight side for Butts, Joints and Returns
3/8
CONCRETE PLASTER
LINOLEUM OR TILE
MORTAR
FILL
LOCKING SHOE
CONCRETE SUB BASE
PAT. PENDG. 7-20-24.

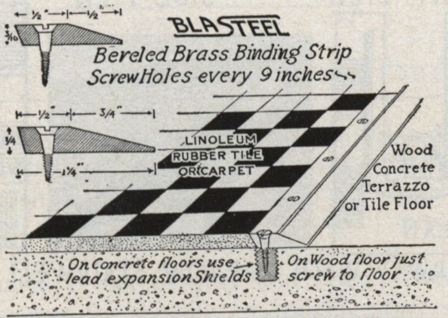
Security Binding Bar

Blasteel Beveled Brass Binding Strip

Valuable for protecting edges of applied floor coverings when placed on finished floors. Prevents chipping or crumbling of linoleum, rubber tile, cork carpet, etc. Can be furnished in either $\frac{3}{16}$ or $\frac{1}{4}$-in. thickness and 1 or $1\frac{1}{4}$-in. widths.

Blasteel Beveled Brass Binding Strip makes an attractive and distinctive decorative edging.

Ask for Circular "C."


BLASTEEL
Beveled Brass Binding Strip
Screw Holes every 9 inches
1/2
1/2
3/16
1/2
3/4
1/4
1 1/4
LINOLEUM
RUBBER TILE
OR CARPET
Wood
Concrete
Terrazzo
or Tile Floor
On Concrete floors use lead expansion Shields
On Wood floor just screw to floor

Blasteel Beveled Brass Binding Strip
Patent pending

THE BULL DOG FLOOR CLIP CO.

108 North First Avenue, WINTERSET, IOWA

90 BRANCH REPRESENTATIVES AND 15 CONVENIENT DISTRIBUTING PLANTS

Put the BULL-DOG on your Pay-roll

Product

BULL DOG FLOOR CLIP for anchoring Wood Floors to Concrete.

Construction Sizes

A one-piece, solidly made, galvanized steel clip which firmly anchors unbeveled sleepers to the concrete floor slab without the use of a concrete fill. Made for 2, 3 and 4-in. sleepers. (Patented, June 14, 1921. Reissue patent No. 15881, granted July 29, 1924. Process Patent 15387430 granted May 19, 1925.)

Advantages of Bull Dog Floor Clips

(1) Bull Dog Floor Clips save 5¢ per sq. ft. by eliminating the cost of material and labor for a concrete fill, and by using 2x2-in. *unbeveled* sleepers in place of 2x3-in. *beveled* sleepers.

(2) Bull Dog Floor Clips can be placed for ½¢ or less each, and sleepers can be laid 50% faster than if anchored by a fill material. Sleepers and finished floors are laid at the same time, preventing delays.

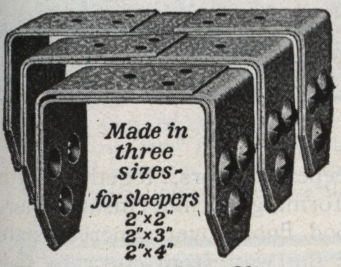
(3) Bull Dog Floor Clips reduce dead weight 18,000 lb. per 1000 sq. ft. of floor area, and save reinforcing steel in proportion.

(4) Bull Dog Floor Clips give a perfectly firm, level floor. Solid bed and anchor overcome all possibility of floor buckling, doming, or squeaking.

(5) Bull Dog Floor Clips provide a dry air space which prevents strips or finished floor from rotting. Experience has demonstrated that no drumhead or hollow sound is produced by this air space.

(6) Bull Dog Floor Clips permit conduits and pipes to be placed on top of slab right under finished floor. Repairs or changes can be made at small expense.

(7) Where a fill is considered necessary, Bull Dog Floor Clips make possible considerable savings in construction costs when used with any standard fill such as cinder-concrete, dry sand, etc., or use of Bull Dog Junior Clip is recommended for a still greater saving. (Illustrated and described further on this page.)



Bull Dog Floor Clip

For anchoring wood floors to concrete without a fill

Specifications

All concrete slabs to be covered with wood floors anchored with Bull Dog Floor Clips are to be screeded, and leveled with a straightedge. Before concrete has attained its initial set, embed Bull Dog Floor Clips of No. 20-gauge galvanized metal in concrete, so top cross bar is flush with surface of concrete. Follow manufacturer's directions for using a straightedge and guide to secure, automatically without measuring, perfect alignment of clips, spaced 16 in. on centers each way.

When floor is ready to be laid, raise top tabs of Bull Dog Floor Clips perpendicular to floor, insert $1\frac{13}{16}$x$1\frac{5}{8}$-in. floor strips between tabs, level up and nail in place with one or more nails in each side of clip through punched holes. All joints to come within clips; each end of strip to be nailed solid. Low spots under strips to be slushed-in with thin cement mortar, after driving wedge at side of floor clip as needed, to insure a solid bearing the entire length of the strip.

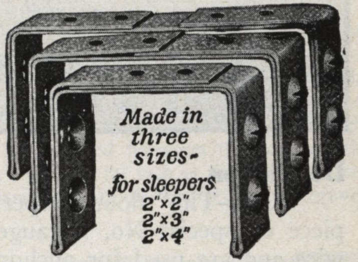
Samples and Blue Prints Furnished

Samples of the three sizes, for 2x2-in. sleeper, 2x3-in. sleeper and 2x4-in. sleeper, together with full size blue print giving installation details and descriptive literature will be sent on request. (Write for name of nearest distributor and location of nearest warehouse.)

Millions of Bull Dog Clips used in thousands of buildings throughout the United States are conclusive evidence of their practicability and economy. Ask for copies of our "Letters of Recommendation."

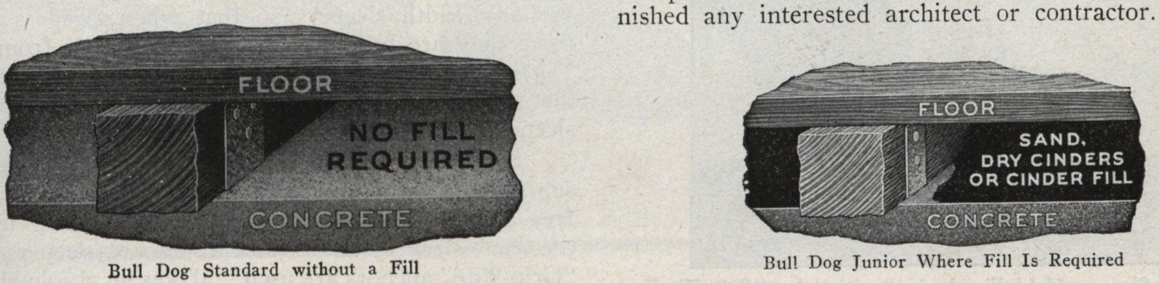
Bull Dog Junior

For floors where ordinances require a fill, or where a light clip is desired, the Bull Dog Junior effects a still greater saving in anchoring wood floors to concrete. It is one-half the width of the regular Bull Dog Clip and is made in three sizes for 2, 3 and 4-in. sleepers. When the Junior Clip is used in conjunction with a fill, we suggest spacing 16 in. and 2½ ft. which requires about 300 clips per 1000 sq. ft. of slab at a cost, including installation, of $9.00. This cost is more than offset in the time and expense of bracing the strips, beveling and shimming sleepers, and a large saving in expense of fill which can be made of any cheap, inexpensive mix, sand or cinders. Samples of each of the three sizes will be promptly furnished any interested architect or contractor.



Bull Dog Junior Floor Clip

For more economically anchoring wood floors to concrete where a fill is required



Bull Dog Standard without a Fill

Bull Dog Junior Where Fill Is Required

Bull Dog Floor Clip Installations

Users of Bull Dog Floor Clips are protected by reissue Patent 15881, July 29, 1924; Process Patent 15387430, May 19, 1925

MUNSON MANUFACTURING COMPANY

Manufacturers of "Grip-Tite" Anchors and Concrete Sub-Sleeper Forming Machines

WINTERSET, IOWA

REPRESENTED IN ALL PRINCIPAL CITIES

Products

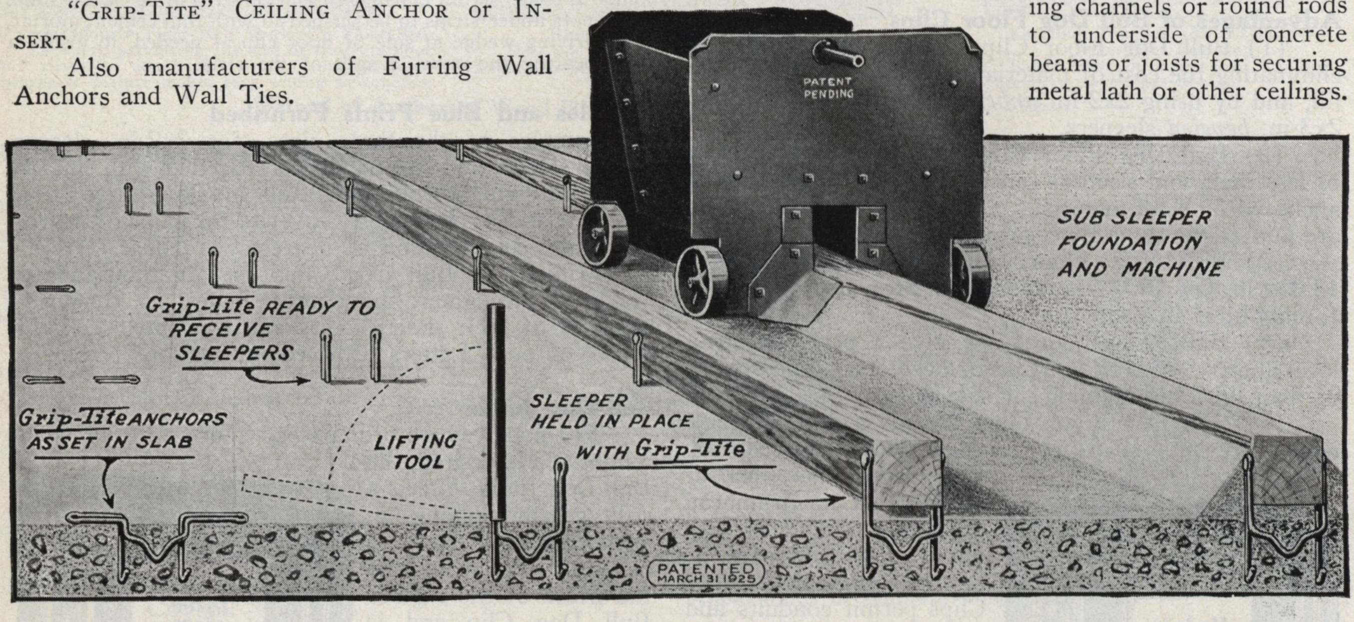
"Grip-Tite" Floor Sleeper Anchors (Patented March 31, 1925).

"Grip-Tite" Sub-Sleeper Forming Machine (Patent Pending).

"Grip-Tite" Ceiling Anchor or Insert.

Also manufacturers of Furring Wall Anchors and Wall Ties.

Grip-Tite
TRADE-MARK

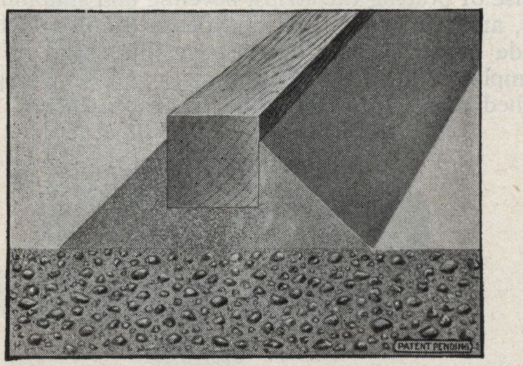

PATENT PENDING
SUB SLEEPER FOUNDATION AND MACHINE
Grip-Tite READY TO RECEIVE SLEEPERS
Grip-Tite ANCHORS AS SET IN SLAB
LIFTING TOOL
SLEEPER HELD IN PLACE WITH Grip-Tite
PATENTED MARCH 31 1925

Description

"Grip-Tite" floor sleeper anchors are made of one piece of special No. 9 gauge, dead soft, galvannealed wire and are used for anchoring wood sleepers to concrete slab.

"Grip-Tite" concrete sub-sleeper forming machine is made of sheet metal and is furnished where "Grip-Tite" floor sleeper anchors are used, for use in forming up concrete sub-sleepers underneath and about wood floor sleepers after they are placed.

"Grip-Tite ceiling anchors or inserts are made of special No. 9 gauge, dead soft, galvannealed wire and are used for anchoring channels or round rods to underside of concrete beams or joists for securing metal lath or other ceilings.



Floor Sleeper Held Firmly in Position by "Grip-Tite" Floor Anchors and Concrete Sub-sleeper

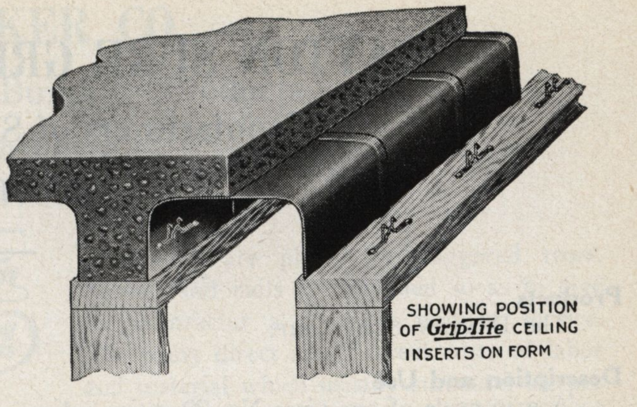
Advantages

"Grip-Tite" floor sleeper anchors, together with the use of our sub-sleeper forming machine, insure a perfect job of anchoring wood floors over concrete slab. A solid bond is made all the way from concrete slab to finished flooring.

Floor Anchors—"Grip-Tite" anchors are easily placed and lined up. They are also easily raised into position for receiving sleepers. These anchors provide all the advantages of any floor anchor or floor clip made for this purpose, in addition to their added strength and lasting qualities and other advantages. They are made for any width sleepers so that when sleepers are in place they are held firmly with the bottom from ½ to 1½ in. off the slab (according to the unevenness of the slab), thus leaving an open space underneath the sleepers for forming concrete sub-sleepers.

Sub-sleeper Forming Machine—The "Grip-Tite" sub-sleeper forming machine works over the top and free of the sleepers and is used for forming up concrete sub-sleepers underneath and about sleepers where "Grip-Tite" anchors are used. Makes an absolutely solid sleeper base the full length of each sleeper, thus prevent-

Continued on next page



SHOWING POSITION OF *Grip-Tite* CEILING INSERTS ON FORM

ing all possibility of drum sound and squeaky floors. This is a foolproof method of anchoring wood floors to concrete slab and makes a more satisfactory job than by the use of beveled sleepers with any kind of a fill. The operation of the machine is very simple and any workman can use it with perfect satisfaction. The work is done better and ten times more rapidly than is possible with a trowel. The machine is very easily operated and weighs less than one hundred pounds.

No wedges are needed in using this machine except temporary wedges for leveling up sleepers. No wedges are left underneath the sleepers when the job is finished.

Ceiling Anchors or Inserts—"Grip-Tite" ceiling anchors or inserts are nailed on top of the forms between the domes or pans before slab is poured and when forms are removed anchor loops are straightened down into position for receiving angle iron or round rods to which metal lath or other ceilings are to be secured. The operating is simple. The anchorage is positive.

Satisfaction

"Grip-Tite" anchors are in general use all over the United States and are giving entire satisfaction. The cost of "Grip-Tite" anchors, together with the use of "Grip-Tite" sub-sleeper forming machine is not as great as some of the other floor anchors or floor clips alone. We will be glad to refer you to architects, contractors or buildings near you that have used "Grip-Tites" or furnish any desired information.

Note: Contractors may secure name of nearest representative by writing us.

Specifications for Floor Sleeper Anchors and Sub-sleeper Forming Machine

Sleeper Anchors—Wherever wood floor occurs over concrete slab, screed off slab to level surface with straightedge, and before initial set occurs set "Grip-Tite" floor sleeper anchors, as made by the MUNSON MANUFACTURING COMPANY of Winterset, Iowa, for sleepers 2, 3 or 4-in. (state which) wide. Anchors to extend 2 in. into slab. Place anchors in straight alignment 12 or 16 in. (state which) on centers both ways.

At time of placing sleepers raise side loops of anchors with "Grip-Tite" lifting tool, place wood sleepers between same with all joints at anchors, bend loops of anchors in opposite directions at joints to receive sleeper ends, level tops of sleepers so that at least ½ in. is left between bottom of sleepers and top of slab and nail solid with one nail in each anchor loop.

After nailing, remove all wedges and other obstructions from underneath and about sleepers, and with the use of "Grip-Tite" concrete sub-sleeper forming machine form concrete sub-sleepers underneath and about all sleepers, using a mixture of 1 part cement to 3 parts sand, according to manufacturer's instructions.

Note: Where ordinance demands a fill, space anchors 36 in. apart along sleepers, use concrete sub-sleeper forming machine and fill space between sleepers with clean dry sand to within ⅓ in. of top of sleepers; or, pour a 1:5:8 mix of concrete and level off to within ⅓ in. of top of sleepers or use headers.

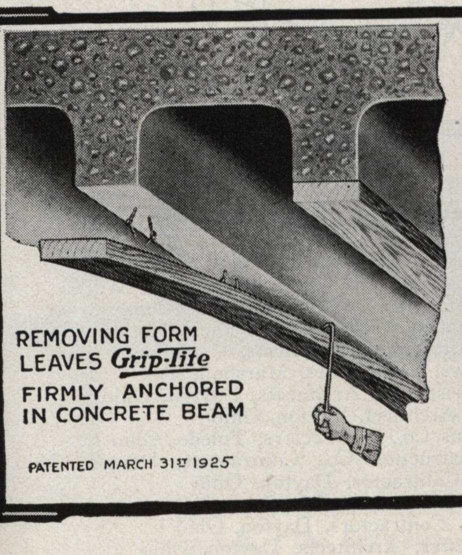
SHORT SPECIFICATION

Sleeper Anchors—Furnish in place according to manufacturer's directions "Grip-Tite" sleeper anchors, as manufactured by MUNSON MANUFACTURING COMPANY of Winterset, Iowa, for attaching all sleepers where wood floors occur over concrete, grouting sleepers in place with "Grip-Tite" concrete sub-sleeper forming machine.

Specifications for "Grip-Tite" Ceiling Anchors or Inserts

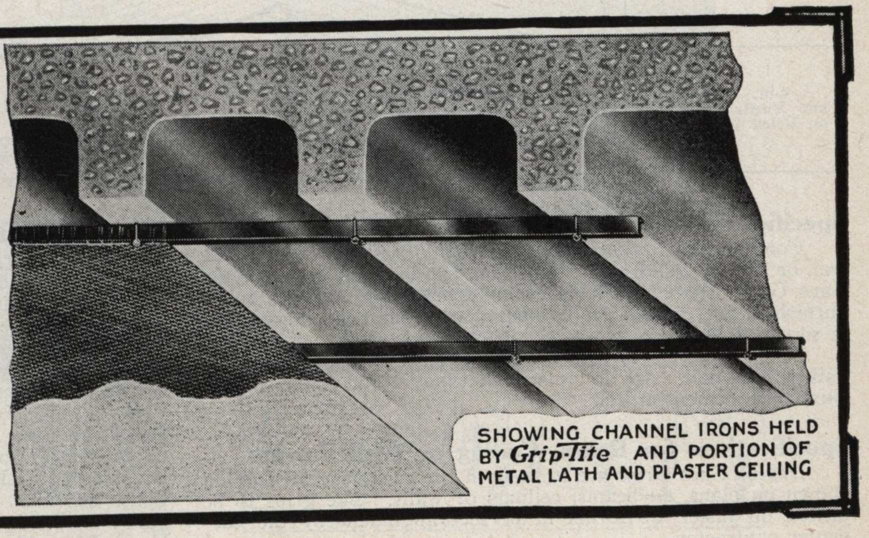
Metal Lath Ceiling—Wherever plastered ceilings occur on underside of concrete joists, and metal pan construction, wire lath is to be supported, as follows:

"Grip-Tite" ceiling inserts are to be nailed to the forms supporting the bottom of concrete joists, inserts to be spaced 12 in. on centers. On removal of forms, the ears of the "Grip-Tite" inserts are to be bent down to a vertical position, and 1-in. cold rolled steel furring channels running at right angles to the joists are to be inserted between the ears of the anchors and wired to same. The metal lath is then to be wired 6 in. on centers to the furring channels, using No. 18 gauge galvanized wire.



REMOVING FORM LEAVES *Grip-Tite* FIRMLY ANCHORED IN CONCRETE BEAM

PATENTED MARCH 31ST 1925



SHOWING CHANNEL IRONS HELD BY *Grip-Tite* AND PORTION OF METAL LATH AND PLASTER CEILING

DAYTON SURE GRIP & SHORE COMPANY

Manufacturers of Sleeper and Furring Clips

DAYTON, OHIO

Products

The DAYTON SURE GRIP.

Description and Use

A grip made of one piece No. 20 gauge galvanized Armco rust resisting metal, which securely anchors unbeveled sleepers with or without the use of a concrete fill; also for wood furring on concrete ceilings, beams, girders, columns, piers and sidewalls and on brick surfaces. Made in 2, 3 and 4-in. sizes.

Patented April 8, 1924.

Advantages

Dayton Sure Grips are made of galvanized Armco iron and insure a better installation of sleepers at less cost.

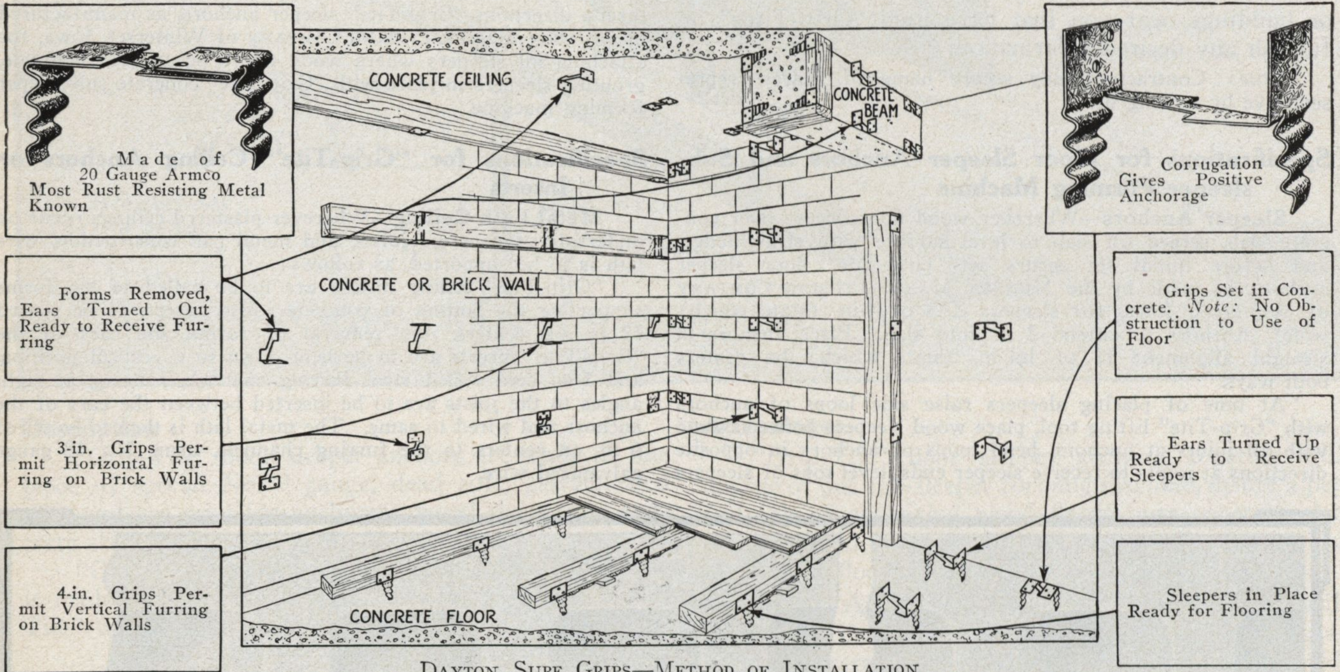
Dayton Sure Grips are formed with corrugated legs which provide positive anchorage and will not tear away once the concrete or masonry has set and will allow the hauling of heavy loads over the floor without injury to the grip or its anchorage.

Dayton Sure Grips guarantee solid wood floors, eliminating squeaking and bulging.

Dayton Sure Grips permit the elimination of sleeper fill, effecting a saving in dead load of from 15 to 20 pounds per square foot.

Dayton Sure Grips by elimination of dead load create a saving in reinforcing steel and concrete.

Dayton Sure Grips have a varied and universal usage. They may be used on brick or concrete walls, beams, columns or slabs.


Made of 20 Gauge Armco Most Rust Resisting Metal Known
Forms Removed, Ears Turned Out Ready to Receive Furring
3-in. Grips Permit Horizontal Furring on Brick Walls
4-in. Grips Permit Vertical Furring on Brick Walls
CONCRETE CEILING
CONCRETE BEAM
CONCRETE OR BRICK WALL
CONCRETE FLOOR
Corrugation Gives Positive Anchorage
Grips Set in Concrete. Note: No Obstruction to Use of Floor
Ears Turned Up Ready to Receive Sleepers
Sleepers in Place Ready for Flooring

DAYTON SURE GRIPS—METHOD OF INSTALLATION

Specifications for Wood Floors Over Concrete

Concrete slabs covered with wood floors to have either 2x2, 2x3, or 2x4-in. wood sleepers anchored to concrete with Dayton Sure Grips, spaced 16 in. on centers each way. Grips to be furnished and placed by carpenter contractor after concrete is screeded level.

When concrete is set raise ears, place sleeper, level and nail with 6d nail. Any low places that may occur under sleeper, slush with cement mortar.

Specifications for Beam, Ceiling or Wall Furring

Dayton Sure Grips are to be used for anchoring all furring shown on plans, on beams, ceilings or walls. The grips to be tacked on inside of forms in perfect alignment by the carpenter contractor.

After concrete is set and forms removed raise ears and place furring to receive wood paneling or lath.

List of Satisfied Users of Dayton Sure Grips

Fisher & Fisher, Architects, Denver, Colo.
Arvid Olson, General Contractor, Denver, Colo.
Meanor and Handloser, Architects, Huntington, W. Va.
Howard W. Germann, Architect, Dayton, Ohio
Schenck & Williams, Architects, Dayton, Ohio
Carmichael & Millspaugh, Architects, Columbus, Ohio
Quisle & Andrews, Contractors, Marshall, Tex.
Pretzinger & Musselman, Architects, Dayton, Ohio
W. M. McCluer, Architect, Dayton, Ohio
A. Bentley & Sons Co., Contractors, Toledo, Ohio
Danis-Hunt Construction Co., Contractors, Dayton, Ohio
Chas. Schnable, Contractor, Dayton, Ohio
H. P. McGrath, Contractor, Columbus, Ohio
H. R. Blagg Co., Contractors, Dayton, Ohio
Gebhart & Schaeffer, Architects, Dayton, Ohio
Edward Honnert, Contractor, Cincinnati, Ohio

THE WHITTAKER CO.

Manufacturers of Metal Building Products

1559-1567 Church Street
DETROIT, MICH.

Products

- ANCORJACKS.
- SLEEPER JACKS.
- SLEEPER TIES.
- BUCK ANCHORS.
- HANGER BOLTS.
- GARAGE DOOR BOLTS.

General

Practical experience in building construction is the foundation of Artisan products.

Good manufacturing practice and correct design have made our building products a pleasing reality.

Each article typifies the utmost in simplicity and practicability, thus effecting that economy of labor and excellency of construction which is so greatly desired.

Samples and literature may be obtained from representatives or by mail, if desired.

A large stock is carried at all times. Efficient shipping facilities enable us to give the prompt service which is so essential to building construction.

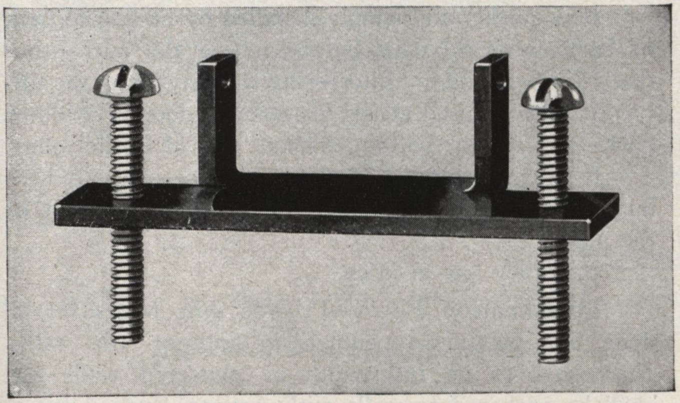
Ancorjacks

The Ancorjack was recently developed by us to supply the needs for a simple, inexpensive and practical device to anchor floor sleepers and which at the same time would provide means in itself to quickly and accurately level the sleepers. Architects and contractors everywhere report unusual satisfaction.

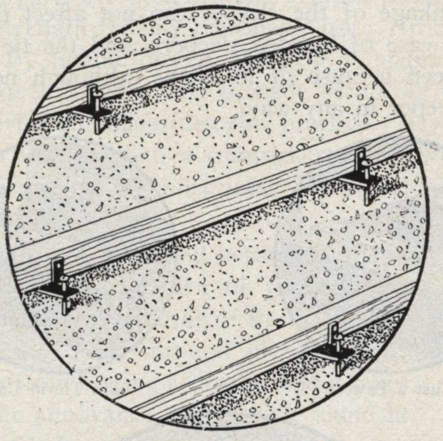
Vertical arms of the strap nail to the sides of the sleepers; two screws, one on each side, perform the leveling and hold the sleepers without chance of displacement until the permanent fill is placed. Thus is a slow, annoying and generally unsatisfactory bit of work done well with the least trouble and expense.

Ancorjacks are spaced 30 in. apart—for best results they are placed in staggered rows. Screws and nails are supplied so as to give the contractor a complete unit of service. The many direct and indirect costs of labor and material which usually surround sleeper construction are reduced to a few direct items by this ingenious device.

Estimate 42 for sleepers 12 in. on centers and 32 for sleepers 16 in. on centers for each 100 sq. ft. of floor where areas are not cut up.



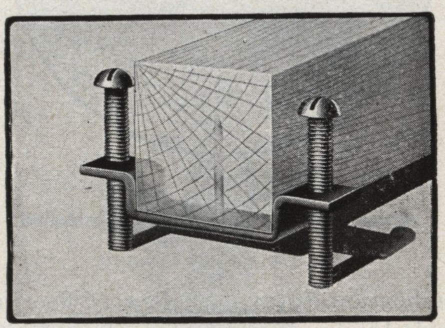
Artisan Ancorjack, "The Engineering Way"
Patented December 16, 1924



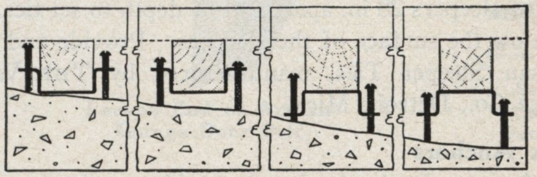
Application of Artisan Ancorjack Ready for Fill

Sleeper Jacks

Artisan Sleeper Jacks provide a mechanical means for making floor sleepers level. Construction is speeded up and after-adjustments, due to displacement of sleepers when set on wood blocks and shims, are eliminated. Extra blocking where slab is too low is done away with



Artisan Sleeper Jack in Place
Patented Dec. 16, 1924



Application of Sleeper Jack for the Various Levels of Floor Space

Continued on next page

because the sleeper jack will adjust itself to every reasonable requirement in height. The small nail which is needed to hold the jacks in place during handling of sleepers is furnished with the device.

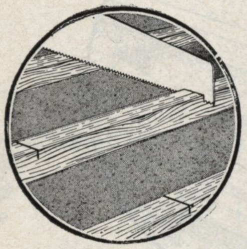
Attach bracket to sleeper according to the height required, as shown in the preceding diagram; insert screws and level by turning screws.

Specification Form—Where wood floors are specified, lay 1¾-in. square sleepers, set to the desired level on Artisan Sleeper Jacks, manufactured by The Whittaker Co., Detroit, Mich., placed 36 in. on centers in staggered rows.

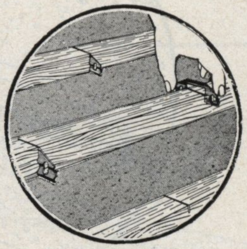
Sleeper Ties

The Artisan Sleeper Tie, as the name implies, ties the sleeper permanently in place by means of wings projecting from the sides of the sleepers and anchored to the fill.

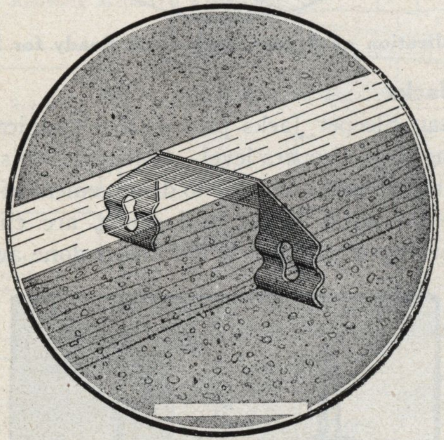
Shrinkage of the sleeper can not affect the bond, as in the case of beveled sleepers, and the tie can not be displaced because of its shape, although not nailed to the sleeper in any way.



Just a Sawcut



Set Tie in Cut



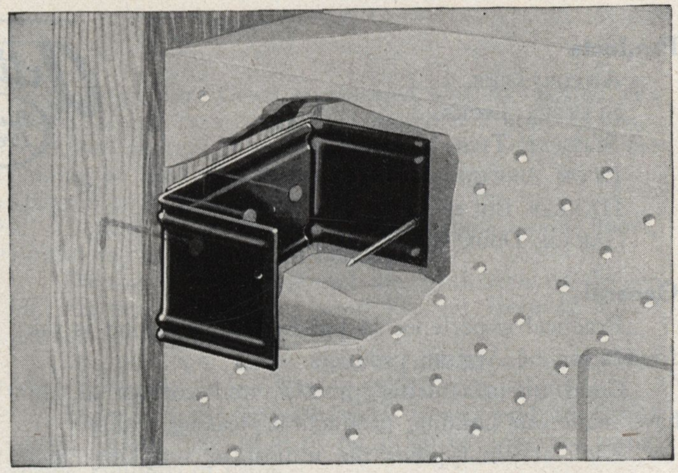
Patented March 24, 1924
Sleeper Tie in Place
Artisan Sleeper Ties Quickly Installed
No nails required
Use 1⅝ in. square sleepers

Specification Form—Where wood floors are specified, provide 1⅝-in. square sleepers placed 12 in. on centers. Level and secure firmly in place. Make sawcuts in tops of sleepers 28 in. apart and of depth to set ties flush or below the surface of the sleepers. Provide and place Artisan Sleeper Ties, manufactured by The Whittaker Co., Detroit, Mich.

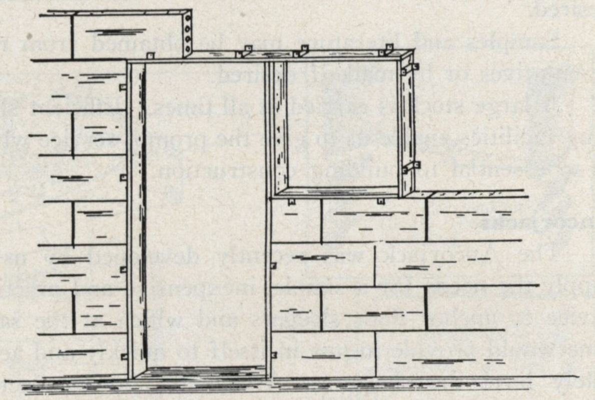
Buck Anchors

Artisan Buck Anchors provide a simple, satisfactory and standard method of anchoring bucks to building tile, and are widely endorsed by discriminating architects and builders.

The Artisan Buck Anchor consists of two duplicate parts which form a "U" to receive the tile. It is nailed to the back of the buck with 8d nails and clinched on the inside of the buck.



Artisan Buck Anchor, "The Common Standard"
Patented March 11, 1924



Application of Artisan Buck Anchors

Features—It laps the wall, independent of mortar joints and plaster, putting the lateral strain upon the whole wall unit instead of mortar joints or plaster.

It is light weight and yet strong and stiff—because of its design.

It is adapted to all size tile—simply extend the plates.

It is quickly and simply installed by nailing to back of bucks with 8d nails before setting the buck—thus ready for wall and not interfering with laying up the tile.

It may be used at any place on a door or window buck—top, side or bottom, without regard to tile joints.

It prevents plaster cracking, because it secures the buck tightly to the wall and functions independent of the plaster.

It is very low in price.

Specification Form—Provide 2-in. bucks for all door and window openings in interior tile walls. Bucks are to be full width of plastered walls and shall be anchored to walls with Artisan Buck Anchors as manufactured by The Whittaker Co., Detroit,

Continued on next page

Mich., in accordance with the directions of the manufacturer.

Use 8 anchors for doors of ordinary size, placed 3 on each jamb and 2 on top.

Where directed for extra heavy doors, use 4 anchors on each jamb.

For windows, use anchors 24 in. apart with one near each corner.

Nail all anchors into face of gypsum tile and where clay tile is used, wire one anchor on each jamb.

Hanger Bolts

The Artisan Hanger Bolt takes the place of the slow and costly method of bolting a nailing strip to the side of a channel beam or channel post through holes punched in the channels. Installation consists only of tightening a nut which locks the bolt by means of a hook washer under the flange, and setting the nailing strip in the hanger.

One-third to one-half of the material required in the old method is saved, by using a 2x4 in place of 2x6, 2x8, etc., and, in addition, the excessive amount of time necessary for the old way. Punching the channel is likewise eliminated.

The length of the threaded portion of the bolt is sufficient to take care of the several size channels which are used.

Specification Form—Provide 2x4 nailing strips for all channel beams, for roofs, etc., and for all channel posts, for sheathed walls, etc., as shown and required. Secure these nailing strips to the steel every 36 in. with Artisan Hanger Bolts, manufactured by The Whittaker Co., Detroit, Mich.

Garage Door Bolts

The value of the Artisan Garage Door Bolt lies in its ability to quickly and easily lock a warped garage door. This feature is exclusive with the Artisan Bolt, and with its other desirable features has made our double action bolt a most attractive locking device for large hinged doors.

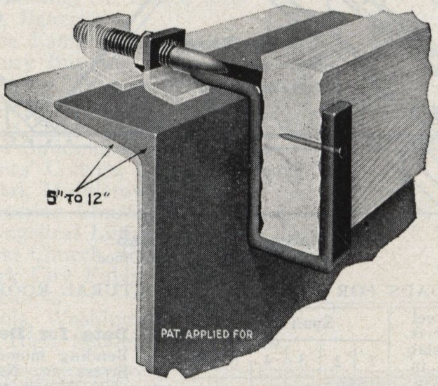
The smooth locking action of the Artisan Door Bolt is brought about by action of the beveled ends over rollers in the keeper plates; friction is eliminated and that ease of closure obtained which is so necessary to serviceable life in the bolt and in the door.

All parts are designed and manufactured to provide ample strength for any reasonable use. No castings are used. By unique design, the gear is stamped of cold rolled steel. Every part is made according to the best engineering and manufacturing practice. Assembled, the Artisan Bolt presents a compact, sturdy device without excessive weight and bulkiness. Furnished only in japan enamel finish.

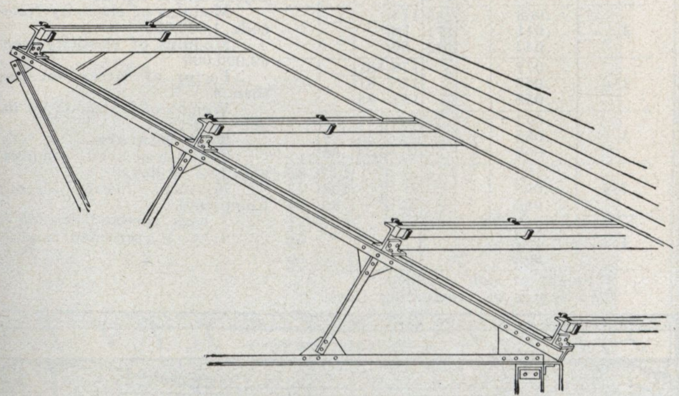
Features—Top and bottom of the door are closed easily by a quarter-turn of the handle in spite of a warped (usual) condition of the door. This feature adds life to the door, through prevention of damage from forcing a closure, and it takes away the annoyance and trouble found in ordinary bolts.

The Artisan Bolt is also suitable for any height door up to 11 ft. without special length rods; it operates with either right or left-hand action, and it is adapted to outswinging or inswinging doors.

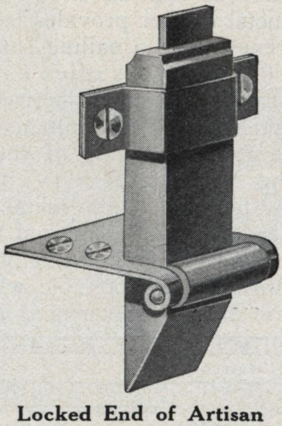
Our device is used for garages, factories, warehouses, and for many special purposes, such as window guards for hospitals, refrigerator doors, etc.



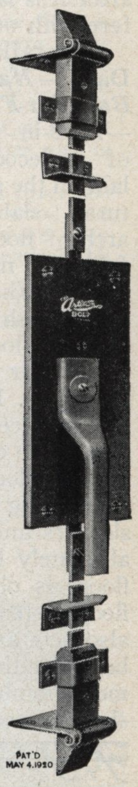
Artisan Hanger Bolt in Place



Application of Artisan Hanger Bolts



Locked End of Artisan Garage Door Bolt



Artisan Garage Door Bolt

PAUL MENDE

INCORPORATED

155-157 East 42nd Street, NEW YORK, N. Y.

Products

Mende's Nalecode, a Nailing Concrete made of indestructible minerals.

"NALECODE"
REGISTERED

Cell-o-fill, a Preservative for Wood, Concrete, Composition, Linoleum and Cork.

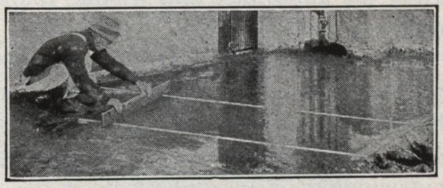
Nalecode—A Nailing Concrete

Nalecode is a compound of powdered and fibrous minerals, which, when mixed with portland cement, sand and water, makes a plastic mortar that sets and forms a tough, elastic mass filled with air cells, into which nails or screws can be driven as readily as into wood. It is made entirely of minerals, and contains no cinders, which generate destructive sulphuric acid fumes. It contains no sawdust, wood chips, vegetable matter, gypsum, lime or other chemically active matter. It will not disintegrate nor lose its nailing properties, and is absolutely verminproof. It prevents condensation, because it is a poor conductor of heat.

Nalecode weighs and costs less than concrete. It eliminates the short-lived wooden sleepers, fill and underflooring, affecting a considerable saving in cost.

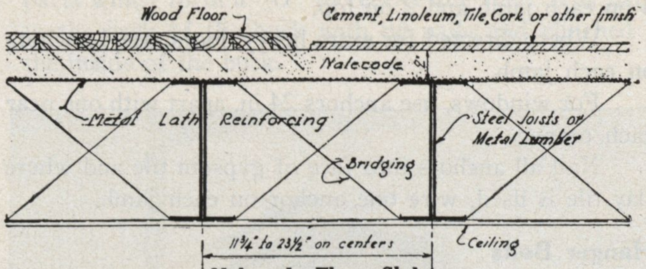
Mixing and Applying—Nalecode compound is shipped in bags, in neat form, and on the job it is mixed with portland cement, sand and water in accordance with directions furnished by the manufacturers. The method for mixing and applying Nalecode is the same as ordinary cement mortar or concrete. Nalecode is slower setting than concrete—however, in two or three days after it is laid, it can be walked upon and will not interfere with other operations in the course of construction.

Installation Data—*Nailing Base for Floors*—A 2-in. layer of Nalecode is laid on the structural slab or arch of floors to form a nailing base. Where a wood finish flooring is specified, Nalecode takes the place of underflooring, wood sleepers and cinder fill.



Nalecode Being Applied As a Nailing Base for Finish Flooring

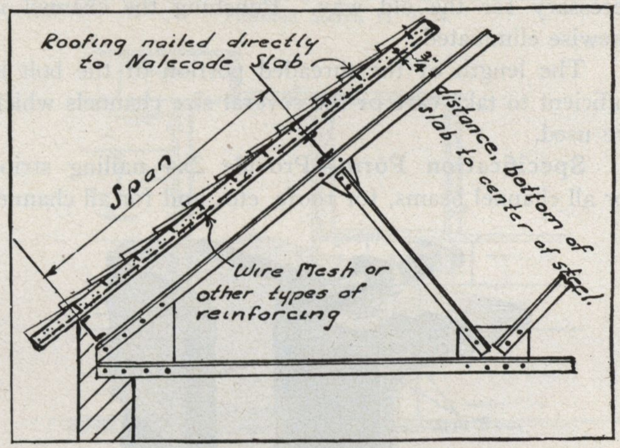
Floor Slab Over Steel Joists or Metal Lumber—A 2-in. layer of Nalecode applied directly to metal lath on steel joists or metal lumber provides both a fireproof slab of ample strength, and a nailing base for the finished floors. The difficulty that is often experienced in making a satisfactory connection between wood sleepers and metal joists is entirely eliminated, and an absolutely level surface for the nailing of the finished floors is obtained. The Nalecode Slab ties the entire floor system together by bonding to the metal lath, and also acts as a sound deadener. The finished floor may be laid either at right angles or longitudinally with the metal lumber; a circumstance not possible when wood sleepers are used, unless an underflooring is employed.



Nalecode Floor Slab

Nailing Base for Roofs—A 2-in. layer of Nalecode, on a reinforced concrete slab, book tile or other structural slab, makes a perfect and permanent base for nailing finish roofings, thus eliminating wood sleepers, fill and sheathing.

Nalecode Structural Roof Slab—A Nalecode structural slab for roofs offers great advantages. It weighs 90 lb. per cu. ft.; provides a perfect nailing base for all kinds of finish roofings; is a good insulator, preventing condensation. Roofing is nailed directly to Nalecode Structural Slab.


Roofing nailed directly to Nalecode Slab
Span
distance, bottom of slab to center of steel.
Wire Mesh or other types of reinforcing

Nalecode Roof Slab

Patented U. S. Patent Office

*SAFE LOADS FOR NALECODE STRUCTURAL ROOF SLABS

Thickness, in.†	Steel per ft. of slab, sq. in.	Span in ft.					
		1	2	3	4	5	6
1½	.049	610	152				
	.040	495	124				
	.032	400	100				
2	.068		260	115			
	.041		171	76			
	.032		132	59			
2½	.077			179	101		
	.068			155	87		
	.058			133	75		
3	.093				144	92	
	.080				123	79	
	.068				104	66	
3½	.107					123	85
	.093					108	75
	.080					93	64
4	.126						117
	.107						99
	.093						86

*Weight of slab included.
†To center of reinforcing steel.

Data for Design—

Bending moment $WL^2 \div 8$

Stress in Nalecode not over 225 lb. per sq. in.

Stress in steel not over 14,000 lb. per sq. in.

Modulus of elasticity Nalecode 1,000,000

Modulus of elasticity steel 30,000,000

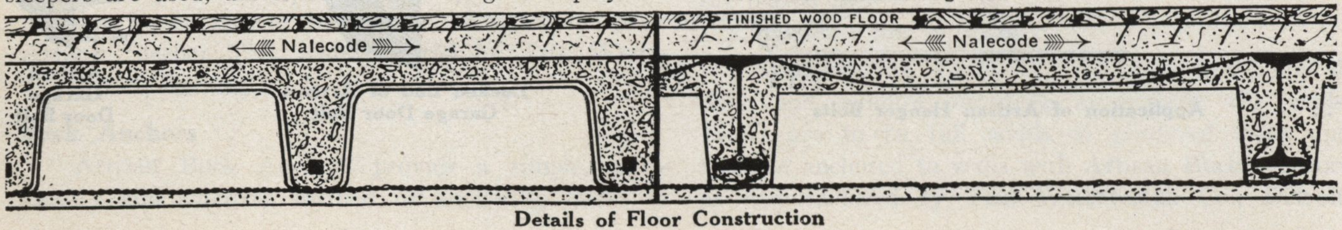
Factor of safety not less than 4

Weight of Nalecode 90 lb. per cu. ft.

Test Mixture—

Table based on compression test 28 day.

Mixture: 1 bag Nalecode Compound.
2 bags portland cement.
4 cu. ft. screened sand.



Details of Floor Construction

Continued on next page

For Reinforced Solid Partitions—A 1-in. coat of Nalecode, applied to either side of reinforced metal, makes a 2-in. solid partition, to which all trim can be readily nailed without furring strips. A Nalecode partition deadens sound and is fireproof.

Specifications—

(To be included in "Concrete Work" under "Masonry Specifications.")

Nalecode—For all the floor areas specified to be finished with wood, or other finish flooring, and for roof areas specified to be finished with tile, slate or other roofing materials, the contractor shall lay a base of Nalecode at least 2 in. thick to receive the flooring and 2 in. thick to receive the roofing. By the use of leveling strips and straightedge, this base shall be finished to a perfectly true and level surface up to the level required by the thickness of the finish flooring or roofing specified.

Nalecode floor base shall be installed immediately after the partitions are erected, and in no case shall the surface be walked over, until it has had at least two days to get its initial set. Nalecode must never be tamped.

The mixture of Nalecode must be such that it will receive and securely hold nails after it obtains its final set. It must contain no cinders, gypsum, lime, wood sawdust, wood chips or any organic or chemically active matter. It must be composed of neat Nalecode, portland cement, and sharp, screened building sand and water, mixed, installed and finished in strict accordance with the instructions of the inventors and manufacturers, PAUL MENDE, INC., 155 East Forty-second Street, New York, N. Y. The nailing compound shall be furnished in bags bearing the name of the material and name and address of the manufacturers. The sand must be screened through ¼-in. mesh. No gravel shall be used, as this would interfere with the proper penetration of the nails.

(To be included in "Floor Work" under "Carpentry Specifications.")

All wood floors are to be securely nailed to the Nalecode base specified in the Masonry Specifications, using the same size, style, thickness and quantity of nails as usual.

References—

Cluett, Peabody & Co., Inc., Troy, N. Y.
Westinghouse Lamp Co., Indianapolis, Ind.
Rice Stix Building, St. Louis, Mo.
Ward Bros., Bakeries
Westinghouse Lamp Co., Bloomfield, N. J.
U. S. Treasury Building
Torpedo Station, Newport, R. I.
Brooklyn State Hospital, Creedmoor, L. I., N. Y.
Massachusetts State House, Boston, Mass.
State Capitol Building, Olympia, Wash.
State Teachers' College, Cape Girardeau, Mo.
State Hospital, Middletown, Conn.
First Presbyterian Church, Utica, N. Y.
German Evangelical Lutheran Church, New York, N. Y.
North Baptist Church, Port Chester, N. Y.
70 New York City Public Schools
Parochial Schools
Public Schools, Washington, D. C.
Immaculate High School, Chicago, Ill.
High School, Tucson, Ariz.
Arsenal, Fifth Avenue and 65th Street, New York, N. Y.
Public School, Fargo, N. D.
Park-Lexington Building, New York, N. Y.
Atlantic Building, Philadelphia, Pa.
Office Building, 8 W. 40th Street, New York, N. Y.
Apartment House, Madison Avenue and 84th Street, New York, N. Y.

"Cell-O-Fill"—A Wood Preservative

Uses—Cell-O-Fill is used to prolong the life of wood. It is used on all varieties of wood, either old or new, in exterior or interior locations and in all climates, with equally good results. The use of this preservative greatly hardens the fibers of wood, thereby increasing its wear resisting properties; by preventing the absorption of moisture it eliminates the primary cause of all decay and insures wood against warping. Certain oils used in its composition render the wood inedible, and therefore immune from attack by fungi and destructive worms and insects.

Cell-O-Fill is also used as a preservative for concrete, composition, linoleum and cork.

Description—Cell-O-Fill is a combination of oils, gums and resins. When applied, the basic or preserving oil is carried into all the cells of the wood where it oxidizes or solidifies, thereby permanently filling the wood and preventing the absorption of moisture. The toxic oils are also retained in the wood by this process of oxidation. The penetrating power of this preservative is so great that one application will completely penetrate and fill the entire thickness of ⅞-in. flooring. Dipping and pressure treatments are never necessary unless complete impregnation of large timbers is desired.

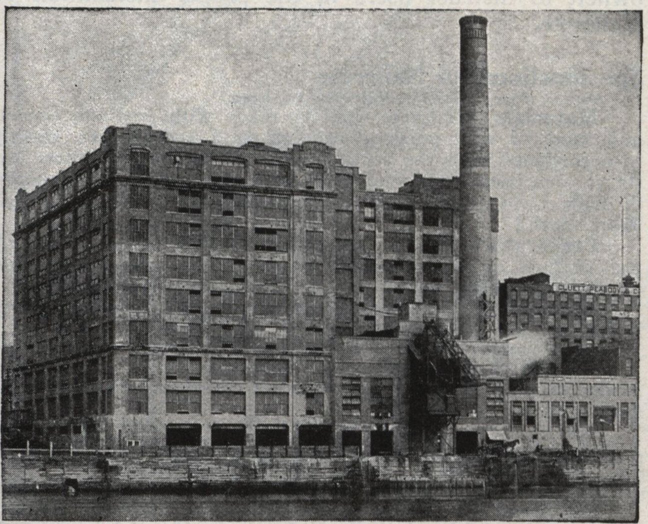
By completely filling the entire thickness of the wood with oil, the fibers are greatly toughened and bound more closely together; the surface becomes resilient instead of hard and brittle; splintering and warping can not occur, and absorption of moisture is reduced to the minimum.

One application of this material will double the life of a wood floor.

Finish—Cell-O-Fill is applied to the wood when in place with an ordinary brush. Apply freely to soft woods and more economically to hard woods. In the case of floors, all traffic should be kept off for twenty-four hours to allow the material time to penetrate. Wipe off residue, if any, and the floor is ready for use. Floors may be washed down with warm water and a non-acid soap powder about three days after application and a semigloss will be obtained. Cell-O-Fill in itself, through constant wear, will produce a superior finish. Can be stained and makes a perfect base for paint or varnish. Cell-O-Fill will not injure the eyes, skin or clothing of the user and is not combustible.

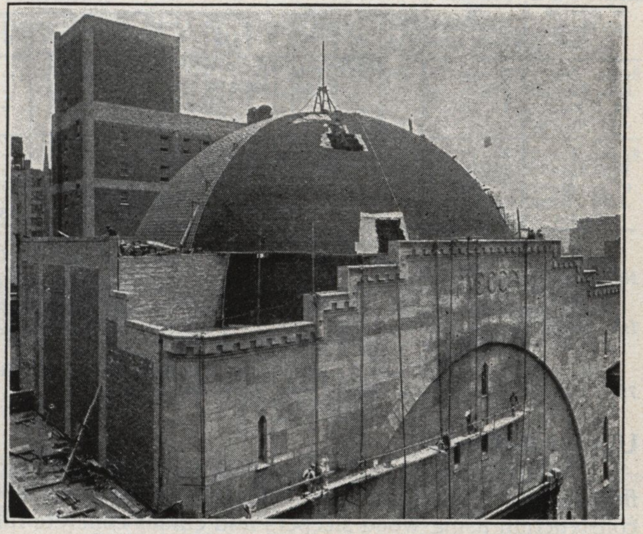
Covering Capacity—One gallon Cell-O-Fill will cover 600 sq. ft. of new oak, maple or similar close grained wood and 400 sq. ft. of new pine, fir or similar woods of more open grain. Covering capacity on old wood is governed entirely by its porosity.

Shipping—Cell-O-Fill is manufactured in New York and is shipped in 1 and 5-gal. cans and in 50 and 100-gal. steel drums. Prices on application.



Cluett, Peabody & Co., Inc., Troy, N. Y.

WESTINGHOUSE, CHURCH, KERR & CO., Engineers and Contractors



Dome of Mecca Temple, New York, N. Y.

H. P. KNOWLES, Architect, CLINTON & RUSSELL, Supervising Architects

THE NAILCRETE CORPORATION

Manufacturer of the Original Nailing Concrete

105 West 40th Street, NEW YORK, N. Y.

Product

NAILCRETE (Nailing Concrete). Patented—name registered.

NAILCRETE
PATENTED · NAME REG.

Nailcrete (Nailing Concrete)

Nailcrete is a cementitious, fibrous, *all-mineral* fireproof compound, containing no animal or vegetable matter, no acids, alkalis or any substance injurious to metals, wood or other construction materials coming in contact with it.

Nailcrete is regularly supplied in burlap bags containing in each case the correct quantity for the mix used. It is to be mixed on the job with portland cement, screened sand and clean water, and screeded smooth and level. Complete instructions accompany each shipment.

Origin

Nailcrete has been in successful commercial use for more than 14 years. It was developed after extended laboratory research and tests conducted by Grosvenor Atterbury, F.A.I. A., collaborating with the Russell Sage Foundation in connection with their economic construction developments. The patents are the property of THE NAILCRETE CORPORATION.

Advantageous Qualities and Physical Properties

Nailcrete is absolutely fireproof and verminproof; will not shrink, swell, or rot; is unaffected by dampness, a poor conductor of heat and an effective sound-deadener.

Nailcrete has the same compressive strength as 1-3-6 cinder concrete and is 25% lighter (Nailcrete weighs 80 to 90 lb. per cu. ft.) thereby saving steel in building design. Its nailing properties are unsurpassed, as Nailcrete holds nails better than pine.

Coefficient of expansion, also setting and drying periods are substantially the same as those of cinder concrete. Nailcrete calls for the same precautions against freezing, quick drying, etc., as are necessary with ordinary concrete.

NAILCRETE SLABS—SAFE LOADS IN LB. PER SQ. FT.

Gross sectional area of steel in sq. in. per ft. slab	Thickness of Nailcrete above steel	Span in feet									
		1½	2	2½	3	3½	4	4½	5	5½	6
⅜-in. Hy-Rib, Ribplex or equal, .061 sq. in.	2 in.	480	312	176	122	....	....	....	....	....	....
	2½ in.	....	....	232	161	118	91	....	....	....	....
	3 in.	....	....	....	....	144	110	87	70	....	....
¾-in. Hy-Rib, Ribplex or equal, .1407 sq. in.	2 in.	....	....	....	158	114	87	....	....	....	....
	2½ in.	....	....	....	230	171	130	102	....	....	....
	3 in.	....	....	....	....	233	177	139	113	....	....
	3½ in.	....	....	....	....	....	228	180	146	121	....
	4 in.	....	....	....	....	....	....	238	193	159	134

Note: Above table based on F. S. and R. S. Nailcrete (sand mixture).

25% additional load can be added to above for F. C. and R. C. Nailcrete (cinder mixture).

Nailcrete weight 84 lb. cu. ft. or 7 lb. per in., 1 ft. square.

Table based on WL/10. For WL/8 (or simple span), deduct 20% from above.

Brace self-centering lath to support wet Nailcrete.

Safe loads on spans above 6 ft. furnished on request.

Total live and dead load on tile roofs: 2-ft. slab, 66 lb.; 2½-ft., 70 lb.; 3-ft., 74 lb.; 3½-ft., 78 lb.; 4-ft., 82 lb. per sq. ft.

Uses of Nailcrete

Nailcrete is used without sleepers and without underflooring or sheathing, and is more durable than the ordinary construction using wood sleepers and cinder-concrete fill. It is especially suitable as a fireproof nailing base for floors, roof coverings of various kinds, etc., as follows:

(a) Subfloors—Nailcrete is laid 2 in. thick (weight 13.4 to 15 lb. per sq. ft.) as a subfloor on top of the structural slab or floor arch, to which is directly applied wood flooring, cork tile, linoleum, etc., giving the floor greater resiliency and making it more impervious to sound. (See specifications.)

(b) Reinforced Floor Slabs for Metal Lumber—Nailcrete is used 2 in. thick on top of metal lath placed on metal lumber floor beams. In this case the Nailcrete acts as fireproof floor slab and as a nailing base for the finished wood floor. (See specifications and table of safe loads.)

(c) Roof Coating—A fireproof, rotproof nailing base 1½ to 2 in. thick directly on top of roof slab to receive tile, slate, copper, etc. (See specifications.)

(d) Reinforced Roof Slab—A poured-in-place construction on rafters of steel, metal lumber or wood. (See specifications and table of safe loads.)

(e) Mortar—For laying up terra cotta partitions and furring blocks, Nailcrete affords perfect nailing in every joint without wood plugs, etc. (See specifications.)

(f) Plaster, Interior and Exterior—For interior plastering especially for fireproofing, sound-insulating and as a nailing base for wood paneling, etc. For exterior plastering of penthouse walls, skylight curbs, etc., to receive the sheet metal covering. (See specifications.)

Cost

Nailcrete installed costs less than good wood sleeper and cinder-concrete fill construction. (Estimates furnished by all contractors.)

Service and Supervision

Nailcrete is made after different formulae giving varying degrees of strength, tenacity and fineness, as may be required for its different uses. Where practicable, THE NAILCRETE CORPORATION will send a representative to the job, without expense to the owner, to instruct users in the proper installation of Nailcrete.

Specifications for Nailcrete

Note: Always specify Nailcrete by name.

Materials—Nailcrete shall be made with portland cement and sand, or with portland cement, sand and cinders, strictly in accordance with the specifications of the manufacturer for its various uses. All sand shall be sharp, clean, and screened through ¼-in. mesh. [All cinders shall be screened through ⅜-in. mesh.]

Preparatory Work—Immediately before Nailcrete is laid, the surface to be covered shall be swept broom-clean and properly sprinkled.

Setting—All Nailcrete shall be allowed to set properly before being walked on.

Note: Ordinarily 2 days in summer and 3 days in winter.

Nailcrete Subfloors—On structural floor construction Nailcrete shall be laid 2 in. thick and screeded, and, if necessary, troweled, to a level.

Note: For high class work specify (under the heading of Carpentry) 1 layer of tarred paper (not less than 2-ply) additional deadening felt, if desired, and the finish wood flooring to be used. *Under-flooring* is *never* necessary.

The floor is to be laid after the Nailcrete has thoroughly dried out.

On Metal Lumber Beams—Cover the floors of rooms, etc. (specify which ones are to be covered), with metal lath secured directly to the beams (not over 2 ft. apart) and on top of the metal lath put a bed of Nailcrete not less than 2 in. thick

Continued on next page

at the thinnest point, screeded level to receive the finish flooring specified under Carpentry.

Note: In high class work specify paper as above. Even in work of the highest class underflooring is unnecessary.

Nailcrete Roof Coating—The structural roof construction shall be covered with 1½ in. of Nailcrete.

Note: If slate are thicker than ¾ in., consult THE NAILCRETE CORPORATION as to the thickness of the Nailcrete.

Reinforced Sloping Roof Slab—Cover the steel rafters with self-centering or ribbed lath (as per specifications of the manufacturers) and on top of the lath apply Nailcrete .... in. thick. (See table.)

Mortar—Nailcrete mortar shall be used for laying up the terra cotta block walls and partitions in ....

Plaster—*Interior*—Plaster interior walls to an approved finish, true and even as per instructions of THE NAILCRETE CORPORATION.

Exterior—Plaster the exterior of penthouse walls, skylight curbs, etc., with Nailcrete plaster 1 in. thick in 2 coats, scratch and finish, troweled (or floated) true and even.

Note: If the Nailcrete plaster is to be applied to gypsum blocks, the blocks should be covered first with proper bonding material, and the Nailcrete is then to be applied while the bonding material is still tacky.

References

35% of all orders have been re-orders.

Grosvenor Atterbury, New York—Executive offices, Sage Foundation Homes Co., Forest Hills, N. Y., floors; 40 dwellings built in last 10 years for Sage Foundation Homes Co., Forest Hills, floors and roofs; Forest Hills Inn, roof; Fabbri Residence, New York, floors; New York City Hall, roof and cupola; Bloomingdale Hospital, Occupation Building and Gymnasium, floors; Metropolitan Museum, New York, floors and roofs

Warren & Wetmore, New York—Plaza Hotel Addition, Fifth Avenue, New York, roof slab

U. S. Government Architect—U. S. Treasury Building, Washington, D. C., roof coating

Board of Education, New York; William H. Gompert and C. B. J. Snyder, Architects—25 schools, floors and roof

Cass Gilbert, New York—Annex to U. S. Treasury Building, Washington, D. C., floors and roof; Interzone Building, New York, floors and roof; Chamber of Commerce Building, Washington, D. C., roof

Bertram Goodhue, New York—Aldred Residence, Glen Cove, N. Y., roof; St. Bartholomew's Church, New York, roof slabs

Lockwood, Greene Co., New York—Cotton mill, Reading, Pa., floors

Carrere & Hastings, New York—Standard Oil Bldg., New York, roofs; Laboratory, Johns Hopkins Univ., Baltimore, Md.

Howells and Stokes, New York—John Sherman Hoyt Residence, New York, floors

Rathbone Debuys, New Orleans, La.—Federal Reserve Bank, New Orleans, La., floors

John Highland Brooks, Washington, D. C.—Hon. Robert W. Bliss Residence, floors and roof coating

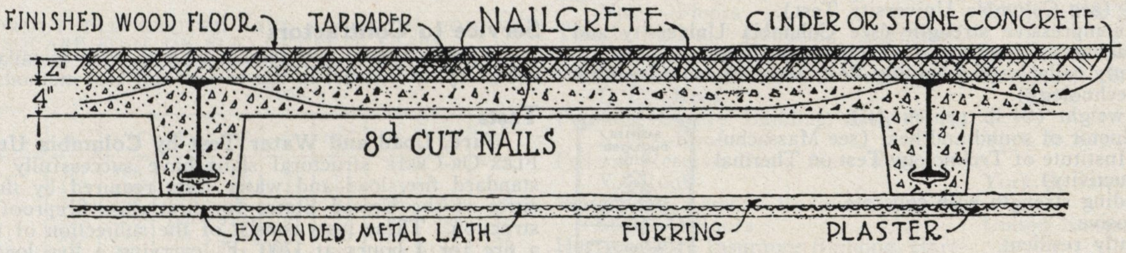
E. S. Masqueray, St. Paul, Minn.—Sioux Falls Cathedral, Sioux Falls, S. D., roof

G. L. Lockhart, Chicago, Ill.—Junior High School, Amsterdam, N. Y., floors

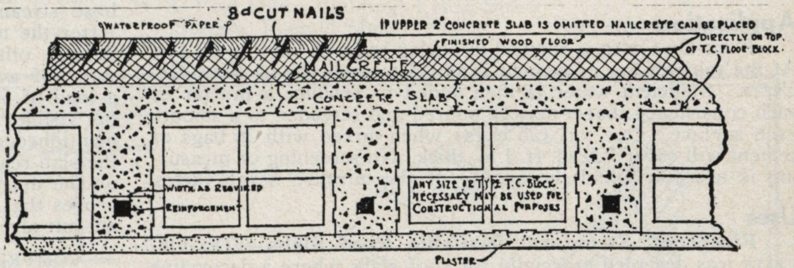
Helmle & Corbett, New York—Apartment House, Beverly Road and E. 17th St., Brooklyn, N. Y., floors

Delano & Aldrich, New York—New York Orthopaedic Hospital Addition, White Plains, N. Y., floors

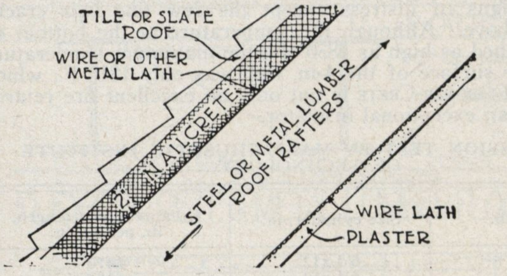
Ritcher & Eiler, Reading, Pa.—Reading Hospital, West Reading, Pa., roofs


FINISHED WOOD FLOOR
TAR PAPER
NAILCRETE
CINDER OR STONE CONCRETE
2"
4"
8d CUT NAILS
EXPANDED METAL LATH
FURRING
PLASTER

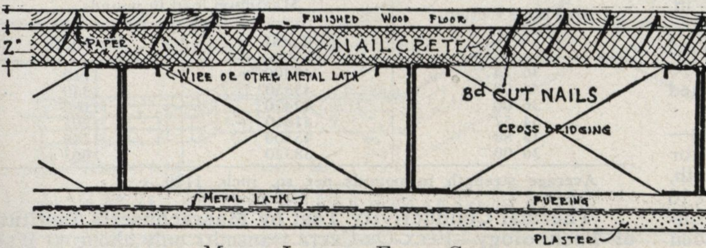
TYPICAL REINFORCED STONE OR CINDER CONCRETE FLOOR CONSTRUCTION


8d CUT NAILS
WATERPROOF PAPER
IF UPPER 2" CONCRETE SLAB IS OMITTED NAILCRETE CAN BE PLACED DIRECTLY ON TOP OF T.C. FLOOR BLOCK.
FINISHED WOOD FLOOR
NAILCRETE
2" CONCRETE SLAB
WIDTH AS REQUIRED
REINFORCEMENT
ANY SIZE OR TYPE T.C. BLOCK NECESSARY MAY BE USED FOR CONSTRUCTIONAL PURPOSES
PLASTER

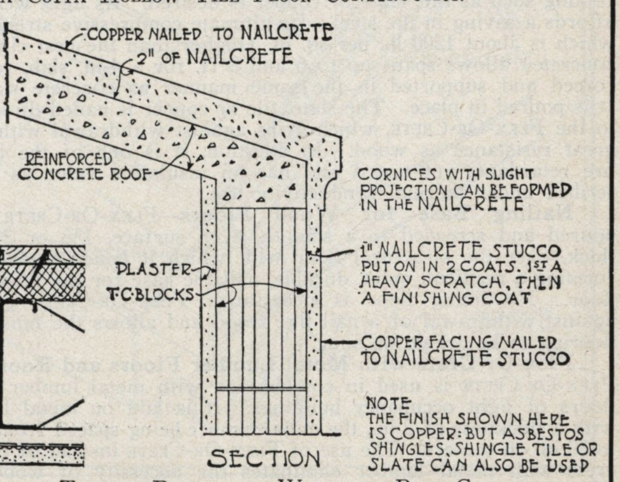
TERRA COTTA HOLLOW TILE FLOOR CONSTRUCTION


TILE OR SLATE ROOF
WIRE OR OTHER METAL LATH
2" NAILCRETE
STEEL OR METAL LUMBER ROOF RAFTERS
WIRE LATH
PLASTER

REINFORCED ROOF CONSTRUCTION


FINISHED WOOD FLOOR
2"
PAPER
NAILCRETE
WIRE OR OTHER METAL LATH
8d CUT NAILS
CROSS BRIDGING
METAL LATH
FURRING
PLASTER

METAL LUMBER FLOOR CONSTRUCTION


COPPER NAILED TO NAILCRETE
2" OF NAILCRETE
REINFORCED CONCRETE ROOF
CORNICES WITH SLIGHT PROJECTION CAN BE FORMED IN THE NAILCRETE
PLASTER
T.C. BLOCKS
1" NAILCRETE STUCCO PUT ON IN 2 COATS. 1st A HEAVY SCRATCH, THEN A FINISHING COAT
COPPER FACING NAILED TO NAILCRETE STUCCO
NOTE THE FINISH SHOWN HERE IS COPPER: BUT ASBESTOS SHINGLES, SHINGLE TILE OR SLATE CAN ALSO BE USED
SECTION

TYPICAL PENTHOUSE WALL AND ROOF CONSTRUCTION

Typical Examples of Nailcrete Construction

STRUCTURAL FLEX-OR-CRETE CO.

Manufacturers and Distributors of Structural Nailing Concrete

Room 629, 200 Devonshire Street
BOSTON, MASS.

FACTORY
SOMERVILLE, MASS.

NEW YORK REPRESENTATIVES: Cement Finish Co., 103 Park Avenue

TRADE MARK
FLEX-OR-CRETE
REGISTERED

Product

Flex-Or-Crete: Structural, Fireproof, Nailing Concrete. Patented. Trade Mark Registered. Sole Lessees of United States and Foreign Patents. Also known in New York as Class "H" Concrete.

Description

Flex-Or-Crete is a cementitious material in the form of powder, the ingredients of which, except cement, are specially prepared and mixed at our factory and shipped in burlap bags. When mixed with cement and poured in place, its surface resembles that of granolithic.

Approvals

Flex-Or-Crete is approved by the building departments of the city of Boston, the several boroughs of the city of New York, the State Labor Board of New York and by several other large cities.

Qualities

Fireproof (see Columbia University Test).
High in compressive strength (see Columbia University and Massachusetts Institute of Technology Tests).
Permanently nailable (see Nailing Test, Massachusetts Institute of Technology).
Light in weight (84 lb. per cu. ft.).
Non-conductor of sound and heat (see Massachusetts Institute of Technology Test on Thermal Conductivity).
High bonding strength with concrete.
Non-corrosive.
Permanently resilient.
Verminproof and sanitary.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

Application

Flex-Or-Crete is shipped in burlap bags, 26 bags to the ton. At the job one bag of cement is added to each bag of Flex-Or-Crete. Sufficient water is then added to produce a mortar of such consistency that it may be poured and screeded to a smooth even surface. One ton (26 bags) when mixed with 26 bags of cement will cover 720 sq. ft. 1 in. thick. No screening or measuring is necessary, and the quality of the mixture never varies.

Uses

Fireproof, Structural, Nailable Roof Slabs—Flex-Or-Crete was designed especially for roof slabs where a decorative roofing such as tile, slate or copper is desired. Its light weight affords a saving in the steel. Its ultimate compressive strength, which is about 1200 lb. per sq. in. (higher than the best cinder concrete) allows spans up to 6 and 8 ft. for a 4-in. slab, reinforced and supported in the same manner as concrete slabs. It is poured in place. The slate, tile or copper is nailed directly to the Flex-Or-Crete, which grips against withdrawal with as great resistance as wood. In addition, it is one of the best fire retardants yet tested and has an insulation value as described under thermal conductivity test.

Nailing Base for Wood Floors—Flex-Or-Crete is poured and screeded to a smooth, even surface, 1½ or 2 in. thick, over the structural floor with which it bonds perfectly, forming a resilient, quiet, durable, nailable base for the finished floor. No lining floor is necessary. Flex-Or-Crete grips against withdrawal of a nail like wood and allows the finished flooring to be drawn up snug.

Flex-Or-Crete with Metal Lumber Floors and Roofs—Flex-Or-Crete is used in combination with metal lumber for floors of light occupancy buildings. It is laid on metal lath, with a thickness of 2 in., the metal lumber being spaced from 16 to 30 in. on centers. The use of Flex-Or-Crete instead of concrete with metal lumber eliminates the necessity of wooden screeds, and thus gives a continuous unbroken slab.

Flex-Or-Crete Sub-floors Under Linoleum—Linoleum laid on concrete is frequently damaged by "sweating" and "blistering," requiring expensive repairs after the work has been installed and considered complete. Apparently these defects are due to the relatively high heat conductivity of the concrete, causing the precipitation of atmospheric moisture.

Linoleum has been laid on Flex-Or-Crete in many buildings, and in not one instance have these defects appeared. Flex-Or-Crete is a non-conductor of heat. Therefore the temperature on the surface of Flex-Or-Crete is always the same as the room temperature, and the conditions causing precipitation are not present.

Ceilings and Partitions—Flex-Or-Crete may be plastered on metal lath for fireproofing, sound deadening, and for a nailing base for wood trim.

Design

In the design of Flex-Or-Crete slabs the same formulas may be used as in the design of concrete slabs. The ultimate compressive strength for Flex-Or-Crete may be taken as 1000 lb. per sq. in., and the working stresses for Flex-Or-Crete may be determined by taking the same percentages of its ultimate compressive strength as are used in determining the working stresses for concrete. The modulus of elasticity of Flex-Or-Crete may be taken as one-fortieth that of steel.

Service to Contractors

This Company will send a man to each installation, when necessary, to instruct in the easiest and best methods of laying.

Tests

Fire, Load and Water Test by Columbia University—Flex-Or-Crete structural slabs have successfully passed the standard fire, load and water tests required by the principal cities of the United States for first class fireproof roof construction. These tests consist of the subjection of the roof to a fire for 4 hours at 1700° F., carrying a live load of 40 lb. per sq. ft.; followed by the application for 10 minutes of a hose stream from a 1⅛-in. nozzle at 60-lb. nozzle pressure. After the test the upper surface of the slab showed no visible defects, other than a few fine hair cracks. The following day the roof was loaded to 160 lb. per sq. ft. and four days later a load of 586 lb. per sq. ft, was placed on the 6-ft. panel, with no visible signs of distress except the few fine hair cracks mentioned above. Although the temperature at the bottom of the slab reached as high as 1850° F., the maximum temperature on the upper surface of the 4-in. slab was only 181° F., which proves that Flex-Or-Crete is not only an excellent fire retardant but also an exceptional insulator.

COMPRESSION TEST BY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Load in lb.	Size cylinder, in.	Compression strength, lb. per sq. in.
41600	6 d.x12	1470
34600	6 d.x12	1225
30800	6 d.x12	1080
29600	6 d.x12	1050

Average, 1206.

COMPRESSION TEST BY COLUMBIA UNIVERSITY

Area cross section, sq. in.	Maximum load in pounds	
	Total	Per sq. in.
36.24	40300	1110
34.08	45330	1330
36.00	42470	1180
34.57	41610	1205
35.88	45500	1270
26.00	38320	1065

Average strength in pounds per sq. inch, 1190.

Thermal Conductivity Test by Massachusetts Institute of Technology—Flex-Or-Crete transmits only about 40 B.t.u. per 24 hours per sq. ft. per in. thickness, per 1° F. temperature difference between surfaces of the slab. This shows that Flex-Or-Crete is 4 to 5 times more effective as an insulator than concrete.

Continued on next page

Nailing Test by Massachusetts Institute of Technology—The test proved that Flex-Or-Crete will receive and retain nails regardless of its age, even when they are pulled and redriven twice in the same hole. Wire nails 3½ in. long under the head were driven 2½ in. into the Flex-Or-Crete and the maximum pull required to remove the nails measured. A new nail was then driven in the holes and a second pull made:

Material	Original nail	Redriven nail	Second redrive
Flex-Or-Crete	540 lb.	360 lb.	220 lb.
Redwood	590 lb.	370 lb.	

Specifications

Note: Specifications for any particular job will be furnished by us on request.

Structural Slabs—(1) All roof slabs, including dormer and cornice slabs, shall be of Flex-Or-Crete, as manufactured by Structural Flex-Or-Crete Co., Boston, Mass.

(2) Flex-Or-Crete shall be mixed in the proportion of one bag of cement to each bag of Flex-Or-Crete, and thoroughly mixed. Sufficient water shall then be added to produce a mortar that can be poured and screeded to a smooth even surface.

(3) The placing of the reinforcement and the forms is the same as for ordinary concrete. The forms shall be of sufficient strength to support the wet material, and shall be tight enough to prevent loss. They shall remain in place till the Flex-Or-Crete has set, at least 10 days.

(4) The thickness shall be (in.) above mesh and (in.) below.

(5) The reinforcement shall be (state reinforcement).

(6) Where marked on plans the structural steel will be wrapped with (   ) reinforcement, and fireproofed with (in.) of Flex-Or-Crete.

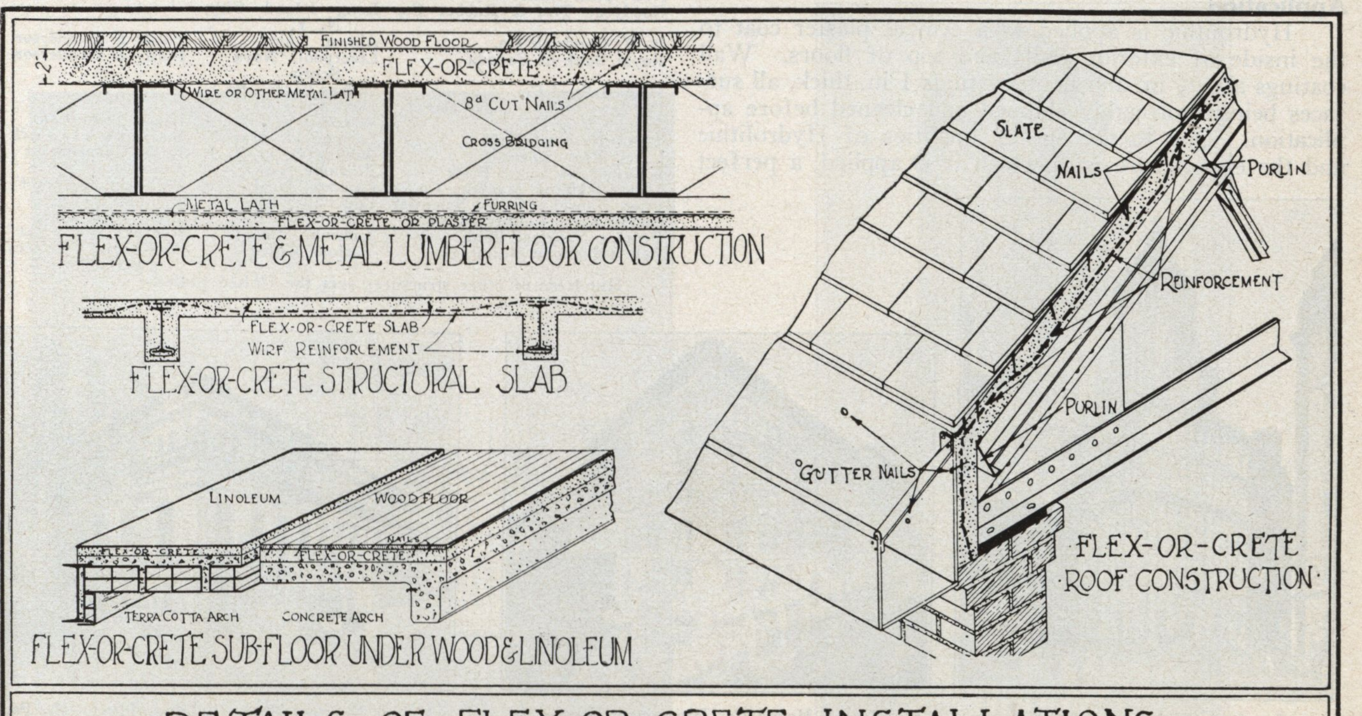
SAFE UNIFORMLY DISTRIBUTED LIVE LOADS IN POUNDS PER SQUARE FOOT ON FLEX-OR-CRETE SLABS

Thickness above mesh, in.	Span								
	4′	4′6″	5′	5′6″	6′	6′6″	7′	7′6″	8′
2	137	108	87	72	61	51			
2½	172	136	110	88	75	65	55		
3	210	165	131	105	83	71	61	53	47
3½	222	176	140	113	91	78	68	60	52
4	242	193	161	138	120	103	95	88	83
5	277	232	202	171	148	130	118	110	103

Table is based on an area of steel per foot of width equal to 0.137 sq. in. Table based on moment co-efficient of $\frac{1}{10}$. For co-efficient of ⅛ take .8 the above values. For co-efficient of $\frac{1}{12}$ take 1.2 above values.

Flex-Or-Crete Installations

Building and Location	Architect
Wellesley College, Wellesley, Mass.—Roofs	Day & Klauder; Coolidge & Carlson
Harvard College, Massachusetts Hall, Cambridge, Mass.—Floors and Roofs	Coolidge, Shepley, Bulfinch and Abbott
Cable Memorial Hospital, Ipswich, Mass.—Floors	Stevens & Lee
St. Luke's Hospital, New Bedford, Mass.—Floors	Stevens & Lee
Sandusky Hospital, Sandusky, Ohio—Floors	Stevens & Lee
Lying-In Hospital, Providence, R. I.—Floors and Roof	Stevens & Lee
Norfolk County Hospital—Floors	Harold Field Kellogg
Crittenton Hospital, Brighton, Mass.—Roof	Harold Field Kellogg
Deaconess Hospital, Boston, Mass.—Floors	D. W. Deering
Grover Cleveland School, Boston, Mass.—Floors	O'Connell & Shaw
East Boston High School, East Boston, Mass.—Floors	John M. Gray
Samuel Adams School, Boston, Mass.—Floors	Charles R. Greco
Frank V. Thompson School, Boston, Mass.—Floors	John F. Cullen
Jamaica Plain School, Boston, Mass.—Floors	Andrews, Jones & Biscoe
Champlain School, Boston, Mass.—Floors	Joseph Driscoll
Charles Summer School, Boston, Mass.—Floors	C. Howard Walker
Washington Irving School, Boston, Mass.—Floors	C. Howard Walker
Signal Apparatus Building, Boston, Mass.—Floors	O'Connell & Shaw
Temple B'Nai Jeshurun, Cleveland, Ohio—Floors and Roof	Charles R. Greco
Washington Cathedral, Washington, D. C.—Roof	Frohman, Robb & Little
Pershing Square Building, New York, N. Y.—Roof	York & Sawyer
Federal Reserve Bank, New York, N. Y.—Roof	York & Sawyer
Watertown Arsenal Buildings, Boston, Mass.—3 Roofs	United States Govt.
Hartford Fire Insurance Building, Hartford, Conn.—Roof	Marc Eidlitz & Son
U. S. Post Office Building, Essex Street Station, Boston, Mass.—Floors	McLaughlin & Burr


FLEX-OR-CRETE & METAL LUMBER FLOOR CONSTRUCTION

FLEX-OR-CRETE STRUCTURAL SLAB

FLEX-OR-CRETE SUB-FLOOR UNDER WOOD & LINOLEUM

FLEX-OR-CRETE ROOF CONSTRUCTION

DETAILS OF FLEX-OR-CRETE INSTALLATIONS

THE HYDROLITHIC WATERPROOFING CO., INC.

Engineers and Contractors for Waterproofing

1401-2 Commonwealth Building, PITTSBURGH, PA.
TELEPHONE, COURT, 1161
NEW YORK OFFICE: 32 Pearl Street—Telephone, Bowling Green 5055

Services

We are ENGINEERS and SPECIALISTS for WATERPROOFING, making a specialty of Cement Coat Waterproofing.

We contract for the waterproofing of basements, subways, reservoirs, vaults, tunnels, swimming pools, boiler rooms, elevator pits, etc.; guaranteeing a positive and permanent waterproofing for all kinds of masonry construction.

Our Engineering Department is always at the service of architects, contractors, or others.

Advantages

The advantages of our Hydrolithic System over the old membrane method or integral waterproofing are many, as follows: it is permanent; it is cheaper, no extra supporting walls are required; no additional floor finish is necessary; ease and economy with which repairs can be made; it can be applied without delaying the other building trades; it can be applied as readily to old buildings as to new; it forms a good wearing surface on the floor and an attractive wall finish; it is not affected by heat and can be used in boiler rooms and other places where the heat would destroy pitch and felt waterproofing.

Twenty-five Years without a Failure

All work is executed in the well-known Winslow's Hydrolithic System which was invented by E. J. Winslow more than 25 years ago. The original plaster coat method and, although its wonderful success has inspired a host of imitators, it is still easily the leader in its field. During the quarter-century it has been in use, we have not had a failure.

Application

Hydrolithic is applied as a cement plaster coat to the inside of exterior walls and top of floors. Wall coatings are ⅝ in. and floor coatings 1 in. thick, all surfaces being thoroughly chipped and cleaned before application. Due to the special qualities of Hydrolithic and the expert care with which it is applied, a perfect bond is secured. Hundreds of successful installations are in existence all over the country where Hydrolithic has for many years remained absolutely dry, although subjected, in some cases, to very high hydrostatic pressure.

Registered
HYDROLITHIC
TRADE-MARK

Specifications

The interior surface of all exterior walls to a height of ....feet above the finished basement floor and the upper surface of the concrete floor slab of the entire basement [sub-basement] as well as all trenches, pits and machinery foundations shown on the plans, shall be waterproofed with Winslow's Hydrolithic Cement Coatings, applied by THE HYDROLITHIC WATERPROOFING CO., INC.

All surfaces, before waterproof coating is applied, shall be thoroughly chipped and cleaned; the coating applied not later than 24 hours after surface has been prepared.

Wall coating shall be ⅝ in. thick, applied in 2 coats, thoroughly floated and troweled to a smooth and even finish, free from imperfection. Floor work shall be 1 in. thick and serve the double purpose of a waterproofing agent and a wearing surface. Floor coating shall be floated and finished as described for wall coating.

Guarantee—THE HYDROLITHIC WATERPROOFING CO., INC., shall furnish a written guarantee covering their work for a period of three years. During this time they shall, at their own expense, promptly repair any leaks which may develop; providing such leaks are not due to structural changes in the building or to external damage to the waterproofing for which they are not responsible.

References

BUILDING	LOCATION	ARCHITECT
Mellon National Bank	Pittsburgh, Pa.	Trowbridge & Livingston and E. P. Mellon
Joseph Horne Store	Pittsburgh, Pa.	Benno Janssen
Colonial Trust Co.	Pittsburgh, Pa.	F. J. Osterling
Standard Oil Building	New York, N. Y.	Carrère & Hastings
College of City of New York	New York, N. Y.	Geo. B. Post & Sons
Fifth Ave. Building	New York, N. Y.	Maynicke & Franke
Manhattan Eye & Ear Hospital	New York, N. Y.	York & Sawyer
New York Harbor Dry Dock Co.	Staten Island, N. Y.	
Goodyear Tire & Rubber Co.	Long Island City, N. Y.	
B. F. Goodrich Co.	Akron, Ohio	Purdy & Henderson
Royal Bank of Canada	Liverpool, Nova Scotia	Purdy & Henderson
Pressed Steel Co.	Wilkes-Barre, Pa.	
Pittsburgh Plate Glass Co.	Ford City, Pa.	
Scovill Mfg. Co.	Waterbury, Conn.	Hugh Thompson
Third National Bank	Springfield, Mass.	Starrett & Van Vleck
U. S. Post Office	Asbury Park, N. J.	U. S. Government
National Exchange Bank	Roanoke, Va.	
Victor Talking Machine Co.	Camden, N. J.	Ballinger & Perrot
First Church of Christ, Scientist	Louisville, Ky.	Brinton B. Davis
Sunningdale Country Club	Scarsdale, N. Y.	Robt. D. Kohn
Peoples National Bank	Jackson, Mich.	Rockers and Vatet
Bell Telephone Buildings	Various Cities	McKenzie, Voorhees & Gmelin

Hundreds of other structures over the United States.

Standard Oil Company Building,
New York, N. Y.
CARRERE & HASTINGS, Architects

Joseph Horne Co. Department Store,
Pittsburgh, Pa.
BENNO JANSSEN, Architect

Mellon National Bank Building, Pittsburgh, Pa.
TROWBRIDGE & LIVINGSTON
and E. P. MELLON, Associate

Buildings Waterproofed by Hydrolithic Waterproofing Co.

OBELISK WATERPROOFING COMPANY

Dampproofing Contractors and Engineers

TELEPHONE
Ashland 1740, 1741

1 Madison Avenue
NEW YORK, N. Y.

Services

Exterior Surfaces of Stone, Brick and Stucco Buildings, above grade, Treated with the Caffall Process.

Business, Residential and Monumental Buildings and Churches Restored, Dampproofed and Preserved; Exteriors of Delicate Marble Preserved from Weather Disintegration; Monuments Restored and Preserved.

Guarantee

Work done under contract with a 10-year guarantee, or a cost-plus-percentage basis without guarantee.

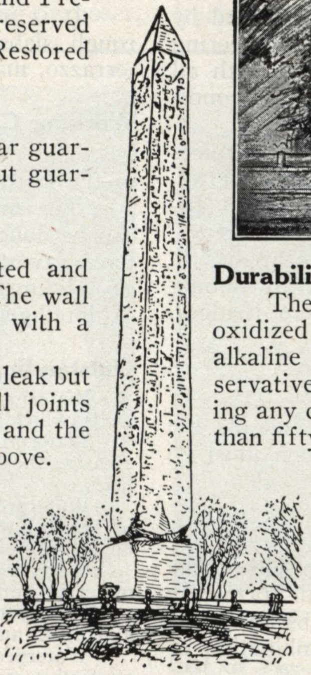
Process

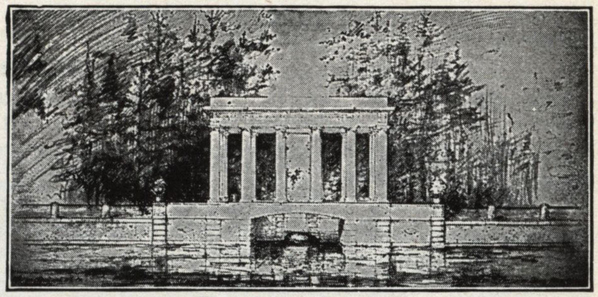
New Structures—The surface is tested and structural defects, if any, are made good. The wall is then impregnated to considerable depth with a melted wax compound forced in by heat.

Old Structures—Where masonry walls leak but material disintegration has not occurred all joints are tested and made sound where necessary, and the entire surface, including joints treated as above.

Where the surface has disintegrated from weather attack, it is restored to sound condition, joints are re-pointed, and the entire surface treated as above. The treatment leaves the appearance unchanged, and one treatment will last for the life of the building.

It will be understood that application of heat to buildings, particularly to fine marble and granite, requires expert skill. Heat dries out the surface and forces penetration of preservative material. On cooling, the wax congeals and becomes an integral part of the material at and below the surface.


Obelisk or Cleopatra's Needle
Restored and preserved by Caffall Process in 1885


Plymouth Rock
Treated 1921

Durability

The principal components can not be easily oxidized and are insoluble in water, acidulated or alkaline solution, or gases. This is the only preservative process having a successful history covering any considerable period. Buildings treated more than fifty years ago are still dry.

Cost

Cost can be ascertained on application to the company. It is determined by the following elements:

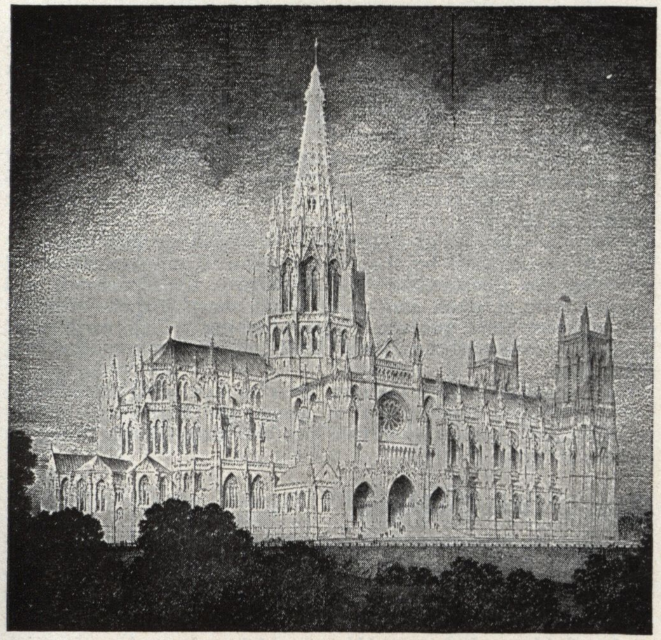
Character of material to be treated.

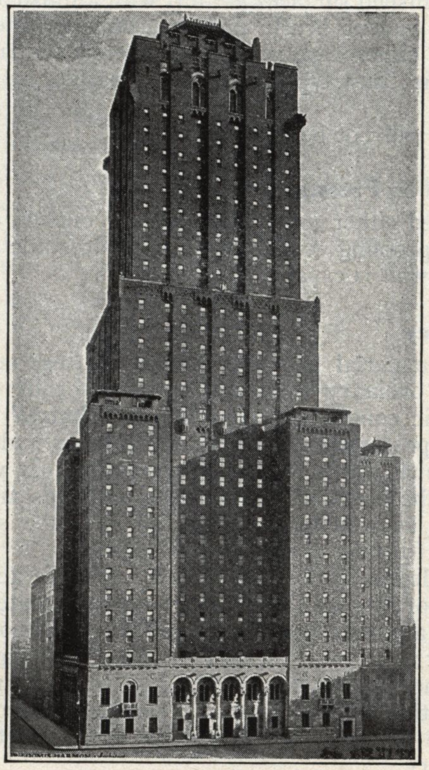
Condition, whether newly erected, old, or requiring renovation.

Area requiring treatment.

Character of surface, whether plain or ornamental.

Location of building or monument.


Cathedral of St. John the Divine, New York, N. Y., As It Will Appear
Portions treated at various times from 1909 to date


Shelton Hotel, New York, N. Y.

PERMANENT WATERPROOFING CO.

Engineers and Contractors for Waterproofing

Peoples Gas Building

CHICAGO, ILL.

OFFICES IN PRINCIPAL CITIES

Services

Real Waterproofing can not be accomplished by haphazard methods. It is a specialized engineering problem, requiring study and wide experience with all materials and methods, used under all sorts of conditions.

It is with this in mind that we offer our services and solicit consideration wherever Waterproofing, Dampproofing or Protective Work is required. Information or suggestions, based on our past experience, will be cheerfully given at all times. This applies to Basement Walls and Floors, Pits, Tanks, Swimming Pools, Cisterns, Tunnels, Subways, Concrete Bridges, Retaining Walls, Roundhouses, Piers, etc.

Material

The Permanent Waterproofing Co. adopts the material best adapted to the conditions which must be met.

Application

The waterproofing can be applied to either the *Inside* or *Outside* surfaces of walls after all forms are removed, and to the top of rough floor slabs and footings, in the form of brush coats or in combination of brush and plaster coats.

Appearance

The finished surfaces are left with a finish and color similar to cement brush coat or cement plaster. The surface in either case may be plastered or painted or finished with any type of cement, marble, or terrazzo surfacing.

Paint will not be discolored.

Resistance to Pressure

Applied either upon the inside or outside of walls, this waterproofing will resist any hydrostatic pressure which the wall is capable of withstanding.

Permanency

This material is not a simple coating, subject to injury by ordinary wear and abrasion or by changing atmospheric conditions. It will not "slump," crack or scale. It possesses much chemical vitality and in combination with water becomes very active. It works its way into the pores of the concrete, expands and unites chemically as well as mechanically with the structural materials, forming a strong and impenetrable mass.

The depth of the penetration varies in accordance with the porosity of the masonry—being greatest where the voids are most numerous and seepage most likely. The result is a surface which is part of the wall or slab and can not be removed without actual cutting. Not only does the material form a *permanent waterproofing,* but it also serves as a preservative and strengthener of the masonry.

Bonding Qualities

It is indispensable where a perfect bond between rough slabs or walls and finish coatings of cement, terrazzo, marble, tile, etc., is required.

Working Conditions

The efficiency of any material or methods depends in the last analysis upon workmanship.

The material is mixed with water, and the work can be done at a time when the working conditions are most favorable. This makes possible the highest class of workmanship when combined with the employment of intelligent experienced workmen, properly directed.

Outstanding Features

Waterproofing placed upon the *inside* or *outside* of wet walls, which penetrates and becomes part of the walls or floors.

Waterproofing which actually increases, rather than decreases, the strength and efficiency of the concrete, stone or brick.

Waterproofing which is continuous and assures (instead of breaks) the bond between footings and walls. This should be considered in case of lateral pressures.

Waterproofing which introduces no foreign or injurious materials into the concrete.

Waterproofing which assures bond between rough surfaces and finish and which is not injured by contact or vibration.

Waterproofing which eliminates the necessity for double or protective walls and slabs.

Waterproofing which offers peculiar resistive qualities to sulphurous fumes, gases, acids, fire and electrolysis.

Waterproofing which may readily be repaired in case of structural cracks.

Waterproofing which is *less expensive* than any other real waterproofing.

Waterproofing which is absolutely *guaranteed.*

Specifications

Walls—All outside walls and areas exposed to seepage shall be waterproofed by the Permanent Waterproofing Co.'s method on the inside surfaces from floor level to outside finished grade level. This work to be done before partitions or other obstructions are installed.

Inside walls and columns extending through the basement slab shall be waterproofed or dampproofed as may be required—upon both sides from the top of the footings to the outside finished grade level.

Floors—After the rough slab has been poured and sufficiently set it shall be thoroughly cleaned and waterproofed according to Permanent Waterproofing Co.'s method, and finished with a slush containing good sharp torpedo sand to give a good bond surface for the topping. This work shall be done before partition walls, machinery bases, conduits, etc., are placed.

Immediately before the topping is applied wash this surface well and apply a bonding coat of cement and Permanent Waterproofing and thoroughly brush into the slab. Apply finish in the usual way.

Disintegration Problems

The disintegration of concrete, brick and stone surfaces has been studied by us for a number of years. During that time we have handled a number of problems of this nature, and have also made a number of tests under field conditions. We would be pleased to furnish detailed information regarding them.

THE PAR-LOCK APPLIERS

Par-Lock for Plastering, Waterproofing, Dampproofing and Cork Insulation

PROCESS OWNED BY
VORTEX MANUFACTURING CO.
1978 West 77th Street, CLEVELAND, OHIO

Products

Par-Lock, the method of mechanically applying waterproofing asphalt compounds; also the method of mechanically building out a coarse rock grit key when used for plastering purposes.

Par-Lock
TRADE-MARK
Patented—Registered

The Par-Lock Appliers have complete equipments in their possession. Their crews are made up of trained experienced men.

Estimates will be furnished and contracts completed promptly.

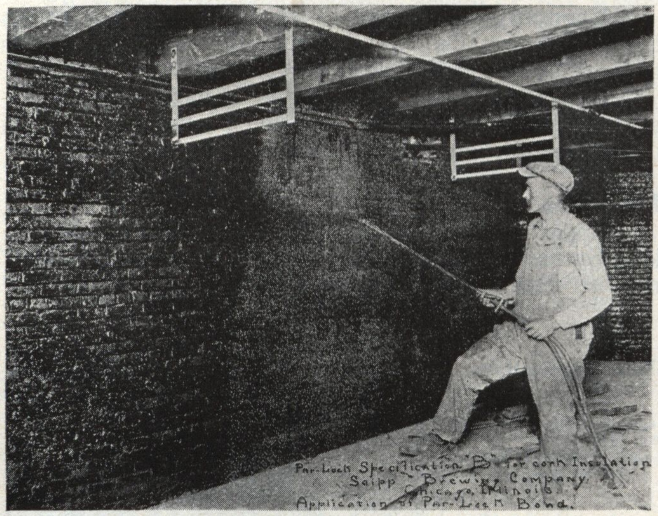

Par-Lock Specification "B" for cork Insulation
Seipp Brewing Company
Chicago, Illinois.
Application of Par-Lock Bond.

Fig. 1. Application of Par-Lock Asphalt Compound

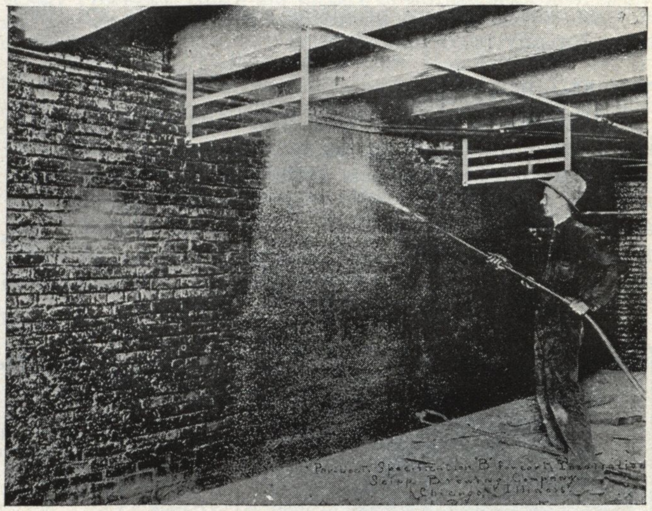

Par-Lock Specification "B" for cork Insulation
Seipp Brewing Company
Chicago, Illinois.

Fig. 2. Application of Par-Lock Grit Key

Par-Lock Specifications

Below are listed the various forms of standardized Par-Lock specifications.

Par-Lock Plastering (No Scratch Coat Required)—*Form "A"*—Preparation for plastering horizontal concrete, concrete tile and tile surfaces, except roof slabs. On roof slabs, use specification "B."

Form "B"—Preparation of surfaces to be plastered. To substitute furring and to seal positively against air filtration and dampness. For use on concrete, brick or tile filled exterior wall surfaces and roof slabs. Also on vertical concrete and terra cotta and gypsum surfaces.

Floor Finish—*Form "C"*—Waterproofing and binding plastic floor finish except below grade line.

Waterproofing—*Form "D"*—For waterproofing surfaces to be finished with portland cement or tile and for bonding thin portland cement, and tile finish to structural bodies, laboratories, basements, swimming pools, tunnels, etc.

Form "E"—"Cotton membrane waterproofing" for heavy waterproofing on basement walls, floor footings, swimming pools, tanks, etc.

Form "F"—For light waterproofing of footings, outside walls below grade line, basement floors, tunnels, etc.

Form "G"—"Membrane waterproofing" for heavy waterproofing to resist hydrostatic pressure (tunnels, swimming pools, reservoirs and deep basements).

Form "H"—For waterproofing bridge decks, basement floors, tunnels, etc.

Dampproofing—*Form "I"*—Dampproofing walls to be furred, and for coating cinder fill mixtures under matched flooring.

Form "J"—For dampproofing tile wall surfaces that are to be plastered. May be used where hand applied bond paints are specified, except on concrete and ceiling surfaces.

Form "K"—A gun applied built-up mastic for surface finishing, cork and other insulating materials. This specification may be built-up, airtight and dampproof or waterproof where required.

Note: If you do not have these specifications on file, they will be sent on request.

List of Par-Lock Appliers

The Par-Lock Appliers of Albany
425 Orange Street, Albany, N. Y.

The Par-Lock Appliers of Chicago
362 Peoples Gas Building, Chicago, Ill.

The Par-Lock Appliers of Cleveland
417 Hunkin-Conkey Building, Cleveland, Ohio

The Par-Lock Appliers of Columbus
1005 East Livingston Avenue, Columbus, Ohio

The Par-Lock Appliers of Eastern Pennsylvania
1613 Sansom Street, Philadelphia, Pa.

The Par-Lock Appliers of Maryland
613 W. Cross Street, Baltimore, Md.

The Par-Lock Appliers of Michigan
2511 First National Building, Detroit, Mich.

The Par-Lock Appliers of Minneapolis
200 Builders Exchange, Minneapolis, Minn.

The Par-Lock Appliers of New Jersey
339 Broad Street Bank Building, Trenton, N. J.

The Par-Lock Appliers of New York City, Inc.
50 Church Street, New York, N. Y.

The Par-Lock Appliers of St. Louis
515 Chemical Building, St. Louis, Mo.

The Par-Lock Appliers of Toronto
2258a Bloor Street, W., Toronto, Ont., Canada

The Par-Lock Appliers of Western New York
958 Ellicott Square Building, Buffalo, N. Y.

The Par-Lock Appliers of Youngstown
509 Wick Building, Youngstown, Ohio

THE WERTZ COMPANY

Waterproofing Engineers and Contractors

CLEVELAND
CHICAGO
NEW YORK
TORONTO (WERTZ CO., LTD.)

BRANCH OFFICES
PITTSBURGH, PA.
BUFFALO, N. Y.
HUNTINGTON, W. VA.
DAYTON, OHIO

Metalkote

TRADE-MARK

Services

Engineers and Contractors specializing in Waterproofing, Dampproofing, Acidproofing, Frostproofing and Oilproofing by the Metalkote System.

Prompt waterproofing service is assured through branch offices and representatives in various cities.

Our Engineering Service Department assists in solving waterproofing problems and suggests specifications for any particular structure.

The Metalkote System

Process—The Metalkote System consists in applying a waterproof coating to various types of masonry. The material Metalkote is composed of finely divided iron in powder form plus rapidly oxidizing chemical agents. It is applied exclusively by The Wertz Company. Two or more coats, depending upon conditions, are applied either by brush coats or as cement plaster.

Adaptability—Metalkote can be applied to wet or dry, exterior or interior surfaces. Leaks in old structures are easily repaired.

Permanence—Metalkote has no volatile oils to evaporate, and is unaffected by sun, water, frost and most acids. It is practically indestructible, hence it lasts indefinitely.

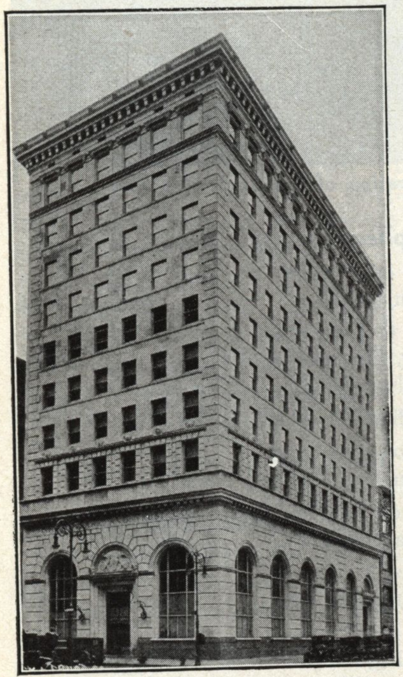
Economy—First cost is low. Metalkote is practically indestructible, consequently there is no maintenance. No protective layers are necessary.

Guarantee—Waterproofing by Metalkote System is guaranteed watertight for a period of five years from date of completion.

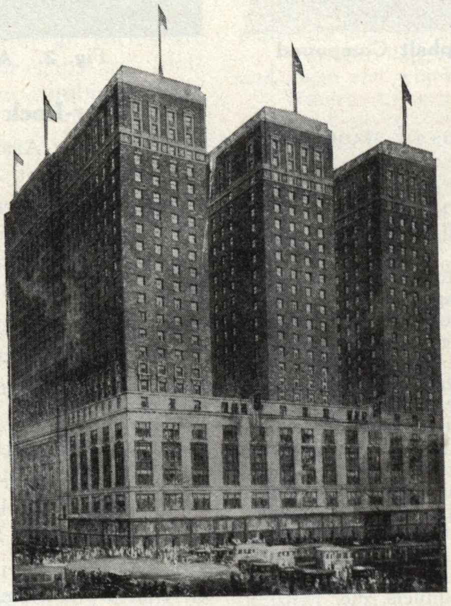
Literature

A postcard will bring booklet describing the Metalkote System of waterproofing and showing many prominent structures waterproofed by the Metalkote System.

Representative Metalkote Applications

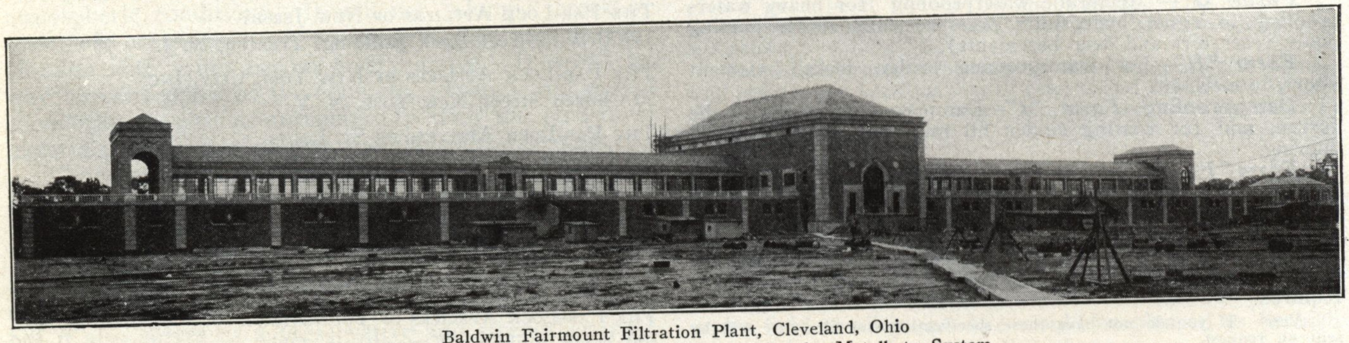


Home Bank & Trust Co., Toledo, Ohio
Walker & Weeks, Architects
H. J. Spieker Co., Contractors



Palmer House, Chicago, Ill.
Holabird & Roche, Architects
Thompson-Starrett Co., Contractors

Coal Exchange Building, Huntington
Meanor & Handloser, Architects
Higginbotham & Jones, Contractors



Baldwin Fairmount Filtration Plant, Cleveland, Ohio
World's largest covered reservoir—waterproofing by Metalkote System

Continued on next page

Simplified Waterproofing Specifications

The four typical waterproofing specifications below cover the usual requirements.

Waterproofing—Waterproofing shall be the Metalkote System as applied by The Wertz Company and guaranteed by them to be watertight for a period of five years from date of completion. Should any defects in the waterproofing occur on account of this contractor's workmanship or material, he shall repair same at his expense during the life of the guarantee.

Foundation Waterproofing (Interior Method)

Walls—Waterproof with Metalkote, applied by The Wertz Company, entire interior surfaces from floor slab to grade of all exterior walls coming in contact with earth fill. This work shall be done before partitions or other obstructions are installed. Inside walls and columns extending through basement slab shall be waterproofed as required on both sides from top of footings to outside finished grade level.

Pits—Waterproof with Metalkote, applied by The Wertz Company, the entire interior surfaces of walls and floors of all pits and ducts.

Floors—Waterproof with Metalkote, applied by The Wertz Company, the entire top surface of all basement floor slabs and any other floor slabs that bear on earth, prior to laying of finished floor.

Sidewalk Slabs—Waterproof with Metalkote, applied by The Wertz Company, the entire top surface of the rough sidewalk and driveway slab over basement prior to laying of finish.

Parapet Walls—Waterproof with Metalkote, applied by The Wertz Company, interior surface of all exposed surfaces of parapet walls up to under side of coping. Also top surface of parapet walls shall be waterproofed prior to setting of coping.

Swimming Pools, Reservoirs, Storage Tanks, etc.

Walls—Waterproof with Metalkote, applied by The Wertz Company, entire interior surfaces of all walls.

Floors—Waterproof with Metalkote, applied by The Wertz Company, entire top surfaces of all floors.

Note: Where tile lining is used, waterproofing shall act as bonding coat. Where tile is not used, waterproofing can be finished with either portland or white cement or painted.

Foundation Waterproofing (Exterior Method)

Footings—Waterproof with Metalkote, applied by The Wertz Company, entire top surfaces of all footings.

Walls—Waterproof with Metalkote, applied by The Wertz Company, entire exterior surfaces of all walls from top of footings to grade that come in contact with earth fill. Inside walls and columns extending through basement slab shall be waterproofed as may be required, on both sides from top of footings to finished floor level.

Floors—Waterproof with Metalkote, applied by The Wertz Company, entire top surface of all basement floor slabs and any other floor slabs that bear on earth, prior to the laying of finished floor.

Parapet Walls—Waterproof with Metalkote, applied by The Wertz Company, interior surface of all exposed surfaces of parapet walls up to under side of coping. Also top surface of parapet wall shall be waterproofed prior to setting of coping.

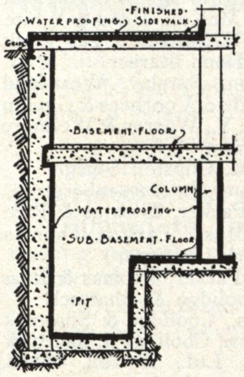
Tunnels, Ducts, Subways, Vaults, Etc.

Walls—Waterproof with Metalkote, applied by The Wertz Company, entire interior surfaces of all walls.

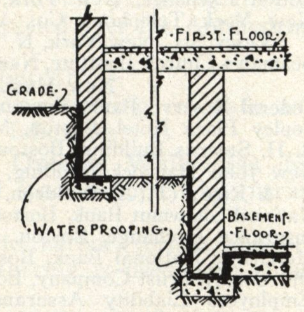
Floor—Waterproof with Metalkote, applied by The Wertz Company, entire top surface of rough floor slab.

Roof—Waterproof with Metalkote, applied by The Wertz Company, entire under side of roof slab.

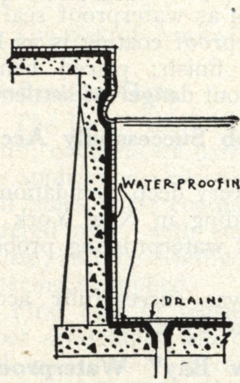
Note: Where open cut is made, waterproof entire top surface extending down walls 2 ft.



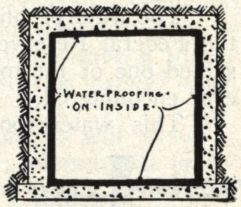
Interior Method of Foundation Waterproofing



Exterior Method of Foundation Waterproofing



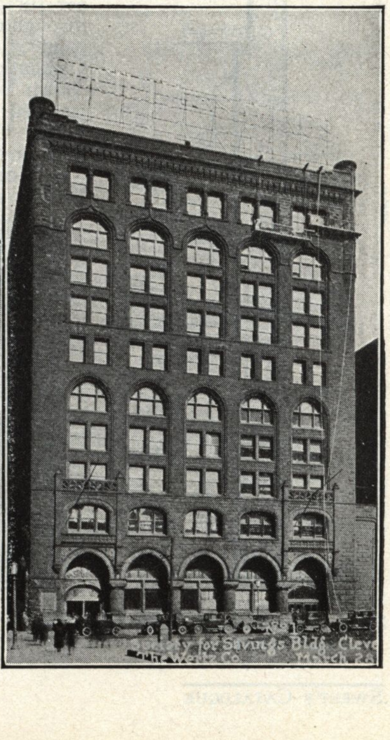
Swimming Pools, Reservoirs, Storage Tanks, etc.



Tunnels, Ducts, Subways, Vaults, etc.

Oakwood Village School, Oakwood, Ohio
Schenck & Williams, Architects
Shook & Billiter, Contractors

Tifereth Israel Temple, Cleveland, Ohio
Chas. R. Greco, Architect
John Gill & Sons, Contractors



Society for Savings Bank, Cleveland, Ohio
Walker & Weeks, Architects
Metalkote applied to all surfaces above grade to stop disintegration of sandstone

THE WATERPROOFING COMPANY

345 East 33rd Street
NEW YORK, N. Y.

65 Albany Street
BOSTON, MASS.

Product and Services

Manufacturers of "Cow Bay" Waterproof Cement.

Engineers and Contractors for Waterproofing, making a specialty of Cement Waterproofing. We contract for the waterproofing of basements, subways, reservoirs, vaults, tunnels, swimming pools, etc., guaranteeing a positive and permanent waterproofing of all kinds of masonry construction.

Designers and builders of Reinforced Concrete Construction.

THE WATERPROOFING CO.
ESTABLISHED 1905
BOSTON NEW YORK PITTSBURGH
COW BAY WATERPROOF CEMENT

TRADE-MARK
Reg. U. S.
Patent Office

Experience

The Waterproofing Company introduced and perfected cement waterproofing. During the past 21 years this company has waterproofed a majority of the important buildings in New York, Boston and Pittsburgh.

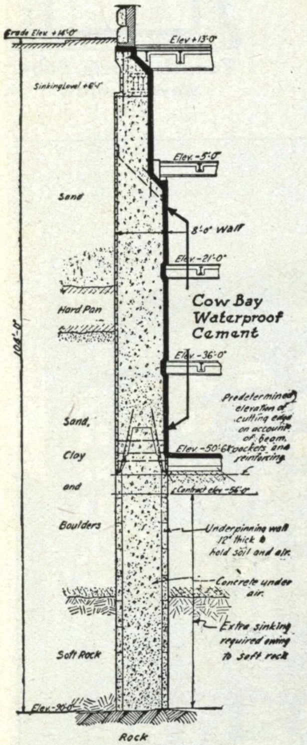
Advantages of "Cow Bay" Cement Waterproofing

No extra supporting walls required. Walls are left with a neat finish; no furring and plastering being necessary. Floor coating serves both as waterproof seal and floor finish. "Cow Bay" waterproof coating is as hard as the best portland cement finish; placed beneath grillages and column bases without danger of settlement.

A Difficult Waterproofing Job Successfully Accomplished

The waterproofing of the very deep foundations of the Federal Reserve bank building in New York presented one of the most difficult waterproofing problems ever encountered.

This waterproofing job was successfully accomplished by us.



Section of Federal Reserve Bank Foundation

"Cow Bay" Waterproofing Specifications

Material—All interior surfaces of all exterior walls and upper surface of concrete floor slab throughout basement (or subbasement), elevator pits, machinery foundations, trenches, etc., as shown on plans, shall be waterproofed with "Cow Bay" Waterproof Cement, applied by The Waterproofing Company.

Workmanship—All surfaces, before application of waterproof coating, shall be thoroughly chipped and cleaned, and coating applied not later than 24 hours after surface has been so prepared. A perfect bond must be secured with underlying masonry. Wall waterproofing shall be ⅝-in. thickness, applied in two coats. The floor work shall be 1 in. in thickness and is to serve as a wearing surface as well as a waterproof coating. All waterproofing shall be floated and troweled to a smooth and even finish free from imperfections.

Guarantee—The Waterproofing Company shall furnish written guarantee that all coating placed by them will be waterproof; that during a period of 3 years after completion of the work, they will promptly repair any leaks appearing through their waterproofing which are not due to causes beyond the waterproofer's control.

A Few Important Waterproofing Contracts

New York District

Federal Reserve Bank, New York, N. Y., York & Sawyer
Woolworth Building, New York, N. Y., Cass Gilbert
Hudson Terminal Buildings, New York, N. Y., Clinton & Russell
Singer Building, New York, N. Y., Ernest Flagg
American Telephone & Telegraph Co., New York, N. Y., Wm. Welles Bosworth
Morgan & Co., New York, N. Y., Trowbridge & Livingston
Stock Exchange, New York, N. Y., Trowbridge & Livingston
Bank of America, New York, N. Y., Trowbridge & Livingston
Municipal Building of New York, N. Y., McKim, Mead & White
Equitable Society Building, New York, N. Y., Starrett & Van Vleck
Cotton Exchange, New York, N. Y., Donn Barber
New York Telephone Co., Washington, Barclay, West and Vesey Sts., New York, N. Y., McKenzie, Voorhees & Gmelin
Seaman's Church Institute, New York, N. Y., Warren & Wetmore

New England District

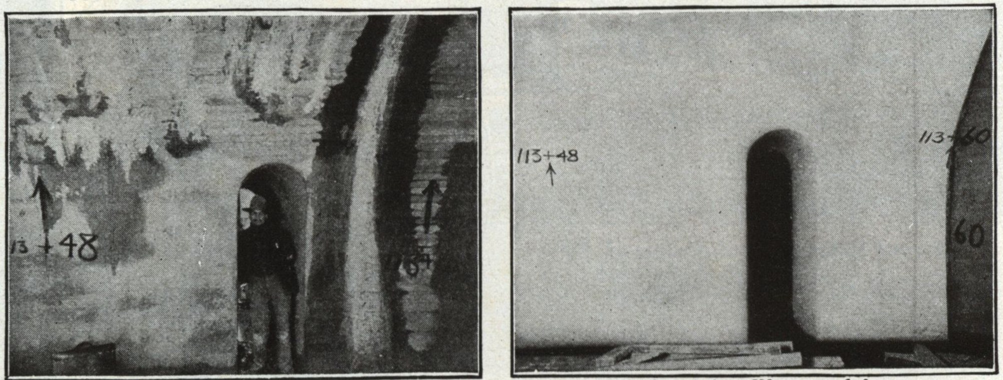
Federal Reserve Bank, Boston, Mass., R. Clipston Sturgis
Copley Plaza Hotel, Boston, Mass., Henry J. Hardenbergh
R. H. Stearns Building, Boston, Mass., Parker, Thomas & Rice
New John Hancock Building, Boston, Mass., Parker, Thomas & Rice; (F. A. Waldron, New York, Engineer)
National Shawmut Bank, Boston, Mass., Parker, Thomas & Rice
Insurance Exchange, Boston, Mass., Coolidge & Shattuck
Merchants National Bank, Boston, Mass., Coolidge & Shattuck
Old Colony Trust Company, Boston, Mass., Coolidge & Shattuck
Employers Liability Assurance Corp., Ltd., Boston, Mass., Coolidge, Shepley, Bullfinch & Abbott

Pittsburgh District

Union Bank Building, Pittsburgh, Pa., MacClure & Spahr
Jones & Laughlin, Pittsburgh, Pa., MacClure & Spahr
Fort Pitt Hotel, Pittsburgh, Pa., Janssen & Abbott
Oliver Office Building, Pittsburgh, Pa., D. H. Burnham & Co.

Miscellaneous

Detroit River Tunnels, Detroit, Mich., Butler Bros. Const. Co.
Shawinigan Falls Tunnels, Northern Aluminum Co.
Cumberland County Power & Light Co., Portland, Me., The Foundation Co., Engineers
51 Telephone Buildings in various cities, McKenzie, Voorhees & Gmelin



Before being Waterprooted

After being Waterproofed

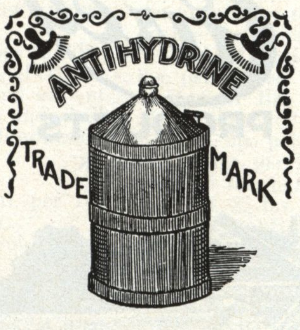
Same Point in Pennsylvania Tunnels Before and After Being Waterproofed with "Cow Bay" Waterproof Cement

ESTABLISHED 1895

THE ANTIHYDRINE COMPANY

308 Washington Building

NEW HAVEN, CONN.



Product

Manufacturers of ANTIHYDRINE, a Coating for Dampproofing and Stainproofing.

Description

Antihydrine is a material made of a high grade of asphalt carefully prepared in combination with several chemicals, which combination gives it the peculiar property of *forming (without heating) a continuous glossy and impervious coating upon porous surfaces, without penetration.*

Antihydrine is the pioneer dampproof paint, having been first made in 1895. *There has been no subsequent change in formula.*

Advantageous Features

(1) Antihydrine eliminates the necessity of using lath and wood furring for interior plastering of outside walls, plastering being applied over the Antihydrine within 24 hours.

(2) Renders walls dampproof.

(3) Prevents staining of plastering on walls and on fireproof work; also, the following:

Applied to Inside of Outside Walls—(4) No furring needed—cost of and space occupied by furring are saved.

(5) Dangerous places to harbor vermin and encourage fires (when wood furring is used) are eliminated.

(6) Outside walls are made absolutely dampproof.

(7) Building is made warmer and more easily heated.

(8) All staining of and efflorescences on plastering are avoided.

Applied to Fireproof Blocks in Ceilings and Partitions—(9) All staining and efflorescence prevented.

(10) Plastering on blocks dries quickly, saving much time.

(11) All plastered surfaces permit diversified decoration without danger of damages from dampness.

(12) Discoloration of plastering from smoky brick is prevented.

Applied to Built-in Surfaces of Iron, Limestone, Marble, Face Brick, etc.—(13) All ironwork built in wall is preserved.

(14) Staining and efflorescence on exterior of limestone, marble and brick are prevented.

(15) Use of *ordinary* cement mortar in the backing is allowed, thus saving time and money otherwise spent in preparation of expensive cement mortar.

Application

After being well stirred, the Antihydrine contents are poured into a pail and any laborer can apply same *cold* with a brush. Material is fully prepared, ready for use, and is applied as easily as whitewash; *the coating, however, must be kept absolutely continuous, covering every part.* A second coat can be applied, if desirable, within a few hours after the first application.

Covering Capacity

Extensive, by reason of its lack of penetration. 1 gal. covers about 100 sq. ft. of brickwork or fireproofing, 1 coat; or, 60 sq. ft., 2 coats; 1 coat, properly applied, is sufficient for the prevention of dampness and stains.

Shipment

Antihydrine is delivered in casks of 10 and 50 gals.

Cost

The cost of Antihydrine is $1.25 per gal.

Specification Data

The brush shall be the kind used for oiling brick fronts; contents of barrel to be thoroughly stirred before application; every part to be covered, leaving no small holes, etc.; coating to be thin where it is to be plastered over, with sufficient body to leave a glossy surface; and the Antihydrine to be soft or "tacky" when plastering is applied.

First coat of plastering, as thin as will allow of proper scratching, will dry quickly; second coat is applied immediately thereafter; after drying, third and last coat of plastering is applied when, after a few days, surface will be ready for painting and decorating.

References

A few buildings in which Antihydrine was used:

NEW YORK, N. Y.

American Museum of Natural History
Delmonico Building
St. James Building
Manhattan Hotel
Skin and Cancer Hospital
Home for Aged Men and Married Couples
Journeay Building
Public School Buildings
New York Hospital
New Hall of Board of Education
Commercial Academy of Marest Bros.
Clara Hirsch Home for Working Girls

OTHER CITIES

Lincoln Memorial, Washington, D. C.
St. John's Home for Boys, Brooklyn, N. Y.
Brazer Building, Boston, Mass., Cass Gilbert, Architect
Masonic Temple, Boston, Mass., Loring & Phipps, Architects
Residence, Beacon St., Boston, Mass., R. Clipston Sturgis, Architect
Hotel Dartmouth, Boston, Mass., Maginnis, Walsh & Sullivan, Architects
St. Joseph's Novitiate, Boston, Mass., Maginnis, Walsh & Sullivan, Architects
Hotel Cambridge, Boston, Mass., W. T. Sears, Architect
Hall of Missions Church, Boston, Mass., T. J. Untersee, Architect

THE PHILIP CAREY COMPANY

Manufacturers of Waterproofing and Dampproofing Materials

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES
FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

Carey
PRODUCTS
TRADE-MARK
Registered

Products

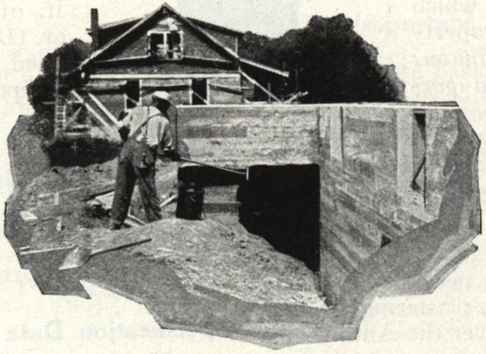
- CAREY PERCOPROOF DAMPPROOFING COMPOUND.
- CAREY PERCOPROOF PLASTER BOND.
- CAREY WATERPROOFING COMPOUND.
- CAREY WATERPROOFING PRIMER.
- CAREY WATERPROOFING FELTS.
- CAREY WATERPROOFING ASBESTOS FELTS.
- CAREY WATERPROOFING FABRICS.
- CAREY WATERPROOFING ASPHALTS.

Also Carey Fabricated Membrane; Carey Preformed Membrane System of Waterproofing.

For expansion Joints, see page 571; for Built-up Roofing, see pages 1042-1045; for Asphalt Shingles, see page 1101; for Pipe Coverings, see pages 2280-2281.

Experience and Facilities

Established in 1873, THE PHILIP CAREY COMPANY has enjoyed over a half century of continuous growth. Our Waterproofing Engineers are at your command. Complete information, specifications and estimates gladly furnished on request.



Applying Carey Percoproof Dampproofing Compound to the Outside of Foundation Walls

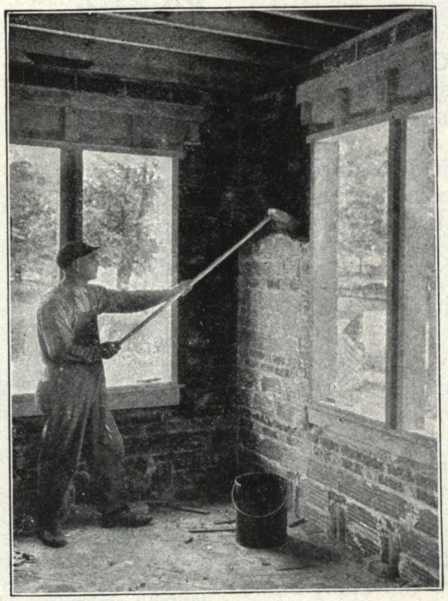
Carey Percoproof Dampproofing Compound

Two coats of Carey Percoproof Dampproofing Compound form an ideal dampproofing to be applied to the outside of foundation walls. The cost is far exceeded by the advantages of having a dry comfortable basement.

Percoproof is a black liquid material carefully and uniformly made by the fusion of select waterproofing gums. It comes ready for use and is applied similar to paint. The covering capacity averages about 100 sq. ft. per gallon. Use Carey Dampproofing Specifications "C."

Carey Percoproof Plaster Bond

Is applied to the rough hollow tile, immediately upon which the plaster is applied without the use of furring or lathing. It is a bituminous dampproofing compound, black in appearance and of a thin brushing consistency, so that it penetrates the pores of the concrete, brick, stone or tile walls forming a barrier to the filtration of any dampness and thus preventing hideous plaster stains. Use Carey Dampproofing Specification "B."



Applying Carey Percoproof Plaster Bond Prior to Plastering

Carey Waterproofing Felts

These materials are high grade asphalt saturated rag felts.

A waterproof membrane built up of waterproofing felts according to our specification forms a flexible, economical and permanent application.

Carey Waterproofing Asbestos Felts

These felts are especially applicable to waterproofing floors in chemical plants and mill construction on account of their acid, alkali and fire resisting qualities.

Carey Waterproofing Fabrics

These materials are made from 100% pure cotton fabrics thoroughly saturated with a flexible asphaltic compound so as to insure an extremely high tensile strength with a reasonable percentage of stretch. They are applicable in waterproof membranes for railroad bridges and other structures where expansion and contraction or vibration are excessive.

Carey Dampproofing Specification "B" (for Dampproofing the Interior Surfaces of Outside Masonry Walls, Prior to Plastering)

(1) **Work Included**—This specification contemplates furnishing all materials and labor required to properly apply Carey Percoproof Plaster Bond to the interior of all outside brick or masonry walls above ground level, prior to plastering.

(2) **Work Not Included**—This specification does not include pointing up masonry or plastering and cementing of any kind. All cracks, holes and voids shall be carefully filled with portland cement mortar, prior to applying Carey Percoproof Plaster Bond. Twenty-four hours after applying Carey Percoproof Plaster Bond the plaster may be applied.

(3) **Materials**—1 coat Carey Percoproof Plaster Bond, 1½ gals. per 100 sq. ft.

(4) **Application**—After all cracks, holes and voids have been filled carefully with portland cement mortar, and the wall is perfectly dry and free from any foreign matter that would interfere with the penetration or bonding qualities of the dampproofing coat, Carey Percoproof Plaster Bond shall be applied uniformly, with a good bristle brush, to the interior of outside masonry walls from grade level to roof.

In cases where the Carey Percoproof Plaster Bond can not be applied to the walls continuously through the floor construction, it shall be applied back on the ceiling for at least 12 in. from the wall.

Continued on next page

Carey Percoproof Plaster Bond shall be applied behind window casings and to all cut-outs and recesses in the wall.

A second coat of about 1 gal. per 100 sq. ft. shall be applied to all very absorbent portions of the wall only.

Carey Dampproofing Specification "C" (for Dampproofing the Outside of Foundation Walls, Concrete Bridges, Abutments, Culverts, Retaining Walls and Other Structures Below Ground Level)

(1) **Work Included**—This specification contemplates furnishing all materials and labor required to properly apply Carey Percoproof to the outside of all foundation walls below ground level.

(2) **Work Not Included**—This specification does not include pointing up masonry or cementing of any kind. All cracks, holes and voids should be carefully filled with portland cement mortar, and the surface shall be thoroughly cleaned and shall also be smooth and sufficiently dry to obtain good adhesion prior to applying Carey Percoproof.

Drain tile may be laid around the footings.

(3) **Materials**—1 coat Carey Percoproof 1½ gal. per 100 sq. ft.; 1 coat Carey Percoproof 1 gal. per 100 sq. ft.

(4) **Application**—After all cracks, holes and voids have been filled carefully with portland cement mortar, and the foundation wall is perfectly dry and free from any foreign matter that would interfere with the penetration or bonding qualities of the dampproofing coat, Carey Percoproof shall be applied uniformly with a good bristle brush to the outside of foundation walls from footings to ground level.

Not less than twenty-four hours after applying the first coat of Carey Percoproof a second coat shall be applied.

Carey Waterproofing Specification No. 32 (for General Waterproofing)

(1) **Work Included**—This specification contemplates furnishing all materials and labor to properly apply the built-up waterproof membrane to (*state here surfaces to be waterproofed*) below ground or water level.

(2) **Work Not Included**—This specification does not include pointing up the concrete, brick, stone, tile, masonry or cementing of any kind. All cracks, holes and voids shall be carefully filled with portland cement mortar. The surface shall be thoroughly clean and shall also be smooth and sufficiently dry to obtain good adhesion prior to applying the Primer.

(3) **Materials**—Carey Waterproofing Primer (1 gal.) 9 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 50 lbs. per 100 sq. ft.; Carey Waterproofing Felt, 15 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey Waterproofing Felt, 15 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey Waterproofing Felt, 15 lbs. per 100 sq. ft. and Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft. Total approximate weight per 100 sq. ft. to be 179 lbs.

(4) **Application**—Carey Waterproofing Primer shall be applied uniformly and thoroughly brushed in. When the primer has dried to a slight tacky state the surface shall be mopped with Carey Waterproofing Asphalt No. 114, into which, while still hot, shall be embedded the first sheet of Carey Waterproofing Felt. The successive sheets of felt shall overlap the previous sheet 25 in., making eight courses of asphalt and felt, including the primer. All the sheets of felt shall be solidly cemented together with asphalt so that at no place shall felt touch felt.

Reinforce all angles at corners, walls, etc., by cementing with Carey Waterproofing Asphalt No. 114 applied hot, into which shall be embedded one thickness of 15-lb. Carey Waterproofing Felt cut to extend at least 6 in. each way from the angle. Two such sheets shall be applied—one immediately after applying the primer, and another after the membrane is completed.

Carey Waterproofing Specification No. 33 (for Waterproofing Floors in Mill Construction, Alkali, Acid and Fire Resistant)

(1) **Work Included**—This specification contemplates furnishing all materials and labor to properly apply the built-up waterproof membrane to the wood floors in mill construction.

(2) **Work Not Included**—All knotholes and open cracks shall be tightly sealed. The floor shall be made free from splinters and nails before applying the waterproofing. Over the membrane shall be laid a second flooring and the flashings on the walls shall be covered with baseboards.

(3) **Materials**—Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey 35-lb. Waterproofing Asbestos Felt, 35 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey 15-lb. Waterproofing Asbestos Felt, 15 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey 15-lb. Waterproofing Asbestos Felt, 15 lbs. per 100 sq. ft. and Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.

(4) **Application**—The clean dry base floors shall be mopped with Carey Waterproofing Asphalt No. 114, into which, while still hot, shall be embedded sheets of 35-lb. Carey Waterproofing Asbestos Felt lapped 2 in. Over this shall be applied 2 plies 15-lb. Carey Waterproofing Asbestos Felt overlapping one another 19 in. and also embedded in hot asphalt No. 114.

Reinforce all angles at corners, walls, etc., by cementing with Carey Waterproofing Asphalt No. 114 applied hot, into which shall be embedded one thickness of 35-lb. Carey Waterproofing Asbestos Felt cut to extend at least 6 in. each way from the angle. Two such sheets shall be applied—one prior to applying the first sheet, another after the membrane is completed. A finishing coat of Carey Waterproofing Asphalt No. 114 shall be applied over the entire membrane.

Carey Waterproofing Specification No. 35 (for Waterproofing Bridges and Structures Where Expansion and Contraction Are Excessive)

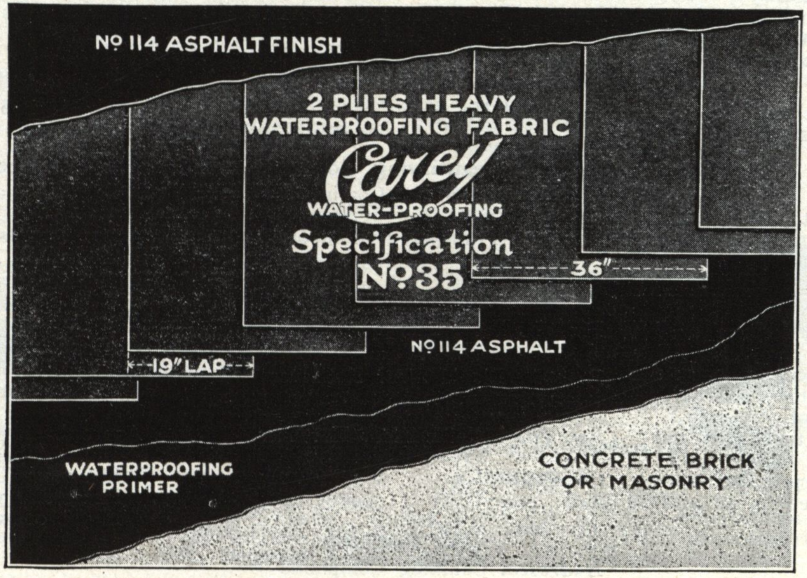
(1) **Work Included**—Use paragraph 1 Specification No. 32.

(2) **Work Not Included**—Use paragraph 2 Specification No. 32.

(3) **Materials**—Carey Waterproofing Primer (1 gal.), 9 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 50 lbs. per 100 sq. ft.; Carey Heavy Waterproofing Fabric, 11 lbs. per 100 sq. ft.; Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.; Carey Heavy Waterproofing Fabric, 11 lbs. per 100 sq. ft. and Carey Waterproofing Asphalt No. 114, 25 lbs. per 100 sq. ft.

(4) **Application**—Carey Waterproofing Primer shall be applied uniformly and thoroughly brushed in. When the primer has dried to a slight tacky state the surface shall be mopped with Carey Waterproofing Asphalt No. 114, into which, while still hot, shall be embedded the first sheet of Carey Heavy Waterproofing Fabric. The second sheet of Carey Waterproofing Fabric shall overlap the previous sheet 19 in. and also be embedded in hot asphalt No. 114 so that at no place shall fabric touch fabric.

Reinforce all angles at corners, walls, etc., by cementing with Carey Waterproofing Asphalt No. 114 applied hot, into which shall be embedded one thickness of Carey Waterproofing Fabric cut to extend at least 6 in. each way from the angles. Two such sheets shall be applied—one immediately after applying the primer and another after the membrane is completed. A finishing coat of Carey Waterproofing Asphalt No. 114 shall be applied over the entire membrane.



CONCRETE WATERPROOF PAINT CO.

Waterproofings, Dampproofings, Floor Hardeners and Technical Paints

EXECUTIVE OFFICES
829-835 North 3rd Street, PHILADELPHIA, PA.

Products

Hydroseal Bitumastic Coatings; Penetrite Integral Waterproofings; Penetrite Floor Hardeners and Coatings; Masonry Coatings.

Below is a list of the specific materials for the average conditions.

Advantages

Years of specialized experience has taught us that the *proper application* is no less important than the use of the highest quality materials. This has led to the maintenance of reliable men with experience pertaining to the application of waterproofing and dampproofing materials.

In using our materials we co-operate with the architect to see that he receives the results that he desires, as well as to see that the material is being applied correctly.

Our liquid materials such as Hydroseals, Kling-Koat Cement Coating and Penetrite Transparent Waterproofing Compound, are applied by spray under 80-lb. pressure. This method insures the Hydroseal, etc., penetrating the surfaces by force, and at the same time gives the surface a coating, making a perfect plaster bond, dampproof coating or waterproofing.

The many prominent buildings on which our materials have been used successfully are permanent testimonials of the quality of our materials and our knowledge of waterproofing.

HYDROSEAL KEEPS DRY
PENETRITE
TRADE-MARKS

Policy

After more than ten years' experience in manufacturing waterproofing materials we are convinced that they should be made only of the highest quality.

From the time we started we adopted the policy of making the very best possible materials. Regardless of competition we have maintained the highest standard of our materials. *Due to our quantity production you can obtain the greatest possible value.*

Our customers appreciate that it does not pay to jeopardize the entire result of the work when the proportionate cost of the waterproofing materials is practically a few per cent of the entire contract. *We have never sacrificed the high quality of our products to meet competition.*

When you use materials manufactured by the Concrete Waterproof Paint Co. you are insuring yourself against unsatisfactory results.

Brands, Uses and Specifications

Purposes	Material	Specifications
	For Dampproofing and Waterproofing Concrete, Brick and Cement	
To dampproof exposed walls to be plastered—unfurred or furred with hollow brick or furring tile	*Hydroseal* No. 330	Coat the interior of all exposed walls 1 coat, and, if necessary, 2
To prevent surface infiltration and dampness in basements and cellars	*Hydroseal* No. 640	Apply 2 heavy continuous coats
To prevent and resist severe conditions of dampness and water below sublevel	*Hydroseal* No. 640, in conjunction with canvas, felt or cheesecloth	Apply No. 640, and canvas, etc., alternately 3 to 5-ply until the hydrostatic pressure is equalized
To render waterproof by physical mixture with concrete and cement	*Penetrite* Integral Waterproofing Paste	For ordinary work add 1 gal to 32 gal. of water
	Penetrite Integral Waterproofing Powder	Use 2 lb. to a bag of cement; under most severe conditions 3 lb.
Used as an integral waterproofer, an integral hardener, as well as an anti-freeze	*Conwatco Mix*	When using Conwatco Mix as an anti-freeze and waterproofer use 1 gal. to 15 gal. of gauging water
	For Stainproofing Limestone and Marble	
For the protection of limestone, marble, etc., against stain caused by the cement through surrounding masonry	*Hydroseal* No. 309	Apply to all unexposed sides of stone, 1 continuous coat
To prevent water penetration through old walls of stucco, cement faced brick or stone by an exterior application	*Penetrite* Transparent Compound	Apply 2 coats after having pointed all joints
	For the Protection of Metal	
For prevention against electrolysis and corrosion of exposed structural steel	*Hydroseal* No. 352	Apply 1 shop coat, to be followed by a field coat
	For Waterproofing and Beautifying Concrete and Plaster Surfaces	
To beautify and protect exterior walls of brick, stucco cement, and concrete	*Kling-Koat* Cement Coating (flat and gloss)	Applied like paint, 2 coats
To prevent water penetration through old walls of stucco, cement faced brick or stone by an exterior application	*Penetrite* Transparent Compound	Apply 2 coats after having pointed all joints
	For Treatment of Floors	
To prevent the dusting and abrasion of concrete floors	*Penetrite* Floor Finish	Apply 1 coat primer and 2 coats finish. Allow 24 hours between applications
For application after cement or concrete floor is laid. Makes the floor hard, dustproof and waterproof	*Penetrite* Liquid Floor Hardener	One application is all that is necessary if the condition is not severe
Mixed with the cement to harden and waterproof	*Penetrite* Metallic Floor Hardener	Approximately 20 lb. to a sq. ft. in the 1-in. top coat
Used as an integral waterproofer, an integral hardener, as well as an anti-freeze	*Conwatco Mix*	When using Conwatco Mix as an anti-freeze and waterproofer use 1 gal. to 15 gal. of gauging water
	For Caulking	
	Hydroseal Caulking Compound	

THE ELATERITE PAINT & MANUFACTURING CO.

Waterproofing and Bonding Materials

DES MOINES, IOWA

EASTERN DISTRIBUTERS

ELATERITE PRODUCTS CORPORATION

NEW YORK, N. Y.: 22 East 17th Street—Telephone Stuyvesant 9084

BOSTON, MASS.: Room 819, 6 Beacon Street—Telephone, Haymarket 3346

Products

No. 60 Des Moines Elaterite for Cement Waterproofing and Bonding; No. 65 Des Moines Elaterite for Stone Backing.

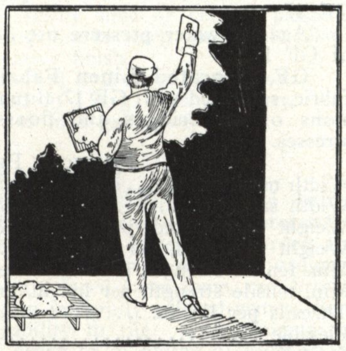
DES MOINES ELATERITE

TRADE-MARK

Also manufacturers of Preservative Paints for all classes of surfaces, including Acid Resistant Paint, Boiler, Stack and Gas Holder Paint, Metal Protective Paint.

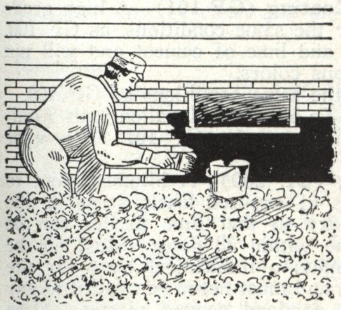
No. 60 Cement Waterproofing and Bonding

No. 60 Des Moines Elaterite is both a waterproofing and a bonding material. Its base is an intensely adhesive, extremely elastic, non-porous, acid resisting, absolutely waterproof hydrocarbon known as "mineral rubber." It seals the pores of cement, brick or stone, destroys capillary attraction and provides a continuous film which completely shuts out dampness. In addition its intensely adhesive quality makes it an ideal bonding material permitting the direct application to it of plaster or stucco coats.


Applying Plaster Coat Directly to "Des Moines Elaterite" Waterproofing and Bonding Coat

Uses—For waterproofing all brick, stone and cement surfaces and as an integral waterproofing to be mixed in concrete or cement mixtures and for bonding plaster, stucco, tile, linoleums, etc.

Advantages — Intensely adhesive, permanent character; extreme resistance to all acids, preventing disintegration; permanent pliability and elasticity, preventing breaking of the waterproof film from hair cracks or expansion and contraction; smooth liquid character, providing a continuous, rubbery blanket; absolute waterproof character, sealing the surface against passage of dampness; combination of waterproofing and bonding, permitting doing away with lath or furring, economizing room and saving in labor and material costs; it meets every waterproofing requirement, thus there is no need to specify a different material for outside foundations, inside walls, basement floors or bonding.


Applying "Des Moines Elaterite" to Outside of Foundation Wall

Application—Applied cold, it spreads rapidly with broad flat brushes or may be applied with an air gun or spray. No hot swabbing or layers or felt required and any workman can apply it.

Covering Capacity—100 to 150 sq. ft., (one coat) per gal. or from 80 to 100 sq. ft. (two coats) on cement, brick or stone, depending on porosity; 250 to 300 sq. ft. on wood or metal.

Specifications—(*a*) *For Waterproofing Substructures*—The waterproofing contractor shall apply a waterproof membrane of No. 60 Cement Waterproofing and Bonding, Des Moines Elaterite, manufactured by The Elaterite Paint & Manufacturing Co., Des Moines, Iowa, to the outside of all foundation walls to a point 6 in. above grade, including piers, and to be carried over all footings and properly joined to waterproofing course on outside walls. Membrane to consist of 2 coats properly applied so there shall be no pinholes or uncovered spaces. At least 24 hr. must elapse after the application of first coat before applying a heavy second coat, allowing it to dry thoroughly before covering. Walls shall be cleaned thoroughly to remove all loose particles, must be dry and, if of concrete, thoroughly set before applying No. 60 Cement Waterproofing and Bonding, Des Moines Elaterite.

Where textile membrane is desired, first apply a coat of No. 60 Cement Waterproofing and Bonding, Des Moines Elaterite, over clean, dry surface; then a layer of open mesh cotton fabric to withstand 90 lb. pressure per sq. in. Over this apply as many layers of No. 60 Des Moines Elaterite and open mesh cotton fabric as may be needed to insure against the water pressure.

(*b*) *For Dampproofing Interior Walls Which Are To Be Plastered, or for Waterproofing Exterior Walls Which Are To Be Stuccoed*—The contractor is to apply 2 coats of No. 60 Cement Waterproofing and Bonding, Des Moines Elaterite, manufactured by The Elaterite Paint & Manufacturing Co., Des Moines, Iowa, over the inside surface of all exterior walls which are to be plastered, and outside surface of all walls which are to be stuccoed. The walls are to be clean and dry and the application to be so made that there shall be no pinholes or uncovered spaces. At least 24 hr. must elapse between the application of the first and second coat, which is to be a heavy coat.

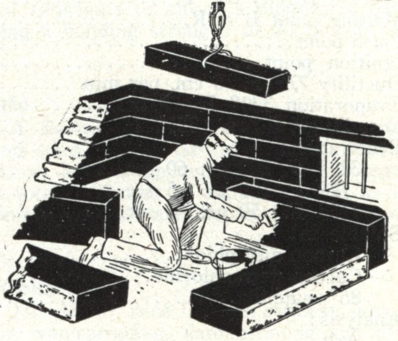
Plaster is to be applied directly over the coating of No. 60 Des Moines Elaterite, after the second coat is "set" but while it is still "tacky," though not sooner than 3 hr. after the second application, nor longer thereafter than 30 days. Stucco is to be applied directly over the coating of No. 60 Des Moines Elaterite while it is "tacky," but not sooner than 3 hr. after application of the second coat nor longer thereafter than 10 hr.

The waterproofing and bonding coats may be applied with air gun or spray, if contractor prefers.

(*c*) *For Integral Waterproofing Use*—All concrete, stucco or cement mortar which is to be waterproofed shall have No. 60 Cement Waterproofing and Bonding, Des Moines Elaterite, manufactured by The Elaterite Paint & Manufacturing Co., Des Moines, Iowa, in the proportion of 1 part of No. 60 Des Moines Elaterite, to 4 parts of water. The No. 60 Des Moines Elaterite is to be added to the mixture in the foregoing proportion immediately after the water has been stirred in, and then the mixing is to be continued until there is a complete and thorough distribution throughout the mixture.

No. 65 Stone Backing

Specification—All stone to be coated, before setting, on the 5 unexposed sides; also entire inner surface, including joints, to be coated after the stone is set with No. 65 Stone Backing, Des Moines Elaterite, as manufactured by The Elaterite Paint & Manufacturing Co. of Des Moines, Iowa.


Protecting Stone Facing from Discoloration with "Des Moines Elaterite"

Prices and References

These will be gladly sent on request.

THE GENERAL FIREPROOFING BUILDING PRODUCTS

Waterproofing and Dampproofing Products and Technical Paints

YOUNGSTOWN, OHIO

For Branch Offices, see page 406

Products

Waterproofings, Integral and Membrane; Dampproofings, above and below grade; Roofings, built-up membrane and plastic; Cement Accelerators and Frost Preventives; Floor Hardeners and Preservatives for cement or wood, integral, plain and colored, and after-treatments; Steel and Iron Paints; Acidproofings; Bonding Compound; Timber Preservative; Oilproofing.

For Metal Lath and Reinforcement, see pages 406-410.

Waterproofings, Integral

GF Waterproofing Paste (GF 10)—An ammonium stearate paste used in the gauging water for densifying and waterproofing all kinds of concrete and cement work.

For mass concrete, 1:2:4 or 1:2½:5, mix 1 gallon GF 10 in every 34 gallons of water.

For cement floors, mortar, plaster or stucco, 1:2 or 1:2½, mix 1 gallon GF 10 in every 17 gallons of water.

GF Waterproofing Powder (GF 11)—This product is the same as the water repellant material formed by the combination of GF 10 with cement in concrete and cement work.

For all work mix, dry, 2 pounds of GF 11 with each bag of cement. Especially suitable for cast stone, cement blocks, and other similar work where a minimum of water is used.

GF Cement Accelerator (GF 12)—A colorless liquid to be mixed with the gauging water. It accelerates the set of cement so that concrete and cement work in 2 days is as hard, throughout its thickness, as ordinary work in 30 days. It raises the temperature of the mass and lowers the freezing point of water, so that it becomes a frost preventive, thereby eliminating the necessity of heating water, aggregates or finished work. It densifies the mass and makes cement work waterproof.

As an accelerator, it requires 1 gallon of GF 12 per barrel of cement, being mixed, for cement work, 1 gallon of GF 12 to 10 gallons of water.

As a frost preventive, the lowest temperature for the next two hours after placing the work must be anticipated and the GF 12 mixed with the gauging water in the following proportions:

Anticipated Temperature	Mixture
29° F.	1 gal. GF 12 to 10 gal. water
24° F.	2 gal. GF 12 to 10 gal. water
17° F.	3 gal. GF 12 to 10 gal. water

Waterproofings, Membrane

GF Bitumen (GF 17)—A high grade pure bitumen to be melted and used hot, with either GF 18 Waterproof Felt or GF 21 Saturated Fabric. Remains elastic at zero and will not run or slide at 140° F.

Physical Properties

Weight per gallon	8.33 lb.
Specific gravity 60° F.	1.012
Melting point B & R	195° F.
Flash point	465° F.
Ignition point	570° F.
Ductility 77° F. 5 cm. per min.	3 cm.
Evaporation 320° F. 7 hrs.	0.09%
Loss 20 gr. 5 hrs. 325° F.	0.13%
Penetration:	
320° F. 200 gr. 60 sec.	18
77° F. 100 gr. 5 sec.	28
115° F. 50 gr. 5 sec.	51
Soluble in:	
Carbon disulphide	99.84%
Carbon tetrachloride	99.82%
86° naphtha	68.32%
Analysis:	
Ash	Trace
Sulphur	2.2%
Paraffin	0.7%
Coal tar	None

Quantities Required

2-ply work.	13 gal. per 100 sq. ft. of surface
3-ply work.	17 gal. per 100 sq. ft. of surface
1 mop coating.	5 gal. per 100 sq. ft. of surface

On concrete it is better to use first a priming coat of GF 16 to give proper bond and penetration to the GF 17.

GF Waterproof Felt (GF 18)—A strong, bitumen-saturated felt, made of wool stock with linen and wood fiber, weighing 15 pounds per 100 square feet, single-ply. Each fiber is coated and impregnated with bitumen. Used with GF 17 Bitumen in alternate layers of GF 17 and GF 18 to form a built-up membrane waterproofing.

For ordinary work use 2 plies of GF 18 and 3 coats of GF 17.

Against water pressure use 3 plies of GF 18 and 4 coats of GF 17.

GF Saturated Linen Fabric (GF 21)—A cotton duck fabric, saturated with GF 17 Bitumen. For use in deep foundations or on bridges and floors subject to vibration and stresses.

Physical Properties

Width unsaturated	37 in.
Width saturated	36 in.
Weight unsaturated, per sq. yd.	5 oz.
Weight saturated, per sq. yd.	14 oz.
Min. tensile strength per lin. in. lengthwise	70 lb.
Min. tensile strength per lin. in. crosswise	50 lb.
Threads per lin. in.	24
Flexible	0-250° F.
Stretch	10%

Use 2 plies of GF 21 and 3 coats of GF 17.

Dampproofings

GF Brush Coating (GF 16)—A pure bitumen paint, applied cold as a brush coating to the exterior faces of walls below grade, and on concrete underbed below wood floors and sleepers. Applied in 1 coat, afterwards touching up any bare spots. Never use any kind of brush coating on the interior of a wall below grade. Use portland cement plaster with GF 10.

GF Mastic Cement (GF 250)—A heavy plastic coating, applied cold with a trowel for the same uses as GF 16.

Can be applied to damp surfaces, such as newly built concrete walls where it is desired to proceed with the backfilling at once. Also as a dampcourse across footings or over tops of foundation walls, turning up 6 inches on inside faces of walls.

Made also in colors for use in calking around window frames, and pointing up joints and cracks in masonry or stucco.

GF Transparent Waterproofing (GF 100)—A transparent, pore filling liquid containing 38% of waterproofing elements, which remain, as a water repellant filling, after the volatile vehicle has evaporated. For waterproofing exposed exteriors of brick, stone, stucco or concrete, and interiors of tanks and reservoirs. Prevents efflorescence and staining or discoloring. Must not be applied when temperature of the surface is below 60° F.

To be applied in 2 coats at intervals of 24 hours, all open joints and cracks being first pointed up with GF 250 Colored.

GF Brick and Cement Coating (GF 101)—A high grade paint for the same uses, under the same conditions, as GF 100. It is unaffected by the alkalis and lime of cement and will not crack or peel. Made in various colors.

Applied in 2 coats under the same conditions as GF 100.

GF Thinner (GF 101)—To be mixed 1 gallon with 5 gallons GF 101, to form a priming coat for GF 101, on new or absorbent surfaces.

GF Dampproof Coating (GF 200)—A bitumen paint to be applied to interior surfaces of exposed brick, stone or tile walls above grade. Dries tacky so that lime plaster can be applied directly to it any time within 30 days. Must not be applied to cement surfaces, unless a mechanical bond for the plaster is obtained by chipping, and must never be applied to any surface intended to receive a portland cement plaster. (Use GF 10 integrally.)

Applied cold with a brush, so that surface is black and shiny, giving all bare spots a second coat.

Continued on next page

Analysis

Gravity at 60° F.	20°
Specific gravity at 68° F.	0.957
Non-volatile components consisting of pure bitumen (Gilsonite 20%)	60%
China wood oil and volatile vehicle consisting of a distillate of a bitumen base	40%
Coal tar or pitch	None

GF Stainproof Backing (GF 220)—A bitumen paint to be applied cold to the built-in parts of all cut stone, to prevent staining and discoloration through penetration of alkalis and moisture from the masonry.

Analysis

Bitumen	60%
Volatile vehicle	40%
Coal tar or pitch	None

Applied cold with a brush, either at the yard or on the ground, touching up all bare spots just before building in.

GF Crystalrox (GF 145)—A fine white powder to be dissolved in water and applied to the exposed faces of all cut stone, marble or cement work, to harden the surface and prevent stains and discolorations.

Also for application to freshly lime or cement plastered walls, to interpose a neutralizing film between the caustic alkalis of the surface and the decorative finish.

Dissolved in water and applied in 2 coats as follows:

1st coat—2 pounds GF 145 in 1½ gallons of water.

2nd coat—2 pounds GF 145 in 1 gallon of water.

Floor Hardening and Preserving

GF Cement Accelerator (GF 12)—Described before under Waterproofings. Used in the mixing water in proportion of 1 gallon of GF 12 to 10 gallons of water will harden and set the floor throughout its thickness in 2 days, as ordinary work in 30 days. Made also in colored paste form, red, brown, buff, gray and green to make an integrally colored cement floor equal in appearance and durability to tile. Use minimum of ½ gallon of red, 1 gallon of green or ¼ gallon of each of the other colors per bag of cement, increasing these quantities if a deeper color is desired.

GF Metallic Hardener (GF 140)—Pure iron particles properly graded and specially treated to become temporarily non-absorbent. To be mixed dry with equal weight of cement and troweled on to the surface of a cement floor at time of laying. Use 15, 25 or 30 pounds of GF 140 per 100 square feet of surface, according to severity of wear.

GF Crystalrox (GF 145)—A colorless powder to be dissolved in water and applied in 2 coats to the set up surface of an old or new cement floor.

1st coat—2 pounds GF 145 in 1½ gallons of water.

2nd coat—2 pounds GF 145 in 1 gallon of water.

This gives a 17% solution of chemical hardener over every foot of surface. Floors can be used between applications.

GF Floor Enamel (GF 155)—A colorless or colored cement floor paint containing a minimum of pigment, just sufficient to hide or cover any stains or discolorations of the surface, being unaffected by the alkalis of cement. Applied in 2 coats with an interval of 24 hours between. Very dusty, porous floors or floors laid directly upon the ground should first receive a priming coat of GF 155 Transparent. Made in colorless, red, brown, gray and green.

GF Wood Floor Preservative (GF 160)—A highly wear resistant transparent oil filler and finish combined, for either hard or soft wood floors, that is unaffected by water, oils, alkalis, etc. Prevents dry rot, shrinkage and splintering. Gives an eggshell, gloss finish, that can be varnished, waxed or polished. One coat sufficient for years of constant wear. Surfaces must be clean and dry.

Roofings

Membrane GF 17, GF 18, and GF 21—Described previously under Waterproofing. Use 3 plies of GF 18 Felt, each stuck and coated with hot GF 17 Bitumen, using altogether 17 gallons of GF 17 per 100 square feet of surface, or, 2 plies of GF 21 Fabric similarly stuck and coated with GF 17, using altogether 13 gallons of GF 17 per 100 square feet of surface. If the GF 21 is turned up 6 inches on parapet walls, etc., no metal flashings will be required.

Plastic GF Mastic Cement (GF 250)—Previously described under Dampproofing. To be applied cold with a trowel to any kind of new or old roof surface, forming a tough, elastic waterproof coating, that will be unaffected by the elements. In all cases, except tin or metal, apply first a brush coat of GF 250 Primer. Form 6 or 8-inch flashings of GF 250 on all parapet walls, etc. If roof is to be walked on, cover with a single layer of GF 18 Felt.

GF Primer (GF 250)—A brush coating to be applied cold to all porous surfaces as a primer for GF 250 Mastic Cement.

GF 250 Brush Coating—A brush coating, containing asbestos fiber and of a similar nature to GF 250 Mastic Cement, to be used cold for recoating and repairing all kinds of built-up membrane roofings.

GF 250 Colored—A trowel coating, for the same purpose as GF 250 Mastic Cement, made in brown, red, gray, buff and green.

Coatings for Structural Steel, Iron and Timber

Steel and Iron—***GF 300 Steel Coating***—A shop coating for structural steel, composed of zinc and lead chromates with Jellatung rubber resin and China wood oil, forming a rust inhibitive, elastic, protective coating; 1 coat to be applied before assembling and a second coat after riveting is completed. If a colored finish is desired for exposed work, such parts to receive a final coat of GF 300 after erection.

GF Alkali Coating (GF 325)—A bitumen paint containing only 34% of volatile vehicle. To be used over GF 300 as a final coat on structural steel embedded in masonry or exposed to the weather. Insulates and prevents electrolytic action.

GF Galvanic Primer (GF 350)—A transparent coating that penetrates the greasy film left by the galvanizing process, bonds to the iron and forms a bond for any ordinary linseed oil paint. Applied in 1 coat to a clean, dry surface.

Timber—***GF Timber Preservative (GF 550)***—A combination of creosote, zinc salts and copper, for application to structural timbers to be embedded in earth or masonry, or exposed to the elements. Prevents dry rot and disintegration from heat, cold, dampness, oils, insects and fungi. Applied cold as a brush coating or by dipping.

GF Wood Preservative (GF 160)—Described previously under Floor Hardening and Preserving. By combining with the natural saps of the wood it protects them against drying out or rotting away, which causes shrinkage cracks in trusses, posts and other structural members.

Applied in 1 coat to a clean, dry surface.

Acidproofings

GF Acidproofing (GF 99)—A transparent brush coating to be applied to any structural surface, forming a durable film that renders the surface immune to the action of acetic acid, alcohol, alkalis, ammonia, blood, caustic soda 50%, disinfectants, ensilage, garbage, hydrochloric acid 25%, lactic acid, live steam, malic acid, molasses, muriatic acid, oxalic acid, picric acid 25%, septic fluids, sewage, smoke, sodium chloride, sugar, tannic acid, wine.

GF Bitumen (GF 17)—Previously described under Waterproofings. Applied hot to protect against alum, ammonia, hydrofluoric acid, hydrochloric acid, mineral acids and dilutes, nitric acids, picric acid, sulphuric acid.

GF Crystalrox (GF 145)—Previously described under Floor Hardening and Preserving. Dissolved in water and applied in 2 coats to protect concrete and cement work against creosote, lactic acid, malic acid, molasses, sugar.

GF Bitumen Paint (GF 220)—Previously described under Dampproofing. Applied cold with a brush to protect against acetic acid, mineral acids and dilutes, cyanides.

Bonding Concrete

GF Bonding Compound (GF 400)—A combination of chemicals, forming a powerful acid powder to be dissolved, 2 pounds of GF 400 in 1 gallon of water, and applied to any concrete or cement surface, floor or walls, to open the pores and expose fresh cement and aggregate to afford a monolithic bond for new work; developing a bonding strength of 80 pounds per square inch.

Oilproofing Concrete

GF 140 Special—A finely ground pure iron powder for mixture with cement and sand, 1 part GF 140 special, 3 parts cement, 1½ parts sand; to be wet up and applied in 2 coats, scratch and finish, to a total thickness of about ½ inch, as an oilproof, plaster coat finish, to walls and floors of concrete oil storage tanks.

Service and Handbooks

The Waterproofing Handbook, sent free on request, covers all ordinary problems in waterproofing, dampproofing and preservation of different parts of building construction. We also maintain a Waterproofing Service Department at Youngstown, Ohio, whose advice and assistance are supplied without cost or obligation.

A. C. HORN COMPANY

Chemical Products for the Conservation of Building Materials

Room 505, Horn Building
LONG ISLAND CITY, N. Y.

BRANCH OFFICES

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AGENCIES LOCATED IN PRINCIPAL CITIES OF UNITED STATES, CANADA, SOUTH AMERICA AND AUSTRALIA

The Names of our Distributers and the nearest Points of Distribution will be given on request

Products

Hydratite Integral Waterproofings for concrete; Dehydratine Dampproofing Compounds; Symentrex Cement Paint for concrete; Koncrex Cement Paint for floors; Vulcatex Calking Compound for windows and joints; Horn's Cement Colors for coloring cement, concrete and stucco; Hornstone Crystals for dustproofing cement floors; Ferro Fax Metallic Integral Hardener; Tripleflex Cotton Fabric for membrane waterproofing.

Also Kopper Karbol Wood Preservative; China Flat Wall Paints; Bondsit for Bonding Old and New Concrete.

Service

We have a waterproofing engineering staff that designs materials and methods for unusual situations, offered gratis to engineers, architects and contractors. *An architect's folder, containing specifications on individual sheets,* offered free on request.

Hydratite Integral Waterproofing Compound

A compound to be mixed with cement to make permanently watertight concrete mixtures. Made in paste and powder form. Paste is a white, smooth material to be dissolved in gauging water and distributed by it through the concrete or cement mortar. In mass concrete, use 1 part to 33 parts of water; in cement plaster and stucco work, 1 part to 17 parts of water.

Dehydratine No. 1 Dampproof Brush Coating

A black coating of paintlike consistency to be applied to interior surfaces of brick, stone or terra cotta walls; it dampproofs and insulates the walls.

Dehydratine No. 10 Dampproof Trowel Coating

A black plastic mass that produces a film of definite thickness. Fills voids and openings left in masonry construction, and is consequently very effective and foolproof. It waterproofs the interior of superstructural walls with a plastic coating impervious to water; insulates the walls against heat, cold and sound; eliminates furring and lathing. Gypsum plaster may be applied directly over this coating.

Dehydratine No. 2 Transparent Exterior Waterproofing Brush Coating

A transparent liquid for dampproofing and reducing the porosity of brick, stone, stucco, masonry or concrete surfaces. It is applied with a brush and has a high penetrating capacity, thereby completely filling the pores and preventing absorption. It is applied on the outside of the building only.

Dehydratine No. 3 Stone and Trim Stainproofing Backing

A specially prepared, quick-drying, black, brush coating to be applied on all unexposed surfaces of cut stone or of wood trim.

Vulcatex Calking Compound

Vulcatex is a permanently elastic material, unaffected by the changes in temperature: Is unexcelled for calking windows, pointing up terra cotta and masonry joints, and for expansion joints in floors. It is made in black, buff, gray, red, brown and green.

Hornstone Crystals

A chemical floor hardener composed of mineral salts, dissolved in water. It is flushed over cement floors, producing a harder, more compact and dustless surface, that is proof against absorption of all liquids for all time. It can be used on old or new floors.

Ferro Fax Metallic Floor Hardener

A ground metallic aggregate and hardener introduced into the top surface of cement floors when laid, and mixed with cement finish coat or topping. Ferro Fax insures a smooth, hard, dense surface that withstands severe traffic. Furnished in gray, black, red or green.

Symentrex Brick, Cement and Masonry Coating

Symentrex is a cementitious coating for dampproofing and making uniform concrete, stucco, brick and masonry exterior walls. Also used on the interior of cement or brick walls. A flat finish, it amalgamates with the material and provides a waterproof and artistic durable finish. Made in white and all colors.

Tripleflex Fabric

A specially woven cotton fabric, completely saturated with a pure bitumen, used for membrane systems of waterproofing.

Horn's Cement Colors for Concrete and Cement

These colors are high grade metallic oxides, and have great tinctorial strength. They are alkaliproof, and are not affected by the actinic rays of light. A small percentage of these colors will permanently color cement for floors and mortar coloring.

Dehydratine No. 80 Liquid Integral Cement Accelerator, Antifreeze Compound and Hardener

A liquid compound to lubricate, harden and permanently strengthen cement, mortar and concrete mixtures. Cuts the time and labor by accelerating the set of cement. In freezing weather, it acts as an Antifreeze, makes cement mortar more "fatty" and increases the bond in masonry work. It is mixed in the gauging water.

Koncrex Liquid Protective Coating for Cement Floors

Prolongs the life of cement, producing a hard, dustproof, washable surface, impervious to the destructive action of oils and other liquids.

References

In our twenty-six years of experience, we have had tests made by governmental departments, engineers, laboratories, etc., and we have a long list of jobs where our materials have given satisfactory service in every section of the world.

LEWIS ASPHALT ENGINEERING CORPORATION

Successors to GARDINER AND LEWIS, INC.

ENGINEERS AND MANUFACTURERS

Specializing in Protection Against Water and Corrosion

30 Church Street, NEW YORK, N. Y.

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CHICAGO, ILL., Tacoma Building

Karnak Membrane Waterproofing System

The Karnak system is based on the use of a highly refined and very ductile asphalt, reinforced and held in place by a strong elastic interlocking membrane, made of cotton cloth saturated with asphalt. Because Karnak asphalt contains no impurities or foreign matter and because this waterproofing is held in place by a strong elastic binder, less plies are required than in felt systems. In the usual case, 2 plies of Karnak fabric with 3 heavy moppings of Karnak asphalt will give absolutely adequate results.

Uses—This system will be found to be thoroughly dependable for use on building foundations, bridges, viaducts, pump wells, retaining walls and wherever sub-level construction is exposed to water pressure.

Karnak Asphalt—Melting point 150° to 160° F.; penetration at 32° F. not less than 10, at 115° F. not more than 100; ductility at 77° F. not less than 30 cm.; loss in weight and penetration under the standard A.S.T.M. heat test, less than 0.5% and 10%, respectively.

Karnak Fabric—An elastic cotton fabric, thoroughly impregnated with Karnak Asphalt, having a minimum tensile strength of 50 lbs. per in. and a minimum stretch of 10% in either direction. The thread count shall be between 18 and 26 threads per in. assuring an open mesh. The raw weight shall be less than 4½ oz. and the saturated weight from two to three times the raw weight.

Architects' Specification — The waterproofing course shall consist of 2 plies of Karnak Fabric and 3 layers of Karnak Asphalt, applied in strict accordance with the manufacturer's directions.

Tests—Every lot of asphalt and fabric is tested at the source by an independent laboratory which places its seals and identification numbers on each package. A copy of this test will be sent directly to the architect by the testing laboratory.

Publications—We have bulletins covering all points: a technical discussion of bituminous waterproofing; lists of architects, engineers and railroads who use Karnak; lists of typical Karnak installations; detailed descriptions of some particularly interesting projects.

Karnak Cut-backs and Plastics—We make a complete line of primers, brush plastics, trowel plastics, joint fillers.

Karnak Special Purpose Asphalts—To meet the needs of the manufacturer. State your needs to our Engineering Department.

Karnak Roofing—The same as the waterproofing blanket. Particularly adaptable for roofs protected with tile or concrete because the expansion of the surfacing will not tear the roofing blanket.

Krodeproof

A Preventive of Corrosion and a New Method of Applying Asphalt as a Waterproofing Agent—Krodeproof consists of minute particles of asphalt suspended in water. When applied to any surface, wood, steel or concrete, the water evaporates and the asphalt particles flow together and coalesce, leaving a protection coating of asphalt.

Advantages—Krodeproof, being an emulsion of asphalt and water, is always applied cold. It can be applied with an air spray, brush or trowel; and it may be built up to any thickness. After the Krodeproof has set up it will not flow, bleed or run at any temperature up to 300° F.

Uses—Krodeproof is most effectively used wherever protection is required against moisture, acid or alkali fumes.

Users—Railroads; against locomotive gases, brine drip and on the decks of concrete bridges, and retaining walls.

Marine; against salt water corrosion.

Contractors and engineers; against moisture below grade and for surfacing roofs.

Hydro-electric plants; on penstocks, transmission towers, etc.

Manufacturing plants; for lining coal bunkers, for lining acid chimneys, boiler setting compound, etc.

Coverage—80 sq. ft. per gal. on steel; 40 sq. ft. per gal. on concrete.

Korkseal

Korkseal is an asphalt plaster used for the protection of cork board insulation. It is made from Krodeproof mixed with inert materials, which gives a creamy plastic, very easy to apply, firmly bonding to the corkboard—setting up into a tough rubbery protection coating which will not crack, and will not permit the penetration of moisture into the corkboard—thereby preserving the original usefulness of the insulating material.

Engineers and contractors have found Korkseal more efficient, and less expensive. A representative list of installations will be sent on request.

Refrigeration Specifications—To maintain the efficiency of corkboard as an insulator, it must be kept dry; to do this it is necessary to keep all "live" air out of the corkboard. Therefore: (1) Prime the masonry wall with Karnak Primer. (2) Erect the corkboard to the primed masonry wall with 180° M.P. Karnak Asphalt. (3) Protect the inside surface with a ⅛-in. coat of Korkseal. All of these materials to be applied strictly in accordance with the instructions of the manufacturer.

Korkseal for Pipes—An asphalt plaster made from Krodeproof and inert materials producing a softer surfacing than Korkseal. Korkseal for Pipes is applied cold with a trowel, on to the surface of the cork pipe cover after installation, giving a seamless asphalt coating which protects the cork perfectly, and at the same time makes a less expensive job, but one more attractive in appearance.

MINWAX COMPANY, INC.

Engineers and Manufacturers of Waterproofing and Protective Products

270 Madison Avenue
NEW YORK, N. Y.

10 East Huron Street
CHICAGO, ILL.

MILL: DELAWANNA, N. J.

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MINNEAPOLIS, MINN., Frank P. White, 200 Builders' Exchange
PHILADELPHIA, PA., C. G. Cope & Company, Schaff Building
PITTSBURGH, PA., Metzger-Richardson Company, May Building
PORTLAND, ORE., F. W. Farrington Co., Henry Building
ST. LOUIS, MO., W. Harding Davis, 214 North 6th Street
SAN FRANCISCO, CAL., Mastercraft Tile & Roofing Co., 1 Twentieth Street, RICHMOND, CAL.
CANADIAN REPRESENTATIVE: E. T. Sampson, 8 Anderson Street, MONTREAL, QUE.

Products

MINWAX MEMBRANE WATERPROOFING SYSTEM.
MINWAX INTEGRAL WATERPROOFING PASTE.
MINWAX FIBROUS BRUSH COAT.
MINWAX CAULKING COMPOUNDS and JOINT FILLERS.
MINWAX STRUCTURAL STEEL COATINGS.
MINWAX BITULOID (ASPHALT PROTECTIVE COATING).
MINWAX STONEBACKING.
MINWAX CLEAR WATERPROOFING.
MINWAX COLORLESS WATERPROOFING.
MINWAX BRICK and CEMENT COATING.
MINWAX PLASTERBOND DAMPPROOFING.
MINWAX CONCRETE FLOOR FINISH.
MINWAX CONCRETE FLOOR PAINT.
MINWAX FLAT FINISH (for wood floors and trim).
MINWAX ACID STAINS.
MINWAX FINISHING WAX.
Also High Melting Point and Special Asphalts and Bituloid Cold Paver.

TRADE MINWAX MARK

Consultation and Field Service for the Designer and Specification Writer

The pages which follow present, in condensed form, complete data on Minwax products. A more detailed discussion is furnished in separate bulletins. Special data will be gladly furnished.

Our engineers will present complete recommendations on design and specifications and furnish estimates either on the entire problem or on some specific detail or question, as desired.

Minwax materials and Minwax service cover the entire range of waterproofing, dampproofing and protection problems and are the outgrowth of 19 years manufacturing and engineering experience in this field. These entire facilities are at your disposal.

Consult with local representative where possible or write direct giving details as completely as practicable.

Minwax Membrane Waterproofing System

Sublevel Waterproofing (Bridges, Tanks, Subways, Floor Slabs, Foundations and Sidewalks)—The Minwax Membrane System is the original cotton fabric or elastic system. It consists of hot mopping of Minwax Waterproofing Asphalt reinforced with Minwax Fabric which has previously been saturated with the same asphalt.

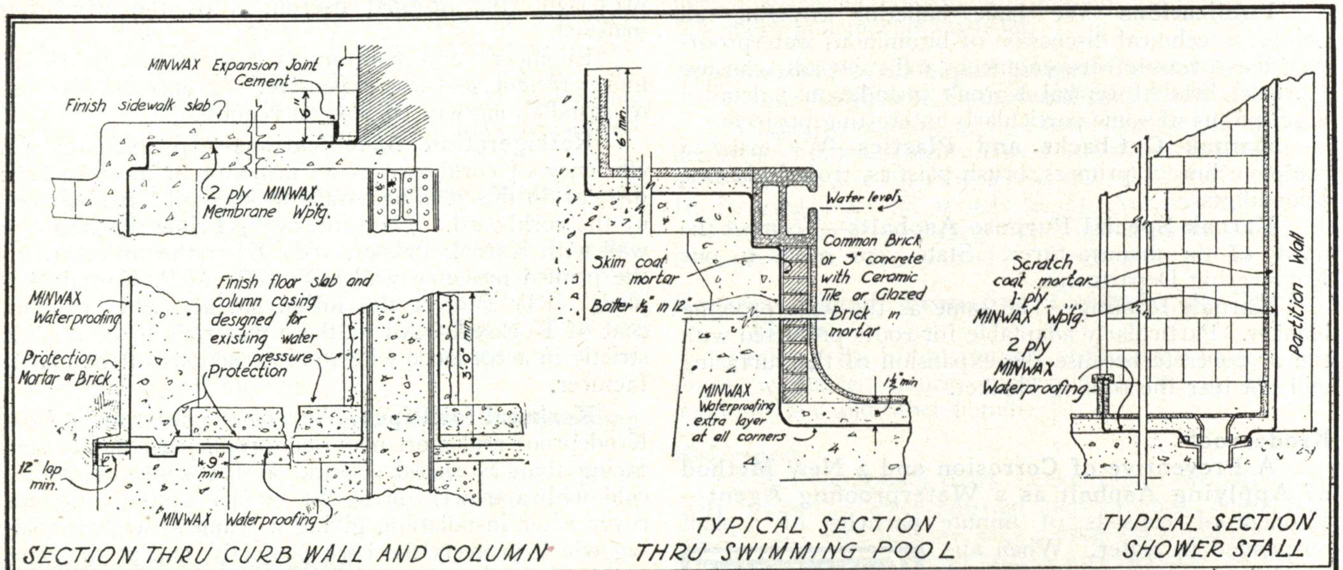
Uses—The Minwax Membrane System is recommended by the Joint Committee on Concrete and Reinforced Concrete for *all locations* where thorough waterproofness is required. Being elastic and stretchable, it is the logical system for slab, pool, floor or deck conditions exposed to variations in temperature or vibration where danger of cracking or checking definitely exists.

Tests—Pittsburgh Testing Laboratories show an elasticity of over 10% for the completed waterproofing.

Tests by Columbia University show that the completed waterproofing will stretch, without rupture, ¼ in. at 0° F. under field conditions.

Tests by the Pittsburgh Testing Laboratories show that the completed 2-ply unsupported membrane is waterproof up to a bursting pressure of 374 lb. per sq. in.

Approvals—Since introduced by this company in 1906, the Minwax Membrane System has established the standard of waterproofing efficiency. The results obtained with the Minwax


MINWAX Expansion Joint Cement
Finish sidewalk slab
6"
2 ply MINWAX Membrane Wpfg.
MINWAX Waterproofing
Protection Mortar or Brick
Finish floor slab and column casing designed for existing water pressure
Protection
3'-0" min.
12" lap min.
9" min.
MINWAX Waterproofing
6" min.
Water level
Common Brick or 3" concrete with Ceramic Tile or Glazed Brick in mortar
Skim coat mortar
Batter ½" in 12"
1½" min
MINWAX Waterproofing extra layer at all corners
Scratch coat mortar
1-ply MINWAX Wpfg.
2 ply MINWAX Waterproofing
Partition Wall

SECTION THRU CURB WALL AND COLUMN

TYPICAL SECTION THRU SWIMMING POOL

TYPICAL SECTION SHOWER STALL

WATERPROOFING DETAILS

Continued on next page

System definitely established the superiority and greater final economy of the cotton fabric system over all others in the face of slightly higher first cost, and largely formed the measure for the standards established by the American Society for Testing Materials, American Specification Institute, Federal Specifications Board and the United States Bureau of Standards.

Minwax materials meet and exceed all requirements of these specifications and deliver many valuable properties which could not be included in a general open specification.

Specification—The waterproofing shall consist of 2 plies of Minwax Specification Fabric (Cotton Cord Cloth) and 3 moppings of Minwax Waterproofing Asphalt applied by experienced mechanics in accordance with the manufacturer's directions.

All surfaces shall be smooth, firm and temporarily dry. Completed work shall be protected from puncture.

Slabs, Sidewalks, Floors, Promenades, etc.—Membrane waterproofing shall be continuous, extending over and into expansion joints and connected to wall waterproofing, or flashed 3 in. above finished grade.

Pools, Tanks, etc.—Reinforce all corners and angles with 18-in. strip. Build first ply on walls, lapping 6 in. out on floor. Build two-ply on floor, lapping 6 in. up on wall. Build second ply on walls. Provide 9-in. flange on all pipes for flashing. Waterproofing shall turn over top of wall and across floor where necessary. Use third ply on pools in upper stories.

Note: Do not place tile directly on waterproofing membrane. There should be a minimum of 3 in. of concrete or 4 in. of brick between tile and waterproofing.

Foundations—From grade, membrane waterproofing shall be carried down outside of walls, through at footings, across basement floor, under and around all pits and trenches, and under or up all columns, forming a complete, watertight envelope. Protect all waterproofing with 1-in. coat of cement mortar.

Where impossible to work outside of wall, build brick course against sheathing, apply waterproofing and cast wall against same.

Where waterproofing must be applied inside structural walls, cover same immediately with concrete designed to hold existing pressure.

Provide pumping to remove all pressure and seepage, and keep surface dry during waterproofing and until concrete has set.

Quantities—Use 12½ yd. of fabric per ply and 4 to 5 gal. of asphalt per mopping.

Number of Plies—Use a third ply on heads of over 15 ft. or under difficult working conditions.

Note: The Minwax Company, Inc., manufactures two fabrics: Specification Fabric, 80-lb. strength; Cotton Cord Cloth, 50-lb. strength. The higher strength will give greater protection and is generally recommended. For complete data and full discussion of the problem, send for Bulletin No. 31.

Minwax Integral Waterproofing Paste for Mass Concrete

Use 10 to 12 lb. per cu. yd. of 1:2:4 concrete.

Minwax Fibrous Brush Coat

For Dampproofing the Backs of Abutments, Retaining Walls, Foundations, etc.—This material is applied cold (as delivered) with a long handled roofer's brush. It eliminates heating equipment cost, wastage, etc. It is a combination of Minwax Asphalts and special graded asbestos fiber. The asphalts penetrate the surface and a soft, sticky, fibrous skin is formed which closely approximates a full membrane system in efficiency.

This coating can not be chipped or flaked off, and backfilling handled in a normally careful manner will in no way cut or damage it.

Covering Capacity—Approximately 100 sq. ft. per gallon per coat.

How Shipped—Shipped in 55 and 30-gal. steel drums, and in 5 and 1-gal. cans.

Specification—Walls shall be coated from grade to footing with 2 thorough applications of Minwax Fibrous Brush Coat, allowing 12 hours to elapse between coats. Materials shall be applied cold, without adulteration, with a long handled roofer's brush and well brushed into all surfaces, leaving no voids. Backfill in not less than 12 hours, exercising care to prevent damage of surface. Material shall be thoroughly stirred before and during application.

Note: It is important to provide subsoil drainage to carry off water and prevent development of hydrostatic pressures.

Special Asphalt Fillers for Sidewalk Lights, Grooves, Expansion Joints, etc.

Minwax Plain Expansion Joint Cement—For filling horizontal flashing grooves, joints in sidewalk grooves, etc. It bonds tenaciously to all materials and does not become brittle at low temperatures. It does not "stew" under the action of the sun but is liable to soften slightly, therefore it should not be used on sloping surfaces. It is heated and then poured in the joint.

Minwax Fibrous Plastic Cement—For steep sloping joints where a hot pouring can not be used. Applied cold with a trowel.

Minwax Fibrous No. 1—For expansion joints with waterproofing membrane, or joints where there is considerable movement. Also used for mopping construction joints to obtain a watertight joint between sections, and for a dampproofing course on bridge decks. It must be heated.

Minwax Fibrous No. 2—A harder grade for sloping exposed joints. It is heated and poured into the joint.

Minwax Caulking Rope—A moulded fibrous rope for vertical joints, grommets, etc.

Specifications—(In general, the specifications for all Minwax Expansion Joint Cements are the same).

Material—The filler for the joints shall be Minwax (specify kind of cement) delivered on the job in original packages clearly marked.

Preparation—The joint shall be clean and dry. All steel shall be free from grease, rust or paint.

Note: It is best practice to give the joint 1 coat of Minwax Asphalt Primer immediately before it is filled.

Application—Cut up container and place material in suitable kettle. Heat slowly until sufficiently liquid to pour easily. Temperature shall be about 250° F. Pour from suitable container.

Note: Shipped in 1, 5 and 25-gal. containers (231 cu. in. per gal.).

Minwax Structural Steel Coatings

Minwax No. 100 Red—A tough, efficient, waterproof ferric oxide shop coat.

Minwax No. 100 Black—A black asphaltic field coat for structural steel.

How Shipped—Minwax Structural Steel Coatings are shipped in 55 and 30-gal. steel drums and in 5 and 1-gal. cans.

Minwax Bituloid for Protecting Metal, Wood or Concrete against Acids, Alkalis, Water, Brine and Corrosive Gases

Minwax Bituloid consists essentially of fine asphalt particles suspended in water. No solvents are used to change the qualities of the asphalt, therefore Bituloid is superior to asphalt paints. It has the same protective value as a hot mopped-on coating of acidproof asphalt, without the difficulty and expense of the latter.

Minwax Bituloid adheres perfectly to damp surfaces. Applied cold with brush or spray, it reaches cracks and corners apt to be overlooked in mopping. It adheres equally well to metal, wood and concrete.

Covering Capacity—Averages 80 sq. ft. per gallon per coat.

How Shipped—Shipped in 50 and 30-gal. steel drums and in 5 and 1-gal. cans.

Specifications—All surfaces to be coated shall be free from oil and loose scale. No coating work shall be carried on at a temperature below 40° F.

Apply 2 generous coats of Minwax Bituloid, flowing it on with a soft, long bristle brush, or use a spray. Allow first coat to become touch-dry before proceeding with the second coat. Material shall be applied in consistency as received, first stirring it thoroughly.

Minwax Stone Backing

This is a heavy asphalt paint which bonds permanently to stone and concrete and forms an impervious barrier that prevents discoloration of stone faced walls from the concrete behind them.

Shipped in 55 and 30-gal. steel drums, and in 5 and 1-gal. cans.

Minwax Clear Waterproofing for Exposed Walls of Concrete, Brick, Stucco and Limestone

Minwax Clear Waterproofing is a positive means of waterproofing and preserving all masonry surfaces without changing their texture or appearance. By sealing the subsurface pores with a tough mineral wax, it prevents the action of frost or the penetration of moisture. The ease with which it can be applied insures positive treatment and protection even on the roughest surfaces of brick or the most delicate carvings of monuments.

Continued on next page

For dampproofing or waterproofing building construction the treatment should be carried from the roof flashing continuously to grade. On monuments, the entire surface should be treated. This treatment will not only prevent leakage or disintegration but will prevent efflorescence or bloom.

The action of Minwax Clear Waterproofing is purely physical, not chemical. It is a transparent liquid applied like paint and does not form a film or coating on the surface but saturates the subsurface, filling all pores with tough mineral wax. It changes the color but slightly and tests have proven that this change is less than that caused by the weather in over a few months time.

Fifteen years of service prove its permanence.

Covering Capacity—100 to 150 sq. ft. on brick and 150 to 250 sq. ft. on stucco and concrete per gallon per coat.

How Shipped—Shipped in 55 and 30-gal. steel drums, and in 5 and 1-gal. cans.

Specifications—Apply 2 thorough coats with a brush or spray, applying as much as the surface will absorb. Allow 24 hours to elapse between coats. All surfaces shall be firm, sound, thoroughly pointed, and no work shall be done in wet weather or in a temperature below 45° F.

Minwax Colorless Waterproofing for Exposed Walls of Concrete, Brick, Stucco and Limestone

Minwax Colorless Waterproofing was designed to meet the need for a waterproofing material which will cause no change of color in limestone or on light colored surfaces. It waterproofs by depositing a water repellent chemical below the surface. It can be applied at any temperature and is recommended where special conditions make the use of Minwax Clear Waterproofing impractical.

Covering Capacity—150 to 250 sq. ft. per gallon per coat.

How Shipped—Shipped in 55 and 30-gal. steel drums and in 5 and 1-gal. cans.

Specifications—Same as for Clear Waterproofing.

Note: This Company will gladly arrange for presenting complete estimates on any wall waterproofing or preservation problem.

Minwax Brick and Cement Coating

For waterproofing and decorating exposed surfaces of cast concrete, brick or stucco.

This Minwax product is a pigment coating produced in a series of attractive flat color tones. It is a combination of the highest grade inert mineral pigments obtainable, ground in and blended with Minwax Clear Waterproofing (one of the oldest best known and most efficient mediums for exposed wall waterproofing) as the carrying vehicle.

This vehicle not only binds the coating on the wall surface so that it stays put, but it penetrates and eliminates the porosity factor and thus prevents the possibility of a dusty, loose coating.

It is not saponifiable and will not burn or peel from alkali action. The coating penetrates and becomes part of the concrete or brick, and the Minwax Clear Waterproofing vehicle penetrates well below the surface and permanently waterproofs it.

The effect produced is flat, without a paint sheen. It changes the texture of concrete or stucco but slightly and maintains the tone of the structural material and gives it the fresh, clean, uniform color selected. On brick, it gives a white-wash effect.

Applied with a brush or spray. Handled with unusual ease. Covers rapidly and effectively.

Uses—Because Minwax Brick and Cement Coating is primarily a waterproofing, it is the most efficient means of decorating and beautifying concrete, brick or stucco and of preserving them from the disintegrating effects of water and frost. It is applicable, therefore, to a wide variety of construction—from concrete industrial buildings where a clean, pleasing, uniform color effect plus protection to the surfaces against dampness is desired, to fine residential construction of stucco or brick.

Recommended also as a coating for light courts where a durable, fadeproof, white surface is desired.

Colors—Furnished in 6 standard colors: white, cream, light buff, dark buff, light gray and dark gray. Special colors extra.

Covering Capacity—Varies between 160 and 250 sq. ft. per gallon per coat, depending upon the roughness and porosity of the surfaces to be treated.

How Shipped—Shipped in 55 and 30-gal. steel drums, in 5-gal. steel pails and 1-gal. cans.

Specifications—All surfaces shall be thoroughly dry, clean, sound and thoroughly pointed and no coating work shall be carried forward at temperatures below 45° F. The painting contractors shall do any incidental pointing of open cracks or joints in the wall surface with B&C Pointing Paste which may be required as work progresses and surfaces shall be brushed to remove all dust and dirt. The wall surfaces, including top and back of parapets, shall be given 2 thorough coats of Minwax Brick and Cement Coating, color as selected. Allow at least 24 hours to elapse between coats.

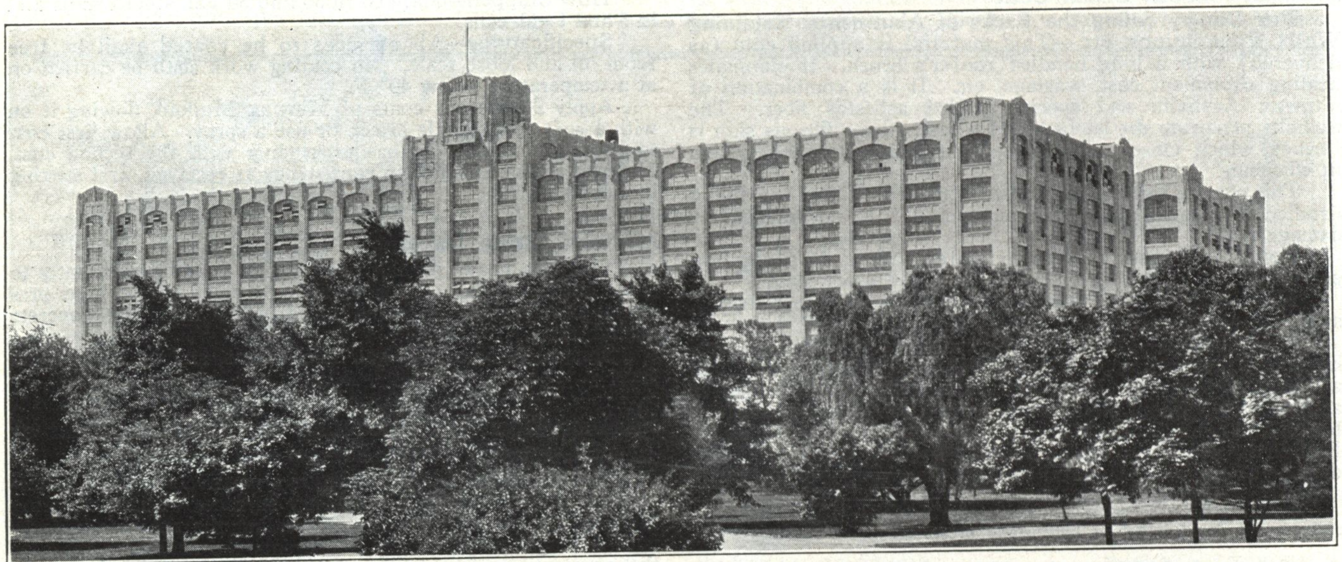
In re-coating previously painted surfaces, all loose particles of the old paint shall be removed by wire brushing before the new coating is applied. Where newly laid brick walls are to be coated or where the coating is to be applied to freshly cast concrete surfaces, we recommend as best procedure, a priming coat of Minwax Neutralizer, to be followed in not less than 12 hours by the first coat of Minwax Brick and Cement Coating.

Minwax Plasterbond Dampproofing

Applied in 2 good brush coats to inside of wall beneath the plaster finish. It cures tacky and remains pliable and elastic indefinitely. It forms a tough, rubberlike, absolutely impervious, waterproof and dampproof skin that bonds securely to wall and plaster. It eliminates furring and prevents staining.

Covering Capacity—80 to 125 sq. ft. per gallon per coat.

How Shipped—Shipped in 55 and 30-gal. steel drums and 5-gal. cans.



Montgomery-Ward Building, Baltimore, Md.

One of three plants (Baltimore, Kansas City and St. Paul) treated with Minwax Brick and Cement Coating

W. H. McCaully, Designing Engineer — Wells Bro. Const. Co., Builders — C. G. Cope, Inc., Application Contractors

Continued on next page

Minwax Concrete Floor Finish

Minwax Concrete Floor Finish fills the pores in the surface and subsurface of concrete floors with a tough, mineral gum. Applied cold as a liquid after the floor has dried and cured, its action is mechanical and positive, creating an absolutely dense smooth surface. It thus eliminates the cause of dusting and disintegration and prevents the penetration of water, stains or liquids of any sort. The mineral gum is highly resistant to and gives maximum protection against the action of *brine, creamery and packing plant acids,* or *oils and dilute acids* found in industrial plants, and makes the floors highly *sanitary*. Floors subjected to heavy trucking have delivered years of efficient service without needing treatment.

On terrazzo and marble tile it brings out color, creates an easily cleaned sanitary surface and prevents dusting and staining. On composition and magnesite it prevents stains, kills salts and prevents disintegration by water.

Covering Capacity—Concrete and composition, 200 to 400 sq. ft. per gallon per coat; terrazzo, marble and tile, 400 to 600 sq. ft. per gallon per coat.

How Shipped—Shipped in 55 and 30-gal. steel drums, and in 5 and 1-gal. cans.

Specifications—Floors shall be clean and dry. For concrete and composition floors, apply 2 saturating coats with "T" head cotton floor mop, allowing 12 hours to elapse between coats. Allow second coat to cure 24 hours before walking over floor. Terrazzo, marble and tile, apply 1 saturating coat. Wipe off surplus in 6 to 12 hours, and allow 24 hours to elapse before walking over floor.

Minwax Concrete Floor Paint

Designed as a coating for concrete floors where a colored surface is desired in office buildings, stores, hotels, hospitals, schools, creameries and all other types of public and private buildings.

The coating dries with a hard, glossy finish which is easy to sweep or clean and is highly resistant to the action of grease or other staining materials. It eliminates the action of light traffic over floors, maintaining a bright, clean surface, uniform in color, and is both protective and decorative.

Standard Colors—Buff, light gray, dark gray and red. Special colors to order.

Covering Capacity—500 sq. ft. per gallon, one coat; 275 sq. ft. per gallon, 2 coats. Put up in ½, 1, 5 and 30-gal. containers.

Specification—Apply 2 coats of color selected as received in original packages, using a regular floor brush. Allow at least 24 hours for drying between coats.

Note: If the floor is very soft, porous or granular, it should first be primed with Minwax Chemical Floor Hardener.

Minwax Flat Finish for Wood Floors and Trim

For finishing and preserving wood floors and trim. It is a combination of certain carefully blended oils and mineral waxes. Applied in saturating coats, it penetrates rapidly, filling the wood with a tough mineral gum. In its natural or clear color (without stain) it does not darken the wood, but by waterproofing and stainproofing, insures the permanence of the clean, fresh surface.

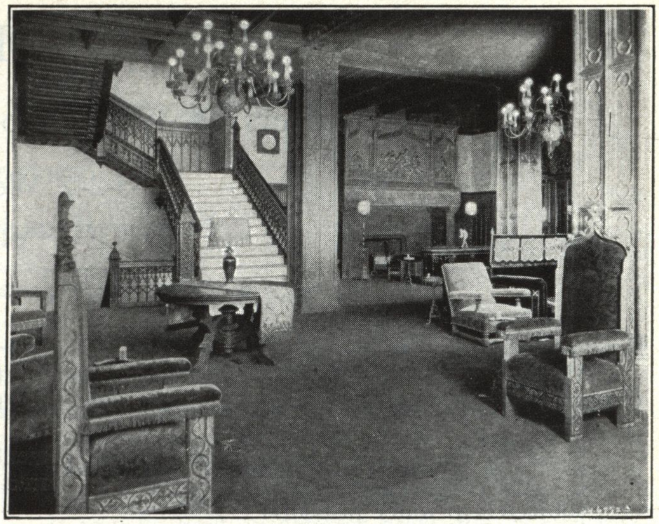
Used on school and industrial floors for 15 years, it has established its outstanding efficiency and permanence. It creates a sanitary, easy-to-clean surface, preventing splintering and eliminating stains.

For use on architectural woodwork, its value and adaptability have been increased by incorporating clear, transparent stains with the original material, so that it constitutes a complete finish. It will accomplish permanently, efficiently and economically the soft wax finish and rich clear stain effects that develop the natural beauty of any wood.

Effects—In general, the effects produced are of the natural wood stained to the color selected and with a soft waxy sheen. The material does not coat or fill the wood and the stains are particularly transparent. A paste filler can be used where a closed, uniform surface is desired and where the wood is open grained.

In combination with one of the Minwax Acid Stains, with or without a colored paste filler, Minwax Flat Finish will produce practically any of the architectural finishes. For a high luster, Minwax Finishing Wax (a solid wax of unusual quality) should be used after the Minwax Flat Finish has cured.

Economical in First Cost and Maintenance—Minwax Flat Finish offers important savings, not only in first cost, but in cost of maintenance. It accomplishes results in 2 easily applied coats, reducing the cost per square foot of finished wood work to the minimum.



Lounge of the Chicago Athletic Club

Plamondon-Gabriel, Interior Decorators

All wood and paneling refinished with Minwax Flat Finish

All Minwax Stains, combined with Minwax Flat Finish and Minwax Acid Stains, are non-fading and sun fast, highly water repellant and water resistant, and will give unusual service on exterior trim exposed to the weather. Under all conditions its maintenance is startlingly simple—a cloth dampened with Minwax Flat Finish and used to wipe down the surface will brighten and renew the finish without showing patches or laps, and, periodically used, will maintain permanently and enhance and enrich the beauty of the finish.

Specifications—*Maple Floors*—Wood shall be clean, dry and thoroughly sanded. Apply 2 saturating coats of Minwax Flat Finish No. 9 with a brush or mop, wipe up each coat with rags in 2 to 6 hours to remove surplus. Allow 24 hours to elapse between coats. Protect second coat from traffic and dirt with paper or sawdust until floor is approved and accepted.

Trim or Floor—Wood shall be clean, dry and carefully sanded and shall be stained and finished with 2 coats of Minwax Flat Finish applied with a brush and in color as selected. Each coat shall be wiped with rags in 2 to 6 hours to remove surplus. Do not apply at temperatures below 55° F. Protect floors as specified under "Maple Floors."

Minwax Flat Finish Stains—No. 9 (natural); No. 11 (light oak); No. 12 (dark oak); No. 13 (walnut); No. 716 (dark walnut); No. 15 (mission green); No. 16 (mahogany).

How Shipped—Shipped in 1, 5, 30 and 50-gal. containers.

Minwax Acid Stains

No. 120 light fume; No. 122 Flemish, No. 123 dark Flemish.

Shipped in ½ and 1-gal. containers.

Specification—Apply with brush or sponge and when dry rub surface lightly with fine sand paper or steel wool. Finish with Minwax Finishing Wax.

Minwax Finishing Wax

For finishing wood floors stained with Minwax Acid Stain.

Specification—Apply with a rag and polish with a weighted brush or cloth when dry.

Service Record

Through 19 years of study and experience in this field, our purpose has been to develop for each problem the material best suited for that particular group of conditions. The record of accomplishment made by each product establishes its outstanding efficiency and permanence, and, in many cases, has created new standards of service.

To list or recount the accomplishments of these years in the limits of this catalogue is impractical, but complete detailed data and a list of nearby installations will be gladly furnished on request.

MORENE PRODUCTS CO., INC.

Manufacturers of Waterproofing and Preserving Specialties

245-247 West 28th Street
NEW YORK, N. Y.

Products

Morene Kemisol, a Preservative and Permanent Colorless Waterproofing for stone, brick and cement surfaces.

Morene Petrofluid, used integrally in cement plaster for Waterproofing basements, tunnels, tanks, etc., subjected to water pressure.

For Morene Wall Finish, see pages 1714-1715.

Kemisol

The scientific, practical and economical perfection of a colorless waterproofing and preservative for stone, brick, concrete and cement surfaces above ground.

Morene Kemisol is a chemical solution, water base, ready for use and is efficient only on absorptive surfaces.

Kemisol is a surface application and permanently waterproofs by destroying the basic cause, absorption or capillarity (a force of nature) existing in the material itself, to depth of penetration. Leaves no coat, fills no pores, and is absolutely colorless.

Kemisol is a preservative for stone, brick and cement; prevents discolorations, stains, and damage from frost.

Kemisol applied to the surface prevents efflorescence or alkali from appearing on walls.

Kemisol applied to the beds and builds of granite, stone and artificial stone before setting in wall will prevent any stains and discolorations appearing from the cement or lime mortar.

Because of condensation, water frequently accumulates on cement floors, laid directly on the ground and covered with linoleum. By thoroughly saturating the cement floor and treating the underside of the linoleum with Kemisol, this difficulty can be successfully overcome.

Application—Estimate to use 1 gal. of Morene Kemisol for 10 to 15 sq. yd. Surface to be treated must be dry and absorptive to obtain proper results. If the structural material is covered with paint, grease or other foreign matter preventing direct contact, same must be thoroughly removed before applying the waterproofing.

Morene Kemisol should be applied with a compressed air spray or a large brush, as required. Every square inch of exposed surface must be treated. Crevices, cracks, voids and all low places must be thoroughly saturated.

Apply freely, not less than two applications, second to follow immediately after first is absorbed, not over ten minutes intervening. Once dry and set, no more can be absorbed. Any material remaining on the surface is useless.

Smooth cut stone or pressed brick surfaces should be wiped off with cheese cloth before last application has thoroughly dried.

Partial List of Representative Buildings in which Kemisol Has Been Used—

Marlin-Rockwell Building, New York, N. Y.
Westchester County Hospital, East View, N. Y.
Chamber of Commerce Building, Brooklyn, N. Y.
Prudential Insurance Co. Building, Newark, N. J.
Brown University, Providence, R. I.
U. S. Naval Hospital, Boston, Mass.
Gillette Safety Razor Building, Boston, Mass.
Fire and Police Station Building, Boston, Mass.
American Woolen Co. Building, Andover, Mass.
Belber Building, Philadelphia, Pa.
Smith College, Northhampton, Mass.
Wellesley College, Wellesley, Mass.
New England Baptist Hospital, Group of Buildings, Boston, Mass.
Orange Memorial Hospital, Orange, N. J.
Elizabeth General Hospital, Elizabeth, N. J.
College of New Rochelle, New Rochelle, N. Y.
Astor Estate, Various Buildings, New York, N. Y.

Petrofluid

An underground waterproofing material for basements, tunnels, tanks and reservoirs, or any concrete or brick construction to resist water pressure; to be used as an integral mixture in cement plaster of floor topping. Surface to be plastered must be properly prepared to secure a perfect bond.

If the surface is smooth or has been painted, roughen by chipping about 70% of the surface. Dry parts of the wall must be thoroughly wetted with water or given a brush coat of equal parts of Morene Petrofluid and water before plastering to avoid quick drying of plaster and assure a perfect bond.

Application—For average conditions, mix 1 part cement and 2 parts fine sharp sand in the usual manner. Add 1 gal. of Morene Petrofluid to each bag of cement, then add sufficient water to make proper consistency. Apply and finish same as ordinary cement plaster.

For troweling or floating surface, use equal parts of Morene Petrofluid and water.

Estimate for this work: 1 bag of cement and 2 bags sand will plaster 6 to 7 sq. yd. $\frac{1}{2}$ in. thick. Minimum thickness of plaster should be $\frac{1}{2}$ in. Where severe water pressure exists, increase the quantity of Morene Petrofluid about 50% or $1\frac{1}{2}$ gal. to each sack of cement. Also increase the thickness of plaster somewhat.

Write for particulars and list of representative buildings where Petrofluid has been used.

Technical Service Department

This company maintains a technical service department. Experts are available for the solution of any problems pertaining to the proper use of Morene Products.

Orders and Shipments

Petrofluid and Kemisol—Any reasonable amount can be shipped promptly.

Weight per gallon, 8 lb. Shipped in wooden barrels containing about 50 gal. Half barrels, 25 to 30 gal. Small quantities in 5-gal. cans.

PYRAMID CHEMICAL COMPANY

Manufacturers of Waterproofing and Dampproofing Materials

GENERAL OFFICE

549 West Washington Boulevard
CHICAGO, ILL.

TELEPHONE
STATE 3299

Products

- Pyramid Chemical Dampproofing.
- Pyramid Chemical Wallsize.
- Pyramid Waterproofing Materials.
- Pyramid Waterproofing No. 17.

Services

This company maintains its own contract department, and is prepared to execute contracts in any part of the United States.

Estimates and specifications for special waterproofing problems are promptly and cheerfully furnished without charge.

If desired, engineers of the company will superintend work undertaken by local firms in accordance with our specifications.

Pyramid Chemical Dampproofing

Pyramid Chemical Dampproofing is a colorless liquid which effectively renders walls of brick, tile and concrete impervious to moisture, and provides an exceptionally efficient plaster bond. It kills the alkali and saltpeter in the brick and tile and prevents discolorations on the plaster from these sources. The chemical penetrates the brick, tile and concrete to a depth of from ¼ to ½ in., depending upon the porosity of the material, and becomes, in effect, an integral part of the wall. It leaves no stains on flooring, masonry, woodwork or clothing.

Where ceilings are constructed of concrete joists with a hollow tile filler, Pyramid Chemical Dampproofing is used to equalize the power of the capillary attraction between the tile and the concrete in order to prevent the appearance of "checkerboard" outline on the ceiling due to the concrete joists and tile showing through the plaster.

The covering capacity of Pyramid Chemical Dampproofing is approximately 150 sq. ft. to the gallon.

Specifications—All brick and tile walls, and all ceilings constructed of concrete joists and hollow tile, shall be given a surface application of Pyramid Chemical Dampproofing, the application to be made with spray or brush.

In every case the material shall be given all that it will absorb.

Pyramid Chemical Wallsize

Pyramid Chemical Wallsize is milky white in appearance, but disappears into the wall so quickly that it is not visible 15 min. after application. Its effect is not to close the pores of the plaster, but rather to stop the suction which absorbs the life of the paint. The use of this Wallsize insures the decorations against stains due to lime burning, alkali, or saltpeter.

It may be used on exterior brick, tile, or concrete walls as a primer, thus saving one coat of paint.

Specifications—All surfaces to be painted shall be given a thorough coating of Pyramid Wallsize, application being made with either spray or brush. In all cases the material treated shall be given all the Chemical Wallsize that it will readily absorb.

Pyramid Waterproofing Materials

Specifications and estimates are gladly furnished for particular waterproofing problems.

In conditions ordinarily encountered in basements and elevator pits where a spray or brush application of Pyramid Chemical Dampproofing is not sufficient to withstand the seepage of water, we recommend the application of a plaster coat ½ in. thick made in the proportion of 1 bag of cement, 2 bags of sharp torpedo sand, to 2 gal. of Pyramid Liquid Waterproofing, bringing the whole to the proper consistency by the addition of water.

Pyramid Waterproofing No. 17 for Heavy Hydrostatic Pressure

Where excessive water pressure is encountered it is necessary to localize the seepage of water by opening the wall at the point of heaviest pressure, thus relieving the balance of the wall from pressure. This done the plaster coat may be applied as in the case described above. After allowing sufficient time for the plaster to set firmly, the hole where the pressure has been localized may be closed by pounding in oakum saturated with a mixture of cement and Pyramid Waterproofing.

This treatment holds back the water pressure for sufficient time to apply the plaster coat covered by the above specifications, and permit it to set, making an air-tight job of the whole. In this manner we have overcome the heaviest hydrostatic heads.

Guarantee

The company guarantees that all work done by its contract department will be fully satisfactory both as to material and workmanship, and that all material manufactured and supplied by the company, when used in accordance with its specifications and directions, will give the results desired, as covered by the foregoing descriptions and instructions.

ESTABLISHED 1848 INCORPORATED 1922

TOCH BROTHERS

Technical and Scientific Paint and Varnish Makers

110 East 42nd Street
NEW YORK, N. Y.

WORKS AND LABORATORIES: LONG ISLAND CITY, N. Y.
DISTRIBUTING AGENCIES IN THE WORLD'S PRINCIPAL CITIES

Products

Inventors and manufacturers of Steel Protective Paints; Damp-proofing and Waterproofing Paints and Compounds; Concrete Floor Coatings; Insulating Paints; Smokestack Paint; Roofing Paint; Enamels; Mortar, Cement and Plaster Colors; Stone Backing; Decorative Paints for all purposes.

R.I.W.
REMEMBER IT'S WATERPROOF
Reg. U. S. Pat. Off.
TRADE-MARK

Damp-proofing

No. 232 "R.I.W." Damp-Resisting Paint—A black, elastic, full-bodied, tacky, damp-proofing paint for brush application to the interior surfaces of exterior brick or terra cotta walls to which hard wall plaster is to be directly applied.

Not to be used on concrete walls or on ceilings of any kind, nor must concrete or portland cement mortar be applied directly over it.

Prevents the penetration of dampness, and renders the inside of walls vermin-proof and stain-proof.

"R.I.W." Plastertox*—A dark olive gray, plastic, damp-proofing compound. Should be applied with a trowel, like any plastic material, under the same conditions as No. 232 "R.I.W."

No. 110 "R.I.W." Damp-Resisting Paint—A black, alkali-proof and waterproof, elastic paint to protect limestone, marble, granite and other cut stone from the chemical action and discoloration due to alkali in cement, and to moisture. Also resistant to mild acids.

"R.I.W." Marine Cement*—A black, damp-proof, thick liquid paint for brush application to the exterior of foundation walls and footings; concrete floor slabs, and wood sleepers laid in concrete. Does not need to be heated.

"R.I.W." Plug-A-Leak*—For brush application to new or old roofs. Stops leaks in roofs, valleys and gutters, canvas, decks, leaders and pipes. Used for making a tight joint around flashings and copings, for filling cracks in brick and stone foundations, etc.

Also sold in plastic form for trowel application.

"R.I.W." Liquid Konkerit (Patented)—Priming and finishing cement paints, ready for use, for damp-proofing, beautifying and overcoming the natural porosity of exposed stucco, concrete and masonry walls. In white and colors. Dries with a flat finish.

For gloss finish apply "R.I.W." Flex-Sicco Ready Mixed Paint in any color.

"R.I.W." Toxloxpore*—A colorless, damp-proofing liquid, especially adapted for application to brick, concrete, stucco, limestone, and Bedford stone.

When applied to a perfectly dry surface it will prevent the development of efflorescence and the penetration of dampness.

"R.I.W." Anhydrosol No. 1 (Transparent)—A transparent, varnish-like material applied with an ordinary paint brush. Used on brick, stone, terra cotta, or concrete, to prevent rain absorption.

Cement and Mortar Colors

"R.I.W." Cement Colors—For coloring portland cement construction to produce the richest shades in stucco, tile, sidewalks, etc. Usually sold in dry powder form.

These mineral colors produce uniformly pleasing and permanent shades.

Furnished in 14 standard shades.

"R.I.W." Edinburgh Mortar Colors—Strong, permanent mineral colors for mortar joints. Not affected by heat or cold.

Usually sold in pulp form because of greater convenience in mixing.

Furnished in 7 standard colors.

Waterproofing

"R.I.W." Toxement (Patented)—A gray powder for the integral waterproofing of mass concrete for foundations, floors, walls, bridges, piers, reservoirs, etc.

"R.I.W." Toxement lubricates concrete, increases its workability, plasticity and flowability, renders it non-porous, and eliminates necessity for extreme tamping and vertical chuting.

No. 421 "R.I.W." Acid-Proof Toxement (Patented)—A gray powder for the integral waterproofing and acid-proofing of concrete walls and floors in chemical plants and concrete storage tanks.

"R.I.W." Toxement Mortar Paste (Patented)*—For the integral waterproofing of cement mortar joints and stucco by arresting capillarity and perfecting the texture of the mortar or stucco through means which are entirely normal and in entire accord with the natural functioning of the other ingredients.

"R.I.W." Self-Healing Bridge Cement*—A waterproof, elastic, non-hardening, coherent and adherent material, which, when applied over burlap, maintains a homogeneous, unbroken membrane coating under normal conditions.

Remains elastic at low temperature and will not run in summer.

For waterproofing thin wall reinforced concrete foundations and footings where there may be danger of cracking from temperature changes and settling.

Concrete Floor Coatings

"R.I.W." Cement Filler (Patented)—Designed primarily for use as a priming coat on dry concrete floors subjected to ordinary conditions of service. It penetrates the pores, neutralizes the lime inherent in concrete and hardens the surface.

The finishing coat should be "R.I.W." Cement Floor Enamel.

No. 2626 "R.I.W." Cement Filler (Patented)—This material is similar to regular "R.I.W." Cement Filler but contains specially selected gums which yield a harder and glossier surface. Usually used on concrete floors subjected to severe conditions of service and to preserve dry, crumbly floors in loft and factory buildings, printing establishments, etc., where protection without decoration is required.

"R.I.W." Pigmented Cement Filler (Patented)—A priming coat for dry, hard troweled or dense concrete floors or other interior concrete surfaces, which are to be given a finishing coat of "R.I.W." Cement Floor Enamel.

"R.I.W." Cement Floor Enamel (Patented)—For a finishing coat on concrete and wood floors not exposed to the elements. Prevents "cement dusting" and resists wear.

Furnished in semi-gloss and high gloss finishes.

"R.I.W." Dustop*—Intended for application to dry concrete floors with a mop, or it may be spilled on the floor and slushed around until absorption ceases, when the excess "R.I.W." Dustop should be removed. Resists abrasion to a limited extent, but its major function is that of a dust preventive.

"R.I.W." Flintox*—A chemical solution which reacts with the cement and precipitates zinc silicious materials in the pores of the concrete. Intended primarily as a surface hardener, but because of the reaction and precipitation referred to, the material may be said to function as a binder and dust preventive.

"R.I.W." Acid-Proof Filler*—A pale brown color solution of organic and inorganic silicates for preserving dry or damp concrete floors exposed to the action of weak acids or oils.

Darkens slightly the surface to which it is applied.

Prevents "cement dusting" and abrasion.

"R.I.W." Exposed Porch and Deck Paint—This is a special paint for use as a finishing coat, over a suitable priming coat, on concrete, wood, metal, canvas or other floor surfaces, and decks, subjected to wear and exposure to the elements.

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*Trade-Mark Registered.

Continued on next page

Steel Preservative Paints

"R.I.W." Tockolith (Patented)—The portland cement gray anti-corrosive paint used for priming iron, steel or other metal.

A finishing coat must always be applied according to the character of the finished surface required and the nature of the service expected.

No. 1087-A "R.I.W."—A quick drying, acid-proof, alkali-proof and waterproof china wood oil, hydro-carbon paint for application to steel or wood. Unaffected by the alkali in cement mortar and concrete, and makes a good shop coat for steel which is to be incased in concrete where a paint of the character of "R.I.W." Tockolith is not required.

Furnished in black, red, brown and dark green.

No. 110 "R.I.W." Damp-Resisting Paint—A waterproof paint which adheres perfectly to concrete or cement mortar.

Used as a finishing coat on structural grillage work which is to be embedded in masonry, also on railroad bridge floors and column footings, pipes buried in the ground, metal lath and steel work in factories or laboratories subjected to the fumes of acids or alkalis.

Furnished in black and maroon.

No. 112 "R.I.W." Damp-Resisting Paint—A waterproof paint which has wonderful resistance to the alkalis in cement mortar or concrete.

Recommended for finishing coat on structural steel building frames, brine and condenser pipes, etc.

Furnished in black and maroon.

"R.I.W." Verte Antique—Made in 2 grades, one for interior and the other for exterior use, for application with a sponge, rag or brush to obtain either a corroded or smooth effect. The exterior grade has a percentage of free acid which combines with copper, dries slowly and withstands weather exposure.

Used on metal cornices, ornamental iron work, grill work, chandeliers and other fixtures to obtain an antique copper finish.

No. 137 "R.I.W."—A bright red paint recommended either for interior or exterior use over a priming coat of "R.I.W." Tockolith, but 2 coats may be used without a primer.

Usually used on steel structures exposed constantly to the weather; roofs, gutters, gas holders, tanks, etc., and in chemical works where acid fumes prevail.

"R.I.W." Battleship Gray—Made in 2 shades of gray, light and dark, for application to wood and metal subjected to atmospheric conditions.

Particularly adapted for protecting molasses tanks, oil tanks, gas holders, vessels and fire escapes.

Does not turn white, streak or chalk near sea water. Endures the excessive heat and moisture of the tropics.

No. 49 "R.I.W." Damp-Resisting Paint—A high grade, exterior exposure paint made in black or dark olive green, and usually applied over a priming coat of "R.I.W." Tockolith.

Withstands the action of locomotive gases, acids and other fumes to which railroad bridges and viaducts are subjected.

Used on tanks, lined smokestacks, etc.

Interior Wall Coatings

"R.I.W." Everlite Mill White—A two-coat priming and finishing mill and factory white that will stay white, is waterproof, easily cleaned with soap and water, and may be applied direct to interior wall and ceiling surfaces whether of brick, concrete, metal or wood.

"R.I.W." Plaster Primer—A liquid coating of semi-opaque character, made in white and light gray, intended for direct application to thoroughly dry and clean plastered walls. It overcomes the alkalinity of unpainted plastered walls and obviates the necessity of using sizing materials: i.e., glue size, sealing varnish or similar preparations.

"R.I.W." Non-packing Flat White—Made especially for use in hotels and apartment houses, where a paint is desired principally for freshening up the room and where the limitations of time and cost are the deciding factors in the selection of paint for this purpose.

"R.I.W." Konkerit Koating (Powder)—Made in two grades, one for interior and the other for exterior use. For application to a wet or damp surface of brick, concrete or stucco. Combines with the surface and forms a hard, non-dusting light reflecting finish which lasts for years.

Enamels

"R.I.W." Hospital and Laboratory Enamel—A waterproof, white, hard usage enamel which resists the action of sulphuretted hydrogen, gases and fumes of acids and other chemicals.

Used principally in hospitals, laboratories, bathrooms, kitchens, milk stations, engine rooms, etc.

"R.I.W." Wonder Koat Enamel—This is an exceptionally high grade enamel adapted for interior or exterior use. It is heavy-bodied, works easily, flows smoothly, has great hiding power and dries slowly with an elastic, durable finish. It possesses the unique property that it always remains in suspension in the package, consequently there is no loss from skinning, straining or stirring.

"R.I.W." Snow White Enamel—This is a high gloss, very white, quick drying, full surfaced enamel for interior use only. It will not turn yellow under ordinary conditions and will rub and polish.

"R.I.W." Interior Flat White Enamel—This is a full-bodied, flat white finish for interior use only. It gives a smooth, sanitary coating that holds its color, is washable, and will not scale or crack under ordinary conditions of service.

"R.I.W." Machinery Enamel—This enamel is intended for use on dynamos, transformers, steam and electric stationary engines, compressors, mill and other machinery, guards, rails, etc., not exposed to the elements.

"R.I.W." Pipe Enamel—Many manufacturers paint each pipe line a different color. This not only saves time by making it easier to tell the lines apart, but in case of emergency, may mean the saving of hundreds of dollars by being able to locate a line quickly.

"R.I.W." Pipe Enamel safeguards all piping—water, oil, gas, sprinkler systems, etc.—against rust and corrosion caused by steam, water, fumes and other destructive agencies.

Specialties

"R.I.W." Trimbak—A black, alkali-proof and waterproof, elastic paint for protecting the back of wood trim; underside of wood floors, wood sleepers, etc.

"R.I.W." Konkerit Koating (A dry powder)—Made in 2 grades, one for interior and the other for exterior use, for application to a wet or damp surface of brick, concrete or stucco. Combines with the surface and forms a hard, non-dusting, light reflecting finish which lasts for years.

Varnishes

"R.I.W." Tochsedo Exterior Spar Varnish—This is a slow drying, waterproof, elastic, tough varnish for exposed woodwork. Will rub in 5 days. Guaranteed not to scratch or mar white.

No. 1017 "R.I.W." Tochsedo Marine Spar Varnish—A quick drying, waterproof, tough, elastic varnish for interior or exterior use. A general utility varnish at a medium price. Dries hard in from 12 to 16 hours.

"R.I.W." Tochsedo Interior Spar Varnish—A slow drying waterproof varnish especially adapted for use in kitchens, engine rooms, hallways, and on other surfaces where a tough, elastic varnish is required. Will rub in 3 days. Will not scratch or mar white.

"R.I.W." Tochsedo Floor Varnish—The toughest and best of all floor finishes. Does not scratch or mar white, and may be washed as often as required. Dries hard overnight. Is excellent for restoring faded and worn linoleum.

"R.I.W." Tochsedo Cabinet Polishing Varnish—This is unexcelled for all work which is to be rubbed or polished. Also where a full, brilliant gloss is desired. Rubs in 48 hours.

"R.I.W." Tochsedo Light Hard Oil Finish—A general utility varnish for interior use. Dries quickly with a full, high gloss. Is pale in color and very durable.

"R.I.W." Tochsedo Flat Wood Finish—For use over gloss finished work to give a rubbed effect without the labor of rubbing with pumice stone and oil and pumice and water.

Specification Book

Note: A copy of the Toch Specification Book, literature and color cards will be gladly sent on request to Dept. SA.

ANTI-HYDRO WATERPROOFING CO.

265-277 Badger Avenue

NEWARK, N. J.

TELEPHONE
TERRACE 5440

ESTABLISHED 1904

Products and Services

"ANTI-HYDRO," a Liquid Integral Compound for waterproofing, dampproofing, accelerating, without weakening, and for hardening all portland cement mixtures.

ARMORTOP, a liquid applied Hardener and Dust Preventer for cement floor surfaces.

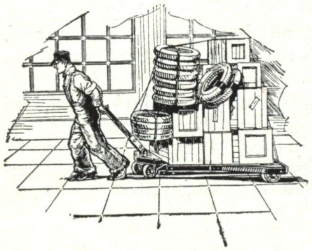
ACCELLO, a water solution of commercially pure calcium chloride for Refrigeration and for Accelerating the Set of Concrete in cold weather, without freezing.

CONSULTING WATERPROOFING ENGINEERS, for consultation and design for all waterproof constructions. Correspondence invited.

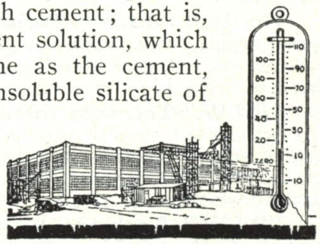
"Anti-Hydro"

ANTI-HYDRO
FOR PERMANENT CONCRETE
HARDENS WATERPROOFS
TRADE-MARK

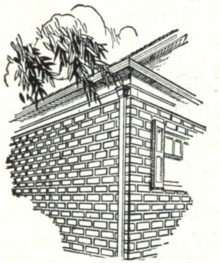
Description—"Anti-Hydro" is a liquid compound, neutral to litmus. When added, in certain percentage to the water used in gauging portland cement mixtures in the usual way, it has the effect, without retarding setting, of rendering cement in all kinds of masonry impervious to water, moisture, frost, gas, oils, odors, sugar solutions, alkalis and most acids. It excites and brings into service all the cohesive or colloidal possibilities of portland cements, which in themselves are most efficient waterproofing mediums. There are no alums, hydrate of lime, greases, oils, stearic acid or decomposable ingredients used; neither are there any iron admixtures—all of which disintegrate concrete in time.

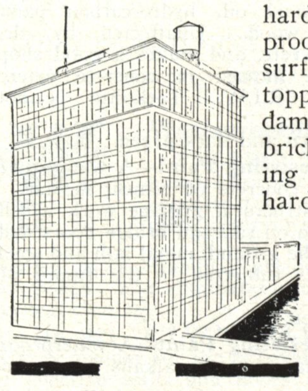

Hardens and Dustproofs Concrete Floors

"Anti-Hydro's" function may be expressed as waterproofing cement with cement; that is, filling the voids with a cement solution, which crystallizes at the same time as the cement, integrally forming a hard, insoluble silicate of greater tensile strength, density and activity. It enriches mortars so that cost of troweling, mixing and supervision is reduced to a minimum. In fact, it more than pays its cost in labor saving. It hardens wearing surfaces to a degree that makes them dustless and adamant. It lowers the freezing point of the gauging water, permitting concreting when the temperature is as low as 15° F.


Lowers Freezing Point

When mixed with portland cement, "Anti-Hydro" forms a plastic mass which sets up very quickly and is used for calking metal passing through concrete, and for stopping leaks under pressure. Mixed with water and cement, it forms a dampproof paint which can be applied to the inside of masonry walls or to the back of limestone to prevent discoloration.


Dampproofs Brick Mortar and Prevents Efflorescence


Waterproofs

"Anti-Hydro" is used for hardening cement floors, waterproofing concrete in mass and in surface coating, and bonding the topping to the underlying slab; dampproofing and waterproofing brick mortar and for preventing efflorescence; waterproofing, hardening and bonding concrete roads.

For coatings, 1 gal. "Anti-Hydro" for each 80 to 100 sq. ft. 1 in. thick; for mass concrete, 1½ to 2 gal. for each cu. yd.

For dampproofing, 1 gal. in a cement wash covers 400 sq. ft. In masonry, 1 gal. per 1000 brick.

Approval—The superiority of "Anti-Hydro" for waterproofing and concrete hardening is demonstrated by the permanency of work completed since 1904, and by the comparative tests of the United States Bureau of Standards. Their Technologic Paper No. 3, designates "Anti-Hydro" as Compound No. 40, and states "It is the most impermeable of any of the mortars."

Road Work—"Anti-Hydro" is especially suited for concrete pavements and roads. It makes concrete as hard in 24 hours as it would ordinarily be in 8 days and actually increases the strength of concrete 22%. Due to its quick hardening qualities, roads are ready for use in 24 hours after they are laid.

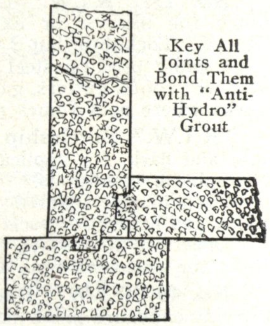
"Anti-Hydro" can be used with any portland cement at a minimum cost.

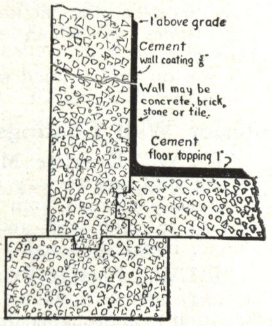
For maintenance work, "Anti-Hydro" will bond new concrete securely to old.

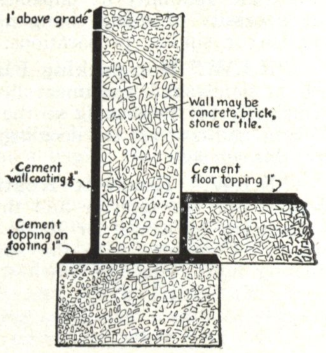
Specifications—*Waterproofing in Mass*—To the 1:2:4 mix, for gauging, add 1½ gal. of "Anti-Hydro" for every cubic yard of concrete. Proper consistency will be obtained if, for each barrel of cement, 1 gal. "Anti-Hydro" and from 10 to 15 gal. of water be used. If forms are below water level, concrete should be poured extremely stiff.

Floor Hardener—The 1-in. floor topping of 1:2 mix shall be gauged by addition of "Anti-Hydro" to all water used in tempering dry mixture, in proportion of 1 gal. of "Anti-Hydro" to each barrel (4 bags) of cement. The proper consistency will be obtained if, for each barrel of cement, 1 gal. of "Anti-Hydro" and 10 to 12 gal. of water be used. (See bonding directions below.)

Waterproofing in Coatings—Floor work shall be 1 in. in thickness, and shall serve the


Key All Joints and Bond Them with "Anti-Hydro" Grout




1' above grade
Wall may be concrete, brick, stone or tile.
Cement wall coating ⅝"
Cement floor topping 1"
Cement topping on footing 1"

Continued on next page

double purpose of waterproofing agent and dustless wearing surface.

Wall coatings shall be ⅝ in. in thickness from floor level, where they shall be properly coved and bonded to floor, and carried up to at least 1 ft. above grade.

The 1:2 mortar shall be gauged by addition of "Anti-Hydro" to all water in proportion of 1 gal. "Anti-Hydro" to each barrel (4 bags) cement.

Perfect Bond—To assure perfect bond to underlying masonry, all surfaces, before application of waterproofing, shall be thoroughly roughened, cleaned, dampened and grouted. A slush or grout of neat cement, using 1 part "Anti-Hydro" to 3 parts of water, is first applied. Coatings shall be applied not later than 24 hours after surfaces have been prepared.

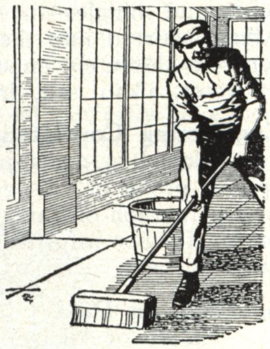
Note: Specifications for waterproofing *Brickwork, Stucco on Solid Masonry* and *Stucco on Metal Lath* and *Dampproofing* furnished on request.

Acid Resisting—Write for special specifications.

Armortop

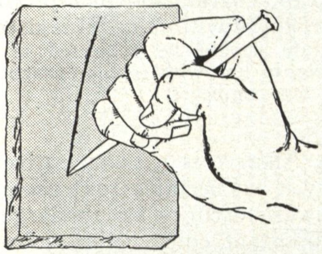
ARMORTOP
THE APPLIED HARDENER FOR CONCRETE
TRADE-MARK

Description—Armortop is a liquid compound which, when mixed with water and applied to any concrete surface, old or new, changes the soft granular topping of the concrete into a granite-like mass which will resist the most severe wear and abrasion without dusting up. The application of Armortop insures added years of wear and use for any cement floor whether it has just been laid or whether it has been in service for several years. It eliminates the necessity of tearing up and relaying old floors which are beginning to rut.

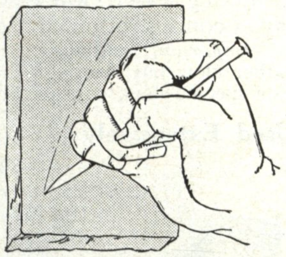


So easily, quickly and surely does Armortop transform soft, crumbling, dusting floors into new, hard, dustproof ones, that the whole job can be performed in the evening after closing hours by any ordinary laborer. By the following morning the floor is ready for use without loss of time, costly shutdowns and delays to manufacturing.

No skill is required to apply Armortop. The entire operation is performed simply by mixing Armortop with water and brushing it with a stiff brush or broom over the surface to be treated.



An Ordinary Concrete Surface Can be Deeply Cut with a Nail or Pointed Instrument as Shown Above



The Same Concrete Surface Treated with Armortop Becomes so Hard That It Can Scarcely Be Scratched with the Same Nail

Armortop reacts chemically with cement and combines with it, forming a new compound which binds the loose, disintegrating particles of the concrete mix into a dense hard mass. Because of this reaction, Armortop results are permanent and should not be confused with temporary paint coatings. The covering capacity of Armortop varies with the density of the floor. One gallon will cover from 70 to 150 sq. ft. of floor surface.

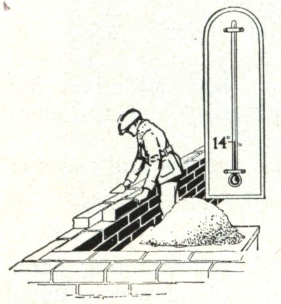
A concrete test slab treated with Armortop will be sent to any one desiring to make the comparative test illustrated above.

Specifications—Upon the clean, dry floor apply a solution of 1 part Armortop and 1 part water in 2 or more coats, depending upon the density of the floor. Allow 4 hours to elapse between coats.

Accello

ACCELLO
For Accelerating the Set of Cement
TRADE-MARK

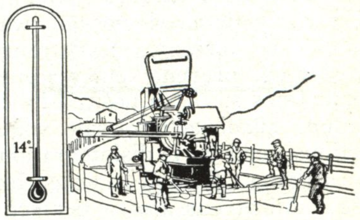
Description — Accello, a liquid solution, is used to accellerate the set of cement mortars and floor finish in very cold weather, and to make possible the hydration of portland cement mixtures at temperatures as low as 14° F.



In plain concrete, cement plaster, floor toppings, brick mortar, and road work, the use of Accello during the winter months, when the temperature falls as low as 14° F., is indispensable. It insures masonry work against frost and freezing, and permits work to continue during the cold weather.

Accello makes better concrete road work possible, speeds up work and reduces delays to traffic to a minimum.

Accello makes bricklaying possible until the temperature drops below the point at which it pays to keep the men at work.



Accello is a standardized solution of calcium chloride, uniform in quality and strength. It is easy to use. Any unskilled workman can add it to the gauging water. The proportions necessary are shown below:

Proportions of Accello and Water at Outside Air Temperatures—

45° F., use 1 part Accello with 50 parts water
40° F., use 1 part Accello with 25 parts water
35° F., use 1 part Accello with 20 parts water
32° F., use 1 part Accello with 15 parts water
28° F., use 1 part Accello with 12 parts water
25° F. (or less), use 1 part Accello with 10 parts water
14° F. (or less), mechanical heat is necessary

Guarantee

On many important installations we have furnished a written guarantee for a period of five years on the maintenance of waterproof concrete and the dustproofing and hardening of concrete floors. A Surety Bond will be furnished on all waterproofing installations supervised by our Engineering Department.

Detailed Information

Write for complete data and specifications for any work within the scope of "Anti-Hydro" products. The services of our Engineers are available at all times.

Dealers Everywhere Carry Stock

A complete stock of "Anti-Hydro" products is carried by dealers throughout the country.

Shipment

"Anti-Hydro" is shipped in standard containers of 5, 10, 20 and 30 gal.

Armortop, in containers of 5, 30 and 50 gal.

Accello, in barrels of 50 gal.

AMERICAN ALGIN PRODUCTS CO.

Waterproofing

WEST DULUTH, MINN.

Alkagel

Patented

Products and Uses

ALKAGEL: a Waterproofing.

Alkagel A—an absolute waterproofing (and alkaliproofing) for concrete.

Alkagel B No. 1—for waterproofing plaster of paris and gypsum.

Alkagel B No. 2—for waterproofing concrete stucco and coatings.

Alkagel B No. 3—for waterproofing mass concrete and concrete products.

Alkagel C—waterproofing and binder for wood pulp articles.

Alkagel D—setting, binding, and adhesive for briquetting various mill waste materials and for electrical insulation products.

Alkagel E—waterproofing for textiles and canvas; acidproofing.

Description

Alkagel—the absolute integral waterproofing (and alkaliproofing)—is a water soluble colloid which, upon drying, produces a water repellant, insoluble film around the concreting particles, increasing density and strength, and safeguarding against attacks of the elements.

General Features—Alkagel is an integral preserver in general. It not only waterproofs concrete absolutely but increases its strength, promotes an early hardening, prevents efflorescence (the unsightly white exudations so often noticed on concrete), prevents frost action, alkali action, salt water action, organic acid actions, and any disintegration caused by water and weathering. Soluble in water, but insoluble after hardening. Alkagel is also a perfect insulator for electricity and heat. Alkagel is not affected by any of the natural disintegrating agencies like water solubility, oxidation, decomposition, carbonating—and it conveys its qualities to the material treated by it. As time goes on, Alkagel treated products go to perfection both as to waterproofing and strength.

Absolute Waterproofing—The waterproofing of concrete with Alkagel is integral and absolute. It is not a surface coating that can be destroyed by abrasion. Alkagel is a colloid which forms an insoluble water repellant film around the concreting particles and fills all capillaries and pores. In the wood pulp field, it is also an ideal waterproofing for insulation boards.

Alkaliproofing—Alkali can not enter and form expanding crystals in the pores of concrete treated with Alkagel. The protecting film is immune to alkali action.

Permanent—Concrete treated with Alkagel is permanent. Frost, alkali, salts, water—none of these can penetrate and harm it. Concrete treated with Alkagel has greater density and greater strength.

A "Fat" Mix—Alkagel is especially well adapted for use in stucco. It produces a "fat" mix, easy to work, and preserves the lath, ship lap and studdings against rot or rust. It preserves against efflorescence and frost deterioration.

Patching—Leaky concrete can be patched waterproof and alkaliproof with a coat of concrete mixed with Alkagel. This method has been successfully used on silos, cisterns, floors, foundations, roofs, and stucco walls.

Insulation—Alkagel C is a waterproofing binder and sizing for insulating building boards and stucco backings. Alkagel D can be used in cast, with or without fillers, to produce insulating slabs for switchboards, radio panels, and other insulating devices.

University Tested

Alkagel has stood up as an absolute waterproofing under the severest university tests. We will furnish copies of the reports on request. In the main, these reports show only an insignificant surface wetting, in spite of prolonged immersion in water, with noticeable increase in density and strength.

General Uses with Concrete

Alkagel has proved satisfactory for use in the mass concrete, for foundations, floors, silos, cisterns, root houses, culverts, aqueducts, elevators, grain bins, piers, dams, tanks, drains, seawalls, flumes, creamery floors, roofs, and shingles—in short, wherever concrete is used Alkagel stirred into the mixing water will render that concrete absolutely impervious to the deleterious action of water, alkali, salt, frost and weathering.

Engineering Consultation

Alkagel is made in various grades to meet with specific problems. In general, these are covered in the first paragraph on this page. For any specific problem, or for further information, we invite consultation with our engineers.

Specification Data

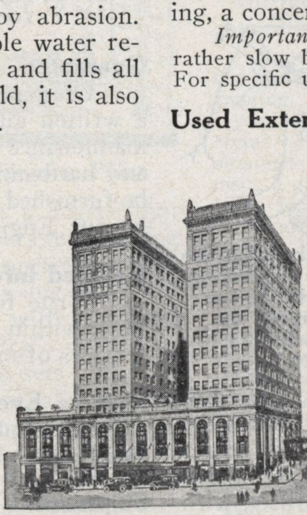
The use of Alkagel is very simple. The compound is merely diluted with the mixing water until the desired concentration is reached. To make mass concrete impervious to moisture use 1 gal. of Alkagel with every 28 gal. of mixing water. For stucco and coating and alkaliproofing, a concentration of 1 part to 14 with Alkagel is used.

Important: Alkagel concrete should be subjected to a rather slow but thorough drying, in line with regular practice. For specific uses, consult with our engineers.

Used Extensively

Though Alkagel is a comparatively new discovery, it has been used extensively in the Northwest territory for the largest and most important construction jobs—the half million dollar school at Grand Rapids, Minnesota; the million dollar high school at Ely, Minnesota; the million dollar county jail at Duluth, Minnesota; the three quarter million dollar Security Van & Storage Co.'s building at Duluth, Minnesota, and the two million dollar "Hotel Duluth." In these buildings Alkagel went in the mass concrete of the foundations and basement floors. All report excellent results.

Aside from these outstanding jobs are a list of smaller jobs such as private residences, too numerous to enumerate.



Hotel Duluth—Duluth, Minn.

The two million dollar "Hotel Duluth," where Alkagel went into the mass concrete of the foundations and basement floors

THE BITU-MORTAR WATERPROOFING COMPANY, INC.

Manufacturers of Cement Waterproofing; Waterproofing Engineers and Contractors

TELEPHONE
CALEDONIA 5663, 5664

280 Madison Avenue
NEW YORK, N. Y.

BITU-MORTAR
WATERPROOFING
WATERPROOFS PERMANENTLY
TRADE-MARK

Products

"B-M No. 78" BITU-MORTAR LIQUID WATERPROOFING COMPOUND.

Services and Guarantee Bond

Contractors for the execution of waterproofing in all sections of the country, making a specialty of difficult operations where other materials have failed.

Will furnish bond from any bonding company, when required, guaranteeing work to remain absolutely watertight for a long term of years.

An engineering department is maintained, which is at the service of all seeking advice on any questions concerning waterproofing of tunnels, subways, foundation walls, sewers, reservoirs, etc.

"B-M No. 78" Bitu-Mortar Liquid Waterproofing Compound

This is a bituminous emulsion which can be readily incorporated in ordinary portland cement mortar, rendering same absolutely and permanently impervious to water, even under severe pressure.

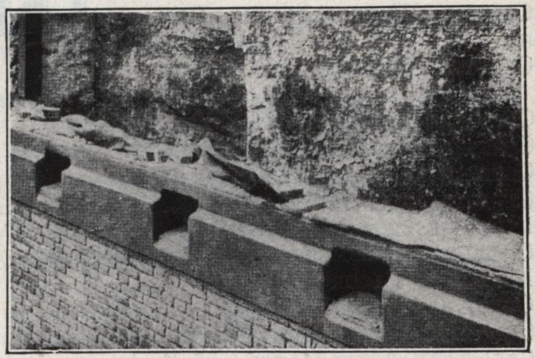
Mortar so prepared will bond perfectly to either old or new concrete, brick, stone or iron, and can be applied to surfaces even when water is coming through.

FISK BUILDING, 57TH STREET, BROADWAY AND EIGHTH AVENUE, NEW YORK, N. Y.

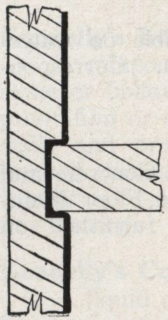
CARRERE & HASTINGS, Architects — FRED T. LEY, Contractor

Suggestions for Application

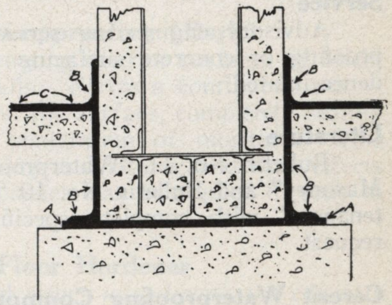
NATURE OF WORK	CONDITIONS	MATERIAL REQUIRED
Tunnels, subways, cellar walls.	Already constructed. Water coming through floors, ceilings or sidewalls.	Bitu-Mortar Liquid Waterproofing Compound, "B-M No. 78."



METHOD OF CARRYING WATERPROOFING BACK OF BEAMS



METHOD OF OBTAINING CONTINUOUS COATING WHERE INTERIOR WALL BUTTS AGAINST OUTSIDE WALL



METHOD OF WATERPROOFING UNDER GRILLAGES

A—First operation, "dampcourse"
B—Second operation
C—Third operation, finished floor

Partial List of Installations

Architectural Insurance Co., Watertown, N. Y.; York & Sawyer, Architects; Charles I. Wills, Inc., Contractor.

Reconstruction Hospital, 100th Street, Central Park West, New York, N. Y.; York & Sawyer, Architects; Charles I. Wills, Inc., Contractor

R. H. Macy & Co., W. 34th and 35th Streets, New York, N. Y.; Robt. D. Kohn, Architect; Marc Eidlitz & Son, Contractors

New York County Courthouse, Pearl and Centre Streets, New York, N. Y.; Guy Lowell, Architect; George A. Fuller Co., Contractors

American Museum of Natural History, 77th Street and Central Park West, New York, N. Y.; Trowbridge & Livingston, Architects; James Stewart & Co., Contractors

Westchester Biltmore Country Club, Harrison, N. Y.; Warren & Wetmore, Architects; George A. Fuller Co., Contractors

Ajax Rubber Co., Trenton, N. J.; Owner's Engineers; Owner's Contractor

Munson S. S. Co. Building, Wall and Beaver Streets, New York, N. Y.; Kenneth Murchison, Architect; George A. Fuller Co., Contractors

Kerr S. S. Co. Building, 38 Beaver Street, New York, N. Y.; Warren & Wetmore, Architects; George A. Fuller Co., Contractors

Combustion Engineering Co. Building, 43-47 Broad Street, New York, N. Y.; Ludlow & Peabody, Architects; George A. Fuller Co., Contractors

7 Gold Street and 83 Maiden Lane Building, New York, N. Y.; Clinton & Russell, Architects; Cauldwell, Wingate Co., Contractors

Jas. A. Hearn & Sons, 26-28 W. 13th Street, New York, N. Y.; Dunsmore & McClear, Engineers; R. H. Howes Construction Co., Contractors

Astoria Gas Plant, Astoria, L. I. (Underground Tunnel); W. Cullen Morris, Engineer; George A. Fuller Co., Contractors

CERESIT WATERPROOFING CORPORATION

Waterproofings, Dampproofings, Floor Hardeners, Protective Coatings

10 South La Salle Street
CHICAGO, ILL.

CERESIT
TRADE MARK REGISTERED

Products

- Ceresit Waterproofing Compound.
- Ceresit Waterproofing Powder.
- Cresolac Transparent Waterproofing.
- Ceresit Asphaltic Dampproofing.
- Ceresit Asphaltic Plaster Bond.
- Ceresit Metallic Hardener.
- Indurite Liquid Hardener.
- Craxement Concrete Repair Compound.
- Metalite Floor Finish.
- Cerox Colored Cement.
- Cem-bric Waterproof Paint.
- Crescrete Accelerator and Frostproofing.

Service

Advisory engineering service available on waterproofing or concrete surfacing problems. Correspondence invited.

Literature

Bulletin No. 11 "Waterproofing for Concrete and Masonry" and Bulletin No. 10 "Concrete Floor Maintenance," with complete specifications, furnished on request.

Ceresit Waterproofing Compound

An integral waterproofing in paste form. Add to portland cement concrete at the time of mixing.

(a) Ceresit waterproofing compound increases workability, and reduces labor costs in placing.

(b) This permits a reduction in the water content, without loss in plasticity or strength.

(c) Densifies and permanently waterproofs concrete.

Requirements—For mass concrete, use 8 lb. per cu. yd. For portland cement plaster, use 2 to 3 lb. to each sack of cement. For portland cement stucco use 2 to 3 lb. to each sack of cement.

Standard Specification—All concrete [cement plaster] [cement stucco] shall be waterproofed by the addition of Ceresit Waterproofing Compound, an integral waterproofing, manufactured by Ceresit Waterproofing Corporation, Chicago, which shall be used in accordance with the manufacturer's directions.

Ceresit Waterproofing Powder

An integral waterproofing in powder form. Added to concrete at the time of mixing. This material performs the same function as Ceresit Waterproofing Compound.

Requirements—Use 2 to 3 lb. to each sack of cement. Mix dry with the cement before adding water or aggregates to the batch.

Cresolac Transparent Waterproofing

A transparent liquid applied with a brush or spray to concrete, brick or other masonry for protection against penetration of water or moisture. This material penetrates the surface pores and makes the treated surface water repellent. It does not affect or change the original color. It is particularly effective on concrete block or tile.

Covering Capacity—Two coats required. 1 gal. covers 200 sq. ft., 2-coat work.

Ceresit Asphaltic Dampproofing

A heavy asphaltic paint for application on foundations of concrete, brick, or other masonry, below grade, to protect against dampness or surface water. It is also used for a primer and cement coat for membrane waterproofing.

Covering Capacity—For 1-coat work, 1 gal. will cover 60 to 70 sq. ft. For 2-coat work, 1 gal. will cover 40 to 50 sq. ft.

Ceresit Asphaltic Plaster Bond

A heavy asphaltic compound for application to the inside surfaces of outer or exposed walls on which plaster is to be applied. This material prevents injury to the plaster from dampness.

Covering Capacity—For 1-coat work, 1 gal. will cover 60 to 70 sq. ft. For 2-coat work, 1 gal. will cover 40 to 50 sq. ft.

Ceresit Metallic Hardener

A finely ground and graded metallic compound for incorporation in the top of wearing course of concrete floors. This material is particularly well adapted for heavy duty floors, producing a surface which is dustless and extremely dense and hard. It is furnished in gray or red.

Requirements—25 to 35 lb. to each 100 sq. ft., depending on traffic conditions.

Indurite Liquid Hardener

A colorless liquid for application to concrete floor surfaces. This material greatly increases hardness, and eliminates dusting. The treatment is made in two applications.

Requirements—1 gal. will treat 100 sq. ft.

Craxement Concrete Repair Compound

A special cement mixture for quickly and permanently repairing cracks and holes in concrete surfaces. It bonds securely to old work.

Metalite Floor Finish

A metallic cement for resurfacing concrete floors. Produces a very hard and dense surface of high strength.

Cerox Colored Cement

A colored waterproof portland cement for use wherever colored concrete surfaces are required. Used in the same manner as standard portland cement. Made in a variety of colors. Eliminates measuring and mixing of colors and cement on the job.

Cem-Bric Waterproofing Paint

A specially prepared paint for use on concrete, brick and masonry surfaces. Dries to dense and hard surface.

Crescrete Accelerator and Frostproofing

For accelerating the set of portland cement and protection against freezing at low temperatures. It is also of value as an integral hardener and waterproofing agent.

NATIONAL WATERPROOFING CO.

Waterproofing Engineers and Contractors

1077-1081 Columbus Avenue
BOSTON, MASS.

Products and Services

ENGINEERS and CONTRACTORS for WATERPROOFING, DAMPPROOFING and OILPROOFING.

KENNELLY'S LIQUID (INTEGRAL) WATERPROOFING and OILPROOFING.

KENNELLY'S DAMPPROOFING PAINT and COMPOUND.

KENNELLY'S CONCRETE FLOOR HARDENER.

General

We will absolutely guarantee all waterproofing done by us to be watertight. We will dampproof without discoloring the outside of any concrete, brick or stone structure and will guarantee the work to be absolutely moistureproof. We will apply a floor hardener to any concrete surface and guarantee the work against dusting or softening of the surface. All work done by us will be carried on in such a manner that no delay will be caused the general contractor or any part of the work.

Engineering Department

Our engineers are always at the service of architects, engineers, contractors and owners for the solution of waterproofing problems, for preparing specifications and for estimating the cost of waterproofing all concrete structures, foundations, tunnels, dams, reservoirs, swimming pools, etc.

Kennelly's Liquid Waterproofing (Integral Method)

Kennelly's liquid waterproofing is an integral waterproofing liquid which crystallizes in the mass as the cement sets, sealing completely and permanently the voids or pores between the sand and cement against the passage of liquids, even under heavy pressure. It is used in concrete or cement mortar to prevent the penetration of water or dampness. Having practically the same specific gravity as water, it immediately becomes part of the tempering water when poured into the barrel, thus becoming evenly distributed throughout the mass. Kennelly's liquid waterproofing not only renders concrete, mortar and stucco permanently impervious to water, but prevents discoloration and efflorescence, gives additional protection to the reinforcement and increases rather than decreases the strength of the mass. It does not affect the color or setting of cement mortars or concrete.

Our method of installing is to have a competent man stationed at the water barrel or any other source of water supply for the mixer, who will put the compound into the water to be used. Thus no delay is caused; in short, whenever concreting is to be done, start the work at once and the concrete can be waterproofed as it is placed and we will guarantee the work to be watertight.

Kennelly's Plaster Waterproofing

If a watertight plaster finish is desired, put the compound into the water used in making mortar and then place the mortar on the surface to be covered and work it out to the desired finish. By this method, concrete, cement mortar and stucco are rendered permanently moistureproof and pressureproof, the finished surface is not discolored, and the strength of the concrete is increased rather than decreased.

Kennelly's Exterior Dampproofing (Colorless)

A colorless liquid for dampproofing exterior surfaces of stucco, brick, stone and concrete masonry. Also extensively used as a sizing for lime plaster on interior walls before paint is applied. It is applied with a brush. Efflorescence and blotches are caused by the absorption of atmospheric moisture and exudation of gypsum and lime. By the use of our dampproofing, we have overcome these disfiguring features without discoloring the original surface or joints.

We will guarantee to make any building dampproof by this method at a reasonable cost.

Kennelly's Interior Dampproofing (Dark)

A compound for coating interior surfaces of brick, stone or hollow tile walls. Forms a continuous waterproof film or coating on the surface, completely sealing walls and preventing penetration of moisture. This method eliminates furring and lathing and thus effects a great saving, as the plaster may be applied directly to this coating.

Kennelly's Concrete Floor Hardener

A liquid compound either *mixed with the concrete* finish in new floors *or applied to the surface* of old as well as new floors. In buildings subject to heavy wear, the dusting of a concrete floor induces disintegration and crumbling of the concrete and thus ruins the floor. Our hardener insures against dusting, and provides a nonabsorbent surface, more impervious to wear than ordinary concrete, makes a durable top surface, and provides a sure non-slip foothold.

Specifications

Integral Waterproofing and Oilproofing—To each 50 gals. of water (1 bbl.) used in tempering the mass concrete, add 6 qts. of Kennelly's Liquid Waterproofing, thoroughly mixing the concrete and carefully spading it into place so as to avoid stone pockets.

Plaster Waterproofing—Material used in same proportion as for integral work, mixing the waterproofing with water used in making concrete mortar and then placing the mortar on the surface to be covered, using 6 qts. of waterproofing to 50 gals. of water.

Dampproofing—Thoroughly clean surfaces to be dampproofed by washing with warm water. Allow to dry, and then apply dampproofing with brush, covering surface well. Allow 4 or 5 hours to elapse before making second application, and when thoroughly absorbed, make a third application.

Concrete Floor Hardener—First thoroughly clean the floor surface to be treated by scrubbing with warm water, thereby removing all foreign particles, etc. Allow to dry, and then apply the floor hardener with brush, covering the surface well and allow to dry for at least 4 or 5 hours before making a second application. Should any dry spots appear, treat with another coat of hardener.

References

Stone & Webster Engineering Corp., Boston, Mass.
General Electric Co., Pittsfield, Mass.
New England Telegraph & Telephone Co., Boston, Mass.
Boston Post, Boston, Mass.
United Illuminating Co.'s Plants, Bridgeport, and New Haven, Conn.

THE SANDUSKY CEMENT COMPANY

Manufacturers of Waterproofing

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 350 Madison Avenue
TOLEDO, OHIO, 1004 Second National Bank Building
DIXON, ILL., 34 Dixon National Bank Building

FACTORIES

BAY BRIDGE, OHIO
SILICA, OHIO
DIXON, ILL.
YORK, PA.

Product

Medusa Waterproofing, the standard of integral waterproofing quality for nineteen years, in either Powder or Paste form—the original integral concrete waterproofing.

For Medusa Portland Cements, see pages 341-349; for Medusa Cement Paint, see pages 1716-1717.

TRADE-MARK

Output

3,000,000 lbs. of waterproofing.

Packages

Medusa Waterproofing Powder is furnished in 40-lb. paper lined cloth sacks. A quart weighs one pound.

Medusa Waterproofing Paste is furnished in metal containers, with large friction seal tops, 1 gal. (8 lbs.) and 5 gals. (40 lbs.) each, packed for shipment in substantial crates of six 1-gal. or two 5-gal. cans each. A pint weighs one pound.

Literature

New Medusa literature, in standard size 8½x11 in., describing many uses for Medusa Waterproofing Powder, Paste and Cement will be gladly sent at your request.

Uses

Medusa will give positive watertight and dampproof results in construction of concrete reservoirs, water towers and tanks, swimming pools, tunnels, disposal plants, pumping stations, elevator pits, stucco, basement walls and floors, cisterns, cement blocks, cast stone, etc.

Medusa Waterproofing Comes in Four Convenient Forms

Medusa Waterproofing Powder — Medusa Waterproofing Powder is white, finely ground and highly water-repellent. When mixed with any reliable brand of plain portland cement, in proper proportions, it is uniformly distributed through the concrete, being entrapped or held in place by the cement, sand and aggregate. Due to its water-repellent nature, it prevents the absorption or percolation of rain water, ground or drainage water, spring water, dampness or moisture from the earth or atmosphere.

For every bag of portland cement used, mix 2%, or 2 lbs., of Medusa Waterproofing Powder if you want absolutely waterproof concrete.

Medusa Waterproofing Powder is furnished in 40-lb. paper lined cloth sacks, enough to mix with and thoroughly waterproof, 20 bags of portland cement.

Medusa Waterproofing Paste—Medusa Waterproofing Paste contains the same percentage of water-repellency as Medusa Waterproofing Powder. Its effect on the concrete mass is exactly the same as that of Medusa Waterproofing Powder. It is a heavy paste, to be dissolved in the gauging water used to mix the concrete.

Two per cent of Medusa Waterproofing Paste by weight of the cement, or 2 lbs. per sack, is the correct proportion to render concrete and cement work permanently waterproof.

Medusa Waterproofed Gray Portland Cement — This is our regular Portland Cement, made according to the exacting standards of the American Society for Testing Materials, to which Medusa Waterproofing is added in exactly the right proportions to the cement clinker during the process of manufacture, and thoroughly ground in to the cement. *See our pages in Cement Section.*

Medusa Waterproofed White Portland Cement —This is our standard White (Non-staining) Portland Cement, used for stucco construction; non-staining mortar for marble, terra cotta, brick, etc.; lawn and garden furniture; building trim; and many other uses.

The addition of Medusa Waterproofing to the white cement as explained above, while the clinker is being ground, assures thorough mixing and the correct proportions of both waterproofing and white cement in each batch. *See our pages in Cement Section.*

There are Three Main Systems of Waterproofing

Since the earliest days of the manufacture of portland cement in this country, the need for preventing the absorption of water by concrete has been fully recognized.

Three main methods exist of rendering concrete waterproof, dampproof, and impermeable:

a—The Integral Method of Waterproofing of concrete or the uniform distribution throughout the concrete of an *insoluble* water-repellent material in sufficient quantity to render the entire mass permanently impervious to water, with no detriment to the concrete.

b—The Waterproof Cement Plaster Coat Method or the application to the water of a layer of from ¾″ to 1″ of a waterproof cement mortar or plaster composed of portland cement, sand and waterproofing; floors should have a 2″ coat.

c—The Membrane Method, consisting of the application of successive coats of asphaltic or bituminous material, heated in order to render it plastic, with the interposition of successive layers of felt or paper.

Integral Method of Waterproofing

Concrete contains many microscopic pores or capillary tubes constituting from 20% to 40% of the cubic contents. Water enters concrete because of the physical law of capillary attraction and its natural absorptive qualities. To make it waterproof, the absorptive properties must be destroyed.

Medusa Waterproofing becomes an inseparable part of the concrete itself. Designed to be mixed with con-

Continued on next page

crete, to lubricate the particles and form an integral part of the mixture, it thus becomes an inseparable part of the mass, being tightly sealed within the concrete.

Medusa Waterproofing will positively and permanently render concrete dampproof and waterproof.

The integral method of waterproofing is economical, it does not require additional excavation on the exterior of basement or foundation walls, it does not require additional brick or concrete protecting walls, no difficulty experienced in making joints around pipes and at the bottom of outside walls, at footings, at junction of the basement floors and footings, and wherever horizontal or vertical joints occur. Blind leaks are not possible in integral waterproofing. Leaks due to settlement cracks can be economically repaired.

Full specifications for waterproofing mass concrete appear on this page.

Waterproofed Cement Plaster Coat Method

This is a permanent and inexpensive method of rendering *a completed concrete or masonry structure dampproof and waterproof.* The fact that it results in a clean, neat and pleasing surface renders its use satisfactory for plastering or lining basement walls, for surfacing floors, and other interior work. Full specifications for the application of this method appear on the following page.

A Word as to the Quantity of Waterproofing Needed

Though somewhat less than the quantity recommended may be used in many cases with excellent results, it has proved advisable in any structural work to have a reasonable factor of safety.

The need of such a factor of safety will be appreciated when the varying conditions affecting concrete work are considered. Specifications vary considerably and so also do the aggregates selected.

It has been found that the quantity prescribed, 2% of the weight of cement (8 lbs. to the barrel) is the correct amount to be used. A reasonable factor of safety is included in this figure and we advise that this specification be rigidly maintained.

The Workmanship Must Be Good

It must be remembered that the addition of a perfect waterproofing agent does not compensate for faulty design; improper proportions or materials, imperfect mixtures of the cement, sand and aggregates, contamination of the mixture with dirt, clay, loam, etc., excess or insufficient water or poor workmanship at any stage of the work.

Proper precautions must be observed in order to obtain good concrete by following proper methods.

The Slightest Excess of Water in the Mix Will Reduce the Strength of the Concrete

Prof. Duff A. Abrams, of the Structural Materials Research Laboratory, Lewis Institute, in pamphlet, "Design of Concrete Mixtures," makes the following statements concerning the amount of water which should be used for mixing concrete:

> "With given concrete materials and conditions of test, the quantity of mixing water determines the strength of the concrete, so long as the mix is of a workable plasticity.
>
> "All the methods of proportioning concrete which have been proposed in the past have failed to give proper attention to the water content of the mix. Our experimental work has emphasized the importance of the water in concrete mixtures, and shows that the water is, in fact, the most important ingredient, since very small variations in water content produce more important variations in the strength and other properties of concrete than similar changes in the other ingredients.
>
> "One pint more water than necessary to produce a plastic concrete reduces the strength to the same extent as if you should omit 2 to 3 lbs. of cement from a bag batch.
>
> "Without regard to the actual quantity of mixing water, the following rule is a safe one to follow:
> *Use the smallest quantity of mixing water that will produce a plastic or workable concrete.*"

Specifications for Waterproofing Mass Concrete

For foundations, walls, footings, floors, piers, swimming pools, reservoirs, tanks, wells, pits, tunnels, concrete blocks, etc.

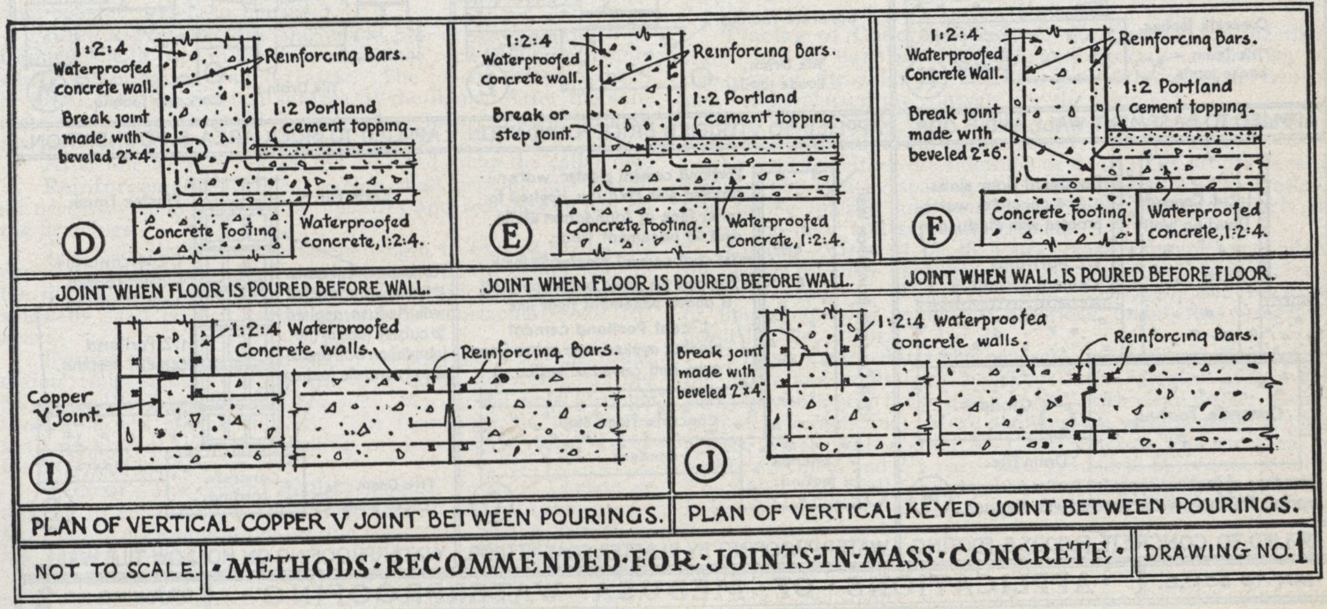
Proportions—The concrete shall consist of 1 part cement, 2 parts sand and 4 parts aggregate.

Cement—The cement shall be Medusa Portland Cement or a brand of equal quality, which will pass all the requirements of the Standard Specifications of the American Society for Testing Materials.

Waterproofing—The contractor shall use Medusa Waterproofing, either powder or paste, to waterproof the portland cement which is used.

(A) Medusa Waterproofing Powder—To render concrete or cement work impervious to water, use Medusa Waterproofing Powder to the amount of 12 lbs. per cu. yd. of 1:2:4 concrete.

Note: 2 qts. of Medusa Waterproofing Powder will weigh 2 lbs. If Medusa Waterproofing Paste is to be used, consult Paragraph "B."



1:2:4 Waterproofed concrete wall.
Reinforcing Bars.
1:2 Portland cement topping.
Break joint made with beveled 2"x4".
Concrete Footing
Waterproofed concrete, 1:2:4.
D
JOINT WHEN FLOOR IS POURED BEFORE WALL.
1:2:4 Waterproofed concrete wall.
Reinforcing Bars.
1:2 Portland cement topping.
Break or step joint.
Concrete Footing.
Waterproofed concrete, 1:2:4.
E
JOINT WHEN FLOOR IS POURED BEFORE WALL.
1:2:4 Waterproofed Concrete Wall.
Reinforcing Bars.
1:2 Portland cement topping.
Break joint made with beveled 2"x6".
Concrete Footing.
Waterproofed concrete, 1:2:4.
F
JOINT WHEN WALL IS POURED BEFORE FLOOR.
1:2:4 Waterproofed Concrete walls.
Reinforcing Bars.
Copper V Joint.
I
PLAN OF VERTICAL COPPER V JOINT BETWEEN POURINGS.
Break joint made with beveled 2"x4".
1:2:4 Waterproofed concrete walls.
Reinforcing Bars.
J
PLAN OF VERTICAL KEYED JOINT BETWEEN POURINGS.
NOT TO SCALE.
·METHODS·RECOMMENDED·FOR·JOINTS·IN·MASS·CONCRETE·
DRAWING NO. 1

Continued on next page

Method of Mixing by Hand—If a mechanical mixer is not used add the powder directly to the dry cement and mix by hand until the powder is uniformly distributed throughout the cement. To the dry mixture of cement and sand, add the crushed stone and mix until a uniform batch has been secured. The above procedure differs in no respect from the thorough mixing recommended for all concrete, except by the addition of the powder and its dissemination throughout the cement. Care shall be taken to add the water a little at a time.

Mechanical Mixing—Where a concrete mixer is employed, the powder shall be added directly to the cement at the hopper or on the loader. The time of mixing shall be sufficient to insure uniformity throughout the mass and shall not be lessened with a view to increasing speed. The water shall be added slowly. The amount of water shall be kept as low as conditions permit, a quaking consistency being required.

(B) Medusa Waterproofing Paste—If the paste is used instead of the powder, use the paste to the amount of 12 lbs. per cu. yd. of 1:2:4 concrete.

Thoroughly mix the Medusa Paste with equal parts of water, and add this paste water to the gauging water used to mix the concrete.

Note: 1 qt. of Medusa Waterproofing Paste will weigh 2 lbs.
If Medusa Waterproofing Powder is to be used, consult paragraph "A."

Gauging Water—The amount of water per cubic yard of concrete varies with conditions. It theoretically requires only about 20 gals. of water to the barrel of cement to make 1:2 mortar or 1:2:4 concrete. This would be 30 gals. to the cubic yard. In actual practice, however, the quantity of water used may be 40 to 50 gals. or even more per cubic yard. The amount of Waterproofing added shall therefore be in proportion to the cement used to make concrete.

We advise that the amount of water which a crew is using be determined, and the correct amount of Medusa Waterproofing Paste be added to the gauging water so that for each cubic yard of 1:2:4 concrete, 1½ gal. of paste (12 lbs.) shall go into the concrete.

No more water shall be used than is absolutely necessary to make a plastic and workable mix.

Sand—The sand shall be well graded, clean, sharp, hard and free from clay, loam, vegetable or other deleterious matter.

Aggregate—The aggregate shall be gravel, crushed trap rock or crushed limestone uniformly graded so that the largest pieces will pass a 1½" ring.

Placing—Concrete shall be placed immediately after mixing and shall be well spaded to expel, entrapped air and insure maximum density. If possible, pouring of concrete for entire operation shall be continuous. If joints are unavoidable, however, extreme care shall be taken to remove all dirt and laitance from old concrete, saturating joint with water and giving it a good coat of cement grout.

Specifications for Waterproofed Cement Plaster

For waterproofing concrete, concrete block, brick, hollow tile or stone foundation walls, pits, etc. Also concrete floors, swimming pools, reservoirs, tanks, wells, tunnels, basements, etc.

Proportions—The cement plaster shall be composed of 1 part cement and 2½ parts sand.

Cement—The cement shall be Medusa Portland Cement or a brand of equal quality which will pass all the requirements of the Standard Specifications of the American Society for Testing Materials.

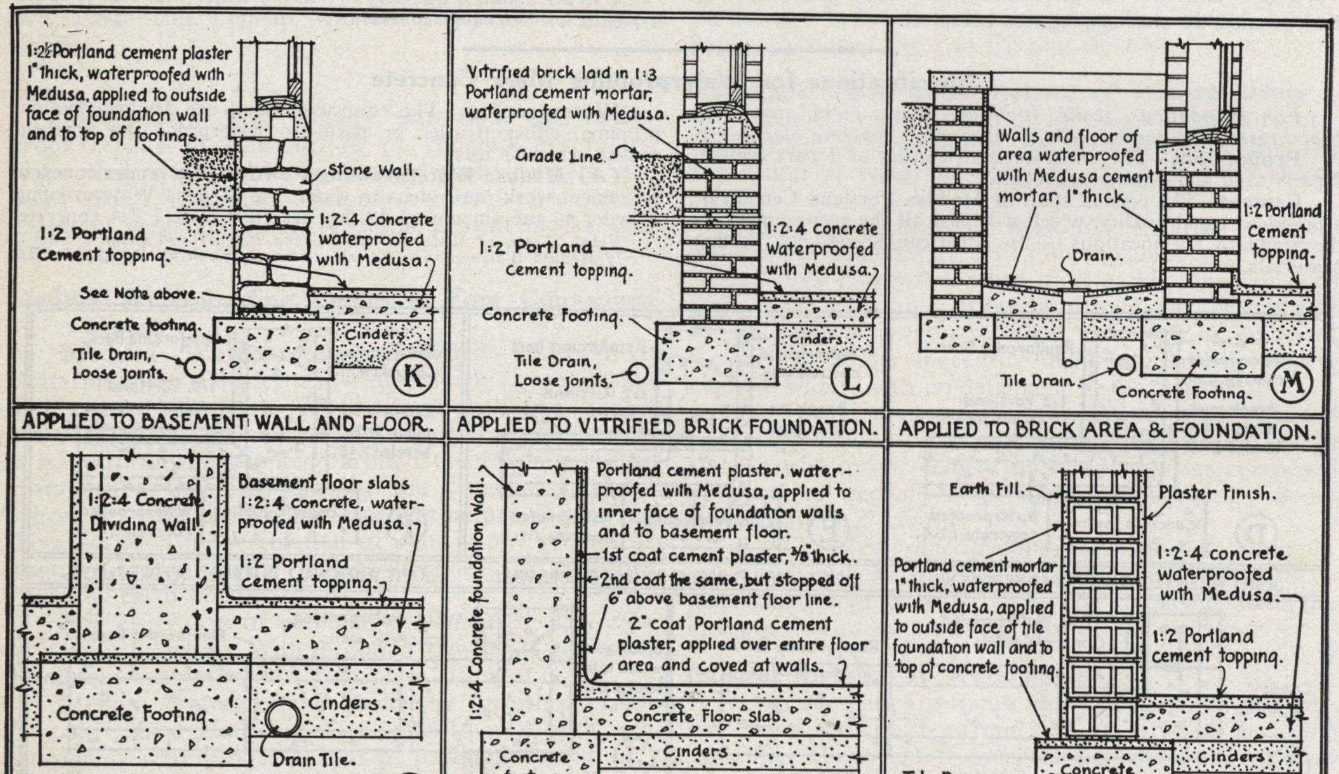
Waterproofing—The contractor shall use Medusa Waterproofing, either powder or paste, to waterproof the portland cement which is used.

(A) Medusa Waterproofing Powder—To render cement mortar impervious to water, use Medusa Waterproofing Powder to the amount of 8 lbs. per 100 sq. ft. of cement plaster 1 in. thick for a 1:2 mixture and for a 1:2½ mix, 6½ lbs. waterproofing.

Note: 2 qts. of Medusa Waterproofing Powder will weigh 2 lbs.
If Medusa Waterproofing Paste is to be used, consult paragraph "B."

Method of Mixing by Hand—If a mechanical mixer is not used add the powder directly to the dry cement and mix by hand until the powder is uniformly distributed throughout the cement. To the dry mixture of cement and powder add the sand and mix until a uniform batch has been secured. The water shall be added slowly.

Mechanical Mixing—Where a mechanical mixer is employed, the powder shall be added directly to the cement at the hopper or on the loader. The time of mixing shall be sufficient to insure uniformity throughout the mass and shall not be lessened with a view to increasing speed. The water shall be added slowly.


1:2½ Portland cement plaster 1" thick, waterproofed with Medusa, applied to outside face of foundation wall and to top of footings.
Stone Wall.
1:2:4 Concrete waterproofed with Medusa.
1:2 Portland cement topping.
See Note above.
Concrete footing.
Cinders.
Tile Drain, Loose joints.
K
Vitrified brick laid in 1:3 Portland cement mortar, waterproofed with Medusa.
Grade Line.
1:2:4 Concrete Waterproofed with Medusa.
1:2 Portland cement topping.
Concrete Footing.
Cinders.
Tile Drain, Loose joints.
L
Walls and floor of area waterproofed with Medusa cement mortar, 1" thick.
1:2 Portland Cement topping.
Drain.
Tile Drain.
Concrete Footing.
M
1:2:4 Concrete Dividing Wall.
Basement floor slabs 1:2:4 concrete, waterproofed with Medusa.
1:2 Portland cement topping.
Concrete Footing.
Cinders.
Drain Tile.
Over tops of footings apply 1:2 Portland cement mortar, 1½ thick, waterproofed with Medusa.
N
1:2:4 Concrete foundation Wall.
Portland cement plaster, waterproofed with Medusa, applied to inner face of foundation walls and to basement floor.
1st coat cement plaster, ⅜ thick.
2nd coat the same, but stopped off 6" above basement floor line.
2" coat Portland cement plaster, applied over entire floor area and coved at walls.
Concrete Floor Slab.
Cinders.
Concrete footing.
O
Earth Fill.
Plaster Finish.
Portland cement mortar 1" thick, waterproofed with Medusa, applied to outside face of tile foundation wall and to top of concrete footing.
1:2:4 concrete waterproofed with Medusa.
1:2 Portland cement topping.
Cinders.
Concrete footing.
Tile Drain Loose Joints.
P

APPLIED TO BASEMENT WALL AND FLOOR. | APPLIED TO VITRIFIED BRICK FOUNDATION. | APPLIED TO BRICK AREA & FOUNDATION.

APPLIED TO CONCRETE FLOORS & FOOTING. | WATERPROOFING BY PLASTER COAT METHOD. | WATERPROOFING ON HOLLOW TILE WALL.

NOT TO SCALE. • APPLICATIONS • OF • MEDUSA • WATERPROOFING • DRAWING NO. 2

Continued on next page

Note: In either hand or mechanical mixing the amount of water shall be kept as low as conditions permit, a quaking consistency is required.

(B) Medusa Waterproofing Paste—If the paste is used instead of the powder, use the paste to the amount of 6½ lbs. per 100 sq. ft. of cement plaster 1″ thick for a 1 : 2½ mixture.

Thoroughly mix the Medusa Paste with equal parts of water, and add this paste water to the gauging water used to mix the mortar.

Note: 1 qt. of Medusa Waterproofing Paste will weigh 2 lbs.

If Medusa Waterproofing Powder is to be used, consult paragraph "A."

Water (or Gauging Water)—No more water (or gauging water) shall be used than is absolutely necessary to make a plastic and workable mix.

Sand—Sand shall be clean, well graded and free from clay, loam, vegetable or other deleterious matter.

Preparation of Surface—(C)—The old concrete surface shall be mechanically roughened or hacked by means of stone mason's hammers, drills or similar tools, exposing the matrix of the concrete and having ¼″ to ⅜″ deep holes every 2″ to 3″ apart, so as to provide a better bond for the cement plaster.

Note: If walls are of brick or other masonry use paragraph (D) instead of (C).

(D) Mortar joints shall be raked out to a depth of ½″ to ¾″ removing all loose or crumbling mortar.

All paint films shall be thoroughly removed by burning, scraping or by sand blast. All hard non-porous surface shall be scored to provide key for plaster.

The entire surface shall be cleaned with stiff wire brushes, or, where available, compressed air or steam shall be used so as to remove all loose pieces or particles.

Apply freely to the cleaned area a solution of 1 part of muriatic acid and 10 parts of water, using a fiber or acid brush. Allow acid solution to remain on the surface until the acid exhausts itself, approximately 10 minutes.

Wash the surface with water from a hose, being careful to remove all of the acid solution.

Application of Cement Plaster—Wet the entire surface of the wall to be plastered with water before grouting to prevent the absorption of water from the cement plaster.

Prepare a grout of portland cement and water. Mix to a creamy consistency and apply with a fiber brush to the cleaned surface, brushing the grout thoroughly into the surface.

First Coat—Apply the first coat of plaster ⅜″ thick, troweling the plaster well into the surface so as to secure a proper bond. Thoroughly scratch the first coat. Do not scratch too deep.

Second Coat—After the first coat has set hard enough, sprinkle with water and apply second coat ⅜″ thick troweling the plaster with sufficient pressure to obtain maximum density and to close all surface pores, leaving a tight, close-grained finish.

Cut the second coat of plaster off 6″ above the finished floor line, to provide for cove base.

Floor Coating—After the walls have been plastered, prepare the surface of the floors, including a coat of cement grout, similar to that specified above for walls. Use extreme care to prevent mud or dirt being brought on the grouted surface.

Apply a 2″ coat of cement plaster or topping over the floor, joining the coved base with the finished wall cement plaster.

General—Where joints must be made in cement plaster work, run the cement work an inch or two beyond the contemplated joint. After the cement has set, cut this surface off in as broad a bevel as possible.

This bevel shall receive a good coat of grout prior to applying adjoining coats.

In Case Water Seepage Interferes with the Work—If there is a continual seepage through the walls, holes shall be bored in the walls and tubes or small gas pipes inserted to concentrate the flow of water and relieve the pressure while the plaster coat is being applied. Calk around the pipes with oakum of lead wool.

The seepage pipes shall remain open until the waterproofing coat has thoroughly set and is capable of resisting the pressure. The seepage pipes shall be removed and plug holes with cork or wood and cover with waterproofed cement plaster.

Where water pressure is too great, sumps shall be provided on the exterior of walls to a depth below the floor level. Provide and maintain pumps continuously until cement surface has thoroughly set.

Prevent Finished Surface from Drying Too Fast—The finished surface shall be protected from too rapid drying out, by keeping moist for at least a week to allow it to thoroughly harden and to prevent hair-cracks. Sprinkle or wet with a hose or cover with canvas or burlap kept continually wet.

Specifications for Placing Medusa Waterproofed Concrete Against Water Pressure

Sump and Sump Pumps—After the general excavation has been completed the contractor shall excavate a sump hole outside the proposed foundation walls and shall provide and install a drain pipe leading to it from the general excavation, passing under the wall. The drain pipe shall have a threaded end with cap to fit and after this pipe has served its purpose it shall be sealed as described under "Inlet Pipes."

Provide, install and maintain a pump (or pumps) to keep the water below the floor mat during the entire construction of the foundations, and for a period of 24 to 48 hours after the final concrete has been poured.

Inlet Pipes—Provide and install one or more threaded 4″ iron pipes with caps in the floor to a loose rock footing at points where the pressure is the greatest. The top of the pipes shall be lower than the finished surface of the floor. After the concrete has set (at least 24 hours) allow water to flow through the pipes and let the concrete cure in this water.

After one week, screw on the caps and pump the cellar dry.

Reinforcement—The contractor shall provide and install all necessary reinforcement of the sizes and spacings shown on the drawings.

The rods shall be of sufficient length to extend across the entire floor leaving a slight convex crown at the center and up the sidewalls to the desired height. Perpendicular rods for the sidewalls shall be tied together with ½″ horizontal rods, 18″ apart.

Forms—Forms shall be placed on both sides for the foundation walls, closely supported with studs according to the height, and well braced on either side. Wiring the studs through the forms will not be allowed. The foundation of the forms shall be skirted with 4″ planking or studding to form a key for the floor mat.

Cement—The cement shall be Medusa Portland Cement or a brand of equal quality which will pass all the requirements of the Standard Specifications of the American Society for Testing Materials.

Sand—Sand shall be clean and sharp, all passing through a ⅛″-mesh sieve, and not over 30% through a 60-mesh sieve. Sands when bone dry shall not show over 35% voids.

Gravel (or Crushed Stone)—All gravel (or crushed stone) shall grade from ¼″ to 1″.

Waterproofing—The contractor shall use Medusa Waterproofing, either powder or paste, to waterproof the portland cement which is used.

Note: In addition to above paragraph under the heading of "Waterproofing" use paragraphs under the headings of "(A) Medusa Waterproofing Powder"—"Method of Mixing by Hand"—"Mechanical Mixing"—"(B) Medusa Waterproofing Paste"—and "Gauging Water" which will be found on pages 119 and 120.

Proportions—The concrete shall consist of 1 part cement, 2 parts sand and 4 parts gravel (or crushed stone).

Placing of Concrete—Pouring the concrete for the sidewalls shall be done in one continuous operation. The key at the base of the sidewalls shall be grouted with clear cement just before placing the concrete for the floor.

The mix for the floor shall be poured directly against the walls and worked towards the center. Sloppy concrete shall not be used for either the sidewalls or floor. The proper density shall be obtained by spading and tamping, giving special attention to the interior and exterior of walls and particularly so where the floor and sidewalls connect.

Curing—After 24 or 48 hours, cease pumping, and allow the water to enter through the inlet pipes and find its level within the interior. Permit the water to remain for one week or longer, treating as before described under the paragraph headed "Inlet Pipes."

Finish Coat—After the concrete has been cured, roughen the floors and walls with a pick or bush hammer. Clean the surface with a stiff brush and wet well with clear water. Grout with clear cement just before applying the waterproofed cement plaster which shall consist of 1 part cement, waterproofed as before specified, and 2½ parts sand graded as before mentioned. The finish coat shall be applied not less than ¾″ thick carrying it up the sidewalls to the height of 8 in. to form a sanitary base.

For sidewall plaster, leave the edge of base course rough and grout as before specified. Avoid excessive troweling.

When sufficiently set, cover the floor with wet sand and keep the walls moist for one week.

THE TRUSCON LABORATORIES

Integral Waterproofings, Dampproofings, Floor Hardeners

DETROIT, MICH.

BRANCH OFFICES

ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
CHICAGO, ILL.
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
EL PASO, TEX.
GRAND RAPIDS, MICH.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
MONTREAL, QUE.
NEW YORK, N. Y.
NORFOLK, VA.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SYRACUSE, N. Y.
TORONTO, ONT.

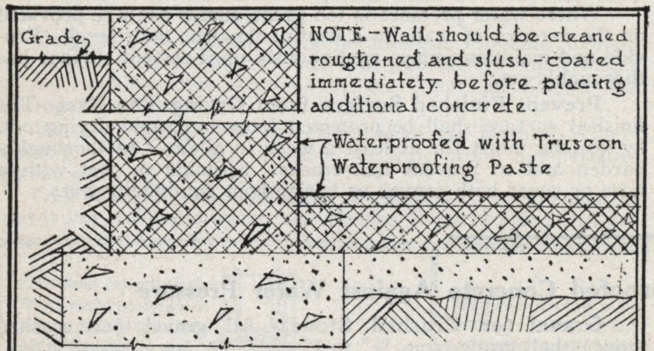
Products

INTEGRAL WATERPROOFINGS for concrete and portland cement mortars.
DAMPPROOFINGS.
CEMENT FLOOR HARDENERS.
ANTI-FREEZE MIXTURES.
For Paints and Varnishes, see page 1703.

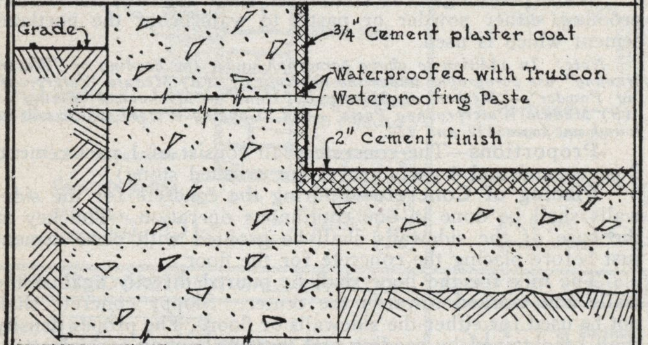
Truscon Waterproofing Paste, Concentrated

Definition—An integral compound for producing thoroughly waterproof concrete or cement mortar. It is adapted to waterproofing concrete construction of various kinds—foundations, reservoirs, tunnels, dams, cisterns, etc. Also used for waterproofing brick and stone structures through the agency of a cement plaster coat into which the waterproofing is introduced. The same waterproofed cement plaster coat will also waterproof old concrete structures. Truscon Waterproofing Paste is also used for producing waterproof cement stucco and cement mortar.

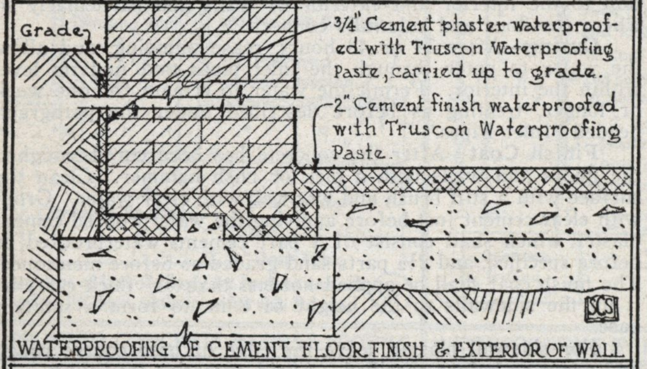
You could dip this house in water
Protected with TRUSCON


Grade
NOTE.—Wall should be cleaned roughened and slush-coated immediately before placing additional concrete.
Waterproofed with Truscon Waterproofing Paste

WATERPROOFING OF CONCRETE FLOOR & WALL BY INTEGRAL METHOD



WATERPROOFING OF CEMENT FLOOR FINISH & INTERIOR OF WALL


Grade
3/4" Cement plaster waterproofed with Truscon Waterproofing Paste, carried up to grade.
2" Cement finish waterproofed with Truscon Waterproofing Paste.
SCS

WATERPROOFING OF CEMENT FLOOR FINISH & EXTERIOR OF WALL

METHODS OF WATERPROOFING WITH TRUSCON WATERPROOFING PASTE

How Used—Truscon Waterproofing Paste, Concentrated, is incorporated into concrete or cement mortar through the medium of the water used for tempering the mix. Being in paste form, it diffuses itself readily through the water, forming a milky mixture. This milky appearing mixture of paste and water is used for tempering concrete or cement in the place of clear water.

Advantages—(1) Water repellent; kills capillary absorption of moisture into concrete or cement plaster. Since "plugging the pores" of cement is physically impossible, the repellent feature of Truscon Waterproofing Paste is the most practical and scientific method of waterproofing.

(2) Colloidal; is concentrated colloid and hence adds to the normal colloidal content of cement mortar, thus increasing its resistance to weathering and wear.

(3) High concentration and freedom from useless filler—it is all waterproofing—contains no clay, lime or such material.

(4) In paste form—the form most easily mixable with wet concrete or cement mortar batches. This insures even distribution of the waterproofing.

(5) Inert—does not react chemically with cement; hence does not lower the strength of the concrete.

(6) Lubricates the mix by cutting the "skin strength" of water—producing a concrete which "chutes" easily to the forms, also a more dense and compact concrete. In the case of cement mortar or stucco, "lubrication" makes these materials of creamy consistency and much easier to apply. Avoids mottling of surface of cement stucco.

(7) Insoluble in water—hence can not be washed out of the concrete or affected by time or weathering. This is an important point because so many of the waterproofings on the market will dissolve in water.

Specifications for Waterproofing Mass Concrete

Estimate 7 lb. of Truscon Waterproofing Paste to the cubic yard of concrete. Applicable to concrete foundations, reservoirs, tunnels, cisterns, swimming pools, etc.

Method—Water-tightness shall be secured by the addition of Truscon Waterproofing Paste, concentrated, to all water used to temper the dry mixture of cement and aggregate in the proportions, and mixed, as directed below.

Ingredients and Proportions for Concrete—The concrete composing the structure shall consist of 1 part of cement, 2 parts of sand and 4 parts of stone (1:2:4) properly graded in size from coarse to fine.

The waterproofing is added in the proportion of 1 volume of Truscon Waterproofing Paste to 36 volumes of water in the following manner:

Mixing—First, mix 7 gal. Truscon Waterproofing Paste with 5 gal. of water. Second, use 1 qt. of this paste and water mixture to each bag of cement, adding same to the dry cemented aggregate. Then temper with clear water as usual.

Placing—All concrete shall be placed in one continuous operation, each pouring being thoroughly spaded. In cases where joints are unavoidable, care shall be taken to clean and roughen the old surface, and have it thoroughly wet and slush coated immediately before placing additional concrete.

Continued on next page

Specifications for Waterproof Cement Plaster Coat

Estimate 6 lb. of Truscon Waterproofing Paste to the 100 sq. ft. of ¾-in. plaster coat applied to the walls, and 16 lb. of paste to the 100 sq. ft. of 2-in. finish applied to the floor. Applicable to reservoirs, swimming pools, cisterns and similar forms of masonry construction, whether of brick, stone or concrete.

Method—Water-tightness shall be secured by plastering the interior surface of the structure with a continuous coating of portland cement mortar waterproofed with Truscon Waterproofing Paste, Concentrated.

Ingredients and Proportions for Waterproofed Plaster Coat—The mortar composing the plaster coat shall consist of 1 part of cement and 2 parts of clean sand (1:2), free from organic matter and uniformly graded.

Preparation—The waterproofed cement mortar shall be prepared by thoroughly tempering (to required consistency) a dry mixture of 1 part of cement to 2 parts of sand, with water to which Truscon Waterproofing Paste, Concentrated, has been added in the proportion of 1 part of paste to 18 parts of water, and thoroughly mixed as follows:

First, mix 1 gal. of Truscon Waterproofing Paste with 1 gal. of water. Second, use 2 qt. of this mixture to each bag of cement, adding same to the dry cement and sand. Then temper with clear water as usual.

Preparation of Surface to be Coated—Before plastering the waterproofed cement mortar on to the hardened concrete, brick or masonry, proper precautions should be taken to insure thorough bonding and keying of the plaster coat to the wall.

Application of Coating to Sides—Immediately after applying a slush coat, the waterproofed plaster shall be applied in 2 coats each ⅜ in. thick as per specifications of the manufacturer, the second coat being applied just before the first has reached its final set.

Application of Floor Coating—Floors shall be prepared and treated with equal care as the walls to insure proper bonding of the mortar, and finished with a waterproofed cement mortar to a thickness of 2 in. Special care must be exercised in joining the wall coating to the floor coating, so that there is a continuous waterproof coating over the entire surface.

Pressure—When moisture is seeping through the walls, proper drainage must be provided during the application and setting of the plaster coat, until such time as the plaster coat has set and is capable of resisting pressure of its own adhesive strength.

Specifications for Waterproof Cement Stucco

Estimate 8 lb. of Truscon Waterproofing Paste to the 100 sq. ft. of 1-in. stucco.

Method—Waterproof cement stucco shall be secured by the addition of Truscon Waterproofing Paste, Concentrated, to all water used for tempering the dry mix.

Materials—The stucco shall consist of 1 part of cement to 3 parts of sand free from organic matter, and uniformly graded. 1 part of Truscon Waterproofing Paste, Concentrated, shall be added to each 18 parts of water as follows:

First, mix 1 gal. of Truscon Waterproofing Paste with 1 gal. of water. Second, use 2 qt. of this mixture to each bag of cement, adding same to the dry cement and sand. Then temper with clear water as usual.

Mixing—The cement shall be added to the dry sand and evenly mixed. The dry mixture shall then be tempered to working consistency with water to which Truscon Waterproofing Paste has been added. This composition shall only be made up in lots that can be immediately applied. Any material that has been mixed with water for over 30 minutes shall be rejected.

Application—The stucco shall be applied in 2 coats to a total depth of 1 in. The face of the first coat shall be thoroughly scratched to form a key for the finish coat; the finish coat to be applied when the first coat has set sufficiently hard to hold it. When plastering over masonry, special care must be taken to thoroughly wet the masonry with water before applying the stucco.

Drying—All stucco shall be protected from the rays of the sun to avoid too rapid drying. No exterior plastering shall be permitted until all interior partitions are studded and completely braced.

Truscon Integral Waterproofing Powder

A concentrated integral waterproofing used in the manufacture of prepared cement stucco, cement blocks, tile and similar work employing a dry mix. Furnished in repellent or non-repellent type as desired. Quantity required: 2% of the cement.

Plaster Bond

A black compound for dampproofing interiors of exposed masonry walls. Plaster bond remains flexible and tacky, providing a permanent bond for a scratch coat of plaster troweled directly on to it, thus eliminating furring and lathing.

Covering capacity: about 80 sq. ft. to gal., 1 coat.

Foundation Coat

A black coating of heavy consistency furnished ready for use (no heating), for dampproofing masonry walls under earth filling. Applied with a large mop or brush. More economical than coal tar or pitch.

Covering capacity: about 80 sq. ft. to gal., 1 coat.

Stone Backing

A black compound for treating unexposed sides of cut stone to avoid mortar stains on face of stone. Should be applied to top, sides and back of stone within 1 in. of face. Also used for coating concrete work in back of stone.

Covering capacity: about 125 sq. ft. to gal., 1 coat.

StoneTex Concrete Paint

The nationally known lime-resistant masonry coating for protecting and dampproofing exterior brick, stone, stucco or concrete. Furnished in white and 10 standard shades. Applied with a brush or spray. Prevents cold and moisture from filtering through masonry walls and avoids disintegration of concrete. Renovates and beautifies masonry buildings.

Covering capacity: about 100 sq. ft. to gal., 2 coats.

Super-PorSeal Transparent Dampproofing

A transparent coating for protecting and dampproofing exterior masonry walls above grade. Applied with brush or spray. Answers same requirements as StoneTex except that it dampproofs without changing color or appearance of the surface. Applied over brick, stone, stucco, concrete, cement block, etc.

Covering capacity: about 80 sq. ft. to gal., 2 coats.

Floor Hardeners

Metallic—Truscon Floor Hardener is a metallic hardener designed for giving floors in factories, warehouses and such places greater resistance to wear. Forms a dense, hard finish. Especially applicable to new cement floors, or to floors which need resurfacing.

Quantity required: 30 lb. to each 100 sq. ft.

Chemical, Dry—Agatex Crystals, a chemical hardener for cement floors, furnished in dry form. Dissolved in water and applied with a brush or broom.

Quantity required: about 1 lb. to each 40 sq. ft.

Chemical, Liquid—Agatex Liquid, a chemical hardener furnished in highly concentrated form for stopping dusting and crumbling of cement floors. Applied with a brush, broom or similarly convenient instrument.

Quantity required: about 1 gal. to each 100 sq. ft.

Temperite

For accelerating and regulating the set of cement mortars and giving protection against frost. This material is furnished in either dry or liquid form, as desired. Used in proportion of about 2% of the cement.

Specifications

For complete specifications on Truscon waterproofings and dampproofings, ask for a copy of "Truscon Architects' Specifications Book 'A.'"

THE SULLIVAN COMPANY

Cement Mixing Compounds; Technical Paints and Building Products

MEMPHIS, TENN.

CABLE ADDRESS
"SULCO, MEMPHIS"

SALES OFFICES

LOS ANGELES, CAL., 618 Grosse Building
HOUSTON, TEX., 507 State National Bank Building
TULSA, OKLA., 601-2 Kennedy Building
SEATTLE, WASH., 513 Pacific Block
NEW ORLEANS, LA., 641 Tchoupitoulas Street

EXPORT: OILFIELD EQUIPMENT CO., INC., 30 Church Street, NEW YORK, N. Y.

KONSET
REG. U.S. PAT. OFFICE

Products

Waterproofing, liquid, paste and powder; Dampproofing; Acidproofing; Rustproofing; Concrete Hardeners; Wood Preservatives; Portland Cement Paint; Caulking Compounds; Canvas Preservatives; Cement Coatings; Cement Patching Compound; Mortar Paste and Stucco Colors; Plaster Bond and Stone Backing; Fireproof Nailing Concrete; Oilproof Coatings; Slipproof Cement Grains; Cement Accelerators, colorless and colored; Iron Cement; Freezeproofing Compounds; Wax Compounds; Floor Dressings; Boiler Compounds; Roofing Paints and Cement; Aluminum Paint; Shingle Stains; Metallic Hardeners; Bonding Compound; Technical Paint and Varnish.

Description and Uses of Products

Konset, an Integral Cement Mixing Compound—When mixed with concrete, provides four desirable conditions:

(1) It accelerates the initial and final set and increases the early tensile strength.

(2) It gives greater plasticity and workability.

(3) It increases density, making it hard and waterproof.

(4) It increases freezing resistance.

Konset is also made in any color in dry powder form, which produces any desired color effect in cement mixtures, such as floors, walls, mortar joints, and it is also used for making cement, brick and tile.

By using Konset in colorless or colored form you save time, labor and money, and at the same time make a surface that is hard, waterproof, and dustproof. This product is a lasting benefit to architects, engineers, contractors and owners.

Sulco Cement Surface Hardener—In liquid or crystal form. This chemical is for hardening and dustproofing cement floors, walks and roads after they are laid. It also is used for stucco and plaster.

Konseal—A colored liquid filler for hardening and dustproofing cement floors after they are laid; serviceable and ornamental. A sanitary treatment for cement and concrete surfaces. Made in all colors.

Kontite-Portland Cement Paint—A flat coating in dry powder form made from portland cement. It is mixed with water instead of oil, for stucco, brick, stone, plaster, wall board, and all interior and exterior surfaces; is fireresisting, sanitary, odorless and weatherproof. Made in gray, blue, red, buff, brown, green, white and cement color; or any shade to match.

Sulco Liquid Waterproofing—A liquid integral waterproofing for all mass concrete or any place that portland cement requires waterproofing.

Sulco Waterproofing Powder—For mixing with the dry cement before sand and water are added.

Sulco Waterproofing Paste—A heavy white paste which is added to the gauging water that is used for mixing the concrete.

Rustcotine—A chemical compound in which petroleum products are used as a base vehicle to carry the rust inhibitive chemicals which prevent rust and corrosion. Made in a paste and a semipaste form, and does not harden like a paint.

Sulco Mortar and Stucco Colors—Sulco Mortar Colors possess the characteristics of durability and permanency as they will not fade. The colors run uniformly as to shade, due to the special process used in manufacturing. Sulco Paste Mortar Colors are the finest and strongest for tinting mortar, or cement; quick setting, dustproof, waterproof and freezeproof.

Sulco Oilproof Coating—A liquid coating for oil proofing all surfaces that come in contact with gasoline, kerosene, naphtha, crude oil and its by-products.

Hardwood Creosote Wood Preserving Oil—A product of wood, and is obtained from the tar produced from the distillation of hardwood—principally oak, hickory, beech, birch and maple. It protects wood from rotting, checking, swelling and shrinking. This product does not leave a heavy surface dressing as is the case with many of the coal tar creosote products. It has great toxic value and is an efficient germicide and fungicide. Can be applied either hot or cold.

Iron-Cote—A metallic hardener for concrete floors in factories, garages, loading platforms, piers, packing houses, etc. It is composed of finely ground iron and other materials; is incorporated in the topping of concrete floors, making them capable of standing the effect of heavy service and protecting them against dusting.

Bux-Skin—A liquid for preserving and rendering awnings, tents, tarpaulins, curtains, covers, fisherman's riggings, hatch covers, canvas and cotton duck goods proof against mildew and water.

Sulco Portland Cement Accelerator—Used where speed in construction work is required. This product is an essential asset, as it saves at least two-thirds of the time ordinarily required for cement to set.

Sulco Freezeproofing Compound—This solution will accelerate cement and freezeproof concrete at 15° above zero without the use of salamanders or other devices.

Sulco Slipproof Grains—An abrasive material in loose form for impregnating cement or composition floors or stair treads to prevent slipping.

Sulco Nailing Concrete or Fiber Wall—For floors, roofs, partitions, plaster and stucco.

Sulco Glazing and Caulking Compound—For bedding, glazing and caulking skylights, conservatories, hothouses, sheet metal frames, window frames, wood sashes, roofs, walls, concrete copings, swimming pools, tile floors, seams in boats, etc.

Sulco Plaster Bond and Stone Backing—A dampproof bonding paint, permanent and adhesive.

Sulco Wood-Seal—Preserves new or old wood floors, composition floors, cork, rubber and linoleum; prevents warping, wear, rotting, disintegration or splintering.

Sulco Wax Compound—For polishing and treating old and new cement and wood floors; gives a beautiful luster. Easy to clean and soft under foot.

Sulco Boiler Compound—A scale solvent for treating boiler feed water. Prevents corrosion.

Sulco Iron Cement—For smoothing the surface of steel and iron castings and repairing blowholes and other defects. Filling up spongy castings, covering up countersunk bolt heads, pipe joints, or all places where an iron or steel patch is required.

Deflect-O-Lite Aluminum Paint—Deflects the solar heat and keeps the surface cool, protecting it against corrosion. For coating steel storage tanks, water tanks, steel bridges, metal buildings, penstocks, boilers, smokestacks, gas holders and all metal surfaces, concrete, brick and plaster.

Literature and Specifications

All of the above products are covered by standard literature and specifications, which we are always glad to furnish on request. We also maintain a technical service laboratory for making any special tests. Experts are available for the solution of any waterproofing problem or other technical information. We will be glad to furnish a list of representative buildings in which Sulco Products have been used, including testimonials.

ADENSITE CO., INC.

Manufacturers of Concrete Hardeners and Densifiers

116 West Thirty-ninth Street
NEW YORK, N. Y.

PHILADELPHIA OFFICE: Land Title Building
LABORATORY: Jackson Avenue and Seventh Street, LONG ISLAND CITY, N. Y.

Product

ADENSITE, a Liquid Integral which is used in the gauging water for Hardening and Waterproofing portland cement concrete and mortar.

Guarantee

"Adensite" is guaranteed to produce positive and permanent results by the manufacturers, the ADENSITE Co., INC.

Surety bond and supervision furnished where desired.

A LIQUID INTEGRAL
ADENSITE
ITS FUNCTION GUARANTEED

TRADE-MARK

Uses

Waterproofing concrete walls below grade, either in mass concrete or in plaster coat.

Hardening and dustproofing cement floor finish.

Waterproofing portland cement stucco.

For brick masonry, Adensite gauged mortar is smooth working, does not drag and prevents "riding."

Character and Function

Adensite makes possible the thorough hydration of the cement in a mix. According to the DuNoy test, it reduces the surface tension of water 25%. It increases the wetting power of the gauging liquid, giving high plasticity to the mass with a low water content.

Service

Our thoroughly trained field men visit construction operations where Adensite is used.

Workability; Strength; Water Content

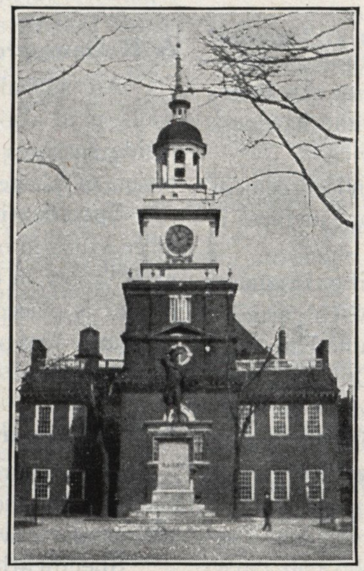
Following is table charted from tests conducted at the United States Bureau of Standards and delivered before the American Concrete Institute:

Mix	Admixture	Percent water	Water cement ratio	Workability	Compressive strength, lb. per sq. in.	
					Damp closet test	Outside test
1-3-6	O	9.6	1.45	242	960	800
	C	9.1	1.36	188	1070	950
1-2½-5	O	9.4	1.20	169	1380	1270
	C	8.9	1.14	111	1530	1410
1-2-4	O	9.6	0.98	108	2080	1880
	C	8.9	0.93	72	2240	2230

O—Water gauged mixture.
C—Adensite mixture.
The lower the workability figure, the greater the plasticity.

Shipments

"Adensite" is shipped in 5, 30 and 50-gal. containers.



Independence Hall, Philadelphia

Waterproofed with Adensite gauged plaster coat

Specifications

Waterproofing Mass Concrete—The gauging liquid for concrete shall be prepared by placing from 3 to 4 gal. of "Adensite" in a 52-gal. barrel and adding water. For every 1-bag batch, use between 3 and 4 gal. of the prepared liquid (amount of liquid varies with fineness of aggregate and temperature).

Joints Between Pourings—Shall be thoroughly grouted with "Adensite" grout.

Waterproof Plaster Coatings—Shall be ⅝ in. in thickness, applied in 2 coats and properly coved and bonded to the floor.

Bonding New to Old Concrete—All surfaces before application of new work shall be thoroughly roughed, cleaned and dampened with "Adensite" grout to insure perfect bond.

"Adensite" Grout—Add 1 part "Adensite" to 3 parts water and enough cement to give mixture a creamy consistency.

Protection of Green Work—To protect green work against action of water, the pump shall be kept in operation 24 hours after pouring or trowelling of work.

Floor Hardening—Upon the plain concrete floor slab shall be laid a 1-in. topping of 1 part cement and 2 parts clean sand. This dry mix shall be tempered with a liquid composed of 3 gal. of water to 1 qt. of "Adensite" for every 1-bag batch. No dryer shall be used.

Gauging Liquid for Floor Finish—Gauging liquid may be prepared by putting 4 gal. of "Adensite" into a 52-gal. barrel and adding water (no stirring required).

Bond—When slab is over 48 hours old, before topping is stretched, it shall be given a coating of "Adensite" grout.

When slab is over 7 days old, before topping is stretched, it shall be roughed with a pick or chisel, cleaned and given a coat of "Adensite" grout.

Colored Floors and Mortar

Adensite intensifies and makes permanent the value of any good earth color in floor finish or mortar.

Some Users of Adensite

Bureau of Yards & Docks, Navy Department, Washington, D. C.
War Department, Washington, D. C.
Texas Co., New York, N. Y.
Coffin & Coffin, New York, N. Y.
Borden Farm Products Co., New York, N. Y.
The Foundation Co., New York, N. Y.
James Stewart & Co., New York, N. Y.
Thompson-Starrett Co., New York, N. Y.
Warren & Wetmore, New York, N. Y.
Grosvenor Atterbury, New York, N. Y.
Dennison & Hirons, New York, N. Y.
Cross & Cross, New York, N. Y.
New York Central Railroad, New York, N. Y.
McCormick Co., Pittsburgh, Pa., and New York, N. Y.
Alfred Bossom, New York, N. Y.
R. D. Kohn, New York, N. Y.
Tidewater Building Co., New York, N. Y.
John Molitor, City Architect, Philadelphia, Pa.
Bureau of Recreation, Philadelphia, Pa.
Stewart A. Jellett Co., Philadelphia, Pa.

AMERICAN BUILDERS CORPORATION

Metallic Floor Hardeners, Repair Cements, and Waterproofings

Otis Building

CHICAGO, ILL.

Products

- A B Metallic Hardener.
- A B Integral Hardener.
- A B Chemical Liquid Hardener.
- A B Waterproofing Paste.
- A B Waterproofing Powder.
- A B Dampproofing.
- A B Plaster Bond.
- A B Transparent Waterproofing.
- A B Repair Cement.
- A B Resurfacing Cement.

A B Metallic Hardener

A triple protective metallic compound to be incorporated in topping of concrete floors. The use of this material gives a floor surface of intense density and hardness which will stand up under heavy duty service.

A B Metallic Hardener is made in standard cement color, and in red where a colored floor surface is desired.

Specifications—Apply cement topping in usual manner, floating to even and true surface when partially set. Dry mix 20 to 35 pounds of A B Metallic Hardener and an equal amount of portland cement. Dust this mixture evenly over floor surface. Float in and trowel, giving surface a second troweling at proper time to secure even finish. Protect floor for several days with wet sand or sawdust.

A B Integral Hardener

A liquid hardener and waterproofer for concrete floors, and other concrete work. When used in concrete floor topping it produces a dense, hard surface, impervious to water, oil and grease.

A B Integral Hardener quickens the set without weakening the tensile strength, and produces an ideal fatty troweling condition. For winter concrete it makes a valuable anti-freeze solution.

Specifications—For concrete floor topping, add one quart for each bag of cement. Special instructions furnished when used as an anti-freeze solution.

A B Chemical Liquid Hardener

A chemical after-treatment for old or new floors to prevent dusting and to give a hard, wearing surface.

Specifications—Apply in two coats, diluting first coat with water, half and half. After first coat dries, apply second coat without dilution. One gallon will cover 100 square feet, both coats.

A B Waterproofing Paste and Powder

A waterproofing material furnished in either paste or powder form. By its use, concrete, cement mortar and cement stucco are made permanently waterproof.

Specifications—In paste form, use eight pounds per cubic yard of concrete. In powder form, use two pounds to each bag of cement.

A B Dampproofing and Plaster Bond

An asphaltic dampproofing paint for foundation walls, used also as a protective bonding material for the inside surfaces of outer or exposed walls before application of plaster.

Specifications—For dampproofing, apply with large brush in one or two applications. For plaster bond work, apply in one heavy coat twenty-four hours before plaster is placed. Covering capacity for one coat, 60 to 75 square feet per gallon. For two coats, 40 to 50 square feet per gallon.

A B Transparent Waterproofing

A transparent liquid for waterproofing exteriors of stucco, brick, stone, and masonry. It effectively seals the surface pores without changing the color.

Specifications—Apply with brush or spray in two coats. Covering capacity, 200 square feet per gallon for both coats.

A B Repair Cement

A compound for repairing cracks, breaks, and holes in concrete surfaces. It is valuable as a patching cement for concrete floors, drives, truck runways, and similar work.

Specifications—These are furnished with shipment.

A B Resurfacing Cement

A special metallic compound for resurfacing old and worn concrete floors. Can be applied in any desired thickness, and will give a new wearing surface at nominal cost.

Specifications—These are furnished with shipment.

GENERAL CHEMICAL COMPANY

Chemical Treatments for Hardening and Waterproofing Concrete

40 Rector Street
NEW YORK, N. Y.

Products

- Hard-n-tyte Concrete Surface Hardener.
- Hard-n-tyte Pre-painting Treatment.
- Hard-n-tyte Colorless Waterproofing.
- Konax Integral Waterproofing.

Hard-n-tyte Concrete Surface Hardener

Hard-n-tyte Surface Hardener is a double crystalline fluosilicate. When mixed with water, it forms a colorless solution which penetrates and hardens the concrete surface. The effect of its application to concrete, plaster or stone surfaces containing lime is a chemical reaction which deposits finely divided silica in the pores or voids and also forms what is known in nature as fluorspar. Besides binding the particles of concrete more firmly together, these deposits themselves sustain heavy wear and weathering. For this reason, concrete and mortar surfaces treated with Hard-n-tyte resist abrasion, penetration of oil, and other liquids, such as acids, alkalis, and water.

Concrete surfaces are treated with Hard-n-tyte Surface Hardener under the direction of authorized representatives of Hard-n-tyte Engineering Service. Every Hard-n-tyte engineer is a specialist in hardening and densifying concrete, mortar, plaster and stone by means of chemical treatment. This national organization brings to you a consulting service from men with wide experience in concrete construction. Wearing surfaces treated under their direction are guaranteed by bond of the United States Fidelity & Guaranty Co.

The use of Hard-n-tyte Surface Hardener on concrete floors secures a surface that is wearproof under the constant gnawing of foot traffic. Research work by the General Chemical Company proved the scientific sureness with which concrete can be made to stand up under the crunching grind of trucking—concrete that comes through the grind without even "dusting." Hard-n-tyte is the result of thousands of dollars spent in taking the guesswork out of concrete hardening.

Specification—All exposed concrete wearing surfaces shall be treated with not less than two applications of Hard-n-tyte Concrete Surface Hardener, of strength specified by the manufacturer, General Chemical Company, and applied under the direction of an authorized sales engineer of said company.

Additional applications shall be made wherever necessary to produce a surface of uniform hardness and maximum resistance to wear.

All cement wearing surfaces as treated above where required shall be guaranteed with a Five-Year Bond of the United States Fidelity & Guaranty Co.

Hard-n-tyte Pre-painting Treatment

New plaster and concrete walls present serious problems to the painter. Various products have been recommended but nothing equal to Hard-n-tyte Pre-painting Treatment. This product neutralizes the lime, making the painting permanent; hardens the surface, rendering it more durable; fills the pores with insoluble material, consequently saving paint. Sold in a dry powder, it is quickly dissolved in either hot or cold water—insoluble when dry on the wall. One lb. covers approximately 400 to 500 sq. ft. on hard wall plaster and about half that amount on concrete or sand finish. Eliminates suction, improves adhesion.

A first class paint job is assured with one application of Hard-n-tyte Pre-painting Treatment and two coats of paint.

Specification—All plaster or concrete surfaces to be papered, calcimined or painted, shall be allowed to dry for at least ten days and then treated with a coat of Hard-n-tyte Pre-painting Treatment mixed in the proportion of 1 lb. to 1 gal. of water; material in solution shall be used the same day. Painting may proceed after 24 hours.

Note: Concrete floors, where specifications call for paint or linoleum, shall be included in this treatment.

Hard-n-tyte Colorless Waterproofing

Concrete, stone and brick surfaces exposed to the weather absorb dirt and moisture readily. Dirt makes the surface unsightly. Water brings out the soluble salts in the masonry, disfiguring the structure. Dirt, water and efflorescence can be barred by the use of Hard-n-tyte Colorless Waterproofing.

This solution penetrates the surface deeply, depositing insoluble and permanent compounds which repel moisture and prevent penetration of grime. Covering capacity varies greatly with the surface but will average about 150 ft. to 1 gal., two applications.

Specification—All exposed masonry shall be treated in place when dry with two applications of Hard-n-tyte Colorless Waterproofing giving the surfaces a thorough saturation at each application.

Konax for Waterproofing Concrete

The ideal chemical compound for waterproofing concrete should react throughout the entire mass. Its efficiency depends upon its reaction with portland cement—a highly standardized product. Likewise, the waterproofing compound should be standardized from the standpoint both of the purity of its ingredients and strength. In these two regards the product of the General Chemical Company—Konax—excels.

When mixed with portland cement concrete, Konax acts as a lubricator, due presumably to the fact that it assists in the solution of the aluminates and silicates. Concrete resulting from the use of Konax flows more easily into the forms, makes possible a lower water content, and consequently greater density.

This chemical combination also has other desirable effects. Concrete mixed with Konax hardens more rapidly, the forms can be removed sooner, more work accomplished, and liability from freezing in any but extreme temperature practically eliminated.

Specification—Wherever waterproof concrete or mortar is indicated, 1 qt. of Konax shall be added to the mixing water for each sack of portland cement.

THE MASTER BUILDERS COMPANY

Specialists in Masterbuilt Concrete Floors

CLEVELAND, OHIO

SALES OFFICES

NEW YORK CHICAGO PHILADELPHIA DETROIT ATLANTA DALLAS MINNEAPOLIS BOSTON KANSAS CITY, MO.
WASHINGTON MILWAUKEE BUFFALO LOS ANGELES ST. LOUIS SAN FRANCISCO MONTREAL TORONTO
MELBOURNE SYDNEY MANILA TOKIO AMSTERDAM HONOLULU BERNE MILAN MUNICH PARIS

Products

MASTER BUILDERS METALLIC CONCRETE HARDNER, used in accordance with MASTER BUILDERS METHOD for making concrete floors dustproof, wearproof, and waterproof. In two colors: Gray and Tile Red.

MASTER MIX, a liquid chemical used integrally in cement mixtures, stucco, brick mortar, etc., to increase strength, to render concrete floors wearproof, dustproof and waterproof, and to waterproof brick mortar at all temperatures down to 15°F.

COLORMIX, a gauging water dye which hardens, dustproofs, and waterproofs cement floors, producing at the same time uniformly and permanently colored floors.

MASTERTEX, waterproof cement coating for decorating and waterproofing exposed exterior and interior concrete surfaces.

SANISEAL, a chemical compound for hardening and dustproofing concrete floors after they are laid. Furnished in crystal or liquid form.

Colorseal, a decorative liquid coating for hardening and dustproofing concrete floors not exposed to weather.

Slatyle, natural colored slate flooring from Vermont quarries, sawed and split into tiles 8x8x$\frac{3}{16}$ in. which are installed as a veneer over both new and old floors of both fireproof and non-fireproof construction by the use of a plastic binder, "Adhestic."

Also manufacturers of Master Builders Integral Waterproofing Liquid, Powder, and Paste; Surface Waterproofings; Plaster Bond; Foundation Coating; Quick-Fix; Concrete Paints.

Masterbuilt Floors
HARDENED DUST PROOF CONCRETE

Description and Advantages of Master Builders Method

Master Builders Method is a formula for building concrete floor surfaces according to definite, standardized principles which eliminate the defects of ordinary concrete construction and produce wearproof, dustproof and waterproof concrete floors.

To accomplish this result, Master Builders Method employs Master Builders Integral Concrete Hardners, of the type and character especially fitted to produce the particular results sought in a particular building.

This Master Builders Hardner when added to the sand and cement when the topping of the floor is installed, eliminates pores, produces a hard wearing, permanent, non-absorbent surface of maximum density that withstands the wear and tear under which ordinary concrete floors break down and wear out.

Master Builders Method is the original and standard method for producing concrete floors that will not dust or absorb moisture and that will resist the hardest kind of wear. Over 50,000 users have more than 500,000,000 sq. ft. of surface in use to date.

MASTERBUILT FLOORS
TRADE MARK

Master Builders Metallic Concrete Hardner

A perfectly graded, scientifically treated metallic aggregate, water absorbent, supplying a non-abrasive element that resists the most severe type of traffic.

Recommended for making wearproof, dustproof, waterproof concrete floors in every type of building, particularly in areas where floors are to be subjected to heavy industrial or foot traffic such as manufacturing plants, warehouses, freight stations, docks, machineshops, foundries, refineries, aisles, corridors, etc.

Master Builders "Standard Specifications" for Metallic Concrete Hardner

Wherever practicable, topping to be laid before base has set.

Proportions of Topping—Topping (thickness at least full ¾ in.) shall consist of the following proportions: 1 part tested portland cement; 2 parts coarse, gritty clean sand.

If rock or grit is used in addition to sand, specify as follows, instead of above: 1 part tested portland cement; 1 part crushed rock or grit (not over ⅜ in. in size) free of dust; 1 part clean, coarse, gritty sand.

Measuring Volumes—These proportions shall be accurately measured by volume, in suitable size boxes. No counting by shovels, or measuring by wheelbarrows or other approximation will be permitted. To determine proper proportions, 1 bag of cement shall equal 1 cu. ft. of sand or grit.

Addition of Water—Mix thoroughly, dry, until uniform in color, showing no streaks or patches of the constituents; if mixed by hand, topping aggregate shall be turned over dry three times. Add sufficient water to saturate mixture and mix thoroughly again. Topping shall at no time be made sloppy.

Application of Topping—Lay and straightedge the topping to a true and even surface; float the surface well with wooden floats to close all voids and hollows.

Wearproof Finish—A dry mixture of 1 part Master Builders Concrete Hardner to 1 part tested portland cement (by weight) mixed to an even color, shall be sprinkled evenly over surface. Not less than 30 lbs. of Master Builders Concrete Hardner and 30 lbs. of portland cement shall be distributed in this manner over each 100 sq. ft. This shall be floated in thoroughly and troweled. A second troweling shall be given surface when it has set sufficiently to finish hard and smooth. Under no circumstances shall wearproof finish be applied when there is any surplus water on the floated surface.

Safeguarding the Floor—After topping has set up, contractor shall cover it with a uniform layer of soft wood sawdust shavings, or other suitable covering. This covering must not be applied until experiment shows surface hard enough to prevent covering from scratching or injuring the finish. Surface shall be kept wet for at least 5 days. Floors, if protected as above, will be ready for light traffic in 1 week, and for heavy traffic in 3 weeks, under favorable weather conditions.

Exceptions—The foregoing "Standard Specifications" is the standard method of procedure for the average building. The 30 lbs. of Master Builders Concrete Hardner recommended per 100 sq. ft. gives a surface which withstands any normal usage.

For floors, piers, loading platforms, etc., which receive extremely heavy wear, specify 35 lbs. of Master Builders Concrete Hardner to every 100 sq. ft. for the wearproof finish. For railroad repair shops, forge shops, etc., specify 40 lbs. of Master Builders Concrete Hardner to every 100 sq. ft. for the wearproof finish.

Continued on next page

Master Mix

Master Mix is the integral liquid concrete hardener that has been used for 10 years to produce high initial tensile strength, and to permanently increase tensile and compressive strength. Recommended for use in all concrete surfaces subjected to normal foot traffic or light industrial traffic, and for all areas to be covered with linoleum, rubber tile, rugs or carpets and other semipermanent coverings. Produces a wear resisting, dustproof, waterproof concrete floor whose wearing quality extends throughout the full cement topping.

Master Mix accelerates the final set of the cement from 2 to 4 hours; increases the tensile strength 71% in the first 24 hours and from 5% to 10% permanently; produces a "fatty" condition of the cement that makes it far easier to trowel; hydrates from 40% to 50% more cement than water, thus producing a dense, hard surface that will not dust or crumble.

Master Mix
CONTROLS CONCRETE

Master Mix is a waterproofing media whose efficiency is independent of temperature, functioning below freezing, down to 15° F. It is used extensively to maintain normal workability of cement mortar used for brickwork in cold weather, and to provide a waterproof brick mortar joint. Master Mix prevents brick mortar from freezing between the mixing box and the scaffold, and maintains its workability, making it possible to lay brick at normal speed despite cold weather.

Master Mix is an efficient integral liquid waterproofing for mass concrete, and for waterproofing cement stucco.

Master Mix Specifications

For Hardening Concrete Floors—1-in. topping shall be installed, proportioned 2 parts clean, fairly coarse sharp sand and 1 part fresh tested portland cement. Mix thoroughly dry. Add Master Mix to gauging water, gradually, in proportion of 1 gal. Master Mix for every barrel of cement used. Pour, float and trowel cement in usual manner. A second troweling shall be given when surface is sufficiently set to produce a hard smooth finish. Protect surface from injury and keep it wet until surface is hard. For this purpose use a layer of soft wood sawdust, properly wet down.

For Waterproofing Brick Masonry—Mortar in which bricks are laid should be 1 part cement and 2 parts sand. Mortar to be tempered with water to which has been added Master Mix in proportion of 1 gal. waterproofing to 10 gal. of water. Carefully grout each course of brick, taking care that all joints are filled with mortar.

For Waterproofing Concrete and Cement Mixtures—To waterproof 1:2:4 mass concrete add ¾ gal. of Master Mix to gauging water to each barrel of cement. To waterproof 1:2:5 mass concrete add 1 gal. of Master Mix to gauging water to each barrel of cement.

Concrete walls, floors, etc., can be made waterproof by the application of a cement coat into which Master Mix has been introduced. A mixture of 1 part cement to 2 parts sand should be made and tempered with water and Master Mix in the proportion of 1 gal. of Master Mix to 18 gal. of water.

For Waterproofing Stucco—Stucco shall be applied in 2 coats. The straightening coat shall consist of 1 part portland cement and 3 parts sand. This shall be gauged with a solution of 1 part Master Mix to each 18 parts of water.

Wall shall first be thoroughly wetted and the straightening coat applied ¾ in. thick. Finish coat shall consist of 1 part portland cement and 2½ parts clean sand, which shall be gauged with the same strength solution of Master Mix and water as the straightening coat and applied ¼ in. thick.

Colormix

Colormix is a perfected hardening compound for producing wearproof, dustproof, waterproof concrete floors in permanent colors, for use where decorative, hard type floors are desired and where money limitations prohibit the use of expensive materials such as tile, terrazzo, etc. Dissolved in the gauging water, Colormix dyes every particle of sand and cement in the entire topping a deep, uniform, permanent color.

COLORMIX

Whereas ordinary coloring agents seriously weaken concrete, Colormix contains hardening elements which maintain the full tensile and compressive strength.

Colormix is made in the following colors: Tile Red, Linoleum Brown, Nile Green, White, Buff, French Gray, Black, and Battleship Gray.

Specifications for Use of Colormix

Colormix Top Finish—A top finish of not less than 1-in. thickness shall be used on a set slab and not less than ¾-in. thickness shall be used on a green slab, topping to be composed of 1 part cement to 2 parts clean sharp sand.

Colormix can be used in the entire thickness of the top finish, but from the standpoint of cost, it is advisable to run the top finish in two layers, using Colormix in the top layer only. If two layers are run, it is simply necessary to scratch a layer of ordinary 1 to 2 top finish over the slab, leaving it ½ in. below finished surface line. This must be followed immediately by the Colormix top finish.

To Mix Colormix Top Finish—If mixed by machine, first place a small quantity of water in the mixer and then throw in a shovelful or two of sand; then add the right proportion of Colormix as specified below. The above should be agitated by the mixer 10 to 20 revolutions which dissolves the Colormix. Then add the balance of the batch into the mixer. Allow this total mix to be thoroughly mixed so as to assure a uniform and even color. Care should be taken that mortar is not mixed too sloppy.

If mixed in mortar box by hand, proceed as follows: Procure a 1-gal. open top paint pail and a small spring scale. Dissolve the proper amount of Colormix for each batch in the pail first. Use this solution as the gauging water to hydrate the 1 to 2 sand and cement mixture in the mortar box. If additional water is required to get proper mortar consistency, add slowly and sparingly, making sure that a perfect and complete mix is secured.

Proportions of Colormix to Be Used—As each color of Colormix weighs differently per unit of volume, one color must not be confused with any other color. Colormix must be proportioned exactly to each bag of cement per the following schedule:

Tile Red, use 12 lb. to each sack of cement. Linoleum Brown, use 12 lb. to each sack of cement. Battleship Gray, use 2 lb. to each sack of cement. Nile Green, use 17 lb. to each sack of cement. Buff, 17 lb. White, 14 lb. French Gray, 10 lb. Black, 4 lb.

Laying the Top Finish—Apply the Colormix Top Finish to the floor and straightedge, float and trowel in the usual manner. Hard trowel the surface a second time when it begins to set hard to a glossy smoothness.

Expansion Joints—Cut through the full thickness of the topping. Shall be cut at intervals of not exceeding 6 ft.

Protection—The surface shall be protected from plaster stain and cement dust by first covering with a stainless paper; over this place a 2-in. cushion of fine lake or plaster sand or stainless sawdust or shavings. This covering shall be applied just as soon as surface is hard enough to prevent injury. This covering should be kept damp for a period of one week and must not be removed until completion of all work.

Colorwaxing—Following completion of all work, surface of the floor shall be cleaned by washing with linseed oil soap and cleaning shall be followed with a waxing, using Master Builders Colorwax of the same color as the floor.

Mastertex

Mastertex waterproof decorative cement coating is a fine, dry powder which when mixed with water forms a paint which both decorates and waterproofs concrete and other masonry surfaces and keeps them dry and attractive indefinitely. Unlike oil paints, Mastertex can be applied direct to wet surfaces. Mastertex contains no oils or other volatile elements and will neither deteriorate under the action of sun and weather nor be injured by the free lime in the concrete beneath. Applied on a wet, dripping basement wall, Mastertex provides a dry, attractive finish.

MASTERTEX

Eight pounds will cover 100 sq. ft. with 2 coats.

Mastertex is an ideal finish for stucco or concrete block, or for brick or masonry. Made in seven tints: Light Green, Blue, Brick Red, White, Cream Ivory, Light Gray, French Gray.

Master Builders Saniseal

Saniseal is a corrective for concrete floors which have started to dust, crumble and disintegrate. Also a preventive of these conditions on new floors. It is a liquid chemical preparation which combines with the lime in the cement, forming a new crystal that is exceedingly hard and wear resisting. It changes the soft, porous surface to a flintlike hardness. Saniseal is easy to use. No complicated dilutions or applications are necessary. Except where a floor is particularly porous, 1 gal. of Saniseal will cover approximately 100 sq. ft. It does the work overnight in most cases, thus preventing delays.

SANISEAL
TRADE MARK

SECURITY CEMENT & LIME COMPANY

SUCCESSORS TO CAL CHEMICAL COMPANY

HAGERSTOWN, MD.

CEMENT PLANT: (6,000,000 bags capacity), SECURITY, MD.
CAL AND HYDRATED LIME PLANT: BERKELEY, W. VA.

CAL SALES OFFICES
NEW YORK, N. Y. CHICAGO, ILL. BALTIMORE, MD. WASHINGTON, D. C.

Stocks carried in principal cities of the United States; Oslo, Norway; Mexico City

LICENSED CAL MANUFACTURER: C. I. CHUBBUCK, 123 25th Avenue, SAN FRANCISCO, CAL.

Product

CAL (Patented), a Concrete Accelerator, Frost-proofing, Waterproofing and Curing Compound.

Also Security Portland Cement; Berkeley Hydrated Lime.

What Cal Is

Cal is the oxychloride of calcium, a slightly basic compound in the form of a white powder, which has been found to possess remarkable properties as a conditioner of portland cement mixtures.

What Cal Costs

Less than ton lots	3¢ lb.
Ton lots, less car lot	2¾¢ lb.

Car lots, prices on request.

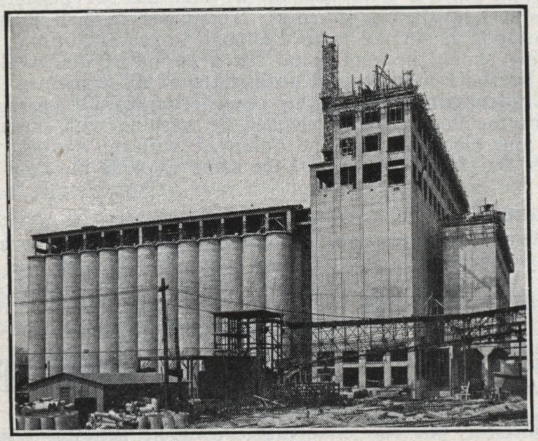
All prices f.o.b. factory, Berkeley, W. Va.

Subject to change without notice.

Official Freight Classification LCL R26, CL 5th Class

Cement dealers charge these prices plus freight and handling costs.

Stocks in principal cities. Name of distributer on request.



BALTIMORE & OHIO TERMINAL GRAIN ELEVATORS, LOCUST POINT, BALTIMORE

H. A. LANE, Chief Engineer M. A. LONG CO., Contractors

Highest Authority

The architect who specifies Cal for his job will have the satisfaction of knowing that his judgment is backed by the published opinion of the highest technical authority of the U. S. Government. Cal is not a secret compound of mysterious composition and activity. It has been completely investigated and reported with analyses and description by the U. S. Bureau of Standards in Technologic Paper 174, entitled, "The Effects of Cal as an Accelerator of the Hardening of Portland Cement Mixtures."

Additional authority is found in the work of the following investigators, who have tested Cal's various features and made public report:

Ecole Nationale de Ponts et Chaussées, France.

Pittsburgh Testing Laboratory, New York, N. Y.

J. C. Witt, now Chief Research Chemist, Portland Cement Association, Lewis Institute, Chicago, Ill.

H. C. Nutting Co., Testing Engineers, Cincinnati, Ohio.

John R. Lapham, Professor of Civil Engineering, George Washington University, Washington, D. C.

Skinner, Sherman & Esselin, Engineers, Boston, Mass.

E. M. Brickett, Civil Engineering Department, Massachusetts Institute of Technology, Boston, Mass.

Distinctive Features

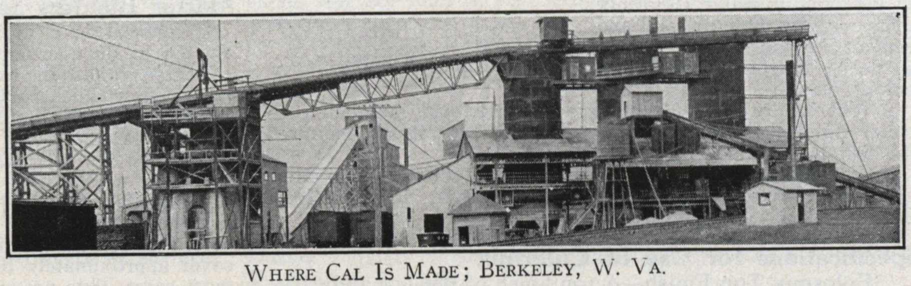
Cal controls the set of portland cement and increases its early strength, without injurious effect on the ultimate strength.

Cal *gives* dense, waterproof concrete, weatherproof stucco and mortar; wear-resisting floors; non-scaling top coat and finish; patches that hold; "fat," workable mixtures which are easy to dump and chute; brighter colored concrete.

Cal *reduces* danger of "soft cure" due to drying-out conditions; crazing and shrinkage cracks; segregation of aggregates; danger of freezing; winter delays.

Workability

One of the most important properties of Cal for all types of work is its effect on the workability of the mix. This effect has been accurately measured by Messrs. Pearson and Hitchcock in direct comparison with many other admixtures to concrete and it has been found to give workability greatly superior to other admixtures commonly used for this purpose. *(A Penetration Test for Determining the Workability of Concrete Mixtures, J. C. Pearson and Frank A. Hitchcock, Proceedings A.S.T.M., 1923.)* High workability means a safeguard against excess water, it means compact placing in forms and improved contact with reinforcements, and it means concrete which can be transported by buggy, barrow or chute with the minimum of segregation.



WHERE CAL IS MADE; BERKELEY, W. VA.

Continued on next page

Winterproofing

The specification of Cal will allow the job to proceed in weather 10° colder than would otherwise be safe. *(Report of Lapham, Feb. 1923.)* Tests also show that at very low temperatures (approximately 0° F.), where the specimens are definitely frozen, the Cal specimens continue to increase in strength, while hydration of the plain specimens is completely arrested. *(Brickett, July, 1922.)*

Curing

The great majority of all construction work is done under drying-out conditions. The result is surface cracks, checks and crazing, and soft-cured concrete, which is subject to disintegration and failure. Under drying-out conditions Cal shows its most outstanding value. In two days a Cal-treated mortar will show the same or better strength than a corresponding plain mortar in 28 days. *(U. S. Bureau of Standards; Lapham; Nutting.)*

Cal-mortar and Cal-concrete, by increased speed of hydration, attain a high strength before evaporation can greatly reduce the water content, and Cal's water of crystallization permits the hydration to continue actively at the later periods when free water has all disappeared.

Waterproofing

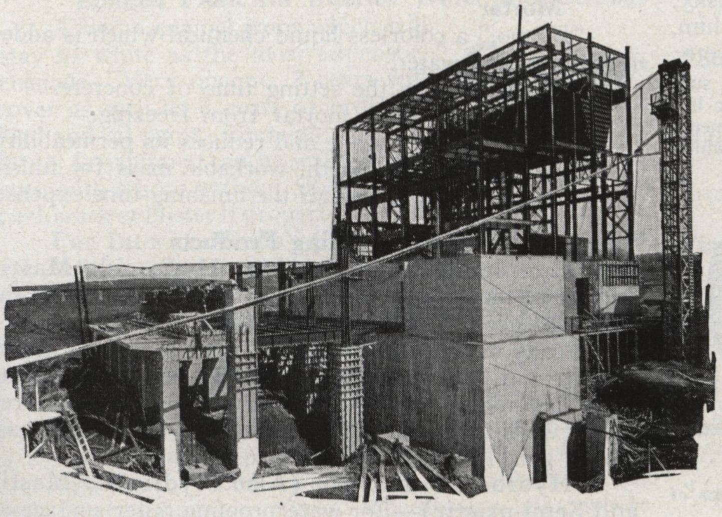
As a waterproofing material for mass concrete Cal combines the recognized advantages of calcium chloride and hydrated lime. At the same time, the improvement of workability and the curing effect of Cal further insure an impermeable job.

As a Floor Hardener

Cal is an integral hardener; not an after-treatment. It hardens the topping all the way through, and, at the same time, insures a good cure without checks and cracks. The great plasticity and workability of the Cal-mix makes it possible to finish the floor with a minimum of water and of troweling—another insurance against a soft, dusty floor.

To Make a Good Bond

For patching or finishing work, where new concrete must bond with old, Cal is unexcelled. The work of Lapham on bonding strength of Cal-cement mortars showed increases in the strength of the bond of from 35% to 75%. *(Cal Chemical Company, Bulletin T-2, 1923.)*



Power Station, Potomac Edison Co., Williamsport, Md.
Sanderson & Porter, Engineers, New York, N. Y.

Uniformity of Treatment

The fact that Cal is in the form of a powder which is added dry to the mix assures the architect of uniform treatment of every batch. The treatment is independent of moisture in the aggregates, and it is based only on the amount of cement in the batch. This is impossible with materials which are added to the gauging water.

No Danger of Corrosion

Careful tests extending for several months to several years have shown conclusively that Cal does not cause corrosion of reinforcements. *(U. S. Bureau of Standards, Technologic Paper 174; Lapham, 1922.)* This is the result to be expected from the addition of a material with a basic reaction.

Specifications

All portland cement [concrete] [mortar] [stucco] [granolithic] [finish] shall be treated with Cal, manufactured by the Security Cement & Lime Company, Hagerstown, Md., or their licensees, and furnished by them or their authorized dealers or representatives. Cal shall be used in the proportion of not less than 3 lb.* nor more than 8 lb.§ per bag of cement, except in special cases to be determined by the architect in charge. Within these specified limits the amount of Cal may be varied by the contractor according to the time of set desired. The Cal shall be added dry to the mix, according to directions issued by the manufacturers.

NET 99 LBS. GROSS 100 LBS.
AN APPROVED MATERIAL FOR CONTROLLING THE SET AND INCREASING THE
EARLY STRENGTH
OF PORTLAND CEMENT MIXTURES
CAL
THE SAME STRENGTH IN HALF THE TIME
"CAL CURES CONCRETE"
DIRECTIONS
ADD AT MIXER FIVE TO EIGHT POUNDS DRY CAL FOR EACH BAG OF PORTLAND CEMENT MIX CONCRETE OR MORTAR THOROUGHLY WITH LEAST POSSIBLE AMOUNT OF WATER. DO NOT ADD CAL TO THE MIXING WATER.
SECURITY CEMENT & LIME CO.
HAGERSTOWN, MD.
Pat'd Oct 22,1918 Jul.18 1919 Jul 11,1922

In a Burlap Bag

Waterproofing—All concrete and mortar on the job, (or on the specified portions of the job), shall be waterproofed by the introduction of 3 to 5 lb.* of Cal for each bag of portland cement. The Cal shall be added dry to the mix at the same time as the cement and aggregates.

Winterproofing—Specify 5 lb. Cal per bag of cement in addition to standard precautions of heating water and aggregates. Allow Cal-treated concrete or brick mortar to be placed at temperatures 10° lower than you would allow for plain, and allow contractor to take advantage of early strength by removing forms in half the usual time.

**Note 1:* Ordinarily, 5 lb. of Cal should be specified; although in 1:2:4 and richer mixes, 3 lb. are sufficient where the drying-out conditions are not severe. For the same strength in half the time always specify 5 lb. until trial on the job has shown satisfactory results with less.

§Note 2: Where conditions demand a greater speed than can be obtained with 8 lb. of Cal, this quantity may be increased, but the manufacturers do not ordinarily recommend the use of more than 8 lb. per bag of cement.

References

Sanderson & Porter, Engineers, New York, N. Y.
George A. Fuller Co., Contractors, New York, N. Y.
Simpson Bros. Corp., Contractors, Boston, Mass.
Vang Construction Co., Pittsburgh, Pa.
F. M. Masters, Engineer, Harrisburg, Pa.
Parker, Thomas & Rice, Architects, Baltimore, Md.
Frainey Bros. & Haighley, Contractors, Baltimore, Md.
Fred Drew Co., Contractors, Washington, D. C.
Milburn-Heister Co., Architects, Washington, D. C.
Louisville Railways, Louisville, Ky.
Capital Traction Co., Washington, D. C.
Lally Column Co., Chicago, Ill.
Commonwealth Edison Co., Chicago, Ill.

Additional references furnished on request.

L. SONNEBORN SONS, INC.

Floor Hardeners, Waterproofing Materials, Decorative and Technical Paints

GENERAL OFFICES
114 Fifth Avenue
NEW YORK, N. Y.

BRANCH OFFICES
BALTIMORE
BOSTON
CHICAGO
SAN FRANCISCO
PHILADELPHIA
DETROIT
LOS ANGELES
SEATTLE

FACTORY: BELLEVILLE, N. J.

SOUTHWESTERN DISTRIBUTORS: SONNEBORN BROS., DALLAS, TEX.

Products

"LAPIDOLITH," the Liquid Chemical Hardener and Dustproofer for concrete floors and Waterproofer for concrete and stucco walls.

"SONNEBORN'S CEMENT FILLER and DUSTPROOFER" for cement floors (transparent and in colors).

"FERMO," an Integral Liquid Chemical for the acceleration of the setting, and for prevention of freezing of concrete mixtures.

"HYDROCIDE" WATERPROOFING PRODUCTS for interior and exterior surfaces.

"LIGNOPHOL," a Preservative for wooden floors.

"CEMCOAT," an Improved Mill White.

"CEMCOAT" FLOOR ENAMEL.

"SONOTINT," a Flat, Washable Wall Coating.

"MARVELWITE," a Fume and Heat-resisting Enamel.

"SONOS," a Long Oil Enamel.

Also Amalie Structural Steel Paints, Galvacote, a coating for galvanized iron; Amalie Pipe Enamel; Amalie Radiator Enamel; Amalie Stack and Boiler Paints; Amalie P & D House Paints; Enamelife.

Hardening, Dustproofing and Waterproofing Old or New Concrete Floors

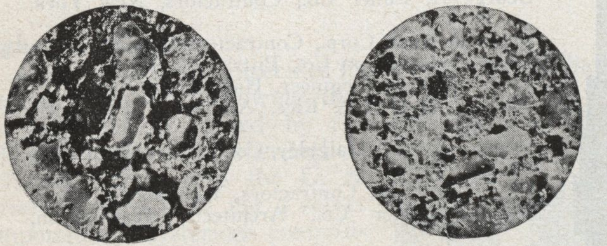
LAPIDOLITH
TRADE MARK

"Lapidolith"—A liquid chemical which penetrates concrete floors, rendering them hard, dustproof, wearproof and watertight. When applied to old concrete floors, "Lapidolith" will prevent further dusting and disintegration. It does not change the color of concrete.

Over 400,000,000 sq. ft. of floors in the largest industrial plants, office buildings, hospitals, hotels, etc., have been treated with "Lapidolith."

An Investigation of the Action of "Lapidolith" on Concrete—Following is an extract from the official report of Prof. R. J. Colony of Columbia University, New York, as the result of an examination by him, under the microscope, of treated and untreated concrete:

"The external application of 'Lapidolith' to concrete surfaces results in (a) the formation of an optically isotropic but crystalline substance, derived by a reaction between components of the 'Lapidolith' and the cement matrix of the concrete which (b) has a tendency to fill in voids and cavities and act as a binding agent, thus rendering the surface smoother and more uniform."



No. 1. Untreated Concrete

No. 2. Lapidolized Concrete

Microphotographs of Specimens of Concrete
Magnified 50 diameters

No. 1. Note large numerous voids (black spots) and roughness of surface.

No. 2. Note roughness is reduced and voids filled with network of newly formed hard crystalline substance

"Lapidolith" actually forms a new crystalline component which reduces the pores of the concrete.

Guarantee of "Lapidolith"—The chemical change effected by "Lapidolith" is guaranteed to be permanent.

Application—"Lapidolith" is mixed with water according to printed directions, flushed on the floor and spread with a broom or long-handled brush. With 3 applications, 1 gal. will cover 70 to 100 sq. ft., varying with the porosity of the cement. An average man can apply 1 coat on 10,000 to 15,000 sq. ft. per day. To harden an ordinary floor, 3 applications are sufficient.

Special Service Work—We also contract to apply "Lapidolith" with our own men under the supervision of a service engineer on areas of 20,000 sq. ft. or over at a substantial saving to the owner in material and labor.

Specification for Concrete Floor—Harden and dustproof the following concrete floor (........) or as noted on the drawings with 3 applications of "Lapidolith," manufactured by L. SONNEBORN SONS, INC., New York, N. Y., and applied as per their directions.

Filling and Dustproofing Concrete Floors Subject to Light Wear

"Sonneborn's Cement Filler and Dustproofer," for concrete floors where there is no excessive wear. Furnished either transparent or in attractive colors. Covering capacity per gal., 1 coat, is 350 sq. ft.; 2 coats, 200 sq. ft.

Specification—Fill and dustproof the following cement floors (........) with 2 coats of "Sonneborn's Cement Filler and Dustproofer" manufactured by L. SONNEBORN SONS, INC., New York, N. Y., applied as per manufacturer's directions.

Accelerating the Setting and Densifying of Concrete, also Preventing Freezing of Concrete and Mortar

"Fermo," a colorless liquid chemical which is added to the gauging water.

(1) Accelerates the setting time of concrete.
(2) Prevents brick mortar from freezing.
(3) Densifies concrete and reduces its permeability.
(4) Produces a smooth, workable mass for finishing concrete floors; saves half the finishing-time expense.

"Hydrocide" Waterproofing Products

"Hydrocide" No. 633 (Also Hydrocide Mastic and Semi-mastic)—Plaster bond for dampproofing the inner surfaces of outside walls above foundations.

Ready for use, applied cold with a brush. Saves furring and lathing expense. Should not be applied to smooth concrete surfaces which are to be plastered unless walls are sufficiently roughened. Covering capacity per gal., 1 coat, is 65 to 100 sq. ft.

"Hydrocide" No. 648 (Also Hydrocide Mastic and Semi-mastic)—For waterproofing outer surface of foundation walls and footings.

Continued on next page

Ready for use, applied cold with a brush. Covering capacity per gal., 1 coat, is 65 to 100 sq. ft.

"Hydrocide" No. 611—For the protection of unexposed surfaces of limestone, caen stone, marble and other fine stones, from stain caused by absorption or communicated by surrounding masonry. Covering capacity from 250 to 350 sq. ft. per gal.

"Hydrocide" Colorless—"A" and "B" for waterproofing exposed exterior walls. "A" for light colored surfaces, such as plain concrete, stucco, etc. "B" for red and buff brick, colored stucco and concrete.

Apply 2 coats with a brush or spraying machine, each coat approximately 100 sq. ft. per gal.

"Hydrocide" Integral Powder—For waterproofing mass concrete, concrete walls, floors, elevator, boiler and battery pits, swimming pools, water tanks, etc. Mix 2 lb. of "Hydrocide" integral powder with each bag of portland cement, then add to sand and stone mixtures.

"Hydrocide" Integral Paste—For waterproofing cement, stucco and mortars. For every bag of portland cement, use one quart of a mixture consisting of equal parts of "Hydrocide" paste and water.

Preservative for New and Old Wood Floors

LIGNOPHOL
FOR WOODEN FLOORS
TRADE-MARK

"Lignophol," a preservative of natural wood gums and oils, which will penetrate to a considerable depth below the surface of a wood floor, filling the voids in and between the wood cells and fibers and, consequently, preventing splintering, checking, cracking, warping and dry rot. Lignophol also acts as a dustproofer and waterproofer and as it checks the growth of fungus and mold, it prevents the disintegration of the wood fibers. Makes floors resilient and more resistant to heavy wear and tear.

New and old wood floors may successfully be treated with Lignophol. Lignophol is suitable for all classes of flooring and is being used most extensively on maple, pine and spruce. Floors treated with Lignophol may be waxed or varnished over. Application is easily made with a long-handled brush, which makes the labor cost practically negligible.

Covering Capacity—One gallon will cover approximately 350 sq. ft., 1 coat, or approximately 200 sq. ft., 2 coats. On new floors, 1 application is sufficient; on old floors, we recommend 2 applications.

"Cemcoat," a Sanitary, Washable, Light-reflecting Enamel Paint for Interior Walls and Ceilings

Cemcoat
TRADE-MARK

A white enamel paint which will stay as white as the most expensive enamels. Very opaque, 2 coats will cover as well as 3 coats of ordinary lead and oil paint. Contains no white lead. Is sanitary, can be washed with soap and water or even with a hose without affecting the surface. Will not peel, crack or blister if properly applied to a normal surface.

For Interior Walls—Can be used on concrete or any other masonry materials, wood or metal. A coat of "Cemcoat" flat undercoat followed by a coat of "Cemcoat" finish will give best results. For very porous surfaces 1 coat of Amalie wall size or Amalie gypsum size and 2 coats of "Cemcoat" finish.

White Gloss Finish "Cemcoat"—Reflects all the light and disseminates it equally throughout the room. It is also more easily cleaned than the eggshell or flat.

Eggshell Finish "Cemcoat"—Recommended for walls and ceilings in offices, schoolrooms, etc., where glare is to be avoided.

Flat Finish "Cemcoat"—For use where a soft white flat finish with absolutely no gloss is required.

Colors—Made in all standard colors.

Covering Capacity—Approximate number of square feet per gallon, per coat:

	First Coat	Second Coat
Concrete	175	225
Brick	200	250
Plaster	250	300
Wood	300	350
Metal	350	400

Exterior "Cemcoat" for Exterior Walls

For decorating and dampproofing exterior walls above grade. Comes in 12 attractive colors, flat or gloss finish.

Covering Capacity—On concrete, brick, stone and stucco, approximately 175 sq. ft. for 2 coats; on wood and metal 250 sq. ft. for 2 coats.

"Cemcoat" Floor Enamel

A very durable and elastic floor coating which comes in 8 colors and dries with a high gloss. One gallon covers approximately 200 sq. ft. with 2 coats.

"Sonotint," a Flat Washable Oil Paint for Interior Walls and Ceilings of Hospitals, Schools, etc.

SONOTINT
TRADE-MARK

A flat oil paint ready for use, which has all the softness and finish of water colors, with the advantage of being washable. It reflects the light without glare. Manufactured in 16 different shades. A color card will be sent on request. "Sonotint" forms a very hard elastic surface not affected by soap and water. Being very opaque, 2 coats cover perfectly and set without showing brush marks.

Covering Capacity—Will cover approximately 250 sq. ft. per gal., 1 coat.

"Marvelwite," an Enamel Which Resists Chemical Gases, Fumes and Vapors

MARVELWITE
TRADE-MARK

An enamel to meet demand for an intensely white wall coating which has highest resistance to conditions which turn color of average enamels. Highly resistant to influences of most chemical gases, fumes and vapors as they exist in laboratories, tanneries, bleacheries, textile mills, laundries, bakeries, chemical plants, hospitals, operating rooms, rubber and tire plants.

Covering Capacity—"Marvelwite" enamel, 500 sq. ft. per gal., 1 coat. "Marvelwite" undercoating, 350 sq. ft. per gal., 1 coat.

"Sonos," an Imported Enamel for Decorating High Class Interiors; also Used for Exteriors

"Sonos" is a long oil enamel of the highest quality obtainable.

Exceptional covering capacity in both density and area. Made in gloss, semigloss (eggshell) and flat.

Further Information

The following printed matter sent on request:

"Specification Data" Portfolio to fit standard correspondence files comprising: floor treatments, dampproofing and waterproofing, interior and exterior painting, technical paints.

Individual Specification Sheets on "Lapidolith," covering schools, hospitals, factories, warehouses, packing plants, bakeries, creameries, garages, power plants. Specifications and Color Cards on "Cemcoat" and other paints.

"Index of Sonneborn Paint Products."

Circular: "A Scientific Investigation of the Value of 'Lignophol'."

Specification Sheets on "Hydrocide" Waterproofing Products and "Fermo."

ESTABLISHED 1881

THE SOLVAY PROCESS COMPANY

DETROIT, MICH. SYRACUSE, N. Y. HUTCHINSON, KAN.

WING & EVANS, INC., SALES DEPARTMENT

40 Rector Street, NEW YORK, N. Y.

BRANCH OFFICES

CHICAGO SYRACUSE BOSTON DETROIT INDIANAPOLIS PHILADELPHIA PITTSBURGH CINCINNATI CLEVELAND

Solvay Calcium Chloride for Accelerating the Setting and Densifying of Concrete

A white, dry, flaky chemical placed in the mixing water accelerates the initial hardening of concrete without affecting the final set; at the same time densifies the concrete, making it more waterproof; reduces the freezing point of water, thereby aiding the green concrete to resist freezing in low temperatures. Calcium Chloride is extremely hygroscopic and dissolves almost instantly in water. It can be used with any brand of Portland cement, although results may vary slightly.

Results Proven by Authoritative Tests—Thorough and extensive tests made by U. S. Bureau of Standards, American Society for Testing Materials, Portland Cement Association, U. S. Engineers, Lewis Institute and our own engineers have definitely established that Calcium Chloride is beneficial to concrete.

At an investigation, carried on by the Bureau of Standards, co-operating with U. S. Engineers at Memphis, Tenn., with many materials, Calcium Chloride showed highest. In the standard mortar test with 3:1 Ottawa sand, it was found that 2 to 4%, by weight of water, of commercial Calcium Chloride increased tensile strength from 155 to 230% at the end of 24 hours; and from 173 to 190% at the end of 48 hours without adverse effect on the final set.

Comparative Strength Ratios between Treated and Untreated Concrete—After testing 7500 compression specimens, Prof. Duff A. Abrams, in charge of Structural Material Research Laboratory of the Lewis Institute, Chicago, Ill., concludes:

> "In the use of Calcium Chloride no advantage was gained for percentages of the commercial product greater than 2 or 3 per cent, corresponding to a chloride content of 1 to 1½ per cent. This amount when used in mixes of about 1:5 and in consistencies suitable for building construction, showed an increase in strength of from 100 to 200 pounds per square inch. For richer and drier consistencies the strength increase was greater and for leaner mixes and wetter concretes it was less."

Accelerating Properties—As shown by tests, concrete gauged with Solvay Calcium Chloride, at the end of 48 hours has the same strength as concrete gauged with plain water has at the end of 7 days. The early strength given to fresh concrete prevents collapse of the cell structure during the drying out period. It increases the crushing, tensile and abrasive strengths.

With Solvay, floor finishing is possible within a short time after pouring; concrete can be poured late in afternoon and finished, saving overtime charges.

Hardens and Densifies—The chemical action of Calcium Chloride densifies and hardens concrete and at the same time increases its resistance to dusting and absorption of water. This decreased porosity makes the surface more resistant to wear and less affected by acids and alkalies. All these qualities are highly desirable in construction of sidewalks, as well as floors in factories, garages, etc.

Advantage of Use in Cold Weather—The qualities of quick initial setting, hardening, densifying and reducing of the freezing point of the mixing water make it possible to progress with concrete work in continued cold weather. The usual precautions against cold weather must be taken, but the factor of safety is very materially increased by the use of Solvay Calcium Chloride.

Efficient solutions for use in freezing weather, using 6 gal. of water per bag of cement, are at 28° F., 2 lbs. to 6 gal. of water; 20° F., 3 lbs.; 15° F., 4 lbs.

In this connection the Portland Cement Association has published a bulletin, "Precautions for Concrete Pavement Construction in Cold Weather" from which the following extract is taken:

> "The only chemical recommended as an addition to the mixing water is Calcium Chloride. This material possesses the properties of lowering the freezing point of water and accelerating the setting of the concrete. It is used by being dissolved in the mixing water."

Waterproofing Qualities—The integral method of waterproofing concrete has been found best by many engineers and architects. The same qualities of hardening, densifying and quick initial setting brought about by Solvay Calcium Chloride tend to make treated concrete more waterproof. An additional aid to the waterproofing is the plastic or "fatty" condition of the mix which makes easier troweling and produces a better finish.

Directions for Using Solvay—For the best results, use not less than 1 lb. nor more than 4 lb. to a bag of cement except in freezing weather when up to 6 lb. may be used. Solvay should be dissolved in the water before water is added to dry mix.

Estimate of amount to be used is approximately 2 lb. per bag of cement—conditions of temperature, location, mix, etc., will vary this amount.

Cost—Solvay Calcium Chloride, east of the Mississippi, costs, approximately, two cents per pound—in the far West cost is slightly higher.

Shipment—Solvay is shipped in 375 lb. net, metal drums or 100 lb. net, paper lined burlap bags; in bags it must be given the same care as given cement. Stock is carried in 75 cities in the United States. Special arrangement for handling by carload lots.

Where Used

Solvay Calcium Chloride has been specified by many of America's leading architects, engineers and contractors. A few of the buildings in which it has been used for the purposes described are:

Chicago Tribune, Chicago, Ill.
American Furniture Mart, Chicago, Ill.
New Studio Building, Boston, Mass.
Dental Building, Boston, Mass.
Park Square Building, Boston, Mass.
Meyercord Building, Chicago, Ill.
Salvador Rodriguez Memorial Building, Tampa, Fla.

Technical Service

The Solvay Process Company maintains a Technical Department whose services are gladly given without charge to engineers and architects.

Literature

Copies of Prof. Abrams' report and booklet describing use of Solvay Calcium Chloride with concrete, sent free on request.

THE ATHENA GLAZED BRICK COMPANY

SUCCESSORS TO THE HOCKING VALLEY FIRE CLAY CO.

Manufacturers of Salt Glazed Brick

NELSONVILLE, OHIO

SALES AGENCIES IN ALL THE PRINCIPAL CITIES OF UNITED STATES AND CANADA

Products

Athena Salt Glazed Brick.
Sanitary Floor Brick.
Everwear Paving Brick.

Athena Salt Glazed Brick

Size—8x2¼x3⅞ in.

Shade Numbers, etc.—Made in beautiful shades of mahogany (102), golden (104), buff (103), thoroughly vitrified and salt glazed on both faces and ends, and rich in both color and glaze. All standard shapes carried in stock and special shapes made on order.

Interior Uses—For facing entire interior walls or wainscot work wherever sanitary conditions are desired. Principal places: schools, hospitals, gymnasiums, swimming pools, stables, garages; office, factory and warehouse buildings; prisons, power plants, city market houses, acid rooms and vats, fire engine houses, packing plants; subways, passenger and freight depots.

A Few Important Jobs—(Interior)—

World's Largest Electric Generating Station, United Electric Light & Power Co., 201st Street, New York City (see illustration)
Ford Motor Company Power Plant, Fordson, Minn.
Louisville Gas & Electric Co., Louisville, Ky.
Twin Market Houses, Pittsburgh, Pa.
Fire Engine Houses, Chicago, New York and Boston
General Chemical Co. Plants (various places)
Swift & Armour Packing Plants (various places)
Pennsylvania Railroad Stations and Tunnels
State Prisons in Ohio, New York and Illinois
Both High and Grade Schools in all principal cities of United States and Canada

Exterior Uses—For facing all exterior walls where a beautiful sanitary and permanent wall is desired, as it is not affected by acids or the elements.

A Few Important Jobs (Exterior)—

6-story Moose Building in Loop District, Chicago, Ill.
Apartment Buildings in all principal cities
3-story Business Block, Dr. J. E. Pickett, Minersville, Pa.
3-story Business Block, Marvin DeMaine, Pomeroy, Ohio

These brick have been furnished for exterior facing in almost every conceivable class of building.

Sanitary Floor Brick

Size—8x3⅞x1⅜ in. (shade 102). 8x4x1⅜ in. (shade 103).

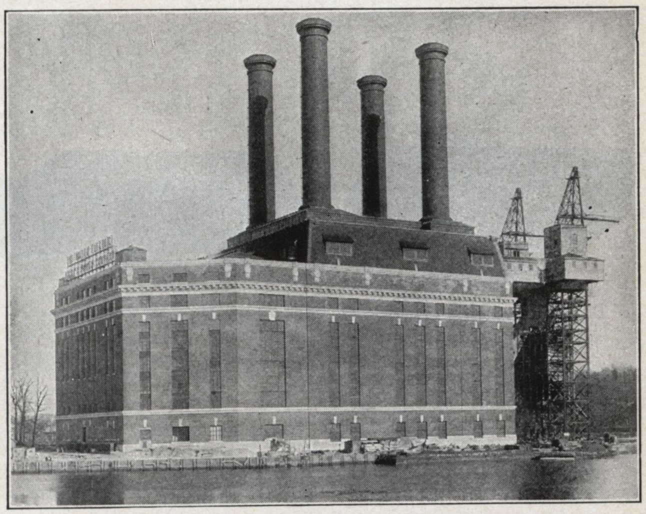
Uses—This product is usually embedded in cement. It is used for practically the same class of floors as those named for our Everwear paving brick, particularly where the desire is for lighter weight material. Especially desirable in packing house floors, and is being used extensively for such purposes. Only one side is glazed and either side can be turned up as desired.

A Few Special Jobs—Millions have been used for wainscoting and floor purposes on the following jobs:

Illinois State Institutions
Massachusetts Schools
Swift & Company (various plants)
Armour & Company (various plants)
William Davis, Ltd., Toronto, Ont.
Detroit Edison Co., Detroit, Mich.
Cincinnati Abattoir Co., Cincinnati, Ohio

Everwear Paving Brick

Size—Size 10x5x2¼ in.



201st Street Generating Station, United Electric Light & Power Co., New York, N. Y.

W. E. McCoy, Engineer — F. F. Nesbit & Co., Contractors

650,000 brick used, shades 103 and 102 (interior)

Uses—Extensively used for paving floors of engine and boiler rooms, power and industrial plants; basements of public buildings, schools, warehouses and battery rooms and for paving around electric and steam railway passenger and freight depots. Thoroughly vitrified and only one side glazed; it is unsurpassed for beauty and wearing qualities. Everwear paving brick save 50% over cement floors on original cost, and have many times the life of a cement floor.

These brick have been upon the floors of boiler and engine rooms of the New York Life Insurance Building, New York, for over 20 years and show scarcely any wear.

A Few of Many Concerns Using Same—

New York Telephone Co., New York, N. Y.
Chicago Edison Electric Co., Chicago, Ill.
Cleveland Electric Railway Co., Cleveland, Ohio
Ford Motor Co., Detroit, Mich.
Cincinnati Gas & Electric Co., Cincinnati, Ohio
Hocking Valley Railway Co., Columbus, Ohio

General Qualities of Salt Glazed Material

All shades of the standard brick and two classes of floor brick are burned to about 2200° Fahr.; it is thoroughly vitrified and salt glazed; non-absorbent of moisture; absolutely acidproof; will not craze, crack or peel; withstands all the elements of the air besides heavy crushing strain, and always looks fresh and clean.

Samples

Samples will be submitted and prices quoted by our nearest sales agency on request.

Facilities

We have a modern electrically equipped plant with a daily capacity of 60,000 brick, or approximately 18,000,000 annually, and a large and well selected stock for quick shipment. All business is given prompt attention.

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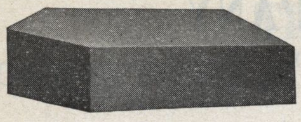
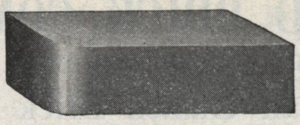


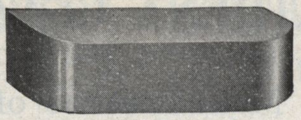
No. 1

45° Octagon



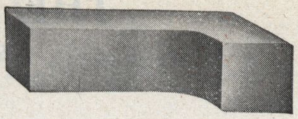
No. 2

2-in. Radius Bullnose



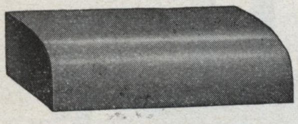
No. 3

2-in. Radius Bullnose Binder



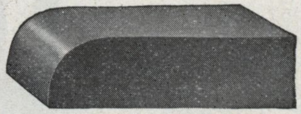
No. 4

2-in. Radius Internal Bullnose



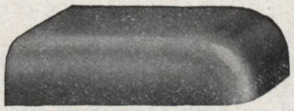
No. 5

2-in. Radius Bullnose Stretcher



No. 6

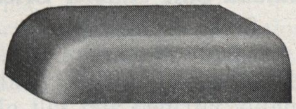
2-in. Radius Bullnose Header



No. 7 Left

2-in. Radius Bullnose Stretcher

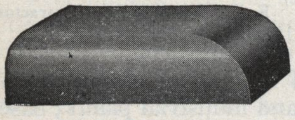
Round external corner



No. 8 Right

2-in. Radius Bullnose Stretcher

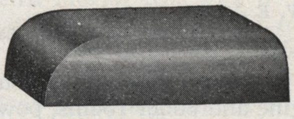
Round external corner



No. 9 Left

2-in. Radius Bullnose Stretcher

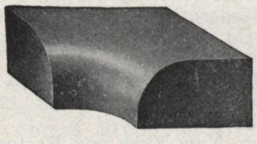
Square external corner



No. 10 Right

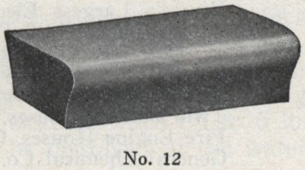
2-in. Radius Bullnose Stretcher

Square external corner



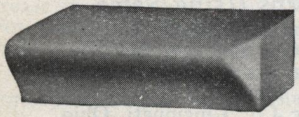
No. 11

2-in. Radius Internal Corner Bullnose Stretcher



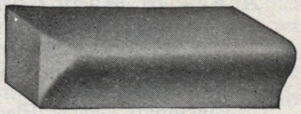
No. 12

O. G. Stretcher



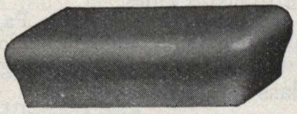
No. 13 Left

O. G. Runout



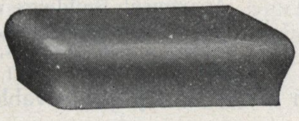
No. 14 Right

O. G. Runout



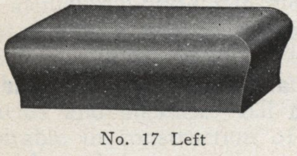
No. 15 Left

O. G. Round External Corner



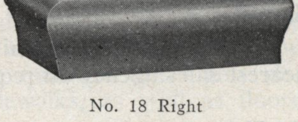
No. 16 Right

O. G. Round External Corner



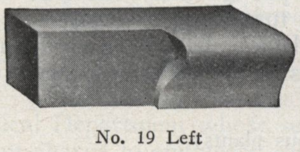
No. 17 Left

O. G. Square External Corner



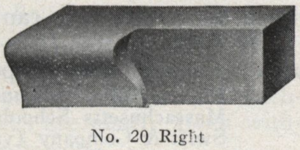
No. 18 Right

O. G. Square External Corner



No. 19 Left

O. G. Internal Corner

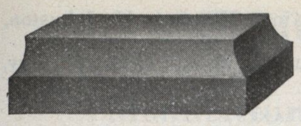


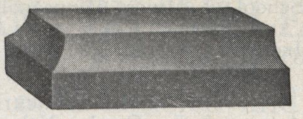
No. 20 Right

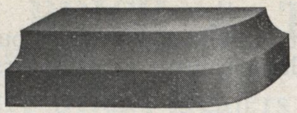
O. G. Internal Corner

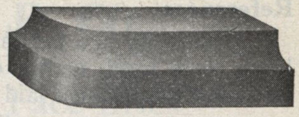
Special Shapes of Athena Salt Glazed Brick

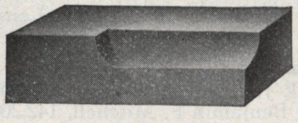
Continued on next page

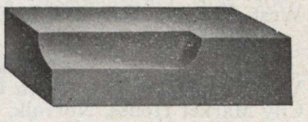

No. 21 Left
1-IN. COVE SQUARE
EXTERNAL CORNER

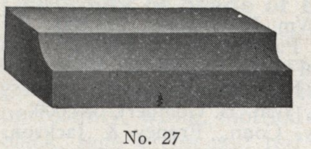

No. 22 Right
1-IN. COVE SQUARE
EXTERNAL CORNER

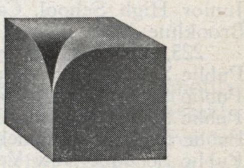

No. 23 Left
1-IN. COVE ROUND
EXTERNAL CORNER

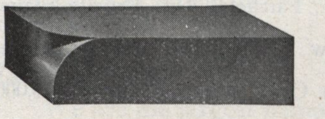

No. 24 Right
1-IN. COVE ROUND
EXTERNAL CORNER

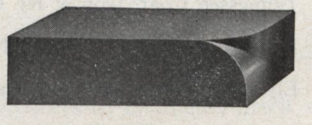

No. 25 Left
1-IN. COVE SQUARE
INTERNAL CORNER

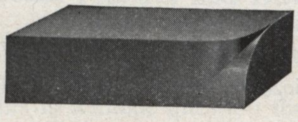

No. 26 Right
1-IN. COVE SQUARE
INTERNAL CORNER

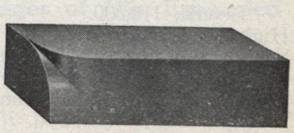

No. 27
1-IN. COVE STRETCHER

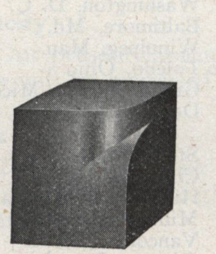

No. 28
2-IN. RADIUS BULLNOSE
INTERNAL CORNER

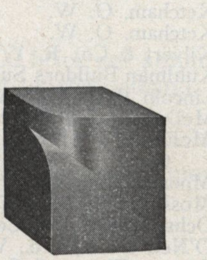

No. 29 Left
2-IN. RADIUS BULLNOSE
HEADER SILL AND JAMB
MITER

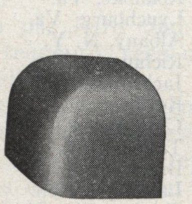

No. 30 Right
2-IN. RADIUS BULLNOSE
HEADER SILL AND JAMB
MITER

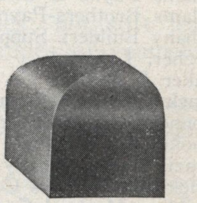

No. 31 Left
2-IN. RADIUS BULLNOSE
STRETCHER, SILL AND JAMB
MITER

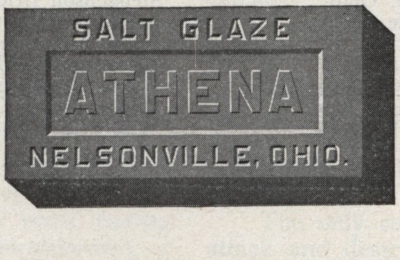

No. 32 Right
2-IN. RADIUS BULLNOSE
STRETCHER, SILL AND JAMB
MITER


No. 33 Left
2-IN. RADIUS BULLNOSE
SILL AND JAMB MITER


No. 34 Right
2-IN. RADIUS BULLNOSE
SILL AND JAMB MITER


No. 35
2-IN. RADIUS ROUND
BULLNOSE CORNER


No. 36
2-IN. RADIUS SQUARE
BULLNOSE CORNER



Order all shapes by number

Special Shapes of Athena Salt Glazed Brick

Continued on next page

References

Following is a partial list of buildings in which our brick were used, names of the architects or engineers, and number of brick laid:

SCHOOLS

Wilmington, Del., Guilbert & Betelle, 70,000
Public School No. 69, Baltimore, Md., Mottu & White, 78,000
Central High School, Saginaw, Mich., R. E. Leroy, 130,000
Public School, New Rochelle, N. Y., Guilbert & Betelle, 140,000
Senior High School, Harrisburg, Pa., C. Howard Lloyd, 150,000
High School, Janesville, Wis., Van Ryn & De Gellecke, 150,000
High School, Ishpeming, Mich., Van Leyan Schilling, 160,000
Bayview High School, Milwaukee, Wis., Van Ryn & De Gellecke, 175,000
Schools, Huntington, W. Va., Richard M. Bates Jr., 200,000
Junior High School, Camden, N. J., Clyde S. Adams, 200,000
Brookline High School, Brookline, Mass., Killham & Hopkins, 225,000
Public School, Brooklyn, N. Y., Wm. H. Gompert, 234,000
Public School, Collinwood, N. J., Paul A. Davis, 268,000
Public School, Camden, N. J., Paul A. Davis, 268,000
Public Schools, Philadelphia, Pa., J. D. Cassell, 340,000
Public Schools, New York, N. Y., Wm. H. Gompert, 384,000
Crosby High School, Waterbury, Conn., Freney & Jackson, 400,000
Grade and High Schools, Allentown, Pa., Jacoby & Everett, 405,000
Public School, Washington, D. C., Albert L. Harris, 1,000,000
Public Schools, Boston, Mass., 1,000,000
Public Schools, Borough of Manhattan, New York, N. Y., Wm. H. Gompert, 165,000
Parkville Public Schools, Parkville, N. Y., Wm. H. Gompert, 146,000
West Side High School, West Newark, N. J., Guilbert & Betelle, 110,000
High School, Irvington, N. Y., Donn Barber, 140,000
School Building, Milwaukee, Wis., Van Ryn & De Gellecke, 410,000
High School, New Lexington, Ohio, John Quincy Adams, 197,000
School of Mines, Minneapolis, Minn., Clarence H. Johnston, 150,000
Industrial School for Boys, Lansing, Mich., Lynn W. Fry, 302,000

PACKING PLANTS

Armour & Co., Omaha, Neb., Armour & Co., Engineers, 400,000
Fried & Reineman Packing Co., Pittsburgh, Pa., Anders & Reimers, 200,000
Swift & Co., Chicago, Ill., R. C. Clark, 160,000
Skinner Packing Co., Omaha, Neb., Harry Lawrie, 100,000
Ohio Packing Co., Columbus, Ohio, E. Elford & Son, 175,000

POWER PLANTS

Ford Motor Co., Fordson, Minn., Stone & Webster, Inc., 350,000
Louisville Gas & Electric Co., Louisville, Ky., Byllesby Engineering Co., 343,000
Ford Motor Co., Iron Mountain, Mich., Albert Kahn, 150,000
Light and Power Stations, New York, N. Y., Private Plans, 930,000
West Virginia Power Co., Charleston, W. Va., C. O. Lenz, 100,000

MISCELLANEOUS

Virginian Power Co., Cabin Creek Junction, West Va., 185,000
City Market House, Norfolk, Va., Benjamin F. Mitchell, 142,200
Perry Iron Works, Erie, Pa., 110,000
Acme Power Co., Toledo, Ohio, A. Bentley & Son, 162,000
City Hall, Winston-Salem, N. C., Northup & O'Brien, 100,000
Scripts Publishing Co., Cleveland, Ohio, 175,000
News Building, Detroit, Mich., Albert Kahn, 125,000
Institution for Feeble Minded, Orient, Ohio, R. H. Harsh, 250,000
Ford Motor Co., Detroit, Mich., Albert H. Kahn, 1,500,000
State Institution, Alton, Ill., Edgar Martin, 540,000
Chickasaw Ship Building Co., Chickasaw, Ala., Private Plans, 248,000
Tennessee Coal, Iron & Ry Co., Fairfield, Ala., Private Plans, 614,000
Indiana Epileptic Village, New Castle, Ind., Herbert Foltz, 175,000
Elyria Pumping Station, Lorain, Ohio, Morris Knowles, 150,000

Sales Agencies

AGENT	CITY	AGENT	CITY
Acme Brick Company	Fort Worth, Tex.	Hood Brick Co., B. Mifflin	Memphis, Tenn.
Acme Brick Company	San Antonio, Tex.	Hood Brick Co., B. Mifflin	Daisy, Tenn.
Acme Brick Company	Houston, Tex.	Hyde & Sons, Ltd.,	Montreal, Canada
Acme Brick Company	Little Rock, Ark.	Ketcham, O. W.	Philadelphia, Pa.
Acme Brick Company	Fort Smith, Ark.	Ketcham, O. W.	New York, N. Y.
Acme Brick Company	Shreveport, La.	Ketcham, O. W.	Washington, D. C.
Acme Brick Company	New Orleans, La.	Ketcham, O. W.	Baltimore, Md.
Adams Payne & Gleaves, Inc.	Roanoke, Va.	Kilvert & Co., R. Y.	Winnipeg, Man.
Adams Brothers-Payne Co.	Lynchburg, Va.	Kuhlman Builders Supply & Brick Co.	Toledo, Ohio
Albany Builders Supply Co.	Albany, N. Y.	Lincoln Brick Company	Grand Rapids, Mich.
Archer, J. S.	Richmond, Va.	McDonald Coal & Brick Co.	Detroit, Mich.
Baker & Holmes Co.	Jacksonville, Fla.	McEwing & Thomas Clay Products Co.	St. Louis, Mo.
Black Company, John H.	Buffalo, N. Y.	Moores-Coney Co.	Cincinnati, Ohio.
Bonner & Marshall Brick Company	Chicago, Ill.	Mossman Brothers Co.	Huntington, W. Va.
Booker & Company	Tampa, Fla.	Ochs Brick & Tile Company, A. C.	Minneapolis, Minn.
Brazil Clay Company	Brazil, Ind.	O'Neil & Co., Ltd., Wm.	Vancouver, B. C.
Brick and Supplies Corporation	Lansing, Mich.	Ottawa Fireproof Supply Co.	Ottawa, Ontario
Building Material Co.	Steubenville, Ohio	Pickett, Dr. J. E.	Minersville, Pa.
Chillicothe Coal Co.	Chillicothe, Ohio	Pomeroy Cement Block Co.	Pomeroy, Ohio.
Consolidated Brick Co.	Charleston, W. Va.	Queisser Co., The R. L.	Cleveland, Ohio
Copp, William	London, Ontario	Reliance Brick Company	Wichita, Kan.
Cummins Brick & Tile Co.	Syracuse, N. Y.	Reliance Brick Company	Des Moines, Iowa
Denison H. Tile & Brick Co.	Pittsburgh, Pa.	Reliance Brick Company	Kansas City, Mo.
Denver Pressed Brick Company	Denver, Colo.	Reliance Brick Company	Oklahoma City, Okla.
Dolben & Company	Boston, Mass.	Reliance Brick Company	Tulsa, Okla.
Drummond & Reeves, Ltd.	Toronto, Ontario	Sioux City Brick & Tile Co.	Sioux City, Iowa
Duluth Builders Supply Co.	Duluth, Minn.	Southern Building Material Co.	Norfolk, Va.
Gaddis-Harrison Brick Co.	Columbus, Ohio	Speakes Co.	Superior, Wis.
Gaddis-Harrison Brick Co.	Dayton, Ohio	Stephenson Brick Co.	Birmingham, Ala.
General Building Service Co.	Marietta, Ohio	Sunderland Brothers Co.	Omaha, Neb.
Hardison Co., W. T.	Nashville, Tenn.	Swan, Theodore H.	Rochester, N. Y.
Hood Brick Co., B. Mifflin	Atlanta, Ga.	Thornton Fire Brick Co.	Clarksburg, W. Va.
Hood Brick Co. Charlotte	Charlotte, N. C.	Watts Morehouse Co.	Jackson, Mich.
Hood Brick Co., B. Mifflin	Raleigh, N. C.	Whaley Brick Co.	Louisville, Ky.
Hood Brick Co., B. Mifflin	Greensboro, N. C.	Wisconsin Face & Fire Brick Co.	Milwaukee, Wis.
Hood Brick Co., B. Mifflin	Greenville, S. C.		

AMERICAN ENAMELED BRICK & TILE CO.

INCORPORATED 1893

Manufacturers of Enameled and Fire Brick; Dealers in Face Brick

TELEPHONE
Murray Hill 8787, 8788, 8789

52 Vanderbilt Avenue
NEW YORK, N. Y.

CABLE ADDRESS
"Amerebrick"

Products

Enameled Brick, White, Mottled and Standard Colors, in standard sizes and ornamental shapes.

Also manufacturers of Fire Brick, Standard 9-in. and 9-in. Series Shapes (as adopted by the members of the Refractories Manufacturers' Association), and Special Shapes.

Fire Clay, packed in bags or in bulk.

Dealers in Face Brick, all shades and textures.

Territory

The business operations of this firm cover North and South America, Europe, Asia and Australia.

Personal Representatives

For the convenience of our customers in the United States and Canada, we have, in order to keep in closer touch with them, located representatives in all the principal cities to attend personally to inquiries, orders and deliveries.

Facilities

We are the largest manufacturers of enameled brick in North and South America.

Our works, located but an hour's travel from the New York office, are situated so as to enable shipping over two of the largest railroads, viz., the Pennsylvania and the Central of New Jersey, and their connecting lines.

Capacity

Our present capacity is 12,000,000 brick per annum, which will be increased as occasioned by the demand.

Stock

The average stock on hand at our factory is more than 2,000,000 brick, giving a large assortment for immediate delivery.

Illustrations of Stock Designs of Enameled Brick

Much delay is saved by use of stock designs of moulded brick. In the following pages are shown designs that we recommend as being most satisfactory in manufacturing results. We try to keep a stock of these on hand, in standard colors.

These designs are chosen to reduce manufacturing difficulties and delays to a minimum; to enable composite mouldings to be made up; and to enable prompt filling of orders.

Colors—Bright, Medium or Matt Finish

In addition to our regular white and standard colors, such as our sage green, red brown, etc., we have made a specialty of mottles in the following colors:

Gray, brown, black, mixed gray and black in both enameled and porcelain finish, which give a very fine appearance for both interior and exterior work, having a finish more on the type of marble than enameled or porcelain brick.

If you have in mind, at any time, a particular color, shade or finish of enameled brick for interior or exterior purposes, advise us of your ideas and requirements and we will be pleased to submit samples.

Uniformity of Shade of Enameled Brick

We guarantee uniformity of shade in all first quality deliveries to the limit of practicability. Colors and effects giving most uniform results are, in order of degree of uniformity, white, mottled gray, mottled brown, mottled black, sage green and red brown. Other colors follow in irregular positions.

We will try on orders of moderate size, or on larger orders if ample time be given, to match in shade the moulded and stretcher stock, but can not always guarantee to uniformly shade shipments of specials, particularly on rush shipments.

Special Features and Advantages of Our Enameled and Porcelain Brick

In making our product we follow the English and Scotch systems, working by the soft mud process. This is without question the only process which insures durability and the closest relation of bond obtainable between body and glaze.

Our brick are burnt in but one fire, thus making the chemical change in the body and the glaze simultaneous.

Where manufacturers use the dry pressed process, the brick have to be burnt first as front brick before the enamel can be applied, and fired again for the fluxing of the glaze.

We use hard and durable glazes; not soft lead glazes frequently seen on inferior grades of enameled brick and tile.

There has not been a single case during our over thirty years of business where any peeling or discoloring has been seen or reported.

This is better than any guarantee which we might be asked to give, as it covers a distributed output of over 135,000,000 brick, located all over the United States, Canada, South America and elsewhere, subject to all varieties of climatic conditions.

Cleaning

Enameled brick are best cleaned with some alkaline solution, such as caustic soda or sodium carbonate. This cleans the enamel and does not affect the cement or lime mortar.

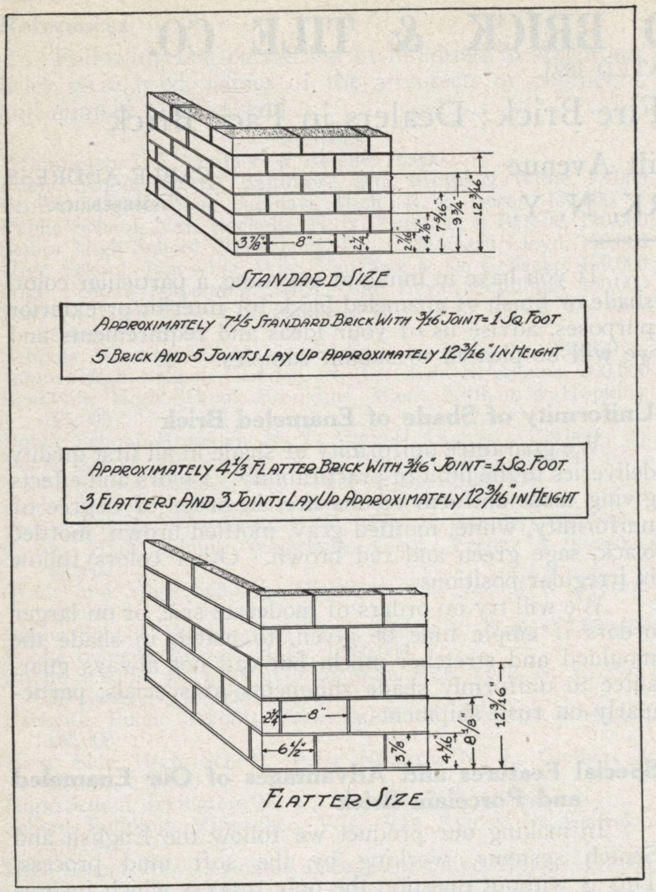
Acids

Sulphuric, nitric or hydrochloric acids, even in concentrated form, will not affect our glazes; but if used as a wash, even when diluted, they will attack the cement or lime mortar.

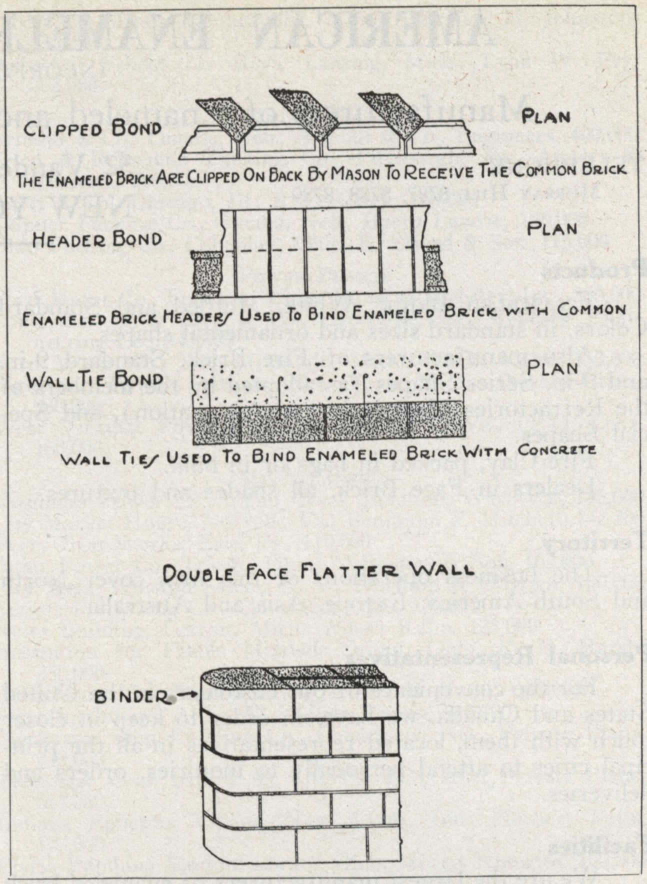
The only commercial acids which will attack and destroy our enamel are hydrofluoric and hydrofluosilicic.

SAMPLES DISPLAYED WITH
ARCHITECTS' SAMPLES CORPORATION
NEW YORK, N.Y.

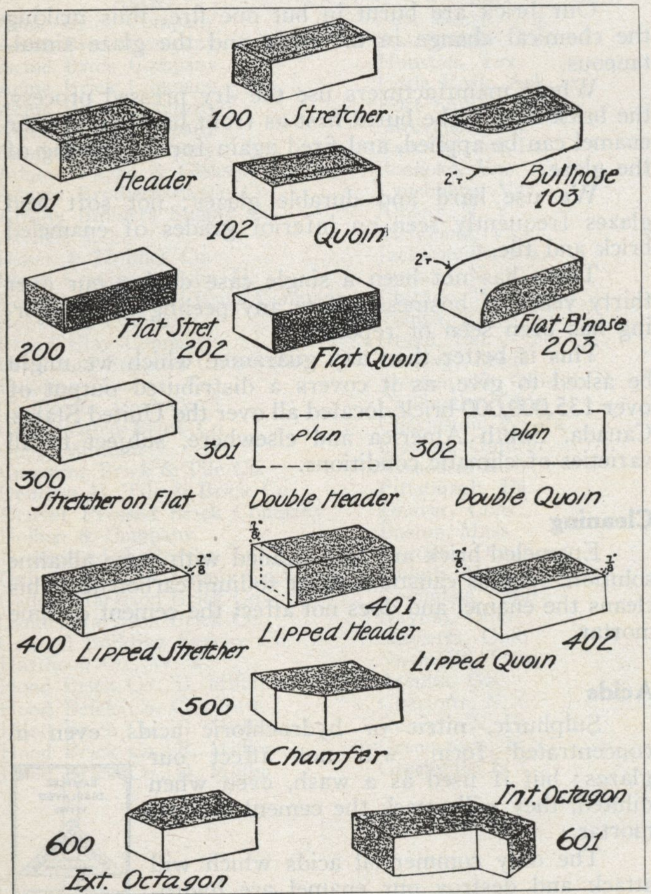
Continued on next page


3 7/8"
8"
2 1/4"
2 7/16"
4 1/8"
7 5/16"
9 3/4"
12 3/16"
STANDARD SIZE
APPROXIMATELY 7 1/5 STANDARD BRICK WITH 3/16" JOINT = 1 SQ. FOOT
5 BRICK AND 5 JOINTS LAY UP APPROXIMATELY 12 3/16" IN HEIGHT
APPROXIMATELY 4 1/3 FLATTER BRICK WITH 3/16" JOINT = 1 SQ. FOOT
3 FLATTERS AND 3 JOINTS LAY UP APPROXIMATELY 12 3/16" IN HEIGHT
2 1/4
8"
6 1/2"
3 7/8
4 1/16
8 1/8"
12 3/16"
FLATTER SIZE

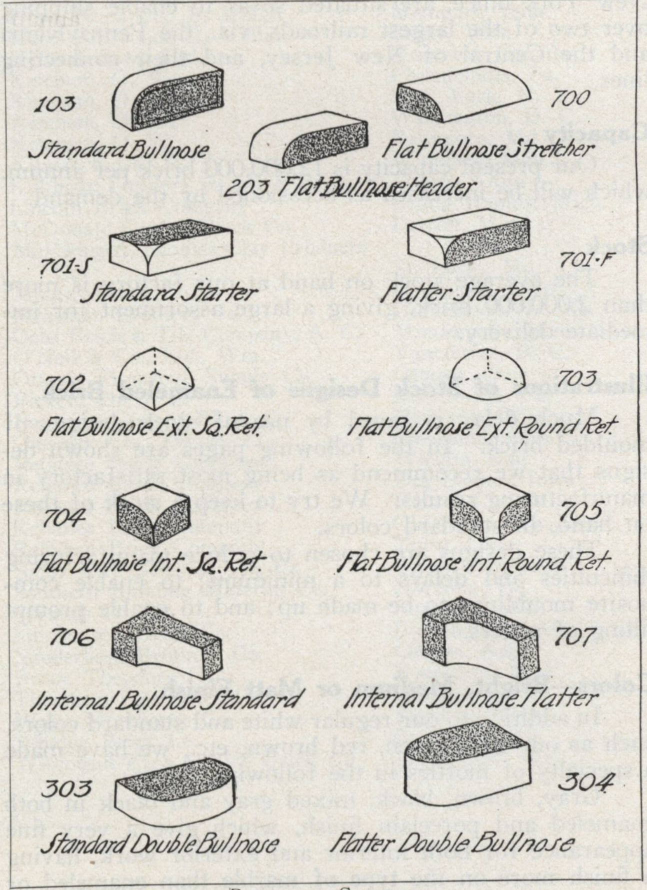
Comparison of Sizes Showing Number of Bricks Per Square Foot
All dimensions are approximate


CLIPPED BOND
PLAN
THE ENAMELED BRICK ARE CLIPPED ON BACK BY MASON TO RECEIVE THE COMMON BRICK
HEADER BOND
PLAN
ENAMELED BRICK HEADERS USED TO BIND ENAMELED BRICK WITH COMMON
WALL TIE BOND
PLAN
WALL TIES USED TO BIND ENAMELED BRICK WITH CONCRETE
DOUBLE FACE FLATTER WALL
BINDER

System of Bonding or Tying Enameled Brick to Common Brick or Concrete Backing, Also Method of Bonding Flatter Brick for Partitions

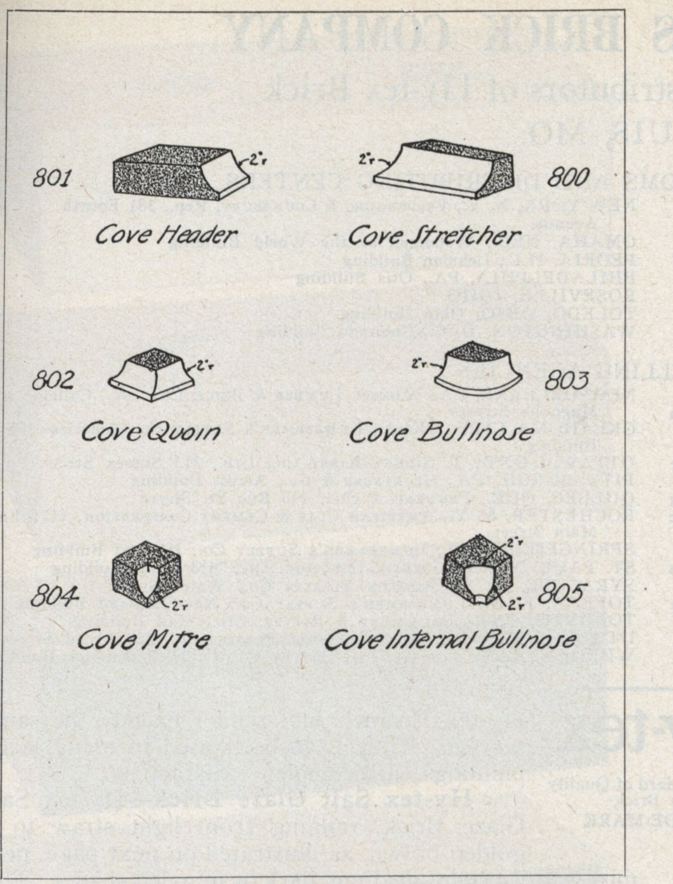

100 Stretcher
101 Header
102 Quoin
Bullnose 103
2"
200 Flat Stret
202 Flat Quoin
2"
Flat B'nose 203
300 Stretcher on Flat
plan
301 Double Header
plan
302 Double Quoin
1/8"
1/8"
400 Lipped Stretcher
401 Lipped Header
402 Lipped Quoin
500 Chamfer
600 Ext. Octagon
Int. Octagon 601

Illustrations of Types
For projection and dimensions see next page

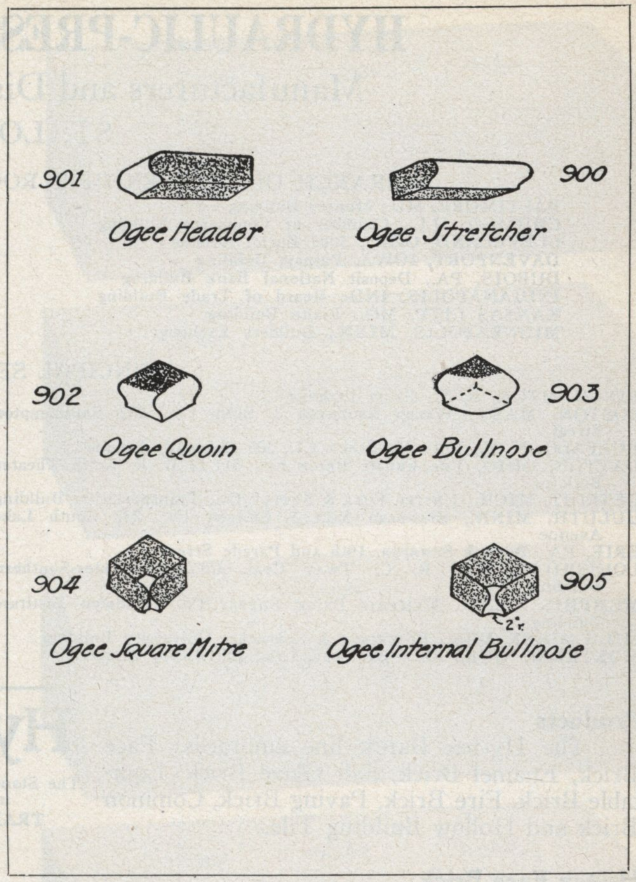

103 Standard Bullnose
700 Flat Bullnose Stretcher
203 Flat Bullnose Header
701-S Standard Starter
701-F Flatter Starter
702 Flat Bullnose Ext. Sq. Ret.
703 Flat Bullnose Ext. Round Ret.
704 Flat Bullnose Int. Sq. Ret.
705 Flat Bullnose Int. Round Ret.
706 Internal Bullnose Standard
707 Internal Bullnose Flatter
303 Standard Double Bullnose
304 Flatter Double Bullnose

Bullnose Specials
For projection and dimensions see next page. All brick shown have 2-in. radius

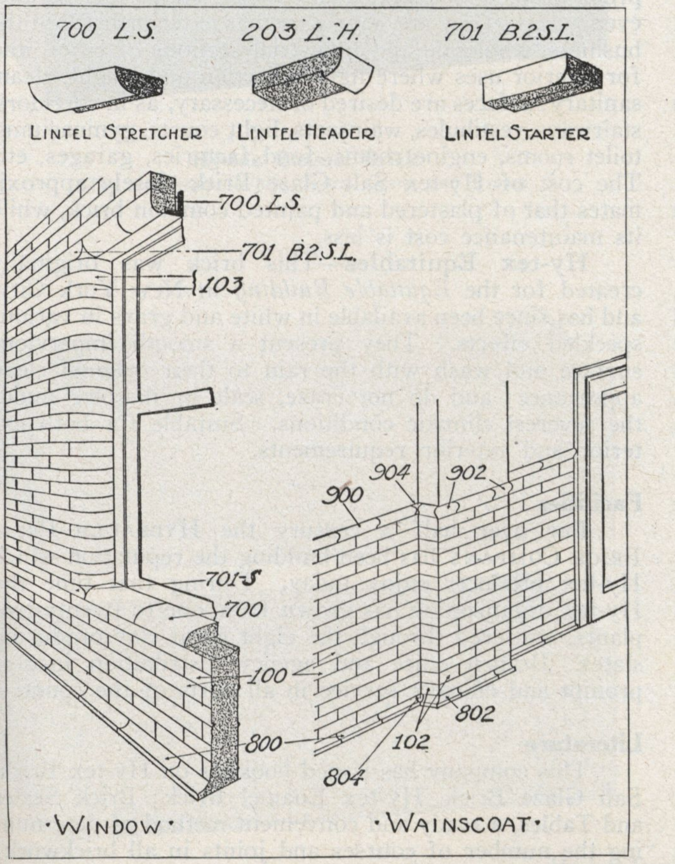
Continued on next page


801
2"r
Cove Header
2"r
800
Cove Stretcher
802
2"r
Cove Quoin
2"r
803
Cove Bullnose
804
2"r
Cove Mitre
2"r
2"r
805
Cove Internal Bullnose

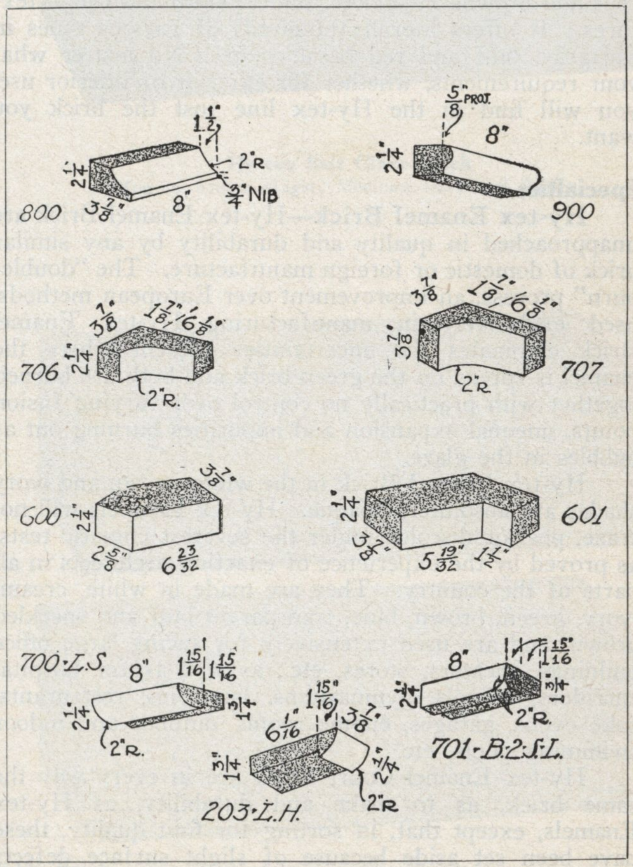
Cove Mould
For projection and dimensions see cut below


901
Ogee Header
900
Ogee Stretcher
902
Ogee Quoin
903
Ogee Bullnose
904
Ogee Square Mitre
905
2"r
Ogee Internal Bullnose

Ogee Mould
For projection and dimensions see cut below


700 L.S.
203 L.H.
701 B.2.S.L.
Lintel Stretcher
Lintel Header
Lintel Starter
700 L.S.
701 B2S.L.
103
904
902
900
701-S
700
100
802
800
102
804
·Window·
Wainscoat·

Study of a Window Opening and of a Base and Cap Course
For projection and dimensions see next cut


1 1/2"
2"R
3/4" Nib
2 1/4"
3 7/8"
8"
800
5/8" Proj.
8"
2 1/4"
900
3 7/8"
1 7/8" / 6 1/8"
2 1/4"
706
2"R.
3 7/8"
1 7/8" / 6 1/8"
3 7/8"
707
2"R
3 7/8"
135°
600
2 1/4"
2 5/8"
6 23/32
2 1/4"
601
3 7/8"
5 19/32"
1 1/2"
700·L.S.
8"
1 15/16
1 15/16
2 1/4"
1 3/4"
2"R.
1 15/16"
6 1/16"
3 7/8"
1 3/4"
2 1/4"
2"R
203·L.H.
8"
1 15/16"
2 1/4"
1 3/4"
2"R.
701-B:2:S:L.

Projection and Dimensions of Special Shapes

HYDRAULIC-PRESS BRICK COMPANY

Manufacturers and Distributors of Hy-tex Brick

ST. LOUIS, MO.

BRANCH OFFICES, EXHIBIT ROOMS AND DISTRIBUTING CENTERS

BALTIMORE, MD., Munsey Building
CHICAGO, ILL., Chamber of Commerce Building
CLEVELAND, OHIO, 5005 Euclid Avenue
DAVENPORT, IOWA, Putnam Building
DUBOIS, PA., Deposit National Bank Building
INDIANAPOLIS, IND., Board of Trade Building
KANSAS CITY, MO., Rialto Building
MINNEAPOLIS, MINN., Builders Exchange
NEW YORK, N. Y., Fredenburg & Lounsbury, Rep., 381 Fourth Avenue
OMAHA, NEB., Woodmen of the World Building
PEORIA, ILL., Lehman Building
PHILADELPHIA, PA., Otis Building
ROSEVILLE, OHIO
TOLEDO, OHIO, Ohio Building
WASHINGTON, D. C., Colorado Building

PRINCIPAL SELLING AGENCIES

BINGHAMTON, N. Y., Pratt Lumber Co.
BOSTON, MASS., Waldo Brothers & Bond Co., 202 Southampton Street
BUFFALO, N. Y., John H. Black Co., 505 Delaware Avenue
DAYTON, OHIO, The Crume Brick Co., 511-12 B. F. Keith Theater Building
DETROIT, MICH., United Fuel & Supply Co., Transportation Building
DULUTH, MINN., Standard Salt & Cement Co., 237 South Lake Avenue
ERIE, PA., Boyd & Schafer, 19th and Parade Streets
LOUISVILLE KY., R. C. Tway Coal Co., 406 Inter-Southern Building
MEMPHIS, TENN., Memphis Brick Supply Co., Goodwyn Institute Building
MILWAUKEE, WIS., Ricketson & Schwarz, University Building
MONTREAL, QUE., Alex Bremner, Ltd., 100 Bleury Street
NEW ORLEANS, LA., Michel Lumber & Brick Co., Inc., Calliope and Magnolia Streets
OKLAHOMA CITY, OKLA., Lumbermen's Supply Co., American Bank Building
OTTAWA, ONT., T. Sidney Kirby Co., Ltd., 213 Sussex Street
PITTSBURGH, PA., Gloninger & Co., Arrott Building
QUEBEC, QUE., Pruneau & Cie., 140 Rue St. Pierre
ROCHESTER, N. Y., American Clay & Cement Corporation, 1175 East Main Street
SPRINGFIELD, MO., Lumbermen's Supply Co., Holland Building
ST. PAUL, MINN., Corning-Donohue, Inc., 613 Ryan Building
SYRACUSE, N. Y., Paragon Plaster Co., Water Street
TOPEKA, KAN., Lumbermen's Supply Co., New England Building
TORONTO, ONT., Drummond & Reeves, Ltd., Mail Building
UTICA, N. Y., American Hard Wall Plaster Co., 728 Broad Street
WICHITA, KAN., Lumbermen's Supply Co., Caldwell-Murdock Building

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Hy-tex

The Standard of Quality in Brick
TRADE-MARK

Products

The Hy-tex Brick line embraces: Face Brick, Enamel Brick, Salt Glaze Brick, Equitable Brick, Fire Brick, Paving Brick, Common Brick and Hollow Building Tile.

Hy-tex Face Brick

The Hy-tex color range runs in face brick from the lightest colored creams, grays and buffs to the darkest reds and browns in smooth, semi-smooth and rough textures. It offers literally hundreds of various tones in the gray, buff and red basal colors. No matter what your requirements, whether for exterior or interior use, you will find in the Hy-tex line just the brick you want.

Specialties

Hy-tex Enamel Brick—Hy-tex Enamel Brick are unapproached in quality and durability by any similar brick of domestic or foreign manufacture. The "double-burn" process, an improvement over European methods, used exclusively in manufacturing Hy-tex Enamel Brick eliminates the uncertainties present where the enamel is spread on the green brick and both are burned together with practically no control over varying fusion points, unequal expansion and impurities burning out as bubbles in the glaze.

Hy-tex Enamel Brick in the white, cream and ivory shades are absolutely opaque. Hy-tex Enamels will not craze, peel or discolor under the severest climatic tests, as proved by the experience of exacting architects in all parts of the country. They are made in white, cream, ivory, green, brown, blue, transparent buff and speckled brown, and are used extensively for facing large office buildings, theaters, stores, etc., as well as for hospital corridors, schools, gymnasiums, laundries, restaurants, bake ovens, garages, engine rooms, outdoor and indoor swimming pools, etc.

Hy-tex Enamel Court Brick are in every way the same brick, as to make and durability, as Hy-tex Enamels, except that, in sorting for first quality, these have been set aside because of slight surface defects which are not noticeable in courts or areas. Unless closely examined, they make the same appearance as Hy-tex Enamels and render exactly the same service. They have been used in many large buildings with complete satisfaction.

Hy-tex Salt Glaze Brick—Hy-tex Salt Glaze Brick, ranging from light straw to a golden brown, as illustrated on next page, permits walls of light, medium, dark or mingled shades. The salt glaze which forms an integral part of the brick, will not scale or peel under the most severe conditions, and is proof against moisture, dust, smoke, stains, germs, and even acids. They are widely used as exterior brick in the business, wholesale and industrial sections of cities, and for interior uses where light reflection and bright, clean, sanitary surfaces are desired or necessary, as in corridors, stairways, vestibules, wainscots, light courts, gymnasiums, toilet rooms, engine rooms, food factories, garages, etc. The cost of Hy-tex Salt Glaze Brick closely approximates that of plastered and painted common brick, while its maintenance cost is less.

Hy-tex Equitables—This brick was originally created for the *Equitable Building* in New York City, and has since been available in white and grays in various speckled effects. They present a smooth impervious surface and wash with the rain to their original clean appearance; and do not craze, scale or discolor under the severest climatic conditions. Suitable for both exterior and interior requirements.

Facilities

For over half a century the Hydraulic-Press Brick Company has been building the reputation which Hy-tex products enjoy today. During that time the Hy-tex organization has grown from one to twenty-two plants, scattered through the eight great clay-producing states. Branch office and agency distribution insures prompt and efficient service in all parts of the country.

Literature

This company has issued booklets on Hy-tex Brick, Salt Glaze Brick, Hy-tex Enamel Brick; Brick Scales and Tables, a ready and convenient method of determining the number of courses and joints in all brickwork; Color Cards, and other material. For any of the above, apply to nearest branch office.

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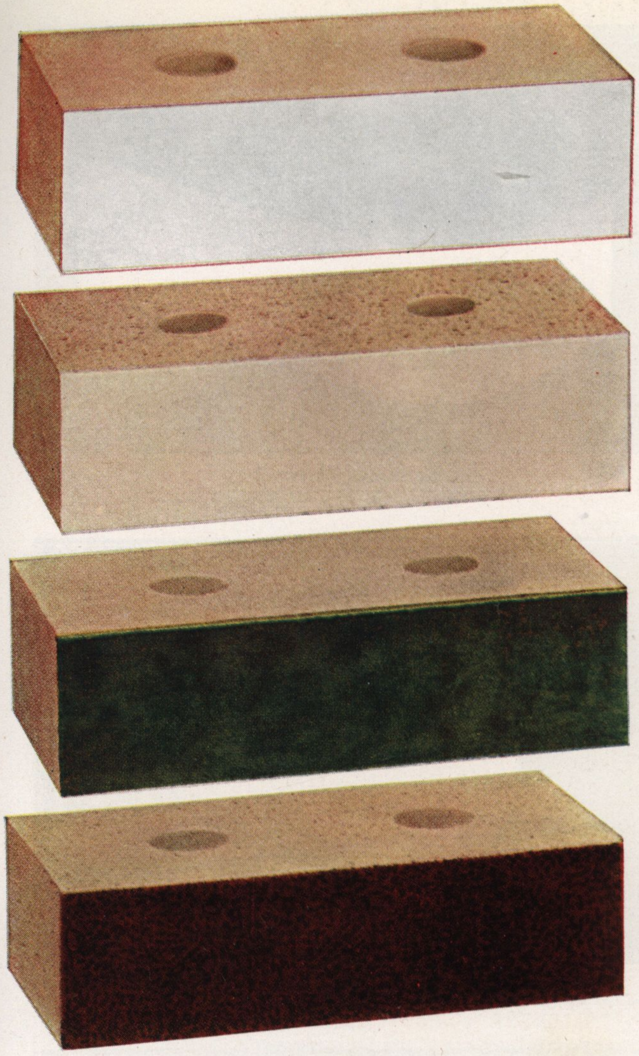
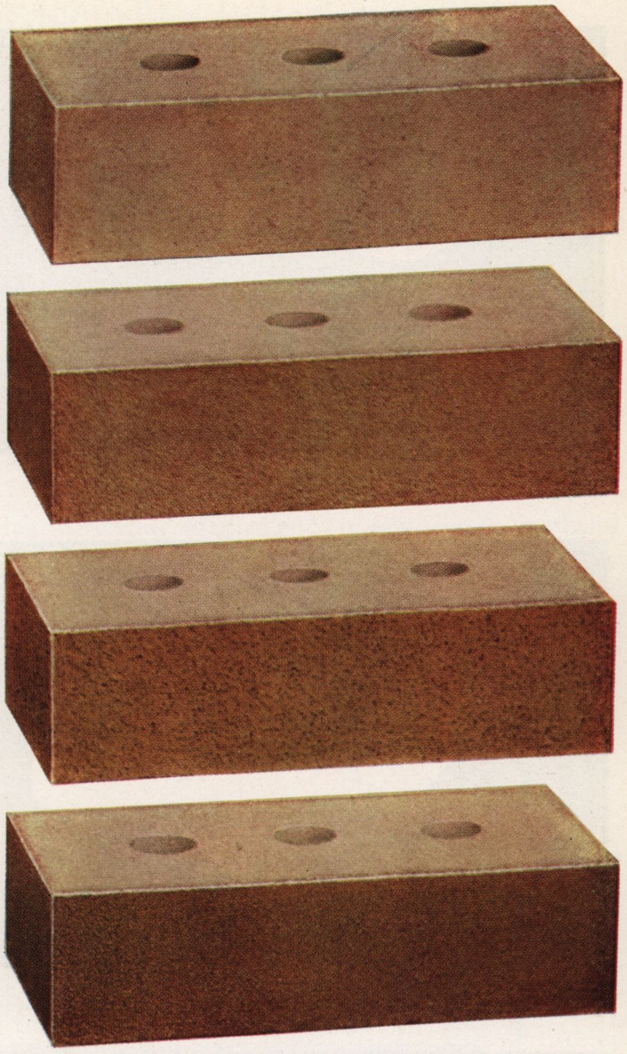
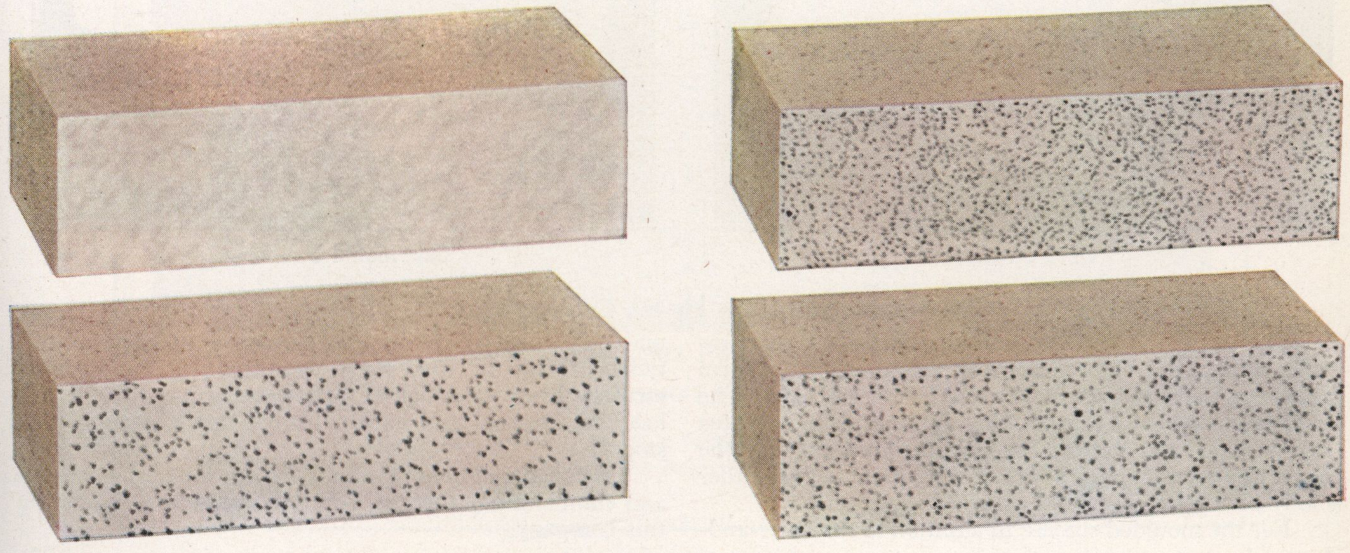


Hy-tex Enamel Brick
Top to bottom—White, Ivory, Green and Brown



Hy-tex Salt Glaze Brick
Top to bottom—Light, Medium, Dark and Brown



Hy-tex Equitable Brick

Color No. 100
Color No. 130

Color No. 110
Color No. 120

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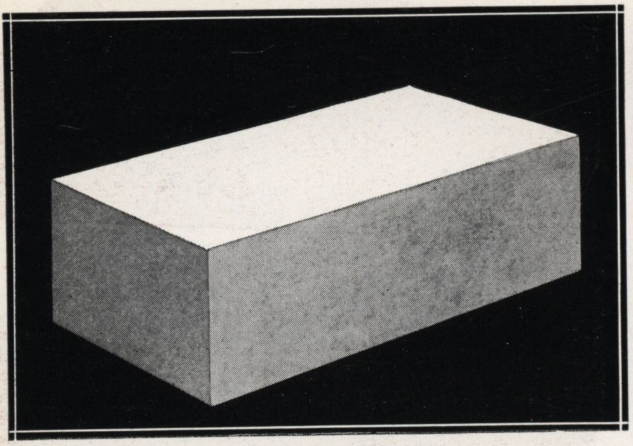
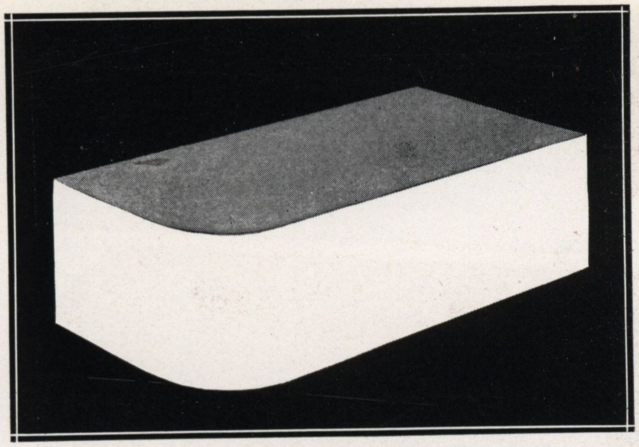
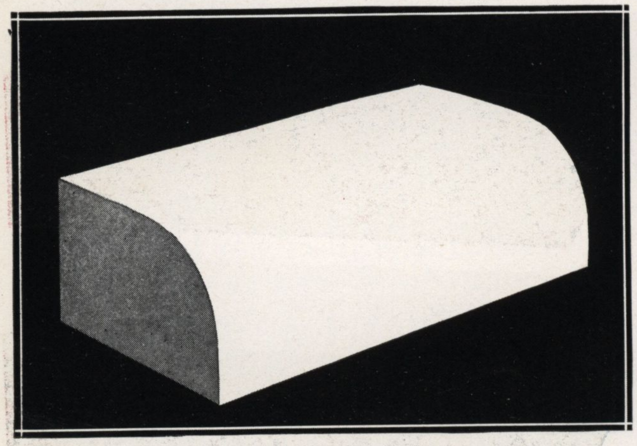


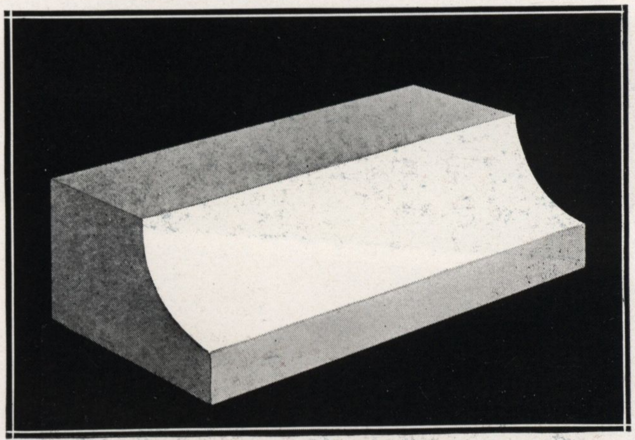
Flatter Stretcher



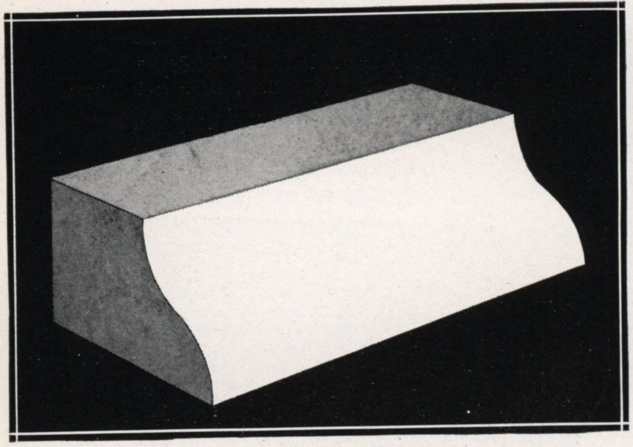
Bullnose External



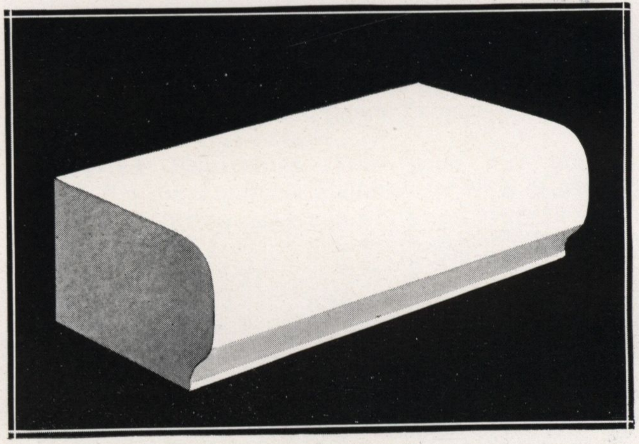
Bullnose Flat Stretcher



Cone Base Stretcher



Ogee Stretcher



Cap Mould Stretcher

Basic Shapes in Hy-tex Enamel Brick

The enameled surfaces and shapes shown here, together with the stretcher shown in the color group, form the seven basic shapes in Hy-tex Enamel Brick. The series is completed by furnishing for the plane surfaces the stretcher and flatter, the quoins, headers, and the over-and-under-dipping of the abutting surfaces—either wholly or in part.

For the moulded shapes, in addition to this over-and-under-dipping which may be necessary to cover conditions arising in use, there is provided the complementary brick essential to their general use. These are headers, internal and external angle brick, returns and stops.

For detailed information, showing the various bricks and combinations thereof, refer to shape book issued by this company.

HOCKING VALLEY PRODUCTS COMPANY

Manufacturers of "Greendale" Face Brick

GENERAL AND SALES OFFICES

LOGAN, OHIO

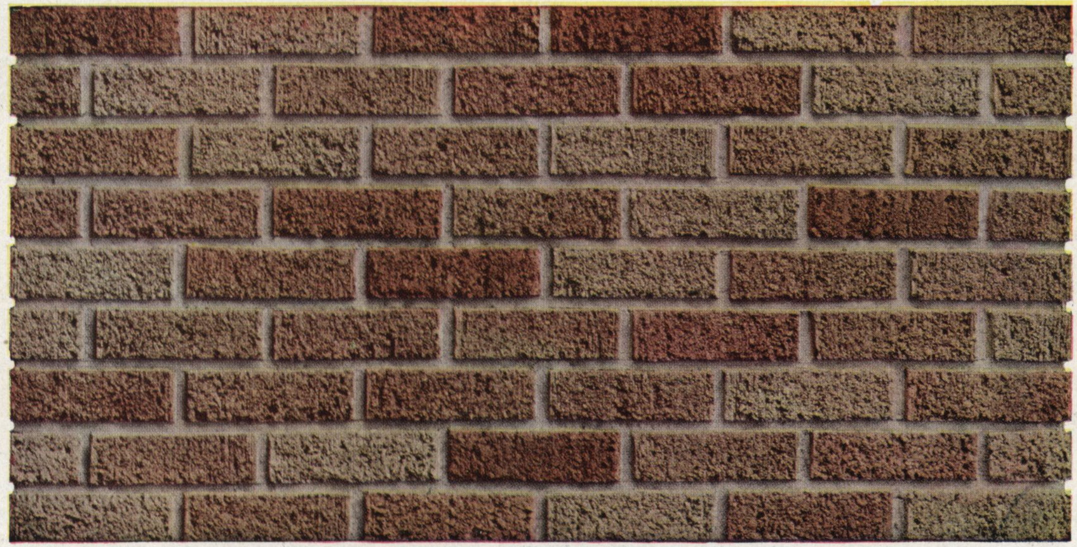
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Suitable for every type of construction, from the simplest bungalow to the most elaborate office building or public structure, GREENDALE Face Brick has achieved wide popularity as a result of high quality, pleasing texture and wonderful color harmony.

GREENDALES are made from clays of unusually high and uniform quality, mined on our own extensive properties.

"Greendale"
TRADE-MARK
FACE BRICK

Being thoroughly vitrified and entirely free from alkalis, they can neither effloresce nor discolor from weathering. GREENDALES may be secured in almost unlimited range of shades, and practically any color combination known may be furnished. This range of color is provided by natural burning, and the brick will not fade, but rather ripen in richness of color with the passing of time.



Shade—561 Full Range

A wall of this shade is a study in masonry with every harsh feature common to other light brick eliminated.

The same colors are produced in Matt texture.

Uniform service is furnished in either Rugs or Matts.

Continued on next page

SAMPLES
DISPLAYED
WITH
ARCHITECTS SAMPLES
CORPORATION
NEW YORK, N.Y.
EST 1913

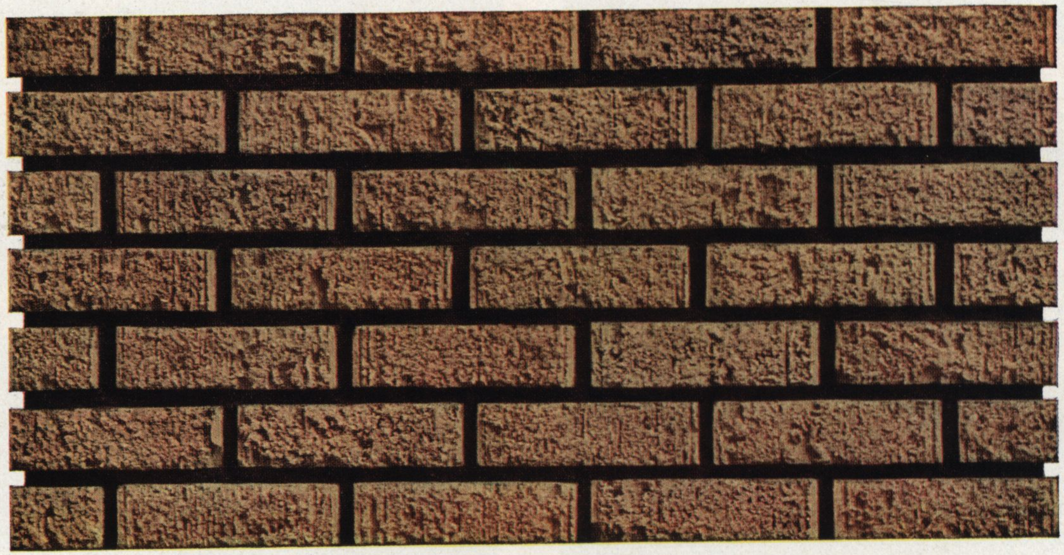
GREENDALE Face Brick is manufactured at Greendale (Logan), Ohio; present plant capacity 25,000,000 brick per annum. Samples are on display at the Architects Samples Corporation, New York City. Distributors are located in all principal cities.

Large production gives assurance of prompt and efficient service. Write for further information.

"Greendale"

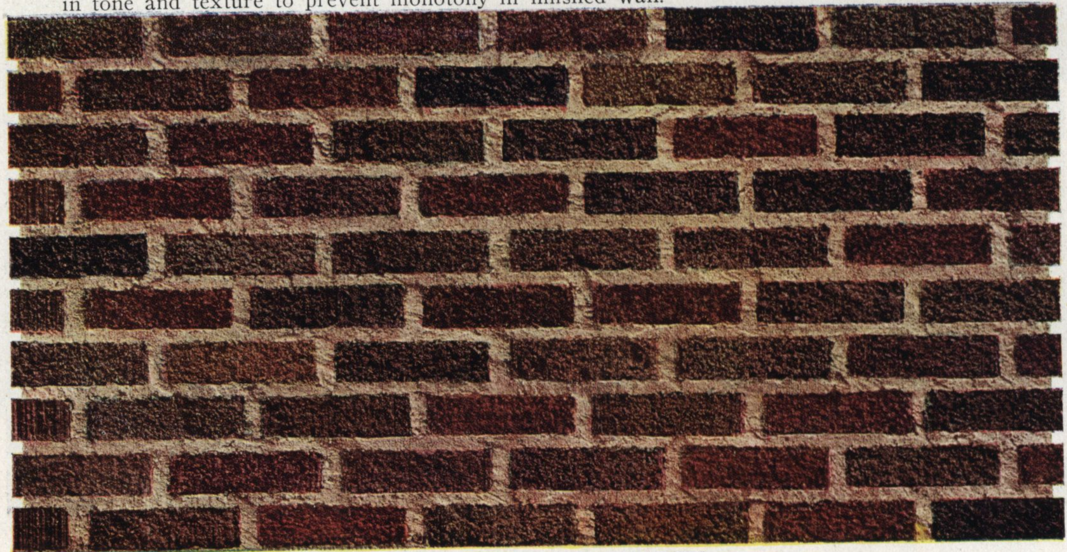
TRADE-MARK

FACE BRICK



Shade No. 561 Medium

This creamy buff combination is a straight shade which possesses sufficient variation in tone and texture to prevent monotony in finished wall.



Shade—Pontiac Pot-Pourri

The soft, mellow color tones of Pontiac Pot-Pourri give to the building a quiet elegance and refinement.

FISKE & COMPANY, INC.

Manufacturers of Face Brick and "Fisklock" Brick
Sole Manufacturers of "Tapestry" Brick

115 Federal Street
BOSTON, MASS.

BRANCH OFFICES
NEW YORK, N. Y., 17 West 46th Street
WATSONTOWN, PA.

Products

Face Brick: "Tapestry," "Fiske," "Caledonian," "Fisklock."

Also "Tapestry" and Repressed Garden Tile, Fire Brick and Brick Specialties.

Trade-Names and Patents

"Tapestry" Reg. U. S. Pat. Off.
"Fiske" Reg. U. S. Pat. Off.
"Caledonian" Reg. U. S. Pat. Off.
"Fisklock" Reg. U. S. Pat. Off.

To protect our customers against substitution of inferior products, these trade-marks are branded on our bricks.

"Tapestry" Brick

TRADE MARK
Tapestry
REG. U.S. PAT. OFF.

"Tapestry," the product of nearly 60 years' manufacturing experience, is a vertical rough texture, end-cut face brick burned to flashed shades. The colors of "Tapestry" brick are soft and rich. Starting from Indian red they run through coppers, olive greens and purple browns to deep blue. With another clay is produced a light brownish gray running into cream-and-coffee shades, deep russets and tobacco brown, giving in mass the effect of old ivory; from still another clay a series of rich old buffs ranging from a soft delicate chamois color to a deep golden brown. One distinguishing feature of "Tapestry" brick is the almost infinite number of intermediate shades obtained from these clays.

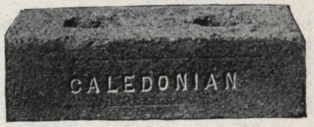
"Tapestry" brick is burned to extreme hardness so that it is practically non-porous. It is a natural clay product, not *colored* brick in the ordinary sense of the word for it is produced without the use of artificial coloring matter. Its beautiful and distinctive shades are due to the selection and blending of natural clays and the expert application of intense fire.

Primarily for exterior use the texture and coloring of both "Tapestry" brick and tile make them particularly adapted for the finish of loggia, vestibule, hall, dining room, library or billiard room of a private house and for a great variety of rooms of a public or semi-public nature, such as schoolrooms, lobbies of hotels and office buildings, grill rooms, waiting rooms in railroad stations, etc. "Tapestry" brick is also largely used for fireplaces.

"Fiske" Brick

A face brick with smooth face in grays and buffs, or end-cut rough texture in full range of colors and clear reds.

"Caledonian" Brick

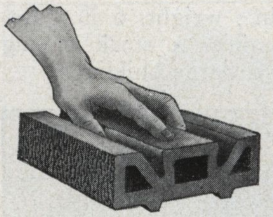


A horizontal rough texture side-cut face brick burned to either clear colors or a range of shades.

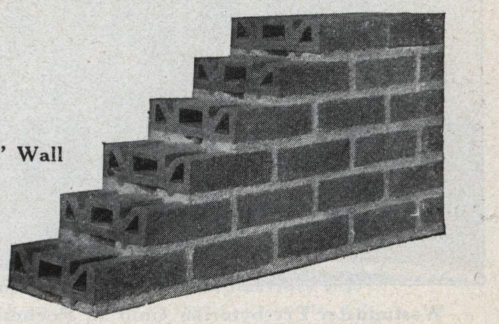
"Fisklock" Brick

"Fisklock" is an interlocking channel brick, 8x2¼x8 in., with the rough texture and beautiful coloring of our "Tapestry" brick. It has the face of a standard brick and is equivalent to one face brick and one common brick, forming an 8-in. wall by itself, saving labor cost of brick backing. The multitude of horizontal dead air cells in a "Fisklock" wall make it an ideal insulator against heat or cold, while the lack of continuous mortar joints prevents moisture from striking through.

Economy—Each "Fisklock" brick is the equivalent of two brick, but is laid without additional effort because of the balanced handhold. "Fisklock" saves freight and truckage costs—it weighs only seven-tenths as much as the face brick and common brick it replaces, and less mortar is required than in an equivalent wall of solid brick. "Fisklock" *in the wall* is cheaper than any other face brick, whether solid or veneer.



Where "Fisklock" Has Been Used—"Fisklock" has been used in over 60 types of buildings, including residences and garages, farm buildings, schoolhouses, libraries, churches, hospitals, cold storage plants, mercantile and factory buildings.



A "Fisklock" Wall

KUSHEQUA BRICK COMPANY

Manufacturers of Face Brick and Paving Materials

OXBLOOD AND GARNET PLANTS

KUSHEQUA, PA.

Products

FACE BRICK; PACKINGHOUSE FLOOR BRICK; PAVING BRICK; ACID TOWER PACKING.

Kushequa Face Brick

The characteristics of Kushequa face bricks are their deep color (specially dark red), density, great strength and high vitrification.

Kushequa face bricks include Oxblood Devonshire, Velours, Saruk, Baluk, Autumnoak, Smooth Wire-cut, Galax, and Kq Paver.

Oxblood Devonshire—2¼x8x3¾ in.; weight, 5½ lb. Very rough texture and of clear, uniform red color. Shade 1, the darkest clear red on the market; Shade 2. a fine deep red; Shade 3, a bright red.

Velours—2¼x8x3¾ in.; weight, 5½ lb. Similar to above, except fine velvety texture and very dense body.

Saruk—2¼x8x3¾ in.; weight, 5½ lb. The rough texture and variegated color give this brick an Oriental rug effect. The hues harmoniously blend from deep red through old rose to greenish gray, and from bronze to tan. To get the best effect, it should be laid with dark mortar joints, not exceeding ½ in., raked.

Baluk—2¼x8x3¾ in.; weight, 5½ lb. Formerly termed Velours Saruk; has the fine texture and dense body of Velours, and coloring like Saruk only less varied and showing more rose-hearts.

Autumnoak—2¼x8x3⅞ in.; weight, 5½ lb. A rough texture brick from our Garnet Plant with full range of colors, warm browns and purplish maroons predominating.

Smooth Wire-cut—2¼x8x3⅞ in.; weight, 6 lb. A standard red brick with smooth face and wire-cut sides, in 4 shades. Shade 1, dark red; Shade 2, deep red; Shade 3, bright red; Shade 4, light red.

Galax—2¼x8x3⅞ in.; weight, 6 lb. Smooth faced, dark red, apparently blended with green. Suggestive of Galax leaf.

Kq Paver—2⅛x8⅛x3⅞ in.; weight, 6 lb. Repressed, with bevel edges, resembles a small paving block. It is particularly pleasing in large buildings.

Westminster Presbyterian Church, Rochester, N. Y.
Faced with 100,000 Saruk and Oxblood mixed

Paving and Acidproof Material

This company commenced business in 1904 with the manufacture of paving blocks out of a strongly ferruginous mountain shale highly vitrified by natural gas. The beauty of color and finish of the product created such demand for building purposes that, for several years, the capacity of the factory was principally taken for face bricks. The high vitrification of our products makes them acidproof and electric insulating. Such products comprise:

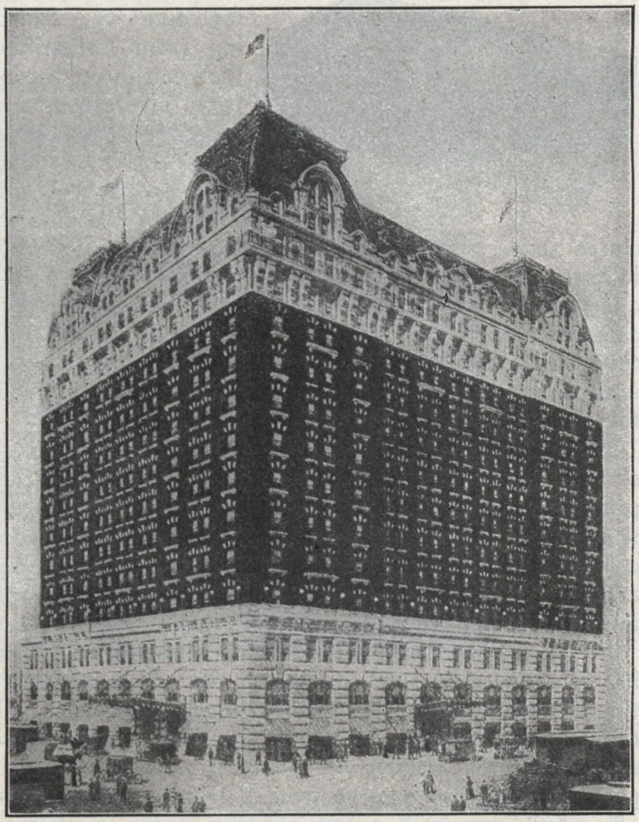
Kushequa Repressed Paving Block—3½x8¾x4 in.; weight, 10 lb. Tough, durable, impervious and handsome in finish. Guaranteed to lay 40 per sq. yd., street measure.

Square-edge Paving Block—4x8x3⅞ in.; weight, 10½ lb. Straight, sharp edges and ends without grooves or lugs. Makes the smoothest and most compact pavement. Economical of cement or filler and less subject to rupture or chipping than other styles. Will lay 40 per sq. yd., surface measure.

Particularly suitable for heavy, acidproof floors.

Kq Paver—2⅛x8⅛x3⅞; weight, 6 lb. While designed for use as a face brick, it is extensively used for paving.

If desired for laying on the flat, orders should so state.



Hotel Sherman, Chicago, Ill.
HOLABIRD & ROCHE, Architects
Faced with 500,000 Kq Pavers

Continued on next page

Packinghouse Floor Brick—4x8x1¾ in.; weight, 5 lb. Specially made for packing house floors to resist grease, hot water and heavy trucking. One side and two ends smooth, without glaze or kiln marks; back and two edges wire-cut. Durability and lightness are combined.

Where durability and level surface are prime requisites and finish is less important, a competitive grade will be supplied at reduced price.

Sanitary cove base and trim, suitable for use with floor brick are made at plant of Kushequa Keramic Co., and may be shipped in same car at low switching or drayage charges.

Acidtower Packing—Garnet Plant makes vitrified acidproof specialties, notably rings for packing condensery towers at acid works, oil refineries and fertilizer plants. These are hollow cylinders 3 or 6-in. diam. and same length, divided by radial partitions. Other shapes made to order.

Acidproof Specialties

We manufacture special forms of vitrified shale products to order. Battery room floor tile, dye vat linings, Hood's spiral rings and chemical arches are instances.

Shipping Facilities

The daily output of Oxblood Plant is 30,000 bricks; of Garnet Plant, 20,000 bricks. Ample stocks carried. Both plants are located at Kushequa on the Mt. Jewett, Kinzua & Riterville R. R., a local railroad connecting direct with the Buffalo, Rochester & Pittsburgh Ry., Erie R. R., Pennsylvania R. R., Baltimore & Ohio R. R. and Pittsburgh, Shawmut & Northern R. R.—consequently competition in freight rates, prompt car supply, and a minimum of embargo annoyances.

References

The following is a partial list of buildings in which Kushequa products were used, giving the location, architect, kind and quantity:

FACE BRICK

Thorp School, Lockwood and Berteau Streets, Chicago, Ill., A. F. Hussander; Brown Saruk, 60,000

Sanitary District Pump Station, Mohawk and Menominee Streets, Chicago, Ill., F. J. Barrett; Oxblood Devonshire, 40,000

Collins Apartments, 54th and Cornell Streets, Chicago, Ill., H. L. Newhouse; Kq Paver dark, 60,000

FACE BRICK—(Continued)

G. S. Bridge Residence, Evanston, Ill., Geo. W. Maher; Velours Shade 2, 30,000

Hotel Sherman, Clark and Randolph Streets, Chicago, Ill., Holabird & Roche; Kq Paver dark, 700,000

Stock Yards Inn, Chicago, Ill., R. L. Lindstrom; Oxblood Devonshire, Shade 1, 450,000

Highlands Co., 6811 Euclid Avenue, Chicago, Ill., J. R. Stone; Kq Paver dark, 25,000

Callahan Apartments, 1622-24 Garfield Boulevard, Chicago, Ill., Worthmann & Steinbach; Kq Paver light, 35,000

Y. W. C. A., Brooklyn, N. Y., Frank Freeman; Saruk and Oxblood (Gardens), 180,000

Erie R. R. Station, Ridgewood, N. J., Graham King; Saruk, 40,000

Electric Power Plant, South Framingham, Mass.; Kq Paver (2nds), 90,000

Fire and Truck House No. 8, Germantown Avenue and Bringhurst Street, Philadelphia, Pa., W. B. Powell; 50,000 Wire-cut Shade 3; 52,000 Blackheaders

8th District Police Station, 10th and Buttonwood Streets, Philadelphia, Pa., W. B. Powell; 47,000 Wire-cut Shade 3; 48,000 Blackheaders

Church of Our Lady of Rosary, Yonkers, N. Y., John V. Van Pelt; Saruks

Boys' High School, Louisville, Ky., J. E. Henry; Oxblood and Saruk mixed, 225,000

Louis Seelbach, Residence, Louisville, Ky., McDonald & Dodd; Wire-cut Shade 2, 65,000

Westminster Presbyterian Church, Rochester, N. Y.; Saruk and Oxblood Devonshire mixed, 100,000.

Colonial Theater, Dayton, Ohio; Oxblood Devonshire, Shade 1, 27,000

Eagles' Temple, Jamestown, N. Y., Freeburg & Fidler; Saruk

United Evangelical Church, Oil City, Pa., J. C. Brenot; Saruk, 90,000

Mayo Bros. Clinic Hospital, Rochester, Minn.; Kq Paver, 125,000

Mayer Bros.' Block, Erie, Pa., Richard Irvin; Velours, 250,000

Academy High School, Erie, Pa., Wm. B. Ittner, St. Louis, Mo.; Saruk, 250,000

PAVING MATERIALS

Ford Motor Co. River Rouge Plant near Detroit, Mich.; Kq Pavers laid flat, 275,000

D. B. Martin Co., Packing House, Claremont, Baltimore, Md.; Brickette, 57,000

J. J. Felin Packing House, Philadelphia, Pa., C. B. Comstock; Floor Brick, 140,000

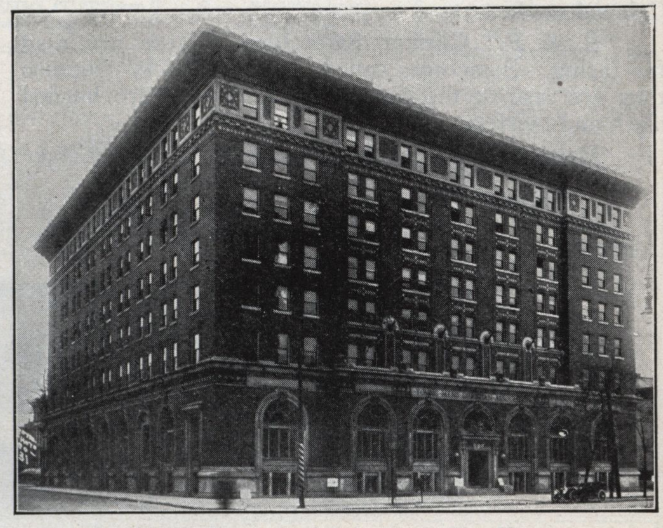
C. K. G. Billings, Driveways, Riverside Drive, New York, N. Y.; Kq Paver (Spl.)

Hammond Packing Co., East Liberty, Pittsburgh, Pa.; Packinghouse Floor Brick

Kingan & Co., Indianapolis, Ind.; Packinghouse Floor Brick, 700,000

Wm. Schluderberg-T. J. Kurdle Co., Baltimore, Md.; Packinghouse Floor Brick, 200,000

Louis Seelbach Residence, Louisville, Ky.
McDONALD & DODD, Architects, Louisville, Ky.
Faced with 65,000 Wire-cut Shade 2



Y. M. C. A. Building, Louisville, Ky.
McDONALD & DODD, Architects, Louisville, Ky.
Faced with Saruk and Oxblood Devonshire mixed

SAYRE & FISHER COMPANY

Manufacturers of All Kinds of Brick

261 Broadway (corner Warren Street)
NEW YORK, N. Y.

Products

Fine Pressed Front Brick; Enameled Brick.

In the Red Brick Department: Hard Building Brick; Selected Colonial Brick; "S. & F." Clinker Stretchers; "Rain-washed," "Old English" Red, Repressed Down-draft Red, and Repressed Up-draft Red Stretchers, and Black Headers for Facing; Hollow Brick and Fire Brick.

Front Brick in Various Colors

Manufactured by this company in a great variety of colors: white, light and dark buff, red, gray, old gold, rough face Persian and mottled—other shades to order—enabling architects to select a material that, while fire resisting and easily handled, shall permit them to lighten and beautify and add strength and variety to a street façade.

Superior Enameled Brick

Superior enameled brick is manufactured in white and various colors. They are coming into more general use for a great variety of purposes, and are especially adapted for lining of waiting rooms of railroad stations, tunnels, markets, hospitals, engine and boiler rooms, kitchens, etc.

Porcelain (Dull Finish) Enameled Brick for Outside Work

Several million used in prominent city buildings.

Red Brick Department

Hard Building Brick—Hard burned, dark red color. Shipments in cargo lots, via our fleet of barges or schooners, or via rail to all points. A very economical building brick for heavy construction work.

Selected Colonial Brick—For facing. Of general dark red color and sufficiently varied in color and shape for "Harvard" work. These are very desirable for Colonial work.

"S. & F." Clinker Stretchers—These are also for facing. Sometimes called "Clinker Brick," because they are nearest the fire in the kilns and are burned black and twisted.

"Rain-washed" Red Stretchers—A pitted face brick and laid either with or without Black Headers. A "chance" product caused by rain on the brick when in a green state in open yards.

"Old English" Red Stretchers—This product is something new and is about the size of the Old English Brick, made in dark red tone and measuring about 8⅞ x 2⅞ x 4 in.

Over 600,000 in the new Curtis Publishing Company's Building in Philadelphia. Selected by the architects after searching the Old World for ideas that were unique and artistic.

Repressed Up-draft Red Stretchers—Same as the Down-draft, except that these show light and dark kiln marks on the stretcher side, which gives a diversified effect.

Repressed Down-draft Red Stretchers—These are of a dark cherry red color and very popular for face work.

Sears, Roebuck Company, Philadelphia, Pa., used 3,000,000.

Black Headers—Made to be used with the Selected Colonial Brick or Repressed Stretchers for the "Harvard" effect if desired.

Hollow Brick—Both stretchers and headers (Haverstraw size) of a very superior quality. They can be furnished in cargo lots.

Fire Brick

Three grades: "Sayre & Fisher Extra," No. 1 "Phoenix" and No. 1 "Flue." Very desirable for boiler settings, furnace linings, etc., in all standard sizes.

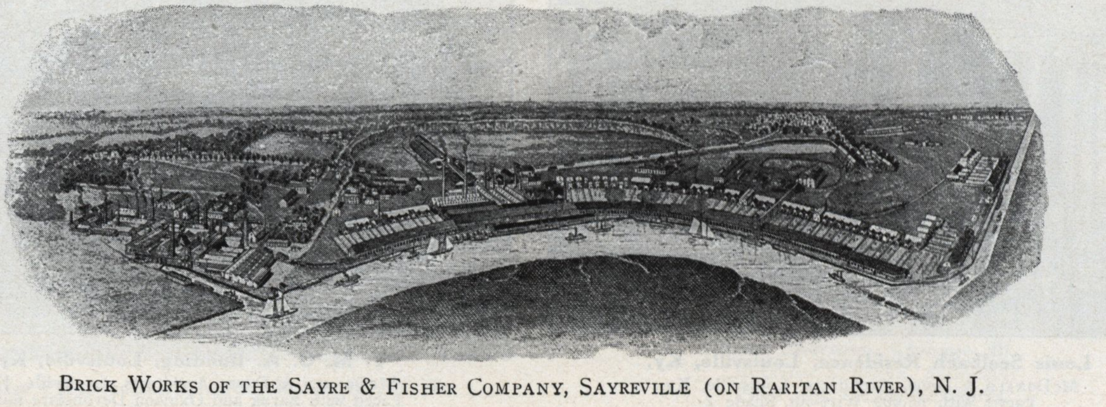
Shipping Facilities

The favorable location of the Sayre & Fisher Company works at deep water on the Raritan River, in New Jersey, permits the loading of vessels of large draught.

Shipments can also be made direct to all points connecting with any line of railroad.

Export Trade

With such adequate and satisfactory facilities for shipment, as well as such large and complete stock always on hand, our export trade has grown to great proportions and is still increasing.



Brick Works of the Sayre & Fisher Company, Sayreville (on Raritan River), N. J.

THE STARK BRICK COMPANY

Manufacturers of Face Building Brick

CANTON, OHIO

FACTORY, EAST CANTON, OHIO

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

FACING BRICK (Salt Glazed Brick a specialty).

Salt Glazed Brick

The brick are made from the best fire clay, taking a heavy glaze and free from iron. Available in all shades.

Uses

We suggest the use of salt glazed brick for interior walls in the following places:

Schools, garages, market houses, dairies, hospitals, domestic science rooms, lavatories, club houses; and in all other structures where cleanliness and sanitary conditions are primary factors.

Size of Brick

Standards are 8x3⅞x2⅜ in. All shapes are made to member with this size.

2-in. radius is standard.

Deliveries

The shapes illustrated below are carried in stock. Four weeks required for special shapes made to order.

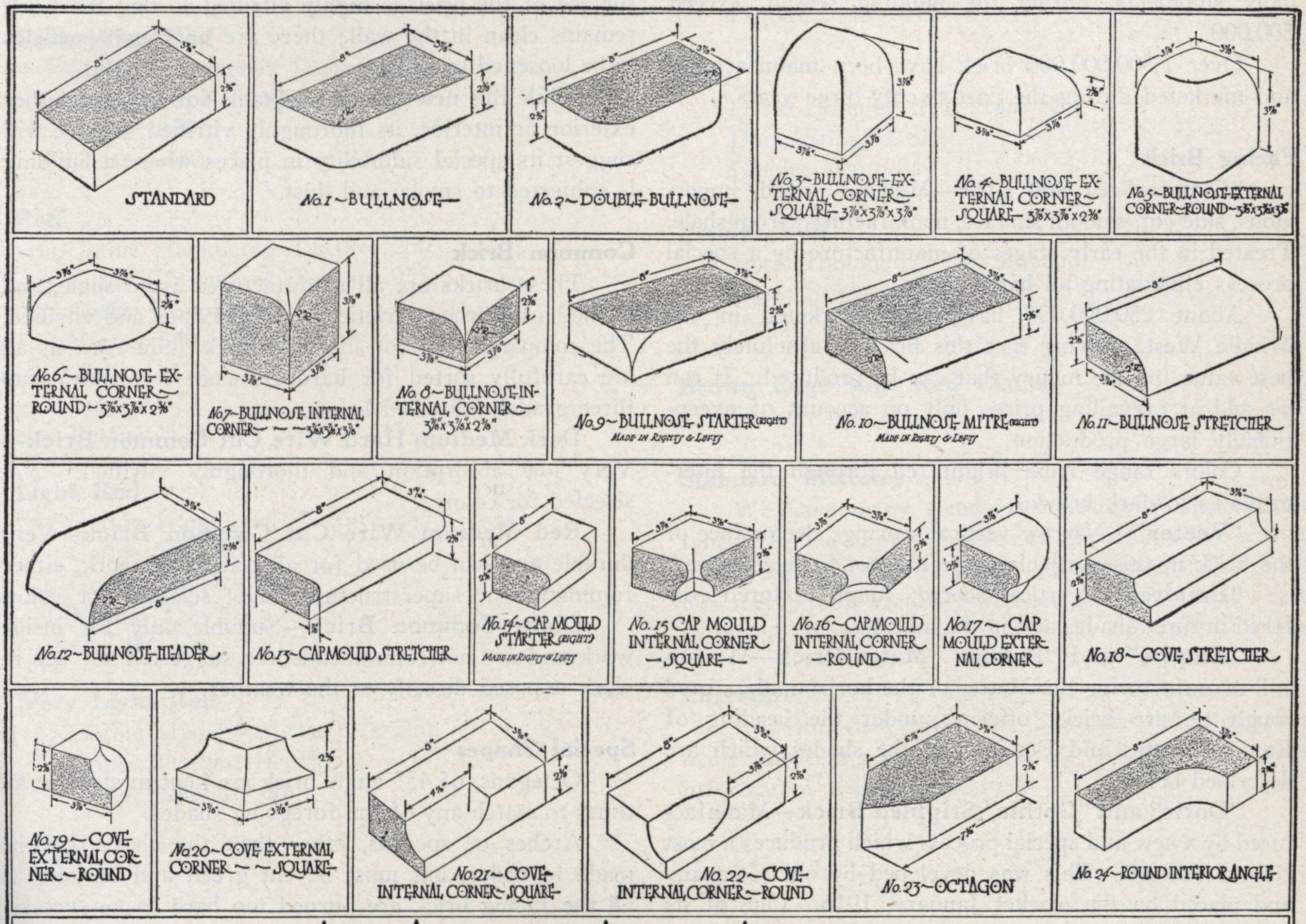
References

Stark Salt Glazed Brick have been widely used throughout the United States and Canada.

A few recent jobs are listed below:

City Hospital, Cleveland, Ohio
McKinley High School, Canton, Ohio
West Technical High School, Akron, Ohio
Junior High School, Bayonne, N. J.
Washington Public School, Bayonne, N. J.
Public School, Paterson, N. J.
St. Aloysius School, Jersey City, N. J.
Ford Motor Co., Ltd., Machineshop, Ford, Ont.
Ford Motor Co., Ltd., Powerhouse, Ford, Ont.
K. of C. Gymnasium, Canton, Ohio
General Motors Building, Detroit, Mich.
Hell Gate Power House, Hell Gate, N. Y.

The last named is the largest job of salt glazed brick in the United States.


STANDARD
No.1 ~ BULLNOSE
No.2 ~ DOUBLE-BULLNOSE
No.3 ~ BULLNOSE-EXTERNAL CORNER ~ SQUARE ~ 3⅞"x3⅞"x3⅞"
No.4 ~ BULLNOSE-EXTERNAL CORNER ~ SQUARE ~ 3⅞"x3⅞"x2⅜"
No.5 ~ BULLNOSE-EXTERNAL CORNER ~ ROUND ~ 3⅞"x3⅞"x3⅞"
No.6 ~ BULLNOSE-EXTERNAL CORNER ~ ROUND ~ 3⅞"x3⅞"x2⅜"
No.7 ~ BULLNOSE-INTERNAL CORNER ~ 3⅞"x3⅞"x3⅞"
No.8 ~ BULLNOSE-INTERNAL CORNER ~ 3⅞"x3⅞"x2⅜"
No.9 ~ BULLNOSE-STARTER (RIGHT) MADE IN RIGHTS & LEFTS
No.10 ~ BULLNOSE-MITRE (RIGHT) MADE IN RIGHTS & LEFTS
No.11 ~ BULLNOSE-STRETCHER
No.12 ~ BULLNOSE-HEADER
No.13 ~ CAPMOULD STRETCHER
No.14 ~ CAP MOULD STARTER (RIGHT) MADE IN RIGHTS & LEFTS
No.15 CAP MOULD INTERNAL CORNER ~ SQUARE
No.16 ~ CAPMOULD INTERNAL CORNER ~ ROUND
No.17 ~ CAP MOULD EXTERNAL CORNER
No.18 ~ COVE-STRETCHER
No.19 ~ COVE-EXTERNAL CORNER ~ ROUND
No.20 ~ COVE-EXTERNAL CORNER ~ SQUARE
No.21 ~ COVE-INTERNAL CORNER ~ SQUARE
No.22 ~ COVE-INTERNAL CORNER ~ ROUND
No.23 ~ OCTAGON
No.24 ~ ROUND INTERIOR ANGLE

STANDARD ◇ SHAPES ◇ AND ◇ SIZES

WESTERN BRICK COMPANY

Manufacturers of Brick of All Kinds

GENERAL SALES OFFICE AND FACTORIES
DANVILLE, ILL.

BRANCH SALES OFFICES
INDIANAPOLIS, IND., 804 Hume-Mansur Building
PEORIA, ILL., 720-22 Jefferson Building
FT. WAYNE, IND., 1214 First National Bank Building

REPRESENTATIVES IN ALL PRINCIPAL CITIES EAST OF THE ROCKY MOUNTAINS

Facilities

The Western Brick Company manufactures annually 135,000,000 brick and tile at its three plants.

The shale and clay supply for these factories is practically inexhaustible; fuel supply is owned by the company in sufficient quantities to last at least twenty-five years.

Shipping facilities are unequalled, as the product is distributed from Danville over 7 railroads. Plants have side track room for about 75 cars, and ordinary daily shipments, during the building season, exceed 500,000.

Over 1,500,000,000 brick have been manufactured and marketed during the past twenty-three years.

Facing Brick

"Cloister" or 400 Line—Medium priced, impervious, side-cut, smooth surface, manufactured from shale. Treated in the early stages of manufacture by a special process eliminating all harsh glaze.

About 250,000,000 have been marketed in the Middle West, proving that this brick is absolutely the best value for the money that can be produced. It can be sold at prevailing prices only on account of exceptionally large production.

Colors range from bright red through the intermediates to dark browns.

"Veetex"—Narrow vertical scoring; the surface of the brick in this particular type has not been destroyed.

"Empires"—Vertical scored, rough textured; offered in three shades and in the mixture.

"Empire" and "Persian" Matte Brick—We are still manufacturing the Mattes or the horizontally-scored rough texture brick; offering under the heading of Empire Mattes and Persians of the shades which are described below.

"Doric" and "Gothic" Stippled Brick—Manufactured by a new and special process which produces a most refined texture. This was developed by our Company and placed on the market January, 1916. One of its features is the elimination of all grain or lines, by the use of this process, making a myriad of small indentations.

TRADE-MARK

"Doric" and "Gothic" Hammered Texture—This brick was created with a definite object in view, meeting the preference expressed by many architects for a refinement in face brick textures. It has the charm and richness of hammered brass and silver, which were its inspiration.

The Hammered Brick affords a free play of light and shade, without destroying the surface of the brick.

This has two decided advantages; the entire exposed surface of the brick is highly vitrified so that the brick remains clean in the wall; there are no rough particles to be loosened by frost.

While this new type is adaptable for any use, either exterior or interior, its thoroughly vitrified surface will suggest its special suitability in places where a building is subjected to smoke and dust.

Common Brick

These bricks are all manufactured from shale, and in the hard burned varieties are impervious and vitrified. The company does not ship any brick "kiln run" as all are carefully sorted for hardness (not for color) into three grades described below.

Dark Medium Hard Wire Cut Common Brick—Very low absorption and thoroughly vitrified. Not selected for color.

Red Medium Wire Cut Common Brick—Very durable and can be used for all classes of work, either foundation or superstructure. Not selected for color.

Light Common Brick—Suitable only for inside work and are not recommended or suggested for use in work exposed directly to the weather.

Special Shapes

Octagons, of 45° angle brick are kept in stock at all times to match any of the foregoing shades.

Arches or specials, other than the above, can be made to order, but must be cut green and burned, as all the facing brick are burned too hard to be successfully ground. This work requires from 3 to 5 weeks, dating from the time the full sized details are received.

Continued on next page

General Color Characteristics of Facing Brick

For the convenience of those interested in our materials, we are grouping our various types or textures as to general color characteristics, believing that this will prove of more value than grouping as to the general type.

Black to Brown
Doric Hammered Texture 851
Doric Stippled 871
Empire Matte 841

Brown
Gothic Hammered Texture 952
Doric Hammered Texture 852
Gothic Stippled 972
Doric Stippled 872
Cloister 420
Empire Matte 842

Brownish Red
Gothic Hammered Texture 224
Gothic Hammered Texture 954
Gothic Stippled 24
Gothic Stippled 974
Vertex 324
Cloister 424

Dark Wine Red
Gothic Hammered Texture 240
Gothic Stippled 40
Veetex 340
Cloister 440

Red
Gothic Hammered Texture 250
Gothic Hammered Texture 955
Gothic Stippled 50
Veetex 350
Cloister 450
Empire 551
Persian 550

Light Red
Gothic Hammered Texture 255
Gothic Stippled 55
Gothic Stippled 975
Veetex 355
Cloister 435

Very Light Red
Gothic Hammered Texture 260
Gothic Hammered 956
Gothic Stippled 60
Gothic Stippled 976
Veetex 360
Cloister 460

Tan to Buff
Doric Hammered Texture 856
Doric Stippled 876
Empire Matte 846

Brown to Tan
Doric Hammered Texture 853
Doric Stippled 873
Empire Matte 843

Tan
Doric Hammered Texture 854
Doric Stippled 874
Empire Matte 844

Tan Red
Gothic Hammered Texture 953
Gothic Stippled 973

Buff
Doric Hammered Texture 858
Doric Stippled 878
Empire Matte 848

Pink
Doric Hammered Texture 859
Doric Stippled 879
Empire Matte 849

Pinkish Buff
Doric Hammered Texture 860
Doric Stippled 880
Empire Matte 840

Brown Edge with Red Center
Cloister 430

Standard Mixtures

We have many standard mixtures of the various types. If one desires samples of this nature, we will be only too glad to furnish them. As a matter of fact, with our method of grading, we can serve practically any architectural requirement, in the way of range of color.

Literature

A postal card will bring literature describing our many interesting shades of Facing Brick or such other information as may be desired.

WILLIAMSGROVE BRICK SALES INC.

High Grade Face Brick
25 West 45th Street
NEW YORK, N. Y.

Products

FACE BRICK in all colors, textures, shapes and sizes. Smooth and Textured FLOOR and WALL TILE.

Organization

For over twenty years prior to 1924 "Williamsgrove" products were sold in New York through agents and dealers. During the year 1924 the Williamsgrove Brick Company Inc., of Bigler, Pennsylvania, formed a subsidiary sales company known as WILLIAMSGROVE BRICK SALES INC., for the purpose of merchandising Williamsgrove products direct to the trade, and to render a character of personal service to architects and contractors that would be of eminent assistance to them in working out their face brick problems.

Work Executed

Some of the largest and most prominent buildings in Greater New York have been built of Williamsgrove Brick, the material being chosen because of its excellence of manufacture, its distinctive tones and our ability to match practically all ranges of colors.

The Heckshers Building at the southwest corner of Fifty-seventh Street and Fifth Avenue is pointed out as an unusual example of our facilities for meeting the architect's design. A special Williamsgrove Brick was supplied, 11¼x3¾x3¾-in. size, using a white enamel over a gray rough texture body, a perfect match for the limestone in the lower portion of the building.

Shelton Hotel, New York, N. Y.
ARTHUR LOOMIS HARMON, Architect

Enamels

When a perfect color match, or the reproduction of an exact tone, is desired, our factory is splendidly equipped for such manufacture.

Our Standard Materials

We can ship promptly the following shades and textures in standard size—8x2¼x3¾-in.:

Gray Rough Texture Brick—One of the most distinct lines on the market. Full range shades or selected light, medium and dark.

Golden Rough Texture Brick—Light, medium and dark, also full range shades. Approximately 12 shades to the range.

Smooth Gray Brick—Light shades or full range.

Smooth Buff Brick—Light shades or full range introducing the semismooth surface.

Smooth Golden Brick—The same ranges of colors as in the Rough Texture Golden.

Smooth Red Brick—A velvety dark wine color, with dark headers that can be used to replace Harvard Brick.

Red Rough Texture—Practically eight shades to the range, from light red to gunmetal and "blue."

Floor and Wall Tiles—6x6x1 in.; 6x3x1 in.; 6x1x1 in.; 4x4x1 in.; 3x3x1 in.; 1x1x1 in. Smooth or rough texture for floor or wall patterns, terraces, loggias, steps or verandahs. In colors to match the standard brick colors already mentioned.

Deliveries

The advantages of dealing direct with the manufacturer are obvious. We control both shading and shipping and where speed of erection is an asset, we place at your command unexcelled factory facilities together with a personal service that insures against delays and rejections.

It is always a distinct pleasure for us to have both contractors and architects accompany us, as our guests, to the factory to corroborate our capabilities as manufacturers and to watch our material in process of manufacture.

Existing Buildings in New York City

We are pleased to refer to any of the following operations, and their architects, where Williamsgrove Brick have been used:

Heckscher Building—Warren & Wetmore
Bankers Trust Co., 57th St. and Madison Ave.—C. I. Birge
Hotel Times Square, 43rd St. and Eighth Ave.—Gronenberg & Leuchtag
Apartment House, 300 Park Ave.—Warren & Wetmore
Nurses' Home, Knickerbocker Hospital—John Oakman
Mail Service Building, 45th St. and Lexington Ave.—Warren & Wetmore
Loft Building, 37th St. and Seventh Ave.—Buchman & Kahn
Gilbert Building—Edward Blum
Bell Telephone Building, Barclay and Vesey Sts.—McKenzie, Voorhees & Gmelin
Pennsylvania Operating Building, 34th St.—Schwartz & Gross

DARLINGTON BRICK & MINING CO.

Manufacturers of Grey and Cream Face Brick

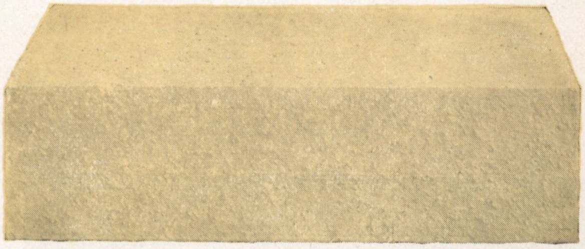
GENERAL OFFICE AND WORKS
DARLINGTON, BEAVER CO., PA.
DEALER REPRESENTATIVES IN ALL THE PRINCIPAL CITIES

The Original Darlington Grey Face Brick

DARCO
TRADE MARK

Annual capacity, 15,000,000 Brick

No. 32 Darco Grey Smooth

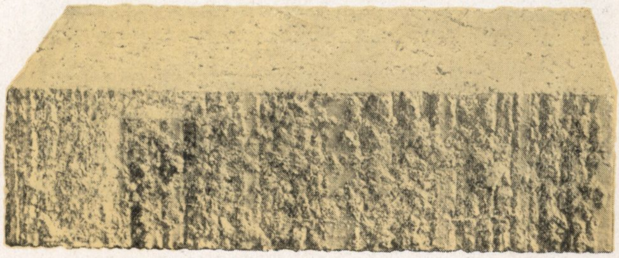


No. 40 Darco Cream Smooth

No. 6 Darco Grey Devonshire

No. 60 Darco Cream Devonshire

No. 72 Darco Grey Rug



No. 82 Darco Cream Rug

A Few Examples of "Darco" Products

THE ROLL MANUFACTURING CO.

Manufacturers of Romaco Mortar Colors

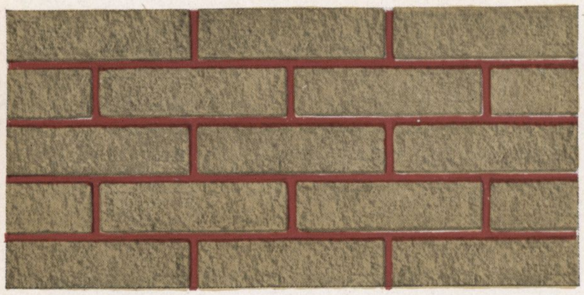
OFFICE AND WORKS
16710 Waterloo Road
CLEVELAND, OHIO
SOLD THROUGH DEALERS ONLY

Romaco Mortar Colors

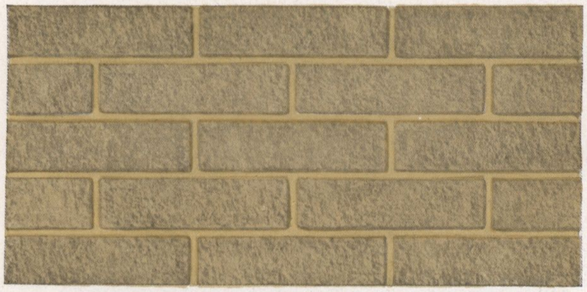
Romaco colors are of dependable uniformity. They are made from the best quality selected ores, ground to extreme fineness, assuring great coloring strength.

When you specify and use Romaco colors you get permanent colors.

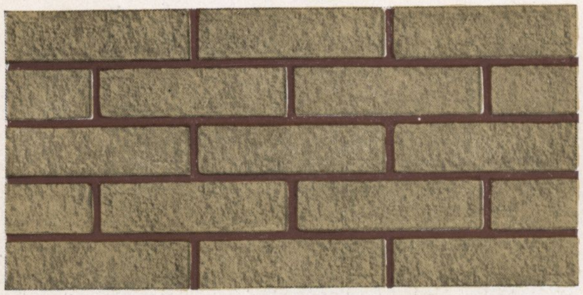
We are also manufacturers of Mineral Paint Colors and Romaco Stucco Retarder.



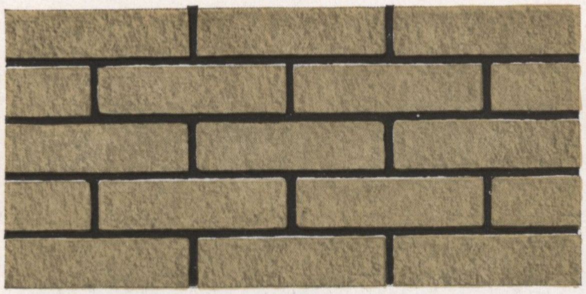
Mortar Colored with Romaco Red



Mortar Colored with Romaco Dark Buff



Mortar Colored with Romaco D. S. Chocolate



Mortar Colored with Romaco D. S. Black

Romaco Mortar Color Joints

All the above panels contain the same brick. The different effects are obtained by changing the color of mortar joints

THE CLINTON METALLIC PAINT COMPANY

Mortar Colors, Cement Colors, Protective Paints and Roofing Cement

200 Clinton Road
CLINTON, N. Y.

BRANCH OFFICE: NEW YORK, N. Y., 101 Park Avenue—Telephone, Ashland 8463

Products

Manufacturers of Clinton Mortar Colors and Clinton Cement Colors.

Also manufacturers of Clinton Iron Oxide Protective Paints and Clinton Silk Fibre Elastic Roof Cement.

Experience

Ever since 1887, The Clinton Metallic Paint Company has served the architectural profession and the building trade with notable integrity. More than 38 years of scientific research and generations of manufacturing experience are reflected in the uniform excellence of all Clinton Products.

Clinton Mortar Colors

The mortar joints of the brick wall frequently represent nearly one-fifth of its area. Consequently, the treatment of these mortar joints, with respect both to color and texture, greatly influences the appearance of the structure of which the brick and mortar form a part. If you will turn to the next page you will find this strikingly illustrated in the three panels of buff brick there reproduced.

All these panels are of the same brick, the various shades being arranged in the same way in each. The only difference between these panels lies in the color of the mortar joints.

Variety Available in Clinton Mortar Colors

Clinton Mortar Colors are made in a wide variety of shades from a rich mellow buff and the deepest red, through warm browns, olive green and chocolates to the blackest black.

These colors used alone in varying quantities or mixed with one another, permit of almost any effect from pearl gray tones (produced by using a very little black), or warm aged tones (obtained by using a small amount of buff), to the most decided tones which may be secured by using these colors in the quantities here specified.

The different colors in which Clinton Mortar Colors are supplied will be found listed on the following page.

Pulp or Dry Mortar Colors

Clinton Mortar Colors are sold either in pulp (some times called paste) or in dry form.

Some brick masons think that pulp colors are more convenient to use and that they mix more readily with mortar. They are somewhat more expensive than dry colors and have less coloring power per unit of weight.

Clinton Mortar Colors

Nature's Permanent Colors—Made Since 1887—at Clinton, N. Y

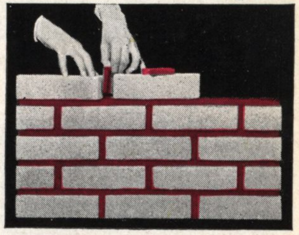
Permanent and Uniform

Clinton Mortar Colors are mineral colors, as permanent as the colors in natural rock. Rigid laboratory tests keep them absolutely uniform from shipment to shipment and from year to year.

Used by leading architects and contractors since 1887.

Selection of the Proper Color

In order to help in the selection of the proper mortar color we have devised the Clinton Mortar Color Experimenter. This consists of a number of strips of wall board ½ inch thick, tinted along the edges to reproduce colored mortars. By using these strips, brick panels can be built up and studied with the various colored strips without the use of actual mortar.



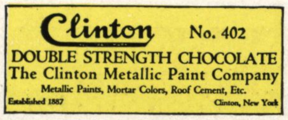
The Clinton Mortar Color Experimenter No. 1

Every Clinton dealer has a Mortar Color Experimenter for the convenience of his customers. We will send an Experimenter upon request to any architect who receives Sweet's Architectural Catalogue.

Test Panels—After using the Color Experimenter to determine what color is most effective with the brick selected, a panel should be set up out of doors with mortar mixed according to formula. Due to local variations in the color of sand and cement it may be found desirable to slightly change the amount of mortar color used.

Test panels should be allowed to stand for a few days before a final decision is made, to give the mortar an opportunity to dry out and attain its permanent color. The mortar when wet, is deeper in shade.

Warning—Test panels should be of the same thickness as the finished wall and should be allowed to dry naturally as under actual working conditions. They should be backed with mortar so that drying may be from the surface which would be exposed in actual construction.



Clinton No. 402
DOUBLE STRENGTH CHOCOLATE
The Clinton Metallic Paint Company
Metallic Paints, Mortar Colors, Roof Cement, Etc.
Established 1887 Clinton, New York

Label

To be sure of a thoroughly dependable Mortar Color look for this yellow label, which appears upon all bags or barrels containing Clinton Mortar Colors

Directions for Using Clinton Mortar Colors

To get a mortar joint of intense color it is necessary to use approximately 100 lbs. of dry mortar color per 1000 brick laid in running or common bond, with half-inch mortar joints. If mortar joints are wider or narrower, or if a bond requiring more or less mortar per

Continued on next page

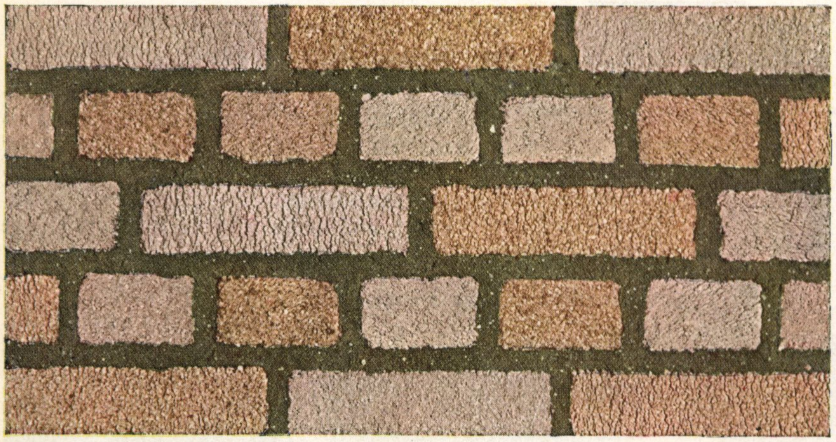
1000 brick is used, the amount of mortar color required per 1000 brick should be increased or decreased proportionately.

Following are two formulas for mortar of deep intense color:

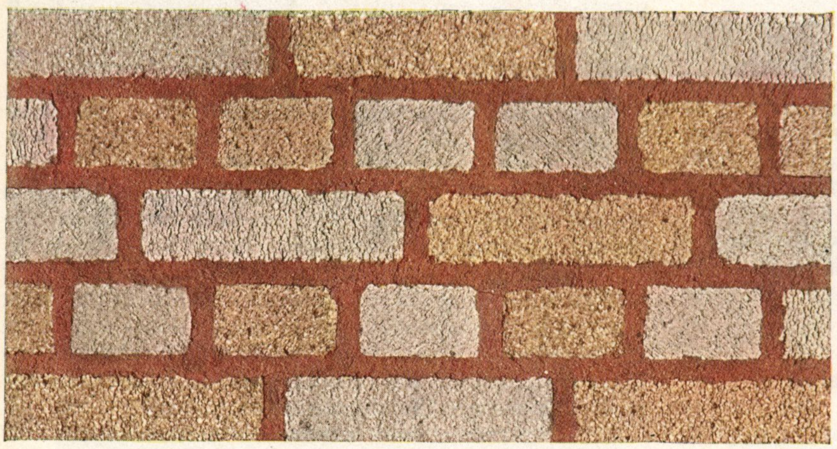
Cement Mortar

Clinton Mortar Color (dry)	25 lbs.
Portland cement	1 bag (1 cu. ft.)
Sand	3 bags (3 cu. ft.)
Hydrated lime	1/10 sack

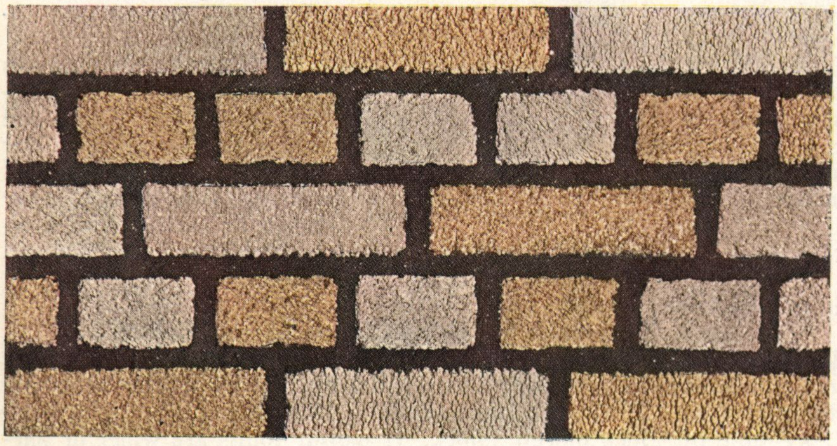
The above is sufficient to lay approximately 250 brick in running or common bond with half-inch mortar joints.



Mortar Colored with Clinton Double Strength Olive Green No. 1503



Mortar Colored with Clinton Pompeiian Buff No. 600



Mortar Colored with Clinton Double Strength Chocolate No. 402

Cement Lime Mortar

Clinton Mortar Color (dry)	30 lbs.
Portland cement	1 bucket (16 qts.)
Hydrated lime	1 bucket (16 qts.)
Sand	6 buckets (96 qts.)

The second formula is sufficient to lay approximately 300 brick in running or common bond with half-inch mortar joints.

As it is not always convenient to weigh the color on the job, we tabulate below the various shades of Clinton Mortar Color, showing in separate columns the number of quarts of dry Clinton Mortar Color (*struck measure*) which are equivalent to 25 lbs. and 30 lbs.

Caution: This table applies only to genuine Clinton Mortar Colors.

	Number of quarts	
	Equivalent to 25 lbs.	Equivalent to 30 lbs.
Clinton Hematite Red No. 10	10	12
Clinton Mortar Brown No. 400	8½	10½
Clinton D. S. Chocolate No. 402	9	11
Clinton Special Chocolate No. 404	9	11
Clinton Colonial Buff No. 700	19	23
Clinton Pompeiian Buff No. 600	19	23
Clinton Dark Buff No. 717	16½	20
Clinton Mortar Black No. 900	18½	22½
Clinton D. S. Black No. 800	19	23
Clinton D. S. Olive Green No. 1503	17½	21

Pearl Gray Mortar may be produced by using one-fourth as much Clinton Double Strength Black No. 800 as is recommended above to produce intense black mortar.

Clinton Mortar Black No. 900 or Single Strength Black, as it is sometimes called, will not give a jet black mortar. For best work use Clinton Double Strength Black No. 800.

If a clear buff mortar is desired a cement-lime mortar is recommended. Light colored cement and sand also tend to make the color of the mortar more brilliant. If a deep buff mortar is desired it will be obtained most readily by using a cement mortar with cement and sand of dark color.

Many contractors get good results with smaller proportions of Clinton Mortar Colors than those above recommended. This is possible if coarse sand is used and colors are mixed, remixed, then mixed again. Experience, however, proves that the amounts of color recommended will give good results under all conditions and we can not assure satisfaction if less color is used. *Money spent for a little extra color often more than pays for itself, in power and wages saved at the mixer and in the owner's satisfaction with the finished job.*

How to Be Sure of Good Results

Mistaken attempts at economy and carelessness in the use of mortar colors sometimes cause dissatisfaction with the results.

Such disappointments are wholly unnecessary and can be avoided if the formulas given are followed and these precautions are observed:

(1) Choose a *dependable brand*—one you *know* is uniform, permanent and of strong coloring power. Insist upon it. Do not accept a substitute. Be sure it is delivered in the original bags or barrels on the job.

(2) *Make up test panels before you start the job.* Make them as thick as the finished wall and back them with mortar so that drying will be under normal building conditions. Let dry thoroughly out of doors before deciding on the color. Mortar dries out lighter than it appears when wet.

(3) *Do not change mortar color brands in the middle of a job.* Some brands are weaker than others and of different color tone.

Continued on next page

(4) Do not, *in the middle of a job, change the kinds of lime, sand or cement used,* especially if the mortar is light in color; either gray or buff.

(5) Measure or weigh mortar material according to directions. Do not guess.

(6) *Mix the materials thoroughly.* It is best to mix the dry color, sand, hydrated lime and cement before the water is added, and after the water has been added mixing should continue until the mass is absolutely free from spots or streaks of color. Mixing can hardly be overdone.

(7) If lump lime is used in place of hydrated lime it *must* be thoroughly slaked and allowed to cool at least 24 hours before being brought into contact with the Mortar Color. *Hot lime fades color.*

(8) *Use Mortar as stiff as practical.* Do not use "sloppy" mortar. Keep batches as nearly as possible at the same consistency throughout the job.

(9) When laying brick with a ½-inch joint, do not use amount of color recommended for a ¼-inch joint or vice versa. Occasionally we find masons still using for a ½-inch joint (which requires twice as much mortar) only 50 pounds of color per 1000 brick because that is the amount they used when the ¼-inch joint was in common use.

(10) *Because a certain number of quarts of one color in a batch of mortar has given good results, do not use the same number of quarts of another color and expect good results.* Bulk and coloring power are not the same for different colors, as will be seen from the table on opposite page. The sack of Clinton Double Strength Chocolate No. 402 shown herewith is, for example, about half the size of the sack of Clinton Double Strength Black No. 800; yet each weighs the same and each will color an equal quantity of mortar. In coloring mortar, follow the exact directions for the specific color wanted and all difficulties will be avoided.

DOUBLE STRENGTH
CHOCOLATE No. 402
Clinton
U. S. BLACK
No. 800
Clinton
The Clinton Metallic Paint Co.
Clinton, N.Y.

(11) If joints are to be raked, *defer raking until mortar has begun to set.* This, together with working mortar as dry as possible, will help to prevent efflorescence—the appearance of a white scum upon the mortar.

(12) If you do have efflorescence, do not worry, and do not blame the mortar color. It is caused by water soluble salts in the cement, lime, sand or water, that are brought to the surface by the water and left there when the mortar dries. It is just as common on plain mortar joints as on colored joints, though it is not always so clearly visible. Clinton Mortar Colors absolutely do not cause efflorescence, being entirely free from water soluble salts.

When mortar is used as dry as possible these salts do not come to the surface nearly as much as when a "sloppy" mortar is used. When joints are raked after the mortar has begun to set this efflorescence or scum is removed and usually does not appear again.

In almost every case the action of rain will in time remove efflorescence. If, however, it is desired to remove it promptly, the surface of the mortar may be scrubbed with a wire brush; or a solution consisting of one part muriatic acid to *not less than* twenty parts water may be applied as a wash. After washing the wall with this solution be sure to wash it down again with water to remove surplus acid.

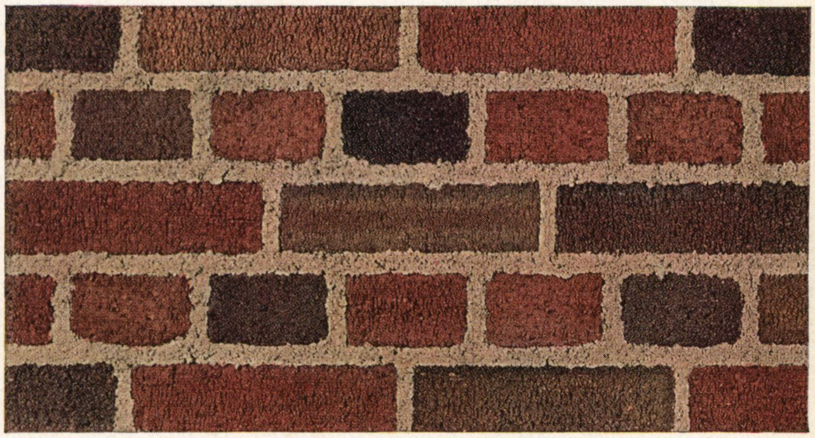
Remember: The man who measures and who mixes the mortar holds one of the most responsible positions on the job. Make him realize this responsibility and it will save a world of trouble and help to insure satisfactory results.

Coloring of Stucco

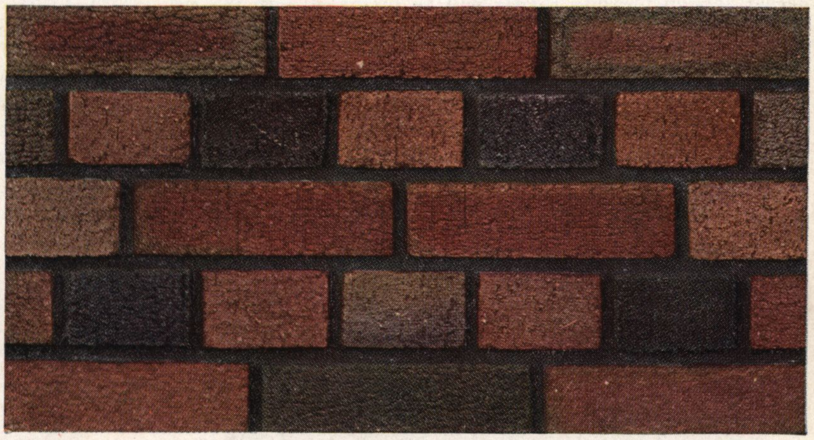
The fact that stucco may be tinted has added much to its popularity as a facing material. By use of various Clinton Mortar Colors, it is possible to color stucco in many pleasing tones.

Coloring of rough surfaced stucco is recommended without qualification. The color lends a rich warmth that ordinary gray stucco does not possess. Its use offers no difficulties and brings no disappointments if specifications are followed with care.

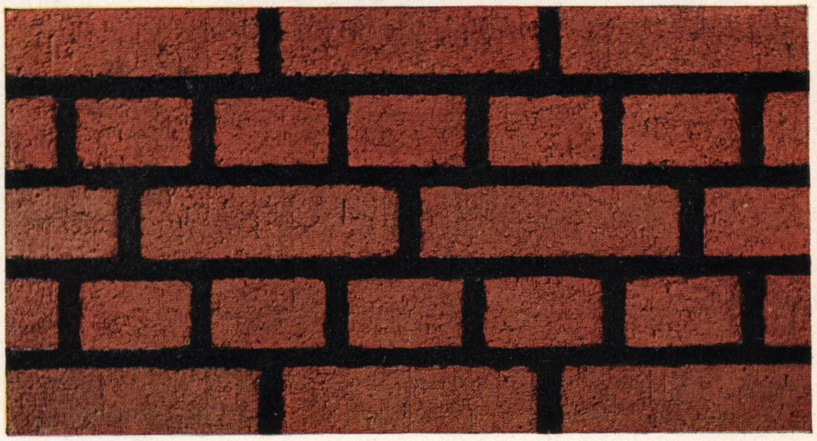
In smooth finished stucco the color follows the trowel or float, giving a surface of somewhat irregular



Mortar Colored with Clinton Colonial Buff No. 700



Mortar Colored with Clinton Special Chocolate No. 404



Mortar Colored with Clinton Double Strength Black No. 800

Full strength is recommended for mortar of intense black color

Continued on next page

or mottled appearance. Many architects consider that this increases the interest of the finished wall and improves the effect. But those whose minds are fixed upon a wall of unbroken color uniformity are advised before using it to study the effects that color gives in smooth finished stucco.

Irregularity and non-uniformity in stucco are increasingly popular. This is evidenced by the large number of jobs where the sweep of the trowel is emphasized and where its traces add to the interest of the wall surface.

The following formula is suggested:

1 quart Clinton Mortar Color (Note 1)
1 quart hydrated lime (if desired)
10 quarts white portland cement (Note 2)
30 quarts sand.

This batch covers about 125 sq. ft. finish coat. Only the finish coat need be colored.

Note 1—We recommend the following Clinton Mortar Colors as producing very pleasing shades when used in stucco as per this formula. Approximate weight per quart (struck measure) is given in each instance for convenience in estimating.

		Approx. wt. per qt. enough for approx. 125 sq. ft.
Rich Pink	Clinton Hematite Red, No. 10	2¾ lbs.
Pinkish Brown	Clinton Mortar Brown, No. 400	3 lbs.
Light Cream	Clinton Colonial Buff, No. 700	1½ lbs.
Deep Buff	Clinton Dark Buff, No. 717	1¾ lbs.
Pinkish Buff	Clinton Pompeiian Buff, No. 600	1½ lbs.
Light Gray	Clinton Mortar Black, No. 900	1½ lbs.
Deep Gray	Clinton Double Strength Black, No. 800	1½ lbs.

Note 2—To obtain the shades described, white portland cement *must be used.* If ordinary cement is substituted, deeper though pleasing shades will be produced with the red, brown and blacks. The buffs yield very unattractive shades with ordinary cement.

Duo- and Multi-colored Stucco

The popularity of duo- and multi-colored stucco, which is being used so extensively in Southern Florida, is rapidly spreading through the country. Clinton Mortar Colors and Cement Colors are particularly well adapted to the coloring of stucco of this type.

In duo- and multi-colored stucco work, the two ordinary base coats are applied as usual and allowed time for setting. For the finish coats, the following formula is suggested:

Sand	3 parts
White cement	1 part
Color	1/10 part or volume equivalent to 10% of volume of cement used
Lime (optional)	1/10 part

In order to secure pleasing tones of buff or yellow, a light colored yellowish sand is recommended and white portland cement is essential.

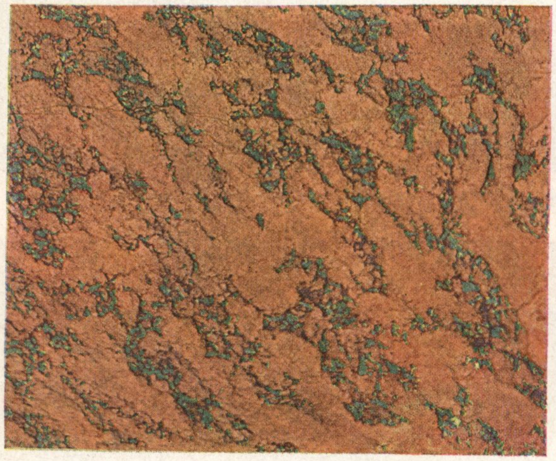
The first colored coat should be applied approximately ⅛ inch thick, with a smooth or sand finish. Blue and green are popular for first colored coats.

The second colored coat may be applied almost immediately. It should be spatter-dashed with a whisk-broom, allowing the first colored coat to show here and there at varying intervals. Although the area of the second colored coat should be somewhat greater than the final visible area of the first colored coat, this exact proportion will depend upon individual taste, size of building, and control of throwing spatter-dash.

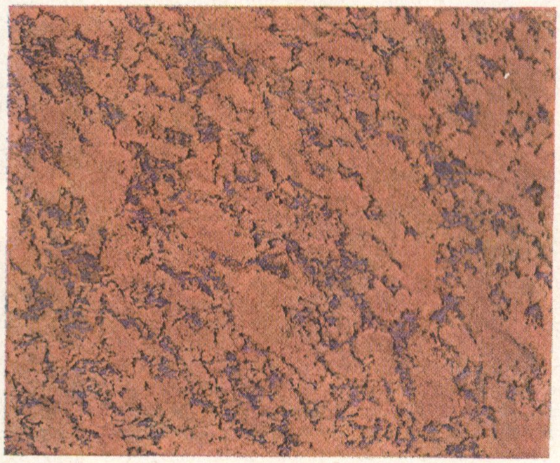
The projections of the second colored coat should then be smoothed down with a steel trowel held almost flat against the surface.

An unlimited variety of pleasing color combinations may be obtained in this type of stucco. Two panels of duo-colored stucco thus prepared are illustrated below. For panel "A" the first coat is colored with Clinton No. 1502 Green Cement Color, the second coat with Clinton No. 717 Buff Mortar Color. For panel "B" the first coat is colored with Clinton No. 1601 Blue Cement Color while the second coat is colored with Clinton No. 600 Pompeiian Buff Mortar Color.

Working samples of Clinton Mortar Colors and Clinton Cement colors are willingly furnished on request.



Panel A



Panel B

THE CARNEY COMPANY

MANKATO, MINN.

DISTRICT SALES OFFICES

CLEVELAND, OHIO, Leader-News Building
OMAHA, NEB., Omaha National Bank Building
MINNEAPOLIS, MINN., Builders' Exchange
CHICAGO, ILL., Chamber of Commerce Building
ST. LOUIS, MO., Syndicate Trust Building
DETROIT, MICH., Book Building

MILLS: MANKATO, MINN.; CARNEY, MINN. QUARRIES: CARNEY, MINN.

Product

CARNEY CEMENT.

Description

THE CARNEY COMPANY has manufactured cement since 1883.

Carney is a cement unlike other used in brick and tile construction. It is made from a peculiar deposit of stone found only at Mankato, Minn. This stone contains the correct proportion of lime combined chemically, so that, when the stone is burned and ground, it needs nothing but sand and water to form a smooth working, slower setting mortar. In the wall it becomes harder than the brick it binds.

Advantages

Carney is lighter in weight, and is easier handled. Carney is packed in cloth or paper sacks, each containing one cubic foot and weighing 50 lbs. Users of Carney are not required to buy lime, hence labor of slaking and mixing is eliminated. Carney requires nothing but sand and water in mixing.

The simple mixing formula saves time and labor and eliminates carelessness. The addition of too much sand or adulteration at the mortar box interferes with the plastic, smooth-working properties of the cement and is immediately noticed by the masons.

Because of the plastic and smoother working properties masons can lay more brick per man per day. Carney lays the maximum number of brick per barrel.

Carney mortar has no waste. Mortar left over at the end of the day or when a job is delayed can be used the next day by retempering with water.

Because of its slower set there is no tamping of brick or retempering on the mortar board.

Carney can be used winter and summer. Frost does not affect the strength of Carney mortar in the wall. Printed directions on tags attached to the cement bags provide for its proper use in cold weather.

In the wall, Carney mortar returns to its native hardness, becoming harder than the brick it joins and, as the mortar is absorbed into the brick because of its slower setting properties, it exerts a tremendous gripping power. It makes one solid wall of masonry.

Specifications for Brick, Tile and Terra Cotta Mortar

Plain Mortar—For all brick, tile and terra cotta mortar above grade, use 1 part Carney, 4 parts good mortar sand, in accordance with the manufacturer's directions attached to the cement bags. When used in connection with Bedford stone, the stone should be made stainproof.

Colored Mortar—Use a good, double strength mortar color, and mix according to manufacturer's instructions.

Catalogue and Descriptive Literature

A catalogue covering every point on Carney will be sent on request.

A list of buildings near you that have been laid up in Carney, together with the names and addresses of the architects and contractors, will also be sent, if requested. We list a few below.

Buildings Laid Up In Carney

BUILDING	LOCATION	ARCHITECT*	CONTRACTOR*
American Furniture Mart	Chicago, Ill.	Henry Raeder; Assoc. Geo. C. Nimmons & Co. and N. Max Dunning	Wells Brothers Const. Co.
American Sugar Refinery	Baltimore, Md.	Chas. T. Main, Boston, Mass.	Stone & Webster, Inc., Boston, Mass.
A. T. & S. F. Office Bldg.	Topeka, Kan.	E. A. Harrison, Chicago, Ill.	Swenson Const. Co., Kansas City, Mo.
Athletic Club	Buffalo, N. Y.	Edw. B. Green & Sons	John W. Cowper Co.
Athletic Club	Indianapolis, Ind.	Robert Frost Daggett	Bedford Stone & Const. Co.
Bankers Reserve Life Insurance Co. Bldg.	Omaha, Neb.	F. A. Henninger	Selden Breck Const. Co.
Buhl Bldg.	Detroit, Mich.	Smith, Hinchman & Grylls	Davis & McGonigle Co.
Builders Exchange Bldg.	St. Paul, Minn.	Toltz-King & Day	Lovering & Longbotham
City Club	St. Louis, Mo.	T. P. Barnett	Ætna Bricklaying & Const. Co.
Coca Cola Factory	Atlanta, Ga.	Arthur Tufts Co.	Arthur Tufts Co.
Cregg Bldg.	Lawrence, Mass.	James E. Allen	Louis Cyr
Etchison's Apartment Bldg.	Washington, D. C.	Stern & Tomlinson	Maurice Wolfe
Exchange National Bank	Pittsburgh, Pa.	Weary & Alford, Chicago, Ill.	S. M. Seisel, Milwaukee, Wis.
Farmer's National Bank	Oklahoma City, Okla.	Hawk & Parr	Gross Const. Co.
Federal Reserve Bank	Chicago, Ill.	Graham, Anderson, Probst & White	John Griffith & Son
Federal Reserve Bank	Denver, Colo.	Graham, Anderson, Probst & White, Chicago, Ill.; Assoc. Fischer & Fischer	C. S. Lambie & Co.
Federal Reserve Bank	Kansas City, Mo.	Graham, Anderson, Probst & White, Chicago, Ill.	Geo. A. Fuller Co., Chicago, Ill.
Francis Marion Hotel	Charleston, S. C.	W. L. Stoddart, New York, N. Y.	John W. Cowper Co., Buffalo, N. Y.
Jefferson Standard Life Insurance Bldg.	Greensboro, N. C.	Chas. C. Hartman	Geo. A. Fuller Co.
Kentucky Military Institute	Louisville, Ky.	Nevin, Wischmeyer & Morgan	Geo. A. Hoertz
Maison Blanche Store	New Orleans, La.	Emile Weil	J. V. & R. T. Burkes
Memorial Stadium, University of Minnesota	Minneapolis, Minn.	Frederick Mann	James Leck Co.
National Cash Register Co. Bldgs.	Dayton, Ohio	Private Plans	Frank Hill Smith, and Davies & Davies
Peabody Hotel	Memphis, Tenn.	Walter W. Ahlschlager, Chicago, Ill.	B. W. Constr. Co., Chicago, Ill.
Scottish Rite Cathedral	Miami, Fla.	Kiehnel & Elliott, Pittsburgh, Pa.	John B. Orr
Union Bank Bldg.	Huntington, W. Va.	Meanor & Handlosher	Geo. A. Fuller Co., Washington, D. C.
Union Trust Co. Bldg.	Cleveland, Ohio	Graham, Anderson, Probst & White, Chicago, Ill.	Thompson-Starrett Co., Chicago, Ill.
Union Trust Co. Bldg.	Dubuque, Iowa	Weary & Alford, Chicago, Ill.	Stuffings Bros. Co., Chicago, Ill.
University of Virginia Gymnasium	Charlottesville, Va.	Fiske Kimball; Assoc. Peebles & Ferguson, Norfolk, Va.	King Lumber Co.

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*Where address is omitted it is the same city as location of building.

PECORA PAINT COMPANY

Mortar Stains and Sash Putty

Fourth Street and Erie Avenue
PHILADELPHIA, PA.

TRADE-MARK
Registered

Products

Pecora Mortar Stains.
Pecora Metal Sash Putty.
For Calking and Glazing Compounds, see page 1790.

Pecora Mortar Stains

Uses—A paste, or pulp, *not a powder,* made in 12 standard colors for mixing with lime or cement mortar, or the two combined, in laying brickwork for facing exterior or interior walls in any type of structure. Equally applicable for coloring mortar for mantel facings, fireplaces, hearths, floors—whether of brick, tile, marble, slate or other material. Also used for pointing and jointing mortar of stonework where any color effect is desired; also for producing color tones in exterior "white-wash."

Advantages—Pecora Mortar Stains are offered as heavy paste or pulp, for in that form only, after much experiment, this company has found it is possible to produce *chemical* (not acid) mortar stains which, made from finely ground ores dissolved in chemicals, have the advantage of being absolutely fadeproof, exceptionally strong and thoroughly economical, and which give that deep, rich tone so often sought and so seldom found.

They have the added advantage of being most easily and thoroughly assimilated by the mortar with which they are mixed. The quality of permeability is obtained by mechanical precision in making the paste, instead of uncertain results of hoeing a dry powder into a wet mass of mortar.

This company's many years of successful research and constantly growing business have *proved this superiority of pulp stain.* While a small detail in the construction of a building, it is, nevertheless, an important one. Its correct use helps to build a lasting quality reputation for architect and contractor.

Properties—Being a pulp or paste, constituting a fast *stain or dye,* and differing in that respect from ordinary coloring mediums, they form a chemical union with the mortar and strengthen, rather than weaken, the mortar joint.

Economically they are unapproached as, *being 50% to 100% stronger than any mere mineral coloring material,* they are much less costly in the long run. Manufactured from carefully selected, finely ground, and richest ores in combination with extenders and fixatives, the colors become permanent after mortar is set, making rich, clean, clear shades, free from streaks or spots. Pecora Mortar Stains do not cause or increase unsightly efflorescence on face of brick walls.

Colors—Shades below are always in stock. Special shades made to order.

Black
Brown
Dark brown
Windsor
Red
Buff
Fern green
Colonial drab
Amber
Terra cotta
French gray

Specifications—Many architects have found that specification by description only has resulted in the substitution of inferior goods, the spotting or fading of which necessitates expensive tuck pointing. Therefore the following outline form is suggested:

All mortar to be colored or stained with Pecora Mortar Stain, manufactured by Pecora Paint Company, Philadelphia, Pa., using by measure 1 bucket of paste or pulp to 7 buckets of face wall mortar.

Mortar must be cold before mixing in stain. To secure a uniform and smooth shade, "hoe in" stain thoroughly. Keep soft in package by covering with water. Pour this off before using. Do not allow stain to freeze before being mixed with mortar.

Note: Depending upon depth of shade desired, the following proportions per 1000 brick, ordinary stretches, will be found to approximate quantity desired:

Red, Buff, Terra Cotta and Amber—For ⅛-in. joint use 45 to 55 lb.

Brown, Windsor, Colonial Drab, Fern Green, French Gray and Dark Brown—For ⅛-in. joint use 35 to 45 lb.

Black—For ⅛-in. joint use 20 to 30 lb.

Mortar varies and takes more or less stain according to richness of lime and quality of sand. Before laying brick it is suggested that a small portion of the stained mortar should be taken from the mortar bed and dried out thoroughly to determine whether the proper quantity of stain is being used to produce the shade desired.

Literature—Booklet showing actual colors and giving full details and photographs of important buildings, with testimonials from architects and owners, sent on request.

Pecora Metal Sash Putty

Uses—A specially prepared putty for use in metal sash only.

Advantages—Pecora Metal Sash Putty is the modern plastic product developed by this company to replace white lead, litharge and ordinary putties used in connection with metal.

It is a "special duty" putty, embodying the essential features of retaining its elasticity and staying in place, regardless of the difference in coefficient of expansion between glass and steel.

Properties—It remains soft in the package; and on removal is immediately ready for use. It is "long," therefore readily applied by the workman; and not requiring any manipulation enables the contractor to reduce his cost of installation.

Colors and Samples—The standard shade is dark red. Other shades are made to order. Sample on request.

Specifications—Be sure to specify Pecora Metal Sash Putty. It will be a trouble-saver as evidenced by the fact that thousands of pounds have been used with the greatest success.

References—A few of the large buildings where this material has been used by David Lupton's Sons Co. of Philadelphia, Pa., are:

Bethlehem Steel Co., South Bethlehem, Pa.
General Electric Co., Schenectady, N. Y., and West Lynn, Mass.
Fore River Ship & Engine Building Co., Fore River, Mass.
Dayton Electric Company, Dayton, Ohio
S. L. Allen & Co., Philadelphia, Pa.
Central Railroad of N. J., Elizabethport, N. J.
Keokuk Electro Metals Company, Keokuk, Iowa

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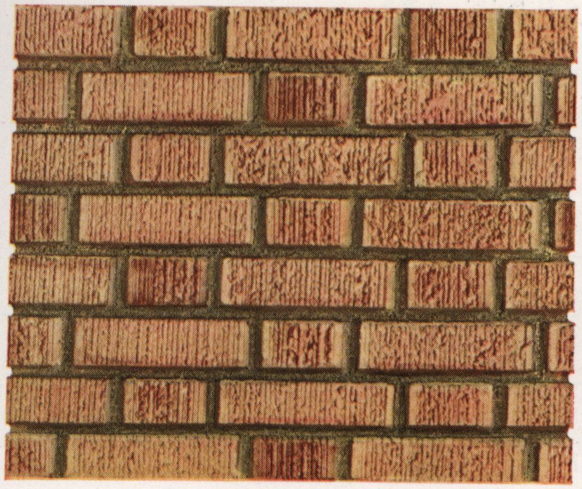
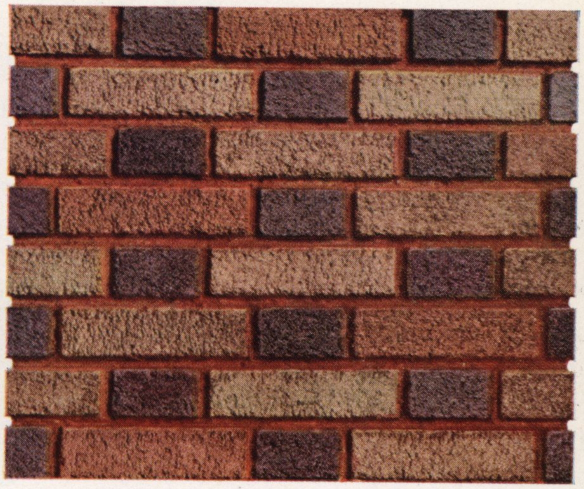
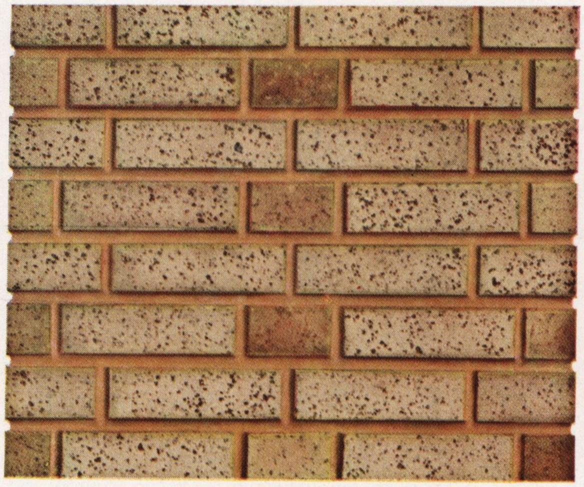


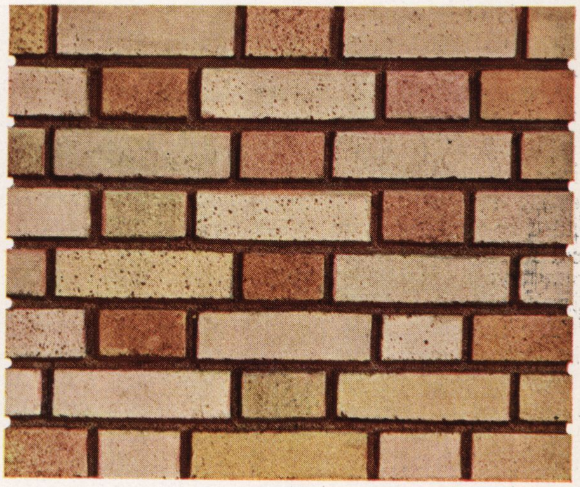
Pecora Fern Green Mortar Stain



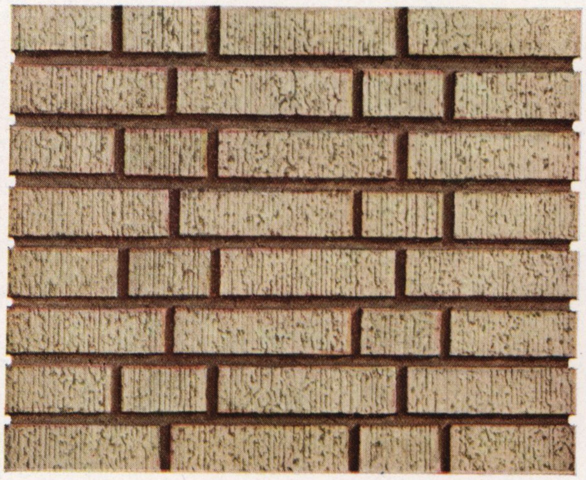
Pecora Red Mortar Stain



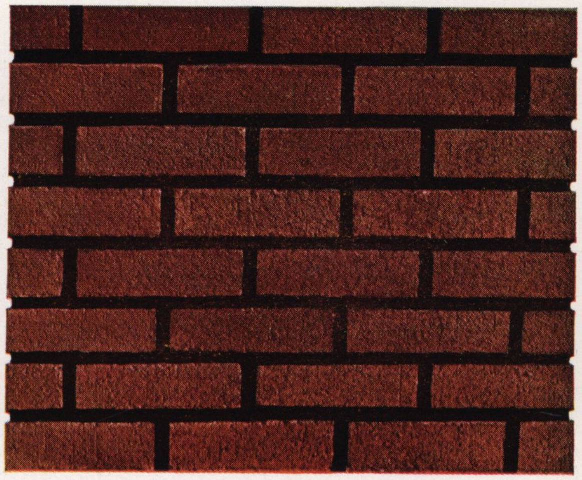
Pecora Buff Mortar Stain



Pecora Brown Mortar Stain



Pecora Dark Brown (Chocolate) Mortar Stain



Pecora Black Mortar Stain

HY-TEST CEMENT CO.

Bricklayers' Cement

MILL
SIEGFRIED, PA.

MAIN OFFICE
PHILADELPHIA, PA.

SALES OFFICES
NEW YORK, N. Y. BOSTON, MASS. WASHINGTON, D. C. BUFFALO, N. Y. DETROIT, MICH. PITTSBURGH, PA.

Product

Hy-Test Masons' Cement, a finely pulverized, plastic, smooth working cement made especially for mortar for laying brick, tile, stone and other masonry construction.

Advantages

Hy-Test Masons' Cement has an important property which is almost entirely lacking in portland cement, that of producing the "fat" mortar demanded by bricklayers.

The advantage of using Hy-Test is that it requires no addition of lime at the mortar box as is the case with portland cement. It already possesses the properties of producing a smooth working mortar, when mixed with the sand.

Architects will be quick to appreciate the fact that a mill finished cement that is self contained and requires no addition of lime at the mortar box, will produce a more uniform quality and color of mortar than the uncertain mixtures of portland cement to which lime is added in varying quantities to suit the individual taste of each brickmason.

Strength of Hy-Test Mortar

The manufacturers guarantee that brickwork laid up in mortar under the simple directions of one (1) part Hy-Test mixed with three (3) parts clean sharp sand and clean water and cured under ordinary conditions, will withstand six times greater compression at the early period of 28 days than the highest stress on brickwork permitted by the building codes of all first class cities.

Lower Costs

In addition to these advantages, Hy-Test lowers the cost of brickwork, as it sells for substantially less than either portland cement or hydrated lime.

Composition

Hy-Test Masons' Cement is not a made up mixture of cement and lime, nor is it a Rosendale cement. It is a true hydraulic cement made from the same raw materials as the highest quality portland cement under a fixed formula and under strict laboratory control, but by burning the raw materials lower than in portland, the desirable quality of smoothness is retained. In all other respects it compares with and accomplishes the required results in masonry construction as does portland cement.

HY-TEST CEMENT COMPANY
BRICK
HY-TEST
CEMENT
MILL AT SIEGFRIED, PA.

MARK ON EVERY BAG

Official Approvals and Tests

Hy-Test has been tested and officially approved by the building departments of New York, Boston, Washington, Philadelphia and other large cities. Tests made by the Massachusetts Institute of Technology, George Washington University, and by eight other reputable testing laboratories are in evidence as to the uniformity and strength of Hy-Test.

Color

The natural color of Hy-Test is a pleasing buff, which makes it very desirable for face brick work. It can be colored in the same manner as portland cement.

Estimating Data

A barrel of Hy-Test consists of four cloth or paper bags totaling approximately 4½ cu. ft. of cement, and is ample, when mixed with ½ cu. yd. of sand, to lay 1000 brick, ⅜-in. joint.

Specifications

Mortar—Hy-Test Masons' Cement (Hy-Test Cement Co., Philadelphia, Pa.) or any other bricklaying cement that has been approved as equal in strength, shall be used for the mortar for laying brick and tile. Proportion the cement and sand loose, mixing one (1) part of Hy-Test with three (3) parts clean sand. The cement shall be delivered in closed bags and three (3) cubic feet of sand shall be added to each bag of cement. No counting by wheelbarrows or shovels will be permitted. In warm weather wet all brick. In cold weather use necessary cold weather precautions. Or contractor shall only under instructions from architect use a mortar composed of one (1) part portland cement mixed with three (3) parts sand, to which shall be added no more than 10% hydrated lime by volume.

SOME REPRESENTATIVE HY-TEST INSTALLATIONS

Building	Approx. Number Bbls. Used	Architects
Brooklyn Edison Generating Station, Brooklyn, N. Y. (The largest in the world)	12,000	Private plans
Metropolitan Life Insurance Co., Long Island, N. Y. (54 apartment houses)	30,000	Andrew J. Thomas and D. E. Waid
$3,000,000 P. & R. R. R. Terminal, Camden, N. J.	6,500	Private plans
25-story Equitable Building, New York, N. Y.	8,000	Starrett & Van Vleck, New York
24-story Packard Building, Philadelphia, Pa.	12,000	Ritter & Shay, Philadelphia
15-story Roosevelt Hotel, New York, N. Y.	10,000	George B. Post & Sons, New York
20-story Franklin Trust Building, Philadelphia, Pa.	10,000	Hoffman-Henon Co., Philadelphia
18-story Benjamin Franklin Hotel, Philadelphia, Pa.	13,000	Horace Trumbauer, Philadelphia
20-story Citizens Bank Building, Baltimore, Md.	6,000	Graham, Anderson, Probst & White
13-story Elks Home, Newark, N. J.	5,600	Warren & Wetmore, New York
9-story Saks Fifth Avenue Store, N. Y.	5,500	Starrett & Van Vleck, New York
16-story Y. M. C. A., Pittsburgh, Pa.	3,500	Benno Janssen, Pittsburgh, Pa.
10-story Walker Hotel, Washington, D. C.	8,000	Warren & Wetmore, New York
Junior High School, Trenton, N. J.	6,000	J. O. Hunt and Ernest Sibley
Junior High School, Altoona, Pa.	3,600	Julian Millard, Altoona, Pa.

KOSMOS PORTLAND CEMENT COMPANY

INCORPORATED

SALES OFFICE

LOUISVILLE, KY.

MILL: KOSMOSDALE, KY.

Products

Kosmortar, and Kosmos Portland Cement.

Kosmortar

A MASON'S CEMENT KOSMORTAR EASY TO SPREAD

TRADE-MARK

A smooth working cement for masonry of all kinds, ready for immediate use.

Advantages of Kosmortar

Easy to Spread—Kosmortar does not drag or work short under the trowel.

Strength—About the same as that of a 50% portland cement and lime mortar, with much better working qualities.

Minimum Labor—Only necessary to add sand and water. No slaking or soaking. Can be mixed by hand or machine.

Uniformity—A strictly artificial product; each ingredient is scientifically controlled. There is no dependence on the variations of a natural deposit. Uniform in color as well as in other qualities.

With Mortar Colors—Kosmortar insures good results with good mortar colors and does not require more color than mortar manufacturers recommend.

Absorption—Percentage of water absorbed is extremely low, giving practically a waterproof joint.

Soundness—Passes same soundness specifications as for portland cement, thus assuring permanence.

Better Joints—Joints where Kosmortar is used cut cleaner, making not only a better appearing job, but saving much labor in cleaning.

Paper Sacks—Kosmortar is packed in strong paper sacks, which allow of no refilling and make the mortar cheaper to handle than in cloth sacks; 4 sacks of 75 lbs. each to the barrel.

Directions for Using Kosmortar

Mix dry 1 part Kosmortar with 3 (4 if preferred) parts sand and add water to make required consistency. Four to five sacks are required for laying 1000 brick, using a 1-to-3 mix.

Kosmortar has a slow initial set, making it unnecessary to retemper for some time after mixing. Upon retempering, Kosmortar retains more strength than other products.

Report of Kosmortar Tests

(1) Made by Robert W. Hunt & Co., Chicago, Ill., from sample received March 23, 1923.

Soundness .... O.K.

Time of Setting:

Initial .... 6 hr. 00 min.

Final .... 17 hr. 30 min.

Fineness:

Passing 100 mesh 95.80%

Passing 200 mesh 81.40%

Tensile Strength (1 part Kosmortar, 3 parts sand):

Average 7 days .... 70 lb. per sq. in.

Average 28 days .... 155 lb. per sq. in.

(2) Made by H. C. Nutting Co., Cincinnati, Ohio, from sample received February 20, 1924.

Compression Strength (1 part Kosmortar to 3 parts sand):

28-day test .... 1376 lb. per sq. in.

Tests of Kosmortar along with other mortars for working qualities, color and strength, are welcomed. Kosmortar excels other prepared mortars in working qualities and will give at least 50% more strength.

Kosmos Portland Cement

A high grade portland cement, passing all standard specification tests, and showing exceptionally great increase in strength. Suitable for use in all kinds of concrete construction. Its reputation is based on twenty years of consistent high quality and reliability.

PORTLAND KOSMOS CEMENT

TRADE-MARK

LOUISVILLE CEMENT COMPANY

INCORPORATED
Speed Building
LOUISVILLE, KY.

BRIXMENT MILLS, PORTLAND CEMENT MILLS, NATURAL CEMENT MILLS: SPEED, IND.
LIME WORKS: MILLTOWN, IND.

Products

Brixment, a Masons' Cement for brick mortar.

Also, Speed Portland Cement, Louisville Natural Cement, Speed Chemical Lime, Speed Chemical Hydrated Lime and Speed Masons' Hydrated Lime.

BRIXMENT
TRADE-MARK

Brixment

A masons' cement for brick mortar with greater strength, endurance, economy and architectural advantages, the outgrowth of almost a century in cement manufacture.

Method of Manufacturing Brixment

The limestone, which is high in alumina and combined lime and silica, is first crushed to uniform size. It is then burned in upright kilns, passed through suitable mills and finally through a ring-roll reducer where such a fineness is obtained that 85% will pass through a 200-mesh screen. It is then placed with the oily materials in a specially constructed hydrater and sufficient water is added for complete hydration of the lime. When reaction has taken place it is conveyed to steel hoppers where, after a short time, the hydrating reaction is completed. From there it goes through the tube mills for final pulverization and thence to storage bins for bagging and shipping.

Advantages of Brixment

Greater Strength and Endurance—Practical tests show that Brixment's early strength approaches that of portland cement mortar, while after the lapse of a few months they are of equal strength. These characteristics of unusual strength and endurance are due to the high content of calcium silicates, the hydration of which is the cause of the final strength in hardened concrete.

Unimpaired by Retempering—The quick-setting substances in Brixment have been retarded, while the slow-setting, strength-giving silicates retain their ability to set and cause the mortar to become hard, even though retempered. This permits mixing larger batches and tempering more slowly than with other cements.

Greater Economy—Being composed of definite elements in chemical equilibrium, according to an unvarying formula, Brixment, when gauged with good sand and properly tempered, produces uniformly good results with economy in time, labor and money. Unusually plastic and "buttery."

Needs No Slaking—Needing no slaking before use, Brixment is constant in volume and will not swell, pop, crumble or scale from rain after becoming hard in the work. Finished joints will always remain smooth.

Will Not Become Air-set—Samples of Brixment taken from a dealer's stock after four years' storage, showed no impairment of strength or condition, and test briquettes of same doubled in strength between the 28- and 90-day periods.

Greater Architectural Advantages—Being invariably uniform in quality and composition, the proportion of binding material required by the specifications need not be left to the discretion of the mortar mixer, as is the practice when using lime mortar tempered with cement.

Repels Moisture and Has Greater Plasticity—The oily content not only imparts greater plasticity to Brixment making it easier to work and assuring smooth joints, but also makes it impervious to moisture. Joints when set, repel rather than absorb moisture.

Inert to Mortar Colors—Brixment is inert to any good mortar color, less color being required to obtain desired shade than with mortars made of lime or other cements.

Directions for Using Brixment

With 1 part Brixment, mix thoroughly 3 parts dry sand. Add sufficient water to make mortar of proper consistency. Mortar may be mixed either by machine mixer or by hand.

Estimating Data

Brixment is put up in sacks containing a little over 1 cu. ft. each. Each sack weighs 75 lbs. Four sacks make 1 bbl., which is of greater volume than 1 bbl. of portland cement.

One barrel Brixment used in the proportion of 1 part Brixment to 3 parts sand should lay 1000 brick.

Average cost, $1.45 per bbl., f. o. b. Speed, Ind.

Tests

Report of the American Bureau of Inspection and Tests:

> "The Brixment produced about the same water-repellent qualities as the waterproofed white cement, and the absorption-resisting qualities of the mortars made with the two cements in the same proportion, appeared to be about equal."

CRUSHING STRENGTH OF BRIXMENT
Test by Robt. W. Hunt Co., Chicago, Ill.

Specimen	No. 1	No. 2	No. 3
Mortar started to crush at about .... lbs.	20,000	23,000	19,000
Brick started to crush at about ..... lbs.	25,000	25,000	24,000

Note: 3 specimens of Brixment used with one-third sand in a ½-in. joint between 2 common bricks. All tested at age of 28 days.

SHEARING STRENGTH OF BRIXMENT VERSUS PORTLAND CEMENT MORTAR
Test by American Bureau of Inspection and Tests

Test No.	Cement used	Bricks used	Shearing load lbs. per sq. in.	
1	Brixment	Common	150	average 112
2	Brixment	Common	73	
3	Cement-lime	Common	63	average 65
4	Cement-lime	Common	68	

PHYSICAL TEST

Fineness 100	96.8%	Steam pat	O. K.
Fineness 200	87.0%	7-day 3-1 tensile	76 lbs.
Initial setting	3 hrs. 30 min.	28-day 3-1 tensile	147 lbs.

A Few Buildings Typical of Those Using Brixment for Mortar

Dixie Terminal Building, Cincinnati, Ohio
New York Times Annex, New York, N. Y.
U. S. Mail Terminal Building, Chicago, Ill.
Durant Motor Co. Building, Detroit, Mich.
Fisher Body-Ohio Co., Cleveland, Ohio
Belknap Hardware & Mfg. Co., Louisville, Ky.

FREDERICK C. BOGK, PRESIDENT

RICKETSON MINERAL PAINT WORKS

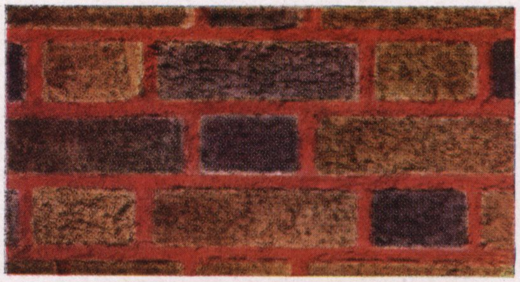
Manufacturers of Mortar Colors and Dry Iron Ore Paints
"You Can't Fade 'Em"

OFFICE
Railway Exchange Building
MILWAUKEE, WIS.

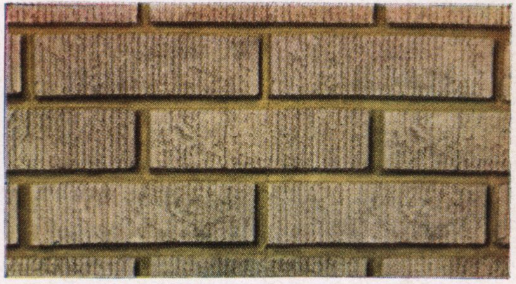
Dependability

Makers of Good Mortar Color since 1885 and used in some of the largest buildings in the United States.

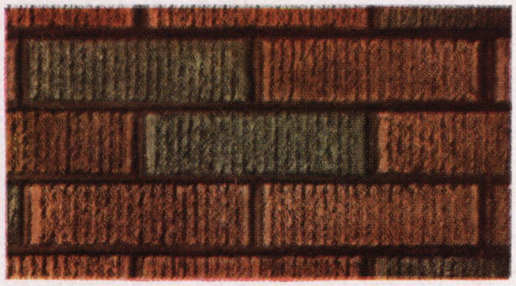
Highest Award
Universal Exposition
St. Louis
1904



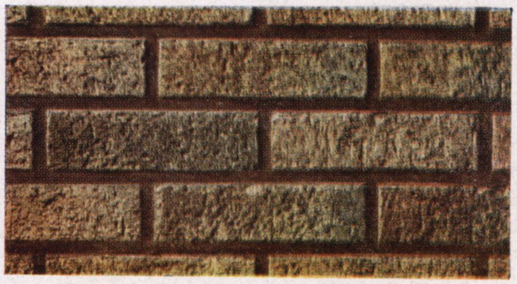
Mortar Colored with Ricketson's Red



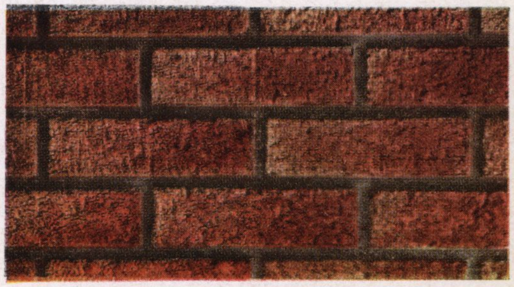
Mortar Colored with Ricketson's Buff



Mortar Colored with Ricketson's Brown



Mortar Colored with Ricketson's Double Strength Chocolate



Mortar Colored with Ricketson's Double Strength Black

Varying Effects

Varying effects with the same kind of brick can be procured by the use of different colored mortar joints and the few panels shown above can only give a slight idea of the infinite number of effects that can be produced by the use of colored mortar joints.

Ricketson Mortar Colors—New Process of Manufacture

Our new "air floated" process, and specially designed machinery will grind our ores to a velvety, "flour-like" fineness greatly adding to their penetration and consequent coloring value.

Continued on next page

All trace of the unstable oxides is removed, leaving only those colors that will permanently resist every effect of weathering, without the slightest change. They never fade. The architect and builder who sticks to Ricketson Mortar Colors is assuring himself that his work will remain as he left it so far as the mortar color is concerned.

There are other reasons why Ricketson Colors are extremely advantageous to use. Being absolutely pure coloring matter without filler or binder and insoluble in water, they never cake or deteriorate, no matter how long kept before using.

Their perfect purity and the impalpable fineness to which they are ground produce a number of desirable results. It makes them easy to obtain a perfect mix. It gives them greater coloring strength than most mortar colors on account of their high percentage of ferric oxide, so that they go farther, pound for pound. And it enables them to act as a filler for the materials with which they are mixed. Laboratory tests show that Ricketson Mortar Colors produce a stronger mortar or concrete aggregate.

Directions for Use

It is obviously impossible to lay down a set of rules or a mixing formula for the use of dry colors, as the width of the joint and depth of shade desired will really determine what amount of color should be used. For laying 1000 brick, from 75 to 125 lbs. of color should be used, depending on the color and the width of the joint. As all good cooks seldom follow the written recipe, but add measures of good sense and good judgment to whatever they are making, so the man at the box must likewise use good sense and good judgment in the mixing of his colors with mortar.

Fundamental Rules—

A few fundamental and never to be violated rules can, however, be set down, and include these:

First—If lump lime is used in place of hydrated lime, it must be thoroughly slaked and allowed to cool at least 24 hours before the color is added. Hot lime, or even warm lime, fades the best of colors.

Second—The dry colors should be mixed thoroughly with sand, hydrated lime and cement before the water is added. After the water is added the mixing should be continued until the mass is free from spots or streaks of color.

Third—Use mortar as thick as practicable. Do not use a "thin" mortar.

Keep the different batches as near the same consistency as possible.

Fourth—Measure or weigh mortar color; do not guess.

The first lot of color should be weighed, and after this has been done and the right shade secured, a measure holding that amount should be used for all subsequent batches of mortar. This is the only way in which a uniform shade can be secured.

That the contractor may be sure of the shade, it is best to make up some sample panels before starting the job. Make the panels as thick as the finished wall and back them with mortar, so the drying will be under normal conditions. Mortar dries out lighter than it appears when wet.

For cement, stucco, concrete, roofing tile, composition flooring, etc., the amount of coloring matter will have to be determined by experimentation, depending on shade desired. Knits material closer together, fills up pores in cement, denser and firmer, sort of waterproofing.

Causes of Inferior Results—

Poor color results can be obtained by:

Guessing at quantity of color used and not actual weight.

Insufficient mixing with the sand, cement and lime.

Skimping in quantity of color.

Mixing color with hot or even warm lime (when lump lime is used).

Efflorescence—

Efflorescence is caused by the depositing of soluble salts on the wall surface after the water of solution has evaporated. These soluble salts may exist in the mortar used in laying up the stone or brick, or they may exist in the brick or stone. This efflorescence is not caused by the incorporation of mortar color into the mortar; it can and does occur when uncolored mortar is used.

Regular Colors

Red, Brown, Buff, Double Strength Chocolate, Black.

For Odd Tints

Olive and Moss Green—

Mix buff and black.

Grays of All Kinds—

Use black sparingly.

Orange—

Mix buff and red.

Old Gold—

Buff, black and a little red.

Golden Brown—

Buff and brown.

Maroon—

Red and black.

Purple—

Red and black with a little ultra-marine.

Permanent Color Effects

As the oldest mortar color manufacturers in the country, we unhesitatingly stand back of our colors now so finely ground as to give the most effective coloring value.

ESTABLISHED 1878

C. K. WILLIAMS & CO.

Anchor Brand Mortar Colors and Cement Colors

EASTON, PA.

MINES AND RAW MATERIAL DEPOSITS

EASTON, PA. (two mines) FLEETWOOD, PA. READING, PA. WYOMISSING, PA. LEHIGH GAP, PA.
FRUITLAND, N. Y. MONROE, LA. MINERAL POINT, MO. MALAGA, SPAIN

PLANTS

EASTON, PA. (four plants) FLEETWOOD, PA. EAST ST. LOUIS, ILL. MINERAL POINT, MO.
FRUITLAND, N. Y. GRANITE CITY, ILL. MARTINS FERRY, OHIO ALLENTOWN, PA. MONROE, LA.
MALAGA, SPAIN

LOCAL REPRESENTATIVES

NEW YORK, N. Y., Emil Hoefle, 338 Grant Avenue, Brooklyn
BOSTON, MASS., C. E. Gale, 141 Milk Street
NEWARK, N. J., Tomkins Brothers, 48 Passaic Street
IRVINGTON, N. J., Tomkins Brothers, South 20th Street near Clinton Avenue
JAMAICA, L. I., N. Y., Tomkins Brothers, 181st Street and L. I. R. R.
RICHMOND, VA., R. McC. Bullington & Co., 1323 East Cary Street
PITTSBURGH, PA., E. E. Zimmerman, Bessemer Building
CLEVELAND, OHIO, Federal Lime & Stone Co., Williamson Building
CINCINNATI, OHIO, Carl Cassin, 37 Thoms Building
DETROIT, MICH., Baker & Collinson, 9800 Greeley Avenue
CHICAGO, ILL., R. D. Kinder, 500 North Dearborn Street
MINNEAPOLIS and ST. PAUL, MINN., L. A. Moore, 2233 Charles Street, Minnesota Transfer
SAN FRANCISCO, CAL., Marshall Dill, 216 Pine Street

AGENTS IN ALL PRINCIPAL CITIES

Products

Anchor Brand Mortar Colors.

Anchor Brand Cement and Stucco Colors.

The Growing Popularity of Mortar Colors

The many reasons for the marked growth in the popularity of mortar colors during the past decade may be summarized under a few main headings:

(1) For Mortar Matching the Brick—There are many instances where the architect desires to specify a mortar matching the brick in color. Where brick of a special color are used to gain particular color effects, or where panels of contrasting color are built into a brick wall, the effects are greatly reinforced by using mortar of the same color as the brickwork. It is also the general custom to specify mortar color matching the brick for interior work, especially hearths and mantels. The standard specifications of the American Face Brick Association provide:

"The hearth shall be of (name) brick laid as per drawings in a 1-3 cement mortar colored to match the brick."

(2) For Mortar Contrasting with the Brick—A second and still more popular effect is gained by specifying mortar colors contrasting with the brick. In such treatments, the brick is laid in a mortar of a color and shade which will bring out the full value of the beautiful gradations in tones and texture of the brick. This may require a certain contrast with the brick all of the same color, or to harmonize with a brick ranging in color from dark purples and blues down through reds, browns, and buffs in the same wall. Such combinations have become very popular and with the range of colors just cited, a good shade of brown or a dark chocolate give very excellent effects. Other combinations which have become especially popular are: rough texture variegated red brick with buff or with chocolate mortar; rough texture buff brick with chocolate brown mortar, red brick with black mortar and smooth-surface light buff or yellow brick with red mortar. However, most architects will prefer to make a personal selection.

(3) For "Mellowing" the Mortar—One of the principal charms of old brick buildings is the warm and mellow tone of the mortar. Unfortunately, not all mortars will acquire the same mellowness as they age, nor can the architect wait half a century for this effect. It can be gained immediately, however, by a judicious use of mortar color.

(4) For Color Control—The color value of sand and cement varies greatly with the source of material. On account of this variation in color, it is difficult for the architect to secure the same results on two jobs, or even a uniform result throughout the same job, unless mortar colors are specified. Our standard specifications as given on the following page provide architects with an exact method of color control.

(5) One-fifth of the Surface of a Brick Wall is Mortar—Proportions vary according to the width of the joint, but in the ordinary wall with ½-in. joints approximately one-fifth of the wall surface is mortar. For this reason, architects realize that it is necessary to select the mortar color with the same discriminating care that is devoted to the choice of the brick.

Special Facilities of C. K. Williams & Co.

C. K. Williams & Co. produces its own mortar, cement, and stucco colors in its own plants and as far as possible, from its own mines and sources of raw materials. For this purpose, it has a highly specialized organization and a plant equipment which consists of seven mines, two quarries, one natural gas well and fourteen color plants. One mine and one color plant are located in Spain where it produces its own Spanish Oxides. The remaining plants are located in different parts of the United States, and wherever possible, right at the source of supply of the raw materials.

The policy of the Company since its inception almost 50 years ago has been to produce colors of maximum quality and uniformity.

Absolute control of color from its raw state in the mine to the finished product direct to the dealer, is an advantage of greatest importance to the user.

Retail distribution is through dealers of mason supplies and building materials. These are supplied with Anchor Brand color strips and samples of available kinds of bricks, and we will be glad to show the possible combinations to facilitate a choice.

Continued on next page

Anchor Brand Mortar Colors

To produce satisfactory results, mortar colors must have three qualities; namely *permanence of color,* so the mortar will not change its shade with age; *uniformity of color,* so that all batches of mortar in which a given color is used will be exactly alike; and *fineness of grinding,* so that the maximum coloring power is developed.

Anchor Brand colors are manufactured in our own mills to meet these three requirements. The minerals are practically all obtained from our own mines and the process of manufacture is carefully controlled so that Anchor Brand colors are absolutely reliable.

Colors—They are furnished in eight colors, covering every ordinary requirement.

No. 1151	Light Red	No. 222	Double Strength Black
No. 115	Deep Red	No. 19	Light Buff (or yellow)
No. 1184	Brown	No. 18	Dark Buff
No. 220	Black	No. 1174	Double Strength Chocolate Brown

For special work we can supply special colors of any shade desired. Also some very good tints can be obtained by mixing the regular colors. Grays are obtained by using black sparingly, etc.

Sold in Dry Form—Anchor brand mortar colors are sold in the form of a dry powder. It is our experience that colors in this dry form are least expensive to the user and show the greatest coloring power per unit of weight.

Specifications for Coloring Mortar with Anchor Brand Mortar Colors

The following paragraphs are to be inserted in the Brick Masonry specifications:

Mortar Color—Mortar color shall be Anchor Brand Mortar Color, manufactured by C. K. Williams & Co., Easton, Pa., and delivered to the site in the original packages.

Cement Mortar—All mortar for face brick work in (state part of work) shall be accurately mixed according to the following formula:

188 lb. sand (2 cu. ft.)
94 lb. cement (1 bag)
9½ lb. hydrated lime
Approximately (15) lb. Anchor Brand (Double Strength Chocolate Brown) Mortar Color

The exact quantity of color to be used will be decided by the architect after the construction of test panels.

Mixing—Dry color, sand, hydrated lime and cement shall be thoroughly mixed before water is added. After the water is added, mixing shall continue until the mass is absolutely free from spots or streaks of color. Mortar shall be mixed as stiff as is practicable, and batches shall be kept as nearly as possible at the same consistency throughout the job. The same proportions of ingredients shall be accurately maintained in all the batches. The kinds of lime, sand, cement and color shall not be changed after the work has begun.

See Notes (1) and (2).

Test Panel—Test or sample panels as required by the architect shall be constructed in the same manner and of the same thickness as the finished wall. Face brick for test panel shall be laid in mortar mixed according to the formula and directions given above.

After test panels are thoroughly dry, the architect will decide whether the color of the mortar is satisfactory, or whether the amount of mortar color in the formula should be increased or reduced.

The first lot of color shall be weighed. After the desired shade is obtained in the first batch, a measure which will just hold the requisite quantity of color may be used for all succeeding batches.

See Notes (3) and (4).

Cleaning and Pointing—When plasterer has left building, all surface brick and mortar shall be thoroughly cleaned down by applying a solution containing not more than 1 part of muriatic acid to 20 parts of water, using a stiff wire brush. Surface shall then be rinsed with clean water. All defective joints shall be carefully pointed up at this time.

See Notes (5) and (6).

NOTES TO SPECIFICATIONS

(1) Lump Lime—If lump lime is used in place of hydrated lime, it must be thoroughly slaked and allowed to cool at least 24 hours before being brought in contact with mortar colors. *Hot lime bleaches color.*

(2) Accurate Mixing Necessary—Lime is a strong pigment, and sand and cement also have an important effect on the color. Thus, it is important to measure proportions accurately and maintain the same proportions throughout the work.

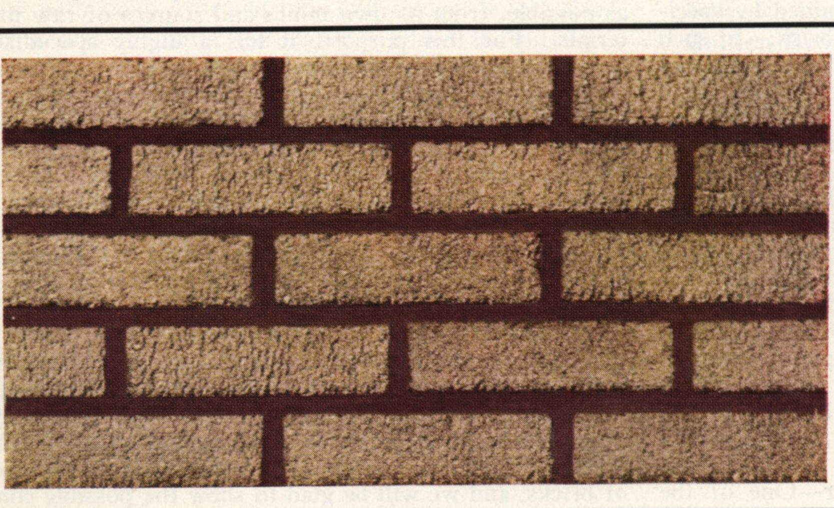
(3) Omission of Test Panel—For smaller jobs where cost is an important consideration, the test panel may be omitted. In this case, a little of the mixed mortar may be taken from the first batch and pressed into a small cake. When this cake is dry, it can be determined whether the color of the mortar will be satisfactory.

(4) Pigments Differ in Strength—For this reason, a specific formula is given for the use of every mortar color.

(5) Raking Joints—If joints are to be raked, defer raking till the mortar has begun to set.

(6) Prevention of Efflorescence—If mortar is mixed stiff and raking of joints deferred till mortar has begun to set, efflorescence will rarely be found. Should any occur, it will be removed by scrubbing the wall surface, as specified under Cleaning and Pointing.

Efflorescence is in no way caused by the mortar color. It is due to the occurrence of soluble salts in cement, sand, lime, water or the brick, and is just as common in plain mortar as in colored mortar, though not so easily visible.



Cream Rough Texture Brick Laid with Anchor Brand No. 1184 Brown

Straight Bond—Flush Joint

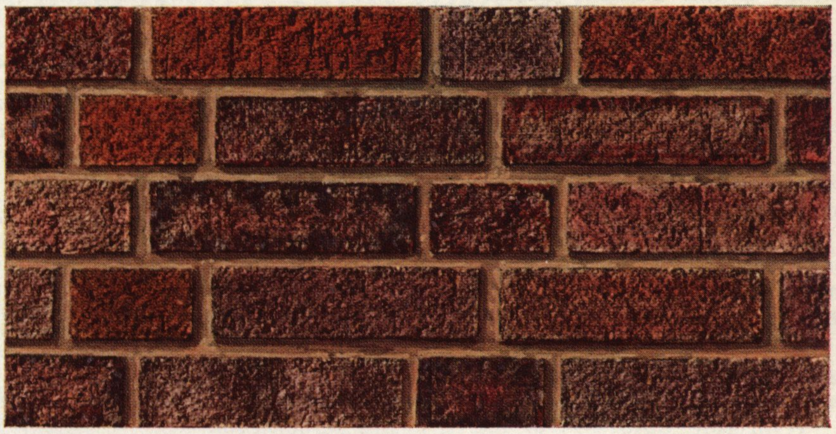
188 lbs. Sand (2 cubic feet)
94 lbs. Cement (1 bag)
9½ lbs. Hydrated Lime
20½ lbs. No. 1184 Brown

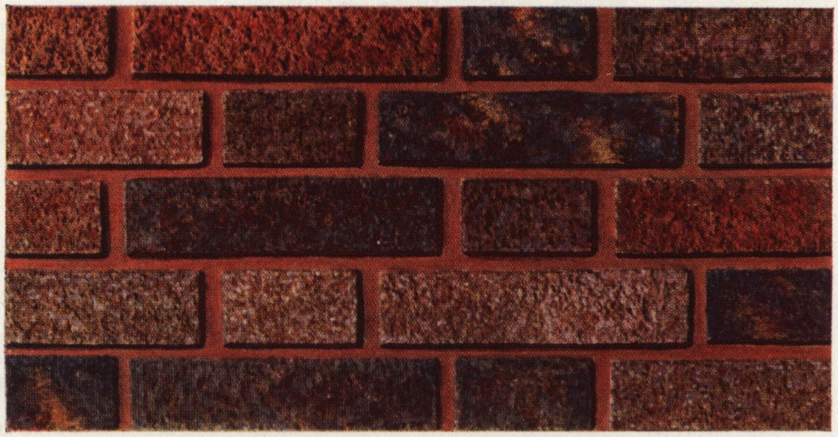
Continued on next page

Five Range Rough Texture Brick Laid with Anchor Brand No. 18 Double Strength Buff

Garden Wall Bond—Raked Joint

188	lbs. Sand (2 cubic feet)
94	lbs. Cement (1 bag)
9½	lbs. Hydrated Lime
13	lbs. No. 18 Double Strength Buff





Full Range Rough Texture Brick Laid with Anchor Brand No. 1151 Red

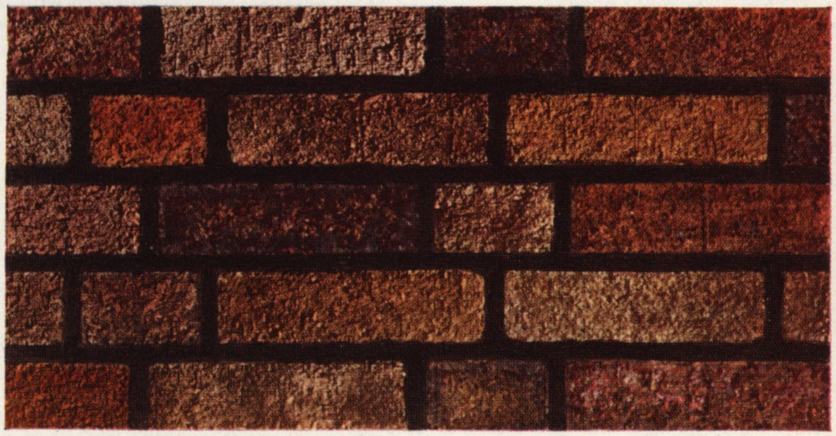
Flemish Bond—Raked Joint

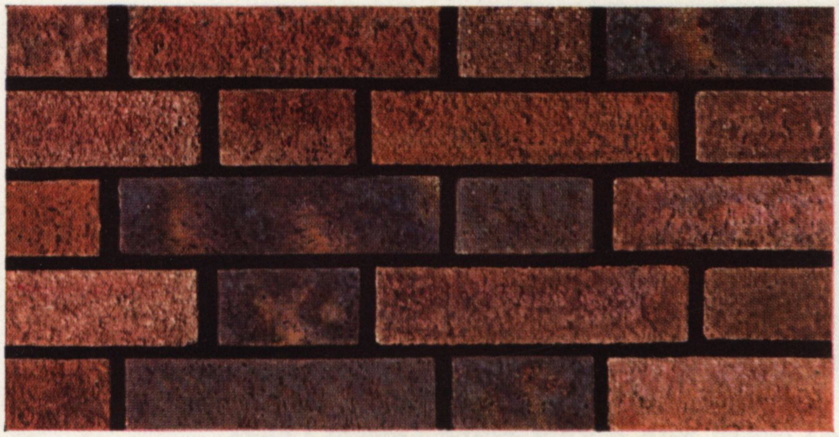
188	lbs. Sand (2 cubic feet)
94	lbs. Cement (1 bag)
9½	lbs. Hydrated Lime
20½	lbs. No. 1151 Red

Five Range Rough Texture Brick Laid with Anchor Brand No. 1174 Double Strength Chocolate

Garden Wall Bond—Flush Joint

188	lbs. Sand (2 cubic feet)
94	lbs. Cement (1 bag)
9½	lbs. Hydrated Lime
15	lbs. No. 1174 Double Strength Chocolate Brown





Full Range Rough Texture Brick Laid with Anchor Brand No. 222 Double Strength Black

Flemish Bond—Flush Joint

188	lbs. Sand (2 cubic feet)
94	lbs. Cement (1 bag)
9½	lbs. Hydrated Lime
14	lbs. No. 222 Double Strength Black

Continued on next page

Anchor Brand Cement Colors

Anchor Brand cement colors are very finely ground and produce clear, bright tones with a minimum of coloring material. They are used in floors, sidewalks, cast-stone work, roofing and floor tile, stucco, etc., and should not be confused with mortar colors.

For Cement Floors—Although colored cement floors are comparatively inexpensive, they should never receive the treatment of a cheap floor. Colored cement, if carefully laid, finished and protected, will be found to possess all the decorative qualities of more expensive materials, along with the strength and economy of concrete. Specifications are shown in the next column.

For Stucco—The popularity of colored or tinted stucco surfaces is increasing rapidly. Directions for the use of our stucco colors will be furnished on request.

Available Colors—Our list of colors suitable for cement and stucco work is too long to publish here, but the more important numbers are given below. For special shades or tints, we will be glad to supply samples on advice of just what is wanted.

No. 294	Maroon
No. 306-M	Dark Red
No. 305	Dark Red
No. 500	Medium Red
No. 487	Medium Red
No. 1241	Medium Red
No. 9135	Light Red
No. 1195-B	Light Red
No. 1133	Light Red
No. 1138	Light Red
No. 1168	Brown
No. 901	Brown
No. 1169	Brown
No. 96-L	Brown
No. 80	Brown
No. 805	Brown
No. 1149-L	Yellow Oxide
No. 1149-M	Yellow Oxide
No. 1149-D	Yellow Oxide
No. 1	French Yellow
No. 5	French Yellow
No. 7	French Yellow
No. 195	Light Buff
No. 17	Dark Buff
No. 18	Dark Buff
No. 1117	Dark Buff
No. 101	Dark Buff
No. 79	Olive Drab
No. 268	Green
No. 271-B	Green
No. 271-D	Green
No. 270	Green
No. 328	Blue
No. 225	Black
No. 216	Black

Specifications for Coloring Cement Floors

Subfloors under colored cement topping should be specified as usual, although it is better to use a fairly dry mix and tamp thoroughly. Allow 1 in. for top dressing, which should be laid immediately. The following paragraphs should be incorporated in the specifications:

Cement Floor—Cement color, wherever specified, shall be Anchor Brand Cement Color, manufactured by C. K. Williams & Co., Easton, Pa., and delivered to the site in original packages.

Top Finish—A 1-in. top finish shall be applied to floors in (state part of work), topping to be composed of 1 part fine sand, free from loam, 1 part cement, and 5% of the above mixture, by weight, of (No. 1195B Light Red) mortar color.

Mixing—Cement, sand and color shall be thoroughly mixed before water is added. Only enough water shall be added to make a heavy paste. Mixing shall continue till the mass is absolutely free from spots or streaks of color.

Application—While base is still moist, top dressing shall be applied as follows:

Trowel down about ½ in. of colored cement at a time, so as to work the air out of the mass. Build to the surface in this manner. Use the stroke board to chop the surface, as the mass will be too tough to stroke in the usual way. Take off any surplus with the trowel. Level the surface and let it lie till it becomes dull. Do not trowel until all water on the surface disappears. When finishing, dust the surface lightly with clear cement and 10% of color, thoroughly mixed.

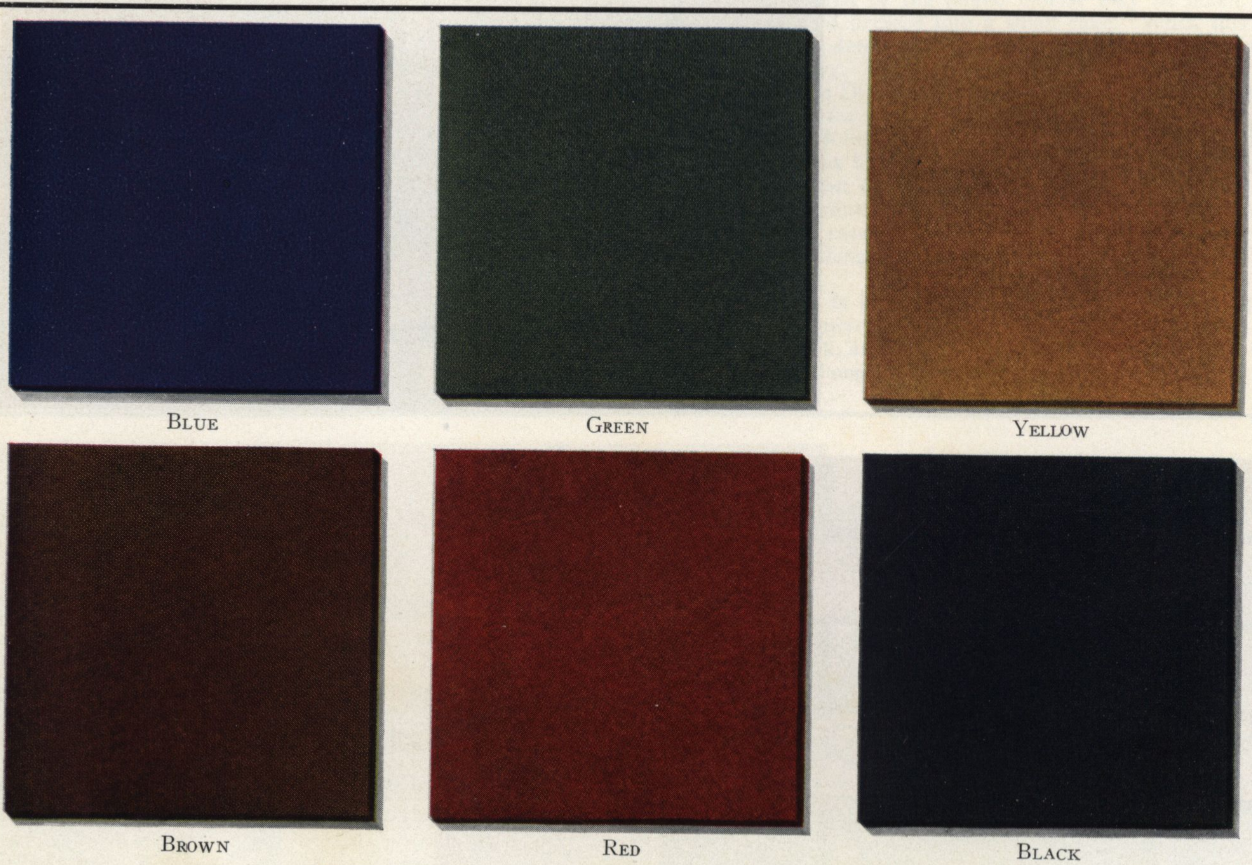
Tile Effect (Optional)—48 hours after application of top finish, floors shall be cut ⅛ in. deep with a three-cornered file sharpened to a diamond point, so as to produce a tile effect in the pattern directed by the architect.

Note: Cutting floors while green will produce a ragged edge.

Protection—As soon as topping is sufficiently set, floors shall be covered with a 2-in. thickness of sawdust, which shall be kept wet for at least 2 weeks.

Cleaning and Waxing (Optional)—When protective coating is removed, the surface shall be washed with linseed oil soap, using a wire brush, if necessary, to remove dirt and stains. When clean and dry, the surface shall again be covered with a 2-in. thickness of sawdust.

Just before the floor is to be put into use, it shall be polished with a floor wax approved by the architect and applied in accordance with the manufacturer's directions.



Blue Green Yellow

Brown Red Black

Cement Floor Tile Colored with Anchor Brand Cement Colors

AMERICAN CHIMNEY CORPORATION

Designers and Builders of Chimneys

TELEPHONE
STUYVESANT 3735, 5741

147 Fourth Avenue
NEW YORK, N. Y.

BRANCHES
PHILADELPHIA, PA., Stephen Girard Building
CLEVELAND, OHIO, 919 Ulmer Building
BOSTON, MASS., 141 Milk Street

Products and Services

The AMERICAN CHIMNEY CORPORATION designs and builds perforated radial brick and common brick chimneys of all sizes and for any purpose, such as boiler operation, smelter plants, chemical plants (acid gases), crematories and incinerators (high temperatures).

We also make a specialty of the repair and extension of old chimneys; design and construction of ornamental chimneys; inspection and repair of lightning rods on chimneys; refractory linings for steel stacks.

Construction Data on Perforated Radial Brick Chimneys

Foundations—The depth of the foundation should be approximately one twenty-fifth of the height of the chimney, but never less than 4 ft. Foundations are generally made octagonal. The width of the bottom slab should be made approximately equal to one-tenth of the height of the chimney plus its clear diameter at the top. It should taper off to a width approximately 1 ft. greater than the stack at its base. The resultant maximum compressive stresses will be found to be approximately 3 tons per sq. ft., suitable for sand or gravel bottoms.

Wall Thickness—The thickness in inches of the brick wall at the bottom of the chimney should be at least equal to

$$\frac{\text{Height of chimney in feet}}{9} + 4 \text{ in.}$$

It should gradually decrease towards the top of the chimney to 7 in. for chimneys of less than 7 ft. in diameter; to 8 in. for chimneys 7 to 10 ft. in diameter; and to 10 in. for chimneys of larger diameter.

Batter—The taper of the chimney depends on the ratio of height to diameter.

The following will serve as a guidance:

H/d equals 15; taper equals 2 ft. 3 in. per 100 ft. in height
H/d equals 20; taper equals 4 ft. per 100 ft. in height
H/d equals 30; taper equals 4 ft. 6 in. per 100 ft. in height

Height of Sections—Sections should not exceed 20 ft. in height.

Lining—A lining should be provided, equal in height to approximately one-fifth of the total height of the chimney in case of boiler plants. It should be equal to at least one-half of the height of the chimney for stacks carrying temperatures of 800° to 1200° and a high grade firebrick lining for the entire height is necessary in case temperature exceeds 1500°.

The lining should start 2 ft. below bottom of flue opening. If there is danger that combustible material may be carried over into the chimney and be ignited there, the lining should start at the top of the foundation.

Base—If a common brick base is desired, it is generally built octagonal or square. The height should be approximately one-fifth of the total height of the chimney.

Wall thickness should be not less than

$$\frac{H}{9} + 7 \text{ in.}$$

Flue—The area of the flue should be approximately 10% larger than the clear area of the chimney at the top.

Let D equal clear diameter of the chimney at the top. Satisfactory results in regard to draft hindrances as well as stability are obtained by making:

Width of flue=0.60 D
Height of flue=1.45 D

The I-beams over the top of the flue should be carefully protected by a masonry arch with ample clearance between I-beams and arch to take care of expansion.

Lightning Rod—The lightning rod should have a point for every 3-ft. circumference at the top of the chimney. The points should be made of copper and should not extend more than 4 or 5 in. above top of the chimney as a protection against the effects of acids contained in the gases and to avoid swaying in the wind, resulting in a quick loosening of the anchors. The cable should be at least $\frac{1}{16}$ in. thick and the earth terminal should consist of a copper cylinder of at least 4-sq. ft. contact surface.

Radial Bricks—The radial bricks should weigh not less than 120 lb. per cu. ft. when laid in the wall, and their perforations should not exceed 25% of the area of the brick. Each perforation should not exceed 1 sq. in. in area as otherwise in laying the bricks the perforations will be entirely filled up with mortar, defeating the purpose for which they are arranged. The water absorption of the brick should be between 8 and 12%.

Steel Bands—Should be provided at least at the top and above and below the flue opening. They should be of ⅜x2½-in. stock.

Step Irons—Step rungs should be of ¾-in. round iron with hooks at the end to secure them in the walls. They should be placed not more than 16 in. apart. An inside ladder is preferable to an outside one.

Cast Iron Cap—Chimneys should be provided with a sectional cast iron cap, especially in cases when they are operated periodically (as in heating plants).

Estimates

When asking for information or estimates, kindly advise on the following points:

(1) Intended use of chimney (boiler furnace, smelter, chemical plant, incinerator).

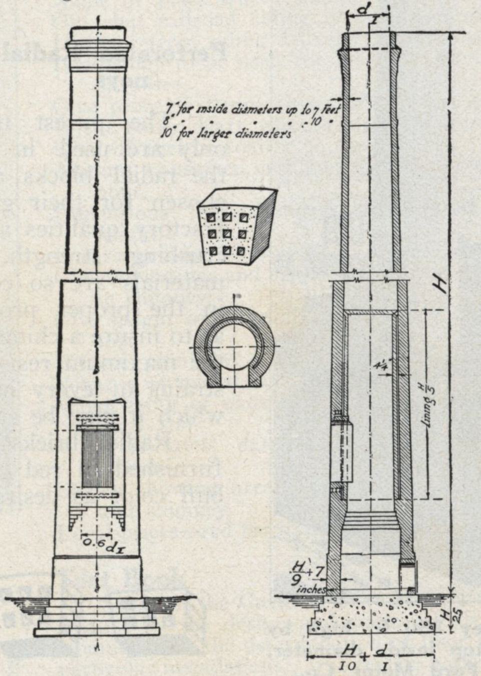
(2) Height above foundation and diameter or boiler horsepower or number and dimensions of boilers.

(3) If a bid is desired on foundation, give character of soil.

(4) Does chimney stand independent of building? If it is a part of the building, state for what height.

(5) Give hauling distance from purchaser's railroad siding or nearest railroad freight yard.

(6) If possible, give approximate prices of building materials and wage scale of local common labor.



DESIGN DATA—CHIMNEY FOR BOILER OPERATION

CONTINENTAL CHIMNEY CO., INC.

Radial, Common Brick and Reinforced Concrete Chimneys

127 North Dearborn Street
CHICAGO, ILL.

TELEPHONE
Dearborn 6607

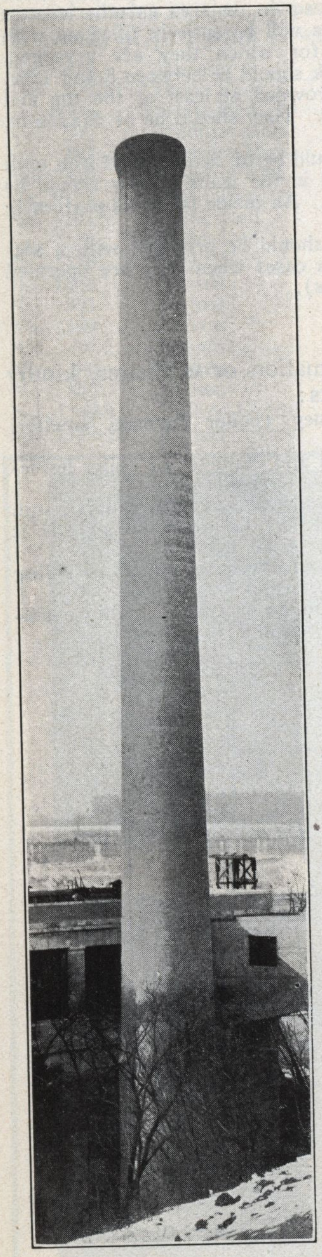
ST. PAUL, MINN., 432 Endicott Building

PHILADELPHIA, PA., 419 Perry Building

Products and Services

Perforated Radial and Common Brick Chimneys, Designed and Constructed for all purposes, and of all sizes.

Old Chimneys Extended, Repaired, Straightened, and Pointed while in operation; Reports and Recommendations on condition of old chimneys; Steel Stacks Lined.



Chimney 250 ft. high by 12-ft. top inside diameter, for Ford Motor Co., St. Paul, Minn.

Engineering Service and Facilities

Reliable information and recommendations will be given by our engineers regarding the proper dimensions of chimneys with full consideration of the purpose for which they are designed. Advice will be given as to boiler arrangements and other conditions.

Twenty-eight years' experience in building chimneys in all parts of the world enables us to render the most efficient and economical service in all the details involved.

Perforated Radial Chimneys

The purest materials only are used in making the radial blocks and are chosen for their great refractory qualities and high crushing strength. These materials are so combined in the proper proportions as to insure a chimney with the maximum resistance to strains of every nature to which it may be subjected.

Radial bricks can be furnished in red or light buff color as desired.

Common Brick Chimneys

The Continental Chimney Co., Inc., also builds round common brick chimneys of inside top diameter from 3 ft. 6 in. and larger.

These chimneys are just as good looking and durable as the radial brick chimneys; they have been in use for many years and have given universally good results and satisfaction.

Data Required for Chimney Designs and Estimates

Give all possible information regarding place, transportation, dimensions of chimney required, boiler horsepower, probable temperatures, etc.

State nature of soil where chimney will be erected.

Give local prices for necessary building material.

In accordance with the above information, designs and lowest estimates of the chimney needed will be submitted.

Chimney Repairing

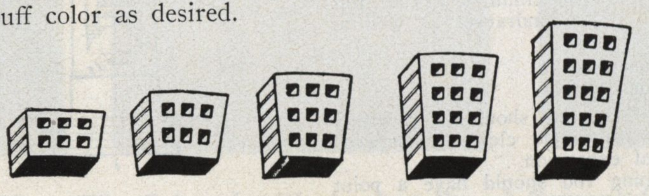
Chimneys are extended with no interference to operation of plant. Old chimneys repaired, straightened, pointed and banded while in operation.

Dimensions or plan of chimney should always be given when requesting information or estimates on repair work or alterations.

We also make inspection of old chimneys and furnish reports on their condition.

ATWATER KENT

Chimney 175 ft. high by 8-ft. top inside diameter, for Atwater Kent Mfg. Co., Philadelphia, Pa.



Perforated Radial Blocks

ALPHONS CUSTODIS CHIMNEY CONSTRUCTION CO.

TELEPHONE
CORTLANDT 8428

95 Nassau Street
NEW YORK, N. Y.
CHICAGO, ILL., Marquette Building

CABLE ADDRESS
"CUSTOS, NEW YORK"

AMERICAN BRANCH OFFICES

ATLANTA, GA., Healey Building
BALTIMORE, MD., 1103 Lexington Building
BOSTON, MASS., 51 Ellery Street
CLEVELAND, OHIO, 405 Caxton Building
DALLAS, TEX., 509 Insurance Building
DETROIT, MICH., 614 Moffat Building
MILWAUKEE, WIS., 548 Milwaukee Street
MINNEAPOLIS, MINN., 120 South 9th Street
PHILADELPHIA, PA., 1234 Callowhill Street
PITTSBURGH, PA., Empire Building
PORTLAND, ORE., 222 Pine Street
RICHMOND, VA., 301 American National Bank Building
ST. LOUIS, MO., Syndicate Trust Building
SEATTLE, WASH., Colman Building

CUSTODIS CANADIAN CHIMNEY COMPANY, LTD.
TORONTO, ONT., 73 King Street, West
MONTREAL, QUE., 306 New Birks Building

Products and Services

Designers and Builders of PERFORATED RADIAL BRICK CHIMNEYS, with FOUNDATIONS and FLUES, of all sizes, for boilers, furnaces, crematories, ovens, smelters, hotels and office buildings; ACIDPROOF CHIMNEYS for paint works, chemical and metallurgical industries; HIGH TEMPERATURE CHIMNEYS for incinerators; BOILER SETTINGS and REFRACTORY BRICKWORK; REPAIRING and HEIGHTENING OLD CHIMNEYS; LIGHTNING RODS Installed and Repaired.

Specifications, plans, designs and data furnished free on request.

The ALPHONS CUSTODIS CHIMNEY CONSTRUCTION Co., with 65 years of experience, is equipped to give expert advice as to the size and shape of any kind of a chimney, for any purpose, as well as make recommendations through its engineers regarding boiler layouts, boiler settings, refractory masonry and the design of flues and settings.

The boilers, the flues, the coal used, kind of gases, geographical location and other conditions affect the determination of the most economical and efficient size of chimney. State conditions and results desired and our engineers will promptly furnish the correct, efficient and economical size and design for that particular purpose. We make no recommendations from theoretical tables, but from our experience and data collected from actual working conditions of our chimneys all over the world.

The fact that there are over 12,000 Custodis radial brick chimneys in successful operation today is conclusive proof of their permanency, economy and efficiency.

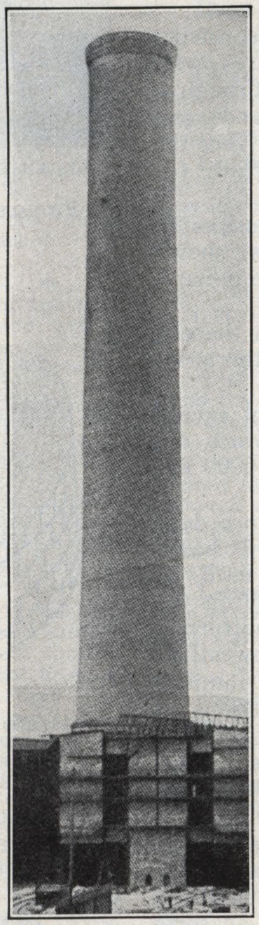
Perforated Radial Brick Chimneys

The perforated radial blocks are made only from the purest clays, selected for high refractory powers and high crushing strength. Special attention is given in the brickyards to making the proper mix of clays in the right proportion to produce a radial brick chimney which will resist heat strains, as well as strains from weight and wind. All the radial blocks are formed to suit the circular and radial lines of each part of the chimney, so that they can be laid with thin, even joints and produce a regular smooth surface.

The blocks are larger than common bricks, making the number of mortar joints in a radial brick chimney one-third of those in a common brick chimney of the same size. Moulded with vertical perforations, the radial blocks are most thoroughly and uniformly burned, materially increasing their density and strength. The perforations form a dead air space around the chimney, insulating the hot column of rising gases on the inside from sudden changes of temperature of the outer air. This results in a maximum draft under all conditions.

Boiler Settings and Refractory Brickwork

We maintain a department for the setting of new boilers; overhauling of old boiler settings; the construction of oil stills, industrial furnaces and similar installations.



Tallest and Largest Chimney in the World Built for Anaconda Copper Mining Company, Anaconda, Mont.

Height above grade, 585 ft.
Inside diameter at top, 60 ft.
Built in 1918

Repairing and Heightening

We repair brick chimneys and concrete chimneys. Work done while chimney is in operation, if necessary.

We heighten old chimneys without interruption to the plant. Send us plan of the old chimney and our Engineering Department will furnish design and figure for heightening it.

We remove old brick chimneys without danger.

We inspect chimneys and make reports and recommendations on their condition.

Lightning Rods

Lightning rods installed and repaired. Special rods for acid chimneys.

Information Required for Estimates

Name of place where chimney is to be erected.
On what railroad siding is same located.
Distance from siding delivery to chimney site.
Is chimney to be used for boiler drafts or other purposes.
Give probable temperatures of the flue gases.
If for boiler draft, what is total horsepower.
Kind of fuel or coal to be used.
Amount consumed per horsepower or total per hour.
Dimensions of chimney required—diameter; height.
Is arrangement for overhead or underground flue.
Give dimensions and shape of flue opening desired in chimney.
Give height of same above or below foundation top.
What is nature of soil where chimney will stand.
What is estimated safe load per square foot.
What depth of excavation is necessary to reach good soil.
What is latest date allowed for erection of chimney.
Sketch showing arrangement of building, boiler and chimney.
Local prices—red brick, lime, cement and sand.

Text Book

Send for the Custodis Text Book, a technical treatise on the design and static calculations of chimneys and the determination of their sizes for particular installations. It is replete with valuable and heretofore unpublished information.

THE M. W. KELLOGG COMPANY

Manufacturers of Perforated Radial Brick Chimneys

140 Cedar Street
NEW YORK, N. Y.

BRANCH OFFICES
BOSTON, MASS. PHILADELPHIA, PA. CHICAGO, ILL. PITTSBURGH, PA.
LOS ANGELES, CAL. SAN FRANCISCO, CAL.
CANADIAN KELLOGG CO., LTD., MONTREAL, TORONTO, WINNIPEG, CAN.

Products

PERFORATED RADIAL BRICK CHIMNEYS.

Service

THE M. W. KELLOGG COMPANY has erected some of the finest chimneys in the United States during the last twenty years, and is ready to share the results of that experience with engineers and architects who are engaged in problems where chimney construction is required.

This company's engineers will be glad to advise on types, sizes, shapes, etc., of chimneys for any condition that may arise.

Kellogg Perforated Radial Brick Chimneys

No artificially produced material for the construction of the modern factory chimney compares with refractory clay. This raw material is put through a variety of scientific treatments by skilled hands and especially designed machines before it comes from the kilns in the form of perforated radial brick ready for shipment, and for use in chimney construction.

Each brick is formed to occupy a certain position in the circular and radial lines of the chimney, as shown by the drawing on this page, and is sound ringing, hard, well burned and free from checks.

Bricks are made to conform closely with the circular and radial lines of the shaft and are weatherproof and acidproof.

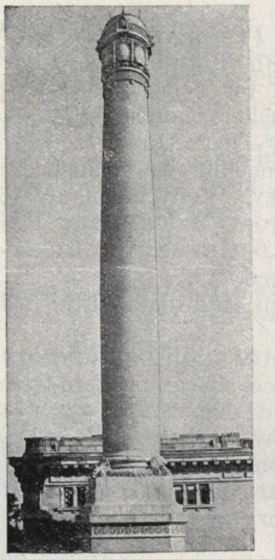
The total amount of perforations does not exceed one-fourth of the cross area of the brick, which are tested to a crushing strength of not less than 6000 lbs. per sq. in.

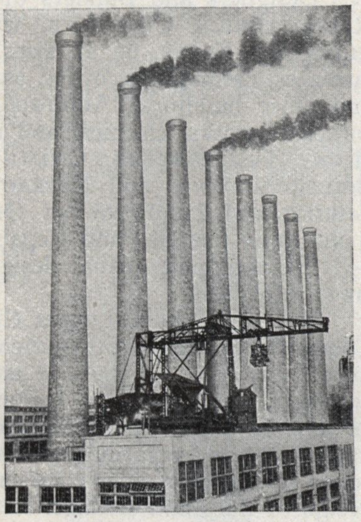
The perforations in the radial bricks form a dead air space about the core of the chimney. This has a marked effect in reducing amount of fuel used, in preventing sudden changes of temperature within the chimney, and in reducing radiation. Thus a uniformly maximum draft is maintained in any kind of weather.

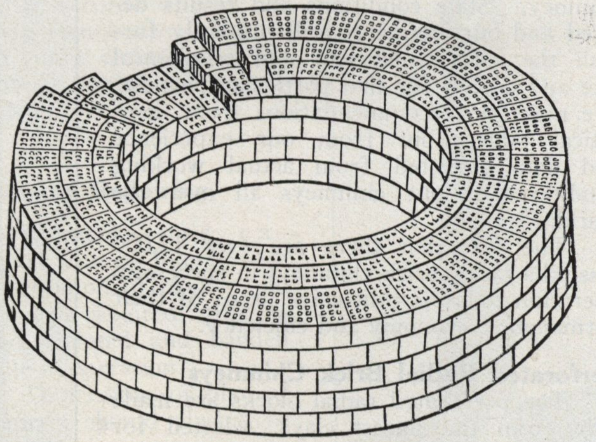
A trained superintendent of construction, familiar with all the details of the plans and specifications of the chimney, accompanies each shipment of radial brick, to supervise unloading and stacking in the order of their use. Throughout the entire construction the bricks of each tier reach their final place under his direction.

An expert mortar man supervises the preparation and use of all of the mortar. The tensile strength of the chimney, its ability to withstand heat and cold and to defy all sorts of weather from without and all sorts of gases from within, depend largely upon this mortar. Each brick is laid in so full a bed of mortar that the latter enters the perforations of the brick from 1 to 1½ in. The joints are struck both inside and out.

A crew of trained men in scientific chimney construction carry forward the erection of the chimney from start to finish, insuring careful construction and the proper grading and matching of brick throughout.


QUEEN LANE FILTER PLANT
PHILADELPHIA, PA.


CORN PRODUCTS REFINING CO., ARGO, ILL.


METHOD OF USING M. W. KELLOGG'S PERFORATED RADIAL BRICK IN CHIMNEY CONSTRUCTION

Standard Specifications for Perforated Radial Brick Chimneys

Scope—The work included under this contract is to consist of all labor and material necessary for the erection complete of one radial brick chimney in accordance with this specification, which shall become a part of the contract. The proposal shall include all scaffolding, cartage, unloading of material and removal of rubbish necessary to leave the chimney in a first class condition ready for operation.

Continued on next page

Delivery—The chimney will be built at................ ....located on the................ ....railroad.

Material may be unloaded on owner's siding, which is within....................of the chimney site.

Space—Sufficient storage room for chimney contractor's materials will be provided adjacent to chimney as well as unobstructed access from transportation delivery to the site of chimney for delivery and removal of materials and tools. At least one side of chimney will be left free and open by the owners for hoisting and working space until the chimney is completed.

Water—The owners will provide the chimney contractor with necessary water within 50 ft. of the site of the chimney free of expense to the chimney contractor. From this point the chimney contractor will make his own hose connections, if required.

Workmanship and Materials—All workmanship and materials shall be first class.

The chimney contractor shall furnish a competent foreman under whose supervision the chimney will be built. Chimney must be built in a thorough, complete and workmanlike manner.

Time of Completion—The chimney contractor shall state in bid the guaranteed number of working days in which he will finish the chimney after receipt of signed contract and approved drawings.

Foundation—Proper foundation will be built by the owner from plans and specifications to be furnished by the chimney contractor, who will, on completion, give in writing his approval of the foundation as being sufficient to sustain the chimney and fulfil the guarantee.

Note: In case, however, it is desired to have chimney contractor build the foundation, the following may be used:

The chimney contractor shall furnish a concrete foundation of proper depth and spread to safely sustain the chimney. The foundation shall not be loaded to more than........tons per sq. ft., which is the safe bearing value as determined for this work.

Excavating shall be done by contractor for foundation.

The concrete shall be composed of cement, sand, stone or gravel in the proportion of 1 part cement to 2½ parts sand and 5 parts of stone or gravel. It shall be deposited in the forms in layers not to exceed 6 in. in thickness and thoroughly rammed into place. Concrete shall be a wet mixture.

Design—The design of the chimney shall conform to the following dimensions as shown on drawing attached:

Height above top of foundation..........ft............in.
Minimum internal diameter..........ft...........in.

The wall of the column shall have one straight and true batter from top to bottom. The wall thickness and section lengths to be as shown on drawing. In case the contractor's standard wall thickness should not be exactly as shown, a variation of 3% will be allowed in either direction.

The chimney shall be built of perforated radial brick for the entire height, as hereinafter specified.

Base—If chimney is to be built with base and column construction, use the following:

The base of the chimney shall be built [here fill in shape of base] in shape..........ft. high, of the dimensions shown on drawing, of straight, hard, well burned, well shaped common building brick laid in full bed of cement lime mortar as herein specified.

Radial Brick—All radial brick shall be best quality, moulded from refractory clay, sound ringing, hard, well burned, well shaped, of reasonably even color and free from checks; made to closely conform with the circular and radial lines of the shaft, and shall be weatherproof and acidproof. They shall have a water absorption of not less than 5% nor more than 12% of their dry weight after immersion for a period of 24 hr.; and shall have a crushing strength of not less than 6000 lb. per sq. in. The total amount of perforations shall not exceed one-fourth of the cross area of the brick. One cu. ft. of radial brickwork shall weigh not less than 120 lb.

The outside faces of the brick shall be of regular size, so that the general appearance of the brickwork will be neat and uniform.

Lining—The chimney shall have an expansion lining built of perforated radial fire brick 4¼ in. thick,..........ft. high from a point 2 ft. below the bottom of the flue opening. The lining prevents flue gases from coming in contact with the solid masonry of which the shell is built, and shall be separated from same by an air space of not less than 2 in.

The lining shall be built after the chimney is finished, and exceptional care must be taken to keep the air space clear and free of loose mortar and other dirt.

Rack out the shell of the chimney approximately 2 in. above lining, to form a ledge for the purpose of diverting the falling soot when the chimney is in operation.

Mortar—All brickwork shall be laid in cement lime mortar, as hereinafter specified, with courses level and with regular joints throughout. Face brickwork and backing to be laid up at the same time with joints of reasonably even thickness, not exceeding ½ in. The mortar to be used in the chimney shall consist of 1 part portland cement, 2 parts fresh burnt lump lime mortar and 5 parts clean, sharp sand. The cement to be added to the sand and lime mortar as the mortar is required, and no mortar having taken an initial set is to be used. The cement must not be added until the lime is cool. The sand shall be clean and sharp, free from loam, vegetable matter and large pebbles. If necessary, it must be both screened and washed.

Bond—All common brickwork shall have every fourth course a header course.

Radial brickwork shall be bonded every three courses.

Breeching Opening—One opening shall be provided in chimney. The opening to be lined on the reveals with refractory material. The masonry above the opening to be supported by heavy I-beams set on steel plates, with air spaces at each end for expansion. Under these I-beams a flat masonry arch shall be built to properly protect the beams from the effect of the gases. The flue opening shall be reinforced laterally by heavy tie rods and plates over the top and at the bottom.

Steel bands, ⅜x3 in., to be placed in the masonry above and below opening.

The opening shall be..........wide by..........high, the bottom of which shall be approximately..........above foundation.

Reinforcing Rings—The chimney contractor shall place in the brickwork at every change in wall thickness steel bands ⅜ in. thick by 3 in. wide.

If the contractor should furnish perforated radial brick having corrugated sides, these bands may be omitted.

Head—The head of the chimney shall be neatly corbeled out and fitted with a heavy annular retaining ring set in full bed of cement mortar.

Clean-out Door—Provide and place in base of chimney where directed by owner a cast iron clean-out door and frame properly hinged and fitted with latch. Said door to be approximately 24 in. wide by 36 in. high.

Ladder—Build on the interior of the chimney a ladder to consist of ¾-in. galvanized iron rungs, spaced approximately 15 in. center to center and securely anchored to the masonry from top to bottom. These ladder irons to be in the shape of a "U" with hooked ends.

Lightning Conductor—The lightning conductor is to consist of..................copper points, ¾ in. in diameter by 8 ft. long, with 1½-in. platinum tips. The points to be anchored to the top of the column and extend from the bottom of the corbeling upward. The lower ends of the points to be connected by a loop of copper cable encircling the chimney. From this loop there is to be 1½-in. 7-strand No. 10 Stubbs' wire gauge copper cable, carried down the side of the chimney and connected to copper ground plate of the 3-winged type as best for the proper distribution of charge. The points to be securely fastened to the top of the chimney and the cable to be anchored every 7 ft. in height with brass anchors, so designed that they will support the weight of the cable. The ground plate shall be buried by the contractor for the foundation when it is built.

Lettering (When Desired)—Work into the column on [one or two] sides as directed the letters [here insert the desired legend] to be made in permanently colored kiln burnt brick. Letters to be true to size and shape and to be in a true vertical line.

Trimmings (If Any)—All necessary stone or terra cotta shown on drawing will be furnished without charge by the building contractor to the chimney contractor, who will set same. No one piece should weigh over 200 lb.

Insurance—The chimney contractor shall carry at his own expense, during the entire period of construction, liability insurance, insuring the men in his employ and the public in general, in case of damage due to accidents.

Guarantee—The chimney contractor shall guarantee the chimney for a period of 5 years from date of completion. The guarantee shall cover any defects that may arise within this period due to faulty design, construction, material, weather, and the products of combustion up to 800° F.; and shall further guarantee to make good at his own expense all defects that may arise from any of the above conditions within the specified period.

The chimney shall be designed for a wind velocity of not less than 100 miles per hour.

Note: The chimney shall be built according to THE M. W. KELLOGG COMPANY [or equal] system of construction.

H. R. HEINICKE, INC.

Builders of Radial Brick Chimneys

221 South New Jersey Street
INDIANAPOLIS, IND.

147 Fourth Avenue
NEW YORK, N. Y.

FACTORY: NEWCOMERSTOWN, OHIO

SALES OFFICES

BOSTON, MASS.
LOS ANGELES, CAL.
CHARLOTTE, N. C.
MILWAUKEE, WIS.
CLEVELAND, OHIO
PHILADELPHIA, PA.
DETROIT, MICH.
MONTREAL, CAN.
KANSAS CITY, MO.
TORONTO, CAN.

Products and Services

Specialists for over 20 years in the design and construction of PERFORATED RADIAL BRICK CHIMNEYS and accessory structural members, including Foundations, Boiler Setting and Brick Furnaces.

Manufacturers of PERFORATED RADIAL BRICK.

Also, Grain Elevators, Tanks and Silos.

Our Engineering Department will gladly advise as to your chimney requirements, and is prepared to furnish special drawings and specifications for architects and engineers.

Rush work a specialty. Material always ready for immediate shipment from the factory.

Repairing and Inspection

We maintain a special Repair and Inspection Department for convenience of our customers. If you have trouble wire us. Repair work done while chimneys are in operation if necessary. Lightning rods installed and repaired.

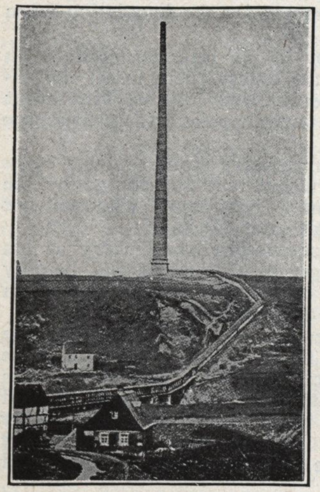
Heinicke Radial Bricks and Chimneys

Heinicke chimneys are constructed of specially formed perforated bricks manufactured by Heinicke themselves. These bricks are shaped to the circular and radial lines of the chimney, producing, when in place, smooth and true inner and outer surfaces.

They are hard burned, regular in shape, sound ringing, weatherproof and acidproof. Produced from selected, chemically tested and carefully proportioned refractory fire clay and shale.

The perforations permit of thorough burning of the bricks, assuring a product which is highly resistant to acids, heat, weather and other deteriorating influences.

Our brick plant is run as a part of this business and not as a separate enterprise. It is the only brick plant in the United States which makes a specialty of radial bricks. Radial bricks are produced by other brick makers simply as a side line in connection with their regular business and, of course, the same care and attention can not be given. The Heinicke bricks are superior to the brick ordinarily used and are made by this company to maintain a high standard of excellence.



HEINICKE CHIMNEY SERVING A SMELTER
Height, 460 ft.; clear diameter at top, 8 ft.

Since we manufacture the brick and erect the chimneys by our own organization, full responsibility is assumed for results without question or argument.

Heinicke chimneys are bonded in every direction. This, with the concealed reinforcement employed, enables us to absolutely guarantee chimneys against cracking, except from unusual cause or abuse.

Heinicke designed chimneys have been erected in Europe and America and thousands are in operation today as examples of their success. As specialists in the engineering and designing of chimneys, this company's experience is available to engineers, architects, contractors and owners.

Features of Design and Workmanship

(A) Perforations in radial bricks form insulating dead air spaces in wall of chimney, which reduce radiation and prevent sudden temperature changes within chimney, resulting in a considerable saving in fuel. Mortar slightly extends into perforations, forming an anchorage that adds greatly to stability of chimney.

(B) Concealed steel bands are used in reinforcing chimney; these add materially to strength in resisting stresses due to expansion, and insure safety against cracking.

(C) The Heinicke system of bonding provides for breaking of joints between courses. Every course is thoroughly bonded through use of bricks varying in length from 4 to 10 in.

This method of bonding gives greater strength and resistance to lateral stresses than other systems; the increase in strength over the common bond amounts to about 300%.

(D) Erection of chimney is done from inside, doing away with outside scaffolding and eliminating accompanying dangers to workmen as well as unnecessary cost.

Estimates

Please advise us on the following points:

(1) Distance from nearest railroad siding or team track.

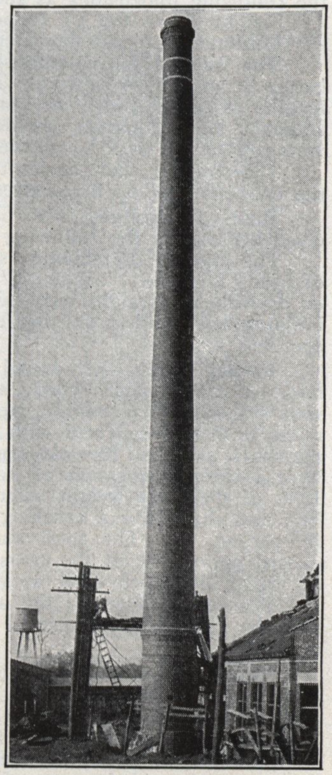
(2) Intended use of chimney (boilers, furnaces, incinerators, smelters).

(3) Height and diameter, or boiler horsepower, or type, number and dimensions of boilers.

(4) Kind of fuel to be used.

(5) Character of soil for foundation.

(6) Approximate price of cement, lime, sand, gravel, crushed stone and common hard brick, delivered at chimney site.



PASSAIC METAL WARE CO., PASSAIC, N. J.
Height, 125 ft.; clear diameter at top, 3 ft.

WM. SUMMERHAYS SONS CORPORATION

Designers and Builders of Radial Brick Chimneys

70 Exchange Street
ROCHESTER, N. Y.

BRANCH OFFICES

PHILADELPHIA, PA., 1015 Chestnut Street
MONTREAL, QUE., 132 St. Peter Street

TORONTO, ONT., 45 Jarvis Street
HALIFAX, N. S., 334 Roy Building

Products

This company designs and builds Radial Brick Chimneys, Common Brick Stacks and Foundations.

Also, Chimney Repairing, Steel Stack Linings, Flues, Brick Boiler Setting, Special Furnaces, and Ovens.

Lightning Arrestors installed and repaired.

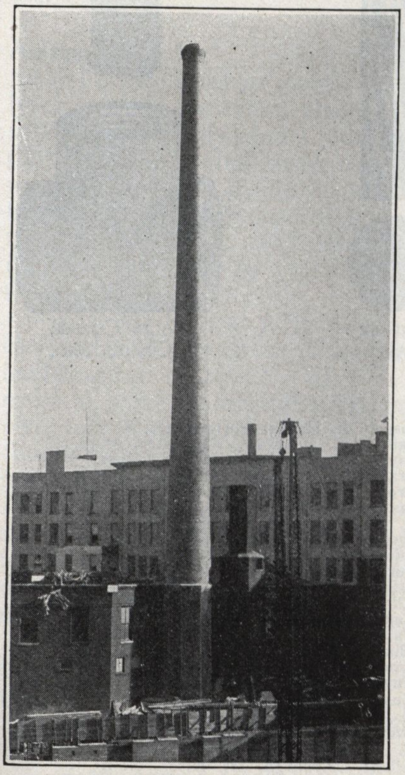
Sixty-nine Years of Successful Chimney Building

Summerhays brick chimneys embody the results of 69 years of successful chimney building and the present day practice is the cumulative experience of three generations.

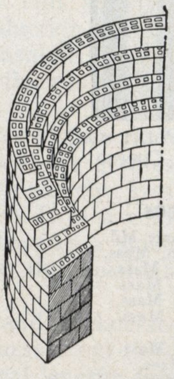
Summerhays chimney experts will, without charge, submit recommendations, plans, estimates, etc., for proposed radial and common brick chimneys and foundations, based on the knowledge gained through their long experience in chimney building.

Perforated Radial Brick

These brick are made from a selected material moulded from dies of this company's own design in varying sizes and radii, to make a perfectly bonded wall and to conform to the circumference of the chimney for any diameter. They are hard burned to the point of vitrification. The perforations insure an even and thorough burning of the entire brick, giving a material of maximum strength. The air pockets formed by these perforations, which are sealed with mortar, serve to insulate the hot flue gases from cooling by the atmosphere.



Built at Rochester, N. Y.
175x4 ft.



How Summerhays Radial Brick Are Bonded

Wall bonding of Summerhays radial brickwork is accomplished by the use of brick of such varying lengths as to assure a thorough breaking of vertical and horizontal joints. This bonding is made every three courses

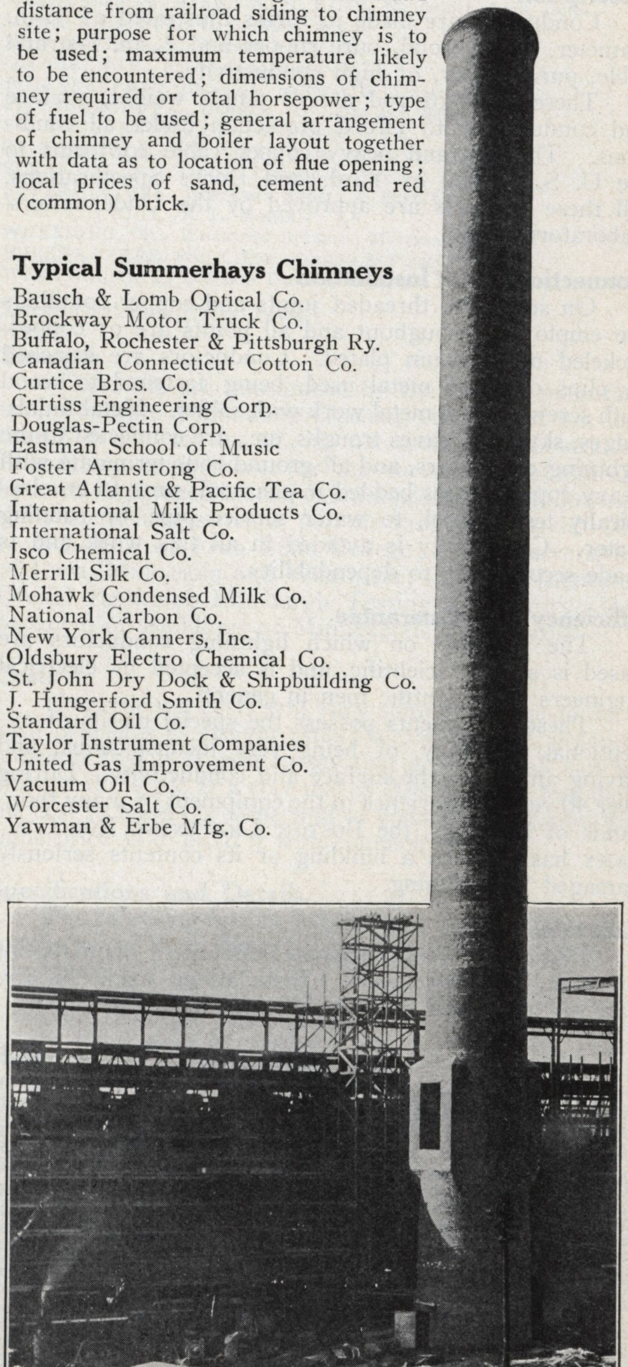
Estimates

When writing for estimates give the following information:

Nearest railroad freight station and distance from railroad siding to chimney site; purpose for which chimney is to be used; maximum temperature likely to be encountered; dimensions of chimney required or total horsepower; type of fuel to be used; general arrangement of chimney and boiler layout together with data as to location of flue opening; local prices of sand, cement and red (common) brick.

Typical Summerhays Chimneys

Bausch & Lomb Optical Co.
Brockway Motor Truck Co.
Buffalo, Rochester & Pittsburgh Ry.
Canadian Connecticut Cotton Co.
Curtice Bros. Co.
Curtiss Engineering Corp.
Douglas-Pectin Corp.
Eastman School of Music
Foster Armstrong Co.
Great Atlantic & Pacific Tea Co.
International Milk Products Co.
International Salt Co.
Isco Chemical Co.
Merrill Silk Co.
Mohawk Condensed Milk Co.
National Carbon Co.
New York Canners, Inc.
Oldsbury Electro Chemical Co.
St. John Dry Dock & Shipbuilding Co.
J. Hungerford Smith Co.
Standard Oil Co.
Taylor Instrument Companies
United Gas Improvement Co.
Vacuum Oil Co.
Worcester Salt Co.
Yawman & Erbe Mfg. Co.



Built at Buffalo, N. Y.
250x14 ft.

ESTABLISHED 1873 INCORPORATED 1911

BOSTON LIGHTNING ROD COMPANY

TELEPHONE
Back Bay 9468

755 Boylston Street, BOSTON, MASS.
WAREHOUSE: DEDHAM, MASS.
NEW YORK OFFICE, 452 Lexington Avenue—Telephone, Vanderbilt 8824

Product

Manufacturers and contractors for installation of Approved Lightning Conductors on all classes of structures.

Description

Conductors are made in forms illustrated of 3/8-in. diameter, round, solid, pure copper and 3/8-in. 7-strand cable, pure copper, of high conductivity.

These types of rod are of ample weight, surface and conductivity to afford protection under all conditions. The 7-strand heavy copper cable conforms to the U. S. Bureau of Yards and Docks Specifications. All these products are approved by the Underwriters' Laboratories, Inc.

Connections and Installation

On solid rod, threaded joints and copper couplings are employed throughout and all points are of copper, nickeled or platinum plated. Conductors are attached by clips of same metal used, being fastened to wood with screws and to metal work with solder. Metal finials ridges, skylights, eaves troughs, etc., are connected to the lightning conductors, and all ground rods terminate with heavy copper plates bedded in charcoal, sunk to an electrically tested level, to water service pipe, or running water. Conspicuity is avoided in all this work and is made second only to dependability.

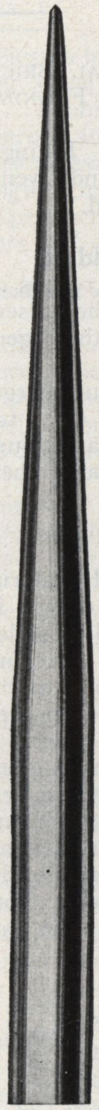
Efficiency and Guarantee

The principle on which lightning conductors are based is strictly scientific, and is accepted by electrical engineers and scientific men in general.

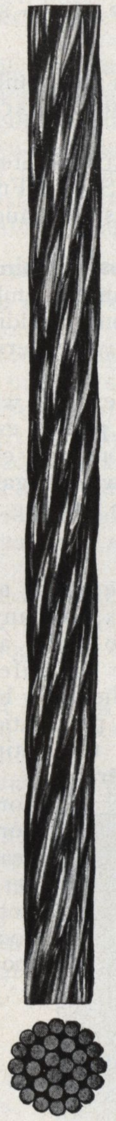
These equipments possess the special merits of exceptional durability, of being very inconspicuous, and having ample weight surface and conductivity. During over 40 years' experience in the equipment of many thousands of buildings, the Boston Lightning Rod Company has not had a building or its contents seriously damaged by lightning.

Estimates

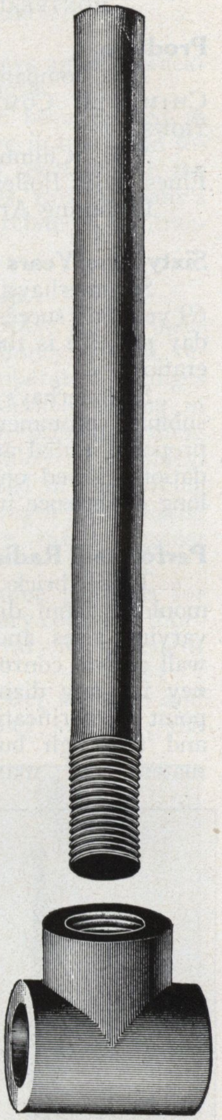
Plans figured and estimates submitted upon receipt of complete information. Installations made in any part of the United States.



Point for Copper



Copper Cable



Solid Copper Conductor

References

Architects and Contractors
Cross & Cross, New York, N. Y.
Treaner & Fatio, New York, N. Y.
Carrere & Hastings, New York, N. Y.
Alfred Hopkins, New York, N. Y.
Delano & Aldrich, New York, N. Y.
Welles Bosworth, New York, N. Y.
Jos. H. Freedlander, New York, N. Y.
Marc Eidlitz & Son, Inc., New York, N. Y.
A. L. Harris, Washington, D. C.
Walter Mellor, Philadelphia, Pa.
Smith Construction Co., Pawtucket, R. I.
Andrews, Jacques & Rantoul, Boston, Mass.
Derby, Robinson & Shepard, Boston, Mass.
J. Williams Beal Sons, Boston, Mass.
Norcross Brothers Co., Worcester, Mass.
Bigelow & Wadsworth, Boston, Mass.
Arthur F. Gray, M. E., Boston, Mass.
Charles K. Cummings, Boston, Mass.
Hewitt & Brown, Minneapolis, Minn.
Roberts & Hoare, Manchester, Mass.
Geo. Hunt Ingraham, Boston, Mass.
Casper Ranger Co., Holyoke, Mass.
Edwin J. Lewis, Jr., Boston, Mass.
French & Hubbard, Boston, Mass.
John Cowan, Inc., Baltimore, Md.
F. Joseph Untersee, Boston, Mass.
Maginnis & Walsh, Boston, Mass.
Cram & Ferguson, Boston, Mass.
Matthew Sullivan, Boston, Mass.
Charles E. Patch, Boston, Mass.
Fox & Gale, Boston, Mass.
Charles T. Main, Boston, Mass.
Ira G. Hersey, Boston, Mass.
Smith & Walker, Boston, Mass.
J. T. Wilson, Nahant, Mass.
J. Henry Miller, Baltimore, Md.
Irwin & Leighton, Philadelphia, Pa.
R. F. Haffenreffer, Fall River, Mass.
Hynicka Bros., Lebanon, Pa.
Rt. Rev. Mgr. James E. Cassidy, Fall River, Mass.
Fordham University, New York, N. Y.
Herbert Dumaresque, Center Harbor, N. H.
James E. Whitin, North Uxbridge, Mass.
Charles F. Choate, Jr., Southboro, Mass.
R. Livingston Beeckman, Newport, R. I.
Geoffrey G. Whitney, Woods Hole, Mass.
Mrs. G. R. Dodge, Madison, N. J.
Hamilton Farm, Gladstone, N. J.
Charles A. Kidder, Southboro, Mass.
Joseph O. Hobbs, Portsmouth, N. H.
Samuel E. Winslow, Worcester, Mass.
Henry L. Higginson, Boston, Mass.
Franklin MacVeagh, Dublin, N. H.
Prof. A. V. Phelps, Westerly, R. I.
Jas. J. Storrow, Boston, Mass.
R. T. Crane, Jr., Chicago, Ill.
Russell Robb, Boston, Mass.
Edmund Hayes, Buffalo, N. Y.
Perry Memorial, Put in Bay, Ohio
Edmund S. Burke, Jr., Chagrin Falls, Ohio
All Souls Church, Washington, D. C.
Emmanuel Baptist Church, Washington, D. C.
Yale University, New Haven, Conn.
Charles M. Schwab, New York, N. Y.
Langwater Farms, North Easton, Mass.
Eugene Endicott, Norwood, Mass.
Russell Grinnell, Providence, R. I.
R. H. Agassiz, Hamilton, Mass.
Burton K. White, Brewster, N. Y.
F. H. Metcalf, Holyoke, Mass.
Albert Clayburgh, Mt. Kisco, N. Y.
F. A. Kennedy, Windsor, Vt.
George C. Lee, Boston, Mass.
Independence Hall, Philadelphia, Pa.

DENISON LOAD-BEARING TILE

PATENTS OWNED BY
AMERICAN TILE ENGINEERING CO.

GENERAL OFFICE, Denison Building, MASON CITY, IOWA
CHICAGO OFFICE, 1520 Marquette Building
LOS ANGELES OFFICE, 611 Pacific Mutual Building

LICENSED MANUFACTURERS

AUGUSTA CLAY PRODUCTS CO., Augusta, Ga.
CARLISLE CLAY PRODUCTS CO., INC., Des Moines, Iowa
DENISON "H" TILE AND BRICK CO., Pittsburgh, Pa.
GOODWIN TILE AND BRICK CO., Des Moines, Iowa
HAEGER BRICK & TILE CO., Aurora, Ill.
MASON CITY BRICK AND TILE CO., Mason City, Iowa
ONTARIO DENISON TILE CO., LTD., Windsor, Ont.
REDFIELD BRICK & TILE CO., Redfield, Iowa

FACTORIES AT STRATEGIC POINTS

GENERAL SALES AGENTS

ATLANTA, GA., B. Mifflin Hood Brick Co.
AUGUSTA, GA., Georgia-Carolina Brick Co.
BOSTON, MASS., Dolben & Co.
BUFFALO, N. Y., Seneca Clay Company
DES MOINES, IOWA, Reliance Brick Company and Carlyle Clay Products Co.
DULUTH, MINN., Duluth Builders Supply Co.
ERIE, PA., Boyd & Schafer
FARGO, N. D., J. H. Holman
HAILEYBURY, ONT., A. P. Dumbar
HARRISBURG, PA., J. T. Hall & Company
HUNTINGTON, W. VA., John S. Farr
IRONWOOD, MICH., Morgan Company
LANSING, MICH., Brick and Supplies Corp.
MASON CITY, IOWA, Mason City Brick and Tile Co.
MILWAUKEE, WIS., Wisconsin Face & Fire Brick Co.
MINNEAPOLIS, MINN., A. D. Klein, Hampshire Arms Hotel
MONTREAL, QUE., C. C. Drew & Co.
NEW YORK, N. Y., Dolben & Co.
OMAHA, NEB., Sunderland Bros. Co.
PHILADELPHIA, PA., Cox, Janeway & Company
PITTSBURGH, PA., Denison "H" Tile and Brick Co.
ST. PAUL, MINN., Corning Donohue, Inc.
SAULT STE. MARIE, ONT., J. B. Briscomb
SCRANTON, PA., LaBar, Parsons & Pierce
SUPERIOR, WIS., Northern Supply & Fuel Co.
TORONTO, ONT., R. L. Moran
WHEELING, PA., Wheeling Building Material Co.
WILKES-BARRE, PA., LaBar, Parsons & Pierce
WINDSOR, ONT., Ontario Denison Tile Co. Ltd.

Sold Through the Best Building Material Dealers in Every Town

Products

Denison Load-Bearing Tile.

Patents and License

The manufacture, sale and use of Denison Load-Bearing Tile are licensed under the "Wilson System Bearing Wall Construction" Patented; patents as follows: United States Patents No. 760,774; No. 784,476; No. 1,234,990; No. 1,171,913. Reissue No. 14,414; No. 1,350,399. Canadian Patents No. 151,165 and No. 178,744. Other domestic and foreign patents pending.

Advantages

(1) Two separate mortar beds in every course, both lying in same horizontal plane. (2) Dead air space insulates between these two mortar beds same as body of tile is insulated, thus preventing formation of frost or moisture lines on inside of wall. (3) This air space between mortar beds insures against conduction of moisture through wall. (4) Because of insulated mortar joints, plaster may be applied direct to the tile without the use of furring.

(5) All vertical webs are in perfect alignment to carry all load pressures. This gives a wall the greatest load-bearing capacity. (6) Tile is completely symmetrical, thereby facilitating laying. (7) It is a complete unit which will stand on its own base in a stable condition when stood on either face or end, thus facilitating handling and piling.

(8) Works out to all brick heights and thicknesses and bonds perfectly with any header course from third to ninth. (9) Dimension tile of fractional lengths furnished to facilitate laying any length of wall. (10) Furnished with scored or smooth face, as ordered.

(11) Corner tile permit turning inside or outside corner without destroying insulating efficiency of wall at corners.

(12) Jamb and half-jamb tile are furnished for either casement or box frame openings, which provide weatherproof joints with the frames and maintain the insulating efficiency of the wall.

Strength

These tile are guaranteed by the various manufacturers to have a minimum crushing strength of not less than 700 lbs. to the sq. in. net area of web section. Laboratory tests, made for the various manufacturers by such recognized testing laboratories as the following, show a crushing strength per tile ranging from 120,000 to 193,750 lbs.: Iowa State College; State Universities of Iowa, Minnesota and Wisconsin; Carnegie Institute; Drexel Institute; Pittsburgh Testing Laboratory; Department of Buildings of Minneapolis and Detroit.

Costs

Construction costs will vary somewhat, due to such local problems as freight rates; yet, in general, practice indicates that it is safe to say that a given wall can be built of these tile at a cost that is 20% to 30% less than the cost to build the same wall of common brick, and the same price as to build it with common tile.

Specifications and Details

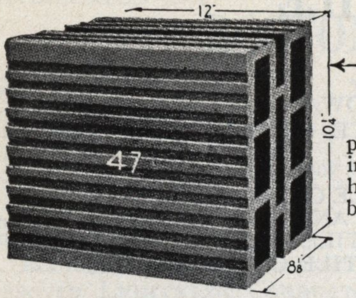
The following may be used as standard specifications for the use of these tile in "Wilson System Bearing Wall Construction":

Denison Load-Bearing Tile shall be laid with the voids horizontal except for corners, jambs, piers or pilasters; all vertical joints shall be staggered and the tile above should overlap the tile below by at least 3 in. When the wall thickness is greater than that of the tile, it shall be constructed of a combination of whole and half thickness units, spaced apart from each other the distance of the void between the two lobes of the whole tile, and the next whole tile above shall bond two subadjacent tile below together by overlapping two bearing webs of each, retaining all bearing webs in alignment. Where joists rest on the wall they shall extend into same so that they will overlap at least two bearing members of the tile. Where wall heights do not work out to even courses of the tile being used, a smaller unit shall be used to complete the height. Dimension lengths, which are furnished in sufficient quantities, shall be used to complete lengths of walls and between openings, etc.

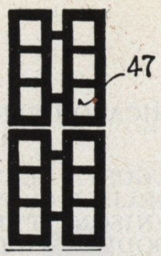
Working Drawings

A portfolio, containing a full set of detail and working drawings and standard specifications furnished free on request made to any licensed manufacturer.

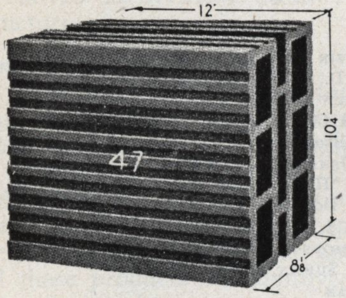
Continued on next page

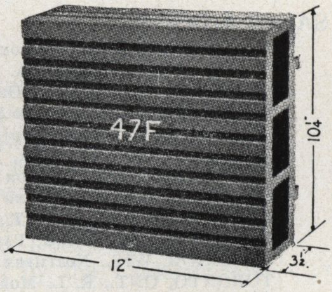


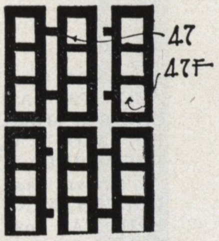
← THESE — BUILD — THESE →



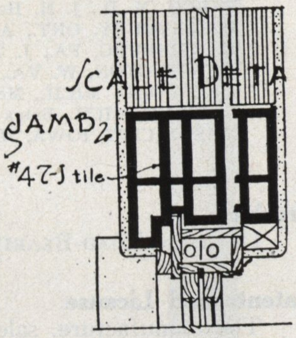
The No. 35 or the No. 23 and their allied units may be used in the place of, or in connection with, the No. 47 and its related units in this or in any of the other constructions shown here. In this way any desired height of wall can be reached that may be reached by using common brick.

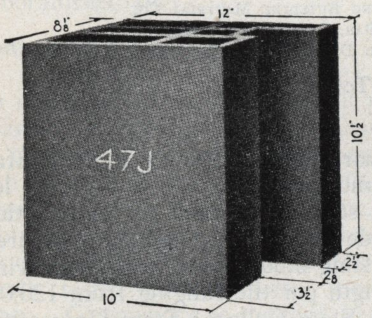


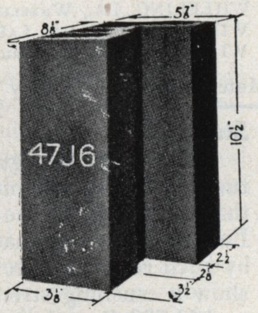

47F
10¼"
12"
3½"



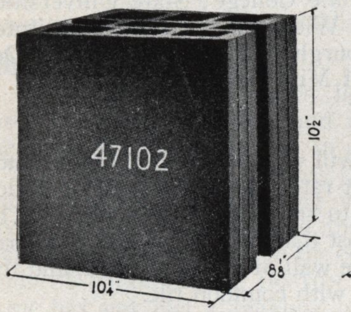
An "F" tile is, in reality, one of the two lobes of either a No. 47, a No. 35 or a No. 23. It may be furnished ready split, or it can be split from the full standard unit on the job.

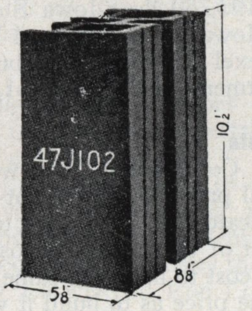

SCALE DETAIL
JAMB
#47-J tile

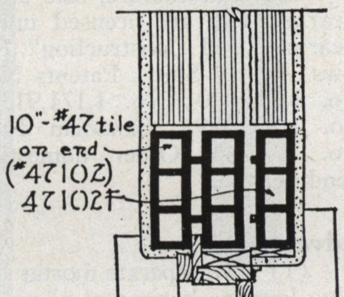

8⅝"
12"
47J
10½"
10"
3½"
2⅝"
2½"


8⅝"
5⅞"
47J6
10½"
3⅞"
3½"
2⅝"
2½"

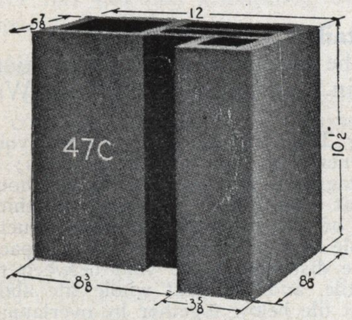
The "J" and "J6" units in the different sizes make possible weatherproof joints between the wall and a box frame without destroying the wall insulation.


47102
10½"
10¼"
8⅝"

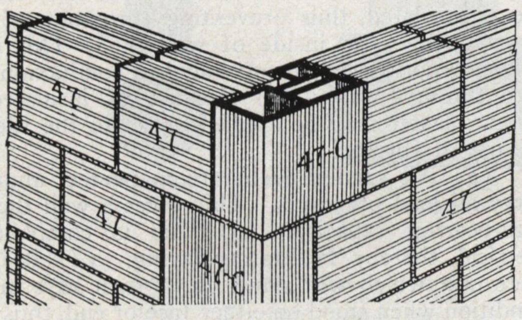

47J102
10½"
5⅞"
8⅝"

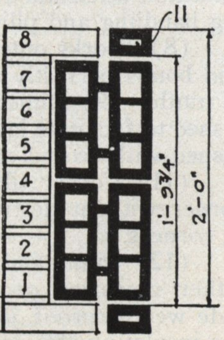

10"-#47 tile
on end
(#47102)
47102F

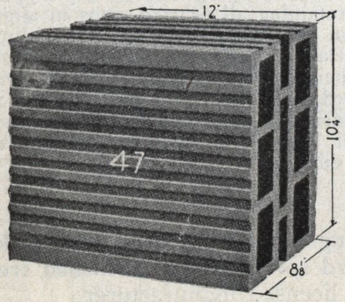
These units in the different sizes make weatherproof joints between the wall and casement frames without destroying the wall insulation.


5⅞"
12
47C
10½"
8⅝"
3⅞"
8⅝"

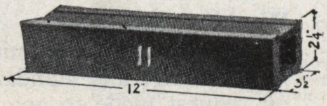
This corner unit enables either an inside or an outside corner to be turned without destroying the wall insulation. It bonds the two walls together into a strong and rigid corner.


47
47
47-C
47
47
47-C


11
8
7
6
5
4
3
2
1
1'-9¾"
2'-0"
5"

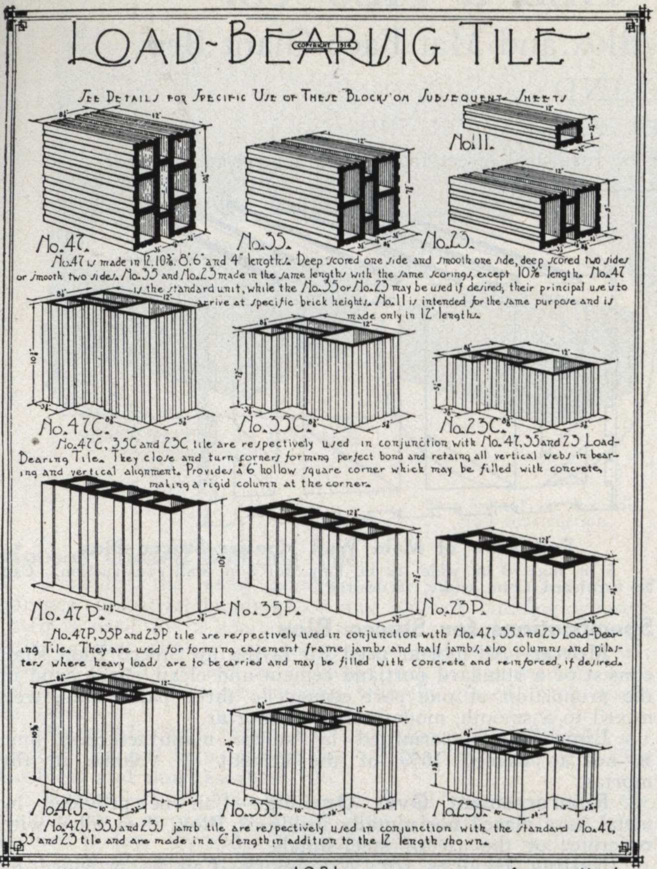


The No. 11 is a hollow unit for backing up header courses of brick and maintains both the insulating and the load bearing efficiency of the wall.



Construction Details of Load-Bearing Tile

Continued on next page


LOAD-BEARING TILE

See Details for Specific Use of These Blocks on Subsequent Sheets

COPYRIGHT 1914
No. 47.
No. 35.
No. 23.
No. 11.
No. 47C.
No. 35C.
No. 23C.
No. 47P.
No. 35P.
No. 23P.
No. 47J.
No. 35J.
No. 23J.
12"
8⅛"
10⅝"
7⅝"
5⅛"
3⅛"
12⅛"
10"

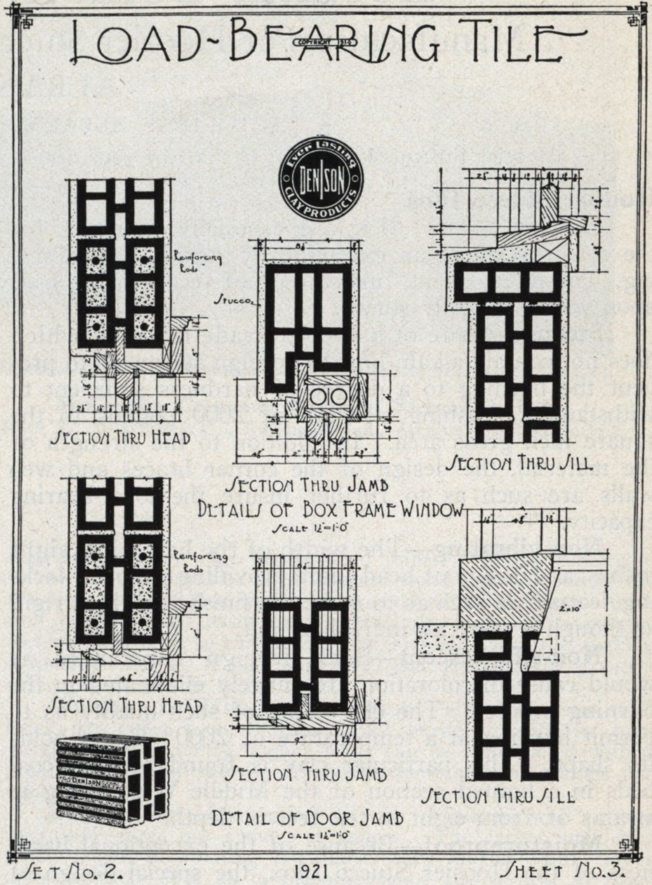
No. 47 is made in 12, 10⅝, 8, 6 and 4" lengths. Deep scored one side and smooth one side, deep scored two sides or smooth two sides. No. 35 and No. 23 made in the same lengths with the same scorings, except 10⅝ length. No. 47 is the standard unit, while the No. 35 or No. 23 may be used if desired, their principal use is to arrive at specific brick heights. No. 11 is intended for the same purpose and is made only in 12" lengths.

No. 47C, 35C and 23C tile are respectively used in conjunction with No. 47, 35 and 23 Load-Bearing Tile. They close and turn corners forming perfect bond and retaing all vertical webs in bearing and vertical alignment. Provides a 6" hollow square corner which may be filled with concrete, making a rigid column at the corner.

No. 47P, 35P and 23P tile are respectively used in conjunction with No. 47, 35 and 23 Load-Bearing Tile. They are used for forming casement frame jambs and half jambs, also columns and pilasters where heavy loads are to be carried and may be filled with concrete and re-inforced, if desired.

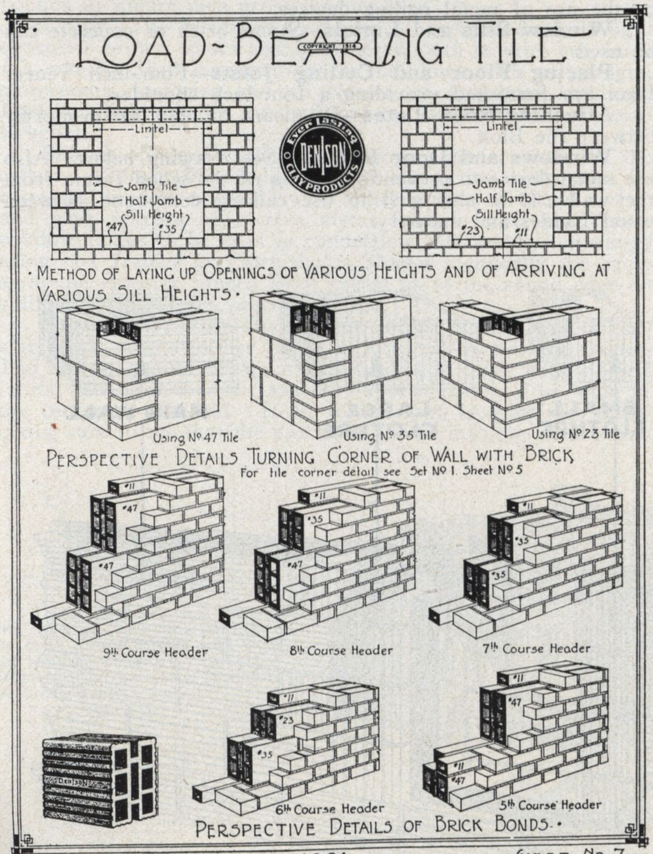
No. 47J, 35J and 23J jamb tile are respectively used in conjunction with the standard No. 47, 35 and 23 tile and are made in a 6" length in addition to the 12" length shown.

Set No. 1. 1921 Sheet No. 1.


LOAD-BEARING TILE

COPYRIGHT 1914
Ever Lasting DENISON CLAY PRODUCTS
Reinforcing Rods
Stucco
Section Thru Head
Section Thru Jamb
Section Thru Sill
Details of Box Frame Window
Scale 1½"=1'-0"
Reinforcing Rods
Section Thru Head
Section Thru Jamb
Section Thru Sill
Denison
Detail of Door Jamb
Scale 1½"=1'-0"

Set No. 2. 1921 Sheet No. 3.


LOAD-BEARING TILE

COPYRIGHT 1914
Ever Lasting DENISON CLAY PRODUCTS
Lintel
Jamb Tile
Half Jamb
Sill Height
#47
#35
Lintel
Jamb Tile
Half Jamb
Sill Height
#23
#11

· Method of Laying up Openings of Various Heights and of Arriving at Various Sill Heights ·

Using No 47 Tile
Using No 35 Tile
Using No 23 Tile

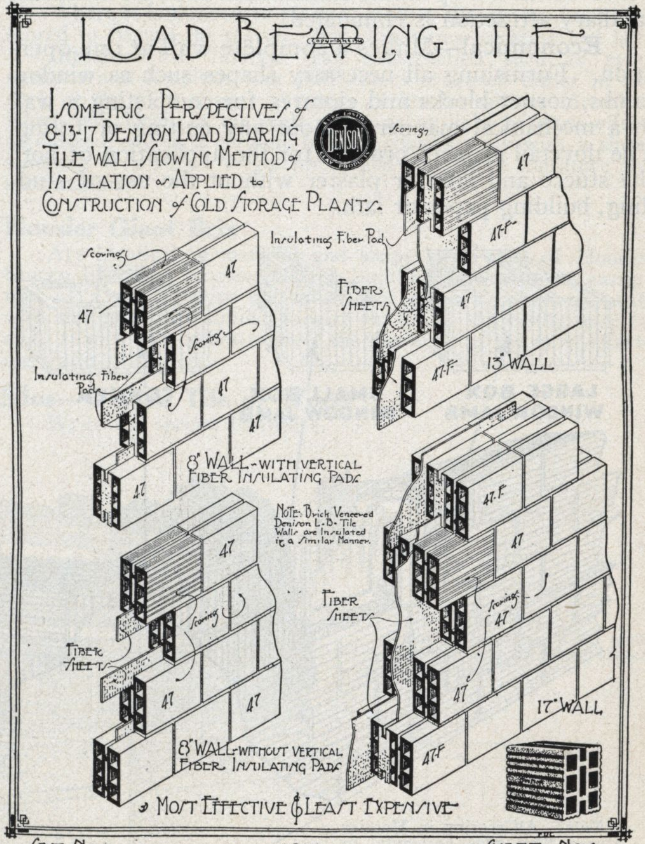
Perspective Details Turning Corner of Wall with Brick

For tile corner detail see Set No 1. Sheet No 5

#11
#47
#35
#23
Denison
9th Course Header
8th Course Header
7th Course Header
6th Course Header
5th Course Header

Perspective Details of Brick Bonds.

Set No. 5. 1921 Sheet No. 7.


LOAD BEARING TILE

Isometric Perspectives of 8-13-17 Denison Load Bearing Tile Wall Showing Method of Insulation as Applied to Construction of Cold Storage Plants.

COPYRIGHT 1914
Ever Lasting DENISON CLAY PRODUCTS
Scorings
Scoring
47
47-F
Insulating Fiber Pad
Fiber Sheets
13" Wall
8" Wall - with vertical Fiber Insulating Pads
17" Wall
8" Wall - without vertical Fiber Insulating Pads

Note: Brick Veneered Denison L.B. Tile Walls are Insulated in a Similar Manner.

» Most Effective & Least Expensive

Set No 8 1916 Sheet No 1

Sample Construction Detail Plates Reduced

HOOSIER BUILDING TILE & SILO CO.

Manufacturers of Hoosier Stucco Blox and Mat Face Giant Brix

ALBANY, IND.

FACTORIES: ALBANY, IND., AND CARBON, IND.

Hoosier Stucco Blox, if not handled by your dealer will be furnished direct from manufacturer to the trade

Hoosier Stucco Blox

Hoosier Stucco Blox are especially designed for the construction of an exceptionally strong, non-vibrating, non-effervescent, moistureproof economical base upon which to apply stucco.

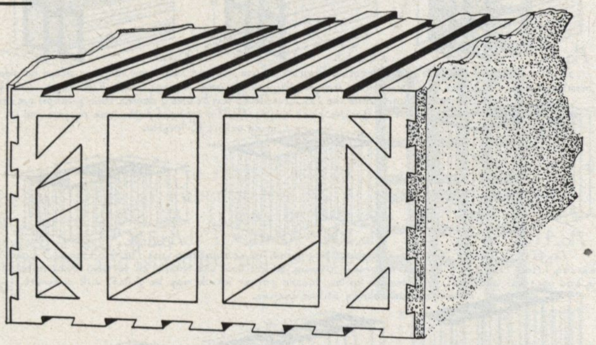
Strong—Made of a special grade fire clay which does not contain alkali, lime or foreign substance to prevent the burning to a degree of hardness sufficient to withstand a crushing strength of 2000 pounds to the square inch gross area. In addition to the strength of the material, the design of the corner braces and web walls are such as to further insure the load bearing capacity.

Non-vibrating—The width of the bed joint, eight inches, and design of head joint, providing a mortar locking feature, is such as to make the finished wall as rigid as though it were an individual unit.

Non-effervescent—Such foreign substances as would cause discoloration are entirely eliminated in the burning process. The clay being of such quality as to permit burning at a temperature of 2000° F. yet holds its shape. This particular clay is found beneath coal beds in a limited section of the Middle West, lying in stratas of from eight to ten feet in depth.

Moistureproof—Because of the exceptional hardness of the Hoosier Stucco Blox, the special design of which when laid up makes a continued dead air chamber, capillary attraction is eliminated.

Economical—Makes a complete wall at one operation. Furnishing all necessary shapes such as window jambs, corner blocks and clotures for completing a wall in a mechanical manner without any cutting or fitting. The dovetail grooves provide for the application of both the stucco and interior plaster without the use of studding, building paper or lath.



End View of Main Wall Hoosier Stucco Blox

5 in. high, 8 in. wide, 12 in. long, for 8-in. wall construction. Can be furnished 12-in. width, if desired

Specifications for Stucco Blox

Mortar—All mortar used for laying up Stucco Blox shall consist of a standard portland cement and clean, sharp sand in the proportion of one part cement to three parts sand, well mixed to a smooth, moderately stiff mortar.

Lime—When permitted by stucco manufacturers, lime is not to exceed 10% of the cement by volume in the mortar.

Reinforcement Over Openings—Can be provided by metal bars placed horizontally inside of Blox, then filled with concrete; or the use of steel lintels.

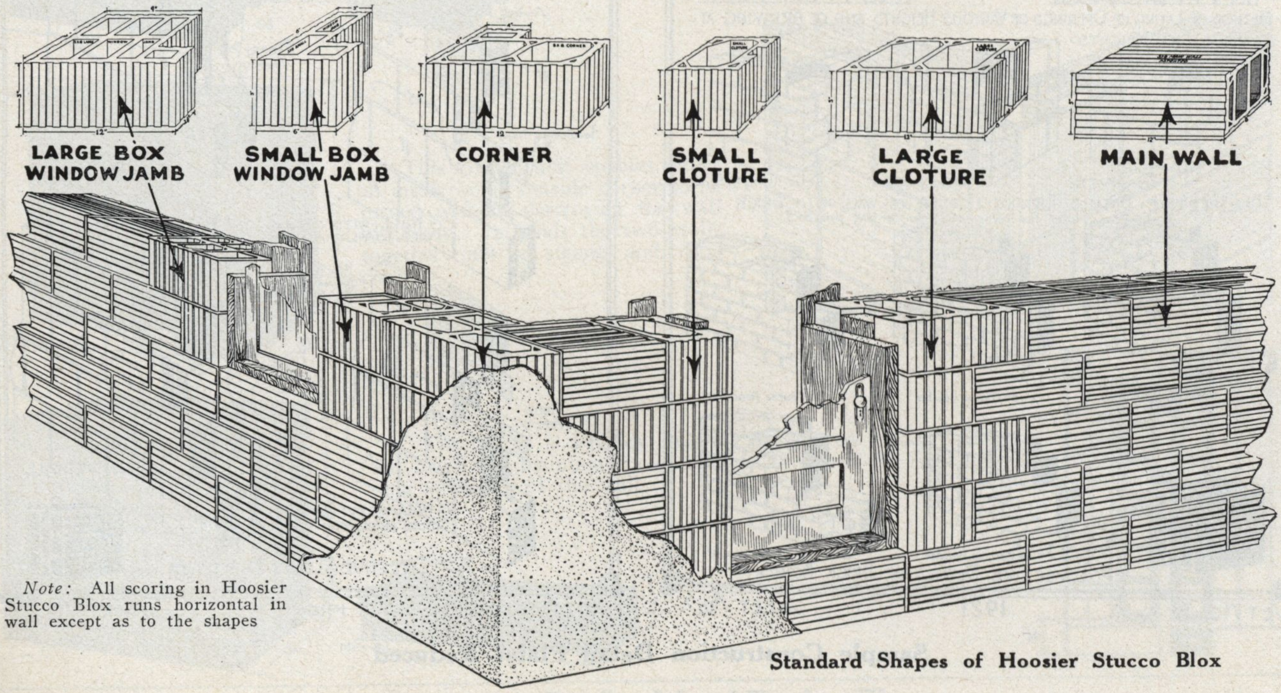
Nailing Devices for Woodwork—Can be provided by placing a wood block in the inner wall; by plugging the wall, or the use of metal nailing devices.

Window Sills and Lintels—Stone, brick or concrete can be used.

Placing Floor and Ceiling Joists—Four-inch veneer Blox are furnished providing a four-inch shoulder.

Attaching Roof Plates—By means of bolts set in mortar between the Blox.

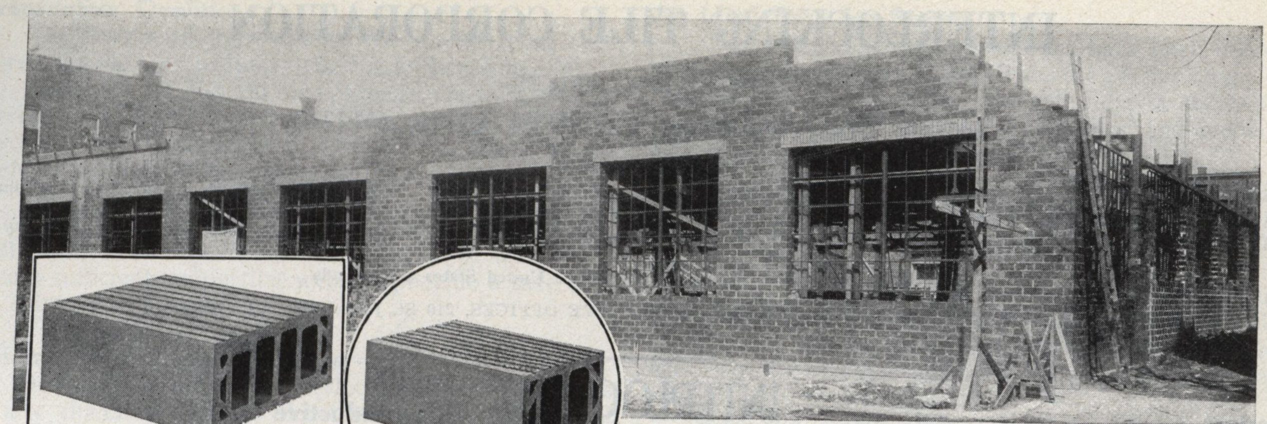
Windows and Door Frames—See drawing below. Also use metal device to prevent spreading of the wood frame from the wall. It is also well to use calking compound between wood frames and masonry.



Note: All scoring in Hoosier Stucco Blox runs horizontal in wall except as to the shapes

Standard Shapes of Hoosier Stucco Blox

Continued on next page



Size 5x12x12 in. for 12-in. wall construction

Size 5x8x12 in. for 8-in. wall construction

McConaha Company Building, Richmond, Ind.
John W. Mueller & Co., Richmond, Ind., Architects and Engineers

Hoosier Glazed Building Tile

Provides the ideal material for wall construction of garages, industrial buildings or any type of building wherein there is need for a sanitary, attractive, strong, moistureproof building that affords low constructive and maintenance cost; also for interior veneer in buildings such as gymnasiums, hospitals, or any class of building wherein glazed brick might be used.

Material—Made from fire clay thoroughly vitrified salt glazed. Burned at a temperature of 2200° F. assuring a flint hardness and non-absorbent tile.

Design—Horizontal bed joint in all the main wall tile making for a stronger wall as to side pressure and more satisfactory to lay. Provides five perpendicular web walls in the eight-inch tile and seven in the twelve-inch, reinforced with corner brace feature. Assuring a crushing strength of 2000 pounds to square inch gross bearing area.

Color—Tile furnished in shades of dark, medium or light chocolate brown colors and in either smooth or wire cut finish for exterior wall construction for buildings such as garages, storerooms, factories and all classes of industrial buildings. Dark or light shades of buff colors for interior wall construction.

Shapes—Special corner tile making a perfect bond on the corner. Cloture tile to be used in connection with door or casement window openings with either square or round corner and with notches to receive metal frames; also box frame window jambs to be used in connection with window openings using box frames are furnished. Shapes identically the same as in the Hoosier Stucco Blox except as to the round edge or bullnose shapes. See preceding page.

Laying the Tile—Hoosier tile should be laid with a regular brick mortar either white or colored to suit the owner. The mortar should be applied to outer and inner edge of bed joints, leaving a dead air space of approximately 2 in. wide in the center of the bed. Head joints must be carefully filled, taking care to see that the mortar is forced into the small openings at the outer edge of the head joints. Calking compound or felt strips should be used wherein wood frames connect the masonry wall. When wall is thus constructed, capillary attraction is eliminated assuring a perfect dry wall. The mortar locking head joint so completely, ties each and every tile, making a finished wall as if one solid unit, and assuring the greatest resistance as to side thrust.

Weight of Walls—Approximately, 50% less than solid brick per cubic foot, therefore, not burdened with its own weight. Consequently, higher walls can be constructed with a greater degree of safety. Approximate weight, 65 pounds per cubic foot.

Lower Cost—Economical to lay. Finished wall at one operation—does not require a veneer. The larger unit lays much faster, eliminating the unnecessary mortar joint; saves approximately 50% as to masonry labor and mortar in comparison with common brick construction.

Where it is desired to plaster interior, tile can be furnished scored to receive the plaster, thus eliminating studding and lath.

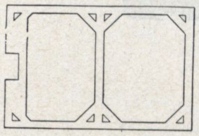
Interior—For interior wall construction such as gymnasiums and hospitals, our buff colors are used either in the dark or the light shade. A range of shades will be furnished which will blend in the wall either as to light or dark effect, as desired, giving a ceramic beauty, possible only with a slight mingling of shades. Write for special descriptive literature and information.

Hoosier Giant Brix

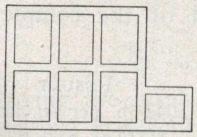
Are identical in material and shapes with that of Hoosier Stucco Blox and Hoosier Glazed Building Tile with the exception of a special wire cut finish that gives a completed wall with an appearance similar to wire cut brick. Carefully selected as to shades and colors to meet the demands of the most exacting trade.

Silos—Glazed Tile or Wood

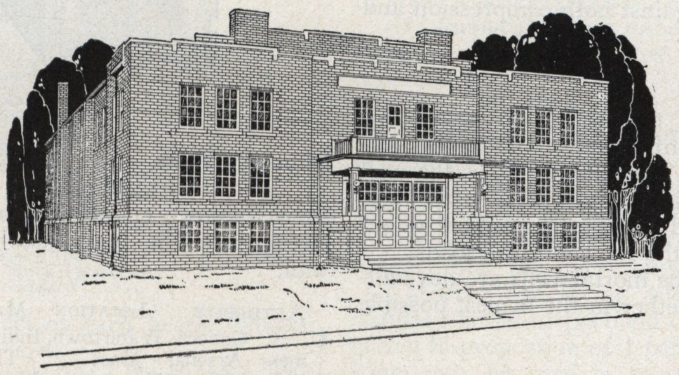
Write for special literature.



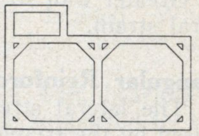
Floor Plan
Large cloture, size 5x8x12 in., for 8-in. wall construction to be used in connection with door or window openings except box frames. One-half size furnished to break bond



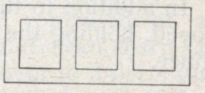
Floor Plan
Box frame window jamb, 5x8x12 in., for 8-in. wall, to be used in connection with box frame openings. Fractional size furnished to break bond



Community Building, Flora, Ind.
Carl J. Horn, Architect, Logansport, Ind.
Erected 1923 by the Community Club, Flora, Ind., L. V. Meyers, Chairman
Built of Hoosier 12-in. mat face building tile



Floor Plan
Corner tile for 8-in. wall. Notice the same in place sketch preceding page



Floor Plan
A unit with several uses, size 5x6x12 in. Used as corner or cloture tile in 12-in. wall construction. Especially adapted to pilaster construction.

INTERLOCKING TILE CORPORATION

EXECUTIVE OFFICES

Union Trust Building, CLEVELAND, OHIO

BRANCH OFFICES

KANSAS CITY, MO., 723 Dwight Building
SEATTLE, WASH., 401 White Building
DETROIT. MICH., 424 McKerchey Building
LOS ANGELES, CAL., 323 Douglas Building
CHICAGO, ILL., 1040 Conway Building
ST. LOUIS, MO., Century Building
WASHINGTON, D. C., Investment Building
SAN FRANCISCO, CAL.
BOSTON, MASS., 200 Devonshire Street

Representatives in other principal cities of the United States and Canada

INTERLOCKING TILE CO. (SOUTHEASTERN STATES)—EXECUTIVE OFFICES, 210 St. James Building, JACKSONVILLE, FLA.

INTERLOCKING TILE
TRADE-MARK
Registered

Product

Interlocking Tile for Bearing Walls, Curtain Walls, Partitions, and Foundations.

Particularly adapted for use with Face Brick and with Stucco Exterior; also made with Smooth and Rough Texture Face for exposed work.

Vertical Webs Always Align

The design of the tile is such that when laid in the wall every vertical web must stand directly over a corresponding web in the tile below. This feature of positive alignment of webs is protected by letters patent and is peculiar to this form of tile.

The 4-in. width of the mortar bed insures thorough bedding between webs; thus every square inch of vertical web section in the wall is available in computing bearing loads.

No Through Mortar Joints

A common fault of other forms of masonry walls is the through mortar joint, which readily conducts moisture, heat and cold through the wall.

In the wall of Interlocking Tile, the mortar beds are on different levels. An air pocket is thus provided in the mortar joint which prevents passage of moisture through the wall by capillary attraction, and insures ideal insulation.

Practical Advantages

The elimination of through mortar joint has the following very practical advantages:

Saves cost of furring—plaster direct on tile.

Lower heating cost shown by repeated tests.

High insulating power without high cost of cork, asbestos or special insulation.

Better fire walls because wall will not heat through.

Greater wall strength against both compression and lateral strain.

Triangular Reinforcement

The lateral strength of the wall is materially increased by the triangular reinforcement due to this offsetting of the mortar beds. This feature gives the wall greater strength for bearing the weight of walls and floors in the buildings, and makes the wall stronger against side thrusts, such as the roof and wall loads.

In addition to this, all the mortar beds are dovetail-grooved, holding the tile together in the firmest possible manner.

No Continuous Cross Webs

None of the cross webs extend continuously through the wall, each being insulated by an air chamber.

Non-conductive Walls

Walls of this tile are, for practical purposes, perfect non-conductors of heat and cold. Buildings are therefore warmer in winter and cooler in summer.

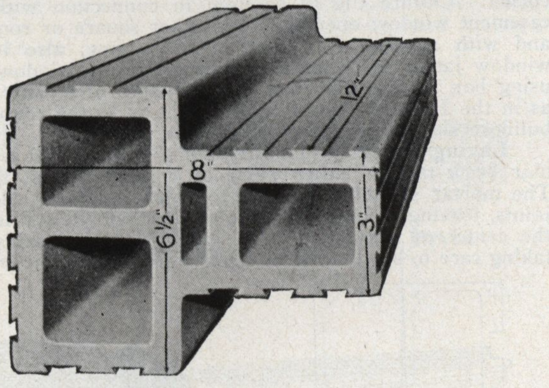
This feature makes the tile especially advantageous for walls in cold storage buildings, lumber dry kilns, warehouses and other places where non-conductive walls are necessary.

Dry Walls

Moisture and dampness quickly penetrate the ordinary masonry wall at the joint. This liability to injury is entirely overcome in the Interlocking Tile wall, because no mortar joint extends entirely through the wall.

Bearing Strength

The bearing strength of an Interlocking Tile wall is greatly enhanced by the fact that all bearing webs are continuous one above another from footing to sill. Thus every particle of strength of the individual tile is transferred to the wall. The web over web feature in this tile is not dependent on the skill or care of the mason; the tile can be laid no other way.



Interlocking Tile

Strength Tests

The following tests on Interlocking Tile conducted by well-known engineering authorities show the bearing strength of the individual tile and of the completed wall.

Authority	Location	Material	Result
U. S. Government Arsenal	Watertown, Mass.	Individual Tile	5042 lb. per sq. in. of vertical web section
Building Department	Tacoma, Wash.	12-in. wall	70.8 tons per sq. ft of gross wall area
U. S. Bureau of Standards	Pittsburgh, Pa.	12-in. brick faced wall	64.8 tons per sq. ft. of gross wall area

Continued on next page

Fireproofing Qualities

The design of Interlocking Tile makes them even more valuable than ordinary tile for fireproofing.

There are no vertical air spaces in the wall, and no furring is required, the plaster being applied directly to the tile, thus eliminating all vertical passages which might carry flames from floor to floor.

There are no through mortar joints to weaken under high temperatures. In case of injury to the outer shell of the wall, rendering it useless, there would still remain sufficient supporting webs to provide a safe wall for salvage.

Building Walls Any Thickness

One shape and size of Interlocking Tile builds walls of any thickness. Regardless of thickness, the wall retains all the advantages outlined on the previous page.

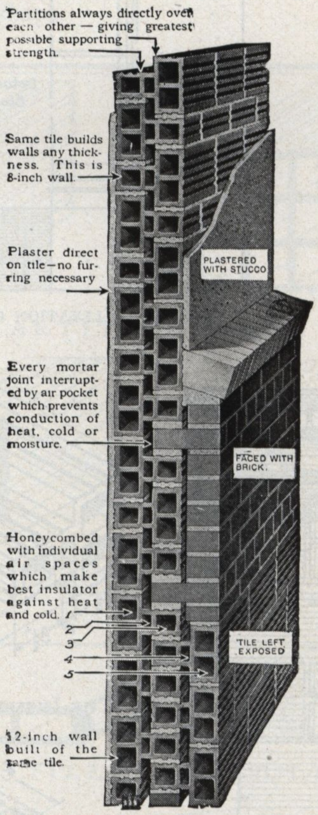
Three or four different thicknesses of walls are required on practically every operation, and one size of Interlocking Tile takes care of them all.

There are no left over sizes, and the mason does not require three or four miscellaneous widths of block on his scaffold.

Bonds Perfectly With Brick

The illustration shows the ideal bonding of Interlocking Tile with face brick.

All other forms of hollow tile backing require a brick stretcher course back of the header, thereby destroying the insulating effect at each header course, and adding materially to the cost.


Partitions always directly over each other — giving greatest possible supporting strength.
Same tile builds walls any thickness. This is 8-inch wall.
Plaster direct on tile—no furring necessary
PLASTERED WITH STUCCO
Every mortar joint interrupted by air pocket which prevents conduction of heat, cold or moisture.
FACED WITH BRICK.
Honeycombed with individual air spaces which make best insulator against heat and cold. 1
2
3
4
5
TILE LEFT EXPOSED
12-inch wall built of the same tile.

Section of Wall Showing How Any Thickness May Be Built

This also shows how tile may be bonded with face brick, plastered with stucco, or left exposed

The brick facing on Interlocking Tile becomes an integral part of the wall, and will not shrink away, bulge or crack. It bears its share of the vertical load.

An Ideal Base for Stucco

The wall is always dry, and the hard burned body prevents absorption of water from the plaster coat.

The tile has practically the same expansion as the cement plaster, thus preventing cracking, and enabling it to withstand severe weather conditions.

The horizontal dovetailed grooves make a perfect mechanical key to hold the plaster or stucco.

Lays Up Rapidly

There is only one size and shape of Interlocking Tile. The shape is such that the mason easily handles the tile with one hand, without laying down the trowel. All other tile of equal displacement require use of both hands.

Each tile is equivalent to 6 bricks. The bricklayer thus lays the equivalent of 6 bricks in one operation. In addition to this advantage, only one-third as much mortar is required as in the solid brick wall.

Details, Catalogues and Data

Each of the district offices is in position to submit details and other data, and to give valuable assistance to the architect or engineer.

Correspondence should be addressed to the nearest office.

How to Order Interlocking Tile

8-in. Tile wall—2.2 tile lay 1 sq. ft. of this wall.
8-in. Tile wall with 4-in. face brick—2 tile lay 1 sq. ft. of this wall.
12-in. Tile wall—3.4 tile lay 1 sq. ft. of this wall.
21-in. Tile wall—5.5 tile lay 1 sq. ft. of this wall.
Corners—Figure four detail blocks for each lineal foot of corners.
Jambs—Figure three detail blocks per lineal foot of jamb. (Include both sides of openings.)

Weight of Wall

Including mortar, 60 lbs. per cu. ft.

Specifications

Provide and erect all exterior and interior bearing walls as shown on plans, of Interlocking Tile. All tile to be hard burned.

The exterior surface of all tile intended for mortar or stucco shall be scored in such a manner as to give good anchorage for mortar or plaster.

Provide all necessary starting and finishing tile; provide necessary detail blocks for the construction of corners, closures and jambs.

For lintels over 4 ft. clear span or lintels supporting floor beams, use Interlocking Tile reinforced with rods in lower chambers and fill with concrete.

Columns and piers to be formed as detailed. Where columns and piers support heavy loads, reinforce with concrete.

Floor beams to have at least a 4-in. bearing on Interlocking Tile wall, in order to be supported by two vertical webs.

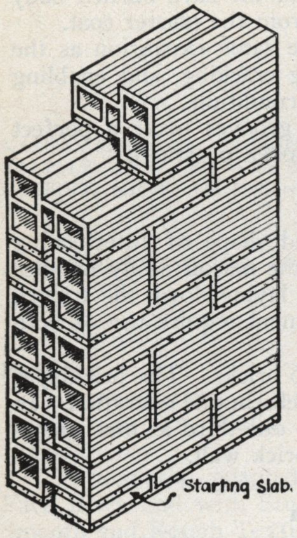
Roof plates to be secured to walls by means of anchor bolts 24 in. long, or toggle bolts.

If brick facing is used with Interlocking Tile, run headers into tile every sixth course, as detailed.

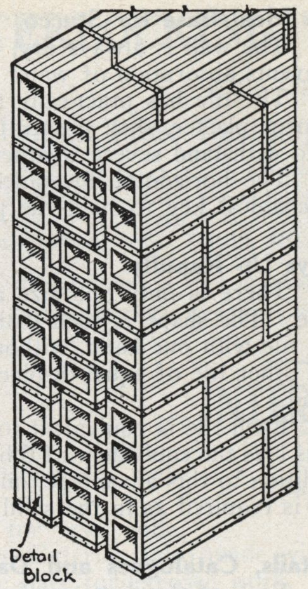
Mortar for laying tile to be composed of any standard brand of portland cement and clean sharp sand mixed in proportion of 1 part of cement to 3 parts sand. Lime may be used in mortar not to exceed 10% of cement.

See next page for details.

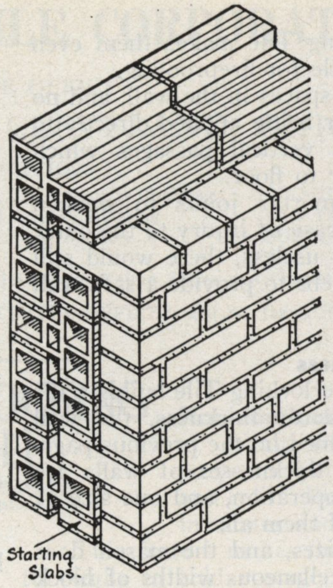
Continued on next page


Starting Slab.

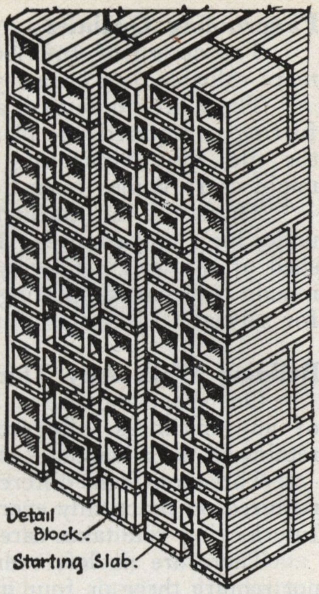
8-in. Tile Wall


Detail Block

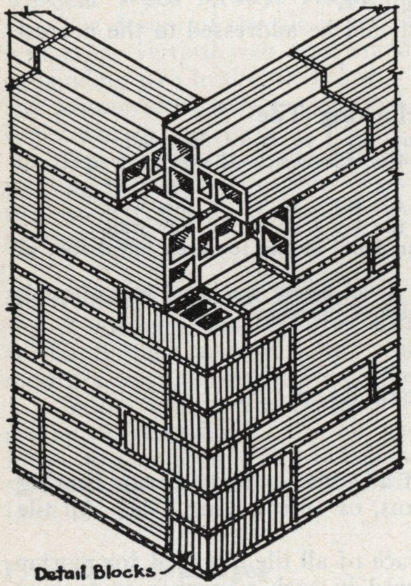
12-in. Tile Wall


Starting Slabs

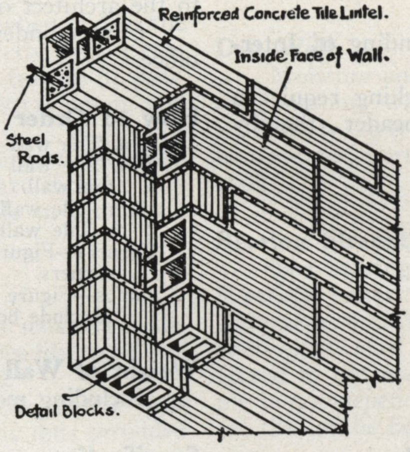
12-in. Tile Wall Brick Faced


Detail Block.
Starting Slab.

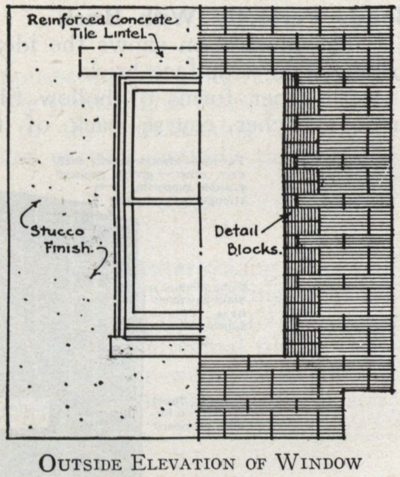
21-in. Tile Wall


Detail Blocks

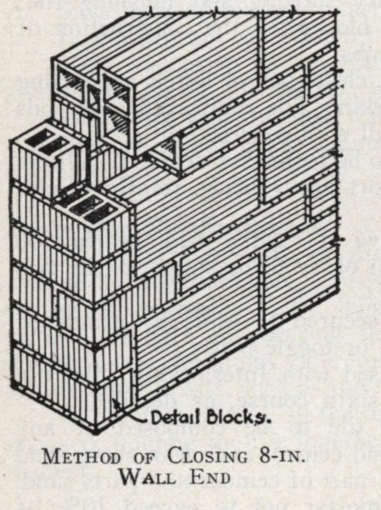
Corner Construction 8-in. Wall


Reinforced Concrete Tile Lintel.
Inside Face of Wall.
Steel Rods.
Detail Blocks.

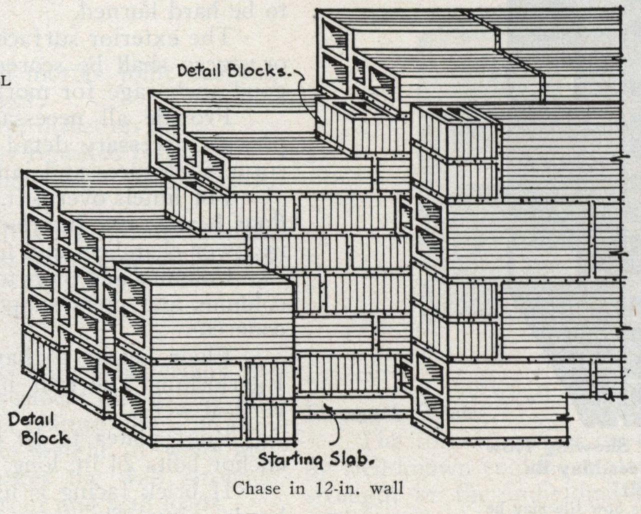
Tile Lintel and Rebate for Box Frame


Reinforced Concrete Tile Lintel.
Stucco Finish.
Detail Blocks.

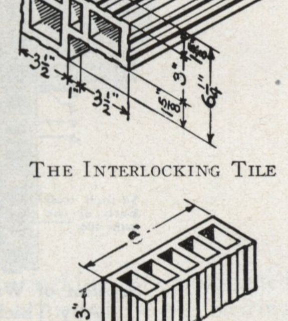
Outside Elevation of Window


Detail Blocks.

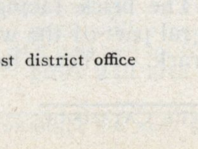
Method of Closing 8-in. Wall End


Detail Blocks.
Detail Block
Starting Slab.

Chase in 12-in. wall


12"
8"
3½"
1"
3½"
3"
5/16"
6½"

The Interlocking Tile



Two sides of each Detail Block are scored and two sides smooth.

Detail Block

Detail Block

With this one shape (the Detail Block at the right), all structural details, including jambs, corners, closures, etc., can be practically and simply constructed without the use of common brick. Complete Detail Book on request

Details of Interlocking Tile Wall

(See preceding pages)

Local conditions make it necessary to deviate somewhat from these details in some localities. Apply to nearest district office

ESTABLISHED SIXTY-SEVEN YEARS

HENRY MAURER & SON

Manufacturers of Hollow Tile for All Classes of Buildings

TELEPHONE
Lexington 2400

420 East Twenty-third Street
NEW YORK, N. Y.

FACTORIES
MAURER, NEW JERSEY

Products

Hollow Tile Blocks for interior partitions, wall furring, exterior walls, backing tile and roof blocks (book tile).

Also Flat and Segmental Floor Arches, Round and Square Column Covering, Girder Covering, "Phoenix" Wall Construction, "Herculean" Long Span Floor Arches, Fire Brick for Boilers, etc.

Facilities

Factories located on tidewater and on Central R. R. of New Jersey and Lehigh Valley R. R. This insures prompt shipment by boat or rail. Direct delivery to buildings in New York and other cities.

Quality

Our material is of the best quality and workmanship, and economical to erect because of its uniformity of size and shape.

Backing Tile

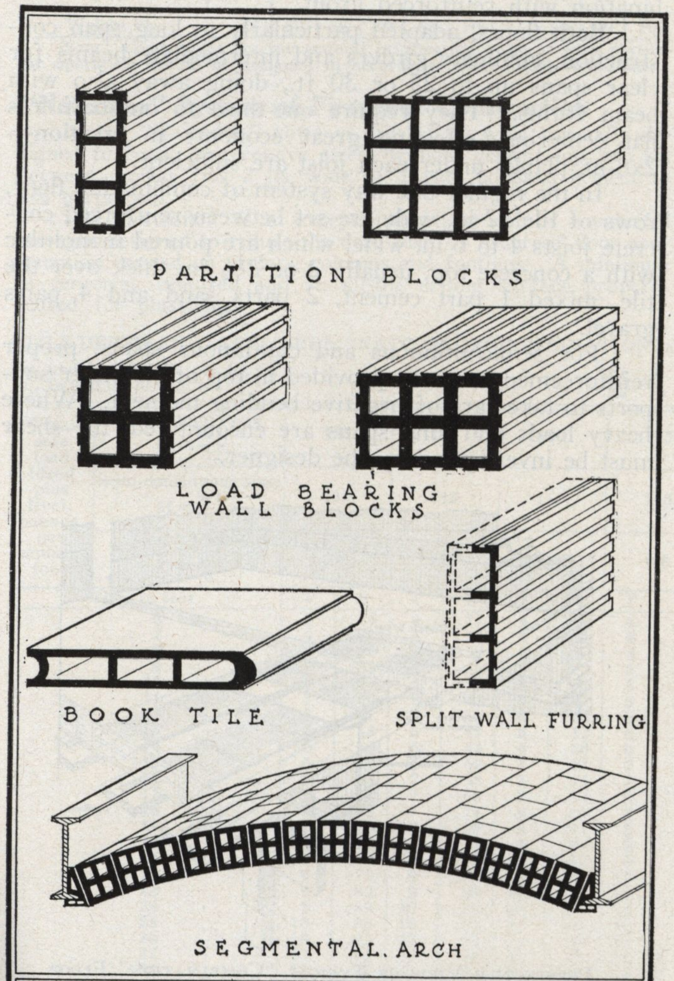
A backing system which makes the strongest and most dampproof wall.

As only one size of block is used, it is the cheapest to build.

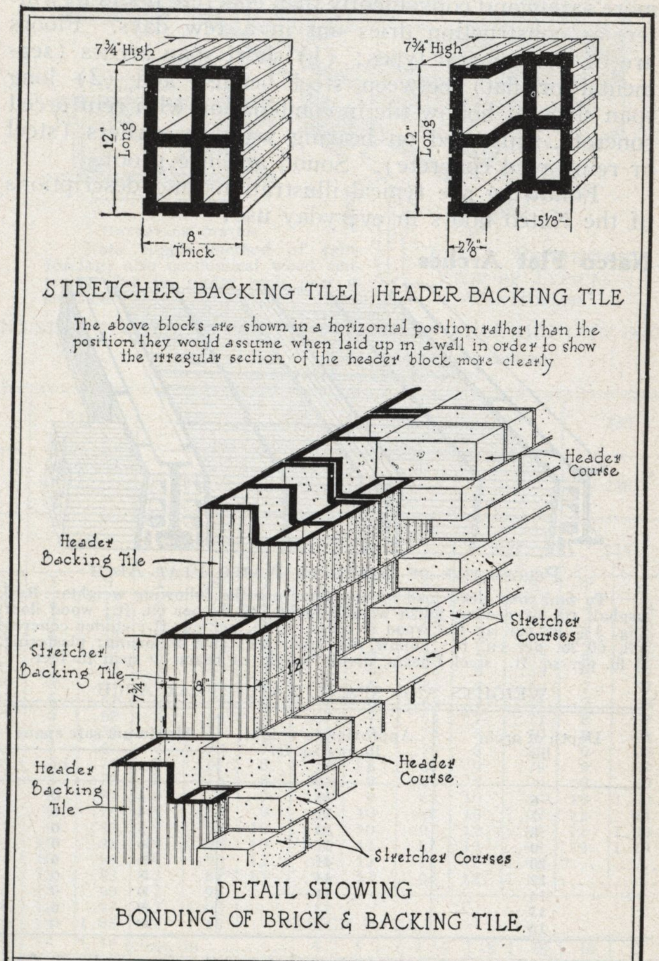
These backing blocks, with webs running vertically back up the stretcher face brick as well as the header face brick, give maximum strength and a true and complete furring within the wall.

The cubical content of the continuous air cells (running the entire height from floor to floor) is the greatest obtainable, reducing to a minimum the danger of moisture penetrating the wall through capillary attraction.

The stretcher and header face brick are backed by tile with vertical webs, creating a wall which resists the greatest amount of compression. The header face brick have absolute support and are held securely so they can not rock out of place.


PARTITION BLOCKS
LOAD BEARING WALL BLOCKS
BOOK TILE
SPLIT WALL FURRING
SEGMENTAL ARCH

HOLLOW TILE FIREPROOFING


7¾" High
12" Long
8" Thick
7¾" High
12" Long
5⅛"
2⅞"
STRETCHER BACKING TILE
HEADER BACKING TILE
The above blocks are shown in a horizontal position rather than the position they would assume when laid up in a wall in order to show the irregular section of the header block more clearly
Header Course
Header Backing Tile
Stretcher Courses
Stretcher Backing Tile
12
8
7¾
Header Course
Header Backing Tile
Stretcher Courses
DETAIL SHOWING BONDING OF BRICK & BACKING TILE

BACKING TILE

ORGANIZED 1889

NATIONAL FIRE PROOFING COMPANY

Manufacturers of Hollow Tile

Fulton Building
PITTSBURGH, PA.

BRANCH OFFICES IN PRINCIPAL CITIES AND TWENTY-TWO FACTORIES IN THE UNITED STATES

TRADE
NATCO
MARK

Products and Services

STANDARD DENSE HOLLOW TILE for fireproof floors, roofs, ceilings, partitions, wall furring, column and girder coverings; for exterior walls of all kinds, including barns, silos, etc.

Also Kiln Bottom Brick and Fire Clay.

Contractors for FIREPROOF CONSTRUCTION in HOLLOW TILE in Chicago and New England Districts.

Facilities

We are the largest concern in the world devoted solely to hollow tile fireproof construction. Our output from 22 conveniently located factories in the United States and 1 in Canada insures economical transportation and prompt delivery.

Branding

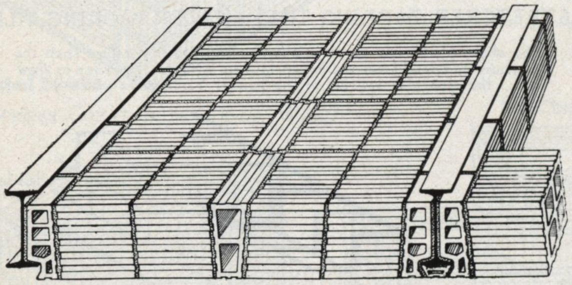
We originated the policy of branding all our hollow tile with our trade-mark name, Natco. Special types bear individual marks of identification, as: Natco XXX, Natco Header-Backer, Natco Bakup, etc.

Natco Floor Construction

Fireproof floors of Natco hollow tile can be set more safely and conveniently than concrete floors in winter, as construction dries out in a few days. Floors are of two general types: (1) short span arches (segmental or flat) between steel beams; and (2) long span slabs of hollow tile in combination with reinforced concrete, supported on bearing walls or girders (steel or reinforced concrete). Sound and fire proof.

Following are typical illustrations and descriptions of the Natco floors in everyday use:

Natco Flat Arches



PERSPECTIVE OF STANDARD NATCO FLAT ARCH

To find total dead load of any floor use the following weights: Rock asphalt tile or cement finish weighs about 140 lb. per cu. ft.; wood flooring, 3½ lb. per sq. ft.; wood sleepers, 30 lb. per cu. ft.; cinder concrete fill, 60 lb. per cu. ft.; hollow tile arch, see table following; plastering, 5 lb. per sq. ft.; steel I-beam, divide weight of beam by span in feet

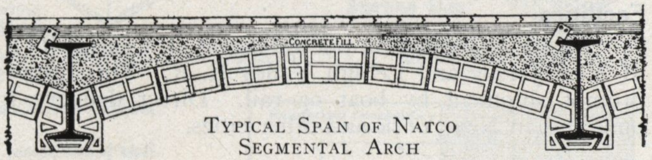
WEIGHTS AND SPANS, NATCO FLAT ARCH

Depth of arch, in.	Approximate weight, lb. per sq. ft.	Maximum safe spans	
		ft.	in.
6	28	4	0
7	31	4	6
8	33	5	0
9	37	6	0
10	41	6	6
12	44	8	0
14	51	9	0
15	53	9	6
16	55	10	0

The flat arch, the accepted type of standard fireproof floor construction, meets every requirement as to strength, fire protection, appearance and minimum weight. Natco flat arch is standard for this type.

Natco Segmental Arch

This form of arch combines great strength with economy and lightness. Suitable for warehouses, lofts, factories, sidewalks, or wherever a flat ceiling is not essential. A metal lath hung ceiling may be suspended from it to give a flat ceiling—a system employed in New York public schools, etc. It weighs approximately 35 lb. per sq. ft. for 6 in. arches.



TYPICAL SPAN OF NATCO SEGMENTAL ARCH

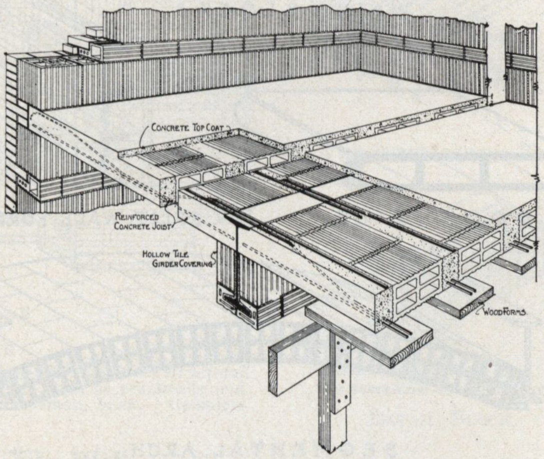
Natco Floors

These floors are of two types: (1) the regular one-way system of tile in combination with reinforced concrete; and (2) "Natcoflor"—a system of tile in combination with reinforced grout.

Both floors, adapted particularly to long span construction, eliminate girders and intermediate beams for clear spans up to 25 or 30 ft., doing away also with beam forms. They require one-third to one-half less flat centering, effecting great economy in erection—2x8-in. planks under each joist are sufficient.

In the regular one-way system of combination floor, rows of tile 12 in. wide are set between reinforced concrete joists 4 to 6 in. wide, which are poured monolithic with a concrete top, usually 2 or 2½ in. thick over the tile, mixed 1 part cement, 2 parts sand and 4 parts gravel.

For semicontinuous and continuous spans, proper reinforcement must be provided in top of slab over supports to take care of negative bending moment. Where heavy loads and long spans are encountered, the shear must be investigated by the designer.



PERSPECTIVE VIEW OF TYPICAL "COMBINATION" FLOOR

Note economical wood centering used; 2x8 or 2x10 in. under each joist is sufficient

Continued on next page

TILE DEPTH AND STEEL AREA REQUIRED, "COMBINATION" FLOOR SLABS, 2-IN. CONCRETE TOP, JOISTS 4 IN. WIDE, 16 IN. O.C.

fc.=650 lb. per sq. in.
fs.=16,000 lb. per sq. in. $\frac{Ec}{Es}=\frac{1}{15}$
Shear, 60 lb. per sq. in.

¾ in. of concrete below reinforcement.
T=Tile; S=Steel.

*If moment $\frac{WL}{12}$ is used, investigate design for shear.

Total safe load (dead plus live), pounds per square foot: Continuous Span $M=\frac{WL}{12}$*	150		165		180		195		210		225		240		260		300		335		375		450	
Semi-continuous span $M=\frac{WL}{10}$	**125**		135		150		160		**175**		**185**		200		220		**250**		280		310		**375**	
Simple span $M=\frac{WL}{8}$	100		110		**120**		130		140		150		160		**175**		200		225		250		300	
Span in feet	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S
6	....	....	....	....	....	....	....	....	....	....	3	.20	3	.22	3	.24	3	.28	4	.24	4	.27	5	.27
7	3	.19	3	.20	3	.22	3	.24	3	.26	3	.28	3	.30	4	.26	4	.30	5	.27	5	.30	6	.31
8	3	.24	3	.26	3	.29	3	.31	3	.34	3	.36	4	.31	4	.34	5	.32	5	.36	6	.34	7	.35
9	3	.31	3	.33	3	.37	3	.40	4	.34	4	.36	4	.39	5	.35	5	.40	6	.38	7	.37	8	.40
10	3	.38	3	.41	3	.46	4	.39	4	.42	4	.45	5	.40	5	.44	6	.42	7	.41	8	.41	9	.44
11	3	.46	4	.39	4	.44	4	.47	5	.42	5	.45	5	.48	6	.45	7	.45	7	.50	8	.49	10	.48
12	4	.43	4	.47	4	.52	5	.46	5	.50	5	.53	6	.49	6	.54	7	.53	8	.53	10	.47	12	.48
13	4	.51	4	.55	5	.50	5	.54	5	.59	6	.53	6	.57	7	.55	8	.55	9	.55	10	.56	12	.57
14	4	.59	5	.53	5	.58	5	.63	6	.58	6	.61	7	.58	7	.64	8	.64	10	.58	12	.54	15	.53
15	5	.56	5	.61	5	.67	6	.61	6	.67	7	.61	7	.66	8	.65	9	.66	10	.67	12	.63	15	.61
16	5	.64	5	.69	6	.65	6	.70	7	.66	7	.70	8	.67	9	.66	10	.68	12	.64	12	.71	15	.70
17	6	.61	6	.67	6	.74	7	.68	7	.75	8	.70	8	.76	9	.75	10	.77	12	.73	15	.65	....	....
18	6	.69	6	.75	6	.82	7	.77	8	.74	8	.78	9	.76	10	.76	12	.73	12	.81	15	.73	....	....
19	6	.76	6	.83	7	.80	7	.86	8	.83	9	.78	9	.85	10	.85	12	.81	15	.73	15	.81	....	....
20	7	.74	7	.80	7	.89	8	.84	8	.91	9	.87	10	.85	12	.79	12	.90	15	.81	15	.90	....	....
21	7	.81	7	.89	8	.87	8	.93	9	.91	9	.96	10	.94	12	.87	15	.80	15	.90	....	....	....	....
22	7	.89	8	.86	8	.95	9	.91	9	.99	10	.95	12	.87	12	.95	15	.88	15	.98	....	....	....	....
23	8	.86	8	.93	8	1.03	9	.98	10	.98	10	1.03	12	.94	12	1.03	15	.95	....	....	....	....	....	....
24	8	.94	8	1.02	9	1.01	9	1.08	10	1.07	12	.96	12	1.03	15	.92	15	1.05	....	....	....	....	....	....
25	8	1.02	9	1.00	9	1.10	10	1.07	12	.98	12	1.03	12	1.12	15	1.00	15	1.13	....	....	....	....	....	....

Note: Based on safe loads indicated, the thickness (inches) and the areas of reinforcement (square inches per joist) are the figures for average conditions, and are for general information only. Each particular operation should be designed in accordance with actual conditions.

The Natco Engineering Department is at the disposal of any one desiring further information.

WEIGHT OF COMBINATION SLABS PER SQUARE FOOT

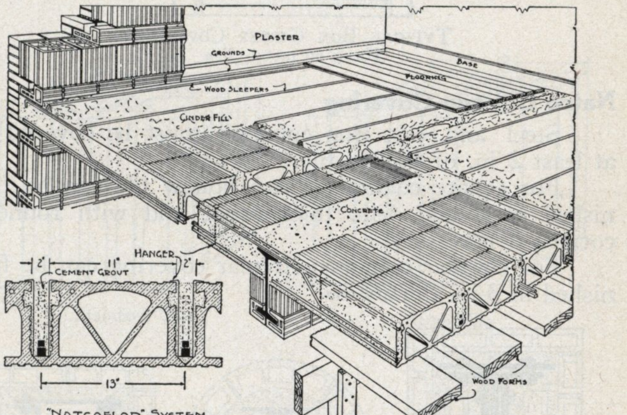
Tile, in.	3	4	5	6	7	8	9	10	12	15
Weight, lb.	45	50	55	60	65	70	75	80	90	105

Note: Load tables are for general information only, as each particular operation should be designed in accordance with actual conditions.

"Natcoflor" System of Fireproof Construction

In the "Natcoflor," rows of tile 13 in. wide, specially designed to resist compressive stress without cement top, are set between mortar ribs 2 in. wide of 1 part portland cement to 2½ parts sand.

The "Natcoflor" is an exceptionally light slab of wonderful strength designed to reduce the dead load of fireproof floor construction carried on girders, columns and footings. A minimum of centering required and an all-tile ceiling surface properly scored for plastering.



"NATCOFLOR" SYSTEM
Note simple method of reinforcing; also economical wood centering, 2x8 in. under each joist is sufficient

Fig. 3. Perspective View of Typical "Natcoflor"

TILE DEPTH AND STEEL AREA, "NATCOFLOR" COMBINATION LONG SPAN FLOORS, NO CEMENT TOP, 2-IN. MORTAR RIBS 13 IN. O. C.

fm. and ft., 1000 lb. per sq. in.
fs., 16,000 lb. per sq. in.

$\frac{Et}{Es}=\frac{1}{10}$

¾-in. below reinforcement.
T=Tile; S=Steel.

Total safe load (dead plus live), pounds per square foot: Continuous span $M=\frac{WL}{12}$	150		165		180		195		210		225		240		260		300		335	
Semi-continuous span $M=\frac{WL}{10}$	125		135		150		160		175		185		200		220		250		280	
Simple span $M=\frac{WL}{8}$	100		110		120		130		140		150		160		175		200		225	
Span in feet	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S
6	4	.16	4	.17	4	.19	4	.20	4	.22	4	.23	4	.25	4	.28	4	.31	4	.35
7	4	.21	4	.23	4	.26	4	.27	4	.30	4	.32	4	.34	4	.38	5	.32	5	.36
8	4	.28	4	.30	4	.33	4	.36	4	.39	5	.31	5	.33	5	.37	5	.42	5	.47
9	4	.35	4	.38	5	.32	5	.34	5	.37	5	.39	5	.42	5	.46	5	.53	6	.46
10	5	.33	5	.35	5	.39	5	.42	5	.46	5	.48	5	.52	6	.45	6	.51	6	.57
11	5	.39	5	.43	5	.47	5	.50	6	.43	6	.46	6	.49	6	.54	6	.62	7	.57
12	5	.47	5	.51	6	.44	6	.47	6	.51	6	.54	6	.59	6	.65	7	.61	7	.68
13	6	.43	6	.47	6	.52	6	.55	6	.60	6	.64	7	.57	7	.63	7	.71	8	.67
14	6	.50	6	.54	6	.60	6	.64	7	.58	7	.61	7	.66	7	.73	8	.70	8	.78
15	6	.57	6	.62	7	.57	7	.61	7	.67	7	.70	7	.76	8	.70	8	.80	9	.78
16	6	.65	7	.58	7	.65	7	.69	7	.76	8	.67	8	.73	8	.80	9	.79	9	.89
17	7	.61	7	.66	7	.73	8	.66	8	.72	8	.76	8	.82	9	.79	9	.90	10	.89
18	7	.68	7	.74	8	.69	8	.74	8	.81	9	.74	9	.80	9	.88	10	.89	10	1.00
19	7	.76	8	.69	8	.77	9	.82	9	.78	9	.83	9	.89	10	.88	10	.99	12	.90
20	8	.71	8	.77	8	.85	9	.79	9	.87	9	.92	10	.88	10	.97	12	.89	12	1.00
21	8	.78	8	.85	9	.82	10	.88	10	.85	10	.90	10	.97	12	.87	12	.98	12	1.10
22	9	.75	9	.81	9	.90	10	.85	10	.93	10	.99	12	.86	12	.95	12	1.08	.....	.....
23	9	.82	9	.89	10	.87	12	.93	12	.83	12	.87	12	.94	12	1.04	12	1.18	.....	.....
24	9	.89	10	.86	10	.95	12	.82	12	.90	12	.95								
25	10	.86	10	.93	12	.84	12	.89	12	.97	12	1.03								
26	10	.93	12	.81	12	.90	12	.96	12	1.05	12	1.12								
27	12	.81	12	.88	12	.97	12	1.04	12	1.13										
28	12	.87	12	.94	12	1.05	12	1.12												
29	12	.94	12	1.01	12	1.12	12	1.20												
30	12	1.00	12	1.08	12	1.20	.....	.....												

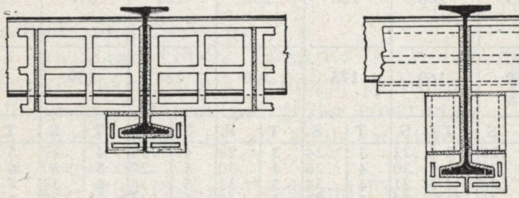
DESIGN DATA

Size, in.	4	5	6	7	8	9	10	12
Mortar per sq. ft......cu. ft.	.05	.06	.07	.088	.10	.111	.123	.156
Wt. of tile ....lb.	26	28	30	32	34	37	40	47
Wt. of floor....lb. per sq. ft.	28	34	39	42	45	48	52	59

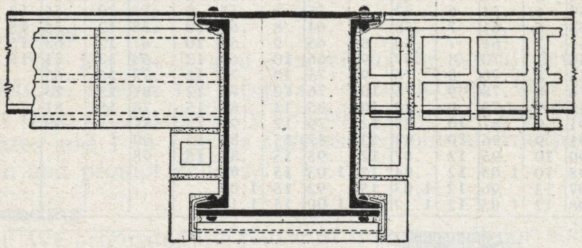
Continued on next page

Natco Girder Covering

Hollow tile beam and girder covering is made in various forms to fit the flanges of all standard steel beams and girders. It is self-supporting except where the width to be covered is more than 12 in.; then the soffit is supported by metal clips.



Standard Natco Beam Covering



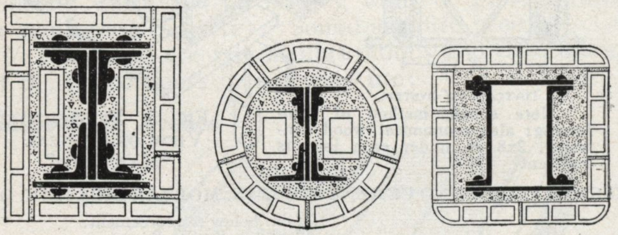
Typical Box Girder Covering
Hung on metal clips

Natco Column Covering

Steel and cast iron columns must be covered by at least 2 in. of hollow tile.

For square columns Natco hollow tile can be furnished in 3 and 4-in. thicknesses, and with rounded corners if necessary.

For circular columns, circular covering can be furnished in 3-in. thickness.



Square Column Covering | Circular Column Covering | Square Column Covering Round Corners

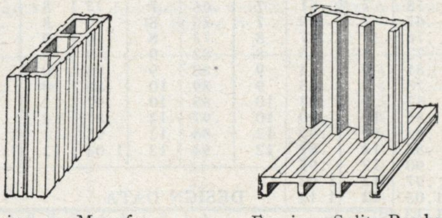
Standard Natco Column Covering

Natco Book Tile (for Both Roofs and Ceilings)

Natco book tile is used between and supported on T-irons to form flat, mansard and hip roofs. It is an effective preventive of condensation. It is also used for flat or hung ceilings.

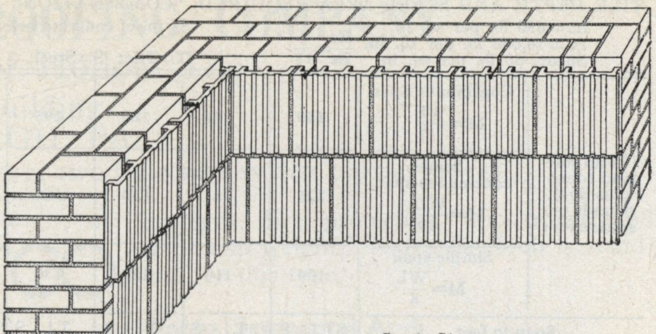
Natco Furring Tile

Walls are furred to prevent the admission of moisture by lining the inside with Natco furring tile.



Furring as Manufactured and Shipped to Job | Furring Split Ready to Lay Against Brick Wall

Natco Wall Furring



Stock Sizes
1½x12x12 in., approximate weight per sq. ft., 8 lb.
2 x12x12 in., approximate weight per sq. ft., 9 lb.

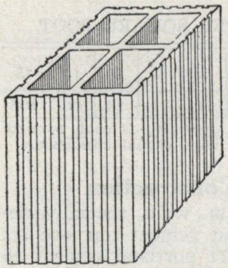
Natco Split Furring Tile Applied to Inside of Brick Wall

Natco Partition Tile

Fireproof, soundproof, easily erected, and the standard for stability, especially where called on to support plumbing fixtures, heavy picture frames, shelving, etc.

Stock sizes 2 to 12 in. thick, laying up 1 sq. ft. of wall surface. Half lengths also furnished.

Hollow tile partitions are commonly built of dense material: 3-in. tile can be used safely to a height of 12 ft.; 4-in. to 16 ft.; 5-in. to 20 ft.; and 6-in. to 24 ft.

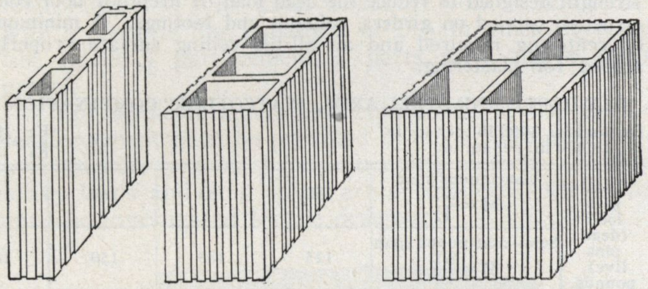


8x12x12 in.

APPROXIMATE SIZES, WEIGHTS, ETC., OF NATCO PARTITION TILE

Size, in.	Minimum number of cells	Weight, lb.
2 x 12 x 12	3	14
3 x 12 x 12	3	15
4 x 12 x 12	3	16
5 x 12 x 12	3	19
6 x 12 x 12	3	22
*7 x 12 x 12	3	25
8 x 12 x 12	4	30
*9 x 12 x 12	4	33
10 x 12 x 12	4	36
12 x 12 x 12	4	40

**Note:* 7 and 9-in. can be furnished on request.



3x12x12 in. | 6x12x12 in. | 12x12x12 in.

Typical Shapes of Natco Hollow Partition Tile

Natco Building Tile (Smooth Face; Glazed and Unglazed, from Eastern Factories Only)

These particular tile are appropriate for bearing or curtain walls of all types of city or farm buildings. Samples sent on request.

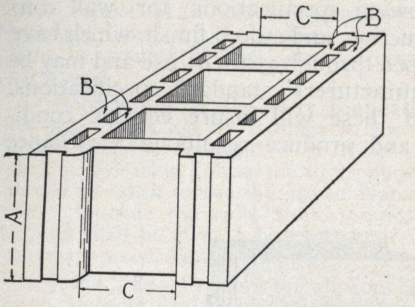
Natco Double Shell Building Tile (Glazed and Unglazed, from Western Factories Only)

These Natco products are hollow tile units with combed and "Tex" face affording a finished exterior surface when laid up in a wall. They have all the structural and artistic advantages of a good face brick with the added advantages of air spaces to check the passage of moisture, heat and cold, and a 30% decrease in cost of laying and mortar; manufactured in 8 and 6-in.

Continued on next page

thicknesses, with all necessary corners, jambs, sills, closures, joist tile, etc.

Superior Features—End construction (A) for greatest strength. Double shell (B) for ideal horizontal mortar joint. Moisture stop (C) for perfect insulation.



Regular Wall Tile 8x12x5 in.

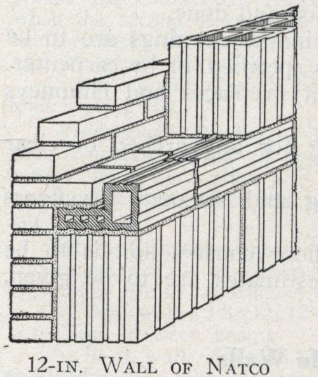
General Features — Burned clay tile—fire safety and permanence. Hollow (enclosed air spaces)—lightness and insulation. Large unit—rapid and economical handling.

Sizes and Types—6x12x5 in. for wall 6 in. thick. 8x12x5 in. for wall 8 in. thick.

Natco Header-Backer Construction (Patented)

This wall construction employs Natco load bearing tile as backing for face brick, properly bonded as required by all building codes. Its use assures a saving of tons of dead weight on structural frame and foundations and approximately one-quarter of labor and mortar expense over solid masonry construction. The Header-Backer wall is greatly superior to any other form of masonry for enclosure walls of office or loft buildings, hotels, warehouses, and for curtain or bearing walls of schools, banks, hospitals, garages, residences, etc.

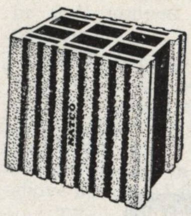
Natco Header-Backer tile is furnished in 6, 8, 10 and 12 in. thicknesses, and the header and backer tile may be combined with the 4-in. face brick to form walls of 8, 10, 12, 14, 16, 18, 20, 22 and 24-in. thickness. The backer tile are cut to heights to work up properly with the joints and bonds in the face brick. The 8-in. header tile displaces 4½ brick, while the 8x12x10½-in. backer tile (most commonly used) displaces 12 brick. For residences we supply 3¾x12x10½-in. tile to be faced with 4 in. of brick which, when bonded with headers every fifth course makes an 8-in. masonry wall.



12-in. Wall of Natco Header-Backer Tile

Natco Double Shell Load Bearing Tile

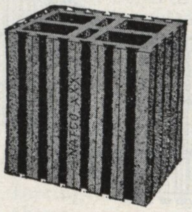
For wall bearing and curtain wall construction—hard burned tile exposed or to be covered with cement stucco finish.



Natco Double Shell Load Bearing Tile

Has a 12x12-in. face furnished for walls 6, 8, 10 and 12 in. thick. Scored for exterior stucco and interior plaster. Has exclusive enduring double shell feature with its moisture stops and wide surfaces for mortar beds. Soundproof and moistureproof. No cutting required. Furnished with reasonable percentage of corners, jambs, closures, sills, lintels and half tile.

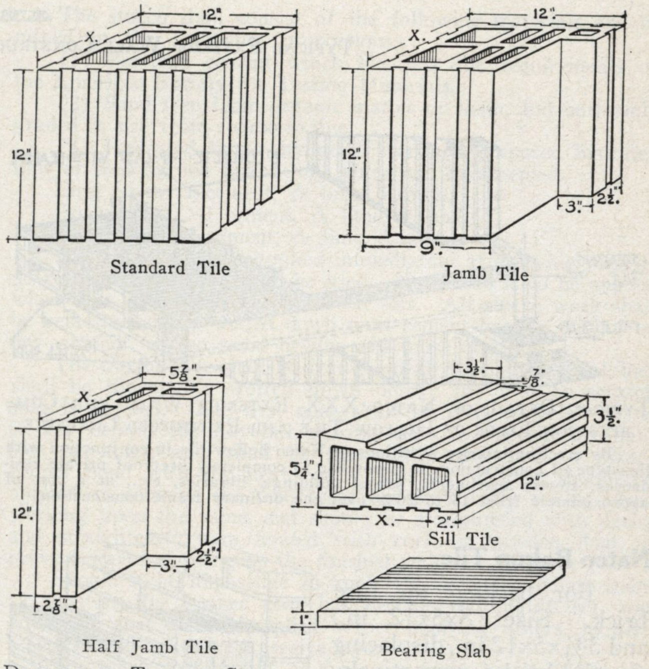
Natco XXX Load Bearing Tile



Natco XXX Tile

Furnished in same sizes for construction similar to that of Natco double shell load bearing tile. Has many of its advantages. One 8x12x12-in. tile of either type is equivalent to 14 brick in an ordinary 8-in. wall.

Write for Bulletin 174 on Natco Wall Construction.



Standard Tile

Jamb Tile

Half Jamb Tile

Sill Tile

Bearing Slab

Details of Typical Shapes of Natco XXX Hollow Tile

APPROXIMATE SIZES, WEIGHTS, ETC., OF NATCO XXX HOLLOW TILE

Standard sizes Thickness (In.—in wall)	Height (In.—in wall)	Length (In.—in wall)	Number of cells	Weight per sq. ft., lb.
3¾	12	12	3	20
6	12	12	6	29
8	12	12	6	36
10	12	12	6	40
12	12	12	9	52
Slabs				
6	1	12	..	6
8	1	12	..	8
10	1	12	..	8
12	1	12	..	12
Sill tile				
10	5¼	12	3	20
12	5¼	12	4	22
14	5¼	12	4	25

Jamb tile			Half jamb tile			Corners		
Thickness	Height	Length	Thickness	Height	Length	Thickness	Height	Length
(In.—in wall)			(In.—in wall)			(In.—in wall)		
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
6	12	12	6	12	5⅞	6	12	12
8	12	12	8	12	5⅞	8	12	2
10	12	12	10	12	5⅞	10	12	4
12	12	12	12	12	5⅞	12	12	6

Note: **When specifically called for on the customer's order, a reasonable percentage of half lengths are manufactured and shipped for use along with 1-in. slabs in working up to story heights.**

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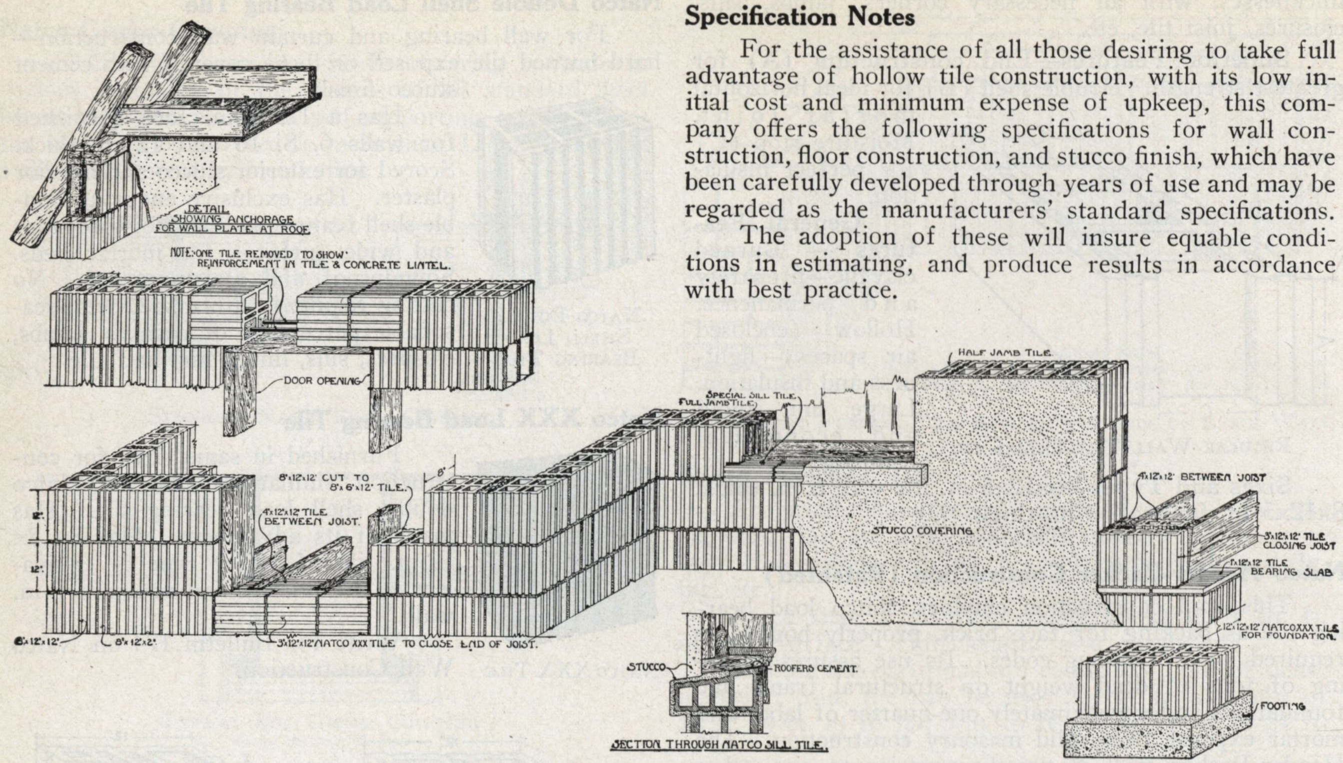
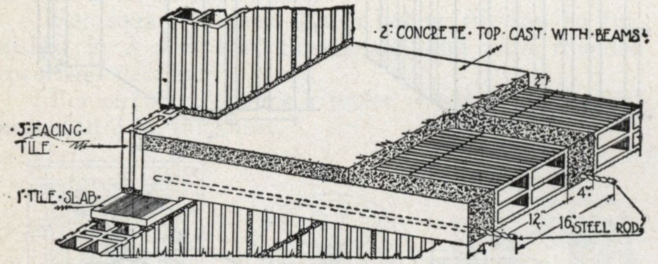

DETAIL SHOWING ANCHORAGE FOR WALL PLATE AT ROOF
NOTE: ONE TILE REMOVED TO SHOW REINFORCEMENT IN TILE & CONCRETE LINTEL.
DOOR OPENING
8"x12"x12" CUT TO 8"x 6"x12" TILE.
8"
4"x12"x12" TILE BETWEEN JOIST.
12"
12"
6"x12"x12"
8"x12"x2"
3"x12"x12" NATCO XXX TILE TO CLOSE END OF JOIST.
HALF JAMB TILE.
SPECIAL SILL TILE.
FULL JAMB TILE.
STUCCO COVERING
4"x12"x12" BETWEEN JOIST
3"x12"x12" TILE CLOSING JOIST
1"x12"x12" TILE BEARING SLAB
12"x12"x12" NATCO XXX TILE FOR FOUNDATION.
FOOTING
STUCCO
ROOFERS CEMENT.
SECTION THROUGH NATCO SILL TILE.

Typical Exterior Wall Construction of Natco XXX Hollow Tile

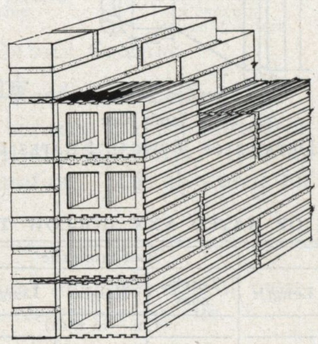

2" CONCRETE TOP CAST WITH BEAMS
3" FACING TILE
1" TILE SLAB
2"
4"
12"
16" STEEL ROD
4"

Typical Detail of Natco XXX Exterior Wall and Combination Floor of Hollow Tile and Reinforced Concrete

By erecting interior partitions of Natco hollow tile in conjunction with this type of construction, it is possible to completely fireproof private residences, stores, apartments, school buildings, libraries, etc., at a cost of approximately from 15 to 20% over the ordinary frame construction

Natco Bakup Tile

For backing up face brick. Sizes 8x5x12 in., and 3¾x5x12 in., displacing 6 and 3 bricks, respectively, in 12-in. and 8-in. walls; smooth on one 5x12-in. face and scored for mortar or plaster on other three sides, assuring decreased weight, an insulated wall and economy in material setting.



Wall of Natco Bakup Tile

Materials and Methods

The materials and methods illustrated and described herein have been determined by wide practical experience in Natco hollow tile construction, and have been approved by fireproofing engineers and architects generally.

Full details, not easily furnished in limited available space, will be supplied on application.

Specification Notes

For the assistance of all those desiring to take full advantage of hollow tile construction, with its low initial cost and minimum expense of upkeep, this company offers the following specifications for wall construction, floor construction, and stucco finish, which have been carefully developed through years of use and may be regarded as the manufacturers' standard specifications.

The adoption of these will insure equable conditions in estimating, and produce results in accordance with best practice.

It is suggested that the first clauses of wall or floor specifications entitled "General" might be quoted in full, followed by clauses stipulating:

(1) Which contractor applies cement coat to exterior of foundation walls of tile.

(2) Whether dampproofing shall be integral or applied and by whom furnished and done.

(3) Whether door or window openings are to be calked by hollow tile layer, as specified, or by carpenter.

(4) How and by whom fireplaces and chimneys shall be constructed.

(5) By whom centering for any arched or clear openings shall be provided.

(6) By whom centering and sleepers for floors shall be provided and set.

(7) Which system of floor construction is to be used, or whether alternate estimates are to be given, etc.

Specification for Hollow Tile Walls

General—The contractor for this part of the work shall furnish, deliver and erect all materials required for exterior and interior bearing walls and any interior subdividing partitions, as indicated on plans, of hard burned hollow tile, together with all necessary special shapes required at corners, at joist level, in working around openings or to complete buildings as called for in this specification to approval of architect. All hollow tile shall be true and regular in size, manufactured of such design that all bearing webs and shells are in direct compression when laid in the wall.

Tile shall have all faces scored with special dovetail scoring to offer a good surface for the stucco and plaster finish. Tile cracked or broken on the outside shells will not be acceptable under this specification.

In general all exterior walls and interior bearing walls shall be of Natco XXX or Natco double shell load bearing hollow tile; non-bearing, subdividing walls shall be Natco partition tile as manufactured by the National Fire Proofing Company.

Laying—All tile used in the exterior walls and any interior bearing partitions must be laid with the cells or voids vertical in the wall, in order to develop their full strength. Interior subdividing, non-bearing partition tile may be laid on side if

Continued on next page

desired, but must be started on the structural floor and wedged against the floor above. Care must be taken that the tops of all unfinished walls are thoroughly covered or protected against stormy weather.

Mortar—All mortar used for laying up the hollow tile shall consist of a standard portland cement, lime putty or hydrated lime, and clean, sharp sand in the following proportions by volume: 1 part portland cement, 1 part lime and 6 parts sand.

Foundation Walls—Any foundation walls so indicated on plans from top of footings to the underside of first floor beams shall be constructed of Natco XXX or Natco double shell load bearing hollow tile to produce thickness shown. Care should be taken to use the proper Natco hollow tile at the corners. Outside of walls from footing to a point above the ground shall be given a heavy coat of waterproofed cement or other approved dampproofing.

Jamb Tile—Provide for all double hung windows Natco jamb tile with rabbeted openings to receive the window frame box. Fill well with mortar the space between the tile and the frame box to within 1 in. of stop bead.

The contractor for the setting of the tile is to calk all doors and windows with roofers' cement or oakum, furnished and set by him, to prevent the passage of air or moisture.

Lintels—Openings not exceeding 5 ft. in clear span may be spanned with Natco load bearing tile reinforced with proper steel rods in lower cells and filled solidly with stone or gravel concrete.

Openings over 5 ft. in clear span to be spanned with reinforced concrete girder faced with tile, or with steel angles—size of structural or reinforcing steel variable with load and span; all to be furnished and set by the contractor for tile laying to approval of architect.

Sills—Form all sills of Natco special hollow sill tile.

Special care must be taken to fill all joints so as to prevent moisture working through the same; the wood sill of the frame to be set in a heavy bed of roofers' cement.

Arch Openings—Build all arch openings shown on plans of 2-course rowlock hollow brick header arches, carefully laid on substantial centers. Arches will spring from the hollow tile and must be well bedded on them.

Porch Columns and Piers—Construct any porch columns and piers, so indicated of hollow tile to sizes as shown. Where column finish is round, build the same of 3-in. circular hollow tile column covering, filling the column with concrete when the second story walls are supported by them. If steel reinforcement is used, care should be taken to band the steel against lateral deflection.

Square columns shall be built of the proper size Natco load bearing tile.

Floor Beam Bearings—Provide and set load bearing tile slabs 1-in. thick under all floor beams as bearing plates for the same. These slabs shall also be used for working up to levels and story heights when the full or fractional tile do not work out correctly.

Beam Courses—Wood floor beams are to be framed into exterior walls as shown on detail, using Natco load bearing hollow tile in accordance with the following:

In 8-in. walls, 3¾x12x12 in. for facing ends of beams and for filling between beams.

In 10-in. walls, 3¾x12x12 in. for facing ends of beams and 6x12x12 in. for filling between beams.

In 12-in. walls 3¾x12x12 in. for facing ends of beams and 8x12x12 in. for filling between beams.

Roof Plates—Embed in cement grout in two upper courses of wall at intervals of 5 ft. ¾-in. bolts 24 in. long. Bolts to project 6 in. above the top of the wall, to allow plate to be fastened down with nuts.

Specifications for Floor Construction

General—Floor construction shall be the type known as the one-way combination hollow tile and concrete floor construction consisting generally of 4-in. reinforced concrete beams spaced 16 in. on centers with Natco hollow tile between, and covered with concrete top as shown or "Natcoflor" without concrete covering, all to have at least 4-in. bearing on walls.

Concrete—All concrete used in floor construction shall consist of 1 part portland cement, 2 parts clean sharp sand, and 4 parts broken stone or gravel of such size as will pass through a ¾-in. ring. Concrete will be of wet mixture, and must be well tamped and worked around reinforcing steel after pouring.

Reinforcing Steel—Steel rods for floor construction must be of such type as will have a mechanical bond with the concrete. Corrugated, twisted or similar type will be accepted. Steel must have an elastic limit of not less than one-half the tensile strength. Rods must be clean and free from rust scales before placing in position, and must be placed not over 1 in. above bottom of floor.

Tile—Depth of Natco tile and size of steel reinforcement will be as shown on the plans or as specified by competent engineers for the given spans and loads, etc. All tile must be wet before concrete or grout is placed, so as to insure proper bond with the concrete.

Centers—Centers must be of such size as to insure of their not deflecting under the weight of the wet materials, and must be provided in such quantity as to insure speedy work. Centers must not be removed before the concrete has properly set, and under long spans a center line of supports must be maintained for at least 3 weeks after the concrete has been poured. In cold weather the centers must be left in place until directed by the architect to remove them.

Natcoflor—Grout for Natcoflor shall consist of 1 part portland cement to 2½ parts of sand. Specifications for reinforcing steel, tile and centering shall be the same as is given above.

Specifications for Stucco on Hollow Tile

The stucco shall consist of the following materials and be mixed in the following proportions:

(1) Portland cement which has met the requirements of the American Society for Testing Materials.

(2) Sand free from organic matter or loam, and uniformly graded in size from coarse to fine.

(3) Hydrated lime—any good brand of prepared hydrated lime or well burned slaked lime putty will be accepted.

First coat: 1 cement, 1/10 lime, 3 sand.
Second coat: 1 cement, 1/10 lime, 3 sand.
Third coat: 1 cement, 1/10 lime, 3 sand.

All stucco shall be applied immediately after being mixed; no re-tempered stucco shall be used. No stucco is to be applied when it is liable to freeze before it sets. All stucco work shall be kept thoroughly wetted down until cement has set, in hot or dry weather, as too rapid drying will cause cracking.

The tile surface shall be free from all foreign material, and shall be thoroughly wetted down before the first or scratch coat is applied. The first coat shall be well troweled so as to key behind the dovetail scoring, also to prevent air bubbles or holes, and shall be thoroughly scratched to insure proper bond with the next coat. The second coat should be applied as soon as the prior coat has sufficiently set to allow working upon the same, and should be straightened with darby and straightedge, then floated with cork or wooden float to prevent waves showing on the finished wall.

Should it be impossible to apply the second and last coats as soon as the former coat has become thoroughly set, wet down the coat already applied before applying others, to give a better bond between successive layers.

The finish coat should, as far as possible, be applied to the entire area of one side of structure to the corners at one operation.

Thickness of each coat should average from ¼ to ½ in. If only 2-coat work, the material must have a total thickness of not less than ¾ in., exclusive of the dovetail scoring.

Finish coat of stucco is to be waterproofed with an approved brand of integral waterproofing compound or other approved compound in accordance with directions of manufacturers.

Co-operative Services

The engineering department maintained by this company is fully equipped to give details and recommendations for the fireproofing of buildings, and furnish all possible help and information to patrons who wish to avail themselves of the advantages offered.

UNIVERSAL UNIT TILE COMPANY

EXECUTIVE OFFICES
Scripps Building
SAN DIEGO, CAL.

ONLY ONE TILE FOR ALL BUILDING PURPOSES
UU

TRADE-MARK

Product

Hollow Building Tile for structural purposes of novel and improved design, suitable for all types and varieties of buildings in which burned clay products can be used.

Design

The Universal Unit was designed to positively prevent moisture and frost penetration and to overcome other disadvantages of the present commercial forms of structural hollow tile, also to facilitate and reduce the cost of manufacturing, shipping, handling, estimating and laying.

Advantages of Universal Unit Tile

(1) One size and shape for all standard thicknesses of walls and details of construction. Starter, corner, jamb, sill, filler and all special shapes readily cut with trowel from standard unit leaving sections of usable size.

(2) Units are two bricks wide, three high and one long, with mortar joints, thus displacing six bricks in wall. Building construction can be designed with the Universal Unit same as for brick as they cut into any necessary combination of brick sizes.

(3) This construction offers maximum resistance to frost and dampness penetration. All mortar bed joints are offset, lead upward from exterior to interior face of wall and are interrupted by vertical rising voids. Stucco and plaster may be applied direct to tile without furring.

(4) Latticed interior construction and direct line continuation of webs through entire Unit insures maximum load bearing and lateral strength.

(5) No ties or reinforcing required except for arch and lintel construction; jamb tile make masonry bond with wall.

(6) Brick veneer work can be figured in supporting strength of walls as Unit bonds perfectly with it.

(7) Perfect balance, easy and quick to lay.

(8) Units nest perfectly, hence minimum breakage.

(9) Units simply yet positively interlock.

(10) Size, shape and cut-up features simplify quantity calculations.

(11) Facilitates placing grounds and plugs for interior finish without danger of moisture penetration.

Estimating and Construction Data

Face sizes of units 8x8x8 in. Two units lay exactly one face foot of 8-in. wall; three units for 13-in. walls; four units for 17-in. walls, etc. Units weigh between 17 and 18 lbs. Lintels formed of standard units or cut sections reinforced and filled with concrete, as required.

Tests by recognized testing engineers show each unit to have crushing strength of 50,000 to 100,000 lbs.

Use of Brick

As units are worked out to brick sizes in every dimension, walls can be built entirely without brick or brick can be used anywhere in construction and they line and bond with the tile.

Quality and Marking

All load bearing Universal Units are composed of properly prepared grades of hard burning clay, shale, fire clay or mixtures thereof to provide maximum strength and fire resistance. Each unit has trademark "UU" impressed thereon.

Non-bearing Construction

Universal Unit tile offers superior advantages for curtain and filler walls in pier and girder construction. The convenient size and shape, ease and rapidity of handling and laying, made it compare favorably in cost with plain tile. Its lightness, in addition to its fireproof, frostproof and dampproof feature, renders its use most desirable in construction of this class.

In cities and localities where the Universal Unit is now available, it is rapidly being given preference over other forms of hollow filler wall construction.

Farm Buildings

The advantages of fireproof construction on the farm is rapidly being realized. Universal Unit is a superior material for all types of farm buildings, houses, barns, silos, corn cribs, etc. The one size and shape builds all.

The simplicity and economy of this construction especially recommends it for use where skilled labor is difficult to obtain and construction costs must be minimized.

Availability

The address of the nearest sales office or agency can be obtained from the executive offices, Scripps Building, San Diego, California.

Specifications

Specifications covering the use of Universal Unit tile for any type of building furnished on request.

Patents

Universal Unit tile is manufactured and sold under the Richard S. Requa patent issued May 25th, 1920. Other United States patents allowed and pending. Canadian patent issued October 12th, 1920. Patents pending, or issued, in all principal foreign countries.

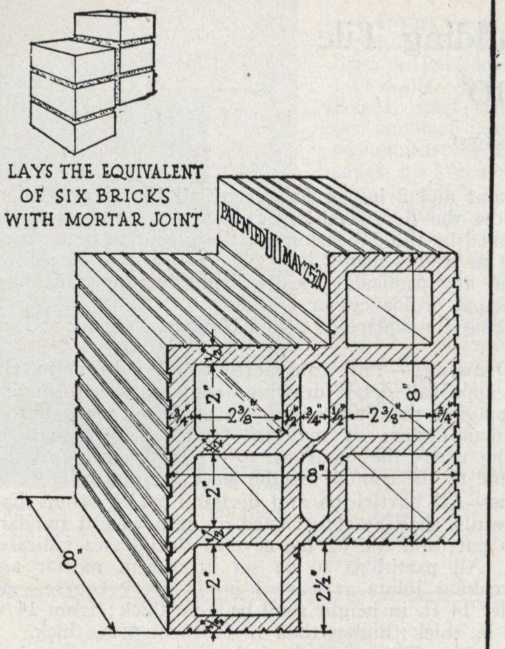
Engineering Service

Free engineering service for advice or data concerning construction problems in connection with the use of Universal Unit tile is available at the Executive Offices. Architects, engineers and contractors are invited to freely avail themselves of this service.

Catalogues and Construction Details

Catalogues, detail sheets, miniature samples and general construction data will be supplied from the Executive office or any of the branch offices.

Continued on next page


LAYS THE EQUIVALENT
OF SIX BRICKS
WITH MORTAR JOINT
PATENTED JU MAY 25 20
2"
2 3/8"
3/4"
1/2"
8"
2"
2"
2 1/4"
8'

UNIVERSAL
UNIT TILE

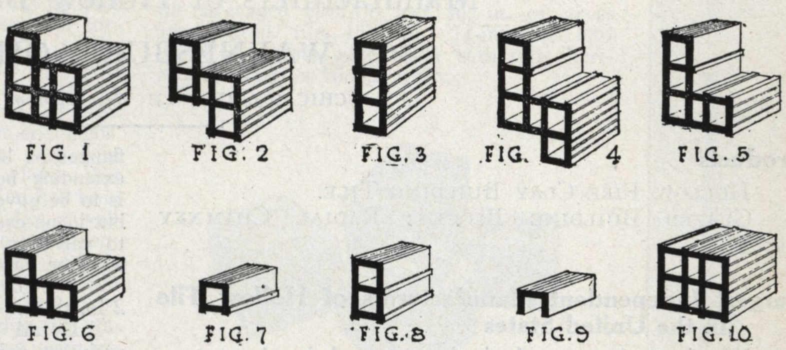
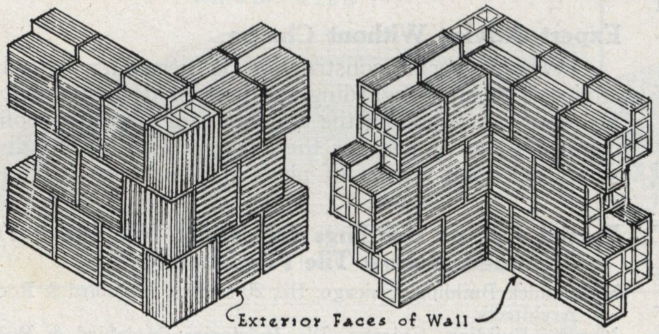


FIG. 1 FIG. 2 FIG. 3 FIG. 4 FIG. 5

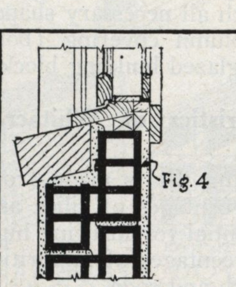
FIG. 6 FIG. 7 FIG. 8 FIG. 9 FIG. 10

Fig. 1 - Section used for window & door heads, and flush jambs.
Fig. 2 - 2/3 Section used where full unit works too high, etc.
Fig. 3 - Longitudinal half section, used for corners and for constructing walls more than 8" thick.
Fig. 4 - For bonding courses in brick veneer work, under brick window sills, special floor construction, etc.
Figs. 5, 6, 7, 8, 9 & 10 - For special construction, fillers, etc. Fig. 9 is a brick-sized section formed in cutting other special sections, and can be used as starter under std. units, or wherever a brick size piece is needed.

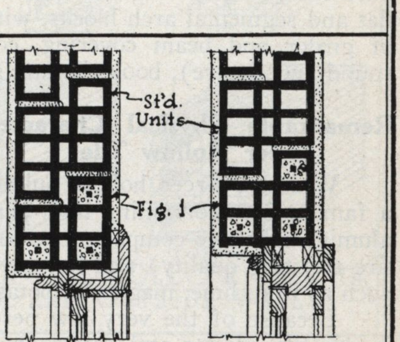
SPECIAL SHAPES CUT FROM STANDARD BLOCKS


Exterior Faces of Wall

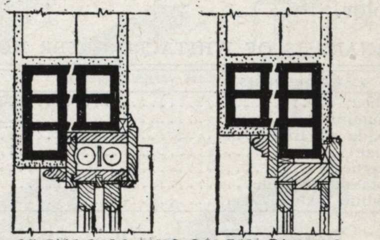
CORNER DETAILS
Note simplicity, strength, and perfect bond.



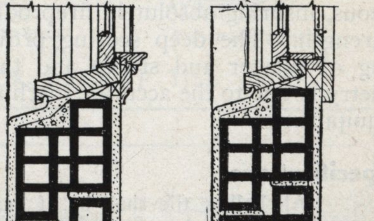
DETAILS OF
BRICK SILL
Shown with
8" wall


Std.
Units
Fig. 1

SECTIONS THROUGH HEADS



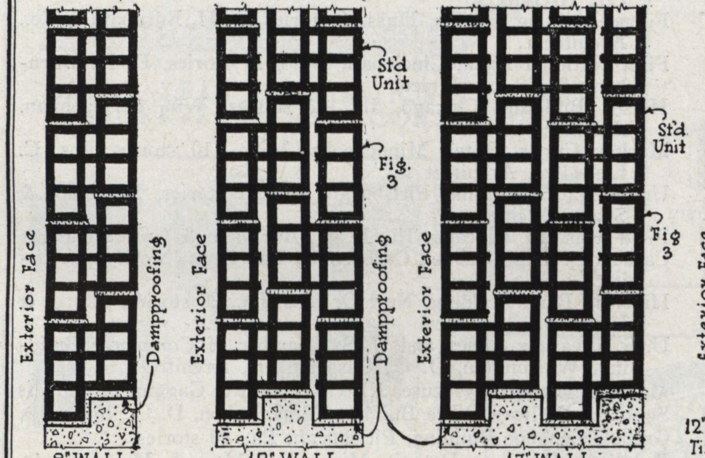
SECTIONS THROUGH JAMBS



SECTIONS THROUGH SILLS

3/4" SCALE DETAIL OF DOUBLE HUNG WINDOW 3/4" SCALE DETAIL OF CASEMENT WINDOW

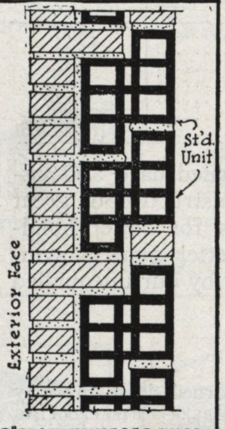
Note the interlocking bond around openings


Std.
Unit
Fig. 3
Std.
Unit
Fig. 3
Exterior Face
Dampproofing
Exterior Face
Dampproofing
Exterior Face

8" WALL 12" WALL 17" WALL

Note simplicity of construction, and the waterproof, fireproof, interlocking and load bearing features of these walls.

3/4" SCALE DETAILS OF TYPICAL WALL CONSTRUCTIONS


Std.
Unit
Exterior Face

12" BRICK VENEERED WALL
Tile perfectly adapted to this work. Bonding may be every 4th & 7th. course

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	UNIVERSAL UNIT TILE, SHOWING VARIOUS SHAPES CUT FROM STANDARD BLOCKS & DETAILS OF CONSTRUCTION	SCALE 3/4" EQUALS 1'-0" DATE: AUG. 22	DRW'G 1

THE WHITACRE-GREER FIREPROOFING COMPANY

Manufacturers of Hollow Building Tile

WAYNESBURG, OHIO

CHICAGO, ILL., 123 West Madison Street

Products

HOLLOW FIRE CLAY BUILDING TILE.

GLAZED BUILDING BLOCKS; RADIAL CHIMNEY BRICK.

Largest Independent Manufacturers of Hollow Tile in the United States

We have been exclusively engaged in the manufacture of hollow fire clay building tile for over 30 years, our product having been used in the construction of many of the largest buildings throughout the country.

Our three plants, situated in the great clay belt of Ohio and equipped with modern clay working machinery, have a combined capacity of 25,000 tons per month. Our exceptional facilities permit us to produce stock and special shapes on the shortest possible notice and at the lowest possible cost.

Hollow clay fireproofing as manufactured by us consists of practically all forms known to the trade—partitions, load bearing and back-up blocks, split furring, flat and segmental arch blocks, with all necessary shapes of girder and beam covering, column covering (both round and square), book tile and glazed building blocks.

Remarkable Physical Characteristics of Whitacre-Greer Hollow Tile

Whitacre-Greer hollow building tile is made from a famous clay containing high percentages of silica and alumina (the two components essential for insuring high fire resisting quality) and low percentages of impurities such as iron, lime, magnesia, potash and soda.

Because of the very low percentages of impurities in our tile, plaster and stucco applied to it will not discolor.

ANALYSIS OF WHITACRE GREER HOLLOW BUILDING TILE

Components	Percentage
Silica	58.75
Alumina	26.43
Oxide of iron	2.57
Lime	.37
Magnesia	.77
Potassium oxide	1.49
Sodium oxide	.45

Whitacre-Greer hollow tile is burned hard and vitreous, insuring absolutely fireproof construction of great strength. The deep scoring provides for better bonding of plaster and stucco and the better general symmetry is due to the accurate machining by our unequalled equipment.

Specifications

All hollow tile shall be of hard burned dense fire clay as manufactured by THE WHITACRE-GREER FIREPROOFING COMPANY, Waynesburg, Ohio. No badly split, cracked, warped or underburned tile shall be used.

Hollow Tile Fireproofing—The hollow tile fireproofing shall be capable of withstanding the tests prescribed by the National Board of Fire Underwriters' standards for fire resistive floor, wall and partition construction. All arches shall be flat arch end construction with side construction keys and either end or side construction skews. The faces of all tile that are to receive plastering or mortar shall have the standard scoring.

Fireproofing Steel—The thickness of fireproofing around steel members shall be 2 in. for soffit coverings on lower flanges of beams and 2 in. on flanges of all beams or girders extending below the floor arches. Thickness of web covering is to be governed by the dimensions of the girder to be covered, but in no case to be less than 2 in. (The above shall be subject to variation in any particular locality depending upon existing state or municipal ordinances or by-laws).

Tile covering for square or round columns shall be at least 2 in. thick.

Detail Drawings—The contractor shall submit to the architect for approval, detail drawings showing the form and method of applying the fireproofing to the steel work before starting the manufacture of material. Stock shapes shall be used throughout where they conform to the requirements of this specification and fit the contour of the steel.

Partitions—All partitions and division walls other than load bearing walls, shall be constructed of light weight standard scored hollow partition tile of the several thicknesses indicated on drawings. All partitions to be set in cement mortar and bonded by breaking joints at least 3 in. in every course. All partitions under 14 ft. in height shall be 3 in. thick; from 14 to 18 ft. to be 4 in. thick; higher than 18 ft. to be 6 in. thick.

Load Bearing Tile—Standard load bearing tile shall have a heavy dovetail scoring and shall have an absorption of not more than 8%. Wherever possible, these tile shall be laid with cells vertical. All tile shall be capable of sustaining a load of 1200 lb. per sq. in. of gross area when laid with cells vertical.

Expert Advice Without Charge

Where special construction is necessary or when advice is desired regarding the best modern practice of fireproof construction, the assistance of our fireproofing engineers can be had for the asking. Estimates will be submitted upon receipt of plans and specifications.

Partial List of Buildings for Which We Have Furnished Hollow Tile Fireproofing

McCormick Building, Chicago, Ill., 20 stories, Holabird & Roche, Architects
Monroe Building, Chicago, Ill., 16 stories, Holabird & Roche, Architects
Merchants National Bank, Indianapolis, Ind., D. H. Burnham & Co., Architects
Filene Building, Boston, Mass., 8 stories, D. H. Burnham & Co., Architects
First National Bank, Cincinnati, Ohio, 19 stories, D. H. Burnham, & Co., Architects
Heisen Building, Chicago, Ill., 22 stories, Wm. Strippelman, Architect
Mackey Curtis Hotel, Minneapolis, Minn., 10 stories, Jos. C. Llewellyn, Architect
Union National Bank, Pittsburgh, Pa., 21 stories, MacClure & Spahr, Architects
Field Museum, Chicago, Ill., D. H. Burnham & Co., Architects
Carbondale High School, Carbondale, Pa., Owen McGlyn, Architect
Hibernia Bank Building, New Orleans, La., 20 stories, Favrot & Livaudais, Architects
U. S. Treasury Annex and U. S. Chamber of Commerce Building, Washington, D. C., Cass Gilbert, Architect
Masonic Temple, Syracuse, N. Y., Gaggin & Gaggin, Architects
Southern Railway Office Building, Washington, D. C., 10 stories
Grant Telephone Building, Pittsburgh, Pa., 20 stories
Penobscot Building, Detroit, Mich., Donaldson & Meier, Architects
William Penn Hotel, Pittsburgh, Pa., Janssen & Abbot, Architects
Cleveland Hotel, Cleveland, Ohio, Geo. B. Post, Architect
Union Trust Building, Cleveland, Ohio, 20 stories, Graham, Anderson, Probst & White, Architects
Commodore Hotel, New York, N. Y.
Bancroft Hall, U. S. Naval Academy, Annapolis, Md.
Book-Cadillac Hotel, Detroit, Mich., Louis Kamper, Architect

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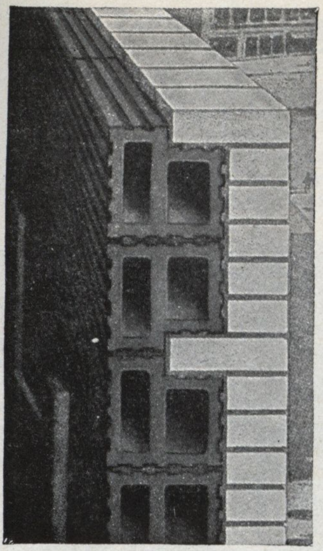


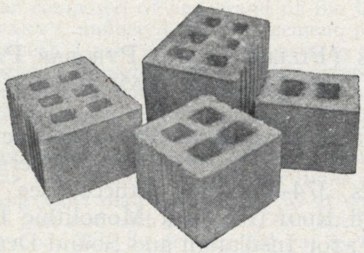
Typical Perfection Header-Backup Tile Construction

Perfection Header-Back-up Tile

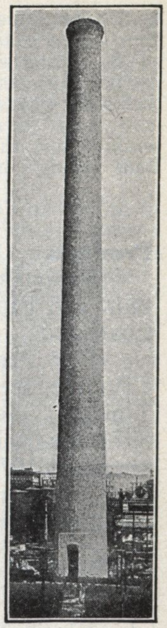
Insures a permanent construction for backing up face brick in load bearing and curtain walls. Adaptable to the largest steel frame buildings or smallest garage. It is economical because its use saves steel, cement and labor. This fact has been proven in many buildings where this form of construction has been used. This tile makes a wall that has a load carrying capacity of solid brick, and is lighter in weight than solid brick and cheaper. It is free from dampness due to the air chambers and passageways which it forms. This eliminates the necessity of furring and provides a scored surface for receiving plaster.

Made in 8, 10 and 12-in. widths so as to make 12, 14 and 16-in. walls with face brick.

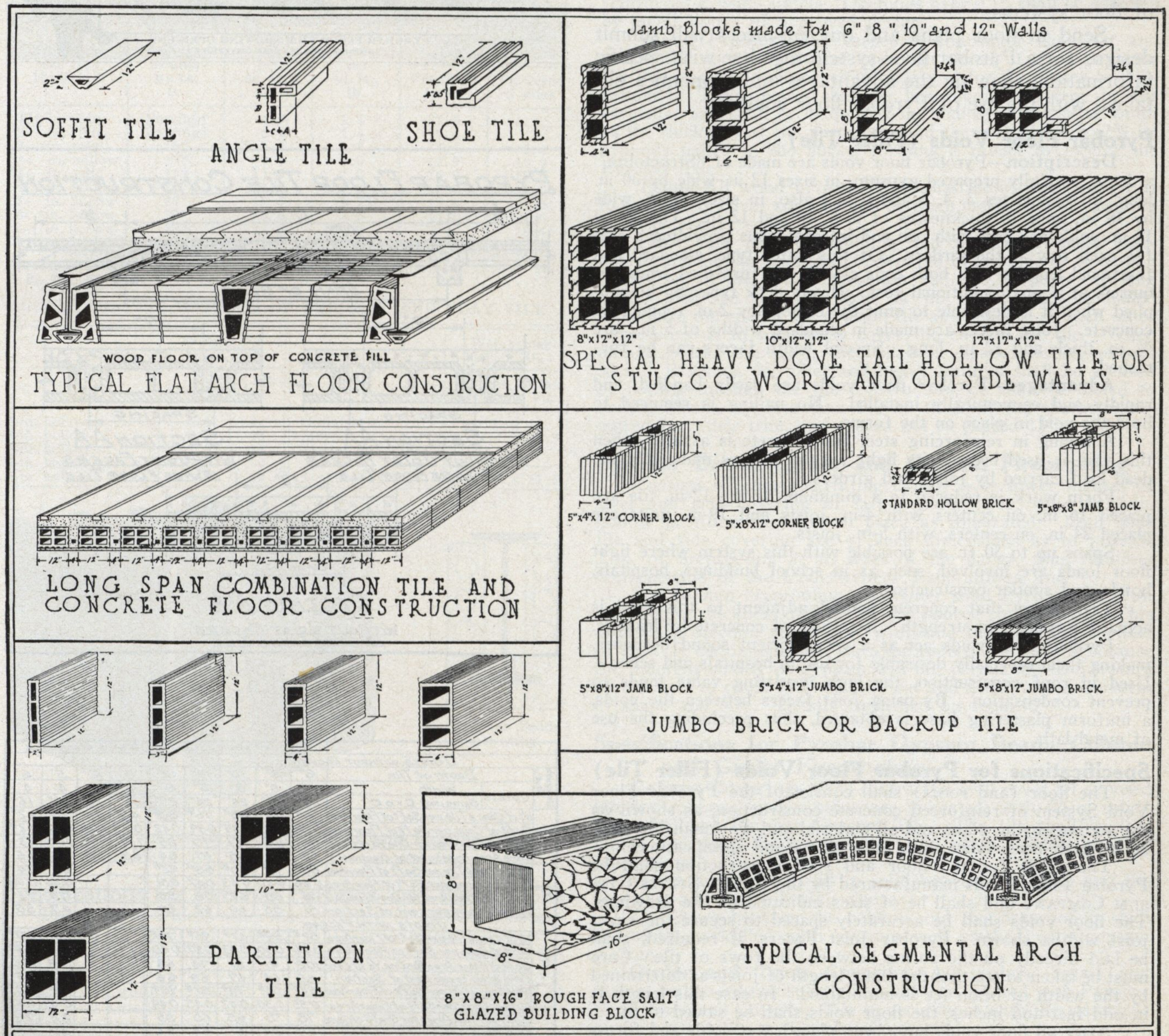
This tile is approved by the New York City Bureau of Buildings. Tests were made at Columbia University for load bearing capacity, with the following results—8-in. tile averaged 2292 lb. per sq. in. of gross area; 10-in. tile, 1544 lb.; 12-in. tile, 1664 lb. These tests were made with cells horizontal, same as laid in walls.



Buff Fire Clay Radial Chimney Brick



Radial Brick Chimney Built of Whitacre-Greer Buff Radial Brick
Heine Chimney Co., Chicago, Builders


2"
12"
SOFFIT TILE
ANGLE TILE
SHOE TILE
WOOD FLOOR ON TOP OF CONCRETE FILL
TYPICAL FLAT ARCH FLOOR CONSTRUCTION
Jamb Blocks made for 6", 8", 10" and 12" Walls
8"x12"x12"
10"x12"x12"
12"x12"x12"
SPECIAL HEAVY DOVE TAIL HOLLOW TILE FOR STUCCO WORK AND OUTSIDE WALLS
LONG SPAN COMBINATION TILE AND CONCRETE FLOOR CONSTRUCTION
5"x4"x12" CORNER BLOCK
5"x8"x12" CORNER BLOCK
STANDARD HOLLOW BRICK
5"x8"x8" JAMB BLOCK
5"x8"x12" JAMB BLOCK
5"x4"x12" JUMBO BRICK
5"x8"x12" JUMBO BRICK
JUMBO BRICK OR BACKUP TILE
PARTITION TILE
8" X 8" X 16" ROUGH FACE SALT GLAZED BUILDING BLOCK
TYPICAL SEGMENTAL ARCH CONSTRUCTION

WHITACRE-GREER HOLLOW FIREPROOFING TILE.

UNITED STATES GYPSUM COMPANY

Floor Voids (Filler Tile)

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see page 374

Products

Pyrobar Voids (Filler Tile); Pyrobar Partition and Furring Tile; Pyrobar Beam and Column Covering.

For Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

Engineering Service

Our Fireproofing Department is organized to cooperate with architects and engineers in the designing of floor systems.

Send in floor plans and our engineers will submit designs for a Pyrobar floor system together with specific information, showing the advantages and economies obtained with the use of Pyrobar floor voids.

Pyrobar Floor Voids (Filler Tile)

Description—Pyrobar floor voids are made of "Structolite," a dense, specially prepared gypsum, in sizes 12 in. wide by 30 in. long, in thicknesses 3, 4, 5 and 6 in.; also, in sizes 19 in. wide by 18 in. long, in thicknesses of 6, 8, 10 and 12 in. The 19 by 18-in. voids are cast with one end integral, thus providing a seal for each row at the girders. Of this latter type, standard and fractional lengths with both ends closed, are furnished when required, at a small additional cost. Heavy deck type can be supplied when it is desirable to omit the customary 2-in. topping of concrete. Joist facers are made in standard widths of 5 in.; are ¾ in. thick and 12 in. long. Special width facers can be furnished.

Advantages—Pyrobar floor voids are easily handled, and rapidly and economically installed. No nailing is required to hold the void in place on the forms.

A saving in reinforcing steel and concrete is assured when this void is used because its light weight reduces materially the dead load carried by joists and girders.

Form work is reduced to a minimum as the 12-in. tile are placed 16 in. on centers with 4-in. joists and 19-in. units are placed 24 in. on centers, with 5-in. joists.

Spans up to 30 ft. are possible with this system where light floor loads are involved, such as in school buildings, hospitals, hotels, and similar construction.

Tests show that concrete poured adjacent to this void is actually increased in strength. No waste of concrete by leakage.

Pyrobar floor voids act as a very efficient sound deadener, making them especially desirable for use in hospitals and schools. Used in roof construction, the high insulating value tends to prevent condensation. By using joist facers between the voids, a uniform plastering base is obtained, thus precluding the use of metal lath.

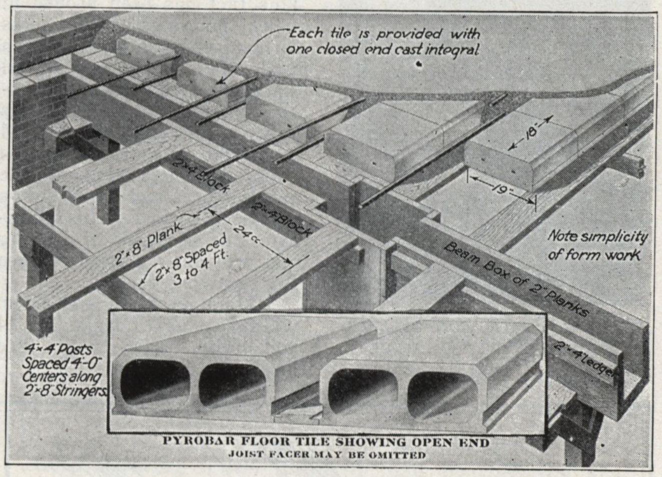
Specifications for Pyrobar Floor Voids (Filler Tile)

The floor (and roofs) shall consist of the Pyrobar Floor Void System of reinforced concrete construction, as shown on the accompanying plans and all material and workmanship shall be in strict accordance with these plans and specifications.

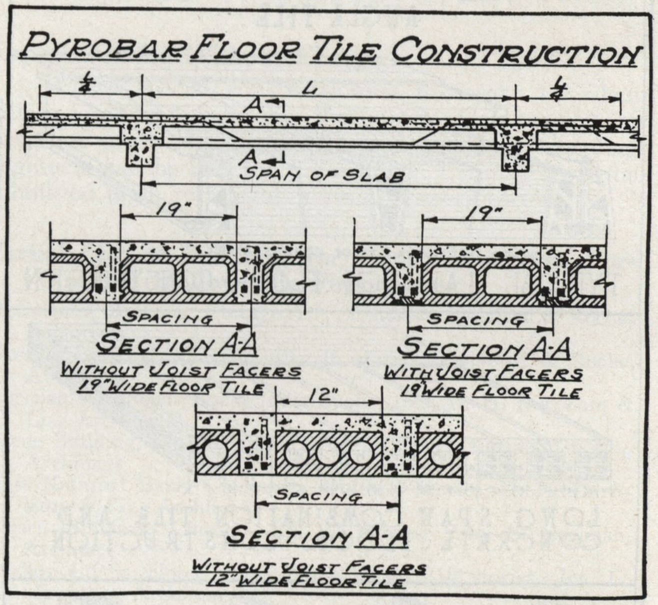
The voids for the floor and roof construction shall be Pyrobar Floor Voids manufactured by the United States Gypsum Company and shall be of sizes indicated on the drawings. The floor voids shall be accurately spaced to secure the exact joist widths shown. Pyrobar Joist Facers, if required, shall be laid directly on the forms between the rows of tile. Care must be taken to see that the exact length of joists as determined by the width of beam tee is maintained. In case this length is in odd feet and inches, the floor voids shall be sawed to fit.

After all floor voids have been placed, wet voids and forms thoroughly before the concrete is poured.

Note: Joist facers may be omitted if desired.


Each tile is provided with one closed end cast integral
18"
19"
2"×4" Block
2"×4" Block
2"×8" Plank
24 c.c.
2"×8" Spaced 3 to 4 Ft.
Note simplicity of form work
Beam Box of 2" Planks
2"×4" Ledger
4"×4" Posts Spaced 4'-0" Centers along 2"×8" Stringers

PYROBAR FLOOR TILE SHOWING OPEN END
JOIST FACER MAY BE OMITTED



Concrete Top			19" Wide Floor Tile					12" Wide Floor Tile			
Joists without Facers											
	Depth of Tile		6"	8"	10"	12"	12"	3"	4"	5"	6"
	Joists	Width	5"	5"	5"	5"	6"	4"	4"	4"	4"
		Spacing C to C	24"	24"	24"	24"	25"	16"	16"	16"	16"
2"	Wt of Conc & Tile per Sq. Ft. of Floor Area		54#	60#	68#	76#	80#	43#	48#	55#	62#
	Cu. Ft of Conc. per Sq. Ft. of Floor Area		0.28	0.32	0.35	0.39	0.42	0.23	0.25	0.27	0.29
	Sq. Ft of Floor Area for One Yd. of Conc.		96	86	77	70	65	117	108	100	93
	Core Area in percent of Section		58	62	65	67	64	45	50	54	56
3"	Wt. of Conc & Tile per Sq. Ft of Floor Area		66#	72#	80#	88#	92#			68	74
	Cu Ft of Conc. per Sq. Ft of Floor Area		0.36	0.40	0.43	0.47	0.51			0.36	0.38
	Sq Ft of Floor Area for One Yd. of Conc		74	68	62	58	53			75	71
	Core Area in per cent of Section		51	56	60	62	60			47	50
Joists with Facers											
2"	Wt of Conc & Tile per Sq. Ft. of Floor Area		52#	59#	67#	75#	78#			53#	60#
	Cu. Ft of Conc. per Sq. Ft. of Floor Area		0.26	0.30	0.33	0.37	0.40			0.25	0.27
	Sq. Ft of Floor Area for One Yd. of Conc		102	91	81	74	68			108	100
	Core Area in per cent of Section		60	64	67	68	66			57	59
3"	Wt. of Conc & Tile per Sq. Ft. of Floor Area		64#	71#	79#	87#	90#			66#	72#
	Cu Ft of Conc. per Sq. Ft of Floor Area		0.35	0.38	0.42	0.45	0.49			0.33	0.35
	Sq. Ft of Floor Area for One Yd of Conc		78	71	65	60	55			82	77
	Core Area in per cent of Section		54	58	61	64	62			50	53

Weights of voids per lin. ft.; 3 in. deep, 11 lb.; 4 in. 15 lb.; 5 in., 20 lb.; 6x30 in., 24 lb.; 6x18 in., 26 lb.; 8 in., 29 lb.; 10 in., 35 lb.; 12 in., 41 lb.

Continued on next page

Pyrobar Partition and Furring Tile

Moulded of 97% gypsum and 3% special wood fiber by continuous automatic machine process, insuring accurate proportions and uniform size, weight, strength, and density.

This company will erect Pyrobar partitions.

Approved by Underwriters' Laboratories, Inc., for:

Non-bearing corridor walls, partitions, wall furring, false columns and pilasters, unplastered partitions and corridors in merchandise storage warehouses.

Fire division walls.

Elevators, stairways, dumbwaiter and corridor enclosures.

Light wells, pipe chases, heat and vent ducts.

As covering for columns, beams, girders and trusses and other steel members requiring fireproofing.

Floor fill instead of cinder concrete.

Installation on concrete roofs.

Advantages—

	Fireproof
Light weight	High insulation
Saves plaster	Soundproof
Perfect plaster base	Speedily erected

Distinctive Economy—Pyrobar units are 2½ sq. ft. each, speeding construction and making for economy in handling and erection costs. Pyrobar walls are straight and true, requiring a uniform ½ in. of plaster on a side to finish.

Cost—Its extreme light weight and large, true units secure economy in freight, labor, handling, erection, and plastering. Note the comparisons.

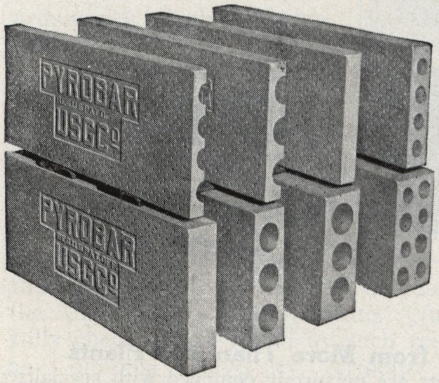
SIZES AND WEIGHTS OF PYROBAR PARTITION TILE

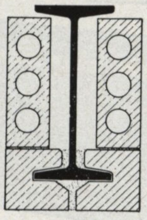
Thickness (all tile 12x30 in.)	For ceilings, heights up to, ft.	Weight tile per sq. ft., lb.	Weight mortar per sq. ft., lb.	Total weight** per sq. ft., lb.	
				Plastered 1 side	Plastered 2 sides
1½-in. split	Furring†	4.9	1.4	7.9	....
2- in. split	Furring†	6.4	1.4	9.4	....
2- in. solid	10*	9.4	1.5	12.4	15.4
3- in. hollow	13*	9.9	2.0	12.9	15.9
3- in. solid	15†	13.0	2.0	16.0	19.0
4- in. hollow	17*	13.0	2.5	16.0	19.0
5- in. hollow	20*	15.6	2.75	18.6	21.6
6- in. hollow	30*	16.6	3.0	19.6	22.6
8- in. hollow	40*	22.4	4.0	25.4	28.4

*Underwriters' Laboratories recommendation. †No Underwriters' recommendation. **Weight of plaster, one side 3 lb. per sq. ft., two sides 6 lb. per sq. ft. (½-in. grounds).

COMPARATIVE WEIGHTS OF PYROBAR AND CLAY TILE

Thickness	Weight per sq. ft., lb.		3-in. tile in place	Weight per sq. ft., lb.	
	Pyrobar	Clay Tile		Hollow Pyrobar	Clay Tile
2-in. hollow........	6.4	12	Unfinished........	9.9	15.
3-in. hollow........	9.9	15	Mortar...........	2.	3.5
4-in. hollow........	13.0	16	Plaster both sides..	6.	9.
5-in. hollow........	15.6	19			
6-in. hollow........	16.6	22	Total weight......	17.9	27.5





Pyrobar Beam Covering

Pyrobar Precast Gypsum Partition and Furring Tile

Approved by Underwriters' Laboratories, Inc.

Specifications for Pyrobar Partition and Furring Tile

Partitions—Unless otherwise specified or shown, all partitions shall be built of United States Gypsum Company's Pyrobar Partition Tile of thickness indicated on plans. All partitions shall be started on the fireproof floor, and the tile shall be set plumb, straight and true, and shall be wedged at ceiling and slushed with mortar. The corners of all partitions shall be built log cabin fashion, the tile interlocking.

Furring—All outside walls, where so shown on plans, shall be furred with Pyrobar Tile of thickness and type indicated on plans, laid up against the wall. Where solid or hollow furring tile are used, these shall be securely spiked to the wall every square yard with 10d cut nails, metal ties, anchor straps or other approved fasteners left in place by mason contractor.

Shafts, Openings and Ducts—Unless otherwise specified, all pipe chases, dumbwaiter shafts, heat and vent ducts, etc., where shown on plans, shall be constructed with 3-in. Hollow Pyrobar wherever possible, otherwise 2-in. Solid Pyrobar shall be used.

Mortar and Laying—All Pyrobar Tile shall be laid up in mortar composed of any brand of the United States Gypsum Company's unfibered gypsum cement plaster (retarded for 4 hours set), 1 part plaster to 3 parts, by weight, of clean, sharp, dry sand, thoroughly mixed. (Important: Do not use portland cement or lime mortar.) No mortar shall be retempered. All tile shall be laid with full, flush joints to a line, with horizontal beds uniformly level on each course. All joints, chinks and crevices between the tile and other work shall be filled with mortar well slushed in. All partitions coming in contact with existing walls shall be anchored by driving spikes into the walls in the joints of each course. The door bucks shall be anchored to Pyrobar Tile by driving 10d cut nails into every course of tile, or secured by any approved clip.

Lintels—Openings not greater than 22 in. in partitions of tile may be spanned with a single tile, which shall have a bearing at each end of not less than 4 in. When such openings are more than 22 in. but not more than 4 ft., the Pyrobar Tile over these openings shall be laid in the form of a jack-arch. Openings over 4 ft. but not over 6 ft. shall be spanned by reinforced gypsum lintels. Openings over 6 ft. shall be spanned by metal lintels of approved design.

Wood Frames—The carpenter contractor shall set and secure the rough bucks for openings ahead of the contractor for this work so as to cause no delay. (For Carpenter Specifications.) These bucks shall be left plumb and true by the carpenter and shall be made of 2-in. lumber of the same width as the thickness of the partitions, and there shall be ½x2¾-in. grounds nailed to the bucks, forming a rabbet to receive the Pyrobar Tile.

Trim—All wood or metal trim shall be of such design as to completely cover any junction between metal bucks or furring and the plaster coats.

Chair rail, picture moulding and plaster grounds, baseboards and similar trim shall be secured to grounds or to nailing blocks set in the tile construction for this purpose. Nailing blocks shall be not less than ⅞ in. thick, shall be nailed directly to the end of the gypsum tile and shall be of such other dimensions as to completely cover the end of the tile. When nailing blocks are used, they shall be spaced not to exceed 30 in. Blackboards, toilet and heavy fixtures shall be secured by bolting through the tile construction, or shall be nailed to nailing blocks not less than 1½ in. thick of the character required for other trim, and spaced not to exceed 15 in.

Pyrobar Beam, Girder and Column Fireproofing

Consists of shoe tile, fitting closely over lower flanges of steel and side covering of larger units (2-in. solid or 3-in. hollow partition tile) set in place as illustrated. Both shoe tile and side covering are of such dimensions as to provide 2 in. of fireproofing at all sides of the flange, thus fulfilling requirements of the Underwriters' Laboratories, Inc.

For column fireproofing, use either solid Pyrobar tile with a minimum thickness of 2 in., or our poured construction. This offers a protection which will withstand the destructive effect of 1900° F. continuous heat for a duration of two hours, because the inherent quality of gypsum will not permit the temperature of the steel to reach 212°. Easily cut and fitted, and is uniform in shape and size. Details furnished on request.

Specifications for Pyrobar Gypsum Beam, Column and Girder Fireproofing

Column Covering—This contractor shall cover all exposed interior columns, unless otherwise indicated, with [2-in. solid] [3-in. hollow] Pyrobar Gypsum Tile. The tile shall be laid plumb and true, the corners built log cabin fashion, the tile interlocking.

(If it is desired to fill in solid between the steel and the covering, add the following clause:)

The space between the column and the fireproofing shall be solidly backfilled with gypsum well slushed with gypsum mortar.

Girder and Truss Covering—All girders, beams and trusses, unless otherwise specified, shall be covered with Pyrobar Beam Shoe and Covering Tile in accordance with the standards of the United States Gypsum Company.

Mortar and Laying—See above specification for mortar and laying Pyrobar Tile.

W. E. DUNN MANUFACTURING CO.

Hollow Concrete Building Units

HOLLAND, MICH.

PARTIAL LIST OF AUTHORIZED MANUFACTURERS

EASTERN STATES

ALLENTOWN, PA., Duntile Mfg. & Supply Co.
ALTOONA, PA., Altoona Duntile Products Co.
AUBURN, ME., Thompson & Turner
BALTIMORE, MD., Duntile & Cement Products Co.
The Duntile Concrete Products Co.
BANTAM, CONN., C. T. Hotchkiss
BEMUS POINT, N. Y., Chautauqua Concrete Products Co.
BOSTON, MASS., Atlantic Cement Products Corp.
BROCKTON, MASS., Cement Building Products, Inc.
BUFFALO, N. Y., Duntile System, Inc.
BUTLER, PA., Klingler-Carson Co.
CARLSTADT, N. J., Horace T. Cimiluca
CHARLESTON, W. VA., Banks & Brauneck
ELLWOOD CITY, PA., Albert Dahl
ERIE, PA., Erie Duntile Co.
FAIRMONT, W. VA., Cement Products Co.
GROVE CITY, PA., R. J. Breckenridge Construction Co.
HEMPSTEAD, N. Y., Hempstead Concrete Products Co.
JERICHO, N. Y., Jericho Duntile & Supply Co.
JOHNSTOWN, PA., Duntile Building Brick Co.
KITTANNING, PA., Bauer Bros.
MANHASSET, N. Y., North Shore Garage & Trucking Co.
MONONGAHELA, PA., Leyda Concrete Products Co.
MORGANTOWN, W. VA., Bliss & Fairfield
MT. EPHRAIM, N. J., Duntile Mfg. & Supply Co.
MT. VERNON, N. Y., Duntile Building & Construction Co.
MERCHANTVILLE, N. J., West Jersey Duntile & Supply Co.
NEW BRUNSWICK, N. J., New Brunswick Concrete Works
NEW CASTLE, PA., New Castle Duntile Co.
NEW HAVEN, CONN., New Haven Duntile Co.
NO. CHELMSFORD, MASS., John J. Buchanan
NORWALK, CONN., Norwalk Duntile Mfg. Co.
OLEAN, N. Y., Allegany Sand & Gravel Co.
PATCHOGUE, N. Y., S. J. Bronski
POINT MARION, PA., Paul E. Conn
ROCHESTER, N. Y., The Rockbrick Corporation
RUTLAND, VT., Y. O. Gilmore
SALISBURY, MD., Salisbury Duntile Mfg. Co.
SHAMOKIN, PA., Edgewood Tile Works
SOMERS POINT, N. J., South Jersey Duntile & Concrete Products Corp.
SOUTH FALLSBURG, N. Y., Walter S. Cutler
STROUDSBURG, PA., Duntile Products Co.
WAYNE, PA., C. W. Lynam
WILKES BARRE, PA., Goeringer Construction Co.
WYOMISSING, PA., Wyomissing Cement Products Co.
YORK, PA., Decker Tile Co.

WESTERN STATES

BOULDER, COLO., Wilson & Wahlgren
DENVER, COLO., Denver Duntile Co.
PHOENIX, ARIZ., W. E. Williams

CENTRAL STATES

BATTLE CREEK, MICH., F. L. Seage
BENTON HARBOR, MICH., National Concrete Corporation
CHAMPAIGN, ILL., Lange Brothers
CHILLICOTHE, OHIO, P. Brewer & Sons
CONCORDIA, KAN., The Concordia Concrete Products Co.
CRESTLINE, OHIO, Concrete Products & Duntile Mfg. Co.
DAVENPORT, IOWA, Davenport Duntile Works
DETROIT, MICH., Detroit Concrete Receptacle Co.
DIXON, ILL., Dixon Tile & Pipe Co.
ELY, MINN., McMahan Lumber Co.
FLINT, MICH., Genesee Gravel Co.
FORT WAYNE, IND., Fort Wayne Duntile Co.
GRAND RAPIDS, MICH., Grand Rapids Duntile Co.
HINCKLEY, ILL., Robert J. Clark
JACKSON, MICH., Kelso & Siamieski
KANSAS CITY, MO., Kansas City Duntile Co.
LAFAYETTE, IND., Wallace Steel & Supply Co.
LANSING, MICH., Lansing Duntile Co.
MANSFIELD, OHIO, Kerr & Kerr
MARINE CITY, MICH., Superior Concrete Co.
MT. CLEMENS, MICH., Multiplex Cement Block Co.
MUSKEGON, MICH., Markle Cement & Coal Co.
NEW ULM, MINN., Saffert Cement Construction Co.
OWOSSO, MICH., S. M. Campbell
PIGEON, MICH., Pigeon Duntile Company
SAGINAW, MICH., Kaufman Duntile Company
SHELBYVILLE, IND., Shelby Duntile Company
SPRINGFIELD, ILL., R. E. & Wm. G. Baker
ST. LOUIS, MO., St. Louis Duntile Company
TERRE HAUTE, IND., Terre Haute Duntile Co.
TOLEDO, OHIO, Hummel & Hillebrand
TOPEKA, KAN., Sargent Cut Stone Company

SOUTHERN STATES

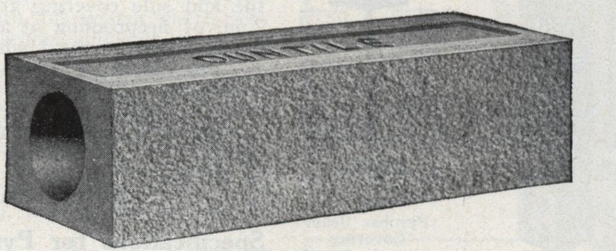
BATON ROUGE, LA., Andrew Clausen
CHERRYDALE, VA., J. A. Van Doren
COCONUT GROVE, FLA., Miami Construction Co., Inc.
DAYTONA BEACH, FLA., The Daytona Duntile Co.
FORT LAUDERDALE, FLA., The Ketchin Duntile Co.
FROSTPROOF, FLA., Duntile Mfg. Co.
GAINESVILLE, FLA., Voyle & Company
KINSTON, N. C., Carolina Duntile Co.
LAKE WORTH, FLA., Florida Duntile Mfg. Co.
PINE BLUFF, ARK., H. J. Hendrix
SARASOTA, FLA., Howard-Duntile Mfg. Co.
SEBRING, FLA., Highlands Duntile Co.
ST. CLOUD, FLA., J. W. Sage
TARPON SPRINGS, FLA., Tarpon Lumber & Supply Co.

FOREIGN

BYCULLA, BOMBAY, INDIA, James Hogan
MEXICO CITY, MEXICO, Leon B. Giraud
MONTREAL, QUE., Duntile Co., Ltd.

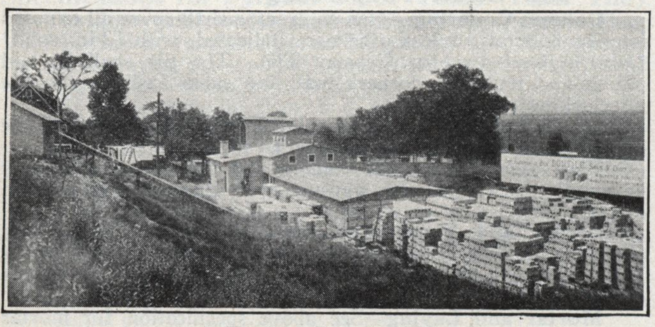
DUNTILE

The Perfected
All-Purpose Concrete
Building Unit



TRADE-MARKS

DUNTILE
Builds
Better Buildings
Cheaper



A Typical Duntile Plant

Stocks Available from More Than 250 Plants

All Duntile plants are uniformly equipped with specialized power machinery and modern curing systems. Every one is owned and operated by local men of high standing who appreciate the importance of manufacturing high quality products and rendering dependable service at all times.

Regardless of what building operations you are concerned with, it will pay you to let the nearest local plant submit facts and figures, because Duntile reduces the cost of finest permanent construction to the level of frame. If there is no Duntile plant in your vicinity listed above write for complete list.

Note: We solicit suggestions and advice from architects and contractors regarding building operations, possible markets, etc., that will aid us in the establishment of additional plants where they can best serve the trade and insure the construction of better buildings at least cost. Write to Holland, Mich. office direct.

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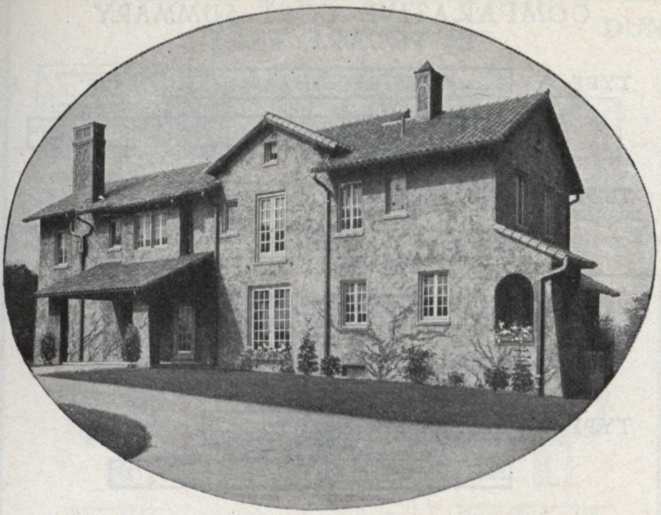


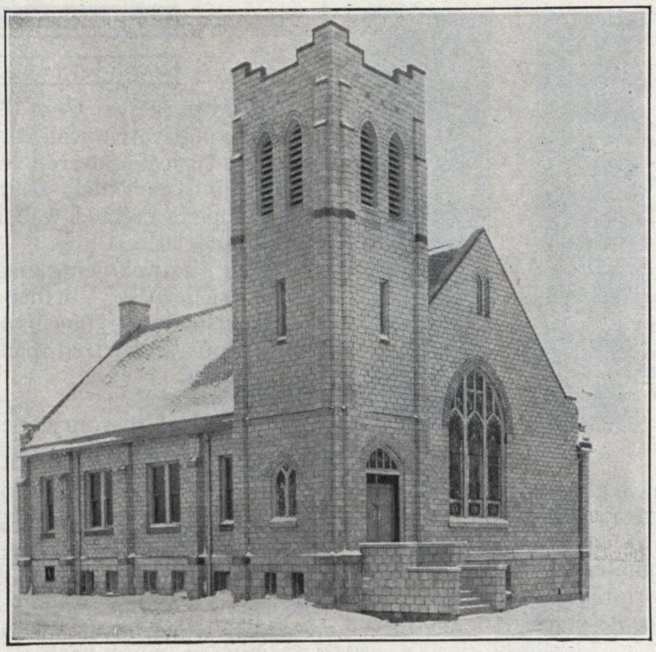
The $35,000 Duntile Home of Geo. B. Rheinfrank, Prominent Toledo Architect

All walls and masonry partitions of Duntile. Two fireplaces and billiard room walls of unplastered Duntile

Duntile

What Is Duntile?—A trade-marked and nationally advertised hollow concrete building unit adapted for the construction of all types of buildings from basement to roof. The Glazed Duntile, furnished in a variety of colors and textures, admirably lends itself to architectural treatment. True color effects of natural stone, brick or granite can also be secured.

Duntile combines light weight with exceptional strength, which is due to its design having large hollow space through its entire length, arch support, and also due to uniform standards under which it is manufactured.



Church Built of Duntile

Except for Duntile, this congregation would have been deprived of this church, as bids on other materials repeatedly exceeded their funds

Cost of Permanent Construction Reduced to Level of Frame—Duntile costs no more than frame construction and, approximately 30% less than brick. We will verify these statements by submitting unquestionable figures. Write the Holland, Michigan, office.

Official Test Data Available—Duntile is manufactured to conform with the standard specifications of the American Concrete Institute. Quality has been carefully checked and tested by such reputable laboratories as Columbia University, Armour Institute of Technology, Pittsburgh Testing Laboratory, Robert W. Hunt, and others. Details of tests can be furnished on request to the Holland, Michigan, office or any of the authorized manufacturers listed on preceding page.

Adapted for All Classes of Buildings—Duntile while offering an ideal wall material for residences, garages, churches, schools, libraries, etc., where beauty and practicability are coupled with initial low cost, is also especially adapted to industrial buildings, warehouses, powerhouses, etc., where great strength and stiffness is required.

Cost of Laying Reduced—Duntile, because of their light weight, full mortar bed, square corners, and true, clean edges, are easily and rapidly laid. Breakage is eliminated through sound design, the circular core furnishing heavily "gusseted" corners. For the same reason, broken out corners are eliminated, thus obviating any necessity for patching or pointing.

Duntile are preferred by masons as they are laid like brick with shove joint.

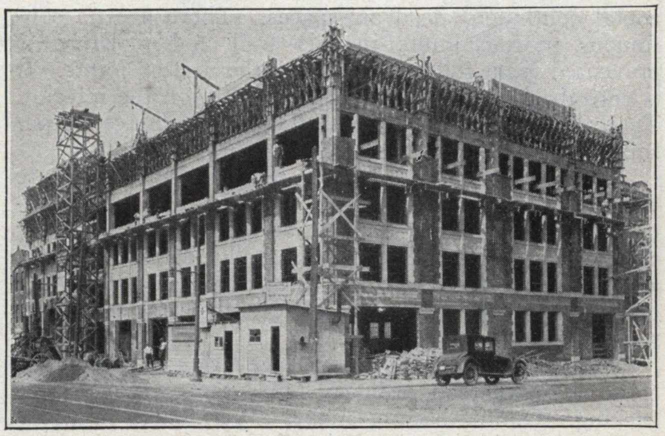
Whether glazed or plain Duntile is used, the saving in mortar is considerable—100 sq. ft. of Duntile triple air space wall (Type A) requires but 7.1 cu. ft. of mortar as compared with 21 cu. ft. of mortar required for 100 sq. ft. of 8-in. brick wall, a saving of two-thirds on this item alone.

Sizes and Strength—Duntile is made in a wide range of standard sizes for the *complete* construction of all types of buildings. (See table on second page following.) The full mortar bed and natural cohesion of mortar to concrete ensures the high efficiency of finished wall.

No Furring Required—Duntile has made possible the now famous thermos bottle type of wall construction. (See cut A on following page.) In this construction, three sealed dead air spaces are created, forming a most efficient insulated masonry wall. Note that no joint extends through the wall, although full mortar bed for each tile is retained. Buildings so constructed are so dry and well insulated that it is standard practice to plaster direct on the inner Duntile walls, which are so true and even that 50% of the plaster material and labor is saved.

Glazed Duntile

Glazed Duntile compares in appearance and quality with high grade face brick. Adaptable wherever appearance is a consideration, it possesses the additional advantage of again reducing cost of construction. Glazed Duntile has



500-car Garage Built and Owned by L. A. Ott & Co., Leading Contractors of Montreal, Can.

Duntile used throughout

Continued on next page

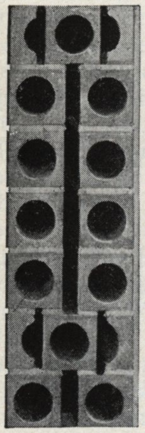
not merely a skin of stucco or veneer applied after the material has become set, but the heavy matt glazed surface is actually an integral part of the tile itself. Carried in stock at most plants in a variety of colors ranging from light buff to dark chocolate and of distinctive grained textures.

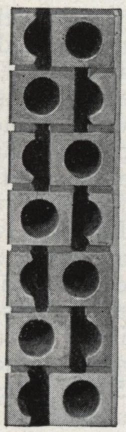
Architectural Treatment and Face Effects—Glazed Duntile lends itself admirably to the exterior construction of handsome residences and the finest commercial buildings. The opportunity for architectural treatment, through selection of tile sizes, colors and contrasting mortar joints, opens a whole new field to the architect who has hitherto been restricted to face brick or stucco as a surface treatment. However, where the use of stucco is advisable plain Duntile forms an unexcelled base.

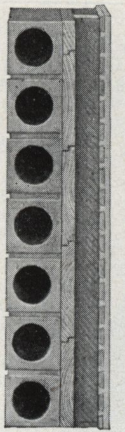
The natural affinity of concrete for stucco, the firm non-warping wall and smooth true surface ensure permanency with minimum material.

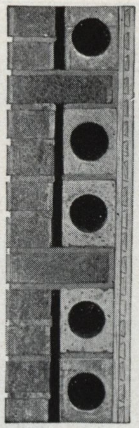
Typical Available Constructions

The wall sections illustrated herewith are typical of a few of the available constructions.


A


B


C


D

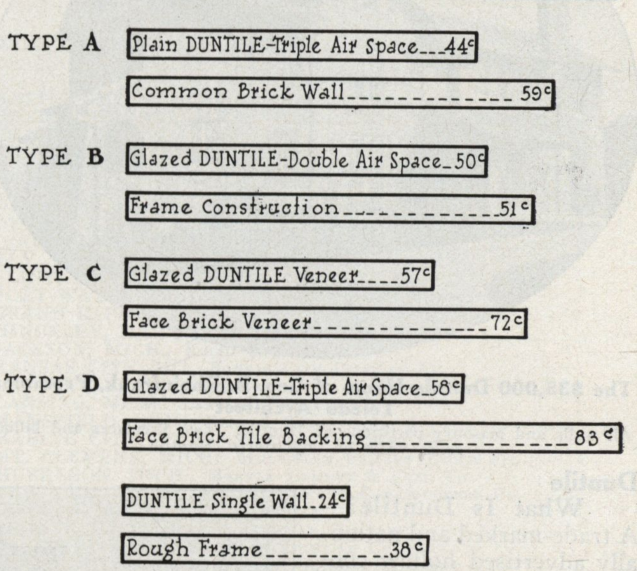
Type A—Represents the highest type of masonry wall at practically the cost of frame. Note the three dead air spaces in the bond as well as in the body of the wall. This bond also eliminates any danger of moisture passing through the mortar joints. Typical cost 9-in. wall Glazed Duntile, 54 cents per square foot, plain Duntile 44 cents.

Type B—Consists of one regular Duntile and one bond tile in each course—in reality a tile and one half, alternating in every other course. This gives two horizontal continuous dead air spaces. There are no continuous mortar joints in this wall and moisture is prevented from following through the mortar joints. It is entirely practicable to plaster directly on the interior. Typical cost 9-in. wall Glazed Duntile, 50 cents per square foot.

Type C—Shows a wall section for use where veneer construction is insisted upon. It has no advantages over the all Duntile wall but is considerably cheaper than face brick veneer and illustrates the adaptability of Duntile when used in conjunction with other materials. Glazed Duntile Veneer costs 57 cents per square foot.

Type D—For use where face brick is demanded, costs no more than ordinary brick veneer with frame backing. Duntile backing makes a permanent fireproof wall and avoids that "efficient" fire trap—veneer on frame. 9-in. wall costs 73 cents; 13-in. wall, 5x8x12-in. Duntile for backing, 83 cents.

COMPARATIVE COST SUMMARY IN SQUARE FEET



TYPE A	Glazed DUNTILE-Triple Air Space	54¢
	Face Brick Wall	83¢
TYPE A	Plain DUNTILE-Triple Air Space	44¢
	Common Brick Wall	59¢
TYPE B	Glazed DUNTILE-Double Air Space	50¢
	Frame Construction	51¢
TYPE C	Glazed DUNTILE Veneer	57¢
	Face Brick Veneer	72¢
TYPE D	Glazed DUNTILE-Triple Air Space	58¢
	Face Brick Tile Backing	83¢
	DUNTILE Single Wall	24¢
	Rough Frame	38¢

Comparative Cost Summary—The above chart shows comparative wall construction costs in square feet that are typical and are averages of a great many figures collected from widely scattered sources. In every case the complete erected wall is considered, including plastering and lath, if any.

On the following page are shown standard construction details. Further information as required will be furnished on request to Holland, Michigan, office or any of our authorized manufacturers.

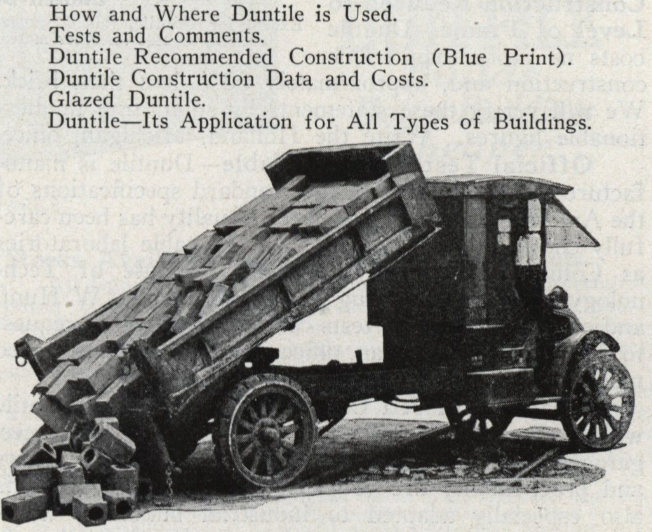
Specifications

Standard masonry specifications apply to the laying of Duntile as well as to brick, no special method or treatment is necessary.

Engineering Service Bureau and Literature

Our engineering department is at the service of architects, at all times, for advisory service on special problems. Write for any of the bulletins listed below, each of which gives special information on Duntile.

"What is Duntile"?
How and Where Duntile is Used.
Tests and Comments.
Duntile Recommended Construction (Blue Print).
Duntile Construction Data and Costs.
Glazed Duntile.
Duntile—Its Application for All Types of Buildings.



No Loss from Breakage—Duntile Can Be Dumped Without Injury

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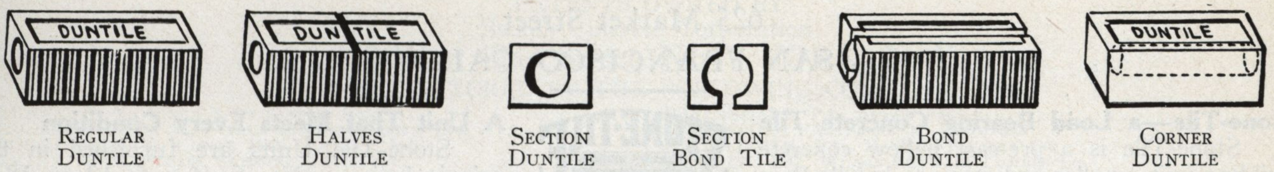
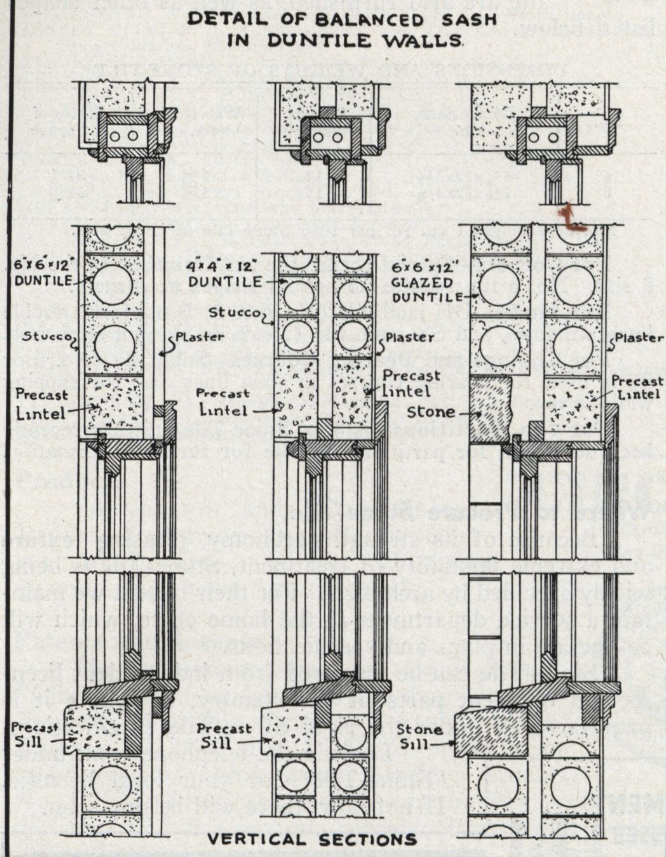
DUNTILE

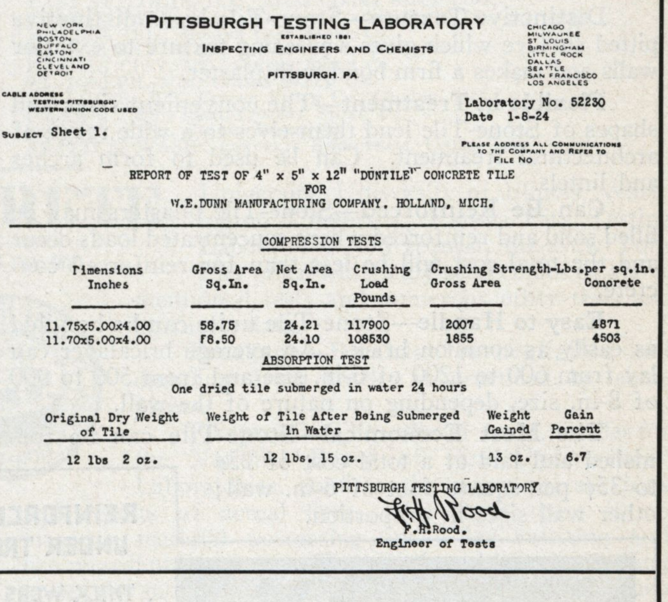

DUNTILE
DUNTILE
DUNTILE
Regular Duntile
Halves Duntile
Section Duntile
Section Bond Tile
Bond Duntile
Corner Duntile

Typical Duntile Units


DETAIL OF BALANCED SASH IN DUNTILE WALLS
6"x6"x12" DUNTILE
Stucco
Plaster
Precast Lintel
4"x4" x 12" DUNTILE
Stucco
Plaster
Precast Lintel
6"x6"x12" GLAZED DUNTILE
Stone
Plaster
Precast Lintel
Precast Sill
Precast Sill
Stone Sill
VERTICAL SECTIONS

STANDARD DUNTILE SIZES

Height, in.	Width, in.	Length, in.	Displacement, cu. in.	Number brick equivalent	Weight, lb.
4	4	11¾	192	2.7	8
4	5	11¾	240	3.4	12
5	6	11¾	360	4.8	16
5	8	11¾	480	6.7	24
6	6	11¾	432	6.	21
6	8	11¾	576	8.	25
8	8	11¾	768	10.6	36


PITTSBURGH TESTING LABORATORY
ESTABLISHED 1881
INSPECTING ENGINEERS AND CHEMISTS
PITTSBURGH, PA

NEW YORK
PHILADELPHIA
BOSTON
BUFFALO
EASTON
CINCINNATI
CLEVELAND
DETROIT

CHICAGO
MILWAUKEE
ST. LOUIS
BIRMINGHAM
LITTLE ROCK
DALLAS
SEATTLE
SAN FRANCISCO
LOS ANGELES

CABLE ADDRESS
TESTING PITTSBURGH"
WESTERN UNION CODE USED

Laboratory No. 52230
Date 1-8-24

SUBJECT Sheet 1.

PLEASE ADDRESS ALL COMMUNICATIONS TO THE COMPANY AND REFER TO FILE NO

REPORT OF TEST OF 4" x 5" x 12" "DUNTILE" CONCRETE TILE
FOR
W.E.DUNN MANUFACTURING COMPANY, HOLLAND, MICH.

COMPRESSION TESTS

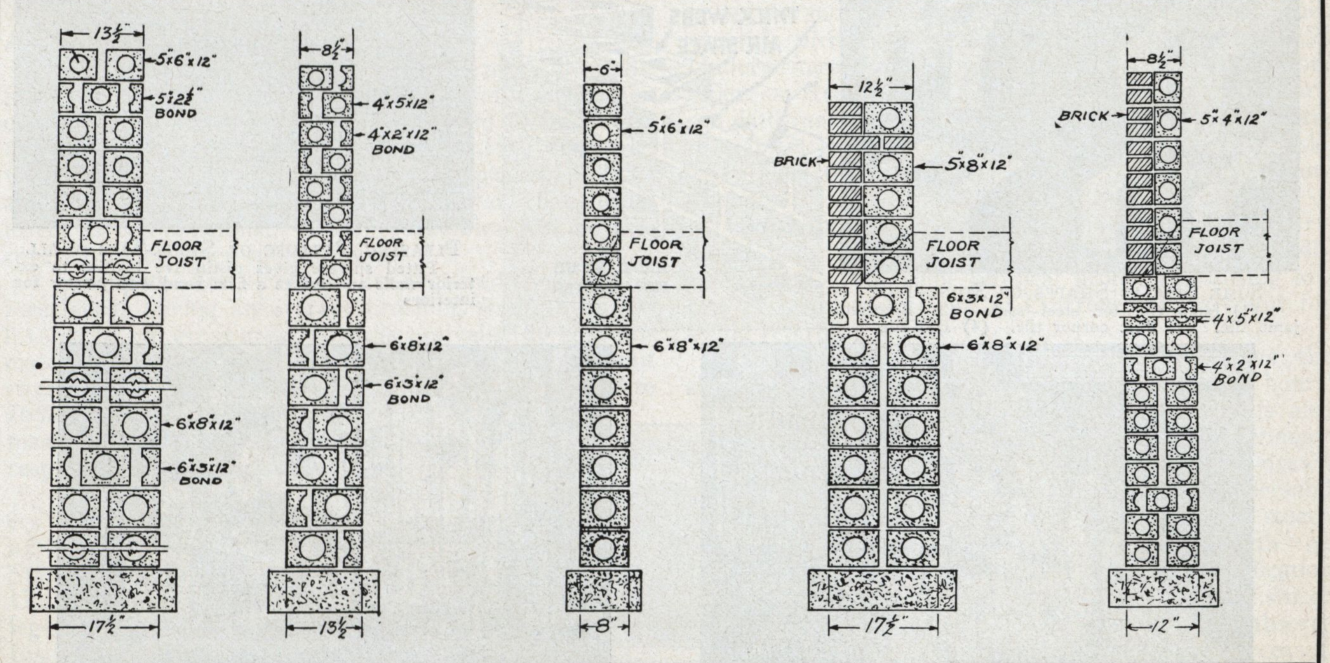
Dimensions Inches	Gross Area Sq.In.	Net Area Sq.In.	Crushing Load Pounds	Crushing Strength-Lbs.per sq.in. Gross Area	Concrete
11.75x5.00x4.00	58.75	24.21	117900	2007	4871
11.70x5.00x4.00	58.50	24.10	108530	1855	4503

ABSORPTION TEST

One dried tile submerged in water 24 hours

Original Dry Weight of Tile	Weight of Tile After Being Submerged in Water	Weight Gained	Gain Percent
12 lbs 2 oz.	12 lbs. 15 oz.	13 oz.	6.7

PITTSBURGH TESTING LABORATORY
F H Rood
F.H.Rood.
Engineer of Tests


13½"
5"x6"x12"
5"x12" BOND
FLOOR JOIST
6"x8"x12"
6"x3"x12" BOND
17½"
8½"
4"x5"x12"
4"x2"x12" BOND
FLOOR JOIST
6"x8"x12"
6"x3"x12" BOND
13½"
6"
5"x6"x12"
FLOOR JOIST
6"x8"x12"
8"
12½"
BRICK
5"x8"x12"
FLOOR JOIST
6"x3"x12" BOND
6"x8"x12"
17½"
8½"
BRICK
5"x4"x12"
FLOOR JOIST
4"x5"x12"
4"x2"x12" BOND
12"

Typical Duntile Construction Details

NATIONAL STONE-TILE CORPORATION

625 Market Street
SAN FRANCISCO, CAL.

STONE-TILE
PERMANENT CONSTRUCTION
TRADE-MARK

Stone-Tile—a Load Bearing Concrete Tile
Stone-Tile is a pre-cast hollow concrete building unit, smaller and easier to handle than building block or hollow tile. It is the most economical material for permanent, fireproof walls in houses, schools, churches and business or industrial buildings of every description.

Made to Rigid Specifications—Concrete used in the manufacture of Stone-Tile must be mixed to a thoroughly plastic or *quaking* consistency, and must contain a high proportion of *coarse aggregate*. Materials are selected in accordance with a national standard of quality which promotes unusual *density* and *strength*.

Produced in Quantity—Every Stone-Tile plant is equipped to fill the largest orders on short notice.

Distinctive Texture—Stone-Tile has a distinctive pitted surface which gives a pleasing texture to exterior walls and makes a firm bond with plaster.

Flexible in Treatment—The convenient sizes and shapes of Stone-Tile lend themselves to a wide range of architectural treatment. Can be used to form arches and lintels.

Can Be Reinforced—Stone-Tile pilasters may be filled solid and reinforced where concentrated loads occur and the total cost will be less than for reinforced concrete.

Easy to Handle—Stone-Tile units can be handled as easily as common brick. An average bricklayer can lay from 600 to 1200 of 6-in. size and from 500 to 900 of 8-in. size, depending on nature of the wall.

The Most Economical—Stone-Tile can be furnished and laid at a total cost of 25¢ to 35¢ per square foot of 6-in. wall; other wall sizes in proportion.

A Unit That Meets Every Condition
Stone-Tile Units are furnished in two principal sizes: No. 6 (for 6, 12 or 18-in. walls), and No. 8 (for 8 or 16-in. walls). Half tile are also furnished, as well as other shapes listed below.

DIMENSIONS AND WEIGHTS OF STONE-TILE

No.	Dimensions, in.	Approx. weight, lb.	Web thickness, in.	Ratio of air space
6	5¾x12x3½	12	1½	32%
8	7¾x12x3½	15	1¾	32%

Mortar averages 1 cu. yd. per 1000 Stone-Tile of either size.

For Corners—Special corner tile are furnished in the No. 8 size. No. 6 tile require no special shapes at corners.

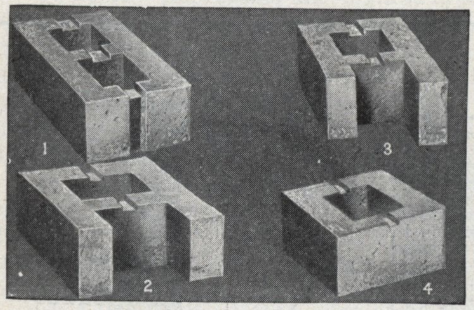
For Jambs—DH jamb tile (No. 6 or 8) is used with double hung windows, and SS jamb tile (No. 6 or 8) with steel sash.

For Copings and Bearing Courses—Solid tile (No. 6 or 8) is used for bearing courses at joist lines and for capping walls at top.

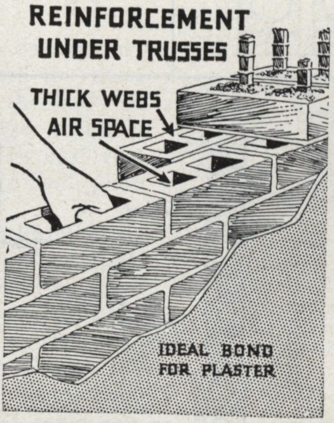
For 4-in. Partitions—A 4-in. Stone-Tile unit has recently been developed for partitions. Write for further information.

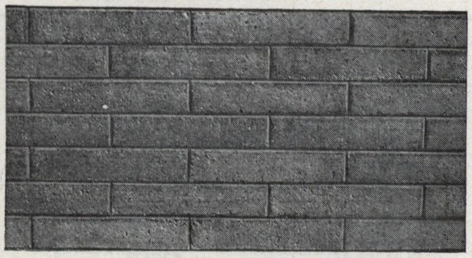
Where to Procure Stone-Tile
Because of its strength, economy, pleasing texture and extreme flexibility of treatment, Stone-Tile is being widely specified by architects. For their benefit we maintain a service department at the home office, which will co-operate in plans and specifications.

Stone-Tile can be procured from independent licensees in different parts of the country, by whom it is manufactured under the rigid Stone-Tile specifications. Look in the telephone book under "Stone-Tile" for your local licensee. If not now, there will be one soon.



Some Special Shapes of Stone-Tile
(1) Jamb tile for steel sash. (2) Recessed jamb tile. (3) 8-in. corner tile. (4) Half-tile





Pleasing Texture of Stone-Tile Wall
Pitted surface gives distinctive texture to exterior walls and makes a firm bond with plaster for interiors

BUILDING WITH STONE-TILE
STONE-TILE
PERMANENT CONSTRUCTION
USED IN CONSTRUCTING THIS BUILDING
Rhodes-Jamieson & Co.

Stone-Tile Is Handled Like Common Brick

A Stone-Tile School

"CINCRETE" CINDER CONCRETE BUILDING UNITS

PATENTS OWNED BY
Straub Cincrete Corporation
120 West 42nd Street, NEW YORK, N. Y.

MANUFACTURED BY THE FOLLOWING COMPANIES

ALBANY, N. Y., Finch & Ostrander, Inc.
BINGHAMTON, N. Y., Straub Building Units, Inc.
BROOKLYN, N. Y., Cinder Tile Company, Inc.
ELMIRA, N. Y., Elmira Building Units, Inc.
JAMESTOWN, N. Y., Jamestown Block & Tile Co.
NEW YORK, N. Y., Cinder Tile Company, Inc., 250 Park Avenue
ROCHESTER, N. Y., Rochester Cinder Block Corp.
CAMDEN, N. J., Concrete Specialties Co.
HOMESTEAD, N. J., Hudson Fireproof Block Co., North Bergen
JERSEY CITY, N. J., Cinder Brick and Tile Co., Adjoining Public Service Station, Marion Plant
RIDGEFIELD PARK, N. J., Bergen Building Block Co.
TRENTON, N. J., Concrete Specialties Co.
WESTFIELD, N. J., Hudson Fireproof Block Co.
ALLENTOWN, PA., Hollywood Building Block Co.
ALTOONA, PA., Juniata Reconstructed Stone Co., Juniata, Pa.
APOLLO, PA., Apollo Steel Co.
BRAEBURN, PA., Apollo Steel Co.
BUTLER, PA., Shufflin & Green
ERIE, PA., Erie Patent Block Co., Inc.
GREENSBURG, PA., Building Materials Co.
GREENVILLE, PA., A. Dambacker & Sons
HARRISBURG, PA., Harrisburg Building Block Co.
HOUSTON, PA., Houston-Canonsburg Cinder Block Co.
JOHNSTOWN, PA., Art Stone Block Co.
LANCASTER, PA., Lancaster Concrete Tile Co.
LEWISTOWN, PA., James L. Shreffler
MT. POCONO, PA., L. T. Smith
NEWCASTLE, PA., Straub Cincrete Co.
NEW KENSINGTON, PA., Straub Cincrete Co.
PHILADELPHIA, PA., Philadelphia Partition & Building Block Co.
PITTSBURGH, PA., **Straub Cincrete Co.**, 908 Park Building
POTTSVILLE, PA., Pottsville Building Block Co.
READING, PA., Berks Building Block Co.
SPRINGDALE, PA., Brown Bros.
TARENTUM, PA., Frank H. Thompson
UNIONTOWN, PA., Hankins-Paulson Co.
WARREN, PA., Wilson-Wetmore Lumber Co.
WAYNESBURG, PA., McCormick & Drury
WILKES-BARRE, PA., Nepenna Building Materials Co., Kingston, Pa.
WILLIAMSPORT, PA., Delvan Block Co., So. Williamsport, Pa.
YORK, PA., York Patented Building Block Co.
WILMINGTON, DEL., Cinder Block Corp.
BALTIMORE, MD., Cinder Block Corp.
WASHINGTON, D. C., Washington Concrete Products Corp.
NORFOLK, VA., Norfolk Building Block Corp., Fairmont Park
RICHMOND, VA., Richmond Patent Building Block Corp.
CLARKSBURG, W. VA., Cincrete, Inc.
FAIRMONT, W. VA., Fairmont Wall Plaster Co.
(Fourteen sub-licensees and distributers in West Virginia)
HARTFORD, W. VA., Hartford Cinder Block Co.
PALMETTO, FLA., Tinkham & Kilburn
POMEROY, OHIO, Hartford Cinder Block Co.
SPRINGFIELD, OHIO, Springfield Cinder Block Co.
WARREN, OHIO, Straub Cincrete Co.
YOUNGSTOWN, OHIO, Peter Klug; Garland Block & Sand Co.
INDIANAPOLIS, IND., Straub Cinder Block Co.
DETROIT, MICH., Detroit Cinder Block & Tile Co.
FLINT, MICH., Flint Cinder Block & Products Co.
EAST ST. LOUIS, ILL., Atlas Cinder Block Corp.
FOREST PARK, ILL., Illinois Cinder Block Co.
MOLINE, ILL., Moline Cast Stone Co.
MILWAUKEE, WIS., Cincrete Products Corp.
KANSAS CITY, MO., Cinder Block Co.
ST. JOSEPH, MO., Cinder Block Co.
ST. LOUIS, MO., Cinder Block Co., Clayton, Mo.
OMAHA, NEB., Ideal Cement Stone Co.
DENVER, COL., Cinder Block Co.
SEATTLE, WASH., Concrete Structural Units, Inc.

CINCRETE
TRADE MARK
(Reg. U.S. Pat. Off.)

NATIONAL CINDER CONCRETE PRODUCTS ASSOCIATION

Products

Foundation and Wall Bearing Blocks; Partition Tile; Brick; Reinforced Lintels; Sills; Chimney Blocks, and Floor Arch Blocks.

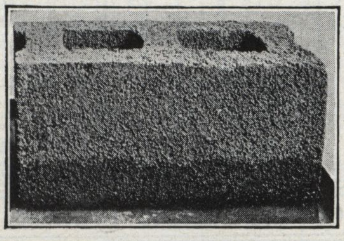
Patents and License

The manufacture, use and sale of Straub "Cincrete" Cinder Concrete Building Units is licensed under the Francis J. Straub U. S. Patents 1,212,840 and 1,399,325 on Process and Products. Other patents pending. Patent No. 1,212,840 has been broadly sustained by unanimous decision of U. S. Court of Appeals. Responsible parties will be licensed in open territories.

Advantages

Costs—These will vary according to local conditions, but normally a saving in finished wall construction can be figured from 25 to 40% compared to same wall dimensions of common brick, and 5 to 15% compared with clay tile. One 8x8x16-in. block displaces 12 bricks and requires about one-quarter the mortar. Plastering direct is recommended. Other economies will be discovered under other subheadings.

Strength—Our licensees are required to manufacture blocks having an average crushing strength of 800 lbs. per sq. in. gross area, which is equivalent to approximately 1200 lb. per sq. in. net area. The ratio of unit strength to wall strength of Cincrete blocks is from 57 to 76%. This is the highest of any known masonry and in consequence carries a corresponding safety factor.



Dampproof

Illustrates absorption after 48 hours—no further absorption

Tests—Tests made by Underwriters' Laboratories, Inc. (page 41 of report of tests on Straub Blocks), Bureau of Standards (U. S. Government), Columbia University, Yale University, Rutgers College, Johns Hopkins University, Lewis Institute, Pittsburgh Testing Laboratory, E. L. Conwell & Co., Philadelphia, Pa., Detroit Testing Laboratory, Ohio State University, University of Illinois, Washington University, Kansas City Testing Laboratory. On request, the New York City office will gladly send copies of above mentioned tests and numerous other tests and pertinent data.

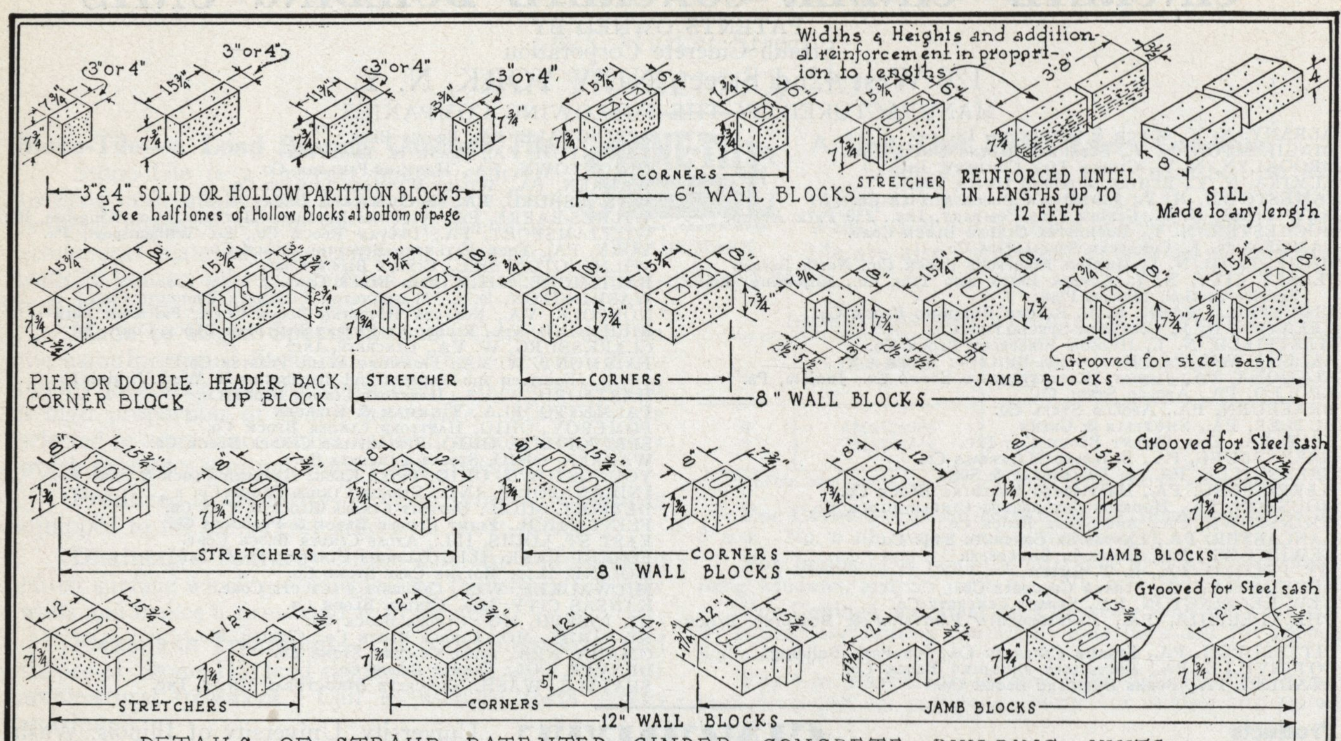
Breakage—Breakage is negligible and dumping from trucks is practiced by some plants.

Fireproof—The official tests, made for the National Board of Fire Underwriters' Laboratories, confirm the many private tests and results of actual fires. We claim there is no masonry material possessing equal fire resisting and fire retardant properties. There is no cracking or spalling under the most violent changes of temperature as when water is turned on to a white hot wall. See page 20 Underwriters' Laboratories report, Conwell Laboratory report on Reading fire test and other data, for comparison with various types of masonry. Cincrete units always re-usable after a fire. Their loss of strength is negligible. They have the lowest rate of heat conductivity of any masonry.

Soundproof—For schools, hospitals and apartments this pronounced quality is becoming rapidly appreciated. The same physical properties causing low rate of heat conductivity in Cincrete units account for sound retarding quality.

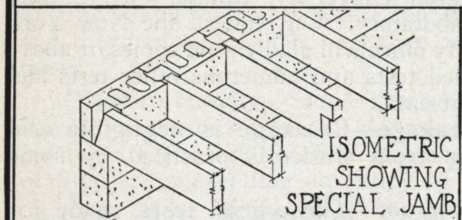
Dampproof—The illustration below shows the slight absorption and lack of capillarity after 48 hours' immersion. This unique quality is also of importance in producing a stronger mortar joint, the moisture is not drawn out of the mortar as with brick or sand blocks. For the same reason, stucco and plaster retain full strength on Cincrete units and require no application of water before mortar, plaster and stucco is applied. The initial suction or absorption is rapid, but after a short time ceases. This favorably affects winter laying of Cincrete units.

Continued on next page

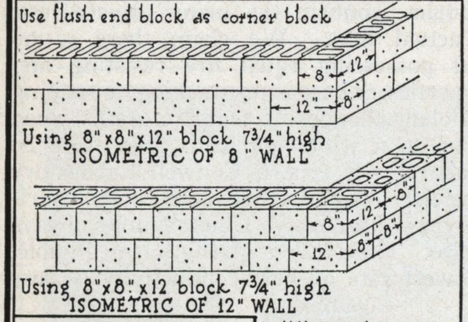


3"or 4"
3"or 4"
3"or 4"
3"or 4"
15¾"
7¾"
11¾"
6"
3"-8"
4"
8
3"&4" SOLID OR HOLLOW PARTITION BLOCKS
See halftones of Hollow Blocks at bottom of page
CORNERS
6" WALL BLOCKS
STRETCHER
Widths & Heights and additional reinforcement in proportion to lengths
REINFORCED LINTEL IN LENGTHS UP TO 12 FEET
SILL Made to any length
PIER OR DOUBLE CORNER BLOCK
HEADER BACK UP BLOCK
STRETCHER
CORNERS
JAMB BLOCKS
Grooved for steel sash
8" WALL BLOCKS
STRETCHERS
CORNERS
8" WALL BLOCKS
JAMB BLOCKS
Grooved for Steel sash
12"
STRETCHERS
CORNERS
12" WALL BLOCKS
JAMB BLOCKS
Grooved for Steel sash

DETAILS OF STRAUB PATENTED CINDER CONCRETE BUILDING UNITS

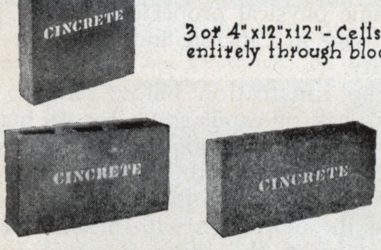


ISOMETRIC SHOWING SPECIAL JAMB BLOCKS IN RELATION TO WOOD JOIST



Use flush end block as corner block
8"
12"
8"
12"
Using 8"x8"x12" block 7¾" high
ISOMETRIC OF 8" WALL
8"
12"
8"
12"
Using 8"x8"x12 block 7¾" high
ISOMETRIC OF 12" WALL

DETAILS OF BONDING AT CORNERS



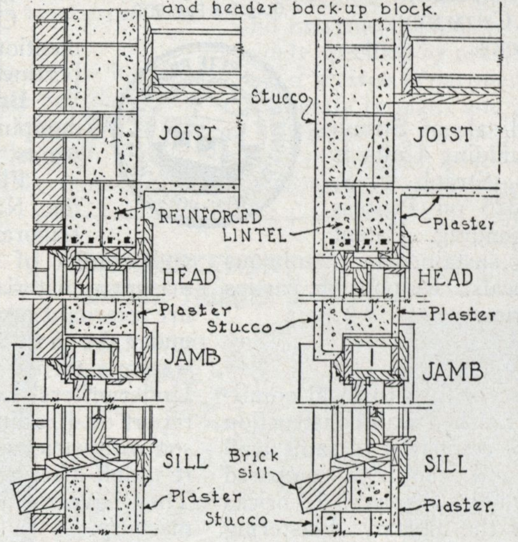
CINCRETE
CINCRETE
CINCRETE

3 or 4"x12"x12"- Cells entirely through block

3" or 4" wide - 8" or 9" high - 16" or 18" long. Cells entirely through tile or top closed for solid mortar bed-as ordered

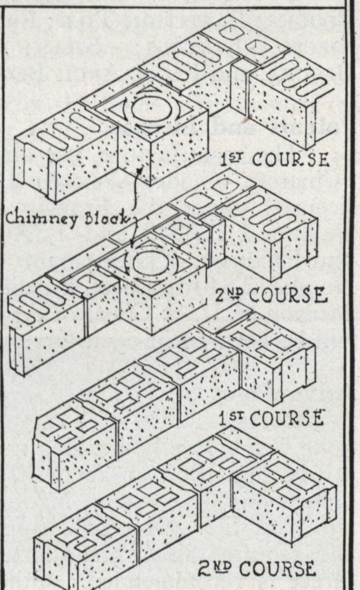
HOLLOW PARTITION TILE

NOTE- Metal ties may be used instead of brick header and header back-up block.



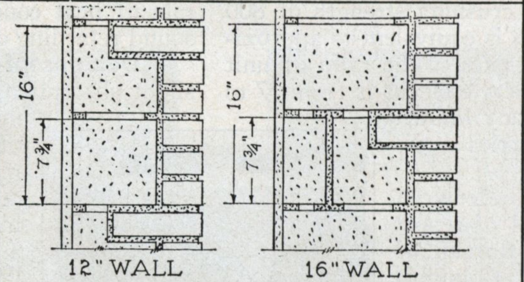
Stucco
JOIST
REINFORCED LINTEL
HEAD
Plaster
Stucco
JAMB
SILL
Plaster
Stucco
JOIST
Plaster
HEAD
Plaster
JAMB
Brick sill
SILL
Plaster
BRICK VENEER
STUCCO

WALL SECTIONS SHOWING WINDOW DETAILS



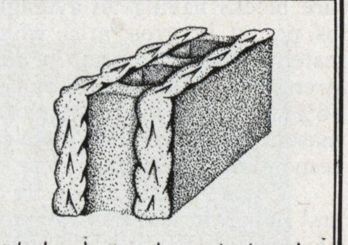
1ST COURSE
Chimney Block
2ND COURSE
1ST COURSE
2ND COURSE

DETAILS OF BONDING AT CORNERS.



16"
7¾"
16"
7¾"
12" WALL
16" WALL

METHOD OF BACKING FACE BRICK.



Block is buttered on outside and inside edges-ribs are left free of mortar

MORTAR JOINTS

DRAWING	SIZES AND USES OF "CINCRETE" CINDER BUILDING UNITS	1

Continued on next page

Non-conductor of Heat and Cold—Cincrete unit walls never "sweat"; are rotproof and verminproof; no mold forms, and decorations are never injured where plaster has been applied direct to exterior walls in the severest climate. Less fuel required to heat; cooler in summer. Ideal for icehouses, large refrigerators, refrigeration plants, heating ovens, dry kilns, etc.

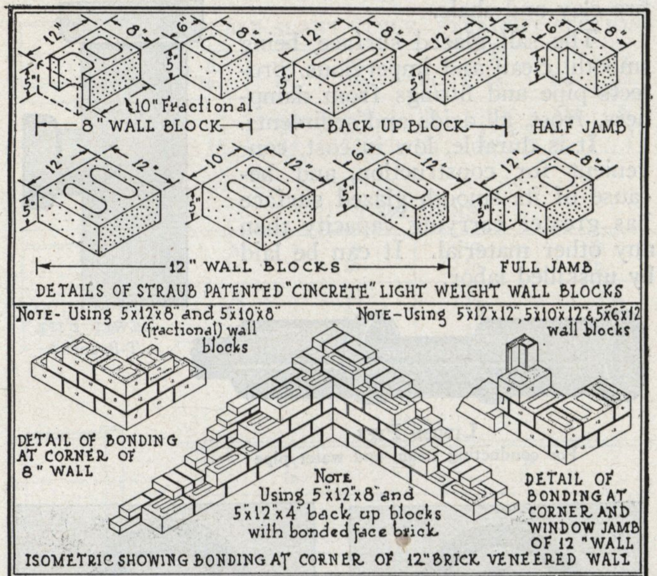
Stucco—The rough texture affords a perfect key for plaster and stucco. The same coefficient of expansion in base and stucco explains why stucco does not crack and spall on Cincrete units. Ideal suction and mechanical bond.

No Through Mortar Joints—A common fault of other types of masonry is the through mortar joint, which readily conducts moisture, heat and cold through the wall. The cinder unit itself is a non-conductor, not depending on the large air spaces as do other forms of hollow masonry.

No Furring Required—Having the lowest capillarity and conductivity of any masonry, furring and lathing are not required. Stucco and plaster are applied direct; one-third less plaster required on account of omission of scratch coat and more uniform surface.

Weight of Wall—A cubic foot of completed wall weighs less than any known masonry of equal strength.

Weight—Forty per cent lighter than standard hollow cement blocks; 60% lighter than brick, and 5 to 10% lighter than hollow clay tile.


12"
8"
5"
10" Fractional
8" WALL BLOCK
BACK UP BLOCK
HALF JAMB
12" WALL BLOCKS
FULL JAMB
DETAILS OF STRAUB PATENTED "CINCRETE" LIGHT WEIGHT WALL BLOCKS
NOTE - Using 5"x12"x8" and 5"x10"x8" (fractional) wall blocks
NOTE - Using 5"x12"x12", 5"x10"x12" & 5"x6"x12" wall blocks
DETAIL OF BONDING AT CORNER OF 8" WALL
NOTE Using 5"x12"x8" and 5"x12"x4" back up blocks with bonded face brick
DETAIL OF BONDING AT CORNER AND WINDOW JAMB OF 12" WALL
ISOMETRIC SHOWING BONDING AT CORNER OF 12" BRICK VENEERED WALL

DRAWING | SIZES AND USES OF "CINCRETE" LIGHT WEIGHT BLOCKS | 2

Rapid Laying—Light weight, uniformity, convenient and small buttering surfaces compared to solid units, contribute to easy, rapid and economical wall erection. Buttering surfaces larger than clay tile, therefore, stronger and more substantial; less waste of mortar and time in laying.

Nailing—As good as wood for nailing; holding power is equal to yellow pine. Nails never rust. See Pittsburgh Testing Laboratory report No. 48544. Wood grounds and trim can be thoroughly secured by toe-nailing. Pipe hangers and other supporting members can be readily secured by means of lag screws, expansion bolts, etc.

Cutting—Cincrete units can be cut to size, chased and channeled for pipe and conduits without fracture.

Corners—Details on this and previous page show several methods, all retaining full insulating value.

Steel Sash Installation—Grooves are moulded into jamb blocks to admit steel window frames. Two lintels to an opening provide this advantage without cutting or channeling.

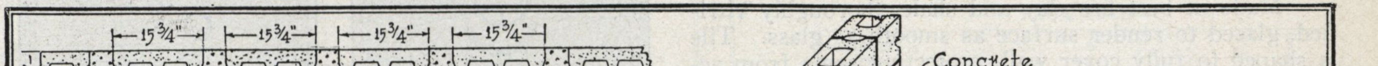
Lintels—Reinforced lintels of cinder concrete provide all the advantages of strength, lightness, nailability and dampproofness. For standard sizes see Drawing No. 1. Specials on order.

Sills—Precast cinder concrete sills have the advantages of lightness, toughness and dampproofness. For standard section see Drawing No. 1. Specials on order.

Floor Arch Blocks—See Drawing No. 3. Wood flooring can be nailed direct to Cincrete blocks; sleepers can be nailed direct (where tee-form beams are used). Plastered ceilings can be applied directly to underside of arch. Suspended ceiling supports can be nailed to Cincrete blocks, saving time and expense of furnishing and setting clips or inserts. Reinforcing rods can be stapled to sides of Cincrete blocks to avoid displacement when pouring concrete beams. Reinforced concrete beams poured between rows of Cincrete floor arch blocks are stronger (see Ohio State University test report showing 31% increase over test batch sample), the explanation of this feature is simple and applies to no other floor arch sections. This added strength can be relied upon and beam strength computed accordingly. The safest and most economical to lay in cold weather. No salamanders required.

Tests and data on request.

Details, Catalogues and Data—Each plant is in position to submit details and give required information to architect or engineer. Address the nearest plant or New York office.


15¾"
8"
CROSS SECTION THRU FLOOR SLAB SUGGESTION No. 1
2"x2" Sleepers nailed to "CINCRETE" blocks
8"-2"
CROSS SECTION THRU FLOOR SLAB SUGGESTION No. 2
12"
CROSS SECTION THRU FLOOR SLAB SUGGESTION No. 3
Concrete
Reinforced Concrete beam
8"
12"
Suitable wooden supports
ISOMETRIC VIEW OF McILROY FIREPROOF FLOOR SYSTEM Showing method of supporting "CINCRETE" blocks.

DRAWING | "CINCRETE" FLOOR CONSTRUCTION – McILROY SYSTEM | 3

P. BANNON PIPE CO.

Hollow Tile Fireproofing and Patent Lidded Pipe

LOUISVILLE, KY.

Products

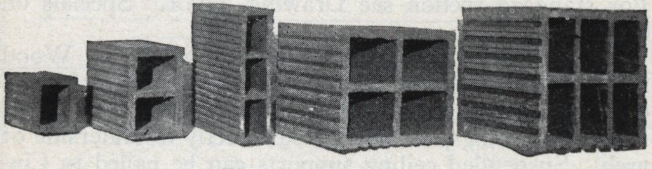
HOLLOW TILE FIREPROOFING; SHALE BRICK; FIRE BRICK; WALL COPING; FLUE LININGS; CHIMNEY TOPS; SEWER PIPES; PATENT LIDDED PIPE and EXPANSION PIPE SUPPORTS.

Also, Vitrified Culvert Pipe; Drain Tile; Glazed Conduit Pipe (for underground work); Vitrified Paving Brick and Blocks; Boiler and Grate Tile.

Hollow Tile and Shale Brick

Hollow Tile—For fireproofing of every description. Made of shale. For partitions and furring tile, 1½ to 16 in.; building tile, 6-cell and 9-cell, 6 to 12 in.; book tile, back up blocks; column covering; standard arch floor tile, 6 to 16 in.

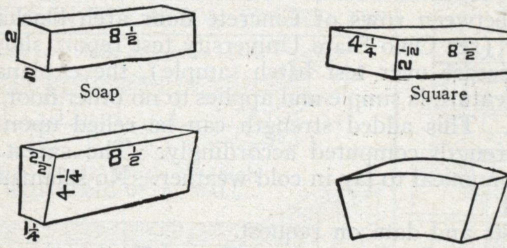
Shale Brick—Are manufactured hollow; with rough texture face, and common.



HOLLOW TILE SIZES

Fire Brick

All shapes and sizes.



Soap

Square

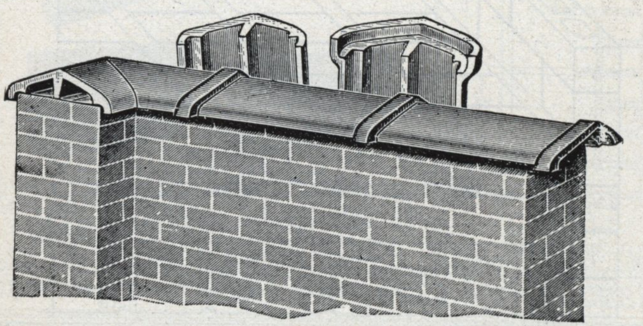
Side Wedge

Circle, 36, 40 and 44

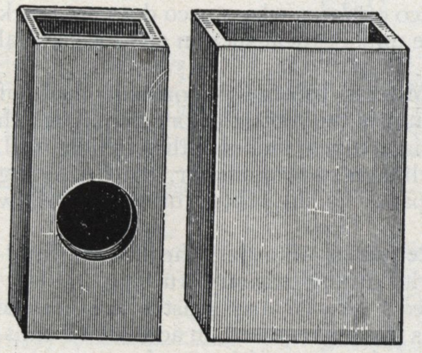
FIRE BRICK SIZES

Wall Coping

Made of best fire clay and shale, thoroughly vitrified, glazed to render surface as smooth as glass. Tile is shaped to fully cover wall, protecting same from action of the elements; also secures the top course of brick.



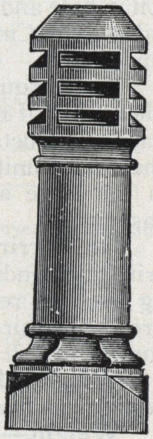
WALL COPING, HIP SHAPE
With or without rib



8½ x 13 in., pipe hole

13 x 13 in.

FLUE LININGS



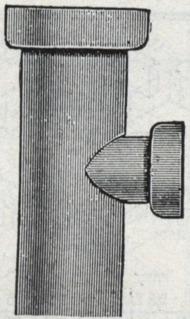
No. 14
CHIMNEY TOP

Sewer Pipe and Fittings

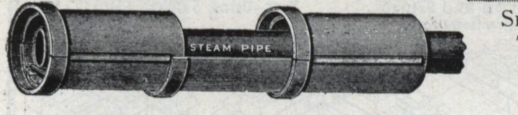
Made of vitrified salt glazed fire clay and shale.

The salt glazed surface, being smooth, clean and impervious, protects pipe and fittings from dampness, frost, all acids and sediments.

It is durable, low in cost, convenient for construction, and because of its smooth glazed surface has greater carrying capacity than any other material. It can be laid by unskilled labor.



SEWER PIPE
T-Branch



LIDDED PIPE
For conducting steam and water pipe

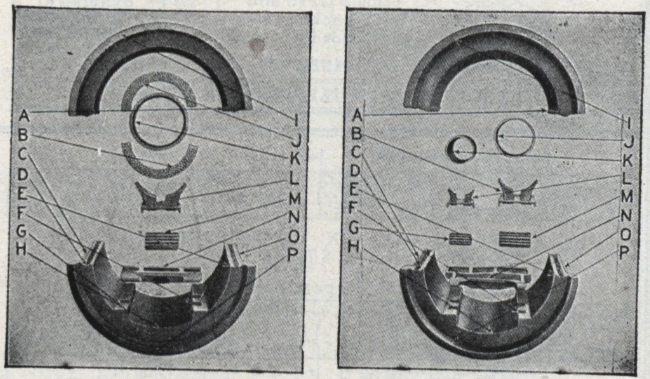


Plate E, Single Line

Plate F, Double Line

DETAIL OF CONDUIT

Reference letters point as follows:

Plates E and F—A, reinforcement inside along score cut on both sides of lid half; C, outer open scores; D, trenchlike fracture; E, inner open scores; F, support anchoring pocket; H, drainage space; I, hub of lid half; O, cement shelf and outer reinforcement at each side of lower half; P, hub of lower half.

Plate E, only—B and J, standard covering; K, 6-in. iron pipe; L, saddle receiving K, direct; M, 4⅛x2-in. toothed roller (meshes in rack of saddle and cradle); N, No. 15-F-15 cradle (the finger supported style).

Plate F, only—B, saddle for main line J; L, saddle for return line K; G, roller for return saddle; M, roller for main line saddle; N, No. 16-P-15-D cradle (the rib supported, boss-anchored style)

CLAY PRODUCTS ASSOCIATION

Chamber of Commerce Building

CHICAGO, ILL.

Products

Vitrified Salt-glazed Clay Wall Coping.

Fire Clay Flue Lining.

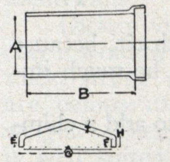
Vitrified Salt-Glazed Clay Wall Coping

Vitrified clay wall coping can not wear out. Sun's heat and frost can not harm it. Moisture can not seep into and disintegrate it. Time can not discolor it.

The soft color of this wall coping blends well with almost any exterior treatment.

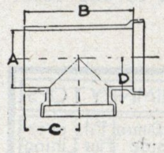
To give a smart finished look to the completed work and to insure its walls against decay for all time, specify vitrified salt-glazed clay wall coping.

Following are tables of standard sizes:



DOUBLE SLANT STYLE—STRAIGHT SECTIONS

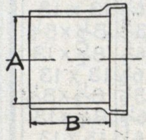
A In.	B In.	E In.	F In.	G In.	H In.	T In.
9	24	1½	¾	10¾	3¼	¾
13	24	2¼	1½	15¼	4	⅞
18	24	2½	1¾	21	6	1



T-SECTIONS

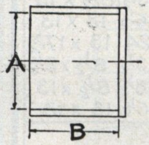
A In.	B In.	C In.	D In.
9	24	12	7¼
13	24	12	10
18	24	12	13

Dimensions C and D are approximate.



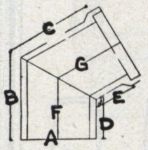
ENDS

A In.	B In.
9	24
13	24
18	24



STARTERS

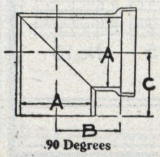
A In.	B In.
9	24
13	24
18	24



120 Degrees

CORNERS, RIGHT AND LEFT—120°

A In.	B In.	C In.	D In.	E In.	F In.	G In.
9	12	12	5¾	5¾	9	9
13	12	12	3½	3½	7¾	7¾
18	12	12	¾	¾	6½	6½



.90 Degrees

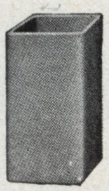
CORNERS, RIGHT AND LEFT—90°

A In.	B In.	C In.
9	7¼	8¾
13	10	11½
18	13	15

Fire Clay Flue Linings

According to insurance and fire marshall's reports, at least three out of every ten residence fires start at the chimney—the unreliable chimney is the greatest single cause of residence fires. The architect can completely cut out that hazard in the works he designs by specifying fire clay flue linings for all chimneys and chimney openings and connections.

Following are tables of standard sizes:



RECTANGULAR FLUE LINING

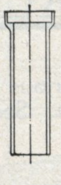
Outside dimensions, in.	Approximate weight per foot, lb.	Minimum thickness, in.	Length, ft.
4½ x 8½	14	⅝	2
4½ x 13	19	¾	2
8½ x 8½	19	¾	2
8½ x 13	28	⅞	2
8½ x 18	37	1	2
13 x 13	36	1	2
13 x 18	52	1⅛	2
18 x 18	70	1¼	2

CIRCULAR FLUES

Inside diameter, in.	Approximate weight per foot, lb.	Minimum thickness, in.	Length, ft.
6	12	⅝	2
8	20	¾	2
10	28	⅞	2
12	39	1	2
15	54	1⅛	2
18	71	1¼	2
21	108	1⅝	2
24	130	1⅝	2

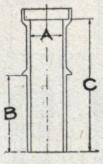
FIRE CLAY THIMBLES

Diameter, in.	Length, in.	Minimum thickness, in.
6	4½, 6, 9 and 12	⅝
7	4½, 6, 9 and 12	11/16
8	4½, 6, 9 and 12	¾
10	4½, 6, 9 and 12	⅞
12	4½, 6, 9 and 12	1



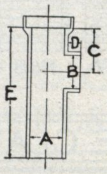
FLUE PIPE

Diameter..............in.	6	7	8
Length..............ft.	2	2	2



FLUE PIPE FITTINGS—BOTTOMS

A In.	B In. approx.	C Ft.
6	14	2
7	14	2
8	14	2



FLUE PIPE FITTINGS—OPENINGS

A B In.	C In.	D In.	E Ft.
6 x 6	8	2½	2
7 x 7	8	2½	2
8 x 6	8	2½	2
8 x 8	8	2½	2

Dimensions C, D and E are approximate.

W. S. DICKEY CLAY MFG. CO.

ESTABLISHED 1885
General Office
KANSAS CITY, MO.
Branch Offices
BIRMINGHAM, ALA.   CHATTANOOGA, TENN.   MACOMB, ILL.   MACON, GA.   SAN ANTONIO, TEX.   TEXARKANA, TEX.
Plants Operated and Large Stocks Carried at Each of the Above Points
Address All Correspondence to the Nearest Office

Products

Clay Products, which include:

Fire Clay Flue Lining, Chimney Tops; Fire Brick and Fire Clay; Vitrified Salt-glazed Clay Sewer Pipe, Culvert Pipe, Segment Sewer Blocks, Wall Coping, Window Sills, Septic Tanks, Hollow Building Blocks, Silos, Meter Boxes; Vitrified Clay Flashing Blocks, Hollow Tile and Drain Tile.

Services

Due to the locations of the plants, and their capacities, it is possible for the buyer of these clay products to receive the very highest grade of service.

The service by mail includes illustrated booklets on all the products listed.

In addition to the co-operation of this broad-gaged and experienced organization, the user of clay products can have confidence that the materials are selected, blended and mixed and burned under the supervision of experts.

Fire Clay Flue Lining

Flue lining serves as a fire preventive, and gives a straight flue of uniform dimensions. The ordinary chimney will not do this. With flue lining, the flue has a smooth inner surface which leaves no lodging place for soot, thus eliminating the possibility of chimney fires. The cost of flue lining is only nominal. It is a cheap method of preventing fire and strengthening the chimney.

Specification Notes—Every smoke flue for a stove or range shall have an inside area of not less than 49 sq. in. Inside cross section of 8½x8½-in. flue lining is 49 sq. in.

The minimum area inside of flue lining used for furnace or fireplace shall be 75 sq. in. Inside cross section area of 8½x13-in. flue lining is 75 sq. in.

The minimum area inside of flue lining used for fireplace should be one-tenth to one-twelfth of the actual area of the fireplace opening.

Chimney Tops

Chimney tops have a practical as well as an ornamental value. By adding height to chimneys, they cause better draft. The unsightliness of loose brick on the top of the chimney is prevented.

Our chimney tops are made from a mixture of fire clay which is not affected by heat and will not crack from changes in temperature.

They are much superior to metal, both in appearance and durability.

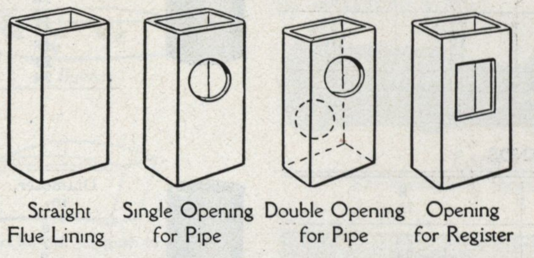
Old chimneys which provide a poor draft, because they are either too short or defective will be much improved by the addition of a chimney top.

The cheapest way to increase draft is to add a chimney top to the height of chimney.

If desired, they can be painted a dark color, such as green, red, brown or black, to conform to the color scheme adopted.

DIMENSIONS OF FLUE LINING

Size	Weight Per Foot	Length Feet	Outside Dimen In.
4½x8½	14 lbs	2	5 x 9
8½x8½	18 lbs	2	8½x8½
4½x13	20 lbs	2	5 x 13¼
8½x13	30 lbs	2	8½x13
13 x 13	38 lbs	2	13 x 13
8½x17½	36 lbs	2	9 x 18
13 x 17½	45 lbs	2	13½x18½
17½x17½	62 lbs	2	17½x17½


Straight Flue Lining   Single Opening for Pipe   Double Opening for Pipe   Opening for Register

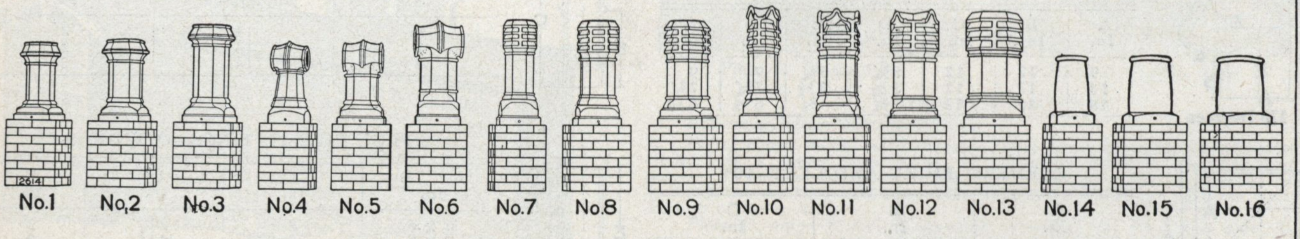
FIRE CLAY FLUE LINING

2968

NOTE: Chimney Tops made in various sizes to fit the sizes of Flue Lining in most general use. See table at right.

DIMENSIONS OF CHIMNEY TOPS

Top No	Approx Wt Ea.	Height over all	Base Dimen Outside	Fits over Flue Lining
1	75 lbs.	30 in.	13½ x13½	8½ x 8½
2	115 lbs.	30 in	13½ x16½	8½ x 13
3	155 lbs.	36 in	16½ x 16½	13 x 13
4	80 lbs.	30 in	13½ x 13½	8½ x 8½
5	120 lbs.	30 in	13½ x16½	8½ x 13
6	160 lbs.	36 in	16½ x16½	13 x 13
7	100 lbs	40 in	13½x13½	8½x8½
8	130 lbs	40 in	13½ x16½	8½x13
9	170 lbs	40 in	16½ x 16½	13 x 13
10	100 lbs.	40 in	13½ x 13½	8½x8½
11	130 lbs	40 in	13½x16½	8½ x 13
12	170 lbs	40 in	16½ x16½	13 x13
13	200 lbs	38½ in	16½ x 24	13 x17½
14	60 lbs	24 in	13½ x13½	8½x8½
15	90 lbs	24 in	13½ x16½	8½ x13
16	130 lbs	24 in.	16½ x16½	13 x 13



DICKEY FIRE CLAY CHIMNEY TOPS

Continued on next page

Fire Clay Stove Pipe Thimbles

A fire clay stove pipe thimble of proper length should extend through the brick chimney wall into the flue opening or clean-out opening in the flue lining. Brick and mortar should be carefully laid around thimble to make airtight joints.

Fire clay thimbles are made in 6, 8, 10 and 12-in. sizes; 4½, 6, 9 and 12-in. lengths in all sizes.

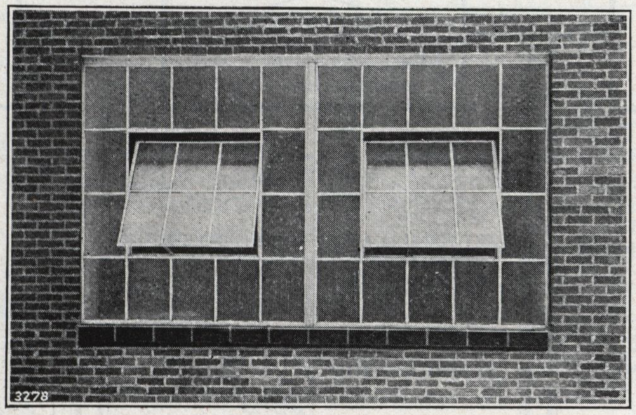
Dickey Vitrified Glazed Clay Window Sills

Lower Cost—The idea for making these glazed clay sills came from architects and builders who have been searching for a permanent material at a lower cost than was possible for made-to-order sills of expensive stone, terra cotta or concrete.

Dickey vitrified salt-glazed clay window sills provide a strong, handsome and permanent construction that is proof against time and weather. Quantity production and shipment from stock result in greatly reduced cost.

They are recommended in combination with either wood or steel sash, for apartments, factories, garages, stores, schools, office buildings, hotels and hospitals. They are adapted for use under steel sash in basement walls.

Dickey vitrified glazed clay window sills have thick, strong walls and yet are comparatively light in weight. Their brown color is well suited to the great majority of brick colorings, and will not alter from wear or weather. The sills are not subject to disintegration or scaling.



Design—They adhere to the accepted standard for form and measurement, which simplifies the task of the draftsman in making the plans and of the mason in laying up the sill.

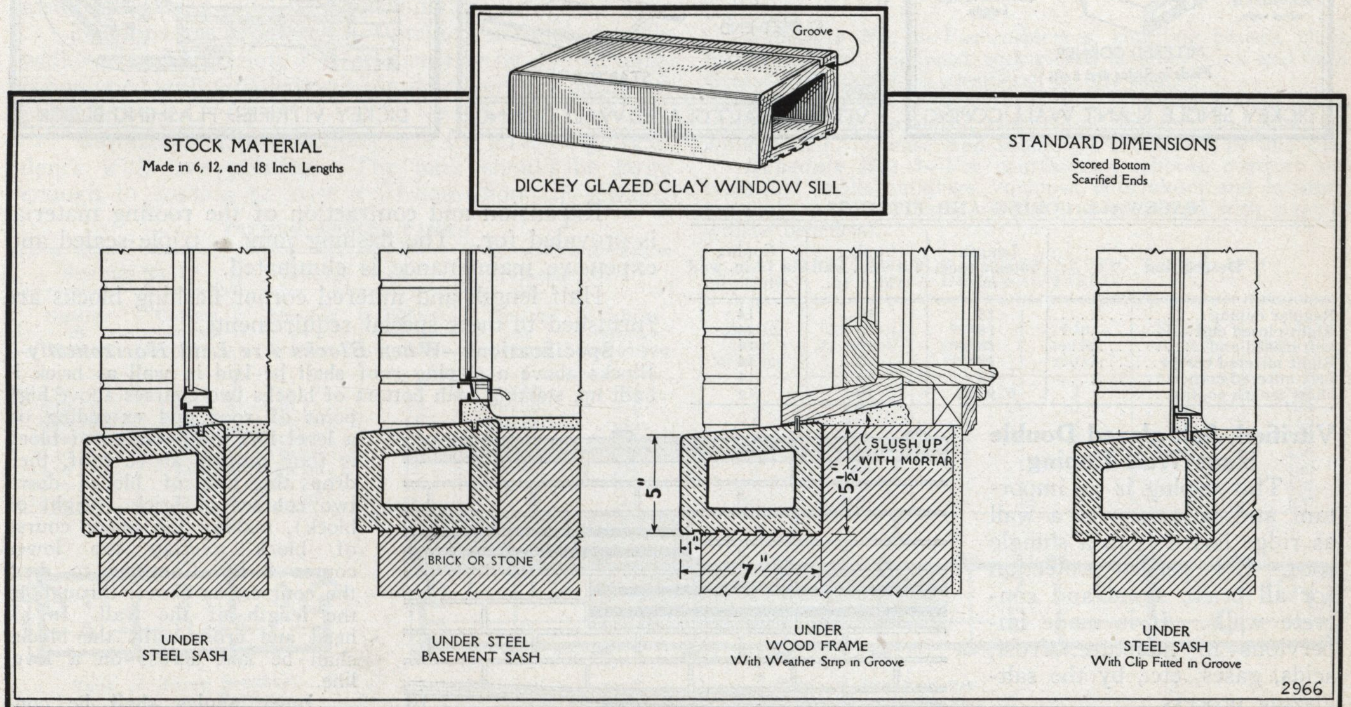
Deep scorings on the bottom insure a good bed joint and scarifications at the ends provide tight end joints. A groove is provided for a weatherstrip, making a tight joint with wood window frame.

Stock lengths are 6, 12, and 18 in. to provide for windows of different widths.

GLAZED CLAY WINDOW SILLS

Sills	Approximate weight, per piece, lb.	Approximate dimensions		
		Thickness of walls, in.	In section	Length, in.
6-in. glazed	12	1⅛	Face of block, 5 in. high	6
12-in. glazed	24	1⅛	Base of block, 7 in. wide	12
18-in. glazed	36	1⅛	Back of block, 5½ in. high	18

Specifications—Dickey Glazed Clay Window Sills shall be laid carefully to line or level, and embedded in portland cement mortar. All joints shall be filled and pointed. Weatherstrip shall be provided under wood sills. Cement mortar shall be slushed up under and behind wood sills or steel sash to make a tight and waterproof joint.


Groove
DICKEY GLAZED CLAY WINDOW SILL
STOCK MATERIAL
Made in 6, 12, and 18 Inch Lengths
STANDARD DIMENSIONS
Scored Bottom
Scarified Ends
5"
5½"
1"
7"
SLUSH UP WITH MORTAR
BRICK OR STONE
UNDER STEEL SASH
UNDER STEEL BASEMENT SASH
UNDER WOOD FRAME
With Weather Strip in Groove
UNDER STEEL SASH
With Clip Fitted in Groove
2966

DETAILS OF DICKEY GLAZED CLAY WINDOW SILLS WITH VARIOUS TYPES OF SASH

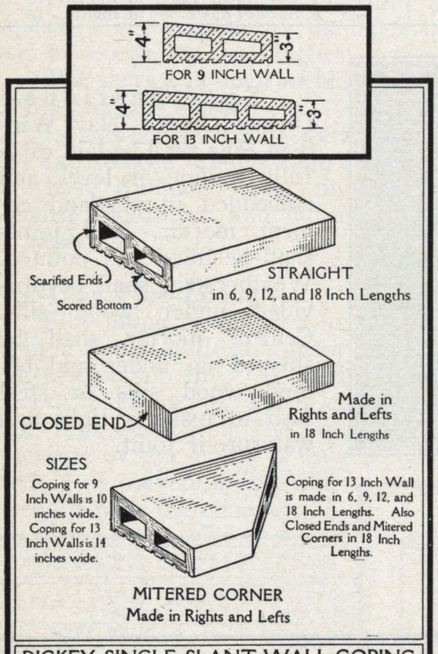
Continued on next page

Dickey Facewall Single Slant Coping

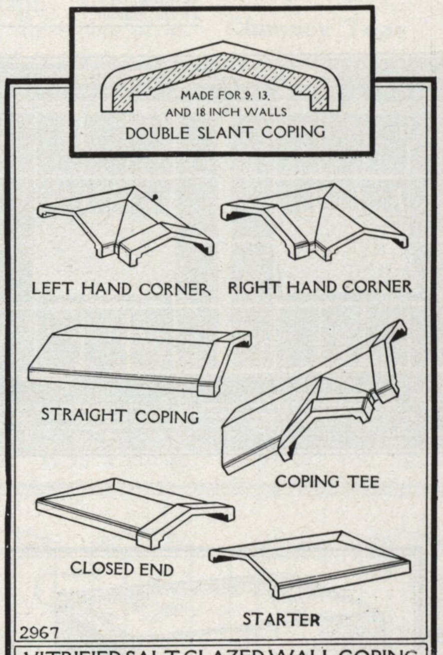
Facewall single slant coping is made of vitrified salt-glazed clay—the everlasting material—the same as double slant vitrified wall coping. It enables the architect to combine economy with good design and pleasing appearance in the front wall. The large reduction in cost is the result of quantity production and delivery out of stock.

Dickey Facewall coping has thick, strong walls and webs, yet it is lighter than other materials. The hard, glazed clay will not scale or disintegrate. The brown color is well suited to the majority of brick colorings. Made in sizes to fit 9- and 13-in. walls.

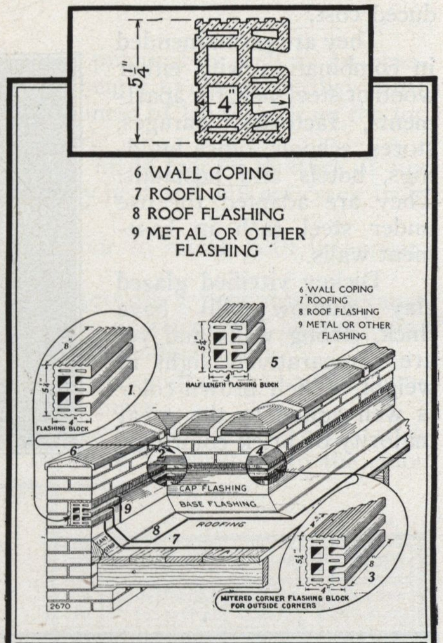
Specifications—All face walls shall be coped with Dickey Facewall single slant coping. Mitered corners and closed ends shall be provided as required. Facewall coping shall be laid to line and embedded in portland cement mortar—mixture 1 to 3. All joints shall be carefully filled and pointed.


4"
3"
FOR 9 INCH WALL
4"
3"
FOR 13 INCH WALL
STRAIGHT
in 6, 9, 12, and 18 Inch Lengths
Scarified Ends
Scored Bottom
Made in
Rights and Lefts
in 18 Inch Lengths
CLOSED END
SIZES
Coping for 9 Inch Walls is 10 inches wide. Coping for 13 Inch Walls is 14 inches wide.
Coping for 13 Inch Wall is made in 6, 9, 12, and 18 Inch Lengths. Also Closed Ends and Mitered Corners in 18 Inch Lengths.
MITERED CORNER
Made in Rights and Lefts

DICKEY SINGLE SLANT WALL COPING


MADE FOR 9, 13, AND 18 INCH WALLS
DOUBLE SLANT COPING
LEFT HAND CORNER
RIGHT HAND CORNER
STRAIGHT COPING
COPING TEE
CLOSED END
STARTER
2967

VITRIFIED SALT GLAZED WALL COPING


5¼"
4"
6 WALL COPING
7 ROOFING
8 ROOF FLASHING
9 METAL OR OTHER FLASHING
6 WALL COPING
7 ROOFING
8 ROOF FLASHING
9 METAL OR OTHER FLASHING
8"
5¼"
4"
1
FLASHING BLOCK
5¼"
4"
5
HALF LENGTH FLASHING BLOCK
6
2
4
CAP FLASHING
BASE FLASHING
ROOFING
9
8
7
CANT STRIP
5¼"
4"
8
3
MITERED CORNER FLASHING BLOCK FOR OUTSIDE CORNERS
2670

DICKEY VITRIFIED FLASHING BLOCK

FACEWALL COPING AND FITTINGS

Description	Length outside face, in.	Coping for 9-in. wall width, in.	Coping for 13-in. wall width, in.
Regular coping	18	10	14
Right closed end	18	10	14
Left closed end	18	10	14
Right mitered corner	18	10	14
Left mitered corner	18	10	14
Short length coping	6, 9, 12	10	14

Vitrified, Salt-glazed Double Slant Wall Coping

This coping is as important and necessary to a wall as ridge board is to a shingle roof. It is needed protection for all brick, stone and concrete walls. It is made impervious to moisture, frost, acids, gases, etc., by the salt-glazing process.

Made in sizes to fit 9, 13 and 18-in. walls. Straight coping made in 2-ft. lengths. Fittings furnished for various structural requirements include: right and left corners, right and left tees, starters and closed ends.

Specifications—All parapet walls shall be coped with vitrified, salt-glazed wall coping. Provide starters, closed ends, corners and tees as required. All coping to be neatly fitted. It shall be embedded in portland cement mortar composed of 1 part portland cement and 3 parts sand.

All voids and joints shall be completely filled with the mortar. All joints shall be neatly pointed. On sloping walls, the sockets should be laid down the slope in order to prevent water from running into the socket joint.

Dickey Flashing Blocks

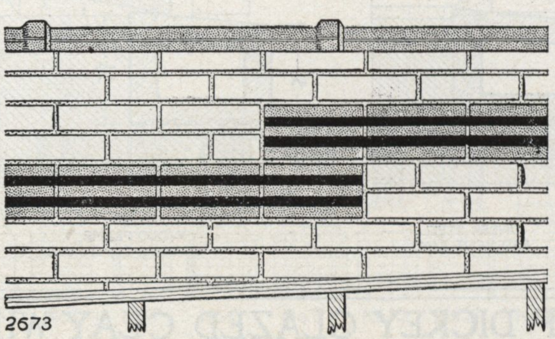
Being made of vitrified clay, they are impervious to moisture and frost, and proof against decay. Outside dimensions conform to structural requirements and practice, resulting in easy construction. The grooves in block furnish permanent anchorage for the base and cap flashings.

Expansion and contraction of the roofing material is provided for. The flashing joint is triple sealed and expensive maintenance is eliminated.

Half length and mitered corner flashing blocks are furnished to meet special requirements.

Specifications—*When Blocks Are Laid Horizontally*—Blocks above a sloping roof shall be laid in wall as brick is built up, starting with bottom of blocks two courses above high point of roof and extending on a level line until bottom of block is four courses above roof, then drop the line of blocks down two courses of brick (height of block), making the upper course of block overlap the lower course 8 in. Continue to drop the courses, as above, throughout the length of the wall. In all head and cross walls the blocks shall be laid across on a level line.

Inner angles shall be constructed by butting the end of one block against the face of another so that grooves match, the end of one block extending 4 in. into the abutting wall.



Dickey Flashing Blocks Laid Horizontally Above a Sloping Roof

Showing method of stepping down the courses of blocks

Continued on next page

Special mitered blocks, in pairs, shall be used for all outer angles, such as offsets and chimney breasts.

When Blocks Are Laid Parallel to Slope of Roof—Installation of blocks must always begin at high point of roof and grooves in blocks to be made to match at all joints. Bottom of blocks to be at least 5 in. above roof line.

The brick shall be cut to conform to angulation and clipping of blocks shall be done at intersections of inner and outer corners.

Flashing Method No. 1—*Preferred*—Triangular wood cant or angle strip, about 3¼x3¼ in. shall be securely fastened along the angle at juncture of roof and wall. Grooves in flashing blocks shall be thoroughly cleaned of all mortar or other foreign material. Roofing material shall be extended over the face of the cant strip and up along the wall. Base flashing shall be tucked into lower groove with oakum to allow for expansion and contraction. It shall extend down over the roofing material, across the cant strip and out on the roof at least 4 in. beyond the lower edge of cant strip. Cap flashing of metal or other material shall be permanently cemented into upper groove with the best portland cement mortar. Cap flashing shall extend down to a point not less than 1 in. below bottom line of flashing blocks.

Method No. 2—When base flashing is not used, the roofing material shall be extended over the face of cant strip, up along the wall and into the lower groove, where it shall be tucked in with oakum to allow for play of expansion and contraction. Cap flashing of metal or other material shall be permanently cemented into upper groove with the best portland cement mortar. Cap flashing shall extend down to a point not less than 1 in. below the bottom line of flashing blocks.

Dickey Vitrified Salt-glazed Septic Tanks

The Dickey Septic Tank is the true solution of sanitary sewage disposal for suburban and rural buildings. It offers the same advantages as the city sewer system wherever running water is available, and obviates the danger of contaminating the water supply by seepage from the outdoor toilet or cesspool to spring or well.

It is odorless, automatic, and operates successfully throughout the year. No chemicals whatever are required. Sewer gases, acids in the sewage or in the ground can not injure the everlasting clay it is made of.

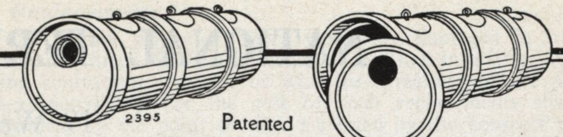
Construction—Dickey Vitrified, Salt-glazed Septic Tanks consist of three or more sections of specially made salt-glazed pipe, laid horizontally.

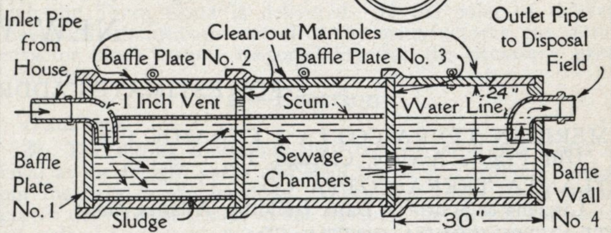
Sections are separated by vitrified salt-glazed baffle walls, and each section, 2 ft. in diameter by 2½ ft. long, is equipped with vitrified, salt-glazed covers for clean-out purposes.

Capacity—Three sections care for an average residence with five persons. The tank should be large enough to contain at least a 24-hour flow of sewage.

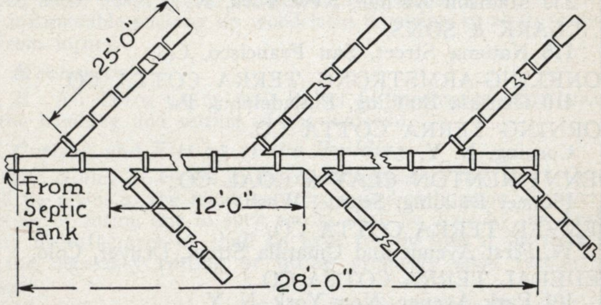
DICKEY SEPTIC TANKS

Schedule No. 1		Schedule No. 2		Schedule No. 3	
Number of persons	Gallons per day per person	Number of persons	Gallons per day per person	Number of persons	Gallons per day per person
2 to 6....	22½	2 to 9....	15	5 to 15....	7½
6 to 8....	22½	9 to 12....	15	15 to 20....	7½
8 to 10....	22½	12 to 15....	15	20 to 25....	7½
10 to 12....	22½	15 to 18....	15	25 to 30....	7½
12 to 14....	22½	18 to 21....	15	30 to 35....	7½
14 to 16....	22½	21 to 24....	15	35 to 40....	7½
16 to 18....	22½	24 to 27....	15	40 to 45....	7½
18 to 20....	22½	27 to 30....	15	45 to 50....	7½





SECTION THROUGH SEPTIC TANK



PLAN SHOWING VITRIFIED DRAIN TILE WITH OPEN JOINTS CONNECTED BY Y BRANCHES TO SEWER PIPE DISTRIBUTING LINE WHICH IS CEMENTED AT JOINTS.

DICKEY SEPTIC TANK SEWAGE DISPOSAL SYSTEMS 2969

Whenever it is desired to increase the capacity, more sections can be added as needed. These tanks are as well adapted to service in public buildings, clubhouses, hotels ,etc., as they are in residences. Some Dickey Septic Tanks serve more than one building.

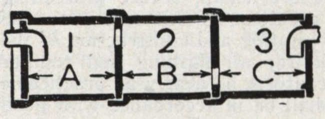
Schedule No. 1—For residences, boarding houses, clubs, institutions, etc., equipped with closet, lavatory, sink and bath. Grease trap should be considered in this case.

Schedule No. 2—For residences, boarding houses, clubs, institutions, etc., equipped with closet, lavatory and sink, but without bath. Grease trap should be considered in this case.

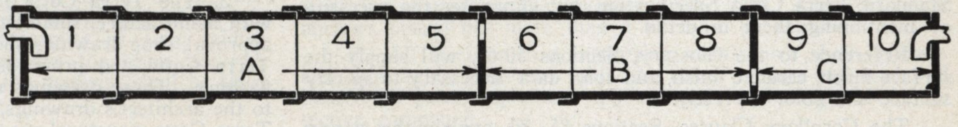
Schedule No. 3—For courthouses, schools, comfort stations and public buildings, equipped with closet and lavatory, but without sink or bath. Grease trap connected with lavatory will be beneficial.

MATERIAL FOR DICKEY SEPTIC TANKS AND DISPOSAL FIELD

Septic tank sections	Capacity 24 hours, gal.	4-in. vented curve	4-in. outlet curve	Stopper or baffle plates	4-in. drain tile, ft.
3	135	1	1	4	150
4	180	1	1	4	200
5	225	1	1	4	250
6	270	1	1	4	300
7	315	1	1	4	350
8	360	1	1	4	400
9	405	1	1	4	450
10	450	1	1	4	500



Tank of Three Sections
Serving 5 or 6 Persons



Tank of Ten Sections
Serving 45 to 50 Persons

Sectional Arrangement of Two Dickey Septic Tanks Showing How Capacity Can Be Increased by the Addition of More Sections

Tanks are always divided into three compartments, A, B and C, as shown

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NEW YORK, N. Y.

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Services of the Society

The National Terra Cotta Society is a bureau operated by the manufacturers of terra cotta in the United States for the technical and artistic improvement of product, the dissemination of authentic information relating to it and the assistance of the architectural and engineering professions in the proper and effective employment of this material. In addition to the Standard Specifications printed below the Society issues other helpful literature relating to the proper construction and detailing of terra cotta and the use of color in architectural design; also illustrated brochures pertaining to various classes of buildings.

Its individual member companies are also prepared to assist architects with counsel and recommendation upon the use of terra cotta in specific instances of application, and to furnish samples of their product when desired.

Standard Specifications for the Manufacture, Furnishing and Setting of Terra Cotta

These Specifications were prepared with the assistance of representatives of the Structural Service Committee of the American Institute of Architects and of the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

Note: The Architect or Specification Writer will find it convenient to follow the Short Form Specifications beginning with Section 63.

The Short Form incorporates all the provisions of the Standard Terra Cotta Specification, but eliminates the necessity of mentioning them in detail.

Reference to the Glossary, Sections 50-62, will supply the surface finish, ceramic finish, and color data necessary to specify surface and color correctly.

The Corollary Clauses, Sections 85, 86, explain the setting option between mason and manufacturer.

Sections 87-91 under Corollary Clauses explain the specifications for flashing, sheet metal, structural steel, structural concrete and rough carpentry. These specifications form a part of the Terra Cotta Specification, although the materials are supplied and set in place by different contracting parties.

A—General Information

Drawings and Schedules

1. The Terra Cotta manufacturer shall be furnished with all drawings, details and other information necessary for the manufacture of Terra Cotta, including drawings for all classes of work with which the Terra Cotta engages.

2. Wherever Terra Cotta is required to match in contour, color, finish and surface treatment, existing Terra Cotta, as for example in connection with alterations or additions to existing work, the Terra Cotta manufacturer shall be furnished with the required profiles and samples of the original work, and other needed information.

3. The Terra Cotta manufacturer shall, before proceeding with manufacture, submit to the architect for his correction and approval, shop drawings showing jointing and construction of the Terra Cotta and provision made for all flashing and counter flashing. These drawings must conform as nearly as practicable to the architect's drawings, but shall be in accordance with good Terra Cotta structural practice.

4. All pieces of Terra Cotta shall be numbered. The Terra Cotta manufacturer shall provide two copies of the completed scale shop drawings to be used for setting and showing the piece numbering of the Terra Cotta, and the size of the joints to be used for setting the various portions of the work clearly indicated. These drawings shall be designated as the setting drawings.

Continued on next page

5. The Terra Cotta manufacturer shall furnish, as promptly as possible, a schedule of all special anchors, hangers, etc., necessary to secure and support the Terra Cotta in a manner approved by the architect.

B—Material

Quality, Tests

6. *Note:* In view of the researches now being conducted by the National Bureau of Standards at the instance of the NATIONAL TERRA COTTA SOCIETY, it seems inadvisable to attempt, at this time, to write either quality clauses in terms of crushing strengths, densities and elasticity, or specifications for tests. Clauses descriptive of the desirable physical characteristics and of tests to prove compliance of the material with such physical requirements will be prepared as soon as the necessary data are available and inserted in a later edition of this standard specification.

Modeling

7. All ornament shall be artistically modeled by the Terra Cotta manufacturer's staff artists. (Or, models made to Terra Cotta shrinkage scale will be furnished to Terra Cotta manufacturer, without cost to him, securely crated for shipment f.o.b. modellers' studio at .)

8. Photographs in duplicate of all ornament shall be submitted to the architect for his approval or correction, or, if he so desires, he may inspect all modeling at the factory. Such approval or inspection by the architect shall be made promptly. No ornamental work shall be burned until modeling has been approved.

Surface Finish, Ceramic Finish and Color

9. The surface finish, ceramic finish and color of all exposed surfaces of Terra Cotta shall be as indicated by the architect's drawings or as specified. For surface and ceramic treatments, see Glossary of Terms relating to Terra Cotta, which is hereby made a part of this specification.

10. The ceramic finish shall be applied to the Terra Cotta in such a manner as thoroughly to coat the exposed surfaces.

Samples

11. The Terra Cotta manufacturer shall submit samples of the color or colors of the ceramic finish to the architect for his approval, and all Terra Cotta shall conform without marked variation to the sample or samples so approved.

C—Design and Structure

Ends, Walls and Partitions

12. Walls shall not be less than one inch thick and partitions shall be of such thickness and so spaced as to perform their proper functions with regard to form and structure. Each piece of Terra Cotta shall be provided with the necessary anchor holes and hand holes and shall be so formed as properly to engage the structure. Beds generally shall be not less than 4 in. deep.

Washes, Weep Holes and Drips

13. Projecting courses, cornices and heavy ornamental detail may have washes, drips and weep holes, where shown on the approved shop drawings.

Preparation for Flashing

14. Where so shown the washes of all projecting cornices and other exposed horizontal surfaces shall have provision made for flashing. All surfaces where the wash pitches inward toward the structure and stops against superimposed work; all balcony floors, and all gutter grades shall have provision made for flashing.

15. Raggles shall be provided to receive gutter linings and flashings when the joints can not be used for the purpose. Raggles shall be not less than ¾ in. deep.

16. All capping courses, copings and sills except of the "slip" type, shall have stools and lugs at intersections with vertical surfaces.

Joints

17. All joints shall be straight and true and of an approximate uniform width of ¼ in. All Terra Cotta shall be laid out at the factory to test it for uniformity of joint widths and over-all dimensions. Where necessary to secure accurate dimensions and uniform joint widths, the material shall be sized straight and true.

D—Transportation, Storage and Protection

Shipment, Delivery and Care

18. Unless otherwise specifically agreed, all Terra Cotta shall be furnished by the manufacturer f.o.b. cars factory, with freight allowed to destination. All Terra Cotta shall be carefully packed in hay, straw, excelsior or other suitable material.

Replacements

19. If any pieces of Terra Cotta are damaged in transit, the manufacturer shall be immediately notified in writing by the setting contractor and proceed with the remaking of the pieces. The responsibility for the cost of such replacements shall be determined by the point of delivery fixed by the contract under which the Terra Cotta is delivered. If the point of delivery is beyond the immediate control of the manufacturer, the setting contractor shall assume responsibility for the necessary proof of damage.

E—Erection

Handling

20. The setting contractor shall receive the Terra Cotta on arrival at the freight yards and shall transfer it without damage from the cars to the building. When the Terra Cotta manufacturer delivers on trucks at the building the setting contractor shall unload and store the Terra Cotta. Terra Cotta shall be stored under cover not in contact with the ground, stacked without inflammable packing on wood laths or strips, so as to protect it from injury.

Mechanics

21. All Terra Cotta shall be set by mechanics experienced in the handling and setting of the material.

Cutting and Fitting at the Building

22. Notice of errors in the manufacture of the Terra Cotta shall be given to the manufacturer immediately upon discovery. Cutting or fitting due to such errors shall be done by the Terra Cotta manufacturer or shall be paid for by him if he fails to do the necessary cutting or fitting promptly upon receipt of notice.

23. Other necessary cutting and fitting of the Terra Cotta that may be required at the building, including all fitting around anchors, steel and iron work and reinforced concrete, shall be done by the contractor for setting Terra Cotta.

Supporting Metal Work and Anchors

24. *In Connection with Structural Steel*—Beams, channels, angles, T's, plates and fabricated members for supporting Terra Cotta and which are not secured to the structural steel by rivets or short bolts, as shown on the architect's drawings, together with all anchors, hangers, bolts, clips, straps, rods and pins for securing Terra Cotta, shall be furnished and set by the contractor for setting Terra Cotta.

25. *In Connection with Structural Concrete*—The contractor for structural concrete shall furnish and set all supporting metal work inbedded in the concrete and all shelf angles and continuous rods. All such metal work shall conform to the requirements of the setting drawings prepared by the Terra Cotta manufacturer.

26. All other loose iron such as clamps, hangers, clips, straps, and pins shall be furnished and set by the Contractor for setting Terra Cotta.

27. All anchors, hangers, bolts, clips, straps, rods and pins for securing Terra Cotta shall be of wrought iron or non-corroding soft steel.

28. Anchors, hangers, bolts, clips, straps, rods and pins for securing the Terra Cotta, except where otherwise shown or specified, shall be of the following minimum sizes:

29. Anchors:—(a) For ashlar or courses balanced on the wall, shall be ¼x¼ in. or ⅛x⅝ in., or No. 6 gauge galvanized wire.

30. (b) For projecting courses not balanced on the wall, shall be not less than ⅝-in. round or square bars or equal cross section.

31. Hangers shall be ⅝-in. diameter round bars or other shapes of equal cross section area.

32. Clips and straps shall be ⅜x2 in.

33. Pins shall be ½-in. diameter round bars.

34. Continuous rods on concrete wall faces to which Terra Cotta ashlar is clipped, shall be ⅝-in. diameter round bars which shall be secured to the masonry with ½-in. diameter round anchors placed not more than 2 ft. 0 in. on centers.

35. All steel or iron supporting metal work shall be clean and thoroughly protected with two coats of pure red lead and linseed oil paint, asphaltum applied hot, or other approved protective compound.

Protection of Supporting Metal Work

36. Metal work of every description, supporting Terra Cotta, shall be imbedded thoroughly in the masonry backing and when not so imbedded, metal work shall be protected against corrosion by encasing with cement mortar or in cement mortar masonry.

37. When the back of a Terra Cotta course comes in con-

Continued on next page

tact with iron or structural concrete in such manner as to prevent the encasing of supporting iron from the rear, an opening shall be made in the top to admit of the placing of the encasing mortar as required above.

Mortar

38. All cement used for setting mortar shall be a standard brand of Portland cement fulfilling the requirements both physical and chemical of the standard specifications for Portland cement adopted by the American Society for Testing Materials.

39. All sand used for setting mortar shall be clean, sharp and well graded in size.

40. All mortar for setting and pointing shall be composed of one volume of Portland cement to three volumes of sand. Hydrated lime, not to exceed 9 pounds to the sack of cement, shall be added.

41. The sand and cement and lime, if any, shall be thoroughly mixed dry before any water is added. The use of retempered mortar shall not be permitted.

Setting

42. All Terra Cotta shall be set true to a line and carefully laid in a solid bed of mortar. All rebates in bed and cross joints from front to back and top to bottom, shall be filled solid with mortar leaving no voids. Each piece of Terra Cotta shall be tamped into place, excess mortar cut off and struck with a jointer or trowel. All sills, wall copings and other capping courses, shall be set in a thick bed of mortar and well pounded down so that the mortar fills all spaces around bottom of webs of Terra Cotta.

43. All Terra Cotta projecting courses shall be so set that the arris casting a shadow shall be true to line.

44. When the Terra Cotta work is of such scope or character that the proper handling and setting of the Terra Cotta require special skill and knowledge, the Terra Cotta manufacturer shall, if required by the contract, furnish a competent Terra Cotta setter to assist in the sorting, selecting and handling of the Terra Cotta, to co-operate with the setting contractor, to assist him when cutting or fitting of the Terra Cotta is necessary, to advise as to interpretation of setting drawings, and to help generally in securing rapid, efficient progress during the setting of the Terra Cotta. For such service the setting contractor shall pay such setter full time at his regular wage rate. When the furnishing of such a competent setter involves traveling expenses, the setting contractor shall pay the same and also make an allowance for his board.

45. When the services of such a competent setter are not required under the contract, the Terra Cotta manufacturer may, at his own option and expense, send such a representative to the work who shall perform the above services, and the setting contractor shall co-operate with and aid and facilitate the performance of such services by such representative.

Pointing

46. All joints in Terra Cotta shall be pointed and struck as the setting progresses except in freezing weather. In freezing weather and when re-pointing is necessary, all joints shall be raked or cut out to a depth of ½ in. and the pointing mortar driven into the joint and struck with a jointing tool.

47. All joints in overhanging Terra Cotta, balustrades, parapets and free standing features shall have joints raked out one-half (½) inch, and pointed with an approved elastic cement.

Protection

48. All uncompleted walls including Terra Cotta and backing shall be protected by waterproof covering at night and at any time when liable to injury from storms or freezing.

(*Note:* All other protection required for projecting courses, jambs of openings, etc., is provided for under the work of other trades.)

Cleaning Down

49. Upon completion of the work, mason's wedges, shoring, supports and centering and all other false work and protections shall be removed and the Terra Cotta cleaned down. If satisfactory results can not be obtained by the use of abrasive soap or washing powder, a solution consisting of 1½ pints of muriatic acid to a gallon of water may be used. In the use of acid solutions only wooden pails and fibre brushes shall be employed.

Glossary of Terms Relating to Terra Cotta

Surface Finish

50. Surface Finish designates the texture of the surface of the clay body prior to application of Ceramic Finish.

51. It may be:

(a) *Smooth.*

(b) *Tooled or Drove.*

(b1) Eight lines to the inch.

(b2) Six lines to the inch.

(c) *Light irregular drag or combing.*

(d) *Heavy irregular drag or combing.*

(e) *Special.*

52. A special Surface Finish like "bush-hammered," "pitted," "vermiculated," etc., involves extra expense and, if required, should be clearly specified.

53. *Surface Finish for unglazed surfaces* may be smooth or may be tooled with a light or heavy drag. Flat surfaces of sufficient width may be tooled, while the curved surfaces of mouldings may be left smooth.

Surface Finish for glazed Ceramic Finish (whether lustrous or mat) is usually made smooth.

54. *Granite Colors,* if unglazed, may be made smooth or with irregular drag, or pitted. A bush-hammered or special surface involves extra expense, and if required should be clearly specified. If glazed Ceramic Finish is used for Granite Colors the surface treatment is usually smooth.

Ceramic Finish and Color

55. Ceramic Finish designates the surface and color applied by the ceramic processes of coating, glazing, burning, etc.

56. (1) *Unglazed Terra Cotta:* Terra Cotta with a Ceramic Finish producing an unglazed finish made in various shades of buff, gray, salmon, red and brown. Most colors thus made are vitreous.

57. (2) *Glazed or Enameled Terra Cotta:* Terra Cotta having an impervious Ceramic Finish of a glassy texture which may be either lustrous or mat (sometimes designated as full or dull glazes or enamels) made in various colors.

58. (3) *Granite Color Terra Cotta:*

(a) Unglazed Granite Color:—A mottled Ceramic Finish similar to unpolished granite.

(b) Glazed or Enameled Granite Color:—A mottled Ceramic Finish similar to polished granite, made either lustrous or mat.

59. (4) *Polychrome Terra Cotta or Faience:* Terra Cotta having two or more colors on the same piece.

(a) Polychrome, Unglazed:—Unglazed Terra Cotta having two or more colors on the same piece.

(b) Polychrome, Glazed:—Glazed Terra Cotta having two or more colors on the same piece.

(c) Polychrome, Blended Colors:—Made only in glazed Terra Cotta. If, in polychrome glazed work, the colors are not to be separated by definite lines or contours of ornaments, but are to be blended together by brush treatment, or the like, the term "Polychrome, blended colors" shall be used. The character of work expected should be explicitly described.

(*Note:* For polychrome work always clearly specify the work to be done and the number of colors on a single piece.)

60. (5) *Special:* There are a number of Ceramic Finishes used by individual manufacturers the processes for which are patented or the names copyrighted which are not included in this Glossary.

61. (6) *Semi-Glaze:* An ambiguous term which should never be used.

62. (7) *Fire-Gilding:* A coating of gold glaze either mat or lustrous, fixed by an additional burning. (The area of surface to be gilded should be clearly described.)

Short Form Specification for Incorporation in the Architect's Specifications

To be used in connection with Standard Specifications and the Standard General Conditions of the American Institute of Architects.

63. *Note to Architect:*—The Standard Specification does not state who shall set the Terra Cotta, who shall provide wood centering, scaffolding, hoists, cover boards and protection (except tops of walls against weather). It does not include any cement or concrete work in connection with forming gutter grades and washes on projecting courses and features, or the furnishing or setting of sheet metal flashings and gutter linings. It does not include the furnishing and erection of metal supporting members which are riveted or bolted with short bolts to the structural steel or structural concrete. It requires the architect to show on his drawings the sizes and arrangement of rolled or fabricated structural shapes used for supporting Terra Cotta. (See notes on corollary clauses at end of this specification for the work of other trades to take care of such omissions.)

General Conditions

64. The general conditions of the American Institute of Architects, Third Edition, shall form a part of this specification and contract and all work shall be subject to the provisions thereof.

Continued on next page

Work Included

65. The work included in the contract comprises the manufacture, (and) delivery (and setting) of all Terra Cotta in accordance with the contract drawings and these specifications.

66. All (here insert a complete description of work) shall be of Terra Cotta.

Work Not Included

67. The following items are not included as a part of the contract for furnishing (and setting) Terra Cotta.

(a) Masonry backing. See specifications for (.................................).

(b) The furnishing and erection of metal supporting members which are riveted or bolted with short bolts to the structural steel. See specifications for (...............................).

(c) Cement or concrete grading for gutters, washes, floors, etc. See specifications for (................................).

(d) Furnishing and setting sheet metal, see specifications for (..................................).

Materials and Workmanship

68. All Terra Cotta work under this contract, except as hereinafter specified, shall be executed in strict conformity with the Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta, adopted by the NATIONAL TERRA COTTA SOCIETY; which Standard Specification is hereby declared and made a part of this specification with the same force and effect as if written herein in full.

Surface Finish, Ceramic Finish and Color

69. All Terra Cotta
(*Note:* If several textures or finishes are to be used give location of each.)
shall be

70. (1) *Unglazed.*
Surface Finish or flat members shall be
(a) *Smooth.*
(b) *Tooled or Drove.*
  (b1) Eight lines to the inch.
  (b2) Six lines to the inch.
(c) *Light irregular drag or combing.*
(d) *Heavy irregular drag or combing.*
(e) *Special.*
(*Note:* Special surface finishes like "bush-hammered," "pitted," "vermiculated," etc., should be described.)

71. The surface finishes of mouldings and curved surfaces generally shall be
(*Note:* Unless otherwise specified these surfaces are generally made smooth.)

72. (2) *Unglazed Granite Colors*—Surface finishes of flat members generally shall be (a, b, c, d, e). The surface finish of mouldings and curved surfaces generally shall be
(*Note:* Unless otherwise specified these surfaces are generally made smooth.)

73. (3) *Lustrous or Full Glazed or Enameled*—Surface finish shall be
(*Note:* Unless otherwise specified these surfaces are generally made smooth.)

74. (4) *Mat or Dull Glazed or Enameled*—Surface finish shall be
(See Note 3.)

75. (5) *Lustrous or Full Glazed or Enameled Granite*—Surface finish shall be
(See Note 3.)

76. (6) *Mat or Dull Glazed Enameled Granite*—Surface finish shall be
(See Note 3.)

77. The color of the Terra Cotta generally shall be (.............................) as per approved sample or samples.

78. (7) The Terra Cotta comprising....(described here in detail....) shall be (two, three, four) color polychrome. Colors (....specify where....) shall be blended.

79. (8) The surface finishes of (....specify where....) shall be fire gilded with (mat or lustrous) gold glaze.
(*Note:* Sections 1, 2, 3, 4, 5, 6 are alternates. If there is no polychrome work or no fire gilding omit sections 7 and 8. Sections a, b, c, d, e, are alternates for surface finish.)

Delivery

80. The Terra Cotta manufacturer shall furnish and deliver (f.o.b. cars factory with freight allowed to destination) (on trucks at the site of the building) (and set) all the Terra Cotta as indicated on the drawings or as here described.

Setting

81. All Terra Cotta shall be set by (Terra Cotta manufacturer) (mason......). For such anchors and metal work as are to be furnished by the setting contractor see Standard Specification.
(*Note:* If the Terra Cotta manufacturer is to set his material include the following clause in the Terra Cotta specification. See also suggested clauses at end of this specification to take care of these omissions and for incorporation in the specifications for the work of other trades.)

82. "Hoisting service, storage space, setting mortar delivered on the scaffold, outside and inside scaffolds, runways and platforms, water, temporary light and removal of refuse, shall be furnished to the Terra Cotta manufacturer free of charge by the (....mason contractor....)."

Terra Cotta Setter

(*Note to Architect:* If the work is of such scope or character that the proper handling and setting requires special skill, the following clause may be inserted:)

"The Terra Cotta manufacturer shall furnish at the expense of the setting contractor a competent Terra Cotta setter to assist in the sorting, selecting, handling and setting of the Terra Cotta."

Joints

83. (The Standard Specification does not require any joints to be rubbed. If rubbed joints are to be required it should be so stated here.)

84. (The Standard Specification requires all joints to be approximately ¼ in. wide. If joints of a different width are desired it should be so stated here.)

Suggestions for Corollary Clauses

85. 1.—If the Terra Cotta is to be set by the Terra Cotta manufacturer, a clause similar in purport to the following should be included in the general requirements relating to masonry or brick work:

86. "Terra Cotta will be furnished and set by the Terra Cotta manufacturer. Hoisting service, storage space, setting mortar delivered on the scaffold, outside and inside scaffolds, runways and platforms, water, temporary light and removal of refuse shall be furnished to the Terra Cotta manufacturer, free of charge, by the (mason contractor)." A provision should also be included to the effect that the (mason contractor) shall construct the brick (concrete) backing for the Terra Cotta and "The backing shall proceed simultaneously with the setting of Terra Cotta. Each piece of Terra Cotta shall be backed up solid with brick and mortar, so as to make a perfect bond and homogeneous mass between wall lines. This backing shall extend beyond the wall line when necessary to structural stability. If concrete is used it shall not be stronger than a 1 to 9 mixture."

Also a provision under which the (mason) contractor shall place all concrete or cement grading for gutters, washes and balcony, loggia or other floors.

87. In the case of parapet walls specifications should state that flashing if used shall be carried through the wall, or if flashing be not used the back of the parapet wall shall be damp-proofed and the waterproofing carried through the wall.

88. 2.—In the specifications for sheet metal work there should be included a clause similar in purport to the following:

"The washes on all cornices and other exposed surfaces, where shown or specified, shall be covered with ( ) which shall be turned up against vertical surfaces (cap flashed) and cemented into the raggles provided for the purpose in the Terra Cotta."

89. 3.—Structural Supports.

Under "Structural Steel," a clause similar in purport to the following should be included:

"Beams, channels, angles, T's, plates and fabricated members for supporting Terra Cotta, and which are secured to the structural steel with short bolts or rivets, shall be furnished and erected by the contractor for (structural steel.)"

90. Under "Structural Concrete" a clause similar in purport to the following should be included:

"Steel beams, channels, angles, T's, plates, fabricated brackets and outlookers and other members, bolts, rods, wires, anchors, and sleeves for supporting Terra Cotta, which are inbedded in the structural concrete, also shelf angles and continuous rods attached to structural concrete shall be furnished and set by the contractor for structural concrete, in strict accordance with setting drawings prepared by the Terra Cotta manufacturer." (For information as to the sizes and character of bolts, rods, anchors, etc., see Section E paragraphs 24 to 35 inclusive on "Supporting Metal Work and Anchors" of Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta. Such supports should be clearly shown on the drawings.)

91. 4.—Under "Rough Carpentry" or other suitable division of work, there should be included a clause providing that the contractor shall furnish, set and maintain all centering, cover boards, boxing and protection for Terra Cotta, and remove the same upon completion of the work.

ATLANTIC TERRA COTTA CO.

350 Madison Avenue

NEW YORK, N. Y.

PLANTS

TOTTENVILLE, S. I., N. Y.   PERTH AMBOY, N. J.   ROCKY HILL, N. J.

ATLANTA TERRA COTTA CO.

Citizens & Southern Bank Building

ATLANTA, GA.

PLANT: EAST POINT, GA.
(Eight miles from Atlanta)

DISTRICT OFFICE: DALLAS, TEX.

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STOCK DESIGNS of ATLANTIC TERRA COTTA for complete elevations or trim for buildings of moderate size.

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Stock Design Catalog obtainable from either the Atlantic or the Atlanta Company. (Mention "Stock Designs" when writing.)

EXTERIOR CLEANING SERVICE in New York and vicinity.

Largest Manufacturers of Terra Cotta in the World.

Printed Information

"Questions Answered"—A 32-page illustrated booklet of general information.

Monthly Magazine "Atlantic Terra Cotta"—Illustrating ancient and modern Terra Cotta.

"Atlantic Terra Cotta Stock Designs"—A catalog of stock designs.

Garden Pottery Catalog—Reproductions of Florentine originals.

Chimney Pot Catalog—Many designs in usual and unusual colors.

Uses of Terra Cotta

For entire facades; for entrances, window trim, mouldings, cornices and panels.

For interior sidewalls and ceilings.

For important rooms in hotels and banks, and for rotundas of public buildings.

For exterior or interior construction and decoration with masonry, steel or reinforced concrete frame.

Colors

Many shades of gray, buff, brown and red in unglazed, vitreous surface.

White, creams and ivories in matt or lustrous glaze.

Conglomerate colors; combinations and textures that occur in natural geological formations.

A practically unrestricted range of blues, greens, sienna, purple, yellow, lavender, etc., in matt glaze.

Every piece is stamped

ATLANTIC

and backed by our reputation.

Cost of Atlantic Terra Cotta

Atlantic Terra Cotta, in its widest application, is made especially for the building in which it is to be used, and is intended to occupy a certain place in that building.

To determine the cost of Atlantic Terra Cotta the architect should submit the following drawings:

Floor plans, and elevations drawn to scale.

Sections showing projections, and sketch details.

When specifications have been prepared, they should be sent with the drawings.

Details such as the amount and character of the modeling, and the color or colors should be indicated.

Stock Designs

Atlantic Terra Cotta in stock designs permits a convenient economical and effective use of Terra Cotta.

The sizes and forms are varied, the choice of colors wide and the quality of the best.

The architect has little trouble in adapting stock designs to his design, for either the entire elevation or trim—particularly stores, small banks, apartment houses, garages, filling stations, theaters, etc.

For full information apply to Atlantic or Atlanta Company.

Exterior Cleaning Service

In New York and vicinity the ATLANTIC TERRA COTTA COMPANY will contract to clean the exterior of any masonry building—Terra Cotta, stone or brick. If desired, this service includes repointing and minor repairs. The cleaning is done rapidly and effectively with minimum inconvenience to tenants, and all operations are covered by Property and Liability Insurance. Sand blast is used sparingly on stone and brick, and Terra Cotta is carefully washed. Exteriors are returned to their original freshness.

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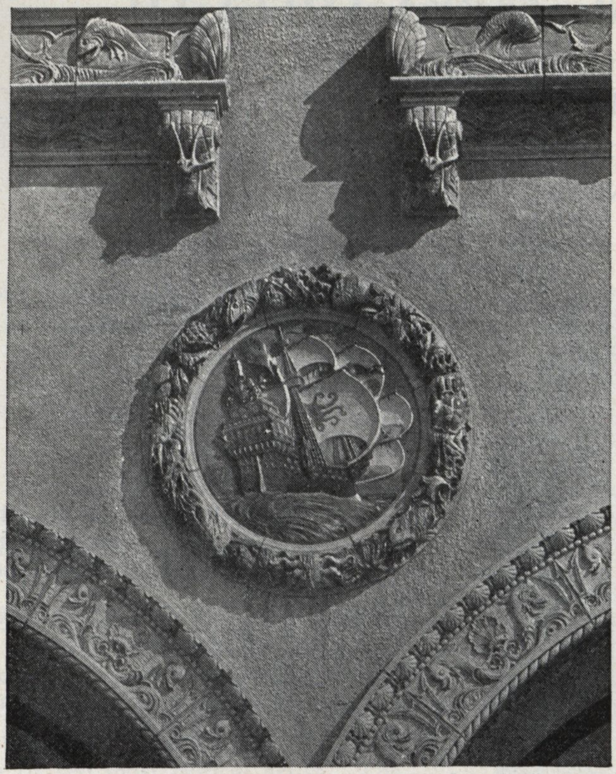
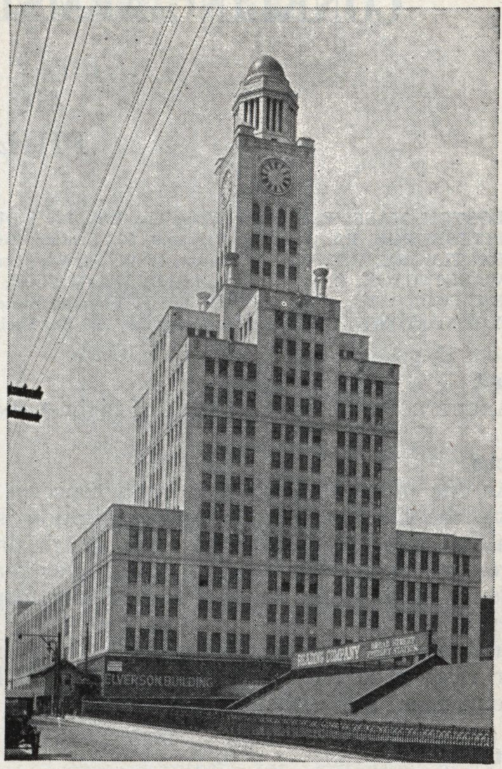
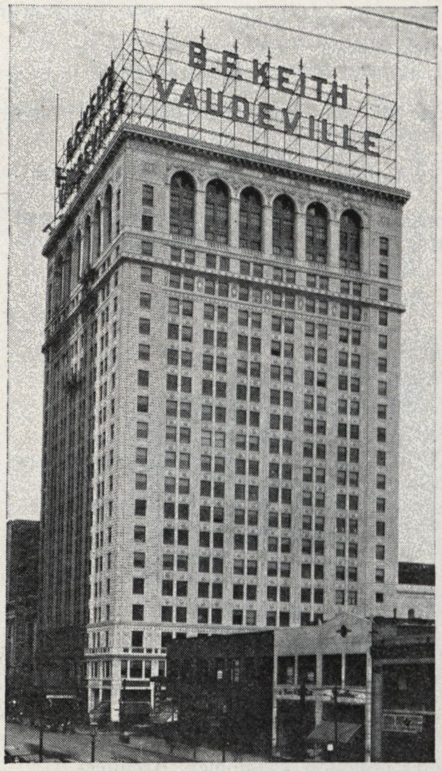


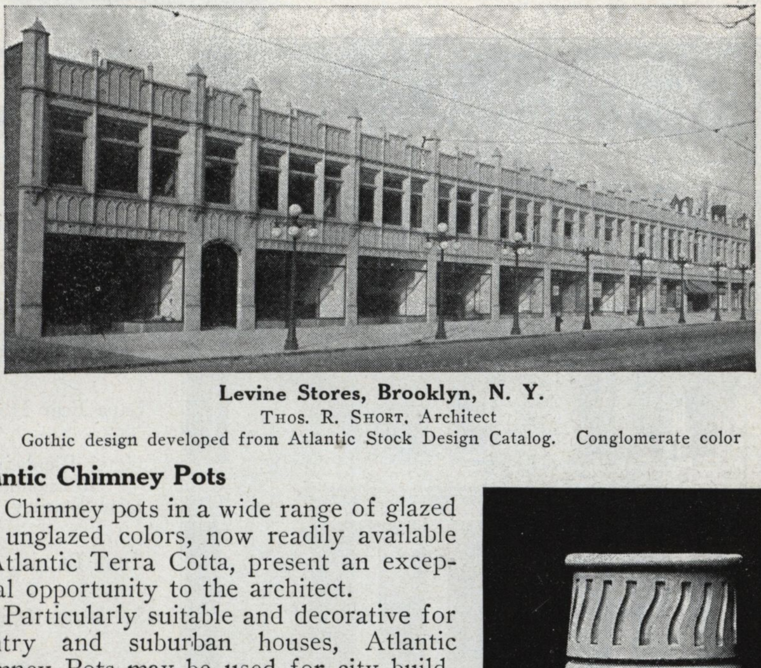
Childs Restaurant, Coney Island, New York, N. Y.
DENNISON & HIRONS, Architects
Brilliant polychrome Atlantic Terra Cotta in many colors, including scarlet and gold



The Elverson Building for the Philadelphia Inquirer, Philadelphia, Penn.
RANKIN, KELLOGG & CRANE, Architects
Atlantic Terra Cotta from watertable up to and including the gold Terra Cotta dome. Base and shaft matt cream



Keith Building, Cleveland, Ohio
C. W. & GEO. L. RAPP, Architects
Entirely of Atlantic Terra Cotta in matt cream glaze with touches of polychrome, easily washed with soap and water. Illustration shows building in process of cleaning; uncleaned portion at left



Levine Stores, Brooklyn, N. Y.
THOS. R. SHORT, Architect
Gothic design developed from Atlantic Stock Design Catalog. Conglomerate color

Atlantic Chimney Pots

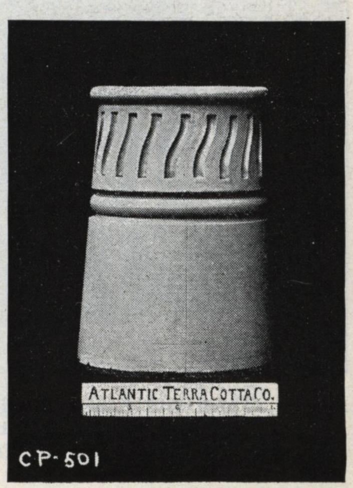
Chimney pots in a wide range of glazed and unglazed colors, now readily available in Atlantic Terra Cotta, present an exceptional opportunity to the architect.

Particularly suitable and decorative for country and suburban houses, Atlantic Chimney Pots may be used for city buildings where practical chimney finish is the one consideration.

Modeled by hand, moulded and finished by hand (but not too smoothly finished), hard burned in Atlantic Terra Cotta body, Atlantic Chimney Pots are unusual.

The wide range of interesting colors makes them unique.

A complete catalogue will be sent on request.



CONKLING-ARMSTRONG TERRA COTTA CO.

SALES OFFICE
410 Denckla Building
PHILADELPHIA, PA.

WORKS
Wissahickon Avenue
and Juniata Street

AGENCIES

BOSTON, MASS., E. Stanley Wires Co., Inc., 120 Boylston Street
PITTSBURGH, PA., James R. Pitcairn, 507 Century Building
BALTIMORE, MD., Wm. T. Carson, 17 W. Saratoga Street
WASHINGTON, D. C., Lally-Rohlader, 1756 M Street, N. W.
RICHMOND, VA., Earnest Bros., 805 E. Franklin Street
YOUNGSTOWN, OHIO, Smith-Faris Co., 226 So. Phelps Street
WILMINGTON, N. C., C. F. Howell
TAMPA, FLA., E. W. Price, So. Howard and DeSoto Avenues
COLUMBIA, S. C., C. W. Turner, 58 Arcade Building
NEW CASTLE, PA., Pearson Brick Co.
DETROIT, MICH., Dresden Brick Co., Hammond Building
SUFFOLK, VA., E. L. Folk, Jr., 702 National Bank Building

Product

Architectural Terra Cotta of highest quality.

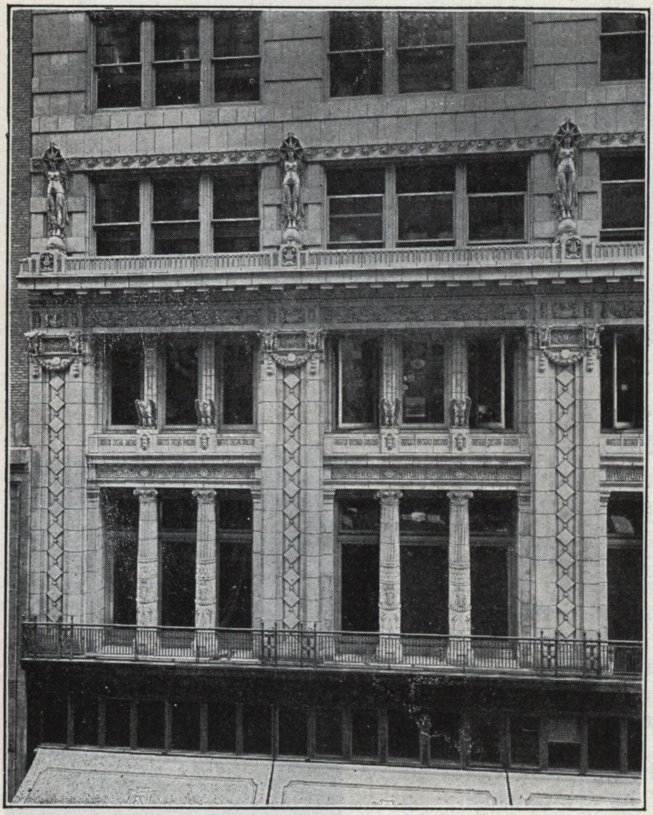
Services

As one of the largest terra cotta concerns in the country, the Conkling-Armstrong organization is in an exceptional position to execute, from sketch drawings if necessary, work of any description, however artistic, complex or technically difficult, and of any magnitude whatever.

Information, specific or general, covering any matter relative to terra cotta and its use gladly supplied on request and without obligation.

Quality

Conkling-Armstrong material has long represented the best in terra cotta both as to satisfactory appearance and permanence. This has been the result of studied investigation, not only of the material, but allied facts such as support, mortar, setting, pointing, etc.



Second, Third and Fourth Stories Frank S. Seder Building, 11th and Market Streets, Philadelphia, Pa.
The Ballinger Co., Architects

Delivery

Large centrally located plant assures convenient delivery to any part of the United States.

Use of This Material

Schools, colleges, churches, theaters, office buildings, banks, store buildings, garages and factory buildings, trimmed with Architectural Terra Cotta, become neighborhood beautifiers.

This material which has stood the test of time and the elements with all its color and surface treatment possibilities, is the logical building material where durability, decorative qualities and color are required to make a complete and permanent design.

Our Record

Thirty-six years' experience, more than 8000 contracts, a maintained standard of excellence during this period, are our credentials for soliciting your business.

Representative Work

Philadelphia, Pa.

Benjamin Franklin Hotel, Horace Trumbauer, Architect
Wesley Building and Robert Morris Hotel, Ballinger Co., Architects
Pine Manor, Pine Lodge and Pine Vista Apartments, Clarence E. Wunder, Architect
Frank & Seder Building, The Ballinger Co., Architects
Earle Theater and Office Building, Hoffman-Henon Co., Architects
Atlantic Refining Company's Filling Station, Broad Street and Roosevelt Boulevard, Joseph F. Kuntz, Pittsburgh, Architect

Boston, Mass.

Filene Building, D. H. Burnham & Co., Architects

Richmond, Va.

Colonial Theater, Carneal & Johnston, Architects

Wilmington, N. C.

Cape Fear Hotel, G. Lloyd Preacher, Inc., Architects

Atlantic City, N. J.

Hotel Blenheim and Central Pier, Price and McLanahan, now McLanahan & Bencker, Architects
New Stanley Theater, Hoffman-Henon Co., Architects

Tampa, Fla.

First Baptist Church, Chas. M. Hart, Architect

Jacksonville, Fla.

St. James Building, H. J. Klutho, Architect

New York, N. Y.

Broadway Tabernacle, Barney & Chapman, Architects
Wanamaker's Store, D. H. Burnham & Co., Architects
Bowling Freen Building, Audsley Bros., Architects

Harrisburg, Pa.

Doutrich's Store Building, Clayton J. Lappley, Architect
Office Building, Charles H. Lloyd, Architect

Trenton, N. J.

Stacy-Trent Hotel, Esenwein & Johnson, Buffalo, N. Y., Architects

Lancaster, Pa.

Brunswick Hotel, C. Emlen Urban, Architect

CORNING TERRA COTTA COMPANY

Architectural Terra Cotta

OFFICE AND WORKS
CORNING, N. Y.
AGENCIES IN ALL PRINCIPAL CITIES

Corning Architectural Terra Cotta

The Corning Terra Cotta Company has been in business since 1887, and during this time great progress has been made in the manufacture of their product. Endless variety of colors are produced in the laboratories, the chemistry of fire being their only limit. Glazed work is produced in many colors, with bright gloss or dull matt surface. Various beautiful mottled effects are produced by the pulsichrome system of glazing (at practically the same cost as plain glazed work). Polychrome work is produced in many colors and effects, to the satisfaction of the most critical artist. The location of the Corning plant, on three main line railroads, affords excellent shipping facilities in all directions.

Specifications

The Corning Terra Cotta Company recommends the use of the standard specifications as adopted by the National Terra Cotta Society for furnishing and setting Terra Cotta.

Statue in Student Chapel, St. Mary's Roman Catholic Chapel, Ann Arbor, Mich.
Rousseau & McConkey, Architects

Ornamentation

Clay, being plastic, enables the production of rich ornamentation at moderate cost, especially if there is repetition of ornament.

As all terra cotta is produced from plaster moulds, the designer will aid materially in keeping the cost of the building down by minimizing the number of moulds required.

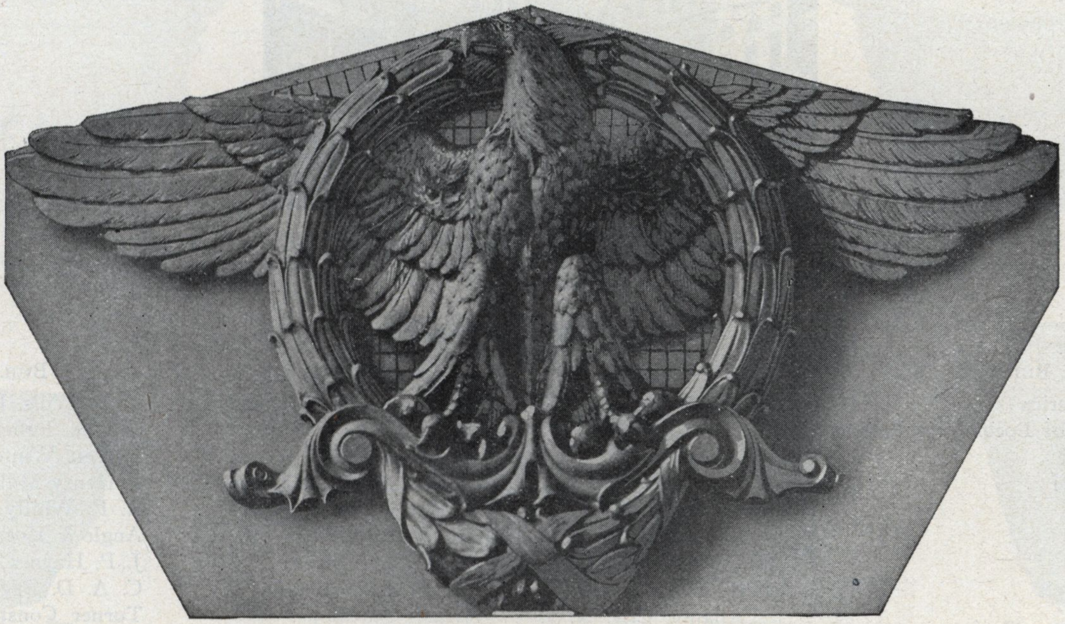
With the expert modelers employed, architects' designs and ideas are fully interpreted and reproduced.

Photographs of clay models and ornamental features are furnished to the architect for criticism and approval.

Stock designs of principal features of buildings illustrated in our catalogue are kept in stock.

Catalogues

The Corning Terra Cotta Company will gladly forward its catalogue to architects when request is made on their business letterhead.



One of Many Corning Terra Cotta Designs

FEDERAL TERRA COTTA CO.

Manufacturers of a Superior Grade of Architectual Terra Cotta

FACTORY
WOODBRIDGE, N. J.

MAIN OFFICE
101 Park Avenue
NEW YORK, N. Y.

SALES OFFICES
IN PRINCIPAL CITIES

Product

Architectural Terra Cotta for exterior and interior use.

Service

Development of preliminary drawings to show adaptability and construction of terra cotta.

Colors and Finishes

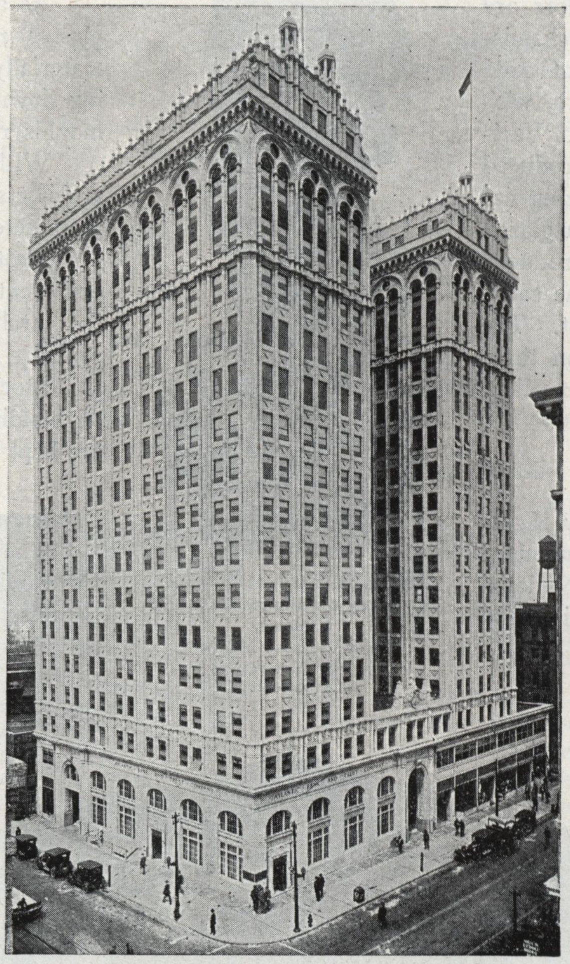
Complete lines of unglazed standard colors, such as gray, buff, red, etc., with hard burned vitreous surface; matt and full glazed white, cream, and polychrome finish.

All surface finishes are hard burned, impervious to weather conditions, and permanently durable.

Specialties

Terra Cotta Granite and Terra Cotta Marble—Reproduced exactly the color, texture and general appearance of the natural material. Samples furnished on request.

Unusually Large Pieces—With careful study of jointing to conform to architect's scale and design.



Jefferson Standard Life Office, Greensboro, N. C.
Charles C. Hartmann, Architect

Representative Work

Building	Location	Architect	Builder
Bank of America	New York, N. Y.	Trowbridge & Livingston	C. T. Wills, Inc.
Brotherhood of Locomotive Engineers	Cleveland, Ohio	Knox & Elliott	Geo. A. Fuller Co.
Webster Hall	Detroit, Mich.	Halpin & Jewell	Everett Winters Co.
Public Service	Baltimore, Md.	Parker, Thomas & Rice	J. Henry Miller, Inc.
Lee House	Washington, D. C.	J. Henri deSibour	R. P. Whitty Co.
Municipal	Greensboro, N. C.	Harry Barton	Angle & Moesser
Medical Arts	San Antonio, Tex.	R. H. Cameron	J. P. Haynes
Hotel Roosevelt	New Orleans, La.	Favrot & Livaudais	C. A. D. Bagley Co., Inc.
Hotel Denis	Atlantic City, N. J.	Walter Smedley	Turner Construction Co.
Courthouse	Fayetteville, N. C.	Harry Barton	William P. Rose

ESTABLISHED 1810

GALLOWAY TERRA COTTA COMPANY

Manufacturers of Galloway Pottery
3200 Walnut Street
PHILADELPHIA, PA.

Products

Galloway Garden and Decorative Pottery and Terra Cotta, including Flower Pots, Boxes, Vases, Bird Baths, Sundials, Tables, Benches, Hermes and Statuary; Chimney Caps.

Also Architectural Terra Cotta.

Finish

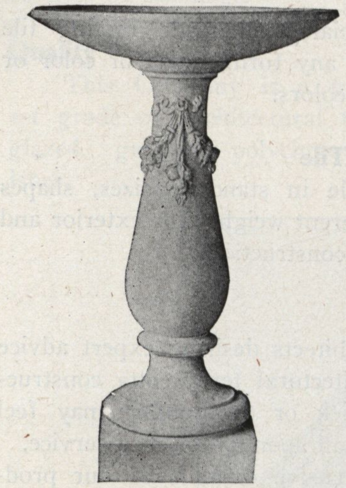
Standard finish, light stony gray. Red, cream, and special finishes made on order.

Chimney Caps

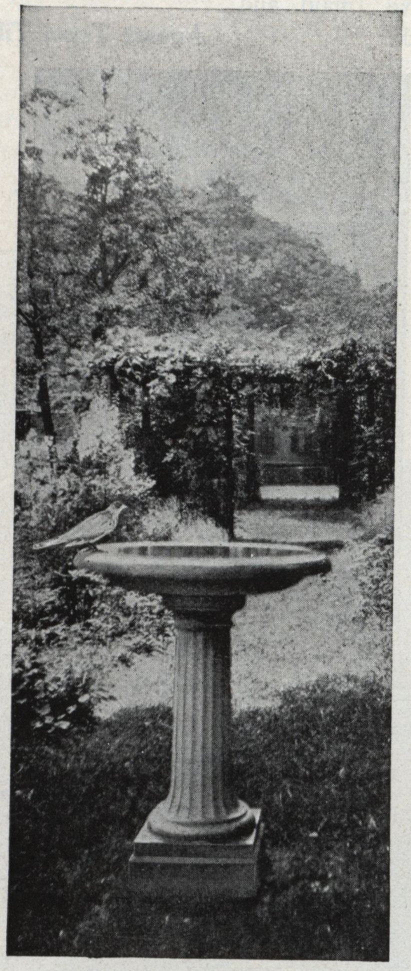
Can be supplied in a number of stock patterns for standard flues. Special caps will be made on order. State requirements in writing for information.

Catalogue

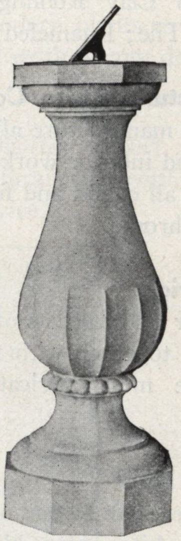
A catalogue of Galloway Pottery will be sent on request. Illustrations of chimney caps can also be sent.



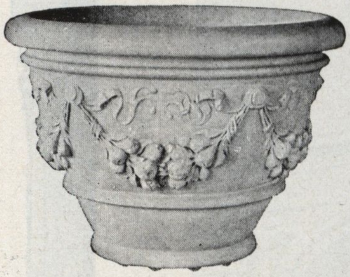
No. 654. Bird Font
35 in. high



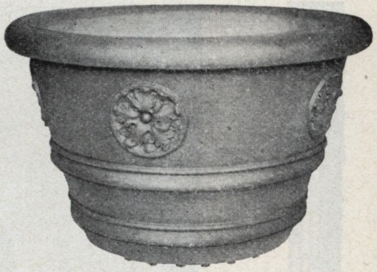
Bird Font in Garden



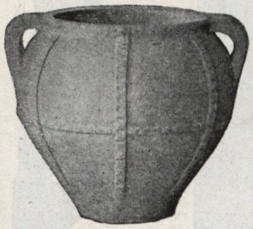
No. 294. Sun Dial
37 in. high



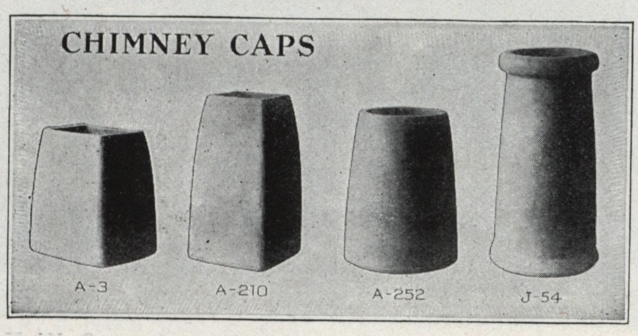
No. 727. Flower Pot
14 in. high x 20 in. wide



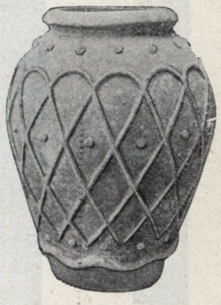
Flower Pot
Sizes up to 43 in. wide



No. 686. Jar
13 in. high



Chimney Caps



No. 277. Vase
20 in. high

O. W. KETCHAM

Ornamental and Structural Burnt Clay Products

121-125 North 18th Street, South of Parkway
PHILADELPHIA, PA.

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WASHINGTON, D. C., Home Life Building
NEW YORK, N. Y., Bush Terminal Building, 130 West 42nd Street

Products

ARCHITECTURAL TERRA COTTA; HAND MADE "AGEART" TERRA TILE; FACE BRICK; GLAZED BRICK; SALT GLAZED "ATHENA" BRICK; HOLLOW TILE FIREPROOFING.

Also Clay Roofing Tile, Decorative Inlaid and Faience Tile; Enameled and Paving Brick.

Architectural Terra Cotta

We manufacture all kinds for exterior and interior work, decorative or plain of all colors and finishes, as well as polychrome.

Face Brick

Our line consists of all colors and finishes, together with moulded brick.

The most intricate shapes and design.

Glazed Brick

These can be had of the following colors: white, green, blue or brown.

Made of standard sizes and shapes.

MASONIC TEMPLE

Salt Glazed "Athena Brick"

Made of three shades. Numbered 102, 103 and 104 with radius jamb and sill moulds.

Also moulded base and cap, and special sanitary floor brick.

Ageart Terra Tile

Special hand made roofing tile made of any form, finish or color or blended colors.

Hollow Tile

Made in standard sizes, shapes and different weights for exterior and interior construction.

Services

Architects desiring expert advice on architectural terra cotta construction, brick or fireproofing may feel free to call upon us for such service.

Extensive exhibits of our products may be seen in all our offices.

Descriptive booklets or samples may be had on request.

THE · CHESTNUT · STREET · OPERA · HOUSE ·

A FEW EXAMPLES OF TERRA COTTA WORK EXECUTED BY O. W. KETCHAM

ECKARDT V. ESKESEN, President and Treasurer
KARL MATHIASEN, Jr., Secretary

THE NEW JERSEY TERRA COTTA COMPANY

ESTABLISHED 1888

Manufacturers of Architectural Terra Cotta

Singer Building, 149 Broadway
NEW YORK, N. Y.

TELEPHONE
Hanover 0176, 0177

WORKS
PERTH AMBOY, N. J.

AGENCIES

BOSTON, MASS., Franklin M. Davis
BUFFALO, N. Y., Seneca Clay Co.
CINCINNATI, OHIO, E. F. Grand Brick Co.
COLUMBUS, OHIO, Allan Ross Raff
DETROIT, MICH., Thomas Bros. & Co., Ltd.
LANSING, MICH., The Briggs Co.
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NEW ORLEANS, LA., Erskine W. Fisher
NORFOLK, VA., Grover L. White
PITTSBURGH, PA., J. Willis Dalzell Co.
RICHMOND, VA., Henry W. O'Grady

Products

Architectural Terra Cotta for exterior and interior of buildings.

Quality

This Company is a manufacturer of the highest grade of architectural terra cotta in glazed, unglazed, granite, polychrome and pulsichrome finishes.

Production

The New Jersey Terra Cotta Company operates one of the largest and most modern plants in the East, and is equipped to manufacture work of any description.

Service

Architects and builders desiring expert advice on questions pertaining to architectural terra cotta may feel free to call on us for such service.

Hotel Syracuse, Syracuse, N. Y.

George B. Post & Sons, Architects   Amsterdam Building Co., Builders

Façade ornamented with "New Jersey" Terra Cotta of unglazed gray speckled finish

THE NORTHWESTERN TERRA COTTA COMPANY

WORKS AND MAIN OFFICE
2525 Clybourn Avenue
CHICAGO, ILL.

WESTERN PLANT: The Denver Terra Cotta Company, DENVER, COLO.
SOUTHWESTERN PLANT: St. Louis Terra Cotta Company, ST. LOUIS, MO.

AGENCIES IN ALL PRINCIPAL CITIES

Products

Architectural Terra Cotta in glazed, unglazed, pulsichrome, polychrome (two-color, three-color, four-color, etc.), and fire gilded (gold) ceramic finishes.

Also Northwestern Terra Cotta Stock Designs; Northwestern Multi-unit Sill for steel sash windows; Chimney Pots; Faience.

Northwestern Terra Cotta

Glazed Northwestern Terra Cotta is impervious to moisture, and is made in any one of three degrees of gloss, viz: bright, satin and matt.

Unglazed Northwestern Terra Cotta is covered with a slip coating of varying degrees of hardness and sheen.

Either glazed or unglazed material may have a plain, pulsichrome, polychrome, speckled, mottled, granite, old ivory, fire flashed, shaded, blended, or special color treatment.

All ceramic finishes are applied over a mechanical surface finish as selected; either smooth, tooled, drove, irregular drag or combing, bush hammered, rugged, pitted or special.

Quality

Northwestern Terra Cotta is made from carefully selected fire clays, chosen for those qualities which enable them to receive in the plastic condition, and maintain through the drying and burning processes, the form of design desired, with a minimum of warping, twisting or other variation, and with a resultant strength sufficient to fill any reasonable structural requirement.

All surface coatings are scientifically adjusted to the body underneath, to eliminate crazing, parting and other surface defects, and are prepared from formulæ so compounded as to give maximum assurance against undesirable variation in color, when passed through the fire.

As a decorative material adapted to fulfill all the requirements of present day architectural construction, Northwestern Terra Cotta is unsurpassed.

The nature of the raw material and the processes of manufacture permit of a variety in design, color and texture, which renders architectural terra cotta a medium unequalled for the expression of the individuality of the designer and the architect.

Service

To take full advantage of these possibilities requires close co-operation between the designer and an organization experienced in the most highly developed methods of manufacture.

The Northwestern Terra Cotta Company through long experience has built up such an organization, and is in a position to render every assistance to designer and builder, relating to the proper uses and application of its product.

To the *designer* and *architect,* consultation at the initial stage of building promotion is recommended, in order that every advantage may be taken of the possibilities of the material.

To the *builder,* a service is offered which insures prompt deliveries, consistent with promises, and a minimum of time and labor necessary for erection.

To the *owner,* a result is obtained which is certain to yield a big return on his investment and a large measure of satisfaction in having used a material which retains its beauty and usefulness for all time.

Production Facilities

The Northwestern Terra Cotta Company operates the largest plant in the world devoted to the manufacture of architectural terra cotta.

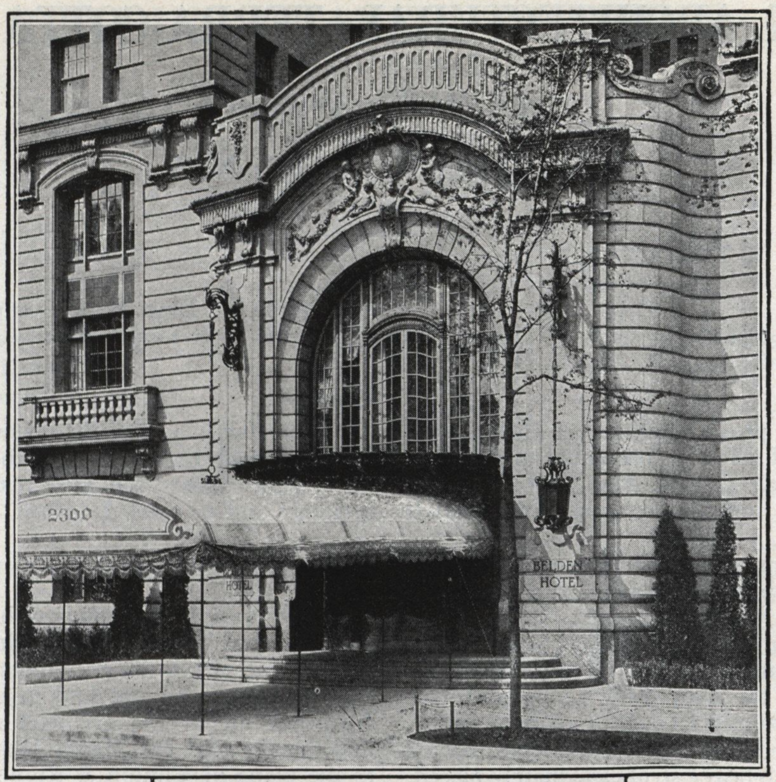
More than fifty years' experience has equipped this company with a plant and organization capable of furnishing a quality and service unsurpassed in the entire industry.

Specifications

"Northwestern" has been a short form of specification covering architectural terra cotta quality and service of the highest degree obtainable, for more than half a century. It needs qualification only with respect to the particular color treatment, mechanical and ceramic finishes desired.

Continued on next page

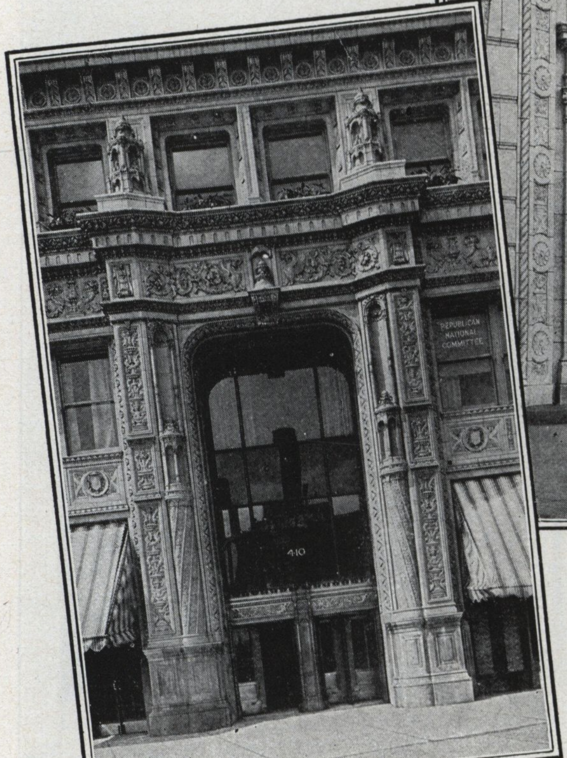
The Belden Hotel,
Chicago.



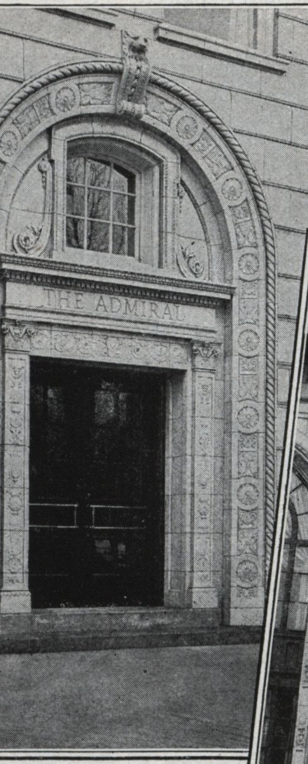
Fridstein & Company,
Engineers.

Impressive
Northwestern
Entrances

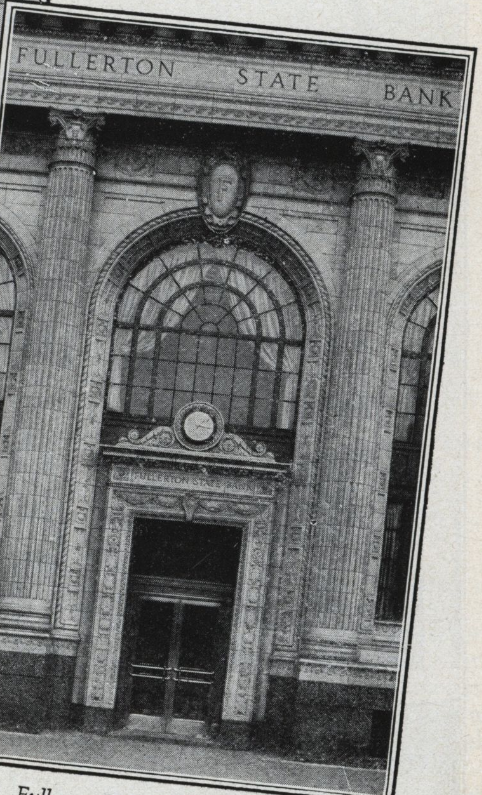
For beauty in texture, for permanency in glaze, and for precision in manufacture, simply specify Northwestern



REPUBLICAN NATIONAL COMMITTEE
410



THE ADMIRAL



FULLERTON STATE BANK
FULLERTON STATE BANK

*The Admiral Hotel,
Chicago.*

*John A. Nyden,
Architect.*

*North Wrigley Building, Chicago.
Graham, Anderson, Probst & White, Architects.*

*Fullerton State Bank, Chicago.
K. M. Vitzthum & Co., Inc , Architects.*

NEW YORK ARCHITECTURAL TERRA-COTTA COMPANY

TELEPHONE
STILLWELL 7400

401 Vernon Avenue
LONG ISLAND CITY, N. Y.

Product

ARCHITECTURAL TERRA-COTTA.

Terra-Cotta

Ceramic finishes of proved merit cover such a wide range that the variety of selection presented to architect and owner is almost limitless. The New York Company presents the results of forty years' constant research in this department.

The New York Company applies these ceramic finishes to terra-cotta which has been fabricated to outlast the building of which it will form a part.

Only the highest grade of selected clays, scientifically mixed and thoroughly pugged, tempered and aged enter into the construction of the New York Company terra-cotta.

With solidly pressed faces, sides and ends, all of honest thickness, and with heavy struts adequately placed, each piece of New York Company terra-cotta carries with it the New York Company guarantee.

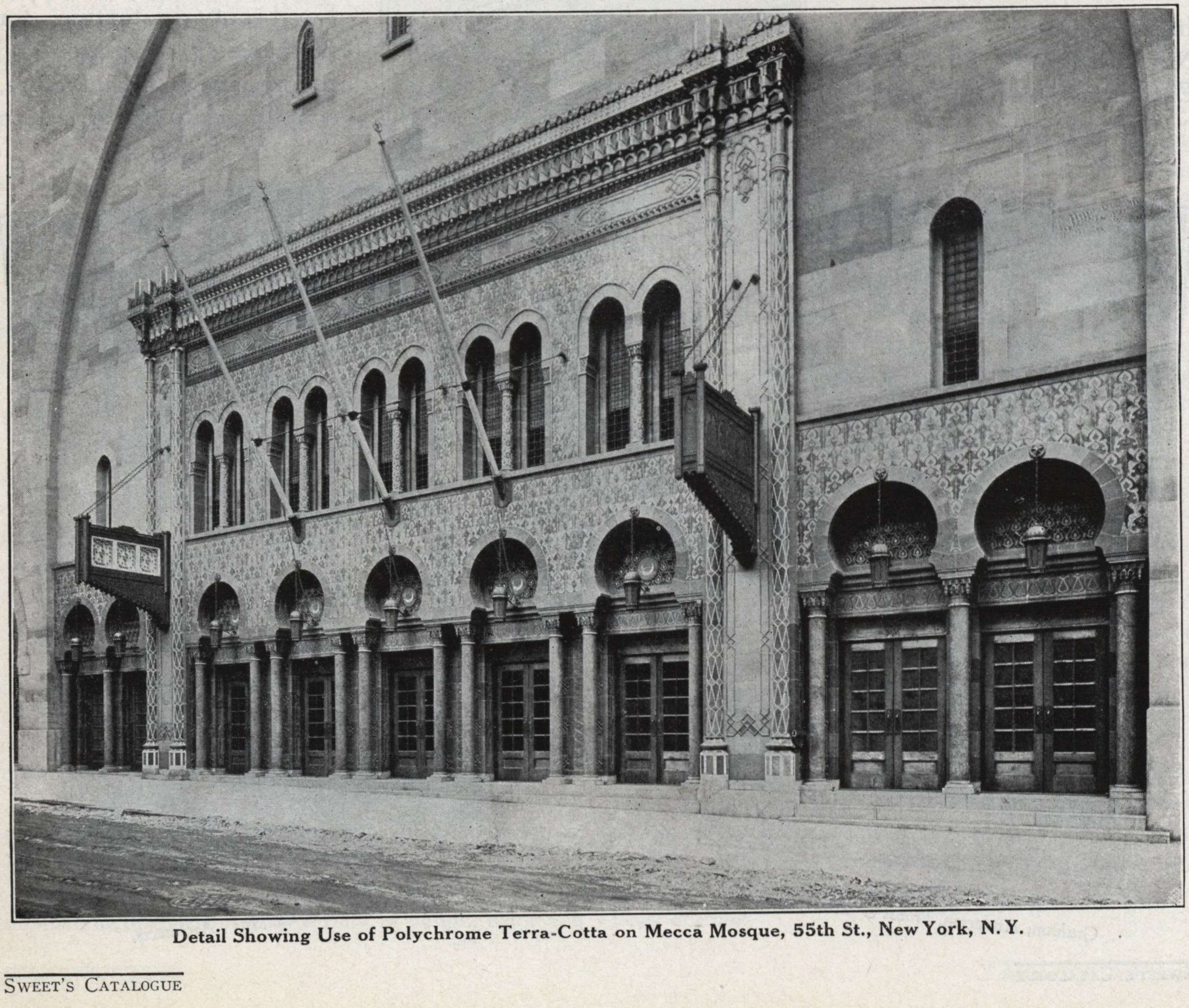
Quality

For forty years the New York Company has manufactured terra-cotta of the highest quality only. Its product meets the most exacting requirements of architect and owner.

Service

The New York Company has at its command most complete facilities for the rendering of steady and dependable service to its customers.

Among prominent buildings just completed, it has furnished all of the architectural terra-cotta, exterior and interior, for the Mecca Mosque, New York, N. Y., to the plans of Clinton & Russell, Architects.



Detail Showing Use of Polychrome Terra-Cotta on Mecca Mosque, 55th St., New York, N. Y.

NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION

INCORPORATED

HARRIE H. SHERMAN, SECRETARY

31 State Street
BOSTON, MASS.

LIST OF MEMBERS

BOOTH BROS. & HURRICANE ISLE GRANITE COMPANY
208 Broadway, New York, N. Y.
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JOHN L. GOSS CORPORATION
Stonington, Me.
Branch Office, 77 Summer Street, Boston, Mass.

LOVEJOY GRANITE COMPANY
Milford, N. H.

MAINE & NEW HAMPSHIRE GRANITE CORPORATION
North Jay, Me.
Branch Offices:
  Redstone, N. H.
  100 East 42nd Street (Pershing Square Building), New York, N. Y.
  431 So. Dearborn Street, Room 303, Chicago, Ill.
  1233 Real Estate Trust Building, Philadelphia, Pa.
  760 Hippodrome Annex, Cleveland, Ohio
  203 Owen Building, Detroit, Mich.
  126 So. 9th Street, Minneapolis, Minn.

MOUNT AIRY GRANITE CUTTING COMPANY
Mount Airy, N. C.

NEW ENGLAND GRANITE WORKS, INC.
Westerly, R. I.
Branch Office, 103 Park Avenue, New York, N. Y.

THE NORTH CAROLINA GRANITE CORPORATION
Mount Airy, N. C.
Branch Offices:
  7 East 42nd Street, New York, N. Y.
    George L. Mead, Representative
  127 No. Dearborn Street, Chicago, Ill.
    Charles H. Gall, Representative
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Products

GRANITE—Rough, Dressed, and Polished—for Commercial, Public, Monumental, and Residential Building; for Memorials, Ornamental Public Improvements, Landscape Work, Mausoleums, and Monuments.

GRANITE—Rough, and Dressed—for Sea Walls, Dry Docks, Bridges, Foundations, and similar construction.

GRANITE—Flagging, Riprap, Rubble, etc.

ROCK FACED and SEAM FACED GRANITE.

The Association and Its Functions

The chief aim of this Association is to further the use and sale of granite for building purposes by extending the knowledge of its many qualities and merits and by establishing means of closer co-operation between the producers of granite and the architects and general building public.

The Association offers a convenient and unbiased service to all interested in the use of granite for permanent construction. This service is freely offered

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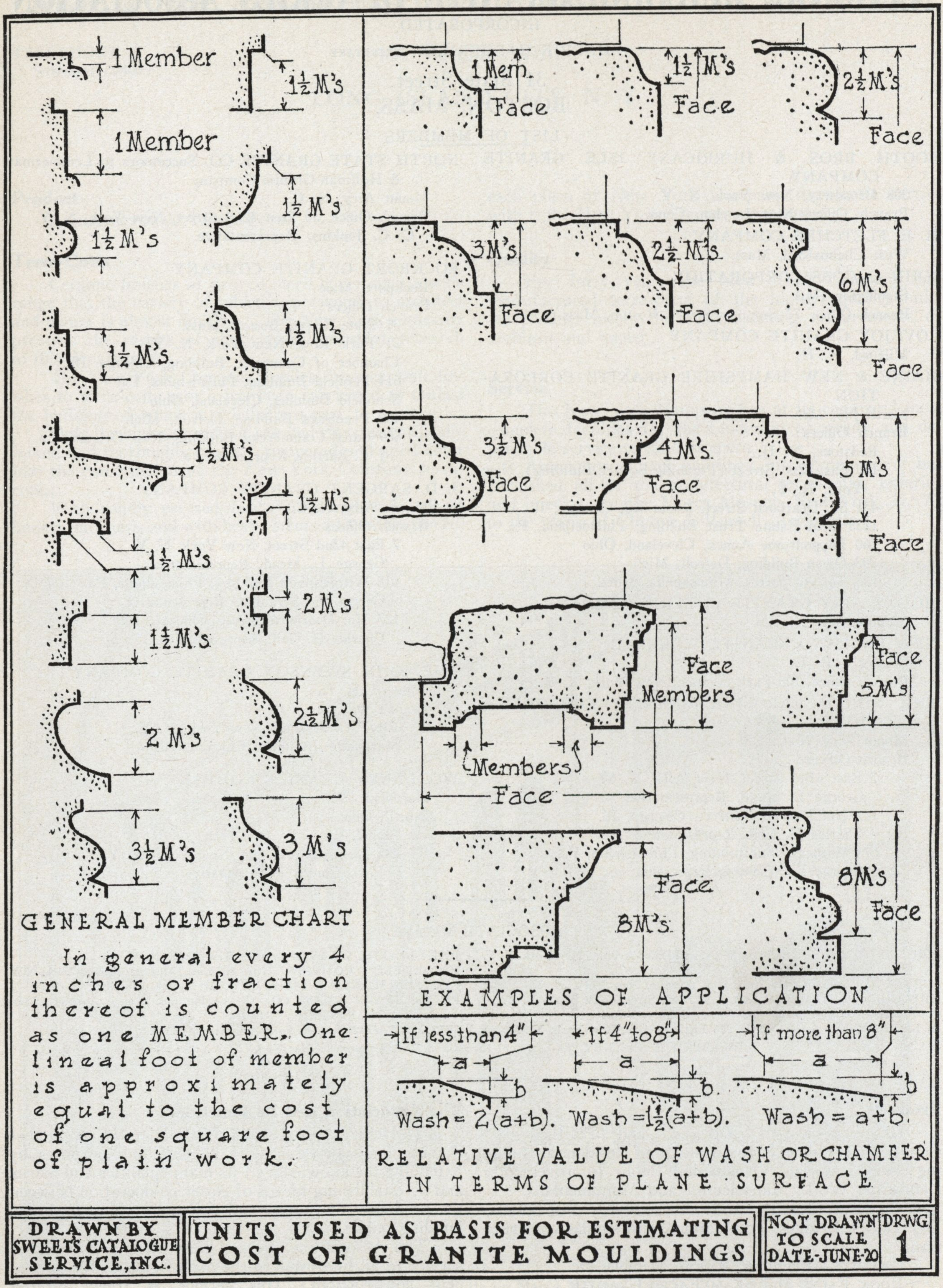
1 Member
1½ M's
1 Member
1½ M's
1½ M's
1½ M's
1½ M's
1½ M's
1½ M's
1½ M's
2 M's
1½ M's
2 M's
2½ M's
3½ M's
3 M's
1 Mem.
Face
1½ M's
Face
2½ M's
Face
3 M's
Face
2½ M's
Face
6 M's
Face
3½ M's
Face
4 M's
Face
5 M's
Face
Face
Members
Members
Face
Face
5 M's
Face
8 M's
8 M's
Face
If less than 4"
a
b
If 4" to 8"
a
b
If more than 8"
a
b
Wash = 2(a+b).
Wash = 1½(a+b).
Wash = a+b.

GENERAL MEMBER CHART

In general every 4 inches or fraction thereof is counted as one MEMBER. One lineal foot of member is approximately equal to the cost of one square foot of plain work.

EXAMPLES OF APPLICATION

RELATIVE VALUE OF WASH OR CHAMFER IN TERMS OF PLANE SURFACE

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

UNITS USED AS BASIS FOR ESTIMATING COST OF GRANITE MOULDINGS

NOT DRAWN TO SCALE
DATE-JUNE-20
DRWG. 1

Continued on next page

wherever it may assist in the logical and proper use of granite, or help to solve the economic or aesthetic problems which may arise when the use of granite is under consideration.

Through the gathering of available information concerning granite from within and without the industry, and through continual research and study of the product itself, its chemical and physical properties, production methods and experience in actual use, the Association has become a clearing house for the best information available.

The Association solicits the opportunity to serve architects and prospective users of granite, and will give its best attention to requests for information pertaining to granite and its use for building purposes.

Estimates and Samples—The Association does not quote prices, but requests for preliminary or final estimates will be transmitted to its members and estimates promptly obtained.

Requests for samples will be transmitted to members producing the kind and quality of granite desired and information will be furnished as to where specific colors and qualities of granite may be obtained.

Permanent Exhibit—A permanent exhibit of samples of the various granites produced by its members is maintained by the Association at the Architects Samples Corporation, 101 Park Avenue, New York City. Here also will be found complete sets of samples illustrating the standard finishes applicable to granite for general building work, and a model "Study in Granite" illustrating the possibilities of combining different colors and textures, using standard building granites.

A permanent exhibit of samples and standard finishes is also maintained at the Association headquarters in Boston. Architects and the general building public are invited to visit these exhibits when considering the selection of materials or finish.

Uniform Proposal and Contract—The Association has adopted a uniform proposal blank which tends to standardize estimates as to terms and conditions. Uniform contract forms have also been adopted which embody the terms and conditions upon which the proposals are based, and have been carefully studied with a view to equity to both parties. One contract form is provided for work delivered and another form for granite work set in place complete.

Competition—The Association, by its impersonal publicity and through its reports to members concerning prospective work and bids desired, insures a wider and more intelligent range of competitive bids, backed up by the best organized and equipped plants in the granite industry.

Architects and contractors, who refer their requests for granite bids through the Association, may secure a larger number of responsible competitive bids with a minimum of effort and expense. Architects and contractors are invited to advise the Association concerning prospective work calling for granite, giving where possible the date when bids will close. This information will be transmitted to the members, and frequently results in bids which otherwise might not have been secured.

The Association stands for fair practice in bidding and advocates that bids, tendered in good faith in accordance with plans and specifications, should be fairly considered and used, both as a matter of principle and in order that the best interests of all parties concerned may be assured.

Granite and Its Architectural Qualifications

Granite has many and varied qualifications suiting it for architectural uses. Its natural qualifications are unsurpassed by any other material for exterior building purposes.

In its form of origin and in its physical characteristics, granite is distinct and different from other building stones such as marble, limestone or sandstone. It is of igneous origin and is composed of the crystals of minerals which include the most durable and beautiful substances known to man. Its constituent minerals are of the kind and substance which form many of our precious and semi-precious gems. The humblest piece of granite is essentially a collection of gem minerals, everlastingly welded together and retaining all the priceless virtues of its gems in blended beauty, color, texture, and durability, which can not be equalled by any other building stone, nor successfully imitated by man-made products.

The various combinations of gem crystals, in kind, size and arrangement, which make up the different granites, provide the wide range of colors and textures available in granite for architectural use, and set granite apart from all other stone which is not so made and constituted. These features, peculiar to granite and so obviously apparent and compelling under the microscope, are responsible for the inherent character and beauty which is always manifest but not so easily accounted for under casual observation.

Aside from its natural beauty, and also due to its form of origin and mineral constituents, granite is the most durable of building stones, and is also harder, stronger and more resistant to the effects of climate, weather and time than other stones.

Granite may be cut into any form desired for architectural use. Exposed surfaces may be dressed in a great variety of finishes, including polished finish which in other stones is either impossible or not sufficiently durable for long exposure to the weather and the elements.

Granite is often and erroneously considered as suited only to plain or massive work. It is a well established fact, on the contrary, that granite may be carved with as much fineness and delicacy of detail as, for instance, marble. There are many fine examples where granite carving and detail can not be surpassed in any material—with the added feature that this detail will retain its sharpness and delicacy indefinitely, unaffected by action of weather or time.

Granite has a well recognized value as a commercial building material, due to its great strength and durability. It is also preeminently suited for perpetuating architectural masterpieces, where ultimate results outweigh mere cost considerations. Modern tools and processes have made it possible to execute fine architectural details and carving in granite within reasonable time and cost, having in mind the worthwhile results.

Design of Detail to Reduce Cost—When cost is an important factor the application of certain fundamental principles in design, which take into account the methods of cutting granite and the elimination of minor details, which tend to increase expense out of proportion to their architectural merit, will enable very substantial savings to be made.

The best results will be secured at the minimum of cost when details are worked out for granite rather than just for stone as is generally the case. It has frequently happened that application of these principles has reduced the total cost very materially. The Association will appreciate every opportunity to make suggestions in this connection.

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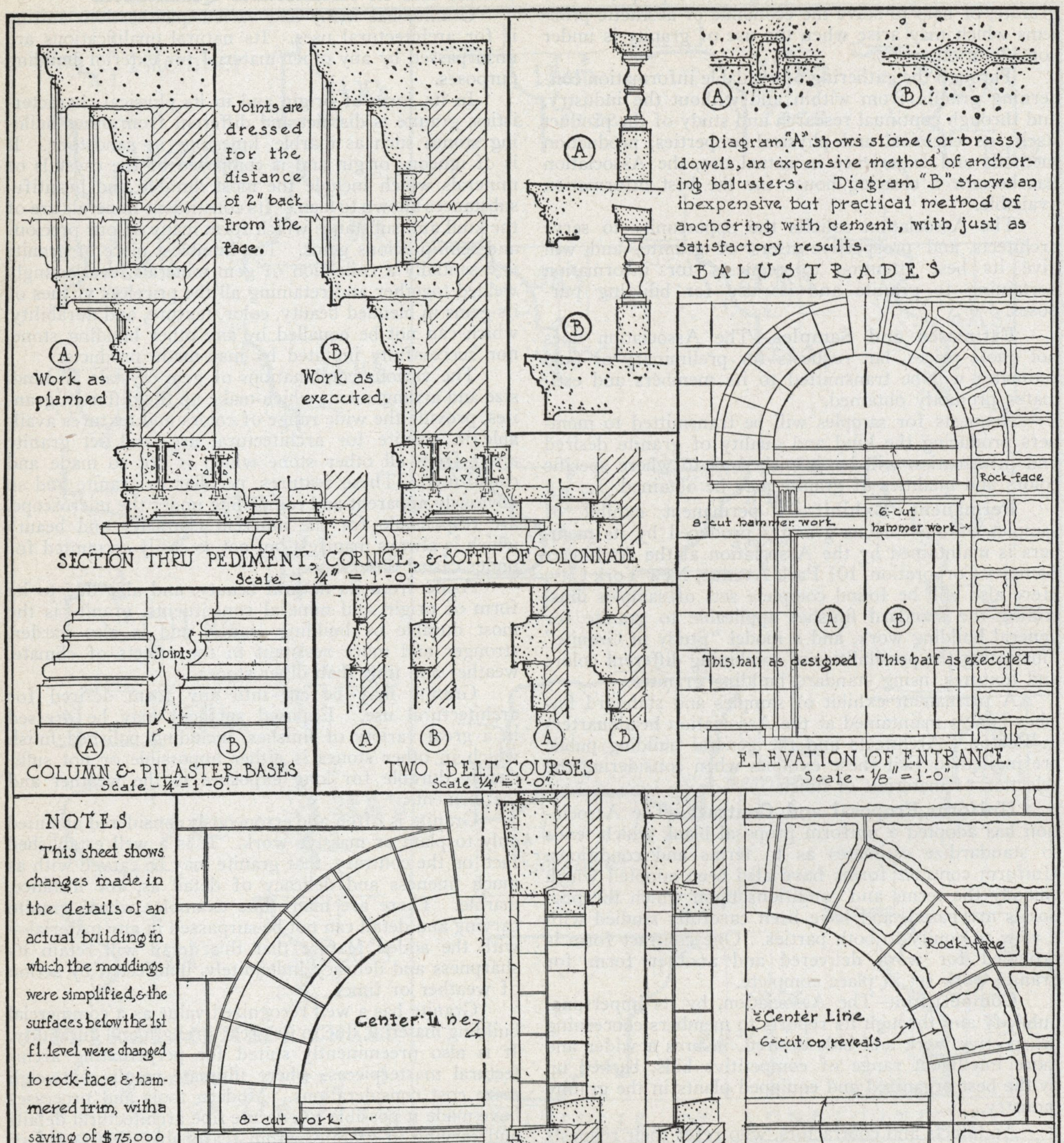
Joints are dressed for the distance of 2" back from the face.
A
Work as planned
B
Work as executed.
SECTION THRU PEDIMENT, CORNICE, & SOFFIT OF COLONNADE
Scale - 1/4" = 1'-0"
A
B
Diagram "A" shows stone (or brass) dowels, an expensive method of anchoring balusters. Diagram "B" shows an inexpensive but practical method of anchoring with cement, with just as satisfactory results.
BALUSTRADES
Rock-face
6-cut hammer work
8-cut hammer work
This half as designed
This half as executed
ELEVATION OF ENTRANCE.
Scale - 1/8" = 1'-0"
Joints
COLUMN & PILASTER BASES
Scale - 1/4" = 1'-0"
TWO BELT COURSES
Scale 1/4" = 1'-0"
Center Line
8-cut work
Rock-face
Center Line
6-cut on reveals
6-cut work
ONE-HALF ELEVATION (A)
SECTION (A)
SECTION (B)
ONE-HALF ELEVATION (B)
1/4" SCALE DRAWINGS OF ARCH AT ENTRANCE.

NOTES

This sheet shows changes made in the details of an actual building in which the mouldings were simplified, & the surfaces below the 1st fl. level were changed to rock-face & hammered trim, with a saving of $75,000 on the granite work.

Details "A" show mouldings as originally designed.

Details "B" show the executed work.

DRAWN BY SWEET'S CATALOGUE SERVICE INC.

COMPARATIVE DETAILS SHOWING ECONOMICAL DESIGN FOR GRANITE WORK.

SCALE, 1/8" & 1/4" EQUAL 1'-0". DATE. JUNE '20.

DRWG 2

Continued on next page

Description of Granite

Granite is a holocrystalline, granular rock of igneous origin. The essential constituents are quartz and a potash feldspar. The principal accessory mineral is usually either mica or hornblende. Other minerals occur in small quantities, but are generally secondary to those mentioned.

The accessory mineral mica, occurs in two forms—black mica or biotite, and white mica or muscovite. The hornblende in building granite is usually black or a very dark green.

Granites are usually classified by the predominating accessory mineral. The most common varieties of building granites are known as biotite, muscovite, biotite-muscovite, muscovite-biotite, hornblende, biotite-hornblende, and quartz-monzonite.

As a general rule the color of granite is determined by that of its feldspars, and the hardness by the quartz and feldspars, varying according to the proportion and hardness of the feldspars.

Colors and Textures—The granites produced by Association members include many shades of gray, lavender, pink, red, green, brown, buff and white.

Natural texture varies according to the distribution and size of crystals of the constituent minerals. Granite is graded as to grain by the size of its feldspar crystals, from very fine to very coarse. The size of crystals or coarseness of grain has practically no bearing on the structural qualities, but gives to granite the variety of texture which adds greatly to its architectural possibilities.

Physical and Chemical Tests

The standard building granites so far exceed all ordinary architectural requirements as to chemical and physical properties, that specific data on tests has little or no bearing upon the relative architectural merits of the different granites.

In confirmation of this, the following statement, prepared by Mr. G. F. Loughlin of the U. S. Geological Survey is quoted in full:

> "Physical tests have supplemented actual experience in the use of granite by showing that it exceeds the requirements for the tallest and most exposed buildings to a great degree. With this fact demonstrated, the actual results of strength and porosity tests are of little significance; far less than an accurate knowledge of the component minerals and their state of preservation as revealed by the microscope.
>
> "Recorded crushing strengths of granite may serve as relative measures of soundness provided the tests were all made on machines that are calibrated alike and provided enough samples of each granite are tested to show its range in strength, also provided all samples are prepared with equal care; but as even the lowest recorded results obtained under unfavorable circumstances are far above the maximum required for the tallest buildings, the fact that the crushing strength of one granite is somewhat more than that of another should be of no concern to the architect or builder. Only when monuments of solid masonry and of unusual height are to be erected or when paving stone for extremely heavy traffic is to be laid, do crushing tests of granite need any consideration.
>
> "Transverse breaking strengths of granites are also quite adequate to support any load that they are expected to support in buildings. There is much more danger of cracking from uneven settling of foundations than from overloading, and examples can be shown where granites with the highest recorded transverse strength have cracked when the load upon them was relatively low.
>
> "Issues have been raised at times regarding the porosity of granite. Unweathered granites such as are supplied to the high class building trade are for all practical purposes absolutely impervious except close to the surfaces of blocks where minute cracks have been developed during splitting or tooling. 'Porosity' varies with the number and depth of these cracks. Differences in 'porosity' may indicate which granites are most likely to 'blister' from frost action if tooled too severely. If 'blistering' takes place it extends only to the depth of the minute surface cracks and thereafter weathering effects are imperceptible. That granite weathers in nature is undisputed, but conditions of weathering in the walls of a building are much less severe and not strictly comparable, and the time necessary for unweathered and properly fabricated granite to show appreciable effects of weathering in buildings is too long to cause concern except for monumental structures intended to last for thousands of years.
>
> "Chemical analyses of granite, as usually recorded, are of little or no value from the builder's standpoint. For proper interpretation they require microscopic study. Such study supplemented by examination of the granite in the quarry and in the building, will disclose the essential facts regarding weathering qualities and other important questions. Such study may result in a call for special chemical tests, for example, to determine permanency of color, and then specific directions should be given to render the test thorough. For most granites, however, competent examination in the quarry and in structures supplemented by microscopic study will give all the information needed without resort to any physical or chemical tests."

Quarrying

In selecting granite for building purposes, the quarry is the first essential and most vital consideration. The principal requirement of a building granite is ability to produce, in quantity, granite of the particular color, texture and sizes required and the quarry must be so equipped that the output may be handled and shipped promptly and at a rate to meet cutting requirements.

The Association quarries without exception meet the above requirements. They are all quarries of established reputation and have been developed to meet the requirements of quantity production. The only practical limit to sizes of individual blocks for specific purposes is that of transportation.

Most of the quarries are operated in conjunction with their own cutting and finishing plants, which handle the bulk of the quarry output, although several of the quarries ship part of their output in the rough to outside cutting plants and one Association quarry ships practically all of its output in the rough.

Cutting and Finishing

Modern time requirements demand that building granite plants be well equipped with machinery and appliances for handling and manufacturing. Association plants include the largest and best equipped plants of their kind in the country.

Granite is delivered from the quarry in rough blocks—some already split to approximate dimension sizes and others in random sizes to be drilled and split to dimension or sawed into slabs for ashlar or polished work. Pneumatic drills are universally used for drilling up rough stock or slabs, and pneumatic hand tools for cutting the edges, mouldings, and for carving.

Pneumatic surfacing machines rough down large surfaces, and point or cut them to the form and finish required. Surfacing machines also bush sawed slabs to the various cut finishes, core and rough out heavy checks or mouldings, recess for panels, rough and finish the surface of columns, rough out the flutes and similar work.

Polishing machines are used for producing rubbed, honed, or polished work, from surfaces prepared either by surfacing machines or saws. Steel shot, carborundum and emery are used as abrasives for grinding down the surfaces, and heavy felt faced wheels gloss the surface thus ground, using oxide of tin and water. Small surfaces, mouldings, etc., are rubbed and polished by hand.

Round work, such as balusters and columns, are usually turned to required finish in specially built lathes using disc cutters. Lathes are also used for polishing round work. Several Association plants are equipped to do turned work for plants not so equipped.

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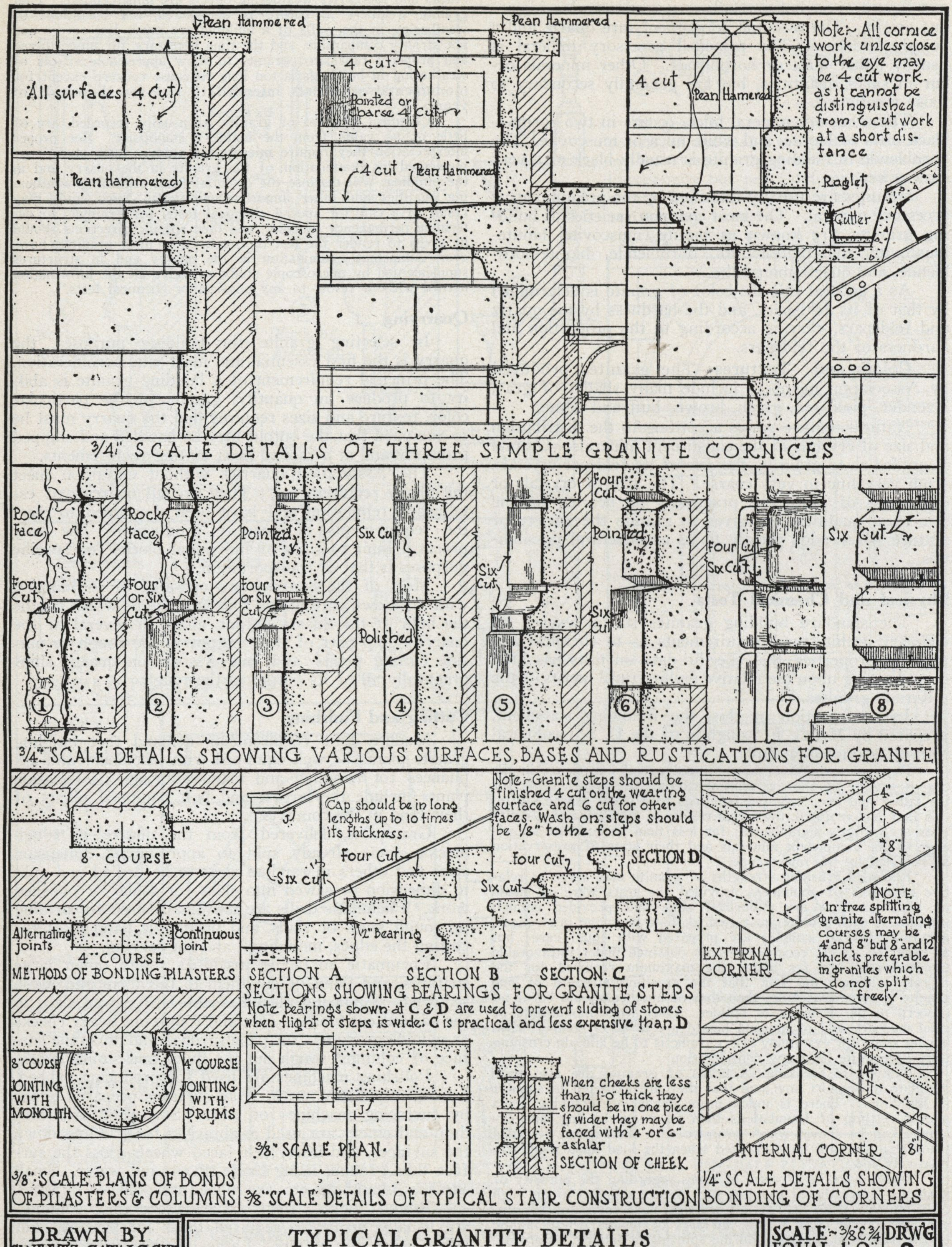

Note:– All cornice work unless close to the eye may be 4 cut work as it cannot be distinguished from 6 cut work at a short distance

3/4" SCALE DETAILS OF THREE SIMPLE GRANITE CORNICES

3/4" SCALE DETAILS SHOWING VARIOUS SURFACES, BASES AND RUSTICATIONS FOR GRANITE

Note:– Granite steps should be finished 4 cut on the wearing surface and 6 cut for other faces. Wash on steps should be 1/8" to the foot.

Cap should be in long lengths up to 10 times its thickness.

SECTIONS SHOWING BEARINGS FOR GRANITE STEPS

Note Bearings shown at C & D are used to prevent sliding of stones when flight of steps is wide: C is practical and less expensive than D

When cheeks are less than 1'-0" thick they should be in one piece If wider they may be faced with 4" or 6" ashlar

NOTE In free splitting granite alternating courses may be 4" and 8" but 8" and 12" thick is preferable in granites which do not split freely.

3/8" SCALE PLANS OF BONDS OF PILASTERS & COLUMNS

3/8" SCALE DETAILS OF TYPICAL STAIR CONSTRUCTION

1/4" SCALE DETAILS SHOWING BONDING OF CORNERS

DRAWN BY SWEETS CATALOGUE SERVICE, INC.

TYPICAL GRANITE DETAILS SHOWING PRACTICAL METHODS OF CONSTRUCTION

SCALE – 3/8 & 3/4 EQUAL 1'-0"
DATE – JUNE – 20

DRWG 3

Pean Hammered
All surfaces 4 Cut
Pean Hammered
4 cut
Pointed or Coarse 4 Cut
4 cut
Pean Hammered
Pean Hammered
4 cut
Pean Hammered
Raglet
Gutter
Rock Face
Four Cut
Rock Face
Four or Six Cut
Pointed
Four or Six Cut
Six Cut
Polished
Six Cut
Four Cut
Pointed
Six Cut
Four Cut
Six Cut
Six Cut
①
②
③
④
⑤
⑥
⑦
⑧
8" COURSE
1"
Alternating joints
Continuous joint
4" COURSE
METHODS OF BONDING PILASTERS
8" COURSE JOINTING WITH MONOLITH
4" COURSE JOINTING WITH DRUMS
Four Cut
Six cut
1/2" Bearing
Four Cut
Six Cut
SECTION D
SECTION A
SECTION B
SECTION C
3/8" SCALE PLAN
SECTION OF CHEEK
4"
8"
EXTERNAL CORNER
4"
INTERNAL CORNER
8"

Continued on next page

Carborundum machines are coming into more general use in granite plants for special work such as cutting checks, rabbets, arrises, and for freeing flutes and mouldings.

Saws are used for cutting up blocks into slabs of various thicknesses, leaving smoothly finished surfaces, ready for bushing or polishing.

Handwork is required in finishing practically every piece of architectural granite, and a good journeyman granite cutter is one of the most skillful craftsmen in industry today. No tool or machine can displace this craftsman—his skill of hand and eye is as indispensable today as when the Egyptians cut their granite temples.

The handling, machining, sawing, and polishing of granite consumes power in relatively large quantities, and the power plant is one of the most important accessories to the direct cutting and finishing operations. Blacksmith shops, carpenter shops, and repair shops are also necessary accessories.

Carving and Models

Granite can be carved with the same delicacy of treatment and detail as much softer and less durable stones. The development of the pneumatic carving tool, and the skill which granite craftsmen have acquired in its manifold uses, have made it possible and practical to carve granite to almost any extent desired.

In the preparation of details and models for granite carving three points should be considered: the color and texture of the granite; location in the building as to distance from the eye; and location as to sunlight.

Color and texture regulate to a material extent the decorative value of the detail produced. Delicate detail would generally be wasted on a granite composed of coarse grained, strongly contrasting mineral constituents. In a fine grained light colored granite or a coarser grained granite, in which the component minerals produce a more nearly uniform tone, delicate details would appear more nearly in their true relative values.

Distance from the eye should regulate the character of detail and treatment. For work near the eye, the finer details would be more effective, and for work distant from the eye bolder detail, having greater light and shade values, would be more appropriate and at the same time more economical.

Location as to sunlight is generally the least considered point of all. A southerly exposure would obviously have greater light and shade value than a northerly exposure, and the detail and mass should be considered according to the exposure.

With the assurance that the craftsman has the ability to produce almost any result required in granite carving, under modern conditions, it lies chiefly with the architect and the modeler to get the best results with the greatest economy. Consideration of the three points above mentioned will be of very material aid.

Standards of Quality

It will be noted under "Physical and Chemical Tests" that these standard building granites come well within all possible requirements of architectural use, so that standards of material are unnecessary. The cutting properties of the granites from different quarries vary quite materially and it would be very difficult to define standards of workmanship.

Quality of workmanship has been graded by usage into three classifications, which, while somewhat elastic and difficult to define exactly, are pretty well established and recognized by the manufacturers.

Monumental Building Grade—For permanent buildings designed to perpetuate public pride or civic spirit, where utility and economy are subordinate to architectural merit, such as state house, courthouse, library or public memorial.

Good Commercial Grade—For high class buildings designed both for utility and to express something of the character, dignity and stability of the occupancy, such as banks or insurance buildings, high class office buildings, churches, schools, etc.

Ordinary Commercial Grade—For buildings where architectural appearance is subordinate to utility and governed by economic considerations. Workmanship will meet requirements of structural safety, but not carried beyond the point of a good appearance to the casual observer.

Color Plates

Color reproductions of nineteen standard American granites were published in the Association catalogue in SWEET'S ARCHITECTURAL CATALOGUE, Fifteenth Edition, pages 177 to 192. Reference is made to these color plates as valuable in making preliminary selections for color and texture.

The above catalogue and color plates have been reprinted by the Association in the form of a booklet entitled "Architectural Granite." A copy of this booklet will be sent to any architect or prospective user of granite on application to the Association Secretary.

Studies in Granite

A series of plates entitled "Studies in Granite" is being prepared and published by the Association for the use of architectural designers, draftsmen and students of architecture.

Each plate is an architectural study, in the form of a composition, of a building or project designed in most cases by an architect of standing, and actually built of granite. The plates cover a wide range of subjects and the details illustrate both the interesting architectural features and something of the granite construction in each case. These plates have been accurately drawn to scale and are based upon both the architectural drawings and the actual shop drawings from which the granite work was executed.

Plates I to XVIII have been reprinted on cameo plate paper and are ready for distribution. A file size portfolio, containing the set of eighteen plates will be mailed, upon request, to architects and others interested in the use or design of granite work.

It is the purpose of the Association to continue the publication of these studies indefinitely, and those who request the original set of eighteen plates will be placed upon the mailing list for such additional plates as may be issued.

Plates Showing Surface Finishes

The half-tone reproductions on the third and fourth pages following illustrate the standard grades of finishes most commonly used on exterior building granite work. The reproductions are full size and have been prepared from a standard gray granite of fine to medium grain and of a light to medium gray color.

The relative cost of the different finishes illustrated, for any particular kind of granite, runs in the same order as the plates are numbered, with rock-face as the less expensive and polished as the most expensive.

The color and texture of a granite should be considered in selecting the grade of finish, as well as the type, and design of building, its location, atmospheric conditions, and relative cost considerations.

Continued on next page

CLASSIFICATION OF BUILDING GRANITES

Quarried and cut by Association Members
White, Gray, Lavender, Pink, Red, Green, Buff, Brown

Name of granite	Producer and manufacturer	Location of quarry	Grain	Color	Technical classification
Bethel White	Woodbury Granite Co., Hardwick, Vt.	Bethel, Vt.	Coarse inclined to medium	White-faintly mottled with gray	Quartz-monzonite
Mount Airy	North Carolina Granite Corp., Mt. Airy, N. C.	Mount Airy, N. C.	Medium	Very light gray	Biotite
Mount Airy	North State Granite Co., successors to Lemmerman & Hoffman Granite Co., Mt. Airy, N. C.	Mount Airy, N. C.	Medium	Very light gray	Biotite
Mount Airy	Mt. Airy Granite Cutting Co., Mt. Airy, N. C.	Mount Airy, N. C.	Medium	Very light gray	Biotite
Mount Airy	J. D. Sargent Granite Co., Mt. Airy, N. C.	Mount Airy, N. C.	Medium	Very light gray	Biotite
North Jay	Maine & New Hampshire Granite Corp., North Jay, Me.	North Jay, Me.	Fine	Very light gray	Biotite-muscovite
Chelmsford Gray	H. E. Fletcher Co., West Chelmsford, Mass.	West Chelmsford, Mass.	Fine and medium.	Light gray	Muscovite-biotite
Milford, N. H.	Lovejoy Granite Co., Milford, N. H.	Milford, N. H.	Fine inclined to medium	Light gray	Quartz-monzonite
Concord	John Swenson Granite Co., Concord, N. H.	Concord, N. H.	Fine to medium.	Light to medium gray	Muscovite-biotite
Connecticut White	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.	Waterford, Conn.	Fine	Medium buff gray, hammers light	Quartz-monzonite
Westerly Blue-White	New England Granite Works, Inc., Westerly, R. I.	Westerly, R. I.	Fine	Bluish gray	Quartz-monzonite
Woodbury Gray	Woodbury Granite Co., Hardwick, Vt.	Woodbury, Vt.	Medium	Medium gray	Biotite
Rockport Gray	Rockport Granite Co., Rockport, Mass.	Rockport, Mass.	Medium to coarse.	Medium gray, slight bluish-green tinge	Hornblende
Goss Pink Deer Isle	John L. Goss Corp., Stonington, Me.	Crotch Island, Stonington, Me.	Coarse	Pinkish-lavender tinted, medium gray	Biotite
Conway Pink	Maine & New Hampshire Granite Corp., North Jay, Me.	Redstone, N. H.	Coarse	Light pink mottled with large gray and small black spots	Biotite
Jonesboro	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.	Jonesboro, Me.	Coarse inclined to medium	Pinkish gray	Biotite
Red Westerly	New England Granite Works, Inc., Westerly, R. I.	Westerly, R. I.	Medium inclined to coarse	Reddish-gray speckled with black	Biotite
Moose-a-bec Red	Rockport Granite Co., Rockport, Mass.	Jonesport, Me.	Coarse	Dark reddish-gray with white and pinkish feldspar	Biotite
Rockport Sea-Green	Rockport Granite Co., Rockport, Mass.	Rockport, Mass.	Medium to coarse.	Dark olive-green-gray with black spottings	Hornblende
Conway-Green	Maine & New Hampshire Granite Co., North Jay, Me.	Redstone, N. H.	Coarse	Dark yellowish-greenish-gray with black spottings	Biotite-hornblende
Somes Sound	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.	Mt. Desert, Me.	Coarse inclined to medium	Light grayish-buff	Biotite
Rockport Seam-Face	Rockport Granite Co., Rockport, Mass.	Rockport, Mass.	Medium	Dark yellow-brown, bright rust-brown, light yellow-brown	Hornblende
Empire State Gray, Buff and White	John Brown & Sons, 141st Street and Rider Avenue, New York, N. Y.	Peekskill, N. Y.	Fine to medium	Light gray, buff and very light gray	Biotite
Texas Pink	Edward J. Davey, Inc., 801 East 134th Street, New York, N. Y.	Granite Mountain, Burnet County, Tex.	Medium to coarse	Pinkish-reddish gray	Biotite

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Surface Finishes

The surface finishes most frequently used for granite on building work, arranged in the order of their relative cost are:

Rock-faced, pointed, pean-hammered, four-cut, six-cut, eight-cut, rubbed and polished. These terms are frequently misunderstood and sometimes misapplied.

The following brief description of finishes most generally used are therefore given:

Rock Face—Generally the least expensive finish, but with decorative as well as utilitarian value.

The relative cost varies according to the grade of work required.

The grades vary from ordinary split or quarry face ashlar with split or roughly squared beds and joints, to carefully quarried faces having practically uniform projection, beds, joints and arrises as carefully and accurately cut as for hammered work, and sometimes with rusticated or tooled margins.

Pointed Work—Coarse, medium, and fine pointed are the three general distinctions for grade of pointing, with many special grades for certain texture effects.

Hand pointing and machine pointing differ slightly in general appearance, machine pointing being generally more uniform. Special pointing will usually necessitate handwork. In general, the point depressions in fine pointing will be approximately 3/8 in. apart, medium pointing 5/8 to 3/4 in., and coarse pointing 1 to 1 1/4 in.

Where special pointing is required, a sample should first be prepared under the architect's personal supervision. Beds, joints and arrises will conform to the method of use and grade of pointing.

Pean-hammered—Finish is adapted to rougher work such as steps, curbings, house or mill sills and thresholds, or on portions of high class work which require level finished surfaces, but which are not exposed to the eye.

In general this finish is somewhat coarser and less regular than four-cut and the point marks are not entirely eradicated by the axing.

Four-, Six-, and Eight-cut—These surfaces are finished by bushing with the patent bush hammer. This is a hand hammer with patent head having two opposite jawlike openings approximately 7/8 in. wide, in which are firmly bolted sets of 4, 6 or 8 cutting blades as the case may be.

Four-cut work is frequently and erroneously described as 4 cuts to the inch. Actually the four-cut hammer leaves nearer 5 cut marks to the inch, as 4 cutting blades are clamped into the 7/8-in. opening of the jaw; 6 and 8 cuts to the inch are likewise improperly so termed.

To produce four-cut work the rough split face is taken out-of-wind and reduced to an approximately level surface by pointing. This pointed surface is then further leveled and smoothed by cross-bushing with either a pean-hammer or four-cut, removing all trace of the pointing. This surface is then bushed with a sharp four-cut hammer, the bushing being kept parallel and in the required direction, until the entire surface is uniformly bushed to a true and level surface. The finished bush marks are not necessarily continuous or mechanically precise, but the resultant surface has the appearance of being uniformly corrugated to the fineness determined by the hammer used.

Six- and eight-cut finishes are simply continuations of the four-cut process, each coarser hammer being used consecutively, until the required finish is reached.

Pneumatic surfacing machines are also used for bushing, especially on larger surfaces, following practically the same routine as above described for hand bushing. Sawed surfaces are bushed under the surfacing machines, in which case the pointing process is unnecessary.

Ten-cut and Twelve-cut—These surfaces are also produced, but the finer finishes are less frequently used on regular building work, being more applicable to monumental or special work.

Texture and character are emphasized by the coarser cuts.

Rubbed and Honed Work—Produced by grinding a pointed or sawed surface under the polishing mill. The grade of rubbing is determined by the extent to which this grinding process is carried from coarse rubbed, with small surface scratches, adapted to work requiring fine finish but not close to the eye, to honed finish which is the last stage just before glossing, with dead smooth surface, practically free from scratches.

Small surfaces and mouldings are generally rubbed or honed by hand and the relative expense of this finish is materially affected by the amount of handwork necessary.

Polished Work—Produced by glossing, under a heavy felt coated wheel, a surface previously rubbed and honed. A durable and mirrorlike polish can only be obtained by carrying the grinding and glossing processes to their extreme stages, leaving the surface free from scratches, dull spots, or indications of stun marks from tooling.

Under modern methods, practically every standard granite may be polished to a satisfactory gloss suitable and durable for most ordinary requirements. Generally the harder granites and those containing the least mica content take a higher and more durable polish than the softer granites and those with abundant mica particles.

The preparation of the surface for polishing is almost as important as the polishing processes. Sawed surfaces are well adapted for polishing, and when surfaces are prepared by hand or machine pointing, sufficient excess material should be left for grinding to avoid stun marks in the finished surface.

Selecting the Finish

The following general suggestions will indicate methods of selection, which depend on the type and design of building, color and texture of the granite, location and atmospheric conditions.

Large scale work: rock-face, pointed and the coarser cuts. Small scale work: the finer cuts.

Rock-face, pointed, pean-hammered, and four-cut for economy, and rock-face and pointed for decorative effect in conjunction with hammered work and other materials.

Six-cut for average work, combining economy with good architectural effect.

Polished for base courses, portions subject to traffic stain, lower stories where exposed to smoky atmosphere, and for decorative effect.

Rubbed or honed where fine finish is required and for softened tone and texture effects.

Polished finish is practically impervious to stain or weather. Fine finishes will keep clean longer than coarser finishes, particularly where subject to atmospheric dirt and dust.

The possibilities of combining different grades of finish are almost unlimited, and combinations of different granites are used extensively with splendid architectural results.

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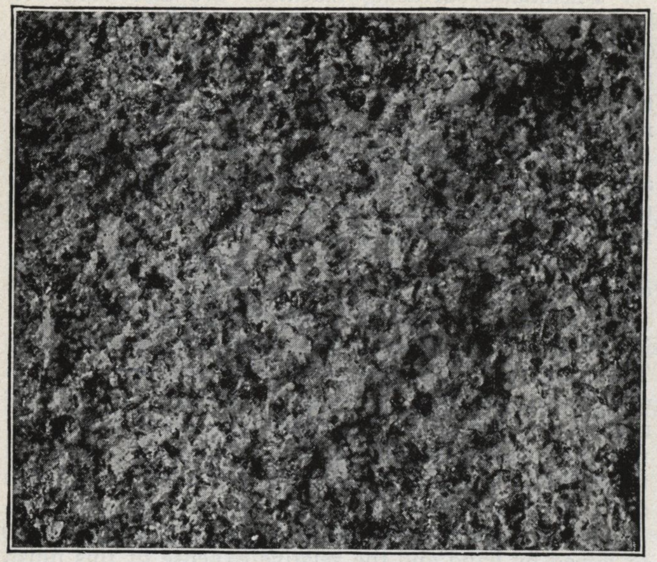

Plate No. 1. Rock-Face

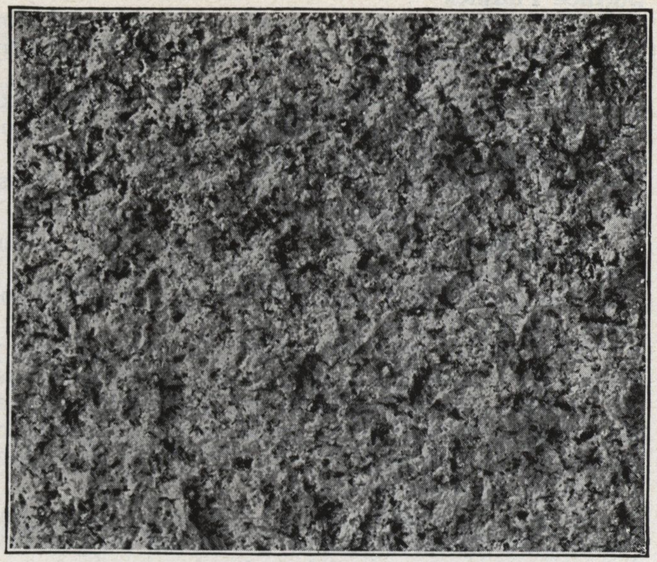

Plate No. 4. Medium Pointed

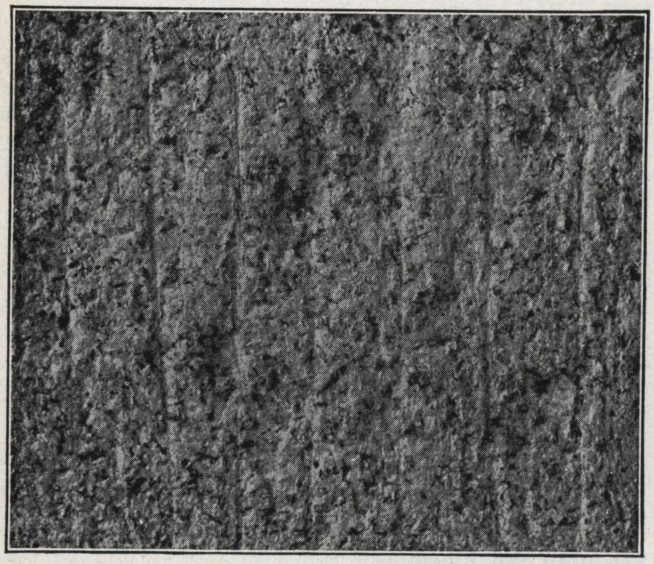

Plate No. 2. Pean Hammered

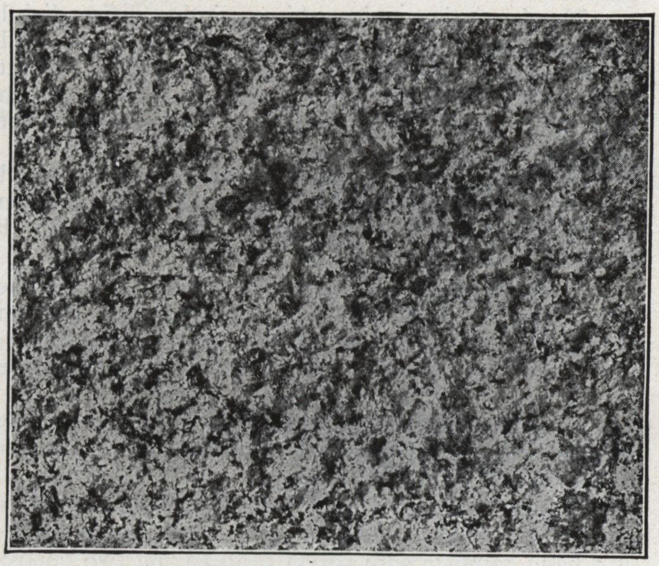

Plate No. 5. Fine Pointed

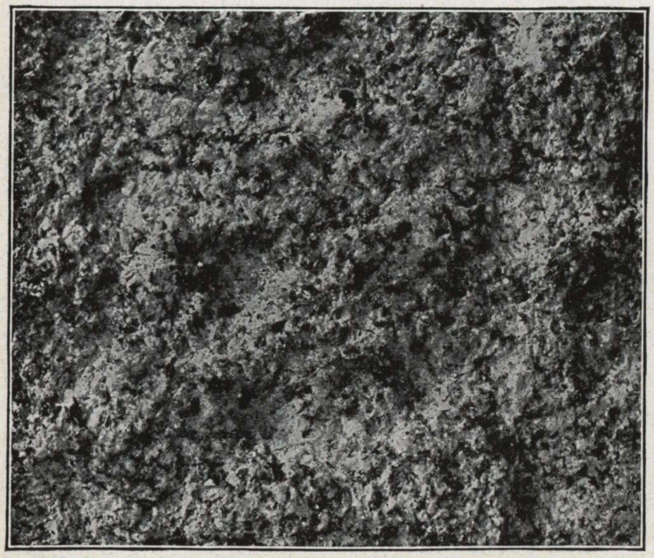

Plate No. 3. Coarse Pointed

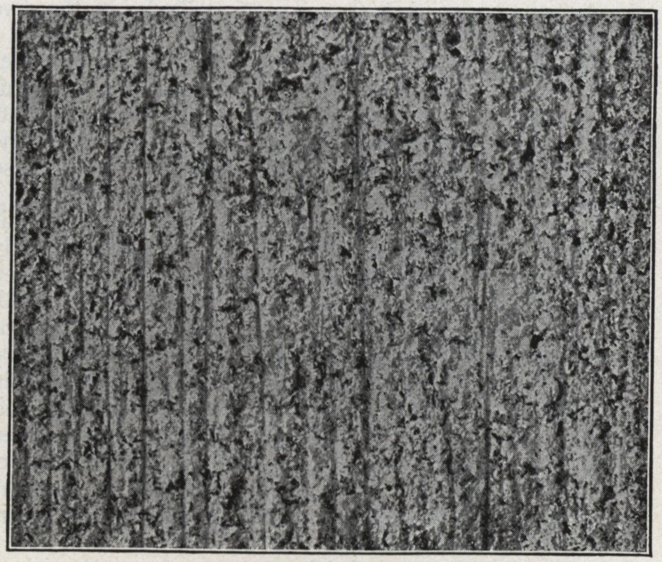

Plate No. 6. Four-Cut

Standard Grades of Finishes for Exterior Building Granite Work

Full-sized reproductions prepared from a standard light to medium granite of fine to medium grain

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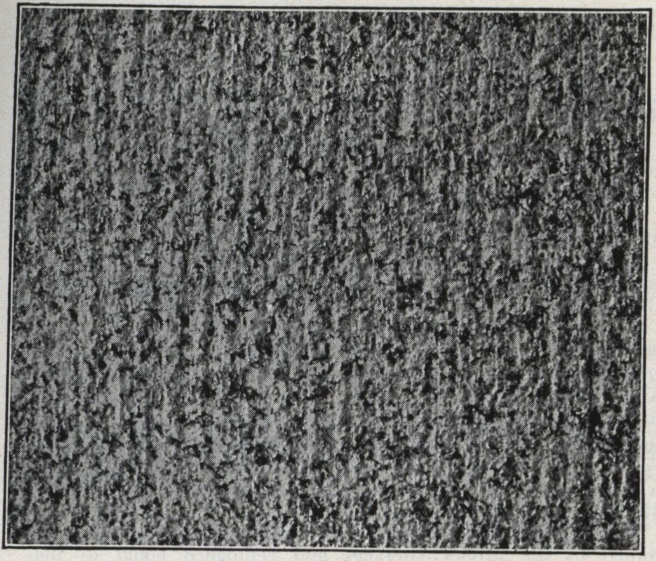

Plate No. 7. Six-Cut

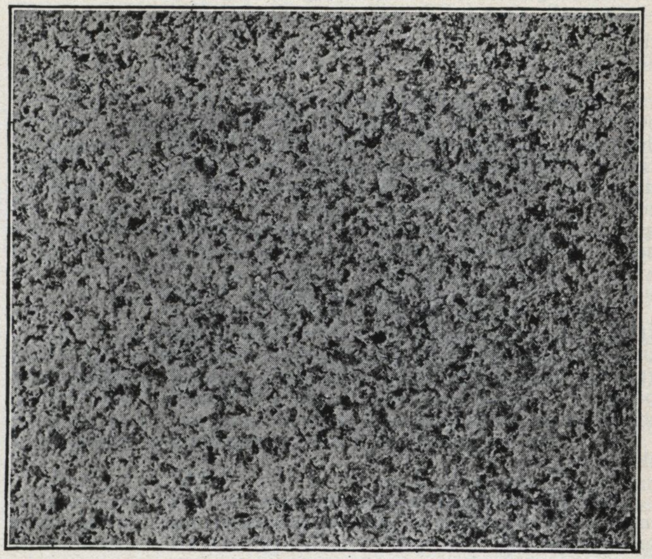

Plate No. 10. Rubbed

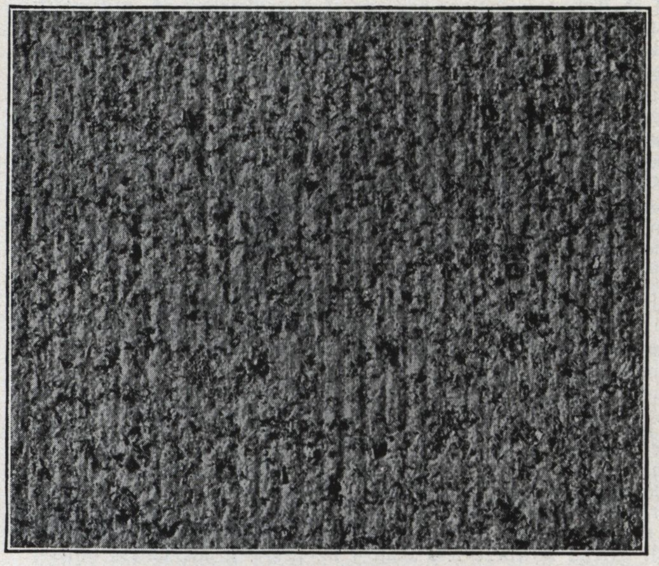

Plate No. 8. Eight-Cut

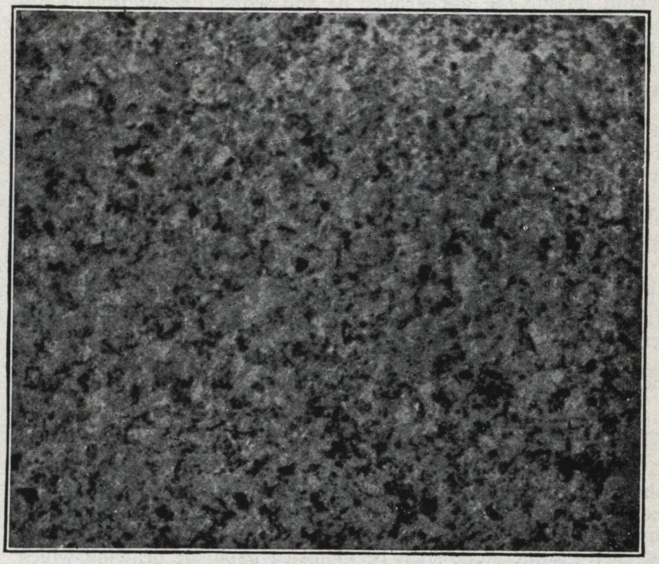

Plate No. 11. Honed

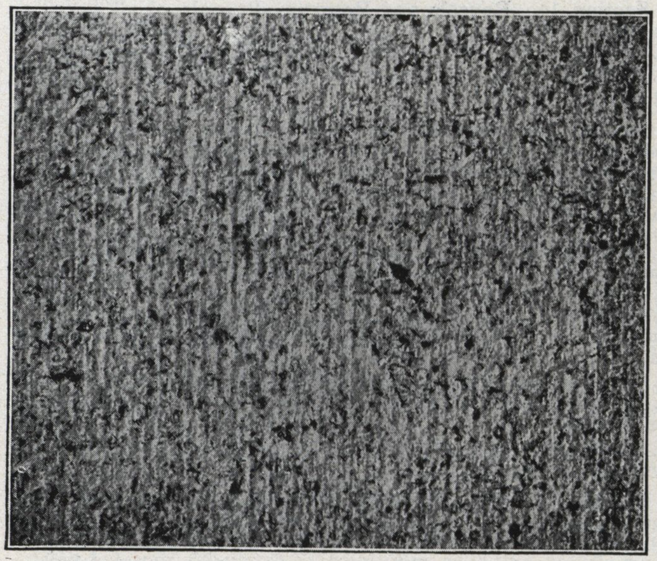

Plate No. 9. Ten-Cut

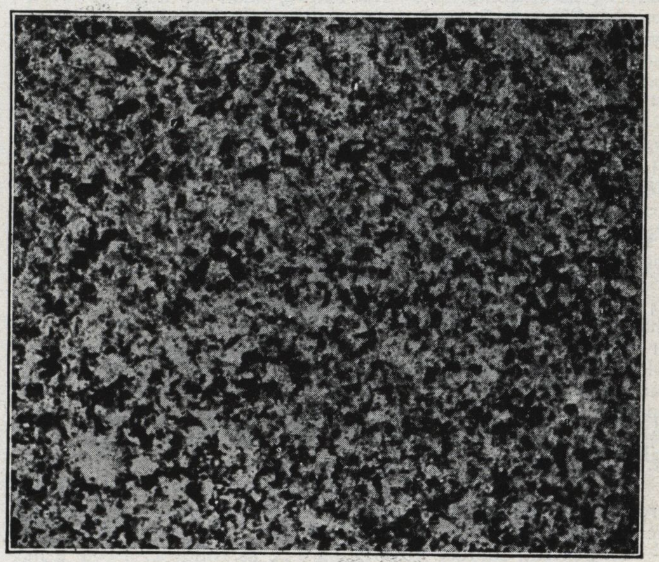

Plate No. 12. Polished

Standard Grades of Finishes for Exterior Building Granite Work

Full-sized reproductions prepared from a standard light to medium granite of fine to medium grain

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Granite Specifications (Complete Form)

Section 1. General Conditions—All work included under the specifications for granite is to be subject to the general conditions hereinbefore written for the entire work.

Section 2. Material—All granite shall be of compact structure, hard and practically non-absorbent, and equal in durability and strength to the best granite of the kind required. Granite shall be (mention color, tone and grain) and of the kind designated as (mention name) granite from quarries at (mention location). Granites designated as (mention names and quarries), will also be considered. In submitting estimates, the contractor shall state the name of granite, and quarry, upon which his proposal is based.

Section 3. Quarry and Plant—Granite must be obtained from approved, well-known quarries having capacity and facilities for furnishing the quantity, sizes, and quality of granite required, and the cutting and finishing must be done by firms properly equipped to produce the finished material without causing delay in the progress of the work.

Evidence to this effect must be submitted if required by the architect.

Section 4. Quality—All the granite shall be selected to meet the requirements of these specifications and shall be absolutely sound and free from seams or other defects which would impair its strength.

Exposed surfaces shall be free from spots, stain, discoloration, knot formations, spalls, chips or other defects, which would impair the appearance of the work, except that in inconspicuous places a reasonable number of knot spots or texture variations inherent to the particular granite proposed may be permissible if samples showing the maximum of such characteristics be submitted to, and approved by, the architect.

In quarrying the granite the blocks shall be so selected that any variations in color permitted by the architect will be uniformly distributed throughout the exposed surfaces of the walls and other portions of the work.

If granites from different quarries are used such granites shall be similar in texture and shall satisfactorily match in color and tone throughout the work.

Section 5. Work Included—The work to be done by the contractor under the heading of Granite shall include the furnishing, delivery and setting in place and completion of all granite work as required by the drawings and herein specified.

The work generally shall include (state portions of work to be of granite).

Note: State any portions or special features which are not to be of granite or not to be included in this contract.

Section 6. Shop Drawings—The granite contractor shall prepare all necessary shop drawings, showing the bedding, bonding, and jointing of all the granite work and typical and special anchoring of same. The dimensions and setting number of each granite stone shall be indicated upon the drawing which shall be submitted and approved by the architect as required under general conditions. No cutting shall be done or work completed except from shop drawings which have been approved by the architect.

Section 7. Corner Stone*—The granite contractor shall furnish and set where indicated on the drawing (or as directed) a corner stone of the required dimensions, having an inscription cut thereon in accordance with the drawings and recessed to receive the copper box to be furnished by the (general contractor).

Section 8. Samples—After the award of the contract 2 samples of each kind of granite required 8 by 8 by 2 in., showing the extreme variation in quality, color and texture that will occur in any granite which will be used, shall be submitted to the architect. Upon approval of these samples, one of each shall be returned to the granite contractor for use at the quarry or plant and the other retained by the architect for comparison with work at the building. Samples shall be dressed on the face and one edge to show finish required by the specification; opposite face may be split or dressed to the approximate size called for or may be dressed to another of the specified finishes called for.

Section 9. Finishes—The exposed surfaces of the granite shall be dressed as indicated on the drawings or specified herein.

In general, surface finishes shall be as follows: From 2 in. below grade to level (state level or course) shall be dressed with best (state finish—as polished, six-cut, eight-cut) work; from level (state level) to level (state level) shall be dressed with best (state finish) work; and from level (state level) to top of parapet shall be dressed with best (state finish) work.

Note: State here any exceptions to the above such as "treads of steps or platforms shall be .... finish"; "back of parapet and coping courses shall be .... finish," etc.

The cut marks of all bush hammer work shall be vertical except as noted.

Soffits shall be bushed at right angles to the face.

Faces of key blocks and voussoirs shall be bushed (state whether vertical or radial).

Top surfaces of window and door sills, steps, copings, washes and projecting courses shall be bushed at right angles to the nosing.

Moulded surfaces shall be bushed parallel to the direction of the mouldings.

Note: Mention other specific instructions on direction of bushing.

Section 10. Cutting—All exposed surfaces must be out-of-wind, free from waves, projections or depressions and faces of granite in the same plane must be absolutely flush at joints. Arrises must be cut sharp and true to square or pattern and continuous with adjoining arrises.

Slight inequalities which may occur in setting shall be trimmed to the proper surfaces and refinished equal to the original finish.

Section 11. Beds and Joints—Beds shall be horizontal and shall be cut full and square for a distance of at least 2 in. back from the face, from which point they may fall off not to exceed 1 in. in 12 in.; and shall be reasonably free from large depression and cuppings, which might impair the stability of the work.

Joints shall be dressed at right angles to the face for at least 1½ in. back from which point they may fall away, not to exceed 1½ in. in 12 in.

Backs of granite stones shall be scabbled or split to approximate vertical surfaces which shall not vary more than 1 in. in 12 in. from the true vertical, nor vary more than 1 in. either way from the thickness called for on the drawing.

Section 12. Jointing—The jointing of the granite work shall be as shown on the drawings and no additional joints will be permitted except upon written consent of the architect. The joints shall be uniformly ¼ in. in thickness.

Section 13. Bonding—The bonding of various portions of the work shall be as shown on drawings. Alternate courses of granite shall bond at least 4 in. with the backing except where otherwise shown. No granite stone shall have less than 4-in. bed; projecting courses shall have beds equal to the projections unless otherwise shown. Where brick backing is required the granite shall not go closer than 4½ in. to the inside of the brick wall. Where granite facing occurs at grades it shall extend nowhere less than 4 in. below grade unless otherwise shown.

Section 14. Reveals and Returns—Reveals of all openings, unless otherwise shown shall be cut solid without vertical joints. Returns shall be not less than indicated on the drawings.

Mitering of granite stones at corners will not be permitted.

Section 15. Mouldings—Granite stones forming continuous moulded courses shall be of uniform profile on the face with continuous unbroken lines absolutely flush at the joints and with the surfaces free from projections or depressions and out-of-wind.

Section 16. Washes and Drips—All exterior projecting granite stones and all exterior sills, steps, platforms, coping and other stones with exposed top surfaces, shall be cut with a wash on top. Where other work is built upon such granite stones, they shall be cut with raised seats and lugs to form level beds for work built upon them.

All projecting granite stone, such as sills, cornices, copings, etc., shall have a groove drip cut on the underside unless otherwise detailed.

All exterior door sills shall be cut with raised thresholds unless otherwise shown.

Section 17. Miscellaneous—Mouldings and projections must not be subjected to pressure; and granite stones having projecting members which have weight of any kind bearing upon the upper surface shall have seats cut to bear such weights; and in all cases the edges of mouldings or projections must be kept free from pressure.

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*If required.

Continued on next page

Specifications (Continued)

Reglets shall be cut for flashing and counterflashings as required.

Section 18. Models—Full size plaster models of all ornamental and carved work, shall be furnished to the granite contractor as hereinbefore specified.

Where necessary for the proper execution of the work, models will be delivered at the plant of the granite contractor free of expense to him, to be used by him for the purpose of roughing and such carving as may be done at the plant, the granite contractor to carefully preserve these models for reshipment to the building if required. The expense of handling and re-crating for shipment at the plant to be borne by the granite contractor.

Section 19. Roughing for Carving—No roughing for carved work is to be done from drawings but from approved models only. Sufficient stock in all cases shall be left for the carving and the granite shall be roughed to suitable form and condition for the carver. The cutter and carver shall cooperate in the method of securing the proper roughing for ornamental work.

Section 20. Carving*—Carving may be done at the site either before or after the granite is set or the work may be delivered at the site already carved.

In case the carving is done at the plant or at the site before being set in place, this contractor shall do all necessary refinishing or retouching to make the carving conform to the models and to the satisfaction of the architect. All carved ornament shall be executed by hand by skilled carvers in a spirited and artistic manner and in strict accordance with the approved models.

Where carving is done after the work is set all necessary staging and protection shall be furnished by the general contractor, and if required the models shall be hoisted into position and properly secured to the scaffolding for the convenient use of the carvers by the general contractor.

Inscriptions, lettering or numerals if required shall be clean cut and in accordance with the models, if provided, or otherwise with the full sized details of same. The incised surfaces of lettering shall be cut smooth and accurately to the full depth and section shown on the models or drawings.

Section 21. Crating and Shipping—This contractor shall properly crate the finished granite for shipment, the crating being so constructed as to properly protect the edges and surfaces of the exposed portions of the work during shipment and handling prior to setting same. Due precaution shall be taken to use crating material which will not stain or discolor the exposed surfaces of granite; and especial care shall be used to protect and suitably note any delicate portion where extra care should be observed in handling.

The finished granite properly crated shall be carefully loaded for shipment by this contractor who shall exercise all necessary precautions in loading to withstand the usual hazards in transit.

Section 22. Precaution Against Stain—Special precautions shall be taken in the setting to guard against possible seepage through the joints of moisture from the mortar or material used in backing up the granite work, which will cause discoloration around the face joints or surface of the granite.

At least 12 hours before the granite is set, all surfaces not exposed shall be thoroughly coated with an approved dampproof compound to within 1 in. of the exposed face. After the granite is set, and before backing up, another coat of the same dampproofing compound shall be applied to the back for the special purpose of covering the backs of the mortar joints.

The painting of the granite may be omitted with the approval of the architect when it is definitely known that the setting mortar will not stain the granite, but the backs of the mortar joints should be dampproofed in any event to guard against seepage.

If the first coat of dampproofing is applied at the mill, the setting numbers must be painted conspicuously over the dampproofing.

The granite shall at all times be protected from stain and upon delivery at the site shall be kept stacked on timber or platforms at least 4 in. above the ground, until set in place in the wall.

Under no circumstances shall salt be used for thawing out lewis-holes or otherwise in connection with the granite work.

Section 23. Setting—Each granite stone shall be brushed clean and drenched immediately before being set. Each piece shall be carefully bedded in a full bed of non-staining mortar and tapped home with a wooden mallet to a full and solid bearing.

The face of the granite work shall be kept free from mortar at all times.

Granite facing shall not in any case be built up more than two courses ahead of the backing and no stone having a greater width of bed than the one below it shall be set until the lower course is backed up.

All surplus mortar shall be immediately raked out to a depth of at least 1 in. and every precaution taken to prevent stones bearing upon the edges.

Sills, etc., subject to pressure, shall be bedded only at the ends.

The cement in the mortar used for setting all granite work where the joint is exposed to the weather shall be made waterproof with a satisfactory waterproofing compound, mixed with the mortar.

The sand used in all setting mortar shall be such as to cause no stain or chemical action with the cement.

Section 24. Anchors, Dowels, etc.—All bolts, expansion bolts, anchors, ties, etc., required in the setting of the granite work, will be furnished to the granite contractor.

All ashlar shall be anchored to the backing with heavily galvanized wrought iron anchors ¼ by 1¼ in. turned down into the granite 1¼ in. and extending into the backing 8 in. if the thickness of wall permits; the end to be turned up 1½ in. into the backing. There shall be at least two anchors to every stone whose length exceeds its height and in general there shall be not less than two anchors to each superficial square yard of ashlar.

Note: Special anchoring for heavy cornices and overhanging courses, cramps, dowels, etc., for parapets, balustrades, pilasters, and columns, etc., should be suitably described or shown according to the requirements of the work.

Section 25. Boxing and Protection—All granite work must be protected from damage during the progress of the work and until the completion of the building.

The general contractor shall provide the necessary protection, covering all projections, top surfaces, angles, etc., protective boxing to be securely fastened in position and securely nailed throughout with galvanized iron nails. No lumber or material to be used which would in any way stain or deface the granite work.

All necessary forms, centers, scaffolding, etc., required by the setter or carver to be furnished by the general contractor.

Section 26. Pointing and Cleaning—After the completion of the granite work or at such time thereafter as all liability from stain of other operations on the building is passed, and when there is no danger therefrom, the whole of the granite work shall be carefully cleaned down, removing all dirt, mortar, stains, and other defacements.

The use of wire brushes, acids or solutions which might cause discoloration will not be permitted.

All face joints shall be raked out to a depth of not less than 1 in., brushed clean, thoroughly wetted, and filled with pointing mortar and then carefully jointed. The pointing mortar must be packed solidly into all joints, completely filling the same; and the form of joint shall be as directed by the architect.

Vertical joints in the top courses of uncovered cornices having a projection of 8 in. or more shall be filled with mortar by grouting to within 3 in. of the top of the granite, then calked with picked oakum and filled with molten lead, calked against the edges and slightly convex at the top—taking care that the oakum is kept at least 2 in. away from the face and top of granite.

Joints in the upper surfaces of projecting stones which are not so protected and in all platforms, steps and coping, shall be raked out at least 2 in. deep and thoroughly grouted flush with the surface of the granite.

Pointing and cleaning shall start at the top and be continued until such work is completed.

Section 27. Defective Work—No patching or hiding of defects will be permitted. Defective granite stones shall be replaced with perfect ones, except in extreme cases where a stone has been damaged through no fault of the granite contractor, and where it is possible and practicable to remedy the defect without in any way impairing the appearance, strength or durability of the work—and then only with the approval and under the supervision of the architect—and where a satisfactory allowance has been agreed upon which shall be deducted from the contract price.

**Note:* If carving is to be done by others than the granite contractor same should be noted here—and this specification modified to suit conditions.

Specifications—Short Form

The following short form of Granite Specifications has been prepared by the Association for use where a comparatively small amount of granite is required, but where the standards of workmanship and other essentials should conform to the same requirements set forth in detail in the complete form printed on the two preceding pages.

(1) **Work Included**—The work to be done shall include the furnishing, delivery, and setting of all granite work required by the drawings and specified herein. (State portions of work to be of granite and note any exceptions about which there might be any question.)

(2) **Material**—The granite shall be sound and of good quality, free from defects which would impair the strength, durability, or appearance of the work, and equal to the approved sample. In estimating, the contractor shall state the name of granite and quarry, upon which his proposal is based. The following granites will be considered: (mention color, tone and grain) granite from (mention locality).

(3) **Samples**—Submit in duplicate, for the architect's approval, samples of the granite showing the extreme variation in quality, color and texture to be used under the contract, and showing the specified finishes. (State size of sample required.)

(4) **Shop Drawings**—The granite contractor shall prepare all necessary shop drawings, showing in detail the jointing, bonding, and construction of the granite work, and special anchoring. These shall be submitted to and approved by the architect before any cutting is done.

(5) **Finishes**—The exposed surfaces of the granite shall be finished as indicated on the drawings or specified herein.

Note: State finishes desired.

(6) **Cutting**—All exposed surfaces shall be out-of-wind, free from waves, projections, or depressions, and flush at the joints. Arrises shall be cut sharp and true to square or pattern, and continuous with adjoining arrises.

(7) **Bed and Joints**—Beds shall be cut full and square for at least 2 in. from face, and may fall off not to exceed 1 in. in 12 in., reasonably free from large depressions. Joints to be full and square at least 1½ in. from face, falling off not to exceed 1½ in. in 12.

(8) Backs of granite shall be scabbled or split to approximately vertical surfaces.

(9) Jointing shall be as shown on approved drawings, and ¼ in. in thickness.

(10) **Bonding**—Shall be as shown on approved drawings, with no bed less than 4 in. Projecting course shall have beds at least equal to projection, unless otherwise shown.

(11) **Mouldings**—Shall be cut with uniform profile throughout their lengths, in conformity with full size details, with lines true and straight, and flush at joints.

(12) **Washes and Drips**—Washes shall be cut on stones whose top surfaces are exposed, unless otherwise shown. Projecting stone shall have groove drip cut on underside.

(13) Raised seats or lugs shall be cut where stone work rests on projections or washers, and raised thresholds shall be cut on exterior door sills.

(14) Reglets shall be cut for flashing where shown or required.

(15) **Models**—Full size plaster models of all ornamental and carved work shall be furnished to the granite contractor, who shall preserve these models for re-shipment to the building, if required.

(16) **Roughing**—For carving shall be done from approved models only, leaving the stone in suitable form and condition for the carving.

(17) **Carving**—All carved ornament shall be executed by skilled carvers, in a spirited and artistic manner, and in strict conformity with the approved models.

(18) **Crating and Shipping**—The finished granite shall be properly crated for shipment, to protect the surfaces and edges of all exposed work.

(19) **Precaution Against Stain**—Precaution shall be taken at all times to protect the granite from stain.

(20) Under no circumstances shall salt be used for thawing out lewis-holes, or otherwise in connection with the granite work.

(21) (If dampproof painting is required, specify requirements here.) After setting, the backs of all mortar joints shall be suitably dampproofed to prevent moisture from the backing seeping through the joints.

(22) **Setting**—The setting of the granite work shall be done by competent, experienced stone setters, and in strict accordance with the approved drawings and specifications.

(23) Each granite stone shall be brushed clean and thoroughly drenched immediately before setting and carefully bedded in a full bed of non-staining mortar. The granite facing shall not be built up more than two courses ahead of the backing, and the faces shall be kept free of mortar at all times.

(24) All surplus mortar shall be immediately raked out to a depth of at least 1 in. Sills, etc., subject to pressure shall be bedded only at the ends.

(25) Where a joint is exposed to the weather, it shall be made waterproof by mixing a satisfactory waterproofing compound with the mortar.

(26) The sand used in all setting mortar shall be such as will cause no stain, or chemical action with the cement.

(27) **Anchoring**—The granite shall be anchored to the backing with galvanized iron anchors, ¼ in. by 1¼ in., turned down into the granite 1¼ in., extending 8 in. into the backing if possible, and turned up into the backing 1½ in. There shall be two anchors to each stone whose length exceeds its height and, in general, not less than two anchors to every superficial yard of ashlar. All anchors, bolts, ties, etc., shall be furnished to the granite contractor.

Note: Special anchoring for heavy cornices, and overhanging courses, cramps, dowels, etc., for parapets, balustrades, pilasters, columns, etc., should be suitably described or shown according to the requirements of the work.

(28) **Boxing and Protection**—All the granite work shall be protected by the general contractor during the progress of the work and until the completion of the building. No lumber or material shall be used which will in any way stain or deface the granite work.

(29) **Centers and Scaffolding**—All necessary forms, centers, scaffolding, etc., required by the setter or carver, will be furnished by the general contractor.

(30) **Pointing and Cleaning**—After all liability from stain or damage from other operations on the building is passed, the granite work shall be carefully cleaned, removing all dirt, mortar stains and other defacements. The use of wire brushes, acids, and solutions which might cause discoloration, will not be permitted.

(31) All face joints shall be brushed out, thoroughly wet with clean water, and carefully pointed as directed by the architect.

Note: See Long Form for special treatment of vertical joints in uncovered cornices, and joints in upper surfaces of projecting stones.

(32) **Defective Work**—No patching or hiding of defects will be permitted. Defective stones shall be replaced with perfect ones, unless otherwise directed by the architect.

JOHN L. GOSS CORPORATION

Producers of "Goss Pink Deer Isle Granite"

QUARRIES AND HOME OFFICE
STONINGTON, MAINE
SALES OFFICE, 77 Summer Street, BOSTON, MASS.
SALES AGENTS
NEW YORK, N. Y., A. Le Poidevin & Co., Inc., 286 Fifth Avenue
PHILADELPHIA, PA., Frank Williamson, 2302 Spruce Street
MIDDLE WESTERN TERRITORY, Wm. H. Mitchell, 30 Church Street, NEW YORK, N. Y.

Product

Goss Pink Deer Isle Granite, for polished, tooled, hammered, pointed or rock-faced work, in buildings, memorials, mausoleums and monuments.

Trade-name

Deer Isle granite has been used for many years under various names, such as Greens Landing, Stonington Pink, Maine Pink, Crotch Island, Deer Island and many others. Material of varying quality, shade and texture has been furnished under these names, from a number of quarries which have been operated in the Deer Isle district from time to time. The Crotch Island quarry of the John L. Goss Corporation was opened in 1870 by Job G. Goss, and has been operated continuously by the same family to this day. Thorough development insures the same high quality of stock—uniform in shade and texture—for years to come. To distinguish the product of this one quarry from all others, the name "Goss Pink Deer Isle" has been adopted.

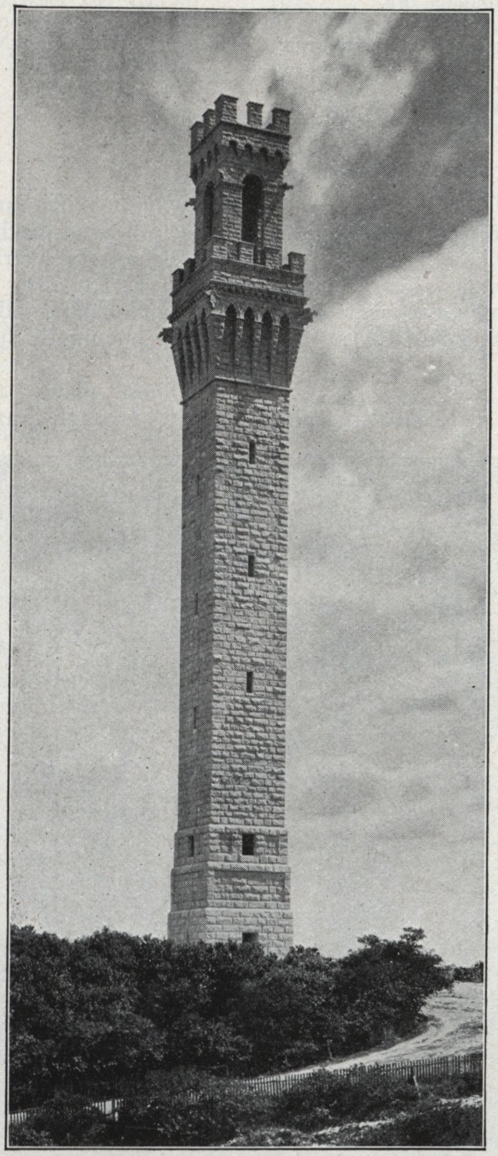
Service Available

The rough granite is shipped to finishing plants all over the country, which are equipped to furnish all classes of work. Any responsible dealer or cutting yard can give quotations on work to be executed in this material. A large number of plants carry stocks on hand, and the quarry always stands ready to supplement these with prompt shipments of any sizes, shapes or quantities. We will be pleased to assist architects and builders to get in touch with the finishing plants best situated to handle any particular project.

Facilities for Production

The natural advantages of the site for our quarry—a free working formation, so located that the product travels the short distance to tidewater dock by gravity—are supplemented by the best of modern equipment: derricks, compressors, air tools, etc., which are being constantly improved, replaced and kept up-to-date.

This makes it possible to give prompt deliveries on large or small orders, and to furnish monoliths of any size that may be desired. We ship directly from our own dock to seaport cities, or deliver to the railroads at Rockland and Portland, Me., and Boston, Mass.



Pilgrim Memorial Tower, Provincetown, Mass.
Willard T. Sears, Architect

Color and Texture

Goss Pink Deer Isle Granite is a warm gray, of medium shade, with the predominating feldspars a lavender pink. As rock face, or with the natural surface, it has a rather coarse texture. It is readily worked, and brought to a fine, delicate surface if desired, and holds sharp arrises perfectly. It is susceptible of a high and permanent polish, which brings out all the colors of the various mineral constituents, and produces a surface that is not easily stained or soiled. It is a peculiar characteristic of this granite, however finished, that it retains its freshness a long time, and does not readily become dirty or discolored even in a city atmosphere.

It is especially desirable for use in combination with other materials, such as limestone, brick or terra cotta, since it harmonizes with the general color scheme, but adds a character and beauty of its own.

Compressive Strength

Tests by the Ordnance Department, U. S. A., give a compressive strength of 23,620 pounds per sq. in. This is well above all structural or code requirements.

References

Project and Location	Architects
Federal Reserve Bank, Boston, Mass.	R. Clipston Sturges
Penn Mutual Life Insurance Building, Philadelphia, Pa.	Horace V. Seiler
Lafayette Building, Philadelphia, Pa.	John T. Windrim
Evans Memorial Galleries, Boston, Mass.	Guy Lowell
Insurance Co. of North America, Philadelphia, Pa.	Stewardson & Page
Telephone Building, New York, N. Y.	McKenzie, Voorhees & Gmelin
Municipal Building, Brooklyn, N. Y.	McKenzie, Voorhees & Gmelin
Security National Bank, Los Angeles, Cal.	John Parkinson
Public Ledger Building, Philadelphia, Pa.	Horace Trumbauer
East Boston (Mass.) Savings Bank	Thomas James
Beacon Trust Co., Boston, Mass.	Arthur W. Bowditch
Tivoli Theatre, Chicago, Ill.	Rapp & Rapp
South Office Building, State Capitol, Harrisburg, Pa.	Arnold W. Brunner
Salem Fields Entrance, Brooklyn, N. Y.	Percy W. Darbyshire
Washington Monument, West Point, N. Y.	Trowbridge & Livingston
Indiana World War Memorial	Walker & Weeks
Tompkins County War Memorial, Ithaca, N. Y.	LeRoy P. Burnham
Fountain of Oceanus, Estate of John D. Rockefeller, Pocantico Hills, N. Y.	Welles Bosworth

GRANITE MANUFACTURERS ASSOCIATION OF MOUNT AIRY

MOUNT AIRY, N. C.

MEMBERS

J. D. SARGENT GRANITE COMPANY
Mount Airy, N. C.
Branch Offices:
7 East 42nd Street, New York, N. Y.
615 Witherspoon Building, Philadelphia, Pa.
127 No. Dearborn Street, Chicago, Ill.

NORTH STATE GRANITE CO. Successors to Lemmerman & Hoffman Granite Company
Mount Airy, N. C.
Branch Office, 30 East 42nd Street, New York, N. Y.

THE NORTH CAROLINA GRANITE CORPORATION
Mount Airy, N. C.
Branch Offices:
7 East 42nd Street, New York, N. Y.
127 No. Dearborn Street, Chicago, Ill.
615 Witherspoon Building, Philadelphia, Pa.

MOUNT AIRY GRANITE CUTTING COMPANY
Mount Airy, N. C.

Products

Dimension Granite for Buildings, Mausoleums, Monuments, Bridges, Dry Docks, etc.

Polished and Turned Granite.

Granite Paving Blocks, Street Curbing, Crosswalk, Rubble, Crushed Granite and Rip Rap.

The Association and Its Object

The aim of this Association is to jointly promote the use of Mount Airy granite for all purposes where granite is adapted.

The individual members will co-operate with architects, engineers, contractors or owners in matters relating to the use of granite, samples, specifications, estimates, etc.

Quarry Production

The quarries were first opened in 1889, the first shipment being made in July, 1890; the output for that year being 135 carloads and has increased rapidly to a maximum output of 3500 carloads in one year.

Owing to the natural advantages peculiar to the Mount Airy quarries, Dimension Stone of unusual size is easily obtained, the only limit being that of railway transportation.

Facilities

The Mount Airy quarries are located one mile east of the Town of Mount Airy, N. C., and have 60 acres in exposed granite area.

Cutting plants and offices are located at the base of the Mount Airy quarries and are equipped with the latest improved machinery for the manufacture of granite, including electric traveling cranes, polishing machinery and turning lathes with individual motors, sand blast and carborundum machines, also compressed air for the pneumatic surfacing machines and hand cutting tools.

These plants, taken together with the unlimited supply of rough granite available, enable large contracts to be executed in quick time.

World War Memorial Erected at Tenafly, N. J.

Geographical Location

The Mount Airy quarries are well situated in reference to shipping, being about an equal distance from New York City, New Orleans and Chicago; which fact guarantees a reasonable transportation cost on their material to points throughout the East, South and Middle West. These quarries are served by the Southern Railway and have a nearby connection with the Norfolk & Western Railway.

Moulding and Carving

Owing to the composition of Mount Airy granite, it is especially adapted for fine moulding, carving and sculpture work, as is attested by reference to the following:

Pennsylvania State Monument, Gettysburg, Pa.
Column Capitals of the North Western Life Insurance Building, Milwaukee, Wis.
Column Capitals and Panels of the Municipal Building, New York, N. Y.

Continued on next page

Colors and Texture

Mount Airy granite, *"The Granite of Individuality,"* is a very light gray, almost white, biotite granite of medium texture. Feldspar, quartz and mica characterize the granite megascopically.

The feldspar is nearly white, while the quartz is a blue gray and the mica black and very evenly distributed, giving an appearance of decided strong character when hammer dressed.

The composition of Mount Airy granite is indicated by the following Chemical Analysis:

SiO_2	70.70
Al_2O_3	16.50
Fe_2O_3	2.34
MgO	0.29
CaO	2.96
Na_2O	4.56
K_2O	2.45
FeS_2	0.09
Total	99.89

Weight per cu. ft.	165 lbs.
Water absorbed per cu. ft.	0.33 lb.
Crushing strength	23,068 lbs. per sq. in.

From Bulletin No. 2, page 155; North Carolina Geological Survey, "The building and ornamental stones of North Carolina."

Joseph Hyde Pratt, State Geologist.

Estimates and Samples

A complete organization is maintained by each member of this Association for furnishing estimates, setting plans, details, etc., on short time.

Preliminary estimates cheerfully furnished on request of architect or contractor. Samples of Mount Airy granite will be furnished on request, and advice as to grade or style of finish desired.

Complete Information on Granite

For detailed information, including complete granite specifications, see the pages of the National Building Granite Quarries Association in this volume.

References

Buildings

Guilford Courthouse, Greensboro, N. C.
Lincoln Deposit & Trust Company, Altoona, Pa.
Citizens & Southern Bank, Augusta, Ga.
Merchants National Bank, Allentown, Pa.
Winona Savings Bank, Winona, Minn.
Isherwood Hall, U. S. Naval Academy, Annapolis, Md.
State Office Building, Richmond, Va.
Agriculture Extension Building, Raleigh, N. C.
Dry Dock No. 3, Navy Yard, Philadelphia, Pa.
Courthouse, Washington, D. C.
Fall Creek Bridge, Indianapolis, Ind.
Rock Creek Bridge, Washington, D. C.
Delaware River Bridge, Philadelphia, Pa.

Public Mausoleums

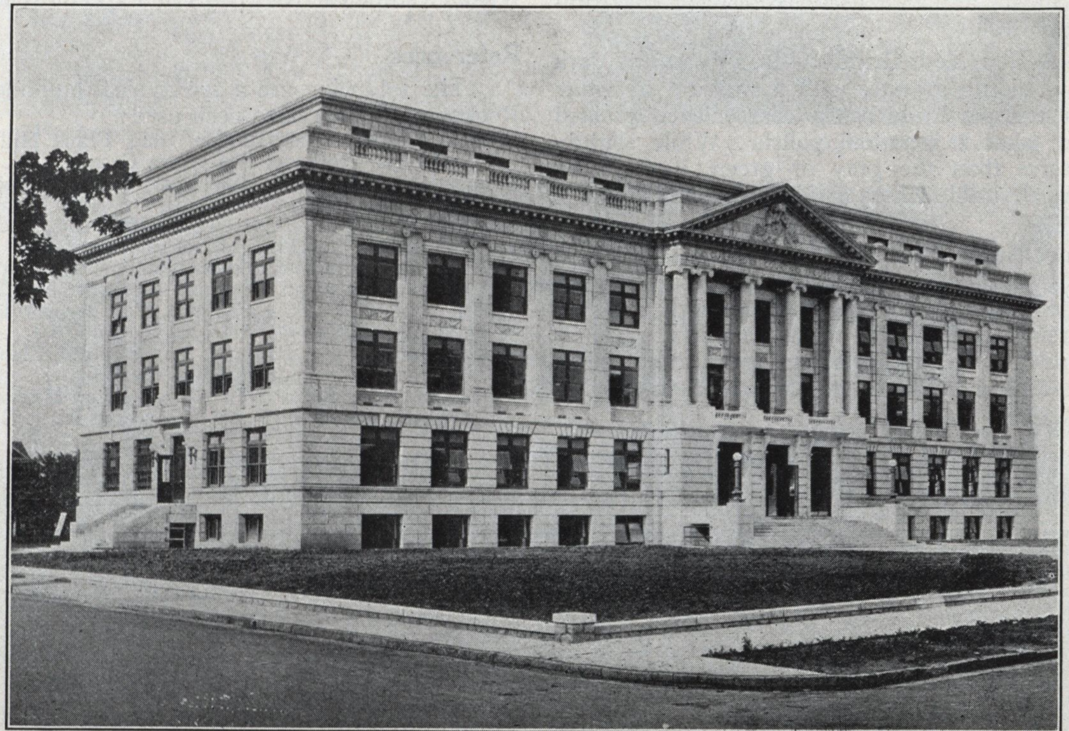
Rose Hill Mausoleum, Chicago, Ill.
Valhalla Mausoleum, St. Louis, Mo.
The Memorial Mausoleum, Reading, Pa.
Rose Hill Mausoleum, Hagerstown, Md.
Lakeland Mausoleum, Lakeland, Fla.
Wheeling Mausoleum, Elm Grove, W. Va.

Private Mausoleums

Sharer Mausoleum, Alliance, Ohio
Stadelman-Grant Mausoleum, Akron, Ohio
Cone Mausoleum, Greensboro, N. C.
Hoerner Mausoleum, New Orleans, La.
Ward Mausoleum, Brooklyn, N. Y.
Myer Cohen Mausoleum, Nashville, Tenn.
Dodge Mausoleum, Detroit, Mich.
Packard Mausoleum, Columbus, Ohio
Studebaker Chapel, South Bend, Ind.
Warden Mausoleum, Fredericksburg, Va.
Geist Mausoleum, Ravenswood, Ill.
S. Z. Poli Mausoleum, New Haven, Conn.
Wege Mausoleum, Columbus, Ohio
Steingard Mausoleum, Forest Park, Ill.
O'Brien Mausoleum, Cincinnati, Ohio

Monuments

McConnell Shaft, Carthage, N. C.
General Julian S. Carr, Durham, N. C.
General Nathaniel Greene, Guilford Battle Ground, N. C.
Victory Monument, Danville, Ill.
Oak Park and River Forest Monument, Illinois
War Memorial, Tenafly, N. J.
Galbraith Memorial, Cincinnati, Ohio
Acacia Spire, Masonic Cemetery, Chicago, Ill.



Guilford Courthouse, Greensboro, N. C.
Harry Barton, Architect

ORGANIZED 1864

ROCKPORT GRANITE COMPANY

ROCKPORT, MASS.

BRANCH OFFICES

BOSTON, MASS., 31 State Street
PHILADELPHIA, PA., 614 Penfield Building
NEW YORK, N. Y., 21 Park Row

CLEVELAND, OHIO, Schofield Building
CHICAGO, ILL., Chamber of Commerce Building
DETROIT, MICH., 400 Penobscot Building

NEW ORLEANS, LA., John C. Bartley, Representative, 509 Canal-Commercial Building

QUARRIES: ROCKPORT, BAY VIEW AND PIGEON COVE, MASS.; JONESPORT, ME.

Products

Rockport Gray (Light, Medium and Dark), Rockport Sea Green and Moose-a-bec Red Granites for the better class of buildings and memorials.

Seam Face Granite for residences and churches. Also Granite for bridges and sea-walls; Granite Paving Blocks and Crushed Stone.

Rockport Granite

Rockport Granite—"The Granite of Character"—is a true hornblende granite, resembling in composition the Egyptian granite of which the ancient obelisks and sarcophagi were built. It is strong beyond all possible requirements, and is decidedly hard and tough. It is remarkably free from impurities, is practically impervious to moisture or stain, and will withstand indefinitely the action of frost and weather.

One of the outstanding qualities of Rockport Gray and Rockport Sea Green Granites is the exceptionally high and durable polish which they take, due largely to the hornblende in their mineral composition.

Rockport Gray Granite—Is available in light, medium and dark gray shades, with a medium to coarse and even grained texture.

Rockport Sea Green Granite—Has practically the same physical properties as the gray. In color it is dark olive green, spotted with black. It is especially beautiful in polished finish, although used extensively for hammered work as well.

Moose-A-Bec Red Granite—Is a beautiful dark reddish gray, biotite granite, with a mixture of white and pinkish feldspars. It has a coarse, even grained texture, and takes a beautiful polish. While slightly more expensive than the gray or green, its coloring makes it very desirable where a richly colored granite is wanted.

Rockport Seam Face Granite—Is available in a mixture of light to very dark reddish, rusty browns, and makes wonderfully attractive ashlar work for residences, churches, etc. Unlike most seam face granites, the color runs deep into the stone and it can therefore be used for headers, sills, steps, etc., as well as for ashlar surfaces.

Facilities

The plants and quarries, comprising more than 800 acres, are located at Rockport, Bay View and Pigeon Cove, Mass., and Jonesport, Me. The company also owns its own docks, and a fleet of vessels, including sloops, schooners, barges, towboats, and lighters. With facilities for both rail and water shipment, the company is in an exceptional position to render first class service, both to seacoast and inland points.

In the several quarries are located forty large power derricks, many of which are of 75-ton capacity and over. Drilling is done with modern appliances using compressed air or steam. The quarries and plants at Rockport, Bay View, and Pigeon Cove are interconnected by rail and heavy capacity motor trucks.

The cutting plants are well equipped with modern tools and appliances, pneumatic tools and drills, pneumatic surfacing machines, lathes, etc. The large modern polishing plant is completely equipped with polishing wheels, polishing lathes and pendulum polishers.

In normal operation, from 600 to 800 men are employed by the Company.

Color Reproductions, Samples and Estimates

The color reproductions of our granites, on the following page, are submitted for preliminary selections. They are full size as to texture, and approximate as to color. Samples will be furnished to architects on request. Opportunity is solicited to submit prompt and reliable estimates from plans and specifications.

References

The following are a few typical buildings in which Rockport granites have been used:

Winters National Bank, Dayton, Ohio, Frank Hill Smith, Inc., Architects—Rockport Sea Green Granite
Seaboard National Bank, New York, N. Y., Alfred C. Bossom, Architect—Rockport Gray base and Sea Green columns
Old State National Bank, Evansville, Ind., Adolf Sherrer, Architect—Polished Moose-a-bec Granite
Soldiers and Sailors World War Memorial, Pittsfield, Mass., Augustus Lukeman, Sculptor—Rockport Sea Green Granite
Mellon National Bank, Pittsburgh, Pa., Trowbridge & Livingston, Architects—Rockport Gray Granite
Scott County Savings Bank, Davenport, Iowa, Clausen & Kruse, Architects—Rockport Light Gray Granite
Federal Reserve Bank, New Orleans, La., Rathbone DeBuys, Architect—Story-high Base, Rockport Light Gray, Polished

Carved Detail, Scott County Savings Bank, Davenport, Iowa
Clausen & Kruse, Architects

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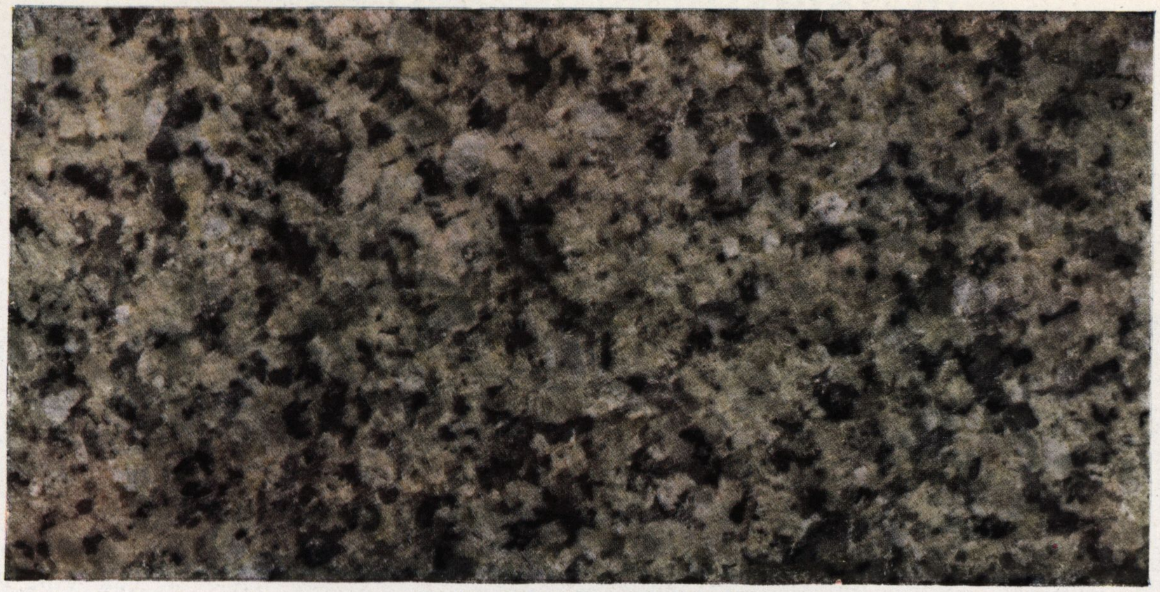
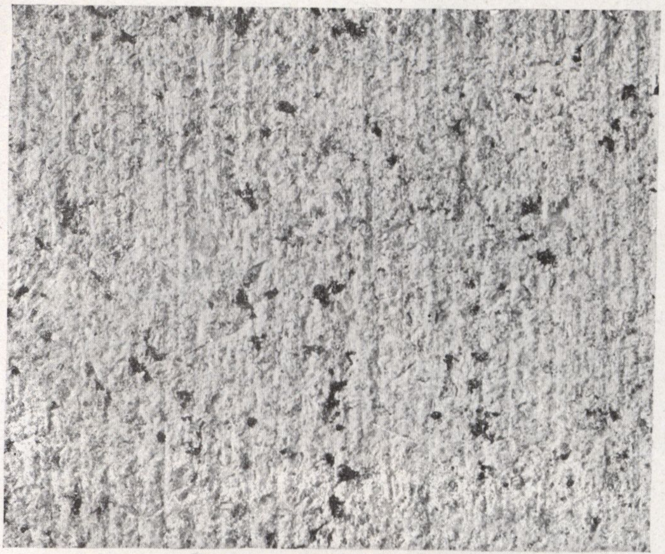
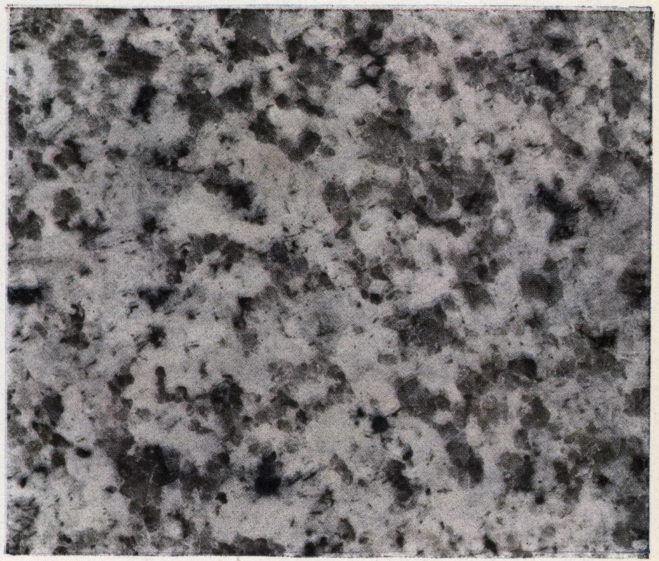


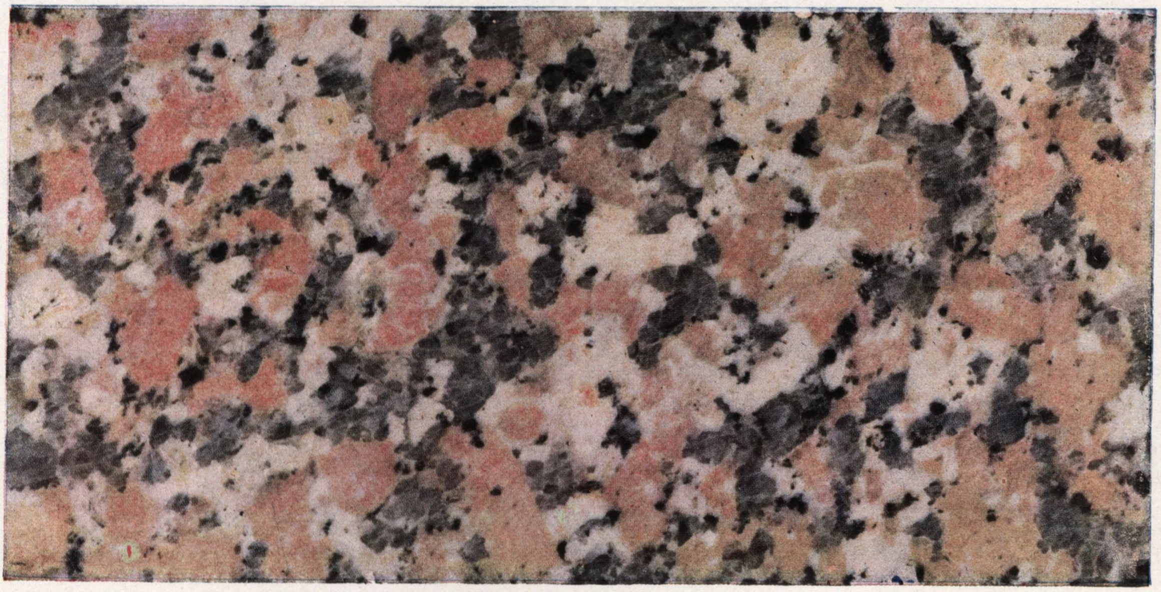
Rockport Sea-Green Polished



Rockport Gray Hammered



Rockport Gray Polished



Moose-A-Bec Red Polished

THE JOHN SWENSON GRANITE CO.

Concord Granite

CONCORD, N. H.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue

CHICAGO, ILL., Marquette Building

Product

Concord Granite, Rough or Finished, for buildings and memorials.

Concord Granite

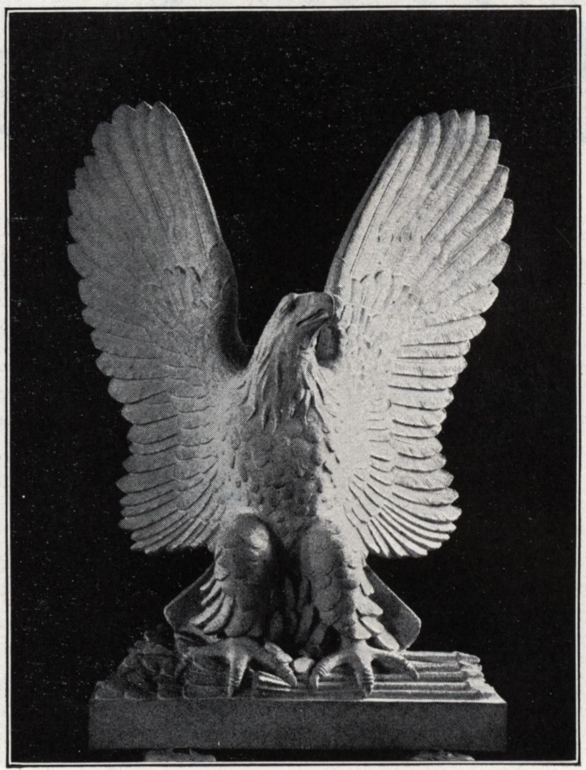
Our Concord Granite is a warm toned, light gray granite of fine to medium grain.

It is classified technically as a "muscovite-biotite" granite. The muscovite (white mica) has a soft, brownish color, giving warmth to the general color of the granite. The biotite (black mica) is in fine particles, uniformly distributed, giving a fine, even texture to the finished surface.

One of the remarkable features of Concord Granite according to Geo. P. Merrill, Curator of Geology, U. S. National Museum, "aside from its color, texture, and freedom from flaws, pyrite, or other injurious constituents, is the wonderful ease with which it can be worked."

Strength

Official tests, at the Watertown Arsenal, give this granite a crushing strength of 30,830 lbs. per sq. in. at right angles to the rift, and 23,860 lbs. parallel to the rift. Visualize this as the pressure at the base of towers of this granite 5 miles and 4 miles high, respectively.



Concord Granite Eagle

New York State Officers Monument, Gettysburg, Pa.
Edward P. Casey, Architect

Durability

Geo. P. Merrill, referring to the Concord State House and Old State's Prison, erected of Concord Granite in 1816-1819 and 1812, respectively, states that "both buildings are in admirable state of preservation, and evidently, so far as the stone is concerned, good for centuries to come."

Facilities

Our quarries have been developed and equipped to meet the demands of production on a large scale. The quarries now in use have been in active operation for over 60 years and, both in quality of granite and productive capacity, are in better condition than ever before.

Our cutting plant is modern in every respect. It is equipped with modern and efficient facilities for prompt and economical production of contract work.

Prices and Service

The working qualities of our granite, and efficient methods of production, insure very reasonable costs.

Reasonable prices, good workmanship and service, and scrupulous adherence to delivery dates have always been the policy of this Company.

The home office at Concord, N. H., and the sales offices in New York and Chicago are always prepared to render every possible service.

Samples and Estimates

Samples, showing finishes desired, furnished on request. Estimates, and consultations upon the economical use of granite, furnished without obligation.

Surface Finishes

For general building work we recommend Concord Granite in six-cut finish for lower portions, and four-cut for the upper work.

Polished finish is most practical for base courses subject to splatter or stain of traffic.

For different texture effects the other standard granite finishes, including rock-face, are equally applicable to this granite.

References

A partial list of typical projects in which our granite has been used. Additional references on request.

BUILDING AND LOCATION	ARCHITECT
Office Buildings	
N. H. Fire Insurance Bldg., Manchester, N. H.	Edward L. Tilton
Railway Exchange, St. Louis, Mo.	Mauran, Russell & Crowell
Book Building, Detroit, Mich.	Louis Kamper
60 Liberty Street Bldg., New York, N. Y.	Cross & Cross
Bank Buildings	
Monongahela National Bank, Brownsville, Pa.	Morgan, French & Co.
German Savings Bank, Davenport, Iowa	F. G. & R. J. Clausen
Titusville Trust & Safe Deposit Bldg., Titusville, Pa.	Alfred C. Bossom
Residences	
Mrs. Eleanor Elkins Widener, Newport, R. I.	Horace Trumbauer
Adolphus Busch, St. Louis, Mo.	Widmann & Walsh
Public Buildings	
Post Office and Courthouse, Dayton, Ohio	J. Knox Taylor
State House (Addition), Concord, N. H.	Peabody & Stearns
Ives Memorial Library, New Haven, Conn.	Cass Gilbert
Seamanship & Navigation Bldg., Annapolis, Md.	Bureau of Yards & Docks
Churches	
First Church of Christ, Scientist, Providence, R. I.	Howard Hoppin
Rodef Sholem Synagogue, Pittsburgh, Pa.	Palmer & Hornbostel
Memorials	
Perry Memorial Arch, Bridgeport, Conn.	Henry Bacon
Plymouth Rock Portico, Plymouth, Mass.	McKim, Mead & White

PERRY BROS. GRANITE CO.

Designers, Quarry Operators and Cutters of Concord Granite

CONCORD, N. H.

BOSTON, MASS., Little Building
DETROIT, MICH., 1416 St. Clair Avenue
CHICAGO, ILL.. 155 No. Clark Street
NEW YORK, N. Y., Room 2843-A, Grand Central Terminal Building
PHILADELPHIA, PA., 1121 Fillmore Street

Product

Concord Granite of Fine Grain in Blue Gray for high grade building work.

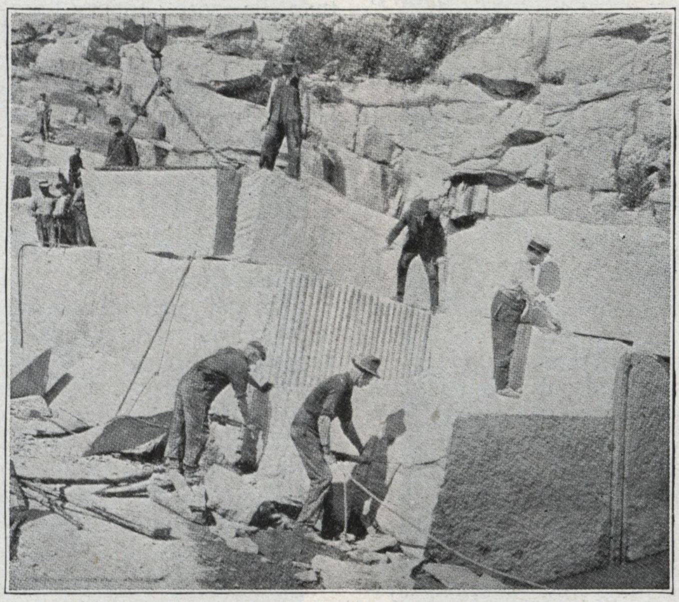
Composition of the Granite

Concord granite is a holocrystaline, granular rock composed of quartz, a potash feldspar, and muscovite-biotite (potassium and magnesium iron mica). The feldspar crystals being very small the granite is of very fine grain.

The color of the granite is blue gray, the shade being determined by feldspars in the quarry.

Quality and Usage

Our product is a very fine grain granite of especially high quality, and is primarily used for buildings of artistic merit and imposing design, intended as a lasting monument to perpetuate a high ideal; such as memorials, public buildings, mausoleums and other structures of a permanent character.



Cutting Large Blocks in the Perry Bros. Quarry

Production and Delivery Facilities

The cutting plant, which is one of the largest and best equipped in the United States, is located in the same place as our quarries at Concord, N. H. This enables us to turn out large quantities of polished, dressed and rough granite in a comparatively short length of time.

Being located on the Boston & Maine R. R., with connections with the Boston & Albany R. R., the Central Vermont Ry., and the New York, New Haven and Hartford R. R., we are in a position to make shipments to all parts of the United States and Canada.

Advice on Proposed Work

Our designers will be glad to consult with you regarding the cutting of designs in proposed work, the reduction of cost, etc.

Unnecessary expense may be avoided by considering the finish of the stone for different parts of a building and the adaptability of design to cutting methods generally employed, depending on the location and the exposure of the granite to smoke and dirt, and its position as regards visibility to the public eye.

Preliminary estimates and samples will be gladly submitted on request.

A Partial List of Our References: Building, Location and Architect

Indianapolis Athletic Club, Indianapolis, Ind., Robert Frost Daggett
Mary E. Clapp Estate Building, Portland, Me., Desmond & Lord
Beverly High School, Beverly, Mass., Adden & Parker
Health Unit Building, Boston, Mass., Coolidge & Shattuck
Police Station, Division No. 2, Boston, Mass., James J. Purdon
Prince District School, Boston, Mass., Parker, Thomas & Rice
Washington-Allston School, Boston, Mass., Kilham, Hopkins & Greeley
Pilgrim Court Apartments, Brookline, Mass., Silverman, Brown & Heenan
St. Anne's R. C. School, Fall River, Mass., Sampson, Dodd & Pierpont
Hyannis Trust Co. Building, Hyannis, Mass., J. William Beal & Sons, and L. Frank Paine
Theodore Roosevelt School, Roxbury, Mass., Joseph J. Driscoll
Technical High School, Springfield, Mass., E. C. & G. C. Gardner
West Springfield Junior High School, West Springfield, Mass., Charles D. Loring
Ford Engineering Laboratory, Dearborn, Mich., Albert Kahn
Detroit Life Insurance Building, Detroit, Mich., E. B. Arnold
R. L. Polk Building, Detroit, Mich., Richard Marr
Smith-Bridgeman Store Building, Detroit, Mich., J. W. Cook Corp.
St. Catherine's High School and Auditorium, Detroit, Mich., City Engineer
Buick Sales and Service Station, Flint, Mich., (own architects)
Lansing Municipal Power Plant, Lansing, Mich., J. E. Woodwell
East Side Junior High School, Saginaw, Mich., Cowles & Mutscheller
Orpheum Theatre, Manchester, N. H., Desmond & Lord
W. Parker Straw Residence, Manchester, N. H., Hutchins & French
Camden Junior High School, Camden, N. J., Clyde S. Adams
Haddon Heights Bank, Haddon Heights, N. J., Simon & Simon
Haddon Heights School, Haddon Heights, N. J., Charles R. Peddle
People's Savings Bank, Yonkers, N. Y., H. Lansing Quick
Freeport High School, Freeport, L. I., N. Y., William Adams
Public School No. 36, St. Albans, L. I., N. Y., William H. Gompert
Hartwell School, Hartwell, Ohio, Garber & Woodward
Lehigh Alumni Memorial, Bethlehem, Pa., Theodore Vischer & James Burley
Bridgeport High School, Bridgeport, Pa., H. Courcy Richards
Conshohocken Bank, Conshohocken, Pa., Magaziner, Eberhard & Davis
Easton Publishing Co. Building, Easton, Pa., A. D. Chidsey, Jr.
Altamont Hotel, Hazelton, Pa., Thomas, Martin & Kirkpatrick
Hazleton National Bank, Hazleton, Pa., Thomas, Martin & Kirkpatrick
First National Bank Building, Nanticoke, Pa., McCormick & French
Abbott's Alderney Dairies, Inc., Philadelphia, Pa., Walter Smedley
Oak Lane Trust Company, Philadelphia, Pa., McLanahan & Bencker
Lancaster Avenue Title & Trust Co. Building, Philadelphia, Pa., Charles C. Schweiker
Fleischmann Building, Philadelphia, Pa., Louis L. Tieman
Belmont Trust Company Bank Building, Philadelphia, Pa., Norman Hulme
Cambridge Trust Co., Inc., Chester, Pa., Thomas M. James
Sibley School, Grand Rapids, Mich., Robinson & Campau
War Memorial, Peterboro, N. H., Little & Russel
Curb for Boston Chamber of Commerce Building, Parker, Thomas & Rice
Union Trust & Hudson County National Bank, Bayonne, N. J., Donald G. Anderson
Calvert Lithographing Co., Detroit, Mich., F. F. Van Tuyl
Ralsar Apartments, Detroit, Mich., Robert Finn
National Bank of Commerce, Detroit, Mich., Albert Kahn
Armory Building, Wilkes-Barre, Pa., Thomas H. Atherton, Jr.
Police and Fire Station, Boston, Mass., Maginnis & Walsh
Commercial High School, Providence, R. I., Hoppin & Field
Atlantic City High School, Atlantic City, N. J., R. T. Rowland, Jr.
Hospital for Insane, Maggie, West Va., Paul A. Davis
Sinclair Refining Co. School, Trainer, Pa., Ritter & Shaw
Langley High School, Washington, D. C., Albert L. Harris
MacFarland High School, Washington, D. C., Albert L. Harris
Public Schools, Nos. 100 and 205, Brooklyn, N. Y., William H. Gompert
Public Schools, Nos. 47 and 60, New York, N. Y., William H. Gompert
James Monroe High School, New York, N. Y., William H. Gompert
James Madison High School, New York, N. Y., William H. Gompert
Public Schools, Nos. 99, 107 and 108, Queens, N. Y., William H. Gompert

COLD SPRING GRANITE COMPANY, INC.

FORMERLY ROCKVILLE GRANITE COMPANY

Quarriers and Producers of Granite

COLD SPRING, MINN.

QUARRIES: ST. CLOUD GRANITE DISTRICT and MORTON, MINN.

Products

MINNESOTA PEARL PINK GRANITE.

COLD SPRING RAINBOW GRANITE for all Structural Purposes and large Memorials.

Minnesota Pearl Pink Granite

Wt. 175 lbs. per cu. ft.

Crushing strength 20,000 lbs.

Modulus of rupture 2,000 lbs.

Absorption test (see table).

Chemical analysis (see table).

The largest block of granite ever taken out of a quarry in the St. Cloud District came from this quarry.

Sizes unlimited.

Quarried the year around.

A versatile granite in that it works well into most any color scheme.

Takes a beautiful polish and assumes a warm gray tone in hammered finishes.

Cold Spring Rainbow Granite

Wt. 185 lbs. per cu. ft.

Crushing strength 23,000 lbs.

Modulus of rupture 3,042 lbs.

Hardest structural granite produced in the State of Minnesota.

Sizes unlimited. Quarried the year around.

General tone a veined buff varying from a dark gray or green to a flesh colored pink. No striking contrasts in color but a perfect blend of varying tones.

Takes a wonderful polish.

No finer material for columns.

Quarries

Equipped with the most efficient modern machinery for quarrying granite. The drilling and broaching system is used to prevent shattering stock for fine polished work. Quarries are operated winter and summer.

Plant

Situated on its own waterpower site, equipped with auxiliary steam plant and hooked up with a public utility company, there is no chance for a shutdown on account of power shortage.

It is one of the most efficiently equipped plants in the industry and the largest in the whole Mississippi valley, having three big drag saws and a battery of five carborundum saws, besides lathes, polishers, surfacers, and a complete line of air tools.

A special feature is the big stock yard where a supply of polished slabs from 1-in. thickness up is maintained at all times. This company is the originator of 2-in. polished granite show window base in store front construction.

Step, flagging and base course material is now being produced at the most economical prices in history with a sawed finish. This finish, made possible by the huge drag saws and their parallel motion, results similar to that of a 4-cut hammer and is more suitable for steps than the more slippery finer finishes.

The first, second and third largest monolithic columns ever turned in the state came from this plant.

Five large electric traveling cranes are used to handle the stock at the plant.

Production

Situated on the Great Northern Railway, more than a carload a day can easily be shipped to any part of the United States.

Organization

In the organization are several men who grew up in the architectural business. This assures a rapid assimilation of the architect's ideas, and less time spent obtaining information and getting out setting plans and details. In accordance with its present system, this company deals direct through plant representatives and not through part time commission men or brokers.

The company welcomes queries of all kinds, and encourages requests for estimates, quotations, samples and references.

ABSORPTION TEST MINNESOTA PEARL PINK GRANITE

4-23-24 to 4-30-24

Weight air dry, grains	Weight after immersion of one hour, grains	Weight after immersion of one day, grains	Weight after immersion of one week, grains	Total gain in weight, grains	Per cent gain
1944	1945.5	1945.5	1945.5	1.5	.07

The weight is the same after a week as it is after an hour. Gain in weight appears to be due to surface moisture only; no moisture being absorbed.

CHEMICAL ANALYSIS OF MINNESOTA PEARL PINK GRANITE

Silica	62.15%	Lime	2.27%
Alumina	19.41%	Phosphorus	.13%
Iron oxide	2.99%	Magnesia	trace

Notable Instances of the Use of Granite from Our Quarries

BUILDING	LOCATION	ARCHITECT
S. S. Kresge Store Fronts	50 in United States	S. S. Kresge Co., New York, N. Y.
Youngs Market Co. Building	Los Angeles, Cal.	C. F. Plummer, Los Angeles, Cal.
Home Telephone & Telegraph Co. Building	Fort Wayne, Ind.	Chas. R. Weatherhogg, Fort Wayne, Ind.
Stearns County Courthouse	St. Cloud, Minn.	Toltz, King & Day, St. Paul, Minn.
Cathedral Rectory Building	St. Paul, Minn.	Maginnis & Walsh, Boston, Mass.
Kansas City Life Building	Kansas City, Mo.	Wight & Wight, Kansas City, Mo.
Land Bank Building	Kansas City, Mo.	Keene & Simpson, Kansas City, Mo.
Nebraska State Capitol	Lincoln, Neb.	Bertram G. Goodhue, New York, N. Y.
Oklahoma State Capitol	Oklahoma City, Okla.	Layton Smith & Forsythe, Oklahoma City, Okla.
Central National Bank	Tulsa, Okla.	H. H. Mahler, Tulsa, Okla.
Mayo Hotel	Tulsa, Okla.	George Winkler, Tulsa, Okla.
Telephone Exchange Building	Cicero, Ill.	Holabird & Roche, Chicago, Ill.
D. A. R. Memorial	St. Paul, Minn.	Holyoke, Jemne & Davis, St. Paul, Minn.
Louisiana National Bank	Baton Rouge, La.	Sanguinett, Statts & Hedrick, Fort Worth, Tex.
Michigan Lafayette Building	Detroit, Mich.	C. Howard Crane, Detroit, Mich.
Security Trust Co. Building	Detroit, Mich.	Albert Kahn, Detroit, Mich.
Randolph Hotel and Office Building	Chicago, Ill.	Rapp & Rapp, Chicago, Ill.
Roosevelt Hotel	New Orleans, La.	Favrot & Livaudias, New Orleans, La.
Equitable Life Building	Des Moines, Iowa	Proudfoot, Bird & Rawson, Des Moines, Iowa
Federal Reserve Bank	St. Louis, Mo.	Mauran, Russell & Crowell, St. Louis, Mo.

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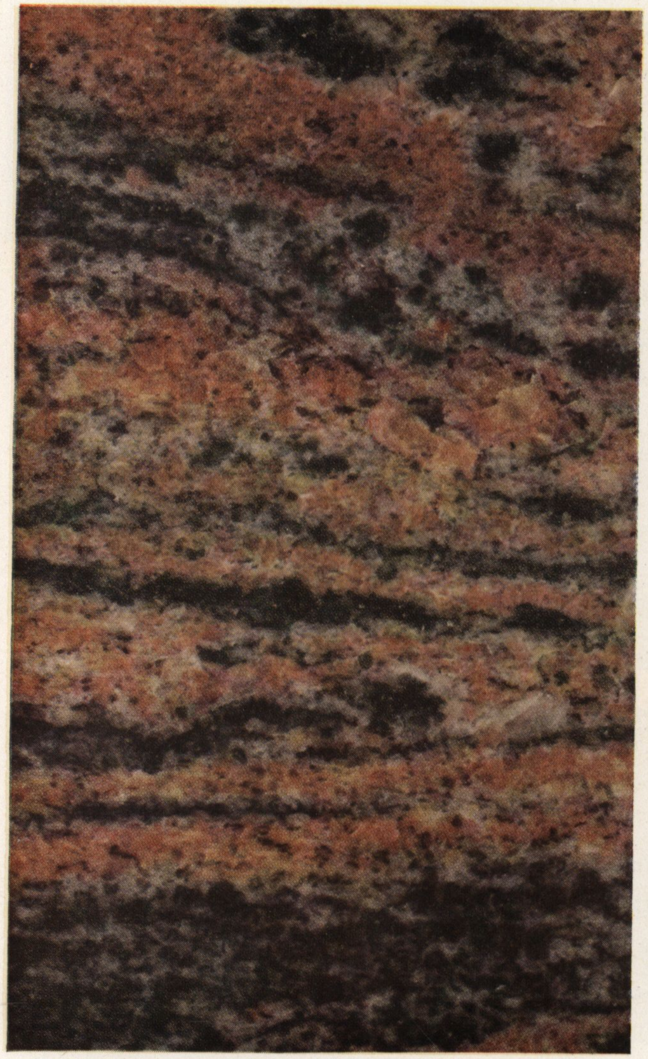
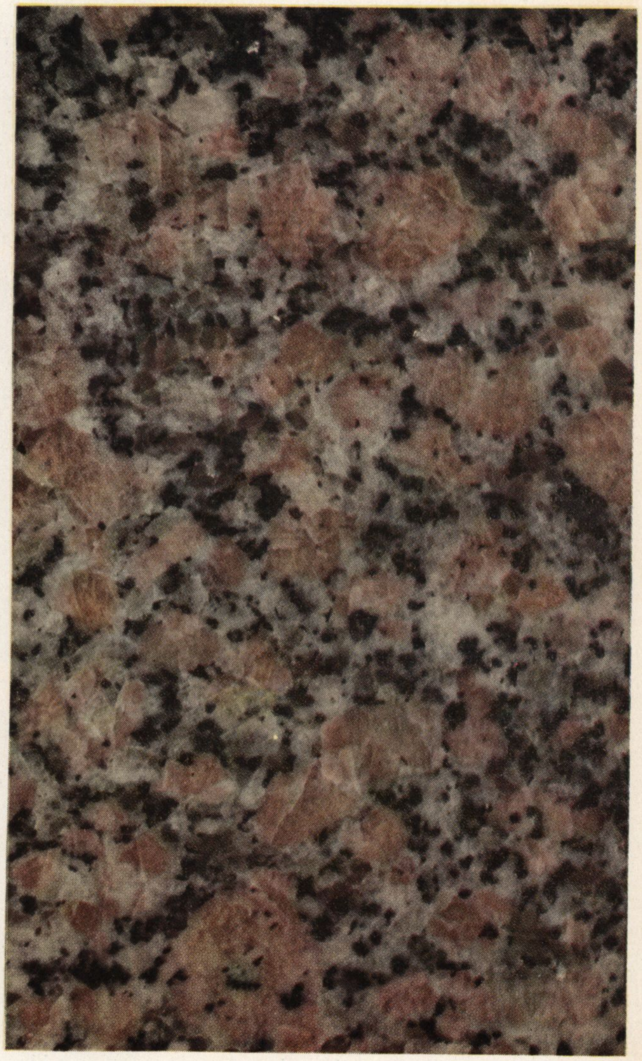


Cold Spring Rainbow Polished



Minnesota Pearl Pink Polished

Plant of the Cold Spring Granite Company, Inc.

THE DOLBEN QUARRIES

Weymouth Seam Face Granite

DOLBEN & COMPANY

7 Water Street, BOSTON, MASS.

QUARRIES AT WEYMOUTH, MASS.

Products

SEAM FACE GRANITE ASHLAR.

SPLIT FACE GRANITE ASHLAR.

Also, Seam Face Flagging and Stepping Stones; Special Stones for Arches, Lintels and Sills, cut according to drawings; Jambs, Quoins, Steps, Copings, etc., of special sizes for trimming walls faced with ashlar.

Facilities

The facilities of this company are adequate to handle operations of any kind.

Nature of Stone

A true granite of great strength, found in nearly upright sheets of various thicknesses. Seams between these sheets provide faces for the blocks into which the stone is cut. Permanent in texture and color.

Split face granite is produced by splitting blocks after quarrying. Surface is generally a little rougher than seam face. Splits evenly and requires no dressing or pointing.

Colors of Stone

The range of colors is large, with a wonderfully beautiful golden gray predominating.

Colors range from light gray to dark brown and purples. Color of split face granite is warm gray.

Sizes

The blocks are produced in varying sizes.

The faces range from 4¼ to 15¼ inches in height, and from 8 to 24 inches in length.

The stones run from 4 to 8 inches in thickness.

Uses

The natural stone for churches, country residences and public buildings.

Cost

The cost of this granite is little in excess of good brickwork, and only a fraction of the cost of dressed granite. No other quarried stone can compare with it in price.

Method of Laying

Reference to the illustrations on the following page shows that our seam face granite is especially adapted to three and four-head ashlar work, and equally well to coursed ashlar.

The quarry cost per square foot is the same for either method of laying, but laying cost is lowest for coursed ashlar and highest for three-head.

Estimates and Samples

Estimates and samples are gladly given to architects, owners and contractors, as well as advice regarding style of finish.

Sample walls in seam face and split face ashlar are shown and described on the following page.

Some Recent Contracts

First Swedish Lutheran Church, Brockton, Mass., Charles C. Coveney, Boston, Mass., Architect.

Vincent Astor Residence, Port Washington, N. Y., Delano & Aldrich, New York, N. Y., Architects

First Unitarian Church, Reading, Mass., Adden & Parker, Boston, Mass., Architects

St. Joseph's Church, Bridgeport, Conn., Joseph Jackson, New Haven, Conn., Architect

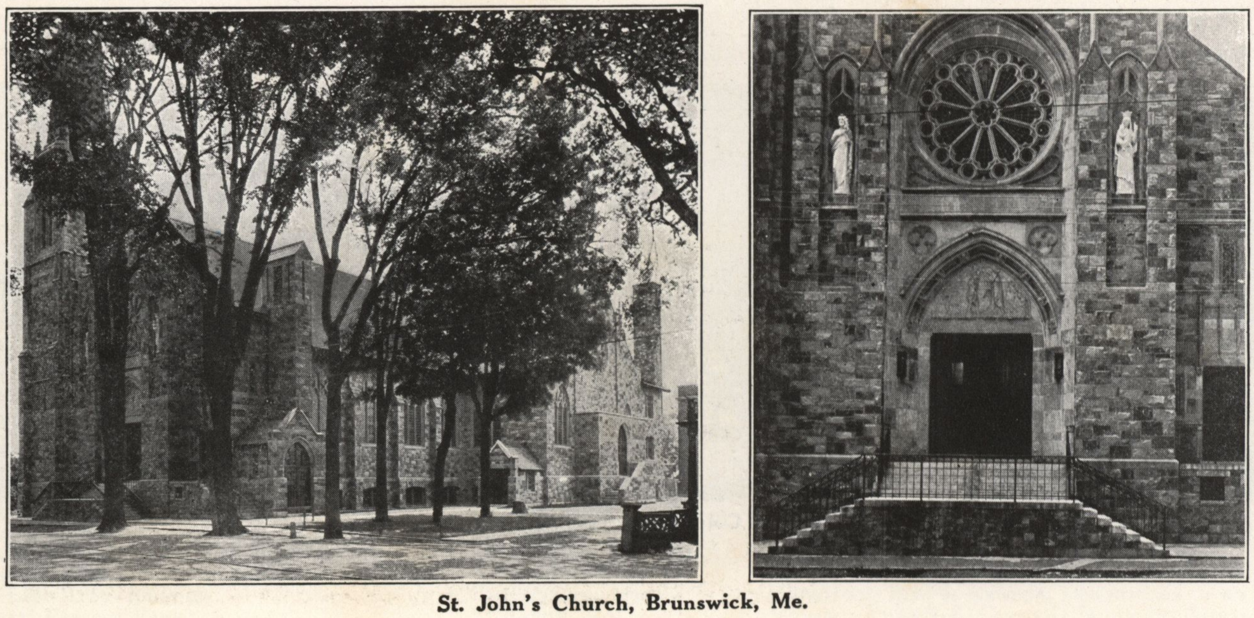
Blessed Sacrament Church, Worcester, Mass., John W. Donahue, Architect

St. Anthony's Church, Revere, Mass., Edward T. Graham, Architect

St. Mary's Church, Uxbridge, Mass., John W. Donahue, Architect

Holy Cross Cathedral, Holyoke, Mass., John W. Donahue, Architect

Immaculate Conception Church, Holyoke, Mass., D. R. Baribault, Architect



St. John's Church, Brunswick, Me.
CHARLES R. GRECO, Architect

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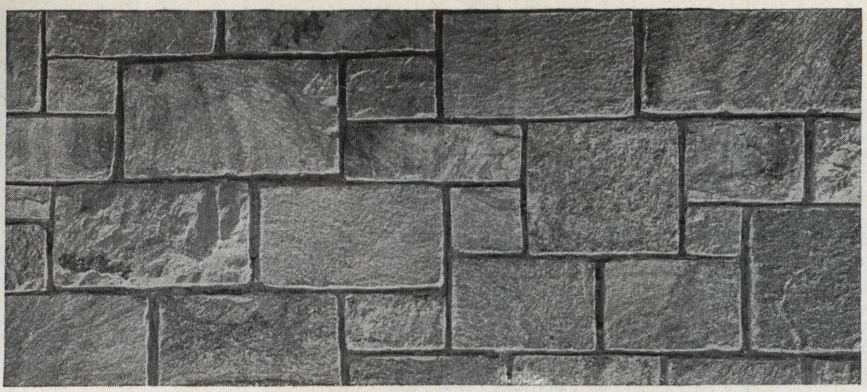
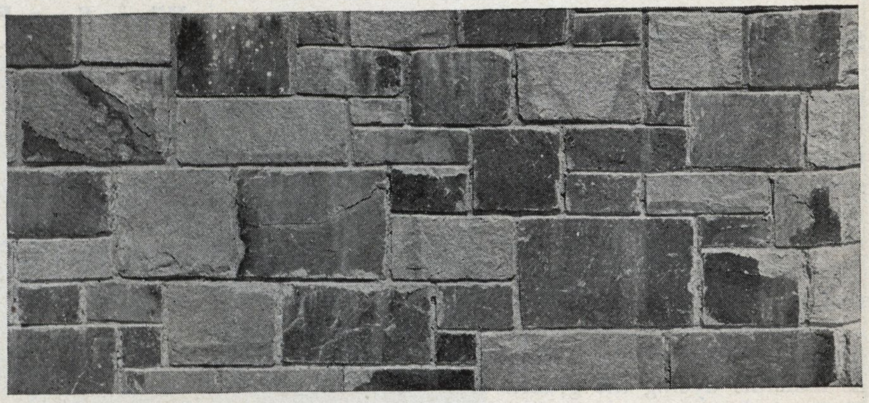


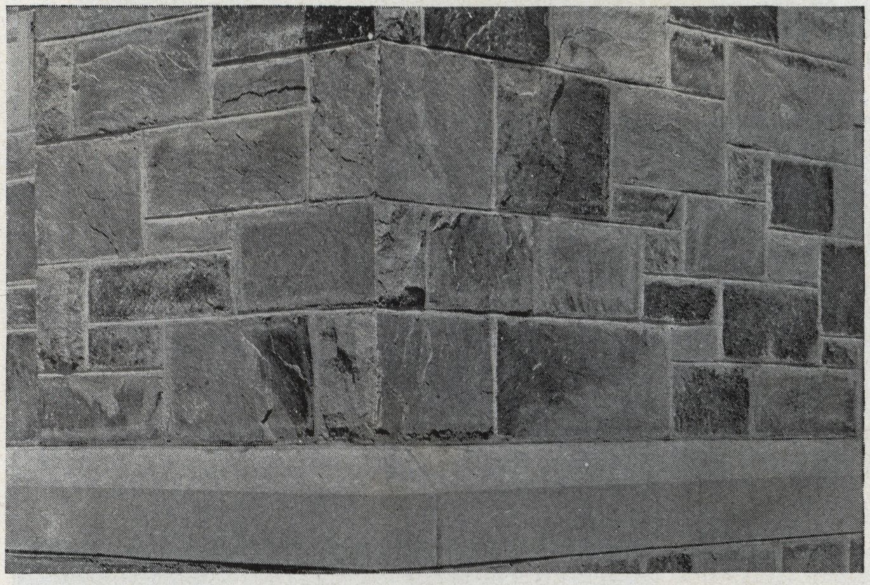
GRAY ASHLAR

with mixture of gray split face ashlar. Any desired color combination can be obtained by apportioning the various shades of seam face and adding a percentage of split face. Gray is the predominating color of the split face granite

QUARRY RUN ASHLAR

Full range of seam face colors, including gray, buff, tan, brown, green and purple



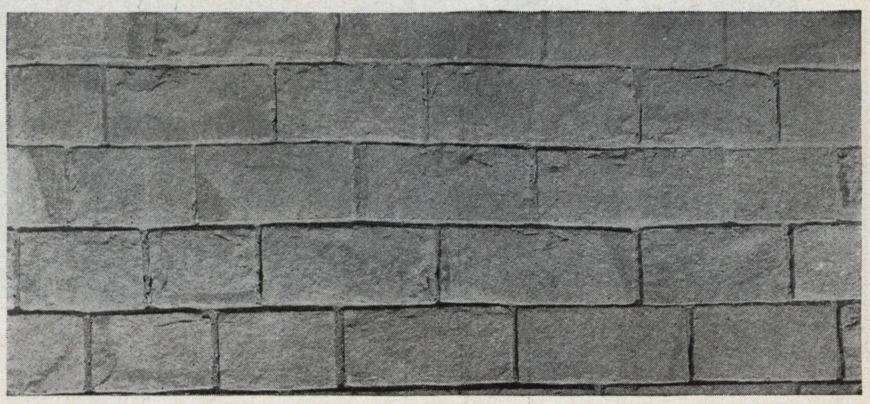


CORNER WORK

Combination of various colors in seam face and split face granite with limestone

COURSED ASHLAR

Selected gray split face granite work



PLYMOUTH QUARRIES INCORPORATED

Specialists in Ashlar

755 Boylston Street
BOSTON, MASS.
QUARRIES AT WEYMOUTH, MASS.

Products

Ashlar, in Seam Face and Split Face Granite.

Flagging and Stepping Stones, in Seam Face Granite.

Seam Face Granite

This is a granite of the highest quality, but, unlike most granites, comes in a large variety of colors, ranging from light gray to dark browns and purples. It is not quarried in large blocks and then sawed or split, like most stones, since it stands in perpendicular sheets of various thicknesses. The faces of these sheets are used as the surface exposed in the wall. These faces vary in texture from smooth to fairly rough.

Between the granite sheets various forms of plant life have grown and decayed for many centuries, as well as minerals dyeing the granite many different shades. This coloring penetrates a short distance in some pieces, while in others it goes clear through, but in any case is permanent, so will not fade. The naturalness of age, which takes many years in any other building material, is thus obtained immediately.

A beautiful example of this effect is the Harkness Memorial Dormitory at Yale University.

Split Face Granite

This is obtained by splitting the blocks so that it can be used for ashlar. It splits very true and produces a surface somewhat rougher than Seam Face, which does not have to be dressed or pointed. It has nearly as wide a range of color, but less variety of texture.

Messrs. Cram and Ferguson have made a most artistic use of this product in their Church of the Sacred Heart, Jersey City, N. J.

Where Seam Face and Split Face Granite Can Be Used

Plymouth Quarries product, both Seam Face and Split Face, can be used for all purposes for which ashlar is suitable: Walls, both exterior and interior; jambs; lintels (if not too large); slip sills; steps, etc. See detail drawings on third page following.

Flagging for Indoors and Out and Stepping Stones

Flagging and stepping stones can be obtained only in Seam Face. The surface is sufficiently smooth to be very suitable for both interior flooring and for garden walks, etc., and has all the variety of color of the ashlar.

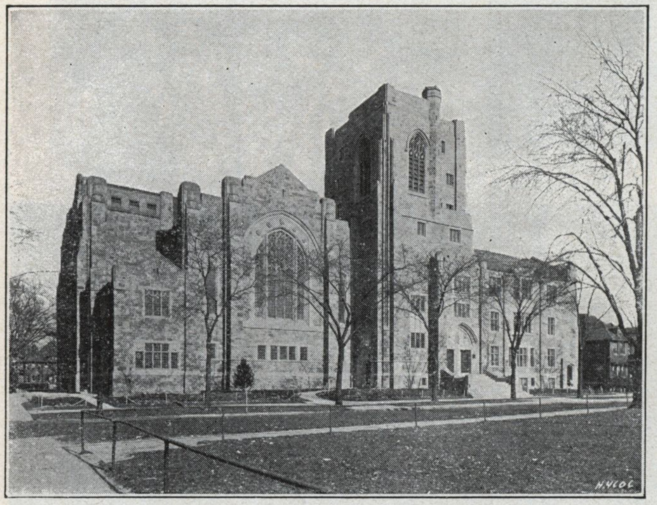
Allow at least 5 in. for bed and flagging.

Thickness and Height of Ashlar

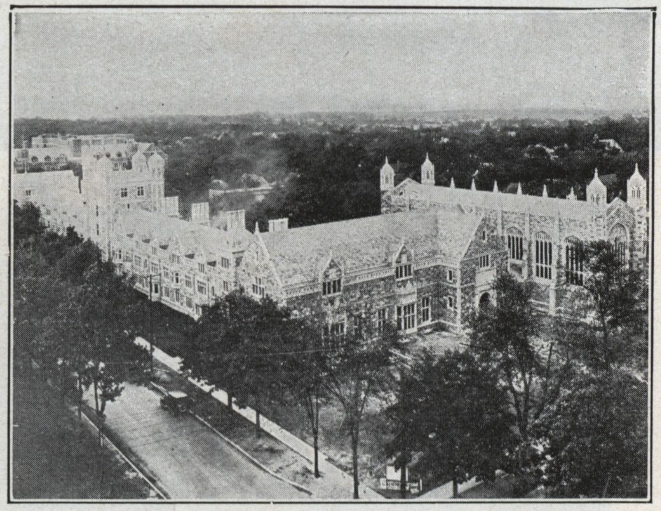
The beds of the Seam Face and Split Face ashlar are from 4 to 8 in. thick. In height it is generally used from 4 in. to 1 ft. 1 in. rises, though higher rises can be obtained, if desired, in limited quantities.

Cost of Ashlar

The method of quarrying, together with our equipment, stock and organization, enables Seam Face and Split Face to be sold cheaper than any other ashlar produced. We can even compete favorably, in most places, with local stone.



North Woodward M. E. Church, Detroit, Mich.
W. E. N. Hunter, Architect
Bryant & Detwiller, Builders

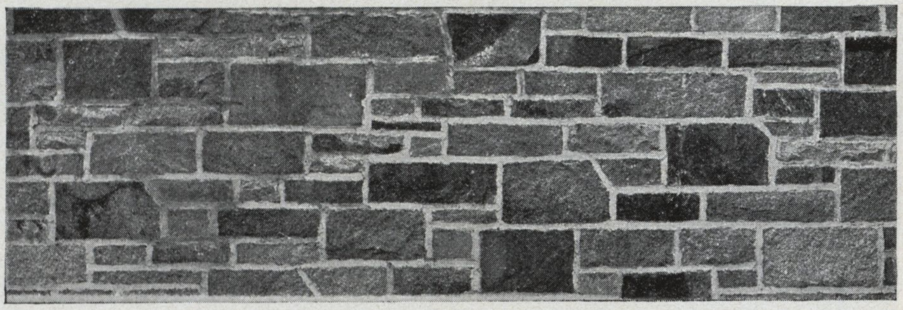


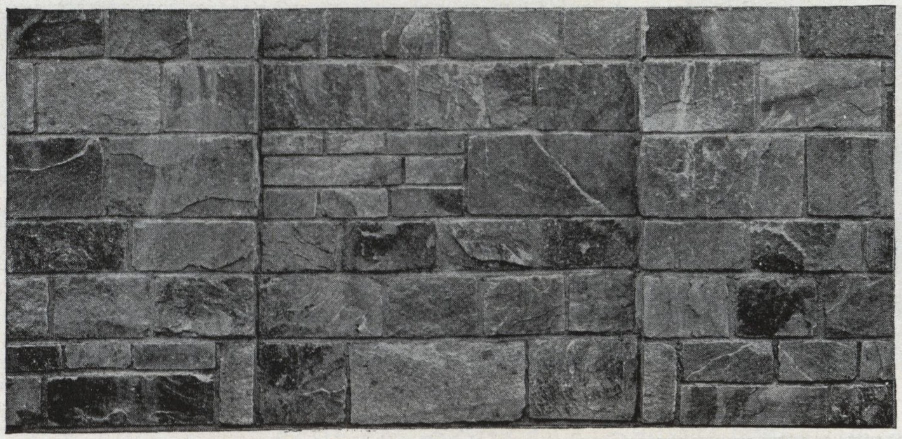
Lawyers' Club and Dormitory, Ann Arbor, Mich.
York & Sawyer, Architects
Starrett Bros., Inc., Builders
Setting of ashlar and trim by Plymouth Quarries Incorporated

Continued on next page

No. 15 Seam Face and Split Face

Three and four-head work with splay joints using about half small stones; half split face and half seam face, with a wide variety of color if desired





No. 6 Seam Face Ashlar of a Rough Face With 15% Split Face

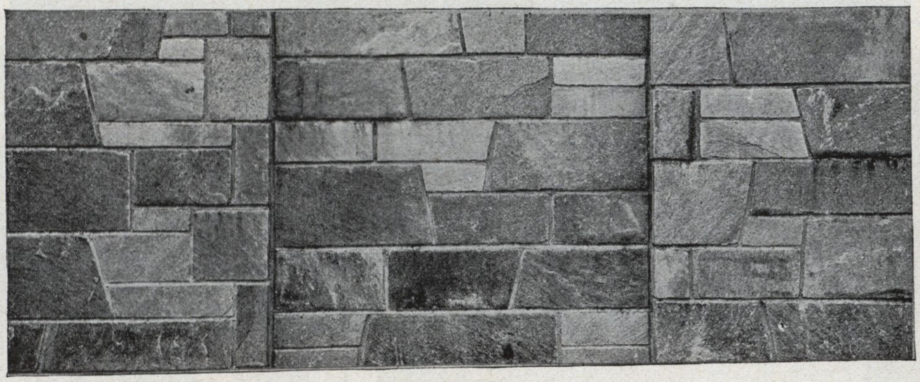
Replica of Harkness Memorial, Yale University. Interrupted courses ashlar. James Gamble Rogers, Architect.

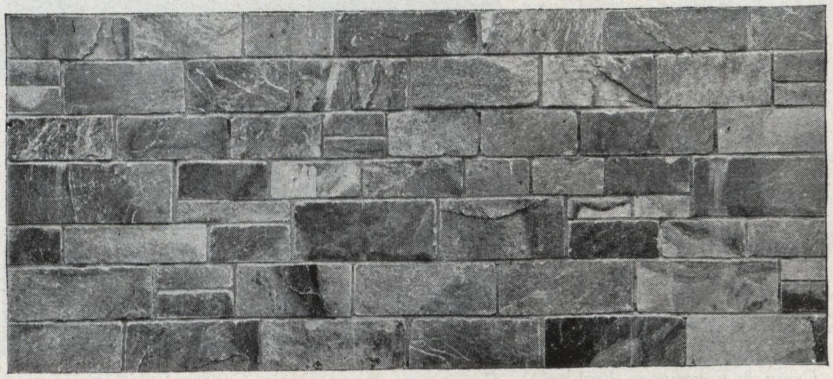
Colors: gray, tan, buff, dull purple, brown, yellow

No. 2 Seam Face Ashlar of a Very Smooth Surface

Three and four-head work with splay joint.

Colors: gray, tan, buff, dull purple, brown, yellow. Can be separated for any color scheme desired





No. 3 Coursed Ashlar with a Few Interruptions

A very wide range of color which may be restricted if desired

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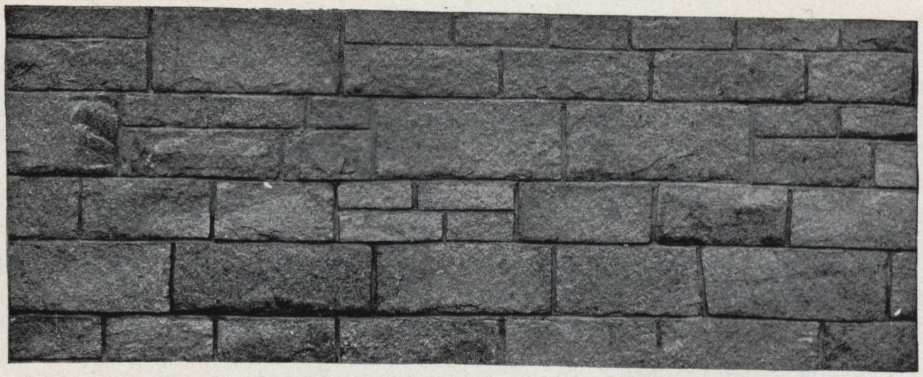
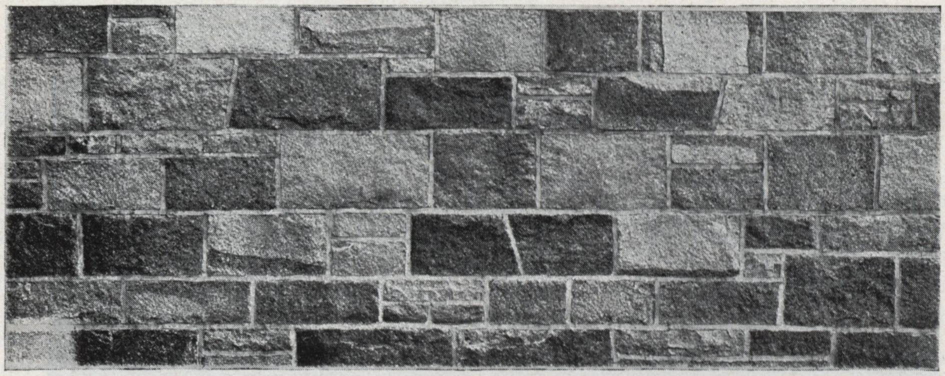


No. 5 Sappy Split Face Laid in Interrupted Courses Ashlar

Of a true surface, no projections over 1 in.

Replica of St. Vincent Ferrer Church, New York, N. Y. Bertram G. Goodhue, Architect.

Colors: Several shades of brown

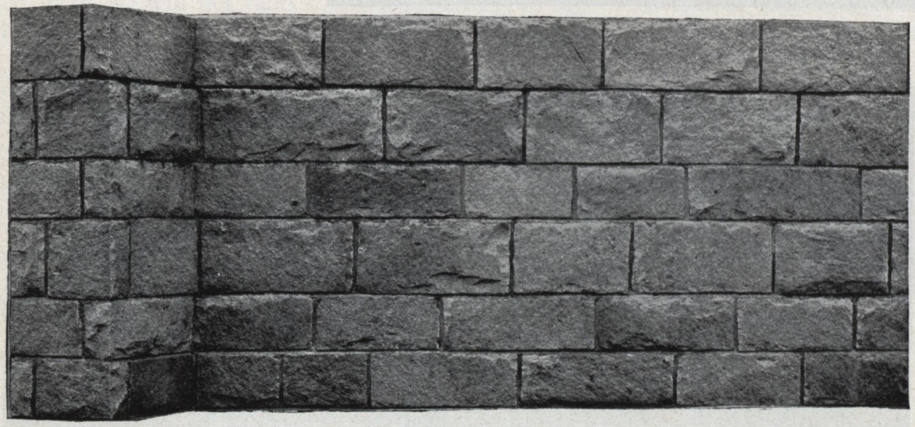


No. 7 Split Face Sappy, Gray and Sappy and Gray Mixed

Coursed with occasional interruptions. True split face, projections not over 1 in.

Replica of Church of The Sacred Heart, Jersey City, N. J., Cram & Ferguson, Architects.

Colors: Gray and several shades of brown



No. 10 Split Face in Varied Courses of a Rough Texture

Projections to 1½ in.

Colors: gray and various shades of brown

References

The following are a few of the buildings where our material has been used:

Harkness Quadrangle, Yale University, New Haven, Conn., James Gamble Rogers, Architect

Lawyers' Club and Dormitory, Ann Arbor, Mich., York & Sawyer, Architects

Jefferson Avenue Presbyterian Church, Detroit, Mich., Smith, Hinchman & Grylls, Architects

Swedenborgian Church, Bryn Athyn, Pa., Bryn Athyn Studio, Architects

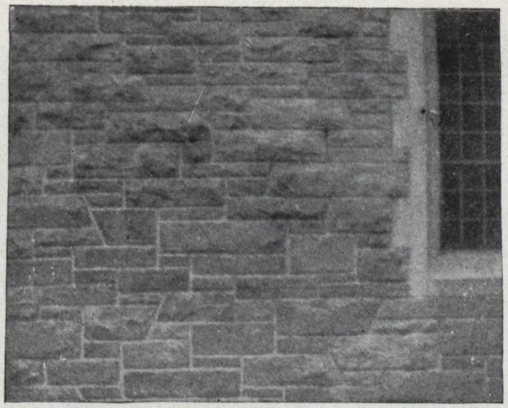
Temple Beth-El of Borough Park, Brooklyn, N. Y., Shampan & Shampan, Architects

Sacred Heart Church, Jersey City, N. J., Cram & Ferguson, Architects

Mercersburg Chapel, Mercersburg, Pa., Cram & Ferguson, Architects

Trinity M. E. Church, Durham, N. C., Cram & Ferguson, Architects

Phelps Association Building, Yale University, New Haven, Conn., Bertram Grosvenor Goodhue, Architect



Split and Rock Face, Colors Gray to Sappy, Three and Four-head Work with Splay Joints

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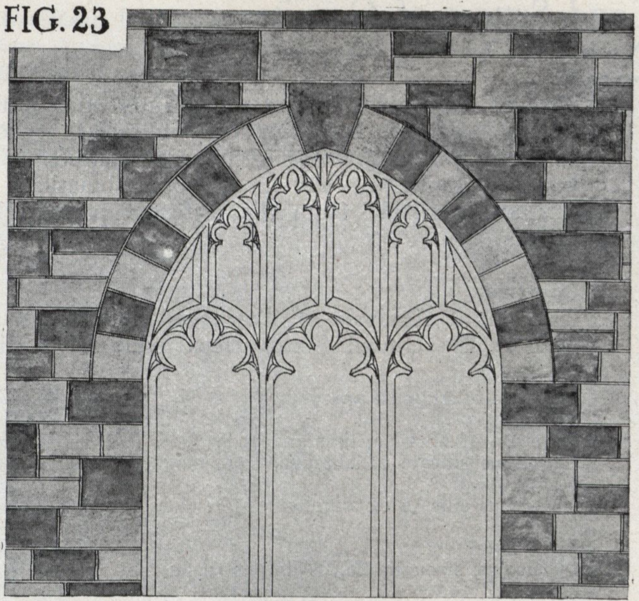
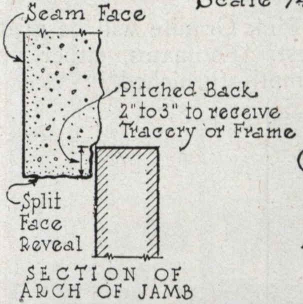
FIG. 23

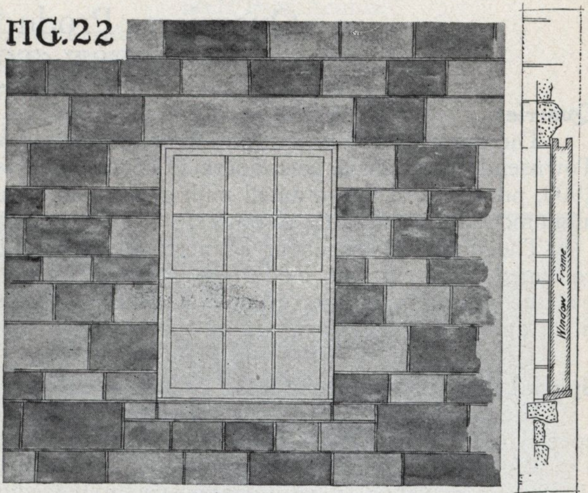


Scale 1/4" equals 1 Ft.

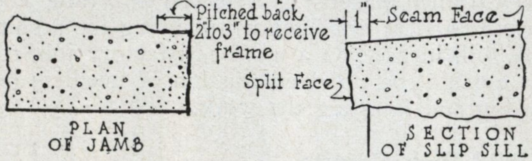

Seam Face
Pitched Back 2" to 3" to receive Tracery or Frame
Split Face Reveal
SECTION OF ARCH OF JAMB

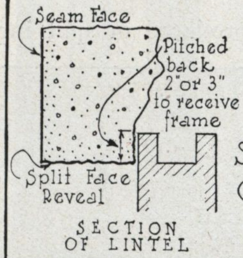
SHOWING USE OF PLYMOUTH SEAM GRANITE FOR JAMBS AND ARCHES. ASHLAR COURSES OF VARIOUS RISES

FIG. 22


Window Frame

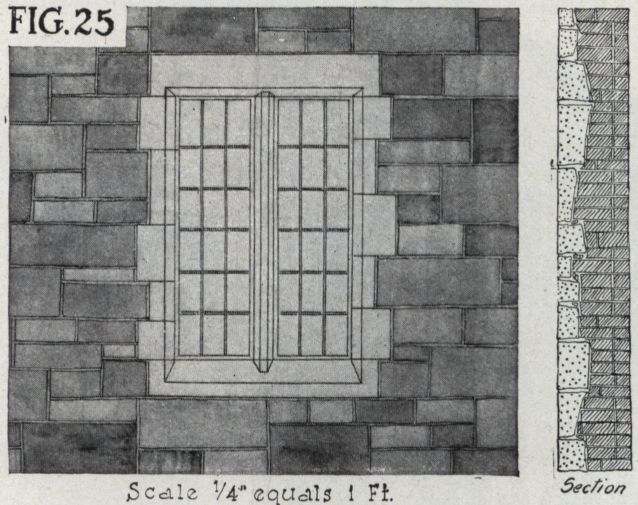
Scale 1/4" equals 1 Ft.


Pitched back 2 to 3" to receive frame
PLAN OF JAMB
1"
Seam Face
Split Face
SECTION OF SLIP SILL


Seam Face
Pitched back 2" or 3" to receive frame
Split Face Reveal
SECTION OF LINTEL

SHOWING USE OF PLYMOUTH SEAM FACE GRANITE FOR SILLS JAMBS & LINTELS. COURSES OF VARIOUS RISES

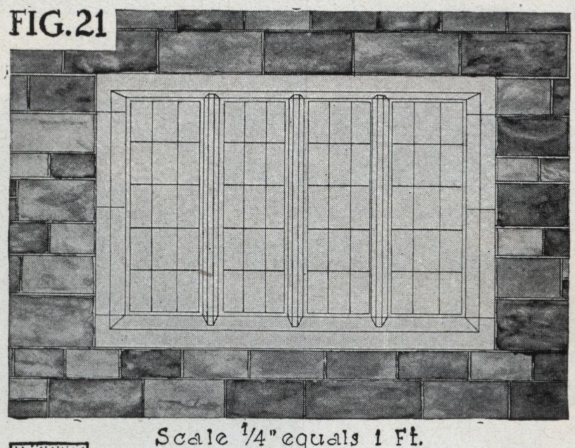
FIG. 25



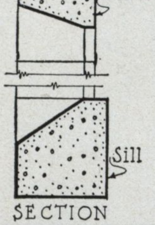
Scale 1/4" equals 1 Ft.

SHOWING USE OF PLYMOUTH SEAM FACE GRANITE FOR THREE AND FOUR HEAD WORK BEDS FROM 4 IN. TO 8 IN. - NOT 4 IN. AND 8 IN.

FIG. 21



Scale 1/4" equals 1 Ft.


Lintel
Sill
SECTION

TYPE OF CUT STONE TRIM SOMETIMES USED WITH PLYMOUTH SEAM FACED GRANITE. COURSES OF VARIOUS RISES

PLYMOUTH QUARRIES INCORPORATED	VARIOUS TREATMENTS OF WINDOWS IN WALLS OF PLYMOUTH QUARRIES SEAM & SPLIT FACE ASHLAR	SCALE 1/4, 3/4 & 3/8 IN. = 1 FT. DATE AUG. 24	DRWG 1

DUNCAN RUSK CORP.

Quarriers, Producers and Setters of Granite

WEST TOWNSEND, MASS.

Quarries

The quarries of the DUNCAN RUSK CORP., in West Townsend, Mass., have been operated continuously since 1900, producing a fine grained pink granite suitable for monumental and building purposes.

The quarries are about 85 acres in area and are equipped with efficient modern machinery for getting out the granite. Orders of any size can be promptly filled and shipped to any part of the country.

Special Service for Architects

We are equipped to serve architects who desire special designs and color combinations in granite.

We not only furnish the granite but, where desired, the necessary labor to set it anywhere in the country. Our well trained masons, experienced in setting Townsend granite and in intelligently following the architect's designs, will insure you a more satisfactory job, reduction in outside costs and elimination of needless delays in starting and finishing the work.

Townsend Pink Granite

Townsend Pink Granite is produced in split face ashlar and seam face. It is a warm, interesting granite especially adapted for churches, libraries, schools, banks, etc., where granites of unusual distinction and effects are desirable. Various color combinations and grains are available from the different parts of the quarries.

Properties

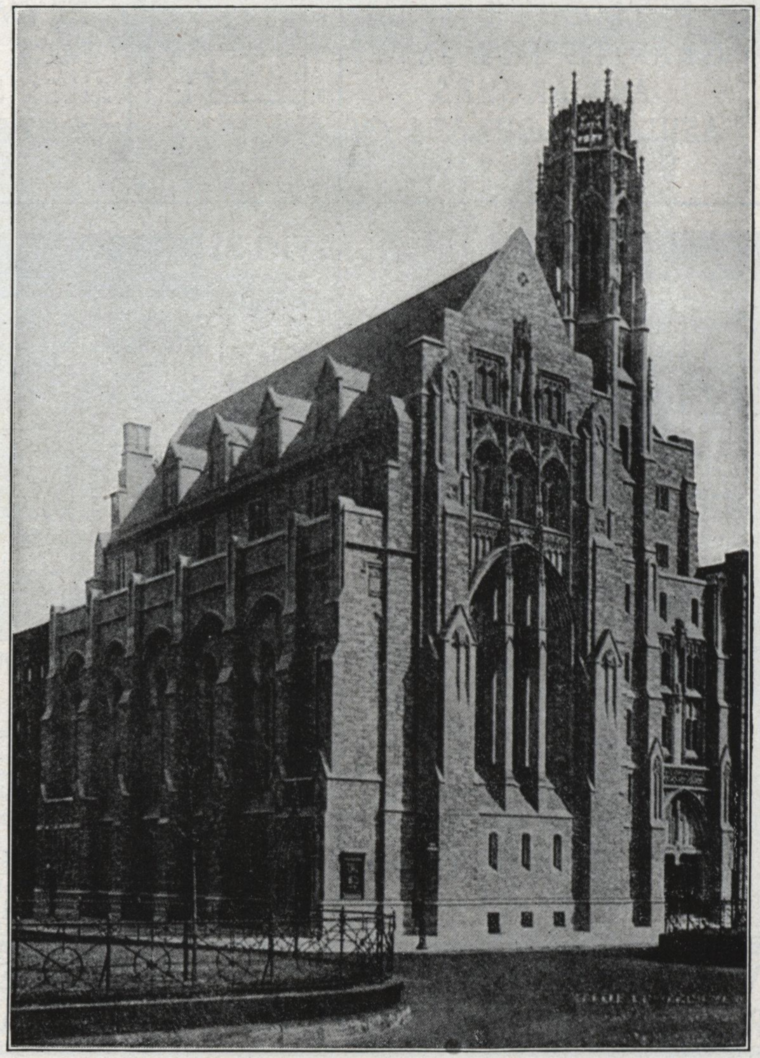
Chemical Analysis of Townsend Granite as furnished by the United States Department of Agriculture.

Silicate of alumina and potash	45.6%
Silica	24.0%
Silicate of alumina, lime and soda	16.0%
Hydrous silicate of alumina, iron, magnesia and potash	7.4%
Hydrous silicate of alumina	7.0%
Total	100.0%

Crushing strength, 25,500 lb. per sq. in.

Samples and Estimates

Samples of Townsend Pink Granite will be gladly sent to architects on request. Estimates, either preliminary or final, will be promptly furnished.



Park Avenue Baptist Church, New York, N. Y.
ALLEN & COLLENS, Architects

Continued on next page

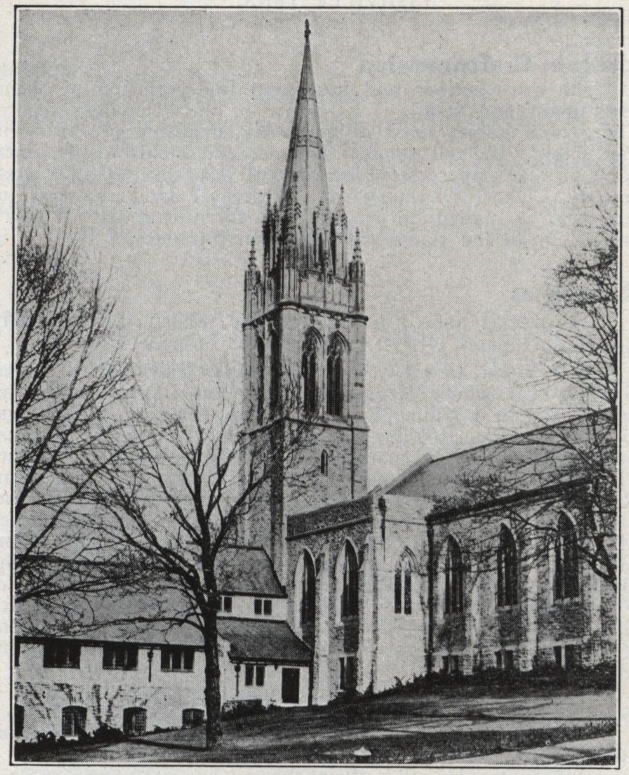
A Partial List of Buildings in Which Townsend Granite Was Used

Cut Granite

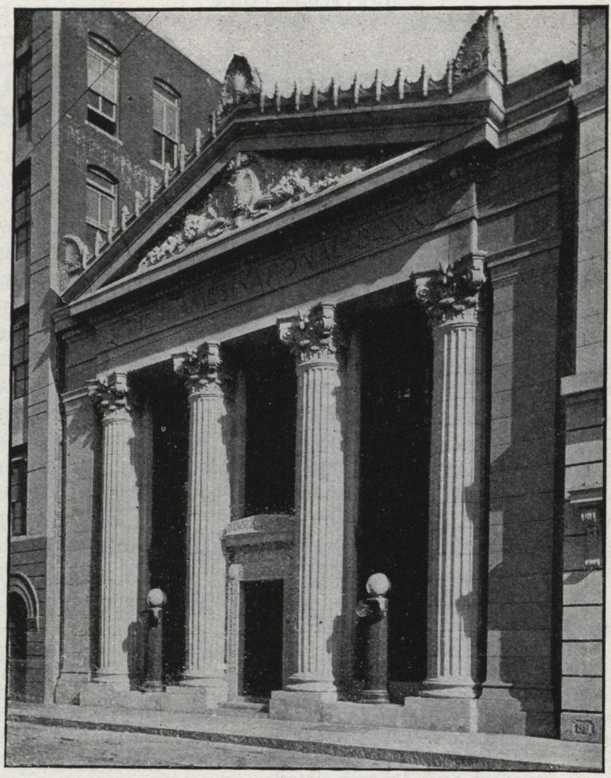
- Massachusetts Institute of Technology Group, Cambridge, Mass.
- Thames National Bank Building, Norwich, Conn.
- Post Office, Rumford, Me.
- Teachers College Library, New York, N. Y.
- Paterson High School, Paterson, N. J.
- Stuyvesant Monument, Jersey City, N. J.

Split Face Ashlar

- Methodist Episcopal Church, Upper Montclair, N. J.
- St. Paul's Church, Newburyport, Mass.
- Tabernacle Church, Salem, Mass.
- Our Lady of Sorrows Church, Hartford, Conn.
- Park Avenue Baptist Church, New York, N. Y.
- Second Universalist Church, Boston, Mass.



Second Congregational Church, West Newton, Mass.
Allen & Collens, Architects



Thames National Bank, Norwich, Conn.
Rowe & Keyes, Architects

Andover Theological Seminary at Harvard University, Cambridge, Mass.
Allen & Collens, Architects

THE PRESBREY-LELAND COMPANY, INC.

Designers and Workers in Stone

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WORKS
BRATTLEBORO, VT.

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Product

Monuments, Mausoleums, Architectural Carvings in Granite, executed and erected complete in all parts of the country.

Special Service for Architects

This company maintains an extensive library of photographs illustrating monuments, mausoleums, etc., throughout the world. These photographs are mailed to architects for reference on request. Technical information and typical plans of mausoleums together with data concerning laws and regulations governing mortuary structures are also available. Estimates on preliminary and final plans are submitted promptly. Traveling experts give personal service to architects on technical problems, economical construction, etc. The company offers the experience of over a quarter century in the construction of more than 800 private mausoleums and 20,000 memorials throughout the United States.

Quarries

The Presbrey-Leland quarries at West Dummerston, Vermont produce the extraordinary white, fine grained granite known as "Dummerston." It is quarried and finished solely by this company. Recent Government tests give Dummerston Granite the highest crushing strength and lowest absorption of the non-staining white granites. It is peculiarly adapted to fine carvings and delicate detail.

Shops

Extensive works are maintained by the company at Brattleboro, Vermont. The plant is thoroughly equipped with the latest labor saving machinery and is under the direct supervision of a vice-president. Skilled workers in stone and carvers long connected with the organization pursue their craft in ideal surroundings where every device to protect health and to promote efficiency has been perfected.

Employees share in the earnings of the company. Supplementary shops are maintained by the company at Valhalla, N. Y., Nashville, Tenn., and Woodlawn, N. Y.

Construction Equipment

The company contracts to manufacture and erect work complete, thus insuring economy and constant supervision. Replete equipment for construction work is maintained at convenient points in the East, South and West.

Expert granite and marble setting crews are retained in the exclusive employ of the company.

Ideals in Craftsmanship

The conscientious and intelligent interpretation of architects' plans and details is a feature of the company's record. There is a unique spirit of good craftsmanship prevailing in the Presbrey-Leland shops. The art and ideals of the company are best appreciated by careful inspection of the work erected. The "Directory of Presbrey-Leland Patrons in America" is mailed on request. It contains a list of work erected in all the states and 7 foreign countries.

References

A partial list of architects for whom the company has done work:

New York—Lewis Colt Albro, Henry Bacon, T. E. Blake, G. A. & H. Boehm; Wells Bosworth; Wm. Lawrence Bottomley; Buchman & Kahn; Butler & Corse; Carrère & Hastings; Cameron Clark; Robbins L. Conn; Crow, Lewis & Wickenhoefer; Victor E. Freeman; Alfred Freeman; Fred D. Gardner (Brooklyn); Julius Gregory; Hiss & Weeks; L. C. Holden; R. M. Hood; Hopkins & McEntee; Hunt & Hunt; Harry Allan Jacobs; Charles N. Kent; Beverly S. King; H. VanBuren Magenigle; Herbert R. Mainzer; Howard Major; James Layng Mills; Kenneth B. Murchison; Necarsulmer & Lehlbach; John B. Peterkin; J. H. Phillips; Charles A. Platt; Lovett Rile; Frank A. Rooke; Ross & McNeil; Edward L. Shire; Frederick Smith; W. L. Smith; B. E. Stern; Stoughton & Stoughton; Taylor & Levi; Treanor & Fation; Trowbridge & Livingston; Walker & Gillette.

Newark—Henry Baechlin, Nathan Byers; J. O'Rourke & Sons; John A. Waferling.

Chicago—Chiles & Smith; Zachary T. Davis; Graham, Burnham & Co.

Richmond—H. T. Barnham.

Cincinnati—Louis Belmont, Starrett & VanVleck.

Wilkes-Barre — Thomas A. Foster.

Pittsfield — Harding & Seaver.

Hazleton — Peter B. Sheridan.

Omaha — Thomas R. Kimball.

Jersey City—Wm. Neumann.

Columbus—Frank L. Packard.

Boston—Wm. H. Punchard.

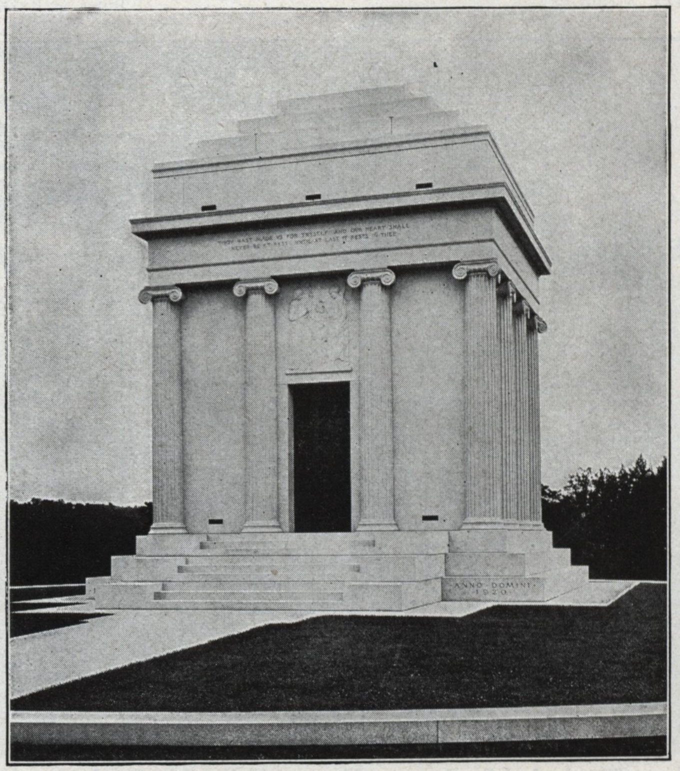
Union, N. J.—Alex C. Schoen.

Philadelphia—Edgar V. Seeler, John T. Windrim.

Pittsburgh — Louis Stevens.

Sculptors—Robert Aitken; John J. Boyle; Daniel Chester French; Charles Keck; Evelyn Beatrice Longman; O. Maldarelli; W. Frank Purdy; Frederick C. R. Roth; Edward V. Valentine.

Contractors — William Crawford, New York, N. Y.; Doyle & Co., Philadelphia, Pa.; Hedden Construction Co., New York, N. Y.; John McKeefrey, Inc., New York, N. Y.; F. H. Ogden Co., Newark, N. J.; George A. Shedden Co., New York, N. Y.



William Rockefeller Mausoleum, Tarrytown, N. Y.
Welles Bosworth, Architect
Executed and erected by the Presbrey-Leland Co.

THE CENTRAL OOLITIC STONE CO.

Indiana Limestone

TELEPHONES
LAWNDALE 8940, 5490

CHICAGO OFFICE
2120-2140 South Kedzie Avenue
CHICAGO, ILL.
MILL: BLOOMINGTON, IND.

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LIMESTONE
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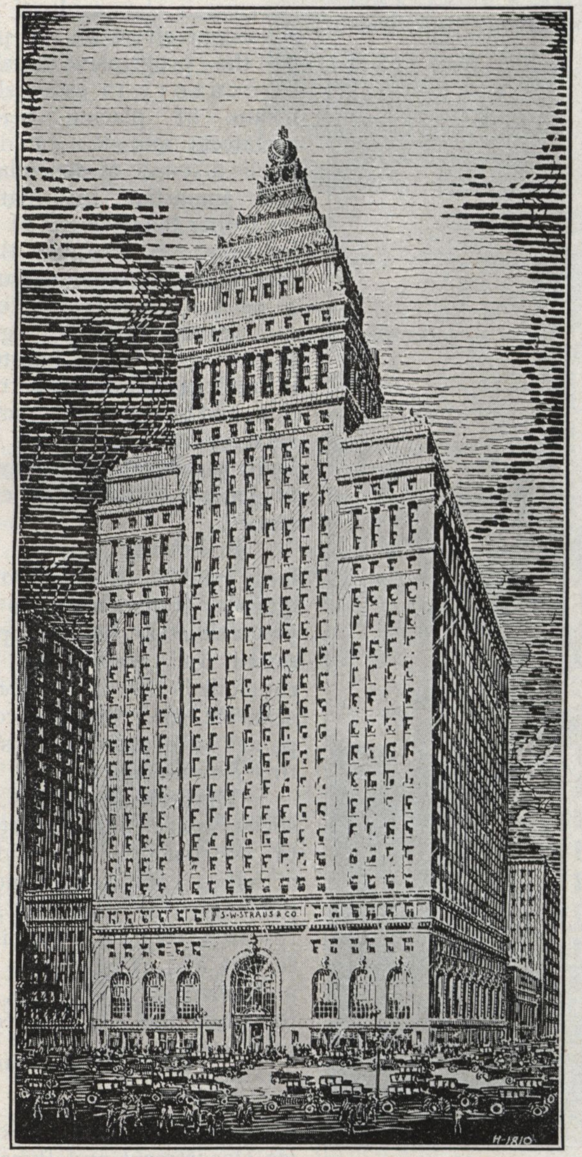
The NATION'S BUILDING STONE
TRADE-MARK

Products

Selected, Standard and Rustic Grades of Buff, Gray and Variegated INDIANA LIMESTONE in the Rough Block, Sawed, Planed, Turned or Cut ready to set in the wall, supplied from any of the well-known quarries in the district.

Facilities

Our mill, located in the heart of the Indiana Limestone district, modernly equipped with electrically operated machinery of the latest approved type, offers excellent facilities for the prompt and efficient execution of contracts of any size.



S. W. STRAUS BUILDING, CHICAGO, ILL.
GRAHAM, ANDERSON, PROBST & WHITE, Architects, Chicago, Ill.

Description

For complete description of the colors and grades of Indiana Limestone, refer to pages of the Indiana Limestone Quarrymen's Association.

Quality

The policy of this company is to see that no work leaves its mill not thoroughly executed in a workmanlike manner, and that the grade of stone is in accordance with the specifications and equal to approved sample submitted.

Samples

To interested parties and prospective buyers will be sent, express prepaid, on request, samples of ordinary size to any part of the United States or Canada.

Estimates

Requests for quotations on stone work are solicited and will be given prompt attention.

Co-operative Service

This company has an organization composed of men thoroughly experienced in their respective lines, and will gladly give information or render service to the architect, owner, and general contractor when called on. Prompt and satisfactory attention will be given to all inquiries and attractive quotations made at all times.

References

This company has executed the stone work for some of the prominent buildings of the country, and points with satisfaction and pride to its references. Some recently completed contracts follow:

London Guarantee & Accident Building, Chicago, Ill., Alfred S. Alschuler, Chicago, Ill., Architect
Union Trust Building, Cleveland, Ohio, Graham, Anderson, Probst & White, Chicago, Ill., Architects
S. W. Straus Building, Chicago, Ill., Graham, Anderson, Probst & White, Chicago, Ill., Architects
Woodward-Duffield Building, Detroit, Mich., Albert Kahn, Detroit, Mich., Architect
Illinois Life Insurance Building, Chicago, Ill., Holabird & Roche, Chicago, Ill., Architects
American Exchange National Bank, Dallas, Tex., Lang & Witchell, Dallas, Tex., Architects
Municipal Courthouse, Des Moines, Iowa, Keffer & Jones, Sawyer & Watrous, Kraetsch & Kraetsch, Norman T. Vorse, Associated Architects of Des Moines, Iowa
Durant Building, Detroit, Mich., 15-story Colonnade and Court Walls, General Motors Co., Owners, Albert Kahn, Detroit, Mich., Architect
First Church of Christ, Scientist, Oklahoma City, Okla., Courtland L. Butler, Tulsa, Okla., Architect
University of Michigan Hospital, Ann Arbor, Mich., Albert Kahn, Detroit, Mich., Architect
First National Bank, Detroit, Mich., Albert Kahn, Detroit, Mich., Architect

Other references gladly supplied on request.

INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION

MAIN OFFICE
P. O. Box 800, BEDFORD, INDIANA

BRANCH OFFICES IN CHARGE OF SERVICE REPRESENTATIVES AT
NEW YORK, N. Y. CHICAGO, ILL. KANSAS CITY, MO.

MEMBERS OF THE INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION

CHICAGO & BLOOMINGTON STONE CO., Bloomington, Ind.
CLEAR CREEK QUARRIES CO., Bloomington, Ind.
CONSOLIDATED STONE CO., Bedford, Ind.
CRESCENT STONE CO., Bloomington, Ind.
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FURST-KERBER CUT STONE CO., Bedford, Ind.
IMPERIAL STONE CO., Bedford, Ind.
INDIANA OOLITIC LIMESTONE CO., Bloomington, Ind.
INDIANAPOLIS OOLITIC STONE CO., Stinesville, Ind.
INDIANA QUARRIES CO., Bedford, Ind.
J. HOADLEY & SONS CO., Bloomington, Ind.
MATHERS STONE COMPANY, Bloomington, Ind.
MONROE COUNTY OOLITIC STONE CO., Bloomington, Ind.
NATIONAL STONE CO., Bloomington, Ind.
PERRY STONE CO., Ellettsville, Ind.
REED-POWERS CUT STONE CO., Bedford, Ind.
SHAWNEE STONE CO., Bloomington, Ind.
SHEA & DONNELLY CO., Bedford, Ind.
STAR STONE CO., Bloomington, Ind.
W. McMILLAN & SON, Bedford, Ind.

Product

INDIANA LIMESTONE (often called "Bedford Stone").

GRAY (or Blue), BUFF and VARIEGATED (or Mixed); also certain other special varieties, including "OLD GOTHIC" a grade showing interesting texture and color-tone variations; also the rough SAWED-FOUR-SIDE INDIANA LIMESTONE of Short-length stock for Random Ashlar and other informal types of Ashlar facing for moderate cost buildings.

Cost

The cost of this material compared with substitute products is always such as to make it economically available for use in all classes of buildings—especially store fronts and small commercial buildings, schools and institutional work—as well as for the larger and more monumental work for which a natural stone is always used. The rough sawed strip stone makes the product suitable for use in decidedly moderate cost residences.

Association Service

Architects and builders are cordially requested to make free use of the Service Department and Bureaus of the Association as a source of reliable information regarding the industry's products and for assistance on any problems pertaining to structural design and use of Indiana Limestone in building construction.

BUILD THE NATION SECURELY WITH
INDIANA LIMESTONE
The NATION'S BUILDING STONE

Standard Oil Building, New York, N. Y.
CARRERE & HASTINGS and SHREVE, LAMB & BLAKE, Associate Architects

The Quarrymen's Association

The INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION is the result of the consistent effort on the part of the progressive quarry operators to establish a means of placing before architects and the building public a source of dependable and impartial information regarding the products of the industry; to promote their proper and economical use; to render assistance on technical problems pertaining to the use of Indiana Limestone in modern building construction, and to render such other services to the users of Indiana Limestone as may be of general benefit to all concerned.

Practically all of the long established and proved quarries from which this dependable stone has been produced for generations are controlled by the *twenty* separate and distinct companies who are members of this Association.

The activities of this Association are confined largely to constructive educational activities, comprising general publicity, investigation and research work, technical service and assistance to the architectural profession, to the trade and others directly interested in the use of the product.

For this purpose the Technical Division, Service Department and Bureaus are maintained.

Continued on next page

Colors and Textures

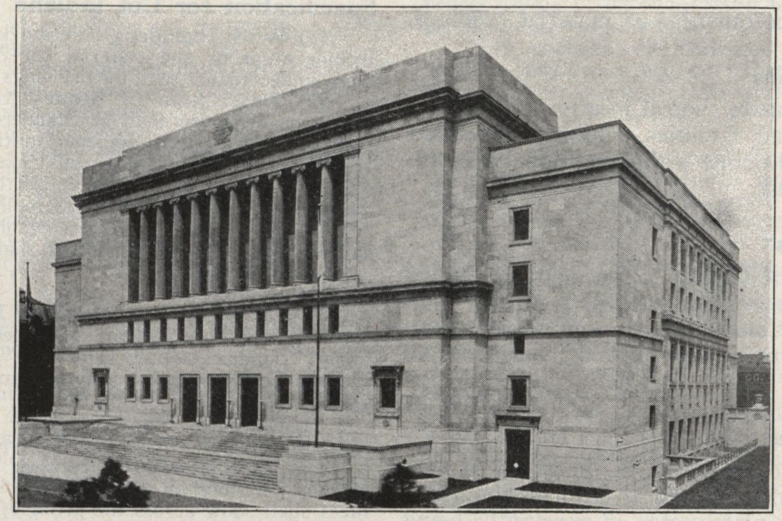
Gray, often called "blue" by the trade, is a silvery gray stone, with a slightly bluish cast. The gray stone is available in both light and medium dark shades.

Buff varies from a very light creamy buff or buff-gray-white to a distinct gray-buff.

Both buff and gray vary somewhat in shade, but in general are fairly represented by these color designations which have been long in use and are now universally recognized.

Variegated (often called "mixed") which occurs in the quarries at the junction of the buff and the gray stone is an irregular mixture of the two, consisting in the finished work of both gray and buff stone, with some stone containing both color-tones on the one piece, but is without cleavage plane. It is in great demand for "textured" walls or the effect of maturity in new buildings, and for producing an informal homelike atmosphere in dwellings.

The gray is specially suitable for both the more important monumental work and the average run of commercial work. The buff has always been extensively used for all purposes, and, on account of its tone, is generally preferred for interior work.



Scottish Rite Cathedral, St. Louis, Mo.
Wm. B. Ittner, Architect
Fine example of simple treatment of wall surfaces in large monumental buildings

In addition to the classification by color-tone the stone is further classified by texture, as follows:

Select—Uniform fine grain; most suitable for carving, interior and special work. It is of a finer texture than generally required for average exterior work.

Standard—The grade most frequently used for exterior work, both plain and monumental, and for all general purposes, including trim. It has a somewhat wider range of texture and color-tone than "Select." This grade is always furnished unless another grade is clearly specified.

Rustic—(Buff usually). Distinctly variable in texture and less uniform in color than the "Standard" variety. Specially suitable for use where antique or rustic effects are wanted and for residences and other buildings where the effect is more dependent on texture and tone of the wall surfaces than on carving and tooled work. Also used very extensively for heavy cornices and other work placed at some elevation above the eye.

This grade costs more to cut and should not be specified where fine detail is required. A sawed finish is best with Rustic.

Ease of Working

No other commercial stone is so easily worked as Indiana Limestone. In spite of its great strength it can be freely sawed, planed, turned and carved, and be otherwise worked by machinery as well as by hand.

Physical Characteristics

Indiana Limestone is *non-crystalline;* the aggregate filler and matrix are all pure carbonate of lime.

Chemical Analysis (Average)

Carbonate of lime	97.26%
Silica	1.69%
Iron and alumina	.49%
Magnesia	.37%
Water and loss	.19%
	100.00%

It is not a hard or brittle stone, and can be cut with equal ease in any direction. For all practical purposes it is considered a free stone, having no evidence of cleavage plane. It possesses far greater strength than required for any ordinary building purpose, the seasoned stone having an average crushing strength around 8000 lb. per sq. in., and a remarkably uniform modulus of rupture value, whether tested parallel to or at an angle with the grain, making it safe for long lintels, etc. It is unnecessary to set this stone on its natural quarry bed.

Indiana Limestone is to all intents and purposes fireproof. It calcines above 1500° F. and will not spall, crumble, split nor check at temperatures up to 1000° F. when drenched with cold water.

Possessing a wonderful internal elasticity, adapting itself without damage to extreme temperature changes and other conditions of permanence that exist in modern building structures, it is for this reason alone particularly well adapted to use in building masonry and as a facing material in the colder northern sections of the United States and in Canada.

Permanence

Durability and resistance to atmospheric action is proved by the exposed quarry ledges that are centuries old and by many fine existing structures of considerable age. The soft light color-tones are permanent, and no other building material remains clean so long or better resists the accumulation of grime from the smoke-laden atmosphere of manufacturing cities.

Many fine monumental and commercial buildings in the South and in Canada may be referred to as attesting the beauty, adaptability, permanence and genuine value of this fine natural building stone under varied climatic conditions.

Finishes

Any hand-tooled, machine, or sawed finish, including rubbing and honing, may be applied, except bush hammering and other so called 'hard stone" finishes which are infrequently used for special purposes.

Additional information on finishes will be found in the service publications of the Association.

Continued on next page

Organization of Industry

Indiana Limestone is found only in two counties of the state of Indiana (Lawrence and Monroe), but is produced in these counties by a number of independent quarrying concerns which are operated along thoroughly modern lines. Millions of dollars are invested in machinery, equipment, buildings, and a network of railway tracks.

The entire production operation is handled with precision and efficiency, more like large-scale manufacturing than quarrying, as quarrying is ordinarily carried on. This enables the industry to give rapid delivery and most satisfactory service, regardless of the size of any operation and the quantity of material required.

Transportation Facilities

Owing to the fortunate central location of quarries and unsurpassed railroad facilities, Indiana Limestone can be transported to all points with exceptional promptness and at minimum cost.

Distribution of Stocks

Good sized stocks of Indiana Limestone are carried by cut stone contractors in nearly all the principal cities of United States and Canada. It is a standard product available in quantity for prompt deliveries at all times.

Literature and Samples

Literature useful to architects in the form of service publications, including technical information, construction detail, service plates, etc., is constantly being prepared, and as published will be furnished gratis to those requesting it.

Samples of the stone will also be furnished to architects and others interested.

Data on setting mortars and cleaning, and other information will be furnished on request.

All architects should obtain a copy of the new Association specifications for random ashlar masonry.

Preface to Standard Form of Cut Stone Specifications for Indiana Oolitic Limestone

For the convenience of architects and others using this specification, it has been prepared and published both in loose leaf typewritten form, in folder form, and in booklet form, and *will be mailed to architects on receipt of postal request.*

In the booklet edition, the specification proper, complete for all ordinary requirements, is arranged in the most approved manner under subheadings as it appears in this publication, but is made more complete by alternate and supplementary clauses, marginal notes, and supplementary data in the form of appendices; also references to the specification clauses that should be inserted in the specifications for other trades.

The explanatory notes and descriptive data included in the appendices are intended to explain the requirements of the specification and the reasons therefor more fully than is possible in the marginal notes, and every one using the specification should have the booklet copy, and read carefully all of these references.

It is particularly important that the notes in reference to setting mortar, sand for setting and pointing mortar, flashing and calking of projecting members, detailing of stone in connection with reinforced concrete and the protection of cut stone at time of delivery, during and after erection, be carefully studied.

In addition to the standard form of specification there has been included in the booklet a short form of specification for use in connection with small jobs or whenever it is not desired to incorporate the entire specification for cut work in the general specification.

Note: It being more or less usual for cut stone to be furnished to the contractor either f.o.b. cars at destination or delivered alongside curb at the building site by trucks or teams, the specification is so arranged that either the setting only, or the delivery and setting, may be readily separated under a separate "Setting Contract."

Specification for Cut Indiana Limestone

(1) Work Included—The work under this contract shall include all labor and material for the furnishing of cut stone work in accordance with the drawings and as hereinafter specified.

(2) Description of Stone—All limestone specified or shown on drawings shall be Standard .... (Color) (Gray, Buff, and Variegated), Indiana Oolitic Limestone building stock, free from all defects that would materially impair its strength, durability or appearance, and within the range of variation of color and texture represented by two samples approved by the architect.

Specially graded stone acceptable as to hardness and color as per samples to be submitted shall be employed where indicated on drawings for .... and all other positions exposed to direct wear.

Wherever the terms "Indiana Limestone" or "Limestone" occur in this specification, they specifically refer to and shall imply "Indiana Oolitic Limestone" quarried in Lawrence or Monroe Counties, Indiana, by a member of Indiana Limestone Quarrymen's Association.

(3) Samples—The contractor shall submit to the architect, two samples which shall be typical of the extremes which the contractor proposes to furnish. Samples to be about 4 in. wide by 7 in. long by about 1 in. thick, produced so that the large faces shall show across the grain of the stone, the finish specified to be indicated on the large faces and at least two of the edges to be rock face.

Similar samples shall be provided when Select stock or specially graded hard stone is specified for certain positions in the building.

All samples shall be labeled or otherwise clearly marked with the name of the contractor submitting them, the grade of the limestone, and the statement: "Samples of Indiana Limestone to be furnished for the (   ) Building."

(4) Standard Practice—In so far as these specifications pertain to the practice set out for the proper use of Indiana Oolitic Limestone, the standards established by the Indiana Limestone Quarrymen's Association of Bedford, Ind., are to govern. Bidders not familiar with these standards are cautioned to inform themselves regarding them.

The architect reserves the right to approve the sub-contractor for cut stone before this portion of the work is awarded.

(5) Cutting and Setting Drawings—The cut stone contractor shall prepare and submit to the architect for approval complete cutting and setting drawings in triplicate for all of the Limestone work under this contract. Such drawings shall show in detail sizes, sections and dimensions of stone, the arrangement of joints and bonding, anchoring, and other necessary details.

These drawings shall be based on and follow the drawings and full size details prepared by the architect, except where it is agreed in writing that changes be made. Each stone indicated on these drawings shall bear the corresponding number marked on the back or bed with a non-staining paint.

Moulded or projecting courses, unless otherwise shown, shall have not less than four-sevenths (4/7) of their cubic contents inside the face of wall and all projecting stones (except where otherwise shown or specially anchored to the structure, and so provided for by details on setting drawings) shall have beds in the wall at least 1 in. greater in depth than their maximum projection. There shall be "through" or bond stones wherever indicated on approved stone details.

Provisions for the proper anchoring and dowelling or cramping of work in keeping with standard practices, also for the support of same by shelf angles and loose steel, etc., when required, shall be clearly indicated on the setting drawings.

(6) Details for Lintels, etc.—Lintels and architraves or other members spanning openings, whether supporting a superimposed load or only their own weight, shall be of the proportions and sectional area that will provide an ample factor of safety based on the average ultimate breaking strength of the stone.

Continued on next page

(7) Carving and Models—All carving shall be done under this contract by skilled carvers, in a correct and artistic manner, in strict accordance with the spirit and intent of the architect's sketches, or from plaster models prepared or approved by the architect.

(8) Cutting—All stone shall be cut accurately to shape and dimensions and full to the square, with jointing as shown on approved drawings. All exposed faces shall be cut true and out of wind. Beds and all joints shall be dressed straight and at right angles to the face unless otherwise shown, and, except where otherwise shown or noted on drawings, joints shall have a uniform thickness of ¼ in.

Patching or hiding of defects will not be permitted, and lewis holes shall not be made on exposed surfaces.

Washes shall be as deep as practicable, and drips of sufficient width and depth to shed water shall be provided on all projecting stones and courses.

Raglets for flashing, etc. shall be cut in the stone where so indicated on the drawings.

Moulded work shall be carefully executed from full size details supplied by the architect and must match perfectly at joints. All arrises to be sharp and true.

All columns shall be accurately cut with entasis, as shown on drawings. All pilasters *unless otherwise indicated* to be cut straight without entasis or taper.

(9) Checking Out of Backs and Fitting to Structural Frame—Stone coming in contact with structural work shall be back-checked as indicated on the general drawings. Stones resting on structural work shall have beds shaped to fit the supports.

Where stone facing adjoins steel columns and spandrel girders, the depth of stone shall be such that will allow not less than 3 in. between extreme edge of metal and the back of the stone.

(10) Finish—The finish on exposed surfaces generally shall be smooth, machine dressed, showing no tool marks.

(11) Lewis Holes and Cutting for Dowels, Anchors, Cramps, etc.—Lewis holes shall be cut in all stones weighing more than 100 lb. No lewis or other holes shall come closer than 2 in. to the exposed face of the stone.

Holes and sinkages shall be cut in stones for all anchors, cramps, dowels, etc., called for under this specification and indicated on the cutting and setting drawings.

(12) Loading and Shipment—The cut Indiana Limestone shall be carefully packed for rail or wagon transportation, with exercise of all customary practicable and reasonable precautions against damage in transit.

All cut stone under this contract shall be delivered promptly as ordered and in the sequence in which it is to be set.

(13) Field Cutting—*Specify in detail any field cutting that will be required.*

Specifications for Setting Indiana Limestone

(14) Work Included—Contractor shall refer to the preceding specification for cut Indiana Limestone for more detailed information regarding the cut stone that is to be set under this contract; also refer to "General Masonry," "Sheet Metal Work," "Roofing" and "Carpentry" specifications for reference to work that must be executed in conjunction with this work.

(15) Delivery and Storage—All Indiana Limestone delivered f.o.b. cars at destination under *another* contract shall be carefully unloaded and delivered to the building site.

Wagon or truck haul shall be handled throughout by competent workmen and by such methods as will guard against soiling, mutilation or snipping in transit to and upon delivery at the building site.

The stone shall be stored at the building site, for whatever period, on planking set so that stone will rest entirely clear of the ground, and be protected by proper means from damage to arrises and from contact with anything which would result in the accumulation of dirt, dust, soot, mud, grease or other staining or disfiguring elements. During extended periods of storage at the building site, the stone to be covered with tarpaulin, stout non-staining paper or boards.

(16) Setting Mortar—All Indiana Limestone shall be set in carefully prepared lime mortar tempered with stainless cement of an approved brand. The mixture to consist of 1 part dry hydrated lime or lump lime paste, to not over 3 parts sharp, *washed clean* sand, with the addition of stainless cement in an amount equal to 15% by volume of the lime used.

Lump lime paste shall be of best quality freshly burned lump lime slaked with cold water and screened through a $\frac{3}{16}$-in. mesh screen into a settling box, following the practice employed in preparing lime for plastering. The lime putty so prepared to stand in the settling box not less than one week and then be mixed with the sand and be properly stacked to age; the cement to be added and thoroughly worked into the mixture in small batches just prior to its use for the setting of the stone.

The sand must be *washed clean,* entirely free from silt, vegetable matter, salts and all other injurious substances, and must be screened if containing pebbles or very coarse grains that would interfere with the proper bedding and jointing of the work. The water must be clear and devoid of salts and all injurious elements.

(17) Scaffolding—All scaffolding required for the proper execution of this work will be furnished and erected by the masonry contractor for the use of all trades.

(18) Centering—All wood centering required for the proper setting of cut stone work will be furnished and erected by the carpentry contractor.

(19) Anchors and Dowels—All anchors, dowels, cramps, lewis anchors, etc., required by setting drawings or necessary for the proper erection of the work shall be of thoroughly galvanized iron. Anchors, etc., to be galvanized after they have been bent to shape.

(20) Setting Cut Stone—The Indiana Limestone shall be set in accordance with the requirements of the drawings. When ready for setting, all stone shall be washed on *all* sides by scrubbing with soap powder and water applied with fiber brushes only and be thoroughly rinsed with clean water. Immediately prior to setting, all stone shall be sponged or drenched on all sides with clean water.

The stone shall be set accurately by competent stone setters, true to line and level, with full flushed joints, filling all anchor holes. Wooden wedges may be used only where necessary to prevent the crushing of mortar under heavy blocks and shall be thoroughly soaked before use.

Heavy projecting courses shall be securely propped until mortar has set and wall above same built.

All beds and vertical joints shall be of a maximum width of ¼ in. except where otherwise indicated. Mortar shall be raked out ¾ in. from the face of the stone to allow for pointing and the stone be sponged off along all joints.

Splashing exposed faces of cut stone with mortar shall be avoided and any splashings shall be immediately removed with a sponge and clean water.

The entire backs of all stone, while wet, shall be plastered with not less than ½-in. coat of setting mortar before backing up same; and where the stone occurs as a facing applied direct to previously erected structural members, both back of stone and face of structural work shall be plastered with setting mortar to insure a thoroughly filled back joint.

The ends only of all sills shall be set in a full bed of mortar, balance of sills to be left free until pointed.

Steps shall be set with a slight pitch to the front.

All cornices, copings and projecting belt courses and all stones forming gutters, etc., shall be set with the vertical joints dry. These joints shall be calked on exposed surfaces with picked oakum and shall then be filled from above with a mortar grout. Grout shall be composed of 1 part non-staining cement and 1 part fine white sand, mixed in small quantities, stirred vigorously until used, and of a consistency as thick as can be poured into joints.

Where the Limestone extends down to the grade line of building, the first course above grade shall be placed on a layer of approved non-staining impervious material.

(21) Backing up Cut Stone—The *first course of brick* next to stone facing, shall be laid in the same kind of mortar as used by masons for setting of stone.

(22) Protection of Finished Work—Contractor setting cut stone shall co-operate with the carpentry contractor who will furnish and erect the necessary protection for sills and projecting stonework.

(23) Cleaning—The face of all stone work under this contract shall be thoroughly cleaned upon completion, this cleaning to be done with soap powder boiled in clean water and applied vigorously with stiff fiber brushes. If necessary, clean sharp fine white sand to be added to the soap and water mixture. After cleaning, all exposed surfaces of stone to be drenched with clear water.

The use of wire brushes or acids of any kind will not be permitted under any circumstances for cleaning the stone work.

(24)—Pointing—All face joints shall be brushed out clean ¾ in. in depth, carefully removing all wedges so that pointing will be continuous, and after a thorough wetting of the stone be pointed flush with mortar, consisting of 1 part stainless cement, 2 parts clean white sand and sufficient cold lime putty to make as stiff a mixture as can be worked.

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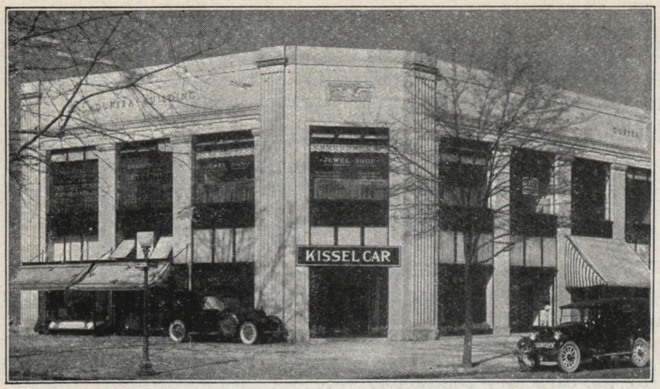


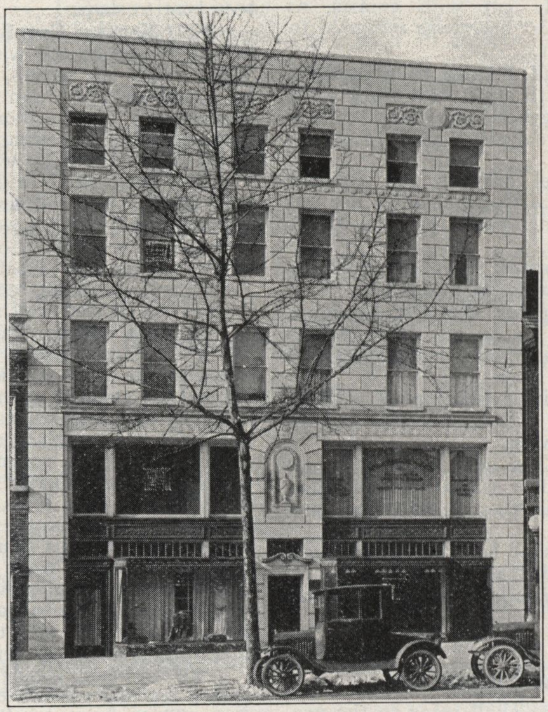
Duryea Building, Washington, D. C.
George N. Ray, Architect
Modern store building showing simple classical treatment of stone. Compare with Green Building on next page

Uses

Indiana Limestone, to the extent of many millions of cubic feet, is used each year for all classes of buildings. A large proportion of the United States Government buildings have been built of this stone.

Many of the finest office buildings, banks, stores, and other commercial structures, churches, school and college buildings, residences, apartments, as well as monumental buildings of all sorts have been built of Indiana Limestone.

It is unsurpassed as a material for residence trim, and for the trim of schools, factories and industrial buildings of all types where it is used in walls of brick or other native stone.



Abramson Building, Washington, D. C.
A. P. Clark, Jr., Architect
Modern store front showing rusticated treatment of wall without cornice

The finer grades of Indiana Limestone are much used for interior work in churches, public buildings, fine residences, etc. The fine grained buff stone, when in place, can scarcely be distinguished from the Caen stone of France; and having greater strength and durability is conceded to be its superior. The finest and most elaborate carved work, both interior and exterior, is easily, beautifully and permanently expressed in this material.

It is widely used for architectural sculpture and statuary groups, gateways, pergolas and garden ornaments with most gratifying effects. For such uses, the practically unlimited size of the perfect units which may be had is a great advantage. Monolithic columns, up to any size which can be transported, are always obtainable.

In addition to its regular use as cut stone for the various purposes already enumerated, it is also used in the rough-sawed form, for masonry facings, forming the field work of walls trimmed with cut stone, as described on the next page. An example of this class of usage in church building is illustrated at the right.

In engineering, Indiana Limestone is extensively used where an architectural effect is desired for retaining walls, piers, bridge abutments, etc., and especially for the balustrades and trim of bridges built of other masonry or of reinforced concrete.

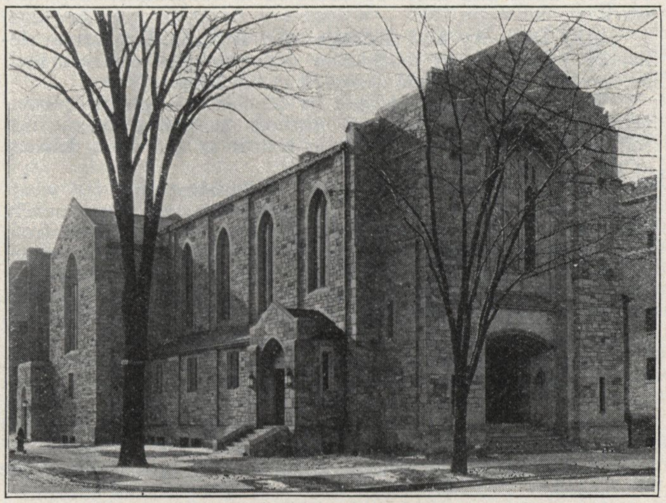
Rough-sawed Indiana Limestone

Rough-sawed Indiana Limestone in "Old Gothic" and Short-length classifications is one of the more recent developments of the product for the facing and building of moderate cost masonry walls.

The wall construction and facing schemes that are embraced within the class of random ashlar, range work, etc., as covered by this specification, are many and varied in detail and effect, and cover a wide field of usage in buildings of various types. These forms of stone wall work are especially adaptable for church, scholastic and institutional buildings of all kinds, as well as for residences, and, in fact, for all other classes of buildings for which a somewhat informal architectural style is considered most suitable.

The architect will find that these forms of construction are decidedly economical and possessed of a great many advantages that are worthy of careful study. On account of the saving in labor that is afforded by the use of material already squared to the exact height and thickness of the different units required by the particular jointing scheme adopted, this rough-sawed ashlar of limestone will frequently be found less costly and more effective in the finished building than walls built of or faced with cheap local stone; especially so, as the facing units may be dimensioned to fit and bond with the brick or tile backing units; also by reason of the easy working qualities of Indiana Limestone, which make possible the breaking and trimming of the sawed stone strips to the proper lengths at a minimum of labor cost.

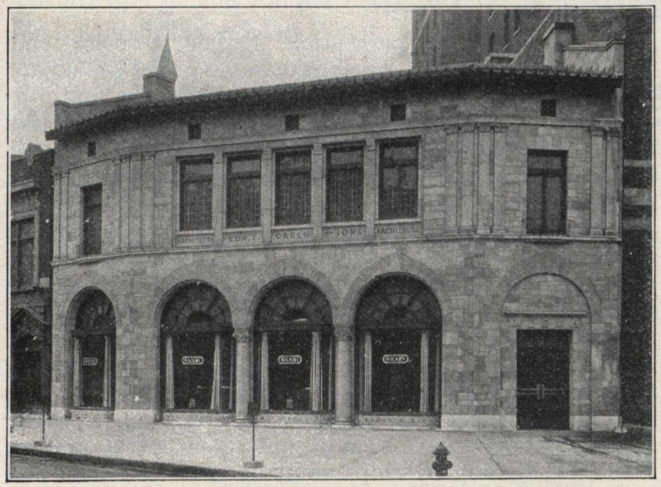
The Rough-sawed, "Old Gothic" and Short-length Indiana Limestone in strip form gives the architect a wider range of choice in the employment of stone for the facing



Redeemer Presbyterian Church, Detroit, Mich.
Geo. D. Mason & Company, Architects
Interesting example of variegated random ashlar, showing a mixture of rough-sawed and split face finish

Continued on next page

of buildings, by filling the gap that has heretofore existed between the regular cut stone ashlar, on the one hand, and the rougher types of wall such as field stone or rubble work and other forms of rock-faced masonry, on the other. It also affords a means of using stone in an economical manner for buildings of moderate cost, for which any form of "cut stone" facing, however desirable, might be considered as involving an unwarranted increase in the cost.



Green Building, Buffalo, N. Y.
E. B. Green Sons, Architects
An example of random ashlar with rough shot-sawed finish

Specification for Random Ashlar Wall Facing of either Sawed-finish "Old Gothic" or Short-length Indiana Limestone (Note A)

All exterior wall facing, except cut stone trim which is elsewhere provided for under the heading of "Cut Stone Work," shall be "Old Gothic" Indiana Limestone, laid up in random ashlar, using the stone of varying textures, sawed on four sides in the several heights required to lay up the work as indicated on the (detail) drawings, with the finish as it comes from the saw *(or the short-length stock may be specified).* (Notes B and C.)

This facing shall be bonded to the backing as shown, having at least one bonding stone 4 in. thicker than facing to each (Note D) ...... sq. ft. of wall, and the units shall be arranged to bond properly with the cut stone quoining at corners, window jambs, etc., and to fit in generally with the bonding scheme of cut stone trim throughout.

All stone for this purpose shall have faces square and be furnished in lengths of not less than 3 ft. 6 in., and shall be broken up and jointed on the job to the sizes required (Note E). All stone shall be set with level beds, shoving each block on to a full bed of mortar. End joints shall be *(vertical)* and be properly staggered, and shall be worked off square with the face of the stone (Note F). All joints shall be ...... thick (Notes G and H), weathered joints well filled with setting mortar struck full to the face of stone as the blocks are set, and each block shall be carefully backplastered with a thick coat of the same mortar as that used for setting.

All mortar droppings adhering to stone shall be immediately removed and the face of stone along all joints be sponged off clean as the work is set.

The specification for setting mortar and for backing up of stone should follow (Note I).

Explanatory Notes—

Note A—This specification should preferably be included under a separate heading of its own, as given in the opposite column, or be made a part of the general masonry specification, under a similar subheading, so as not to form a part of the Cut Stone Specification.

Note B—This Sawed-four-side, "Old Gothic" or the Short-length Indiana Limestone may also be used where a rock face random ashlar is required. In such cases, for a 4-in. thick ashlar facing, the stone would be sawed to a thickness of 10, 11, 12 in., or more, according to the amount of rock required on the face, and then be split apart on the job giving two rock faced slabs with sawed beds and backs. After the strips have been jointed off to the required lengths, the rock face is pitched off to a line parallel with the back.

Or, as an alternate, sawed slabs may be used for rock face work, involving a little more labor at the building but costing less than Sawed-four-side material f.o.b. the quarry.

Note C—Where the desired design has not been fairly well indicated on the drawings, it is advisable to add the following clause to the first paragraph:

"The length of Random Ashlar units generally shall not be less than one and one-half times their height" (except for closures and except where a long effect is desired) "nor more than three and one-half times their height."

Note D—The requirement for bond stones will vary somewhat with the ashlar design and unit height of units employed, and a small section of the wall should be carefully detailed to determine this. These units should generally be worked out in multiples of the brick or hollow tile backing units. Under usual conditions, one bond stone in from 8 to 12 sq. ft. of wall is considered sufficient.

Note E—The stone stock furnished under the Short-length classification will vary from 3 ft. 6 in. to 5 ft. 11 in. in length. Where greater length of stock is required the ashlar must be cut from full dimension quarry blocks, and the Old Gothic must be specified, as the Short-length Random Ashlar classification will not apply.

Note F—This provides for the more regular and usual form of random ashlar. Where the irregular form with the angular end joints is desired, omit the word *(vertical)* and substitute either the words *(irregular)* or *(hammer broken)*.

Note G—It is not practicable nor desirable to require joints less than ⅜ in. thick for wall facing of this rough-sawed material, and this thickness is recommended as the minimum, ½-in. joints to be specified for the ordinary run of work. For rock face work or where a rougher effect is desired, a wider joint than ½-in. joint is often preferable. For rough, irregular work, where the end joints are not vertical but are pitched off at an angle with the bed, fairly wide joints should be specified. It is not intended that the joints be raked out and pointed later but that the work be laid by masons with a full joint struck off flush, or weathered, at the time of setting.

Note H—A struck weathered joint, finished as the stone is set and requiring no pointing up later on, is specified, as it is considered the most appropriate type of mortar joint for this character of stone work.

As an alternate to this, especially when the joints are not very wide and it is considered advisable to accent them, a slightly raked out joint may be specified. For a raked joint, especially if wide, an unusually stiff mortar is sometimes necessary.

Note I—Where the use of a lime mortar is impracticable for any reason, a lime-cement or cement-lime mortar, made with a non-staining cement, should always be used.

Ordinary gray portland cement should not be used, because of its detrimental effect on any natural stone and on account of the frequently resultant staining of the limestone. Lime mortar, similar to that employed for cut stone work, is recommended for this work and for parging or immediate backing up of it, unless the uncertain and varied antique effect produced by cement staining is considered a desirable element in the design; in which case particular mention of careful backplastering in connection with the setting of all cut stone trim, should be made in the specification for that portion of the work.

Co-operative Service

For further information and data address the Association Service Department at Bedford, P. O. Box 800.

THE CONSOLIDATED STONE COMPANY

Indiana Limestone

BEDFORD, INDIANA

REPRESENTATIVES

BEDFORD, IND., E. E. Dickinson
CHICAGO, ILL., George W. Houlsby, 716 Marquette Building
CHICAGO, ILL., J. W. Ward, 716 Marquette Building
DETROIT, MICH., R. E. Farley, 421 Transportation Building
FORT WASHINGTON, PA., G. W. Muir
KANSAS CITY, MO., J. Blackburn, Pioneer Trust Building
NEW YORK, N. Y., Michael Cohen & Co., 8 W. 40th Street
PITTSBURGH, PA., Martin Brick Co., Chamber of Commerce Building
TORONTO, ONT., A. W. Steward, Builders' Exchange

Product

Indiana Limestone—in Select Gray, Standard Gray, Variegated, and Consolidated Old Gothic.

Build The Nation Securely With
INDIANA LIMESTONE
The Nation's Building Stone

Furnished in the rough blocks, semifinished, and cut ready to set in the building.

Description of Product

Full general description of Indiana Limestone and its qualities appears in pages of the Indiana Limestone Quarrymen's Association in this volume.

Gray—Consolidated Dark Hollow Gray is one of the most popular Indiana Limestones. It can be furnished in both the light and dark shades, and is of a silvery gray tone with a slightly bluish cast.

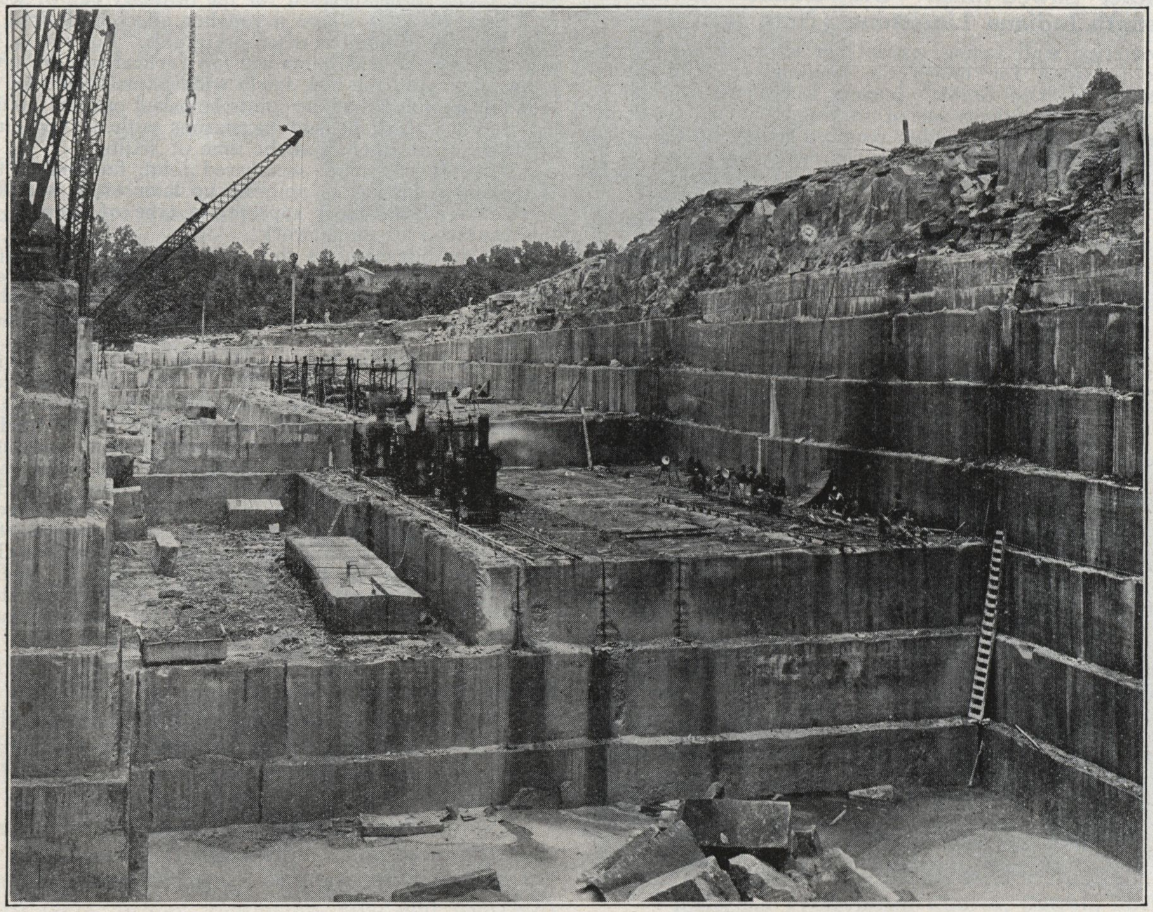
This stone lies 40 to 50 feet under the surface, the deepest in the quarry, below the line of all defects. Time and superimposed pressure have made it the hardest, most compact and finest in grain of all Indiana Limestones. With Consolidated Dark Hollow Gray fine clean lines are readily cut and permanently retained. During many years of weathering process there is no perceptible change in color-tone.

Variegated—Includes some pieces all buff, some all gray and others with both colors. Taken from the heart of the quarry, it is hard, and although varying some in texture is generally fine grained. Either light or dark shade can be furnished.

Consolidated Old Gothic—An Indiana Limestone distinguished by variety in color-tones, in texture and in markings. It ranges from exceptionally coarse to fine in grain; in color, varying shades of gray and buff. It is especially suited for veneer random ashlar walls.

Experience and Facilities

The Dark Hollow Quarries of The Consolidated Stone Company have been in continuous operation since 1871. The company ships annually over five thousand car loads of Indiana Limestone. It carries in stock one million cubic feet of stone. In addition to its quarries it operates two cut stone plants and two sawmills. For over fifty years its stone has been used in the larger monumental buildings of the United States and Canada.



Ledge at the Consolidated Dark Hollow Quarry

The largest single ledge in operation in the Limestone district, measuring 1400 feet long, 140 feet wide and 60 feet deep. This will cube 11,760,000 feet, approximately 20,000 large car loads of Indiana Limestone

ESTABLISHED 1884

J. HOADLEY & SONS CO., INC.

Cut Stone Contractors and Quarrymen of Cream Buff Indiana Limestone

BLOOMINGTON, IND.

INDIANA LIMESTONE
The NATION'S BUILDING STONE

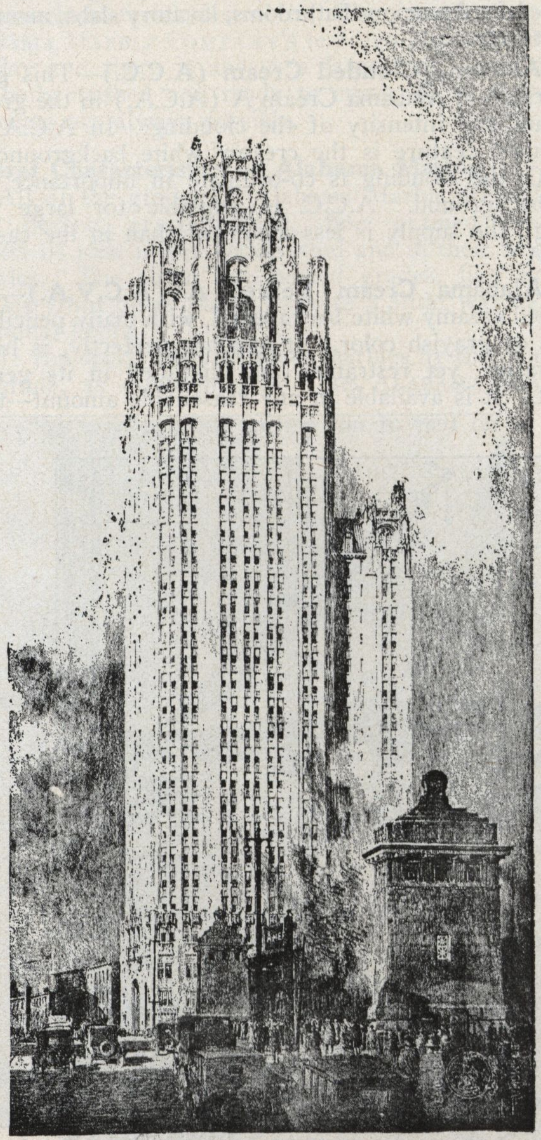
Products

CREAM BUFF INDIANA LIMESTONE: Rough Blocks, Sawn, Planed, Turned or Cut and Carved ready to set in accordance with plans and specifications.

Facilities

Our modern steam heated daylight plant, with an operating space of over two acres, has the latest improved machinery and an annual capacity of 500 carloads of cut stone. Our sawing mills have an additional capacity of 300 carloads each year.

When required, can load and unload 15 cars at different points in our plant.



Tribune Tower, Chicago, Ill.

JOHN M. HOWELLS AND RAYMOND M. HOOD, Associated Architects
HEGEMAN-HARRIS CO., INC., General Contractors
J. HOADLEY & SONS CO., INC., Bloomington, Ind., Cut Stone Contractors

Owning and operating our own quarries, which produce 25 per cent more Cream Buff Indiana Limestone than required by our finishing mills, we are assured at all times of an ample supply of raw material.

Variety of Production

We produce the following classes of Indiana Limestone:

Select Cream Buff; Standard Cream Buff; Rustic Buff and, our specialty, Special Hard Cream White. Cream Buff Limestone has a light creamy color giving it more warmth and is of uniform texture.

A choice of effects may be had with the above range in textures.

Special Hard Cream White Indiana Limestone

Produced only in the quarries of J. HOADLEY & SONS CO., INC. Is of extremely fine grain and, as the name indicates, very hard.

Having a crushing strength of over twice that of ordinary Buff Indiana Limestone and a percentage of absorption less than half, it is very hard and durable for steps, base courses, etc., or where a hard non-absorbent stone is required.

Where the available money will not permit the adoption of the more expensive marbles and granites, the use of this Super-Select Stone will be found a worthy substitute for buildings in their entirety, and at a minimum cost. Complete test data and samples will be sent on request.

Service

The services of our Drafting and Estimating Departments are at the disposal of architects and builders. Estimates and information on the use of our material gladly furnished without obligation.

Indorsement

A partial list of typical structures in which our products have been employed:

Scottish Rite Cathedral, Guthrie, Okla.
Scottish Rite Cathedral, St. Louis, Mo.
Masonic Temple, Madison, Wis.
Courthouse and Jail, Cortland, N. Y.
Kansas City Life Insurance Building, Kansas City, Mo.
Wilmington Savings Fund Society, Wilmington, Del.
Wilmington Free Library, Wilmington, Del.
Second Church of Christ, Scientist, Dayton, Ohio
Packard Office Building, Philadelphia, Pa.
St. Vibiana Cathedral, Los Angeles, Cal.
Glenn Building, Atlanta, Ga.
War Memorial, Racine, Wis.
Courthouse, Newton, N. C.
Tribune Tower, Chicago, Ill.
Montgomery Ward Memorial, Northwestern University, Chicago, Ill. (under construction)

THE ALABAMA MARBLE COMPANY

Producers of All Grades of Alabama Marble and Manufacturers and Contractors for Interior Marble Work in Any Kind of Marble

MAIN OFFICE AND PLANT
GANTT'S QUARRY, ALA.
HEADQUARTERS SALES DEPARTMENT: 1701 Avenue A, BIRMINGHAM, ALA.
Inquiries should be addressed to Sales Department, Birmingham, Ala.

Alabama Marble

The white marble deposit which runs northeast and southwest through Talladega County, Alabama, is, like all such deposits, quite variable in thickness and in quality.

At Gantt's Quarry, where the quarries of The Alabama Marble Company are located, the merchantable marble in the deposit attains an uninterrupted thickness of 120 ft., measured at right angles to the beds, and is of high average grade. It is a remarkable and probably a unique feature of these particular quarries, that fully 75% of the entire output from top to bottom of the deposit falls into one well defined grade. For a fine grained saccharoidal white marble, such as these quarries produce, this is very unusual.

The grade referred to is Alabama Cream A (A.C.A.)

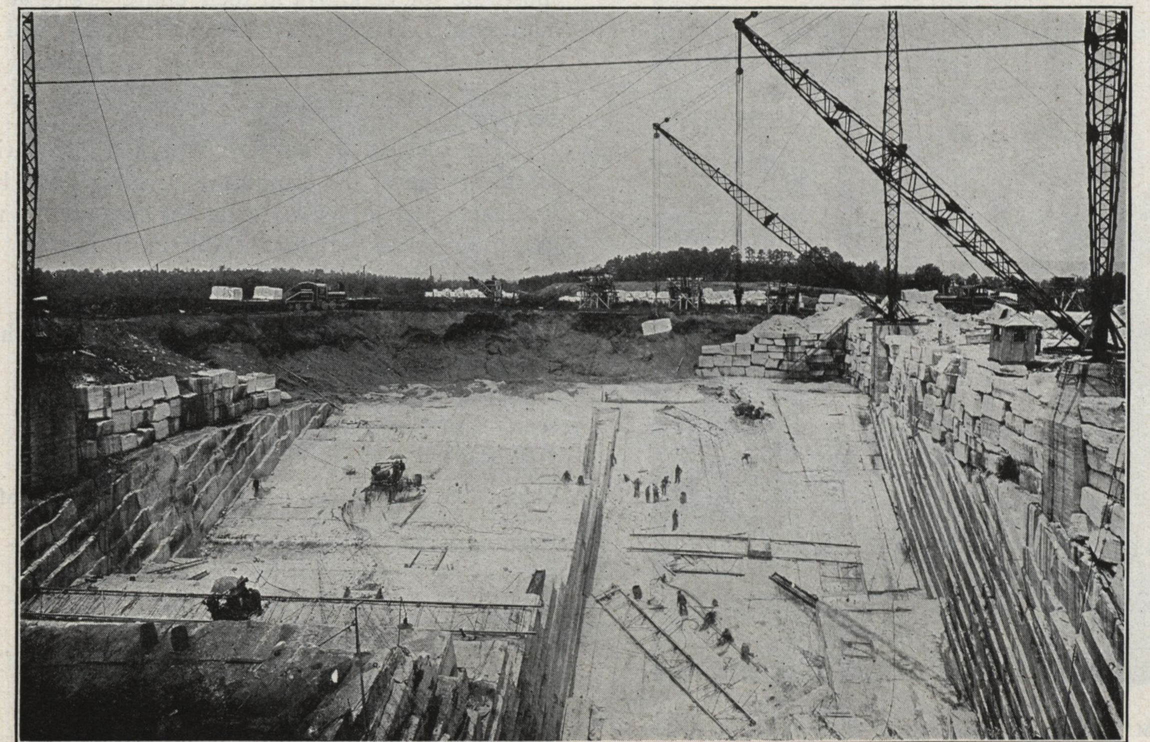
Alabama Cream A (A.C.A.)

We believe we may fairly claim this grade to be a *standard* among interior white marbles available at this time. It is fine grained, has a warm, creamy background with light to moderate clouding; carves and polishes perfectly; is impervious and non-staining, strong, elastic and hard, and extremely durable under all ordinary exposures, either interior or exterior. It is available in slabs and pieces of any size likely to be required, and in quantities sufficient for any job, however large. The great amount of marble on The Alabama Marble Company's properties, and the extensive development of their quarries insure both the *adequacy and permanence* of the supply. Moreover, The Alabama Marble Company has a record extending back many years and covering the delivery of millions of feet of marble for hundreds of buildings *without having been the cause of delay on any one of them.*

Alabama Cream Blanc P (A.C.B.P.)—Creamy white, free of any but the merest suggestion of clouding and veining. Practically a statuary marble. It is separated from other grades by sawing. It is difficult to secure in large slabs, and in thicknesses greater than twelve inches. The supply is not unlimited but is available in sufficient quantity for pilasters, bases, caps and stiles. Also for rails in large decorative schemes where a framework of white marble of the very highest grade is desired for luxurious bathrooms, lavatory slabs, memorial tablets, etc.

Alabama Clouded Cream (A.C.C.)—This grade differs from Alabama Cream A (A.C.A.) in the greater amount and intensity of the clouding. In A.C.A. the dominant feature is the creamy white background; in A.C.C. the clouding is co-ordinate in importance with the background. A.C.C. is available for large jobs, though the supply is less abundant than in the case of A.C.A.

Alabama Cream Veined A (A.C.V.A.)—Fine grained creamy white background, with many pencil-like veins of grayish color. It matches perfectly, is highly decorative, yet restrained and dignified in its general effect. It is available in any reasonable amount—there need be no fear of not getting it.



One of the Quarries of The Alabama Marble Company

Continued on next page

Alabama Pocahontas (A.P.)—Somewhat similar in veining to A.C.V.A. but the veins may be heavier; they are greenish or blackish and bordered by orange or pink clouding. A very decorative marble—quite different from any other. Available in moderate quantities. An excellent material for unique decorative effect in jobs of moderate size. Highly effective when used in panels framed in white—such as A.C.B.P.

Alabama Ivory Pavonazza (A.I.P.)—The most richly colored and marked of any Alabama Marble so far produced. The ground tone is of a creamy ivory white, with veins varying from black to greenish black and clouding of yellow, orange and pink. It matches perfectly and is an extremely rich decorative material, especially when framed in with A.C.B.P. It is available only in moderate quantities, and its occurrence in the deposit is rather erratic. When available it is a beautiful and unique material. It is one material that can not be overdone by too general use.

Alabama Terrazzo

THE ALABAMA MARBLE COMPANY is also the largest producer in the country of pure white marble terrazzo. Alabama Terrazzo is unexcelled in all the qualities which make such material desirable. The capacity of THE ALABAMA MARBLE COMPANY's terrazzo plant is 200 tons per day and there is always a large reserve of material, both crushed and ready to crush, so that prompt shipments are always possible.

General Characteristics of Alabama Marble

All of the grades of Alabama Marble are alike in their perfect crystallization, fine grained texture, warmth of tone in the background and in their working qualities. The three last named grades, like similar marbles from other places, require a little waxing and occasional liners.

If you specify any of these marbles by the name of the grade, as established by THE ALABAMA MARBLE COMPANY, you can be sure that the material you have in mind is available and can be obtained—each grade at a fair price; but in specifying a grade, use a *completed job as a standard,* not a small sample. No small sample can ever correctly represent a grade of marble to the extent of giving an accurate idea of what it will be like in a completed job. A completed job, in any of our marbles, can always be duplicated to your satisfaction.

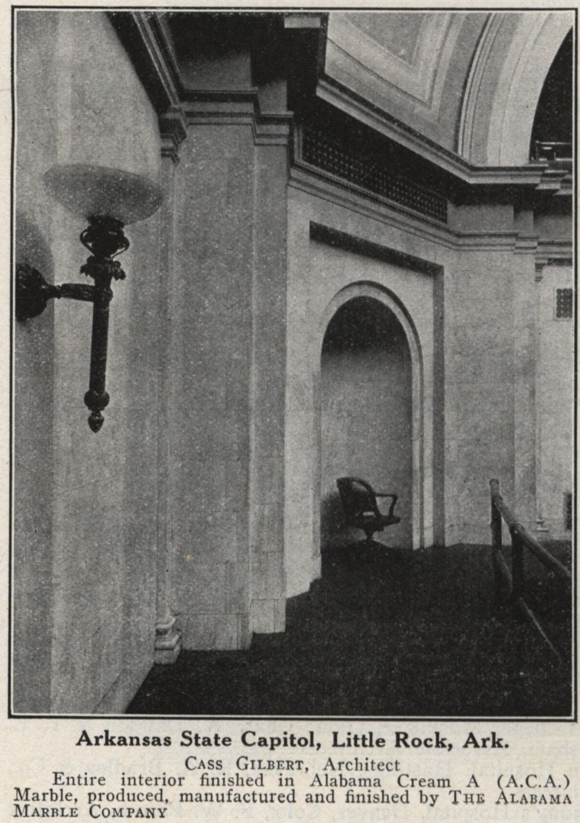
Some of the Prominent Buildings Where Alabama Marble Was Used and Their Architects

INTERIORS

David Whitney Building, Detroit, Mich., Graham, Anderson, Probst & White
Alworth Building, Duluth, Minn., Graham, Anderson, Probst & White
Straus Building, Chicago, Ill., Graham, Anderson, Probst & White
Peoples Gas Building, Chicago, Ill., Graham, Anderson, Probst & White
Continental & Commercial Bank Building, Chicago, Ill., Graham, Anderson, Probst & White
Insurance Exchange Building, Chicago, Ill., Graham, Anderson, Probst & White
Westminster Building, Chicago, Ill., Alfred S. Alschuler
United States Custom House, New York, N. Y., Cass Gilbert
Arkansas State Capitol, Little Rock, Ark., Cass Gilbert
Cleveland Discount Building, Cleveland, Ohio, Walker & Weeks
First National Bank, Youngstown, Ohio, Albert Kahn
Atlanta Biltmore Hotel, Atlanta, Ga., Shultz & Weaver
Northwestern Mutual Insurance Building, Milwaukee, Wis., Marshall & Fox
Bankers Trust Building, Philadelphia, Pa., Horace Trumbauer
William Penn Hotel, Pittsburgh, Pa., Benno Janssen
Union Arcade Building, Pittsburgh, Pa., Fred Osterling
Jefferson Standard Life Insurance Building, Greensboro, N. C., C. C. Hartman
Pike Consistory, Little Rock, Ark., Mann & Stern
Johnson Building, Charlotte, N. C., W. L. Stoddard
Packard Building, Philadelphia, Pa., Ritter & Shay
Book-Cadillac Hotel, Detroit, Mich., Louis Kamper
New Peabody Hotel, Memphis, Tenn., Walter W. Alschlager

EXTERIORS

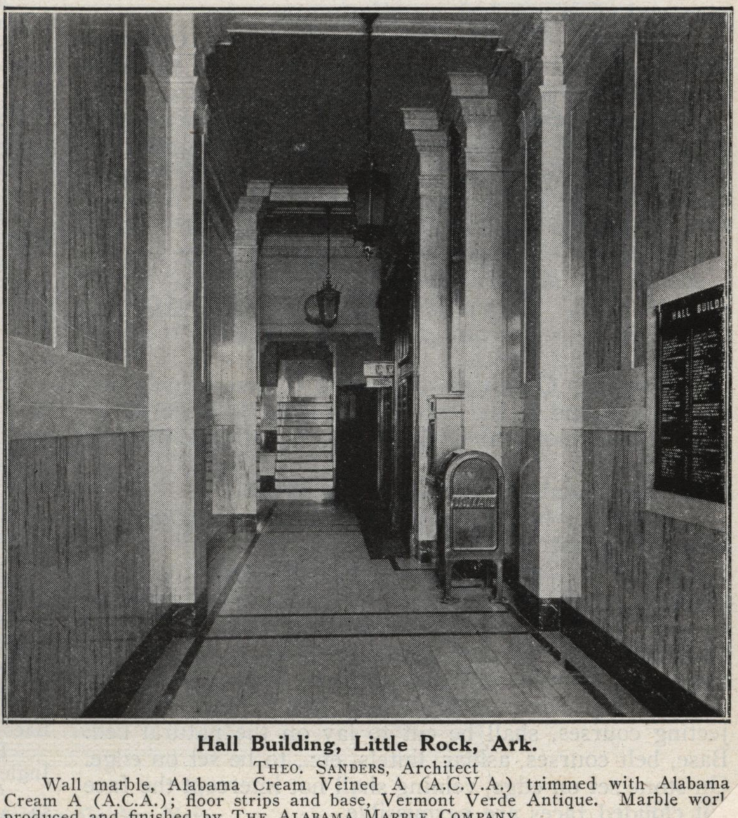
Maryland Institute, Baltimore, Md., Pell & Corbett
Connecticut Savings Bank Building, New Haven, Conn., Tracey & Swartwout



Arkansas State Capitol, Little Rock, Ark.

CASS GILBERT, Architect

Entire interior finished in Alabama Cream A (A.C.A.) Marble, produced, manufactured and finished by THE ALABAMA MARBLE COMPANY



Hall Building, Little Rock, Ark.

THEO. SANDERS, Architect

Wall marble, Alabama Cream Veined A (A.C.V.A.) trimmed with Alabama Cream A (A.C.A.); floor strips and base, Vermont Verde Antique. Marble worl produced and finished by THE ALABAMA MARBLE COMPANY.

Set in place by Southwestern Marble & Tile Co., Little Rock, Ark.

CARTHAGE MARBLE & WHITE LIME COMPANY

Producers of Imperial Gray Marble

QUARRIES AND MILLS
CARTHAGE, MO.

GRAY IMPERIAL MARBLE
CARTHAGE MARBLE & WHITE LIME CO.
TRADE-MARK

Product

Imperial Gray Marble:
Sawed, Planed, Turned and Cut Stone for interior and exterior work.

Experience and Facilities

The Carthage Marble & White Lime Company (incorporated 1884) are the pioneer quarriers of the Carthage District and have been operating quarries continuously over 42 years, furnishing stone for exterior and interior work for banks, schools, churches, public buildings and residences. Throughout the widest scope of application Imperial Gray marble has been uniformly found to give the highest degree of satisfaction.

A fully equipped quarry, sawmill and finishing plant is maintained at Carthage, Mo., for finishing of exterior and interior work.

Blocks and slabs of any reasonable size can be furnished without delay, and estimates given on finished exterior work.

Imperial Gray Marble

Of a beautiful, soft gray color that is always pleasing to the eye. When sawed with the grain as recommended, the result is often a very fine clouded effect which shows no veining, and is extremely handsome. The fossil ingredients of this stone when polished give it a surface not obtainable in any other marble. The color is such that almost any color scheme used in decorating will harmonize with the marble.

When sand rubbed, it has a pleasing white appearance, and when polished, a uniform gray color.

Analysis—Chemical analysis shows that Imperial Gray marble contains nothing which can in any way discolor it. It is 99% calcium carbonate and is free from iron.

Non-absorbent—The ratio of absorption of this stone is 45/100 of 1%. Such a quality is of great importance in both exterior and interior work, for stains that can not penetrate the marble can be easily removed from the face, a feature of great value in sanitary work.

Strength—The strength of Imperial Gray marble is such that it stands all tests subjected through various kinds of work. Its crushing strength is about 20,000 lbs. per sq. in., which is considerably more than is required in any building work.

Wearing Qualities—Exposed to every weather condition found in the extreme climates, Imperial Gray marble has demonstrated its excellent qualities admirably.

Short Specifications for Ordinary Work

Write for booklet giving full specifications and information regarding exterior work.

Exterior Specifications—All cut stone to be of properly selected Carthage building stock, as furnished by the Carthage Marble & White Lime Company, Carthage, Mo. Veining averaging ¼ in. or less, if tight and sound, is permissible anywhere in face of stone.

All steps, door and window sills, coping and projecting courses, shall be cut to lay on the natural bed. Base, belt courses, ashlar, lintels, etc., to be set on edge. On stone set on edge, veining shall not intercept the face but clouded faces are permissible.

Setting—All exterior cut stone to be set in lime mortar. No acid to be used in cleaning stonework.

Finish—On exterior work, sand rubbed finish shows up to best advantage on ordinary work, but where a special finish is wanted, rock face, bushhammer or tooled may be used.

Interior Specifications—Marble to be Imperial Gray as furnished by the Carthage Marble & White Lime Company, Carthage, Mo., sawed with the grain to show clear faces.

Finish—Susceptible to all finishes of any natural stone or marble, but polished finish is recommended for interior finish only.

Veining

Attention is called to the fact that this company can not agree to furnish Carthage marble free from veins which are characteristic of all marbles.

References

Exterior

Hospital, University of Missouri, Columbia, Mo., Jamieson & Spearl, Architects
General Hospital, University of Wisconsin, Madison, Wis., Arthur Peabody, Architect
First Liberty Savings Bank, Eagle Grove, Iowa, Thorwald Thorson, Architect
First National Bank, Las Vegas, N. M., I. H. & W. M. Rapp and A. C. Hendrickson, Architects
Courthouse and Jail, Union, Mo., N. B. Howard and Bonsack & Pearce, Associated Architects
Insurance Exchange Building, Des Moines, Iowa, Boyd & Moore, Architects
Columns and Bases, Clements Library, Ann Arbor, Mich., Albert Kahn, Architect
High School, Winnsboro, La., Neild & Olschner, Architects
First State Bank, Rochester, Minn., F. H. Ellerbe, Architect
Butler County State Bank, Eldorado, Kan., W. H. Simon, Architect
W. K. Jewett Residence, Pasadena, Cal., Marston & Van Pelt, Architects
R. M. Bennett Residence, Lake Minnetonka, Minn., Pike & Cooke, Architects
Community Mausoleum, Wellington, Kan., R. W. Shaw, Architect
Citizens National Bank, Kirksville, Mo., Irwin Dunbar, Architect.
City Hall, Lubbock, Tex., Sanguinet, Staats & Hedrick, Architects
J. P. Evans Residence, Shreveport, La., Neild & Olschner, Architects
Tristate Hotel, Memphis, Tenn., Barnett, Haynes & Barnett, Architects

Interior

Y. W. C. A., Tulsa, Okla., C. K. Birdsall, Architect
High School, Butler, Pa., W. G. Eckles, Architect
Y. M. C. A., Joplin, Mo., Smith, Rea & Lovitt, Architects
Dormitory Building, Gary, Ind., A. F. Wickes, Architect
U. S. Post Office, Raton, N. M., J. A. Wetmore, Architect
Kennedy Building, Tulsa, Okla., W. Black, Architect
Missouri Athletic Association, St. Louis, Mo., G. F. A. Brueggeman, Architect
Buder School, St. Louis, Mo., W. B. Ittner, Architect
Carved Entrance, Geo. D. Harter Bank, Canton, Ohio, Walker & Weeks, Architects
St. Mary's Hospital, St. Louis, Mo., A. B. Groves, Architect
Bacone College, Muskogee, Okla., Chas. W. Dawson & T. E. Bassham, Associate Architects
Ingleside Hospital, Hastings, Nebraska, R. A. Bradley & Co., Architects
St. Anthony's Hospital, Denver, Colo., F. W. Paroth, Architect

APPALACHIAN MARBLE CO., INC.

Quarriers and Manufacturers of Appalachian Tennessee Marbles

KNOXVILLE, TENN.

APPALACHIAN TENNESSEE MARBLE, especially for interior use, including:

Appalachian Gray. (Page A. Illustration No. 1.)

Appalachian Golden Vein. (Page A. Illustration No. 2.)

Appalachian Champion Pink. (Page B. Illustration No. 3.)

Appalachian Roseal. (Page C. Illustration No. 4.)

Appalachian Silver Gray. (Page D. Illustration No. 5.)

Appalachian Dark Chocolate. (Page D. Illustration No. 6.)

Floor Tile, Ashlar, Crushed Marble, Rubble Marble, Tennessee Granito, Foreign Marbles.

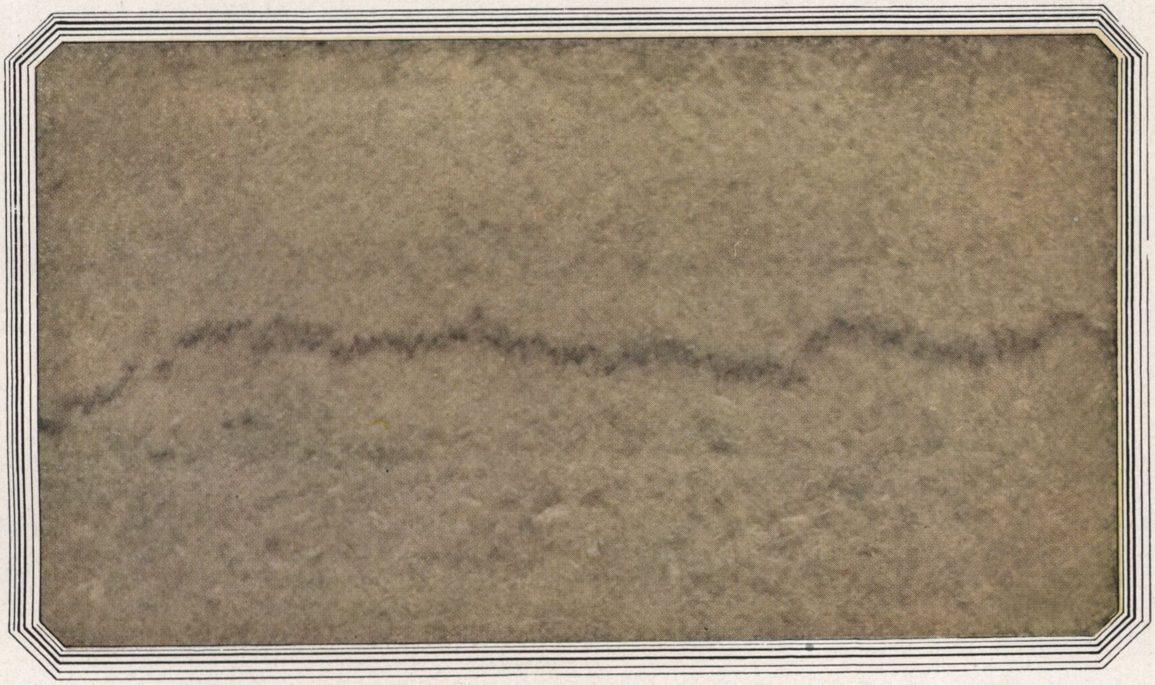


Illustration No. 1 **Appalachian Gray**

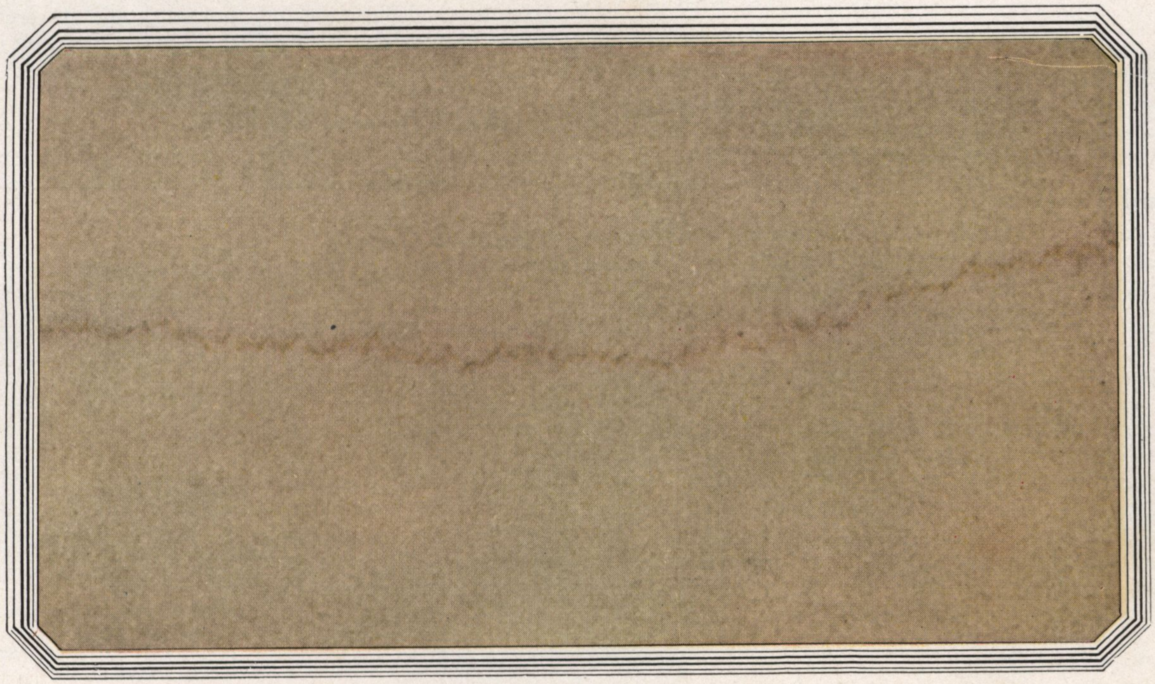


Illustration No. 2 **Appalachian Golden Vein**

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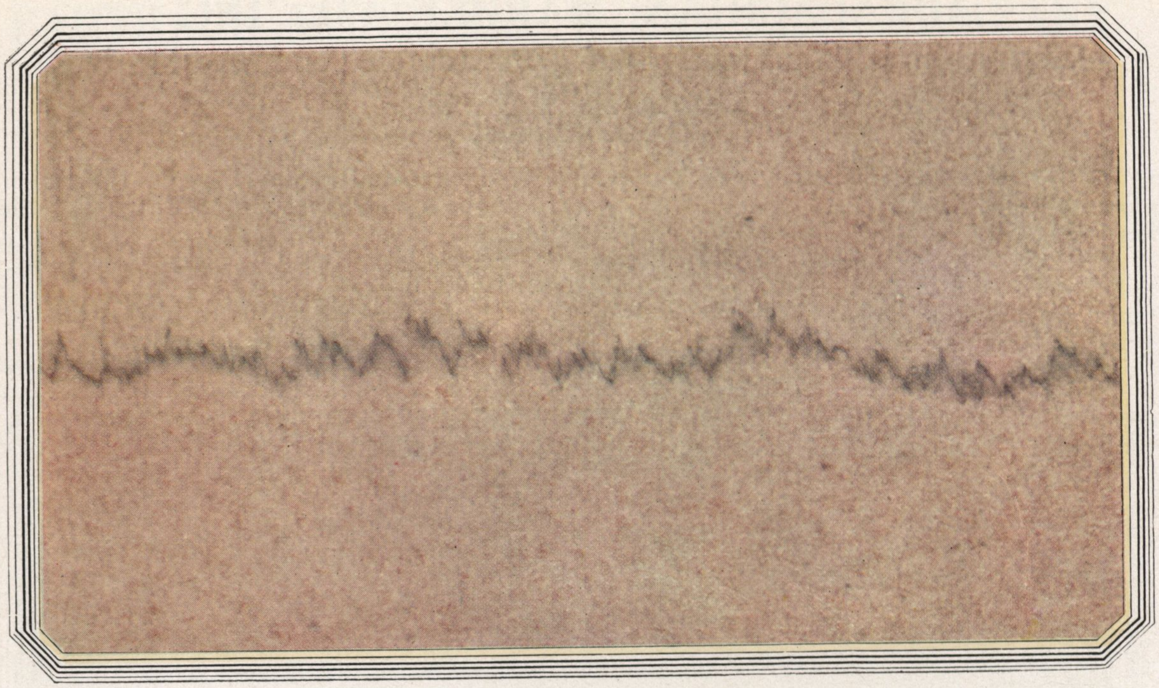

Illustration No. 3 **Appalachian Champion Pink**

Availability

All of the various Appalachian Marbles are available in practically unlimited quantities. The quarry holdings of the APPALACHIAN MARBLE CO., INC. are the largest in Tennessee.

Quality

Appalachian Marbles are non-absorbing, long wearing, strong and easily workable.

	Average
Co-efficient of absorption	.047
Tensile strength (transverse to bed)	1,554 lbs. per sq. in.
Tensile strength (with bed)	1,551 lbs. per sq. in.
Transverse strength (modulus of rupture)	2,686 lbs. per sq. in.
Compressive strength	18,274 lbs. per sq. in.

These tests made by U. S. Bureau of Standards and reported by T. Nelson Dale, Retired Geologist, U. S. Geological Survey.

Standard Thickness

Appalachian Marble is cut in standard thicknesses. They are (after honing and polishing): 7/8, 1¼, 1½ and 2 inches. Other thicknesses on order.

Floor Tile

Appalachian Floor Tile comes in 8x16 and 10x20 inches, 12, 10 and 8 inches square standard sizes. It can also be obtained in any special sizes the architect may desire for exactly carrying out his own ideas. It can be had in a wide variety of beautiful colorings. Appalachian floors are low in initial cost, low in maintenance cost and last the life of the building. They are easy and economical to keep clean, materially reduce the dust nuisance and make for better health. They subdue traffic noise and afford a safe, comfortable walking surface. 8x16 and 10x20-inch tile is always on hand, and shipment of other standard sizes can usually be made on receipt of order.

Ashlar

Appalachian Marble tile for ashlar, either hone or polish finish, can be furnished in our standard tile sizes at prices which make marble ashlar available for the comparatively moderately priced home as well as for more pretentious structures. This is because it is one of our by-products.

Crushed Tennessee Marble

Beautiful, bright light colored Tennessee Marble suitable for stucco work. Marble dust.

Tennessee Granito

Sizes No. 1, 2 and 3 for terrazzo floors.

Tennessee Rubble Marble

This company is in a position to ship large quantities of one man's size stone for prompt delivery.

Price

Because of quantity production Appalachian Marbles, although as beautiful as most fine foreign marble and superior in quality to the best of them, are a great deal cheaper in price than imported marbles, as well as like quality domestic marbles.

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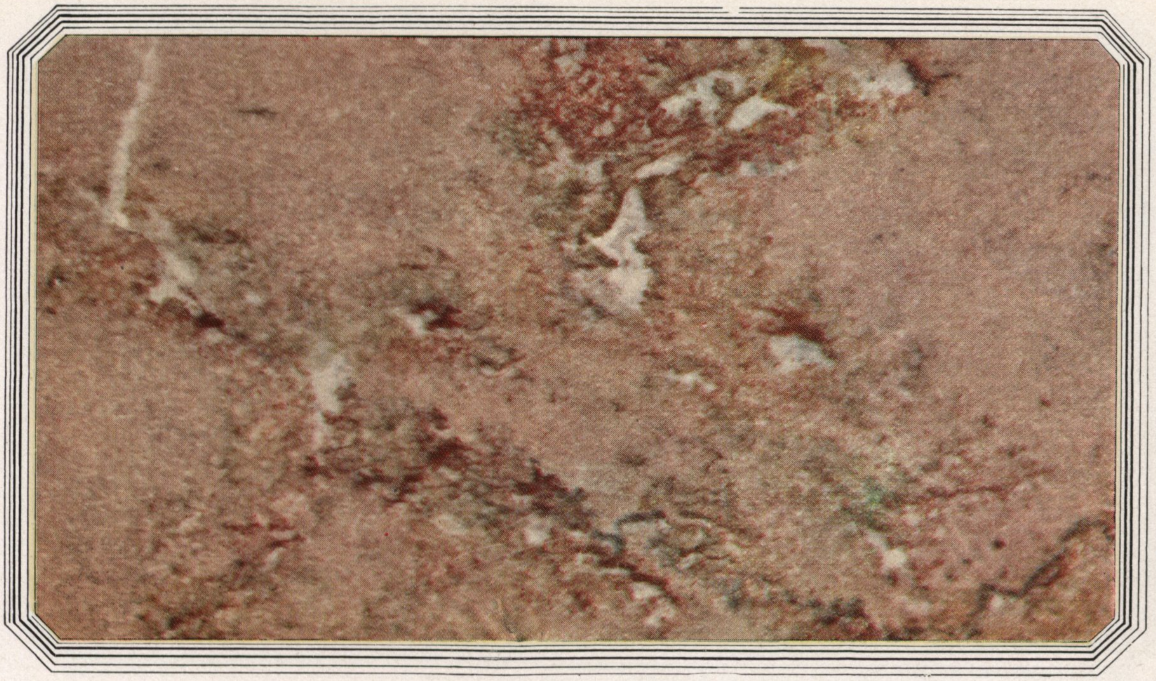


Illustration No. 4 **Appalachian Roseal**

Samples

Polished samples showing the beauty of the Appalachian Marbles, of which the illustrations shown herewith only hint, will be sent to any interested architect on request.

Installation

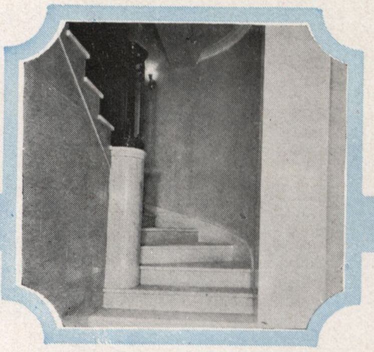
A few of the buildings in which Appalachian Marble has been used are:

NAME OF JOB, ARCHITECT AND ADDRESS

Regent Central Office Bldg., Philadelphia, Pa.; Delaware Central Office Bldg., Trenton, N. J.; Evergreen Central Office Bldg., Philadelphia, Pa.; Telephone Bldg., Warren, Pa.; Girard Bldg., Philadelphia, Pa., Jno. T. Windrim, Philadelphia, Pa.
Varsity Club, State College, Pa., Day & Klauder, Philadelphia, Pa.
Wisconsin State Hospital, Madison, Wis., State Architect
St. Thomas Hospital, Panama City, Panama
Addition to Buffalo City Hospital, Buffalo, N. Y.; Wende County Infirmary, Kidd & Kidd, Buffalo, N. Y.
C. B. & Q. Passenger Station, Aurora, Ill., Engineering Dept.
Schools Nos. 42, 65, 68 and 69, Buffalo, N. Y., Associated Buffalo Architects
High School, Greenville, Ohio; High School, Medina, N. Y., Wm. B. Ittner, St. Louis, Mo.
Memorial Hall and Milledge Dormitory, University of Georgia, Athens, Ga., Ludlow & Peabody
Edgewater Beach Hotel, Chicago, Ill., Marshall & Fox, Chicago, Ill.
Eastman Theater, Rochester, N. Y.
Giddens Lane Bldg., Shreveport, La.; Municipal Bldg., Shreveport, La., Edward F. Neild, Shreveport, La.
Administration Bldg., Boyd Memorial Hall, Academic and Low Bldg., Alumni Hall, Soldiers' Memorial and Hill Memorial Library, all of Louisiana State University, Baton Rouge, La., T. C. Link, Jackson, Miss.
Pontiac Savings Bank, Pontiac, Mich., Smith, Hinchman & Grylls, Detroit, Mich.
Bank of Orlando, Orlando, Fla., W. L. Stoddart, New York, N. Y.
East Tennessee National Bank, Knoxville, Tenn., Barber & McMurry, Knoxville, Tenn.
Andover Savings Bank, Andover, Mass., Hutchins & French, Boston, Mass.
High School, Dayton, Ohio, Schenck & Williams, Dayton, Ohio
High School and Liberty Bldg., Des Moines, Iowa, Proudfoot, Bird & Rawson, Des Moines, Iowa
Belknap's Warehouse, Louisville, Ky., Graham, Anderson, Probst & White, Chicago, Ill.
Memorial Auditorium, Chattanooga, Tenn., R. H. Hunt & Co., Chattanooga, Tenn.
Central National Bank, St. Petersburg, Fla., Ritchie-Parsons & Jonesburg, Boston, Mass.

Foreign Marbles

Because of our established connections abroad, large buying power and the present exchange rates, we can quote exceedingly low on fine foreign marbles brought to this country in block, and manufactured by us according to specifications.



Giddens Lane Building
Shreveport, La.
EDWARD F. NEILD, Shreveport, La., Architect

Roosevelt School
Dayton, Ohio
SCHENCK & WILLIAMS, Dayton, Ohio, Architects

Jacksonville Terminal Station
Jacksonville, Fla.
KENNETH M. MURCHISON, New York, N. Y. Architect

Continued on next page

Illustration No. 5 **Appalachian Silver Gray**

Cost Estimates and Co-operative Service

The Service Department of the APPALACHIAN MARBLE CO., INC. welcomes the opportunity to co-operate with the architect. This co-operation reaches its highest state of efficiency when architects furnish the Appalachian Service Department with blue prints of the projects upon which they are working. The Service Department is then in a position to carefully estimate on work and offer all possible co-operation.

Bank Fixture and Toilet Details

Complete bank fixture and toilet details will be worked up by the Appalachian Service Department from the architect's drawings.

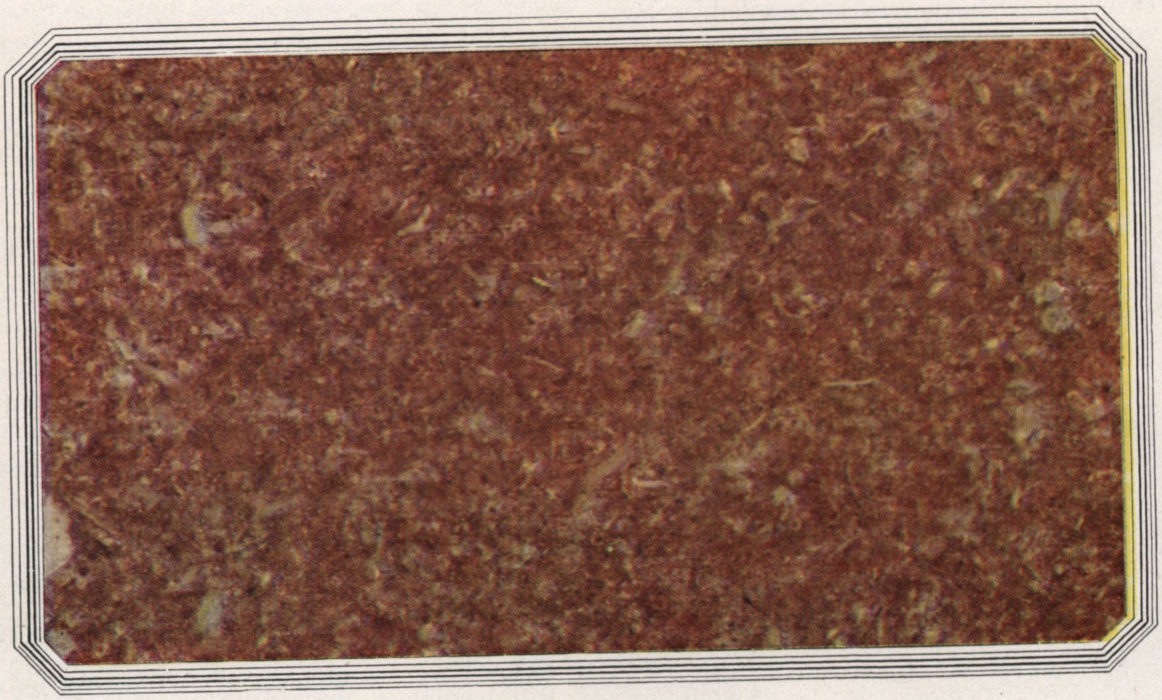


Illustration No. 6 **Appalachian Dark Chocolate**

Catalogue

A copy of the elaborate Appalachian loose leaf catalogue, illustrated in full colors, will be gladly furnished to architects and others interested in interior marble.

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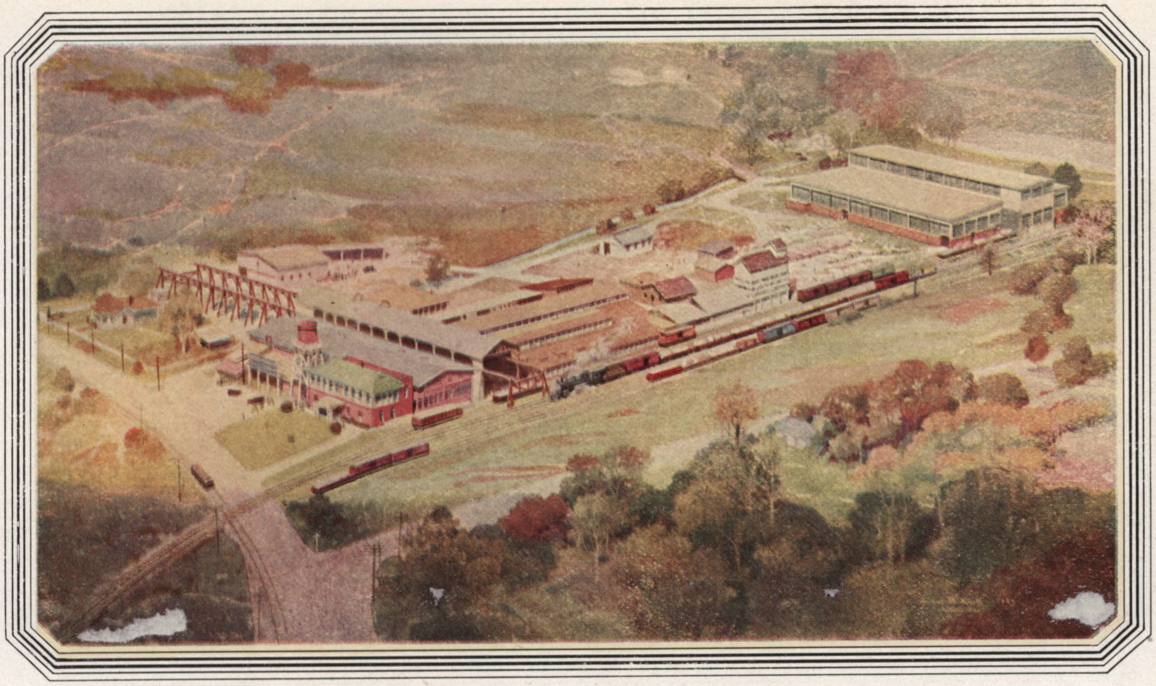

Illustration No. 7 **Appalachian Marble Company's Mill**

Shipping Facilities

The fifteen-acre mill property of the Appalachian Marble Co., Inc. has one-half mile of railroad tracks with continuous loading points to facilitate rapid loading of all shipments.

Mill Capacity

The mill, with 2½ acres floor space, is one-story construction to provide for efficient and economical handling of marble. Yearly handling capacity is 200,000 cubic feet, or a daily capacity of three carloads of finished marble. Use of hydro-electric power further lessens production cost.

Trained Marble Workers

The mill is located in the heart of a marble district where its employees are the third and fourth generations of trained marble workers.

Freight Rates

Because marble has been manufactured in this district for over 60 years, freight rates from Knoxville are estimated at commodity rates to all points in the United States and Canada. Knoxville is the most strategic marble shipping point in the country.

Equipment

The mill turns out over one-half of the finished Tennessee marble manufactured in the Knoxville district. It has 36 gang saws, 10 rubbing beds and twice as much finishing machinery, including planers, lathes and carborundum machines, as is actually required for sawing capacity, so as to be able to rapidly take care of all orders for marble. The mill has two units, each being an independent plant, and duplicate equipment throughout, so as to guard against delays which might be caused through any breakdowns.

All Waste Utilized

Every bit of marble waste is utilized and sold, which enables the Appalachian Marble Co., Inc. to make its marble more cheaply.

The Appalachian Marble Co., Inc. has manufactured marble for fifteen years and annually sells $1,000,000 of Appalachian Marble to England, Canada, Cuba, Latin America and every state of the Union.

National Theater
Richmond, Va.
C. K. Howell, Richmond, Va.,
Architect

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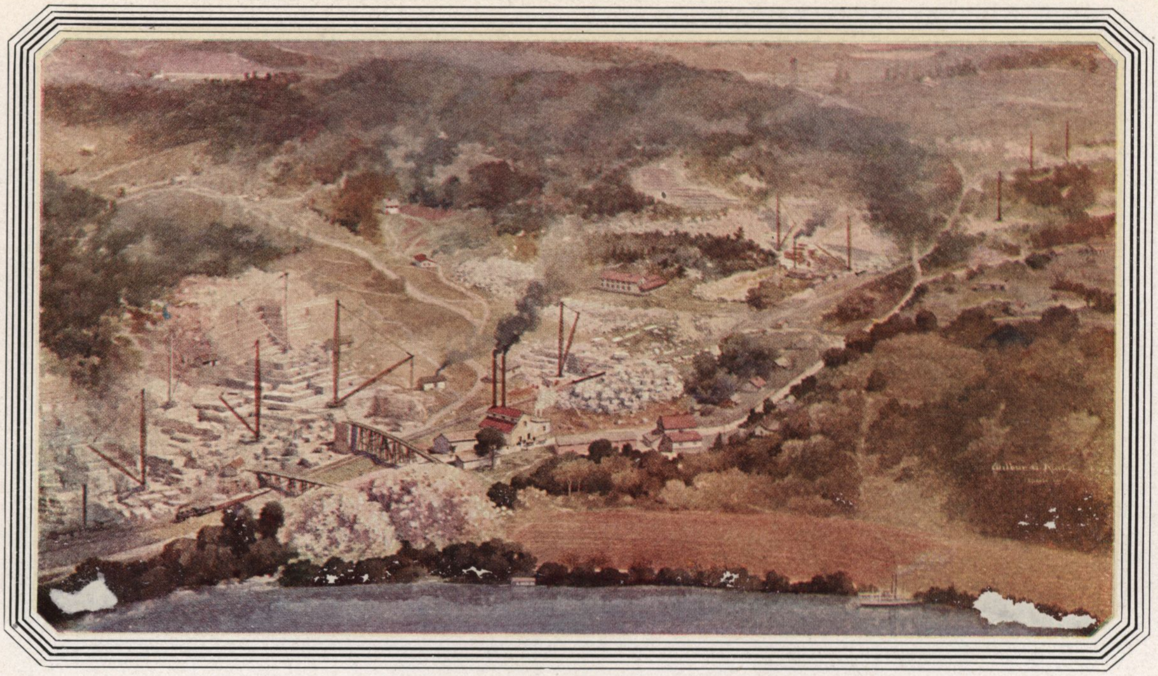


Illustration No. 8 **Appalachian Marble Company's Quarry**

Size of Quarry

The quarry holdings of the APPALACHIAN MARBLE Co., INC. are so great that its marble actually in sight will not be exhausted within a century. The quarry equipment includes nine 115 feet high, 50-ton derricks, sixty drills and six chandlers of the most modern type.

Power Equipment

The Company has a six hundred horsepower boiler plant and uses all steam with condensing plant of latest and most economical design. It has duplicate air compressors driven by Corliss engines.

Shop Facilities

The Company has its own shop facilities which allow it quickly to do its own repairs at the lowest possible cost.

Production Capacity

The quarry capacity is in excess of the milling capacity. All quarry waste is made into lime. There is absolutely no non-productive waste from either mill or quarry.

Reserve Supply

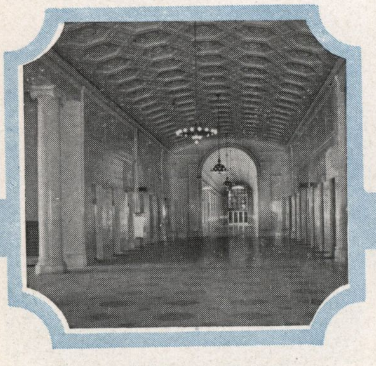
The APPALACHIAN MARBLE Co., INC. stores its own production to create a reserve supply.

Labor Conditions

Because it provides unusually good living conditions, including sixty houses and a fine modern boarding house, the Company has a very small labor turnover. Orders placed with the Company are not subject to delays that might result from labor troubles and can be delivered at the mill, ready for manufacture, on 24 hours' notice.

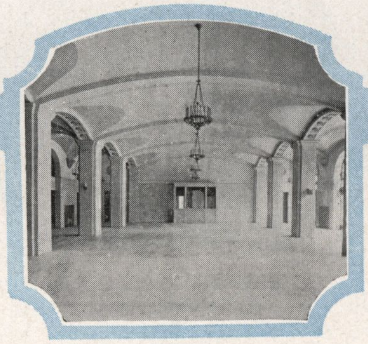
Prompt Shipments

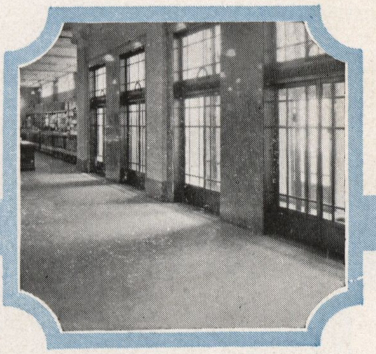
Orders placed for Appalachian Marble receive instant attention and are rapidly routed through from quarry to mill to loading on railroad cars.



General Motors Building
Detroit, Mich.
ALBERT KAHN, Detroit, Mich.,
Architect

Chattanooga Auditorium
Chattanooga, Tenn.
R. H. HUNT, Chattanooga, Tenn.,
Architect





Gimbel's Department Store
Milwaukee, Wis.
HERMAN J. ESSER, Milwaukee, Wis.,
Architect

THE GEORGIA MARBLE COMPANY

TATE, GA.

BRANCH OFFICES
ATLANTA, GA., 511 Bona Allen Building
CHICAGO, ILL., 456 Monadnock Block
NEW YORK, N. Y., 1328 Broadway—Telephone, Wisconsin 6574

Products

Georgia Marble for exterior and interior building and monumental work.

Rough quarry blocks, sawed stock or finished work in the following marbles produced by us: "White," "Light Cherokee," "Silver Gray," "Mezzotint," "Creole," and "Pink."

Durability

Georgia marble, owing to its dense, flawless, crystalline formation and non-absorbing qualities, does not disintegrate. It will stand the test of time, as proved by use in many fine buildings and memorials.

Colors

"White"—This company operates four quarries of white marble ranging from almost pure white to white with more or less dark marking, known as "White Georgia" and "Kennesaw."

"Light Cherokee"—A very light gray with clouding and veins running in waves well distributed.

"Silver Gray"—A uniform pearl gray, practically free from marking.

"Mezzotint"—Gray background with rather heavy dark marking occurring in waves, between "Silver Gray" and "Creole."

"Creole"—Heavily veined and having white background with black and bluish black veining and figures.

"Pink"—Ranges from a very light salmon to a deep old rose with very warm tints.

Physical Properties of Georgia Marble

Crushing Strength—Tests by the Ordnance Department, United States Army, show crushing strength to be from 11,000 to 16,000 lbs. per sq. in.

Analysis—Made at Worcester Polytechnic Institute:

Carbonate of Calcium	98.96%
Carbonate of Magnesium	0.13%
Alumina	0.22%
Silica	0.61%
Loss	.08%

Weight—The specific gravity at 60° Fahr. is 2.7178, equaling a weight of 169.5 lbs. per cu. ft.

Absorption—A 2-in. cube was dried at 220° Fahr. till its weight was constant; it was then placed in water at 60° Fahr. for 24 hours, and reweighed. It was found to have absorbed only 0.028% of moisture.

Statuary

The "White" and "Silver Gray" Georgia marble are unexcelled for sculpture work exposed to the weather. The marble is unaffected by the most severe weather. Large sizes can readily be obtained.

Columns and Monoliths

Special attention is given to the production of long columns in one piece. The company has furnished monoliths 30 ft. long by 4 ft. diameter.

Facilities

Facilities for production and finishing are unexcelled. Eight quarries are operated, which will easily produce 1,000,000 cu. ft. per annum. The equipment of the four plants consists of upwards of 100 gang saws, 22 rubbing beds, planers, lathes, diamond saws, carborundum machines, etc.; and with an unlimited supply of marble any size order can be accurately and promptly filled.

References

A few representative buildings in which Georgia marble has been used, location, and architect or sculptor:

Exterior of Buildings

Cleveland Museum of Art, Cleveland, Ohio, Hubbell & Benes
New York Stock Exchange, New York, N. Y., Trowbridge & Livingston
Girard Trust Company, Philadelphia, Pa., McKim, Mead & White, and Furness, Evans & Co.
U. S. Post Office, Birmingham, Ala., Supervising Architect, Treasury Department
Pan American Building, Washington, D. C., Albert Kelsey and Paul P. Cret
Federal Reserve Bank, Atlanta, Ga., A. Ten Eyck Brown
Federal Reserve Bank, Cleveland, Ohio, Walker & Weeks

Interior of Buildings

Guardian Savings & Trust Co., Cleveland, Ohio, Walker & Weeks
State Capitol, Salt Lake City, Utah, Richard Kletting
House of Representatives Office Building, Washington, D. C., Thomas Hastings and Elliott Woods
Manufacturers & Traders National Bank, Buffalo, N. Y., Furness, Evans & Co.

Monumental and Sculpture

Lincoln's Statue, Lincoln Memorial Building, Washington, D. C., Daniel Chester French
"Civic Virtue" Municipal Fountain, City Hall Park, New York, N. Y., Frederick W. MacMonnies
Pediment, National Capitol, Washington, D. C., Paul Bartlett
Du Pont Memorial Fountain, Washington, D. C., Daniel Chester French
Columbus Memorial Fountain, Washington, D. C., Lorado Taft

WILLIAM McKINLEY

McKinley Birthplace Memorial, Niles, Ohio
McKim, Mead & White, Architects
Entirely of Georgia marble, including statue of McKinley in center of peristyle. 28 columns, 25 ft. high, 3 ft. 4 in. in diameter; furnished in monoliths

THE STANDARD MARBLE WORKS CO.

Manufacturers of Foreign and Domestic Marble

TELEPHONE
West 2705

CINCINNATI, OHIO

Products

Every Marble manufactured for interior and exterior of buildings; Marble Altars; Furniture Marble, etc.

Also Soapstone and Slate for all purposes.

Facilities

We have a complete sawing and finishing mill and are prepared to execute work promptly from our large stocks of sawn and block marble which are always on hand.

Orders for blocks, full sized slabs and custom sawing solicited.

Service

We contract for marble installed anywhere, or finished f.o.b. Cincinnati.

Installations

We can refer to many large jobs, located in practically every state.

Estimates

Estimates will be submitted upon definite plans and specifications, or complete lists.

Marble Classifications

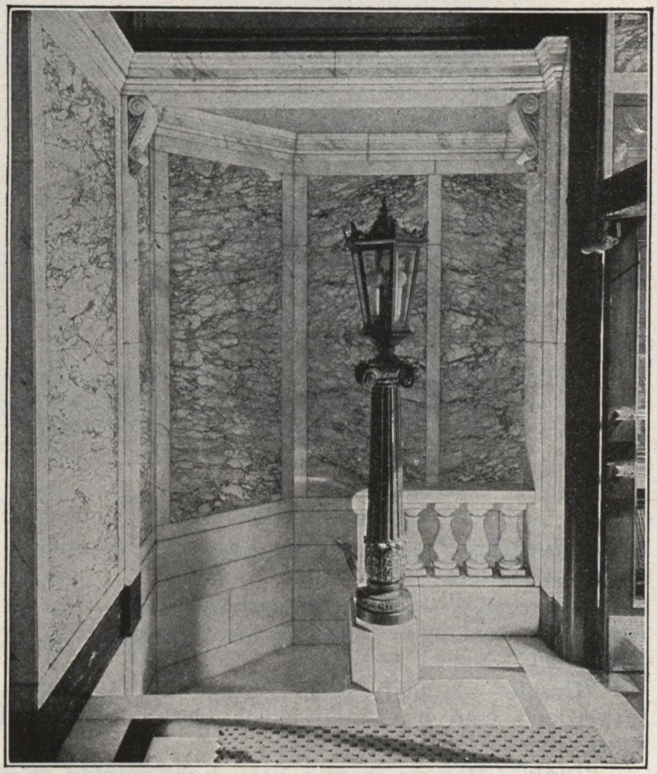
To convey a knowledge of the characteristics of the various marbles, we have alloted each kind to one of four groups, viz:

Group A—A marble obtained in fair size regular blocks and sold as sound marble.

Group B—A marble obtained in medium size or irregular blocks and sold as sound marble.

Group C—A marble which has a minimum amount of natural faults that are treated in an approved manner and sold as semisound marble.

Group D—A marble generally obtained in irregular shaped blocks, including most all highly colored decorative marbles, having natural faults which are treated by approved methods and are sold with this understanding.



Stair Corner, Keith Office Building, Cincinnati, Ohio

Standard Thickness for Wainscot

Marble is sawn in thickness to finish approximately ⅞, 1¼, 1½ and 2 in.

Other thicknesses to order.

Standard Size Floor Tile

8x16-in. and 10x20-in. tile carried in stock in ⅞-in. thickness only.

Other size tile and pattern floor to order.

Elks Club, Portland, Ore.

Winters National Bank & Trust Co., Dayton, Ohio

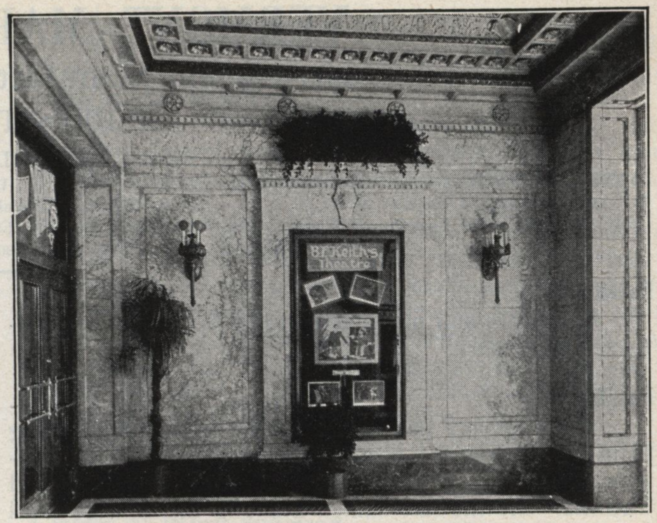
Continued on next page

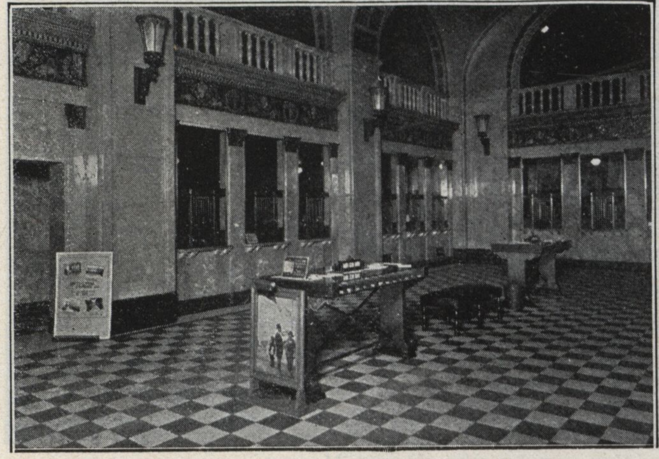
List of Marbles

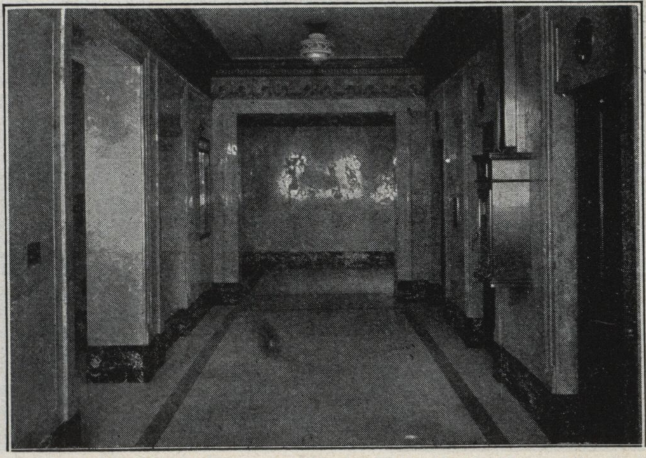
The following, while only a partial list of the marbles and kindred products we carry in stock, gives suitable variations to complete any marble installation:

Trade Name	Group	Where Quarried
Alabama Cream Veined	B	Alabama
Alabama Pocahontas	C	Alabama
Alamora	B	New Mexico
American Paonazzo	B	Vermont
Alps Green	D	Italy
Antwerp Black	B	Virginia
Alberene Stone	A	Virginia
Batesville	A	Arkansas
Basseville	C	Italy
Belgium Black	B	Belgium
Bianco P.	B	Italy
Black & Gold	D	Italy
Bleu Belge	B	Belgium
Breccia Violletto	C	Italy
Breche Paonazzo	C	Italy
Breche Opal	C	Italy
Bois Jourdan	C	France
Botticino	C	Italy
Broacadillo	A	Vermont
Campan Marbles	C	France
Cardiff Green	D	Maryland
Cenere	C	France
Champlain Black	B	Vermont
Champville	B	France
Cipollino Antico	D	Greece
Colonial Gray Veined	A	Missouri
Colonial Gray Veinless	A	Missouri
Colorado Yule	B	Colorado
Eastman Marbles	C	Vermont
Escalette	C	France
Eschaillon	D	France
F. O. Norwegian	A	Norway
Famosa	C	Germany
Fleur de Pecher	D	France
French Gray	A	New York
Georgia Creole	A	Georgia
Georgia Gray	A	Georgia
Georgia Pink	A	Georgia
Georgia White	A	Georgia
Glens Falls Black	B	New York
Grand Antique	D	France
Griotte	D	France
Hauteville	C	France
Italian English Vein	A	Italy
Italian Paonazzo	C	Italy
Italian Statuary Vein	A	Italy
Italian Second Statuary	A	Italy
Italian White	A	Italy
Jaune Nile	C	Italy
Juraville	C	Austria
Lanquedoc	D	France
Levanto	D	Italy
Light Cloud	A	Vermont
Middlebury Cream Antique	C	Vermont
Monte Perla	C	Uruguay
Monte Turquesa	C	Uruguay
Napoleon Gray	A	Missouri
Numidian Red	D	Africa
Numidian Yellow	D	Africa
Onyx Pedrara	D	Mexico
Pentelicon	B	Greece
Pink Lepanto	A	New York
Pittsford Italian	A	Vermont
Red Ark Fossil	B	Arkansas
Regal Blue	B	North Carolina
Repen-Zola	A	Austria
Rosata	C	Italy
Rosso Antico	D	France
Rouge Royal	D	Belgium
Second Statuary	A	Vermont
Sienna Gray	D	Italy
Sienna Yellow	D	Italy
Skyros A.	C	Greece
Skyros 12	C	Greece
Skyros 14	C	Greece
Sonora	C	France
St. Baume	C	Italy
Ste. Genevieve Golden Vein	C	Missouri
Sylvan Green	D	Pennsylvania
Slate, Clear Black	A	Pennsylvania
Slate, Ribbon Black	A	Pennsylvania
Soapstone	A	Virginia
Tavernelle Claire	C	Italy
Tavernelle Fleuri	C	Italy
Tavernelle Rose	C	Italy
Tennessee Chocolate	A	Tennessee
Tennessee Gray	A	Tennessee
Tennessee Pink	A	Tennessee
Tennessee Roseal	A	Tennessee
Tennessee Tavernelle	A	Tennessee
Tinos No. 3	C	Greece
Traniville	C	Italy
Travertine	A	Italy
Venosa	A	Vermont
Verdello	C	Italy
Vermont Verde Antique	C	Vermont
Verona Red	C	Italy
Verona Yellow	C	Italy
Westfield Green	C	Massachusetts
York Fossil	B	New York

Description, color plate or samples furnished upon request.


Keith Theater, Cincinnati, Ohio


Continental National Bank, Indianapolis, Ind.


Elevator Lobby, Continental National Bank, Indianapolis, Ind.

VERMONT MARBLE COMPANY

Quarriers and Manufacturers of Vermont Marble

PROCTOR, VT.

BRANCHES AND SALES OFFICES

CLEVELAND, OHIO, 9508 Quincy Avenue, S. E.
BOSTON, MASS., 10 Thacher Street
CHICAGO, ILL., 404 East North Water Street
NEW YORK, N. Y., 101 Park Avenue
ALBANY, N. Y., Waldorf Building
TACOMA, WASH., East End 11th Street Bridge
PHILADELPHIA, PA., 22nd and Westmoreland Streets
SAN FRANCISCO, CAL., 244 Brannan Street
DALLAS, TEX., VERMONT MARBLE CO. OF TEXAS, 1513 Wall Street

Products

Producers and manufacturers of EXTERIOR and INTERIOR MARBLES.

Facilities

The company has large sawing mills and finishing plants in Vermont; also finishing plants in Philadelphia, Cleveland, Chicago, Dallas, San Francisco and Tacoma. At the last-named plant is the storage yard for the Alaska marble, which can be shipped from there in rough or finished state. Alaska marble can also be supplied from any of the other plants.

Varieties

Exterior—Mountain White Danby, Imperial Danby, Highland Danby, Corona, Eureka and Pearl Gray Vermont.

Interior—***Vermont Marble***—Over 40 varieties, including white, lightly clouded and veined; gray, light green and dark green; red and black.

Alaska Marble—Several different kinds, the predominating color being pearl white veined with gray or black.

Physical Properties of Marble

Tests made by the United States Bureau of Standards show Vermont marble to have an ultimate crushing strength varying from 11,000 to 16,000 lb. per sq. in.

Tests made by the United States Bureau of Standards show that Danby Vermont marble, a variety much used for exterior purposes, absorbs about one-tenth of one per cent by weight when immersed in water.

Suggested Specifications for Exterior Marble

Material—All cut stone work shall be (insert name of variety of marble wanted).

Quality—All marble entering into the construction of the work shall be selected for uniform color. It must be free from cracks, chips, stains, or other defects upon exposed surfaces.

Samples—Before proceeding with the work the contractor shall submit a sample 4x8x2 in. of the marble he proposes to use. One face of this sample shall have (specify what finish is desired).

Joints—All marble shall be cut for $\frac{3}{16}$-in. joints.

Finish—All exposed surfaces of marble work shall have (specify desired finish).

Drawings—Detailed drawings will be furnished by the architect for all work requiring them. The contractor shall make and submit for the architect's approval, shop drawings showing in plan and elevation the dimensions of all stones, position of joints, and the spacing of dentils or other repeated ornament.

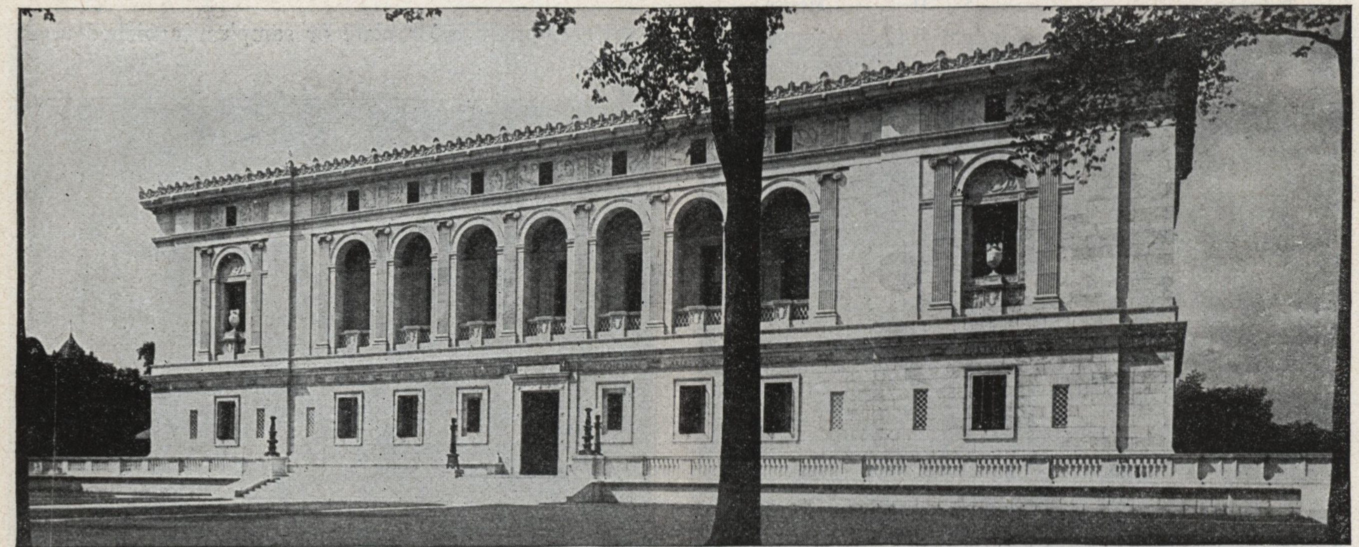
Cutting—All cutting must be done in a workmanlike manner and in accordance with the shop drawings referred to. All faces shall be free from winds, so as to present a true and even surface. Joints shall be at right angles to the face. Intersecting profiles shall be accurately cut. Re-entering angles of mouldings shall be cut from the solid, unless otherwise shown by the drawings. The contractor shall, where called for by the architect's drawings, cut the marble work to accommodate steel, flashings, leaders or other structural materials.

Delivery—All marble shall be crated or otherwise protected so as to be delivered at site in good condition.

Storage—All marble stored at the site shall be on cleats, off the ground, and protected where necessary from any stains from above.

Setting—Marble shall be set with a derrick and in full bed of mortar. The mortar-bed shall be kept back at least 1 in. from the face of the stones.

Mortar—Mortar for setting marble shall be composed of 1 part white non-staining portland cement, 3 parts clean, sharp sand and a quantity of hydrated lime equal to 10% of the volume of cement.



PUBLIC LIBRARY, DETROIT, MICH., BUILT OF VERMONT IMPERIAL DANBY MARBLE
CASS GILBERT, Architect

Continued on next page

Protection—During construction, all sills, moulding, or other work liable to injury shall be suitably protected by boards which shall not be removed until the cleaning and pointing is done.

Anchors—Anchors to be of wrought iron, heavily galvanized or painted 2 coats with an approved brand of dampproofing paint and allowed to dry before using. For each stone 2 ft. long one anchor shall be used, and for each stone over 2 ft. long, at least two anchors. Provide suitable clamps at corners and such special anchors as the architect may direct. Balusters shall be doweled top and bottom with brass, copper, zinc or some other non-staining metal.

Pointing and Cleaning—All exposed surfaces of the building shall, on completion, and when directed by the architect, be cleaned with clean water only and fiber brushes. All joints shall be raked out, 1 in. back from the face, and carefully pointed with a mixture of 1 part white non-staining portland cement and 2 parts clean white sand. Joints shall be ruled with a tool of approved shape.

Vermont Interior Marble Service

We contract either for interior marble work installed or to finish and furnish it to local interior marble dealers, following whichever method will give best service to architects, contractors and owners.

Suggested Specifications for Interior Marble

Material—All interior marble shall be as follows: All toilet marble, Vermont Venoso; all corridor marble, Vermont Brocadillo. (Always insert the name of the desired grade, avoiding the too general term "Vermont Marble.")

Quality—All interior marble shall be of good quality, free from stains. Patching will be permitted only where the natural imperfections of a particular stone are subject to correction by the established usage of the industry.

Samples—Before proceeding with the work the contractor shall submit to the architect samples of all the marble specified above, 1 ft. square and 7/8 in. thick.

Finish—All floors and stair treads shall have a fine sand finish. All standing marble shall be highly polished.

Drawings—Detailed drawings will be furnished by the architect for all work requiring them. The contractor shall make and submit for the architect's approval, shop drawings showing proposed jointing.

Measurements—Before proceeding to finish the interior work the contractor shall verify all measurements at the building.

Cutting—The marble contractor shall do such necessary cutting and fitting to accommodate his work to other trades as is sanctioned by common usage in the trade.

Setting—All floor marble shall be set in a cement mortar of 1 part cement and 3 parts sand, adding a quantity of hydrated lime, not exceeding 10% of the volume of cement. The concrete fill must be swept and thoroughly sprinkled before setting is started. All stair treads and all standing marble shall be set in plaster of paris. All wall marble shall be securely anchored with brass, copper or aluminum wire.

When work is completed all marble shall be cleaned and left in good condition.

Classes of Work Supplied

Wainscot and interior decorative treatment generally: floor tile, stair treads, bank screens, counter tops, soda counters, electric switchboards, scale tops, lamp bases, and many other purposes.

Adaptability

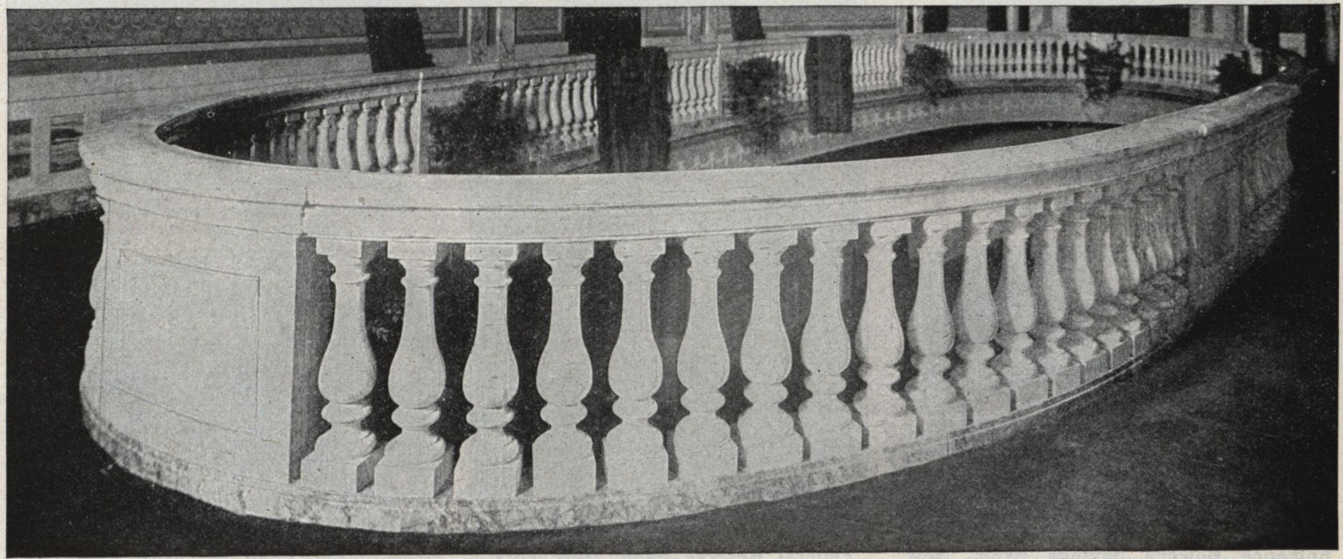
Innumerable are the ways in which Vermont marble may be applied to building construction. Nor is it merely a beautiful product. It is thoroughly sanitary as well as fireproof, though it may be readily cleaned. It needs no refinishing. Although initial cost of marble may be slightly in excess of certain other materials, in the end it is no more expensive.

Marble Exhibit in New York City

There is an exhibit of large-sized samples of our marbles at our New York office in the Architects' Building, 101 Park Avenue, to which architects, engineers, contractors and owners are cordially invited.

"The Book of Vermont Marble"

A brief compendium of our products and the best ways to use them; our facilities; a number of drawings and details showing most approved methods of construction in exterior and interior marble work, etc. Contains 65 pages, of standard architect's size. Furnished without charge to any architect upon request.



VERMONT AND ALASKA MARBLE—ORPHEUM THEATER, BOSTON, MASS.
THOS. W. LAMB and THE HOFFMAN COMPANY, Architects

THE BRIAR HILL STONE CO.

Producers of Golden Buff and Variegated Sandstone

GLENMONT, OHIO

Product

Briar Hill Sandstone in Golden Buff, Light Variegated or Dark Variegated, or in combination as desired.

Adaptability

Suitable for all classes of buildings, both for interiors and exteriors; effective as trim for seam face granite, field stone, brick or stucco, and especially adapted to gothic architecture, because of its easy working qualities.

Durability

The illustration below showing the corner stone of an old church at Glenmont which was built of stone from this quarry in 1857 is positive proof of the element-resisting qualities of Briar Hill stone. Original tool marks are still clean cut and sound.

Cost

Briar Hill stone although distinctive and in a class by itself is quite moderate in price for the following reasons:

(1) Modern equipment at the quarry means low production costs and consequently a low price f. o. b. Glenmont, Ohio.

(2) Location of quarry on a main line of Pennsylvania R. R. makes possible reasonable commodity freight rates to all points east of the Mississippi River.

(3) No other commercial stone with the possible exception of some limestones is so easily worked.

Physical and Chemical Properties

Results of physical and chemical analyses, compression, freezing and absorption tests gladly furnished on request.

Size of Quarry and Supply

Quarry face at present time 400 ft. long, 35 to 40 ft. deep. Stone can be obtained in any heights for column drums, etc.

Supply unlimited: quarry produces 50% golden buff, 30% light variegated, 20% dark variegated.

Facilities

Our quarry is equipped with modern machinery, capable of handling any size project. We operate our own sawmill and are in position to furnish sawed stone as well as block stone. We operate twelve derricks, four modern steel gangs; tram equipment is 1100 ft. long; 100,000 cu. ft. storage capacity; railroad switch capacity thirty cars.

Prompt service assured at all times.

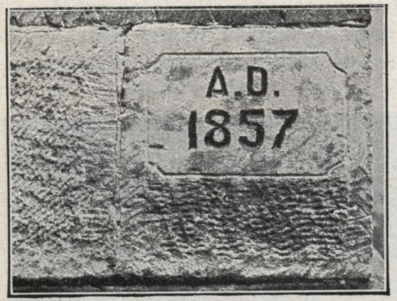
Service

Suggested specifications, samples, or any desired data cheerfully sent to interested persons. We will be glad to co-operate with architects in getting cut stone estimates from reliable contractors.

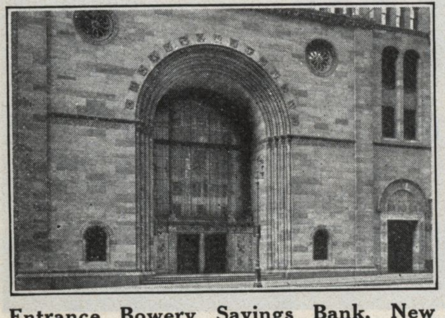
References

A partial list of important buildings (and their architects) in which Briar Hill Sandstone has been used:

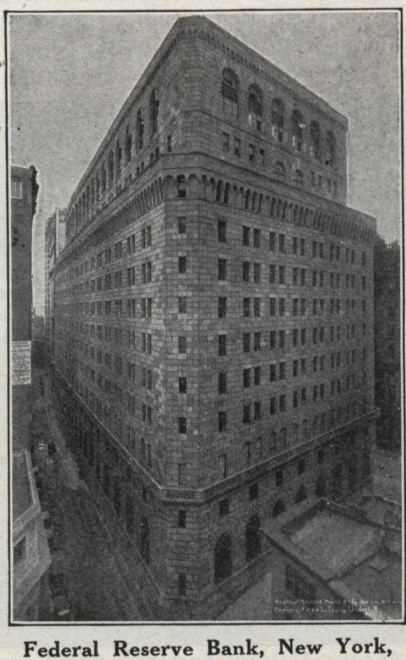
Harkness Memorial Quadrangle, Yale University, James Gamble Rogers
Washington Loan & Trust Co., West End Branch, Washington, D. C., Arthur B. Heaton
Bowery Savings Bank, 42nd St., New York, N. Y., York & Sawyer
Mecca Temple, New York, N. Y., J. K. Knowles Estate and Clinton & Russell.
Trinity Chapel, Washington, D. C., Maginnis & Walsh
Fisher Residence, Detroit, Mich., Richard H. Marr
F. Eugene Dixon Residence, Elkins Park, Pa., Horace Trumbauer
Walter Law Residence, Port Chester, N. Y., James Dwight Baum
J. K. Branch Residence, Richmond, Va., John Russell Pope
First National Bank, Boston, Mass., York & Sawyer
Sewickley Library, Sewickley, Pa., H. D. Gilchrist
Warren Bicknell Residence, Cleveland, Ohio, Frank B. Meade
Moreland Courts Apartments, Cleveland, Ohio, Alfred W. Harris
Blossom Residence, Cleveland, Ohio, Abram Garfield
H. S. Snyder Residence, Farmersville, Pa., Duncan Frazer
Wm. B. Lasher Residence, Fairfield, Conn., Walter John Skinner
Timken Residence, Canton, Ohio, H. D. Gilchrist
Kenyon College, Leonard Hall, Gambier, Ohio, Abram Garfield
Sherman Residence, Lakeville, L. I., N. Y., James W. O'Connor
Mrs. Lillian Thomas Residence, Mill Neck, L. I., N. Y., Clinton & Russell
Francis E. Drury Residence, Cleveland, Ohio, Charles S. Schneider
Trinity College, Toronto, Ont., Darling & Pearson
Cataract National Bank, Niagara Falls, N. Y., Simon & Russell Larke
Seaboard Airline Railway Office Building, Norfolk, Va., Neff & Thompson
President's Residence, Ohio State University, Columbus, Ohio, Jos. N. Bradford
Sacred Heart Church, Pittsburgh, Pa., Carlton Strong
St. Paul's Cathedral, St. Paul, Minn., Maginnis & Walsh
Children's Hospital of Michigan, Detroit, Mich., Albert Kahn, Inc.



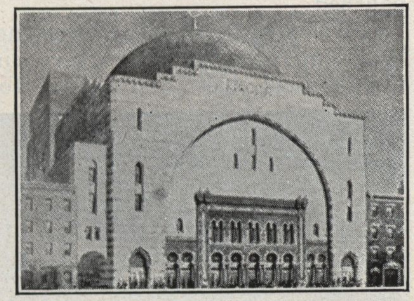
Corner Stone Old Church, Glenmont, Ohio



Entrance Bowery Savings Bank, New York, N. Y.
York & Sawyer, Architects



Federal Reserve Bank, New York, N. Y.
York & Sawyer, Architects



Mecca Temple, New York, N. Y.
Clinton & Russell, Architects

Washington Loan & Trust Co., West End Branch, Washington, D. C.
Arthur B. Heaton, Architect

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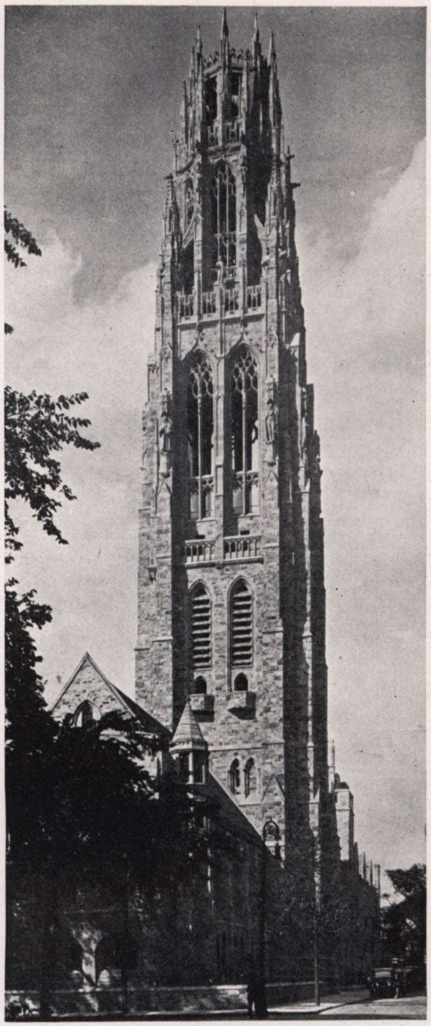
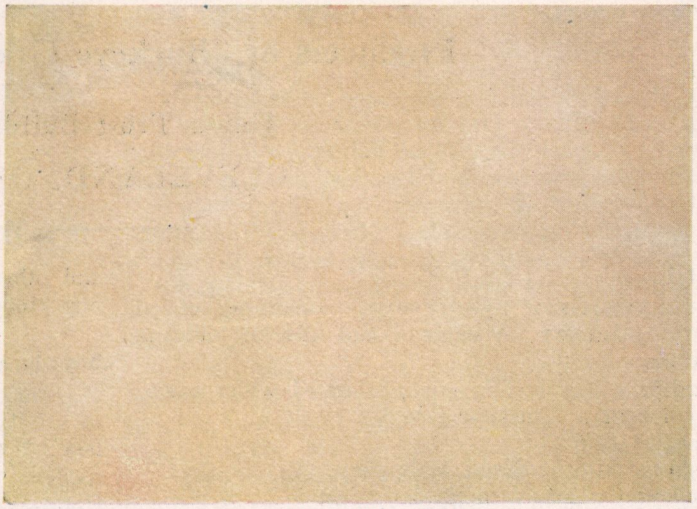
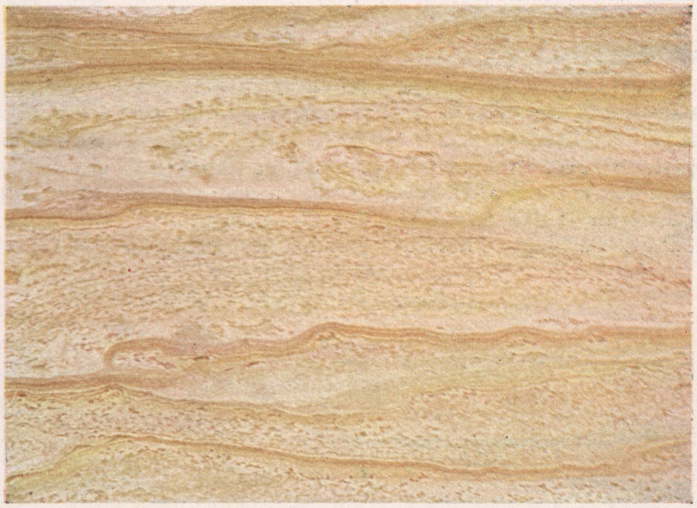


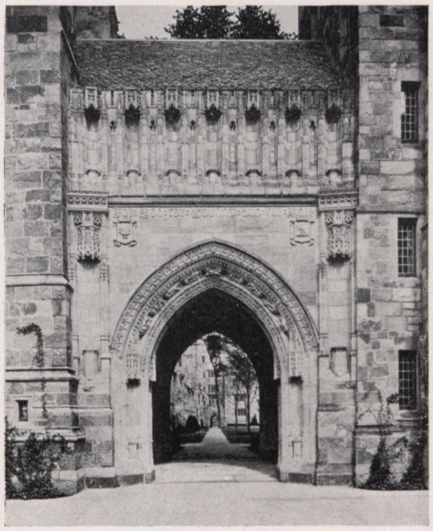
Harkness Memorial Tower and Quadrangle
Yale University
James Gamble Rogers, Architect



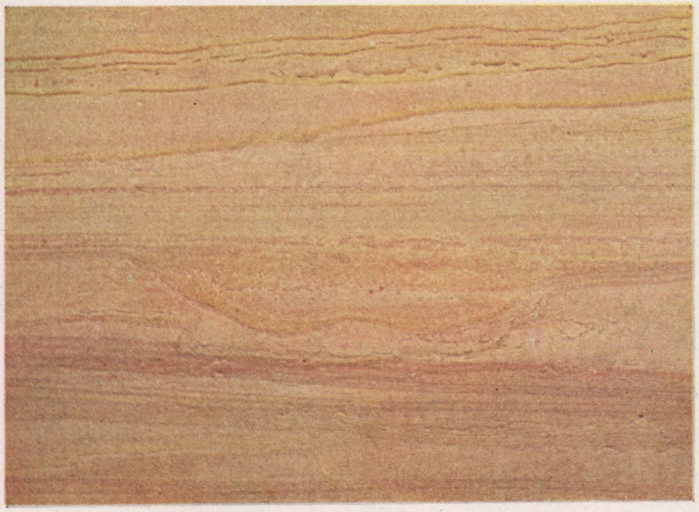
Briar Hill Golden Buff



Briar Hill Light Variegated



Entrance Detail—Harkness Quadrangle
Briar Hill Stone used for practically all trim, Gothic tracery and carved work



Briar Hill Dark Variegated

Color illustrations about ⅙ actual size.

THE OHIO QUARRIES COMPANY

Producers of "Buckeye Gray" Sandstone

Union Trust Building
CLEVELAND, OHIO

Product

"Buckeye Gray" Sandstone (sometimes called Amherst Sandstone) for exterior and interior building construction.

Sandstone identical in quality, but of wider variation in color than "Buckeye Gray":

Amherst Buff.
Amherst Multi-colored Mahogany.
Buckeye Golden Vein Spider Web.
Birmingham Gray.
Birmingham Buff.
Birmingham Multi-colored Buff.

Trade-name

"Buckeye Gray" is the trade-name of the finest stone taken from the quarry and is furnished in *one grade only.*

The stone specially selected for building purposes comes from below the 100-ft. level in the quarry, which has a total depth of 212 ft. The stone above this point is utilized for curbing, sidewalks, grindstones, bridges and other purposes where appearance is not of prime importance.

Supply and Facilities

In connection with an ample quarrying capacity, to satisfy the requirements of any undertaking regardless of the quantity of stone involved, we operate a modern mill, which consists of 24 gangs of saws, a steel tramway one-third mile in length equipped with 5 electric traveling cranes and a railroad embracing 4 miles of standard gage track, which furnishes a connection with the main line of the New York Central Railroad.

A separate organization has 3 cut stone plants in operation adjacent to our quarries, and one plant in Cleveland, devoted exclusively to supplying the trade with stone cut ready to set. These plants are each completely equipped with modern machinery such as planers, lathes, air compressors, rubbing beds, circular saws, etc., and are in a position to make attractive figures on "Buckeye Gray" sandstone cut ready to set.

Partial View of Buckeye Quarry Located at Amherst, Lorain County, Ohio

A point about 35 miles southwest of Cleveland, Ohio. This is one of the largest quarries in the world; over 1600 ft. in length, 400 ft. in width, 212 ft. in depth

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Color and Texture

"Buckeye Gray" sandstone is of a distinctive shade of rich light gray, with natural variations in tone. If desired, stone can be selected of an almost uniform shade.

It is of a fine and even texture, and does not contain flint streaks, holes, glass seams or other such imperfections.

Analysis

"Buckeye Gray" sandstone has been analyzed as follows:

Silica	93.28%
Alumina	3.60%
Sesqui oxide of iron	1.45%
Carbonate of iron	None
Carbonate of lime	.57%
Carbonate of magnesia	.46%
Water	.59%

There is no iron as pyrite present.

Structure

"Buckeye Gray" sandstone is what is geologically known as a silicious sandstone, analyzing approximately 95% pure silica, and should not be confused with other classifications of sandstone, the cementing qualities of which are carbonate of lime, iron oxide or clayey matter. It is the presence of a large percentage of silica in the rock which gives it wonderful enduring qualities.

Staining

"Buckeye Gray" sandstone will not stain by portland cement mortar and therefore does not require any special treatment to prevent discoloration from any elements in the mortar; nor is it necessary to paint the backs of the stone.

Strength

"Buckeye Gray" sandstone has withstood a crushing strength of 10,000 lb. per sq. in.

If this stone was piled as high as the Washington Monument (555 ft. 5 in.) there would only be a pressure at the bottom of 579 lb. per sq. in.

Fire Resistance

"Buckeye Gray" sandstone, which is held together by silica, will withstand much higher temperature than sandstone in which the cementing qualities are largely limonite or clay, and will withstand temperatures up to approximately 2500° F. and softens at 3000° F.

The fact that thousands of tons of this stone are used annually by steel companies for the lining of furnaces to protect the steel jacket from intense heat, is sufficient proof of its fire resisting qualities. Compact, fine grain, silicious sandstone withstands action of fire better than any other stone.

Effect of Temperature

In a test, a sample of "Buckeye Gray" sandstone, 6 in. square, was immersed in water for 6 hr., and then exposed to a temperature of about 4° F. for approximately 18 hr. No cracking, shaling or other change in the sample was noted. The sample was then "thawed out" at 100° F. The smooth surface of the stone was not affected.

Dielectric Strength Test

In a series of fine tests on "Buckeye Gray" sandstone, the average voltage of puncture was 41,200.

Durability

The excellent appearance of the stonework in many old buildings in Cleveland and vicinity, having been subjected for a period of over 65 years to adverse climatic conditions and severe atmospheric tests without a sign of disintegration appearing, illustrates the fact that nature has endowed "Buckeye Gray" sandstone with wonderful element resisting qualities. The original tool marks of the stonecutters' tools are as clean cut and sound today as when the stone was first set in the wall.

Many old buildings, having outlived their usefulness, have been torn down, the stone removed to a new location, re-cut and used a second time, which is another proof that the stone is durable beyond question.

The severest test that can be applied to stone to determine its durability is where it is used for street curbing, as it is constantly subjected to the moisture and acids from the soil and pavement refuse and during the winter months to a continuous freezing and thawing process.

Curbing made of this material has been in place over 45 years on certain heavy traffic streets in the city of Cleveland, during which time the road surface has been renewed three times, but the original curbing is still in place and unaffected by the elements working against it.

"Buckeye Gray" sandstone has never been known to scale or disintegrate.

Weight

"Buckeye Gray" sandstone weighs approximately 150 lb. per cu. ft. when cut ready to set.

How to Use "Buckeye Gray" Sandstone

Many a fine stone job has been ruined due to various causes before and after the stone arrives at the site. There are a few set rules which, if strictly adhered to, will insure an attractive stone job, to wit:

(1) Design the stonework, as far as practicable, so that the rain water will drain off and not run over the face of the stone. This is exceedingly important at porticos, porte-cochères, porches and other such features. Provide *drips* on all projecting stones.

(2) Keep the stone clean until it is set. (This is very important.)

(3) Waterproof the first course at grade, both top and bottom beds, also waterproof the back of parapet walls.

(4) *Good setting.* Employ experienced stonesetters only.

Service Bureau

Expert information and data relating to the use, cost, handling, setting, etc., of "Buckeye Gray" sandstone; samples; suggested specifications and general information gladly furnished gratis.

Send plans for cut stone figures and we will secure them from reliable cut stone contractors who make a specialty of cutting "Buckeye Gray" sandstone.

THE LONGMEADOW CO., INC.

Producers of Longmeadow Red and Brown Sandstone

360 Worthington Street
SPRINGFIELD, MASS.

QUARRIES AND MILL, EAST LONGMEADOW, MASS.

NEW YORK REPRESENTATIVE: Arlando Marine, 7 East 42nd Street, NEW YORK, N. Y.

Products

Longmeadow Sandstone, Red and Brown, suitable for all classes of buildings.

Facilities

Our quarries are equipped with hoisting machinery of the latest and most efficient types, which are capable of handling blocks of any size required by contractors or which may be specified by architects.

Our mill is located near the quarries, in the same town (East Longmeadow), and has its own railroad siding. Planes, lathes, compressor and gang saws are electrically driven.

We are in a position to furnish finished stone, sawed to size, or quarried blocks.

Estimates, etc.

We are glad at all times to furnish estimates for architects or contractors, and to give any information or suggestions which might be helpful in the preparation of designs or plans.

Samples of the stone, in either color, forwarded upon request.

References

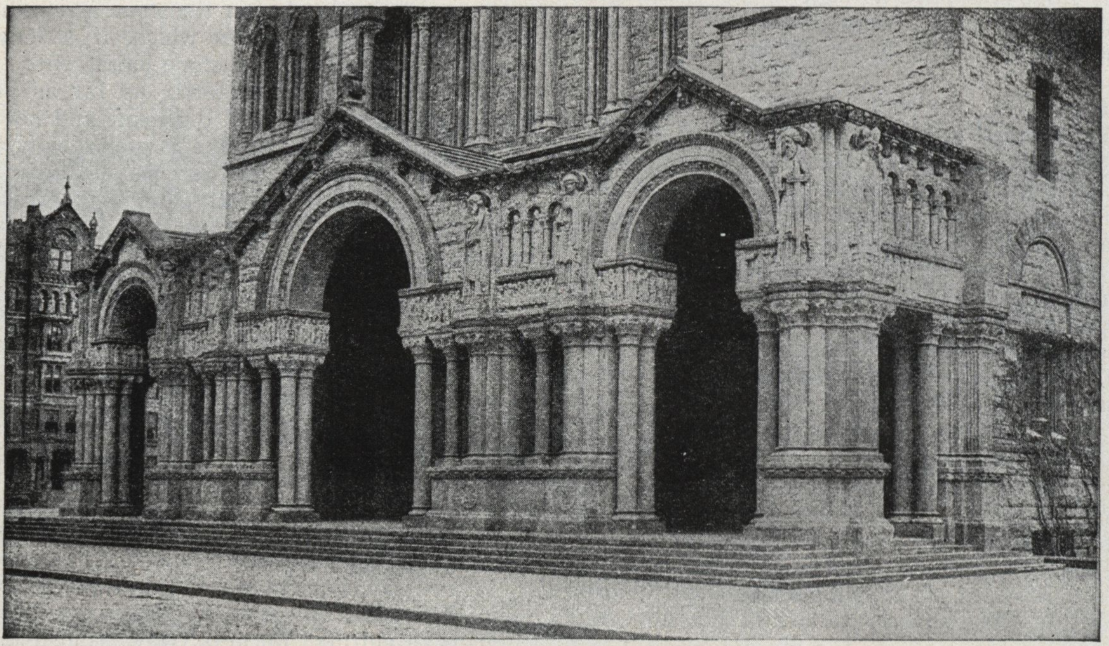
Longmeadow sandstone appears in numerous important buildings throughout the country.

A notable example is the impressive and tasteful Romanesque entrance to Trinity church, Boston (of which the late Phillips Brooks was rector for many years), well known as the Galilee porch.

A few more representative buildings are listed below, and we shall be glad to name others which may be nearer to the address of any architect inquiring.

Second Congregational Church, Holyoke, Mass.
Sterling Chemical Laboratory, Yale University, New Haven, Conn.
Mary Lyon Hall, Mt. Holyoke College, South Hadley, Mass.
Skinner Chapel, Holyoke, Mass.
Marshall Field Building, Chicago, Ill.
New York Life Insurance Building, Omaha, Neb.
New England Building, Cleveland, Ohio.
Library and Stack Building, Princeton University, Princeton, N. J.

Correspondence is invited.



Galilee Porch, Trinity Church, Boston, Mass.
Shepley, Rutan & Coolidge, Architects
Built of Longmeadow brownstone

THE ECONOMY CONCRETE COMPANY

Cast Stone Building Trim

1337 Dixwell Avenue, NEW HAVEN, CONN.

Information Required by Manufacturer for Estimating

Cast stone can be made in various colors and different finishes, some of which are shown. It is used for churches, schools, residences, banks, commercial, industrial and public buildings.

When estimates are requested, it is necessary that the manufacturer understands the color and finish desired.

A sand finish is the least expensive to manufacture and naturally sells for a lower price than other finishes, but is usually made in only one or two colors.

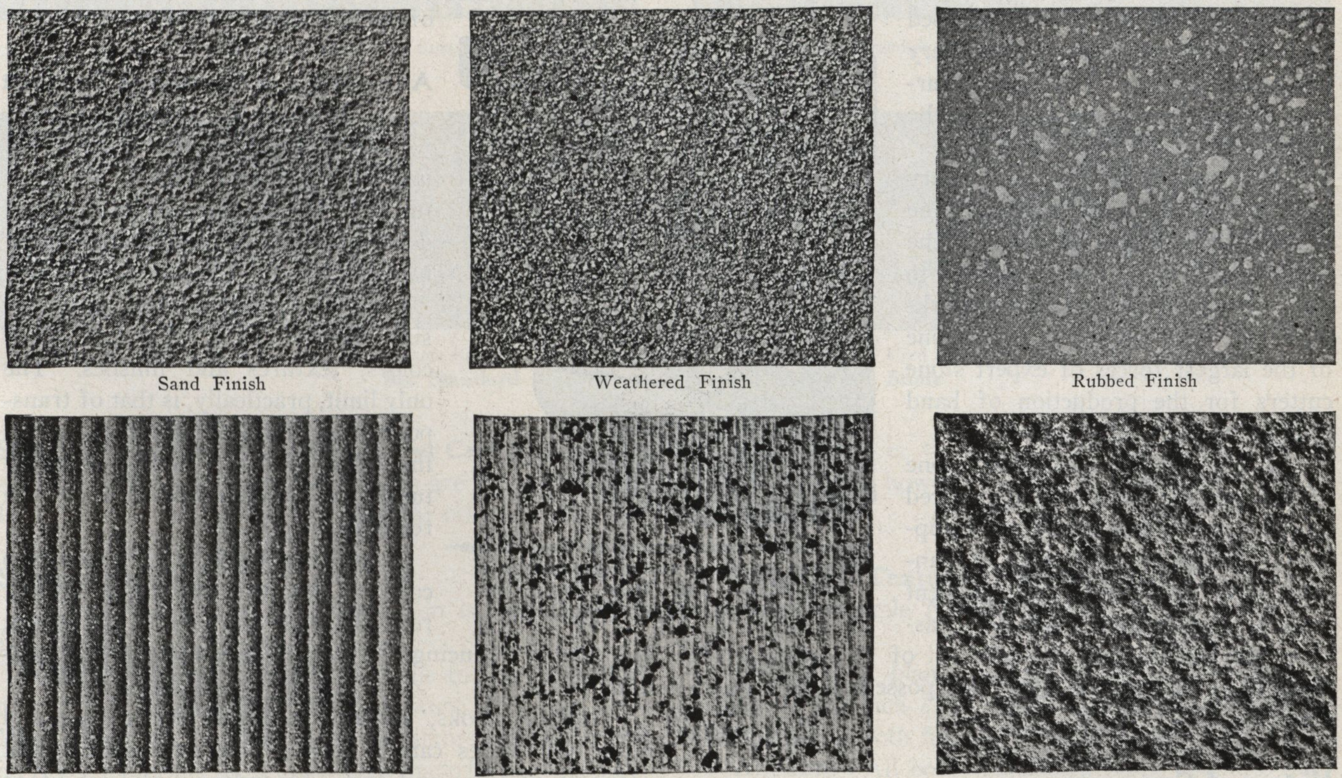
Weathered finish is produced by washing the stone before it is fully cured, giving it a rather rough or antique finish.

Smooth rubbed finish is done both by hand and machine and leaves a hard smooth stone.

Tooling is done both by casting and machine cutting, with the cast tooling less expensive to produce.

Bush-hammering and crandalling are done by hand with tools, and are the most expensive finish of any.

These items treat the finish in order of their cost, there being a saving of from 20% to 30% between sand finish and hand cutting, with the other finishes graduated between.



Sand Finish

Weathered Finish

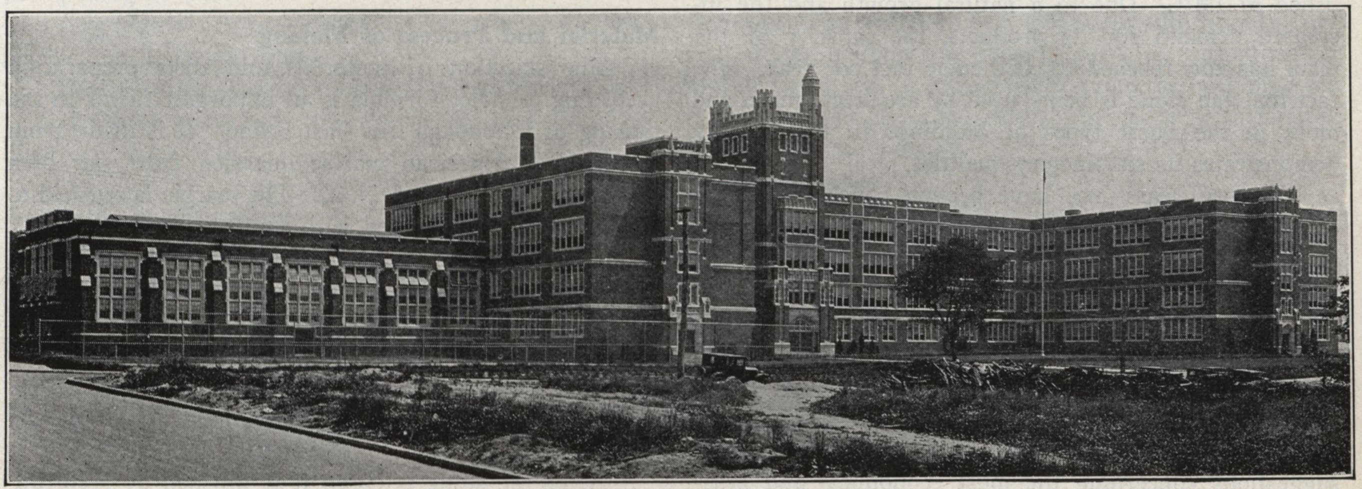
Rubbed Finish

Tooled Finish

Bush-hammered Finish

Crandalled Finish

Illustrations of Different Finishes of Concrete Stone



Forest Park Junior-Senior High School, Baltimore, Md.

Parker, Thomas & Rice, Architects

ONONDAGA LITHOLITE COMPANY

Makers of Onondaga Cut Cast Marble and Granite

PLANT AND MAIN OFFICE

SYRACUSE, N. Y.

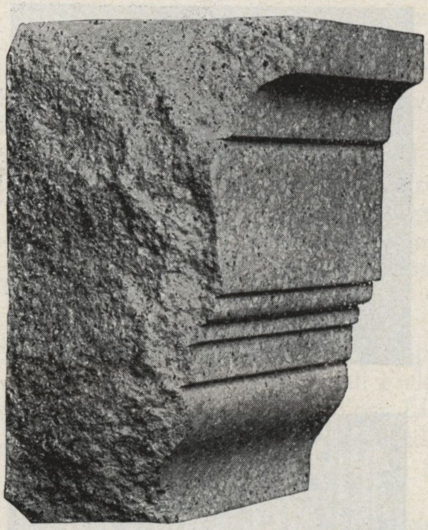
REPRESENTATIVES IN PRINCIPAL CITIES

Distinguishing Characteristics of Onondaga Cut Cast Stone

Onondaga Cut Cast Stone is a quality building material for use in high grade modern structures. It is different from what is generally known as cast stone. Onondaga Cut Cast Stone is first cast larger than the final dimensions required. The surfaces of all joints are then cut and the finish of the exposed surface is cut by hand or machinery like a natural stone. The finished surface of the stone is never cast on the stone.

The most modern machinery used for cutting and handling stone has been installed in the plant of the ONONDAGA LITHOLITE COMPANY to assure the highest standards of workmanship. This company employs one of the largest forces of expert stone cutters for the production of hand finishes in the United States.

The production of cut cast stone of this quality demands experienced workers, special machinery and equipment. It also requires years of manufacturing experience and sufficient capacity and financial backing to assure the satisfactory completion of contracts. The ONONDAGA LITHOLITE COMPANY possesses these qualifications.



Section of Onondaga Cut Cast Stone Broken to Show the Composition of the Stone and How It is of Uniform Texture Throughout

History of Company

The ONONDAGA LITHOLITE COMPANY was established in 1901. Due to a natural growth and the increased demand for its products, the capacity of the plant has now reached 600,000 cubic feet per year. The fact that the stone is being used by architects more and more in the finest types of buildings in the country demonstrates its satisfactory qualities.

Twenty years' use have proven conclusively that Onondaga Cut Cast Stone will stand every test and improves with time both in hardness and in appearance.

Co-operation with the Architect

Samples and full information regarding Onondaga Cut Cast Stone are gladly supplied. The planning department of the company is often able to give good suggestions concerning the most economical and practical use of this stone. Estimates of costs will be given to the architect to use as a working basis for his own estimates without obligation of any kind.

It is the endeavor of this company to co-operate with the architect in carrying out his ideas as to finishes and design. This is especially true with carved work. The experience of the company covers all types and styles of buildings and the staff is familiar with all styles of architecture.

Advantages of Onondaga Cut Cast Stone

Onondaga Cut Cast Stone is of uniform quality throughout its structure. It does not stain from salts and does not require waterproofing or back painting.

It can be manufactured in any size required in a wide variety of colors, textures and finishes. The only limit, practically, is that of transportation. Reinforcement placed in the stone effects a saving in structural steel which would otherwise be required.

In large work it is possible to core and reinforce the stones without reducing their structural soundness, but greatly reducing the weight and freight and handling costs.

Lifting hooks, anchors, conduits for wiring and other accessories can be cast in the stone with great economy of labor and cost. Onondaga Cut Cast Stone weighs 150 pounds per cubic foot.

Material and Process of Making

The selection of materials and their preparation according to strict formula is an important factor in the making of Onondaga Cut Cast Stone. It is made from the hardest American marble quarried from our own quarries at Gouverneur, N. Y. The marble is crushed to various sizes, then mixed with water and cement.

Plaster moulds made from clay models are used for carved pieces while sand moulds made from wood patterns are used for simple pieces.

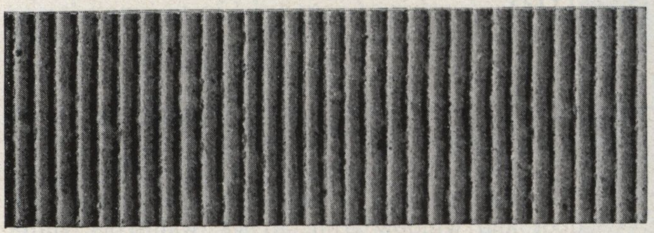
The material, kept under constant agitation, is poured into the mould and allowed to harden. Steel reinforcement is used where the stone must stand unusual stress or strain.

After the stone is cured it is finished by recutting all exposed surfaces either by machinery or hand.

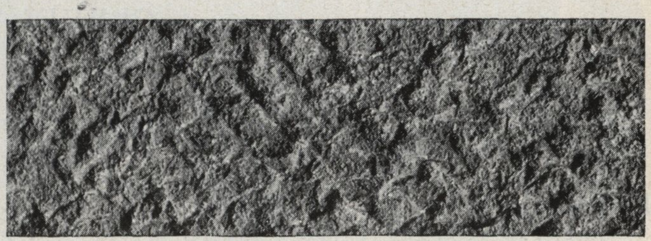
Continued on next page

Planer or Honed Finish, Resulting in Fine Arrises and Lines

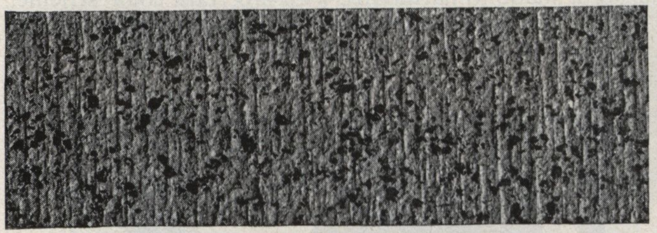
Fine Crandall Finish, Used Extensively on Some Natural Stones



Machine Tooled Finish, Four or Six Cuts to the Inch



Coarse Crandall Finish, Used for Heavier Work



Hammer Dressed Finish, Generally Used on Cut Cast Granite

Point Finish, Used to Give Rough, Sturdy Appearance

Six Standard Finishes of Onondaga Cut Cast Stone

Standard Finishes of Onondaga Cut Cast Stone

The above six standard finishes are the most popular. There is no end to the variety of other finishes that can be obtained in Onondaga Cut Cast Stone if desired. These six, however, usually include every requirement.

Specifications

The following short specification is recommended for Cut Cast Stone:

All stonework indicated on plans to be the product of the ONONDAGA LITHOLITE COMPANY, Syracuse, New York, or an approved equal. Contractors wishing to bid on other materials must have such material approved before opening of bids. No stone will be approved after the opening of bids.

Aggregate—Aggregate to be of granite or hard marble and uniform throughout.

Reinforcing—Stone must be properly reinforced where necessary to carry loads and for handling.

Color and Texture—Color and texture to be same as approved sample No. 100 (*) on file in architect's office.

Finish—All plain surfaces to be machine tooled, six cuts to the inch (**), mouldings and smaller members to have smooth finish (***).

Anchors—All bolts, expansion bolts, anchors, ties, etc., required for the Cut Cast Stone shall be furnished by the steel contractor. All ashlar and similar shaped stones shall be anchored to the backing with heavily galvanized wrought iron anchors ¼x1¼ in. turned down into the stone 1¼ in. and extending into the backing 8 in. if the thickness of walls permits, the end to be turned up 1¼ in. into the backing.

Notes on Specifications

*Stone No. 100, as called for above, is white in color. If buff granite is required, use No. *272*; for plain buff, use No. 202; for gray granite, use No. 170; black granite, No. 494; pink granite, No. 3115.

**Smooth finish may be used instead of six cuts to the inch. Plain surfaces can be changed to hammer dressed or fine Crandall finish, which are hand finishes and more costly.

***Mouldings and ornamental work can have hammer dressed, smooth or fine Crandall finish. Six-cut machine finish can not be used on mouldings and ornamental work.

Hammer dressed, planer or fine Crandall finish can be used on all surfaces, alone, or in combination with any finish desired.

ESTABLISHED 1870

THE GEO. RACKLE & SONS CO.

Originators of Artstone

CLEVELAND, OHIO

Products

Ashlar, Sills, Lintels, Cornice, Balustrades, and all kinds of Building Trim for exterior and interior work; Gothic Windows. Flat Slab Concrete Roofing Tile.

TRADE-MARK

Organization and Facilities

This firm has manufactured Artstone for over fifty years, being the originator of the material and the leading producer of it today. During these years, a strong organization has been built up qualified to handle the best class of work, and constantly enlarging factory space has made it possible to take care of the growth in business.

Ornamental work is a specialty, being in the hands of competent artists, and special care is taken to carry out with precision the architect's designs.

Artstone

Rackle Artstone is made from a specially prepared concrete which has been developed during the half century the firm has been in business, and the result is a product distinct from any other.

Care is taken throughout all the processes of manufacture to turn out as perfect a material as can be made, nothing being left undone which will add strength, beauty or durability.

Setting of Rackle Artstone is easy, as each piece is lettered and numbered to correspond with similar marking in the diagrams furnished.

Advantages of Artstone

The low cost of Rackle Artstone, as compared with other products of equal permanence, is possibly the first point in its favor, and yet its attractive appearance is likewise of prime importance.

The possibilities of reinforcing are such that certain designs can be carried out in Artstone which are not practicable in anything else. Especially is this true where delicacy of detail must be combined with strength.

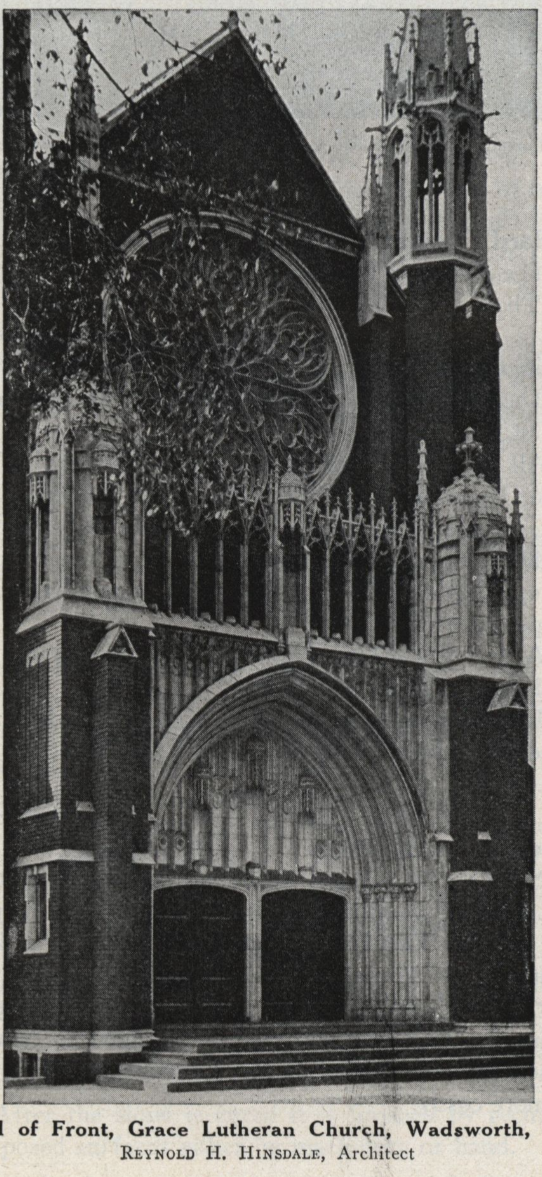
Rackle Artstone's everlasting qualities should be added to its other good points, so that altogether a material is found which is ideal for use in masonry walls.

Uses of Artstone

Rackle Artstone is suitable for all exterior work, such as ashlar, water table, sills, lintels, cornice, belts, quoins, and for any place where a medium is required for the proper expression of architectural design. Balustrades are successful in Artstone, as are relief ornamentation and statuary.

For interiors, Rackle Artstone is used for door and window trim, arches, wainscots, stairways, mantels and columns.

It is often desirable to have Artstone made of a shade to harmonize with a certain color scheme. This idea is carried out very successfully, so that beautiful results are obtained.



Detail of Front, Grace Lutheran Church, Wadsworth, Ohio
Reynold H. Hinsdale, Architect

Continued on next page

Gothic Windows in Artstone

For Gothic window tracery Rackle Artstone is a superior material. Thoroughly reinforced, it is strong, straight and true, making it ideal for holding glass. Furthermore, it has no grain or strata to cause splits at curves and angles. Gothic windows in Rackle Artstone have been a special line for many years, and a booklet on the subject has been issued which is mailed free on request. This booklet shows how the amount of labor may be reduced when designing these windows for Artstone, thus effecting certain economies.

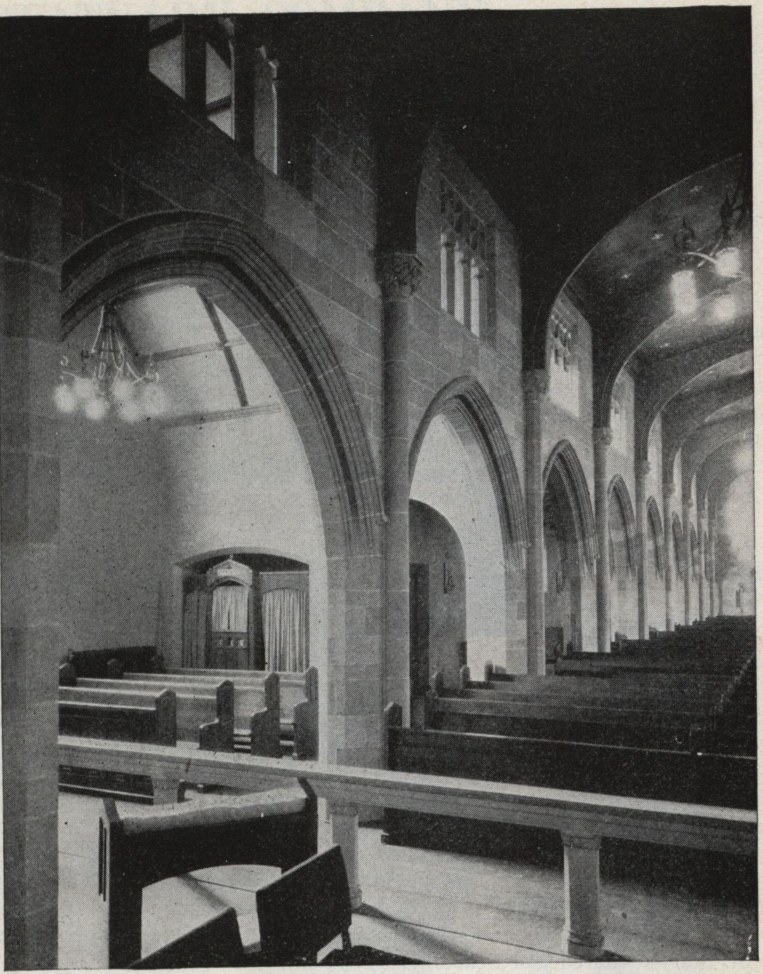
Artstone Colors

Regular colors include white, buff, red, brown, limestone and granite, besides many combinations of these. The buff, red and brown may be made either lighter or darker, and the limestone and granite may be varied in shade or combined with the buff, red or brown.

Special colors, to meet unusual conditions or to match other work, are made as required by the architect's specifications.

Artstone Finishes

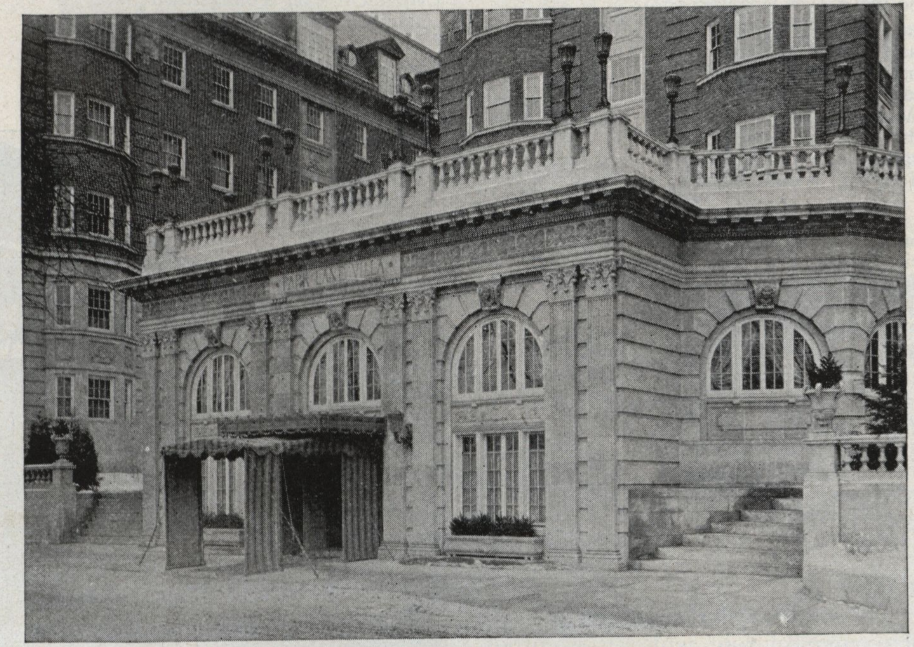
Smooth and tooled finishes are both produced. The most satisfactory surface for resisting wear and the action of the elements has been found to be one which is composed of such material as to present a slightly rough surface. This gives a rich, artistic effect when appearing in masses, as in exterior work. Many architects like the same texture for interior work as for exterior, while others prefer a finer grained surface, such as Caen stone or smooth white, either of which has been found satisfactory for inside use.



Interior, Church of the Annunciation, Akron, Ohio
Edward T. P. Graham, Architect

Co-operation and Service

The manufacturers of Rackle Artstone have always taken pride in maintaining close co-operation with the architect. To carry out with exactness the ideas of the designer of the building is the constant endeavor, and so it is always preferable when the architect can give complete information on all points involved. However, there are occasions when the architect desires consultation with



Entrance Detail, Park Lane Villa, Cleveland, Ohio
Reynold H. Hinsdale, Architect

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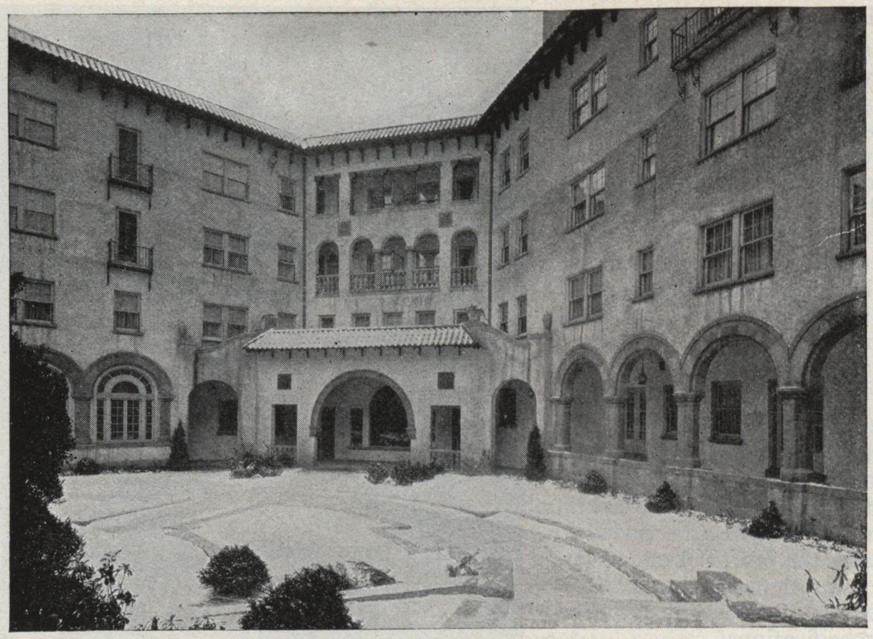


Court of the Alcazar Apartments, Cleveland, Ohio
H. T. Jeffery, Architect

those who make a special product, and it is at such times that the services of the Rackle organization may be called on freely, no matter whether the question raised refers to an estimate, to the qualities of the material as tested by experience, or to its adaptability to a certain design the architect has in mind.

Artstone References

Churches

St. Mary's Church and School, St. Paul, Minn.
Mt. Olive Lutheran Church, Milwaukee, Wis.
St. Vincent de Paul Church, Mt. Vernon, Ohio
Grace Covenant Presbyterian Church, Richmond, Va.
St. Patrick's Church, Seneca, Ill.
Trinity M. E. Church, Oil City, Pa.
First Presbyterian Church, Waterloo, Iowa
First M. E. Church, Bradford, Pa.
Church of the Annunciation, Akron, Ohio
Trinity M. E. Church, Buffalo, N. Y.

Schools and Hospitals

Ball Gymnasium, State Normal School, Muncie, Ind.
St. Mary's Convent and Academy, Little Rock, Ark.
Jefferson High School, Roanoke, Va.
Sisters of Mercy Academy, Westwood, Cincinnati, Ohio
Columbian School, Mattoon, Ill.
Emporium High School, Emporium, Pa.
U. S. Veterans' Hospital, Aspinwall, Pa.
Allegheny County Hospital, Woodville, Pa.

Business Buildings

U. B. Publishing House, Dayton, Ohio
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
National Lamp Works of General Electric Co., Cleveland, Ohio
Commercial National Bank, Peoria, Ill.
The Jeffrey Mfg. Co., Columbus, Ohio
Dayton Power & Light Co. (Millers Ford), Dayton, Ohio
Duquesne Light Co., Pittsburgh, Pa.

Apartments, Hotels and Residences

Embassy Building No. 8, Washington, D. C.
Vendome Realty Co., Milwaukee, Wis.
Stuart Court Apartments, Richmond, Virginia
Eiger Bros. Building, Chicago, Ill.
Bolton Square Hotel, Cleveland, Ohio
Park Lane Villa, Cleveland, Ohio

Flat Slab Roofing Tile

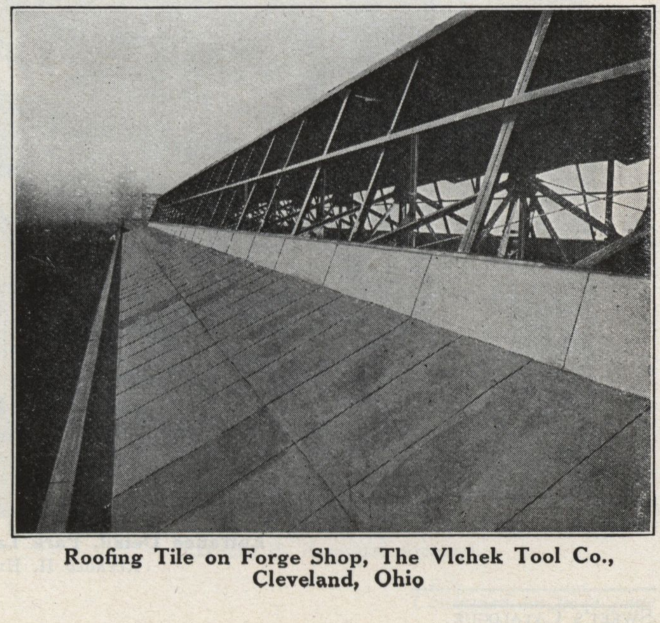
Rackle reinforced concrete flat roofing tile form a light, strong and economical roof which is fireproof, and meets every requirement of first class building construction.

For foundries, shops, warehouses, garages, schools and theaters they are well adapted. They are laid rapidly in place on steel purlins, no forms or centering being required, and are suitable for either flat or pitched roofs.

A booklet, which is sent free on application, gives information regarding these tile, sizes of purlins for different spans, methods for meeting special conditions, etc.

Roofing Tile References in Ohio

Garage for the City of Cleveland
Auditorium Garage Building, Cleveland
B. of L. E. Building, Cleveland
National Woolen Co., Cleveland
Cleveland Twist Drill Co., Cleveland
Senior High School, Mansfield
Citizen's National Bank, Mansfield
St. Dominic's Church and School, Youngstown
Lyden Oil Co., Youngstown
Bakelite Corp., Painesville
Lima Locomotive Co., Lima
Canton Sheet Steel Co., Canton
Wellman-Seaver-Morgan Co., Akron
McMyler Interstate Co., Bedford



Roofing Tile on Forge Shop, The Vlchek Tool Co., Cleveland, Ohio

DAPRATO STATUARY COMPANY

Designers, Sculptors and Makers of Statuary, Reliefs, Altars and Stained Glass Windows

STUDIOS
CHICAGO, NEW YORK,
PIETRASANTA, ITALY

762-770 West Adams Street
CHICAGO, ILL.

BRANCH OFFICES
NEW YORK, N. Y., 53 Barclay Street
MONTREAL, CAN., 415 Drolet Street

Products and Services

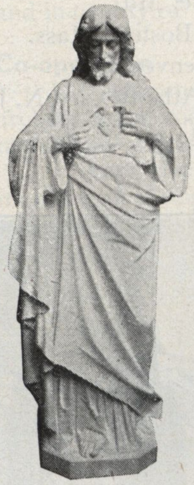
Designers, Sculptors and Makers of HIGH GRADE ECCLESIASTICAL WORK, such as: Altars, Altar Railings and Pulpits of Marble, Scagliola and Rigalico; Statues; Stations of the Cross; Cemetery Groups; Stained Glass Windows; Sounding Boards; Baptismal Fonts; Sanctuary Lamps; Electroliers; Monuments; Oil Paintings; Mosaics.

Special Sculpturing and Modeling of all kinds.

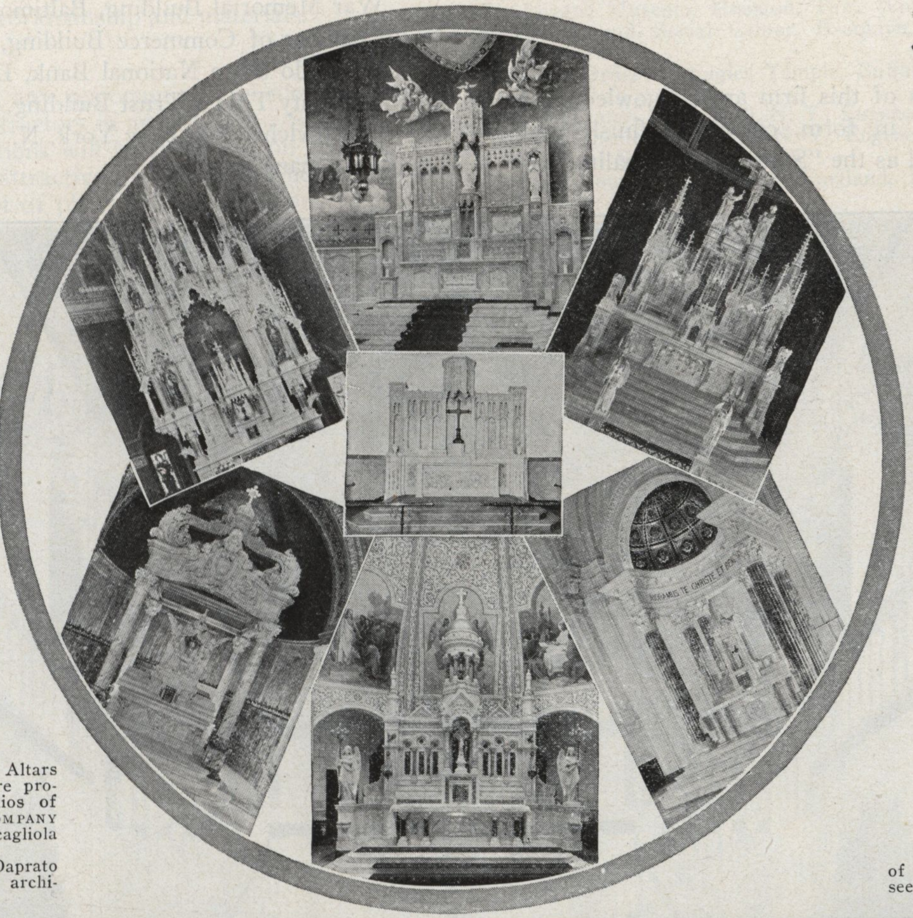
Facilities

The studios of DAPRATO STATUARY COMPANY have been established for 65 years, and are today the largest of their kind in the world. Here is available the work of artists, sculptors and modelers of exceptional skill and ability. Architects, whose plans include the creation of new ideas in architectural embellishment, either in the form of special statuary, relief work or ornamental effects, can utilize our facilities to advantage.

Correspondence invited.



STATUE OF MARBLE



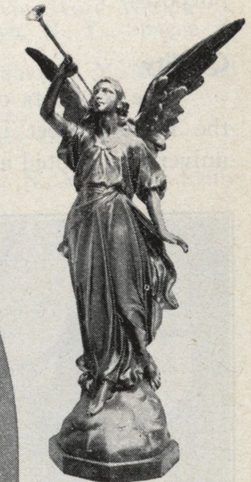
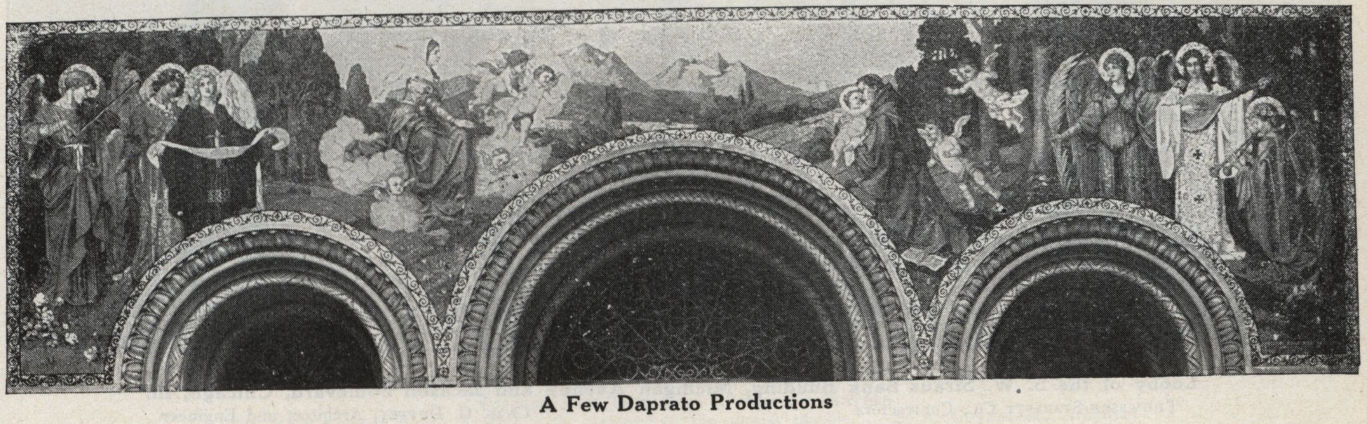


FIGURE OF METAL

The Group of Altars shown to the right are productions of the Studios of DAPRATO STATUARY COMPANY
Made in marble, scagliola or rigalico
Our publication "Daprato Altars" sent free to architects on request

A wonderful enrichment of a Church Portal will be seen in the Mosaic below



A Few Daprato Productions

H. A. COUSINS, INC.

Art Marble, Travertine and Scagliola

516-524 West 25th Street
NEW YORK, N. Y.

Products

Mycenian Marble; Scagliola; Travertine. Caen Stone; Ornamental Plastering.

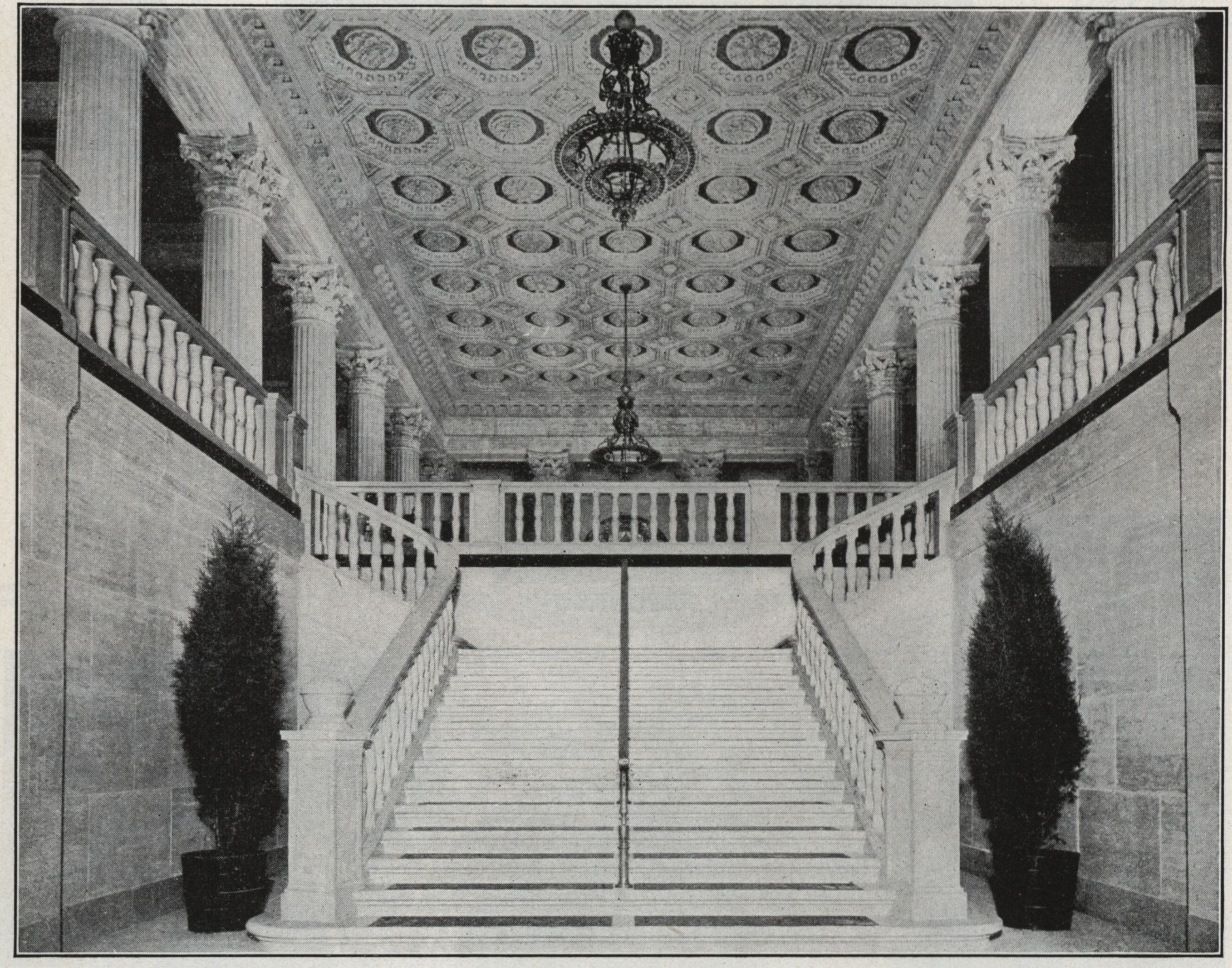
Synthetic Reproductions of Imported and Domestic Marbles and Stones indistinguishable from the natural, for architectural and decorative purposes.

Quality

The products of this firm are acknowledged to be the most perfect in form, color and finish, and are universally quoted as the "Standard of Quality."

Among Recent Installations Are the Following

Straus Bank and Office Building, Chicago, Ill.
Benjamin Franklin Hotel, Philadelphia, Pa.
New Uptown Theater, Chicago, Ill.
Lawyers Title & Trust Bank, Brooklyn, N. Y.
Old Town National Bank, Baltimore, Md.
War Memorial Building, Baltimore, Md.
Chamber of Commerce Building, Boston, Mass.
Colorado State National Bank, Denver, Colo.
Guaranty Title & Trust Building, Atlantic City, N. J.
Greenwich Bank, New York, N. Y.
And many others.



Lobby of the S. W. Straus Bank Building, Michigan Avenue and Jackson Boulevard, Chicago, Ill.
Thompson-Starrett Co., Contractors — Chas. G. Duffey, Architect and Engineer

JOHN J. WISE & COMPANY—INCORPORATED

Artificial Marble, Scagliola and Travertine

655 Second Avenue
NEW YORK, N. Y.

Products and Services

Manufacturers and Contractors for:

Artificial Marble, Scagliola, Imitation Travertine, Imitation Lime and Caen Stones, etc.

Synthetic Reproductions of all kinds of Imported and Domestic Stones and Marbles for Architectural and Decorative Purposes.

Contracts taken and executed, large or small, in any part of the United States or in Canada.

Quality

Products of this firm are of the best character, both in æsthetic values in reproductions of natural marbles and in quality of workmanship and materials.

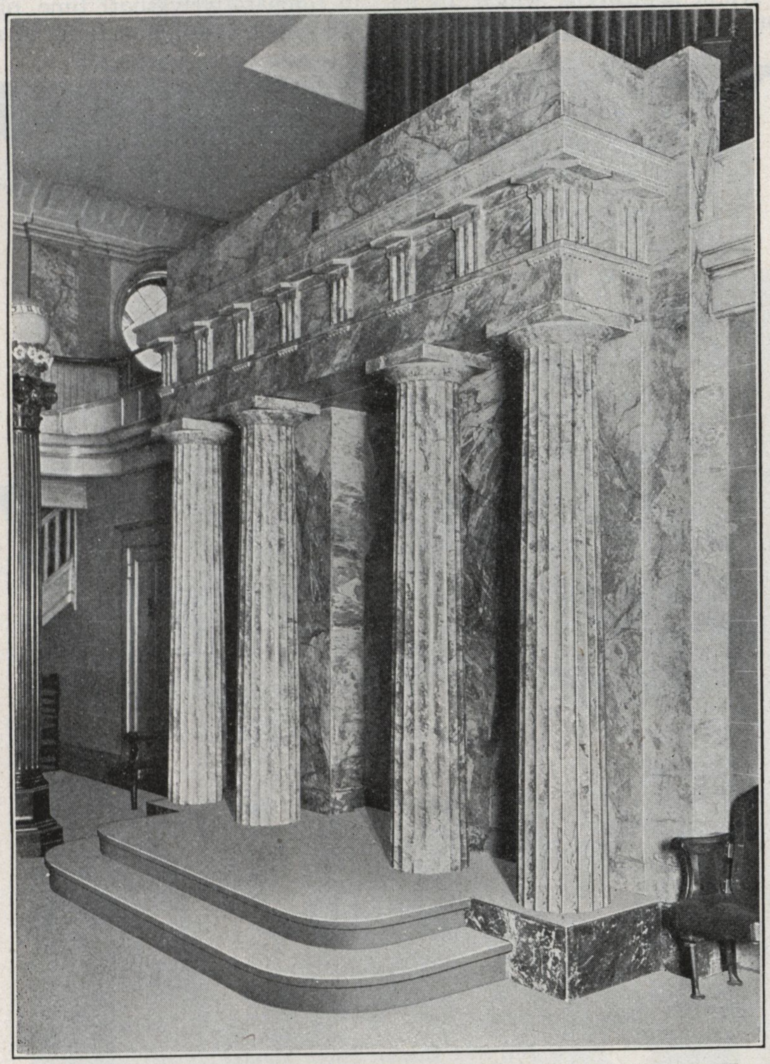
Co-operation

We welcome any opportunity to be of service to architects and contractors in any capacity. Samples, estimates and suggestions will be submitted on request.

Prompt and attractive proposals will be sent to the inquirer on receipt of plans and specifications.

A Few Recent Installations and Their Architects

Jenkintown Trust Co., Jenkintown, Pa., Horace Trumbauer
Commercial National Bank, Peoria, Ill., Hewitt & Emerson
Second National Bank, Saginaw, Mich., Smith, Hinchman & Grylls
Montclair National Bank, Montclair, N. J., John F. Jackson
International Acceptance Bank, New York, N. Y., Walker & Gillette
North Ward Bank, Newark, N. J., Guilbert & Betelle
Roosevelt Savings Bank, Brooklyn, N. Y., Carl L. Otto
Waldorf-Astoria Hotel, New York, N. Y., McKim, Mead & White
Statler Hotel, Buffalo, N. Y., Geo. B. Post & Son
St. Charles R. C. Church, Bridgeport, Conn., Jos. A. Jackson
Our Lady of Consolation Shrine, Carey, O., Ogden & Gander
Art League Museum, Houston, Tex., Wm. Ward Watkin
Synagogue and Social Center, Brooklyn, N. Y., Simeon B. Eisendrath
Fraternal Order of Eagles Temple, Buffalo, N. Y., Townsend & McNeil
Colony Theater, New York, N. Y., Eugene De Rosa
Terminal Theater, Brooklyn, N. Y., Eugene De Rosa
F. W. Grant Store, Atlanta, Ga.
Cortland County Courthouse, Cortland, N. Y., James Reilly Gordon



Senior Warden's Station in the West, Mount Vernon, N. Y., Masonic Temple
Executed in Imitation of Sienna Marble
The other stations in the Temple were executed in the similar marble. S. A. Gutenberg, Architect

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Mantels in Cretan Stone

2 West 47th Street, NEW YORK, N. Y.
CHICAGO OFFICE, 318 North Michigan Avenue
FOUNDRY AND SHOPS, 335 Carroll Street, BROOKLYN, N. Y.

Products

MANTELS in CRETAN STONE.

For Tile and Swimming Pools, see page 477; for Ornamental Bronze and Iron Work, see page 767; for Bronze and Iron Windows, see page 982.

Mantels in Cretan Stone

The illustration is an example of the artistic and decorative possibilities in mantels in Cretan stone. We have reproduced many antiques selected from importations and authentic models, as well as from designs of prominent American architects.

Hearths, also facings, plain or with false joints, can be furnished where required for all Cretan stone mantels, as well as door and window trim, cornice, wainscoting, pedestals, fountains, etc.

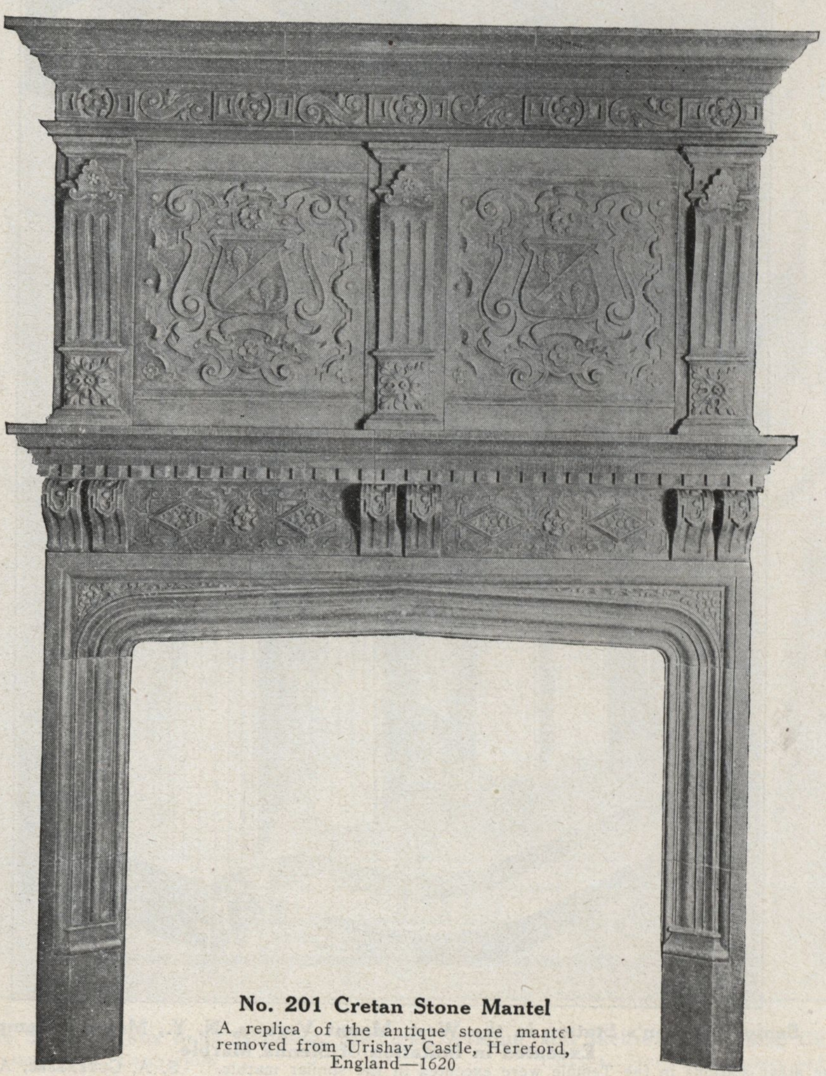
Features and Advantages of Cretan Stone

Cretan stone is a synthetic material which, in its durability, texture, beauty and finish, is in every way the equal of the popular Grecian, Roman and other natural stones. Its base is crushed marble, assembled after a special formula into a solid mass by a durable chemical binder. It is free from portland cement and plaster of paris and the preponderance of marble insures utmost endurance and permanence.

The manufacturing process permits the reproduction of the most intricate ornamentation of design, while its homogeneous structure allows chiseling and tooling of the finest character. At the same time the quality of the binder renders it as hard as natural stone. The texture lends itself readily to antique and other finishes.

Cretan stone is about equal in specific gravity to marble or limestone, but as the average thickness of the finished product is only one and one-half inches, reinforced, it is much lighter in weight than either of them. This is an important advantage in handling, shipping and installation.

For special designs Cretan stone can be produced in comparatively short time, obviating delay incident to the selection and quarrying of natural stone.



No. 201 Cretan Stone Mantel

A replica of the antique stone mantel removed from Urishay Castle, Hereford, England—1620

LOUIS GEIB
ARTHUR P. WINDOLPH

JACOBSON MANTEL & ORNAMENT CO., INC.

322-324 East 44th Street
NEW YORK, N. Y.

Products

MANTELS OF ARTIFICIAL STONE, including: Limestone, Caen, Bedford, Travertine, or any other kind of stone.

COMPOSITION ORNAMENTS or "COMPO" for application on woodwork.

Scope of Service

Old masterpieces of mantels reproduced to look exactly like originals. Special facilities for supplying mantels for apartments and hotels.

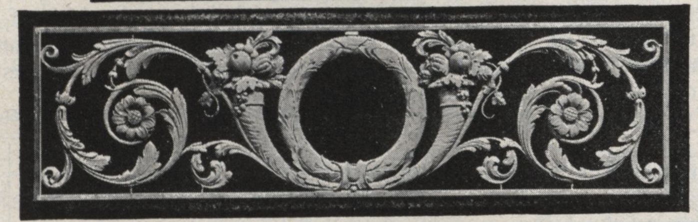
Lignoid compo ornaments for application to woodwork to take the place of wood carving.

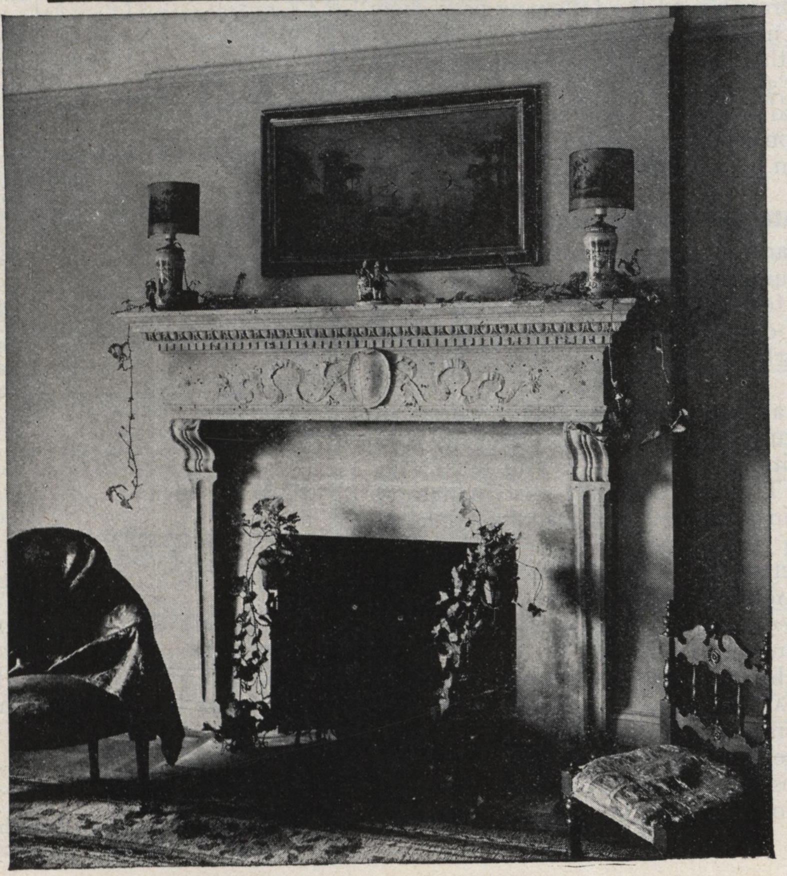
Compo is a composition which represents the maximum of achievement of a quarter of a century of study and experience. Models are carved in wood and then cast in lignoid compo and applied to woodwork, reproducing the minutest detail and texture of the original. It may be used for painted wood as well as natural.

Ornamental lighting fixtures are also made of compo.

Catalogue

A catalogue of mantels is issued to architects, builders and decorators.





NATURAL SLATE BLACKBOARD COMPANY

PEN ARGYL, PA.

MILLS AT SLATINGTON, WIND GAP, PEN ARGYL AND BANGOR

BRANCH OFFICES

ATLANTA, GA., 101 Marietta Street
BUFFALO, N. Y., 823 White Building
CHICAGO, ILL., 1451 Marquette Building
CINCINNATI, OHIO, 807 Gerke Building
CLEVELAND, OHIO, 618 National Building
KANSAS CITY, MO., 2422 Broadway
MINNEAPOLIS, MINN., 538 Builders Exchange Building
NEW YORK, N. Y., Room 1128, 200 Fifth Avenue
PHILADELPHIA, PA., 406 Perry Building
PITTSBURGH, PA., 307 Union Bank Building
ST. LOUIS, MO., 721 Olive Street
WACO, TEX., P. O. Box 461
WASHINGTON, D. C., 620 Bond Building

REPRESENTATIVES

BOSTON, MASS., New England Slate Blackboard Co., 224 Congress Street
NEW ORLEANS, LA., Brandin Slate Company, 227 Dauphine Street

AGENCIES IN ALL PRINCIPAL CITIES

Product

Natural Slate Blackboards.

"CENTURIES OF SERVICE"
PYRAMID
NATURAL SLATE
BLACKBOARDS
Proof against Time-Wear-Water-Fire!
TRADE-MARK

Service and Organization

Foremost in the minds of the various producers of slate who form the Natural Slate Blackboard Company, is the necessity of giving the consumer all of the information which will enable him to advantageously use the material.

In order to assure to architects, constructors and owners the best available data, the Natural Slate Blackboard Company has had the Structural Service Bureau of Philadelphia conduct extensive investigations into the production and utilization of natural slate for blackboards. The information thus obtained has been put into available form for use in laying out the blackboards and also for specifying the same in varying forms of construction.

Certain of this informative data is published in these pages, which also contain the specifications finally adopted. Detailed drawings on the following page show typical standardized methods of application.

In the pages of the Structural Slate Company within this issue of Sweet's Architectural Catalogue will be found reference to a series of publications which contain much information of value concerning the characteristics and production of structural slate.

Advantages of Slate for Blackboards

The structure and characteristics of natural slate are such that the surface may be brought to a finish which is unexcelled for blackboard purposes. It results in a smooth, even, dark writing surface upon which chalk marks are clearly legible and which may be easily erased or cleaned.

As slate is not affected by atmospheric changes in the classroom, its true, velvetlike surface remains constant under all conditions and does not wear out or require replacement. The first and only cost in natural slate blackboards is in furnishing and installing them at the time the building is constructed. In order that they may be properly erected it has been the endeavor of the Natural Slate Blackboard Company to place at the service of all users of natural slate blackboards their years of experience in this installation.

The "Pyramid" brand, which is stamped on all slate furnished by the Natural Slate Blackboard Company, was adopted in order to distinguish the material distributed by this company as a guarantee of the enforcement of the most rigid rules of workmanship and inspection in order to assure the best possible selection for the purpose.

Heights, Widths, and Areas Required

The ages of the pupils in the various grades should determine the height at which blackboards are to be placed above the floor. In a district school where children of all grades may be in a single room, the board is usually placed at an average height of 2 ft. 4 in. from the floor to the chalk rail. In some cases the board behind the teacher's desk is set higher than the others as it may be used entirely for illustration work.

Nearly all states and the larger cities have adopted requirements governing the height of chalk rails and the area, height and width of blackboards. The tables and data here presented represent standard requirements compiled from the sources noted.

STANDARD HEIGHTS OF CHALK RAILS AND BLACKBOARDS

Grade	Height of chalk trough				Height of blackboard				Top of board above floor			
	New York		Boston		New York		Boston		New York		Boston	
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
Kindergarten	2	0	2	2	4	0	4	0	6	0	6	2
1st, 2d, 3d...	2	0	2	2	4	0	4	0	6	0	6	2
4th.........	2	6	2′4″	2′6″	3	6	4	0	6	0	6′4″	6′6″
5th, 6th.....	2	6	2	8	3	6	4	0	6	0	6	8
7th.........	3	0	2	8	3	6	4	0	6	0	6	8
8th.........	3	0	2	8	3	6	4	0	6	6	6	8
High schools	3	0	2	8	3	6	4	0	6	6	6	8

For colleges it is usual to set the board 3 ft. above the floor and use a 4-ft. width.

BLACKBOARD AREAS

High Schools

Lecture rooms	Not less than 50 sq. ft.
Manual training room	15x4 ft.
Drafting rooms	15x4 ft.
Cooking rooms	10x4 ft.
Chemical laboratory	Board parallel to desk section and back of demonstration table.
Physical laboratory	As much board as possible.
Botanical and zoological laboratory	50 sq. ft. of board.

Colleges

Small lecture rooms	Blackboard back of instructor's desk and full on one side.
Laboratories generally	15 to 20 lin. ft.
Lecture room for mathematics	All board space possible.
Drafting rooms	About 15 lin. ft.

"Not less than 80 ft." of blackboard are required for the walls of each classroom by the Pennsylvania State Board of Education, which also requires the following heights and widths as best suited to the uses indicated:

Primary rooms	21 in. above floor
Elementary rooms	25 in. above floor
High school rooms	30 in. above floor

Boards should be not less than 3 ft. 6 in. wide, but 4-ft. widths are more suitable for accommodating all grades.

Continued on next page

Architect's Specification

The following note and specification are identical with those in "Natural Slate for Blackboards" issued by the Natural Slate Blackboard Company and copyrighted by the Structural Service Bureau, Philadelphia, Pa. They may be copied in full or referred to by name in the architect's specifications as governing the installation of blackboards.

Note: A complete specification for the furnishing and setting of blackboards affects the work of several different trades. In connection with this specification the specification for carpentry and millwork should call attention to requirements in regard to the grounds, trim, etc., to be furnished and set, and the kind of wood should be specified. It should be noted whether or not switches, thermostats, etc., are to be placed in trims of openings; and these trims designed accordingly. The location of switches, thermostats, etc., should be also specified under electrical work, heating work, etc.

Under masonry the setting of blocks or plugs to be built into the walls should be provided for. Under plastering it should be noted whether or not the walls back of the boards are to be plastered and under painting the finishing of the exposed frame and trim should be provided for.

(1) The general contractor shall furnish and arrange for the complete installation of Natural Slate Blackboards in every classroom (in the Manual Training room, the Domestic Science room, in all Laboratories and in the Assembly Hall) and in all other portions of the building where so shown or noted on the drawings.

(2) On all walls where blackboards occur they shall run full to corners and trim of openings. The heights of the slate to be as follows (state heights and whether single height or "double-tier").

(3) Where wardrobes occur in classrooms, place slate blackboards in each door, as follows (describe recessed panels, etc.).

(4) The slate shall be the finest quality selected blackboard stock, even in color, free from veinings or imperfections, not less than ¼ in., nor more than ⅜ in. thick. Each piece shall be surfaced in accordance with the Natural Slate Blackboard Company's standards, and shall be branded with the "Pyramid" trade-mark.

(5) Spaces 4 ft. 6 in. or less in length shall be in one piece: from 4 ft. 6 in. to 9 ft. in two pieces; longer spaces to be divided into pieces as nearly approximating 4 ft. 6 in. as space and standard lengths permit. Slate shall be furnished with joints ground straight, true and neatly fitted.

(6) The carpenter-contractor will furnish and set all grounds and will set all blackboards complete, with trim. All trim will be furnished by the millman. The complete installation shall be in accordance with the details and with the printed directions of the Natural Slate Blackboard Company, consistent herewith.

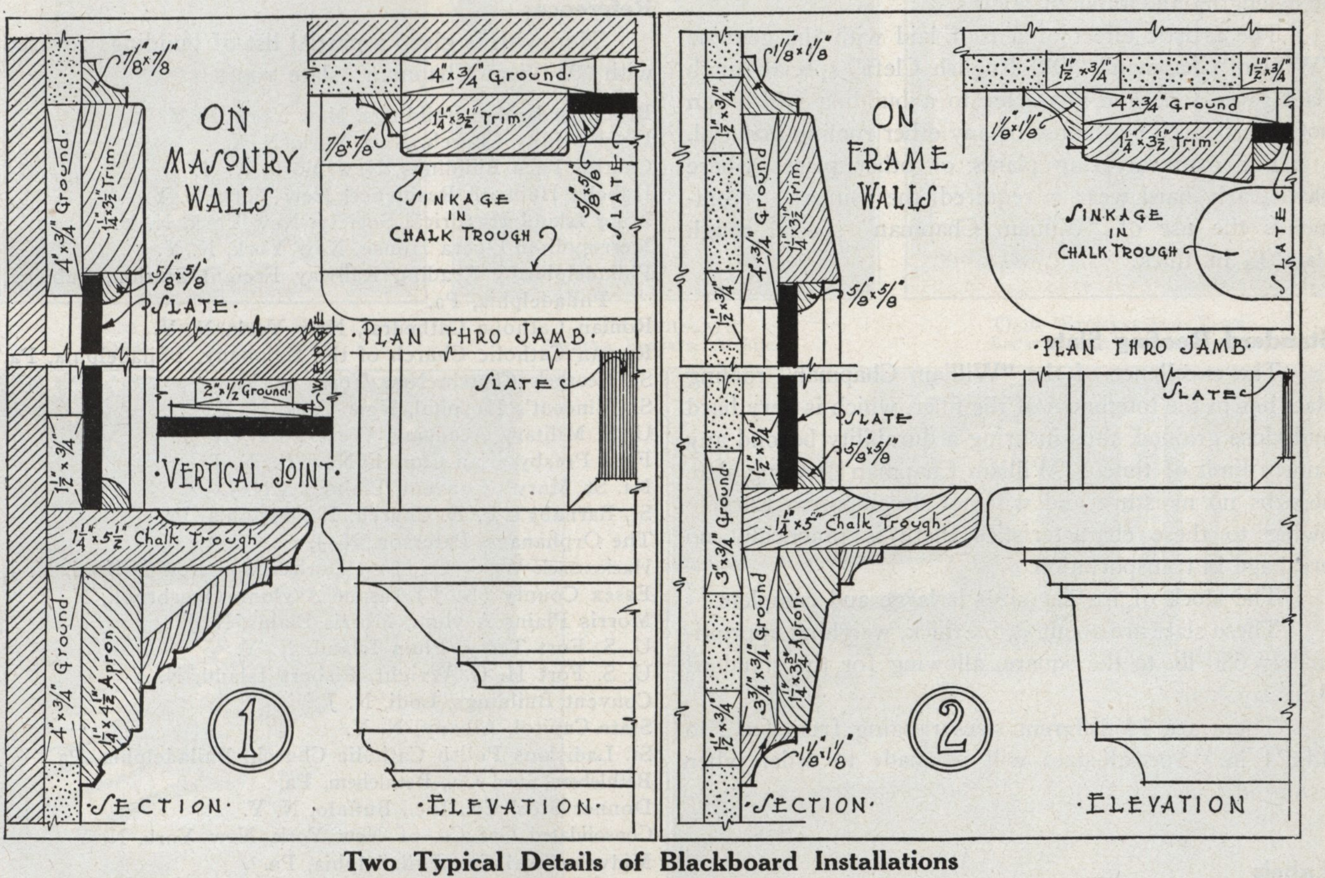
(7) Fasten securely to the walls, kiln-dried white pine "ground" strips 4x¾ in. at top, bottom and ends of all spaces to be occupied by blackboards (and intermediate strip near top if double-tiered). Back of all joints in slate securely place 2 x½-in. white pine strips and, when blackboards are being set, tap wood wedges behind slate and glue and sprig the wedges to these uprights.

(8) To the "ground" strips, above mentioned, securely set 1¼x3½-in. trim, slightly rounded at edges.

(9) At bottoms of blackboards place 5½x1¼-in. countersunk chalk troughs carefully leveled extending under blackboards to face of wall (or studs) and securely nailed to "ground" strips and to 4½-in. moulded aprons. Chalk trough shall be (moulded or rounded) on all exposed edges and returned at ends (or left open for cleaning), as detailed.

(10) As the blackboards are set, a ⅝x⅝-in. quarter-round shall be well secured to surrounding trims and chalk trough, firmly holding slate in place. Any free standing end trims and all tops shall be back-banded with ⅞-in. coved scotia mould (1¼ in. if on frame walls).

(11) The joints between slate shall, after being wedged as before specified, be made tight with special glue or jointing compound, which shall be furnished with the slate, and after completion of setting, joints shall be shaved and scraped to have the appearance of a smooth plane with adjoining surfaces. All slate blackboards shall be left sound, clean-black, ready for use and in every way a complete and satisfactory installation.



Two Typical Details of Blackboard Installations

(1) Detail of installation on masonry walls, (2) detail of installation on frame walls. Scale as printed 3 in. equals 1 ft

THE CHAPMAN SLATE COMPANY

BETHLEHEM, PA.

Member of the National Slate Association

Products

Makers and shippers of "William Chapman" Black Roofing Slate in all regular stock sizes, also in graduated lengths and thicknesses and random widths.

Quarries

The quarries of The Chapman Slate Company were opened in 1850, and today, with a capacity of over 3000 squares per month, produce more roofing slate than any other single hard vein quarry operating in the country.

The Chapman product today is quarried from a depth of over 200 ft.; is made by highly skilled mechanics, many of whom have long been in the service of the company, and the entire output is most carefully inspected to insure the proper grading.

Heavy "Old English Cleft" Special Rough Slate

Owing to the numerous and constantly increasing demands from architects, the company has, for the past years, been making a heavy rough "Old English Cleft" slate ranging from ¼ to 1 in. in thickness, and in graduated lengths and random widths.

The artistic effect of a roof laid with the genuine "William Chapman" "Old English Cleft" special rough slate gives tone and character to a building which can not be produced by the use of any other roofing material.

For manufacturing plants or other places where particularly hard wear is required, the company recommends the use of "William Chapman" special rough slate, ¼ in. thick.

Standard Roofing Slate

The excellence of the "William Chapman" roofing slate lies in the toughness of the fiber, which is very hard and close grained, thus insuring a durability beyond any known limit of time. "William Chapman" roofing slate absorbs no moisture and will not decompose. Largely owing to these characteristics there is practically no breakage in transportation.

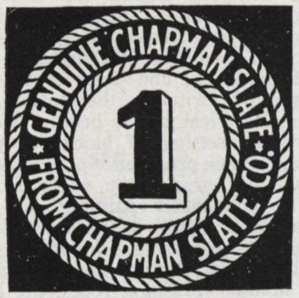
The stock of regular sizes is large and complete.

These slate are about $\frac{3}{16}$ in. thick, weighing approximately 680 lb. to the square, allowing for the standard 3-in. lap.

There are 14 different sizes ranging from 6x12 to 14x24 in. Special sizes will be made to order when required.

Labels

To prevent substitution of inferior quality slate, the company has instituted the practice of labeling about 2% of each shipment of genuine "William Chapman" roofing slate with a label, facsimile of which is reproduced herewith, on which is indicated the grade, whether No. 1 or No. 2.


GENUINE CHAPMAN SLATE CO.
1
FROM CHAPMAN SLATE CO.

"William Chapman" Slate Label

Shipping Facilities

The company ships direct from the Chapman quarries to every state in the Union, to Canada and Mexico, or to seaboard for export to Europe or South America.

With the present capacity, any size order for "regular" stock can be supplied promptly.

References

Herewith is given a partial list of buildings covered with "William Chapman" slate roofs:

Brooklyn Bridge Buildings, New York, N. Y.
Holy Trinity Church, New York, N. Y.
Central Park Buildings, New York, N. Y.
Isabella Heimath Residence, New York, N. Y.
Long Island Historical Society, New York, N. Y.
Metropolitan Opera House, New York, N. Y.
Philadelphia & Reading Railway Freight Station, Subway, Philadelphia, Pa.
Roman Catholic Cathedral, New York, N. Y.
Roman Catholic Church of the Epiphany, Philadelphia, Pa.
St. George's Church, New York, N. Y.
St. Vincent's Hospital, New York, N. Y.
U. S. Military Academy, West Point, N. Y.
First Presbyterian Church, Newark, N. J.
Mt. St. Mary's Convent, Plainfield, N. J.
St. Barnaby's P. E. Church, Philadelphia, Pa.
The Orphanage, Paterson, N. J.
Hackensack Water Co., New Durham and New Milford, N. J.
Essex County (N. J.) Insane Asylum, Overbrook, N. J.
Morris Plains Asylum, Morris Plains, N. J.
U. S. Fort Terry, Plum Island, N. Y.
U. S. Fort H. G. Wright, Fishers Island, N. Y.
Convent Buildings, Lodi, N. J.
State Capitol, Albany, N. Y.
St. Ladislaus Polish Catholic Church, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., Buffalo, N. Y.
Consolidated Gas Co. of New York, New York, N. Y.
Midvale Steel Co., Philadelphia, Pa.
Bethlehem Fabricators, Inc., Bethlehem, Pa.
Brethren Church, Ambler, Pa.
Hotel Dennis, Atlantic City, N. J.

ESTABLISHED 1873

THE JOHN D. EMACK CO.

Olde Stonesfield Roofs and Flagging

ARCHITECTURAL SERVICE AND DISPLAY ROOMS

112 South 16th Street
PHILADELPHIA, PA.

17 East 49th Street
NEW YORK, N. Y.

OLDE STONESFIELD PRODUCTS REPRESENTED BY
CHICAGO, ILL., Burt T. Wheeler Brick Co., Chamber of Commerce Building
DETROIT, MICH., Thomas Bros. & Co. Ltd., Empire Building
CINCINNATI, OHIO, Baldwin-Tarvin Company

Olde Stonesfield

Is individual service, the proper conception, right handling and careful planning of each roof by experts.

This costs you nothing but insures you much.

Our reputation is your specification.

Thatchslate

An exclusive Emack production; interesting textures and choice colorings, moderate in cost, simple in application.

Olde Stonesfield Flagging

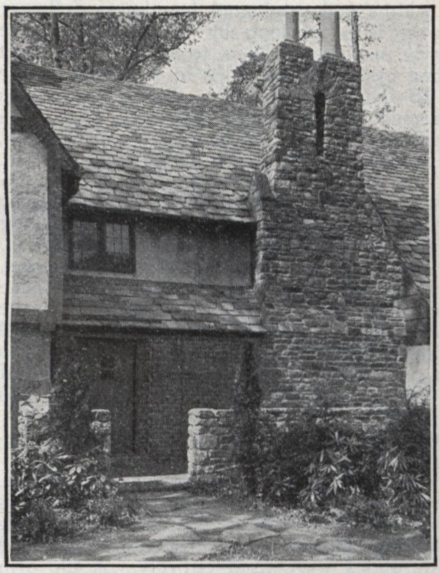
Interesting textures and charming colors for steps, coping, terraces, walks and interior floors.

Stock

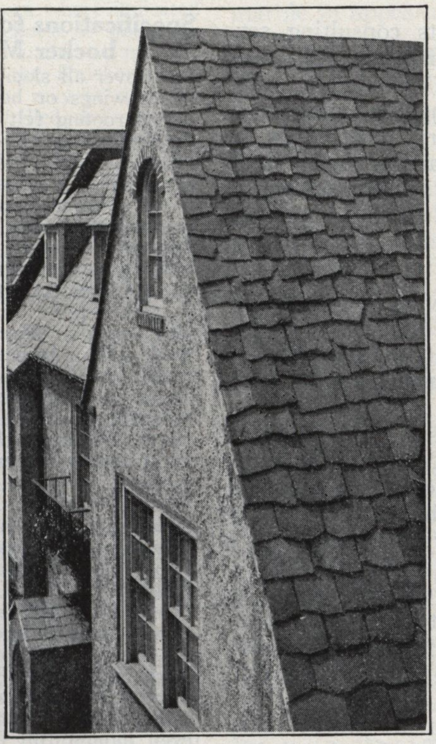
We carry large stocks of both roofing and flagging for immediate shipment.

Circulars

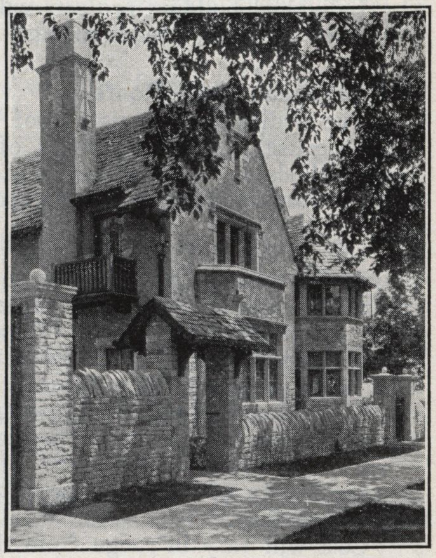
Send for circulars on Olde Stonesfield Thatchslate and Flagging.



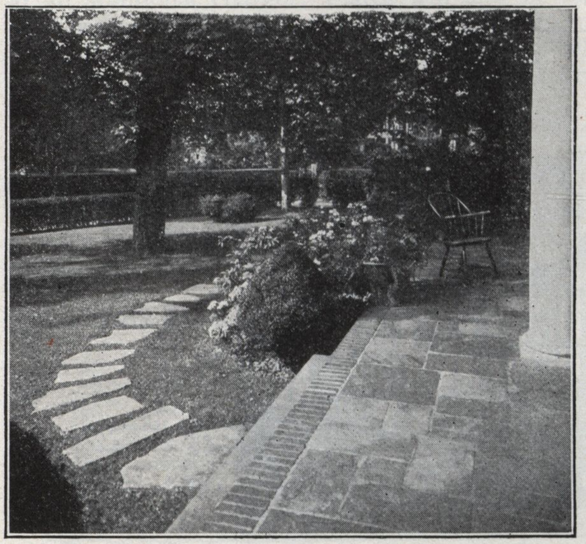
Olde Stonesfield Roof
Frank J. Foster, Architect



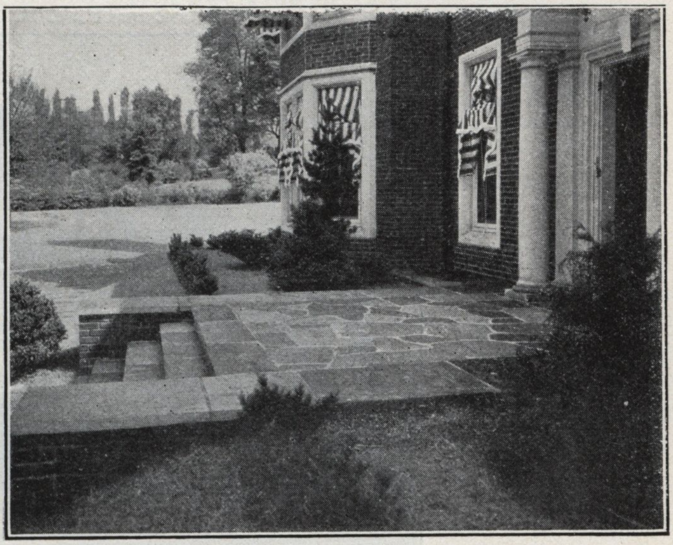
Thatchslate
Spencer Roberts, Architect



Olde Stonesfield Roof
Brust & Phillips, Architects



Olde Stonesfield Flagging and Walk
Showing use of random rectangular terrace and stepping stone walk in irregular sizes



Irregular Flagging Steps and Coping
Druckenmuller & Williams, Architects
Showing slate steps and coping with irregular field of Stonesfield flagging

KNICKERBOCKER SLATE CORPORATION

E. J. JOHNSON, President

153 East 38th Street, NEW YORK, N. Y.

Products

Roof Slates; Garden Flagging; Slate Blackboards; Structural Slate; Snow Guards; Slating Nails.

Slaters' Tools.

Consulting Service

Technical knowledge has become a valuable factor in assembling proper color combinations, exposures and thicknesses in the Old European roofs, properly adapted to a given roof project.

This concern affords, through its consulting service, an experience of over 36 years in quarrying slate and working out the most advanced installation problems. Our service includes supplying architects with technical facts covering actual quarry possibilities in slate, specification suggestions and plans of layouts.

Individual building projects will be worked out to meet their respective requirements.

Old European Slate Roofs

The ordinary type slate roof while highly practical, because of the uniformity of dimension of the individual slates, and its one color (generally black), failed to lend itself to the modern requirements of architecture.

Our Old European slate roof is all that modern artistic demands can possibly desire. Marked in texture, graduated in exposures and thicknesses, random in widths, colors placed haphazard throughout the roof, with more or less departure from symmetry of lines, gives a brief word picture of these beautiful roofs.

Colors range in purples, grays, greens and blacks of varying shades, with some weathering to buffs. An interesting color feature of these roofs is the fact that they grow in beauty with age, in direct contrast with manufactured roofings.

Cost will vary in range from that of the ordinary slate roof upwards. We invite requests for detail features and advice.

Old European Terrace and Garden Flagging

Slate in purple with green mottling of unfading character, or to include slate weathering to buff; natural quarry surface textures; irregular shapes and sizes ranging from approximately 2 to 5 sq. ft., each.

An artistic floor for loggias, garden walks, church floors, porches, terraces, etc. Same material is supplied in rubbed surfaces, in square or rectangular pieces.

Our booklet fully describes this product and gives method of installation.

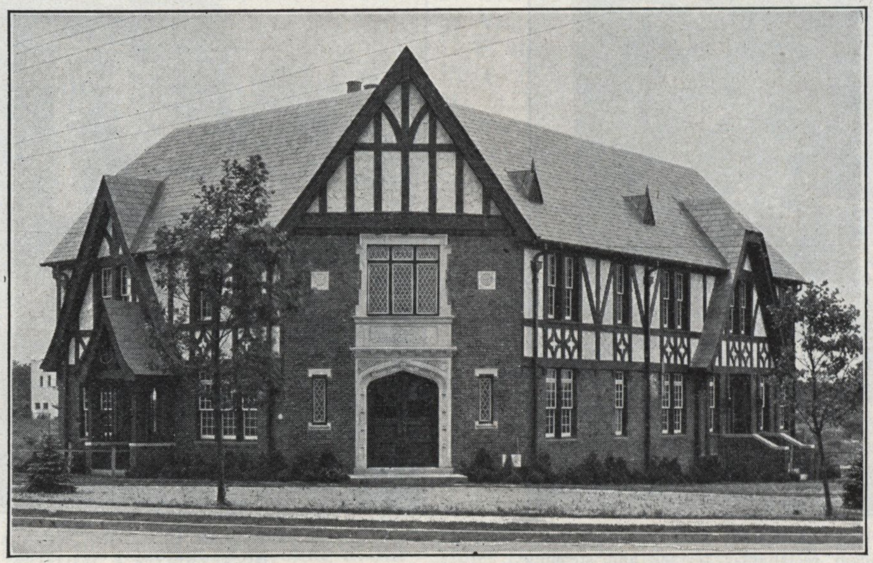
Specifications for Old European Slate Roof, Knickerbocker Method

Cover all sloping roofs (and other surfaces where indicated on drawings or herein specified) with one thickness of heavy tarred roofing felt to be approved by architect, over which lay the Knickerbocker Slate Color Scheme K (or other color arrangement as may be desired), with nailholes drilled and countersunk and in random widths and graduated lengths as follows:

Under eave course, 17½ in. long by ½ in. thick; eave course, 30 in. long by ½ in. thick, 13½ in. to weather; the next two courses, 30 in. long by 1 in. thick, 13½ in. to weather; the next three courses, 28 in. long by ¾ in. thick, 12½ in. to weather; the next three courses, 26 in. long by ½ in. thick, 11½ in. to weather; the next four courses, 24 in. long by ⅜ in. thick, 10½ in. to weather; the next four courses, 22 in. long by ¼ in. thick, 9½ in. to weather; the next five courses 20 in. long by ¼ in. thick, 8½ in. to weather; the next five courses, 18 in. long by $\frac{3}{16}$ in. thick, 7½ in. to weather; the next five courses, 16 in. long by $\frac{3}{16}$ in. thick, 6½ in. to weather; the next five courses 14 in. long by $\frac{3}{16}$ in. thick, 5½ in. to weather; the next five courses, 12 in. long by $\frac{3}{16}$ in. thick, 4½ in. to weather. All slates to be fastened with yellow metal nails of suitable length for the various thicknesses. Any degree of rough effect may be obtained by laying varying thicknesses of slates in the same course. Slates at valleys, hips, rakes and ridges to be laid in elastic cement of same color as slate. Small pieces of slate at valleys and hips will not be allowed.

Notes: We supply blue prints of roof plan showing exposures and thickness of each course.

The foregoing specification is for a roof with a 30-ft. rafter. Arrangement may be varied to suit any length rafter, thickness increased or decreased, exposures varied, cost reduced by using thinner slates as random and graduated effect would be obtained even though full $\frac{3}{16}$-in. slates were used entirely. A uniform length of slate and exposure throughout roof with random widths is another scheme specially adapted to $\frac{3}{16}$-in. thickness.



Knickerbocker Slate Roof on Borough Hall, Deal, N. J.

Continued on next page

Standard No. 1 Roof Slate Full 3/16 in. Thick

"Standard No. 1 Slate" is the trade-name applied to the ordinary thickness of roof slate, which approximates $\frac{3}{16}$ in. in any of the colors, and implies the best material as to quality. Thickness is not sufficiently or properly established in the trade to make that important point clear and definitely fixed as it should be, but leaves the question open to the use of thin or substantially split slate as may be the policy of those who supply it. We are earnest advocates of substantially split slates and supply in all our roof slates a Standard No. 1 full $\frac{3}{16}$ in. thick; and if architects will specify the "Knickerbocker Standard No. 1 Slates *full $\frac{3}{16}$ in. thick,*" it will insure this point of maximum strength and thickness which is so properly expected in a slate roof.

Specifications for Ordinary or Standard No. 1 Slate of Full 3/16 in. Thickness

Cover all sloping roofs (and other surfaces where indicated on drawings or herein specified) with one thickness of single-ply tarred roofing felt properly lapped and of quality as may be approved by the architect, over which lay the Knickerbocker Unfading Green Roof Slate (or otherwise as may be desired) Standard No. 1 full $\frac{3}{16}$ in. thick, nailholes drilled and countersunk, size 20x10 in. (or size as desired), each slate fastened with 2 yellow metal slating nails 1¼ in. long. All slates to be laid with 3-in. lap and exposure of 8½ in. (or other dimensions suitable to size of slate used), with butts laying tight. Under eaves and top courses to be of same width and with grain of slate vertical; no "stretchers" or slate with grain running horizontal will be permitted. Slates at valleys, hips, rakes and ridges to be laid in elastic cement of same color as slate. Small pieces of slate at valleys and hips will not be allowed.

Metal at gutters must run well up under slate. Ridging and hips of 16-oz. cold rolled copper (or other metal), 3-in. flange coming down over slate, covering all nailholes; 14-oz. copper flashings and 16-oz. cap flashings wherever necessary.

Note: Boston hips and ridges of slate are not only effective but are exceedingly practical. Detailed information respecting specification requirements will be furnished architects on request.

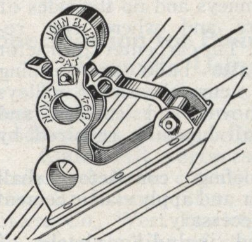
Snow Guards

The patent snow guard standard, in connection with ¾-in. (outside measurement, 1 in.) galvanized gas pipe, composes the "pipe" or "rail" guard. This standard is adjustable to any pitch of roof. The plate is made the thickness of Standard No. 1 slate and of the same dimensions as the slate upon the roof where used, the plate taking the place of a slate and being well secured to the roof with wood screws or otherwise as may be desired.

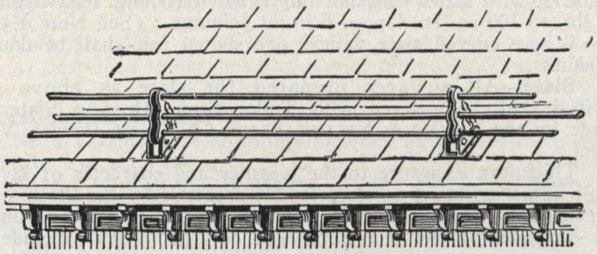
Standards with plates of greater thickness than Standard No. 1 slate will be made to suit heavier slate at an additional charge. Plates will also be made of suitable form for use on tile roofs of any pattern.

Standards are placed along the eaves of all roofs from 5 to 6 ft. apart and are made for 2 or 3 pipes.

When ordering, specify the size of slate to be used on the roof (Standard No. 1 thickness is understood unless otherwise ordered) and the number of pipes that will be used. We quote on and ship 3 pipe standards unless otherwise specified.



Snow Guard Standard


Pipe or Rail Guard Complete

Slating Nails

The nails used for fastening slate should be of the most durable material, since most slate roof troubles are due to slates falling out because the nails have corroded. Cut yellow metal or copper wire nails are recommended.

Our nails are made up and shaped distinctly for slating purposes—the result of many years' experience.

Structural Slate

Furnished in various shapes and sizes for use for steps, platforms, risers, wainscoting, base, toilet slabs of all kinds, floors, electrical slabs, etc.

Can be supplied in regular ribbon black, clear black, light green and mottled purple and green.

The light green and mottled purple and green slates present a very fine appearance and are especially suitable for use in entrances, lobbies, stairways, etc., where architectural beauty is desired. They compare favorably with marble in appearance and are considerably cheaper.

Slate Blackboards

Best black slate with the highest grade of machine rubbed finish. Spaces made up of stated dimensions.

References

Slate roofs and interior structural slate supplied by us have been used throughout the country for buildings planned by leading architects.

A list of a few of these buildings, with the architects' names, follows:

Nicholas Brady Residence, Roslyn, L. I., N. Y., John T. Windrim
Cornell University, Residential Halls "A" and "D," Ithaca, N. Y., Day & Klauder
Southern Methodist University, Dallas, Tex., Shepley, Rutan & Coolidge
Wm. Percy Bartram Residence, Stamford, Conn., Hollingsworth & Bragdon
St. Johns Church and Rectory, Locust Valley, N. Y., H. W. Rowe
Cathedral of Sacred Heart, Newark, N. J., I. E. Ditmars
H. S. Snyder Residence, Bethlehem, Pa., Duncan Fraser
M. P. Worthington Residence, Birmingham, Ala., Warren & Knight
St. Michaels Church, Litchfield, Conn., Rossiter & Muller
Philosophy Hall, University of Washington, Seattle, Wash., Bebb & Gould
Administration Building, Lindenwood College, St. Charles, Mo., Labeaume & Klein
Mrs. Leighton Lobdell Residence, Rumsen, N. J., Alfred Busselle
Sarah Choate Residence, Pleasantville, N. Y., McKim, Meade & White
Convent for Holy Trinity Church, Mamaroneck, N. Y., Robt. J. Reilly
Lincoln School, New York, N. Y., Starrett & Van Vleck
Milton Point School, Rye, N. Y., Tooker & Marsh
Convent Divine Compassion, White Plains, N. Y., Anthony F. A Schmitt
Culver Apartment, New York, N. Y., Walker & Gillette
Allerton Apartment, New York, N. Y., A. Loomis Harmon
Quaker Ridge Golf Club, Mamaroneck, N. Y., Buchman & Kahn
Princeton Club, New York, N. Y., Aymar Embury, 2nd
Academy of Sacred Heart, San Francisco, Cal.
Business Building, Columbia University, New York, N. Y., McKim, Mead & White
Federal Reserve Bank, New York, N. Y., York & Sawyer
Lincoln National Life Building, Ft. Wayne, Ind., Benj. W. Morris
John H. Carlyle Residence, Passaic, N. J., John F. Jackson
Parish of St. Gabriel, East Elmhurst, L. I., N. Y., Gustave E. Steinbuch
40 West 40th Street, New York, N. Y., Raymond W. Hood
Sacred Heart Church, Jersey City, N. J., Cram & Ferguson
Union County Park Commission Building, Elizabeth, N. J., C. G. Poggi
Harkness Memorial Quadrangle, Yale University, New Haven, Conn., James Gamble Rogers
Port Washington High School, Port Washington, L. I., N. Y., W. Sherwood Bessel
American Radiator Co. Building, New York, N. Y., Raymond Hood
Junior and Senior High School, Bayonne, N. J., D. G. Anderson
High School of Commerce, New York, N. Y., W. H. Gompert

ESTABLISHED 1869

RISING & NELSON SLATE CO.

Miners, Makers and Shippers of High Grade Roofing Slate

QUARRIES AND MAIN OFFICE
WEST PAWLET, VT.

NEW YORK OFFICE, 101 Park Avenue
PHILADELPHIA OFFICE, 112 South 16th Street
CHICAGO OFFICE, 2554 West Harrison Street
BOSTON OFFICE, 46 Cornhill
LONDON OFFICE, 26 Martin Lane, Cannon Street
ARCHITECTS' SERVICE DEPARTMENT, 101 Park Avenue, NEW YORK, N. Y.

Tudor Stone Roofs

TRADE-MARK

Products

"Tudor Stone" and "Tudor Stone jr." Roofing Slate.
Commercial Roofing Slate.
Flooring Slate and Garden Flagging.

Production

The fact that this company owns and operates numerous quarries in addition to controlling the production of a number of others insures quality and uniformity of result in all slate. This is especially true of architectural slate, which is quarried to order under trained architectural supervision.

Architectural Specialties

"Tudor Stone" Roofing Slate; also the following, which are variations of the *"Tudor Stone"* group: Golden Pheasant, Valenheli, Verde Unique, Yorkshire Gray, Cotswold, *"Tudor Stone Jr.,"* etc. These are distinct types, not ordinary slate parading under new names, as can readily be seen by comparison.

Commercial Roofing Slate

Sea Green, Unfading Green, Weathering Green, Mottled Green and Purple, Clear Purple, Purple Vein, Rustics, Red, etc., quarried in Vermont.

Genuine Bangor, Albion or Jackson Bangor Washington, Bangor, Franklin, Chapman, Peach Bottom, etc., quarried in Pennsylvania and elsewhere. Monson and Brownville, quarried in Maine. Buckingham, quarried in Virginia.

Flooring Slate and Garden Flagging

Split surface or rubbed surface, trimmed or sawn edges. Irregular shapes, random sizes, rectangular shapes and regular size pieces. In full range of weathering and unfading colors in all thicknesses.

Samples and Booklet

Samples of any slate desired forwarded on request.

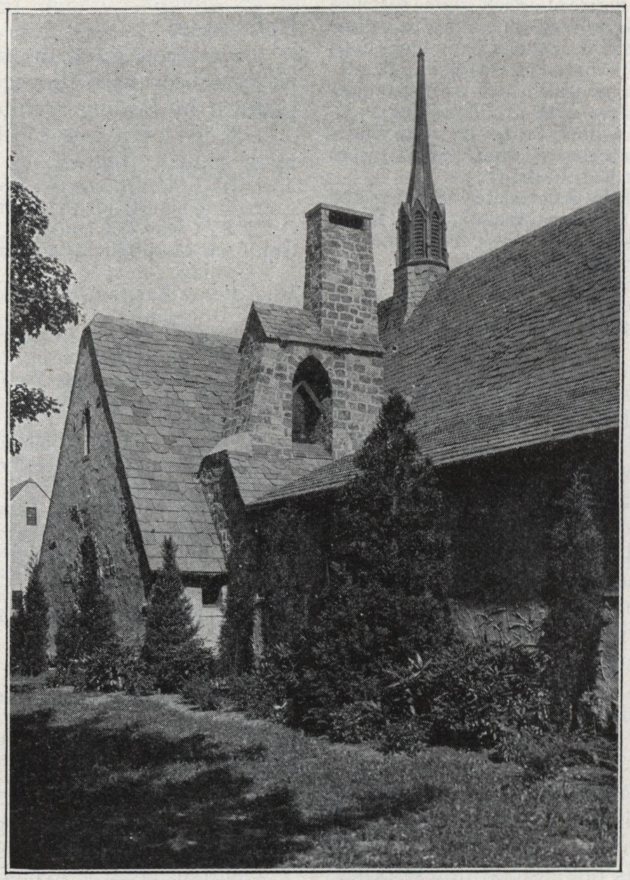
We have a new booklet and architectural leaflet showing examples of our products. We would be pleased to forward copies of these on request.

Architects' Service Department

The Service Department established in the Architects Building, 101 Park Avenue, New York City, is under trained architectural direction, and is equipped and maintained by this company for the convenience of architects and others who may require information in reference to roof design and construction.

Architects are requested to make use of the facilities offered, either for preliminary work or for the preparation of complete roof layouts and estimates of costs.

This service is without any obligation.



All Saints Episcopal Church, Great Neck, L. I., N. Y.
Mann & MacNeille, Architects

Specifications for Tudor Stone Roofing Slate

Preparation—Slating contractor shall examine roof boarding and report to carpenter all defects which would be detrimental to the durability of the finished roof, and shall see that defects are remedied before applying felt.

Carpenter contractor shall furnish and apply a cant strip nailed about 2 in. above the eave line of the slate and shall put water shedding cant strips back of chimneys and up the sides of dormers and where else required. The carpenter contractor shall also build up forming where curved slate valleys are shown and furnish and place all blocking required by roofer.

Roofing contractor shall furnish and apply elastic cement where in his judgment the same is necessary.

Felt—Cover surface to be slated, including cheeks of dormers, with slater's asphalt impregnated roofing felt weighing 40 lbs. to 100 sq. ft., lapped 6 in. at joinings. (See Note 1.)

Where curved slate valleys are shown felt shall be double thickness.

Slate—All surfaces prepared for slate as above described shall be covered with Tudor Stone Roofing Slate, as made by the Rising & Nelson Slate Co., West Pawlet, Vermont.

Thickness, exposure to the weather and character of laying shall be as indicated on roof layout prepared by the Architects' Service Department of the Rising & Nelson Slate Co., under the direction of the architect. The contractor shall include in his estimate a sum sufficient to pay the expense of an expert

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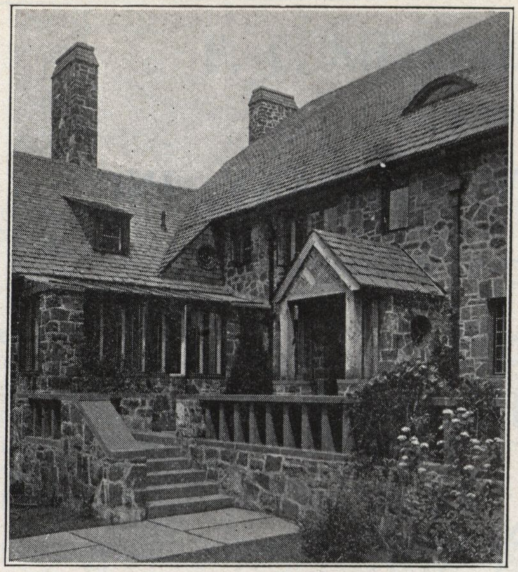


W. H. Putnam Residence, Hartford, Conn.
Smith & Bassett, Architects

from said Service Department to visit the work and assist the roofer in obtaining the architectural effect desired.

Nails—Nails shall be copper (see Note 4) slater's nails of sufficient length to adequately penetrate the roof boards using not less than 2 to each slate.

Flashing—The sheet metal contractor shall furnish and the slate contractor shall install 16-oz. soft rolled copper built-in flashings as required at closed valleys, chimneys, dormers and other necessary places. Flashing shall extend not less than 4 in. under slate and have not less than 4 in. exposed above the slate on a line at right angle to the roof and shall not be nailed to the vertical surface. Roofing contractor shall insert all aprons required, which will be furnished by sheet metal contractor. Sheet metal contractor shall apply counterflashing and make same secure against leaks.

Open Valleys—All open valleys shall be 16-oz. soft rolled copper (see Note 5), 20 in. wide, nailed at top only. In applying slate, care shall be used that no nails penetrate the sheet metal valleys.

Closed Valleys—All closed valleys to be flashed with 16-oz. copper flashing over each course. Flashing to lap at least 2 in. and to extend 10 in. either side of valley.

Round Valleys—To be carefully fitted and laid with special long slate. No metal used unless specially directed, but care must be taken to preserve continuity of roof color and texture.

Ridges—Ridges and hips shall be of slate laid mitered (or Boston style). If design should so require, ridges and hips should have 16 oz. copper hip and ridge rolls (see Note 6) as shown and detailed.

Guarantee—Contractor shall guarantee to maintain all slate roof surfaces in a watertight condition for a period of 2 years from completion.

Specification for Plain Hipped Roof with Valleys and Dormers Using Commercial Grade Slate

Preparation, Cement, Felt and *Guarantee* to be specified as described under heading Tudor Stone Roofing Slate with such modifications as may be necessary to meet the individual problem.

Slate—All surfaces prepared with felt as above described shall be covered with No. 1 Weathering Green (see Note 2) Roofing Slate, as furnished by the Rising & Nelson Slate Co., West Pawlet, Vermont.

Slate shall be of random widths and 16 in. long (see Note 3); laid with 3-in. head lap so that distance to the weather shall be 6½ in.

Nails (see Note 4), *Valleys Flashing* and *Ridge* to be specified as described under heading Tudor Stone Roofing Slate.

Specification Notes

Note 1—For best commercial work 30-lb. felt is recommended. For slate not over ¼ in. thick 16-lb. felt may be used.

Note 2—Substitute, if desired, Tudor Stone Jr., Weathering Green, Unfading Green, Mottled Green and Purple, Clear Purple, Red or Pennsylvania Slate.

Note 3—Substitute other lengths or uniform widths if desired, but note that commercial slate are made in lengths from 10 to 24 in., always in even inches, and that slate should have 3-in. head lap on second slate.

Note 4—Substitute for less expensive work away from seashore, galvanized iron or copper clad steel nails.

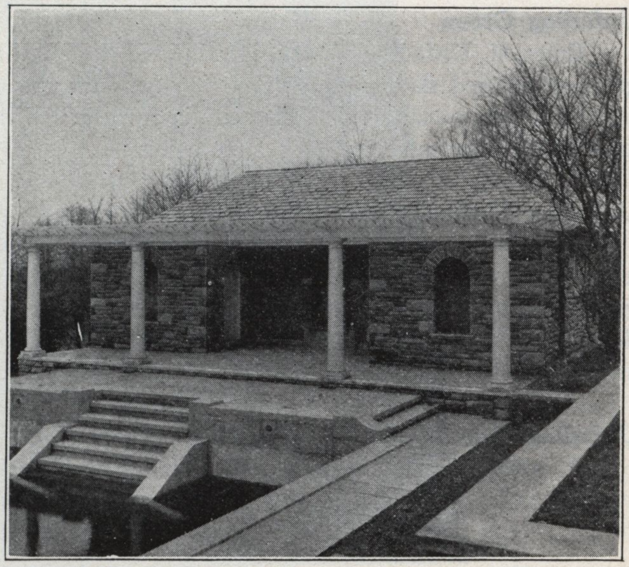
Note 5—Substitute zinc, galvanized iron or tin if desired. Copper is recommended. Curved slate valleys require special attention and when required should be specified to be watertight and of uniform appearance to adjoining slate.

Note 6—Substitute 4-lb. sheet lead or galvanized iron if desired, or specify slated "Boston" hips and ridges or mitered slated hips and ridges. Plumbing specifications should call for 4-lb. sheet lead flashings, 18-in. square, turned up 4 in. around all plumbing pipes, with separate lead cap flashing extended down to the slate and calked into first joint of pipe above the roof.

References

A partial list of prominent architects who use our products:

Chas. I. Berg, New York, N. Y.
Alfred Hopkins, New York, N. Y.
Carrère & Hastings, New York, N. Y.
John Russell Pope, New York, N. Y.
Delano & Aldrich, New York, N. Y.
H. T. Lindeberg, New York, N. Y.
Chas. A. Platt, New York, N. Y.
Bertram G. Goodhue, New York, N. Y.
Walker & Gillette, New York, N. Y.
Murphy & Dana, New York, N. Y.
McKim, Mead & White, New York, N. Y.
Trowbridge & Ackerman, New York, N. Y.
Goodwin, Bullard & Woolsey, New York, N. Y.
Ewing & Allen, New York, N. Y.
James W. O'Connor, New York, N. Y.
Aymar Embury, 2nd, New York, N. Y.
Theodate Pope, New York, N. Y.
Smith & Bassette, Hartford, Conn.
Howard VanDoren Shaw, Chicago, Ill.
Perkins, Fellows & Hamilton, Chicago, Ill.
Cram & Ferguson, Boston, Mass.
R. Clipston Sturgis, Boston, Mass.
Parker, Thomas & Rice, Boston, Mass. and Baltimore, Md.
Bakewell & Brown, San Francisco, Cal.
John T. Windrim, Philadelphia, Pa.
Wm. B. Itner, St. Louis, Mo.
Archer & Gloyd, Kansas City, Mo.
Chas. S. Cobb, Toronto, Can.
Kenneth Rea, Montreal, Can.
Schenck & Williams, Dayton, Ohio
Brust & Phillipp, Milwaukee, Wis.
Favrot & Livaudais, Ltd., New Orleans, La.
Albert Kahn, Detroit, Mich.
Ludlow & Peabody, New York, N. Y.
Allen & Collins, Boston, Mass.
Zanzinger, Borie & Medary, Philadelphia, Pa.
Horace Trumbauer, Philadelphia, Pa.
Day and Klauder, Philadelphia, Pa.
Mellor, Meigs & Howe, Philadelphia, Pa.



Bath House on C. A. Warden Estate, Haverford, Pa.
Horace Wells, Architect

ESTABLISHED 1901

O'BRIEN BROTHERS SLATE COMPANY, INC.

Quarriers and Manufacturers of Roofing Slate

OFFICE

GRANVILLE, N. Y.

NEW YORK, N. Y., 120 East 41st Street—Telephone, Ashland 5150

Products

Roofing Slate, Floor Slate and Garden Flagging.

Service

Architects and engineers are invited to consult with our Service Department at 120 East 41st Street, New York, N. Y., for information and specifications in the preparing of details for a graduated thick slate roof. We are also prepared to make sketches and offer suggestions for the use of slate in landscape work.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1913

Production

All orders executed under our personal supervision, assuring our clients that the years of our experience as slatemakers have gone into the preparing of their roof.

Unfading Green

Emerald Unfading Green is admitted to be the greenest colored slate produced. It is of a dark green color and never changing. This slate is furnished with an absolute guarantee not to change color.

Unfading Mottled Green and Purple

Unfading mottled green and purple slate produces a roof full of warmth and life. An effect of either green or purple predominating can be produced, if so desired. This slate should be given consideration by architects who desire to obtain the best in a slate roof.

Unfading Gray

A gray-green slate with irregular shaped dark splotches. Some slate are a solid gray with no markings.

Rustic Gray

A very desirable colored slate to blend with other colors. Dark streaks run through the slate. Some fade to a brown and beautiful buff color.

Vermont Black

Some are a gray-black, while others are real shiny "Niggerhead Blacks." This slate is unfading and used to the best effect in a heavy roof.

Weathering Green

The commercial sea green makes a very durable watertight roof at the least possible expense. After a few month's exposure on the roof some fade to a brown and buff color while others retain their original gray-green color.

Architectural Slate

By blending the various Vermont colored slates in the proper percentages, an effect can be obtained similar to the autumn foliage. This type of roof should be planned in conjunction with our Architectural Department to secure the proper coloring and thickness of slate suitable for the roof being planned.

Garden Flagging

Natural cleft, irregular flagging is being used extensively for landscape work. This can be obtained in any desired pattern as shapes cut to size or in rectangular shapes. Can be furnished in all colors.

Samples

Small size samples will be mailed free on request.

F. C. SHELDON SLATE COMPANY

GRANVILLE, N. Y.

BRANCH OFFICES

CHICAGO, ILL., Marquette Building
CINCINNATI, OHIO, 534 Main Street
COLUMBIA, S. C., 17 Carolina National Bank Building
DALLAS, TEX., 416 Thomas Building
MONTREAL, QUE., 9 Olier Street
DETROIT, MICH., 1410 Kresge Building
NEW YORK, N. Y., 101 Park Avenue
TORONTO, ONT.

SHELDON'S
RED GREEN PURPLE BLACK
SLATES
TRADE-MARK

MEMBERS OF
NATIONAL SLATE ASSOCIATION
SLATE
CONSIDER ITS USES
FOUNDED 1922

Products

Roofing Slate of every known size, color and thickness, comprising the Black Slates of Maine, Pennsylvania and Virginia; the Red Slate of New York; and the varying shades of Greens, Grays and Purples, permanent or weathering, from the Sheldon mines in Vermont.

Also, Structural and Electrical Slate; Blackboards; Flagging for Gardens and Floors.

Production

We are generally recognized as the largest individual producers of colored roofing slate, both commercial and architectural, from quarries actually owned and operated under our personal supervision. This not only enables us to maintain the uniform quality which has established the superiority of Sheldon's slates, but insures prompt and satisfactory execution of all commissions entrusted to us.

Co-operative Service

An architects' service department is maintained at the main office at Granville, N. Y., thoroughly equipped for supplying detail layouts or other general and technical information pertaining in any way to the use of slate for every interior and exterior purpose. A well informed representative will confer with members of the profession at any time and render any desired assistance towards the furtherance of any architect's slate requirements. Our experts will supervise the application of any roof when required.

Sheldon's Semi-Weathering Green and Gray Slates

These slates are produced from Sheldon mines in Vermont, the largest in the district, from the deep slate formations created thousands of years ago during the Cambrian period. The colorings shown are the exclusive assets of this particular production, and to insure this effect, Sheldon's Slates and Certificate should invariably be insisted upon.

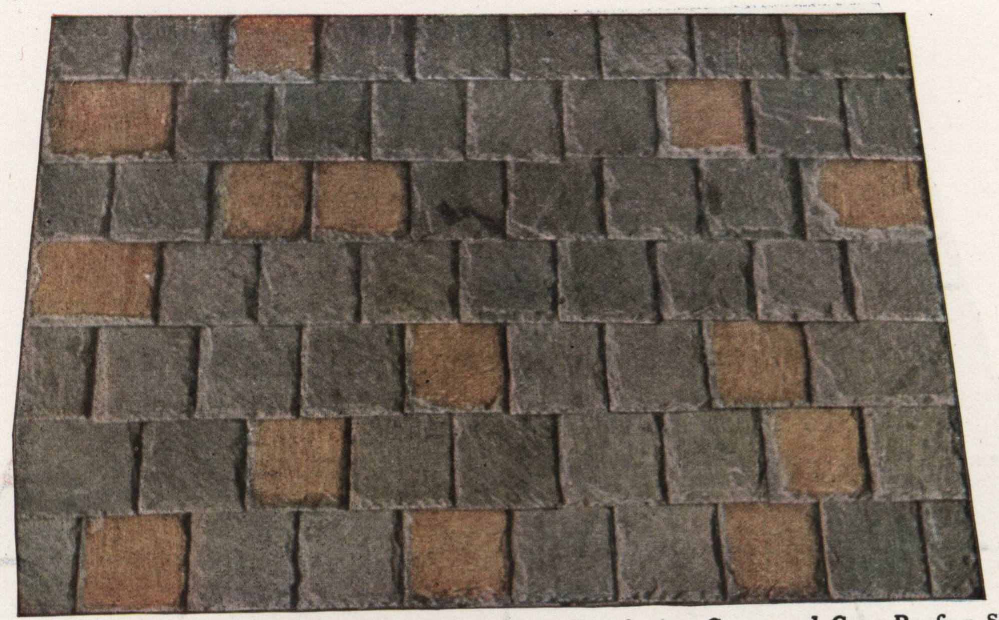
When first quarried and split these slates are gray-green in color, but after exposure to the action of the elements a uniform percentage invariably "weather" to soft tones of brown and buff, forming a random mixture with the unfading grays and greens.

In many cases this particular type of slate, all coming from the same quarry and blending together in natural harmony, insures more satisfactory architectural results than can be realized by the use of combinations of different colors from several quarries, which develop too many sharp contrasts.

Man has often sought to imitate by artificial processes but has never succeeded in producing a roofing material which can compare with this perfect natural product. Its practicability lies in its everlasting durability; its beauty in the soft harmonious blending of colors as in a beautiful tapestry, but with the added charm of texture developed by shadow lines.

The ultimate colorings and textures are harmonious with all types of domestic architecture and that of Continental precedent for larger buildings.

A large stock is always on hand and prompt deliveries are guaranteed.



Exact Reproduction at Full Maturity of Sheldon's Semi-Weathering Green and Gray Roofing Slate of Standard Commercial Thickness Averaging 3-16 In.

Continued on next page

Strength, Absorption and Acid Tests—Made by Cambria Steel Company, Johnstown, Pa., and certified by S. M. Marshall, Engineer of Tests, March 26, 1914, to establish the strength and absorption of *No. 1 Commercial Semi-Weathering green and gray slate.* The results are a correct basis for comparison as to real strength when compared to other roofing material.

Thickness	Width	Load	Span	Breaking stress
0.165 in.	10 in.	385 lb.	8 in.	17,000 lb.
0.165 in.	10 in.	435 lb.	8 in.	19,200 lb.
0.160 in.	10 in.	395 lb.	8 in.	18 500 lb.

Some specimens of the slate were put in water for 24 hours and others in a 5% sulphuric acid solution for the same period of time, to determine the absorption and loss in acid action.

Gain in weight, 24 hours in water	Loss in weight 24 hours in 5% acid solution	
	Actual loss	Corrected for absorption
0.49% (less than ½ of 1%)..........	0.29%	0.39%

Specifications for Sheldon's Commercial Semi-Weathering Green and Gray Slates—

(1) Furnish all materials and labor and cover with slate all portions of the building shown, marked or indicated for slate, and form all slate hips and ridges and all metal flashings, valleys, etc., in accordance with the tentative specification of the F. C. SHELDON SLATE COMPANY. (If metal other than copper is to be permitted for flashings, valleys or nails, the exceptions should follow here.)

(2) The slate shall be Sheldon's Semi-Weathering Green and Gray of commercial thickness of ...... size.

Note to Specification: If Architectural Slate are required, change paragraph (1) to read: "The slate shall be Sheldon's Semi-Weathering Green and Gray graduated in length and thickness in accordance with detailed graduation. 'A,' 'B,' 'C,' or 'D,' to be applied in accordance with shop drawing to be submitted by manufacturers for approval of architect before work is commenced."

Slate for Architectural Purposes

All of the slate described, herewith, are available, and are being extensively furnished from the Sheldon quarries, in thickness ranging from ¼" to 2", and in graduated, or random sizes as desired.

LAYOUT SUGGESTIONS FOR ARCHITECTURAL SLATE

A—20% each 1", ¾", ½", ⅜", ¼" thickness.
B—20% each ¾", ½", ⅜", ¼", 3/16" thickness.
C—10% 1", 15% ¾", 20% ½", 25% ⅜", 30% ¼" thickness.
D—10% ¾", 15% ½", 20% ⅜", 25% ¼", 30% 3/16" thickness.

Sizes 24" to 12" in length, random widths. Lower percentages of thick and higher percentages of thin slate than in graduation "C" and "D" are not recommended. Percentages are based on length of rafter. Heavier slates can be furnished when required up to 2" in. thickness.

SHIPPING WEIGHT IN POUNDS PER SQUARE

Commercial 3/16", 700; ¼", 1000; ⅜", 1500; ½", 2000
¾", 3000; 1", 4000; 1¼", 5000; 1½", 6000

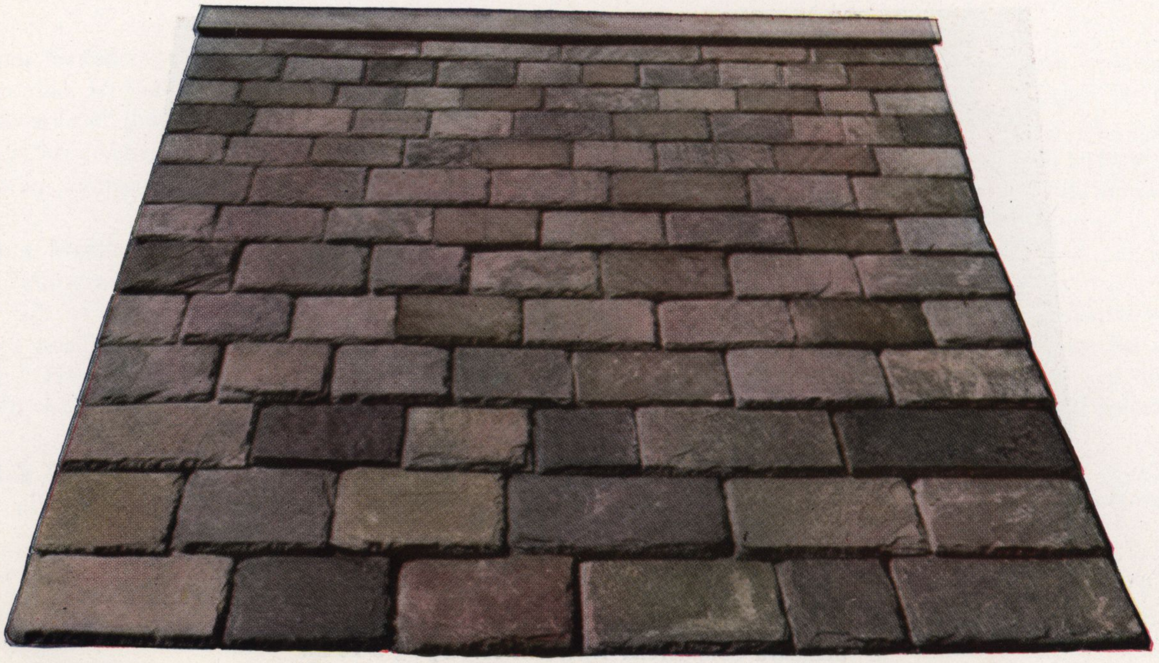
Irregular Shapes and Sizes—Or random rectangular sizes may be had for flagging, garden walks, terraces, pergolas and other requirements of landscape architecture as well as for interior use.

Olde English Architectural Slate Combination No. 12

A combination of various thicknesses, sizes and colors of slate designed particularly for producing the finest type of architectural roof. Slate can be furnished in any range of thickness and exposures desired either in medium or extremely rough textures. This combination No. 12 is also available in random rectangular flagging for flooring, garden walks, etc.

In the illustration below is shown a photographic reproduction in actual natural colors of Sheldon's Olde English Architectural Slate Combination No. 12. In the particular installation illustrated the range of thickness was from 1" to ¼"., with exposures varying from 10½" at eave to 5½" at ridge. The slate is of medium texture.

Due to the extent of our quarrying operations and production facilities, timely deliveries are insured. Simply specify—"Roofs to be covered with Sheldon's Olde English Slate Combination No. 12" (following with maximum and minimum thicknesses and exposures) "as manufactured by F. C. SHELDON COMPANY, Granville, N. Y., in accordance with detailed layout to be furnished by them and approved by architect."



Olde English Architectural Slate Combination No. 12

Continued on next page

Other Exclusive Specialties

Semi-Weathering Mottled Purple and Green—A predominating purple tone when first manufactured, some having spots or streaks of green of varying size. A uniform percentage change upon exposure to harmonious shades of brown, while others present an unchanged appearance.

Unfading Mottled Purple and Green—Consist of slightly varying shades of purples—sometimes almost clear—frequently clouded with spots or traces of green, others with light and dark clouds of purple, some having a purplish tint that might otherwise pass for green slate. Absolutely steadfast in color and of unlimited durability.

Unfading Green and Gray—The green is a sage green. The grays can be had in light and dark shades; the former practically clear and of a light gray tone; the latter mottled with dark streaks or clouds.

Arabian Red—Distinctively a New York State product, Washington County of this state being the only place in the world where roofing slate of this color and quality has been found in deposits of sufficient size to insure profitable operations.

Hard Vein Freaks—Just what the name implies—freak slates—from rock formations centuries old, of a character that will not permit the manufacturing of any under 3/8" in thickness and from this up to 2" for architectural purposes. A great array of colors are available, comprising gray-blacks, opals, bronzes, buffs and browns, grays, blue-grays and others, so varied and unique that when displayed en masse, one is reminded of a beautiful tapestry.

Olde English Special Rough Cleft—Furnished in any individual color or combination of colors; random lengths and widths and promiscuous thicknesses ranging from $\frac{3}{16}''$ to 3/8". The use of these slate, in accordance with our layout and specifications, guarantees the finest low priced architectural roof extant.

National Black—A strictly high grade Sheldon product. Guaranteed absolutely unfading. Delivered to many localities at a considerable saving in cost over Maine, Peachbottom, or Buckingham.

Commercial Roofing Slate—General Information

Sheldon's Commercial Roofing Slate is furnished in standard sizes ranging from 24"x14" to 10"x6", $\frac{3}{16}''$ in thickness. All colors except freaks.

Strength of Substructure—The fact that there is no necessity of increasing the sizes of the roof framing members for a commercial ($\frac{3}{16}''$) slate roof is based upon the following facts:

The live load, including wind and snow, required by various city building codes ranges from 30 to 50 lb. per sq. ft., an average of 40 lb. or 4000 lb. per square of 100 sq. ft. The actual dead load—roof covering, sheathing and rafters—for a roof covered with wood shingles is about 790 lb. per square, or a total load of 4790 lb. The same roof covered with slate would have a total load of 5240 lb. or only 450 lb. for each 100 sq. ft. or 4½ lb. for each square foot more. It will be observed that the actual dead load is comparatively small in proportion to the theoretical live load which must be provided for.

In the live load, the wind pressure is of course equal regardless of the roofing material, but authorities agree that the snow load may be assumed as less for a slate roof than for shingle, for instance, Kidder gives slate a credit of from 3 to 12 lb. per sq. ft., according to the slope and climate.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1913

A Few Installations of Sheldon's Semi-Weathering Green and Gray Slate

Building	Location	Architect
Peabody Residence	Hinsdale, Mass.	Marshall & Fox
Standard Steel Car Co. Factory	Hammond, Ind.	Owners
Aspinwall Hotel	Lenox Station, Mass.	J. McArthur Vance
General Motors Housing Development	Flint and Pontiac, Mich.	Owners
James Simpson Residence	Glencoe, Ill.	Graham, Anderson, Probst & White
Stoneleigh Manor	Rye Beach, N. H.	Cram & Ferguson
Second Congregational Church	Holyoke, Mass.	Allen & Collens
Saturn Club	Buffalo, N. Y.	Bley & Lyman
Elks Home	Cohoes, N. Y.	Ogden & Gander
Baptist Hospital	Brookline, Mass.	E. Sears Reed
Rumford School	Winchester, Mass.	C. G. Loring
Princeton Inn	Princeton, N. J.	Andrew Jackson Thomas
E. Clarence Jones Residence	Saratoga, N. Y.	Aymer Embury II.
Berkshire Industrial Farm	Canaan, N. Y.	J. C. Greenleaf
Bigelow Carpet Works Operation	Thompsonville, Conn.	Waring Company
U. S. Veterans Hospital	Leeds, Mass.	Government Specification
Glassboro High School	Glassboro, N. J.	Guilbert & Betelle
Lees-McRae Institute	Johnson City, Tenn.	D. R. Beeson
Stone Project	Troy, N. Y.	Stanton P. Lee
Municipal Auditorium	San Francisco, Cal.	Architectural Commission
T. D. Loffland Residence	Tulsa, Okla.	L. E. Blue
Recreation Building, Borden Mfg. Co.	Fall River, Mass.	Fox & Gale
Columbia Park Building	Chicago, Ill.	J. B. Dibelka
Presbyterian Church	Dallas, Tex.	H. M. Green Co.
Niagara Inn	Niagara Falls, N. Y.	Harold Cook
Sacred Heart Church	Berlin, N. Y.	Frank Morgan
McKnight Residence	Glenosborne, Pa.	H. D. Gilchrist
Bliss Residence	Washington, D. C.	F. H. Brooks
F. G. Robb Residence	Montreal, Que.	F. G. Robb
Columbia County Hospital	Philmont, N. Y.	Tooker & Marsh
Norfolk County Hospital	Braintree, Mass.	H. F. Kellogg
Scarsdale High School	Scarsdale, N. Y.	Stevenson & Cameron
Central Church of Christ	Buffalo, N. Y.	F. A. Spangenburg
American Window Glass Co. Warehouse	Jeannette, Pa.	Owners
Cutting Memorial	Newport, R. I.	Owners
Bancroft High School	Worcester, Mass.	Andrews, Rantoul & Jones
U. S. Government Housing Operations	Bristol, Pa., and Bridgeport, Conn.	
Minnehaha Lutheran Church	Minneapolis, Minn.	Lang, Rangland & Lewis
Baseball Cage, Amherst College	Amherst, Mass.	McKim, Mead & White
Second Universalist Church	Boston, Mass.	Allen & Collens
Miss Hall's School	Pittsfield, Mass.	York & Sawyer
Porter Hospital, Middlebury College	Middlebury, Vt.	Trowbridge & Livingston
Goodyear Residence	Buffalo, N. Y.	Bley & Lyman
Bridgewater Normal School	Bridgewater, Mass.	Guy Lowell
A. Santaella Residence	Tampa, Fla.	Fred J. James

VENDOR SLATE CO.

EASTON, PA.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue
CHICAGO, ILL., Marquette Building
WASHINGTON, D. C., Bond Building
DETROIT, MICH., Hoffman Building
PITTSBURGH, PA., 6600 Hamilton Avenue
COLUMBUS, OHIO, Atlas Building
LONDON, ENG., Martin Lane

QUARRY OPERATIONS

BANGOR, PA.
PEN ARGYL, PA.
SLATINGTON, PA.
MIDDLE GRANVILLE, N. Y.
GRANVILLE, N. Y.
POULTNEY, VT.
FAIRHAVEN, VT.

CONCENTRATION YARDS AND STORAGE WAREHOUSES: MIDDLE GRANVILLE, N. Y.

(For assembling and shipping Architectural Slate)

STORAGE WAREHOUSES

PITTSBURGH, PA., 6600 Hamilton Avenue
ST. LOUIS, MO., 1548 Vandeventer Avenue

METTOWEE STONE from the PENRHYN HILLS

Production

Mettowee Stone Architectural and Commercial Roofing Slate.

Mettowee Flooring and Garden Slate.

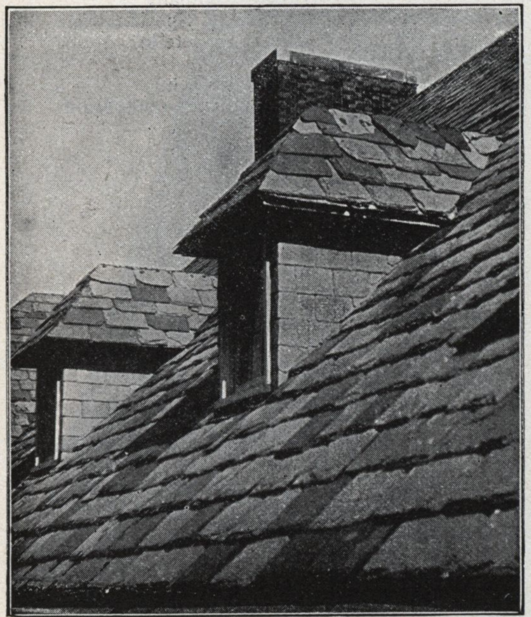
Quarries

The Vendor Slate Co. is the largest slate organization in the United States. It operates and controls the output of the most important slate quarries in America, among them being the famous "Old Bangor" quarry, the Pen Argyl operations, the "Genuine Washington" and "Provident" quarries, the "Old Red" quarry and many Vermont Architectural Slate quarries.

Assembling and Shipping Yards

The Vendor Slate Co. has reserve stocks in Vermont and Pennsylvania that are larger than those of the combined stocks of all other slate operators.

The company's concentration yard and warehouses with their private railroad sidings are situated in the heart of the Vermont architectural slate belt region.



An Attractive Mettowee Stone Roof

Architects' Service Departments

The Vendor Slate Co. maintains architects' service departments in New York, N. Y., and Easton, Pa.

These departments are under the direction of trained architects and are maintained wholly for the use of architects and others requiring information concerning slate roof design and construction.

Architects are urged to avail themselves of this service either for preliminary studies or the preparation of complete slate roofing layouts and cost estimates.

Our service department will supervise the application of slate when necessary.

Literature

Send for our catalogue and other literature.

References

Architect	Commission
York & Sawyer	Michigan University
Day & Klauder	Princeton University
Henry C. Hibbs	Southwestern University
Granger, Lowe & Bolenbacher	Indiana University
Arnold Brunner	Dennison University
Theodate Pope	Avon College
Frederick L. Ackermann	DuPratt-White Residence
Delano & Aldrich	Fowler Residence
Schenck & Williams	Oakwood School
Howard VanDoren Shaw	Adam Thompson Residence
Lewis Bowman	Cloister Inn
Geo. M. Mason & Co.	Edw. S. George Residence
Clifford A. Wendehack	Wingfoot Country Club

Continued on next page

"Mettowee Stone" Roofs

Mettowee Stone is produced exclusively by the Vendor Slate Co. It is quarried in the Penrhyn Hills lying along the border line of Vermont and New York.

Mettowee Stone is of exceptional beauty, ranking highest in quality and architectural excellence.

Its value and beauty lie in its rough texture and variety of colors and its chief characteristic is its adaptability in producing roof effects in a mixture of colors that blend harmoniously with the structure itself. In period reproductions it is invaluable.

Mettowee Stone is now produced in standard commercial thickness for roofs of low cost, yet it possesses individual character and refinement.

Mettowee Stone is produced in the following colors.

Antique Red—A deep red containing markings of burnt sienna, quartz and streaks of moss green.

Florentine Red—Similar to antique red but of a lighter shade and without markings.

Verdelite Unfading Green—A slate of excellent quality, permanent in color and having a definite greenish cast.

Mottled Gray—A light, unfading greenish gray slate of permanent color, having streaks or mottling of darker gray.

Dark Gray—An Oxford gray most suitable for reproducing antique effects.

It will weather slightly.

Clear Purple—A dark purple slate with minute green markings.

Slates in this range are produced in both unfading and weathering qualities.

Variegated Green and Purple—A beautiful slate of an opal blend in greens and purples. Light and dark shades.

Black—Produced in both unfading and weathering varieties, in a variation of black, blue-black and dark gray.

Weathering Green—A tough, durable green-gray slate when newly quarried.

An uncertain percentage will, after exposure, change to tans, buffs and browns.

Sea Green—A slate similar in color to weathering green when freshly quarried, but which will weather to yellows and tans.

Specifications for Mettowee Stone Roofs

Roofing contractors shall examine roof boarding and report to superintendent any defects that would interfere with the finished roof or guarantee.

Carpenter contractor shall furnish and apply, where necessary, 1-in. cant strips at eaves, backs of chimneys and up sides of dormers.

Carpenter contractor shall do all framing for rounded valleys where indicated on plans.

Felt—Cover all surfaces to be slated, including cheeks of dormers, with 40-lb. roofing felt lapped 6 in. at joinings (30-lb. felt lapped 3 in. for commercial work).

Slate—All surfaces prepared for slate shall be covered with Mettowee Stone as furnished by the Vendor Slate Co. of Easton, Pa., and applied in accordance with the roofing slate layout furnished by the Architects' Service Department of the Vendor Slate Co. under the direction of the architect.

Nails—Secure each slate with 2 (4 where necessary) copper or yellow metal nails of sufficient length to penetrate roof boarding 1 in.

Flashing—Sheet metal contractor shall furnish and slate contractor shall install, as required, 16-oz. soft rolled copper flashings at closed valleys, chimneys, dormers and other necessary places.

Flashing shall extend not less than 4 in. under slate and shall have not less than 4 in. exposure above the slate.

Sheet metal contractor shall furnish and roofing contractor shall apply such shingle flashing and aprons as may be necessary.

Sheet metal contractor shall apply counterflashing and make same watertight.

Open Valleys—Provide 16-oz. soft rolled copper flashing 24 in. wide, nailed at top only.

Closed Valleys—Flash all closed valleys with 16-oz. copper flashing over each course. Flashing shall lap 2 in. and shall extend 12 in. on each side of the valley.

Round Valleys—Slate shall be carefully fitted and laid with special long slate. Flashing shall be slip or shingle flashing.

Hips and Ridge Rolls—Form copper hip and ridge rolls where indicated on plans.

Guarantee—Roofing contractor shall guarantee all slate roof surfaces to remain in a watertight condition for a period of 2 years after date of completion.

METTOWEE STONE ROOFING SLATE

Thickness, in.	Weight, lb.	Thickness, in.	Weight, lb.
1½	6000	½	2000
1¼	5000	⅜	1500
1	4000	¼	1000
¾	3000	3/16	750

Length, in.	Exposure, in.	Widths, in.
26	11½	14
24	10½	12 and 14
22	9½	11, 12 and 14
20	8½	10, 11, 12 and 14
18	7½	9, 10, 11 and 12
16	6½	8, 9, 10 and 12
14	5½	7, 8, 9, 10 and 12
12	4½	6, 7, 8, 9 and 10

Continued on next page

Mettowee Garden Walks and Flooring

Mettowee Stone is the ideal material for garden walks, terrace or porch flooring, sun parlors, conservatories, fireplaces, pergolas, and various other interior and exterior pavements.

It is supplied in irregular shapes and random sizes as well as in rectangular shapes of varied lengths and widths, and can be set to any pre-conceived floor plan.

Send for descriptive circular No. 4.

Specifications for Setting Mettowee Stone Garden Walks

When Set in Loam with Grass Joints and Moss Joints (Rock Flowers Are Often Most Effectively Planted in Joints)—Excavate walks to a depth of 8 to 10 in. Fill 4 to 6 in. with cinders. Moisten and tamp well. Use best grade of loam and fill loosely to 1 in. above level desired for finished walk.

Set Mettowee Stone produced by the Vendor Slate Co. of Easton, Pa. in shapes desired. Beat slopes down and tamp well. Each slate should be set individually. This should bring the walk to the desired level.

Seed joints as directed by the owner or architect.

When Set in Cement—Excavate walks to a depth of 6 in. Fill 4 in. with cinder concrete. When this is thoroughly hardened, build up the remaining 2 in. with cement and (specify variety shape and size of Mettowee Stone desired), using a mixture of 3 parts sand and 1 part cement. Each piece of Mettowee Stone shall be set separately. Grout all joints before cement (in which stones are set) hardens. Point up all joints as directed by the architect or owner.

Note: If colored joints are desired, architect should specify brand of mortar color and shade desired.

Specifications for Setting Mettowee Stone Terrace Floors, Porch Floors, Fireplaces, Pergolas, Gazaboes, etc.

New Work—The general contractor shall bring rough concrete finish to within 2 in. of desired level for finished floor. Remaining 2 in. shall be built up with cement (3 parts sand and 1 part cement), and Mettowee Stone of shape and size desired. Each piece of slate shall be set separately. Grout all joints before cement in which it is set hardens. Point up all joints as desired by architect or owner.

Old Work—Remove old floor to a depth of 2 in. If same is of wood, cut down beams 2 in. below level desired for finished floor and build rough floor between beams to support cement and Mettowee Stone. (Then follow general specifications for setting in new work as in paragraph above).

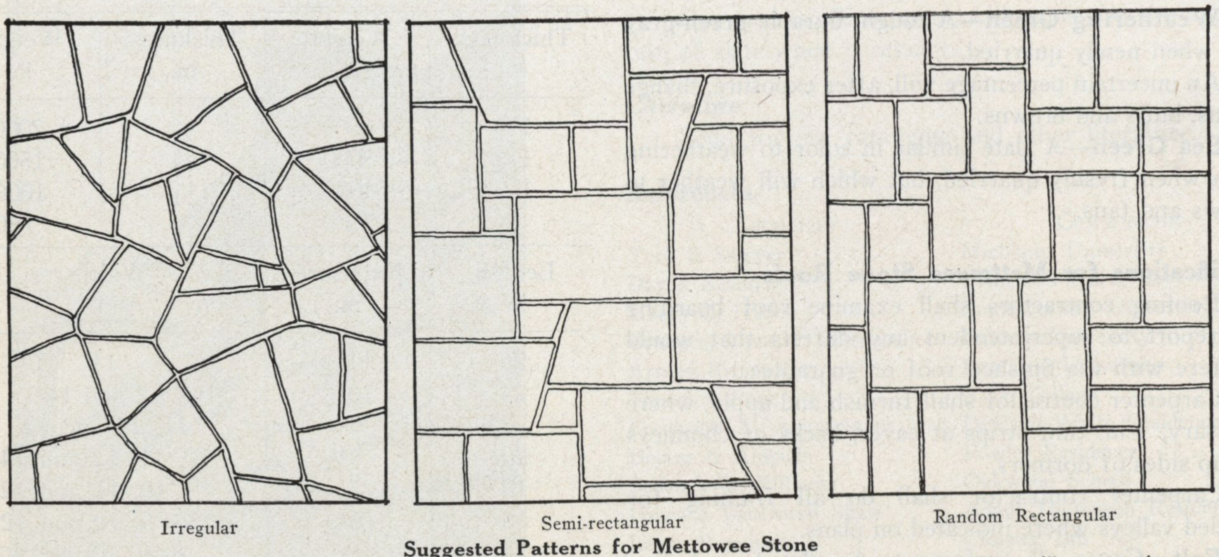
Setting Directly Over Wood Floors—Nail metal lath over wood floor and set in cement (as in paragraph above). For this work it is more desirable to use Mettowee Stone of approximately ½ in. thickness. The thickness, whether ½ or 1 in., depends upon the desired level of the finished floor. Immediately after cleaning, wash off thoroughly with clear water.

Caution: We urge that architects and owners desiring our Mettowee Stone specify, order and insist upon "Mettowee Stone produced by the Vendor Slate Co. of Easton, Pa.," thus avoiding the possible substitution of inferior material.

Special Note: Before leaving the job, Mettowee Stone which has been set in cement must be thoroughly cleaned with a solution of 1 part muriatic acid in 20 parts water. Use in sufficient quantity to remove all dirt and cement stains.

Some of the Prominent Projects on Which Mettowee Stone Was Used

John D. Rockefeller, Jr., Residence, Seal Harbor, Me.
Wm. Randolph Hearst Residence, New York, N. Y.
Mrs. H. E. Dodge Residence, Detroit, Mich.
Adolph Zukor Estate, Rockland County, N. Y.
Louis Horowitz Residence, Locust Valley, L. I., N. Y.
A. V. Davis Residence, Mill Neck, L. I., N. Y.
Geo. H. Townsend Residence, Greenwich, Conn.
Trinity Church, Bridgeport, Conn.
S. M. Nickey Residence, Memphis, Tenn.
Art Museum, Toledo, Ohio
Griffith Watkins Residence, Alton, Ill.
Mortimer Schiff Residence, Oyster Bay, L. I., N. Y.
Trowbridge Residence, Noroton, Conn.
Thousand Island Country Club, Alexandria Bay, N. Y.
T. S. Quinn Residence, Lebanon, Pa.
Glen Hall Residence, Rye, N. Y.
F. Floury Loucks Residence, Wrightsville, Pa.
Walter Jennings Estate, Cold Spring Harbor, L. I.



Irregular

Semi-rectangular

Random Rectangular

Suggested Patterns for Mettowee Stone

These typical patterns are among those most commonly used but they are presented with the expectation that they will suggest the many variations possible with this natural stone

Continued on next page

Pennsylvania Blue-Gray Slate

Where the architecture of a building requires a roof of uniform subdued tone with simple harmony, nothing answers so appropriately as Pennsylvania blue-gray slate.

The beds in the region producing this slate are so numerous and varied that a difference in quality is quite manifest. Caution should therefore be exercised in an endeavor to see that the kind of slate specified is shipped.

For the protection of architects and owners, the Vendor Slate Co. issues a certificate of quality guarantee with each shipment of the several standard grades.

Classifications of Pennsylvania Blue-Gray Slate

In the following list, practically every slate of American origin is given under its basic name with a brief and accurate description of its physical characteristics.

Genuine Bangor—The highest quality slate produced in the blue-gray slates of Pennsylvania. No appreciable weathering.

Genuine Bangor slate, while all produced from the same beds, is divided into two classifications as follows:

No. 1 Clear—Tolerably uniform as to surface. Thickness, about $\frac{3}{16}$ in. Straight, with square corners and entirely clear stock.

No. 1 Ribbon—Produced from the same beds of slate as No. 1 clear, but contains dark streaks entirely hidden when laid on the roof with the regulation 3-in. head lap.

It is a 50-year roof.

Note: Genuine Bangor slate needs no further recommendation than its name. To protect architects and users against the substitution of inferior grades, the producers have formed the Bangor Slate Association, and with all shipments of Genuine Bangor slate is furnished a certificate of the Association.

Genuine Washington Big Bed and Provident Big Bed—A very high quality slate of a darker blue shade than Genuine Bangor. Very uniform in color and *unfading.*

Specified and accepted by the United States government because of its excellent quality and dependability of color.

This slate is produced in the Slatington region of Pennsylvania and on roofs of large area it is unequalled, owing to the absence of varying shades of color. This is due to the large size of the beds of slate from which it is produced.

Genuine Franklin Big Bed—This slate is produced in the Slatington region of Pennsylvania and is of the same general excellence as the other Big Beds. It is dependable in both color and strength.

Genuine Albion—This slate has an excellent reputation for strength and color.

Rough Textured Slate (Architectural)—Produced from selected beds that have a rough textured cleave.

Neither surface nor thickness is uniform (purposely so). Thickness varies from $\frac{3}{16}$ in. to full ¼ in. and this, combined with the rough surface, provides an architectural effect that is impossible with the smoother surfaced slates.

Monson (Maine) Slate—The darkest in color of all slates. The quality is excellent.

Buckingham—A high quality slate, very tough and lustrous.

Peach Bottom—A high quality slate produced in Pennsylvania near the Maryland border.

Note: As the Monson, Buckingham and Peach Bottom slates are produced in very limited quantities, the Vendor Slate Co. can not offer the same degree of service as in the high grade slates of the Bangor and Slatington regions, but will be pleased to quote prices on request and give an approximate idea as to date of delivery.

Specifications for Pennsylvania Blue-Gray Slate

Note: Accessories such as felt, nails and flashing should be specified very much as under "Specifications for Mettowee Stone Roofs" on second page preceding, although on inexpensive work, cheaper grades may have to be used—such as galvanized nails, 15-lb. asphalt felt, tin or galvanized iron flashing.

Slate—Over the properly felt covered roof, lay Vendor Slate Co.'s No. 1 Genuine Bangor (or any other desired slate) roofing slate 24 in. by random (or desired size).

All slate shall be quarry punched, 2 holes to each slate, and shall be laid with 3-in. head lap under second course above, with joints well broken.

Adjacent to ridges, hips, valleys or vertical surfaces, slate shall be laid in elastic cement for a distance of 1 ft.

Hips or ridges shall be laid Boston style (or plain or covered with metal roll).

Valleys shall be open (or closed), using 16-oz. soft rolled copper.

On completion, replace any broken slates and repair any leaks that may develop during a period of one year from acceptance of the work.

J. W. WILLIAMS SLATE CO.

Producers of Highest Quality Slate Roofs and Slate Specialties

ARCHITECTURAL SERVICE DEPARTMENT
103 Park Avenue
NEW YORK, N. Y.

PENNSYLVANIA OFFICE, Drake Building, Easton, Pa.
VERMONT OFFICE, Poultney, Vt.

Production (Slate Roofing)

The J. W. Williams Slate Company—with the production of "Verdelite Unfading Green" slate at the Penryhn quarries in Vermont, Unfading Purple, the beautiful and varied weathered effects in Penryhn Stone, from the same regions, and the "Blue-Greys" from the Pen-Bangor quarries which it operates in Pennsylvania—is in position to give the best possible service.

Architectural Roof Design

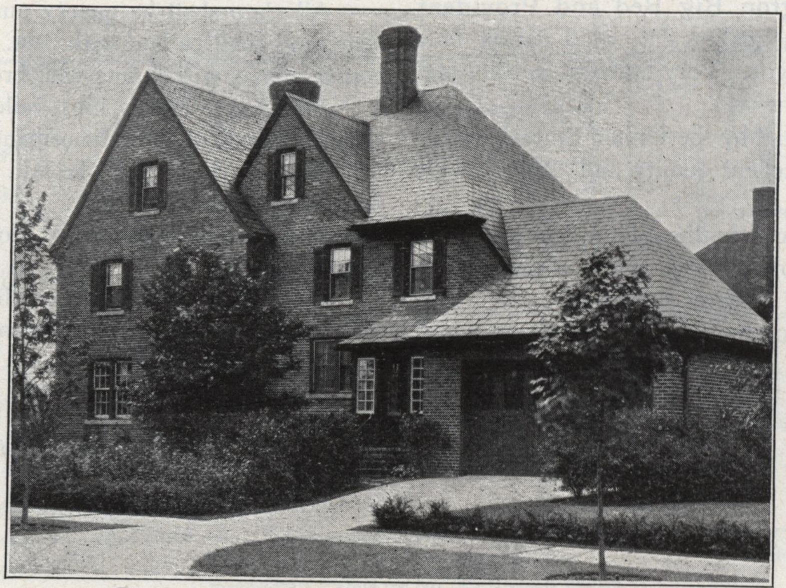
The Company's organization with its nine years' experience in the layout of roofs for numerous important projects throughout the United States, and its intimate knowledge of the possibilities connected with the slate produced and available in the Vermont and Pennsylvania quarries, is prepared to collaborate with the architectural profession in the preparation of specifications for the artistic roofing of any style of architecture.

A department for this service is maintained at 103 Park Avenue, New York City.

Penryhn Stone

A combination of beautifully weathered tones in rough textured slate rock quarried from various openings in the Penryhn Hills and adjacent deposits in the State of Vermont. It is almost impossible to describe the different shades of greenish grey, browns, greens, purples, etc., as no two are exactly alike, but the resulting combination of colorful effects produces a roof that not only gives the immediate appearance of the roofs covering the ancient structures in England, but continues to improve in mellowness of color as times goes by.

Either dark or colorful effects can be produced just as the architect desires or period reproduction demands, but the nature of the rock does not admit of being split into commercial thickness and is therefore particularly suited for roofs where texture is the paramount feature.



Residence of S. W. Emerson, Esq., Cleveland, Ohio
Bohnard & Parsons, Architects Cuyahoga Roofing Co., Cleveland, Ohio, Contractors

Graduated Roofs

Although the best architectural practice is to graduate the thickness in the different exposures and restrict these thicknesses to a minimum of either ⅜ or ¼ in. in order to preserve the texture throughout, yet the monotony and flatness of a commercial thickness ($\frac{3}{16}$ in.) slate can be overcome by the use of graduated exposures in random widths as against the common practice of specifying a slate of all one length.

In specifying graduated thicknesses, the incorporation of commercial thickness ($\frac{3}{16}$ in.) for the upper section of the roof, although more economical, should be avoided, if texture is to be maintained—the minimum should be not less than ¼ in. Commercial thickness slate comes from beds that lack the necessary texture and color for harmonious intermixture with the slates of a heavier thickness, and, while they make an admirable roof when used alone, their use with the more textureful slate is liable to cause a marked difference or "band" on the completed roof.

Verdelite Unfading Green Slate

This slate is of a beautiful dark green color of good texture that is positively unfading. It is produced in both commercial and architectural thicknesses and is especially suitable for structures that are of a plain or severe type of architecture, and especially so for roofs of large area where the use of mixed colors or the darker blue-greys of Pennsylvania is not desired. Among the many buildings on which Verdelite Unfading Green has been used are the following:

Netherlands Embassy, Washington, D. C.
United States Veterans Hospital, Tupper Lake, N. Y.
New York State Hospital Buildings, Thiells, N. Y.
Southern Theological Seminary, Louisville, Ky.
Home for Aged, Salisbury, Md.
Shriners Hospital for Crippled Children, Philadelphia, Pa.
St. Patricks Church, Jersey City, N. J.
Dalhousie University, Halifax, N. S.

Verdelite Unfading Green is produced at the Penryhn quarries in Vermont and is exclusive with the J. W. Williams Slate Company.

Pennsylvania Blue-Grey Slate

We own and operate the Pen-Bangor quarries which produce the highest grade of blue-grey roofing slate. Pen-Bangor slate is unequalled for strength—it is unfading and uniform in color and in every way dependable.

Continued on next page

Rough Cleft Blue-Grey Slate

Although the use of Pennsylvania Blue-Grey slate is usually confined to a smooth surfaced slate of standard thickness, the demand for a heavier rougher slate of architectural quality has become insistent. To meet this demand we are producing a Rough-Cleft slate in thicknesses from $1/4$ to 1 in. in varying lengths and widths. For graduated exposures in either a single thickness or graduated thicknesses.

Slate Blackboards

The Pen-Bangor output of blackboards has a high reputation for quality, strength and color. They are produced from beds of slate that are devoid of "bend" and the smoothness and straightness of the finished board is unequalled.

Structural Slate

We produce electric switchboards, partitions, platforms, steps, base, coping, etc., in accordance with any specifications.

Slate for Floors, Garden Walks, Garden Seats, Wainscoting, Base and Various Other Purposes:

The wonderful applicabality of slate for both interior and exterior effects with its beautiful and especially effective yet subdued natural colorings is now fully recognized by the architectural profession.

It has the advantage over other materials in that it can be used with either a rough cleft surface in any degree of roughness desired, or with a rubbed finish similar to a marble tile. The range of colors obtainable is extensive and when carefully selected and blended the result is exceptionally striking and artistic.

The use of slate for terrace and porch floorings in random irregular shapes in mixed colorings is coming more and more into use in America—in Europe it has been used for centuries, as a reference to illustrations of the floorings and walks of these old structures will testify.

For steps, risers, coping and window sills, slate has many advantages over other materials—it does not absorb moisture, and the colorings can be selected to harmonize with the slate roof.

We have recently completed a very attractive flagging exhibit on the floors in our offices at 103 Park Avenue (corner of 41st Street, Room 1004).

Specifications for Graduated Architectural Slate Roofs

(1) The roofer shall inspect the roof surfaces and have any defects corrected that may interfere with the integrity of his work or the durability of the completed roof.

(2) The carpenter contractor shall provide and apply a cant strip of the proper thickness above the eaves and at such other places as the roofer may direct. He shall also build up any forms that may be required where curved or round valleys are specified and furnish and place all blocking that the roofer may require.

(3) **Paper**—Cover all roof surfaces intended for receiving slate with 40-lb. (steep pitches, 30-lb.) asphalt impregnated roofing felt of approved brand. The felt shall be well lapped, laid to shed water and in undamaged condition when the slate is applied.

(4) **Nails**—Each slate shall be secured with at least 2 copper or yellow slaters' nails, of length in every instance to penetrate the roof boarding 1 in. Nails securing slate must in no instance be driven through flashings.

(5) **Slate**—All surfaces prepared in accordance with these specifications shall be covered with "Penrhyn Stone" as produced by the J. W. Williams Slate Co. of New York City. Thickness, graduation and character of application shall be in accordance with the layout prepared by the J. W. Williams Slate Co., and approved by the architect.

(6) **Laying of Slate**—All slate shall be laid in a proper weathertight manner, with joints well broken and preserving a head lap of at least 3 in. under second course above in all instances.

(7) **Open Valleys**—All open valleys shall be of 16-oz. soft rolled copper of sufficient width to extend 8 in. under the slate each side (for steep pitches 6 in. is sufficient). Care should be taken to prevent any nails penetrating the metal.

(8) **Closed Valleys**—All closed valleys shall be properly slip slashed under each course and each flashing shall be of sufficient size to lap 2 in. under the flashing next above and extend 8 in. under slate each side.

(9) **Round Valleys**—Shall be carefully fitted and laid with slate of proper lengths, and care taken to preserve continuity of color and texture of slate.

(10) **Ridges**—Make all ridges tight, using cement. Ridges shall be plain type as directed (or Boston ridges and hips, or metal as below).

(11) **Ridge Rolls** — (Metal) — Form 16-oz. copper or 4-lb. sheet lead to detail and secure to all ridges (and hips).

(12) **Guarantee**—The contractor shall guarantee his work for a period of two years from acceptance of his work, replacing or repairing any broken slates or any leaks until the end of the guarantee period.

C. G. BOSTWICK

Manufacturers of Snow Guards for Roofs

69 Bartholomew Avenue
HARTFORD, CONN.

Products

"Campbell" Patented Snow Guards for slate, tile, and other steep roofs.

"Campbell" Patented Snow Guards

The "Campbell" is a positive snow guard that stays put and will not break, bend nor wear out. It is made of pure copper only and will last as long as the building upon which it is installed.

An especially valuable feature of the "Campbell" snow guard is that it can be installed on roofs already laid, without breaking or removing slates.

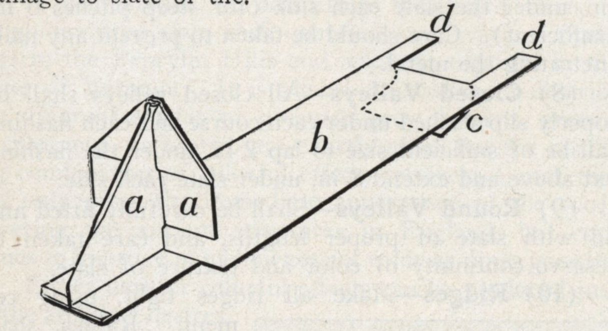
Construction Details

The snow stop or guard head (a) is so designed and constructed that it can not bend or collapse under the weight of the snow or ice.

The broad, flat, thin supporting strap (b) gives a distributed bearing, does not lift the slates and positively will not cause them to break.

The hook end (c) on the supporting strap is broad and will not split nor injure the slates and stays put.

The fingers (d) on the hook end are designed for quick and easy installing on roofs already slated without damage to slate or tile.



Number of Guards to Set, Per Square

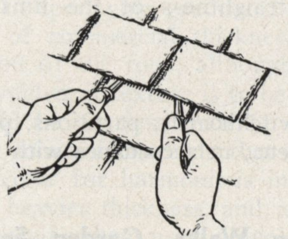
This varies according to the size of the slates, pitch of the roof and special needs.

For graduated, random slate roofs, space the guards from 16 to 24 in. apart horizontally and so spaced up and down as to properly stagger in alternate courses. The following table is worked out by this method:

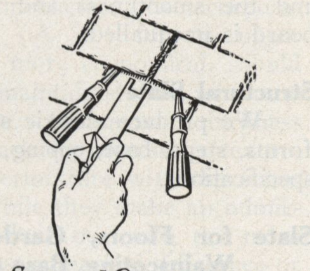
Size of slate, in.	Guards required per square	Where to place guards	
		Horizontally	Perpendicularly
12x6 12x7	60 50	Every 3rd slate	Every 3rd course
12x8	40	Every 2nd slate	Every 5th course
14x7 14x8	45 40	Every 3rd slate	Every 3rd course
14x10	35	Every 2nd slate	Every 4th course
16x8	30	Every 3rd slate	Every 3rd course
16x9 16x10 16x12 18x9 18x10 18x12 20x10 20x12 22x11 22x12 24x12	60 55 45 50 45 40 40 35 35 30 30	Every 2nd slate	Every 2nd course

Directions for Installing

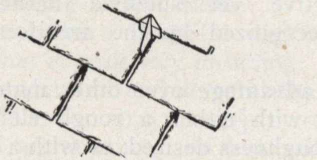
The only tools required are two screwdrivers. Push a screwdriver under the butt of the slate at each side of the joint where the guard is to be installed. Then push the guard into place, remove the screwdrivers and continue with the succeeding guards in a like manner.



First Operation



Second Operation



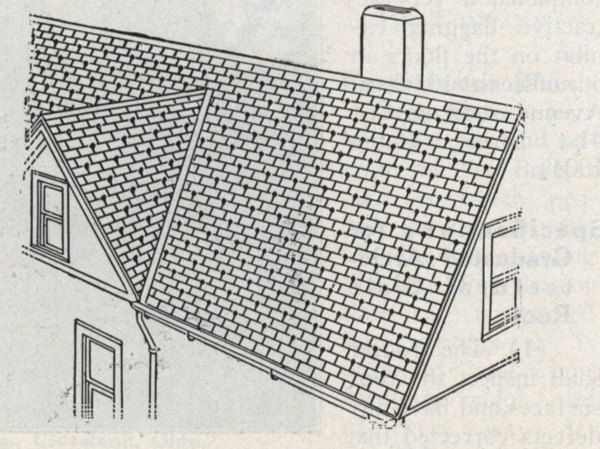
Finished and in Place

If the guards are securely hooked on the slates no staging will be required after the first course has been installed.

Start installing at the eaves and work up to the ridge, using the guards as a foothold to work on. However, as a precaution, it is well to have a rope or plank.

Architects' Specification

Install "Campbell" Patented Snow Guards, as manufactured by C. G. Bostwick, Hartford, Conn., spaced not more than 24 in. nor less than 16 in. apart, and so spaced up and down that they will properly stagger in alternate courses.



Spacing of Snow Guards on Typical Roof

THE CLASON-MILLER CO.

Wire Snow Guards for Roofs

PROVIDENCE, R. I.

Product

Wire Snow Guards for roofs.

Their Purpose

To lessen chances of damage suits against owners of property by increasing both personal and property safety.

There are many buildings so situated that the use of snow guards is essential to personal safety; there are more cases where the use of snow guards could protect the surrounding roofing and sheet metal work against costly damages.

Sliding snow and ice often injure roofings, and puncture or tear away gutters, etc. The use of our snow guards forestalls these dangers, as they hold the ice and snow where they form. They are a cheap and unobtrusive preventive against damage.

Important Notation

We note a growing tendency to permit the installation of three, four, or five courses of snow guards near the roof eaves. The result is that a few guards are compelled to hold not only the weight of snow and ice which they are located to care for, but also to withstand the tremendous tearing force of slides starting from the roof surfaces above.

No guards will withstand such conditions, and their installation in such a manner precludes the *purpose* for which they are used. When specifying our guards please do so according to our table and *insist* upon the roofer following the specification.

Manufacture

We make our guards in our own plant, and are not dependent upon the facilities or services of others.

These guards are manufactured either from pure copper wire or galvanized steel wire, both selected for ductility and stiffness. No copper-covered steel wire is used.

Practicality

Our wire snow guards combine strength, long service, economy and unobtrusive design.

Types

Two general designs are offered:

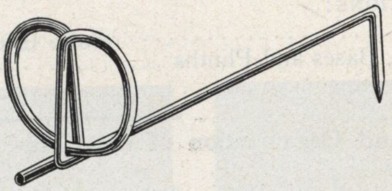
For new roofs, the "Clason."

For old roofs, the "Clason Special."

The "Clason"

The "Clason" has been for years the standard guard, and is the strongest guard made.

Note from the illustration that the "butterfly" loops brace and strengthen each other, while the extension brace lends additional strength.



"Clason" Snow Guard for New Roofs

Number Per Square

The following table gives the approximate number of snow guards which may be safely specified for use in each 100 sq. ft. of roof surface:

Roof Pitch	Number of Guards
One-quarter	50
One-third	75
One-half	150

Towers, and steeper roofs than above indicated, may require special consideration.

How to Specify

Apply to all pitched roofs "Clason" [for old roofs "Clason Special"] Snow Guards, as made by The Clason-Miller Co., Providence, R. I. The guards to be made from pure copper [galvanized steel] wire. (Here specify the number of guards required per square, dependent upon the pitch of the roof and other special conditions.)

In applying the snow guards, the eaves course of the roofing material shall be laid as usual, but the next course shall be laid with the joints slightly open to receive the shank of the snow guard.

After striking the line for the third course of the roofing material, place the guards in the joints, with the loop just below the lap of the course, and drive the prong into the roof decking; then lay the course, leaving only the loop exposed.

Care must be used to insure having the shank well sunk into the joints, so that the following course of roofing material will lie flat and not bear upon the guard.

(*Note:* The architect or engineer may omit at his discretion the method of application of the guards.)

THE STRUCTURAL SLATE COMPANY

PEN ARGYL, PA.

BRANCH OFFICES

ATLANTA, GA., 101 Marietta Street
BOSTON, MASS., 627 Old South Building
BUFFALO, N. Y., 823 White Building
CHICAGO, ILL., 1451 Marquette Building
CINCINNATI, OHIO, 807 Gerke Building
CLEVELAND, OHIO, 618 National Building
KANSAS CITY, MO., 2422 Broadway
LOS ANGELES, CAL., 3978 West Sixth Street
MINNEAPOLIS, MINN., 538 Builders Exch.
NEW ORLEANS, LA., 227 Dauphine Street
NEW YORK, N. Y., Room 1128, 200 Fifth Avenue
PHILADELPHIA, PA., 406 Perry Building
PITTSBURGH, PA., 307 Union Bank Building
WACO, TEX., P. O. Box 461
WASHINGTON, D. C., 620 Bond Building

Members of the National Slate Association

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Also manufacturers of Garden Steps, Grave Vaults, Hearths, Mausoleum Crypts, Mortuary Slabs, Panelboards, Septic Tanks, Switchboards, Vats and Tanks, Window Sills and Lintels.

CENTURIES OF SERVICE
PYRAMID
NATURAL SLATE
STRUCTURAL
Proof against Time - Wear - Water - Fire!

TRADE-MARK

Quarries and Organization of the Company

The deposits of slate in the counties of Northampton and Lehigh, State of Pennsylvania, possess characteristics which, with the abundant supply and ease of working, make this material particularly adaptable to a wide variety of uses in building construction and for commercial and scientific purposes.

In order to develop the most efficient standards of extraction, workmanship, assembling, distribution and methods of installation, as well as to encourage the maximum production and use of slate, the majority of the quarries throughout this far-famed slate district co-operate through one organization—The Structural Slate Company.

Equipment and Production

The different member companies have thus been enabled to enlarge and modernize mills and machinery, to co-ordinate in producing slate for all types of installations either of the standards adopted or to suit any special requirements and to co-operate with architects, engineers and constructors in obtaining fullest conservation of materials at a minimum outlay.

This has also made it possible to so produce large quantities of slate, as to maintain a stock of all sizes constantly on hand ready for prompt shipment.

Inspection and "Pyramid" Brand Trade-mark

All slate produced by this group of operators is thoroughly inspected before and after working and given the name "Pyramid." This trade-mark is registered and can be relied upon as indicative of the best that can be produced through careful methods of quarrying and experienced workmanship. Specifications need only call for "Pyramid" brand structural slate to insure that excellence of product and service which is obtainable through The Structural Slate Company organization alone.

Research and Service

In addition to the work of the Company's own service department, containing specialists in the quarrying and utilization of slate, the Structural Service Bureau of Philadelphia, as architectural advisor and structural standardist, has conducted a series of researches into the production, uses and methods of installation within buildings as best adapted to their occupancy. As a result The Structural Service Bureau has advocated the adoption as standards of certain sizes, parts and details and has prepared data as to number, arrangement, accessories and preparatory work for the various slate installations.

This data, prepared in co-operation with The Structural Slate Company, has been issued by it in the form of 15 separate Chapters. These may be obtained by addressing the Company, on your letterhead, if you do not already have them on file.

The Purpose of this Catalogue

The Chapters, before mentioned, contain many subjects other than those of interest to architects. In this catalogue only structural slate products which are of direct interest to architects are included. The information, while in a much more condensed form than in the Chapters, is complete on the products included. A description of the product with the necessary details and specifications are given.

Structural Characteristics of "Pyramid" Slate

Among the chief characteristics of structural slate from the Pennsylvania quarries are its fine, even grain, its uniform color, and its cleavage or fissility, which allows it to be split into slabs of practically any thickness.

The result of tests which are given in Chapter I show that slate is one of the least absorptive of Nature's products, having a mean absorption of only 174/1000 of one per cent when immersed in water for 24 hours. Its tensile strength is 3625 lb. per sq. in.

Slate is extremely tough and elastic, as manifested by its resistance to strain, shock, blows and the effect of settlement. Moreover, it will not contract or expand under changing conditions of heat and humidity.

Further data in connection with the natural formation and quarrying of slate may be secured from Bulletin 586 of the U. S. Geological Survey.

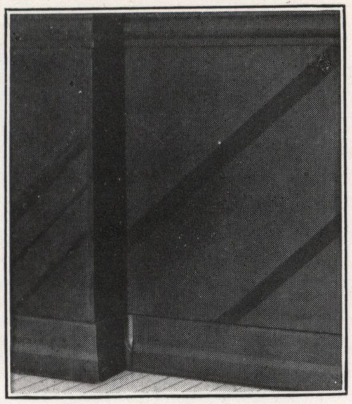
Grading of Structural Slate

Slate is produced in one quality only, but the stock is divided into two natural gradings, known as "clear stock" and "ribbon stock."

Continued on next page

Ribbon Stock—About 80% of the natural slate has ribbon veinings, which in no way affect its impermeability or strength. The appearance of the ribbon stock varies indiscriminately, selection for ribbons never being made. Ribbon stock is standard for structural and sanitary installations, and will be furnished for such purposes unless the clear stock is definitely specified.

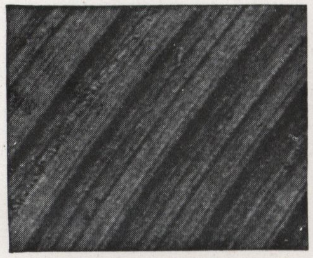
After being given the commercial oiled finish, it presents almost the same uniform dull black as the clear stock. However, an increasing number of users prefer not to conceal the ribbons, which lend a distinctive appearance to the material.


Slate Wainscot, Showing Typical Markings of Ribbon Stock

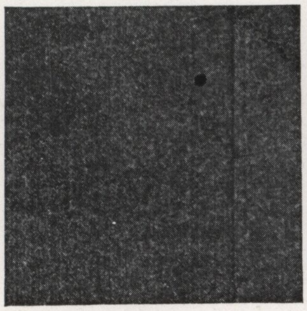
Clear Stock—Represents the remaining 20% of the natural slate. It is a special selection, but is standard for electrical panelboards and blackboards, and can also be specified wherever the elimination of veinings seems desirable from the standpoint of appearance. Its cost is from 25 to 30% more than ribbon stock.

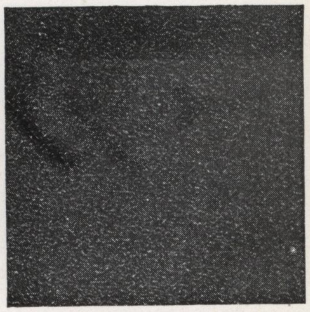
Color—The mill stock of commerce in the Pennsylvania district is a dark blue-gray color and has been called black slate, because of its appearance when finished with oil.

Surfaces and Finishes of Structural Slate


Sawed Edges
Actual size

Split Face Surface
Actual size


Planed Surface
Actual size


Standard Sand Rubbed Finish
Actual size

It is important that architects and users have a knowledge of the commercial surfaces and finishes in which slate is procurable. This assures the selection of surface and finish best and most economically adapted to the specific purposes for which the slate is to be used. Proper selection saves time and money and does away with confusion, delays and misunderstanding.

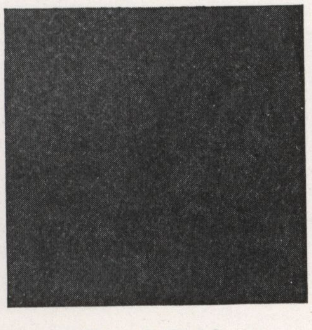
Sawed Edges—This is the surface left by the saw on the edges of all slate—a series of curved serrations somewhat resembling a coarse tooled finish.

Use—Sawed edges are confined to slabs 6 in. and under, and are particularly adaptable to the faces of window sills, edges of wall copings, the straight nosing of outside steps, etc. Choice may be had between this and the standard sand rubbed finish for the same purposes.

Split Face Surface—This is the surface left as a result of the first cleaving or splitting at the mill and before the slate has gone to the planing machine.

Use—Split face finish should be used where a smooth finish is not necessary or where a rough surface or texture effect is desired, such as the undersides of floor or roof slabs or wherever the surface is concealed. For outside steps, terrace floors, cloister effects, stepping stones or garden walks.

Planed Surface—This is the surface left by the planing machine. While it has not the rough characteristics of the split face finish, the marks of the plane are faintly indicated.


Honed Finish
Actual size

Use—Planed surface for reasonable economy should be used for the underside of stair treads, landings and risers, and wherever absolute uniformity of finish is not essential.

Standard Sand Rubbed Finish—After being smoothed by the plane, slate is sand rubbed under the action of sand and water on large revolving metal disks. The result is a uniformly smooth, even surface, having the slightest kind of a grain or stipple. This surface finish will be supplied unless otherwise specified.

Use—Standard sand rubbed finish should be used for toilet room partitions, lavatory stalls, shower baths, urinals, washtubs, tanks, etc., unless in special instances it is desired to go to the additional expense of honing.

Honed Finish—The mistake is often made of confusing sand rubbed finish with honed finish.

Honed finish is much smoother than sand rubbed, being the nearest approach to actual polish that can be given slate. It is not a necessary or suitable finish to be used where slate is subjected to the constant abrasion given floors, stair treads, thresholds, etc.

Honing is the final process through which slate can go in the mill after being planed and sand rubbed, and this finish is only applied in special instances or for particular purposes.

Use—Honed finish is most generally used for electrical installations and other purposes where a velvety smooth surface is required or desirable.

Continued on next page

"Struco-Slate"—Permanently Finished in White or Colors

For several years, demands have been pouring in upon The Structural Slate Company to develop some method by which engineers, architects and contractors could utilize the valuable qualities of slate, but still secure almost any color required, especially where installations were to be made in places artificially illuminated, and where white surfaces or light color effects seemed to be essential.

In order to meet these demands, various types of coating materials were put to test in a series of experiments which extended over more than four years. It was definitely determined, as a result of these tests, that a permanent finish in almost any color, tone or shade desired can be applied to slate at the point of production.

A Finish That Outlasts the Building—The finish selected is one which will not chip, crack or peel, and is highly resistant to acids. It will not stain or fade; and under no circumstances will become unsightly or unsanitary. Moreover, there is nothing poisonous in its composition; no oil or fat in the solvents, and it contains no chemicals which will oxidize. It is a finish which will outlast the building where the slate is installed.

For 12 years before its adaptation to slate, this finish was in use on wood and composition bases, for drainboards, toilet seats, golf balls, and other products where a hard, elastic, non-staining, non-cracking surface is a prime requisite. For all these purposes it has given entire satisfaction.

Slate, during the tests, showed that because of its non-absorptive structure, it was peculiarly adapted to receive a finish of this sort.

"Struco-Slate" Is an Exclusive Product—The Structural Slate Company has secured exclusive rights to the use of this finish on slate. It has arranged for the colored finishing of slate to be a separate branch of its production, and has adopted "Struco-Slate" as its trade-marked name for this material.

"Struco-Slate" will be marketed as a new product, without conflict with natural slate in its many diversified uses.

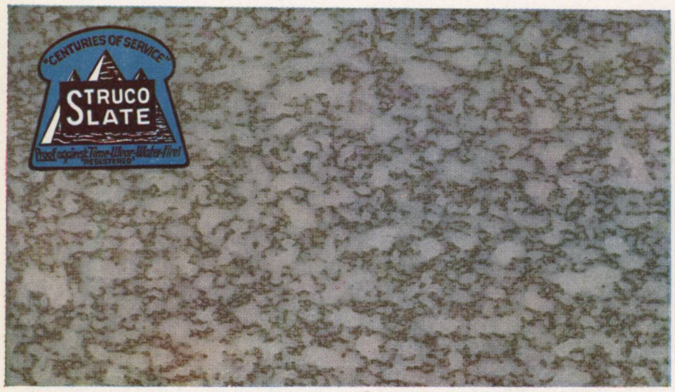
Where "Struco-Slate" Is Used—"Struco-Slate" can be installed wherever the slate is not subjected to abrasive action, being specially recommended for shelving, wainscoting, trim, and for toilet, shower and urinal stalls.

Three Standard and Many Special Colors—"Struco-Slate" will prove especially useful for installations where color harmony is essential, for it can now be manufactured not only in the three standard colors of white, gray and olive green, but also in many other colors or combinations of colors.

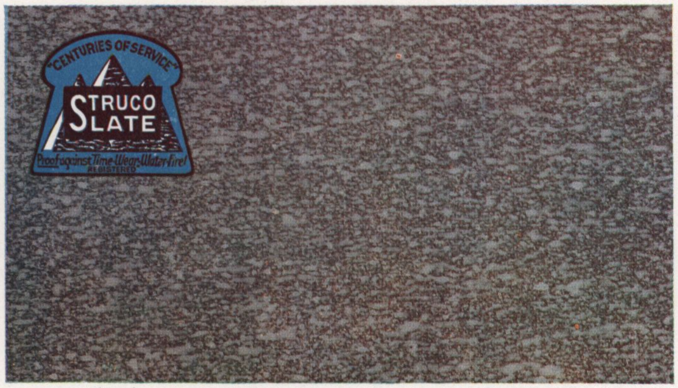
However, too much emphasis can not be placed on the fact that this Struco finish, wherever installed, is utilized merely to lend an added beauty to the natural slate. Many materials require some sort of surface coating to protect them, but on structural slate the new finish, although lightening the color, merely extends the usefulness of its natural characteristics.

Two Standard Finishes—Underlying the white, the solid colors and the "spattered" effects, all of which have an eggshell finish on the face, the surface of "Struco-Slate" will be furnished either smooth rubbed or matt-surfaced.

Smooth Rubbed—Over this surface, the eggshell finish will present a smooth, even plane in both the solid and spattered colors.



"Struco-Slate" Spattered S-6



"Struco-Slate" Spattered S-9

Matt-surfaced—Under the same eggshell finish, the sanded surface will present infinitesimal variations of the flat plane which provide a distinctive matt effect—one which is destined, in spite of its economy, to give "Struco-Slate" a front rank among materials affording a combination of decorative, sanitary and utilitarian qualities.

Unless otherwise specified, the color called for in "Struco-Slate" installations will be furnished with the matt-surfaced finish underlying the eggshell finish.

Integral Penetration—Either three or four coats of the Struco finish are applied, according to the use and effect desired.

Special attention is called to the fact that since the solvents in each coat react upon those in all the previous coats, there is penetration entirely through, and the result is a multiple single coat.

No Cost for Maintenance or Repairs—"Struco-Slate," during the lifetime of a building, should require no expense for upkeep or repairs. However, should the surface be accidentally scratched or marred, it may be readily repaired through this characteristic of integral penetration.

A can of Struco repairing material is furnished with each installation. This may be applied to the scratched portion with a putty knife or small brush, and will not merely hide the defect, but will become an integral part of the original coating.

Color Samples Submitted on Request—Samples of any obtainable color will be prepared in either finish and submitted for approval upon request to The Structural Slate Company.

A booklet containing colored illustrations of the many effects obtainable will also be supplied.

Continued on next page

Factors Determining the Cost of Structural Slate

In order that architects may have a better idea of the factors which determine the cost of slate a table of relative costs is given below. While the prices of slate vary from time to time, the approximate figures for the relative cost of the various areas and thicknesses will bear, approximately, the same relative value. It will be noted that the cost per square foot increases in proportion to the increased area of the slab and it should be kept in mind, when designing or specifying, that if the cost is an important consideration, the sizes of the pieces should be kept small.

Slate slabs of almost any desired size, however, may be obtained when necessary for some particular use or condition.

ESTIMATING DATA FOR STRUCTURAL SLATE

Group	Area in sq. ft.	List price in cents per sq. ft.					Special lengths, not over 6 ft. wide					
		1 in.	1¼ in.	1½ in.	1¾ in.	2 in.	Over, ft.	Group price	Over, ft.	Group price	Ft.	Group price
1	1 to 5	24	28	32	38	44	6	2	7	3	8 to 9	4
2	5 to 10	30	34	40	44	50	6	3	7	4	8 to 9	5
3	10 to 16	36	40	46	52	60	7	4	8	5	9 to 10	6
4	16 to 22	44	48	52	60	68	8	5	9	6	10 to 11	7
5	22 to 28	52	56	62	70	76	9	6	10	7	11 to 12	8
6	28 to 35	62	66	72	80	86	10	7	11	8	Over 12	Special
7	35 to 40	77	81	87	95	101	10	8	11	Special	Over 12	Special
8	40 to 45	90	100	110	120	130	10	Special	11	Special	Over 12	Special

Prices are based on slabs cut at right angles—rubbed one face and edges.

An extra charge of 50% added to the lists is made for irregular shapes.

No slab figured less than 6 in. wide, or less than 1 sq. ft. in area.

No slabs figured less than 1 in. thick. Intermediate thicknesses take next higher list.

An additional charge of 6¢ per sq. ft. is made for each additional ¼ in. in thickness over 2 in.

Rubbing two faces: Add, for stones 16 sq. ft. and less, 6¢ per sq. ft.; and over 16 sq. ft., 8¢ per sq. ft.

Allow 2¢ per sq. ft. to 16 sq. ft. and 3¢ net above 16 sq. ft. for not rubbing.

Crating: 5¢ net per sq. ft. to and including 2 in.; over 2 in., 2¢ net for each inch or fraction. Minimum charge, 35¢ net.

Weight: The weight of a slab of structural slate 1 in. thick by 12 in. square is 15 lb.; when crated, 16 lbs.

These prices are list prices, subject to discounts or additions. They represent, approximately, the value of ribbon stock. Clear grade stock costs about 25% to 30% more than ribbon stock.

Basic Specification for Structural Slate Work

General Conditions

(See paragraphs 15 and 16 for Abbreviated Form)

(1) Furnish all labor, materials, tools and appliances necessary for the execution and completion of the work in accordance with this specification, except as the same may be modified in any way by the architect's drawings or specifications, in which case the architect's drawings and specifications shall govern.

(2) The General Conditions of the specifications written by the architect are hereby made a part of this Basic Specification and of the contract for the Structural Slate work.

(3) **Work Included**—For extent of work, and for the grade and finish of Structural Slate, see the architect's drawings and specifications—and schedule, if any is furnished.

(4) **Acceptance of Preparatory Work**—It shall be the duty of the Structural Slate Contractor before beginning any of his work to examine all floor and wall construction and any other supports for his work provided by others, and satisfy himself that everything is in proper condition to receive his work. The architect shall be notified by the Structural Slate Contractor in writing of any exception he may take to such construction. Failure to do so shall constitute acceptance of the construction by the Structural Slate Contractor as suitable in all ways to receive his work.

(5) **Samples**—If so required, typical samples, each marked as to grade and finish of slate proposed to be used, shall be submitted to the architect for approval, and left with him, before material is ordered.

(6) **Quality and Finish**—All slate hereafter specified shall be dark blue-gray (black if oil finished) in color, hard and nonabsorbent, whole, sound and free from irregularities in production or defects in manufacture, and of the commercial grading known as Ribbon Stock, except where Clear Stock may be specifically called for, or is customarily furnished.

(7) All slate used shall be branded with the trade-mark "Pyramid," exposed surfaces shall be smooth and free from depressions, loose pieces, cracks, or chipped edges, and all shall be left in true alignment and in every respect thoroughly neat and satisfactory.

(8) All exposed surfaces, unless honed finish is specifically called for, shall have standard sand rubbed finish.

(9) After complete erection and pointing, every piece of slate, except water-flushed backs of urinals, floors or parts of stairways noted, shall be finally treated with raw linseed oil, thinned with turpentine, unless otherwise specifically mentioned, and all shall be left clean and complete.

(10) **Erection**—Each piece of standing slate against any wall or partition shall be properly backed up at the edges or joints with cement mortar or plaster of paris, according to the space, and anchored in place in such a manner as to insure its remaining firm and rigid. No piece to have less than two anchors, which shall be [galvanized] [brass] [bronze], so placed as to be concealed, and where of wire, not less than No. 12, W. and M. Gauge.

(11) Where space back of slate against masonry walls is more than 2 in., brick in cement mortar shall be applied back of all joints. Any intermediate joints necessary in slate slabs shall be of the kind specified for the corner or abutting joints in the same piece of work and thoroughly filled with the same packing material; if showing, the joints must be true, close and smooth.

(12) All slabs, partitions, stiles, curbs, bases, treads or other pieces of slate shall be erected, fastened together or secured in place in a first class manner and left rigid and complete, to the satisfaction of the architect or his representative.

(13) Joints or external angles shall be made on the side least exposed to view. All external angles and all exposed edges or corners shall be slightly rounded, unless otherwise shown on drawings, or specified. The contractor for slate shall do any cutting and drilling of slate for all other trades, and for anything that is to be connected or attached to slate.

(14) Before any work is placed in the mill, two copies of shop or setting drawings shall, if required by the architect, be submitted to him for approval of the general principles involved in construction. Such approval, when given, with any corrections required, unless taken exception to by the contractor in writing shall not relieve the contractor of obligations as to rigidity of construction, correctness of sizes and measurements, or other matters pertaining to his contractual relations or to any guarantee.

General Conditions

(Abbreviated)

(15) *Note:* As this specification is being given wide circulation among architects and slate contractors, and is copyrighted by and registered with the Structural Service Bureau, it is suggested that the brief form indicated by Paragraph 16 be used wherever desired.

(16) The General Conditions, Paragraphs 1 to 14, inclusive, as printed in the Twentieth Edition of SWEET'S ARCHITECTURAL CATALOGUE, and in Chapter No. 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing the date of April 15, 1920, are hereby made to constitute the General Conditions of this specification.

Floors, Bases and Plinths

(49) The floors, bases and plinths in (here enumerate) shall be of Ribbon Stock [Clear Stock] [laid alternating] slate.

(50) The floor slate shall be 1 in. thick and about 12 in. square (or other size desired, and 1¼ in. thick if over 24 in.) cut in uniform lengths and widths to fit the spaces.

(51) The bases at all walls and partitions shall be 1 in. thick, ... high above floors and extending 1 in. below the floor. (If base is to be coved, specify it to be 6 in. high above floor, from 2-in. stock with 1-in. radius cove cut on bottom, returned on itself at all openings, and cut with solid returns at all interior and external angles.) All bases to be slightly rounded [bullnosed] on top. (Details or specifications should indicate whether or not base projects full thickness beyond face of wall finish above.)

(52) All trimmed openings where bases occur shall have plinths ...... high conforming by beveled or straight angled faces to the profile of the trims (and of jambs if door is not hung on slate finished side), in accordance with the detail drawings.

(53) Saddles, or thresholds of slate, 2 in. thick, beveled two sides shall be provided at all doors or at openings where floor materials change; the same to be, on the flat surface, the full width of the door or jamb of opening, and, in length, to either extend under plinth or return on same.

(54) *Note:* The above contemplates a sand rubbed floor for interior use. If natural split surfaces of irregular or random sizes, for either interior or exterior use, are desired, so specify, and in any case provide for proper firm and solid foundation in another part of specification. (See Preparatory Work, paragraphs 6 to 19.)

Continued on next page

(55) All slate and the concrete bed beneath shall be thoroughly cleaned and drenched with clear water immediately before slate is laid. Spread a full bed of mortar, from ½ to ¾ in. thick, composed of one volume of portland cement and two volumes of well graded, clean sand, and thoroughly tamp each piece of slate as laid.

(56) The joints of floors shall be tight butt joints grouted in with cement mortar, colored same as slate (or wide joints with light colored mortar, pointed, in which case so specify). Leave floors clean and flush and true at all joints, with each piece of slate solidly bedded.

(57) The bases (whether straight or coved) shall be in pieces of the longest practicable length, thoroughly bedded on cement foundation and against walls, in same mortar as floors, and pointed tight.

(58) In addition to the cement backing, the plinths shall be held in place by nickelplated brass, round head screws into the door bucks. (If concealed screws are desired, state that galvanized screws are to be used with heads countersunk and flushed with "slater's wax.")

(59) *Note:* According to location and intended use, state whether above slate is to be oiled or left unfinished.

Wainscoting

(60) Where shown or specified, furnish and set slate slabs to form wainscoting .... high, not less than ⅞ in. thick at edges, and in widths between 3 and 4 ft. to divide with approximate regularity into the various space lengths. Each slab to have (two brass or bronze dowels into base, if any, and) two anchors of brass or bronze into wall at back [at top if above eye line or covered with mould].

(61) *Note:* State whether wainscot height includes caps, if any, and whether slabs shall be cut long enough to extend 1 in. into a cement floor, will have a tile or cement cove or a wood scotia, etc. If slate base is desired, use paragraphs 51, 57 and 63.

(62) Moulded top, or wainscot cap, shall be thoroughly anchored into wall and mortared against same, bedded to slabs and be cut true to full size details. Joints in interior and external angles and at all openings shall be cut with solid returns and not mitered.

(63) All bases, if of slate, to be thoroughly bedded, set and anchored in cement mortar (as specified for floors).

(64) All butt joints of slabs (and mouldings) to be thoroughly backed up with plaster of paris, filled and pointed with same, colored, and left close, neat and true.

(65) *Note:* Under "Plastering" in new work, state that behind all slate wainscot, plaster is to be omitted.

(66) In Existing Buildings—For the application of slate wainscots in existing buildings, with or without bases, specify the slabs to be secured through from the face, either with round head screws or with countersunk screws, concealed with "slate-wax," the screws in masonry to be inserted into expansion sockets or spot grounds and not into wood plugging.

Bases (Without Slate Floors or Wainscots)

(67) Against Masonry Backgrounds—In all halls, corridors, passages or other portions of the building so indicated run a slate base ...... thick and ...... high at each wall or partition, pilaster, etc., same to be ...... (to complete, refer to Paragraphs 51, 57 and 63).

(68) Against Wooden Backgrounds—In other portions so noted (or here specified) run a plain ⅞x16-in. base (or other height as may be required by local ordinance) with slightly rounded top [bullnose]. To be set and applied in same manner as specified for wainscoting under Paragraph 65, except that it shall be screwed directly into wood supports.

Preparatory Work for Slate Wall and Floor Slabs

The following paragraphs refer to items usually not made a part of the work of the Structural Slate Contractor, and are here presented as suggestions or reminders, in connection with other specifications, or parts thereof, for the work of the various building trades. The Standard or Basic Specification presupposes that the following structural requirements have been complied with by other trades.

For Slate Used Vertically

(1) Masonry Backgrounds—Wall or partitions of brick, hollow tile, concrete, or other masonry afford excellent backgrounds for slate surfacing, either as parts of enclosures, or as wainscots, bases, etc. It is not necessary to insert plugs or grounds in any such walls, as the specification for slate work requires that the slatesetter drill, or otherwise provide, for his own anchors. Mortar or plastering is unnecessary on masonry backgrounds, as the slatesetter's backing up and jointing will take care of inequalities in these surfaces.

(2) Where shower enclosures are supported on wooden joists, all vertical slate features should be independent of the walls or partitions or have sliding anchors to allow shrinkage in the joists to permit all slate to settle equally and avoid the opening of joints which might otherwise result.

(3) Such opening of joints in the case of wainscots, or wall slabs, where wood joists occur, may be avoided by several means—such as bases, coves, wooden scotias, cutting the finished floor against the slabs, and otherwise.

(4) Wood or Metal Backgrounds—On wood or metal studs or furring back of slate, it is desirable that lathing and plastering should be placed.

(5) Wood studs should be not less than 2x4 in., and spaced not over 16-in. centers, braced at least once in their height with 2x4-in. horizontal bracing.

For Slate Used Horizontally

(6) Masonry Floor Construction—The tops of all structural tile or concrete floor construction should be kept down below the finished floor line to the depth required by the thickness of the concrete bed and the slate floor slabs and setting-bed to be used.

(7) Steel Beams—The tops of any steel beams or girders should be kept down at least 3 in. below the finished floor line, and should be covered with roofing slate, sheet metal or waterproof paper to prevent adhesion of the concrete bed.

(8) Concrete Bed on Masonry Floor Construction—The top of floor construction should be swept clean, well drenched with water and a 2-in. thick concrete bed of stone, sand or cinder concrete laid, ready to receive the slate contractor's setting-bed.

(9) Where any pipes are to be run in the concrete bed, the floor construction should be lowered, so that the top of any pipe will not come above the top of the concrete bed.

(10) Concrete Bed on Earth or Fill—When slate slabs or floors occur in connection with earth, cinder or gravel fill, the fill should be thoroughly puddled and tamped, and a concrete bed not less than 3 in. thick provided. The bed should be of crushed stone, slag or gravel for outside work, and may be of clean cinders for inside, mixed with cement and sand in accordance with good practice, ready for the setting-bed of cement mortar to be furnished and applied by the contractor for slate work.

(11) Reinforcement—Reinforcing metal, where required for concrete beds under slate floors, should be from 2 to 3-in. mesh No. 16 gauge expanded metal, or 3x8 in. No. 8 and No. 10 gauge reinforcement.

(12) Reinforcement should be placed about ¾ in. above the bottom of the concrete bed, and where more than one width or length is required, be lapped not less than 6 in. (See paragraph 19).

(13) Wood Floor Joists—The tops of wood floor joists, wherever possible, should be lowered to the level required to provide space for a continuous concrete bed or foundation to receive slate and the slate contractor's setting-bed.

(14) Where floor joists can not be lowered to the required level, the tops of the joists should be beveled off to a sharp edge, until the top is at least 2 in. below the finished floor.

(15) Spans of joists from 6 ft. 10 in. should be bridged with one row of cross bridging, and spans of 10 ft. and over with one row to each 5 ft. Bridging should not be less than 1x3 in.; should be accurately cut to fit, and securely nailed at each end with two 8d nails.

(16) Wood Underflooring—On top of the joists, if the joists have been lowered, should be laid a flooring of 1 in. by not over 6-in. wide boards placed about ¼ in. apart* and securely nailed to each joist.

(17) To the sides of the joists, if the joists have not been lowered, should be securely nailed 1 in. by not less than 2½-in. cleats at the depth required. Between the joists set 1 in. by not over 6-in. wide boards laid about ¼ in. apart* and securely nailed to the cleats.

(18) Concrete Beds on Wood Joist Construction—The wood underflooring and tops of joists, if joists have not been lowered, should be covered with a layer of waterproof paper, weighing not less than 11 lb. per 100 sq. ft. For floor areas of 100 sq. ft. or less, the concrete bed, if of stone, gravel, or coarse sand concrete, should be 2 in. thick, or if of cinder concrete, 3 in. thick. For areas of over 100 sq. ft. the concrete bed, if of stone, gravel or coarse sand concrete should be 2½ in. thick, or if of cinder concrete, 3½ in. thick.

(19) For floor areas of more than 100 sq. ft., the concrete bed should be reinforced. (See paragraphs 11 and 12.)

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*If laid tight, the moisture in the concrete may swell up and buckle the floor boards.

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Toilet Enclosures

Information on Toilet Enclosures—*Type Series A* have slate backs and ends 1 in. thick and 6 ft. 11 in. high and are continuous to floor. Slate partitions 1 in. thick are set 11 in. above floor. Stiles are 1¼ in. thick, with 2x4-in. slate rail across top. Backs, ends and stiles are let 1 in. into the floor.

Type Series B have slate backs and ends 1 in. thick and 5 ft. 11 in. high and are continuous to floor. Slate partitions 1 in. thick are set 11 in. above floor. End stiles are continuous to floor, other stiles are set 11 in. above floor, supported on nickelplated brass standards. Stiles are 1¼ in. thick. Backs, ends and end stiles are 1 in. into floor. Top standards are 9 in. high to center of 1⅛-in. outside diameter tubing across front and at exposed ends, and all are of nickelplated brass. Rails are finished against walls with nickelplated cast brass flanges.

Type Series C are similar to Series B except that stiles are not used.

General—Ventilating space is 7 in. wide, covered with 1-in. slate and closed at free standing ends with 1-in. slate.

Work spaces are 1 ft. 6 in. and 2 ft. 6 in. wide, covered with 1-in. slate and closed at free standing ends with 1-in. slate, arranged to be removable.

Unless otherwise specified, enclosures will be furnished in ribbon stock with all exposed surfaces standard sand rubbed.

Enclosures will be furnished either with right or left or with both ends free standing, or with both ends against walls in accordance with drawings or instructions.

All required angles, stirrups, bolts, nuts, bottom standards, top standards, top rails and wall flanges are included with each type and will be furnished in nickelplated brass.

Any doors and hardware required for doors, any register faces, fittings, accessories for enclosures may be selected from Chapter 4 on Fittings or from other sources and should be specified accordingly.

Enclosures furnished as illustrated and priced with weights given in pounds, include all slate and fittings for a complete installation as described, but do not include doors, door hardware, openings or register faces for ventilation vent flue collars or accessories.

Suggested Form of Specification for Toilet Enclosures

General Conditions—(a) The General Conditions, paragraphs 1 to 14, inclusive, as printed in the Twentieth Edition of Sweet's Architectural Catalogue, and in Chapter 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing date of April 15, 1920, are hereby made to constitute the General Conditions of this specification, except as they may be herein specifically modified for slate toilet enclosures.

Toilet Enclosures—(b) Furnish and install all toilet enclosures, and leave rigid and complete with oiled finish, in the location shown on plans. Those in the various rooms or other places, to be as follows:

(c) In (men's lavatory, first story), all shall be of Type AAV-1, as described and illustrated in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 16 and 17 in Chapter 5 of a series on Structural Slate, issued January 15, 1921, by The Structural Slate Company, Pen Argyl, Pa.

(d) In (women's lavatory, first story), all shall be of Type AA-2, as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 12 and 13 of same Chapter.

(e) In (basement toilet room), all shall be of Type B-3, etc.

(f) All joints shall be made and slabs secured in accordance with Pyramid Standard details. Joints shall be set with plaster of paris, pointed with same material, colored with lampblack, except any joints occurring in or at floors, which shall be made with a full packing of glycerine and litharge.

(g) The enclosures in............shall be left complete without doors.

(h) All other enclosures shall be supplied with wood [metal] doors, similar to No. .... as shown on page .... of Chapter 4, with butts No. .... and lock No. .... Each door and all hardware shall be furnished and hung by the slate contractor and left ready for finishing by the painting contractor.

Note: If doors are to be furnished by another contractor, paragraph h should be changed to suit and under carpentry, mill work and hardware and, in any case, painting, provisions should be made accordingly.

(i) The slate contractor shall furnish and set paper holder No. ...., as shown on page .... of Chapter 4, and other accessories as follows ....:

Note: The slate work of all enclosures, as provided by General Conditions, will be finished by the contractor erecting the slate work, with one coat of linseed oil and turpentine with or without the addition of lampblack, as directed at the building; but if a painted finish is desired, paragraph j and its note should be followed.

(j) The slate work of all enclosures shall be left free of oil and ready to be finished by the contractor for painting.

Note: Under painting, specify that all slate work of toilet enclosures shall be given 3 coats of white lead and oil paint of color selected by the architect.

Where it is desired to use the standard type of enclosure, but of a size not included in this Chapter, the following form of paragraph is suggested:

(k) (*Same as paragraph* (*c*) *to end and add*) except that the size of enclosures shall be ..... wide by ..... long.

Note: If it is desired to set any enclosures directly on any floor or upon a slate base or cove, or a cove of tile, cement or other material with which the floor may be surfaced, this will require special mention in the specifications, and separate detailing.

PRICES AND WEIGHTS OF VARIOUS TOILET ENCLOSURES .

Type	Size No. 1				Size No. 2				Size No. 3				Size No. 4			
	1 unit		Each additional unit		1 unit		Each additional unit		1 unit		Each additional unit		1 unit		Each additional unit	
	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.	Price	Wt., lb.
A	$ 90.00	1465	$ 47.75	850	$ 75.75	1355	$45.00	800	$ 89.25	1450	$ 47.00	820	$ 75.00	1338	$43.25	745
AA	166.00	2600	74.75	1365	140.00	2375	67.00	1270	165.25	2585	74.00	1335	136.50	2365	68.50	1220
AV	106.50	1620	57.00	1000	92.00	1525	49.50	820	105.50	1625	51.50	850	81.75	1500	50.50	800
AAV	201.75	3080	108.50	1845	173.00	2855	98.75	1620	200.00	3040	102.00	1675	171.25	2820	97.00	1580
AW	110.50	1865	50.15	912	96.25	1770	45.50	840	109.50	1850	47.50	870	95.25	1735	32.25	520
AAW	212.75	3575	101.00	1820	184.00	3355	95.50	1720	201.00	3545	108.75	1770	183.00	3320	91.50	1625

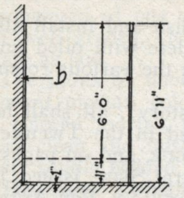
Type	Size No. 1						Size No. 2						Size No. 3 (3 stalls)						Size No. 4					
	1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit	
	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.
B	$92.00	1245	$85.75	1085	$43.00	700	$82.00	1150	$76.00	1000	$42.50	655	$86.00	1225	$83.25	1065	$43.75	680	$79.75	1130	$44.00	985	$39.50	650
BB	170.50	2200	165.25	1880	83.00	1100	158.00	2000	146.00	1720	74.50	1020	168.00	2185	162.50	1865	78.75	1090	155.25	1995	143.50	1705	71.75	1010
BV	105.75	1385	99.50	1225	53.75	735	99.50	1290	93.50	1140	49.50	685	103.25	1370	100.50	1210	51.50	705	97.00	1275	91.25	1130	47.00	665
BBV	201.25	2620	196.00	2300	103.00	1415	189.50	2430	177.50	2150	93.50	1335	195.25	2585	189.75	2265	97.25	1385	182.75	2400	171.00	2110	89.75	1330
BW	120.00	1595	113.75	1435	49.50	775	113.75	1515	107.75	1365	45.00	720	117.25	1575	114.50	1415	46.75	745	111.00	1485	105.25	1340	42.50	710
BBW	228.50	3065	223.25	2745	98.25	1515	216.00	2875	204.00	2595	89.75	1430	223.50	3035	218.00	2715	92.75	1465	211.00	2845	199.25	2555	84.25	1385

Type	Size No. 2						Size No. 4						Size No. 5						Size No. 6					
	1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit		1 unit		Alternate type		Each additional unit	
	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt.,lb.	Price	Wt..lb.
C	$79.25	1050	$72.25	920	$41.25	600	$76.25	1035	$69.25	905	$38.00	585	$68.50	955	$67.50	845	$37.00	570	$66.00	940	$65.00	825	$35.00	545
CC	143.50	1820	129.50	1560	71.50	925	140.75	1800	126.75	1545	69.00	900	121.75	1625	119.50	1405	67.75	845	119.00	1610	116.75	1385	45.75	635
CV	93.50	1195	86.50	1065	44.00	635	91.50	1180	84.50	1050	43.00	615	83.75	1100	82.75	990	42.00	600	80.25	1075	79.25	960	39.25	580
CCV	174.00	2235	160.00	1975	87.75	1225	171.50	2200	157.50	1945	80.00	1200	154.50	2045	152.25	1825	79.00	1150	147.25	2010	145.00	1785	78.00	1115
CW	106.25	1415	99.25	1285	44.75	670	103.50	1385	96.50	1255	43.25	660	95.25	1320	94.00	1210	42.50	635	92.75	1290	91.00	1175	40.00	615
CCW	201.25	2685	187.25	2425	84.00	1320	196.25	2650	182.25	2395	80.00	1275	179.75	2490	177.50	2270	79.00	1240	174.50	2460	172.25	2235	74.75	1190

OVER-ALL DIMENSIONS

Number of stalls.....	1	2	3	4	5	6	7	8	9	10
2′ 10″ width..........	2′ 10″	5′ 8″	8′ 6″	11′ 4″	14′ 2″	17′ 0″	19′ 10″	22′ 8″	25′ 6″	28′ 4″
2′ 8″ width..........	2′ 8″	5′ 4″	8′ 0″	10′ 8″	13′ 4″	16′ 0″	18′ 8″	21′ 4″	24′ 0″	26′ 8″

Continued on next page



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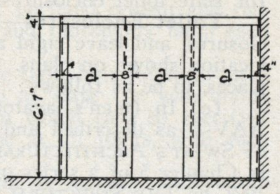
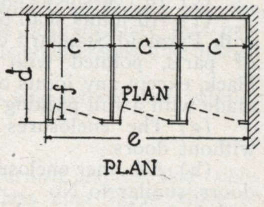


FRONT ELEVATION

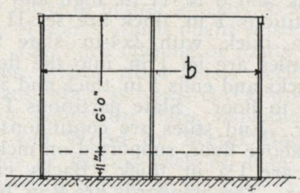
Schedule of Dimensions

Type	a	b	c	d	e	f
A1	2-2	4-8¼	2-10	4-8¼	8-6	4-6
A2	2-2	4-2¼	2-10	4-2¼	8-6	4-0
A3	2-0	4-8¼	2-8	4-8¼	8-0	4-6
A4	2-0	4-2¼	2-8	4-2¼	8-0	4-0


c
c
c
d
f
PLAN
e

PLAN

TYPE·A Inward swing doors on A1 & A3, Outward on A2 & A4



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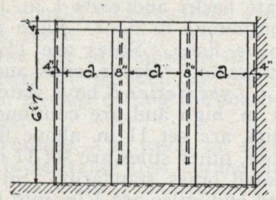
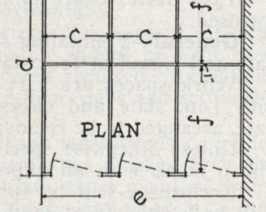


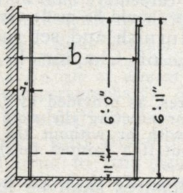
FRONT ELEVATION

Schedule of Dimensions

Type	a	b	c	d	e	f
AA1	2-2	9-3½	2-10	8-6	9-3½	4-6
AA2	2-2	8-3½	2-10	8-6	8-3½	4-0
AA3	2-0	9-3½	2-8	8-0	9-3½	4-6
AA4	2-0	8-3½	2-8	8-0	8-3½	4-0


c
c
c
d
f
f
PLAN
e

TYPE AA Inward swing doors on AA1 & AA3, Outward on AA2 & AA4



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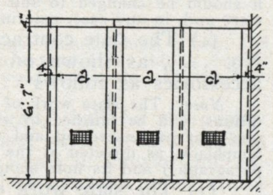
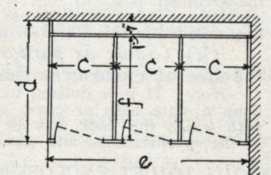


FRONT ELEVATION

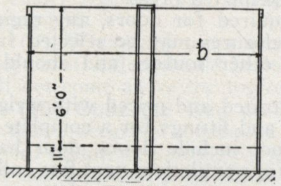
Schedule of Dimensions

Type	a	b	c	d	e	f
AV1	2-2	5-3¼	2-10	5-3¼	8-6	4-6
AV2	2-2	4-9¼	2-10	4-9¼	8-6	4-0
AV3	2-0	5-3¼	2-8	5-3¼	8-0	4-6
AV4	2-0	4-9¼	2-8	4-9¼	8-0	4-0



PLAN

TYPE·AV Inward swing doors on AV1 & AV3, Outward on AV2 & AV4



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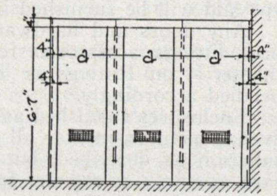
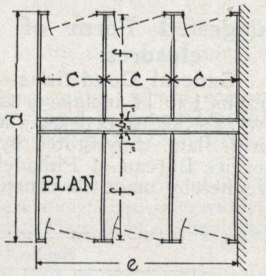


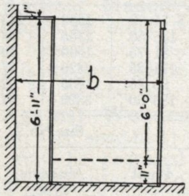
FRONT ELEVATION

Schedule of Dimensions

Type	a	b	c	d	e	f
AAV1	2-2	9-11½	2-10	8-6	8-11½	4-6
AAV2	2-2	8-11½	2-10	8-6	8-11½	4-0
AAV3	2-0	9-11½	2-8	8-0	9-11½	4-6
AAV4	2-0	8-11½	2-8	8-0	9-11½	4-0


c
c
c
d
f
f
PLAN
e

TYPE AAV Inward swing doors on AAV1 & AAV3, Outward on AAV2 & AAV4



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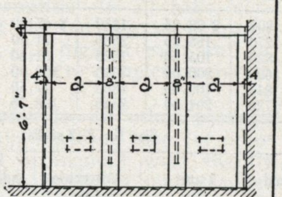
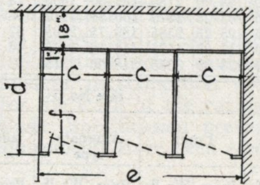


FRONT ELEVATION

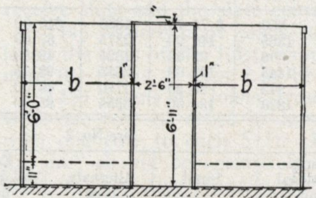
Schedule of Dimensions

Type	a	b	c	d	e	f
AW1	2-2	6-2¼	2-10	6-2¼	8-6	4-6
AW2	2-2	5-8¼	2-10	5-8¼	8-6	4-0
AW3	2-0	6-2¼	2-8	6-2¼	8-0	4-6
AW4	2-0	5-8¼	2-8	5-8¼	8-0	4-0

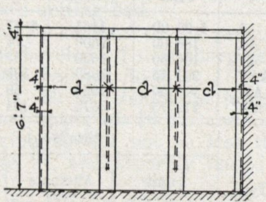


PLAN

TYPE AW Inward swing doors on AW1 & AW3, Outward on AW2 & AW4


b
1"
2'-6"
1"
b
6'-0"
6'-11"
11"

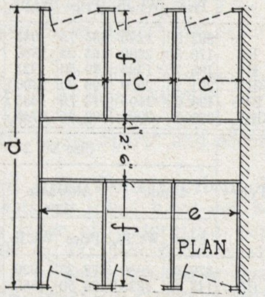
END ELEVATION



FRONT ELEVATION

Schedule of Dimensions

Type	a	b	c	d	e	f
AAW1	2-2	4-6	2-10	11-10½	8-6	4-6
AAW2	2-2	4-0	2-10	10-10½	8-6	4-0
AAW3	2-0	4-6	2-8	11-10½	8-0	4-6
AAW4	2-0	4-0	2-8	10-10½	8-0	4-0


c
c
c
f
2'-6"
d
f
e
PLAN

TYPE·AAW Inward swing doors on AAW1 & AAW3, Outward on AAW2 & AAW4

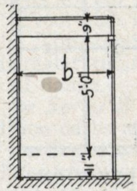
SWEETS
CATALOGUE
SERVICE

TOILET ENCLOSURES~PYRAMID TYPES
A~AA~AV~AAV~AW~AAW

NOT DRAWN
TO SCALE
DATE SEPT. 25

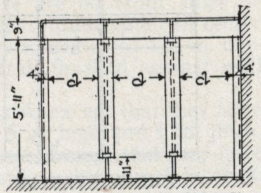
DRWG
1

Continued on next page



END ELEVATION

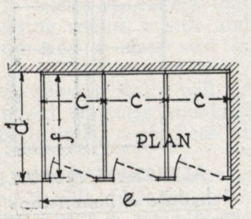
Alternate Type B
Exposed Ends and
Stiles are set 11 in.
above floor support-
ed on N.P. Brass
Standards.



FRONT ELEVATION

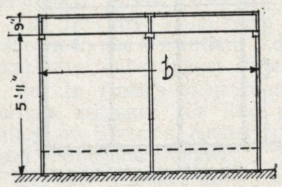
Schedule of Dimensions

Type	a	b	c	d	e	f
B1	2-2	4-8¼	2-10	4-8¼	8-6	4-6
B2	2-2	4-2¼	2-10	4-2¼	8-6	4-0
B3	2-0	4-8¼	2-8	4-8¼	8-0	4-6
B4	2-0	4-2¼	2-8	4-2¼	8-0	4-0

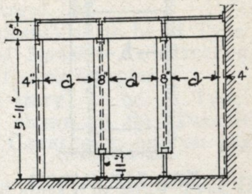


PLAN

TYPE·B Inward swing doors on B1 & B Outward on B2 & B4



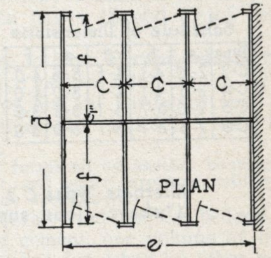
END ELEVATION



FRONT ELEVATION

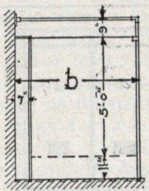
Schedule of Dimensions

Type	a	b	c	d	e	f
BB1	2-2	9-3½	2-10	9-3½	8-6	4-6
BB2	2-2	8-3½	2-10	8-3½	8-6	4-0
BB3	2-0	9-3½	2-8	9-3½	8-0	4-6
BB4	2-0	8-3½	2-8	8-3½	8-0	4-0



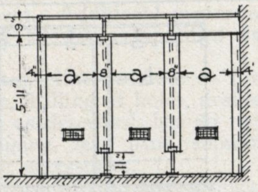
PLAN

TYPE·BB Inward swing doors on BB1 & BB3, Outward on BB2 & BB4



END ELEVATION

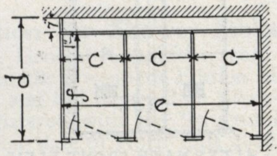
Alternate Types
BV 1,2,3,4.
Exposed Ends and
Stiles are set 11 in
above floor sup-
ported on N.P.
Brass Standards.



FRONT ELEVATION

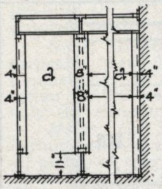
Schedule of Dimensions

Type	a	b	c	d	e	f
BV1	2-2	5-3¼	2-10	5-3¼	8-6	4-6
BV2	2-2	4-9¼	2-10	4-9¼	8-6	4-0
BV3	2-0	5-3¼	2-8	5-3¼	8-0	4-6
BV4	2-0	4-9¼	2-8	4-9¼	8-0	4-0

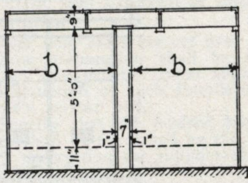


PLAN

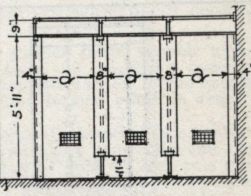
TYPE·BV Inward swing doors on BV1 & BV3. Outward on BV2 & BV4.



ALTERNATE
FRONT VIEW



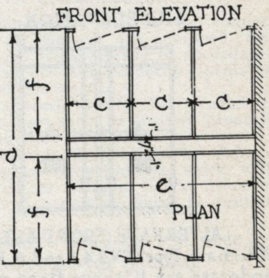
END ELEVATION



FRONT ELEVATION

Schedule of Dimensions

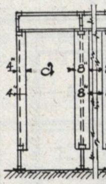
Type	a	b	c	d	e	f
BBV1	2-2	4-7¼	2-10	9-11½	8-6	4-6
BBV2	2-2	4-1¼	2-10	8-11½	8-6	4-0
BBV3	2-0	4-7¼	2-8	9-11½	8-0	4-6
BBV4	2-0	4-1¼	2-8	8-11½	8-0	4-0



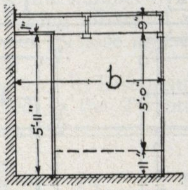
PLAN

Alternate Types BV 1,2,3,4. Exposed Ends and Stiles are set 11" above floor supported on N.P. Brass Standards.

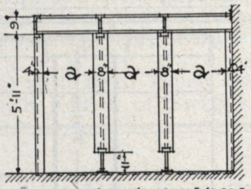
TYPE·BBV Inward swing doors on BBV1 & BBV3. Outward on BBV2 & BBV4



ALTERNATE
FRONT VIEW



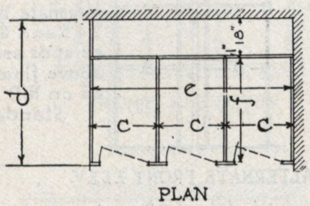
END ELEVATION



FRONT ELEVATION

Schedule of Dimensions

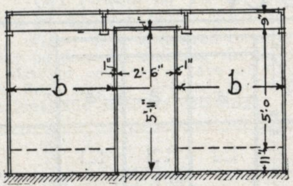
Type	a	b	c	d	e	f
BW1	2-2	6-2¼	2-10	6-2¼	8-6	4-6
BW2	2-2	5-8¼	2-10	5-8¼	8-6	4-0
BW3	2-0	6-2¼	2-8	6-2¼	8-0	4-6
BW4	2-0	5-8¼	2-8	5-8¼	8-0	4-0



PLAN

Alternate Types BW 1,2,3,4. Exposed Ends and Stiles are set 11" above floor on N.P. Brass Standards.

TYPE·BW Inward swing doors on BW1 & BW3. Outward on BW2 & BW4



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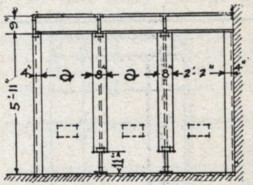
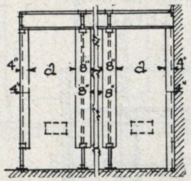
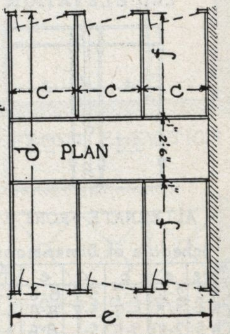


FRONT ELEVATION



Alternate Types
BW1,2,3,4.
Exposed Ends and
Stiles are set 11" a-
bove floor. Support-
ed on Brass Stan-
dards.



PLAN

Inward swing doors on BBW1 & BBW3,
outward swing on BBW2 & BBW4

Schedule of Dimensions

Type	a	b	c	d	e	f
BBW1	2-2	4-7¼	2-10	10-10½	8-6	4-6
BBW2	2-2	4-1¼	2-10	10-10½	8-6	4-0
BBW3	2-0	4-7¼	2-8	10-10½	8-0	4-6
BBW4	2-0	4-1¼	2-8	10-10½	8-0	4-0

TYPE·BBW

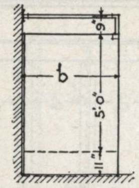
SWEETS
CATALOGUE
SERVICE

TOILET ENCLOSURES~PYRAMID TYPES B, BB, BV, BBV, BW, BBW

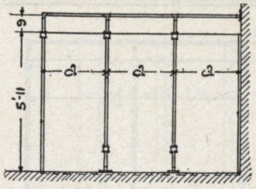
NOT DRAWN
TO SCALE,
DATE SEPT. 25

DR'WG
2

Continued on next page



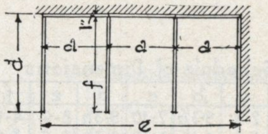
END ELEVATION



FRONT ELEVATION

Schedule of Dimensions

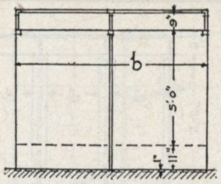
Type	a	b	d	e	f
C-2	2-10	4-1	4-1	8-6	4-0
C-4	2-8	4-1	4-1	8-0	4-0
C-5	2-10	3-7	3-7	8-6	3-6
C-6	2-8	3-7	3-7	8-0	3-6



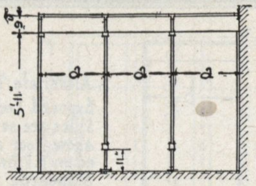
PLAN

Alternate Types C 2,4,5 and 6 Exposed ends are set 11" above floor, supported on N.P. Brass Standards

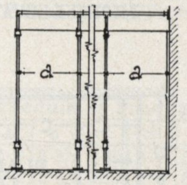
TYPE C



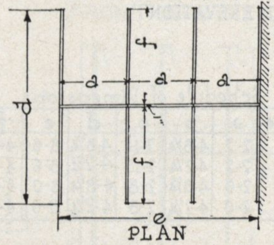
END ELEVATION



FRONT ELEVATION



ALTERNATE FRONT ELEV.



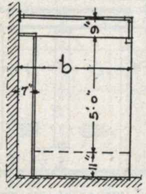
PLAN

Schedule of Dimensions

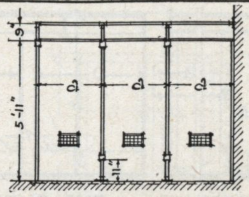
Type	a	b	d	e	f
CC 2	2-10	8-1	8-1	8-6	4-0
CC 4	2-8	8-1	8-1	8-0	4-0
CC 5	2-10	7-1	7-1	8-6	3-6
CC 6	2-8	7-1	7-1	8-0	3-6

Alternate Types CC 2,4,5 and 6. Exposed ends are set 11" above floor, supported on N.P. Brass Standards

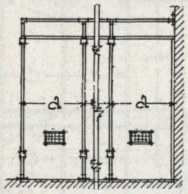
TYPE CC



END ELEVATION

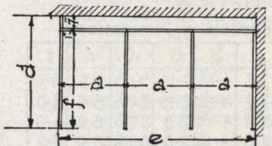


FRONT ELEVATION



ALTERNATE FRONT ELEV.

Alternate Types CV 2,4,5 and 6. Exposed ends are set 11" above floor supported on N.P. Brass Standards

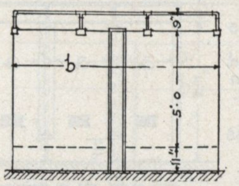


PLAN

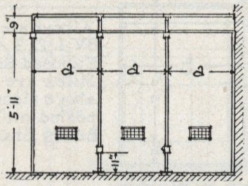
Schedule of Dimensions

Type	a	b	d	e	f
CV 2	2-10	4-8	4-8	8-6	4-0
CV 4	2-8	4-8	4-8	8-0	4-0
CV 5	2-10	4-2	4-2	8-6	3-6
CV 6	2-8	4-2	4-2	8-0	3-6

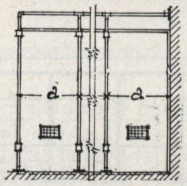
TYPE CV



END ELEVATION



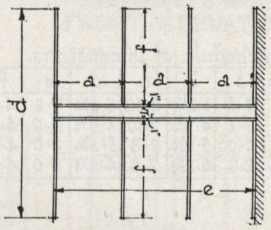
FRONT ELEVATION



ALTERNATE FRONT ELEV

Schedule of Dimensions

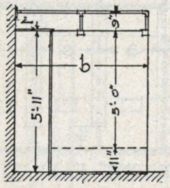
Type	a	b	d	e	f
CCV 2	2-10	8-9	8-9	8-6	4-0
CCV 4	2-8	8-9	8-9	8-0	4-0
CCV 5	2-10	7-9	7-9	8-6	3-6
CCV 6	2-8	7-9	7-9	8-0	3-6



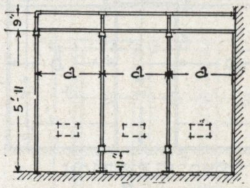
PLAN

Alternate Types CCV 2,4,5 and 6. Exposed ends are set 11" above floor, supported on N.P. Brass Standards

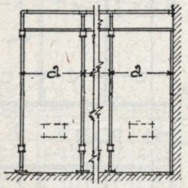
TYPE CCV



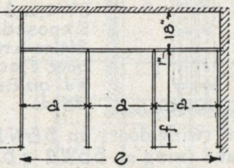
END ELEVATION



FRONT ELEVATION



ALTERNATE FRONT ELEV



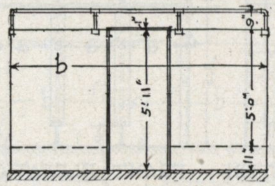
PLAN

Schedule of Dimensions

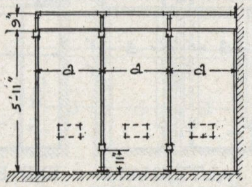
Type	a	b	d	e	f
CW 2	2-10	5-7	5-7	8-6	4-0
CW 4	2-8	5-7	5-7	8-0	4-0
CW 5	2-10	5-1	5-1	8-6	3-6
CW 6	2-8	5-1	5-1	8-0	3-6

Alternate Types CW 2,4,5 and 6. Exposed ends are set 11" above floor, supported on N.P. Brass Standards.

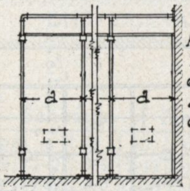
TYPE CW



END ELEVATION



FRONT ELEVATION

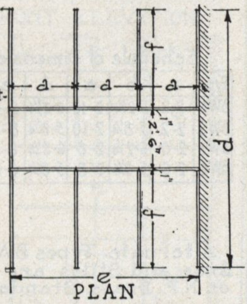


Alternate Types CCW 2,4,5 and 6. Exposed ends are set 11" above floor, supported on N.P. Brass Standards

ALTERNATE FRONT ELEV.

Schedule of Dimensions

Type	a	b	d	e	f
CCW 2	2-10	10-6	10-8	8-6	4-0
CCW 4	2-8	10-6	10-8	8-0	4-0
CCW 5	2-10	9-6	9-8	8-6	3-6
CCW 6	2-8	9-6	9-8	8-0	3-6



PLAN

TYPE CCW

SWEETS
CATALOGUE
SERVICE

TOILET ENCLOSURES ~ PYRAMID TYPES C, CC, CV, CCV, CW, CCW.

NOT DRAWN
TO SCALE.
DATE SEPT. 25

DR'WG
3

Continued on next page

Shower Stalls

Information on Shower Stalls—*Type Series A* have slate backs, ends and partitions 1 in. thick and 6 ft. 6 in. high and are continuous to top of floor slab. There are no front stiles or curbs. Floor slab is 2 in. thick, sloping to drain outlet in center of slab. Top standards are 2⅛ in. high to center of 1⅛-in. outside diameter tubing across fronts. Rail finished against wall and wall flange.

Type Series B are similar to Series A, except that they have in addition curbs at bottom, which are 6 in. high and 1 in. thick.

Type Series C are similar to Series A, except that they have in addition curbs at bottom, and front stiles which are 1 in. thick and continuous to top of curb.

Type Series D and E are similar to Series A, except that they have in addition front stiles of dressing rooms, a stile and curb between shower and dressing room and a slate seat in dressing room.

General—Unless otherwise specified, shower stalls will be furnished in ribbon stock with all exposed surfaces standard sand rubbed, including both sides of both ends, regardless of location.

All required angles, stirrups, bolts, nuts, bottom standards, top standards, top rails, wall flanges and double drainage drain for outlet are included and will be furnished in nickelplated brass.

Alternate type will be furnished only when specified as Type .. Alternate.

Where it is desired to use lead pans with showers, there will be no change in size or arrangement. Additional pieces to cover lead work will be furnished if shower is specified as Type .. for lead pan.

All type shower stalls and alternates, either without or for lead pans, as illustrated, include all slate, drilling of holes, drains and fittings for a complete installation as described, but do not include trap, valves, shower heads, piping, lead pans, shower curtains, snap hooks, doors, hardware or accessories.

Any doors and hardware required for doors, any fittings, trimmings or accessories for shower stalls may be selected from Chapter 4 on Fittings or from other sources, and should be specified accordingly.

Suggested Form of Specification for Shower Stalls

General Conditions—(a) The General Conditions, paragraph 1 to 14, inclusive, as printed in the Twentieth Edition of Sweet's Architectural Catalogue, and in Chapter 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing date of April 15th, 1920, are hereby made to constitute the General Conditions of this specification, execpt as they may be herein specifically modified for slate shower stalls.

Shower Stalls—(b) Furnish and install all shower stalls, and leave rigid and complete, with oiled finish, in the location shown and, in extent, to the number of stalls and dressing rooms indicated on plans, including all metal work in accordance with the Pyramid descriptions. Those in the various rooms or other places to be as follows:

(c) In (men's lavatory in basement) all to be of Type C as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 12 and 13 in Chapter 7 of a Series on Structural Slate, issued May 31st, 1921, by The Structural Slate Company, Pen Argyl, Pa.

(d) In (girl's toilet room in basement) all to be of Type D as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 16 and 17 of same Chapter.

(e) In (men's toilet room, first story) to be of Type A alternate arranged for lead pan as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 4 and 5 of same Chapter.

(f) In (women's toilet room, first story) to be of Type DD for lead pan as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 18 and 19 of same Chapter.

(g) Shower stalls in ...... are to have Pyramid doors No. ..... with hardware as follows (give various numbers .....) as illustrated in Chapter 4. Each door and all hardware shall be furnished and hung by the slate contractor and left ready for finishing by the painting contractor.

Note: (h) If the doors are to be furnished by another contractor, paragraph (g) should be changed to suit, and under carpentry, mill work and hardware, provisions should be made accordingly.

(i) All floor slabs shall be securely and solidly bedded in mortar composed of one volume of cement, one volume of lime and six volumes of sand on foundations furnished by other contractors. All joints shall be made and slabs secured in accordance with Pyramid Standard details. Joints shall be set with a full packing of glycerine and litharge or approved waterproof cement colored with lampblack.

Note: If shower floor slabs are set over wooden joists, provide under carpenter work how preparation shall be made for receiving concrete foundations. In any case provide under appropriate section of the specification for the construction of such foundations formed ready to require only the slatesetter's mortar bed.

Note: (k) Specify that the desired kinds of shower heads, valves, curtains and hooks shall be furnished by the plumbing contractor and that all piping of every description for supplies shall be done by him as a part of the plumbing work. Heads, valves and curtains may be selected from Chapter 4 and specified accordingly.

Note: (l) Specify that the plumbing contractor shall set and connect to the double drainage drain with which all showers are equipped, furnishing and installing all such other drainage requirements in accordance with the remainder of the specification, as are not regularly furnished with the showers as described with Pyramid Standards.

Note: (m) Where lead pans are to be used, specify that plumber is to furnish lead of weight desired, and fit and set same in position properly connected to the drain ready for setting of slate floor slabs.

Note: (n) The slate work of all enclosures, as provided by General Conditions, will be finished by the contractor erecting the slate work, with one coat of linseed oil and turpentine with or without the addition of lampblack, as directed at the building; but if a painted finish is desired, paragraph (o) should be followed.

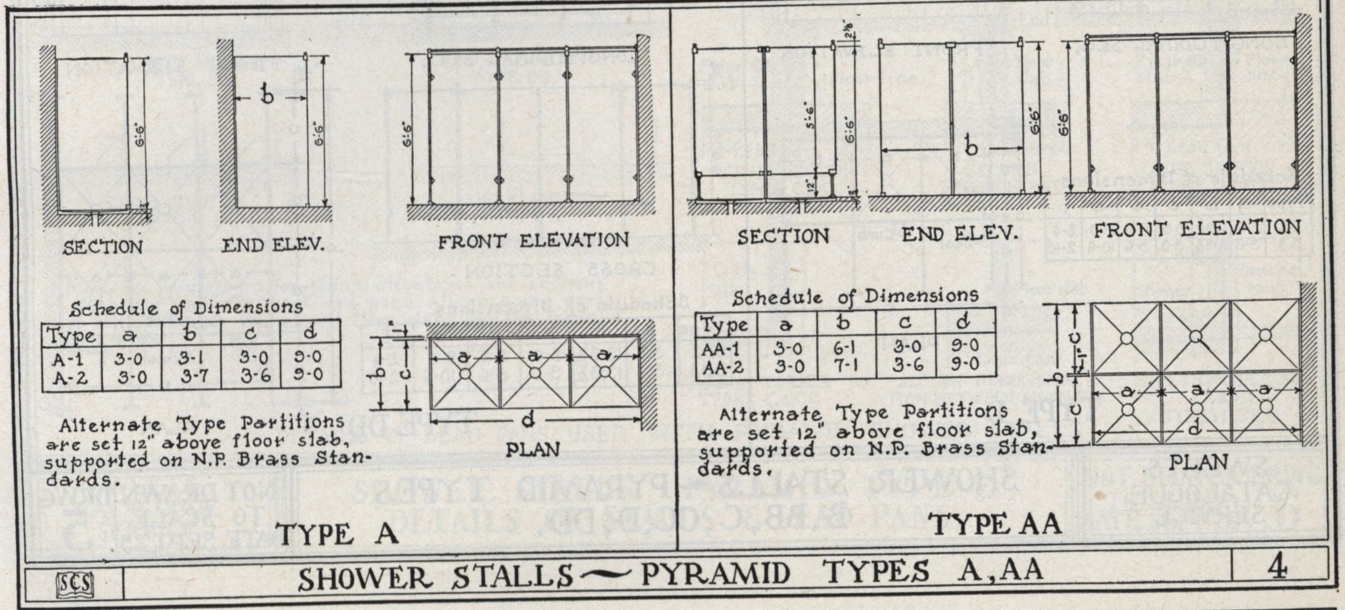
(o) The slate work of all enclosures shall be left free of oil and ready to be finished by the contractor for painting.

Note: Under painting specify that all slate work of toilet enclosures shall be given 3 coats of white lead and oil paint of color selected.

Note: (p) Where it is desired to use the Standard type shower, but of a size not shown in this Chapter, the following form is suggested.

(q) *(Same as paragraph (c) to end and add)* except that size of shower stalls shall be ......

Note: If it is desired to set any enclosures directly on any floor this may be done by omitting the slate floor slab. If to be set directly upon a slate or cove, or a cove of tile, cement or other material with which the floor may be surfaced, this will require special mention in the specifications, and separate detailing.



Schedule of Dimensions

Type	a	b	c	d
A-1	3-0	3-1	3-0	9-0
A-2	3-0	3-7	3-6	9-0

Alternate Type Partitions are set 12" above floor slab, supported on N.P. Brass Standards.

TYPE A

Schedule of Dimensions

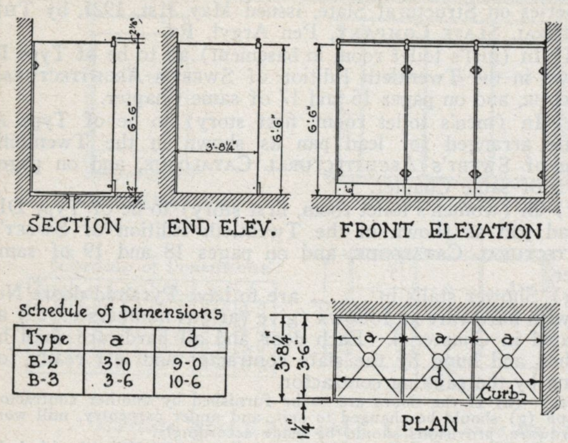
Type	a	b	c	d
AA-1	3-0	6-1	3-0	9-0
AA-2	3-0	7-1	3-6	9-0

Alternate Type Partitions are set 12" above floor slab, supported on N.P. Brass Standards.

TYPE AA

SHOWER STALLS — PYRAMID TYPES A, AA

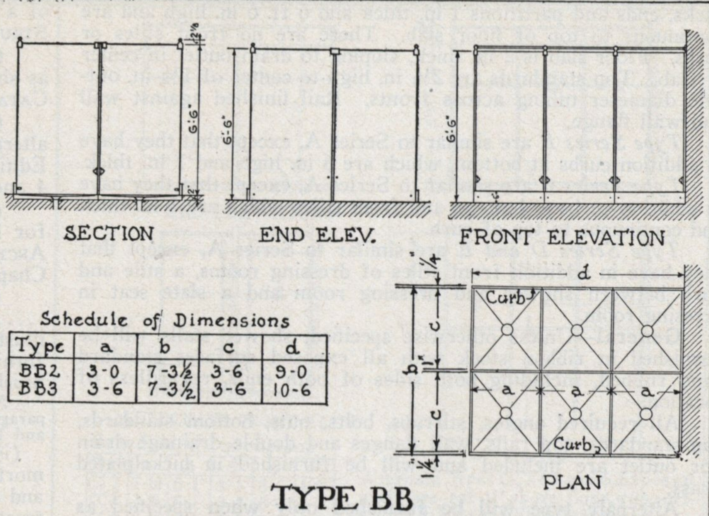
Continued on next page


SECTION
END ELEV.
FRONT ELEVATION
PLAN
6'-6"
3'-8¼"
Curb
a
d
3'-8¼"
3'-6"
1¼"

Schedule of Dimensions

Type	a	d
B-2	3-0	9-0
B-3	3-6	10-6

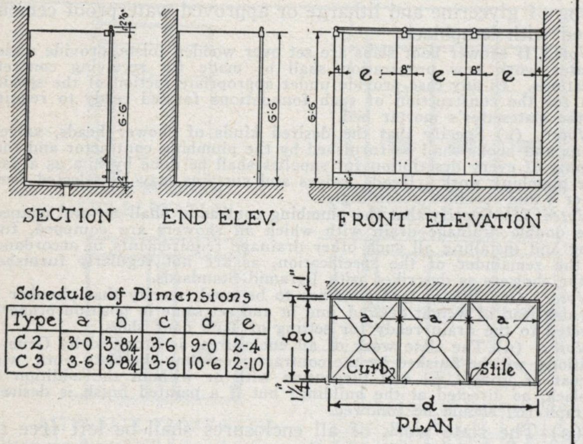
TYPE B


SECTION
END ELEV.
FRONT ELEVATION
PLAN
6'-6"
Curb
a
b
c
d

Schedule of Dimensions

Type	a	b	c	d
BB2	3-0	7-3½	3-6	9-0
BB3	3-6	7-3½	3-6	10-6

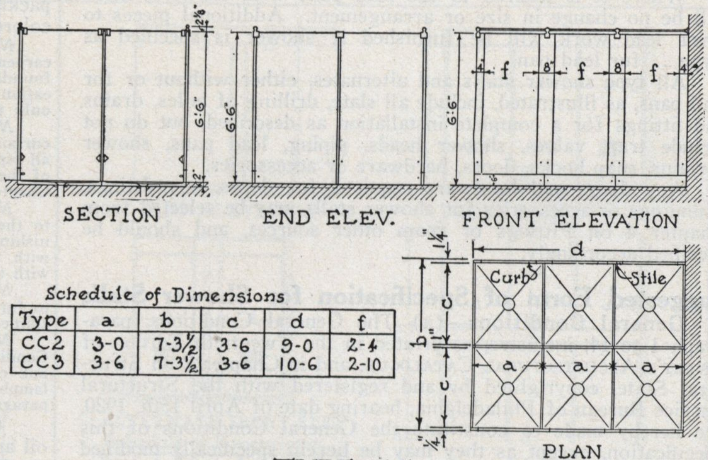
TYPE BB


SECTION
END ELEV.
FRONT ELEVATION
PLAN
6'-6"
e
8"
Curb
Stile
a
b
c
d
1¼"

Schedule of Dimensions

Type	a	b	c	d	e
C2	3-0	3-8¼	3-6	9-0	2-4
C3	3-6	3-8¼	3-6	10-6	2-10

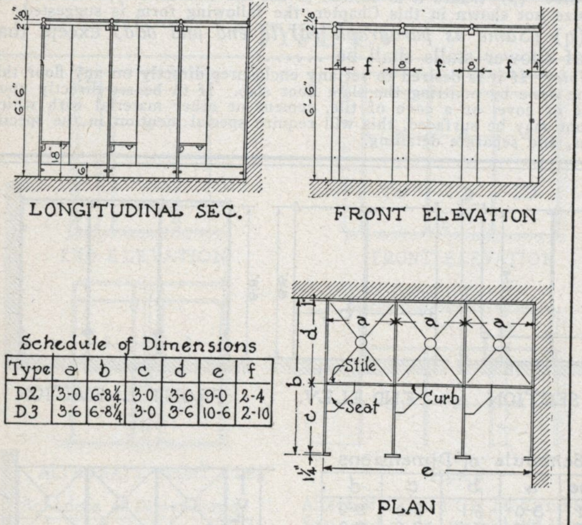
TYPE C


SECTION
END ELEV.
FRONT ELEVATION
PLAN
6'-6"
f
8"
4"
Curb
Stile
a
b
c
d

Schedule of Dimensions

Type	a	b	c	d	f
CC2	3-0	7-3½	3-6	9-0	2-4
CC3	3-6	7-3½	3-6	10-6	2-10

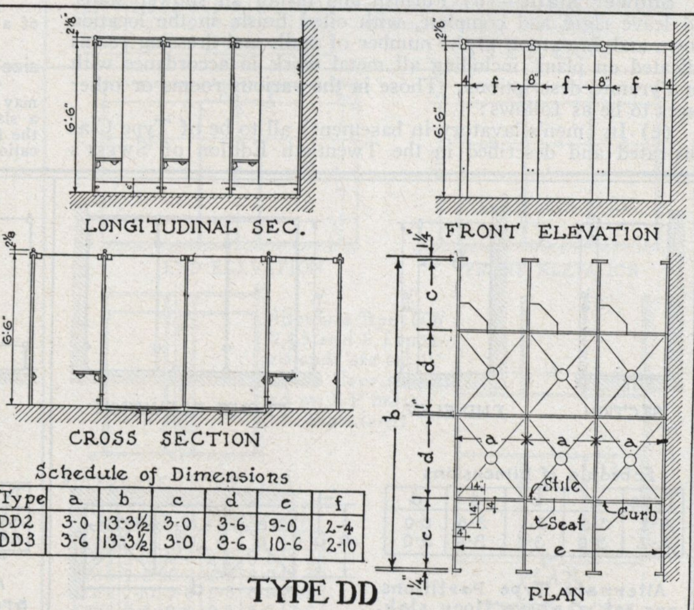
TYPE CC


LONGITUDINAL SEC.
FRONT ELEVATION
PLAN
6'-6"
18"
f
8"
4"
Stile
Seat
Curb
a
b
c
d
e
1¼"

Schedule of Dimensions

Type	a	b	c	d	e	f
D2	3-0	6-8¼	3-0	3-6	9-0	2-4
D3	3-6	6-8¼	3-0	3-6	10-6	2-10

TYPE D


LONGITUDINAL SEC.
FRONT ELEVATION
CROSS SECTION
PLAN
6'-6"
f
8"
4"
Stile
Seat
Curb
a
b
c
d
e
1¼"

Schedule of Dimensions

Type	a	b	c	d	e	f
DD2	3-0	13-3½	3-0	3-6	9-0	2-4
DD3	3-6	13-3½	3-0	3-6	10-6	2-10

TYPE DD

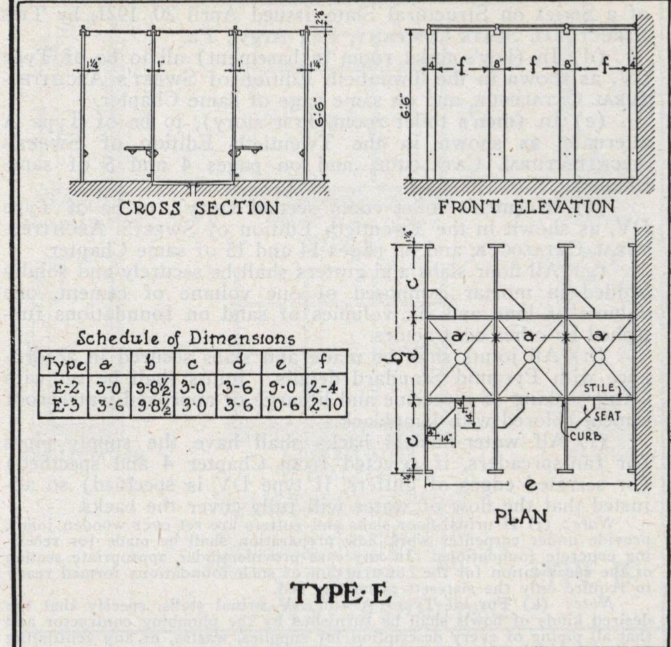
SWEETS
CATALOGUE
SERVICE

SHOWER STALLS—PYRAMID TYPES
B, BB, C, CC, D, DD.

NOT DRAWN
TO SCALE
DATE SEPT. '25

DRWG
5

Continued on next page


1¼"
6'-6"
f
8"
a
b
c
d
e
STILE
SEAT
CURB
1¼"

CROSS SECTION

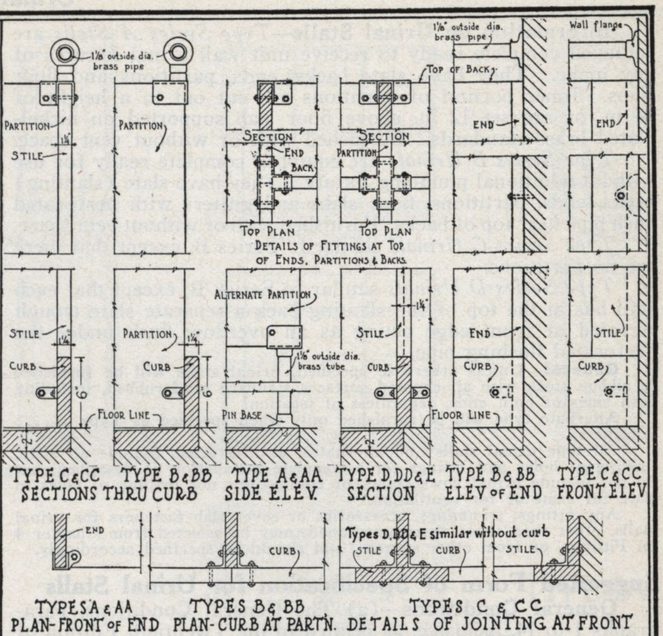
FRONT ELEVATION

PLAN

Schedule of Dimensions

Type	a	b	c	d	e	f
E-2	3-0	9-8½	3-0	3-6	9-0	2-4
E-3	3-6	9-8½	3-0	3-6	10-6	2-10

TYPE E


1⅛" outside dia. brass pipe
PARTITION
STILE
1¼"
SECTION
END
BACK
PARTITION
TOP PLAN
TOP OF BACK
END
Wall flange
ALTERNATE PARTITION
1⅛" outside dia. brass tube
STILE
CURB
FLOOR LINE
PIN BASE
6"
END
CURB
Types D,DD & E similar without curb
STILE

DETAILS OF FITTINGS AT TOP OF ENDS, PARTITIONS & BACKS.

TYPE C & CC SECTIONS THRU CURB

TYPE B & BB SIDE ELEV.

TYPE A & AA SIDE ELEV.

TYPE D, DD & E SECTION

TYPE B & BB ELEV OF END

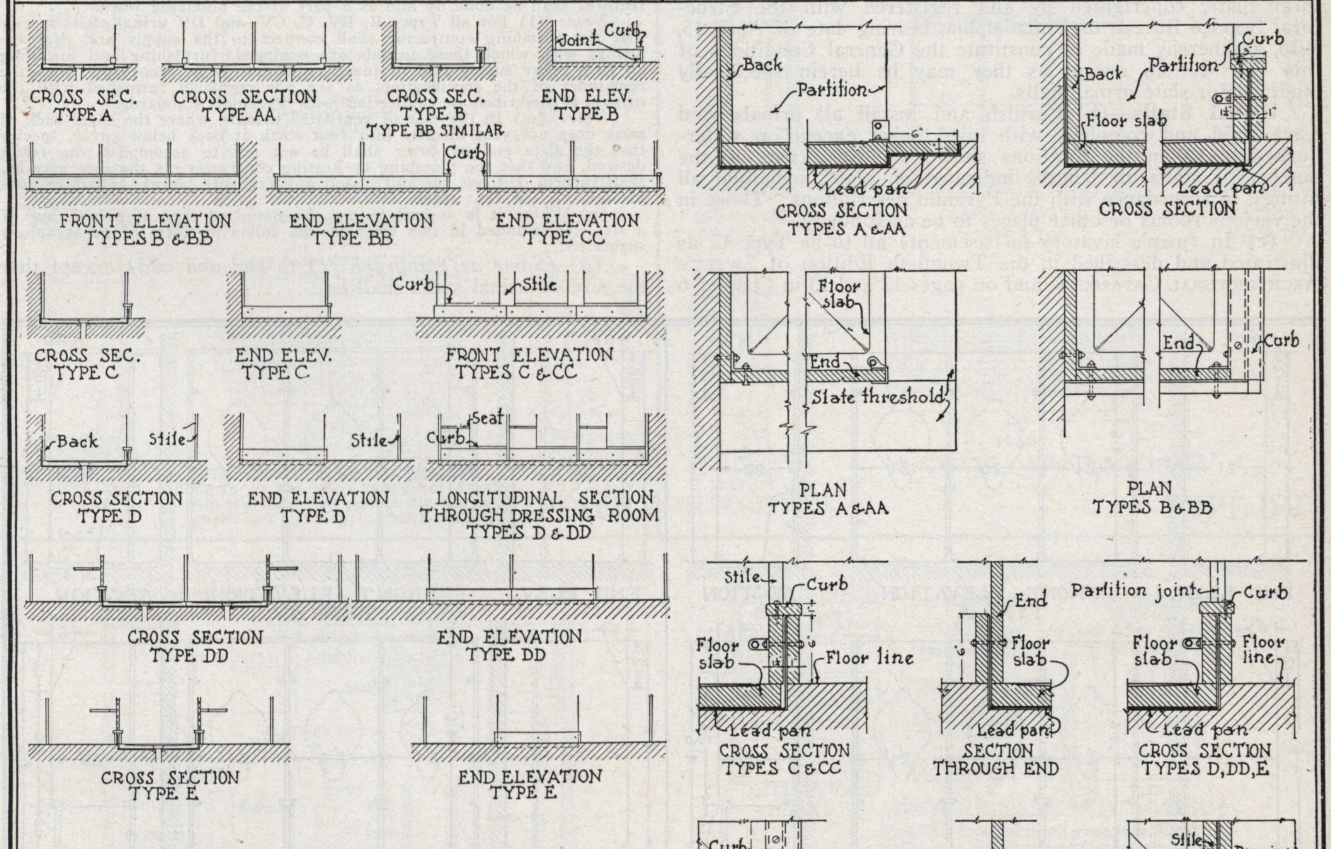
TYPE C & CC FRONT ELEV

TYPES A & AA PLAN-FRONT OF END

TYPES B & BB PLAN-CURB AT PARTN.

TYPES C & CC DETAILS OF JOINTING AT FRONT

SHOWER STALL DETAILS


Joint
Curb
Stile
Back
Stile
Seat
Curb
Back
Partition
Floor slab
Lead pan
6"
Curb
Partition
Back
Floor slab
Lead pan
Floor slab
End
Slate threshold
End
Curb
Stile
Curb
Floor slab
Floor line
Lead pan
End
Floor slab
Lead pan
Partition joint
Curb
Floor slab
Floor line
Lead pan
Curb
Stile
Floor slab
Lead pan
Stile
Shower
Dressing room
End

CROSS SEC. TYPE A

CROSS SECTION TYPE AA

CROSS SEC. TYPE B

END ELEV. TYPE B

TYPE BB SIMILAR

FRONT ELEVATION TYPES B & BB

END ELEVATION TYPE BB

END ELEVATION TYPE CC

CROSS SEC. TYPE C

END ELEV. TYPE C

FRONT ELEVATION TYPES C & CC

CROSS SECTION TYPE D

END ELEVATION TYPE D

LONGITUDINAL SECTION THROUGH DRESSING ROOM TYPES D & DD

CROSS SECTION TYPE DD

END ELEVATION TYPE DD

CROSS SECTION TYPE E

END ELEVATION TYPE E

CROSS SECTION TYPES A & AA

CROSS SECTION

PLAN TYPES A & AA

PLAN TYPES B & BB

CROSS SECTION TYPES C & CC

SECTION THROUGH END

CROSS SECTION TYPES D, DD, E

PLAN AT CORNER TYPES C & CC

SECTION THROUGH PARTITION BETWEEN SHOWERS

PLAN THROUGH CURB AT END TYPES D, DD, E

NOTE: See Drawings 4 & 5 for plans, elevations and sections of shower stalls without lead pans. All sizes and parts of stalls, dressing rooms and floor slabs are the same in both types.

DETAILS OF LEAD PANS USED WITH PYRAMID SHOWER STALLS

SWEETS CATALOGUE SERVICE	SHOWER STALLS ~ PYRAMID TYPE E DETAILS OF STALLS & LEAD PANS	NOT DRAWN TO SCALE DATE SEPT. '25	DRWG 6

Continued on next page

Urinal Stalls

Information on Urinal Stalls—*Type Series A Stalls* are equipped complete ready to receive unit wall urinal fixtures of any make. They have slate backs, ends, partitions and floor slabs. Inner portion of partitions are cut out to a height of 18 in. or are set 12 in. above floor slab supported on nickel-plated brass standards. Furnished with or without vent space.

Type Series B Urinals are equipped complete ready for use without additional plumbing fixture. They have slate (slanting) backs, ends, partitions, floor slabs and gutters with perforated flush pipe near top of backs. Furnished with or without vent space.

Type Series C Urinals similar to Series B, except that there are no partitions.

Type Series D Urinals similar to Series B, except that each stall has at the top of the slanting back a separate slate trough serrated at front edge acting as an overflow flush under the perforated flushing pipe.

General—Unless otherwise specified, urinal stalls will be furnished in ribbon stock with all exposed surfaces standard sand rubbed, including both sides of both ends, regardless of location.

Alternate type will be furnished only when specified as Type ...... Alternate.

All type urinal stalls and alternates, as illustrated, include all slate, drilling of holes and fittings for a complete installation as described, but do not include urinal bowls, pipes or connections nor drilling of holes in slate for same or for ventilation.

Any fittings, trimmings, accessories or cover slab fasteners for urinal stalls, other than those above mentioned, may be selected from Chapter 4 on Fittings, or from other sources, and should be specified accordingly.

Suggested Form of Specification for Urinal Stalls

General Conditions—(a) The General Conditions, paragraphs 1 to 14, inclusive, as printed in the Twentieth Edition of Sweet's Architectural Catalogue, and in Chapter 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing date of April 15, 1920, are hereby made to constitute the General Conditions of this specification, except as they may be herein specifically modified for slate urinal stalls.

Urinal Stalls—(b) Furnish and install all urinals, and leave rigid and complete, with oiled finish except on water-flushed backs, in the locations shown and, in extent, to the number of stalls, or lengths indicated on plans, including all fittings, in accordance with the Pyramid descriptions. Those in the various rooms or other places to be as follows:

(c) In (men's lavatory in basement) all to be Type C, as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 12 and 13 in Chapter 6 of a Series on Structural Slate, issued April 20, 1921, by The Structural Slate Company, Pen Argyl, Pa.

(d) In (boy's toilet room in basement) all to be of Type CV, as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on same page of same Chapter.

(e) In (men's toilet room, first story), to be of Type A alternate, as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 4 and 5 of same Chapter.

(f) In (men's toilet room second story), to be of Type DV, as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 14 and 15 of same Chapter.

(g) All floor slabs and gutters shall be securely and solidly bedded in mortar composed of one volume of cement, one volume of lime and six volumes of sand on foundations furnished by other contractors.

(h) All joints shall be made and slabs secured in accordance with Pyramid Standard details. Joints shall be set with a full packing of glycerine and litharge or approved waterproof cement colored with lampblack.

(i) All water-flushed backs shall have the supply pipes (or fan-spreaders, if selected from Chapter 4 and specified) (or serrated edges of gutters, if type DV is specified) so adjusted that the flow of water will fully cover the backs.

Note: (j) If urinal floor slabs and gutters are set over wooden joists, provide under carpenter work how preparation shall be made for receiving concrete foundations. In any case provide under appropriate section of the specification for the construction of such foundations formed ready to require only the slatesetters mortar bed.

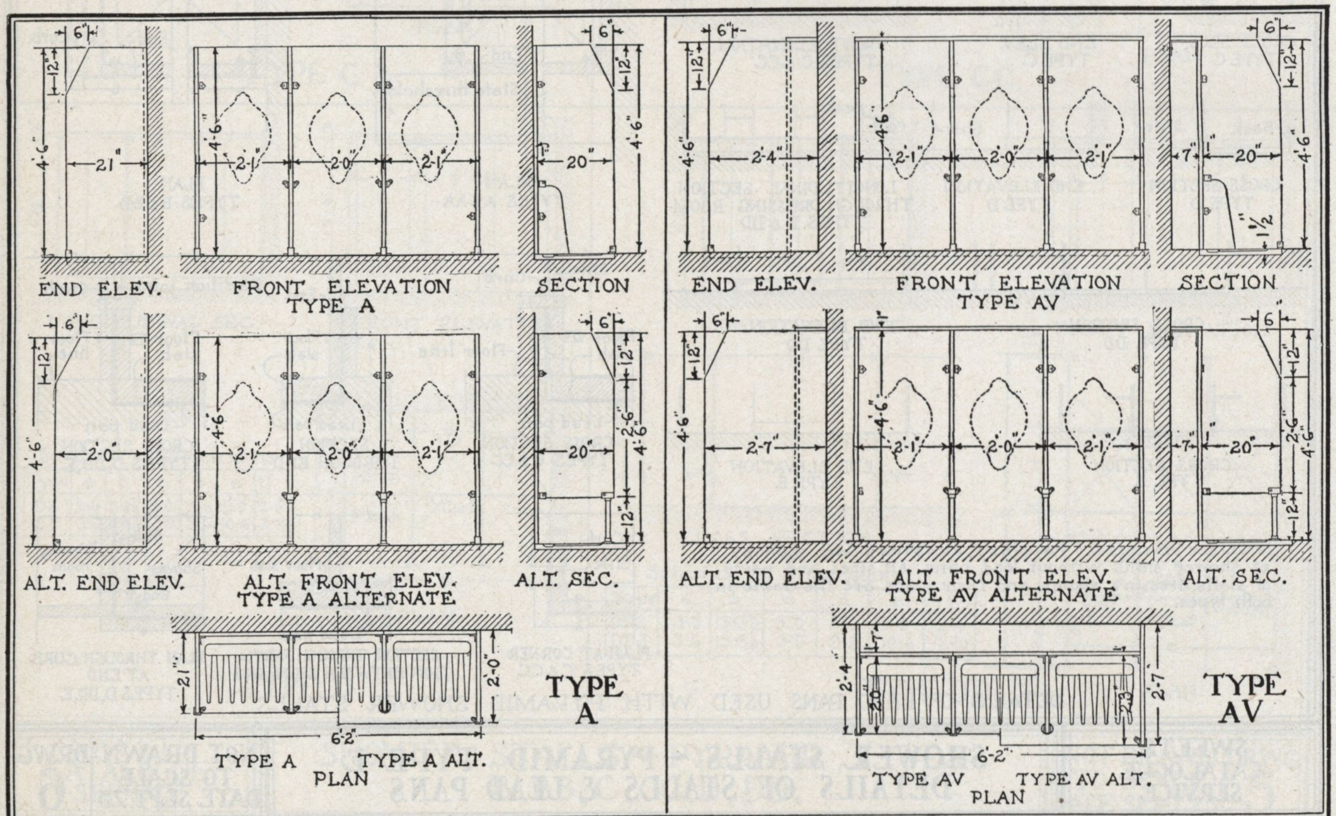
Note: (k) For all Types A and AV urinal stalls, specify that the desired kinds of bowls shall be furnished by the plumbing contractor and that all piping of every description for supplies, wastes, or any ventilating features shall be done by him as a part of the plumbing work.

Note: (l) For all Types B, BV, C, CV, and DV urinal stalls specify that the plumbing contractor shall connect to the supply and drainage fittings with which these urinals are equipped, furnishing and installing all such other supply and drainage requirements in accordance with the remainder of the specification, as are not regularly furnished with the urinals as described in connection with Pyramid Standards.

Note: (m) In the case of ventilated urinals, where the space back of same does not vent directly into vent stack at back below cover, specify that the slate end or cover shall be cut out to accomplish the result desired, and that the plumbing or heating contractor, as the case may be, shall furnish, cut out for and install any requisite piping, collars or connections to the vent stack.

(n) Where it is desired to use the Standard type of urinal, but of a size not included in this Chapter, the following form of paragraph is suggested:

(o) *(Same as paragraph (c) to end and add)* except that the size of urinal stalls shall be ....



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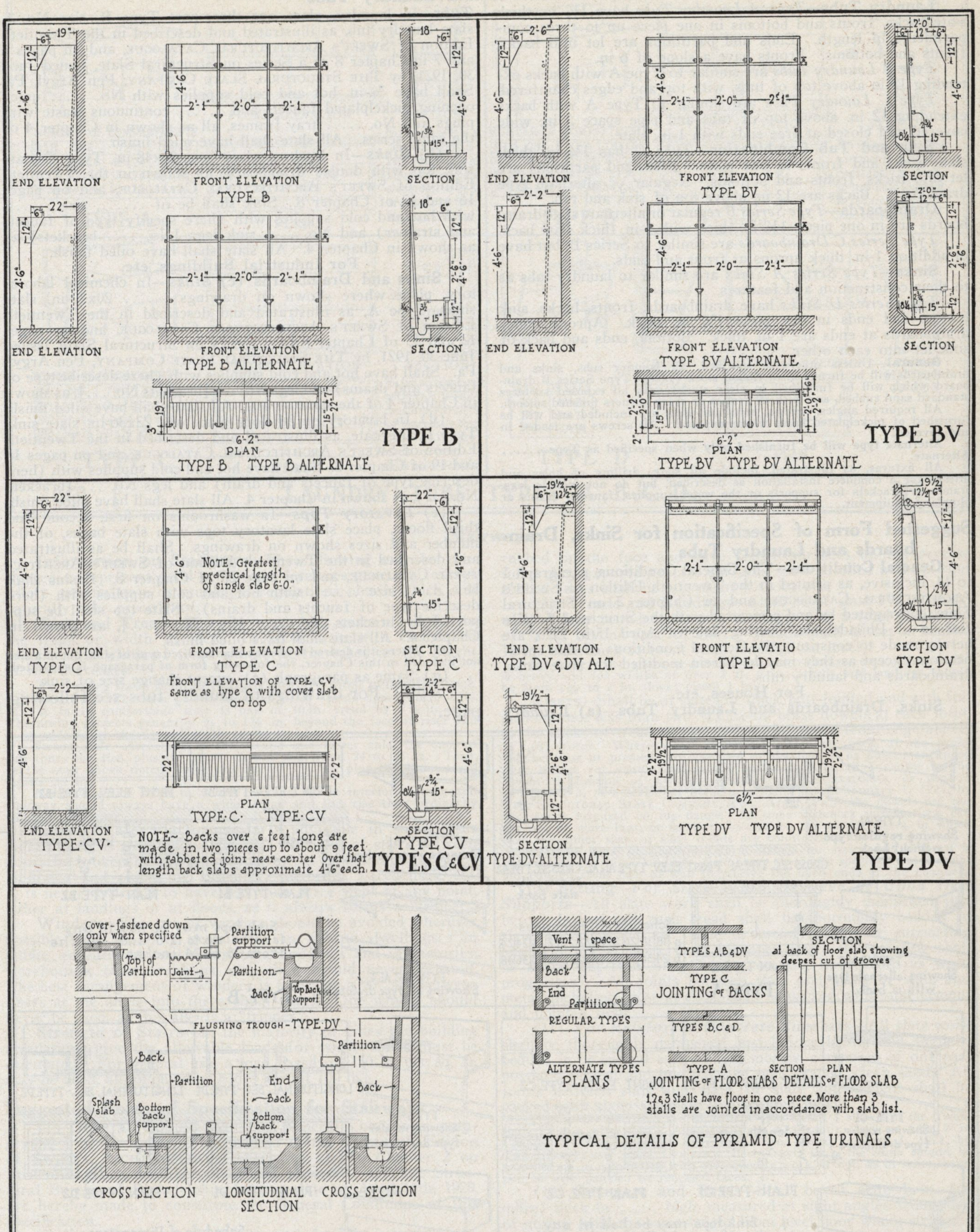

END ELEVATION
FRONT ELEVATION
SECTION
TYPE B
19"
6"
12"
4'-6"
2'-1"
2'-0"
2'-1"
18"
15"
3¾"
END ELEVATION
FRONT ELEVATION
SECTION
TYPE B ALTERNATE
22"
16"
6"
2'-6"
4'-6"
12"
15"
PLAN
TYPE B TYPE B ALTERNATE
6'-2"
2'-2"
15"
TYPE B
END ELEVATION
FRONT ELEVATION
SECTION
TYPE BV
2'-6"
2'-0"
12"
6"
2'-1"
2'-0"
2'-1"
4'-6"
8¼"
15"
3¾"
2'-2"
END ELEVATION
FRONT ELEVATION
SECTION
TYPE BV ALTERNATE
PLAN
TYPE BV TYPE BV ALTERNATE
6'-2"
TYPE BV
END ELEVATION
TYPE C
NOTE - Greatest practical length of single slab 6'-0"
FRONT ELEVATION
TYPE C
SECTION
TYPE C
22"
6"
12"
4'-6"
15"
2¾"
2'-2"
FRONT ELEVATION OF TYPE CV same as type C with cover slab on top
PLAN
TYPE C TYPE CV
END ELEVATION
TYPE CV
SECTION
TYPE CV
14"
8¼"
15"
2¾"
NOTE ~ Backs over 6 feet long are made in two pieces up to about 9 feet with rabbeted joint near center. Over that length back slabs approximate 4'-6" each.
TYPES C & CV
19½"
12½"
6"
12"
4'-6"
END ELEVATION
TYPE DV & DV ALT.
FRONT ELEVATIO
TYPE DV
SECTION
TYPE DV
2'-1"
2'-0"
2'-1"
8¼"
15"
2¼"
SECTION
TYPE DV ALTERNATE
2'-6"
PLAN
TYPE DV TYPE DV ALTERNATE
6½"
2'-2"
19½"
TYPE DV
Cover - fastened down only when specified
Partition support
Top of Partition
Joint
Partition
Back
Top Back Support
FLUSHING TROUGH - TYPE DV
Partition
Back
Partition
Splash slab
Bottom back support
End
Back
Bottom back support
Back
CROSS SECTION
LONGITUDINAL SECTION
CROSS SECTION
Vent space
Back
End
Partition
REGULAR TYPES
ALTERNATE TYPES
PLANS
TYPES A, B & DV
TYPE C
JOINTING OF BACKS
TYPES B, C & D
TYPE A
JOINTING OF FLOOR SLABS
SECTION at back of floor slab showing deepest cut of grooves
SECTION
PLAN
DETAILS OF FLOOR SLAB
1, 2 & 3 stalls have floor in one piece. More than 3 stalls are jointed in accordance with slab list.
TYPICAL DETAILS OF PYRAMID TYPE URINALS

SWEETS CATALOGUE SERVICE	URINAL STALLS ~ PYRAMID TYPES B, BV, C, CV, DV.	NOT DRAWN TO SCALE DATE SEPT '25	DRWG 8

Continued on next page

Sinks, Drainboards and Laundry Tubs

Laundry Tubs—*Type A Laundry Tubs* have 1¼ in. thick slate backs, fronts and bottoms in one piece up to three compartments in length. Ends and partitions are let into backs, fronts and bottoms. Fronts have a slope of 6 in.

Type B Laundry Tubs are similar to Type A with backs extending 12 in above top of tubs, with top and edges chamfered.

Type C Laundry Tubs are similar to Type A with backs extending 12 in. above top of tubs and pipe space 3 in. wide covered and closed at free ends with 1-in. slate.

Sink and Tub Combination—*Type D* has 1¼-in. thick slate backs and fronts in one piece. Ends and partitions are let into backs, fronts and bottoms. Regular or alternate type drainboard. Backs are 12 in. above top of sink and tub.

Drainboards—*Type Series B* regular or alternate slate drainboards are in one piece, 1¼ in. thick with 1-in. thick slate back.

Type Series C Drainboards are similar to Series B, but have in addition 1-in. thick aprons at front and ends.

Sinks—*Type Series A Sinks* are similar to laundry tubs as to their construction and features.

Type Series D Sinks have drainboards, fronts, backs, sink bottom and ends in one piece 1¼ in. thick. Aprons under drainboards at ends are 1 in. thick. Bottom, ends and back of sink let into each other.

General—Unless otherwise specified, all laundry tubs, sinks and drainboards will be furnished in ribbon stock (except Type Series B drainboard which will be furnished in clear stock) with all exposed surfaces standard sand rubbed, and with all arrises or sharp corners finished smooth.

All required angles, screws, bolts and nuts are included and will be furnished of nickelplated brass where exposed. All screws are leaded in and covered.

Alternate type will be furnished only when specified as Type ...... Alternate.

All fixtures, as illustrated, include all slate, drilling of holes and fittings for a complete installation as described, but do not include legs, frames or brackets for supports or the water supplies, faucets, drains or plumbing equipment.

Suggested Form of Specification for Sinks, Drainboards and Laundry Tubs

General Conditions—The General Conditions, paragraph 1 to 14, inclusive, as printed in the Twentieth Edition of Sweet's Architectural Catalogue, and in Chapter 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing date of April 15th, 1920, are hereby made to constitute the General Conditions of this specification, except as they may be herein modified for slate sinks, drainboards and laundry tubs.

For Houses, etc.

Sinks, Drainboards and Laundry Tubs—(a) ***Laundry Tubs***—In laundry, place one three-part Type B, size No. 1, slate laundry tub, as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 6 and 7 in Chapter 8 of a Series on Structural Slate, issued June 30, 1921, by The Structural Slate Company, Pen Argyl, Pa. Shall have ¾-in. hot and cold supplies with No. ..... quick opening nickelplated faucets and ...... continuous waste with plugs and No. ..... tray frames, all as shown in Chapter 4 of the same series. All slate shall have oiled finish.

(b) ***Sinks***—In kitchen, place one 24x48-in. Type C slate sink top with double drainboard, as shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 16 and 17 of Chapter 8. Sink shall be of ......, size ......, with hot and cold supplies with (here specify type of faucets and strainer) and No. .... sink legs [No. .... brackets] all as shown in Chapter 4. All slate shall have oiled finish.

For Industrial Buildings, etc.

Sinks and Drainboards (c) *Sinks*—In chemical laboratory, place where shown on drawings ...... 20x30-in. slate sinks, Type A, as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 12 and 13 of Chapter 8 of a Series on Structural Slate, issued June 30, 1921, by The Structural Slate Company, Pen Argyl, Pa. Shall have hot and cold supplies with (here describe type of faucets and drains) and legs No. ... [brackets No. ...], as shown in Chapter 4 of the same series. All slate shall have oiled finish.

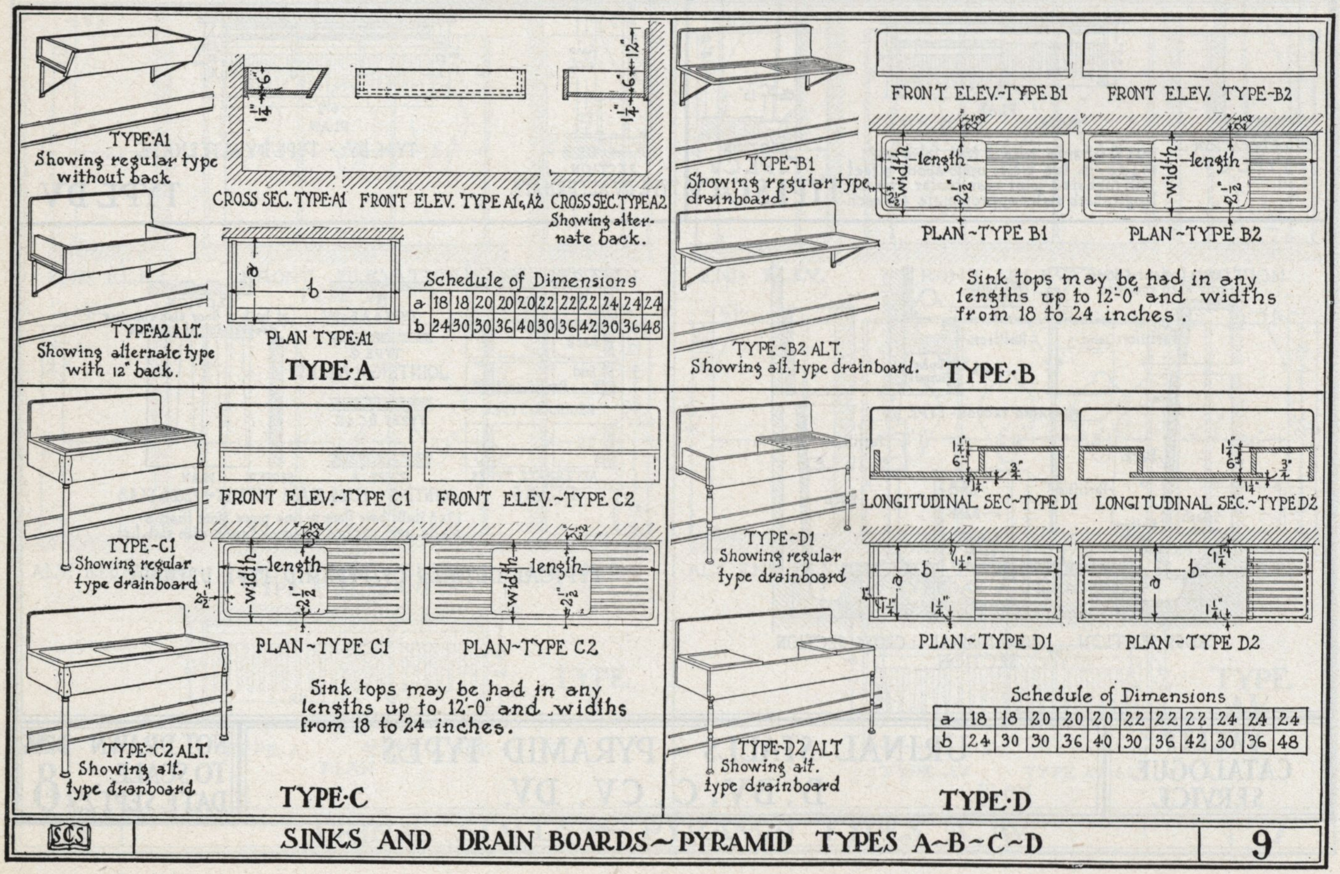
(d) In lavatory on 3d floor place one 22x36-in. slate sink, Type D alternate, as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on pages 18 and 19 of Chapter 8. Shall have hot and cold supplies with (here describe type of faucets and drain) and legs No. ... [brackets No. ...], as shown in Chapter 4. All slate shall have oiled finish.

(e) ***Lavatory Tops***—In washrooms on first, second and third floors, place slate lavatory tops with slate backs, of the number and sizes shown on drawings. Shall be as illustrated and described in the Twentieth Edition of Sweet's Architectural Catalogue, and on page 20 of Chapter 8. Basins shall be ......, size ......, with hot and cold supplies with (here describe type of faucets and drains). Slate top shall be supported by brackets No. .... [legs No. ....], as shown in Chapter 4. All slate shall have oiled finish.

(f) Where it is desired to use the Standardized type of sink, but of a size not included in this Chapter, the following form of paragraph is suggested.

(g) Same as paragraph (c), except change size of sink.

Note: For drawings of laundry tubs see following page.


TYPE-A1
Showing regular type without back
CROSS SEC. TYPE-A1
FRONT ELEV. TYPE A1 & A2
CROSS SEC. TYPE A2
Showing alternate back.
TYPE-A2 ALT.
Showing alternate type with 12" back.
PLAN TYPE-A1
a
b
TYPE·A
FRONT ELEV.-TYPE B1
FRONT ELEV. TYPE-B2
TYPE-B1
Showing regular type drainboard.
width
length
PLAN~TYPE B1
PLAN~TYPE B2
TYPE-B2 ALT.
Showing alt. type drainboard.
TYPE·B
FRONT ELEV.~TYPE C1
FRONT ELEV.~TYPE C2
TYPE~C1
Showing regular type drainboard
PLAN~TYPE C1
PLAN~TYPE C2
TYPE-C2 ALT.
Showing alt. type drainboard
TYPE·C
LONGITUDINAL SEC~TYPE D1
LONGITUDINAL SEC.~TYPE D2
TYPE-D1
Showing regular type drainboard
PLAN~TYPE D1
PLAN~TYPE D2
TYPE-D2 ALT
Showing alt. type drainboard
TYPE·D

Schedule of Dimensions

a	18	18	20	20	20	22	22	22	24	24	24
b	24	30	30	36	40	30	36	42	30	36	48

Sink tops may be had in any lengths up to 12'-0" and widths from 18 to 24 inches.

Sink tops may be had in any lengths up to 12'-0" and widths from 18 to 24 inches.

Schedule of Dimensions

a	18	18	20	20	20	22	22	22	24	24	24
b	24	30	30	36	40	30	36	42	30	36	48

SCS SINKS AND DRAIN BOARDS~PYRAMID TYPES A~B~C~D 9

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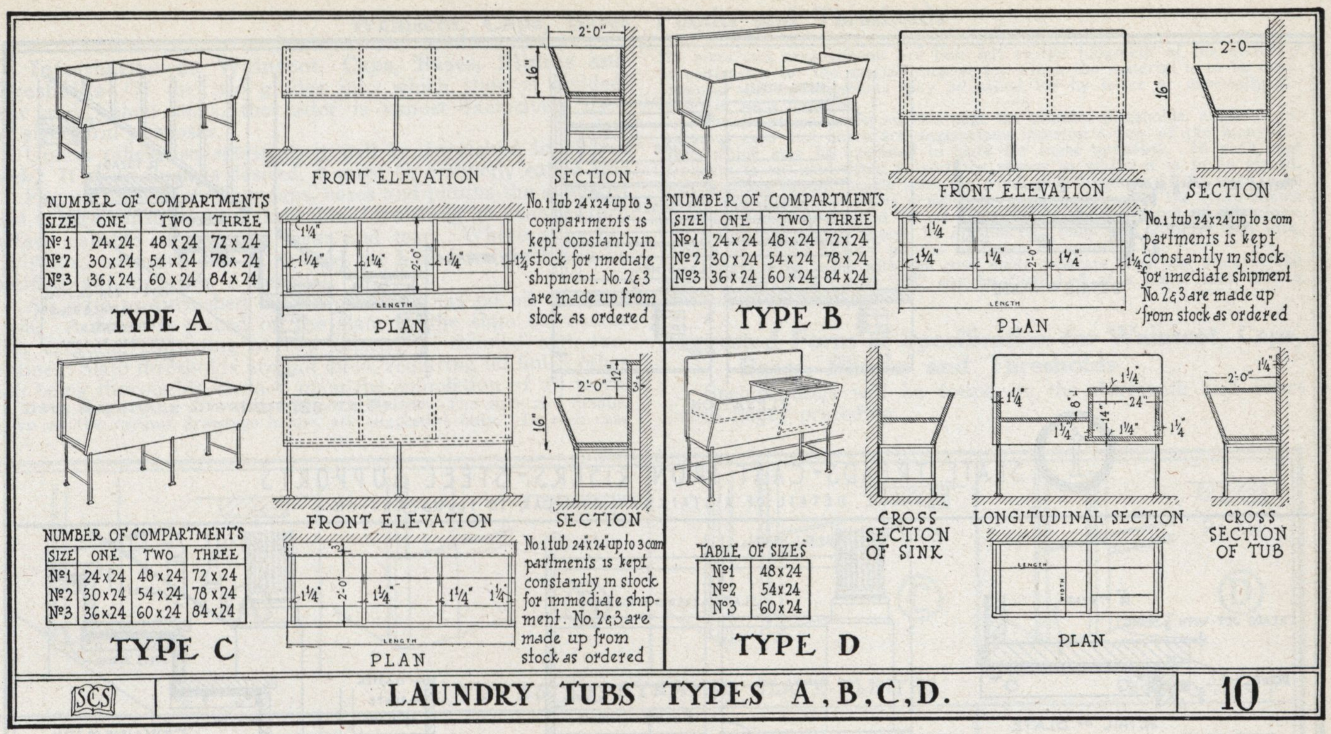


TYPE A — NUMBER OF COMPARTMENTS

SIZE	ONE	TWO	THREE
Nº1	24x24	48x24	72x24
Nº2	30x24	54x24	78x24
Nº3	36x24	60x24	84x24

No. 1 tub 24"x24" up to 3 compartments is kept constantly in stock for imediate shipment. No. 2 & 3 are made up from stock as ordered

TYPE B — NUMBER OF COMPARTMENTS

SIZE	ONE	TWO	THREE
Nº1	24x24	48x24	72x24
Nº2	30x24	54x24	78x24
Nº3	36x24	60x24	84x24

No. 1 tub 24"x24" up to 3 compartments is kept constantly in stock for imediate shipment No. 2 & 3 are made up from stock as ordered

TYPE C — NUMBER OF COMPARTMENTS

SIZE	ONE	TWO	THREE
Nº1	24x24	48x24	72x24
Nº2	30x24	54x24	78x24
Nº3	36x24	60x24	84x24

No. 1 tub 24"x24" up to 3 compartments is kept constantly in stock for immediate shipment. No. 2 & 3 are made up from stock as ordered

TYPE D — TABLE OF SIZES

Nº1	48x24
Nº2	54x24
Nº3	60x24

LAUNDRY TUBS TYPES A, B, C, D. 10

Stairways

Information on Stairways—The following may be considered to represent good practice in localities generally, except where specific state or municipal regulations obtain which will naturally take precedence.

Rise and Tread—The rise must bear certain relation to the tread or width of step. In accordance with established practice, the width of tread should be increased as the height of rise decreases.

Two rules have been developed and are most generally used.

First Rule—The sum of the tread and rise should approximate 17½ in. A fairly comfortable stair is one of 10-in. tread by 7½-in. rise. The nosing projects generally ¾ to 1¼ in. beyond the face of riser and is in addition to the figured width of the tread.

Second Rule—According to the second and better rule, the sum of two times the rise, plus the tread, should total from 24 to 26 in. Thus, in the stair above noted, twice the rise of 7½ in. plus the 10-in. tread equals 25 in.

Note: Exterior steps to public building or an interior monumental stairway should always have a wider tread and less rise than ordinarily would be the case.

Intermediate Platforms—It is advisable in some cases and in many is required by law, that the flight of stairs between floors be broken by the use of platforms or landings in public buildings and places of assembly, factories, warehouses, etc. It is never desirable to have less than three steps at any point, either at landings or at floors, as it always forms a "tripper."

Winders—The use of winders should be avoided wherever possible and are only permissible in private dwellings. In public, educational, and amusement buildings and in factories, warehouses, office buildings, etc., they should never be used. The best arrangement of winders is to divide a 90° arc between risers at the angle into three equal parts. One winder should never be used, as this also is a "tripper."

Strength of Stairs—In the majority of cities the building regulations give the allowable loads for which stairs must be calculated. For general use, a load based on 150 lb. per sq. ft. may be used, although some codes permit 100 lb.

Suggested Form of Specification for Stairways

(1) **General Conditions**—The General Conditions, paragraphs 1 to 14, inclusive, as printed in the Twentieth Edition of Sweet's Architectural Catalogue, and in Chapter 2 on Structural Slate, copyrighted by and registered with the Structural Bureau of Philadelphia, bearing date of April 15th, 1920, are hereby made to constitute the General Conditions of this specification.

(2) *Note:* Each portion of the slate work for stairs is specially mentioned in the following specification, in order that the portions not applicable in any particular instance need only be eliminated.

(3) **Materials and Work Included**—Furnish and install complete on the (metal, concrete, or other) structural supports supplied by other contractors, the slate work in connection with all steps or stairways indicated on the drawings and in accordance with this specification.

(4) **Finish**—All pieces of slate shall be standard sand rubbed on the face and have planed surfaces on the reverse side. Any exposed reverse surfaces shall be oiled and all sand rubbed faces shall be left clean without oil.

(5) **Treads and Landings**—Shall be of slate 1¼ in. thick, with slightly rounded edges to nosings, with a total projection of ¾ in. beyond face of riser. Treads shall be set to incline ⅛ in. from back to front (and landings set level).

(6) *Note:* For stairs in hotels, theaters, subways, etc., where traffic is heavy and for widths of over 3 ft. 6 in., treads and landings should be from 1½ to 2 in. thick; risers 1 in.

Risers—Shall be of slate 1 in. thick, butt-jointed, and with full packing, not less than two ¼x1¼-in. brass dowels at each joint, to the backs of treads below and to the under front edge above.

(8) *Notes:* Where metal risers for stairs are used, if the same, whether cast or pressed, are specified or detailed to be angled or lipped near bottom for slate tread to slip under (see Detail I shown in the Twentieth Edition of Sweet's Architectural Catalogue, or page 6 in Chapter 3, of a series on Structural Slate, issued January 1, 1921, by The Structural Slate Company, Pen. Argyl, Pa.), the dowels are not necessarily required on top flange. In some instances specifications call for two or more lugs, or spuds to be cast on the top of risers, in which case the under sizes of slate treads are countersunk to fit over same.

(9) The metal channels will form strings for stairs, but if metal is not continued around landings, slate bases should be specified and brought out enough from face of wall to receive the open ends of the channels.

(10) **Setting**—***For Slate Work Between or Upon Iron Supports***—All slate work shall be thoroughly dampened just before laying and each tread shall be thoroughly bedded in slater's cement on all (slate or metal) risers or supporting angles or metal work (and for open stairs this jointing shall be neatly cut back or pointed from the underneath as work progresses). All joints between slate and slate, or slate and metal, including those at ends, shall be packed with same cement and pointed tight.

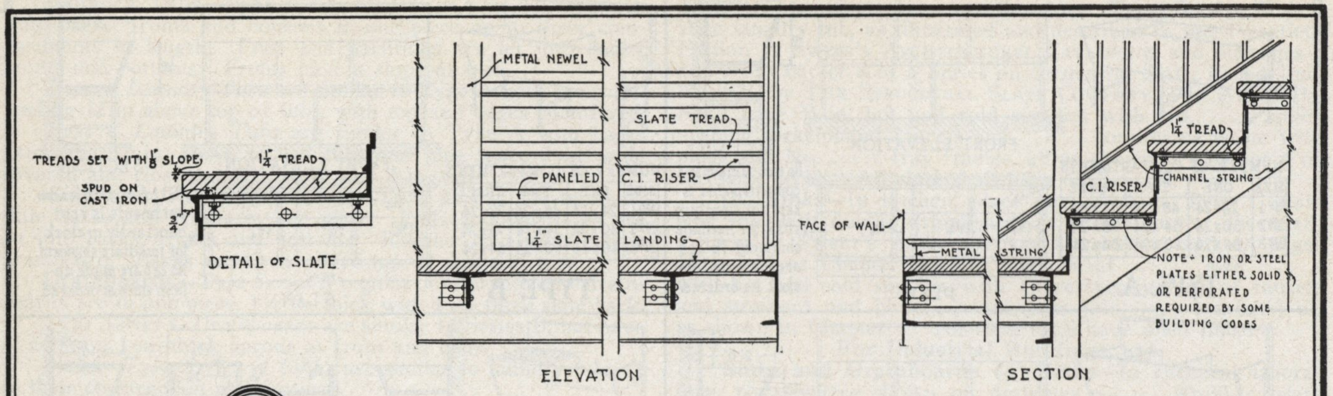
(11) ***For Reinforced Concrete Supports***—All slate work shall be thoroughly dampened just before laying and shall be bedded in or backed with cement mortar, composed of one part portland cement and two parts of well graded, clean sand. All joints between slate and slate, or slate and cement shall be packed with slater's cement and pointed flush.

(12) *Note:* If risers are of cement (see Detail 3 shown in the Twentieth Edition of Sweet's Architectural Catalogue, and on page 7 in Chapter 3, of a series on Structural Slate, issued January 1, 1921, by The Structural Slate Company, Pen Argyl, Pa.), the same should be troweled on in connection with the concrete work, if not, as in some cases, poured with paneled or recessed faces.

(13) **Stringers and Bases**—Shall be of slate 1 in. (or more) thick by ..... high, measured at right angles from edge of nosing (and the same height from level floor where stringers are continued around landings at floor levels or between same). All strings [bases] shall be rounded [moulded] at top with returns cut on the solid at any openings (and, where moulded, cut with solid returns on all interior and exterior angles).

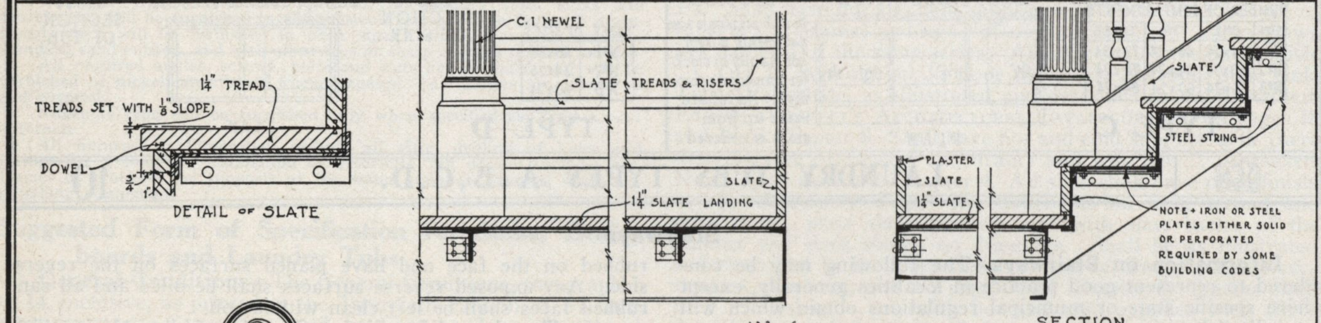
(14) **For Floors, Bases, Plinths, Thresholds and Wainscoting**—See specification in the Twentieth Edition of Sweet's Architectural Catalogue and in Chapter 2, pages 9 and 10.

Continued on next page


TREADS SET WITH 1/8" SLOPE
1¼" TREAD
SPUD ON CAST IRON
¾"
DETAIL OF SLATE
METAL NEWEL
SLATE TREAD
PANELED C.I. RISER
1¼" SLATE LANDING
ELEVATION
1¼" TREAD
CHANNEL STRING
C.I. RISER
FACE OF WALL
METAL STRING
NOTE - IRON OR STEEL PLATES EITHER SOLID OR PERFORATED REQUIRED BY SOME BUILDING CODES
SECTION

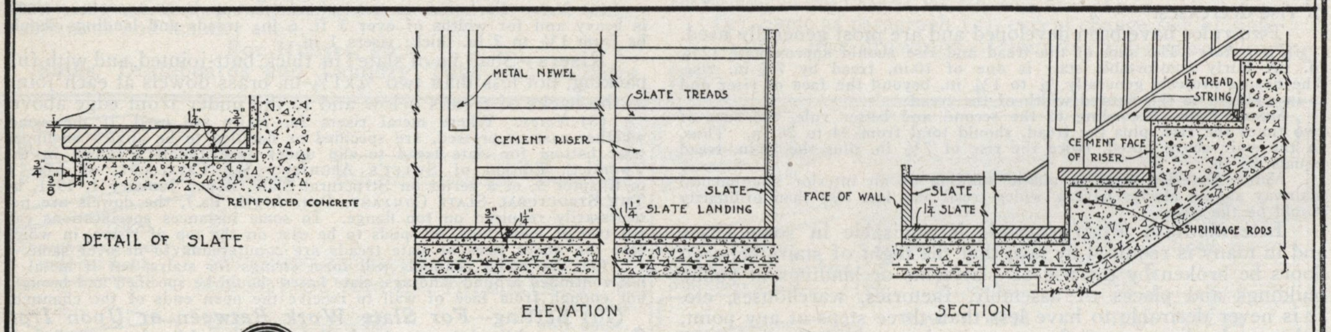
① SLATE TREADS-CAST IRON RISERS-STEEL SUPPORTS

TYPICAL DETAIL OF A STAIRWAY SIMILAR TO ILLUSTRATION


1¼" TREAD
TREADS SET WITH 1/8" SLOPE
DOWEL
DETAIL OF SLATE
C.I. NEWEL
SLATE TREADS & RISERS
SLATE
1¼" SLATE LANDING
SCALE IN INCHES
ELEVATION
SLATE
STEEL STRING
PLASTER
SLATE
1¼" SLATE
NOTE - IRON OR STEEL PLATES EITHER SOLID OR PERFORATED REQUIRED BY SOME BUILDING CODES
SECTION

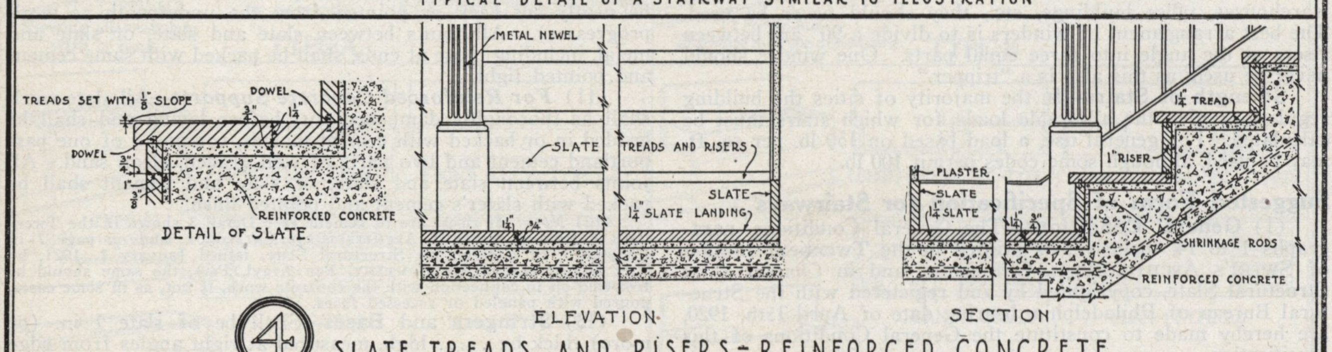
② SLATE TREADS AND RISERS-STEEL SUPPORTS

TYPICAL DETAIL OF A STAIRWAY SIMILAR TO ILLUSTRATION


1¼"
REINFORCED CONCRETE
DETAIL OF SLATE
METAL NEWEL
SLATE TREADS
CEMENT RISER
SLATE
1¼" SLATE LANDING
ELEVATION
1¼" TREAD
STRING
CEMENT FACE OF RISER
FACE OF WALL
SLATE
1¼" SLATE
SHRINKAGE RODS
SECTION

③ SLATE TREADS-CEMENT RISERS-REINFORCED CONCRETE

TYPICAL DETAIL OF A STAIRWAY SIMILAR TO ILLUSTRATION


TREADS SET WITH 1/8" SLOPE
DOWEL
1¼"
DOWEL
REINFORCED CONCRETE
DETAIL OF SLATE
METAL NEWEL
SLATE TREADS AND RISERS
SLATE
1¼" SLATE LANDING
ELEVATION
1¼" TREAD
1" RISER
PLASTER
SLATE
1¼" SLATE
SHRINKAGE RODS
REINFORCED CONCRETE
SECTION

④ SLATE TREADS AND RISERS-REINFORCED CONCRETE

TYPICAL DETAIL OF A STAIRWAY SIMILAR TO ILLUSTRATION

SCS

DETAILS OF SLATE STAIRS

11

Continued on next page

Wainscot, Caps, Bases, Plinths and Thresholds

Information on Wainscot, Caps, Bases, Plinths and Thresholds—Of the two grades into which slate is divided, clear and ribbon stock, the latter is almost exclusively used for structural purposes.

Unless otherwise specified, it will be furnished in ribbon stock. If clear stock is desired, it must be distinctly called for.

For use in wainscoting, caps, bases and plinths the standard sand rubbed finish in most desirable, furnishing an even texture surface capable of resisting wear and tear. Where a particularly fine, smooth finish is desired the honed finish should be specified, although this is unusual.

All slate as furnished by the producer has no oil or other finish. A finish is placed on the slate by the slate contractor after erection, consisting of raw linseed oil thinned with turpentine. Slate thresholds are not oiled, requiring no finish other than being thoroughly cleaned upon the completion of all work.

Data Regarding Drawings Shown Below—The sizes and details, shown on the various drawings below, are suggestive only. In each case the sizes and arrangement are best left to the judgment of the architect or contractor for the special purpose for which the material is to be used. Designs and arrangements may be called for by letter or especially detailed in each instance.

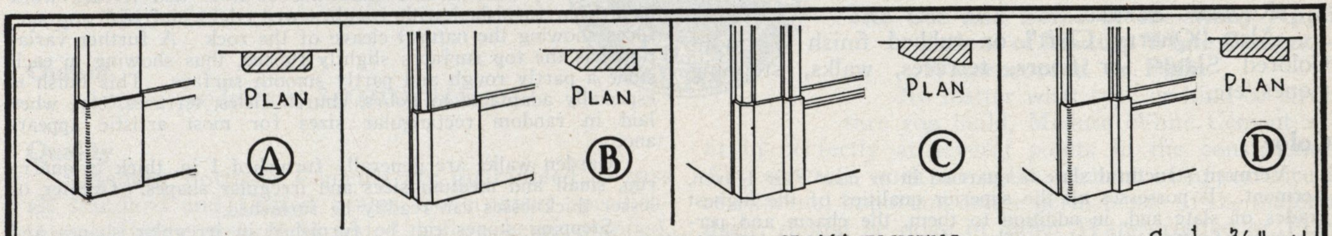
The drawings shown on this page for plinths, thresholds, angle coves, wainscot caps and bases are suggestions showing a few of the many designs which may be executed in slate for these purposes. In each case the slate is cut and fitted to suit the spaces in which it is to be placed. Specifications should clearly state the width and thickness of the slate to be used. The design should be detailed or, if desired, one of the types shown may be selected and called for as described in the suggested specifications.

Note: Thresholds should be of sufficient length to properly butt into, receive or return against plinths or finish of openings.

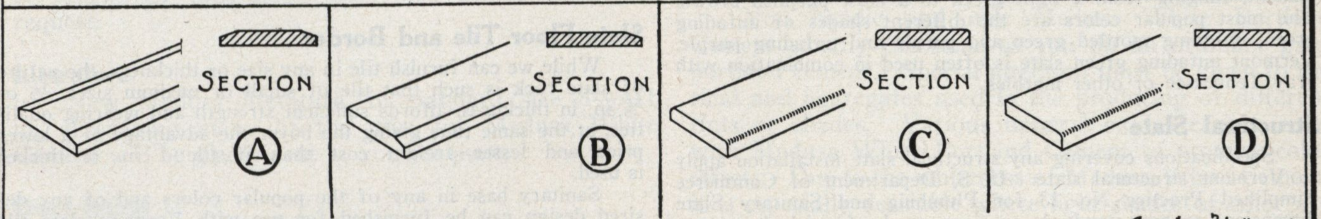
Note: Cove bases with the cove made separate from the body of the base, as shown in detail "B," can be furnished at a lesser cost than a solid one-piece coved base.

Suggested Form of Specification for Wainscot, Caps, Bases, Plinths and Thresholds

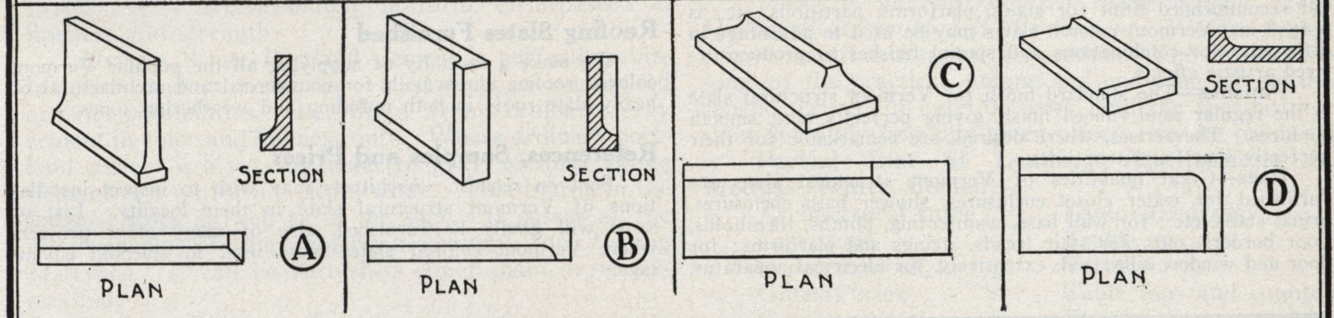
Specifications will be found on the thirteenth and fourteenth pages preceding.



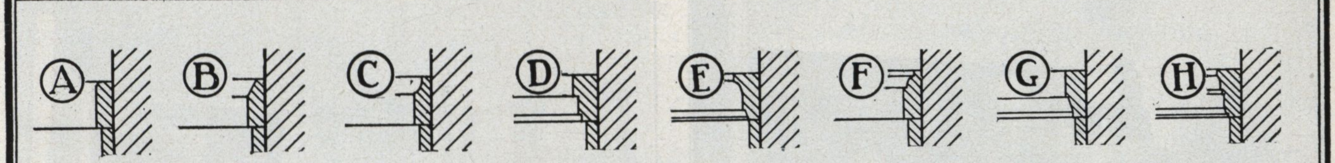
TYPES OF PYRAMID SLATE PLINTHS Scale 3/4" = 1'



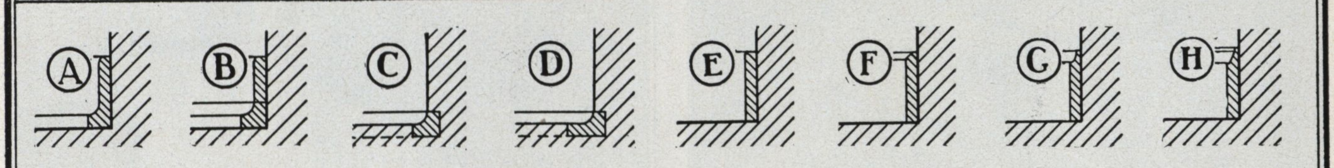
TYPES OF PYRAMID SLATE THRESHOLDS Scale 3/4" = 1'



TYPES OF INTERIOR AND EXTERIOR ANGLE COVES Scale 3/4" = 1'



TYPES OF PYRAMID WAINSCOT CAPS Scale 3/4" = 1'



TYPES OF PYRAMID BASES Scale 3/4" = 1'

SCS PLINTHS, THRESHOLDS. WAINSCOT CAPS & BASES. 12

VERMONT STRUCTURAL SLATE CO.

FAIR HAVEN, VT.

BOSTON REPRESENTATIVE, E. A. BULLARD, 746 Tremont Building

PHILADELPHIA REPRESENTATIVE, WILLIAM MOORE CO., 1516 Sansom Street

NEW YORK REPRESENTATIVE, KIRKLAND & FRANCIS, 103 Park Avenue

CHICAGO REPRESENTATIVE, SLATE & FLAGSTONE CO., 1825 Central Street, Evanston, Ill.

ATLANTA REPRESENTATIVE, ROBERT MCKNIGHT PARDEE, 101 Marietta Street

Products

VERMONT UNFADING GREEN STRUCTURAL SLATE.

VERMONT UNFADING MOTTLED GREEN and PURPLE STRUCTURAL SLATE.

VERMONT UNFADING PURPLE STRUCTURAL SLATE.

GARDEN FLAGGING OF STEPPING STONES.

ROOFING SLATES.

Also "Quarry Cleft" or rubbed finish Vermont Colored Slates for floors, terraces, walks, stepping stones, etc.

Color

Vermont structural slate is quarried in or near Fair Haven, Vermont. It possesses all the superior qualities of the highest grades of slate and, in addition to them, the charm and permanency of attractive color. The colors are distinct and permanent, ranging from a light green to a dark purplish brown. The most popular colors are the different shades of unfading green, unfading mottled green and purple and unfading purple. Vermont unfading green slate is often used in combination with gray Tennessee or other marbles.

Structural Slate

Specifications covering any structural slate installation apply to Vermont structural slate. U. S. Department of Commerce Simplified Practice No. 13 for Plumbing and Sanitary Slate dimensions or any standards or sizes can be furnished up to 6 ft. wide by 8 ft. long. Up to 12-ft. treads have been furnished, but recommended limit for stairs, platforms, partitions, etc., is 6 ft. 3 in. Vermont colored slates may be used to advantage in different color combinations and special finishes to produce desired artistic effects.

Finishes—The standard finish for Vermont structural slate is the regular sand rubbed finish, giving perfectly true, smooth surfaces. The arrises, where desired, are remarkable for their perfectly sharp and true lines.

Uses—Great quantities of Vermont structural slate are furnished for water closet enclosures, shower bath enclosures, urinal stalls, etc.; for wall base, wainscoting, plinths, thresholds, floor borders, etc.; for stair treads, strings and platforms; for door and window sills; and, extensively, for electrical apparatus.

Slate Floors, Terraces, Walks and Rough Wainscot

The development of this branch of our business for the past two years has been phenomenal. To meet the increasing demand for such uses of Vermont colored slates we have installed special equipment and are prepared to furnish architects in this line, any effect desired. A large stock insures prompt deliveries.

Recently considerable quantities of floor and terrace work have been furnished with rough sawed edges and with top surfaces showing the natural cleave of the rock. A further variation has the top surfaces slightly rubbed, thus showing in each stone a partly rough and partly smooth surface. This finish is especially adaptable to floors, church aisles, terraces, etc., when laid in random rectangular sizes for most artistic appearance.

Garden walks are generally furnished 1 in. thick in quarry run, small and medium sizes and irregular shapes. Greater or lesser thicknesses can readily be furnished.

Stepping stones can be furnished in irregular shapes and sizes or in rectangular shapes with rough trimmed edges.

Slate Floor Tile and Border

While we can furnish tile in any size or thickness, the nature of slate rock is such that tile of small or medium sizes, ½ or ⅝ in. in thickness, affords sufficient strength and wearing qualities, at the same time giving the buyer the advantage of a lower price and lesser freight cost than if tile 1 in. or thicker is used.

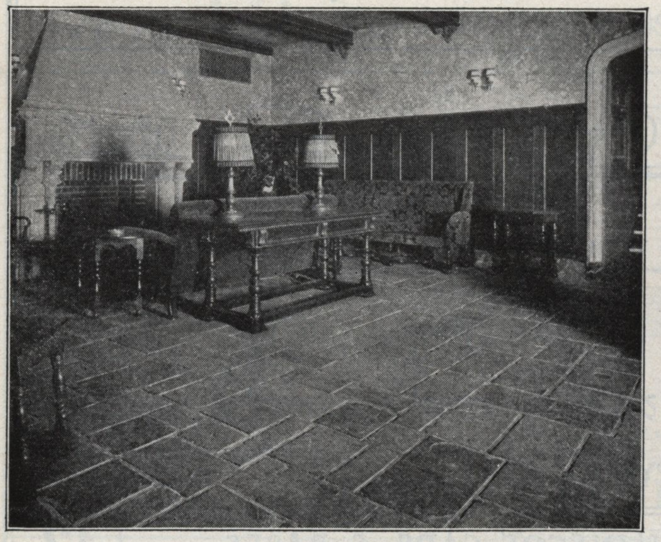
Sanitary base in any of the popular colors and of any desired design can be furnished for use with Vermont slate tile floors.

Roofing Slates Furnished

We make a specialty of supplying all the popular Vermont colored roofing slates both for commercial and architectural or heavy slate roofs in both unfading and weathering tones.

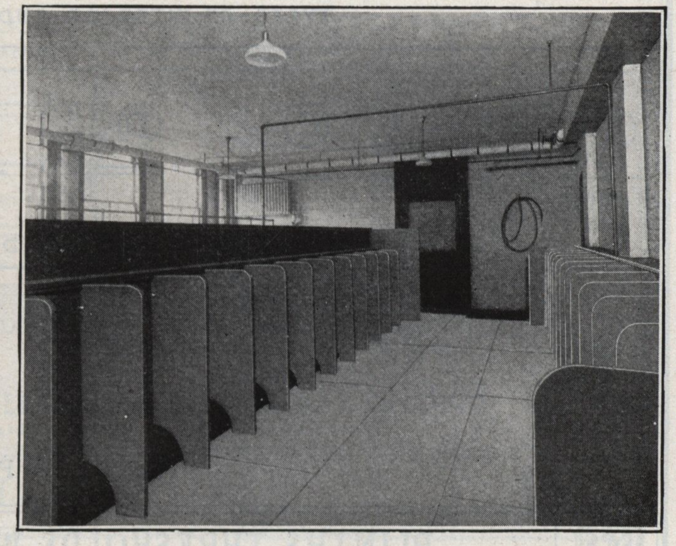
References, Samples and Prices

Sent on request. Architects may wish to inspect installations of Vermont structural slate in their locality. List of same will gladly be furnished, also of many other projects where Vermont colored slates were used to splendid advantage.



Natural Cleft Random Rectangular Pattern Slate Floors

Suitable for residences, hotel and theater lounges



Urinal Stall Installation, Vermont Green Slate, Howard Street School, Springfield, Mass.

THE SANDUSKY CEMENT COMPANY

Manufacturers of Medusa Portland Cements

CLEVELAND, OHIO
BRANCH OFFICES
NEW YORK, N. Y., 350 Madison Avenue TOLEDO, OHIO, 1004 Second National Bank Building DIXON, ILL., 34 Dixon National Bank Building
FACTORIES
BAY BRIDGE, OHIO SILICA, OHIO DIXON, ILL. YORK, PA.

Products

MEDUSA PORTLAND CEMENTS: Medusa Gray and Medusa White Portland Cements; Medusa Waterproofed Gray and Medusa Waterproofed White Portland Cements.

For Medusa Waterproofing, see pages 118-121; for Medusa Cement Paint, see pages 1716-1717.

Output

Annual production, 3,000,000 bbls.

Quality

Medusa Portland Cements are guaranteed to pass all standard and United States Government specifications. Every carload is tested before being shipped. A record of laboratory tests will be furnished on request.

Literature

New Medusa literature, in standard size 8½x11 in., describing many of the uses for Medusa White Cement will be gladly sent at your request.

Description

Medusa Portland Cements attain high strength rapidly; they are absolutely uniform, unsurpassed in fineness and strength.

Medusa White Portland Cement is perfectly white in color and non-staining; a product of unlimited artistic possibilities. It differs from ordinary gray cement in color and fineness only. Where ordinary portland cement is a varying shade of gray, Medusa White Cement is a uniformly clean, white. This is true in the finished work as well as in the sack. It passes all the requirements of the American Society for Testing Materials. It can be furnished either plain or waterproofed.

Medusa Waterproofed Cements are our regular gray and white brands, waterproofed with our celebrated Medusa Waterproofing (see our pages in Waterproofing Section), and ready for use.

The presence of the waterproofing makes the mass dense and compact, and renders stucco, concrete or cast stone waterproof, dampproof and impervious. It also reduces the tendency to form shrinkage cracks.

The Use and Some of the Many Applications of Medusa White Cement—Waterproofed or Plain

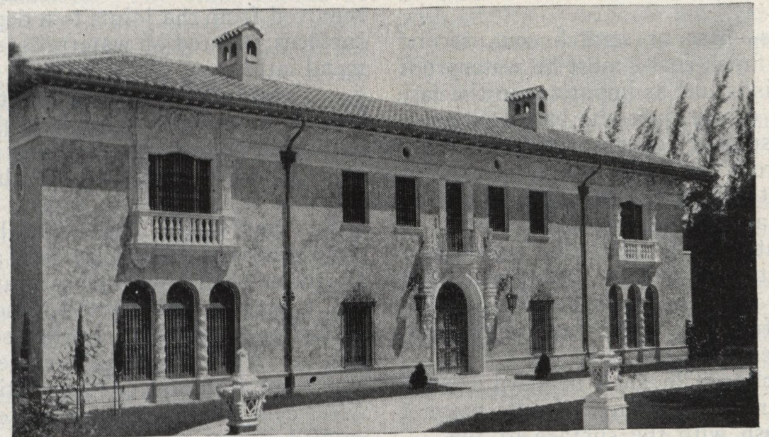
No matter what type or kind of structure you build, Medusa White Cement will fit in perfectly at several points in the construction. Any concrete work when the element of appearance is as vital and important as the permanence of the material itself, should be done in either Waterproofed or Plain Medusa White Cement.

You handle and mix Medusa White Portland Cement exactly the same as you do an ordinary gray portland cement. Special attention must be given to the sand and aggregates used in the producing of different tints or shades. Various mineral oxides can be used with Medusa White Portland Cement to produce color effects. Due to the whiteness of Medusa White Cement, it is especially desirable where light shades of color are required.

There is no waterproofed white cement except Medusa Waterproofed White Cement. We are the exclusive manufacturers of this product. The details show some of the practical, unique and enduring effects that can be secured in exterior work, and the specifications show definitely how any given effects may be produced.

Partial List of Leading Applications for Medusa White Cement—

Architectural stone
Cast stone
Concrete block facing
Cement brick
Cement mantels
Floor tile
Lawn furniture
Ornamental cement work
Lamp standards
Traffic markers
Terrazzo tile
Table tops and counters
Stucco
Mortar
Swimming pools
Shower baths



A Remarkable Illustration of the Possibilities in Architectural Embellishment of Precast Work Using Medusa White Cement, on the Estate of John Bindley, Cocoanut Grove, Fla.

KIEHNEL & ELLIOTT of Pittsburgh and Miami, Architects
All of the ornamentation shown was done under the able execution of JOHN B. ORR of Miami

Continued on next page

Materials Required for Stucco and Cement Mixtures

Amounts of Cement and Sand Required for Stucco Work—The areas covered by 1 bbl. of cement, as given below, are calculated for an average sand and without allowance for waste. In estimating, allowance must be made for waste. Openings are not deducted. When figuring for stucco, the loss of mortar, forming the keys behind the lath for the first coat, should be taken into account.

AREA COVERED BY 1 BBL. CEMENT IN VARIOUS MIXES

Mixture parts by volume		Thickness of mortar coat				
		¼ in.	⅜ in.	½ in.	¾ in.	1 in.
Cement	Sand	Area covered, sq. ft.				
1	1½	336	226	168	112	84
1	2	404	270	202	135	101
1	2½	472	314	236	157	118
1	3	542	362	271	181	136

AREA COVERED BY 1 CU. YD. SAND IN VARIOUS MIXES

Mixture parts by volume		Thickness of mortar coat				
		¼ in.	⅜ in.	½ in.	¾ in.	1 in.
Cement	Sand	Area covered, sq. ft.				
1	1½	1508	1006	754	503	377
1	2	1364	910	682	455	341
1	2½	1282	855	641	427	321
1	3	1222	815	611	407	306

It is not necessary to allow for waste where the stucco is applied to a paper backed wire fabric, simalar to the National Steel Fabric, or E-Cod Fabric.

AREA OF WALL SURFACE COVERED PER SACK OF CEMENT, FOR DIFFERENT PROPORTIONS AND VARYING THICKNESS OF PLASTERING

Proportions of mixture	Materials				Total thickness of plaster				
	Sacks cement	Cu. ft. sand	Medusa wpfg., lb.	Hair* lb.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.
					Area covered, sq. ft.				
1:1	1	1	2	1	33.0	22.0	16.5	13.2	11.0
1:1½	1	1½	2	1	42.0	28.0	21.0	16.0	14.0
1:2	1	2	2	1	50.4	33.6	25.2	20.1	16.8
1:2½	1	2½	2	1	59.4	39.6	29.7	23.7	19.8
1:3	1	3	2	1	67.8	45.2	33.9	27.1	21.6

Note: These figures are based on average conditions and may vary 10% either way, according to the quality of the sand used. No allowance is made for waste.

*Used in scratch coat only.

MATERIALS REQUIRED FOR 100 SQ. FT. OF SURFACE FOR VARYING THICKNESS OF PLASTER AND FLOOR TOPPING

Proportions	1:1			1:2			1:2½			1:3		
Thickness, in.	Cmt., sacks	Sand, cu. yd.	Med. wpfg., lb.	Cmt., sacks	Sand, cu. yd.	Med. wpfg., lb.	Cmt., sacks	Sand, cu. yd.	Med. wpfg., lb.	Cmt., sacks	Sand, cu. yd.	Med. wpfg., lb.
⅜	2.2	0.08	4.4	1.5	0.11	3.0	1.3	0.12	2.6	1.1	0.13	2.2
½	3.0	0.11	6.0	2.0	0.15	4.0	1.7	0.16	3.4	1.5	0.17	3.0
¾	4.5	0.16	9.0	2.9	0.22	5.8	2.5	0.23	5.0	2.2	0.25	4.4
1	6.0	0.22	12.0	3.9	0.29	7.8	3.3	0.31	6.6	3.0	0.33	6.0
1¼	7.5	0.27	15.0	4.9	0.36	9.8	4.2	0.39	8.4	3.7	0.41	7.4
1½	9.0	0.33	18.0	5.9	0.43	11.8	5.1	0.47	10.2	4.5	0.50	9.0
1¾	10.5	0.39	21.0	6.9	0.50	13.8	6.0	0.56	12.0	5.4	0.60	10.8
2	12.0	0.45	24.0	7.9	0.58	15.8	6.9	0.64	13.8	6.2	0.69	12.4

Hair is used in the scratch coat only in amount of 1 lb. to 1 sack of cement.

These figures may vary 10% in either direction due to the character of the sand.

No allowance is made for waste.

CEMENT PLASTER OR CEMENT MORTAR
(With Ordinary Coarse Bank Sand)

Do not use leaner mixes than 1:2½ sand where waterproof plaster or mortar is required, or 1:3 for stucco.

Quantities of material required per 100 sq. ft., based on cement weighing 94 lb. to the cu. ft.

Proportions	1 cement		1 sand		1 cement		1½ sand	
Thick in.	½	1	1½	2	½	1	1½	2
Packed cement bbl.	.75	1.51	2.26	3.01	.60	1.20	1.79	2.39
Loose sand cu. ft.	3.00	6.00	9.01	12.01	3.59	7.17	10.76	14.34
Medusa waterproofing, lb.	6	12	18	24	5	10	14	19

Proportions	1 cement		2 sand		1 cement		2½ sand	
Thick in.	½	1	1½	2	½	1	1½	2
Packed cement bbl.	.50	.99	1.49	1.98	.42	.85	1.27	1.69
Loose sand cu. ft.	3.96	7.92	11.88	15.84	4.21	8.42	12.63	16.84
Medusa waterproofing, lb.	4	8	12	16	3½	7	10	13½

Proportions	1 cement		3 sand		
Thick in.	½	1	1½	2	Medusa waterproofing is used in proportion of 2% of weight of cement—equal to 2 lb. waterproofing to a sack, or 8 lb. to the barrel of cement.
Packed cement bbl.	.37	.74	1.11	1.48	
Loose sand cu. ft.	4.42	8.84	13.26	17.68	
Medusa waterproofing, lb.	3	6	9	12	

Use of Medusa Waterproofed Portland Cement for Stucco Work

Important Precautions Which Can Not Be Overestimated—The following fundamental rules must be considered in the production of good stucco:

a—Use a good rigid background which will not shrink, warp, bend or deteriorate with time.

b—Use proper proportions and carefully selected sand and aggregates of correct fineness.

c—If an absorbent base, such as hollow tile, concrete block or brick is used, the surface must be sprinkled with water to the point of saturation before applying fresh stucco.

d—All stucco coats—base or scratch coat, second or brown coat, third or finish coat—must be waterproof and non-absorbent. This is just as important in the case of the base coat as any other, since the base coat must not possess sufficient "suction" or absorptive tendency to take up the water from the fresh cement plaster or stucco coat applied to it before the cement has had an opportunity to hydrate, and the coat to set.

e—Each stucco coat must be sprinkled with water before applying the next coat; and the finish coat must be kept evenly moist by sprinkling. In hot weather the work must be shielded from the direct rays of the sun, and protected at all times from the wind.

Hollow Tile Blocks—Tile shall be hard burned with dovetail or heavy ragged scoring. Joints are not to be raked, but cut flush with the surface of tile.

Surface of tile shall be brushed free from all dirt, dust and loose particles, and prior to application of stucco, shall be wet to saturation to prevent suction and absorption.

New Brickwork—Brick shall be rough hard burned brick, set with ⅜" joints. Joints to be raked out ½" from face of brick. Surface of brick shall be brushed free from all dirt, dust and loose particles, and prior to application of stucco shall be wet to complete saturation.

Old Brickwork—Old brick walls which are to be overcoated shall have all loose, friable or soft mortar removed from the joints to a depth of at least ½" Brick surfaces, painted or waterproofed, shall be covered with metal lath.

Extremely soft brick must be covered with metal lath or fine poultry wire securely fastened by means of expansion bolts or plugs driven into joints of brickwork.

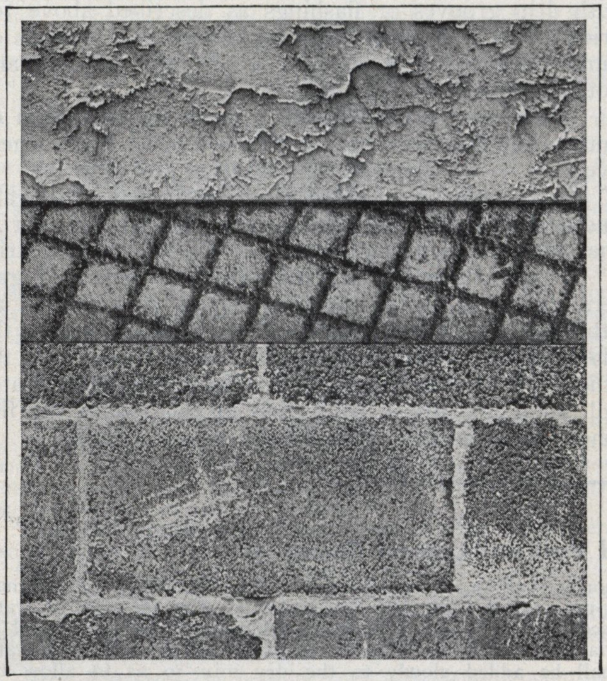
Concrete Blocks—Shall be rough and coarse, but not friable, and set in cement mortar, with joints cut flush. Surface of blocks shall be brushed free from all dirt,, dust and loose particles, and prior to application of stucco, shall be wet to saturation.

Concrete Surfaces—Concrete surfaces shall be hacked or roughened by drills, so as to provide bond for stucco. After hacking, surface shall be washed down with a solution of 1 part muriatic acid to 10 parts water. After acid solution has exhausted itself, surface is to be washed down, to remove any remaining acid. Wire-brush surface so as to remove all loose pieces of concrete.

Continued on next page

Prior to application of stucco, wet the wall thoroughly so as to prevent absorption of water from stucco, and apply a good creamy cement grout an hour before applying stucco.

Metal Lath Where Sheathing Is Used—Sheathing boards should not be less than 6″ nor more than 8″ wide, dressed on one or both sides to a uniform thickness of $\frac{13}{16}$″; laid horizontally across wall studs and fastened with not less than two 8d nails at each stud.



Portland Cement Stucco on Concrete Block

The perfect bond obtained between stucco and base makes concrete block an ideal backing for stucco. Where the wall has been laid up with few irregularities, two-course work may be used, as shown here, providing the first coat is doubled. In all other cases three-course work is recommended

Over sheathing boards should be laid in horizontal layers, beginning at the bottom, a substantial paper well impregnated with tar or asphalt. The bottom strip should be laid over the baseboard at the bottom of the wall, and each strip should lap the flashings at all openings.

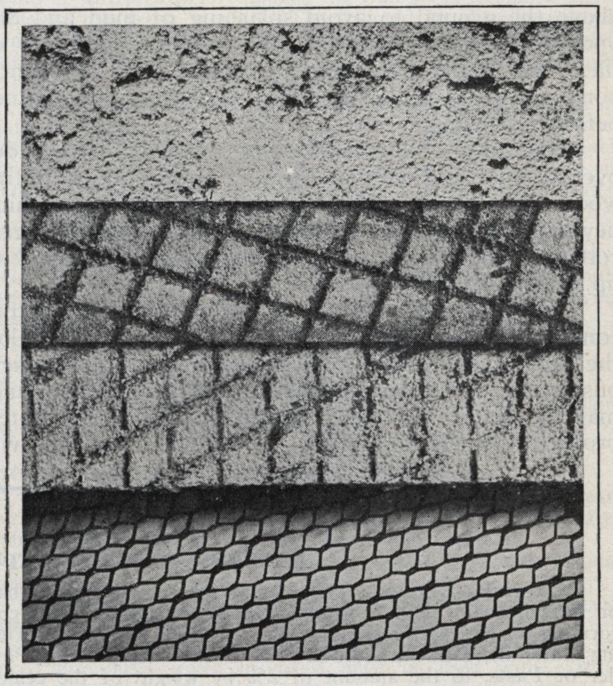
Metal Lath Where No Sheathing Is Used—*Framing*—Studs spaced not to exceed 16″ on centers should be run from foundation to rafters without any intervening horizontal members. The studs should be tied together just below the floor joists with 1″x6″ boards which should be let into the studs on their inner side, so as to be flush, and securely nailed to them. These boards will also act as sills for floor joists, which should be securely spiked to the side of studs.

Bracing—Corners of each wall should be braced diagonally with 1″x6″ boards let into studs on inner side, securely nailed to them.

In backplastered construction in which sheathing is omitted, at least once midway in each story height, the studs should be braced horizontally with 2″x3″ bridging set 1″ back of the face of the studs. This assumes that the studs are 2″x4″. Larger sizes require larger bridging.

Insulation—The air space in backplastered walls may be divided by applying building paper, quilting, felt, or other suitable insulating material between the studs, fastening it to the studs and bridging by nailing wood strips over the folded edges of the material. This insulation should be so fastened as to leave about 1″ air space between it and stucco. Keep insulating material clear of stucco; make tight joints against the framing.

Metal Furring with or without Sheathing—½″, No. 22 gage crimped furring strips, 16″ on centers, should be fastened direct to the sheathing (or studding), using 1¼″, No. 14 gage staples placed 12″ apart.



Portland Cement Stucco on Metal Lath

Each coat of stucco should be heavily scored to provide a good bonding surface for the succeeding coat. No coat should be applied until the preceding one has thoroughly cured

Expanded Metal or Wire Lath with or Without Sheathing—Expanded metal, or wire mesh, galvanized or painted, weighing at least 3.4 lbs. per sq. yd.

Metal lath should be placed horizontally, drawn tight, and attached with 1¼″ No. 14 gage staples, or 6d nails driven to a penetration of at least ⅞″ and bent to engage at least one rib, not over 8″ on centers.

Lath should not be lapped more than 1″ horizontally and tied with No. 18 gage black tie wire at least once between studs. Vertical laps should not be more than 1″ and should occur at studs. Lapped ends fastened with staples or 6d nails not over 4″ on centers.

Corners—The sheets of metal lath shall be folded around the corners for at least 3″ but not more than 4″ and well stapled down.

Corner bead is not recommended, but a strip of diamond mesh expanded metal, No. 24 gage, formed to a 6″ angle may be used.

Backplastering—No Sheathing—Should be applied directly following the completion of the brown coat. The keys of the scratch coat should first be thoroughly dampened, and the backing coat well troweled on to insure filling spaces between keys and thoroughly covering back of lath. The backing coat should provide a total thickness of plaster back of lath of ⅝″ or ¾″.

Design—Whenever the design of the structure permits, an overhanging roof or similar projection is recommended to afford protection to the stucco. It is well for the architect to prevent concentration of water flow getting at the stucco at all, so as to avoid

Continued on next page

staining of the finish. Stuccoed copings, cornices and other exposed horizontal surfaces should shed water quickly, and whenever departure from the vertical is necessary (at water tables, belt courses, etc.) the greatest possible slope should be obtained.

Stucco should not be run to the ground—but should have a water table or belt course which is high enough above the ground to avoid splashing of mud and dirt upon the finished surface. The backing should be of tile, brick, stone, or concrete, providing good mechanical bond for the stucco, and must be thoroughly cleaned before plastering.

Flashing—Suitable flashing should be provided over all door and window openings wherever projecting wood trim occurs. Wall copings, cornices, rails, chimney caps, etc., should be built of concrete, stone, terra cotta, or metal, with ample overhanging drip groove or lip, and watertight joints.

If copings are set in blocks with mortar joints, continuous flashing should extend across the wall below the coping and project beyond and form an inconspicuous lip over the upper edge of the stucco—or the copings may be set in mortar composed of Medusa Waterproofed Cement and sand. Continuous flashing with similar projecting lip should be provided under brick sills. This flashing should be so installed as to insure absolute protection against interior leakage.

Cornices set with mortar joint should be provided with flashing over the top—or set in mortar composed of Medusa Waterproofed Cement and sand. Sills should project well from the face of the stucco and be provided with drip grooves or flashings as described above for brick sills. Sills should also be provided with stools or jamb seats to insure wash of water over the face and not over the ends.

Special attention should be given to the design of gutters and down-spouts at returns of porch roofs where overflow would result in discoloration and cracking. A 2" strip should be provided at the intersection of walls and sloping roofs, and flashing extended up and over it, the stucco being brought down to the top of the strip.

Preparation of Original Surface—All roof gutters should be fixed, and down-spout hangers and all other fixed supports should be put in place, before the plastering is done, in order to avoid breaks in the stucco. All trim should be placed in such manner that it will show its proper projection in relation to the finished stucco surface, particularly in overcoating.

Specifications for Waterproofed Portland Cement Stucco

Materials—*Cement*—The cement for the first coat (base or scratch coat) shall be standard gray portland cement conforming to the Specifications of the American Society for Testing Materials, with the addition of Medusa Waterproofing Powder or Paste, to the amount of 2% by weight of the cement used (2 lbs. to the sack of cement).

The cement for the second or brown coat, and the third or finish coat, shall be Medusa Waterproofed White Portland Cement.

Fine Aggregate—Fine aggregate shall consist of sand, screenings from crushed stone, or crushed pebbles, evenly graded from fine to coarse, passing when dry a No. 8 screen. Fine aggregates should preferably be of silicious materials, clean, coarse and free from loam, vegetable or other deleterious matter.

Hydrated Lime—Hydrated lime shall meet the requirements of the standard specifications for hydrated lime of the American Society for Testing Materials, being used to add plasticity to the mixture.

Coloring Matter—Only permanent, mineral oxides and limeproof colors shall be used. Finish coat containing colors shall be applied as dry as possible to prevent separation of the colors. (The use of Medusa Waterproofed Cement will prevent the gradual washing out of a color surface).

Water—Water shall be clean, free from oil, acid, strong alkali or vegetable matter.

Preparation of Mortar—***Mixing***—The ingredients of the mortar shall be mixed until thoroughly distributed and the mass is uniform in color and homogeneous. The quantity of water necessary for the desired consistency should be determined by trial, and thereafter measured in proper proportion. The water shall be added slowly to the dry mix so as to allow the aggregates to absorb as much as possible in the course of mixing.

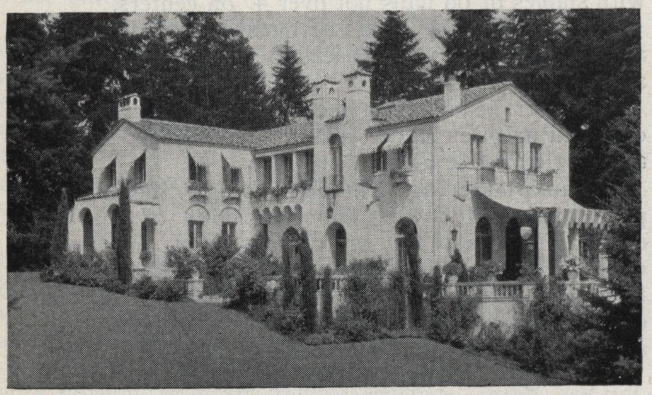
Machine Mixing—The mortar shall preferably be mixed in a suitable mortar-mixing machine of the rotating drum type. The period of machine mixing shall be not less than 5 minutes after all the ingredients are introduced into the mixer.

Hand Mixing—The mixing shall be done in a watertight mortar box, and the ingredients shall be mixed dry until the mass is uniform in color and homogeneous. The proper amount of water shall then be added and the mixing continued until the consistency is uniform.

Measuring Proportions—Methods of measurement of the proportions of water shall be used which will secure separate uniform measurements at all times. All proportions stated shall be by volume. A bag of cement (94 lbs. net) may be assumed to contain 1 cu. ft.; 40 lbs. may be assumed as the weight of 1 cu. ft. of hydrated lime. Hydrated lime shall be measured dry, and shall *not* be measured nor added to the mortar in the form of putty.

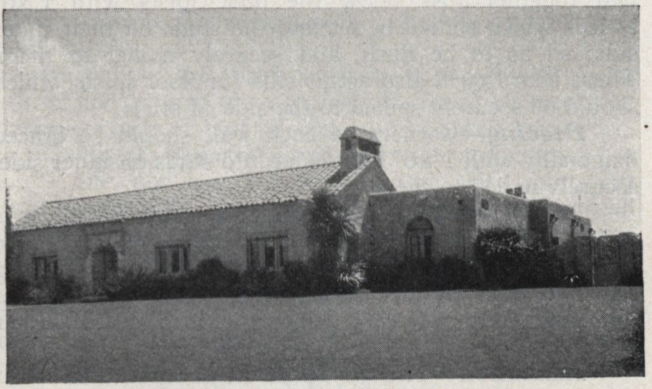
Retempering—Mortar which has begun to stiffen or take its initial set shall not be used.

Consistency—Only sufficient water shall be used to produce



Residence of J. L. Carmen, Gravelly Lake, Near Tacoma, Wash.

Kirtland Cutter, Spokane, Architect
Stucco applied by Fred Stabbert, Tacoma
Medusa White Cement stucco on hollow tile



Halliday Residence, Santa Monica, Cal.

Mr. Pierpont, Architect
Exterior finish of California Stucco Products Company Cement Stucco in which Medusa White Cement was used

Continued on next page

a good workable consistency. The less water in the mix, the better the quality of the mortar, within working limits.

Mortar Coats—***Mortar***—All coats shall contain not less than 3 cu. ft. of fine aggregate to 1 sack of portland cement.

Application—The plastering shall be applied with a steel trowel and carried on continually in one general direction without allowing the plaster to dry at the edge. If it is impossible to work the full width of the wall at one time, the joining shall be at some natural division of the surface, such as a window or door. The first coat shall thoroughly cover the base on which it is applied and shall be troweled enough to insure the best obtainable bond. Before the coat has set it shall be heavily cross-scratched with a saw-toothed metal paddle or other suitable device to provide a strong mechanical key.

The first coat shall be thoroughly wet down before the second coat is applied. The second coat shall be applied, whenever possible, on the day following the application of the scratch coat, and shall be brought to a true and even surface by screeding at intervals not exceeding 5′ 0″, and by constant use of a straight-edge. When the second coat has stiffened sufficiently, it shall be floated with a wood float and lightly and evenly cross-scratched to form a good mechanical bond for the finish coat. The day following the application of the second coat, and for not less than 3 days thereafter, the stucco must be thoroughly sprayed at frequent intervals and kept from drying out. The finish coat shall be applied not less than a week after the application of the second coat. Methods of application will hereinafter be described under "Finish."

Drying Out—*The finish coat must not be permitted to dry out rapidly and adequate precaution must be taken to make this certain by sprinkling frequently after the mortar is set hard enough to permit it, or by hanging wet burlap or similar material over the surface, during hot weather.*

Freezing—Stucco should not be applied when the temperature is below 32° Fahr., nor under any conditions such that ice or frost may form on the surface of the wall.

Finish—***Stippled***—The finishing coat should be troweled smooth with a metal trowel with as little rubbing as possible, and then should be lightly patted with a brush of broom straw to give an even, stippled surface.

Sand Floated—The finishing coat, after being brought to a smooth, even surface, should be rubbed with a circular motion of a wood float with the addition of a little sand to slightly roughen the surface. This floating should be done when the mortar has partly hardened.

Sand Sprayed—After the finishing coat has been brought to an even surface, it should be sprayed by means of a wide, long fiber brush (a whisk broom does very well) dipped into a creamy mixture of 1 part of cement to 3 parts sand, mixed fresh at least every 30 minutes and kept well stirred. This coating should be thrown forcibly against the surface to be finished. This treatment should be applied while the finishing coat is still moist and before it has attained its early hardening; that is, within 3 to 5 hours.

Rough Cast or Spatter Dash—After the finishing coat has been brought to a smooth, even surface with a wooden float, and before finally hardened, it should be uniformly coated with a mixture of 1 sack of cement to 3 cu. ft. of fine aggregate thrown forcibly against it to produce a rough surface of uniform texture when viewed from a distance of 20 ft. Special care should be taken to prevent the rapid drying out of this finish by thorough wetting down at intervals after stucco has hardened sufficiently to prevent injury.

Applied Aggregate—After the finishing coat has been brought to a smooth, even surface, and before it has begun to harden, clean round pebbles or other material as selected, not smaller than ¼″ or larger than ½″ and previously wetted, should be thrown forcibly against the wall so as to embed themselves in the fresh mortar. They should be distributed uniformly over the mortar and tamped to an even surface with broad wood float or board. No rubbing of the surface should be done after the pebbles are embedded.

Exposed Aggregate—The finishing coat should contain an approved, selected coarse sand, crushed marble, granite or other special material, in the proportion given for finishing coats, and within 24 hours after being applied and troweled to an even surface should be scrubbed with a stiff brush and water. In case the stucco is too hard, a solution of 1 part hydrochloric (muriatic) acid in 4 parts of water by volume can be used in place of plain water. After the aggregate particles have been uniformly exposed by scrubbing, particular care should be taken to remove all traces of the acid by thoroughly spraying with water from a hose.

Stains—Dirt may be readily washed off Medusa Waterproofed White Portland Cement stucco by using a brush and Sapolio, or other cleaning compound.

Mortar Colors—Should not be used to color portland cement stucco, use only mineral oxides.

Specifications for "Dry-Dash" Stucco

Clean the surface by scrubbing with a solution of 1 part muriatic acid in 10 parts water, and rinse well with water from a hose as soon as the acid has stopped foaming.

Then wet and apply a creamy mixture of cement and water.

Each coat must be sprinkled with water before the next coat is applied.

The methods of application and general specifications for stucco previously given in detail must be used with careful attention to all precautions.

First Coat or Scratch Coat—One part gray portland cement; 3 parts clean, screened, sharp sand; 2 lbs. of Medusa Waterproofing Powder or Paste for each bag of portland cement. Scratch or roughen surface with stiff brush or broom before material reaches initial set.

Second Coat or Brown Coat—A second or brown coat may be employed as described under the general stucco specifications, but is not in all cases essential.

Dash Coat or Finish Coat—⅜-in. body. 1 part Medusa Waterproofed White Portland Cement; 1 part clean white sand; 1 part rough asbestos sand. If Medusa Plain White Portland Cement is used instead of Medusa Waterproofed White Cement, add 2 lbs. of Medusa Waterproofing per bag of white portland cement.

Note: Since the percentage of asbestos fiber contained in the asbestos sand is to some extent variable, it is advisable to experiment with a small panel to determine the efficiency of the asbestos sand.

Apply the aggregates by throwing them on forcibly as soon as possible after applying the finish coat.

Use of Medusa White Waterproofed Portland Cement for Stainless Mortar

The setting and backing up of marble and stone work, and the laying of face brickwork requires a mortar that will not discolor the face of the stone.

Medusa Stainless White Cement contains only a trace of iron. Due to this purity of composition it will not streak or stain the finest of building materials. It is used extensively from coast to coast, on the finest of buildings for this purpose.

Specifications for Waterproofed Non-staining Portland Cement Mortar

For setting, backing and pointing marble and stone work.

Non-staining Waterproofed Cement—Cement shall be Medusa Waterproofed White (Non-staining) Portland Cement, manufactured by THE SANDUSKY CEMENT COMPANY, Cleveland; or other approved white (non-staining) portland cement conforming with the requirements of the American Society for Testing Materials, and guaranteed by the manufacturer to contain 20% or more of water-repellents, ground in with the cement during process of manufacture at the mill.

Waterproofing mixed with a non-staining cement by hand or machine, at the job or elsewhere, will not be permitted to be used.

Sand—Sand shall be clean river, lake or bank sand, light in color and evenly graded from fine to coarse, all passing through a ⅛″-mesh sieve, with voids not in excess of 35% by water after thoroughly drying.

Crushed Marble for Pointing—Crushed white marble for pointing mortar shall be equal to Conlin Marble Company's, Tuckahoe, N. Y., size 20 to 30.

Measuring—Assuming that 1 bag of portland cement measures 1 cu. ft., other aggregates are to be measured accordingly by the use of a bottomless box that holds 1 cu. ft. *The measuring of sand or other material with a shovel will not be permitted.*

Water—Water in all cases shall be added slowly and only sufficient water used to reach a stiff, workable consistency.

Continued on next page

Setting Mortar—Mortar for the setting and backing of marble and stone work shall consist of:

1 part Medusa Waterproofed White Portland Cement.
⅕ part hydrated lime, by volume.
3 parts sand.

Pointing Mortar—Mortar for pointing of marble shall consist of:

1 part Medusa Waterproofed White Portland Cement.
⅕ part hydrated lime, by volume.
2½ parts white crushed marble.

Setting of Marble or Stone—All marble or stone work shall be sufficiently embedded and backplastered in the mortar to form one continuous coating. Special attention must be given to all belt courses, copings and other exposed surfaces.

Specifications for Impervious White Portland Cement Mortar for Laying Face Brick

Note: The object of using Medusa Waterproofed Cement is to overcome discoloration, dampness and efflorescence.

Non-staining Waterproofed Cement—Cement shall be Medusa Waterproofed White (Non-staining) Portland Cement, manufactured by The Sandusky Cement Company, Cleveland; or other approved white (non-staining) portland cement conforming with the requirements of the American Society for Testing Materials, and guaranteed by the manufacturers to contain 20% or more of water-repellents, ground in with the cement during process of manufacture at the mill.

Waterproofing mixed with a non-staining cement by hand or machine at the job or elsewhere, will not be permitted to be used.

Sand—Sand shall be clean river, lake or bank sand, light in color and evenly graded from fine to coarse, all passing through a ⅛"-mesh sieve, with voids not in excess of 35% by water after thoroughly drying.

Water—Water in all cases shall be added slowly and only sufficient water used to reach a stiff, workable consistency.

Measuring—Assuming that 1 bag of portland cement contains 1 cu. ft., other aggregates are to be measured accordingly by the use of a bottomless box that holds 1 cu. ft. *The measuring of sand or other material with a shovel or other implement that has no positive dimensions will not be allowed.*

Setting Mortar—Mortar for laying face brick shall consist of:

1 part Medusa Waterproofed White Portland Cement.
⅕ part hydrated lime, by volume.
3 parts sand.

Joints—Should a joint exceeding ⅝" be desired, the necessary amount of coarse grit may be added to the above mortar.

Mixing—When mortar is hand mixed, dampen the sand to a damp earth consistency, add Medusa Waterproofed Cement and hydrated lime, and mix as usual. When sand, Medusa Waterproofed Cement and lime are uniformly mixed add only enough water to secure proper consistency.

When a batch mortar mixing machine is used, dampen the sand and put into the mixer with the Medusa Waterproofed Cement and hydrated lime; allow mixer to run until cement, sand and lime are uniformly mixed. Then add only enough water to secure proper consistency.

Specifications for Impervious White Portland Cement Mortar for Laying Exterior Common Brick Walls

Notes: The object of using Medusa Waterproofing Powder or Paste is to prevent efflorescence, dampness and discoloration of the face brick or the exterior face of the brick wall.

See our pages in Waterproofing Section describing Medusa Waterproofing, Powder and Paste, Nos. 118-121.

Cement—All cement shall be an approved brand of white (non-staining) portland cement conforming with the requirements of the American Society for Testing Materials.

Sand—All sand shall be clean bank sand, light in color and evenly graded from fine to coarse, all passing through an ⅛"-mesh sieve, with voids not in excess of 35% by water after thoroughly drying.

Waterproofing Powder (or Paste)—All waterproofing shall be Medusa Waterproofing Powder (or Paste) mixed according to the directions of the manufacturers or their representatives.

Water—Water in all cases must be added slowly and only sufficient water used to reach a stiff, workable consistency.

Note: If Medusa Waterproofing Paste is to be used the above Water clause should be omitted.

Measuring—Assuming that 1 bag of cement contains 1 cu. ft., other aggregates are to be measured accordingly by the use of a bottomless box that holds 1 cu. ft. *The measuring of sand or other material with a shovel or other implement that has no positive dimensions will not be allowed.*

Setting Mortar—Mortar for laying exterior brick walls shall consist of:

1 part approved portland cement.
⅕ part hydrated lime, by volume.
3 parts sand.

(A) Medusa Waterproofing Powder shall be used in quantity equal to 2% by weight of the cement (8 lbs. to the barrel) thoroughly mixed with the dry cement, then in turn with the sand. All according to the directions of the manufacturers or their representatives.

Note: If Medusa Waterproofing Paste is used instead of powder, the following clause (B) should be used in place of clause (A).

(B) Medusa Waterproofing Paste shall be used as follows: 1 gal. (8 lbs.) of Medusa Paste shall be added to 20 gals. of water. This is sufficient to gauge 1 barrel of cement. All according to the directions of the manufacturers or their representatives.

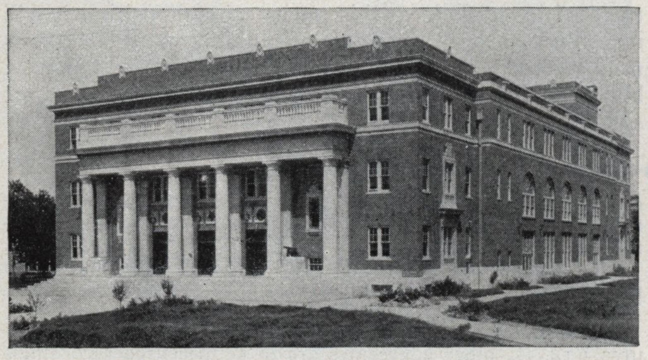
Note: If Medusa Waterproofing Paste is to be used the above Water clause should be omitted.

Architectural Stone Made with Medusa Stainless White Portland Cement (Plain or Waterproofed)

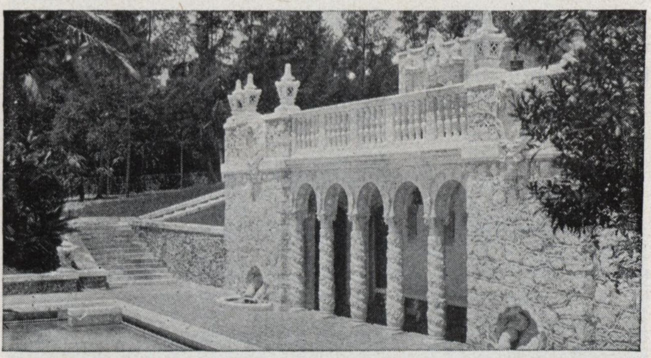
No better grade of cement can be employed as the principal ingredient in the manufacture of artificial architectural stone, such as cut cast stone and cast stone both plain, moulded and ornamental, than Medusa Stainless White Portland Cement (Plain or Waterproofed) especially due to its whiteness, which is permanent; its stainless qualities; and when Medusa Waterproofed White Portland Cement is used, the manufactured product becomes impervious to water and moisture.

Special attention must be given to the aggregates used to produce different results. This information we will gladly furnish at your request.

The illustrations shown below indicate some of the good work that has been wrought by skilled craftsmen, using Medusa Stainless White Portland Cement.



Salina Memorial Hall, Salina, Kan.
Charles Shaver, Salina, Architect
Peterson Construction Co., General Contractors
Cast architectural trim stone made by the Concrete Products Company, Salina. This product, faced with Medusa White Cement, is known as Granitite



Beautiful Cast Stone Work on the John Bindley Estate, Cocoanut Grove, Fla.
Kiehnel & Elliott, Pittsburg, Pa., and Miami, Fla., Architects
John B. Orr of Miami designed and executed the cast architectural trim stone

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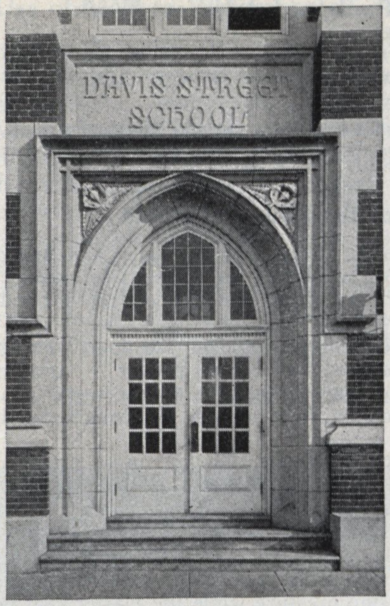
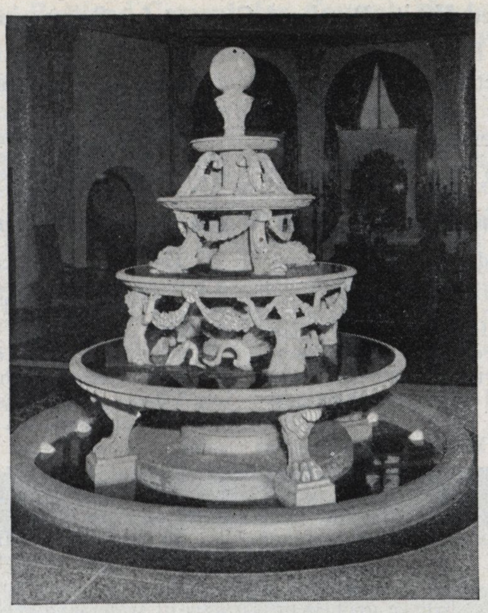


Detail of Entrance to Davis Street School, Westville, Conn.

Brown & Van Beren, Architects, New Haven, Conn.

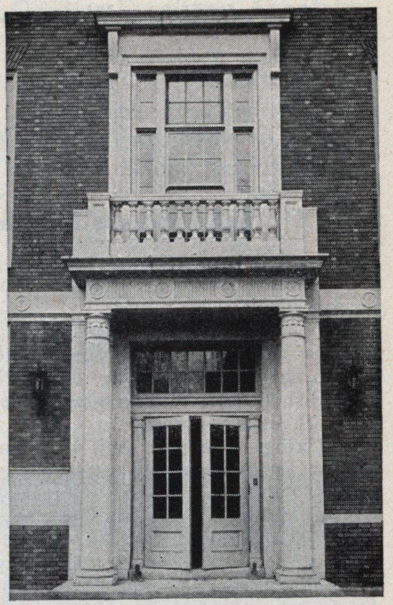
"Dextone," cast architectural trim stone, made by the Decorative Stone Co. of New Haven, was used



Fountain in Lobby of Park Lane Villa, Cleveland, Ohio

Reynold H. Hinsdale, Cleveland, Ohio, Architect

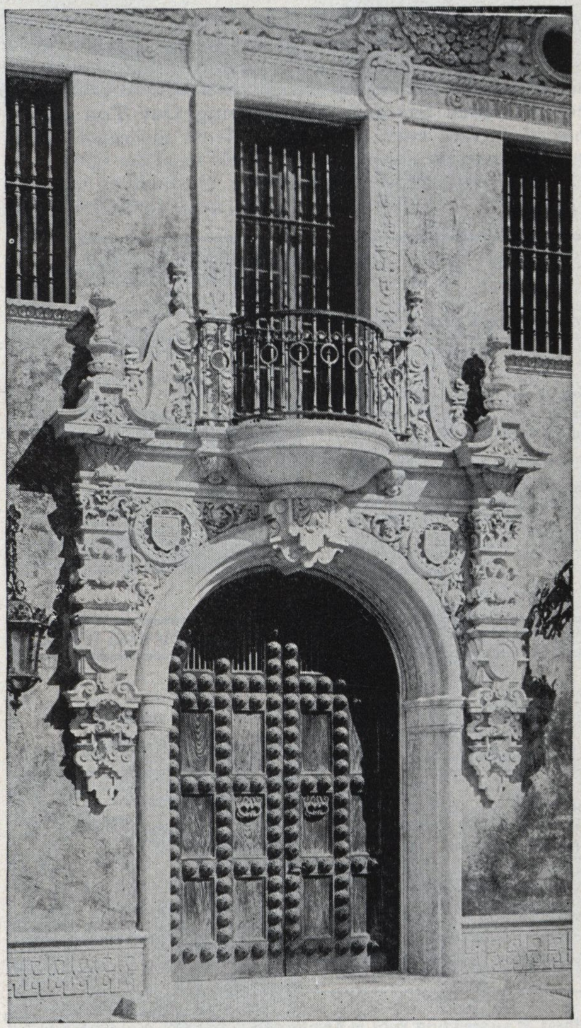
Fountain designed and executed by Fischer and Jirouch, Cleveland, Ohio, Medusa White Cement, colored, used for facing of cast stone



Entrance Detail to Medina High School, Rochester, N. Y.

William B. Ittner, St. Louis, Mo., Architect

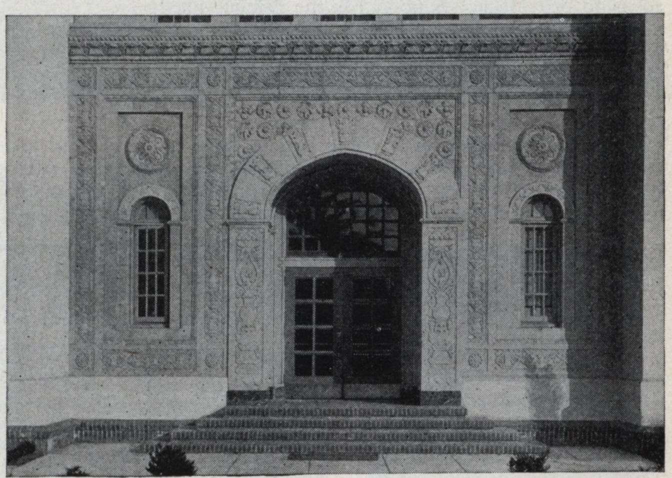
Cast architectural trim stone by J. Frank Norris, Rochester



Detail of Entrance to Residence of John Bindley, Cocoanut Grove, Fla.

Kiehnel & Elliott, Pittsburgh, Pa. and Miami, Fla., Architects

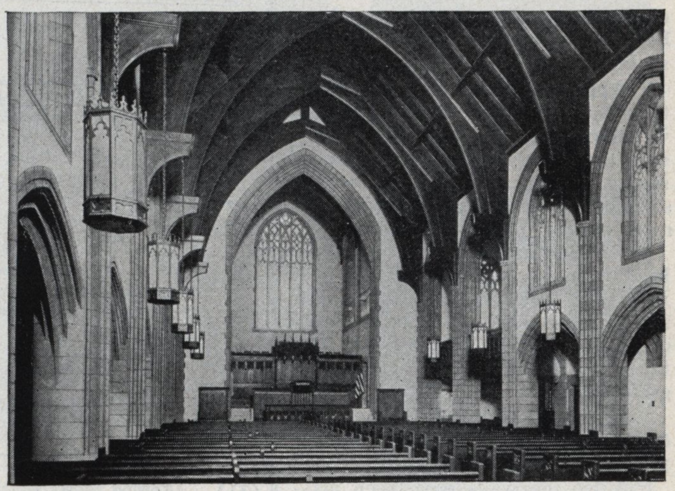
John B. Orr, Miami, designed and executed the cast stone work



Entrance Detail to Watsonville High School, Watsonville, Cal.

W. H. Weeks, San Francisco, Cal., Architect

Cast architectural trim stone by A. Knowles, San Francisco, Cal.



Interior of Tabernacle Presbyterian Church, Indianapolis, Ind.

J. W. C. Corbusier, Cleveland, Ohio, and R. F. Daggett, Indianapolis, Ind., Associated Architects

Precast "Artstone" done by The Geo. Rackle & Sons Co., Cleveland, Ohio

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Use of Medusa Waterproofed White Portland Cement for Swimming Pools and Adjacent Work

Medusa Waterproofed White Portland Cement is used extensively in the construction of swimming pools. It has been employed in the mass concrete construction of pools; for the finished cement plaster lining; for the cement mortar used in laying and setting of brick, terra cotta, tile, etc., used for lining of pools; for adjacent floors, walls, steps, shower and locker rooms, etc.

Note: For waterproofing mass concrete used for foundations, walls, floors, footings, piers, steps, shower and locker rooms, etc., see our pages in Waterproofing section, Nos. 118-121.

Specifications for Medusa Waterproofed White Cement Plaster for the Lining of Pools

The following specifications will produce a smooth, permanently white and water-repellent lining for both indoor and outdoor pools.

The bottom, walls, gutter and platform around the pool shall be finished with Medusa Waterproofed White Cement, and an aggregate consisting of equal parts of clean white sand and crushed white marble, grading from dust to particles passing a ⅛″-mesh screen.

Mixing—The mix shall be 1 part Medusa Waterproofed White Cement, and 2½ parts white aggregate. For quicker results and easier mixing, dampen or sprinkle the aggregate before mixing with the Medusa Waterproofed Cement, thoroughly mix the two materials together and then add just enough water to obtain the proper consistency.

Thickness—The finish over bottom and platform shall be not less than 1½″ thick. Finish of walls shall be applied in 2 coats, each not less than ⅜″ thick.

Preparation of Surface—The concrete surface shall be mechanically roughened or hacked by means of stone masons' hammers, drills, or simliar tools, exposing the matrix of the concrete and having ¼″ to ⅜″ holes every 2″ to 3″ apart so as to provide better bond for the cement plaster.

Remove all loosened pieces, and apply freely to the cleaned area a solution of 1 part of muriatic acid and 10 parts of water, using a fiber or acid brush. Allow acid solution to remain on concrete until the acid exhausts itself, approximately 10 minutes.

Wash the surface with water from a hose, being careful to remove all of the acid solution. Go over the walls with stiff wire brushes, or where available, compressed air or steam may be used, and remove any remaining loose pieces or particles.

Wet the entire surface with water before grouting to prevent the concrete absorbing water from the cement plaster before the cement has set.

Prepare a grout of portland cement, and water. Mix to a creamy consistency and apply with a fiber brush to the cleaned surface, brushing the grout thoroughly into the concrete.

If the walls are of brick or concrete blocks, rake out the joints, ½″ or ¼″ deep, removing all loose or crumbling mortar, and proceed as heretofore specified, roughening the surface.

Application of Cement Plaster—Apply the first coat of plaster ⅜″ thick, troweling the plaster well into the concrete surface so as to secure a proper bond. Thoroughly scratch the first coat. Do not use nails, trowels, or scratch too deep.

As soon as the first coat has set hard enough, apply the second coat ⅜″ thick, troweling the plaster with sufficient pressure to obtain maximum density and to close all surface pores, leaving a tight, close grained finish.

Cut the second coat of plaster off 6″ above the finished floor line, to provide for a coved base.

After the walls have been plastered, prepare the surface of the floors including the 6″ base at the walls in the same manner as the walls.

Have the floor cleaned, saturated with water and apply a coat of grout as described above for the walls. Use extreme care to prevent mud or dirt being brought on the ground surface

Apply a 2″ coat of cement plaster over the floor, joining the coved base with the finished wall cement plaster.

Where joints must be made in cement plaster work, run the cement work an inch or two beyond the contemplated joint.

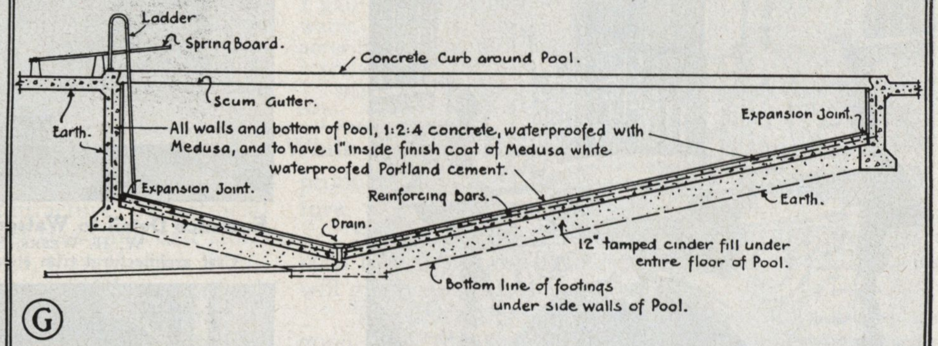
After plaster has set, cut this surplus off on as broad a bevel as possible, giving this bevel a good coat of grout prior to applying subsequent plaster.

In Case Water Interferes with Work—If there is a continual seepage through the walls, holes must be bored in the walls and tubes or small gas pipes inserted to concentrate the flow of water and relieve the pressure while the plaster coat is being applied. Calk around pipes with oakum or lead wool.

Drainage pipes should remain open until the waterproofed coat has thoroughly set and is capable of resisting the pressure by its own adhesive strength, after which remove pipes and plug holes with cork or wood and cover with waterproofed cement plaster.

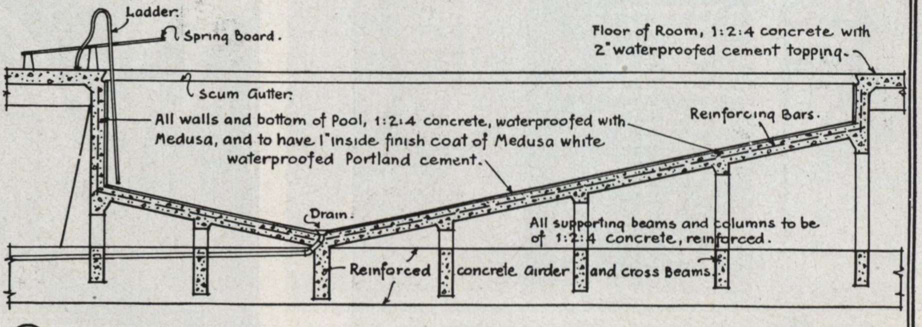
If the water pressure is exceedingly great, it will be necessary to sink sumps on the exterior of the walls to a depth below the basement floor level, and keeps pumps going continually until the plaster has thoroughly set.

Keep Finished Surface from Drying Out Too Fast—The finished surface must be protected from too rapid drying out, by keeping moist for at least a week to allow it to thoroughly harden and to prevent hair-cracks. Sprinkle or wet with a hose or cover with canvas or burlap kept continually wet.


Ladder
Spring Board.
Concrete Curb around Pool.
Scum Gutter.
Earth.
All walls and bottom of Pool, 1:2:4 concrete, waterproofed with Medusa, and to have 1″ inside finish coat of Medusa white waterproofed Portland cement.
Expansion Joint.
Expansion Joint.
Reinforcing Bars.
Earth.
Drain.
12″ tamped cinder fill under entire floor of Pool.
Bottom line of footings under side walls of Pool.

G

LONGITUDINAL SECTION • WATERPROOFED CONCRETE OUT-DOOR SWIMMING POOL.


Ladder.
Spring Board.
Floor of Room, 1:2:4 concrete with 2″ waterproofed cement topping.
Scum Gutter.
All walls and bottom of Pool, 1:2:4 concrete, waterproofed with Medusa, and to have 1″ inside finish coat of Medusa white waterproofed Portland cement.
Reinforcing Bars.
Drain.
All supporting beams and columns to be of 1:2:4 concrete, reinforced.
Reinforced concrete Girder and cross Beams.

H Drawing shows suggested method of suspending Pool in Reinforced Concrete Building.

LONGITUDINAL SECTION • WATERPROOFED CONCRETE IN-DOOR SWIMMING POOL.

Continued on next page

Use of Medusa Waterproofed White Portland Cement for Cement Mantels, Garden Furniture, Fountains, Lamp Standards and Many Other Art Purposes

Architects, sculptors and manufacturers will make no mistake when specifying or employing Medusa Waterproofed White Portland Cement in the casting or finishing the surface of mantels, garden furniture, urns, fountains, lamp standards and the many other art objects.

Exceptionally fine work has been executed by skilled craftsmen both in plain white and color.

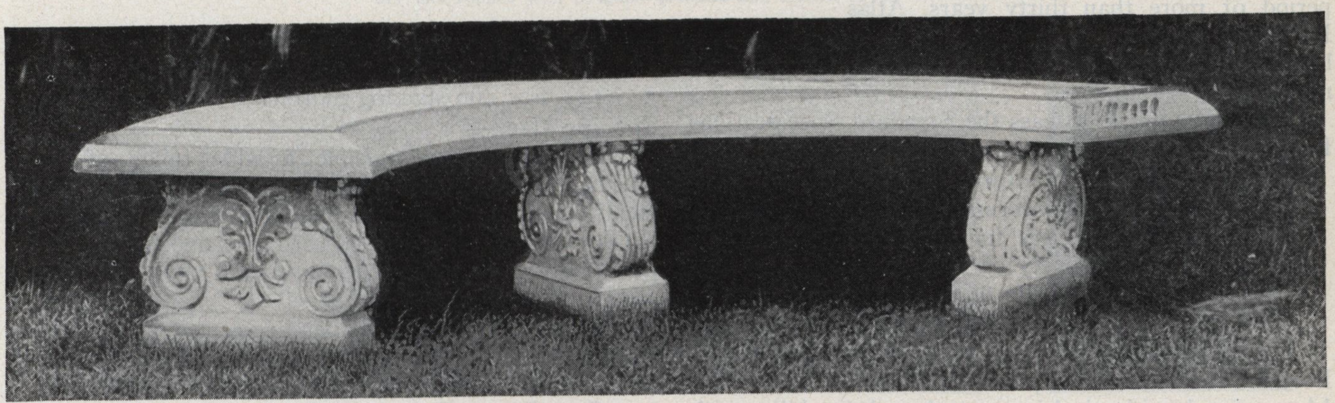
Brilliant effects can be obtained from all dry mix castings, by spraying with a very fine spray of water the entire surface as soon as it is taken from the mould.

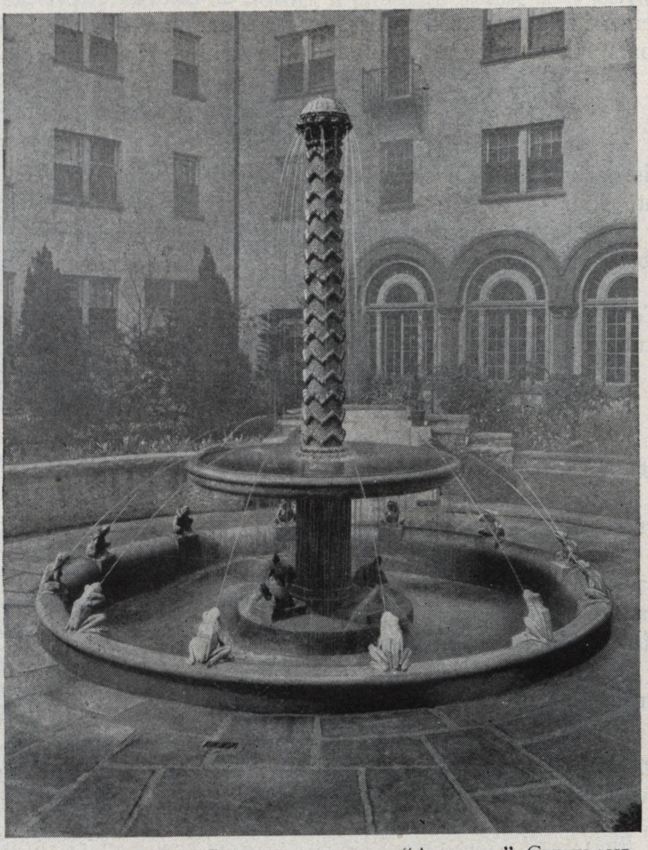
The film of cement on the face is thus carried into the concrete, leaving the sparkling effect of the aggregate in sight.

This method causes no loss of strength.

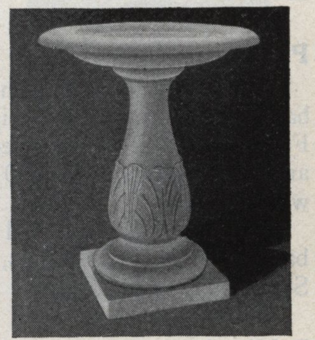
Color Work—Any desired color concrete can be produced by dry mixing mineral oxide coloring with the cement. We suggest the following amounts of mineral coloring to be added to each sack of cement.

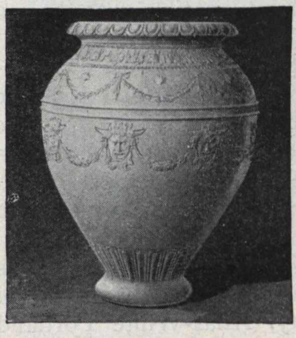
For Gray—½ to 1 lb. lamp black, or—
Blue—5 to 10 lbs. ultramarine blue.
Dull red—5 to 10 lbs. red oxide of iron.
Bright red—5 to 10 lbs. mineral turkey red.
Yellow or buff—5 to 10 lbs. yellow ochre.
Black—½ to 1 lb. carbon black.

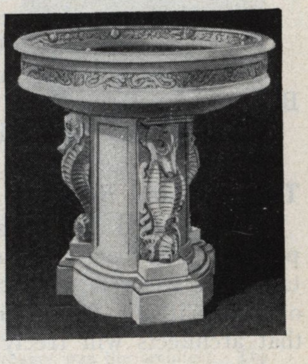




Fountain in the Courtyard of the "Alcazar," Cleveland, Ohio
Cast stone work by Fischer and Jirouch, Cleveland, Ohio
Imitation caen stone







Fountain and Garden Furniture Faced with Medusa White Portland Cement

THE ATLAS PORTLAND CEMENT COMPANY

25 Broadway
NEW YORK, N. Y.

CHICAGO, ILL. BIRMINGHAM, ALA. INDEPENDENCE, KAN.
PHILADELPHIA, PA. BOSTON, MASS. ST. LOUIS, MO. DES MOINES, IOWA DAYTON, OHIO
OMAHA, NEB. BUFFALO, N. Y. KANSAS CITY, MO. JACKSONVILLE, FLA.

TRADE-MARKS

Products

Atlas Portland Cement.
Atlas-White Portland Cement.

Quality

Atlas Portland Cement—Over a period of more than thirty years, Atlas Portland Cement has merited the distinction of being "the Standard by which all other makes are measured."

It is guaranteed to pass the Standard Specifications for portland cement which have been adopted by:

The United States Government
The American Engineering Standards Committee
The American Society for Testing Materials
The American Society of Civil Engineers
The American Institute of Architects
The American Railway Engineering Association

"Atlas-White Portland Cement"—Atlas-White Portland Cement (white) has been manufactured for 14 years and is identical in strength and durability with Atlas Portland Cement (gray).

Atlas-White Portland Cement is guaranteed to pass the Standard Specifications for portland cement as noted above.

Packages

Atlas Portland Cement is packed in duck or paper bags of 94 lbs. net weight, 4 bags to the barrel. For export, it is shipped in especially constructed and lined barrels of 400 lbs. gross or 376 lbs. net weight.

Atlas-White Portland Cement is packed in paper bags inside of duck bags, and for export, in barrels. Same weights as above.

Publications

For architects, the following informative publications are authoritative on the subjects covered. Any or all of these books will be furnished the architect on application, without charge.

"Guide to Good Stucco and Textural Finishes"

"Atlas Handbook on Concrete Construction"

"Non-staining Mortar for Pointing, Setting and Backing"

"Cast Stone," with illustrations

Technical and Research Department

A technical and research department is at the disposal of architects for assistance in any problems pertaining to concrete or stucco. This service is of course offered without obligation to them, and it is hoped that architects will freely avail themselves of this department.

The Atlas Technical Department is in position to assist architects by supplying helpful data and statistics on this efficient, fireproof and economical type of construction for industrial buildings, houses, garages, etc.

Uses of Atlas-White Portland Cement

(1) Wherever a pure color or white is desired.
(2) For non-staining mortar.

Specific Uses—

Stucco—Makes possible a wide range of color effects. As Atlas-White is neutral in color toward pigments, it gives clear and unmuddied shades. Also produces excellent results when used in connection with exposed aggregates, or when mixed with naturally colored sands.

Brick Joints—Makes possible a pure white or correctly colored joint. Can be colored by mixing directly with a colored sand or by pigments.

Cast Stone, Trim and Garden Furniture—Gives white or colored effects as desired.

Terrazzo—White cement when used for this purpose doubles the number of color combinations. It will not discolor.

Lining Swimming Pools—Used with white sand and applied as a plaster, gives an inexpensive, durable and attractive lining. Particularly adapted to outdoor pools.

Interior Plastering—Interior plastering of white cement mortar makes possible interesting color and textural effects. As it is unaffected by moisture, it is also used for dairies, cold storage rooms and lavatories.

For Its Non-staining Qualities—

Pointing, Setting and Backing Fine Stone—Widely used for setting Indiana limestone and marble. Gives the strongest possible mortar and is absolutely non-staining.

Setting Tile—Will not stain the tile and is unaffected by moisture.

Stucco Finishes

The illustrations show only four of the endless variety of stucco finishes which are possible with the use of a portland cement stucco using Atlas-White.

The endless number of textures possible are produced by various methods of manipulation of the plastic material. While it is difficult to describe in detail the exact method by which they are obtained, an examination by the architect of the photographs in "Guide to Good Stucco and Textural Finishes," the book referred to above, will make the manner of finishing evident.

Stucco finishes in portland cement are unlimited as to texture and color. To secure permanently successful results in color and durability, Atlas-White Portland Cement is the ideal material.

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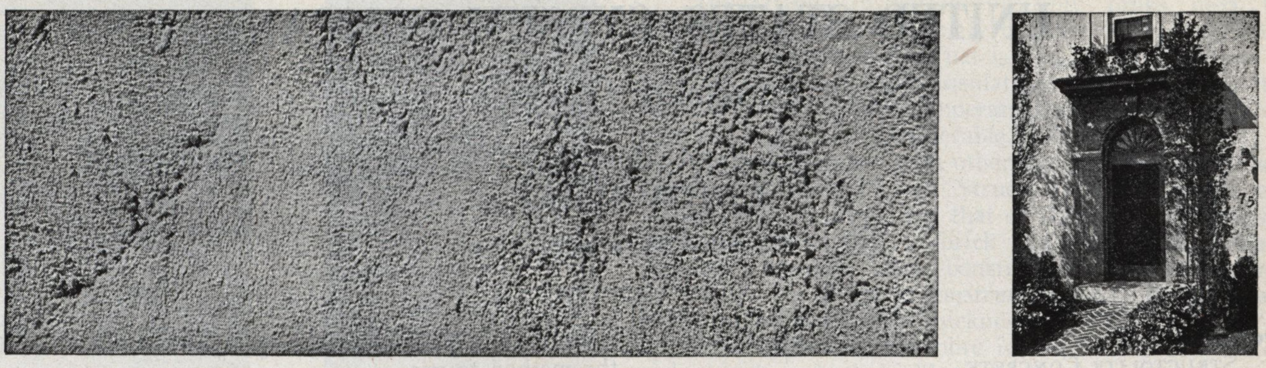
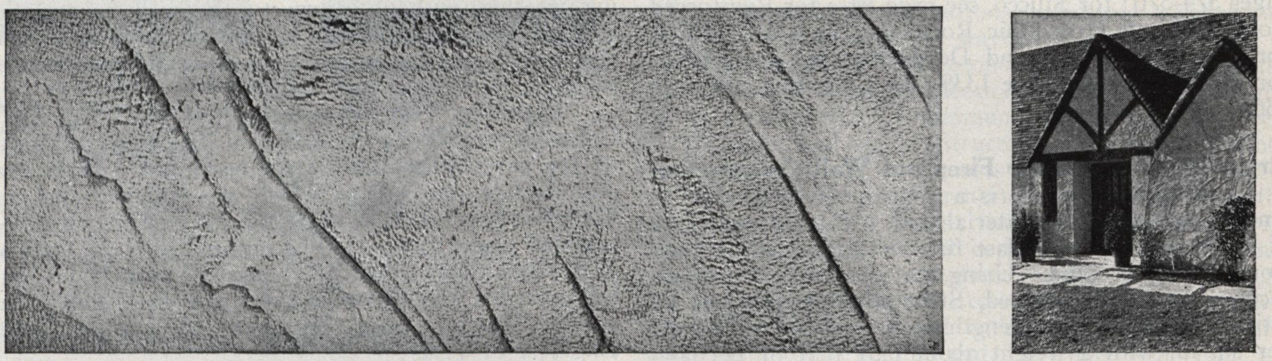


Stucco Finish Used on House at Forest Hills, L. I.

The house, portion of which is shown, was designed by W. L. Bottomley, New York City. The finish is from an actual wall and shows a rather dry mix applied with irregular pressure and motion of the trowel

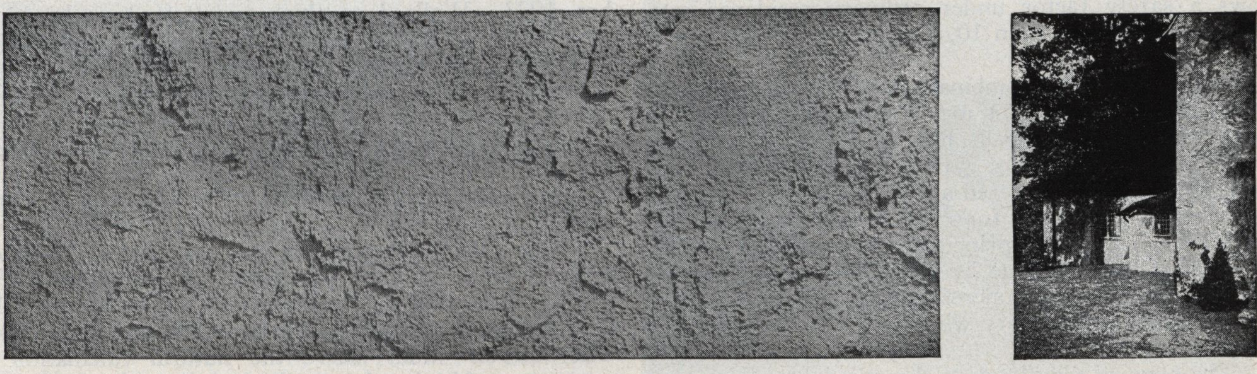


Stucco Finish Used on House at Pelham N. Y.

This house, for which Bloodgood Tuttle of New York was the architect, is particularly pleasing in its use of stucco. The panel shows a finish placed with a sweep of the trowel, using more pressure on one end than the other

Stucco Finish Used on House at Jamestown, N. Y.

A. J. Bodker of New York was the architect for this residence. The finish was obtained by throwing on a spatter dash and smoothing the high parts with a steel trowel



Stucco Finish Used on House at Riverdale, N. Y.

The adaptability of stucco to harmonize with architectural design is evident in this house for which Julius Gregory was the architect. The panel shows a finish obtained with a rather dry mix applied with an irregular motion of the trowel

UNITED STATES GYPSUM COMPANY

Structolite Concrete

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see page 374

Products

STRUCTOLITE CONCRETE.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201, for Plaster Base, see page 449; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

Structolite Concrete for Fireproof Wall Construction

Structolite Concrete is a mixture of Structolite as binding or cementing material with a coarser aggregate of steam coal cinders, blast furnace slag, crushed limestone, gravel or sand. Using the standard proportions recommended, when cured, Structolite concrete has an ultimate compressive strength of from 900 to 1300 lb. per sq. in. with a weight about half that of portland cement concrete.

Compression Test—The structural value of this material has been determined by compression tests made at Columbia University, New York City, The Building Department, Philadelphia, Pa. and at our own mills, using various mixtures of different aggregates.

The following table shows the excellent results obtained by the tests conducted in the laboratories of the Building Department of the City of Philadelphia on specimens 28 days old.

Proportions by Volume
1½ Structolite, 1 Sand, 3 Aggregate

Aggregate	Av. Unit Stress Per Sq. In.
Gravel	1312
Crushed Slag	1297
Crushed Limestone	1281
Cinders	908

A comparison of the loads and results of all tests shows a safety factor under ordinary residence construction of not less than 10, and under average conditions from 15 to 25.

This exceptional combination of high compressive strength and light weight makes it most desirable for use in exterior bearing walls, floor and interior partitions of homes, service stations, garages and similar buildings where the loads encountered are light. Structolite Concrete is also adaptable for curtain walls of factories where loads are carried principally by structural steel.

Mixing may be done by hand in a mortar box or in a drop type batch concrete mixer, which has been found entirely satisfactory when properly cleaned after each batch.

The pouring may be done directly from the mixing box into the forms or by means of buckets, wheelbarrows or other standard equipment usually used for concrete work. The size of the operation would determine the method to use.

Structolite Concrete generates heat in setting and if proper precautions are taken to use aggregates free from frost, pouring may be done successfully in freezing weather without injury to the wall construction. The set can be regulated to suit working conditions. The specifications contain suggestions and recommendations for pouring in cold weather.

Freezing Test—A freezing test was conducted at Columbia University on 4x8x8-in. blocks of a mixture of 1½ parts Structolite, 1 part sand and 3 parts steam coal cinders, one side of which was waterproofed with Toch Brothers' R. I. W. No. 232 and surface with ⅞-in. portland cement stucco. The purpose of these tests was to determine any effect of alternate freezing and thawing upon the bond between the stucco base and gypsum block. Quoting from the report of W. J. Krefeld, Engineer of Tests:

"The specimens were subjected to 20 changes, alternating freezing and thawing, in accordance with the regulations of the New York Bureau of Buildings, except that the specimens were thawed in an electric oven at 150° instead of by immersion in water at this temperature. Each alternate freezing and thawing was made in a period of 24 hours; i. e., 16 hours in refrigerator and 8 hours thawing.

"No visible effects of the exposure to alternate dry freezing and thawing were detected. The mortar base showed no cracks and the bond between the gypsum block and the mortar base was not visibly affected."

Fireproof—Tests during the last thirty years by reputable agencies in Europe and America have proved it is not only fireproof, but will not permit sufficient heat to pass through to ignite furnishings in adjacent rooms.

Fire Test—The Building Department of the City of New York, co-operating with the Civil Engineering Department of Columbia University, conducted a Fire Test at the University Testing Laboratories in December, 1923. Walls 3 in. thick and 9 ft. high by 14 ft. long were subjected to a maximum temperature of 1810° F. An average temperature of 1707° F. was maintained within this structure for one hour. Immediately following this, a stream of water from a 1⅛-in. nozzle at a distance of approximately 8 ft., and a nozzle pressure of 30 lb., was directed against the superheated interior walls for 2½ minutes. The test was an entire success.

The Official Report on this test states, "The exterior surface of these partitions, as they appeared on the day following the test, showed no visible sign that they had gone through a one-hour fire and water test." The interior walls where the natural calcination of gypsum would take place, still showed some of the form marks, indicating that calcination from this intense heat and the washing action of the hose stream had not pro-

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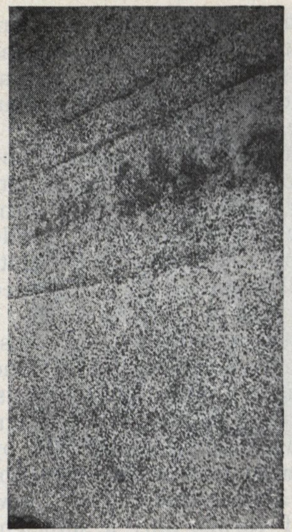
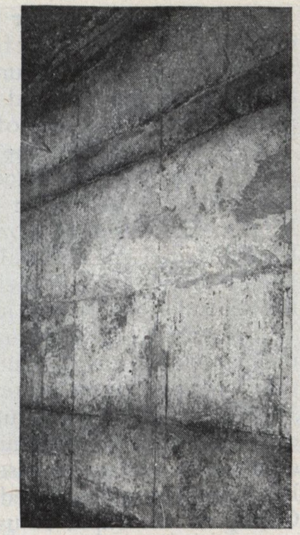


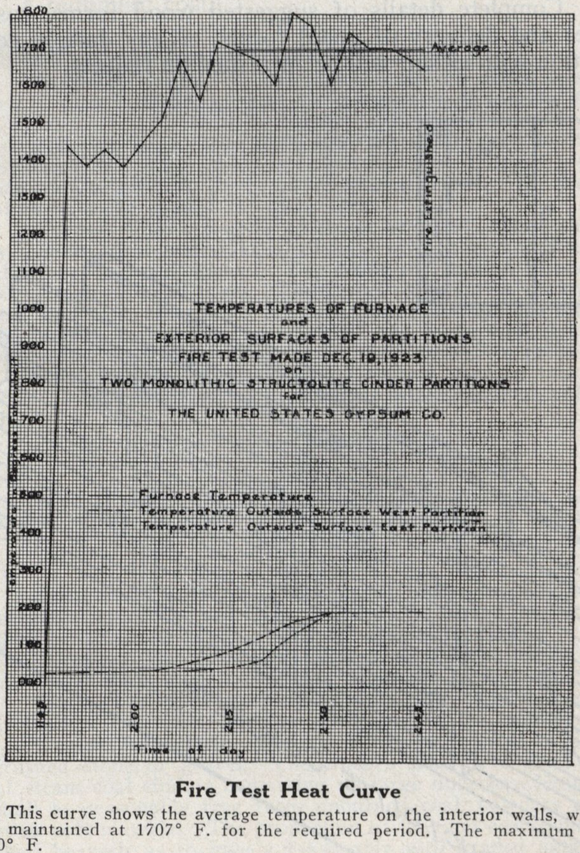
One of the Interior Surfaces of the Structolite Concrete Walls Before the Fire and Water Test at Columbia University



The Same Wall After the Fire and Water Test— Notice Form Marks Are Still Visible

gressed to a depth sufficient to damage materially the structural strength of the wall.

This test was conducted in accordance with the building code of the City of New York, Article No. 17, Section No. 355, Subdivision No. 3, and the Industrial Code of the State of New York, Rule No. 512 of Bulletin No. 7. Upon the satisfactory results of this test, Structolite has been approved for fireproof residence construction by the five boroughs of Greater New York.



Fire Test Heat Curve

This curve shows the average temperature on the interior walls, which was maintained at 1707° F. for the required period. The maximum was 1810° F.

Notice that the outsides of these walls, only 3 in. thick, did not exceed 210° F.

Insulation—Insulation probably ranks next in importance because it directly reduces the original cost of heating equipment. What is equally as important is the fact that this same insulation means less fuel to maintain a comfortable temperature and this saving over a period of years is considerable.

As a comparison with other accepted forms of wall construction now in use, Structolite Concrete has an insulating value 3½ times that of portland cement concrete, 1½ times that of brick and slightly more than 2½ times that of frame construction, not considering the infiltration in frame construction. Comparisons are based on walls of equal thickness.

Soundproof—Structolite is one of the few materials which is both highly insulating and at the same time presents an effective barrier to sound transmission. If you strike a Structolite wall there is merely a dull thud and this same test on many other wall materials will set up noticeable vibrations, indicating a reflection and transmission of sound waves.

Economy—The real economy of Structolite Concrete homes is readily understood because all materials are obtained locally; a minimum of skilled labor is required; the rapid set of Structolite reduces the period of construction and labor costs and permits the re-use of forms; a minimum of treatment is required for both exterior and interior walls; less heating equipment is required; a saving in fuel cost, insurance and maintenance costs extends throughout the life of the building.

Unlimited Adaptability—Any architectural design which can be formed with wood or metal forms can be built of Structolite and thus there is no limit to the type, size, shape or kind of a residence which can be built of Structolite in any climate in any section of the country. Block or tile precast on the job and sawed or otherwise cut to meet the exact requirements may be utilized to secure desirable decorative treatments not readily poured integral with metal or wood forms.

Wall Treatment—Structolite is a non-hydraulic material and all exterior surfaces must be protected from the elements by coating with an approved dampproofing and given an exterior finish in keeping with the architecture. United States Gypsum Company's Oriental Stucco lends itself most readily to exterior wall treatment and offers a variety of ready-mixed permanent colors. When a stucco treatment is to be applied, a 2x2-in. No. 14 gauge crimped, galvanized, electrically welded fabric is stapled to the wall, using a 2-in. staple every square foot of fabric. A crimped fabric is self-centering, thus insuring correct location in the stucco for maximum strength. A brick veneer

Simplicity of Formwork and Smooth Finish

Continued on next page

may be applied to the exterior of Structolite Concrete with equally good results at but slight increase in cost, or it may be finished with drop siding, stained or painted to express the taste of owner or architect.

The inside surfaces of exterior walls and interior partitions may be plastered directly with gypsum plaster without the use of any fabric and two-coat plaster work to ⅜ in. grounds is sufficient. If for any reason it is desired to furr the inside wall, 1x2-in. strips may be securely nailed directly to the Structolite Concrete to which may be applied lath and plaster in the usual way. Any desirable finish may then be applied to the plaster surface.

Method of Procedure—The simplicity of this construction is one of its strongest recommendations. Foundation walls are run up not less than 18 in. above grade, thoroughly waterproofed with an approved dampproofing and a strip of 40-lb. waterproof felt or fabric laid on top of the foundation wall. Wood or metal forms adjusted and properly braced are next set, allowing 6-in. minimum thickness for exterior bearing walls. Floors and interior partitions should be formed and poured along with exterior walls. Experience has shown that a height of 2 ft. is best for each pouring course. All corners are reinforced with ½-in. rod at least 4 ft. long spaced 2 ft. apart.

Immediately on pouring the course, an additional set of forms is erected and the second course poured. By the time this is completed the bottom course will have set enough to permit the removal of the lower tier of forms. These are erected on top of the second tier and the procedure continued to the required wall height.

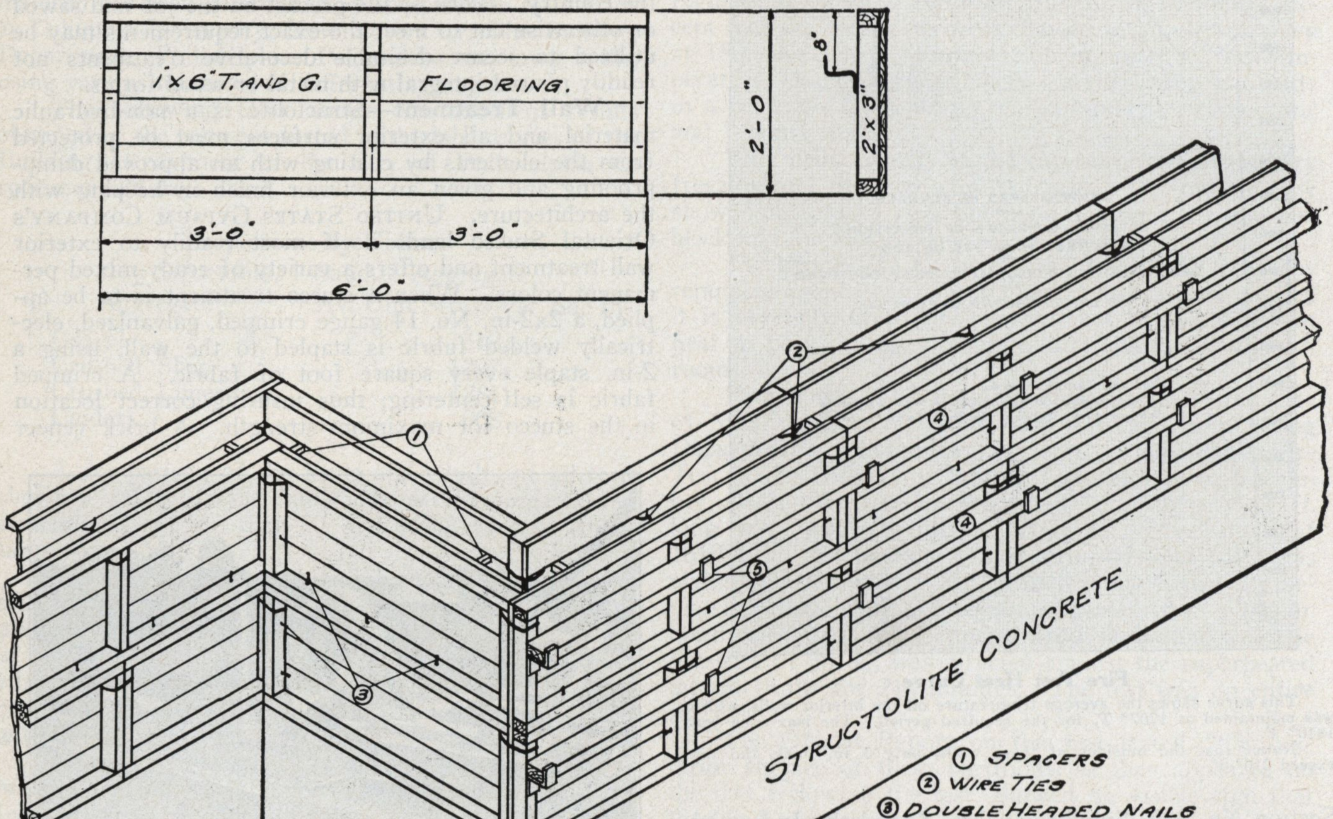
All rough bucks for openings and frames for windows are set in place before the forms are erected and the formwork should run past the opening so that as the walls are poured and puddled the Structolite forms a tight seal on all sides of these openings.

At the height of the first story ceiling, the second story joists may be placed and the usual tee anchors fastened to the end on every seventh joist. At the height of the second story ceiling, anchor bolts should be embedded in the walls and a 2x6-in. wood plate bolted to the top of the wall, upon which are placed the second story ceiling joists and the roof rafters.

Forms—Metal forms are recommended because they are more easily handled, very elastic, durable and rapidly reset, thereby tending to reduce labor costs. However, wood forms can be used with economy whenever desired. A minimum of bracing is required by either as the lateral pressure in a quick setting Structolite Concrete wall erected in 2-ft. courses is very low. Owing to the rapid re-use of forms, only a sufficient quantity is required which will take care of a two-hour pouring schedule. The wood form panels may be made for each job or for repeat jobs, in either case 2x3 in. framing should be nailed to the 1x6-in. tongue and grooved flooring as watertight facing.

Lateral bracing, in the form of aligners, is required for one side only and should be 2x4-in. mill dressed material, spaced 2 ft. apart. Separators may be 1x1-in. strips in lengths to maintain uniform wall thickness. The inner and outer forms are tied together with wire.

Complete details of suggested wood forms, costs, sizes and delivery of metal forms, or any data in connection with either, will be furnished on request.



Wooden Form, Design No. 1, for Structolite Concrete Construction

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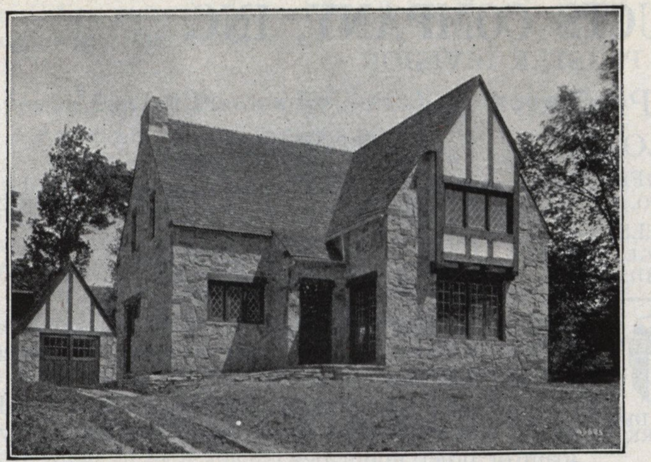


A Milwaukee Structolite Concrete Home with Native Stone
Gable half timbered and treated with Oriental Stucco

Structolite Floors and Roofs

When Structolite floors and roof construction are to be used, forms are set and procedure followed as previously outlined.

Variations of our Sheetrock-Pyrofill, poured monolithic or precast roof systems may be adapted to suit various residential or factory designs.

In addition to the fireproof floor details, our precast floor voids in the concrete joist floor system offers a fireproof floor construction suitable for any residence, at a minimum cost.

Specifications for Structolite Concrete

Scope of Work—All exterior and interior walls, as shown on plans or specified, shall be constructed according to the United States Gypsum Company's system of Structolite Concrete construction. All walls and partitions shall be of the thickness shown on plans and shall be erected straight, plumb and true, and left in the proper condition required for the kind of finish to be applied to either face.

Forms—Forms may be of wood or metal. They shall be well built, tight and rigid, shall be erected plumb and in true alignment and well braced. The inside surfaces of forms shall be kept clean at all times. The forms shall not be removed in less than 15 minutes after the Structolite Concrete has set. All inside wall surfaces to be plastered are to be well scored as soon as the forms are removed, so as to provide a proper key.

Proportions—All Structolite Concrete used in this work shall be of the following proportions which shall be volumetric:

1½ parts of Structolite
1 part of sand
3 parts of coarse aggregate

Note: If cinders are used as an aggregate and contain a sufficient quantity of fines to properly fill the voids the addition of sand may be omitted and the following proportions used:

1 part of Structolite
2½ parts of cinders.

Structolite Cement—The Structolite Cement used shall be as manufactured by the United States Gypsum Company and shall be delivered to the job in the original packages.

Storage—The Structolite Cement shall be stored in a dry place and shall be well protected from the elements.

Sand—The sand used shall be clean, sharp and well graded. It shall be free from loam or other organic material.

Coarse Aggregate—The coarse aggregate shall be cinders, crushed stone or gravel. The cinders shall be a good grade of steam coal cinders containing no large unbroken lumps and shall be reasonably free from unburned coal, powdery ash or other soft material. The proportion of fine and coarse material shall be such as to give a reasonably well graded aggregate. The crushed stone shall be limestone, traprock, or granite, and shall be crushed to such a size as will pass through a ¾-in. ring and be retained on a ¼-in. sieve. The gravel shall be clean and well graded from ¼ to ¾ in. in diameter; it shall be free from clay or other soft material.

Water—The water used for mixing shall be free and clear from organic substances.

Mixing and Placing—The mixing of the Structolite Concrete may be done by a tilting drum type, batch mixer, as used for concrete, or it may be done by hand in a deep mortar box. When using a machine mixer, the speed of the drum shall not exceed 20 r. p. m. The predetermined amount of water shall be introduced into the drum first, and the drum allowed to revolve until the paddles and sides are cleaned from any material left from the preceding mix. The feeding hopper is then loaded with Structolite and aggregate in the proportions specified and dumped into the drum for mixing. Just enough water shall be used to insure a thorough mixing of the mass into a workable consistency. (The amount of water required will vary with the dampness of the aggregate.) As soon as the mass has become thoroughly mixed it shall be removed immediately and placed in the wall. Do not allow the drum to idle and further agitate the mass, once the mixing has been completed. With a drum speed of 20 r. p. m. the entire mixing time shall not exceed two minutes after the Structolite and aggregate have been introduced into the drum.

Mortar Box Mixing—If the mixing is done by means of a mortar box the procedure is as follows:

(1) Place evenly in the mortar box the required amount of aggregate for the batch.

(2) If sand is used, place sand evenly on the coarse aggregate.

(3) Spread over the sand the Structolite cement required.

(4) Dry mix the aggregate and cement thoroughly and then add the required amount of water and mix thoroughly.

(5) Deposit the Structolite Concrete immediately into the moulds, puddling the mixture during the pouring so as to prevent air bubbles or honeycombed surfaces.

Reinforcement—All window and door openings not exceeding 5 ft. clear span shall be reinforced with not less than three ½-in. round rods. When the location of the opening is such that the depth of the lintel is less than 18 in., a steel or reinforced concrete lintel shall be used. Spans in excess of 5 ft. shall have steel or reinforced concrete lintels. The rods shall extend not less than 24 in. beyond the clear opening on either side and shall have hooked ends to provide anchorage. All corners shall be reinforced with ½-in. round rods located in the center of the wall and extending not less than 24 in. each way. They shall have hooked ends and shall be spaced 24 in. on centers.

Foundation Walls—All Structolite Concrete walls shall start from the foundation walls. Foundation walls shall be carried up to not less than 18 in. above the grade line. The top of the foundation walls shall be coated with an approved dampproofing compound. A strip of not less than 40-lb. roofing felt or other approved fabric shall then be laid on the top of the wall and another coating of dampproofing applied over it before pouring the Structolite Concrete.

Chimneys and Fireplaces—Chimneys may be built by enclosing the flue lining with Structolite Concrete.

Fireplaces may be built of Structolite Concrete by facing the exposed surfaces with fire brick or other lining.

Waterproofing—All exterior Structolite wall surfaces shall be thoroughly coated with an approved dampproofing compound before any exterior finish is applied.

In bathrooms or elsewhere where a tile wainscot is used or where portland cement is used as a plastering material the Structolite Concrete partitions or walls shall be coated with an approved dampproofing compound and a 2x2-in. galvanized wire fabric of not less than No. 14 gauge wires shall be securely stapled to such walls before applying the cement plaster.

Exterior Stucco—If an exterior stucco finish is desired a 2x2-in. galvanized welded fabric of not less than No. 14 gauge wires shall be securely stapled to the Structolite Concrete walls, using 2-in. staples.

Winter Work—When pouring is to be done under freezing condition, the aggregates used must be free from frost. Newly poured walls should be protected.

Architectural and Engineering Service

Our architectural and engineering service is always available to assist in working out any problems which may come up involving the use of Structolite in roofs, floors, partitions or exterior walls. Quantity survey of structural materials will be made upon receipt of plans and specifications.

THE BEAVER PRODUCTS COMPANY, INC.

AMERICAN CEMENT PLASTER DIVISION

Gypsum Products

THOROLD, ONT. BUFFALO, N. Y. LONDON, ENG.

SALES OFFICES

ATLANTA, GA. KANSAS CITY, MO. CHICAGO, ILL. NEW YORK, N. Y. CLEVELAND, OHIO

MILLS

GRAND RAPIDS, MICH. FORT DODGE, IOWA GYPSUM, OHIO
AKRON, N. Y. BLUE RAPIDS, KAN. AGATITE, TEX.

TRADE MARK

Products

Gypsum Plasters (Hard Wall Plasters), which include: Gypsum Cement Plasters, Unsanded (Hair Fibered or Unfibered); Gypsum Wood Fiber Plaster; Gypsum Plasters for Concrete surfaces.

Gypsum Finishing Plasters, which include: Prepared Gypsum Finishing Plasters; Gypsum Gauging Plasters; Gypsum Moulding and Casting Plasters; Best Bros. Keene's Cement.

Gypsum Lath and Blocks.

For Beaver Vulcanite Roofing Materials, see pages 1096-1097; for Beaver Plaster and Fiber Wall Boards, see pages 1336-1337.

Quality and Service

Architects will find this line of products full and complete. The American Cement Plaster Division owns and operates six of the best and largest gypsum deposits in the United States, located at the principal gypsum producing centers. This company can thus at all times advantageously serve its trade in all principal markets on short hauls and low freight at the most economical costs. Mills are modern, unexcelled in equipment; the quality of these products is established in their 25 years usage.

BEAVER
AMERICAN
PLASTER
80 LBS. NET WEIGHT

New Sack (Front)

Guarantee

All these products are fully guaranteed as to quality and give the best results when used in accordance with the specifications of this company.

American Cement Plaster Division Gypsum Plasters

Classification—The American Cement Plaster Division gypsum plasters (sometimes called hard wall plaster, patent plaster, cement plaster, etc.) may be broadly divided into *two* classes: (1) Plasters for base coats; (2) plasters for finish coats.

Plasters for Base Coats—These plasters are made in *four* classes, each for a particular use, as follows: (1) Cement plasters, unsanded (hair fibered or unfibered); (2) sanded plasters; (3) wood fibered plasters; (4) plasters for concrete surfaces.

Plasters for Finish Coats—These are made in *four* classes, each for a particular use, as follows: (1) Prepared finishing plasters; (2) gauging plasters; (3) moulding and casting plasters; (4) Keene's cement plaster.

Materials—All of the American Cement Plaster Division gypsum plasters have, for their cementitious base, carefully selected gypsum rock, scientifically ground and calcined. To this cementitious base, where required, other materials such as retarder, wood fiber and hair are added to control the set, produce perfect working qualities and permit proper bond to the surfaces to be plastered as hereinafter described under specific headings.

All sand in sanded plasters is carefully selected, clean, sharp siliceous sand, free from salt, clay, loam or other impurities.

Advantages—Gypsum plasters have many advantages:

Adhere to all material used as backing for plaster, gypsum blocks, plaster board, stone, brick, hollow tile, concrete, wood or metal lath; highly adhesive; do not crumble; work smoothly and easily under the trowel; set slowly, giving the plasterer ample time for troweling.

Gypsum plasters harden and dry quickly, permitting carpentry and other work to proceed almost immediately after plastering is finished.

The finished wall is a non-conductor of heat and cold; it resists fire and is verminproof.

Can be painted, frescoed, papered, or finished with any kind of decorative material a few days after its application.

After it sets, freezing will not harm it.

Standard Packages

Our plasters are shipped in convenient packages. Jute sacks, which are returnable, contain 100 lb. each. Paper sacks, which are non-returnable, contain 80 lb.

AMERICAN CEMENT PLASTER
THE BEAVER PRODUCTS CO. INC.

New Sack (Back)
Showing circle and eagle

Brands

The American Cement Plaster Division gypsum plasters are marketed under the various brands listed below; all brands being of the same high standard of quality.

American
Crystal Rock
White Rock
Fishack
Akron
Great Western
Agatite
Eagle
Peerless
Eureka

Gypsum Cement Plaster (Unsanded) for Scratch or Brown Coat

This plaster is a "neat" plaster for scratch and brown coats. It is made for use where good sand is available at reasonable cost, or where, for other reasons, it is desirable to sand the plaster at the job.

This is an "all-purpose" plaster for scratch and brown coats on interior walls and ceilings of any material which can be plastered.

It is furnished *hair fibered* for scratch coats on metal lath, wood lath and plaster board, and *unfibered*, if desired, for the brown or second coat for use on brick or tile.

Finishing Coats—Any type of finishing coat may be used over the brown coat, including: Gypsum plaster

Continued on next page

finish, lime putty finish, sand float finish, Keene's cement finish, caen stone finish, etc.

Gypsum Sanded Plasters for Scratch or Brown Coat

American sanded gypsum plasters have for their base same ingredients as the "unsanded" plasters, the additional advantage being that the cement and sand are machine mixed at the factory, insuring thorough and uniform mixing of materials and *absolute correctness of the proportions.*

This latter advantage is perhaps appreciated most by the architect, as it prevents all chance of using a poor quality of sand, or too much of it; it also saves the architect or owner much time in the supervision of the mixing.

This is a splendid "cold weather plaster." Needing only water to fit it for application, it may be readily and quickly mixed inside the building with no worry about sand, or troubles arising from the use of frosty sand.

Furnished *hair fibered* for scratch coats and *unfibered* for brown coats. Like the "sanded" gypsum plasters it will take any type of finishing coat.

Gypsum Wood Fibered Plaster for Scratch or Brown Coat

American wood fiber plaster is composed of pure rock gypsum and thoroughly shredded wood fiber. It is adapted for use with the addition of not to exceed equal parts of clean sharp sand. When desirable, it can be applied without the addition of sand.

Wood fibered plaster, when applied either with or without the addition of sand, produces a wall that can not be excelled for strength, elasticity and durability. These features, together with lightness in weight, make it an ideal plastering material. It is especially desirable where one-coat work is to be done.

COVERING CAPACITIES AMERICAN CEMENT PLASTER DIVISION GYPSUM CEMENT PLASTERS PER 100 SQ. YD.

Material mixed and used as per Specifications

Plastering surface	Gypsum cement plaster, neat, 100-lb. bags	Gypsum wood fiber plaster, 100-lb. bags	Gypsum sanded plaster, 100-lb. bags
Wood lath	9 to 11 (sanded 2 to 1)	14 to 17 unsanded	22 to 24
Metal lath	17 to 20 (sanded 2 to 1)	22 to 27 unsanded	45 to 50
American plaster board	8 or 9 (sanded 2 to 1)	13 to 16 unsanded	22 to 24
Brick and clay tile	14 to 17 (sanded 2½ to 1)	18 to 20 (equal parts sand to be added)	34 to 39
American gypsum block	10 to 12 (sanded 2½ to 1)	14 to 16 (equal parts sand to be added)	26 to 29

American Bond Plaster for Concrete Surfaces

This is a plaster made for direct application on interior concrete surfaces. American bond plaster needs the addition of water only to prepare it for use, and its cohesive and adhesive properties make it an ideal plaster for application on interior concrete surfaces.

See specifications.

Gypsum Prepared Finishes, Trowel and Sand Float

These finishes made from gypsum are ready for application with the addition of water only. They are machine mixed, thereby producing an absolutely uniform distribution of their ingredients, which eliminates chance of errors at mixing box.

Decorative treatment can be applied as soon as finish is dry.

Smooth trowel finish is made from the finest selected gypsum rock and ingredients of a high standard of purity.

Sand float finish is made from high grade gypsum rock and materials that have been developed after much study to meet the demands of our trade for a moderate cost prepared finishing plaster.

Gypsum Gauging Plasters for Lime Putty Finishes

Our gypsum plasters made for this purpose are manufactured from carefully selected dry gypsum rock which for its purity and adaptability for manufacturing the highest grade finishing plaster is unexcelled. They are uniformly ground to the exact proper fineness for a finishing plaster to mix freely and quickly with lime putty.

For cool-working finishing plaster to produce an enduring smooth surface of snow white appearance specify our Satin Spar brand.

Sunflower Moulding and Casting Plaster

Our Sunflower moulding and casting plaster is manufactured at our Blue Rapids, Kansas, mill only.

The natural purity of the gypsum and the care taken in its manufacture produce the exact proper fineness and setting time. Sunflower moulding and casting plaster has those soft and smooth working qualities which are necessary in order to form clearly and distinctly the most delicate decorative plastic ornamentation.

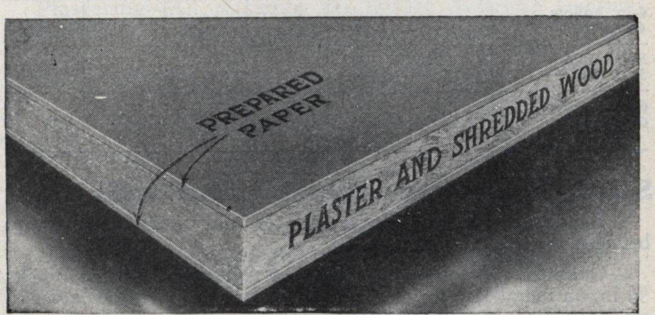
Best Bros. Keene's Cement

Manufactured by the Best Bros. Keene's Cement Company, Medicine Lodge, Kan. (See their pages in this edition.) Carried in stock at all of our mills for shipment with other commodities as manufactured by our company. The best Keene's cement manufactured in the United States.

Beaver Gypsum Lath

Beaver gypsum lath (plaster board) is composed of gypsum plaster mixed with a small percentage of shredded wood fiber, and both sides surfaced with a specially prepared paper.

It is a fire, sound, heat and cold resisting lathing and sheathing material and forms a perfect backing for gypsum plasters. It strengthens the building when used as sheathing or lathing; avoids lath buckling, stains and discoloration; saves fuel, time, labor and money.



Section of Beaver Gypsum Lath

Sizes and Thicknesses—Manufactured in standard sizes of, approximately, 24x32 in., 32x36 in. and

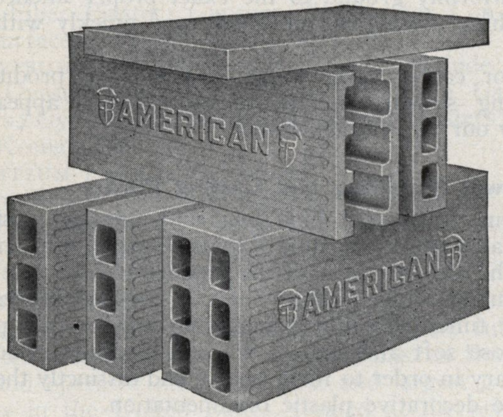
Continued on next page

32x48 in. and ⅜ in. thick. It weighs, approximately, 2 lb. per sq. ft.

Special sizes made for Simplex system for suspended ceilings and non-bearing partitions.

Beaver American Gypsum Block

This gypsum product has established a high reputation in the building world through repeated use by representative architects, contractors and builders. It is fireproof (approved by the National Board of Fire Underwriters); is a non-conductor of heat, cold and sound; is light in weight, strong and tough; erects economically without waste, and is recognized as the modern non-bearing partition and furring material for fireproof buildings.



Beaver American Gypsum Block

SIZES AND WEIGHTS OF BEAVER AMERICAN GYPSUM BLOCK

Size, in.	Ceiling height, ft.	Weight Block per sq. ft., lb.	Weight plaster 1 side per sq. ft., lb. (¼-in. grounds)	Total weight plastered 1 side per sq. ft., lb.	Weight plaster 2 sides per sq. ft., lb. (¼-in. grounds)	Total weight plastered 2 sides per sq. ft., lb.
1½-in., split 1½x12x30	Furring	5	3	8	....	....
2-in. split 2x12x30	Furring	6	3	9	....	....
2-in. solid 2x12x30	10	9.3	3	12.5	6	15.2
3-in. hollow 3x12x30	13	9.3	3	13	6	15.3
3-in. solid 3x12x30	15	12.5	3	15.5	6	18.5
4-in. hollow 4x12x30	17	12.0	3	16.0	6	18.0
5-in. hollow 5x12x30	25	15	3	18	6	21
6-in. hollow 6x12x30	28	19	3	20	6	23

Specifications for American Gypsum Plasters

Studs and Joists—To be spaced not more than 16 in. between centers.

Grounds—To be ½ in. on Beaver American Gypsum Block; ⅝ in. on metal lath, brick and clay tile, ¾ in. on wood lath and on ¼-in. Beaver Gypsum Lath; ⅞ in. on ⅜-in. board.

Wood Lath—To be of good quality, straight grained and free from knots, bark and sapwood. To be spaced ⅜ in. apart with not less than ⅛ in. space between ends; with joints broken every fifth lath. To be well nailed to each stud and joist with 3d lathing nails. If lath are dry, they are to be thoroughly wetted at least 4 hours before mortar is applied to them, so that they will not swell or warp after the plaster is on them.

Grooved Sheathing Lath—To be well nailed to studs spaced not more than 16 in. between centers; to be spaced at least ⅛ in. apart, and to be thoroughly wet at least 4 hours before plaster is applied to them, so that they will not swell or warp after plaster is on them.

Brick and Tile—To be dampened before plaster is applied to them.

Concrete—Surface to be cleaned free from all efflorescence, dust, dirt and oil, and, where very smooth, to be well hacked before mortar is applied.

Sand—To be clean, sharp, and free from clay, soil, alkali, salt and quicksand.

Mortar; Hair Fibered and Unfibered Plasters—*On Beaver Gypsum Lath—(Plaster Board)*—To be 1 part plaster to 2 parts sand.

On Wood Lath and Metal Lath—First coat to be 1 part plaster to 1½ part sand; second coat to be 1 part plaster to 2 parts sand.

On Brick and Tile—Mortar to be 1 part plaster to not more than 2½ parts sand.

Mortar; Wood Fiber Plaster—For making extremely light tough plastering, it is recommended that the wood fiber plaster be used without sand; but it will make excellent plastering when the mortar is equal parts of the wood fiber plaster and clean sharp sand.

Mortar; American Bond Plaster—*For Plastering on Concrete*—To be American Bond Plaster properly mixed with water with no other material added.

Mixing Sanded Mortar—All mortar to be mixed in clean tight boxes; the plaster and sand to be first thoroughly mixed dry, then immediately tempered with sufficient water to make good stiff mortar. No part of one batch of mortar is to be mixed with another batch in the mortar box or on the mortar board, and no mortar is to be used or worked after it has partly set.

Mortar box, tools, hods, mortar board and water to be kept clean and free from set and partly set plaster, unless quick setting mortar is desired.

Mixing Wood Fiber Mortar—Plaster to be put in one end of mortar box, water in other end; then plaster to be slowly hoed into water and thoroughly mixed until there are no lumps or dry plaster in the mortar. No part of one batch of mortar is to be mixed with another batch in the mortar box or on the mortar board, and no mortar is to be used or worked after it has partly set. Mortar box, tools, hods, mortar board and water to be kept clean and free from set or partly set mortar, unless quick setting mortar is desired.

Applying Mortar to Beaver Gypsum Lath (Plaster Board)—The boards not to be wetted before mortar is applied. All spaces between boards to be well filled with mortar, either by pointing the joint with quick setting neat plaster, or by carefully pressing the mortar used for first coat into the spaces between the boards as the first coat is put on. The second coat to be straightened with rod and darby ready for the finish coat, and must not be floated.

Applying to Wood Lath—First coat to be applied with sufficient pressure to form good keys, leaving a light coat of mortar over the lath, with surface rough. The second coat to be applied with strong pressure, when the first coat has set hard, but before the first coat is dry; and is to be straightened with rod and darby.

Applying to Metal Lath—The first coat to be applied so as to fill the meshes and lightly cover the lath. The second coat to be applied when the first coat is set hard, but before the first coat is dry.

Applying to Brick and Clay Tile—Crooked, uneven walls to be first straightened by filling the low places with mortar. After mortar used to straighten walls has set, sufficient mortar to fill out to grounds to be applied with strong pressure, and straightened ready for the finish coat.

Applying to Concrete—Where work can be straightened with 1 light coat of mortar, sufficient mortar to fill out to grounds is to be applied in 1 coat with strong pressure, and straightened ready for the finish coat. Where work can not be straightened with 1 light coat, 2 coats are to be applied; the first coat to be set hard before applying second coat.

Finishing Plaster—*Mortar for Smooth White Finish*—To be 1 measure of Gypsum Finishing Plaster to not more than 3 measures of perfectly slaked lime putty; the plaster and lime to be thoroughly and uniformly mixed.

Mortar for Cement Finish—To be 1 measure of Unfibered Cement Plaster to not more than 3 measures of perfectly slaked lime putty, thoroughly and uniformly mixed.

Continued on next page

Mortar for Sand Float Finish—To be Unfibered Cement Plaster, perfectly slaked lime putty, and clean, sharp sand, thoroughly mixed in the proportions of 4 measures of plaster, 1 measure of lime, and 5 measures of sand.

Mortar for Prepared Finishes—To be made of the prepared finish mixed with water only.

Applying Finish Coat—Troweled finish coat to be applied after base coat has set and dried, the base coat to be slightly dampened to reduce suction, before finish coat is applied.

Applying Sand Float Finish Coat—The base coat to be set hard, but not dry, when finish is applied.

Care of Plaster After It Is On the Wall—In hot, dry, or windy weather, plastering is to be protected from wind, and if necessary, sprinkled with water, to prevent the plastering drying out too much before it has set. In freezing weather, plastering to be protected from frost until it has set hard. When plastering has set, doors and windows are to be kept open, so that the plastering will dry quickly.

Specifications for Beaver Gypsum Lath (Plaster Board)

Boards are not to be wetted before applying mortar to them.

Studs and Joists—To be set on 12 or 16-in. centers.

Spacing—Boards to be spaced ¼ in. apart with nailing edges bearing not less than ¾ in. on studs or joists, with horizontal joints in walls and joints at right angles with ceiling joists, broken at each board and with vertical joints on opposite sides of partitions not on the same studs.

Nailing—Nails to be 1¼-in., 11½ gauge, 7/16-in. head wire nails, set not more than 6 in. apart, and driven home, the center of board to be nailed first.

Pointing—The spaces between boards to be well filled with mortar, either by pointing the joints with quick setting neat mortar before the first coat of plaster is applied, or by pressing mortar used for the first coat well into the joints when the first coat is applied.

Specifications for Beaver American Gypsum Partition and Furring Block

Work to be Done—All partitions and furring, unless otherwise specified or shown, shall be built of Beaver American Gypsum Block as manufactured by American Cement Plaster Division, of thickness specified.

General—In fireproof construction all Beaver American Gypsum Block shall be started with a gypsum mortar bed laid on fireproof construction. Block courses must not be started on frozen concrete nor on cinder concrete when such is used for the purpose of fill only.

Partitions—All non-bearing partitions of Beaver American Gypsum Block shall be laid with vertical joints broken. Such partitions shall extend from floor to ceiling, shall be wedged at the ceiling, and the joints slushed with gypsum mortar.

Intersections—All intersecting partitions shall be bonded by overlapping not less than at every third course.

Partitions intersecting brick, or other masonry walls, shall be securely anchored to such walls by means of "approved" masonry bond or metal anchors, or by 10d steel cut nails driven into the masonry joints at each gypsum block course.

Corners—Partitions shall be bonded at the corners by overlapping alternate courses (log cabin fashion).

Furring—Beaver American Gypsum Block furring shall be laid as herein required for partitions. All furring in contact with the construction shall be securely anchored to the masonry by means of 10d steel cut nails driven into the masonry joints at intervals not greater than every 3 ft. horizontally and vertically. Free standing furring shall be of not less thickness, nor of greater height, than is required for partitions. Metal ties or other "approved" methods for securing furring to the masonry may be used.

Bucks—***Wood***—Where wood bucks are used they shall be of not less than 2-in. lumber and of a width equal to the total thickness of the block and plaster constructions, and may or may not be rabbeted to receive the ends of the block; or the bucks shall be of a width equal to the thickness of block only and have not less than ½-in. grounds nailed to the sides and projecting beyond the buck not less than ¾ in., forming a rabbet to receive the ends of partition block.

All wood bucks shall be secured to the ends of the partition block with 10d cut nails driven into every course.

Metal—Where metal bucks are used they shall be of a width not less than the thickness of the block construction, and of such form as to receive the ends of the block. When the metal bucks are of a width equal to the thickness of the block construction, furring strips of wood shall be secured to the buck as a stop for the plaster coats and for a nailing base for trim. Where metal bucks are of a width to include the total thickness of the block and plaster construction, the trim shall be secured direct to the metal bucks or to wood nailing blocks bolted to the face of the bucks.

Lintels, Built-up—Openings in partitions of gypsum block not more than 22 in. in width can be spanned by a gypsum block. When such openings are more than 22 in. but not more than 4 ft. in width, the gypsum block over the opening shall be laid in the form of a jack arch. Skew-backs shall be cut in the block over the jambs, intermediate block shall be beveled to fit the skew-jacks, and a key block to fit shall be set in the center. Bevel cuts shall not be less than 4 in. to the foot. The skew-back block shall have a bearing on the jambs of not less than 12 in. nor shall they be set so as to project beyond the face of the jambs more than one-third of the bearing.

When jack arch construction is employed, the jack arch shall be reinforced with strips of not less than No. 14 gauge woven wire mesh not less than 2 in. in width, or the reinforcement may consist of two strips of not less than No. 24 gauge perforated metal not less than 1 in. in width. The reinforcement shall be continuous, and shall be laid in the mortar joint between the jack arch and the course immediately above, extending into the partition construction not less than 30 in. beyond the face of each jamb.

Lintels, Reinforced and Cast—Openings in partitions of gypsum block which are more than 4 ft. but not over 6 ft. in width shall be spanned by lintels of reinforced gypsum of monolithic design.

(a) Mat Reinforcement—Mat reinforced lintels shall be 12 in. in height and shall be reinforced with a galvanized welded wire mat on each side (face) of the lintel. Each of the welded wire mats required shall consist of not less than three No. 12 gauge wires, for the full length of the lintel, spaced 5 in. on center, the bottom wire to be 1 in. from the bottom of the lintel. The longitudinal wires shall be secured to transverse wires of not less than No. 12 gauge which shall occur at not less than 9-in. intervals and shall be welded to the longitudinal reinforcement.

(b) Rod Reinforcement—Rod reinforced lintels shall be 12 in. in height and shall be reinforced with not less than two ¼-in. twisted rods for the full length of the lintel. One of the required rods shall be straight and the other shall be bent up for shear. The horizontal part of the reinforcement, at the bottom, shall be 1 in. from the lower face of the lintel and both ends of both rods shall, at their extreme ends, be bent so as to form an anchor within the material.

All reinforced gypsum lintels shall have a bearing on each jamb of not less than 8 in.

Lintels, Metal—Openings in partitions of gypsum block which are more than 6 ft. in width shall be spanned by metal lintels of approved design.

All metal lintels shall provide a distributed and uniform bearing on each jamb of not less than 8 in.

Mortar—All Beaver American Gypsum Block construction shall be laid up with a gypsum mortar composed of hydrated calcined gypsum thoroughly mixed in the proportions by weight of 1 part calcined gypsum to not more than 3 parts of clean, sharp, dry sand. Gypsum mortar shall not be retempered.

Plastering—All plastering on Beaver American Gypsum Block shall be done with gypsum plasters applied in accordance with the architect's specifications, or the specifications of the American Cement Plaster Division. When the plaster is applied the Beaver American Gypsum Block surface shall be so wetted that water will not be rapidly absorbed from the plaster, but not so wetted that water will remain standing on the surface.

Metal Lath—Lintels or bucks of metal or wood, and vertical joints between Beaver American Gypsum Block and other masonry construction shall be covered with strips of metal lath not less than 8 in. in width.

Trim—All wood or metal trim shall be of such design as to completely cover any junction between metal bucks or furring and the plaster coats.

Baseboards, chair rail, picture moulding and similar trim shall be secured to grounds or to nailing blocks set in the block construction for this purpose. Nailing blocks shall be not less than ⅞ in. thick, shall be nailed directly to the end of the gypsum block and shall be of such other dimensions as to completely cover the end of the block. When nailing blocks are used they shall be spaced not to exceed 30 in.

Blackboards, toilet and heavy fixtures shall be secured by bolting through the block construction, or shall be nailed to nailing blocks not less than 1½ in. thick of the character required for other trim, and spaced not to exceed 15 in.

ESTABLISHED 1889

THE BEST BROS. KEENE'S CEMENT CO.

MEDICINE LODGE, KANS.

BRANCH OFFICES

CHICAGO, ILL.   NEW YORK, N. Y.

BEST
BROS
KEENE'S
CEMENT
COMPANY
MEDICINE LODGE
KANSAS

Product

Manufacturers of Best Bros. Keene's Cement.

Grades of Cement

Best Bros. Keene's "Regular" for plastering and general finishing purposes.

Best Bros. Keene's "Fine" is made from selected gypsum rock. It is used for wainscots, columns, etc. It is also used for producing artificial caen stone and travertine finishes, and for backing up scagliola or art marble.

Best Bros. Keene's "Quickset" is used for castings.

Best Bros. Keene's "Superfine" is used for facing scagliola or art marble. It is slow setting, pure white, of high tensile strength and takes a high polish.

Description

The various grades of Best Bros. Keene's Cement are manufactured from gypsum rock of exceptional purity. Careful, standardized attention from quarry to finished product insures the uniform excellence of the various grades. Best Bros. Keene's Cement has been manufactured in the United States since 1889. The Best Bros. Keene's Cement Co. are not only the original and largest manufacturers of Keene's Cement in this country, but are the only concern making Keene's Cement exclusively.

Advantages

Best Bros. Keene's Cement forms the toughest, most durable and whitest wall it is possible to obtain, and can be trowelled or floated to practically any state or style of finish that may be desired. It is non-resonant, sanitary and fire resistant. It will not corrode metal lath. Best Bros. Keene's Cement also combines perfectly with lime. It possesses two other qualities of great value: first, the fact that it will keep indefinitely and can be used with perfect results after being stored for years; secondly, it can be retempered as often as necessary. It does not "kill."

Packages

Best Bros. Keene's Cement is packed in jute bags containing 100 lbs. each.

Additional

Comprehensive and detailed data is contained in the new Specification Booklet, which will be promptly supplied on request.

General Office Building, Atchison, Topeka & Santa Fe Railway Co., Topeka, Kans.

E. A. Harrison, Architect   H. W. Wagner, Chief Engineer   Swenson Construction Co., Contractors

Plastered throughout with Best Bros. Keene's Cement

Continued on next page

Specifications Suitable for the Use of Architects

Plastering—All plastering shall be done with Best Bros. Keene's Cement mixed and applied according to the specifications of the manufacturer, provided they do not conflict with the requirements herein.

Three-coat Work on Wood or Metal Lath—

(A) ***Scratch Coat***—Shall be mixed in the following proportions: To 160 pounds of lime putty add 700 pounds (42 No. 2 shovels) of sand and plenty of good, well beaten, water soaked cattle hair. Gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

(B) ***Brown Coat***—Shall be mixed in the following proportions: To 180 pounds of lime putty add 1050 pounds (63 No. 2 shovels) of sand, and gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

Two-coat Work on Tile, Brick or Gypsum Block—

(A) ***Brown (or Base) Coat***—Shall be mixed in the following proportions: To 150 pounds of lime putty add 1000 pounds (60 No. 2 shovels) of sand, and gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

Two-coat Work on Concrete Walls and Ceilings—

(A) ***Brown (or Base) Coat***—Shall be mixed in the following proportions: To 80 pounds of lime putty add 450 pounds (27 No. 2 shovels) of sand, and gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

Finish Coats—

Sec. 1. Smooth Finish—To each 100 pounds of Best Bros. Keene's "Regular" add 80 pounds of lime putty.

Sec. 2. Sand Float Finish—To 120 pounds of lime putty add 400 pounds (24 No. 2 shovels) of sand, and gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

Smooth Hard Finish for Bathroom, Wainscots and Similar Work—The finish coat shall be mixed in proportions of 400 pounds of Best Bros. Keene's "Regular" and 100 pounds of lime putty. (If an extra hard white finish is required, use Best Bros. Keene's "Regular" neat with no lime to be added).

Brick and Tile Surfaces—All brick and tile surfaces shall be thoroughly broomed off and washed before the mortar is applied, and shall be damp when it is applied.

Concrete Surfaces—New concrete must not be plastered until it is dry. All dust and loose particles shall be removed from concrete or cement surfaces by brushing well with a wire brush. The surfaces shall be washed with clean water and kept moist while the plaster is being applied. Should the concrete surfaces be oily or gummy, they must be washed with a 10% solution of muriatic acid and water (one quart of acid to a bucket of water), and washed out with clean water within twenty minutes after the acid solution is applied.

This coat must be laid on with a trowel or wooden float, and not touched again except to knock off the rough edges with the float. Great care must be exercised in applying the base coat to concrete. It must be laid on in one operation and not touched again, for if the coat is moved in any way the bond is broken.

Any plastered surfaces that are loose and not properly attached to the concrete after the mortar has dried out must be cut out and done over again, and sufficient area shall be thus removed to make a uniform surface without having the appearance of patch work.

Finish coat should never be applied direct to concrete walls or ceilings.

Grounds—On wood lath, grounds shall be ⅞ inch; on metal lath, ⅝ inch; on brick or tile, ½ inch.

Sand—Must be screened, clean and sharp; free from loam, quicksand or other impurities.

Lime—Hydrated lime shall be soaked in watertight boxes, for at least 24 hours before using.

Lump lime shall be well slaked; run through a sieve of $\frac{1}{16}$-inch mesh, and properly stored and protected for a sufficient time before using to ensure all particles being thoroughly slaked.

Lathing—Metal lath shall be either painted or galvanized. Wood lath shall be of a good grade, free from knots, sap and bark (white pine preferred). It shall be thoroughly dampened shortly before plaster is applied.

Specifications for Ornamental Work

Lathing—If the work is to be applied to lathed surfaces, only coated or galvanized metal lath shall be used.

Plastering—Scratch and brown coats shall be mixed in the same proportions as specified for wall surfaces (see above). Allow scratch coat to dry and brown out to within one-fourth inch of the finish coat with a muffled mould. The finish coat shall be applied while the brown coat is green.

Run Work—All mouldings, window stools, door and window trim and work of like character shall be run in Best Bros. Keene's "Fine."

Mouldings shall be run straight and true, using metal templates with profiles as given on full sized details.

Cornices—The finish coat for cornices shall be mixed in proportions of 400 pounds Best Bros. Keene's "Fine" and 200 pounds of lime putty.

Cast Work—Ornamental work of every kind, excepting run mouldings and cornices as previously specified, shall be cast with Best Bros. Keene's "Fine" used neat. (The contractor shall have the option of using Best Bros. Keene's "Quickset" in place of the "Fine" for this work). Add only sufficient water to bring it to the consistency of a thick paste. It shall be thoroughly pressed and worked into place, making all members neat and clean. All castings shall be set in place and securely anchored as hereinbefore specified.

Scagliola Work (Artificial Marble)—Scagliola columns, pilasters, walls, etc., shall be browned out to a true and even surface with a brown coat mixed in the following proportions: To 160 pounds of lime putty, add 700 pounds (42 No. 2 shovels) of sand, and plenty of good, well beaten, water soaked cattle hair. Gauge this mixture with one (1) bag of Best Bros. Keene's "Regular" of 100 pounds weight.

This work shall be done by the plastering contractor under the supervision of the contractor for the scagliola work.

After the base coat is dry, the scagliola contractor shall apply a brown coat of Best Bros. Keene's "Fine" mixed with marble dust in the proportions of 2 parts of Best Bros. Keene's "Fine" to 3 parts of marble dust. This brown coat shall be brought out to a thickness of ⅝ inch.

The facing, or finish coat shall be $\frac{3}{16}$ inch thick, and shall be composed of Best Bros. Keene's "Superfine" with sufficient dry colors to produce a correct reproduction of the type of marble specified. This finish coat shall be stoned with Bimmstein, Scotch hones and razor hones, and shall be filled between the different stonings.

This finish coat shall be polished with putty powder, oxalic acid and alcohol, and shall be brought to a high polish. No shellac or french polish will be accepted.

Where scagliola work is to be pre-cast, it shall be cast in moulds with a facing composed of Best Bros. Keene's "Superfine" as specified hereinbefore, and shall be backed up to the required thickness with a mixture composed of 2 parts of Best Bros. Keene's "Fine" and 3 parts of marble dust, and shall be reinforced with burlap.

THE AMERICAN HARD WALL PLASTER CO.

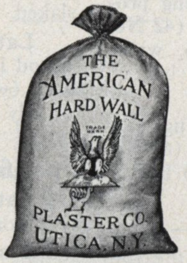
ESTABLISHED 1897

Manufacturers of Gypsum Wall Plasters

GENERAL OFFICE AND MILL
UTICA, N. Y.
MINE AND MILL, OAKFIELD, N. Y.

Products

American Neat (Unsanded) Plaster.
American Wood Fiber Plaster.
American First Coat (Sanded) Plaster.
American Sanded Wood Fiber Plaster.
American Concrete Bonding Plaster.
American Putty Finish (White).
American Complete White Finish.
American Complete Grey Finish.
American Sand Float Finish.
Also manufacturers of:
American Stucco Kote (a cement stucco in colors).
American Magnebestos (Magnesite) Stucco.



American Hard Wall Plasters

American Hard Wall Plasters are manufactured from the best quality of gypsum rock from our own mine at Oakfield, New York. Our mill being equipped with the most modern machinery, a quality product is assured at all times. Prompt shipments can be made of any of the above plasters, as well as mixed carloads containing plaster paris, finish hydrated lime, gypsum wall board, Keene's cement, plaster board, etc.

American Neat (Unsanded) Plaster—A hair fibered plaster to be mixed with two parts clean sharp sand. On brick, tile, or as a browning coat, three parts sand may be used. Mix dry to a uniform color, add water and temper to a good stiff mortar. Also manufactured with extra hair for use on metal lath and without hair for use on brick and tile walls and as a browning coat.

American Wood Fiber Plaster—Fibered with shredded wood. Can be used without the addition of sand, or, if desired, equal parts of clean sharp sand may be added. If sand is added, mix dry to a uniform color, add water and temper to a good stiff mortar. It is important that wood fiber plaster be thoroughly mixed to avoid dry lumps.

American Concrete Bonding Plaster—Ready for use with the addition of water. Mix and let soak for about fifteen minutes. Then remix to proper consistency.

American First Coat (Sanded) Plaster—Ready for use with the addition of water. Also manufactured with extra hair for use on metal lath and without hair for use on brick and tile walls and as a browning coat.

American Sanded Wood Fiber Plaster—Fibered with shredded wood and contains a small amount of carefully graded sand. Ready for use when mixed with clean water.

American Putty Finish—A hard white coat for finishing, requiring the addition of lime putty at the building. When using hydrated finishing lime for putty it should be soaked twenty-four hours, or longer. Putty made from lump lime should be cured for two weeks or longer before use, and must be thoroughly slaked. Add one part American putty finish to two parts lime putty by measure. Place putty and finish in opposite ends of mixing box, mix adding water to bring to proper consistency. Requires from one to one and one-half hours to set.

American Complete White Finish—Produces a white hard finish. Ready for use with the addition of water. Place finish in one end of box and water in other end, mix to proper consistency.

American Complete Grey Finish—Similar to the Complete White Finish above, but of a grey color. Suitable for walls requiring decoration.

American Sand Float Finish—Ready for use with the addition of water. Mix as directed for Complete White Finish. Finish walls with felt, cork or carpet float depending on coarseness desired.

Note: All American Finishes are prepared at the factory and are intended for use without the addition of any solid matter whatever, with the exception of American Putty Finish, to which lime putty is to be added.

Packages—American Plasters are furnished in 100-lb. burlap bags and 80-lb. paper sacks at option of customer.

General Directions and Requirements

Plaster must be kept in dry storage. Never on the ground or against damp walls.

In mixing, a clean, tight box, approximately, 3x6 feet should be used, raised about 4 inches on one end.

Mixing box to be thoroughly cleaned after each batch.

Only clean water free from alkali, salt or other impurities to be used.

Water in which tools are rinsed should never be used.

Tools to be kept clean.

Never mix one batch with another or attempt to retemper plaster after it has commenced to set.

Mix only a quantity which can be applied in one hour.

Should sand be added at the building, it must be clean, sharp sand, free from frost, loam, dirt, or other impurities and of good voidage. Avoid quicksand.

Plaster and sand to be thoroughly mixed dry to a uniform color before adding water.

Put plaster (or plaster and sand after being thoroughly mixed dry) in raised end of mixing box, water in other end, and hoe plaster into water slowly, mixing thoroughly. Mix thin at first, adding sufficient dry material to bring to proper consistency.

Specifications

Grounds—Wood lath ¾ inch. Metal lath ¾ inch. Brick and tile ⅝ inch. Gypsum blocks ½ inch.

Wood Lath—Lath to be best obtainable, free from sap, bark, or knots, well nailed, joints broken every fifth lath with at least ¼-inch space at ends. They should be thoroughly soaked several hours before plastering, to absorb all the water possible. Apply plaster with sufficient pressure to obtain a good clinch. Screed, plumb, and leave back from face of grounds for finish coat. Do not float.

Metal Lath—Lath to be applied in accordance with manufacturer's directions. Apply plaster lightly—but with sufficient pressure to fill keys and cover lath with a thin coat of plaster, leaving rough to receive the second coat. When set, but before dry, apply second coat with strong pressure. Screed, plumb, and leave back from face of grounds for finish coat. Do not float.

Gypsum Blocks, Brick and Tile—Soak walls to reduce suction. Apply plaster with strong pressure. Screed, plumb, and leave back from face of grounds for finish coat. Do not float. In case walls are very uneven fill low spots first to prevent applying too heavy a coat at one time.

Concrete Surfaces—All concrete to be poured in forms using rough boards. All oil or dressed boards to be avoided. Concrete surface to be dry and free from dust, oil or efflorescence, before bonding plaster is applied. It case oil or grease should, through accident, show on the concrete surface, it must be burnt off with a torch and any efflorescence should be scrubbed off with a wire brush and a solution of muriatic acid, after which application the concrete should be thoroughly washed with clean water. Only water is to be added to the bonding plaster, which should be very thoroughly mixed. Do not apply any greater thickness of plaster than is absolutely necessary to bring work to a level surface.

CERTAIN-TEED PRODUCTS CORPORATION

(ACME CEMENT PLASTER CO.)

GENERAL OFFICES
100 East 42nd Street
NEW YORK, N. Y.

BRANCH OFFICES

ATLANTA, GA.
BALTIMORE, MD.
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MILLS AND PLANTS

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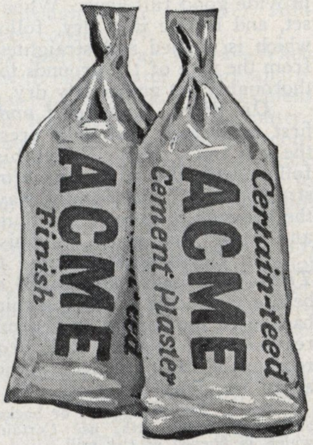
GRAND RAPIDS, MICH.
LARAMIE, WYO.
CEMENT, OKLA.
GYPSUM, ORE.
ACME, TEX.
ACME, OKLA.
ACME, N. M.

Products

Certain-teed Acme Plasters; Certain-teed Acme Keene's Cement; Certain-teed Acme Wood Fibered Plasters; Certain-teed Acme Gypsum Blocks.

Also, Certain-teed Acme Prepared Finishing Plasters, Certain-teed Acme Pure White Plaster Paris Finish, Certain-teed Acme Moulding and Casting Plasters, Gypsum Products.



For Linoleum, see pages 590-591; for Roofing and Building Paper, see page 1041; for Paints and Varnishes, see pages 1672-1673.

Reputation and Guarantee

The Certain-teed Acme products have a national reputation and are sold under a guaranteed trade-mark to meet every requirement of the American Society for Testing Materials as to quality, tensile and crushing strength, spreading and covering capacity, and working qualities; and the fire resisting and endurance properties required by the Underwriters' Laboratories, Inc.

Certain-teed Acme Plaster continues to be made by the same organization that has for years made Acme what its name implies—the very Acme of quality. In becoming a part of the Certain-teed business, Acme has all the advantages that it had formerly, plus the backing of the greater Certain-teed organization and resources.

Certain-teed Acme Plaster

The original natural (gypsum) cement plaster first introduced in the United States. It will keep in good condition in stock; it works evenly and uniformly and possesses physical properties and durability which have made it a great favorite with architects, contractors and plasterers.

Covering Capacity

Certain-teed Acme Gypsum Plasters, mixed and used in accordance with these specifications, will yield covering capacities as follows:

COVERING CAPACITY OF GYPSUM AND GYPSITE PLASTERS PER 100 SQ. YDS. FOR "LAID-OFF" WORK (3 COATS)
Material mixed and used as directed

Plastering surface	Neat Cement Plaster, No. of 100-lb. bags	Wood Fiber, No. of 100-lb. bags	Sanded Plaster, No. of 100-lb. bags
Wood lath	9 to 12 Sanded 2 to 1	14 to 17 Unsanded	22 to 24
Metal lath	16 to 19 Sanded 2 to 1	20 to 25 Unsanded	45 to 50
Plaster board	8 to 9 Sanded 2 to 1	12 to 15 Unsanded	22 to 24
Brick and clay tile	14 to 17 Sanded 3 to 1	18 to 20 Equal parts sand to be added	34 to 39
Certain-teed Acme gypsum blocks	10 to 12 Sanded 3 to 1	14 to 16 Equal parts sand	36 to 39

Architects' Specifications for Certain-teed Acme Plasters

(1) General Requirements

Quality of Plaster—The quality of Certain-teed Acme Plasters, required under these specifications, shall be not less than equal to that prescribed in Standard Specifications for Gypsum Plasters (Serial Designation C28-21) of the American Society for Testing Materials. The plaster must be in good condition when received on the building site and, if not immediately used, must be stored under cover and off the ground in a dry place. Plastering must not be done upon any surface, of whatever character, which contains frost, and all plastering must be kept from freezing.

Mortar Box—The mortar box must be kept clean and must be scraped and thoroughly cleaned out prior to the mixing of each batch of plaster. (Certain-teed Acme Plasters "set" and can not be retempered after the set begins. A very little "set" plaster in cement plaster mortar, whether from the mortar boxes, the water barrel in which tools have been washed, or droppings from the floor will cause all the mortar to "set" too quickly.)

Water—The water used for mixing must be clean, free from alkali and impurities and must not contain alum, sulphur, organic or vegetable matter. The use of water from stagnant pools or wells will not be permitted.

Sand—All sand used must be dry, clean and sharp, and shall conform as closely as possible to the following:

(a) It shall be free from salt and from alkaline, organic and other deleterious substances.

(b) It shall be graded from fine to coarse, and when dry not more than 10 per cent by weight shall be retained on a No. 8 sieve; not less than 80 per cent by weight shall be retained on a No. 50 sieve, and not more than 6 per cent by weight shall pass a No. 100 sieve. All sieves shall meet the specifications given in the Bureau of Standards' Standard Screen Scale.

Bases or Backgrounds—Surfaces to be plastered upon must be in proper condition to receive the plaster. Surfaces of

Continued on next page

masonry must not be too dry nor too wet. Gypsum tile, soft burned clay tile, soft brick or similar porous materials must be sprinkled with water (this process reduces suction) prior to the application of the plaster.

Wood lath must be thoroughly wetted a few hours before plastering.

Plaster board lath shall *not* be wetted before plastering.

Concrete Surfaces—Prior to plastering, all concrete surfaces which, under these specifications, are to be plastered, shall be put in condition to receive and retain the plaster coats, as follows:

(a) Remove with a wire brush all dust and loose particles. Grease, oil or efflorescence shall be washed off with a solution of one part of commercial muriatic acid to four parts of water, and the surface so treated washed again, with clean water.

(b) Smooth and dense surfaces must be hacked so as to provide a rough base or background for the plaster, or shall be treated with layers of asphalt applied with force and into which there is afterwards driven a coarse rough grit. Plastering upon smooth concrete surfaces, which are first covered with so-called waterproof paints or compounds will not be allowed.

(c) All plastering upon concrete surfaces shall be applied in light thin coats.

Metal Lath—All expanded or sheet metal lath used shall be of ...... brand, ... gauge and shall weigh not less than .... pounds per square yard. Wire lath shall be woven of No. .... wire having not less than two and one-half meshes per linear inch. All metal lath shall be covered with protective pigment or shall be galvanized and shall be applied in accordance with the recommendations of the Associated Metal Lath Manufacturers.

Plaster Board Lath—All plaster board lath shall consist of one or more layers of gypsum reinforced on the surfaces with fibrous binding material. The quality, dimensions, weight and strength of gypsum plaster board shall conform to the specifications for such of the American Society for Testing Materials (Serial Designation C37-22T) and shall be applied in accordance with the recommendations of The Gypsum Industries.

Wood Lath—Shall be of good grade white pine, cypress, spruce or other approved wood. The dimensions and application shall conform to the recommendations of the National Lumber Manufacturers Associations.

Drying of Plaster—Gypsum plastering operations must be conducted in such manner as to prevent the possibility of the plaster drying out before it has set. Uneven and too rapid drying must be prevented. When the material has set provide for free and even circulation of air. All necessary precautions must be taken to prevent freezing during cold weather. Certain-teed Acme Plaster mortar will "set" quick and work short if there is delay in tempering with water after sand has been mixed with it. It will spread a little easier if allowed to stand a few minutes after it has been tempered. To get the maximum tensile strength, plaster should be tempered as stiff as the mortar can be conveniently worked.

If finished walls are soft and chalky, it is because the water in the mortar has been evaporated before the plaster has "set." Spraying the walls with clean water, or with brush and water having powdered alum dissolved in it, is the remedy.

Grounds—All gypsum plaster, unless otherwise prescribed for fire protection or other purposes, shall be applied to not less than the following grounds:

⅞ inch, for ⅜-inch thick gypsum plaster board.

¾ inch, for expanded and sheet metal lath, woven wire lath, ¼-inch thick gypsum plaster board and wood lath.

⅝ inch, for brick and clay tile surfaces.

½ inch, for gypsum tile, concrete or similarly smooth masonry.

Note: All grounds include the thickness of the lath. Where, of necessity, grounds are to be applied over gypsum plaster board, they are to be reduced in thickness an amount equal to the thickness of the board and shall be secured by nailing through the plaster board into the support.

(2) Certain-teed Acme Neat (Cement) Plaster

Mixing—First mix dry plaster and dry sand to an even color, then apply water, hoeing material into the water and mixing thoroughly to proper consistency for application. Do not mix more material than will be used in about an hour. Material must not be retempered after it has started to set.

Proportion—For first coat on gypsum plaster board lath, wood wire, expanded or sheet metal lath: 1 part plaster to 2 parts of sand, by weight.

For brick, gypsum or clay tile, and for the second (browning) coat: 1 part of plaster to 3 parts of sand, by weight.

For clean and rough concrete surfaces: 1 part of plaster to not more than 2 parts, by weight of sand. When the surface is smooth, reduce quantity of sand to possibly less than 1 part by weight.

Application—This Certain-teed Acme Gypsum Plaster shall be applied to the bases or backgrounds as follows:

On Gypsum Plaster Board (Two-coat Work)—Work plaster well into all spaces between the boards and follow at once with the base or first coat which is applied and straightened in regular way, keeping back from the face of the grounds to receive the finishing coat. When thoroughly set and nearly dry, apply the finishing coat.

On Gypsum Plaster Board (Three-coat Work)—Apply the first or scratch coat, working it well into all spaces between the boards. When this coat has been scratched, has set, and before it is dry, follow with second or browning coat which is applied and straightened in regular way keeping back from the face of the grounds to receive the finishing coat. When thoroughly set and newly dry, apply the finishing coat.

On Wood Lath (Two-coat Work)—First wet the lath thoroughly so that all swelling of the wood will take place in advance of the application of the plaster. Apply base or first coat with pressure to fill all spaces between the lath and provide good full keys; straighten in the regular way, keeping back from the face of the grounds to receive the finishing coat. When thoroughly set and nearly dry, apply the finishing coat.

On Wood Lath (Three-coat Work)—Wet the lath thoroughly, as required for two-coat work. Apply the first or scratch coat with pressure to fill all spaces between the lath and provide good full keys. When this coat has been scratched, has set, and before it is dry, follow with second or browning coat which is applied and straightened in regular way, keeping back from the face of the grounds to receive the finishing coat. When thoroughly set and nearly dry, apply the finishing coat.

On Wire, Expanded and Sheet Metal Lath—Apply the first or scratch coat with pressure to fill all meshes and cover the lath and scratch. When this coat has set and before it is dry, follow with the second or browning coat which is applied and straightened in the regular way, keeping back from the face of the grounds to receive the finishing coat. When thoroughly set and nearly dry, apply the finishing coat.

On Certain-teed Acme Gypsum Block, Brick or Clay Tile—When necessary to kill excessive suction, wet the surface before plastering. Apply a thin coat of the plaster, then double back with the second or browning coat which is straightened in regular way keeping back from the face of the grounds, to receive the finishing coat. When thoroughly set and nearly dry, apply the finishing coat.

Note: For open bases or backgrounds such as wood, wire, expanded and sheet metal lath, use Certain-teed Acme Neat (Cement) Plaster which is fibered at the mill.

On Concrete Surfaces—Condition the surface to receive the plaster coats, as specified under (1) General Requirements for Concrete Surfaces. Apply plaster in light thin coats.

(3) Certain-teed Acme Wood Fibered Plaster

The addition of wood fiber gives toughness and elasticity, making plastered walls that will bend without cracking, and preventing lath cracks. An extra good material for finishing concrete ceilings.

Ideal for use where good sand is not available at reasonable cost; and can be made so that an equal measure of inferior quality of sand may be gauged with it, giving good results.

Mixing (without Sand)—Hoe material into water allowing it to soak for a few minutes before using.

Mixing (with Sand)—First mix dry plaster and dry sand to an even color, then apply water, hoe material into the water, mix thoroughly, and allow it to soak for a few minutes before using.

Proportions—For first coat on gypsum plaster board, lath, wood wire, expanded or sheet metal lath: Mix with water only.

For brick, Certain-teed Acme Gypsum Blocks or clay tile and for the second or browning coat: Mix with water only, or with an equal part by weight of sand.

For clean and rough concrete surfaces: 1 part of plaster to 1 part of sand, by weight. When the surface is smooth, use the wood fibered plaster without sand.

Application—This gypsum plaster shall be applied to the bases or backgrounds in a manner similar to that specified for gypsum neat (cement) plaster.

(4) Certain-teed Acme Keene's Cement

General Requirements—Grounds—Lath and sand same as Certain-teed Acme Plasters.

Directions for Applying—Gauging for Wood Lath—*(a) First Coat*—Equal parts Certain-teed Acme Keene's Cement and finely strained, well seasoned lime putty, making 1

Continued on next page

part; to this mixture add 2 parts clean, sharp sand. Fiber well with cattle hair or other equally good fiber, and add sufficient water to temper to proper consistency. Scratch or broom and then let dry.

(b) Second Coat—(When scratch coat is bone dry, dampen with clean water before applying second coat.) Shall consist of equal parts Certain-teed Acme Keene's Cement and finely strained, well seasoned lime putty, making 1 part; to this mixture add 3 parts clean, sharp sand for ceilings [add 5 parts sand for walls]. Add sufficient water to temper to proper consistency. Droppings may be retempered and used if done promptly.

(c) Third Coat—Specify any of the alternative finishes under heading "Certain-teed Acme Keene's Cement finishes."

Certain-teed Acme Gypsum Block, Tile or Brick—

(a) First Coat—Equal parts of Certain-teed Acme Keene's Cement and finely strained, well seasoned lime putty, making 1 part; to this mixture add 3 parts clean, sharp sand for ceilings [add 5 parts sand for walls]. Add sufficient water to temper to proper consistency.

(b) Second Coat or Finishing Coat—Specify Certain-teed Acme Keene's Cement Smooth Finish or any of the other methods of "finish" as shown.

Certain-teed Acme Keene's Cement Finishes—

For Smooth Finish—When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Certain-teed Acme Keene's Cement and finely strained, well seasoned white lime putty, making 1 part; to this mixture add 1/6 part clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

For Bathroom Wainscoting and Similar Work—When brown coat is bone dry, dampen with clean water before applying finish coat. One part Certain-teed Acme Keene's Cement and ½ part finely strained, well seasoned white lime putty; to this mixture add sufficient water to temper to proper consistency. In laying off wainscoting in imitation of tiling, brick or stone, the finish must be sufficiently hard for the tools to cut sharply defined lines without tearing the walls. Do not draw the lines deep; only deep enough to show distinctly.

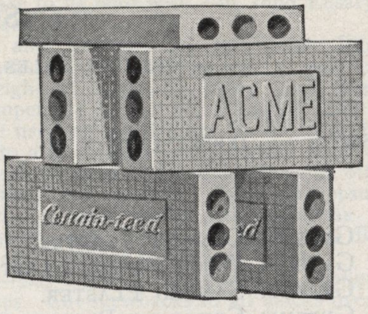
For Trowel Sand Finish—When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Certain-teed Acme Keene's Cement and finely strained, well seasoned white lime putty, making 1 part; to this mixture add ½ part clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

For Float or Sand Finish—When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Certain-teed Acme Keene's Cement and finely strained, well seasoned white lime putty, making 1 part; to this mixture add 2 parts clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

General Directions for Mixing Finish Coat—First add some clean water to the Certain-teed Acme Keene's Cement, and quickly break up the initial set; then add other ingredients as required for the different finishes, as given above.

Certain-teed Acme Gypsum Blocks

Certain-teed Acme Gypsum Blocks are singularly adapted for use in all fireproof partitions, corridors, column covering and wall furring. Made from purest gypsum and fiber under a fully protected formula. Certain-teed Acme Gypsum Blocks by test have proved to embody maximum density, greatest crushing strength, supreme fire, sound, and vermin proof qualities, less absorption and negligible breakage. They are light in weight, reducing cost of freight and handling.



CERTAIN-TEED ACME GYPSUM BLOCKS

Both sides of Certain-teed Acme Gypsum Blocks are marked off by inches both longitudinally and vertically. This feature minimizes labor expense and expedites erection.

Architects' Specifications for Certain-teed Acme Gypsum Blocks and Lintels

(1) General Requirements—

The quality, size, dimensions and strength of Certain-teed Acme Tile or Block, required under these specifications, shall be not less than equal to that prescribed in Tentative Specifications for Gypsum Partition and Furring Tile (Serial Designation C52-24T) of the American Society for Testing Materials.

All rough bucks for openings to the exact size of openings; set in place by the carpenter, securely braced and left plumb and true for the masonry contractor. All bucks to be exact size of abutting partitions and 2 inches thick, and have grounds 2½ in. wide by ½ in. thick, nailed thereon to receive the ends of the Certain-teed Acme Gypsum Blocks.

(2) Directions for Applying—

Furring—Fur outside walls with 2-inch hollow back Certain-teed Acme Gypsum Blocks, laid up against the walls and securely spiked to the walls with 20d nails.

Interior Columns—All exposed interior columns to be covered with 2-inch solid or 3-inch hollow Certain-teed Acme Gypsum Blocks, securely bonded with gypsum mortar.

Mortar—Set all Certain-teed Acme Gypsum Blocks in a mortar composed of 1 measure Unfibered Certain-teed Acme Plaster, 3 equal measures clean, sharp, coarse sand, and tempered clean water to the consistency of bricklayers' cement.

Ceiling Heights—Use sizes of blocks for ceiling heights as provided by the National Board of Fire Underwriters, or as follows:

Non-bearing corridor and room partitions, not exceeding 13, 17 and 22 feet in height, 3, 4, and 5-inch hollow blocks, respectively; 6-inch hollow block to ceilings over 22 feet and up to 30 feet; 8-inch hollow block when over 30 feet and up to 40 feet.

Certain-teed Acme Gypsum Lintels—Over all openings less than 5 feet in width, place a Certain-teed Acme Gypsum Lintel of the same thickness as the wall. This lintel to be 12 inches longer than the width of the opening, and to have not less than 6-inch bearing on wall on either side, well bedded in gypsum mortar and kept ½ inch above wood buck or jamb. Over all openings more than 5 feet, place the iron channels supplied for these openings by the general contractor.

EBSARY GYPSUM COMPANY, INC.

SCOTTSVILLE, N. Y.

GENERAL SALES OFFICES, 103 Park Avenue, NEW YORK, N. Y.

SALES OFFICES

BOSTON, MASS. JERSEY CITY, N. J. PHILADELPHIA, PA. WASHINGTON, D. C. NEWARK, N. J.

Products

- Ebsary Gypsum Cement Plaster.
- Ebsary Gypsum Wood Fibred Plaster.
- Ebsary Gypsum Sanded Plaster.
- Ebsary Gypsum Concrete Plaster.
- Ebsary Gypsum Partition Block.
- Ebsary Gypsum Roof Block.

Ebsary Gypsum Plaster

Gypsum Plaster is shipped in 100-lb. jute bags and 80-lb. paper bags. Careful attention is given to the manufacture of this plaster so that it will work perfectly under varying climatic conditions, and each individual market is supplied with a plaster that will work best under the particular conditions prevailing.

Cement Plaster—Is prepared for use in the larger cities and where the sand conditions are good. This is the material that is distinguished by the well-known Ebsary Blue Tag and is well and favorably known throughout the East.

Wood Fibred Plaster—Is intended for those sections of the country where the sand obtainable is not of as good quality as would be required for use with Cement Plaster, and also where a particularly smooth and easy working plaster is desired.

Sanded Plaster—Is a prepared plaster requiring only the addition of water when it is used and it is used where sand is not obtainable locally, and also it is a fine material to use where skilled labor can not be secured.

Concrete Plaster—Is especially prepared to be used directly upon smooth concrete walls and ceilings and requires only the addition of water when being mixed.

When architects specify Ebsary Plaster they can depend upon receiving a plaster that is uniform in quality and dependable under the practical conditions met with upon all types of building construction.

Representative Jobs—This plaster was used in the following representative buildings, by architects who are well-known throughout the profession:

New Equitable Society Building, New York, Starrett & Van Vleck, Architects
Liggett Building, New York, Carrere & Hastings, Architects
Park-Lexington Building, New York, Warren & Wetmore, Architects
Hotel Statler, Buffalo, George B. Post & Sons, Architects
Craftsman's Club, Philadelphia, Clyde S. Adams, Architect
Lankenau Hospital, Philadelphia, John T. Windrim, Architect
Law Building, Norfolk, Peebles & Ferguson, Architects
Home for Incurables, Washington, Appleton C. Clark, Architect
Shelton Hotel, New York, Arthur Loomis Harmon, Architect

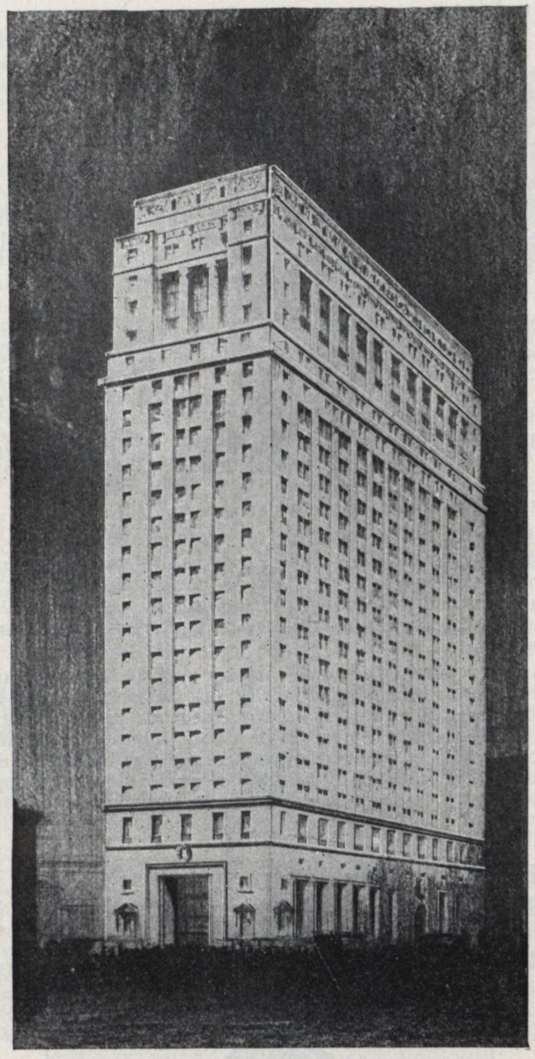
New Equitable Building, New York, N. Y.
Starrett & Van Vleck, Architects Thompson-Starrett Co., Contractors
James J. Conroy, Plasterer Central Builders Supply Co., Dealers
Ebsary neat plaster used throughout this building

New Statler Hotel, Buffalo, N. Y.
Geo. B. Post & Sons, Architects
Ebsary neat plaster and Ebsary gypsum blocks used in this building

Continued on next page

Ebsary Gypsum Roof Tile

Ebsary gypsum roof tile are made 12x30 in., 3 in. thick and reinforced with wire mesh, for use in roof construction in conjunction with tee-irons.



Packard Building, Philadelphia, Pa.

Ritter & Shay, Architects Thompson-Starrett Co., Contractors
J. J. Conroy, Plastering Contractor
Ebsary gypsum blocks and Ebsary cement plaster used

Ebsary Gypsum Partition Blocks

Ebsary blocks are made in all standard thicknesses for use in fireproof partition construction in first-class buildings. They have been tested and approved for this purpose by the Chicago Testing Laboratory of the National Board of Underwriters and are manufactured in accordance with their specifications and subject to their inspection. List of sizes and weights for various heights of partitions:

Size	Weight	Partition Height
2x12 in. x 30 in. solid	10 lbs. per sq. ft.	10 ft.
3x12 in. x 30 in. hollow	9.8 lbs. per sq. ft.	12 ft.
4x12 in. x 30 in. hollow	12.8 lbs. per sq. ft.	14 ft.
5x12 in. x 30 in. hollow	16 lbs. per sq. ft.	16 ft.
6x12 in. x 30 in. hollow	21 lbs. per sq. ft.	20 ft.

Specifications for Ebsary Gypsum Partition Blocks—
Partitions—All partitions are to be started on fireproof floor, blocks to be plumbed straight and true, wedged at ceiling and grouted with mortar. All corners to be dovetailed in log cabin fashion alternating the tile.

Wall Furring—All wall furring is to be built with Ebsary 2-in. Split Furring Blocks if close to the wall, or with 3-in. Partition Blocks if free standing. Wall furring is to be laid up in the same way as partitions and is to be held in place by galvanized metal or wire wall ties previously laid up in the brickwork.

Flues and Pipe Chases—Heating and ventilating flues and pipe chases are to be built with 2-in. solid Ebsary Blocks unless otherwise specified.

Mortar and Laying—Lay up Ebsary Blocks in Ebsary Gypsum Block-setting Cement using one part cement to three parts by weight of clean dry sharp sand thoroughly mixed. Do not retemper the mortar nor allow portland cement or lime mortar to be used on the gypsum blocks. Lay blocks with full flush joints to a line, bedded horizontally, level on each course. All joints and crevices between blocks and other work must be well grouted with mortar. Spike all gypsum block partitions into the existing walls, spiking in the joints of each course. Fasten wood door bucks to Ebsary Blocks with 10d cut nails in every course of blocks.

Lintels—Lay Ebsary Blocks over all openings in the form of jack arches. Cut skewbacks in all blocks over jambs. Level off intermediate blocks and set a keyblock in the center. To prevent cracking over doors where the span is over 3 ft., the block should be reinforced. Rods are inserted in the lower hole of block and then filled with mortar. The size and number of these rods will depend upon the span.

Wood Frames—Rough bucks for openings are to be set and secured in place by the carpenter so as not to delay the block setter. Bucks to be left true and plumb by the carpenter and to be of 2-in. lumber as wide as the thickness of the gypsum partitions, nailing ½x2¾-in. grounds to the bucks, forming a rabbet to hold the Ebsary Blocks. All door bucks should be carried to ceiling and wedged to construction. (Strip of wire lath overlapping gypsum blocks on either side to be nailed to buck). Baseboards are to be attached by nailing 1x12-in. wood nailing blocks (as wide as Ebsary Partition Blocks) to one end of each Ebsary Block in the base course before laying up Ebsary Blocks. Use 2-in. nailing blocks (as wide as Ebsary Partition Blocks) in spiking heavy toilet fixtures through the partition blocks. Fasten blackboards by attaching to a ⅞-in. wood nailing block the width of the gypsum block, spiking the nailing block into the Ebsary Partition.

Plaster—Always use Gypsum Plaster on Gypsum Block. Under no circumstances should lime mortar be permitted.

Fireproofing—The object of a fireproof partition is to confine the fire within the room. Authorities agree gypsum is practically free from expansion, consequently when exposed to high temperature it will absorb so little heat its expansion is negligible. In other types of partitions, while admitting they are incombustible, absorption of heat will cause enough expansion to wreck the partition.

Soundproofing—The Eastman School of Music, Rochester, N. Y., made tests on all types of materials and construction and selected Ebsary Gypsum Blocks as best adapted for the retention of sound. Tests conducted at Lewis Institute of Technology show gypsum blocks to be 60% more effective than other standard materials.

To prevent resound in a room, carpets, draperies and furniture are the best sound deadening that can be produced.

Ebsary Gypsum Partition Blocks were used in the following list of prominent buildings:

Statler Hotel, Buffalo, N. Y.
Onondaga Hotel, Syracuse, N. Y.
Ten Eyck Hotel, Albany, N. Y.
Penn Harris Hotel, Harrisburg, Pa.
Ritz-Carlton Hotel, Atlantic City, N. J.
Biltmore Hotel, Providence, R. I.
King Edward Hotel, Toronto, Ont.
Mount Royal Hotel, Montreal, Que.
Ritz-Carlton Hotel, Montreal, Que.
Royal Connaught Hotel, Hamilton, Ont.
Sylvania Hotel, Philadelphia, Pa.
Massachusetts Institute of Technology, Boston, Mass.
Chamber of Commerce, Newark, N. J.
Forrest Park High School, Baltimore, Md.
Clifton Park High School, Baltimore, Md.
St. Francis Hospital, Wilmington, Del.
Eastman School of Music, Rochester, N. Y.
Packard Building, Philadelphia, Pa.
Keefer Building, Montreal, Que.
Westchester Biltmore Country Club, Rye, N. Y.

Facilities

The Ebsary mills are located just outside of Rochester, N. Y., where they have access to seven trunk line railroads. Ebsary sales offices are located in all larger Eastern centers and stocks are carried by the more prominent dealers.

EMPIRE GYPSUM COMPANY, INC.

Manufacturers of Gypsum Wall Plasters

318-319 Cutler Building
ROCHESTER, N. Y.

MILLS AND MINES, GARBUTT, N. Y.

Products

Empire Neat Cement Plaster.
Reliance Wood Fiber Plaster.
Excelsior Sanded Wall Plaster.
Empire Concrete Plaster.
Empire Gypsum Blocks.

Gypsum Hard Wall Plasters

Gypsum is the basis of all hard wall plasters made by this company. Through the use of these plasters, *harder and firmer walls are obtained with lighter grounds,* thus removing enormous weight from the construction. The adhesive and formative properties permit of a solid wall in two or three hours after tempering. Plastering repairs are eliminated.

Iron-clad formulae, based on established facts, are followed in the process of manufacture, and utmost care is exercised in the mixing, each batch being accurately timed.

Delivered on the job *ready for use.*

The brands of Empire Gypsum Plaster are:

Empire Neat Cement, or Hair Plaster

Manufactured under a formula that demands sand under all conditions; with 1 part of Empire Neat Plaster (haired mortar), 2 parts of sand on lath, and 3 parts on brick or tile are required to be mixed.

Reliance Wood Fiber Plaster

Contains *wood pulp* as a binder, giving it a light, stretchy, working action. Used in neat condition to a great extent, but will carry 1 part of sand on wood and metal lath work, and 2 parts on brick or tile. It sets in 2 hours and dries out rapidly.

Excelsior Sanded Plaster

Used in localities not having sand in the immediate vicinity.

The sand is clean and sharp, screened to proper mesh for plaster work and thoroughly dried.

Empire Concrete Plaster

To be applied direct to concrete interior walls and ceilings. Ready for use, water only is to be added. Grounds to be ½ in. See that concrete work is thoroughly dry before base coat is applied.

Concrete plaster should be allowed to soak in the water for about 10 minutes before hoeing; after which it is to be mixed the same as any other hard plaster. Concrete plaster may be trowel or float finished as any other hard plaster. Before applying finish, be sure base coat is dry and hard.

It is very important that concrete surface be rough, and under no circumstances should oiled boards be used for casting forms.

Grounds

The grounds required for all the above brands are as follows: ½ in. for brick or tile; ¾ in. for plaster boards, wood lath, wire or expanded metal lath.

General Specifications

Lath—Wood, space ⅜ to ¼ in.; spray in warm weather if exceedingly dry. Nail lath firmly. Break joints. Wire or metal must be rigid to insure results. Too much give means sagging.

Brick or Tile—Wet surface before application. Do not apply any brand of plaster which does not contain sand to brick or tile. The correct proportions are: wood fiber, 1 part, sand, 2 parts; neat, 1 part, sand, 3 parts, weight, not volume.

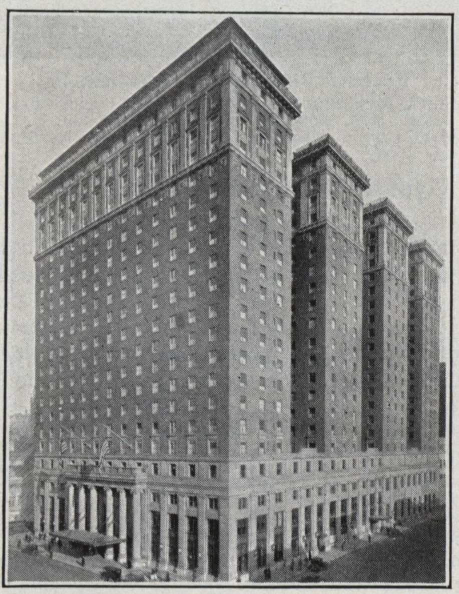
Sand—Clean, sharp sand free from gravel must be used.

Mixing—Sand and plaster must be thoroughly mixed before adding water. Use clean tools and clean water. Mix only that amount which will be applied in one hour. Do not re-temper. Work the material to a light consistency for best results.

Application—Hard wall plaster can be applied to any surface—wood or metal lath, brick, tile, plaster board. Use a firm but even pressure to secure clinch. Apply a light coat first on all surfaces. Scratch or darby same for doubling up or second coat. Fill out to grounds and run an even surface with darby. Permit walls to dry before finish coat is applied; then wet down lightly. Use water sparingly in applying finish coat.

Empire Gypsum Blocks

These blocks are used for partitions in first class fireproof buildings. Standard size, 12x30 in. and 2, 3, 4 and 6 in. in thickness.



Largest Hotel in the World, Hotel Pennsylvania, New York, N. Y.

McKim, Mead & White, New York, Architects
George A. Fuller Co., New York, General Contractors
H. W. Miller, Inc., New York, Plastering Contractors
Plastered with Empire Neat Cement

NIAGARA GYPSUM COMPANY

Manufacturers of Plasters and Gypsum Products

GENERAL OFFICE
BUFFALO, N. Y.

MILLS
OAKFIELD, N. Y.

Products

Niagara Plasters and Gypsum Products as follows: Neat Cement Plaster (sand to be added), Wood Fiber Plaster, Sanded Plaster (add water only), Kon-Kreet Plaster, Finishing Plaster, Gypsum Partition Blocks, Plaster Board and Gypsum Wall Board.

Also Finishing Limes, Plaster of Paris (white), and Keene's Cement for mixed car shipments.

Facilities

Mills are located at Oakfield, N. Y., on the West Shore R. R., convenient for the rapid filling of orders and shipment without delays. Mines and mills electrically operated, with a daily capacity of 600 tons.

TRADE-MARK

Quality of Gypsum

Report of state geologists, which is available on request, shows our rock to be of high analysis and uniform run. The deposit is one of the most extensive in the country and insures many years' supply.

Neat Cement Plaster

Requires addition of sand on the job, and most economical on large operations and where a good clean, sharp sand is available. It is well hair fibered for scratch or brown coats over wood lath, metal lath, brick, or tile surfaces and may be supplied unfibered when desired. When mixed according to directions, one ton with sand added will cover as much surface as three tons of ready sanded plaster.

Specifications—Grounds should be ¾ in. for 2-coat work and ⅞ in. for 3-coat work.

Wood Lath—Good quality and free from sap, bark and knots, spaced about ⅜ in. apart, joints broken every seventh lath. Thoroughly swell lath and do not let them shrink before plaster is applied. Use 2 parts of sand to 1 part plaster by weight, over wood lath. Screen openings in warm weather to prevent dry-outs. Lath should be well nailed and ¼ in. allowed between ends.

On Metal Lath—Apply a light scratch coat, lightly covering lath and filling meshes. After the scratch coat has set firm and hard, but before it is dry, apply the second coat and bring to straight and even surface with rod and darby, ready to receive the finish coat.

On Brick, Gypsum Block or Clay Tile—Sprinkle dry walls to reduce suction. Use 3 parts sand to 1 of plaster by weight. Apply sufficient material to fill out grounds.

Mixing—Mix materials well together before adding water.

Wood Fiber Plaster (Wood Pulp)

Contains finely shredded wood fiber, giving the plaster toughness, flexibility and bulk. Spreads easily and especially suitable for plastering over plaster board. Ready to apply with the addition of water only. If desired, equal parts of good clean sand may be added at the work. More bulky than other grades of wall plasters and covers more surface per ton.

Specifications—Grounds and lathing same as for Neat Cement plaster. It is important to specify whether the Wood Fiber Plaster is to be used with or without sand. If sand is to be added, the setting time will be hastened and the mill should be notified accordingly.

On Plaster Board—Do not wet the board. Plaster should be applied not less than ⅜ in. thick for best results, giving total grounds of ¾ to ⅞ in. Base coat may be left rough to receive finish or, if desired, may be troweled smooth.

On Wood Lath—If lath are dry, swell them thoroughly the night before plastering and do not let them shrink again. Apply first thin coat of mortar, following at once, before it sets, with sufficient material to fill out the grounds. Where Wood Fiber is to be troweled down smooth for a finish, it should be used Neat. Otherwise leave surface of base coat rough to receive the finish. Scratch or broom well before plaster begins to set.

For Wire and Metal Lath—Apply the mortar a little stiff. Scratch a thin coat on the lath. After this coat is set hard apply second coat and straighten up walls. Leave second coat rough or broomed for the finish.

For Brick or Clay Tile—Mix equal parts by weight of plaster and clean sharp sand. Apply plaster as usual.

Mixing—In mixing, the Wood Fiber Plaster should be placed in upper end of the box and water in lower. Hoe plaster into water and allow to soak from 10 to 15 minutes. Mix to right consistency. If sand is added, material must be specially retarded.

Sanded Plaster

This material is ready for use with addition of water only. Sand is clean and sharp, making a mortar that is noted for its smooth and easy working qualities. For use on wood lath, metal lath, brick, tile or gypsum block; three grades of sanded plaster being manufactured. The sanded wood fiber is especially adapted for use over plaster board.

Specifications—Grounds and lathing to be same as for Neat Cement.

Directions for Mixing—Nothing is to be added to this material but water, and under no circumstances will the contractor be allowed to mix in more sand. Put plaster in one end and water in other end of box. Hoe plaster into water, mixing thoroughly. Work to a proper consistency for application.

Application—Apply same as specified for cement plaster.

Prepared Finishes

Gray skim coat; economical for giving a smooth, hard surface for papering.

Also a ready prepared white finish for hard, glossy body coat. Also sand finish for walls to be tinted.

Specifications—These finishes require nothing but water to fit them for application. Mix thin and in small batches, as required, while being applied. Base coat should be well scratched or broomed before finish is applied, and walls should be about 75% dry. Use as little water as possible in floating.

Bond or Kon-Kreet Plaster

A material especially manufactured for application to interior concrete walls and ceilings, with strongest possible bonding features to insure thorough adhesion. Used by addition of water only. Walls must be clean and free from dust, oils, or efflorescence. Grounds to be of sufficient thickness to bring to a true and even surface. Dries to a light, gray color. Can be finished by troweling.

Plaster Board

A better material than wood lath. Comes in sheets 32x36 in. and in ⅜ or ½-in. thickness. Four-ply nailing edge on each side. Applied directly to studding on sidewalls, and on 2-in. furring strips set on 12 or 16-in. centers on joists. A splendid sound deadener and fire retardant. Space boards ¼ in. apart and break joints vertically on walls and at right angles to furring on ceiling. Use large flat headed galvanized nails, 1¼ in. long, spaced 6 in. apart round the board.

Do not dampen boards before plastering. Apply plaster not less than ⅜ in. or equal thickness over board. Wood fiber or Sanded Wood Fiber Plaster is recommended, which bonds thoroughly with the board.

Gypsum Wall Board

The modern substitute for lath and plaster. Both 32 and 48-in. widths, ⅜-in. thickness, and lengths from 6 to 10 ft. Has two good sides and special 4-ply reinforced nailing edge on each side for protection against breakage in handling or nailing.

Ceiling-high sections nailed to studs and may be sawed like lumber. Crack filler furnished for joints and nailheads. Can be immediately decorated by painting, papering or calcimining. It is fire resisting, sound deadening, and a good non-conductor of heat and cold. Lasts as long as the building itself.

Gypsum Block

For laying up non-bearing partitions and furring of other walls. Light in weight and fire resisting. Surface sizes, 12x30 and 13½x32 in. Thicknesses, 2, 3, 4, and 6 in., and 2-in. furring.

ESTABLISHED 1887

M. A. REEB CORPORATION

Manufacturers of Plasters and Gypsum Products

GENERAL OFFICE
BUFFALO, N. Y.
MILLS AT BUFFALO AND OAKFIELD, N. Y.

TRADE-MARK

Products

Peerless Plasters and Gypsum Products as follows: Neat Cement Plaster (sand to be added), Wood Fiber Plaster, Sanded Plaster (add water only), Concrete Plaster, Finishing Plaster, Gypsum Partition Blocks, Plaster Board and Gypsum Wall Board.

Also Portland Cement Mortar, Finishing Limes, Plaster of Paris (white), and Keene's Cement for mixed car shipments.

Facilities

Mills are located at Oakfield, N. Y., on the West Shore R. R., and at Buffalo, N. Y., on the New York Central & Hudson River R. R., convenient for the rapid filling of orders and shipment without delays. Mines and mills electrically operated, with a daily capacity of 600 tons.

Quality of Gypsum

Report of state geologists, which is available on request, shows our rock to be of high analysis and uniform run. The deposit is one of the most extensive in the country and insures many years' supply.

Neat Cement Plaster

Requires addition of sand on the job, and most economical on large operations and where a good clean, sharp sand is available. It is well hair fibered for scratch or brown coats over wood lath, metal lath, brick, or tile surfaces and may be supplied unfibered when desired. When mixed according to directions, one ton with sand added will cover as much surface as three tons of ready sanded plaster.

Specifications—Grounds should be ¾ in. for 2-coat work and ⅞ in. for 3-coat work.

Wood Lath—Good quality and free from sap, bark and knots, spaced about ⅜ in. apart, joints broken every seventh lath. Thoroughly swell lath and do not let them shrink before plaster is applied. Use 2 parts of sand to 1 part plaster by weight, over wood lath. Screen openings in warm weather to prevent dry-outs. Lath should be well-nailed and ¼ in. allowed between ends.

On Metal Lath—Apply a light scratch coat, lightly covering lath and filling meshes. After the scratch coat has set firm and hard, but before it is dry, apply the second coat and bring to straight and even surface with rod and darby, ready to receive the finish coat.

On Brick, Gypsum Block or Clay Tile—Sprinkle dry walls to reduce suction. Use 3 parts sand to 1 of plaster by weight. Apply sufficient material to fill out grounds.

Mixing—Mix materials well together before adding water.

Wood Fiber Plaster (Wood Pulp)

Contains finely shredded wood fiber, giving the plaster toughness, flexibility and bulk. Spreads easily and especially suitable for plastering over plaster board. Ready to apply with the addition of water only. If desired, equal parts of good clean sand may be added at the work. More bulky than other grades of wall plasters and covers more surface per ton.

Specifications—Grounds and lathing same as for Neat Cement plaster. It is important to specify whether the Wood Fiber Plaster is to be used with or without sand. If sand is to be added, the setting time will be hastened and the mill should be notified accordingly.

On Plaster Board—Do not wet the board. Plaster should be applied not less than ⅜ in. thick for best results, giving total grounds of ¾ to ⅞ in. Base coat may be left rough to receive finish or, if desired, may be troweled smooth.

On Wood Lath—If lath are dry, swell them thoroughly the night before plastering and do not let them shrink again. Apply first thin coat of mortar, following at once, before it sets, with sufficient material to fill out the grounds. Where Wood Fiber is to be troweled down smooth for a finish, it should be used Neat. Otherwise leave surface of base coat rough to receive the finish. Scratch or broom well before the plaster begins to set.

For Wire and Metal Lath—Apply the mortar a little stiff. Scratch a thin coat on the lath. After this coat is set hard apply second coat and straighten up walls. Leave second coat rough or broomed for the finish.

For Brick or Clay Tile—Mix equal parts by weight of plaster and clean sharp sand. Apply plaster as usual.

Mixing—In mixing, the Wood Fiber Plaster should be placed in upper end of the box and water in lower. Hoe plaster into water and allow to soak from 10 to 15 minutes. Mix to right consistency. If sand is added, material must be specially retarded.

Sanded Plaster

This material is ready for use with addition of water only. Sand is clean and sharp, making a mortar that is noted for its smooth and easy working qualities. For use on wood lath, metal lath, brick, tile or gypsum block; three grades of Sanded Plaster being manufactured. The Sanded Wood Fiber is especially adapted for use over plaster board.

Specifications—Grounds and lathing to be same as for Neat Cement.

Directions for Mixing—Nothing is to be added to this material but water, and under no circumstances will the contractor be allowed to mix in more sand. Put plaster in one end and water in other end of box. Hoe plaster into water, mixing thoroughly. Work to a proper consistency for application.

Application—Apply same as specified for cement plaster.

Prepared Finishes

Gray skim coat; economical for giving a smooth, hard surface for papering.

Also a ready prepared white finish for hard, glossy body coat. Also sand finish for walls to be tinted.

Specifications—These finishes require nothing but water to fit them for application. Mix thin and in small batches, as required, while being applied. Base coat should be well scratched or broomed before finish is applied, and walls should be about 75% dry. Use as little water as possible in floating.

Bond or Concrete Plaster

A material especially manufactured for application to interior concrete walls and ceilings, with strongest possible bonding features to insure thorough adhesion. Used by addition of water only. Walls must be clean and free from dust, oils, or efflorescence. Grounds to be of sufficient thickness to bring to a true and even surface. Dries to a light, gray color. Can be finished by troweling.

Plaster Board

A better material than wood lath. Comes in sheets 32x36 in. and in ⅜ or ½-in thickness. Four-ply nailing edge on each side. Applied directly to studding on sidewalls, and on 2-in. furring strips set on 12 or 16-in. centers on joists. A splendid sound deadener and fire retardant. Space boards ¼ in. apart and break joints vertically on walls and at right angles to furring on ceiling. Use large flat headed galvanized nails, 1¼ in. long, spaced 6 in. apart around the board.

Do not dampen boards before plastering. Apply plaster not less than ⅜ in. or equal thickness over board. Wood Fiber or Sanded Wood Fiber Plaster is recommended, which bonds thoroughly with the board.

Gypsum Wall Board

The modern substitute for lath and plaster. Both 32 and 48-in. widths, ⅜-in. thickness, and lengths from 6 to 10 ft. Has two good sides and special 4-ply reinforced nailing edge on each side for protection against breakage in handling or nailing.

Ceiling-high sections nailed to studs and may be sawed like lumber. Crack filler furnished for joints and nailheads. Can be immediately decorated by painting, papering or calcimining. It is fire resisting, sound deadening, and a good non-conductor of heat and cold. Lasts as long as the building itself.

Gypsum Block

For laying up non-bearing partitions and furring of other walls. Light in weight and fire resisting. Surface sizes, 12x30 and 13½x32 in. Thicknesses 2, 3, 4, and 6 in., and 2-in. furring.

ROCK PLASTER CORPORATION

QUARRIES
WALTON, N. S.

GENERAL OFFICES
40 Rector Street
NEW YORK, N. Y.

FACTORY
NEW YORK, N. Y.

Products

Gypsum Building Materials of every description.

Advantages of "Rock Wall" Products

The gypsum products of the Rock Plaster Corporation are distinguished by advantages in location of quarries, in manufacture, and in distribution that should especially recommend them to architects who desire the best:

Desirable Location of Quarries—"Rock Wall" gypsum is quarried at Walton, Nova Scotia, in the middle of the famous gypsum deposits of that province. The Walton beds of gypsum, which are under the exclusive control of this company, are accessible, practically inexhaustible, and produce rock of the whitest and finest quality—absolutely the best that can be procured. From Walton, the gypsum is transported by water directly to the "Rock Wall" factory in New York City.

Skill in Manufacture—In the New York factory "Rock Wall" products have been manufactured for over thirty years by the same owners and operators. The skill and progressive efficiency developed throughout this long period, together with the unexcelled supply of Nova Scotia gypsum, have established a standard for "Rock Wall" products of the highest class.

In our calcining we use the "Slow Process" exclusively—it insures uniformity of quality and set.

Direct Shipping Facilities—We possess direct rail connections. New York, New Haven & Hartford R. R. sidings on the premises. We maintain our own steam lighter service, thus facilitating prompt deliveries to all yards, railroads and steamship lines in the Metropolitan and Port districts of New York.

A Few of Our Standard Products

We make all kinds of building materials of which gypsum is the base, including "Rock" Board, "Rock Block," and the following plasters:

"Rock Wall Blue Seal" Neat Cement Plaster—For use when sand is added at the job.

"Rock Wall Ready Mixed" Sanded Plaster—A complete plaster, requiring only the addition of water at the job.

"Rock Wall Walton Concrete" Plaster—For use on concrete surfaces. Its adhesive and cohesive properties are perfect. Ready for use by adding water.

"Riverside" Plaster of Paris—For the finishing coat of walls and ceilings. A superfine quality called "Riverside Casting" plaster is made for ornamental work, cornices, etc.

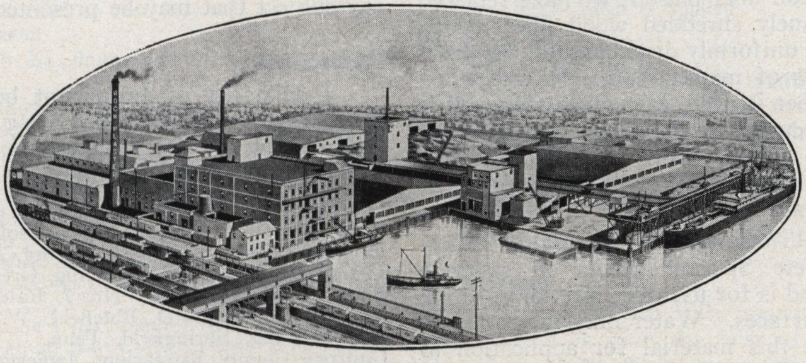
Some Buildings in which "Rock Wall" Products were Used

New York City

BUILDING	ARCHITECT
New York Telephone & Telegraph Building	Wm. Welles Bosworth
Monastery of The Blessed Sacrament	Maginnis & Walsh
New York Stock Exchange (1922 Addition)	Trowbridge & Livingston
Westchester Biltmore Country Club	Warren & Wetmore
Munson S. S. Line Building	Kenneth M. Murchison
Cunard S. S. Line Building	Benjamin W. Morris Carrère & Hastings
Garment Center Buildings	Walter M. Mason
Mount Sinai Hospital	Arnold W. Brunner
Seaboard Bank	Alfred C. Bossom
Union Club	Cass Gilbert
Bankers Trust Company	Trowbridge & Livingston
Emigrant Industrial Savings Bank	Raymond Almirall
National Park Bank	Donn Barber
New York Stock Exchange	Geo. B. Post & Sons
New York Public Library	Carrère & Hastings
St. Luke's Hospital	Ernest Flagg
Columbia University (18 buildings)	McKim, Mead & White
New York Public Schools (115)	C. B. J. Snyder
655 Park Avenue	J. E. R. Carpenter
Postum Building	Cross & Cross
Metropolitan Housing Project	A. J. Thomas D. E. Waid
Kings County Hospital	Franklin B. Ware Lewis F. Pilcer
Mecca Temple	Clinton & Russell
Metropolitan Museum of Art	McKim, Mead & White
American Museum of Natural History	Trowbridge & Livingston
Institution for the Blind	McKim, Mead & White
Telephone Exchanges (15)	McKenzie, Voorhees & Gmelin

Other Locations

Elks Club, Union Hill, N. J.	J. D. Lugasch
Twin Theater, Union Hill, N. J.	Percy Dizarttas
Public Schools (12), Philadelphia, Pa.	J. D. Cassell
Jefferson Hospital, Philadelphia, Pa.	John Windrim
High School, Summit, N. J.	Guilbert & Betelle
Nelson W. Aldrich Residence, Warwick, R. I.	Carrère & Hastings
Woonsocket Hospital, Woonsocket, R. I.	Kendall, Taylor & Co.
La Salle Academy, Providence, R. I.	John Wm. Donohue
School of Design, Providence, R. I.	Wm. T. Aldrich
Littlefield and Hedgeman Dormitories, Brown University, Providence, R. I.	Day & Klauder
Junior High School, Pawtucket, R. I.	R. C. N. Monohan



Rail and Water Connections at Factory of Rock Plaster Corporation

SOUTHERN GYPSUM CO., INC.

Manufacturers of Gypsum Wall Plasters, Partition Tile and Plaster Board

GENERAL OFFICE AND PLANT
NORTH HOLSTON, VA.
CHICAGO OFFICE, Tacoma Building, 5 North La Salle Street

TRADE-MARK

Products

PLASTERS and PLASTER FINISHES, which include:

Cement (neat) Wall Plasters: "Cherokee," "King's Mountain," "Boone," "White Top," "Watauga," "Tennessee Special," "Stonewall," "Vulcan."

Wood Fiber Gypsum Plasters: "Cherokee," "King's Mountain," "Boone," "White Top," "Watauga," "Tennessee Special," "Stonewall," "Vulcan."

"Concrete Special": for concrete interiors, walls and ceilings.

PLASTER BOARD: "Southern."

"SOUTHERN" PARTITION TILE for fireproofing, sound deadening, sanitation and insulation.

Quality

Our plasters are made of the purest gypsum rock, treated with the greatest care in grinding, calcining and mixing. Maximum strength, toughness, uniformity, covering capacity and working qualities guaranteed.

Specification Data for Wall Plasters, Finishes and Plaster Board

Cement Plaster—Cement plaster is made for those who are able to obtain good sand and prefer to sand their own mortar. For base coat on wood lath, mix 2 parts of clean sharp sand with 1 part plaster. For base coat on brick or tile, the proportion is 3 parts of sand to 1 of plaster. For base or scratch coat on wire or metal lath, mix 2 parts clean sharp sand with 1 part plaster. For base coat on "Southern" plaster board, mix 2 parts clean sharp sand with 1 part of plaster. (Write for copy of "Standard Specifications for the Use of Cement Plaster.")

Wood Fiber Plaster—Wood fiber plaster is to be used "neat"—all it needs is water. You can not improve its quality by adding sand. Though wood fiber has been used with sand for walls, we do not recommend it. Be safe and get the best results—use it neat. When a float or trowel finish is desired, the surface of base coat must be broomed—left rough—to receive the finish. Broom before the plaster begins to set, otherwise there is danger of killing the surface. In the manufacture of wood fiber plaster, we have replaced the sand by adding finely shredded wood fiber, which is uniformly distributed in the process of manufacture. Where wood fiber is used, a good flexible wall is secured which allows the building to adjust itself and settle within certain limits without danger of cracking.

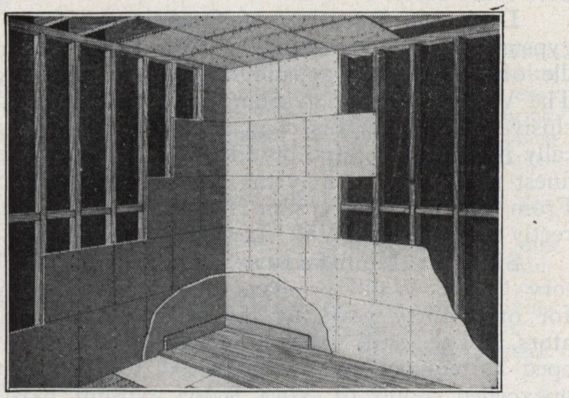
"Concrete Special"—"Concrete Special" bonds on concrete and is for use over interior concrete surfaces. Water only is needed to fit this material for application to work.

NORTH HOLSTON VA.
SOUTHERN
GYPSUM COMPANY INC.

SOUTHERN GYPSUM CO. BAG

"Southern" Plaster Board

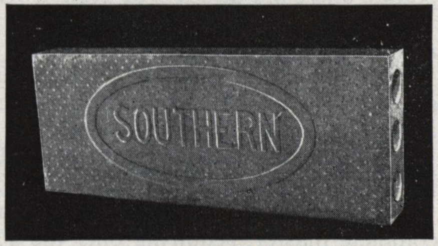
A substitute for wood and metal lath. Nail directly to studding or joist, using nails with $\frac{3}{8}$-in. heads, 21 nails to the board for sidewalls and 28 for ceilings. Space boards not less than $\frac{1}{4}$ in. apart at all joints which do not come on studs or joists. All joints coming on studs or joists are butted tight. Each nailing edge must have a bearing on studs or joists of not less than $\frac{3}{4}$ in.



ROOM PARTLY COVERED WITH PLASTER BOARD

Southern Partition Tile

"Southern" partition tile are fireproof, permit rapid construction and present an even surface which permits a saving in plaster. They successfully resist the action of water during and after a fire and weigh only half as much per square foot as terra cotta and clay tile. Made in thicknesses of 2, 3, 4, 6 and 8 in.



SOUTHERN PARTITION TILE

Co-operative Service

It will be a pleasure to have a representative call at any time, and the office force stands ready to discuss any subject that may be presented.

References

Partial list of prominent buildings on which the products of the SOUTHERN GYPSUM CO., INC., were used:

Ford Assembly Plants, Charlotte, N. C. and Jacksonville, Fla.
State Office Building, Richmond, Va.
Patrick Henry Hotel, Roanoke, Va.
Shenandoah Hotel, Martinsburg, W. Va.
Francis Carlton Apartments, Sarasota, Fla.
Telephone Building, St. Petersburg, Fla.
Chamber of Commerce Building, Greenville, S. C.
State College Dormitory No. 7, Raleigh, N. C.
West Virginian Hotel, Bluefield, W. Va.
Bell Building, Springfield, Tenn.
Guilford County Sanitarium, Jamestown, N. C.
Lantern Lane, St. Petersburg, Fla.

TEXAS CEMENT PLASTER CO.

SALES OFFICE
OKLAHOMA CITY, OKLA.
MILL: PLASTERCO, TEX.

TRADE-MARK

Products

Texas Cement Plaster; Finishing Plaster.

Texas Cement Plaster

Texas cement plaster is cement and must be handled like cement to get results. It must be protected from dampness by being stored in a dry place, never on the ground, against a damp wall, or in any damp place when delivered to the building.

Texas cement plaster can not be re-tempered after the "set" begins. A very little "set" plaster in cement plaster mortar, whether from the mortar boxes, the water barrel in which tools have been washed, or droppings from the floor, will cause all of the plaster mortar to "set" too quickly.

Texas cement plaster mortar will "set" quick and work short if there is delay in tempering with water after sand has been mixed with it. It will spread a little easier if allowed to stand a few minutes after it has been tempered. To get the maximum tensile strength from Texas cement plaster it should be tempered as stiff as the mortar can conveniently be worked.

If finished walls are soft and chalky, it is because the water in the mortar has been evaporated before the plaster has "set." Spraying the walls with clean water, or with brush and water having powdered alum dissolved in it, is the remedy.

Specifications for Texas Cement Plaster

Studs and Joists—To be spaced not more than 16 in. between centers.

Grounds—To be ¾ in. for plaster board, wood lath and metal lath; ½ in. for gypsum blocks; ¾ in. for clay tile.

Plaster Boards—To be spaced ¼ in. apart; with nailing edges bearing at least ¾ in. on stud or joists; with horizontal joints in walls and joints at right angles with ceiling joists, broken at each board; and with vertical joints on opposite sides of partitions, not on the same studs; to be well nailed to studs, joists or furring, with 1¼-in. No. 1½ gauge, ⅞-in. head wire nails, spaced not more than 6 in. apart; all of the center of each board to be nailed before the edges are nailed.

Wood Lath—To be of good quality, straight grained, and free from knots, bark and sapwood. To be spaced ⅜ in. apart with not less than ⅛-in. space between ends; with joints broken every fifth lath. To be well nailed to each stud and joist with 3d lathing nails.

If lath are dry, they are to be thoroughly wet at least 4 hours before mortar is applied to them, so that they will not swell nor warp after the plaster is on them.

Grooved Sheathing Lath—To be well nailed to studs spaced not more than 16 in. between centers; to be spaced at least ⅛ in. apart, and to be thoroughly wet at least 4 hours before plaster is applied to them, so that they will not swell nor warp after plaster is on them.

Brick and Tile—To be dampened before plaster is applied to them.

Concrete—The surface to be cleaned free from all efflorescence, dust, dirt and oil and, where very smooth, to be well hacked before mortar is applied.

Sand—To be clean, sharp and free from clay, soil, alkali, salt and quicksand.

Mortar—*Hair Fibered and Unfibered Plasters on Plaster Board*—To be 1 part plaster and 2 parts sand.

On Wood Lath and Metal Lath—First coat to be 1 part plaster to 1½ parts sand; second coat to be 1 part plaster to 2 parts sand.

On Brick and Tile—To be 1 part plaster to 2½ parts sand.

On Concrete—To be equal parts plaster and sand.

Mortar—*Wood Fiber Plaster*—For making extremely light, tough plastering, it is recommended that the wood fiber plaster be used without sand, but it will make excellent plaster when the mortar is equal parts of the wood fiber plaster and clean sharp sand.

Mixing Sanded Mortar—All mortar to be mixed in clean, tight boxes; the plaster and sand to be first thoroughly mixed dry, then immediately tempered with sufficient water to make good stiff mortar. No part of one batch of mortar is to be mixed with another batch in the mortar box or on the mortar board, and no mortar is to be used or worked after it has partly set. Mortar box, tools, hods, mortar board and water to be kept clean and free from set and partly set plaster, unless quick setting mortar is desired.

Application—*Mortar to Plaster Board*—The boards not to be wet before mortar is applied. All spaces between boards to be well filled with mortar, either by pointing the joint with quick setting neat plaster, or by carefully pressing the mortar used for first coat into the spaces between the boards as the first coat is put on. The second coat to be straightened with rod and darby ready for the finish coat, and must not be floated.

To Wood Lath—First coat to be applied with sufficient pressure to form good keys, leaving a light coat of mortar over the lath, with surface rough. The second coat to be applied with strong pressure, when the first coat has set hard but before the first coat is dry, and is to be straightened with rod and darby, broomed ready for finish coat, and must not be floated

To Metal Lath—The first coat to be applied so as to fill the meshes and lightly cover the lath. The second coat to be applied when the first coat is set hard, but before the first coat is dry.

To Brick and Clay Tile—Crooked, uneven walls to be first straightened by filling the low places with mortar. After mortar used to straighten walls has set, sufficient mortar to fill out to grounds to be applied with strong pressure and straightened ready for finish coat.

To Concrete—Where work can be straightened with 1 light coat of mortar, sufficient mortar to fill out to grounds is to be applied in 1 coat with strong pressure, and straightened ready for the finish coat. Where work can not be straightened with 1 light coat 2 coats are to be applied; the first coat to be set hard before applying second coat.

Specifications for Finishing Plaster

Mortar—*For Smooth White Finish*—To be 1 measure of Plaster Paris finishing plaster to not more than 3 measures of perfectly slaked lime putty; the plaster and lime to be thoroughly and uniformly mixed.

For Cement Finish—To be 3 measures of unfibered cement plaster to not more than 1 measure of perfectly slaked lime putty, thoroughly and uniformly mixed.

For Sand Float Finish—To be unfibered cement plaster, perfectly slaked lime putty, and clean, sharp sand, thoroughly mixed in the proportions of 4 measures of plaster, 1 measure of lime and 5 measures of sand.

Application—*Finish Coat*—Trowelled finish coat to be applied after base coat has set and dried, the base coat to be slightly dampened to reduce suction, before finish coat is applied.

Sand Float Finish Coat—The base coat to be set hard, but not dry, when finish is applied.

Care of Plaster

In hot, dry and windy weather, plastering is to be protected from wind, and, if necessary, sprinkled with water, to prevent the plaster drying out too much before it is set.

In freezing weather, plaster to be protected from frost until set hard. Then windows and doors to be opened so that the plastering will dry quickly.

Guarantee

All products are fully guaranteed to be of the best quality, and to give the best of results when used in accordance with above specifications.

UNITED STATES GYPSUM COMPANY

Plasters and Finishes

205 West Monroe Street
CHICAGO, ILL.

SALES OFFICES

NEW YORK, N. Y., 17 State Street
BUFFALO, N. Y., 620 Ellicott Square Building
BOSTON, MASS., 100 Boylston Street
WASHINGTON, D. C., 1523 L Street
BALTIMORE, MD., 1008 American Building
PHILADELPHIA, PA., 415 Otis Building
PITTSBURGH, PA., 917 Bessemer Building
CLEVELAND, OHIO, 625 Hanna Building
ATLANTA, GA., 625 Healey Building
CINCINNATI, OHIO, 704 Atlas Bank Building
DETROIT, MICH., 1462 Penobscot Building
MILWAUKEE, WIS., Grove and Oregon Streets
MINNEAPOLIS, MINN., 634 McKnight Building
ST. LOUIS, MO., 1339 Syndicate Trust Building
KANSAS CITY, MO., 420 Lathrop Building
OMAHA, NEB., 705 Brandeis Theater Building
DENVER, COLO., Denham Building
LOS ANGELES, CAL., 1105 Edwards & Wildey Building

Products

GYPSUM CEMENT PLASTER, Fibred and Unfibred.

GYPSUM WOOD FIBRE PLASTER.

GYPSUM PREPARED (SANDED) PLASTER.

BONDCRETE PLASTER, for plastering Interior Concrete Surfaces.

IVORY KEENE'S CEMENT.

PREPARED TROWEL and SAND FLOAT FINISHES.

ARIDIZE GYPSUM GAUGING PLASTERS (including Pure White Plasters), for Lime Putty Finishes.

ARIDIZE GYPSUM MOULDING and CASTING PLASTERS.

IVORY and GRAND PRIZE HYDRATED FINISHING LIME (High Magnesia), and MASON'S HYDRATE.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

USG
TRADE-MARK

United States Gypsum Company Plasters

UNITED STATES GYPSUM COMPANY plasters, made from calcined gypsum rock, adhere equally well to wood lath, metal lath, plaster board, brick, tile, or other plastering bases.

They set uniformly hard throughout within 2 or 3 hours after application and within 36 hours trim may be applied without danger of dampness or sweating. These plasters resist fire, and because of the patented process of manufacture, possess unequaled strength, uniformity, and an unusual economy of application and upkeep.

Characterized by the "Red Top" Bag—All U.S.G. hard wall plaster containers have a distinctive *red top*. This signifies: (1) The maximum in plaster economy and the most advanced process of manufacture. (2) "Standardized" material of absolute uniformity, rigidly inspected, and dependable for any locality. (3) Exceptional richness and plasticity. (4) Greater coverage of wall surface. (5) Strong, durable walls of maximum strength and hardness. The cement plasters, wood fibre plasters and sanded plasters described below are packed in bags with the easily distinguishable *red top*.

Brands and Classes

UNITED STATES GYPSUM COMPANY'S wall plasters are furnished in three general classes: Gypsum cement plaster, Gypsum wood fibre plaster, and Gypsum sanded plaster. *Each class is marketed under the various brands listed below; all brands being of the same standard of quality:*

Red Top§
Adamant §
Alabaster
Big Four §
Buckhorn
Eldorado *
Granite
Imperial §
Arden Hardwall †
Ivory §
Kings Windsor§
Pyramid *

* Gypsite or "dark plasters."
§ Supplied also in sanded form.
† Cement plasters only.

USG
UNITED STATES GYPSUM COMPANY
CHICAGO

80-LB. RED TOP ROPE FIBRE BAG

Unless otherwise stated, all plasters are shipped in this package or in 100-lb. jute bags

Gypsum Cement Plaster

This class of plaster is supplied fibred for scratch coat on metal lath and for base coat on wood lath and Rocklath. It is also supplied unfibred for use on brick, Pyrobar gypsum tile, clay tile, and for browning coat (second coat) on metal lath. Sand is to be added at the job. The material is made for use where good sand is available at reasonable cost and where the purchaser prefers to sand his own mortar. See brands above, and specifications on second page following.

Gypsum Wood Fibre Plaster

This class of plaster requires only the addition of water to prepare it for use. It contains finely shredded wood fibre, machine mixed to insure uniform distribution. As wood fibre plaster requires no sand, all danger of poor sand or of oversanding is averted.

It makes a dense, durable wall, of almost half the weight of a sanded mortar wall, and has superior fire resisting, insulating and sound retarding qualities.

Its "tough" nature renders it more capable of withstanding shock and vibration. See brands above and specifications on second page following.

Continued on next page

Gypsum Sanded Plaster

This product consists of gypsum cement plaster and clean, sharp sand, machine mixed in mathematically correct proportions. It needs only water to fit it for application; it may be readily and quickly mixed inside the building, saving time and labor. See brands on preceding page and specifications on following page.

COVERING CAPACITIES OF WALL PLASTERS PER 100 SQ. YD.
Material mixed and used as per Specifications

Surface	Gypsum cement plaster. Number 100-lb. bags	Gypsum wood fibre plaster. Number 100-lb. bags	Gypsum sanded plaster. Number 100-lb. bags
Wood lath	9 to 11 (sanded 2 to 1)	14 to 17 unsanded	22 to 24
Metal lath	17 to 20 (sanded 2 to 1)	22 to 27 unsanded	45 to 50
Sackett plaster board	8 or 9 (sanded 2 to 1)	13 to 16 unsanded	20 to 22
Brick and clay tile	14 to 17 (sanded 3 to 1)	18 to 20 (equal parts sand to be added)	35 to 40
Pyrobar gypsum tile	10 to 12 (sanded 3 to 1)	14 to 16 (equal parts sand to be added)	25 to 28

All conditions equal, these plasters are guaranteed to cover as much surface as any similar material made.

Bondcrete Plaster

This is the safest and best plaster made for direct application to interior concrete surfaces.

It adheres strongly to the concrete because of its cementitious qualities and because it maintains a practically unchanging volume during the process of setting and hardening. Bondcrete plaster is dense, durable and fire resisting. The plaster works well under the tools, and needs only water to fit it for use.

Average covering capacity, 125 to 140 yd. to the ton. Specifications on following page.

Ivory Keene's Cement

Ivory Keene's cement is made from the pure gypsum found at Southard, Oklahoma.

The gypsum is carefully hand-selected, and up-to-date manufacturing processes and rigid inspection insure maximum strength and perfect uniformity.

Ivory Keene's cement can be applied as a finishing coat over gypsum or lime bases. It requires only the addition of water to fit it for use.

The material is very hard and dense and will take a very high polish. Walls finished with it may be sponged with soft water without injury.

Ivory Keene's cement is equal to any imported "Keene's" for scagliola work. Shipped in new 100-lb. cloth sacks. See specifications on following page.

Gypsum Prepared Finishes, Trowel and Sand Float

These finishes contain no lime; are ready for use when water is added; and set extremely hard. They are uniformly mixed in correct proportions.

As there is no lime to be slaked and no gauging, these finishes save time and labor. They work freely under the tools and their use does away with mistakes at the mortar box.

They set up hard within a few hours—no time lost waiting for walls to dry out. They eliminate lime trouble such as "pops," pits, map-cracks, shrinking, staining. Their hard, stainless surface is ideal for decorating. Decorations of any kind may be applied immediately following the drying out of the finish coat.

They are made in two general groups:

Group 1, Adamant finishes, have exceptional quality and hardness. Group 2 finishes are very high grade materials that have been developed to supply the demand for a moderate cost prepared finish.

See table below for brands, descriptions, etc. Complete specifications furnished on request.

GYPSUM PREPARED FINISHES

Finish	Color and description	Covering capacity
GROUP NO. 1		
Adamant IXXX Adamant No. 1 Adamant No. 40 Adamant IXX	White, trowel Gray, trowel Slate, trowel	1 ton covers 350 to 400 sq. yd.
	Light gray sand float finish	1 ton covers 250 to 300 sq. yd.
GROUP NO. 2		
Universal No. 3 Imperial W. T. Kings Ready Finish	White, trowel	1 ton covers 350 to 400 sq. yd.
Universal No. 1 Badger	Grayish-white trowel finishes	
Silico Imperial	Light gray sand float finishes	1 ton covers 250 to 300 sq. yd.

Shipped in 100-lb. cloth and 80-lb. paper bags.

Aridize Gypsum Gauging Plasters for Lime Putty Finishes

These plasters are made from carefully selected raw materials under our patented process. This process, together with the uniform calcination and fineness to which the plaster is ground, insures rapid absorption and superior spreading qualities. See specifications for Lime Putty and Sand Float Finishes on following page.

Slow-set Brands—Matchless, Pearl, Quality. *Pure white brands:* Challenge, Star, Kings Windsor Superfine.

Quick-set Brands—Michigan "A," Big Four, N.Y.C. Mills, "O. K.," Arden Superior Finish. *Pure white brands:* Champion, Kings Diamond, Kings Hillsboro.

Aridize Gypsum Moulding and Casting Plasters

These plasters are very carefully manufactured from specially selected white gypsum rock under our patented process, resulting in cool, smooth working and uniform setting qualities. U.S.G. Moulding No. 1, U.S.G. Moulding No. 2, Golden Seal, Kings Diamond and Kings Hillsboro are exceptionally pure and fine ground. Ivory Moulding, N.Y.C. Mills and Arden Gypsum Casting brands are grayish white in color.

Ivory and Grand Prize Hydrated Finishing Lime

This finishing lime is made of pure limestone from Genoa, Ohio, which contains the highest percentage of magnesium (the component which gives to lime its smooth, easy spreading qualities). It has exceptional covering capacity; 1 ton mixed with 1000 lb. of gauging plaster covers about 1000 sq. yd. See specifications for Lime Putty and Sand Float Finish on following page.

Masons' Hydrate

A high grade hydrated lime for masons' use packed in 50-lb. paper sacks. Saves time and labor of screening and slaking on the job and assures uniformity. Used in Portland Cement mortars, in concrete mixtures, in stucco, and for any purpose for which lump lime is used.

Gypsum Plaster Specifications

The following general directions apply to all brands of cement, wood fibre and prepared plasters:

(1) **General Directions—**

(2) Use a clean, tight mixing box, about 3½x7 ft., raised about 4 in. at one end. Mix with a hoe; the manufacturer disclaims all responsibility if mixing is done by machine.

(3) Use only clean water, free from alkali and impurities; keep tools clean. Never rinse tools in gauging water.

(4) Do not mix more material than can be applied in about an hour.

(5) Do not mix one gauging with another; and never retemper plaster after it has commenced to set. Clean the mixing box after each gauging.

(6) Keep plaster from freezing for 24 hours after application.

Continued on next page

(7) In hot, dry weather, close all openings while plastering to prevent drying out of the material before it is set. Should this happen, however, and the work show soft, white spots, the condition can be remedied by sprinkling with clean water from a spray pump or brush until the material sets.

(8) After plastering has set, open the windows and permit the wall to dry out as quickly as possible.

(9) Keep plaster in a dry place; never store it on the bare ground.

Specifications for Gypsum Cement Plasters

(1) **General Requirements—**

(2) ***Grounds***—To be not less than ¾ in. for wood, wire or expanded metal lath; ⅞ in. for Rocklath; ½ in. for Pyrobar Tile; ⅝ in. for brick or clay tile.

(3) ***Lathing***—Preferably ⅜-in. Rocklath, applied according to manufacturer's specifications. If wood lath, it should be of good grade—free from knots, sap or bark. White pine, cypress or spruce lath are best. Lath must be well nailed; not less than four 3d common nails to each 4-ft. lath, driven well home. Double nailing should be resorted to on very particular jobs, especially if lath are not up to standard in quality and condition.

Break joints every fifth lath, and do not permit ends of lath to butt or overlap; at least ¼ in. space between ends is best.

(4) ***Mortar***—To be any brand of United States Gypsum Company's Cement Plaster (see preceding pages), and to be mixed and applied according to directions of the manufacturer.

(5) **Directions for Mixing—**

(6) First put in a layer of sand, then one of plaster in raised end of box. Hoe dry from one end of the box to the other, then back again, working sand and plaster thoroughly together to a uniform color. Put water in the other end of the box; hoe plaster into the water, mixing thoroughly. Mix thin at first, then add sufficient dry plaster and sand in right proportions to bring it to the proper consistency for application.

(7) Do not mix sand and plaster until ready to add the water.

(8) Use only clean, sharp sand, free from loam and dirt. Screen through a 6-mesh screen. Avoid quicksand.

(9) ***For Rocklath, Wood, Wire and Expanded Metal Lath***—Mix 2 parts, by weight, of clean, sharp sand with 1 part of plaster.

(10) ***For Brick, Pyrobar Tile, Clay Tile and Second or Browning Coat***—Mix 3 parts, by weight, of clean, sharp sand with 1 part of plaster.

(11) **Directions for Applying—**

(12) ***On Rocklath***—Do not wet board. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be ½ in. thick when Rocklath is applied to wood studs. Straighten all angles and base ready to receive finish.

(13) ***On Wood Lath***—Soak lath thoroughly the day before and again an hour or so before applying the plaster, so that they will absorb all the water they can hold. Lay plaster on lightly, but with sufficient pressure to obtain a good key, and fill up grounds. Darby lightly, and use water sparingly.

(14) ***On Wire or Expanded Metal Lath***—Apply a scratch coat, lightly covering the lath and filling meshes. After the scratch coat is set firm and hard, but before it is dry, apply the second coat, bringing it to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

(15) ***On Brick, Pyrobar Gypsum Tile, or Clay Tile Walls***—Soak brick or clay tile walls thoroughly—and if necessary sprinkle Pyrobar lightly—to reduce the suction. Apply sufficient material to fill out grounds. Bring to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

Specifications for Gypsum Wood Fibre Plasters

See General Directions, Nos. 1 to 9, on preceding page.

(16) **General Requirements—**

(17) ***Grounds and Lathing***—Same as specified for cement plasters, 2 and 3, above.

(18) ***Mortar***—To be any brand of the United States Gypsum Company's Wood Fibre Plaster, to be mixed and applied according to directions of the manufacturer.

(19) Only water is to be added to this material to fit it for application, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

(20) **Directions for Mixing—**

(21) Place the plaster in upper end of box and water in lower end. Hoe the plaster into the water and allow it to soak from 10 to 20 minutes. Then mix to correct consistency.

(22) **Directions for Applying—**

(23) ***For Rocklath***—Do not wet board. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be ½ in. thick when Rocklath is applied to wood studs. Straighten all angles and base. Leave base coat rough to receive finish.

(24) ***Wood Lath***—Soak thoroughly the day before, and again an hour or so before plastering. Apply first a thin coat of mortar, following up at once before it sets with sufficient material to fill out the grounds. When the wood fibre is to be troweled down smooth for a finish, it should be used neat. When a float or trowel finish coat is desired, the surface of base coat must be broomed—left rough—to receive the finish. Broom before the plaster begins to set.

(25) ***For Wire and Metal Lath***—Apply the mortar a little stiff. Scratch a thin coat on the lath. After this coat is set hard, apply a second coat mixed same as for brick (see No. 26) straightening up the walls. The second coat should be left rough or broomed to receive the finish.

Note: The company also manufactures wood fibre plaster under a formula allowing the use of an equal amount of sand by weight, but recommends the use of the neat material for application to wood lath and plaster board, as the addition of sand reduces the flexibility and toughness and adds weight.

(26) ***For Pyrobar Tile, Brick or Clay Tile***—Mix equal parts by weight of plaster and clean, sharp sand. Apply plaster in usual manner. Material must be specially retarded for use with sand.

Specifications for Prepared (Sanded) Wall Plasters

See General Directions, Nos. 1 to 9, on preceding page.

(27) **General Requirements—**

(28) ***Grounds and Lathing***—Same as specified for cement plasters, Nos. 2 and 3, in opposite column.

(29) ***Mortar***—To be any brand (see preceding page) of the United States Gypsum Company's Prepared Wall Plaster.

(30) **Directions for Mixing and Applying—**

(31) Nothing is to be added to this material but water, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

(32) Put plaster in one end and water in the other end of box. Hoe plaster into water, mixing thoroughly. Mix thin at first, then add a sufficient amount of dry material, and work to proper consistency for application.

Apply same as specified for cement plaster, Nos. 11, 12, 13, 14 and 15, in opposite column.

Specifications for Bondcrete Plaster

General Requirements—

Caution—Use rough form boards. Avoid dressed or oiled boards. The concrete surface must be dry and free from dust, oils and efflorescence before base coat plaster is applied. If oil or grease is on the concrete surfaces, burn off with a torch. If there is any efflorescence, remove the frost with a wire brush, then wash with a diluted solution (1 to 5) of muriatic acid. Wash off acid with clean water.

Mortar—To be Bondcrete Plaster, manufactured by the United States Gypsum Company, only water to be added, the plaster to be mixed and applied according to directions of manufacturer.

Grounds—To be of sufficient thickness to bring to a true and even surface.

Directions for Mixing and Applying—

Same as for unsanded wood fibre plaster, Nos. 20 and 22, on this page.

Specifications for Ivory Keene's Cement

For a smooth, hard finish, add water only, mix thoroughly, bring to working consistency, and apply. In applying, follow directions for Prepared Trowel Finishes. A smooth, highly polished surface may be produced by rubbing the walls with a cloth after the cement is dry.

In cases where extra plasticity is desired, 1 pail of lime putty may be added to each 100-lb. bag of Ivory Keene's Cement.

Specifications for Lime Putty and Sand Float Finishes

Add water to United States Gypsum Company's Ivory Grand Prize Hydrated Finishing Lime and allow lime to soak for 24 hours.

Trowel Finish—Mix 3 parts of this lime putty by measure with 1 part of dry United States Gypsum Company's Gauging Plaster (see Brands, preceding page) equal to 2 parts of dry hydrated lime and 1 part dry gauging plaster by weight. Lime putty must stand 24 hours before mixing in the plaster. Mix thoroughly and apply in customary manner.

Float Finish—Use 1 part United States Gypsum Company's Unfibred Gypsum Cement Plaster (see Brands, on preceding page) to 1 part clean, sharp sand. Screen sand through No. 12 screen. Mix thoroughly and apply in usual manner.

UNIVERSAL GYPSUM COMPANY

Manufacturers of Gypsum Products

Conway Building, CHICAGO, ILL.

DISTRICT SALES OFFICES

NEW YORK, N. Y. FORT DODGE, IOWA KANSAS CITY, MO ATLANTA, GA.

MILLS: FORT DODGE, IOWA, AKRON, N. Y., ROTAN, TEX., and BATAVIA, N. Y.

TRADE-MARK

Products

- Gypsum Cement Plaster.
- Gypsum Wood Fibered Plaster.
- Gypsum Finishing Plaster.
- Gypsum Sanded Plaster.
- Gypsum Bond Plaster for interior concrete surfaces.
- Prepared Trowel and Sand Float Finishes.
- Best Bros. Keene's Cement.
- Gypsum Gauging Plaster.
- Gypsum Plaster Board.
- Gypsum Partition Tile.
- Exterior Stucco.

Also Hydrated Finishing Lime; Moulding Plasters.

For Insulex, a Gypsum Insulation, see pages 1092-1093; for Gypsum Wall Board, see page 1340.

Service

We have five mills located at points which insure excellent service in all markets east of the Rocky Mountains.

Our salesmen, who cover this territory, together with our engineering department are always at your immediate service to furnish estimates and technical information.

Guarantee

All products are fully guaranteed best quality and to give satisfactory results if used in accordance with our specifications.

Quality of Universal Gypsum Company's Plasters

Universal Gypsum Company's plasters are made from carefully selected basic materials, scientifically prepared by experienced men.

Advantages

Adhere equally well to wood lath, metal lath, plaster board, brick, tile, gypsum blocks, or other plastering bases.

Gypsum plasters set uniformly hard throughout, within 2 or 3 hours after application and dry quickly, permitting carpentry and other work to proceed almost immediately after plastering is finished. Walls finished with gypsum plaster are non-conductors of heat and cold; will resist fire and are verminproof. Can be painted, frescoed, papered or finished with any kind of decorative material a few days after application. Freezing will not harm gypsum plaster after it sets.

Standard Packages

Unless otherwise stated, our plasters are shipped in paper bags containing 80 lb., or in returnable jute bags containing 100 lb.

Classes of Plasters

Universal Gypsum Company gypsum plasters are furnished in three general classes: (1) Plasters for base coats, (2) plasters for finish coats, (3) exterior stucco for exterior surfaces.

Plasters for Base Coats—These plasters are made in four classes each for a particular use, as follows: (1) Cement plasters, unsanded (hair fibered or unfibered); (2) sanded plasters; (3) wood fibered plaster; (4) plasters for concrete surfaces.

Plaster for Finish Coats—These are made in (1) prepared finishing plasters; (2) gauging plasters; (3) moulding and casting plasters; (4) Keene's cement plaster.

Exterior Stucco—For base coat and finishing purposes.

Brands of Universal Gypsum Plasters

Gypsum plasters of each class are marketed under the various brands listed below, all brands of each class being of the same high standard of quality.

Acolite
Blue Ribbon Moulding
§*Brownstone
*Crescent
†Empire Finish
Universal Exterior Stucco
§*Graystone
†No.4 Gray Finish
*Iowana
*Nobles
§*Pioneer
*Pilot
*Plymouth
†Red Band Finish
†Sand Float Finish
§*Stonewall
§*Universal

*These brands for hair fibered, unfibered or wood fibered plasters.

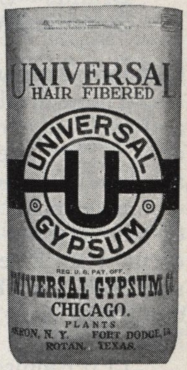
†These brands are finish plasters.

§These brands are also manufactured from Gypsite or dark plaster.

Gypsum Cement Plaster (Unsanded) for Scratch or Brown Coat

This plaster is a "neat" plaster for scratch and brown coats. It is made for use where good sand is available at reasonable cost, or where, for other reasons, it is desirable to sand the plaster at the job.

This is an "all-purpose" plaster for scratch and brown coats on interior walls and ceilings of any material which can be plastered. It is furnished *hair fibered* for scratch coats on metal lath and base on wood lath and plaster board, and *unfibered* for the brown (second) coat over the scratch coat on metal lath work, and for the brown coat on masonry surfaces (two coat work)—no scratch coat being required on the last mentioned surfaces.



Finishing Coats—Any type of finishing coat may be used over the brown coat, including: gypsum plaster finish, lime putty finish, sand float finish, Keene's cement finish, caen stone finish, etc.

Brands—See "Brands" above.

Specifications—See following pages.

Gypsum Sanded Plasters for Scratch or Brown Coat

This is a splendid "cold weather plaster." Needing only water to fit it for application, it may be readily and quickly mixed inside the building with no worry about sand, or troubles arising from the use of frosty sand.

Continued on next page

Furnished *hair fibered* for scratch coats and *unfibered* for brown coats. Like the "sanded" gypsum plasters it will take any type of finishing coat.

Brands—Crescent, Nobles, Plymouth, Universal.

Specifications—See following page.

Gypsum Wood Fibered Plaster for Scratch or Brown Coat

The UNIVERSAL GYPSUM COMPANY's wood fibered plaster is composed of pure rock gypsum and thoroughly shredded wood fiber. It is adapted for use with the addition of not to exceed equal parts of clean sharp sand. When desirable, it can be applied without the addition of sand.

Wood fibered plaster, when applied either with or without the addition of sand, produces a wall that can not be excelled for strength, elasticity and durability.

These features together with lightness in weight make it an ideal plastering material.

It is especially desirable where one-coat work is to be done.

Brands—See "Brands" on preceding page.

Specifications—See following page.

COVERING CAPACITIES UNIVERSAL GYPSUM COMPANY'S GYPSUM PLASTERS PER 100 SQ. YD.

Material mixed and used as per Specifications

Plastering surface	Gypsum cement plaster, neat, 100-lb. bags	Gypsum wood fibered plaster, 100-lb. bags	Gypsum sanded plaster, 100-lb. bags
Wood lath	9 to 12 (sanded 2 to 1)	14 to 17 (unsanded)	22 to 24
Metal lath	16 to 19 (sanded 2 to 1)	20 to 25 (unsanded)	45 to 50
Universal plaster board	8 or 9 (sanded 2 to 1)	12 to 15 (unsanded)	22 to 24
Brick and clay tile	14 to 17 (sanded 3 to 1)	18 to 20 (equal parts sand to be added)	34 to 39
Plymouth or Universal gypsum tile	10 to 12 (sanded 3 to 1)	14 to 16 (equal parts sand to be added)	26 to 29

Bond Plaster for Concrete Surfaces

This is an especially made plaster to be used only for direct application as a brown coat on interior concrete surfaces. Bond plaster needs the addition of water only to prepare it for use, and its cohesive and adhesive properties make it an ideal plaster for application on interior concrete surfaces.

Brands—Universal, Plymouth.

Specifications—See following page.

Gypsum Prepared Finishes, Trowel and Sand Float

These finishes made from gypsum contain no lime and are ready for application with the addition of water only. They are machine mixed, thereby producing an absolutely uniform distribution of the ingredients, which eliminates chance of error at mixing box. The absence of lime in these finishes eliminates troubles (which often occur when lime is used) such as pops, pits, map cracks, soft wall, shrinkage, etc. Decorative treatment can be applied as soon as finish is dry. Manufactured in two kinds.

(1) Empire brand white trowel finish is made from the finest selected gypsum rock and other ingredients of a high standard of purity insuring a smooth hard finish.

(2) Sand float finish is made from high grade gypsum rock and materials that have been developed after much study to meet the demands of our trade for a moderate cost prepared float finish plaster.

Specifications—See following page.

Gypsum Gauging Plasters for Lime Putty Finishes

Our gypsum plasters made for this purpose are manufactured from carefully selected dry gypsum rock which for its purity and adaptability for manufacturing the highest grade finishing plaster is unexcelled. They are uniformly ground to the exact proper fineness for a finishing plaster to mix freely and quickly with lime putty.

Brands—See "Brands" on preceding page.

Specifications—See following page.

Universal Exterior Stucco

Permanence—Universal exterior stucco for base coat is a ready mixed stucco that has standard gray portland cement for its base, which, together with other carefully selected ingredients all scientifically proportioned and machine mixed in large quantities according to formula, combine to produce easy working, uniformly dependable and permanent stucco.

Beauty—The base of Universal exterior stucco for finish coat is white portland cement and is mixed with the proper selected ingredients according to a correct formula to permit the use of this exterior stucco on the best classes of homes. It can be floated, stippled and rough cast.

A further variety of textures can be secured depending upon the ingenuity of the contractor and architect.

Both types of Universal exterior stucco need only the addition of water to make them ready for application.

Economy—The first coat is the last. There is no upkeep for painting or repairing.

Best Bros. Keene's Cement

Manufactured by the Best Bros. Keene's Cement Company, Medicine Lodge, Kan. (See their pages in this edition.)

Carried in stock at all mills for shipment with other commodities as manufactured by our company. The best Keene's cement manufactured in the United States.

Universal Gypsum Plaster Board

It is a fire, sound, heat and cold resisting lathing and sheathing material and forms a perfect backing for gypsum plasters.

It strengthens the building when used as sheathing or lathing; avoids lath buckling, stains and discoloration; saves fuel, time, labor and money.

Sizes and Thickness—Manufactured in standard sizes of approximately 32x36 and 32x48 in., by 3/8 in. thick, weighing 1½ lb. per sq. ft.

Universal or Plymouth Gypsum Partition Tile

This gypsum product tested and approved by the National Board of Fire Underwriters has an established reputation in the building world through repeated use by architects, contractors and builders. It is fireproof, a non-conductor of heat, cold and sound; is light in weight, strong and tough, erects economically without waste, and is recognized as the modern non-bearing partition and furring material for fireproof buildings.

UNIVERSAL
U
GYPSUM

Sizes—Standard 12x30 in. in thickness of 2 and 3 in. solid; 3, 4, 5 and 6 in. hollow.

Continued on next page

Specifications for Universal Gypsum Company's Plasters

The general directions apply to all brands of cement, wood fiber and prepared plasters:

(1) General Directions—

(2) Use a clean, tight box, about 3½x7 ft. x 12 in. deep. Box to be thoroughly cleaned after each mixing. Old and new boxes must be cleaned of all spent material, dirt and lumps.

(3) The water used for mixing must be clean, free from alkali and impurities. Do not wash tools in the gauging water. Tools to be kept clean.

(4) One gauging must not be mixed with another, and never retemper plaster after it has commenced to set. Box to be cleaned after each mixing.

(5) Plaster to be kept from freezing twenty-four hours after application.

(6) Never mix more material than can be applied in about an hour.

(7) In hot, dry, or windy weather, plastering is to be protected from wind, and if necessary, sprinkled with water, to prevent the plastering drying out too much before it has set.

(8) In freezing weather, plastering to be protected from frost until it has set hard.

(9) When plastering has set, doors and windows are to be kept open, so that plastering will dry quickly.

Specifications for Gypsum Cement Plaster

(1) Grounds—To be not less than ¾ in. for ¼-in. plaster board, wood, wire or expanded metal lath; ⅞ in. for ⅜-in. Universal plaster board; ½ in. for Universal or Plymouth gypsum tile; ⅝ in. for brick or clay tile.

(2) Lathing—Preferably ⅜ in. Universal plaster board, applied according to manufacturer's specifications. If wood lath, it should be 32 or 48 in. in length, ¼ in. thick and approximately 1½ in. wide. White pine, cypress or spruce lath are best. Lath must be well nailed; not less than four 3d common nails to each 4 ft. of lath, driven well home. Break joints every fifth lath, and do not permit ends of lath to butt or overlap; at least ¼-in. space between ends is best.

(3) Mortar—To be any brand of Universal Gypsum Company's cement plaster (see preceding page) and to be mixed and applied according to directions of the manufacturer.

(4) Mixing Directions—Raise one end of the mortar box about 4 in. Place in upper end of box 1 layer of sand, and on top of the sand one layer of plaster. Hoe the material dry from the upper end of the box down to the lower and back again until the dry mixture is of an even color. Put water into the empty or lower end of the box and hoe the plaster and sand into the water, mixing thoroughly to the proper consistency for application.

(5) Plaster and sand are not to be mixed until ready to add water.

(6) Only clean, sharp sand, free from loam and dirt, to be used. Avoid quicksand.

(7) For Universal plaster board, wood, wire and expanded metal lath mix 2 parts, by weight, of clean, sharp sand with 1 part of plaster.

(8) For brick, gypsum tile, clay tile and second or browning coat mix 3 parts, by weight, of clean, sharp sand with 1 part plaster.

(9) Application Directions—

(10) On Universal plaster board, board must not be wet. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be ½ in. thick when Universal board is applied to wood studs and ⅝ in. thick when applied to Simplex ceilings and partitions. Straighten all angles and base ready to receive finish.

(11) On wood lath wet the lath thoroughly several hours before plastering, so that all swelling of the wood will take place in advance of the application of the plaster. Lay plaster on lightly, but with sufficient pressure to obtain a good key, and fill up grounds. Darby lightly and use water sparingly.

(12) On wire or expanded metal lath, apply scratch coat with sufficient pressure to fill all meshes, covering and stiffening the lath, then scratch to form a rough surface to provide a bond for second coat. After scratch coat has set firm and hard, but before it is dry, follow with the second coat, which is applied and straightened in the regular way, keeping back from the grounds to allow for finishing coat. Surface of second coat must be roughened to receive finishing coat. When thoroughly set and nearly dry, apply finishing coat.

(13) On brick, gypsum tile or clay tile walls, soak walls thoroughly and, if necessary, sprinkle gypsum tile lightly to reduce suction. Apply sufficient material to fill out grounds. Bring to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

Specifications for Gypsum Wood Fibered Plasters
(See General Directions Nos. 1 to 9)

(14) Grounds and Lathing—Same as specified for cement plasters (see 1 and 2).

(15) To be any brand of Universal Gypsum Company's wood fibered plasters, to be mixed and applied according to directions of the manufacturer.

(16) Use water only in mixing, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

(17) Mixing Directions—Place the plaster in the upper end of box and water in lower end. Hoe the plaster into the water and allow it to soak from ten to fifteen minutes, then mix to correct consistency.

(18) Application Directions—

(19) On plasterboard, board not to be wet. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be ½ in. thick when plaster board is applied to wood studs and ⅝ in. thick when applied to Simplex ceilings and partitions. Straighten all angles and base, leaving base coat rough to receive finish.

(20) On wood lath wet the lath thoroughly several hours before plastering, so that all swelling of the wood will take place in advance of the application of the plaster. Apply a thin coat of mortar first, following up at once, before it sets, with sufficient material to fill out the grounds. When the wood fiber is to be troweled down smooth for a finish, it should be used neat. When a float or trowel finish coat is desired, the surface of the base coat must be broomed (left rough) to receive the finish. Broom before the plaster begins to set.

(21) On wire and metal lath, apply the mortar a little stiff. Scratch a thin coat on the lath. After this coat has set hard, apply a second coat, mixing the same as for brick (see No. 22) straightening up the walls. The second coat should be left rough, or broomed, to receive the finish.

Note: Gypsum wood fibered plaster with but 1 part, by weight, of sand can be used on brick, gypsum and clay tile and wood lath surfaces, and for second coat on gypsum plaster board, wire, expanded or sheet metal lath. When it is to be used with sand, manufacturer should be advised.

(22) Gypsum tile, brick or clay tile. Mix equal parts, by weight, of plaster and clean, sharp sand. Apply plaster in usual manner. Material must be especially retarded for use with sand.

Specifications for Prepared (Sanded) Wall Plasters
(See General Directions Nos. 1 to 9)

(23) Grounds and Lathing—Same as specified for cement plasters, Nos. 1 and 2.

(24) Mortar—To be any brand of the Universal Gypsum Company's prepared wall plaster (see preceding page).

(25) Mixing and Application Directions—Nothing to be added to this material but water, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

(26) Put plaster in one end and water in the other end of box. Hoe plaster into water, mixing thoroughly. Mix thin at first, then add a sufficient amount of dry material and work to proper consistency for application. Apply same as specified for cement plaster, Nos. 9, 10, 11, 12, 13.

Specifications for Universal Bond Plaster

(27) Note: Use rough form boards. Avoid dressed or oiled boards.

(28) Before plastering, all concrete surfaces shall be clean and all dust and loose particles removed. Grease, oil or efflorescence, if present, shall be washed off with a solution of one part of commercial muriatic acid to four parts of water, and the surface then washed again with clean water. Mortar to be Universal bond plaster manufactured by the Universal Gypsum Company—only water to be added—then plaster to be mixed and applied according to manufacturer's directions.

(29) Grounds—To be of sufficient thickness to bring to a true and even surface.

(30) Mixing and Application Directions—Same as for unsanded wood fibered plaster (see Nos. 17 and 18).

Specifications for Lime Putty and Sand Float Finishes

Add water to Universal Gypsum Company's Universal or Plymouth Rock hydrated finishing lime and allow lime to soak for 24 hours.

Trowel Finish—Mix 3 parts of this lime putty by measure with 1 part of dry Universal Gypsum Company's gauging plaster (see brands, second page preceding) equal to 2 parts of dry hydrated lime and 1 part dry gauging plaster by weight. Lime putty must stand 24 hours before mixing in the plaster. Mix thoroughly and apply in customary manner.

Float Finish—Use 1 part Universal Gypsum Company's unfibered gypsum cement plaster (see brands, second page preceding) to 1 part clean, sharp sand. Screen sand through No. 12 screen. Mix thoroughly and apply in usual manner.

THE KELLEY ISLAND LIME & TRANSPORT CO.

World's Largest Producer of Lime

Leader News Building
CLEVELAND, OHIO

TRADE-MARK

Products

Tiger White Rock Finish Hydrated Lime, ordinarily known as "Tiger Finish"; Tiger Mason's Hydrated Lime, generally known as "Tiger Mason's."

Also Lime Products for agricultural and chemical purposes.

Slogan

Because it spreads so easily and covers so many yards per sack, the phrase "Spreads like warm butter" has long been associated with "Tiger Finish."

Facilities and Distribution

The Kelley Island Lime & Transport Co. is the world's largest producer of lime and limestone products. This company has eleven plants conveniently located. All correspondence should be addressed to the General Offices at Cleveland.

Tiger Finish and Tiger Mason's are packed in 50-lb. valve paper sacks, which always bear the "Tiger" trademark. They are handled by over four thousand builders' supply dealers in all parts of the United States.

Lump Lime and Hydrated Lime

Architects, builders and contractors realize a great saving of time, space and expense in using Tiger Hydrated Lime. The value of hydrated lime is an assurance of perfect slaking in the hydrated product, and its ability to keep in good condition when stored in a dry place. Lump lime furnished when desired.

Tiger White Rock Hydrated Lime—"Tiger Finish"

Manufacture—Nowhere else in all the world have the magnesium limestone deposits in White Rock, Ohio, ever been equalled. Nature has provided there a rock that is acknowledged to be the best for producing finishing lime. The snowy whiteness of "Tiger Finish" is due to this natural advantage plus a scientific process of refining. The result is a pure lime which makes a putty that spreads like warm butter and covers more yards of wall surface. (Covers about 800 sq. yds. per ton.) Uniform high quality maintained for more than a quarter century has made "Tiger Finish" first choice of architect, builder, plasterer and owner.

When properly proportioned with sand and hair and applied as scratch or brown coat to wood or metal lath, hollow tile, brick or gypsum block, it forms a perfect wall or ceiling, free from impurities and ready for finishing.

"Tiger Finish" produces a perfect white finish when mixed with a good grade of calcined plaster and, when proportioned with a fine sand, it forms a good sand finish.

In Interior Plastering—(1) Hydrated lime has long been considered a valuable constituent of plaster and is regularly used for one, two or three-coat work.

(2) Hydrated lime plaster is an excellent sound absorbing material. The reason for this is due to its porous nature in the hardened state and its great sand carrying capacity.

(3) It is the most sanitary of plasters.

(4) It is fire resisting.

(5) Its covering capacities are extremely large.

(6) Its easy working qualities make the highest class workmanship possible and encourage faster work.

(7) It has great tensile strength.

Tiger Mason's Hydrated Lime

(1) "Tiger Mason's" improves the spreading quality of cement mortar, making an easy working mortar of high compressive strength that forms a better bond. It eliminates the labor required to slake lump lime.

(2) It helps to retain sufficient moisture, thereby allowing a good bonding surface of the masonry unit.

(3) "Tiger Mason's" contains all the ingredients necessary for an easy working lime mortar and for portland cement mixtures.

In Concrete Mixtures—(1) Hydrated lime lubricates the mix so that it flows freely through the chutes.

(2) It positively aids in preventing segregation of aggregates.

(3) It produces smooth exterior surfaces, and minimizes honeycombing and hair cracking.

(4) It increases the density and watertightness of the concrete by virtue of remarkable void filling properties.

Continued on next page

TIGER
White Rock
FINISH
Spread like warm butter
50 LBS
NET

Checking List

The following is a guide to specification writers in checking items where Tiger Hydrated Lime products can be advantageously specified:

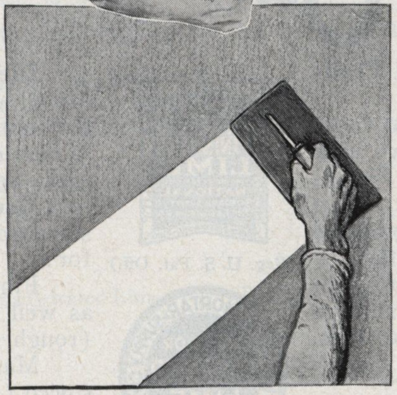
Concrete Work—Grillage, footings, foundation walls, retaining walls, piers, columns, girders, beams, vaults, floors, stairways, chimneys, roofs, partitions, enclosures, machinery foundations, cellar and area bottoms, curbs and sidewalks, subways, roadways and gutters, drives and paths, cisterns, cesspools, sumps, pits, sewer pipes, piling, steps, stucco, ramps, railings, slabs, balustrades.

Amount to Use for All Concrete Work—10% of hydrated lime by weight of portland cement used.

Masonry—General brickwork, stone, marble, granite and tile setting.

Amount to Use—25, 50 or 100% of Tiger hydrated lime by weight of portland cement to 3 to 4 parts sand makes good mortars. The 100%, or what is known as 50-50 mortar, is highly recommended.

Plastering—*Exterior*—Hydrated lime is found to have great advantages for use in cement stucco.



For All Surfaces "Tiger Finish" Is without Equal

Specification—General Directions for Interior Plastering

(1) All materials to be delivered on the job in the manufacturers' packages and kept dry.

(2) All plaster for the interior of the building to be "Tiger Finish" mixed on the job in proportions and applied according to the specification herewith.

(3) (a) Scratch coating on wood lath to be mixed in proportions of 1550 lbs. of sand to 450 lbs. hydrated lime and 3 lbs. hair.

(b) Scratch coating on metal lath to be mixed in proportions of 1550 lbs. of sand to 450 lbs. hydrated lime and 4 lbs. hair.

(c) Scratch coating on brick or tile to be mixed in proportions of 1600 lbs. of sand to 400 lbs. hydrated lime and 1½ lbs. hair.

Apply the scratch coat lightly, but with sufficient pressure to obtain a good clinch. Scratch the face to strengthen bond for brown coat. Allow scratch coat to dry before applying brown coat.

(4) (a) Brown coating on wood or metal lath to be mixed in proportions of 1600 lbs. of sand to 400 lbs. hydrated lime and 1½ lbs. of hair.

(b) Brown coating on brick or tile to be mixed in proportions of 1600 lbs. of sand to 400 lbs. hydrated lime.

Interior—Apply enough material to bring out to grounds, using rod and darby to form an even surface and straight angles. When surface is firm but not thoroughly dry handfloat same to prevent shrinkage cracks in both brown and finish coats.

Finish Coat (White)—Soak "Tiger Finish" lime 24 hours if possible to form a plastic putty. Thoroughly mix putty with 20 to 30% of high grade plaster to a working consistency. Apply with trowel and bring to a smooth surface, keeping same moist during operation. Trowel surface to the desired effect.

Sand Finish—Mix a good plastering sand with "Tiger Finish" hydrated lime in proportions 3 parts sand to 1 part of lime. While in a dry state screen through a No. 10 to 15-mesh screen, then add water to bring to a plastic consistency. If possible, allow finish to stand overnight before applying, forming an easy spreading material. Apply with trowel to an even surface, then scour with water brush and float to desired effect.

Architectural Service and Information Department

This company will be glad to discuss with architects, contractors or builders any problem in connection with the use of hydrated lime.

"Studies in Lime" is an attractive book in colors, illustrating many interior designs and texture finishes and giving working details for plastering decoration. Free on request.

NATIONAL MORTAR & SUPPLY COMPANY

Manufacturers of Lime and Limestone Products

GENERAL OFFICES
Federal Reserve Building
PITTSBURGH, PA.

PLANTS: GIBSONBURG AND COLD SPRINGS, OHIO

Products

Banner Hydrated Finishing Lime; Superior Hydrated Lime.

Also manufacturers of Lump Lime and Crushed Limestone.

Banner

50 LBS NET
IMPROVED SYSTEM
BANNER
HYDRATED
FINISHING
LIME
MANUFACTURED BY
NATIONAL
MORTAR & SUPPLY CO
PITTSBURGH, PA
BEST QUALITY
WORKS-GIBSONBURG-OHIO

(Reg. U. S. Pat. Off.)

NATIONAL MORTAR & SUPPLY CO.
SUPERIOR
HYDRATED
LIME
OFFICE PITTSBURG, PA.

TRADE-MARKS

The Company and Its Trade-marked Products

The National Mortar & Supply Company specializes in the production of two high grade lime products—*Banner Hydrated Finishing Lime,* a finishing lime of the highest quality; and *Superior Hydrated Lime,* the finest grade of white lime for first and second coat plaster, for mortar for laying brick, stone or tile, or as an admixture in concrete. Both materials more than comply with all A.S.T.M. specifications.

Plants and Manufacturing Facilities

The company operates two plants:

A modern 35-kiln plant with a daily capacity of 350 tons, located at Gibsonburg, Ohio, in the heart of the Ohio finishing lime district, specializes in the production of Banner Hydrated Finishing Lime, known as the finishing lime that is *"easy to spread—hard to beat."* Another specially equipped 10-kiln plant, located at Cold Springs, Ohio, near Springfield, specializes in Superior Hydrated Lime, with a daily capacity of 100 tons.

Distribution Centers

A wide and economic distribution of Banner Finish and Superior Hydrated Lime is assured through our sales representatives strategically located at New York, Chicago, Philadelphia, Cleveland, Pittsburgh, Columbus, Detroit, and Newark, N. J.

Building supply dealers in practically every city and town in the eastern half of the United States carry large stocks at all times for immediate delivery to the job.

Packing and Shipping

Our lime is packed in 50-lb. paper valve sacks. All cars are carefully lined with a heavy paper and sacks are neatly piled to avoid breakage in transit. Loading is a very important item with us and is done under the close supervision of a corps of inspectors.

Banner Hydrated Finishing Lime

Quality—Banner lime is made from lump lime, burned from the purest dolomitic limestone which is quarried from the finest rock deposits in the country. The limestone is sized mechanically by a screening process before it is burned. This process assures a uniform size of stone in the kiln which allows the heat to be applied equally to all the lime and causes it to be evenly and thoroughly burned. Absolute heat regulation through the use of producer gas in modern vertical kilns assures the finest quality of lump lime. It is then carefully hydrated in a series of specially-designed, continuous-process, closed hydrators, after which it is air-separated, not screened, to insure powdery fineness. Due to its extreme fineness it has easy spreading qualities, permitting fast work without rolling up under the trowel.

Identification—In order that Banner Hydrated Finishing Lime may be identified on the job, the trade-mark as illustrated, is printed in blue on each bag so that any substitution can easily be detected.

Uses—Banner, when used according to standard specifications, will give perfect results for:

Finish or white coat on all kinds of plaster as well as for first and second coat plastering (rough or scratch coat and brown coat).

Masonry (brick, stone and tile mortar); stucco (exterior plaster); concrete (waterproofing and lubricating); whitewashing.

We will gladly furnish, on request, complete standard specifications on any or all of the above.

Covering Capacity—For white coating or finishing walls, on average work, 1 ton of Banner Hydrated Finishing Lime will cover 1,000-yd.

Directions for Using Banner Hydrated Finishing Lime

For Mixing Finish Coat (White Finish, Skim Coat, etc.)—Soak in an ordinary mortar box, or any watertight box. One about 6x4x1 ft., and clean, will be found most convenient and entirely satisfactory. Fill the box half full of water first, then scatter Banner Lime in evenly until the box is almost full, the water covering the entire mass and softening it thoroughly. To secure best results, this mixture should be allowed to stand at least 12 hours before using the hoe or other tools. Always be sure to soak enough material each day to meet the requirements of the day following.

Before applying, circle the putty out on the mortar board. Fill in with a little water, sprinkle in a sufficient quantity of calcined plaster (plaster of paris) to get the desired set and hardness, and then thoroughly mix the two. On average work, about 200 lb. of Banner is sufficient to cover 100 yd. of plastering.

For Mixing Sand Finish Coat—Use a clean, tight mortar box, as above. Put in the lime, together with sand enough to bring to the desired finish, and hoe from one end of box and back again to thoroughly mix the two materials. Add enough water to bring to the proper consistency and allow to stand overnight. Mix enough material to meet requirements of next day.

Specifications for Applying Banner Hydrated Finishing Lime

To Wood Lath—*Three-coat Work*—Where plaster is mentioned, it shall mean a mixture of Banner Hydrated Finishing Lime which passes the Standard Specifications for Hydrated Lime of the American Society for Testing Materials, and sand in proportions and applied as mentioned on next page.

Continued on next page

Where wood lath is mentioned, it shall mean the ⅜x1½-in. No. 1 spruce, hemlock or white and Norway pine lath, free from knots, sap, bark or other imperfections.

Lathing is to be put on a full ¼-in. apart and nailed with 3d nails well driven flush with the lath. If the lath are dry, sprinkle same with water before applying the plaster.

Grounds to be ⅞-in.

Scratch Coat—Apply the scratch coat lightly, but with sufficient pressure to obtain a good clinch. Scratch the face to strengthen bond for brown coat. When this coat is thoroughly dry apply the brown coat.

Brown Coat—Use enough material to bring out to grounds. Darby and float the entire surface to obtain a true and even plane ready for finish coat.

Finish Coat—[*White:* Bring the putty to the proper consistency for application and trowel to a perfect finish, keeping the surface moist.] [*Sand:* After applying the material, use the brush and float well to cause the surface to present a characteristic sandpaper finish.]

Note: Incorporate only one paragraph, "White" or "Sand," as desired.

Proportions for Hydrated Lime Plaster on Wood Lath, Three-coat Work—The following are the proportions in which materials should be mixed at the mixing plant or by the contractor on the job:

Per ton of Sanded Plaster	Per 100 lb. of Banner Hydrated Lime
SCRATCH COAT	
1550 lb. sand 450 lb. Banner Hydrated Lime 3½ lb. hair	350 lb. sand 100 lb. Banner Hydrated Lime ¾ lb. hair
BROWN COAT	
1600 lb. sand 400 lb. Banner Hydrated Lime 1½ lb. hair	400 lb. sand 100 lb. Banner Hydrated Lime ⅜ lb. hair
FINISH COAT, WHITE	
Banner Lime Putty properly gauged with plaster of paris	
SAND FLOAT FINISH	
1450 lb. sand 550 lb. Banner Hydrated Lime	275 lb. sand 100 lb. Banner Hydrated Lime

These are average mixtures for first class, clean, sharp, plastering sand. Mixtures may be changed to meet other qualities of sand.

To Metal Lath—***Three-coat Work***—Where plaster is mentioned, it shall mean a mixture of Banner Hydrated Finishing Lime, which passes the Standard Specifications for Hydrated Lime of the American Society for Testing Materials, and sand in proportions and applied as mentioned below.

Grounds to be ¾-in.

(Metal Lath to be kind and grade designated by the architect.)

Scratch Coat—Apply the scratch coat lightly, but with sufficient pressure to thoroughly embed the metal lath in the plaster. Scratch the face to strengthen bond for brown coat. When this coat is thoroughly dry apply the brown coat.

Brown Coat—Bring this coat out to grounds, use the darby and float to form a true and even surface for the finish coat.

Finish Coat—[*White:* Bring the putty to the proper consistency for application and trowel to a perfect finish, keeping the surface moist.] [*Sand:* After applying the material, use the brush and float well to cause the surface to present a characteristic sandpaper finish.]

Note: Incorporate only one paragraph, "White" or "Sand," as desired.

Proportions for Hydrated Lime Plaster on Metal Lath, Three-coat Work—The following are the proportions in which materials should be mixed at the mixing plant or by the contractor on the job:

Per ton of Sanded Plaster	Per 100 lb. of Banner Hydrated Lime
SCRATCH COAT	
1550 lb. sand 450 lb. Banner Hydrated Lime 4 lb. hair	350 lb. sand 100 lb. Banner Hydrated Lime 1 lb. hair
BROWN COAT	
1600 lb. sand 400 lb. Banner Hydrated Lime 1½ lb. hair	400 lb. sand 100 lb. Banner Hydrated Lime ½ lb. hair
FINISH COAT, WHITE	
Banner Lime Putty properly gauged with plaster of paris	
SAND FLOAT FINISH	
1450 lb. sand 550 lb. Banner Hydrated Lime	275 lb. sand 100 lb. Banner Hydrated Lime

These are average mixtures for first class, clean, sharp, plastering sand. Mixtures may be changed to meet other qualities of sand.

To Brick or Tile—***Three-coat Work***—Same as specifications for applying to metal lath, except for quantities which are:

Per ton of Sanded Plaster	Per 100 lb. of Banner Hydrated Lime
SCRATCH COAT	
1600 lb. sand 400 lb. Banner Hydrated Lime 1½ lb. hair	400 lb. sand 100 lb. Banner Hydrated Lime ⅜ lb. hair
BROWN COAT	
1600 lb. sand 400 lb. Banner Hydrated Lime	400 lb. sand 100 lb. Banner Hydrated Lime
FINISH COAT, WHITE	
Banner Lime Putty properly gauged with plaster of paris	
SAND FLOAT FINISH	
1450 lb. sand 550 lb. Banner Hydrated Lime	275 lb. sand 100 lb. Banner Hydrated Lime

Superior Hydrated Lime

Quality—Springfield, Ohio, lime, from which our Superior Hydrated Lime is manufactured has been conceded for many years to be the highest grade of material for masons' use, as well as for rough coat plastering.

The old style Springfield lump lime has always been noted for its smooth working qualities, sand carrying capacity, and plasticity. In hydrated form this material retains all these qualities, in addition to the advantages which any good hydrated lime always has over the old style lump lime.

Uses—For first and second coat plaster, better known as rough or scratch coat and leveling or brown coat.

Mortar for laying brick, stone or tile; also for stucco work.

In concrete as a lubricant for spouting (makes concrete flow easily in chutes, also around reinforcement, complicated forms, arches, etc.), prevents segregation of aggregates and because of its extreme fineness (screen test 99% plus through 100-mesh) fills all voids, making waterproof concrete.

Directions for Using Superior Hydrated Lime

All mixing should be done in a watertight mortar box of ample size. Sufficient turnings should be given the materials, both when dry and wet, to insure uniform color and consistency. The importance of proper and thorough mixing of the ingredients can not be too strongly emphasized.

Specifications for Applying Superior Hydrated Lime

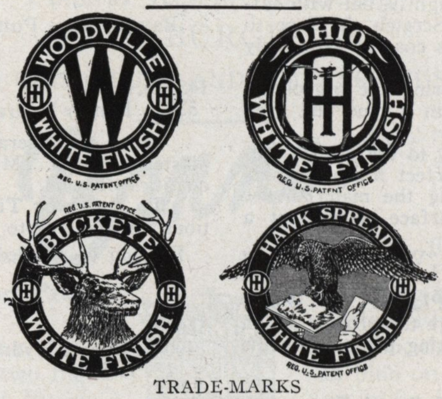
This can be used the same as Banner Hydrated Finishing Lime for rough and brown coat plastering, as shown in above specifications.

Full specifications for all other uses sent free on request.

THE OHIO HYDRATE & SUPPLY CO.

Manufacturers and Distributors of Hydrated Lime and Limestone Products

OFFICES AND PLANT
WOODVILLE, OHIO



TRADE-MARKS

Products

Hydrated Lime: Ohio, Woodville, Buckeye and Hawk Spread White Finish for finish, scratch, and brown coats, concrete and mortars.

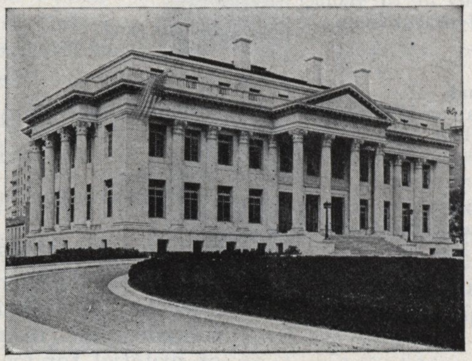
Also manufacturers of Lump Lime and Crushed Limestone.

All Ohio Hydrate products are guaranteed to meet the standard specifications of the American Society for Testing Materials.

Facilities and Organization

Organized in 1916, this company has enjoyed a constant and steady growth until today its annual plant capacity is over 100,000 tons of finishing hydrate. Plant located on Pennsylvania R. R., giving through freight rates to principal centers.

Products sold by 6500 building supply dealers in all parts of the United States and Canada.



Red Cross Building, Washington, D. C.

Quality of Ohio Hydrated Lime

The four brands listed above are of one quality and each will produce the same result.

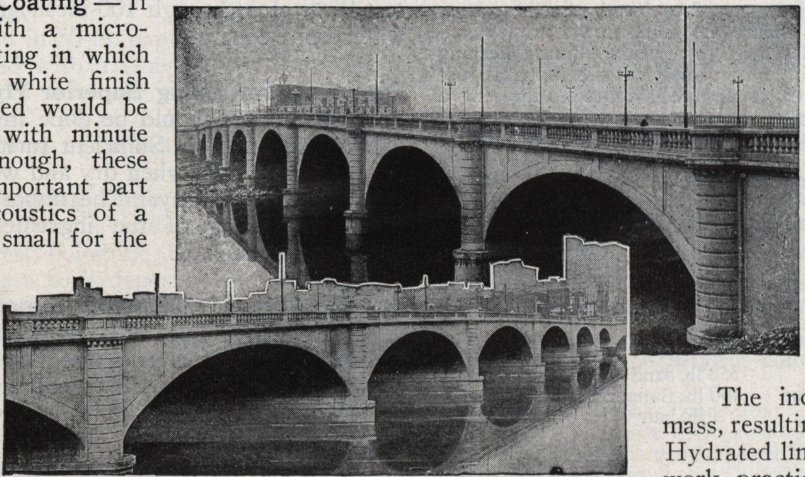
The dolomitic limestone from which Ohio Hydrated lime is made is 99½% pure as it leaves the quarry. Modern methods of manufacture result in further purification. In the hands of the plasterer this exceptional purity, plus an unusual chemical content and the natural peculiar composition of the limestone rock, results in an extremely hard, smooth, white wall. This purity also explains the fire-resisting, metal-preserving and sound-proofing properties of Ohio Hydrated lime.

The fatness and workability of this lime account for its easy spreading and far reaching qualities.

Where Ohio Hydrated Lime Should Be Used

For convenience, the following list is given as representing the general classifications of work where Ohio Hydrated lime can be used with decided advantage.

For White Coating—If closely examined with a microscope, the white coating in which any Ohio Hydrate white finish product has been used would be found to be filled with minute pores. Peculiarly enough, these pores play a very important part in the successful acoustics of a room. Although too small for the naked eye to see, yet they break up and absorb the sound waves, preventing any rebound which is the reason for the echo nuisance where this porosity does not exist.



Broad Street Bridge, Columbus, Ohio
Waterproofed and lubricated with Ohio Hydrated lime

Another distinct advantage realized is the permanency of the walls which affords a like degree of permanency in the decorations. If white coated walls are allowed to stand undecorated for at least one year, this permits the building to settle so that any cracks which may result from the settling, can be properly filled and allowed to harden. The result is a perfectly smooth, white wall, capable of being made permanently beautiful because of the corresponding permanency of Ohio Hydrate white finish lime.

Scratch and Brown Coats—The uniform quality and unusual plasticity of Ohio Hydrated lime have made it an important factor in high grade interior plaster work, including scratch and brown coats.

As a matter of fact, there is no kind of interior plaster work where Ohio Hydrated lime plaster does not excel. It can be used on all kinds and grades of material with better results, in acoustics, light, sanitation, appearance and life of the wall.

Exterior Stucco Work—The use of Ohio Hydrated lime as an admixture to cement greatly improves exterior stucco work because of its unusual plasticity and "fatness." This characteristic makes it possible to cover the metal lath with less pressure than is required for ordinary stucco mixtures.

In like manner is the efficiency of the mixture increased for use on wood lath because of the liberal "key" produced. Then too, the plasticity or workability of the mass aids in effecting a complete "fill" in every crack and crevice. The monolithic surface thus produced prevents any absorption of outside moisture. Naturally this adds greatly to the lasting qualities of the stucco work.

Watertight Concrete Work—The addition of Ohio Hydrated lime to any concrete mixture in the proportion of 5% to 10% of the weight of the cement used renders the mixture much easier to handle. The plasticity of the lime lubricates the mixture, making it mix better, pour easier, and run into the forms and around the reinforcing much more evenly and uniformly, making it possible to attain a clean, smooth finish.

The increased density of the mass, resulting from the use of Ohio Hydrated lime, renders the concrete work practically watertight, hence far more permanent.

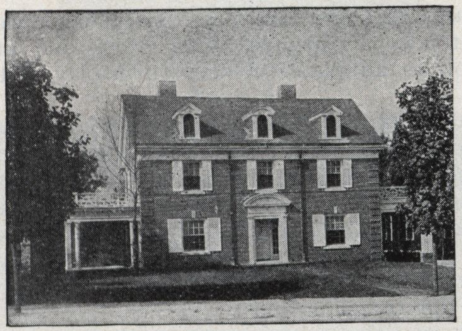
Continued on next page

Lime-Cement Mixtures

Portland cement mixtures are greatly improved through the use of Ohio Hydrated dolomitic lime. It possesses certain lubricating properties which facilitate the movement of the mixture through the chutes as well as aiding in its handling.

It also acts adhesively, holding the mass together, thereby preventing a separation of the sand and stone from the cement. In other words, the addition of Ohio Hydrated lime renders the mixture more plastic, easier to handle and easier to spread which alone effects a saving in labor.

Then too, the same qualities which cause the greater plasticity, tend toward a closer contact in the mass with the result that the density of the mixture is increased and its resistive powers greatly multiplied. It is because of this peculiar characteristic that cement mixtures in which Ohio Hydrated lime is used, are much denser and far less liable to crack.



Residence Mrs. Phillip F. L. Engle, Atlanta, Ga.

Mortar

Portland cement mortars can be produced much easier and cheaper through the use of Ohio Hydrated lime. Not only does it make the mixture easier to handle, but also does away with the labor ordinarily required to slake the lump lime.

It can readily be realized that the use of mortar of such plasticity will naturally allow the brick, stone, tile or other material, to become more firmly embedded. This, of course, produces a compactness which obviously must add strength to the entire work. Likewise does this same characteristic tend to make the work more watertight, while also making it possible to work the material in low temperatures when ordinary cement mortar could not be safely handled.

Stacy-Trent Hotel, Trenton, N. J.

Specifications

Materials—The building is to be plastered throughout with lime plaster made with Ohio brand hydrated lime and sand of the quality mentioned below.

All materials are to be applied in thorough and workmanlike manner. Specifications must be followed in detail and contractor must remove all his unused material, scaffolding, rubbish, etc., from the premises.

Where lime is mentioned in these specifications, it shall mean Ohio brand hydrated lime, which has been slaked at the mill by the manufacturer, each sack bearing the name of the manufacturer, The Ohio Hydrate & Supply Co.

When material is delivered sanded on the job, the sacks must bear the name of the mixing plant where same was mixed.

Where sand is mentioned, it shall mean a clean, sharp sand such as will pass through a No. 8 screen (64 meshes to the square inch) and to contain not over 5% loam.

Where wood lath is mentioned, it shall mean ⅜x1½-in. No. 1 spruce, hemlock or white and Norway pine lath, free from knots, sap, bark, or other imperfections.

Where calcined plaster (plaster of paris) is mentioned it shall mean a standard grade of finely pulverized calcined plaster, free from lumps and suitable for gauging finishing lime putty.

Finish Coat—The finish coat is to be applied when the second coat is dry. The second coat is to be sprinkled generously with clean water before applying the finish coat. Soak Ohio brand hydrated finishing lime overnight (24 hours is better) before using. Form the putty into a ring on the mortar board and add about 20 lbs. of calcined plaster to each 100 lbs. of Ohio brand hydrated finishing lime, working it thoroughly.

Finish coat is to be applied in a first class, workmanlike manner and troweled to a smoothly polished surface free from brush marks.

Wood Lath (Three-coat Work)—Scratch coat: 1500 lbs. sand, 450 lbs. Ohio Hydrated lime, 3½ lbs. hair. Brown coat: 1600 lbs. sand, 400 lbs. Ohio Hydrated lime, 1½ lbs. hair. Finish coat: Ohio Hydrated lime putty.

Wood Lath (Two-coat Work)—First coat: 1550 lbs. sand, 450 lbs. Ohio Hydrated lime, 3½ lbs. hair. Finish coat: Ohio Hydrated lime putty.

Brick or Tile (Three-coat Work)—Scratch coat: 1600 lbs. sand, 400 lbs. Ohio Hydrated lime, 1½ lbs. hair. Brown coat: 1600 lbs. sand, 400 lbs. Ohio Hydrated lime. Finish coat: Ohio Hydrated lime putty.

Brick or Tile (Two-coat Work)—First coat: 1600 lbs. sand, 450 lbs. Ohio Hydrated lime, 1½ lbs. hair. Finish coat: Ohio Hydrated lime putty.

Metal Lath (Three-coat Work)—Scratch coat: 1500 lbs. sand, 450 lbs. Ohio Hydrated lime, 4½ lbs. hair. Brown coat: 1600 lbs. sand, 400 lbs. Ohio Hydrated lime, 1½ lbs. hair. Finish coat: Ohio Hydrated lime putty. 15% to 20% cement by weight of lime is recommended for gauging scratch or brown coat plaster to accelerate setting.

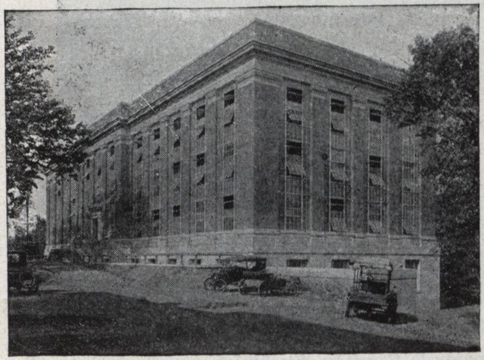
Sand Float Finish—475 lbs. Ohio Hydrated lime, 1525 lbs. sand.

Portland Cement Concrete—Add 10% Ohio Hydrated lime by weight of cement to secure a plastic, dense and reliable concrete.

Portland Cement Mortar—Add 40 lbs. of Ohio Hydrated lime to every 100 lbs. of cement for economical mortar of maximum strength.

Booklet

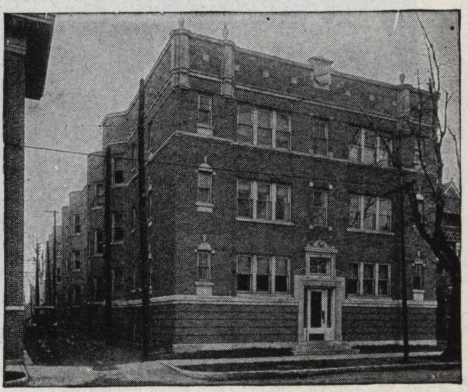
An illustrated booklet entitled "A Job that took a Million Years, or The Tale of the Clam," which describes the source, manufacture, use and abuse of Ohio Hydrated lime will be sent to any architect or contractor on request.



Northwest Chemistry Building, Bureau of Standards, Washington, D. C.

THE HELLER BROS CO.
GENERAL CONTRACTORS
YOUNGSTOWN, OHIO
THE NEW HOME SAVINGS
& LOAN CO. BUILDING

New Home Savings & Loan Co. Building, Youngstown, Ohio



An Indianapolis Apartment House

JACOBSON & COMPANY

Plain and Decorative Plastering; Architectural Sculpture; Artificial Stones

241 East 44th Street
NEW YORK, N. Y.

Products and Services

An organization of skilled craftsmen and designers specializing in DECORATIVE PLASTER WORK for interiors and exteriors; ARTIFICIAL STONES for interiors, including Limestone, Caen and Travertine; and ARCHITECTURAL SCULPTURE.

Monumental buildings, such as churches, banks, theaters, public buildings and residences of distinction, are especially within our scope. Contracts may include metal furring and lathing in addition to all plain or ornamental plaster work.

Decorative Plaster Work (Pargeting)

Decorative plaster work lends tone and character to flat surfaces which would otherwise seem bare, and for this reason is rapidly growing in favor with the architectural profession. Any texture or color is possible. Designs may be geometrical, conventionalized or free, but the present tendency is toward the romantic and simple periods of ornamentation, with special emphasis on the Tudor.

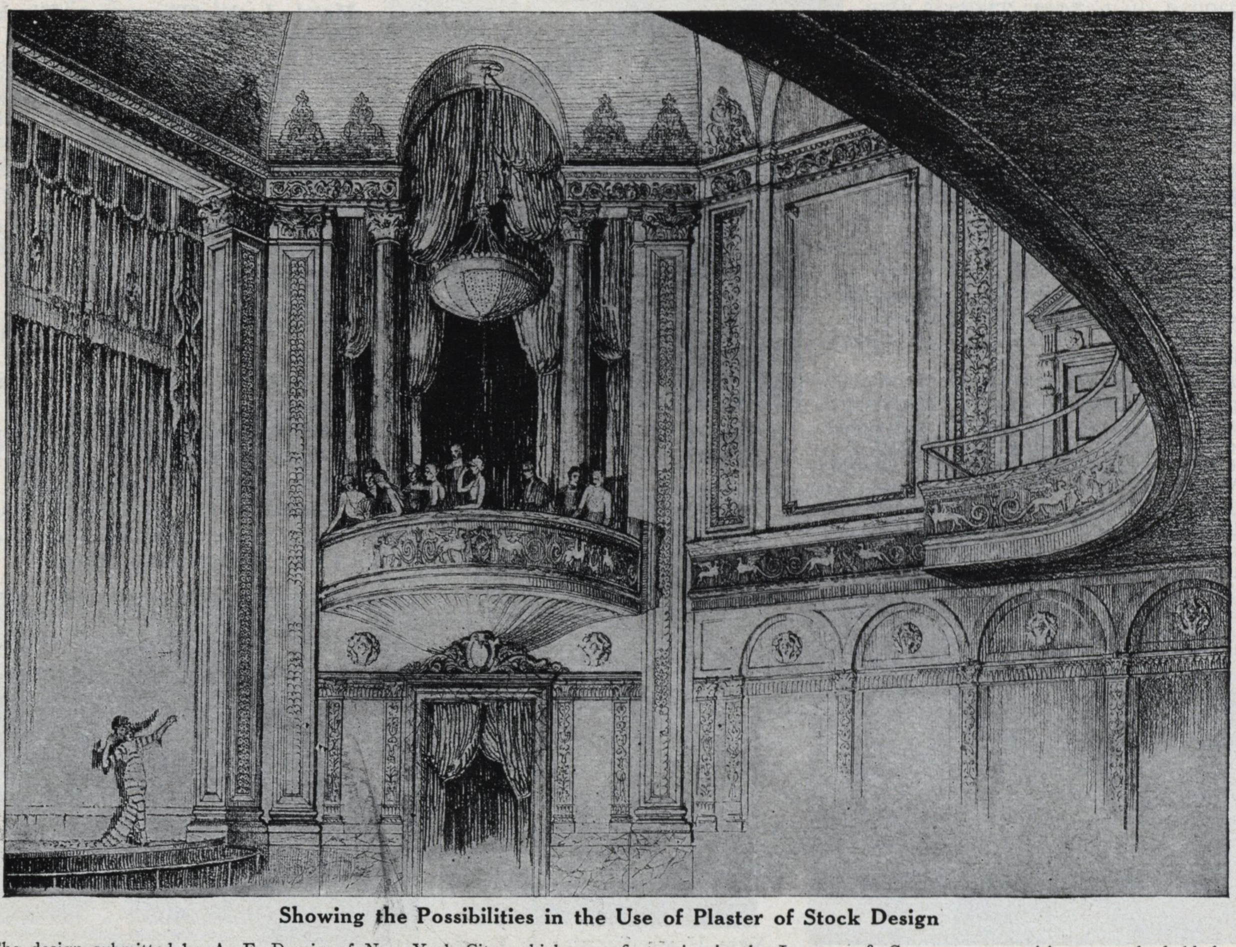
Owing to a long experience in decorative plaster work, we can promise the closest co-operation in carrying out the architect's desires. We have made a special study of pre-Elizabethan ornament in manor houses and inns, and our reproductions of the old-world masterpieces are exact not only in design but in color, texture and finish.

Pargeted stucco for exterior walls is also coming into favor, and unusually fine examples of this type are on display in the Jacobson Studios.

Catalogue Designs

Quantity production has made pargeting available for buildings of more moderate price than was formerly considered possible. Figures and patterns for drawing rooms, dining rooms, nurseries and other interiors are now carried in stock. They can easily be fixed in any ceiling or wall, and the joints, when plastered over, become invisible.

The Jacobson catalogue (sent to architects on request) shows a great number of attractive panels, with the roughing-in dimensions of each.



Showing the Possibilities in the Use of Plaster of Stock Design

The design submitted by A. F. Darrin of New York City, which won first prize in the JACOBSON & COMPANY competition recently held for the purpose of stimulating the use of ornamental plaster of stock design and to bring out the possibilities in the use of this material without the expense and loss of time necessary where special designs are called for

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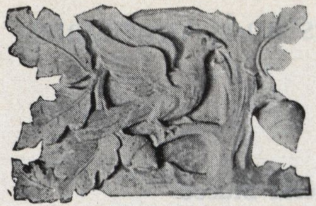

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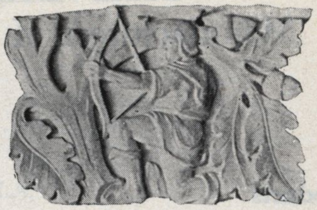

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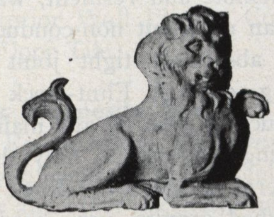

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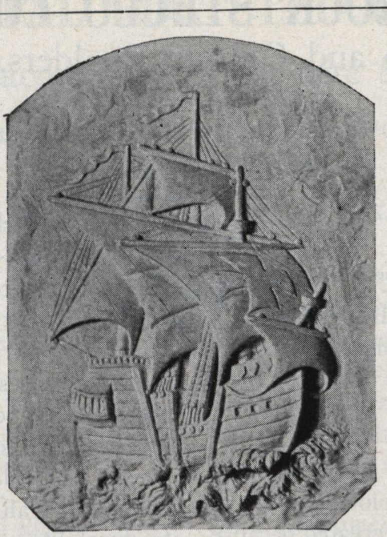

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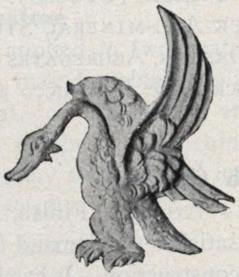

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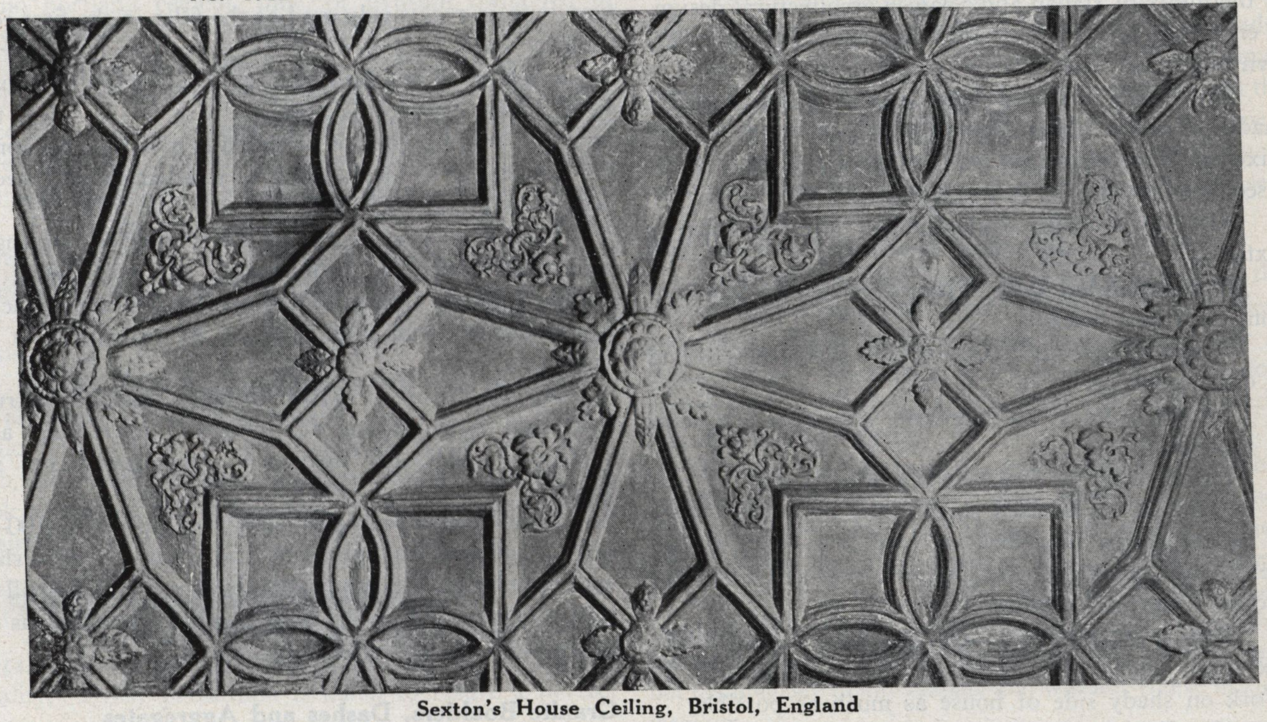
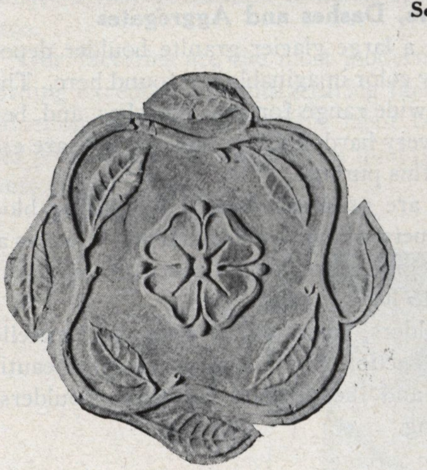


Sexton's House Ceiling, Bristol, England



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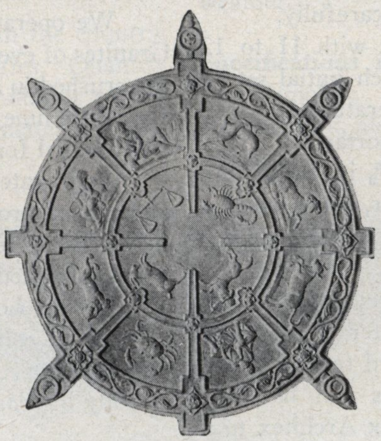

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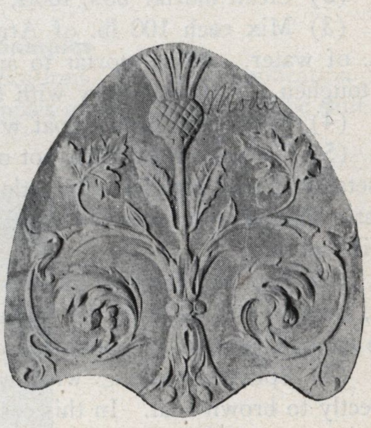


No. 461

TYPICAL EXAMPLES OF JACOBSON CRAFTSMANSHIP

THE FLINT-ROCK STUCCO COMPANY, INC.

Manufacturers of Stucco and Granite Boulders, Dashes and Aggregates

GENERAL OFFICES
260-264 Fourth Street Arcade Building
DAYTON, OHIO

Products

Architex Finish (Stucco).
Flint-Rock All-mineral Stucco.
Granite Dashes, Aggregates and Boulders.
For Keylock Base for stucco and plaster, see page 435.

Architex Finish (Stucco)

Flint-Rock's Architex Finish, best physically and architecturally, satisfies the demand for color planning of stucco in home construction. It has been created because of the influx of Italian and Spanish architectural design. It enables every architect and home builder to fulfill his own individual taste.

Architex is a stucco finish coat in many beautiful shades of color. It is accurately proportioned, factory mixed and carefully tested. It will not crack, craze, fade, discolor or mottle. It is waterproof.

Architex is readily worked in any desirable finish or texture.

Recommended Use—The recommended construction for a new home is:

First, Keylock stucco base applied direct to studding or over sheathing.

Second, Flint Rock magnesite stucco in two coats ¼ in. thick.

Third, Architex Finish in texture desired.

Architex can be used successfully over other types of backing, brick, tile, block, etc. It is especially recommended as a color coat over old brick or stucco which has become dirty and weather beaten.

How to Apply Architex—(1) Do not apply Architex when temperature is below 32° or above 95° F. Work on shady side of house as much as possible.

(2) Clean mortar box, tools, etc., carefully.

(3) Mix each 100 lb. of Architex with 11 to 12 qts. of water. Allow mortar to approach initial set or to toughen. Time will vary with temperature.

(4) Wet down brown coat with mortar.

(5) Trowel on Architex not over $\frac{3}{16}$ in. thick. As it sets, float with addition of a little water, using wooden float. This prevents cracks caused by premature drying while setting.

(6) If other than float finish is desired, such as stipple, sponge, etc., go over the surface after floating and use enough material to obtain the desired texture.

(7) Splatter dashing with willows can be done directly to brown coat. In this case, mix Architex to a creamy consistency varying according to roughness of effect desired.

(8) In hot weather Architex should be sprayed lightly for several days after application.

Flint-Rock All-mineral Stucco

Flint-Rock stucco is an all-mineral oxychloride cement of remarkable strength and durability. It is flexible and resilient, water and fire resistant, and an excellent non-conductor of heat.

It creates an absolutely tight joint against the frames, trim, coping, etc. A Flint-Rock home minimizes cost of construction, heating and maintenance.

Its formula being confined to only the very best materials of all-mineral nature, Flint-Rock is noted for its durability. Crushed granite, very hard, gritty and tenacious, is exclusively used as the filler in the first coat of Flint-Rock.

Its Use—Flint-Rock is always applied in two coats ¼ in. thick. When it is used as a base for Architex, the second coat is roughed or broomed to give a better bonding surface. It is then allowed to weather about 2 weeks before Architex is applied.

Flint-Rock granite dashes, all crushed at our Ingomar plant, offer a wide range of very beautiful dashed finishes. Our granite deposit and crushing facilities insure uniform color and size of our dashes at all times.

Applications of Flint Rock—Complete instructions and specifications for preparation, mixing and application will be furnished immediately on request.

Flint-Rock is packed in heavy, waterproofed, 100-lb. bags. Sufficient magnesium chloride to mix is furnished with each order. Its application is simple and we will be glad to co-operate in drafting specific specifications or instructions for application.

Granite Boulders, Dashes and Aggregates

We operate a large glacier granite boulder deposit. Granites of every color imaginable are found here. These are crushed in a wide range for stucco dashes, and, being free from lime, very hard and lustrous in color, are especially suited for this purpose.

Aggregates are used extensively for facing blocks and cement products, for exposed surfacing of walks and drives and as integral aggregates in concrete construction when subjected to heavy usage.

Granite boulders, when laid in walls, give excellent strength of construction. Such homes are very beautiful and distinctive, and the demand for these boulders is steadily increasing.

Catalogue

Complete descriptive literature covering construction and application of our products awaits your request.

THE KRYSTAL ROK STUCCO CO., INC.

Manufacturers of Magnesite Stucco
Atlas Building
COLUMBUS, OHIO
FACTORIES: BREMEN, OHIO, and LAKE ALFRED, FLA.

Products

Magnesite Stucco.

Also Interior Wall Plaster, Composition Flooring, and Mosaic Floor Tile.

Krystal Rok Magnesite Stucco

Krystal Rok is a high grade magnesite stucco composed chiefly of magnesium oxychloride cement, sand, asbestos fiber and other necessary mineral fillers. There is no portland cement, lime, or gypsum contained in Krystal Rok.

It is shipped in 100-lb. bags in dry powdered form and is mixed on the job with magnesium chloride (the necessary amount being supplied by us in separate bags free of charge), a non-freezing compound that crystallizes the aggregate into a dense, waterproof, flintlike mass.

By supplying the magnesium chloride separate and free, the user receives 2340 lbs. for a ton, or 17% more than where the chloride is mixed with the aggregate by the manufacturer and sold on a straight 2000-lb. ton basis.

Krystal Rok may be applied with perfect satisfaction to all kinds of surfaces, such as brick, stone, concrete, hollow tile, wood, patent sheathing, wood lath, metal lath, etc. Old and new buildings finished with Krystal Rok are preserved indefinitely in any texture or color desired.

A Quality Product at Reasonable Cost

In preparing Krystal Rok, all ingredients are scientifically tested and guaranteed to be of the highest quality. Every precaution is taken to insure a perfect stucco.

Our factories are the most modern in the country, affording exceptional manufacturing facilities. Quantity production with very favorable labor conditions permit us to produce strictly the highest quality material at the lowest possible cost.

Application and Texture

Krystal Rok is applied in two coats, each 1/4 inch thick. Any texture may be obtained, including dash, sponge, stipple, float, or the more artistic English, Grecian or Spanish finishes. The colored granite or quartz pebble dashes may also be used in beautiful combinations very successfully.

Colored Stucco

Besides the natural color of pure white, Krystal Rok is now furnished in colored stucco in several shades of gray, buff, and pink. The discoloration that at times results from blooming of the magnesium chloride and the magnesite has been successfully eliminated. This perfection of colored magnesite stucco is a decisive advancement and is meeting with striking success wherever used.

Physical Properties and Advantages

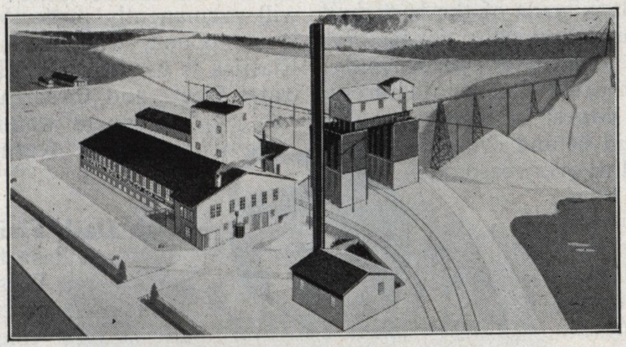
When dry, Krystal Rok stucco has 3 to 4 times the strength of portland stucco, yet is light in weight, resilient and elastic. It is waterproof and fireproof, immune to expansion and contraction and will withstand vibration, settlement, wind stresses and rough usage without cracking, checking or bulging.

Krystal Rok works easily under the trowel and has remarkable adhesive and bonding qualities. It bonds tenaciously to its base and to door and window frames, etc., thus preventing the entry of dampness and moisture.

Krystal Rok is a non-conductor of heat, cold, electricity and sound, and constitutes an excellent insulating material. It is unaffected by temperature changes, will not disintegrate in any climate and will not freeze in zero weather.

Specifications and Samples

Complete specifications for the application of Krystal Rok, also samples and estimates, will be sent on request.



The Home of Krystal Rok Products, Bremen, Ohio

ELASTICA STUCCO

The Permanently Waterproofed Stucco

MANUFACTURED BY
AMERICAN MATERIALS COMPANY
101 Park Avenue, NEW YORK, N. Y.

ART STUCCO MATERIALS COMPANY
12854 Oakland Avenue, DETROIT, MICH.

U. S. MATERIALS CO.
1551 Kingsbury Street, CHICAGO, ILL.

NORTH WEST MATERIALS COMPANY
Foot of Drake Street, ST. PAUL, MINN.

ELASTICA
THE WATERPROOFED STUCCO
TRADE-MARK

Product

ELASTICA, a permanently waterproofed stucco.

Description

Elastica Stucco is a magnesite oxychloride cement. It is composed of the best grade of calcined and very finely ground magnesite, washed and dried silica sand, asbestos, ground cork (in the scratch coat), very finely ground silica, an all-mineral, integrally mixed waterproofing and a non-freezing binder. Each one of these ingredients is the best that can be obtained. Magnesite is commonly used as an insulator for steel furnaces and its coefficient of expansion is practically zero. Asbestos and ground cork are used to give Elastica a further insulating value, to give the material a better covering capacity, easy application and greater elasticity (see chart No. 2). Cork is one of the best insulators known and when exposed to the weather will outlast steel or wood. The all-mineral waterproofing used in Elastica is an exclusive feature and renders the material permanently waterproofed.

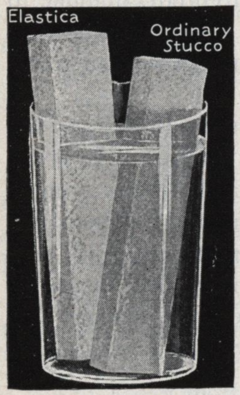


Chart No. 1. Test Showing Effect of Water on Elastica and Ordinary Stucco

Immerse sample of Elastica and one of ordinary stucco in water for one hour or longer. Break samples and note that water has not penetrated Elastica. Write manufacturer for samples or, better still, make them yourself from stock material.

Advantages

The advantages of using Elastica are many. It is the best stucco it is possible to manufacture. It is made of the best raw materials obtainable; is factory mixed and it is permanently waterproofed. Its manufacturers are reliable and probably the largest in their field. The manufacturers stand behind every pound of Elastica properly applied over reasonably good construction.

Complete in a Sack

Elastica is manufactured complete in a sack. Each ingredient is very carefully and accurately weighed and then thoroughly machine mixed. The proper amount of binder is included in each bag of Elastica. In this way uniform results are assured, both as to quality, accuracy and color. Nothing is left to the inexperienced mechanic except ordinary mixing with clean water.

Crack-free

Magnesite has practically no expansion or contraction, and also possesses an elasticity not found in any other cement. The use of ground cork in Elastica Scratch Coat and the use of asbestos in both coats, also aids in rendering Elastica proof against cracking under ordinary conditions when it is properly applied over reasonably good construction. Due to its great elasticity, Elastica will take up the ordinary wind-strains and movements of a building without cracking.

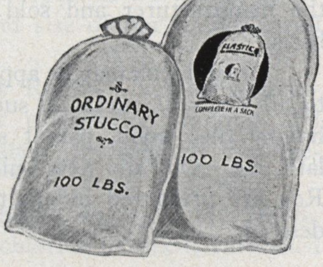


Chart No. 2. Showing Comparative Bulk of Elastica and Ordinary Stucco

Elastica is lighter, bulkier—covers more square yards to the ton

Permanently Waterproofed

Elastica is known as the only permanently waterproofed stucco on the market. Stearates and other ordinary and temporary waterproofings can be found, but the waterproofing used in both coats of Elastica is an all-mineral and integrally mixed compound. It is unaffected by heat, cold, rain or snow. It renders Elastica immune to the weather. Properly applied Elastica will permanently protect any kind of lath over which it is applied, whether it be wood or metal. When Elastica is used over brick or tile, water can not penetrate, freeze and force the stucco from the wall. The permanent waterproofing is one of the most important features in Elastica. See chart No. 1.

ELASTICA
COMPLETE IN A SACK

Elastica Bag

Rock Dash Finishes

Rock dash finishes are very satisfactorily applied over Elastica Scratch and Finish Coats. These rock dashes can be obtained in practically any straight color or any mixed colors. See specifications.

Continued on next page

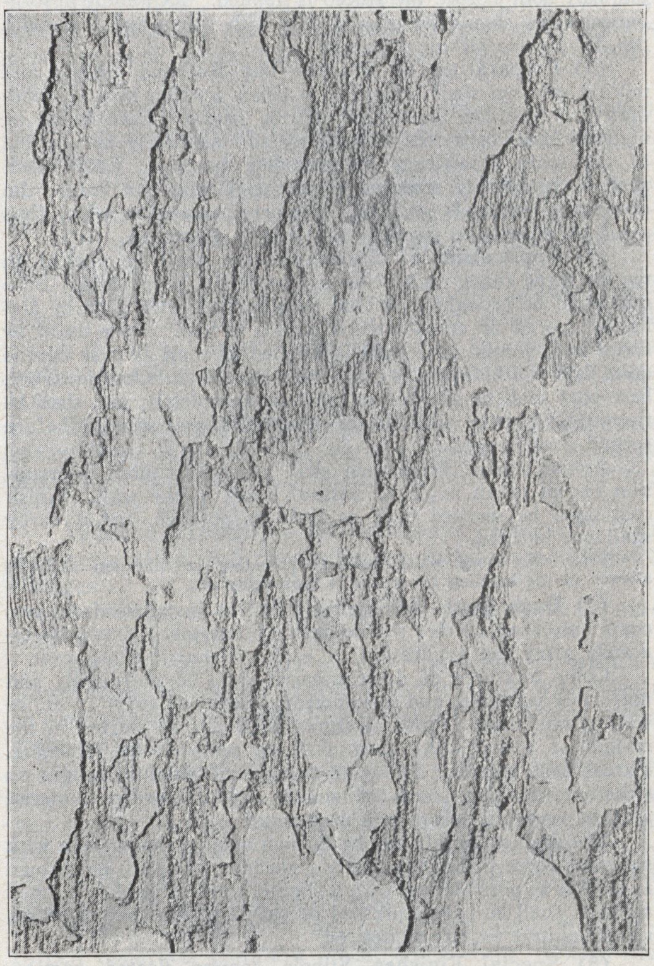
Stippled, Sponged or Any Special Troweled Finish

ELASTICA
THE WATERPROOFED STUCCO
French Finish

Elastica Bag

Any kind of a troweled, float or special finish is very easily and satisfactorily obtained with Elastica French Finish Coat. This material is manufactured in the same manner as regular Elastica Scratch and Finish Coats and it is made of very high grade and somewhat different materials. It is applied as a third coat over the two coats of regular Elastica, and in this way a crack-free and permanently waterproofed base is assured.

Elastica French Finish Coat can be obtained in any standard color—white, cream, buff, gray, pink, etc. Color results are uniform and as permanent as it is possible to make them. Troweling will not discolor Elastica French Finish Coat. See specifications.



A Reproduction of the Oak Leaf Finish, One of the French Finishes, Reduced

Specifications for Rock Dash Finishes

Mix Elastica Scratch and Finish Coats thoroughly with clean water only (mixing directions are found in each bag). Never add sand, lime, plaster or any other foreign material.

For wetting down walls, use clean water only.

Apply Elastica Scratch Coat at least ¼ in. thick over the face of lath, tile, brick, etc. Leave it broom-scratched to set until it is strong enough to hold the weight of the next coat (being thoroughly waterproofed, this coat does not need wetting down when the next coat is applied). Then apply Elastica Regular Finish Coat at least ¼ in. thick, bringing it to a true surface.

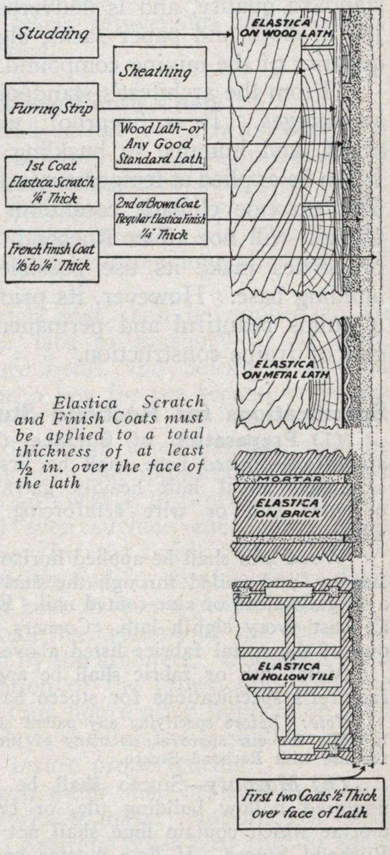
Dry Rock Dash—After being thoroughly screened and cleaned, rock dash should be thrown on the finish coat immediately after it is applied and while still very soft.

The rock dash should be applied by a second plasterer who should follow immediately after the plasterer applying the regular finish coat. Immediately after the wall is dashed, it should be lightly and evenly tamped with a wood float or clean trowel.

Lath

Any good standard lath, either metal or wood, may be satisfactorily used as a backing for Elastica. Metal lath need not be furred but applied directly over the sheathing. All lath should be well nailed and when wood lath of any kind is used, all corners should be wrapped with wire mesh. Hollow tile, brick, cement blocks, etc., make a very satisfactory backing for Elastica.

For further instructions write for printed specifications.


Studding
Sheathing
Furring Strip
Wood Lath—or Any Good Standard Lath
1st Coat Elastica Scratch ¼" Thick
2nd or Brown Coat Regular Elastica Finish ¼" Thick
French Finish Coat ⅛" to ¼" Thick
ELASTICA ON WOOD LATH
ELASTICA ON METAL LATH
MORTAR
ELASTICA ON BRICK
ELASTICA ON HOLLOW TILE
First two Coats ½" Thick over face of Lath

Elastica Scratch and Finish Coats must be applied to a total thickness of at least ½ in. over the face of the lath

Chart No. 3

Application of Elastica French Finish Coat

Elastica French Finish Coat is mixed in the same manner as the regular scratch and finish coats. It should be used in all cases where a regular dash finish is not desired—for sponged, stippled, troweled finishes, etc.

Elastica French Finish Coat must be applied as a third coat over the regular Elastica Scratch and Finish Coats, the second coat of regular finish having first been well broom-scratched to afford a good mechanical key and permitted to set until thoroughly dry.

First apply a tight butter-coat of Elastica French Finish, pressing it well into the coat underneath. Then immediately apply another thin coat, then float, stipple, sponge or trowel to any effect desired.

Elastica French Finish Coat must be applied not less than ⅛ to ¼ inch thick.

Elastica French Finish Coat must be applied in temperatures above 20° F. In warm weather, newly applied Elastica French Finish should be lightly sprayed with clean water three or four times during the first 24 hours after application.

THE ROCBOND COMPANY

Manufacturers of Magnesite Stucco

PLANTS
VAN WERT, OHIO
CEDAR RAPIDS, IOWA
HARRISBURG, PA.
NEW YORK, N. Y.

WAREHOUSES
KANSAS CITY, MO.
ST. LOUIS, MO.
PHILADELPHIA, PA.
NEW YORK, N. Y.

ROCBOND
Exterior Stucco
TRADE-MARK

Rocbond Stucco—for Permanent Homes

Rocbond is a magnesite stucco designed for use on permanent structures of a high type. It is made only in one standard quality, and is delivered to the job in cloth and paper sacks, along with the necessary quantity of the mixing compound.

From the architect's standpoint, Rocbond has many advantages. It is fireproof, weatherproof, moistureproof, and immune to buckling and weather-checking. It can be applied at temperatures as low as 10° below zero. The extreme climatic conditions of the far South or Canada will not affect Rocbond. Its excellent bonding properties make its use possible over any substantial building base. However, its principal advantage is that it builds beautiful and permanent homes at about the cost of frame construction.

Specifications for Rocbond Stucco

(1) Preparation of Surface—*(a) Wood Frame Construction*—Stucco base shall be first quality wood lath; or expanded metal lath heavily galvanized after fabrication; or wire lath or wire reinforcing fabric galvanized after weaving.

Wood lath shall be applied horizontally over sheathing and furring, and nailed through the furring over each stud with a 4d galvanized or zinc-coated nail. End joints shall be broken at least every eighth lath. Corners shall be reinforced with one of the metal fabrics listed above.

Metal lath or fabric shall be applied as per their manufacturer's specifications for stucco base.

Note: Before specifying any patent stucco backing, it is advisable to write for our approval, as many of these products are not suitable for use with Rocbond Stucco.

(b) Masonry—Stucco shall be applied direct to brick, unglazed hollow building tile, or cement block. Brick and mortar which contain lime shall not be used in contact with Rocbond Stucco. If lime mortar has been used in any new masonry to be stuccoed, mortar joints shall be painted with an asphalt paint thinned with an equal volume of gasoline. Smooth cement or cement block walls and painted brickwork shall be chipped to form an adequate bonding surface. All masonry shall be brushed clean with a wire brush.

(c) Trim and Details—All window and door trim, mouldings, water tables, copings, sills, belt courses, gutters, brackets and flashings shall be in place before stucco is applied. Downspouts may be hung temporarily 6 to 10 in. from face of wall. All metal coming in contact with stucco shall be copper, lead, zinc or galvanized.

(d) Inspection—Before applying stucco, all surfaces shall be examined, and imperfect ground work shall be reported to the architect. If backing surface is uneven, depressions shall be filled with stucco and allowed to set before base coat is applied.

Note: Stucco shall not be applied on horizontal surfaces, nor shall it extend to ground or grade line.

(2) Storage and Care of Materials—All stucco materials shall be stored in a dry building—not in a basement or on the ground. When Rocbond Stucco is mixed in hot weather, mixing box and all materials shall be kept in the shade. Any stucco material that is damp, hard or lumpy shall be discarded.

(3) Mixing Solution—The magnesium chloride flakes shall be dissolved in pure clean water in either wooden barrels or galvanized tubs. Solution strength shall be adjusted exactly to 22° Baume, as determined by test with an accurate hydrometer. All scum and foam shall be removed from the liquid before testing. The tests shall be made in a vessel deep enough to float the hydrometer.

(4) Priming Surfaces—All wood and masonry surfaces shall be brushed well with the mixing liquid not more than one-half hour before the stucco is applied. Extremely absorbent surfaces should be primed first with water and then with the 22° Baume mixing solution.

(5) Preparation of Stucco—The Rocbond Stucco and mixing solution shall be mixed in clean wooden boxes, immediately before the application of the stucco. Each batch of material shall be mixed thoroughly and as nearly as possible of the same consistency as preceding batches. Each batch shall be completely removed from the mixing box before the succeeding batch is started. Tempered material which has stood till it becomes partially set shall be discarded.

(6) Application of Stucco—Stucco shall be applied in two or three coats, each being not less than ¼ in. thick. Base coat shall be brought to a true even surface with a darby and lightly scored or cross-hatched with a broom. *Over wood or metal lath,* second coat shall be applied as soon as base coat is quite firm and before it is completely cured out. *Over masonry,* base coat shall be allowed to cure out completely, and shall be thoroughly primed with the 22° Baume mixing solution before second coat is applied.

Application of finish coat shall proceed without interruption except at an angle or natural break in the wall. Finish coat shall be worked over as little as possible, and a darby shall not be used.

Note: No work which involves pounding or vibration shall be allowed in the building till stucco is thoroughly set.

(7) Dash Coat—All Rocbond Stucco installations in two coats only shall receive pebble dash (Stone-tone) finish, *immediately* after the application of each section of finish coat.

Color mixtures of dash material shall be thoroughly and uniformly prepared, and in sufficient quantity to cover an entire wall at one time. Fresh mixtures shall not be started in the middle of a wall. All dust shall be removed by screening. Excess dash material falling to the ground shall be caught on clean canvas, and pieces of stucco and all foreign material shall be removed before it is used again.

The dash material shall be thrown against the surface with sufficient force to become firmly embedded. It shall be thrown as quickly as possible and with a slightly upward stroke. Dashed surfaces shall be lightly pressed or patted with a trowel, unless rough natural texture is desired.

(8) Special Finishes—Stipple, sponge, floated, suction, spatter, antique, pebble-inset and other special finishes shall be produced only in a third coat composed of Special Finish Rocbond material, and only by the highest skilled mechanics. Complete instructions for this work will be furnished to architects on request.

Rocbond Tone-kote—A Stucco Coloring

A solution which is applied like paint to any finish of Rocbond Stucco except the pebble-dash; as well as to brick and hollow tile. It offers a wide range of the soft, dull color tones which have become so popular in stucco houses.

Rocbond Tone-kote comes in 1 and 5-gal. cans. Specifications, color chart, and prices on request.

ARTSTONE PRODUCTS, INCORPORATED

Manufacturers of Non-fading Portland Cement Stucco and Interior Plaster, Cement Mortar and Paint

52 Vanderbilt Avenue
NEW YORK, N. Y.

ARTSTONE
TRADE-MARK

Products

- Colored and Waterproofed Portland Cement Exterior Stucco and Interior Plaster Finish Coats.
- Cement Mortar.
- Brush-Koat (Cement Paint).

Artstone Finish Coats

Materials Used—Standardized gray and white portland cement, carefully selected and graded white marble and sand, non-fading mineral pigments, waterproofing, and inert ingredients (no lime) to insure plasticity.

Proportioning—Mechanically exact to formulae which have stood the test of over twenty years' use in the field.

Mixing—By electrically driven special machinery in an up-to-date plant under the direction of experts.

Colors—Uniformity and permanency are positively assured.

Standard colors are white, buff, red, brown, limestone, yellow and orange in a variety of shades. Special colors to meet unusual conditions, or to match other work, are made as required by the architect's specifications.

Textures and Polychromes—Artstone finish coats spread very easily and the variety of exquisite textures and polychrome effects obtainable is limited only by the skill of the plasterer.

Weatherproofing—All Artstone materials are weatherproofed and unaffected by moisture or climatic changes.

Advantages—Portland cement concrete is permanent and improves with age.

Artstone finish coats provide the architect with an almost limitless variety of colors and textures with which to give expression to his ideals in portland cement concrete permanence.

Combined with rigid construction, either masonry or frame and metal lath, and aided by good workmanship and proper curing, Artstone finish coats over cement and sand undercoats, produce self-decorative, fire resisting, moistureproof surfaces free from deterioration and upkeep at an extremely low cost.

Bases—Concrete tile and block, monolithic and reinforced concrete, common brick, terra cotta, hollow tile and metal lath provide excellent bases for portland cement stucco or interior plaster.

Standard Recommended Practice

The report of the Committee on Concrete Surfaces of the American Concrete Institute is generally considered as the standard recommended practice for portland cement stucco and has been endorsed by the Portland Cement Association and the Associated Metal Lath Manufacturers.

Cement Mortar

Artstone cement mortar is made in colors to match exterior stucco or interior plaster for laying up fireplaces, chimneys or other masonry.

Brush-Koat (Portland Cement Paint)

Artstone Brush-Koat, in colors and weatherproofed, applied with a brush over old portland cement stucco, reinforced and monolithic portland cement concrete, blocks and tile as well as terra cotta tile and common brick, rejuvenates and beautifies and has a "stay-put" bond.

Specifications for Artstone Finish Coats

First or scratch and second or brown undercoats shall be composed (by volume) of 1 part gray portland cement to 3 parts of clean well graded sharp sand. The quantity of hydrated lime used shall not exceed (by volume) one fifth of the cement used. (In other words, no more than 8 pounds of hydrated lime shall be used to the sack of cement.)

The first or scratch coat shall be applied to an average thickness over lath or masonry of ⅜ inch, well troweled to insure bond, and before it has set cross scratched to form a key for the second or brown coat.

The second or brown coat, when possible, shall be applied on the day following the application of the first or scratch coat and to an average thickness of ⅜ inch, floated to a true and even surface and lightly cross scratched to form a key for the finish coat. Twenty-four hours after application, and for five successive days, spray with water from hose to insure proper curing.

The finish coat shall be Artstone of the color and for the texture selected by the architect. One week shall elapse between application of the brown and Artstone finish coats. Twenty-four hours after application, and for several successive days, the finish coat shall be lightly sprayed with water to insure proper curing.

Only sufficient clean water shall be used in mixing all coats to insure a workable mass. Nothing but clean water shall be added to Artstone finish coat and the same quantity shall be used in each mix.

Artstone Quantities

Artstone materials in the color and for the purpose desired come to the job in bags of 100 pounds ready for use after mixing with clean water.

Twenty bags (2000 pounds) of Artstone finish coat will cover 100 net square yards, ¼ inch thick, in float or smooth trowel finish.

Thirteen bags (1300 pounds) of Artstone finish coat will cover 100 net square yards in wet rough cast (paddle, spatter dash) finish.

Four bags (400 pounds) of Artstone Brush-Koat will cover 100 net square yards of moderately smooth surface.

Ten bags (1000 pounds) of Artstone Cement Mortar will lay 1000 bricks with ¼-inch joint (one flat side and one end).

Service

We will welcome any opportunity to be of service to architects and contractors. Prices, samples, literature, list of users, etc., on request.

THE CLEVELAND BUILDERS SUPPLY & BRICK CO.

Manufacturers and Distributers of Excelsior Caen Stone Cement

Leader-News Building, CLEVELAND, OHIO

TRADE-MARK

Products

Excelsior Caen Stone Cement.

Excelsior Caen Stone Cement

Excelsior Caen Stone Cement is a successful equivalent for French Caen stone. After being applied and jointed off, it is in every important respect an exact reproduction of the quarried stone, absolutely fulfilling the essential requirements of durability, texture and color.

The color of Excelsior Caen Stone Cement is a light buff or cream, obtained solely by the use of a finely powdered stone as one of its principal ingredients. No artificial coloring is used. This ground stone is mixed in proper proportions with other materials necessary to secure a correct combination for imitating the texture and color of natural Caen stone.

The entire output of this ground stone is under the control of The Cleveland Builders Supply & Brick Co. The uniformity of color and texture of Excelsior Caen Stone Cement is assured, provided instructions are followed explicitly.

Application

Excelsior Caen Stone Cement is a free working, plastic material that can be applied readily by any competent plasterer. The directions given herewith have been worked out carefully. They are practical, simple and easy to follow. The finished surfaces are secured by floating and sandpapering.

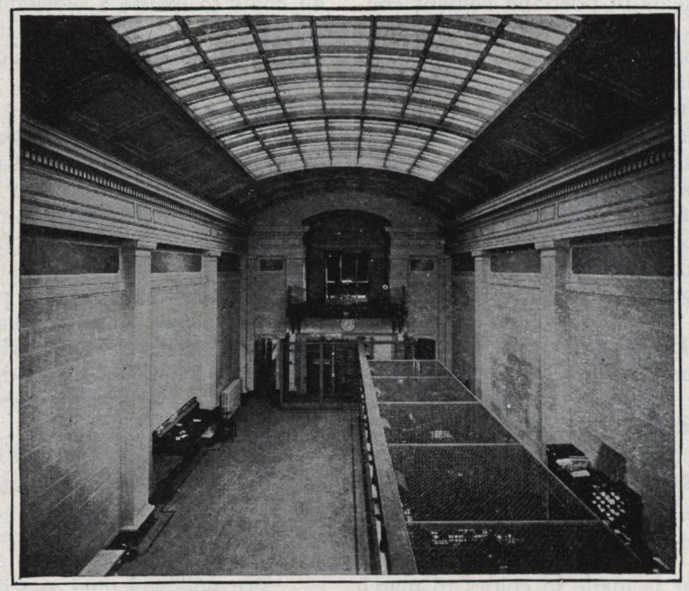
Features and Advantages

Excelsior Caen Stone Cement produces the same soft and pleasing effect as is obtained by the use of the natural Caen stone, and at only a fraction of the cost. Displaces marble at a great saving.

It is perfectly adapted for casting into moulds and for running cornices. Its strength increases with age; and its durability will practically equal that of the natural Caen stone. Requires no decoration nor tinting; saves cost of painting. Can be easily cleaned.

Scope of Use

Excelsior Caen Stone Cement is especially designed for a finish coat for walls and ceilings in churches, colleges, courthouses, post offices, banking rooms, railway stations, club rooms, hotel and theater lobbies, schools and libraries; for corridors and vestibules of office buildings and residences; for wainscotings, columns, pilasters, caps, brackets, cornices and ornaments.



The Lakewood Bank, Lakewood, Ohio
R. H. Hinsdale, Architect

"Slow Set" and "Quick Set"

For interior work, Excelsior Caen Stone Cement "Slow Set" is made slow setting for finishing plain surfaces, and "Quick Set," quick setting for running cornices and casting into moulds. For running cornices the "Slow Set" is gauged with the "Quick Set" by the usual method. For casting into ornaments, use "Quick Set" only.

Covering Capacity

To cover approximately 50 sq. ft. of surface, ¼ in. in thickness, 100 lbs. of Excelsior Caen Stone Cement are required.

Specifications for Architects

Dampproofing—When Excelsior Caen Stone Cement is to be used on the interior of outside brick or tile walls, first apply two heavy coats of any approved brand of damp resisting paint.

This is to keep dampness from coming through and staining the finished Caen Stone coat.

Scratch Coat on Metal Lath—Apply an approved brand of gypsum hard wall plaster, or lime mortar containing plenty of hair, gauged in proportions of 2 parts of mortar to 1 of Best Bros. [or equal] Keene's Cement.

Brown Coat—To be used as a doubling up coat over scratch coat on metal lath, or as a first coat on brick or tile walls.

Mortar shall consist of an approved brand of gypsum hard wall plaster, or lime mortar mixed as above specified, except that hair is not required. Scratch brown coat well. Let stand until thoroughly dry.

Caen Stone Coat—Shall be Excelsior Caen Stone Cement ["Slow Set"] ["Quick Set"] manufactured by The Cleveland Builders Supply & Brick Co., Cleveland, Ohio.

Clean Box—Use a clean watertight mixing box that has not been used for mixing any other kind of materials. Clean box thoroughly after each mixing.

Suction—Before applying Caen Stone Finish Coat, soak brown coat thoroughly with clean water to take out suction, using a hose.

Applying Caen Stone Coat—Apply Caen Stone Finish Coat not less than ¼ in. thick, and preferably ⅜ in. thick. All according to manufacturer's directions.

Cutting and Filling Joints—After Caen Stone Cement has set thoroughly, cut out joints to size specified, straight and true, uniform in width and depth. When filled joints are desired, fill flush with Best Bros. [or equal] Keene's Cement.

Sandpapering—After the joints are filled, let Caen Stone stand until thoroughly dry, then rub down with sandpaper. Use No. 2½ garnet sandpaper for rubbing the plain surfaces and No. 2 for rubbing the finished joints.

Note — Sandpapering is essential. It is absolutely necessary to sandpaper the entire Caen Stone surface to get a uniform texture and color, and thus bring out the true beauty and effect of Excelsior Caen Stone Cement.

CLIFFORD L. MILLER

Caen-stone and Lime-stone Cement

280 Madison Avenue
NEW YORK, N. Y.

Products

Monarque Brand Caen-stone Cement; Monarque Brand Lime-stone Cement for Interior Stone Finishes.

Monarque Brand Artificial Stone Compositions

The Monarque brand of artificial stone compositions, which reproduce Caen-stone and Lime-stone cement, are being used extensively for interior finish in all types of buildings. The material is indistinguishable in tone and texture from the natural stone.

Specifications

The first or scratch coat on galvanized wire, ingot iron lath or concrete, shall consist of a mortar composed of the following:

Sand, 3 parts; hydrated lime, 1 part; Keene's cement, 1 part. Add sufficient goat hair to secure a strong clinch.

This mass shall be thoroughly mixed, while dry, then tempered with water and applied by the usual method. Double score and allow work to set (not dry) before applying brown coat. If scratch coat becomes dry, wet thoroughly before applying brown coat. The second, or "brown" coat, shall be applied on scratch coat and shall consist of the following:

Sand, 4 parts; hydrated lime, 1 part; Keene's cement, 1 part. Add sufficient cattle hair to produce a fibrous material. If Keene's cement is not obtainable use any standard brand of neat cement plaster, gaged extra well to secure hard perfect surfaces.

Brown coat alone is sufficient base on brick or terra cotta.

Where grounds are set the exact width of jambs, brown coat shall be recessed the required depth, ¼ in. to ⅜ in., and stone cement finished even with grounds.

Concrete surfaces shall be scored and cleaned with a weak dilution of muriatic acid and water, and immediately washed with clean water, to remove all traces of acid, before applying scratch coat. Grounds on concrete should be less in depth than those used for other surfaces and mortar shall be laid as thinly as possible, using only sufficient material to finish work true and level.

All browned surfaces shall be rodded and floated to true planes without voids, depressions or projections.

The finish coat shall be Monarque brand artificial Caen-stone or Lime-stone, manufactured by Clifford L. Miller, New York, N. Y.

Allow brown coat to set and dry, then cover browned surfaces with a coat of dampproof material on which a light coat of the stone cement shall be applied while the dampproof is tacky, using a steel trowel. Scratch this stone cement coat with a broom and allow it to remain until set.

Succeeding coats shall be applied with a float until specified thickness is obtained. Rod all work plumb, level and true. Fill all voids using a float (not a steel trowel). Float until required fineness of work is perfected. If cracks appear, slightly moisten and compress with float.

Patching should be avoided, therefore all base, wainscot and trim should be set and browning finished close to all trim before applying Caen-stone or Lime-stone cement.

Finished stone cement work shall be dry before being dressed. If a tooled finish is desired, specify markings per inch. If a fine rubbed finish is required, use French Gres stone (imported by Clifford L. Miller) for surfacing, which will produce true grain of natural stone. If any part of work becomes extremely hard, use a fine tooth hacksaw scraper to scrape surfaces before using the tooler or Gres stone. If discolorations appear on finished work, remove them with Gres stone.

Joints may be started with a pick tool, and finished with a tooth-saw-jointer to sizes specified, and may be pointed or left hollow. For white joints, fill with Keene's cement. For colored joints, color Keene's cement the desired tint.

Finally, to prevent dusting after work is dressed, dilute 1 part of milk with 10 parts of water and brush evenly over finished surfaces.

For Cornicing—Block all run mouldings, while brown coat is in operation, within ⅜ in. of finished surfaces with material that is gaged sufficiently strong to insure a firm moulding, using brown mortar proportions as a minimum. This work shall be in same condition of set as plain surfaces before stone finish is applied. Stone cement finish for this work not to be gaged as stiff as material used for plain surfaces.

All screeds, upon which rods are fastened and slippers of moulds are operated, shall be composed of stone cement, perfected in the usual manner and smoothed with a steel trowel. Lime putty and plaster shall not be used for screeds upon which stone mouldings are to be run.

Castings shall be made in glue moulds. Care must be taken to press stiff-gaged cement in moulds, as it will not harden if gaged thin. The more material is gaged, the harder it will become.

Burlapped plaster of paris may be used for backing stone cement castings, but allow stone cement to set before backing with plaster of paris as swelling of plaster may fracture the cast if it is reinforced before cement sets. Better results are obtained, however, by the use of Keene's cement.

Where rubbed surfaces are specified for mouldings or castings, use emery paper.

For tooled surfaces on mouldings or castings, fine wire brushes are used. Mouldings and enrichments may be finished by stone carvers. For plain surfaces and run mouldings, use slow setting cement. For castings, use quick setting cement.

References

The buildings listed below show the varied character of artificial stone compositions and indicate the growing field for this class of interior stone finish.

Building and Location	Architects
Hibernia Bank & Trust Co., New Orleans, La.	Favrot & Livaudais and Alfred C. Bossom
The Commercial Bank, Atlanta, Ga.	Edwards & Sayward
Hotel Philips, Philipsburg, Pa.	Geo. S. Idell
Central Park School, Schenectady, N. Y.	W. Thomas Wooley & Associates
L. F. Sunlin Residence, Flint, Mich.	Geo. Bachmann
Federal Reserve Bank, Richmond, Va.	Carneal & Johnston
Florida National Bank, Jacksonville, Fla.	Mowbray & Uffinger
Klepfer Bros. Bldg., Buffalo, N. Y.	A. Hart Hopkins
Church of the Messiah, Baltimore, Md.	Mottu & White
Industrial Trust Building, Wilmington, Del.	Mills & Haugaard
City Hall, Cleveland, Ohio	J. Milton Dyer
Wellsville (N. Y.) National Bank	Harold J. Cook
East Side High School, Fairmount, W. Va.	Jones & Nuzum
Hotel Shelburne, Atlantic City, N. J.	Warren & Wetmore
Equitable Building, New York, N. Y.	E. R. Graham
Museum Addition, Burholme Park, Pa.	Zantzinger, Borie & Medary
Majestic Theater, Detroit, Mich.	C. R. Crane
First National Bank, Lexington, Ky.	A. C. Bossom
County Courthouse, Schenectady, N. Y.	W. L. Stoddart
Union National Bank, Mahanoy City, Pa.	Benj. R. Stevens
Reidsville Hotel, Reidsville, N. C.	H. Macklin and W. C. Northrup
Commercial Trust Building, New Britain, Conn.	W. P. Crabtree
St. Catherine's Court, Buffalo, N. Y.	Bley & Lyman
Citizens National Bank, Evansville, Ind.	W. L. Stoddart
E. T. Stotesbury Residence, Chestnut Hill, Pa.	Horace Trumbauer
Colony Club, New York, N. Y.	Delano & Aldrich
H. J. Heinz Residence, Pittsburgh, Pa.	Robert Maurice Trimble
St. Augustine College, Brookland, D. C.	John A. McKibbin
Rainier Building, 5th and Locust Streets, St. Louis, Mo.	Eames & Young
Louisville High School, Louisville, Ky.	J. Earl Henry
Lyon-Healy Building, Chicago, Ill.	Marshall & Fox
American Building & Loan Building, Jackson, Mich.	Claire Allen & Sons
The Commercial & Savings Bank, Winchester, Va.	Stuart H. Edmonds

PALMER LIME & CEMENT CO.

Importers of French Caen Stone Cement

103 Park Avenue
NEW YORK, N. Y.

Products

Tate and DeVigan Brands of French Imported Caen Stone Cement for interior and exterior finish.

Also Lump and Challenge Hydrated Lime.

Caen Stone Cement

Natural caen stone, found in France, has a texture and color-tone so pleasing to the eye that it has met with general approval for mantels, staircases, walls, entrance halls, etc. It has been used for centuries in artistic constructions in Europe. Its decorative possibilities are unequalled in natural stone, but although the high cost of natural caen stone has caused a general demand for a substitute, no natural stone has been found which even approaches it in color and texture.

Superiority of Imported over Domestic Brands—Imported caen stone cement gives the same appearance, color and texture as natural caen stone. It is made in France from the natural caen stone crushed and mixed with a special cement and chemicals.

Various domestic compositions are offered as substitutes for imported caen stone cement, but the *uncertainty of their set,* the *non-uniformity of their color,* and *their tendency to crack,* have deprived them of the consideration of experienced architects.

Economy—The comparatively low cost of this material and the great facility with which it can be worked make it available for general use. One ton (2000 lb.) will cover from 60 to 80 sq. yd.

Delivery—We are exclusive agents for Taté and DeVigan brands imported French caen stone cement. These brands are imported regularly and we are prepared to make prompt deliveries.

Brands of Imported Caen Stone Cement

Taté—For coating interior decorative work. Sets in 50 to 60 minutes. Put up in 110-lb. bags.

DeVigan Slow Setting—Same as Taté except that tint is *slightly* grayer. Put up in 100-lb. bags.

DeVigan Quick Setting—For casting in moulds; worked the same as plaster. Sets in 15 to 20 minutes. Used extensively for ornaments. Put up in 100-lb. bags.

Specification for Interior Caen Stone Finish

Work Included—All surfaces of walls, columns, piers, stair facia and stair soffit (list locations) shall be finished with artificial caen stone as shown on the drawings and as hereinafter specified.

Materials—*Scratch Coat*—Shall be composed of lime mortar gauged with 3 bags of Keene's cement to 1 cu. yd. of mortar.

Brown Coat—Shall be composed of lime mortar gauged with 2 bags of Keene's cement to 1 cu. yd. of mortar.

Caen Stone Cement Finish—All caen stone cement shall be the finest quality imported French caen stone cement, Taté or DeVigan Brand, sold only by the Palmer Lime & Cement Co., New York. All caen stone cement shall be delivered at the building in sealed bags bearing the brand name ready for mixing by the addition of water only.

Workmanship—Scratch coat mixture shall be thoroughly mixed and wet down, and applied so as to give a satisfactory clinch. The surface shall be thoroughly scratched and cross scratched and allowed to set before the brown coat is applied. The brown coat shall then be applied and must be brought out to a line within ⅝ in. of the finished imitation caen stone surface.

The caen stone cement finish coat shall be carefully mixed; no more water shall be used than is necessary to produce a stiff mortar. Care shall be used to prevent any foreign matter being introduced which may affect the tone or color. The material shall be mixed and applied in a manner to imitate as nearly as possible the natural stone. The brown coat shall be thoroughly wet down with brushes and the caen stone cement shall then be applied by hand and shall be well and thoroughly compressed to a minimum thickness of ⅜ in. When partially set, the surface shall be straightened with a long straight-edge, then dressed with a tooth edge dressing tool and finally with a sharp, smooth tool so as to produce a fine grained uniform surface.

All mouldings in imitation stone shall be run with metal templates reproducing full size. Details will be supplied.

Decoration—All imitation caen stone decorations shall be made of the same material as straight work, cast in the most approved manner in glue moulds made from models which shall be executed in clay from the architects' full size details. They shall be changed as often as may be required to make them satisfactory, without extra charge. Moulds shall not be made until the models have been approved.

Finishing—After the finish coat has thoroughly dried, all surfaces shall be redressed to match approved sample. At least fifteen days shall be allowed for proper drying.

All flat and moulded surfaces shall be finished with scrapers and planers made for this express purpose, the entire surface being thus treated. (If a finer rubbed surface is desired, add: All surfaces shall be rubbed with pumicestone or carborundum and sand papered to imitate rubbed stone finish.)

All decorative work shall be finished by skilled carvers.

Jointing—All joints, as shown, shall be carefully cut true, straight and smooth with sharp saw blades selected for the purpose, to a uniform width not exceeding ¼ in.

DeVigan Brand for Exterior Work

The space will not permit us to describe this material in detail but it is especially adapted for coating the facings of buildings and exterior castings and decorations. It is a waterproof material offering great resistance to all climatic conditions. For further information together with specifications, we refer you to our latest illustrated catalogue.

Work on Which French Caen Stone Cement Was Used

Location	Architect
Biltmore Hotel (Fountain Room), New York, N. Y.	Warren & Wetmore
New Statler Hotel, Detroit, Mich.	Geo. B. Post & Sons
Citizens Trust Co., Utica, N. Y.	Mowbray & Uffinger
New York Telephone Co. Bldg., Albany, N. Y.	McKenzie, Voorhees & Gmelin
Gorton High School, Yonkers, N. Y.	G. Howard Chamberlin
Trinity Parish House, New Haven, Conn.	Charles S. Palmer
Abraham & Straus Department Store (Show Windows), Brooklyn, N. Y.	Starrett & Van Vleck
Ouachita National Bank, Monroe, La.	Albert S. Gottlieb
Hanan & Son (Show Windows), 56th St. and Fifth Ave., New York, N. Y.	A. D. Seymour, Jr.
Gotham National Bank, Columbus Circle, New York, N. Y.	Sommerfield & Steckler
Scandinavian-American Line, New York, N. Y.	Axel S Hedman
Citizens Savings Bank, Providence, R. I.	Clark & Howe
Childs Restaurant, 377 Fifth Ave., New York, N. Y.	J. C. Westervelt
Canal-Commercial Bldg., New Orleans, La.	Emil Weil and Jones, Roessle & Olschner
Clairidge Theater, Montclair, N. J.	William E. Lehman
City Trust Co., Passaic, N. J.	John F. Kelly
Carlson Hat Co., Altoona, Pa.	
Lord & Taylor Department Store (Show Windows) Fifth Ave. and 39th St., New York, N. Y.	Starrett & Van Vleck

UNITED STATES GYPSUM COMPANY

Oriental Stucco

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see page 374

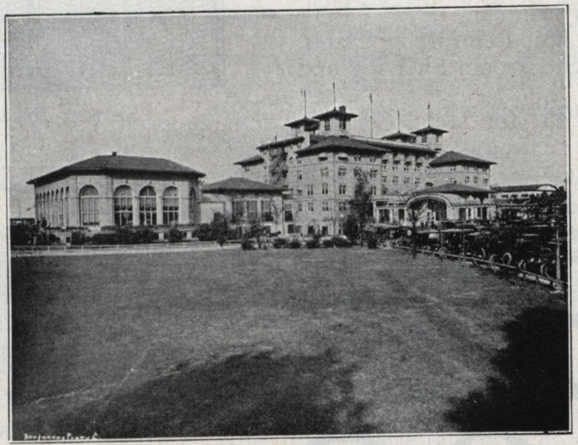
Product

Oriental Stucco.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

Oriental Stucco

A scientifically compounded exterior stucco furnished as *base* and *finish* coats—each ready mixed, waterproof, plastic, easy to apply, and permanently durable. This material meets the demand for a stucco which will harmonize in texture and color with the building upon which it is used.



South Shore Country Club, Chicago
Marshall & Fox, Architects, Chicago
Oriental Stucco was used on the exterior. Built in 1916

The base coat is a Portland Cement base compounded with the correct proportion of sharp, graded sand and ingredients to make it waterproof and non-staining. The finish coat is a hydraulic lime base thoroughly mixed with materials to make it plastic and waterproof. It is mixed, also, with mineral colors and is furnished in eleven standard tints and white.

Base and finish coats are packed in 80-pound paper bags.

Advantages

As both coats are ready for use with the addition of water, the possibility of insufficient mixing or the use of poor sand is eliminated and uniform results are assured on every job. The finish coat is ready colored and, as a result, exactly the same shade may be maintained regardless of the number of mixes required.

Oriental Stucco may be applied over metal lath, wire lath, brick, tile, concrete, and over Gyp-Lap wall construction. It is also especially adaptable for overcoating old cement walls, masonry surfaces, and the walls of frame buildings.

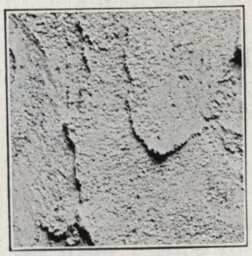
The base coat should be applied in the same fashion as Portland Cement stucco, in 2 coats. The first coat should be scratched and allowed to dry thoroughly, and should then be followed with the brown coat, properly floated to straighten the work. The brown coat must be allowed to dry before applying Oriental Stucco Finish.

Surface Possibilities

Because of its unusual plasticity, Oriental Stucco Finish Coat can be surfaced with ordinary tools to accurately reproduce any period texture — English, Colonial, Spanish, etc. In addition, it is adaptable to the entire range of stucco treatment known to architects. It is equally easy to achieve, in Oriental Stucco Finish, the smooth trowel, the stipple, sponge, sand sprayed, rough cast or spatter dash finishes, according to taste or requirement.

Covering Capacities

The covering capacity of Oriental Stucco Base Coat depends upon the thickness of the coat and the skill of the workman applying it. One ton of Oriental Stucco Base Coat applied ½ in. thick as a scratch coat over metal lath, wire lath, Gyp-Lap wall construction, concrete and brick with flush joints should cover approximately 40 sq. yd. Applied ⅜ in. thick as a brown coat over scratch coat, one ton should cover about 50 sq. yd.



Typical English Texture
This and other period textures can be reproduced in Oriental Stucco with common tools

While the covering capacity of Oriental Stucco Finish is dependent upon the same factors, one ton of the material will cover about 150 to 200 sq. yd. With a light dash, a greater covering capacity can be obtained.

For best results Oriental Stucco Finish should never be applied to a thickness greater than ⅛ to ¼ in.

Specifications upon request.

THE BERGER MANUFACTURING CO.

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MINNEAPOLIS, MINN., 1701-1729 Broadway N. E.
SAN FRANCISCO, CAL., 1120 Mission Street

ROCHESTER, N. Y., 212 Wilder Building
LOS ANGELES, CAL., 405 East Second Street
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BERLOY
TRADE-MARK

Products

DIAMOND MESH METAL LATH; SHEET LATH; ⅜-INCH RIBPLEX METAL LATH; ¾-INCH RIBPLEX REINFORCEMENT; CHANNELS; CORNER BEAD; BASE BEAD; CONCEALED PICTURE MOULD; METAL LUMBER JOISTS AND STUDS.

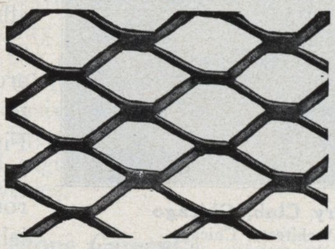
Also Multiplex and Ferro-Lithic Reinforcing Plates, Metal Ceilings, Steel Lockers, Stockroom Shelving and Filing Equipment.

For Floor Cores, see page 45; for Metal Ceilings, see page 1205.

Berloy Diamond Mesh Metal Lath

The ideal metal lath for all bent or formed work and for all plastering purposes where supports are not over 16 in. on center.

Made in two mesh sizes. Exact size of B.B. mesh is shown. Post Office mesh is slightly larger and is made to comply with U. S. Government specifications.



BERLOY DIAMOND MESH METAL LATH

BERLOY DIAMOND MESH METAL LATH

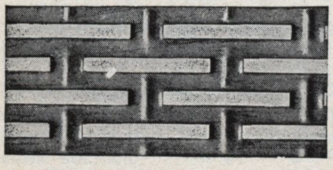
Weight per sq. yd., lb.	Mesh	Size of sheets, in.	Sq. yd. per sheet	Sq. yd. per bundle
2.20	B. B.	24x96	1.78	16
2.50	B. B.	24x96	1.78	16
3.00	B. B.	24x96	1.78	16
3.40	B. B.	24x96	1.78	16
4.00	P. O.	24x96	1.78	16

The above applies to steel lath in all weights, painted black, to Toncan Metal lath in all weights painted green and to lath cut from galvanized sheets in the 2.50-lb. and 3.40-lb. weights.

Specifications—Berloy Diamond mesh metal lath conforms in every way to requirements of specifications of the Associated Metal Lath Manufacturers.

Berloy Sheet Lath

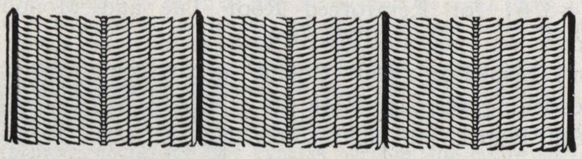
This lath is a perforated sheet; not expanded. Because of its great stiffness and plaster-clinching qualities, Berloy sheet lath is preferred by many architects for tile back-up and similar work. Weight per sq. yd., 4.50 lb. Size of sheets, 18x96 in. Number of square yards per sheet, 1.33. Sheets per bundle, 9. Square yards per bundle, 12. Made only in painted steel.



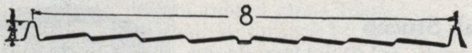
BERLOY SHEET LATH

Berloy ⅜-in. Ribplex Metal Lath

A ribbed expanded metal lath used principally for partition and ceiling plaster work, for exterior stucco and for overcoating old buildings.



SECTION ACROSS ⅜-IN. RIBPLEX SHEET



CROSS SECTION TO SHOW RELATION BETWEEN RIBS AND MESH

The ⅜-in. ribs take the place of separate furring strips and permit wider spacing of supports (see table). Ribs nest together at sides and ends to make a rigid splice and a uniform plastering surface. Effective covering width, 24 in. No waste of material in side laps.

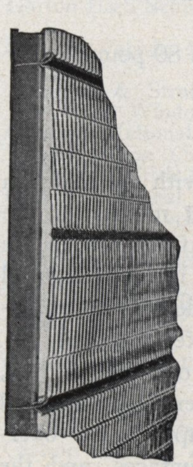
Finished work is strong, firm, uniform, permanent and satisfactory in every way.

BERLOY ⅜-IN. RIBPLEX METAL LATH

Weight per sq. yd., lb.	Size of sheets, in.	Sq. yd. per sheet	Sheets per bundle	Sq. yd. per bundle
2.50	24x96	1.78	9	16
3.00	24x96	1.78	9	16
3.50	24x96	1.78	9	16
4.00	24x96	1.78	9	16

The above applies to steel ⅜-in. Ribplex painted black, and to Toncan Metal ⅜-in. Ribplex painted green. Toncan Metal Ribplex is not made in the 2.50 lb. weight.

Erection Specifications—The following is supplementary and conforms to the specifications of the Associated Metal Lath Manufacturers:



RIBS AGAINST SUPPORT

In all cases place ribs against, and mesh away from, supports. Place ribs at right angles to supports. All adjoining sheets are to be interlocked at sides and ends.

Sheets shall be securely wired together with 18 gauge wire once between supports and not over 24 in. apart along ribs at sides and every 4 in. at ends. ⅜-in. Ribplex lath shall be securely wired to channels with 18 gauge wire or stapled to studs with 1¼-in. 14 gauge galvanized wire staples at least every 8 in.

When splices are necessary between supports, they shall be at least 2 ft. apart in adjacent rows. Allow 1-in. end lap when splices are at supports. If splices are between supports, allow 8 in. Spacing of supports for ⅜-in. Ribplex shall be according to the Associated Metal Lath Manufacturers' specifications.

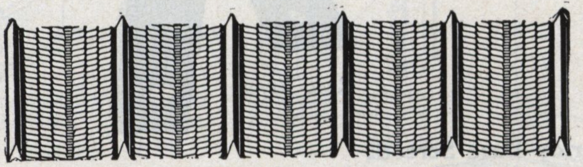
Continued on next page

Berloy ¾-in. Ribplex Reinforcement

Berloy ¾-in. Ribplex is an effective centering and reinforcement for concrete roofs and floors, and for concrete or plaster partitions and ceilings. It also has a wide range of usefulness in general concrete work.

It is a stiff metal mesh with ¾-in. ribs spaced 4.8 in. apart, all formed cold from the same sheet of metal.

In addition to the uses described below, ¾-in. Ribplex can be used to good advantage in many forms of special work such as column and beam protection, balconies, galleries, bathhouses and other small buildings; fences and walls, ducts, tanks, etc.



SECTION ACROSS ¾-IN. RIBPLEX SHEET
Ribs are ¾ in. high spaced 4.8 in. on centers

PAINTED STEEL ¾-IN. RIBPLEX

Gauge No.	Weight per sq. ft., lb.	Total sect. area per ft., sq. ft.	Width of sheets, in.	Length of sheets for all gauges, ft.
28	.50	.1406	24	4, 5, 6, 7, 8, 9, 10, 11, and 12
26	60	.1688	24	
24	.75	.2250	24	

Roofs of ¾-in. Ribplex

As forms and reinforcement, ¾-in. Ribplex extends the field of concrete to steep pitched roofs, sawtooth roofs, etc. For these types as well as for flat roofs the Ribplex is applied with ribs up.

The concrete is applied directly to the Berloy ¾-in. Ribplex and just enough goes through the mesh to embed the metal. The undersurface is usually backplastered and in many types of buildings no further ceiling is required.

As the table below shows, 2 in. of concrete usually gives ample strength for any concrete roof of Ribplex construction.

Floors of ¾-in. Ribplex

For floors, ¾-in. Ribplex is used in the same way and offers the same advantages as for flat roofs.

Slabs, of course, should be thicker, but here, too, the safe load table below shows that a substantial saving can be made in dead weight, materials and supporting structure.

SAFE TOTAL LOADS IN POUNDS PER SQUARE FOOT

Thickness of concrete	Gauge No.	Resisting moment per ft. of width	Span in feet							
			3	4	5	6	7	8	9	10
2 in. Wt.=24 lb. per sq. ft.	28	3140	291	164	104	73	....	....	....	....
	26	3720	346	194	124	85	63	....	....	....
	24	4370	405	228	146	101	74	....	....	....
2½ in. Wt.=30 lb. per sq. ft.	28	4070	376	211	135	94	69	53	....	....
	26	4850	449	253	162	112	82	62	....	....
	24	6360	588	331	211	147	108	81	....	....
3 in. Wt.=36 lb. per sq. ft.	28	5030	465	261	168	116	85	65	....	....
	26	5930	550	309	198	137	101	77	61	....
	24	7820	722	406	260	180	133	101	84	....
3½ in. Wt.=42 lb. per sq. ft.	28	5950	550	310	198	137	101	77	64	....
	26	7060	654	368	237	163	120	92	72	....
	24	9300	861	484	310	214	158	121	96	....
4 in. Wt.=48 lb. per sq. ft.	28	6910	640	360	230	160	117	90	71	....
	26	8160	756	425	272	188	139	106	84	68
	24	10760	997	561	359	249	183	140	110	90

For safe live loads deduct weight of slab.
Stress in steel 16,000 lb. per sq. in.
Stress in concrete 650 lb. per sq. in.
Ratio or moduli of elasticity = 15.
Distance of center of gravity above bottom of plate = .21 in.
Bending moment $\frac{WL^2}{10}$ for $\frac{WL^2}{12}$ add, 20%; for $\frac{WL^2}{8}$ deduct 20% from above loads.

Solid Partitions and Walls of ¾-in. Ribplex

Berloy ¾-in. Ribplex placed with ribs vertical, forms an excellent base for a 2-in. solid wall or partition.

Temporary bracing is used until the first coat of plaster, applied on the side opposite the ribs, has set. The bracing is then removed and the Ribplex backplastered; a second coat over the first and the partition is ready for the finish coats.

Berloy standard ceiling and floor track or metal lath bent at right angles are used for the attachment of the Ribplex at ceiling and floor.

Hollow Partitions and Walls of ¾-in. Ribplex

Berloy ¾-in. Ribplex is also used extensively for hollow partitions and exterior walls, usually with ribs horizontal and next to supports to act as furring.

This use permits spacing of supports from 4 to 6 ft. apart.

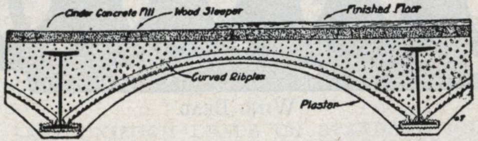
Ceilings of ¾-in. Ribplex

In many cases Ribplex roofs or floors are backplastered beneath to form very effective ceilings.

¾-in. Ribplex as a base makes ceilings firm and even and supports may be spaced 4 to 6 ft. apart. ¾-in. Ribplex can also be used to good advantage in suspended ceiling construction with light channel supports. In all cases the ribs remain on the upper side in order to realize their full strength and give a smooth, even plastering surface beneath.

Curved Ribplex

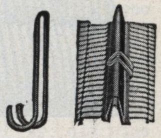
Berloy ¾-in. Ribplex can be supplied curved to any desired radius with ribs on the outside of the curve. For roof and floor construction it is supplied as part of a circle evenly curved or with middle portion flat and ends curved to the desired radius. Curved Ribplex was used to splendid advantage between deep girders in the recent addition to the R. H. Macy Store, New York City, to save concrete and reduce dead load.



APPLICATION OF CURVED RIBPLEX

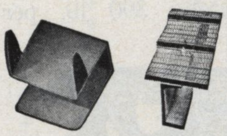
¾-in. Ribplex Clips

No. 1—Side Clip—Used as shown for fastening side laps together. Not needed for spans up to 3 ft. For longer spans these clips should be used spaced 3 ft. apart or less. Necessary side clips are supplied without extra charge. The illustration also shows how ribs nest together to form a firm even joint.



No. 1. SIDE CLIP

No. 2—Purlin Clip—For fastening ¾-in. Ribplex to I-beams or channels in floor or roof construction as shown. The clip has a spring grip on the flange of beam which insures a very rigid connection. Clips should be placed at every other rib along the structural member which means one for every 9⅗ in. of length.



No. 2. PURLIN CLIP

MAXIMUM SPANS WITH WET CONCRETE

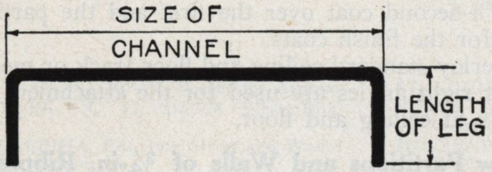
Slab thickness........	2 in.			2½ in.			3 in.			3½ in.			4 in.		
Gauge of ¾-in. Ribplex	28	26	24	28	26	24	28	26	24	28	26	24	28	26	24
Maximum span... ft.	3¼	3½	4	3	3¼	3⅔	2¾	3	3⅓	2½	2¾	3	2¼	2½	2¾

Note: In using ¾-in. Ribplex as centering in concrete roofs and floors no supports are necessary except for long spans or extra thickness. The table above shows limits above which supports should be used until the concrete sets.

Continued on next page

Berloy Cold Rolled Channels

For partitions, ceilings, furring and formed work. Made of 16 gauge steel in sizes ¾ to 2 in. with length of leg ⅜ and ½ in. Stock lengths, 12, 14, 16, 18 and 20 ft.



Berloy Cold Rolled Channels

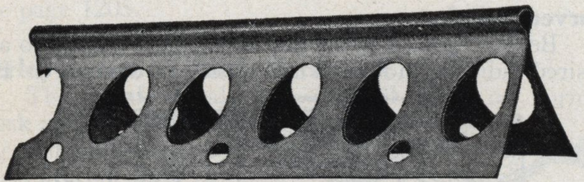
Size, in.	Approximate length of leg, in.	Gauge No.	Weight per 1000 lin. ft., lb.
¾	⅜	16	276
1	⅜	16	332
1½	⅜	16	442
2	⅜	16	553

Note: ¾ and 1-in. sizes are packed 20 pieces to the bundle; 1½ and 2-in. sizes are packed 10 pieces to the bundle.

Berloy Corner Bead

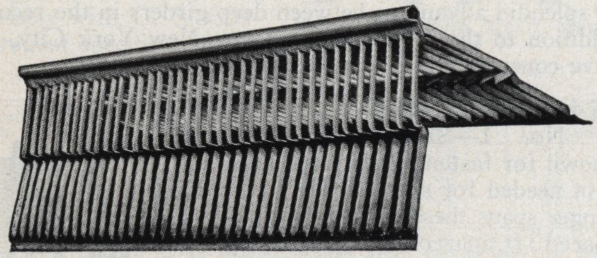
Made in styles as illustrated and described below, also in special long flange styles.

Wing Bead—Made from 26 gauge galvanized steel. Stock lengths, 6, 7, 8, 9, 10 and 12 ft. Shipped in bundles of 10 pieces. Weight, 175 lb. per 1000 ft.



Wing Bead

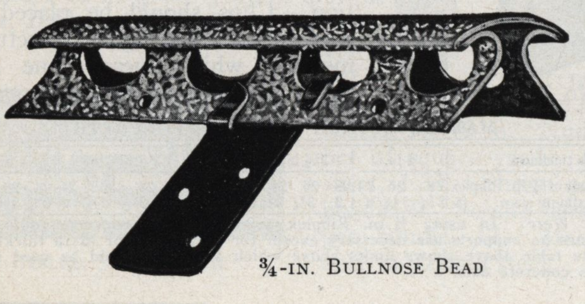
Protex Bead—Made from galvanized steel. Stock lengths, 6, 7, 8, 9, 10 and 12 ft. Shipped 75 pieces to the crate, regardless of length. Weight, 225 lb. per 1000 ft.



Protex Bead

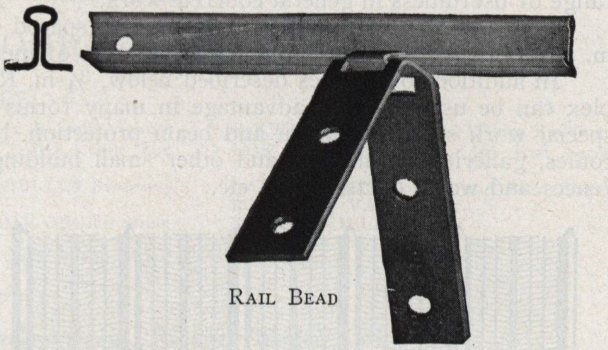
Style 50 Bullnose Bead—¾-in. radius, 26 gauge. Short flange. Clips required, but extra. Shipping weight, approximately, 270 lb. per 1000 ft.

Style 53 Bullnose Bead—1½-in. radius, 26 gauge. Short flange. Weight, approximately, 390 lb. per 1000 ft.



¾-in. Bullnose Bead

Rail Bead—Made from 24 gauge galvanized steel. One clip supplied with each lineal foot. Stock lengths, 6, 7, 8, 9, 10 and 12 ft. Shipped in bundles of 25 pieces. Weight, 180 lb. per 1000 ft., including weight of clips.



Rail Bead

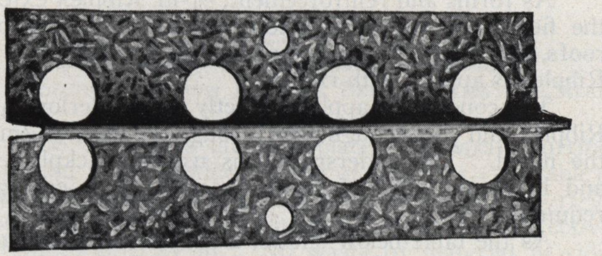
Berloy Base Screeds

Berloy base screed is used to divide a cement base from plaster wall.

It provides a ground for both the plaster and the cement or granolithic base and its use prevents the cement from staining the plaster.

Straight Point Base Screed—For ½, ⅝ or ¾-in. ground. 10-ft. lengths only.

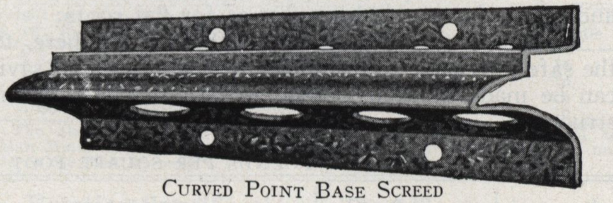
Style 60: 26 gauge; weight, 175 lb. per 1000 ft.
Style 62: 24 gauge; weight, 240 lb. per 1000 ft.



Straight Point Base Screed

Curved Point Base Screed—Style 74: 26 gauge; weight, 202 lb. per 1000 ft. 10-ft. lengths only.

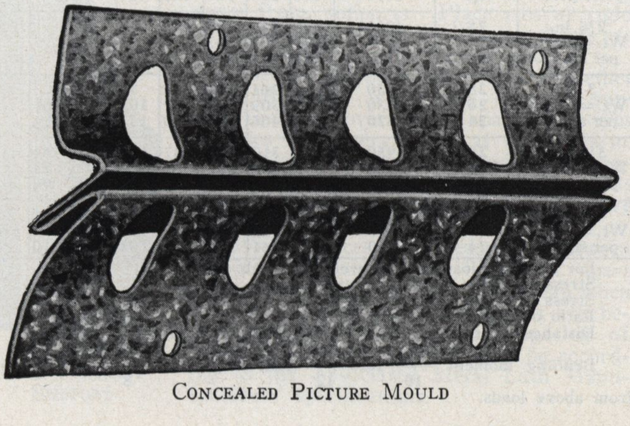
Clips for attaching, 39 lb. per 1000.



Curved Point Base Screed

Berloy Picture Mould

Concealed picture mould. Style 70: 26 gauge; weight, 236 lb. per 1000 ft. 10-ft. lengths only.



Concealed Picture Mould

Continued on next page

Berloy Metal Lumber

Has a 16-year successful service record. Berloy joists combine simplicity and low cost of unit joist type of construction with solidity and fireproof qualities of heavier and more expensive fireproof systems.

Berloy pressed steel joists and studs are factory made and can be easily inspected. The best and most economical fireproof floor system for light occupancy buildings. Berloy Metal Lumber is easy to design and erect, and the architect is assured of safe construction with minimum inspection.

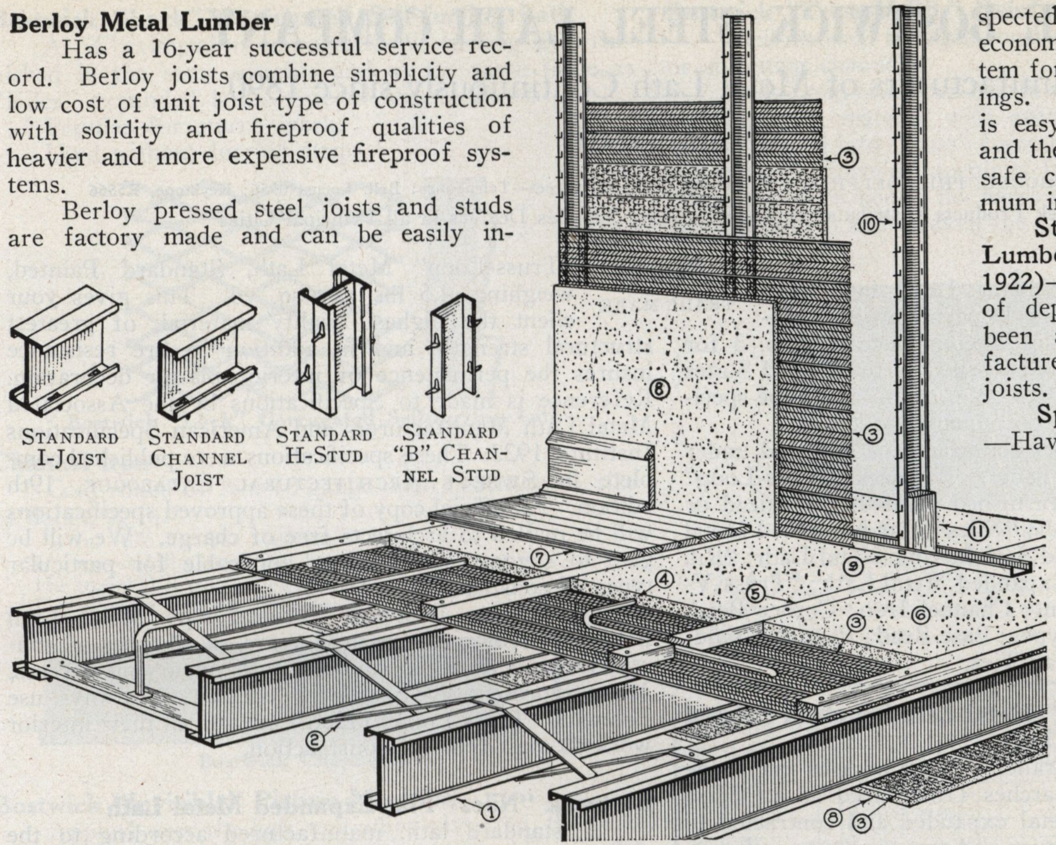
Standard Berloy Metal Lumber Joists (June 1, 1922)—These Standards of depth and strength have been adopted by all manufacturers of pressed steel joists.

Special Berloy I-Joists—Have greater strength and are used principally for headers, trimmers, etc., and can be made in special shapes for these purposes.

Details as simple as for wood.

Berloy Metal Lumber Handbook

A 32-page book, A.I.A. file No. 13G, with tables and more than 100 illustrations, gladly sent to any architect on request.



(1) Berloy metal lumber-I-joists
(2) Metal cross bridging
(3) ⅜-in. Berloy Ribplex metal lath
(4) Electric conduits
(5) Wood nailing strips
(6) Concrete fill
(7) Finished wood floor
(8) Plaster
(9) Berloy-"B"-channel socket strip
(10) Berloy-"B"-channel studs
(11) Wood nailing block

Berloy Metal Lumber Joists

PHYSICAL PROPERTIES

Standard Joists					Special Joists			
Wt. per ft. lb.	Flange width, in.	Web thickness, in.	Section modulus	Depth in.	Wt. per ft. lb.	Flange width, in.	Web thickness, in.	Section modulus
3.7	3	.144	1.3	4	6.1	3	.240	2.14
4.2	3	.144	1.75	5	6.9	3	.240	2.92
4.7	3	.144	2.3	6	7.8	3	.240	3.77
5.5	3½	.144	3.2	7	9.2	3½	.240	5.26
6.1	4	.144	4.2	8	10.5	4	.240	6.92
7.0	4	.150	5.3	9	11.4	4	.240	8.28
8.0	4½	.156	6.65	10	12.6	4½	.240	10.23
9.5	4½	.172	8.4	11	13.5	4½	.240	11.72
10.5	4½	.180	10.0	12	14.3	4½	.240	13.30

Bearings on brick walls, one-half the depth of the joists, but not less than 4 in.; on steel beams or shelf angles, not less than 2½ in.

TOTAL SAFE UNIFORM LOADS ON STANDARD JOISTS IN POUNDS PER SQUARE FOOT OF FLOOR AREA

Joists Spaced 24 in. Center to Center

	Depth of joist, in.	4	5	6	7	8	9	10	11	12
	Wt. per lin. ft.	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
Clear Span in Feet	6	193	.....	.....	.....	.....	.....	.....	.....	.....
	7	142	191	.....	.....	.....	.....	.....	.....	.....
	8	108	146	192	.....	.....	.....	.....	.....	.....
	9	77	115	152	211	.....	.....	.....	.....	.....
	10	56	94	123	171	.....	.....	.....	.....	.....
	11	42	70	102	141	.....	.....	.....	.....	.....
	12	32	54	85	119	156	.....	.....	.....	.....
	13	.....	43	67	101	133	167	.....	.....	.....
	14	.....	34	54	87	115	144	.....	.....	.....
	15	.....	.....	44	71	100	126	158	199	237
	16	.....	.....	37	59	88	111	139	175	209
	17	.....	.....	.....	49	74	98	123	155	185
	18	.....	.....	.....	41	62	88	110	139	165
	19	.....	.....	.....	.....	53	75	99	124	148
	20	.....	.....	.....	.....	45	64	89	112	134
	21	.....	.....	.....	.....	39	56	78	102	121
	22	.....	.....	.....	.....	.....	48	67	93	110
	23	.....	.....	.....	.....	.....	42	59	82	101
	24	.....	.....	.....	.....	.....	.....	52	72	93
	25	.....	.....	.....	.....	.....	.....	46	64	83
	26	.....	.....	.....	.....	.....	.....	41	57	74

Note: Tables are based on moment of WL/8 and extreme fiber stress not over 16,000 lb. per sq. in. Deflection not over 1/360th of span.

These are total loads. To find safe live load deduct dead load which will average about 40 lb. per sq. ft. of finished floor construction. All values based on joists braced with bridging, lath, etc., as in standard floor construction.

TOTAL SAFE UNIFORM LOADS ON STANDARD JOISTS IN POUNDS PER SQUARE FOOT OF FLOOR AREA (Cont.)

	Depth of joist, in.	4	5	6	7	8	9	10	11	12
	Wt. per lin. ft.	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
	Joists Spaced 19 in. Center to Center									
Clear Span in Feet	6	244	.....	.....	.....	.....	.....	.....	.....	.....
	7	179	240	.....	.....	.....	.....	.....	.....	.....
	8	137	184	241	.....	.....	.....	.....	.....	.....
	9	97	146	191	266	.....	.....	.....	.....	.....
	10	71	118	155	216	.....	.....	.....	.....	.....
	11	53	89	128	178	.....	.....	.....	.....	.....
	12	40	69	107	149	196	.....	.....	.....	.....
	13	.....	54	85	127	167	211	.....	.....	.....
	14	.....	43	68	110	145	182	.....	.....	.....
	15	.....	.....	55	90	126	159	199	252	299
	16	.....	.....	46	74	110	140	175	221	263
	17	.....	.....	.....	62	93	124	155	196	233
	18	.....	.....	.....	52	78	110	138	175	208
	19	.....	.....	.....	.....	66	95	124	157	186
	20	.....	.....	.....	.....	57	81	112	141	169
	21	.....	.....	.....	.....	49	70	98	128	153
	22	.....	.....	.....	.....	.....	61	85	117	139
	23	.....	.....	.....	.....	.....	53	74	103	127
	24	.....	.....	.....	.....	.....	.....	65	91	117
	25	.....	.....	.....	.....	.....	.....	57	80	104
	26	.....	.....	.....	.....	.....	.....	51	71	93
	Joists Spaced 16 in. Center to Center									
Clear Span in Feet	6	289	.....	.....	.....	.....	.....	.....	.....	.....
	7	212	286	.....	.....	.....	.....	.....	.....	.....
	8	163	219	287	.....	.....	.....	.....	.....	.....
	9	116	173	227	316	.....	.....	.....	.....	.....
	10	84	140	184	256	.....	.....	.....	.....	.....
	11	63	106	152	212	.....	.....	.....	.....	.....
	12	48	82	128	178	234	.....	.....	.....	.....
	13	.....	64	101	152	199	251	.....	.....	.....
	14	.....	51	81	130	172	216	.....	.....	.....
	15	.....	.....	66	107	150	188	236	299	356
	16	.....	.....	54	88	131	166	208	262	313
	17	.....	.....	.....	74	110	147	184	232	277
	18	.....	.....	.....	62	93	131	164	208	247
	19	.....	.....	.....	.....	79	113	147	186	221
	20	.....	.....	.....	.....	68	96	133	168	200
	21	.....	.....	.....	.....	58	83	116	152	182
	22	.....	.....	.....	.....	.....	72	101	139	165
	23	.....	.....	.....	.....	.....	63	88	123	151
	24	.....	.....	.....	.....	.....	.....	77	108	139
	25	.....	.....	.....	.....	.....	.....	68	95	124
	26	.....	.....	.....	.....	.....	.....	61	85	110

THE BOSTWICK STEEL LATH COMPANY

Manufacturers of Metal Lath Continuously since 1890

NILES, OHIO

TELEPHONE
BELL 836, PBX

EASTERN WAREHOUSE: PHILADELPHIA, PA., 2324-28 Callowhill Street—Telephones: Bell, Locust 0956; Keystone, R5566

Bostwick Products Distributed through Building Supplies Dealers in all Principal Cities

Bostwick
TRADE-MARK

Products

Manufacturers of METAL LATH in accordance with United States Department of Commerce, Simplified Practice Recommendation No. 3 for the Elimination of Waste as issued by the United States Bureau of Standards. "All types of lath are to be specified and sold by weight per square yard."

BOSTWICK PRODUCTS manufactured and sold under the "BOSTWICK" Trade-name: Bostwick "Truss-Loop" Metal Lath Standard, furnished painted, galvanized or from copper bearing steel; "Niles" Flat Expanded Metal Lath; "Lock" corrugated Self-furring Metal Lath; "Rib Expanded" ⅜-in. Rib Expanded Metal Lath; "Truss-V-Rib," light reinforcement; Channel Iron; Corner Bead, galvanized, 5 standard types; Base Bead; Picture Moulding; Wall Plugs and Wall Ties.

Bostwick "Truss-Loop" Metal Lath Standard Painted —a Distinctive Type

Construction—Parallel corrugated ribs each side of a series of trussed arches (recognized as strongest form of support.) Metal expanded and contracted to forms of scientific structure and arrangement; each outside rib makes a nest for lapping, and gives double strength at every joint; openings spaced to give largest and most perfect plaster key. Weight, 4½ lbs. per sq. yd.

Advantages—Strength and rigidity and low cost of finished plaster surface; safely used on centers up to 24 in.

Economy—Saves 11% in lath, because there is no waste overlapping; nails direct to studding or joist; no time lost in stretching; does not give under trowel; allows rapid work; scratch and brown coats can be applied without changing or removing the scaffold; requires no furring; saves labor.

Permanence—This heaviest Metal Lath, weight, 4.5 lbs. per sq. yd., contains sufficient metal to guarantee permanence. Reference is made, with permission, to the United States Bureau of Standards, Washington, D. C., where we have filed and have had accepted a piece of Bostwick Metal Lath now 31 years old. This Bostwick Lath was in the plaster walls of the Ellington Apartments, Cleveland, Ohio, from 1894 to 1920. We can cite many other splendid records of Bostwick permanence and strength from 1890 up to present date.

Suggested Specifications—Wherever Metal Lath is used as an interior plaster base, specify Bostwick "Truss-Loop" Metal Lath, Standard Painted, weighing, 4.5 lbs. per sq. yd. This gives your client the highest quality material, of greatest structural strength, and in addition to fire resistance insures the permanence of interior plaster decoration. Reference is made to Specifications by the Associated Metal Lath Manufacturers and American Specifications Institute, 1923. These specifications were published complete in SWEET'S ARCHITECTURAL CATALOGUE, 19th edition. An official copy of these approved specifications will be mailed to architects free of charge. We will be glad to suggest specifications applicable for particular types of construction.

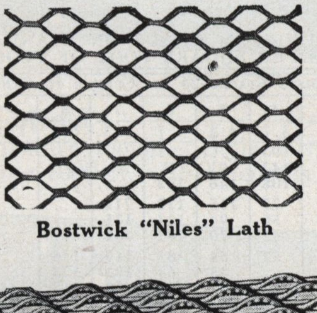
Reference—Bostwick "Truss-Loop" Metal Lath has been used for the past 35 years, in all types of construction, all over the country, with unvarying success. Many representative plastering contractors always use Bostwick "Truss-Loop" Metal Lath for all their interior work on most types of construction.

Bostwick "Niles" Flat Expanded Metal Lath

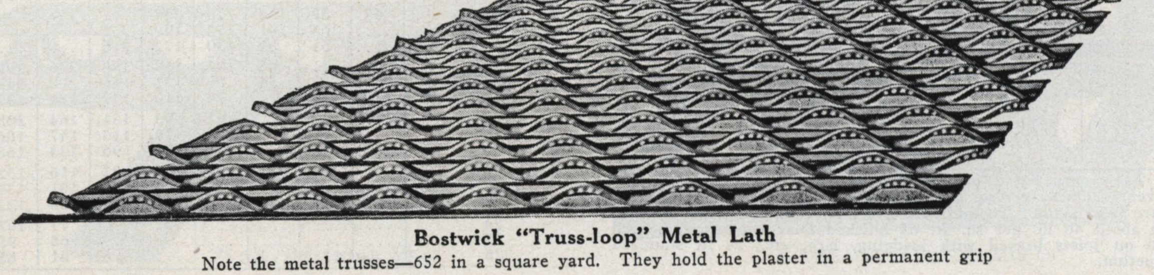
A standard lath, manufactured according to the United States Department of Commerce, Simplified Practice Recommendation No. 3. Of good plaster holding capacity, made in wide sheets favored by contractors. An eminently satisfactory material.

"NILES" LATH

Sizes, in.		Sheets per bundle	Yards per bundle	Weight per sq. yd., lbs.
Width	Length			
24	96	9	16	3.40
24	96	9	16	3.00
24	96	9	16	2.50
24	96	9	16	2.20



Bostwick "Niles" Lath



Bostwick "Truss-loop" Metal Lath

Note the metal trusses—652 in a square yard. They hold the plaster in a permanent grip

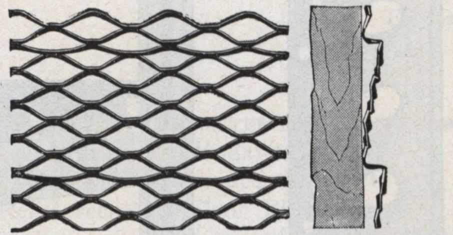
Continued on next page

Bostwick "Lock" Corrugated Self-furring Lath

A "Z" crimped or corrugated self-furring lath, furnished in the same weights and at the same price as "Niles" expanded lath. Size of sheets, 24x96 in.

Popular for stucco work.

Used without furring strips.

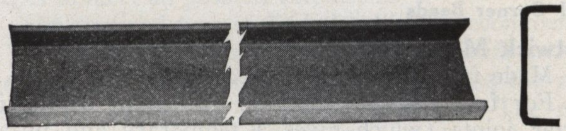


Bostwick "Lock" Corrugated Self-furring Lath

Channel Iron

Cold rolled of No. 16 gauge open hearth steel, size of flange ⅜ in.

¾ in.	276 lbs. per 1000 lin. ft.
1 in.	332 lbs. per 1000 lin. ft.
1½ in.	450 lbs. per 1000 lin. ft.
2 in.	575 lbs. per 1000 lin. ft.



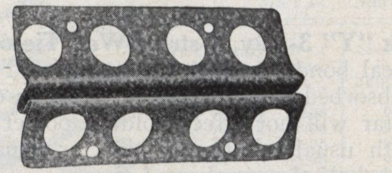
Bostwick Channel Iron

Bostwick "Invisible" Picture Moulding

Applied over the lath, and when plastered, the bead is out of sight, showing only the opening or slot for the picture hook.

Bostwick "Invisible" picture moulding is furnished in the standard length of 10 ft., and weighs 225 lbs. to the 1000 lin. ft.

Shipped crated to preserve straight edge.



Bostwick "Invisible" Picture Moulding

Bostwick ⅜-in. Rib Expanded Metal Lath

An expanded lath with ribs spaced every 4 in. Particularly serviceable for suspended ceilings, and as ceiling lath with metal joists.

Furnished in sheets 24x96 in., and in weights of 2.5, 3.0, 3.5, and 4.0 lbs. per sq. yd.

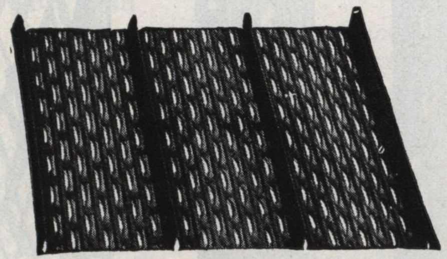
A smooth, even surface for plastering is maintained when Bostwick ⅜-in. Rib Lath is either lapped or the outside ribs nested.

Bostwick "Truss-V-Rib" Reinforced Metal Lath

Ideal material for light concrete work without forms or stiffening channels.

Made from best open hearth sheet.

A ribbed material with every ounce of metal retained, shaped into "truss" formations for weight carrying capacity, forming openings for strongest and most efficient plaster bond; no narrow strands of metal to break from rib and weaken the fabric.



Bostwick "Truss-V-Rib" Metal Lath

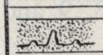
Rib, ¾ in. high; width between ribs, 7 in. Size of stock sheets, 21 in. wide by 4, 5, 6, 7, 8, 9 and 10 ft. long.

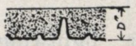
Area of sheet, 21x96 in.: 14 sq. ft.

Weight of sheet, 21x96 in.: No. 24, 17.333 lbs.; No. 26, 13 lbs.; No. 28, 10.85 lbs.

Packed 5 sheets to the bundle.

TABLE OF LIVE LOADS, FLOOR & ROOF SLABS

SECTION OF SLAB	DEPTH OF SLAB	WT. OF SLAB PER SQ. FT.	GAUGE OF METAL	SPAN IN FEET—SAFETY FACTOR 4									SPAN IN FEET—SAFETY FACTOR 2								
				2	3	4	5	6	7	8	9	10	2	3	4	5	6	7	8	9	10
	1½"	19	28	124	68	40							245	136	80	42					
			26	190	95	65	36						380	190	130	72	38				
			24	260	124	90	65						520	248	180	130	85				
	2"	25	28	270	142	98	67	38					540	282	196	144	76	40			
			26	296	160	110	72	48	22				580	320	220	134	96	44			
			24	398	190	135	90	64	37				790	380	270	180	125	70			
	2½"	31	28	291	235	178	102	72	45				580	470	355	200	140	90			
			26	350	272	205	134	91	61	30			700	540	410	265	180	120	60		
			24	462	310	261	167	122	82	51			920	620	520	330	240	160	100		
	3"	37	28	511	372	214	136	108	68	38			520	740	425	270	215	135	75		
			26		448	292	185	126	94	70	56			895	580	370	252	185	140	112	
			24		602	394	245	168	124	95	75			1200	785	490	335	245	190	150	
	3½"	43	28		426	260	166	115	84	63	48	26		850	520	332	230	165	125	95	50
			26		548	308	198	140	100	76	58	32		1095	635	395	280	200	150	115	60
			24			404	265	184	134	100	77	38			805	530	365	265	200	144	76



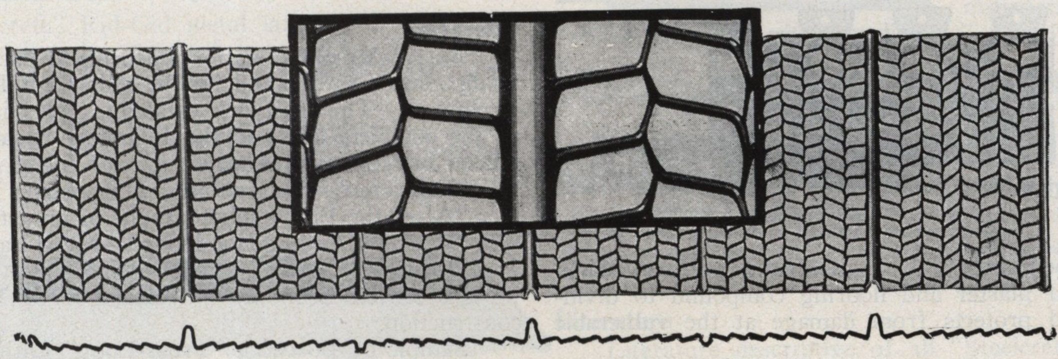
GAUGE	D=1"	D=1½"	D=2"	D=2½"	D=3"	D=3½"	D=4"	D=4½"	D=5"
28	3'-6"	3'-0"	2'-8"	2'-4"	2'-1"	1'-10"			
26	4'-1"	3'-6"	3'-1"	2'-9"	2'-5"	2'-2"	1'-11"	1'-8"	
24	4'-8"	4'-1"	3'-7"	3'-4"	2'-11"	2'-7"	2'-0"	1'-10"	1'-8"

Bostwick Corrugated Metal Wall Tie or Brick Bond

Made from heavy galvanized sheets, with deep corrugations, giving maximum bonding power. Regular size, 7 in. long by ⅞ in. wide. Any reasonable size made to order.

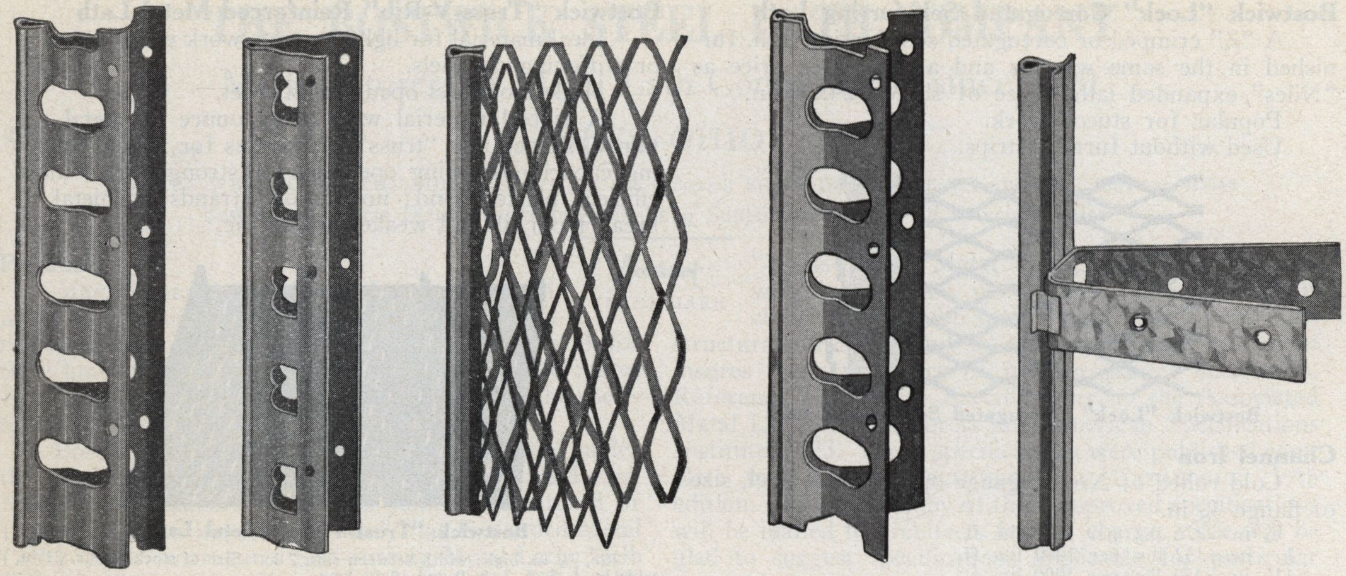
All ties punched for veneer work. Regular size, 351 lbs. Packed 1000 to box.

Bostwick Corrugated Wall Tie



Bostwick ⅜-in. Expanded Metal Lath

Continued on next page



Truss Wing Bead — Type "B" Bead — Expanded Bead — Standard Bead — Rail Bead and Clip

Bostwick Galvanized Metal Corner Beads

Bostwick Galvanized Metal Corner Beads

For supporting and protecting exposed plaster corners. Now used on practically every plaster job because it is more satisfactory and more economical than having plaster form the corner with a "straight-edge."

Bostwick Corner Bead is manufactured in five standard types, as illustrated. All Bostwick Corner Beads are furnished in stock lengths 6, 7, 8, 9 and 10 ft.

Bostwick Standard Bead—A 24-in. gauge bead of standard ¾-in. ground, meeting maximum specifications in all respects. Weight, 250 lbs. per 1000 ft.

Bostwick Truss Wing Bead—A bead of standard ¾-in. ground, but lighter gauge than Standard. Weight, 200 lbs. per 1000 ft.

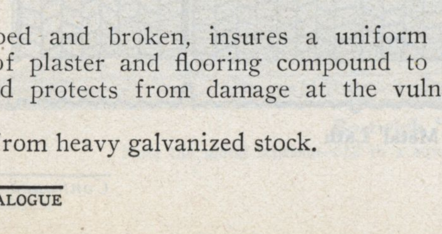
Bostwick "B" Bead—A popular lightweight bead of sub-standard grounds. Weight, 175 lbs. per 1000 ft.

Bostwick Expanded Bead—Has wings of expanded metal that integrate closely with the lath structurally. Weight, 200 lbs. per 1000 ft.

Bostwick Rail Bead with Clips—A general purpose bead, but especially useful for bends, arches, etc. Weight, 180 lbs. per 1000 ft.

Bostwick Metal Ground Bead or Base Section

Where composition floors are used, Bostwick metal ground bead prevents plaster running to a thin edge easily chipped and broken, insures a uniform thickness both of plaster and flooring compound to dividing line and protects from damage at the vulnerable point.



Bostwick Metal Ground Bead or Base Section

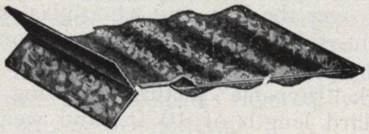
Type A, ½ in. Grounds

Made from heavy galvanized stock.

Bostwick Metal Wall Plug or Nailing Base

Made from heavy galvanized stock.

For fastening interior trim instead of nailing into mortar joints (which gives a temporary and unsatisfactory hold), or wooden blocks which shrink and loosen from wall.



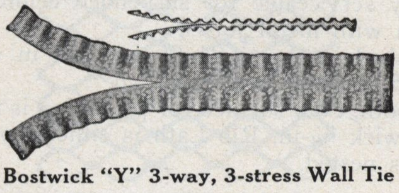
Bostwick Metal Wall Plug

Length, 2⅞ in.; width, 2¼ in. Packed 500 per carton. Shipping weight, 50 lbs.

Bostwick "Y" 3-way, 3-stress Wall Tie or Brick Bond

A real bond in which the stress and strain of the wall is absorbed in three ways. Change of position in wet mortar will not affect holding power. Ties every brick with usual number of ties, or usual number of brick with half the number of ties.

Packed 1000 per box; weight 65 lbs. Heavy galvanized stock with deep corrugations at various angles. All ties punched for veneer work.



Bostwick "Y" 3-way, 3-stress Wall Tie

Literature

Bostwick printed matter conforms to size for advertising matter as adopted by the American Institute of Architects. The Bostwick catalogue gives information of the complete line and the following booklets are of special interest to architects:

"Princeton"—illustrations of Princeton University.

"After the Fire"—photographs of an actual fire.

"Wall and Ceiling Handbook"—Metal Lath practice.

"Bostwick News"—published monthly.

"Bostwick Economy"—a catalogue of Metal Lath construction.

Sample of Bostwick "Truss-Loop" Lath, folded in descriptive wall card. Sent on application.

THE CONSOLIDATED EXPANDED METAL COMPANIES

Plastering Lath, Channel and Corner Bead

BRADDOCK, PA.

For Sales Offices, see page 54

Steelcrete
TRADE-MARK

Products

Expanded Metal Plastering Lath; Corner Bead; Channel Furring.

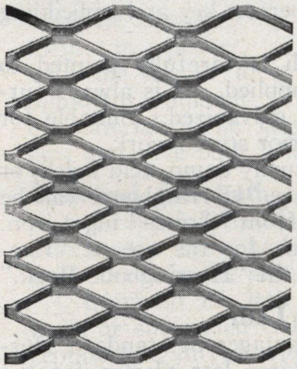
For "Steelcrete" Expanded Metal for Concrete Reinforcement, Floor Binders and Beam Wrappers, see page 54; for "Steelcrete" Expanded Metal for the construction of Armored Vaults, see page 1025.

Expanded Metal Plastering Lath

"Steelcrete" lath is furnished in large, stiff sheets 28 in. wide by 96 in. long, and in different weights and designs to meet all possible conditions.

The diamond type is the lath which is recommended for general construction. The sheets are stiff and the openings are of the proper size to allow just the right amount of mortar to be forced through. The mortar clinches on the back and thoroughly embeds the lath.

Lath should be wired to metal furring with No. 18 gauge annealed steel wire. For fastening to wood studs or sheathing, use staples long enough to enter at least ¾ inch.



"Steelcrete" Diamond Lath

"STEELCRETE" EXPANDED METAL LATH

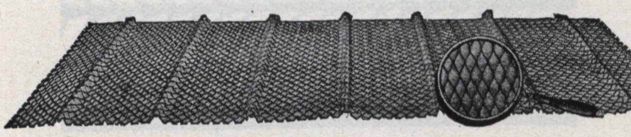
Weight per sq. yd., lb.	Size of sheets, in.	Sheets in bundle	Sq. yd. in bundle
3.40	28x96	9	18.66
3.00	28x96	9	18.66
2.50	28x96	9	18.66
2.20	28x96	9	18.66

The above laths can be furnished in the following:
(1) Painted black.
(2) Rid-Gid form.
(3) Copper-bearing steel painted red.
(4) Lath cut from galvanized sheets furnished in weights of 2.50 lb. and 3.40 lb. per sq. yd.

Rid-Gid Metal Lath

"Steelcrete" Rid-Gid metal lath, as the name implies, has ridges incorporated in it during the process of manufacture. The ridges are approximately 4 in. on centers.

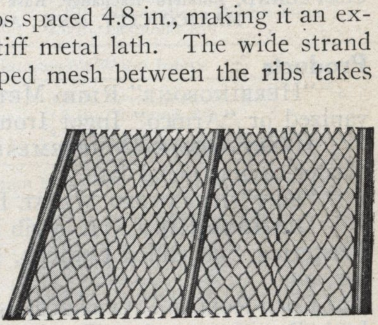
This style of lath is a self-furring lath and particularly designed for stucco work, making possible the elimination of pencil rods or furring strips.



Rid-Gid Metal Lath

Rib Lath

Steelcrete rib lath is a diamond mesh lath with solid ribs spaced 4.8 in., making it an exceptionally stiff metal lath. The wide strand diamond-shaped mesh between the ribs takes the plaster easily and rapidly without waste. *Steelcrete rib lath serves the purpose.*



"Steelcrete" Rib Lath

Steelcrete rib lath is a labor and material saver. It is a smooth sheet that can be easily handled. Its erection is rapid and easy—the interlocking ribs along the sides and at the ends fit perfectly and it requires less fastening to the supports than other types of lath.

Supports can be spaced farther apart when Steelcrete rib lath is used, without sacrificing stiffness of plaster, thereby resulting in a great saving of material.

Steelcrete rib lath is furnished in three weights: 3.0 lb., 3.5 lb. and 4.0 lb. per sq. yd. The sheets are 24 in. wide (c-c outside ribs) by 96 in. long. The ribs are spaced 4.8 in. c-c. A bundle contains 9 sheets—16 sq. yd.

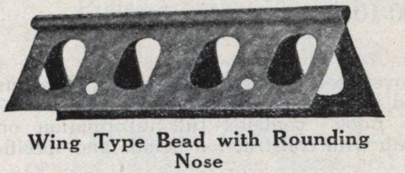
MAXIMUM SPANS FOR STEELCRETE RIB LATH (INCHES)

Weight per sq. yd., lb.	Ceilings		Partitions	
	Steel furring	Wood joists	Steel studs	Wood studs
3.0	19	24	24	30
3.5	24	30	30	36
4.0	27	33	33	38

"Steelcrete" Corner Beads and Channels

The standard wing type, rail type and bullnose corner beads in the standard gauges, may be obtained cut from galvanized sheet. Beads are strong and straight, and prevent cracking of the plaster after erection.

Corner beads furnished in lengths of 6, 7, 8, 9, 10 and 12 ft.

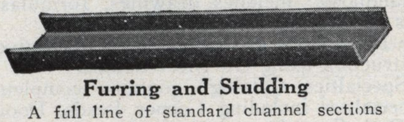


Wing Type Bead with Rounding Nose

Strong and rigid and well suited for general use

T-Rail Bead

Adjustable to any depth grounds. Clips may be fastened with every foot of bead



Furring and Studding

A full line of standard channel sections for furring and studding
Sizes, ¾, 1, 1½, and 2 in.

Literature

Literature descriptive of all "Steelcrete" products furnished free.

THE GENERAL FIREPROOFING BUILDING PRODUCTS

Expanded Metal Lath, Expanded Metal Reinforcement, Steel Tile for Floor Construction, and Steel Lumber

YOUNGSTOWN, OHIO

BRANCH OFFICES

ATLANTA, 257-263 Decatur Street
BOSTON, 143 Federal Street
BUFFALO, Hinman Avenue at Delaware Avenue
CHICAGO, 2921 So. La Salle Street
CLEVELAND, Builders' Exchange, Rose Building
KANSAS CITY, 1009 Waldheim Building
LOS ANGELES, 1920 Atlantic Street
MILWAUKEE, 141 Wisconsin Street
MINNEAPOLIS, 1020 Builders' Exchange
NEW YORK, 538 E. 133rd Street
OMAHA, 532 Peters Trust Building
PHILADELPHIA, 1503 Packard Building
SAN FRANCISCO, 20 Beale Street
ST. LOUIS, 513 Arcade Building, Olive Street
SYRACUSE, 707 Keith Theater Building
MEXICO CITY, MEX., Avenida Francisco I. Madero 53
EXPORT DEPARTMENT: 90 West Street, NEW YORK

Products

"Herringbone" Rigid Metal Lath, Painted, Galvanized or "Armco" Ingot Iron.

Herringbone Doublemesh Lath, a small mesh plaster-saving metal lath.

"Key" Expanded Metal Lath.

Diamond Rib Lath, a rib reinforced lath used for Plastering Suspended Ceilings, Floors over Steel Lumber, etc.

Cold Rolled Channels, used as Studding for Metal Lath Partitions and as Furring for Suspended Ceilings, Cornices, False Beams and Ornamental Plaster Work.

Corner Bead, for supporting and protecting exposed plaster corners.

"Self-Sentering," an Expanded Metal Reinforcement for Concrete, acting as both Form and Reinforcement or as Lath and Stud.

Expanded Metal Angles.

"Trussit," a patented Reinforcement for Curtain Walls and Partitions without studding.

Expanded Metal, the general purpose Reinforcement for Concrete Work.

Steel Lumber, used similarly to wood joists and studs in Fire Resistive Floor and Partition Construction.

"Peds," patented Spot Grounds for attaching wood and metal trim to walls, and screeds to concrete floors.

Steel-Tile and End-Tile, Steel Forms for joisted Concrete Floor Slabs.

Duplex Steel Bridging, a one-piece galvanized steel cross bridging for wood joist floors.

Also Metal Building Specialties, including Picture Moulds, Base Grounds, Base Screeds, Door and Window Casings, Window Stools, Chair Rails, Chalk Troughs, Baseboards.

Steel Sash, Steel Basement and Casement Windows, Lintels, Industrial Steel Doors, Concrete Reinforcement and Wire Mesh. Ask for special literature on these products.

For Waterproofings, Dampproofings and Technical Paints, see pages 100-101.

Handbooks

GF publications cover construction data concerning our products completely and include standard specifications.

The "Herringbone Book" contains full information on "Herringbone" metal lath with construction details and specifications.

The "Fireproofing Handbook" treats fully the uses of "Self-Sentering," "Trussit" and expanded metal.

The "Steel-Tile Handbook" includes drawings, formulas, tables and computations for the concrete designer.

The "Steel Lumber Handbook" gives data on fire resistive floor and partition construction using GF Steel Lumber.

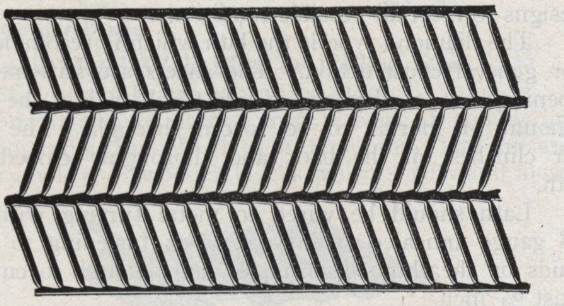
"Metal Building Specialties Catalog" contains complete description of metal specialties including Corner Beads, Door and Window Casings, Base Screeds, etc.

Specific information on any of these products, together with advice and estimates on particular applications, can be obtained from our Engineering Service Department.

"Herringbone" Expanded Metal Lath

"Herringbone" metal lath, universally used because of its stiffness, is, on account of its heavy, longitudinal ribs, the most rigid metal lath made for general plastering. Its use permits the widest stud or joist spacing.

"Herringbone" offers a firm surface, over which it is easy to apply a level coating of plaster. It will not buckle or sag between supports, which means a saving of plaster and labor. The interlocking edges eliminate waste from lapping and materially reduce the cost of lacing the sheets together.



"Herringbone" Expanded Metal Lath

The mortar curls around the flattened cross strands and the main ribs, forming a perfect key and embedding the metal lath therein.

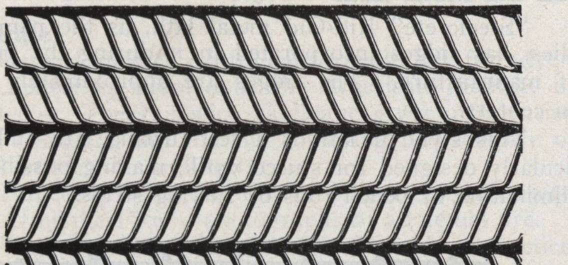
"Herringbone" metal lath is carefully painted to protect it until the plaster is applied. It is always furnished painted, unless ordered galvanized. Suitable for all interior plastering and exterior stucco work.

Where the climate is unusually damp, acid laden, or in case of a salt sea atmosphere "Herringbone" can be furnished galvanized or made from "Armco" ingot iron.

For complete specifications for the use of "Herringbone" metal lath, send for the "Herringbone Book."

"Herringbone" Double-mesh Lath

This lath has all the advantages of standard Herringbone and in addition requires less plaster for the scratch coat. It has double the number of meshes of any former type of Herringbone for the same area with a corresponding decrease in the size of the openings. "Herringbone" Double-mesh Lath has the smallest mesh



"Herringbone" Double-mesh Lath

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of any expanded metal lath on the market at the same time being the most rigid. It is, therefore, the most economical lath to buy, effecting a big saving in both the labor of erecting it and in the plastering. Plastered on ½-in. grounds, the cost of the completed job, including lath and plaster, is very close to that for wood lath and plaster on ⅝-in. grounds—the results are far superior.

HERRINGBONE EXPANDED METAL LATH

Approximate Weights per Square Yard

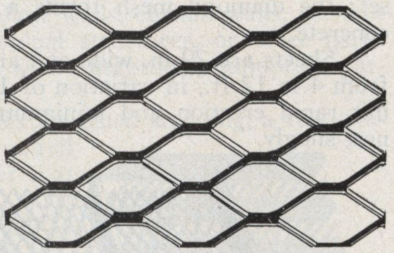
Style	Painted, lb.	Galvanized, lb.	Armco, lb.	How shipped
Standard	2.2 2.5 3.0 3.4	.... 2.5 .... 3.4	2.2 2.5 3.0 3.4	Sheets 20¼x96 in., 1½ sq. yd. Packed 15 sheets (22½ sq. yd.) to the bundle
"AAA"	2.5	....	2.5	Sheets 18x96 in., 1⅓ sq. yd. Packed 15 sheets (20 sq. yd.) to the bundle
Double-mesh	3.4	3.4	3.4	Sheets 15x96 in. Packed 18 sheets (20 sq. yd.) to the bundle

"Key" Expanded Metal Lath

Approved by Underwriters' Laboratories, Inc.

"Key" expanded metal lath is extensively used in all locations and is especially suitable for curved surfaces because of its flexibility.

"Key" lath is easy to handle and erect. The small mesh insures its complete envelopment in plaster, with the use of a minimum amount of material. The large sheets reduce the number of laps and save both labor and material.



Key Expanded Metal Lath

Approximate Weight Per Square Yard

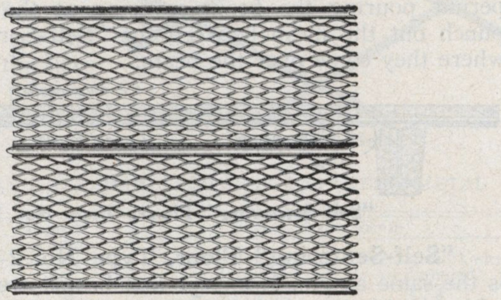
Painted, lb.	Galvanized, lb.	Armco, lb.
2.2	....	2.2
2.5	2.5	2.5
3.0	....	3.0
3.4	3.4	3.4

Sheets 24x96 in. Packed 9 sheets to a bundle, 16 sq. yd.

Diamond Rib Lath

A rib reinforced lath stiffened by U-shaped ribs approximately ⅜ in. high, 4.8 in. on centers, with diamond mesh between the ribs.

Diamond rib lath is primarily a plaster base for walls or suspended ceilings, permitting, through its exceptional rigidity, a wider spacing of support.



Diamond Rib Lath

Weights per Square Yard

Painted steel, lb.	Armco ingot iron, lb.
3.0	....
3.5	3.5
4.0	4.0

All sheets 24 in. wide and 8 ft. long. (Special lengths involving 5 tons or more furnished on mill order.) Packed 9 sheets (16 sq. yd.) per bundle.

WEIGHTS AND STYLES OF METAL LATH FOR DIFFERENT PURPOSES

Spacing of Supports	Type of lath
For Solid or Double Plaster or Cement Partitions	
12 in. c-c	2.2 lb. Herringbone or Key
16 in. c-c	2.5 lb. Herringbone or Key
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.0 lb. Diamond Rib
30 in. c-c	3.5 lb. Diamond Rib
36 in. c-c	4.0 lb. Diamond Rib
For Interior Walls and Partitions on Wood Studs	
16 in. c-c	2.5 lb. Herringbone or Key
19½ in. c-c	2.5 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.0 lb. Diamond Rib
For Ceilings on Wood Joists	
16 in. c-c	3.0 lb. Herringbone or Key
19½ in. c-c	2.5 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.5 lb. Diamond Rib
For Ceilings Suspended More than 6 In. Below Supports	
12 in. c-c	3.0 lb. Herringbone or Key
16 in. c-c	3.4 lb. Herringbone or Key
19½ in. c-c	3.0 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.5 lb. Diamond Rib
30 in. c-c	4.0 lb. Diamond Rib
For Attached Ceilings or Ceilings Suspended Less Than 6 In. Below Supports	
12 in. c-c	3.0 lb. Herringbone or Key
16 in. c-c	3.4 lb. Herringbone or Key
19½ in. c-c	3.0 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.5 lb. Diamond Rib
30 in. c-c	4.0 lb. Diamond Rib
For Floors Over Steel Lumber Joists	
12 in. c-c	3.0 lb. Herringbone or Key
16 in. c-c	3.4 lb. Herringbone or Key
19½ in. c-c	3.5 lb. Diamond Rib
24 in. c-c	4.0 lb. Diamond Rib
For Ceilings Under Steel Lumber Joists	
12 in. c-c	3.0 lb. Herringbone or Key
16 in. c-c	3.4 lb. Herringbone or Key
19½ in. c-c	3.0 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.5 lb. Diamond Rib
30 in. c-c	4.0 lb. Diamond Rib
For Wall Furring	
12 in. c-c	2.2 lb. Herringbone or Key
16 in. c-c	2.5 lb. Herringbone or Key
19½ in. c-c	2.5 lb. Diamond Rib
19½ in. c-c	3.4 lb. Herringbone Double-mesh
24 in. c-c	3.0 lb. Diamond Rib
30 in. c-c	3.5 lb. Diamond Rib
36 in. c-c	4.0 lb. Diamond Rib
For Exterior Stucco	
16 in. c-c	3.4 lb. Herringbone or Key
16 in. c-c	3.5 lb. Diamond Rib

GF Cold Rolled Channel Studding and Furring

Rolled from No. 16 gage steel, with square corners and true right angle sides.

GF channels are light, stiff and straight; therefore, easily erected.

GF cold rolled channels are used for studding in solid or hollow partitions, for furring on flat or suspended ceilings, false beams and columns, cornice work, and on masonry.

WEIGHTS AND SIZES OF STEEL CHANNELS

Width, in.	Legs, in.	No. gauge	Weight per lin. ft.	Length, ft.	Pieces per bundle
¾	11/32	16	.276	12 to 20	20
1	⅜	16	.332	12 to 20	20
1½	⅜	16	.442	12 to 20	20
2	7/16	16	.580	12 to 20	20

1½ and 2-in. sizes also furnished perforated.

Corner Beads

GF Expanded Corner Bead—Not only protects exposed plastered corners from severe impact, but also

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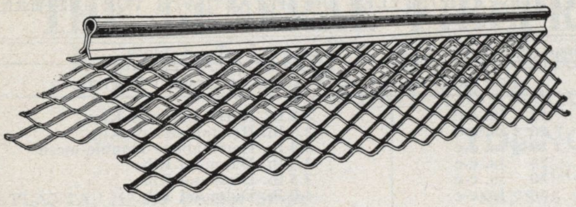


"GF" Expanded Corner Bead

reinforces the plaster for a safe distance back from the corner. Plaster keys through the steel mesh work, giving a continuous attachment the full length of the bead. Made in the following lengths: 6, 7, 8, 9, 10, 11 and 12 ft.

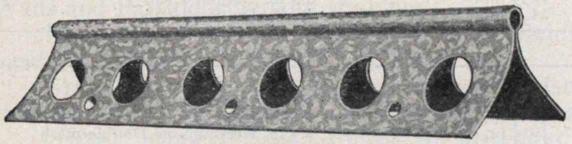
Always shipped crated. Bundled, 10 pieces per bundle, 10 bundles to crate. Crated weight, 230 lbs. per 1000 ft., approximate.

No. 500 "GF" Corner Bead—A short-wing corner bead adapted to all nail-on work. Nose well formed and wings are unusually rigid. Used largely for residential work over wood or metal lath where protection with economy is desired. With Clip No. 501 may be adapted to fireproof surfaces of brick or tile.

Lengths, 6, 7, 8, 9, 10 and 12 ft.

Packed 10 pieces to bundle, 10 bundles to crate. Crated weight, 175 lbs. per 1000 ft.

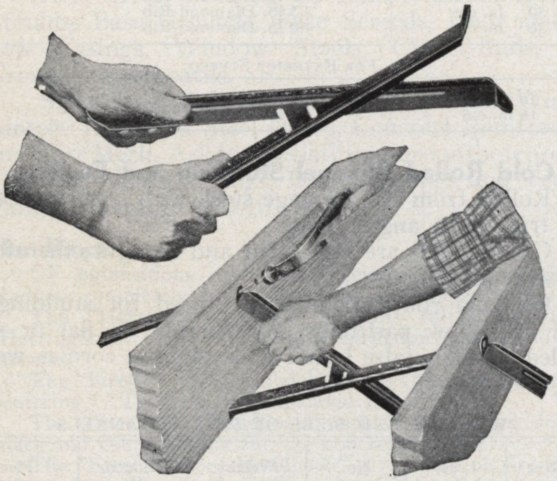
No. 505 "GF" Corner Bead—A wider winged bead than No. 500. Used for both nail-on and on fireproof surfaces. Under most circumstances can be used for the latter without clip. This bead is recommended where beads of highest quality are required.



No. 505 "GF" Corner Bead

Lengths, 6, 7, 8, 9, 10 and 12 ft.

Packed 10 pieces to bundle, 10 bundles to crate. Crated weight, 200 lbs. per 1000 ft.



"GF" Duplex Steel Bridging

"GF" Duplex Steel Bridging (for Wood Joists)

Shipped flat in bundles of 25. Made of heavy gauge galvanized steel, flanged and ribbed to give extra stiffness. A complete cross bridging in one piece.

Made in six sizes for 8, 10 and 12-in. joists and for 12 and 16-in. joist spacings.

SIZES AND WEIGHTS, STEEL BRIDGING

Size No.	Size of joist, in.	Joist spacing, in. c-c	Average weight per 100, lb.
1	8	12	75
2	10	12	75
3	12	12	75
4	8	16	90
5	10	16	90
6	12	16	90

"Self-Sentering"

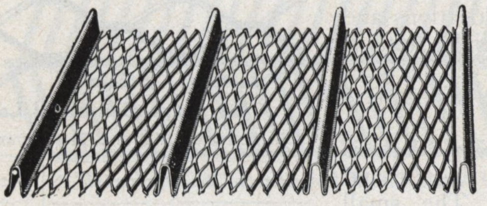
"Self-Sentering" is a combined reinforcement and centering used extensively for concrete floor and roof construction.

It is also used for solid and hollow walls, light partitions, etc., making possible a light weight, thin slab, built without expensive formwork, and equal to cast reinforced concrete in fire protection.

Roofs of any design and pitch can be built with "Self-Sentering" without solid forms.

"Self-Sentering" is an expanded metal sheet, stiffened by heavy ribs $\frac{11}{16}$ in. high, and spaced $3\frac{5}{8}$ in. apart. The ribs carry the weight of the concrete until set; the diamond mesh forms a perfect bond for the concrete.

Sheets are 29 in. wide and are furnished in lengths from 4 to 12 ft., in variation of 1 ft. Long sheets permit rapid erection and minimum laps. The side ribs nest snugly.



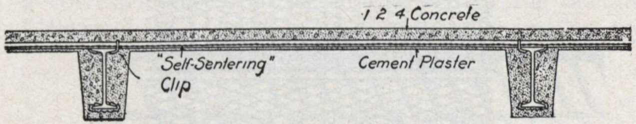
"Self-Sentering"
Patented March 3, 1914

Weights and Sectional Areas Per Square Foot

Weight, painted, lb.	Weight, galvanized, lb.	Effective sectional area per foot width, sq. in.
.56	.73	.173
.65	.83	.208
.75	....	.223

"Self-Sentering" Floor Designs

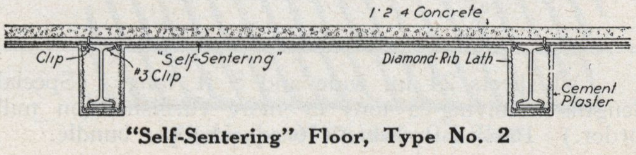
"Self-Sentering" Floor, Type No. 1—"Self-Sentering" is attached direct to steel beams by clips; concrete is applied to the desired thickness and the underside plastered with cement mortar. Sides of beam boxes are wired together, to save bracing across the span. To permit pouring the beam covering at the same time, punch out the mesh between the "Self-Sentering" ribs where they come over the beam.



"Self-Sentering" Floor, Type No. 1

"Self-Sentering" Floor, Type No. 2—This type is the same as No. 1, except that beams are fireproofed with metal lath and plastered.

This can be done at the same time the underside of the slab is plastered.



"Self-Sentering" Floor, Type No. 2

Continued on next page

SAFE LIVE LOADS PER SQUARE FOOT FOR "SELF-SENTERING" SLABS

(Weight of slab and plaster on underside deducted)

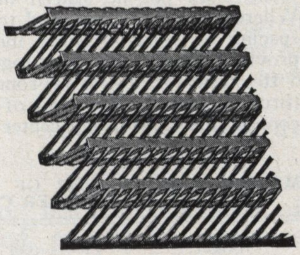
Thickness of slabs above mesh, in.	Wt. S. S. per sq. ft., lb.	Max. stress in concrete, lb. per sq. in.	Moment of resistance per ft. of width	Span in feet								
				3	4	5	6	7	8	9	10	11
2	.56	700	4557	392	207	122	75	48	29			
	.65	700	4774	412	219	129	80	51	32			
	.75	700	4984	431	229	136	85	55	35			
2½	.56	630	6144	532	283	168	106	68	44	27		
	.65	690	7052		332	199	127	84	56	37		
	.75	700	7525		356	215	138	92	62	41		
3	.56	560	7551		352	210	133	86	56	36		
	.65	610	8657		408	247	158	106	71	46	30	
	.75	670	9939		475	289	188	127	87	60	41	
3½	.56	510	8964		419	251	160	104	69	44	27	
	.65	555	10290		487	295	190	127	86	58	38	
	.75	605	11797			346	226	153	106	73	50	33
4	.56	470	10377		486	292	186	123	81	53	32	
	.65	515	11926			343	222	149	101	69	45	28
	.75	555	13672			402	264	178	124	87	60	40

B.M.=1/10WL² For B.M.=1/12WL² add 20% to above loads.
For B.M.= 1/8WL² deduct 20% from above loads.

"Trussit"

"Trussit" is an expanded steel reinforcement specially designed for solid plastered fireproof walls and partitions; also, for hollow walls, curtain walls, elevator enclosures, small individual structures, or office partitions in large buildings where fireproof, soundproof partitions are required.

"Trussit" eliminates the usual studding, a few temporary braces being required only till the first plaster coat has set.


"Trussit"
(Patented)

WEIGHTS PER SQUARE FOOT

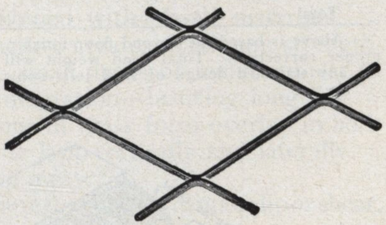
Painted, lb.	Galvanized. lb.
.57	.68
.62	....
.83	.88

Sheets are attached to floor and ceiling with expanded metal angles or by other methods that insure a firm support.

"Trussit" is uniformly expanded in both directions. This makes it possible to plaster both sides exactly alike and, when the wall is finished, steel and concrete are so uniformly distributed that cracking from expansion or contraction is prevented.

Expanded Metal Reinforcement

Expanded metal, made by expanding sheets of steel into a diamond shape mesh, has greater reinforcing strength, pound for pound, than any other material. It is cut and expanded to the sizes required for particular classes or sizes of work.


Expanded Metal

WEIGHTS AND STANDARD SIZES OF EXPANDED METAL SHEETS

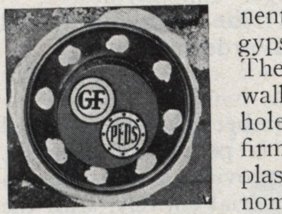
Style	Approx. weight sq. ft., lb.	Standard size sheets	
		Lengths, long way of diamond	Widths, short way of diamond
3-059	.20	6′, 8′, 10′-8″	4′, 8′
3-08	.27	6′, 8′, 10′-8″	3′, 4′, 6′
3-10	.34	6′, 8′, 9′, 10′-8″	4′, 8′
3-125	.42	6′, 8′, 9′, 10′-8″	4′-2″, 6′-3″
3-15	.51	6′, 8′, 9′, 10′-8″	3′-6″ 4′-7″
3-176	.60	6′, 8′, 9′, 10′-8″	3′, 4′, 6″
3-20	.68	6′, 8′, 9′, 10′-8″	3′, 6′, 7′
3-25	.85	6′, 8′, 9′, 10′-8″	4′-3″, 5′-8″
3-30	1.02	6′, 8′, 9′, 10′-8″	3′, 6′, 7′
3-35	1.19	6′, 8′, 9′, 10′-8″	3′, 4′, 6′

The larger meshes are used for reinforcing concrete in the construction of floors, roofs, sidewalks over basements, bridge decks, retaining walls, sewers, conduits, tanks, reservoirs, etc.

Smaller meshes are used in lighter cement work and for railings, window guards, elevator and tool room enclosures.

"Peds"

"Peds" are patented spot grounds for attaching wood or metal trim to walls, and screeds to concrete floors. They avoid the dangerous practice of embedding wood strips in masonry.



GF "Ped"

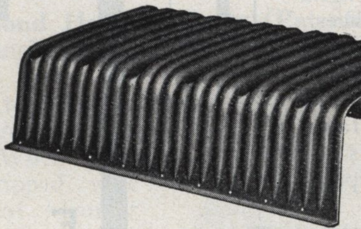
Wall "Peds" adhere permanently to metal lath, brick, concrete, gypsum block or hollow tile surfaces. They are set with ordinary gypsum wall plaster, which keys through the holes in the metal rim, and are firmly held in place by the finished plaster. "Peds" are easily and economically applied and give a better nailing base for wall trim at a much lower grounding cost.

Floor "Peds" are set in cement mortar beds in rows 16 in. on centers and 18 to 24 in. apart. Screeds are then nailed to the "Peds," providing a firm base for the floor.

"Peds" will not shrink, come loose, or split when nails are driven in.

Steel-Tile and End-Tile

GF Steel-Tile are light weight steel forms for joisted concrete floor slabs, designed on the well-known T-beam principle—deep reinforced joists and thin connecting slabs of concrete.


GF Steel-Tile

Steel-Tile secure the substantial reduction in dead weight. Useless concrete is eliminated, reducing the dead load on girders, columns, foundations and footings, and permitting a lighter construction throughout, without sacrificing strength.

GF Steel-Tile make the old, expensive solid form work unnecessary. Centering along the line of joists, which are 25 in. apart, is sufficient. Flanges are flat and fit snugly against forms, preventing any leakage of concrete.

PROPERTIES OF STEEL-TILE FLOORS

Width of joists, in.	Center to center of joists, in.	2 in. of Concrete Above					
		Size Steel-Tile.....	6 in.	8 in.	10 in.	12 in.	14 in.
4	24	Average weight per sq. ft., lb....	40.1	46.0	53.5	61.0	72.6
		Cu. ft. of concrete per sq. ft. of floor	.278	.319	.371	.423	.505
		Core area, per cent of section.......	58.3	61.7	63.0	63.8	62.2
5	25	Average weight per sq. ft., lb....	42.3	49.4	57.1	65.3	78.4
		Cu. ft. of concrete per sq. ft. of floor	.293	.342	.396	.452	.537
		Core area, per cent of section......	55.9	59.2	60.3	61.2	59.7

Send for GF Steel-Tile Handbook.

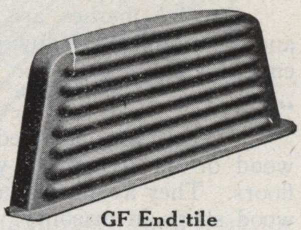
Steel-Tile are adapted to schools, hotels, office buildings, department stores, apartments, warehouses, lofts, etc. Wherever long spans are required GF Steel-Tile construction will be found most economical.

Flat ceilings are easily constructed under Steel-Tile

Continued on next page

floors. Suspended ceilings are supported from hangers which are placed in joists before pouring concrete.

GF Steel-Tile with End-Tile to match are made of corrugated steel in sizes of 4, 6, 8, 10, 12 and 14 in., also 6, 8, 10, 12 and 14 in. in single and double tapered tile and tapered ends. Steel-Tile are furnished in 35-in. length. Width at bottom, 20 in., exclusive of flange. Shipped nested.


GF End-tile

Standard tile furnished in No. 26 gage. 16 and 22 gage tile furnished on special orders.

GF Steel Lumber

Description—GF Steel Lumber gives economical light weight construction that is permanent, durable, fireproof and soundproof. It provides a construction which eliminates combustible material entirely, with the minimum dead weight on beams and columns, and is a safe, dependable type of construction for erection in all seasons.

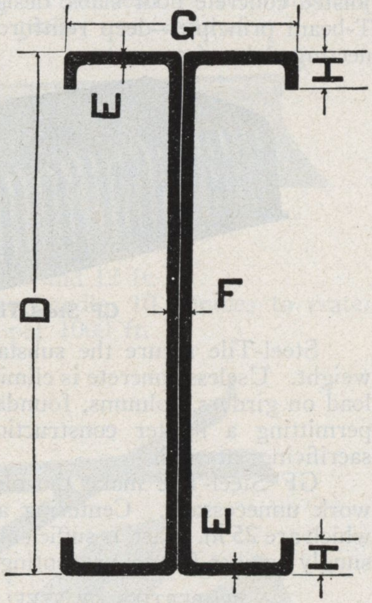
Steel Lumber is cut and fabricated ready for use when it arrives on the job and is handled and placed simliar to wood joists or studs.

GF Steel Lumber joist sections are made of two absolutely uniform strips, of special steel, formed cold into channel sections and spot-welded together, a process insuring absolute uniformity of size and strength of the finished member. All lengths continuous, no splices.

All GF Steel Lumber is given one coat of oil before fabrication, and after fabrication all sections are painted before shipping to destination.

GF Steel Lumber floor construction consists of pressed steel joists parallel to each other on supporting beams or walls, and secured in position by 1-in. strips of No. 20 gage steel or No. 14 gage galvanized iron cross bracing, approximately 6 ft. on centers.

GF Steel Lumber is furnished in 4, 5, 6, 7, 8, 9, 10, 11 and 12-in. floor joist and 4-in. channels and I's for studding.



Section GF Steel Joists

SIZES, AREAS AND DIMENSIONS OF GF STEEL JOISTS

Depth, in.	Weight, lb. per ft.	Area of section, sq. in.	Thickness of metal, in.		Width of flanges, in.		Moment of inertia I	Section modulus S	Depth, in.
			E	F	G	H			
4	3.7	1.08	.072	.144	3	½	2.60	1.30	4
5	4.2	1.22	.072	.144	3	½	4.38	1.75	5
6	4.7	1.38	.072	.144	3	½	6.90	2.30	6
7	5.5	1.62	.072	.144	3½	⅝	11.20	3.20	7
8	6.1	1.80	.072	.144	4	⅝	16.80	4.20	8
9	7.0	2.06	.075	.150	4	¾	23.85	5.30	9
10	8.0	2.35	.078	.156	4½	¾	33.25	6.65	10
11	9.5	2.80	.086	.172	4½	¾	46.20	8.40	11
12	10.5	3.10	.090	.180	4½	¾	60.00	10.00	12

For convenience in identification and specifying, sections are designated by their depth and weight, that is: 10 in.-8-lb. I.

Sections are furnished only on catalogue weights and to an allowable variation of 2½% from published weights.

Specifications—***Metal Lath***—Over joists a layer of Diamond Rib Herringbone Metal Lath is to be placed to support and reinforce the concrete slab, in which wooden floor screeds are embedded. (If cement finish or tile floor is desired, screeds to be omitted; in which case a richer mix of concrete shall be used for top slab.) Diamond Rib or Herringbone Lath on top of joist to be attached by driving large head 6d roofing nails through lath into joint between the sections of joist or by special clips.

For wood floor finish, screeds or nailing strips, approximately 1¾x1¾ in., to be set on top of metal lath and along the center line of the joist and attached to joist with 12d nails at frequent intervals. Floor filling to be placed between screeds, lightly tamped or pressed in place and neatly leveled off flush with their surface. Wood finish is then nailed directly to screeds.

Metal lath under joists to be Diamond Rib or Herringbone Rigid Metal Lath of sufficient weight to support ¾ to 1 in. of plaster ceiling and retain its true position when the ground coat is applied. (See table below.) All metal lath to be given a dip coat of good paint by the manufacturer.

Metal lath for floor and ceiling to be lapped at ends and interlocked at sides. All laps at ends of sheets to come at steel joists. Ceiling lath under joists to be attached by special clips.

Floor Filling—Floor lath to be covered with floor filling as specified, if a wood top floor is used.

If cement finished floor is desired, use 1-2-4 concrete for top slab with cement finish.

Spacing—In no case shall joists in floor construction, or any studs in bearing partition construction, be spaced more than 24 in. center to center. In roof construction, where metal lath and a concrete slab are used above the steel joists, joists shall not be spaced more than 30 in. center to center. Where steel joists are used to support cement tile on flat roofs, spacing of joists may be increased to meet tile requirements, provided joists are tied together at intervals not exceeding 6 ft. on centers by ½-in. round steel tie rods securely fastened through joists at each end of rods. Punching of holes for rod connections to be along center of web.

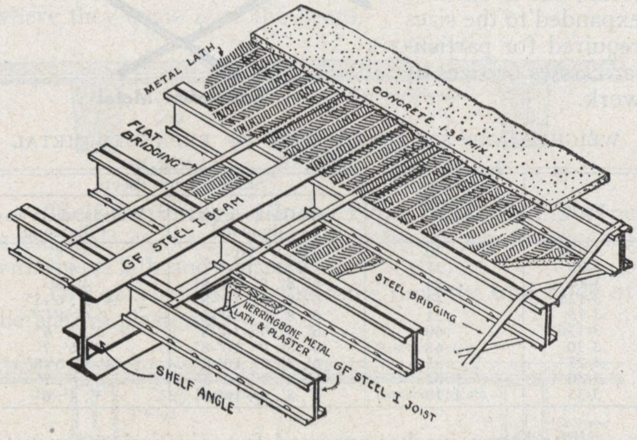
MAXIMUM SPANS FOR GF DIAMOND RIB LATH IN STEEL LUMBER CONSTRUCTION

Weight, per sq. yd., lb.	Floors over joist, in.	Ceilings under joist, in.	Partitions, in.
4.0	24	30	36
3.5	19½	24	30
3.0	....	19½	24

APPROXIMATE WEIGHT OF GF STEEL LUMBER FLOORS

	Weight per sq. ft., lb.
Wood flooring	3
1¾-in. concrete	21
GF steel joists (average)	3
Plaster ceiling	7
Total	34

Above is based on a wood floor finish. For other types of finish make proper correction. Total dead weight will not exceed 40 lb. per sq. ft. for any standard design of steel joist construction.



GF Steel Lumber and Metal Lath in Practical Application

THE GOLDSMITH METAL LATH CO.

Manufacturers of Metal Lath, Concrete Reinforcing Specialties

GENERAL OFFICE AND FACTORY
CINCINNATI, OHIO

Products

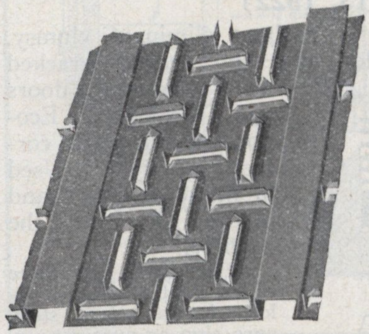
Shurebond Metal Lath; Four-Rib Shurebond; Phoenix Lath; Clincher Lath; Shurebond Hanger Inserts; Shurebond Furring Inserts and Spacers; Shurebond Cold Formed Channels; Shurebond Floor Clips; Etc.

For Shurebond Unit System of Metal Tile Construction, see page 55.

Services

Catalogue with complete details, specifications, instructions for placing and installing, and other information mailed on request.

Shurebond Metal Lath (Patented)



Shurebond Metal Lath

A patented metal reinforcement and self-supporting lath for fireproof, composite, or wood structures; particularly suitable for solid plaster partitions, suspended and furred ceilings, fireproofing of beams, columns, short span floor and roof construction, outside walls, etc.

Shurebond Metal Lath is furnished painted or black in multiples of ½ ft. lengths to 6 ft. and even-foot lengths to 12 ft. It is made in widths of 2 ft. covering surface—allowance for laps unnecessary. Furnished in three weights, namely: .80 lb. per sq. ft., .95 lb. per sq. ft., 1.25 lbs. per sq. ft. Shurebond Metal Lath can be arched to any radius down to cylinders 6 in. in diameter. Shurebond Metal Lath .80 lb. per sq. ft. can be used for suspended ceilings on 4-ft. spans without additional cross furring.

Advantages of Shurebond Metal Lath

Dovetail ribs 4 in. on centers give maximum bond and stiffness when combined with plastic materials.

Process of manufacture creates maximum strength.

No sharp edges or small areas of metal subject to corrosive attack or disintegration—insuring long life.

Webs or perforations in truss form overlap in both directions and stiffen the lath vertically and laterally.

No metal is sheared away.

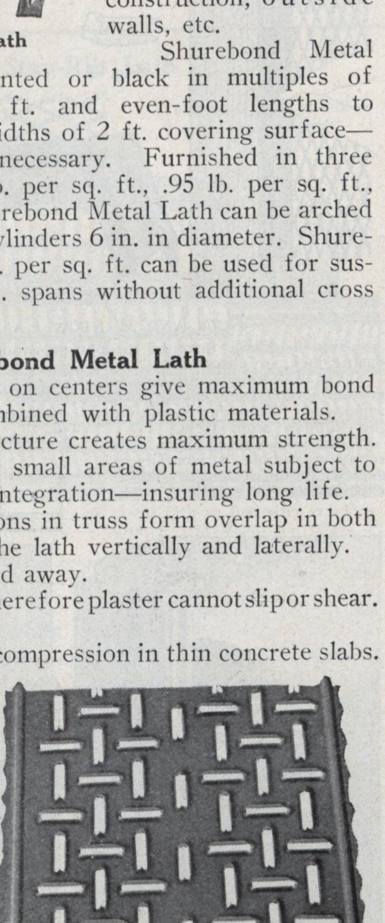
No straight lines, therefore plaster cannot slip or shear.

No cracks at laps.

Ribs do not act in compression in thin concrete slabs.

No sharp edges to cut mortar.

Plastered as easily as wood.



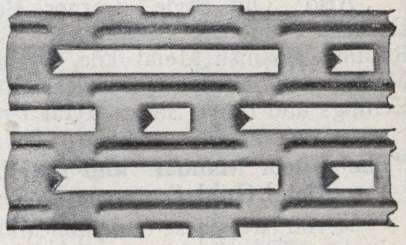
Phoenix Metal Lath

Four-Rib Shurebond Metal Lath

The same as Shurebond, except ribs are channel shaped and 8 in. on centers. Made in weights of 5 lb. or 6.3 lb. per sq. yd.; sheets 8 ft. long by 2 ft. wide covering surface, painted. Used mainly for suspended ceilings, spans approximately 2 ft. 8 in., and in the manufacture of lath bottom units for the Shurebond Unit System of Metal Tile (page 55).

Phoenix Metal Lath (Self-furring)

For nailing on wood studs or joists, spans approximately 2 ft.; also for attached ceilings with removable forms. Painted sheets 8 ft. long, 24½ in. wide, weighing 4.85 lb. per sq. yd.; 9 sheets (16.34 yd.) per bundle; ribs 8 in. on centers. Long life assured. Plastered as easily as wood lath. No bagging or sagging.



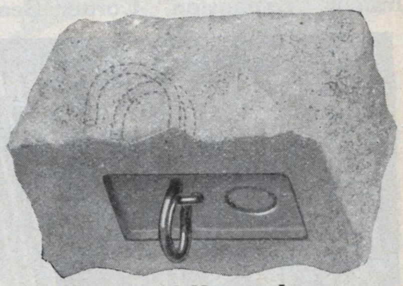
Clincher Metal Lath

Clincher Metal Lath

For nailing on wood studs or joists, and for stucco work and in connection with light iron furring. Painted sheets 8 ft. long, 13½ in. wide (1 sq. yd.); 10 sheets to the bundle.

Shurebond Hanger Inserts (Patented)

Simplest and most economical device for suspending ceilings from concrete slabs, suspending pipes, etc. Nailed to forms—no holes to drill. Wires form permanent bond with concrete. When forms are stripped, wire loop of hanger insert is easily wedged down. Inconspicuous in slabs, and when placed for future contingencies, a big time and money saver.



Shurebond Hanger Insert

Shurebond Furring Inserts (Patented)

Simplest and most economical device to provide for furred ceilings under concrete slabs; also for attachment of metal lath to concrete, for furring walls or columns. Nailed on forms—no boring of holes or hooking over reinforcing steel.

Shurebond Spacers

Used with furring inserts to establish the exact distance from concrete surfaces to furring members where space is desired between concrete and plastered surfaces. Spacers furnished for 1, 2, 3, 4, or 5 in.

Shurebond Cold Formed Channels

Stock sizes furnished of No. 16 gauge in ¾, 1, 1½ and 2 in., in 20-ft. lengths, 20 pieces to the bundle. Other sizes, lengths, or gauges made on special order.

Shurebond Floor Clips (Patent Applied for)

An improved method of attaching wood floors to concrete, assuring positive anchorage and alignment.

MILWAUKEE CORRUGATING CO.

Metal Building Specialties

MILWAUKEE, WIS.

BRANCH FACTORIES and WAREHOUSES: CHICAGO, ILL.; KANSAS CITY, MO., and LA CROSSE, WIS.

Products

MILCOR
TRADE-MARK
(Registered)

"EXPANSION" CORNER BEADS, CASINGS, BASE SCREED and FLASHING.

NETMESH DIAMOND EXPANDED METAL LATH.

STAY-RIB METAL LATH NO. 1.

3/8-INCH STAY-RIB NO. 2.

STEEL DOMES for reinforced concrete floors.

COLD ROLLED STEEL CHANNELS.

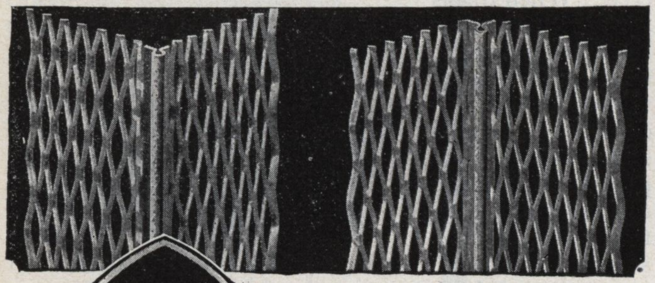
Also "Old Style" Corner Beads, Base Screeds, Concealed Picture Moulding, "Titelock" Art Metal Roofing, Spanish Metal Tile, Architectural Ornaments, Marquises, Ventilators, Cornices, "Invisible Joint" Metal Ceilings and other Sheet Metal Products.

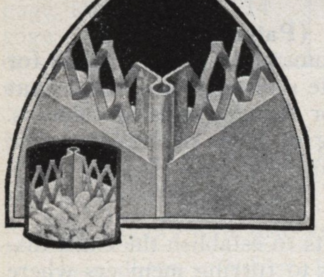
"The Milcor Manual" and the "Architectural Sheet Metal Guide"

If you have these two publications in your files, consult them for complete details. If they are not in your files we shall be glad to furnish them promptly. The "Manual" embodies data on fireproof construction, metal lath and allied products, steel domes, etc., with complete Standard Architects' Specifications. The "Guide" embodies data on art metal roofing, ventilators, skylights, ceilings, marquises and architectural ornaments.

Write for copies. Samples of products also gladly furnished.

Milcor "Expansion" Corner Beads





No. 1—For outer, exposed angles. Furnished in tight-coat galvanized steel for interior plastered walls or in pure zinc or pure copper for exterior stucco.

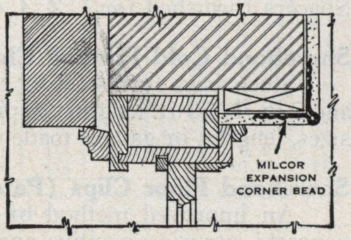
Lengths of 6, 7, 8, 9, 10, 11 and 12 ft.

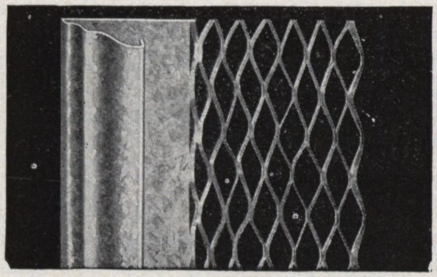
No. 2—For inner corners, ceiling junctures, etc.

Lengths of 6, 7, 8, 9, 10, 11 and 12 ft.

The above shows front and back of expansion bead after plastering. Mortar oozes through the expanded metal wings, embeds entire bead and gives unequalled reinforcement to the corner.

Architectural detail shown at the right.





Milcor "Expansion" Door and Window Casings (Patented June 13, 1922)

These modern metal casings eliminate clumsy, costly, unsanitary wooden trim and prevent cracked walls around doors and windows. Economical but most correct in style. Used in finest buildings and homes all over the country.

Furnished in three styles, profiles shown below; in galvanized steel, pure zinc or pure copper, in lengths of 6, 7½, 8, 9, 10 and 12 ft.

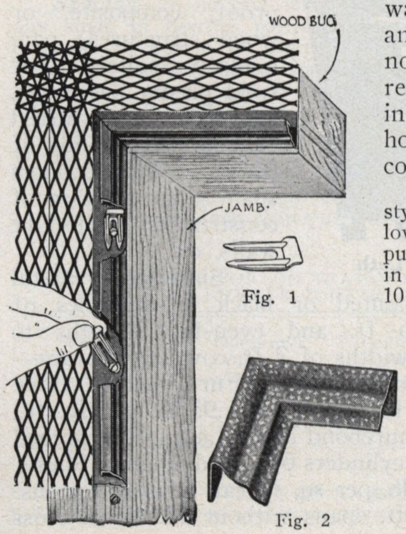


Fig. 1

Fig. 2

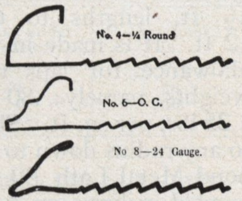


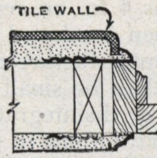
Fig. 3

DOOR AND WINDOW CASING DETAILS

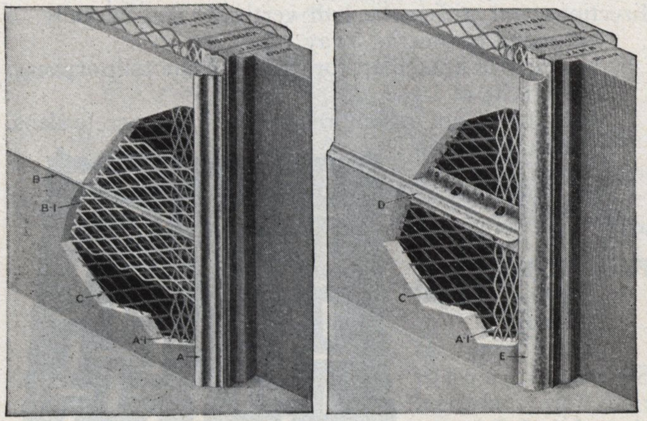
Fig. 1—Easily fastened to door or window jamb with Milcor patented casing lock, or clip.

Fig. 2—One-piece miters for corner joints keep casing from separating. They slip inside casing—hidden from view.

Fig. 3—These three conservative, simple, universally accepted designs are available—each artistically excellent



SECTION THRU JAMB SHOWING MILCOR METAL CASINGS



"A": exposed solid part of casing; "A-1": expanded wing of same; "B": base screed bead; "B-1": expanded wings of same; "C": Netmesh lath; "D": curved point base screed

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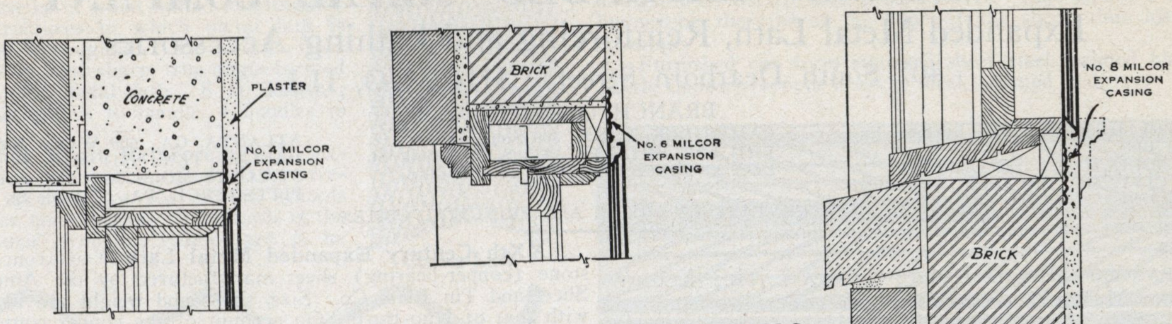
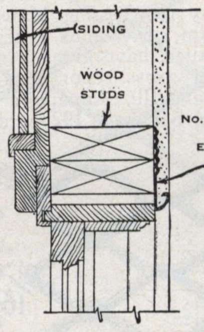
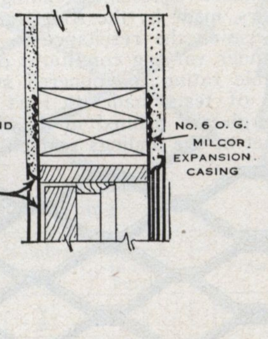

CONCRETE
PLASTER
No. 4 MILCOR EXPANSION CASING
BRICK
No. 6 MILCOR EXPANSION CASING
No. 8 MILCOR EXPANSION CASING
BRICK

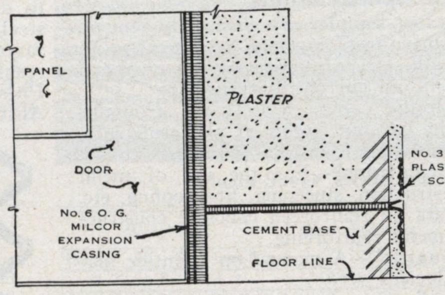
DETAIL OF MILCOR EXPANSION CASINGS USED ON MASONRY WALLS


SIDING
WOOD STUDS
No. 4-¼ ROUND MILCOR EXPANSION CASING

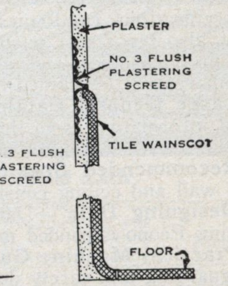
DETAIL OF MILCOR No. 4-¼ ROUND EXPANSION CASING USED IN FRAME WALL


No. 6 O. G. MILCOR EXPANSION CASING

INTERIOR DOOR-HEAD SHOWING APPLICATION OF MILCOR METAL CASINGS

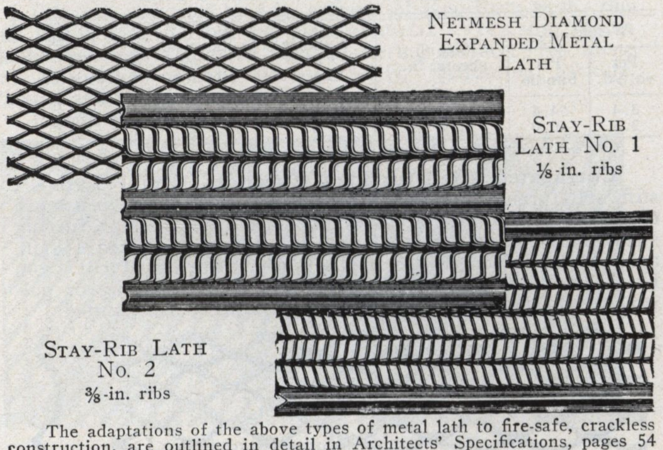

PANEL
PLASTER
DOOR
No. 6 O. G. MILCOR EXPANSION CASING
No. 3 FLUSH PLASTERING SCREED
CEMENT BASE
FLOOR LINE

ELEVATION AND SECTION SHOWING EXPANSION No. 3 FLUSH PLASTERING SCREED BUTTING INTO No 6 O.G. EXPANSION CASING


PLASTER
No. 3 FLUSH PLASTERING SCREED
TILE WAINSCOT
FLOOR

SECTION SHOWING No. 3 MILCOR SCREED SEPARATING TILE WAINSCOT FROM PLASTER

Milcor Netmesh and Stay-Rib Lath

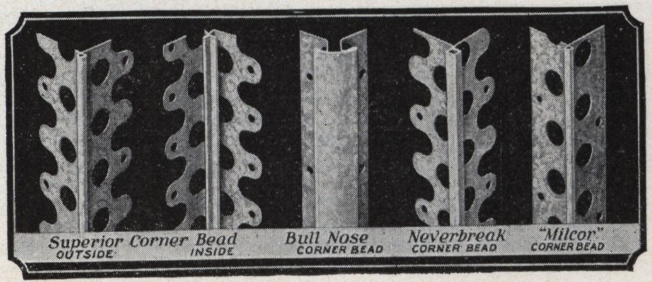

NETMESH DIAMOND EXPANDED METAL LATH
STAY-RIB LATH No. 1
⅛-in. ribs
STAY-RIB LATH No. 2
⅜-in. ribs

The adaptations of the above types of metal lath to fire-safe, crackless construction, are outlined in detail in Architects' Specifications, pages 54 to 63 of "The Milcor Manual."

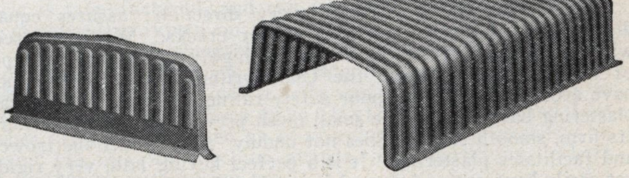
Note—Wherever specifications refer to strips or "Cornerite" for corners, change so as to specify Milcor "Expansion" Corner Bead No. 1 or No. 2.

Milcor Solid Wing Corner Beads

Under the circumstances which permit the use of old-style corner beads, the Milcor line of Solid Wing Beads is the most practical available. Complete data in "The Milcor Manual." Samples on request.


Superior Corner Bead
OUTSIDE
INSIDE
Bull Nose
CORNER BEAD
Neverbreak
CORNER BEAD
"Milcor"
CORNER BEAD

Milcor Steel Domes



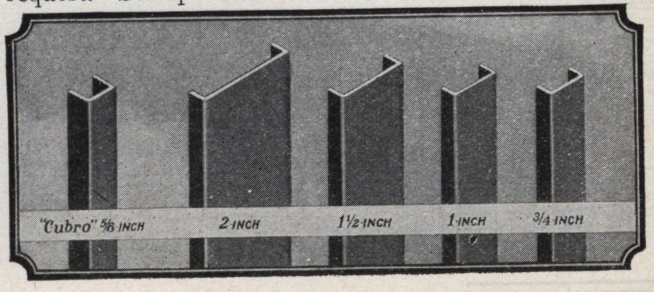
For long-span floors in buildings classed for "light occupancy" the reinforced concrete-joist type of floor construction, made possible through use of Milcor Steel Domes, is thoroughly practical and permits important savings. Sixteen pages of valuable engineering data on this subject in "The Milcor Manual."

Convenient Joist-Scale Free

Write for this joist-scale. It tells at a glance the number of joists and domes for various spans. Free—no obligation.

Milcor Cold Rolled Steel Channels

As supporting members for Milcor metal lath in solid partition work, Milcor Cold Rolled Channels answer every requirement most efficiently. The new "Cubro" Channel is particularly well adapted to this work. Lengths of 16, 18, 20 or 22 feet. Samples and details on request. See specifications in "The Milcor Manual."


"Cubro" ⅝ INCH
2-INCH
1½-INCH
1-INCH
¾-INCH

NORTHWESTERN EXPANDED METAL COMPANY

Expanded Metal Lath, Reinforcing and Lathing Accessories

407 South Dearborn Street, CHICAGO, ILL.

BRANCH OFFICES

MINNEAPOLIS, MINN., 211 Lumber Exchange Bldg.
INDIANAPOLIS, IND., 2187 Olney St.
KANSAS CITY, MO., 409 Orear-Leslie Bldg.
CAMBRIDGE, MASS., 300 Sidney St.
PHILADELPHIA, PA., 112 S. Twentieth St.
LOS ANGELES, CAL., 709 Central Bldg.
ATLANTA, GA., 609 Walton Bldg.
DALLAS, TEX., 1311 Kirby Bldg.
ST. LOUIS, MO., 420-421 Fullerton Bldg.
PITTSBURGH, PA., 33 Pride St.

REPRESENTATIVES ARE IN ALL PRINCIPAL CITIES

Products

Expanded Metal Lath; Corna-Lath; Econo Expanded Metal Reinforcing for concrete.

Also Nemco Corner Bead, Cold Formed Channels and other Metal Lath Accessories: Base Screeds, Base Grounds, Picture Mould, etc.

Literature, Samples and Specifications

Specifications, catalogues or samples are cheerfully sent on request, also reports of scientific tests covering acoustical properties, fire resistance, strength, etc., of various types of metal lath construction. Included in our current literature are:

"Large General Catalogue"—Size, 8½x11 in. Contains detailed information as to the different styles of plastering lath, and stock sizes and weights in which each type is furnished.

"Recommended Specifications"—For the use of metal lath in wall and ceiling construction, stuccoing, fireproofing, etc.

"Designing Data"—Data on reinforced concrete construction using Econo expanded metal reinforcing.

"Practical Machine Guards"—A manual on scientific machine guarding and safety devices.

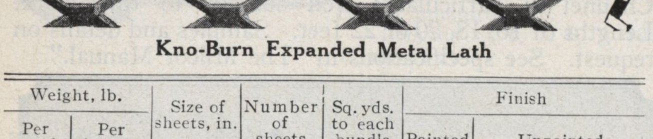
"Underwriters' Report"—Contains the findings and recommendations of Underwriters' Laboratories, Inc. in fire-resistive construction.

Expanded Metal Lath

Kno-Burn—A flat, ⅜-in. diamond meshed steel base and reinforcing for all types of plastering work, fireproofing, fire stopping, etc.

Reinforces the plaster in every direction; assures equal distribution of stress; prevents plaster cracks. When covered with gypsum plaster, it constitutes a highly fire retardant type of construction to which the Underwriters' Laboratories, Inc. have accorded a full one-hour safety rating. A most economical plastering base because the small mesh prevents waste of plaster. Its firm, smooth surface does not unduly "give" under the trowel and facilitates plastering. It is a perfect keying lath, very rigid, yet easily bent, cut and shaped for use in elaborate or ornamental plastering.

Furnished cut from U. S. standard open hearth steel sheets, XXth Century (copper-bearing) steel, pure iron or galvanized sheet. All except galvanized lath are painted.



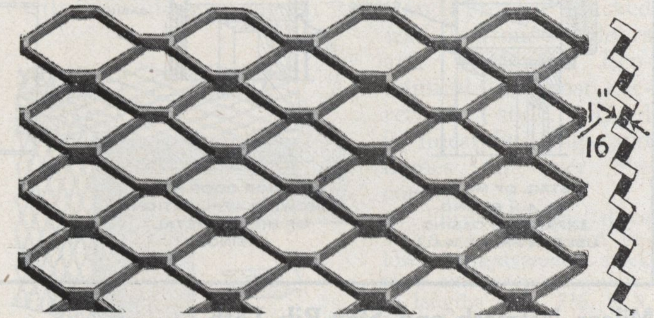
Kno-Burn Expanded Metal Lath

Weight, lb.		Size of sheets, in.	Number of sheets	Sq. yds. to each bundle	Finish	
Per sq. yd.	Per bundle				Painted	Unpainted
3.4	54.4	24 x 96	9	16	A, B, C	Stand. steel galv. sht.
3.0	48.0	24 x 96	9	16	A, D, E	
2.5	40.0	24 x 96	9	16	A, B, C	Stand. steel galv. sht.
2.2	35.2	24 x 96	9	16	A, E	

A, Standard steel, painted black.
B, XXth Century copper-bearing steel, painted red.
C, Pure iron, painted red.
D, Pure iron, on special order only.
E, XXth Century, on special order only.

XXth Century Expanded Metal Lath—Cut from Keystone (copper-bearing) sheet manufactured by the American Sheet and Tin Plate Co. Size, shape and weight are identical with that of Kno-Burn. On account of the copper content, it is recommended for all conditions of unusual severity, such as work exposed to dampness or near the ocean; with patent plaster, and for ratproofing.

Exhaustive tests, extending over a period of more than six years, made by the American Society for Testing Materials to determine the resistance to corrosion of various types of steel under varying conditions of exposure, have given a most favorable rating to coppered steel. Progress reports on the results of tests made at Fort Sheridan, Ill., Annapolis and Pittsburgh are printed in detail in the Society's 1923 annual. Abstract of the findings sent on request.

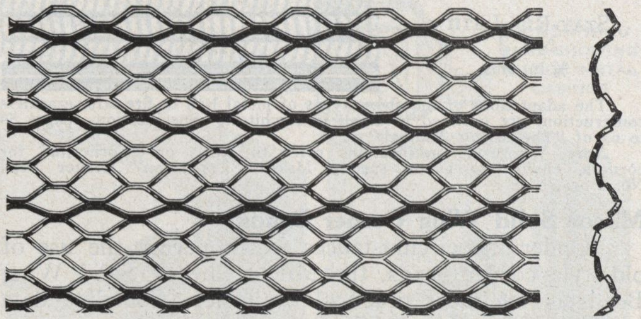


XXth Century Expanded Metal Lath

Weight, lb.		Size of sheets, in.	Number of sheets	Sq. yds. to each bundle	Finish
Per sq. yd.	Per bundle				Painted
3.4	54.4	24 x 96	9	16	Red
2.5	40.0	24 x 96	9	16	Red

Can be furnished in 3.0 and 2.2-lb. weights, but only on special order.

Corrugated (Self-furring) Expanded Metal Lath—A stiff, self-furring lath for stucco, overcoating, etc. Open mesh corrugations ¼ in. deep, give added rigidity, serve as furring strips and eliminate cost of separate furring. Placed 1½ in. apart and run lengthwise of the sheet. Furnished cut from U. S. standard steel sheets, pure iron, copper-bearing or galvanized sheets. All types, except galvanized, are painted.



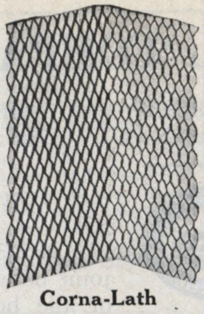
Corrugated Expanded Metal Lath

Weight, lb.		Size of sheets, in.	Number of sheets	Sq. yds. to each bundle	Finish	
Per sq. yd.	Per bundle				Painted	Unpainted
3.4	54.4	24 x 96	9	16	A, B, C	Stand.steelgalv.sht.
3.0	48.0	24 x 96	9	16	A, D, E	
2.5	40.0	24 x 96	9	16	A, B, C	Stand.steelgalv.sht.
2.2	35.2	24 x 96	9	16	A, E	

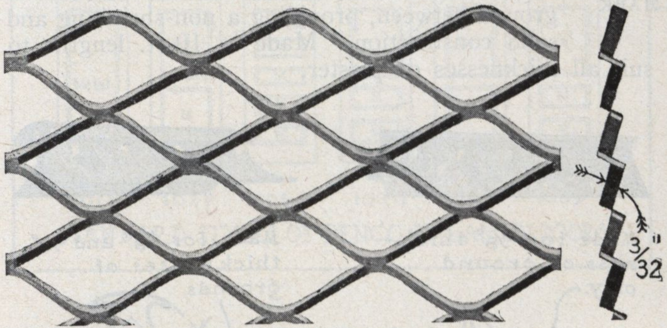
A, Standard steel, painted black.
B, XXth Century copper-bearing steel, painted red.
C, Pure iron, painted red.
D, Pure iron, on special order only.
E, XXth Century, on special order only.

Continued on next page

Corna-Lath—Designed to prevent corner cracks in wood lathed buildings or other structures in which metal lath is not used throughout. *Corna-lath* is a 4 in. x 4 in. L or sharp, true angle formed of expanded metal lath. 8 ft. lengths; packed 25 pieces to bundle, 4 bundles to crate.


Corna-Lath

Burial Vault Reinforcing—An extra heavy, larger meshed lath, frequently specified for post offices, schools and other construction. The mesh is the "Kno Burn" type but strands are 3/32 in. wide.



Burial Vault Reinforcing

Weight, lb.		Size of sheets, in.	Number of sheets	Sq. yds. to each bundle	Finish
Per sq. yd.	Per bundle				
3.4	54.4	24x96	9	16	Unpainted
2.5	40.0	24x96	9	16	Unpainted

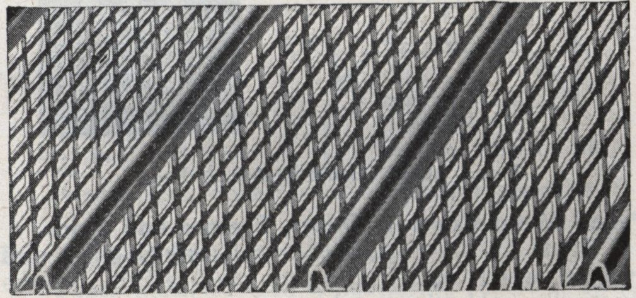
Long dimension of the mesh runs lengthwise of the sheets.

Longspan Expanded Metal Lath—An economical ⅜-in. U-rib lath. Permits wide spacing of supports; saves channels and wiring.

For ceilings, walls, partitions, etc., or where supports are more than 16 in. on centers. Largely used for ceilings under the joist type of reinforced concrete floor construction.

Ribs are connected by 4-in. sections of Kno-Burn mesh; ribs and lath expanded from one piece of metal. Very stiff, splices easily; provides a smooth, rigid plastering surface. No waste for side laps. U-ribs nest perfectly, facilitating packing. Painted and shipped uncrated.

Packed 9 sheets (16 sq. yd.) to the bundle.


Longspan Expanded Metal Lath

Weight, lb.		Spacing c. to c. of ribs, in.	No. of ribs per sheet	Size of sheets, in.	Cross sectional area per ft. of width, sq. in.
Per sq. yd.	Per bundle				
*4.0	64.0	4	7	24x96	0.130
3.5	56.0	4	7	24x96	0.114
3.0	48.0	4	7	24x96	0.098

All weights can be supplied cut from copper-bearing sheet on special order.

*Can be supplied cut from pure iron on special order.

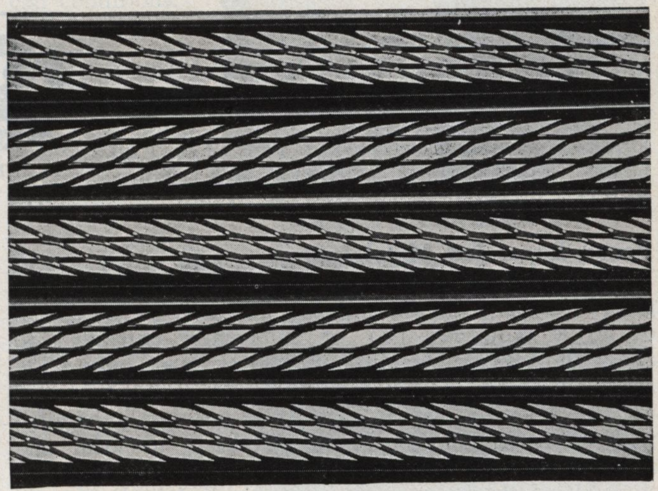
Plasta-Saver Expanded Metal Lath—A new and very economical ⅛ in. flat ribbed lath designed especially to provide a fire resisting plastering base for the class of work in which wood lath or wall boards would ordinarily be used. Ribs are ½ in. wide, 1.2 in. on centers, and connected by a mesh of the Kno-Burn type. Mesh and ribs formed from the same sheet. Along the center of each rib is a bead ⅛ in. high.

The combination of mesh, rib and bead provides a perfect bonding lath of unusual stiffness.

The ⅛ in. beads are high enough to provide stiffness, yet do not require additional mortar to cover them.

When secured to wooden supports, the simplest method is to drive a 3d nail through the ribs. The groove formed by the bead provides a guide for the nail, or the nail can be driven alongside of the rib and clinched over. Side laps are formed by nesting the ribs at the edge of the sheet, thus losing no coverage.

Furnished cut from standard sheet steel, painted black, or XXth Century copper-bearing steel, painted red.


Plasta-Saver Expanded Metal Lath

Weight, lb.		Size of sheets, in.	Number of sheets	Sq. yds. to each bundle	Finish
Per sq. yd.	Per bundle				
3.4	54.4	24 x 96	9	16	Painted

Econo Expanded Metal Reinforcing

A cold drawn, fabricated or meshed reinforcing for any type of concrete slab construction of moderate span and load. A labor and time saving material.

Permits large areas of reinforcing to be quickly placed by unskilled workmen without possibility of error, since the correct amount of steel to be used is determined at the time the fabric is manufactured, and can not be altered by careless or inexperienced workmen on the job.

The large, stiff sheets lie flat without stretching, flattening, or other work preliminary to placing in forms; the solid network distributing stress over a wide area. Meshes, ½x1½ in. to 3x8 in., and for special uses up to 5¼x12 in. The 2¼ and 3-in. meshes are generally used as reinforcing; smaller meshes (½, ¾ and 1½ in.) for machine guards, open partitions, lockers and various manufacturing uses.

Each style has a definite steel cross-sectional area which is used as part of the number designating the style, thus 15-3 Econo has 0.15 sq. in. of cross-sectional area of steel for every 12 in. in the width of the sheet measured across the short diagonal of the diamond.

ECONO EXPANDED METAL

Style	Size of mesh, in.	U. S. Std. Gauge, No.	Approx. size of strands, in.	Sect. area per ft. of width, sq. in.	Weight per sq. ft., lb.	Width, short way of mesh, ft.–in.	Length, long way of mesh, ft.
			REINFORCING MESHES				
06–3	3	16	1/16x7/64	.06	0.20	6—0	8 and 12
08–3	3	16	1/16x9/64	.08	0.27	6—0	8 and 12
10–3	3	13	3/32x⅛	.10	0.34	4—0	8 and 12
125–3	3	13	3/32x5/32	.125	0.42	5—6	8 and 12
15–3	3	10	9/64x⅛	.15	0.51	7—0	8, 10, and 12
176–3	3	10	9/64x9/64	.176	0.60	6—0	8, 10, and 12
20–3	3	10	9/64x11/64	.20	0.68	5—6	8, 10, and 12
25–3	3	10	9/64x13/64	.25	0.85	4—3	8, 10, and 12
30–3	3	10	9/64x¼	.30	1.02	7—0	8, 10, and 12
35–3	3	10	9/64x19/64	.35	1.19	6—0	8, 10, and 12
40–3	3	7	3/16x¼	.40	1.36	7—0	8, 10, and 12
45–3	3	7	3/16x9/32	.45	1.53	6—3	8, 10, and 12
50–3	3	7	3/16x5/16	.50	1.70	5—9	8, 10, and 12
54–3	3	7	3/16x21/64	.54	1.83	5—6	8, 10, and 12
60–3	3	7	3/16x⅜	.60	2.04	4—9	8, 10, and 12
65–3	3	7	3/16x13/32	.65	2.19	4—3	8, 10, and 12
10–2¼	2¼	16	1/16x9/64	.10	0.34	5—0	8 and 12
15–2¼	2¼	13	3/32x11/64	.15	0.51	4—9	8 and 12
			SPECIAL MESHES				
06–1½	1½	18	3/64x1/16	.06	.20	2—9	8 only
18–1½	1½	13	3/32x7/64	.18	.60	4	8 and 12
375–1½	1½	9	5/32x9/64	.375	1.28	6	8 only
15–¾	¾	16	1/16x3/32	.15	.51	7	8 and 12
24–¾	¾	13	3/32x3/32	.24	.80	4 and 6	8 and 12
53–¾	¾	9	5/32x⅛	.53	1.80	4—6	8 only
20–½	½	18	3/64x5/64	.20	.68	4	8 only

PENN METAL COMPANY

CAMBRIDGE, MASS.
675 Concord Avenue

JERSEY CITY, N. J.
First Street

PARKERSBURG, W. VA.
(Near Pittsburgh, Pa.)

PHILADELPHIA, PA.
25th and Wharton Streets

PORTLAND, ME.
95 Exchange Street

anything in sheet metal — Penco 1363 — TRADE-MARK

Products

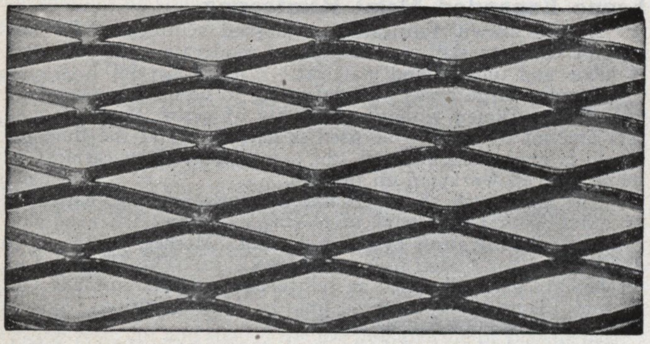
Manufacturers of Metal Lath and Accessories; Concrete Reinforcement; Metal Covered Doors, Frames, Trim, Windows, Entrances and Partitions; Tin Clad Fire Doors; Toilet and Shower Partitions; Metal Ceilings.

Penco Expanded Metal Lath

A perfect metal lath should (1) be rigid; (2) have gauge consistent with span of supports or condition of work required; (3) be sufficiently expanded to allow thorough embedding in plaster; (4) have wide strand to hold plaster with a proper slant to avoid cutting key; (5) be of a width conveniently handled without extra labor; (6) be in sheets uniform and squared.

All of these essentials are embodied in Penco expanded metal lath, backed by over 25 years' actual service in outside and inside construction.

Penco expanded metal lath is a reinforcement and not a background for plaster.



Penco Expanded Metal Lath, Full Size

Weight per sq. yd., painted	Weight per sq. yd., galv.	
2.20	2.50	Note: Size of sheets, 24 by 96 in. Packed 9 sheets to a bundle, 16 sq. yd. Made in steel, painted or galvanized; also Hampton rust resisting metal.
2.50	....	
3.00	3.40	
3.40	....	

Penco Non-rusting Metal Corner Beads and Base Screeds or Grounds

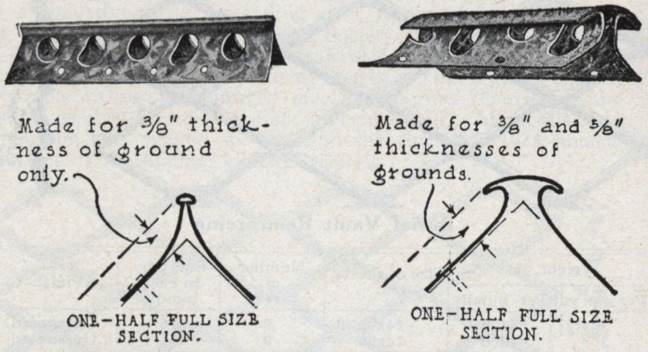
Metal Corner Beads—Made to tie in and protect the plaster. They offer a perfect key for plaster. The staggered holes, placed near the outer edge form a splendid clinch, thus bonding the plaster where most needed. Formed over micrometered dies that make a true, straight edge.

No. 2 metal corner bead of No. 26 gauge, galvanized. For buildings where there is unusual wear and tear, such as schoolhouses and public buildings. For ⅜-in. grounds. Lengths: 6, 7, 8, 8½, 9, 10 and 12 ft.

No. 4 metal corner bead is a bullnose corner bead, used in hospitals and public buildings. Makes a large rounded corner and at a cost much less than an all-plaster corner. For ⅜ and ⅝-in. grounds. Lengths: 10 and 12 ft.

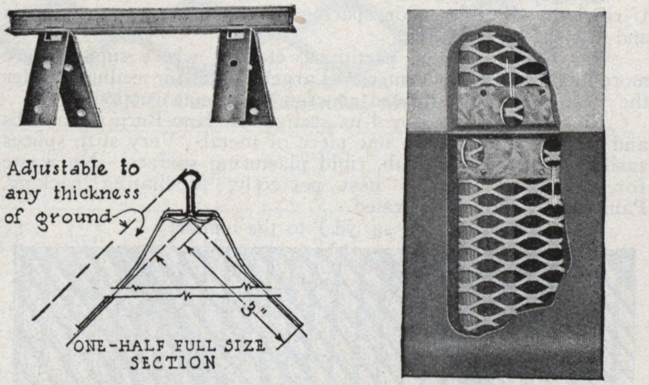
No. 6 metal corner bead, a rail type, adjustable for any depth of grounds. One clip furnished with each foot of rail. Lengths, 6, 7, 8, 9 and 10 ft.

No. 3 Metal Ground or Base Bead—The joint between the plaster above and the cement or tile below is formed with a Penco metal ground between, providing a non-shrinking and solid construction. Made in 10-ft. lengths to suit all thicknesses of plaster.


Made for ⅜" thickness of ground only.
ONE-HALF FULL SIZE SECTION.
Made for ⅜" and ⅝" thicknesses of grounds.
ONE-HALF FULL SIZE SECTION.

No. 2 Metal Corner Bead

No. 4 Metal Corner Bead


Adjustable to any thickness of ground
ONE-HALF FULL SIZE SECTION

No. 6 Metal Corner Bead

No. 3 Metal Base Bead

Penco Metal Corner and Base Beads

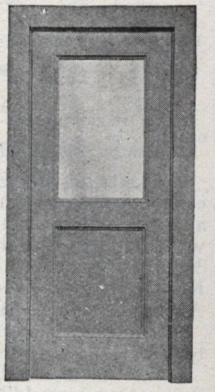
Penco Metal Covered Doors, Frames and Trim

Made by drawing sheet metal through steel dies over a wood core of white pine. This process practically welds the metal covering to its core, eliminates buckles and brings out all moulding members in clear relief.

Made in kalamein iron, galvanized steel, Hampton metal (a galvanized, rust resisting alloy), copper and low brass, in sections, tongued, grooved and pinned together, and finished with a priming coat of gray paint.

Stock sizes (door size): 2 ft. 8 in. x 6 ft. 8 in.; 2 ft. 6 in. x 6 ft. 8 in.; 3x7 ft. Sizes and styles in kalamein iron as illustrated are carried in stock for immediate shipment.

Special styles and sizes will be furnished on short notice.



No. 102G. Penco Metal Covered Door

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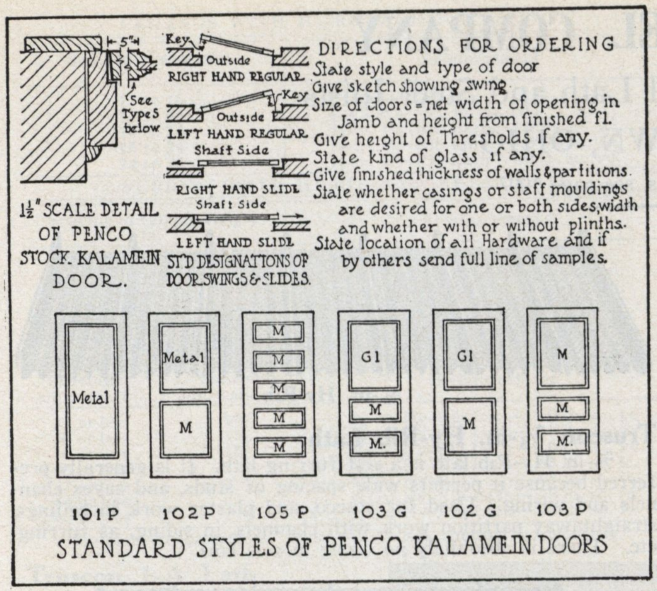
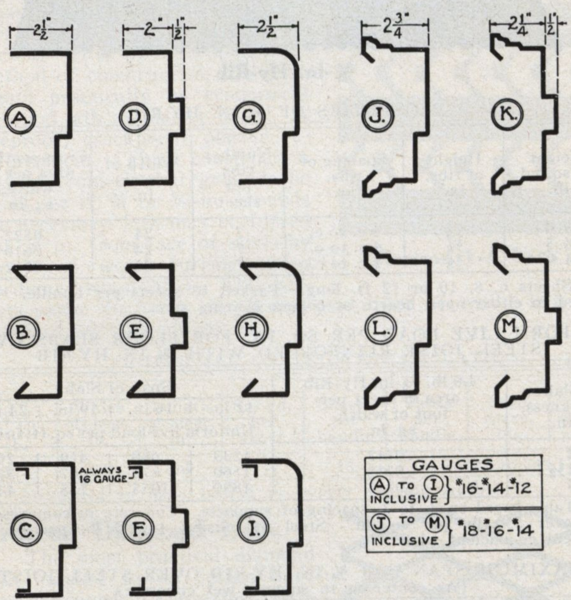

5"
Key
Outside
RIGHT HAND REGULAR
Key
Outside
LEFT HAND REGULAR
Shaft Side
RIGHT HAND SLIDE
Shaft Side
LEFT HAND SLIDE
See Types below
1½" SCALE DETAIL OF PENCO STOCK KALAMEIN DOOR.
ST'D DESIGNATIONS OF DOOR SWINGS & SLIDES.
Metal
Metal
M
M
M
M
M
M
Gl
M
M.
Gl
M
M
M
M.
101 P
102 P
105 P
103 G
102 G
103 P

DIRECTIONS FOR ORDERING
State style and type of door
Give sketch showing swing.
Size of doors = net width of opening in Jamb and height from finished fl.
Give height of Thresholds if any.
State kind of glass if any.
Give finished thickness of walls & partitions.
State whether casings or staff mouldings are desired for one or both sides, width and whether with or without plinths.
State location of all Hardware and if by others send full line of samples.

STANDARD STYLES OF PENCO KALAMEIN DOORS


2½"
2"
½"
2½"
2¾"
2¼"
½"
A
D
G
J
K
B
E
H
L
M
C
ALWAYS 16 GAUGE
F
I
GAUGES
A TO I INCLUSIVE #16-#14-#12
J TO M INCLUSIVE #18-#16-#14

PRESSED STEEL DOOR FRAMES—STANDARD SECTIONS.

Penco Metal Covered Windows

Penco metal covered windows are superior, owing to their simple construction, ease of operation, fire retarding qualities and the unusually high standard maintained in regard to the materials used in their construction.

They combine safety, economy, durability and weatherproofness.

Made for all classes of buildings in all required types and sizes, either from our own or architects' details.

Penco Metal Covered Partitions

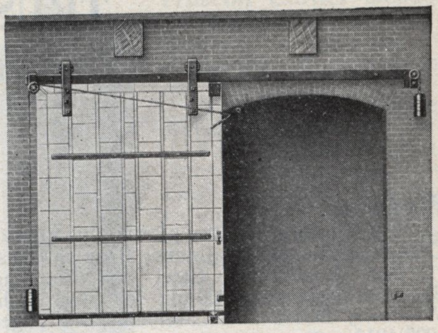
Kalamein iron, brass or copper-covered partitions are made by us from architects' details. Extensively used as office partitions, staircase and elevator enclosures, etc.

To eliminate the cost of special dies, Penco standard moulding is recommended, and many designs are available, details of which may be had on request.

Penco Tin Clad Fire Doors and Shutters

Made in any style and size to meet either standard or special conditions.

Doors are furnished with or without hardware, f.o.b. cars Boston, or installed complete at option of purchaser.



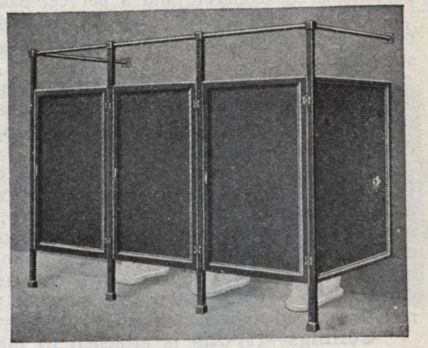
Penco Tin Clad Fire Door

Penco Toilet and Shower Partitions

High grade, sanitary, durable, easily erected and reasonably priced. The hard metal finish is non-absorbent and impervious to moisture.

Made in standard units consisting of partition, door and necessary bracing.

Fit any type of construction. Can be furnished without doors as toilet room entrance screens.



Penco Toilet Partition

STANDARD SIZES OF PENCO METAL TOILET PARTITIONS

Partitions			Doors	
Depth, in.	Height, in.	Post height, in.	Width, in.	Height, in.
48	54	78	24-26-28-30	54
54	54	78	24-26-28-30	54
60	54	78	24-26-28-30	54

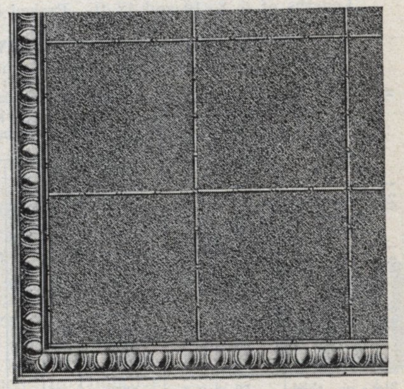
Hardware furnished: post footings and caps, head rail wall sockets, door catches and pulls, gravity hinges and coat hooks, all in polished aluminum. Back partitions can be furnished to enclose plumbing, if desired, with or without removable covers over plumbing space.

STANDARD SIZES OF PENCO METAL SHOWER PARTITIONS

Depth, in.	48	54	48	54	Curb height is included in over-all height
Height over all, in.	78	78	84	84	

Penco Metal Ceilings

A pattern for every purpose. Made of the highest grade steel. We specialize in Colonial designs and plaster effects and contract for entire work including making of layouts, placing of furring, erecting the ceiling and painting, as required. Write for complete catalogue and prices or send sketches for estimates.



No. 4023. Metal Ceiling Panel with Plaster Effect

Thermalized Ceiling—In addition to the standard priming, a thermalizing process will be applied if so specified. This is a coat of white lead and oil baked on both sides which adds protection on the underside and permits the final painting with a single coat.

TRUSCON STEEL COMPANY

Manufacturers of Metal Lath and Steel Joists

YOUNGSTOWN, OHIO

For Branch Offices, see page 1007

Products

Hy-Rib; Metal Lath; Steel Channels; Corner Beads; Steel Joists; Base Screeds.

For Reinforcing Steel and Building Specialties, see pages 60-61; for Steel Sash, Windows, Doors and Casements, see pages 1007-1013.

TRADE-MARK

Truscon Hy-Rib and Metal Lath

Hy-Rib—A steel sheathing stiffened by rigid ribs, eliminating forms and saving studs—an ideal reinforcement for concrete and a perfect base for plaster.

Floors and Roofs—Hy-Rib provides both centering and reinforcement for concrete, reduces costs and simplifies construction.

Industrial Walls and Sidings—Apply the Hy-Rib, plaster both sides, and the wall is complete. Hy-Rib provides a solid, monolithic wall, 2 in. thick, at half the cost of brick. No forms are required.

Partitions—There are two types of Hy-Rib partitions: (1) the ribs of the Hy-Rib extend vertically from floor to ceiling and eliminate all stiffening channels; (2) the Hy-Rib lath with ribs extending horizontally is supported by widely spaced channels. Both types save channels and the expense of attaching lath to them. Solid Hy-Rib partitions, only 2 in. thick, save valuable floor space, stop fire, prevent cracks and are sound resisting, rigid and economical.

Ceilings—Hy-Rib is attached to the lines of support and plaster applied directly to the underside. Hy-Rib permits wide spacing of supports, saving channels and labor of attaching lath to them.

Furring—Attach the Hy-Rib to wall with lath side outward and apply plaster. Hy-Rib does away with furring strips.

Truscon ¾-in. Hy-Rib Lath

A reinforcement for floors, roofs, sidewalls, arches and outer types of concrete construction. Rigidity of lath permits extremely wide spacing of supports in ceilings and sidings. It is an ideal furring where considerable air space is desired. The sheets may be furnished curved in practically any desired radius.

PROPERTIES OF ¾-IN. HY-RIB

Weight per sq. ft., lb.	Height of ribs, in.	Spacing of ribs, in.	Number ribs per sheet	Width of sheet, in.	Cross-sectional area per foot width, sq. in.
.58	¾	4 c. to c.	8	28	.1172
.68	¾	4 c. to c.	8	28	.1407
.78	¾	4 c. to c.	8	28	.1642

Lengths of 6, 8, 10 and 12 ft. Packed 8 sheets per bundle.

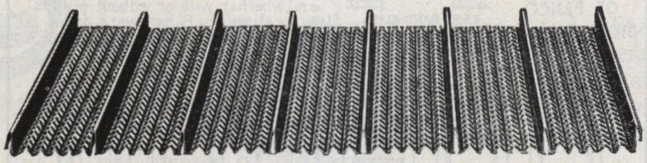
SAFE LOADS FOR ¾-IN. HY-RIB (8 RIBS)
(Safe loads include weight of slab. For safe live loads deduct weight of slab.)

Thickness of slabs above base of Hy-Rib	Wt. per sq. ft. ¾-in. Hy-Rib, lb.	* "A"	Moment of resistance per ft. of width	Safe loads in lb. per sq. ft. for various spans (in feet) reinforced with ¾-in. Hy-Rib								
				3	4	5	6	7	8	9	10	11
2-in. thick slab. Wgt., 24 lb. per sq. ft....	.58	3-4	3440	318	179	115	80	....	....	....	....	....
	.68	3-8	3940	365	205	131	91	....	....	....	....	....
	.78	3-11	4160	385	216	138	96	....	....	....	....	....
2½ - in. thick slab. Wgt., 30 lb. per sq. ft.	.58	3-0	4530	420	236	151	105	77	59	....	....	....
	.68	3-3	5380	498	280	179	125	91	70	....	....	....
	.78	3-6	6230	577	325	208	144	106	81	....	....	....
3-in. thick slab. Wgt., 36 lb. per sq. ft....	.58	2-9	5630	522	293	188	131	96	73	....	....	....
	.68	3-0	6710	622	349	224	155	114	87	69	....	....
	.78	3-3	7780	720	405	259	180	132	101	80	....	....
3½ - in. thick slab. Wgt., 42 lb. per sq. ft.	.58	2-6	6750	625	352	225	156	115	88	....	....	....
	.68	2-9	8020	743	418	268	186	136	104	83	....	....
	.78	3-0	9300	862	484	310	215	158	121	96	78	....
4-in. thick slab. Wgt., 48 lb. per sq. ft....	.58	2-4	7850	727	409	262	182	134	102	81	....	....
	.68	2-7	9350	866	487	312	216	159	122	96	78	....
	.78	2-9	10870	1060	566	362	252	185	142	112	91	75

B.M.=$\frac{1}{10wl^2}$ For B.M.=$\frac{1}{12wl^2}$, add 20% to above loads.

For B.M.=$\frac{1}{8wl^2}$, deduct 20% from above loads.

*"A," maximum spans for ¾-in. Hy-Rib as centering to support wet concrete. When greater spans are used, provide temporary supports.



¾-in. Hy-Rib

Truscon ⅜-in. Hy-Rib Lath

⅜-in. Hy-Rib lath is a self-furring lath. It is generally preferred because it permits wide spacing of studs, and saves channels and wiring. Used for stucco, and plaster work in ceilings, straightaway partition work with channels, in siding, as furring, etc. There is absolutely no waste in side laps.

⅜-in. Hy-Rib

PROPERTIES OF ⅜-IN. HY-RIB

Weight per sq. yd. lb.	Height of ribs, in.	Spacing of ribs, in.	Number ribs per sheet	Width of sheet, in.	Cross-sectional area per ft. width, sq. in.
3.0	⅜	4 c. to c.	7	24	.0522
3.5	⅜	4 c. to c.	7	24	.0610
4.0	⅜	4 c. to c.	7	24	.0712

Sheets 6, 8, 10 or 12 ft. long. Packed 18 sheets per bundle. Furnished in either open hearth or copper bearing steel.

UNIFORM LIVE LOAD PER SQ. FT. FOR FLOOR SLABS OVER STEEL JOIST REINFORCED WITH ⅜-IN HY-RIB

Slab thickness, in.	4.0 lb. ⅜-in. Hy-Rib area of sheet per foot of width, sq. in.	Span of Slab			
		12 in.	16 in.	19 in.	24 in.
		Uniform live load per sq. ft. in lb.			
2	.0712	1233	688	479	291
2½	.0712	1560	870	607	370
3	.0712	1890	1055	735	447

Table based on 3. to 3. spacing of supports. Concrete in compression not over 550 lb. per sq. in. Steel in tension 16,000 lb. per sq. in. Moment co-efficient wl 8.

MAXIMUM SPAN FOR ⅜-IN. HY-RIB OVER STEEL JOIST
(As centering to support wet concrete)

Maximum span for centering, in.	Weight Hy-Rib per sq. yd., lb.	Thickness per slab, in.
0 to 19	3.5	2
19 to 24	4.0	2

SOLID PARTITIONS WITH HY-RIB LATH

Without Channels			With Channels	
Height of partitions, ft.	Thickness, in.	Reinforcement ¾-in. Hy-Rib, lb. per sq. ft.	Spacing of channels, in.	Reinforcement
10	1¾	.58	12 to 16	Diamond Laths
12	2	.58	19 to 24	⅜-in. Hy-Rib 3 lb. sq. yd.
14	2¼	.58		
16	2½	.58	24 to 30	⅜-in. Hy-Rib 4 lb. sq. yd.
18	2¾	.68		
20	3	.68	32 to 36	⅜-in. Hy-Rib 4 lb. sq. yd.

Maximum Heights

Thickness of partitions, in.	Maximum height, ft.
1¾	16
2½	20
3	24

HOLLOW NON-BEARING PARTITIONS WITH HY-RIB AND METAL LATH

Spacing of studs or channels in partitions, in.	Reinforcement
12 to 16	Diamond Laths
16 to 24	1-A Lath—3.2 lb. sq. yd.
19 to 24	⅜-in. Hy-Rib Lath—3.0 lb. sq. yd.
24 to 30	⅜-in. Hy-Rib Lath—3.5 lb. sq. yd.
32 to 36	⅜-in. Hy-Rib Lath—4.0 lb. sq. yd.

Continued on next page

CEILINGS WITH HY-RIB AND METAL LATH

Spacing of supports, in.	Reinforcement
12 to 16	Diamond Laths
12 to 24	1-A Lath—3.2 lb. sq. yd.
16 to 24	⅜-in. Hy-Rib Lath—3.0 lb. sq. yd.
16 to 24	⅜-in. Hy-Rib Lath—3.5 lb. sq. yd.
24 to 32	⅜-in. Hy-Rib Lath—4.0 lb. sq. yd.

FURRING WITH HY-RIB AND METAL LATH

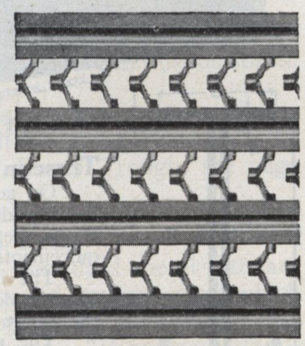
Spacing of furring strips, in.	Reinforcement
16 to 24	1-A Lath—3.2 lb. sq. yd.
19 to 24	⅜-in. Hy-Rib Lath—3.0 lb. sq. yd.
24 to 30	⅜-in. Hy-Rib Lath—3.5 lb. sq. yd.
32 to 36	⅜-in. Hy-Rib Lath—4.0 lb. sq. yd.
Attach to flat surface	Self-furring Diamond Lath

SIDE WALLS REINFORCED WITH HY-RIB

Spacing of supports, in.	Thickness of wall, in.	Reinforcement
24 or less	1¾	⅜-in. Hy-Rib Lath—3.0 lb. sa. yd.
30 or less	1¾	⅜-in. Hy-Rib Lath—3.5 lb. sq. yd.
36 or less	1¾	⅜-in. Hy-Rib Lath—4.0 lb. sq. yd.
60 or less	2	¾-in. Hy-Rib Lath—.58 lb. sq. ft.
72 or less	2	¾-in. Hy-Rib Lath—.68 lb. sq. ft.
84 or less	2	¾-in. Hy-Rib Lath—.78 lb. sq. ft.
96 or less	2½	¾-in. Hy-Rib Lath—.78 lb. sq. ft.

Minimum requirements. Ribs of Hy-Rib running horizontally.

Truscon 1-A Lath


Truscon 1-A Lath

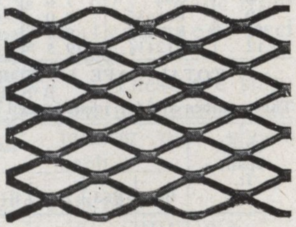
Widely used in commercial and industrial buildings of all types because of its economy of plaster and of labor in application. For homes, when used in connection with our recommended method of construction, it will be found practically as economical as wood lath or plaster board. A fireproof, crackproof plaster reinforcement. This construction merely requires that grounds be ½ in., or if ¾ or ⅞-in. grounds are necessary, lath may be furred out ⅜ in. from face of studs by means of wood furring strips (ordinary wood lath). This permits same thickness of plaster over face of metal lath as is standard over wood lath.

PROPERTIES OF TRUSCON 1-A LATH

Weight per sq. yd., lb.	Width of sheet, in.	Length of sheet, in.	Sq. yd. per sheet	Sheets per bundle	Yards per bundle	Stud space, in.	Joist space, in.
3.2	18	96	1⅓	15	20	16 to 24	12 to 24

Furnished in open hearth or copper bearing steel.

Truscon Diamond Lath


Diamond Lath

The most practical diamond lath because in its design have been combined: (1) greatest rigidity, (2) straight edges, saving in laps, sheets trimmed 8 ft. 1 in. in length, (3) maximum size, (4) small sized diamonds.

All types of Truscon metal lath are furnished in either open hearth or copper bearing steel.

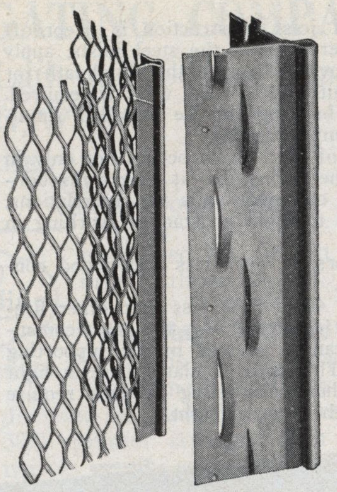
PROPERTIES OF TRUSCON DIAMOND LATH

Weight per sq. yd., lb.		Stud spacing for walls and partitions, in.	Joist spacing for ceilings, in.
Truscon	2.2	12 to 14	12 to 14
	2.3	12 to 14	12 to 14
	2.5	12 to 16	12 to 14
	2.8	12 to 16	12 to 14
	3.0	12 to 16	12 to 16
	3.4	14 to 16	14 to 16
	4.0	14 to 16	14 to 16
Galvanized	2.5	12 to 16	12 to 14
	3.4	14 to 16	14 to 16

Sheets, 27x96 in., packed 10 sheets (20 sq. yd.) per bundle, except 4.0-lb. lath, 24x96 in., packed 15 sheets (26⅔ sq. yd.) per bundle.
Furnished in open hearth or copper bearing steel.

Truscon Self-furring Diamond Lath

Attached directly to the wall or other surface without the use of furring strips. Ample space provided for thoroughly keying plaster. Ribs are formed in the lath at frequent intervals to act as furring. Furnished in exactly the same mesh and weights as Truscon Diamond lath listed above.



Corner Beads

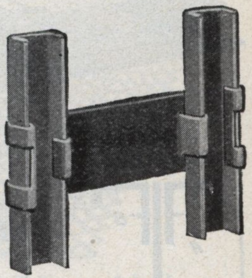
Truscon Corner Beads

Furnished in two types to meet every requirement for the protection of plastered corners.

Truscon Expanded Metal Corner Bead—Provides a perfect key for plaster right up to the rounding nose. This type is preferred by most architects and contractors. Made of galvanized copper bearing steel. Furnished in stock lengths of 6, 7, 8, 9, 10 and 12 ft.; shipped in bundles of 10.

Truscon Double Bond Corner Bead—Widely used in connection with wood lath, metal lath and masonry. Made of galvanized copper bearing steel. Furnished in stock lengths of 6, 7, 8, 9, 10 and 12 ft.; shipped in bundles of 10.

Truscon Hollow Studs

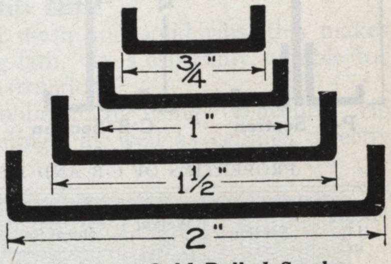

Section of Hollow Stud

Truscon hollow studs are used in hollow partitions.

Studs are made up by uniting two ¾-in. channels by means of spacing clips which are spaced at 36-in. centers.

Studs are furnished in standard outside widths of 2, 3 and 4 in.; shipped either assembled or knocked down. Other widths may be obtained on special order.

Truscon Cold Rolled Steel Channels



Truscon Cold Rolled Steel Channels

Truscon cold rolled steel channels are used in suspended ceilings, solid partitions and for furring metal lath.

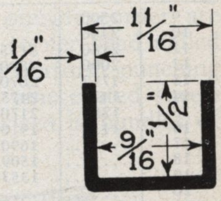
Channels are carried in stock lengths of 12, 14, 16, 18 and 20 ft. ¾ and 1-in. channels are shipped in bundles of 25; 1½ and 2-in. are shipped in bundles of 10.

PROPERTIES OF TRUSCON COLD ROLLED STEEL CHANNELS

Size channel, in.	Weight per lin. ft., lb.	Moment of inertia	Section modulus
¾	0.276	.0064	.0171
1	0.332	.0130	.0260
1½	0.442	.0362	.0482
2	0.553	.0759	.0759

All channels are rolled from No. 16 gauge steel.
l=span c-c of supports in inches. Values for spans based on $\frac{wl^2}{8}$
w=load in pounds per linear foot of channel.

Truscon Square Channel

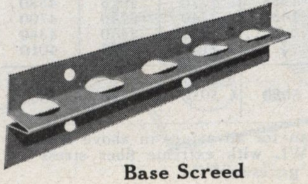


Square Channel

Truscon square channel, owing to the wide flanges, has greatly increased strength, which is practically equal in any direction; may be used either with flanges or base as a bearing.

Square channels are carried in stock lengths of 16 and 20 ft.; weight per foot 0.271 lb.; shipped in bundles of 25.

Truscon Metal Base Screeds


Base Screed

Used in place of wood screeds between cement bases and plastered walls. Furnished in No. 24 gauge metal, galvanized either before or after forming. Standard lengths, 6, 7, 8, 9 and 10 ft.

Continued on next page

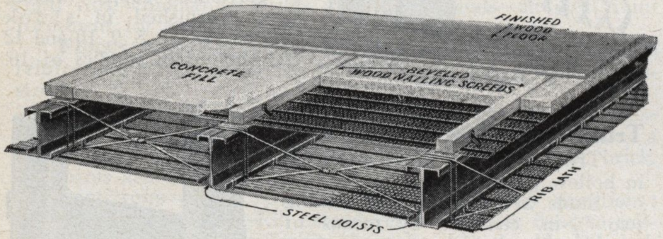
Truscon Steel Joists

Simplicity—Truscon steel joist construction is fireproofness in its simplest terms. Merely place the steel joists, apply the metal lath and concrete above and attach the metal lath for plastered ceiling below. No centering or false work is required. Any number of floors of a building can be installed simultaneously. No special equipment is needed.

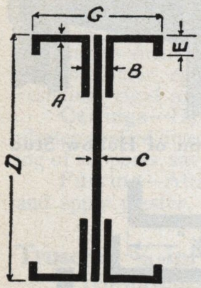
Economy—The economy of steel joists occurs not only in the construction itself but in the saving that it effects throughout the building in the beams, columns, walls and foundations, and in the advantages it offers to other contractors working in the building.

When used in cement floors, it costs less than wood construction with hardwood floors.

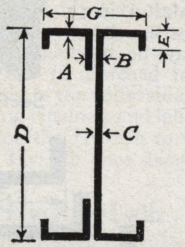
Light Weight—Weighing 40 to 70% less than other fireproof floors, Truscon steel joist construction is not only economical in itself but effects substantial savings in the supporting framework and foundations. This is particularly true in light occupancy buildings, where other fireproofing systems require half their strength to support their own weight.



Wood Floor Finish



P-B Section



C-B Section

Truscon Standard Steel Joists

In the P-B and C-B sections, the elimination of excess metal at the neutral axis and its proper placement in the tension and compression flanges as contrasted with the special B section, is plainly shown.

PROPERTIES OF C-B AND P-B STEEL JOISTS

Depth (D), in.	Section	Weight per ft., lbs.	Thickness of metal, in.			Dimensions of flanges, in.		Moment of inertia, in.^{4}	Section modulus, in.^{3}
			A	B	C	G	E		
6	CB-63	4.1	.072	.144	.072	3	½	6.74	2.25
7	CB-73½	4.9	.083	.155	.072	3½	½	11.37	3.25
8	CB-84	5.4	.083	.155	.072	4	½	16.53	4.13
9	PB-94	6.5	.072	.227	.083	4	½	24.41	5.42
10	PB-104½	7.5	.072	.239	.095	4½	½	34.04	6.81
11	PB-115	9.1	.083	.275	.109	4⅞	½	50.14	9.12
12	PB-125	9.9	.083	.286	.120	4⅞	½	63.09	10.52

TOTAL SAFE UNIFORM LOADS IN POUNDS ON C-B AND P-B STEEL JOISTS

These values are for joists braced laterally as in standard floor construction

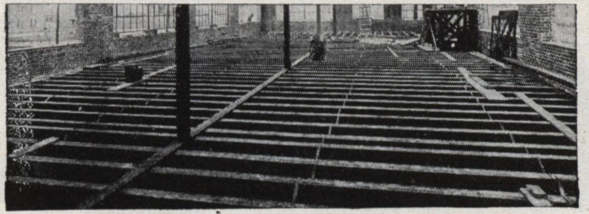
Clear span, ft.	Section No.						
	CB63	CB73½	CB84	PB94	PB104½	PB115	PB125
9	2500	....	....	....	....	....	....
10	2400	....	....	....	....	....	....
11	2180	3125	....	5080	....	....	....
12	2000	2890	3630	4820	5950	....	....
13	1712	2670	3388	4450	5600	....	....
14	1478	2475	3150	4125	5200	6790	7800
15	1288	2170	2940	3850	4850	6480	7480
16	1130	1910	2760	3610	4550	6075	7020
17	....	1690	2455	3400	4275	5720	6610
18	....	1509	2190	3210	4040	5400	6240
19	....	1353	1967	2910	3830	5120	5910
20	....	....	1775	2625	3640	4860	5620
21	....	....	1610	2380	3320	4630	5350
22	....	....	....	2170	3030	4420	5100
23	....	....	....	1985	2770	4075	4880
24	....	....	....	1822	2540	3740	4700
25	....	....	....	....	2345	3450	4340
26	....	....	....	....	2165	3185	4010
Max. safe load, lb.	2500	3125	3630	5080	5950	6790	7800

Deflection is less than 1/360 of span for all values in above table.

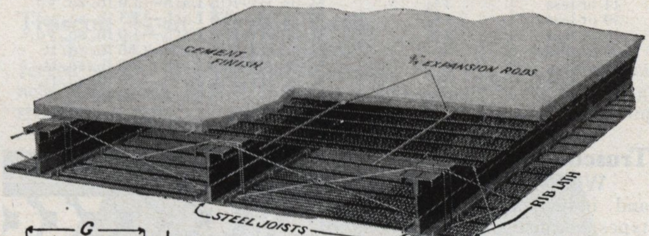
Values based on moment of ⅛ WL with extreme fiber stress not exceeding 16,000 lb.

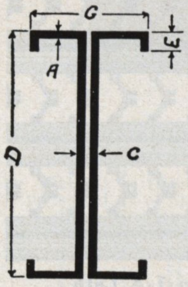
At every step in building, Truscon steel joists offer the maximum in permanence, fire safety and economy in the floor construction of schools, hospitals, apartment houses, commercial buildings and homes.

Quick Erection—Installation of steel joists is very rapid because they are shop fabricated and entail the minimum amount of field labor. Being self-sustaining, any number of floors can be installed at one time.



Buckeye Gas Mantle Factory, Columbus, Ohio





Cement Floor Finish

B Section

Truscon Special Steel Joists

On account of the greater efficiency of the standard sections, the special B sections are only furnished for special requirements.

The half section or C channel, is frequently desirable as a wall member where the entire section is not required for strength.

The properties of the C sections may be assumed as one-half those of the B sections.

PROPERTIES OF DOUBLE CHANNEL B STEEL JOISTS

Depth (D), in.	Section	Weight per ft., lbs.	Thickness of metal, in.		Dimensions of flanges, in.		Moment of inertia, in.^{4}	Section modulus, in.^{3}
			A	C	G	E		
4	B43	3.7	.072	.144	3	½	2.60	1.30
5	B53	4.2	.072	.144	3	½	4.38	1.75
6	B63	4.7	.072	.144	3	½	6.90	2.30
7	B73½	5.5	.072	.144	3½	½	11.20	3.20
8	B84	6.1	.072	.144	4	½	16.80	4.20
9	B94	7.0	.075	.150	4	¾	23.85	5.30
10	B104½	8.0	.078	.156	4½	¾	33.25	6.65
11	B114½	9.5	.086	.172	4½	¾	46.20	8.40
12	B124½	10.5	.090	.180	4½	¾	60.00	10.00

TOTAL SAFE UNIFORM LOADS IN POUNDS ON B STEEL JOISTS

These values are for joists braced laterally as in standard floor construction

Clear span, ft.	Section No.								
	B43	B53	B63	B73½	B84	B94	B104½	B114½	B124½
6	2311	.....	.....	.....	.....	.....	.....	.....	.....
7	1981	2667	.....	.....	.....	.....	.....	.....	.....
8	1733	2333	3067	.....	.....	.....	.....	.....	.....
9	1380	2074	2726	3793	.....	.....	.....	.....	.....
10	1118	1867	2453	3413	.....	.....	.....	.....	.....
11	922	1550	2230	3103	.....	.....	.....	.....	.....
12	773	1305	2045	2845	3733	.....	.....	.....	.....
13	.....	1113	1754	2626	3446	4348	.....	.....	.....
14	.....	958	1511	2438	3200	4038	.....	.....	.....
15	.....	.....	1318	2135	2986	3769	4729	5973	7111
16	.....	.....	1159	1880	2800	3533	4433	5600	6666
17	.....	.....	.....	1669	2500	3325	4172	5271	6275
18	.....	.....	.....	1481	2225	3141	3940	4978	5926
19	.....	.....	.....	.....	2000	2844	3733	4716	5614
20	.....	.....	.....	.....	1800	2562	3546	4480	5333
21	.....	.....	.....	.....	1637	2322	3250	4267	5079
22	.....	.....	.....	.....	.....	2120	2942	4073	4848
23	.....	.....	.....	.....	.....	1937	2700	3752	4638
24	.....	.....	.....	.....	.....	.....	2475	3446	4445
25	.....	.....	.....	.....	.....	.....	2285	3181	4133
26	.....	.....	.....	.....	.....	.....	2115	2930	3820
Max. safe load, lb.	.....	.....	3940	4890	3840	4600	5900	6624	8050
Wt. per lin. ft., lb.	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5

Deflection is less than 1/360 of span for all values in above table.

Values based on moment of ⅛ WL with extreme fiber stress not exceeding 16,000 lb.

WHEELING CORRUGATING COMPANY

Manufacturers of Metal Lath and Corner Beads

WHEELING, W. VA.

BRANCHES

NEW YORK, N. Y.
CHICAGO, ILL.
PHILADELPHIA, PA.
ST. LOUIS, MO.
KANSAS CITY, MO.
CHATTANOOGA, TENN.
RICHMOND, VA.
MINNEAPOLIS, MINN.

TRADE-MARK

Products

"Wheeling" Standard Metal Lath, an Expanded Metal Diamond Mesh Lath for all classes of work, including partitions, ceilings, veneered houses, stucco, etc.

"Wheeling" Rid-Gid Metal Lath, a Self-furring Lath for stucco, eliminating the cost of furring strips.

"Wheeling" ⅜-in. Rib Lath, a Diamond Mesh Lath with Solid Ribs making an exceptionally strong lath, especially adapted for floor and partition construction.

"Wheeling" Copper-bearing Metal Lath, recommended for moist climates, especially in outside stucco work.

"Wheeling" Corner Beads, for inside and outside corners; fully protect all plastered corners.

For Conductor Pipe and Eaves Trough, see page 1145.

"Wheeling" Standard Metal Lath

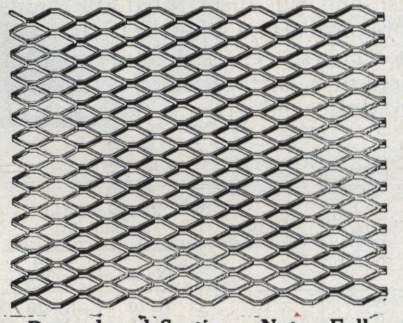
All sheets of "Wheeling" standard metal lath are 28 in. wide with square corners and straight edges which prevent loss from excessive lapping necessary with sheets that do not possess these features. "Wheeling" standard metal lath can be furnished:

(1) Made from open hearth steel, painted with a good grade of black paint.

(2) Made from Ohio metal (copper bearing), painted with a good grade of red paint.

(3) Made from galvanized steel sheets.

These are shipped in bundles containing nine sheets each.



Reproduced Section—Not a Full Sheet of Lath

WEIGHTS AND SIZES PAINTED

Designation and wt. per sq. yd. in bundle, lb.	Size of sheets, in.	Sheets in bundle	Sq. yd. in bundle	Weight per bundle, lb.
Painted				
3.4	28x96	9	18.66	63.44
3.0	28x96	9	18.66	55.98
2.5	28x96	9	18.66	46.65
2.2	28x96	9	18.66	41.05
Galvanized (Zinc Coated)				
3.4	28x96	9	18.66	63.44
2.5	28x96	9	18.66	46.65

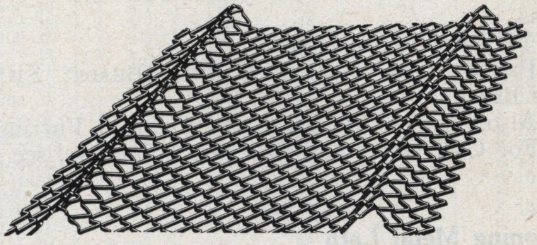
"Wheeling" Copper-bearing Metal Lath

There are thousands of firm advocates of copper-bearing steel sheets because of its rust resistance, which is a matter of record, proved by hundreds of independent and unbiased tests. A large tonnage of this valuable metal is now produced annually.

"Wheeling" copper-bearing steel lath is made from Ohio metal, our own copper-bearing steel of exceptional merit and high resistance to rust, in standard sizes and bundles. This lath is painted red and each bundle is tagged so that it can not be confused with any other lath on the job.

"Wheeling" Rid-Gid Metal Lath

This lath is supplied in the same size and shape mesh that has popularized our standard diamond lath, with the trusses added, and provides about 30% greater strength with no added weight. These trusses or ribs make "Rid-Gid" metal lath self-furring, eliminating the cost of furring strips. Size of sheet, weight and cost of "Rid-Gid" metal lath is the same as for standard "Wheeling" lath.

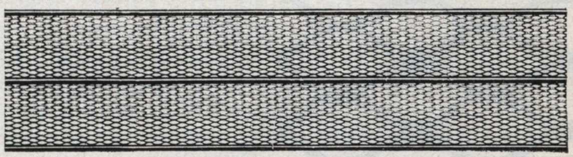


Reproduced Section—Not a Full Sheet of Lath

"Wheeling" ⅜-in. Rib Lath

With its diamond mesh and solid ribs, this makes an exceptionally strong lath. It is especially suitable for floor and partition construction.

A perfect key is obtained by using "Wheeling" rib lath for suspended ceilings, as well as ceilings directly below floors.



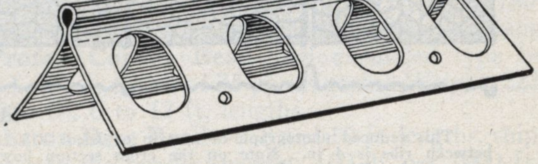
"Wheeling" ⅜-in. Rib Lath

Specifications

Write into your specifications the name "Wheeling" with the style of lath desired to prevent substitution. Stocks are carried at all warehouses and by prominent jobbers and dealers in building materials.

"Wheeling" Corner Bead

Clean, straight edges to every outside corner are made possible by use of "Wheeling" corner bead nailed directly to studding. This Bead has uniform punching for nailing. Made from high grade zinc coated sheets in 6, 7, 8, 9, 10 and 12-ft. lengths, wired in bundles of ten pieces.



"Wheeling" Corner Bead

THE YOUNGSTOWN PRESSED STEEL COMPANY

Metal Lath, Channels, Corner and Base Beads, Furring and Expanded Metal

GENERAL OFFICES AND FACTORIES
WARREN, OHIO

DISTRICT OFFICES

NEW YORK, N. Y., 347 Madison Avenue
PHILADELPHIA, PA., 917 Crozer Building
SAN FRANCISCO, CAL., 180 Jessie Street
CHICAGO, ILL., 927 Straus Building
DETROIT, MICH., 901 Dime Bank Building
LOS ANGELES, CAL., 1736 East 15th Street
BOSTON, MASS., 258 Washington Street

TRADE-MARK

Products

Mahoning Metal Lath; Zee Stucco Lath; Ideal Rib Lath.

Sharon Channels; Youngstown Box Channel; Youngstown Pencil Channel.

Steel Bridging and Joist Pin Anchors.

YPS Expanded Metal.

Protex and Parker Corner Beads; Sharon Base Bead.

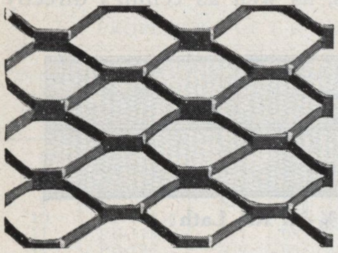
Also, ¾-inch Ribplex Lath; Crimped Furring.

For Coal Doors and Basement Windows, see page 698.

Mahoning Metal Lath

An expanded lath with a small diamond shaped mesh that requires a minimum of plaster. Adapted for all types of interior plastering and especially easy to erect as a base for ornamental plaster cornices, arches, column capitals, mouldings and other intricate work.

The sheet is flat, straight sided and rigid—manufactured from the best grade open hearth steel, furnished painted black; copper alloy painted red; also galvanized.



Mahoning Metal Lath
Actual size of mesh

MAHONING METAL LATH

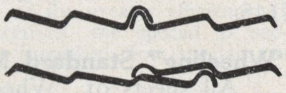
Weight per sq. yd., lb.		
Steel	Copper alloy	Galvanized
2.2	2.2	....
2.5	2.5	2.5
3.0	3.0	....
3.4	3.4	3.4

Note: All laths are packed 9 sheets, or 16 square yards to the bundle. In filling orders, bundles are not broken, but the nearest number of even bundles to the yardage specified is shipped, but in no event a quantity less than that ordered.

Ideal Rib Lath

Construction—The illustration below describes the unique construction of Ideal Rib Lath. Ideal Rib Lath is not only rigid with the ribs, but also possesses great cross rigidity, due to the peculiar twist of the strand. The small outside rib insures perfect nesting in the bundle. It arrives on the job in perfect condition so that it is easy to handle and apply. Where lapping is desired it can be done without producing a hump or ridge (see illustration).

Easy to Plaster—The smooth uniform surface of Ideal Rib Lath in place, gives the plasterer an opportunity to work fast and do the job right. This means plastering economy and a smooth even plaster surface.



Can Be Lapped or Nested
A smooth even surface is maintained either when Ideal Rib Lath is lapped or the outside ribs nested

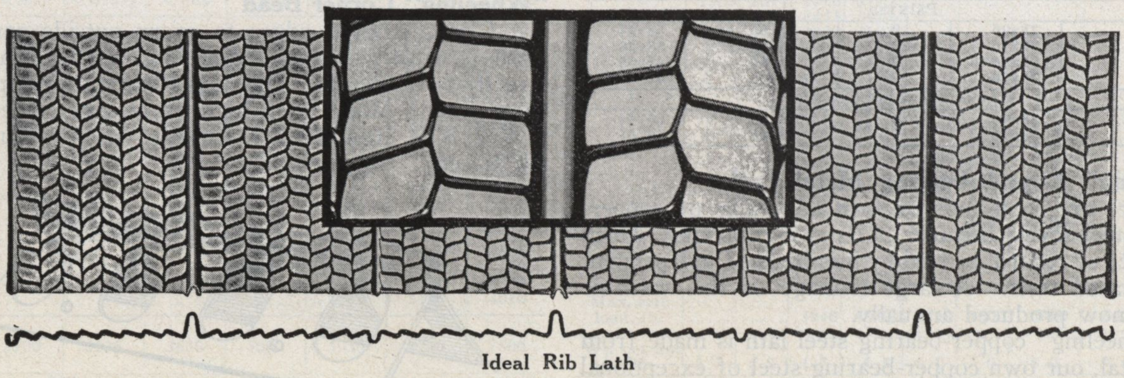
Fireproof Floor Construction—Due to its exceptional stiffness of mesh and rib, Ideal Rib Lath is unexcelled for use in floor construction with steel joists and other types of fireproof floors. The sheets are rigid in both directions and present a surface which retains the concrete mix with no waste and gives a floor slab of uniform thickness.

IDEAL RIB LATH

Weight per sq. yd., lb.	Size sheet, in.	Sheets per bundle	Yards per bundle	Recommended spacing, in.	
				Walls	Ceilings
2.5	24x96	9	16	16-20	16-20
*3.0	24x96	9	16	19-24	18-22
*3.5	24x96	9	16	24-30	22-28
4.0	24x96	9	16	32-36	24-30

*Also furnished in copper alloy.

Average spacing of floor joists runs from 16 to 28 in. 4-lb. lath should be used for the wider spans. 3.5-lb., and under ideal conditions, 3-lb. lath will give satisfactory results for smaller spans.



Ideal Rib Lath

This reduced photograph of a strip of Ideal Rib Lath shows the shape of the opening between strands. Interval between ribs is 4 in. Note on the cross section how ribs are designed to lend great rigidity and also reduce lappage waste to a minimum. Insert shows actual size of mesh

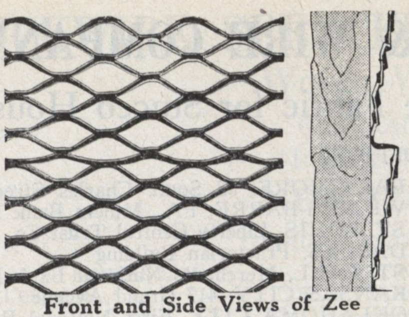
Continued on next page

Zee Stucco Lath

A most rigid lath for stucco work, in which a lateral edge is incorporated every 1⅞ in. throughout the course of the sheet as illustrated.

Recommended for stucco construction of all kinds.

Zee Stucco Lath is supplied in the same weights as Mahoning Lath.



Front and Side Views of Zee Metal Lath

Mesh same size as for Mahoning

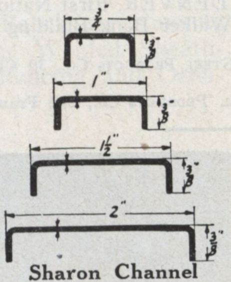
Sharon Channel

Made in the sizes listed below:

Size, in.	Size of flange, in.	Weight per 1000 lin. ft, lb.
¾	⅜	276
1	⅜	332
1½	⅜	442
2	⅜	553
*1½	½	497
*2	½	608

Sharon Channels are carried in stock lengths from 12 to 20 ft., but any special lengths can be supplied as required.

*Manufactured only to order.



Sharon Channel
(Cross section)

Youngstown Box Channel

A greater percentage of metal in the flange rather than in the web makes Youngstown Box Channel far stronger and more rigid than other furring channel of the same weight. Weight 276 pounds per 1000 ft.; 12 to 20-ft. lengths; 20 pieces per bundle.

The wide flange insures absolute stability during erection, so that the channel can not turn over. This gives rapid economical erection.

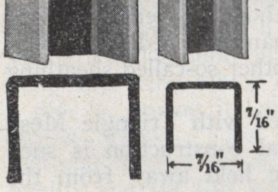
Youngstown Pencil Channel

Youngstown Pencil Channel is really a miniature Youngstown Box Channel 7/16 in. square.

This channel is designed to meet conditions where ordinary ¼-in. pencil rods have been used in the past.

Sizes and Weights—Carried in stock in 12 and 14-ft. lengths, weighing 113 lb. per 1000 lineal ft. Shipped in bundles of 20 pieces each.

Other lengths can be furnished on special order.



Youngstown Box Channel
Actual Size
(Patented)

Youngstown Pencil Channel

YPS Steel Bridging

YPS Steel Bridging, as its name implies, takes the place of ordinary wooden cross bridging used in conjunction with wood joists to stiffen the beams against lateral deflection. It is installed in the same manner as wooden bridging, with 4-penny nails.

STEEL BRIDGING

Style No.	Net diagonal length, in.	Wood joist, in.	Centers, in.	Approximate shipping weight, lbs. per 100 pairs
1	15 1/16	2x 8	16	72
2	15⅞	2x10 2x12	16	75
3	12½	2x10 2x12	12	60

YPS Joist Pin Anchors

Made from steel strips ¾x⅛ in., 14½ in. long. One end punched with two ¼-in. holes for fastening to the joist. Inserted in the other end, which is widened to 1½ in. is a steel pin 7/16-in. diameter and 5 in. long. This pin acts as an anchor in the masonry.

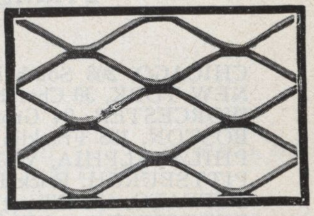
Shipping weight, approximately, 70 lb. per 100. Shipped in any quantities.

YPS Expanded Metal

YPS expanded metal is manufactured in a number of different sectional areas per foot of widths and weights per square foot.

The large diamonds are used for concrete reinforcement in the construction of floors, roofs, sidewalks, bridges, sewers, conduits, tanks, reservoirs and retaining walls.

The smaller meshes are used as gratings, window guards, machinery guards, factory partitions and enclosures of all kinds.



YPS Expanded Metal

YPS EXPANDED METAL

Style	Diamond size, in.	Sectional area, sq. in.	Weight per sq. ft., lb.	Standard Sizes: Width (Short way of diamond) ft. in.	Standard Sizes: Length (Long way of diamond) ft.
*3 –060–20	3 x 7	.060	.20	5—4	8, 10
*3 –082–28	3 x 7	.082	.28	5—4	8, 10
*3 –100–34	3 x 7	.100	.34	5—4	8, 10
*3 –125–42	3 x 7	.125	.42	5—4	8, 10
*3 –151–51	3 x 7	.151	.51	5—4	8, 10
*3 –179–61	3 x 7	.179	.61	5	8, 10
*3 –200–68	3 x 7	.200	.68	5	8, 10
*3 –250–85	3 x 7	.250	.85	5	8, 10
*3 –300–102	3 x 7	.300	1.02	5	8, 10
*3 –350–119	3 x 7	.350	1.19	5	8, 10
2¼–100–34	2¼ x 5	.100	.34	5	8, 10
2¼–151–51	2¼ x 5	.151	.51	5	8, 10
**1½–060–20	1½ x 4	.060	.20	4	8
*1½–179–61	1½ x 3	.179	.61	5	8, 10
¾–151–51	¾ x 2	.151	.51	6	8
** ¾–235–80	¾ x 2	.235	.80	6	8
** ½–212–72	½ x 1 3/16	.212	.72	6	8

**Carried in stock in the widths shown in 8-ft. lengths.
*Carried in stock in the widths shown in 10-ft. lengths only.
Style 1½-060-20 is recommended as beam wrapper and floor binder.

Standard Sheets—The standard sizes of sheets in which our expanded metal is regularly furnished are shown in the table.

Special Weights—We are prepared to manufacture expanded metal of sectional areas and weights other than those listed. Such orders are made specially and subject to special quotations and mill delivery.

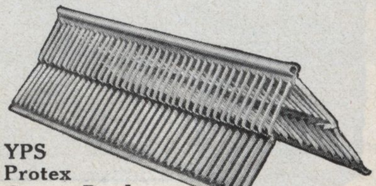
Orders—All expanded metal should be ordered by cross sectional area, size of mesh and weight per square foot only, in indicated size of sheet.

The use of gauge numbers in designating expanded metal is a source of confusion, and the right is reserved to use any thickness of metal convenient to the manufacturer, whose only obligation is to supply the size of mesh and weight per square foot or sectional area in square inches per foot of width, indicated by customer.

Corner and Base Beads

We also manufacture the following:

Parker Corner Bead—A rail type bead erected with clips; shipping weight, 180 lb. per 1000 ft.; 6 to 12-ft. lengths. Shipped 25 pieces to the bundle.



YPS Protex Corner Bead

Youngstown Corner Bead—A wing type bead erected either with or without clips. Weight, 180 lb. per 1000 ft.; 6 to 12-ft. lengths. 25 pieces to the bundle.

Protex Corner Bead—An expanded type bead, shipped only in crates of 75 pieces each. Weight, 225 lb. per 1000 ft., 6 to 12-ft. lengths.

Sharon Base Bead—6, 8 and 10-ft. lengths, shipped 12 pieces to the bundle; weight, 160 lb. per 1000 ft.

AMERICAN STEEL & WIRE COMPANY

Triangle Mesh Woven Wire Fabric for Stucco Houses

SALES OFFICES

CHICAGO, 208 South La Salle Street
NEW YORK, 30 Church Street
WORCESTER, 94 Grove Street
BOSTON, 185 Franklin Street
PHILADELPHIA, Widener Building
PITTSBURGH, Frick Building
BUFFALO, 670 Ellicott Street
DETROIT, Foot of First Street
CINCINNATI, Union Trust Building
CLEVELAND, Rockefeller Building
BALTIMORE, 32 South Charles Street
WILKES-BARRE, PA., Miners Bank Building
ST. LOUIS, Liberty Central Trust Co. Building
DALLAS, Praetorian Building
ST. PAUL, Merchants National Bank Building
KANSAS CITY, 417 Grand Avenue
OKLAHOMA CITY, First National Bank Building
BIRMINGHAM, ALA., Brown-Marx Building
MEMPHIS, TENN., Union and Planters Bank Building
DENVER, First National Bank Building
SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, UNITED STATES STEEL PRODUCTS CO., 30 Church Street, New York

PACIFIC COAST REPRESENTATIVES, UNITED STATES STEEL PRODUCTS CO., San Francisco, Los Angeles, Portland, Seattle

Product

TRIANGLE MESH GALVANIZED WOVEN WIRE FABRIC for Stucco Work.

For Wire Rope, see pages 29-33; for Concrete Reinforcement, see pages 40-44; for Electrical Wires and Cables, see pages 2372-2383.

Description and Uses

Triangle Mesh is a woven fabric made of galvanized cold drawn steel wire. It is used for reinforcing cement or magnesite stucco on new buildings or overcoating of old wood, brick or stone structures.

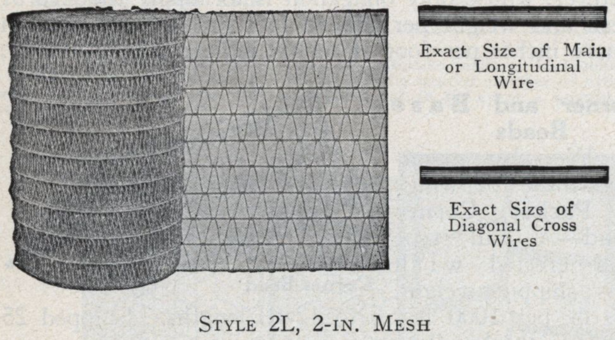
Advantages

Positive reinforcement of the stucco; self-furring; openings of sufficient size to allow the stucco to be pushed through and completely around the wires; galvanized coating insures a lasting construction; diagonal wires act as bracing to the building; low first and installation costs.

Economy

The economy of galvanized Triangle Mesh fabric lies in its efficiency, low first cost, low installation cost and long life.

The cost to the contractor in small lots will average about 22¢ per sq. yd.


Exact Size of Main or Longitudinal Wire
Exact Size of Diagonal Cross Wires

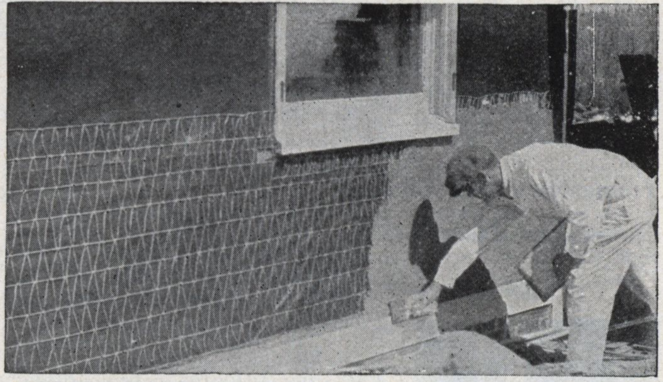
STYLE 2L, 2-IN. MESH

GALVANIZED TRIANGLE MESH WOVEN WIRE REINFORCEMENT FOR STUCCO

Style No.	Longitudinal wires		Cross wires		Approx. weight, lb., per sq. yd.
	Gauge No.	Spacing, in.	Gauge No.	Spacing, in.	
2L	12	4	14	2	2.84
2M	12	4	14	4	1.94

Made regularly in rolls 150 ft. long and 36 or 48 in. wide.

Rolls 150 ft. long, 36 in. wide contain 50 sq. yd. Rolls 150 ft. long, 48 in. wide contain 66⅔ sq. yd.



APPLYING SCRATCH COAT OVER GALVANIZED TRIANGLE MESH, STYLE 2L

Application

Apply over a suitable backing consisting of the usual board sheathing with or without a covering of light weight tarred building paper, a manufactured felt, paper, or gypsum board, or any of the other so-called sheathing or plasterboards.

No furring strips are needed with Triangle Mesh reinforcement because its general construction is such as to insure that the wires are held away from the sheathing.

For fastening to wood sheathing use 1-in. or larger galvanized wire poultry netting or metal lath staples, using at least one staple in every square foot of fabric. Special care should be taken to staple the mesh securely at all corners and all openings. Galvanized staples or nails are preferred for all types of stucco and are absolutely necessary when used with any of the magnesite stuccos.

The wire fabric should extend around the corners, no laps being closer than 8 in. from the corner. The laps along the sides of the sheets should be at least 2 in. The cutting of the fabric can be easily done by means of heavy snips.

Overcoating of Old Structures

If the weatherboarding on the old wood building is in bad condition, it is advisable to have it removed before applying the building paper and the fabric; otherwise staple directly to the old weatherboarding.

For fastening to old siding, use 8d or 10d wire nails driven well into the sheathing or studding and bent over the reinforcement. For fastening to old brick walls, 10d wire nails should be driven well into the mortar joints and bent over the reinforcement.

WICKWIRE SPENCER STEEL COMPANY

Woven Wire Lath

GENERAL OFFICES
41 East 42nd Street
NEW YORK, N. Y.

OFFICES AND WAREHOUSES
WORCESTER, MASS. BUFFALO, N. Y. DETROIT, MICH. CLEVELAND, OHIO CHICAGO, ILL.
LOS ANGELES, CAL. SAN FRANCISCO, CAL. SEATTLE, WASH.

Products

CLINTON WIRE LATH.

For Electrically Welded Wire Fabric for concrete reinforcement, see pages 62-65; for Welded Sheathing, see pages 432-434; for Wire Fencing and Ornamental Metal Work, see page 793.

Clinton Wire Lath

Clinton wire lath has been the recognized standard of quality for over half a century and is the most efficient and trustworthy lathing material in use at the present time.

The Clinton Wire Cloth Company (WICKWIRE SPENCER STEEL COMPANY, INC., successor), the originator of wire cloth weaving, was the first concern to engage in the manufacture of fireproof lath.

Soon after the invention of power looms for the weaving of woolens and cotton, the Clinton Wire Cloth Company perfected a form of loom for weaving wire and entered into the manufacture of their wire lath. This woven wire mesh was the first efficient form of metal fireproofing ever used. It was used for fireproofing purposes as early as 1856, and many buildings are now standing which were fireproofed with this material at that time.

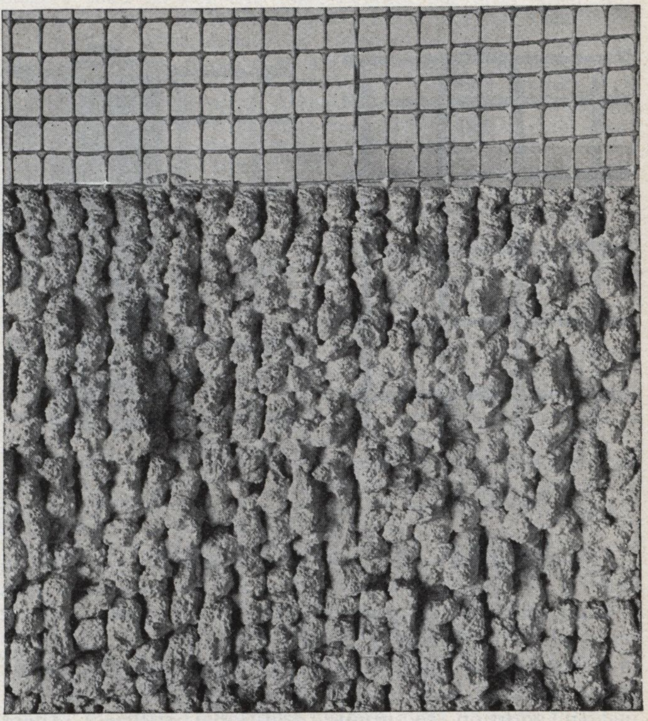
Wire versus Sheet Metal—A drawn steel wire when compared with a sheet metal is, in the matter of strength and general quality of material, a superior product. The wire, which is made by being drawn through a die, is, during its manufacture, subjected to a high tensile stress. This drawing and working of the material renders the wire a fibrous material of uniform quality and for this reason it is stronger and more reliable than sheet metal, which is necessarily of an inferior grade and which suffers more or less injury through the process of cold cutting and expansion.

Perfect Key—The primary function of any lathing material is to serve as a foundation to grip and hold mortar. It is the key or the clinch of the backplaster which actually determines the efficiency of the plastered surface.

To obtain the best results it is not sufficient to have isolated portions of mortar here and there pushed through and turned on the reverse side of the lath, as is obtained with a great many types of metal lath. In order to insure substantial and permanent construction, it is absolutely essential that the lath be actually embedded in the body of the plaster. Without a thorough covering of backplaster, air and moisture will in time attack the metal and slow but sure disintegration will result.

In view of the ease with which mortar will pass over and around the small circular strands of a wire mesh with no flat or inclined surfaces to deflect or obstruct its passages, Clinton lath enables plaster to form a more perfect key than can be obtained with any other type of lath.

Quantity of Plaster—This perfect key does not by any means indicate that wire lath will waste plaster. All metal which enters into the structural elements of a building must be protected against rust and corrosion. In the case of a metal lath it is this backplaster, this key, this rear side covering, which must be relied upon to offer the necessary protection to the lath. The claim made by some manufacturers that their lath saves mortar is in itself an admission of the fact that a thorough and satisfactory key is not obtained. Naturally any type of lath which permits plaster to pass through and be turned here and there at isolated spots on the reverse side of the lath will use less plaster than one which permits the plaster to thoroughly cover the metal.



THE KEY OF CLINTON WIRE LATH

It must be remembered that this rear side of the plastered surface is inaccessible; it can not be reached after the front side has been plastered, and it is consequently necessary to rely upon the plaster that works through and forms the key to offer the necessary protection to the metal on the rear side of the wall.

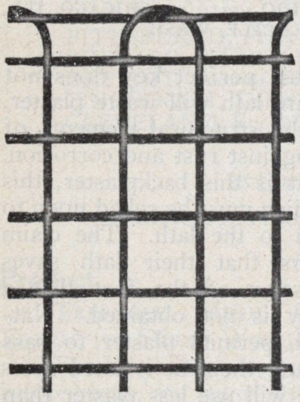
If good work is desired, plaster must be used and Clinton wire lath will require absolutely no more plaster than will be necessary on any other type of metal lath used in such a way as to insure good first class and reliable construction.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

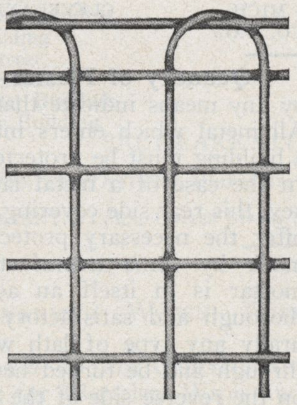
Continued on next page

Stock Grades and Sizes of Clinton Wire Lath

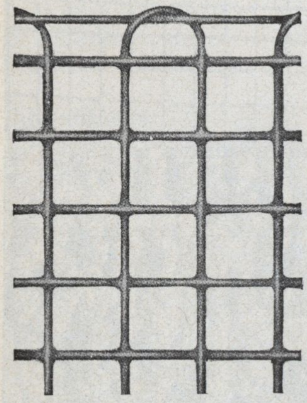
Mesh and Gauge—All stock grades of Clinton wire lath are woven from No. 18 to No. 21 Washburn & Moen gauge wire with 2 and 2½ meshes per lineal inch in each direction. In Clinton lath the gauge of wire is always correctly tagged, thus showing the actual size of wire used.



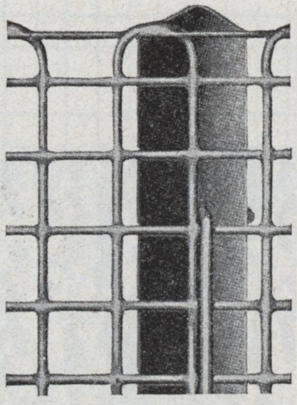
Plain Japanned Wire Lath
2½x2½ mesh



Plain Galvanized Wire Lath
2x2 mesh



Plain Galvanized Wire Lath
2½x2½ mesh



Stiffened Galvanized Wire Lath
2½x2½ mesh

V-stiffeners—In cases where special rigidity is desired or where furring strips are widely separated, Clinton lath may be provided with V-stiffeners. These are rigid V-shaped ribs of No. 24 gauge steel securely fastened to the wires and extending across the fabric at intervals of 8 in.

In addition to giving additional stiffness, these V-stiffeners also afford an offset of ⅜ in. from the supports to which the lath is attached. The V-stiffeners are attached to the wire by flat steel clips which hold them rigidly in position. The V-stiffeners may be utilized as furring strips, thus enabling stiffened lath to be applied directly to flat surfaces with sufficient clearance behind the wire to establish a satisfactory key for the plaster.

Japanned Lath—All sizes of Clinton lath, either plain or stiffened, may be obtained either japanned or galvanized. Japanning, while cheaper than galvanizing, affords for average interior construction a thoroughly satisfactory and efficient protective covering. If, however, it is desired to use the best that the market affords, the galvanized grade should be used.

Galvanized-after-woven Lath—Clinton lath, either plain or stiffened, may be obtained in the grade known as "galvanized-after-woven."

This process of galvanizing after the mesh is formed increases the rigidity of the fabric as a result of the soldering action of the galvanizing fluid at the points where the wires cross each other. This grade of material should always be used for exterior construction where the work is subjected to severe climatic conditions.

Size of Rolls—Clinton V-stiffened lath, either japanned or galvanized-after-woven, is furnished in rolls 150 ft. long.

Clinton plain lath, (i.e., lath without stiffeners) either japanned or galvanized-after-woven, is furnished in rolls 150 ft. long.

The stock width of Clinton lath, either plain or stiffened, is actually 36 in. Thus a 150-ft. roll of Clinton lath actually contains 50 sq. yd.

Special Grades and Sizes—Clinton wire lath may, upon special order, be obtained with various combinations of mesh and gauge other than those mentioned under "Stock Grades and Sizes."

SHIPPING WEIGHTS AND DIMENSIONS ONE ROLL CLINTON WIRE LATH*

Mesh §	Gauge	Plain Lath				Stiffened Lath			
		Painted		Galvanized		Painted		Galvanized	
		Wgt., lb.	Dia., in.	Wgt., lb.	Dia., in.	Wgt., lb.	Dia., in.	Wgt., lb.	Dia., in.
2	18	126	13	160	14	170	19	220	21
2	19	98	13	122	13	142	18	182	20
2	20	72	12	105	12	116	16	165	20
2½	18	161	13	203	14	203	19	263	21
2½	19	124	13	158	14	165	18	218	20
2½	20	90	13	124	13	135	16	188	20
2½	21	75	13	105	13	120	15	165	19

*All lath 36 in. wide; i.e., height of all rolls 36 in.
§Meshes per lineal inch in each direction.

WIRE LACING AND WIRE STAPLES REQUIRED TO APPLY 100 SQ. YD. OF CLINTON WIRE LATH

Spacing of furring, in. c. to c.	Plain Lath		V-stiffened Lath	
	No. 18 galvanized wire lacing, lb.	¾-in. No. 14 galvanized wire staples, lb.	No. 18 galvanized wire lacing, lb.	1¼-in. No. 13 galvanized wire staples, lb.
12	6	4	5½	9½
14	5	3½	4½	8
16	4½	2	4	7
18	....	....	3½	6

Proper Grade of Clinton Wire Lath to Use

As to the proper grade of lath to be used in any given case, that is, whether plain or stiffened, it may be said that this usually depends upon the spacing of the furring or the supports to which the lath is attached. In general, plain lath can be used with perfect satisfaction when the furring members are spaced 12 in., and in some cases even 16 in., whereas the stiffened type should always be used when the supports are more than 16 in. apart.

As to the proper size of wire to be used, the company would in general recommend, for ordinary average construction with 12-in. spacing of furring, the use of a No. 19 gauge wire when the lath is plain, while a No. 18 gauge may be used in special ceilings or cornices which are slightly heavier than usual or in other cases where it is desired to increase the spacing of furring to 14 or 16 in. If, however, the lath is provided with V-stiffeners, which are in reality small, secondary furring strips on 8-in. centers, a No. 20 gauge wire is sufficient. In the case of the galvanized-after-woven grade slightly smaller sizes may be used with perfect satisfaction; as, for instance, a No. 20 gauge when plain and a No. 21 gauge when V-stiffened.

Continued on next page

Specifications for Interior Furring and Lathing

Wire Lath—The lath throughout shall consist of No. 20 gauge Clinton Wire Lath woven with 2½ meshes per inch. All lath shall be thoroughly galvanized-after-woven. (If galvanizing is not desired, substitute word "japanned" for words "galvanized-after-woven.") The lath shall be provided with V-stiffening ribs, the depth of which shall be not less than ⅜ in. beyond the face of the lath. These ribs shall be securely clamped to the transverse wires, and shall extend across the full width of the fabric at intervals not exceeding 8 in. (These last two sentences may be omitted if the stiffened type is not desired.)

Laps—All lath shall be lapped at least 1 in. where end joints are made, and at the sides of the sheet shall be lapped and tied in such a manner as to provide secure and unbroken continuity to the lathed surface.

Wire Lacing—Lath shall be securely tied or laced to furring, as hereinafter specified, with No. 18 gauge annealed galvanized wire, and the ends of all ties shall be secured by a double turn and bent back flush with the face of the lath.

How to Apply—In applying wire lath to wooden supports either against sheathing or to bare studs in walls and partitions, or against joists as in ceilings, the lath shall be securely stapled in place with galvanized wire staples, driven down so as to bring the lath to a secure bearing against the supporting background.

In applying plain lath to wooden furring, it shall be stapled along each stud or joist.

In case stiffened lath is applied directly to sheathing, each stiffener shall be stapled both at the sides and at the center of the sheet.

Workmanship—All lath shall be tightly drawn with proper tools and shall finish smooth and true to the required lines without bag, bulge or sag.

All nuts shall be tightly drawn and all lath securely wired before plastering is begun.

All furring, cross-furring, studs, frames, brackets and lath shall be true, exact and rigid, and all necessary supports, connections and attachments shall be supplied and erected as required, leaving all surfaces in proper condition to receive the plaster.

Ceilings—*Size of Furring*—Furring for ceilings shall be done with suitable channels, angles, tees, or flats of such size and strength as will adequately support the depending loads. All furring and supports for same shall be of sufficient strength to sustain a load of at least 10 lbs. per sq. ft. of plastered surface, and all furring members shall have such stiffness that they will not deflect more than 1/360 of the span under the final load which they are required to sustain.

Furring bars shall in no case be less than ¾-in. channels, or their equivalent, for spans up to 5 ft.; nor less than 1x⅜x⅛-in. channels, or other approved sections of equivalent strength, for spans up to 7 ft.

For spans exceeding 7 ft., the sectional area and strength of furring bars shall either be increased in proper proportion or they shall be provided with intermediate supports consisting of clips or hangers securely fastened to or anchored in the floor construction above.

In all cases where heavy ornamentation or other special attachments are called for, special provision shall be made to sustain the loads imposed.

Suspended Ceilings—When ceilings extend more than 6 in. below the floor beams, they shall be considered as suspended ceilings and shall be properly cross-furred by means of running bars which shall receive and support the furring bars.

Running Bars—Suspended ceilings shall be provided with continuous running bars properly suspended by hangers from the beams or floor construction as may be required.

These running bars, which shall be spaced not more than 5 ft. apart, shall be of such size and strength as to adequately support the loads imposed, but shall in no case be less than 1½x¼-in. flat steel or other approved shapes of equivalent size and strength.

Connection of Furring Bars to Running Bars—In suspended ceilings the furring bars shall be securely bolted or clipped to or passed through the running bars. If running bars and furring bars are bolt-connected, the bolts for such connections shall be ¼ in. in diameter, or if hairpin clips are used they shall be of No. 9 annealed galvanized wire and shall pass up on both sides of the furring bars and be securely hooked over the running bars.

If furring bars are passed through running bars, they shall fit snug in the openings provided to receive them in order to prevent undue play or movement of the bars.

Spacing of Furring Bars—The spacing of furring bars in clipped and suspended ceilings shall depend upon the type of lath used, but shall not be more than 12 in. when the lath is plain nor more than 18 in. when the lath is provided with V-stiffeners.

Clips—Clips used for the purpose of receiving and supporting furring bars for ceilings shall be made from not less than 1x⅛-in. flat steel, but must in all cases be of sufficient strength to sustain the loads imposed, and of such fabrication and design as will meet the approval of the architect. All clips attached to steel beams shall be of the forked or clamped type and must be securely fastened over both sides of the bottom flange of the beam.

Unless other secure and approved means be provided for receiving and supporting furring bars, the lower ends of clips shall be punched for and provided with ¼-in. diameter bolts for attaching furring to same.

Hangers—In suspended ceilings the main running bars shall be suspended from the floor construction above by means of hangers which shall be not less than 1x3/16-in. flat steel, but which in all cases shall be of such strength, fabrication and design as to adequately support the loads imposed. All hangers attaching to steel beams shall be of such a type that they will securely clamp on both sides of the bottom flange. At their lower ends, hangers shall be punched for and provided with ⅜-in. diameter bolts for securing the furring to same and shall be of varying lengths so that any variation may be taken up and the wire lath ceiling made firm and secure to the proper lines.

Auxiliary hangers shall be provided for furring bars in clipped ceilings and for running bars in suspended ceilings at points where the strength and rigidity of the construction requires intermediate supports between floor beams. These hangers shall be not less than 1x⅛-in. flat steel when supporting furring bars as in clipped ceilings, nor less than 1x3/16-in. flat steel when supporting running bars as in suspended ceilings, but must in all cases be of such size and strength as is required to sustain the depending loads. Such hangers shall be provided at their upper ends with suitable means for attaching to or anchoring in the floor construction, and at their lower ends shall be punched for and provided with suitable bolts for connecting furring to same. These bolts shall be of ¼-in. diameter for hangers supporting furring bars as in clipped ceilings and of ⅜-in. diameter for hangers supporting running bars as in suspended ceilings.

Connection to Concrete or Wooden Beams—All hangers and clips which do not attach to steel beams must in the case of concrete beams be securely anchored therein or in the case of wooden beams be securely spiked thereto.

Partitions—*Size of Studs*—All studding for partitions shall consist of suitable channels, angles, tees or flats of such size and strength as will produce and maintain a stiff and rigid partition wall, but shall in no case be less than ¾-in. channels or other approved shapes of equivalent size and strength.

Arrangement of Studs—In solid partitions the furring shall consist of a single line of vertical studs set plumb and true to the proper lines and of such size as will give the required thickness to the finished partition wall.

In hollow partitions the furring may consist either of a single or a double line of vertical studs set plumb and true to the proper lines.

If a single line of studs be used, they shall be of such strength as will provide the required stiffness and rigidity of construction and of such width or depth as will give the required thickness to the finished partition wall.

If a double line of studs be used, the two lines shall at all times be maintained the proper distance apart, in order to obtain the required air space within the partition, and also give the proper thickness to the finished partition.

Supports for Studs—All studs shall be securely fastened to the floor and ceiling construction by bent knees, slotted clips or runner plates of approved type.

Runner Plates—Where runner plates are used, they shall be not less than 1x⅛-in. flat steel or 1x1x⅛-in. angles, but must, in any case, be of sufficient size, strength and width to receive and hold the studs in such a manner as to obtain rigid and secure supports for same.

Runner plates must be securely clamped or fastened to the floor beams by suitable attachments or must be securely connected to floor and ceiling construction by means of expansion bolts or anchor nails of approved type.

If a double line of studs be used, and if these are connected top and bottom to runner plates, two lines of such plates shall be provided both top and bottom—that is, one for each line of studs; and these plates shall be absolutely parallel and shall be maintained the proper distance apart.

Continued on next page

Separators—When two lines of studs are used, all studs, in addition to being bolted or otherwise securely connected to the ceiling and floor construction, must be braced and stiffened also by means of separators connecting the studs of one line with the corresponding studs of the other.

These separators which shall not be less than 1x⅛-in. flat steel shall be spaced at intervals of not more than 5 ft. vertically, and shall be securely bolted to the studs with ¼-in. diameter bolts.

Frames for Openings—Frames for doors, windows and other openings shall consist of suitable channels, angles, tees or other approved shapes assembled in a rigid manner and securely bolted in place.

All frames for openings must be true in size and shape, must have correct location and position as indicated on the plans or as may be directed by the architect and shall be provided with 3/16-in. round holes punched 18 in. apart to receive bolts for attaching to the wooden bucks. (See "Carpenter Work.")

Spacing of Studs—The spacing of the studs in a direction longitudinal with the length of the partition wall shall depend upon the type of lath used, but in no case shall such spacing be more than 16 in. when plain lath is used, nor more than 18 in. when the lath is provided with V-stiffeners.

False Columns—*Size and Arrangement of Studs*—Furring for false columns shall consist of suitable channels, angles, tees, flats or built-up sections of such strength and arrangement as will provide a firm and secure foundation for the plaster or ornamental covering.

In all false columns each column shall enclose at least four vertical studs which shall in no case be smaller than 1x1x⅛-in. angles or other approved shapes of equivalent size and strength. These longitudinal studs shall be set true and plumb and shall be accurately spaced and arranged in such a way as to conform to the general outline of the finished column.

False Beams and Cornices—Furring for false beams and cornices shall consist of steel brackets accurately bent and shaped so as to conform to the general outline of the finished beam or cornice. These brackets shall be formed with channels, angles, tees or flats of proper size and strength to adequately support the depending load, but shall in no case be formed with less than ¾-in. channels or other approved shapes of equivalent size and strength.

All brackets must be formed so as to constitute rigid and secure frames for supporting the plaster covering, and shall be securely bolted top and bottom to the longitudinal supporting rails with ¼-in. diameter bolts.

Longitudinal Rails—Extending at right angles to the brackets and in a direction longitudinal with the beams or cornice which is being furred, there shall be provided a top and bottom rail which shall be of proper size and strength to receive and support the bars of which the brackets are formed. These rails shall in no case be less than 1x3/16-in. flat steel, or other approved shapes of equivalent size and strength, and shall be securely connected to or supported from the beams, walls or ceilings by means of clips, bolts or hangers.

Chases, Air Ducts, etc.—All pipe chases, air ducts and other spaces as may be required, and all surfaces of iron or steel coming within spaces to be plastered, shall be properly furred and lathed.

Without Furring—All such openings or spaces as do not exceed 2 ft. in width may be lathed by the direct application of Clinton V-Stiffened Wire Lath without the use of any furring.

In such cases the lath shall be applied in such a way that the V-stiffening ribs span across the space or opening with sufficient lap on either side and with each stiffener secured on each side with staples or anchor nails of approved type.

With Furring—Openings not less than 2 ft. nor more than 4 ft. in width shall have a 1x1x⅛-in. angle, set along each side with the outstanding leg flush with the wall surface and the other leg secured to the wall with expansion bolts or anchor nails of approved type.

Extending across the opening and bolted with ¼-in. diameter bolts to the outstanding leg of each angle stud there shall be provided furring strips which shall be not less than 1x3/16-in. flat steel, but must, in any case, have such stiffness and rigidity as to offer adequate support to the lath and plaster.

The vertical spacing of these furring strips shall depend upon the type of lath used, but shall not in any case be more than 16 in. if plain lath is used, nor more than 18 in. if the lath is provided with V-stiffeners.

Lath Adjoining Masonry—All lath shall be lapped at least 4 in. over all adjoining masonry and shall be properly secured thereto by galvanized staples or anchor nails of approved type.

Joints—Where materials of different kind come together such as the joining of brick to gypsum, or gypsum to terra cotta, etc., such joints shall be covered with a strip of Clinton Wire Lath which shall extend 6 in. on each side of the joint and which shall be properly secured in place by galvanized staples or anchor nails of approved type.

Miscellaneous—It is to be understood that all miscellaneous furring and lathing as indicated on the plans, but which may not herein be specifically described, shall be done in a workmanlike manner conforming in all respects with the general scope and intent of these specifications, and in such degree of detail and exactness as will meet the approval of the architect.

Specifications for Exterior Furring and Lathing

General Requirements—*Intent*—It is the intent of this specification to include the furnishing of all labor, materials, apparatus, ladders, scaffolding, hoisting and cartage necessary to supply, erect and complete all waterproofing, furring and lathing required to construct a substantial and proper foundation for exterior plastering.

Wire Lath—The lath throughout shall consist of Clinton Wire Lath woven with 2½ meshes per lineal inch and of size and type as hereinafter specified.

Galvanizing—All lath used for supporting exterior plaster shall be thoroughly galvanized-after-woven, and no type of painted or dipped lath other than that which is galvanized will be accepted when used to support exterior plaster.

Laps—All lath shall be lapped at least 1 in. where end joints are made and these joints shall be properly alternated or broken.

Side joints shall be properly lapped and stapled in such a manner as to provide secure and unbroken continuity to the lathed surface.

Staples—All lath applied to wooden supports shall be properly secured thereto with Clinton Galvanized Wire Staples as hereinafter specified.

Walls with Wooden Sheathing—Where the wall framing is constructed with wooden sheathing, the exterior surface of the sheathing shall be waterproofed with an approved quality of 3-ply waterproof building paper of such thickness that 8 sq. ft. will weigh 1 lb.

Strips of the same paper as herewith specified shall extend around all openings and shall lap the flashings and be securely cemented thereto with approved liquid tar or asphalt.

Furring Strips—After the sheathing is thoroughly waterproofed as hereinbefore specified, ¾-in. wooden furring strips shall be set vertically at 12-in. intervals. These furring strips shall be securely nailed in place and leveled and plumbed in such a way as to provide a proper and secure foundation to receive the lath.

Wire Lath—Over the furring there shall then be applied No. 19 gauge Clinton Galvanized Wire Lath.

Application of Lath—The lath shall be tightly drawn and lapped as hereinbefore specified and shall be securely stapled at 6-in. intervals along each furring strip with ¾-in. No. 14 round top Clinton Galvanized Wire Staples.

Special Stiffened Lath without Wooden Furring—Wooden furring strips as hereinbefore specified may be omitted by using Clinton Wire Lath provided with special ⅜-in. V-stiffeners. The lath for this purpose shall be No. 20 gauge Clinton Galvanized Wire Lath provided with special V-stiffening ribs, the depth of which shall be not less than ⅜ in. beyond the face of the lath.

Walls without Sheathing—*Waterproofing*—Where the wall framing consists of wooden studs without sheathing, the exterior face of each stud and the sides of each stud to a depth of not less than 1 in., or to such depth as may come in contact with the plaster, shall be waterproofed by thoroughly painting with approved liquid tar or asphalt compound.

Wire Lath—After the studs have been properly waterproofed they shall be covered with No. 20 gauge Clinton Galvanized Wire Lath, provided with standard V-stiffening ribs, the depth of which shall be not less than ⅜ in. beyond the face of the lath.

These ribs shall be securely clamped to the transverse wires and shall extend across the full width of the fabric at intervals not exceeding 8 in.

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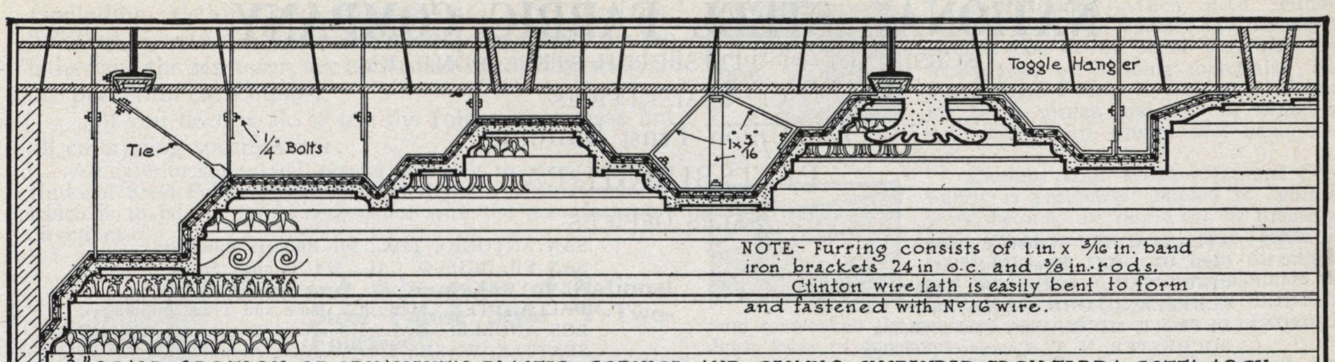
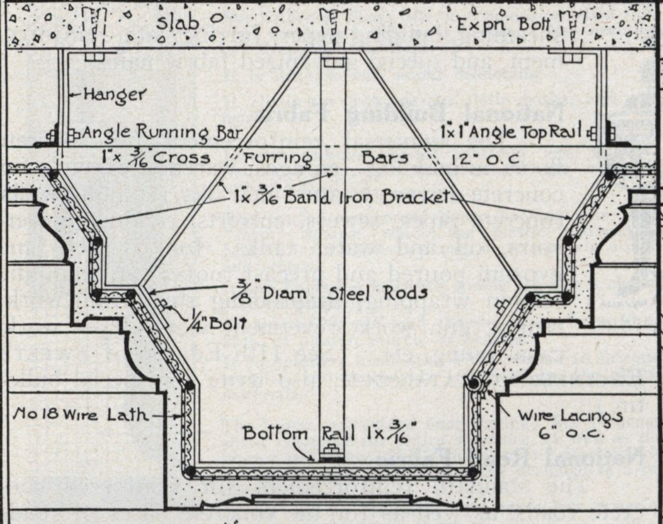

Toggle Hanger
Tie
1/4" Bolts
1x3/16"

NOTE - Furring consists of 1 in. x 3/16 in. band iron brackets 24 in o.c. and 3/8 in. rods.
Clinton wire lath is easily bent to form and fastened with No 16 wire.

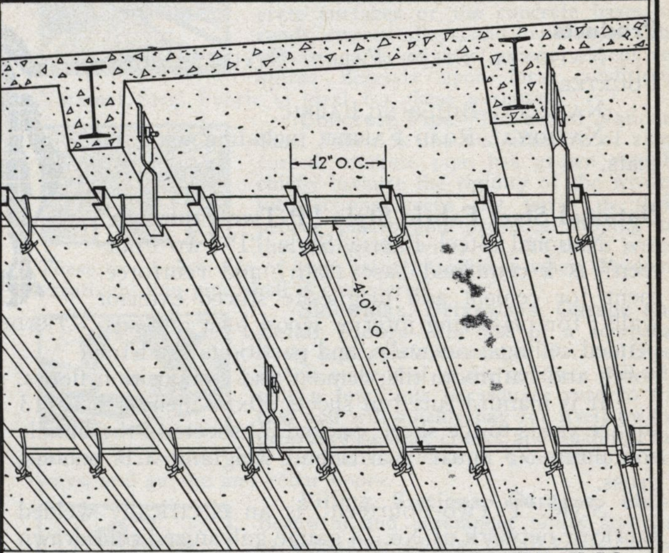
3/4" SCALE SECTION OF ORNAMENTAL PLASTER CORNICE AND CEILING SUSPENDED FROM TERRA COTTA ARCH.

METHODS OF CONSTRUCTION FOR FURRED BEAMS AND CORNICES

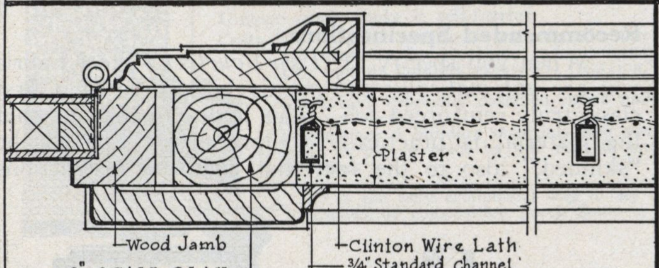

Slab
Expn Bolt
Hanger
Angle Running Bar
1x1" Angle Top Rail
1"x 3/16" Cross Furring Bars 12" o.c.
1x 3/16 Band Iron Bracket
3/8" Diam Steel Rods
1/4" Bolt
No 18 Wire Lath
Wire Lacings 6" o.c.
Bottom Rail 1x 3/16"

1½ SCALE SECTION

FALSE BEAM WORK SUSPENDED FROM REINFORCED CONCRETE SLAB

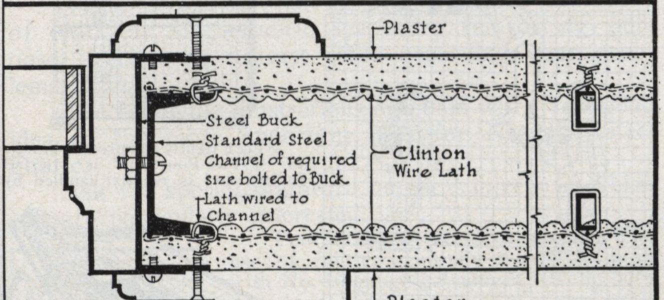


PERSPECTIVE OF FRAMING FOR HUNG CEILINGS


Plaster
Wood Jamb
Clinton Wire Lath
3/4" Standard Channel
Wood Buck

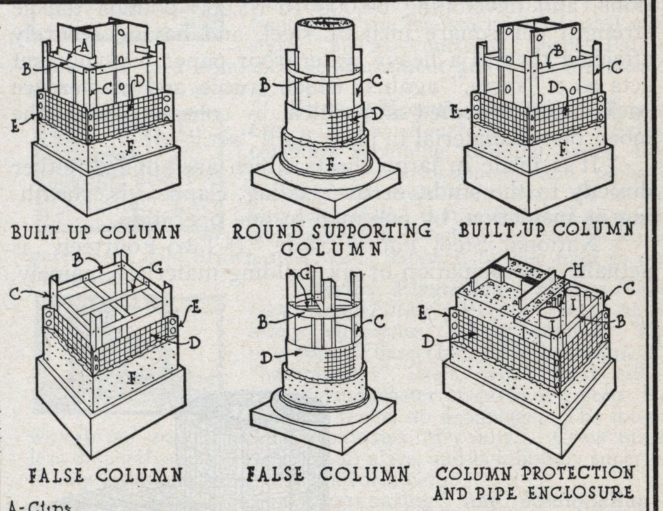
3" SCALE PLAN

TWO INCH SOLID PARTITION AT DOOR OPENING


Plaster
Steel Buck
Standard Steel Channel of required size bolted to Buck
Clinton Wire Lath
Lath wired to Channel
Plaster

3" SCALE PLAN

HOLLOW PARTITION WITH HOLLOW METAL TRIM


A
B
C
D
E
F
G
H
I
BUILT UP COLUMN
ROUND SUPPORTING COLUMN
BUILT UP COLUMN
FALSE COLUMN
FALSE COLUMN
COLUMN PROTECTION AND PIPE ENCLOSURE

A-Clips.
B-3/16x1" Furrings 2'-0" o.c.
C-1½"x1½" Standard steel angles.
D-Clinton wire lath.
E-Metal corner beads.
F-Plaster
G-3/16x1" Strap stiffeners
H-Electric conduits
I-Pipes

Clinton wire lath serves as a protection to the fireproofing of steel columns, preventing the cinder concrete from being washed away by streams of water in case of fire.

Pipes and conduits should be run in a furred space entirely outside of the necessary column protection.

TYPICAL METHODS OF COLUMN PROTECTION

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

DETAILS SHOWING USE OF METAL LATH IN FIREPROOF CONSTRUCTION

SCALE 3/4, 1½ & 3" EQUALS 1'-0"
DATE-AUG: 20
DRWG B1

NATIONAL STEEL FABRIC COMPANY

SUBSIDIARY OF PITTSBURGH STEEL COMPANY

GENERAL OFFICES
728 Union Trust Building
PITTSBURGH, PA.

SALES OFFICES

ATLANTA, GA., Walton Building
CHICAGO, ILL., Straus Building
CINCINNATI, OHIO, Dixie Terminal Building
CLEVELAND, OHIO, Hanna Annex Building
DETROIT, MICH., Dime Bank Building
ROCHESTER, N. Y., Commerce Building
ST. LOUIS, MO., Railway Exchange Building
PHILADELPHIA, PA., Harrison Building
SAN ANTONIO, TEX., 501 Builders Building
SAN FRANCISCO, CAL., 274 Brannan Street
NEW YORK, N. Y., 523 West 33rd Street
DALLAS, TEX., Mercantile Bank and Trust Building
LOS ANGELES, CAL., 1736 Naud Street
SEATTLE, WASH., 2700 Westlake Avenue
BOSTON, MASS., 185 Devonshire Street
PORTLAND, ORE., 350 East Ankeny Street

Products

National Steel Fabric Style "P-Two-Fourteen."

National Building Fabric.

National Road Fabric, including wire rod mats.

SIR FABRIC
NATIONAL
STEEL
FABRIC
TRADE MARK
TRADE-MARK

National Steel Fabric Style "P-Two-Fourteen"

National Steel Fabric Style "P-Two-Fourteen" is a combined base (lath) and reinforcement for cement and magnesite stucco exterior walls; for plastering interior wood joist and suspended ceilings, sidewalls, and partitions; and for porch and bathroom tile, cement and composition floors.

It is manufactured in sheets 50x50 inches; 1 12/13 square yards to the sheet; packed 39 sheets to the bundle containing 75 square yards and weighing 220 pounds, gross.

Style "P-Two-Fourteen" is an electrically welded fabric or network of No. 14 gauge galvanized cold drawn steel wires, having equal reinforcing value in all directions, and developing 60,000 to 85,000 pounds tensile strength per square inch of steel, and having securely attached thereto a heavy waterproof paper backing that acts as a "form," against which stucco and plaster are packed and densified and which, by cohesion, holds the moist plastic material in place until "set."

It is made in large sheets which are applied, either directly to the studs, or over siding, clapboards, sheathing or insulation, by one man in one operation.

National Steel Fabric Style "P-Two-Fourteen" is actually a combination of six building materials; namely, sheathing, building paper, furring, lath, reinforcement, and special galvanized fabric nails.

National Building Fabric

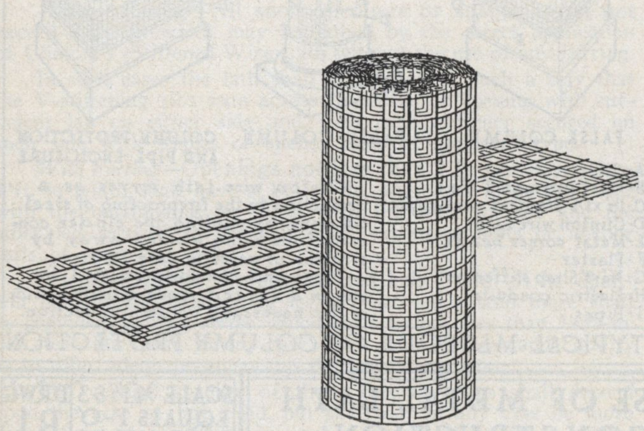
The universal reinforcement for concrete floors in buildings, garages, warehouses, etc.; for concrete driveways and sidewalks, retaining walls, concrete pipes, sewers, culverts, conduits, reservoirs, oil and water tanks; for concrete and gypsum poured and precast roofs; for beam and column wrapping, fireproofing steel framework, cement gun work, revetment work, levee work, canal lining, etc. (See 11th Edition of Sweet's Engineering Catalogue; also write for special bulletin.)

National Road Fabric

The standard reinforcement for reinforced concrete roads, as well as for the concrete bases of roads having brick, asphalt, and other surfaces. (Write for special bulletins.)

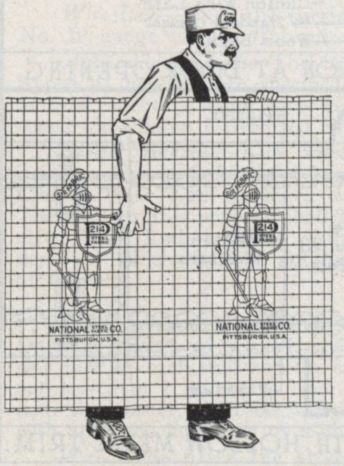
Recommended Specifications

When you specify *"P-Two-Fourteen"* Steel Fabric you are *automatically* and positively assured of a first class, truly reinforced job. This is due to the fact that the material is practically foolproof and can not be "skinned," also to the fact that complete instructions

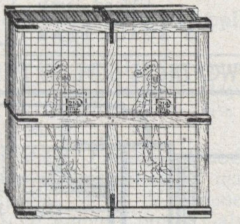


National Steel Fabric

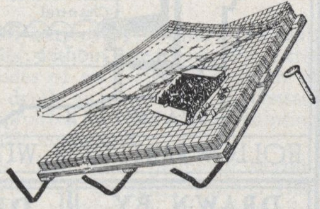
All styles of National Steel Fabric (with the exception of "P-Two-Fourteen") are furnished in rolls or sheets, and in plain or galvanized finish


NATIONAL CO.
PITTSBURGH, U.S.A.
NATIONAL CO.
PITTSBURGH, U.S.A.

"P-Two-Fourteen" Steel Fabric is furnished in sheets 50x50 inches, which are applied by one man in one operation



Each tightly compressed bundle of "P-Two-Fourteen" is 51x51x8 inches, and is readily handled by one man



Each bundle of "P-Two-Fourteen" contains 39 sheets (75 square yards), sufficient galvanized special fabric nails, and full directions for lathing and plastering

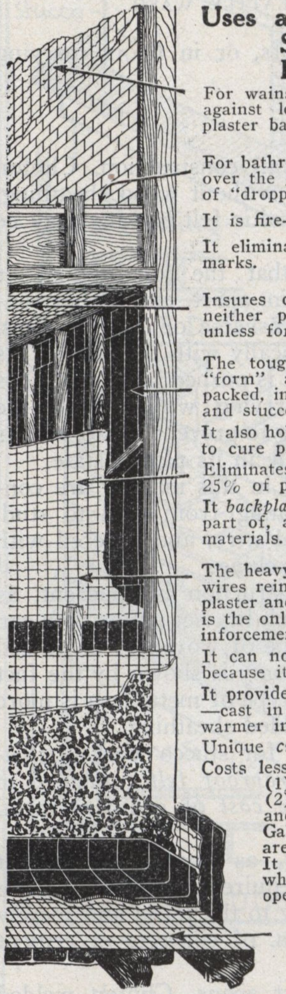
"P-Two-Fourteen"

Continued on next page

(including details and illustrations) for applying *"P-Two-Fourteen"* Steel Fabric, addressed both to the lather and the plasterer, are contained in envelopes which are packed in each bundle.

All you need to do is use the following concise but all embracing specification:

All exterior stucco and interior plaster is to be applied over National Steel Fabric Reinforcement Style *"P-Two-Fourteen,"* which is to be put on in accordance with the manufacturer's directions.



Uses and Advantages of National Steel Fabric Style "P-Two-Fourteen"

For wainscots, tile walls, and mantels—it insures against loose and broken tiles by keeping the plaster background intact.

For bathroom floors, tile or composition—laid right over the joists; eliminates "forms," also necessity of "dropping" the floor.

It is fire-safe and sound deadening.

It eliminates dust streaks, lath marks, and rust marks.

Insures ceilings against cracking and falling—neither plaster nor reinforcement can come off unless forced off.

The tough, waterproof paper backing acts as a "form" against which the plastic material is packed, insuring more dense, more uniform plaster and stucco.

It also holds the moisture, giving the slab a chance to cure properly.

Eliminates "keys," and thereby saves from 10 to 25% of plaster, stucco, or cement.

It *backplasters* itself—the wires become an integral part of, and thoroughly embedded in, the plastic materials.

The heavy, *galvanized* (non-rusting) No. 14 gauge wires reinforce the entire structure, as well as the plaster and stucco. "P-Two-Fourteen" Steel Fabric is the only lath that is primarily designed as a reinforcement.

It can not be "skinned," yet takes less material because it eliminates "keys."

It provides monolithic one-piece walls and ceilings—cast in place; no joints or cracks—therefore, warmer in winter and cooler in summer.

Unique *crimps* make it self-furring.

Costs less in place because it entirely eliminates (1) necessity for sheathing and insulation, (2) separate building paper, (3) "furring," and (4) lath.

Galvanized, especially designed fabric nails are furnished.

It combines 6 building materials into one, which is put in place by one man in one operation.

It is the only economical way to lay a cement or composition porch floor.

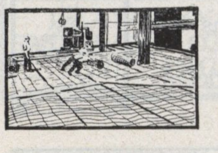
Summary of Reinforcements

There is a style (that is, proper weight and area) of National Steel Fabric for every reinforcing purpose. Write our nearest office regarding your problems.

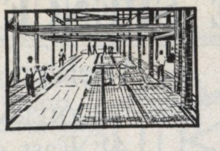
The following illustrations and data will give a good idea of the more important uses for National Steel Fabric.

Ask for special literature on the subjects in which you are particularly interested.

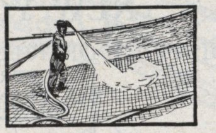
Temperature Reinforcement—The use of fabric, generally a 6x6-in. mesh with No. 10 gauge galvanized wire in both directions (our style (*"C-C-Ten-Ten"*), as a temperature reinforcement in the top or finish layer of cement or terrazzo office building floors is standard practice and recommended by leading architects.



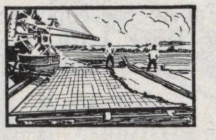
Floor Slabs—Reinforced concrete floor slabs are often most economically designed by using a fabric having main members spaced comparatively close in the load bearing directions. There are standard styles of National Steel Fabric for this purpose.



Fireproofing—When used without suitable protection against fire, structural steel is one of the most unreliable and treacherous of building materials. National Steel Fabric is peculiarly adapted for beam, girder, and column wrapping, and millions of square feet have been used for these purposes.



Cement Gun Work—National Steel Fabric is peculiarly adapted to "gunite" work, because the fabric can be furnished with equal reinforcing value (that is, equal area of steel) in both directions, and the welded intersections eliminate the knobs or ties which, because of their bulk, tend to weaken the required comparatively thin yet extremely dense layer of concrete.



Roads, Pavements, Driveways, etc.—All engineers recognize the necessity for the use of steel reinforcement for the concrete surfaces or the concrete bases of roads, streets, alleys, and driveways. The effective area of steel reinforcement required depends upon local conditions. National Steel Fabric is ideal for these purposes.

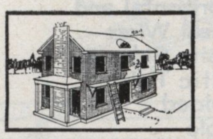
Concrete Pipe—The use of National Steel Fabric in the manufacture of reinforced concrete pipe has grown rapidly chiefly because the rigidity of the welded intersections keeps the wires in their proper places and prevents slipping of the transverse wires on the main wires. These two points are of very great importance when the comparatively thin pipe shell is considered.

Sidewalks, Driveways, Garage and Cellar Floors—The use of a comparatively light reinforcement of National Steel Fabric embedded in the concrete will add only a few cents per square yard to the cost and will quickly pay for itself by the *insurance* against cracks and spalling, the saving in repairs, and the increased life of sidewalks, driveways, and garage and cellar floors.

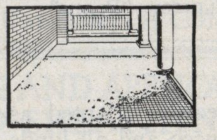
Filling Stations, Garages, etc.—Beautiful and permanent filling stations, garages, and "stands" of all kinds can be erected for *less* cost than even standard wooden frame and clapboard construction, when you use stucco reinforced with style "P-Two-Fourteen" Steel Fabric. This style is a combined reinforcement and base for stucco, plaster, cement, gypsum, etc.

Stucco Houses, Cottages, Hotels, etc.—*"P-Two-Fourteen" Steel Fabric* combines sheathing, building paper, furring, lath, reinforcement, and nails—6 building materials—*into one.* It is the only base (lath) that is designed as a true reinforcement. Made from No. 14 gauge galvanized cold drawn steel wire. Applied by one man in one operation.

Interior Plastering—*"P-Two-Fourteen" Steel Fabric* prevents cracks; absolutely eliminates falling plaster. The only type of base (lath) that *automatically* "backplasters" itself, when used either for interior plaster or exterior stucco. No keys, no waste, no droppings. The tough, waterproof paper backing eliminates "dry-outs." Costs much less than galvanized metal lath in place, and is infinitely superior to any lath, because it is a reinforcement.



"Overcoating" and Remodeling—When used for remodeling and "overcoating" with stucco, *"P-Two-Fourteen" Steel Fabric* is nailed directly to siding, clapboards, and shingles. Also being used on old brick and stone buildings; no rebuilding of window and door frames. The least expensive and most effective method of remodeling.



Porch Floors, Store Entrances, Bathroom Floors, Walls, also Mantels, Hearths, etc.—When used for these purposes, *"P-Two-Fourteen Steel Fabric* becomes a combined *form* and *slab reinforcement.* It is laid right on the joists; eliminates forms, shoring, false floors, and dropping of floors. Will carry safe live loads up to 280 pounds per square foot. The only economical way to lay these light slabs. Cement, tile, composition, or terrazzo finishes can be applied.

WICKWIRE SPENCER STEEL COMPANY

Welded Sheathing

GENERAL OFFICES
41 East 42nd Street
NEW YORK, N. Y.

DISTRICT OFFICES AND WAREHOUSES
WORCESTER, MASS. BUFFALO, N. Y. DETROIT, MICH. CLEVELAND, OHIO CHICAGO, ILL.
LOS ANGELES, CAL. SAN FRANCISCO, CAL. SEATTLE, WASH.

Product

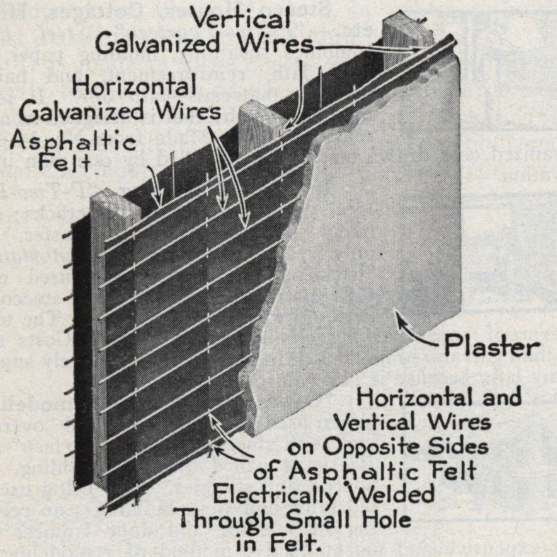
CLINTON WELDED SHEATHING.

For Electrically Welded Wire Fabric for concrete reinforcement, see pages 62-65; for Wire Lath, see pages 425-429; for Wire Fencing and Ornamental Metal Work, see page 793.

Description

Clinton welded sheathing, which consists of a light grade of electrically welded wire fabric provided with a tarred felt backing, is a most economical and efficient lathing for stucco or interior plastering.

This material is manufactured by arranging longitudinal and transverse wires on opposite sides of a sheet of asphaltic felt, and electrically welding them together through very small holes previously punched in the felt at each point where a longitudinal crosses a transverse wire. In this way the asphaltic felt becomes an integral part of the wire mesh, being securely locked and held between the two groups of wires, but at the same time having no physical connection to any of the wires. Thus the longitudinal or so-called "carrying" wires, all of which are arranged on the side of the felt to which the plaster or cement mortar is applied, are entirely unobstructed, and thereby become thoroughly embedded in the body of the plaster, since the felt bulges slightly away from the wires under the pressure of the plasterer's trowel.


Vertical Galvanized Wires
Horizontal Galvanized Wires
Asphaltic Felt
Plaster
Horizontal and Vertical Wires on Opposite Sides of Asphaltic Felt Electrically Welded Through Small Hole in Felt.

DETAILS SHOWING APPLICATION OF CLINTON "PLAIN" WELDED SHEATHING

Uses

Clinton welded sheathing is especially adapted as an inexpensive lathing material for stucco and all kinds of interior plastering; also as a reinforcement for short span concrete slabs, as in roofs, or in floors carrying comparatively light loads.

Advantages

As applied to exterior wall construction, Clinton welded sheathing may be used without wood sheathing, as the wire fabric with its asphaltic felt backing may be stapled directly to the studs.

The lath is placed so that the longitudinal or "carrying" wires, which are 3 in. apart, extend horizontally across the studs; the transverse or "stay" wires, which are 8 in. apart, run vertically with the studs. As the cement mortar is applied, it is pushed back, and keys thoroughly around all the carrying wires; while the asphaltic felt serves as a backing to prevent waste, and as a stop to retain the mortar while in its plastic state.

Exterior walls constructed in this manner are continuous slabs of cement, spanning from stud to stud, reinforced with galvanized steel wire, and covered with an impervious moistureproof backing.

The strength of this construction is apparent, as the reinforcing wires are of much heavier gauge than can be conveniently used in any type of woven or expanded metal lath; while its great economy is shown by the fact that the cost of any acceptable type of metal lath is more than double that of Clinton welded sheathing.

Here is the ideal material for stucco work—*galvanized wire lathing and moistureproof felt* combined in one material at about *half the cost* of ordinary metal lath.

Clinton welded sheathing, as applied to cement roof and floor construction, requires no forms, as the material may be stapled directly to the joists and merely screeded over with 1 to 1½ in. of concrete or cement mortar.

For light loads and short spans, Clinton welded sheathing provides both *forms* and *galvanized wire reinforcement* combined in one material, at about *half the cost* of wood forms in place.

Stock Sizes

Stock grades of Clinton welded sheathing consist of galvanized longitudinal wires of No. 13 Washburn & Moen gauge, spaced 3 in. apart and cross-welded to No. 13 galvanized transverse wires spaced 8 in. apart. Inserted in the wire mesh is a well saturated grade of asphaltic felt. The material is cut into flat sheets 32 in. wide and 8 ft. long, packed in bundles of convenient size and crated for shipment.

Heavier wires and sheets of special size may be obtained upon special order.

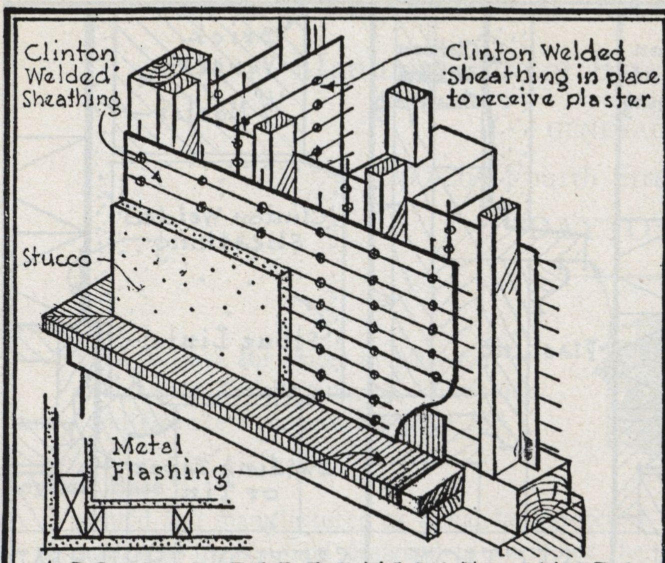
Details

Details of standard constructions are shown on the following two pages.

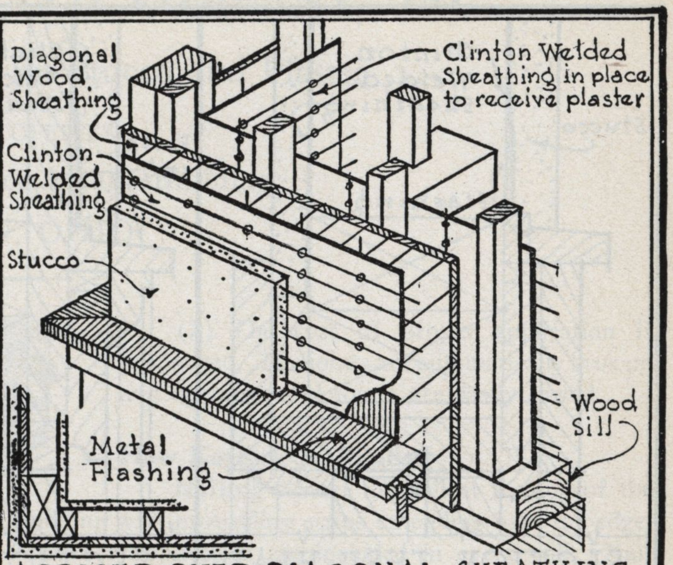
A booklet showing additional details will be sent on request.

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK, N.Y.

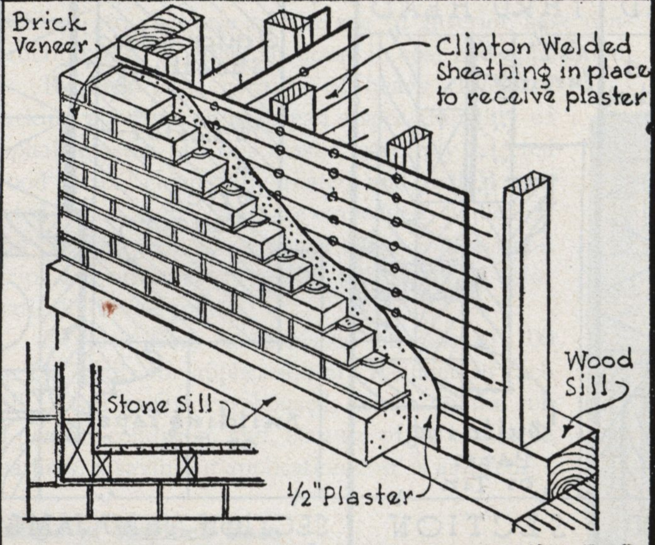
Continued on next page


Clinton Welded Sheathing
Clinton Welded Sheathing in place to receive plaster
Stucco
Metal Flashing

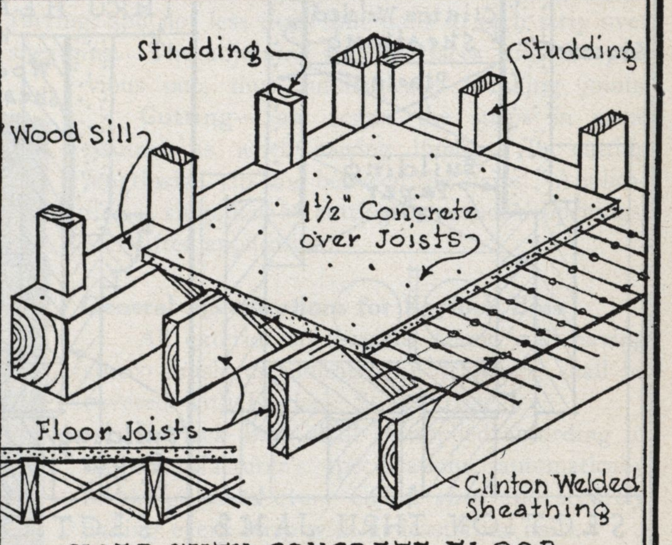
APPLIED DIRECTLY TO STUDS


Diagonal Wood Sheathing
Clinton Welded Sheathing in place to receive plaster
Clinton Welded Sheathing
Stucco
Wood Sill
Metal Flashing

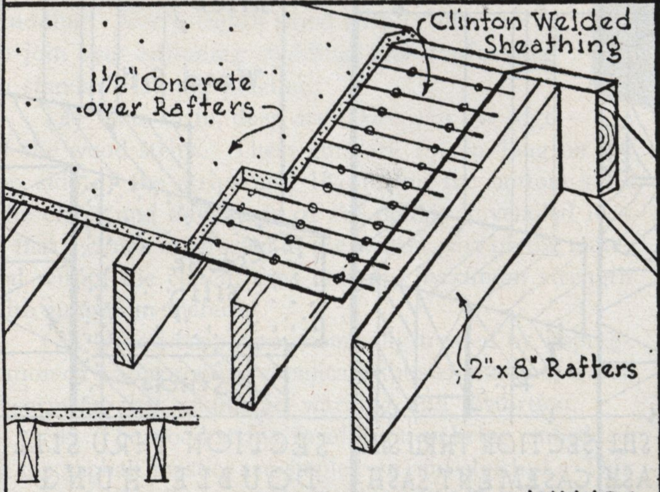
APPLIED OVER DIAGONAL SHEATHING


Brick Veneer
Clinton Welded Sheathing in place to receive plaster
Wood Sill
Stone Sill
1/2" Plaster

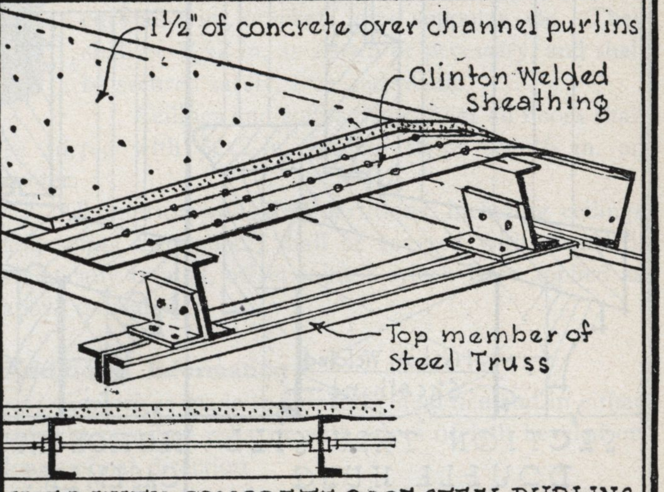
APPLIED TO STUDS UNDER BRICK VENEER


Studding
Studding
Wood Sill
1½" Concrete over Joists
Floor Joists
Clinton Welded Sheathing

USED WITH CONCRETE FLOOR


Clinton Welded Sheathing
1½" Concrete over Rafters
2"x 8" Rafters

USED WITH CONCRETE ROOF WOOD RAFTERS


1½" of concrete over channel purlins
Clinton Welded Sheathing
Top member of Steel Truss

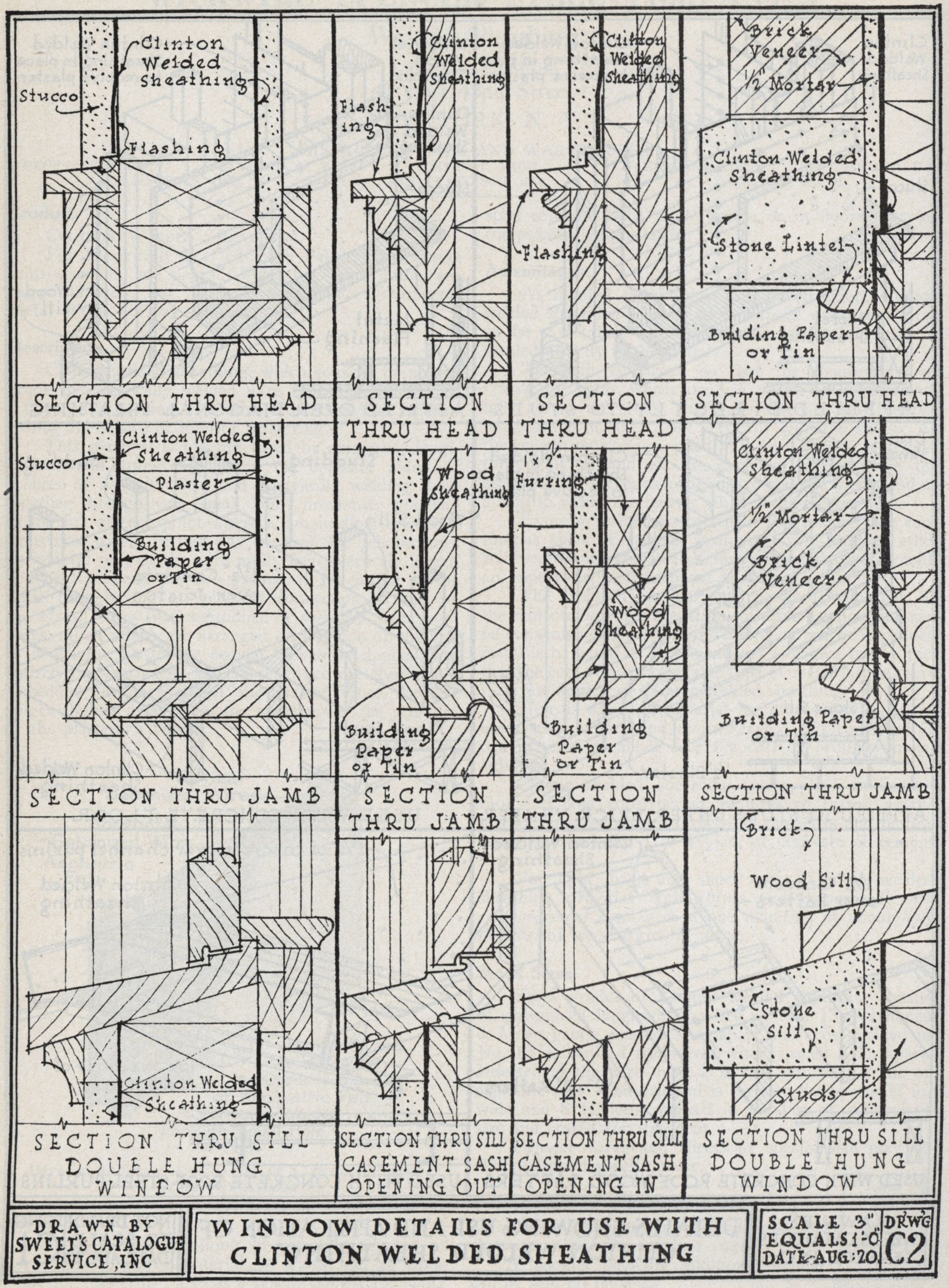
USED WITH CONCRETE ROOF STEEL PURLINS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

DETAILS SHOWING USE AND APPLICATION OF CLINTON WELDED SHEATHING

NOT DRAWN TO SCALE
DATE-AUG.'20
DRW'G C1

Continued on next page


Clinton Welded Sheathing
Stucco
Flashing
Clinton Welded Sheathing
Flashing
Clinton Welded Sheathing
Flashing
Brick Veneer
½" Mortar
Clinton Welded Sheathing
Stone Lintel
Building Paper or Tin
Stucco
Clinton Welded Sheathing
Plaster
Building Paper or Tin
Wood Sheathing
Building Paper or Tin
1"×2" Furring
Wood Sheathing
Building Paper or Tin
Clinton Welded Sheathing
½" Mortar
Brick Veneer
Building Paper or Tin
Brick
Wood Sill
Stone Sill
Studs
Clinton Welded Sheathing

SECTION THRU HEAD

SECTION THRU HEAD

SECTION THRU HEAD

SECTION THRU HEAD

SECTION THRU JAMB

SECTION THRU JAMB

SECTION THRU JAMB

SECTION THRU JAMB

SECTION THRU SILL DOUBLE HUNG WINDOW

SECTION THRU SILL CASEMENT SASH OPENING OUT

SECTION THRU SILL CASEMENT SASH OPENING IN

SECTION THRU SILL DOUBLE HUNG WINDOW

DRAWN BY SWEET'S CATALOGUE SERVICE, INC

WINDOW DETAILS FOR USE WITH CLINTON WELDED SHEATHING

SCALE 3" EQUALS 1'-0"
DATE AUG. 20.
DR'WG C2

THE FLINT-ROCK STUCCO COMPANY, INC.

Manufacturers of Base for Stucco and Plaster

GENERAL OFFICES
260-264 Fourth Street Arcade Building
DAYTON, OHIO

Products

KEYLOCK BASE for stucco or plaster.

For Architex Finish (Stucco), Flint-Rock Stucco and Granite Products, see page 388.

Keylock Base

Patented and manufactured as a standard material of strength and quality, and designed to overcome the difficulties met with in stucco, plaster and brick veneer backing, etc., because of the use of inferior base construction, also to effect economy in cost and application.

Keylock Base consists of heavy chipboard backing upon which is spread a special quality of asphalt mastic. In this mastic, carefully selected wood strips, chemically treated and with a patented cut on their edges, are embedded, stapled on and clinched with heavy gauge wire. These wood strips are offset every eighth lath so as to automatically break joints.

Keylock Base is furnished in rolls of 100 sq. ft. Nails for application are included in each roll. It is easily warehoused, comes on the job in perfect condition, and, because of its exclusive features, a saving in application cost is assured.

KEYLOCK
IMPROVED
BASE
STUCCO PLASTER

Nature of Keylock Base

(1) Keylock automatically breaks joints over studding. Every eighth wood strip is offset so as to join over adjoining studding, thus conforming to standard lathing practice.

(2) Cuts 1/4 in. deep are taken into the edge of the wood strips. These cuts are 1 3/8 in. long on the top side of the strips and 1 3/4 in. on the bottom side. The effect and advantage of the double dovetailed lock is that a clinch is effected at the widest part of the material within the clinch, thus creating maximum strength with minimum material.

(3) Wood strips are chemically treated by impregnation of waterproofing chemicals, thus eliminating water absorption that results in warping and distortion.

(4) The wood strips, in addition to being embedded in the asphalt mastic, are stapled on and clinched. This insures absolute accuracy in spacing and solves the problem of safe and practical warehousing.

(5) The heavy chipboard backing and asphalt mastic lend insulating and sound deadening qualities.

(6) Waterproofing and verminproofing of the frame structure are insured by the heavy coat of asphalt.

(7) The cost of proper application is minimized. The joints are automatically broken, and openings and joints are easily sawed.

How Keylock Is Applied

Nailing—Start the roll at the top of the studding with protruding strips extending over the edge. Nails for application are included in every roll. Nail each strip at each bearing point when used on studs or furring, and not less than four nails to each strip over sheathing. The adjoining roll interlaces with the previous one, thus automatically breaking joints.

Cutting—Saw across the strips in same manner as when sawing lumber. In cutting lengthwise, rip saw between the strips. Application is simplified by cutting out window openings, etc., after application.

General Specifications for Keylock Base

All exterior surfaces of frame wall having stucco finish, as indicated on drawings, shall be covered with Keylock Stucco Base.

Keylock Base shall be applied according to the manufacturer's specifications, automatically breaking joints every eighth strip and securely nailing every strip with at least four nails.

Grounds or blocks shall be provided to secure all trim, brackets, pipe supports, etc. They shall be 3/4x2 in. as shown or necessary, and shall be secured safely, true and plumb.

Ceilings and soffits throughout all floors shall be furred with 7/8x2-in. furring strips set 16 in. on center.

All interior walls and partitions, including ceilings and soffits throughout, shall be covered with standard, chemically treated, offset joint Keylock Base applied as above indicated.

Additional Information

Keylock is made to suit individual demand in either straight or offset rolls, or with edges of lath beveled on longitudinal direction.

Printed copies of specifications as well as architectural drawings, together with descriptive catalogue, are available to all architects, dealers and users.

The manufacturers will be pleased to co-operate in specifications or proposed construction by submission of samples and specifications.

KNAPP BROTHERS MANUFACTURING COMPANY

Manufacturers of Metal Building Specialties and Sanitary Metal Trim

TELEPHONES
Lawndale 2222, 2223
Cicero 223

1343-1349 South 55th Court
CHICAGO, ILL.

SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

Knapp
SANITARY METAL TRIM
TRADE MARK

Products

Metal Window Trim; Metal Window and Door Casings; Metal Cove Bases; Carpet Strip Anchors; Metal Carpet Fastener and Two-member Metal Base Combination; Metal Cove; Base Screeds; Metal Picture Mouldings; Metal Base Grounds; Metal Corner Beads, Plain and Bullnose types.

Also manufacturers of a complete line of small Nose Corner Beads, Linoleum Base Accessories; Chalk Troughs for schools; Mouldings, External and Internal Corner Fittings for bases, casings, etc.

Co-operative Service

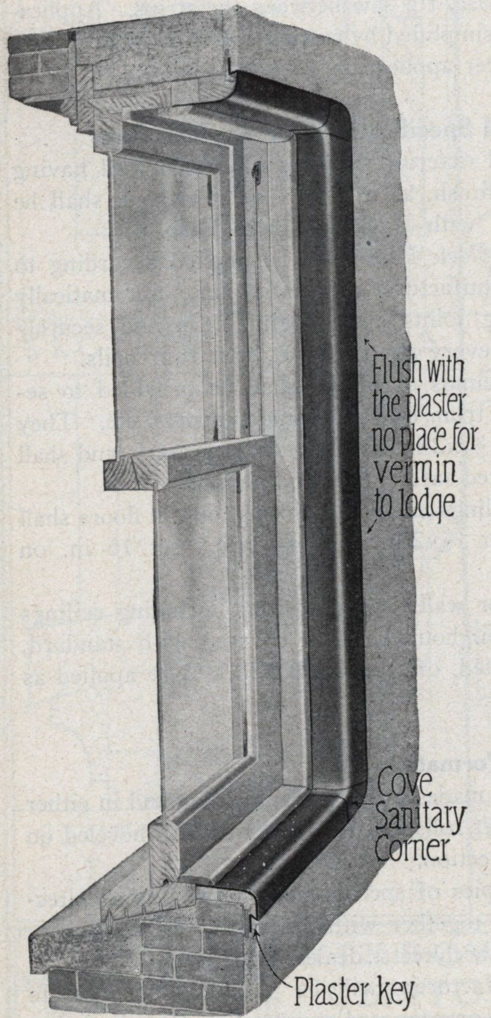
Knapp Brothers have in their organization an experienced registered architect and an engineer who will be glad to assist in the solution of technical problems connected with the Knapp products.

Standard Primer

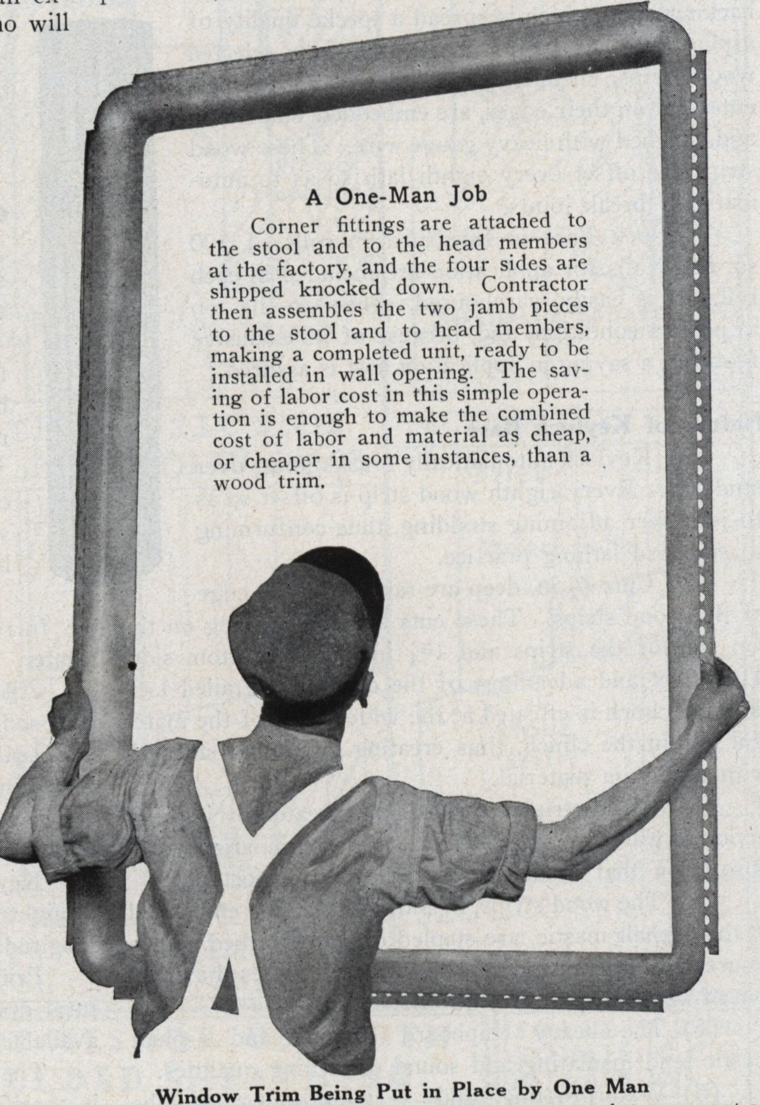
All Knapp products are made of tight-coat galvanized steel, and the surface that will be exposed after plastering is primed with a special galvanic primer at the factory. This primer sticks to the metal and forms the basis of subsequent decorations.

Sanitary Metal Window Trim and Reveal Lining (Patented)

Style No. 302—Can be used either as a stool only or continued around a window opening to form a complete trim, as shown below. The cove corner fittings,



Style No. 302 Window Trim Used Entirely Around Opening



A One-Man Job

Corner fittings are attached to the stool and to the head members at the factory, and the four sides are shipped knocked down. Contractor then assembles the two jamb pieces to the stool and to head members, making a completed unit, ready to be installed in wall opening. The saving of labor cost in this simple operation is enough to make the combined cost of labor and material as cheap, or cheaper in some instances, than a wood trim.

Window Trim Being Put in Place by One Man

This type of trim can be assembled complete at the factory, but on account of its bulk, the crating and freight costs are increased

Continued on next page

together with the flush-with-the-plaster feature, constitute an absolutely sanitary trim. This trim is erected before plastering and provides a screed for the plaster. Curvature of the nose can be had in either 1½ or ¾-in. radius.

Style No. 304 Stool—Projects slightly beyond the plaster line (see detail below). This style is designed as a stool only, but is frequently used in connection with Style 302 jamb and head trim or with the plain or bullnose type of corner beads.

Gauge of Metal Recommended—No. 20 gauge metal is recommended when the length of the stool is 5 ft. or less and the depth of the reveal is 4 in. or less. No. 18 or even No. 16 gauge metal (depending upon extreme dimensions) are recommended for stool dimensions greater than the above.

No. 20 gauge is ample for jambs and head for all practical purposes.

When a No. 16 gauge stool is required, the nailing flange is electrically welded to the stool member, making a sharp edge and positive plaster key (see detail below).

Spot grouting under the stool is very desirable and always recommended, but in most cases it is ignored. Therefore, a No. 16 gauge stool is desirable to provide the necessary stiffness to prevent sagging and indentations.

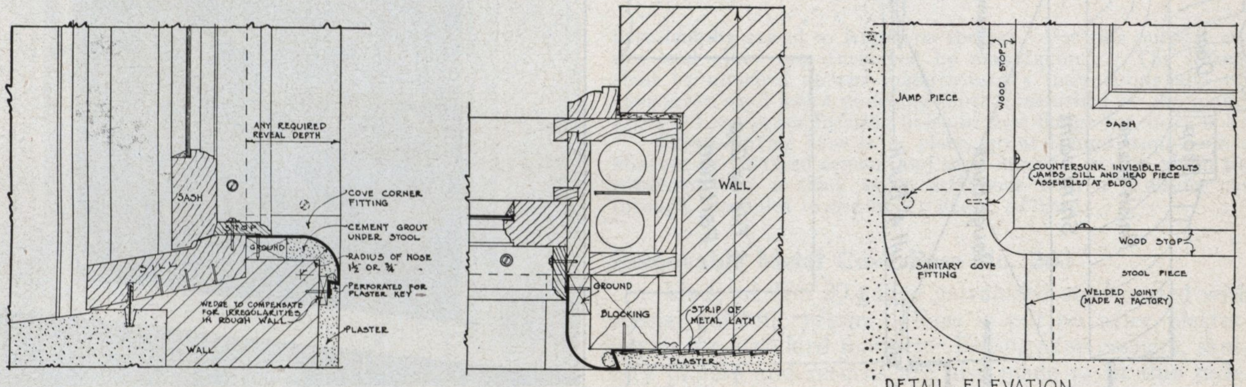
Corner Fittings—In addition to the standard cast corner fittings, we can furnish stamped metal fittings, which give a very neat appearance, cost 25% less, and are highly recommended.

How Furnished—All our window trim is made to order to fit the individual window opening.

We require the contractor to furnish us with exact dimensions, and when this is done, the trim is shipped knocked down, ready to be set in place in the building.

Further Details—Write for full set of details showing how trim can be used with casement windows, steel windows, curved head windows and mullioned windows.

The saving feature of No. 302 as a unit is worth careful consideration.


ANY REQUIRED REVEAL DEPTH
SASH
STOP
GROUND
SILL
WALL
COVE CORNER FITTING
CEMENT GROUT UNDER STOOL
RADIUS OF NOSE 1½" OR ¾"
PERFORATED FOR PLASTER KEY
WEDGE TO COMPENSATE FOR IRREGULARITIES IN ROUGH WALL
PLASTER
WALL
GROUND
BLOCKING
STRIP OF METAL LATH
PLASTER
JAMB PIECE
WOOD STOP
SASH
COUNTERSUNK INVISIBLE BOLTS (JAMBS SILL AND HEAD PIECE ASSEMBLED AT BLDG)
WOOD STOP
SANITARY COVE FITTING
STOOL PIECE
WELDED JOINT (MADE AT FACTORY)

SECTION THRU' SILL TYPICAL BOX FRAME

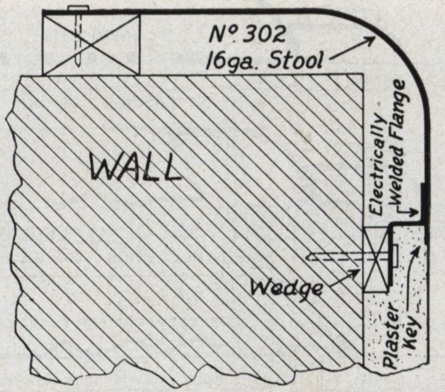
PLAN SECTION THRU' JAMB

DETAIL ELEVATION OF CORNER FITTING

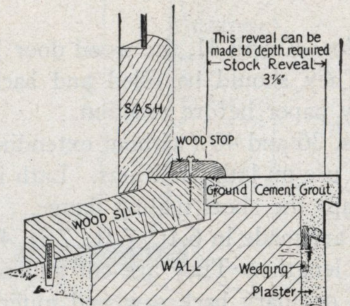
FLUSH METAL WINDOW TRIM STYLE 302 AND FITTINGS

PATENTED

NOTE.- WINDOW TRIM IS MADE UP TO REQUIREMENTS OF OPENINGS AND SENT TO THE JOB KNOCKED DOWN BUT OF EXACT SIZE READY TO SET IN PLACE CORNER FITTINGS ATTACHED AT FACTORY


Nº 302
16ga. Stool
WALL
Electrically Welded Flange
Wedge
Plaster Key

Detail of No. 302 Stool When Heavier Than No. 18 Gauge Metal Is Required


This reveal can be made to depth required
Stock Reveal
3⅞"
SASH
WOOD STOP
Ground
Cement Grout
WOOD SILL
WALL
Wedging
Plaster

Style No. 304 Stool

DETAILS OF METAL WINDOW TRIM

Continued on next page

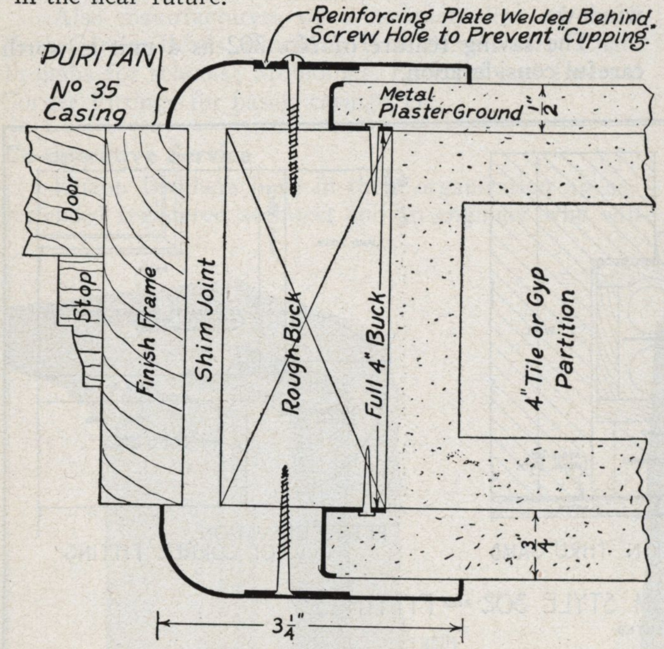
Knapp "Puritan" No. 35 Door Casing (Patented)

A new type of construction just introduced. The principal features are:

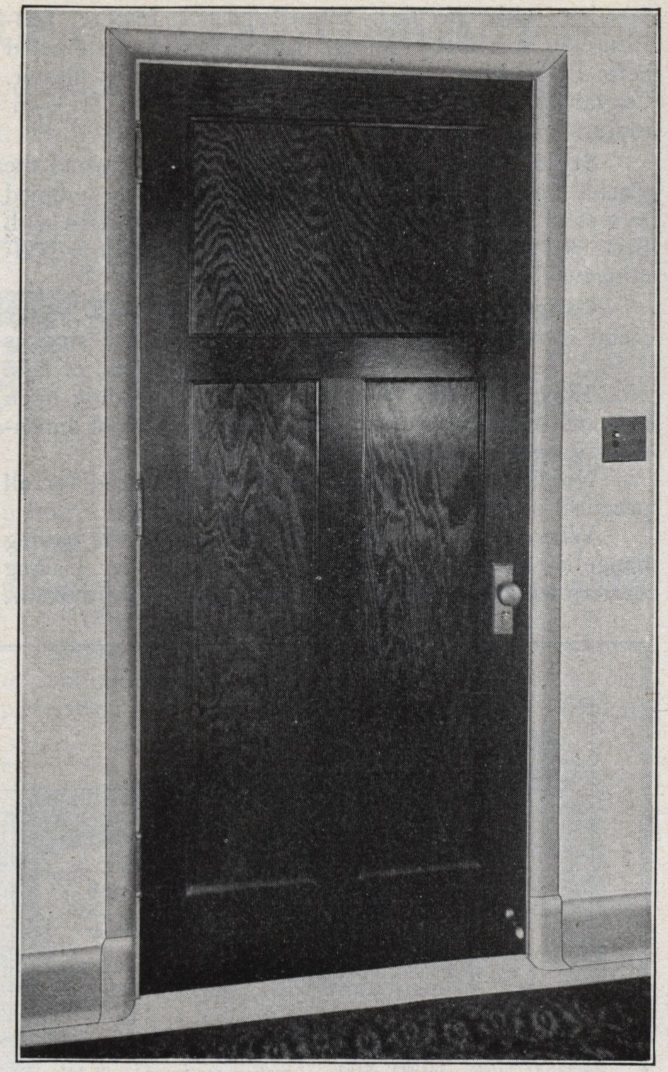
Reinforced plate welded behind screw holes to stiffen and to prevent cupping; screw heads (oval) exposed or countersunk; covers up plaster cracks which sometimes occur around doors due to vibration or insecure anchoring of rough door bucks; furnishes a neat appearance; adaptable to ½ or ¾-in. thickness of plaster; casing can be applied as soon as plastering is done; not necessary to wait until plastering has dried out; economical.

Made of No. 18 gauge tightcoat galvanized metal. Exposed face coated with a special galvanic primer at the factory.

Other styles or designs of this principle will be made in the near future.


Reinforcing Plate Welded Behind Screw Hole to Prevent "Cupping."
PURITAN No 35 Casing
Metal Plaster Ground
½
Door
Stop
Finish Frame
Shim Joint
Rough Buck
Full 4" Buck
4" Tile or Gyp Partition
¾
3¼"

Details of "Puritan" No. 35 Door Casing



Door Trimmed with "Puritan" No. 35 Door Casing

Sanitary Flush Metal Door Casings

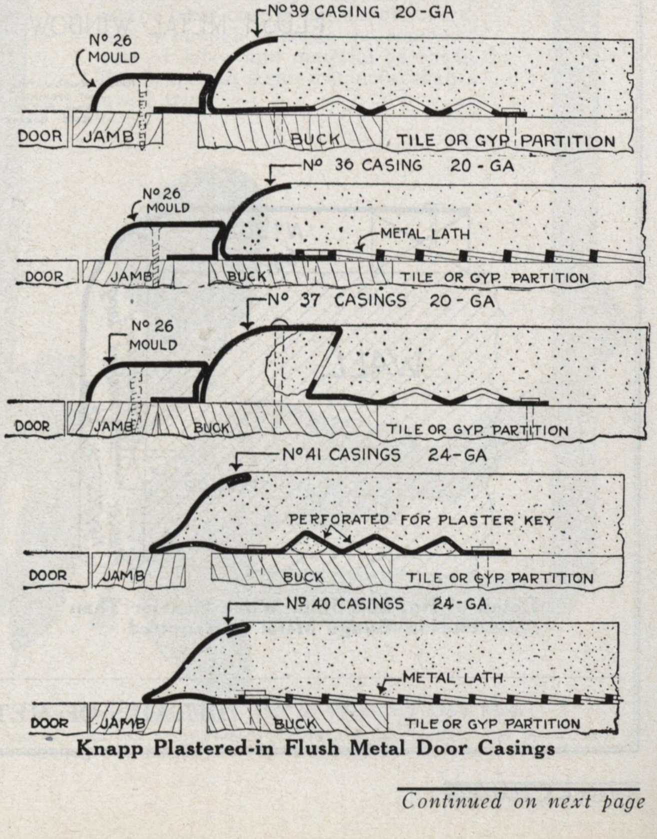
Casings are put on before plastering and are self-grounding. The corrugated and perforated flange not only acts as a key strip between the buck and partition, but also as a strengthening anchor between the two.

In casing Nos. 40 and 41, the wood door jambs are erected first. They should be filled and back painted and protected by paper before erection.

Casings Nos. 36 and 40 (without extending flange) are designed for use on lath partitions. Lath is brought up to and overlaps the short nailing flange.

All casings are made in 6 ft., 7 ft., 7 ft. 4 in., 8 ft., 9 ft. and 10 ft. lengths. They are cut and mitered on the job with an ordinary hack saw and miter box, but miters can be cut at the factory at nominal cost. Casings can be made for both ½ and ¾-in. thickness of plaster.

We make a sanitary plinth fitting which allows all our casings to be used in connection with our metal base. Full particulars sent on request.


No 39 CASING 20-GA
No 26 MOULD
DOOR
JAMB
BUCK
TILE OR GYP PARTITION
No 36 CASING 20-GA
No 26 MOULD
METAL LATH
DOOR
JAMB
BUCK
TILE OR GYP. PARTITION
No 37 CASINGS 20-GA
No 26 MOULD
DOOR
JAMB
BUCK
TILE OR GYP. PARTITION
No 41 CASINGS 24-GA
PERFORATED FOR PLASTER KEY
DOOR
JAMB
BUCK
TILE OR GYP. PARTITION
No 40 CASINGS 24-GA.
METAL LATH
DOOR
JAMB
BUCK
TILE OR GYP PARTITION

Knapp Plastered-in Flush Metal Door Casings

Continued on next page

Knapp Sanitary Metal Cove Base

Suggested Brief Specification for Cove Base Style No. 202—The base to be used shall be Knapp Brothers Manufacturing Company's Style No. 202 flush cove base 4 in. [6 in.] high, made of No. 20 U. S. gauge [No. 18 gauge] tightcoat galvanized steel. The base shall be primed on the exposed face at the factory with a special gray galvanic primer.

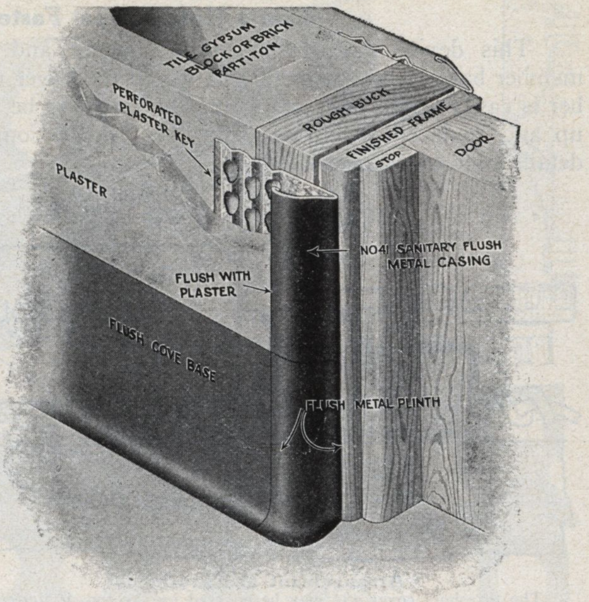
Fittings—At all corners, both internal and external, in all rooms and spaces, provide ¾-in. radius corner fittings which shall be attached to ends of base by concealed stove bolts.

Note: The corner fittings may also be 1½-in. radius or square, but architect should specify either one with care.

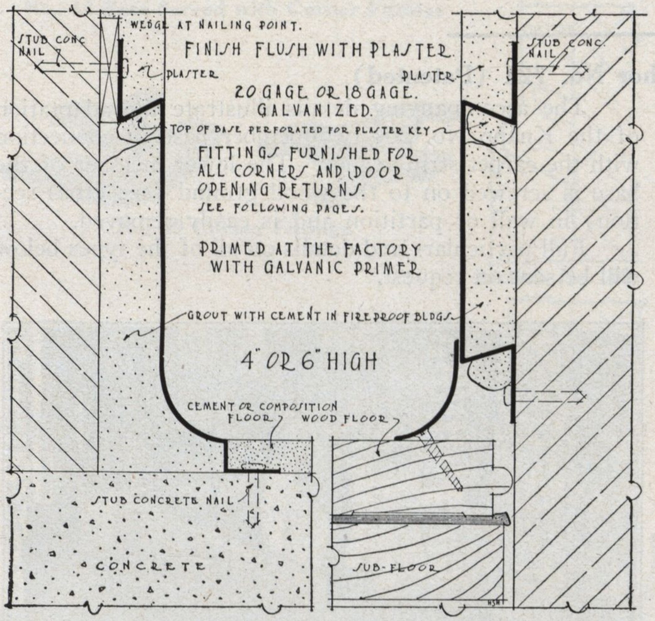
At all door openings provide a sanitary flush plinth fitting which shall be similarly attached to the ends of base. At other terminating points such as at the head of stairs, provide an end stop fitting. All fittings shall be made of cast iron, free from flaws and dipped in primer at the factory.

Erection—Base shall be erected before plastering and shall be so set as to form a ground screed for plaster and for the finished floors. Care shall be taken to have same perfectly level and in true plane with the plaster. Where necessary to compensate for irregularities in the rough wall, wedge out behind upper nailing flange with wood wedges. Base shall be substantially nailed at frequent intervals with cement coated nails as indicated by detail.

In fitting base to spaces, measurements shall be made and base lengths sawed to length on the job. For this purpose use saw and miter box furnished by manufacturer. The fittings shall be attached as per manufacturer's instructions and the contractor shall use a punching block (furnished by the manufacturer) made for locating holes in base flange for stove bolts.


TILE GYPSUM BLOCK OR BRICK PARTITON
PERFORATED PLASTER KEY
PLASTER
ROUGH BUCK
FINISHED FRAME
STOP
DOOR
NO41 SANITARY FLUSH METAL CASING
FLUSH WITH PLASTER
FLUSH COVE BASE
FLUSH METAL PLINTH

Sanitary Plinth for Base, Style No. 202
Used in connection with flush door casing No. 41


WEDGE AT NAILING POINT.
STUD CONC NAIL
FINISH FLUSH WITH PLASTER.
PLASTER
PLASTER
20 GAGE OR 18 GAGE. GALVANIZED.
TOP OF BASE PERFORATED FOR PLASTER KEY
FITTINGS FURNISHED FOR ALL CORNERS AND DOOR OPENING RETURNS. SEE FOLLOWING PAGES.
PRIMED AT THE FACTORY WITH GALVANIC PRIMER
GROUT WITH CEMENT IN FIREPROOF BLDGS.
4" OR 6" HIGH
CEMENT OR COMPOSITION FLOOR
WOOD FLOOR
STUD CONCRETE NAIL
CONCRETE
SUB-FLOOR
STUD CONC. NAIL

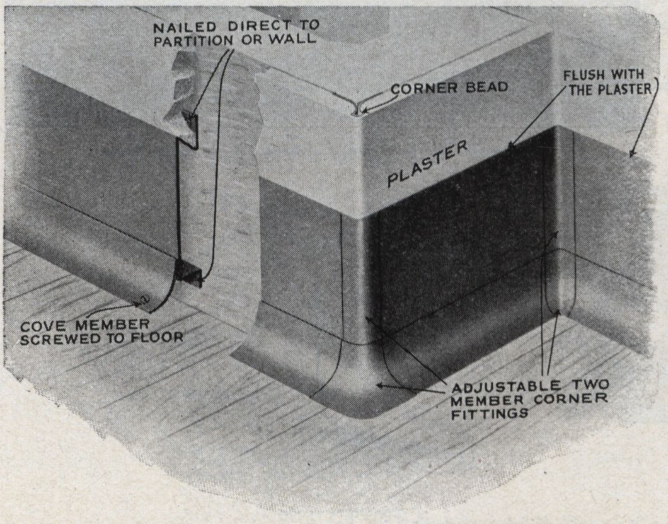
Base No. 202 Base No. 205
Details of Knapp Sanitary Metal Cove Base

Grout—After base is in place, grout behind same with a mixture of portland cement and sand mixed 1 to 3 to about the consistency of a thick syrup and pour with a grouting can through the holes in the upper flange of base.

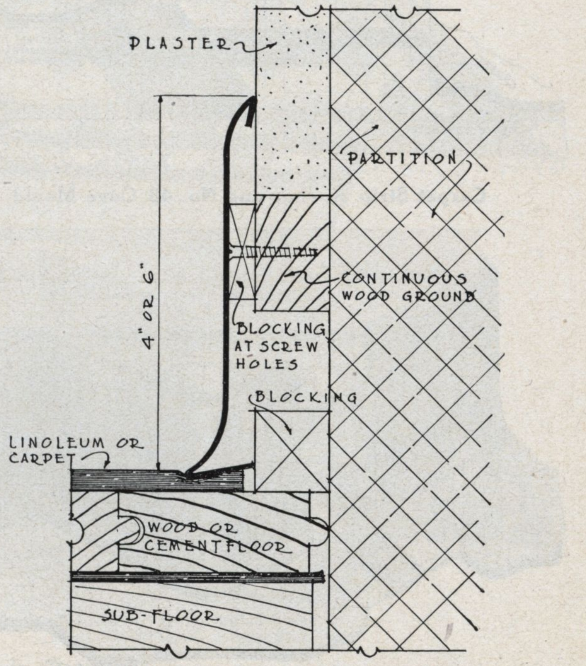
Removable Metal Cove Base No. 203

Made of No. 20 gauge galvanized steel coated with special galvanic primer. Base is put on after plastering in the standard manner. Fittings for corners, sanitary plinths and returns are also made to fit this style. Base, 4 and 6 in. high.

Style No. 204 is made with a detachable cove similar to Style No. 205.


NAILED DIRECT TO PARTITION OR WALL
CORNER BEAD
FLUSH WITH THE PLASTER
PLASTER
COVE MEMBER SCREWED TO FLOOR
ADJUSTABLE TWO MEMBER CORNER FITTINGS

Sanitary Flush Base, Style No. 205
Showing adjustable cove feature and corner fittings

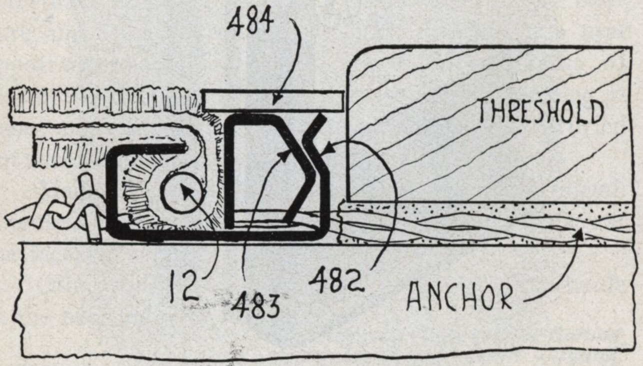

PLASTER
PARTITION
CONTINUOUS WOOD GROUND
4" OR 6"
BLOCKING AT SCREW HOLES
BLOCKING
LINOLEUM OR CARPET
WOOD OR CEMENT FLOOR
SUB-FLOOR

Half Size Section No. 203 Sanitary Base

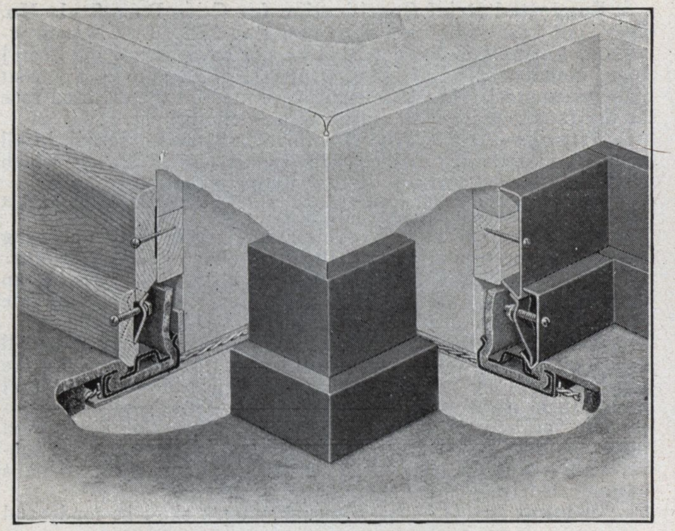
Continued on next page

Knapp Hotel Carpet Fastener and Two-member Base (Patented)

This device features a carpet fastener and two-member base (wood or metal) of which the lower member is easily removable, permitting the carpet to be taken up and replaced without the use of tacks. Complete details sent on request.


484
THRESHOLD
12
483
482
ANCHOR

Arrangement at Thresholds
The threshold cover 484 may be covered on the top, if desired, with a narrow strip of carpet.

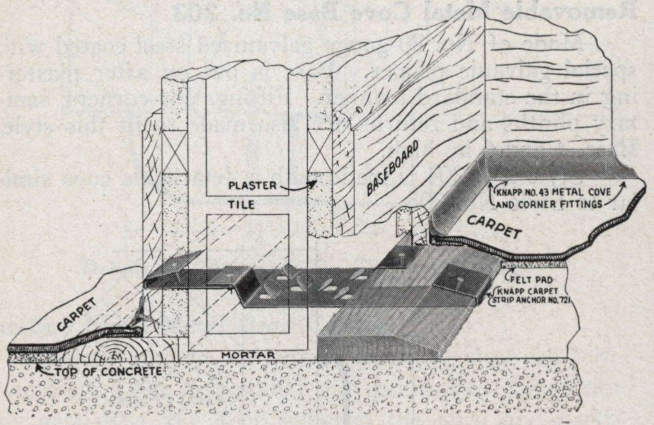


Knapp Hotel Carpet Fastener and Two-member Base

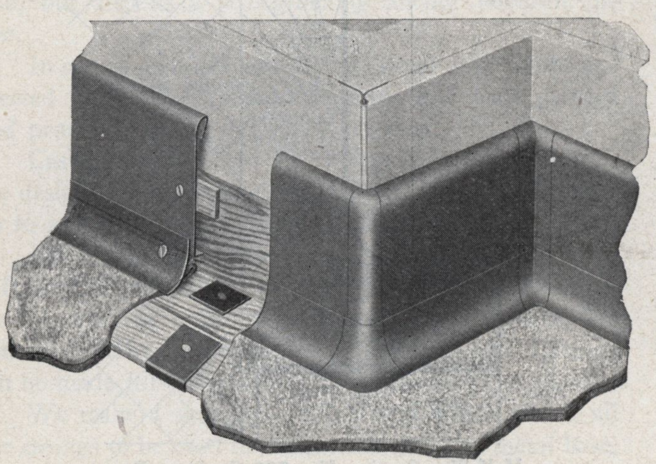
Knapp Carpet Strip Anchor No. 721 (Patented)

A new time and labor saving device for anchoring wood carpet strips to concrete floors. Installed at the time that partitions are built, as illustrated.

Knapp No. 43 metal cove moulding (see below) provides a sanitary metal cove at the intersection of the carpet and wood baseboard and is recommended in all old or new hotels having wood base.


PLASTER
TILE
BASEBOARD
KNAPP NO. 43 METAL COVE AND CORNER FITTINGS
CARPET
FELT PAD
KNAPP CARPET STRIP ANCHOR NO. 721
CARPET
MORTAR
TOP OF CONCRETE

Carpet Strip Anchor and No. 43 Cove Mould

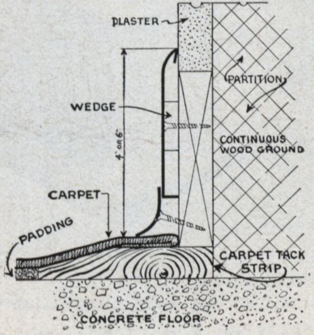


Style 204 Two-member Base for Hotel Use

The accompanying details illustrate the adaptation of the Knapp No. 204 two-member base in connection with the carpet strip anchor. The lower member of the base is screwed on to the wood ground (see cross section) in wall or partition and is easily removed.

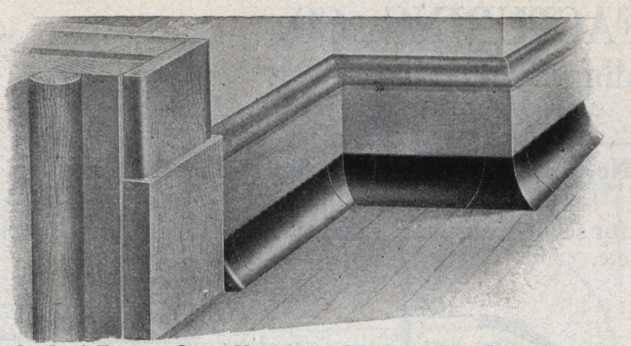
Full particulars and details on all of the types below will be sent on request.

Method of Setting Carpet Strip Anchors

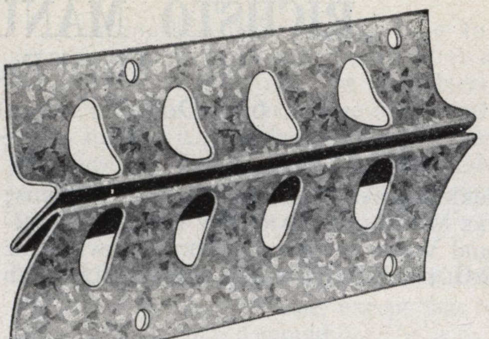

PLASTER
PARTITION
WEDGE
4" OR 6"
CONTINUOUS WOOD GROUND
CARPET
PADDING
CARPET TACK STRIP
CONCRETE FLOOR

Section Through No. 204 Two-member Base

Continued on next page

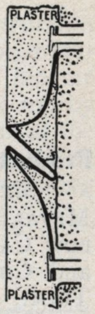


Method of Fitting Cove No. 43 at Wall Angles, Returns, etc., by Use of End Stop and Corner Castings (Patented)

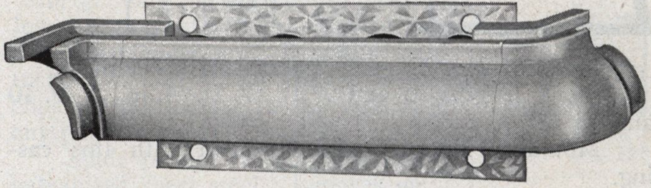


No. 23 Concealed Picture Moulding

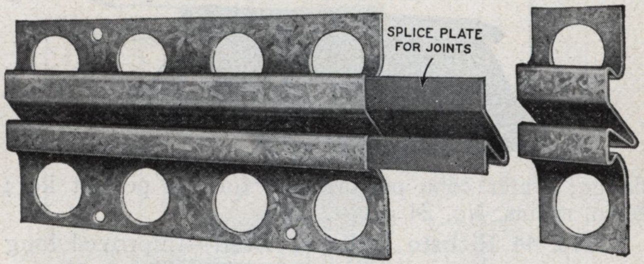
Approximately two-thirds natural size


PLASTER
PLASTER

Section

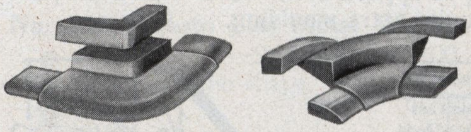


No. 42 Base Screed with Corner Fittings

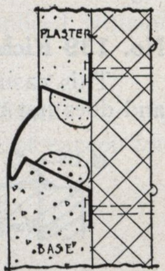

SPLICE PLATE FOR JOINTS

No. 20 Concealed Picture Moulding (Patented)

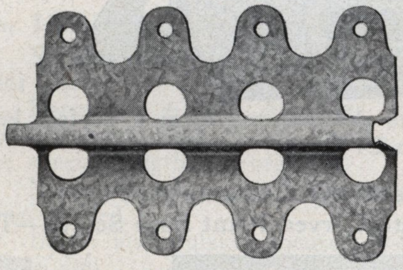
Painting the two exposed faces provides a double border ornament and separation



No. 49 Corner Fittings

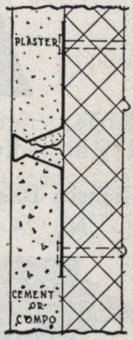

PLASTER
BASE

Section No. 42

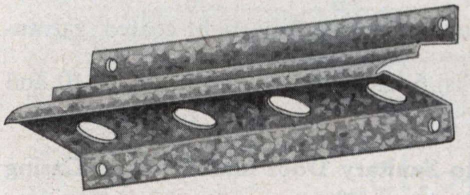


No. 2 Base Ground

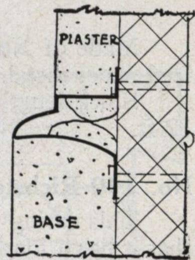
Note the plaster key


PLASTER
CEMENT OR COMPO

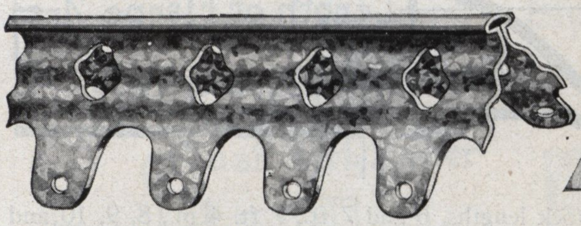
Section No. 2



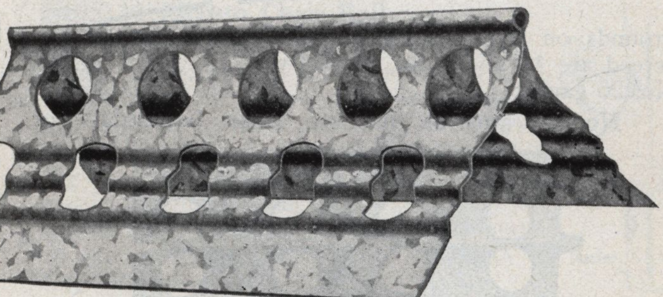
No. 49 Base Screed


PLASTER
BASE

Section No. 49

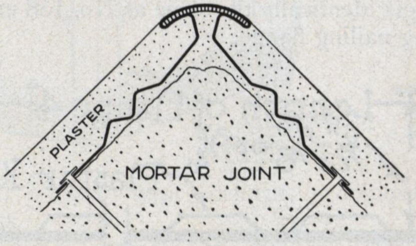


No. 15½ Corner Bead, No. 26 Gauge Scalloped and Crimped Flanges for Strength

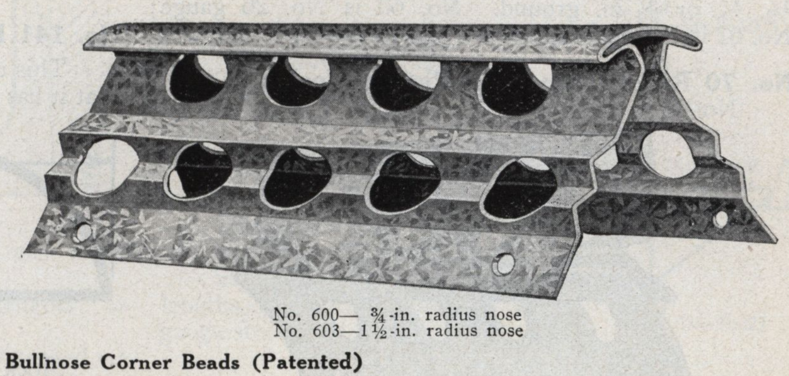


No. 12 "Ideal" Non-clip Corner Bead (Patented)

A positive straight-edge in itself


PLASTER
MORTAR JOINT

Section No. 600



No. 600— ¾-in. radius nose
No. 603—1½-in. radius nose

Reinforced Bullnose Corner Beads (Patented)

About one-half natural size

RICHSTO MANUFACTURING CO.

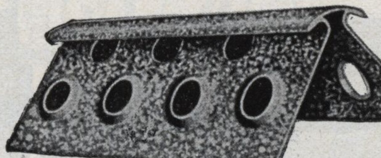
Sheet Metal Building Specialties
678 Douglas Avenue, AURORA, ILL.

Products

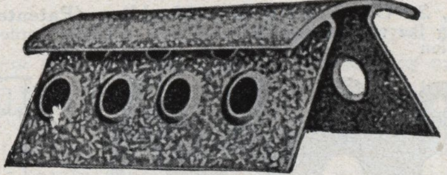
Metal Corner Bead, Base Screed and Grounds; Metal Picture Moulding; Sanitary Door and Window Casing and Window Stools; Metal Cove Base and Chair Rail; Chalk Trough and Blackboard Trim.

Corner Bead

No. 31 Richsto Bullnose Bead—Improved long flange; crater cone perforations form a perfect key; ¾-in. radius, No. 24 gauge.

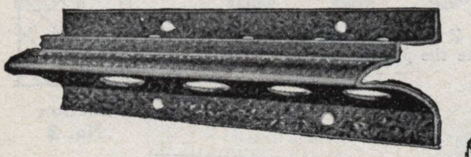


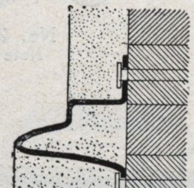
No. 44 Richsto Bullnose Bead—Improved long flange; crater cone perforations form a perfect key; 1½-in. radius, No. 24 gauge.



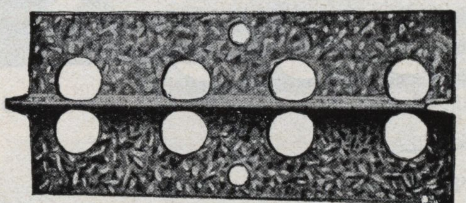
Richsto Base Screed and Grounds

No. 74 Richsto Curved Point Base Screed—The grounds on top and bottom of this screed are ½ and 1 in., respectively. No. 26 gauge.



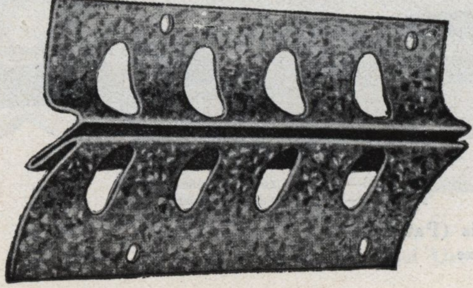


No. 60 and 62 Richsto Base Grounds—For ½, ⅝ or ¾-in. ground. No. 60 is No. 26 gauge; No. 62 is No. 24 gauge.



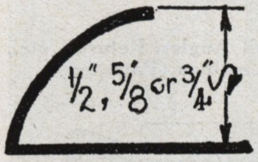
No. 70 Richsto Concealed Picture Moulds

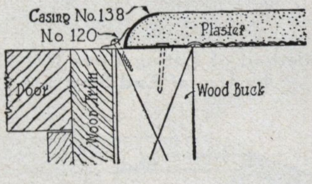
No. 26 gauge.



No. 138 Richsto Casing for Public Buildings

This casing and moulding is especially recommended for schools, hospitals, sanitariums, office buildings, hotels, etc.





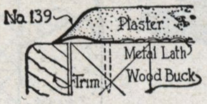
Made of No. 20 gauge galvanized sheet metal.

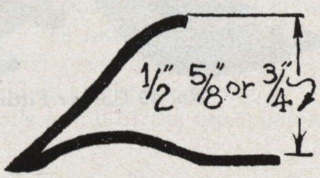
Stock lengths, 6 and 7 ft., 7 ft. 4 in., 8, 9, 10 and 12 ft.

Moulding No. 120 recommended with this casing.

No. 139 Richsto Sanitary Door and Window Casing

This casing is applied after wood trim is in place and does not require extra moulding.



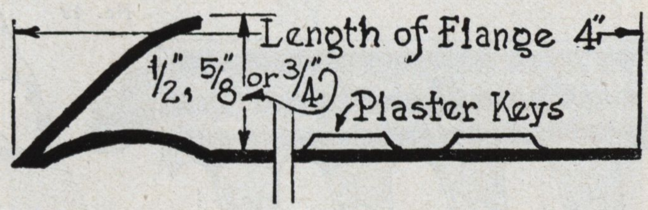


Made of No. 24 gauge special, tight coated, galvanized sheet metal.

Stock lengths, 6 and 7 ft., 7 ft. 4 in., 8, 9, 10 and 12 ft.

No. 140 Richsto Sanitary Door and Window Casing

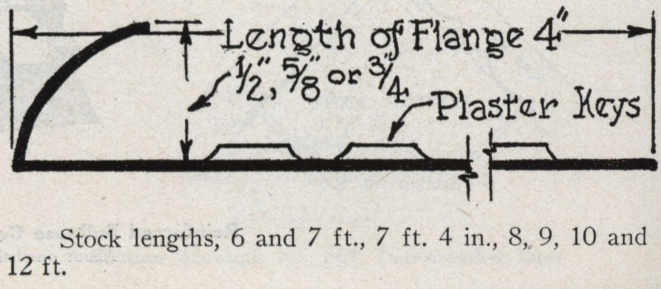
This casing is identically the same as No. 139 except that it has a long nailing flange.



Stock lengths, 6 and 7 ft., 7 ft. 4 in., 8, 9, 10 and 12 ft.

No. 141 Richsto Sanitary Door and Window Casing

This casing is identically the same as No. 138 except that it has a long nailing flange.

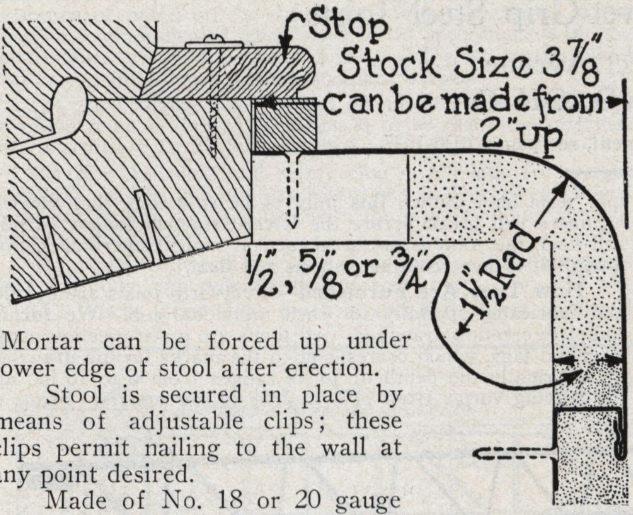


Stock lengths, 6 and 7 ft., 7 ft. 4 in., 8, 9, 10 and 12 ft.

Continued on next page

No. 100 Richsto Curved Metal Window Stool

Stool is filled with cement mortar at time of setting.



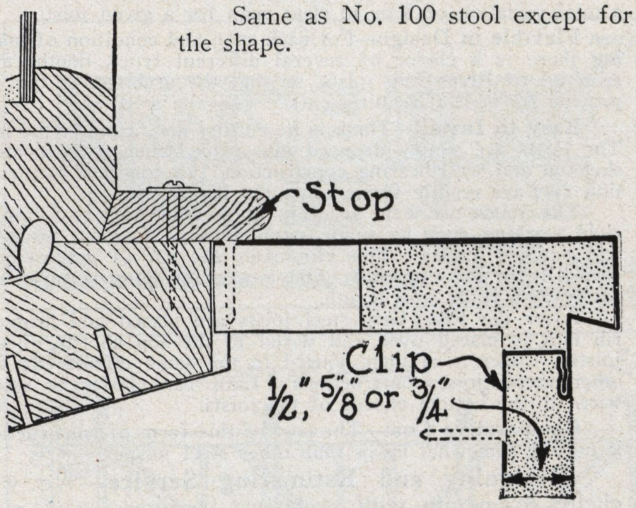
Mortar can be forced up under lower edge of stool after erection.

Stool is secured in place by means of adjustable clips; these clips permit nailing to the wall at any point desired.

Made of No. 18 or 20 gauge galvanized sheet steel. Lengths up to 10 ft. without splice. Over 10 ft., spliced without extra charge.

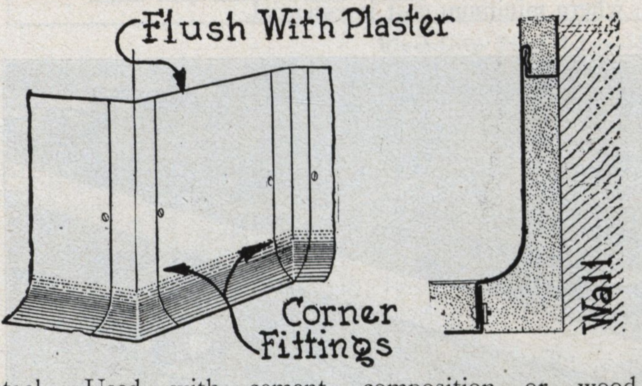
No. 102 Richsto Flat Metal Window Stool

Same as No. 100 stool except for the shape.



No. 110 Richsto Flush Metal Cove Base

Made of No. 18 or 20 gauge galvanized sheet steel. Used with cement, composition or wood floors.



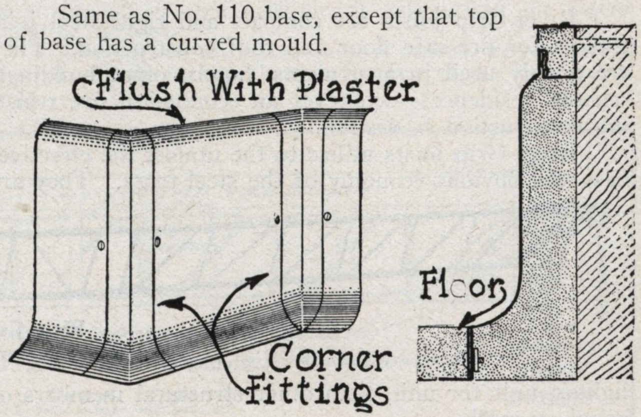
Made in 10-ft. lengths; special lengths to order.

Necessary tools for erection of base rented at nominal charge.

Our method of attaching base to construction permits of grouting base in back after erection without the use of grouting can or buttering of mortar on back before erection. Base is secured at the top by a clip, making it possible to fasten to construction at the point desired. Lower part of base has a slotted fastening to allow for settling of floors, thus preventing cracking in wall at top of base.

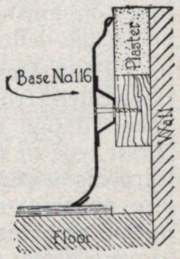
No. 112 Richsto Flush Metal Cove Base

Same as No. 110 base, except that top of base has a curved mould.



No. 116 Richsto Removable Base

No. 116 base is of the removable type. Applied after plaster and flooring.

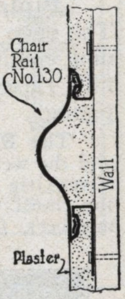


Furnished in No. 20 gauge galvanized sheet metal. Stock lengths 10 ft.; special lengths to order.

Necessary tools rented for erection when desired.

Inside and outside square, ¾-in. radius and 1½-in. radius corners and end stops supplied for all bases. Plinths and plinth blocks supplied for use with all bases and all casings.

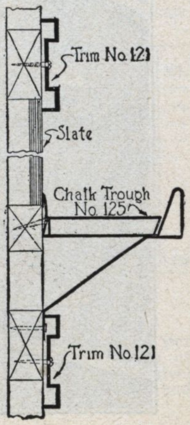
No. 130 Richsto Chair Rail



Made of No. 20 gauge galvanized steel, has sliding clip arrangement for attachment. This makes it possible to nail at convenient points about 12 in. on centers and leaves ample openings for easy grouting after erection. Stock lengths 10 ft.; special lengths to order.

End stops to be used to finish end of each run: right end, stop No. 130A; left end, stop No. 130B.

No. 125 Richsto Chalk Trough and Blackboard Trim



The chalk trough is made of No. 24 gauge sheet steel. The perforated tray is removable for cleaning.

Stock lengths 10 ft.; special lengths to order.

Trim—Our 121 trim is shown for use in combination with chalk trough.

Stock lengths 10 ft.; special lengths to order. Made of No. 20 gauge steel.

THE RIVET-GRIP STEEL CO.

Manufacturers of Rivet-Grip Steel Joists

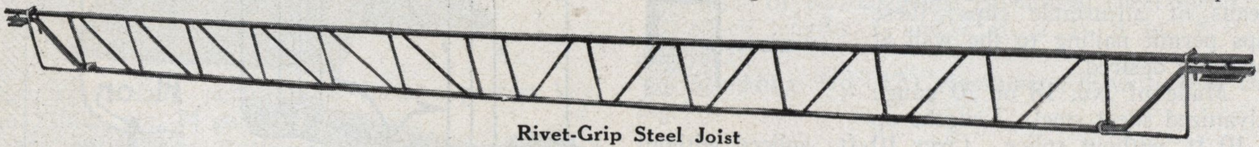
2735 Prospect Avenue
CLEVELAND, OHIO

For Bank Vault Reinforcement, see pages 1026-1027

Rivet-Grip Steel Joists

Rivet-Grip joists are compact and rigid steel joist trusses for fire-safe floor and roof construction. They are widely used in apartments, hotels, office buildings, schools, residences—wherever an economical fire resisting construction is desired.

Rivet-Grip joists utilize to the utmost the effectiveness and obvious economy of the steel truss. They are lighter, unit for unit, than other structural members of equal strength.



Rivet-Grip Steel Joist
Note clean-cut appearance and simplicity of detail

Rivet-Grip floor construction is rigid, permanent, fire resisting and economical. It is recognized as equal to other forms of fireproof construction by building codes and by architects who have specified it. Load tests on finished floors have shown only a fraction of allowable deflections for the spans tested.

How Designed and Fabricated—The joists are fabricated from specially rolled heavy steel sections. Their design is simple and practical. It embodies the Pratt type of truss web system, which allows great load carrying capacity for a given area of section. There are no thin, corrodible metal strips, the lightest web members being $\frac{9}{16}$x¼ in. Before shipment, joists receive a heavy coat of rust inhibitive paint.

Piping Can Be Run Through the Open Webs—The open webs of the joists allow ample space for running conduits, thus eliminating the expense of excessive fills, raised floors or special furred ceilings to conceal piping.

The Rivet Grip—A permanent joint between the chords and the web members of the trusses is formed by the patented Rivet-Grip process. Under a pressure of 30 tons, the wings of the chord members are forced around the knobs on the web members, forming a positive mechanical connection. Laboratory tests have shown this joint to be so strong that the web members will break before the Rivet-Grip will loosen. Under full load, the joint is not weakened at high temperatures, even though it is kept continuously at red heat.

How They Are Furnished—Rivet-Grip joists are detailed and fabricated specially for each individual job. We furnish complete erection drawings. All joists are given erection marks on metal tags, which correspond to the marks on the drawings.

Normally the depth of joists ranges from 6 to 16 in., and the spacing varies from 11¾ to 23½ in. on centers. Spans up to 30 ft. are used. In special cases joists can be furnished for span lengths up to 32 ft. The standard end bearing is 4½ in. This bearing may vary from 4 to 5½ in., thus allowing a total variation of 3 in. in clear span for a given joist.

Flexible in Design—For each span and condition of loading there is a choice of several different types, depths and spacings of Rivet-Grip joists, so that the architect is free to provide for special requirements.

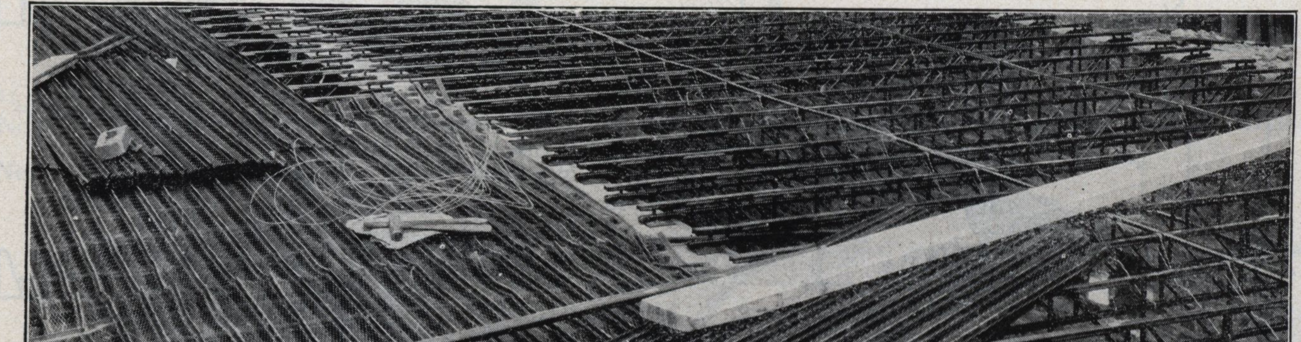
Easy to Install—There is no cutting nor fitting at the job. The joists are simply dropped into place, when used in steel skeleton and wall bearing construction. In concrete construction they are readily framed into the formwork.

The joists are held securely in position and tied into a rigid working deck by single strap or wire diagonal bridging and notched angles. This eliminates the use of spacers and special beam seats or clips. One row of bridging is furnished for every 6 ft. of joist length.

After the Rivet-Grip steel joists are placed and bridged, rib lath is placed over and wired to the top chords of the joists. Concrete is then poured in the same manner as for other metal joist constructions. Lath for plaster is easily wired to the bottom chords of the joists.

Comparative Cost—The cost of this form of construction is usually somewhat lower than other steel joists.

Designing and Estimating Service—We will gladly co-operate with architects, engineers and contractors, without obligation on their part, in designing Rivet-Grip steel joist floors for any building, either for original specifications or as an alternate construction where minimum cost is essential.



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Specifications for Rivet-Grip Steel Joist Floors

Steel Joists—(1) Provide and set Rivet-Grip Steel Joists manufactured by The Rivet-Grip Steel Co., Cleveland, Ohio, as shown or noted on the drawings. Where the sizes of the joists are not indicated, they shall be in accordance with the manufacturer's tables of safe loads. All joist trusses shall conform to the manufacturer's standard details.

(2) All bridging shall consist of notched angles and wire or single strap bridging. Bridging is to be placed at intervals not exceeding 6 ft. of joist length.

(3) For centering and reinforcing, a rib lath (of weight specified) shall be laid on, lath side down, and wired or clipped to the top chords of the joists, with the ribs extending at right angles to the joists.

(4) Place temperature rods (of size and at spacings specified) and pour 2-in. concrete slab of 1:2:4 mix.

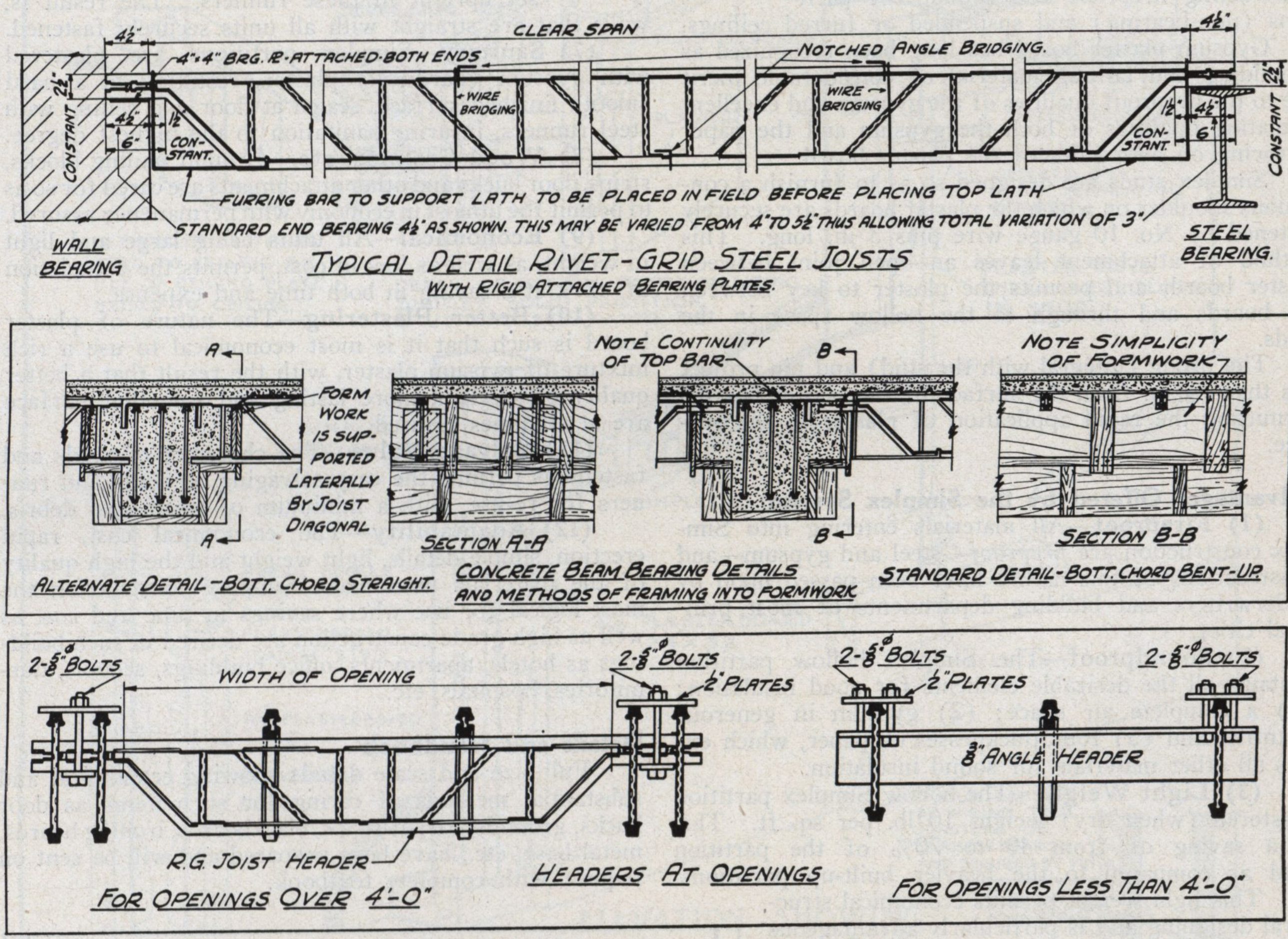
(5) Where wood floor finish is specified, insert approved clips in concrete slab and attach 2x2 in. screeds or nailing strips properly leveled.

Optional method: Where wood floor finish is specified, 1x2-in. screeds or nailing strips shall be placed over the lath and securely wired to the top chords of the joists. The screeds are to be placed at an angle with the joists and are to be blocked up from the lath about 1 in. to allow the concrete to get between the screeds and the lath.

(6) Ceilings shall be constructed by furring the bottom of the joists with ¼-in. round rods or furring channels spaced not more than 16 in. on centers. A flat lath shall then be wired to the furring rods or channels.

Note: The furring rods or channels may be omitted if a ⅜-in. rib lath is used with the rib side against the bottom chord of the joists.

Where extreme fire resistiveness is desired, we recommend the use of 1-in. furring channels in place of the ¼-in. round rods.



CLEAR SPAN
4½"
4½"
4"×4" BRG. P. ATTACHED BOTH ENDS
NOTCHED ANGLE BRIDGING.
2½"
CONSTANT
WIRE BRIDGING
WIRE BRIDGING
4½"
6"
½"
CON-STANT.
1½"
4½"
6
CON-STANT.
2½"
CONSTANT
FURRING BAR TO SUPPORT LATH TO BE PLACED IN FIELD BEFORE PLACING TOP LATH
STANDARD END BEARING 4½" AS SHOWN. THIS MAY BE VARIED FROM 4" TO 5½" THUS ALLOWING TOTAL VARIATION OF 3"
WALL BEARING
STEEL BEARING.
TYPICAL DETAIL RIVET-GRIP STEEL JOISTS
WITH RIGID ATTACHED BEARING PLATES.
A
A
FORM WORK IS SUPPORTED LATERALLY BY JOIST DIAGONAL
NOTE CONTINUITY OF TOP BAR
B
B
NOTE SIMPLICITY OF FORMWORK
SECTION A-A
SECTION B-B
ALTERNATE DETAIL-BOTT. CHORD STRAIGHT.
CONCRETE BEAM BEARING DETAILS AND METHODS OF FRAMING INTO FORMWORK
STANDARD DETAIL-BOTT. CHORD BENT-UP.
2-⅝"ϕ BOLTS
WIDTH OF OPENING
2-⅝"ϕ BOLTS
½" PLATES
2-⅝"ϕ BOLTS
½" PLATES
2-⅝"ϕ BOLTS
⅜" ANGLE HEADER
R.G. JOIST HEADER
HEADERS AT OPENINGS
FOR OPENINGS OVER 4'-0"
FOR OPENINGS LESS THAN 4'-0"

Rivet-Grip Steel Joists—Floor Construction Details

TOTAL SAFE LOAD IN POUNDS PER LINEAL FOOT ON RIVET-GRIP JOISTS

Type of joist	Depth in.	Weight per ft., lb.	Safe resisting moment	Clear span in feet																									
				5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
55	6	4.1	34,300	510	425	364	318	285	230	190	155	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
55	8	4.1	46,800	....	....	....	....	284	255	232	220	189	162	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
66	8	5.3	66,000	....	....	....	....	....	408	372	312	266	230	200	176	....	....	....	....	....	....	....	....	....	....	....	....	....	....
66	9	5.3	75,000	....	....	....	....	....	....	372	339	310	262	228	200	177	158	....	....	....	....	....	....	....	....	....	....	....	....
66	10	5.3	84,000	....	....	....	....	....	....	....	339	314	292	256	224	200	177	159	144	....	....	....	....	....	....	....	....	....	....
66	12	5.3	102,000	....	....	....	....	....	....	....	339	314	292	272	255	242	215	193	174	158	144	132	121	....	....	....	....	....	....
77	9	6.7	99,150	....	....	....	....	....	....	....	425	395	345	300	264	234	208	....	....	....	....	....	....	....	....	....	....	....	....
77	10	6.7	111,400	....	....	....	....	....	....	....	....	395	365	336	296	262	234	210	189	....	....	....	....	....	....	....	....	....	....
77	12	6.7	135,900	....	....	....	....	....	....	....	....	....	....	340	319	300	285	256	232	210	191	175	161	....	....	....	....	....	....
77	14	6.7	160,400	....	....	....	....	....	....	....	....	....	....	....	....	....	283	268	255	243	226	206	190	175	161	150	139	....	....
77	16	6.7	184,900	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	242	232	222	212	202	186	173	161	150	140

Maximum fiber stress, 16,000 lb. per sq. in. Special tables will be furnished for maximum fiber stress of 18,000 lb.
Loads to the left of heavy lines are limited by shear.
Rivet-Grip steel joists made up of heavier sections can be furnished for unusual conditions of loading or spans over 30 ft.

To Find Loads per Square Foot for Standard Joist Spacings—For 11¾-in. joist spacing, multiply loads in above table by 1. For 13½-in. joist spacing, multiply these loads by ⅞. For 15¾-in. joist spacing, multiply by ¾. For 18¾-in. joist spacing, multiply by ⅝. For 23½-in. joist spacing, multiply by ½.

To Determine Safe Superimposed Load—Find safe load per square foot as indicated above. From this figure, subtract (1) weight of slab, joists and ceiling, and (2) weight of finish and fill. Rivet-Grip steel joist floors including top slab and ceiling, but not including finish and fill, weigh approximately 40 lb. per sq. ft.

SIMPLEX STEEL PRODUCTS CO.

Non-bearing Partitions and Suspended Ceilings

TELEPHONE
LAKEVIEW 0395

1146 Roscoe Street
CHICAGO, ILL.

Product

The SIMPLEX SYSTEM of PARTITION and CEILING CONSTRUCTION.

The SIMPLEX SYSTEM

TRADE-MARK

The Simplex System

An effective and economical method of constructing fireproof and soundproof partitions (non-bearing) and suspended or furred ceilings.

Gypsum plaster board has long been recognized as a building and lathing material of considerable merit due to the fireproof qualities of the gypsum and excellent insulating qualities of both the gypsum and the paper surfacing on both sides of the plaster board.

Simplex studs are designed so as to furnish a continuous shoulder on which the plaster boards are securely fastened by No. 10 gauge wire pins 3 in. long. This method of attachment leaves an open joint between plaster boards and permits the plaster to key between the boards and through to the hollow space in the studs.

The prong (integral with the stud) and pin project less than ⅛ in. from the surface of the plaster boards, permitting the rapid application of plaster to the surface.

Advantages Offered by the Simplex System

(I) **Fireproof**—All materials entering into Simplex construction are *fireproof*—steel and gypsum—and constructions of this nature have been passed upon by underwriters and building departments of most principal cities.

(2) **Soundproof**—The Simplex hollow partition contains all the desirable elements for good insulation: (1) a complete air space; (2) gypsum in generous quantity, and (3) four thicknesses of paper, which excels all other materials for sound insulation.

(3) **Light Weight**—The hollow Simplex partition plastered (when dry) weighs 10 lb. per sq. ft. This is a saving of from 40 to 70% of the partition load as compared to the heavier built-up partitions.

This light weight permits economical structural designing and is particularly advantageous when designing buildings for light occupancy using steel or bar joists, or similar light and rapid construction.

(4) **Saves Space**—Because of the construction details and the method of erection, Simplex partitions save from 1 to 2½ in. in finished thickness with results equally as effective and satisfactory.

The following sizes carried in stock for immediate shipment. Other sizes made to order.

1¼-in. hollow studs for partitions to finish 3 in.
2¼-in. hollow studs for partitions to finish 4 in.
3 -in. hollow studs for partitions to finish 4¾ in.
4¼-in. hollow studs for partitions to finish 6 in.
6 -in. hollow studs for partitions to finish 8 in.

(5) **Conceals Piping**—Conduit and other piping is readily concealed in the hollow space and by using the proper size studs, piping as well as steel columns, etc., can be completely covered without patching or the use of other materials.

(6) **Rigid Construction**—In erecting Simplex partitions steel channel runners are used on the floor and ceiling. The studs are set upright in these runners. The result is, walls that are straight with all units securely fastened.

(7) **Sanitary**—Simplex partitions are plastered with gypsum (hardwall) plaster, resulting in a hard smooth finished surface, sealed at floor and ceiling with steel runners, insuring sanitation to the highest degree.

(8) **Wood Grounds, etc.**—Ground nailing blocks, strips, door bucks and other attachments are cared for so as to permit the utmost in economy with permanency assured.

(9) **Economical**—All units being large and light in weight, as well as low in cost, permits the completion of work at a saving in both time and expense.

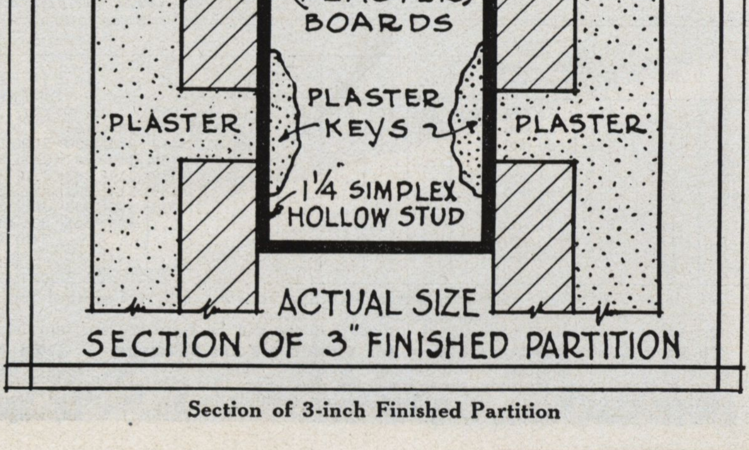
(10) **Better Plastering**—The nature of plaster board is such that it is most economical to use a rich mixture of gypsum plaster, with the result that a better quality of work, a more lasting and smoother surface are at all times assured.

(11) **Salvage Value**—The character of studs and fastenings permits the easy salvaging of studs and runners for re-use, with a minimum of waste and debris.

(12) **Adaptability**—The economical cost, rapid erection, simple details, light weight and the high quality of the materials used make Simplex construction the most logical for use where savings in time and cost as well as high grade construction are desired in such buildings as hotels, apartments, office buildings, schools, dormitories, hospitals, etc.

Details and Handbook

Full size and scale details showing economical and substantial methods of caring for such items as door bucks, grounds, carpet strips, blackboards, ironing boards, metal base, etc., have been prepared and will be sent on request with complete textbook.



Section of 3-inch Finished Partition

Continued on next page

Specifications for Hollow Partitions

This contractor to erect hollow Simplex partitions where shown, using Simplex studs of the sizes shown on plans, anchoring channel runners to floor and ceiling, and setting studs upright on 24½-in. centers. Studs to be securely nailed to door bucks and nailed or wired to intersecting walls. Corner studs to be used where required.

After studs have been properly placed, attach ⅜x24x32-in. gypsum plaster board to each side of studs, using No. 10 wire pins secured in place by use of Simplex tying tool to hold boards securely against steel studs. Pins to be 6 in. or less apart.

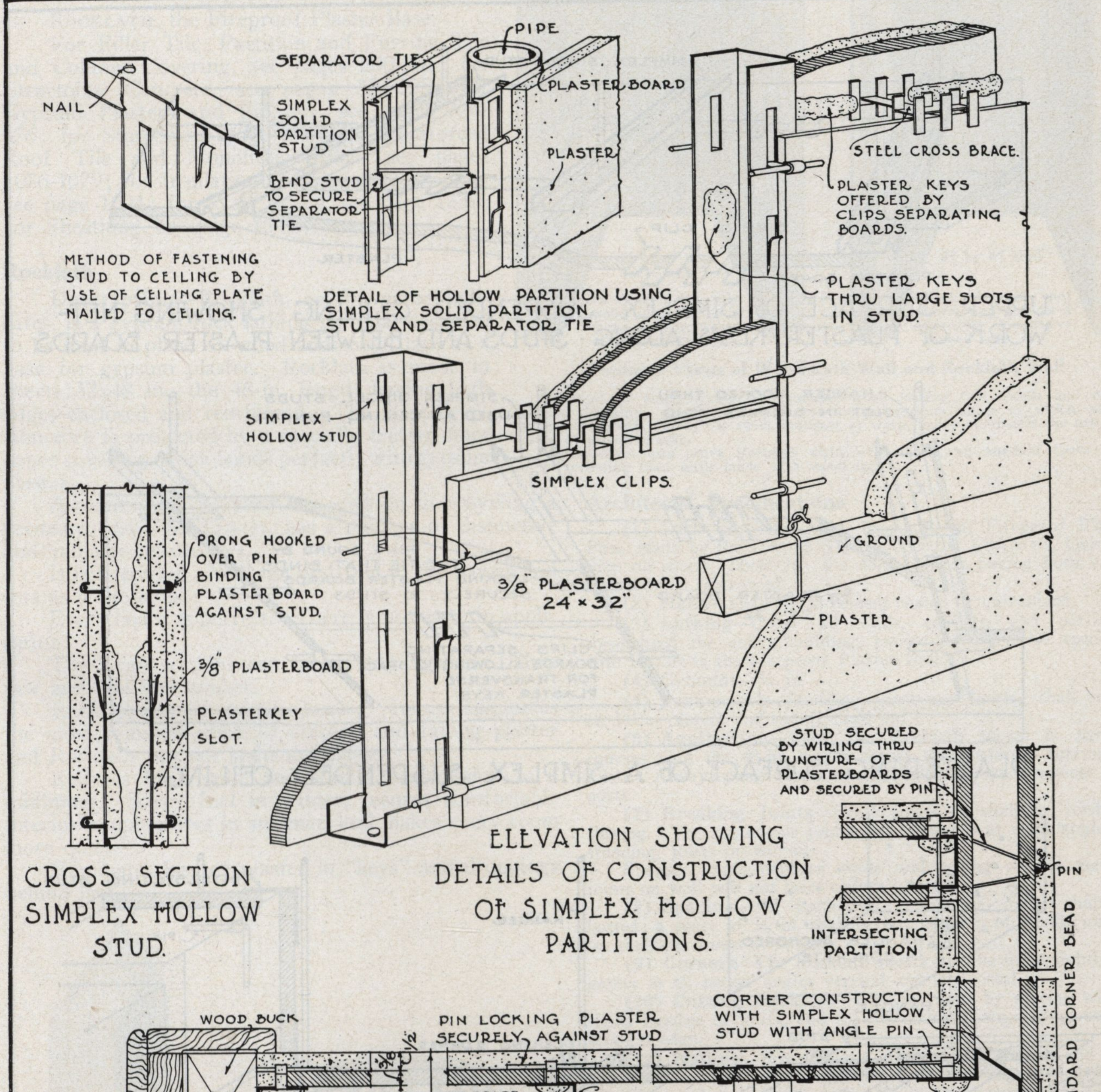
The bottom row of plaster boards shall be full and half size, alternated to give broken joints. In center of each horizontal joint furnish and place one Simplex cross clip to separate boards not less than ¼ in. for plaster key.

If more practical for wide partitions, two rows of studs may be used with plaster board attached to exposed sides only.

All exposed surfaces to be plastered in accordance with recommended specification of the Gypsum Industries.

Note: Suggested specifications detailing three methods of mixing and applying plaster to Simplex partitions and ceilings have been prepared and will be sent on request.

Simplex construction insures you of getting straighter, better walls at less cost and in less time, better plastering, smoother surface and faster work. They create harmony on the job, eliminate congestion and debris.


NAIL
METHOD OF FASTENING STUD TO CEILING BY USE OF CEILING PLATE NAILED TO CEILING.
PIPE
SEPARATOR TIE
SIMPLEX SOLID PARTITION STUD
PLASTER BOARD
PLASTER
BEND STUD TO SECURE SEPARATOR TIE
DETAIL OF HOLLOW PARTITION USING SIMPLEX SOLID PARTITION STUD AND SEPARATOR TIE
STEEL CROSS BRACE.
PLASTER KEYS OFFERED BY CLIPS SEPARATING BOARDS.
PLASTER KEYS THRU LARGE SLOTS IN STUD.
SIMPLEX HOLLOW STUD
SIMPLEX CLIPS.
GROUND
3/8" PLASTERBOARD 24"x32"
PLASTER
PRONG HOOKED OVER PIN BINDING PLASTERBOARD AGAINST STUD.
3/8" PLASTERBOARD
PLASTERKEY
SLOT.
CROSS SECTION SIMPLEX HOLLOW STUD.
ELEVATION SHOWING DETAILS OF CONSTRUCTION OF SIMPLEX HOLLOW PARTITIONS.
STUD SECURED BY WIRING THRU JUNCTURE OF PLASTERBOARDS AND SECURED BY PIN
PIN
INTERSECTING PARTITION
STANDARD CORNER BEAD
CORNER CONSTRUCTION WITH SIMPLEX HOLLOW STUD WITH ANGLE PIN
WOOD BUCK
PIN LOCKING PLASTER SECURELY AGAINST STUD
1/2
3/8
1¼"
3"
AIRSPACE ENCLOSING WIRE CONDUITS ETC.
SIMPLEX HOLLOW STUD
STEEL CROSSBRACE IF DESIRED
ANGLE PIN
DOOR
PLASTER FACE
CROSS SECTION OF SIMPLEX HOLLOW PARTITION.

Details of Construction of Simplex Hollow Partitions

Continued on next page

Specifications for Simplex Ceilings

This contractor to erect or attach all flat suspended or furred ceilings by the Simplex System.

Under Concrete Slabs or Joists—Wire hangers of No. 8 or 9 gauge to be inserted in concrete at time of pouring, on about 2-ft. centers both ways.

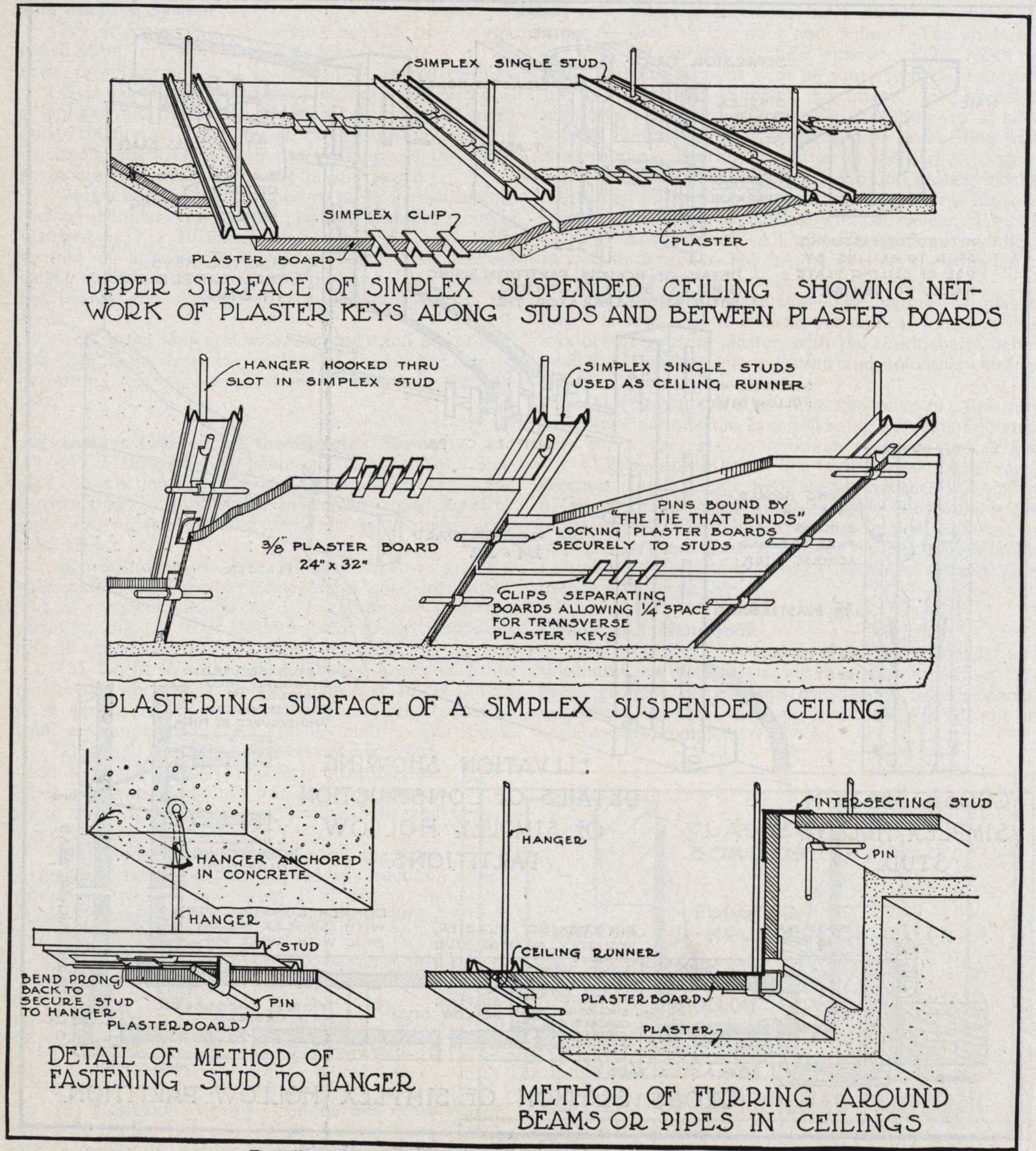
After hangers have been straightened and marked for height level, bend at right angles and tie around ¾-in. channel irons and cross furr under channel iron with Simplex ceiling runners set on 24½ to 24⅝-in. centers properly paralleled, using a double strand of No. 18 gauge tie wire. Cross tie on each channel. Where ceilings are to carry plank walk, gauge of hangers should be increased and channel irons should be 1½-in. instead of ¾-in.

Under Steel Joists—Where ceilings are attached to under side of steel joists, Simplex ceiling runners are to be attached immediately below joists, set on 24½ to 24⅝-in. centers, using Simplex steel joist clips for attaching.

Under Steel Bar Joists—Where ceilings are attached to underside of bar joists, Simplex ceiling runners are to be tied to underside of joists transverse to joists, on 24½ to 24⅝-in. centers, using a double strand of No. 18 galvanized tie wire. Cross tie on each bar.

All Ceilings—After ceiling runners have been properly supported, attach ⅜x24x32-in. gypsum plaster boards, securing them to runners with 3-in. long wire pins, using Simplex tying tool to firmly lock pin in prong to hold board in place. Plaster board courses to be started with full and half size pieces alternated to provide broken joints. In center of each joint between plaster boards, place one Simplex cross clip to separate boards not less than ¼ in., which separation and slots in runners are to be used for plaster keys.

Note: For plastering specifications see Simplex Partitions.


SIMPLEX SINGLE STUD
SIMPLEX CLIP
PLASTER BOARD
PLASTER
UPPER SURFACE OF SIMPLEX SUSPENDED CEILING SHOWING NETWORK OF PLASTER KEYS ALONG STUDS AND BETWEEN PLASTER BOARDS
HANGER HOOKED THRU SLOT IN SIMPLEX STUD
SIMPLEX SINGLE STUDS USED AS CEILING RUNNER
PINS BOUND BY "THE TIE THAT BINDS"
LOCKING PLASTER BOARDS SECURELY TO STUDS
3/8" PLASTER BOARD 24" x 32"
CLIPS SEPARATING BOARDS ALLOWING 1/4" SPACE FOR TRANSVERSE PLASTER KEYS
PLASTERING SURFACE OF A SIMPLEX SUSPENDED CEILING
HANGER ANCHORED IN CONCRETE
HANGER
STUD
BEND PRONG BACK TO SECURE STUD TO HANGER
PIN
PLASTERBOARD
DETAIL OF METHOD OF FASTENING STUD TO HANGER
HANGER
INTERSECTING STUD
PIN
CEILING RUNNER
PLASTER BOARD
PLASTER
METHOD OF FURRING AROUND BEAMS OR PIPES IN CEILINGS

Details of Construction of Simplex Suspended Ceilings

UNITED STATES GYPSUM COMPANY

Rocklath, Fireproof Plaster Base

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see page 374

Product

Rocklath, the Fireproof Plaster Base.

For Filler Tile, Partition and Furring Tile and Column Covering, see pages 200-201; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

Rocklath

Description—Rocklath, as the name indicates, is a gypsum rock lathing material designed to be used in place of wood and metal lath as a base for gypsum plaster. Rocklath is made in sheets 32x48 in., the 48-in. length having both edges enclosed and reinforced. The ⅜-in. gypsum core is protected by a specially treated fibre paper covering which bonds perfectly with gypsum plaster.

Advantages—Rocklath, in addition to providing a permanent base for plaster, has a number of distinctive and valuable advantages.

It is fireproof. Will not add fuel to the flames and acts as a fire-stop.

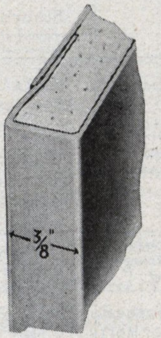
Every board is perfect. There is no waste in application.

The large sections can be quickly applied. They saw and nail like lumber.

Rocklath can not warp or buckle. Its use eliminates the most common cause of cracked and falling plaster and Rocklath can not stain the plaster.

Reduces heat, cold, and sound transmission to a minimum. Saves fuel in winter, insures comfortable interior temperatures in summer, and makes every room more quiet.

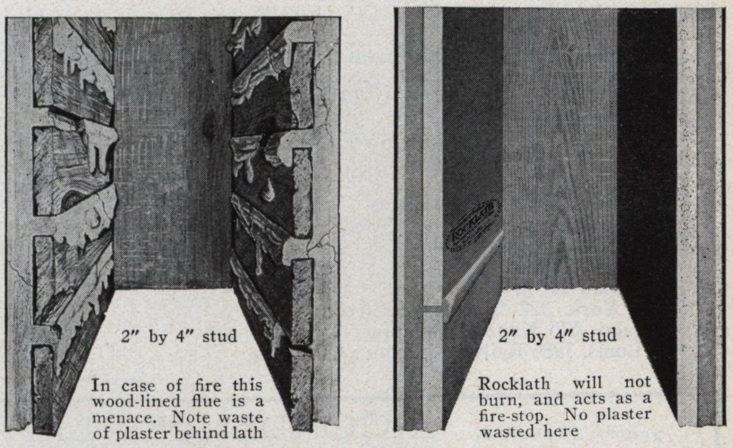
Eliminates loss of plaster in "keys" and droppings behind lath.



Rocklath
Note patented reinforced nailing edges

UNITED STATES GYPSUM CO.
ROCKLATH
The *FIREPROOF* PLASTER BASE
CHICAGO, ILL.
Patented June 11, 1912, Aug. 6, 1912, Feb. 10, 1920, Nov. 9, 1920, June 28, 1921, July 12, 1921

TRADE-MARK BORNE BY
GENUINE ROCKLATH



In case of fire this wood-lined flue is a menace. Note waste of plaster behind lath

Rocklath will not burn, and acts as a fire-stop. No plaster wasted here

Sectional Views of Wood Lath Wall and Rocklath Wall

Instead of weak, flimsy, inflammable wood lathing that swells and cracks plaster, Rocklath provides a solid, continuous gypsum sheet to which plaster adheres perfectly. Does not swell, contract or warp, hence eliminates the principal cause of plaster cracks.

Exhaustive tests prove Rocklath walls over three and one-half times more sound resisting than walls made with wood lath

Architects' Specifications

(1) **Lath**—Shall be ⅜-in. Rocklath, the Fireproof Plaster Base, made by the United States Gypsum Company, Chicago. Size of sheets, 32x48 in., the 48-in. length having both edges enclosed and reinforced.

(2) **Nails**—Shall be 3d cement coated or galvanized.

(3) **Lathing**—Cover all walls, ceilings, and partitions throughout the entire building, except as otherwise specified, with Rocklath, the Fireproof Plaster Base.

(4) **Grounds**—⅞ in.

(5) **Framework**—Studding, joists and furring shall be set on 16-in. centers and evenly lined up.

(6) **Application**—Place the Rocklath sheets in parallel courses with the 48-in. length across the studding, furring or joists. Always place the trade-mark side of board against supports.

(7) **Breaking Joints**—Break joints on studding, joists or furring. The continuous joints run crosswise at right angles to studding, joists or furring.

Stagger joints between walls and ceiling so the vertical joints on wall will not meet ceiling joints.

(8) **Spacing**—All horizontal continuous joints shall be butted; a space of ¼ in. shall be left between mill ends joining on studding, joists or furring.

(9) **Corners**—The Rocklath sheets shall be fitted tightly together at all corner angles vertical and horizontal.

(10) **Cutting Rocklath**—Shall be done by scoring with a sharp hatchet or knife, and then breaking down and up over a straight edge.

(11) **Nailing**—Space nails 4 in. apart on sidewalls and 3 in. apart on ceilings. First, nail board to intermediate supports; then outer edges, spotting nails ⅜ in. from outer edge. Nail each corner of board. Each nailing edge of Rocklath must have a bearing on studs, joists or furring of not less than ¾ in. Drive all nails "home"—straight, firm and tight, but not far enough to rupture sheets.

(12) **Judge of Work**—The above description of breaking joints, spacing, nailing, etc., shall be strictly followed, and the architect reserves the right to order removed all sheets that are not applied according to the above specifications and they shall be replaced by the lather.

ASSOCIATED TILE MANUFACTURERS

Wall and Floor Tiles, Ceramic Mosaic and Faience

BEAVER FALLS, PA.

PRODUCERS OF ASSOCIATION TILES

ALHAMBRA TILE COMPANY
  Newport, Ky.
AMERICAN ENCAUSTIC TILING CO., LTD.
  Zanesville, Ohio
  Maurer, N. J.
  Los Angeles, Cal.
  New York, 16 East 41st Street
  Chicago, 332 South Michigan Avenue
BEAVER FALLS ART TILE COMPANY
  Beaver Falls, Pa.
  New York, 156 West 49th Street
  Chicago, 306 South Wabash Avenue
CAMBRIDGE TILE MANUFACTURING COMPANY
  Covington, Ky.
  New York, 8-10 West 13th Street
GRUEBY FAIENCE AND TILE COMPANY
  Perth Amboy, N. J.
  New York, 9 East 45th Street
  Philadelphia, 1600 Walnut Street
MOSAIC TILE COMPANY
  Zanesville, Ohio
  Matawan, N. J.
  New York, 327 West 42nd Street
  Chicago, 626 Kimball Building
  St. Louis, 1986 Railway Exchange Building
MATAWAN TILE COMPANY
  Matawan, N. J.
NATIONAL TILE COMPANY
  Anderson, Ind.
  New York, 636-38 West 34th Street
  Chicago, 59 East Adams Street
  St. Louis, 1725 Railway Exchange Building
  San Francisco, 914 Balboa Building
OLD BRIDGE ENAMELED BRICK AND TILE CO.
  Old Bridge, N. J.
  Chicago, 122 South Michigan Boulevard
THE C. PARDEE WORKS
  Perth Amboy, N. J.
  New York, 9 East 45th Street
  Philadelphia, 1600 Walnut Street
PERTH AMBOY TILE WORKS
  Perth Amboy, N. J.
  New York, 156 West 49th Street
  Chicago, 306 South Wabash Avenue
UNITED STATES ENCAUSTIC TILE WORKS
  Indianapolis, Ind.
  New York, 101 Park Avenue
  Chicago, Tower Building, 6 North Michigan Boulevard
WHEELING TILE COMPANY
  Wheeling, W. Va.

• CONDENSED LIST OF TILES •

THEIR CHARACTERISTICS & USES

KIND OF TILES	GRADES*	THICKNESS	SHAPES AND SIZES**	COLORS	SURFACES & GLAZES	GENERAL USES
CERAMIC MOSAIC	Sel. (In White) (Sel. & Com)	$\frac{1}{4}$	Square $\frac{3}{4}$ $\frac{1}{2}$ Oblong $2\frac{1}{16} \times 1$ $1\frac{1}{16} \times \frac{1}{2}$ Hexagon $1\frac{1}{4}$ 1 Round $\frac{13}{16}$	See Vitreous and Semivitreous Tiles	Unglazed	Floors Walls Swimming Pools Plunge Baths Kitchen Sinks Interior Exterior
ENAMEL MOSAIC GLAZED MOSAIC	Sel.			See Dull Glazed Tiles	Bright	
DULL GLAZED MOS. MATT GLAZED MOS.					Dull Matt	
FAIENCE MOSAIC	Sel.	Variable	Any shape or size less than $2\frac{1}{4}$ Square Inches in area	See Faience Tiles	Plain or Embossed Bright, Dull or Matt	
PLASTIC MOS.				See Plastic Tiles	Plain or Embossed Unglazed	
VITREOUS TILES	Sel. and Com.	$\frac{1}{2}$	Square 3, $2\frac{1}{8}$, $1\frac{1}{2}$, $1\frac{1}{16}$. Oblong $3 \times 1\frac{1}{2}$, 3×1, $3 \times \frac{1}{2}$, $2\frac{1}{8} \times 1\frac{1}{16}$. $1\frac{1}{16} \times \frac{17}{32}$ Hexagon 3, 2, Octagon 3 Triangle 3, $1\frac{47}{64}$, $1\frac{5}{32}$	White, Celadon, Silver-Gray, Green, Blue green, Light blue, Dark blue, Pink, Cream and Granites of these colors.	Unglazed	Floors Walls Fireplaces Interior or Exterior
GLAZED					Bright	
DULL GLAZED MATT GLAZED				See Dull Glazed Tiles	Dull Matt	
SEMIVITREOUS TILES	Sel.		Same as Vitreous Tiles, Also: Square 6, $4\frac{1}{4}$ Oblong 9×3, 6×4, 6×3, 6×2, $6 \times 1\frac{1}{2}$. $6 \times \frac{3}{4}$. $6 \times \frac{1}{2}$, $4\frac{1}{4} \times 2\frac{1}{8}$. $4\frac{1}{4} \times 1\frac{1}{16}$, Hexagon 6, $4\frac{1}{4}$, 6×3, $4\frac{1}{4} \times 2\frac{1}{8}$ Octagon 6, $4\frac{1}{4}$ Pentagon $5\frac{5}{16}$, $2\frac{1}{8}$	Buff, Salmon, Light gray, Dark gray, Red, Black, Chocolate, and Granites of these Colors.	Unglazed	
GLAZED					Bright	
DULL GLAZED MATT GLAZED				See Dull Glazed Tiles	Dull Matt	
FLINT PAVING TILES	Sel. and Com.	$\frac{3}{4}$	Square 6, $4\frac{1}{4}$ Oblong 6×4, 6×3, $6 \times \frac{1}{2}$ Hexagon 6, $4\frac{1}{4}$ Octagon 6	White, Light gray, Dark gray, Celadon, Sage, Light blue, Dark blue, Green, Cream	Unglazed	Floors, Walls Interior-Exterior
HYDRAULIC	Sel.	$\frac{3}{4}$ and $\frac{21}{32}$	Square 6, $4\frac{1}{4}$ Oblong 10×5, 9×3, 6×3, $6 \times \frac{1}{2}$ Hexagon 6, $4\frac{1}{4}$	See Semivitreous Tiles		Floors Interior-Exterior
WHITE GLAZED TILES	Sel. Std. and Com.	$\frac{1}{2}$ and $\frac{3}{8}$	Square 6, $4\frac{1}{4}$, 3, $2\frac{1}{8}$, $1\frac{1}{2}$. $1\frac{1}{16}$, $\frac{3}{4}$, $\frac{1}{2}$ Oblong 6×3, 6×2, $6 \times 1\frac{1}{2}$, 6×1, $6 \times \frac{3}{4}$, $6 \times \frac{1}{2}$, $4\frac{1}{4} \times 2\frac{1}{8}$, $4\frac{1}{4} \times 1\frac{1}{16}$, $3 \times 1\frac{1}{2}$. 3×1, $3 \times \frac{1}{2}$, $3 \times \frac{1}{4}$, $2\frac{1}{8} \times 1\frac{1}{16}$ Hexagon 3, 2 Octagon 3	White	Plain or Embossed Bright	Walls Interior
DULL GLAZED TILES MATT GLAZED TILES	Sel. and Com.	$\frac{1}{2}$		-Unlimited Color Range- Selection must be made from samples and colors specified by numbers	Plain or Embossed Dull Matt	Walls Interior Fireplaces
ENAMELS					Bright	
PLASTIC TILES	Sel.	$\frac{1}{2}$ and over	Obtainable in all of the above, and Special Shapes & Sizes	Colors that result from firing of natural clays	Plain or Embossed Smooth or Rough Unglazed	Floors Walls Interior Exterior Fireplaces
FAIENCE	Sel. and Com.			See Dull Glazed Tiles	Plain or Embossed Bright, Dull or Matt	
QUARRY TILES	Sel.	1 and $\frac{3}{4}$	Square 9, 6	Red, Salmon, Gray	Unglazed	Floors Interior-Exterior

*Grades: Sel. = Selected, Std. = Standard, Com. = Commercial

** Only Standardized Shapes and Sizes Given

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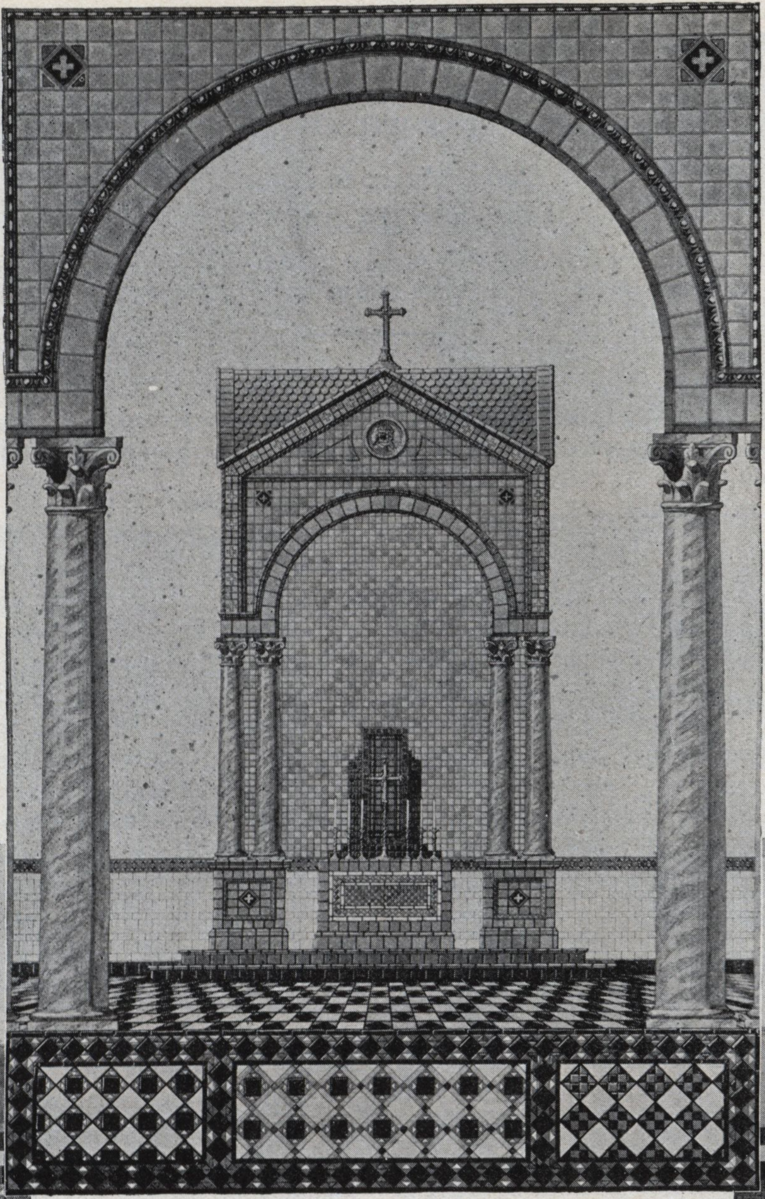
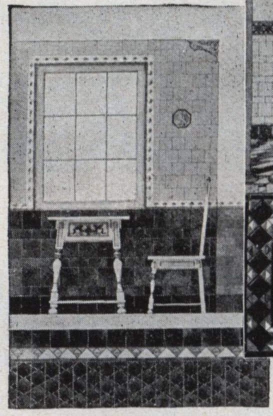
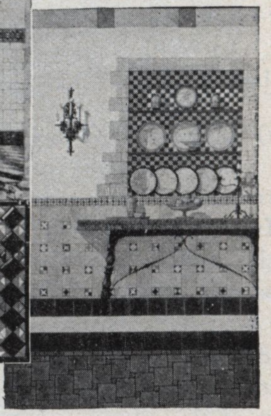


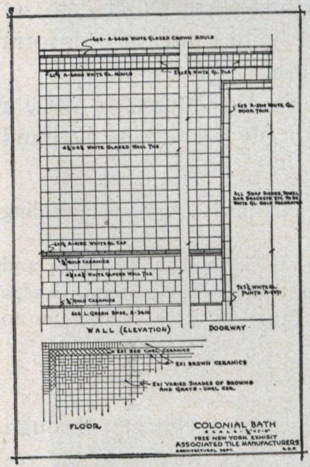
An Early Christian Baldacchino
A period motif



A Venetian Breakfast Nook
A period motif



A Spanish Dining Room
A period motif

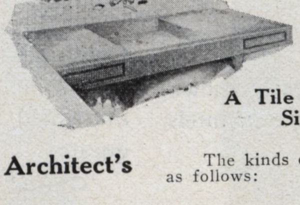

6x6 A-6400 WHITE GLAZED CROWN MOULD
A-6000 WHITE GL. MOULD
WHITE GL. TILE
A-3110 WHITE GL. DOOR TRIM
4¼x4¼ WHITE GLAZED WALL TILE
ALL SOAP DISHES, TOWEL BAR BRACKETS ETC. TO BE WHITE GL. GOLD DECORATED
A-4186 WHITE GL. CAP
GOLD CERAMICS
4¼x4¼ WHITE GLAZED WALL TILE
WHITE GL. PLINTH
GOLD CERAMICS
6x6 L GREEN BASE, A-3610
WALL (ELEVATION)
DOORWAY
RED UNGL. CERAMICS
BROWN CERAMICS
VARIED SHADES OF BROWNS AND GRAYS - UNGL. CER.
FLOOR
COLONIAL BATH
1925 NEW YORK EXHIBIT
ASSOCIATED TILE MANUFACTURERS
ARCHITECTURAL DEPT.

From "The House of Tiles"

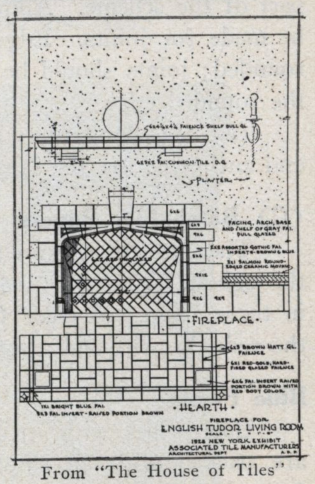
Ask for Publications for Architects

All publications are A.I.A. standard size 7½x10⅝ inches.

K-200. Basic Information—sizes, colors, grades.
K-300. Basic Specifications—a standard document.
K-400. Glazed Tiles and Trimmers—standard sizes and shapes.
K-500. Ceramic Mosaic—standard patterns in color.
Full Size Details of Glazed Tiles and Trimmers—wall charts.
Tiled Swimming Pools—second edition, popular.
Tiled Swimming Pools—architects' technical edition.
Tiled Hospitals—illustrated.
The Market—illustrated.
Home Suggestions—a series of color plates.
Architectural Monographs on Tiles and Tilework.
Period Motifs—in color with specification.
House of Tiles—dimensioned details and photographs of ten rooms.
Tile Kitchen Sink—technical information illustrated.



A Tile Kitchen Sink


FAIENCE SHELF DULL GL.
FAI. CUSHION TILE - D.G.
PLASTER
FACING, ARCH, BASE AND SHELF OF GRAY FAI. DULL GLAZED
ASSORTED GOTHIC FAI. INSERTS - BROWN & BLUE
SALMON ROUND-EDGED CERAMIC MOSAIC
RED UNGLAZED
FIREPLACE
6x3 BROWN MATT GL. FAIENCE
6x1 RED-GOLD, HARD-FIRED GLAZED FAIENCE
6x6 FAI. INSERT RAISED PORTION BROWN WITH RED BODY COLOR
1x1 BRIGHT BLUE FAI.
3x3 FAI. INSERT - RAISED PORTION BROWN
HEARTH
FIREPLACE FOR ENGLISH TUDOR LIVING ROOM
1925 NEW YORK EXHIBIT
ASSOCIATED TILE MANUFACTURERS
ARCHITECTURAL DEPT

From "The House of Tiles"

Single Paragraph for Incorporation in the Architect's Specification on Tilework

Furnish all materials and labor necessary for the completion of the tilework. The Basic Specification for Tilework, Second Edition, 1924, as issued by the ASSOCIATED TILE MANUFACTURERS, Beaver Falls, Pa., in so far as any portion is applicable to this building, is hereby made a part of this specification and of the contract.

The kinds of tile and accessories and the extent of tilework shall be as follows:

Architectural Service Department

Our Architectural Service Department is maintained for your benefit. It welcomes inquiries concerning the proper use of tiles as well as treatments in particular styles or periods. It is at your service.

BATCHELDER TILES

Manufactured by
BATCHELDER-WILSON COMPANY

2633 Artesian Street
LOS ANGELES, CAL.

NEW YORK OFFICE AND DISPLAY ROOMS, 1002 Architects Building, 101 Park Avenue
WAREHOUSE FOR EASTERN DISTRIBUTION: NEW YORK, N. Y.

Products

Product is of three distinctive types all of which, when properly installed, are guaranteed to stand up under any climatic conditions.

TILES; TERRA COTTA; PAVERS.

(A) Batchelder Tiles

They are made from high fired clay bodies with a surface coloration of mineral slips fired to the same temperatures as the bodies, assuring permanence. These tiles have a characteristic texture with many modifications of color. As there is no superficially applied overglaze, they are not subject to any form of crazing or cracking.

(a) They are made with slightly rounded edges for recessed pointing as in mantels and fountains.

(b) With square cut edges for flush pointing as in bathrooms and floors.

(B) Batchelder Terra Cotta

This is unique in color and texture. It blends harmoniously with plaster, brick, cement or stone. It is free from high lights and monotonous surfaces. For ashlar wall facings, the varying colors and textures are especially effective.

(a) This material is structurally the same as standard terra cotta and should be specified in the same manner, except that joints are considered an essential part of the scheme. Allowance of ⅜ to ⅝ in. should be made for joints. Edges of units are made slightly rounded; joints should be recessed sufficient to expose the rounded edge.

(b) Size limitations and the methods of bedding and anchoring are the same as for standard terra cotta.

(C) Batchelder Pavers

They are of a semivitreous body uniform in color throughout, with a non-slip surface. They are made in three ranges of color from black to cream through the reds, browns and grays.

Blue Prints

Blue prints, with setting dimensions clearly shown, are packed with all shipments of catalogue mantels, fountains, etc.

Setting Instructions

These instructions to the tile setter are packed with all shipments.

Specifications should require that installation of the material shall accord with the printed instructions furnished by the manufacturer with each shipment.

Standard Sizes

Tiles—Our tiles are slightly less than nominal sizes in order to insure the proper width of joint essential to a handmade product. For example, 6x6-in. tiles will average $5\frac{13}{16}$ in. square; 4x4, $3\frac{13}{16}$ in. square. Mortar joints should be from ¼ in. for 3x3 in. to ½ in. for 12x12.

Pavers—Carried in stock in 4-in. hexagon with long and short halves, 4x4, 2x4 and 2x2, paver colors. They may be ordered in all sizes up to a maximum size of 10x10. Where larger units are desirable, a grouping of several tiles with close cross joints and a wider joint surrounding the group is recommended. For instance, a group of four 6x6-in. tiles, laid as above, gives the structural effect of a 12x12-in. unit, and allows a pleasing variation in the tone of the individual units.

Setting Dimensions

Setting dimensions are given to centers of joints and work should be laid out on that basis. Two 6x6 in. or three 4x4 in. or four 3x3 in. at 12¼ in. to centers of joints; four 6x6 in. to 2 ft. ½ in.; eight 6x6 in. to 4 ft. 1 in.

(a) Bathroom Installations—Are planned to set to an even multiple of 12 in. on joint centers to conform with requirements in general use.

(b) Rough Work—Should be planned to allow a maximum of 1½ in. to face of tile for setting bed and tile thickness.

Note: Batchelder Tiles are ¾ in. thick up to and including 9-in. dimensions.

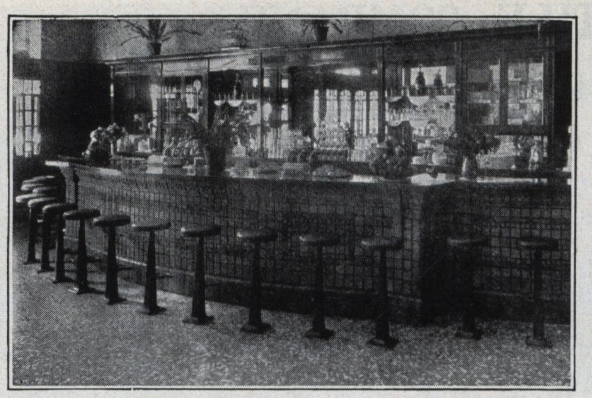
Batchelder Pavers are ⅝ in. thick in 4-in. hexagon and 4x4; ⅞ in. thick in 6x6 in.; 1⅛ in. thick in larger units. Large paver units should have an allowance of 2 in. maximum to rough work.

Complete Data

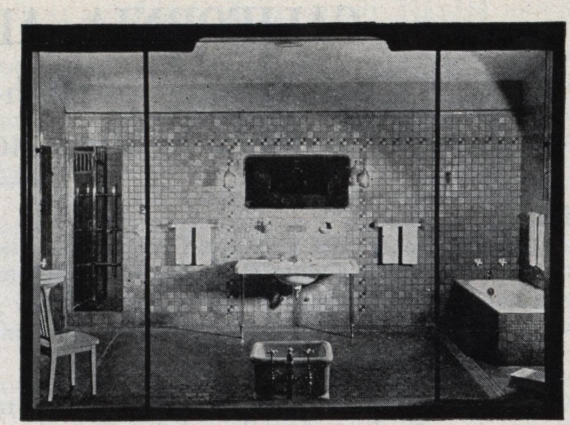
Complete data is available to architects through illustrated catalogues and price lists furnished on request:

General Catalog and Price List
Mantel Catalog and Price List
Fountain Catalog and Price List
Pavement Catalog and Price List

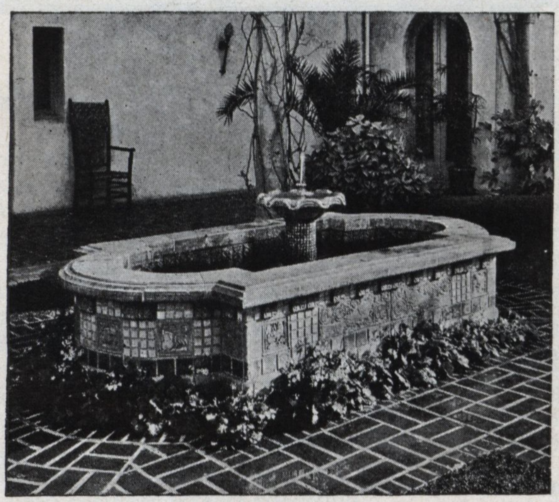
Continued on next page



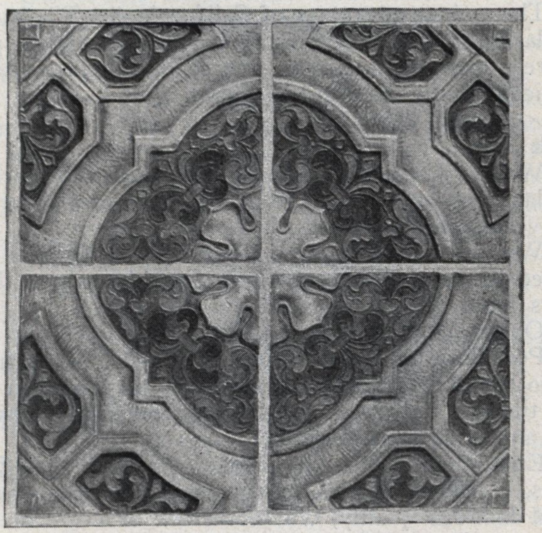
Lunch Room Counter



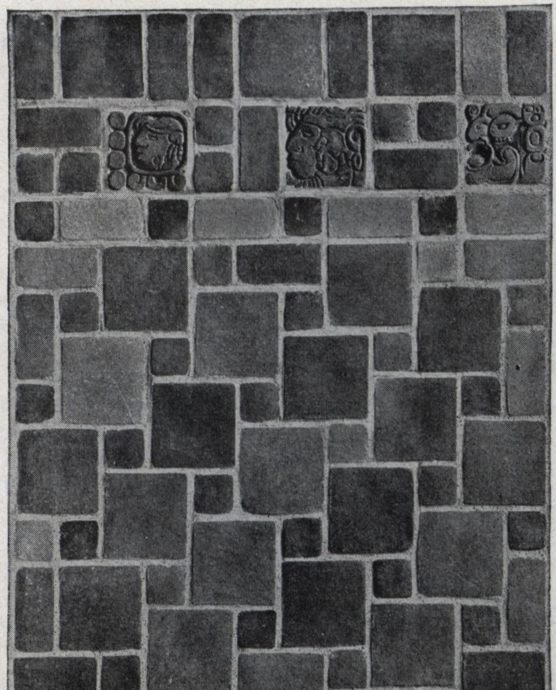
Bathroom Complete



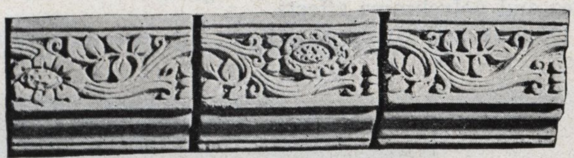
Fountain No. 558



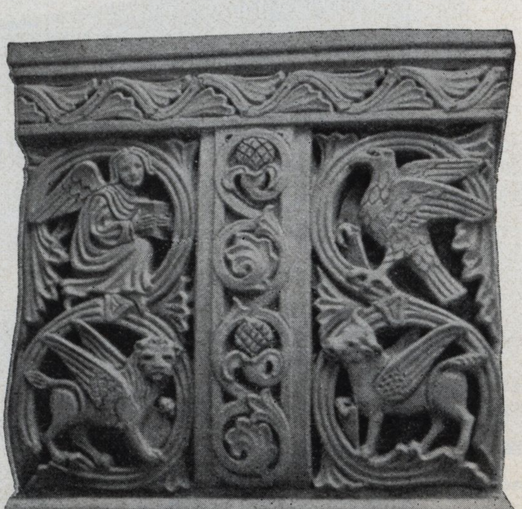
Repeated Unit, Design No. 707—6x6



Batchelder Pavers, Design No. 775



Border, Design No. 500—4x3



Example of Terra Cotta

CALIFORNIA ART TILE COMPANY

Manufacturers of High-fired Faience and Floor Tile

RICHMOND, CALIF.

Products

FLOOR and WALL TILE, FAIENCE TILE and MOORISH TILE for every use, including store fronts, bathrooms, mantels, counters, fountains and swimming tanks.

Also Tile Bathroom Fixtures.

The Only High-fired Tile

The faience and floor tile of CALIFORNIA ART TILE COMPANY are, to the best of our knowledge, the only tile with a high-fired body and enamel manufactured in the United States.

This unique advantage of California Art Tile has so popularized it that the company has now expanded from a purely local institution to one selling its products in practically every state in the Union.

Stock Tile

We carry in stock hundreds of designs in the various popular sizes, and in a range of 24 colors as well as distinctive polychrome effects.

We also finish up any of our stock designs in any desired shade or polychrome effect within two or three weeks from receipt of order.

Our stock tile includes:

Porcelain and Dull Matt Tile—All sizes from 2x2 to 12x12 inches, in seven shades. Our porcelain dull matt tile are high-fired, just vitreous enough to have a hard and impervious surface.

Enameled Tile—All sizes from 2x2 to 12x12 inches, in 100 shades. Our enameled tile have a wonderful lustrous quality, will not crack or craze in any climate, and are guaranteed non-fading.

Decorative Tile—Hundreds of designs in four shades and polychrome effects.

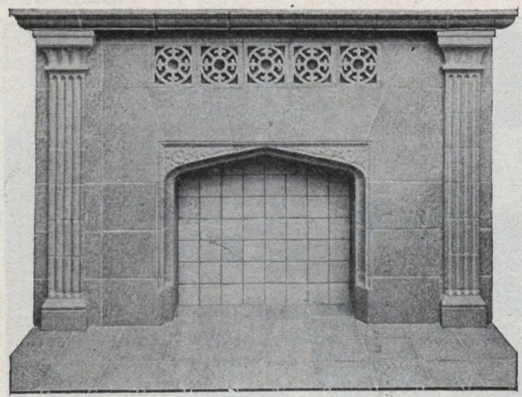
Designs and colors shown in our loose-leaf catalogue.

We Design to Order

We have exceptional facilities for designing and making to order from sketches special tile in any desired motifs and colors.

Specially designed tile are completed within 30 to 45 days from receipt of order, according to the intricacy of the design.

We are glad to quote figures on special work of this kind.



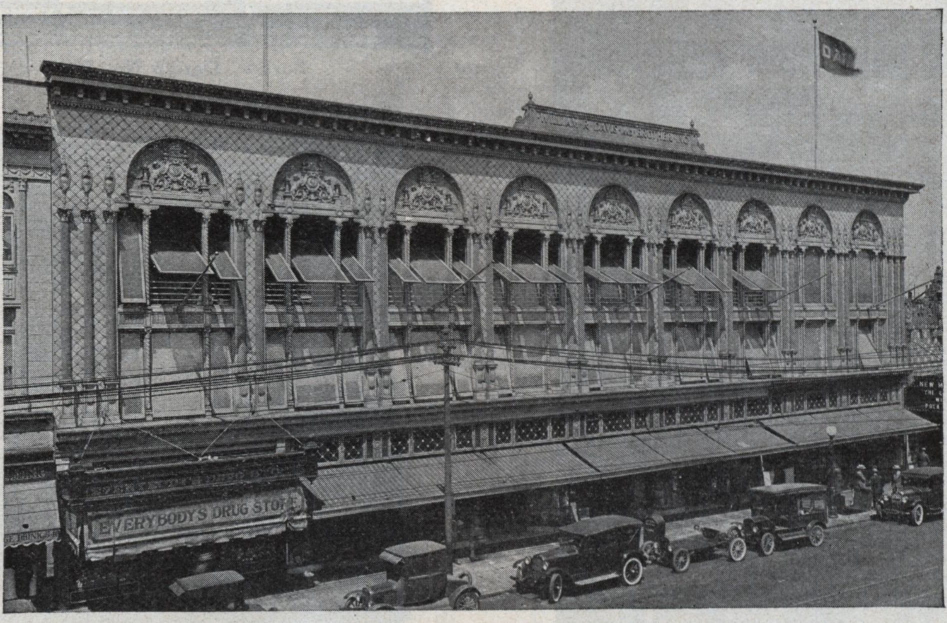
A California Art Tile Mantel

Has true artistic distinction

Order from Your Dealer

California Art Tile are as perfect as care and skill can make them. The satisfaction they give depends, in a great measure, upon the skill with which they are set.

We therefore distribute our tile solely through reputable tile and mantel dealers.



Davis Brothers' Department Store, San Francisco, Calif.

Facade of CALIFORNIA ART TILE COMPANY'S Faience, a favored material for store fronts and interiors

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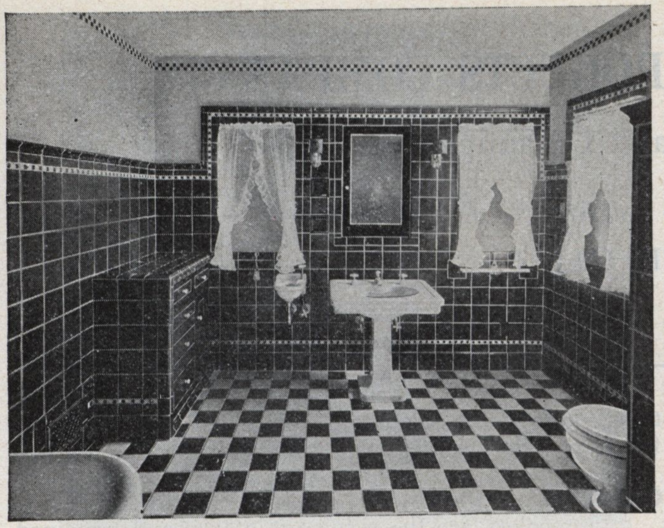

A Typical Bathroom of California Art Tile Company's Faience

Advantages of High-fired Tile

California Art Tile, to the best of our knowledge the only high-fired tile manufactured in the United States, have been brought to their present high degree of excellence by the perfection of a special-formula enamel, the result of years of experimentation by our ceramist.

The Mellon Institute has tested this enamel on the same body used for our tile, and has found that it will stand a temperature range of 600° F.—from 350° below zero to 250° above zero—without defacement.

California Art Tile will not crack or craze in any climate, are wearproof, scratchproof, and steamproof, and the colors are guaranteed non-fading. A particular advantage is the fact that California Art Porcelain Matt Finished Tile, unlike other art tiles, require no oiling to keep them in perfect condition.

Suitable for Floors as Well as Walls

The very hard finish of California Art Tile make them as suitable for floors as they are for walls, thus permitting the architect to utilize to the full their decorative possibilities by planning a tile floor exactly to match the walls.

Ever-increasing Use of Tile

Architects, builders and decorators who strive for beauty and distinction are employing art tile in ever-increasing quantities.

In the Home—Art tile are used for the walls and floors of the bathroom, dining room, reception hall, sunroom, veranda and garage; for hearths, and in general wherever the ease with which tile are kept clean is an advantage.

In Store and Restaurant Interiors—Tile are deservedly first choice because of their cleanliness and the atmosphere of brightness and neatness they afford.

On Store and Building Fronts—Art tile, skillfully used, give beauty and distinction.

For Remodeling Old Buildings—Art tile, used as a veneer over old brick, concrete or frame, are perhaps the most economical and effective medium. They are particularly useful when the front wall of the building is up to the building line, a situation which frequently makes the use of a brick veneer impracticable.

General Instructions

Laying Out—Tile are made in proper sizes to lay in even inches and feet with a $\frac{3}{16}$-inch joint. For example, a 2x2-inch tile actually measures $1\frac{13}{16}$x$1\frac{13}{16}$ inches; a 4x4-inch tile is actually $3\frac{13}{16}$x$3\frac{13}{16}$ inches, etc. In laying out work, figure from center to center of joint, and slight irregularities in size will be readily overcome.

Where a tighter joint than $\frac{3}{16}$-inch is desired, it can be readily arranged for by a little time spent on sorting or sizing, as California Art Tile are very uniform in size.

On Brick or Concrete Base—Surface of work should be thoroughly cleaned with a stiff broom so as to be free of dust and loose particles. Surface should then be thoroughly soaked with water. While still wet, a wash of pure cement, about the consistency of paint, should be applied with a brush.

The next step is to apply the ground or scratch coat, using a three-of-sand, one-of-cement mixture. This bed should be from ⅜ to ⅝ inch thick. Where possible, the scratch coat should be allowed to set about 24 hours.

On Wood Base—Nail on chicken wire or metal lath, as for stucco base. Apply scratch coat ½ to ¾ inch thick, composed of three-of-sand and one-of-cement, and then proceed as on brick foundation.

Setting Tile—When scratch coat, or bed, is sufficiently set, the tile, which have been thoroughly saturated by being placed in water for at least one-half hour before using, are put into place by buttering on the back with a pure cement mortar, and are either laid with facing strip or work is marked out on bed for spacing.

Pointing Up—After tile are all set in place and mortar is thoroughly set, joints may be pointed either with a pointing trowel or by plastering over the entire surface and rubbing joints in with pointing tool or trowel.

Cleaning—A solution of four parts of clean water and one part of muriatic acid is recommended for cleaning mortar from tile. Scrub thoroughly with a stiff brush.

Note: Acid will not affect California Art Tile, and therefore the strong solution given above is recommended, as it cleans more readily.

Loose-leaf Catalogue

Write for our loose-leaf catalogue showing stock designs and colors of California Art Tile.

12-room Community Apartments, 2000 Washington Street, San Francisco, Calif.

C. A. Meussdorffer, Architect

Typical of the many palatial apartments, hotels and clubs in which California Art Tile Bathrooms have been installed

CALIFORNIA CLAY PRODUCTS COMPANY

Everlasting Glazed Tile and Ceramic Floor Tile

OFFICE AND FACTORY
SOUTHGATE, CALIF.

Correspondence and Orders to Box 238, Southgate, Calif.

Faience Tile

Hand Moulded Mantel Tile, including inserts, brackets, arches and shelves. Made in twelve neutral shades of matt glaze, all of different texture and color tone, yet blending harmoniously when used together. Suitable for mantels, counters, bulkheads, wainscoting, etc.

Aztec Mantels

A special product made only in a medley of pastel shades in several sizes with authentic designs reproduced from Maya carvings in the ancient Sun God temples of Yucatan and Mexico. A unique and original product giving effects entirely different from conventional mantel designs.

Hand Made Wall Tile

For bathrooms, and also adapted for use in counters, bulkheads and wainscots. Includes tile for walls, floors, trim, decoration, borders and bathroom accessories. Made in six bright glaze colors, on a buff body, with rounded edges and set with countersunk joint. Accessories glazed in colors to match wall tile.

Machine Made Wall Tile

Made in six colors on white body and in sizes from 2x2 in. up to 6x6 in. Includes trim, banding, paneling, etc.

Sink Tile

White and five colors; vitrified hexagon drainboard; vitrified ridge and capping. Back wall in either hand made or machine made wall tile. The permanently vitrified surface of our sink ridge and cap make it nonabsorbent and impervious to wear.

Hand Made Floor Tile

Vitrified Brown Floor Tile in various shades of brown, buff and gray; sizes from 2 in. square to 9 in. square, including hexagon and octagon shapes. Unequalled for soft harmonious color toning and shading.

Ceramic Floor Tile

Made in 1 and 2-in. hexagon and 2x2-in. square shapes in white and five medley colors with suitable borders to match. Mounted on paper for rapid laying.

Perforated Ventilator Tile

In many designs and sizes and in bright or matt colors.

Spanish and Moorish Tile

Colorful replicas of Mohammedan, Saracen, Spanish and Moorish designs. Made in several color combinations. Adapted for fountain and garden use as well as for store fronts and exterior trim on buildings.

Colors

Our colors are the result of intense and sustained heat in modern kilns and are permanently baked into the body of the tile. All our tiles are adapted for either exterior or interior use.

Shapes and Sizes

We supply sufficient sizes to enable the architect to execute any design in a residence or building.

Stock Designs

Our catalog illustrates mantels, floors, bathrooms, wainscots, store fronts, etc. The architect may use these directly or we will make drawings utilizing standard materials, thus eliminating the expense of special shapes.

Specifications

All shipments leaving our factory are carefully inspected and checked. Setting instructions are set forth below:

(1) Tile must be soaked in clean water before setting.

(2) Allow not over ¼-in. joints when setting plain and hand moulded tile; ⅜-in. for floor tile; ⅛-in. or less for machine made wall tile. Pointing to be depressed on plain and hand moulded tile and flush on floor and machine made tile.

(3) Color of mortar for joints to be lighter than tile themselves. White Medusa or Atlas cement on colored bright glaze tile, plain or machine made. Natural portland cement color for vitrified brown floor and hand moulded mantel tile. For coloring for our mantel tile joints use only a small amount of lamp black; ochre or red colored joints are not recommended.

(4) After setting, clean tiles with water and dry with newspapers or soft cloths. Cement left on tile overnight is hard to remove and becomes set if neglected. Tile should be washed the second day after setting with soft sponge and clean water to remove any cement from previous washings.

Use no acid on these tiles.

(5) Coal oil or linseed oil is used in polishing vitrified brown floor tile and mantel tile after setting, but no oil whatsoever should be used on bright glazed or ceramic floor tile. An oiled rag is sufficient to put on a polish.

Catalog

A complete catalog of our products will be sent to all architects interested. We gladly solicit inquiries. All inquiries will receive prompt and careful attention.

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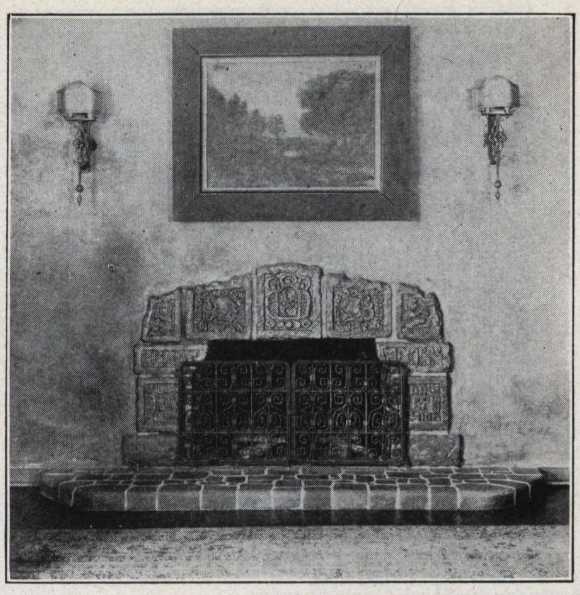
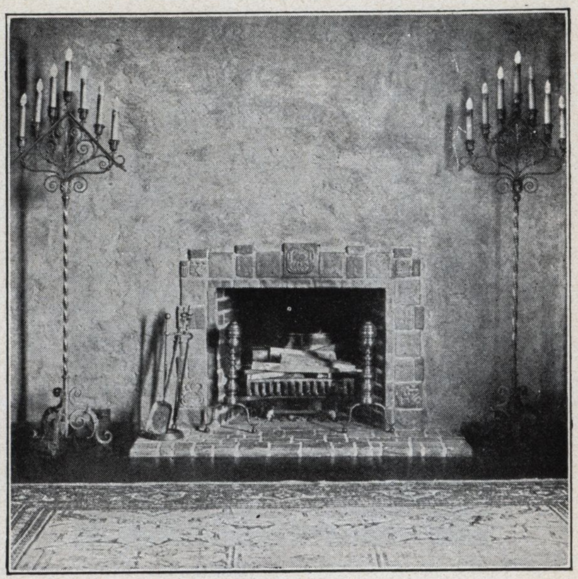
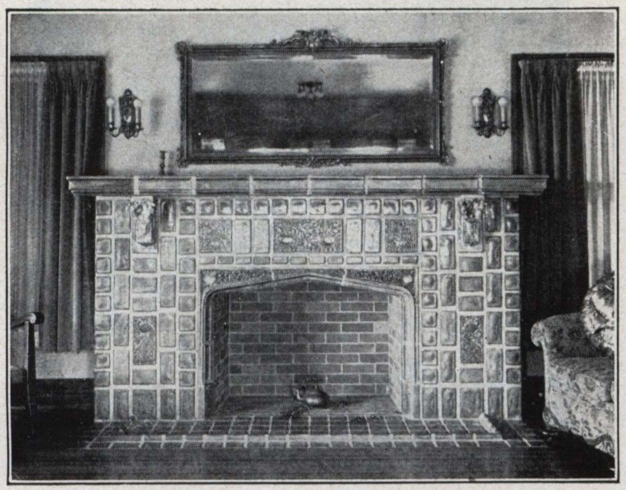
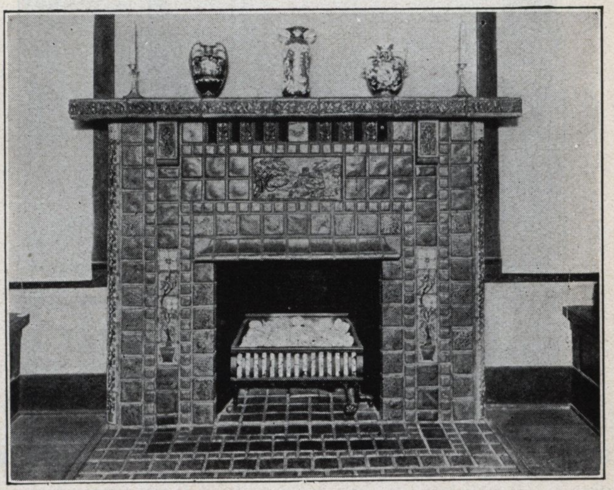


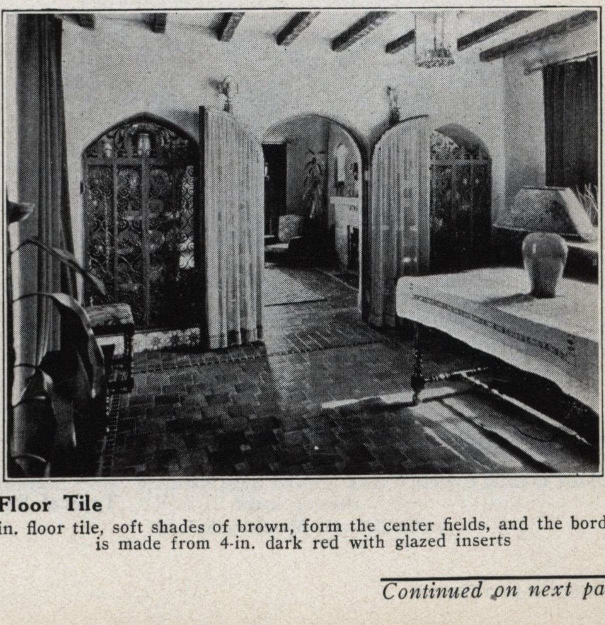


Two Typical Aztec Mantels in Residence of Franklyn Booth
Harwood Hewitt, Los Angeles, Cal., Architect
These mantels are made in pastel shades only





Mantels Made from Stock Hand Moulded Tile
These mantels are stocked in various sizes and seven neutral colors



Vitrified Brown Floor Tile

4-in. Hex tile, made in a medley of buff, gray and brown, with suitable borders

6-in. floor tile, soft shades of brown, form the center fields, and the border is made from 4-in. dark red with glazed inserts

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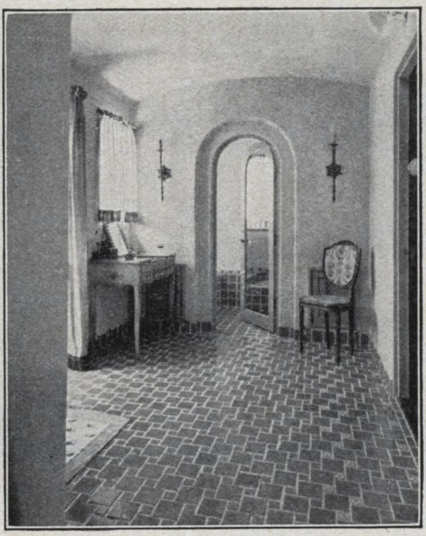
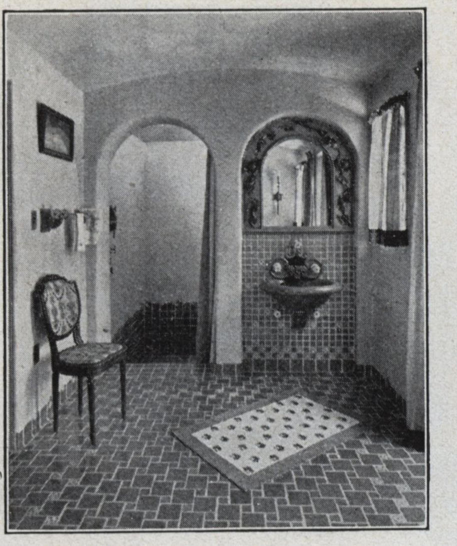
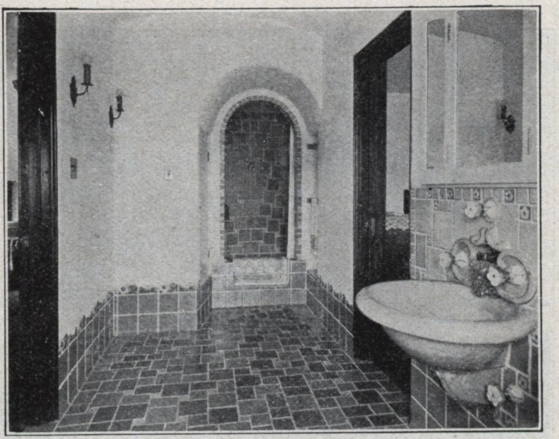




Bathroom Treatment in Residence at Beverley Hills, Cal.

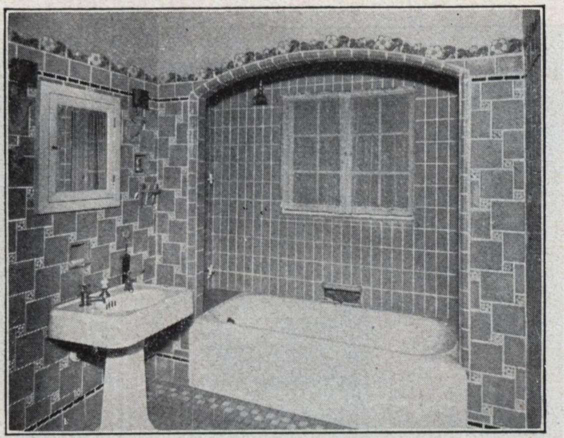
Roy Seldon Price, Beverley Hills, Cal., Architect

Bright glazed plain tile are used on floors and walls. Six distinct, bright glaze, bathroom colors are made for this purpose



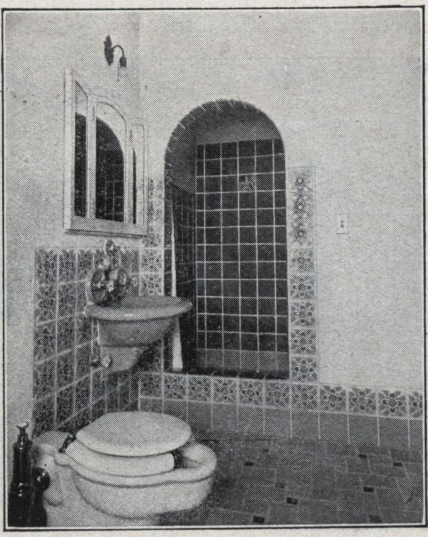
Low Wainscot and Shower

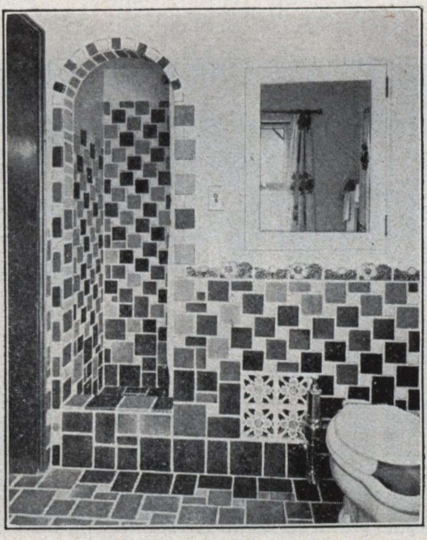
Showing our flowered cap in polychrome colors with matt glazed floor tile



High Wainscot, Bath Enclosed

Note use of soap dishes, electric light brackets, etc., made in color to match wall tile





Typical Shower Installations

Considerable Moorish tile used

Bright glazed brown tile in contrasting shades used on walls; the floor is in matt glazes, and the register is made from Moorish tile

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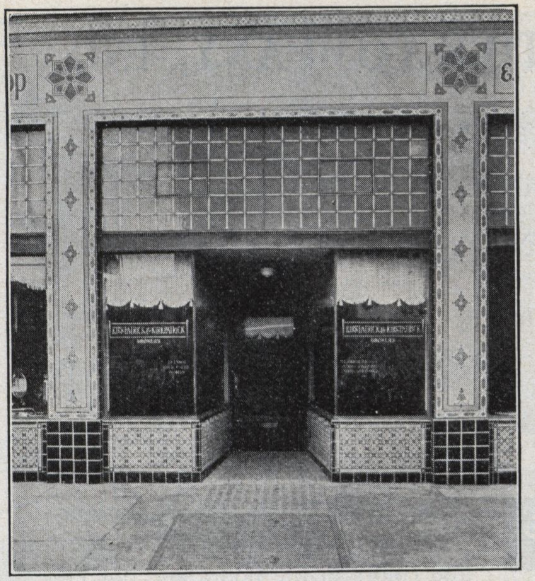
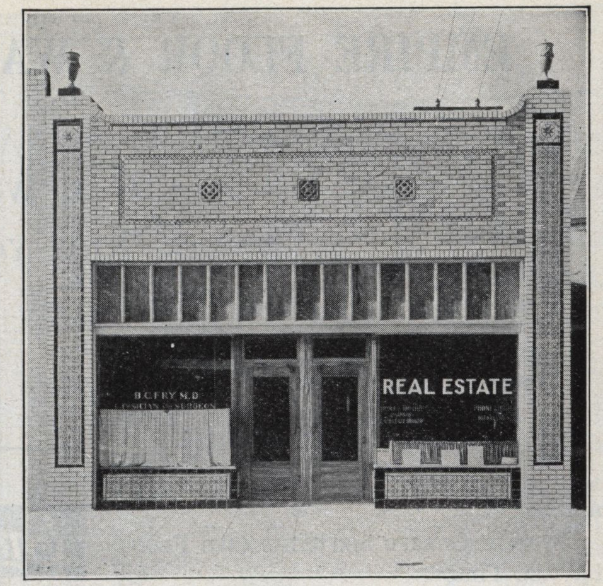
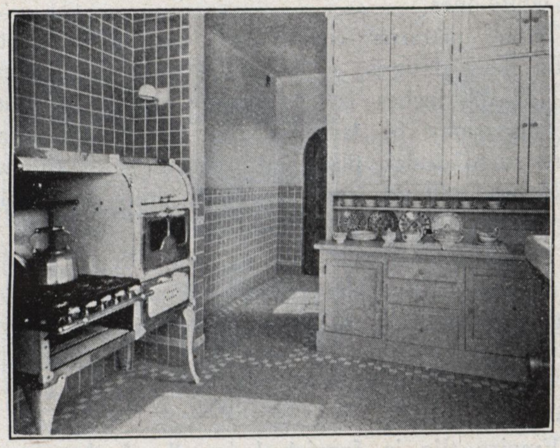




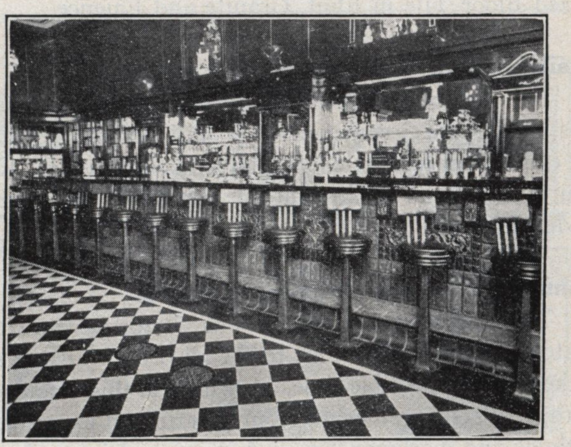
Store Front Tile Work Using Bright Colored Black and Moorish Tile

Note the pilaster and bulkhead treatment, also our ventilators as used for exterior decoration



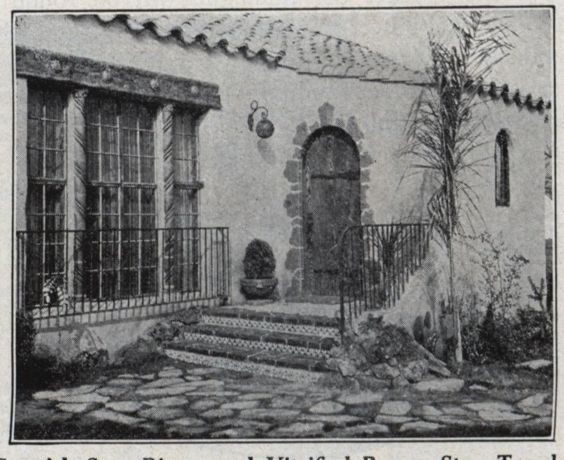
Typical Kitchen

Our 2-in. hexagon vitrified ceramic floor tile and border with 4x4-in. bright glazed wall tile

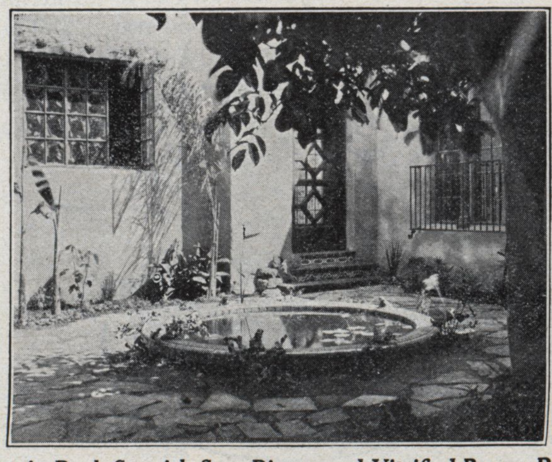


Lunch Counter

Our stock, matt glazed hand moulded tile are used for this purpose together with various inserts and brackets, all in soft neutral colors



Spanish Step Risers and Vitrified Brown Step Treads



Fountain Pool, Spanish Step Risers, and Vitrified Brown Rustic Step Treads

All among our garden decorations

EMPIRE FLOOR & WALL TILE COMPANY, INC.

GENERAL OFFICES

137-139 West 25th Street

NEW YORK, N. Y.

BRANCH OFFICES

PHILADELPHIA, PA., 1317 Pine Street
CHICAGO, ILL., 444 West Grand Avenue
DETROIT, MICH., 1261 Pennsylvania Avenue
ATLANTA, GA., 19 Crescent Avenue

Empire
TRADE-MARK

Products

CERAMIC GLAZED and UNGLAZED FLOOR and WALL TILE.

CERAMIC MOSAIC TILE.

We specialize in Wall Tile in Bright Glaze, Matt Glaze, Bright Color Glaze and Faience. Also in Ceramic Mosaic and Vitreous, Semi-vitreous, Glazed and Unglazed Floor Tile in Flint, Granite and Faience.

Availability of Raw Materials

The important feature of availability of raw materials, under all circumstances, is well taken care of in our connection with feldspar, clay and silica mines. This assures us of an uninterrupted supply of the highest grade materials.

Manufacturing and Shipping Facilities

The enormous output of our factories and their strategic location enable us to fill all orders of any size in the shortest possible time, anywhere in this country or Europe. This, together with our careful and experienced methods and workmanship, including rigid inspection, is the architect's and owner's assurance of 100% satisfaction, both as to prompt delivery and quality of materials.

Service

Probably our most important service to the architect consists of our reputation and demonstrated ability to deliver a product that will be exactly as specified.

In addition to this we stand ready at all times to assist the architect in making special designs or in carefully following the designs submitted.

"Fool-Proof" Tile Floor Designs

The modern tendency is toward patterns and colors in tile floors and our efforts have been directed towards reduction in their cost. By means of "Fool-Proof" Floor Designs, of which we are the originators and patentees, the cost of artistic pattern floors has been brought down to virtually that of plain white ones.

These patterns consist of carefully selected, artistic floor designs, so arranged in plan that each sheet of 24 inches is a complete design in itself. This unit may be laid on the floor without any adherence to design plan and, regardless of the way laid down, will fit itself perfectly into a complete design.

Tests have proven that as many feet per day, per man, of artistically colored "Fool-Proof" Floor Design can be laid, as is possible with plain white tile.

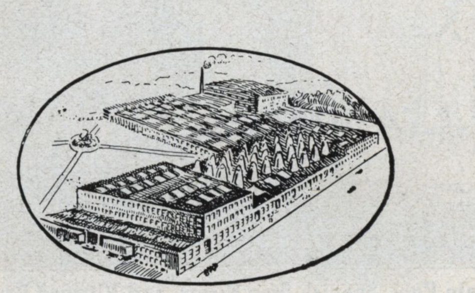
Sizes

Empire tile is furnished in all of the regular tile sizes, ranging from ½-inch square to 18x24 inches.

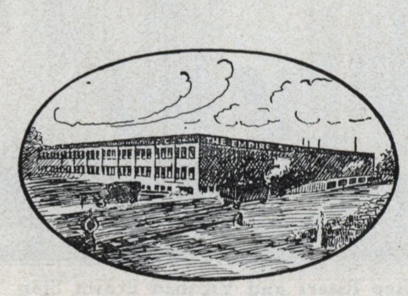
Pocket Catalogue of Tile in Color

Our new pocket tile catalogue will be found of value to every architect and tile contractor. It is replete with valuable information presented in a simple, concise and practical manner and contains many suggestive artistic designs in full color.

A copy is yours for the asking.



Factory No. 1—Zanesville, Ohio
Daily capacity, 35,000 sq. ft.



Factory No. 2—Metuchen, N. J.
Daily capacity, 60,000 sq. ft.

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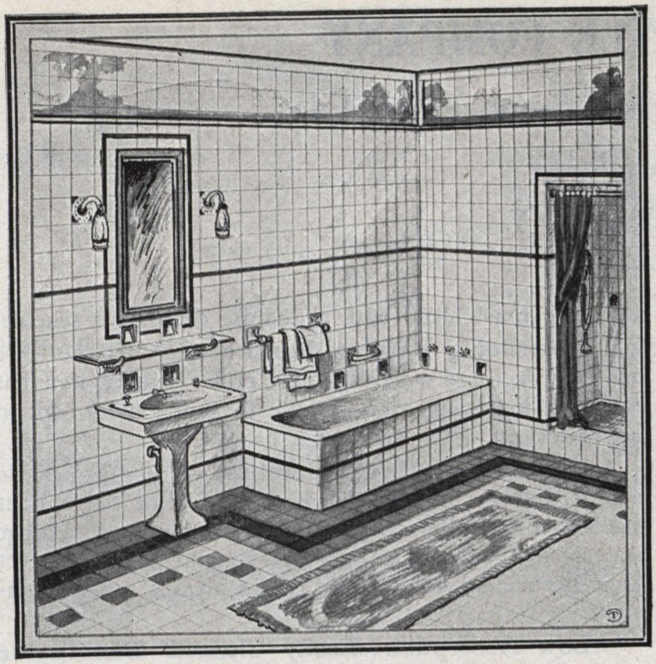
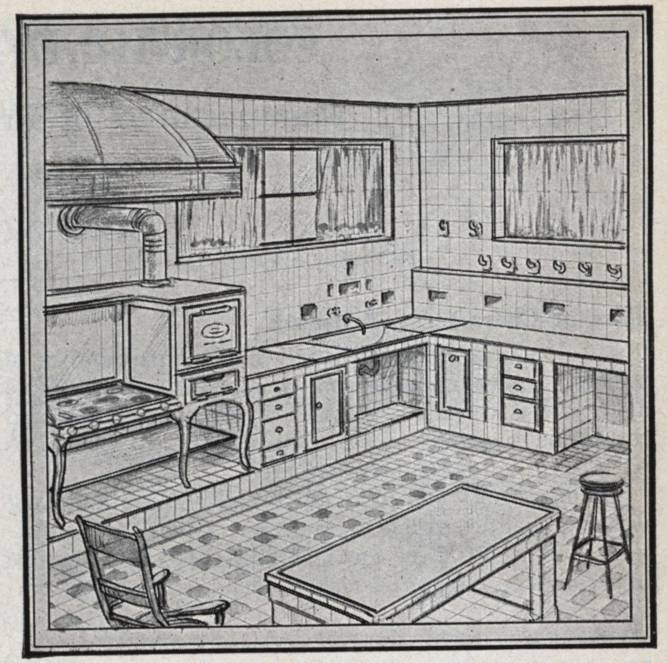
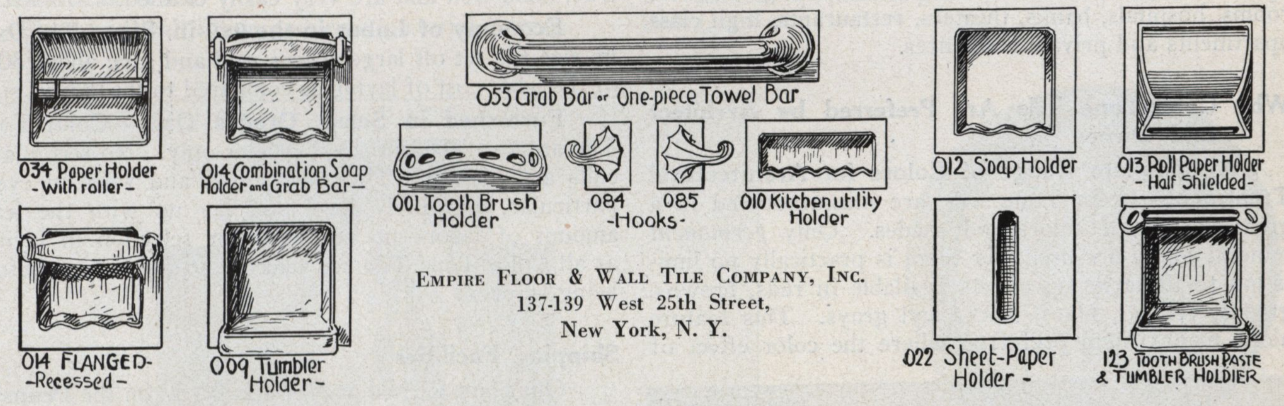


Complete Modern Bathroom Tiled with Empire Product

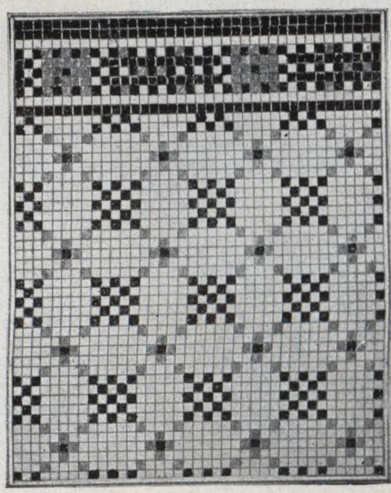


Modern Sanitary Kitchen Tiled with Empire Tile—Clean and Beautiful

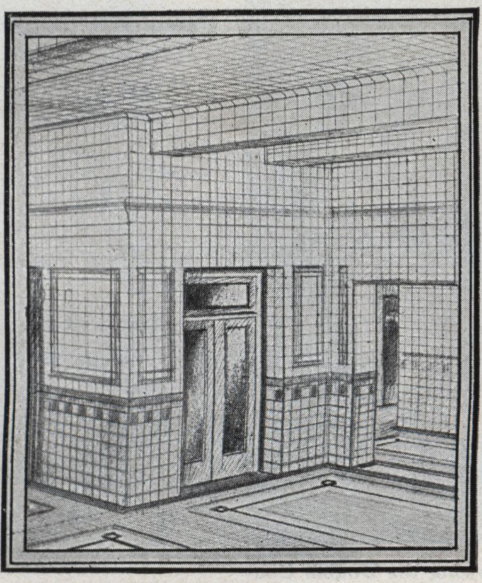

034 Paper Holder
-With roller-
014 Combination Soap Holder and Grab Bar-
055 Grab Bar or One-piece Towel Bar
001 Tooth Brush Holder
084
085
-Hooks-
010 Kitchen utility Holder
012 Soap Holder
013 Roll Paper Holder
- Half Shielded-
014 FLANGED-
-Recessed-
009 Tumbler Holder-
022 Sheet-Paper Holder -
123 TOOTH BRUSH PASTE & TUMBLER HOLDIER

Empire Floor & Wall Tile Company, Inc.
137-139 West 25th Street,
New York, N. Y.

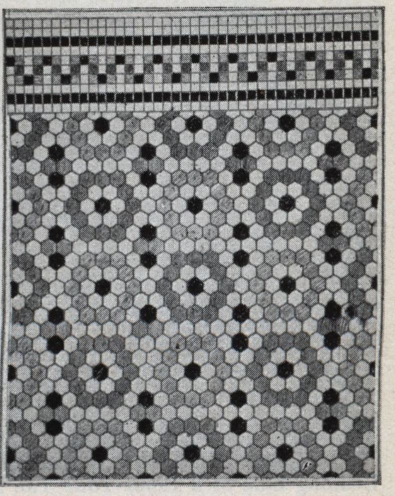
China Bathroom Fixtures from Our Metuchen Factory—Useful and Ornamental



Ceramic Mosaic Floor



Tile Corridor



Ceramic Mosaic Floor

COLOR-TONE TILE COMPANY

TELEPHONE
Barclay 2743

Manufacturers of Pressed Stone Floor Tile

97 Warren Street
NEW YORK, N. Y.

Tiles of Character and Beauty

Color-Tone Tile consist of finely crushed rock, a mineral binder and *permanent* mineral colors. This aggregate is consolidated under hydraulic pressure and the tile subsequently subjected to a treatment which imparts great hardness and durability.

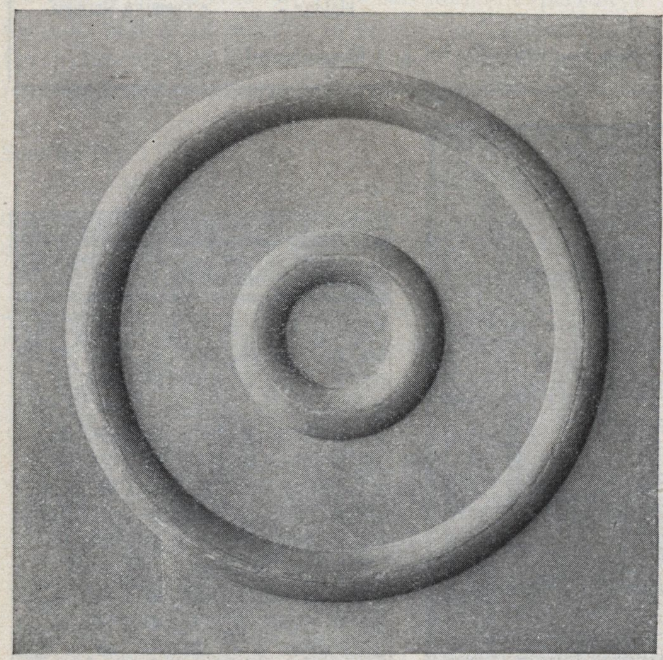
Color-Tone Tile have all the advantages and long wearing qualities of marble and travertine with the additional feature of lower cost. Besides they are obtainable in a complete range of colors to blend with any decorative scheme.

Uses of Color-Tone Tile

Color-Tone Tile are suitable for use wherever a floor tile of the highest grade is required. They are extensively used for hotel lobbies, halls, lounge and rest rooms, hospitals, banks, theaters, restaurants, high class apartments and private residences.

Why Color-Tone Tile Are Preferred by Architect and Owner

A Complete Range of Colors for Architectural Treatment—Color-Tone Tile are manufactured in a great variety of colors and shades. Only *permanent* mineral colors are used, but there is practically no limitation to the coloring effects available in reds, browns, greens, yellows, blues, blacks and grays. This feature alone makes them preferred where the color effect of the floor must blend with a definite decorative scheme.



Bedding Side of a Color-Tone Tile Showing the Double Concentric Non-sliding Bedding Feature

Non-sliding Bedding Feature—Color-Tone Tile are manufactured with a double circular bedding key that makes it impossible for the tile to slide on its bed, in any direction, after the mortar has set.

Uniform Texture and Hardness—Color-Tone Tile are of uniform texture, hardness and color throughout the body of the tile. They are free from glaze and other superficial effects. The most severe wear does not affect their permanent colors—the colors always remain constant.

Low Absorption—Easily Cleaned—Due to the great pressure applied in their manufacture and the fact that they are a crushed rock product, Color-Tone Tile are of very close texture and low absorption. They cut true, bond well and are very easily cleaned.

Economy of Labor in the 9x9-in. Size—The 9x9-in. size tile set off large spaces well and save about 30% of the labor cost of laying as compared to the 9x6-in. size.

Furnished in Select Grades Only—Color-Tone Tile are furnished in select grades only. No seconds or culls are offered. They are sound and solid in every particular, absolutely level and lay up with the least amount of labor—no necessity for selection in laying, as all Color-Tone Tile are selected at the factory before being shipped.

Shipping Facilities

Our plant located at Newark, N. J., on the Pennsylvania Railroad has unexcelled facilities for prompt shipment of orders in any quantity.

Personal Co-operation with the Architect

We welcome inquiries from architects and will furnish free of charge samples in color and sketches designed to enable the architect and owner to secure substantial savings in time and money on any high grade floor tile construction.

Test data from reputable laboratories available on request.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

Summary of Special Features

Unusual range of colors and adaptability to decorative schemes.

Great density and low absorption.

Exceptionally attractive texture.

Great durability.

Excellent cutting and bonding qualities.

Ease of setting.

Coloring same throughout and permanent—no glaze or other temporary surface finish.

MUELLER MOSAIC COMPANY

Tilemakers

TELEPHONE, 3830

WORKS AND MAIN OFFICE

TRENTON, N. J.

NEW YORK SHOWROOM: ROSSMAN'S, Seventh Avenue and 49th Street—Telephone, Bryant 3626

TRADE-MARK

Products

- FLOOR and WALL TILE.
- FAIENCE.
- MOSAICS.
- FROSTPROOF EXTERIOR TILE.
- MURAL DECORATIONS.

Flemish Tile

For porches, lobbies, garages, etc. A strong artistic frostproof flooring product.

Architectural Work

Special designs, mouldings, decorative details, etc.

Ecclesiastical Work

Floor and wall tiling, emblems, pictorial faience.

Signs

Weatherproof and frostproof in all colors and styles.

Norman-Flash Mosaic

A characteristic non-slip flooring for interiors.

Standard and Special Sizes

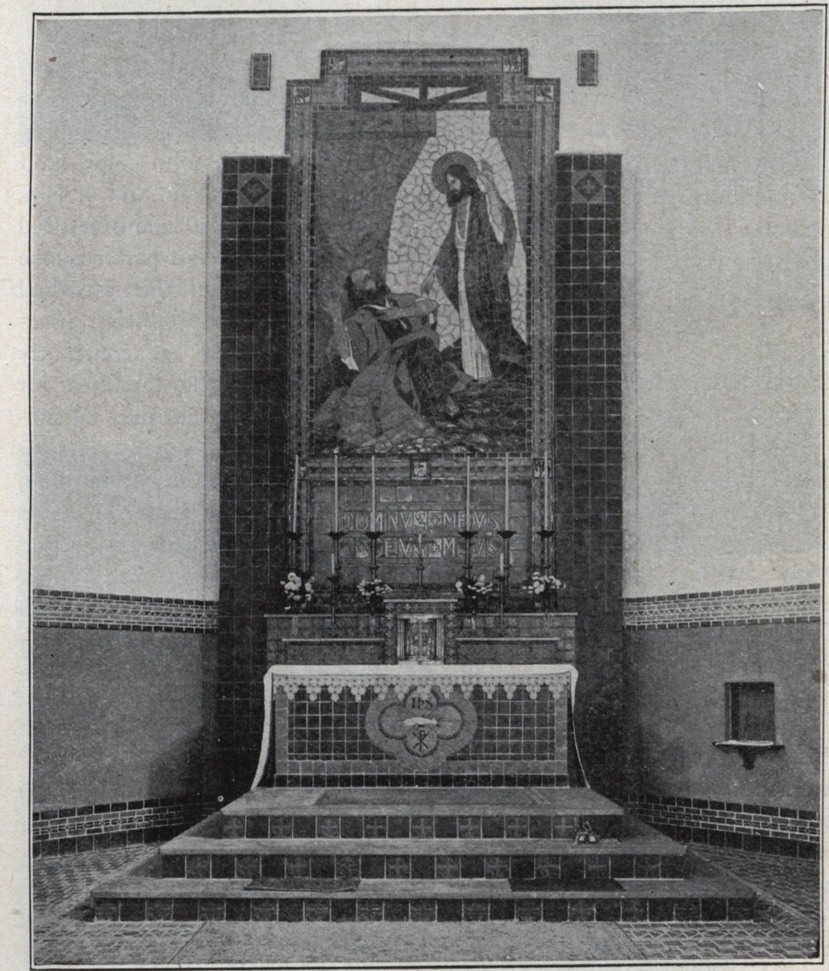
Standard sizes of every known shape. Special sizes and shapes.

Colors

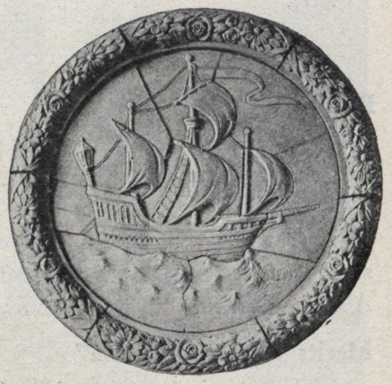
A complete palette of harmonizing colors and tints.

Swimming Pools

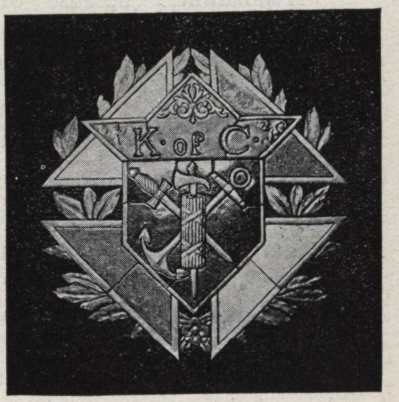
Entire equipment, gutter and hand rails, non-slip floors, etc.



Polychrome Faience Altar



Panel C-4
Polychrome Faience Panel



Faience Emblem

NATIONAL FLOOR TILE COMPANY

Manufacturers of Floor Tile

MAIN OFFICE AND WORKS
MOBILE, ALA.

REPRESENTATIVES

ATLANTA, GA., Keeling-Cassidy Brick Co., 234 Peachtree Street
BIRMINGHAM, ALA., Wittichen Coal & Transfer Co., 12 S. Twentieth Street
BUFFALO, N. Y., E. H. Wood, Jackson Building
CHARLOTTE, N. C., Southern Brick & Tile Corp., Latonia Building (For North and South Carolina)
CHICAGO, ILL., H. B. Carter Co., 4302 North Kedzie Avenue
DALLAS, TEX., Sales Service Co., 602 Mercantile Bank and Trust Co. Building
DULUTH, MINN., Thomson-Williams Co., Builders Exchange
HARRISBURG, PA., C. H. Strayer, 50 West Philadelphia Street, York, Pa.
HOUSTON, TEX., C. E. Washburn, 703 Keystone Building
JACKSONVILLE, FLA., Jacksonville Marble & Tile Co.
LANCASTER, PA., C. H. Strayer, 50 West Philadelphia Street, York, Pa.
LITTLE ROCK, ARK., M. B. Sanders, Southern Trust Company
LOCKPORT, N. Y., Niagara Building and Supply Co., 48 Cottage Street
LOS ANGELES, CALIF., Western Tile and Marble Co.
MEMPHIS, TENN., John A. Denie's Sons Co., 373 Adams Street
MIAMI, FLA., Dixie Mosaic & Tile Company
MONTGOMERY, ALA., Central Cement & Supply Co., 30 Commerce Street
NEW ORLEANS, LA., Salmen Yards, 3901 So. Carrollton Avenue
NORFOLK, VA., G. S. Friebus, 302 Monticello Arcade
OKLAHOMA CITY, OKLA., Lumbermen's Supply Co.
PASADENA, CALIF., Western Tile and Marble Co., 386 South Raymond Avenue
READING, PA., Vanderstucken & Co., 624 Washington Street
RICHMOND, VA., Earnest Brothers, 805 E. Franklin Street
ROCHESTER, N. Y., Niagara Building and Supply Co., 48 Cottage Street, Lockport, N. Y.
SAINT LOUIS, MO., H. C. Morrison Company, 2011 Railway Exchange Building
SAN ANTONIO, TEX., Sales Service Company, Builders Exchange Building
SARASOTA, FLA., Sarasota Tile Co.
SCRANTON, PA., F. L. Schott, Kingston, Pa.
SHREVEPORT, LA., H. C. Bellows, 214 Edwards Street
SYRACUSE, N. Y., Syracuse Wall Plaster Co., 319 N. Clinton Street
TULSA, OKLA., Lumbermen's Supply Co., Oklahoma City
WASHINGTON, D. C., Dupont Supply Co., Inc., 921 Fifteenth Street, N.W.
WILDWOOD, N. J., T. S. Goslin Lumber Co.
WILKESBARRE, PA., F. L. Schott, Kingston, Pa.
YORK, PA., C. H. Strayer, 50 W. Philadelphia Street

Products

"Adamantile" and "Diamantile" in all solid colors: "Adamantile" in richly colored Spanish and Moorish designs; "Adamantile" in beautiful imitation marble effects; "Adamantile" cove base in any color desired; Embossed Tiles in various colored designs; Abrasive Tiles in all solid colors.

Merits of "Adamantile"

The practical merits of "Adamantile" include durability, non-slip surface, permanence and variety of colors, flexibility of designs, sanitary, sound resisting and absolute fireproof qualities. It does not warp, and possesses the rare virtue of improving in beauty with age.

"Adamantile," because of its extremely hard, smooth surface, is very desirable for spaces subjected to hard usage, and because of its wide range of colors and flexibility of design, it is very appropriate for spaces where decorative effects are required.

Manufacture of "Adamantile" and "Diamantile"

The high standard of workmanship entering into the manufacture of "Adamantile" and "Diamantile" is maintained through employing only the most highly skilled Spanish tilewrights, who acquired the art from their fathers. For this reason "Adamantile" is some times called Spanish or Moorish tile. Every tile is handmade, and the utmost care is exercised to insure absolute uniformity in size and color. Only the highest grade raw materials are used, and the colors are non-fading.

"Adamantile" is made in all plain solid colors and shades, and in sizes 8x8 in., 6x6 in., 4x8 in. and 4x4 in. "Adamantile," in the 8x8 in. size, is also manufactured in more than one hundred different design patterns, the colors in any of which can be varied to suit the individual requirements of the architect, thereby producing practically unlimited effects. New designs are constantly being added, and this company has the facilities for executing promptly any special designs that may be submitted by architects.

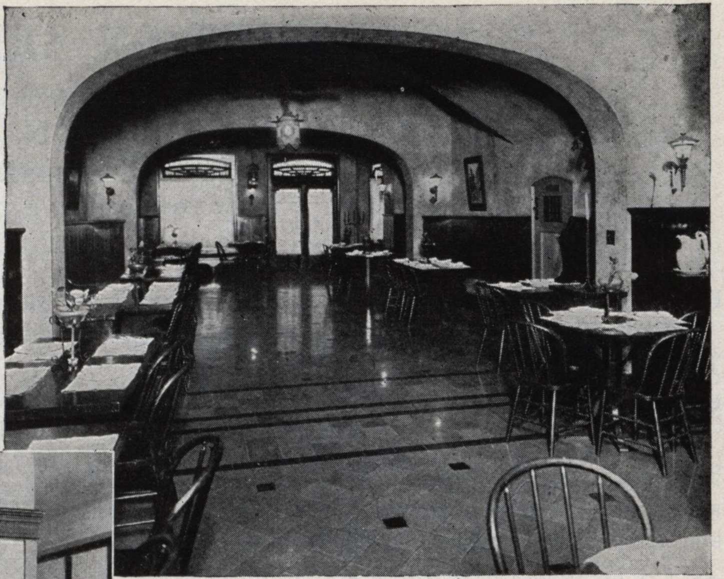
"Diamantile" differs from "Adamantile" in that fine, white aggregates are mixed with the face material. The surface of the tile is then polished in order to expose the aggregates, producing an extremely beautiful effect which must be seen to be appreciated. "Diamantile" is made in all strong colors and in various sizes. It can also be supplied in a limited number of designs, but these can be furnished only in the 8x8 in. size.

Facilities and Service

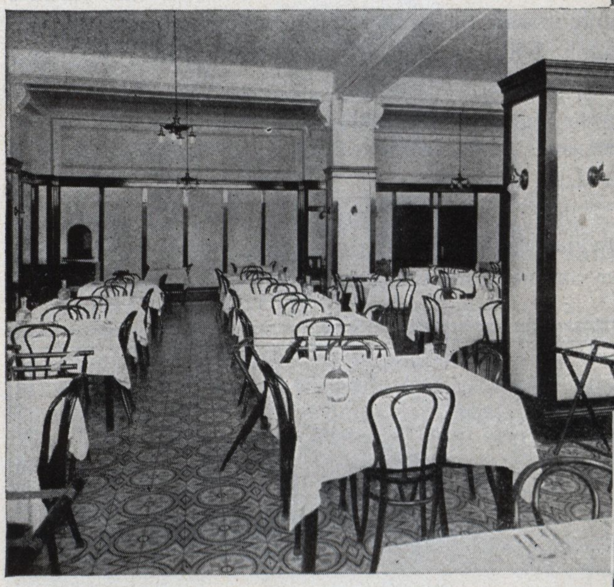
Large stocks of standard colors and designs constantly maintained, thereby insuring prompt execution of orders. Special shades and designs can be produced on short notice.

Literature, samples and estimates will be gladly furnished on application either to the main office or to any of the representatives listed above.

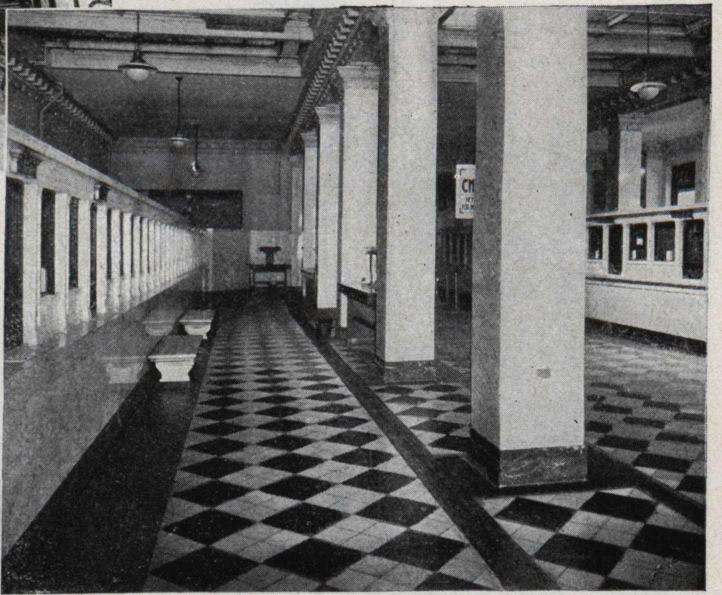
Continued on next page



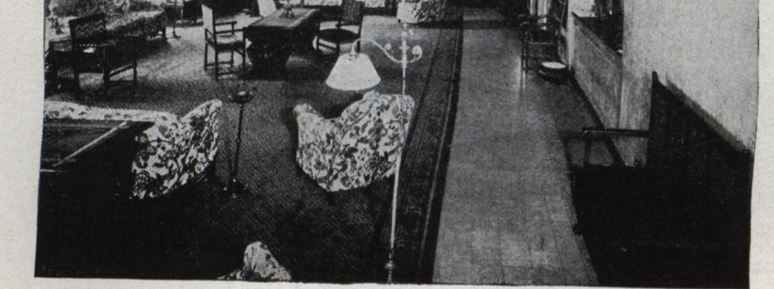
Patio Royal,
New Orleans, La.



Dining Room of Breene Hotel,
St. Cloud, Minn.



First National Bank,
Mobile, Ala.
George B. Rogers, Architect



Fenway Apartments,
Cleveland, Ohio
George B. Post & Sons, Architects

ROBERTSON ART TILE CO.

MAIN OFFICE
TRENTON, N. J.
FACTORY: MORRISVILLE, PA.
NEW YORK OFFICE, 48 East 41st Street

Products

Glazed Wall Tile, including extensive line of Trim and Ceramic Mosaic Tile.

Services

The Technical Department of the Robertson Art Tile Co. is at the service of interested parties and will supply any desired information, furnish plans, sketches and samples upon request.

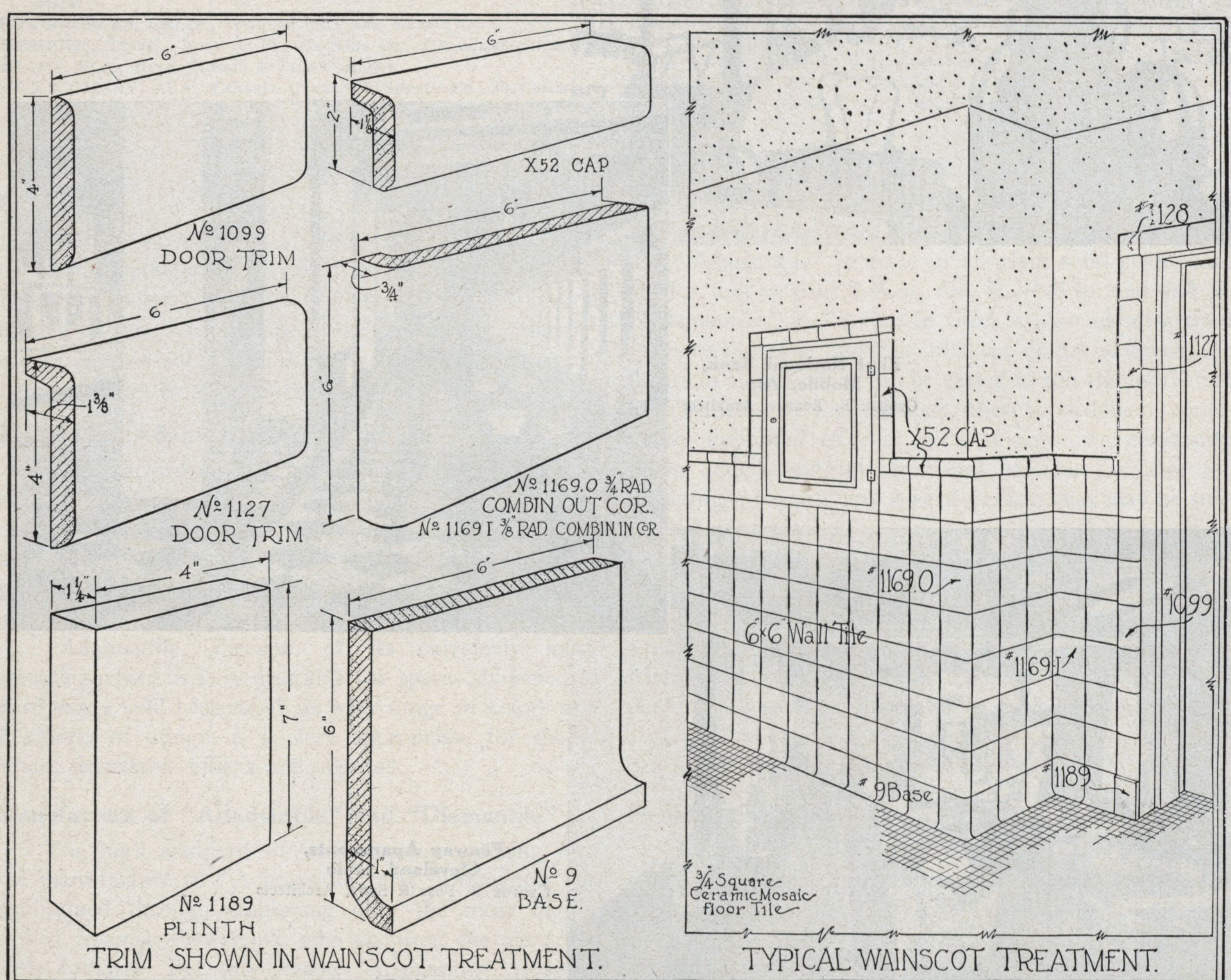
Glazed Wall Tile

We aim to carry in stock the most popular sizes of white glazed wall tile, which includes 6x6, 6x3, 6x2, 4¼x4¼ and 4¼x2⅛ in., together with base and cap mouldings, combination corners, and various angles to work out desired combinations or special treatment. We are especially well equipped in this respect to take care of hospital, hotel, society, residential construction, etc.

In the manufacture of floor tile we can furnish ceramic mosaic tile in any of the following sizes: 1¼-in. hexagon, 1-in. hexagon, ¾-in. square, $\frac{13}{16}$-in. round, and 1x½-in. white.

We also manufacture a full line of colors in the above sizes enabling us to make any design or pattern desired.

Below we illustrate typical wainscot treatment in white glazed wall tile with design numbers inserted. Many other combinations can be made up from catalogue designs.



6"
4"
№ 1099
DOOR TRIM
6"
2"
1⅛"
X52 CAP
6"
3/4"
6"
№ 1169.0 ¾" RAD
COMBIN. OUT COR.
№ 1169 I ⅜ RAD. COMBIN. IN COR.
6"
1⅜"
4"
№ 1127
DOOR TRIM
1¼"
4"
7"
№ 1189
PLINTH
6"
6"
1"
№ 9
BASE.
#1128
#1127
X52 CAP
#1169.0
6x6 Wall Tile
#1099
#1169 I
9 Base
#1189
¾ Square
Ceramic Mosaic
floor Tile

TRIM SHOWN IN WAINSCOT TREATMENT.

TYPICAL WAINSCOT TREATMENT.

TYPICAL APPLICATION OF ROBERTSON WHITE GLAZED TILE

Continued on next page

Ceramic Mosaic Tile for Swimming Pools

Ceramic mosaic tile is recognized as the most sanitary, durable and attractive material known for the veneering of swimming pools.

The Robertson Art Tile Co. was the first to introduce this material for this purpose, and it has been used very successfully for years past, and is being specified by leading architects and swimming pool experts. It is also being used just as successfully for the veneering of walls around the pool, wainscoting of the main building and galleries, as well as shower rooms.

Advantages—We have no hesitancy in saying there is no other material on the market that possesses all the good qualities of ceramic mosaic tile.

It is entirely vitreous, consequently impervious to moisture.

It is exceedingly strong, does not stain easily and can be readily cleaned.

This material takes up very little room, as it is only ¼ in. thick and, including the cement coating in which it is set, requires only from 1 to 1¼ in. in thickness.

The small tesserae lend themselves readily to the undulation of walls and floors, especially since we have provided all necessary coves and angles with suitable curved tile.

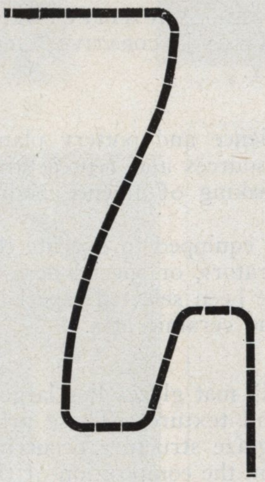
Colors—We manufacture this material in a variety of colors, making it possible to obtain very attractive effects. Experience convinces us that swimming pools should be veneered with white tile and have colored lines extending through the bottom to indicate swimming alleys. If desired, a simple, attractive border can be placed at the water line.

Overflow Trough—The overflow trough is usually made in some attractive design and numerals set in to indicate distances; while at either end the depth of the pool should be indicated in the same way. The numerals are all made with colored ceramic mosaic tile and are just as permanent as the rest of the work.

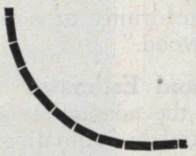
The formation of an overflow trough is one of the important features in swimming pool construction. While there are several forms being used, we believe trough No. 2 to be the most practical design.

Illustration of trough No. 2 also shows a very satisfactory design of life rail. The trough is arranged so that all surplus water from the walk around the pool will fall into it. We will be glad to furnish full size detail on application.

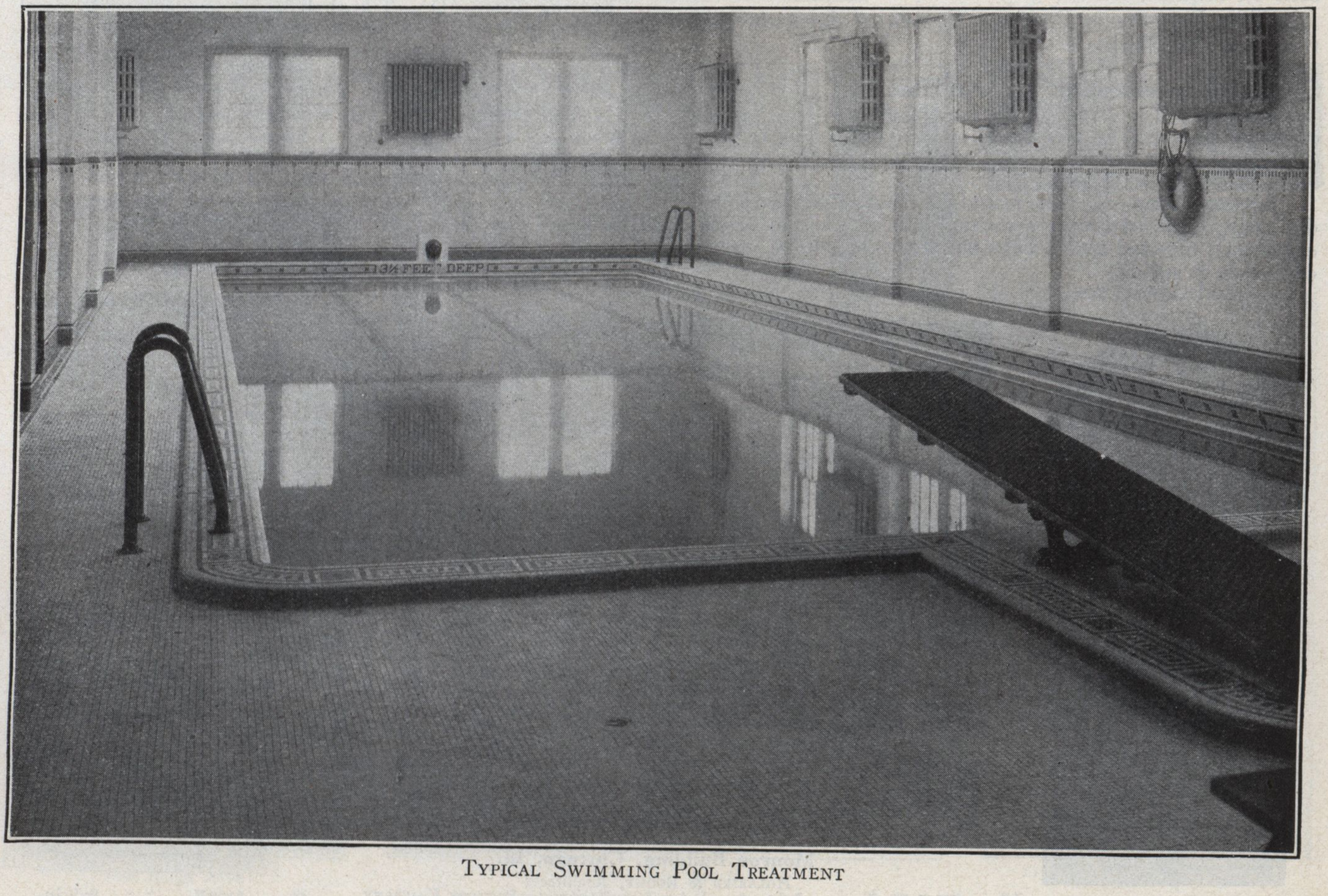
References—We have furnished, and in many instances made the plans for, more than 200 prominent swimming pools throughout the country, and would be glad to furnish interested parties with a list of same and their location.



Ceramic Mosaic Gutter No. 2



4-in. Radius Corners of Pool



Typical Swimming Pool Treatment

THE ROOKWOOD POTTERY COMPANY

CINCINNATI, OHIO

TELEPHONE
Canal 6135, 6136

Products

"Rookwood" Mat Glazed Architectural Faience; Floor and Wall Tile; Decorative Tile; Garden Ornaments; Pottery.

Facilities

Complete architectural faience and pottery plants unrivaled in their technical resources and representing 45 years' experience in the making of faience bodies and colored glazes.

The plants are thoroughly equipped to execute the designs of architects and decorators, or special designs by Rookwood artists, who have been selected especially on account of their skill in the ceramic arts.

"Rookwood" Mat Glazes

The charm of "Rookwood" mat glazes lies largely in their variations of shade and texture. These arise from delicate changes in the glaze structure occurring in the fire and calculated upon in the composition of the glaze. These variations are not sufficient to throw any color out of harmony, but only such as stamp the material with its true character as a product of one of the arts of fire. The monotonous uniformity of a painted wall will not be found in "Rookwood."

Special Service, Co-operation and Estimates

Assistance will be given in the adaptation of our materials to architects' designs, and in estimating costs for appropriations. Satisfactory results require that faience should be specified under allowance, reserving to the architect the right of selection. Appropriate forms sent on request.

The Rookwood Pottery Company does not contract for installation.

Standard Specification for Architects

Tile—(1) The tile shall be faience on hard fired plastic clay body and shall be in surface, texture and quality of color equal to that manufactured by The Rookwood Pottery Company of Cincinnati, Ohio.

Setting Plans—(2) The manufacturer shall provide setting drawings, approved by the architect, with all tiles, mouldings, ornamental tiles and special units and angles numbered to avoid confusion in setting.

Special Conditions—(3) All external and internal angles, special angles and miter corners shall be manufactured to fit the conditions. And where absolute dimensions are obtainable in time to allow for manufacture, special take-up lengths must be provided, in order to eliminate as much as possible, cutting on the job.

(4) For all special ornamental parts, the manufacturer must submit photographs of the models for the approval of the architect.

Floors—(5) Foundation. The tile shall be laid on a level, solid bed of concrete, 2½ in. thick; concrete to consist of one (1) part portland cement, three (3) parts clean, washed sand, and one (1) part gravel. The surface of this bed shall be uniformly rough and well tamped and brought to within 1½ in. of the finished floor line.

Laying Tile—(6) Cement mortar for setting shall consist of one (1) part portland cement and three (3) parts clean, washed sand. All tile shall be thoroughly soaked in clean water. Before laying tile, dry cement must be dusted over the cement mortar. All tile shall be set before cement mortar reaches its initial set. When more mortar has been spread than can be covered with tile on the same day, all mortar on the unfinished portions shall be removed, leaving a clean edge along the last row of tiles.

Masonry Walls—(7) Before applying the scratch coat, wet the walls thoroughly with clean water.

Stud Walls and Pipe Slots—(8) Stud walls and pipe slots shall be covered with wire or expanded metal lath tightly stretched and joints between sheets lapped and wired.

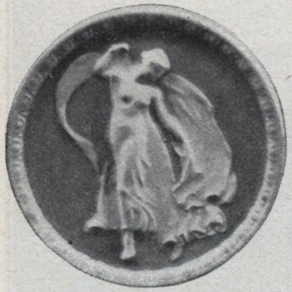
(9) Gypsum blocks, if used, shall be coated with waterproof paint. Wire lath or expanded metal shall be securely fastened to blocks.

Scratch Coat—(10) The scratch coat shall be brought to an even surface allowing ⅝ in. for setting mortar, and consist of one (1) part portland cement, two (2) parts clean washed sand and ten per cent well slaked or hydrated lime. The scratch coat shall be well broomed or scratched horizontally and allowed to harden for at least one day before setting tile. The scratch coat on metal lath shall have a small admixture of hair or wood fiber.

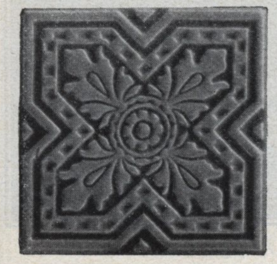
Setting Tile—(11)—Tile shall be set to true surfaces and with uniform joints. Cement mortar for setting tile shall consist of one (1) part portland cement and two and one-half (2½) parts clean, washed sand. All tile shall be thoroughly soaked in clean water before setting. No lime shall be mixed into cement mortar used for setting faience of boxed construction.

Grouting—(12) Joints shall be grouted with equal parts portland cement and fine clean sand mixed with water to the consistency of cream. Grout shall be forced into the joints. All trace of cement shall be wiped from the surface of the tile before hardening

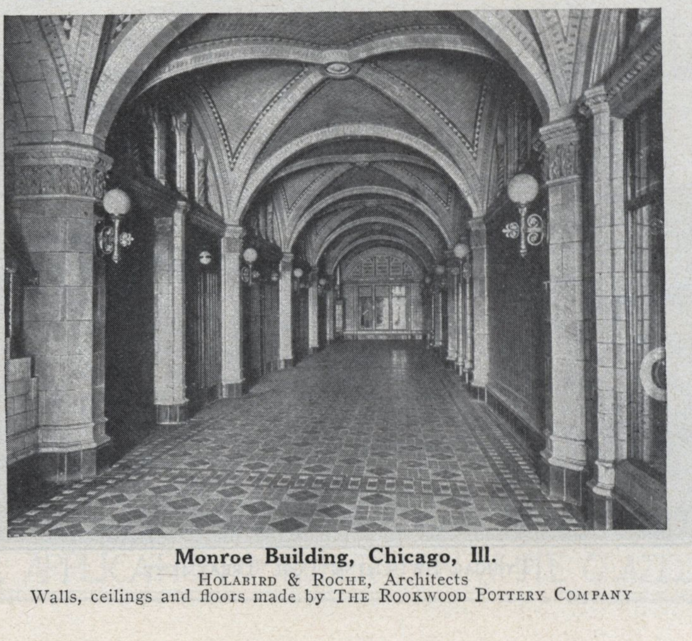
Cleaning—(13) A day or two after grouting, the entire surface shall be thoroughly cleaned.



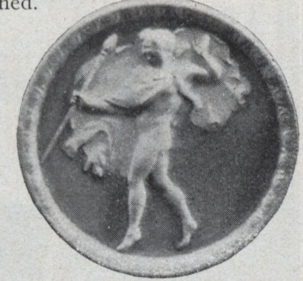
3259Y2—9-in. Diameter



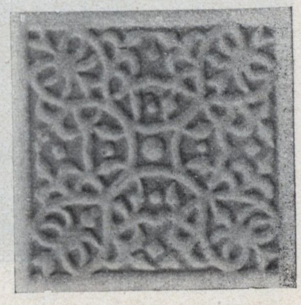
3128Y 8x8 in.
Decorative Tile



Monroe Building, Chicago, Ill.
Holabird & Roche, Architects
Walls, ceilings and floors made by The Rookwood Pottery Company



3259Y1—9-in. Diameter



3108Y 9x9 in.
Decorative Tile

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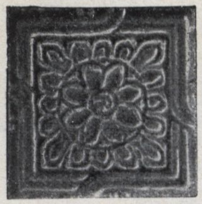
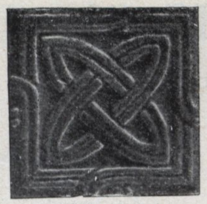
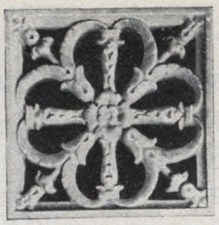
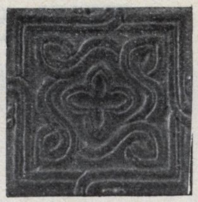
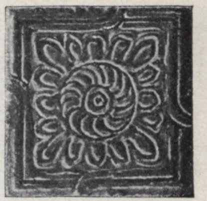
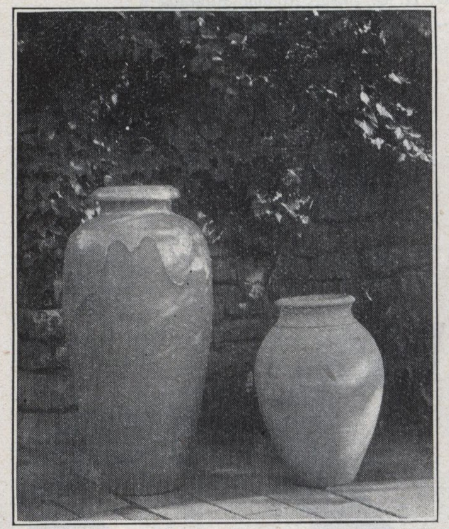

1978Y—6x6 in.

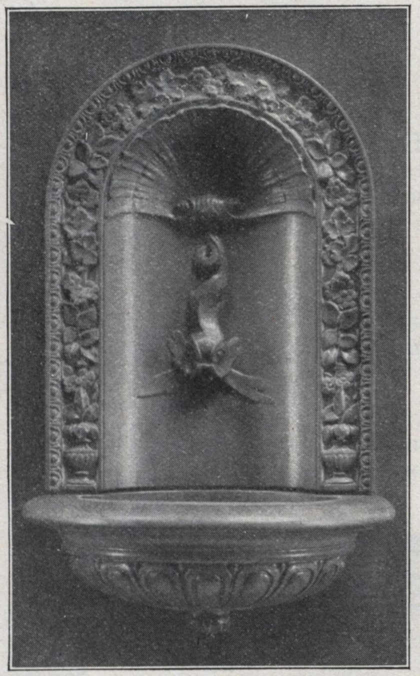

1975Y—6x6 in.

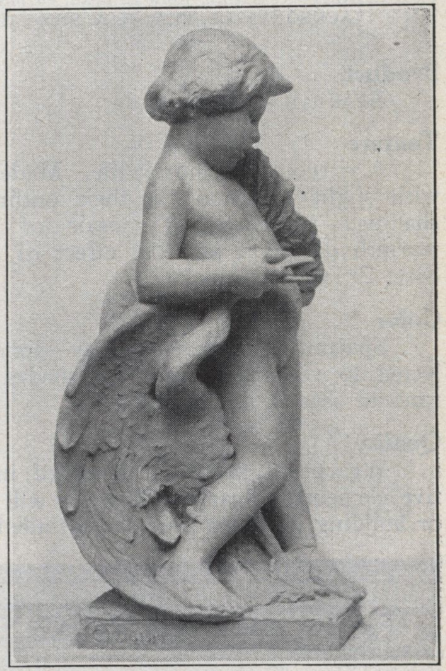

3284Y—12x12 in.
Grille Tile

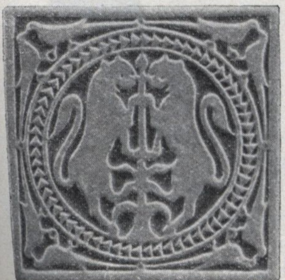

1976Y—6x6 in.

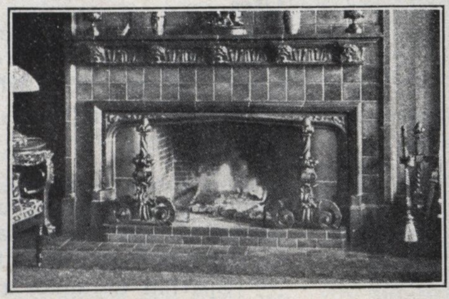

1977Y—6x6 in.

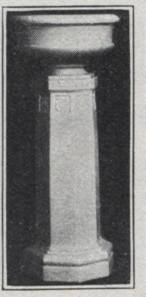

3163Y Garden Pottery 3076Y

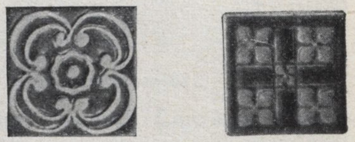

Fountain—3143Y

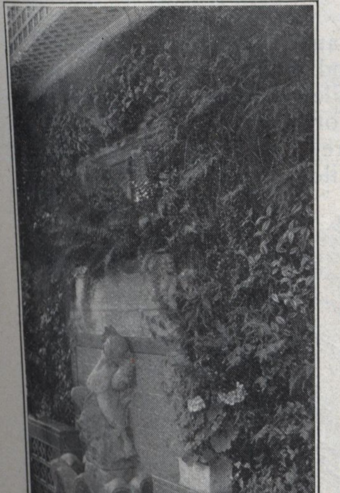

3065Y
C. J. Barnhorn, Sculptor

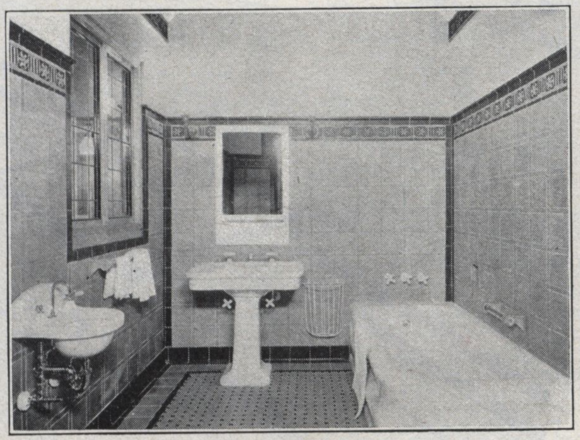

3144Y—Tile Insert, 9x9 in.

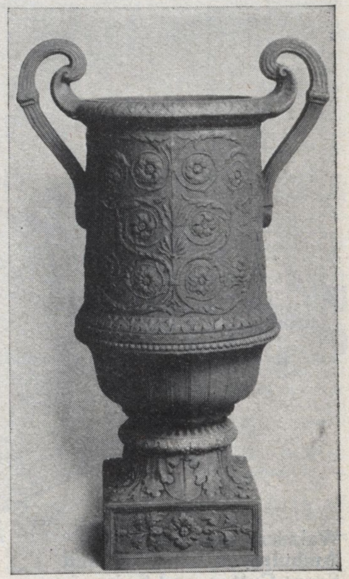

Mantel A420


Drinking
Fountain
3191Y


1942Y—4x4 in.—3109Y
Decorative Tile Inserts


Sun Room A698


Bathroom A1449


Garden Pottery 3041Y

Examples of Rookwood Faience for Interior and Exterior Use

THE SPARTA CERAMIC CO.

Manufacturers of Spartan Ceramics

5005 Euclid Avenue
CLEVELAND, OHIO

DISTRICT SALES OFFICES

NEW YORK, N. Y., W. B. Cherry, 30 Church Street
BOSTON, MASS., John L. Lash, 80 Boylston Street
JACKSONVILLE, FLA., B. A. Stone, 204 Mitchell Building
CHICAGO, ILL., J. T. Williams, 1500 South Western Avenue
MT. VERNON, OHIO, H. G. Beam, Struble Building
HOLLYWOOD, CAL., H. G. Heaton, 5601 Sunset Boulevard

Product

Spartan Ceramics.

Texture

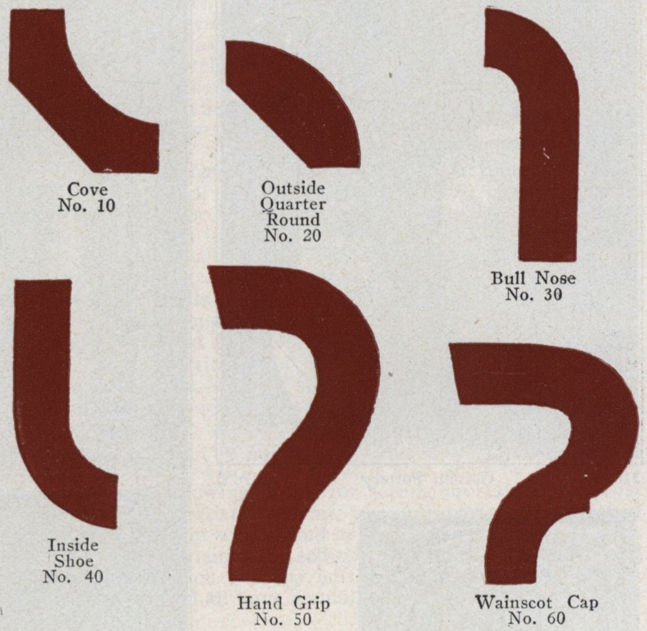
A vitreous flint mosaic tile. Made from pure shales, with slight variations in their outlines, surfaces and shadings—presenting a mosaic of soft harmonious warmth of color, and the effect of a woven texture. Size, $2 \times 1 \times \frac{5}{16}$ in. thick.

Color

Spartan red—spartan grey—spartan brown. Selected to reasonably uniform shades or furnished in random shades, as desired.

Quality

Wearproof, fireproof, dirtproof, immune to destructive elements. Spartan Ceramics will outlive the home or building in which they are installed.



Spartan Trim Members—¾ Actual Size

All styles of angles furnished for each

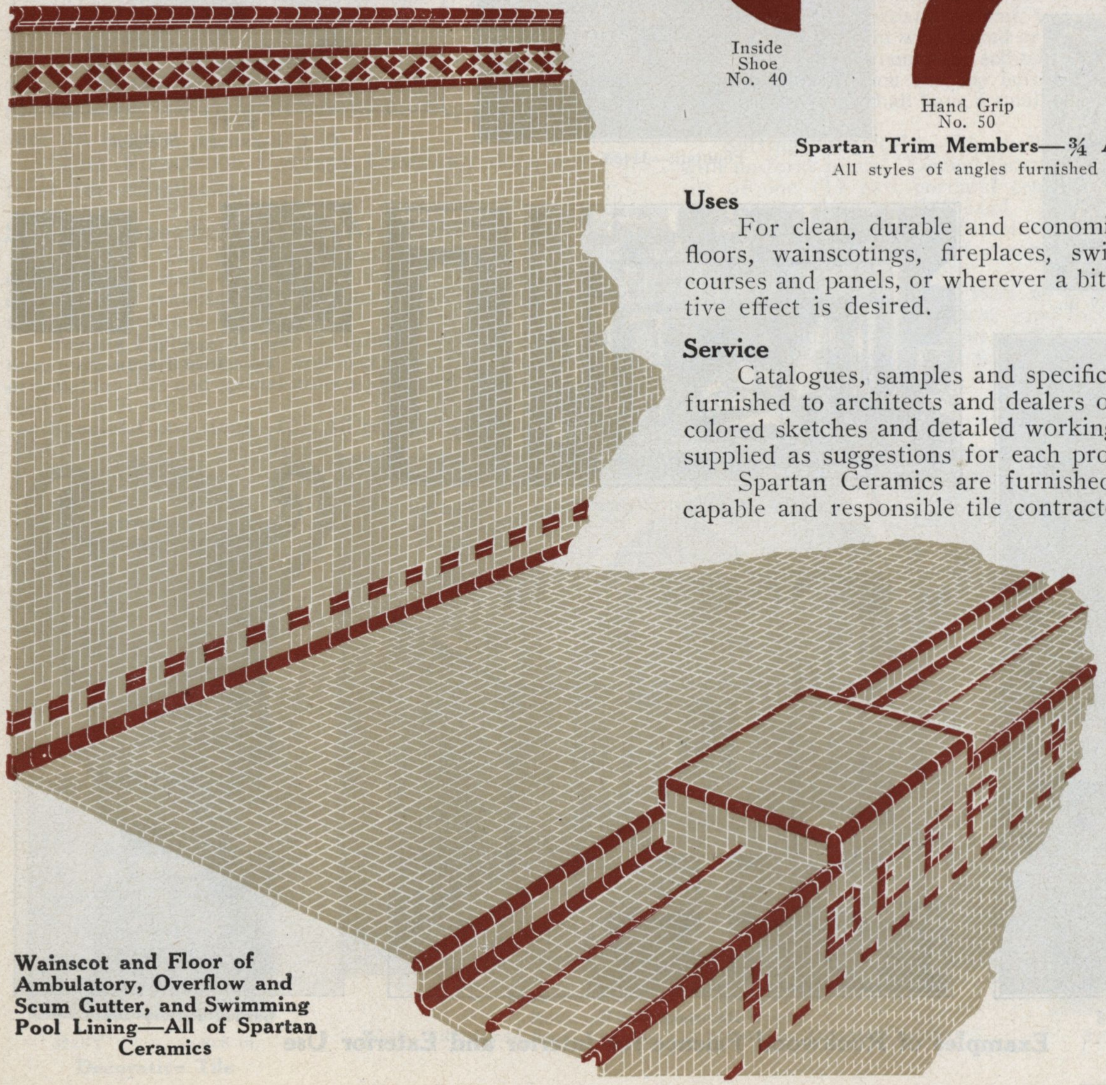
Uses

For clean, durable and economical construction of floors, wainscotings, fireplaces, swimming pools, belt courses and panels, or wherever a bit of color or decorative effect is desired.

Service

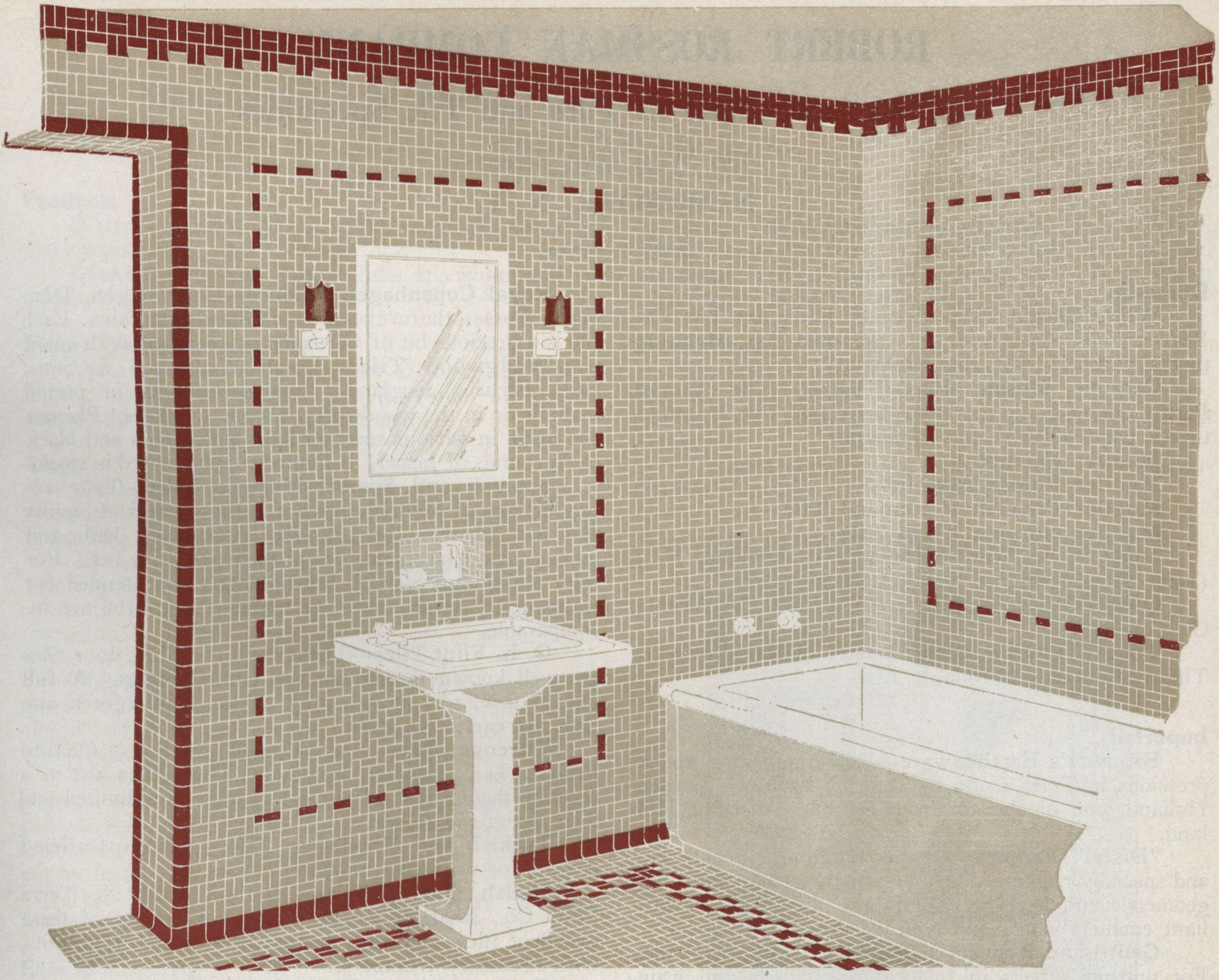
Catalogues, samples and specification sheets will be furnished to architects and dealers on request. Special colored sketches and detailed working drawings are also supplied as suggestions for each prospect.

Spartan Ceramics are furnished only by the most capable and responsible tile contractors.



Wainscot and Floor of Ambulatory, Overflow and Scum Gutter, and Swimming Pool Lining—All of Spartan Ceramics

Continued on next page



Wainscot, Floor and Treatment Around Door and Window Openings with Spartan Ceramics

Specifications for Laying Spartan Ceramic Floors

(1) This Contractor is referred to the "General Conditions" of this specification, as said "General Conditions" are as much a part of this sub-division as if rewritten herein.

(2) The following rooms (give list) are to have floors laid of Spartan Ceramics as manufactured by The Sparta Ceramic Co. of Cleveland, Ohio, according to the color and design selected by the Architect.

Foundation—(3) The tiles are to be laid on a concrete foundation, which has been tamped to a true level and even surface, not less than 3 in. thick.

Concrete—(4) The concrete shall consist of one part of portland cement, two parts of clean washed sand, four parts of clean gravel, surfaced to not less than 1 in. below the finished floor level, leaving at least 1 in. for the Spartan Ceramic and the cement mortar. The concrete is not to be allowed to stand more than three days before the tile is laid and is to be well brushed to remove dust and dirt, thoroughly soaked with water and then dusted with a thin coat of pure portland cement before applying cement mortar for laying the tile.

Lime Mortar—(5) No lime mortar is to be permitted in the concrete coat.

Reinforcing—(6) Place on top of the concrete an open metal lath and spread the cement mortar over it evenly and perfectly level.

Cement Mortar—(7) Cement mortar is to consist of one part best quality portland cement, three parts clean, washed, sharp sand, thoroughly mixed. All cement mortar is to be used fresh, before it has had its initial set.

Caution—(8) Before laying the sheets of Spartan Ceramics on the cement mortar, sprinkle same carefully with a little dry portland cement through a fine hand screen.

Laying—(9) The tile setter will first examine the sheets of tile to familiarize himself with the proper method of laying same. The sheets of ceramic laid, paper side up, each sheet to be properly interlocked before beaten into the cement mortar. In the case of design borders, the corners are to be laid first and the borders each way from the corners, meeting in the center of each stretch. All fitting together of the borders is to be done in the center of each stretch of borders. The ceramic must be well beaten into the cement mortar with a block and hammer until the paper over the joints of the tile become wet, and after the paper is removed the tile are to be thoroughly rubbed to an even surface.

Grouting—(10) Joints to be grouted are to be filled even and true with pure portland cement mixed with clear water. The tiles are to be cleaned as soon as the grouting is done, leaving no cement scum on their surface.

Cleaning—(11) Cleaning is to remove all trace of cement from the face of the tile and leave same thoroughly cleaned and true to original colors of the tile. The floor is to be covered at once with sawdust and boards to protect it from other trades.

Specifications for Setting Spartan Ceramic Wainscoting

(1) Furnish and set in the following rooms (give list) wainscoting ...... high of Spartan Ceramic of color and design as selected by the architect; to include 2x2-in. sanitary cove shoe No. 40 at floor and 2x2-in. cap No. 60 as top finish, with interior and exterior corners for same, rounded corners for all standing out corners of the wainscot, and to include all necessary trimmers required to make a finished installation.

(2) Scratch coat or concrete backing for wainscot shall consist of a stiff portland cement mortar not less than ½ in. thick (one part cement to three parts clean sharp sand) put up to an even and true surface, surfaced scratched and allowed to set for 24 hours before setting tile.

(3) Before setting tile wainscoting, brush scratch coat wall free from all dust and dirt, then thoroughly saturate the wall with clean water. Wall is then to be given a thin coat of neat portland cement mixed with water to a thin batter.

Cement Mortar—(4) Cement mortar shall consist of one part portland cement to three parts clean sharp sand with not over 5% of hydrated lime, or in place of lime, a high grade, fine ground fire clay may be used; all well mixed together and floated out over the wall to a plumb, true surface not less than ½ in. thick, in sections no larger than to remain of proper consistency to float and bed the tile in.

Setting—(5) Before beating the tile into cement mortar, each sheet of Spartan Ceramic shall be laid, paper side down, on a pallet of about the same size as the sheet and all of the joints between the ceramic tiles filled with as dry a mixture of *white* portland cement and clean water as can be worked.

Note: Only clean *white* portland cement is to be used in filling joints and for surface grouting of wainscotings of Spartan Ceramics. With aid of the pallets the sheets of tile are then set in place in the cement mortar properly interlocked with adjoining tile and well beaten in and bedded in the cement mortar to a true and plumb wall with all joints spaced even and true.

(6) The face of the wainscoting and joints between the tile shall be kept clean, free from dust, dirt and dark cement while work is in progress.

Grouting and Pointing Joints—(7) After the tile are properly set the joints are to be carefully washed out with clean water and filled flush with the tile with a thinly mixed neat white portland cement, all trace of which is at once to be washed from the face of the tile.

(8) Upon completion of the work according to these specifications, all unused materials are to be removed from the building. The tile shall be properly cleaned and in first class condition, when it will be at once accepted by the architect. Further cleaning or repairs necessitated upon completion of the building shall be done by the **General Contractor.**

ROBERT ROSSMAN COMPANY

Domestic and Imported Tiles and Tile Specialties

156 West 49th Street
NEW YORK, N. Y.

Domestic

White Glazed Tiles—Beaver Falls Art Tile Co., Beaver Falls, Pa. (refer to Associated Tile Manufacturers, pages 430-431, this catalogue).

Ceramic Mosaic—Perth Amboy Tile Works, Perth Amboy, N. J. (refer to Associated Tile Manufacturers, pages 430-431, this catalogue).

Mueller Faience—
Mueller Roman Mosaic—
Mueller Flemish Handmade Tile—
Mueller Norman Flash Tile—
Made by the Mueller Mosaic Co., Trenton, N. J. (refer to page 449, this catalogue).

Quarry Tiles—B. Mifflin Hood Brick Co., Atlanta, Ga.

Tiffany Favrile Glass Lustre Tiles—Louis C. Tiffany Furnaces, Corona, L. I.

Imported

Brouwer's Earthenware—Extremely modern expressions in Terra Cotta by Wm. C. Brouwer, Leyden, Holland, one of the foremost ceramic artists of Holland.

"Distel" Faience—Gouda, Holland. Frostproof, and specially recommended for artistic storefronts. The geometric and heraldic designs are illuminated by brilliant enamels which give unusual decorative effects.

Gentil and Bourdet Faience—Billancourt, France. For unusual effects in faience for mantels and wainscots. A combination of beauty and simplicity.

Helman Iridescent Faience—Brussels, Belgium. The designs of this house are supplied by the foremost artists of Belgium. Especially recommended for fine interior and exterior church work, fountains, wainscoting and fine decorative panels.

Japanese Lacquer Tiles—For mantels and Japanese or Chippendale interiors.

Chinese Grill Tiles—Also balustrades and garden furniture.

Sphynx Crystal Faience Tiles—For sun rooms, wainscots, vestibules, etc.

"Rako" Faience—The color range of these fine Czecho-Slovakian products is unlimited; designs are artistic and fit any style, period or scheme suitable for faience. Material is frostproof and can be used for exteriors as well as interiors.

Royal Copenhagen Faience—Copenhagen, Denmark. Possess the rare beauties of Copenhagen china. Each tile is a precious bit of Ceramic art, sparkling with color.

Wedgwood Tiles—Josiah Wedgwood & Sons, Ltd., Etruria, England. For decorations in period mantels or in the woodwork of show windows. Plaques are made in various sizes on light blue, green and black backgrounds of Jasper. A limited supply carried in stock.

Spanish and Spanish-Moresco Tiles—True reproductions of Moorish mosaics in the Alcazar at Sevilla and the Alhambra at Granada. Vestibules, halls and inner courts lend themselves to their extensive use. For color and design Spanish Renaissance tiles, intended for wainscots of large rooms, vestibules and courts, are incomparable.

O. K. Flint Tiles—These imported flint floor tiles are well known throughout the United States. A full line of 6-in. tile, in red, gray, white, black, green and blue, are carried in stock.

Vitreous Tiles—Jas. Powell & Sons (White Friars), Ltd., London, England. These tiles are in a class by themselves. Their color range is unlimited and their designs aristocratic.

Turkish and Rhodesian Tiles—Of unparalleled beauty, for wainscots, tabouret covers, etc.

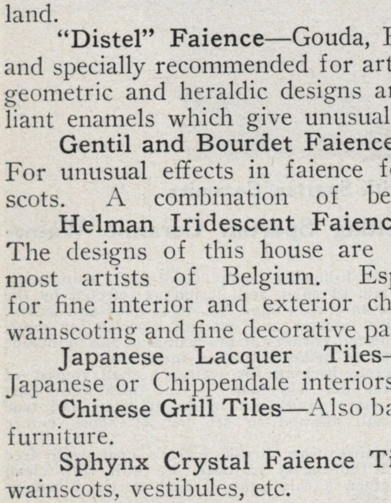
Welsh Quarry Tiles—Ruabon Brick & Terra Cotta Co., Ruabon, North Wales. A supply of these excellent tiles is always carried in 4, 6 and 9-in. units, with necessary trimmers.

Tunis (African) Tile—The beauty of these tiles lies in their soft colors and charming designs. Predominating colors are blue, green, yellow and brown. Recommended for patios, gardens and fountains in mild climates. A large stock is carried on hand.

Delftblue and **Polychrome Tiles**—From Holland. Conventional Dutch 5x5 and 6x6-in. delftblue and polychrome tiles with landscapes, ships, fish, artisans, knights, children and biblical subjects in a variety of combinations, for large colonial fireplaces, etc.

"Westraven" Tiles—Utrecht, Holland. 4-in. faience tiles with glazes of crystallized mottled orange (golden rod) yellow, green and blue in various shades. Glazes are indestructible, frostproof and suitable for walls or private floors.

Sundries—We keep a stock of English red flame tiles, Della Robbia Panels, Persian period tiles, Florentine and Faenza tiles.


Rossman "Recessories"

Rossman "Recessories"

Rossman "Recessories" comprise one of the most complete lines of recess fixtures on the market. These "Recessories" are for use in tiled bathrooms, kitchens, pantries and wheresoever water, soap and towels are used. They can also be installed individually in plaster walls. A large stock of "Recessories" is carried in New York for immediate shipment.

R
ROSSMAN
RECESSORIES

TRADE-MARK

TRENT TILE CO., INC.

Manufacturers of Floor, Wall and Trim Tile of Every Variety

TRENTON, N. J.

Products

WHITE GLAZED WALL TILE and all necessary TRIMMERS.

CERAMIC MOSAIC FLOOR TILE in white and all colors.

Floor, Wall and Trim Tile

We are pioneer manufacturers of tile in the United States, and we are original manufacturers of ceramic mosaic floor tile in white and all colors.

Uses

Owing to the adaptability and long life of our glazed tile products in industrial plants, they are finding widely increasing and divergent applications.

Modern manufacturing laboratories and research laboratories are built for permanence, and floors built with our ceramic mosaic floor tile will be clean, resist corrosion, be leakproof and will last as long as the building.

The walls of laboratories lined with our white glazed wall tile and trimmers are always bright, easily cleaned of dust and chemical stains, are not attacked by corrosive liquids, and are non-conductors.

Trent Tile is being used for lining vats in chemical plants where the products must have thorough sanitary surroundings during processing. Among these products are foods, pharmaceuticals, cosmetics, fruit juices, patent medicines, etc.

Trent Tiles are also used for factory libraries, lunchrooms, restrooms, washrooms and lavatories.

Ease of Cleaning

Trent Tile can be cleaned in a very short time, in exactly the same manner as glass, therefore it always appears as when first installed.

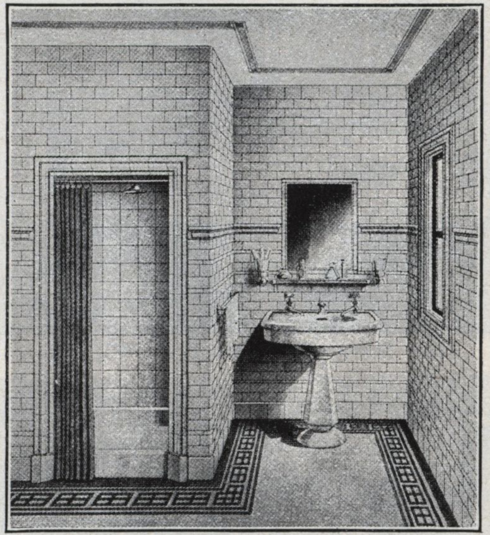
Shapes

Trent Tile is furnished in all shapes: flats, squares, oblongs, cove and base, in-and-out corner, etc.; in fact, any shape or style required to line a tank or vat, finish a laboratory, lavatory, entry, kitchen, etc.

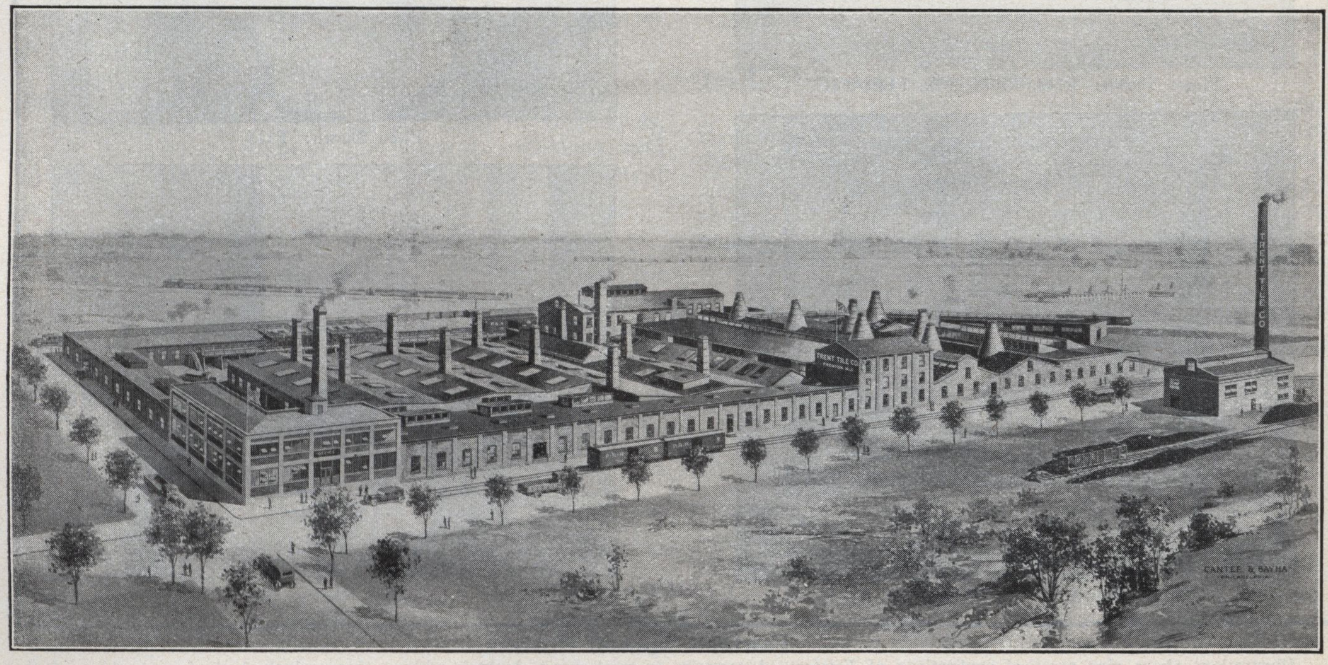
Installations

The TRENT TILE CO., INC., has furnished the floor and wall tile for the Standard Oil Co.'s different refineries, office buildings, etc., throughout the United States.

We have also furnished tile for other chemical industrial plants for various purposes.



A MODERN FACTORY WASHROOM
Shower, 6x6-in. tiles. Walls, 6x3-in. tiles



PLANT OF THE TRENT TILE CO., INC.

THE FAIRFACTS CO., INC.

Manufacturers of Bathroom Accessories

NEW YORK, N. Y.

AGENCIES

LOS ANGELES, CAL., W. E. Graham, 505 Kerckhoff Building
WASHINGTON, D. C., M. E. Shorey, 1743 Connecticut Avenue, N. W.
SAN FRANCISCO, CAL., California Pottery Co., Mills Building
DETROIT, MICH., R. R. Randall, 2167 Alter Road

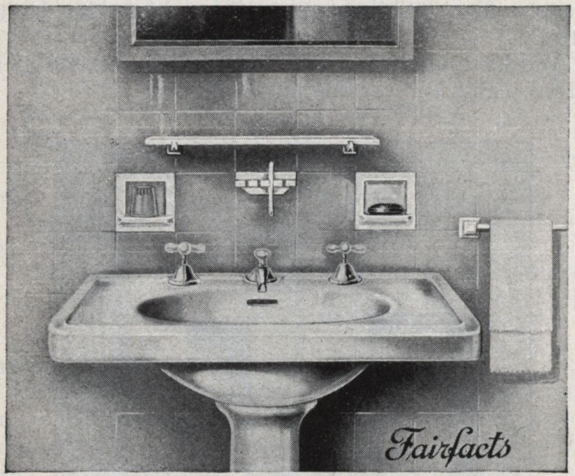
Products

Bathroom Accessories of China: Recessed and Projecting Types, cemented, not screwed, to walls.

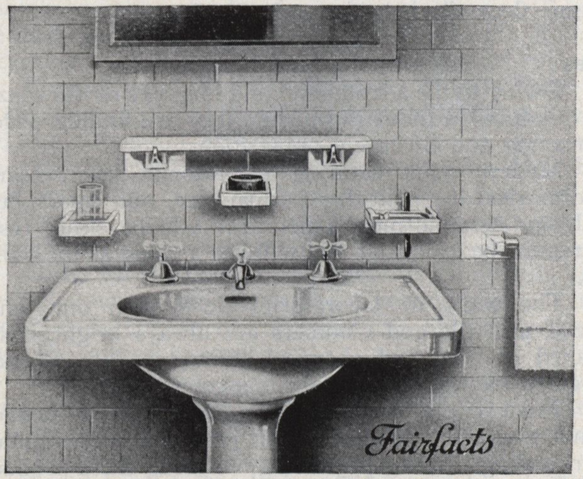
Recessed Type includes Holders for Soap, Tumblers, Sponges, Toilet Paper; China Bathroom Radiators; Safety Wall Grips; Combined Safety Wall Grip and Soap Holders; Combined Soap and Tumbler Holders, Soap and Sponge Holders, etc.

Projecting Type includes Holders for Soap, Tumblers, Sponges, Tooth Brushes and Toilet Paper; Towel Bars; Glass Shelves; China Hooks, Non-slip Towel Bars with China Posts; China Bathroom Seats, etc.

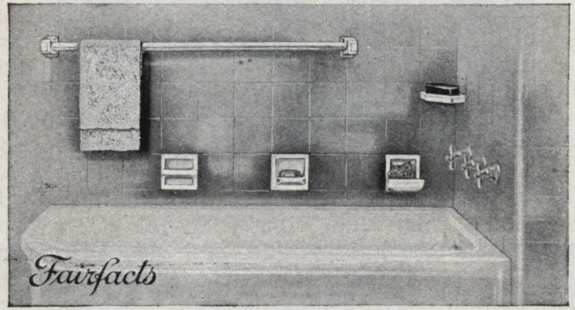
BATHROOM
Fairfacts
FIXTURES
TRADE-MARK



Pieces Shown: F160, F330, F115, F321, F301

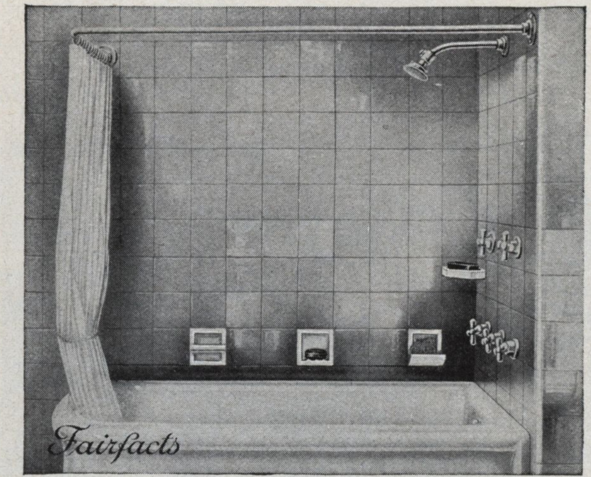


Pieces Shown: F403, F400, F461, F405, F430

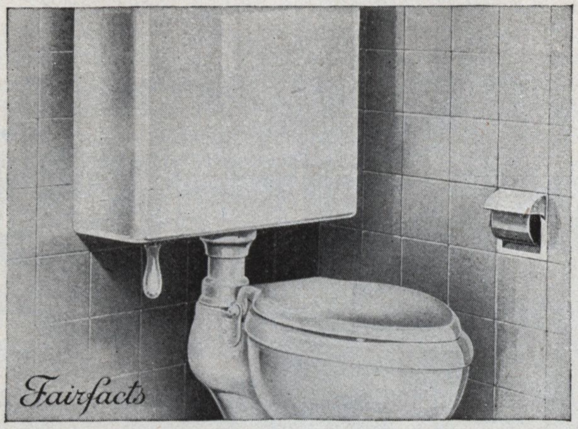


Pieces Shown: F140, F115, F170, F135, F316

Piece Shown: F115



Pieces Shown: F140, F125, F170, F135



Piece Shown: F1

Fairfacts Special Process

Illustrations above give practical applications of Fairfacts Accessories to wash basin, bathtub without shower bath, bathtub with shower bath, kitchen sink and toilet. The arrangement is the result of long experience. By counting the tiles, exact locations may be determined

Continued on next page

Fairfacts Biltin or Recessed Accessories

Fairfacts Biltin (recessed type) accessories are set back into the walls and cemented in place when the tile is laid. They should be included in the tile contract (see Specifications on following page). They can also be used in Keene's cement wainscots.

Soap holders with fluted base should be used with shower installations, because of their self-draining feature. Safety wall grips prevent accidents and aid in getting in and out of bathtubs. Safety wall grips and soap holders combined are used largely in hotels and apartments. There are many attractive combinations of holders for special cases.

Fairfacts Projecting Type Accessories

Projecting type accessories should be included in the tile contract, and can be set while the tile is being laid, or after it is laid. They can also be used satisfactorily in Keene's cement wainscots. Heavy wood bucks should be set back of the finished wall and cut out to receive the shanks of the back shank or dowel type.

Advantages of Fairfacts Bathroom Accessories

Both types of Fairfacts bathroom accessories have the qualities that are liked: strength, durability, cleanliness, attractiveness.

Strength—They are strongly made of heavy china and cemented securely into place.

Durability—Fairfacts accessories will not crack nor craze. Since they are installed without screws, there is nothing about them to work loose. They are part of the wall and will last as long as the wall.

Cleanliness—China is the most sanitary of materials. By its use the necessity for metal polishing is done away with; Fairfacts accessories can be wiped clean with a damp cloth.

Attractiveness—Fairfacts accessories are part of the tile wall; they replace the ugly and conspicuous fixtures in use before their invention. These handsome fixtures add much to the appearance of the modern bathroom. They add renting value and selling value to any building in which they are installed.

Because of the friendly interest of numerous architects who have been quick to realize these advantages, Fairfacts accessories are now installed in thousands of fine bathrooms.

Adaptability of Fairfacts Bathroom Accessories

Both types of accessories are used in residences, hotels, apartment buildings and hospitals especially, and in all kinds and types of buildings where good equipment is desired.

Installation Data

All 4¼x4¼-in. and 8½x4¼-in. fixtures are for use with 4¼x4¼-in. tile. All others are for use with 6x3-in. or 6x6-in. tile, but can be used with any size tile by cutting the tile. The greatest depth in the wall taken by recessed fixtures is 3¼ in.

Superior Merit of Fairfacts Accessories

Fairfacts accessories are made of china, because it does not craze and because it is much stronger and more durable than tile. Tile is a very porous and fragile clay product, quite similar to a clay pipe, but having an extremely thin glazed surface. Expansion and contraction break the glazed surface into numerous cracks, called crazes, exposing the soft clay beneath, which quickly absorbs dirty water, soap, greases, etc., when made into bathroom accessories. An unsightly as well as unsanitary condition results. China is as hard as flint all the way through, and does not craze. When made into Fairfacts accessories of heavy and substantial design, it is a material that is ideal for the purpose.

White Fairfacts Accessories in Colored Tile Walls

Where colored tile is used for bathroom walls, it is the general practice to specify white Fairfacts accessories. The effect is more pleasing, because of the contrast, than if fixtures of the same color as the tile were used.

The crackproof and crazeproof solid china construction of white Fairfacts accessories is a second reason for this practice. A third is the fact that white fixtures can always be promptly obtained. Errors, breakage or changes in plans cause no special delay where white Fairfacts accessories are specified.

The final reason for specifying white fixtures is because they meet the high standard of cleanliness and sanitation demanded by a critical public.

Service

Literature and roughing-in measures furnished on request. If building operation is to be low in cost, write us for special economical selection.

Patents

Fairfacts bathroom accessories are patented and bear the following dates: Feb. 13, Aug. 21, Aug. 28, Sept. 4, Sept. 11 and Oct. 23, 1917; Feb. 12, May 28 and July 16, 1918; and April 15 and July 29, 1919.

Our accessories have been widely imitated, but like most imitations, many are of poor quality, and purchasers should protect themselves by insisting upon having our trade-marked and guaranteed fixtures.

Trade-Mark and Guarantee

Fairfacts Fixtures are trade-marked and guaranteed for the life of the building. The trade-mark and the guarantee certificate are attached to each fixture. These important documents are for your protection, and should remain on the fixtures until you see them, and make sure that you have secured genuine Fairfacts Fixtures.

Catalogue

Write for late catalogues having additional and complete information.

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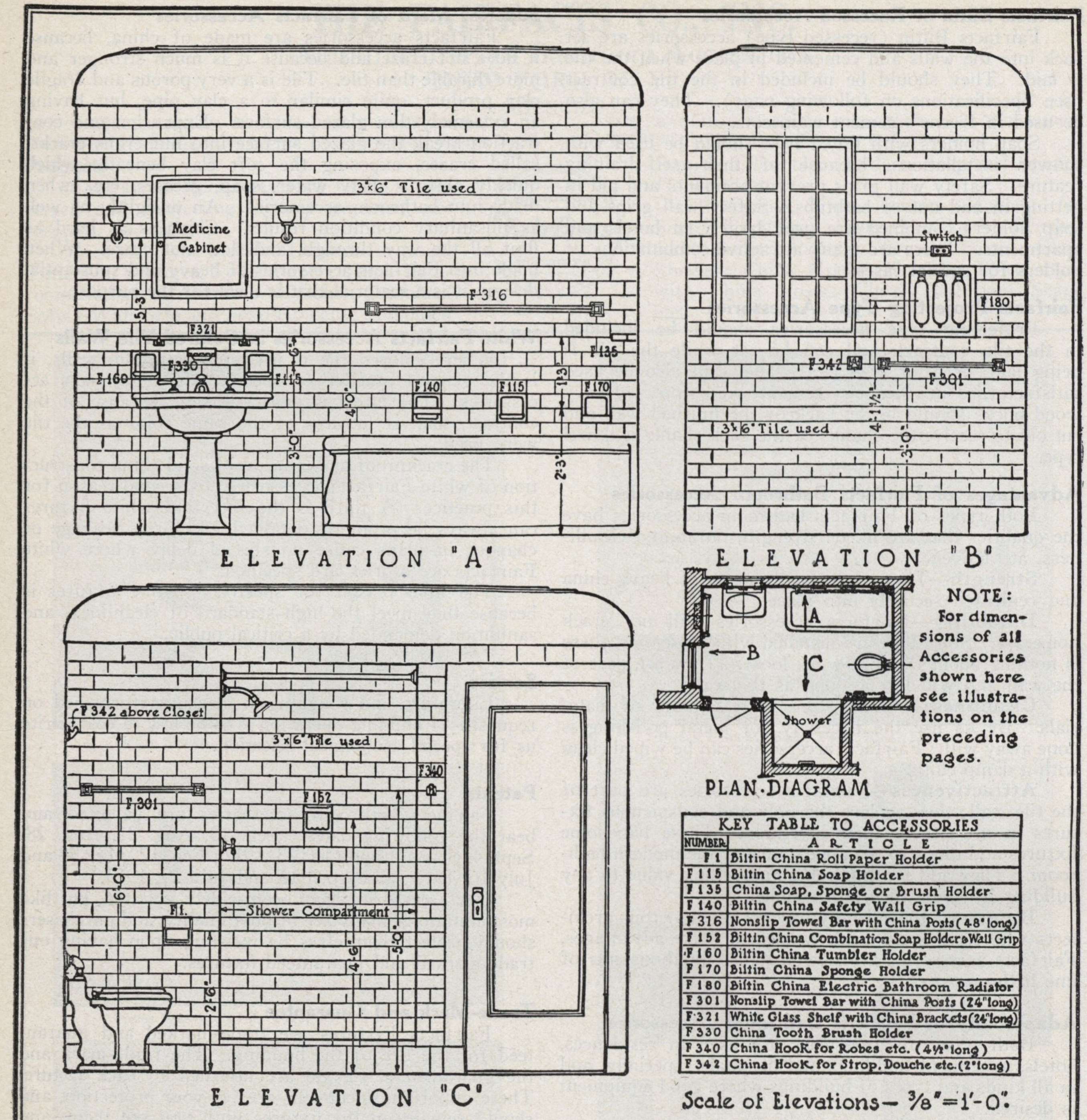


NOTE: For dimensions of all Accessories shown here see illustrations on the preceding pages.

KEY TABLE TO ACCESSORIES	
NUMBER	ARTICLE
F 1	Biltin China Roll Paper Holder
F 115	Biltin China Soap Holder
F 135	China Soap, Sponge or Brush Holder
F 140	Biltin China Safety Wall Grip
F 316	Nonslip Towel Bar with China Posts (48" long)
F 152	Biltin China Combination Soap Holder & Wall Grip
F 160	Biltin China Tumbler Holder
F 170	Biltin China Sponge Holder
F 180	Biltin China Electric Bathroom Radiator
F 301	Nonslip Towel Bar with China Posts (24" long)
F 321	White Glass Shelf with China Brackets (24" long)
F 330	China Tooth Brush Holder
F 340	China Hook for Robes etc. (4½" long)
F 342	China Hook for Strop, Douche etc. (2" long)

Scale of Elevations— 3/8"=1'-0".

TYPICAL BATHROOM SHOWING FAIRFACTS ACCESSORIES

Specifications

Bathroom Accessories—(1) The tile contractor shall furnish and set China Bathroom Accessories as manufactured by THE FAIRFACTS CO., INC., New York, N. Y., in accordance with the subjoined specification and schedule of accessories.

(2) *Setting Biltin* (*Recessed Type*)—(a) In stud and metal lath partitions, cut the metal lath across the top of the opening and down the two sides; bend the flap back to form a shelf and fill the space around the opening with excelsior bound together with plaster of paris to form a pocket; then set the piece in rich cement in the same manner that tile is set.

(b) In masonry partitions, cut pockets and fill up any openings to prevent the escape of cement when setting.

(3) *Setting Projecting Types*—Projecting types to be set while laying the tile or after it is laid. Cut hole of sufficient size to receive the shank and set in rich cement mortar.

(4) *Location*—Accessories shall be set as shown on drawings or as will be directed by the architect. Care shall be taken to locate tile joints in such manner that accessories will center over fixtures without the necessity of cutting any tile.

Note: In setting electric radiators, all wiring to be furnished and set by electrical contractor (see electrical wiring specifications).

Schedule of Bathroom Accessories (A Typical List)—

(5) For each lavatory: F 115 Soap Holder; F 160 Tumbler Holder; F 330 Tooth Brush Holder; F 321 Glass Shelf; F 301 Towel Bar.

(6) For each bathtub: F 115 Soap Holder; F 140 Wall Grip; F 170 Sponge Holder; F 135 Brush Holder; F 303 Towel Bar.

(7) For each water closet: F 1 Paper Holder.

(8) For each shower compartment: F 152 Safety Wall Grip and Soap Holder; F 340 Towel Hook.

(9) For each bathroom: F 180 Electric Bathroom Radiator; F 340 Towel Hook; F 342 Strop or Douche Hook.

(10) For each kitchen sink, pantry sink, vegetable sink, slop sink and wash tray: F 115 Soap Holder.

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Tile for Swimming Pools and General Decorative Purposes

TELEPHONE
Bryant 8430

2 West 47th Street
NEW YORK, N. Y.

CHICAGO OFFICE: 318 North Michigan Avenue
FOUNDRY AND SHOPS, 335 Carroll Street, BROOKLYN, N. Y.
MONTREAL, QUE.: Wm. H. Jackson Company of Canada, Ltd., 167 Wellington Street

Products and Services

Tile for the Lining of Swimming Pools, Overflow Gutters, Ladders, Floors, etc.

The Furnishing and Application of the proper Waterproofing in connection with the tile application and the essential Metal Strainers, Inlets, Outlets, etc.

For Stone Mantels, see page 300; for Ornamental Bronze and Iron Work, see page 767; for Bronze and Iron Windows, see page 982.

Experience, Co-operative Service, and Construction

Our organization, established in 1827, is the pioneer in the development of the tile industry for swimming pools.

In addition to the general service in the study of decorative tile application this organization co-operates with architects and others in the development and study of swimming pool problems, including the correct waterproofing and, if required, will furnish drawings and specifications for the general construction together with estimates for furnishing and installing same.

Jackson Tile Lined Pools

Jackson Swimming Pools, both interior and exterior, installed by our firm, combine either a simple or highly elaborate decorative effect with perfect serviceability. Our tile is suitable not only for the pool, but for the floor, walls and wainscotings as well, thereby obtaining a most satisfactory unity of effect.

Some of the special features of Jackson swimming pools are the Jackson pool life rail, the grip coping, the overflow gutters, depth and distance numerals, safety guides, etc.

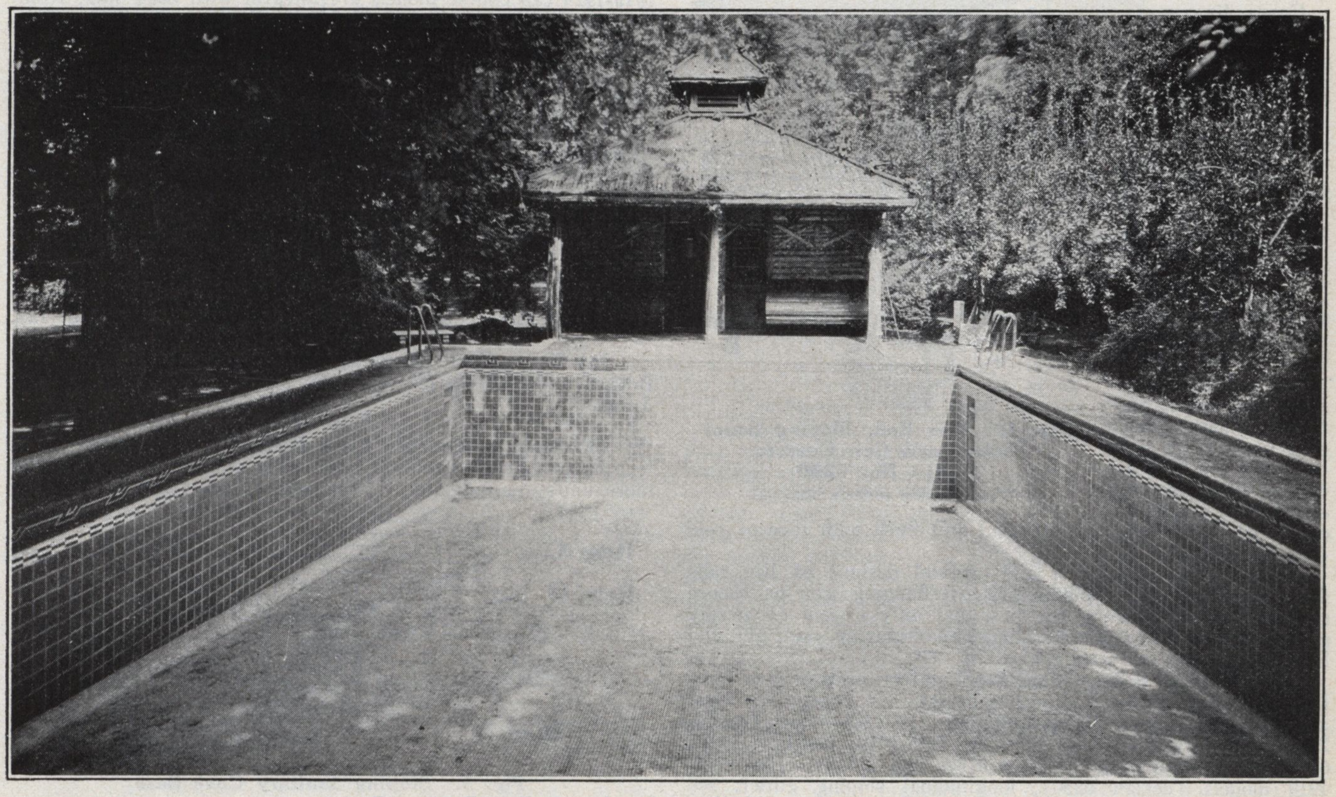
We also furnish the necessary metal strainers, inlet, outlet, and floor drains, for which we have many special patterns, and diving boards if required.

Installations

The following pools have been furnished and installed by us:

Natatorium, U. S. Naval Academy, Annapolis, Md.
The Congressional Country Club, Washington, D. C.
Broadmoor Hotel, Colorado Springs, Colo.
Fordham University, Fordham, New York, N. Y.
B. P. O. Elks, Philadelphia, Pa.
K. of C., Brooklyn, N. Y.
Y. M. C. A. swimming pools, 47 buildings
Y. W. C. A. swimming pools, 9 buildings
Private estate swimming pools, 24 residences
Club swimming pools, 12 buildings
Community centers, 10

And about 50 others.



Exterior Pool Designed and Installed on a Private Estate

J. FRANCIS BOORAEM, M. E.

Sanitary Swimming Pool Construction and Equipment

52 Vanderbilt Avenue
NEW YORK, N. Y.

TELEPHONE
Murray Hill 8787

MEMBER OF AMERICAN SOCIETY
OF MECHANICAL ENGINEERS

Products

Swimming Pool Construction and Equipment.

Development of Swimming Pools

Illustrations of both the oldest and the latest pools equipped by our organization, also a list of operations completed by us are given on pages 482 and 483.

Note: See "Special Notice" on page 481.

Co-operative Service

Architects are invited to consult us at first stage of swimming pool design.

Details of Booraem features and working drawings of previous installations are at the disposal of architects for preparing layouts and specifications of any or all equipment. Itemized bids also furnished. All features are patented, providing full protection to owner as to cost and against infringement.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1913

Get your quotation *before* you write your Specifications.

Ask for large cuts of prominent pools and other data in booklet.

Detail and Working Drawings

We furnish detail fabrication plans on all contracts, laying out all features chosen for the prospective pool. These plans serve for locating all "roughing-in," building of concrete forms and location of all centers before pouring concrete.

Send for new 1922 Sectional Perspective One-quarter Scale Details, 7 sheets, size 12x18 in., blue line prints.

Skeleton Specifications and Installation Data

Alphabetically designated items or groups in these specifications are covered by one lump sum figure in our quotation.

Item B

Enameled Terra Cotta Features

All life rail, cap course and gutter units are made in uniform cross section; no *rights* and *lefts.* Furnished in uniform 12-in. lengths, (or nearest equivalent which layout of job will permit). All units finished on grinding table with ground joints for uniform $\frac{3}{16}$-in. joints and set up in shop for alignment before shipment.

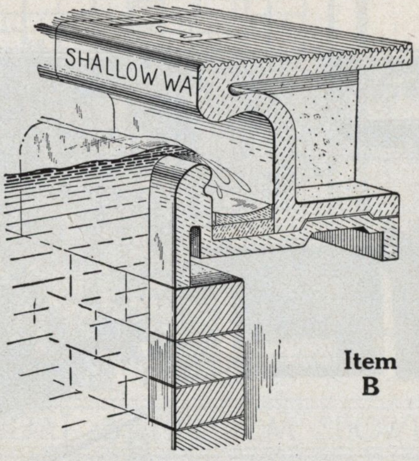


Fig. 1. Life Rail, Sloping Scum Gutter and Cap Course; Design No. 6250

With non-slip surface integral

(1) Life Rail—Life rail unit furnished (with finger grip recess) set level to water line and arranged either flush or offset with respect to cap course as desired, but life rail unit flush with face of pool (see Figs. 1 and 2).

Note: These are first and original designs of life rails flush with water line, eliminating overhanging iron or bronze railings; also furnishing the first and only system of steeply sloping gutter for quick flushing, and requiring no right and left construction or setting.

(2) Sloping Scum Gutter—All gutter units are of uniform cross section but designed to be set on a slope. Furnished as layout permits, in 12-in. long units, in 1914 model (design 73431); and in 6-in. long units in 1915-1919 models (design 6250), and 1922 models (designs 31808 and 31915). For 1915-1919 models (design 6250), longitudinal sloping gutter, see Figs. 1 and 2.

Standard slope, $\frac{1}{8}$ to $\frac{1}{4}$ in. per ft. arranged on 10-ft. slope lengths right and left from high point; outlets, 20 ft. apart. For pools whose lengths or widths are not multiples of 20 ft. see chart for locating outlets (1922 Sectional Perspective Details). This system affords a saving of 75% of plumbing cost over 5 ft. outlet spacing, the customary practice on level gutter system.

For 1922 model (designs 31808 and 31915), transverse spill trench gutter, see third page following.

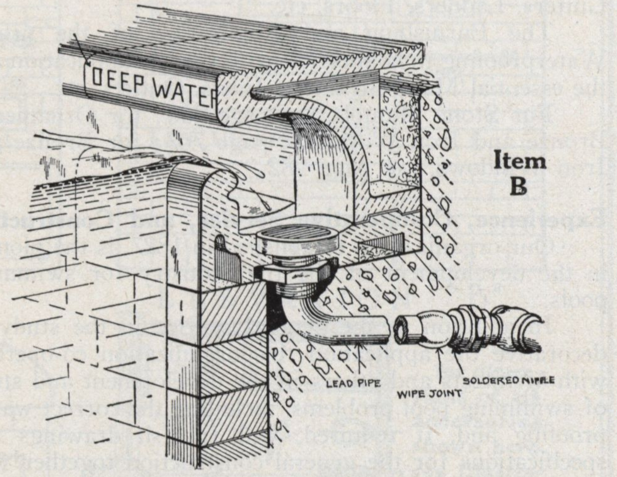


Fig. 2. Life Rail, Sloping Scum Gutter, Outlet Section and Cap Course; Design No. 6250

With non-slip integral. With bronze outlet thimble including strainer to be set by mason with terra cotta. (Mason's Specifications.) Soft lead pipe connection with solder nipple to hard pipe. (To be roughed in by pipe fitters.) (Plumber's Specifications)

(3) Level Cap Course—Furnished in 12-in. long units. 1915-1919 cap course models are integral with back wall, forming canalization for insertion of 6-in. sloping gutter tile (Figs. 1 and 2).

Arranged optionally with

(4) Non-Slip Surface—Integral on top of cap course (Figs. 1 and 2), or

(4a) Non-Slip Surface—By insert in rabbet in cap course to receive same. Price of cap course unit is the same for either method. Insert such as cement, cork, tile, etc., not included in price.

(5) Gutter Outlet Units in Terra Cotta—These gutter outlets in combination with bronze thimbles (with removable strainer) and sweated joint to thimble, connected to hard pipe waste line by a solder nipple, soft lead pipe (2 in. o. d.) enables rectification of plumbers' roughing-in errors to exact center position of terra cotta outlet units (Fig. 2; see also Fig. 12).

Item C

(6) Terra Cotta Housing for Bottom Outlet Fittings—Bottom outlet—horizontal (Fig. 13); side outlet—vertical (Figs. 3 and 14).

Item D

(7) Sloping Sanitary Cove Base—Made in sections, of lengths established for each tank; each section comprising 3 or more units approximately 12 in. long. Made right and left for

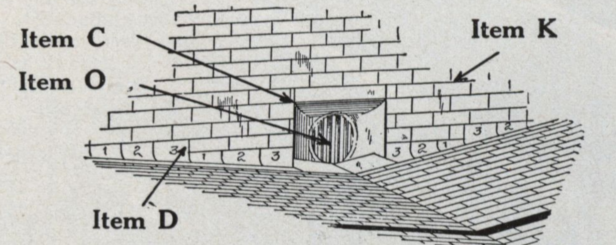


Fig. 3. Sloping Sanitary Cove Base

Showing also vertical bottom outlet and lane marks

Continued on next page

both sides of tank, establishing predetermined slope of bottom. Tops of sections of sloping base, all level, receive first courses of brick, sections repeating to end of tank. Abutting ends of each section stepped to receive next corresponding course of brick eliminating all cutting and fitting of bricks at intersections of sloping bottom and horizontal courses of side walls.

Items E and F

(8) Flush and Sanitary Step Ladder Units—With hand grip and Mexican stirrup-like pocket for the foot and weep-hole drain for pocket. Flush and non-slip terra cotta step ladder units built flush in wall with uniform rise of 12 in.; in 3 standard lengths, 9, 12 and 18 in. All edges square and straight for bonding with enameled brick. Ladder tread especially designed for support of toe and arch of foot, and finger grip for the hands, rendering use easier and safer than the pipe rung or ship ladder. The 18-in. units are economical for horizontal flush foot rest longitudinally of tank in deep water end. If not used continuously, individual units are recommended to be placed immediately under gutter outlet points, at a depth of 4 ft. 6 in. below water, to induce expectoration at outlets, when resting.

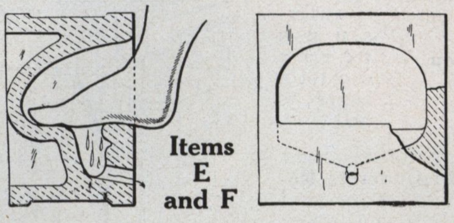


Fig. 4. Flush Step Ladder Unit

(9) Hand Grip in Cap Course Above Step Ladders—Special cap unit made with flush and depressed hand grips set in floor, eliminating use of old style hand rail. Hand grips provided with weep-hole drains.

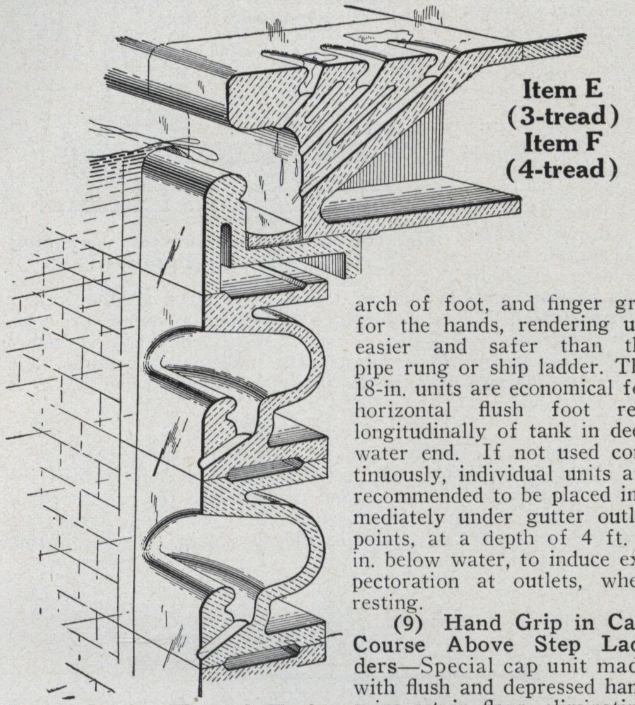


Fig. 5. Section Through Flush Step Ladder Showing Step Ladder Units and Hand Grip Unit in Cap Course

Item G

(10) Ornamental Terra Cotta Inlet Fittings—Statuettes and lion heads. Send for designs and photographs.

Item H

UNDERGLAZED LETTERING ON TERRA COTTA

(11) Yard Marks—(3 in. by ½-in.) with numerals (2½-in. by 1¾-in.) from 1 to length of tank with intermediate foot marks (1-in. by ¼-in.) on top or face of cap course to measure swimming or diving contests (see Fig. 1).

Item I

(12) Deep and Shallow Water Signs—On face of cap course: "Safety First" warning to non-swimmers and reckless divers—letters 3 in. high (see Figs. 1 and 2).

Item J

(13) Depth Numerals on Face of Cap Course—"Goal" signs and marks for polo games, also depth figures, viz: (4 ft.).

Item K

ENAMELED BRICK LINING FOR SIDES, ENDS AND BOTTOM

(14) Enameled Brick Lining for Sides, Ends and Bottom—Afford maximum efficiency of constructive durability against inward hydrostatic pressure and germproof qualities for sanitary purposes (see booklet for details).

(15) Lane Marks—On bottom of pool in colored brick to guide underwater swimmers (see Fig. 3).

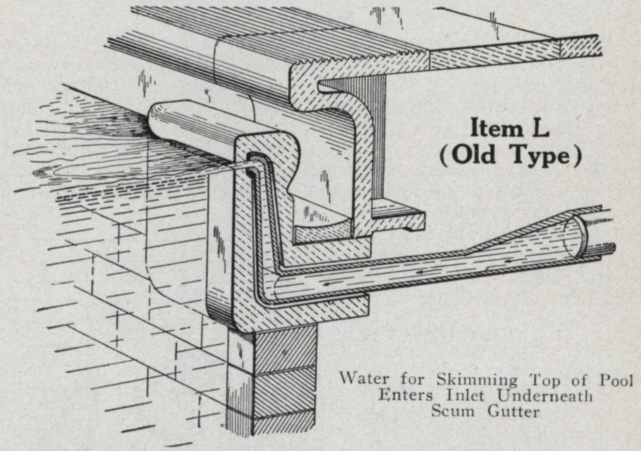
Item L

BRONZE FITTINGS AND WHITE ENAMELED TERRA COTTA HOUSINGS FOR PLUMBING TERMINALS AND CONNECTIONS TO CLEANING FEATURES

Note: Omit Items L. M. N. O and P from plumber's specification. Include in general specifications because these special bronzes must be set with terra cotta.

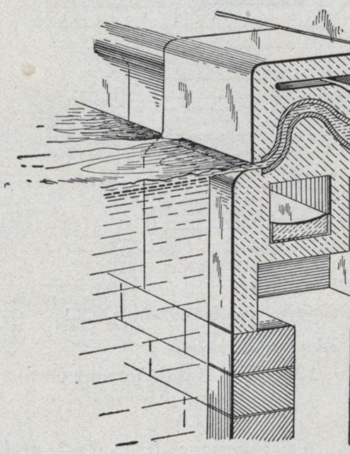
(16) Combination Bronze and White Enameled Terra Cotta Surface Skimming Inlets in Battery—Includes pressure surface spray for skimming top of full pool. These units register and joint up with terra cotta rail units, and except for change in form for special duty, their finish is indistinguishable from the enameled terra cotta rail units.

All skimming inlet delivery ducts are connected in a battery to a header feed line under one valve control, and are located on *one long side of pool only.* All floating scum and overflow removed to gutter on three remaining sides of pool, discharging simultaneously at surface of the full tank, sweeping saliva scum and floating impurities into gutter.



Water for Skimming Top of Pool Enters Inlet Underneath Scum Gutter

Fig. 6. Skimming Inlet Unit, Design No. 6250



Skimming Water Enters Inlet Above Scum Gutter Above Surface of Pool Water

Fig. 7. Skimming Inlet Unit, Design No. 6250

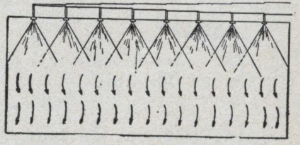


Fig. 8. Plan View of Arrangement and Operation of Skimming Inlets

Item M

(17) Pressure Inlet and Suction Cleaner Outlet Unit—Includes suction cleaner discharge for cleaning bottom of full pool, and pressure hose inlet for washing empty pool. Two or more pressure inlet and suction cleaner outlet units, housed in terra cotta boxes, are usually supplied for each pool. Furnished with standard 2-in. hose terminal connection and nickelplated flush cover. This terminal connection is piped to a 2-way read end connection under individual valve control, one side being connected to hydrant pressure and the other side to centrifugal jump on filtration circuit. When working under pressure,

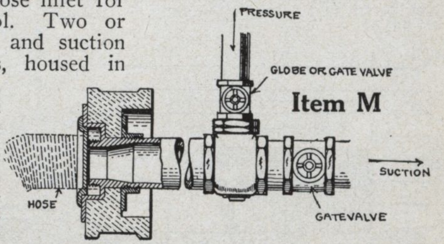


Fig. 9. Pressure Inlet and Suction Cleaner Outlet Unit and Fittings

Continued on next page

the unit serves for cleaning down walls of empty pool. When working under suction, it serves to remove all impurities which have settled to the bottom, through the same duct by suction discharge, out of full pool to sewer. The outlet fitting being below water level, the breaking of the priming of the pump is prevented. No special pump required, as system connects with centrifugal pump on refiltration system.

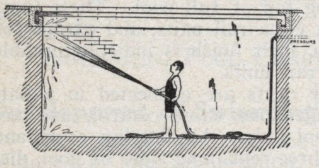


Fig. 10. Cleaning Down Walls of Empty Pool

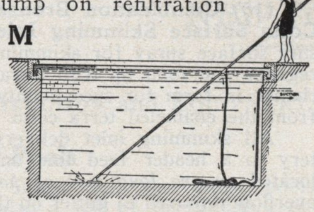


Fig. 11. Cleaning Bottom of Full Pool by Suction

Item N

(18) **Bronze Scum Gutter Outlet Thimbles**—With removable strainer and groove for sweated joints under strainer for soft lead pipe (2 in. o. d.) connecting through thimbles and terra cotta outlet unit, by wiped joint to solid nipple and hard pipe roughing-in (see also Fig. 2). Makes watertight joint with terra cotta at the outlet in gutter. Lead pipe affords adjustment of plumber's roughing-in to exact position predetermined for all terra cotta outlet units, and prevents strain on terra cotta if pipe expands. Outlet thimbles are fastened to rail member, for which a special unit is furnished. See item (5) and Fig. 2.

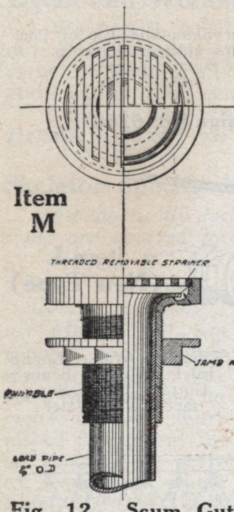

Item M
THREADED REMOVABLE STRAINER
JAMB NUT
THIMBLE
LEAD PIPE 2" O.D.

Fig. 12. Scum Gutter Outlet Thimble

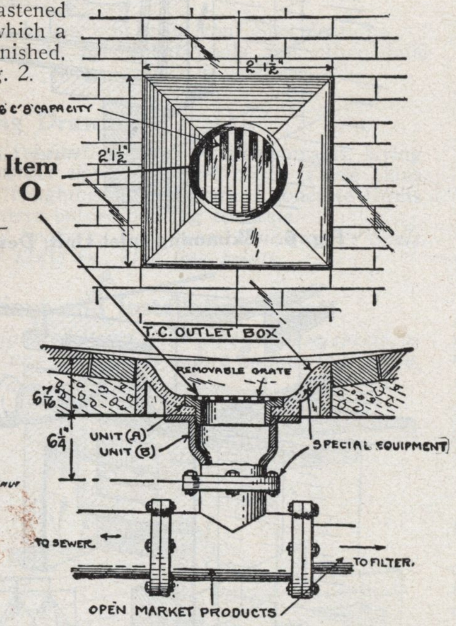

2' 1½"
SLOTTED FOR 6" C 8" CAPACITY
2' 1½"
Item O
T.C. OUTLET BOX
REMOVABLE GRATE
6 7/16"
6¼"
UNIT (A)
UNIT (B)
SPECIAL EQUIPMENT
TO SEWER
TO FILTER
OPEN MARKET PRODUCTS

Fig. 13. Horizontal Bottom Outlet Unit and Fittings

Item O

(19) **Bronze Bottom Outlet Fittings; Unit "A" and Unit "B"**—Unit "A" with removable strainer, passing freely the capacity of bottom outlet pipe, optional 6-, 8- or 12-in. diameter, arranged with reducer unit "B" to standard 6-, 8- or 12-in. pipe of standard wrought iron flange pipe dimensions, standard bolt circle drilling. This makes a watertight joint which will afford allowance for expansion and contraction and workmanlike connection from pool lining to wrought iron outlet main. See item (6).

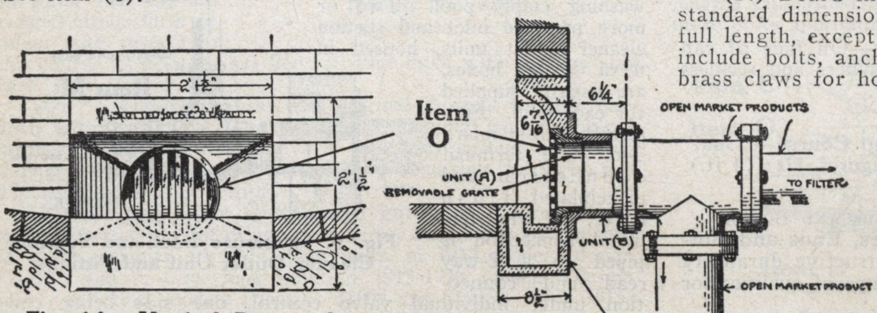

2' 1½"
SLOTTED FOR 6" C 8" CAPACITY
2' 1½"
Item O
6 7/16
6¼"
UNIT (A)
REMOVABLE GRATE
UNIT (B)
OPEN MARKET PRODUCTS
TO FILTER
OPEN MARKET PRODUCT
8½"
TO SEWER
T.C. OUTLET BOX

Fig. 14. Vertical Bottom Outlet Unit and Fittings for High Sewers

Item P

(20) **Filtration Inlet Fittings and Terra Cotta Housing**—Similar to gutter outlet thimbles with lead pipe, solder nipple and wiped joint, making flexible connection for expansion and contraction, or cored and tapped to make hard pipe coupling connection to main line. These fittings countersunk flush to face of enameled brick in special countersunk terra cotta boxes to fit.

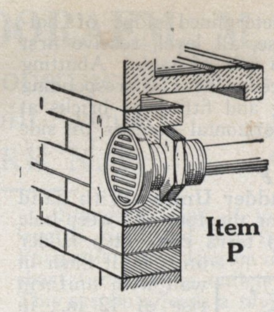


Fig. 15. Filtration Inlet Unit and Fittings

Reinforced Concrete Construction

(21) **Section of Concrete Retaining Tank**—With horizontal dimensions for thickness of concrete and centers for all reinforcing, suitable for maximum depth of any pool.

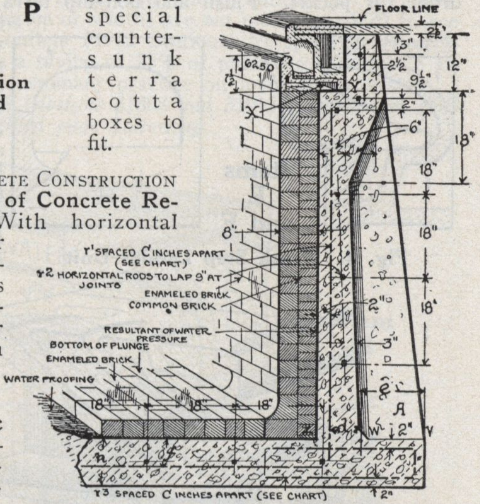

FLOOR LINE
2½"
3"
12"
2½"
9½"
6250
1½"
X
2"
6"
18"
18"
8"
18"
r' SPACED C INCHES APART (SEE CHART)
r2 HORIZONTAL RODS TO LAP 9" AT JOINTS
ENAMELED BRICK
COMMON BRICK
2"
18"
RESULTANT OF WATER PRESSURE
3"
BOTTOM OF PLUNGE
ENAMELED BRICK
WATER PROOFING
18"
18"
18"
A
2"
r3 SPACED C INCHES APART (SEE CHART)
2"

Fig. 16. Section of Concrete Retaining Tank—Details Furnished

Waterproofing

(22) **Fabric Waterproofing** — Fabric waterproofing 3- to 5-ply durable fabric and asphalt recommended instead of integral waterproofing, unless desired to supplement the former by using both. This waterproofing behind a course of common brick, back of 4-in. course of enameled brick, furnishes a reliable waterproof membrane with stable interior lining, able to resist inward hydrostatic pressure acting when tank is emptied quickly.

Item Q

Adjustable Springboard Holder and Springboard

(23) **Springboard Holder**—Galvanized cast iron interior grip portion, bronze and nickelplated bronze working parts. Has smooth, convex bronze cover carrying Armstrong pressed cork insert tread, 18 in. wide by 24 in. long, or having plain corrugated surface.

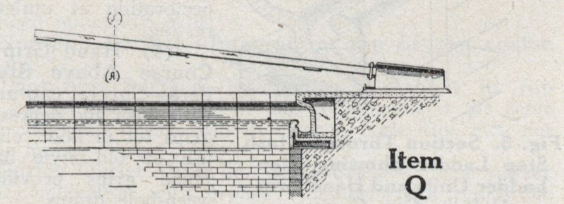


Fig. 17. Wood Springboard and Adjustable Metal Holder

(23a) **Compound Hickory Springboard**—16 in. wide; 2 in. thick at base, tapering to 1¼ in. at tip. Compounded of 8-in. hickory planks, firmly bolted in the grip portion and battened on underside of overhanging portion. Top surface covered with non-slip corrugated rubber.

Item R

All Wood Springboard and Anchorage

(24) Board made of selected hickory planks, built to standard dimensions; covered with corrugated rubber mat full length, except tread which is cocoa matting. Fittings include bolts, anchor plates, wood saddle or fulcrum, and brass claws for holding board down to fulcrum.

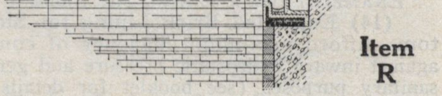


Fig. 18. All Wood Springboard and Anchorage

Continued on next page

Patented Trench Gutter System for Handling Pool Surface Overflow and All Floor Drainage

Another entirely new departure in swimming pool design. Consists of special terra cotta units so arranged as to drain the floor around the pool, and to handle the pool overflow by *transverse* spill, all water being carried off in the trench gutter to one or two drainage outlets per pool (see illustrations). The terra cotta units embody the original Booraem flush life rail and the entirely new transverse overflow system, eliminating the longitudinal flow of water in gutter. Removal openings or outlets to the trench are provided at every foot of the length and width of the pool.

All special features of the older system, such as surface skimming inlets, suction and pressure cleaners, etc., which are related and associated with the coping courses, have been redesigned for application to this radical improvement in swimming pool treatment.

Advantages—Eliminates all piping required for other systems for handling of scum gutter overflow, and for draining drip from bathers or wash water from the floor surrounding the pool. Requires only one spillway up to 100-ft. perimeter. Twelve-inch fall of gutter available. Eliminates punctures of retaining tank to connect old style gutter with round-about pipe for scum removal.

Saves 1 sq. ft. of "flooring surface" per lineal foot of pool perimeter, due to greater depth of cap unit measured back from edge of pool. Saves labor of installation and material cost for features eliminated as mentioned ($500 to $1000 and upwards).

Accessibility for Cleaning—The trench gutter may be readily cleaned by steam or hot water hose from standing position on pool floor. Has removable bronze grids at suitable intervals.

Ornamental Design—Note repeating arch effect between top of life rail and nose of cap course, when viewed from opposite sides or ends of pool.

Gutter Spillways—For removing water from trench gutter to sewer. Designed to be used singly or in pairs. Located convenient to sewer.

Note: Patents on this system are broad and cover production in any material, concrete alone, or ceramic or mosaic coated concrete, as well as the method herewith shown. Under certain conditions license will be issued, for reasonable consideration, to use this general cross section if our terra cotta section is not desired. Persons adopting this section without authority will be prosecuted in protection of our business interests.

Double Level Pools

For double level pools, with lower level for standard use from 4 to 6 ft. deep, and upper level from 7 to 9 ft. deep for polo and other water games, combinations of various designs, including double trench gutter systems, may be used for upper and lower levels.

Lower gutter may be shut off by a single valve to prevent loss of water when using upper level. Upper gutter always handles floor drain when either level is in use. Each level discharges through its own spillway.

Special Notice

Complete Protection Against Frost on Outdoor Pools—Broad patents granted. We are prepared to afford this protection and to offer a special guarantee against the action of frost on outdoor pools, involving slight extra construction and expense. Correspond with us if interested.

Protection of Our Customers' and Our Own Interests—Our progress in this work is the result of long and diligent study and cash expenditure. Our constant effort is to protect the owner and architect on cost and service. Expert service in complete development of working drawings and long experience is included in our figure.

In protection of our rights and our customers' confidence, infringements will be vigorously prosecuted. Uniform price, highest quality of material and service is our past record and uniform policy. To get guaranteed costs before specifying, send size of pool (60x20 or 75x30 ft.).

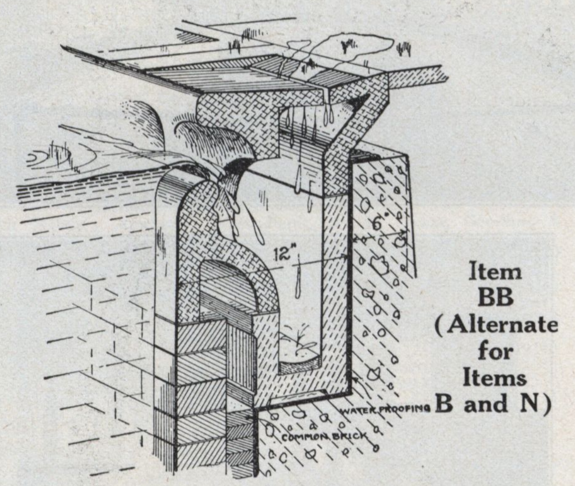


Fig. 19. Trench Gutter Composed of All Terra Cotta Units—for 18-in. Wall Section

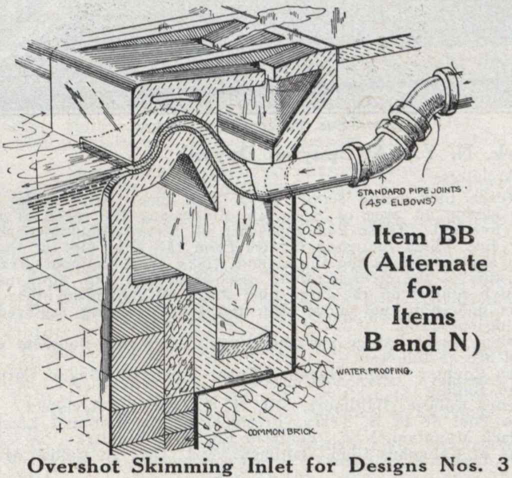

STANDARD PIPE JOINTS (45° ELBOWS)
Item BB (Alternate for Items B and N)
WATER PROOFING
COMMON BRICK

Fig. 21. Overshot Skimming Inlet for Designs Nos. 31915 and 31934

Applicable with slight variations in design to Designs Nos. 31807 and 31808

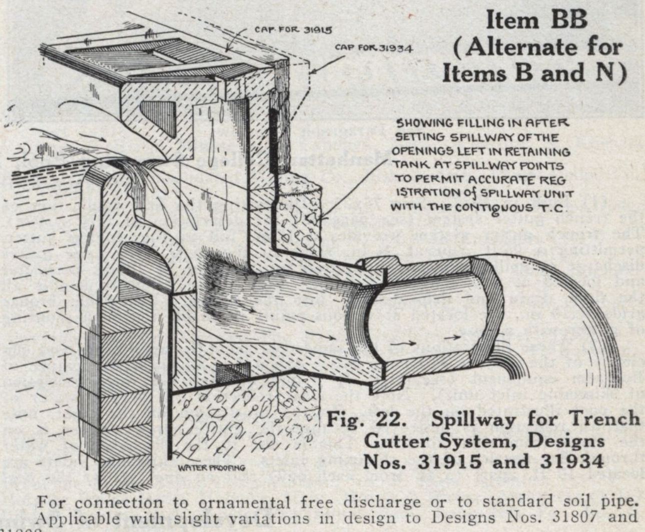

CAP FOR 31915
CAP FOR 31934
Item BB (Alternate for Items B and N)
SHOWING FILLING IN AFTER SETTING SPILLWAY OF THE OPENINGS LEFT IN RETAINING TANK AT SPILLWAY POINTS TO PERMIT ACCURATE REGISTRATION of SPILLWAY UNIT WITH THE CONTIGUOUS T.C.
WATER PROOFING

Fig. 22. Spillway for Trench Gutter System, Designs Nos. 31915 and 31934

For connection to ornamental free discharge or to standard soil pipe. Applicable with slight variations in design to Designs Nos. 31807 and 31808

Patented Trench Gutter Sections for Handling Pool Surface Overflow and all Floor Drainage

Reprints, showing subsequent developments and improvements of these sections, not completed in time for publication in this volume, will be sent on request

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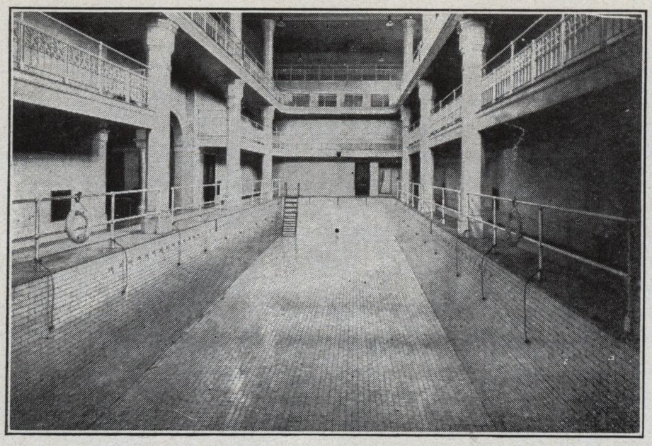


New York Athletic Club Swimming Pool, New York, N. Y.

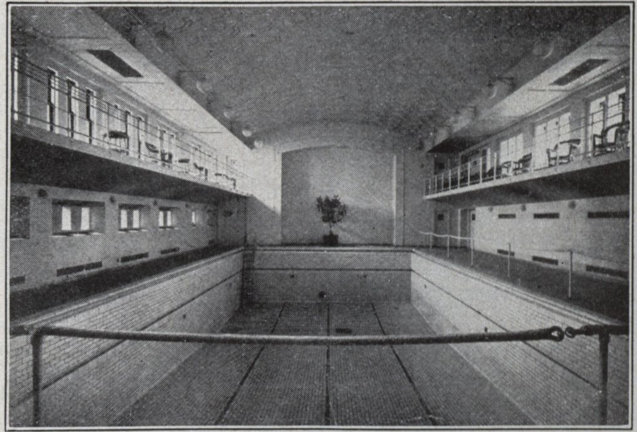
Wm. Cable, Architect

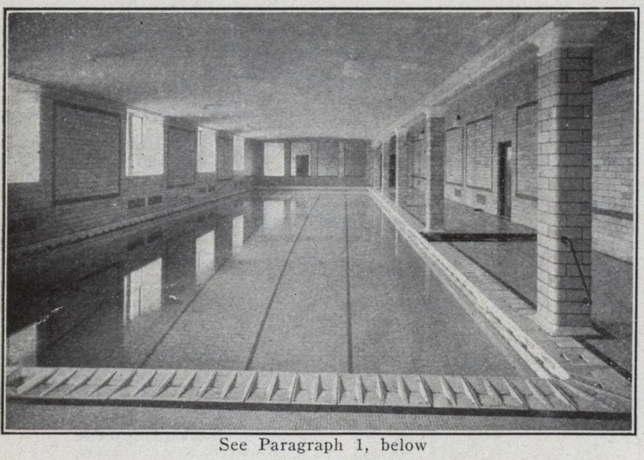
Built in 1899. In use for 26 years and still in good condition. Note settlement crack on left side near bottom, which developed ten years after construction. No leak in pool up to date because of fabric waterproofing. Note life ropes and water level 3 ft. below floor. Built before the development of the Booraem flush life rail and sloping gutter

Cleveland Athletic Club Swimming Pool, Cleveland, Ohio

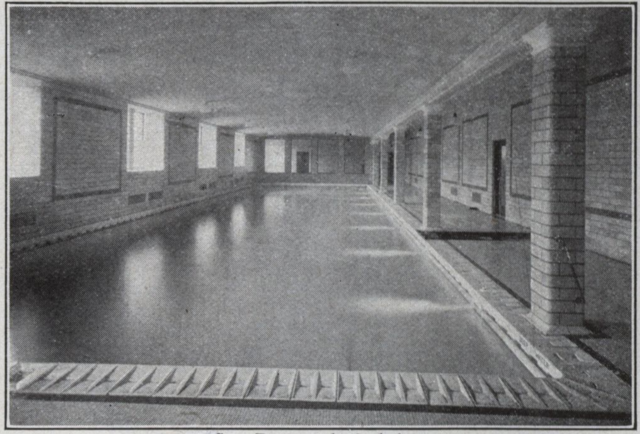
J. Milton Dyer, Architect

Built in 1911. In use for 15 years. Located on eighth floor of building. A steel tank surrounds the concrete retaining tank, all being supported by special steel girder construction. Two water depths are established—a lower level for ordinary use of members (4 ft. sloping to 7 ft.) and a higher level for aquatic sports (7 ft. sloping to 10 ft.) (see "Double Level Pools" on page 481). Fall of gutter in this design is 1¼ in. in 10 ft. Outlets every 20 ft. (Trench gutters in the illustrations below have a 12-in. fall.)





See Paragraph 1, below



See Paragraph 2, below

Manhattan College Swimming Pool, New York, N. Y. (At Spuyten Duyvil)

O'Connor & Delaney, Architects

(1) Built in 1922. Size 75x25. Illustrating the first application of the trench gutter system (see page 481 for description of this system). The trench gutter system provides a 12-in. fall in the sloping gutter, permitting a 96-ft. run at ⅛-in. slope to the foot. Only one gutter discharge or spillway opening required for pools up to 100-ft. perimeter and located at any convenient point. Cap course members handle all the floor drain and drip directly into the gutter. Removable bronze grids, 8x10 in., are located at various points to enable thorough scouring of gutter with a hose.

(2) These illustrations of the same pool show the application and efficiency of the *surface skimming inlets* (Item L), an exclusive feature of Booraem equipment (see Figs. 6, 7 and 8, page 479 for description of skimming inlet unit). Note the clear reflection on the still water of the pool illustrated on the left. In the illustration on the right, note that all reflection is destroyed because the entire surface water is on the move from right to left. This is due to the discharge of water through flat nozzles of the skimming inlets. These skimming inlets are located 10 ft. apart (5 ft. from each end) and *on one side of the pool only* (each inlet being served by a 2-in. pipe), with a flat discharge nozzle having an area of ¾-sq. in., increasing the speed of the water nearly five-fold. These 2-in. pipes are all served simultaneously from a header line which increases in size from the 2-in. pipe at the farthest end to a pipe size at the initial end whose cross-sectional area is equal to the sum of the cross-sectional areas of all the 2-in. pipes used. The one valve control on the large pipe starts all skimming inlets in simultaneous operation, not more than ten minutes being required for the skimming operation.

Other trench gutter swimming pools in which Booraem equipment is used are as follows:

Havana Country Club, Havana, Cuba, Frederick Snare Corp., Donor and Builder
St. Agnes College, Baltimore, Md., F. L. Berwin, Architect
Private Pool of F. S. Terry, President of the National Lamp Works, Black Mountain, N. C., Fentzlaff Eng. Co., Builders
Knights of Columbus Club, Baltimore, Md., Geo. A. Callis, Architect

Development of Swimming Pool Construction

The oldest pools equipped by our organization, from 1894 to 1899, show plainly that architects treated them merely as water tanks. They have required no repairs, because they were sturdily built, but what they contain and what they do not contain make them curiosities in the light of subsequent development.

Radical initial and subsequent developments originated by us have not been equaled or duplicated, and our completed operations, enthusiastically endorsed, are listed on the opposite page.

All pools illustrated above are lined with *enameled brick* made by the American Enameled Brick & Tile Co., backed up with 4 in. of common brick and 3-ply fabric waterproofing, presenting a durable construction that is proof against collapse from inward hydrostatic pressure.

Continued on next page

Partial List of Swimming Pools in Which Booraem Patented Sanitary Swimming Pool Construction and Equipment Were Used

Over 200 pools are represented by this list, including duplicate orders from some architects.

Public and Private Schools

P. S. Nos. 1, 32, 57 and 59, Buffalo, N. Y., built in 1910, 1912, 1913 and 1910, respectively
Central H. S., Buffalo, N. Y.
Hutchinson H. S., Buffalo, N. Y., H. Osgood Holland, Architect (1913)
Colfax P. S., Pittsburgh, Pa., E. Stotz, Architect (1911)
Junior H. S., Evansville, Ind., Clifford Shopbel & Co., Architects (1911)
Scott H. S., Toledo, Ohio, Chas. Nordhoff, Architect (1912)
Waite H. S., Toledo, Ohio, Chas. Nordhoff, Architect (1913)
Kalamazoo H. S., Kalamazoo, Mich., Robinson & Campau, Architects (1912)
Pontiac H. S., Pontiac, Mich., J. W. Chase, Architect (1913)
Plainfield H. S., Plainfield, N. J., Wilder & White, Architects (1913)
Carpenter Memorial H. S., Natchez, Miss., R. H. Hunt, Architect (1913)
East Side H. S., Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects (1911)
Kennard School, Cleveland, Ohio, Board of Education
Crestview School, Columbus, Ohio (1914)
Cheney Normal School, Cheney, Wash. (1914)
Riverside H. S., Riverside, Ill., Miller, Fuller, Wider & Dowley, Architects (1914)
Schenley H. S., Pittsburgh, Pa., E. Stotz, Architect (1915)
Clark School, Waterbury, Conn., Louis A. Walsh, Architect (1915)
Canyon City Normal School, New York, N. Y., H. B. Herts, Architect (1915)
Greenville H. S., Greenville, Miss., R. H. Hunt, 2nd, Architect (1915)
Public School No. 45, New York, N. Y., C. B. I. Snyder, Architect (1916)
Chazy Central Rural Schools, Chazy, N. Y., 2 pools, F. B. Townsend, Architect (1916)
St. Cloud H. S., St. Cloud, Minn., F. M. Mann, Architect (1916)
West Intermediate H. S., Jackson, Mich., L. J. Field, Architect (1916)
Delaware P. S., Syracuse, N. Y., J. A. Randall, Architect (1917)
Homer School, Wilkinsburg, Pa., Hingham & Boyd, Architects (1917)
Lansing H. S., Lansing, Mich., J. M. Churchill, Architect (1917)
East Junior H. S., Lansing, Mich., J. M. Churchill, Architect (1922)
West Junior H. S., Lansing, Mich., J. M. Churchill, Architect (1922)
Walter French Jr. H. S., Lansing, Mich., J. M. Churchill, Architect (1925)
Hokeville School, Waterbury, Conn., W. E. Goertz, Architect (1917)
Public School No. 62, Buffalo, N. Y., City Architect (1917)
English H. S., Waterbury, Conn., Louis J. Walsh, Architect (1917)
Arsenal District P.S., Hartford, Conn., Behrens & Moses, Architects (1919)
East Dwight Street School, Holyoke, Mass., Howse & Howse, Architects (1919)
St. Marys Industrial School, Baltimore, Md., Q. I. Kavanagh, Architect (1919)
Junior H. S., New Castle, Pa., W. G. Eccles, Architect (1921)
East Pittsburgh H. S., Pittsburgh, Pa., C. P. Hitchens, Architect (1922)
Troy Public School, Troy, N. Y., Wm. F. Cummings Co., Architects (1922)
South Side H. S., Pittsburgh, Pa., E. Stotz, Architect (1923)
Vandeveer H. S., Vandergrift, Pa., W. G. Eccles, Architect (1923)

Colleges, Academies and Armories

West Point Military Academy, West Point, N. Y., Cram, Goodhue & Ferguson, Architects (1909)
22nd Regt. Armory, New York, N. Y., Walker & Morris, Architects (1912)
National Guard Armory, Tonawanda, N. Y. (1912)
National Guard Armory, Owosso, Mich., Edwin A. Bowd, Architect (1915)
Hotchkiss School, Lakeville, Conn., E. K. Rossiter, Architect (1913)
Mount Hermon School, Northfield, Mass., Parish & Schroder, Architects
Wells College, Aurora, N. Y., Gibbs & Waltz, Architects (1911)
University of Georgia, Athens, Ga., Ludlow & Peabody, Architects (1911)
Phillips Academy, Andover, Mass., Putnam & Fox, Architects (1911)
Haverford College, Haverford, Pa., Bailey & Bassett, Architects (1911)
University of Texas, Austin, Tex., Endress & Walsh, Architects (1911)
Delaware College, Newark, Del., L. B. Jacobs, Builder (1913)
Dubuque German College, Dubuque, Iowa, Perkins, Fellows & Hamilton, Architects (1914)
University of Toronto, Toronto, Ont., Sproatt & Rolph, Architects (1914)
University of Wooster, Wooster, Ohio, L. C. Holden, Architect (1914)
Geo. Peabody University, Nashville, Tenn., Ludlow & Peabody, Architects (1915)
Coker College, Columbia, S. C., Wilson & Sompayrac, Architects (1915)
St. Marys Lyceum, Niagara Falls, N. Y., Wm. P. Ginter, Architect (1915)
Trinity College, Washington, D. C., Wm. Franklin Wagner, Architect (1916)
Hart House Club, Toronto, Ont., Sproatt & Rolph, Architects (1917)
Lake Erie College, Zanesville, Ohio, Abrams & Garfield, Architects (1919)
St. Joseph College, Emmettsville, Ind., J. V. T. Bramble, Architect (1922)
Manhattan College, New York, N. Y. (Spuyten Duyvil), Jas. W. O'Connor and J. F. Delaney, Architects (1922)
Hollins College, Hollins, Va., Frye & Stone, Architects (1924)
St. Agnes College, Baltimore, Md., F. L. Berwin, Architect (1924)

Young Men's Christian Associations

West Division Street Y. M. C. A., Chicago, Ill., R. C. Berlin, Architect (1910)
Coraopolis Y. M. C. A., Coraopolis, Pa., McClure & Spahr, Architects (1911)
Quincy Y. M. C. A., Quincy, Mass. (1910)
West Side Y. M. C. A., Chicago, Ill., R. C. Berlin, Architect (1911)
Chelsea Y. M. C. A., Chelsea, Mass., Walter Atherton, Architect (1910)
Wilson Y. M. C. A., Chicago, Ill., R. C. Berlin, Architect (1910)
Hornell Y. M. C. A., Hornell, N. Y., Boring & Tilton, Architects (1911)
Kedzie Ave. Y. M. C. A., Chicago, Ill., Nimmons & Fellows, Architects (1910)
Greenville Y. M. C. A., Greenville, S. C., Wilson & Sompayrac, Architects (1911)
Sumter Y. M. C. A., Sumter, S. C., Wilson & Sompayrac, Architects (1911)
East Side Y. M. C. A., Cleveland, Ohio, Abram Garfield, Architect (1911)
St. Louis Y. M. C. A., St. Louis, Mo., Mariner & LaBaume, Architects (1911)
Pittsfield Y. M. C. A., Pittsfield, Mass., Beckwith & Pike, Architects (1910)
Franklin Y. M. C. A., Franklin, Pa., Brakeman & Brakeman, Architects (1911)
Woonsocket Y. M. C. A., Woonsocket, R. I., Walter Fontaine, Architect (1911)
Portland Y. M. C. A., Portland, Ore., Raymond & McNaughton, Architects
Central Y. M. C. A., Cleveland, Ohio, Hubble & Benes, Architects (1911)
East Side Y. M. C. A., Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects (1911)
Wooster University Y. M. C. A., Wooster, Ohio, L. C. Holden, Architect (1912)

Young Men's Christian Associations (Continued)

Des Moines Y. M. C. A., Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects (1911)
Belleville Y. M. C. A., Belleville, Ont., (1911)
Newark Y. M. C. A., Newark, N. J., Geo. B. Post, Architect (1912)
Santa Barbara Y. M. C. A., Santa Barbara, Cal., Russell Ray and Windsor Soule, Architects (1913)
Wilmington Y. M. C. A., Wilmington, N. C. (1913)
Morristown Y. M. C. A., Morristown, N J., Louis E. Jellade, Architect (1913)
Passaic Y. M. C. A., Passaic, N. J., Milton R. Strong, Architect (1913)
Pennsylvania Railroad Y. M. C. A., Harrisburg, Pa. (1912)
Taunton Y. M. C. A., Taunton, Mass., Walter L. Park, Architect (1911)
Rochester Y. M. C. A., Rochester, N. Y., Crandall & Stroebel, Architects (1911)
Y. M. C. A. Administration Building, Richmond, Va., Noland & Baskerill, Architects (1913)
Pennsylvania Railroad Y. M. C. A., Tyrone, Pa., Own Engineers (1912)
Hamilton Y. M. C. A., Hamilton, Ont.
Helena Y. M. C. A., Helena, Mont., Link & Hare, Architects (1914)
New Britain Y. M. C. A., New Britain, Conn., Davis & Brooks, Architects (1913)
Young Men's Institute, New York, N. Y., Parish & Schroder, Architects (1915)
Springfield Y. M. C. A., Springfield, Mo., Mr. Brettner, Architect (1916)
Petersboro Y. M. C. A., Petersboro, Ont., Sproat & Rolph, Architects (1917)
El Paso Y. M. C. A., El Paso, Tex.
Lynn Y. M. C. A., Lynn, Mass., Walter Atherton, Architect (1919)

Club and Private Pools

Bethany Chapel, Philadelphia, Pa. (John Wanamaker, Donor), Knapp & Bosworth, Architects (1912)
C. K. G. Billings (private), New York, N. Y., Guy Lowell, Architect (1909)
J. T. Lupton (private), Chattanooga, Tenn. (1910)
Carroll Sanitarium, Asheville, N. C. (1910)
W. H. Smith (private), Bryn Mawr, Pa.
Herbert Coppell (two private pools), Tenafly, N. J., J. J. Ferry, Jr., Architect (1910 and 1911)
Curtis Hall Gymnasium, Jamaica Plain, Mass., Lewis Bacon, Architect (1911)
Cleveland Athletic Club, Cleveland, Ohio, J. Milton Dyer, Architect (1911)
Parish House, Little Falls, N. Y., Harold J. Cook, Architect (1911)
Riggs Building, Washington, D. C., John DeSibour, Architect (1911)
Young Men's Catholic Club, Canton, Ohio, Edmund Herrmann, Architect (1913)
New York Association for the Blind, New York, N. Y., W. W. Bosworth, Architect (1912)
Rathborn's Private Pool, Rensselaer, N. Y., A. C. Jackson, Architect (1911)
E. H. Everett (private), Washington, D. C., G. O. Totten, Architect (1911)
M. L. Schiff (private), Oyster Bay, N. Y., C. H. P. Gilbert, Architect (1912)
Mrs. F. F. Thompson (private), Canandaigua, N. Y., Allin & Collins, Architects (1914)
Louis A. Swift (private), Lake Forest, Ill., B. H. Jillson (private) (1914)
J. C. Baldwin (private), Mt. Kisco, N. Y., B. W. Morris, Architect (1916)
Hotel Des Artistic, New York, N. Y., Geo. M. Pollard, Architect (1916)
Hinsdale Club, Chicago, Ill., Perkins, Fellows & Hamilton, Architects (1916)
Chas. D. Wyman (John Deere Plow Co.), Moline, Ill., A. O. Eckman, Architect (1916)
Alfred W. Mellon (Secretary U. S. Treasury), Pittsburgh, Pa., E. P. Mellon, 2nd, Architect (1916)
Mrs. M. B. Brown (private), Gloucester, Mass., H. M. Hanson, Architect (1917)
Rolling Rock Country Club, Rolling Rock, Pa., E. P. Mellon, 3nd, Architect (1921)
Havana Country Club, Havana, Cuba (turquoise blue), Frederick Snare Corp., Donors and Builders (1922)
Masonic Temple, Birmingham, Ala., Warren & Knight, Architects (1922)
Louis J. Parke (private), Sewickley, Pa., Blumm, Weldin Engineering Co., Builders (1922)
F. S. Terry (private), Black Mountain, N. C., Alfred Fentzlaff Engineering Co., Builders (1923)
Havana Press Club, Havana, Cuba (Pompeiian red), R. C. Coyeneche, Havana, Cuba, Architect (1924)

Industrial Pools

Union Stock Yards, Armour & Co., Chicago, Ill., R. C. Clarke, Architect (1915)
Calumet & Hecla Mining Co., Calumet, Mich., Charlton & Kuenzli, Architects (1911)
Copper Queen Consolidated Mining Co., Bisbee, Ariz., Phelps-Dodge Co., Owners (1913)
Copper Queen Mining Co. Y. M. C. A., Douglas, Ariz., Phelps-Dodge Co., Owners, Own Engineers, two pools (1916)
Bristol Myers Chemical Co., Brooklyn, N. Y., Own Engineers (1915)
Copper Cliff Club House, Toronto, Ont., Own Engineers (1915)
Louisville Water Co., Louisville, Ky., James B. Wilson, Chief Engineer (1919)
New York & Pennsylvania Pulp Co., Johnsonburg, Pa., Own Engineers (1919)
Aberfogle Mfg. Co., Chester, Pa., Ralph E. White, Architect (1920)
Kirsch Mfg. Co., Sturgis, Mich. (complete re-design by J. F. Booraem), Ernest S. Battersan, Architect (1922)
Borden Mills, Inc., Boys' Club, Fall River, Mass.

Municipal and Public Baths

Peoples Palace Plunge, Jersey City, N. J., Dodge & Morrison, Architects (1914)
Pat. J. Lyons, Mobile, Ala., Stone & Rhen, Architects (1915)
Brookline Public Baths, Boston, Mass., Jos. F. Ranz, Architect (1916)
Holyoke Public Baths, Holyoke, Mass., Howse & Howse, Architects (1919)
Rocky Springs Park Public Playground Pool, Lancaster, Pa., Ed. B. Ruth, Architect (1920)
New York City Public Baths, Brownsville, Brooklyn, N. Y., Henry Bacon, Architect (1921)
Municipal Baths, Salt Lake City, Utah, Channon & Fetzer, Architects (1922)
Central Avenue and Park Avenue Baths, Cleveland, Ohio, Herman Kregelius, Architect (1925)

SWIMMING POOL CONSTRUCTION CORPORATION

Designers and Constructors of Swimming Pools

Room 1511, Grand Central Terminal
NEW YORK, N. Y.

EMBLEM

Products and Services

Design, Construction and Equipment of INDOOR and OUTDOOR SWIMMING POOLS, WADING POOLS and ORNAMENTAL GARDEN POOLS.

In addition to complete plans and specifications, our work includes any or all of the following items:

- Reinforced Concrete
- Waterproofing
- Sterilizers
- Filters
- Diving Boards
- Suction Cleaners
- Tiling
- Pumps
- Heaters
- Inlets
- Outlets
- Floor Drains

Designing the Modern Swimming Pool

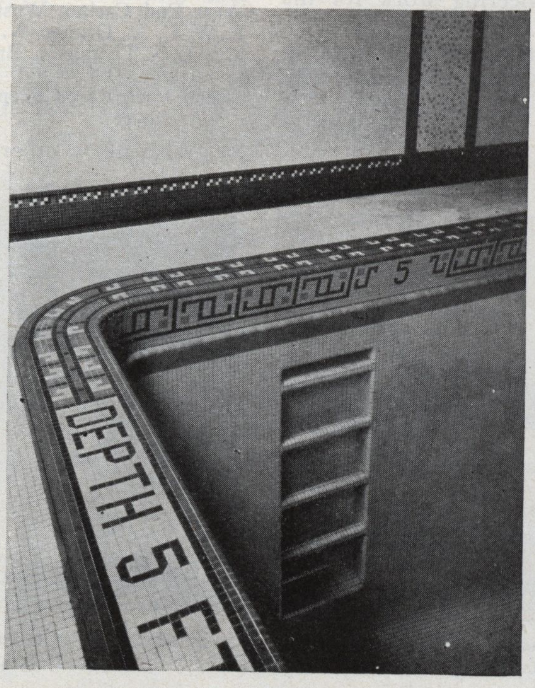
The rapid growth in the popularity of swimming pools during the last few years has been accompanied by a greater demand for convenience and for sanitary equipment. New systems of filtering, sterilizing, heating and recirculating the water have been developed. The problem of sanitary maintenance has produced changes in the design of the pool itself, while at the same time more attention is being paid to the decorative treatment of the surroundings. As a result of these developments, the work of planning, specifying and building an up-to-date pool has become increasingly complex.

It has been found that the best solution from the architect's point of view is to consult with an experienced firm of swimming pool engineers. In this way the architect can hold down construction costs, avoid excessive demands on his own time, and insure the construction of a satisfactory, permanent swimming pool.

The material in these pages has been prepared to assist the architect in making preliminary designs. Final plans and specifications should be prepared in consultation with the swimming pool engineers.

Tile Is the Accepted Material

Although this Company is prepared to design and construct pools of every type—including tile, faience, cement and enameled brick—we recommend tile pools in almost every instance. Tile has the advantages of sanitation, beauty, permanence and reasonable cost. It has become the accepted material for lining the modern swimming pool.



Corner Detail of Tile Swimming Pool

Showing (1) easily cleaned cove base and rounded corner; (2) built-in tile ladder; (3) simple design of overflow trough; (4) depth and distance markings; (5) tile runways and wainscot; (6) simple decorative treatment

Sanitary Value—A smooth tile lining has no cracks or crevices where dirt may lodge. Owing to the dense, nonabsorbent nature of tile, impurities can not penetrate beneath the surface, and this insures the thoroughness of the cleaning operation.

Decorative Value—Much more attention is being paid to the element of attractiveness in swimming pools, and especially to the color scheme. For the walls and floors of the pool, white or tinted tile forms the most pleasing and practical ground, but color is used for the swimming lines, depth markers, gutter and curb; also in many cases for the walk and walls surrounding the pool. Faience panels in special designs are often built into the walls of the pool room. In general, where tile is used for the swimming pool there are unlimited possibilities of decorative treatment.

Permanence—Tile is the most durable of materials. Continuous contact with the water has no effect on its shape, texture or color.

Economic Advantages—Tile is reasonable in cost and can be applied with comparative rapidity. Its use allows a substantial saving over other materials. It also occupies less space, and reduces the thickness of the pool walls anywhere from 4 to 9 in.—an important consideration where space is limited.

When the smaller sizes of tile are used, there is no need of special shapes for building overflow gutters, hand rails, ladders, copings, and rounded corners. Here again the cost is reduced considerably.

Experienced Tile Setters Necessary—To set tile properly requires experienced artisans and superintendents. This Company is widely experienced in tiling work and can execute the most complicated shapes or patterns with complete satisfaction. We can also help the architect by suggesting staple tiles which can be used for their decorative value without adding to the cost of the pool.

Continued on next page

Luxor Baths, 121 West 46th Street, New York, N. Y.
The walls and ceiling of the pool room are lined with glazed tile with designs in ceramic mosaic

Reinforced Concrete and Waterproofing

The thickness and reinforcement of concrete walls and floors in a swimming pool depend on many complicated factors. Among these are capacity of the pool, ground-water pressure, bearing capacity of the soil and when the pool is located in an upper story, vibration of the building and expansion and contraction of supports. It is necessary for best results that the reinforced concrete be designed by an engineer experienced in swimming pool work.

Concrete should be poured in a continuous operation to avoid construction joints.

As for waterproofing, the integral method is generally sufficient for pools at the ground level. Membranous waterproofing is advised for pools in an upper story, on account of its greater elasticity. Consultation with swimming pool engineers is especially recommended in the case of waterproofing work, as their intimate knowledge of the problem will prevent both unnecessary expenditures during construction and the even more expensive failures due to faulty design or execution.

Water Supply

Only a limited amount of water is required for the upkeep of a modern swimming pool. Once the tank is filled, the water is withdrawn, filtered, sterilized and returned to the pool by a continuous process of recirculation. Only enough fresh water need be added to make up for overflow losses.

The rate of recirculation is regulated so that the entire content of the pool is renovated one or more times a day, depending on the number of bathers. At intervals of several months the pool is drained and refilled.

In some localities the water supply must be specially treated to make it clear and attractive.

Mechanical Equipment and Accessories

The mechanical equipment for an indoor swimming pool consists in general of pumps, heaters, filters, sterilizers and suction cleaners. This Company can furnish and install approved equipment of all these types (see drawings on the following page).

We also furnish and install diving boards, plain or aerating inlets, outlets, and floor drains.

Standard Dimensions of Indoor Swimming Pools

The size of the indoor pool is determined by three factors, namely, the space or funds available, the probable attendance, and the requirements for water sports. The last factor can often be disregarded in the case of private pools, Turkish baths, etc., but for colleges, clubs and Y. M. C. A.'s it is all-important.

Length—For swimming contests, the length should be a multiple of 15 ft., and 60 ft. is the minimum.

Breadth—Should be about one-third the length.

Depth—The depth at the shallow end of the pool depends on the age and type of the bathers. The maximum depth at the other end depends on whether there will be high diving.

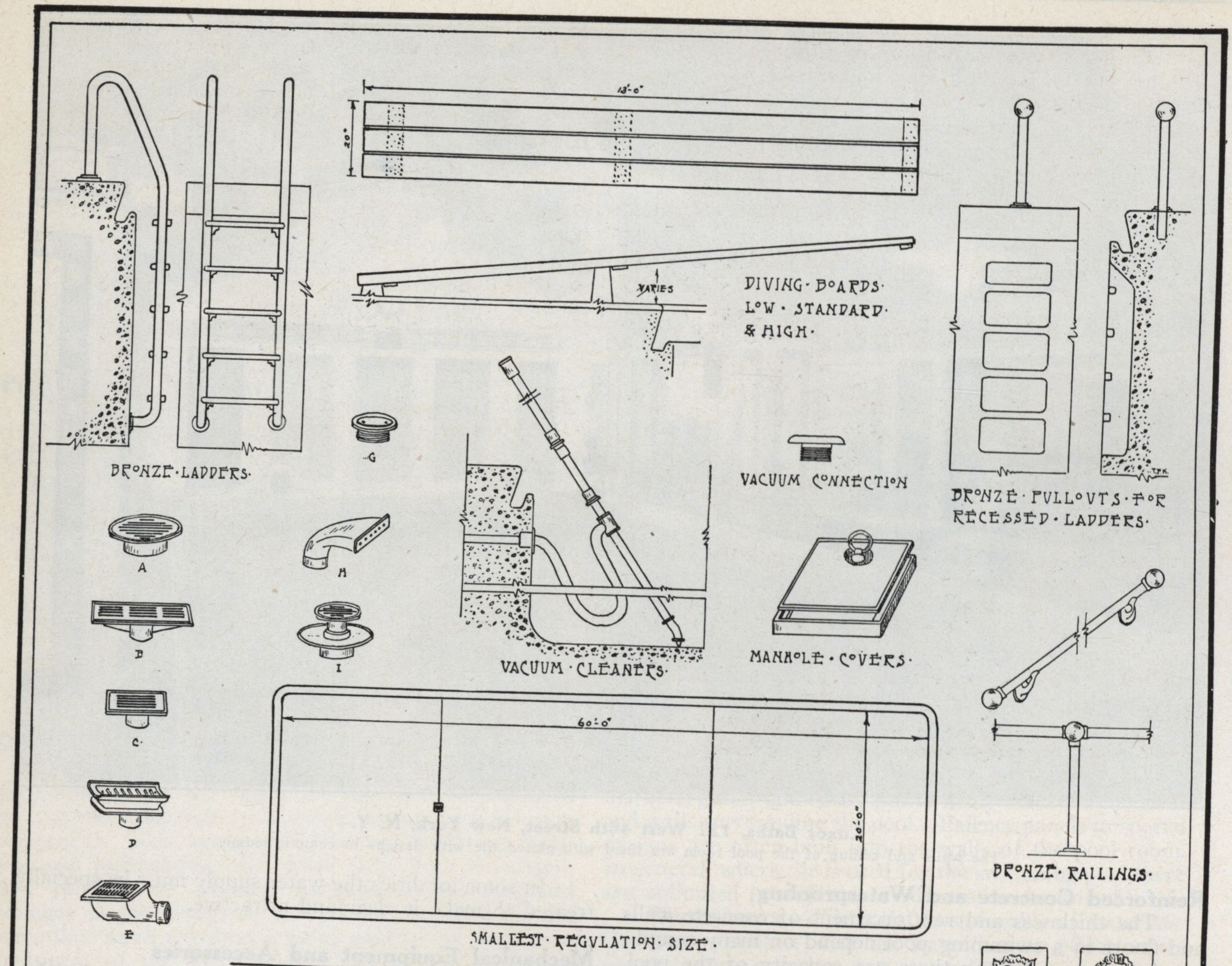
Contour—The three contours most commonly used are shown on the following page. Contour A is the most effective for general purposes. It provides separate areas for swimmers and non-swimmers and plenty of deep water for diving.

Contour B is advised for many of the larger pools. It allows the necessary playing area for water sports.

Runways—Wherever possible, space should be allowed for runways on all sides of the pool. At the two ends the runways should be 6 ft. or more in width. 3 ft. or more should be allowed for the side runways.

Standard Pools—The most practical sizes for indoor pools are 20x60 ft. and 25x75 ft. The 60-ft. size predominates and is the national standard. The plan of a typical pool of this size is shown on the following page.

Continued on next page


13'-0"
20"
DIVING · BOARDS ·
LOW · STANDARD ·
& HIGH ·
VARIES
BRONZE · LADDERS ·
G
VACUUM · CONNECTION
BRONZE · PULLOUTS · FOR
RECESSED · LADDERS ·
A
H
B
I
VACUUM · CLEANERS ·
MANHOLE · COVERS ·
C
60'-0"
20'-0"
D
BRONZE · RAILINGS ·
E
SMALLEST · REGULATION · SIZE ·
F
FOUNTAIN · HEADS ·
STANDARD · TYPE 'A'
STRAINERS ·
A · E · F · OUTLETS
B · C · D · GUTTER
DRAINS
H · SPRAY
INLETS
G · I UNDER
WATER INLETS
STERILIZERS ·
WE FURNISH ·
ALL MAKES
OF STERILIZERS
CHLORINE
VIOLET RAY
OZONE
4'-0"
POLO · & OTHER SPORTS · TYPE 'B'
COIL · HEATERS ·
ALUM
SODA
S.P.C.C.
N.Y.
PRESSURE · FILTERS ·
COAGULANT · FEEDERS ·
HEATERS ·
PUMPS · ALL SIZES ·

ENGINEERING · CONSTRUCTION ·
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SANITATION · FILTRATION
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GRAND · CENTRAL · TERMINAL · BUILDING · NEW · YORK ·

TILING · FILTERS ·
PUMPS · HEATERS ·
DIVING BOARDS ·
INLETS & OUTLETS ·

Continued on next page

Outdoor Swimming Pools (for Cities, Amusement Parks, Estates and Country Clubs)

The building of outdoor swimming pools is a special branch of the work. Care must be taken with waterproofing to prevent pollution from ground water, and concrete must be designed to resist frost stresses. On the other hand, the omission of heating equipment greatly reduces the construction costs.

Pools for municipalities and amusement parks are generally much larger than indoor pools. Lengths of 150 ft. and more are not exceptional. Circular and oval pools are very popular, and for outdoor work present but little more difficulty than a rectangular pool. Plain concrete lining is the rule.

For estates and country clubs, rectangular pools are the rule. The favorite lining materials for such pools are unglazed vitreous-body tile, ceramic mosaic and faience—all of them strictly frostproof.

Ornamental Garden Pools and Wading Pools

Garden pools may be used for swimming or for purely ornamental purposes. In shape and general architectural treatment they should harmonize with the design of house and grounds.

A happy variation of the garden pool is the tiled wading pool for the youngsters. Wading pools should slope to a maximum depth of 1 ft. or less. They can be built at little expense, require no elaborate plumbing and are suited to the smallest grounds.

Special Uses for Swimming Pools

When placed in an elevated position—either on a hillside or in an upper story—swimming pools will serve as tanks for fire protection. This has been done in modern factories and on many country estates.

Country club swimming pools can be drained at night, and the water can be used for sprinkling the golf course and lawns.

Swimming Pools Are Not Expensive

The cost of constructing a swimming pool varies with location, size, type of construction and equipment. For a standard 20x60-ft. indoor pool as used in Y. M. C. A.'s, the cost including tile work, filters, heaters, sterilizers and cleaning equipment, varies from $10,000 up. Outdoor pools without heating plants can be built for much less in proportion to their size.

Unit Contracts for Swimming Pools

To obtain the best results, the swimming pool should be treated as a unit when apportioning contracts. That is, the entire swimming pool work, including reinforced concrete, waterproofing, tiling, mechanical equipment and accessories, should be let as a single contract. In this way, responsibility for successful results rests on one organization. Preferably the swimming pool contract should be under the direct supervision of the architect and owner.

Our Swimming Pool Service

SWIMMING POOL CONSTRUCTION CORPORATION is a firm of swimming pool engineers and contractors.

As engineers, we design indoor and outdoor swimming pools, garden pools and wading pools. We furnish all the necessary drawings and perform the engineering work for the reinforced concrete and waterproofing. We also lay out all plumbing and mechanical equipment and we write specifications for everything connected with the pool.

As contractors, we undertake contracts for swimming pool work complete, or for any portion, such as reinforced tile, waterproofing, mechanical equipment and accessories.

If the contract is awarded to us, we make no charge for our engineering work. However, if the contract is awarded to others, we charge a regular engineering fee for services.

A Few of Our Recent Installations

Jacob H. Schiff Center, New York, N Y.
Elks Club, Newark, N. J
Norristown Y. M. C. A., Norristown, Pa.
Pingry School, Elizabeth, N. J.
Bronx Turkish Baths, New York, N. Y.
Young Men's & Young Women's Hebrew Association, Paterson, N. J.
Luxor Baths, 121 West 46th Street, New York, N. Y.
Flushing Y. M. C. A., Flushing, L. I., N. Y.
Charles J. Fay Residence, Dongan Hills, Staten Island, N. Y.
William V. C. Ruxton Residence, Greenwich, Conn
St. Francis Orphan Asylum, New Haven, Conn.
Boys' Club, Olneyville, Providence, R. I.
Robert J. F. Schwarzenbach Residence, Hicksville, L. I.
Paterson High School, Paterson, N J.*
Magner's Baths, Rye, N. Y.*
Weston Field Natatorium, Scranton, Pa.*
And many others

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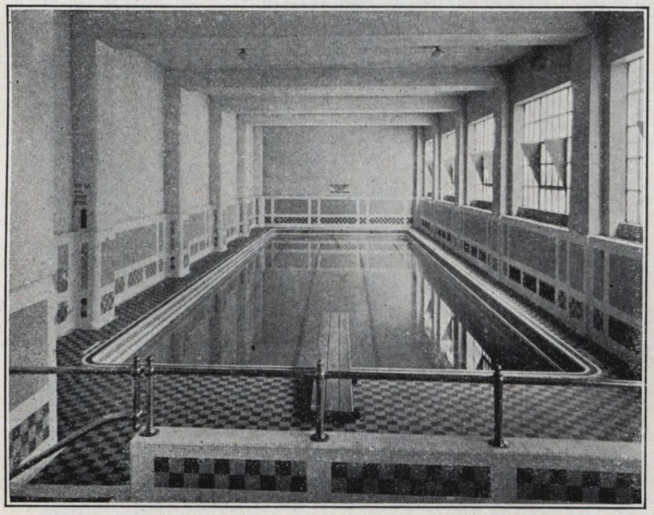
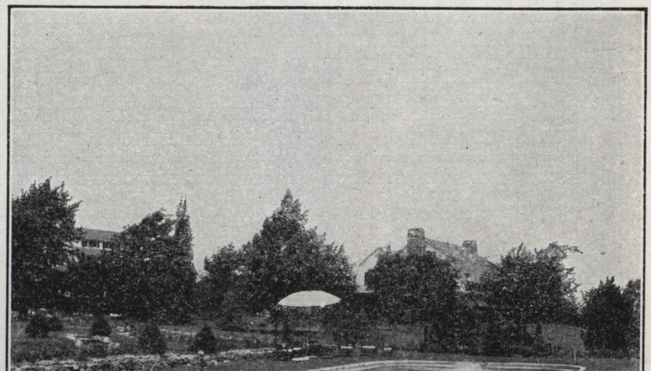
*Engineering only



Norristown Y. M. C. A., Norristown, Pa.
Standard 60x20-ft. pool tiled in gray, green and white ceramic mosaic



Charles J. Fay Residence, Dongan Hills, Staten Island, N. Y.
Simple and attractive outdoor pool of concrete

ROHMER STANDARD SWIMMING POOL EQUIPMENT

EVOLVED UNDER PERSONAL SUPERVISION OF
GABRIEL E. ROHMER, M. E. and E. M., SANITARY ENGINEER

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Products

New Features in Sanitary Swimming Pool Construction, Equipment and Decoration. Patents pending.

Sanitary Swimming Pool Design

In presenting to the architect, the contractor and the prospective owner of a swimming pool, the Rohmer Standard (patents pending) of modern sanitary swimming pool equipment, we believe we have embodied the most modern, sanitary, practical and artistic features in the creation or designing of swimming pools.

Gabriel E. Rohmer has concentrated on swimming pool designing since 1910, and has been in Europe for five years inspecting and investigating the various methods and systems of European designs.

Therefore, we are introducing, with a certain amount of pride, many new features of construction, equipment and decoration, which we believe will constitute the modern swimming pool, embodying the best in American and European practice.

The services of our organization are at the entire disposal of the architect for any and all information he may desire.

The Rohmer Standard Modern Sanitary Swimming Pool Equipment Consists of

Twenty-two Main Features—(1) Rohmer Monolithicsteel Reinforced Concrete Construction; (2) Rohmer Standard Terra Cotta Lining Units; (3) Rohmerlite Waterproofing Strip; (4) Rohmer Terra Cotta Perimeter Top Unit; (5) Life Rail Unit; (6) Arch Overflow Outlet and Spill Slab; (7) Drainage Duct; (8) Non-slip Coping; (9) Rohmer Terra Cotta Perimeter Top Outlet Unit; (10) Rohmer Bronze Outlet; (11) Rohmer Bronze Outlet Terra Cotta Casings; (12) Terra Cotta Coping and Lane Markings; (13) Rohmer Terra Cotta Inclined Receding Step Ladder with Combination Exit Flat Railing; (14) Rohmer Standard Cove Base; (15) Rohmer Springboards; (16) Rohmer Rubber Cushion Springboard Holders; (17) Rohmer Standard Water Slide; (18) Rohmer Standard Swimming Apparatus; (19) Rohmer Terra Cotta Benches; (20) Rohmer Standard Enameled Foot Basinette for bathhouse compartment; (21) Rohmer Standard Hot Air Body Dryers; (22) Rohmer Standard Automatic Showers.

Sanitation

Three Main Features—(23) Rohmer Thermosyphon for water circulation; (24) Rohmer Mineral Filter; (25) Rohmer Ozonizer for bacteriological purification.

Decoration

Five Main Features—(26) Rohmer Non-slip Tiles; (27) Rohmer Decorative Tiles for wainscoting and lining of vertical walls; (28) Rohmer Terra Cotta Ornamental Benches; (29) Rohmer Terra Cotta Decorative Fountains; (30) Complete Ornamental Terra Cotta Equipment from the most famous terra cotta masters of Europe.

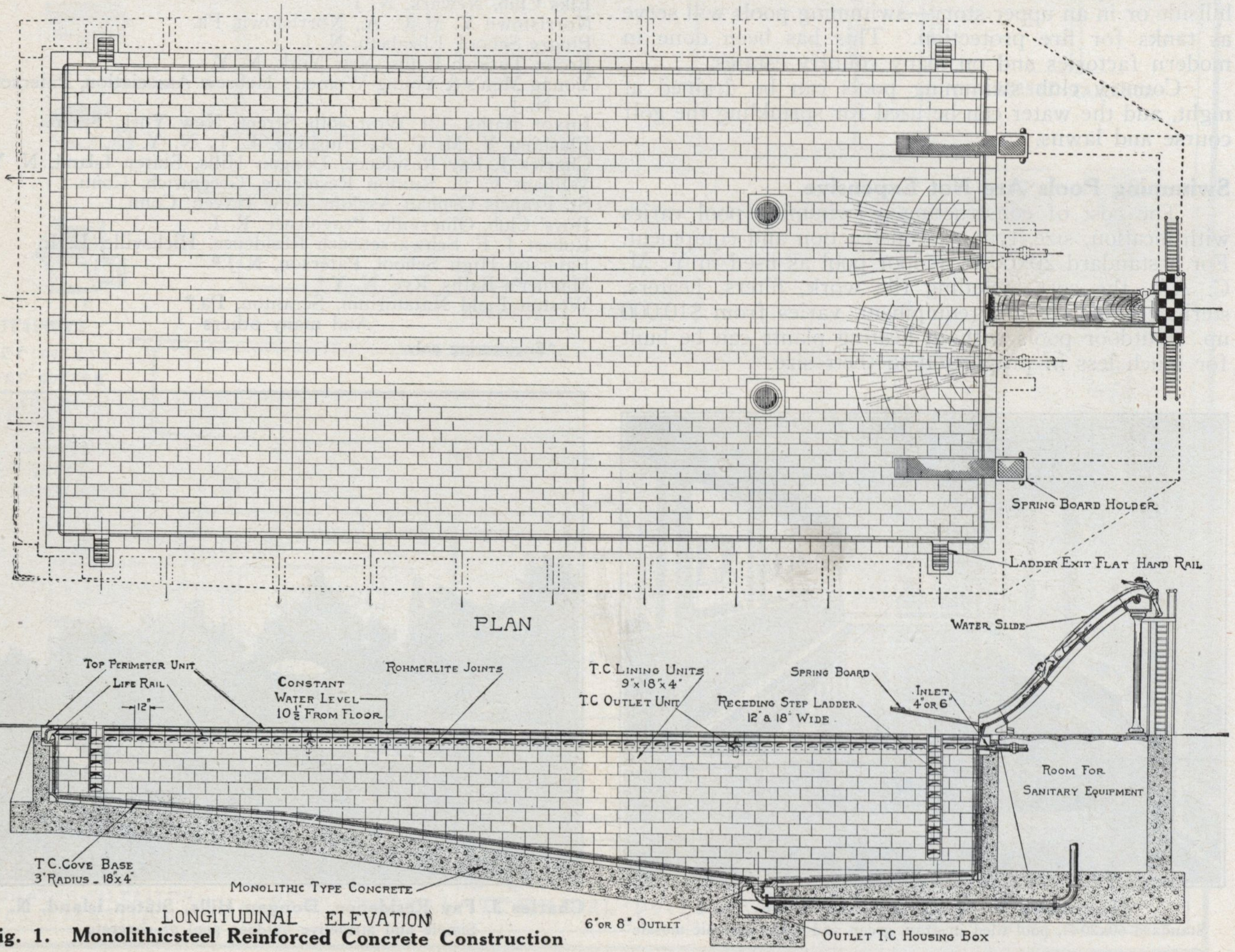
Spring Board Holder
Ladder Exit Flat Hand Rail
PLAN
Water Slide
Top Perimeter Unit
Life Rail
12"
Constant Water Level 10½ From Floor
Rohmerlite Joints
T.C Lining Units 9"x18"x4"
T.C Outlet Unit
Spring Board
Receding Step Ladder 12" & 18" Wide
Inlet 4" or 6"
Room For Sanitary Equipment
T.C. Cove Base 3' Radius - 18x4"
Monolithic Type Concrete
LONGITUDINAL ELEVATION
6" or 8" Outlet
Outlet T.C Housing Box

Fig. 1. Monolithicsteel Reinforced Concrete Construction

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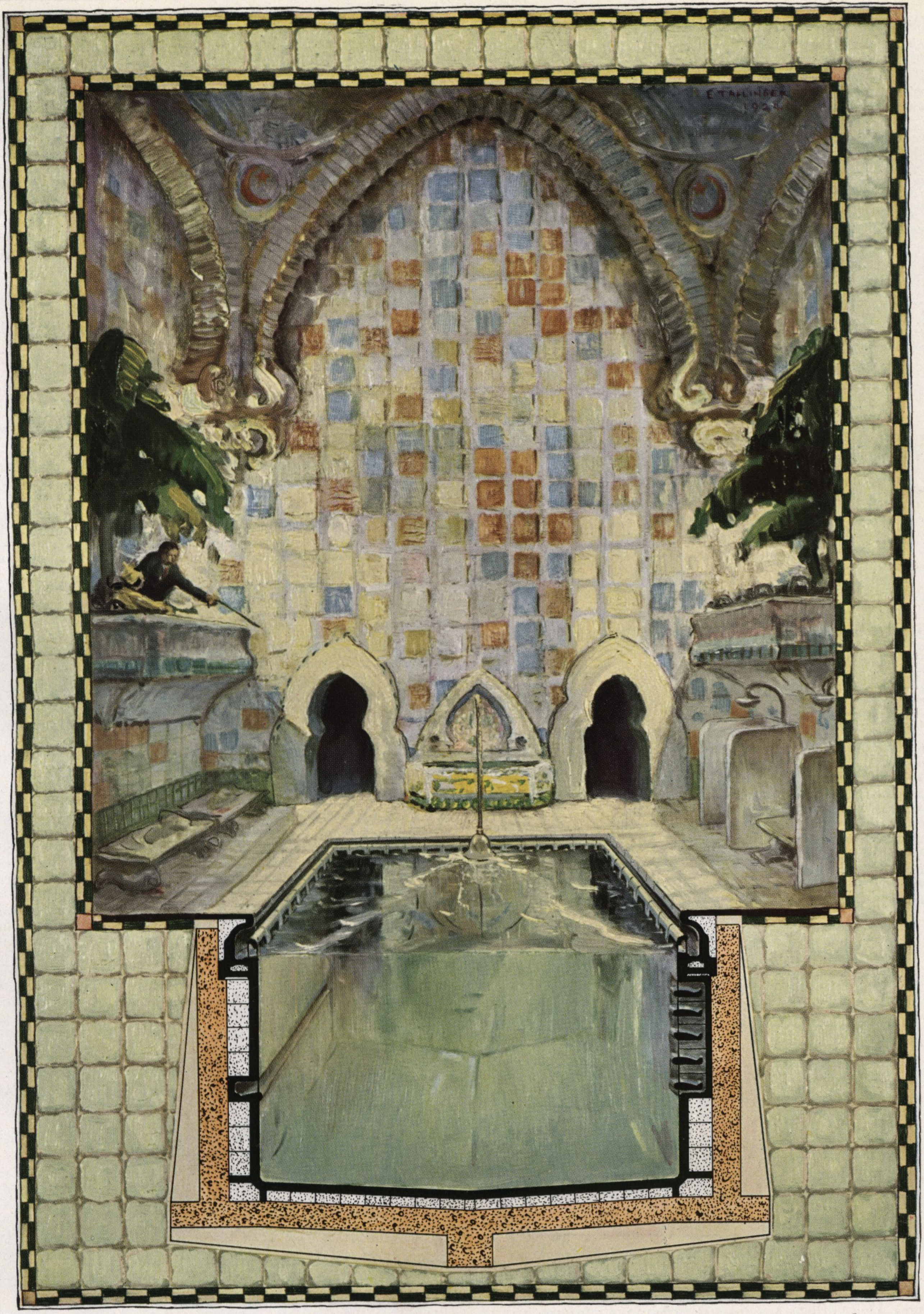


The Sultan of Turkey's "Piscine" in the Palace of Dolma Baghcheh, Constantinople

Showing how Rohmer Standard Swimming Pool Equipment would be adapted to the Sultan's pool. Note decorative possibilities

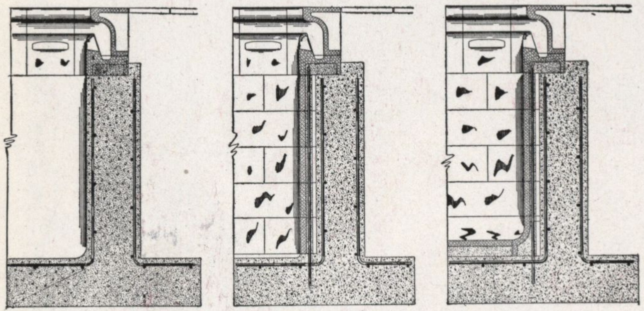
Continued on next page

Rohmer Monolithicsteel Reinforced Concrete Construction

Feature No. 1—In our Rohmer Monolithicsteel design (Fig. 1) we have created a monolithicsteel reinforced concrete construction, capable of withstanding side soil pressure, ground water pressure and slight settlement of soil bottom.

The reinforced concrete bottom is further strengthened by means of a concrete longitudinal girder and concrete cross ribs properly reinforced with steel rods of approved shapes, sizes and quantity. The sidewalls are also strengthened by ribs or buttresses properly reinforced with steel rods as required.

A special feature is the concave shape of the bottom (see Fig. 1) which causes water and sediment to collect in center of pool bottom at waste outlet.



Type 1 Type 2 Type 3

Three Types of Monolithicsteel Reinforced Concrete Construction

Type 1. Cheapest—reinforced concrete with standard terra cotta top perimeter unit only.

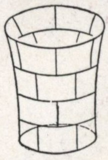
Type 2. Reinforced concrete with terra cotta lining units on four vertical sides.

Type 3. Reinforced concrete with terra cotta lining units on vertical sides and bottom

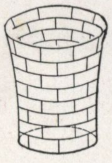
Guarantee—We guarantee our monolithicsteel reinforced concrete construction to hold finished swimming pool full of water without disaster regardless of soil condition, even if the pool should settle out of level.

Rohmer Standard Terra Cotta Lining Units for Bottom and Sides of Pool

Feature No. 2—An ordinary drinking glass represents the most perfect receptacle adapted to hold water because it has no joints. If the receptacle is so large as to necessitate its being made in sections diagram No. 1 illustrates a more rational construction, having fewer joints, than diagram No. 2.



Diag. 1



Diag. 2

In evolving Rohmer Standard Terra Cotta Lining Units for lining swimming pools, we have been guided by the same reasoning and have consequently eliminated the enamel and common brick courses, substituting for them the Rohmer Standard Terra Cotta Lining Units which are manufactured in a uniform size of 18x9 in. with 4-in. bond, thus reducing the number of joints by at least one-half. See diagrams Nos. 3 and 4.

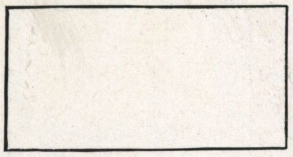


Diagram 3

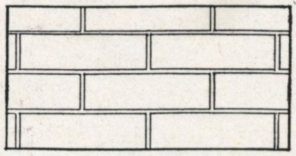


Diagram 4

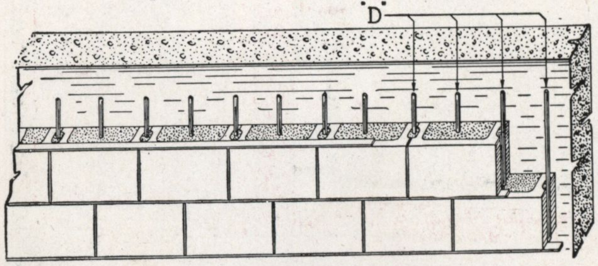


Fig. 2. Rohmer Standard Terra Cotta Lining Units

The enamel surface can be shaded to any color. All cove base units are made to match slopes. Concave corner strips are also included in lining equipment.

Rohmer Standard Terra Cotta Lining Units for sidewalls (Fig. 2) are provided with grooves on vertical ends to engage the upright steel rods (D) (Figs. 2 and 3) thus affording a perfect monolithic bond between terra cotta units and our patented reinforced concrete construction.

Note: All Rohmer Standard Terra Cotta Lining Units including cove bases and concave corner strips are ground for $\frac{3}{16}$-in. joints and assembled on factory floor before shipping. When erected, with the reinforcing steel rods, they are grouted to obtain monolithic bond with reinforced concrete structure.

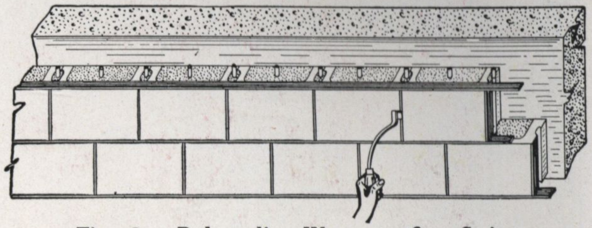


Fig. 3. Rohmerlite Waterproofing Strips

Rohmerlite Waterproofing Strips for Waterproofing of Swimming Pools

Feature No. 3—The waterproofing of a swimming pool in a most thorough manner is a serious problem to the architect. Upon it depends the stability and long life of the structure.

Terra Cotta—We have made extensive researches and analyses concerning the characteristics of clays best adapted for the manufacture of terra cotta, the close bond between the enamel surface and the terra cotta itself depending upon the porosity of the clay compound after burning.

In Holland, Germany, Italy and Tunis we have found clays, which, when burned, make a perfect bond with the enamel surface and create a product having the lowest coefficient of porosity.

No one finds fault when a block of natural marble or stone decays after erection, but the architect and manufacturer are invariably criticized when the enamel surfaces of terra cotta peel or crack after erection.

Our entire terra cotta equipment is made for us by one of the leading manufacturers in America with clays compounded according to our specifications to meet the best American and European standards.

Cement Joints—We have no confidence in the old methods of waterproofing with tar and tarred felt. (a) Because such waterproofing can easily be punctured during erection. (b) Tar dries readily and becomes very brittle in cold weather. (c) Such waterproofing can not be placed on the inside lining walls of the pool, but is usually located between the concrete retaining walls and the brick or tile lining; but the waterproofing of the numerous surface joints has received no consideration. The logical waterproofing should be in the joints forming a bond between the enamel surfaces of the wall lining.

Rohmerlite Waterproofing Strips—Guided by the old Italian art of repairing marbles and potteries by the hot burnishing process, we are introducing the Rohmerlite Waterproofing Strips (Fig. 3) furnished in strips 1½ in. wide by $\frac{3}{16}$ in. thick. These strips are made of a special compound which remains soft like rubber and will not run or harden regardless of temperature conditions. They are set by the mason when laying the lining units and later calked and burnished with a hot iron. A perfect waterproofing bond with the enamel surface of terra cotta is thus obtained.

Marble, stone, terra cotta (enamel or rough surface), enameled tiles, cement blocks, etc., set with Rohmerlite Waterproofing Strips never crack. Rohmerlite Waterproofing Strips prevent water seepage through the joints which eventually impregnates the porous terra cotta back of the enamel and freezes, causing surface finish to crack and spall.

Rohmer Terra Cotta Perimeter Top Unit

Feature No. 4—We have eliminated the ordinary gutter around the top perimeter of the pool on account of its non-

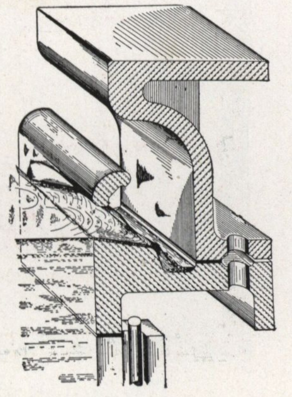


Fig. 4. Rohmer Top Unit

Continued on next page

accessibility and the difficulty experienced in cleaning. We have replaced it by arched overflow outlets and spill slabs to scum drainage duct (Fig. 4) enabling all the faces of the perimeter top to be easily reached and cleaned, thus doing away with re-entering corners so easily filled with scum and dirt, and which form foul air pockets.

Life Rail Unit

Feature No. 5—The life rail (Fig. 5, at "A") is constructed and so located to be always above water level. The rail allows for a full grip by fingers and thumb; the fingers obtaining a perfect hold on the curved surfaces "B" thus reducing chances of arm cramps.

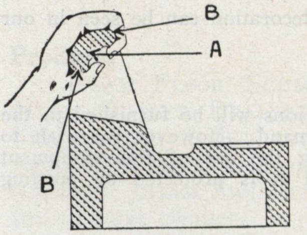


Fig. 5. Life Rail Unit

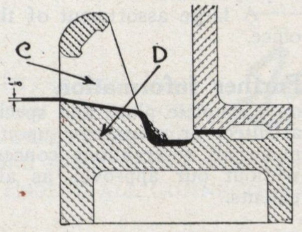


Fig. 6. Overflow Outlet and Spill Slab

Arched Overflow Outlet and Spill Slab

Feature No. 6—The arch overflow (C) and spill slab (D) (Fig. 6) is a new feature located under the life rail and allows for the passage of water when overflowing the pool. With the ordinary design of life rail it is necessary to raise the water level at least 3 in. when flushing the pool. With our rectangular overflow outlet a raise of water level of 1/8 in. is sufficient to carry off scum, saliva and other impurities.

This feature alone will save, in water bills, sufficient money to pay for the entire cost of the pool.

Furthermore our new arch life rail is the only feature on the market permitting a constant water level in the pool with a standard regulation height of 10½ in. from floor level to water level.

Drainage Duct

Feature No. 7—The drainage duct forms a flat bottom duct of exceedingly shallow depth, thus inducing an easy running flow to sump or return water systems.

Note: We do not recommend providing for strong flows of water to remove impurities from the water surface. Such flows splash the scum on the upper enamel surfaces where it sticks in a manner similar to soapsuds and scum in a bathtub.

On account of the small volume of water we displace when the pool overflows we recommend a unit foot slope of 1/16 in. thus rendering possible a very shallow duct easily cleaned.

We recommend the use of anchor rods for securing coping (F) to concrete retaining walls. By filling with cement and thoroughly grouting all voids, the coping member (F) resting on the shelf or bed (G) is thoroughly set and locked in place.

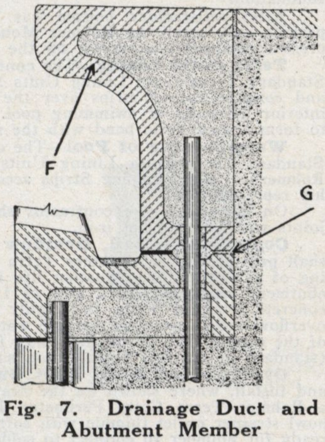


Fig. 7. Drainage Duct and Abutment Member

Non-slip Coping

Feature No. 8—We provide a non-slip finish on top of the coping member; the non-slip finish is efficient and has the advantage of being integral with the coping. The coping is also made with a depression for insertion of any other non-slip material the architect may select. The top surface of coping is pitched away from pool for sanitary drainage.

Surface and Floor Drainage—We recommend, for sanitary reasons, draining all floor surfaces away from the pool in a separate drainage system.

Rohmer Terra Cotta Perimeter Top, Outlet Unit

Feature No. 9—This unit (Fig. 8) made preferably in one piece of terra cotta, is adapted to receive a special bronze outlet thimble fitted with a trap bowl strainer removable by simply lifting out of its socket. This allows frequent cleaning and prevents impurities and solid waste matter entering the piping system.

All piping connections from the outlets to the main header are soft lead pipes sweated to drain outlet and soldered to nipples provided by the plumber at the main header.

Rohmer Bronze Outlet

Feature No. 10—Made of bronze, provided with strainer, with a flange for attaching to outlet piping system.

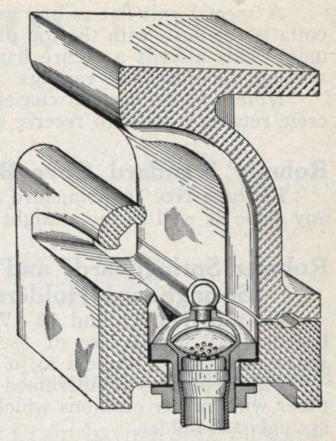


Fig. 8. Rohmer Terra Cotta Perimeter Top, Outlet Unit

Rohmer Bronze Outlet Terra Cotta Box

Feature No. 11—Terra cotta box made in different sizes to house bronze outlet and permit easy access to flange bolts of outlet.

Terra Cotta Coping and Lane Markings

Feature No. 12—Markings in colors (either black, brown, green or red) are provided in coping members; the markings are burnt in the underglaze of the coping face; also lettering, approximately, 2 in. high.

The marking and lettering used in general practice are: *deep* and *shallow water* repeated twice at each side of both ends of the pool; *yard marks,* 2½ in. high and *foot marks,* 1½ in. high on the longitudinal sides of the pool.

The lanes for the bottom of the pool can also be made in shades mentioned above and run the full length of the pool.

Rohmer Terra Cotta Inclined Step Ladder with Combination Exit Flat Railing

Feature No. 13—Vertical step ladders impose enormous strains on corpulent bathers. Our ladder (Fig. 9) has its steps inclined to eliminate this objection. Each tread is formed to the natural shape of the sole of the foot with a stop lip which engages the second phalanxes of the toes, thus insuring a secure footing.

An open space is provided between the edge of tread and wall which leaves the toes free from the thrust of the body weight; this is not the case with pocket type ladders where the toes push and are strained against the pocket wall.

An additional purpose of the open space at the back edge of the tread is to provide a hand grip while climbing the ladder.

The ladder is recessed and built in units with side edges flush with wall of pool. The treads have a uniform height of 9 in. All pockets and weep-holes have been eliminated for easy access and cleaning of all exposed enamel surfaces.

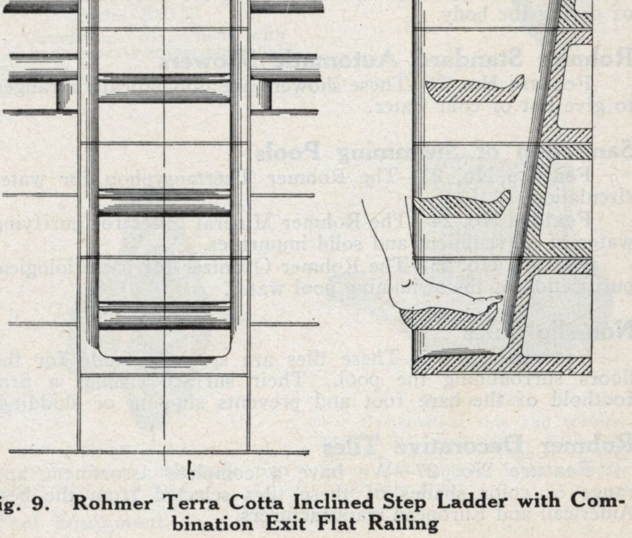


Fig. 9. Rohmer Terra Cotta Inclined Step Ladder with Combination Exit Flat Railing

Continued on next page

A special exit flat railing made of bronze or enamel terra cotta is set flush with the top of the coping in a special coping unit. This affords a secure handhold and eliminates the protruding vertical hand railings.

Note: Open vertical chases must be provided in the concrete retaining walls to receive each step ladder.

Rohmer Standard Cove Base

Feature No. 14—Standard cove base can be made to meet any slope as well as the straight side of pools.

Rohmer Springboards and Rohmer Rubber Cushion Springboard Holders

Feature No. 15 and 16—We have three types of springboards. All boards are of special design and made of well seasoned hickory, adapted to fit our standard holder.

This apparatus is fulcrumed at one end and provided at the other with rubber cushions which form the elastic means of the springboard holder.

The rebounding effect of the holder is such that when an average weight bather exerts a kick at the end of the board, preparatory to diving, the rebounding is such that his body will be shot up in the air from three to four times as high as it would occur if an ordinary diving board was used. The holder is made of bronze or of malleable iron, enameled throughout.

Rohmer Standard Water Slide

Feature No. 17—This slide, made of malleable iron enameled throughout, is provided with a water gusher, furnishing a strong stream of water to the slide. This waterflow impinges the body of the bather in a rapid downward course. The amount of merriment, pleasure and exercise it gives to children, as well as grown-ups, makes the slide a real attraction to any swimming place.

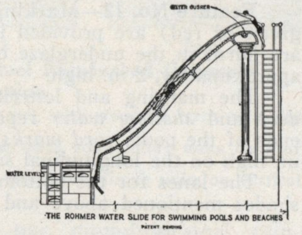


Fig. 10 Rohmer Water Slide
(Patent pending)

Rohmer Standard Swimming Apparatus

Feature No. 18—This appliance is made to teach bathers how to swim and preferably under the direction of a swimming expert. Several of these machines can be installed in a pool, and complete specification can be furnished upon request.

Rohmer Terra Cotta Benches

Feature No. 19—These benches are standard and always carried in stock. They accommodate four persons.

Rohmer Standard Enameled Foot Basinette

Feature No. 20—This basinette, made of enameled terra cotta or malleable iron, is installed in every bathing compartment and enables the bathers to rinse their feet after swimming.

Rohmer Standard Hot Air Body Dryer

Feature No. 21—This apparatus, more economical than towels, is twice as effective, besides being the most sanitary way of drying the body.

Rohmer Standard Automatic Showers

Feature No. 22—These showers are automatically arranged to give hot or cold water.

Sanitation of Swimming Pools

Feature No. 23—The Rohmer Thermosyphon for water circulation.

Feature No. 24—The Rohmer Mineral Filter for purifying water of all sediment and solid impurities.

Feature No. 25—The Rohmer Ozonizer for bacteriological purification of the swimming pool water.

Non-slip Tiles

Feature No. 26—These tiles are specially made for the floors surrounding the pool. Their surface enables a firm foothold of the bare foot and prevents slipping or skidding.

Rohmer Decorative Tiles

Feature No. 27—We have a complete assortment and range of color shades of these tiles selected from the best American and European manufacturers.

Rohmer Terra Cotta Ornamental Benches

Feature No. 28—These benches come in different designs to accomodate from one to twenty bathers at a time.

They are manufactured by famous Italian and Dutch masters, and a complete set of illustrating plates will be furnished upon demand.

Rohmer Terra Cotta Decorative Fountains and Ornamental Terra Cotta Equipment

Feature Nos. 29 and 30—We have more than sixty designs of decorative fountains and similar terra cotta equipment made in Europe. This terra cotta decorative equipment comprises: jardiniers, flower and fernery pots, statuary, gushing fountains in polychrome.

A large assortment of this decoration can be seen in our office.

Further Information

Complete plans and specifications will be furnished to the architect or contractor upon demand. However we wish to make all reservations concerning the use of this equipment without our approval, as all of it is protected by pending patents.

Construction and Equipment of Swimming Pools

At the option of the architect, we undertake the complete equipment of the swimming pool from the ground up, including excavation, the building of the reinforced concrete, the lining of the pool with our terra cotta specialties, the installation of the sanitation system and of the decorative features, or we furnish our complete equipment for erection by the contractor.

No engineering fee is charged if contract for construction is awarded to us, if contract is awarded to others, then a charge is made for engineering.

Specifications for Complete Rohmer Standard Swimming Pool Equipment

Excavation—All earth and rock excavation will be done by others.

Foundation—After the excavation is completed, tests shall be made. Where soil is not capable of carrying 2 tons per sq. ft. an approved system of pile foundation shall be installed.

After the excavation has been completed the contractor shall test the soil bottom. The bearing power of the soil shall be capable of supporting not less than 2 tons per sq. ft. Where shifting sands are encountered, the contractor shall provide an approved system of pile foundation.

After satisfactory bottom has been obtained the contractor shall provide and install the Rohmer Monolithicsteel Type of Reinforced Concrete construction as shown on the drawings.

Terra Cotta Lining—The contractor shall provide and lay Rohmer Standard Terra Cotta Lining Units 18x9 in. with the required cove base and concave corner strips over the entire surfaces of the bottom and interior sidewalls of swimming pool. They shall be grouted thoroughly to form a monolithic bond with the rough concrete.

Waterproofing of Pool—The contractor shall, when laying Rohmer Standard Terra Cotta Lining Units, provide and set in all joints the Rohmerlite Waterproofing Strips according to instructions of patentee or his representative.

On completion the contractor shall thoroughly calk and burnish all joints with suitable hot iron.

Coping, Life Rail, Overflow and Scum Duct—The contractor shall provide and set Rohmer Terra Cotta Perimeter Top Units, consisting of the coping, combination life rail and overflow, and the duct and abutment members. Each unit of 12-in. length shall be laid on top of concrete retaining walls, thoroughly cemented and grouted. The arched overflow outlets establish the high water level of the pool. The top surface of the coping shall be pitched away from pool and shall be provided with (standard or special) non-slip top surface.

Overflow and Scum Duct Outlets—The contractor shall provide and install, where shown on the drawings, at all low points in the duct a Rohmer Terra Cotta Perimeter Top Outlet Unit fitted with a trap bowl strainer outlet thimble with soft lead piping connections sweated on ready for plumber to connect to soldering nipples in main piping system.

Markings in Terra Cotta Coping—The contractor shall provide, where shown on the drawings and schedule, all markings and lettering in colors as selected. The markings and lettering shall be applied and burnt in the underglaze of the coping face.

Inclined Step Ladder with Combination Exit Flat Railing—The contractor shall provide and set, where shown on the drawings, Rohmer Terra Cotta Inclined Step Ladders with Combination Exit Flat Railings built of terra cotta units each tread having a uniform rise of 9-in. Each ladder shall be provided with an Exit Flat Railing made of (bronze or terra cotta) set in a special coping unit.

Springboards—The contractor shall provide and set (one or two) Rohmer Springboards, Type No. (1, 2 and 3) made of well seasoned hickory of special design, adapted to fit the Rohmer Standard Springboard Holder.

Sanitation Equipment—The contractor shall provide and install strictly in accordance with the requirements of the manufacturers the following three complete systems, the Rohmer Thermosyphon for water circulation; the Rohmer Mineral Filter for purifying water of all sediment and solid impurities; the Rohmer Ozonizer for bacteriological purification of the swimming pool water, ready for plumber to make his connection.

The contractor shall consult with the patentee of the Rohmer Standard Swimming Pool Equipment for the installation of all the different specialties included in such equipment, and shall install it after complete understanding with the subcontractors.

THE JOSAM MANUFACTURING CO.

Swimming Pool Equipment

MAIN SALES OFFICE
4900 Euclid Building, CLEVELAND, OHIO

FACTORY
MICHIGAN CITY, IND.

DISTRICT BRANCH OFFICES
NEW YORK, N. Y., 229 East 38th Street
CLEVELAND, OHIO, 4900 Euclid Building
CHICAGO, ILL., Majestic Theater Building
ATLANTA, GA., 209 Bona Allen Building
REPRESENTATIVES IN PRINCIPAL CITIES IN UNITED STATES AND CANADA

Products

Josam Floor, Scum Gutter and Pool Main Outlet Drains; Josam Overflow, Circulating Inlet and Outlet Connections with fan shaped or round spout, round or square strainers; Josam Swimming Pool Wall Connections for vacuum cleaner.

Josam Spray Connections used to create circulation; Josam Bronze Lion Head Inlets.

All Josam Swimming Pool Equipment furnished either for Durham or soil pipe installation, except 2003-E scum gutter drain which is furnished only with threaded outlet.

For Josam Floor, Shower, Urinal and Roof Drains and other Josam Products, see pages 1846-1849.

Materials

Bodies of iron or brass. Strainers, spouts, and all exposed parts, either nickelplated or polished brass or white metal.

Waterproofing Provision

Josam Swimming Pool Equipment can be furnished with the waterproofing flange and Josam design clamping ring if so specified.

Josam Inlet or Circulation Fittings with Spouts

Josam 301-C Drain having 3-in. pipe connection and Josam Spout, when set in side wall of pool, makes an assured watertight connection. Water may be diverted at any angle desired by turning the spout.

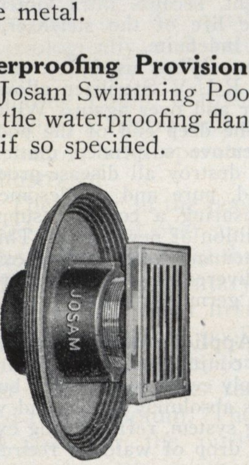
Josam Swimming Pool Equipment

Josam Drains with special feature attachments make ideal swimming pool equipment. All Josam Drains, used in swimming pools under water level line, should be specified or ordered *without* weep holes in flange and *with* the Josam exclusive type clamping ring to hold the waterproofing membrane.

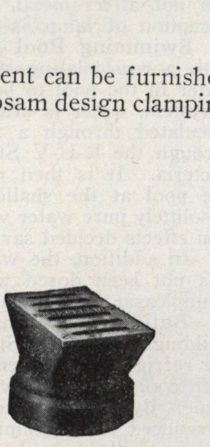
See pages 1846-1849 for other Josam Drains applicable to Swimming Pool use.

Service, Catalogues, Literature

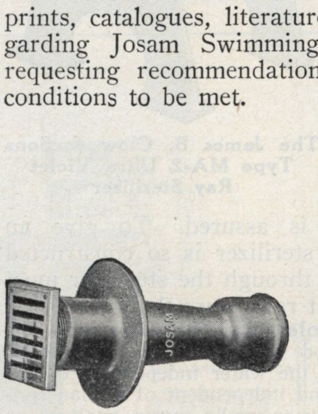
Architects, engineers, designers, and builders of swimming pools consult our Architects Service Department at Cleveland for drafting room detail plates, blue prints, catalogues, literature, and recommendations regarding Josam Swimming Pool Equipment. When requesting recommendations kindly furnish sketch of conditions to be met.



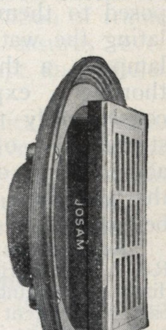
Series 300
Circulating connection with 4-in. square brass adjustable strainer and collar.



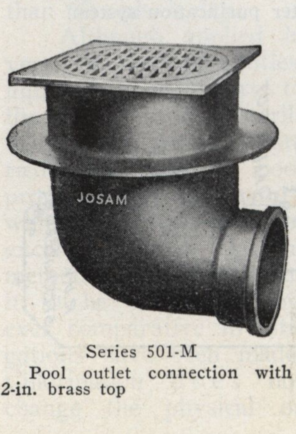
Series 2003-E
All-brass scum gutter drain. Shape conforms to narrow course of the gutter. Threaded outlet



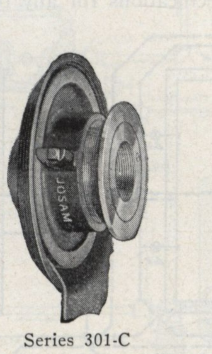
Series 2003-X
Circulating connection with 4-in. square brass adjustable collar and grate



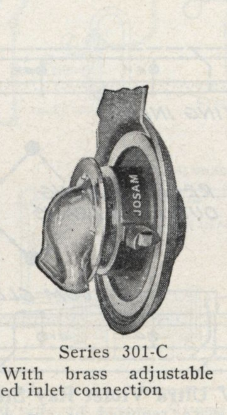
Series 302-B
Overflow or outlet connection $6\frac{1}{2}$x$9\frac{1}{2}$-in. brass top frame and removable grate



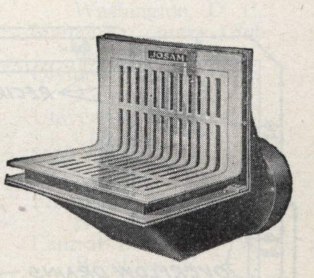
Series 501-M
Pool outlet connection with 12-in. brass top



Series 301-C
With threaded brass adjustable connection for vacuum hose



Series 301-C
With brass adjustable fan shaped inlet connection



Series 1200
Combination side and bottom pool outlet connection, with reversible outlet. Angular brass frame and clamping device. Brass removable grate

Josam Swimming Pool Equipment

ULTRA VIOLET RAY WATER STERILIZER

MANUFACTURED BY

The R-U-V Company, Inc.
383 Madison Avenue, NEW YORK, N. Y.
TELEPHONE, VANDERBILT 8358

James B. Clow & Sons
534 South Franklin Street, CHICAGO, ILL.
TELEPHONE, WABASH 2789

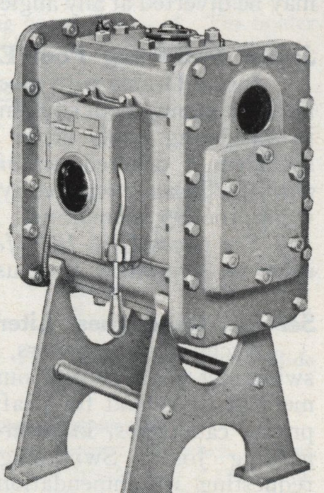
Products

ULTRA VIOLET RAY WATER STERILIZING APPARATUS for swimming pools, building recirculating drinking water systems, municipal water works, ice manufacturing plants and bottling plants and wherever absolutely pure, wholesome and unadulterated water is desired. Capacities range from 100 gallons per hour up.

Guarantee

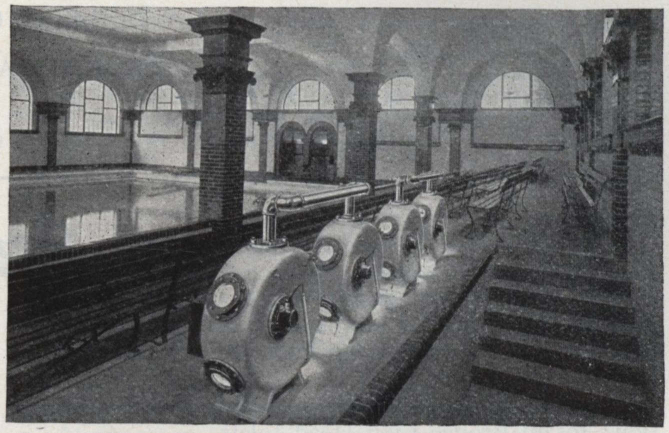
That when the sterilizer is erected, connected and operated in accordance with instructions, the water delivered by the sterilizer shall be free from pathogenic bacteria and shall comply with the requirements for pure water as adopted by the United States Treasury Department, without changing the taste, odor or chemical composition of the water treated or imparting any irritating qualities to it.

Modern Principle of Sterilization—The R-U-V ultra violet ray method of sterilization is remarkably simple—yet highly effective. The water is exposed to the purifying ultra violet rays produced by a mercury vapor quartz lamp. These rays kill instantaneously all pathogenic or disease-producing bacteria that are exposed to them. By circulating the water about the lamp in a thin film, the thorough exposure and consequently the complete sterilization of each drop is assured. To give an added factor of safety, the sterilizer is so constructed that the water in its passage through the sterilizer must be exposed to the ultra violet rays more than once.



The James B. Clow & Sons Type MA-2 Ultra Violet Ray Sterilizer

Advantages of Ultra Violet Ray Sterilization—The R-U-V ultra violet ray method assures 100% removal of disease-producing bacteria from the water independent of the bacterial content of the water and independent of human control. With it, it is unnecessary to make water analyses to determine the dosage necessary, and unnecessary to regulate any dosage to suit the condition of the water. The R-U-V Sterilizer adds no chemical disinfectant to the water. Thus, the water delivered is absolutely unchanged in taste and composition.



Culver Military Academy, Culver, Ind., Protects the Users of Its Pool with R-U-V, Ultra Violet Ray, Sterilization

Operation, Maintenance and Depreciation—Through the positive and automatic action of the R-U-V Sterilizer, the presence and consequent expense of an expert attendant is eliminated. The small amount of electricity consumed forms practically the only operating charge.

Maintenance and depreciation charges are reduced to a similar minimum. The only item that can be charged under these heads is the renewal of the quartz lamp. This lamp is covered by an adjustment guarantee, and can be replaced at a nominal cost. Heavy corrosion of metal parts, common to chemical treating outfits, is absent, because ultra violet rays can not affect metal. Thus, the life of the sterilizer, with exception of lamp, is practically indefinite.

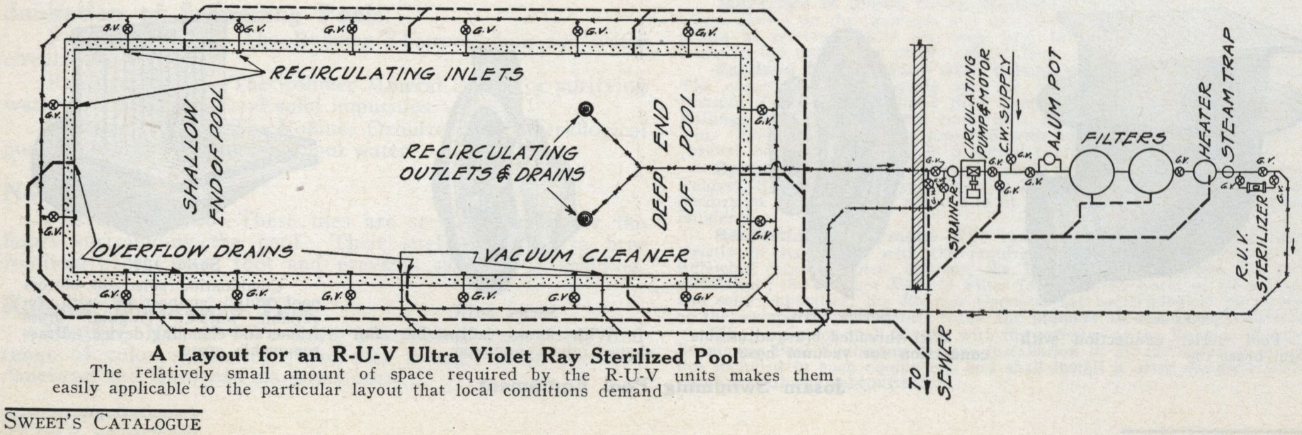
Swimming Pool Application—When used in connection with a recirculating system, the R-U-V Sterilizer allows the water in the pool to be used over and over again. With such a system, water is drawn from the deep end of the pool and circulated through a filter to remove suspended matter and through the R-U-V Sterilizer to destroy all disease-producing bacteria. It is then reintroduced, pure and wholesome, into the pool at the shallow end, insuring a constant supply of absolutely pure water without addition of new water. This system effects decided savings in water and water heating expense.

In addition, the water so delivered is absolutely pure and has not been dosed with biting germicidals that often make it unpleasant to the bathers.

Building Drinking Water Application—For the modern building, the R-U-V Sterilizer, in conjunction with a recirculating refrigerating system, will supply every room in the building with cool refreshing water that is absolutely sterile and wholesome. By utilizing a recirculating system, refrigerating expense is reduced to a minimum. Each drop of water is recirculated and resterilized until used.

Service to Architects and Engineers

The engineering departments of both THE R-U-V COMPANY, INC., and JAMES B. CLOW & SONS will prepare plans and specifications for any type of water purification system.



A Layout for an R-U-V Ultra Violet Ray Sterilized Pool
The relatively small amount of space required by the R-U-V units makes them easily applicable to the particular layout that local conditions demand

WALLACE & TIERNAN CO., INC.

Chlorine Control Apparatus for Swimming Pool Sterilization

NEWARK, N. J.

BRANCH SALES OFFICES AND SERVICE HEADQUARTERS

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TORONTO, CAN., WALLACE & TIERNAN, LTD.

AGENCIES IN ALL FOREIGN COUNTRIES

TRADE-MARK

Chlorination of Swimming Pools

A swimming pool maintained in an improper sanitary condition is a menace to the health of all who use it. Pollution from the body and mouth rinsings of the bathers can not be avoided, but the dangers can be overcome. Chlorination affords complete protection to the bathers and will absolutely prevent the transmission of disease.

Even if the water is daily replenished or recirculated and filtered, if it is not sterilized it is not safe. Clearness is not an index to the bacterial condition of the pool. Filtration without sterilization will not give germ-free water. Sterilization will definitely insure proper sanitation. Sterilization by liquid chlorine is the most effective method known to insure proper protection. The initial and operating costs are remarkably low.

Swimming Pool Purification

A modern swimming pool is equipped with a complete recirculating system which continuously draws water out of the pool, purifies it physically and bacteriologically and returns it to the pool. Such a system consists of a recirculating pump, a pressure filter, a heater and a chlorinator, and operates as illustrated.

The water in the pool is used over and over and at the end of six months is often in better sanitary condition than when first introduced to the pool. The operating charges for water and heat are reduced to a minimum. The total cost for the purification of an average 50,000-gallon pool including chlorination, depreciation and interest is less than 60 cents a day.

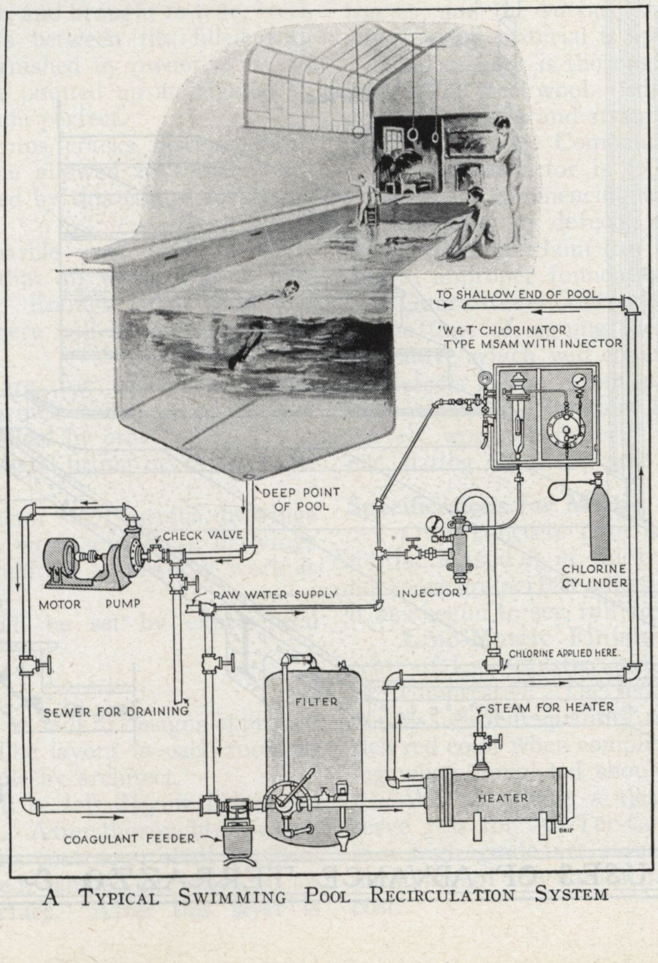
Although applied in very minute quantities, liquid chlorine imparts to the water a residual sterilizing action which is carried out into the pool proper. It is this feature which makes chlorination excel all other known methods, and has caused it to be adopted whenever comparative investigations have been made. Chlorination does not change the physical or chemical characteristics of the water, will not create tastes or odors or cause irritation to eyes or mucous membranes.

W & T Chlorine Control Apparatus

The W & T chlorinator for the sterilization of swimming pools is identically the same apparatus which daily sterilizes the drinking water supplies of over 4000 American municipalities. Obviously any process that will make water safe to drink will make it safe to bathe in. Solution feed type MSAM with special chlorine injector is generally recommended for indoor swimming pools. Type MSVM is used in larger pools and outdoor natatoriums.

The chlorine can be applied at any point in the recirculation system but preferably at some point between the filter and pool.

All apparatus is guaranteed against inherent mechanical defects for a period of one year from date of shipment. Every piece of equipment is thoroughly tested under actual operating conditions before leaving our factory.



A TYPICAL SWIMMING POOL RECIRCULATION SYSTEM

Service

A country wide service organization of trained engineers assures every user prompt and efficient service.

Technical Publication No. 41 gives full details concerning the Sanitation of Swimming Pools.

Write for a copy.

Installations

Over 400 swimming pools are equipped with the W & T chlorinators. A few of our installations are listed below:

Potomac Park Tidal Basin
Washington, D. C.
Memphis Country Club
Memphis, Tenn.
Olympic Park
Newark, N. J.
University of Chicago
Chicago, Ill.
Yale University
New Haven, Conn.
Fordham University
New York, N. Y.
Central Branch Y. M. C. A.
Brooklyn, N. Y.
Central Branch Y. W. C. A.
Chicago, Ill.
Rotterdam Swimming Pool
Rotterdam, Holland
American Country Club
Shanghai, China

ADVANCE TERRAZZO COMPANY

Manufacturers of and Contractors for Terrazzo, Art Marble and Composition Flooring

TELEPHONE
Dearborn 5343
Armitage 8579

179 West Washington Street
CHICAGO, ILL.

Products

Advance Art Marble.
Advance Terrazzo.
Advance Waterproof Composition.
Advance Mastic Floors.
Advance Asphalt Floors.
Ad-Ter-Co Store Front Bulkheads.

Installation and Service

We are manufacturers and contractors for the installation of art marble, terrazzo, waterproof composition floors, etc., mastic floors, Mas-Tile floors and pavements, Lino-Mastic flooring, and have a complete organization in the shop and also in the field to handle flooring contracts for a building complete, eliminating the usual numerous subcontracts.

The Advance Terrazzo Company maintains a designing and engineering service which is at your disposal without obligation at all times. Write us of your problems and we will be glad to advise with you on their solution.

Art Marble

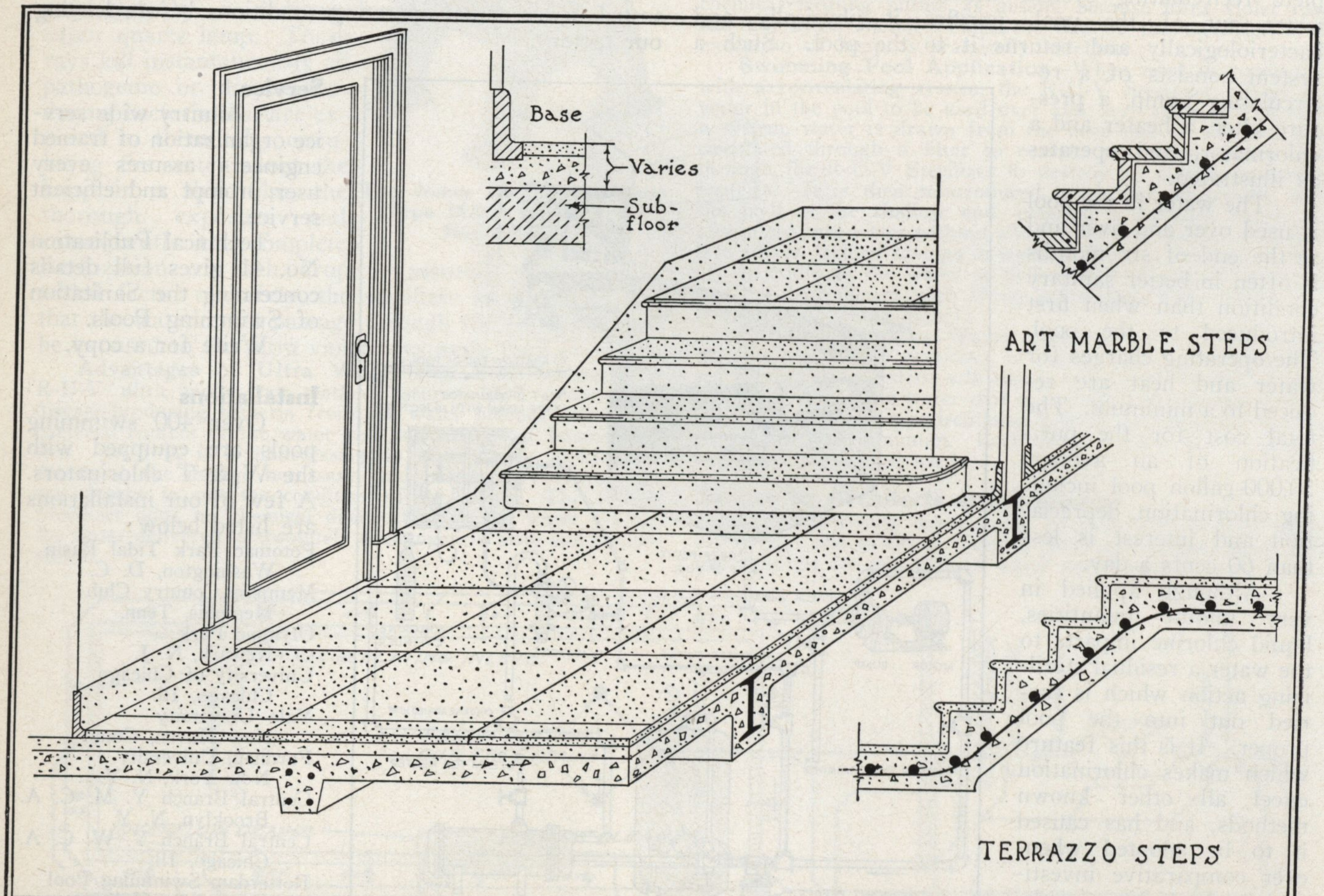
Art marble is precast in our factory to any desired design or shape and can be had in any color or combination of colors, using any foreign or domestic marbles that may be desired. All work is ground to a true even surface and all vertical surfaces highly polished upon completion.

Terrazzo

Advance terrazzo work for floors, stair work, wainscoting, sanitary cove base, etc., is executed in accordance with the best standards of workmanship and materials and as per specifications of the architect. It may be had in plain colors or in combination of colors, laid in squares or other designs and with or without Advance brass dividing strips. The use of Advance brass dividing strips permits a wide variety of designs, adding to the attractiveness, also forming an expansion joint.

Waterproof Composition

Advance Waterproof Composition is a high grade



DETAILS SHOWING USES OF ADVANCE TERRAZZO & ART MARBLE.

Continued on next page

magnesite composition composed of selected high grade aggregates in which a waterproof element has been incorporated, making the finished work absolutely and permanently impervious to moisture. This element removes practically all the previous objections to the use of magnesite composition floors, etc. Advance Waterproof Composition may be had in any standard color or combination of colors that may be called for by the architect's designs.

Mastic

Advance Mas-Tile floor and pavement and mastic flooring are of acid resistant asphalt laid over concrete or wood, new or old, from ¼ in. to 2 in. in thickness, to conform to conditions in the building and traffic requirements. They are sanitary, quiet, and are in general use in hospitals, schools, and also in a great many industrial buildings where heavy duty floors are required.

Specifications for Art Marble

All art marble shall be precast and of grade equal to that manufactured by the ADVANCE TERRAZZO COMPANY of Chicago, made of selected marble chips and cement colored with mineral pigments. Samples shall be submitted for selection of color. All art marble parts shall be made in shop and shipped to job seasoned, honed, reinforced, and ready to set in place.

Each piece of art marble shall be perfect in all details, all arrises sharp, square and true, all surfaces true and free from winds or warps, cracks, chips, or other defects, and all reinforced with metal where necessary.

Each piece of floor tile shall be even, true, and sound and shall be laid in cement mortar fully bedded.

All work where required shall be securely set with dowels, anchors, etc. Floor tile shall be pointed up and machine honed after being set, and brought to true, level, and even surface; all joints between tile filled with cement. Current will be furnished by owner.

Slabs and bases shall be pointed up and honed by hand after being set, and made perfect.

No work which shows chips, cracks, discolorations, pits, or other defects will be allowed to remain, and shall be removed and replaced by this contractor at his own expense.

Seasoning—The art marble work shall be made far enough in advance so that all work will be perfectly seasoned and strong. Enough extra slabs and tile shall be made so that there will be no delay from breakage.

Hardware—All hardware for toilet doors and access doors to plumbing which come in connection with art marble will be furnished by others.

Cutting—Do all cutting and fitting necessary to fit the work of others.

Drawings—This contractor shall furnish drawings showing every detail of his work and these drawings shall be approved by the architect before any work is fabricated.

Setting—All work shall be set by experienced marble setters.

Specifications for Terrazzo

All terrazzo floors shall be laid in designs approved and selected by architect. The layout in each room to be in accordance with schedule by architect.

Rough concrete slab will be left 2½ in. below top surface of finished floor line. After thoroughly soaking this slab with clear water this contractor shall lay 2-in. layer of lean concrete floated, tamped or rolled to an absolute level and true surface. After this layer is properly set, apply terrazzo mixed to produce the design selected and to have not less than 80% of marble chips showing after rubbing and polishing. This final terrazzo coat to be not less than ½ in. thick after polishing.

After terrazzo sublayer and finish is thoroughly dry and hard, the surface shall be ground down with electrically operated machines using No. 30 grit carborundum stones. Then polish, using No. 80 grit stones. Rub down to a true and even surface and bring out the color effect selected. Electric current for operating machines will be furnished to this contractor without charge. After grinding, protect the floors with sawdust.

Specifications for Composition

Composition Floor and Border—Floor and border shall be in accordance with specifications of the U. S. Government for Composition floor and as manufactured by the Advance Terrazzo Company.

The raw materials are to be mixed to a mortar with chloride of magnesia at 22° Baume.

On top of present floated concrete floors lay Advance Waterproof Composition floor, with 12-in. wide border of colors to be selected by architect, to a uniform total thickness of not less than ½ in. at any point and floated to a perfectly true, straight, and level surface. Floors to come even with top of the adjoining finished floor levels, all troweled to a perfectly smooth, hard, and polished surface, equal to approved sample in architect's office.

Floors and borders must be completed without visible joints due to stoppage of work, and the finished work must be smooth, hard, and free from cracks, hollows, and other defects.

All surfaces under composition floors must be thoroughly cleaned of all foreign substances by this contractor, and the surface shall be absolutely dry before any flooring material is applied.

When floor is thoroughly dry and hard, rub lightly with No. 2 steel wool. Edges of border must be rubbed down to a clean and straight joint. Give all work light coat of Advance Compolustre on completion.

This contractor is to inspect and accept the subfloor before commencing work and report in writing to the architect any defects, as it is to be understood and agreed that no claim can be made for defective work due to improper foundation.

Guarantee—Contractor will be required to furnish at the time of signing the contract a five-year written guarantee which will cover all expenses for repairs of all defects arising from settlement, cracking, chipping, hollowness, discoloration, loosening from concrete, imperfect work or material of composition floors, base, etc., dating from the time final certificate is issued.

Specifications for Mastic

Over concrete base lay a cushion coat of Asbestolithic Mastic $\frac{3}{16}$ in. thick, applied in plastic form while hot to secure perfect adhesion with concrete base. After it has begun to set, roll down and thoroughly compress.

Lino-Mastic Finish—Over cushion coat apply 2 coats of Lino-Mastic, each coat to be thoroughly rolled and compressed. The second and finish coat shall contain a sufficient quantity of oxide of iron to give it a rich red color when completed. Total thickness of flooring when completed should not be less than ¼ in.

We also have a designing department ready to serve you for Ad-Ter-Co store front material. This is a high grade art stone having the appearance and durability of the natural marbles at about one-half the cost.

L. DEL TURCO & BROS., INC.

Mosaic and Terrazzo Contractors; Metal Floor Dividers

229-233 Cleveland Avenue
HARRISON, N. J.

Products

Mosaic and Terrazzo Contractors.
Corrugated Metal Dividers for Terrazzo Floors.
Also Tile Work.

Modern Terrazzo Floors That Will Not Crack

The method of jointing terrazzo floors by means of the metal dividers introduced by us some years ago has met with the approval of the architectural profession, with the result that terrazzo floors are seldom specified nowadays without our metal dividers.

These dividers (Fig. 1) prevent or localize cracking and provide effective joints in the floor. If a crack should occur, it will run along the metal dividers and be unnoticeable. The thin metal lines formed by the dividers neatly define the various patterns and give the floor an artistic effect not easily obtained with other materials.

The use of metal dividers in terrazzo floor enables the workman to lay successive or adjoining panels, thus eliminating the slow and expensive method of laying alternating sections and saving considerable time.

Our metal dividers are corrugated so that they key into the mortar and completely separate adjoining panels. They are made of brass, aluminum or zinc, and are 1½ in. deep, of No. 20 B. & S. gauge standard thickness.

We sell our patented dividers at reasonable cost; thus making competitive bidding possible.

The most effective method of preventing or localizing cracks is to run continuous joints the entire length and width of the room parallel with the walls and columns (Fig. 2), exercising care that joints occur over beams and girders, and dividing the surface in sections of about 25 sq. ft.

Best Practice Calls for the Use of a Sand Bed—Formerly terrazzo floors were thoroughly bonded to the concrete floor slab, but experience has proven that this is not the best practice. Terrazzo floors separated from the concrete floor slabs by a sand bed and tar paper as shown in Fig. 3, and properly jointed, are immune from cracks. This is conclusively proven by the fact that floors installed with sand bed during past years are free from cracks.

When a sand bed is used, cracks originating in the concrete floor slab will not appear at the surface of the terrazzo, but terminate at the sand bed.

Recommended Thicknesses of Terrazzo Floors—Fig. 3 shows the thickness of terrazzo floors recommended by us. The underbed can be varied in thickness, however, according to conditions.

Where the distance from the floor slab to the finished floor is more than 3 in. clean cinders or slag may be mixed with the sand and cement in the underbed. However, when the concrete floor slab is more than 4½ in. below the finished floor, it will be more economical to have a concrete fill put in by others, leaving 3 in. for the terrazzo contractor. Where space will allow the underbed to be made only 1 in. thick, or less, it is advisable to reinforce it with No. 18 gauge galvanized wire net, ½-in. mesh.

We recommend that the combined thickness of underbed and wearing surface be never less than 1½ in. because the floor, being separated from the concrete by the sand bed, must have a substantial thickness. If terrazzo must be laid thin, we advise that it be laid in small sections and wire reinforcement used and cut at each joint in the floor.

Two-year Guarantee Against Cracking—Terrazzo floors laid by us in accordance with the specifications on the following page are guaranteed against cracking for two years.

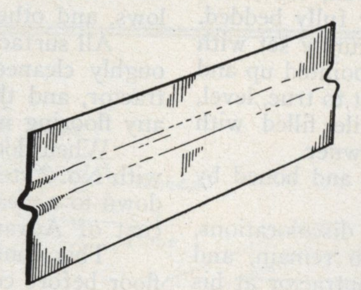
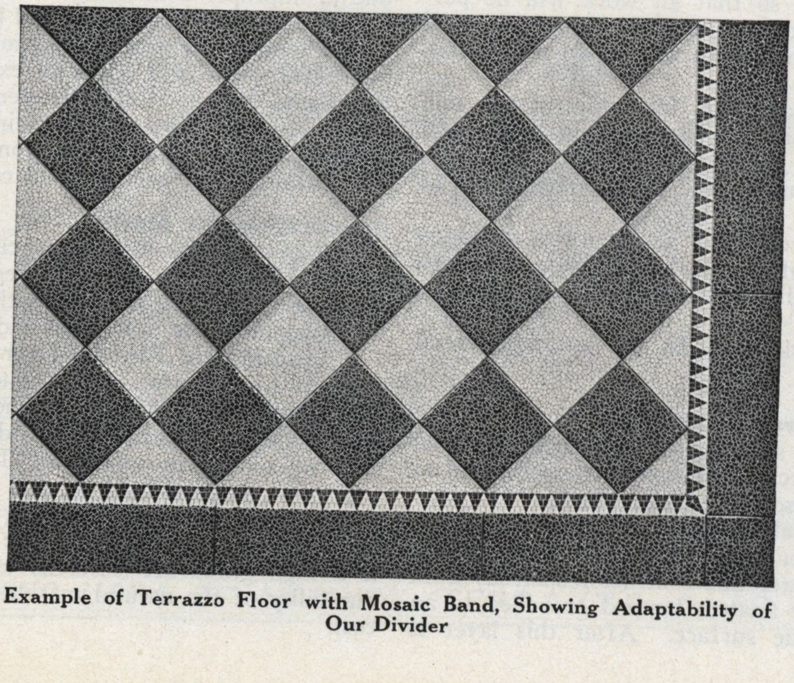


Fig. 1. Del Turco Metal Divider for Terrazzo Floors



Example of Terrazzo Floor with Mosaic Band, Showing Adaptability of Our Divider

Terrazzo Base and Plinth Blocks

Terrazzo base is preferably cast, finished to exact sizes and polished with suitable machinery at the shop in lengths of about 5 ft. and installed on the job in the same manner as marble. Base applied plastic on the job is a trifle cheaper, but the result does not compare favorably with pre-cast base. Pre-cast base and plinth blocks also save considerable time in installing at the building.

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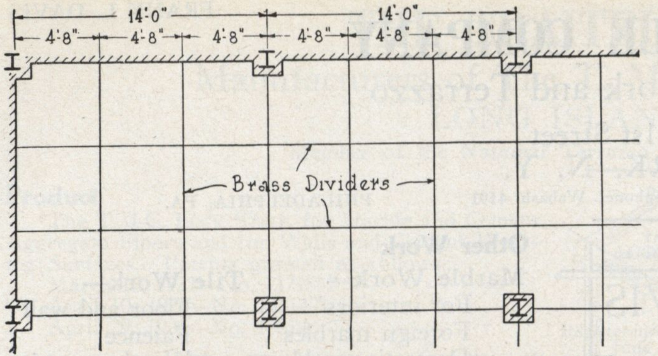


Fig. 2. Correct Method of Placing Del Turco Metal Floor Dividers

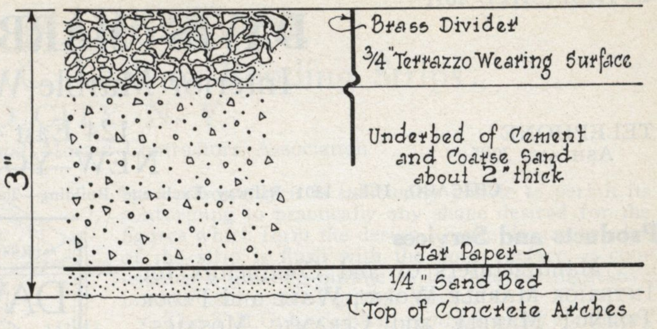

Brass Divider
3/4" Terrazzo Wearing Surface
Underbed of Cement and Coarse Sand about 2" thick
3"
Tar Paper
1/4" Sand Bed
Top of Concrete Arches

Fig. 3. Section of Terrazzo Floor Showing Metal Dividers and Sand Bed

Non-slip Terrazzo for Stair Treads, etc.

We use Norton alundum aggregate mixed with marble granules and cement in making non-slip terrazzo for vestibules, ramps and especially in our precast stair treads, which are about 1½ in. thick.

Specifications for Terrazzo Work

Specifications for Non-cracking Terrazzo Floors—Terrazzo floors shall be furnished and installed where shown on plans. Alphabetic letters marked on plans indicate approximately the colors desired. Refer to Publication A, of L. Del Turco & Bros., Inc., Harrison, N. J., for the colors which these letters represent. Samples shall be submitted for approval. The concrete foundation is provided under another heading and shall be left 3 in. below the finished floor.

Note: See text under "Recommended Thicknesses of Terrazzo Floors" when concrete foundation is more or less than 3 in. below the finished floor.

Spread over the concrete foundation a bed of dry sand about ¼ in. thick and cover this sand with a layer of tar paper. Over the tar paper lay the underbed composed of 1 part portland cement and 4 parts coarse sand, and level off to exactly ¾ in. below the finished floor. Form borders and divide the fields in patterns [squares] as shown on plans (if not shown on plans, state here the approximate size of square desired) by embedding in the mortar Del Turco corrugated brass dividers as described in the aforementioned Publication A. The dividers must be set with their top edges level with the finished floor. When the underbed has hardened sufficiently to withstand rolling, spread the terrazzo aggregate ¾ in. thick, composed of 2 parts marble granule and 1 part portland cement. Roll and trowel in the best manner.

After the terrazzo has set, rub the surface with approved machines or by hand where the machines can not reach. Leave the surface smooth and free from holes and protect the finished work by covering it with wood shavings or building paper. Clean it thoroughly when so directed by the architect and deliver the whole in perfect condition.

Specifications for Terrazzo Base and Plinth Blocks—Furnish and install a precast terrazzo base ...... inches high, of colors as selected, with 1-in. radius cove at the floor line and rounded at the top, in the following rooms ......

Plinth blocks of the same terrazzo material shall be provided under all door trim wherever terrazzo base occurs. Samples shall be submitted to the architect before proceeding with the work.

The base shall be precast, rubbed and finished at the shop and delivered to the building, ready to be installed. It shall be cast in about 5-ft. lengths, ⅞ in. thick, reinforced with steel rods. Base shall be secured to walls in a substantial manner, using anchors if necessary, and shall be set to project ¼ in. beyond the face of the plaster. Point up the joints neatly and wash down thoroughly at completion.

Specifications for Non-slip Terrazzo Stair Treads and Platforms—Furnish and set terrazzo stair treads and platforms where shown on plans. These shall be precast and rubbed in the shop, and delivered to the building in a finished state, cut to size and ready for installation.

All treads and platforms shall be ...... inches thick, with rounded nosings, and shall be reinforced with steel rods.

This work shall be composed of a mixture of granulated marble and Norton alundum aggregate so as to provide a non-slip surface. The proportion shall be about 3 parts marble and 2 parts alundum, of colors as selected, mixed with portland cement in the proportion of 2 to 1.

Note: If non-slip is not required, the alundum can be omitted.

All work shall be set in cement mortar and securely installed on the concrete or iron structure to the satisfaction of the architect. Protect the work until the completion of the building and deliver the whole in perfect condition.

Note: Terrazzo risers and stringers are precast in the same way and are usually made ⅞ in. thick. They are preferably reinforced with galvanized wire reinforcement. Terrazzo saddles are made in the same manner as stair treads and are about 1½ in. thick, reinforced with steel rods.

Marble Mosaic Floors

Our new Publication A illustrates the marbles (in color) commonly used in mosaic floors.

The standard sizes of mosaic tesserae are ⅝ and ¾ in. square, and about ½ in. thick.

Mosaic borders and designs are mounted on paper in sheets of convenient size and set in the mortar bed at the building. Plain mosaic fields are either prepared mounted on paper or the tesserae are laid individually at the building.

Specifications for Marble Mosaic Floors—Mosaic shall be of ...... inch tesserae. Borders as shown on plans shall be ...... (state colors), field shall be ...... (state color).

Wherever mosaic floor is to be laid, the concrete fill will be left 1½ in. below finished floor. Over this shall be spread a cement and sand mortar leveling coat to within ⅞ in. of finished floor. Then the setting mortar bed is laid, composed of 1 part portland cement, 2 parts sand and a sufficient quantity of lime to make the mortar plastic, into which the mosaic tesserae shall be embedded. All mosaic borders and designs shall be prepared mounted on paper, while the plain field can be either mounted on paper or the tesserae laid individually on the job. The mosaic shall be pressed and tamped into the mortar and joints filled with cement. After mortar has set, the whole floor shall be rubbed by machine and by hand where the machine can not reach, and left in a smooth honed finish surface. Joints shall be carefully grouted again and left full and smooth. Protect finished work with wood shavings or heavy paper and boards, and at completion, clean floor and deliver the work in perfect condition.

"Modern Mosaic and Terrazzo Floors"

Our Publication A referred to in the above specifications for terrazzo floors is the most comprehensive book on this subject ever published. It is entitled "Modern Mosaic and Terrazzo Floors." Reliable data is to be found in it relative to the improved method of laying terrazzo; also full size color samples and floor designs. This valuable publication will be sent to architects on written application.

References

Buildings and Architects

Hotel Roosevelt, New York, Geo. B. Post & Sons
New York Trust Co., 100 Broadway, New York, N. Y., Walker & Gillette.
Metropolitan Life Insurance Co. Annex, New York, N. Y., Everett D. Waid
Main Telephone Building, Brooklyn, N. Y., McKenzie, Voorhees & Gmelin
Cathedral College, Washington and Atlantic Avenues, Brooklyn, N. Y., F. J. Berlenbach
Springfield Avenue Trust Co., Newark, N. J., Guilbert & Betelle
Wellmont Theater, Montclair, N. J., Reilly & Hall
Statler Hotel, Buffalo, N. Y., Geo. B. Post & Sons

ESTABLISHED 1891

FRANK L. DAVIS

DAVIS MARBLE COMPANY

Interior Marble Work and Terrazzo

TELEPHONE
ASHLAND 3085

124 East 41st Street
NEW YORK, N. Y.

CHICAGO, ILL., 1301 Railway Exchange Building—Telephone, Wabash 4191

PHILADELPHIA, PA.

Products and Services

Manufacturers of and Contractors for Interior Marble Work; Wall and Floor Tiling; Marble and Ceramic Mosaics; Terrazzo Work and the Davis Terrazzo Dividing Strip.

Inquiries welcomed for technical information and layout of architects' designs.

PAT'D JAN 24·1922
DAVIS
STRIP
TRADE MARK

Other Work

Marble Work—
- For interiors
- Foreign marbles
- Domestic marbles
- Marble mantels

Mosaic Work—
- Of all kinds

Swimming Pools

Bath Accessories

Tile Work—
- Floor and wall
- Faience
- Weatherproof
- Quarries
- Ceramic mosaic
- Pictorial

"Rim Grip" Tile
(Patented)

Terrazzo Work

Contractors for all kinds of Terrazzo work.

Terrazzo Floors—Laid in panels, with metal dividing strips, permitting the use of different colors in designs and preventing cracking.

Dividing Strips—The "Davis Dividing Strip" (patented) is simple in section, easy to handle and set, effective in service and reinforces the pavement.

The Section—The section is such that any metal becomes rigid when bent to this form and this permits the use of zinc, copper or brass. Made in 1¼ in. or more in depth, and in 6 and 8-ft. lengths.

Handling—This form of strip will nest for packing, handling and shipping and therefore remains rigid, straight and true for setting in the floor.

Setting—This section gives a continuous angle bearing the entire length of the strip when set in the leveling cement bed and keeps the strip straight after setting, with all top edges level and in one plane.

Shoulder—Keeps the strip from sinking and disappearing below the surface of the floor during the process of laying and rolling the terrazzo.

"Arterrazzo"—By the use of the Davis dividing strip, an Arterrazzo floor can be divided into square, rectangular or other shaped panels and can be set at a considerable saving of time and expense.

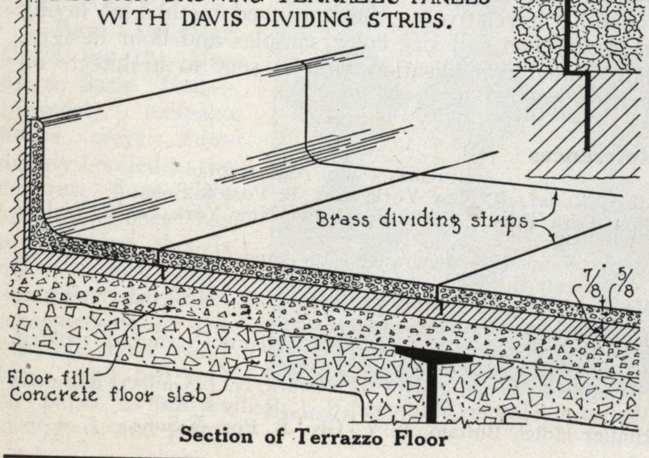
Installations—Furnished and installed with our Arterrazzo floors or sold separately at reasonable prices to others, whenever specified or wherever required.

Terrazzo Tiles—In all sizes and colors.

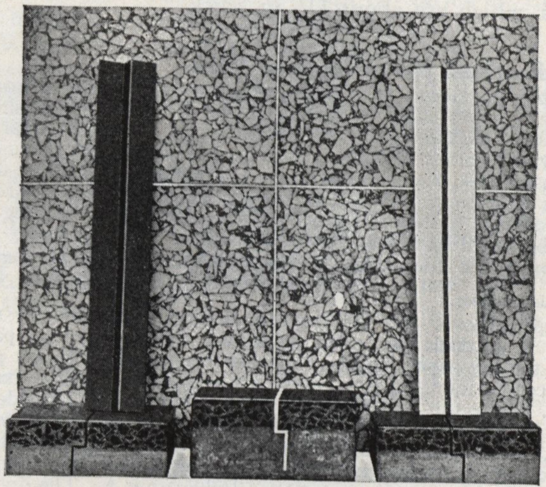
Terrazzo Treads—In place or set separately.

Terrazzo Base—With integral border.

Specifications—Furnished on application.



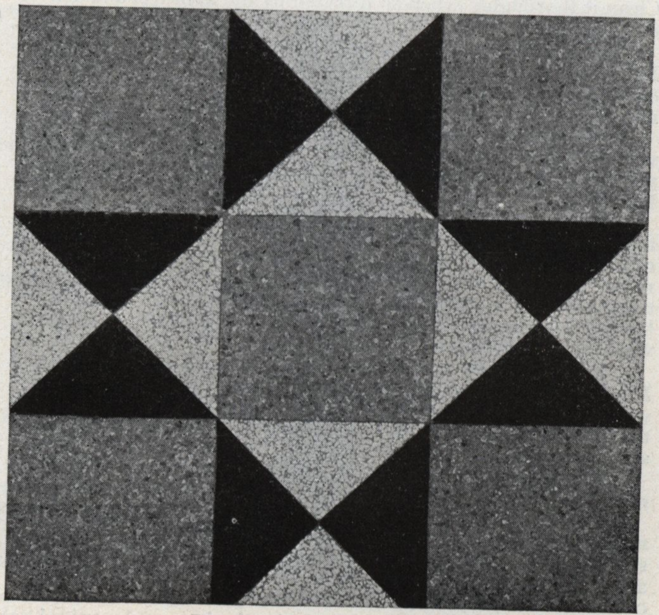
Section of Terrazzo Floor



Davis Dividing Strips

References

Federal Reserve Bank, Plaza Hotel, R. H. Macy & Co., New York; Bellevue-Stratford Hotel, Land Title Building, Philadelphia; Public Library, Peoples Gas Building, Chicago; Ambassador Hotel, Ritz-Carlton Hotel, Atlantic City.



Detail of Terrazzo Floor

THE TRAITEL MARBLE CO.

Manufacturers of The T. M. C. Lock or Bonding Strips

LONG ISLAND CITY, N. Y.

Member of the National Terrazzo and Mosaic Contractors Association

Product

The T.M.C. Lock Strip, for Marble and Cement Aggregate Floors and for Walls and Cement Wearing Surfaces. Patents granted as follows:
March 15, 1921—No. 1371857
April 10, 1923—No. 1451491
April 29, 1924—No. 15824

T.M.C LOCKSTRIP

Registered—No. 143837
June 7, 1921

Cloisonn-A—"The Floor Without a Flaw"

Cloisonn-A is a floor of marble and cement aggregate inlaid within the T.M.C. Lock Strip, by means of which floors of any design and any colors obtainable in marble may be produced.

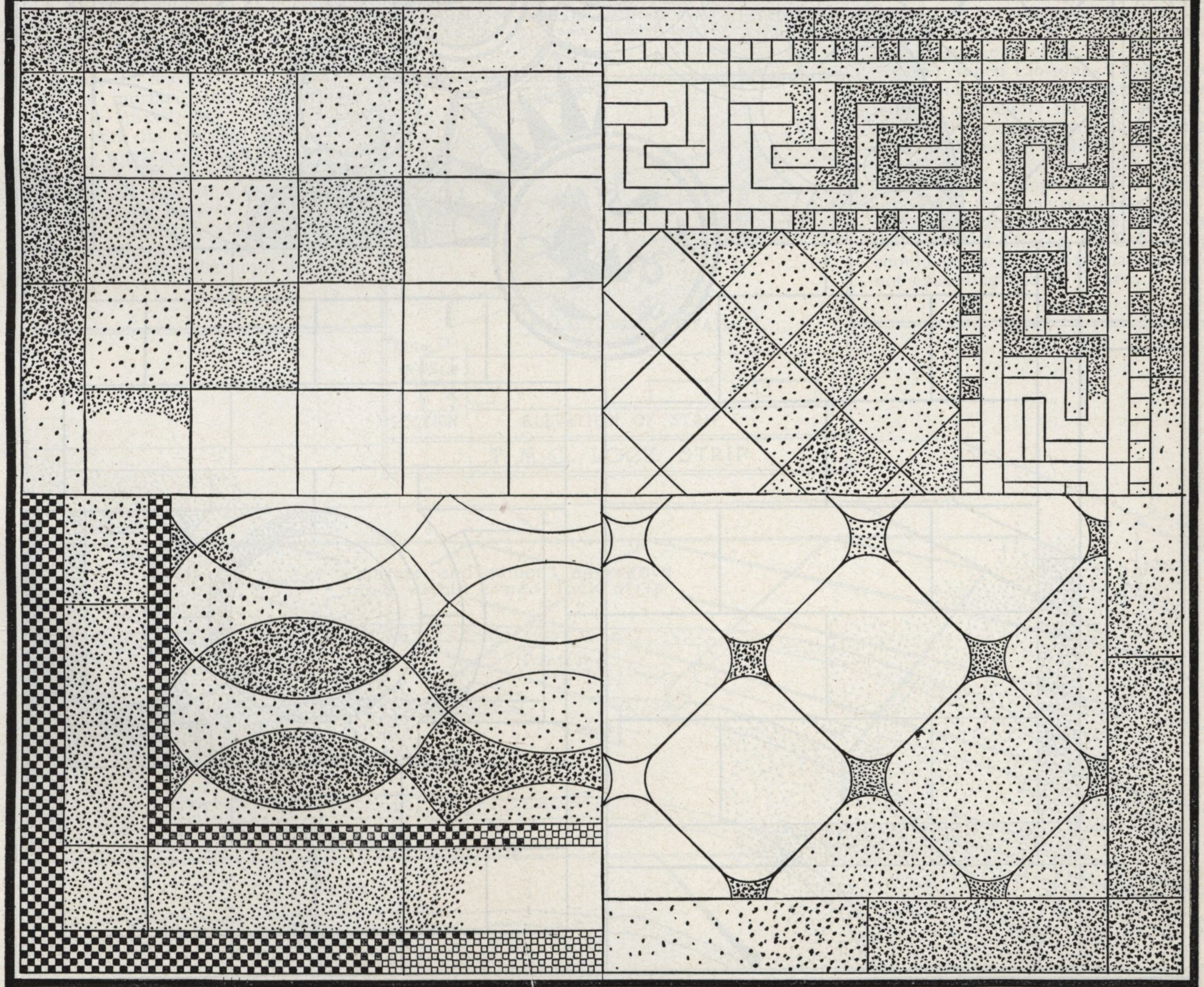
T.M.C. Lock Strip is economical to use, as it renders wood framing strips unnecessary. All the panels of a floor, regardless of color, can be laid at the same time, preventing delay. The use of T.M.C. Lock Strip permits surfacing of floors of a uniformly hard surface, prevents breaking of edges, and in general gives better results. Cost is reduced materially, and pattern work made commercially possible.

The T.M.C. Lock Strip is of brass and vertically rigid, but horizontally it is sufficiently pliable to permit its conforming to practically any shape desired for the figures which form the design. Since the upper edge of the strip is flush with the floor surface, it contributes a pleasing outline to the figures, suggestive in color and tone of golden thread.

The T.M.C. Lock Strip reinforcement eliminates cracking, with the possible exception at the point of least resistance—the cement plug passing through the lock. This plug, covered by the flanges, may crack, but remains invisible, as it does not break through the upper layer of marble aggregate and across the surface of the floor.

The wearing properties of marble and cement aggregates are much greater than those of marble or cement alone. Expense of upkeep and cleaning is less for Cloisonn-A than for any other kind of flooring. Hand scrubbing is not necessary as with encaustic tiles. Repairing is practically eliminated as there is nothing to get loose, the Lock Strip tying all the panels together.

As a sanitary flooring, Cloisonn-A has no superior, and of greater importance are its almost soundproof qualities.



CLOISONN-A
Registered Trade-mark
May 31, 1924—
No. 143497

THE TRAITEL MARBLE CO.
STANDARD DESIGNS OF T.M.C. LOCKSTRIP IN CLOISONN-A FLOORS

THE FLOOR
WITHOUT A FLAW
Registered Trade-mark
Feb. 10, 1923—No. 184417

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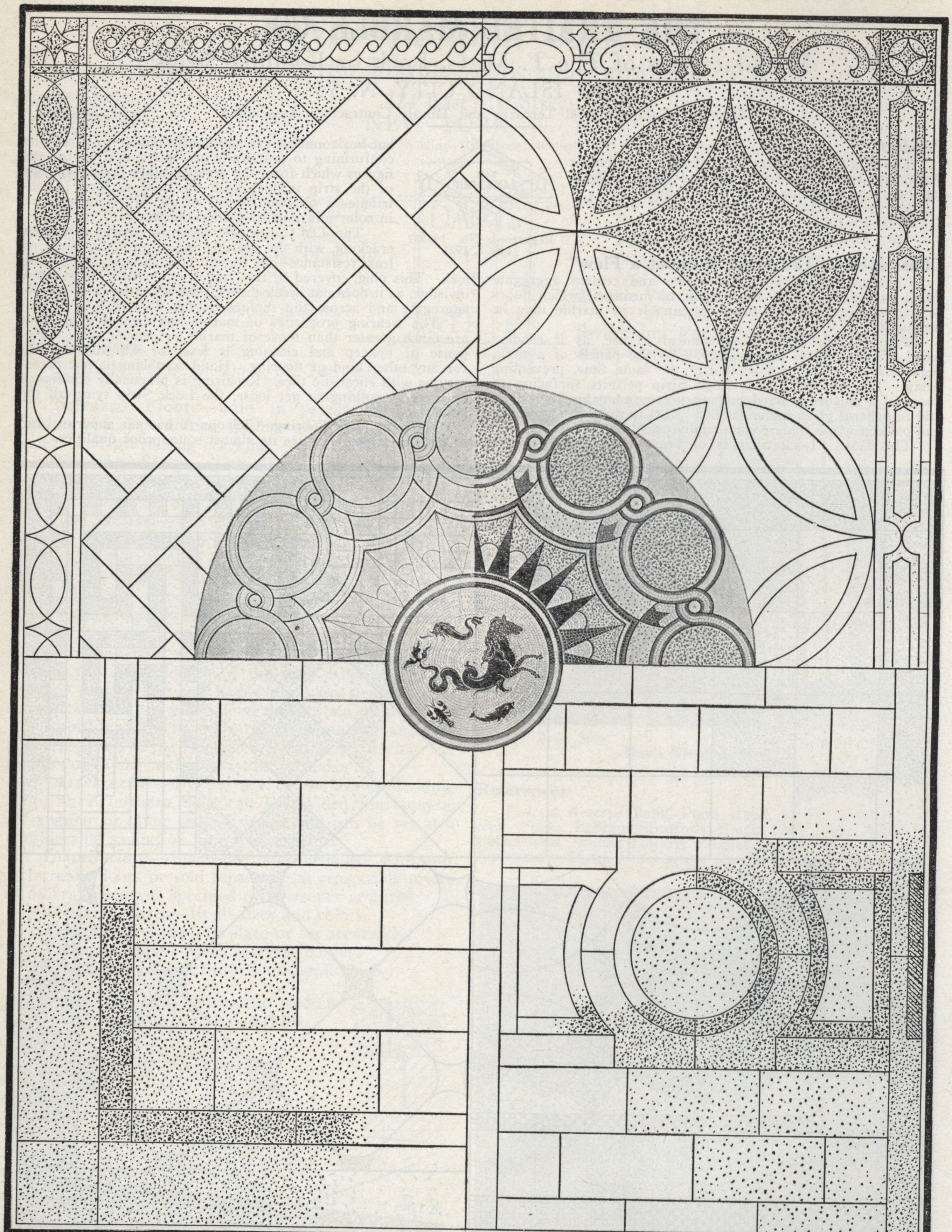


CLOISONN-A
Registered Trade-mark
May 31, 1924—
No. 143497

THE TRAITEL MARBLE CO.

ILLUSTRATING FLEXIBILITY OF T.M.C LOCKSTRIP IN CLOISONN-A FLOORS

THE FLOOR
WITHOUT A FLAW
Registered Trade-mark
Feb. 10, 1923—No. 184417

Continued on next page

Special Aggregates

By the use of special aggregates we produce antislip floors, hard and durable, particularly suitable for public buildings, railroad stations, ramps, etc., in connection with any desired marble.

How Furnished

T.M.C. Lock Strips are sold in any length desired and any contractor can purchase and install T.M.C. Lock Strip.

Specifications for Cloisonn-A Floors

(1) A properly concreted floor, finished to within 1½ in. of the finished level of the floor to be installed, shall be provided under another contract.

(2) Upon the concrete lay a ⅞-in. screed coat composed of: 1 part portland cement and 4 parts sharp screened sand, free from loam.

While this screed coat is still plastic, install T.M.C. Lock Strip as manufactured by The Traitel Marble Co., Webster Avenue and East River, Long Island City, N. Y., which shall be properly bonded by the use of a regular setting edge made for this purpose. The Lock Strip shall form panels or designs of such dimensions as indicated on plans.

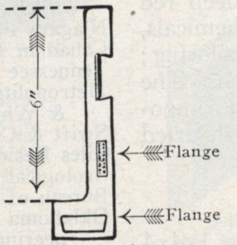
(3) The finished surface shall be spread not less than ⅝ inch in thickness, of such marble and of such sizes of aggregates as to most nearly produce the effect of the natural marble of colors hereinafter specified.

An approved brand of portland cement shall be used of a light shade with such mineral mortar stains (not to exceed 3 lb. per sack of cement) as may be required to produce the shade to match the marble.

The mortar color and cement shall be mixed dry before being mixed with the crushed marble.

The aggregate shall be in proportion of 200 lb. of marble chips to 100 lb. of cement, well mixed dry before adding water.

This aggregate shall be spread evenly level with the top edge of the Lock Strip and rolled until perfectly compact.



THE ONLY BASE LOCK STRIP MANUFACTURED

Note: Base Lock Strips permit a continuation of the floor joint in the base itself, an added insurance against cracking.

It shall then be troweled to an even surface leaving the top edge of the Lock Strip visible.

(4) The grinding or rubbing of these floors must not be started until, within the judgment of the terrazzo contractor, the cement binder has set sufficiently to permit of this without dragging or defacing the finished surface.

(5) It shall then be machine rubbed until the surface shows not less than 80% marble aggregate, after which it shall be grouted with liquid cement, which shall be permitted to remain until other trades are out of the building.

It shall then be machine cleaned with fine grit and waxed.

Note: All pipes and conduits must be laid close to the floor arches and securely fastened, and so arranged as not to cross or overlap each other or project above sand cushion or concrete.

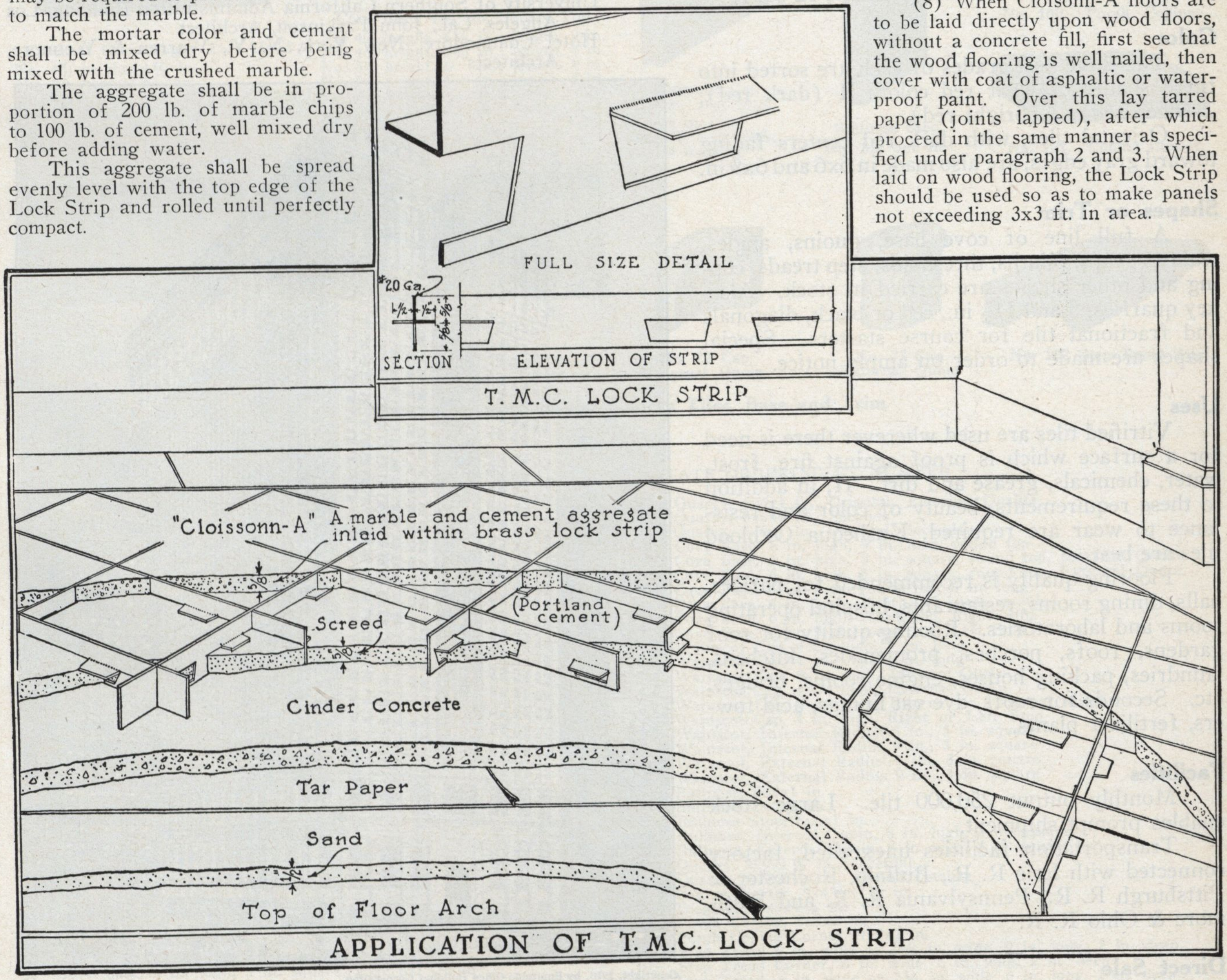
Base—(6) All pipes shall project at top ¼ in. beyond finished plaster line unless otherwise specified.

This contractor shall apply a screed of portland cement to walls at back of base and shall run base to a wood ground set by another contractor to the specified height above finished floor line. It shall be divided into sections not to exceed 5 ft. in length, with T.M.C. Cove Base Lock Strip forms having cove at floor line of ½-in. radius.

(7) *Optional:* In buildings where much vibration or expansion and contraction from steel work is anticipated, the contractor shall first cover the floor arches with a layer of sand ½ inch in thickness, protecting this with a layer of tarred paper before placing the concrete fill to the required level to receive the finished flooring.

This will assist in eliminating any cracking over the steel beams, or movement of the flooring from expansion and contraction of the steel work. See illustration below.

(8) When Cloisonn-A floors are to be laid directly upon wood floors, without a concrete fill, first see that the wood flooring is well nailed, then cover with coat of asphaltic or waterproof paint. Over this lay tarred paper (joints lapped), after which proceed in the same manner as specified under paragraph 2 and 3. When laid on wood flooring, the Lock Strip should be used so as to make panels not exceeding 3x3 ft. in area.



T. M.C. LOCK STRIP

APPLICATION OF T.M.C. LOCK STRIP

KUSHEQUA KERAMIC COMPANY

ELISHA K. KANE, LESSEE

Manufacturer of Oxblood Floor and Roof Tiles

KUSHEQUA, PA.

Products

Kushequa Promenade and Quarry Floor and Roof Tiles; Cove Base and Wainscot Trim.

Oxblood Tiles

Oxblood tiles show superiority in clear, deep red color, density, imperviousness, resistance to chemicals, strength and neat finish. No artificial glaze or coloring; uniform substance and color from face to back. The material is a stratified mountain shale of uniform composition. It is ground very fine, thoroughly pugged, dried and highly vitrified.

Size and Grading

Oxblood tiles are made in five principal sizes, 1x4x4 in., 1x6x6 in., 1x6x9 in., 1⅛x9x9 in., and 1$\frac{3}{16}$x12x12 in. There are four grades: Choicest or Flooring Quality (very fine); Competitive or Roofing Quality (for floors or best roofs); Seconds (for roofs or cheap floors) and Thirds (for covering concrete, etc.).

When crated, each crate contains 12 sq. ft.

Color

The three best grades of each are sorted into three shades of clear red color: 1 (dark red), 2 (deep red), 3 (bright red).

Oriental tiles, with dark red centers fading toward gray edges, are also made in 6x6 and 6x9 in.

Shapes or Trim

A full line of cove base, quoins, angles, wainscot caps, plinths, thresholds, step treads, coping and other shapes are carried in stock. Also, key quarries, 3 and 1½ in., red or black, diagonals and fractional tile for course starters. Special shapes are made to order on ample notice.

Uses

Vitrified tiles are used wherever there is need for a surface which is proof against fire, frost, water, chemicals, grease and dirt. If, in addition to these requirements, beauty of color and resistance to wear are required, Kushequa Oxblood tiles are best.

Flooring quality is recommended for parlors, halls, dining rooms, restaurants, hospital operating rooms and laboratories. Roofing quality for roof gardens, roofs, porches, promenades, kitchens, laundries, packing houses, engine rooms, bridges, etc. Seconds for roofs, dye vat linings, acid towers, fertilizer plants.

Facilities

Monthly output 250,000 tile. Large stock enables prompt shipment.

Transportation facilities unexcelled, factory connected with Erie R. R., Buffalo, Rochester & Pittsburgh R. R., Pennsylvania R. R. and Baltimore & Ohio R. R.

Direct Sale

Although represented in principal cities by capable wholesale dealers, customers who so desire may buy direct at open published prices. There will be a reasonable discrimination in favor of tile setters and dealers.

References

- Stock Yards Inn, Chicago, Ill., R. L. Lindstrom, Architect
- Engineering Laboratory, University of Michigan, Ann Arbor, Mich., Smith, Hinchman & Gryllis, Architects
- Niagara Falls Bridges, Niagara Falls, N. Y.
- Canadian Pacific Hotels, Edmonton and Laggan, Alta.
- Tennessee Coal and Iron & Railroad Co., Fairfield, Ala.
- Metropolitan Museum of Art, New York, N. Y., McKim, Mead & White, Architects
- Swift & Co., Packing House, Montreal, Que.
- Giles Residence, Orlando, Fla., L. Percival Hutton, Architect
- Geological Building, Interior Department, Washington, D. C.
- Bureau of Engraving and Printing, Washington, D. C.
- Oklahoma General Power Co., Reinach, Okla., Byllesby Engineering & Management Corp.
- Rockefeller Institute, East 64th Street, New York, N. Y., Shepley, Rutan & Coolidge, Architects
- High School, Waterbury, Conn., Griggs & Hunt, Architects
- St. Augustine's Church, Convent and School, San Juan, P. R.
- Broadmoor Hotel, Colorado Springs, Colo.
- Pennsylvania Hotel, 33rd Street and 7th Avenue, New York, N. Y., McKim, Mead & White, Architects
- University of Southern California Administration Building, Los Angeles, Cal., John Parkinson, Architect
- Hotel Commodore, New York, N. Y., Warren & Wetmore, Architects

Copyright, 1916, by Equitable Office Building Corporation

Equitable Building, New York, N. Y.

Graham-Burnham, Architects

Roofed with Kushequa Promenade Tile

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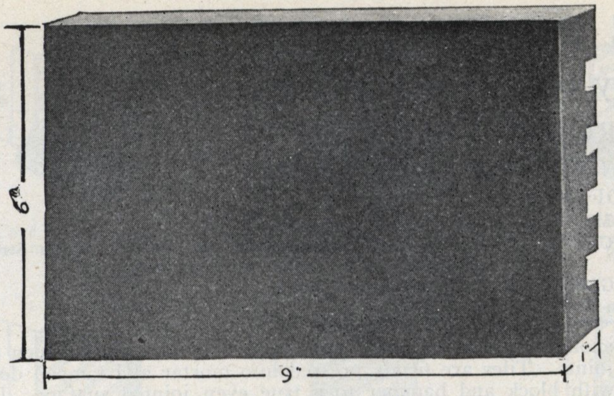
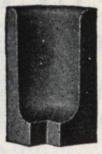
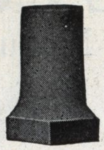


Oxblood Promenade Tile

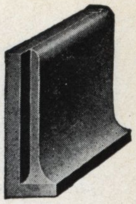
Straight Sizes	Fractional Sizes
Nos. 9 and 92, 9x9 in.	No. 99 Diagonal, 9x9 in.
Nos. 1, 10, 11, 12, 13 and 14, 6x9 in.	No. 26 Diagonal, 6x6 in.
Nos. 6, 60, 61 and 62, 6x6 in.	No. 95 Starter, 9x4½ in.
Nos. 3 and 22, 3x3 in.	No. 24 Starter, 6x4½ in.
Nos. 2 and 20, 1½x1½ in.	No. 23 Starter, 6x3 in.



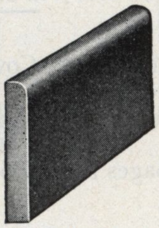
Internal Quoin
No. 64, height, 6 in.
No. 54, height, 6 in.
No. 34, height, 3 in.



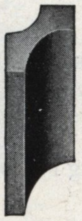
External Quoin
No. 65, height, 6 in.
No. 55, height, 6 in.
No. 35, height, 3 in.



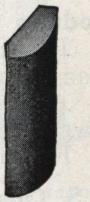
No. 58, Right Stop
No. 59, Left Stop
No. 68, Right Stop
No. 69, Left Stop



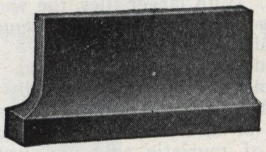
Bullnose
No. 80, 6x9 in.
No. 81, 6x6 in.



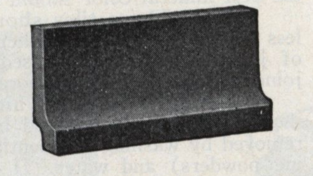
Internal Radius
No. 76, 6 in.
No. 77, 9 in.



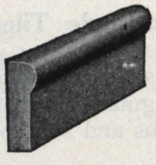
External Radius
No. 78, 6 in.
No. 79, 9 in.



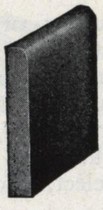
External Cove Angle, Left Hand
No. 43, height, 4½ in.
No. 53, height, 6 in.
No. 42, height, 4½ in., Right Hand
No. 52, height, 6 in., Right Hand



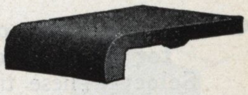
Cove Base, 4½ in., Square Top
No. 40, height, 4½ in.; length, 9 in.
No. 46, height, 4½ in.; length, 6 in.
No. 50, height, 6 in.; length, 9 in.
No. 56, height, 6 in.; length, 6 in.
No. 30, height, 3 in.; length, 9 in.
No. 36, height, 3 in.; length, 6 in.



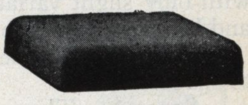
Wainscot Cap
No. 70, 4 in. high, 9 in. long
No. 71, 4 in. high, 6 in. long



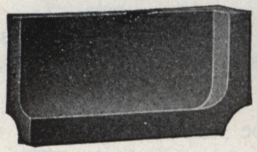
Bullnose Stop
No. 82, 6x6 in.



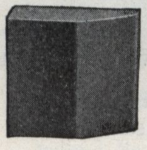
No. 100. Porch Coping



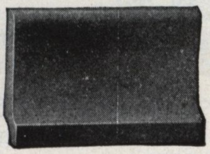
No. 101. Coping Corner



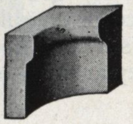
Internal Cove Angle
No. 41, height, 4½ in.
No. 51, height, 6 in.



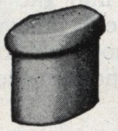
Square Plinth
No. 57, height, 6 in.
No. 47, height, 4½ in.
No. 67, Rounded



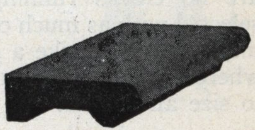
Cove Base, 6 in., Round Top
No. 63, length, 9 in.
No. 66, length, 6 in.



No. 72 Cap
Internal Quoin



No. 73 Cap
External Quoin



No. 102 Step Tread Tile

Kushequa Promenade and Quarry Tiles, Base and Trim

NUMERICAL LIST OF ABOVE TO FACILITATE ORDERING BY NUMBER

1	Promenade Tile, 6x9x1 in., Flooring Quality
2	Key Quarry, 1½x1½x1 in., Flooring Quality
3	Key Quarry, 3x3x1 in., Flooring Quality
4	Key Quarry, 4x4x1 in., Flooring Quality
6	Quarry, 6x6x1 in., Flooring Quality
9	Quarry, 9x9x1⅛ in., Flooring Quality
10	Promenade Tile, Oriental, Flooring Quality
11	Promenade Tile, Roofing Quality
12	Promenade Tile, Second Quality
13	Promenade Tile, Third Quality
14	Promenade Tile, Oriental, Seconds
20	Key Quarry, 1½x1½x1 in., Blackish
22	Key Quarry, 3x3x1 in., Blackish
23	Course Starter, 6x3x1 in.
24	Course Starter, 6x4½x1 in.
25	Course Starter, 3x9x1 in.
26	Diagonal, 6x6x1 in.
30	Cove, 3 in. high, square top, 9 in. long
34	Cove, 3 in. high, 3 in. square, Internal Quoin
35	Cove, 3 in. high, 3 in. square, External Quoin
36	Cove, 3 in. high, square top, 6 in. long
40	Cove Base, 4½ in. high, square top, 9 in. long
41	Cove Base, 4½ in. high, square top, Internal Angle
42	Cove Base, 4½ in. high, square top, External Angle, Right Hand
43	Cove Base, 4½ in. high, square top, External Angle, Left Hand
46	Cove Base, 4½ in. high, square top, 6 in. long
47	Cove Base, 4½ in. high, square top, Plinth
50	Cove Base, 6 in. high, square top, 9 in. long
51	Cove Base, 6 in. high, square top, Internal Angle
52	Cove Base, 6 in. high, square top, External Angle, Right Hand
53	Cove Base, 6 in. high, square top, External Angle, Left Hand
54	Cove Base, 6 in. high, 3 in. square, Internal Quoin
55	Cove Base, 6 in. high, 3 in. square, External Quoin
56	Cove Base, 6 in. high, square top, 6 in. long
57	Cove Base, 6 in. high, square top, Plinth
58	Cove Base, 6 in. high, square top, Right Stop
59	Cove Base, 6 in. high, square top, Left Stop
60	Quarry, 6x6x1 in., Oriental, Flooring Quality
61	Quarry, 6x6x1 in., Seconds
62	Quarry, 6x6x1 in., Oriental, Seconds
63	Cove Base, 6 in. high, 9 in. long, round top
64	Cove Base, 6 in. high, 3 in. square, round top, Internal Quoin
65	Cove Base, 6 in. high, 3 in. square, round top, External Quoin
66	Cove Base, 6 in. high, round top, 6 in. long
67	Cove Base, 6 in. high, Plinth, all edges rounded
68	Cove Base, 6 in. high, round top, Right Stop
69	Cove Base, 6 in. high, round top, Left Stop
70	Wainscot Cap, 4 in. high, 9 in. long
71	Wainscot Cap, 4 in. high, 6 in. long
72	Wainscot Cap, 4 in. high, Internal Quoin
73	Wainscot Cap, 4 in. high, External Quoin
74	Wainscot Cap, 4 in. high, Internal or External Miter
75	Wainscot Cap, 4 in. high, Right or Left Stop
76	Wainscot, Internal Radius 6 in., 3 in. square
77	Wainscot, Internal Radius 9 in., 3 in. square
78	Wainscot, External Radius 6 in., 3 in. square
79	Wainscot, External Radius 9 in., 3 in. square
80	Bullnose, 6x9x1 in.
81	Bullnose, 6x6x1 in.
82	Bullnose Stop, 6x6x1 in.
83	Bullnose, Internal Quoin, 6 in. high, 3 in. square
84	Bullnose, External Quoin, 6 in. high, 3 in. square
90	Quarry, 9x9x1⅛ in., Oriental
92	Quarry, 9x9x1⅛ in., Second Quality
95	Course Starter, 9x4½x1⅛ in.
99	Diagonal, 9x9x1⅛ in.
100	Porch Coping, 6x9x2 in.
101	Porch Coping Corner, 9x9x2 in.
102	Step Tread 6 in. wide or 7½ in. wide, 9 in. long, 2 in. deep
103	Step Tread Corner, 6 in. wide, 6 in. long, 2 in. deep
106	Step Tread, 6 in. wide or 7½ in. wide, 6 in. long, 2 in. deep
120	Quarry Tile, 12x12x1 3/16 in., Flooring Quality
121	Quarry Tile, 12x12x1 3/16 in., Second Quality
125	Threshold Tile, 7 in. wide, 9 in. long, 1¾ in. deep at middle

THE UNITED STATES ROOFING TILE CO.

Manufacturers of Quarry or Promenade Tiles

PARKERSBURG, W. VA.

FACTORIES: PARKERSBURG, W. VA., EAST SPARTA, OHIO

BRANCH OFFICES

NEW YORK, N. Y., W. B. Cherry (Floor Grade), 432 Hudson Terminal Building; David Levow (Roofing Grade), 542 West 23rd Street
PHILADELPHIA, PA., Rosse Clay Products Corp., 2315 Walnut Street
BALTIMORE, MD., B. A. Stone, 934 Chauncey Avenue
MT. VERNON, OHIO, H. G. Beam
CHICAGO, ILL., J. T. Williams, Room 800, 59 East Adams Street; F. R. Matson, Room 1036, 122 So. Michigan Boulevard
GLENDALE, CAL., Gladding, McBean Co.
CLEVELAND, OHIO, J. A. Gillette, Room 220, 5005 Euclid Avenue

Products

Floor Tiles; Quarry or Promenade Tiles; Cove Base, Wainscot Cap, Angles, Stops, etc.

Also manufacturers of Stair Treads and Acid Tower Lining.

For Tiles for Roofing Purposes, see pages 1064-1065.

U. S. Quarry Tiles

Material—Made from shale by modern methods, resulting in a perfect product with low absorption.

Colors—Made in rich, natural reds, ivory, gray and brown.

Grades and Uses of Quarry or Promenade Tiles for Floors and Flat Roofs

Select—These tiles are sound and solid in every particular. Approximately, level and regular in lines with only slight variation in lengths, widths and shades, and lay up well in floor work.

Standard—Same as Select, assorted to size, but not to shade.

Seconds—These tiles are those rejected from our Select and Standard grades. The imperfections consist of slightly broken corners and chipped edges. There are no cracks running into the tiles. They are not selected with as much care as to level surface and regular lines, but will make a good roof, or a satisfactory floor where first class tiles are not required. They are selected to size and shade.

Specifications and Instructions

General—A good foundation is always necessary and should be solid and perfectly level, free from spring or vibration. Tile must be laid upon a concrete foundation, prepared from the best quality portland cement and clean, sharp, washed sand and gravel. Cinders, if used, should have ashes screened out and the vitrified cinder or clinker thoroughly washed (sulphur in cinders will destroy the reinforcing in concrete). Concrete should be allowed to harden thoroughly before laying floor; thoroughly brushed to remove all dust; well soaked with water, dusting on concrete thin coat of pure portland cement before applying cement mortar for laying tile. Concrete should never be allowed to stand more than 3 or 4 days before laying tile.

Lime Mortar—Lime mortar should never be mixed with concrete.

Concrete—Concrete to consist of 1 part portland cement, 3 parts clean, washed, sharp sand, 4 parts clean gravel, clean, fine broken stone, or cinders free from ashes. Mix cement and sand thoroughly dry, add gravel or broken stone and mix, adding sufficient water to form, when laid, a hard, solid mass when well beaten to a bed. Bed should not be less than 3 in. thick. Surface of concrete must be level and finished within 2 in. of finished floor line (1½ in. when ½-in. tiles are used), which will leave space of 1 in. for cement mortar.

Cement Mortar—Cement mortar to consist of 1 part best quality portland cement, 3 parts clean, washed, sharp sand, thoroughly mixed as directed for concrete. All mortar to be used fresh, before it has its initial setting.

Laying Tiles—Tiles must be soaked in water not less than ½ hour before being placed upon mortar which must be stiff enough to hold weight of tiles and not work up between the joints. Tiles are firmly pressed into mortar and tamped down with block and hammer to a true even jointed surface. Lay tiles with smooth edges running the same way.

Grouting—When cement is sufficiently set, which should be in about 1 day, floor should be well scrubbed with clean water and broom, and joints grouted flush with cement grout to consist of 2 parts best quality portland cement and 1 part clean, washed, sharp sand. Before grouting, rub face of tiles with oily waste to facilitate cleaning. When grouting is colored, only the best mineral color should be used.

Joints—These tiles should never be laid with joints of less than ¼ in. for the smaller tiles. With larger tiles, the width of joints should be increased proportionately. Natural cement joints are preferable and more durable.

Cleaning Tiles—A white scum sometimes appears on the surface of tiles, caused by cement. This can generally be removed by washing frequently with Wyandot (or similar cleaning powders) and water. If scum or dirt can not be removed by washing, then use a solution of muriatic acid and water (1 pt. of acid to a wooden bucket of water) applied with scrubbing brush. Allow acid to remain on floor for a few seconds only, then thoroughly wash off.

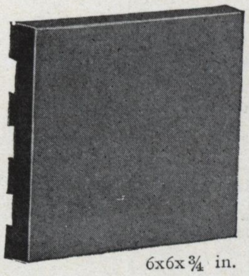
To Brighen Floors—Saturate a clean cloth with equal parts of raw linseed oil and turpentine. Rub well over surface of tiles and wipe dry with clean cotton cloth.

Facilities

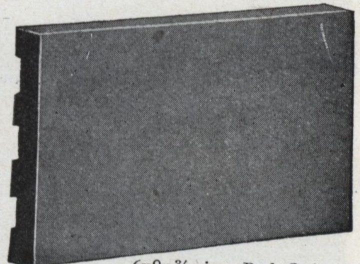
This company operates two factories and carries large stocks from which prompt shipment can be made.

Catalogue and Samples

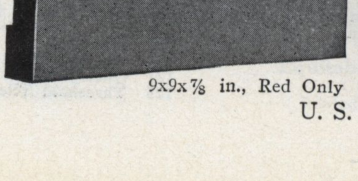
Catalogue and samples will be sent on request.



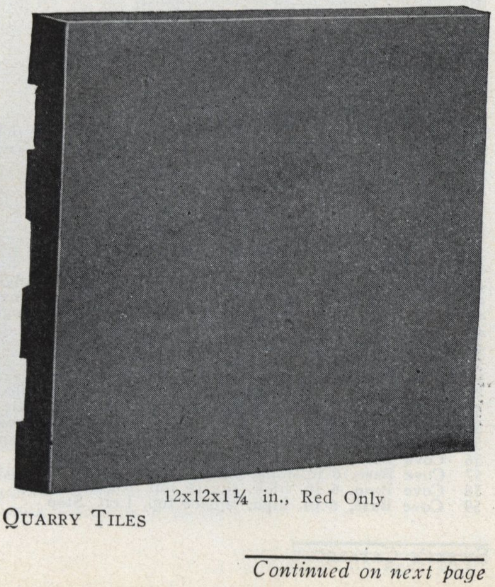
6x6x¾ in.



6x9x¾ in., Red Only



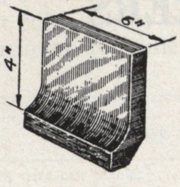
9x9x⅞ in., Red Only



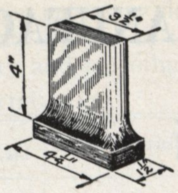
12x12x1¼ in., Red Only

U. S. Quarry Tiles

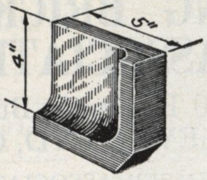
Continued on next page



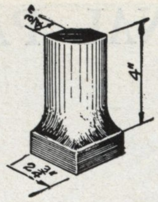
Cove Base No. 1
Also made 9 in. long



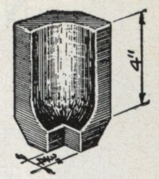
Cove Base Angle
External No. 2
Right



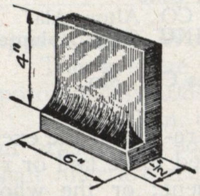
Cove Base Angle
Internal No. 3
Right



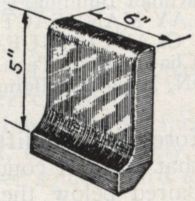
Cove Base Angle
External No. 4
2-in. radius on face



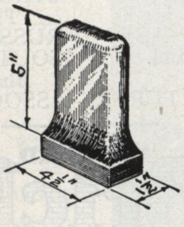
Cove Base Angle
Internal No. 5
2-in. radius on face



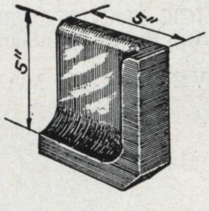
Left Door Stop for
Cove Base No. 1



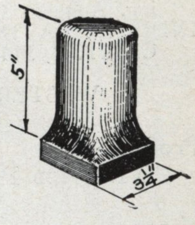
Cove Base No. 11
Also made 9 in. long



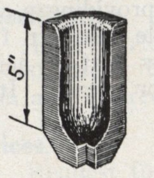
Cove Base Angle
External No. 12
Right



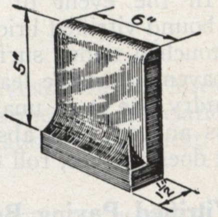
Cove Base Angle
Internal No. 13
Right



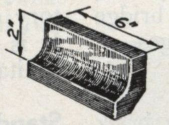
Cove Base Angle
External No. 14
2½-in. radius on face



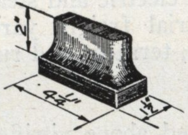
Cove Base Angle
Internal No. 15
1½-in. radius on face



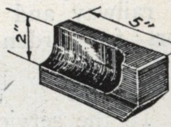
Left Door Stop for
Cove Base No. 11



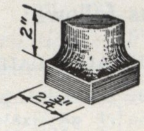
Cove Base No. 31
Also made 9 in. long



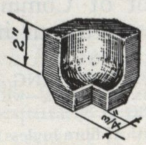
Cove Base Angle
External No. 32
Right



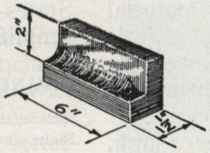
Cove Base Angle
Internal No. 33
Right



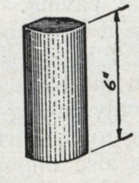
Cove Base Angle
External No. 34
2-in. radius on face



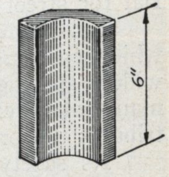
Cove Base Angle
Internal No. 35
2-in. radius on face



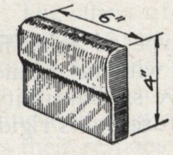
Left Door Stop for
Cove Base No. 31



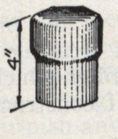
Wainscot Angle
External No. 6



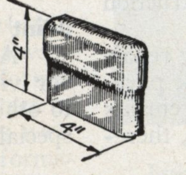
Wainscot Angle
Internal No. 7



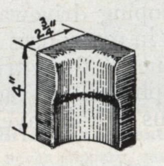
Wainscot Cap No. 10



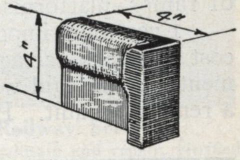
Wainscot Cap Angle
External No. 8
2-in. radius on face



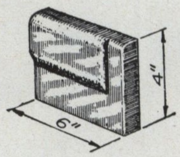
Wainscot Cap Angle
External No. 18
¾-in. radius at corner
Right



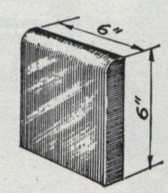
Wainscot Cap Angle
Internal No. 9
2-in. radius on face



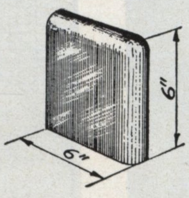
Wainscot Cap Angle
Internal No. 19
Square Corner
Right



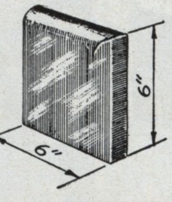
Left Stop for Wainscot
Cap No. 10



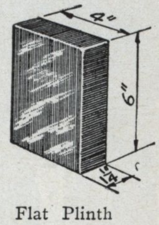
Bullnose Tile
Made in various sizes



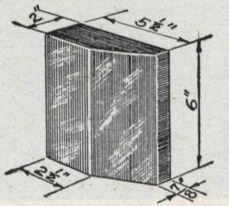
External Base Angles
for Bullnose Tiles



Internal Base Angles
for Bullnose Tiles

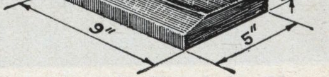


Flat Plinth



Beveled Plinth

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK N.Y. EST. 1915



Threshold Tile

Specimens of U. S. Quarry Tile Trimmings

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION

830 Engineers Building
CLEVELAND, OHIO

MEMBER ASSOCIATIONS

EASTERN PAVING BRICK MANUFACTURERS ASSOCIATION, Lincoln Building, Philadelphia, Pa.
GEORGIA VITRIFIED BRICK & CLAY CO., Lamar Building, Augusta, Ga.
INDIANA PAVING BRICK MANUFACTURERS ASSOCIATION, Fidelity Trust Building, Indianapolis, Ind.
MIDWEST PAVING BRICK MANUFACTURERS ASSOCIATION, Straus Building, Chicago, Ill.
OHIO PAVING BRICK MANUFACTURERS ASSOCIATION, Hartman Building, Columbus, Ohio
RUSSELL CLAY MANUFACTURING CO., Alton, Ala.
SOUTHERN CLAY MANUFACTURING CO., Volunteer Building, Chattanooga, Tenn.
WESTERN PAVING BRICK MANUFACTURERS ASSOCIATION, Dwight Building, Kansas City, Mo.

Product

Vitrified Paving Brick.

VITRIFIED Brick PAVEMENTS OUTLAST THE BONDS

Uses

Vitrified paving brick is used architecturally for the wearing surfaces of driveways, ramps and walks serving residences, public buildings, factories and foundries; for passenger and freight platforms in electric and steam railway use; for railway and industrial freight yards; for bridge floors; for garden walks, terraces and rustic bridges.

Advantages

To the services listed above vitrified paving brick brings the same resistance to the wear and tear of traffic which has proved it the most economical surfacing material for street and highway paving.

Furthermore, because it is the only paving material which possesses a richness of color and texture, it is widely specified solely on the basis of appearance. In many instances, it is the only paving surface which contributes the proper setting to the structure it serves.

Its safety feature is also important. The rough, heat-hardened texture is virtually "skidproof" and is thus a protection to pedestrians, horses and motor vehicles, a particularly valuable asset in the construction of ramps, platforms or sloping driveways.

Even more important in many uses is the low repair cost and high salvage value of the vitrified brick pavement. When laid with asphalt filler, each brick remains a removable unit. Portions of the pavement can, therefore, be easily lifted and re-laid in the event that pipes or conduits need to be laid or repaired below the pavement; or the whole pavement can be moved to another location with frequently 100% salvage of the brick. In the event of abusive traffic, asphalt-bound vitrified brick can be lifted and relaid with the untouched under surface up, providing a virtually new pavement at the least possible cost. In factory or foundry use it is unaffected by heat or acids. It is dustless and will not absorb oil or grease. It is sanitary. It does not rot, roll or crack.

Standard Vitrified Paving Brick

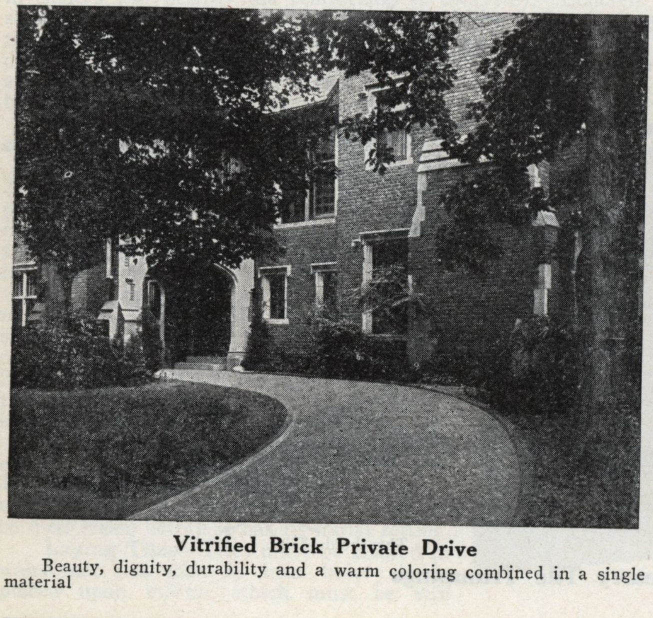
Selection of type should be made from the standard types of the Committee on Simplification of Variety and Standards for Vitrified Paving Brick of the United States Department of Commerce. Subject to further simplification, these are four in number, as follows:

STANDARD VITRIFIED PAVING BRICK (AS USUALLY LAID)
Dimensions in inches—width x depth x length

Plain wire-cut brick (vertical fibre lugless)	4 x3 x8½ 4 x3½ x8½
Repressed lug brick	3½x4 x8½
Wire-cut lug brick (Dunn)	3½x4 x8½

Joint Filler

Asphalt filler is the preferred type of joint filler for vitrified brick wearing surfaces, without prejudice to other types of filler which may have special utility in special instances of construction. Nature fights rigidity,



Vitrified Brick Private Drive

Beauty, dignity, durability and a warm coloring combined in a single material

Vitrified Brick in Industrial Service

Anti-rutting, anti-crumbling, anti-absorbent and dustless, vitrified brick meets the severest industrial requirements

Continued on next page

and asphalt filler provides the necessary flexibility without robbing the brick surface of any of its qualities of hardness, toughness, density and smoothness.

ESTIMATING DATA

Kind of brick	Laid	Depth of wearing surface	Number to lay 1 sq. yd.
Plain wire-cut brick:			
All sizes	Flat	3 and 3½ in.	36
3½ in. size	Edge	4 in.	40
Repressed lug brick:			
3½ in. size	Edge	4 in.	40
Wire-cut lug brick:			
All sizes	Edge	4 in.	40

Approximate Weights

The average weight of vitrified paving brick is approximately .084 lb. per cu. in.

With a 3-in. depth of wearing surface, plain wire-cut brick, filler squeegeed, approximately 12 lb. of asphalt filler are required per square yard and 14 lb. for the 3½-in. depth.

Up to 15 lb. of filler per square yard are required for lug brick in the 4-in. depth. Other depths about in proportion.

Specification

The NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, through its member associations, will furnish any desired specifications on request.

Prices

Request for price quotations made to any association listed above will be referred to individual manufacturers who will then submit prices.

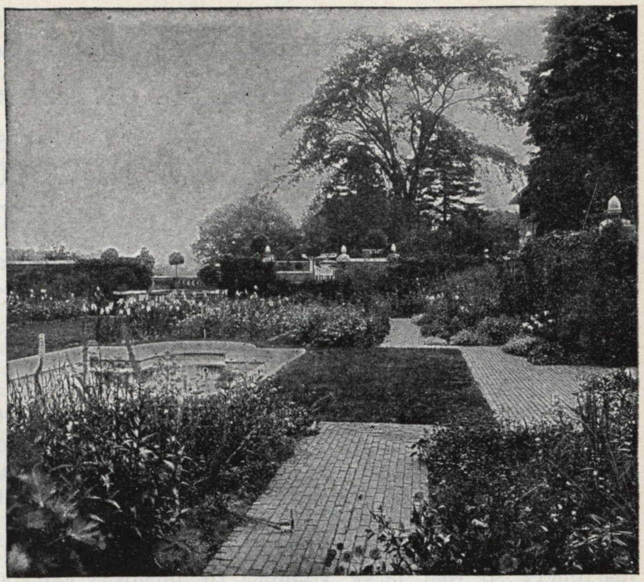
Free Handbook

The 92-page, fully illustrated data book, *"The Construction of Vitrified Brick Pavements,"* which includes recommended specifications, will be found helpful when approaching any project requiring a paving specification.

Free to architects on request if professional letterhead is used.

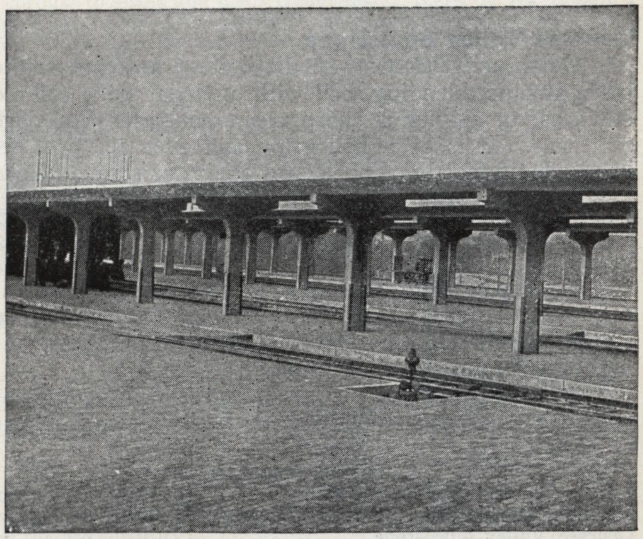
Co-operative Service

The offices of the NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION and its members are always ready to respond promptly to any request for information or personal consultation made by any architect or engineer in regard to vitrified paving brick and its uses. It is their responsibility to furnish any detailed information within their power and be as useful to any architect or engineer as the opportunity offers.



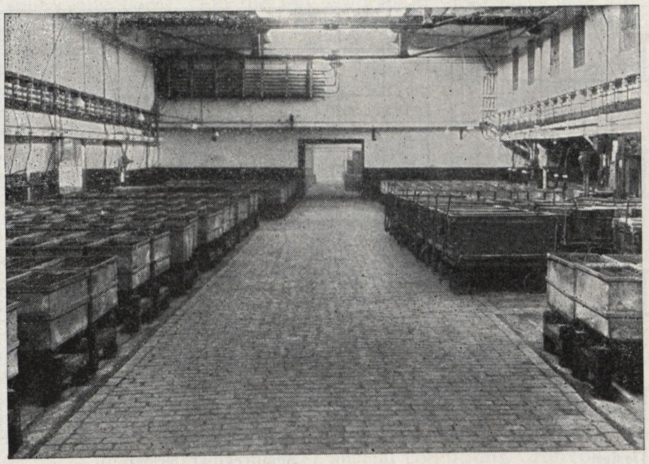
Vitrified Brick Walks Around the Home

Beauty of texture plus beauty of color plus the opportunity for interesting patterns. Paving brick harmonize with beautiful surroundings



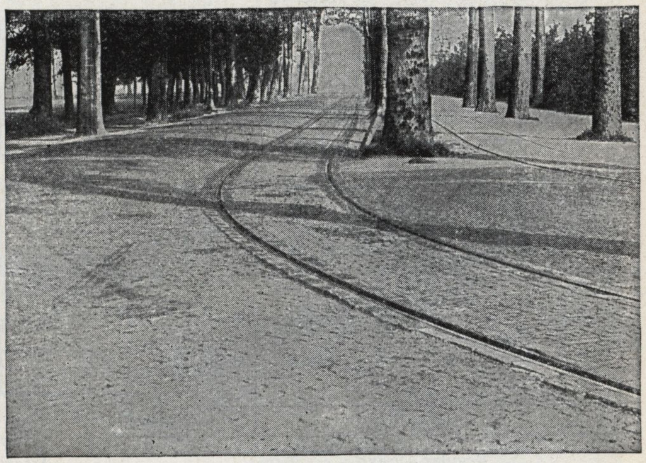
Vitrified Brick Pavements in Railway Service

Resisting abuse, never slippery, easy to maintain and repair, vitrified brick is the right choice for railroad platforms, ramps and freight yards



Vitrified Brick Pavement in Factory Service

Long life, low repair cost and a skidproof, non-absorbent, acidproof surface make vitrified brick the logical and foresighted selection



Selected by Napoleon

Holland boasts of brick pavements, still in use after more than a hundred years, built by order of Napoleon Bonaparte

AMERICAN BLUE STONE COMPANY

Producers of Genesee Valley Blue Stone

1 Madison Avenue
NEW YORK, N. Y.

QUARRIES AND MILLS
PORTAGEVILLE, (AMBLUCO), N. Y.

Products

Genesee Valley Blue Stone, a New York State Blue Stone for exterior and interior building construction.

Ambluco Blue Stone Flooring and Wall Base.

Facilities

This company was organized and opened its first quarry in 1899, now having well developed quarries on its own property of about 200 acres located at Ambluco, Wyoming County, N. Y. The blue stone is taken out to a depth of 100 ft. from the top of the ground.

Mills and yards are equipped with the most modern machinery so that large volumes of business can be shipped without delay. This blue stone is handled by dealers in principal cities east of the Mississippi River. Samples are displayed with the Architects Samples Corporation, 101 Park Ave., New York.

Genesee Valley Blue Stone

Color and Texture—A distinctive uniform shade of light blue, blending well with adjacent light colored surfaces, or giving a sharp clean contrast with dark materials. It is of a fine grain and even texture, being made up mostly of pure hard quartz as shown below.

Mineralogically Considered

Fine hard sand, mostly quartz	70%
Clay, as binding material	28%
Water	2%

Strength, Weight and Fire Resistance—Few, if any, stones have a greater crushing and transverse strength than this blue stone. Likewise, the stone has high tensile and shearing strengths.

The following table gives its crushing strength, as compiled from tests made by the United States Ordnance Department:

Crushing Strength

Rockport granite (Kidder's Hand Book)	17,750 lb. per sq. in.
Vermont marble	Average 13,500 lb. per sq. in.
Genesee Valley blue stone	19,970 lb. per sq. in.

Although of great density it weighs only approximately 150 lb. per cu. ft. when cut ready to set.

It offers great resistance to extreme heat.

Durability—Specimens of this blue stone have been critically and carefully analyzed by eminent mineralogists and pronounced one of the most durable of all stones. In abrasive tests it excels most other stones. Like all stones, it should be cut to set on its natural bed.

Chemical Analysis

Silica	76.50%
Alumina	14.75%
Oxide of iron	6.35%
Water	2.00%
	99.60%

Specification Suggestions for Exterior Use—It is essential that Genesee Valley Blue Stone be specified, and better to guard against the substitution of inferior blue stones, mention this company's name and address as producers.

Specifications should require all Blue Stone (as well as most other stones) to be thoroughly seasoned and to be cut so as to set on its natural bed, especially when used for grade courses.

The practical finishes, in order of their costs are: Sand sawed; rock face; wet sand rubbed; fine axed (6-cut); horizontally (machined) tooled; and vertically (hand) tooled. This blue stone also takes most any finish applied to a natural stone. The sand sawed finish, showing no saw marks, is very uniform and brings out the character of the stone. This is produced by a slow process and does not burn or bruise the surface of a stone as does planing and axing.

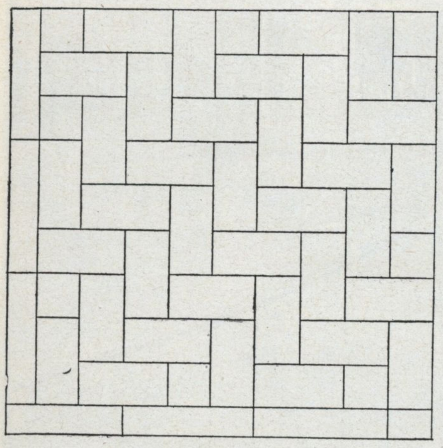
Ambluco Blue Stone Flooring and Wall Base

In Blue Stone flooring, quartz, the essential constituent, being harder than the accessory minerals, is pre-eminent on the wearing surface, which makes the floor slip proof and very durable. Besides the rust proof, non-porous, dustless and sanitary qualifications of this flooring, it is quiet to walk on. Sand sawed or rubbed finishes should be used. Suggested designs of flooring are shown below. In case of an irregular design it is advisable for economy to limit the number of sizes to five.

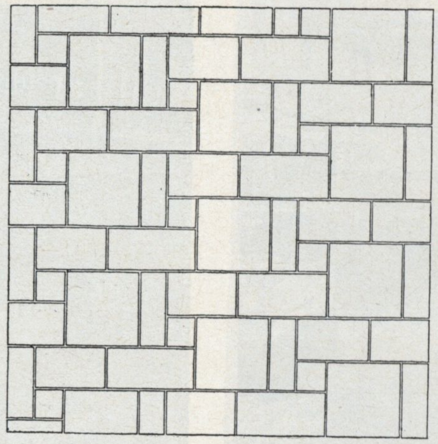
Ambluco Non-slip Stair treads are described on page 669.

Co-operative Service

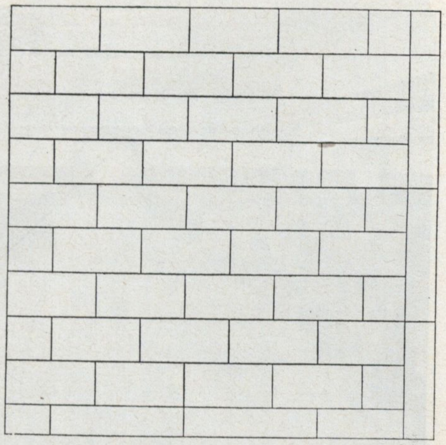
Our organization, through its members' lifelong experience with Blue Stone, offers its knowledge in an impartial manner, unbiased by thought of personal profit.



Regular Design
Oblong Blue Stone Slabs 24x12 **in.** laid with straight joints and transverse joints uniformly broken. Border of Blue Stone 8 in. wide



Irregular Design
Five different size Blue Stone slabs laid to a pattern with broken ¼-in. joints



Semi-regular Design
Oblong Blue Stone slabs laid herringbone. Border of Blue Stone 8 in. wide

Suggested Designs for Ambluco Flooring

CARTER BLOXONEND FLOORING CO.

KANSAS CITY, MO.

SALES OFFICES

NEW YORK, N. Y., 501 Fifth Avenue—Telephone, Murray Hill 0558
CHICAGO, ILL., 332 South Michigan Avenue—Telephone, Harrison 6491
CLEVELAND, OHIO, 1900 Euclid Avenue—Telephone, Prospect 403
WASHINGTON, D. C., 700 Insurance Building—Telephone, Main 1854
BOSTON, MASS., 910 Broad Exchange Building—Telephone, Main 0316
SAN FRANCISCO, CAL., 905 Hobart Building—Telephone, Garfield 522
DETROIT, MICH., 2511 First National Bank Building—Telephone, Cadillac 1294
ST. PAUL, MINN., 1561 Sherburne Avenue—Telephone, Midway 2915

Product

Bloxonend Flooring, a "Built-up" Wood Block Flooring (blocks anchored to base—not loose blocks).

Bloxonend—Wood Block Flooring

Uses—For heavy service floors in factories, warehouses, shipping rooms, shops, freight houses, textile mills, baggage and express cars, bakeries, gymnasiums (especially selected stock), schools, department stores, printing and publishing plants, elevator platforms, loading docks and all locations subjected to trucking (hand or power) or concentrated footwear—where practically everlasting smoothness is the desideratum.

Advantages—An installation of Bloxonend invariably convinces the user that it costs less per square foot, per year, than any other flooring on the market. Its use insures a durable, quiet, resilient, non-slip floor which practically eliminates repair costs, speeds up trucking and increases operating efficiency in general. Bloxonend is warm, quiet, clean, absorbs vibration, insulates and affords a soft bed for tools or materials dropped. It is slow wearing because the tough fibre ends are presented to wear; smooth wearing for the same reason and because the entire floor is formed into a compact composite unit with no loose blocks to kick out or break the regularity of the surface. Bloxonend has all the advantages of the best block pavement with the added advantage of lasting smoothness.

Construction—Built up at our plant in flooring sections approximately 8 ft. long (Fig. 1). Blocks of selected Southern pine, on end, are dovetailed to horizontal baseboards, presenting end of grain to wear, forming flooring sections which are milled to uniform height and grooved in the sides for heavy splines. Splines are used to break joints, to keep flooring sections in alignment and to secure smooth surface.

Size—Standard sections are built with 2-in. blocks dovetailed onto base made from 1-in. stock. When ready to ship, sections measure $2\frac{9}{16}$ in. thick by 3½-in. face, in lengths averaging over 7 ft. 6 in.

Application

(1) Over Concrete, Lateral Nailing, Standard (Fig. 2)—For laying over concrete (old or new) without nailing strips or wood subfloor, Bloxonend sections are furnished bored every 16 in. along the groove and with special nails positioned in countersunk bores. On the job, sections are assembled like any other tongued and grooved floor and positioned nails driven through spline into next section, drawing the sections together laterally into a compact, smooth surface. Concrete base must be straightedged, leveled and floated to a true horizontal plane and with no variations permissible in surface exceeding ⅛ in. Slab shall be mopped with a heavy coat of pitch. Joints between both sections and splines should be staggered. Leave sufficient expansion joints at walls, partitions and columns to take care of unusual expansion resulting from combination of atmospheric and occupational conditions.

Note: When necessary in old work to reconcile floor levels, or for any other special service, Bloxonend may be laid over and toe-nailed to wood strips of proper thickness spaced to meet conditions. Specifications for laying Bloxonend in gymnasiums, assembly rooms, armories and similar locations gladly furnished on request.

(2) Over Concrete, Alternate (Fig. 3)—For locations exposed to moisture, where the tendency to swell must be restrained: Bloxonend shall be laid at right angles on and nailed to beveled creosoted sleepers either bedded or laid over slab and filled flush with no depressions between sleepers. 2x4-in. sleepers at 11¾-in. centers are standard. Size of sleepers can be increased for extra heavy service or other special conditions. Bloxonend may be toe-nailed through base before inserting splines, or blind-nailed in groove with heavier nails where conditions require greater resistance. Nails should be of sufficient length to give utmost penetration without perforating sleepers. Use only cut flooring or casing nails. Pre-expansion of Bloxonend should be induced to meet unusual moisture conditions, and in all cases expansion joints should be left at walls, columns and curbs to safeguard against further expansion caused by unexpected combination of conditions not provided for in advance.

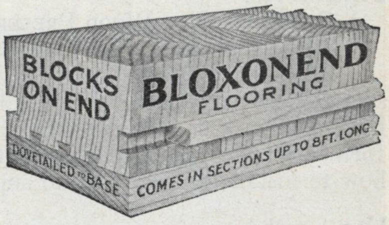


Fig. 1. Section of Bloxonend

(3) Over Wood Structure—Over joists or open sleepers, Bloxonend should be laid on substantial subfloor of proper thickness to furnish firm level support without deflection according to spans and loads contemplated, allowing for Bloxonend itself tensile strength of a good inch floor. Subfloor laid 15° off intended line of Bloxonend will prevent coincidence of longitudinal joints and preserve maximum strength and stiffness of both.

Treatment

For dry locations, Bloxonend is not creosoted but is treated with our standard dampproofer which is odorless and does not discolor the wood. For wet locations, we recommend treatment with a highly refined creosote oil of great toxic qualities, yet clean enough to be used in many places where ordinary creosote would be objectionable.

Special Information

Scarcely any two floors serve under exactly the same conditions. If the specifications given do not fully cover your requirements, write us advising areas to be covered, use of floors and nature of subfloor.

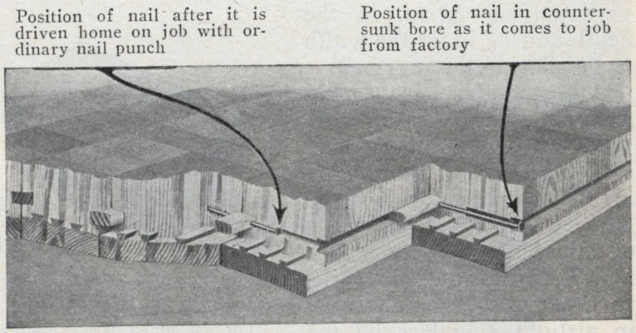

Position of nail after it is driven home on job with ordinary nail punch
Position of nail in countersunk bore as it comes to job from factory

Fig. 2. Bloxonend Laterally Nailed

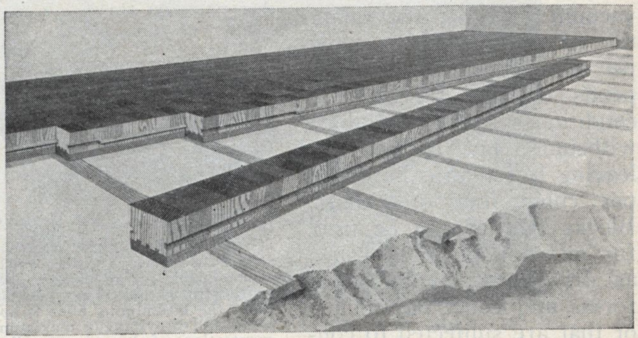


Fig. 3. Bloxonend on Beveled Sleepers in Concrete

THE JENNISON-WRIGHT COMPANY

Manufacturers of Kreolite Wood Block Floors

2480 Broadway
TOLEDO, OHIO

BRANCH OFFICES
BOSTON, MASS. DETROIT, MICH. PHILADELPHIA, PA. PITTSBURGH, PA. CHICAGO, ILL. ST. LOUIS, MO.

KREOLITE
TRADE-MARK

Products and Services

Kreolite Wood Block Floors and Pavements.

Specialists in Wood Preserving.

Also Timbers, Cross Ties, etc.

The Jennison-Wright Company maintain a Construction Department to handle the installation of Kreolite wood block floors complete; or, if preferred, they can furnish expert superintendents to instruct purchasers how to install the floors, or to supervise the installation.

Use

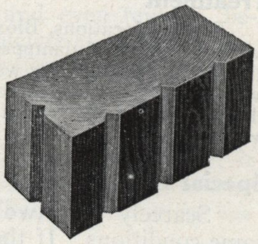
Kreolite wood block floors are used in factories, machine shops, printing plants, warerooms, loading platforms, annealing rooms, foundries, pickling rooms, dye rooms, glass factories, paper mills, rubber tire plants, garages and stables. They are also used on bridge floors and streets.

General Description of Kreolite Wood Blocks

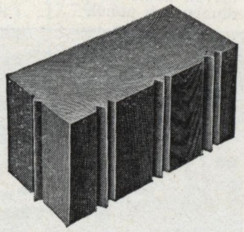
Manufactured in special designs (see illustrations) to meet dry or wet conditions. They are rectangular in shape, surfaced on both sides and one end to a uniform size, either 3 or 4 in. in width and from 2 to 4 in. in depth, depending on the severity of service. All blocks are furnished of the same width and depth for any one job. (A variation of $\frac{1}{16}$ in. in the depth and ⅛ in. in the width to be allowed.)

Material—All blocks are manufactured from carefully selected Southern long leaf yellow pine, thoroughly air seasoned and free from bark, loose or rotten knots or other injurious defects.

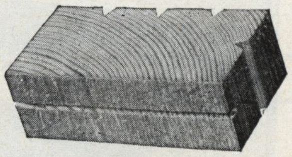
Treatment—All blocks for interior floors are treated in airtight cylinders by the Kreolite pressure and vacuum process; the quantity of preservative injected per cubic foot of timber depends on the service and conditions the floor must withstand, but in no case leaving less than 6 lb. of oil per cubic foot of timber. Blocks that are to be used for exterior purposes—such as driveways, loading platforms and court pavements, or that are subjected to considerable moisture—are treated by the Kreolite "two-stage" process which consists of a second application of hot Kreolite oil injected to insure a more thorough waterproofing of the blocks.



Kreolite Grooved Block
For dry heated conditions



Kreolite Kountersunk Lug Block
For use under wet conditions where the factor of expansion is to be encountered; also to offset slipperiness on grades



Kreolite Join-Tite Blocks
Note slots running at right angles to grain of the wood, which enable air to escape, preventing formation of air pockets when the bituminous filler is applied, and providing a maximum penetration of bituminous filler

A pure grade of Kreolite creosote oil is used.

Specifications for Installing Kreolite Block Floors

The following method of laying Kreolite blocks is recommended for the average floor. If unusual conditions are to be met, special specifications will be gladly furnished.

Blocks—Kreolite Grooved Wood Blocks shall be used wherever the floors are subjected to dry conditions, and Kreolite Kountersunk Lug Wood Blocks where the conditions are wet, or considerable moisture is encountered. They shall be — in. in depth, approximately 3 or 4 in. in width, and may vary from 4 to 8 in. in length.

They shall be manufactured by The Jennison-Wright Company of Toledo, Ohio, and laid according to the following specifications, under the direction of the manufacturer's superintendent.

They shall be manufactured from thoroughly air seasoned, carefully selected, long leaf yellow pine, and shall be treated in accordance with the Kreolite Pressure and Vacuum Process, with not less than 6 lb. of Kreolite Oil per cubic foot of timber.

Concrete Foundation—The blocks shall be installed on a concrete base, which shall be finished smooth, exactly the depth below the finished floor level corresponding with the depth of the block used. Care must be taken to see that there are no projections in the concrete that will form an uneven bearing for the blocks.

Kreolite Koncrete Coating—After the concrete has thoroughly dried out, it shall be swept clean and given a thin, even coating of Kreolite Bitumen, not exceeding ⅛ in. in thickness. The coating shall be allowed to harden before laying the blocks and shall not be applied over 20 ft. in advance of the block laying.

Laying the Blocks—Upon the base, as above prepared, the blocks shall be laid tightly together, with the grain vertical; the courses of the blocks shall be kept straight and parallel, starting from one side of the building and carried through to the other side; all joints shall be broken by a lap of at least 2 in. In truckways, and whenever possible, the blocks shall be laid with their length at right angles with the line of traffic.

Blocks to Be Tightened Before Applying Filler—*(A) Dry Floor Conditions*—Heated interior rooms, etc., Kreolite Groove Blocks shall be used, and after every four rows of blocks shall have been laid in place, a piece of 2x4-in. planking shall be laid along the outside edge of the blocks and the courses driven together as tightly as possible. The blocks in each separate row shall also be tightened lengthwise before the filler is applied, by forcing the blocks together from the ends, with a lever, pick or other instrument.

(B) Wet Floor Conditions—For floors subjected to moisture, high humidity, etc., Kreolite Kountersunk Lug Blocks, which provide an individual expansion joint between each block, shall be used, and shall be laid with the lugs in close contact with the adjoining blocks.

Expansion Joints—Against the walls on all sides of the floor, as well as around all columns and other obstructions, a bituminous expansion joint 1 in. in width shall be formed by, first, laying a strip of that width and, after removal, filling the space to within an inch of the top with Kreolite Bituminous Filler.

Application of Kreolite Bituminous Filler—After the blocks have been laid in place and brought to as true and level a surface as possible, the joints between the blocks shall be filled with Kreolite Bituminous Filler applied at a temperature of not less than 350° F.

Continued on next page

The filler shall be applied by flushing over the surface of the floor, using a rubber-edged squeegee to force it into the joints. Care must be taken to see that the filler penetrates the full depth of the blocks and that the joints are completely filled at the time of application. The filler, in cooling, shall not settle more than ¾ in. from the surface. With proper care, the floor surface will be practically free from bitumen. Dry, sharp sand shall then be swept over the floor, completely covering the blocks, same to be left on the floor until the blocks are well set, if possible for a period of three weeks. Traffic during that time will wear off the thin film of bitumen left on the surface.

Kreolite Standard Lite Color Block Floors

Where cleanliness and a light color floor is essential, the Kreolite Standard Lite Color Block—manufactured from select, dense, long leaf yellow pine, treated with an antiseptic, colorless and practically odorless oil, laid in conformance with Kreolite standard construction for such floors—is advisable.

Kreolite Insulating Koating

Produced in three colors: aluminum or silver, orange and black. The only commercially economic material ever produced that will adhere to creosoted wood. Ideal for marking aisleways in any institution having creosoted wood block floors.

Also applicable to the coating or painting of creosoted wood roofing timbers, etc.

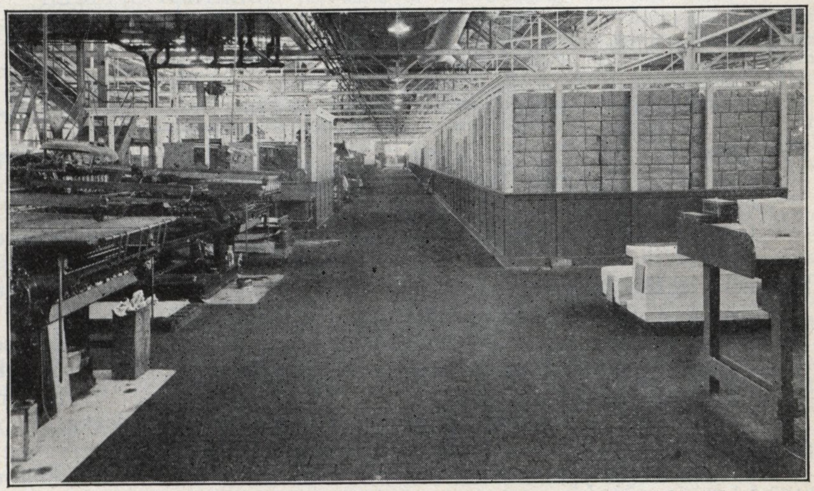
Kreolite Untreated Redwood Floors

Manufactured from selected, high grade California Redwood—odorless, fire resistant, clean, light red in color and pleasing to the eye.

Kreolite installation provides a waterproof cushion for the blocks and Kreolite Redwood Filler flushed into the joints furnishes a waterproof, smooth wearing surface which is sanded, waxed and polished.

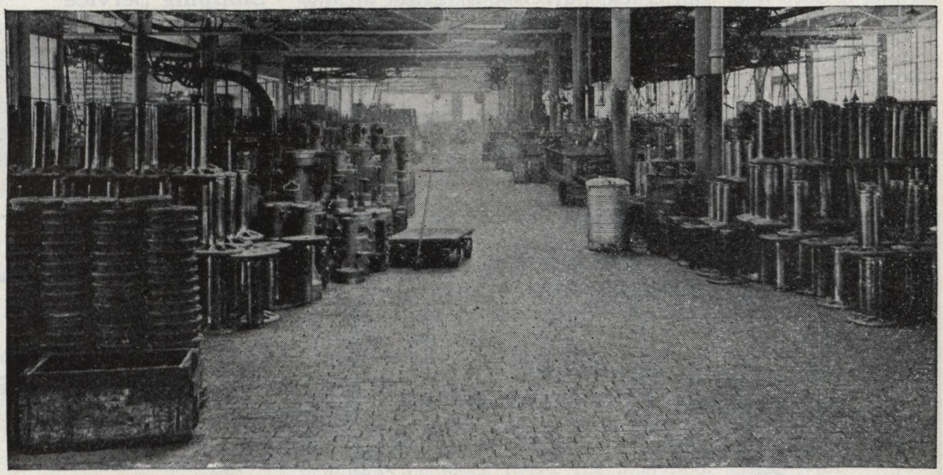
Co-operative Service

Our engineering department will furnish information as to how Kreolite wood block floors can be used to advantage in your factory; how they will reduce maintenance and repair bills, increase the efficiency of workmen, and cut production costs. Inform us as to the requirements. *Detailed specifications sent on request.*

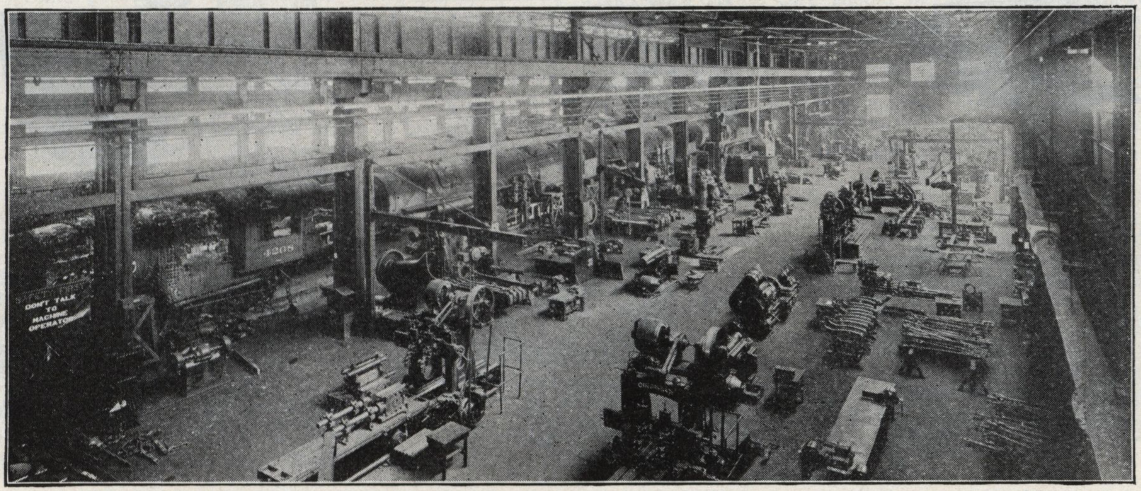


View of Kreolite Wood Block Flooring in Building No. 21, National Cash Register Company, Dayton, Ohio

This building contains the printing department and every modern development of the printing industry. Over 145,000 sq. ft. of Kreolite block floors in service in this plant



Kreolite Wood Block Floor in Assembling Room of the A. O. Norton Co., Inc., Boston, Mass.



Kreolite Wood Block Floor, Baltimore & Ohio Railroad Engine Shops, Cumberland, Md.

This floor is subjected to very heavy and rough usage and is frequently flooded with water

REPUBLIC CREOSOTING COMPANY

Original Makers of Creosoted Wood Block Floors

1614 Merchants Bank Building
INDIANAPOLIS, IND.

BRANCH OFFICES

CHICAGO, ILL.
PHILADELPHIA, PA.
CLEVELAND, OHIO
LOUISVILLE, KY.
RICHMOND, VA.
BOSTON, MASS.
DETROIT, MICH.
BUFFALO, N. Y.
NEW YORK, N. Y.
ST. LOUIS, MO.

PLANTS

INDIANAPOLIS, IND. MINNEAPOLIS, MINN. MOBILE, ALA. SEATTLE, WASH. NORFOLK, VA. SALT LAKE CITY, UTAH

Products

Republic Interior Wood Block Floors.
Creosote Oil.
Creosoted Ties, Poles, Piling and Timber.

Pioneers in the Industry

The first creosoted wood block floor in the United States was manufactured by this Company and is still giving entirely satisfactory service, as are all other Republic floors produced since then.

The present tremendous demand for Republic interior wood block floor is proof of its unequaled efficiency. No other type of floor is now considered where the floor must withstand heavy service and where the wood must be preserved against decay.

Unlike concrete and other rigid, abrasive floor materials, it does not chip, crack, pulverize or grind up into dust. It can never disintegrate or develop ruts.

Long hard service simply makes this floor smoother.

Advantages

Production engineers have demonstrated by repeated time studies that a wood block floor will show a decided increase in production per man, together with a decrease in labor expense.

The first cost is practically the only cost, as there is no maintenance expense.

Alterations are quickly and easily made, for blocks can be lifted out and set back in place at will.

Pure Creosote Oil is Used in Impregnating Republic Blocks

The preservative used in impregnating Republic blocks is pure creosote oil—the only efficient wood preservative for this purpose.

Contains no tar or other adulterants.

Republic interior wood floors are absolutely decay-proof and practically fireproof.

Shipping Service

Our many manufacturing plants are located favorably to give prompt and efficient service to all parts of the country on the lowest possible costs. Capacity is practically unlimited.

Our engineers from any of our offices or plants will gladly make a study of your plant conditions, gratis.

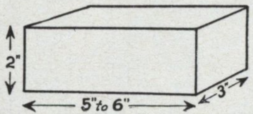


Fig. B-1

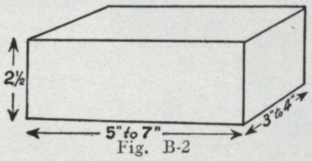

2½
5" to 7"
3" to 4"

Fig. B-2

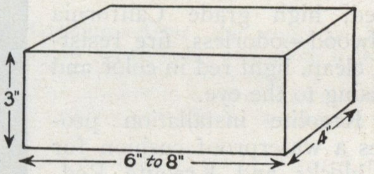


Fig. B-3

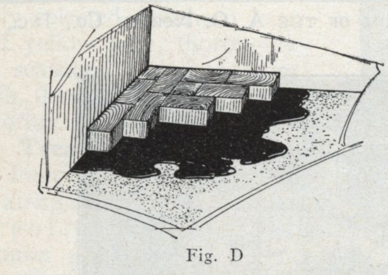


Fig. D

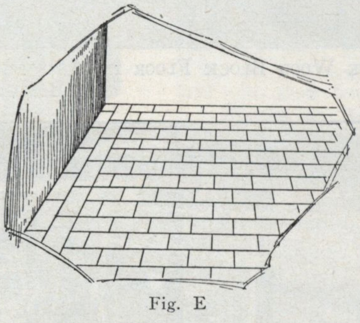


Fig. E

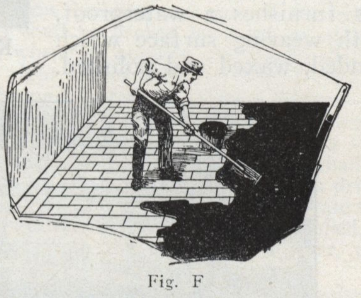


Fig. F

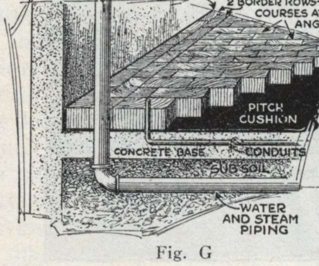

EXPANSION JOINT
2 BORDER ROWS-BLOCK COURSES AT RIGHT ANGLE TO TRAFFIC
PITCH CUSHION
CONCRETE BASE
CONDUITS
SUB SOIL
WATER AND STEAM PIPING

Fig. G

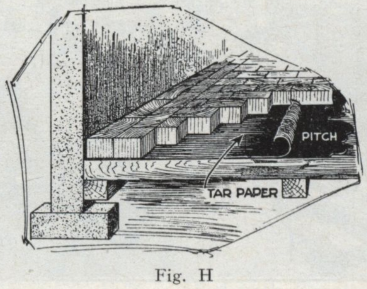

PITCH
TAR PAPER

Fig. H

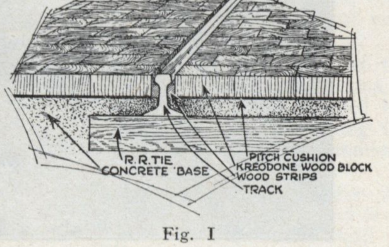

R.R. TIE
CONCRETE BASE
PITCH CUSHION
KREODONE WOOD BLOCK
WOOD STRIPS
TRACK

Fig. I

Details of Application of Republic Wood Block Floors

Continued on next page

(A) Specifications for Timber

Timber—The blocks to be manufactured from thoroughly air-seasoned Long Leaf Yellow Pine timber, square edged, sound and free from loose or rotten knots, shakes, bark and other defects detrimental to their strength and durability. The timber shall average at least 6 annular rings per inch. Checks are evidence of proper seasoning and are not to be considered a defect.

Size of Blocks—Careful study should be given to the loads, frequency of service and shop conditions generally, so that most economical as well as the most serviceable size may be selected, viz:

2-in. blocks may be used where truck loads carried do not exceed 1000 lb. and the trucking conditions are light, such as light assembly, warehouse storage, light machinework, etc. Weight in place, 90 lb. per sq. yd. See Fig. B-1.

2½-in. blocks should be used where truck loads carried do not exceed 4000 lb. per truck. This size block is suitable for manufacturing, machineshops, paper plants, etc. Weight in place, 110 lb. per sq. yd. See Fig. B-2.

3-in. blocks should be used where truck loads carried reach 20,000 lb., such as heavy factory work, heavy machineshops, roundhouses, loading platforms, etc. Weight in place, 125 lb. per sq. yd. See Fig. B-3.

Blocks shall be manufactured from 3 to 4-in. paving stock, surfaced three sides when cut into blocks, after seasoning. The length of block shall not average in excess of three times their depth. A variation of ⅛ in. in width and depth of blocks is allowable.

These specifications are standard on 2, 2½ and 3-in. floor blocks.

Constantly wet floors require special construction and treatment.

Note: Republic blocks are made in all shapes; standard rectangular groove, lug or corner cut, at your option, at no additional expense.

(B) Specifications for Creosote Oil and Treatment

The preservative used is a pure distillate creosote oil—viz.: Kreodone.

Specifications for Kreodone Creosote Oil—The oil shall be wholly an unadulterated distillate of coal tar. No material of any kind such as liquid tar, petroleum or other products shall be added to or mixed with it. Its specific gravity at 38° C. shall be not less than 1.09 and not more than 1.12.

It shall conform to the following points:

Up to 200°C., not more than 2% shall distill.

Up to 210°C., not less than 3% and not more than 5% total shall distill.

Up to 235°C., not less than 10% and not more than 20% total shall distill.

Up to 315°C., not less than 30% total and not more than 40% total shall distill.

The residue at 355° must be a crystalline solid, and shall not be in the least sticky, and when a small portion of it is placed on white filter paper and warmed, the oil spot produced, when viewed by transmitted light, shall appear of a dark amber color. The specific gravity of the residue shall not be less than one and fifteen hundredths (1.15). The coke test applied to the oil, according to the N.E.L.A. method, shall show not more than 1½% coke.

The specific gravity of the distillate between 235°C. and 315°C. shall be not less than 1.04 and the unsulphonated residue of this fraction shall not exceed 2½%. Also, a distillate shall be taken from the oil between 300°C. and 360°C., inclusive, and the unsulphonated residue of this fraction shall not exceed 2½%.

Treatment of Block—The block shall be placed in air-tight cylinders, where they shall be subjected to an initial air pressure, after which the cylinder shall be filled with oil as specified at a temperature of 170° C., the oil being introduced at the same pressure as the air maintained in the cylinder and additional oil pumped in until from 150 to 200 lb. to the sq. in. shall be recorded in the gauges. This pressure shall be maintained until the block has absorbed sufficient oil, after which the oil shall be forced back into the storage tanks, the air pressure on the treating cylinders released and a vacuum of 24 in. raised to hasten the ejecting of surplus oil from the pores of the wood so that the *open* cell walls are coated with oil.

(C) Specifications for Construction

Pitch Bed—The concrete base built by others shall be dry, level and smooth and swept clean of dust and debris. A coating of coal tar pitch of 140° to 150° melting point shall be applied to the surface thereof. The pitch shall be heated to a point where it will pour and spread freely and evenly when applied to the surface and distributed by means of a rubber-edged squeegee. The wood blocks are laid directly upon this pitch bed after it has been allowed to harden. Pitch bed should not average more than ⅛-in. thickness. Approximately 6 lb. of pitch per sq. yd. are required for this purpose. See Fig. D.

Laying the Blocks—Two courses of blocks shall be laid parallel to the sides of the building with the grain of the wood vertical. The major portion of the floor shall be laid in straight parallel lines at right angles to the two courses mentioned above. The blocks shall be laid with their length at right angles to the general direction of the traffic. After four or eight rows have been laid, they shall be rammed tight in the direction of the course and also at right angles to it until all blocks are in contact and courses are in straight line. All courses shall break joints alternately by a lap of not less than 1 in.

Liquid Pitch Filler—After all the blocks have been laid and the floor approved by the engineer in charge, the floor should be left unused for at least 10 days—then joints between the blocks shall be filled with Kreodone pitch filler applied hot over the surface of the floor and distributed into the joints by means of a rubber-edged squeegee until all the joints are sealed, at time of application. See Fig. F.

Care must be taken that as little pitch as possible be left on the floor surface. Dry, sharp sand shall be swept over the filled floor and allowed to remain several days or until the floor is put into service.

Powdered Plastic Filler—A week or 10 days after all the blocks have been laid and the floor approved by the engineer in charge, the joints between the blocks shall be filled with powdered plastic filler. The filler shall be mixed dry on the floor and swept into the joints with a broom until the joints are completely filled. The floor is then to be sprayed with a small quantity of liquid solvent and worked into the joints with a rubber-edged squeegee. This liquid solvent will fuse the powdered filler into a perfect adhesive binder at the sides of the blocks, and the finished floor surface shall be free from any sticky substance.

Expansion Joints—A 1-in. expansion joint shall be provided adjacent to all walls and other parts of the floor, when deemed necessary by the engineer in charge, by laying the block against a 1-in. separator board, which shall be removed after the blocks have been laid and the expansion joints thus made shall be filled to one-half their depth with hot pitch. After the pitch has set the remainder shall be filled with dry sand, to seal the opening and prevent the pitch from being forced out upon the floor in case of expansion.

Handling of Blocks—All floor blocks are shipped in *closed or box cars* and should be promptly unloaded on arrival and placed at a point convenient to installation, under cover and at all times protected from the weather or moisture.

Concrete Base—The concrete base shall be of suitable depth and texture as specified by the engineer or architect. The top surface shall have a smooth, true finish, finished the depth of the block below the final floor grade—viz:

2 in. below for 2-in. block, 2½ in. below for 2½-in. block and 3 in. below for 3-in. block. In finishing the surface of the concrete, extreme care should be taken to prevent the water content from puddling and rising to the surface which, upon drying, will leave a thin dust film on the surface and prevent a substantial bond of the pitch bed to the base. The finished concrete base shall, when thoroughly dry, present an unyielding hard finish and be a true contour of the finished floor. See Fig. G.

Plank Base—When plank subflooring is used it should be of creosoted timber constructed and supported to form a rigid foundation and smooth surface under the blocks. Tar paper shall be securely fastened on the smooth surface and the paper mopped with hot coal tar pitch to serve as a bed for the block. The block shall then be laid as before specified under heading: "Laying the Blocks." See Fig. H.

Special Conditions

Exposed pavements for loading platforms, driveways, court pavements, pickling rooms, stables or other abnormal conditions frequently require positive waterproofing treatment. Details on request.

THE RODD COMPANY

Contract Engineers for Redwood Block Floors

MANUFACTURED BY THE PACIFIC LUMBER COMPANY

McCormick Building	Century Building	Robert Dollar Building
CHICAGO, ILL.	PITTSBURGH, PA.	SAN FRANCISCO, CAL.

Product

Rodd Redwood Block Floors, manufactured from all heart, air seasoned, kiln dried T. P. L. Co. California Redwood.

Appearance and Adaptability

In addition to their extreme durability, Rodd Redwood Block Floors are light in color and therefore add greatly to the brightness and appearance of any room in which they are used.

Rodd Redwood Floors can be laid and sanded smooth, and are suitable for situations where treated blocks can not be used, or where a finished surface which will not catch lint is desired. The surface of the floor may be filled and varnished to a gloss, or velvet waterproof finish, and can be stained any color.

Rodd Floors of Redwood Blocks are particularly suitable for machine shops, foundries, textile mills, food manufacturing plants, dairies, packing houses, canning factories, milk depots, ice cream plants, refrigerating plants, loading platforms, department stores, gymnasiums, hotels, churches, hospitals and private residences.

Why Redwood Is Unrivaled for Wood Block Floors

Resists Decay—Some years ago in felling a spruce whose age, indicated by the annular rings, was more than 600 years, there was found buried beneath its roots a Redwood log which when dug up was so free from decay or worm holes that it was sawn into merchantable lumber. Here is evidence of one very desirable quality in wood for block floors—resistance to rot and the attacks of worms and insects.

Because of its resistance to rot and decay Redwood requires no preservative treatment. The wood is impregnated during growth with a *natural,* odorless preservative, therefore the cost of treating the blocks is saved.

Freedom from Odor—Containing no pitch or resin, Redwood is odorless. The pungent odor of treated blocks makes floors of that type undesirable for dairies and food storage depots because of the injury the strong odors do to so many kinds of foods.

Shrinkage and Expansion—Properly seasoned Redwood has a very low coefficient of contraction and expansion. Exhaustive tests and experiments have proved that Rodd Redwood Block Floors stay flat.

Low Tractive Effort—The remarkable smoothness of Redwood Floors, even when not sanded, greatly reduces the traction required in moving loads over the surface. The ends of the wood fiber iron down, forming a surface that grows stronger with use, and which does not crack, corrugate or become slippery.

Fire Hazard

Due to the absence of pitch or other inflammable substances, Redwood is highly fire resistant.

Desirable Qualities of Redwood Block Floors

Rodd Floors are smooth, noiseless, wonderfully resilient and durable and are always at an even temperature. The first cost is reasonable and the upkeep cost practically nil. Rodd Floors stand wear and tear of heavy service indefinitely.

Maintenance and Repairs

The unit construction of Rodd Redwood Floors makes alterations or repairs a very simple matter.

Resurfacing Old Floors

With Redwood Blocks and Rodd methods of construction the problem of repairing or replacing old floors can be easily accomplished.

For example: if it is a question of an old concrete floor, the surface can be brought to a uniform level with a cushion of Creolignum Asphaltic Cement, and Redwood Blocks of the proper thickness bedded firmly therein. The entire surface can then be sanded smooth, and varnished if desired.

Creolignum Filler Paste and Creolignum Filler Varnish

Where a very smooth hard finish is required the complete floor is first scraped or sanded, then filled and finished with Creolignum Waterproofing Varnish. These materials have been designed specially for Rodd Redwood Floors and can be furnished in any color.

Redwood Blocks of Highest Quality

The high quality of our blocks is guaranteed by The Pacific Lumber Company, the largest manufacturers and distributers of California Redwood and every block is selected from the best stock, as well as being specially cured for flooring use in the Leaver drying kilns.

A Service Organization

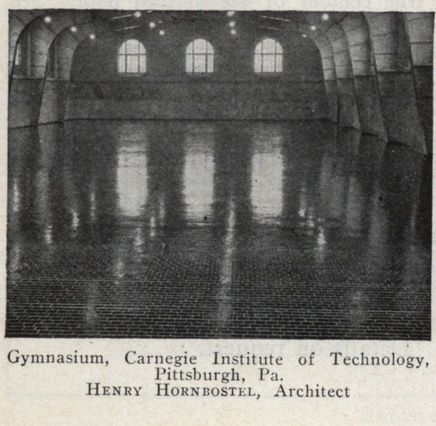
The Rodd Company sells good floors—not floor materials. Our organization has furnished and installed floors for many of the leading railroad and industrial organizations of the country.

Detailed information and estimates furnished on request. We invite inquiries.

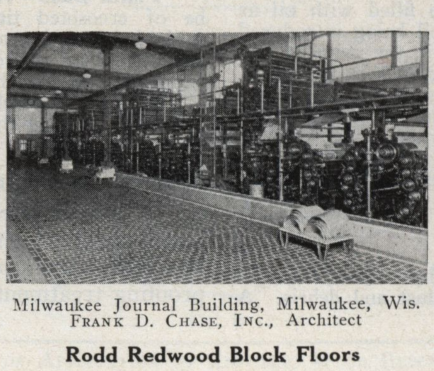
Recent Installations of Rodd Floors

Besides the floors shown The Rodd Company has installed Redwood Floors for such well-known firms as the Steinway Piano Co.; General Electric Co.; Bethlehem Steel Corp.; Spang Chalfant Bank; Chevrolet Motor Co.; Newark Evening News; Chicago Union Station; Westinghouse Electric & Mfg. Co.; National Supply Co.; U. S. Aluminum Co.; National Biscuit Co.; Williamson Candy Co.

U. S. Post Office, San Francisco, Cal.
Alfred S. Alschuler, Architect



Gymnasium, Carnegie Institute of Technology, Pittsburgh, Pa.
Henry Hornbostel, Architect



Milwaukee Journal Building, Milwaukee, Wis.
Frank D. Chase, Inc., Architect

B'Nair Israel Synagogue, Pittsburgh, Pa.
Sharove & Friedman, Architects

Rodd Redwood Block Floors

SOUTHERN WOOD PRESERVING COMPANY

ATLANTA, GA.

SALES OFFICES

BALTIMORE, MD., 115 Commerce Street
BUFFALO, N. Y., Erie County Bank Building
CHARLOTTE, N. C., Box 583
PHILADELPHIA, PA., 121 No. Broad Street
CHICAGO, ILL., 38 So. Dearborn Street
CLEVELAND, OHIO, Hunkin-Conkey Building
KANSAS CITY MO., R. A. Long Building
NEW YORK, N. Y., 10 East 43rd Street
PITTSBURGH, PA., Dollar Savings & Trust Building
TOLEDO, OHIO, Spitzer Building

TREATING PLANTS: EAST POINT, GA. and CHATTANOOGA, TENN.

Products

CREO-PINE WOOD BLOCK FLOORS.

Also Creo-pine Subflooring, Wood Conduit, Cross Arms, Fence Posts and Poles.

Uses of Creo-pine Wood Block Floors

Creo-pine floors are used in factories, machine-shops, warehouses, loading platforms and other establishments where durability is an essential factor, and comfort to workmen and consequent increased human efficiency are items of consideration.

Qualifications of a Good Floor

(1) It should withstand surface wear and afford a smooth surface. (2) It should be resilient, free from vibration, non-conductive of heat and non-slippery. (3) It should not dust or crumble. (4) It should be sanitary and easy to clean. (5) It should adapt itself readily to repairs, not only to the surface but to subfloor work. (6) It should be impervious to decay and the action of oils, acids, etc.

Determining Factors of a Good Floor

(1) Blocks shall be made of select Southern yellow pine. (2) They shall be manufactured with mechanical precision to the proper size for service required. (3) They shall be impregnated with creosote oil in accordance with standard specifications. (4) They shall be correctly installed.

Creo-pine Floors Conform to the Ideal

Creo-pine floors meet the above qualifications, as the foregoing determining factors are embodied in each finished floor. The lumber used is the best obtainable Southern yellow pine, thoroughly air seasoned.

Blocks are carefully manufactured to correct size for service required and impregnated with creosote oil by use of the most modern wood preserving equipment. Creosote used is obtained wholly from pure coal tar and is in accordance with standard specifications. The installation is handled by experienced superintendents.

Further information and estimates gladly furnished.

Creo-pine
TRADE NAME
Registered

Specifications for Creo-pine Floors

Timber—Timber shall be air seasoned Southern Yellow Pine, square edged and sound, free from bark, loose or rotten knots, wormholes, shakes, check, or other defects detrimental to its strength or durability. It shall average not less than 6 annular rings to the inch measured radially and beginning 2 in. from the heart center.

Size—Blocks shall be truly rectangular, 2½ to 4 in. wide, 5½ to 9 in. long, and 2, 2½ or 3 in. deep (parallel to the fiber). A variation of $\frac{1}{16}$ in. shall be allowed in depth, and ⅛ in. in width.

Only one width of blocks shall be used on any single floor.

Preservative—Creosote must be a pure coal tar product obtained entirely from coal gas or coke oven tar and must not contain any admixture of tar oils, petroleum or any other products. It shall be completely liquid at 38° C. and not more than 3% of the water-free oil shall be insoluble in chloroform or benzol. Specific gravity shall not be less than 1.05 and shall not exceed 1.14. When 100 grams of the creosote are placed in a retort and subjected to a distilling test as described in Bulletin No. 96 of the American Railway Engineering and Maintenance of Way Association, amount of distillation shall not exceed the following:

Up to 200° C., no distillate.
Up to 210° C., less than 5%.
Up to 235° C., not more than 25%.
Up to 315° C., not more than 50%.
The oil shall not contain more than 2% of water.

Treatment—Blocks shall be properly treated by pressure-vacuum-empty cell process by a creosoting plant properly equipped for such work, injecting not less than 16 lb. of oil per cu. ft. into blocks with a final retention of 6 to 8 lb.

Foundation—A concrete foundation shall be prepared from 4 to 6 in. thick, depending upon loads to which floor will be subjected, consisting of 1 part cement, 3 parts sand and 6 parts crushed stone or gravel, and brought to a smooth finish sufficiently below grade of floor to provide for depth of blocks.

Concrete must be brought to a smooth and true surface, allowing no coarse aggregate to show, as any unevenness will be apparent in the finished floor.

Bituminous Paint Coat—Upon the thoroughly cleaned and dried concrete base apply a coat of bitumen, spreading same smoothly with squeegees to a uniform thickness of not more than ⅛ in.

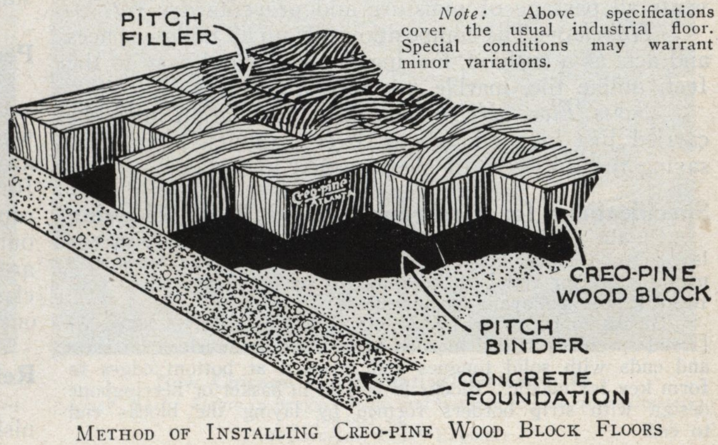
Laying Blocks—Blocks shall be laid on the paint coat in straight parallel lines (at right angles to line of traffic) breaking joints not less than 2 in. and using only whole blocks, except to start and finish courses. Blocks shall be driven tightly together both on sides and ends.

Top Dressing—After blocks have been laid, a top coat of bitumen shall be squeegeed over top of the blocks and well into interstices between the blocks.

Sand Covering—The entire floor shall be covered with a thin coat of fine clean sand which shall be allowed to remain for several weeks.

Note: Above specifications cover the usual industrial floor. Special conditions may warrant minor variations.

PLANT OF ILLINOIS GLASS CO., BRIDGETON, N. J.



METHOD OF INSTALLING CREO-PINE WOOD BLOCK FLOORS

ESTABLISHED 1899

HASBROUCK FLOORING COMPANY

Parquetry and Wood Block Flooring, Cork Tiling

501-509 East 70th Street
NEW YORK, N. Y.

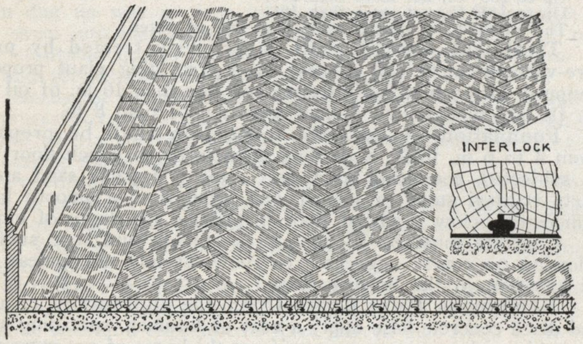
Products

Wood Block Flooring; Period and Wide Plank Flooring; Parquetry, Cork and Composition Tiling and Goodyear Rubber Tile.

Wood Block Flooring

Hasbrouck wood block flooring consists of tongued and grooved blocks so designed as to interlock at both ends and sides, insuring permanently level and even floors. These blocks are set in an asphaltic composition on a cement base. The sides are grooved at the bottom edge to form a key for the mastic, which binds the whole so as to form a solid permanent floor surface.

Hasbrouck wood blocks are made in two thicknesses, ⅞ and 1⅛ in. and can be furnished in teak, walnut, oak, maple and Georgia comb grained pine. For private residences and where the best class of floor is desired, we recommend that teak, walnut or oak be used and that maple or pine be used in public buildings and institutions.



Hasbrouck Wood Block Flooring

These blocks can be laid in a great variety of designs. They should not be confused with pine end wood blocks set on a sand base.

Advantages—*Fireproof*—There are no air spaces under this flooring to feed flames.

Sanitary—No cracks or unevenness to hold filth or germs.

Durable—It will outwear marble.

Dampproof—Asphaltic composition effectually prevents all passage of moisture and prevents *dry rot.*

Noiseless—The composition fills up all hollow spaces and acts as a cushion, making floor soft and easy to the feet, unlike tile, marble, terrazzo or cement.

Saves Floor Height—Cement foundation may be carried just high enough to cover conduits, pipes, etc., saving the thickness of sleepers and underfloor.

Specifications for Hasbrouck Wood Block Flooring

On the cement foundation of rooms specified, furnish and lay a wood block floor of Hasbrouck Flooring Company's manufacture, or equal, to be approved by architect and to conform to the following requirements:

Blocks to be ⅞ or 1⅛ in. x 2 or 2½ in. x 12 or 14 in. of [wood specified] milled in such manner as to interlock on sides and ends with solid tongues and grooved at bottom edges to form key for mastic. Blocks to be laid in basket or herringbone design with strip borders formed by laying the blocks end to end.

Mastic to be a pure asphaltic composition, sample of which shall be submitted to architect for his approval.

These floors shall not be laid until the foundations are thoroughly seasoned and dried out, when the foundation will receive a coat of special preparation to act as a binder. On this the wood blocks are to be set in the mastic, which must be heated to such temperature as to allow it to flow freely, and fill all grooves at bottom of blocks.

Floors to be traversed, smoothed and sandpapered to smooth even surface ready for painter's finish.

Contractor shall be required to give a written five-year guarantee that the floor will not become detached or loose from the foundation, or show any other defects attributable to imperfect materials or workmanship, and to make good any such defects which may develop; also to repair any damages to other work by reason of such repair.

Cork Tiling

A pure cork compressed to great density and baked. Particularly suitable where a sanitary, noiseless flooring is desired.

This tiling may be laid on a wood or cement foundation. In either case they are set in our special cementing compound which holds the tile firmly in place and seals the joints, making a waterproof and acidproof floor. The tiles are made in colors so as to give designs of a very pleasing effect.

A sanitary cove and base can be furnished for use with these floors.

Stock sizes of cork tiling are ½ in. thick, by 4½x4½, 6x6, 9x9, 12x12, 3x6, 4½x9, 6x12, 9x18, 12x18 and 12x24 in.; but any intermediate size can be cut to order at small additional cost, and it is possible to work out any parquetry or marble design with this material.

Cork Composition Tiling

A composition of ground cork, oxidized linseed oil and special gums. It is laid in our special waterproof cementing compound on any kind of smooth, level foundation.

The tiles are made in 7 colors: blue, brown, black, white, red, green and gray, which allows them to make beautiful parquetry designs.

Particularly suitable for public buildings, steamships, service portions of clubs, hotels and dwellings, stair treads and landings.

Period and Wide Plank Flooring

We make a specialty of these floors, both veneered and solid, and in all the domestic and imported cabinet woods. Any special pattern or design desired by the architect to carry out the scheme of decoration can be furnished, as all floors laid by us are made from the rough lumber at our plant in New York City and under our supervision. Our men, both in mill and outside, are trained in the making and laying of high class floors, many of them having been in our employ over twenty-five years.

References and Installations

List of references and installations furnished upon application.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST 1913

ESTABLISHED 1870

FULTON ASPHALT COMPANY

Manufacturers of Asphalt Mastic Floors

Monadnock Block
CHICAGO, ILL.

PLANTS: CLEARING, ILL., AND CHICAGO, ILL.

Products

Asphalt Mastic Floors.
Acidproof Mastic Floors.
Also manufacturers of:
Fulton 1870 Brand Asphalt Mastic.
Fulton 1870 Brand Acidproof Mastic.
Fulton 1870 Brand Waterproofing Mastic.
Fulton 1870 Brand Pure Asphalts.
Fulton 1870 Brand Asphalt Paints.

Fulton Service

Over 50 years of experience and service in the manufacture and installation of asphalt and acidproof mastic floors in all types of building construction throughout the country, have given us the practical knowledge and ability necessary to efficiently and correctly install this type of flooring to meet all conditions. Pure asphalts, specially manufactured to meet each individual flooring condition, installed by expert mechanics who have laid this particular type of floor for 25 years or more, insure the engineer or owner of the best quality of workmanship and materials obtainable.

Floors installed in all parts of the United States and Canada.

Uses of Asphalt Mastic and Acidproof Mastic Flooring

The practical flooring for service in the following class of buildings:

Railroad passenger and freight terminals.
Packing, cold storage and manufacturing plants.
Paper and textile mills.
Laundries, dairies, cheese and ice cream plants.
Warehouses and stables.
Schools and colleges.
Chemical, acid, plating, engraving, battery, dye, preserving, vinegar, pickle and yeast plants.

Advantages and Adaptability of Asphalt Mastic Floors

Asphalt mastic floors are unsurpassed for their durable, resilient, waterproof, sanitary, fireproof, dustless and noiseless qualities.

Our installations in place for the last 25 years are giving excellent service today without maintenance, under conditions which other types of flooring have failed to withstand.

Heavy trucking does not grind or wear the surfaces of this floor.

There are no joints or cracks for liquids to lodge in, hence its waterproof and sanitary qualities.

All the above qualities combine to make this flooring the best as well as the lowest priced, measuring cost per year of service, that can be laid.

Acidproof Mastic Floors

In addition to having all of the excellent and necessary qualities of a satisfactory flooring, this type of floor is proof against all commercial, fruit and vinegar acids, is waterproof, and has the same unexcelled wearing qualities as an asphalt mastic floor.

This floor type is used very extensively by manufacturers of acids, also those who use acids in the manufacture of their products.

Installation

Both types of mastic floors are successfully installed over wood or concrete base in new or old buildings by our expert mechanics.

Guarantee

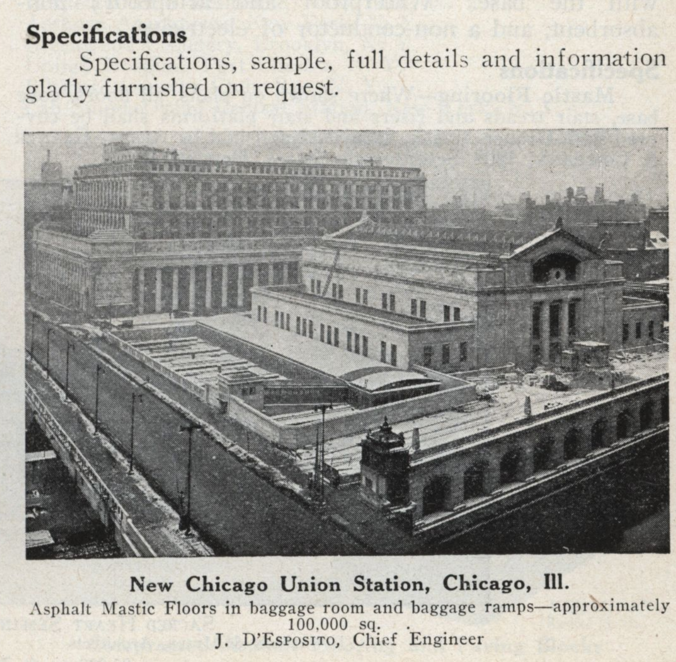
All work is guaranteed by us to give the service for which it is installed.

Specifications

Specifications, sample, full details and information gladly furnished on request.

St. Paul Union Passenger Terminal, St. Paul, Minn.

Asphalt Mastic Floors in mail, baggage and express rooms, throughout entire depot—250,000 sq. ft.
G. H. Wilsey, Chief Engineer



New Chicago Union Station, Chicago, Ill.

Asphalt Mastic Floors in baggage room and baggage ramps—approximately 100,000 sq. .
J. D'Esposito, Chief Engineer

ALBERT GRAUER & COMPANY

Mastic, Composition and Cement Finished Floors

1408-1424 Seventeenth Street, DETROIT, MICH.

REPRESENTATIVES

AKRON, OHIO, Knoske Sales Co., 502 Ohio Building
ATLANTA, GA., S. R. Hewitt, 608 Walton Building
BOSTON, MASS., Rubin-Burke Co., 333 Washington Street
BUFFALO, N. Y., W. D. Shumway, 1014 Fidelity Building
CHARLESTON, W. VA., Metal Products Co.
CHARLOTTE, N. C., Monteith-Soule Co., 1906 South Boulevard
CINCINNATI, OHIO, Baldwin-Tarvin Co., Sixth and Carr Streets
COLUMBUS, OHIO, The B. M. Freeman Co., Columbian Building, 35 East Gay Street
DAYTON, OHIO, John G. Pool Co., Schwind Building
GRAND RAPIDS, MICH., Charles Vandervelde, 757 Hawthorne Street
HUNTINGTON, W. VA., E. L. Warnick, P. O. Box 1581
INDIANAPOLIS, IND., General Construction Supply Co., 631 South Delaware Street
KNOXVILLE, TENN., Charles M. Allen Co., 209 West Clinch Avenue
LANSING, MICH., Capitol Steel Corporation, 236 Tussing Building
LIMA, OHIO, Lugabill Fuel & Building Material Company
LOUISVILLE, KY., Louisville Building Supply, 18th Street and Magnolia
MEMPHIS, TENN., Calston Builders Supply Co., 281 Shrine Building
MINNEAPOLIS, MINN., H. S. Nesbitt Co., 422 Builders Exchange Building
PHILADELPHIA, PA., R. C. Kratz, 419 Perry Building
SAN ANTONIO, TEX., George E. Ginter, 502 Calcasieu Building
SOUTH BEND, IND., The Builders Agency, 211 Christman Building
YORK, PA., C. H. Strayer, 50 West Philadelphia Street

Products

Grauer Mastic Flooring.

For Sidewalk Lights and Skylights, see pages 602-603.

Service

Floors installed by us or by our experienced representatives in the United States as well as in foreign countries. Where desired, we are prepared to build up subfloors of wood or concrete to the proper grade before applying. Quotations, catalogues and samples are gladly furnished.

Grauer Mastic Flooring

Grauer Mastic can be supplied in red, green, brown or black. It is laid with a trowel in 7 or more thin coats to a total thickness of ⅛ to ¼ in., forming a continuous, seamless sheet and bonding to subfloor so as to become practically part of same.

Grauer Mastic is primarily a serviceable flooring, rendering long, satisfactory wear. It is distinguished from other mastic floors in having a finer surface texture secured with Grauer Special Finishes. The most careful attention is paid to workmanship, which means a great deal in building a floor that will give the utmost in wear.

Where others use one coat of primer, we use two coats, each of a different consistency for its special purpose. Due to this, Grauer Mastic floors never come loose from the subfloor.

Properties and Uses

Grauer Mastic floors are elastic and will not crack, check, peel, crawl or wrinkle, but expand and contract with the base. Waterproof and acidproof; nonabsorbent, and a non-conductor of electricity.

Specifications

Mastic Flooring—Where shown on plans, all floors, cove base, stair treads and risers and stair platforms shall be covered with Grauer Mastic, furnished and laid by Albert Grauer & Company, 1408 Seventeenth Street, Detroit, Mich.

Grauer

SKYLIGHTS
FLOOR LIGHTS
MASTIC FLOORS
SIDEWALK LIGHTS
COMPOSITION FLOORS

Subfloor or Foundation—Wherever mastic is specified or shown on plans, this contractor shall be provided with suitable base on which to apply the mastic. Subfloor, to be furnished in place by others, must be of sufficient strength to withstand load, traffic or usage, to which finished floor may be subjected.

Over Cement Surfaces—Cement subfloor shall be troweled to a hard, smooth, sidewalk finish, left ⅛ in. below finished grade, and laid true and level without high or low spots.

Over Wood Surfaces—Wood subfloor to be covered with mastic shall be of well seasoned or kiln dried matched boards securely nailed, so they will not warp or permit motion between adjoining boards. Subfloor shall be ½ in. below finished grade. On wood floor, this contractor shall apply ⅜ in. of Grauer Composition Scratch Coat reinforced with wire mesh or metal lath, securely nailed in place.

All subfloors shall be delivered to this contractor bone dry, broom cleaned and free from plaster, grease or paint.

Floors—On all floors where mastic is indicated on plans, this contractor shall apply 7 coats of Grauer Mastic to a total thickness of not less than ⅛ in.

Cove Base—Where mastic covered cove base is specified or indicated on plans, this contractor shall be furnished a cove base, put in place by others, on which mastic is to be applied. Cove shall be smooth and even with a radius not to exceed 1½ in., and a height not to exceed 6 in.

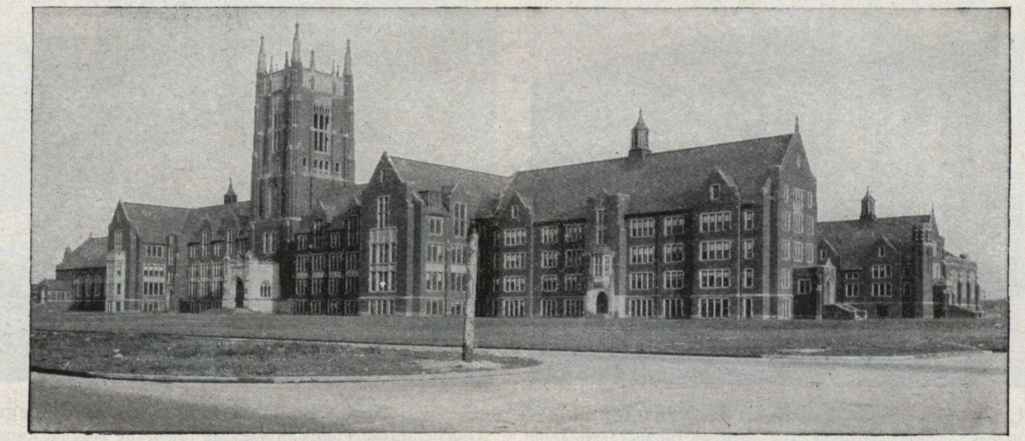
Stair Treads and Platforms—Where mastic covered stair treads or platform are indicated on plans, this contractor shall be supplied with a clean dry base on which to apply the mastic. Cement treads to have a smooth, hard, level surface. Iron treads to be free from scale. All treads and platforms with suitable nosings furnished by another contractor so that a ⅛-in. thickness of mastic finishes flush with top of nosings.

Protection of Finished Work—Finished mastic floors, stair treads and platforms shall not be subjected to any use whatever for a period of one week after mastic work has been completed.

Guarantee—All mastic work shall be guaranteed for a period of two years from date of completion against any defects of materials and workmanship, and be repaired free should defects appear during said term.

Guarantee

All floors laid by Albert Grauer & Company, whether mastic, composition, or cement, are fully guaranteed as to materials and workmanship, for a period of two years from date of completion.



Sacred Heart Seminary, Detroit, Mich.
Donaldson & Meier, Architects W. E. Wood Co., Contractor
85,000 sq. ft. Mastic Flooring

THE HASTINGS PAVEMENT COMPANY

TELEPHONE
Broad 1496

25 Broad Street
NEW YORK, N. Y.

WORKS
HASTINGS-ON-HUDSON, N. Y.

Products

Compressed Asphalt Flooring and Paving Blocks.

Asphalt Blocks

A scientifically manufactured material for the wearing surface of streets and roads, and of piers, warehouses, loading platforms, factory floors, bridges, driveways, courtyards, etc.

Manufactured at a large permanent plant; shipped in block form ready to lay; and always obtainable in any quantity for extension and repairs.

Composition—A properly proportioned mixture of natural asphalt, crushed rock and limestone dust is heated to 300° Fahr., and shaped into uniform blocks under a pressure of 4000 lbs. per sq. in.

SIZES AND WEIGHTS

Width, in.	Length, in.	Depth, in.	Weight, lbs.
5	12	2	11
5	12	2½	13½
4	8	1¼	3½ ("Eightfours")

A square foot of 2-in. block weighs 26 lbs.
A square foot of 1¼-in. "Eightfours" weighs 15½ lbs.
The minimum specific gravity of asphalt block is 2.35.

"Eightfour" Blocks

The "Eightfour" asphalt flooring block is designed especially to meet those conditions in which weight and thickness of flooring must be at a minimum consistent with durability under heavy traffic.

The "Eightfour" is used also for protection of waterproofing on railroad bridges and is also suitable for roofs subject to traffic.

Advantages—Asphalt blocks are pleasing in appearance; smooth, noiseless, dustless, warm and easy under foot; sanitary, because non-absorbent; and, next to granite, the most durable.

They present a gritty, non-slippery, non-skiddable surface, and are easily taken up and relaid.

They are non-expansive, odorless and free from exudations; and are not affected by standing loads, extremes of temperature, or by automobile oils.

They are reasonable in cost, and are made to suit any climate and traffic conditions.

Method of Laying—Upon the surface of the concrete foundation there is spread a bed of portland cement mortar ½ in. thick, which is struck to a true and even surface. Upon this bed the blocks are immediately laid, with close joints and uniform top surface, the joints being broken 4 in. After being laid, the blocks are given a light coat of sharp, fine sand, well broomed into the joints. The joints of the "Eightfours" are grouted. Traffic is permitted in 4 or 5 days.

References

Manufacturing Plants, etc.

General Electric Co., Schenectady, N. Y.
Endicott-Johnson Corp., Endicott, N. Y.
Otis Elevator Co., Harrison, N. J.
Westinghouse Electric & Mfg. Co., Essington, Pa.
United States Navy Yards: Brooklyn, N. Y.; Boston, Mass.; Washington, D. C.
United States Naval Supply Base, Brooklyn, N. Y.
United States Naval Operating Base, Hampton Roads, Va.
Scovill Manufacturing Co., Waterbury, Conn.
American Copper Products Corporation, Bayway, Elizabeth, N. J.
Studebaker Corporation, South Bend, Ind.
Morgan Engineering Co., Alliance, Ohio
Standard Steel Works, Burnham, Pa.

Piers

Pier No. 84 South, Philadelphia, Pa.
Gerard Piers Nos. 3 and 5, Philadelphia, Pa.
Bush Terminal, Pier No. 6, Brooklyn, N. Y.
New York Dock Co., Piers Nos. 16, 18, 26 and 36, Brooklyn, N. Y.
Ocean Steamship Co. Piers, Savannah, Ga.
Pennsylvania Railroad Pier, Greenville, N. J.
Lamport & Holt Line Piers, Hoboken, N. J.
United States Army Supply Base Piers, Brooklyn, N. Y.
New York City Piers, Stapleton, Staten Island, N. Y.
Lehigh Valley Railroad Pier, Jersey City, N. J.

Loading Platforms

Arbuckle Building, Brooklyn, N. Y.
New York Central Railroad Freight Terminal, Cleveland, Ohio
United States Army Supply Base, Brooklyn, N. Y.
Chicago, Burlington & Quincy Railroad Freight Terminal, Chicago, Ill.

Bridges

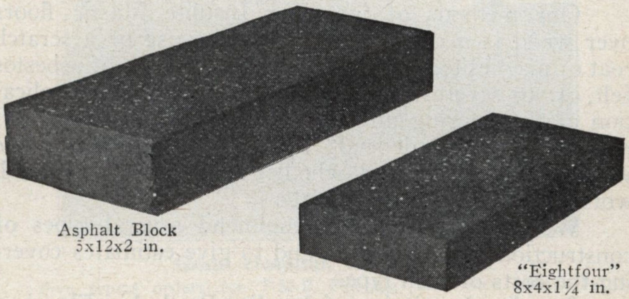
New York Central Railroad, New York & Westchester Co., N. Y.
Pennsylvania Railroad, Sunnyside Yards, New York, N. Y.
Long Island Railroad, Bay Ridge, Brooklyn, N. Y.

Driveways and Courtyards

Whitelaw Reid Residence, New York, N. Y.
Apthorp Apartments, New York, N. Y.
Greenwood Cemetery, Brooklyn, N. Y.
United Hospital, Port Chester, N. Y.
Biltmore Country Club, Rye, N. Y.
Cab Stand, Grand Central Station, New York, N. Y.

Streets and Roads

Bronx and Pelham Parkway, New York, N. Y.
Albany Post Road, North Tarrytown, N. Y.
Boston Post Road, Port Chester, N. Y.
Bronx River Parkway Drive, Westchester Co., N. Y.
Nassau Street, Princeton, N. J.
Wyoming Avenue, Wyoming, Pa.
Broad Street, Richmond, Va.
Memorial Boulevard, Hillsborough Co., Fla.



Compressed Asphalt Flooring and Paving Blocks

INSULITE CHEMICAL COMPANY

Insulite Mastic Flooring—The Original of Its Type

HOME OFFICE AND FACTORY
AURORA, ILL.

REPRESENTATIVES IN THE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

Products

INSULITE MASTIC FLOORING.

INSULITE BATTLESHIP TILE FLOORING.

INSULITE WATERPROOFING AND DAMPPROOFING PAINTS.

Insulite Mastic Flooring

Pure elaterite—not a compound containing gilsonite and asphaltum—and careful workmanship, have established Insulite's superiority.

Insulite Mastic is the original of the thin mastic type of flooring. We use an unadulterated mineral rubber gum refined in our own plant from Utah elaterite (wurtzelite) as our binder. This, scientifically combined with asbestos fiber and pigments, forms a tough, permanently resilient wearing surface for cement or wood, which, if given reasonable care, will endure almost indefinitely.

Distinguishing Features—

Insulite Mastic will not crack, crumble, buckle or loosen from its base.

Bonded permanently to the subfloor in a single, seamless sheet, it provides no joints, or places for the accumulation of dirt.

It is non-absorbent, waterproof, chemically inert, a non-conductor of electricity, unaffected by acids or alkalies and thoroughly sanitary.

It may be brought up to form cove and base if desired.

It overcomes the objectionable features of the hard inflexible type of flooring and presents all of the advantages of battleship linoleum with none of its disadvantages.

New material bonds perfectly to the old and should the floor be damaged mechanically in any conceivable manner, it may be completely resurfaced or patched and the repairs will not be evident.

We furnish expert superintendence and experienced workmen, and guarantee our floors.

Insulite flooring is manufactured in shades of red, green, gray, tan and black.

Where unusual hardness is required a special combination of materials and installation methods is used.

Fifteen years of experience enable us to meet special conditions.

Installation Over Wood Floors—

Our methods of installing Insulite Mastic floors over wood is necessarily varied. The use of a scratch coat of magnesite, of impregnated fiber sheets, of asbestos felt, of our several types of filler material, or the application of the flooring directly to the wood without intermediate material, depends upon the condition of the wood floor to be covered, whether it be new or old wood, worn or in good condition, etc.

We are prepared to recommend several types of construction in many cases, and to give estimates covering the costs of each type.

See also description of Insulite Battleship Flooring.

Specifications for Insulite Mastic Flooring—

The concrete base must be brought to a smooth hard level surface by a good float or trowel finish, the proper level below the finished floor grade. The surface must be clean, free from oils, dirt, scum, plaster, chalky spots or other foreign matter.

Upon the base thus prepared, Insulite Mastic Flooring to be applied in strict accordance with the specifications for installation and under the direct supervision of the manufacturer.

Insulite Battleship Tile Flooring

Manufactured in sheet and tile form and cured thoroughly at the factory; laid in mastic over wood or concrete, cut in blocks or tile of various sizes.

Usual thickness $\frac{3}{16}$ in.; special thicknesses and strengths to order.

Colors red, green, tan and black. Two styles, finished and unfinished. The unfinished is given the final surface coat after it is installed.

Cut to required sizes for stair treads, landings, for covering base and cove, etc.

This flooring is especially recommended for use over wood floors, where use is required without delay, where varied colors and patterns are required, and is suitable for use wherever mastic flooring is used.

All installations are made by factory representatives or under factory supervision and specifications.

The Insulite Battleship flooring and the process of manufacture is patented and the exclusive use of the patents is held by the INSULITE CHEMICAL COMPANY.

Insulite Mineral Rubber Waterproofing

Manufactured from reduced elaterite refined to give the highest waterproofing qualities. Acidproof and alkaliproof, not affected by salt or fresh water or by the elements.

The material sets tough and flexible and retains these qualities under extremes of heat and cold.

Used for waterproofing all concrete, stucco, brick or stone work, on either exterior or interior walls. Applied as a paint with brush or spray.

It may be used as a priming coat on walls, as it is a perfect filler and will not stain through plaster, lime or cement mortar, or other protective or decorative covering.

It is an ideal plaster bond.

Details, samples, prices, further information and literature on request.

Service

A service department is maintained to assist architects and builders, to recommend various types of construction for special conditions, to prepare estimates, etc.

Details and recommendations will be supplied on request. The use of the Service Department involves no obligation of any kind. Correspondence solicited.

THOS. MOULDING BRICK CO.

133 West Washington Street, CHICAGO, ILL.

NEW YORK, N. Y., Grand Central Terminal Building

T-M-B
FLOORING
TRADE-MARK

Products

T-M-B Flooring.
Moulstone Flooring.

Service and Guarantee

Installations by our experienced workmen everywhere in the United States and Canada. We also furnish materials for installation by others.

Estimates, samples, specifications, literature, and references sent on request.

We fully guarantee our floors.

T-M-B Flooring

A permanent, hygienic, waterproof floor especially designed for foot traffic.

It is laid over old or new cement, concrete, composition, tile, steel or wood, and is used extensively in schools, colleges, laboratories, hospitals, sanitariums, hotels, churches, public and office buildings, roof gardens, basements, etc.

Repeatedly specified by leading architects because of its long wearing quality.

Laid plastic in one continuous, seamless area. It is absolutely sanitary, because there are no crevices or joints to harbor germs, dirt or vermin.

T-M-B Flooring bonds perfectly to any subfloor and lasts as long as the latter. It clings snugly to and around pipes, refrigerator fixtures, corners and doorways, and it may be continued without a seam to form a cove base. No cutting or fitting anywhere.

T-M-B Flooring is tough in texture and has unusual durability and freedom from abrasion, and is uniform throughout its thickness. It is made of imperishable minerals and will never rot, deteriorate, blister, wrinkle, bulge, expand, shrink, become loose, dust or flake. It is waterproof, acidproof, chemically inert and easily cleaned.

T-M-B Flooring is produced in red, green, tan and black. The colors never fade or streak.

The rubberlike resilient quality of T-M-B Flooring assures a quiet, comfortable and safe non-slippery floor.

It is recognized as the best floor for outdoor areas and basements. It is not affected by heat of summer or the cold and storms of winter. Neither a lighted cigarette or continuous flow of hot water can ever injure T-M-B Flooring.

A non-conductor of electricity, T-M-B Flooring is used extensively as a safe insulating floor in power-houses and as an ideal covering over cork boards in refrigerating rooms.

DuPont Hotel and Office Building, Wilmington, Del.
100,000 sq. ft. of T-M-B Flooring installed in 1917 and 1918 are in fine condition

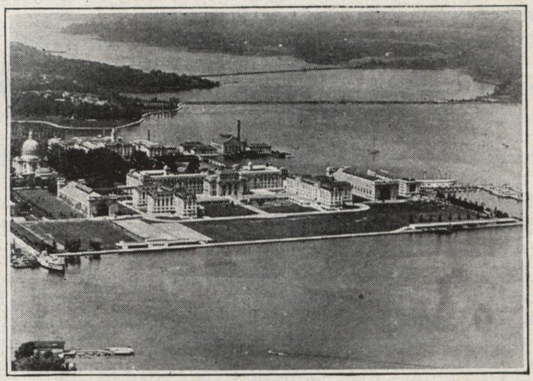
Moulstone Flooring

An especially high quality floor for stores, apartments, offices, schools, churches, hotels, factories, warehouses, printing and newspaper plants, and all types of buildings.

It is obtainable in a great variety of colors, and is installed over old or new wood or cement.

References

Our list of installations and of architects who repeatedly specify these floors would cover several pages of this book. They will be furnished on request.



United States Naval Academy, Annapolis, Md.
After eight years of hard service in this institution, more than 100,000 sq. ft. of T-M-B Flooring look like new

Grant Hospital, Chicago, Ill.
Five repeat orders for T-M-B Flooring have been placed by this institution

REZILITE MANUFACTURING COMPANY

Manufacturers of Mastic and Composition Flooring

122 South Michigan Avenue

CHICAGO, ILL.

BRANCHES

NEW YORK, N. Y.
NASHVILLE, TENN.
MINNEAPOLIS, MINN.
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PITTSBURGH, PA.
TORONTO, ONT.

REZILITE

TRADE-MARK
(Reg. U. S. Pat. Off.)

Product

Rezilite, an Applied Wearproof Flooring; also suitable for Coved Sanitary Base, Stair Treads, etc.

Also manufacturers of Duro-Magnesite Flooring, Dampproofing, Rezilite Asbestos Shingles, Steel Preservative, Waterproofing, Concrete Hardener, Wood Finishes, Varnishes, and Liquid Wax Polish.

Rezilite

Rezilite comes in semiliquid form and has a large covering capacity because it is laid but ⅛ *in. thick* over the entire floor. If desired it can be extended up over cove base, forming one continuous sheet, which is waterproof, acidproof, wearproof, dustproof, germproof and fire resisting.

Rezilite will not crack, crumble nor peel; retains its elasticity. Deadens sounds, and expands and contracts with the base to which it is applied. It is the most economical permanent floor on the market.

Rezilite is made in rich mahogany, battleship tan, and deep green. Packed in barrels.

Wearproof

Rezilite floors are very durable and will last as long as the building; are quiet to walk upon, resilient, noiseless, and easy on the feet; eliminate fatigue. They combine all the good features of concrete, tile, wood and linoleum. Rezilite has permanent wearing qualities, the warmth of wood and the resilient, noiseless, dustless qualities of linoleum, cork and rubber at a substantial saving.

Waterproof

Water can not injure Rezilite floors, neither will water make Rezilite slippery. It is therefore adaptable for stair treads, stair landings, elevator landings, elevator floors, street and railway cars, ships and other places where a permanent and waterproof floor is required. After once applied it becomes a part of the floor and is therefore permanent.

Acidproof

Rezilite floors are acidproof and alkaliproof and can be used to advantage in chemical laboratories, operating rooms, nickelplating rooms, and other places where a good acidproof floor is necessary. Rezilite is of inestimable value in hospitals, schools, colleges, asylums, institutions, churches, theaters, hotels, clubs, office buildings, etc.

Slipproof

Rezilite floors are never slippery, wet or dry, thus being easy to walk upon. Rezilite floors are non-conductors of electricity, and can be used as an insulation in power plants, switchboard rooms, telephone exchanges, powder plants, electric plants, ammunition plants, packing plants, chemical plants, etc.

Thoroughly Sanitary

Rezilite when laid in one piece on cove up to the top of base is the most sanitary floor extant. By reason of its perfect adhesion it becomes a part of the permanent construction. Water, dirt, vermin and disease germs can not penetrate and get between it and the base to which it is applied, as is the case with linoleum, wood, or other floors, that must be pasted down. It is not affected by changes in temperature, electricity, etc.

Where Used

On stair treads, stair landings, platforms, gymnasium floors and walls, indoor tennis courts, dance floors, etc. In rooms, corridors, halls, class and lecture rooms, church and theater aisles, schools, hospitals, offices, stores, billiard rooms, chemical laboratories, power stations, refrigerating plants, etc.

Specifications

Floor Surface—The base, slab or floor shall be laid by the cement contractor and brought up to a true, even level and screeded surface, within ⅛ in. of the top or finished floor level, troweled or floated to a sidewalk finish without joints. (Concrete must be hard and sound—a soft, scaly or loose surface can not be used for this type of floor.)

First Coat of Rezilite—Apply ¾ gal. of *Rezilite* first coater (6 lb. by weight) to every 100 sq. ft. of floor surface.

Second Coat of Rezilite—Apply 4½ gal. (51½ lb. by weight) *Rezilite* cushion coat to every 100 sq. ft. of floor surface.

Third Coat of Rezilite—Apply 4½ gal. (51½ lb. by weight) of *Rezilite* cushion coat to every 100 sq. ft. of floor surface.

Fourth Coat of Rezilite—Apply 3¼ gal (35 lb. by weight) of *Rezilite* finish to every 100 sq. ft. floor surface.

Fifth Coat of Rezilite—Apply 2 gal. (21 lb. by weight) of *Rezilite* finish. Thus applying 15 gal. per 100 sq. ft. in all (165 lb. by weight). A less quantity will not be accepted.

It shall be especially provided that the last or fifth coat of *Rezilite Finish* as nearly as may be, shall be applied after all other trades are out of the building, and uninterrupted possession is obtainable. The areas shall stand free of all traffic or occupation for 7 days before used or occupied.

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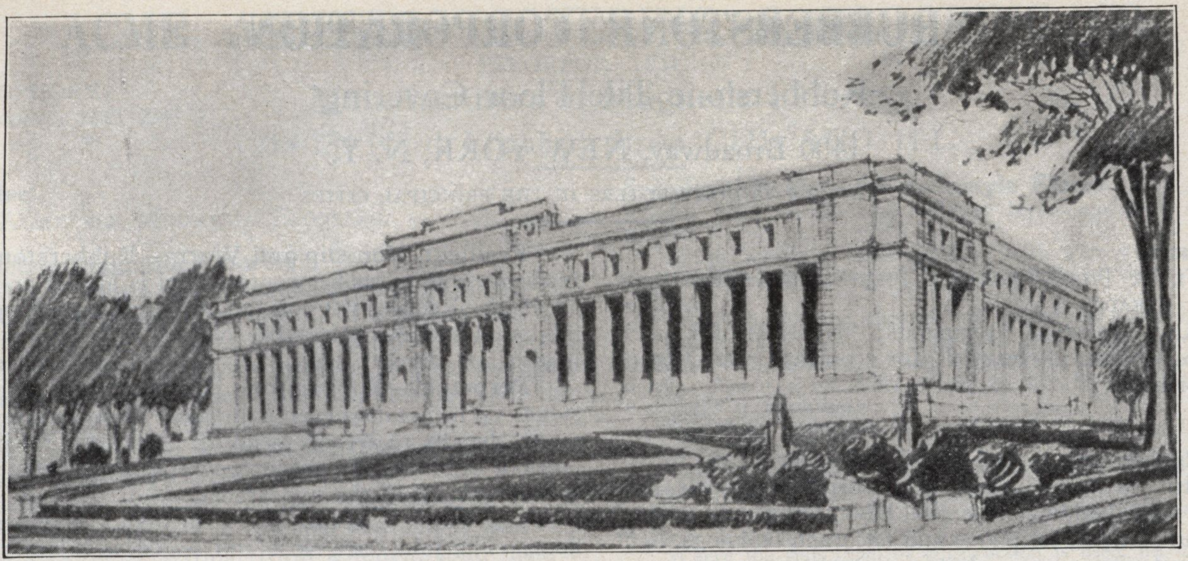
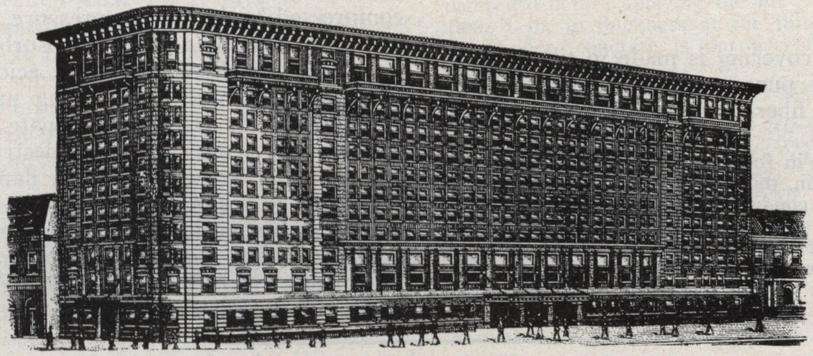


Laboratory of Chemistry, Cornell University, Ithaca, N. Y.
Gibb & Waltz, Architects, Ithaca, N. Y. Day & Klauder, Associate Architects, Philadelphia, Pa.



Arlington Building, U. S. Government, Washington, D. C.
800,000 sq. ft. of Rezilite laid

Underpinning & Foundation Co., Builders, New York, N. Y.
Winston & Co., Engineers, New York, N. Y.

Buildings Where Rezilite Has Been Installed

Changes from the Foregoing Necessary Where Rezilite Is to Cover Old or New Wood Floors—The wood floor must positively be *dry* and free from grease. Large cracks, open joints, breaks, shakes, loose knots, knotholes shall have tin nailed over them. Where there are weaving or loose boards they shall be face nailed with coated nails of sufficient size to hold them tight. Joints and projections shall be flush with the floor, and joists not more than 16 in. on centers, or closer if necessary to carry the load intended.

Reinforcing—On top of the second coat of *Rezilite,* while it is wet or as soon as it is laid, lay all over the floor (pressing it into the material with a trowel) *Rezilite* reinforcing burlap or linen or steel reinforcing, as required.

It should be troweled until the material oozes through, or comes up through the burlap or linen; then on top of this lay some more, or enough plain *Rezilite* to cover the reinforcing; let this dry until hard, then finish the floor in the usual way, as previously indicated.

A Few Installations

U. S. Treasury Building, Top Floor, Washington, D. C.
Arlington Building, U. S. Government, Washington, D. C.
New Jersey Zinc Co., Palmerton, Pa.
Vanderbilt University, Nashville, Tenn.
Chemistry Building, University of Illinois, Urbana, Ill.
First M. E. Church, Grand Rapids, Mich.
Reid, Murdock & Co., Pierceton, Ind.
Pittsburgh Plate Glass Research Laboratory, Milwaukee, Wis.
Y.M.C.A. Building, Minneapolis, Minn.
Miller Hotel, Milwaukee, Wis.
Miller Theater, Milwaukee, Wis.
Indiana State Normal Science Building, Terre Haute, Ind.
Solvay Coke Co., Hutchinson, Kan.
Shawnee Hospital, Shawnee, Okla.
Richard Memorial Building, Bacone College, Bacone, Okla.
Claypool High School, Claypool, Ind.
London Guarantee & Accident Co. Offices, Toronto, Ont.
Rose Avenue School, Toronto, Ont.
High School, Isabel, Kan.
Tuberculosis Hospital, Leach Farm, Pittsburgh, Pa.
Linwood School, Linwood, Kan.
Tuberculosis Hospital, N. H. D. V. S., Sawtelle, Cal.
Vanderbilt Hospital, Nashville, Tenn.
Cornwell Beef Co., Saginaw, Mich.
Peoples National Bank, Waynesboro, Pa.
Union High School, Knoxville District, Pittsburgh, Pa.
St. John's Home, Milwaukee, Wis.
New Baker Laboratory, Cornell University, Ithaca, N. Y.
Animal Research Building and Robinson Laboratory, Ohio State University, Columbus, Ohio
Biology and Geology Building, Hamilton College, Clinton, N. Y.
Ashford School, Methuen, Mass.
Cregg School, Lawrence, Mass.
Decatur High School, Decatur, Ind.
Oliver High School, Pittsburgh, Pa.
Peabody High School, Pittsburgh, Pa.
Scottish Rite Temple, Nashville, Tenn.
Garden Road School, Wellesley Hills, Mass.

RUBBERSTONE CORPORATION

Rubberstone Tile Floor Covering

1400 Broadway, NEW YORK, N. Y.

OFFICES OR DISTRIBUTERS IN THE PRINCIPAL CITIES

Products

FLOOR TILE; FLEXIBLE TILE for COVE BASE and STAIR TREADS.

Also Acoustical Treatments: "No-Nois" for quieting noisy offices; "Hearwel" for acoustical correction of auditoriums.

Use

Rubberstone is well suited for general use.

It is particularly adapted for corridors, schools, hospitals, office buildings, chemical laboratories, institutions, railroad stations, telephone and telegraph buildings, light manufacturing spaces, electric powerhouses, etc.

Caution: The only place where it is not recommended is where appreciable quantities of oil or grease remain more or less continuously on the floor or where heavy trucking is done.

Description

Rubberstone floor covering is made in tile form by the skillful blending of pure vegetable rubber, selected asphaltic oils, asbestos fiber, and coloring pigments of high quality.

Sizes—The tiles come in four sizes: 6x6, 12x12, 12x24 and 12x36 in., either ⅛ or $\frac{3}{16}$ in. thick. The ⅛-in. standard thickness is suitable for most conditions, but the $\frac{3}{16}$ in. is recommended for stair treads and for other places subject to unusually severe wear. It is serviceable throughout its entire thickness, and under severe use will wear for years.

Colors—Furnished in olive green, tan, terra cotta red, dark brown and black.

Resilient, Non-slip and Warm—Rubberstone has resiliency due to rubber content, and is almost as warm as wood. Reduces the noise of walking or trucking to a minimum and is comfortable to stand or walk upon. It is also non-slippery even when covered with water.

Perpetual—Rubberstone is almost as durable as stone. When it does eventually wear or require replacement, due to re-arrangement of partitions, repairs to pipes or conduits, or damage, new tiles can be easily laid without changing the appearance.

The tiles are securely cemented to the underlying floor. The joints are close and sealed with waterproof cement. Rubberstone will not crack, crawl, wrinkle nor turn up at the corners.

Sanitary, Chemical and Fire Resisting—Being compressed under heavy pressure, Rubberstone has no voids, and the surface is non-absorbent.

It is not affected by most acids or alkalis. Marks from ink, cigarettes or burning matches, can be easily washed off. It does not originate dust. It is not fireproof in the sense of being indestructible by fire, but is fire resistant and will not carry flame nor feed a fire.

Stair Treads—Rubberstone is ideal for stair treads, platforms and landings, not only on account of its great durability and ease of maintenance, but because it provides a safe footing. A metal nosing is necessary to protect the edge of the tile.

Specifications for Rubberstone

Rubberstone Over Portland Cement Foundation—All portland cement floors upon which Rubberstone is to be applied shall have a top layer 1 to 1½ in. thick, composed of portland cement and clean, sharp sand in such proportions as to be structurally sound and capable of sustaining the loads for which they are intended.

It should be thoroughly bonded to the fill, laid to an even grade, free from high and low spots and troweled to a smooth finish at a distance below the established grade of the finished Rubberstone floors equal to the thickness of the material specified (⅛ or $\frac{3}{16}$ in.).

Portland cement floors which have been frozen, which have a chalky or scaly surface or which are not well bonded to the fill, are not satisfactory as foundation for Rubberstone, and will not be accepted.

Note: Rubberstone can not be applied to a wet surface. Portland cement floors laid below grade must be thoroughly waterproofed, and whether below grade or not, must be bone dry when Rubberstone is applied.

Rubberstone Coved Base—When a Rubberstone coved base is specified, there shall be provided as base or grounds for the same, a portland cement or composition base of the height specified, terminating against a metal plaster ground at a distance back of the finished wall surface equal to the thickness of the Rubberstone (⅛ or $\frac{3}{16}$ in.).

This base shall be finished smooth and uniform with a curve at the intersection of the floor and wall, tangent to the floor surface and having a radius not less than 1½ in.

Rubberstone Over Wooden Floors—Rubberstone will not be laid directly on a lumber base. A course of single-ply, 1½-lb. saturated builder's deadening felt will first be securely cemented to the base, and the Rubberstone applied over the felt membrane.

All wooden floors which are to receive Rubberstone shall be of double construction, composed of well seasoned lumber.

They shall be structurally sound, close jointed, securely nailed and there shall be no springy boards nor loose butts.

The surface shall be planed, scraped or sandpapered, as may be necessary to produce a smooth finish, at a distance below the established grade of the finished Rubberstone floors equal to the thickness of the material specified (⅛ or $\frac{3}{16}$ in.), plus the thickness of the felt membrane.

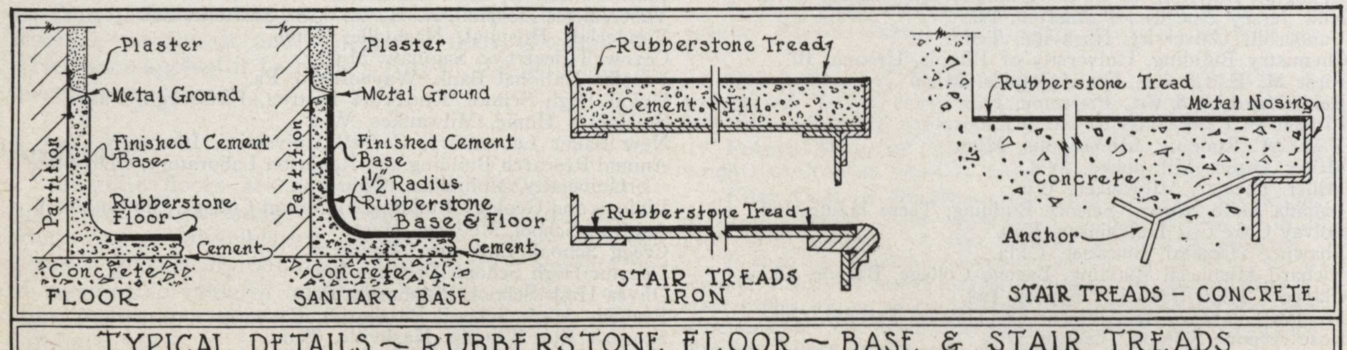
Rubberstone Stair Treads—When Rubberstone stair treads, stair platforms or landings are specified or shown on plans; grounds or foundations shall be provided for same by others. These grounds shall be of portland cement (as specified for floors), of sound and rigid metal, of marble, slate or wood.

They shall be finished smooth and set at a distance below the established level of the finished Rubberstone treads or platforms equal to the thickness of the material specified.

All stair treads, landings, etc., shall be provided with suitable nosings, rigidly set in such manner that the specified thickness of Rubberstone will finish flush with the top of the nosing.

Delivery—All subfloors or grounds upon which Rubberstone is to be applied are to be delivered to us bone dry, broom clean, and *free from grease or paint,* and we are to be given free and uninterrupted possession of such areas as we may require while our work is in progress.

Guarantee—We guarantee Rubberstone Flooring laid by us in accordance with the foregoing specifications, not to disintegrate, crack, wrinkle, nor come loose from the underlying foundation within one year from the date of completion. Should such defects appear within the time stated, we will make them good at our own expense.



TYPICAL DETAILS ~ RUBBERSTONE FLOOR ~ BASE & STAIR TREADS

ACME ASBESTOS COVERING & FLOORING CO.

INCORPORATED 1907

TELEPHONE
Monroe 2342, 2343

Manufacturers of Magnesia Flooring

218-234 North Elizabeth Street, CHICAGO, ILL.

Product

Acmetyle Magnesia Flooring.

Acmetyle Magnesia Flooring

Acmetyle is a modern sanitary fireproof floor.

Composition—Acmetyle is a composition of a magnesium base and an aggregate of other finely graded minerals which, in plastic, forms a smooth, monolithic surface—thoroughly fireproof, non-dusting and comparatively light in weight.

Acmetyle is laid in eight strong, warm colors, either plain or in paneled effects.

Life—In ordinary service, Acmetyle is practically indestructible. The repeated trowelings, when it is in the process of setting, form a tough, solid mass of extremely close texture with a non-dusting surface which is remarkable for its resistance to wear.

Cost—The installed cost of Acmetyle is comparatively low—ordinarily being but little more than for finished hardwood. It must be remembered that there is seldom any extra subfloor expense occasioned by the use of Acmetyle. This fact, together with its unusual durability and low cost of maintenance, means Acmetyle is a floor of genuine economy in every way.

Installation of Acmetyle

Acmetyle is laid in plastic form in two coats, to a total thickness of ¼ to 1 in. (½ in. being standard), is troweled to a smooth, even surface. Both first and finish coats are of the same color. It can be laid on any firm subsurface, new or old, of wood, concrete or cement as flooring, cove base, wainscot, stair treads, etc. Where laid over wood, a No. 16 gauge metal reinforcement is firmly nailed down to receive the application of the first coat.

Where desired Acmetyle may be surface-scored to imitate tiles of any size.

Suitability of Acmetyle

The all-round suitability of Acmetyle makes it adaptable for almost every type of building. It is recommended for public buildings of all kinds, residences, theaters, stores and offices, institutions, hospitals and schools. It is especially serviceable for reconstruction work as it can be laid directly over old floors without the expense of their removal.

Guarantee

Acmetyle is fully guaranteed against cracking or other considerable defects due to fault of our material or workmanship. We will repair at our own expense any work proving so defective.

Specification Data for Acmetyle Floors

All Acmetyle shall be laid two layers and both shall be colored.

Finish surfacing shall be done with a trowel in a first class, workmanlike manner, in such colors as chosen by the architect.

All work shall be cleaned and waxed on completion.

Subfloors—Subfloors must be reasonably level, free from holes and projections and brought to within ½ in. of the finishing line (or for other depths as may be provided by the architect's specification).

Any slope desired in the finished floors must be provided in the subfloor.

Concrete—A 1:2:4 mix is desirable; using only good portland cement, clean sharp torpedo sand and gravel or crushed stone, well tamped and given a rough float or broom finish.

Where the slab form of construction is used, fill to within ½ in. of the finished floor line as above after the finished coat of plaster has been applied. The slab must be thoroughly cleaned so as to remove all lime and other impurities and should be well dampened before applying the fill. This fill should not be less than 1 in. in thickness at the thinnest point.

Cinder concrete is not acceptable as a foundation for Acmetyle.

Concrete fill on iron landings and platforms should be 2½ in. or more and reinforced.

Note: Concrete must be bone dry—when laid on the ground should be waterproofed to prevent moisture from coming through. All concrete shall be installed by other contractors. Acmetyle flooring will not adhere to wet, limy, porous or weak concrete.

Hot pipes running through concrete must be insulated properly with asbestos; on top of same there must be not less than 2 in. of concrete.

Wood Subfloors—Six-inch sheathing, not less than ⅞ in. thick, laid rough side up, fairly close together is preferable; boards must be well seasoned, securely nailed and supported so that floor is firm and not springy; a No. 16 gauge metal reinforcer shall be furnished by the composition contractor and be nailed securely to the wood, with roofing nails 6 in. apart or less.

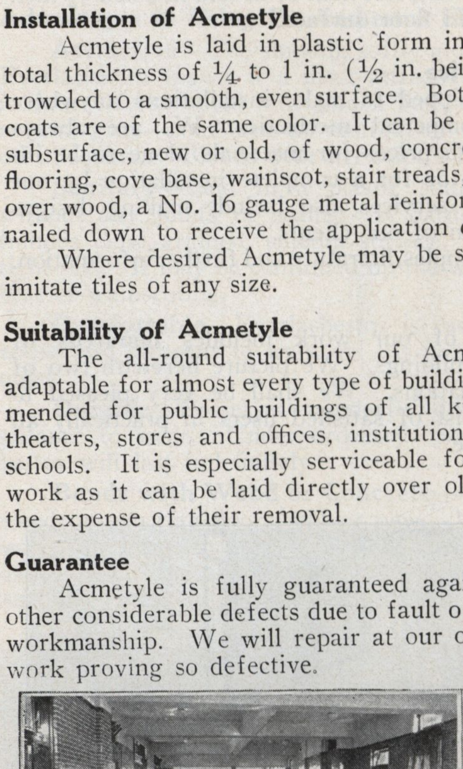
Backing for Wainscot and Base—Acmetyle can be laid directly on brick, terra cotta, concrete and stone, all of which should be brought to within ⅜ in. of the finishing line; to bring same to the proper level use a mixture of 1:2 portland cement and sand not thinner than ¾ in. Acmetyle will not adhere to lime plaster or gypsum tile. Wood sheathing ⅞ in. or thicker may be used as above, securely nailed. Where Acmetyle base or wainscot are installed flush with plaster, a wood or metal ground strip shall be installed by others to divide the plaster and Acmetyle.

Floors, Wainscot, Base, Miscellaneous—Plastering shall be completed and all plaster, debris, etc., cleaned from the floors and spaces where Acmetyle is to be laid.

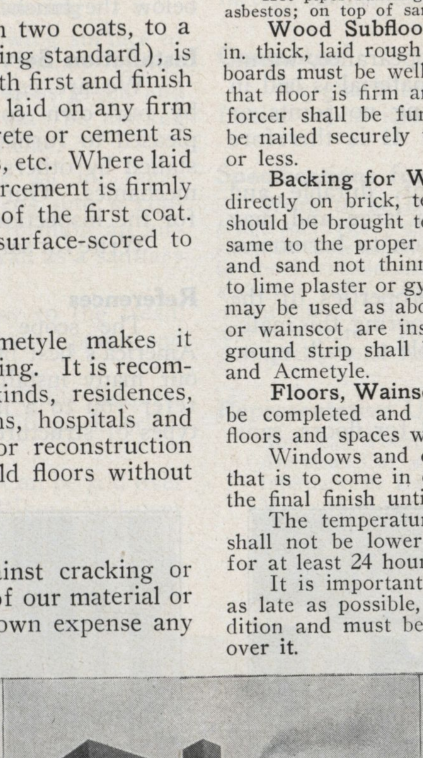
Windows and doors must be installed; trim set, but trim that is to come in contact with the Acmetyle shall not receive the final finish until the flooring is completed.

The temperature of rooms while Acmetyle is being laid shall not be lower than 65° F., and shall be so maintained for at least 24 hours after completion.

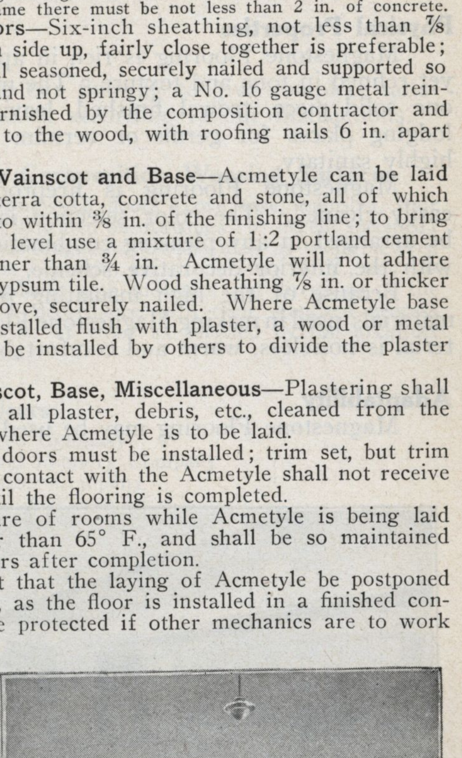
It is important that the laying of Acmetyle be postponed as late as possible, as the floor is installed in a finished condition and must be protected if other mechanics are to work over it.



Lounge, Hyde Building, State Hospital, Farmington, Mo.
Acmetyle used throughout



Factory Behind Acmetyle



Study Hall, Mt. St. Francis Preparatory College, New Albany, Ind.
25,000 ft. Acmetyle used in main building

AMERICAN MAGNESTONE CORPORATION

Manufacturers of Artistic Flooring and Stuccoes

(GENERAL OFFICES)
SPRINGFIELD, ILL.

PLANTS AND SALES OFFICES
OTTAWA, ILL. KANSAS CITY, MO. BROOKLYN, N. Y.

Products

Magnestone Composition Flooring.

Also Magnestone Roman Plain Finish Stucco; Granite Dash Finish Stucco and Interior Plaster of highest quality.

Magnestone Flooring

Magnestone Flooring is a composition of pure calcined magnesite, asbestos fiber, silica and other pure minerals, combined with the highest grade of inert mineral colors of our own manufacture, and is laid ½ inch thick.

Because of our great care in selecting and using only the very finest materials, the price of Magnestone Flooring is somewhat higher than other similar floorings of cheaper content. Our methods are scientific and positive both in our laboratories and factories.

Physical Properties

Magnestone Flooring is rich in appearance, warm, yet refined in tone and texture. The material is laid in one solid piece, trowel finished, leaving no joints or lodging places for germs or vermin. It is therefore highly sanitary.

Magnestone Flooring is fireproof, durable and easily cleaned. The color selection is large and may be arranged in any pleasing combination to harmonize with the interior decorative scheme.

Because of the high insulating properties of the materials used in making Magnestone Flooring, this material is noiseless, warm and comfortable to walk upon.

Adaptability

Magnestone Flooring may be used for floors, sanitary base, wainscoting and stairs in hospitals, apartment buildings, schools, clubs, hotels, laboratories, restaurants, showrooms and commercial buildings. Many of our hundreds of installations throughout this country have been in faithful service the past ten years.

It is equally adaptable and useful in the largest skyscraper to the coziest bungalow.

Foundation Requirements

Magnestone Flooring can be installed over new or old wood or concrete foundations ½ inch thick. If over wood, same shall be ⅞-inch subflooring well nailed to the joists. Over this foundation diamond mesh metal lath shall be nailed every 6 inches with large headed roofing nails. If over concrete foundations, concrete shall be of a rich mix, left float or broom finished ½ inch below the finished floor surface.

Installation Service

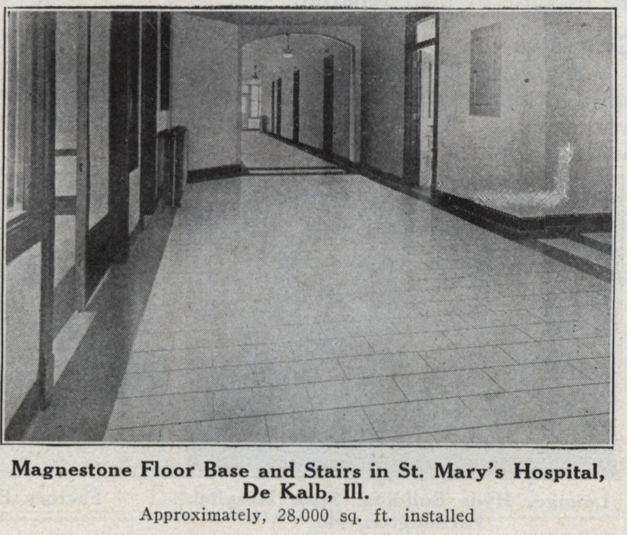
We are equipped to make installations anywhere by our own competent mechanics. We are always pleased to furnish prices for materials alone to be installed by others or for a complete installation by our mechanics. Our services also include making designs for the inspection of our clients.

Write for samples, literature and further information.

References

The scope of our work includes hundreds of America's best buildings. We picture herewith two of our many installations. We shall be very pleased to refer you to a list of satisfied users in practically all types of structure.

Magnestone Floor and Base in Lodge Room of Memphis Club, Memphis, Tenn.
Approximately, 14,000 sq. ft. installed



Magnestone Floor Base and Stairs in St. Mary's Hospital, De Kalb, Ill.
Approximately, 28,000 sq. ft. installed

EVERLASBESTOS FLOORING CO.

Manufacturers of Magnesite Composition Flooring

ROCHESTER, N. Y.

Everlasbestos Flooring
REG. U. S. PAT. OFF.
TRADE-MARK

Product

Everlasbestos, a Magnesite Composition for Floors, Wainscot and Stairways.

Scope of Use

Adapted for residences, office buildings, stores, factories, restaurants, banks, theaters, libraries, schools, hotels and apartment houses, churches, hospitals, institutions, etc.

Description

Everlasbestos is a plastic composition made of magnesite, asbestos and various chemical ingredients. It consists of a dry powder and magnesium chloride flakes, both shipped in convenient size bags, ready for use. Mixed at the job and troweled on to the floor by local masons or cement finishers. Illustrated directions free with order. Weighs about 3 lb. per sq. ft. laid. Thickness 1/2 in.

Advantages in Using Everlasbestos Flooring

Attractive—The smooth, softly glowing surface of Everlasbestos makes it a most attractive floor. Comes in four colors—royal red, golden buff, moss green and natural gray—combined as desired, or may be marked off in squares. Blends with any color scheme.

Sanitary—Laid in a plastic state 1/2 in. thick, without any joints or seams. It hardens into a continuous close grained, smooth surface, forming an air-tight seal. It may be continued up the wall as a sanitary base or wainscoting.

Comfortable—Everlasbestos is easy to the tread, warm and pleasant to walk on. It is non-slipping and quiet.

Durable—Possesses wonderful durability and resistance to wear. Under ordinary conditions Everlasbestos will last indefinitely.

Bonds with Wood or Concrete—Can be laid over wood or concrete floors, old or new. Where laid over wood, an inexpensive metal lath or wire mesh is first nailed down and the Everlasbestos is then troweled in over the meshes, reinforcing the entire floor. Laid directly over concrete without metal lath. Bonds equally well with brick or hollow tile.

Dustless—Does not give off dust under heavy wear and needs no surface application to keep it dustless.

Easy to Clean—Remarkably easy floor to keep clean on account of smooth surface and lack of any joints or crevices.

Comparative Cost—Initial cost of Everlasbestos is low. Price on fair sized installations, including laying, is but a trifle more than good linoleum. An economical, inexpensive, permanent flooring.

Ease of Installation

A floor can be laid in a few hours and put into service the next day. Any local mason can lay Everlasbestos successfully. Our illustrated Instruction Manual explains the method of installing in simple terms. The owner is thus saved the unnecessary expense of factory mechanics.

Guarantee

We guarantee our flooring to give complete satisfaction when installed according to our instructions.

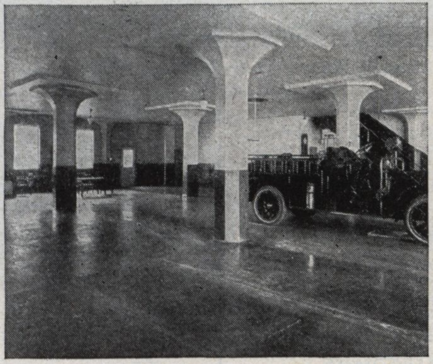
Specifications for Composition Wearing Surfaces

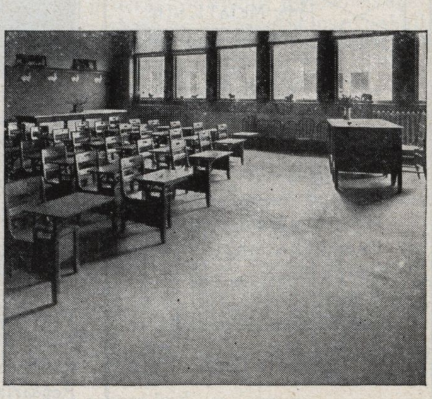
Work to be Done—All floors (cove base, wainscot, stair treads and risers) as indicated on drawings (or herein specified) shall be Everlasbestos Magnesite Composition as manufactured by the Everlasbestos Flooring Co., Rochester, N. Y., and installed in strict accordance with the rules and directions of the manufacturers and in accordance with their standard process and procedure. To be of color as selected by the architect (or specify color here).

Representative Users

American Tobacco Company
American Car and Foundry Company
International Heater Company
Missouri, Kansas & Texas Ry. Co.
Standard Oil Company
United States Navy
Warner Sugar Refining Company
Westinghouse Electric & Mfg. Co.

Y. M. C. A. Lobby, Rochester, N. Y.


Fire House No. 12, Rochester, N. Y.


Class Room, No. 22 School, Rochester, N. Y.

THE FIBRETILE COMPANY

Manufacturers of and Contractors for Magnesite Composition Flooring and Magnesite Stucco

MAIN OFFICE
210 New Telegraph Building, DETROIT, MICH.
FACTORY, BIRMINGHAM, MICH.

Products

"FIBRETILE" SANITARY, MAGNESITE COMPOSITION FLOORING, for Floors, Cove Base, Stair Treads, Wainscoting, etc.

Also "Fibretile" Weatherproof Magnesite Stucco.

Fibretile Flooring

Fibretile is a high grade magnesite composition flooring, which is sanitary, jointless, dustless, fireproof and resilient. It is installed in two coats of 1/4 inch each for a total thickness of 1/2 inch. The undercoat is of a softer mix, which forms a bed or cushion for the hard finish top coat. In the finish coat no soft aggregate, such as sawdust, cork, hair or other material of that nature is used. A small percentage of asbestos is used together with hard aggregates and a high percentage of magnesite. Therefore, Fibretile flooring, while resilient under foot, is extremely durable and will not disintegrate under severe usage extending over a period of many years.

Fibretile can be installed with equal facility over wood, concrete or iron. It is specified and used where a sanitary, fireproof and dustless floor is desired, and is adapted to every type of building. It has been installed by us in schools, apartments, churches, residences, hotels, stores, and many other types of buildings.

Harmonious Color Effects—As Fibretile can be installed in any of twenty different colors, beautiful effects may be obtained by installing borders or bands of a contrasting color from the field of the floors.

Condensed Specifications

Where shown on the plans, composition flooring (cove base, stair treads, risers and wainscoting) shall be installed in two coats of 1/4 inch each for a total thickness of 1/2 inch. This flooring shall be Fibretile, manufactured and installed by THE FIBRETILE COMPANY, Detroit, Mich.

Concrete Subfloors—Concrete subflooring shall be composed of 1 part portland cement, 2 parts clean sharp sand and 4 parts clean gravel. This shall be thoroughly tamped and be brought up level and true to within 1/2 inch of the finished floor line and left under a rough float finish, free from holes and projections. All pitches to drains or slopes must be provided in the underfloor. Concrete shall be thoroughly dry before Fibretile flooring is applied.

Wood Underflooring—Wood subflooring shall be of well seasoned boards laid with the rough side up, not less than 7/8 inch thick and not over 8 inches wide, well nailed to the joists.

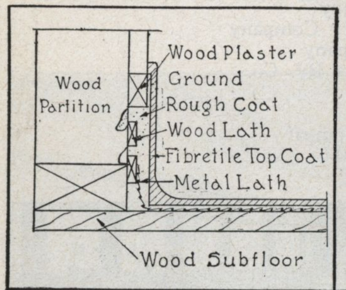
Sanitary Base and Wainscoting—All plaster shall be finished to a ground of metal or wood where Fibretile base or wainscoting is to terminate. A backing of portland cement and clean sharp sand in the proportions of 1 and 2, respectively, shall be applied and brought to within 1/2 inch of the finished wainscot line. Where cove base only is to be installed, a wood backing adjoining the plaster ground on the floor is sufficient for the reception of Fibretile base. In this case, Fibretile scratch coat shall be brought out to within 1/4 inch of the finished base line.

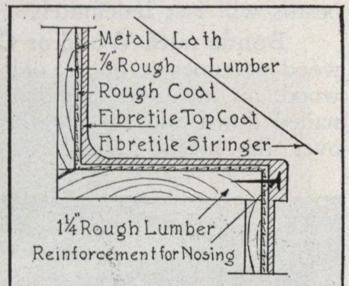
Final Finish—Fibretile flooring shall be installed after the plastering is done, trim is set and all glass is in place. The temperature where installation is to be made shall not be less than 65° F. (Salamanders or fire pots are not considered adequate devices). After our flooring has been laid, it shall be thoroughly cleaned and oiled by this Company.

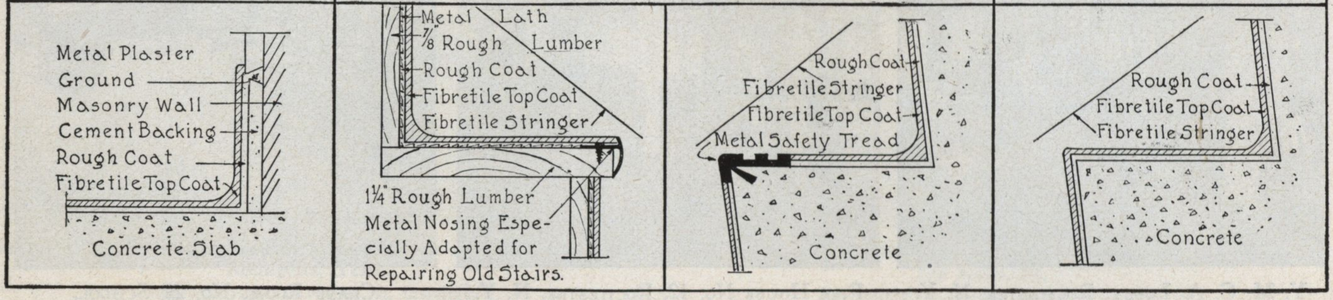
Fibretile Service

All installations of Fibretile flooring are put in by our own experienced mechanics. This enables us to stand back of all of our flooring installations, and all work done by us is fully guaranteed.

Board Room, Detroit Stock Exchange


Wood Partition
Wood Plaster Ground
Rough Coat
Wood Lath
Fibretile Top Coat
Metal Lath
Wood Subfloor


Metal Lath
7/8 Rough Lumber
Rough Coat
Fibretile Top Coat
Fibretile Stringer
1¼ Rough Lumber
Reinforcement for Nosing


Metal Plaster Ground
Masonry Wall
Cement Backing
Rough Coat
Fibretile Top Coat
Concrete Slab
Metal Lath
7/8 Rough Lumber
Rough Coat
Fibretile Top Coat
Fibretile Stringer
1¼ Rough Lumber
Metal Nosing Especially Adapted for Repairing Old Stairs.
Rough Coat
Fibretile Stringer
Fibretile Top Coat
Metal Safety Tread
Concrete
Rough Coat
Fibretile Top Coat
Fibretile Stringer
Concrete

Various Types of Fibretile Installations

INCORPORATED 1914

THE FLEXSTONE FLOORING CO.

COLUMBUS, OHIO

PLASTIC
FLEXSTONE
FLOORING

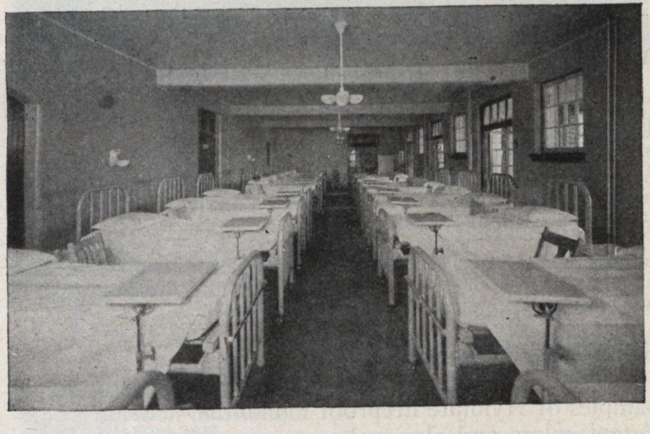
TRADE-MARK
(Reg. U. S. Pat. Off.)

Flexstone Plastic Flooring

Distinctive in character and reliable in performance, Flexstone flooring has demonstrated its efficiency for successful use in offices, banks, schools, commercial buildings, apartment houses, hospitals and other buildings where sanitation, endurance and low cost of upkeep are considered essential factors. It is a solid, substantial floor of great tensile, compressive and adhesive strength and of strong impact, fire and water resistance.

No Disintegration—Flexstone flooring is a magnesite-stone product, containing no vegetable fiber or other hygroscopic material and therefore does not hold or absorb moisture.

In thus providing a composition that does not absorb moisture, we not only have immediate and lasting assurance against disintegration, but assurance also that the whole Flexstone fabric will remain perfectly pure and sterile. Soiled water from the mop can not penetrate the surface of Flexstone, nor will a constant, heavy tread force or grind in dirt or other foreign matter to mar or deface its velvety, dustless, non-slippery polish—a polish which arises wholly out of the solid ingredients used in the manufacture of Flexstone.



Interior Views of the Franklin County Tuberculosis Hospital, Columbus, Ohio

W. H. Tremaine, Architect
20,000 sq. ft. Flexstone Flooring installed throughout the building

The surface of Flexstone is in no sense artificial, but is part of the integral Flexstone structure.

Tireless Tread—Notwithstanding the opposing elements of the solid materials which guarantee the sanitary permanency of Flexstone, the finished floor responds with a non-fatiguing tireless tread, while its monolithic solidarity, with complete freedom from vacuum and hollow sound, helps give the floor a high degree of comfort and noiselessness.

Good Workmanship Guaranteed—Flexstone flooring is manufactured and installed by none other than our own skilled workmen. It is laid at a standard thickness of 3/8 in. in one homogeneous coat directly on wood or concrete sub-floor or foundation without the use of metal lath or other artificial binding properties. When the sanitary cove base is used, the base becomes an integral part of the floor without crevice or joint.

Design and Color—Flexstone flooring is susceptible to a varied design of inlaid or depressed lines forming borders, block or slab of any size. The Flexstone range of colors is confined to those which we guarantee to hold fast.

Re-covering Old Wood Floors—In addition to its special usefulness in modern fireproof structures, Flexstone is being used successfully in re-covering old wood floors, thereby adding the element of fire resistance—a matter of much concern in remodeling old buildings for modern needs and purposes.

Specifications for Foundations—Foundations shall be furnished and installed by the general contractor or owner to conform with the following requirements, and shall be subject to our approval. Foundations shall be thoroughly dry and cleaned by general contractor or owner, care being taken to remove all lime or plaster from surface. Wherever pitch or slope in finished floor is desired, the same shall be provided for in the foundation.

Concrete foundations shall be 1 part portland cement, 2 parts clean sand and 4 parts broken stone or gravel, 1/2-in. ring size. Not less than 3-in. thickness, and shall be installed at one operation and brought up to within 3/8 in. of the finished floor level, and given a broomed finish.

Wood foundations shall be of tongued and grooved lumber not over 6 in. wide and not less than 7/8 in. thick, securely nailed to joists, and brought up to within 3/8 in. of the finished floor line.

Cement for backing wainscot and cove base to be composed of 1 part portland cement and 2 parts clean sand and shall be furnished and installed by general contractor or owner against all walls and partitions where base or wainscot is used; shall be given a broom finish, and brought to within 3/8 in. of the finished line. Where cove base or wainscot is to project beyond finished wall line, backing for same shall be finished flush. Where cove base or wainscot is to be installed flush with finished wall line a galvanized metal ground must be furnished and installed by the general contractor or owner to separate plaster from our material. Backing must be thoroughly dry. Flexstone can not be installed directly over plaster, plaster board, patent plaster, Keene's cement or terra cotta, nor over concrete or cement containing lime or compounds thereof.

In cold weather artificial heat shall be furnished by general contractor or owner in sufficient quantity to maintain a temperature of at least 70° Fahr. Salamanders or fire pots do not constitute adequate heating devices.

Flexstone shall not be installed until practically all other work has been finished, plastering completed, trim set and level for floors in the adjoining rooms laid.

HYLONITE PRODUCTS COMPANY

Manufacturers of Hylonite Monolithic Flooring
1107-1117 Addison Street
CHICAGO, ILL.

Products

HYLONITE FIREPROOF MONOLITHIC FLOORING for Floors, Cove Bases, Stair Treads and Landings.

For Hylonite Fireproof Sound Deadener and Hylonite High Temperature Bricks, Blocks and Powder, see page 1091.

Hylonite

Hylonite is a mineral substance of minute cellular structure which does not fuse under 2929° F. It is absolutely inert, will not expand or contract and owing to its extremely high fusion point it is 100% fireproof.

Hylonite Flooring

Hylonite flooring is a mixture of Hylonite and other carefully selected, finely ground materials, blended with permanent colors which produce a monolithic floor of lasting quality which will not dust or disintegrate, and which will not crack or buckle due to expansion or contraction of materials. It is absolutely sanitary as well as fireproof and is guaranteed against defects caused by faulty material or workmanship supplied by us.

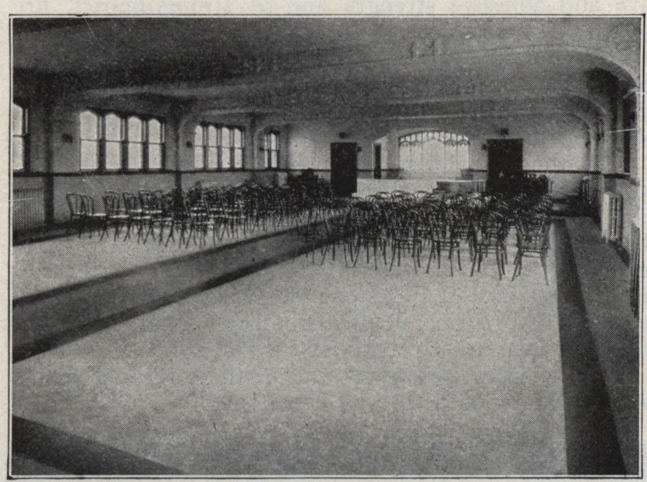
Hylonite Floor Features This Large Dining Room

Uses

Hylonite floors are not restricted to any particular kind of building but may be installed wherever a durable sanitary and medium priced floor is desired. Cove bases can be laid monolithic with the floor or, if desired, the cove bases and border may be laid in different color.

Advantages

Hylonite floors are low in cost, present a pleasing appearance, are quickly cleaned, easy to walk upon and firm enough to withstand ordinary wear for a lifetime. The cost is little more than good linoleum and about one-third the cost of mosaic tile.



The Spacious Floor of This Assembly Room Was Made of Hylonite Material

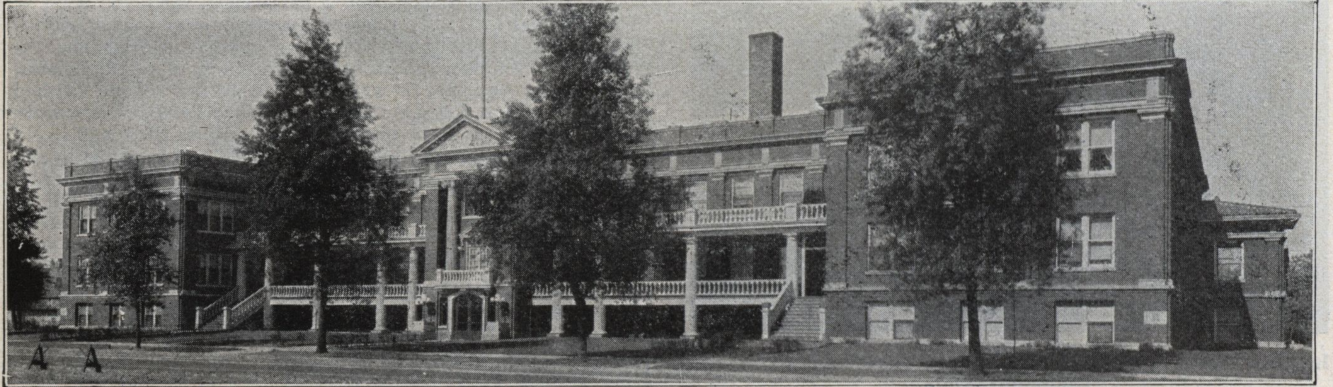
Installation

Hylonite floors are easily and quickly installed over old or new floors of either wood or concrete. Installation will be made by us, or we will furnish the material and full laying instructions to any contractor.

Hylonite floors are laid standard thickness, from ⅜ to ½ in. and the average cement finisher can install a good serviceable floor in a short time, by following the directions which are plain and simple.

Samples and Suggestions

Our Service Department will be pleased to supply samples of Hylonite fireproof monolithic flooring in different colors and also make recommendations and give estimates on request. The use of this department involves no obligation. We invite your correspondence.



Augustana Home for the Aged, Chicago, Ill.

Hylonite floor material used throughout the new building for floors, landings, corridors and cove base

HACHMEISTER-LIND CHEMICAL CO.

Halicomp Magnesite Composition Flooring, Masticomp Cold Mastic Flooring

PITTSBURGH, PA.

CANADIAN FACTORY AND OFFICE: SARNIA, ONTARIO

BRANCH OFFICES IN PRINCIPAL CITIES

Products

Halicomp Magnesite Composition Flooring.

Masticomp Cold Mastic Flooring.

Also Stuk-kote Magnesite Stucco.

Halicomp

Halicomp floors are modern floors—floors that are fireproof, sanitary, comfortable under foot, distinctively attractive—floors that regardless of these combined advantages can be installed at a surprisingly low cost.

Halicomp Flooring is installed in plastic form over new or old concrete or wood floors, (see details below) —also over steel plates—to a total thickness of ½ in. It sets into a seamless, permanent and attractive finished floor the same day it is laid.

Properties—Halicomp Flooring is non-dusting—is easily cleaned. Its low absorbency and freeness from joints make Halicomp Flooring unusually sanitary.

The colors of Halicomp floors are permanent. The colors used in Halicomp are of our own production, and not just ordinary mineral colors. We suggest color comparison of Halicomp samples with other magnesite floors.

Samples—Halicomp samples in all standard colors and our latest Halicomp catalogue with complete specifications will be sent on request.

We invite architects to ask for our standard Halicomp sample cabinet containing samples of Halicomp in various colors. Such boxes are imprinted with architect's name and address, and are furnished without charge.

Halicomp Specifications

Where so indicated on plans and required under specifications, floors (coved sanitary base, treads and risers) shall be Halicomp Magnesite Composition Flooring ½ in. thick as manufactured and installed by the Hachmeister-Lind Chemical Co., Pittsburgh, Pa. Installation must be made in strict accordance with manufacturers' installation specifications.

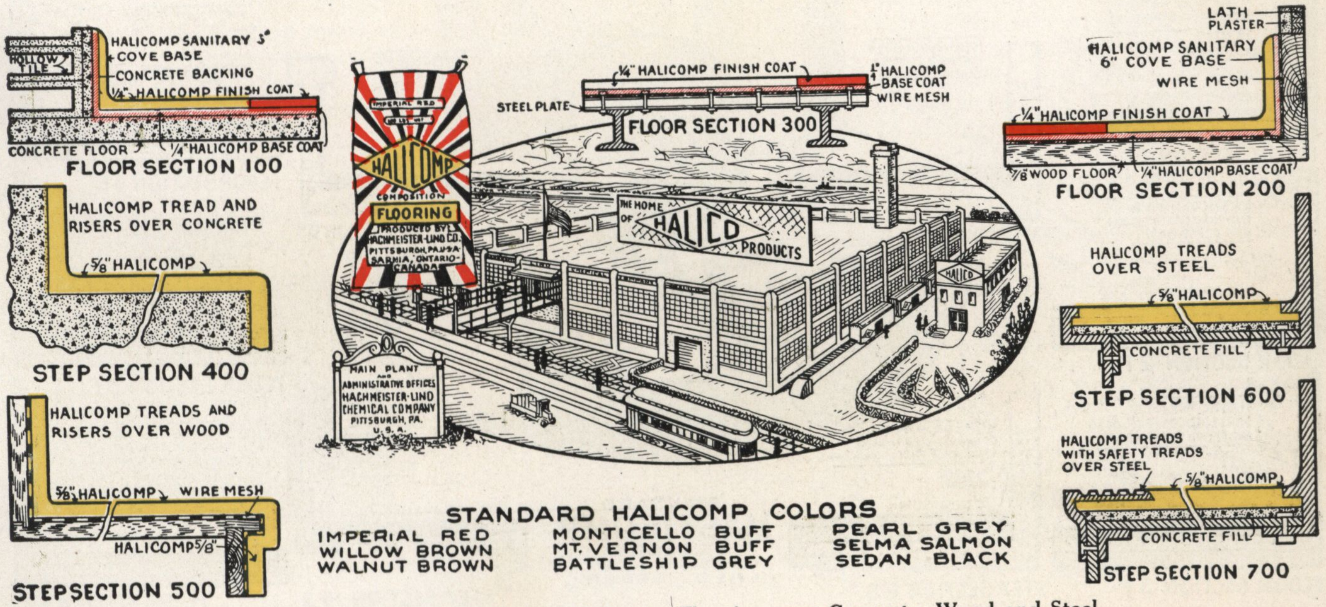
Foundations for Floor or Stair Treads—*Concrete*—Concrete foundations shall consist of 1 part of portland cement, 2 parts of good sharp sand free from loam, and 4 parts of gravel (never use lime in cement or concrete over which Halicomp is to be applied). Slab is not to be less than 3 in. thick and must be brought to within ½ in. of the finished floor level. Surface must be broom finished to afford a proper bond for Halicomp.

Wood—Foundations of wood to receive Halicomp shall consist of seasoned lumber preferably 4 in. but never over 6 in. in width nor less than ⅞ in. thick. This wood floor must be securely nailed to joists. Floor must be rigid—allow ½ in. for finished Halicomp.

Foundations for Coved Base or Wainscoting—*Cement*—A backing consisting of 1 part of portland cement and 2 parts of clean sharp sand never less than ½ in. thick must be furnished as a foundation on all walls over which Halicomp base or wainscoting is to be applied. Surface must be broom or scratch finished—allow ½ in. for Halicomp.

Wood—Boards not over 6 in. in width and not less than ⅞ in. thick can be used for base or wainscoting backing. Such boards must be nailed rigidly to studs—allow ½ in. for Halicomp.

For complete specifications, request our Form F. R. S.


HOLLOW TILE
HALICOMP SANITARY 3" COVE BASE
CONCRETE BACKING
¼" HALICOMP FINISH COAT
CONCRETE FLOOR
¼" HALICOMP BASE COAT
FLOOR SECTION 100
HALICOMP TREAD AND RISERS OVER CONCRETE
⅝" HALICOMP
STEP SECTION 400
HALICOMP TREADS AND RISERS OVER WOOD
⅝" HALICOMP
WIRE MESH
HALICOMP ⅝"
STEP SECTION 500
IMPERIAL RED
HALICOMP COMPOSITION FLOORING
PRODUCED BY HACHMEISTER-LIND CO. PITTSBURGH, PA. U.S.A. SARNIA, ONTARIO CANADA
¼" HALICOMP FINISH COAT
¼" HALICOMP BASE COAT
WIRE MESH
STEEL PLATE
FLOOR SECTION 300
THE HOME OF HALICO PRODUCTS
HALICO
MAIN PLANT AND ADMINISTRATIVE OFFICES HACHMEISTER-LIND CHEMICAL COMPANY PITTSBURGH, PA. U.S.A.
LATH PLASTER
HALICOMP SANITARY 6" COVE BASE
WIRE MESH
¼" HALICOMP FINISH COAT
⅞ WOOD FLOOR
¼" HALICOMP BASE COAT
FLOOR SECTION 200
HALICOMP TREADS OVER STEEL
⅝" HALICOMP
CONCRETE FILL
STEP SECTION 600
HALICOMP TREADS WITH SAFETY TREADS OVER STEEL
⅝" HALICOMP
CONCRETE FILL
STEP SECTION 700
STANDARD HALICOMP COLORS
IMPERIAL RED
WILLOW BROWN
WALNUT BROWN
MONTICELLO BUFF
MT. VERNON BUFF
BATTLESHIP GREY
PEARL GREY
SELMA SALMON
SEDAN BLACK

Sections Detailing Installation of Halicomp Flooring over Concrete, Wood and Steel

Continued on next page

MASTICOMP
COLD MASTIC FLOORING

Masticomp

Masticomp Flooring is the only cold mastic flooring that is both laid by cold method and manufactured without the aid of heat.

The mastic base dissolved in volatile solvents to produce Masticomp in plastic form is entirely the pure Elaterite, also known as mineral rubber.

Elaterite melts at 240°. The solvents necessarily used volatilize at 90°. It is easily understood, and we have determined in our own laboratories, that mastics made by hot process lose varying quantities of solvent resulting in an ununiform finished product bound to reflect in the finished floor.

Government specifications, for cold mastic floors require that Elaterite be used entirely for mastic contents. We guarantee that Masticomp meets Government specifications for this type of flooring.

The colors used in Masticomp are our own precipitated oxides, and not just ordinary natural mineral pigments. Compare Masticomp colors for density, positiveness of shade, and rubbing with any other flooring of its type on the market. All our colors are ground into the total mastic mass by Ball Mill process.

Properties—Masticomp is laid to thickness of ⅛ in. over concrete or wood floors. (See details below.)

Masticomp is applied in plastic state, troweled down to form a continuous, jointless finished floor having much greater durability than the best linoleum, yet giving about the same comfort under foot.

Masticomp actually bonds to the underfloor, forming an integral part of it. Its superior sanitary value is not to be overlooked. Masticomp is waterproof, acid-proof, non-absorbent, and there are no joints to harbor dust, dirt or vermin.

The initial cost of a Masticomp installation is surprisingly low.

Use—Masticomp is repeatedly specified for sanitariums, hospitals, schools, colleges, chemical laboratories, office buildings, public buildings of all kinds, theaters, stores, gymnasiums, exposed roofs subjected to traffic, refrigerating plants, etc.

Masticomp Specifications

Where so indicated on plans and required under specifications, floors (built up or painted mastic base, mastic treads or risers) shall be Masticomp Cold Mastic Flooring ⅛ in. thick, as manufactured and installed by the HACHMEISTER-LIND CHEMICAL Co., Pittsburgh, Pa. Installation must be made in strict accordance with manufacturers' installation specifications.

Foundation for Masticomp—***Over Cement***—Cement floors to receive Masticomp must be smoothly troweled, level and hard finished. Such finished cement floors must be left ⅛ in. below the finished floor line. (See details below.)

Over Wood—Wood floors to receive Masticomp must be left ½ in. under finished floor line. Wood flooring shall consist of regular 4-in. tongue and grooved ⅞ in. thick. This must be carefully nailed. Floor must be rigid. The finished Masticomp floor over wood is to consist of ⅛ in. thickness of Masticomp to be applied over ⅜-in. magnesite fill. (See details below.)

Base—Coved cement base can be finished with Masticomp, either built up to ⅛-in. thickness or painted with Masticomp Finish.

Coved base to receive Masticomp can also be built up with manufacturers' magnesite fill. (See details below.)

Stairs—Masticomp is applied over either steel or concrete steps. (Details for various types of step construction noted below.)

Complete Masticomp specifications will be sent on request.

Service

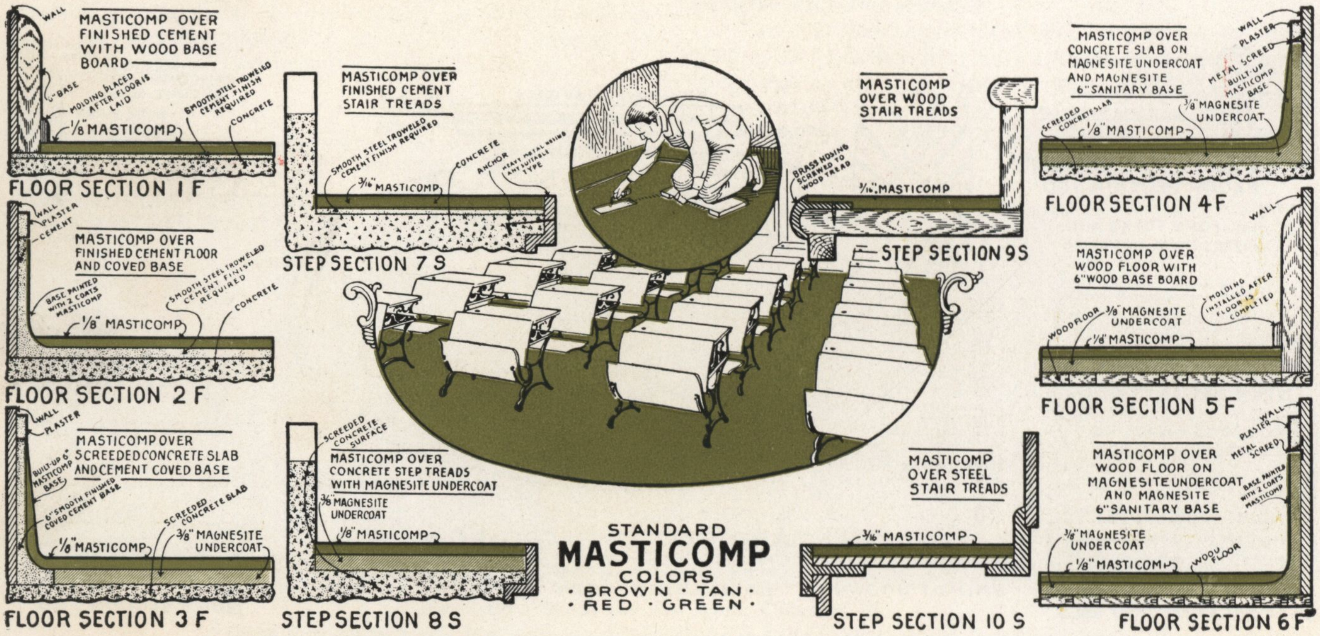
We maintain a large and very efficient Installation Department, and install both Halicomp and Masticomp Floors throughout the United States and Canada. Upon receipt of plans and specifications detailing work, or itemized list of quantities and details covering floors involved, we will submit proposals.

Guaranty

We guarantee every Halicomp and Masticomp installation; under this guarantee we repair free of charge any defects caused by faulty workmanship or material.

Responsibility

On reverse side of this insert we show our main plant at Pittsburgh. This is the largest and best equipped plant of its kind in the United States. We have been making magnesite products since 1903, and invite comparison of our financial rating, as listed in Dun's or Bradstreet's, with that of any other manufacturer in our line.


WALL
MASTICOMP OVER FINISHED CEMENT WITH WOOD BASE BOARD
6" BASE
MOLDING PLACED AFTER FLOOR IS LAID
SMOOTH STEEL TROWELED CEMENT FINISH REQUIRED
CONCRETE
1/8" MASTICOMP
FLOOR SECTION 1 F
MASTICOMP OVER FINISHED CEMENT STAIR TREADS
SMOOTH STEEL TROWELED CEMENT FINISH REQUIRED
CONCRETE
ANCHOR
HEAVY METAL NOSING ANY SUITABLE TYPE
3/16" MASTICOMP
STEP SECTION 7 S
WALL
PLASTER
CEMENT
MASTICOMP OVER FINISHED CEMENT FLOOR AND COVED BASE
BASE PAINTED WITH 2 COATS MASTICOMP
SMOOTH STEEL TROWELED CEMENT FINISH REQUIRED
CONCRETE
1/8" MASTICOMP
FLOOR SECTION 2 F
MASTICOMP OVER WOOD STAIR TREADS
BRASS NOSING SCREWED TO WOOD TREAD
3/16" MASTICOMP
STEP SECTION 9S
MASTICOMP OVER CONCRETE SLAB ON MAGNESITE UNDERCOAT AND MAGNESITE 6" SANITARY BASE
WALL
PLASTER
METAL SCREED
BUILT-UP MASTICOMP BASE
SCREEDED CONCRETE SLAB
3/8" MAGNESITE UNDERCOAT
1/8" MASTICOMP
FLOOR SECTION 4 F
WALL
MASTICOMP OVER WOOD FLOOR WITH 6" WOOD BASE BOARD
MOLDING INSTALLED AFTER FLOOR IS COMPLETED
WOOD FLOOR
3/8" MAGNESITE UNDERCOAT
1/8" MASTICOMP
FLOOR SECTION 5 F
WALL
PLASTER
MASTICOMP OVER SCREEDED CONCRETE SLAB AND CEMENT COVED BASE
BUILT-UP 6" MASTICOMP BASE
6" SMOOTH FINISHED COVED CEMENT BASE
SCREEDED CONCRETE SLAB
3/8" MAGNESITE UNDERCOAT
1/8" MASTICOMP
FLOOR SECTION 3 F
SCREEDED CONCRETE SURFACE
MASTICOMP OVER CONCRETE STEP TREADS WITH MAGNESITE UNDERCOAT
3/8" MAGNESITE UNDERCOAT
1/8" MASTICOMP
STEP SECTION 8 S
STANDARD
MASTICOMP
COLORS
· BROWN · TAN ·
· RED · GREEN ·
MASTICOMP OVER STEEL STAIR TREADS
3/16" MASTICOMP
STEP SECTION 10 S
WALL
PLASTER
METAL SCREED
MASTICOMP OVER WOOD FLOOR ON MAGNESITE UNDERCOAT AND MAGNESITE 6" SANITARY BASE
BASE PAINTED WITH 2 COATS MASTICOMP
3/8" MAGNESITE UNDERCOAT
1/8" MASTICOMP
WOOD FLOOR
FLOOR SECTION 6 F

Sections Detailing Installation of Masticomp Flooring over Concrete, Wood and Steel

THE MARBLELOID COMPANY

Manufacturers of and Contractors for Magnesite Products

461 Eighth Avenue, NEW YORK, N. Y.
FACTORIES: NEW DURHAM, N. J., and DETROIT, MICH.

BRANCH OFFICES

*PITTSBURGH, PA., 6624 Hamilton Avenue
*PHILADELPHIA, PA., 1524 Chestnut Street
*CLEVELAND, OHIO, 528 Erie Building
*DETROIT, MICH., 433 Brady Street
*BOSTON, MASS., 12 Pearl Street
BALTIMORE, MD., 115 East Commerce Street
CHARLOTTE, N. C., Latta Arcade
CINCINNATI, OHIO, 310 So. Ohio Bank Building
RICHMOND, VA., 1900 W. Broad Street
ST. LOUIS, MO., Railway Exchange Building
KNOXVILLE, TENN., 209 W. Clinch Street
BUFFALO, N. Y., 887 Ellicott Square

Products

"Marbleloid" Fireproof Plastic Flooring, a Magnesite Material for Floors, Coved Sanitary Base, Wainscot, Trim, Treads, etc.

Marbleloid Flooring

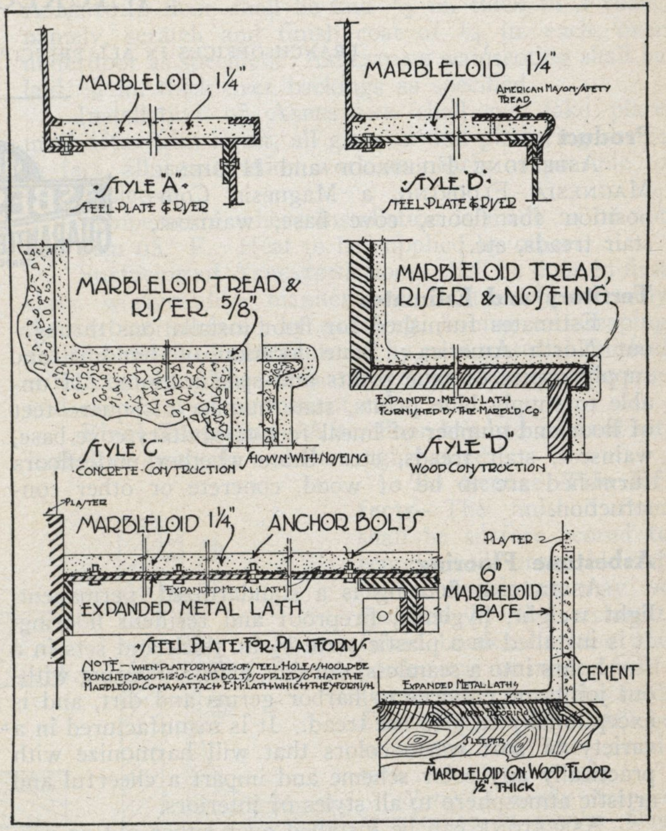
Physical Characteristics, Properties and Advantages—Marbleloid is a sanitary, standardized, permanent, light weight, fireproof and resilient flooring. It is installed in a plastic state, ½ in. thick, and sets in a few hours into a seamless, tough, elastic body, presenting a fine grained, smooth surface.

It is jointless, remarkably free from a tendency to crack and practically non-absorbent. It is easily kept clean; it is non-dusting; it is quiet to the tread; it is not slippery. Owing to its elasticity, it is not fatiguing; it is a non-conductor of heat and never cold; it has great crushing and structural strength and does not contract nor expand to any appreciable degree.

Marbleloid adheres firmly to wood, concrete or iron, and may be installed over old flooring, base or wainscot, as well as upon new construction. It is made in all colors, offering possibilities in color schemes.

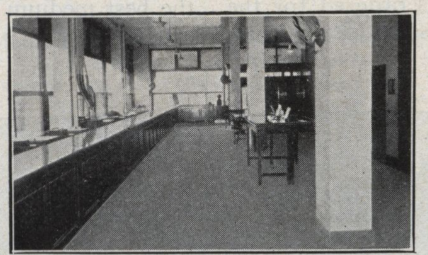
Adaptability—Marbleloid has been in use for the past twenty years. Approximately, 2,000,000 sq. ft. of Marbleloid are annually installed in the United States and Canada in industrial plants, offices, institutions, schools, public buildings, churches, restaurants, clubs, hotels, theaters, libraries, banks, residences, apartment houses, laboratories, stores, garages, and in railroad cars, railroad stations, and steamships.

Marbleloid Service—The Marbleloid Company maintains trained and skilled workmen at principal building centers of the country and is, therefore, unusually equipped to perform work in any section.


MARBLELOID 1¼"
•STYLE "A"•
STEEL PLATE & RISER
MARBLELOID 1¼"
AMERICAN MASON SAFETY TREAD
•STYLE "B"•
STEEL PLATE & RISER
MARBLELOID TREAD & RISER 5/8"
STYLE "C"
CONCRETE CONSTRUCTION
SHOWN WITH NOSEING
MARBLELOID TREAD, RISER & NOSEING
EXPANDED METAL LATH FURNISHED BY THE MARBL'D Co.
STYLE "D"
WOOD CONSTRUCTION
PLASTER
MARBLELOID 1¼"
ANCHOR BOLTS
EXPANDED METAL LATH
EXPANDED METAL LATH
•STEEL PLATE FOR PLATFORMS•
NOTE—WHEN PLATFORMS ARE OF STEEL HOLES SHOULD BE PUNCHED ABOUT 12" O.C. AND BOLTS SUPPLIED SO THAT THE MARBLEOID CO. MAY ATTACH E.M. LATH WHICH THEY FURNISH
PLASTER
6" MARBLELOID BASE
CEMENT
EXPANDED METAL LATHS
WOOD FLOORING
SLEEPER
MARBLELOID ON WOOD FLOOR ½" THICK

Application of Marbleloid in Different Types of Construction

Owing to the fact that installations are unsuccessful when made by local cement masons, inexperienced in the handling of material of this nature, Marbleloid flooring is not sold in bulk. *All work is installed by the Marbleloid organization and is rigidly guaranteed.*



Marbleloid in Office of Cleveland Telephone Co., Cleveland, Ohio

Marbleloid Flooring in Y. M. C. A. Building, Easton, Pa.

Before actually beginning the installation of the Marbleloid material, a preliminary inspection is made by an engineer thoroughly familiar with all phases of building construction.

At the plant and in the field, Marbleloid facilities are such that the company is always prepared to handle all work, no matter how large, with the utmost dispatch and efficiency.

Relative Low Cost—Marbleloid may be put into service 24 hours after it has been installed. It may be used just as readily over wood flooring (finished or subfloor) as it can be over concrete fill or finished cement. In alteration work both the time and expense of the preparation of a special foundation may be eliminated.

The price of Marbleloid flooring, sanitary coved base, wainscoting, stair work, etc., varies, naturally, with the area involved, nature of the foundation (wood, concrete, or iron) and location.

Marbleloid Specifications, Samples, etc.

Before drawing up specifications covering the use of Marbleloid, the company suggests that engineers or architects secure a copy of this company's Standard Specification Sheet, containing foundation requirements and other essential data.

Upon receipt of data giving information regarding nature of foundation, the area of floor and wainscot, lineal extent of sanitary base, treads, etc., a definite proposal for the work completely installed will be furnished.

Architect's and engineer's sample case and color card, together with full literature including booklet, Standard Specification, etc., will be gladly mailed on request.

---

*Indicates Warehouse.

ESTABLISHED 1906

FRANKLYN R. MULLER, INC.

Manufacturers of and Contractors for Magnesia Flooring

MAIN OFFICE AND FACTORY
900 Madison Street
WAUKEGAN, ILL.

BRANCH OFFICES IN ALL PRINCIPAL CITIES IN THE UNITED STATES

MULLER ASBESTONE GUARANTEED PRODUCTS TRADE MARK

Product

ASBESTONE FIREPROOF and HYGIENIC MAGNESIA FLOORING, a Magnesia Composition for floors, cove base, wainscot, stair treads, etc.

Territory and Estimates

Estimates furnished for floor installations throughout North America. State location of building and supply copies of blue prints and specifications. If unable to supply blue prints, state number of square feet of floor and number of lineal feet of sanitary cove base, wainscot, stair treads, etc. State whether underfloors furnished are to be of wood, concrete or other construction.

Asbestone Flooring

ASBESTONE flooring is a standardized, permanent, light weight, hygienic, fireproof and resilient flooring. It is installed in a plastic state ½ in. thick and sets in a few hours into a seamless, durable, artistic flooring without joints or crevices to harbor germs and dirt, and is exceptionally easy to the tread. It is manufactured in a variety of soft warm colors that will harmonize with practically any color scheme and impart a cheerful and artistic atmosphere to all styles of interiors.

ASBESTONE can be installed over either old or new wood, concrete or iron underfloors.

ASBESTONE flooring is prepared as ordered for the individual job. The composition is a scientifically compounded mixture of calcined magnesite, magnesium chloride and other proper ingredients to insure a uniform flooring material. All ingredients are scientifically tested as to their chemical and physical properties by our own chemists in our completely equipped laboratory. They are then carefully compounded by competent workmen under the supervision of experts.

A thoroughly equipped plant and unequalled transportation facilities enable us to guarantee prompt deliveries, no matter how large the job.

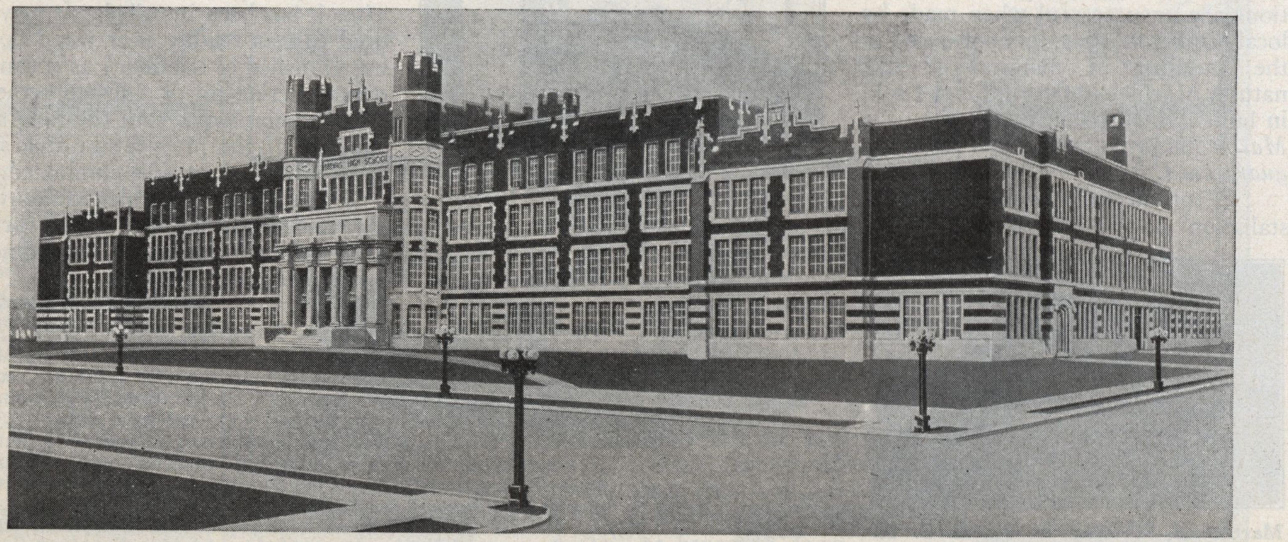
Physical Tests

ASBESTONE weighs approximately 3 lb. to the sq. ft., and has a very low percentage of absorption. It has an average tensile strength of from 800 to 1000 lb. per sq. in., a modulus of rupture strength of 1600 to 1800 lb. per sq. in. Its compressive strength is over 6000 lb. per sq. in. It has very great resistance to abrasion, and will stand under light trucking.

Service

We maintain thoroughly trained and skilled workmen to make installation of ASBESTONE flooring.

Where a medium priced flooring is desired for any class of building, we claim that ASBESTONE flooring is the best medium priced interior flooring known to modern science.



Hibbing High School, Hibbing, Minn.

W. T. BRAY, Duluth, Minn., Architect — JACOBSON BROS., Duluth, Minn., contractors

One of the largest public schools in the country. Over 200,000 sq. ft. of ASBESTONE flooring installed in classrooms and corridors

Continued on next page

Specifications for Asbestone Flooring

Concrete Underfloors—Should be composed of 1 part of a good standard portland cement, 2 parts of clean, sharp sand, and 4 parts of clean gravel or crushed limestone.

Same must be thoroughly tamped and leveled with wood float, and brought up to within ½ in. of desired finished floor line to a true, even surface, free from holes or projections.

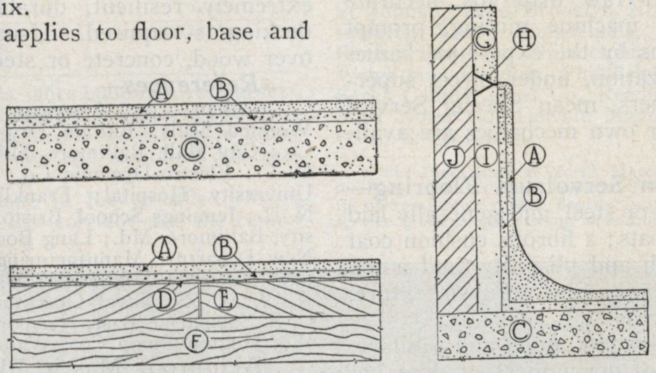
All concrete shall be thoroughly dry and set before ASBESTONE is applied.

All pitches to drains, slopes and levels must be provided for within ½ in. of desired finished floor line in underfloors.

Wherever pipes that are subject to expansion and contraction pass through concrete underfloors, they shall be surrounded by sleeves large enough to allow for necessary expansion. All pipes embedded in concrete, and subject to expansion and contraction, shall be covered with asbestos pipe covering, over the top of which there shall be not less than 2 in. of concrete. This work to be included in masonry contract.

Backing for Base and Wainscot—All plaster shall be brought down to a ground, preferably of metal, at a point where ASBESTONE shall terminate. The desired backings for ASBESTONE, if of brick, terra cotta, stone or metal lath, shall be covered with a coating of portland cement free from lime and brought up to within ⅜ in. of desired finished surface. This cement shall be not less than 1 in. thick and be 1:4 mix.

Wood Backing—This applies to floor, base and wainscoting over wood. Wood backing shall be of soft wood, rough stock not over 8-in. face, securely face nailed to joists or studding, and made as rigid as possible. The same shall be brought up for floors to within ½ in. of desired finished surface and within ⅜ in. for sanitary base and wainscoting. If lumber is faced one side, have rough side up or out, as composition can then get a better bond. This work to be included in carpenter's contract. Where ASBESTONE is to be laid over either soft wood or hardwood underfloors, the underfloors should first be covered with light weight tarred felt known as slater's felt. This is used to prevent warping of the underfloors during setting action. Nail down over the slater's felt, with large headed roofing nails, either 1-in. mesh galvanized-after-woven wire netting, or flat diamond mesh metal lath, either of which should be nailed every 6 in. in all directions.



Cove Base Over Concrete

Proper Method of Installing Asbestone Flooring Over Concrete or Wood Underfloors

(A) ASBESTONE top coat. (B) ASBESTONE cushion coat. (C) Concrete subfloor. (D) Metal binder. (E) Wood subfloor. (F) Joist. (G) Plaster. (H) Metal ground. (I) Cement backing. (J) Wall

Asbestone Floors, Wainscoting and Base—ASBESTONE floor shall be laid ½ in. thick in 2 coats, namely, scratch and finish coat of ¼ in. each, over underfloor as specified. ASBESTONE wainscoting shall be laid ⅜ in. thick over backings as specified.

Installation of ASBESTONE shall not take place until after trim is set, all glass in and plastering done; in fact, all construction work as nearly as possible to be completed.

Temperature where installation is made to be not less than 65° F. Heat to be supplied by others.

Surfacing of ASBESTONE floors shall be done in first class, workmanlike manner with a trowel, and any ASBESTONE surfaced by grinding, honing or scraping shall be removed and replaced by new material finished with a trowel. The surface of composition shall be true and even and of permanent color.

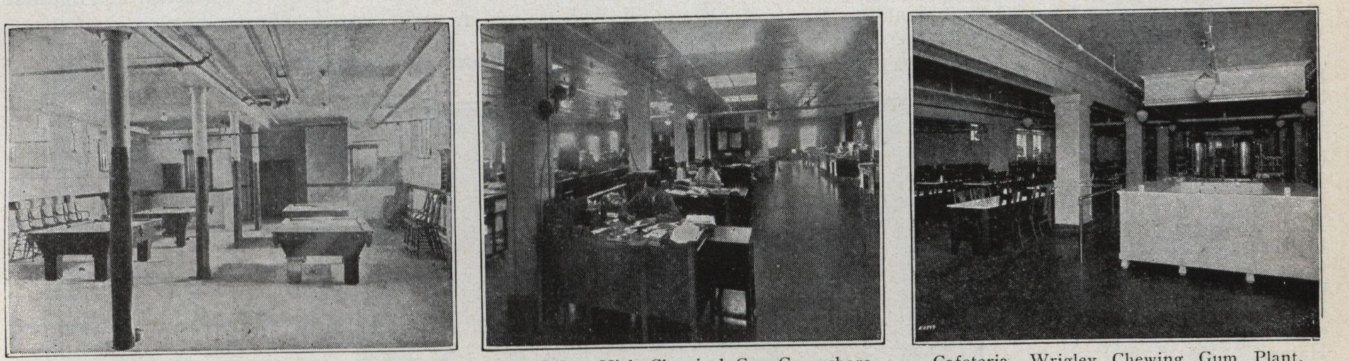
Final Surfacing—After floor has had its final set, it shall be properly and thoroughly oiled.

To Secure Tile Effects—The finished floor shall be surface scored to represent tile or marble slab in such sizes as may be specified by the architect. Inlaid border or base and border may be made of different color from the field. Plans for the same will be submitted by the architect.

Note: A neatly arranged specification in regular filing size furnished on request.

Guarantee

We guarantee all our work against any defects in material or workmanship.



Koehler Country Club House, Koehler, Wis.

Main Office, Vick Chemical Co., Greensboro, N. C.

Cafeteria, Wrigley Chewing Gum Plant, Chicago, Ill.

A Few Representative Installations of Asbestone Flooring

SPECIAL SERVICE FLOORING CORPORATION

Manufacturers of Composition and Asphalt Industrial Floors

2039 Grand Central Terminal, NEW YORK, N. Y.
WESTERN OFFICE, Storm King Building, 2704 Kettner Boulevard, SAN DIEGO, CAL.
FACTORIES: MAMARONECK, N. Y., NORFOLK, VA., SAN DIEGO, CAL.

BRANCH OFFICES

BALTIMORE, MD., 10 West Chase Street
CINCINNATI, OHIO, 805 Reakirt Building
CLEVELAND, OHIO, Schofield Building
DAYTON, OHIO, 403 Keith Building
MIAMI, FLA., Bedford Building
MONTREAL, QUE., 230 Dorchester Street, West
NORFOLK, VA., 302 Monticello Arcade
OKLAHOMA CITY, OKLA., 901 Braniff Building
SALT LAKE CITY, UTAH, B-100 Bransford
SAN ANTONIO, TEX., 727 No. Cherry Street
WINSTON-SALEM, N. C., Five Points

Products and Services

MAGNESITE COMPOSITION SERVOLEUM FLOORING; NATURAL CORK TILES; BATTLESHIP LINOLEUM; ASPHALT MASTIC FLOORS—"Thin Mastic Eoleum," Acidproof, Colored and Regular; MAGNESITE STUCCO (plain and colored). Also Rubber Tile and Colored Cement and Tile Floors.

FLOORING ENGINEERS and CONTRACTORS, assuming the entire flooring problem. Our engineers study the requirements that the floor must meet and suggest the proper one of the many types of Special Service Floors that will best fulfil the conditions. The flooring materials are then manufactured at the factory, expressly for the special service to which the floor is to be subjected.

Special Service Floors

There is no accident or mere good fortune associated with the international prestige of Special Service Floors. Careful analysis of raw materials, accurate compounding and thorough machine mixing, prompt shipments, skilled installations by the expert mechanics of our large, flexible organization, under direct supervision of one of our engineers, mean Special Service Floors. Skilled crews of our own mechanics are available from coast to coast.

Magnesite Composition Servoleum Flooring—Installed over wood, concrete or steel, and generally laid plastic $\frac{1}{2}$ in. thick, in two coats; a fibrous cushion coat $\frac{3}{16}$ in. thick of great strength and pliability, and a top coat $\frac{5}{16}$ in. thick of exceedingly fine grained texture, highly immune to abrasive wear.

It is fireproof, smooth, dustless, quiet and sanitary, and since it has the quality of springiness, it does not tire a person standing on it. Made in all colors.

References—It is significant that a great number of these installations are repeat orders.

Aluminum Co. of America; American Can Co.; American Locomotive Co.; American Woolen Co.; Bethlehem Hotel; Brooklyn Rapid Transit Co.; Chesapeake & Ohio R. R. Co.; Creighton University; Chapman Bank Building, Portland, Me.; Chamber of Commerce Building, Watertown, N. Y.; City Market, Norfolk, Va.; Dayton Power & Light Co.; Thomas A. Edison Co.; General Chemical Co.; General Electric Co.; International Harvester Co.; Johnson & Johnson; "Little Church Around the Corner," New York, N. Y.; Kelly Tire & Rubber Co.; Lachine School, Montreal, Que.; Johns Hopkins University; National Carbon Co.; National Screw & Tack Co.; Methodist College, High Point, N. C.; New York Central R. R. Co.; New York, New Haven & Hartford Railroad; New York Edison Co.; New York Telephone Co.; New York University; Procter & Gamble Co.; Theodore Roosevelt High School, Syracuse, N. Y.; U. S. Military Academy, West Point, N. Y.; U. S. Naval Hospitals: Brooklyn, N. Y., Pelham Bay, Wards Island and San Diego; U. S. Veterans' Hospitals: Cincinnati, Ohio, Fort Bayard, N. M., Oteen, N. C., Perryville, Md., Washington, D. C., Lake City, Fla.; Westinghouse Electric & Mfg. Co.; White Automobile Co.; William Wrigley Co.; Worthington Pump Co.

Cork Tile—Made of pure compressed cork; laid as floor, base or stair treads. Installed in many sizes and shades running from light tan to dark tobacco brown. Makes a warm, quiet, soft, durable and sanitary floor. Ideal for hospitals, libraries, banks, residences, offices, etc. Can be installed over wood, cement, steel or iron.

Battleship Linoleum—For use in schools, corridors, hospitals, homes, stores, banks and other places where an inexpensive soft floor is desired. An extensive range of attractive shades.

Eoleum Thin Mastic Floors—Resilient, flashproof, and a good thermal and electric insulator. Laid $\frac{1}{8}$ in. thick.

Asphalt Trinidad Mastic Flooring—Used where extremely resilient, durable and waterproof floor or decking is required. Usually laid $\frac{3}{4}$ to $1\frac{1}{2}$ in. thick over wood, concrete or steel.

References—

Aeolian Co.; American Ever Ready Works; Botany Worsted Mills; Buffalo Dry Dock Co.; Curtis Engineering Co.; City Hall, Baltimore, Md.; Burville School, Washington, D. C.; Electro-Dynamic Co.; General Electric Co.; Harvard University Hospital; Franklin Street School, Manchester, N. H.; Jennings School, Bristol, Conn.; Johns Hopkins University, Baltimore, Md.; Lang Body Co.; Linde Air Products Co.; New Departure Manufacturing Co.; New York Chronic Hospital; Tweedy Silk Mills; U. S. Naval Drill Hall, Pelham, N. Y.; U. S. Naval Operating Base, Hampton Roads, Va.; U. S. Submarine Base, Newport, R. I.; White Automobile Co.; Worthington Pump Co.; Walter Reed Hospital.

Acidproof Mastic Flooring—An acidproof floor which is being used successfully in metal pickling rooms, battery plants and plating works. Usually installed 1 to 2 in. thick over wood, concrete or steel.

Guarantee

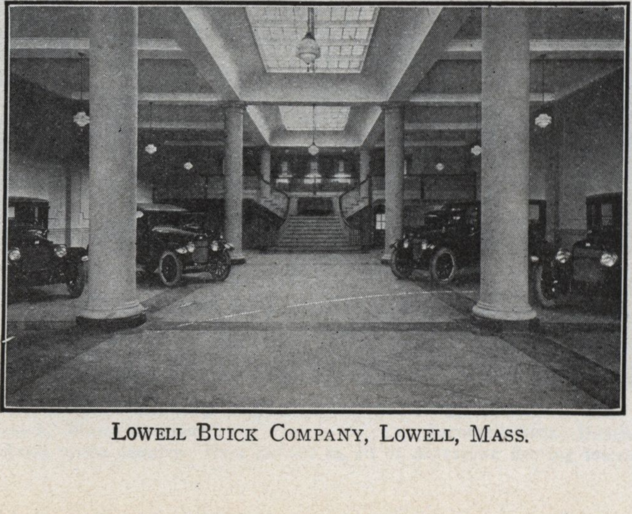
All products which we install are guaranteed against all defects of materials or workmanship.

Magnesite Stucco, "Storm King"

High tensile strength and very elastic, therefore does not crack like ordinary portland cement stucco. Easily applied over wood or metal lath. Made in a great variety of colors. Good insulator.

Specifications, Estimates, etc.

Complete specifications, lists of installations of the different types of flooring in your vicinity, samples, and further information regarding our products furnished promptly on request.



LOWELL BUICK COMPANY, LOWELL, MASS.

AMERICAN TILE & RUBBER COMPANY

Manufacturers of Amtico Marbleized Rubber Tile and Flooring

Perrine Avenue, TRENTON, N. J.

SALES OFFICES

BOSTON NEW YORK TRENTON PHILADELPHIA DETROIT CHICAGO SAN FRANCISCO

SUBSIDIARY TO

PANTHER RUBBER MFG. CO., Stoughton, Mass.
PANCO RUBBER COMPANY, Chelsea, Mass.
PURITAN RUBBER MFG. CO., Trenton, N. J.
PANTHER RUBBER CO., LTD., Sherbrooke, Que., Can.

Amtico Rubber Tile and Flooring

The result of over 25 years' successful rubber manufacturing experience. Made of new selected live rubber, scientifically compounded and colored. Vulcanized under tremendous hydraulic pressure, resulting in a beautiful, durable, resilient product having an appearance closely resembling marble.

Colors—Made in a wide variety of colors and veinings, including blacks, whites, blues, greens, golds, grays and the very popular paisley effects.

How Laid—Amtico is laid over old and new floors, both wood and concrete or stone. It is laid in tile patterns, in a wide variety of designs securely fastened to the subfloor by our own Amtico Waterproof Cement.

Size of Tile—As shown in table below:

Thickness, in.	Squares, in.	Oblongs, in.
3/16	4x 4	4x 8
1/4	6x 6 8x 8	6x12 9x18
3/8	12x12 18x18 24x24	12x24 ....

Uses—Used in hospitals, hotels, office buildings, restaurants, tea rooms, stores, boats, clubs, churches, homes, etc.; in fact, in all classes of buildings where the floors are subject to heavy foot traffic, and where silence, beauty and sanitation are necessary.

Runners—Amtico is also made in the so-called runner style, 12 ft. long by 30 in. wide. For corridor use, the runner type can be installed in the so-called panel design, with good effects.

Guarantee—All our installations are fully guaranteed against defects in material and workmanship, and for permanence of color. We will gladly furnish designs, prices, etc. upon application. Our engineering department is available for use at all times, free of charge.

Partial List of Installations

- Masonic Home, Sanford, Me.
- Greek Church, Newark, N. J.
- Filene's Department Store, Boston, Mass.
- Poli Theater, New Haven, Conn.
- Warren Harding High School, Bridgeport, Conn.
- Pershing Square Building, New York, N. Y.
- *Shubert Imperial Theater, New York, N. Y.
- United Hotels Company, New York, N. Y.
- Strand Theater, Stamford, Conn.
- Hotel Roosevelt, New York, N. Y.
- Lincoln National Bank, Newark, N. J.
- St. Johns College, Brooklyn, N. Y.
- Integrity Trust, Philadelphia, Pa.
- Penfield Building, Philadelphia, Pa.
- Weightman Building, Philadelphia, Pa.
- Berks County Trust Co., Reading, Pa.
- Ford Motor Co., Detroit, Mich.
- U. S. S. Cleveland.

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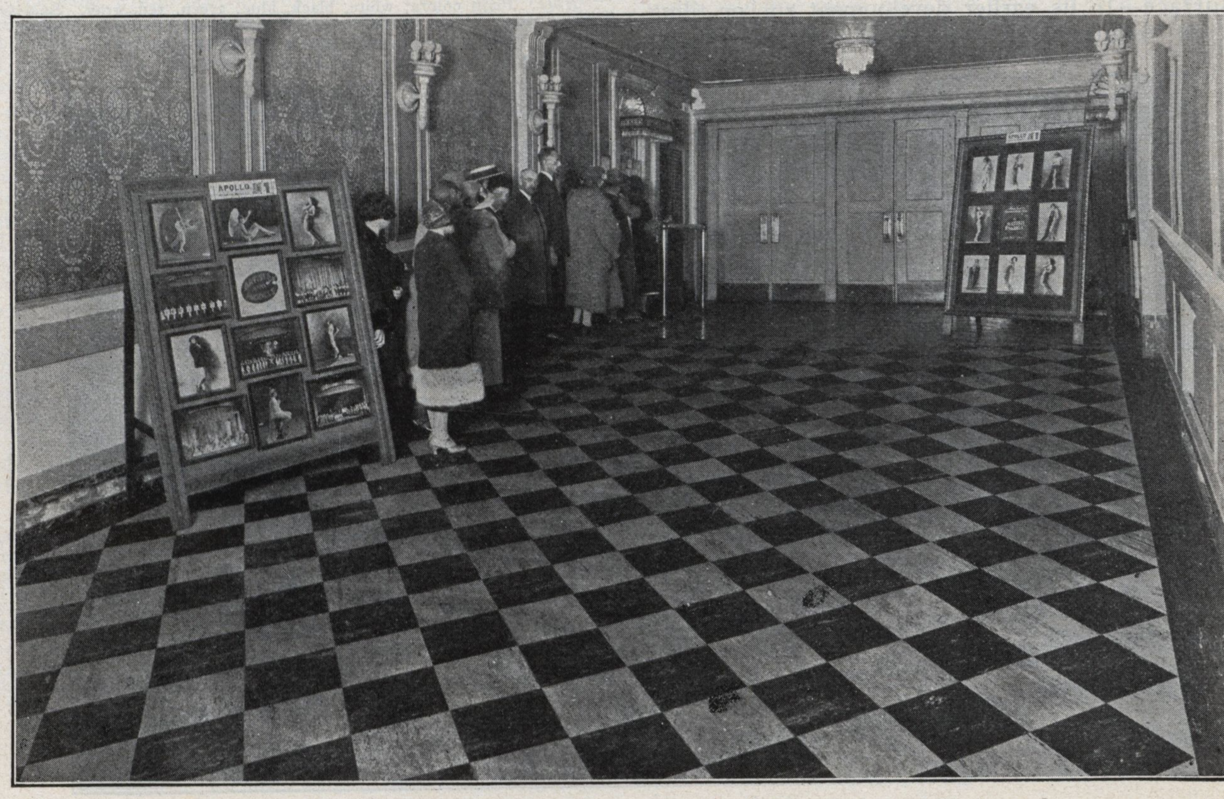
*The India Rubber World, March 1, 1925, published an illustration of the lobby of the Shubert Imperial Theater, New York City, where 2000 sq. ft. of reinforced rubber flooring was laid and after 18 months constant service (5000 people passing in and out daily) shows not the slightest wear.



Installation of Amtico Rubber Tile Flooring in Apollo Theater, Atlantic City, N. J.

AMERICAN RUBBER PRODUCTS CORPORATION

Eighth and Henderson Streets
JERSEY CITY, N. J.

Rubberock

Rubberock is the copyrighted trademark for tiling made by the AMERICAN RUBBER PRODUCTS CORPORATION. The name was chosen as correctly indicating a material that has the resiliency of rubber, the wearing quality of stone and the beauty of marble. The phrase, "The Lifetime Rubber Flooring" is usually added to the trade-mark to indicate the remarkable resistance to wear this material possesses.

RUBBEROCK
THE LIFETIME RUBBER FLOORING
TRADE MARK

Distinctive Features

Composition—Rubberock is composed of pure rubber which unites under great pressure and steam heat with a large percentage of mineral content and coloring materials into a homogeneous product hardly distinguishable from marble.

Resiliency and Color Effects—Rubberock is very resilient, giving a sure footing and ease in walking or standing and is a non-conductor of cold and dampness. It makes possible soft, mellow color effects which can be had in a wide range of colors, at a moderate cost.

Manufacturing Methods—Everything possible in the rubber making art is employed to give Rubberock pre-eminence in rubber floor tiling. Its manufacture is supervised by experts of long experience in tile making and the materials of which it is composed are the best that can be purchased.

Rubber Content—Only sufficient rubber, of the best quality, is used to unite the other materials to the best condition obtainable for the purpose required.

Surface—In its earlier development rubber tiling was made so soft that it could be bent double without breaking. Although this softness and pliability indicated elasticity, it was really the greatest obstacle to obtaining the polished surface so desirable for appearance and ease of cleaning, and which is characteristic of Rubberock.

Where Used

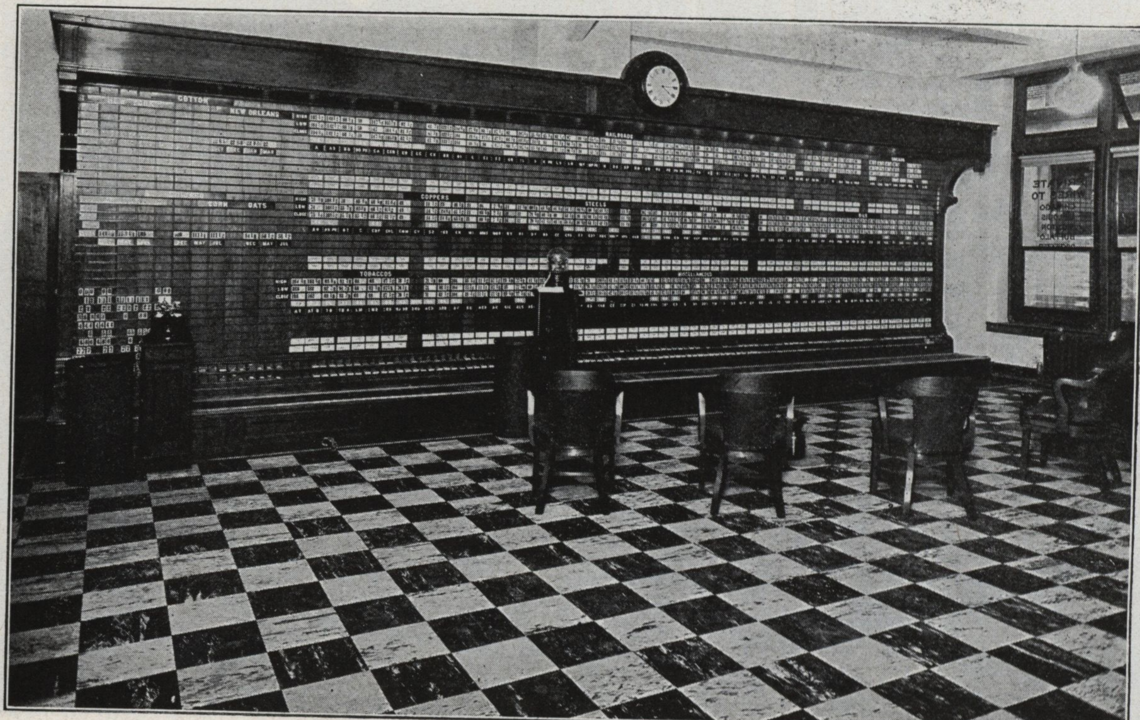
Rubber floor tiling has been on the market a sufficient time to enable architects to become well acquainted with its superior merits as an enduring, decorative, noiseless, sanitary material for flooring. It is recognized as being especially adapted for hospitals, schools, churches, hotels, banks, offices, mercantile establishments, and for many, if not all, of the rooms in residences.

STANDARD PATTERNS OF RUBBEROCK

No.	Designation	Base	Patterns
L10	White and Black	White	Mottling-black
D11	Black and White	Black	Mottling-white
D12	Gray Paisley	Gray	Mottling-black and white
D13	Red Paisley	Red	Mottling-black and white
D14	Black Mixture	Black	Mottling-red and white
L15	Cream	Cream	Mottling-gold and brown
D16	Brown	Brown	Mottling-cream and gold
D17	Maroon Mixture	Maroon	Mottling-gold and black
D18	Black Paisley	Black	Mottling-gold and red
L19	Lt. Verde Antique	White	Mottling-green and black
D20	Verde Antique	Black	Mottling-green and white
L21	Tennessee Pink	Pink	Mottling-white and black
L22	White and Green	White	Mottling-green
D23	Black and Green	Black	Mottling-green
L24	Gold	Gold	Mottling-red and white
D25	Black and Gold	Black	Mottling-gold
L26	Cream and Blue	Cream	Mottling-blue
L27	White and Blue	White	Mottling-blue
L28	Blue and White	Blue	Mottling-white
D29	Mahogany	Mahogany	Mottling-black

Note: Plain colors: white, black, blue, green, red, gray. Specify by "Plain Black," "Plain Green," etc. All other patterns made on order.

Cove base: In stock on patterns D11, D14, D20.



Uptown Office, Shearson, Hammill & Co., New York, N. Y.

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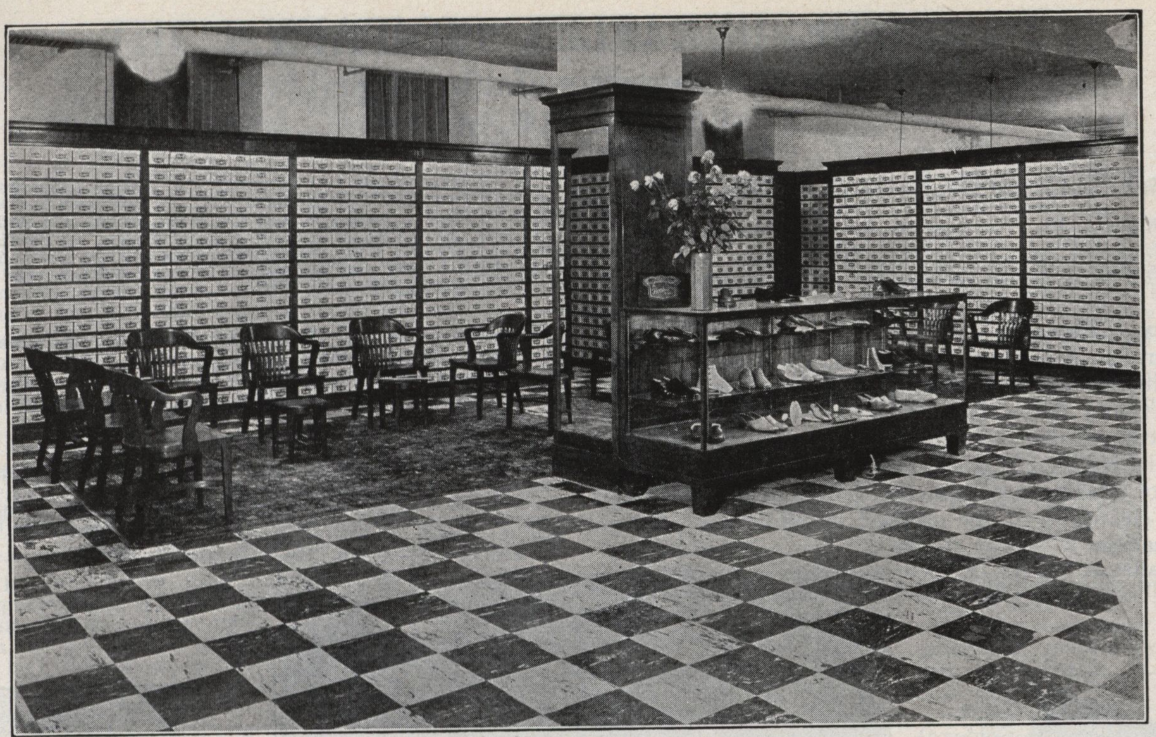


Corner of Wallach Bros. Store, Fifth Avenue at Forty Second Street, New York, N. Y.

Specifications for "Rubberock"

Allowance—When laid over wood, for $\frac{3}{16}$, $\frac{7}{32}$, ¼, ⅜, ½-in. tile, allow $\frac{5}{16}$, $\frac{11}{32}$, ⅜, ¼, ⅝ in. When laid over concrete, for $\frac{3}{16}$, $\frac{7}{32}$, ¼, ⅜, ½-in. tile, allow ¼, $\frac{9}{32}$, $\frac{5}{16}$, $\frac{7}{16}$, $\frac{9}{16}$ in.

In spaces so indicated, furnish and apply AMERICAN RUBBER PRODUCTS CORPORATION "Rubberock," as specified by the manufacturers and furnished by them, in accordance with the manufacturers' directions throughout, using cement supplied by them for bed and joint.

Preparation of Wood Floor—In all spaces designated by AMERICAN RUBBER PRODUCTS CORPORATION "Rubberock," bring underflooring within specified distance of the required finished level. The underflooring shall not be less than ¾-in. tongue and groove flooring, not more than 4 in. wide, driven in tight and blind nailed. Secure all ends of boards and bring irregularities to a smooth surface.

Preparation of Concrete Floor—Concrete subfloors shall have a smooth sidewalk finish and be free from high and low spots. Concrete shall be delivered to us dry, clean and free from dirt or foreign material. Concrete which has been frozen, which has a chalky or scaly surface or which is not well bonded to fill, must be removed and properly replaced. Concrete to be laid in contact with the ground to be waterproofed.

Note: On new work, send for our specifications for concrete backing.

Laying—At least two weeks after concrete has set, and when thoroughly dry, carefully sweep off dust and remove any lumps or roughness. Lay "Rubberock" in cement supplied by AMERICAN RUBBER PRODUCTS CORPORATION, using as much as necessary to preserve an even surface at the joints. Lay with a slide or "push" motion to secure complete coating of all contact edges.

Base—Where called for, shall be set even and straight, flush with floor and come ⅛ in. in advance of finished wall surface, tile or plaster.

Clean-up—Soon after laying, and before it finally hardens, wipe up all surplus cement with cloth moistened in alcohol, and leave the floor clean, smooth and level, covering it with a sheathing paper.

Briefer Form—In spaces so indicated, furnish and apply "Rubberock" as made by the AMERICAN RUBBER PRODUCTS CORPORATION, Jersey City, N. J.

Technical Data

Size of Tiles—
Squares: 3x3, 4x4, 6x6, 9x9, 12x12, 18x18 in.
Rectangles: 6x12, 9x12, 9x18, 12x18, 12x24, 18x24 in.
Sheets: 18x36 in.
Thickness: Tiles $\frac{3}{16}$, $\frac{7}{32}$, ¼, ⅜, ½ in.
Sheets $\frac{3}{16}$, $\frac{7}{32}$, ¼, ⅜, ½ in.
Wainscoting ⅛, $\frac{3}{16}$, ¼ in.
Wall coverings ⅛, $\frac{3}{16}$, ¼ in.

Colors—Mottled and plain colors. The mottled tiles are made in a range of beautiful color combinations, and the plain ones are made in rich hues.

Cost

The price is influenced by such considerations as labor costs, transportation facilities, market conditions, and other factors, which cause the price to vary slightly from time to time.

The real price of "Rubberock," however, is not to be judged by even its initial cost, because it is built to resist the silent tread of years—it wears and wears.

Guarantee (Rubber Association Standard Form)

We guarantee "Rubberock" to be free from defects in workmanship and materials. All guarantees, expressed or implied, are contingent on the use of such cleaning agents and methods as are recommended in our instructions.

Inspection

Each individual tile is inspected for thickness and gauged for squareness.

Estimates

Estimates will be made promptly from blue prints and descriptions, or specifications. Samples will be gladly sent you.

THE DURAFLEX COMPANY

Manufacturers of Flooring

BALTIMORE, MD.

DISTRICT OFFICES

BOSTON, MASS., The Duraflex Co. of New England, 11 Beacon Street
NEW YORK, N. Y., The Duraflex Co. of New York, 1400 Broadway
PHILADELPHIA, PA., The Duraflex Company, Flanders Building
CINCINNATI, OHIO, Cincinnati Builders Supply Co., 534 Main Street
READING, PA., Daniel Yost, Baer Building
WASHINGTON, D. C., The Duraflex Company, 1011 B Street, N. W.
GREENSBORO, N. C., P. D. Clement, 701 Jefferson Life Building
GREENVILLE, S. C., J. MacRabb
RICHMOND, VA., Myers Rubber Company, Goddin Hall Building
LOS ANGELES, CAL., C. G. Bullis, 828 Standard Oil Building
SAN FRANCISCO, CAL., Pacific Materials Company, 444 Market Street
MONTREAL, QUE., H. H. Symmes & Company, Ltd., 124 Board of Trade Building

Duraflex-A Flooring

Duraflex-A is a continuous, seamless flooring made of a ductile mineral rubber. The surface becomes smoother and the body tougher with normal use.

It can be maintained in perfect condition for the life of the building in which it is placed. It is acidproof, alkaliproof, waterproof, quiet to a high degree, dustless, easy to clean and of the greatest durability.

Specification

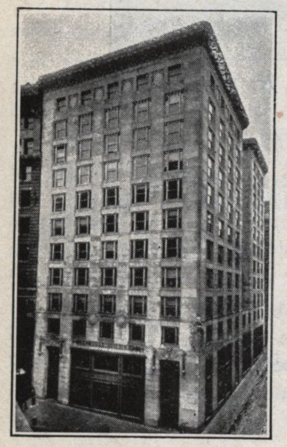
Duraflex-A Floors—All floors, where shown on the drawings, shall be covered with Duraflex-A flooring as manufactured and installed by The Duraflex Company, Baltimore, Md.

Preparation of Surface to Receive Duraflex-A Flooring—The surface of the cement finish to receive Duraflex-A flooring shall be smooth, level and trowel finished ⅛ in. below the desired finish floor line.

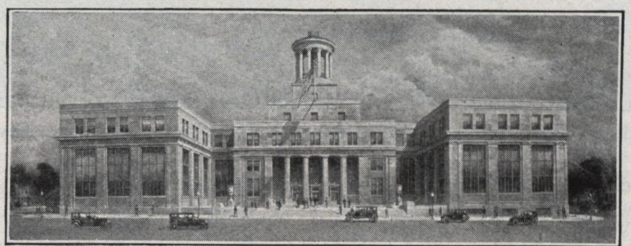
Bases—Surface of the plain or cove cement bases shall be trowel finished to a smooth true surface flush with plastered wall. The cove to be level.

Note: If bases are not to be finished with Duraflex-A, the cement floor surface shall be finished to a true straight line ⅛ in. below the edge of the cove (or face of plain base).

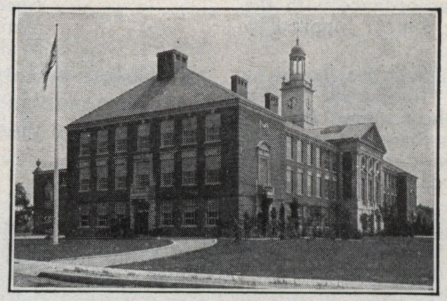
Stairs—All treads, landings and platforms shall be provided with metal nosing and filled with reinforced cement mortar to within ¼ in. of the top of the nosing.



Lawyers Building,
Boston, Mass.
Coolidge & Shattuck,
Architects

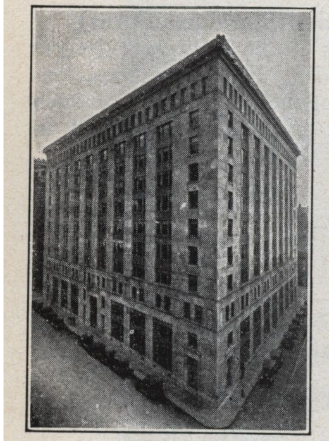


Lincoln National Life Building, Fort Wayne, Ind.
Benjamin Wistar Morris, Architect

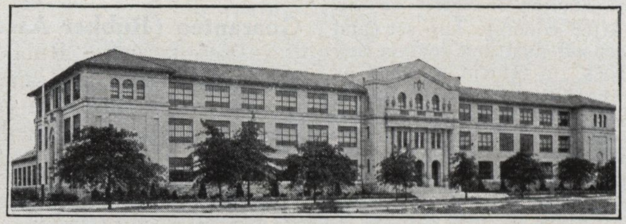


South Side Memorial High School,
Rockville Center, N. Y.
Huse Templeton Blanchard, Architect

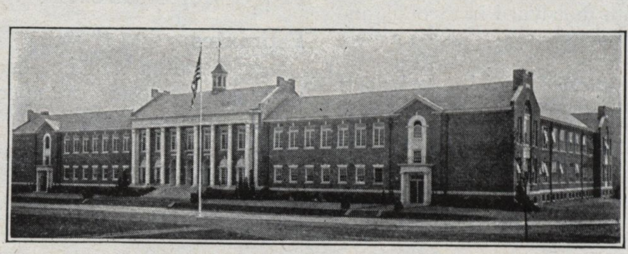
Jefferson Standard Life
Building,
Greensboro, N. C.
Charles C. Hartmann,
Architect



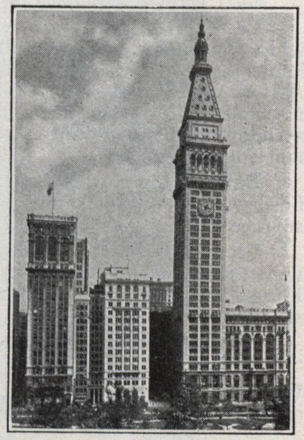
Insurance Exchange Building,
Boston, Mass.
Coolidge & Shattuck,
Architects



Cooper B. Hatch Junior High School, Camden, N. J.
Clyde S. Adams, Architect



Charles Gorton High School, Yonkers, N. Y.
G. Howard Chamberlin, Architect



Metropolitan Life Building,
New York, N. Y.
D. Everett Waid, Architect

Over 1,000,000 Square Feet of Duraflex-A Flooring Installed in These Buildings

THE B. F. GOODRICH RUBBER COMPANY

Manufacturers of Rubber Flooring

AKRON, OHIO
AGENTS IN ALL PRINCIPAL CITIES

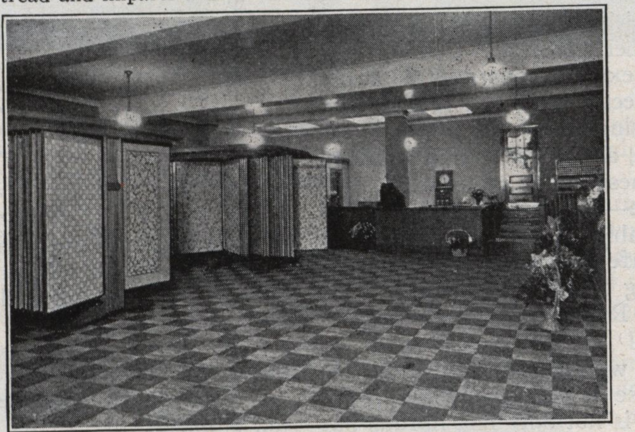
Goodrich Flooring

Recently devised processes and machinery have enabled Goodrich to so reduce the mechanical cost of sheet rubber flooring that a finished product of highest quality in a great variety of color combinations and inlaid designs, is now available at no greater cost than other types of rubber flooring.

Description—Goodrich flooring consists of various blocks and strips assembled into designs at the factory and vulcanized under great pressure into one solid sheet with no seams. It is made up of two completely united layers—the "tread" and the "backing."

The tread is composed of highest grade Plantation Para Rubber combined with high quality ingredients which add permanence and wearing quality, and the necessary color pigments. It contains no reclaimed rubber, fiber or cotton.

The backing is a more rigid rubber construction which reinforces and supports the soft elastic tread and imparts a desirable firmness to the flooring.



Properties—***Resistance to Abrasion***—The use of soft rubber as a cushion lining in sand-blasting hose, for the nozzles of the cement gun and in automobile tires are familiar examples of its surprising abrasion resisting properties.

The inherent softness and resiliency of rubber allows its surface particles to escape destruction by yielding to the grinding wear of another surface. This resistance has been greatly increased by improved methods of compounding rubber with other ingredients.

The Goodrich tread is of naturally soft and elastic rubber combined with materials which add to its durability. Its uniformity of texture prevents excessive wear in spots due to variation in resistance of the material.

Resistance to Slipping—Its smooth, unpolished surface, when dry, affords sureness of footing and prevents sliding of rugs, etc.; when wet, its resistance to slipping equals equally smooth materials.

Resistance to Pressure—Its elastic properties make it noticeably superior to other soft flooring materials in recovering surface smoothness after indentation by casters and furniture legs.

Waterproof—Water has no injurious effect even when permitted to stand for a long period of time.

Resistance to Acids, Alkalis and Oils—Not damaged by dilute acids and effectively resists strong acids, except nitric and sulphuric. Not damaged by lye or other alkalis, except under prolonged exposure. Strong soaps have no deteriorating effect. Oils and grease, particularly mineral oils, are harmful if not promptly removed.

Non-staining—Stains do not penetrate and may be completely scoured off. If ink is allowed to dry on a sample, a section cut through stain will show no penetration.

Fire Resistance—Burning matches or cigarettes leave only a slight scorched spot, easily scoured off. This is easily tested by the method described under "Non-staining."

Non-fading—The fast colors in Goodrich designs retain their freshness indefinitely, as shown in many installations which have been exposed to sunlight and weather for many years.

Resistance to Age—Goodrich flooring does not harden, crack, scuff up or become shabby from age, but retains its smoothness and actually improves in appearance with wear and repeated cleaning.

Expansion and Contraction—Goodrich flooring accommodates itself to expansion, contraction and settlement of structures. It does not shrink or stretch under temperature changes, hence will not buckle, crack or open. Will not "step-out" or spread under wear.

Sanitary and Odorless—Its non-absorbent, smooth texture surface and minimum of cemented seams afford no lodgement to disease germs or odors. The slight characteristic rubber odor soon disappears.

Silence—It is non-resonant and non-vibrant, making unnecessary the use of cushion tips on furniture legs.

Electric Conductivity—Being a non-conductor of electricity it is of value wherever electric current is used. For safety installation against high voltage a specially designed backing is used.

Thermal Conductivity—Like other materials of high rubber content, it is a non-conductor of heat. The following comparison of the heat conductivity of various materials is from Kent's Handbook of Mechanical Engineering, the coefficient being expressed in B.t.u. per hr. per sq. ft. per in. thickness, per degree of temperature difference at atmospheric temperatures:

Material	Coeff.	Material	Coeff.	Material	Coeff.
Rubber......	1.07	Sandstone....	15.96	Asphalt......	4.8
Concrete (stone).....	6.38	Oak (across grain)......	1.00	Cork Board...	.35
Granite......	15.38	White pine (across grain)	.79	Air..........	.17

Comfort—Goodrich flooring combines firm elasticity with restful softness; it is cooler than carpeting and considerably warmer than tile or stone; it will not draw the feet.

Prevention of Breakage—It reduces damage from breakage of fragile articles to a minimum in laboratories, restaurants, etc.

Limitations—Goodrich flooring should not be laid in basements or outdoors, as continual moisture impairs its adhesion to the base. It is not fitted for such installations as automobile showrooms, on account of the attendant exposure to dripping oil and grease.

Installation and Upkeep—***Orders***—Authorized agents of experience in installation work and of established reputation in each city are prepared to quote on Goodrich floors installed and ready for use.

Installation—Goodrich flooring can be quickly and easily installed without noise, dirt or confusion, by the skilled workmen available in every vicinity. It may be applied to concrete, metal, stone or wood underfloors. It is pliable in any temperature, lies flat, requires no heating before handling, and can be cut and twisted around pipes or sharp corners, without damage. Does not spread, creep or buckle; once properly laid it never requires readjustment from these causes.

Maintenance and Repairs—No refinishing, waxing or polishing are required. A damaged section is easily replaced and the repair is less perceptible than with most flooring materials.

Cleaning—Being non-absorbent, dirt does not penetrate below surface. A linseed-oil soap or slightly abrasive soap powder is effective for scrubbing the surface when it becomes badly soiled.

Patterns—These include a wide range of designs. Samples of the more popular designs can be promptly furnished by agents, all others on short notice from the factory.

Widths and Lengths—Goodrich flooring is manufactured and sold in rolls 25 yds. long; widths, 36 and 48 in.

Thickness—Standard thickness, ⅛ in. (tread 1/16 and backing 1/16 in., approximate). For special installations, Goodrich may be obtained in 3/16 or ¼-in. thicknesses.

Net Weights—Weight per sq. yd. ⅛ in. thick, 11 lbs. net; greater thicknesses in proportion.

Suggestions for Specifications—In specifying underfloors perfect smoothness should be emphasized; corners should be thoroughly cleaned and square.

For concrete, stone or metal underfloors, allow only for thickness of rubber; for wood underfloors, allow in addition 1/16 in. for layer of deadening felt under rubber. Let concrete subfloors dry thoroughly before installing flooring.

For satisfactory results and responsibility the laying should be intrusted to an authorized B. F. Goodrich Rubber Company agent.

Literature—Architects' Portfolio of lithographed patterns, sample, details of cove base application and name of nearest agent will be furnished on request.

THE GOODYEAR TIRE & RUBBER CO., INC.

Manufacturers of Goodyear Rubber Flooring

AKRON, OHIO

GOODYEAR
TRADE-MARK

Products

Goodyear Rubber Flooring in Tile or Sheet Form, in solid colors and marbleized effects.

Description

Goodyear Rubber Flooring is made from rubber. By a special process the different color compounds are so mixed that when vulcanized they are fused together into one solid, homogeneous mass.

Advantages

Beauty—Handsome finished effects are a special advantage of Goodyear Rubber Flooring. Coming in a great variety of colors and textures it permits floor designs which harmonize perfectly with the rest of the room and are especially pleasing to the eye.

Its beauty is lasting, too, as the colors and veinings run through the entire thickness of the material.

Quiet and Comfortable—Goodyear Rubber Flooring is as quiet and comfortable underfoot as a rubber heel. It insures a firm, safe footing. It effectively deadens the noise of scraping chairs and tables.

Cleanliness—Goodyear Rubber Flooring is easy to keep clean.

Ordinarily, going over it with a damp cloth makes it bright and spotless. This ease of cleaning is due to the fact that Goodyear Flooring is not only non-fibrous but is so compounded that it holds its polished finish permanently, when properly cleaned with washing compounds we recommend.

Durability—You are sure of long wear from Goodyear Rubber Flooring.

It will not "dust" or disintegrate. Freedom from fibrous material makes it non-absorbing and non-staining.

Its extreme toughness makes it virtually scratchproof and dentproof.

In flooring, as in other Goodyear products, "Goodyear means good wear."

Where Used

Goodyear Rubber Flooring is ideally suited for use in entries, kitchens, bathrooms and sunporches, and even in all other rooms of private homes and apartment buildings; also for general flooring in churches, stores, theaters, banks, office buildings, schools, hospitals, and many other types of buildings.

Recreation Room with Goodyear Rubber Flooring

Colors

Goodyear Rubber Flooring in both tile and sheet form is available in the following standard color effects:

Plain Colors

T-100—White
T-102—Buff
T-103—Yellow
T-104—Dark gray
T-105—Light gray
T-106—Red
T-107—Chocolate
T-108—Maroon
T-109—Dark blue
T-110—Green
T-111—Light green
T-113—Pink
T-114—Pearl gray
T-115—Light blue

Mottled Colors

T-200—White, maroon, black
T-201—White, green, black
T-202—Black, green, white
T-203—Black, red, white
T-204—Yellow, chocolate, white
T-205—Maroon, white, black
T-206—Pink, white, black
T-207—Chocolate, yellow, white
T-208—White, black
T-209—Black, white
T-210—Black, yellow
T-211—Light gray, black, white
T-212—Maroon, black
T-213—Napoleon gray
T-214—Dark gray, black, white
T-216—Blue, white
T-217—White, blue
T-218—Black, gold, brown

Samples—Sample tiles in any desired combination of colors will be sent on request. We will gladly cooperate in achieving a flooring effect in harmony with any decorative plan.

Sizes and Thickness

The tile come in these standard sizes: in squares, 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 27 in.; and in oblongs 9x18 in. and 12x24 in. The sheets are up to 36 in. wide by 28 ft. long. Border strips in proportion. All units have machined edges to insure tight fitting joints.

Both tile and sheets may be had in these thicknesses: $\frac{3}{16}$ in., $\frac{7}{32}$ in., ¼ in., and ⅜ in. The tile are sanded on the underside to insure absolutely uniform thickness. Cove base in 4, 5 and 6-in. heights, for all thicknesses of tile. Plinth blocks in 5⅜ in. widths, any heights.

Weights

With a variation between colors amounting to as much as ¼ lb. to the square foot, Goodyear ¼-in. tile weigh approximately 2¾ lb. to the square foot.

Guarantee

Goodyear Flooring is guaranteed for first class workmanship by distributers, also for good wear and color permanence.

Continued on next page

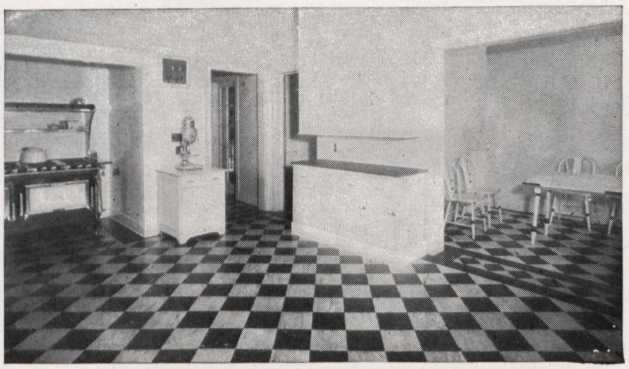
Specifications

Goodyear Rubber Flooring in Store

Preparing Wood Floors—To provide for the expansion and contraction of wood floors a flexible sub-base should be used before Goodyear Rubber Flooring (tile or sheeting) is laid. The two methods recommended are: $1\frac{1}{2}$-lb. deadening felt applied to the wood floor with a suitable linoleum cement, or cotton cloth on felt tacked on 3-in. centers and staggered. After the felt base is securely pasted or tacked and the area is laid out, the tile is cemented to the sub-base.

Note: Rubber should never be installed under any circumstances on a wood floor which has been laid over concrete, as this type of sub-floor is subject to dry rot, which will ultimately result in complete disintegration.

Concrete Sub-floors—Goodyear Rubber Flooring may be cemented directly to concrete. The concrete must have taken its permanent set, for if moisture be present the flooring cement can not bond properly. The top surface of the concrete should be troweled sufficiently to give a smooth, true surface. Concrete which has frozen or has a chalky, crumbly surface can not be accepted.



Goodyear Rubber Flooring in Kitchen

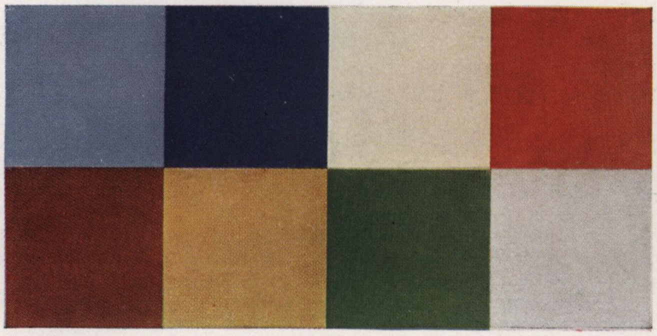
Basement Floors—Basement floors and all concrete floors up to 3 ft. above grade should be constructed in the following way to receive Goodyear Rubber Flooring:

A sub-floor of concrete approximately 4 in. thick with a good float finish should be the base. Apply to it five plies of saturated felt roofing laid and mopped with hot asphalt—the roofing felt to be carried up around all sides of the area at least 6 in. above finished floor line. Then apply a regular concrete floor consisting of 2 in. of rough concrete with a 1-in. top coat of cement steel troweled to a good sidewalk finish.

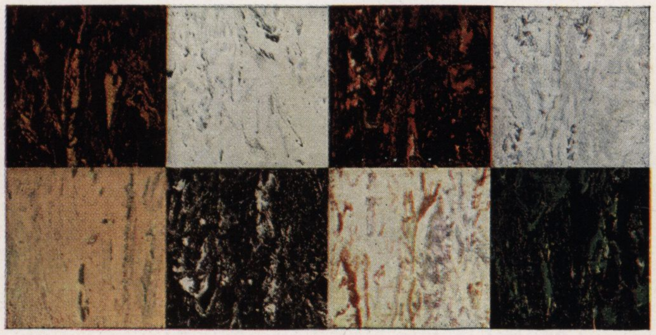
Separating Strips—When Goodyear Rubber Floor Tile are used in conjunction with hard floors, such as concrete, mosaics, etc., an individual separating strip should be used between the tile and the floors. These strips will greatly improve the finished appearance of the installation. They are usually $1\frac{1}{4}$x$\frac{1}{4}$-in. brass stock, set in cement and anchored. The use of strips is particularly advisable where countersunk spaces are wanted to allow for the rubber tile, as it gives a true line to butt the rubber tile against and insures a perfect joint.

Laying the Tile—All areas must be centered up. The start is made from the center, working out toward the walls or base moulds. In laying the tile the mechanic should not spread more than 4 to 6 sq. ft. at a time with cement. Each tile is set in place as quickly as possible to prevent a surface film forming on the cement and giving only a partial bond. To make sure that the cement gets under all contact edges the tile should be put down with a seesaw or sidewise movement.

Cove Base—In using Goodyear Rubber Tile either to a single wide ground or to two small grounds, care should be taken to have the ground installed properly to insure straight lines horizontally and perpendicularly. Rubber cove base is applied directly to the ground. All plaster and wood against which base is to be installed should be carried at right angles to underfloor and be free from dirt or other obstructions.



Goodyear Rubber Tile, Clear



Goodyear Rubber Tile, Veined

NEW YORK BELTING & PACKING CO.

Rubber Tile Flooring

NEW YORK, 91-93 Chambers Street
CHICAGO, 124-26 West Lake Street
PHILADELPHIA, 821-23 Arch Street
ST. LOUIS, 218-20 Chestnut Street
SAN FRANCISCO, 519 Mission Street
BOSTON, 65 Pearl Street
PITTSBURGH, 420 First Avenue

Products

Rubber Tile Flooring in Interlocking and Square designs.

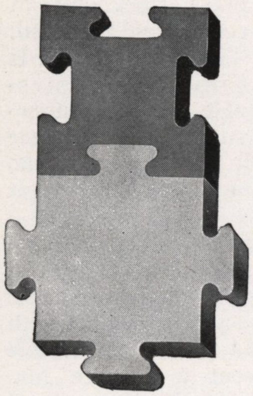
Also Sanitary Rubber Base; Steel Reinforced Rubber Stair Nosing.

For Perforated Rubber Mats and Rubber Matting, see page 2687.

Rubber Tile Flooring

Rubber tiling is essentially a permanent floor that is built into a structure, whether business or public building, residence or club, and is not to be confused with materials of a thinner and lighter nature that are classed as floor coverings. It is $\frac{3}{8}$ in. thick; heavy enough to last for years when subjected to the most severe wear. Sufficiently firm to stand the heaviest traffic, waterproof and non-absorbent.

Interlocking rubber tiling was originated by this company many years ago and floors in service as long as twenty to twenty-five years are still in excellent condition.



Interlocking Rubber Tile

Advantages of Rubber Tile Floors

Because of the elasticity of rubber these floors are noiseless and comfortable to walk upon.

Give a safe foothold without danger of slipping; are sanitary and easy to clean.

Impervious to water, non-absorbent and beautiful in appearance.

The wearing quality is one of the chief advantages of rubber tile.

Can be laid on any smooth base, whether wood, cement or metal.

With twelve rich colors to choose from, a selection of designs can be made to harmonize with any color treatment.

Durability

The wearing quality of rubber tiling is truly remarkable. Years of service under the most severe traffic conditions have proved it to be the longest wearing floor made. *Floors installed over twenty-five years ago are still in excellent condition* and good for a long time to come. The resiliency of the rubber prevents wear resulting from the effects of abrasion and friction, and the elasticity saves it from cracking and becoming unsightly.

Where Used

For all places subject to unusual wear there is nothing to equal rubber tiling. It is the ideal floor for office buildings, hospitals, public buildings, banks, churches, clubs, libraries, schools, stores, theaters, residences and all buildings where a sanitary, durable and safe floor is required.

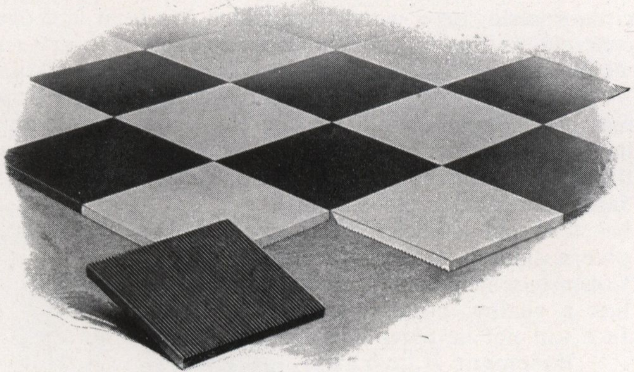
Colors and Designs

Made in twelve rich colors: blue, red, white, light green, dark green, black, buff, salmon, slate, light chocolate, dark chocolate and pearl gray. The colors are permanent and no amount of wear and tear can affect them.

With such a variety of colors offered, designs in harmony with any decorative scheme can be selected.

Interlocking and Square Designs

Two distinct types of tiling are made; interlocking and block designs. The interlocking tiles measure $2\frac{3}{8}$x$2\frac{3}{8}$ in. The block or square tiles are made 6x6 and 12x12 in. with border strips $1\frac{1}{2}$ and 3 in. wide. Interlining strips are $\frac{1}{2}$ in. wide. All tiling is made $\frac{3}{8}$ in. thick.



Square Block Rubber Tile

Method of Manufacture

The rubber compound is thoroughly and evenly mixed with coloring matter, formed into shape in steel moulds and vulcanized. As each tile is moulded individually under tremendous hydraulic pressure, absolute uniformity and accuracy in size is maintained. The interlocking tiling is assembled into sheets at the factory by blocking the tiles together, the interlocking tongues serving to hold the tiles in sheet form for shipment.

Samples and Catalogues

We will send, on request, an assortment of samples of interlocking and square tiles. Please specify colors and shapes desired.

A catalogue showing interior views in color and a variety of designs in both interlocking and square types will also be furnished on request.

Specifications

For the guidance of architects the following simple form of specification is suggested:

Rubber Tiling—Furnish and install complete, floor of rubber tiling, $\frac{3}{8}$ in. thick, [interlocking type] [square block type], manufactured by New York Belting & Packing Co., in spaces specified herein. Design to be selected by the architect.

This tiling shall be carefully cemented to the base by the manufacturer's special impervious liquid cement. After the cement has dried, the surface of the tile shall be thoroughly cleaned and left ready for use.

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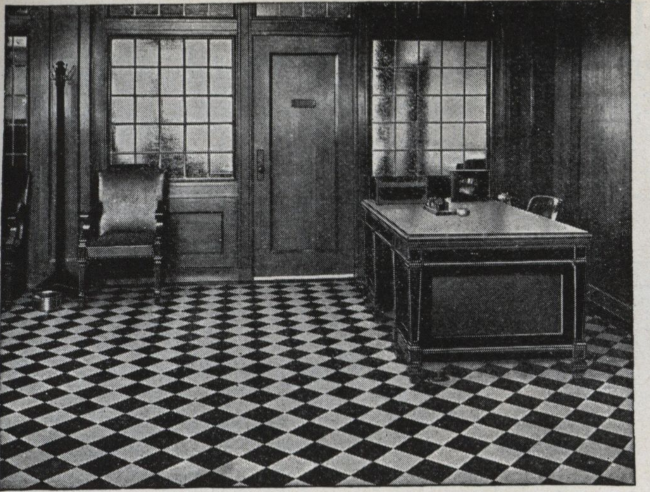
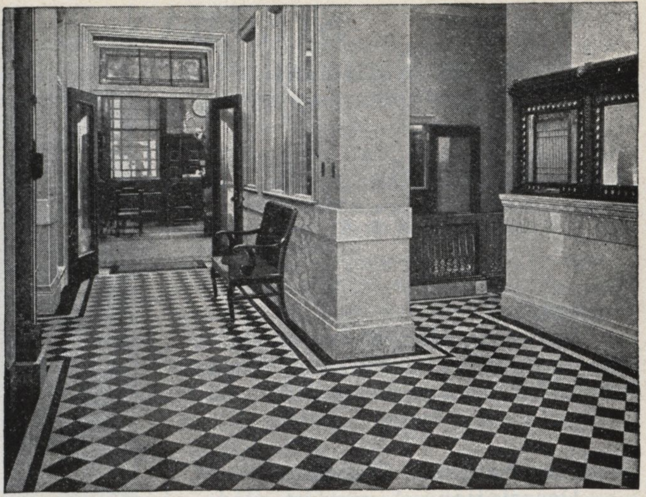


Square Block Rubber Tile in Office of Deere & Co., Moline, Ill.



Square Block Rubber Tile in Office of A. B. Leach & Co., New York, N. Y.

Preparation of the Base—*Cement Floors*—Wherever rubber tiling is to be installed, lay a finished coat of 3-to-1 cement, not less than 1½ in. thick, the surface to be troweled smooth and level and free from all lines or scores. Allowance of ⅜ in. to be made for the thickness of the rubber tile. All cement shall be thoroughly dry and clean before the installation of the tiling.

Wood Floors—Wherever rubber tiling is to be installed, lay a tongue and groove wood floor of well seasoned stock, not over 3 in. wide, this floor to be blind nailed and the surface planed smooth and free from irregularities. Allowance of ⅜ in. to be made for the thickness of the rubber tile.

A Few New York Belting & Packing Co. Installations

Interlocking Design

Empire Building, 71 Broadway, New York, N. Y.—Main Corridor
Knox Hat Store, Fifth Avenue and 40th Street, New York, N. Y.—Tiling installed over 20 years ago
United States Rubber Co. Building, 58th Street and Broadway, New York, N. Y.—15,000 sq. ft. All elevator halls
Rubber Association of America, Offices, New York, N. Y.
Yorkville Bank, New York, N. Y.
Maiden Lane Realty Co., New York, N. Y.
Second National Bank, New York, N. Y.
Mutual Life Insurance Co., New York, N. Y.
American Steel & Wire Co., New York, N. Y.
M. C. D. Borden & Sons, New York, N. Y.
Geo. Borgfeldt & Co., New York, N. Y.
Emigrant Industrial Savings Bank, New York, N. Y.
Fifth Avenue Bank Building, New York, N. Y.
First National Bank, New York, N. Y.
Gimbel Brothers, New York, N. Y.
Globe & Rutgers Fire Insurance Co., New York, N. Y.
Hanover National Bank, New York, N. Y.
Henry Clews & Co., New York, N. Y.
Hotel Plaza, New York, N. Y.
Century Theater, New York, N. Y.
Title Guarantee & Trust Co., Brooklyn, N. Y.—5500 sq. ft.
Williamsburgh Savings Bank, Brooklyn, N. Y.
Louis Bossert & Sons, Inc., Brooklyn, N. Y.
Knights of Columbus Home, Brooklyn, N. Y.—2125 sq. ft.
Witherbee, Sherman & Co., Port Henry, N. Y.
Smith Bros., Poughkeepsie, N. Y.
First National Bank, Greenport, N. Y.
Richmond Hill National Bank, Queens, N. Y.
Corning Hospital, Corning, N. Y.
Northville National Bank, Northville, N. Y.
Strand Theater, Mechanicsville, N. Y.
D. L. & W. Railroad Ferryboats—60,000 sq. ft. in service 17 years
Steinbach Co., Asbury Park, N. J.
National Musical String Co., New Brunswick, N. J.
New Jersey Title Guarantee & Trust Co., Jersey City, N. J.
First National Bank, Hoboken, N. J.
Scovill Mfg. Co., Waterbury, Conn.—Switchboard room
Fairfield County Courthouse, Bridgeport, Conn.—Library, Courtrooms, etc. Part of this tiling installed over 20 years ago
New Haven County Courthouse, Waterbury, Conn.—Corridors
Quinnipiak Club, New Haven, Conn.
Ansonia National Bank, Ansonia, Conn.
R. Marston Co., 33 Hanover Street, Boston, Mass.—10,000 sq. ft.
Page & Shaw, 12 State Street, Boston, Mass.—3000 sq. ft.
The First Church of Christ, Scientist, Falmouth Street, Boston, Mass.—25,000 sq. ft.
J. M. Longyear, Brookline, Mass.—5000 sq. ft.
Jenckes Spinning Co., Pawtucket, R. I.
Farmers Bank Building, Pittsburgh, Pa.
Henry W. Oliver Building, Pittsburgh, Pa.
Kaufmann & Baer Co., Pittsburgh, Pa.
Braddock National Bank, Braddock, Pa.
Somerset County Courthouse, Somerset, Pa.
Second National Bank, Uniontown, Pa.
Chicago & Northwestern Terminal Station, Chicago, Ill.—Main Concourse, stairs, landings, stairs to balcony. 7000 sq. ft.
Reo Motor Car Co., Lansing, Mich.—General offices, 4500 sq. ft.
St. Patrick's Catholic Church, South Bend, Ind.
City National & Kankakee County Trust & Savings Bank Building, Kankakee, Ill., Joseph Scheitler, Architect
Standard Oil Co. Building, San Francisco, Cal., Geo. W. Kelham, Architect—37,000 sq. ft.
Standard Oil Co. Building, Los Angeles, Cal., George W. Kelham, Architect—5500 sq. ft.
California State Life Insurance Co., Sacramento, Cal., George C. Sellon, Architect—10,000 sq. ft.
National Bank of Commerce, Norfolk, Va.
J. B. Duke Residence, Charlotte, N. C.
Commercial & Savings Bank, Florence, S. C.
Memphis Municipal Water Reserve Station, Memphis, Tenn.
Chesapeake & Potomac Telephone Co., Washington, D. C.; Richmond, Va.; Hagerstown, Md.
Cambridge Trust Co., Chester, Pa., Thomas M. James Co., Architects
Second National Bank, Atlantic City, N. J., J. Vaughn Mattis, Architect
St. Charles Seminary, Overbrook, Philadelphia, Pa.—4000 sq. ft.
Magnolia Building, Dallas, Tex.—40,000 sq. ft.

Square Block Design

Deere & Co., Moline, Ill.—7000 sq. ft.
Blind Brook Club, Portchester, N. Y.—2000 sq. ft.
Page & Shaw, 362 Fifth Avenue, New York, N. Y.—500 sq. ft.
A. B. Leach & Co., Inc., 62 Cedar Street, New York, N. Y.
Hotel Ambassador, New York, N. Y.
American & Cuba S. S. Line, New York, N. Y.—4000 sq. ft.
Audubon Theater, New York, N. Y.—650 sq. ft.
E. F. Rothchild Residence, New York, N. Y.
Robert C. Kerr, Jr., Great Neck, L. I., N. Y.
Frederick Loeser & Co., Inc., Brooklyn, N. Y.—1400 sq. ft.
St. Peter's Cathedral, Belleville, Ill.
St. Margaret's Church, St. Louis, Mo.
Brown Shoe Co., St. Louis, Mo.—4000 sq. ft.
Ely Walker Dry Goods Co., St. Louis, Mo.
Jackson County Courthouse, Holton, Kan.
Railway Exchange Building, St. Louis, Mo.

Samples displayed with Architects Samples Corporation New York, N.Y. Est 1913

STEDMAN PRODUCTS COMPANY

Stedman Naturized Flooring—The Original Reinforced Rubber Flooring

SOUTH BRAINTREE, MASSACHUSETTS

BRANCHES

NEW YORK, N. Y., 101 Park Avenue
CLEVELAND, OHIO, 216 Union Building
BOSTON, MASS., 4 Park Street
WASHINGTON, D. C., 424 Transportation Building
CHICAGO, ILL., 343 So. Dearborn Street
DETROIT, MICH., 1217 Book Building
PHILADELPHIA, PA., 1524 Chestnut Street
MIAMI, FLA., News Tower Building
CANADA, GUTTA PERCHA & RUBBER, LTD., 47 Yonge Street, TORONTO, ONT.
AGENCIES IN ALL PRINCIPAL CITIES

Products

STEDMAN NATURIZED FLOORING (patented February 5th, 1924); Square and Rectangular Tiles, Runners and Panel Strips in marble, granite and rug effects, solid colors and tones.

Stedman Naturized Flooring

Description—A product made of rubber, reinforced with cotton fiber under vulcanizing heat and great hydraulic pressure, resulting in a material so integrally tenacious as to withstand the shock of severest traffic abrasion. Firm, yet resilient. It is laid by our own organization over wood or concrete permanently set in a waterproof cement.

Built after many years' experience in chemistry, processes, and actual floor-test installations. All manufacturing processes are under accurate control and include several secret formulæ, the use of which eliminates the shortcomings of the old type rubber flooring.

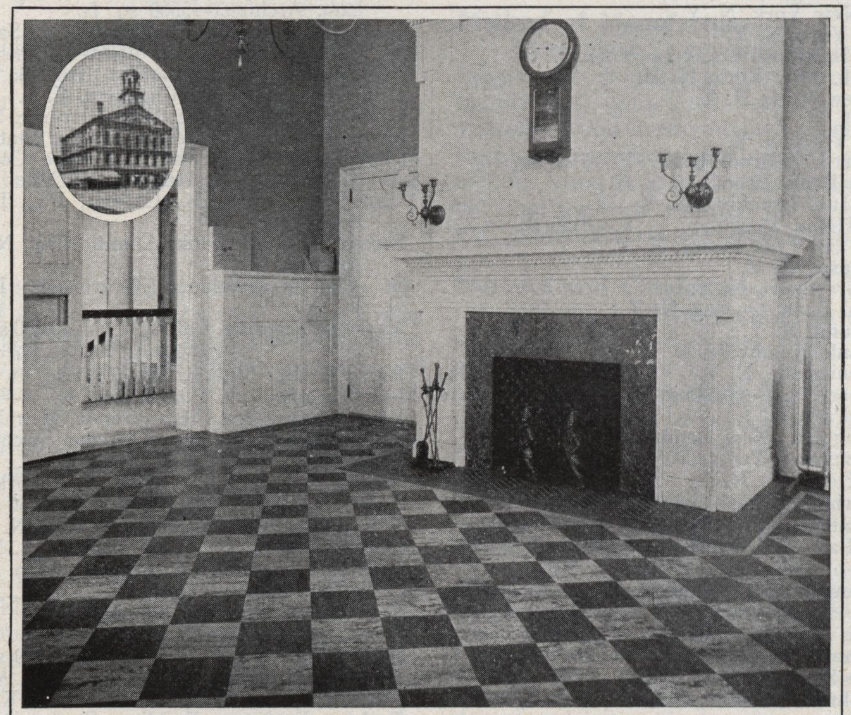
The combination of rubber and cotton fiber reinforcement is the toughest known in rubber manufacture. By test, its abrasion resistance equals, and in many cases exceeds, marble. It does not indent under standing or moving furniture. Installations of extreme severity have not in 10 years indicated its probable life.

Uses—Hospitals, banks, hotels, residences, clubs and public buildings for both work spaces and corridors; light industrial buildings, department stores, laboratories, barber shops, schools, libraries, churches, auditoriums, boats, railroad trains, elevators; in brief, any floor subject to heavy or light wear, requiring beauty and cleanliness, together with silence, foot-comfort, and low maintenance cost.

Appearance—Its sheer beauty and gracefulness of color and texture is completely satisfying to the eye. Its color is permanent, and the veining runs through the entire thickness of the material. To the architect and the decorator, its appeal is both specific and general, as from its wide range of types any scheme or motif may be completed. Plain colors, veinings, blendings, and paisley effects are obtainable. Certain examples are provided for hospital use; others for the bank, the shop or the residence. Blended types are obtainable which neutralize the effects of heavy foot traffic. The different notes of cheerfulness, gaiety, impressiveness or dignity may be struck; harmonizing effects and contrasts are equally available through its unlimited variety of types.

Comfort and Quietness—It furnishes true comfort under foot because of its shock absorbing qualities, temperature and surefootedness. The fiber reinforcement prevents "drawing" of the feet and provides a reassuring tread. It possesses in full the property of being non-resonant and non-vibrant. Yielding slightly to foot fall, it produces quietness by stopping noise at the source.

Sanitation—It is manufactured under tremendous hydraulic pressure, which results in a material of great density, whose body is pleasingly resilient, while its surface is slightly glazed and non-absorbent. Almost every common soiling or staining agent—ink, antiseptic washes, grease and urine—have little or no effect upon it. Its joints are close and easily sealed with insoluble cement.



Stedman Flooring in Historic Faneuil Hall, Boston

Continued on next page

A Stedman Installation in Martin's, Brooklyn, N. Y.

It does not generate dust. It is non-odorous.

Limitations—Stedman Naturized Flooring should not be laid on basement floors nor where it is continually subject to contact of strong acids or alkalis, oils or moisture. It should not be laid out-of-doors.

Fire Resistance—It possesses to a high degree the virtue of being non-combustible.

Maintenance—Waxing or oiling is neither necessary nor desirable. Proper washing with plain water only or dry mopping keeps floor and surface in a permanently efficient and attractive condition.

Costs—Costs vary with market conditions, labor charges, transportation, size of installation, types selected and designs used. The first cost is slightly higher than for other types of non-rigid floors but the negligible maintenance cost makes it in years of service, the most inexpensive floor.

Technical Data—*Sizes of Tile in Inches*—Squares: No. 4 ($4\frac{3}{32}$); No. 4a ($4\frac{9}{16}$); No. 5 ($5\frac{1}{8}$); No. 5a ($5\frac{13}{16}$); No. 6 ($6\frac{13}{16}$); No. 8 ($8\frac{3}{16}$); No. 10 ($10\frac{1}{4}$); No. 13 ($13\frac{5}{8}$); No. 20 ($20\frac{1}{2}$). Rectangles: 3R ($13\frac{5}{8}$x$6\frac{13}{16}$); 2R ($20\frac{1}{2}$x$10\frac{1}{4}$); 1R ($18\frac{3}{16}$x$24\frac{9}{16}$).

Runners—16 ft. x 41 in.

Borders—Proportionate.

Thickness—Tile, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in. Runners, $\frac{3}{16}$, $\frac{1}{4}$ in. Wainscoting, $\frac{3}{16}$ in., any height, in tile form or runners.

Designs—This product may be laid square, diagonally, in rectangles or any of the conventional forms. The herringbone, log cabin, basket weave or ashlar designs are obtainable. It may be also laid at random both as to color and size or in special designs as per template.

Special inlays of names, trade-marks, emblems, animals or other designs may be had for additional decorative purposes. These are particularly desirable for children's hospitals, stores, clubs and lodges, kindergartens and similar areas.

The Runner—Stedman Naturized Flooring is also available in runners or long strips, unit piece 16 ft. by 41 in. Decorative results are greatly enhanced because of the characteristic veinings and blendings and by the use of contrasting borders and panels.

Its size also admits of its use in wainscotings, panelings and wall coverings, besides special flooring designs.

Guarantee—(Standard form adopted by Rubber Flooring Division of the Rubber Association of America): We guarantee this tiling to be free from defects in workmanship and material. All guarantees, express or implied, are contingent on the use of such cleaning agents and methods as are recommended by the manufacturer.

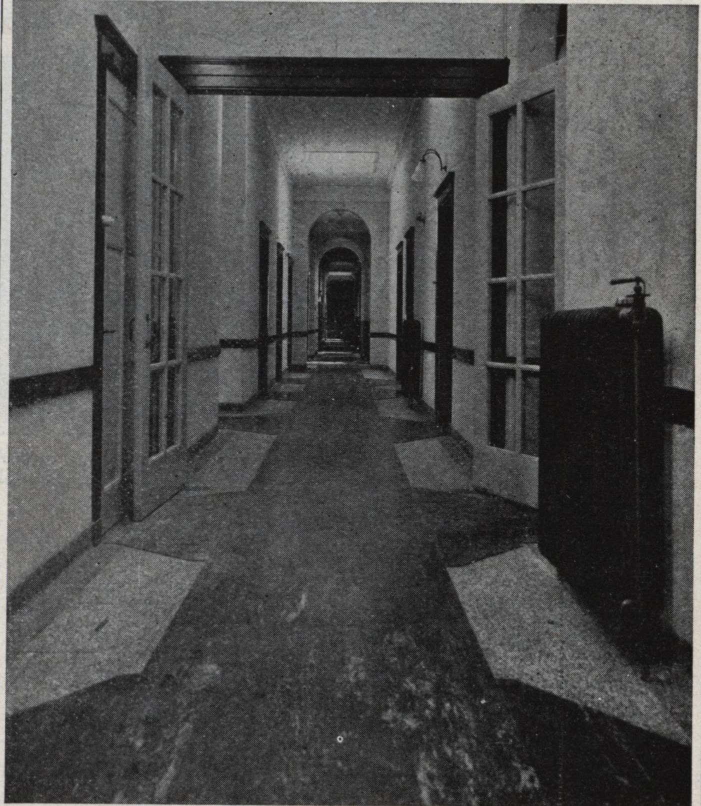
Other Products

Wainscoting; sanitary bases; stair treads; wall coverings; table and desk tops; interior decorative units; bed bumpers.

Specifications for Stedman Naturized Flooring

Note: Stedman Naturized Flooring lays over any smooth level and dry surface of wood or concrete. It is furnished in tile form, squares or rectangles, or long runner effects.

In spaces so indicated, furnish and apply Stedman Naturized Flooring, as manufactured by the Stedman Products Company, South Braintree, Mass., in accordance with manufacturer's directions throughout, using cement supplied by them for bed and joints. (Allowance for finish floor level to be equal to thickness of rubber tile or runner.)



Corridor, Apeldoorn Hospital, The Hague, Holland

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Preparation of Wood Floor—In all spaces designated as "Stedman Naturized Flooring," bring underflooring within specified distance of the required finished level. The underfloor shall be not less than ¾-in. tongue and groove flooring, not more than 4 in. wide, driven in tight and blind nailed. Secure all ends of boards and bring irregularities to a smooth surface.

Preparation of Concrete Floor—In all spaces designated as "Stedman Naturized Flooring," bring the surface of the concrete within specified distance of the finished level and trowel smooth. Over a cinder concrete or coarse stone concrete, use a top dressing of 1 to 3 cement and sand, at least ½-in. in thickness and finish at the level clearance, above mentioned. Concrete which has been frozen or has a choppy or crumbly surface can not be accepted. Work must be completed at least two weeks before ready to lay the Stedman Naturized Flooring, and must be dry.

Laying—At least two weeks after concrete has set and when thoroughly dry, sweep carefully of dust and remove any lumps or roughness. Lay the Stedman Naturized Flooring in the cement supplied by the STEDMAN PRODUCTS COMPANY, using little or more as necessary to preserve an even surface at the joints. Lay with a slide or "push" motion to insure complete coating of all contact edges.

Base—Where called for, shall be set even and straight, flush with floor and to come ⅛ in. in advance of finished wall surface, tile, or plaster.

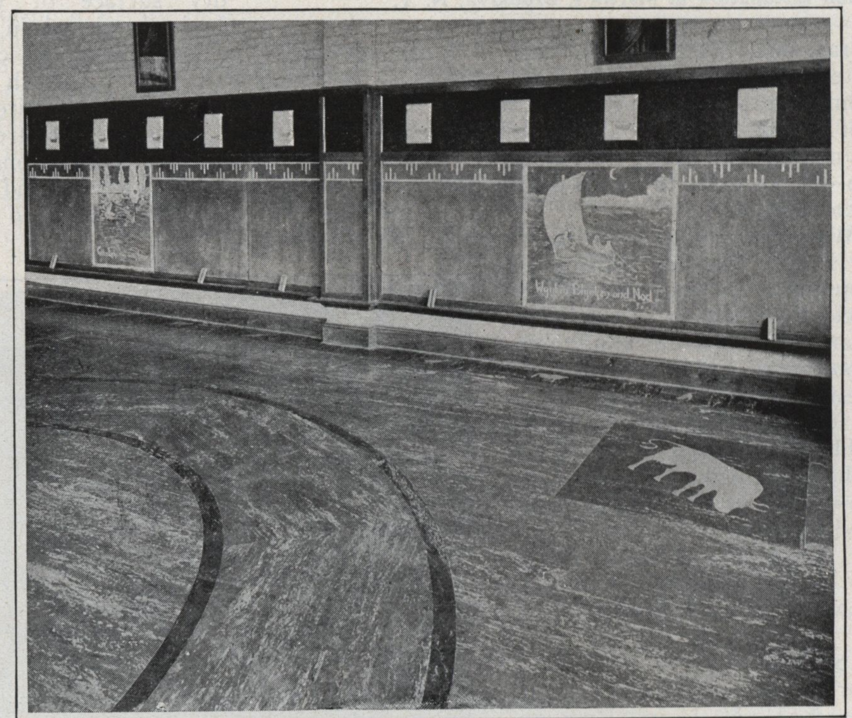
Clean Up—Soon after laying and before it finally hardens, wipe up all surplus cement with cloth moistened with alcohol and leave the floor clean, smooth and level, covering it with sheathing paper.

Special Flooring Service

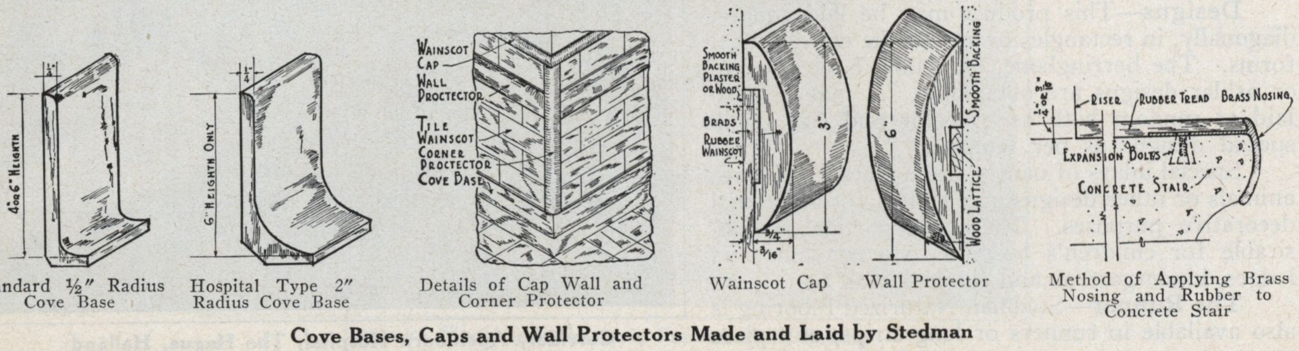
We have made a study of the flooring requirements of hospitals and are prepared to furnish special installation treatment where advisable. This product fulfills all the points held to be requisites by the American Hospital Association Flooring Committee in their Bulletin No. 47 entitled Report of Committee on Floors.

For interior decoration, many beautiful and harmonious effects are possible through the adaptation of Stedman Naturized Flooring to special purposes, such as walls, wainscoting, paneling, table tops and desk tops, counter display and kindred uses. The new variegated types now available in long lengths open a wider field of uses wherein the architect or decorator may achieve new and important results.

It is worthy of mention that Stedman Naturized Flooring is made by us, sold by us and laid by us, thus fixing proper responsibility for quality, service and performance.



Kindergarten Showing Floor and Animal Inlay by Stedman, St. Patrick's Church School, Hartford, Conn.



Standard ½" Radius Cove Base

Hospital Type 2" Radius Cove Base

Details of Cap Wall and Corner Protector

Wainscot Cap

Wall Protector

Method of Applying Brass Nosing and Rubber to Concrete Stair

Cove Bases, Caps and Wall Protectors Made and Laid by Stedman

SYRA-BORD RUBBER FLOORING CORP.

SYRACUSE, N. Y.

Syra-Bord

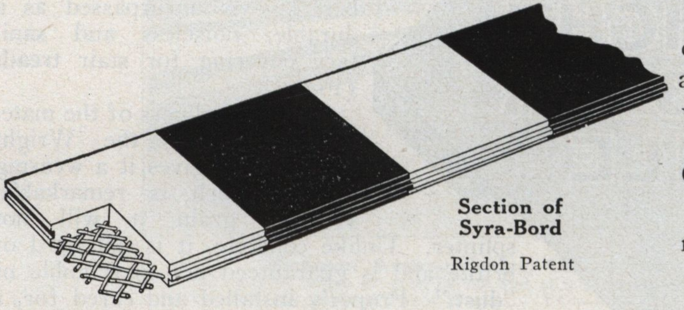
TRADE-MARK

Syra-Bord—A Superior Rubber Flooring That Stays Laid

Syra-Bord is a real flooring, not merely a floor covering.

It is made with pure rubber as a base material and has a cushion bottom (reinforced by heavy braided wire) to take care of expansion and contraction of the subfloor.

The sides and ends are tongued and grooved, same as wood flooring. It is made in 6 to 12-in. squares, 3/8 in. thick and 10 ft. long, with expansion joints separating the squares, making a continuous strip of square tiles.



Section of Syra-Bord

Rigdon Patent

Easily Laid

Syra-Bord is very easily and quickly laid and can be nailed in the same manner as a tongued and grooved wood floor without showing the nails.

When Syra-Bord is to be laid over a concrete base, we furnish a cement which gives a permanent bond.

Durable and Attractive

The materials compounded in Syra-Bord insure durability, and its patented features and methods employed in its manufacture insure its permanency because they prevent creeping, curling, cracking, peeling and warping.

Syra-Bord combines attractiveness with the utmost durability and comfort.

Other Points of Merit

Syra-Bord is sanitary, verminproof, moistureproof, dustless, non-slipping, and quiet and soft under the tread.

Syra-Bord embodies all the resiliency possible to obtain without loss of the other characteristics necessary to the ideal floor and will retain its natural elasticity permanently.

These features all combine to make Syra-Bord the logical floor for kitchens, bathrooms, sun parlors, breakfast nooks, vestibules and other rooms in residences.

Ideal for Heavy Duty

Added to the above features, the wire reinforcement makes Syra-Bord the ideal floor for stores, show windows, elevators, offices, banks, hospitals, hotels, restaurants, factories or any place where a heavy duty floor is required.

Color Effects

These can be made in solid or two-color designs, either in plain or mottled colors.

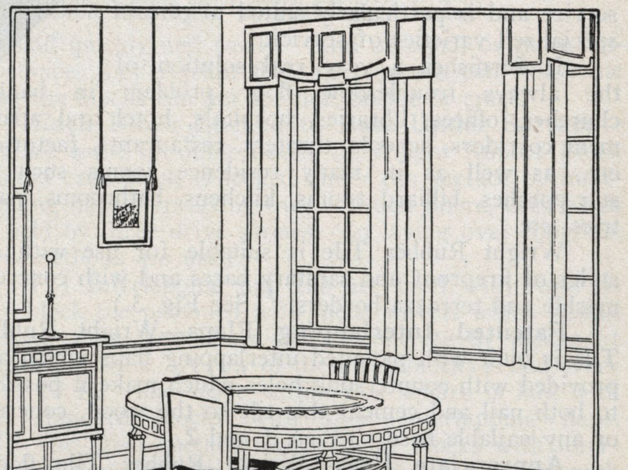
Special color designs can also be created.

Border Effects

Syra-Bord is also made in 2-in. strips for either complete floors or for borders. These strips are tongued and grooved the same as the 6-in. Syra-Bord strips previously described.

Cove Base and Stair Treads

We make a suitable cove base and stair tread to match Syra-Bord flooring.



An Attractive Syra-Bord Floor

WRIGHT RUBBER PRODUCTS CO.

Manufacturers of Wright Rubber Tile, Cove Bases, Stair Treads and Paving Block

RACINE, WIS.

THE
WRIGHT
RUBBER
TILE

Products

Wright Rubber Tile for floors; Stair Treads; Cove Bases; Paving Block.

Floor Tile

The Wright Rubber Tile is a composition of rubber and other wear resisting materials, specially prepared, through a new and exclusive process, to give the highest type of satisfying service.

Where Used—Because it embraces all the attributes of durability, cleanliness, noiselessness and fine appearance so desirable in a floor covering, the Wright Rubber Tile is the ideal floor for all classes of service and is particularly suited to certain specialized varieties of service.

It furnishes a very real solution of the always troublesome floor problem in banks, churches, offices, libraries, hospitals, hotel and apartment corridors, schools, theaters, restaurants, factories, etc., as well as in many residence rooms such as sun porches, billiard rooms, kitchens, bathrooms, pantries, etc.

Wright Rubber Tile is suitable for use with all styles of fireproof and sanitary bases and with concrete marble and terrazza borders. (See Fig. 3.)

Patented Interlapping Flaps—Wright Rubber Tile is built with patented interlapping flaps which are provided with countersunk holes which make it possible to both nail and cement this tile to the wood, concrete or any nailable base. (Figs. 1 and 2.)

Appropriate Uses—Wright Rubber Tile floors may be waxed and polished. When given proper care, they are a credit to the most luxurious surroundings. While many people still believe that tiled floors should be confined to halls, kitchens, bathrooms, churches, clubs, theaters and offices, the applicability of Wright Rubber Tile to harmonize with any surroundings is causing it to be recommended for floors in living, dining and bed rooms in homes and apartments as well as for general flooring.

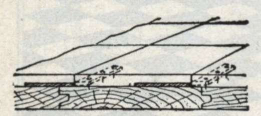


Fig. 1. Wright Rubber Tile may be used over wood or concrete floors. Exclusive interlapping flaps make possible locking of corners as well as cementing tile to floor

Easily Cleaned, Sanitary—Because of its smooth, waterproof surface it can be cleaned with a wet mop. Powdered cleansing agents or scrubbing brushes can be used without injury to tile. Being non-porous, non-absorbent, odorless, with joints close and absolutely sealed with insoluble cement, it makes an ideal sanitary floor.

Samples—Samples will be sent to architects on request.

Durability—Wright Rubber Tile is unsurpassed as a durable, noiseless and sanitary covering for stair treads (Fig. 4).

The toughness of the materials composing the Wright Rubber Tile gives it a wearing quality which is remarkable. Without grain it will not splinter. Unlike concrete, it is not hard or brittle and is guaranteed not to crumble or "dust." Properly installed and cared for, a Wright Rubber Tile floor will wear for years under the heaviest traffic because of its great resistance to abrasion. Not susceptible to temperature changes, to any appreciable degree, Wright Rubber Tile will not curl or warp.

Colors—Pattern Arrangement—All colors are permanent as they permeate entire thickness. Plain, mottled or grained effects may be had in extensive variety.

Color possibilities and pattern arrangement of field and border are unlimited.

Standard Sizes—Standard size floor tile are 4 and 6 in. square, and in ¼ and $\frac{3}{16}$-in. thickness. Borders come in strips 18 in. wide, cut to lengths 18 and 36 in.

Co-operation with Architect—We are always at your service to submit laying specifications and recommendations covering the installation of Wright Rubber Tile on any commission you may submit.

If preferred, we will, upon request, furnish you with standard specifications for laying Wright Rubber Tile.

Cost of Tile, Stair Treads, etc.

Costs of Wright Rubber Products vary with market conditions, labor charges, transportation and many other factors differing geographically from time to time.

We will gladly furnish prices and estimates.

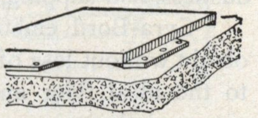


Fig. 2. The Interlapping Flaps of Wright Rubber Tile makes possible the locking of corners as well as cementing tile to floor. Wright Tile also made *without* flaps

Continued on next page

Wright Rubber Stair Treads

Especially suited for use in factories, hotels, buildings, stores, apartments, homes and anywhere that long wear and safety is desired. Wright Rubber Stair Tread is long wearing, non-slippery, sanitary, noiseless and attractive. May be had either smooth or corrugated surface to be used with or without brass nosing. Can be both cemented and nailed. Comes in 3 ft. 6-in. and 18-in. lengths, 12 in. wide. Can be applied over old as well as new stairs. For stairs, Wright Rubber Tile is an ideal covering.

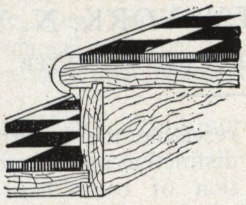


Fig. 3

Durable, noiseless and sanitary, and restful to walk on.

Wright Rubber Cove Bases

Wright Rubber Tile is constructively appropriate for use with all styles of fireproof and sanitary bases, and with concrete, marble and terrazza borders.

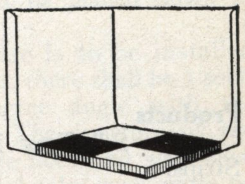
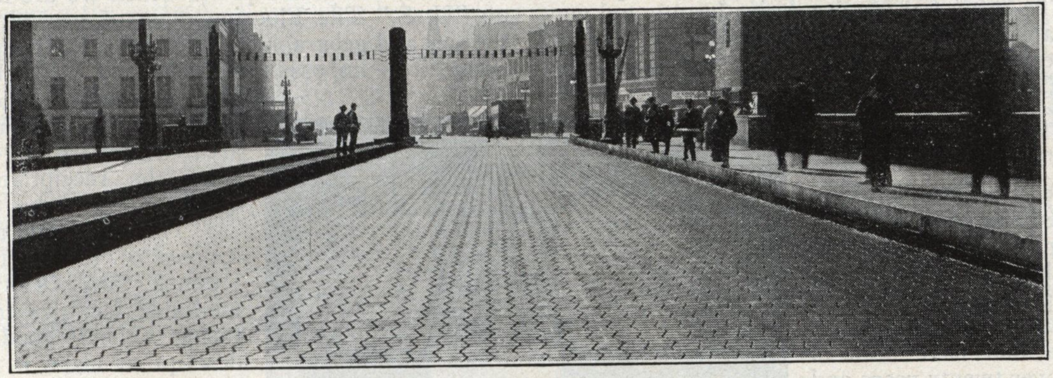


Fig. 4

Industrial Floors, Side Walks and Pavements

Unaffected by Extreme Temperature Changes—Wright Rubber Block floors are not affected by excessive water or by extremes in temperature, because each block is cured under 330° F. of heat and hydraulic pressure of 2500 lbs. per sq. in. of block. It is obvious that nowhere would floors be subjected to 330° of heat or hydraulic pressure.



Michigan Avenue Bridge, Chicago, Ill., Paved with Wright Rubber Block
Over this famous bridge between 58,000 and 60,000 motor vehicles, including heavy motor busses, pass every 24 hours
A. A. Sprague, Commissioner Public Works Thomas G. Pihlfeldt, Engineer of Bridges John Ericson, City Engineer

Unaffected by Expansion or Contraction—Being cured under extreme heat and pressure, it is not affected by the ordinary climatic changes such as occur outdoors and range from 20° to 40° below zero to 110° in the sun. We know of no interior service where such extremes in temperature exist.

The Ideal Floor for—Manufacturing plants of all kinds; warehouses; central stations; canneries; creameries; gymnasiums; armories; zoological gardens; bridges; driveways; pavements; stables; garages; steam and ferry boat decks; locker and shower rooms for golf, country and athletic clubs.

Standard Sizes and Shapes—Wright Rubber Blocks are furnished in the following thicknesses: $\frac{5}{16}$, ½, ⅞ in.; all blocks 6 in. wide and 12 in. long.

Blocks are made in smooth and several types of corrugated surfaces.

Resilient, Prevents Breakage—Manufacturers whose products are breakable find that Wright Rubber Floors materially reduce breakage.

Restful, Noiseless—The resiliency of these floors makes them particularly restful to walk on. As for sanitation, the fact that Wright Rubber Floors are used in many of America's leading hospitals is proof positive of their sanitary features. We believe no known material makes as quiet a floor as rubber and this is highly important in many plants for both offices and factory. Trucks glide quietly and easily over this even, smooth floor.

A Non-conductor of Electricity—For use in central stations and power plants, and in factories where motor generator sets or motors are used, Wright Rubber Blocks make an ideal floor because, being rubber, they are non-conductors of electricity. No need of rubber mats around generators and motors or switch boxes.

Laying Simple and Quick—The cost of laying is an important item in estimating the cost of a floor, although this becomes less as the length of service increases. Because of their size (6x12 in.), their uniformity, the absence of rough, scratchy surfaces and patented interlapping flaps, Wright Rubber Blocks can be laid quickly and easily. And of equal or more importance, they remain flat—the corners can not come up—the blocks can not splinter, buckle or crack.

Each Block Locked to Base Under Surface—Unlike wood or other floors, in Wright Rubber Block Floors each block is locked under the surface by interlapping flaps. In laying over wooden floors, each block is held by three drive screws. In laying over concrete, two methods are used:

(1) Interlapping flap tile are used with rows of key block tile provided with metal inserts which permit locking these key block tile to concrete by means of expansion bolts. A row of these key blocks is laid every 5 to 10 ft. The space within this square is laid with the standard blocks with their interlapping flaps. (2) The other method uses regular blocks with interlapping flaps. Holes are drilled in the concrete with a speedway electric hammer and lead expanders inserted. Then drive screws are driven through the holes in the flaps into the metal expanders.

Durability Proven on Bridge, Pavement and Railroad Crossings—The durability of Wright Rubber Block has been proven on such outstanding installations as the Michigan Avenue Bridge, Chicago; the Northern Avenue Bridge, Boston; the Eads Bridge at St. Louis and the Main Street crossing of the Chicago, Milwaukee & St. Paul R. R. at Racine. Particulars on request.

Engineering Service—There is a type of Wright Rubber Flooring for every service. Our engineering department will gladly furnish information about your particular problem, whether it be for bridge, driveway, pavement, or a floor for an industrial plant, office building or public building.

UNITED STATES RUBBER COMPANY

RUBBER FLOORING DEPARTMENT

1790 Broadway, NEW YORK, N. Y.

BRANCHES IN EVERY INDUSTRIAL CENTER

Products

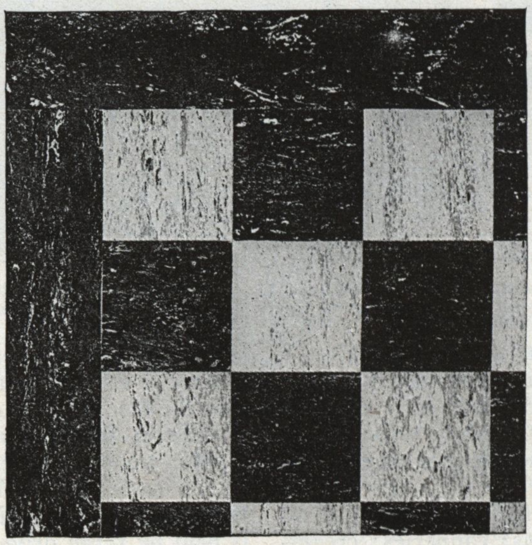
"U. S." Tile Flooring, in Tiles, Runners and Strips.

"U. S." Tile Wainscoting.

Also Usco Sheet Rubber Flooring and Stair Treads, Sanitary Cove Base, Table and Desk Topping, Mats and Mattings.

"U. S." Tile Flooring

A rubber flooring of extraordinary durability. The United States Rubber Company has been known for its manufacture of fine rubber floors since 1897. These years of experience have enabled us to perfect a product that cannot be surpassed for decorative beauty and general serviceability. "U. S." Tile combines the sanitary and easy cleaning features of hard tile, the beauty and quietness of rug and carpet, and the wearing qualities of marble.



Square Design

Field—T-10½ (White—Black Mottling). T-13 (Black—White Mottling). Border—T-13

Durability

The life of an installation of "U. S." Tile is practically that of the building in which it is laid. It actually has a durability that approaches permanency. We can point to rubber floors of our manufacture that have been in service for over twenty years and that are still in excellent condition.

Resilient and Quiet

"U. S." Tile Flooring is highly resilient and comfortable under foot. It effectively eliminates foot traffic noises and insures a quiet, restful atmosphere wherever installed. Its unusual resiliency makes its surface proof against indentation from furniture.

Cost and Maintenance

The initial cost of "U. S." Tile is practically its only cost. It requires no waxing or oiling—only proper washing when it becomes dirty. Dry mopping is sufficient for home cleaning, or damp mopping with warm water occasionally. Where heavy traffic is encountered, use the two-pail and mop method—with a mild cleaning agent in the first pail.

Sanitary

"U. S." Tile is non-absorbent and highly resistant to acids. The non-absorbent tiles are cemented tightly together with a special waterproof glue when laid. There are no separations or cracks to accumulate dirt and germs.

Decorative

"U. S." Tile is made in a large variety of attractive designs and color combinations. The color grainings, which run through the entire thickness of the tiles, resemble the beautiful natural veinings of marble—a distinctive and attractive effect. The resulting distribution of color has that pleasing variance of design which is found only in the highest grades of Italian marble.

Samples

Samples will be mailed to you on request. We shall also be glad to help you work out any desired flooring effect to harmonize with interior decoration plans.

Information and Prices

Inasmuch as the prices which we are able to quote on "U. S." Tile Flooring must of necessity vary with the size and geographical location of the proposed installation, it is impossible to us to list prices herein. We shall be glad to send immediate advice as to the estimate on any area within twenty-four hours after the receipt of your inquiry.

The practically unlimited resources of the United States Rubber Company and its remarkable facilities for manufacturing rubber goods of every description make it possible for us to sell our product for the lowest possible price commensurate with its quality and construction.

When inquiring for prices on "U. S." Tile Flooring either include with your inquiry a sketch of the space to be covered showing all necessary dimensions, or an accurate blue print or sketch drawn to scale. We can then determine the actual number of square feet in the job, and give you an accurate quotation.

Guarantee

We guarantee "U. S." Tile Flooring to be free from defects in workmanship and material. Experience has proved that any such defects will appear within one year from the date of installation. All guarantees are contingent on the use of such cleaning agents and methods as are recommended by us.

In every possible case we prefer to lay "U. S." Tile with our own expert corps of workmen, who are experienced not only with the installation of this type of flooring, but also with its manufacture. This is additional assurance of a satisfactory installation.

Sizes of Tile

"U. S." Tile is available in three thicknesses: $\frac{3}{16}$, ¼ and ⅜ inch. Tiles are furnished in 6, 9, 12 and 18-inch squares, as well as in rectangles of any desired size. Tiles 6x6 inches are usually sold for small spaces. The 18x18-inch size is especially adapted to large spaces.

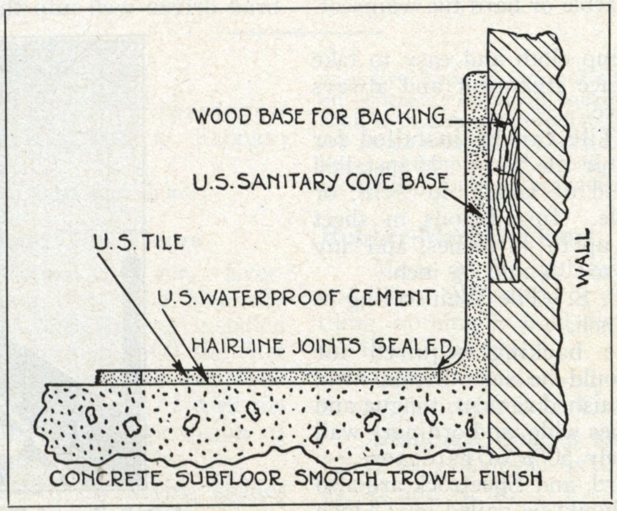
Continued on next page

Specifications for "U. S." Tile Flooring

Wherever indicated on drawings or in rooms and spaces herein specified, the flooring shall be "U. S." Tile Flooring, as manufactured by the United States Rubber Company, 1790 Broadway, New York, N. Y. It shall be installed in strict accordance with the rules and directions of the manufacturers and their standard processes and procedures.

If Over Concrete—Wherever "U. S." Tile Flooring is to be installed, the concrete subfloor shall have a top layer 1½ inches thick, composed of 1 part portland cement and 3 parts clean screened sand, troweled to a smooth finish, free from all waves and irregularities. This top layer shall be finished below the required floor level the thickness of the "U. S." Tile specified. All lines struck upon the surface shall be filled in before laying "U. S." Tile. All concrete shall be absolutely dry, clean and free from foreign material before installation of flooring.

Frozen concrete shall not be considered a satisfactory subfloor unless its scale surface is removed and it is refinished with at least 1½ inches of new top layer, as specified above.



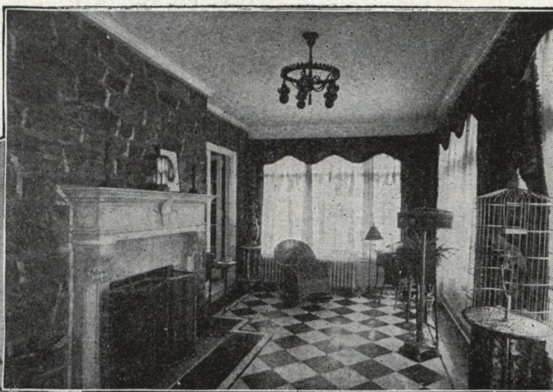
Cross Section Illustrating Method of Installing "U. S." Tile Flooring

If Over Wood Floors—Wherever "U. S." Tile Flooring is to be installed, the underfloor shall be quarter-sawed, kiln dried hardwood, laid in tongue and groove flooring not more than 3 inches wide, tightly driven in and blind nailed over centers not exceeding 16 inches. All irregularities of surface shall be planed down to present a smooth face.

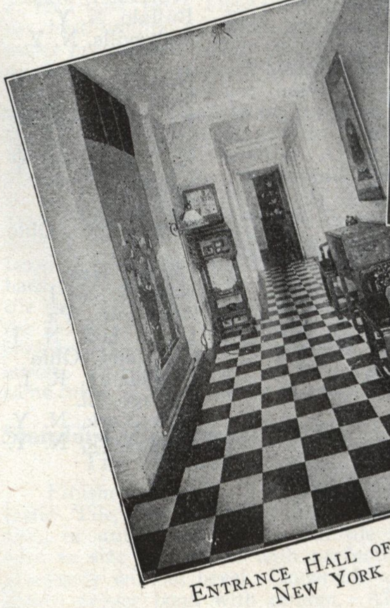
Cove Base—Where cove base is to be installed with "U. S." Tile on concrete floors, there shall be a solid wall backing rising at a 90-degree angle with the floor. The juncture of the concrete floor and wall must be absolutely even with no signs of raggedness. Furring strips shall be placed to come ¼ inch below the top of the cove base to be installed.

Special Note: No subfloor of concrete or wood is acceptable unless it is smooth, *dry* and level. Basements, spaces below grade, or laid directly on the ground are apt to be damp, and are not suitable for the installation of "U. S." Tile. Public kitchens and laundries, spaces behind restaurant counters and soda fountains should not be covered with this type of flooring.

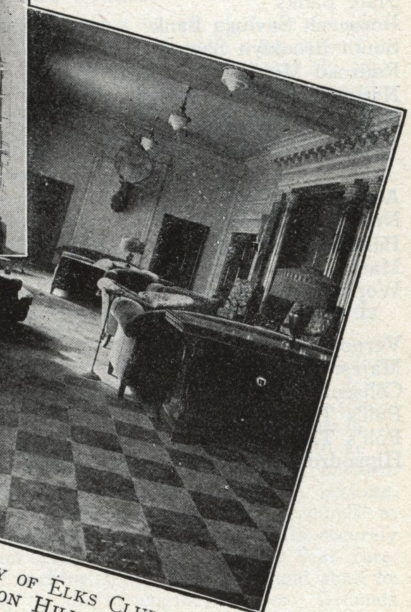
Subfloors that are rough, due to cracking or crumbling of concrete, or warping of boards, are not acceptable.



Sun Porch in Philadelphia Residence



Entrance Hall of Residence, New York City



Lobby of Elks Club, Union Hill, N. J.

Three Interesting "U. S." Tile Installations

Continued on next page

"U. S." Tile in Strip Form

"U. S." Tile can be supplied in strip or runner form in all widths up to 40 inches, and in all lengths up to and including 19 feet. Excellent effects can be obtained with this type of "U. S." Tile by paneling these long strips with cross strips and borders of a contrasting color.

Wainscoting with "U. S." Tile

Rubber wainscoting is coming into vogue. It is used in the same manner as marble or hard tile wainscoting and its cost is moderate.

Easily cleaned with a damp cloth and easy to take care of. It requires no surface treatment and always presents a beautiful appearance.

Size of Unit—"U. S." Tile can be installed for wainscot work in either sheet or tile form. If installed in tile form the ashlar method of laying, in 9x18, or 6x12-inch blocks is preferable. Installations in sheet form can be made in widths up to 48 inches, and any height. Thicknesses available are $\frac{3}{16}$ and $\frac{1}{8}$ inch.

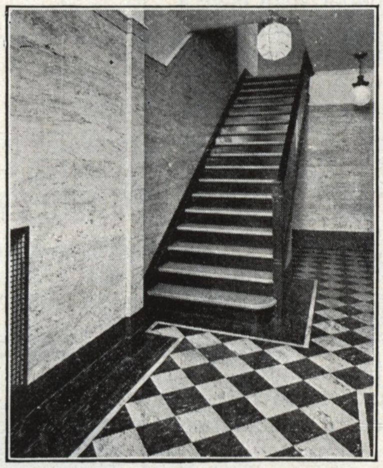
The illustration shows "U. S." Tile Wainscoting in block form, 9x18 inches x $\frac{1}{8}$ inch.

Backing Required—The backing required for "U. S." Tile Wainscoting should be smooth and firm. Suitable backings are trowel finished cement, tongue and grooved boards not over 3 inches wide, and ordinary wall plaster containing approximately 50% of hardener.

Compo-board, plaster board, and Sheetrock are also satisfactory. The last three should be nailed on 12-inch centers with large headed roofing nails set below or flush with the surface of the material.

Wainscot Cap—The "U. S." Wainscot Cap should be used to finish off the top. This wainscot cap is designed to fit directly over the nailing strip and flush against the back of the wall, just above where the wainscot ends.

The wainscot cap is fixed to the nailing strip with our special Usco Cement, and an occasional headless brad driven well into the rubber.



Installation of "U. S." Tile as Wainscoting

Typical Installations of "U. S." Tile Flooring

Following is a partial list of buildings in various parts of the country where "U. S." Tile Floors have been installed throughout or in certain rooms requiring durable, architecturally correct floors. This partial list will serve to indicate the availability of this material in service anywhere in the United States.

Banks	
Federal Reserve Bank	New York, N. Y.
Federal Reserve Bank	Cleveland, Ohio
Federal Reserve Bank	San Francisco, Cal.
Anglo and London Paris National Bank	Los Angeles, Cal.
Bowery Savings Bank	New York, N. Y.
State Banks	New York, N. Y.
Roosevelt Savings Bank	Brooklyn, N. Y.
South Brooklyn Savings Bank	Brooklyn, N. Y.
Railroad Men's Co-operative Bank	Indianapolis, Ind.
National Shawmut Bank	Boston, Mass.
First National Bank	Boston, Mass.
People's Savings & Trust Co.	Monroe, La.

Office Buildings	
American Radiator Co.	New York, N. Y.
New York Times Annex	New York, N. Y.
Publicity Building	New York, N. Y.
Matson Navigation Co.	San Francisco, Cal.
Worcester Investment Trust Co.	Worcester, Mass.

Theaters	
Vernon Theater	Columbus, Ohio
Majestic Theater	Columbus, Ohio
Coliseum Theater	New York, N. Y.
Poli's Theater	Bridgeport, Conn.
Poli's Theater	Washington, D. C.
Hippodrome Theater, Million Dollar Pier	Atlantic City, N. J.

Hospitals	
Memorial Hospital	New York, N. Y.
Lenox Hill Hospital	New York, N. Y.
Mt. Sinai Hospital	New York, N. Y.
Presbyterian Hospital	Philadelphia, Pa.
Jackson Memorial Hospital	Miami, Fla.
Grandview Sanitarium	Cincinnati, Ohio
Jewish Hospital	Cincinnati, Ohio
Methodist Hospital	Los Angeles, Cal.
A. C. L. Hospital	Waycross, Ga.

Schools	
Union Hill High School	Union Hill, N. J.
University Park School	Denver, Colo.
Buhl High School	Buhl, Minn.
Ohio Wesleyan	Delaware, Ohio
Holy Cross College	Worcester, Mass.
Nichols School	Buffalo, N. Y.
Dolgeville High School	Dolgeville, N. Y.

Hotels	
Hotel Chatham	New York, N. Y.
Hotel Astor	New York, N. Y.
Hotel Pennsylvania	New York, N. Y.
Hotel Commodore	New York, N. Y.
Hotel Embassy	New York, N. Y.
Hotel Grady	Atlanta, Ga.
Hotel Mayo	Tulsa, Okla.
Ohio Hotel	Youngstown, Ohio

Clubs	
Elks' Club	Omaha, Neb.
Elks' Club	Newark, N. J.
Elks' Club	Allentown, Pa.
Elks' Club	Union Hill, N. J.
Lakehouse Country Club	Cleveland, Ohio
Turks Head Club	Providence, R. I.
Chicago Athletic Club	Chicago, Ill.
St. Anthony Club	New York, N. Y.
Grand Street Boys' Club	New York, N. Y.

ESTABLISHED 1899

DAVID E. KENNEDY, INC.

Kennedy Soft Tile Floors

Fisk Building
NEW YORK

Rand McNally Building
CHICAGO

Real Estate Trust Building
PHILADELPHIA

LOS ANGELES, CAL., Gardner-Payne Co.

Products

Cork Tile; Everlastic Tile; Cork Composition Tile; Linoleum Tile; Rubber-Marble Floors; Kencor Bulletin Boards.

Experience is the vital factor in excellence.

Cork Tile Floors and Everlastic Tile Floors

Kennedy cork tile is the original cork tile. Everlastic tile is the original linoleum tile. The Kennedy Company is the pioneer in these lines, having installed in 1899 the first cork tile floors and in 1909 the first linoleum tile floors. We have equipped with improved machinery a new plant for the manufacture of cork tile where we are manufacturing under the supervision of David E. Kennedy the best cork tile ever made.

Colors—Cork tile is furnished in varying shades of brown, which for convenience of reference are grouped into three classifications: light, medium, dark.

Everlastic tile is furnished in the following colors—Sumac Red, Italian Red, Mediterranean Blue, Peacock Blue, Chinese Blue, Moss Green, Leaf Green, Van Dyke Brown, Leather Brown, Buff, Tan, Colonial Buff, Gold, Slate Gray, Steel Gray, French Gray, Quaker Gray, Oyster White, Ivory White and India Black.

Standard Shapes and Sizes—*Cork Tile*—Squares, 6x6 and 12x12 in.; oblongs, 6x12, 12x24, 12x36 in. Thickness, ½ and $\frac{5}{16}$ in. Cove base any height.

Everlastic Tile—Squares, 6x6, 9x9, 12x12, 18x18 in.; oblongs, 6x12, 9x18, 12x24 in. Thickness, ¼ in. Cove base any height.

Standard Specifications for Cork Tile Floors

All cork tile floors shall be manufactured and laid by David E. Kennedy, Inc. They shall be $\frac{5}{16}$ [½] in. thick, made only of the best quality of clean, ground cork shavings, compressed under pressure of 500 lb. to the square inch and baked in closed moulds at a temperature between 550° and 650° F. Tile ½ in. thick shall weigh not less than 20 oz. per sq. ft. for all light and medium cork tile and 18 oz. for dark cork tile. All tile shall be free from foreign substances and cement of any kind other than the natural gum of the cork. All cork tile shall be compressed and baked under the "single-thick" method; that is, the thickness of the boards into which the ground cork is compressed for baking shall not exceed ¾ in. between steel plates. All tile shall be set with a special waterproof cement. When laid on any backing other than wood, tile shall be securely attached to the backing by cement only, no nails or brads to be used. All cork tile shall be of American manufacture and shall be installed by the manufacturer who shall fully guarantee and assume full responsibility for both the material and workmanship of installation. The contractor for the cork tile floors and samples of same must be approved by the architect in writing.

Standard Specifications for Everlastic (Linoleum) Tile Floors

Finished floors in (enumerate spaces) shall be of Everlastic Tile, manufactured and laid by David E. Kennedy Inc., or authorized agent. All tile shall be ¼ in. thick, cut true to size and shape with perfectly square, clean cut edges absolutely without bevel. Underside of tile should be scored to insure proper bond with cement. All tile must pass the tests required by the Navy standard specifications for battleship linoleum. Tile must be homogeneous throughout. All tile shall be set with Everlastic waterproof cement; on concrete backing, directly on concrete; on wood backing, canvas or strong cotton fabric shall be thoroughly tacked to the wood, and tile cemented to same. All joints must be left waterproof. All tile shall be installed by the manufacturer, who shall fully guarantee and assume full responsibility for both the material and workmanship of installation.

Rubber-Marble Floors

Made of the best quality of new rubber, pigments and filler. No cotton or other fiber is used in our rubber tiling, nothing to hold dirt, create absorption or shorten the life of the tile.

Colors—Plain and marble effects are produced in any desired color. Cove base is made any height.

Standard Shapes and Sizes—Squares: 9x9 and 12x12 in.; oblongs: 6x12, 9x18, 12x24 in. Thickness: $\frac{3}{16}$, ¼ and ⅜ in.

Standard Specifications for Rubber-Marble Floors

All finished floors in (enumerate spaces) shall be of Rubber-Marble, furnished and laid by David E. Kennedy, Inc., or duly authorized agent. Colors and sizes of blocks will be selected by the architect. Thickness to be ¼ in. [$\frac{3}{16}$ in.] [⅜ in.].

All Rubber-Marble floors shall have a smooth, glossy surface. Tile are to contain no cotton or other fiber. Quality and markings shall be equal to samples held by the architect. Rubber-Marble shall be fastened to concrete backing throughout its entire surface by a waterproof adhesive. All joints shall be tight and waterproof. Where laid upon a wood backing, heavy cotton fabric or canvas shall be tacked to the wood, and Rubber-Marble cemented thoroughly to fabric with waterproof adhesive. All tile shall be installed by David E. Kennedy, Inc., who shall fully guarantee both the material and the installation.

Standard Specifications for Concrete Sub-floor for Kennedy Soft Tile Floors

Concrete sub-floors in all spaces where plans or specifications require Kennedy soft tile floors shall have a top layer 1 in. thick composed of 1 part standard portland cement and 2½ parts clean, coarse, screened sand. This top layer shall be trowelled to a level, smooth and even finish at the required level. Joints shall be cut clear through this top layer following the middle line of floor beams and girders, but not more than 20 ft. apart. This concrete shall be kept wet for 2 days after laying. The joints shall then be completely filled and trowelled smooth and even with the top surface. No lines shall be struck in the surface. Sub-floor shall be delivered to the tile contractor dry, clean and free from foreign material.

Standard Specifications for Kencor Bulletin Boards

Furnish and install Kencor bulletin boards and chart boards as shown on drawings. Furnish and install Kencor tacking spaces in connection with all blackboards, as shown on drawings. All bulletin boards, chart boards and tacking spaces shall be Kencor Bulletin Boards manufactured by David E. Kennedy, Inc., of New York and Chicago. They shall be of uniform ½-in. thickness, consisting of sheet cork of uniform color and resiliency, cemented to special composition backing. Carpenter contractor shall securely install wood grounds to which Kencor bulletin boards and tacking strips shall be securely nailed. Grounds to be not less than ⅞ in. thick by 2-in. face. In each bulletin board or tacking strip space a ground shall be set in the middle running the entire length of space. Grounds shall be set at each end and at top and bottom of all bulletin boards and tacking strip spaces, and also at any line where two sections of bulletin boards may join.

ARMSTRONG CORK & INSULATION COMPANY

Manufacturers of and Contractors for Linotile and Armstrong's Cork Tile Floors

135 Twenty-fourth Street, PITTSBURGH, PA.

BRANCHES AND AGENTS

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KANSAS CITY, MO.
OMAHA, NEB.
SPOKANE, WASH.
SEATTLE, WASH.
PORTLAND, ORE.
TACOMA, WASH.
LOS ANGELES, CAL.
SAN FRANCISCO, CAL.
CHARLOTTE, N. C.
CINCINNATI, OHIO
MEMPHIS, TENN.
DENVER, COLO.

Products

LINOTILE for floors and stair treads.

ARMSTRONG'S CORK TILE for floors and stair treads, sanitary cove and base.

For House and Roof Insulation, see pages 1350-1351; for Cold Storage Insulating Materials, see pages 2354-2355; for Cork Bulletin Boards, see page 2828.

Linotile

Linotile is a composition of powdered cork, oxidized linseed oil, gums and pigments, thoroughly mixed and calendered into sheets $\frac{1}{4}$ in. thick. After being subjected to a seasoning process, these are cut into square or oblong tiles of various sizes and into narrow strips used for interlining between the tiles. At all stages of manufacture the sheets and tiles are kept flat to eliminate any tendency to curl.

Advantages—Because of the elasticity of the ingredients, Linotile is resilient and restful underfoot, nonslippery and practically noiseless. It is a warm, comfortable floor.

Being impervious to moisture, Linotile is perfectly sanitary and is easy to clean and keep clean.

Linotile can be laid over any smooth, dry base—wood, concrete or metal. Special dampproofing is required when Linotile is installed over any base which rests directly on the ground.

Because of its wide range of colors and sizes, Linotile can be laid in a great variety of designs and lends itself readily to individual treatment.

Durability—Linotile has no grain like wood and will not splinter; neither will it crumble or "dust" like hard, brittle materials. Its resistance to abrasion is such that, when properly laid and cared for, Linotile will last for years under the heaviest foot traffic.

As Linotile does not appreciably expand or contract, it does not buckle or warp on the floor.

Where Used—The peculiar properties of Linotile make it the most satisfactory solution for the always troublesome floor problem in offices, banks, churches, libraries, hospitals, apartment and hotel corridors, restaurants, theaters, schools, etc., as well as in many residence rooms such as sun porches, bathrooms, kitchens, pantries and billiard rooms.

While Linotile is not a cheap floor, it is not expensive when consideration is given to its long life and its many points of superiority over other flooring materials.

10x10-IN. LIGHT AND DARK MARBLE LINOTILE SQUARES
CORLIES, MACY & CO., New York, N. Y.

LINOTILE FLOOR IN 8x16-IN. WHITE WITH $\frac{1}{4}$-IN. BLACK JOINTS AND BLACK AND WHITE BORDER, COMMERCIAL TRUST AND SAVINGS BANK, OAKLAND, CAL.

Sizes and Shapes—Linotile is made in the following standard sizes:

Squares—2, 3, 4, 6, 8, 10, 12 and 18 in.

Oblongs—2x4, 6 and 8 in.; 3x6 in.; 4x8 in.; 6x9½ in.; 6x12 in.; 8x16 in., and 18x36 in.

Interlining Strips—For use between tiles, ¼, ⅜, ½, ¾ and 1 in. wide.

Special Designs—Monograms, fleur-de-lis and tiles of shapes and sizes not listed as standard can be supplied on special order.

Colors—Linotile is supplied in the following colors:

Light brown
Dark brown
Light gray
Dark gray
Light blue
Dark blue
Light marble
Light green
Dark green
White
Dark marble
Black
Red
Orange

Installation—Linotile is sold only on a contract basis, to be furnished and installed by the ARMSTRONG CORK & INSULATION COMPANY or its authorized agents. This is necessary in order to eliminate all risk of unskilled workmanship.

All branches and agents are qualified to submit estimates for furnishing and laying Linotile floors and all maintain specially trained mechanics to install Linotile.

Short Specification—Architects desiring to use a brief form of specification will find the following entirely adequate:

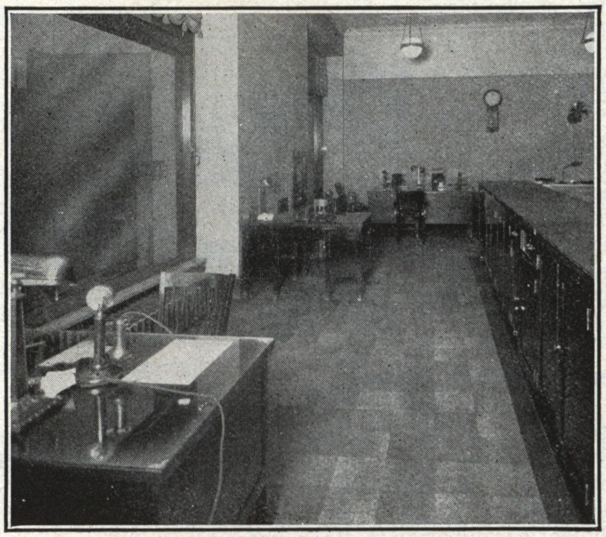
> The Linotile floors, of color and design to be approved by the architect [or owner] shall be furnished and installed by the ARMSTRONG CORK & INSULATION COMPANY, or its authorized agent, in accordance with that Company's standard specification.

Continued on next page

Samples, Literature and Designs—Linotile floors are described in two new books, "Linotile Floors for Residences" and "Linotile Floors for Public and Semi-Public Buildings." Both contain complete information, detailed specifications, design plates in color and many illustrations. Either or both, with samples, will be sent on request.

Armstrong's Cork Tile

Armstrong's Cork Tile is made from clean cork curlings compressed in moulds and baked. The effect of the heat is to drive off any moisture and to liquefy the natural gum in the cork, which gives the separate particles a waterproof coating and serves to bind them together. To the baking process, also, is due the beautiful brown color of cork tile, three shades—light, medium and dark brown—being produced by varying the time of baking. After removal from the moulds, the sheets are cut into tiles, ½ in. in thickness, of the sizes desired, and carefully sorted for color.



Armstrong's Cork Tile Floor, Land Title Abstract and Trust Company, Cleveland, Ohio

Advantages—Armstrong's Cork Tile can be laid over any smooth, dry base—wood, concrete or metal. When installed in basements or over any floor in direct contact with the ground, a special dampproofing specification (see catalogue) must be used.

Armstrong's Cork Tile is yielding and practically noiseless underfoot. Due to the frictional quality of cork, it affords a firm and sure foothold even when laid on an incline at a considerable angle.

Cork is a nonconductor of heat; hence, a floor of cork tile is always comfortable. In cold weather it does not permit the heat to be drawn away from the feet, as is the case with a hard tile or concrete floor.

While not fireproof, Armstrong's Cork Tile is fire-retarding. It will not burn or support combustion without the application of heat from some external source.

Durability—Armstrong's Cork Tile will meet the most exacting demands on the score of durability. The toughness and elasticity of the cork and the tenacious binding quality of the natural gum give it a high power of resistance to wear, abrasion and shock. It will not "dust" or crumble. It will stand comparatively heavy loads and sudden temperature change without cracking or breaking; and it will not splinter or warp. With all its other distinctive merits, Armstrong's Cork Tile has the lasting endurance of many floorings much harder and more costly.

Durability has a most important bearing on the question of price. The first cost of Armstrong's Cork Tile, while higher than that of some other materials, is not excessive when considered in relation to the length of service rendered and the many advantages afforded.

Field of Usefulness—Obviously, Armstrong's Cork Tile is not an "all purpose" floor. There is, however, a large class of rooms and buildings where its peculiar features commend it at once to the discriminating architect and owner as the most desirable and satisfactory flooring that can be installed. Wherever it is essential to have quiet, comfort and cleanliness and security against slipping; where workers are on their feet for long periods; where beauty and durability are desirable—in short, wherever the floor is to be a real architectural feature, Armstrong's Cork Tile offers the best solution.

The three warm, soft shades of brown, the distinctive texture and peculiar mottled surface, and the variety of shapes and sizes in which it is supplied, make it an easy matter to design floors of Armstrong's Cork Tile which have a distinctiveness not attained with ordinary floorings.

Colors, Shapes and Sizes—Armstrong's Cork Tile is made in three shades—light, medium and dark brown—and in the following shapes and sizes:

Squares—2, 3, 4, 4½, 6, 9 and 12 in.

Oblongs—2x6 in.; 3x9 in.; 3, 4, and 6x12 in.; 1, 1½, 2, 3, 4, 4½, 6, 9 and 12x18 in.; 3, 4, 4½, 6, 9 and 12x36 in.

Cove and Base—Sanitary cove and corner cove—1¼x1¼ in.—and sanitary base in the standard 6-in. height are furnished in all three colors.

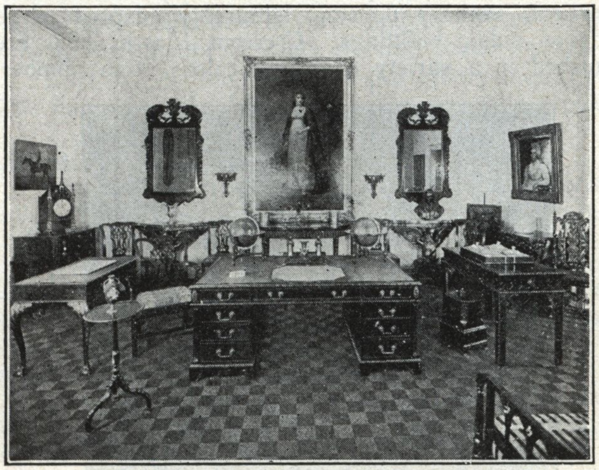
Installation—In order to eliminate the risk of unskilled workmanship, Armstrong's Cork Tile is installed only by the ARMSTRONG CORK & INSULATION COMPANY, or its authorized agents.

Specially trained workmen are maintained in the principal cities of the United States and Canada and all branches and agencies are qualified to furnish estimates of cost and other information.

Short Specification—Architects desiring to use a brief form of specification will find the following entirely adequate:

Armstrong's Cork Tile floors, of color and design to be approved by the architect [or owner] shall be furnished and installed by the ARMSTRONG CORK & INSULATION COMPANY or its authorized agents, in accordance with that Company's standard specification.

Samples and Literature—The book, "Armstrong's Cork Tile Floors," containing full information, specifications, design plates and illustrations in color, will be sent on request, together with sample tiles.



Armstrong's Cork Tile Floor, Antique Shop of Henry Symons & Company, Chicago, Ill.

UNITED CORK FLOORING COMPANY

SELLING OFFICE
50 Church Street, NEW YORK, N. Y.

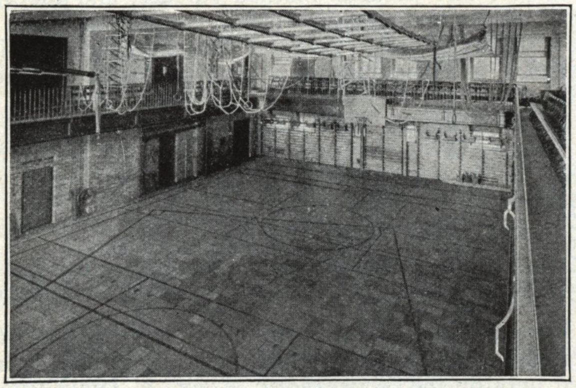
FACTORY AND MAIN OFFICE, LYNDHURST, N. J.

Products

Crescent Cork Tile, Elastic Tile, Cork Brick, Cork Bulletin Board.

Crescent Cork Tile

Made of pure granulated cork shavings, carefully freed from bark and all foreign matter; nothing else is used in their manufacture. The tile are produced by baking the cork in iron moulds, while under heavy compression. After having been planed and sized they provide a firm, non-slippery flooring, which because of its warmth and resilient nature, provides comfort and quietness unequaled by any other floor covering.

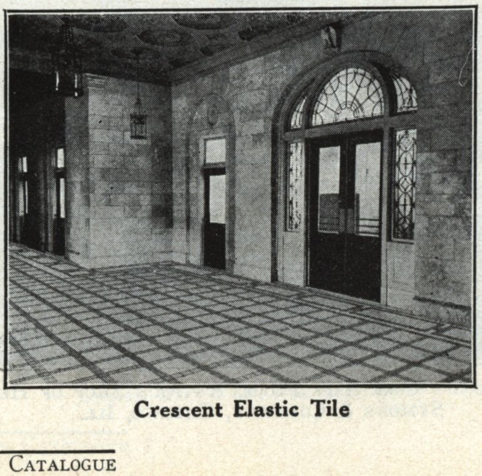


Crescent Cork Tile, Y. W. C. A. Gymnasium

Crescent Cork Tile make an ideal floor for banks, churches, libraries, gymnasiums, and similar rooms. They are made in three shades: light, medium and dark, and are furnished in any size that may be cut without waste from sheets 12x36 in. Crescent Cork Tile are of a standard thickness of ½ in., and weigh approximately 20 oz. per sq. ft. Cove and base of same material are supplied when desired.

Crescent Elastic Tile

Consist of a mixture of pure powdered cork, linseed oil, gum and pigments. The combination of these basic materials produces a dense, smooth, nonabsorbent, sanitary flooring, admirably adapted to all kinds of public buildings. Crescent Elastic Tiles are furnished in a variety of bright colors, 9 in number, and can be cut to any desired dimension, square or oblong, suitable for flooring purposes. This permits of a combination of sizes and color schemes practically without limit.

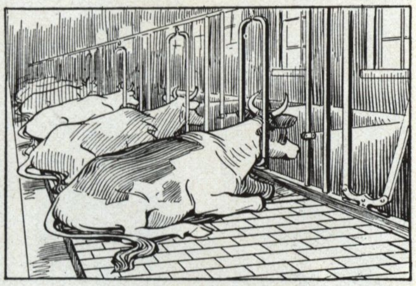


Crescent Elastic Tile

Crescent Elastic Tile, ¼ in. thick, which is the standard gauge, weigh about 18 oz. per sq. ft. Cove and base of same material also furnished when desired.

Crescent Cork Brick

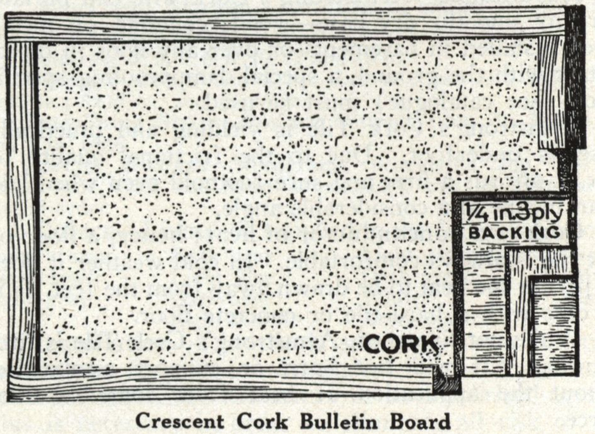
A mixture of finely ground cork and specially prepared asphalt binder. They make a floor which is warm and comfortable, and as they do not rot, chip, or splinter, make a sanitary and healthful floor for barns, stalls and other places where animals are kept. They measure 1¾x4x9 in. Laid flat, four of them will cover a square foot. Their standard weight is approximately 2½ lb. each.



Crescent Cork Brick

Crescent Bulletin Board

Made of a high grade granulated cork mixed with a special binder pressed on a burlap backing. It comes in large flexible sheets ¼ in. thick with a backing of ¼-in. fiberboard (total thickness ½ in.), ready for installation. Due to its being soft and pliable and immune to pinholes, it is superior to other materials used for posting notices in school buildings, factories and commercial establishments. It is extensively used for this purpose.



Crescent Cork Bulletin Board

Facilities and Services

Because of the many varying conditions of underfloors, cements, service requirements, etc., which may affect the proper selection and the best method of laying floors, we recommend that experienced floor builders only be consulted and employed for the installation of tile floors.

We maintain a special department for laying tile floors; if work is entrusted to us, we will fully guarantee satisfactory workmanship and a most economical installation.

E. L. BRUCE COMPANY

Manufacturers of Oak Flooring

EXECUTIVE OFFICES

MEMPHIS, TENN.

MILLS: MEMPHIS, TENN., AND LITTLE ROCK, ARK.

Products

Oak Flooring; Ceda'line, genuine Tennessee Aromatic Red Cedar Lining for clothes closets.

Also Oak, Gum and Beech Mouldings, Finish and Boards.

BRUCE

TRADE-MARK

Bruce Oak Flooring

Bruce Oak Flooring is made of the best of raw material. Sixty per cent of the desirable and available supply of oak lumber is to be found within a radius of two hundred miles of Memphis and Little Rock.

Bruce Oak Flooring is manufactured in modern daylight plants built expressly for the purpose and equipped with machinery and tools of the latest and most efficient type.

The kiln drying of the raw material represents the latest improvements in the proper seasoning and conditioning of the lumber in order to guard against cupping, twisting and other troubles due to improperly seasoned material.

Specially trained operators in well equipped laboratories keep a careful check on the lumber at all stages in its journey through the kilns.

Tests of the finished product as it comes from the machines are made every few minutes by experienced workers with steel templets to insure proper fitting of all flooring.

In fact, every precaution is taken to see that all manufacturing problems are carefully dealt with in order to make Bruce Oak Flooring live up to the good name that it has always enjoyed.

Sizes—Being members of the Oak Flooring Manufacturers Association (page 570), our flooring is made in all the standard sizes and may be used interchangeably with flooring made by any member of the Association.

The standard sizes are:

⅜-in. thickness in 1½ and 2-in. face in plain or quartered red and white oak.

½-in. thickness in 1½ and 2-in. face in plain or quartered red and white oak.

$\frac{13}{16}$-in. thickness in 1½ and 2¼-in. face in plain or quartered red and white oak.

Grades—The grades as set forth by the Oak Flooring Manufacturers Association are strictly adhered to.

Each bundle is marked as to grade to insure correct delivery of material desired. Check graders are regrading bundles continuously to see that the primary graders are using the proper care and judgment in marking grades.

There is a grade of Bruce Oak Flooring to meet any pocketbook.

Method of Packing—Bruce Oak Flooring is carefully packed in bundles securely bound by wires—enough to guard against one or two wires opening and the breaking of bundles. Length of bundles varies according to the grade, but due to our careful manufacturing facilities, a much better than the standard average length is maintained.

Design Flooring—Oak flooring designs in a wide variety of patterns from squares to herringbone. Made in $\frac{13}{16}$-in. thickness in 1½ and 2¼-in. face in plain or quartered red or white oak. Our catalogue on oak flooring design, showing many possible patterns, is awaiting your request.

Square edge flooring made in $\frac{5}{16}$-in. thickness in ⅞ in. and 2-in. face, plain or quartered red or white oak.

Identification—Every piece of Bruce Oak Flooring is branded Bruce Memphis-Little Rock. Every bundle bears a label.

Ceda'line

This genuine Tennessee aromatic red cedar is unexcelled for use in lining clothes closets. Ceda'line is manufactured exclusively by E. L. Bruce Company at Memphis, Tenn. It may be obtained through your local lumber dealer.

Sizes—⅜x1½, ⅜x2, ⅜x2½, ⅜x3¼, ⅜x4¼, $\frac{13}{16}$x2¼ in. (latter size for floors) and quarter round (for corners of walls, ceilings and floors).

Application—Ceda'line is manufactured similar to oak flooring, tongued, grooved and end matched. It is recommended that building paper be used, applying Ceda'line horizontally, blind nailing to studding. A layer of inexpensive ceiling may be used and the Ceda'line applied vertically. The inside of doors may be lined or not as desired. Furring strips should be used in applying over lath and plaster in old homes.

Finish—Use no finish whatsoever. Varnish destroys aromatic qualities.

Grade—Ceda'line is furnished in one grade permitting any amount of knots or other sound defects.

Cost—Ceda'line, material and labor, should cost little more than the lath and plaster it usually replaces.

Literature

"Just Inside Your Threshold," a 24-page booklet, fully illustrated, contains information of interest to architects on such subjects as:

Why Wood Floors—A Brief History of Oak Floors—Red or White Oak Flooring—Plain or Quarter-Sawn, Narrow or Wide, Tongue and Grooved or Square-edged—Bruce Design Patterns—Color Finishes—Appropriate Use of Various Grades and Widths.

This and other technical literature will be gladly sent to you or your client, on request. Our technical service department will be glad to answer inquiries regarding Bruce products and their use, and will appreciate your suggestions.

INDIANA FLOORING COMPANY

INCLUDING BY MERGER, G. W. KOCH & SON, INC.

OFFICE, FACTORY AND WAREHOUSE
234 Rider Avenue
NEW YORK, N. Y.

TELEPHONE
MOTT HAVEN 3193

WASHINGTON, D. C.: Office and Warehouse, 201 B Street, N. W.—Telephone, Main 32
REED CITY, MICH.: Office and Mill—Telephone, Bell 6
COAL GROVE, OHIO: Office and Mill—Telephone, Home 162

"FROM FOREST TO FLOOR"

SLOGAN

Products and Services

FINISHED WOOD FLOORING, including such domestic woods as Oak, Maple, Pine, Beech, Birch, Aromatic Tennessee Cedar and all Cabinet Woods, including such imported woods as Teakwood, Koa Wood, Mahogany, Yalapa, Tigerwood, Mahajua, and Turkish, Italian, and Circassian Walnut.

PARQUETRY and MARQUETRY FLOORING in solid or veneered woods, in wide plank or special architectural designs.

SQUASH COURTS designed and installed.

"From Forest To Floor" accurately describes the scope of our work. We will manufacture special sizes and grades, will sell flooring at wholesale in carload quantities or at retail in less than carload lots, or will contract to furnish and lay floors in any part of the United States.

The merger with our Company of the business of *G. W. Koch & Son, Inc.* (which was established in 1857 and was the oldest parquet flooring concern in the United States), enables us to furnish the special Veneered Teakwood Floors, which for years were a specialty with this old and well-known house.

Facilities

We own and operate at Reed City, Mich., a hardwood flooring plant with a production capacity of 15,000,000 ft. per annum. This is the newest and most modern of all the mills in the Michigan-Wisconsin field. Here we manufacture principally maple, beech and birch flooring under the IFCO Brand.

We also own and operate at Coal Grove, Ohio, a modern oak mill, where we manufacture oak strip and oak parquet flooring in all sizes. This mill is tributary to the territory where grows the soft textured Appalachian oak, the finest in the world for flooring purposes.

The parquetry flooring and cabinet mill at our main address, New York City, is devoted entirely to the manufacture of the higher grade parquetry, marquetry, wide plank and special design flooring in both solid and veneered woods.

We also have a retail warehouse in New York City (in addition to our factory), where an average of 3,000,000 ft. of flooring is carried, the most diversified stock in the country.

Our retail warehouse in Washington, D. C., carries an average stock of 750,000 ft. of flooring.

We maintain a complete departmentalized organization to handle contracts for laying and finishing floors anywhere. Skilled mechanics who have specialized in floor work only, are employed. This department is equipped with the most modern machinery and appliances so that special work of any kind can be handled at all times.

Guarantee

We unequivocally guarantee without any exception whatever, the satisfactory completion of any work with which we are entrusted; and without reservation, guarantee all workmanship and materials against defects and to be exactly as represented.

Maple, Beech and Birch

These are the hardest domestic woods in general use for flooring, any one of which will outwear a granolithic surface. Where wear is the essential requisite for a floor, any of the three will give absolute satisfaction.

Maple, beech or birch, grown in the northern States is considerably harder and more suitable for flooring than the southern stock. Birch, not quite so close in grain as maple and beech, is best suited for residential work where staining is desirable. Maple and beech, harder and more closely grained, are generally favored for factory, mill, store, loft building, office and schoolroom.

The standard sizes of maple are: 13/16-in. thickness; widths, 1½, 2, 2¼ and 3¼-in. face. The standard sizes of birch and beech are 13/16-in. thickness; widths, 2 and 2¼-in. face.

All flooring is tongued and grooved both sides and ends with the exception of the standard 3½-in. square edged maple stock, used where replacements due to abnormal wear are necessary. This stock is end tongued and grooved only and has jointed edges.

The standard grades are:

Maple: Clear (best); No. 1, (intermediate); Factory (lowest).

Beech and birch: Clear and No. 1.

Special Thicknesses—For special purposes, such as covering old floors, the standard sizes are, ⅜-in. thickness; widths, 1½ and 2-in. face.

When floors for heavy traffic are neccssary and the usual rough flooring is omitted, maple flooring is made in 1 1/16, 1 5/16 and 1 11/16 in. thickness. Due to the limited demand for this stock, it is usually furnished in "Factory and Better" grade, which averages about 20% Factory and 40% each No. 1 and Clear.

Oak

This wood has the advantage of a distinct character in grain, and is the most popular of all domestic woods for use as flooring in residences. Its adaptability to any tone in finishing and its long wearing qualities make it especially popular for flooring in private homes and apartment houses.

Standard sizes for commercial stock oak are: 13/16-in. thickness; widths, 1½ and 2¼-in. face.

Standard sizes for use in covering old floors are: ⅜-in. thickness; widths, 1½ and 2-in. face.

All grades are tongued and grooved sides and ends.

The various grades enumerated below cover a wide quality range and no difficulty will be found in determining one suitable for any need.

The commercial grades are:

Quarter sawed: clear red or white, sap clear white, select red or white.

Plain oak: clear red or white, select red or white, No. 1 Common and No. 2 Common.

Pine

Pine flooring may be had in two distinctive forms; edge grained or flat grained.

Edge grained is quarter sawed and presents a handsome grain and a hard wearing surface equal to many of the higher priced woods.

Flat grained pine is less durable and is particularly suited to use in carpeted rooms.

Continued on next page

The standard sizes in both forms are: $\frac{13}{16}$-in. thicknesses by 2½-in. face. Side tongued and grooved.

Teakwood

About 25 years ago, under the direction of Stanford White, architect, we laid a teakwood floor in the Winthrop residence at Westbury, L. I., N. Y. This was the first teakwood floor laid in this country. Since that time, we have installed thousands of feet of this beautiful wood in some of the most prominent homes in this country including:

Andrew Carnegie, New York, N. Y., Babb, Cook & Willard, Architects
J. D. Rockefeller, Jr., New York, N. Y., Wm. W. Bosworth, Architect
J. S. Phipps, New York, N. Y., G. Atterbury, Architect
W. H. Vanderbilt, Oakdale, N. Y., Hunt and Hunt, Architects, New York, N. Y.
H. S. Firestone, Akron, Ohio, Harpster & Bliss, Architects
F. A. Seiberling, Akron, Ohio, Geo. B. Post & Sons, Architects, New York, N. Y.
F. D. Stout, Chicago, Ill., Arthur Heun, Architect
Ex. Gov. James M. Cox, Dayton, Ohio, Oswald C. Herring, Architect, New York, N. Y.
Beckinridge Long, St. Louis, Mo., Roth & Study, Architects
Irenee du Pont, Wilmington, Del., MacClure & Spahr, Pittsburgh, Pa., Architects
Federal Reserve Bank, Minneapolis, Minn., Cass Gilbert, Architect, New York, N. Y.

Teakwood is especially well suited for residential work on account of its beauty of color and grain, which can not be matched in any other wood by staining, also because of its inherent oily quality which makes it practically impervious to dampness or atmospheric conditions. Due to its exceptional qualities, we have specialized in its manufacture and can furnish it in any design.

Wide Planking

The use of wide boards or planks for flooring is a reversion to the old type so popular in early English and early French architecture.

These boards are made of veneers on frame backing to prevent twisting and curling after being laid. Planks are often laid with open joints to better give an appearance of age. This floor is held with screws countersunk through the face, and wooden plugs are inserted over the screw head, to give the appearance of pegs.

The standard thickness of the flooring is ⅞ in., and is now made by us by the same method which has always given satisfaction, and was employed by *G. W. Koch & Son, Inc.,* for almost 70 years.

This style of floor is adaptable to any domestic or foreign wood and lends itself very advantageously to any scheme of color or design. It is the very highest type of floor construction. While naturally dependent upon the size of logs from which the particular kind of wood is selected, it is generally laid in assorted width planks running from 4 to 12 or 14 in. wide.

Parquet and Design Flooring

There is practically no limit for the development of a pattern to harmonize with some individual requirement or distinctive architectural scheme. Any pattern to suit a particular design can be made to fit required space. Conventional designs most popular, include herringbone, basket weave, parquet squares and French herringbone. These or special designs can be made in any wood or combination of woods, either domestic or foreign to correspond to the form or nature of interior decoration employed. All special design work is handled in our own cabinet shop and intricate designs are certain to be faithfully reproduced.

Special Imported Cabinet Woods

These differ so much in their physical properties that we mention only for references, a few of the prominent installations that we have made.

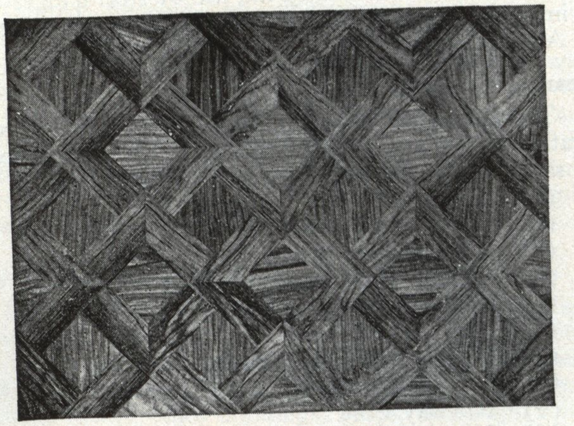
Koa Wood—R. W. Bliss, Washington, D. C., F. H. Brooke, Architect
Yalapa—Malcolm Mackay, Tenafly, N. J.
Mahajua—H. McKay Landon, Indianapolis, Ind.
Italian Walnut—Paris Exposition, Paris, France
Mahogany—Gold medal design, Paris Exposition, Paris, France, W. G. Scheer, Douglaston, N. Y.
Tigerwood—A. R. Peacock, Pittsburgh, Pa., Alden & Harlow, Architects.
Turkish Walnut—John L. Severance, Cleveland, Ohio, F. Schweinforth, Architect
French Walnut—F. W. Woolworth, Glen Cove, L. I., N. Y., C. H. P. Gilbert, Architect, New York, N. Y.

Squash Courts

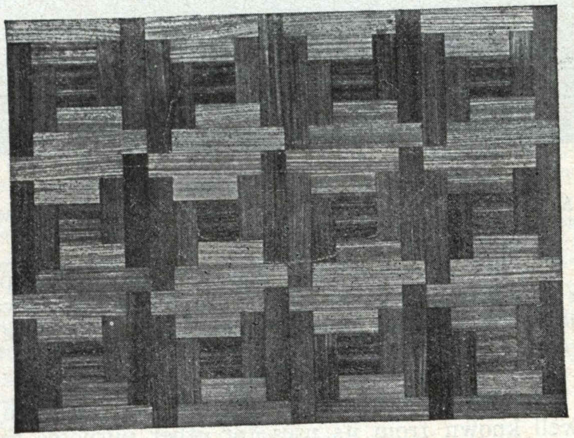
A feature of our regular business is the installation of Squash Courts. Where such a court is contemplated in any plans it is essential that exactly the proper allowance is made for size. The speed at which the game is played makes absolute accuracy of dimensions very necessary. Further particulars will be supplied on request.

Catalogue

We have published a very comprehensive catalogue, dealing with wood floors, squash courts and other features of our work. This catalogue illustrates by colored plates various types of installations and will be furnished on request.



Floor of Circassian Walnut
The design for which we were awarded first prize and gold medal at Paris Exposition



An Unusual Design Executed in Mahajua Wood

MAPLE FLOORING MANUFACTURERS ASSN.

Maple, Beech and Birch Floorings

1062 Stock Exchange Building
CHICAGO, ILL.

Products

Maple, Beech, and Birch Floorings, standardized, trade-marked and guaranteed as to grade and manufacture.

Slogan

Floor *with* Maple
Beech *or* Birch

General Characteristics

Although Maple, Beech and Birch represent a versatile range so far as color possibilities and uses are concerned, the three woods are closely related in general characteristics.

All three are close grained, hard fibered, free from slivering and splintering, and polish under friction in a way which increases their wearing qualities.

All three have natural beauty when given a wax or varnish finish, and are suitable for use in any room of a fine dwelling, as well as for hard industrial service.

All three have a subdued grain pattern, in keeping with the changing taste, which is away from gaudiness in woods.

All three are particularly clean and sanitary, since the closeness of their grain and the smoothness of their surface afford no lodging place for dirt or germs.

Individual Characteristics

Maple—This flooring is dense, strong, heavy, and very hard, and is supremely durable. The color of the heartwood is brownish and the sapwood is much lighter.

The grain is close—sometimes curly or birdseye.

Maple has unusual ability to resist pointed pressure without abrasion. It takes a high polish but is too tight grained for extensive staining.

Softwood
Maple

A Contrast in Cleanliness and Comfort

A comparative illustration, showing how a softwood has worn alongside Maple, where both have been subject to the same traffic conditions for 18 years

Beech—This wood shows slightly more grain pattern than Maple and has slightly more color when varnished or waxed. In physical properties it is so close to Maple that it is frequently used in Maple's stead.

Beech takes a beautiful stain.

Birch—The ability of Birch to take color stain is so well known from its uses for other purposes than floors as to need little comment.

The fact that is ordinarily not known about both Beech and Birch is that the natural wood takes a colorful finish and makes a beautiful and serviceable floor.

Beauty

Due to their leadership in wearing qualities, these woods have sometimes been stressed for service uses, to the exclusion of any consideration of their beauty. And yet no one who has seen the mirror-like luster of a dance floor can deny that such a floor has beauty.

Color Possibilities

Maple shows an attractive golden hue when waxed or varnished—it is literally a "floor of captive sunlight" which mellows and ripens with passing years. The color of Maple flooring, when used for its beauty, is demonstrated by its appearance in ballrooms, where the cushioning comfort of wood is almost universally preferred.

While Maple does not lend itself to staining, Beech and Birch supply qualities of endurance closest to those of Maple, and at the same time will take a variety of stains which open alluring possibilities to the home builder who wishes to attain rich and distinctive harmonies in flooring.

Staining Beech and Birch

It is important, in choosing a flooring wood for staining, to avoid any wood which has such a fibrous structure that prevents the even penetration of the stain. The grain pattern of both Beech and Birch is a delicate tracery, without fibrous ridges. Stains penetrate Beech and Birch evenly, so that a floor laid with either of these woods will present an attractive appearance—and will have a wearing quality which makes the attractiveness last for years.

The great preference for dark floors in residential buildings has therefore brought a rapidly growing preference for Beech and Birch. Their hardness on the one hand and their susceptibility to staining on the other hand sets them in a distinct class by themselves for these particular purposes.

Standardization

MFMA flooring is made to accurate specifications. This accuracy is attained by the use of steel gauges and by impartial inspection by a traveling representative of the Association.

Wearing Qualities

Tests show, in the order named, the following comparative values for wearing qualities, under practically the same conditions, of woods used for flooring:

(1) Maple
(2) Beech and Birch
(3) Oak, quarter sawed
(4) Yellow Pine, quarter sawed
(5) Fir, quarter sawed.
(6) Oak, plain sawed
(7) Yellow Pine, plain sawed
(8) Fir, plain sawed
(9) Norway Pine
(10) White Pine

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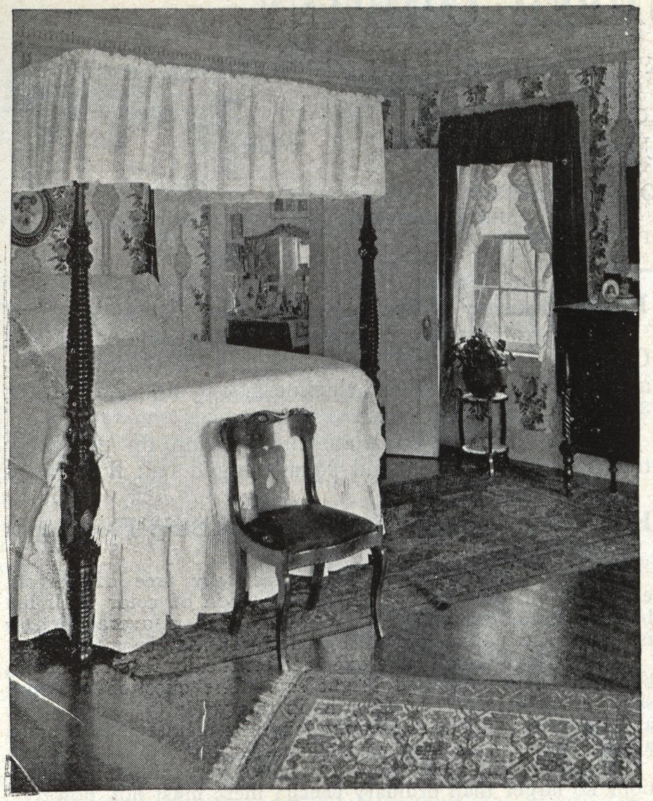


A Stained Floor Which Keeps Its Finish and Harmonizes with the Color Scheme

This is made possible by the exceptional fitness of Beech and Birch for stained floorings in any residential building

MFMA Grading Rules

Maple, Beech, and Birch are sold in standard grades, described in accurate detail in a book of Grading Rules which may be had on application to the headquarters of the Association.

The standard lengths, in 25/32 in. and thicker, are as follows:

Clear Grade: 2 to 16 ft. may contain up to 20% of 2 to 3½ ft., inclusive.

No. 1 Grade: 1½ to 16 ft. may contain up to 40% of 1½ to 3½ ft., inclusive.

Factory Grade: 1 to 16 ft. may contain up to 60% of 1 to 3½ ft., inclusive.

Standard Measurement

Flooring, ⅝ in. and thicker, all faces, is measured ¾-in. waste for matching.

Flooring, ½ in. and thinner, all faces, is measured ½-in. waste for matching.

Jointed flooring, all thicknesses and faces, is measured ½-in. waste.

All flooring shall be end-matched unless otherwise specified.

It is the custom in bundling flooring to "give and take" by including pieces of flooring 3 in. over and 3 in. under the length marked on the bundle, and to include some pieces of flooring 3 in. under the minimum lengths specified in the Grading Rules.

Uses of the Different Grades

Clear—This grade is the first quality. It makes the most durable and desirable floor for any building, and is particularly suited for fine homes, apartment buildings, churches, clubs, dance floors, gymnasiums, hospitals, hotels, office buildings, public buildings, roller skating rinks, schools, stores and other buildings where fine appearance as well as wear is desired.

No. 1—Is the second quality—just as serviceable as Clear, and can be used in the same type of buildings as Clear, when slight imperfections in appearance are admissible. The No. 1 grade is also used for finer industrial floors.

Factory—Is the third grade. It will give excellent satisfaction in factories, creameries, granaries, mills, warehouses, workshops, or at mines, on farms, etc. Where a low priced floor is wanted for wear, nothing better than this grade can be obtained at a relative cost.

THICKNESSES AND FACES, MAPLE, BEECH AND BIRCH FLOORINGS; CLEAR, NO. 1, AND FACTORY GRADES

Thicknesses	Faces or Widths
STANDARD THICKNESS	
25/32 in.	1½, 2, 2¼ and 3¼ in.
SPECIAL THICKNESSES	
33/32, 41/32 and 53/32 in.	2, 2¼ and 3¼ in.
⅜, ½ and ⅝ in.	1½, 2 and 2¼ in.

Uses of Different Thicknesses

The 25/32-in. thickness of Maple, Beech, and Birch flooring is most commonly used. It can be laid directly on the joists, or on strips embedded in cement when the latter is used for fireproofing, but is more frequently laid on a subfloor.

For ordinary purposes a diagonal subfloor made of softwood boards surfaced one or two sides is sufficient. This may be used for the work floor during the progress of building and the hardwood floor should not be laid until the building is dry.

For factories and warehouses where greater strength and slow burning construction are required, the subfloor should be made of matched softwood 1¾ in. thick.

The 33/32-in. thick hardwood flooring is sometimes preferred when the floor is to be subjected to extraordinary strain, but the 25/32 in. is suitable for general purposes.

The ⅜-in. thickness is the most popular thickness under 25/32 in. It is superior to parquetry, because the sides and ends of the flooring are matched so that it can be laid with the nails entirely concealed, and they can not work out. It is suitable for residences, apartment buildings, offices, churches, etc., where both its appearance and utility are important. Factory 25/32-in. Maple, Beech or Birch makes an ideal subfloor for the ⅜-in. thickness.

Guarantee

MFMA Flooring is guaranteed by the Association to be properly graded and properly manufactured.

Provision is made for inspection by an official inspector of the Association should doubt arise regarding flooring manufactured under the MFMA trade-mark and proper adjustment will be made in the event that the flooring does not conform to MFMA standards.

Literature for Free Distribution

The following booklets are offered through the offices of the Association, and will gladly be mailed on request, free of charge:

"Color Harmony in Floors"
"How to Lay and Finish Maple, Beech and Birch Floors"
"Floors for Educational Buildings"
"Grading Rules for MFMA Flooring."

W. M. RITTER LUMBER COMPANY

Manufacturers of Appalachian Oak Flooring and Hardwood Lumber

115 East Rich Street,
COLUMBUS, OHIO

BRANCH OFFICES
NEW YORK, N. Y., 50 Church Street
PHILADELPHIA, PA., City Center Building
LONDON and LIVERPOOL, ENGLAND

Products

Ritter Appalachian Oak Flooring.

Also Maple, Beech and Birch Flooring; Hardwood Lumber, including the finest grades of White and Red Oak and Yellow Poplar.

Why Ritter Appalachian Oak Flooring Should Be Specified

(1) Ritter Flooring is Scientifically Seasoned—The stock is permitted to air-dry for several months and then is accurately kiln-dried to an average of 5½% moisture content. Afterwards it is permitted to cool in a dry place for a minimum of 72 hours before it is manufactured into flooring, thus preventing the warping and twisting of the finished stock and eliminating many of the difficulties of laying floors.

(2) Ritter Flooring is Accurately Manufactured—It must pass a rigid system of inspection. The pieces are tested with a steel templet when leaving the side-matching machines and tested for squareness when delivered from the end-matching machines. Two more inspections must be passed before the flooring is bundled and sent to the warehouse.

(3) Ritter Flooring is Stored in Heated Warehouses—To protect Ritter Flooring from absorbing moisture, it is held till shipment in steam heated, well ventilated warehouses, where a uniform temperature is maintained from month to month.

(4) Ritter Flooring Is Economical to Lay—Owing to the excellent quality of the oak and the extreme care exercised in its seasoning and manufacture, the initial cost of Ritter Flooring is somewhat higher than ordinary flooring, but in the long run, it is more economical. It matches so accurately that it can be laid with a minimum of labor and material. Because of its mild texture, it can be properly nailed, scraped, and finished more easily than the harder oak flooring produced from the timber of the lowlands. Flooring contractors have estimated the saving on Ritter Flooring in scraping alone to be $10 per 1000 square feet.

How to Arrive at the Amount of Tongued and Grooved Oak Flooring Required

To cover a certain space, figure the number of square feet. which means the width of the room in feet multiplied by its length in feet; for instance: a room 12 feet wide by 15 feet long would contain twelve times fifteen or 180 square feet. In addition to 3% for mechanic's waste in laying the floor, add to the square feet of surface to be covered, the following percentages:

50%	for 13/16x1½ in.
33⅓%	for 13/16x2¼ in.
33⅓%	for ⅜x1½ in.
25%	for ⅜x2 in.

The above figures are based on laying flooring straight across the room. Proper allowances should be made for bay windows, hearths, and other projections.

STANDARD WEIGHTS AND COUNTS OF RITTER TONGUED AND GROOVED OAK FLOORING

13/16″x2¼″ face,	2000 lbs. per 1000 feet.	Counted 1″x3″
13/16″x1½″ face,	2000 lbs. per 1000 feet.	Counted 1″x2¼″
⅜″x2″ face,	1000 lbs. per 1000 feet.	Counted 1″x2½″
⅜″x1½″ face,	1000 lbs. per 1000 feet.	Counted 1″x2″

Ritter Flooring is Made in Standard Sizes

The standard measurements of Ritter Tongued and Grooved Strip Oak Flooring are: 13/16-in. thickness, 1½ and 2¼-in. face; ½-in. thickness, 1½ and 2-in. face; ⅜-in. thickness, 2-in. face.

Write us for complete information on parquetry tongued and grooved and square-edged oak flooring.

How Ritter Tongued and Grooved Strip Flooring Is Graded

Clear—Shall have the face practically free of defects, except ⅜ in. of bright sap. The question of color shall not be considered. Lengths, 2 ft. and up. If a 5-ft. average length is maintained, as much as 20% under 4 ft. may be included.

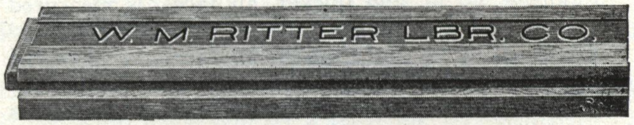
Sap Clear—Shall have one face practically free of defects, but will admit unlimited bright sap. The question of color shall not be considered. Lengths in this grade to be 1 ft. 6 in. and longer. If a 4½-ft. average length is maintained, as much as 25% under 4 ft. may be included.

Select—Will admit pinworm holes, very slight imperfections no larger than ordinary pencil; there must not, however, be more than one of any of the above defects for each 3 ft. of length. Bright sap admitted without limit. Lengths, 1 ft. 6 in. and longer. If a 4½-ft. average length is maintained, as much as 35% under 4 ft. may be included.

Star—May contain bright sap without limit, pinworm holes somewhat in excess of the number admitted in the Select grade, and may include flagworm holes, not to exceed two for each 3 ft. or fraction thereof of length, the wood surrounding which is but slightly discolored. Lengths, 1 ft. 6 in. and longer. If a 4½-ft. average length is maintained, as much as 35% under 4 ft. may be included.

No. 1 Common—May contain pinworm holes, spotworm holes if surrounded by sound wood, and any other smooth, sound tight defects which will enable one to lay a sound, serviceable floor without cutting. Lengths, 1 ft. 6 in. and longer. If a 3½-ft. average length is maintained, as much as 45% under 4 ft. may be included.

No. 2 Common—This grade is composed of pieces containing defects too large or too rough to go into the Common grade. This grade will lay a serviceable floor with slight cutting. Lengths, 1 ft. and longer. If a 3-ft. average length is maintained, as much as 60% under 4 ft. may be included.



Branded for Your Protection

General Specification Data

Subfloors—Non-fireproof Construction

Joists—

(1) All joists shall be level and thoroughly braced by bridging before the subfloor is laid.

Material—

(2) The material used for the subfloors shall be of thoroughly dry, sound, square-edged, 1-in. boards of any width, preferably from 4 to 6 in., surfaced two sides to a uniform thickness.

Laying Subfloor—

(3) The boards in the subfloor shall be laid diagonally to the joists when the pattern in the finished floor is to be at right angles to the joists. (See Fig. 2.)

(4) The boards in the subfloor shall be laid at right angles to the joists when the pattern in the finished floor is to be diagonal to the joists. (See Fig. 1.)

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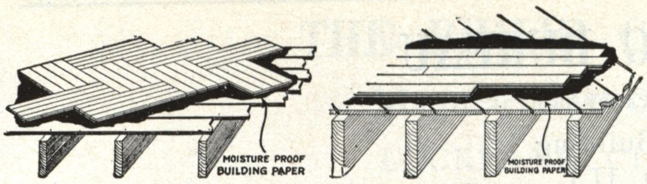


Fig. 1 Fig. 2

Illustrating Method of Laying Flooring Over Subfloors, Non-fireproof Construction

(5) A space of ⅛ to ¼ in. shall be left between each board in the subfloor. Each board shall be so cut that both of its ends will rest firmly upon the joist. Each board shall be nailed at every bearing with at least two 8d or 10d flat headed nails.

Subfloors—Fireproof Construction

Sleepers—

(6) Creosoted cypress wood sleepers free of sap (2x3 in.) shall be embedded in the concrete from 12 to 16 in. apart. (See Fig. 3.) These sleepers shall be so placed as to form a level, firm support upon which to nail the subfloor. The concrete shall be brought up to, and struck off even with, the top of the sleepers in order to form a level, even surface over which to lay the subfloor. When the concrete has thoroughly dried, it shall be given a heavy coat of tar paint. Fig. 4 illustrates another method of securing subfloors to concrete base.

Material for Subfloor—

(7) Same as for subfloor in non-fireproof construction.

Laying Subfloor—

(8) Same as in case of non-fireproof construction. No subfloor shall be laid until the concrete has had sufficient time to dry thoroughly.

Laying Strip Flooring

(1) No flooring shall be hauled to the building until the plastering has been completed and is dry, the windows and outside doors put in place, and the building has been heated a sufficient length of time to become thoroughly dry. Every care should be taken at all times to protect the flooring stock from absorbing moisture.

(2) Before any flooring is laid, the subfloors shall be level and well swept to remove all shavings, dirt, and all other refuse.

(3) The subfloors, except in fireproof construction, shall be well covered with a good quality of moisture proof paper. This paper shall be so laid that all joints will be overlapped and no part of the subfloor will be exposed.

(4) Before flooring is laid, all fireplaces shall be framed in with at least one strip of flooring, mitered at the corners.

(5) All Oak Flooring used shall be manufactured from Appalachian Upland timber, thoroughly kiln-dried and tested for uniformity of manufacture. This flooring shall be manufactured by W. M. Ritter Lumber Company, and shall be branded "W. M. Ritter Lbr. Co."

(6) The flooring shall be furnished in (kind and grades of material, face width and thickness) for (state which rooms or space) and in (state kind, grades, etc. for all remaining rooms and spaces).

Nailing—

(7) All tongued and grooved flooring shall be blind nailed. For 13/16-in. flooring, 8d cut casing nails shall be used and spaced not more than 16 in. apart. For ⅜-in. flooring, 4d finishing nails, spaced not more than 8 in. apart shall be used. For 5/16-in. square-edge flooring, two 1-in. No. 15 cement coated nails with diamond point, spaced not more than 8 in. apart shall be used.

(8) A space of not less than ¼ in. shall be left on all sides of the room between the flooring and the wall, to allow for expansion in the event of any dampness being absorbed by the floor causing it to expand—this space to be covered by the base-shoe.

Laying Oak Floors Over Old Floors

(9) All old floors shall first be gone over carefully and any loose boards securely nailed down, and squeaks eliminated.

(10) All rough or raised places in the old floor shall be surfaced off to insure an even surface. The old floor shall be level before the new flooring is laid over it.

(11) The Oak Flooring to be laid over old floors shall be ⅜-in. tongued and grooved stock of (state width) inches in width and of (state grade). This flooring shall be manufactured of Appalachian Upland timber by W. M. Ritter Lumber Company, and branded "W. M. Ritter Lbr. Co."

Surfacing Strip Flooring Preparatory to Finishing

(12) After the Oak Floors have been laid they shall be thoroughly swept to remove all refuse before surfacing.

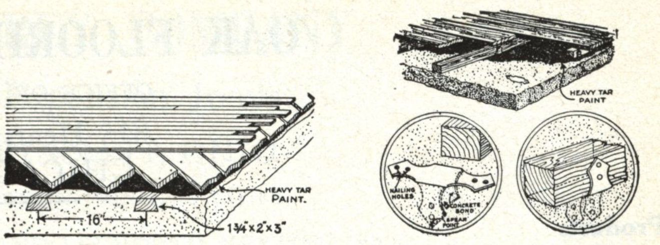


Fig. 3 Fig. 4

Illustrating Methods of Securing Subfloor to a Concrete Base

Sanding—

(13) All 13/16-in. strip flooring shall be first traversed at 45° with a power-sanding machine. Coarse sandpaper No. 2½ to No. 3 shall be used for the first sanding. When the surface of the floor has been thoroughly sanded and made level, it shall then be power-sanded in the direction in which the strips run, with No. 2½ to No. 3 sandpaper to remove all marks and scratches of the previous sanding. When all rough places have been eliminated, the floor shall be power-sanded with No. ½ to No. 1 sandpaper until it is perfectly smooth.

(14) All ⅜-in. strip flooring shall first be power-sanded with No. 2½ to No. 3 sandpaper in the direction in which the strips run until a smooth surface has been obtained. The floor shall then be sanded to a finishing surface with No. ½ to No. 1 sandpaper.

(15) All places on the floor which can not be reached with the power-sanding machine shall be hand-sanded until perfectly smooth and ready for the finishing materials.

Laying Parquetry Flooring

(16) All Parquetry Oak Floors shall be manufactured from Appalachian Upland timber by W. M. Ritter Lumber Company, and shall be branded "W. M. Ritter Lbr. Co."

(17) Parquetry Flooring shall be furnished in (kind and grade of material, face, width and thickness) for (state which room or space) and in (state kind, grade, etc., for all remaining rooms and spaces).

(18) No Parquetry Flooring shall be delivered to the building until the plastering has been completed and is dry, the windows and outside doors put in place and the building has been heated a sufficient length of time to become thoroughly dry.

(19) Before the flooring is laid the subfloors shall be thoroughly swept to remove shavings, dirt and other refuse.

(20) The subfloors, except in fireproof construction, shall be covered with a good quality of moistureproof paper before the flooring is laid.

(21) Each room floored with Parquetry Flooring shall have a border of (state width) inches in width on all sides. One-quarter inch space shall be left between the border and the wall on all sides of each room to allow for possible expansion in the floor, this space to be covered by the base-shoe.

Nailing Parquetry Flooring—

(22) Each piece of 13/16-in. Parquetry Flooring shall be nailed with 8d cut casing nails, one nail near each end at a distance of one-fourth the length of the piece from the end of the piece. These nails shall be driven at an angle of from 45° to 55°. A slip tongue shall be used on all blocks where the grooves come together. Nails shall be driven through the slip tongue to hold it in place.

(23) The border strips shall be blind nailed. Border strips next to the wall where it is impossible to do blind nailing shall be face nailed with 8d wire finishing nails set not more than 16 in. apart. These nails shall be countersunk and puttied over.

Surfacing Parquetry Flooring Preparatory to Finishing

(24) All Parquetry Floors shall be thoroughly swept before being surfaced.

(25) All parquetry floors shall be hand scraped at an angle of 45° until the surface is perfectly level.

(26) When a level surface has been obtained, each block shall be scraped *with the grain of the wood* until it is smooth. The scraper shall be kept sharpened to a cabinet edge to insure smooth, satisfactory results.

Note: Where the surface is large, and it is desirable to use a power-sanding machine, use No. 00 sandpaper on the last sanding.

Finishing Oak Flooring

(27) Write us for complete information on finishing Oak Floors.

OAK FLOORING BUREAU

OFFICE OF SECRETARY
815 Hearst Building
CHICAGO, ILL.

Products

Oak Flooring, Plain Sawed and Quarter Sawed, White or Red; scientifically and thoroughly Kiln Dried, properly Milled and Graded; Standardized.

Slogan

Nature's Gift of Everlasting Beauty.

Advantages

The natural characteristics of oak are too well known to require any eulogy.

When made into flooring the diversified figure of oak is exhibited to perfection. It is a wood that will harmonize with any kind of interior trim, and will do more to give distinction to a home than any other part of the interior construction.

Oak flooring is demanded, because it is rich and cheerful in color and blends harmoniously with any type of furniture and color decoration. It combines beauty, distinctiveness and durability.

Oak is a sanitary wood, and requires but little care to keep it in good condition. Real estate dealers and owners know the value of oak flooring, and emphasize oak flooring when advertising their property. It assures better renting and selling values and attracts a better class of tenants.

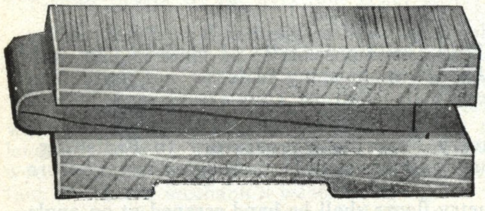
For economy, ⅜-in. thickness may be laid at a very low cost over old floors in old homes. It is matched and end matched so that it can be blind nailed. When laid, it has in every respect the appearance of heavy flooring.

Durability

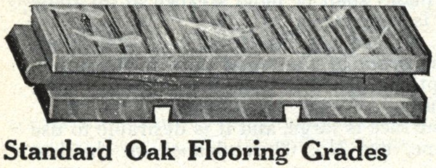
In numerous public buildings and houses throughout the country in which oak flooring was laid from 25 to 50 years ago, these floors are in good condition today. The word "Oak" has long been a synonym for *strength, beauty* and *endurance.*

Standard Measurement

13/16-in. thickness all faces, count ¾ in. allowance for matching.
⅜-in. thickness all faces, count ½ in. allowance for matching.
½-in. thickness all faces, count ½ in. allowance for matching.
5/16-in. thickness square edge all faces, count face count.



13/16x2¼-in. Face Oak Flooring
Actual size



⅜x2-in. Face Oak Flooring
Actual size

Standard Oak Flooring Grades

The grades of oak flooring are known as:

Clear, Sap Clear, Select, No. 1 Common, and No. 2 Common.

Quarter Sawed

Clear—Shall have one face practically free from defects, except ⅜ in. of bright sap; the question of color shall not be considered. Bundles to be 2 ft. and up, not to exceed 20% under 4 ft.; average length, 5 ft.

Sap Clear—Shall have one face practically free of defects, but will admit unlimited bright sap; the question of color shall not be considered. Bundles to be 2 ft. and up, not to exceed 20% under 4 ft.; average length, 5 ft.

Select—May contain sap, and will admit pinworm holes, streaks, slight imperfections in working or a small, tight knot, not to exceed one to every 3 ft. in length. Bundles to be 1 ft. and up, not to exceed 35% under 4 ft.; average length, 4 ft.

Plain Sawed

Clear—Shall have one face practically free of defects, except ⅜ in. of bright sap; the question of color shall not be considered. Bundles to be 2 ft. and up, not to exceed 20% under 4 ft.; average length, 5 ft.

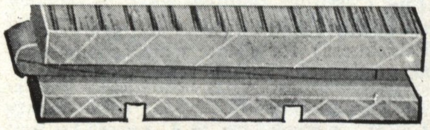
Select—May contain sap, and will admit pinworm holes, streaks, slight imperfections in working or a small, tight knot, not to exceed one to every 3 ft. in length. Bundles to be 1 ft. and up, not to exceed 35% under 4 ft.; average length, 4 ft.

No. 1 Common—Shall be of such nature as will make and lay a sound floor without cutting. Bundles to be 1 ft. and up, not to exceed 45% under 4 ft.; average length, 3 ft.

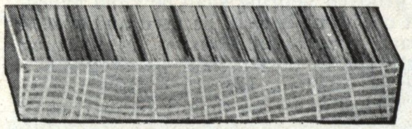
No. 2 Common—May contain every character of defect, but will lay a serviceable floor with some cutting. Bundles to be 1 ft. and up; average length, 2½ ft.

Note: Oak flooring is bundled by averaging the lengths. A bundle may include pieces from 6 in. under to 6 in. over the nominal length of the bundle. No piece shorter than 9 in. admitted.

The percentages under 4 ft. referred to above apply on total footage in any one shipment of the item.



½x2-in. Face Oak Flooring
Actual size



5/16x2-in. Face Square-edge Oak Flooring
Actual size

Use of the Different Grades

Clear, Quarter Sawed—*Red or White*—High class residences, hotels, apartment and club houses.

Sap Clear or Select—*Quartered, Red or White*—An economical substitute for clear quartered where a dark finish is desired. Equally as durable as first grade.

Clear, Plain Sawed—*Red or White*—High class residences, hotels, churches, apartment and club houses.

Select, Plain Sawed—*Red or White*—Medium priced residences, hotels and apartments, schools, office buildings and stores.

No. 1 Common—Cheap dwellings, tenements, stores, high class factories and manufacturers' buildings.

No. 2 Common—Warehouses, factories and cheap tenements.

Correspondence

Correspondence solicited. Write for books.

THE PHILIP CAREY COMPANY

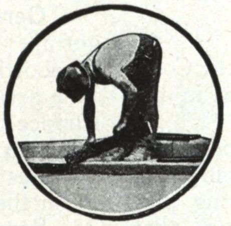
Manufacturers of Expansion Joints

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

Carey Elastite EXPANSION JOINT


TRADE-MARK

Product

Carey Elastite Expansion Joint.

For Waterproofing and Dampproofing, see pages 96-97; for Built-up Roofing, see pages 1042-1045; for Asphalt Shingles, see page 1101; for Pipe Coverings, see pages 2280-2281.

Elastite Expansion Joint

Elastite expansion joint consists of a body of compressible asphaltic compound sandwiched between two walls of asphalt saturated felt, the whole being inseparably bonded together to a uniform thickness by mechanical pressure. It has for many years been specified and used by progressive engineers and contractors in pavements, roofs, floors, bridges, reservoirs, swimming pools, walls, dams, and other structures where provision for expansion is advisable.

It is furnished in thicknesses, widths and lengths as desired. It can also be supplied cut to special shapes or formed to meet unusual conditions of installation, arriving on the job ready to use.

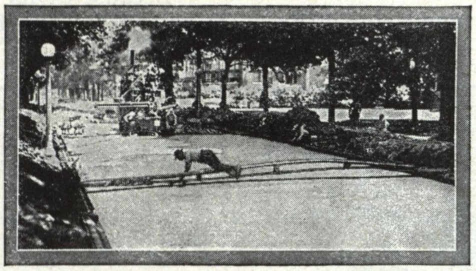
It is cheap; easy to handle and install; does not stick together in summer or become brittle in winter; it is used without loss or waste; and once installed becomes an integral part of the work, functioning efficiently as long as the structure itself endures.

In Roads and Streets

Elastite expansion joint should be installed in pavements of concrete, brick, granite block or wood block and in concrete base course under sheet asphalt, bitulithic and other types having a bituminous wearing coat.

In roads it should be used longitudinally on the center-line ¼ in. thick; transversely ¼ to ½ in. thick at intervals of 25 to 50 ft., depending on conditions.

In city streets it should be located as required for roads, with the addition of a ½ to ¾-in. strip separating the pavement from each curb. Joints should, in all cases, extend entirely through the pavement structure.


Elastite Expansion Joint in Concrete, Brick, Wood Block or Granite Block Pavements

In Roofs

Concrete roof slabs should be provided with Elastite expansion joint at frequent intervals in both directions, allowing for at least ⅜ in. expansion to each 25 ft. Installed between slab and parapet walls it acts as a safety measure to prevent displacement of parapets and subsequent danger to lives and property.

In Concrete Floors

Elastite expansion joint, placed vertically and extending entirely through the slab, should be used to lay off extensive floor areas, such as public garages, warehouses and industrial buildings, into panels of convenient size, based on ¼-in. expansion allowance to each 20 ft. It should be used in a similar manner to separate all walls, column bases and other obstructions from the floor slab.

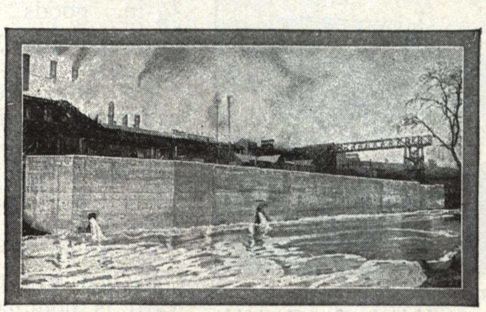
In Sidewalks and Driveways

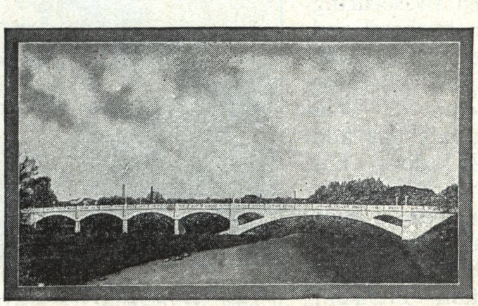
Elastite expansion joint should be built into all concrete sidewalks and driveways at intervals of about 30 ft. placed perpendicular to the surface and at right angles to the length of the pavement. Similar installations should always be made at points where the sidewalk or the driveway joins the curb.

Other Uses

For Elastite expansion joint, non-deteriorating through action of the elements, or by water, possessed of valuable acid resisting qualities, and resilient at all atmospheric temperatures, new applications and fields of usefulness are constantly being discovered.

Send for sample and literature.


Elastite Expansion Joint in Retaining Walls, Reservoirs and Swimming Pools


Elastite Expansion Joint in Bridges, Viaducts and Other Concrete Structures

AMERICAN LINOLEUM MANUFACTURING COMPANY

Genuine Cork Linoleum and Cork Carpet

SOLE SELLING AGENTS
JOSEPH WILD & CO.
EXECUTIVE OFFICE AND MAIN SHOWROOM
230 Fifth Avenue
NEW YORK, N. Y.

BRANCHES
BOSTON, MASS., 91-93 Summer Street
CHICAGO, ILL., 63 East Adams Street
SAN FRANCISCO, CAL., 660 Mission Street

Products

Wild's Original Battleship Linoleum; Wild's Cork Carpet; Wild's "Keystone" Linoleum Cement.

Also Wild's "Straight Line" Inlaid Linoleum.

Genuine Linoleum (Walton Process)

The American Linoleum Manufacturing Company is the original manufacturer of linoleum in the United States.

In the manufacture of linoleum this company has always used only true linoleum ingredients—pure linseed oil, ground cork, kauri gum, rosin, coloring pigments, etc. Many experiments have proved that substitute materials do not produce equally satisfactory linoleum, chiefly in the matter of durability.

Battleship Linoleum (U. S. Navy Standard)

Originally made for the United States Naval Department shortly after the Spanish-American war and used as a general flooring for battleships to eliminate the casualties resulting from splintering wood floors during an engagement. Now used on all battleships, but far more extensively for public buildings, hospitals, colleges, offices, city halls, courthouses, schools, etc.

Made in four standard thicknesses: Heavy (¼ in.), Six Millimeters, Medium ($\frac{3}{16}$ in.) and Light Weight (about ⅛ in.)—and in brown, dark green, gray and terra cotta colors, also in special colors. Only one grade, the best; no second grade made in the same thicknesses.

Cork Carpet

A linoleum made of coarsely ground cork. Best quality, full ¼ in. thick, 5 colors. Very resilient and noiseless. Desirable for libraries, lecture halls, theaters, churches, etc.

Keystone Linoleum Cement

An inexpensive, quick-drying, gum and pigment paste adhesive used in securing linoleum to wood and concrete floors. No weights, no rollers or drags required. Will not generate gas and positively does not contain any ingredients injurious to linoleum, thus eliminating various troubles caused by certain linoleum cements. Being a paste it fills up small irregularities in the floor surface and provides a smooth, even bed for the linoleum. One gallon will spread about 12 square yards.

Advantages of Linoleum

Germicidal—Genuine linoleum is death on germs. Experiments by Dr. Ludwig Bitter and by Dr. Jacobowitz proved that the very resistant staphylococci (the germs of infection) perished within 24 hours on the surface of linoleum, the same results being secured with linoleum that had been in use for 4 years. "Linoleum operates to kill the majority of micro-organisms brought in on the shoes."

Semi-fireproof—Genuine linoleum is far less inflammable than wood floors. A red hot coal dropped upon wood will cause it to burst into flames while on linoleum it will simply char a hole, smolder and go out. This semi-fireproof quality is due to:

(1) The linoleum is more compact than wood, owing to the pressure it receives in its manufacture.

(2) The greater content of mineral matter, about 23 times as much as wood, which acts as a diluent to the combustible matter present.

(3) The fire points of the materials used in linoleum lie in the neighborhood of 600° F.

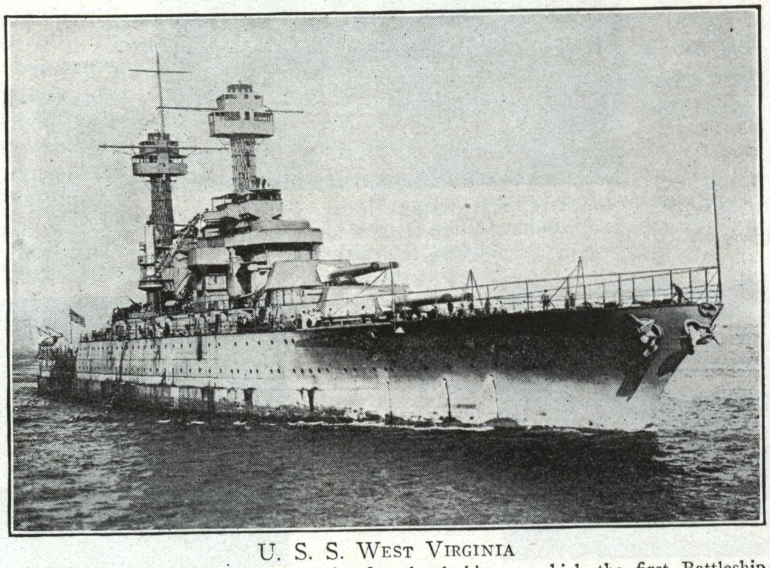
Impervious to Water—The City of New York in testing a purchase of Wild's ¼-in. Battleship Linoleum under the New York specifications, which are far more rigid than those of the United States Naval Department, found that after immersion in water for 48 hours its weight had increased only 3½%.

Because of its imperviousness, Battleship Linoleum is one of the few floorings that will remain dry in ice skating rinks.

Durability — A heavy compact Battleship Linoleum is phenomenally durable. In Lord & Taylor's old store on Broadway, New York, Wild's Linoleum on the first floor wore only about $\frac{1}{32}$ in. in 6 years. The ¼-in. goods would have lasted 42 years.

In May Co. Store, Cleveland, with an estimated traffic of 45,000,000 people during the years it was down, Wild's Battleship Linoleum wore only $\frac{1}{12}$ in.

The cost per yard is nominal; the cost per year insignificant.



U. S. S. West Virginia

The U. S. S. Kearsarge was the first battleship on which the first Battleship Linoleum (Wild's) was laid in 1899. On the last battleship (before the "10-year holiday"), the U. S. S. West Virginia, about 9000 square yards of Wild's $\frac{3}{16}$-in. Battleship Linoleum was laid in 1923

Continued on next page

Specifications for Laying Battleship Linoleum over Wood or Concrete

The two following paragraphs to be inserted in the carpentry or masonry specifications:

Level—The floor level shall be .... (insert thickness of linoleum) below the floor line shown on the drawings.

Floor—The floor shall be thoroughly dry, smooth and free from plaster and all foreign materials, ready for the linoleum contractor.

The paragraph following to be inserted in the heating specifications:

Heating—The heating contractor shall furnish sufficient heat to maintain a temperature of at least 70° F. in the rooms where linoleum is to be laid, commencing 48 hours before the linoleum work starts and continuing until it is finished.

Linoleum—The linoleum contractor shall furnish and install Wild's .... Battleship Linoleum (insert ¼-in. Heavy, six Millimeters, $\frac{3}{16}$-in. Medium Weight, or Light Weight), color....... (insert color).

Linoleum Cement—The adhesive used in securing the linoleum to the floor shall be Wild's Keystone Linoleum Cement (or equal). It shall be a quick-drying gum and pigment paste that will not generate gas and that does not contain any ingredients injurious to linoleum.

American Telephone and Telegraph Building, New York
14 miles of Wild's ¼-in. Battleship Linoleum 2 yards wide (50,000 square yards) were laid in this building, cemented direct to the concrete floors

Heating—The heating contractor (or owner) is required to maintain a temperature of 70° F. in all parts of the building where linoleum is to be laid, but the responsibility shall rest with the linoleum contractor to see that this temperature is maintained. No linoleum shall be unrolled or laid that has not been heated for 48 hours at a temperature of 70° F.

Laying—Unroll and lay out the linoleum with seams overlapped ½ in. and with ends and wall edges cut full to the floor. Taking one breadth at a time, pull linoleum back over itself and spread cement evenly over floor about 6 or 8 square yards at a time and just thick enough so 1 gallon covers about 12 square yards. Ease linoleum back into place and proceed in the same manner with the entire breadth. Cement next breadth in place; trim ends and cut through the overlapped edges, making perfectly met seams. Hammer along ends and along seams to level edges. Thus proceed with each room or hall. Tread over linoleum a little, especially at seams and ends, making the cement grip securely. Wash off within 1 or 2 hours any cement that may get on the surface of the linoleum.

After laying the linoleum, the linoleum contractor shall remove all scraps and surplus material, leaving the floors clean and ready for occupancy.

Samples

For samples, names of linoleum contractors in vicinity of construction, special information, etc., address Joseph Wild & Co., 230 Fifth Avenue, New York City.

Government Contracts

Since 1899, when Wild's Battleship Linoleum was first produced, it has been used by the Government on numerous superdreadnoughts, dreadnoughts, battleships, torpedo boat destroyers, etc. A few of them are listed below. On some from 5000 to 9000 yards were laid, while on others a smaller quantity was used.

Arkansas
Cassin
Charleston
Culgoa
Delaware
Fanning
Florida
Frederick
Huntington
Illinois
Kearsarge
Kentucky
Louisiana
Maine
Maryland
Minnesota
Mississippi
Missouri
Monaghan
Montana
New Hampshire
North Carolina
North Dakota
Ossipee
Ozark
Pennsylvania
Roe
Tallapoosa
Tennessee
Terry
Texas
Utah
Vermont
Virginia
West Virginia
Wyoming

General Contracts

The diversified character of the buildings in which Wild's Battleship Linoleum has been laid in recent years, and the extent to which it is used, is well typified by the following list of a few of the larger general contractors:

Building	Sq. Yds.
New York Telephone Building	50,000
San Francisco City Hall	18,000
U. S. Rubber Co. Building, New York, N. Y	12,000
San Francisco Hospital	12,000
South Side High School, Fort Wayne, Ind	12,000
Hamilton County Courthouse, Cincinnati, Ohio	11,000
Wells Fargo Building, New York, N. Y	10,000
Alaska Commercial Building, San Francisco, Cal	8,000
Examiner Building, San Francisco, Cal	8,000
Western Electric Co., Chicago, Ill	7,500
Union Pacific and Southern Pacific R. R. Offices, New York, N. Y.	7,000
Ward's Island Hospital, New York, N. Y	7,000
Call Building, San Francisco, Cal	6,000
State Capitol, Madison, Wis	4,500
Illinois Bell Telephone Co., Chicago, Ill	4,500
Bell Telephone Building, Pittsburgh, Pa	4,300
Forest Park School, Fort Wayne, Ind	4,000
Hartford-Connecticut Trust Co. Building, Hartford, Conn.	4,000
Wayne Street M. E. Church, Fort Wayne, Ind	4,000
East High School, Cincinnati, Ohio	3,500
Rockefeller Institute, New York, N. Y	3,000
Standard Oil Building, San Francisco, Cal	3,000
Western Electric Offices, New York, N. Y	3,000
University of California	3,000
Pacific Telephone Building, Portland, Ore	3,000
Clapp Memorial Building, Portland, Me	3,000
Knights of Pythias Building, South Bend, Ind	2,800
U. S. Forest Products Laboratory, Madison, Wis	2,500

ARMSTRONG CORK COMPANY

LINOLEUM DIVISION

Manufacturers of Linoleum and Cork Carpet Floorings

HOME OFFICE
LANCASTER, PA.

BRANCH OFFICES
NEW YORK, N. Y., 295 Fifth Avenue
ATLANTA, GA., 1228 Candler Building
DALLAS, TEX., 706 Santa Fe Building
DENVER, COLO., 720 Symes Building
MINNEAPOLIS, MINN., 803 Plymouth Building
CHICAGO, ILL., 1206 Heyworth Building
CLEVELAND, OHIO, 716-18 Keith Building
SAN FRANCISCO, CAL., 180 New Montgomery Street
SEATTLE, WASH., 803 Terminal Sales Building
KANSAS CITY, MO., 410 West 6th Street
MEMPHIS, TENN., 2 Graham Building

Products

ARMSTRONG'S LINOLEUM: Battleship and Plain; Jaspé (two-tone effect); Inlaid (straight line and moulded); Marble Inlaid; Inset Tile Inlaid; Inset Marble Tile Inlaid; Handcraft Tile Inlaid; Granite.

ARMSTRONG'S CORK CARPET.

ARMSTRONG'S SANITARY COVE and BASE.

ARMSTRONG'S WATERPROOF LINOLEUM CEMENT.

ARMSTRONG'S LINOLEUM PASTE.

All genuine Armstrong goods bear the name and the Circle A trade-mark.

Linoleum

Linoleum takes its name from one of its principal ingredients, linseed oil (*linum,* flax, and *oleum,* oil). The oil is oxidized by exposing it to the air until it hardens into a tough, rubberlike substance, and is then thoroughly mixed with powdered cork, wood flour, various gums, and suitable color pigments. The resulting plastic mass is pressed on burlap by means of heavy calenders, the exact processes varying with different kinds of linoleum. The "green" linoleum then passes into drying buildings called "stoves," where it is cured and seasoned from two to six weeks, depending on the thickness of the material.

Armstrong's Linoleum

Every yard of Armstrong's Linoleum is fully guaranteed. The company will make good any piece that proves defective in manufacture.

Both in manufacturing methods and equipment, the Armstrong plant at Lancaster, Pa., is the most modern in America.

Only the best obtainable ingredients are used in the manufacture of Armstrong's Linoleum. Most of the cork comes from the company's own factories here and abroad. Every car of linseed oil and all color pigments are tested in the laboratory. The whole manufacturing process is under physical and chemical control.

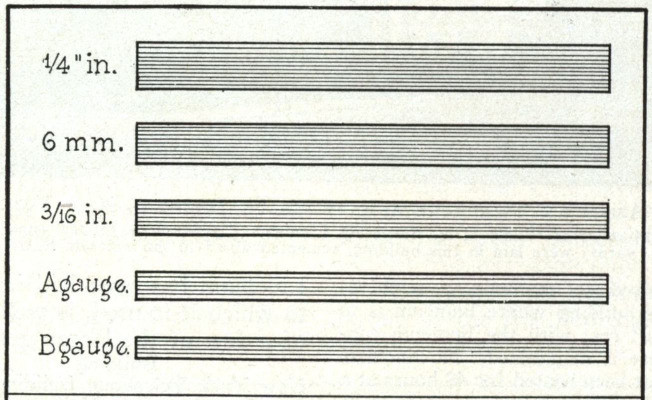


DIAGRAM OF WORKING GAUGES

TABLE OF LINOLEUM GAUGES AND WEIGHTS

Gauges	Width, yd.	Approximate thickness, in.	Finished gauge, in.	Average net weight per sq. ft., lb.
Plain Linoleum—				
Battleship 1/4-in	2	1/4	.250	1.48
Battleship 6 mm	2	1/4	.235	1.41
Battleship 3/16-in	2	3/16	.187	1.10
A-gauge (Light Battleship)	2	5/32	.142	.88
B-gauge	2	1/8	.119	.76
C-gauge	2	3/32	.095	.60
Jaspé Linoleum—				
3/16-in.	2	3/16	.187	1.14
A-gauge	2	5/32	.142	.94
B-gauge	2	1/8	.119	.79
Marble Inlaid	2	1/8	.118	.94
Inset Tile Linoleum	2	1/8	.118	.97
Granite Inlaid—B-gauge	2	3/32	.095	.63
Parquetry Inlaid	2	1/8	.118	.89
Straight Line Inlaid—A-gauge	2	1/8	.118	.93
B-gauge Inlaid	2 and 4	3/32	.095	.66
C-gauge Inlaid	2 and 4	1/16	.078	.53
Cork Carpet—				
Grade XXX	2	9/32	.264	.88
Grade XX	2	1/4	.230	.73

The weights and gauges given in this table are the manufacturing standards for the various kinds of linoleum. Slight variations will occur, but for practical purposes, these weights and gauges are substantially correct.

Armstrong's Linoleum
for Every Floor (A) in the House
TRADE-MARK

The ARMSTRONG CORK COMPANY possesses an organization of thoroughly experienced linoleum experts. Many of these men were trained abroad where linoleum traditions were founded and developed. Exceptional attention is paid to the designing of the patterns and the selection of the colorings.

Tests—Armstrong's Linoleum is carefully tested at every step of the making. Final inspections are especially rigid. The guiding principle in the Armstrong factories is "quality," not "quantity"; not "how much," but "how good" can linoleum be made.

Among the rigid tests are the following:

(1) **Penetrometer Test**—Applied to the "cement" or "binder" (oxidized linseed oil mixed with gums and resins). Electrically operated needles are pressed into samples of the elastic "cement," and the exact degree of hardness is registered. This test insures proper consistency of the binder for mixing with pulverized cork.

(2) **Abrasion Test** — Before leaving the "stoves," samples of every "run" of linoleum are tested to see if the material is thoroughly seasoned. The rounded nose of a vertical shaft is revolved rapidly on the linoleum for 60 seconds under a standard pressure. If the linoleum is properly matured, no abrasion on the surface is noticeable.

(3) **Indentation Test**—Applied to all Battleship Linoleum. A plunger (about 1/4 in. in diameter) under 80 lb. pressure is applied against the linoleum for 60 seconds. Provided the material is thoroughly seasoned, there is no surface breaking and any perceptible indentation will disappear.

Protection of Customer—For the protection of the purchaser the gauge mark is printed on the back of every yard of Armstrong's Battleship Linoleum, and where there are slight imperfections which cause the goods to be sold at a discount, the

Continued on next page

word "Seconds" is plainly marked on the burlap back.

Note: In some cases attempts have been made to substitute 6 mm. Battleship Linoleum for Quarter-Inch Battleship Linoleum under some such designation as "Commercial Quarter-Inch Battleship Linoleum." Insist that contractors state exact thickness in all bids, and that the goods furnished are of the thickness specified. Remember Armstrong gauges are plainly marked.

Armstrong's Battleship Linoleum more than meets the exacting new "United States Government Master Specification for Battleship Linoleum" promulgated by the Federal Specification Board on July 30, 1924, as Specification No. 209.

Grand Prize—Armstrong's Linoleum received the grand prize at the Panama-Pacific International Exposition—the highest possible award—conferred on no other brand of linoleum, foreign or domestic.

Advantages of Linoleum Floors

Linoleum as a permanent floor has certain marked advantages when installed while the building is being erected. It is equally satisfactory whether installed over a wood or concrete base.

Linoleum floors are: (1) Sanitary, because they are non-absorbent, smooth, free from cracks, and germicidal. (2) Easily cleaned. (3) Comfortable, because they are resilient, quiet, warm, and odorless. (4) Artistic.

(5) Durable. (6) Adapted to fireproof construction.

(7) Easy to install. (8) Economical, because they are reasonable in first cost and inexpensive to maintain.

Varieties of Armstrong's Linoleum

Plain Linoleum—Solid colors without pattern—the four heavier gauges of which are known as Quarter-Inch, 6 mm. $\frac{3}{16}$-in., and Light Battleship (A-gauge with unpainted back). What is commonly spoken of as Plain Linoleum is of the same quality as Battleship Linoleum, only lighter in gauge. Altogether, there are 7 thicknesses of Plain Linoleum and 7 colors.

Color No. 20—Brown
Color No. 21—Green
Color No. 22—Dark Gray
Color No. 26—Light Gray
Color No. 27—Black
Color No. 28—Tan
Color No. 29—Blue

The four Battleship thicknesses are made only in brown (No. 20), green (No. 21), and dark gray (No. 22). Plain black (No. 27) may be had in the $\frac{3}{16}$-in. gauge. All Armstrong's Battleship and Plain Linoleum is manufactured regularly 2 yd. wide only.

Jaspé Linoleum—A species of inlaid linoleum, since the colors run clear through to the back. It presents a striated appearance with a two-tone effect and is made in 3 gauges, $\frac{3}{16}$-in., A, and B, and in 6 colors:

Color No. 13—Light Gray
Color No. 15—Dark Gray
Color No. 16—Light Brown
Color No. 17—Dark Brown
Color No. 18—Blue
Color No. 19—Green

Inlaid Linoleum (Straight Line and Moulded) The colors of the patterns go through to the burlap. In making Straight Line Inlaids, the individual parts of the pattern are die cut, laid in position and finally keyed on the burlap under enormous pressure. In making Moulded Inlaids, the designs are worked out on the burlap by means of metal "stencils." The loose "mixes" mould slightly into each other along the lines of the design, thus making possible very artistic effects in Handcraft Tiles (patented), carpet designs and similar patterns. Designated according to pattern, Armstrong's Inlaid Linoleum comes in Tile Inlaids, Parquetry Inlaids, and Carpet Inlaids.

Inset Tile Inlaid and Inset Marble Tile Inlaid Linoleum—A Straight Line Inlaid Linoleum in which the pattern consists of solid color or marbleized blocks 5½ in. square with ½-in. interliners of a contrasting color. Made in A-gauge and in various colors.

Marble Inlaid Linoleum—A Straight Line Inlaid Linoleum in which the design is made up of large marbleized blocks of varied designs and colorings. Made in A-gauge only.

Granite Linoleum—Also a variety of inlaid, in which colors go clear through. It has a mottled appearance resembling terrazzo and is made in B and C-gauges and in 3 colors as follows:

Color No. 3—Green
Color No. 5—Blue
Color No. 6—Brown

Armstrong's Cork Carpet

Cork carpet is made of relatively large granules of cork by a process which preserves the natural elasticity to a high degree. Cork carpet, therefore, not only softens footsteps, but helps absorb other noises as well. For auditoriums and other rooms in churches, lodges, libraries, museums, etc., where excessive dirt is not tracked in directly from the street and where heavy traffic is not an everyday occurrence, cork carpet is admirably adapted.

Where the wear is severe, and the floor is in almost daily use, hence needs frequent cleaning, Armstrong's Linoleum in the "Battleship" thicknesses is recommended.

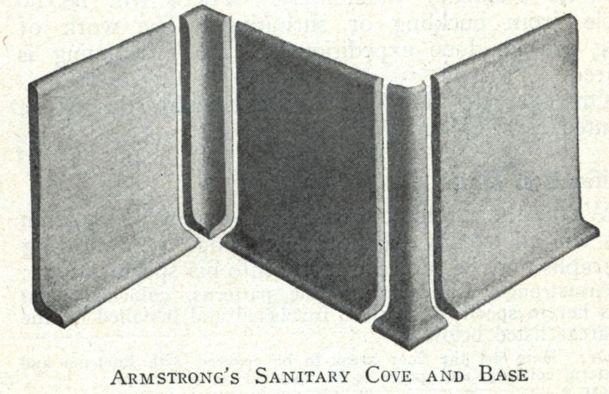
Armstrong's Cork Carpet is made in two gauges: XXX (.264-in.) and XX (.230-in.). Each gauge is made in 2 colors:

No. 31—Brown
No. 32—Green

Armstrong's Sanitary Cove and Base

For hospitals and institutions of similar character where it is necessary to provide a sanitary trim that meets the floor and which affords no place for the collection of dirt, Armstrong's Sanitary Cove and Base is especially recommended. This cove and base is made of the same materials used in Armstrong's Linoleum—ground cork, wood flour, gums, and oxidized linseed oil—and comes in the three Battleship colorings, brown, green, and gray. It is made 6 in. high only and in sections 20 in. long, with convex and concave corner sections made separately.

Samples of Armstrong's Sanitary Cove and Base will be mailed to any architect free on request.



Armstrong's Sanitary Cove and Base

Recommended Uses for Armstrong's Linoleum

The following will give an idea of the gauges and patterns of Armstrong's Linoleum which are especially recommended for use in various types of buildings:

Continued on next page

Business Buildings—Including banks, lofts, office buildings, restaurants, and stores: ¼-in. or $\frac{3}{16}$-in. Battleship (for corridors and areas subjected to heavy traffic); A-gauge Plain; Jaspé; Inset Tile, Marble Tile or Straight Line Inlaid; Handcraft Tiles.

Educational Buildings—Including gymnasiums, laboratories, libraries, museums, observatories, schools and colleges (private and public): ¼-in. or $\frac{3}{16}$-in. Battleship; Cork Carpet (for rooms where a silent and resilient floor is a first consideration).

Hospitals and Institutions—Including homes, institutions, hospitals and sanitariums: ¼-in. or $\frac{3}{16}$-in. Battleship (for corridors and areas subjected to heavy traffic); A-gauge Plain; Jaspé; Straight Line Inlaid; Handcraft Tile Inlaids.

Industrial Buildings—¼-in. or $\frac{3}{16}$-in. Battleship.

Public Buildings—Including capitols, city halls, town halls, court and custom houses, comfort stations, fire and police stations, jails and reformatories, and post offices: ¼-in. or $\frac{3}{16}$-in. Battleship.

Religious and Memorial Buildings—Including churches, chapels and parish houses, convents and monasteries: ¼-in. or $\frac{3}{16}$-in. Battleship (for areas where traffic is very heavy); Cork Carpet (for rooms where a silent and resilient floor is a first consideration); A-gauge Plain; Jaspé.

Residential Buildings—Including apartments, flats and tenements, dwellings, dormitories and hotels: ¼-in. or $\frac{3}{16}$-in. Battleship (for corridors and areas where traffic is exceptionally heavy); A-gauge or B-gauge Plain; Jaspé; Granite; Inset Tile; Marble Tile; Straight Line Inlaid; Handcraft Tile Inlaids.

Social and Recreational Buildings—Including auditoriums and halls, clubs, lodges, natatoriums, bathhouses and locker buildings, theaters, service buildings (Y. M. C. A., Y. W. C. A., K. of C., and Salvation Army): ¼-in. or $\frac{3}{16}$-in. Battleship; Cork Carpet (where a silent and resilient floor is required).

Method of Laying Linoleum and Cork Carpet

There is only one absolutely satisfactory way to lay linoleum or cork carpet over wood, and that is to cement it down over a layer of heavy felt.

The best obtainable grade of builders' deadening felt, weighing 1½ lb. per sq. yd., is first pasted to the floor and the linoleum is then pasted to the felt. The seams and edges of the linoleum are glued down with waterproof cement.

Laid in this manner, linoleum will wear longer and retain its resiliency indefinitely. There will be no trouble from buckling or shrinking. The work of laying can be done expeditiously. No retrimming is required.

On concrete floors, linoleum should always be cemented, preferably over felt.

Specification Data

When the architect wishes to specify linoleum floors for all or any part of a building, the following paragraphs may be copied directly into his specifications:

"Armstrong's Linoleum, in the patterns, colorings, and gauges herein specified, shall be furnished and installed on the floor areas listed below:

Note: Here list the floor areas to be covered with linoleum and the pattern, coloring, and gauge to be installed on each area.

"All linoleum floors covered by these specifications are to be installed in accordance with the manufacturer's Specification No. ...., given on page .... of SWEET'S ARCHITECTURAL CATALOGUE, Twentieth Edition, 1925-1926, and the linoleum contractor's bid on linoleum shall include all the labor and materials—felt, paste, cement, wax, etc.—required to install the linoleum in accordance with these specifications."

The following provisions properly observed in the architect's specifications, in combination with the above paragraphs, will insure satisfactory installation of Armstrong's Linoleum floors over either wood or concrete base.

(1) Linoleum floors should not be installed in basements or on any cement floor in direct contact with the ground, unless the base, floors, and walls below grade have been thoroughly waterproofed and are absolutely dry before the floor is laid.

(2) All linoleum floors on a wood base should be laid with a felt interlining. All wood underfloors are subject to expansion and contraction due to heat, cold and varying atmospheric changes. The felt takes up the expansion and contraction and prevents bulging, cracking, or breaking of the linoleum floor. It also permits the removal of the linoleum with little difficulty and without damage, if the occasion should arise.

(3) Wood floors to which linoleum is to be applied should preferably be double floors with the underfloor laid diagonally to the floor joists. Underfloors may be of rough sheathing, well seasoned, the ends of all boards to come directly over bearings and all to be nailed to each and every bearing with 8d common nails.

(4) Top floors to which linoleum floors are to be applied (whether single or double floors) should be of kiln dried, matched and end matched boards free from large or loose knots, not more than 3½-in. face and thoroughly blind nailed (if single floors) to each and every bearing, and, if double floors, blind nailed to the underfloor every 16 in. with 8d common nails.

(5) The surface of the top wood floor to which linoleum is to be applied should be true, even, level, clean and dry, and should be ⅛ in. plus the thickness of the gauge of linoleum selected (see Table of Working Gauges on second preceding page) below the desired finished linoleum floor level. It is sometimes cheaper and more practical, however, to continue wood floors on which linoleum is to be laid at the same general level with other floors, and then protect the linoleum at doorways with a wood, rubber, or metal binder.

(6) Where wood base is used in connection with linoleum floors, the carpenter work specifications should provide for a quarter-round or suitable floor mould to cover the junction of baseboard and linoleum, to be secured by the carpenter contractor after the linoleum is laid.

(7) Concrete floors must be brought to a true, even and level surface, ⅛ in. plus the thickness of the gauge of linoleum selected below the desired finished linoleum floor level. Because of the difficulty in fastening a binder to concrete, it is practically always preferable to make this allowance in floors to be covered with linoleum, rather than retain the same floor level throughout and attempt to protect the edges of linoleum at doorways with a binder.

(8) Where concrete floors are to be covered with linoleum, better adhesion usually obtains between linoleum and concrete if the concrete base is first properly treated with a reliable concrete hardener.

(9) When single strips of linoleum are laid as runners in corridors, hallways, church aisles, etc., the edges of the linoleum must be protected with a binder of wood, metal, or rubber. Similar protection must always be given linoleum at doorways, where the underfloor is not countersunk or there is no threshold against which to butt the linoleum.

(10) The general contractor (or owner) must make provision for maintaining a temperature of 70° F. in all rooms where linoleum floors are to be laid.

(11) For filling cracks and seams in concrete underfloors, plaster of Paris may be used. Wide cracks in wood underfloors should be filled with strips of wood. This work should be done by the general contractor before the linoleum contractor takes charge.

Specification No. 1—Laying Linoleum or Cork Carpet over Wood

(1) The linoleum contractor shall furnish all labor and materials to cover the entire floor surfaces in the rooms herein specified, or indicated on the drawings, as follows:

(*Note:* A list of rooms and gauge and pattern to follow here.)

(2) Before any materials are laid, the linoleum contractor shall satisfy himself that all base wood floors are thoroughly nailed to all bearings; that the surfaces are true and even and that there are no loose knots, nails or other protrusions that might cause damage to the finished linoleum floors.

(3) The linoleum contractor shall see that all joints between boards have been properly filled and that the surface

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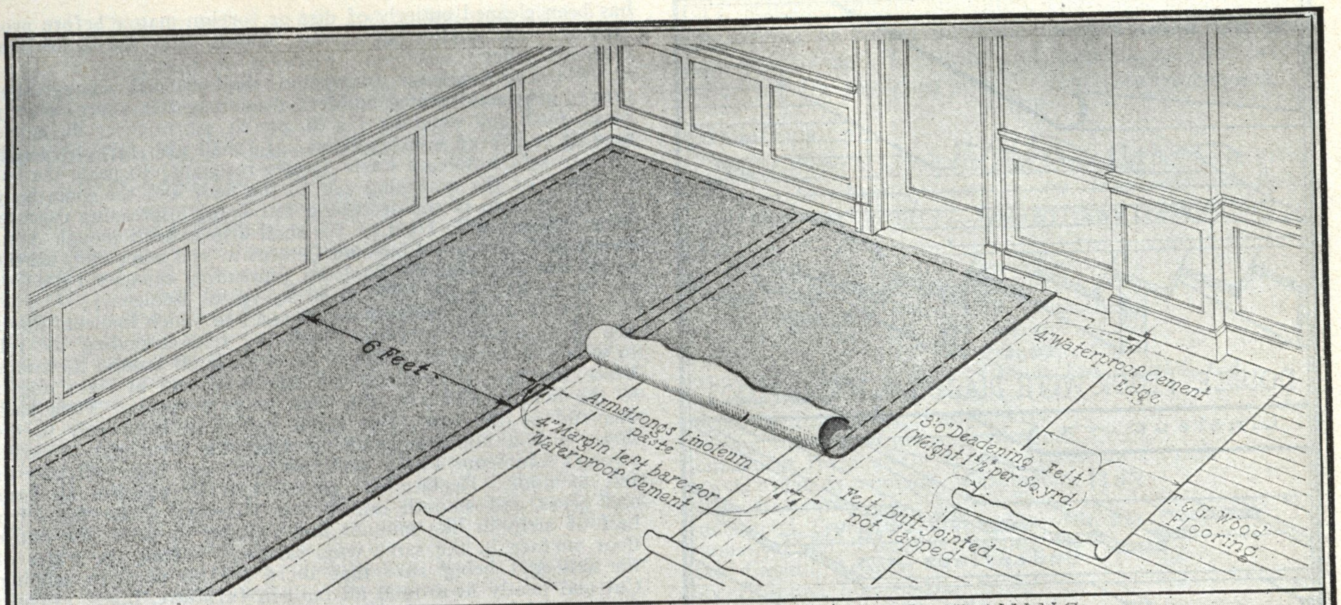
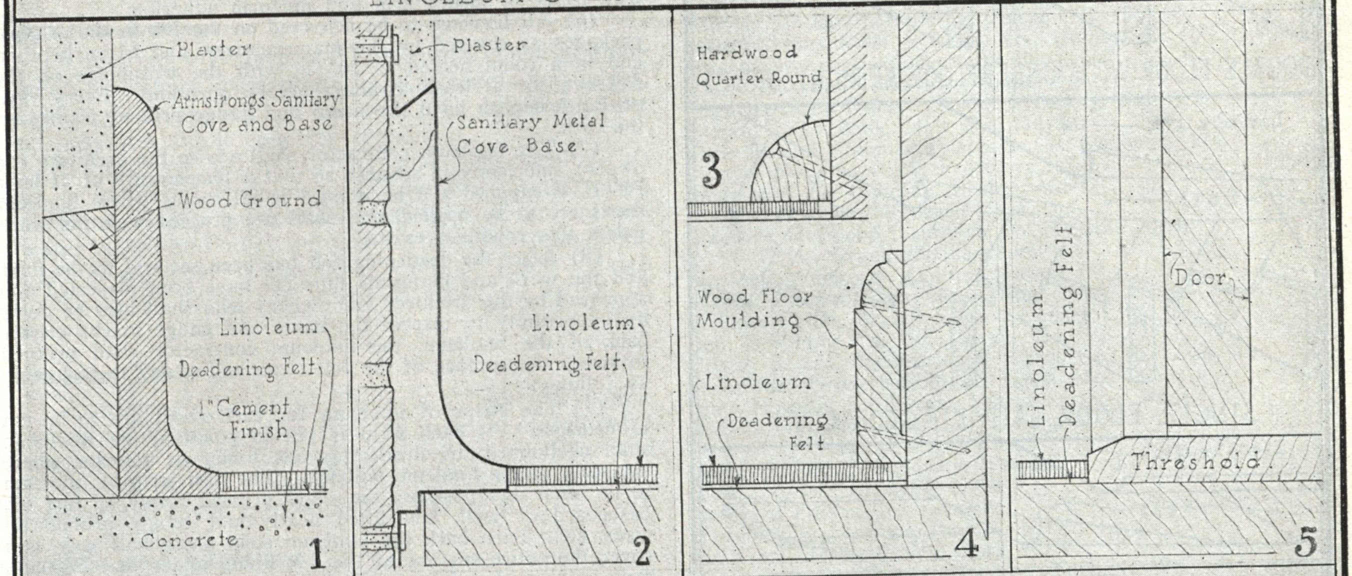
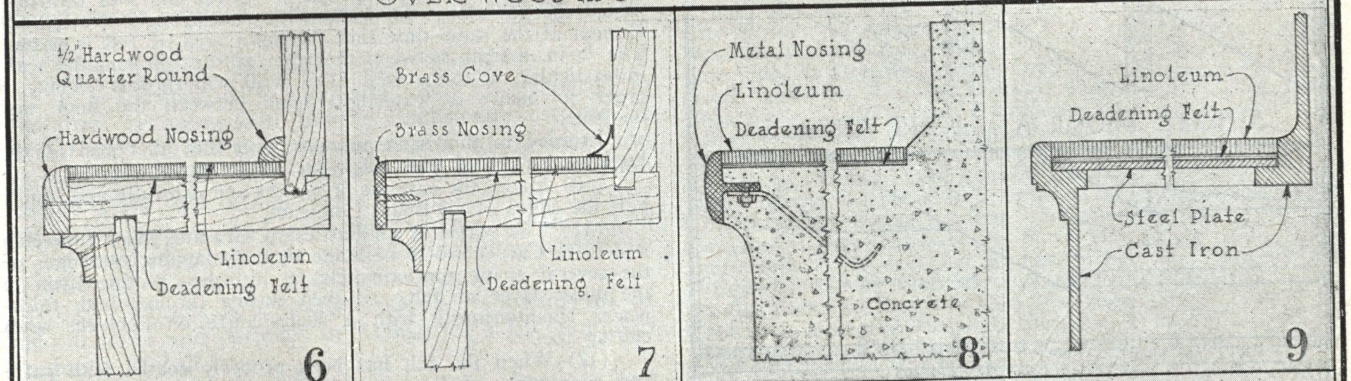

6 Feet
Armstrongs Linoleum paste
4" Margin left bare for Waterproof Cement
4" Waterproof Cement Edge
3'0" Deadening Felt (Weight 1½# per Sq. yrd.)
Felt, butt-jointed, not lapped
T. & G. Wood Flooring

PERSPECTIVE VIEW SHOWING METHOD OF LAYING LINOLEUM OVER FELT ON WOOD FLOOR


Plaster
Armstrongs Sanitary Cove and Base
Wood Ground
Linoleum
Deadening Felt
1" Cement Finish
Concrete
1
Plaster
Sanitary Metal Cove Base
Linoleum
Deadening Felt
2
Hardwood Quarter Round
3
Wood Floor Moulding
Linoleum
Deadening Felt
4
Door
Linoleum
Deadening Felt
Threshold
5

METHODS OF FINISHING LINOLEUM AT BASE OVER WOOD AND CONCRETE FLOORS


½" Hardwood Quarter Round
Hardwood Nosing
Linoleum
Deadening Felt
6
Brass Cove
Brass Nosing
Linoleum
Deadening Felt
7
Metal Nosing
Linoleum
Deadening Felt
Concrete
8
Linoleum
Deadening Felt
Steel Plate
Cast Iron
9

3" SCALE DETAILS SHOWING LINOLEUM LAID OVER WOOD CONCRETE AND METAL STAIRS WITH VARIOUS KINDS OF NOSINGS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC..	FINISHING OF ARMSTRONG'S LINOLEUM AT BASEBOARDS AND ON STAIR TREADS	SCALE 6" & 3" EQUALS 1'-0" DATE AUG. '22.	DWRG 1

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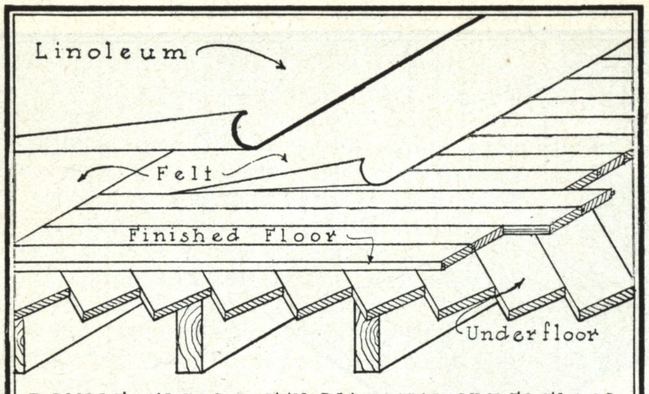
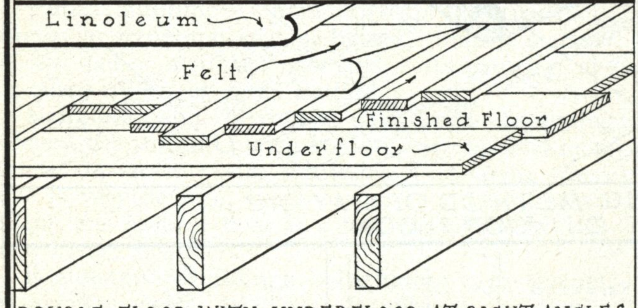
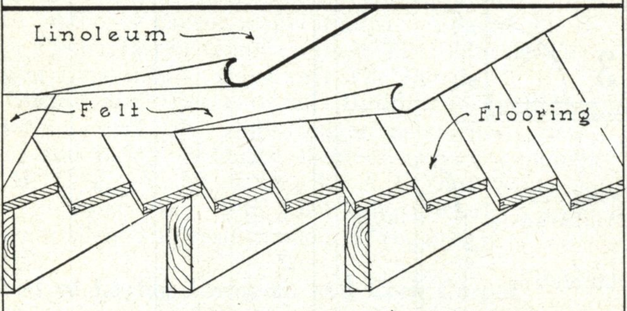


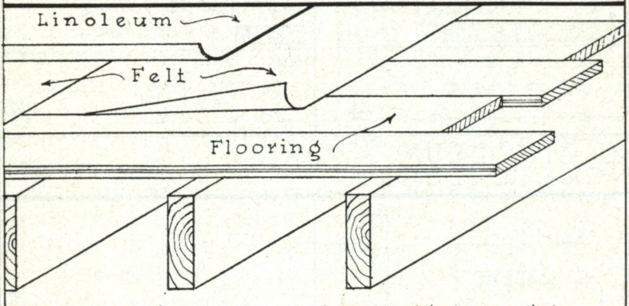
DOUBLE FLOOR WITH DIAGONAL UNDERFLOOR



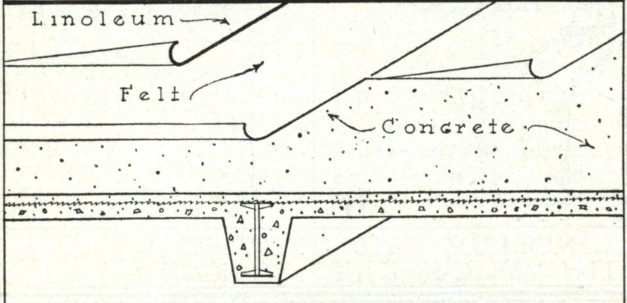
DOUBLE FLOOR WITH UNDERFLOOR AT RIGHT ANGLES



SINGLE FLOOR LAID DIAGONALLY



SINGLE FLOOR AT RIGHT ANGLES



CONCRETE FLOOR

·METHOD·OF·LAYING·LINOLEUM·AND·FELT·
OVER·VARIOUS·TYPES·OF·FLOOR·CONSTRUCTION

has been cleaned entirely of dirt or foreign matter before proceeding. He shall also satisfy himself that the floors are thoroughly dry.

(4) The linoleum contractor shall furnish enough approved gray unsaturated builders' deadening felt, approximately ⅛ in. thick and weighing 1½ lb. per sq. yd. to cover the entire area to be floored with linoleum. He shall also furnish enough Armstrong's Linoleum Paste (water-resistant) to paste the entire body of the deadening felt to the floor and the main body of the linoleum to the deadening felt lining (spreading capacity about 100 sq. ft. to 1 gal.). He shall also furnish enough Armstrong's Waterproof Linoleum Cement to seal completely all the seams and edges of the linoleum (spreading capacity 1 gal. for the seams and edges of each 40 sq. yd. of linoleum).

(5) Cover the entire floor surfaces to which linoleum floors are to be applied with the deadening felt, extending the felt to within ¼ in. of the walls or baseboards all around the room. Place the first strip along the side wall and at right angles to the boards, and trim the ends to fit properly. Turn back one end of the loose felt about half way and apply to the floor, with a linoleum paste spreader, an even coat of Armstrong's Linoleum Paste, sufficient to insure firm adhesion of felt to floor. Replace the pasted half in position on floor and press and smooth out all air blisters. Paste the other half of strip in like manner and proceed to cover the entire floor surface in the same way, carefully butting the edges of the felt and being sure that there are no portions lapping. Cut and neatly fit around all built-in furniture, pipes, radiator feet, door jambs and thresholds. Each strip of felt when completely pasted is to be rolled and smoothed out with a 150-lb. iron roller to insure firm and uniform adhesion.

(6) All linoleum to be delivered on the job in the original packages as shipped by the manufacturer, and to be kept on end in a room heated to 70° F. with the wrappings on the roll cut, for at least 48 hours before unrolling. Every yard of Battleship to have the name and gauge printed plainly on the back.

(7) The linoleum contractor shall advise the architect (or owner) sufficiently in advance so that a temperature of at least 70° F. is supplied and maintained in all rooms where linoleum floors are to be applied, and shall not proceed with his work unless this condition exists.

(8) After the deadening felt has been secured to the floor and the work and materials thus far have been inspected and approved by the architect (or owner) who shall also be given an opportunity to inspect the name and gauge marks on the back of the linoleum, the linoleum contractor shall proceed to sweep the surface of the felt clean and to lay the linoleum as follows:

(9) The strips of linoleum for each room are to be cut to measure. As each strip is put in position, the workman shall chalkmark the deadening felt lining to indicate where the seam of the linoleum will fall. The first strip of linoleum to be fitted into position, the edges pressed firmly against the baseboard or wall, and fitted neatly and snugly around all pipes, etc. Turn back the linoleum strip about half way, and cover the entire surface of the felt lining under that linoleum strip up to within 5 or 6 in. of the edges of the strip (which space must *not* be pasted) with Armstrong's Linoleum Paste applied as specified in paragraph 5. Cover the 5 or 6-in. unpasted margin along the walls with Armstrong's Waterproof Cement at the same time that the main area of felt is pasted. The ¼-in. margin between the edge of the felt and the wall, in particular, is to be well filled with waterproof cement, in order to insure a watertight bond between the floor and linoleum.

Proceed in this same manner with the other end of the linoleum strip and with each succeeding strip.

(10) Match the patterns or figures and carefully and snugly butt the edges of all Inlaid Linoleum.

(11) The seams of all Battleship, Granite, Jaspé Linoleum and Cork Carpet are to be made tight by lapping the edges of the several strips approximately ½ in. when pasting them to the under layer of felt, and then cutting through both thicknesses simultaneously with a sharp knife or linoleum seam cutting tool.

(12) When the felt has been properly coated with paste and each strip of linoleum carefully fitted and rolled with a 150-lb. roller, all air blisters completely smoothed out, and the paste given sufficient time to set properly, the edges of the linoleum strips are to be lifted sufficiently to apply a good coat of Armstrong's Waterproof Linoleum Cement on both sides of the seams and around all pipes, etc., so that it will completely fill the space back to the paste. As soon as seams are cemented, they are to be thoroughly rolled until the cement has begun to set firmly, or the seams and edges of the linoleum may be weighted with sandbags.

Continued on next page

(13) Clean the entire surface and remove with alcohol any and all cement that may appear on the face of the linoleum. Apply a good coat of standard floor wax to the linoleum, polish the waxed surface and turn the entire job over to the owner in a perfectly clean and workmanlike condition.

Specification No. 2—Laying Linoleum or Cork Carpet over Concrete Floors

(1) Use paragraph 1, Specification No. 1.

(2) Before proceeding with the work, the linoleum contractor shall ascertain the condition of the concrete and assure himself that it is thoroughly dry and that the surface is true and even. He shall test the floor for moisture by laying several pieces of linoleum, 6 or 8 in. square, face downward on the concrete, one in each corner of the room and the others in the center, weighting them with brick or other weights, and allowing them to remain at least 18 hours. If, when the pieces are taken up, moisture appears on the surface of concrete or linoleum, the room shall be kept heated for 4 or 5 days and the test repeated. When no moisture follows this procedure, the contractor shall proceed with the work as herein specified.

(3) The linoleum contractor shall see that the floor has been cleaned of dirt or foreign matter and that all cracks have been filled with plaster of Paris, or other satisfactory filler.

(4) Use paragraph 4, Specification No. 1.

(5) Use paragraph 5, Specification No. 1, omitting the words "and at right angles to the boards."

(6, 7, 8, 9, 10, 11, 12 and 13) Use same paragraphs as in Specification No. 1.

Linoleum Cement

Armstrong's Waterproof Linoleum Cement is guaranteed to make a waterproof joint at seams and edges, when properly applied. It has very high adhesive power and possesses ample covering capacity.

Because of its uniformity and high quality, its use is strongly recommended wherever Armstrong's Linoleum is laid. It is entirely free from sodium silicate (water glass) and other ingredients harmful to linoleum. A gallon will cover about 60 ft. of floor space, enough to cement the seams and edges of about 40 sq. yd. of linoleum.

Linoleum Paste

Armstrong's Linoleum Paste is a high grade non-waterproof adhesive (free from all harmful ingredients) intended for use in fastening the felt to the floor and the centers of the strips of the linoleum to the felt. A gallon will cover approximately 100 sq. ft.

Samples and Literature

Samples of any coloring or pattern or thickness of Armstrong's Linoleum and Cork Carpet will be sent cheerfully to any architect, contractor or builder on request.

The following literature is also offered:

(a) "Armstrong's Linoleum Floors," prepared in the form recommended by the American Institute of Architects. In addition to a description of linoleum and its uses, this handbook contains the essential information needed in the selection of Armstrong's Linoleum for any particular purpose, and information regarding the laying of linoleum over wood or concrete, including architects' detailed specifications. 8½x11 in. in size.

(b) "Pocket Size Pattern Book," showing all of the colorings and patterns in Armstrong's Linoleum reproduced in full color.

(c) "Pocket Size Quality Sample Books," two books containing actual samples of all of the various thicknesses of plain, printed and inlaid linoleum.

(d) "The Art of Home Furnishing and Decoration," by Frank Alvah Parsons, a prominent authority on interior decoration. Sent for 20¢ in stamps.

(e) "Business Floors," a 48-page booklet setting forth the advantages of linoleum for offices, stores, theaters, schools, public buildings, churches, etc., contains illustrations of actual installations, color plates of linoleum designs, and directions and specifications for laying and caring for linoleum floors. Sent free on request.

Installations

Armstrong's Linoleum and Cork Carpet have given years of satisfactory service on hundreds of floors throughout the country. A few recent installations include:

Jemison Seibels & Co., Inc., Birmingham, Ala.
Mandarin Cafe, Phoenix, Ariz.
Pfeifer Department Store, Little Rock, Ark.
Women's Athletic Club, San Francisco, Cal.
Walk-Over Shoe Store, San Francisco, Cal.
Los Angeles Trust & Savings Bank, Los Angeles, Cal.
Colorado State Capitol, Denver, Colo.
Pueblo Medical Clinic, Pueblo, Colo.
Phoenix Insurance Company, Hartford, Conn.
Connecticut Hospital for Insane, Middletown, Conn.
Kew Garden Apartments, Washington, D. C.
Wallis Restaurant, Washington, D. C.
Underwood Typewriter Co., Jacksonville, Fla.
Nunnally Candy Company, Atlanta, Ga.
State Capitol, Atlanta, Ga.
City Hospital, Macon, Ga.
Kelly's Club Cafe, Boise, Ida.
Illinois Telephone Co., Chicago, Ill.
Englewood High School, Chicago, Ill.
Popular Mechanics Building, Chicago, Ill.
State Savings Loan & Trust Co., Quincy, Ill.
Studebaker Corporation, South Bend, Ind.
Mercy Hospital, Iowa City, Iowa
Pittsburg State Normal School, Pittsburg, Kan.
Federal Land Bank, New Orleans, La.
Chesapeake & Potomac Telephone Co., Baltimore, Md.
Fidelity National Bank, Frostburg, Md.
Bankers' Trust Building, Boston, Mass.
Hotel Nonotuck, Holyoke, Mass.
Standard Accident Insurance Co., Detroit, Mich.
Y. W. C. A., Grand Rapids, Mich.
Marshall Wells Co., Duluth, Minn.
Wayzatta School, Wayzatta, Minn.
William Cullen Bryant School, Kansas City, Mo.
Bell Telephone Co., St. Joseph, Mo.
Pilsbry-Becker Engineering & Supply Co., St. Louis, Mo.
Woodward Grade School, St. Louis, Mo.
State Hospital for Insane, Warm Springs, Mont.
Nashua Manufacturing Co., Nashua, N. H.
Jersey City Hospital, Jersey City, N. J.
Globe Indemnity Company, Newark, N. J.
State Capitol, Santa Fe, N. M.
Brooklyn Edison Co., Brooklyn, N. Y.
Buffalo City Hospital, Buffalo, N. Y.
Mt. Sinai Hospital, New York, N. Y.
Remington Typewriter Co., New York, N. Y.
Maple Avenue School, Niagara Falls, N. Y.
Peoples National Bank, Winston-Salem, N. C.
Central Savings Bank, Canton, Ohio
City Hospital, Youngstown, Ohio
Masonic Temple, Enid, Okla.
University of Oregon, Eugene, Ore.
Good Samaritan Hospital, Portland, Ore.
Boas Street Grade School, Harrisburg, Pa.
Allegheny General Hospital, Pittsburgh, Pa.
Mellon National Bank, Pittsburgh, Pa.
Lackawanna County Courthouse, Scranton, Pa.
New England Telephone & Telegraph Co., Providence, R. I.
Citadel Square Baptist Church, Charleston, S. C.
Converse College, Spartanburg, S. C.
State Soldiers' Home, Hot Springs, S. D.
Pennington County Courthouse, Rapid City, S. D.
Baptist Memorial Hospital, Memphis, Tenn.
Protestant Memorial Hospital, Nashville, Tenn.
Great Southern Life Insurance Co., Houston, Tex.
Gulf Refining Company, Port Arthur, Tex.
San Antonio Telephone Co., San Antonio, Tex.
Elks' Home, St. Johnsbury, Vt.
Negro Memorial Hospital, Richmond, Va.
Scottish Rite Cathedral, Richmond, Va.
University of Washington, Seattle, Wash.
Shenandoah Valley Bank, Martinsburg, W. Va.
High School, Fond du Lac, Wis.
Clinic Hospital, Sheboygan, Wis.
University of Wyoming, Laramie, Wyo.

THE GEORGE W. BLABON COMPANY

Manufacturers of Linoleum, Kindred Products and Linseed Oil

EXECUTIVE OFFICES AND PLANT
PHILADELPHIA, PA.

HEAD OFFICE OF THE SALES DEPARTMENT: 295 Fifth Avenue, NEW YORK, N. Y.

Products

Blabon's "Invincible" Battleship Linoleum; Blabon's Plain, and Jaspé Linoleum; Blabon's Cork Carpet; Blabon's Inlaid Linoleum; Blabon's Printed Linoleum.

Also Blabon's Rugs of Genuine Linoleum, Blabon's Feltex (Felt-Base) Rugs and Yard Goods, and Linseed Oil.

Varieties of Linoleum

Battleship; plain and jaspé in a variety of colors; inlaid; carpet inlaid; marble inlaid; granite inlaid; printed; linoleum rugs (printed).

Composition of Linoleum

The principal ingredient of linoleum is linseed oil. The quality of this ingredient is the first governing factor in the wearing quality of the finished product and it is of the highest importance, therefore, that the linseed oil be of the finest quality, and be properly and thoroughly processed.

Only by producing his own linseed oil can the linoleum manufacturer be absolutely certain of its excellence. For this reason this company makes its own linseed oil, being the only linoleum manufacturer in America equipped to do so. In making linoleum the linseed oil is oxidized by exposure to the air into a tough, rubber-like substance. It is then mixed with powdered cork, kauri gum, rosin, coloring matter and other ingredients; and the resultant plastic substance is pressed upon a backing of burlap, after which it is passed into drying ovens, where it is thoroughly cured and seasoned.

The colors and designs of inlaid linoleum go clear through the thickness of the material to the burlap back; therefore the figures and colors comprising the design do not disappear with wear.

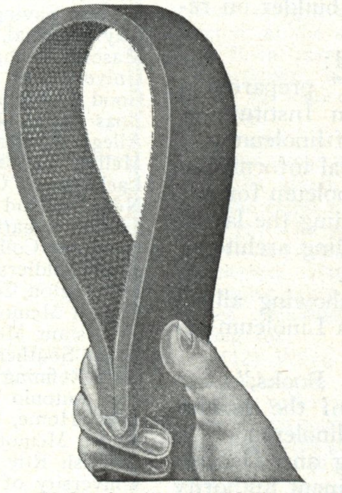
Plain linoleum has no design, one solid color going clear through the thickness of the material to the burlap back. Made in brown, green, gray, terra cotta and black.

Printed linoleum is plain brown linoleum with a design painted on its face.

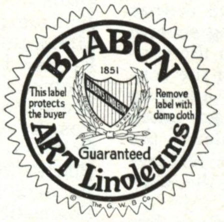
Advantages of Linoleum Floors

There are many weighty reasons to support the assertion that linoleum is an ideal flooring for office buildings, schools, theaters, club and lodge buildings, libraries, hotels, churches, banks, stores and other commercial and public and semipublic buildings. For such uses, and in fact for all uses where traffic is exceptionally heavy, the "battleship" grades of linoleum are recommended. Because of the thickness of the material, they make the most durable and most comfortable linoleum floors that can be installed.

The principal advantages of linoleum as a flooring are:



Blabon's "Invincible" Battleship Linoleum
Pliable, tough and wear resisting. Bends without breaking


BLABON
1851
This label protects the buyer
Remove label with damp cloth
Guaranteed
ART Linoleums

LABEL
The identifying mark on the face of all Blabon's Linoleum

(1) Serves as Floor and Floor Covering in One—Where linoleum is used over concrete as a flooring, in place of wood, tile or some other material, it becomes unnecessary to use rugs or carpets. Because of its quietness, resilience and comfort to the tread, linoleum serves both as floor and floor covering.

It is particularly advantageous where persons are compelled to stand for long hours.

(2) Durability—A floor of Blabon "Invincible" Battleship Linoleum will wear for many years. In fact, its durability is such that if properly laid and given proper care it will wear indefinitely.

(3) Sanitation—A linoleum floor is sanitary, because it has a non-absorbent surface through which dust and dirt can not penetrate; and because, when properly laid, its almost invisible joints are likewise practically sealed against such penetration.

Further, a well-known European chemist has established by original researches that the linseed oil in linoleum yields certain acid gases which destroy the bacterial germs that find habitation in other floors and floor coverings.

(4) Economy—The cost of linoleum floors under normal conditions is very much less than that of hardwood, tiling and other usual materials. This is true not only of the cost of the material itself, but the cost of installing it. And it is further true of the cost of maintenance.

In large buildings, for example, the cost of periodically refinishing hardwood floors is an expense that can be done away with by the use of linoleum floors, which never require refinishing, but merely an occasional waxing and polishing.

(5) Easy to Clean—In office buildings and other large structures having wood floors, the cost of scrubbing and keeping clean these floors is a considerable item in the building's upkeep. But where linoleum floors are used this item is reduced to a minimum. Linoleum does not require constant scrubbing—nor, as has been said before, refinishing. The only daily treatment required by linoleum is a light sweeping or wiping with a damp mop.

(6) Suitable for Fireproof Construction—The volume of inflammable substance represented in a linoleum floor is much less than in a wood floor, particularly since linoleum floors can be laid on concrete without wood underneath to hold them in place, as is needed with wood floors.

(7) Artistic and Decorative Values—Linoleum as made today is worthy of the architect's and decorator's consideration from the artistic viewpoint, as well as the practical.

Continued on next page

There is no prohibitive reason why linoleum should not equal, and in some respects surpass, the decorative effects achieved in woven floor coverings and other types of permanent floors. American linoleum manufacturers have visioned the artistic possibilities of their product, and have developed it to a high estate.

Whereas in the past, even in office buildings and other commercial structures, it has been a custom to use rugs and carpets when exceptionally attractive effects were desired, the necessity for this no longer holds good with the artistic development of linoleum.

Where rugs or carpets would formerly have been used, Blabon's Linoleum in carpet, tile, marble and hardwood effects can be installed with the construction of the building, and serve not only as a durable, economical, sanitary floor, but as an artistic, comfortable, quiet floor covering as well.

Linoleum floors laid with borders of solid colors are particularly attractive.

The artistic possibilities of linoleum are fully set forth in our new brochure—Planning the Color Schemes for Your Home—sent upon receipt of 20 cents.

Linoleum Designs and Colors

Blabon's Linoleum is today made in 229 diversified designs, portraying the styles of tile, mosaic, terrazzo, marble, parquetry, hardwood, carpet, matting and other types of ornamentation suitable for a wide variety of uses.

Blabon's Battleship and Plain Linoleum is made in 4 colors: brown, green, gray, and black. Black is made in A, B and C grades only. Jaspé is made in gray and brown in A grade only. These linoleums (especially in the "battleship" grades) are probably the most advantageous for installation in commercial or public buildings.

All Blabon's "Invincible" Battleship Linoleums are made in accordance with the rigid specifications of the United States government.

Where Blabon's Linoleum Can Be Obtained

In nearly every city of the country Blabon's Linoleum is sold by leading floor covering dealers, department stores and furniture stores. Usually these stores employ experienced layers; if not, they can invariably refer to one.

For the handling of large installations, there are contract linoleum layers in most good sized cities, who will bid on furnishing and installing Blabon's Linoleum. This company will gladly supply architects, decorators or builders with the names either of reliable merchants or contract layers who are competent to handle large orders.

How to Lay Linoleum Floors

Preferred Method—The best method of laying linoleum floors, especially when they are installed as an integral part of a new structure, is to paste a layer of heavy unsaturated felt paper over the concrete or wood or whatever material is used to support the linoleum and then cement the linoleum to the felt layer.

This method of laying a linoleum floor actually prolongs its life, and insures perfect satisfaction in all ways—as follows:

First, when correctly pasted to the felt, the linoleum will not bulge, expand or contract, and retrimming is therefore unnecessary. Secondly, the presence of the felt paper gives the floor a certain "cushion," which makes it springy and exceptionally agreeable to the tread. This cushion action induced by the felt paper also increases the life of the linoleum. Thirdly, a linoleum floor laid in this way is much warmer in winter. Fourthly, in case it is desired to remove the linoleum, it can be done with comparative ease and no damage to the linoleum.

Caution: In all methods of laying, care should be taken that the linoleum paste used be of a known quality and composition. Avoid cements which contain silicate of soda *(waterglass)* as a base. They are injurious to linoleum. Names of reliable brands of linoleum paste and waterproof cement will be furnished upon request.

Other Methods—Laying linoleum directly over wood or concrete without an intermediary layer of felt is the most common method, but it is not recommended. In laying linoleum this way, it is of the utmost importance when cutting the linoleum to allow from ½ to 1 in. more than is needed on all sides for possible contraction or expansion; the linoleum should not be fastened down to the floor until it has lain loose on the floor for 10 days or 2 weeks. After such period has past, giving the linoleum plenty of time for expansion or contraction, it can be fastened down.

This is usually done in one of three ways, named in the order of merit:

First, by cementing the entire back surface of the linoleum to the floor.

Secondly, by cementing only the seams and edges to the floor.

Thirdly, when laid over wood, by fastening it down along the seams and edges with No. 18, ¾-in. brads, spaced about 3 in. apart.

Library of the Vocational High School, New Britain, Conn., which has a Blabon Floor of Cork Carpet

Office of the Franklin Fire Insurance Co., Philadelphia, Pa., which has a Floor of Blabon's $\frac{3}{16}$" Gray Battleship Linoleum

Blabon's "Invincible" Battleship Linoleum and Cork Carpet Selected for the Above Installations

Quiet, sanitary, easily cleaned. These qualities commend a Blabon floor especially for hospitals, libraries, churches, auditoriums and business buildings, as well as private homes.

Notice the high type of office buildings, libraries, clubs, churches, schools, theaters and public halls throughout the United States that have Blabon floors of linoleum

Continued on next page

TABLE OF GRADES, GAUGES AND WEIGHTS OF BLABON LINOLEUMS

Grades	Width, yards	Finished Gauges		Standard weight per sq. yd., lbs.
		in.	mm.	
PLAIN LINOLEUM				
¼″ Battleship...	2	.250	6.35	12.60
6 mm Battleship.	2	.235	6.00	12.10
3/16″ Battleship....	2	.1875	4.76	9.60
Light Battleship..	2	.143	3.63	7.80
A Grade.........	2	.143	3.63	7.80
B Grade.........	2	.118	3.00	6.40
C Grade.........	2	.098	2.49	5.40
D Grade........	2	.080	2.00	4.20

The above linoleums are made in the following colors: brown, green, gray and black. Black is made in A, B, and C grades only. Jaspé is made in A grade in brown and gray only.

Grades	Width, yards	in.	mm.	Standard weight per sq. yd., lbs.
INLAID LINOLEUM				
A Straight Line..	2	.118	3.00	7.30
B Straight Line...	2	.098	2.49	6.20
Tioga Straight Line..........	2	.080	2.00	4.30
A Grade Moulded	2	.118	3.00	6.70
B Grade Moulded	2	.098	2.49	5.60
Granite (B Grade)	2	.098	2.49	5.60
Midvale Moulded.	2	.079	2.00	4.00
PRINTED LINOLEUM				
D Grade........	2 and 4	.084	2.03	4.60
E Grade.........	2 and 4	.070	1.78	4.00
CORK CARPET				
Unpolished......	2	.235	5.97	7.50
Polished.........	2	.220	5.59	7.00

Cork Carpet may be had with either the polished or unpolished (natural) finish in brown or green shades. The polished cork carpet is about .015 in. thinner than the unpolished.

The gauges and weights shown in the table are the recognized standards for the grades indicated. While slight variations will occasionally occur, the figures given are substantially correct for all practical purposes.

Specifications for Laying Linoleum

The following specifications cover the installation of a linoleum floor over a wood or concrete base, as well as the preparation of the wood or concrete to receive the linoleum.

Specification A—For Laying Linoleum (or Cork Carpet) over a Layer of Builder's Deadening Felt

The linoleum contractor shall furnish and install Blabon Linoleum, Pattern No. .... grade .... of good, durable quality, according to the following directions and specifications:

(1) The general contractor (or owner) shall make provision for maintaining a temperature of 70° Fahr. in all locations where Blabon Linoleum is being laid, from the time the linoleum is delivered until the completion of the contract.

(2) The linoleum shall not be unrolled until it has been subjected continuously to a temperature not less than 70° Fahr. for at least 48 hours.

(3) The linoleum contractor shall furnish unsaturated building felt of good quality weighing 1½ lbs. to the sq. yd., sufficient to cover the whole area on which the linoleum is to be laid. He shall also furnish linoleum paste of good quality for pasting the felt to the floor and the main area of the linoleum to the felt, and in addition shall supply waterproof linoleum cement of good quality for gluing down the seams and edges.

(4) The linoleum contractor shall employ the following method in laying the felt: the felt shall be cut to fit the long way of the room, hall or corridor, and shall be so laid. A good coat of linoleum paste of good quality shall be applied to the back of the felt, which shall at once be smoothly and accurately fitted to the base, and the entire surface rolled thoroughly from center to edges with a 150-lb. iron roller. The same process shall be repeated for each width in turn. The edges of the felt shall be butted carefully, and no ridges shall be left under the linoleum. The strips of linoleum shall be laid in the same direction as the strips of felt, but the seams of the linoleum and the seams of the felt must not coincide.

(5) Not less than 24 hours after the felt has been pasted in place, the entire upper surface shall be swept clean and the linoleum laid in the following manner: the linoleum shall be accurately fitted to the walls and around all pipes and other projections in the floor. A linoleum paste of good quality shall then be applied to the surface of the felt in sufficient quantity to insure firm adhesion, except for a space 5 or 6 in. in width at those points where the edges and joints in the linoleum fall (which spaces shall be left bare for the later application of waterproof linoleum cement of good quality). The linoleum shall be placed in position immediately after the paste is applied to the felt, and the surface rolled thoroughly with a 150-lb. iron roller, until all air blisters are smoothed out.

The seams of all printed and inlaid linoleum laid under these specifications shall be made tight by butting the edges of the several strips snugly together, care being taken to preserve the symmetry of the pattern. The seams in all plain, jaspé, battleship, and granite linoleum (and cork carpet) shall be made tight by lapping the edges of the several strips approximately ½ in. when pasting them to the under layer of felt, and later cutting through both thicknesses simultaneously with a sharp knife.

Along all seams, edges and joints in the linoleum, waterproof linoleum cement of good quality shall be used to secure the material firmly to the felt. At all such points the edges of the linoleum shall be lifted, and the cement applied thickly to the surface of the felt as far back under the linoleum as the edge of the coating of paste. The cemented edges of the linoleum shall then be pressed firmly into place and thoroughly rolled until the surface is smooth and even. All seams, edges and joints shall be weighted down with pressed bricks, sandbags, or other suitable weights for not less than 24 hours.

(6) Any cement coming in contact with the surface of the linoleum shall be removed with denatured alcohol at once.

(7) The linoleum contractor shall remove the bricks, or other weights after the cement has set, and clean up all debris or dirt.

(8) To protect the linoleum floor against abuse or accident while the building is under completion, the linoleum contractor shall cover the entire surface of the linoleum floor with heavy builder's deadening felt, which shall not be removed until the building is ready for occupancy.

Specification B—Preparation of Wood Floor for Laying Linoleum

The following paragraph is to be added to the article of the architect's specifications that relates to the furnishing and installation of the wood flooring which is to serve as a base for the linoleum:

The tongued and grooved flooring, as specified, shall be thoroughly dry and well seasoned. The wood floor level shall be * inch below the finished floor level, to allow for the felt and the linoleum. The wood floor shall be sanded to a smooth, level finish. No dirt, plaster or foreign matter shall be left on the surface.

Specification C—Preparation of Concrete Base for Laying Linoleum

The following paragraph is to be added to the article of the architect's specifications that relates to the furnishing and installation of the concrete base upon which the linoleum is later to be laid:

The cement finish level shall be * inch below the finished floor line, to allow for the felt and the linoleum, and shall be troweled to an absolutely smooth and level surface. After the cement finish is thoroughly dry and well seasoned, all expansion joints shall be filled with plaster of paris, and the surface left perfectly smooth, even and free from loose particles of dirt.

Cork Carpet

This product, which is made especially for use in churches, theaters, public libraries, and other places where a soft, silent, springy floor is desired, deserves special mention here. Cork Carpet contains the same ingredients and is manufactured by the same process as a high grade of plain linoleum, but the cork composition is pressed less compactly on the burlap foundation and for this reason cork carpet retains greater resilience than linoleum, yet it is a highly durable material.

Guarantee

There is nothing new or untried about the quality of Blabon's Linoleum, as THE GEORGE W. BLABON COMPANY have been manufacturing, at first oilcloth, and then linoleum, for the past 74 years, and were pioneers in the industry.

Architects and decorators can specify or recommend Blabon products with absolute safety, because every yard is guaranteed to give satisfaction.

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*Note. In figuring the thickness of the linoleum floor, allow ⅛ in. for the deadening felt, plus the thickness of the grade of linoleum selected.

Continued on next page

How to Clean and Preserve Linoleum

The life of linoleum will be greatly prolonged and the freshness and brightness of its color indefinitely preserved if it is washed or scrubbed with lukewarm water and a good soap containing no free alkali. Always avoid strong scouring soaps or quick-cleaning preparations as they are injurious to linoleum. A list of approved soaps, cleaners, etc., will be sent on request.

The beauty and wearing qualities of inlaid or plain linoleum will be materially benefited by an occasional polishing with a good polish made of wax and pure oils, free from acid. There are several wax preparations on the market which give excellent results.

A good method of preserving printed linoleum is to give the surface of the goods a coat of good floor varnish once or twice a year. This will brighten the appearance of the linoleum, preserve the original design, and make it easier to clean.

Where heavy furniture is used, glass shoes, metal domes or rubber tips should be substituted for casters as the usual small metal casters cause undue wear and may cut through the linoleum. Glass shoes are made in several sizes, have a similar shank to that on a regular caster, and will fit into the same sockets. If glass shoes or metal domes are not obtainable, rubber tips placed on the legs of heavy furniture will answer the same purpose.

Blabon Linoleum Laying Accessories

All the materials and equipment necessary for laying linoleum along the most approved lines may be obtained at the nearest Blabon jobber, dealer or from our Linoleum Accessory Department.

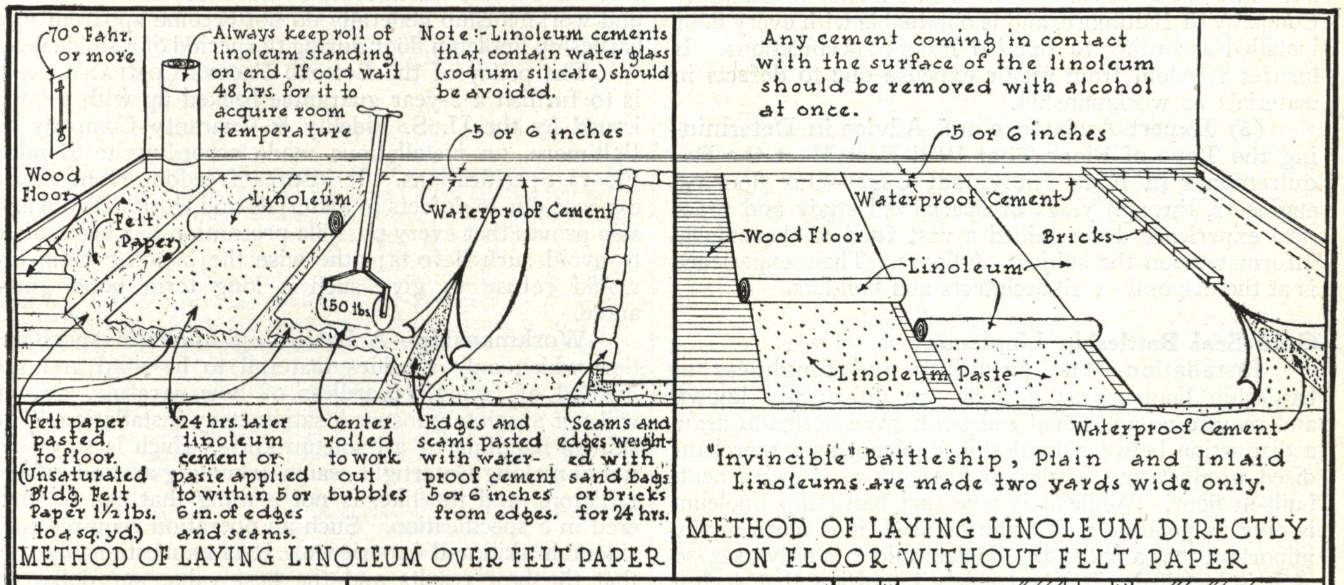
These products are made of the best materials obtainable, and are guaranteed to give satisfaction. A list of these sundries follows: Blabon's Linoleum Cement (Waterproof), Linoleum Paste (Water Resistant), Liquid Wax, Linoleum Varnish and Deadening Felt.

Growing Vogue for Colorful Floors

Unquestionably there is a growing vogue for more artistic floors, and today thoughtful women are turning to the new linoleum creations to secure color and bring new beauty into the home. There is, in fact, a pronounced and insistent call for colorful and patterned floors that has been answered by the inexhaustible range of clean-cut and blended linoleum patterns that are now obtainable, and which serve equally well as an entire floor in themselves or as a background for fabric rugs. Laid over old or stained wood floors a smart linoleum design imparts the charm of restored newness, and at the same time affords a sanitary, smooth, warm, comfortable and easy-to-clean floor.

Pattern Book and Quality Samples

Information of any character will gladly be given to architects, decorators, linoleum contractors and builders who address the company. The Blabon Pocket Size Pattern Book, showing all patterns in colors, and a large box of quality samples, containing specimens of various grades of Blabon's Linoleum, should be in every architect's files.


70° Fahr. or more
Always keep roll of linoleum standing on end. If cold wait 48 hrs. for it to acquire room temperature
Note:-Linoleum cements that contain water glass (sodium silicate) should be avoided.
5 or 6 inches
Wood Floor
Linoleum
Felt Paper
Waterproof Cement
150 lbs.
Felt paper pasted to floor. (Unsaturated Bldg. Felt Paper 1½ lbs. to a sq. yd.)
24 hrs. later linoleum cement or paste applied to within 5 or 6 in. of edges and seams.
Center rolled to work out bubbles
Edges and seams pasted with waterproof cement 5 or 6 inches from edges.
Seams and edges weighted with sand bags or bricks for 24 hrs.
METHOD OF LAYING LINOLEUM OVER FELT PAPER
Any cement coming in contact with the surface of the linoleum should be removed with alcohol at once.
5 or 6 inches
Waterproof Cement
Wood Floor
Bricks
Linoleum
Linoleum Paste
Waterproof Cement
"Invincible" Battleship, Plain and Inlaid Linoleums are made two yards wide only.
METHOD OF LAYING LINOLEUM DIRECTLY ON FLOOR WITHOUT FELT PAPER
METHOD OF CUTTING LINOLEUM HAVING NO PATTERN FOR BUTT JOINT
Direction of Greatest Traffic
LINOLEUM SHOULD BE LAID IN DIRECTION OF GREATEST TRAFFIC
Plaster
Wood
Linoleum
Plaster
Metal Cove
Linoleum
DETAILS SHOWING LINOLEUM BASE AND WOOD BASE WITH METAL COVE

METHODS OF LAYING AND DETAILS FOR USE OF BLABON LINOLEUM © The George W. Blabon Co. Philadelphia, Pa.

BONDED FLOORS COMPANY, INC.

Manufacturers, Engineers, Contractors

TELEPHONE
Rittenhouse 0352

EXECUTIVE OFFICES
1421 Chestnut Street, PHILADELPHIA, PA.

BRANCH OFFICES
NEW YORK, N. Y. PHILADELPHIA, PA. CHICAGO, ILL. DETROIT, MICH.
LOS ANGELES, CAL. SAN FRANCISCO, CAL. CLEVELAND, OHIO
AGENCIES IN OTHER PRINCIPAL CITIES OF UNITED STATES

Products

Gold Seal Battleship Linoleum.
Gold Seal Cork Tile.
Gold Seal Treadlite Tile (Cork Composition Tile).
Gold Seal Cork Carpet.

Service

The complete flooring service of Bonded Floors Company, Inc., a national organization of experienced flooring specialists, is available to architects and building contractors wherever located. This service, which covers all types of resilient floors includes:

(1) Scientific Floor Installation—In our flooring installations we combine the highest grade of materials, skillful workmanship and expert supervision. It has been conclusively proven that proper installation and proper materials are equally essential to the durability of all resilient floors.

(2) A Surety Company Bond—This bond is issued at our expense by the U. S. Fidelity & Guaranty Company of Baltimore, and is obtainable with every floor installed according to Bonded Floors specifications. It insures freedom from repair expense due to defects in materials or workmanship.

(3) Expert Assistance and Advice in Determining the Type of Floor That Will Best Meet the Requirements in Each Individual Case—Our flooring engineers, through years of specialized study and practical experience, have gained a vast fund of dependable information on the subject of floors. Their experience is at the disposal of all architects and builders.

Gold Seal Battleship Linoleum

Installation—The durability and toughness of battleship linoleum as a floor are universally known and require no additional comment. We desire to draw a distinction between battleship linoleum as a merchandised product and battleship linoleum as a permanent, built-in floor. While it is true that battleship linoleum is only as good as it is manufactured, it is more vitally important that a battleship linoleum floor is only as good as it is installed. It is extremely important that such a floor be installed by experienced mechanics skilled in this work, that the highest grade approved cements be used, and that the correct method of installation be followed.

Weights—Gold Seal battleship linoleum is manufactured to conform strictly to the rigid requirements of Federal Specification No. 209, which superseded U. S. Navy Specification 29L1C and became mandatory for all Departments and Independent Establishments of the Government on October 30, 1924. It is furnished in 4 thicknesses: $\frac{1}{4}$-in., 6 mm., $\frac{3}{16}$ in. and $\frac{1}{8}$ in. The $\frac{1}{4}$-in. and 6-mm. thicknesses are intended for extreme wear over a long period of years.

The $\frac{3}{16}$ and $\frac{1}{8}$-in. thicknesses will give excellent satisfaction for periods ranging from 10 to 15 years if maintained by the waxing method and reasonable care given in upkeep.

Colors and Decorative Effects—Gold Seal battleship linoleum is manufactured and carried in stock in the following standard colors: brown, terra cotta, gray and green. It can also be provided in the following special colors (in $\frac{1}{4}$ in. thickness only): white, light gray, medium gray, black, buff, chocolate, blue, and orange.

As installed by the Bonded Floors Company, Inc., the decorative possibilities of battleship linoleum may be enhanced by the use of borders of different but harmonious colors and by the general conformity of color to the interior decorations of the room in which it is installed. Panels of unique design and color allow individuality and create a distinctive floor of striking personality.

We are glad to furnish sketches showing design suggestions, to supply samples, and in every way to coöperate to make a beautiful, satisfactory floor.

Sanitary Cove Base—Made in any desired height or color.

Guaranteed and Bonded—The 1-year guarantee usually given by flooring contractors does not fully protect the owner, we believe, because defective materials and workmanship generally do not become apparent in a battleship linoleum floor during the period of a single year.

The policy of the Bonded Floors Company, Inc., is to furnish a 5-year guarantee backed up with a bond issued by the U. S. Fidelity & Guaranty Company of Baltimore, on installations made according to Bonded Floors Specifications. It insures freedom from repair expense due to defects in materials and workmanship and also proves that every possible precaution has been taken to avoid such defects; otherwise the bonding company would refuse to give such a long term bond guarantee.

Workmanship—A battleship linoleum specification which only specifies material to be used and the method of laying, regardless of how carefully drawn, will not absolutely insure a satisfactory installation. The skillful handling of a linoleum knife, which is so essential in making watertight seams, trimming around pillars, radiators, and the like, is not a thing that can be covered in a specification. Such an operation requires considerable skill and experience. It is unquestionably true that the best results and the best value per dollar of cost, can be obtained when the architect specifies that the installation must be made by one of a number of concerns who are specialists in this type of work, and with whose standards of workmanship he is thoroughly familiar and knows to be satisfactory.

Standard Specification for Battleship Linoleum on Concrete Base

Foreword—As the largest concern in the United States specializing in the installation of resilient floors, we are vitally interested in the service rendered by all floors of this type, whether installed by us or not. *The sole object of presenting this specification to architects is to insure high-grade jobs. It provides a fair basis for competitive bids by all reputable contractors and eliminates unscrupulous, irresponsible bidders who skimp on quality.*

Continued on next page

Specification

General—The contractor for this work shall furnish all labor and material necessary to properly install the linoleum on the floors as indicated on the drawings, or as herein specified.

Note: Specify rooms, stairs, landings, etc., which are to have linoleum floors.

Material—***1. Linoleum***—(a) The linoleum shall be U. S. Government Standard (Walton Process) (insert color desired) battleship linoleum.

(b) It shall have a maximum thickness of ...... in. and a minimum thickness of ...... in.

Note: The Federal Specification Board's Specification 209 for linoleum requires material to gauge as follows:

	Minimum	Maximum
Light weight	0.137	0.147
Medium weight	0.182	0.192
Heavy weight	0.230	0.240

(c) Only first quality material may be installed under these specifications. Material generally known to the trade as "seconds" will not be accepted.

(d) The linoleum contractor shall submit with his proposal two samples of the linoleum on which his proposal is based. These shall bear both the contractor's and manufacturer's names. After having been approved in writing by the architect, one sample shall be returned to the contractor and one retained by the architect for comparison with the linoleum furnished, which shall be equal in every respect.

2. Cement—(a) The cement used in securing the linoleum to the floor shall be one of the following brands:

—For cementing body of the linoleum.
(*Non-waterproof*)
Sisk's Lino-Tack
Bonded Floors Co. Linoleum Paste
Armstrong's Linoleum Paste
Keystone Linoleum Cement
Glue-Tite Linoleum Paste
Manayunk Stickum

—For cementing the seams and edges:
(*Waterproof*)
Bonded Floors Co. Waterproof Linoleum Cement
Armstrong's Waterproof Linoleum Cement
20th Century Linoleum Glue Cement, Grade A
Ulmer's No. 97, Crescents or Sticklin Cements
Atlas Super Cement
Wocher's No. 97 Cement

(b) The cement must be shipped to the job in the manufacturer's original package.

Workmanship—***1. Standard of Workmanship***—(a) The linoleum shall be furnished and installed by one of the following contractors: (here insert names of two or more linoleum contractors whose standard of workmanship is acceptable, or else use the general specification: "The linoleum shall be furnished and installed by the Bonded Floors Company, Inc., or a linoleum contractor equally acceptable to the architect").

2. Method of Installation—(a) No linoleum is to be installed until the concrete sub-floors are clean, smooth and free from all moisture. Before commencing work, the contractor shall inspect the underfloor and assure himself that it is in every way satisfactory and in accordance with the specifications. In the event that the underfloor is not suitable in every respect, the linoleum contractor shall notify the architect and general contractor in writing, and shall not proceed with the installation of the linoleum until such defects have been remedied.

Note: See paragraph 1 under "Additional Clauses to be Inserted in Specifications for Masonry, Heating, etc.," on following page.

(b) The linoleum contractor shall advise the general contractor sufficiently in advance so that a temperature of at least 70° F. may be supplied and maintained in all rooms where linoleum floors are to be installed, and shall not proceed with this work unless this condition exists.

Note: See paragraph 2 under "Additional Clauses to be Inserted in Specifications for Masonry, Heating, etc.," on following page.

Explanation

Indicate, if practicable, directly on the drawings, the spaces to be covered. In any event, list them in the body of the specification. This procedure will eliminate disputes and errors.

1. Linoleum—The rigid tests provided by Federal Specification Board's Specification 209, effective October 30, 1924, under which the U. S. Navy and all other Departments and Independent Establishments of the Government are making their purchases, insure a high standard of quality.

It is essential to specify Walton Process to prevent the use of an inferior grade of linoleum which is made with *physically* changed (polymerized) linseed oil rather than by the customary method with oxidized linseed oil.

This short-cut method, generally referred to as the Taylor Process, produces a grade of linoleum which on occasions will pass the Government test when fresh from the mill, but which will not conform to the Federal requirements when over six months old.

"U. S. Government Standard (Walton Process)" is definite and understandable to all manufacturers and contractors, and provides for maximum competition on a quality of material which will meet the service requirements of any floor where linoleum is suitable.

2. Cement—(a) There are no generally accepted standardized tests for cement as there are for linoleum, consequently the only alternative is to specify a number of cements known by experience to be satisfactory.

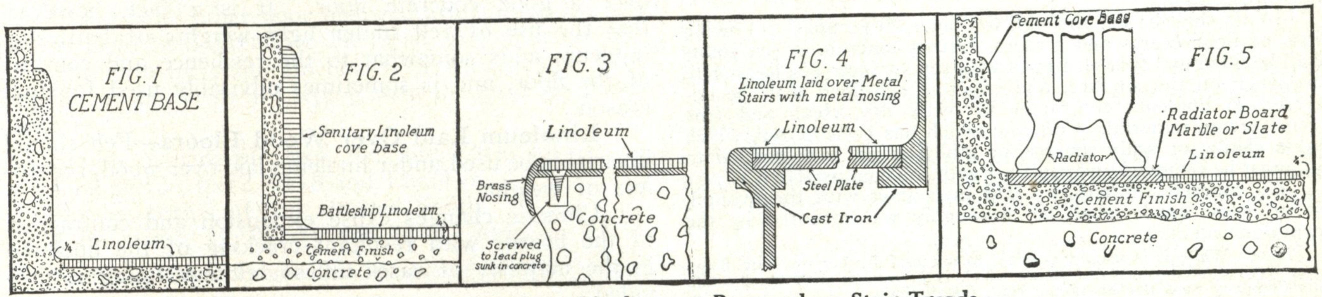
(b) Prevents unscrupulous contractors substituting inferior cements.

1. (a) Experience proves that the durability of battleship linoleum floor depends quite as much on how the work is done as upon the quality of the material used. *In the case of this particular product, there is no substitute for skilled workmanship.*

2. (a) Do not specify Linoleum floors laid over sub-floors in contact with the ground, either on or below grade, without consulting Engineering Department, Bonded Floors Company, Inc.

It is impossible to install battleship linoleum satisfactorily on a sub-floor which is not entirely free from all moisture.

(b) Battleship linoleum when cold, or if unrolled in a cold room, has a tendency to crack. It should be stored in a warm room at least 24 hours before unrolling.



Details for Finishing Linoleum at Base and on Stair Treads

Continued on next page

(c) The linoleum shall be rolled out and cut into lengths required, allowing sufficient additional for trimming at the ends of each strip.	(c) Self-explanatory.
(d) The linoleum is to be laid with the fewest possible number of seams. The use of small pieces, resulting in unnecessary seams, shall not be permitted.	(d) Avoid a patched-up looking job.
(e) All seams are to be lapped (not butted) approximately ½ in.	(e) See paragraph "h" below.
(f) The body of the linoleum shall then be secured, with one of the approved brands of non-waterproof cement, to the concrete underflooring to within 4 to 6 in. of the seam. Sufficient cement shall be applied to thoroughly key the burlap to the floor.	(f) Better results can be obtained when cementing the body of the linoleum to the sub-floor with non-waterproof rather than waterproof cement. Most waterproof cements are cut with alcohol and when this solvent evaporates under the body of a sheet of linoleum, it causes buckles; the gas has no way of escaping as it has when used along the seams and edges. We do not recommend the use of felt under heavy and medium weight battleship linoleum when laid over concrete (see "When to Install Linoleum Over Felt," on this page).
(g) The linoleum shall then immediately be rolled thoroughly with a roller to smooth out any air blisters and to secure proper adhesion. The roller shall be made of independently weighted sections, each section being not more than 12 in. long, and shall have sufficient weight to give not less than 10-lb. pressure per lineal inch of the surface which is in contact with the floor.	(g) The wider the roller the more possibility of a greater part of the rolling surface losing contact with the floor by reason of running over bumps. Therefore, 12 in. should be the maximum length. Greater breadth can be obtained by the combination of independently weighted sections. Substantial pressure per lineal inch of rolling surface is of course essential.
(h) Where the linoleum has been lapped, seams are to be cut through both thicknesses on a straight even line with a sharp knife, so as to make a tight and practically invisible joint.	(h) It is only in this manner that seams can be made watertight and practically invisible. To cut seams satisfactorily is an operation that requires considerable skill and experience.
(i) These edges must then be thoroughly cemented with one of the approved waterproof cements and rolled with a roller of the type specified under "g" above and weighted with sand bags, bricks or other appropriate weights for 24 hours.	(i) The use of waterproof cement for seams and edges is advisable in order to prevent cleaning water, which may get into the seams and edges, from loosening the linoleum from the floor.
(j) Linoleum shall be cut to fit accurately and snugly against all walls, pipes, floor outlet boxes and other permanent projections in the floor.	(j) This is another operation that can only be satisfactorily done by skilled mechanics, hence the importance of specifying a standard of workmanship.
(k) Upon completion of the work, the linoleum contractor shall clean the floors of all surplus material, and leave them ready for occupancy.	(k) Self-explanatory.
Guarantee—The linoleum contractor shall guarantee his work to the owner or general contractor, as directed by the architect, against defects of material or workmanship for a period of 5 years from date of acceptance by the architect, and shall, on receipt of written notice from the owner, make, at his own expense, any repairs that may be necessary, except repairs of injury from any cause other than ordinary wear and tear, and shall furnish a surety bond in the full amount of the contract covering the performance of this guarantee.	**Guarantee**—The customary 1-year guarantee clause, while adequate on construction work in general, does not fully protect the owner in the case of a battleship linoleum floor. *The reason is that defective materials and workmanship generally do not become apparent during the period of a single year.* On account of the very nature of the product and its method of installation, it is not possible to write a specification that will absolutely prevent unscrupulous and irresponsible contractors from substituting inferior materials and using cheap labor. The best defense against such practices, which unfortunately are only too common, is for the architect to require a 5-year guarantee *backed up with a surety bond.* The cost of such a bond to a financially and morally responsible contractor is purely nominal. Such a surety bond guarantee is the best assurance that the architect will obtain for his client what he is in the market to buy; i. e., satisfactory flooring.

Additional Clauses to be Inserted in Specifications for Masonry, Heating, etc.—*(1) Masonry—Levels*—Finished concrete floor level shall be (insert thickness of linoleum to be used) below finished floor line given or shown on drawings.

Cement Finish—Concrete floor slab shall have a top layer 1 to 1½ in. thick, composed of 1 part portland cement to 2½ parts clean screened sand, troweled to a smooth sidewalk finish and free from high and low spots. Do not sprinkle with portland cement when troweling and do not trowel hard enough to obtain a hard glazed finish. Cement hardeners and so-called integral waterproofings should not be used in concrete over which linoleum is to be installed. They tend to close the surface pores of the concrete, thus retarding evaporation of the moisture content.

Joints shall be cut through top layer 20 ft. apart following lines of floor beams and girders. After concrete is set, joints shall be filled and troweled even with top surface. No lines shall be struck on the surface, and concrete sub-floor shall be delivered to linoleum contractor perfectly dry, clean and free from foreign material. Concrete which has been frozen, which has a chalky or scaly surface, or which is not well bonded to fill, must be removed and replaced with top coat as above.

All concrete or masonry laid in contact with the ground, on or below grade, shall be thoroughly waterproofed by the membrane method.

Note: While it is usually possible to successfully lay linoleum floors on a waterproofed concrete backing which is in contact with the ground, this Company does not guarantee such installations.

(2) Heating—General contractor shall furnish temporary heat necessary to maintain a temperature in the rooms where linoleum is to be laid of not less than 70° F., commencing 48 hours before linoleum work is to start and continuously until finished.

(3) Lighting, etc.—General contractor will provide light, storage space and hoisting facilities required for proper execution of linoleum contractor's work.

When to Install Linoleum Over Felt

Linoleum Laid Over Concrete—It is never necessary to use felt interlining under linoleum when installed over a good concrete floor. It is a fact, however, that the use of felt under light weights of battleship linoleum adds somewhat to the resilience and comfort of the floor, and is sometimes advisably used for that reason.

Linoleum Laid Over Wood Floors—Felt should invariably be used under linoleum laid over wood, regardless of weight.

Climatic changes cause expansion and contraction of the boards with resultant cracking of the linoleum in the majority of cases unless felt interlining is provided.

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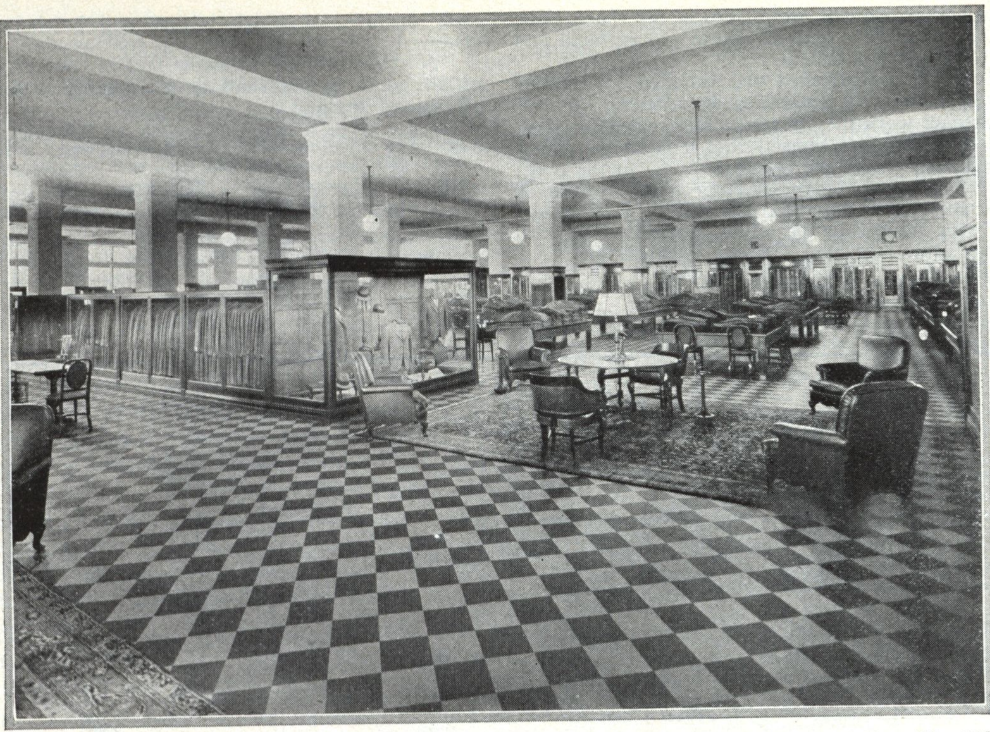


Men's Shop in Saks-Fifth Avenue Store, New York, N. Y. The Floor of Gold Seal Treadlite Tile, Installed by Bonded Floors Company, Inc., Is Quiet, Restful and Distinctive

Gold Seal Treadlite Tile

Description—Gold Seal Treadlite Tile is a soft, resilient compound of cork, gums and pigments.

It possesses to a remarkable degree the permanent resiliency, sure foothold and freedom from disintegration so characteristic of cork, its principal ingredient.

It is absolutely non-absorbent, durable even beyond the requirements of the average floor, quiet, bright and clean in appearance, sanitary and easily washed—in fact, it satisfies every utilitarian floor requirement from the corridor of a great office building to the daintiest rooms in a private house.

It is adaptable to any type of construction, and can be installed on any smooth, solid backing, such as wood, concrete, steel, marble, etc.

Decorative Effect—It is manufactured in extremely attractive colors: stone-gray, moss-green, terra cotta, craft brown, slate-gray, fawn-gray, buff, Pacific blue, mahogany brown, ivory white, black, and orange.

This wide choice of colors affords an opportunity to provide a floor which is artistic, distinctive, and thoroughly in keeping with the general scheme of decoration and design of the room in which it is to be installed.

There is no other floor material available at the low cost of Gold Seal Treadlite Tile, that so completely fills all of the many requirements of a satisfactory floor installation and is so in keeping with the most luxurious interiors.

Sizes—Square tile, 6x6, 9x9 and 12x12 in.
Oblong tile, 6x12, 9x18 and 12x24 in.
Border Strips of any desired width.
Joint strips, 1/4, 3/8, 1/2 and 3/4 in. wide.

Sanitary Cove Base—Made in any desired height of any standard color.

Stair Treads—Gold Seal Treadlite Tile is ideal for stair work. It may be laid as a mat, covering part of the tread only, or over the entire tread.

It is also frequently used as a combined tread and riser with sanitary cove at the intersection. This is particularly desirable construction where the treads are closed at both sides.

Installations—Bonded Floors Company, Inc., is equipped to take contracts for Gold Seal Treadlite Tile floors installed complete, also to give all necessary technical data regarding construction and general conditions.

We maintain a designing and drafting department, which will make layouts and designs for all work. This service is available to architects and contractors wherever located.

Guaranteed and Bonded—The 1-year guarantee usually given by flooring contractors does not fully protect the owner, we believe, because latent defects in materials and workmanship generally do not become apparent in a resilient floor during a period of a single year.

The policy of the Bonded Floors Company, Inc., is to furnish a 5-year guarantee, backed up with a bond issued by the United States Fidelity & Guaranty Company, of Baltimore, Md., on installations made according to Bonded Floors specifications. It insures freedom from repair expense due to defects in materials and workmanship, and also proves that every possible precaution has been taken to avoid such defects; otherwise the bonding company would refuse to give such a long term bond guarantee.

Standard Specifications for Gold Seal Treadlite Tile Floors—Gold Seal Treadlite Tile shall be installed in (specify spaces or rooms) and on treads and landings of (mention stairways).

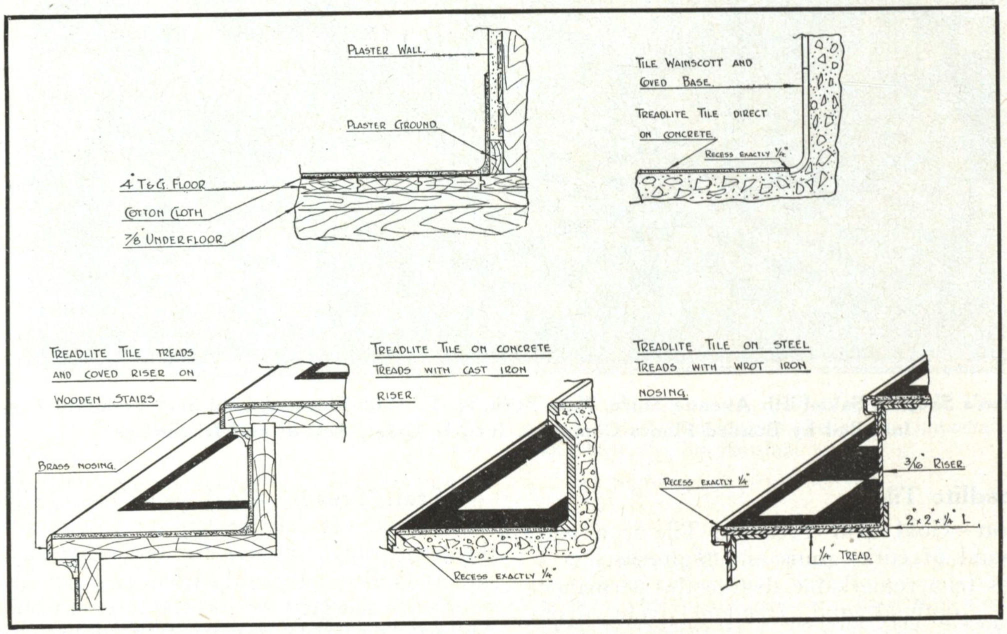
Tile shall be 1/4 in. thick, homogeneous in texture throughout, cut true to size and shape with absolutely square, clean-cut edges. It shall be cut to and fitted accurately against all walls,

Continued on next page

pipes, outlet boxes and permanent projections in the room. The underside of the tile shall be scored to insure proper bond and shall be set with waterproof cement.

Treadlite Tile shall be furnished and installed by Bonded Floors Company, Inc. or their authorized distributers.

Before commencing work the Treadlite Tile contractor shall inspect the sub-floor and assure himself that it is in every way suitable and in accordance with the specifications. In the event that the sub-floor is not suitable in every respect, this contractor shall notify the architect and general contractor in writing, and shall not proceed with the installation of the Treadlite Tile until such defects have been remedied. (See Specifications "A," "B", "C", and "D").


PLASTER WALL.
PLASTER GROUND
4" T&G FLOOR
COTTON CLOTH
7/8" UNDERFLOOR
TILE WAINSCOTT AND COVED BASE.
TREADLITE TILE DIRECT ON CONCRETE.
RECESS EXACTLY 1/4"
TREADLITE TILE TREADS AND COVED RISER ON WOODEN STAIRS
BRASS NOSING.
TREADLITE TILE ON CONCRETE TREADS WITH CAST IRON RISER.
RECESS EXACTLY 1/4"
TREADLITE TILE ON STEEL TREADS WITH WROT IRON NOSING.
3/16" RISER.
RECESS EXACTLY 1/4"
2"×2"×1/4" L
1/4" TREAD.

Details of Gold Seal Treadlite Tile

The Treadlite Tile contractor shall advise the general contractor sufficiently in advance so that a temperature of not less than 70° F. may be supplied and maintained in all rooms where Gold Seal Treadlite Tile is to be installed, and shall not proceed with his work until this condition exists.

Guarantee—The Treadlite Tile contractor shall guarantee his work to the owner or general contractor, as directed by the architect, against defects of material or workmanship for a period of 5 years from date of acceptance by the architect, and shall, on receipt of written notice from the owner, make, at his own expense, any repairs that may be necessary, except repairs of injury from any cause other than ordinary wear and tear and shall furnish a surety bond in the full amount of the contract covering the performance of this guarantee.

Specifications "A" for Concrete Backing
Include in Mason's Specifications for Floors

Concrete sub-floor to receive Treadlite Tile shall have a top layer 1 to 1½ in. thick, composed of 1 part portland cement to 2½ parts clean screened sand, troweled to a smooth sidewalk finish and free from high and low spots, ¼ in. below the required finished floor level.

Joints shall be cut through top layer approximately 20 ft. apart, following the lines of floor beams and girders. After the concrete has set, the joints are to be filled and troweled even with top surface. No lines shall be struck on the surface, and it shall be delivered to the Treadlite Tile contractor clean, dry and free from foreign material.

Cement hardeners and so-called waterproofings should not be used in concrete over which linoleum is to be installed. They tend to close the surface pores of the concrete, thus retarding evaporation of the moisture content.

In order to insure rapid drying, allow all possible ventilation in rooms where Treadlite Tile floors are to be laid.

Concrete which has been frozen, which has a chalky or scaly surface, or which is not well bonded to fill, must be removed and replaced with top coat as above.

All concrete and masonry laid in contact with the ground, on or below grade shall be thoroughly waterproofed by the membrane method.

Note: While it is usually possible to successfully lay Treadlite Tile floors on a waterproofed concrete backing which is in contact with the ground, this Company does not bond such installations.

Specifications "B" for Wood Backing
Include in Carpenter's Specifications for Floors

In spaces where Treadlite Tile is called for in the plans and specifications, lay double floors; the top or finished floors to be ⅞-in. tongued and grooved, not more than 4 in. wide, driven tight, well nailed and finished true and level ¼ in. below the required finished floor level; joints and butts to be planed or scraped smooth.

Old Work—In preparing old wood floors to receive Treadlite Tile, remove all badly worn or decayed boards or boards containing knotholes or loose knots, and replace with new lumber, in accordance with wood flooring specifications. Old floors to be thoroughly surface-nailed to secure all springy boards, loose butts or joints; joints or butts then to be scraped or planed smooth and even.

Note: Treadlite Tile should never be installed on a wood floor which is laid on sleepers over concrete unless the concrete has had ample time to become *absolutely dry*. If this rule is not observed, the moisture from the concrete will rot the wood floor, thus destroying the entire job. It is always considered better construction to lay Treadlite Tile floors directly on concrete and all new work should be so designed.

Specification "C" for Backing for Cove Base

Plaster, wood or other material against which base or wainscoting is to be installed shall be carried down to and finished square with the underfloor, making a clean, straight right-angle with same and free from lumps, dirt or other obstructions.

Specification "D" for Radiator Bases
Include in Marble and Tile Specifications

All radiators which rest on the floor shall have a (here insert marble, slate or cement) base extending from the wall to a line 1 in. beyond the radiator legs at each end. When such base is set on wood floors, it shall be carefully shimmed up so as to be true and rigid.

Temporary Heat—The heating contractor shall, when notified by the general contractor, furnish heat necessary to maintain a temperature of not less than 70° F. in all spaces in which Treadlite Tile is to be laid.

Do not specify Treadlite floors laid over sub-floors which are in contact with the ground, either on or below grade, without consultation with the Engineering Department of the Bonded Floors Company, Inc.

Continued on next page

Gold Seal Natural Cork Tile

Of all types of resilient floors, natural cork tile is the most difficult to specify in such a manner as to insure a durable, satisfactory installation. There is no other flooring material wherein there is such a wide variation in quality without fixed standards for comparison.

It is possible to make two pieces of tile equal in weight and general appearance, but varying widely in cost, one of them with a probable life of 2 to 5 years and the other 20 to 25 years.

Because of this inherent characteristic of the material, it is extremely important that the architect write specifications which permit him to select a cork tile sub-contractor, of known standing in this particular field.

Description and Manufacture—Gold Seal natural cork tile is manufactured from the finest quality of carefully selected, pure cork shavings, under the most approved process. The cork is compressed in closed moulds and baked. It is free from artificial binder or foreign substance of any kind. The extreme heat of the baking liquefies the gum of the cork, causing it to fill all voids and to act as a natural cement or binder.

Durability—Cork is recognized as a remarkably durable and resilient flooring material. Its toughness and elasticity are proof against the hardest service.

Appearance—Gold Seal natural cork tile floors are of natural varying shades of brown.

The squares and oblongs of numerous sizes lend themselves to many and pleasing interesting designs.

Economy—Cork requires no care but ordinary washing with soap and water. Its first cost is its only cost, and that is comparatively low.

Special Features—*Resiliency*—The permanent elasticity of Gold Seal natural cork tile makes walking on it as pleasant and restful as walking on the thickest carpet. Cork, being an insulator of heat and cold, neither chills, burns nor tires the feet.

Safety and Noiselessness—Gold Seal natural cork tile is non-slippery and noiseless under foot.

Sanitation—Non-absorbent, it is dust-proof, verminproof and impervious to grease, water and other liquids.

Scope of Use—Gold Seal natural cork tile is the logical floor where quiet comfort under foot and secure foothold are essential, particularly in spaces where people are compelled to stand, such as in libraries, museums, working spaces in banks, art galleries, courtrooms, billiard rooms and gymnasiums.

Installation—Cork tile is laid in an elastic, waterproof, adhesive cement; can be applied to any smooth, dry, level surface, such as concrete, wood, steel, etc.

Sanitary Cove Base—Gold Seal natural cork cove base can be furnished to any height desired; 6 in. is standard. It may be applied to any smooth, nailable wall surface.

Colors—Light, medium and dark brown.

Standard Sizes—Square tile, 6x6, 9x9 and 12x12 in.
Oblong tile, 6x12, 9x12 and 12x24 in.
Border tile, 3x36, 6x36, 12x36 and 20x40 in.
Other sizes to order.

Guaranteed and Bonded—The 1-year guarantee usually given by flooring contractors does not fully protect the owner, we believe, because latent defects in materials and workmanship generally do not become apparent in a cork tile floor during a period of a single year. The policy of the Bonded Floors Company, Inc., is to furnish a 5-year guarantee, backed up with a bond issued by the United States Fidelity & Guaranty Company, of Baltimore, Md. It insures freedom from repair expense due to defects in materials and workmanship, and also proves that every possible precaution has been taken to avoid such defects; otherwise the bonding company would refuse to give such a long term bond guarantee.

Standard Specifications for Gold Seal Cork Tile—Floors (or stair treads) shall be of Gold Seal cork tile ½ in. thick, made entirely of the best grade of clear, carefully selected cork shavings; compressed solidly in closed moulds and thoroughly baked. It shall contain no granulated cork and shall be free from all foreign substances and cement of any kind, other than the natural gum of the cork, and shall weigh at least 21 oz. per sq. ft., ½ in. thick.

It shall be set in a waterproof cement, so applied to the tile and foundation as to achieve perfect adherence and hermetically seal and bind all joints.

All cork tile to be furnished under this specification shall be installed by a contractor thoroughly experienced in this line of work and satisfactory to the architect in every respect.

If cove base is required, state height required.

Note: The mention of our name will unmistakably identify the kind of material required and preclude the substitution of all inferior makes and imitations.

Samples—The cork tile contractor shall submit with his proposal two samples of the cork tile on which his proposal is based. These shall bear both the contractor's and the manufacturer's names.

All cork tile to be furnished under this specification shall be installed by a contractor thoroughly experienced in this line of work and satisfactory to the architect in every respect.

Guarantee—The cork tile contractor shall guarantee his work to the owner or general contractor, as directed by the architect, against defects of material or workmanship for a period of 5 years from date of acceptance by the architect, and shall, on receipt of written notice from the owner, make, at his own expense, any repairs that may be necessary, except repairs of injury from any cause other than ordinary wear and tear, and shall furnish a surety bond in the full amount of the contract covering the performance of this guarantee.

Specification for Concrete Backing

Include in Mason's Specifications for Floors

The concrete floor slab shall have a top layer 1 to 1½ in. thick, composed of 1 part portland cement to 3 parts clean, screened sand, troweled to a smooth sidewalk finish and free from high and low spots. Do not sprinkle with portland cement when troweling and do not trowel hard enough to obtain a hard glazed finish. Cement hardeners and so-called internal waterproofings should not be used in concrete over which linoleum is to be installed. They tend to close the surface pores of the concrete, thus retarding evaporation of the moisture content. Joints shall be cut through the top layer 20 ft. apart, following the lines of the floor beams and girders.

After the concrete is set, the joints shall be filled and troweled even with the top surface. No line shall be struck on the surface, and the concrete sub-floor shall be delivered to the cork tile contractor perfectly dry, clean and free from foreign material.

Concrete which has been frozen, which has a chalky or scaly surface, or which is not well bonded to fill, must be removed and replaced with top coat as above.

All concrete or masonry laid in contact with the ground, on or below grade, shall be thoroughly waterproofed by the membrane method.

Note: While it is usually possible to successfully lay cork tile floors on a waterproofed concrete backing which is in contact with the ground, this Company does not guarantee such installations.

Specification for Wood Backing

Include in Carpenter's Specifications for Floors

The wood floor on which the cork tile is to be laid shall be laid ½ in. below finished floor level. It shall be of good quality (at least ⅞ in. thick) dry, seasoned, dressed flooring, tongued and grooved, not over 4 in. wide. This flooring shall be laid with tight joints, perfectly smooth, even and level, and well nailed.

Do not specify Cork Tile floors laid over sub-floors which are in contact with the ground, either on or below grade, without consultation with the Engineering Department of the Bonded Floors Company, Inc.

CERTAIN-TEED PRODUCTS CORPORATION

LINOLEUM DIVISION

GENERAL OFFICES

100 East 42nd Street

NEW YORK, N. Y.

SALES OFFICES

ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DES MOINES, IOWA
RICHMOND, VA.
DETROIT, MICH.
HOUSTON, TEX.
INDIANAPOLIS, IND.
KANSAS CITY, MO.
SAN FRANCISCO, CAL.
LOS ANGELES, CAL.
MEMPHIS, TENN.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
ST. LOUIS, MO.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.

Products

Battleship Linoleum, Plain Linoleum, Cork Carpet, Inlaid Linoleum.

Also Printed Linoleum, Printed Linoleum Rugs, Floortex (Felt Base Floor Covering), Floortex Rugs.

Also manufacturers of Oilcloth.

For Gypsum Products, see pages 363-365; for Roofing and Building Papers, see page 1041; for Paints and Varnishes, see pages 1672-1673.

Quality

Certain-teed Linoleum, like all other products bearing the Certain-teed label is the highest quality. It is manufactured from the best raw materials obtainable, gathered from different parts of the world. Each ingredient is carefully tested by expert chemists to insure maintenance of the rigid Certain-teed standards.

Certain-teed Linoleum is made under formulas that are the result of long, practical experience, by an organization that has been making these goods for many years. The manufacturing processes are under constant inspection and chemical control. Each piece of Certain-teed Linoleum is carefully inspected before it leaves the factory—only products measuring up to the exacting Certain-teed requirements are sold under the Certain-teed label.

General Specifications

Certain-teed Battleship and Plain Linoleum is made by the Walton Process.

All linoleum is manufactured 2 yards wide and packed one roll of approximately 60 square yards to the case. Printed Linoleum is also made 4 yards wide (approximately 120 square yards per roll).

Certain-teed Battleship Linoleum

Certain-teed Battleship Linoleum is extensively used in office buildings, hospitals, schools, and similar buildings where the floor surface is subjected to unusually hard wear.

The resilience, long-life, sound-deadening properties, economy and good appearance of this product recommend it to every architect.

Made in brown and green and in three weights—Heavy, Medium and Light, the only difference between the various weights being in the thickness of the material.

For weights and thicknesses see table.

Certain-teed Plain Linoleum

Exactly the same product as Certain-teed Battleship Linoleum. Made in lighter weights—B, C, D and E grade, respectively. The grades differ only in the thickness of the material. Manufactured in brown, green and gray. Gives excellent service and is recommended where the heavy linoleum is not required.

For weights and thicknesses see table.

Commercial Battleship and Plain Linoleum—Commercial Battleship and Plain Linoleum is a standard quality product made by the Taylor Process. It is extremely pliable, resilient, easy to lay and long wearing. It is being used extensively in office buildings, schools, hospitals and wherever the floor is subjected to extremely hard wear.

For weights and thicknesses see table.

Certain-teed Cork Carpet

This material is unexcelled for its sound-deadening properties and resilience. It finds its greatest use in auditoriums, churches, libraries and in gymnasiums as a covering for basketball floors and running tracks. It makes an attractive floor and will give good service. It is made in brown and green.

For weights and thicknesses see table.

Certain-teed Inlaid Linoleum

The Certain-teed line of inlaid linoleum is complete. It offers a wide range of patterns and a variety of colors, giving a choice of several designs to match any color scheme.

There are two types of inlaid linoleum—straight line and moulded. In straight line linoleum the lines of the patterns are die cut, making them straight and uniform. The moulded inlaid is made by "sifting" through stencils the various colored materials while in the granulated form. Moulded inlaid has a softness of color which harmonizes beautifully with any type of interior decoration. In both kinds of inlaid linoleum, the patterns go through to the burlap back, insuring their permanence until the goods are completely worn out.

Certain-teed Straight Line Inlaid Linoleum—This material comes in many attractive tile patterns with a large variety of color effects.

Certain-teed Moulded Inlaid Linoleum—Certain-teed Moulded Inlaid Linoleum is made in a variety of designs and patterns, in two weights, both of the same high quality and differing only in the thickness of the material.

Certain-teed Granite Inlaid Linoleum—Moulded inlaid linoleum having a mottled effect similar to the

Continued on next page

stone from which it takes its name. Made in brown and blue.

Use of Felt Under Linoleum

We do not consider it necessary to use felt under linoleum unless the floor is so rough and uneven that it can not be fairly leveled.

Specifications for Laying

The contractor shall furnish all material and labor necessary to properly lay the linoleum on the floors indicated on the drawing (or specified herein as follows):

(1) Preparation of Floors

Note: Use paragraph 1a or 1b depending on type of floor to be covered.

(1a) Wood Floors—Contractor shall make sure that all base floor wood is securely nailed to the supporting members; that floor surface is thoroughly dry and that material used is thoroughly seasoned. Floor shall be free from all nails, loose knots or protrusions. No foreign matter such as dirt, plaster, etc., shall be left on the floor surface.

Floor shall be sanded to a smooth level finish. Contractor shall furnish a satisfactory crack and crevice filler and fill all seams or joints that open more than 1/8 inch between boards.

(1b) Concrete Floors—Concrete subfloor shall be cleaned smooth and free from all moisture. Contractor shall make sure that subfloor is in absolutely satisfactory condition before proceeding with the laying of linoleum. All cracks, expansion joints, etc., shall be filled with plaster of paris or similar materials so as to give an absolutely smooth and level subfloor surface.

Note: Linoleum should not be laid on floors directly in contact with the ground or on any floor surface under which there is no air space of at least 18 inches, unless floor is thoroughly waterproofed.

(2) Linoleum—Linoleum used for this work shall be Certain-teed .... (insert kind such as Battleship, Plain, Inlaid, etc.). Color: .... (insert brown or green for Battleship and Plains or pattern number for Inlaids). It shall have a thickness of ...... (see table for this information). Linoleum contractor shall furnish with this proposal two samples of linoleum on which his proposal is based. One sample shall be returned to the contractor, the other shall be retained by the architect for comparison with the linoleum furnished.

(3) Cement—Cement for this purpose shall be a material that has no ingredient which is injurious to the linoleum. It shall, when set, have sufficient adhesive strength to cause the linoleum to adhere securely to the floor.

(4) Method of Application

(4a) Heating—The linoleum contractor shall notify the general contractor sufficiently in advance so that the latter may supply a temperature of 70° F., starting at least 48 hours before the linoleum work is begun and maintained continuously until 24 hours after the linoleum has been laid.

The linoleum contractor shall be responsible for seeing that these conditions are met and shall not proceed with the laying of the linoleum until they have been met.

(4b) Unrolling—Linoleum shall not be unrolled until it has been subjected on the job to a temperature of 70° F. for a minimum of 48 hours with rolls loosened.

(4c) Fitting—Linoleum shall be laid with as few seams as possible. Allowances shall be made for trimming the edges of Battleship and Plain Linoleum with 1/2-inch lap along each sheet at seams. The sheets shall run parallel to the length of the room, if possible, and shall be straight and tight. Small pieces of linoleum which would produce unnecessary seams shall not be used.

Linoleum shall be cut to fit accurately and snugly against all walls, pipes, outlets or other permanent projections from the floor.

(4d) Applying—Linoleum shall be rolled out and cut into lengths required, allowing sufficient additional length for trimming at the ends of each strip. The body of the linoleum shall then be secured with cement as specified in paragraph 3. This cement shall be applied to the underflooring the full width of the linoleum strip. Sufficient cement shall be applied so as to cause the burlap to thoroughly adhere to the subfloor.

Note: One gallon will be required to every ten or twelve square yards.

The linoleum shall then be placed in position, with seams overlapping 1/2-inch for Battleship or Plain Linoleum, and the surface rolled thoroughly with a roller to smooth out any air pockets or blisters.

Seams where material has been overlapped shall be made smooth, even and tight by cutting through both thicknesses of the material with a sharp linoleum knife.

Note: This method can not be used on pattern goods. Pattern goods shall be trimmed and edges butted together.

Edges shall then be rolled and weighed down with weights which are thoroughly dry. These weights shall remain on the seams for at least two hours. If cement should come in contact with the surface of linoleum it shall be wiped off immediately by a damp cloth.

(4e) Cleaning—The linoleum contractor shall (upon completion of the work) clean the floors of all surface material leaving them ready for occupancy.

[We would recommend that linoleum contractor wax and polish the linoleum after properly cleaning surface.]

Note: If waterproof cement for edges is desired, method of application is same as above except that an area 8 to 12 inches wide along the seams and edges is left uncovered with non-waterproof cement. Waterproof cement shall then be applied to this uncovered area.

LINOLEUM WEIGHTS AND THICKNESSES

NAME AND GRADE	THICKNESS		Net weight per sq. yd., lb.
	Inches	Millimeters	
Certain-teed Battleship (Walton Process)			
Heavy	.238	6.00	11.9
Medium	.187	4.76	9.4
Light	.142	3.60	6.8
Certain-teed Plain (Walton Process)			
"B" Grade	.118	3.00	5.8
"C" Grade	.095	2.40	4.9
"D" Grade	.079	2.00	4.1
"E" Grade	.069	1.75	3.5
Commercial Battleship (Taylor Process)			
Heavy	.238	6.00	10.0
Medium	.187	4.76	8.0
Light	.142	3.60	6.0
Commercial Plain (Taylor Process)			
"B" Grade	.118	3.00	5.1
"C" Grade	.095	2.40	4.1
Cork Carpet			
"A" Grade	.262	6.60	7.7
"AA" Grade	.224	5.70	6.6
Straight Line Inlaid Linoleum	.071	1.80	5.1
Moulded Inlaid Linoleum			
"B" Grade	.098	2.50	6.3
Mercer	.071	1.80	5.0
Granite	.083	2.10	5.6

CONGOLEUM-NAIRN INC.

Nairn Linoleum

PHILADELPHIA, PA.

PHILADELPHIA, PA., 1421 Chestnut Street
NEW YORK, N. Y., 295 Fifth Avenue
CHICAGO, ILL., 1435 West 37th Street
SAN FRANCISCO, CAL., 350 Second Street
BOSTON, MASS., 666 Summer Street
MINNEAPOLIS, MINN., 900 No. 4th Street

NEW ORLEANS, LA., 118 No. Front Street
DALLAS, TEX., 405 Commerce Street
KANSAS CITY, MO., 1324-26 West 12th Street
ATLANTA, GA., 1010 Marietta Street
PITTSBURGH, PA., 620 Second Avenue
CLEVELAND, OHIO, 6300 Euclid Avenue

How Quality Is Built into Nairn Linoleums

The fundamental materials used in the manufacture of all Nairn Linoleums are more or less the same. We subject all raw materials to exhaustive tests before they are processed. The 37 years which Nairn has devoted solely to the manufacture of linoleum have given us the experience necessary to combine these raw materials in the best way to give a resultant material that will resist wear and give long life in a remarkable degree.

Samples of each run of goods are subjected to tests of abrasion, indentation, bending and seasoning, and every yard is thoroughly inspected before being shipped.

MADE IN NAIRN'S U.S.A.
REGISTERED TRADE MARK

NAIRN
Gold Seal
INLAID
TRADE MARK
SATISFACTION GUARANTEED OR YOUR MONEY BACK IF LAID ACCORDING TO DIRECTIONS ON BACK OF THE GOODS
REMOVE SEAL WITH WET CLOTH

TRADE-MARKS

Types of Nairn Linoleum

To meet the general demand, Nairn manufactures the most complete line of linoleums. This line comprises Battleship and Plain Linoleum, Gold Seal Inlaids (including *Belflor* and *Universal*), Moulded, Moiré and Granite Linoleums, Cork Carpet, and Printed Linoleum.

Contract Linoleum

Nairn Battleship Linoleum is a heavy linoleum of the highest quality, manufactured under the Walton process to more than meet U. S. Government specifications. It is recommended for use in buildings of every type where severe traffic conditions require maximum durability.

Nairn Battleship is made in four thicknesses. A tolerance of .005 in. either way is customary in measurement.

"XXX"—¼ in., 6.35 mm. thick.

"XX"—Heavy weight Government standard, 6.00 mm. thick.

"X"—$\frac{3}{16}$ in. (medium weight Government standard), 4.80 mm. thick.

Light Weight—3.60 mm. thick. For use in covering large floor spaces where the heavier grades of Nairn Battleship are more costly than conditions require.

All thicknesses are made only in the 6-ft. width.

Nairn Plain Linoleum

Exactly the same in quality as Nairn Battleship, from which it may be distinguished by the fact that its gauges are lighter and its burlap backing painted instead of plain. As the thickness becomes less, the resistance to wear is reduced correspondingly. However, Nairn Plain Linoleum is sufficiently durable for all but the most exacting uses, and wherever the traffic is not severe will prove as satisfactory as the battleship grade at a material saving in first cost.

Thicknesses and Widths—Made in three thicknesses varying from 3.00 to 1.70 mm., and in 6-ft. widths.

Colors—All grades of battleship and plain linoleum are made in brown, green, gray and terra cotta.

Gold Seal Inlaid—Belflor Patterns

This distinctive inlaid, made exclusively by CONGOLEUM-NAIRN INC., can be advantageously used as the foundation of any decorative scheme. The tiles which form the patterns have an inlaid over-all decoration, giving a soft-toned, prismatic effect. The patterns in this line are divided between two thicknesses or grades:

Belflor Heavy Gauge—2.95 mm. thick. (0.120 in.)

Belflor Household Gauge—1.85 mm. thick. (.073 in.)

Gold Seal Inlaids, Newark and Universal

The same huge inlaying machines on which Belflor is made are used for production of these straight line inlaids. Each tile which forms the pattern is cut automatically from sheets of cork and linseed oil composition. The pieces are fitted perfectly together, and pressed until the surface is entirely smooth and all joints are knitted firmly into one piece. This makes a clean cut pattern for use wherever a durable tile effect is desired.

Made in two thicknesses, the quality of the material being the same for both thicknesses.

Newark A—2.95 mm. (0.120 in.).

Universal—1.85 mm. (.073 in.).

Other Nairn Figured Linoleums

Moulded Inlaid—Of the same high quality as straight line inlaid, the process of manufacture only being different. Here granular linoleum color is moulded through stencil trays to form the pattern. The granules of color are then hydraulically pressed until they become solid. Two thicknesses:

Hudson—1.95 mm. A particularly well-known grade suitable for rooms in homes, hotels, etc.

Reliance—1.85 mm. A slightly lighter grade with attractive patterns, reasonably priced.

Moresque and Granite—These over-all mottled effects in nine different colorings can be used appropriately in small offices and showrooms as well as in the home. Moresque is 1.95 mm. thick. Granite is 1.80 mm. thick.

Moiré—This two-toned effect makes a pleasing background for fabric rugs, and can be used effectively to harmonize with well planned interiors. 2.40 mm. thick.

How to Obtain Nairn Linoleum

Nairn Linoleum is sold by leading furniture stores, rug and carpet houses and department stores throughout the country. Most dealers who carry linoleum have competent laying departments, and bid on furnishing and laying linoleum. Names of reliable firms who handle large installations will be supplied on request.

We will be glad to send samples and pattern books in full colors showing the wide range of Nairn Linoleums.

Standard Specifications for Laying Nairn Linoleum

General—The contractor for this work shall furnish all labor and material necessary to properly install the linoleum on the floors as indicated on the drawings or as herein specified.

....

....

Material—*(1) Linoleum*—(a) The linoleum shall be Nairn (insert kind, such as Battleship, Plain, Inlaid) linoleum, (insert color or pattern number).

(b) It shall have a maximum thickness of ...... and a minimum of ...... inches.

(c) Only first quality material may be installed under these specifications. Material generally known to the trade as "seconds" will not be accepted.

(d) The linoleum contractor shall submit with his proposal two samples of the linoleum on which his proposal is based. These shall bear both the contractor's and manufacturer's names. After having been approved in writing by the architect, one sample shall be returned to the contractor and one retained by the architect for comparison with the linoleum furnished, which shall be equal in every respect.

(2) Cement—(a) The cement used in securing the linoleum to the floor shall be one of the following brands:

(Non-waterproof) for cementing felt to underfloor and body of the linoleum to felt:

Bonded Floors Co. Linoleum Paste, Sisk's Lino-Tack, Keystone Linoleum Cement, Glue-Tite Linoleum Paste, Manayunk Stickum.

Continued on next page

(Waterproof) for cementing seams and edges of linoleum; Bonded Floors Co. Waterproof Linoleum Cement, 20th Century Linoleum Glue Cement, Grade A, Ulmer's No. 97 Cement, Atlas Super Cement, Wocher's No. 97 Cement.

(b) The cement must be shipped to the job in the manufacturer's original package.

(3) Felt—The felt used between the floor and the linoleum shall be 1½-lb. builders' deadening felt and shall be one of the following brands: Congo Felt Lining or Bird's Felt.

Note: If linoleum is being laid over smooth concrete the felt may be omitted, if desired.

Workmanship—***(1) Standard of Workmanship***—(a) The linoleum shall be furnished and installed by one of the following contractors:

....

....

....

(2) Method of Installation—(a) No linoleum is to be installed until the subfloors are clean, smooth and free from all moisture. Before commencing work, the contractor shall inspect the underfloor and assure himself that it is in every way satisfactory and in accordance with the specifications. In the event that the underfloor is not suitable in every respect, the linoleum contractor shall notify the architect and general contractor in writing, and shall not proceed with the installation of the linoleum until such defects have been remedied.

Note: See paragraphs 1 and 2 under "Additional Clauses to be inserted in Specifications for Carpentry, Masonry, Heating, etc," in next column.

(b) The linoleum contractor shall advise the general contractor sufficiently in advance so that a temperature of at least 70° may be supplied and maintained in all rooms where linoleum floors are to be installed and shall not proceed with this work unless this condition exists.

Note: See paragraph 3 under "Additional Clauses to be Inserted in Carpenter's Specifications for Carpentry, Masonry, Heating, etc.," in next column.

(c) The felt shall be secured to the underfloor with one of the approved brands of non-waterproof cement. The cement shall be used under the entire surface of the felt. The felt shall be cut to fit accurately against the walls, pipes, floor outlet boxes and other permanent projections in the floor. The strips of felt shall be laid in the opposite direction to that of the boards if the underfloor is of wood. All seams in the felt shall be carefully butted, not lapped. When the felt has been entirely cemented to the floor, it shall be thoroughly rolled with an iron roller to smooth out any air blisters and to secure proper adhesion. The roller shall be as described below for use in rolling the linoleum. After felt has been cemented and rolled, no attempt shall be made to lay linoleum over it for at least twelve hours.

(d) The linoleum shall be rolled out and cut into lengths required, allowing sufficient additional for trimming at the ends of each strip.

(e) The linoleum is to be laid with the fewest possible number of seams. The use of small pieces, resulting in unnecessary seams, shall not be permitted.

(f) All seams are to be lapped (not butted) approximately ½ in.

Note: In the case of Figured Linoleum this paragraph should read as follows:

(f) The pattern must be carefully matched and seams can not be lapped, but must be forced up close together.

(g) The body of the linoleum shall then be secured, with one of the approved brands of non-waterproof cement, to the felt to within 4 to 6 in. of the seams. Sufficient cement shall be applied to thoroughly key the burlap to the felt.

(h) The linoleum shall then immediately be rolled thoroughly with a roller to smooth out any air blisters and to secure proper adhesion. The roller shall be made of independently weighted sections, each section being not more than 12 in. long, and shall have sufficient weight to give not less than 10-lb. pressure per lineal inch of the surface contact with the floor.

(i) Where the linoleum has been lapped, seams are to be cut through both thicknesses on a straight, even line with a sharp knife so as to make a tight and practically invisible joint.

(j) These seams as well as outside edges must then be thoroughly cemented with one of the approved waterproof cements and rolled with a roller of type specified under "h" above, and weighted with sandbags, bricks or other appropriate weights, for 24 hours.

(k) Linoleum shall be cut to fit accurately and snugly against all walls, pipes, floor outlet boxes and other permanent projections in the floor.

(l) Upon completion of the work, the linoleum contractor shall clean the floors of all surplus material, and leave them ready for occupancy.

Guarantee—The Linoleum contractor shall guarantee his work to the owner or general contractor, as directed by the architect, against defects of material or workmanship for a period of 1 year from date of acceptance by the architect, and shall, on receipt of written notice from the owner, make, at his own expense, any repairs that may be necessary, except repairs of injury from any cause other than ordinary wear and tear.

Additional Clauses to Be Inserted in Specifications for Carpentry, Masonry, Heating, Lighting, etc.—

(1) Carpenter's Specifications—*Levels*—Finished floor level shall be ...... in. below finished floor line given or shown on drawings.

Specifications for Wood Backing—In spaces where linoleum is called for in the plans and specifications, lay double floors; the top or finished floors to be ⅞-in. tongued and grooved, not more than 4 in. wide, driven tight, well nailed and finished true and level ...... in. below the required finished floor level; joints and butts to be planed or scraped smooth.

Old Work—In preparing old wood floors to receive linoleum, remove all badly worn or decayed boards or boards containing knotholes or loose knots, and replace with new lumber, in accordance with wood flooring specifications. Old floors to be thoroughly surface-nailed to secure all springy boards, loose butts or joints; joints or butts then to be scraped or planed smooth and even.

Specifications for Backing for Cove Base—Plaster, wood or other material against which base or wainscoting is to be installed shall be carried down to and finished square with the underfloor, making a clean, straight right angle with same and free from lumps, dirt or other obstructions.

(2) Masonry—*Levels*—Finished concrete floor level shall be ...... in. below finished floor line given or shown on drawings.

Cement Finish—Concrete floor slab shall have a top layer 1 to 1½ in. thick, composed of 1 part portland cement to 2½ parts clean screened sand, troweled to a smooth sidewalk finish and free from high and low spots. Do not sprinkle with portland cement when troweling and do not trowel hard enough to obtain a hard glazed finish. Do not use so-called integral waterproofings or concrete hardeners in cement finish, as they tend to retard drying.

Joints shall be cut through top layer 20 ft. apart following lines of floor beams and girders. After concrete is set, joints shall be filled and troweled even with top surface. No lines shall be struck on the surface and concrete subfloor shall be delivered to linoleum contractor perfectly dry, clean and free from foreign material. Concrete which has been frozen, which has a chalky or scaly surface, or which is not well bonded to fill, must be removed and replaced with top coat as above.

All concrete or masonry laid in contact with the ground, on or below grade, shall be thoroughly waterproofed by the membrane method.

(3) Heating—General contractor shall furnish temporary heat necessary to maintain a temperature in the rooms where linoleum is to be laid of not less than 70° F., commencing 48 hours before Linoleum work is to start and continuously until finished.

(4) Lighting, etc.—General contractor will provide light, storage space and hoisting facilities required for proper execution of linoleum contractor's work.

L. W. FERDINAND & CO.

Manufacturers of Waterproof Glues for Linoleum and Tile

152 Kneeland Street
BOSTON, MASS.

Products

The 20th Century Linoleum Glue-Cements; Tile Pastes, and Waterproof Adhesives.

20th Century Linoleum Glue-Cement, Grade A

In liquid form, ready for use; waterproof; not affected by heat or cold. Especially suited for attaching linoleum, cork carpet and oilcloth to concrete, steel, stone, tile and wood floors; also used by the automobile industry to attach linoleum to running boards and foot boards.

We recommend this Grade A cement to architects with no reservations. It is a superlative product; dependable, unvarying in quality and producing the unfailing results so much desired by the finer craftsmen. It has a holding strength far greater than is required by the most severe conditions, and at the same time is waterproof, elastic, durable and insulating. Its creamy texture allows it to be spread with a paint brush, and insures maximum surface area per gallon.

20TH CENTURY PRODUCT
20th CENTURY
LINOLEUM GLUE-CEMENT
GRADE A
TRADE
Ferdico
MARK
ONE GALLON

BRAND MARK

Where entire surface is to be covered, 1 gal. will spread about 10 sq. yd. on a smooth floor. When covering seams and edges only, 1 gal. is sufficient for about 25 sq. yd. It is often desirable, where this method is employed, to fill in the center areas with a lower priced cement or paste. We recommend that the entire surface be cemented and with waterproof cement.

Grade A cement is a product which through years has not varied from the strict line of quality. It is not a competitive commodity made to meet a price.

20th Century Glue-Cement, Victory Brand

Ready for use; waterproof; not affected by heat or cold. Recommended for attaching linoleum, cork carpet and oil cloth to concrete, steel, stone, tile or wood floors, and automobile foot and running boards.

Although we do not claim Victory Brand to be equal to our old reliable Grade A, it is a high-grade product and superior to many of the so-called waterproof cements. Many of our customers who formerly used Grade A exclusively, are using Victory Brand with satisfactory results.

20TH CENTURY PRODUCT
20th CENTURY
LINOLEUM GLUE-CEMENT
VICTORY BRAND
TRADE
Ferdico
MARK
ONE GALLON

BRAND MARK

The consistency and nature of Victory Brand are similar to Grade A cement, and it will spread the same area per gallon.

Specification Data for Cementing Linoleum

In cementing linoleum to various floors, it should be borne in mind that method of applying is similar to that of gluing wood with animal glue, viz.: (1) Too much or too little cement should be avoided. If too much is used it will dry out slowly, and if too little is will not hold when dry. Experience will show thickness of coat necessary to produce best results. (2) As with animal glue, it is necessary that contact should be perfect; that is, that linoleum should be held tightly to floor during drying out or setting process. Unless this is attended to carefully, bulges or blisters are liable to occur. (3) It takes time; 48 hours is about the limit of time when weights can be safely removed.

The linoleum should first be laid on the floor without cementing until all stretch and roll are taken out of it.

After cement has been applied and linoleum laid, roll down thoroughly with a heavy roller. This not only takes out the roll, but is quite an assistance in placing it properly in position. Roll from center to edges; this will force out any air which may collect and prevent air bubbles or blisters. It is then ready for weights.

Should any blisters be discovered, a small puncture will let out the air; sufficient cement should then be forced into the hole, using for the purpose an engineer's oiler with a spring bottom. That spot must be specially weighted to attach it properly.

One of the best methods of weighting is by using canvas sand bags 25 to 50 lb. in weight, which will conform to any uneven surface of floor.

20th Century Staysput Tile Paste

Created expressly to hold tile quickly and permanently in place, whether the tile be rubber, composition, cork, linoleum, clay, wood or marble.

For several years there has been a demand for a floor cement which would have an immediate grip on the floor covering, thus eliminating the need for applying weights. This immediate grip is especially desirable for tile or block goods, since it is difficult to weight them properly. 20th Century Staysput Tile Paste was developed after long research to meet the demand for a combination of quick-gripping qualities with all the characteristics needed for durability.

20TH CENTURY PRODUCT
20th CENTURY
GLUE-CEMENT
STAYSPUT TILE PASTE
TRADE
Ferdico
MARK
ONE GALLON

BRAND MARK

Qualities—

Quick gripping
Durable
Tough and elastic
Waterproof
Quick setting
Tenacious
Dependable
Alkali resisting
Will not freeze in cold weather
Will not mould in hot weather

Application—20th Century Staysput Tile Paste is spread most easily with a plasterer's trowel. After the tile have been laid, they are rolled with a heavy roller and left without need of weights.

Literature

Send for booklet.

ESTABLISHED OVER 32 YEARS

THE R. J. SISK COMPANY

Manufacturers of Linoleum Cements and Paperhangers' Sizings

NEW LONDON, CONN.

Product

Gum and Pigment Linoleum Cements.

Importance of Properly Cementing Linoleum

All linoleum and floor covering manufacturers recognize the importance of cementing all floor covering solidly to its base; to prevent stretching, shrinking, bulging and cracking. Our materials accomplish this result.

Sisk's "Lin-O-Tack" Gum and Pigment Linoleum Cement

Sisk's "Lin-O-Tack" is the original pigment paste cement, the first to be made on a gum and pigment basis. Its use for years by the largest concerns in the floor covering trade attests its merits.

SISK'S
LIN-O-TACK
MAKES THE FLOOR SANITARY
R. J. SISK MFG. CO. New London, Conn.

Sisk's "Lin-O-Tack" is a water resisting smooth gum paste cement easily applied with a piece of linoleum or thin board about 4x6 in. It is recommended for best results when laying linoleum, oilcloth, felt or paper base on wood, concrete or metal surfaces.

It does not generate gas in the container or under the floor covering; is not affected by extreme cold, and spreads as easily in zero weather as in summer; requires no weights when laid. Floor covering is held permanently flat—until worn out.

Covering Capacity per Gallon—For linoleum or oilcloth, "Lin-O-Tack" will cover from 10 to 12 sq. yd. of floor surface; for felt or paper base will cover from 16 to 18 sq. yd., when reduced one-third with hot water.

Sisk's "Lin-O-Seal" Waterproof Cement

For a strictly waterproof job, use "Lin-O-Seal" on a 3-in. margin at all seams, ends and edges of all openings for pipes, etc.

Guaranteed to be impervious to moisture and should be used where Sisk's "Lin-O-Tack" or any other cement is used on the main area. It is easily applied with a stiff brush and sets in about 15 minutes.

Sisk's "Lay-Ole-Um" Gum and Pigment Semi-Liquid Linoleum Cement

This cement is very adhesive and is recommended for fastening oilcloth, linoleums or leather effects to wood, concrete or metal surfaces, desk tops, etc.

It is easily applied with a stiff brush, sets in 10 to 15 minutes, and is of a water resisting nature.

Sisk's "Tile-Set" Waterproof Cement

A special cement for fastening rubber, cork or linoleum composition tiles to wood, concrete or metal surfaces. Guaranteed to be impervious to moisture. Very adhesive, easily applied with a stiff brush and sets in about 15 minutes.

Instructions for the Laying of Linoleum

Send for our booklet, "Instructions for the Laying of Linoleum"; it gives the proper and complete information for laying linoleums and their proper care.

Cementing to Floor and Use of Underlining

While we do not advocate the use of underlining for linoleum on concrete or seasoned wood floors we do recommend it on green or new wood floors—in this case it gives with the shrinking of the wood and leaves the linoleum intact. While underlining may add to the resiliency of a floor, we claim that direct adhesion makes the linoleum literally a part of the floor and adds to the life of the linoleum.

Specifications for Laying Linoleum

New Cement Floors

(1) **General**—Linoleum shall not be unrolled when cold, but shall stand at least 48 hours in a warm room before being laid. Two-yard wide rolls shall stand on ends, four-yard wide rolls shall lay flat.

(2) **Waterproof Cement for Laying Linoleum**—All cement shall be Sisk's "Lin-O-Tack" Gum and Pigment Linoleum Cement for the main floor surface to be covered leaving a 3-in. margin at all seams, ends, and edges of all openings for pipes, etc., in the linoleum. Sisk's "Lin-O-Seal" Waterproof Cement shall be used for all 3-in. margins. All cements shall be applied in strict accordance with this specification and the manufacturer's instructions. Or the following Alternate:

(2a) **Water Resisting Cement for Laying Linoleum**—All cement shall be Sisk's "Lin-O-Tack" Gum and Pigment Linoleum Cement for the entire floor surface to be covered, including all seams, ends, and edges of all openings for pipes, etc., in the linoleum. All cement shall be applied in strict accordance with this specification and the manufacturer's instructions.

Note: If alternate paragraph 2a is used, paragraphs 4 and 5 must be revised accordingly.

(3) **New Cement Floors**—After the completion of the cement floors, at least six (6) weeks shall elapse before laying linoleum; the floors must be perfectly dry.

(4) The floor surface shall be swept clean, all joints and cracks shall be filled with an approved crack filler to insure a smooth surface; the linoleum cut and matched; the first strip laid in position and rolled back to the center. Sisk's "Lin-O-Tack" Cement shall then be spread, starting from the center of the strip, to a thickness of about ⅛ in. and continued to within 3 in. of all seams, edges and ends; roll the linoleum into the cement as soon as spread; continue similarly until the entire floor is laid, cementing and rolling the 3-in. margins every two (2) strips.

(5) **Cleaning**—Remove surplus "Lin-O-Tack" Cement with water, and "Lin-O-Seal" Cement immediately with alcohol.

New Wood Floors

Use the above form of specifications, substituting the following paragraphs 3a and 4a, in place of paragraph 3 and first part of paragraph 4:

(3a) **New Wood Floors**—After the completion of the wood floors, all joints and cracks shall be filled with an approved crack filler to insure a smooth surface.

(4a) The floor surface shall be swept clean and the felt base [paper lining] shall be cut, fitted and laid crosswise to the final direction of the linoleum strips, cemented with Sisk's "Lin-O-Tack" reduced one-third with warm water; 24 hours shall elapse before linoleum is laid.

Specifications for Using Sisk's "Lay-Ole-Um" Cement

The same method is used as for Sisk's "Lin-O-Tack" Cement. The above form of specifications can be used.

Specifications for Laying Rubber, Cork or Linoleum Composition Tile

(1) **Cement for Laying Tile**—All cement shall be Sisk's "Tile-Set" Waterproof Cement.

(2) All cement shall be applied in strict accordance with this specification and the manufacturer's instructions.

(3) **Laying of Tile on New Cement Floor**—After the completion of the cement floors at least six (6) weeks shall elapse before laying the tile; the floor must be perfectly dry.

(4) The floor surface shall be thoroughly cleaned and Sisk's "Tile-Set" Cement spread on the floor surface about 1 yd. square and the tiles then laid into the cement (this cement sets very quickly, therefore, only small areas can be worked at one time).

(5) **Cleaning**—Wash off immediately all surplus cement with alcohol. After the tile is laid, the entire floor surface shall be rolled with a heavy iron roller.

STEVENS SOUND-PROOFING CO.

Sound-proofing Engineers
Room 1827, 14 East Jackson Boulevard
CHICAGO, ILL.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

Product

STEVENS SYSTEM of SOUNDPROOFING for floors, partitions, ceilings of buildings, bowling alley foundations, music rooms, machinery platforms, etc.

Engineering Service

We offer, in addition to a soundproofing system of wide scope, an engineering service to the architect and engineer. We are prepared to present suggestions and make recommendations on any soundproofing problem that may arise in connection with any class of construction, and the architect and engineer are invited to call upon us at any time in order to avail themselves of this service. It is good policy to go into such matters at the time preliminary plans are being drawn, so that recommendations can be made before final details of construction are arranged.

This service is offered without charge and the recommendations being based on years of experience in this field, to which our entire time has been devoted, eliminates the necessity of working out experimentally such problems on a purely theoretical basis.

We not only isolate one solid from the other, but we also eliminate the drum effect, or reverberation in hollow air spaces by using the proper cellular fill.

Various Forms of Stevens Soundproofing Devices

Stevens System Chairs for use in ordinary construction under floors and partitions which raise the nailing strips and floor plates above the conduits.

Stevens System Special Chairs for ordinary construction, which are installed flush to the rough floor. This chair is designed for buildings where economy of floor heights must be secured with consequent saving of construction cost.

Stevens System Chairs for use in fireproof construction which are fastened to concrete or tile floor arch with cement after arch is in place.

Stevens Wall Isolators for use on any wood, tile, cement, or gypsum partition.

Stevens Isolator for use on any wood, tile, cement, or gypsum ceiling construction.

Stevens Special Ceiling Isolator for use in connection with hangers on any type of suspended ceiling.

Stevens Special Channel Iron Partition where it is desired to soundproof same without use of wood, tile, cement, or gypsum, as a base.

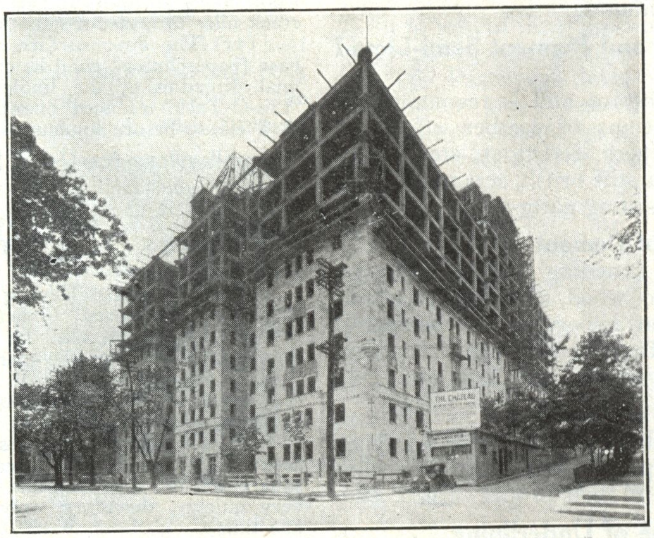
Stevens Unlined Clips for attaching wood floors to fireproof construction in office buildings, or other classes of buildings where question of soundproofing is not considered.

Stevens Special Designed Platforms for isolating ventilating fans, motors, printing presses, bowling alleys, laundry machinery and machinery of all kinds from the building construction.

In fireproof construction, where wood floors are to be used, our system is especially adaptable, as we function in several ways: (1) We attach wood floors to the construction. (2) We isolate the wood floor from the arch by floating it and filling up all the voids with a special cellular fill, which offers practical soundproofing and complies with underwriters' and building department requirements. (3) The use of a dry fill between the arch and finished floor eliminates moisture and insures level floors free from buckling or warping.

All Machinery in This Building Above Basement Installed on Stevens Anti Vibration Foundations

Palmer House, Chicago, Ill.
HOLABIRD & ROCHE, Architects
THOMPSON-STARRETT CO., General Contractors



The Chateau Apartments, Montreal, Que., Canada

ROSS AND MACDONALD, Architects ANGLIN-NORCROSS CO., Contractors
H. L. FEATHERSTONAUGH, Associate Architect

Cost

In figuring costs of installing Stevens System under wood floors in fireproof buildings, we offer a comparison based on work which has actually been done.

Average cost of installing cinder concrete 3 in. thick with beveled nailing strip, 11¢ per sq. ft.

Average cost of installing Stevens System, which includes the cost of Stevens chairs; cost of grouting the chairs to the arch; cost of fastening chairs to nailing strip with special hold-down nailing device; cost of nailing strips, cinders and labor of installing them, 15¢ per sq. ft.

These figures are based on work done in Chicago, and on the basis of Chicago prices for labor and materials. In making the comparison it will be noted that the cost of installation of a level resilient floor, which will not warp, or bulge, and which also accomplishes thorough soundproofing, is 4¢ per sq. ft. This is cheaper by far than any other known method of soundproofing, and at the same time offers real results.

The cost of space in cities has reached such a high point that people who in the past lived in detached dwellings have been forced to go into large apartments where a great many families live under one roof. In order to secure the privacy to which they have been accustomed, it is necessary that the building be soundproofed.

The resiliency obtained in using the Stevens System under dance floors and gymnasium floors recommends its use, without considering the soundproofing features and we have a long list of satisfied users for your consideration.

Specifications

Furnish and install Stevens System of Soundproofing as designed and manufactured by the STEVENS SOUND-PROOFING CO., 1827 Lytton Building, Chicago, Ill.

This system to be installed under the specifications and direction of the manufacturer.

Further Information

If further information is desired, a representative will call at your request. Write for new catalogue.

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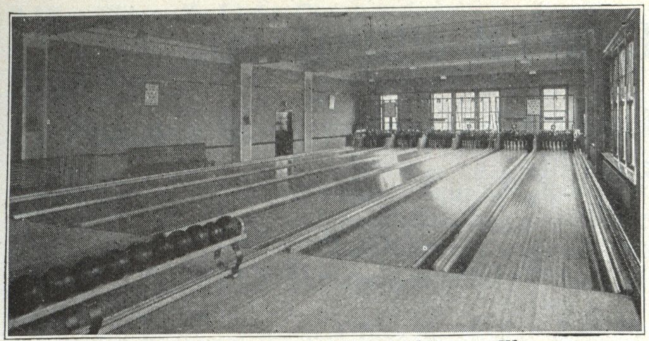
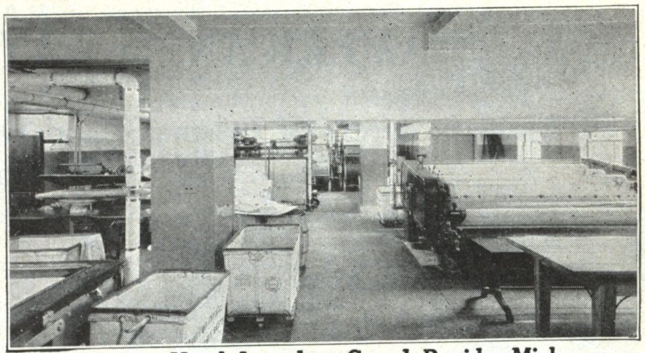
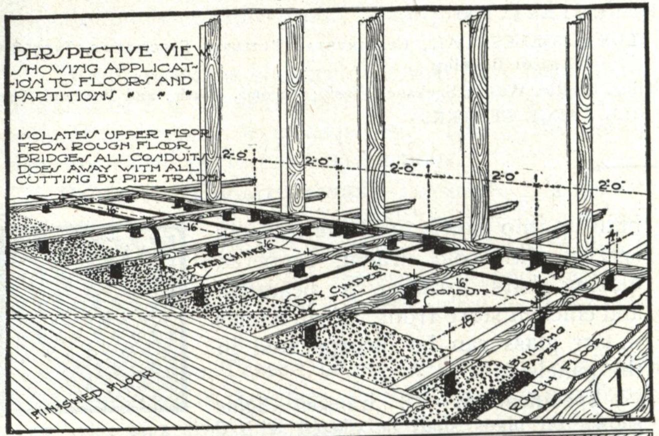


Adelphi Theatre Building, Chicago, Ill.
J. E. O. Pridmore, Architect
6 bowling alleys above a theater placed on Stevens soundproof foundation



Morton Hotel Laundry, Grand Rapids, Mich.
Holabird & Roche, Architects
Laundry machinery placed on second floor of hotel above main dining room. Soundproofed under Stevens System


PERSPECTIVE VIEW SHOWING APPLICATION TO FLOORS AND PARTITIONS " "
ISOLATES UPPER FLOOR FROM ROUGH FLOOR BRIDGES ALL CONDUITS DOES AWAY WITH ALL CUTTING BY PIPE TRADES
2'-0"
2'-0"
2'-0"
2'-0"
2'-0"
16"
16"
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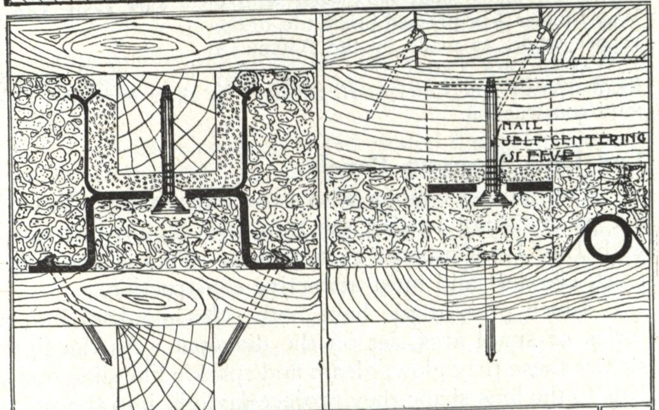
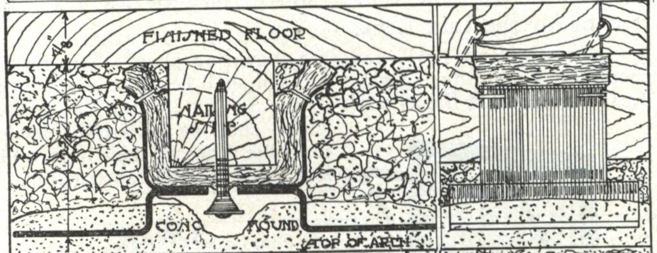
STEEL CHAIRS
DRY CINDER FILL
CONDUIT
BUILDING PAPER
ROUGH FLOOR
FINISHED FLOOR
1


NAIL
SELF CENTERING SLEEVE

PATENTS AUG 22-191 MAY 6-191 JUNE 6-191 PAT-PENDIN

STEVENS SYSTEM FOR FLOORS ON ORDINARY CONSTRUCTION SHOWING "HOLD DOWN DEVICE"

2.


FINISHED FLOOR
NAILING STRIP
CONC MOUND
TOP OF ARCH

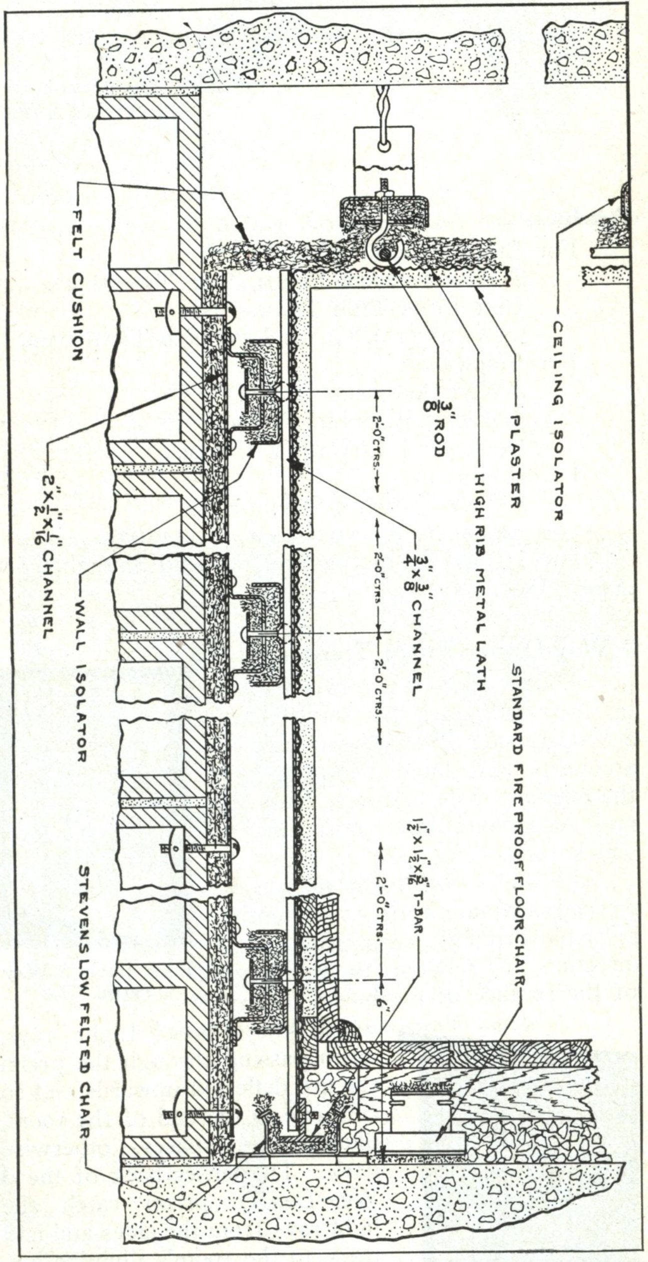
+ FULL SIZE DETAIL OF FIRE-PROOF CHAIRS +
SAVES TIME, NO WAITING FOR CINDER CONCRETE TO DRY
PASSED BY CHICAGO BOARD OF UNDER-WRITERS AUG 7th 1916.
HOLD-DOWN NAILS TO BE USED AS SPECIFIED

7A

PATD AUG.22 1916.

FIRE-PROOF CONSTRUCTION
THIS METHOD SAVES THE DIFFERENCE BETWEEN CINDER CONCRETE AND DRY CINDERS IN WEIGHT AND COST.

7.


FELT CUSHION
2"x1/2"x1/16" CHANNEL
WALL ISOLATOR
STEVENS LOW FELTED CHAIR
3/8" ROD
HIGH RIB METAL LATH
PLASTER
CEILING ISOLATOR
3/4"x3/8" CHANNEL
STANDARD FIRE PROOF FLOOR CHAIR
1 1/2"x1 1/2"x3/16" T-BAR
2'-0" CTRS
2'-0" CTRS
2'-0" CTRS
2'-0" CTRS
6"

ELEVATION
SHOWING METHOD IN DETAIL OF APPLICATION OF STEVENS WALL ISOLATERS TO TILE PARTITION IN CONJUNCTION WITH STEVENS CEILING ISOLATERS AND FIREPROOF FLOOR CHAIRS

Detailed Drawings, Stevens System of Floor Deadening

Ordinary Construction: (1) Isolates upper floor from rough floor. Does away with all cutting by pipe trades. Eliminates all cutting of the floor plate; bridges all conduits. (2) Hold-down chairs for use where floors have a tendency to buckle, in center of rooms, etc.

Fireproof Construction: (1) Eliminates buckling of finished floors. Saves all cinder concrete fill. Conduits easily changed. Saves time. No waiting for the cinder concrete to dry. Hold-down chairs to prevent buckling floors.

Stevens System of Floor Deadening requires 4 in. height from subfloor to top of finished floor

AMERICAN 3 WAY-LUXFER PRISM CO.

Manufacturers of Prismatic and Diffusing Tile Transoms, Skylights and Sidewalk Lights

1303-1311 South 55th Court
CICERO, ILL.

37-28 30th Street
LONG ISLAND CITY, N. Y.

BRANCH OFFICES
DETROIT, MICH., 400 Penobscot Building
KANSAS CITY, MO., 404 Ridge Building
CLEVELAND, OHIO, Room 1605, 811 Superior Avenue, East

WESTERN REPRESENTATIVES
SAN FRANCISCO, CAL., Waterhouse-Wilcox Co., 523 Market Street
LOS ANGELES, CAL., Continental Building Specialties, Inc., 800 Hibernian Building
WASHINGTON AND OREGON: D. E. Freyer Co., Lumber Exchange Building, Seattle, Wash.; Spokane, Wash.; Tacoma, Wash., and Portland, Ore.
REPRESENTATIVES IN ALL LARGE CENTERS

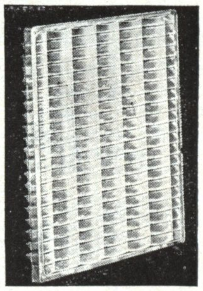
Products

- For Store Fronts:
  - 3 Way-Luxfer Prism Tile Transoms.
  - Lux Lens Tile Transoms.
  - Ornamental Glass Lettered Transoms.
- For Sidewalks:
  - 3-Way Armored Glass.
  - Simplex Fresnel Floor Lights.
  - Doors and Coalhole Covers.
- For Roofs:
  - 3-Way Simplex Skylights.
  - Armored Wired Glass Skylights.

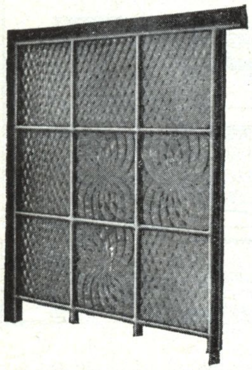
For 3-Way Ventilating and Steelead Skylights, see pages 1150-1151.

3 Way-Luxfer Prism Transoms

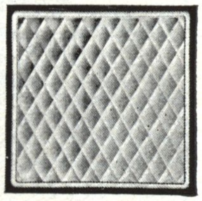
Today, more than ever before in their 30 years of service are 3 Way-Luxfer Prisms being used by architects and builders to daylight the interior of dark stores. It is the most economical and most efficient way known.


Lens Back 3-Way Prism Tile

3 Way-Luxfer prisms are a commercial adaptation of the scientific principle that light rays change their direction in relation to the angle of the surface of the media through which they pass. Light rays, when passing through the prism tile are deflected upwards and so continue to the end of the room, illuminating spaces otherwise dark. The lenses back of the 3 Way-Luxfer prism catch the light rays from the sides and add these to the room's illumination. This is the only way to daylight a room without great cost.


3 Way-Luxfer Prism Transom Construction

3 Way-Luxfer prisms are made in 4-in. tiles of Flintex-Lazalite quality glass which does not change color. These tile are built up into panels to fit the transom spaces, with cold drawn, coppered glazing bars, making a beautiful and efficient store front. Firm names in art glass can be incorporated in the panels.


Lux Lens Tile

Specifications—All transom lights shown on plans shall be glazed with 3 Way-Luxfer 4-in. pressed prism tile, of the proper angle, as made by the American 3 Way-Luxfer Prism Co. These shall be in rigid panels, weatherproof and waterproof, as made by their improved lock joint construction.

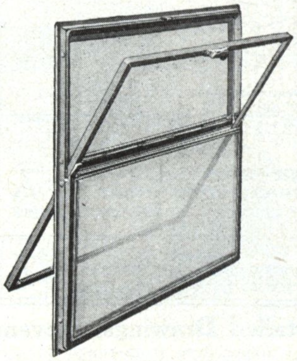
Lux Lens Transom Panels

For those locations where the daylighting effect of the prism is not needed the transoms should be glazed with Lux Lens pressed glass panels. This is the snappiest, classiest and most attractive construction.

4-inch pressed tile have both sides moulded into a series of small arcs, set on the diagonal. As the light strikes these they glow, gleam and sparkle like diamonds. Due to the lens shape they project daylight into the room in a beautiful, soft diffusion.

Easily kept clean for the long curves of the arcs flush clean with the rain. Spiro Lens tile are used as a trim for the Lux Lens.

Specifications—All transoms shown on plans where ornamental glass or diffusing glass is noted shall be glazed with Lux Lens 4-in. pressed tile as made by the 3 Way-Luxfer Prism Co. These shall be built into panels to fit the space by their improved lock joint glazing construction.


3-Way Transom Ventilator

3-Way Transom Ventilators

A swinging, self-closing and locking transom ventilator in several sizes, designed for use in built-up windows of all kinds, particularly the panels of 4-in. pressed tile, either Prism or Lux Lens.

Can be fitted with the 3-Way patented flat fly screens.

Continued on next page

3-Way Sidewalk Light Constructions

Sub-sidewalk space is today so valuable that it must be made usable for merchandising or for manufacturing purposes. To accomplish this it must be daylighted, else the illumination cost will outweigh the value of the space.

In the several 3-Way sidewalk light and floor light constructions architects find the ideal means of securing this daylight. For the 3-Way constructions have the greatest percentage of light area, in some reaching as high as 71%.

Added to this is the fact that the 3-Way sidewalk lights, as developed by us in our 25 years' experience, are today free from all the earlier faults. They are absolutely weatherproof, waterproof and permanent.

Installations the country over that have been in for upwards of 8 to 10 years have given perfect satisfaction without any repair or upkeep cost. This is the reason they are called perfected constructions.

Perfected Constructions—To secure this perfection the finest of engineering skill, backed by our long experience has developed a practice and a design that is unequalled. First, superior materials; second, improved design; third, better labor; fourth, ideal working conditions.

Polariscope Tested Glass—Of the materials the most important is the glass, for ordinary glass will not stand the assaults of weather or traffic.

All glass in 3-Way sidewalk lights is of Flintex-Lazalite quality that does not change color under action of the elements. It is annealed after moulding to insure toughness.

Then each piece is tested under the polariscope to locate the invisible stresses and strains that cause failure in use, and all but perfect lenses are rejected.

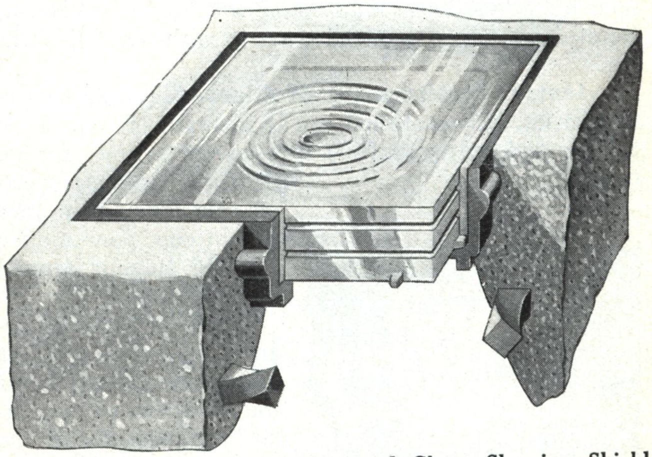
Reground Cement—To assure a perfect setting in the primary mix the finest of reground cement is used. This insures against after-hydration and its consequent internal expansion and excess pressure on the glass. It also makes the mass waterproof without the use of chemicals.

Reinforcing—Reinforcing is such that the greatest strength and greatest rigidity is assured. 3-Way Sidewalk Light construction will carry many times any possible traffic load.

Ready-to-set Slabs—3-Way sidewalk lights are made in factory finished slabs to fit the openings in the walk. They are ready to slip to seat as soon as received.

3-Way Armored Glass Sidewalk Lights
(Glass Guaranteed for 5 Years)

The faultless construction. In 3-Way Armored Glass every demand of any architect, builder or owner is met and anticipated. Everything you have wanted in a sidewalk light is embodied in this construction:

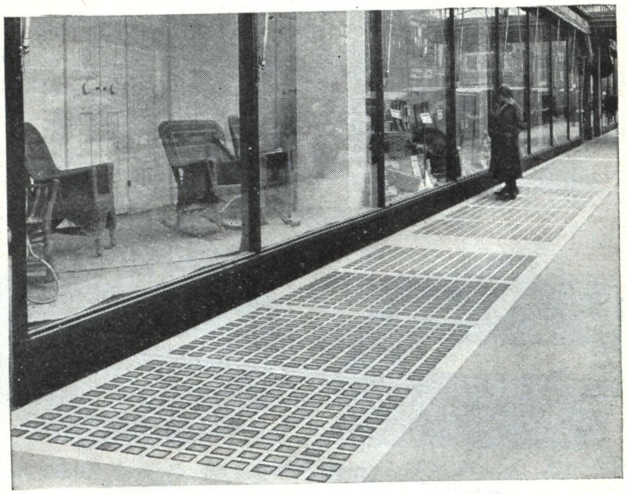


Cut-away View of 3-Way Armored Glass, Showing Shield Embedded in Concrete

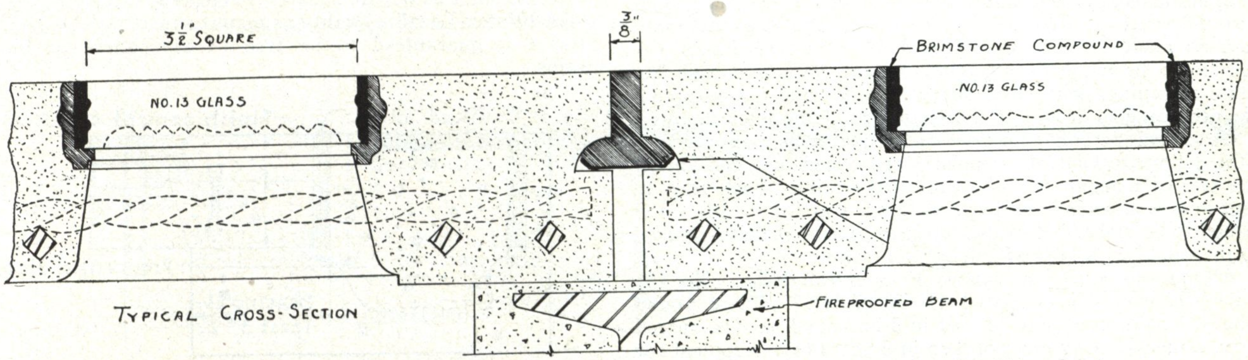
Great light area
Weatherproof
Perfect walking surface
Great strength
Waterproof
Protection to glass
Instant replacement of glass
5-year glass guarantee

In this construction each lens, round or square, is caulked in a shield of cast iron, with a cushion of tar and sulphur. The shield is embedded in the concrete and held by the shoulder on the outside.

Thus each glass is armored against both expansion



3-Way Armored Glass Sidewalk Lights



Section 3-Way Armored Glass Sidewalk Lights Showing Waterproof Intermediate Joint

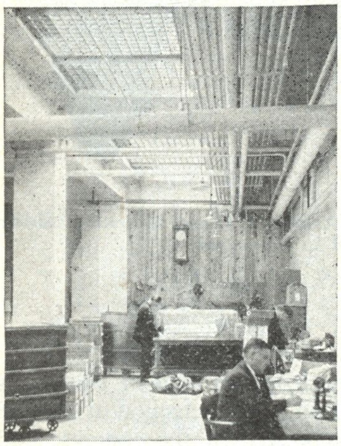
Continued on next page

pressure and the assaults of traffic. Yet each one can be replaced in a minute by simply cleaning out the shield and bedding a new one.

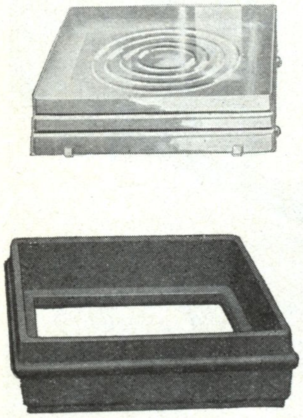
Lenses are polariscope tested Flintex-Lazalite glass. No. 13 is 3½-in. square Fresnel lens. No. 12 is 2¾-in. round sunburst lens. Concrete is of selected, washed sand and granite screenings mixed with reground cement. Reinforcing is of preferred types to withstand all traffic loads.

Instant Replacement of Glass—Even these perfect lenses, fully protected, are accidentally broken. Such can be replaced by anyone in a minute's time, for no cement work is needed. Just three moves: clean out old lens, drop new one in cup, pour molten tar and sulphur around it.

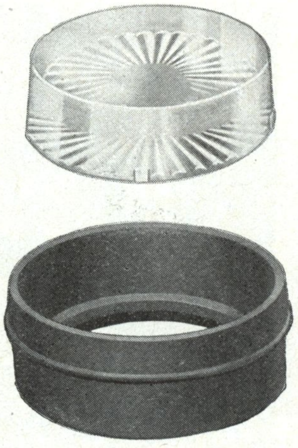
5-Year Glass Guarantee—So perfectly does this construction protect the glass, and so particular are we about the quality of the glass, that we know it should last as long as the balance of the sidewalk. We back this up by our guarantee to supply free for replacement, f.o.b. factory, all glass broken, from any cause, for a period of five years.



Underside of 3-Way Armored Glass Sidewalk



No. 13 Square Glass and Shield



No. 12 Round Glass and Shield

Specifications—Sidewalk lights as shown on the plans shall be of the reinforced concrete type known as 3-Way Armored Glass, as made by the American 3 Way-Luxfer Prism Co. Concrete to be made of reground cement, 95% fine, and fine granite screenings with clean sharp torpedo sand. Reinforcing to be according to design of the engineers of the manufacturer.

Glass shall be only Flintex-Lazalite quality as manufactured by the Jeannette Glass Co.; polariscope tested and guaranteed to be free of manganese and all internal strains. Each glass to be set in a cast iron shield that provides a seat for the glass and a flange to be embedded in the concrete. Glass shall be caulked into the shield with tar and sulphur compound.

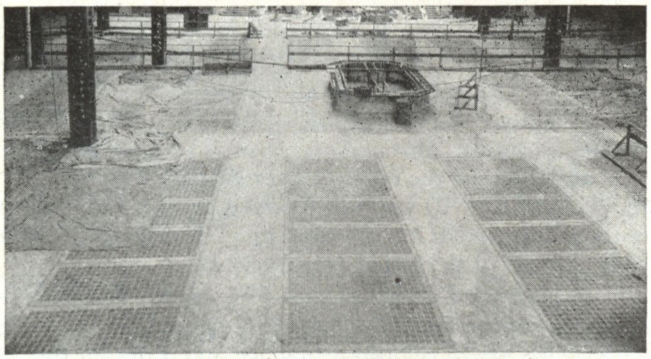
All glass to be [3½-in. square, Fresnel lens design (No. 13) set in 4-in. iron shields spaced 4¾-in. centers] [2¾-in. round sunburst lens design (No. 12) set in 3-in. round shields, spaced 4½-in. centers]. Any glass broken in 5 years to be supplied for replacement free.

Load carrying capacity shall be 300 lb. per sq. ft. on a 5-ft. clear span, with a safety factor of 4.

Caulk all joints between and around slabs, after setting, with 3-Way Caulking Compound.

Simplex Fresnel Floor Lights

This construction, with its 4 in. square lenses set 4¾ in. centers has the greatest light area of any construction made. And it is the strongest, as well. For floor lights, where daylight is to be carried to rooms below, it is unequalled for these reasons.



Simplex Fresnel Floor Lights Installed in Concourse, New Union Station, Chicago, Ill.

Specifications—Floor Lights as shown on the plans shall be the reinforced concrete type with no exposed metal, known as the Simplex Fresnel Construction as manufactured by the American 3 Way-Luxfer Prism Co.

Concrete to be made of reground cement 95% fine, clean sharp torpedo sand and fine granite screenings. Reinforcing shall be 1½-in. "I" bars (channel flats), punched and interlaced at right angles with ⅜-in. deformed rods spaced 4¾-in. centers.

Glass shall be 4 in. square of Fresnel lens design or replaceable type, of Flintex-Lazalite glass, polariscope tested, as made by the Jeannette Glass Co. and guaranteed free of stresses and strains.

3-Way Simplex Floor Lights

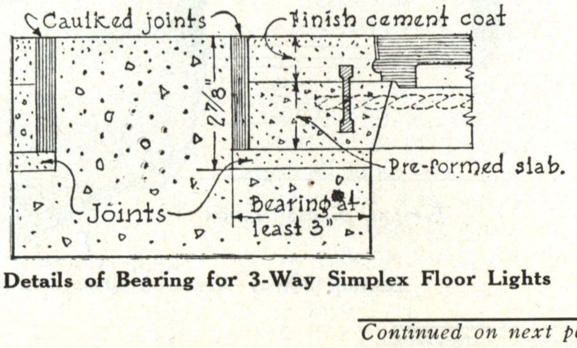
A reinforced concrete construction; everlasting, weatherproof, gasproof and fumeproof, fire resisting, no upkeep.

There is no exposed metal, either above or below, so never needs paint. Light area is up to 76% of the sight opening. Weight 30 lb. per sq. ft., and carrying capacity 400 lb. per sq. ft.

Specifications—Floor Lights shown on plans shall be of the reinforced concrete type, with no exposed metal, known as the 3-Way Simplex Construction as manufactured by the American 3 Way-Luxfer Prism Co.

Concrete shall consist of reground cement, 95% fine, fine granite screenings and clean sharp torpedo sand. Reinforcing shall be 1½-in. "I" bars (channel flats), punched and interlaced at right angles with ⅜-in. deformed rods, spaced 7½-in. centers.

Glass shall be 6⅛ in. square of replaceable type, polariscope tested Flintex-Lazalite quality as manufactured by the Jeannette Glass Co., guaranteed to be free of manganese or internal strains.



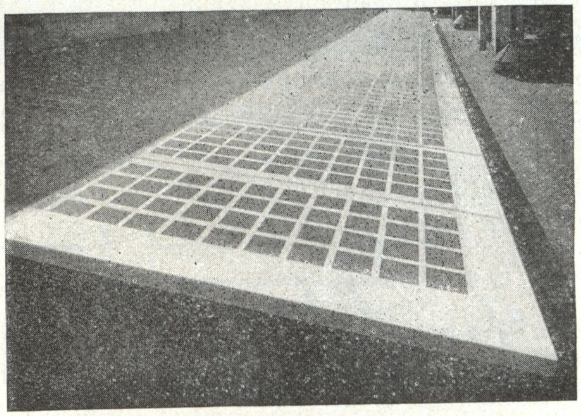
Details of Bearing for 3-Way Simplex Floor Lights

Continued on next page

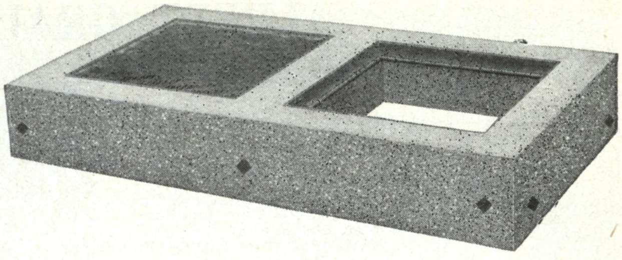
3-Way Armored Wire Glass Skylights
(5-year Glass Guarantee)

This construction combines the advantages of the reinforced concrete skylight with those of the metallic wired glass constructions. It has great light area, absolutely fire resisting, weatherproof, burglarproof, everlasting, no upkeep, no protecting screen, can be walked on and instant replacement of broken glass. So perfected is this construction that we supply all glass for replacement for a period of 5 years.

The glass is cut from standard ½-in. thick wired glass into panels 8¼ in. square. These are firmly and tightly caulked into galvanized cast iron shields. These, in turn are embedded in the concrete. The shields protect the glass from the expansion pressure, yet they permit the instant and easy replacement of any one broken.



3-Way Armored Wired Glass Skylight, Public Service Co., Chicago, Ill.



Section of 3-Way Armored Wired Glass Skylight

Weight is 33 lb. per sq. ft. Carrying capacity is 150 lb. per sq. ft. on a 10-ft. span, with a factor of safety of 4.

These 3-Way reinforced concrete skylights can be laid flush with the roof, but we recommend that they be raised on curbs and provided with a definite pitch.

Specifications—All skylights shown on plans shall be of the reinforced concrete type known as 3-Way Armored Wired Glass Construction as manufactured by the American 3 Way-Luxfer Prism Co.

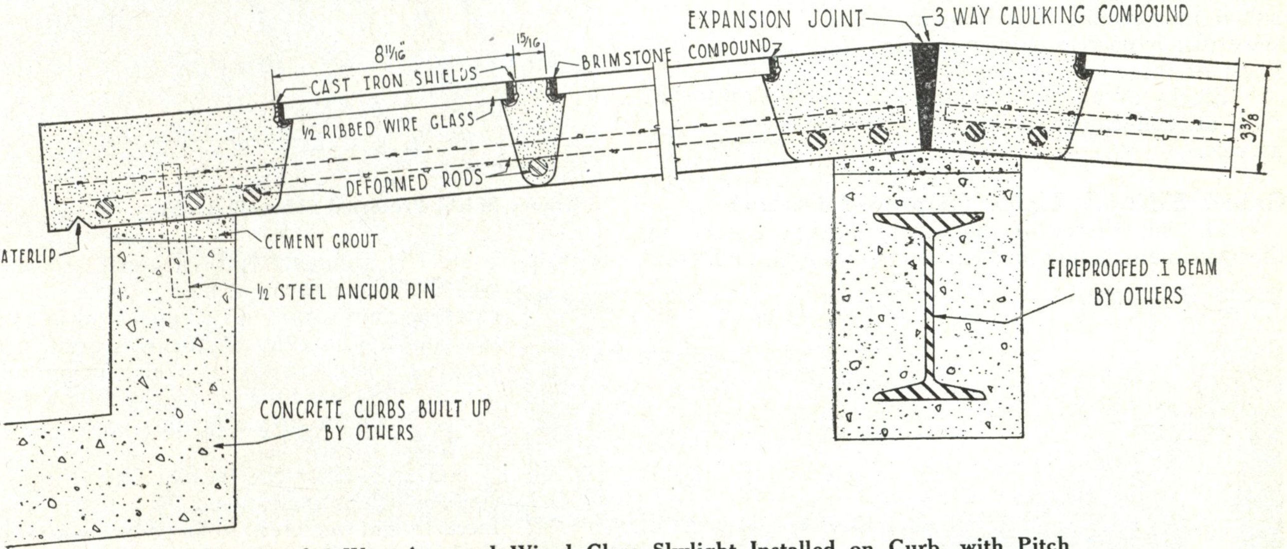
Concrete shall consist of reground cement, 95% fine, clean sharp torpedo sand, and fine granite screenings. Reinforcing to be of twisted rods, both ways at right angles, spaced 9½ in. centers.

Glass shall be standard ½-in. wired glass cut into squares of 8¼ in., set and caulked with tar and sulphur compound, into tight-galvanized cast iron shields which are embedded in the concrete.

Glass for replacement to be supplied free for a period of five years.

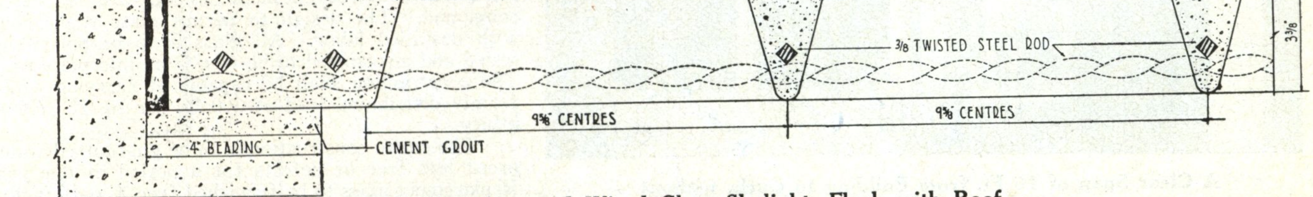
Carrying capacity to be 150 lb. per sq. ft. on a 10-ft. clear span, with a factor of safety of 4.

All joints between and around slabs to be caulked with 3-Way Caulking Compound.



EXPANSION JOINT
3 WAY CAULKING COMPOUND
8$\frac{11}{16}$"
$\frac{15}{16}$
CAST IRON SHIELDS
BRIMSTONE COMPOUND
½ RIBBED WIRE GLASS
DEFORMED RODS
3⅜"
WATERLIP
CEMENT GROUT
½ STEEL ANCHOR PIN
FIREPROOFED I BEAM BY OTHERS
CONCRETE CURBS BUILT UP BY OTHERS

Details of 3-Way Armored Wired Glass Skylight Installed on Curb, with Pitch



3 WAY CAULKING COMPOUND
EXPANSION JOINT
½"
CAST IRON SHIELD
8$\frac{11}{16}$"
TAR AND SULPHUR COMPOUND
$\frac{15}{16}$"
CAST IRON SHIELD
½ RIBBED WIRE GLASS 8¼ SQUARE
⅜ TWISTED STEEL ROD
3⅜
9⅜" CENTRES
9⅜" CENTRES
4" BEARING
CEMENT GROUT

Details 3-Way Armored Wired Glass Skylight, Flush with Roof

ALBERT GRAUER & COMPANY

Sidewalk Lights, Skylights and Floor Lights

1408-1424 Seventeenth Street
DETROIT, MICH.

REPRESENTATIVES

AKRON, OHIO, Knoske Sales Co., 502 Ohio Building
ATLANTA, GA., S. R. Hewitt, 608 Walton Building
BUFFALO, N. Y., W. D. Shumway, 1014 Fidelity Building
CHARLESTON, W. VA., Metal Products Co.
CHARLOTTE, N. C., Monteith-Soule Co., 1906 South Boulevard
CINCINNATI, OHIO, Baldwin-Tarvin Co., Sixth and Carr Streets
COLUMBUS, OHIO, The B. M. Freeman Co., Columbian Building, 35 East Gay Street
DAYTON, OHIO, John G. Pool Co., Schwind Building
GRAND RAPIDS, MICH., Charles Vandervelde, 757 Hawthorne Street
HUNTINGTON, W. VA., E. L. Warnick, P. O. Box 1581
INDIANAPOLIS, IND., General Construction Supply Co., 631 South Delaware Street
KNOXVILLE, TENN., Charles M. Allen Co., 209 West Clinch Avenue
LANSING, MICH., Capitol Steel Corporation, 236 Tussing Building
LIMA, OHIO, Lugabill Fuel & Building Material Company
LOUISVILLE, KY., Louisville Builders Supply, 18th Street and Magnolia
MEMPHIS, TENN., Calston Builders Supply Co., 281 Shrine Building
MINNEAPOLIS, MINN., H. S. Nesbitt Co., 422 Builders Exchange Building
SAN ANTONIO, TEX., George E. Ginter, 502 Calcasieu Building
SOUTH BEND, IND., The Builders Agency, 211 Christman Building
YORK, PA., C. H. Strayer, 50 West Pniladelphia Street

SKYLIGHTS
FLOOR LIGHTS
MASTIC FLOORS
SIDEWALK LIGHTS
COMPOSITION FLOORS

Products

Grauer System of Reinforced Concrete Sidewalk Lights, Skylights and Floor Lights, used in all classes of buildings, tunnels, subways, trainsheds, etc., installed in place or shipped in slabs, ready to set.

Also manufacturers of Illuminating Sidewalk Doors; Coalhole Covers and Rings; Sidewalk Ventilators; Bullseye Glasses of every size for repairing iron frame sidewalk lights.

For Mastic Floors, see page 522.

Services and Facilities

Our Engineering Department will furnish details and estimates for work installed in place, or for slabs completely glazed ready to set.

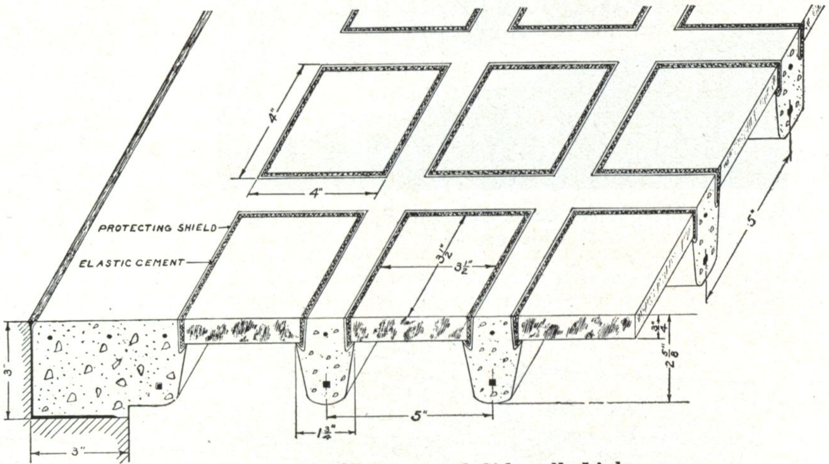
Our experience of 32 years in the design and construction of sidewalk lights, floor lights and skylights has resulted in constant improvements in the scientifically correct Grauer system. The latest of these is described herein.

Stocks of all our products are carried at convenient points for prompt service.

Grauer Sidewalk Lights (Improved Design)

The superiority of the Grauer design in securing the maximum in lighting efficiency, strength and durability is apparent to every one familiar with advanced building practice, since the principles involved have been extended to many other associated lines. The new improved design, as shown in the detail, marks the latest step in our efforts to still further increase the all-round efficiency of the Grauer system.

Construction Features—The glass is set in a rustproofed metal shield in an elastic compound. The reinforcing steel is accurately proportioned and spaced and the whole forms a unit capable of safely carrying a uniformly distributed load of 300 lb. per sq. ft. This design forms a permanently watertight and rustproof construction which permits the glass to be easily replaced with unskilled labor, in such a manner as to show no patchwork.

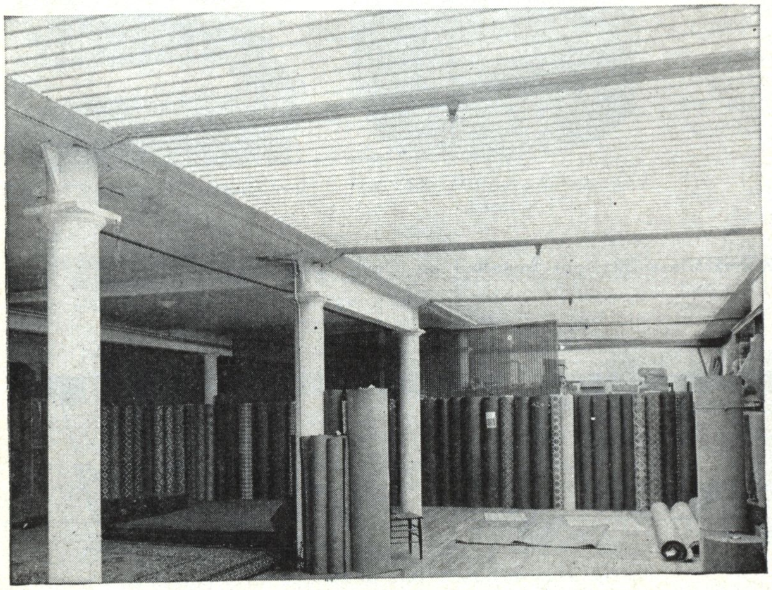


Grauer Shield Protected Sidewalk Light

Glass—Only the best quality of glass is used, which is guaranteed by both the manufacturer and ourselves to be properly annealed. Each glass passes the polariscope test and all imperfectly annealed pieces are rejected. The standard glass used is Grauer No. 20.

Specification—The sidewalk lights shown on plans shall be constructed with carrying members of reinforced concrete. The glass shall be Grauer No. 20, set in rustproofed metal shields with an elastic compound. The design to permit glass replacement with unskilled labor. All glass is to be polariscope tested and guaranteed to be free from internal strains. The construction shall be capable of carrying a uniformly distributed load of 300 lb. per sq. ft. without injury.

The entire construction is to be guaranteed waterproof and free of defects for a period of one year. Replacement glass to be furnished free, f. o. b. factory for a period of five years.



A Clear Span of 16 Ft. from Building to Curb, without Intermediate Spans

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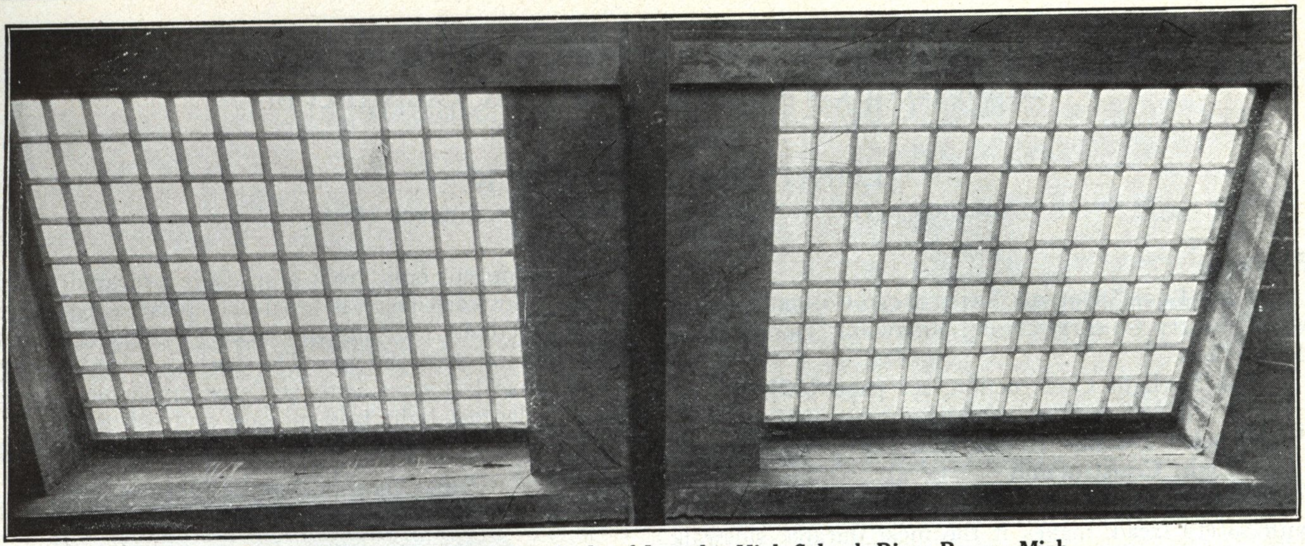


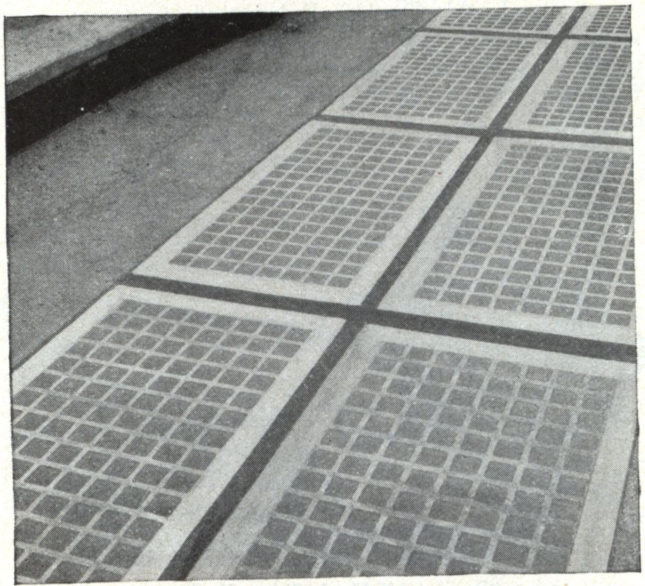
Underside of Skylights at Our Lady of Lourdes High School, River Rouge, Mich.

Grauer Floor Lights (Improved Design)

The Grauer system of reinforced concrete floor lights is built along lines similar to the improved sidewalk lights. The concrete carrying ribs however, run in both directions, which gives a more ornamental appearance from underneath.

Grauer Skylights (Improved Design)

Grauer skylights with wire glass set in metal shields supported by a reinforced concrete grille represent one of the greatest advances in skylight construction in years. The construction features are clearly shown in illustration.



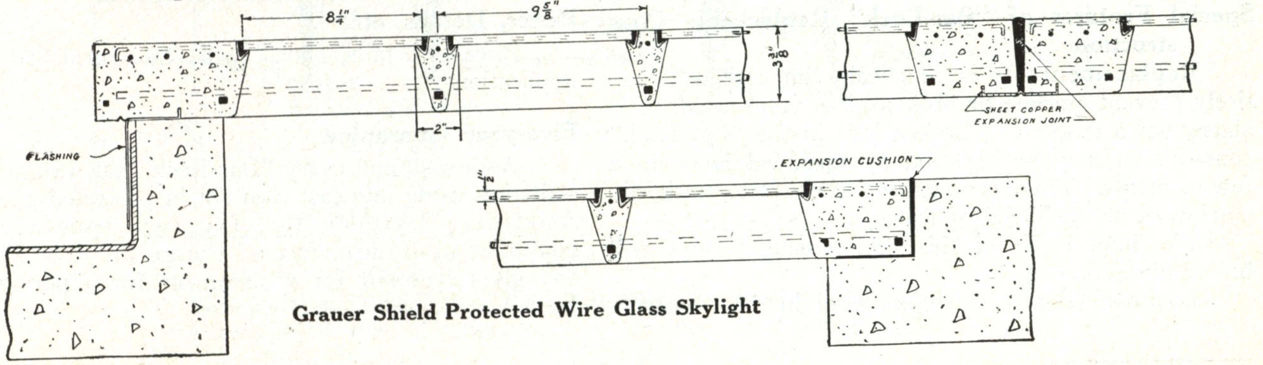
Skylight Over Swimming Pool, Ferris School, Highland Park, Mich.

Outstanding Advantages—Large glass area. Great strength, insuring permanence. Absence of glass breakage. Permanent and durable, all metal being rustproofed and encased in concrete. Fireproof, burglarproof and waterproof. Ease of glass replacement in case of accident. Glass unconditionally guaranteed for five years. Upkeep a negligible factor. Glass set in rustproof metal cups with elastic compound. Glass protected from pressure, both structural and expansion. Can be set flush in roof and used as a floor.

Specification—The skylights shown on plans shall have structural members of reinforced concrete supporting permanent metal shields in which glass is set. Metal shields are to be rustproofed. Glass to be ribbed wire 8¼ in. square, ½ in. thick, set in an elastic, waterproof compound. Spans are to be without intermediate beams up to 13 ft. clear. The entire construction is to be guaranteed for a period of one year. Replacement glass to be furnished free, f. o. b. factory for a period of five years.

Prominent Work

NAME AND LOCATION	ARCHITECT
Book-Cadillac Hotel, Detroit, Mich.	Louis Kamper
Industrial Bank Bldg., Detroit, Mich.	Louis Kamper
Bell Telephone Bldg., Detroit, Flint and Grand Rapids, Mich.	Smith, Hinchman & Grylls
Detroit Edison Co., Detroit, Marysville and Trenton, Mich.	Smith, Hinchman & Grylls
Roosevelt School, Detroit, Mich.	Malcomson & Higginbotham
Barbour Intermediate School, Detroit, Mich.	Malcomson & Higginbotham
Sacred Heart Seminary, Detroit, Mich.	Donaldson & Meier
Annunciation Parish Hall, Detroit, Mich.	Donaldson & Meier
Scherer Bldg., Detroit, Mich.	George D. Mason & Co.
Children's Hospital, Detroit, Mich.	Albert Kahn
Medical Science Bldg., O. S. U., Columbus, Ohio	Jos. N. Bradford
First National Bank, Altoona, Pa.	J. A. Dempwolf



Grauer Shield Protected Wire Glass Skylight

AMERICAN BAR-LOCK CO., INC.

Manufacturers of Sidewalk Light Construction

Hulst Street
LONG ISLAND CITY, N. Y.
BRANCH OFFICES OR REPRESENTATIVES IN ALL LARGE CITIES

Products

"BAR-LOCK" DOUBLE REINFORCED CONCRETE SIDEWALK LIGHT CONSTRUCTION; SIDEWALK DOORS of all descriptions.

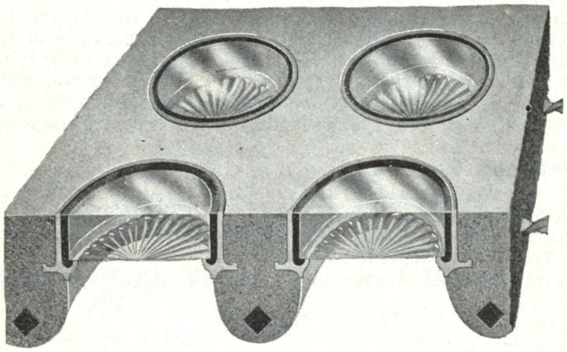
For Skylight Construction, see page 1171.

"Bar-Lock" Double Reinforced Concrete Sidewalk Light Construction

The "Bar-Lock," cast iron shield protected glass with safety tread, makes it the most durable sidewalk light ever placed on the market in our 28 years' experience in this line of business. Especially designed for use where permanence, freedom from broken glass, leakage and maintenance charges are appreciated.

Made in completed factory finished slabs ready to drop over the openings, or we will send our own mechanics, if preferred, to install in the field anywhere in the United States.

The cast iron shield insures an absolutely watertight joint under and around the glass, and the flange on the outer surface insures a perfect anchor in the concrete.



"Bar-Lock" Round Lenses

The heavy body of reinforced concrete does not come in contact with the glass, eliminating another previous cause of breakage of glass from expansion.

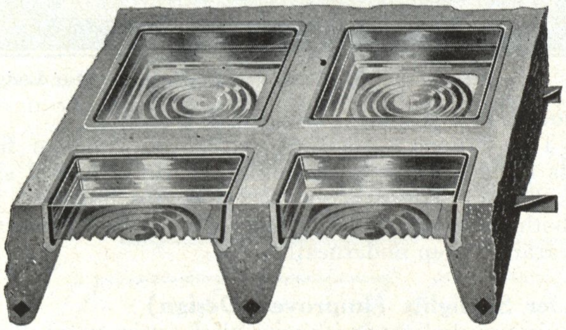
The cast iron shields are solidly embedded in the heavy concrete construction and will last for the life of the building.

Special Features of "Bar-Lock" Replaceable Construction

Replacement—It is practically impossible to entirely prevent cracked or broken glass from accident or abuse, but a cracked or broken lens in the "Bar-Lock" construction may be replaced by unskilled labor in a few moments. There is no cutting of concrete, unsightly patchwork or likelihood of leakage.

The importance of this replacement feature will be readily appreciated.

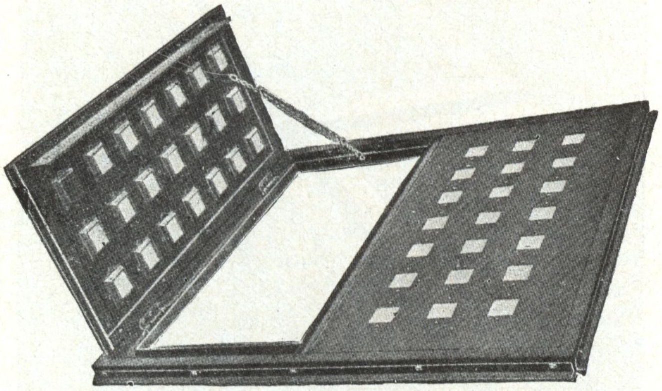
Lazalite Glass—The glass used in this construction is made not only from a specially prepared, tough mixture, but each piece is separately polariscope tested, which effectually prevents all cracking or breakage from expansion or contraction. The lenses, being of pure crystal annealed glass with sunburst undersurface, insure the largest light transmission and diffusion.



"Bar-Lock" Square Lenses

Specification

"'Bar-Lock' Double Reinforced Concrete Construction, using Lazalite polariscope tested glass, protected by cast iron shields, with signed guarantee to furnish glass for replacement free of charge for a period of 5 years."



"Bar-Lock" Flush Sidewalk Doors

Prices, Details, etc.

Prices, details, etc., will be furnished upon application.

Five-year Guarantee

With each and every "Bar-Lock" sidewalk light installation using our cast iron shield protected glass, the AMERICAN BAR-LOCK CO., INC., will issue a written guarantee to furnish, free of charge (f. o. b. factory) any glass required for replacement for a period of 5 years.

J. MERRILL RICHARDS

Manufacturer of Sidewalk and Roof Lights

119-122 West First Street
BOSTON, MASS.

Products

RICHARDS' "UNITY" PERMANENT SIDEWALK LIGHTS and ROOF-LIGHT SKYLIGHTS.

For Magnalite Glass, see page 1781.

Shield Protected Glass Construction

Sidewalk Lights—Double reinforced concrete and glass construction, with glass set into cast iron protecting shields with elastic material. 2¾-in. diameter round, and 3½-in. square glass units.

Roof-light Skylights—8¼-in. square, ½-in. thick wired glass set into non-rusting metallic shields with elastic material.

Glass

Every piece of glass used in Unity construction will pass the standard polariscope test.

Advantages of Shield Constructions

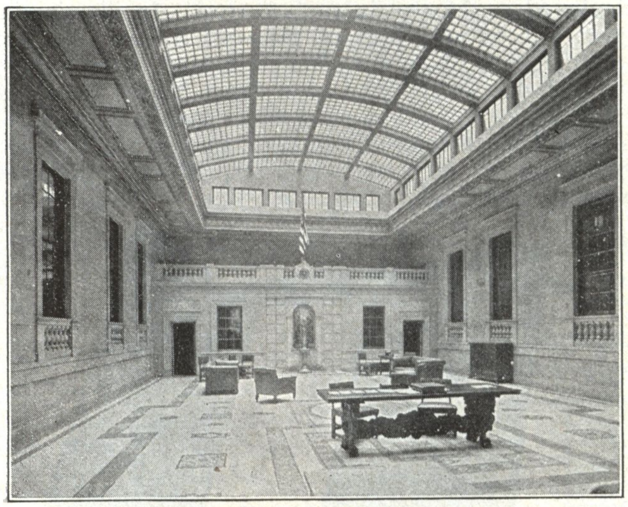
Shields protect the glass from all compression in the top of the slab, eliminating glass breakage.

Glass broken by accident can be replaced in a moment's time by unskilled labor, making no unsightly repair patch.

There is no leakage.

Permanency.

Five-year glass guarantee.



Federal Reserve Bank of Boston
R. CLIPSTON STURGIS, Architect

Specifications for Shield Construction

Roof-sidewalk-floor-lights as shown on plans shall be Richards' "Unity" sidewalk [roof] lights using 2¾ in. round [3½ in. square] [8 in. square ½-in. wired glass] set into metallic protecting shields with elastic material.

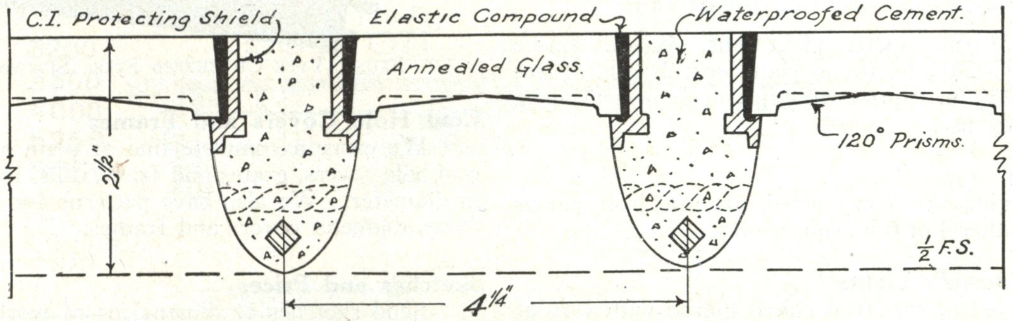
Guarantee

This contractor shall furnish written guarantee to maintain the construction against faulty materials and workmanship and any leakage caused by such for a period of one year.

Glass for replacement shall be furnished owner, free of cost f.o.b. factory, over a period of five (5) years for units broken by any cause outside of fire and accident.

List of Installations

BUILDING AND LOCATION	ARCHITECTS
Banks	
New England Trust Co., Boston, Mass.	Appleton & Stearns
Federal Reserve Bank, Boston, Mass.	R. Clipston Sturgis
National Shawmut Bank, Boston, Mass.	Parker, Thomas & Rice
Appleton National Bank, Lowell, Mass.	E. M. Parsons Co.
Office Buildings	
New John Hancock Mutual Life Insurance Building, Boston, Mass.	Parker, Thomas & Rice F. A. Waldron, Engineer
Lawyers Building, Boston, Mass.	Coolidge & Shattuck
Decatur-Hopkins Building, Boston, Mass.	Monks & Johnson
Schools and Halls	
Dearborn District School, Roxbury, Mass.	McLaughlin & Burr
Latin School, Boston, Mass.	McLaughlin & Burr
Putnam District School, Roxbury, Mass.	J. J. Driscoll
Lyons Union School, Lyons, N. Y.	Carl C. Ade
Faneuil Hall, Boston, Mass.	Cram & Ferguson
Factories	
C. N. & S. N. Russell Co., Pittsfield, Mass.	S. M. Green Co.
Potter Drug & Chemical Corp., Malden, Mass.	Lawrence & Wambolt
Whitin Machine Works, Whitinsville, Mass.	J. D. Leland Co.
Gillette Safety Razor Co., South Boston, Mass.	Charles T. Main Co.



Section 2¾-in. Round Glass, Typical of Shield Protected Glass Construction
Besides shielded glass we stock 6¼-in. square replaceable glass adaptable for floor lights

RICHARDS & KELLY MANUFACTURING CO.

Manufacturers of Prismatic Lights

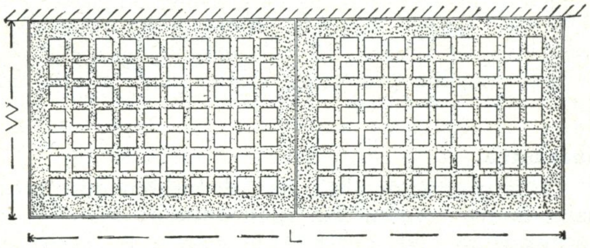
309-311 West Twenty-third Street
CHICAGO, ILL.

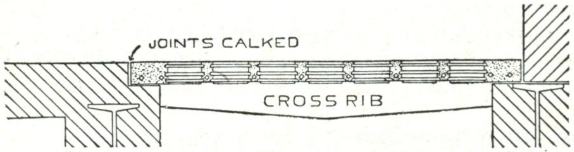
Products

Reinforced Concrete Sidewalk Lights; Cast Iron Sidewalk Lights; Floor Lights; Sidewalk Doors; Coal Hole Covers.

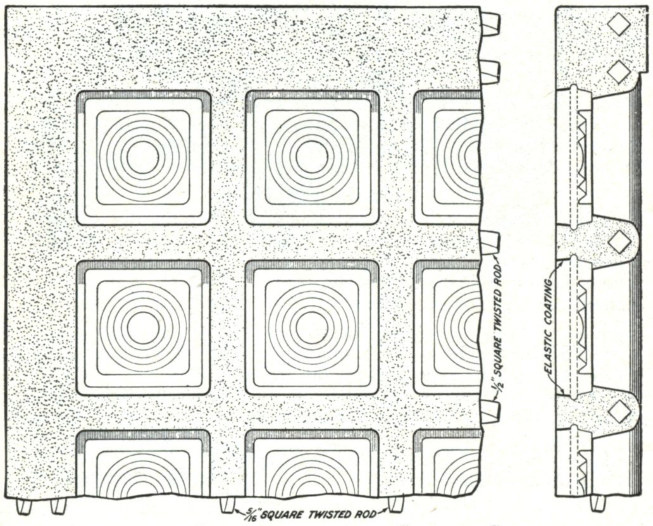
Reinforced Concrete Sidewalk Lights

Constructed of a body of concrete reinforced with twisted steel bars set between the rows of glass and around the outer edges of panels.





Details Construction of Reinforced Concrete Sidewalk Lights



Details Panel with 4-in. Square Glass

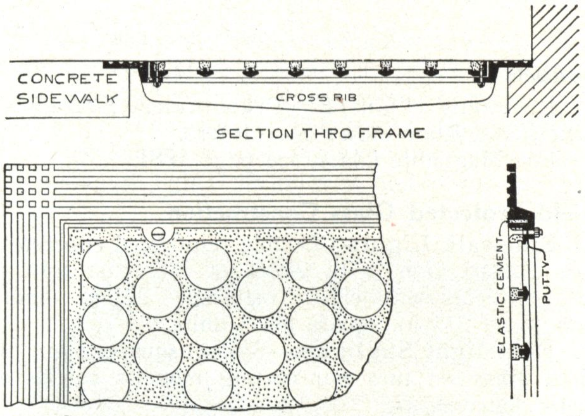
Glass—3¼-in. square plain lens, 3¼-in. square multiprism lens, 3¼-in. round plain lens, 2¾-in. square plain lens, 2¾-in. square multiprism lens and 4-in. square target lens.

Floor Lights

Floor lights are constructed of cast iron panels glazed with either 4 or 6-in. square glass.

Cast Iron Sidewalk Lights

Constructed of cast iron panels glazed with various sizes of glass set in concrete, or in panels with projecting iron knobs with glass set with elastic cement.



Details Construction of Cast Iron Sidewalk Lights, Concrete Setting

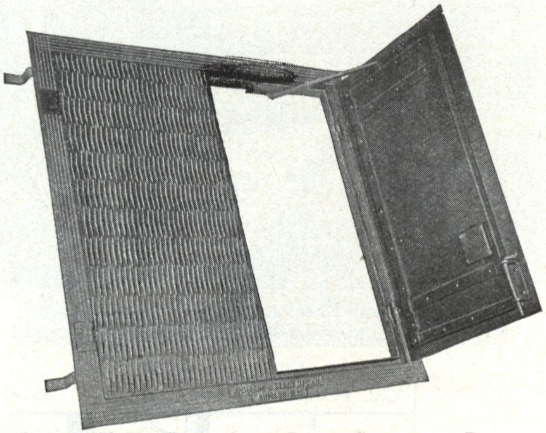
Furnished with panels only or with panels and cast iron outer framework.

Glass—For concrete surface panels, 2, 2½, 3 in. in diameter; 3 in. square; 2½x3½ in. and 2¼x5 in. For projecting iron knob surface panels, 1⅝ in. in diameter.

Sidewalk Doors

Manufactured in flush or raised types, with either checkered steel or plain surface steel. In illuminating type, with various sizes of glass set in cast iron construction, or with square glass set in steel plates.

All doors are fitted with brass hinges, flush lift rings, device to hold in place while open, and slide bolt to lock from below. Flush door frames are cast with gutter to carry off water which seeps through the joints between doors and frames.



Flush Type Checkered Steel Sidewalk Door

Coal Hole Covers and Frames

We carry a complete line of plain and illuminated coal hole covers, grates and frames, 16, 18, 20 and 24 in. in diameter. We also have patterns for 26, 28, 30 and 36-in. diameter covers and frames.

Sketches and Prices

Send sketches or dimensions of work required and estimates will be furnished promptly. Prices given f.o.b. cars or set in place at building.

C. F. ERNST'S SONS

Manufacturers of Combined Automobile Turntable and Washrack

61-87 Lathrop Street
BUFFALO, N. Y.

Product

The "Ernst" Combined Automobile Turntable and Washrack.

Types

Model 1—Designed for installation in the ground floor of a garage where there is no basement, and places where the depth required for the model is available.

Model 2—Designed for installation in upper floors of buildings and in ground floor where there is a basement, or when the depth required for model 1 is not available.

Description

This patented apparatus which is in use in garages throughout the United States, consists of a circular platform flush with the floor, revolving about a hardened steel resistance pin set in the center of a heavy cast iron base.

The floor of the turntable is supported by steel floor beams, rigidly secured to a heavy iron casting which surmounts the base, supported by large hardened steel balls upon which it revolves easily with little effort. These balls bear in grooves cut in two heavy steel ball runs, set in each casting.

Use as Washrack

The turntable is also designed for use as a washrack and the gutter provided in the concrete pit may be connected with sewer or other outlet.

Guarantee

We agree to refund the price of the turntable and to pay for replacing floor, if after 60 days the turntable is not found to be absolutely satisfactory.

TABLE READY
TO RECEIVE WOOD TOP
WEIGHTS-MODEL-1
12 ft.- 2000 lbs. 15 ft. 3000 lbs.
13 ft. 2000 lbs. 16 ft 3000 lbs.
14 ft. 2000 lbs.

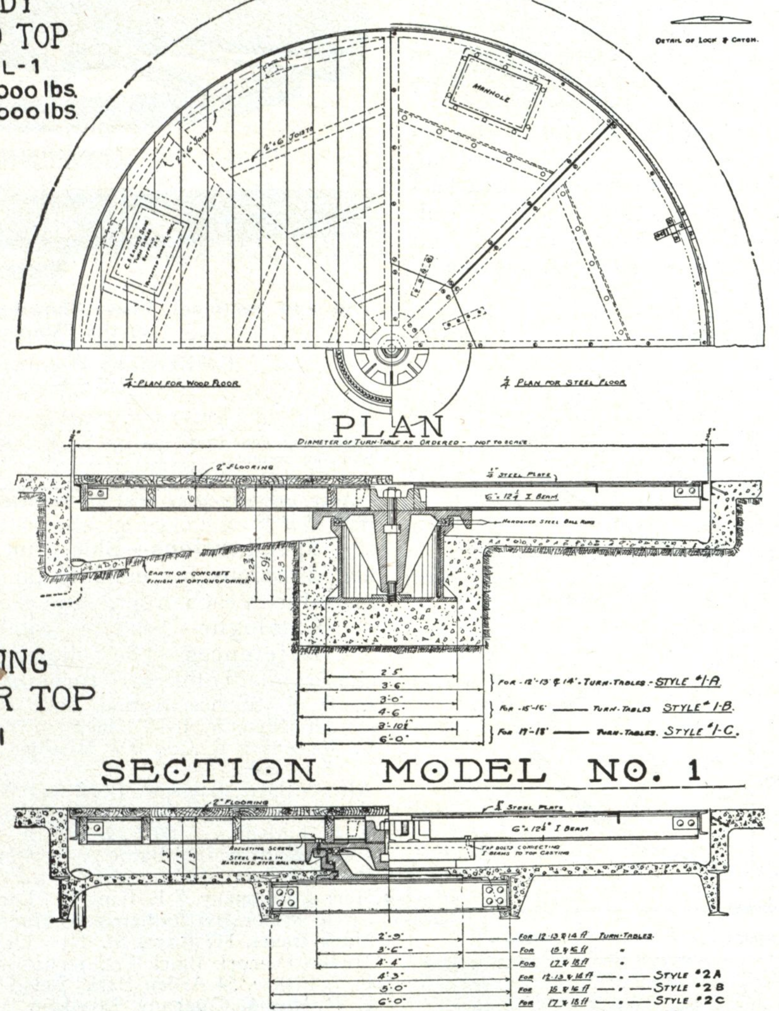

Detail of Lock & Catch.
Manhole
2"x6" Joists
¼ Plan for Wood Floor
¼ Plan for Steel Floor
PLAN
Diameter of Turn-Table as Ordered - Not to scale.
2" Flooring
¼" Steel Plate
6"x 12¼ I Beam
Hardened Steel Ball Runs
Earth or concrete finish at option of owner
6"
2' 2¾"
2' 9½"
3' 3"
2' 5"
3' 6"
3' 0"
4' 6"
3' 10½"
6' 0"
For - 12'- 13' & 14'- Turn-Tables - Style #1-A.
For - 15'-16' —— Turn-Tables Style #1-B.
For 17'-18' —— Turn-Tables. Style #1-C.
SECTION MODEL NO. 1
2" Flooring
¼" Steel Plate
6"x 12¼" I Beam
Adjusting Screws
Steel balls in hardened steel ball runs
Tap bolts connecting I beams to top casting
1' 3"
1' 3"
1' 3"
2' 9"
3' 6"
4' 4"
4' 3"
5' 0"
6' 0"
For 12-13 & 14 ft Turn-Tables.
For 15 & 16 ft "
For 17 & 18 ft "
For 12-13 & 14 ft —— " —— Style #2 A
For 15 & 16 ft —— " —— Style #2 B
For 17 & 18 ft —— " —— Style #2 C
SECTION MODEL NO. 2

TABLE INCLUDING
STEEL FLOOR TOP
WEIGHT-MODEL-1

12 ft.	3200
13 ft.	3500
14 ft.	4000
15 ft.	5750
16 ft.	6050

TABLE SUITABLE FOR DIFFERENT WHEEL BASE CARS

SIZE	WHEEL BASE
12 ft.	110 Inches
13 ft.	124 "
14 ft.	138 "
15 ft.	150 "
16 ft.	164 "

DETAIL DRAWING OF ERNST TURNTABLE MODEL NOS. 1 & 2

THE CANTON FOUNDRY & MACHINE CO.

Manufacturers of Automobile Turntables

CANTON, OHIO

NEW YORK OFFICE: 203 East 15th Street—Telephone, Lexington 5144, 4497

REPRESENTATIVES

MILWAUKEE, WIS., Fred F. Stoll, 453 East Water Street
BOSTON, MASS., Zenas R. Taylor, Inc., 535 Albany Street
LOS ANGELES, CAL., J. E. Dwan, 616 South Utah Street
CHICAGO, ILL., E. C. Moore, 10 South La Salle Street
PHILADELPHIA, PA., Robt. B. Lederle, Witherspoon Building
SAN FRANCISCO, CAL., C. J. Jorgenson Co., 356 Market Street

Products

"Universal" Automobile Turntables for pleasure cars.

"Pitless" Automobile Turntables.

For Builders' Accessories, see pages 620-621.

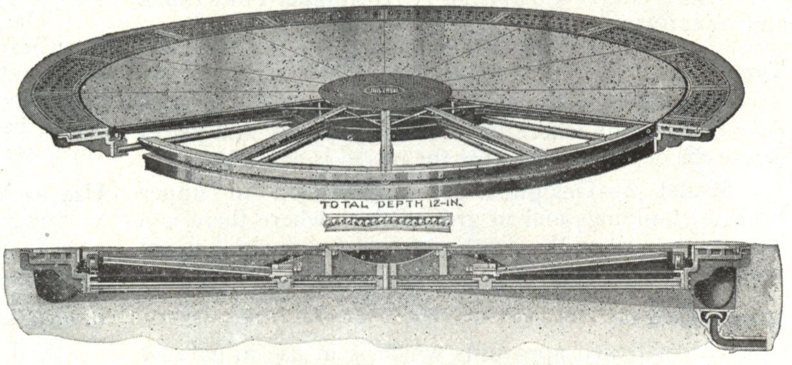
"Universal" Automobile Turntable

Two styles, with and without washrack extension. Mechanically perfect in construction, and easy to turn. Weight of table and load it supports rests on 2-in. ball bearings, that rest on the high points of serpentine, circular track, 6 ft. in diameter, reducing friction to a minimum.

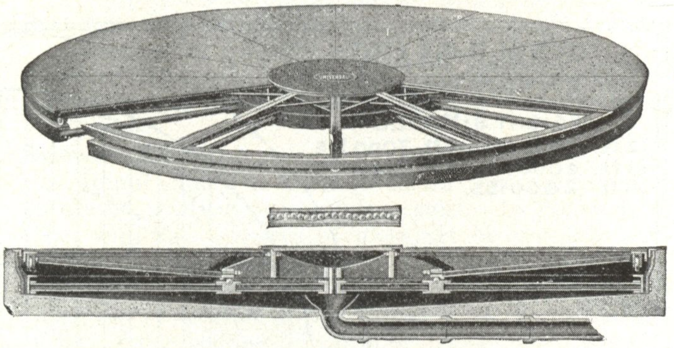
Superstructure is of structural steel, built in truss form to give greatest possible strength; top of table made of $\frac{3}{16}$-in. steel plates. All parts made of iron and steel; simple in construction.

"Universals" may be placed on upper floors as well as on ground floors. Castor wheels at periphery of table are used only to prevent table from tilting. Heavy load does not substantially increase friction.

Advantages—Removable ribbed steel plates on top, adjustable by means of truss bolts to take care of any wear; water drains to rim, then through grooves back to center of pit or outlet; can not tilt, always perfectly poised; easily turned. Quickly and easily erected from knocked down shipment, by one man; always ready; only 12 in. in depth.



Top and Sectional View Showing Details of Construction of the "Universal" with Washrack Extension



Top and Sectional View, Showing Details of Construction of the "Universal"

TURNTABLES FOR PLEASURE CARS

Wheelbase .... in.	108	132	144	156
Diameter .... ft.	12	14	15	16
Supporting capacities .... lb.	8000	8000	8000	8000
Shipping weights .... lb.	4550	5300	5600	6000

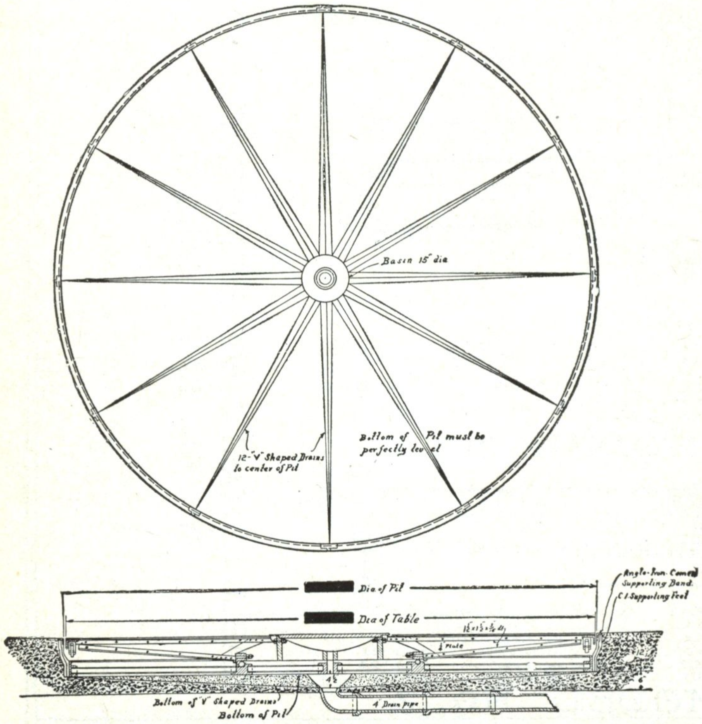
Angle iron supporting band for concrete floors comes fastened to outer circle of table.

Specifications—Blue print, complete specifications and directions for building pit and erecting table furnished with each order. Any careful mechanic can erect.

Catalogue—Send for catalogue "C-99."

References—The following are a few recent purchasers of "Universal" turntables:

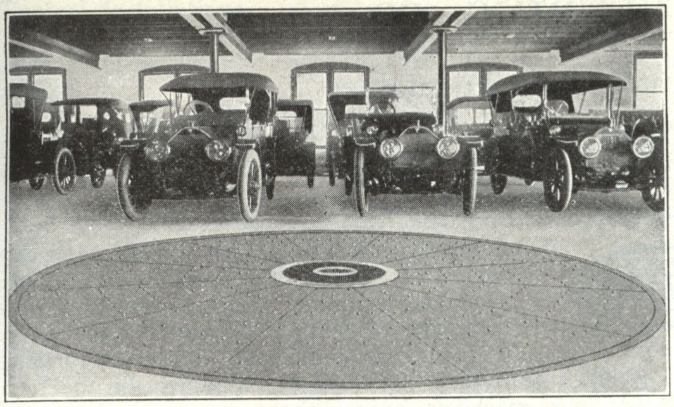
L. & F. Service Station, Inc., 4180 Hudson Blvd., West Hoboken, N. J.—2 tables
C. Jorgensen & Co., 604 Mission St., San Francisco, Cal.—2 tables
Alfredo Diaz, Bayshore Blvd. and Waverly St., Tampa, Fla.
Porter Estate Building, 608 So. Wabash Ave., Chicago, Ill.
E. H. Latham Co., 60 E. Broad St., Columbus, Ohio
Henry Kantor, 1515 Baltic Ave., Atlantic City, N. J.
Pierce & Gaetz, 42 Weybosset St., Providence, R. I.
Herr & Company, 7 E. King St., Lancaster, Pa.
Circle Motor Inn, Indianapolis, Ind.—3 tables
Mark Isaacs, 117 Royal St., New Orleans, La.
Medlin-Peacock Buick Co., Jacksonville, Fla.
F. J. Fisher, 54 Arden Park, Detroit, Mich.
E. F. Maxim Company, Lewiston, Maine
Brewer Bros., Inc., Pittsfield, Mass.
Tracy Bros. Co., Waterbury, Conn.
M. L. Benedum, Pittsburgh, Pa.
H. V. Hickox, Springfield, Ill.


Basin 15" dia
12-"V" Shaped Drains to center of Pit
Bottom of Pit must be perfectly level
Dia. of Pit
Dia of Table
Angle-Iron Cement Supporting Band.
C.I. Supporting Feet
$1\frac{1}{2}$x$1\frac{1}{2}$x$\frac{3}{16}$ Ls
$\frac{1}{4}$ Plate
12
6
$4\frac{1}{2}$
Bottom of "V" Shaped Drains
Bottom of Pit
4 Drain pipe

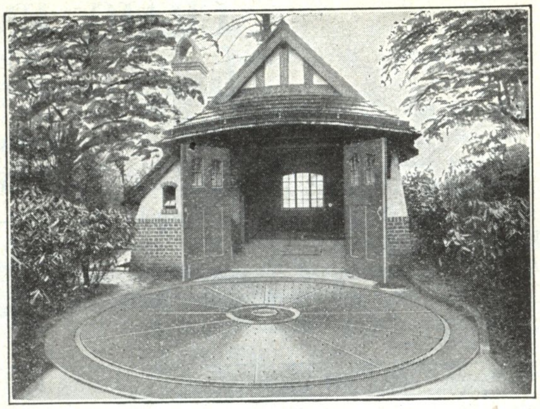
Foundation Plan for "Universal" Automobile Turntable

Patented December 27, 1904; June 29, 1909; October 4, 1910; January 2, 1912

Continued on next page



Public Garage of Maxwell Motor Car Co., Lawrenceville, Ill.



Private Garage of Edward Bok, Merion, Pa.

Two Installations of "Universal" Automobile Turntables

"Pitless" Automobile Turntable

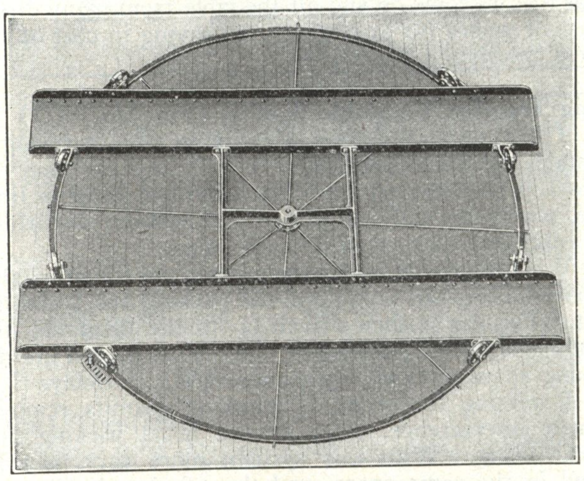
A circular steel track, 1½ in. high, surrounds a center plate, to which it is attached and held rigid by 8 radial rods. The track is surmounted by 2 steel runways, each 18 in. wide and 13 ft. long. Each runway has 4 ball bearing wheels as shown in accompanying illustrations, and the entire weight of the car is borne by these bearings, reducing friction to the minimum. The wheels support the runways ¾ in. above the track. The runways are held in place by a brace at the middle. A steel king pin, running through this brace and the center plate, forms the pivot of the turntable. The track is 11 ft. in diameter.

Advantages—An automobile turntable is almost as essential for human comfort as the automobile itself. In fact, the automobile is dangerous and destructive when the driver is under the handicap of facing in one direction, while he drives in another.

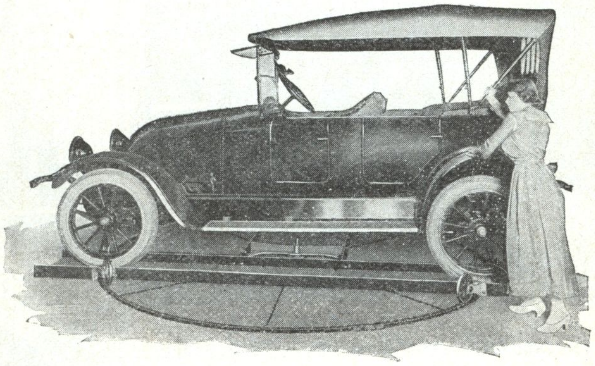
The "Pitless" requires no elaborate and expensive preparation for installing. Since it needs no pit, it can be set down anywhere on a solid base and it is ready to turn the car. But it may also be installed with the track and bracing embedded in a concrete floor. This is easily done in a new garage when the concrete is soft. It may also be installed in the same way in an old garage by chipping away channels for the track and brace rods.

Since the working parts are not covered by a solid platform, but merely have two runways to receive the car, a minimum of steel is used, and therefore a minimum of weight and a minimum of expense result.

The "Pitless" turntable may be locked so it will not glide or wobble when the car is being driven off or back on the turntable.



"Pitless" Automobile Turntable
If locked after car has been turned, it provides a solid runway



Turning a Car On the "Pitless" Automobile Turntable
A light construction, completely equipped with steel ball bearings makes this easy

A woman can turn the heaviest car with no more effort than opening the garage door. This turntable revolves on 208 balls incased in 16 bearings, 2 bearings on each wheel. It is the lightest type of design known.

The runway idea provides a platform only where a platform is needed, under the wheels, eliminating costly, heavy and superfluous steel.

Advisory Service—If the desired location for the garage is difficult of access, information will be given as to how the turntable should be placed to solve the problem.

Specifications and detailed instructions go with each turntable.

Catalogue—Write for catalogue G which gives further description, details and prices.

References—A few "Pitless" installations:

McAlister Brothers, Baum Blvd. and Fairmount Ave., Pittsburgh, Pa.—2 tables
Chicago Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.—3 tables
Cadillac Motor Car Co., 2301 S. Michigan Ave., Chicago, Ill.—2 tables
Henry H. Love, 2nd Ave. and 2nd St., S., St. Petersburg, Fla.—5 tables
Chandell Realty Co., 76 Carlyl Ave., Yonkers, N. Y.—2 tables
Eagan Tire & Rubber Co., 185 Middle St., Bridgeport, Conn.
Benner Construction Co., 306 W. 25th St., New York, N. Y.
Uppercu Cadillac Co., 1881 Broadway, New York, N. Y.
E. A. Cronauer, Skaneateles Falls, N. Y.
Ike Hanley, Inc., Huntington, W. Va.
Mrs. Bertha Snyder, Claverack, N. Y.
Henry V. Bauer, Kansas City, Mo.
Chris Kolpin, Mt. Vernon, N. Y.
Russell A. Rogers, Fulton, N. Y.
Geo. B. DeCaire, Fulton, N. Y.
S. J. Flaherty, Elizabeth, N. J.

CRAIG ENGINEERING CO.

Manufacturers of Automobile Turntables

Schwind Building
DAYTON, OHIO

Products

Craig Automobile Turntables: Pit and Pitless Types for public and private garages; Transfer Types for public garages.

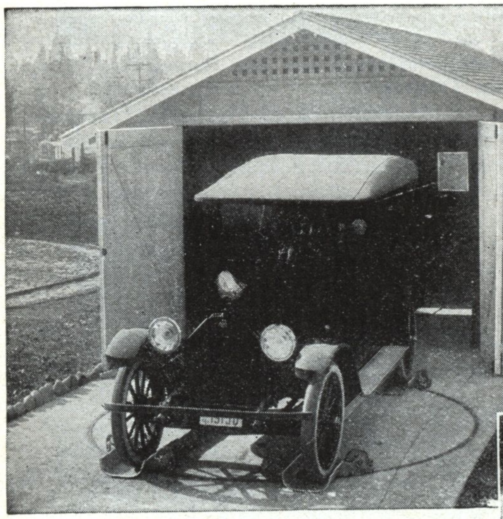
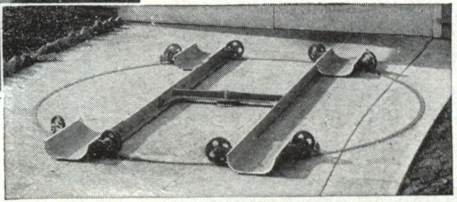
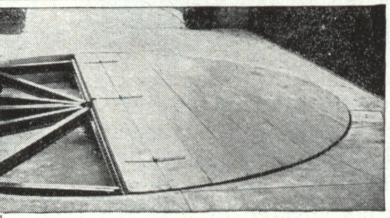


Fig. No. "A"
Installation of Pitless Type Turntable





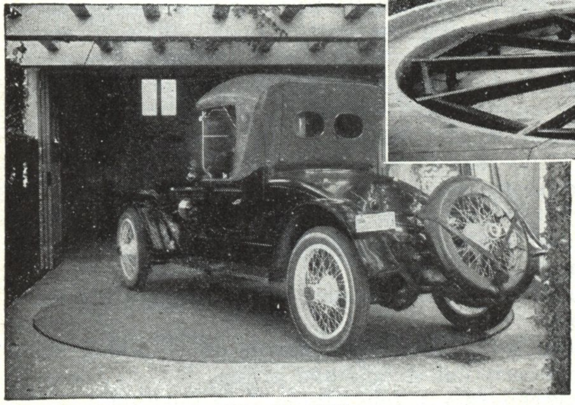


Fig. No. "B"
Installation of Pit Type Turntable

Facts About Craig Automobile Turntables

Every backward motion of a motor car is hazardous to life, limb, property, and should be avoided whenever possible, especially when there are children on the premises.

An automobile turntable should be used wherever safety and convenience are considered, where space is limited, and where beauty of grounds is desirable.

The saving in cost of expensive concrete surface in yard and driveway often goes a long way toward paying for one of our turntables.

Our machines are built entirely of steel and iron, except the cover or floor on the pit turntable, which is generally of wood plank, but may be steel or cement, if desired. The weight of the turntable and car is carried on large ball bearing wheels rolling on a circular steel track. Each wheel is mounted on two sets of heavy duty combination radial and thrust ball bearings. This construction, together with their light weight, accounts for the fact that our machines are, without question, the most easily operated turntables ever designed. A child can turn the heaviest car.

Craig Pitless Turntable (Fig. No. "A")

Designed especially for use in private garages to avoid the necessity for backing a car to the street, and is by far our most popular style for that service. It is a radical departure from former practice and is fully covered by patents.

This construction is low in first cost, easily installed, and readily moved to a new location if desired. The use of this style of turntable adds to the cleanliness of the garage and helps reduce tire expense, as it keeps the tires out of the grease and oil on the floor. If space in garage does not permit turning a car inside, the turntable may be installed outside.

No pit being required, the pitless auto turntable can be installed on any smooth, level floor, stiff enough to bear the weight of the car. On a wood floor, the installation may be made in an hour or two; on a cement floor, half a day should be sufficient.

Craig Pit Type Turntable (Fig. No. "B")

Suitable for any location where the pitless turntable would be an obstruction, such as in a driveway over which other traffic must pass; in public garages where all kinds of cars come on and off the table from many directions; or where for any reason the saving in cost of the pitless type is not attractive.

Craig Transfer Turntable System (Fig. No. "C")

The system comprises a transfer table carrying a turntable which is so operated that any car may be parked in, or removed from, its individual space in little time, with practically no effort, and without disturbing any other cars parked in adjacent spaces.

When a vehicle enters the garage, the transfer table is moved along the rails up to the parking space allotted to it. The car is then driven on to the turntable, the turntable is turned 90 degrees, and the car moved into its parking space without any manœuvering or delay.

Reversing the order of handling permits removal without interference, delay or the usual backing and manœuvering. With this system, more cars may be stored in the same space, and there is less liability of damage to the cars.

Continued on next page

Typical Installations

The illustrations below will convey an idea of the many ways in which Craig auto turntables may be installed.

We will gladly co-operate with architects in planning their adaptation to any peculiar situation or location. Our experience along this line may be of service.

No. 1—Narrow single garage with pitless turntable outside.

No. 2—Wide single garage with pitless turntable inside.

No. 3—Three-car garage with pit turntable inside front entrance.

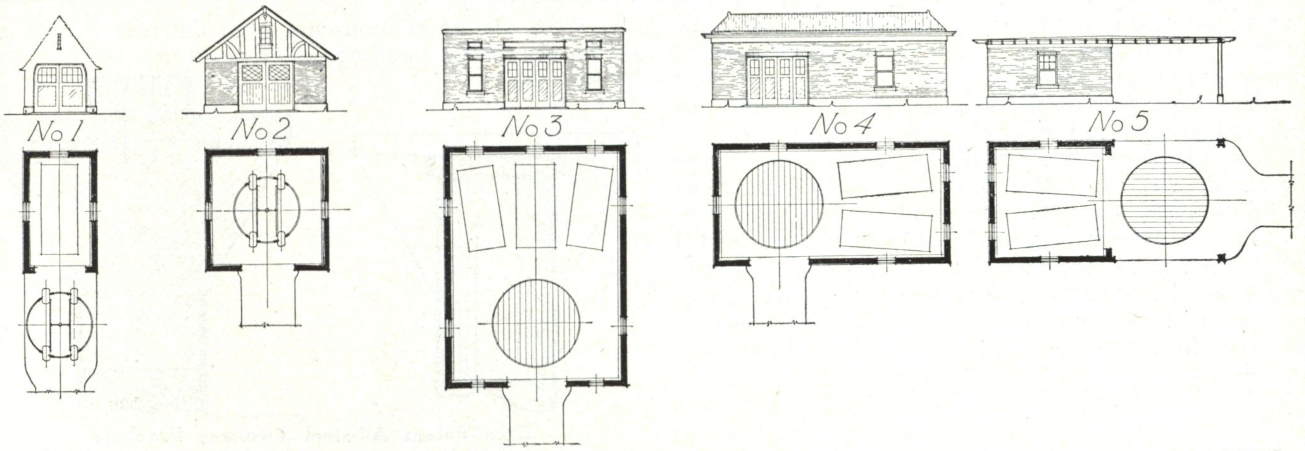
No. 4—Two-car garage with pit turntable inside side entrance.

No. 5—Two-car garage with pit turntable outside and with canopy to protect it from the weather.

No. "C"—Public Garage with transfer turntable system.

These are typical installations and may be varied at will. For instance: the canopy of No. 5 may be used on No. 1; the pit or pitless types may be used in any one; No. 3 may have side entrance; No. 4 may have front entrance. Other changes will suggest themselves as more harmonious to the type of dwelling where garage is erected, or more fitting to the location selected.

In figuring the space required for turning a car, remember that most cars extend beyond the table at both ends, and it is the greatest diagonal length of the car which determines the clearance necessary between the turntable and walls, fences, etc.



TYPICAL INSTALLATIONS OF CRAIG PIT AND PITLESS TYPE TURNTABLES FOR PRIVATE GARAGES

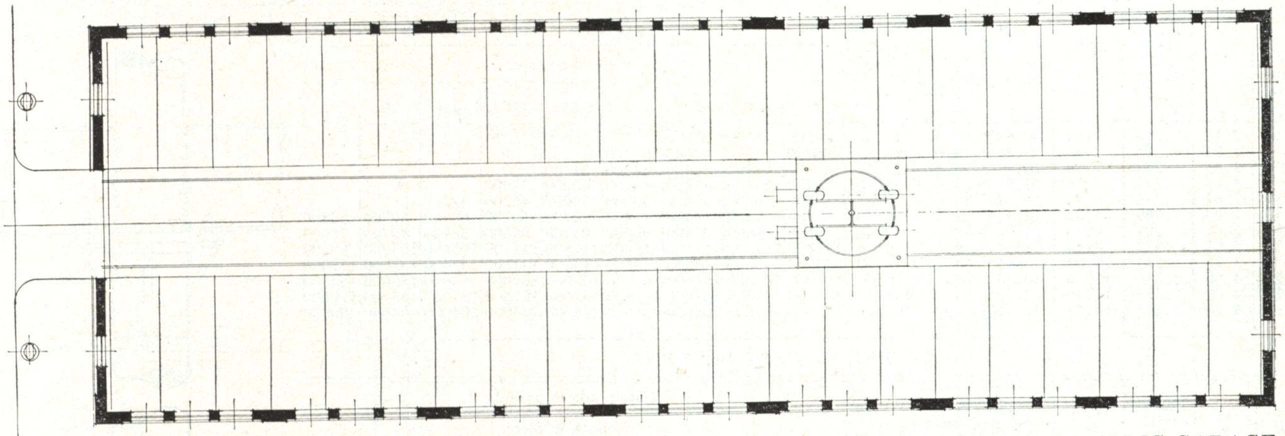


FIG. NO. "C," TYPICAL INSTALLATION OF CRAIG TRANSFER TURNTABLE SYSTEM IN PUBLIC GARAGE

CRAIG PITLESS TYPE BALL BEARING AUTOMOBILE TURNTABLES

Style	Length over all, in.	Length between pans, in.	Diagonal diam., ft.	Track diam., ft.	Wheel diam., in.	Width of pans or runways, in.	Approx. shipping weight, lb.
No. 5	120	72	11⅓	9½	6¼	10	350
No. 6	144	84	13⅓	11	7½	14	600

Height of runway (top), above floor, ¾ in.

No. 5 is suitable for short cars, such as the Ford, Maxwell, Overland, Chevrolet, Gray, Star, electrics, etc. No. 6 is suitable for all ordinary weights and lengths of cars. There are only two or three cars on the market which can not be turned on this table.

Special Turntables

Special turntables designed for special purposes.

Prices

Prices on request.

CRAIG PIT TYPE BALL BEARING AUTOMOBILE TURNTABLES

Diam. of pit, ft.	Approx. depth of pit, ft.	Wheel diam., in.	Steel track diam., ft.	Approx. shipping weight, steel and iron work, lb.
14½	1	6	12	1000

We furnish all steel and iron work, to which the plank top is secured by screws or spikes, but we do not furnish the planking because it can easily be obtained by the purchaser from any lumber dealer more cheaply than we can deliver it.

Service

The services of our engineering staff are at the command of architects who may require special assistance in the adapting of Craig auto turntables to their plans.

CREX PATENT COLUMN CO.

GENERAL OFFICE AND WORKS
2300-2310 South Springfield Avenue
CHICAGO, ILL.

TELEPHONE
Lawndale 2634, 2635

BRANCHES
DECATUR, ILL., Box 299
MILWAUKEE, WIS., 951-53 Thirtieth Street
TOLEDO, OHIO, Summit and Sandusky Streets

Product

Manufacturers of Crex Patent Columns.

Construction

Crex Patent columns consist of an outer shell of steel filled with concrete, and only the best materials are employed in their manufacture.

Especial care is taken in filling these columns so that the concrete filling shall be perfectly solid and uniform throughout, thus obtaining the full strength of a solid concrete interior.

The caps and connections are made of steel, of sufficient strength to receive the superimposed loads.

Crex Patent Column Co. holds the original patent for an all-steel cap. The cap being entirely of steel, its strength can be reliably computed.

The connections are made in such a manner that only a steel plate separates the shaft of the lower column from the one above, securing the full strength of the column at the connection. Crex columns can be furnished in about one-fifth the time required for other columns.

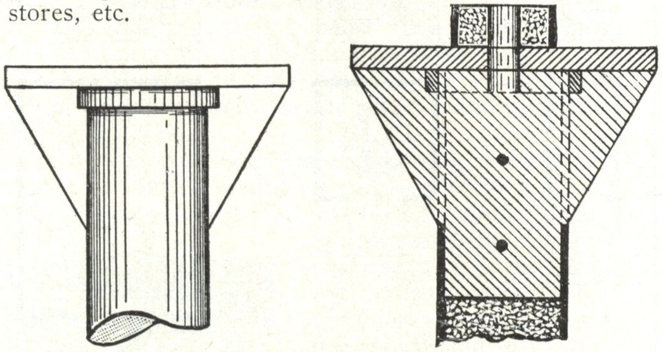
Crex Patent Column Co. was formed for the purpose of supplying the increased demand for this class of columns with the best that can be made, both as regards strength and appearance.

Approval

Crex Patent columns are approved by the building departments of all large cities.

Adaptability

Crex Patent columns are used extensively in factories, apartment buildings, stores, etc.



Crex Patent All-steel Two-way Brackets

HEAVY WEIGHT CREX COLUMNS

Out-side diam., in.	r	Thick-ness of steel, in.	Area of steel, sq. in.	Weight of steel per ft., lb.	Area of con-crete, sq. in.	Weight of column per ft., lb.	Safe loads in pounds								
							Length in feet								
							6	8	10	12	14	16	18	20	22
3½	1.18	.216	2.24	7.58	7.07	14.65	30200	26920	24000						
4	1.32	.226	2.69	9.11	9.62	18.81	36800	33900	30600	27200					
4½	1.45	.237	3.19	10.79	12.57	23.47	44100	42100	38400	34800	31200				
5	1.70	.247	3.71	12.54	15.90	28.70	51200	51200	47800	44200	40500	37000			
5½	1.87	.258	4.32	14.62	19.64	34.51	59600	59600	57800	53800	50000	46200	42200		
6⅝	2.22	.280	5.61	18.97	28.27	47.58	77400	77400	77400	74400	70200	66200	61800	59700	53400
7⅝	2.61	.301	6.96	23.54	38.48	62.48	96600	96600	96600	96600	93100	86800	84600	79700	75500
8⅝	2.97	.322	8.44	28.55	50.27	79.46	117800	117800	117800	117800	117800	113400	108600	104000	99200
9¹¹⁄₁₆	3.28	.344	10.03	33.91	63.62	98.60	143800	143800	143800	143800	143800	142800	137600	132600	127000
10¾	3.66	.366	11.92	40.48	78.54	120.10	167000	167000	167000	167000	167000	167000	165600	159000	154800
11¾	4.01	.375	13.46	45.56	95.03	141.00	187600	187600	187600	187600	187600	187600	187600	185200	179600
12¾	4.36	.375	14.62	49.56	113.10	164.40	205600	205600	205600	205600	205600	204000	204000	204000	200000

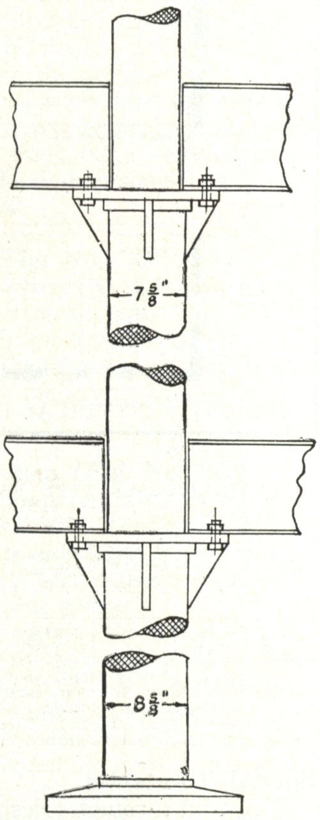
LIGHT WEIGHT CREX COLUMNS

Out-side diam., in.	r	Thick-ness of steel, in.	Area of steel, sq. in.	Weight of steel per ft., lb.	Area of con-crete, sq. in.	Weight of column per ft., lb.	Safe loads in pounds								
							Length in feet								
							6	8	10	12	14	16	18	20	22
3½	1.20	.120	1.28	4.33	8.35	12.79	17660	15840	14000						
4	1.33	.134	1.64	5.53	10.93	14.57	23000	21200	19200	17100					
4½	1.54	.134	1.85	6.25	14.10	20.57	25900	25240	23200	21200	19120				
5	1.71	.148	2.29	7.67	17.42	25.38	32100	32100	30000	27500	25500	23300			
6	2.04	.165	3.05	10.28	25.25	35.95	42400	42400	42000	39600	37160	34600	32000	29600	

Standard steel boiler tubes, Crane Co., 1913.

EXTRA HEAVY WEIGHT CREX COLUMNS

Out-side diam., in.	r	Thick-ness of steel, in.	Area of steel, sq. in.	Weight of steel per ft., lb.	Area of con-crete, sq. in.	Weight of column per ft., lb.	Safe loads in pounds								
							Length in feet								
							6	8	10	12	14	16	18	20	22
3½	1.15	.300	3.03	10.25	6.67	17.05	40200	35900	31600	27500					
4	1.30	.318	3.70	12.51	8.87	21.52	51800	47440	42760	38000	33100				
4½	1.47	.331	4.43	14.98	11.45	26.66	62300	59400	54400	49600	44500	39440			
5	1.65	.356	5.21	17.61	14.39	32.90	73500	72000	67720	62500	57600	51700	46400		
5⁹⁄₁₆	1.83	.375	6.14	20.78	18.19	39.07	85500	85500	81900	76400	70800	65200	59400	53800	
6⅝	2.19	.432	8.44	28.57	25.97	55.07	119000	119000	119000	113600	107100	100800	94100	87500	81100
7⅝	2.54	.500	11.26	38.05	34.47	72.86	156800	156800	156800	156800	149400	142000	134800	127600	120000
8⅝	2.89	.500	12.81	43.39	45.66	89.50	178600	178600	178600	178600	178200	170200	163000	155400	148000



Steel Bracket Cap Construction

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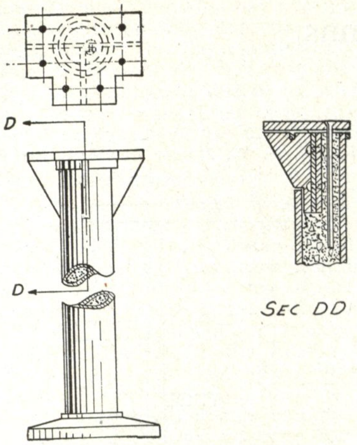
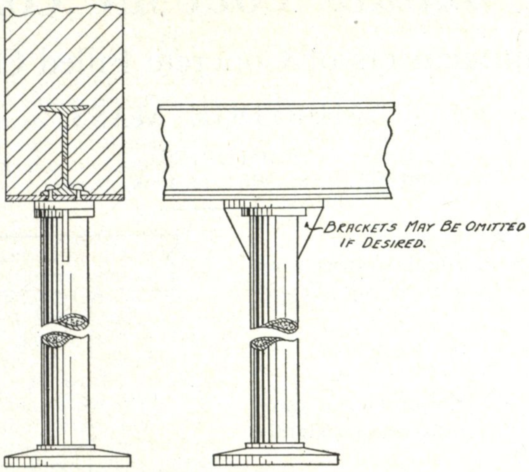
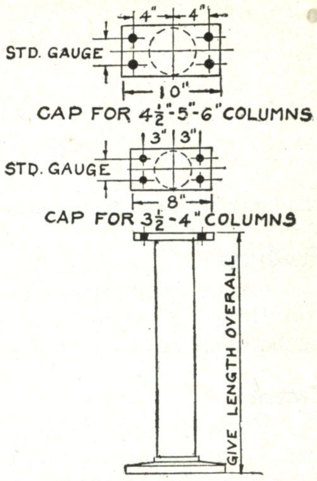


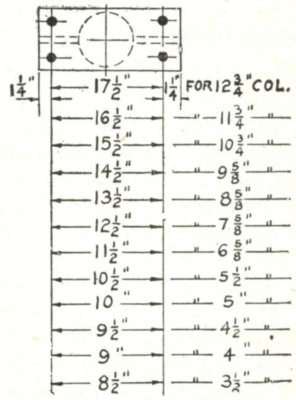
Three-way Bracket


BRACKETS MAY BE OMITTED IF DESIRED.

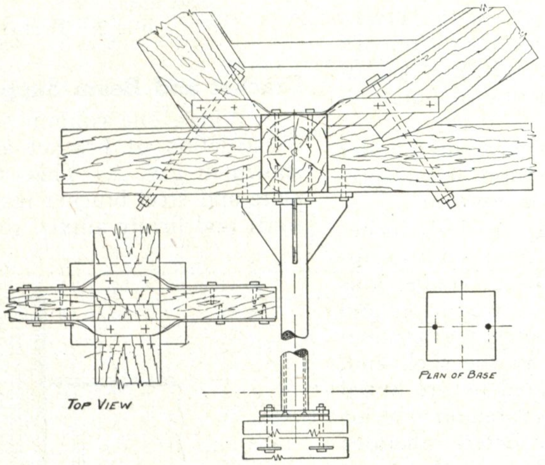
Details Showing Crex Columns in Store Front Construction


4"
4"
STD. GAUGE
10"
CAP FOR 4½"-5"-6" COLUMNS
3"
3"
STD. GAUGE
8"
CAP FOR 3½-4" COLUMNS
GIVE LENGTH OVERALL

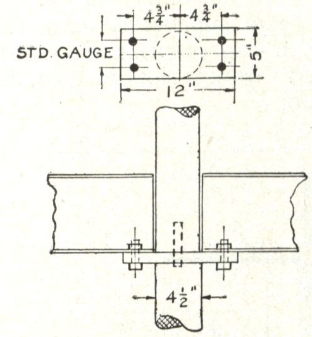
BASEMENT COLUMNS

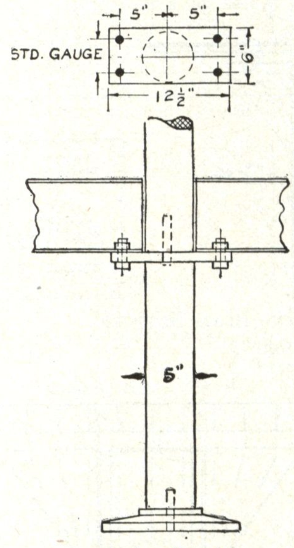

1¼"
17½"
1¼"
FOR 12¾" COL.
16½"
11¾"
15½"
10¾"
14½"
9⅝"
13½"
8⅝"
12½"
7⅝"
11½"
6⅝"
10½"
5½"
10"
5"
9½"
4½"
9"
4"
8½"
3½"

Standard Gauge for I-Beams

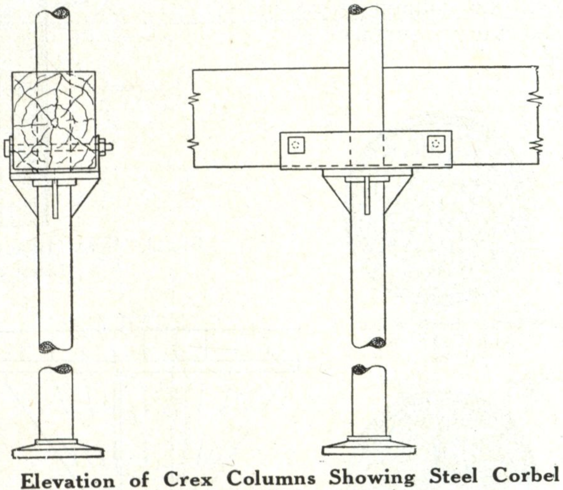

TOP VIEW
PLAN OF BASE

Details Showing Crex Columns in Sawtooth Construction

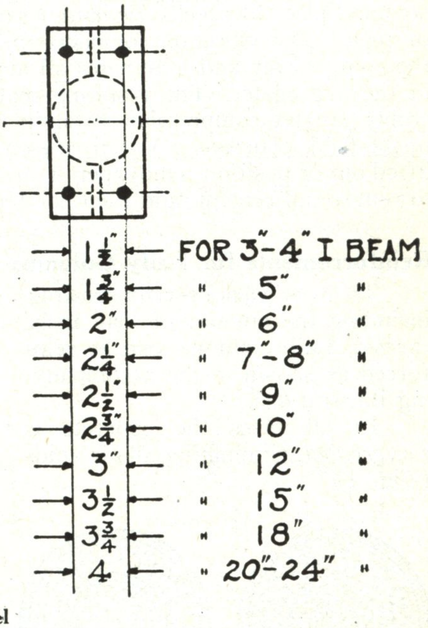

4¾"
4¾"
STD. GAUGE
5"
12"
4½"


5"
5"
STD. GAUGE
6"
12½"
5"

Stack for Partitions, Apartment Buildings



Elevation of Crex Columns Showing Steel Corbel Used in Mill Construction


1½ FOR 3"-4" I BEAM
1¾ " 5" "
2" " 6" "
2¼ " 7"-8" "
2½" " 9" "
2¾" " 10" "
3" " 12" "
3½ " 15" "
3¾ " 18" "
4 " 20"-24" "

Prices, etc.

Quotations and any additional information furnished on request.

Installations

Crex columns have been installed in thousands of buildings in various parts of the United States. This fact gives proof of the economy, reliability and fine appearance of Crex columns.

ESTABLISHED 1897

LALLY COLUMN CO.

Manufacturers of Concrete Filled Columns

CAMBRIDGE, MASS.

FACTORIES

CHICAGO, ILL., 4001 Wentworth Avenue
CAMBRIDGE, MASS., Erie and Albany Streets
BROOKLYN, N. Y., 211-249 Lombardy Street

Products

Lally Columns with patented Steel Connections and Bracketed Caps securely fastened, making a rigid tie between beams and columns.

Patents

Various improvements on Lally columns are covered by numerous patents under different dates extending from 1898 to the present time.

Infringements will be prosecuted.

Manufacturing Process

Lally Columns are manufactured by the Lally Column Co., Inc., of New York, the Lally Column Co., Cambridge, Mass., and the Lally Column Co. of Chicago, representing an annual production of hundreds of thousands of columns.

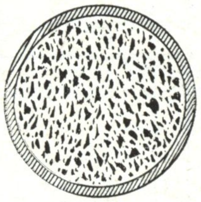
The column is a *shop-made* unit manufactured under the most thorough and careful supervision and inspection, and is shipped to the job ready for erection.

Standard tested mild steel pipes, 3½ to 12¾ inches outside diameter, are cut to the lengths required by plans and specifications, slotted to receive beam connections and splice plates, set up perpendicular on level bases and held in a vertical position by lateral supports. A machine-mixed stone concrete fill is deposited in the shell and, to insure dense concrete, shaft is agitated before initial set takes place by an electric hammer operated on exterior of pipe. The vibration compacts the concrete, liberates the confined air and eliminates all air holes and cavities in the aggregate. The resulting material is of considerably greater compressive strength than ordinary cast-in-the-field concrete. When seasoned, the column is lifted out of position, sandpapered on the exterior surface to remove all cement, and then painted.

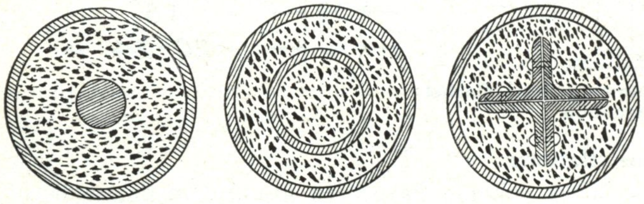
Reinforcements for Lally Columns

To meet various requirements, including the amount of load to be carried, Lally columns can be reinforced as shown in the accompanying illustrations.

In all cases the concrete is *compressed,* eliminating all air voids (Fig. 1).



Outer Shell Filled with Compressed Concrete



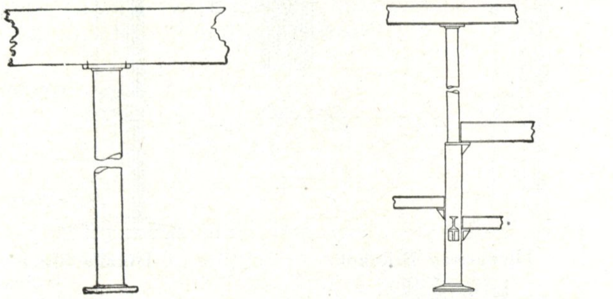
Single Steel Bar Reinforcement

Pipe Reinforcement

Four Angle Iron Reinforcement

Fig. 1. Sectional Views Showing Manner of Reinforcement of Lally Columns

Note: The angle iron reinforcement above makes a compact fireproof column; column is designed so that load is carried by the four angle irons and concrete within radius of same; outer shell and outer concrete act as fireproofing, making a column practically indestructible



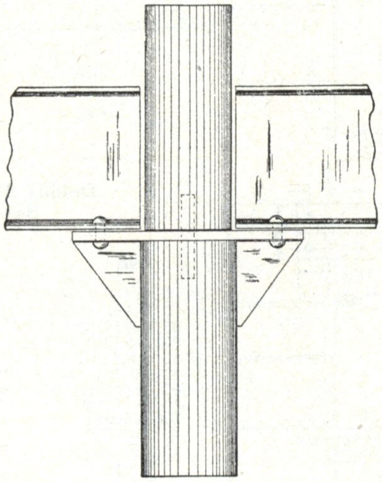
Plain, with Ordinary Plate for Wood Beam Connection

With Beam Supports at Different Elevations

Fig. 2. Types of Lally Columns

Bracket and Beam Support (New Style of Cap)

Where one column sets over the other, our latest construction of bracket and beam support is used, as shown in Fig. 3. This style of cap consists of crown plate and steel bracket inserted through slots in column shaft and firmly affixed thereto.



SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST 1916

Fig. 3. Steel Bracket and Beam Support
Latest construction

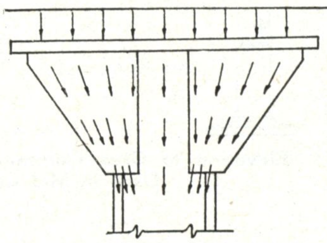


Fig. 4. Steel

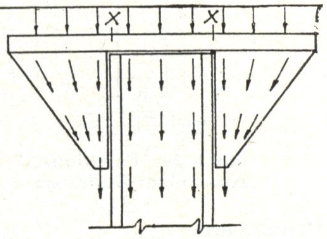


Fig. 5. Cast Iron

Bracket Caps

Fig. 4. Cross section of a typical Lally steel bracket cap showing diagrammatically with arrows how all the load on the cap plate is distributed to the column, eliminating the chance of failure due to improper distribution of the load

Fig. 5. Cross section of a typical loose cast iron cap showing by means of arrows that only part of the load is distributed directly to the column, thereby causing failure by shear at the points marked "x." Load between points "x—x" is the only load carried by the column

Continued on next page

Approvals

The Lally column is endorsed by engineers throughout the country, and approvals have been granted for its use by all the leading city building departments after extensive tests and investigations. Its adaptability to all forms of building construction, its economy in first cost and in floor space occupied, its speed of erection, as well as its strength, durability and practical performance, have been demonstrated by successful and uniformly satisfactory use under especially severe conditions.

Fire Resistance

The value of the Lally column in fire resisting construction has been frequently demonstrated both in actual fires and scientifically conducted fire tests. This type of column section, without additional exterior protection, has withstood the flames and high temperatures of some of the greatest fires; such as the Chelsea conflagration in April, 1908, the Salem fire in June, 1914, the Standard Oil fire at Greenpoint, N. Y., in September, 1919, and the fire in the Edison Phonograph works at West Orange, N. J., in December, 1914. In this latter fire, large pieces of steel and cast iron melted in the same building in which concrete-filled pipe columns were used and there were evidences of exposed concrete having been fused. The defect produced on the concrete-filled steel pipe columns was a slight lateral bend which was generally less than 1 inch. A complete report on the fire in the Edison Phonograph Works was prepared under the joint auspices of the National Fire Protection Association and the National Board of Fire Underwriters and gives in detail the effects of fire on the various materials which entered into the construction.

In the Underwriters' Laboratories at Chicago, Ill., 1917-1919, two types of Lally columns were tested in a series of fire tests of structural steel, reinforced concrete, steel pipe and cast iron columns. The Lally columns were unprotected on the exterior surface. These columns were tested under Standard time-temperature fire curve conditions while supporting loads in excess of the recommended design loads. As a result of the tests, the comparative fire resisting ratings of Lally columns were determined as 25 minutes for the unreinforced, which was 11% overloaded during the test, and 45 minutes for the reinforced section, which was 3% overloaded during the test. Actual test runs were 36 minutes and 1 hour 11¾ minutes, respectively. Compared to these ratings, unprotected structural steel and round cast iron columns were granted tentative ratings of only 10 and 20 minutes, respectively. Lally column ratings would probably have been still further increased if the test loads had not exceeded the safe working values recommended.

References

The names and addresses of the principal purchasers and satisfied users of Lally columns will be furnished on request.

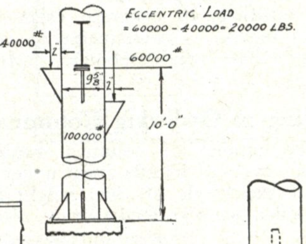
SAFE LOADS FOR LALLY CONCRETE FILLED COLUMNS IN THOUSANDS OF POUNDS

Limit of Length=40 Diameters ($^l/_r=120$) $P=(A_c+12\ A_s)\ (1200-18^l/_d)$

For eccentric loads find the direct load equivalent to the bending moment in inch pounds and add to the total load; or for eccentric loads of 1000 lb. or multiples at eccentricities of half-diameter of column plus 2 in., multiply the number of thousand pounds eccentric load by the corresponding factor and add the result to the total load.

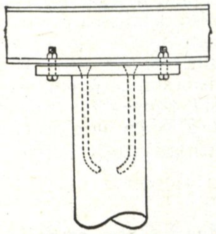
Diam. of col., in.		Weight per ft., lbs.	Area of steel, sq. in.	Area of concrete, sq. in.	Unbraced length of column in feet															*Max. length, ft.	Direct load in thousands of lb. equivalent to	
					6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		10000 in., lbs. bend. mom.	1000 lb. with eccentricity ½" diam. + 2"
Light weight	3½	13	1.27	8.35	19.6	18.1	16.6	15.2	13.7	12.3	10.8									11.91		Light weight tube cols. to be used for concentric loads only
	4	17	1.63	10.94	26.7	25.0	23.4	21.8	20.1	18.5	16.8	15.2	13.5							13.71		
Heavy weight	3½	15	2.23	7.39	28.3	26.2	24.1	22.0	19.8	17.7	15.6									11.64	12.1	4.5
	4	20	2.68	9.89	36.8	34.5	32.2	30.0	27.7	25.5	23.2	21.0	18.7							13.37	10.9	4.4
	4½	24	3.17	12.73	46.2	43.8	41.5	39.0	36.6	34.1	31.7	29.2	26.8	24.4						15.10	10.0	4.3
	5	29	3.69	15.95	56.6	54.0	51.5	48.8	46.2	43.7	41.1	38.6	36.0	33.4	30.8	28.2				16.83	9.1	4.1
	5½	36	4.30	20.01	69.0	66.4	63.5	60.6	57.9	55.1	52.4	49.4	46.7	44.0	41.0	38.3	35.3	32.5		18.78	8.4	4.0
	6⅝	49	5.58	28.89	96.5	93.4	90.2	87.0	83.9	80.8	77.6	74.6	71.5	68.2	65.1	61.8	58.9	55.7	52.6	22.45	7.2	3.8
	7⅝	64	6.92	38.74	125.1	122.0	118.1	114.8	111.5	107.8	104.5	101.0	98.0	94.4	91.2	87.6	83.9	80.4	77.1	25.92	6.4	3.7
	8⅝	81	8.40	50.03	158.2	154.5	150.8	147.0	143.0	139.2	135.5	131.7	127.8	123.8	120.0	116.1	112.2	108.6	104.7	29.38	5.6	3.6
	9⅝	100	9.97	62.79	194.2	190.5	186.1	182.0	178.0	173.9	169.5	165.8	161.5	157.2	153.1	149.1	145.0	141.0	136.8	32.84	5.3	3.6
	10¾	123	11.91	78.86	239.5	235.0	230.2	226.0	221.0	216.5	212.2	207.5	203.1	198.5	194.0	189.6	185.2	180.8	176.3	36.74	4.8	3.5
	12¾	169	14.58	113.10	316.3	311.4	306.5	301.3	296.7	291.5	286.6	281.7	277.1	272.2	267.6	262.7	257.5	252.6	248.0	43.77	4.2	3.5

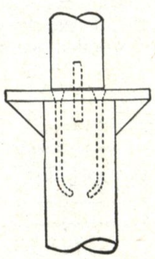
*Radius of gyration equals $\frac{1}{10}$ quantity in this column.

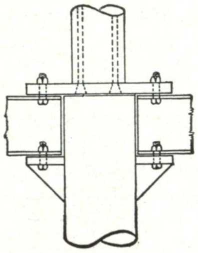


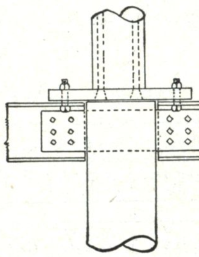
Based on eccentricity=(½ diam. of column+2 in.)

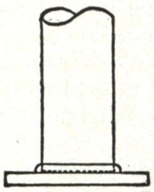
Example:
Column Load=40000+60000 =100000 lb.
Unbraced length=10 ft. 0 in.
For 7⅝ in. column from table, the factor for 1000 lb. eccentric load is 3.7
Hence equivalent direct load=20000×3.7 = 74000
Total concentric load =174000
Therefore use 9⅝ in. in place of 7⅝ in. column.

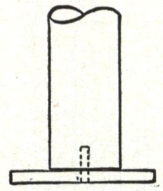

Steel Fastened Cap

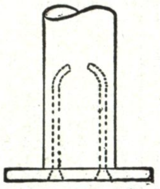

Bracket Cap


Double Flange Tie


Web Tie


Loose Base (with Ring)


Loose Base (with Dowel)


Steel Fastened Base

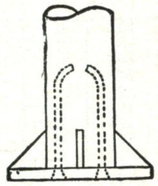

Bracket Base

FIG. 6. VARIOUS TYPES OF LALLY STEEL CAPS AND BASES

Specify Lally columns complete with steel caps and bases as manufactured by LALLY COLUMN CO.

MILFORD IRON FOUNDRY

Manufacturers of Concrete Filled Columns

MILFORD, MASS.

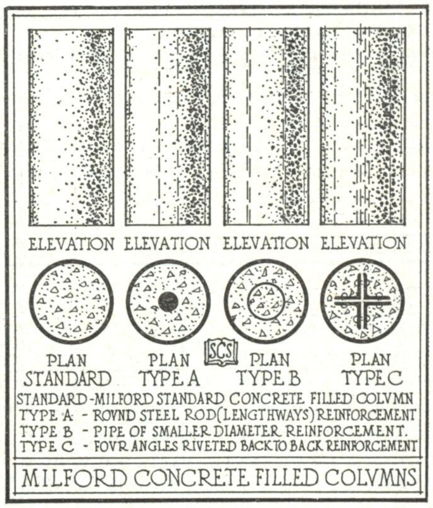
Products

Steel Concrete Filled Columns; Standard and Special Caps and Bases.

TRADE-MARK

Description of Milford Columns

A combination of steel shell and concrete filling. Steel is either thin tubes (for light weight columns) or standard steel pipe (for heavy weight columns). Concrete is best grade American portland cement, clean sharp grit sand, and ½-in. screened trap rock—machine mixed 1:1½:2¾.


ELEVATION
ELEVATION
ELEVATION
ELEVATION
PLAN
STANDARD
PLAN
TYPE A
SCS
PLAN
TYPE B
PLAN
TYPE C
STANDARD - MILFORD STANDARD CONCRETE FILLED COLVMN
TYPE A - ROVND STEEL ROD (LENGTHWAYS) REINFORCEMENT
TYPE B - PIPE OF SMALLER DIAMETER REINFORCEMENT.
TYPE C - FOVR ANGLES RIVETED BACK TO BACK REINFORCEMENT
MILFORD CONCRETE FILLED COLVMNS

Steel shell is placed on end, filled from overhead hopper and repeatedly raised and dropped in a perpendicular position. Direction of the compacting forces is along the long axis of pipe, and the entire concrete mass receives the shock. Mass becomes close and dense with initial blow, and an even distribution of aggregates is assured.

Special attention is given to producing accurate stock or special lengths, the cut being perfectly square, flat, and at right angles to axis of pipe.

Design of Columns

For good design, length should not exceed 30 times diameter of column. For safe loads, see accompanying table.

TABLE 1. SAFE LOADS FOR COLUMNS, IN TONS OF 2000 LB.

Size, column, in.	Weight, column, per ft., lb.	Nominal thickness of steel, in.	Length, feet														
			6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LIGHT WEIGHT COLUMNS																	
3	9	0.109	7	6	5	....	....	....	....	....	....	....	....	....	....	....	....
3½	13	0.120	10	9	8	7	....	....	....	....	....	....	....	....	....	....	....
4	17	0.134	13	13	12	12	11	....	....	....	....	....	....	....	....	....	....
HEAVY WEIGHT COLUMNS																	
2⅞	10	0.203	9	8	7	....	....	....	....	....	....	....	....	....	....	....	....
3½	15	0.216	14	13	12	11	....	....	....	....	....	....	....	....	....	....	....
4	20	0.226	19	18	17	16	15	....	....	....	....	....	....	....	....	....	....
4½	24	0.237	24	23	22	20	18	17	....	....	....	....	....	....	....	....	....
5	29	0.247	28	28	27	25	24	23	22	20	....	....	....	....	....	....	....
5½	36	0.258	34	34	33	32	31	29	28	27	26	....	....	....	....	....	....
6⅝	49	0.280	45	45	45	45	45	43	41	39	37	36	35	33	....	....	....
7⅝	64	0.301	60	60	59	58	58	58	56	54	52	50	49	48	47	46	....
8⅝	81	0.322	75	74	73	72	71	71	71	71	69	66	63	61	60	58	56
9⅝	100	0.342	93	92	91	90	89	88	87	87	87	85	83	81	79	77	75
10¾	123	0.365	112	111	110	109	108	107	106	106	106	106	106	104	101	97	94
11¾	146	0.375	130	129	128	127	126	125	125	125	125	125	125	124	123	120	116
12¾	169	0.375	150	149	148	147	146	145	144	143	142	141	140	139	139	138	136

Types of Columns

Light Weight—Mainly used in residential work, or where loads are not an important factor.

Heavy Weight—For conditions where carrying capacities are essential.

Extra Heavy and Double Extra Heavy—Seldom used and then only when especially called for. In this case, smaller diameter can be obtained for load carried.

Reinforced—(See drawings of types "A," "B" and "C" in first column). To increase load bearing capacity of columns of given diameter or to meet insurance classification requirements, various forms of standard and special reinforcements are occasionally used. The types shown are most common.

Formula for Safe Working Load of Columns

As a result of tests, the Massachusetts Institute of Technology, Jan. 26, 1915, suggests the following formula as giving safe working load that can be applied to Milford columns for values of $\frac{1}{r}$ between 0 and 120.

This information is given to assist the architect when he wishes to use a reinforced column and to ascertain the minimum diameter of column required.

Where $\frac{1}{d}=0$ to 15, safe load$=1100\ (A_c+A_s\times 9.6)$. Where $\frac{1}{d}=15$ to 30, safe load$=(A_c+A_s\times 9.6)\ (1600-7\frac{1}{r})$. $A_c=$ Area of concrete in cross section. $A_s=$ Area of steel in cross section. $\frac{E_s}{E_c}=9.6$. $E_s=$ Modulus of elasticity of steel. $E_c=$ Modulus of elasticity of concrete (sets deducted). $1=$ Length of column in inches. $d=$ Diameter of column in inches. $r=$ Radius of gyration (solid section). Safe load is in pounds.

For Detailing or Ordering Columns

Show the number of columns wanted; whether light or heavy weight; over-all length from under side of base plate or upper side of cap; style of cap; height and weight of I-beam or size of wooden beam framed thereto, also details showing location of intermediate side brackets; pillow block requirements, etc., if any. If bolt holes are other than standard (¾ in., and located as per list), show what is desired. Use order number when practicable.

See accompanying pages for standards.

Milford Standard Caps and Bases

The following types have been designed to cover as far as possible the great variety of framing this company has had to deal with in the 20 years of specialization in this work.

Attention has been given to economy and efficiency of material, and to architectural proportion.

Continued on next page

Standard Bases—(See Table 2 and details on following page.) Each designed for maximum load for each size column, figured on allowable load of 30 tons per sq. ft. on concrete, with sufficient thickness and stiffness to distribute load uniformly under base. Bearing surfaces for bases for 6⅝-in. columns, or larger, are machined.

Flat Caps—(See Table 3 and details on following page.) Flat caps are used when there are no second section columns, and where beams extend to center of column. These caps are made for wooden and double or single I-beams.

Standard Bracket Caps—(See Tables 4 and 7 and details on following page.) Wings are as short as practicable for concentric loading close to column axis. Wing ends bevel 1½ in., preventing load concentrating on outer edge from excessive bending of beams.

Light Type Bases and Caps—(See Tables 5 and 6 and illustrations.) These plates are cheaper and are recommended only when small columns carry less than their full listed loads. Adapted for cellar supports in the less pretentious residences.

Milford House Columns

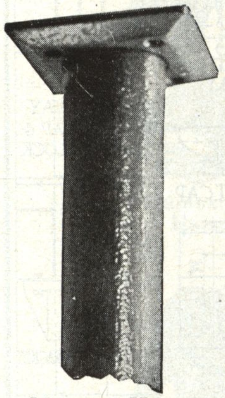
For housing construction, light weight columns (3, 3½ and 4 in.) with light type bases and caps are used. These are stocked by dealers and can be obtained on short notice.

TABLE 3. DIMENSIONS OF FLAT CAPS
(See Details on following page)

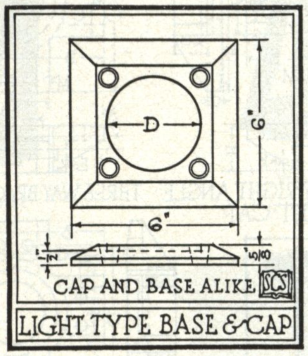
Diam. column in.	Dimensions, in.													Order No.	
	A		B		C	D	E	F		G		H	J		
	Wood beam	I-beam	Wood beam	I-beam				Wood beam	I-beam	Wood beam	I-beam			Wood beam	I-beam
2⅞	6	4½	8	9	½	3	½	3	To suit flanges of I-beams used (see following page)	5	6	½	4	30	45
3	6	4½	8	9	½	3⅛	½	3		5	6	½	4⅛	31	46
3½	6	4½	8	9	½	3⅝	½	3		5½	6½	½	4⅝	32	47
4	8	4¾	8	10	⅝	4⅛	½	4		5½	7	½	5⅛	33	48
4½	8	5	8	10	¾	4⅝	½	5½		5½	7½	½	5⅝	34	49
5	8	5½	10	11	¾	5⅛	¾	5½		7	8½	¾	6⅝	35	50
5½	10	6	10	12	¾	5⅝	¾	7		7	9	¾	7⅛	36	51
6	10	6	10	12	¾	6⅛	¾	7½		7½	9½	¾	7⅝	37	52
6⅝	10	6	13	13	1	6¾	¾	7		10	10	¾	8¼	38	53
7⅝	12	6	14	14	1	7¾	¾	9		11	11	¾	9¼	39	54
8⅝	12	6¼	15	15	1	8¾	¾	9		12	12	¾	10¼	40	55
9⅝	12	6½	16	16	1	9¾	¾	9		13	13	¾	11¼	41	56
10¾	14	7	17	17	1	11	¾	10		14	14	¾	12½	42	57
11¾	14	7½	18	18	1	12	¾	10		15	15	¾	13½	43	58
12¾	16	8	19	19	1	13	¾	12		16	16	¾	14½	44	59

TABLE 4. STANDARD BRACKET CAPS FOR SINGLE I-BEAMS
For 1-way, 2-way, 2-way right angle, 3-way and 4-way
(See Details on following page)

Diam. column in.	Dimensions, in.															Order No.				
	A	B			C	E	G		H	J		K	L	M	N					
		1-way	2-way, 3-way, 4-way	2-way, right angle			1-way, 2-way right angle	2-way, 3-way, 4-way,		1-way, 2-way, 2-way right angle	3-way				3-way only	1-way	2-way	2-way right angle	3-way	4-way
2⅞	6	7	10	8	⅝	½	3½	7	3	4	8	¼	⅝	½	3½	135	150	165	180	195
3	6	7	10	8	⅝	½	3½	7	3	4⅛	8	¼	⅝	½	3½	136	151	166	181	196
3½	6½	8	11	8¾	⅝	⅝	4	8	3	4⅞	8¾	⅜	¾	⅝	4	137	152	167	182	197
4	6½	8½	11½	9	¾	¾	4¼	8½	3	5⅝	9	⅜	¾	¾	4¼	138	153	168	183	198
4½	6½	9	12	9¼	¾	¾	4½	9	3	6⅛	9¼	⅜	¾	¾	4½	139	154	169	184	199
5	6½	9½	12½	9½	1	¾	4¾	9½	3	6⅝	9½	⅜	¾	¾	4¾	140	155	170	185	200
5½	7	10	13	10	1	¾	5	10	3	7⅛	10	⅜	1	¾	5	141	156	171	186	201
6	7	10½	13½	10½	1	¾	5¼	10½	3	7⅝	10½	⅜	1	¾	5¼	142	157	172	187	202
6⅝	8	12	14½	12	1	1	6	11½	3	8¾	12	⅜	1	1	6	143	158	173	188	203
7⅝	8	13	15½	13	1	1	6½	12½	3	9¾	13	⅜	1	1	6½	144	159	174	189	204
8⅝	8	14	16½	14	1	1	7	13½	3	10¾	14	⅜	1	1	7	145	160	175	190	205
9⅝	8	15	17½	15	1	1	7½	14½	3	11¾	15	⅜	1	1	7½	146	161	176	191	206
10¾	8	16	18½	16	1	1	8	15½	3¼	13	16	⅜	1¼	1	8	147	162	177	192	207
11¾	8	17	19½	17	1	1	8½	16½	3¼	14	17	⅜	1¼	1	8½	148	163	178	193	208
12¾	8	18	20½	18	1	1	9	17½	3¼	15	18	⅜	1¼	1	9	149	164	179	194	209



Milford House Column



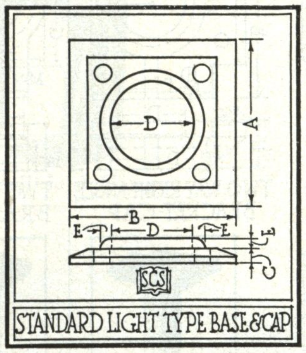


TABLE 5. DIMENSIONS OF STANDARD LIGHT TYPE BASES AND CAPS

Diam., column in.	Weight	Dimensions, in.				Order No.
		A and B	C	D	E	
4	Light	8	⅝	4⅛	½	20
4	Heavy	8	⅝	4⅛	½	21
4½	Heavy	8	¾	4⅝	½	23
5	Heavy	10	¾	5⅛	¾	25
5½	Heavy	12	1	5⅝	¾	26A

TABLE 6. DIMENSIONS OF LIGHT TYPE BASES AND CAPS

Diam., column, in.	D, in.	Order No.
3	3⅛	27
3½	3⅝	28
4	4⅛	29

TABLE 2. DIMENSIONS OF STANDARD BASES
(See Details on following page)

Diam. column in.	Weight	Dimensions, in.							Order No.
		A	B	C	D	E	F	G	
2⅞	Heavy	6	6	⅞	3	½	⅜	½	7
3	Light	6	6	⅞	3⅛	½	⅜	½	1
3½	Light	7	7	1	3⅝	½	½	½	2
3½	Heavy	8	8	1¼	3⅝	½	½	½	8
4	Light	8	8	1⅛	4⅛	½	½	½	3
4	Heavy	9	9	1½	4⅛	½	⅝	½	9
4½	Heavy	10	10	1⅝	4⅝	½	¾	½	10
5	Heavy	11	11	1¾	5⅛	¾	¾	¾	11
5½	Heavy	12	12	1⅞	5⅝	¾	¾	¾	12
6⅝	Heavy	14	14	2⅛	6¾	¾	⅞	¾	13
7⅝	Heavy	16	16	2⅜	7⅞	¾	⅞	¾	14
8⅝	Heavy	18	18	2⅝	8⅞	¾	1	¾	15
9⅝	Heavy	20	20	3	9⅞	¾	1	¾	16
10¾	Heavy	22	22	3¼	11	¾	1	¾	17
11¾	Heavy	24	24	3½	12	¾	1	¾	18
12¾	Heavy	25	25	3½	13	¾	1	¾	19

TABLE 7. STANDARD BRACKET CAPS FOR WOODEN BEAMS OR DOUBLE I-BEAMS
For 1-way, 2-way, 2-way right angle, 3-way and 4-way
(See Details on following page)

Diam. column in.	Dimensions, in.																Order No.				
	A	B			C	D*	E	F	G		H	J	K	L	M	N					
		1-way	2-way, 3-way, 4-way	2-way right angle					1-way, 2-way right angle	2-way, 3-way, 4-way		3-way only				3-way only	1-way	2-way	2-way right angle	3-way	4-way
2⅞	6	7	10	8	⅝	...	½	3	3½	7	3	8	¼	⅝	½	3½	60	75	90	105	120
3	6	7	10	8	⅝	...	½	3	3½	7	3	8	¼	⅝	½	3½	61	76	91	106	121
3½	6	8	11	8½	⅝	...	⅝	3	4	8	3	8½	⅜	¾	⅝	4	62	77	92	107	122
4	8	8½	11½	9¾	¾	...	¾	5	4¼	8½	3	9¾	⅜	¾	¾	4¼	63	78	93	108	123
4½	8	9	12	10	¾	...	¾	5	4½	9	3	10	⅜	¾	¾	4½	64	79	94	109	124
5	10	9½	12½	11¼	1	...	¾	7	4¾	9½	3	11¼	⅜	¾	¾	4¾	65	80	95	110	125
5½	10	10	13	11½	1	...	¾	7	5	10	3	11½	⅜	1	¾	5	66	81	96	111	126
6	10	10½	13½	11¾	1	...	¾	7	5¼	10½	3	11¾	⅜	1	¾	5¼	67	82	97	112	127
6⅝	10	12	14½	12½	1	...	1	7	6	11½	3	12½	⅜	1	1	6	68	83	98	113	128
7⅝	12	13	15½	14	1	...	1	8	6½	12½	3	14	⅜	1	1	6½	69	84	99	114	129
8⅝	12	14	16½	14½	1	...	1	8	7	13½	3	14½	⅜	1	1	7	70	85	100	115	130
9⅝	12	15	17½	15	1	...	1	8	7½	14½	3	15	⅜	1	1	7½	71	86	101	116	131
10¾	14	16	18½	16½	1	...	1	10	8	15½	3¼	16½	⅜	1¼	1	8	72	87	102	117	132
11¾	14	17	19½	17	1	...	1	10	8½	16½	3¼	17	⅜	1¼	1	8½	73	88	103	118	133
12¾	16	18	20½	18½	1	...	1	12	9	17½	3¼	18½	⅜	1¼	1	9	74	89	104	119	134

*Dimension D is ⅛ in. more than column diameter. For columns 6⅝ in. in diameter and larger, bearing surfaces are machined. Wings 10 in. or more have 2 brackets. (See standards on following page.)

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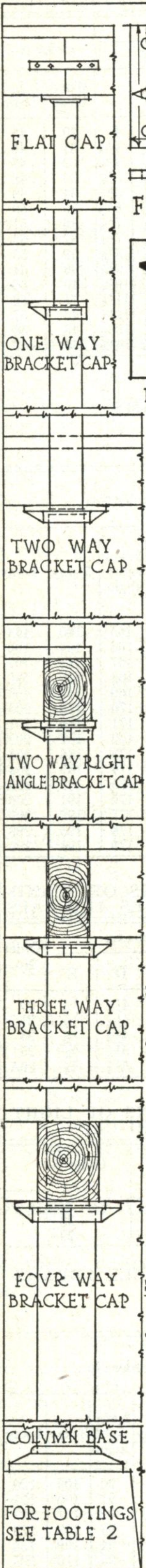
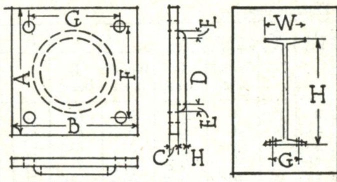
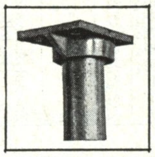

FLAT CAP
ONE WAY BRACKET CAP
TWO WAY BRACKET CAP
TWO WAY RIGHT ANGLE BRACKET CAP
THREE WAY BRACKET CAP
FOVR WAY BRACKET CAP
COLVMN BASE
FOR FOOTINGS SEE TABLE 2


G
A
F
B
E
D
C
H
W
H
G

FLAT CAP

FLAT CAP



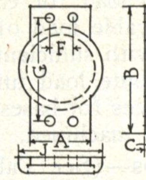
ONE WAY BRACKET CAP

STANDARD I BEAMS

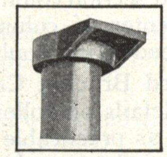
H"	WGT	W"	G"	H"	WGT	W"	G"	H"	WGT	W"	G"	H"	WGT	W"	G"
4	7.5	2.66	1½	7	17.5	3.76	2¼	10	30.0	4.80	2⅝	18	55.0	6.00	3¼
	8.5	2.73	1½		20.0	3.87	2¼		35.0	4.95	2⅝		60.0	6.10	3¼
	9.5	2.81	1½	8	18.0	4.00	2¼		40.0	5.10	2⅝		65.0	6.18	3¼
	10.5	2.88	1½		20.25	4.08	2¼	12	31.5	5.00	2¾		75.0	6.26	3¼
5	9.75	3.00	1¾		22.75	4.17	2¼		35.0	5.09	2¾	20	65.0	6.25	3½
	12.25	3.15	1¾		25.25	4.26	2¼		40.0	5.21	2¾		70.0	6.33	3½
	14.75	3.29	1¾	9	21.0	4.33	2½	15	42.0	5.50	3		75.0	6.40	3½
6	12.25	3.33	2		25.0	4.45	2½		45.0	5.55	3	24	80.0	7.00	4
	14.75	3.45	2		30.0	4.61	2½		50.0	5.65	3		85.0	7.07	4
	17.25	3.57	2		35.0	4.77	2½		55.0	5.75	3		90.0	7.13	4
7	15.00	3.66	2¼	10	25.0	4.66	2⅝		60.0	5.84	3		95.0	7.19	4

BETHLEHEM I BEAMS

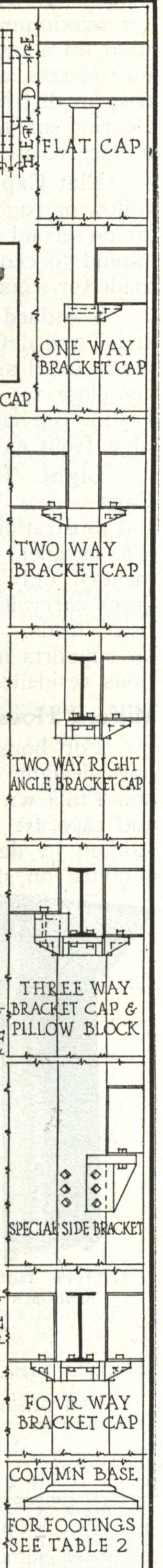
H"	WGT	W"	G"	H"	WGT	W"	G"	H"	WGT	W"	G"	H"	WGT	W"	G"
30	120	10.5	6½	20	69	8.14	4½	15	64	7.19	4	10	28.5	5.98	3¼
28	105	10.0	6		64	8.08	4½		54	7.0	4		23.5	5.84	3¼
26	90	9.5	5½		59	8.0	4½		46	6.81	3¾	9	24.	5.56	3
24	84	9.25	5¼	18	59	7.67	4¼		41	6.72	3¾		20.	5.44	3
	83	9.12	5¼		54	7.59	4¼		38	6.66	3¾	8	19.5	5.33	2¾
	73	9.0	5¼		52	7.56	4¼	12	36	6.30	3½		17.5	5.25	2¾
20	82	8.89	5		48.5	7.50	4¼		32	6.19	3½				
	72	8.75	5	15	71	7.50	4¼		28.5	6.13	3½				

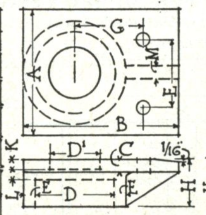


FLAT CAP



ONE WAY BRACKET CAP


FLAT CAP
ONE WAY BRACKET CAP
TWO WAY BRACKET CAP
TWO WAY RIGHT ANGLE BRACKET CAP
THREE WAY BRACKET CAP & PILLOW BLOCK
SPECIAL SIDE BRACKET
FOVR WAY BRACKET CAP
COLVMN BASE
FOR FOOTINGS SEE TABLE 2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E
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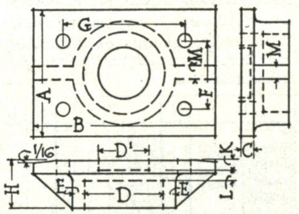
H

ONE WAY BRACKET CAP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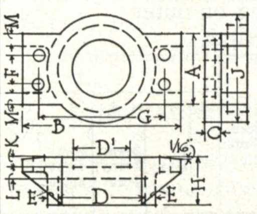
TWO WAY BRACKET CAP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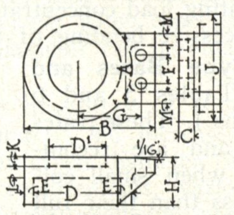
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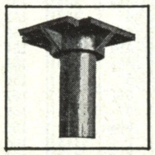
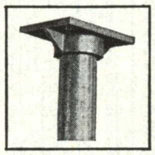
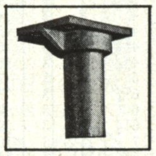
ONE WAY BRACKET CAP



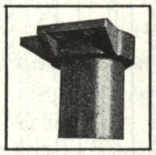
THREE WAY BRACKET CAP



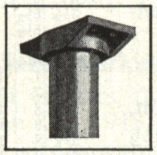
TWO WAY BRACKET CAP



TWO WAY RIGHT ANGLE BRACKET CAP

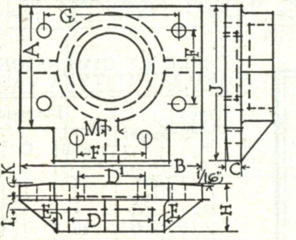


TWO WAY RIGHT ANGLE BRACKET CAP



TWO WAY BRACKET CAP

THREE WAY BRACKET CAP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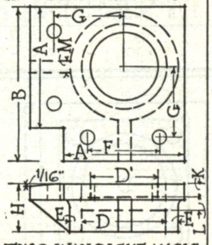
THREE WAY BRACKET CAP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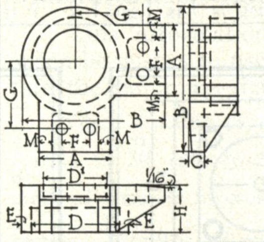
TWO WAY RIGHT ANGLE BRACKET CAP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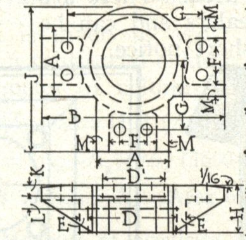
TWO WAY RIGHT ANGLE BRACKET CAP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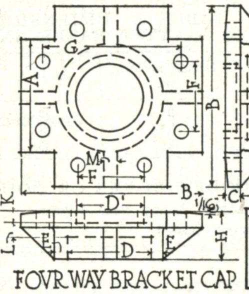
THREE WAY BRACKET CAP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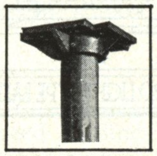
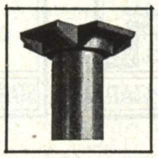
FOVR WAY BRACKET CAP



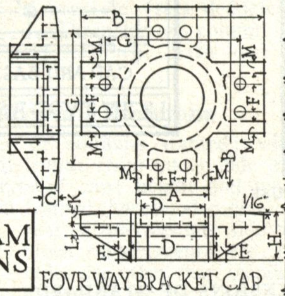
FOVR WAY BRACKET CAP



FOVR WAY BRACKET CAP

WOODEN GIRDER & DOVBLE I BEAM CONDITIONS

SINGLE I BEAM CONDITIONS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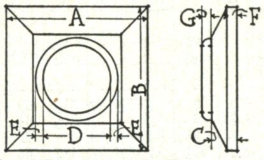
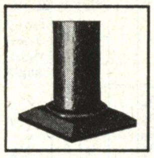
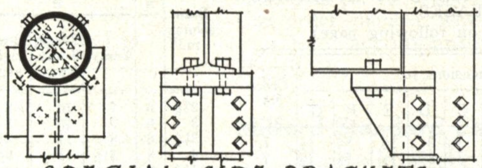
FOVR WAY BRACKET CAP



COLVMN BASE



COLVMN BASE



SPECIAL SIDE BRACKETS

NOTE APPARENT INCONSISTENCIES BETWEEN SCALE DRAWINGS AND TABVLATED DIMENSIONS ARE DVE TO THE VARIENCE OF PROPORTIONS OF PARTS [A J ETC] OF CAPS FOR THE DIFFERENT SIZES OF COLVMNS — THE SIZES GIVEN IN THE TABLES ARE CORRECT

DRAWN BY
SWEET'S CATALOGVE
SERVICE, INC.

MILFORD "STANDARD" BRACKET CAPS AND "STANDARD" BASE

DETAILS NOT MADE TO SCALE

THE DUPLEX HANGER CO.

East 53rd Street and Lakeside Avenue
CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 16 Warren Street
PHILADELPHIA, PA., 1513 Wood Street
NEW ORLEANS, LA., 610 United Fruit Co. Building
BOSTON, MASS., 88 Broad Street

Products

"DUPLEX" JOIST, WALL, CONCRETE BLOCK and I-BEAM HANGERS; "DUPLEX" POST CAPS, POST BASES, WALL PLATES and WALL BOXES, for warehouses, factories, heavy mill construction and all other wood constructed buildings.

Specifications

"Duplex" hangers and post caps are designed with a large factor of safety to carry the timbers for which they are intended. If architects and engineers will, when using hangers and post caps, specify "Duplex," the proper hangers and post caps for the timbers will be furnished. The "Duplex" Hanger, with the "Duplex" Post Cap, has no equal. Tested by time and endorsed by thousands of satisfied customers. Recognized everywhere as the standard of hanger and post cap construction.

Duplex Hangers

Single Joist Hangers—Are made of malleable iron and every hanger is thoroughly tested. The best and most economical hangers for timber framing. "Duplex" Joist Hangers reduce the shrinkage of joists to a minimum.

Double Joist Hangers—The best hangers for the heaviest type of mill construction. By using this type of hanger, the entire building is tied together laterally. No other method of construction does this. Made in two parts and can be adjusted to fit the various timbers for which they are intended.

Wall Hangers—Embody every established requirement for good construction. Superior in design. Do not break the bond in masonry walls. Self-releasing in case of fire.

Steel Wall Hangers—Have no equal in carrying timbers clear of the wall. Distribute the load perfectly over the bearing surface of the masonry. Furnished for standard and extra heavy construction.

I-beam Hangers—Are noted for being one of the most economical devices for framing wood joists to I-beams. All of the load is carried on the lower flange of the I-beam, this being the only correct method.

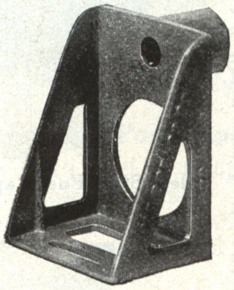
Duplex Steel Post Caps

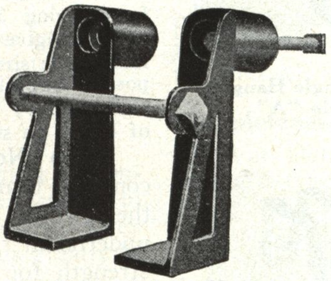
The "Duplex" Post Caps are made of mild, open hearth steel and consist of three pieces; a bearing bracket and two side plates bolted together with four heavy bolts. All engineers who have investigated and used this cap are unanimous in declaring it to be the best design for rigid construction. Tests have fully proven the great strength of this design and that it is not possible to break the cap when even more than six times the ultimate safe load of the timber is applied.

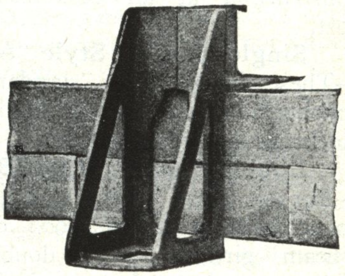
These caps are furnished for 1-way, 2-way, 3-way and 4-way construction and may be had for timbers larger than the post.

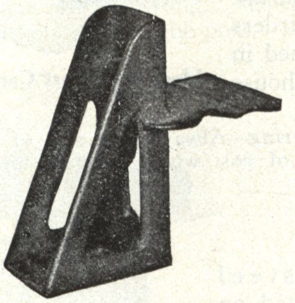
Duplex Steel Post Bases

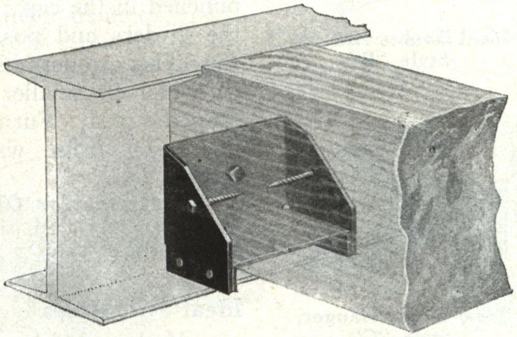
Are made of steel plates and angles to fit the post. More economical than cast iron plates.

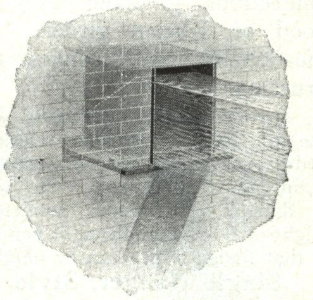

"Duplex" Joist Hanger

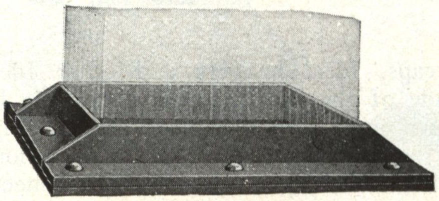

"Duplex" Joist Hanger
For very heavy mill construction

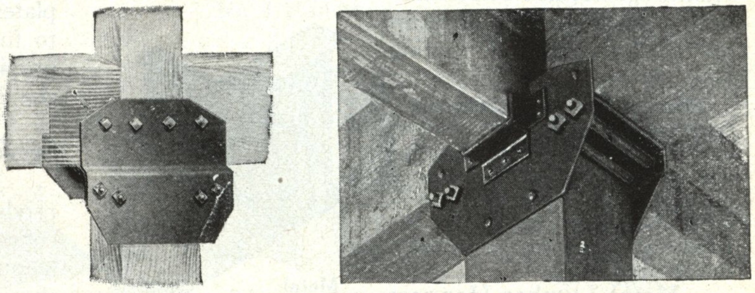

"Duplex" Wall Joist Hanger


"Duplex" Concrete Block Wall Joist Hanger


"Duplex" I-beam Joist Hanger


"Duplex" Wall Joist Box


"Duplex" Steel Post Base


"Duplex" Steel Post Caps
For one, two, three or four-way to suit any framing

THE IDEAL HANGER COMPANY

1270 East 53d Street
CLEVELAND, OHIO

Products

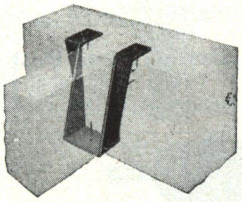
IDEAL JOIST HANGERS (Wall Hangers, Wall Boxes and Metal Lumber Hangers); POST CAPS; POST BASES.

Also Barn Framing Fittings.

Ideal Joist Hangers

Introduction—Ideal hangers are made of the best grade open hearth steel bars and are formed so the hanger fits flat against the timber, increasing the carrying capacity of the hanger. This hanger fitting close on all sides does not interfere with furring and permits the use of spikes or lag screws to fasten the hanger to the girder.

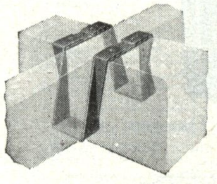
No costly framing. Easily applied and neat in appearance. The same section of bar is used throughout, giving the strongest construction at an economical cost.



Ideal Single Hanger, Style "A"

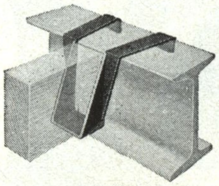
Single Hanger, Style "A"—These hangers are standard construction and are carried in stock for every size timber.

Double Hanger, Style "B"—For use where joists frame opposite each other on wood or I-beam girders. The double hanger consists of two single hangers, each riveted to strap connections to hang over the wood or I-beam girder. Unquestionably, the strongest construction.



Ideal Double Hanger, Style "B"

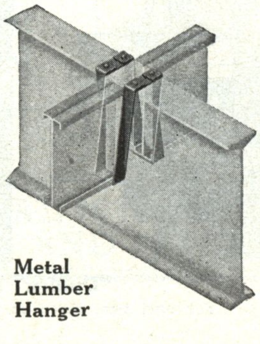
Directions for Ordering—Give size of joists and also width of girder over which hanger must span, or, in case of an I-beam, exact width of flange, or if more convenient, height of I-beam and weight per foot, so that flange width can be obtained.



Ideal Single Hanger, Style "C"

Single Hanger, Style "C"—Used where a single joist frames against an I-beam channel or wood girder, the arms of the joist hanger running over the top.

Directions for Ordering—Give size of joist and dimensions over which hanger arms must go, namely: width of timber header, or, in case of I-beams or channels, width of flange or height and weight per foot so flange width can be obtained.



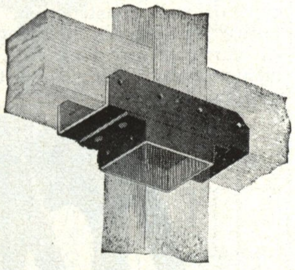
Metal Lumber Hanger

Metal Lumber Hangers—Are the most economical and satisfactory method of framing steel I-joists and save from 60 to 75% of the cost of shelf angles. Being a shop-fabricated product of known strength and integrity, the use of Ideal metal lumber hangers follows the simplest possible design. Easily placed, safe, strong and secure. Send plans for estimate.

Ideal Steel Post Caps

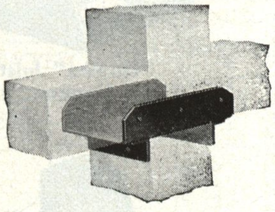
Cap No. 2—Combines all the features necessary to strength in construction. Easily installed, no framing being necessary. The angles on the bottom of the cap are bent to form a socket into which the post fits, preventing any twisting of the cap. Channel is of open hearth plate steel riveted to the socket. Brackets are riveted to channel to carry beams framing on the side. Girders and beams will be flush unless otherwise noted.

Directions for Ordering—In ordering 3 or 4-way construction, give the following information: size post below; size post above; width and height of main girder; width and height of beams on side of cap.



Ideal Steel Post Cap No. 2

Cap No. 3—Forms a complete bearing channel for the girder. Heavy angles underneath give necessary strength for lighter type of construction. Holes are punched in the cap for tying the girders and post to the cap. This cap permits the use of wider or smaller girders than the post. Furnished in any size from warehouse stock.

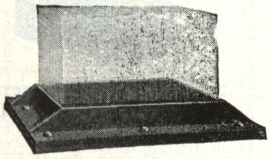


Ideal Steel Post Cap No. 3

Directions for Ordering—Always give size of post on which cap is placed, size of post which rests on top of cap and size of girder.

Ideal Post Bases

Made of heavy steel plates with angles riveted on to form a socket for the post, providing necessary spread for standard construction.



Ideal Post Base

Service

Ideal post caps, Ideal hangers and other Ideal products are made of the best material obtainable by competent workmen on modern machines. Prompt shipments are made from stock. Estimates and quotations cheerfully furnished and designs submitted by engineers who are specialists in timber construction.

THE VAN DORN IRON WORKS COMPANY

Manufacturers of Post Caps and Joist Hangers

TELEPHONE
Randolph 6630

2685 East 79th Street
CLEVELAND, OHIO

EASTERN DISTRIBUTORS: The Rothrock Company, Inc., 404 Washington Avenue, LONG ISLAND CITY, N. Y.
Telephone, Astoria 4423. A complete stock carried at this point

Products

Steel Post Caps; Post Bases; Wall Boxes; Joist, Wall and I-beam Hangers; Wall and Floor Plugs.

Also manufacturers of Anchors, Metallic Furniture, Structural Steel Work, Ornamental Iron Work, Metal Filing Cabinets and Desks, Steel Shelving, Iron Fencing and Fire Escapes; Dump Truck Hoists and Bodies.

For Steel Jail Construction, see pages 710-711.

Materials and Guarantee

The steel used in all Van Dorn products is the best obtainable. All goods are guaranteed to be first class, both as to materials and workmanship, and "just as represented."

General Description

Van Dorn post caps are made to sizes which will permit close framing of all timbers, being made to conform to actual timber sizes as published by the Southern Pine Association. The construction is such that every ounce of metal is used to the best advantage.

Blue Prints—Blue prints showing the exact details and dimensions of the various Van Dorn post caps, hangers, etc., will be furnished on request.

Van Dorn Steel Post Caps

Van Dorn steel post caps are made to meet all conditions of timber framing. They are manufactured to carry timbers either one, two, three or four ways. They are made from special steel plate, which adds greatly to their carrying capacity.

Description—Van Dorn standard steel post caps have a girder carrying channel 6 in. deep, made of ¼-in. mild steel plate. The bearing is 6 in., reinforced by the riveted leg of the angle, which forms a closed socket fitting closely around the post.

A Van Dorn post cap, identical to those illustrated, of standard stock material, tested at the Case School of Applied Science, carried a sustained load of 150,000 lb. Substantiated by other tests, the carrying capacity of Van Dorn post caps is assured.

Van Dorn Steel Wall Boxes

Van Dorn wall boxes have a close fitting cover and ample anchorage at back of box; timber is self-releasing. Ventilation is provided around the beam.

Van Dorn Hangers

Van Dorn steel joist hangers are made from specially rolled ribbed bar and special rolled angle. Superior to any other make on the market. By adding bent plates of the desired shapes, the standard (No. 1) joist hanger is readily adapted to the production of a number of different styles for use over steel I-beams, or in brick or concrete walls.

No. 1 or Regular Joist Hanger—The side flanges are wrought with a groove and ridge, the ridge serving as additional strength, especially at the angle of the prong where the severest strain comes. The spikes hold joist and headers together—season cracks will not affect the strength of the connection.

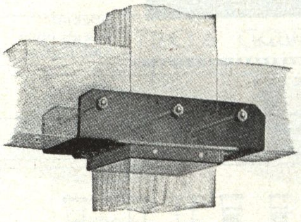
Completeness of Line

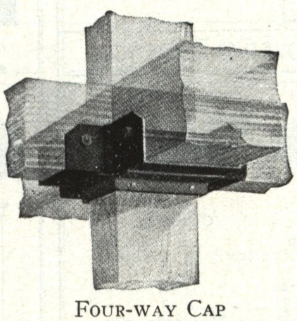
Van Dorn post caps and joist hangers are made in standard types to take care of regular framing conditions, and also in special types to take care of unusual framing conditions. We can supply post caps and joist hangers as well as wall plugs, post bases and wall boxes for whatever your requirements.

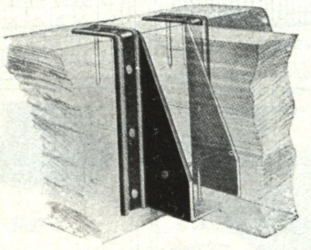
Send blue prints or plans for estimate.

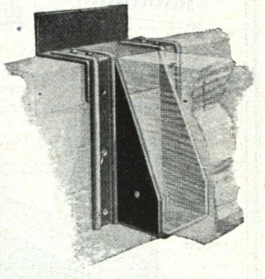
Catalogue and Prices

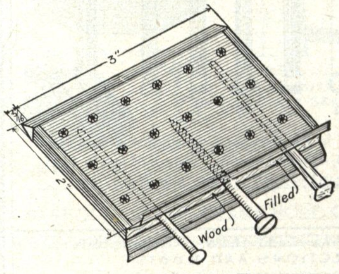
Catalogue 94B and prices furnished on request.


Two-way Cap

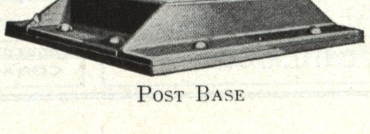

Four-way Cap

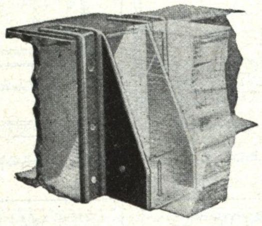

No. 1 Hanger

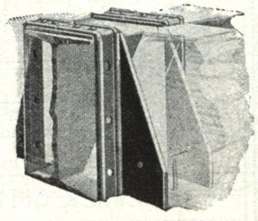

No. 4 Wall Hanger



Griptite Wall Plug


Post Base


No. 7 I-beam Hanger
(Hooking over flange at back)


No. 6 Double Hanger

THE CANTON FOUNDRY & MACHINE CO.

Manufacturers of Building Specialties

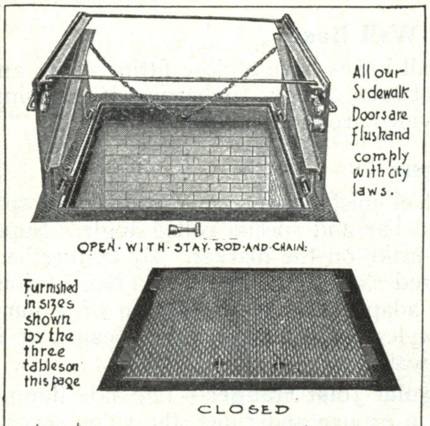
CANTON, OHIO

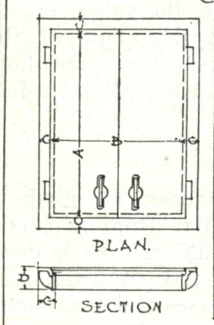
NEW YORK OFFICE: 203 East 15th Street—Telephone, Lexington 5144, 4497

Products

Sidewalk Doors; Coalhole Covers; Sidewalk Ventilators; Area Gratings; Illuminating Iron Sidewalk Plates; Sidewalk Gutter Boxes; Conductor Connections; Conductor Boots; Ash Pit Doors; Stack Doors; Coal Chutes (Foundation); Coal Doors; Columns (Cast Iron); Wheel Guards; Valve Covers; Drain Covers; Water Meter Covers; Lamphole Covers; Catchbasin Covers; Manhole Covers; Street Drain Boxes; Street Castings.

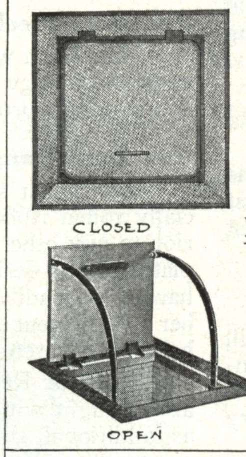
For Automobile Turntables, see pages 607-A—607-B.

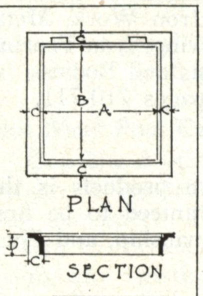

All our Sidewalk Doors are flush and comply with city laws.
OPEN · WITH · STAY · ROD · AND · CHAIN:
Furnished in sizes shown by the three tables on this page
CLOSED


A
B
C
PLAN.
D
C
SECTION

A	B	C	D	A	B	C	D
In.	In.	In.	In.	In	In.	In	In
30	42	4½	4	48	60	4½	4
30	48	4½	4	48	66	4½	4
30	54	4½	4	48	72	4½	4
33	58	4½	4	50	38	4½	4
33	72	4½	4	52	45	4½	4
36	36	4½	4	52	52	4½	4
36	44	4½	4	52	60	4½	4
36	48	4½	4	52	72	4½	4
36	60	4½	4	54	36	4½	4
36	72	4½	4	54	48	4½	4
40	48	4½	4	56	26	4½	4
40	54	4½	4	60	36	4½	4
40	60	4½	4	60	48	4½	4
40	72	4½	4	60	76	4½	4
42	30	4½	4	64	52	4½	4
43	41	4½	4	65	59	4½	4
44	36	4½	4	66	36	4½	4
44	44	4½	4	66	48	4½	4
44	48	4½	4	66	54	4½	4
44	60	4½	4	70	52	4½	4
44	72	4½	4	72	44	4½	4
48	30	4½	4	72	48	4½	4
48	36	4½	4	72	52	4½	4
48	48	4½	4	72	60	4½	4
48	54	4½	4	76	42	4½	4

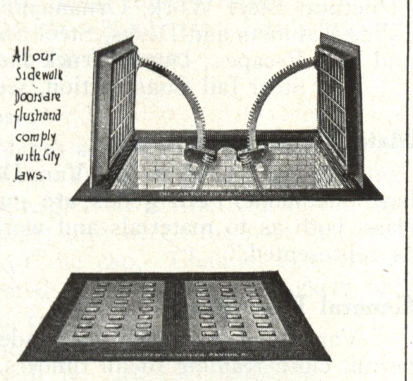
FLUSH · SIDEWALK · DOOR · DOUBLE · LEAF ·


CLOSED
OPEN

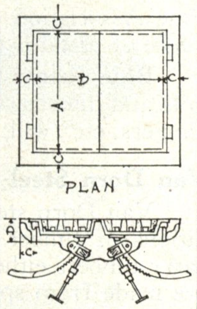

C
B
A
C
C
C
PLAN
D
C
SECTION

A	B	C	D
In	In.	In.	In
20	18	4½	4
24	18	4½	4
24	24	4½	4
30	24	4½	4
30	30	4½	4
36	30	4½	4

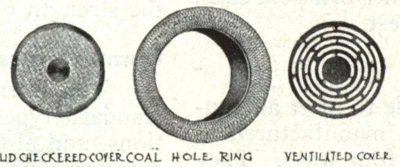
FLUSH SIDEWALK DOOR SINGLE LEAF

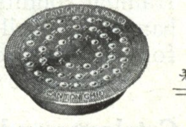

All our Sidewalk Doors are flush and comply with City laws.

A	B	C	D	A	B	C	D
In.	In	In.	In	In.	In.	In	In
30	42	4½	4	48	54	4½	4
30	48	4½	4	48	60	4½	4
30	54	4½	4	48	66	4½	4
33	58	4½	4	48	72	4½	4
33	72	4½	4	52	45	4½	4
36	36	4½	4	52	52	4½	4
36	44	4½	4	52	60	4½	4
36	48	4½	4	52	72	4½	4
36	60	4½	4	54	36	4½	4
36	72	4½	4	54	48	4½	4
40	48	4½	4	56	26	4½	4
40	54	4½	4	60	36	4½	4
40	60	4½	4	60	48	4½	4
40	72	4½	4	64	52	4½	4
43	41	4½	4	65	59	4½	4
44	36	4½	4	66	36	4½	4
44	44	4½	4	66	48	4½	4
44	48	4½	4	66	54	4½	4
44	60	4½	4	72	44	4½	4
44	72	4½	4	72	48	4½	4
48	36	4½	4	72	60	4½	4
48	48	4½	4	76	42	4½	4

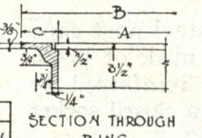

C
D
C
A
PLAN
D
C
SECTION

ILLUMINATED SIDEWALK DOOR. DOUBLE LEAF


SOLID CHECKERED COVER COAL
HOLE RING
VENTILATED COVER.



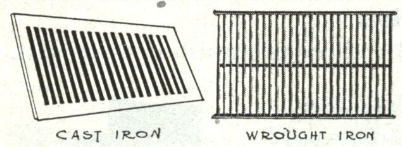
ILLUMINATED COVER & RING


B
A
3/8"
C
1/2"
3/4"
8 1/2"
3/4"
1/4"

SECTION THROUGH RING

SIZES							
A	14	16	18	20	24	30	36
B	20	22	24	26	30	36	42
C	3	3	3	3	3	3	3

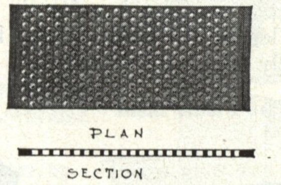
COAL HOLE COVERS & RINGS


CAST IRON
WROUGHT IRON

Cast iron area gratings Furnished 12, 14, 16, 18 & 20 ins wide. All 46 ins long

Wrought Iron gratings to order in various rectangular shapes and sizes

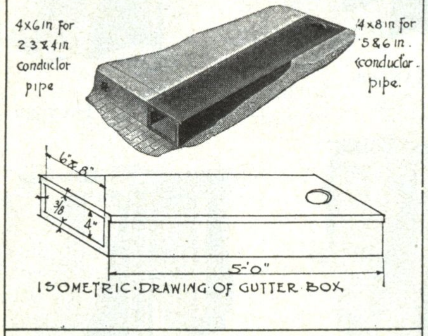
AREA - GRATING


PLAN
SECTION

Standard sizes 24x48 ins.

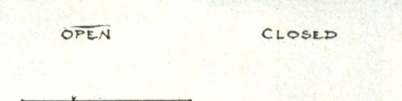
Special sizes upon specification

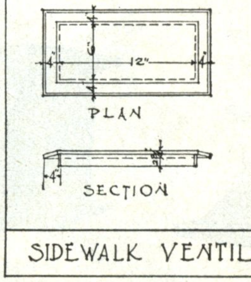
ILLUMINATING IRON SIDE WALK LIGHT


4x6 in for 2 3 & 4 in conductor pipe
4x8 in for 5 & 6 in. conductor pipe.
6"x 8"
3/8
4"
5'-0"

ISOMETRIC · DRAWING · OF · GUTTER · BOX

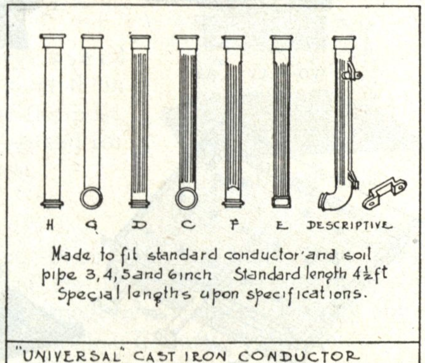
SIDEWALK GUTTER BOX


OPEN
CLOSED


12"
PLAN
SECTION

This sidewalk Ventilator is flush and water proof it locks and unlocks on the inside only.

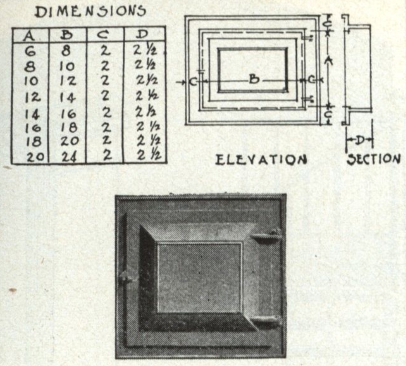
SIDEWALK VENTILATOR


H
G
D
C
F
E
DESCRIPTIVE

Made to fit standard conductor and soil pipe 3, 4, 5 and 6 inch Standard length 4½ ft Special lengths upon specifications.

"UNIVERSAL" CAST IRON CONDUCTOR CONNECTIONS AND BOOTS.

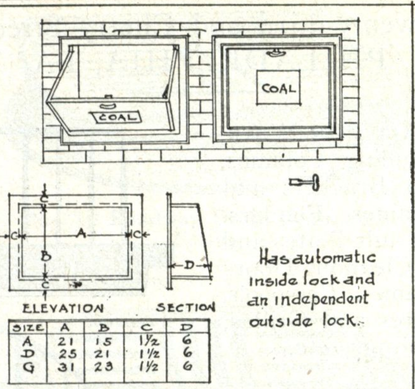
Continued on next page


A
B
C
D
ELEVATION
SECTION

DIMENSIONS

A	B	C	D
6	8	2	2½
8	10	2	2½
10	12	2	2½
12	14	2	2½
14	16	2	2½
16	18	2	2½
18	20	2	2½
20	24	2	2½

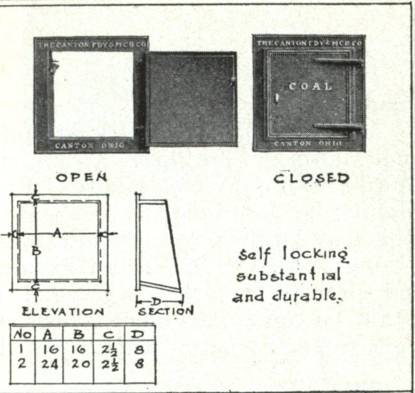
ASH PIT DOORS


COAL
COAL
A
B
C
D
ELEVATION
SECTION

Has automatic inside lock and an independent outside lock.

SIZE	A	B	C	D
A	21	15	1½	6
D	25	21	1½	6
G	31	23	1½	6

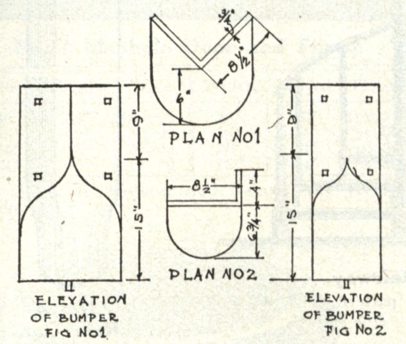
SELF·LOCKING. BURGLAR·PROOF COAL CHUTE.


THE CANTON FDY & MCH CO
CANTON OHIO
COAL
OPEN
CLOSED
A
B
C
D
ELEVATION
SECTION

Self locking substantial and durable.

No	A	B	C	D
1	16	16	2½	8
2	24	20	2½	8

SELF LOCKING BURGLAR·PROOF COAL DOOR


¾"
8½"
6"
PLAN No1
9"
15"
8½"
4"
6¾"
PLAN NO2
9"
15"
ELEVATION OF BUMPER FIG No1
ELEVATION OF BUMPER FIG No2

CAST IRON WHEEL GUARDS

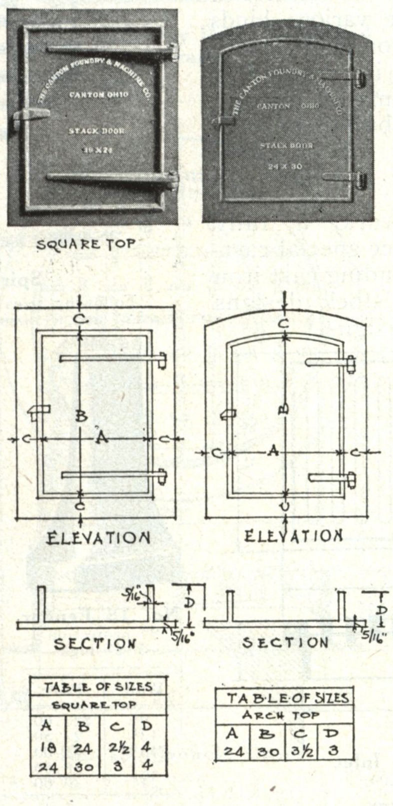

THE CANTON FOUNDRY & MACHINE CO.
CANTON OHIO
STACK DOOR
18 X 24
SQUARE TOP
THE CANTON FOUNDRY & MACHINE CO.
CANTON OHIO
STACK DOOR
24 X 30
A
B
C
ELEVATION
ELEVATION
5/16"
D
5/16"
SECTION
SECTION

TABLE OF SIZES

SQUARE TOP

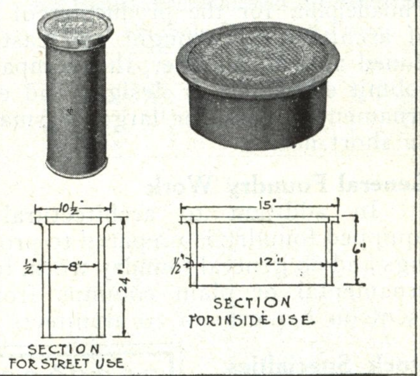
A	B	C	D
18	24	2½	4
24	30	3	4

TA·B·LE·OF SIZES

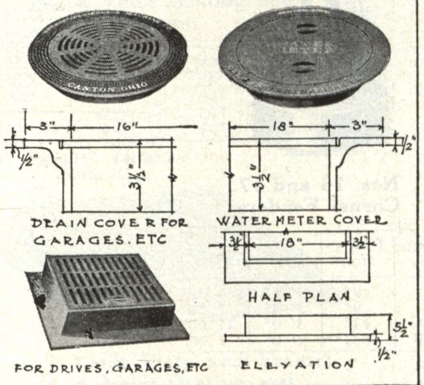
ARCH TOP

A	B	C	D
24	30	3½	3

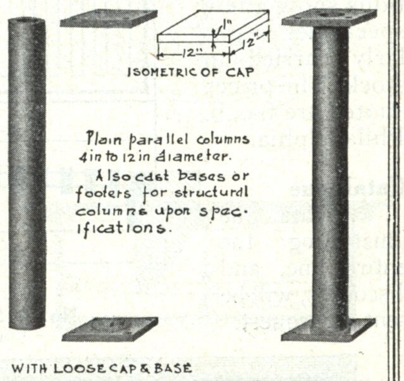
STACK DOORS


10½"
½"
8"
24"
SECTION FOR STREET USE
15"
½"
12"
6"
SECTION FOR INSIDE USE

VALVE COVERS


CANTON OHIO
3"
16"
½"
3½"
DRAIN COVER FOR GARAGES. ETC
18"
3"
½"
3½"
WATER METER COVER
3½"
18"
3½"
HALF PLAN
FOR DRIVES, GARAGES, ETC
5½"
½"
ELEVATION

CAST IRON COVERS


1"
12"
12"
ISOMETRIC OF CAP
WITH LOOSE CAP & BASE

Plain parallel columns 4in to 12in diameter.
Also cast bases or footers for structural columns upon specifications.

CAST IRON COLUMNS

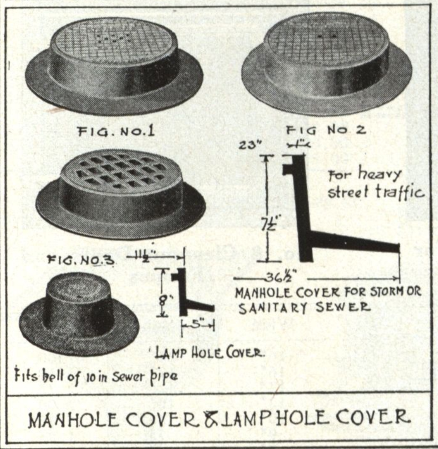


FIG. NO.1
FIG No 2
23"
1"
7½"
36½"
FIG. NO.3
1½"
8"
5"
LAMP HOLE COVER.
Fits bell of 10 in Sewer pipe
MANHOLE COVER FOR STORM OR SANITARY SEWER

For heavy street traffic

MANHOLE COVER & LAMP HOLE COVER

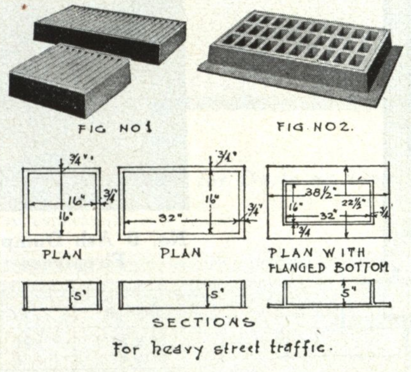


FIG NO1
FIG NO2.
¾"
16"
16"
¾"
¾"
16"
32"
¾"
38½"
22½"
16"
32"
¾
¾
PLAN
PLAN
PLAN WITH FLANGED BOTTOM
5"
5"
5"
SECTIONS

For heavy street traffic.

CHANNEL DRAIN BOXES

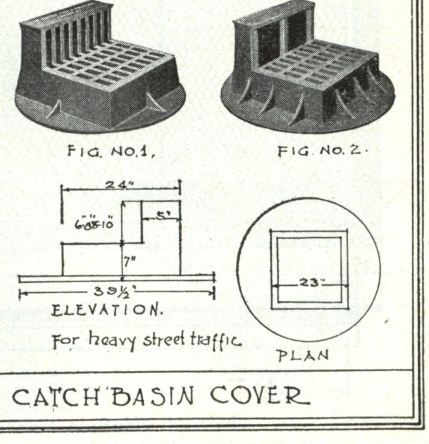


FIG. NO.1,
FIG. NO.2.
24"
6"-8"-10"
5"
7"
39½"
ELEVATION.
23"
PLAN

For heavy street traffic

CATCH BASIN COVER

THE SAMUEL J. CRESWELL IRON WORKS

Twenty-third and Cherry Streets
PHILADELPHIA, PA.

Products

ARCHITECTURAL WROUGHT and CAST IRON WORK, and GENERAL FOUNDRY WORK, including Columns, Spiral Stairs, Wheel Guards, Lamp Brackets and Standards, Manhole Doors and Frames, Fenders, Roadway Drain Grates and Frames, Vault Plates and Frames, Ash Pit Doors and Frames, Cleanout Doors and Frames, Trench Covers and Frames, Cesspools, Drain Gutters, Pavement Doors, Gates and Grilles, Post Caps, Elevator Enclosures, Railings, etc.

Facilities

THE SAMUEL J. CRESWELL IRON WORKS is one of the largest and best equipped plants in the vicinity of Philadelphia for the production of the various kinds of architectural wrought and cast iron work mentioned above. Further, this company is prepared to submit estimates, or designs and estimates, for any ornamental work for large or small buildings, etc., on short notice.

General Foundry Work

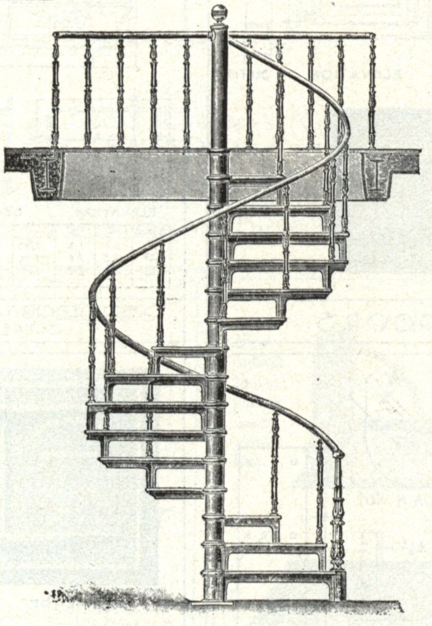
In addition to architectural work, a fully equipped foundry is prepared to produce special castings and do general foundry work, including cast iron ornamental or plain columns from stock designs (sent on request) or to architects' designs.

Stock Specialties

The accompanying illustrations show a few specialties regularly carried in stock. The prices quoted are f. o. b. Philadelphia.

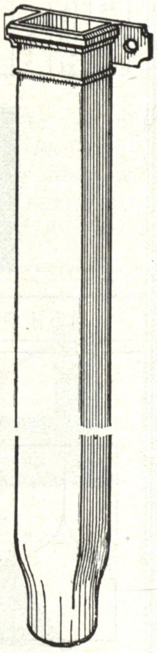
Catalogue

A catalogue illustrating the entire line, and discounts, will be sent on request.



Spiral Stairway

Following sizes stock pattern, 3′6″, 4′, 4′6″, 5′, 5′6″ and 6′ diameters. Any height.

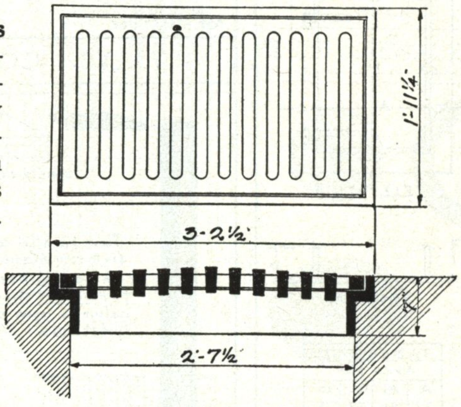


No. 4 Rain Conductor Shoes

3″x4″

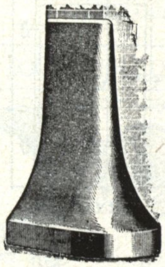
Length	Price
5′0″	$7.25
4′0″	6.50
3′0″	5.00
2′0″	3.50
1′6″	2.75
1′0″	2.00

We have patterns for other sizes. Prices on application.



No. 3 Sewer Inlet

Price, $22.00

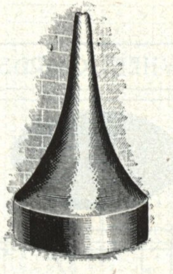


No. 15 Fender

9″ projection
3′ 5″ high

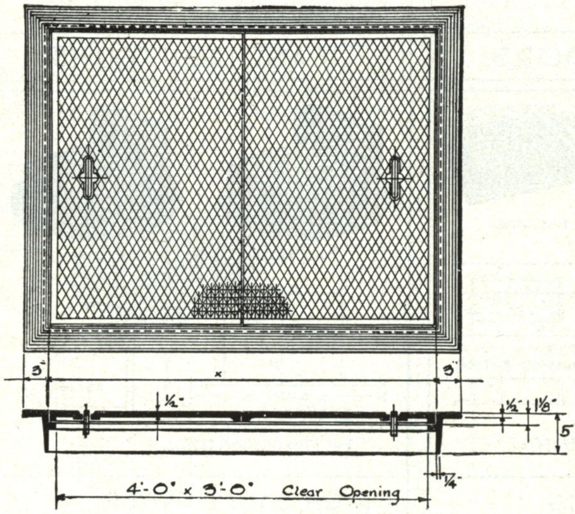
Wall	Price
9″	$23.00
13″	23.50
18″	25.00
22″	28.50
24″	30.00

Can be made for walls to 36 in. thick.



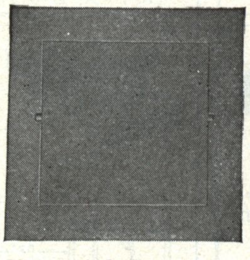
Nos. 16 and 17 Corner Fenders

Design No.	Projection	High	Price
16	9″	3′ 5″	$ 9.50
17	9″	2′ 8″	7.50
17A	14″	3′ 0″	25.00
17B	8⅜″	2′ 0″	7.00



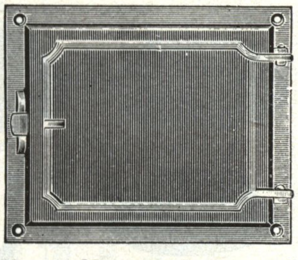
No. 34 Manhole Cover

Price, $35.00. Extra heavy pattern, price, $55.00



No. 9 Ash Dump for Fireplaces

Opening	Price
6″ x 6″	$1.25
6″ x 8″	1.50



No. 8 Cleanout Doors and Frames

Wide	High	Price
16″	24″	$7.00
16″	12″	3.50
12″	12″	2.25
12″	10″	2.00
10″	8″	1.75
9″	7″	1.25
8″	6″	1.25
7″	5″	1.25

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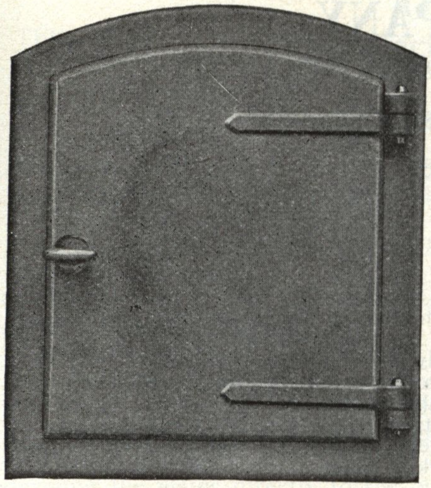
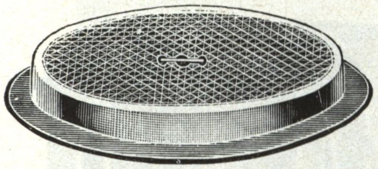


No. 1 Manhole Door and Frame

Width	Height	Price	Width	Height	Price
36″	36″	$30.00	24″	30″	$11.75
33″	49″	30.00	24″	24″	11.00
24″	48″	20.00	20″	24″	10.00
24″	36″	12.50	18″	24″	8.50

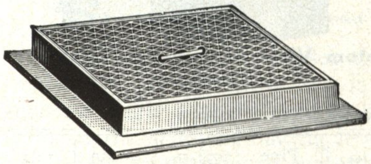
All manhole doors and frames have return flanges 4 in. deep.



No. 3 Vault Plate and Frame; No. 4 Vault Grating and Frame

Size	Price	Size	Price
12″	$3.00	20″	$7.00
14″	4.00	24″	9.50
16″	5.00	30″	22.00
18″	6.00	34″	25.00

Depth of frame, 3 in.

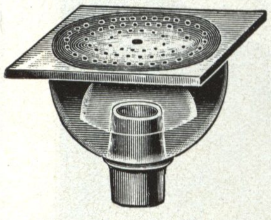


No. 7 Vault Plate and Frame; No. 8 Vault Grating and Frame

Size	Price	Size	Price
36″ x 36″	$27.00	7½″ x 7½″	$2.00
30″ x 30″	18.00	14″ x 24″	7.00
24″ x 24″	10.00	18″ x 24″	8.50
20″ x 20″	8.50	18″x 30″	10.00
18″ x 18″	7.50	18″ x 36″	12.50
16″ x 16″	6.50	24″ x 30″	13.50
14″ x 14″	5.00	24″ x 36″	18.00
12″ x 12″	3.00	24″ x 42″	20.00
		24″ x 48″	25.00

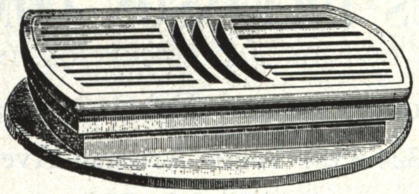
Depth of frame, 3 in.

All sizes can be made extra heavy at additional cost.



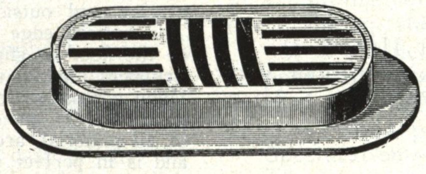
No. 21 Bell Trap

12″x12″, 4-in. outlet.
Price, painted..........$2.00



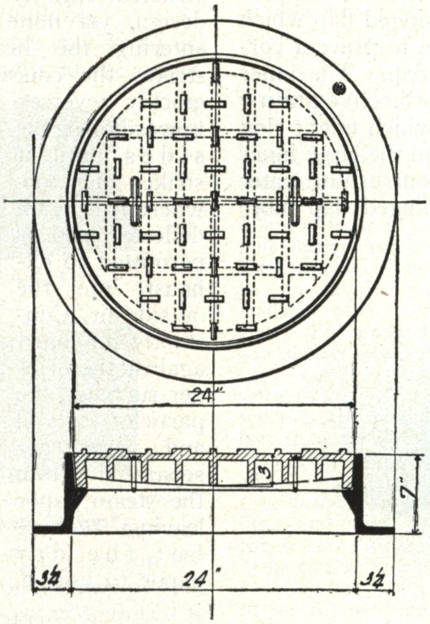
No. 10 Roadway Drain Grate and Frame

13¼″x24½″ grating......................$7.00
12″ x18″ grating...................... 6.00



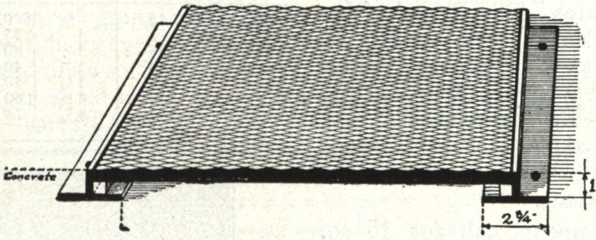
No. 11 Roadway Drain Grate and Frame

11″ x22½″ grating......................$6.00
8¼″x17¼″ grating...................... 4.00



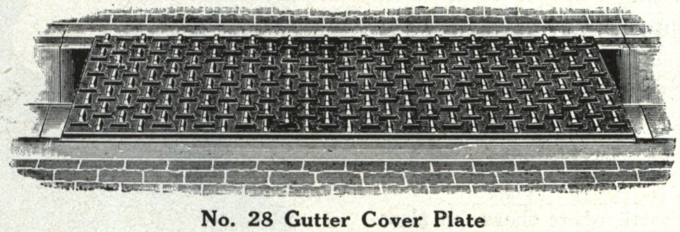
No. 19 Manhole Cover

Extra heavy for city use................$17.00
With concrete or asphalt filled cover...... 22.00



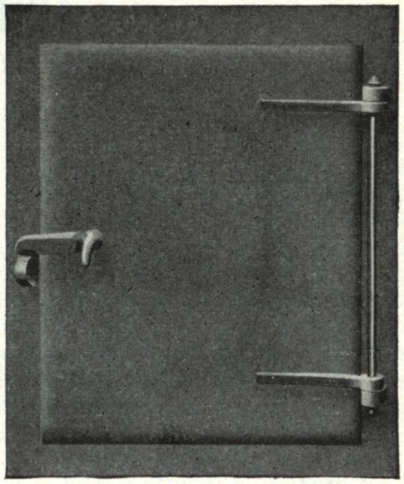
Cover and Curbing for Ducts or Trenches

Plates made to suit conditions. Curbing carried in stock. Prices on application.



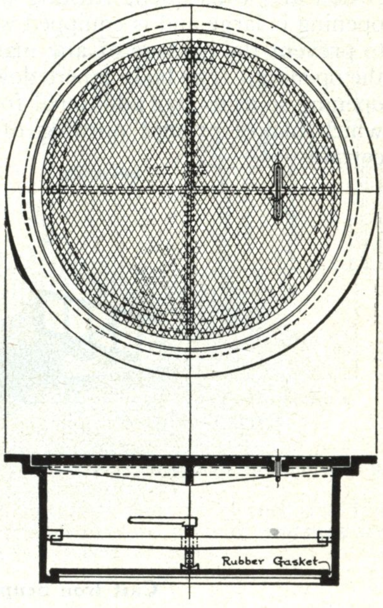
No. 28 Gutter Cover Plate

18″ wide, 1″ thick, $3.00 per lineal ft.
24″ wide, 1½″ thick, $6.00 per lineal ft.



No. 3 Manhole Door and Frame

Width	Height	Price	Width	Height	Price
24″	36″	$12.50	16″	24″	$ 8.00
24″	24″	11.00	16″	20″	7.25
18″	24″	8.50	16″	10″	4.50
18″	18″	7.50	12″	16″	4.50

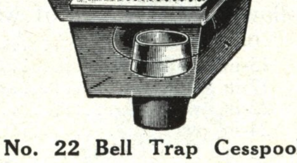


No. 23 Manhole Cover with Inside Lid

Lock bar with brass screw

Size	Price
36″	$50.00
30″	35.00
24″	20.00
20″	18.00
18″	14.00

Depth of Frame, 9 in.



No. 22 Bell Trap Cesspool

16″x16″, 4-in. outlet.
Price $5.00
12″x12″, 4-in. outlet.
Price $3.75

ÆOLUS DICKINSON COMPANY

INDUSTRIAL DIVISION PAUL DICKINSON, INCORPORATED

Scuppers and Exhaust Heads

3324-3354 South Artesian Avenue
CHICAGO, ILL.

TELEPHONE
Lafayette 1862, 1863

Products

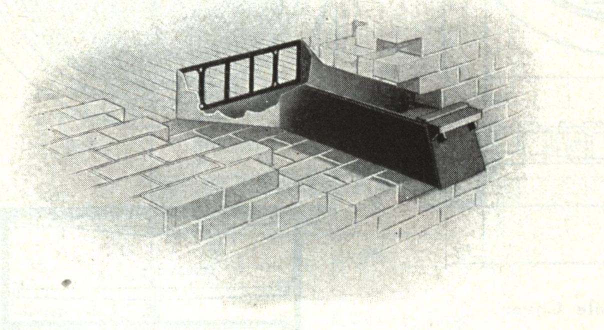
Dickinson Cast Iron Scuppers.

Dickinson Cast Iron Exhaust Heads.

For "Æolus" Ventilators and Dickinson Floor Ventilators, Mushroom Type, see page 1176.

Cast Iron Scuppers

Dickinson scuppers are constructed entirely of light gray cast iron. They are the result of careful study by our engineering department and are simple, effective, durable and easily installed. The portion which protrudes beyond the wall is covered by a hinged flap which is held in place by a hinge pin of bronze to prevent corrosion and consequent sticking of the flap. The inner opening is large and is equipped with a protective grating to prevent the passage of any material which might clog the opening. The body tapers down from the large inner opening so as to give additional force to outrushing water which makes prompt opening of the hinged flap more certain.



Cast Iron Scupper

Reduction in Insurance Rates—The Board of Insurance Underwriters has ruled that certain types of buildings be equipped with scuppers. Factories, warehouses and loft buildings of fireproof construction and sprinkler equipped, when fitted with scuppers represent first class risks. Allowance is made in the insurance rates when a building is fitted with scuppers, the amount varying with the type of the contents.

Size—Underwriters' requirements call for 15 sq. in. for each 1000 sq. ft. drained. Dickinson scuppers have a capacity of 16 sq. in. at the smallest point. The outside or smaller end is 4x4 in.

List Price—Dickinson scuppers may be had for the following thicknesses of wall:

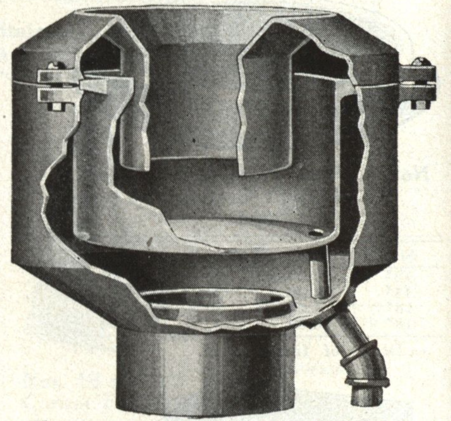
9-in. wall	$3.30
13-in. wall	4.40
17-in. wall	5.50
22-in. wall	6.60
24-in. wall	7.70

Prices are f.o.b. Chicago.

Specifications—Furnish and install where shown on plans gray cast iron scuppers which are to have outlet of 4x4 in., as manufactured by Æolus Dickinson Company, 3324-3354 South Artesian Ave., Chicago, Ill. Inlet to have a protective grating and outside to have a flap hinged on a bronze pin. The bottom edge of the inside end shall be set at the level of the floor or slightly below it so that water will drain clear. Scuppers must have a pitch of from 2 to 2½ in. to the foot. Upon completion of the building and before being turned over to the owners, the contractor shall see that all scuppers are clear of all material, are clean and that the hinged flap moves freely and is in perfect working order.

Cast Iron Exhaust Heads

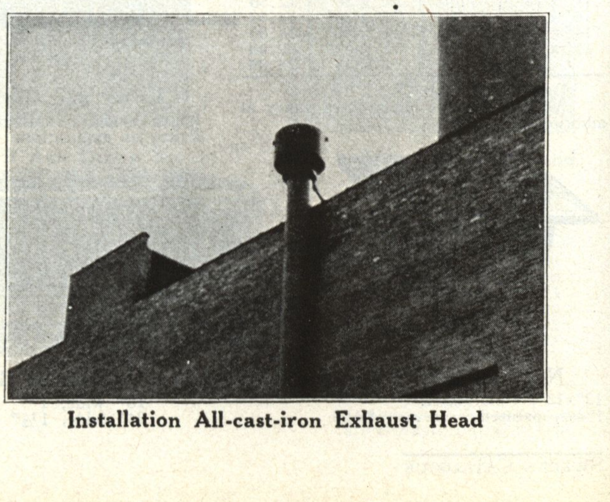
Dickinson exhaust heads are the only make constructed entirely of cast iron. They are simple in design, yet none the less effective in operation. On entering the head the gradually expanding steam strikes the concave surface of an inner shell which quickly reverses its direction. Then the steam flows upward along the sides until it strikes the top, where it is again deflected and is permitted to exhaust into the outside air. Constantly impinged against these inner surfaces, the particles of oil and water are separated from the steam vapor leaving nothing but the dry vapor to escape.



Phantom View All-cast-iron Exhaust Head

DICKINSON EXHAUST HEAD

Pipe sizes, in.	Weight, lb.	Drain opening, in.	List price	Pipe sizes, in.	Weight, lb.	Drain opening, in.	List price
1 and 1½	15	¾	$20.00	8	174	1¼	$90.00
2 and 2½	21	1	25.00	10	241	2	125.00
3 and 3½	35	1	30.00	12	325	2½	150.00
4 and 4½	48	1	40.00	14	475	2½	200.00
5	100	1¼	50.00	16	650	3	250.00
6	120	1¼	60.00	18	900	3	300.00
7	154	1¼	75.00	20	1100	3½	360.00



Installation All-cast-iron Exhaust Head

OLNEY J. DEAN & CO.

TELEPHONE
Randolph 3600

Manufacturers of Scuppers and Concrete Inserts

137 South La Salle Street
CHICAGO, ILL.

Products

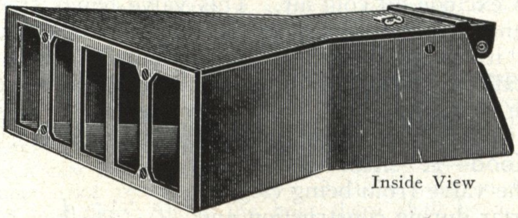
Dean's Chicago Type Scuppers.
Dean's Concrete Inserts.
Also Reinforcing Steel, Wire Mesh, Beam Wrapping, Spirals, Spacers.

Dean's Chicago Scuppers

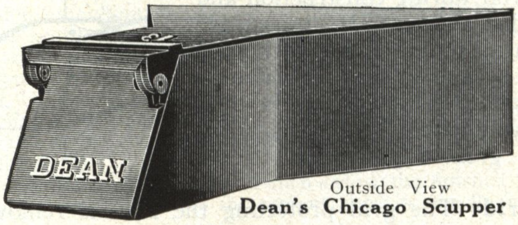
Advantages—Windproof and rainproof, meet all the requirements of the National Board of Underwriters. Reduce insurance rates 3 to 5 per cent. Initial cost low in comparison to this annual saving. Reduce water losses and interruption to business in case of fire by draining the water directly to the outside of the building. Protect goods on the floor in case of breaks in water or sprinkler system. Protect wood floors from standing water.

Therefore use scuppers in every building.

Construction—Our Chicago scupper has 48 sq. in. capacity at the inlet and 16 sq. in. capacity at the outlet.



Inside View



Outside View

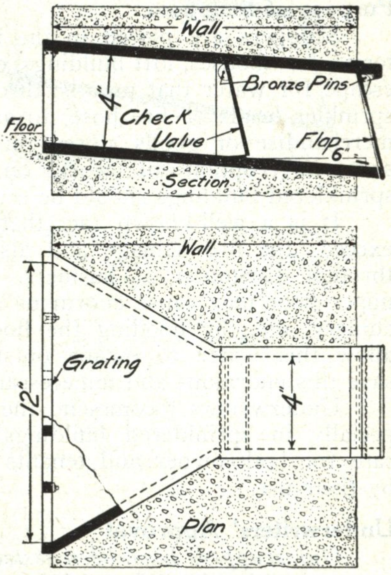
Dean's Chicago Scupper

The wide inlet increases the water pressure on the flap at the outlet. This flap is hung on bronze pins at such an angle that its weight holds it snug against the walls of the scupper making it windtight and watertight, but a very small flow of water from within will open it. A small shelf projecting from the outside of the scupper protects the hinges and valve from clogging with mortar, dirt or ice. The grating within prevents clogging from the inside of the building and allows a clear inspection of the interior of the scupper at all times.

Check Valve—While the careful fitting of the outer flap makes the Chicago scupper windproof, we can, if desired, insert an additional check valve in the box.

Installation—The National Fire Protective Association recommends, under ordinary conditions, one Dean Chicago Type Scupper to every 1000 sq. ft. of floor, or, in a building equipped with a sprinkler system, one to every 500 sq. ft. of floor.

It is not necessary to slope the floor with a Dean scupper. If the inside end is placed well below the finished floor line and the scupper given a pitch of 2 to 12 in. outward, perfect drainage will be secured.



Section and Plan of Dean's Chicago Scupper

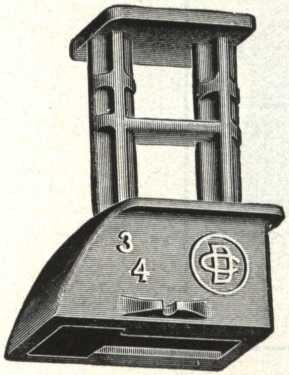
Specification—The mason contractor shall furnish and set one Dean Chicago Type Scupper in each bay of the exterior wall as shown on plans. The scuppers are to meet the recommendations of the National Board of Fire Underwriters, having well fitted and non-clogging outside flaps hung on bronze pins and removable inside gratings. They shall have inlets at least 12 in. wide and outlet areas of at least 16 sq. in. They shall be set in the masonry walls at each floor level above the ground floor as shown on details. Care must be taken in setting the scuppers to see that the pitch is not less than 2 in. in 12 in., that the lower inside edges of scuppers are set 1 in. below finished floor line, and that scuppers are set true to wall lines and are not sprung or broken during construction work.

On completion of the job, flaps must be cleaned and left in perfect working order and all exposed parts of scuppers are to be cleaned and given a heavy coat of paint.

Service

A complete stock of all sizes of scuppers is kept in the Chicago warehouse.

Chicago being centrally located with exceptionally good package car service on all railroads, delivery can be made within a few days' time to all points. This is an important consideration in regard to scuppers, as they are very often forgotten until actually needed on the job.

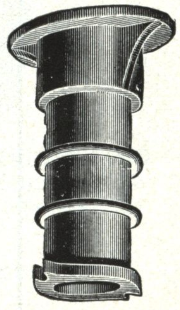


Slotted or Adjustable

DEAN'S CONCRETE INSERTS

Size bolt, in.	Allowable load, lb.	Height out to out, in.	Shipping wt. per 100, lb.
Slotted or Adjustable Inserts			
3/8	800	2	30
1/2	1500	2½	47.5
5/8	2400	4	96
3/4	3600	4¼	130
7/8	5000	4¼	190
Threaded Inserts			
3/8	400	2½	31
1/2	750	2½	31
5/8	1200	3⅜	75
4/4	1800	3⅜	75

Drilling Holes in Your Concrete Is Expensive—Use Inserts


Threaded Insert

WATERTITE DRAIN & SCUPPER CO., INC.

Windproof Hooded Scuppers

137 East 46th Street, NEW YORK, N. Y.

AGENTS

BALTIMORE, MD., McNeill Ornamental Iron & Construction Co., 460 East Cross Street
BOSTON, MASS., Folsom Snow Guard Co., 10 Milk Street
BUFFALO, N. Y., James M. Hawkins, 705 Ellicott Square
CEDAR RAPIDS, IOWA, Builders' Material Co., 601 South Third Street
CHICAGO, ILL., J. Norman Jensen, 243 South Dearborn Street
CINCINNATI, OHIO, Calvin C. Huenefeld, 310 Southern Ohio Bank Building
CLEVELAND, OHIO, R. L. Queisser Co., Schofield Building
GREENVILLE, S. C., Wilson Co., 1206 Woodside Building
HOUSTON, TEX., John C. Mitchell Sales Agency, 304 Stewart Building
INDIANAPOLIS, IND., Van Camp Hardware & Iron Co.
LOS ANGELES, CAL., J. A. Fraters Co., 440 Commercial Avenue
LOUISVILLE, KY., F. W. Maury, 2434 Frankfort Avenue
KANSAS CITY, MO., Builders Material Supply Co., Continental Building
MILWAUKEE, WIS., Builders Supply Co., 290 Third Street
MINNEAPOLIS, MINN., The Reed Co., 253 Plymouth Building
NEW ORLEANS, LA., Ernest R. Bartholomew, 927 Canal Street
NORFOLK, VA., S. H. Hodges, 721 Citizens Bank Building
PHILADELPHIA, PA., Penn Building Specialties Co., 1814 Ludlow Street
PITTSBURGH, PA., Walter Boswell Co., 1522 Oliver Building
READING, PA., Daniel F. Yost, 312 Baer Building
RICHMOND, VA., Earnest Bros., 805 East Franklin Street
ROCHESTER, N. Y., American Clay & Cement Corporation,
SALT LAKE CITY, UTAH, Hawley-Richardson-Williams Co., Dooley Building
ST. LOUIS, MO., Schurk Iron Works, Cardinal Ave., South of Laclede Avenue
SAN FRANCISCO, CAL., Price-Teltz Co., 523 Market Street
SYRACUSE, N. Y., Paragon Plaster Co.
TOLEDO, OHIO, Henry J. Conlon, 223 Michigan Street
UTICA, N. Y., American Hard Wall Plaster Co.

Purpose of Scuppers

Scuppers are placed in the interior walls of factories, warehouses, loft buildings, etc., to provide a quick escape for water that may be thrown on floors through sprinkler heads or fire hose, to avert water damage to merchandise or goods stored on floors below and to save interruption of work on lower floors. All sprinklered buildings should be scuppered.

It is a well-known fact that water damage often exceeds the fire damage and also causes large losses through disruption of business. A small fire on an upper floor may cause enormous damage to goods, machinery, etc., by flooding the floors below. Scuppers allow this water to escape outside the building and save this enormous and unnecessary loss.

Underwriters recommend the use of scuppers (especially in sprinklered buildings) and the insurance rate for both owner and tenants is favorably affected by their use.

Underwriters' Approval

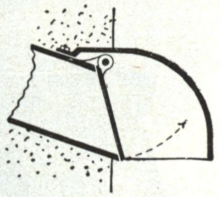
Our scuppers have been tested, approved and listed as standard by the Chicago Laboratories of the National Board of Fire Underwriters. This secures their acceptance by all local exchanges and the maximum allowance in the rate.

As the scupper is an emergency device it must be ready to function at all times and it would be folly to install a cheaply made scupper that through rust, corrosion or incrustations of dirt, or sealing by ice in winter, would fail to function through any defect of design or construction.

Construction of Type R Scupper

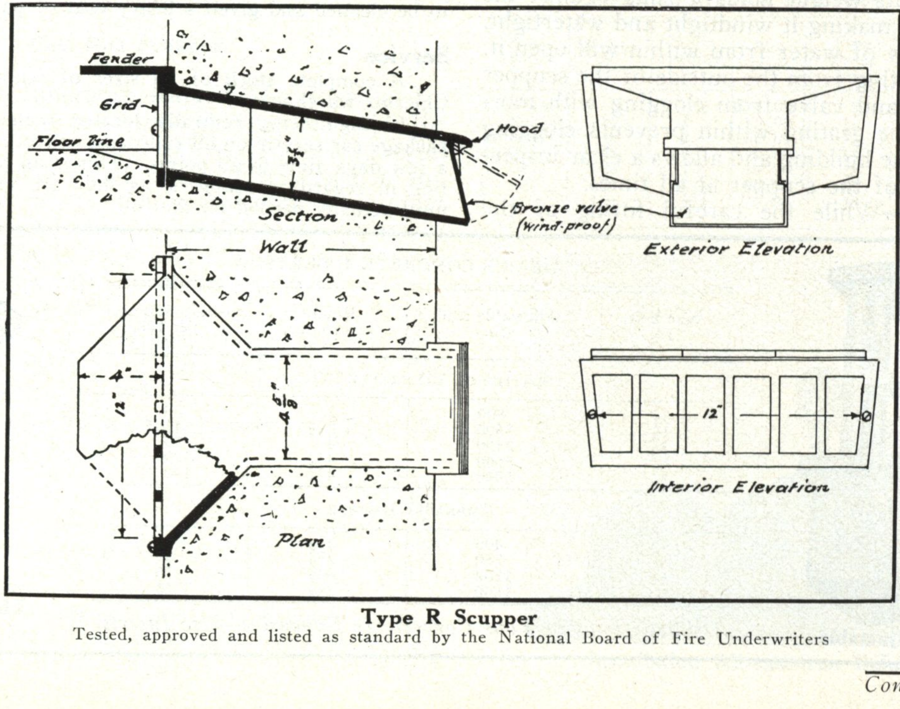
Windproof Valve—At the outer end of the scupper is a cast bronze gravity valve hung in bronze bushings to exclude all cold air. This valve hangs free and clear and is not recessed in the mouth of the scupper where it would soon become practically sealed by incrustations of dirt and by ice and sleet in winter. As the scupper is an emergency device it must be ready to function at all times, else it is useless.

Hood—A small hood protects the valve from being clogged by mortar during construction and from dirt and ice. If desired, we can furnish the "complete hood," shown here, enclosing the valve on three sides. This form is favored by New England Underwriters, as giving greater protection to the valve.



Grid—The grid protecting the inlet is removable, being secured by two brass setscrews.

Fender—The fender projecting 4 inches into the room is designed to prevent the storing of goods against



Type R Scupper
Tested, approved and listed as standard by the National Board of Fire Underwriters

Continued on next page

the inlet of the scupper. The fender can be omitted, if desired.

Pitch—Our scupper has a downward pitch of 2 inches to the foot, providing a good head of water to open the valve.

Discharge Capacity—The tests made by the Underwriters' Laboratories developed that our scupper will discharge 60 gallons per minute under 1-inch head of water on the floor and 100 gallons per minute under 3-inch head.

Necessity of Bronze Fittings—As the scuppers may not be called into use until years after they have been installed it is necessary that the valve be of a material not subject to rust—ours are of bronze hung in bronze bushings.

Number Required

In sprinklered buildings, it is advisable to provide one scupper to every 500 square feet of floor surface. In unsprinklered buildings one to every 1,000 square feet.

Scuppers are usually placed in the curtain walls below the windows.

Sizes and Prices

The scuppers are made for any thickness of wall and prices will be quoted on application. State thickness of wall and type of scupper required, also number required.

Specification for Type R (Approved) Scuppers

Furnish and set in exterior walls, where indicated, cast iron scuppers with inlet not less than 12 inches wide, outlet to have an area of not less than 16 square inches; outlet to have a cast bronze gravity valve overlapping the end of the scupper (not recessed). Valve shall be hung in bronze or brass bushings. Above the inlet there shall be a cast iron fender extending 4 inches into the room (can be omitted if floors are not for storage purposes). All iron parts shall have one coat protective paint (or be galvanized) before shipping. Scuppers shall have the approval of the National Board of Fire Underwriters and be included in their list of Approved Mechanical Devices. All as manufactured by the WATERTITE DRAIN & SCUPPER CO., INC., 137 East 46th Street, New York, N. Y.

Set the scuppers about 1 inch below the finished floor line. Grade a channel to it in the cement finish of the floor.

Variation of Type R Scupper

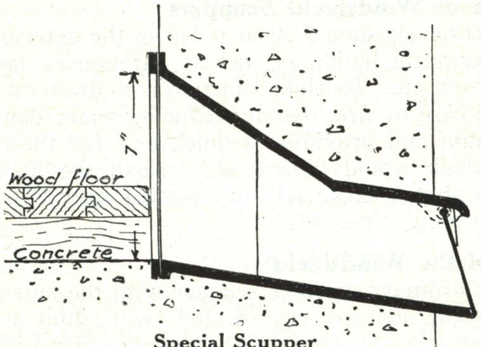
The illustration at bottom of page shows a Type R scupper having a secondary brass air check valve placed in the neck of the scupper, an additional security against the entrance of cold air. No fender is shown in this cut but can be provided if desired. The air check adds but one dollar to the cost of the scupper.

For Wood Floors on Cement

The illustration shows a special scupper made for wood floors laid on sleepers bedded in the cement slab. The inlet is 7 inches high and the bottom of the scupper is set flush with the cement floor to take off any water that might seep through the wood floor.

A Few Installations

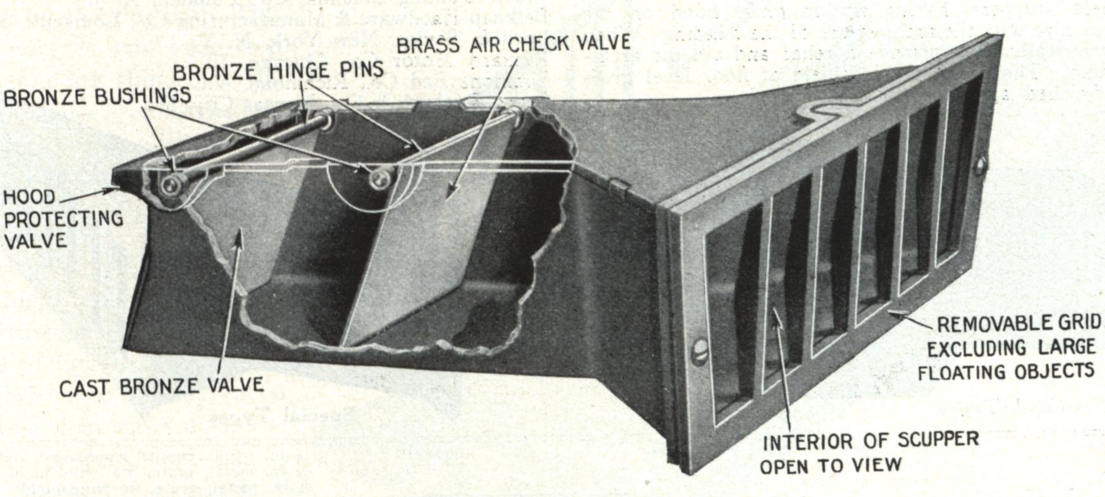
Please note that our scuppers were selected by Government architects and used in the two largest army base depots ever built, at Brooklyn and New Orleans. Also in other important Government work.



Special Scupper
For wood floors on concrete slab

A Few Installations

U. S. Army Supply Base, Brooklyn, N. Y., 1181 scuppers
U. S. Army Supply Depot, New Orleans, La., 1070 scuppers
U. S. Aircraft Storehouse, Philadelphia, Pa., Navy Yard
Frankford Arsenal, Philadelphia, Pa.
Kelly-Springfield Tire Co., Cumberland, Md.
Columbia Graphophone Factories, Baltimore, Md.
Studebaker Body Plant, South Bend, Ind.
American Can Co., Honolulu, T. H.
International Harvester Co., Chicago, Ill.
Endicott-Johnson Corp., Endicott, N. Y.
Stanley Works, New Britain, Conn.
Jas. Butler Warehouse, Long Island City, N. Y.
Diamond Match Company, Oshkosh, Wis.
Eastman Kodak Co., Rochester, N. Y.
Standard Oil Co., Brooklyn, N. Y.
Hill Publishing Company, New York, N. Y.
Cluett-Peabody Company, Troy, N. Y.
American Ever-Ready Co., Long Island City, N. Y.
Printing Crafts Building, New York, N. Y.
Holtzer-Cabot Building, Cambridge, Mass.
Oliver Chilled Plow Works, South Bend, Ind.
Pennsylvania R. R. Co., Inbound Warehouse, East Liberty, Pa.
Reymann Abattoir and Packing House, Wheeling, W. Va.
American Cigar Co., Hartford, Conn.
United Drug Co., Boston, Mass.
U. S. Playing Card Co., Cincinnati, Ohio
R. H. Macy & Co. Warehouse, New York, N. Y.
Knitwear Mfg. Co., Brooklyn, N. Y.
Westinghouse Lamp Co., Bloomfield, N. J.



Windproof Hooded Scupper with Air Check Valve

WINDSHIELD SCUPPER COMPANY

16 Warren Street, NEW YORK, N. Y.

SALES REPRESENTATIVES

ATLANTA, GA., R. C. Lieb Co., 340 Whitehall Street
BALTIMORE, MD., Edwin Cugle, 328 North Charles Street
BOSTON, MASS., E. A. Simpson, 88 Broad Street
DES MOINES, IOWA, Tower Materials Co., 709 Hubbell Building
DETROIT, MICH., L. T. Ollesheimer, 524 Penobscot Building
INDIANAPOLIS, IND., Hoosier Steel & Wire Co., 2230 Almont Street
KANSAS CITY, MO., C. A. Brockett Cement Co., 2035 East 19th Street
LOS ANGELES, CAL., E. R. Kuns Co., Inc., 226 West 9th Street
MILWAUKEE, WIS., Philip Gross Hardware & Supply Co., 216 Third Street
NASHVILLE, TENN., Geo. W. Ruth & Co., 61 Arcade
NEW ORLEANS, LA., Nachary Builders Supply Co., 423 Carondelet Street
PHILADELPHIA, PA., Kahn Products Co., 1513 Wood Street
PITTSBURGH, PA., Fort Pitt Hardware Co., 807 Liberty Avenue
RICHMOND, VA., Construction Supply Co., Arlington Road at North Boulevard
ST. LOUIS, MO., F. A. Camman Builder's Service Co., 927 Century Building
SAN FRANCISCO, CAL., M. E. Hammond, Pacific Building

Purpose of Windshield Scuppers

This device should be installed in the exterior walls of all mercantile buildings, such as warehouses, factories, lofts, stores, etc. Its chief function is to drain off excess water in case of fire, thereby reducing water damage to a minimum and providing a quick exit for the tons of water which would otherwise overload the floors. It has also proven invaluable in cases of defective sprinklers, bursting pipes, etc.

Value of the Windshield

The ordinary old type scupper with the outside flap lying on the surface, unprotected, will admit a strong draft even when there is only a moderate wind blowing, and in a high wind the flap is often blown open entirely. The effect upon the employees is demoralizing and invariably results in the stuffing of the scupper with waste material, rendering it useless and defeating its purpose. More heat is also required which means larger coal bills. The *windshield* overcomes these objections; it positively prevents drafts. In addition it acts as a fire retardent when an adjoining building is burning and when there is a tendency for the flames to communicate through the open scupper and ignite merchandise on the floor.

Construction and Quality

All Windshield scuppers are cast in one piece, with no parts to become separated, lost or broken. They are made of best grade, high silicon iron, (not brittle, so-called stove plate iron) ⅜ to ¼ in. thick; no less. We recommend a scupper ⅜ in. thick on account of greater strength and freedom from breakage by careless handling, but manufacture a ¼-in. scupper where economy is necessary.

The exterior weather valve is of bronze and hung on a brass hinge pin to prevent corrosion; it is so constructed that it can not be rendered inoperative by any foreign substance. It is hung inside of the housing, protecting the hinge against ice and can not blow open as is the case with the old-style unprotected flap that lies on the surface of the scupper. The Windshield is also hung on brass pivots insuring ease of operation.

Appearance

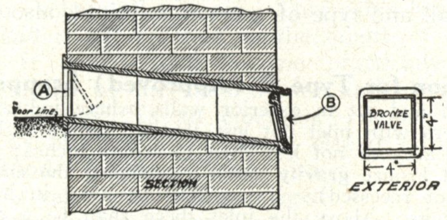
Windshield scuppers, having no unsightly hood on the exterior, harmonize with the architecture of the building. When located symmetrically, they provide a relief and aid the architectural scheme. The polished windshield at floor level gives the base a finished appearance.

Reduced Insurance Rates

Windshield scuppers meet the requirements of the underwriters. When installed in accordance with their recommendations, insurance companies allow a reduction in insurance rates on both building and contents. The saving pays the entire cost of scuppers in a few years. In addition to this great saving, buildings so equipped command a higher rental on account of the lower insurance rates afforded the tenants.

Specification for One-piece Windshield Scuppers

Provide and install in walls where shown on plans, Windshield Scuppers, Type (......), cast in one piece, equipped with windshield and with bronze exterior weather valve hung on bronze or brass hinge pins, as manufactured by the Windshield Scupper Company, 16 Warren Street, New York, N. Y.



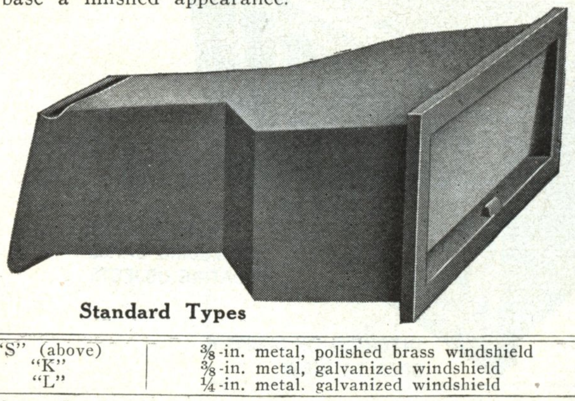
Details of Windshield Scuppers

"A"—patented windshield. "B"—exterior bronze weather valve

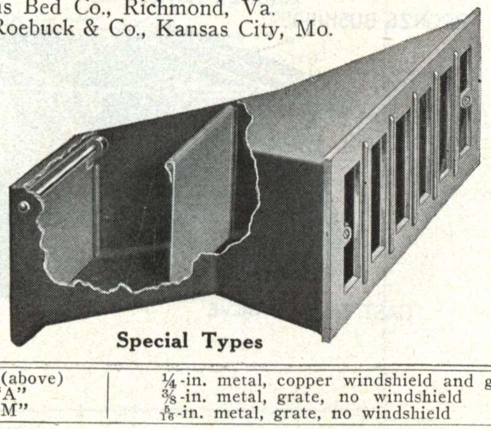
See "Kidder's Handbook," 17th edition, page 767; Crosby, Fiske & Foster on fire protection, 6th edition, page 158.

Recent Representative Installations

American Can Co., Cincinnati, Ohio and San Francisco, Cal.
Standard Oil Co., Long Island City, N. Y.
Naumkeag Steam Cotton Mills, Salem, Mass.
B. & O. R. R. Co. Warehouses, Philadelphia and Pittsburgh, Pa.
Fisher Body Corp., Cleveland, Ohio and Detroit, Mich.
Real Silk Hosiery Co., Indianapolis, Ind.
American Safety Razor Co., Brooklyn, N. Y.
Cooper Dry Goods Co., Los Angeles, Cal.
Westinghouse Electric Co., Cincinnati, Ohio and Pittsburgh, Pa.
Garment Center Buildings, New York, N. Y.
International Shoe Co., St. Louis, Mo.
General Electric Co., Newark, N. J.
Studebaker Buildings, South Bend, Ind. and Detroit, Mich.
Victor Talking Machine Co., Camden, N. J.
Belknap Hardware & Manufacturing Co., Louisville, Ky.
Lord & Taylor, New York, N. Y.
Packard Motor Co., Chicago, Ill.
Simmons Bed Co., Richmond, Va.
Sears, Roebuck & Co., Kansas City, Mo.



Standard Types



Special Types

"S" (above)	⅜-in. metal, polished brass windshield	"E" (above)	¼-in. metal, copper windshield and grate
"K"	⅜-in. metal, galvanized windshield	"A"	⅜-in. metal, grate, no windshield
"L"	¼-in. metal. galvanized windshield	"M"	$\frac{5}{16}$-in. metal, grate, no windshield

Note: Standard types have Windshield at the floor level, where it is always in full view, accessible and renewable. All types have bronze exterior weather valves and are cast in one piece. Made for walls of any thickness.

BABCOCK-DAVIS CORPORATION

Manufacturers of Pre-cast Concrete Stairs with Steel Stringers

474 Dorchester Avenue
BOSTON, MASS.

Products and Services

Babcock-Davis Pre-cast Concrete Stairs with Steel Stringers. (Patented.)

Also manufacturers of Ornamental Iron Work: including Cast and Wrought Iron Stairs; Railings, Marquises; Wire Grilles; Elevator Fronts, Frames and Thresholds.

Our engineers invite consultation during preparation of plans and will gladly co-operate in making working drawings and computing proper sizes required. Estimates submitted on request.

For Counterbalanced Elevator Fire Doors, see pages 890-891.

Pre-cast Concrete Tread and Riser

Strength (Factor of Safety, 10)—At the Massachusetts Institute of Technology tests were made by Professor Irving H. Cowdrey on 4 units. Each unit consisted of a pre-cast concrete tread, 4 ft. long by 11¼ in. wide, and 8-in. riser mounted on steel channel iron stringers. The average of these tests shows:

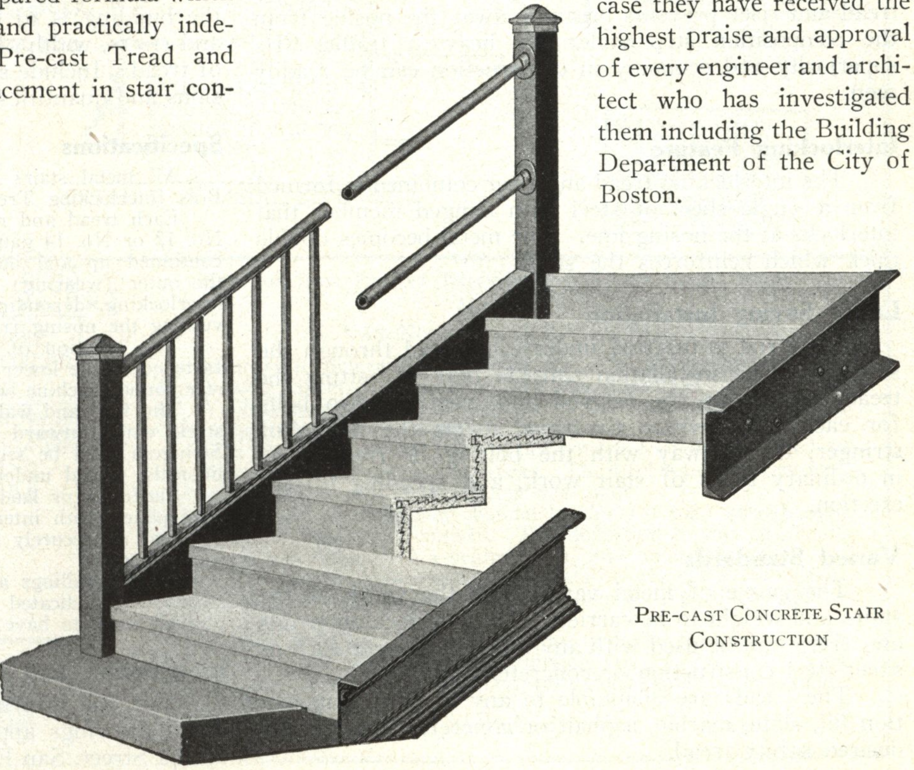
First hair crack in riser at 2300 lb. total load. Maximum load 3575 lb.

Construction—"Pre-cast concrete tread and riser" construction is economical to install and maintain, and is made from a scientifically prepared formula which makes the stair as hard as stone and practically indestructible. The Babcock-Davis "Pre-cast Tread and Riser" stair marks a decided advancement in stair construction for either inside or outside installation. As the name suggests, it is a combined reinforced concrete tread and riser cast in one interlocking unit. This work is done in our own shop and the units are shipped to the building under construction, where they are applied to the steel stringers furnished by us.

Advantages

Its very practical principle of interlocking, replaceable units has many advantages:

It is of lighter construction, is installed more quickly, at a smaller cost than stairs made entirely of concrete, and has a *stringer buttress* as required by insurance engineers.



Pre-cast Concrete Stair Construction

Wood forms, and such obstructions which delay building operations while the cement is hardening in all-concrete stair construction, are done away with.

There is no ringing sound or vibration to "Pre-cast Concrete Stairs" when in use, for they are practically noiseless. They are attractive in appearance. All joints are tight. Their upkeep is reduced to a minimum, as steps need not be painted, and, being dustless, they are easily kept clean.

Pre-cast Concrete Treads and Risers" are more fireproof than iron or pressed steel stairs, concrete filled at building, and have the further advantages of quicker installation and much greater rigidity.

Specifications

In writing specification, state: "Stairs are to be made of steel, with 'Pre-cast Concrete Treads and Risers,' as made by Babcock-Davis Corporation, 474 Dorchester Avenue, Boston, Mass., Patentee," who shall also furnish stringers, iron rails and posts complete.

For schools, hospitals and public buildings, where non-slipping qualities are desired, specify "To be treaded with Babcock-Davis Corporation Non-slipping Formula."

Installations

We have installed our pre-cast concrete stairs in a great many buildings in the United States and in every case they have received the highest praise and approval of every engineer and architect who has investigated them including the Building Department of the City of Boston.

BOIS PATENTED INTERLOCKING SHEET STEEL STAIRS

(N. BOIS, PATENTEE, 2846 CALIFORNIA STREET, SAN FRANCISCO, CAL.)

MANUFACTURED IN THE UNITED STATES, CANADA AND EUROPE BY THE FOLLOWING COMPANIES

NEW ENGLAND STATES

E. Van Noorden & Co., 100 Magazine Street, Boston, Mass.

GEORGIA, TENNESSEE, FLORIDA, NORTH AND SOUTH CAROLINA

Dowman-Dozier Mfg. Co., Campleton Road, Atlanta, Ga.

OHIO, MICHIGAN AND INDIANA

Riester & Thesmacher, 1512 W. 25th Street, Cleveland, Ohio

NEBRASKA, KANSAS AND OKLAHOMA

Paxton & Vierling Iron Works, S. 17th Street and Union Pacific R. R., Omaha, Neb.

ILLINOIS, WISCONSIN AND IOWA

Wetzel Iron Works, 3349 West Grand Avenue, Chicago, Ill.

TEXAS

Southern Ornamental Iron Works, Dallas, Tex.

SOUTHERN CALIFORNIA, ARIZONA AND HAWAIIAN ISLANDS

A. J. Bayer Co., Slauson and Santa Fe Avenues, Los Angeles, Cal.

MISSOURI

Lasar Manufacturing Co., 16th and O'Fallon Streets, St. Louis, Mo.

NORTHERN CALIFORNIA

Peerless Ornamental Iron & Bronze Co., 1528 Folsom Street, San Francisco, Cal.

PENNSYLVANIA AND WEST VIRGINIA

Taylor & Dean, Penn Avenue and 25th Street, Pittsburgh, Pa.

ALABAMA, LOUISIANA, MISSISSIPPI AND ARKANSAS

Decatur Cornice & Roofing Co., Decatur, Ala.

KENTUCKY AND VIRGINIA

The Dow Company, 1025 Franklin Street, Louisville, Ky.

MARYLAND, DELAWARE, DISTRICT OF COLUMBIA, COLORADO, WYOMING AND UTAH

Hughes-Keenan Co., Mansfield, Ohio

QUEBEC, NEW BRUNSWICK, ONTARIO, NOVA SCOTIA AND PRINCE EDWARD ISLAND

Geo. W. Reed & Co., Ltd., 37 St. Antoine Street, Montreal, Que., Canada

GREAT BRITAIN, FRANCE AND BELGIUM

Fred K. Braby & Co., Ltd., Petershill Road, Glasgow, Scotland

NEW YORK and NEW JERSEY

Pan-American Iron Works, 447-453 East 120th Street, New York, N. Y.

Products

Bois Patented Interlocking Sheet Steel Treads and Risers.

Also manufacturers of Sheet Steel Stairs.

Advantages

Bois interlocking tread and riser offers distinct advantages of economy, rigidity and rapid erection. The *interlocking* feature eliminates the labor of bolting or riveting, and makes rapid installation possible with unskilled labor.

Heretofore the nosing on sheet metal stairs broke away from the composition steps. Bois interlocking tread and riser prevents breaking away the nosing from the composition step under the heaviest traffic. Its superiority and economy in construction can be readily seen.

Interlocking Feature

The interlocking tread and riser combined is formed from a single sheet of steel with flanged member that interlocks at the nosing line. The metal becomes double thick which reinforces the steps.

Labor Saving Installation

A tie rod is inserted under each tread through the stringer. The installation consists only of setting the tread, bolting up the tie rod and inserting two bolts for each tread where the tread meets the flange of stringer, doing away with the bolting or riveting as in ordinary types of stair work, and speeding up the erection.

Varied Standards

The gauge of metal varies with the width of the stairs and weight to be carried. The interlocking treads and risers can be used with any type of stringer such as sheet steel construction or concrete.

The treads are adaptable to any kind of composition fill, slate, marble, asphalt or concrete, also for any desired safety tread.

Deliveries

When sheet steel stringers are used, the stairs can be assembled at the factory and delivered at the building ready for installation. Each section can be installed as the building progresses, eliminating the use of temporary stairs or ladders, doing away with unnecessary expenses.

If concrete stringers are to be used, the treads and risers are interlocked and put in position from floor to floor, after which the stringers are moulded as usual.

Inquiries

Make all inquiries for estimates to the Manufacturer (list in heading) controlling the territory in which the building is to be erected. State number of treads and risers, width of stairs, type of stringers, and nature of tread. Include sketch or drawing on which all dimensions and quantities are indicated.

Specifications

All metal stairs throughout the building shall be of the Bois Interlocking Tread and Riser construction type.

Each tread and riser shall be of one continuous piece of No. 12 or No. 14 gauge sheet steel. The tread metal shall be continued up and bent into an inner nosing, around which the outer (wearing) nosing shall be bent and secured by an interlocking, depending flange, reinforcing the step and preventing the nosing from breaking away from the concrete.

The junction of the treads and risers shall be securely fastened to the lower flange of the stringers with $\frac{5}{16}$-in. diameter round machine bolts.

The face and wall stringers shall be of No. 10 gage sheet steel, with outward top flange and inward bottom flange. Stringers shall be securely tied together with $\frac{7}{16}$-in. diameter tie rods, placed under each tread, near the nosing.

Platforms or landings shall be of No. 14 gauge corrugated steel plates, with interlocking nosing for connection with riser and shall be securely fastened to angle iron supports connected to stringers.

Newels, railings and balustrades to be of design and construction as indicated on plans.

All work to have 1 shop coat of approved paint.

Information and Catalogue

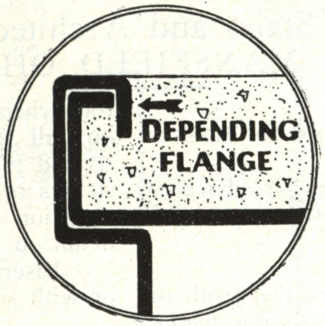
For full information and illustrated catalogues and detail drawings apply to agent or N. Bois, 2846 California Street, San Francisco, Cal.

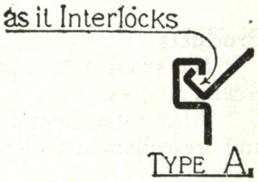
Continued on next page

FEATURE OF THE BOIS PATENT INTERLOCKING TREADS AND RISERS FOR STAIR CONSTRUCTION;

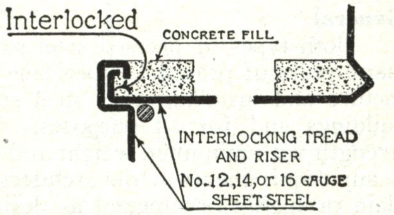
It eliminates all bolting and riveting thus saving considerable labor when assembling the stairs. Where the tread interlocks at the nosing the metal becomes double thick, reinforcing the step and preventing the metal breaking away from the concrete.

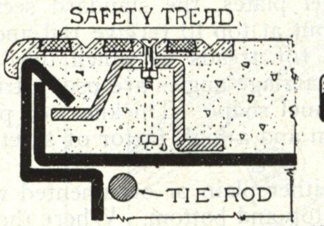
It is the most practical, economical, superior stair construction.

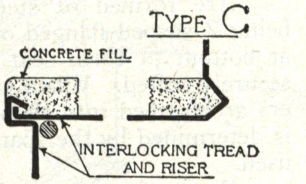

DEPENDING FLANGE


as it Interlocks

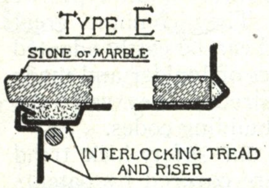
TYPE A.


Interlocked
CONCRETE FILL
INTERLOCKING TREAD AND RISER
No. 12, 14, or 16 GAUGE SHEET STEEL

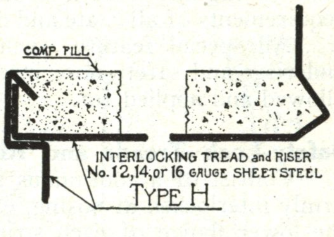

SAFETY TREAD
TIE-ROD


CONCRETE FILL
INTERLOCKING TREAD AND RISER

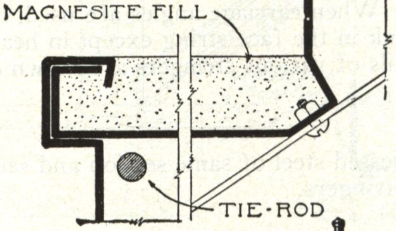
TYPE C

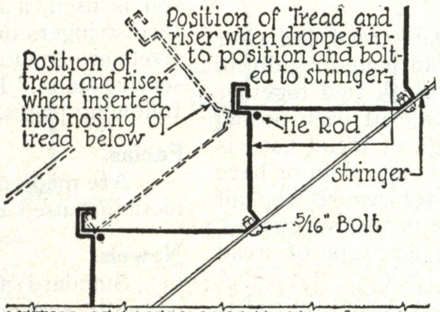

STONE or MARBLE
INTERLOCKING TREAD AND RISER

TYPE E

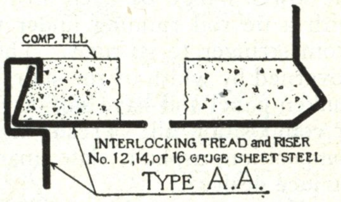

COMP. FILL
INTERLOCKING TREAD and RISER
No. 12, 14, or 16 GAUGE SHEET STEEL

TYPE H

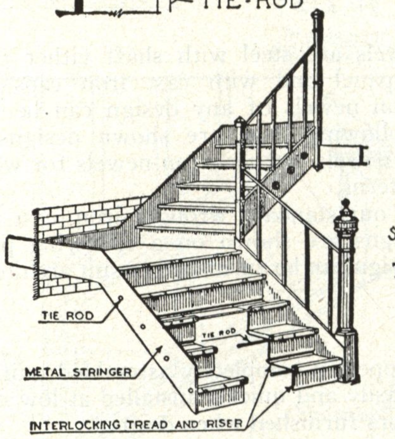

CEMENT OR MAGNESITE FILL
TIE-ROD

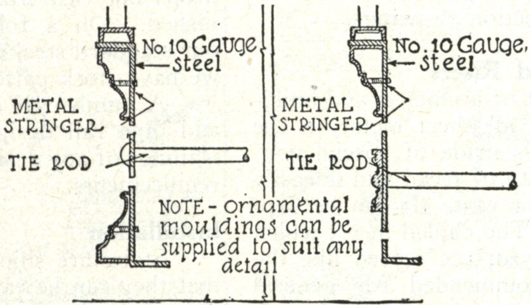

Position of tread and riser when dropped into position and bolted to stringer
Position of tread and riser when inserted into nosing of tread below
Tie Rod
stringer
5/16" Bolt

METHOD OF ASSEMBLING TREADS & RISERS


COMP. FILL
INTERLOCKING TREAD and RISER
No. 12, 14, or 16 GAUGE SHEET STEEL

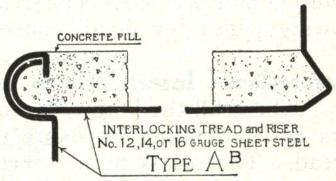
TYPE A.A.


TIE ROD
TIE ROD
METAL STRINGER
INTERLOCKING TREAD AND RISER


No. 10 Gauge steel
METAL STRINGER
TIE ROD
No. 10 Gauge, steel
METAL STRINGER
TIE ROD

NOTE - ornamental mouldings can be supplied to suit any detail

DETAILS OF METAL STRINGERS


CONCRETE FILL
INTERLOCKING TREAD and RISER
No. 12, 14, or 16 GAUGE SHEET STEEL

TYPE A^B

U. S. Patent No. 1,244,021
U. S. Patent No. 1,304,533
U. S. Patent No. 1,353,377
Canadian Patent No. 194,134
Canadian Patent No. 194,135
Canadian Patent No. 213,306
France Patent No. 501,494
Belgian Patent No. 281,657
Great Britain Patent No. 145,251

APPROXIMATE WEIGHT OF BOIS INTERLOCKING TREADS AND RISERS

WIDTH OF STAIRS	SQ. FT. OF METAL IN ONE INTERLOCKING TR. & RISER.	WEIGHT OF ONE INTERLOCKING TREAD AND RISER		
		NO. 12 GA.	NO. 14 GA.	NO 16 GA
2'-0"	4 sq. feet	18.0 lbs	12.8 lbs.	10.4 lbs.
2'-6"	5 " "	22.5 "	16.0 "	13.0 "
3'-0"	6 " "	27.0 "	19.2 "	15.6 "
3'-6"	7 " "	31.5 "	22.4 "	
4'-0"	8 " "	36.0 "	25.6 "	
4'-6"	9 " "	40.5 "	28.8 "	
5'-0"	10 " "	45.0 "	32.0 "	
5'-6"	11 " "	49.5 "		
6'-0"	12 " "	54 0 "		

TYPICAL SECTIONS SHOWING CONSTRUCTION OF BOIS PATENTED INTERLOCKING TREADS AND RISERS

Test of Bois Patent Interlocking Sheet Steel Stair
Made by
E. Van Noorden Co., Boston, Mass.

In order to determine accurately the safe loading for the Bois Interlocking Sheet Steel stair, a test was conducted by Professor H. W. Hayward of the Massachusetts Institute of Technology, Cambridge, Mass. A summary of this test is as follows:

"The full load of 600 pounds per square foot was allowed to remain upon the stairs for two weeks. The load was then removed and after four days the inspection was made.

"The slight distortion in channel header (at top) straightened out when the load was removed. The deflection in the top flange of runner was reduced to a negligible amount upon removal of the load. The general appearance of the stairs was good. No indications of overstrain could be noted either as regards lateral or vertical deflections.

"It should be noted that during the time the load was on the stairs the temperature varied approximately from 0° to 50° F. This variation in temperature would cause additional indeterminate stresses on the stairs."

Full report of test will be sent on request.

THE HUGHES-KEENAN CO.

Pressed Steel Stairs and Architectural Iron Work

MANSFIELD, OHIO

Products

Safety-Lock and Safety-Nose Insert Pressed Steel Stairs.

Also Ornamental and Pipe Railing, Fire Escapes and miscellaneous Ornamental Iron Work.

General

Both types of pressed steel stairs are the result of many years of practical experience in the design, manufacture and installation of steel stairs for all types of buildings and for all purposes. They combine great strength with minimum weight and can be easily adapted to any requirements of the architect or builder and made plain or highly ornamental as desired. They meet the requirements of all State and city building codes.

All special features such as our safety-lock tread and riser and safety-nose insert are covered by patents allowed and applied for.

Safety-Lock Treads and Risers

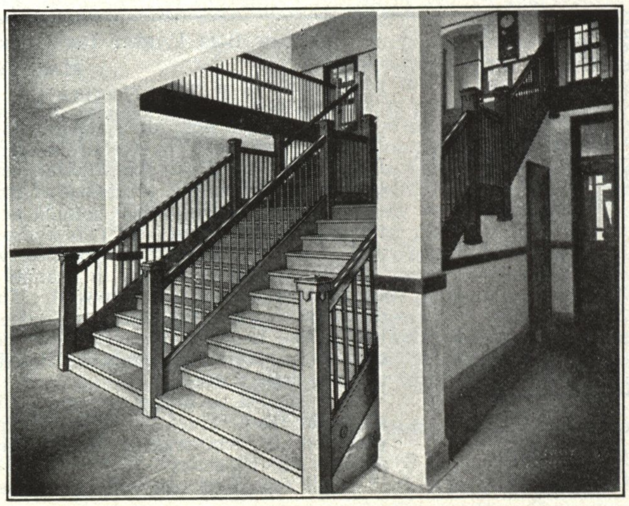
Consist of a continuous steel plate tread and riser firmly interlocked at nosing, each tread bolted rigidly to the lower flange of each stringer and all tied together with a tie rod running under the angle of each nosing from stringer to stringer. The gauge of metal used is governed by width of the stair. Risers are plain or have sunken panel and have sanitary cove for cement, asphalt or composition fill. Treads are made to receive cement, composition, asphalt, slate, marble or any type of tread surface desired.

With channel shaped pressed steel string, tie rod is omitted and pressed steel carriage angles used. See following pages for detail construction drawings.

Safety-Nose Insert Treads and Risers

These fill the long-felt want of architects and builders by eliminating exposure of all sheet metal on the tread. The safety-nose insert is made of special non-slip material, extending full width of tread and is easily and quickly installed at very low cost. It can be supplied in a variety of materials. The chilled insert which has an especially hard wearing surface scored like the old-fashioned mill burr is recommended for general use and compressed cork, rubber, fabric or carborundum when it is desired to eliminate all metal from the tread.

The tread and riser is a continuous steel plate, the gauge of metal being determined by the width of stair, formed at nosing into a channel or trough section in which the safety-nose insert is firmly held. The insert can be quickly and easily removed for renewal if desired without disturbing the tread. Treads are designed for cement, asphalt or composition fill of any depth desired—1½-in. depth recommended. Treads are supported on specially formed pressed steel carriage angles, rigidly connected to stringers and tie rods when Z-shaped pressed steel stringers are used; and on full tread and riser pressed steel carriage angles riveted to stringers when channel-shaped pressed steel strings or structural channel stringers are used. Construction of each type of tread supports is shown in detail on following pages.



Stairs Furnished by The Hughes-Keenan Co. for Ashland High School, Ashland, Ohio

Risers are made with sanitary cove and either plain or with sunken panel.

Stringers

Are formed of steel plates, the standard section being Z-shaped flanged out at top to receive rail and in at bottom to form seat for treads to which they are securely bolted. When carriage angles are used, stringers are formed into channel shape. Thickness of plate is determined by the span and a high factor of safety is used.

Face stringers are either plain or ornamented with drawn steel moulding at top and bottom. Where the tie rod is used, a cast iron rosette is used on ornamental face stringers only. When carriage angles are used, the rivets are countersunk in the face string except in heavy service stairs. Details of various stringers are shown on following pages.

Facias

Are made of pressed steel of same section and same moulding used for stringers.

Newels

Standard newels are steel with shaft either plain or with sunken panel and with cast iron caps and drops but cast iron newels of any design can be furnished. On a following page are shown designs of our standard steel newels and cast iron newels for which we have stock patterns.

A number of our standard wrought iron, cast iron and pipe rail designs are shown on a following page. Railings of any design can be furnished to suit architect's requirements.

Installation

Stairs are shipped in completely assembled units so that they can be easily and quickly installed at low cost. Experienced erectors furnished when desired.

Stairs to Architects' Designs

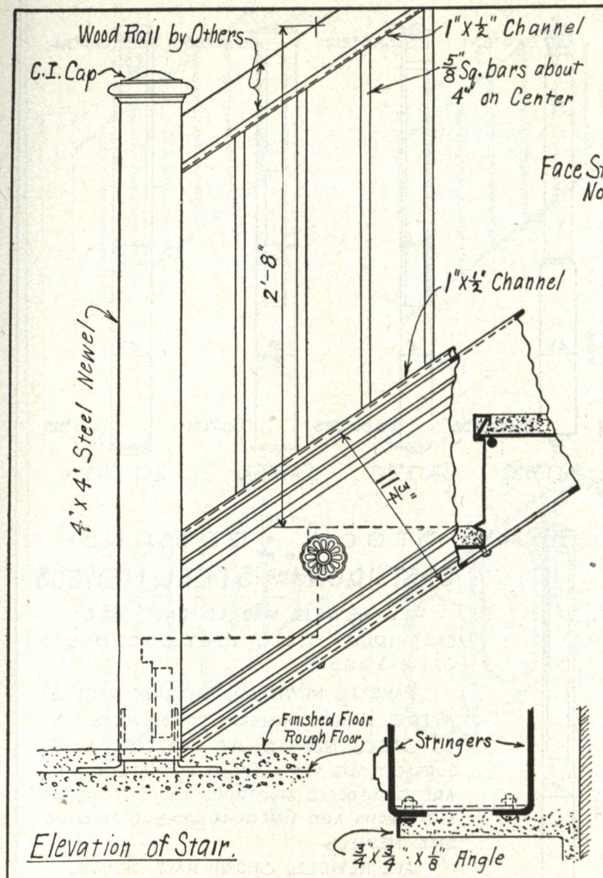
In addition to our patented pressed steel stairs, we can furnish steel stairs of any design and to meet all architects' requirements.

We can also furnish the Bois Interlocking Steel Stairs in the states of Maryland, Delaware, District of Columbia, Colorado, Wyoming, Utah, New York and New Jersey.

Information and Estimates

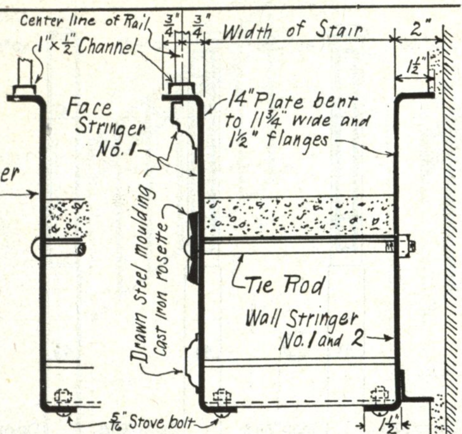
For catalogue, complete information regarding construction and typical installations and estimates, write The Hughes-Keenan Co., Mansfield, Ohio.

Continued on next page


Wood Rail by Others
C.I. Cap
1"x½" Channel
5/8" Sq. bars about 4" on Center
2'-8"
1"x½" Channel
4"x4' Steel Newel
11¾"
Finished Floor
Rough Floor
Stringers
¾"x¾" x⅛" Angle

Elevation of Stair.

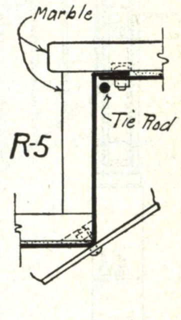
Arrangement for Plastered Soffit


Center line of Rail
¾
¾
Width of Stair
2"
1"x½" Channel
Face Stringer No. 1
14" Plate bent to 11¾" wide and 1½" flanges
1½"
Face Stringer No. 2
Drawn Steel moulding
Cast iron rosette
Tie Rod
Wall Stringer No. 1 and 2
5/16" Stove bolt
1½"

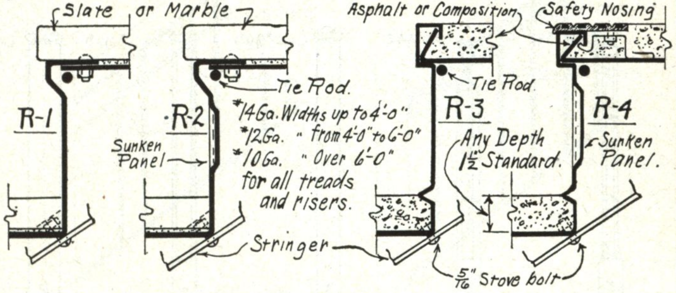
Section through Stringers.

Stringer No. 1 - Moulding on Face Stringer.

Stringer No. 2 - No. Moulding.


Marble
Tie Rod
R-5

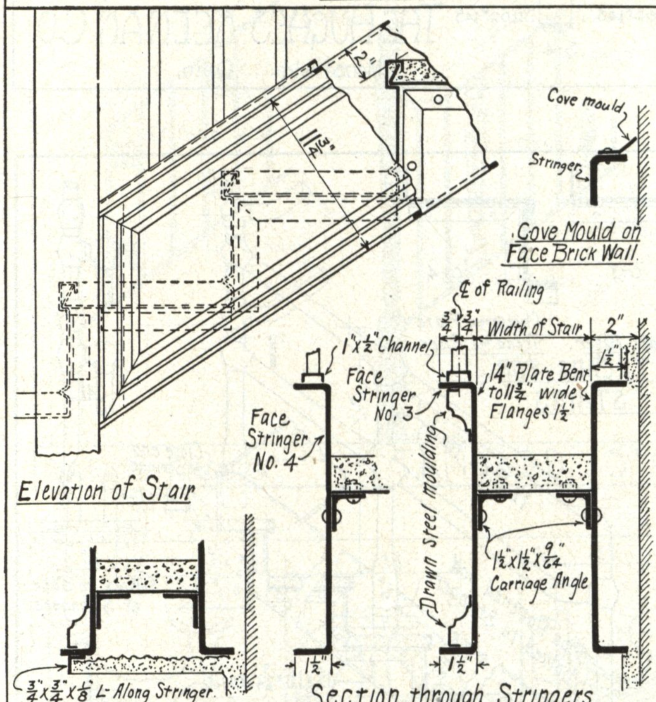
Tread and Riser for Marble.


Slate or Marble
R-1
R-2
Tie Rod.
*14 Ga. Widths up to 4'-0"
*12 Ga. " from 4'-0" to 6'-0"
*10 Ga. " Over 6'-0"
for all treads and risers.
Sunken Panel
Stringer
Asphalt or Composition
Safety Nosing
Tie Rod.
R-3
R-4
Any Depth
1½ Standard.
Sunken Panel.
5/16" Stove bolt

Various Types of Treads and Risers.

Tread and Riser Continuous. Riser either plain or with sunken panel.

STANDARD SAFETY-LOCK PRESSED STEEL STAIRS CONSTRUCTION


2"
11¾"
Cove mould
Stringer
℄ of Railing
¾
¾
Width of Stair
2"
1"x½" Channel
Face Stringer No. 3
14" Plate Bent to 11½" wide Flanges 1½"
½
Face Stringer No. 4
Drawn Steel moulding
1½"x1½"x9/64" Carriage Angle
1½"
1½"
¾"x¾"x⅛" L-Along Stringer.

Cove Mould on Face Brick Wall.

Elevation of Stair

Arrangement for Plastered Soffit.

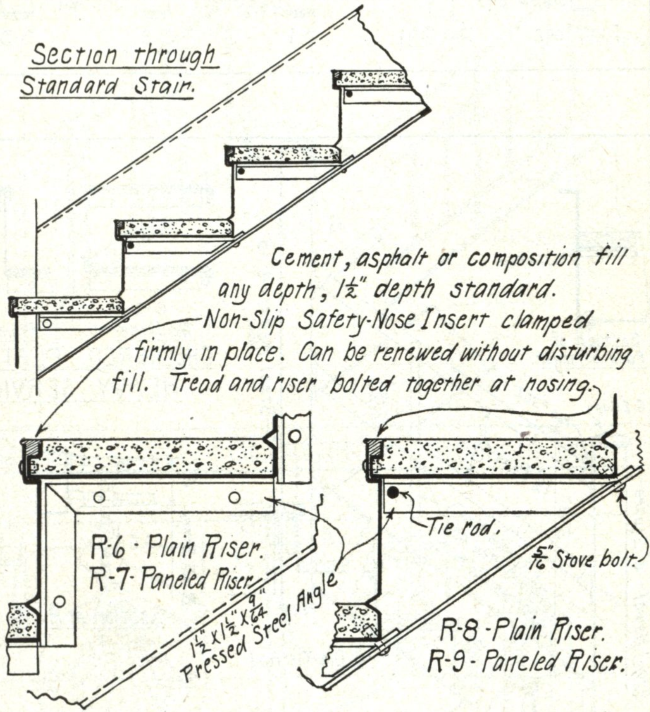
Section through Stringers.

Stringer No.3 - Moulding on Face Stringer.

Stringer No.4 - No Moulding.

Treads and Risers same as R-1,2,3,4 and 5.

SAFETY-LOCK PRESSED STEEL STAIRS WITH CARRIAGE ANGLES.


R-6 - Plain Riser.
R-7 - Paneled Riser.
1½"x1½"x9/64" Pressed Steel Angle
Tie rod.
5/16" Stove bolt.
R-8 - Plain Riser.
R-9 - Paneled Riser.

Section through Standard Stair.

Cement, asphalt or composition fill any depth, 1½" depth standard. Non-Slip Safety-Nose Insert clamped firmly in place. Can be renewed without disturbing fill. Tread and riser bolted together at nosing.

Carriage Angle Construction
Use with Stringers No.3 or 4.

Standard Construction.
Use with Stringers No.1 or 2.

Tread and riser continuous. Riser either plain or with sunken panel.

SAFETY NOSE INSERT PRESSED STEEL STAIRS CONSTRUCTION.

The Hughes-Keenan Co. **STAIR CONSTRUCTION DETAILS.** Mansfield, Ohio.

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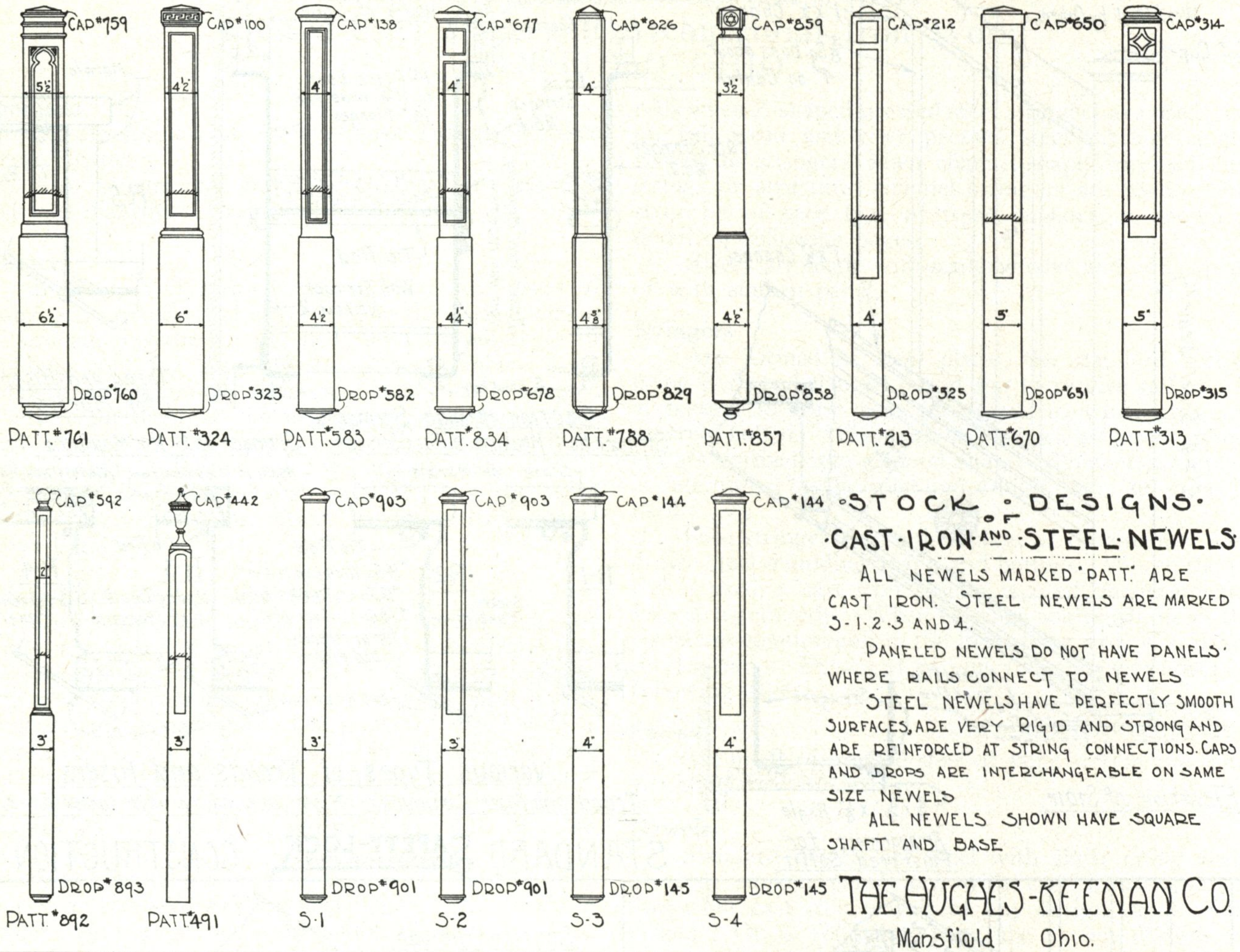

CAP #759
5½"
6½"
DROP #760
PATT. #761
CAP #100
4½"
6"
DROP #323
PATT. #324
CAP #138
4"
4½"
DROP #582
PATT. #583
CAP #677
4"
4¼"
DROP #678
PATT. #834
CAP #826
4"
4⅜"
DROP #829
PATT. #788
CAP #859
3½"
4½"
DROP #858
PATT. #857
CAP #212
4"
DROP #525
PATT. #213
CAP #650
5"
DROP #651
PATT. #670
CAP #314
5"
DROP #315
PATT. #313
CAP #592
2"
3"
DROP #893
PATT. #892
CAP #442
3"
PATT #491
CAP #903
3"
DROP #901
S-1
CAP #903
3"
DROP #901
S-2
CAP #144
4"
DROP #145
S-3
CAP #144
4"
DROP #145
S-4

STOCK DESIGNS OF CAST IRON AND STEEL NEWELS

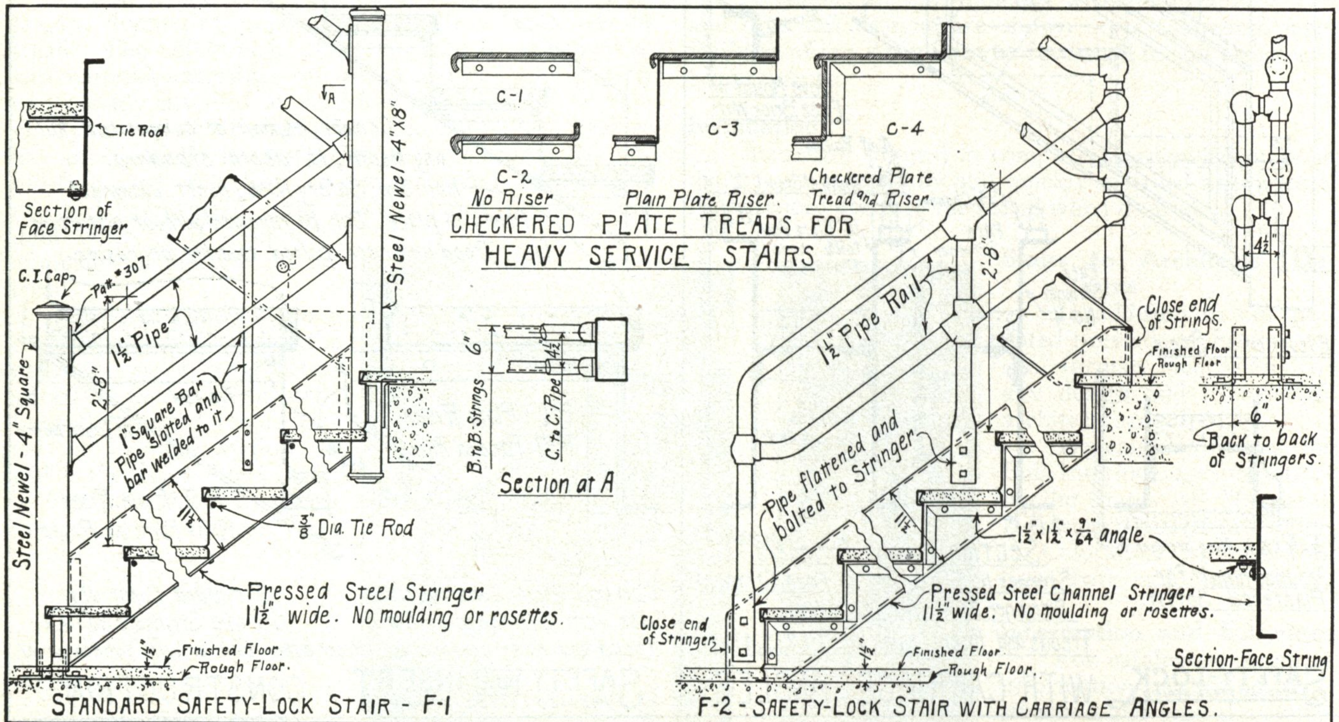
ALL NEWELS MARKED "PATT." ARE CAST IRON. STEEL NEWELS ARE MARKED S-1-2-3 AND 4.

PANELED NEWELS DO NOT HAVE PANELS WHERE RAILS CONNECT TO NEWELS.

STEEL NEWELS HAVE PERFECTLY SMOOTH SURFACES, ARE VERY RIGID AND STRONG AND ARE REINFORCED AT STRING CONNECTIONS. CAPS AND DROPS ARE INTERCHANGEABLE ON SAME SIZE NEWELS.

ALL NEWELS SHOWN HAVE SQUARE SHAFT AND BASE.

THE HUGHES-KEENAN CO.
Mansfield Ohio.


Tie Rod
Section of Face Stringer
C. I. Cap
Patt. #307
1½" Pipe
2'-8"
1" Square Bar Pipe slotted and bar welded to it
Steel Newel - 4" Square
Steel Newel - 4"x8"
A
1½"
⅜" Dia. Tie Rod
Pressed Steel Stringer 11½" wide. No moulding or rosettes.
Finished Floor
Rough Floor
1½"
C-1
C-2
No Riser
C-3
Plain Plate Riser.
C-4
Checkered Plate Tread and Riser.
CHECKERED PLATE TREADS FOR HEAVY SERVICE STAIRS
6"
4½"
B. to B. Strings
C. to C. Pipe
Section at A
1½" Pipe Rail
2'-8"
Close end of Strings.
Finished Floor
Rough Floor
4½"
6"
Back to back of Stringers.
Pipe flattened and bolted to Stringer
1½"
1½"x1½"x9/64" angle
Pressed Steel Channel Stringer 11½" wide. No moulding or rosettes.
Close end of Stringer
1½"
Finished Floor
Rough Floor.
Section-Face String

STANDARD SAFETY-LOCK STAIR - F-1

F-2 - SAFETY-LOCK STAIR WITH CARRIAGE ANGLES.

The Hughes-Keenan Co. FACTORY AND SERVICE STAIR DETAILS Mansfield, Ohio.

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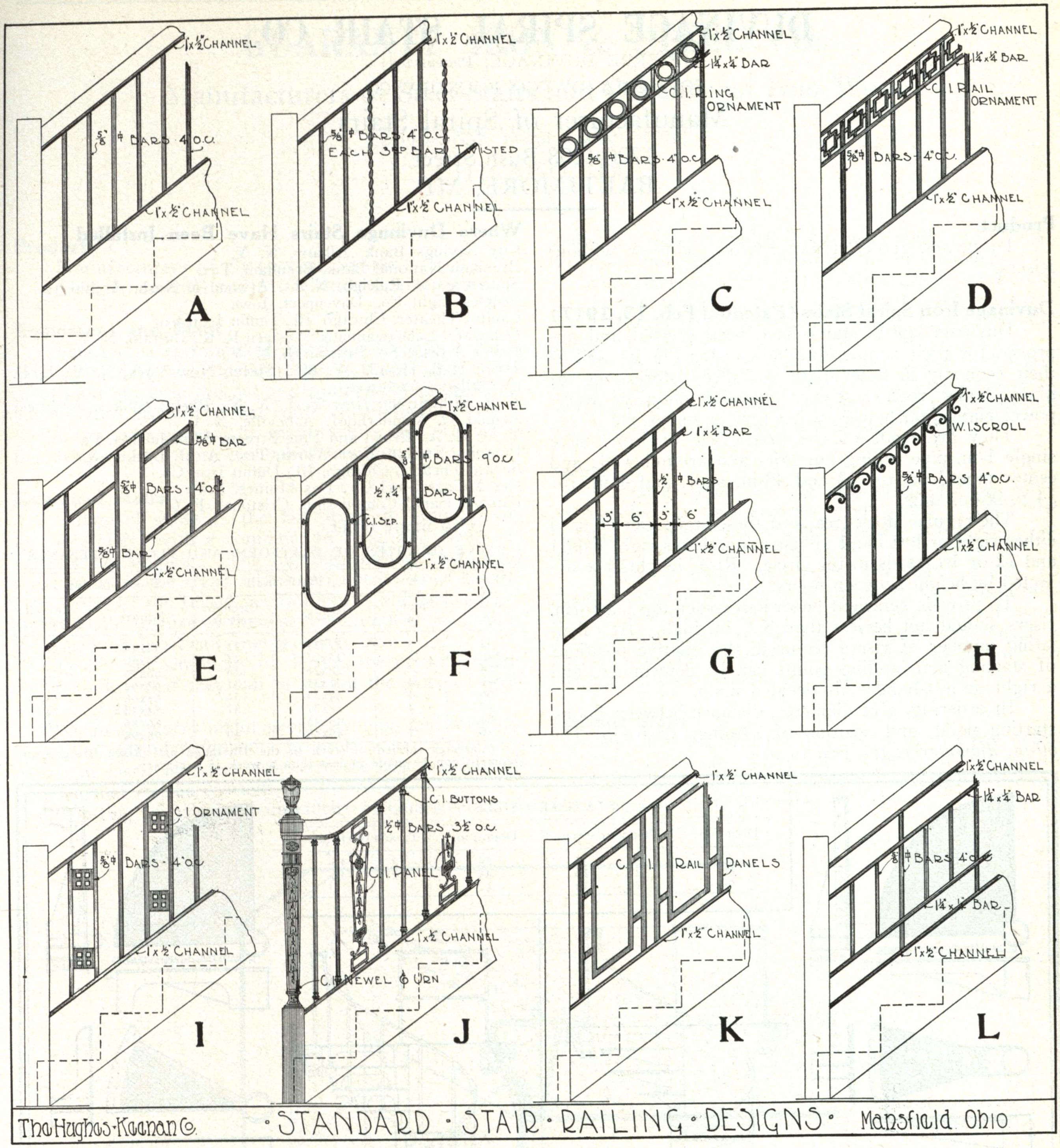
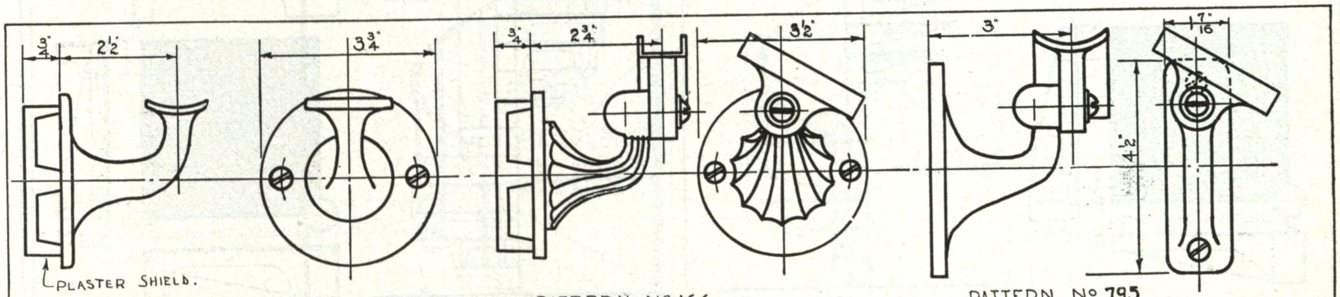


1"x½" CHANNEL
⅝"φ BARS 4" O.C.
1"x½" CHANNEL
A
1"x½" CHANNEL
⅝"φ BARS 4" O.C. EACH 3RD BAR TWISTED
1"x½" CHANNEL
B
1"x½" CHANNEL
1¼"x¼" BAR
C.I. RING ORNAMENT
⅝"φ BARS 4" O.C.
1"x½" CHANNEL
C
1"x½" CHANNEL
1¼"x¼" BAR
C.I. RAIL ORNAMENT
⅝"φ BARS 4" O.C.
1"x½" CHANNEL
D
1"x½" CHANNEL
⅝"φ BAR
⅝"φ BARS 4" O.C.
⅝"φ BAR
1"x½" CHANNEL
E
1"x½" CHANNEL
⅝"φ BARS 9" O.C.
½"x¼" BAR
C.I. SEP.
1"x½" CHANNEL
F
1"x½" CHANNEL
1"x¼" BAR
½"φ BARS
3" 6" 3" 6"
1"x½" CHANNEL
G
1"x½" CHANNEL
W.I. SCROLL
⅝"φ BARS 4" O.C.
1"x½" CHANNEL
H
1"x½" CHANNEL
C.I. ORNAMENT
⅝"φ BARS 4" O.C.
1"x½" CHANNEL
I
1"x½" CHANNEL
C.I. BUTTONS
½"φ BARS 3½" O.C.
C.I. PANEL
1"x½" CHANNEL
C.I. NEWEL & URN
J
1"x½" CHANNEL
C.I. RAIL PANELS
1"x½" CHANNEL
K
1"x½" CHANNEL
1¼"x¼" BAR
⅝"φ BARS 4" O.C.
1¼"x¼" BAR
1"x½" CHANNEL
L

The Hughes-Keenan Co. ·STANDARD·STAIR·RAILING·DESIGNS· Mansfield Ohio



¾" 2½"
3¾"
¾" 2¾"
3½"
3"
7/16"
4½"
PLASTER SHIELD.

PATTERN Nº 142 PATTERN Nº 166 PATTERN Nº 795

SWIVEL SHOWN ON PATT. NO. 166 IS FOR WOOD HANDRAIL AND ON PATT. NO. 795 IS FOR PIPE OR ROUND WOOD HANDRAIL, THESE SWIVELS ARE INTERCHANGEABLE ON THE TWO BRACKETS TO SUIT TYPE OF HANDRAIL USED BRACKET NO 795 MAY BE USED ALSO ON BAR RAILING

PLASTER SHIELD SHOWN ON PATT. NO 142 & 166 MAY BE OMITTED WHEN ATTACHED TO FACE BRICK WALLS

·STANDARD·C.I.·WALL·HANDRAIL·BRACKETS·

THE HUGHES·KEENAN CO. MANSFIELD, OHIO.

DUVINAGE SPIRAL STAIR CO.

(PIERRE DUVINAGE, PROPRIETOR)
FORMERLY OWEGO FOUNDRY CO.

Manufacturer of Spiral Stairs

1200-1208 Bush Street
BALTIMORE, MD.

Product

Duvinage Iron Spiral Stairs, with or without Risers.

Duvinage Iron Spiral Stairs (Patented Feb. 13, 1917)

Duvinage spiral stairs have been erected and approved for their simple, durable construction as well as their economy in floor space, in offices, stores, mezzanines, boiler rooms, sewage disposal pumping wells, power plants, gas houses, water towers, mines, etc.

They are made of the best grade of iron; have single 1-in. pipe railing on stairs and around well; and center pipe 3 in. for 42 and 48-in. stair, and 4 in. for 54 to 96-in. stair.

The regular stock treads of these stairs can be used either right or left hand (illustration shows right hand) and 12 or 16 treads to the circle. Riser heights are affected by height between floors.

To provide sufficient headroom under top platform, risers should not be less than 8¼ in. high. By calculating number of risers required, the relative positions of starting and landing points can be determined, and a right or left-hand stair decided upon.

In ordering, give diameter, distance between floors, starting point, and position of landings desired. The *60-in. diameter is the best to use.*

Where Duvinage Stairs Have Been Installed

City Savings Bank, Albany, N. Y.
Brenham National Bank, Brenham, Tex.
State Capitol, Raleigh, N. C., Atwood & Nash, Architects
Peoples Light Co., Davenport, Iowa
Capitol Theater, Chicago, Ill., Duffin Iron Co.
Delaware, Lackawanna & Western R. R., Buffalo, N. Y.
Water Works, So. Pittsburgh, N. Y.
Town Hall, 113-123 W. 43rd Street, New York, N. Y., L. E. Jallade, Architect
27 E. 57th Street, New York, N. Y., Phelps Stokes, Architect
Arnold H. Vanderhoof, Asheville, N. C.
Y. M. H. A., Broad and Pine Streets, Philadelphia, Pa.
Pumping Station, Fort Worth, Tex., A. M. Lockett & Co.
Senate Theater, Chicago, Ill., Duffin Iron Co.
Des Moines Steel Co., Des Moines, Iowa
Panama Canal Commission, Cristobal, P. C.

Also many others.

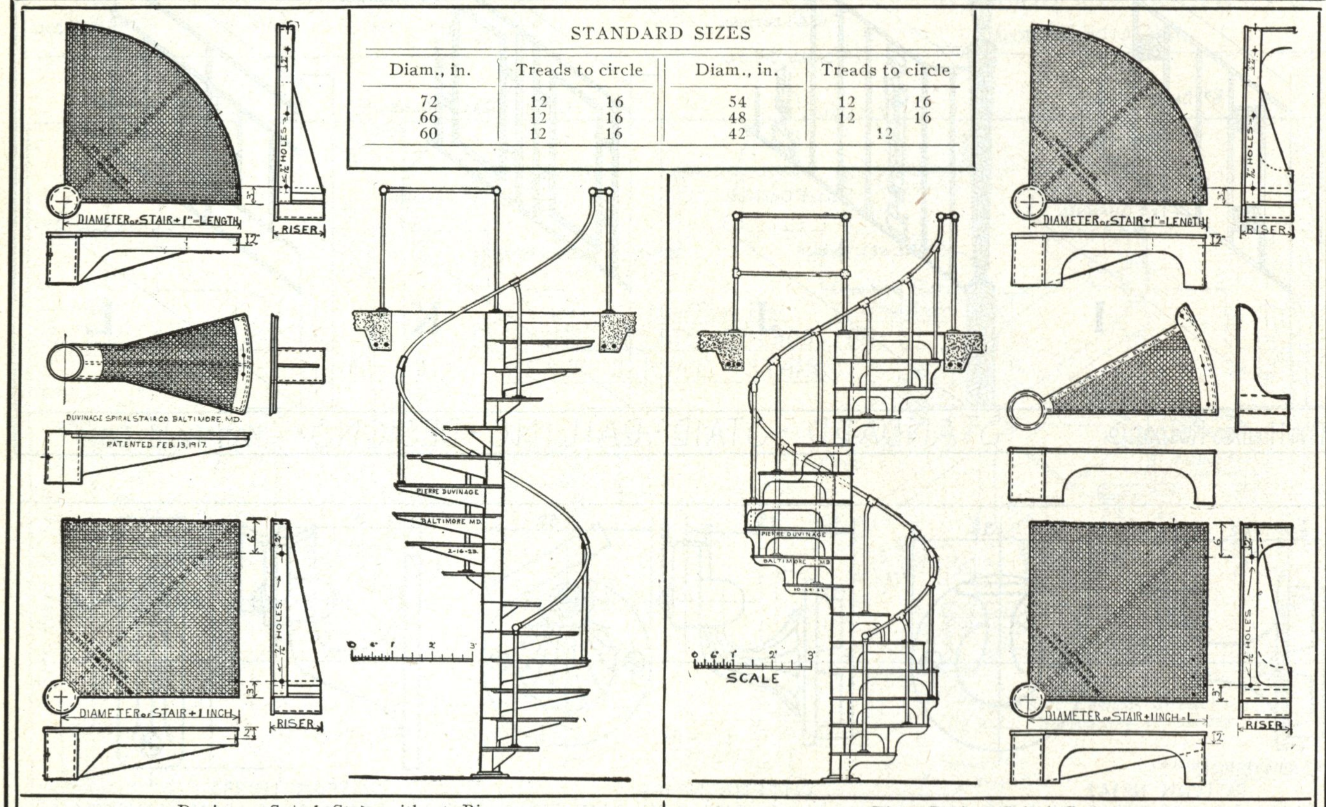
TABLE OF SIZES OF PLATFORM AND FLOOR OPENINGS

Diam. of stair, in.	Center pipe, in.	Platform, in.		Floor opening, in.	
		Square	Circular radius	Square	Round (diameter)
42	3	22x22	22	44x44	44
*48	3	25x25	25	50x50	50
*54	4	28x28	28	56x56	56
*60	4	31x31	31	62x62	62
66	4	34x34	34	68x68	68
72	4	37x37	37	74x74	74
84	4	43x43	43	86x86	86
96	4	49x49	49	98x98	98

*Castings carried in stock in the Duvinage and Riser Designs and shipment can be made in less than a week if necessary.

STANDARD SIZES

Diam., in.	Treads to circle		Diam., in.	Treads to circle	
72	12	16	54	12	16
66	12	16	48	12	16
60	12	16	42	12	


DIAMETER of STAIR + 1" = LENGTH
RISER
½" HOLES
DUVINAGE SPIRAL STAIR CO. BALTIMORE, MD.
PATENTED FEB. 13, 1917
DIAMETER of STAIR + 1 INCH
PIERRE DUVINAGE
BALTIMORE MD.
SCALE

Duvinage Spiral Stair without Riser

Riser Design Spiral Stair

Duvinage Iron Spiral Stairs (Patented)

GUARANTY IRON & STEEL CO.

Manufacturers of Steel Stairs and Ornamental Iron Work

3845-3855 West Lake Street
CHICAGO, ILL.

Products

Manufacturers of GUARSTEEL STAIRS.
Also Ornamental and Miscellaneous Iron Work.

Equipment and Plant

Due to the enormous demand for Guarsteel stairs, a modern, fireproof, daylight factory covering an acre of ground has been erected and equipped with the latest labor-saving machinery that could be produced, so as to facilitate production and to manufacture this product in the cheapest and most economical manner.

Guarsteel Stairs

Guarsteel stairs is the last word in stairs, being the only stairs with a combination tread and riser that permits no slipping. The big outstanding feature of these stairs is the tread which can not be worn smooth on account of the raised perforations. The permanency and non-slip feature of these stairs can not be adequately described—it practically never wears out.

Due to the simplicity of design, the manufacturing cost is so low that they can be sold at the price of ordinary steel stairs.

No more worry about people slipping and breaking bones, no more damage suits, no more worry about accidents; in fact, Guarsteel stairs are the best accident insurance that can be carried.

A fitting proof of the superiority of Guarsteel stairs is the fact that over 4000 flights were made and erected, satisfying our large and growing list of customers.

Guarsteel stairs are cheaper than wood or concrete.

Our immense stock of raw materials which we carry at all times permits us to quote the lowest prices and quickest deliveries.

An engineering department, consisting of the best in our line and ready to serve at any time, will assist in designing any type of stair that may be desired and will make them according to your specifications.

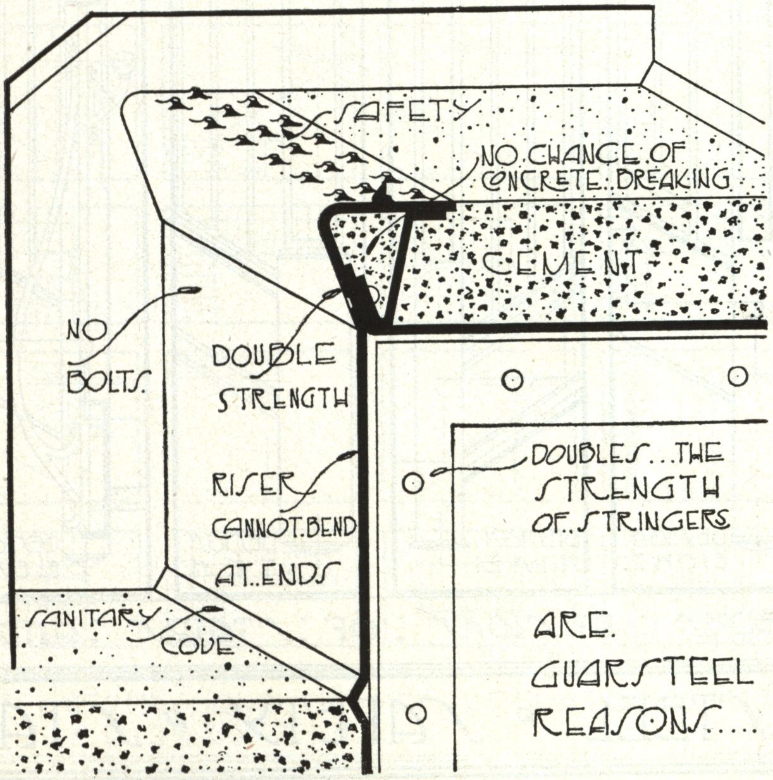
Safety

Guarsteel stairs are the only stairs which should be specified, as they embrace every good feature now lacking in other stairs, besides being the safest and most desirable type of stairs now made.

Guarsteel treads and risers are made of No. 12 gauge blue annealed steel, in one unit, with raised buttons on the tread side. These buttons are perforated and, coming close to the edge of the nosing, make a perfect non-slip edge with no danger of slippage so common in other makes of stairs.

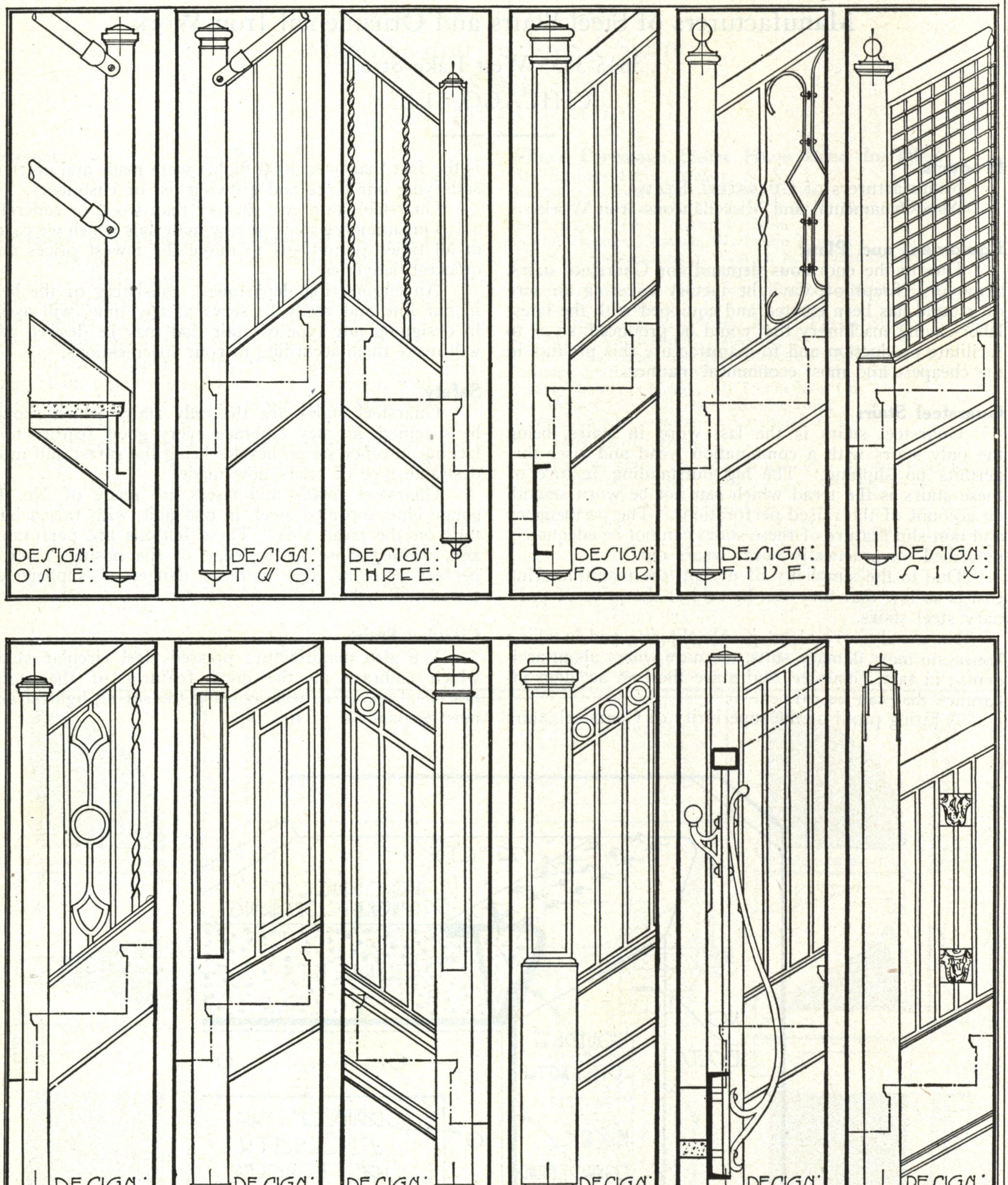
Circular Stairs

We also manufacture pressed steel circular stairs which embrace all the good features of the stairs described above, as well as being the safest, lightest and most economical of this type.


SAFETY
NO CHANCE OF CONCRETE BREAKING
CEMENT
NO BOLTS
DOUBLE STRENGTH
RISER CANNOT BEND AT ENDS
DOUBLES THE STRENGTH OF STRINGERS
SANITARY COVE
ARE GUARSTEEL REASONS....

DETAIL OF GUARSTEEL STAIRS

Continued on next page


DESIGN : ONE :
DESIGN : TWO :
DESIGN : THREE :
DESIGN : FOUR :
DESIGN : FIVE :
DESIGN : SIX :
DESIGN : SEVEN :
DESIGN : EIGHT :
DESIGN : NINE :
DESIGN : TEN :
DESIGN : ELEVEN :
DESIGN : TWELVE :

MISCELLANEOUS : DESIGNS : OF : STAIRS : AND : NEWELS

GUARSTEEL SAFETY STAIRS

Continued on next page

Specifications for Guarsteel Stairs

All stairs shall be Guarsteel, Design No. ......, as manufactured by the Guaranty Iron & Steel Co. Stringers shall be of bent plates or rolled sections with angle riveted on same to carry treads. Risers and treads shall be made of No. 12 gauge steel with Guarsteel safety nosing. Railings shall be of design shown. Newels shall be of steel or cast iron. All work shall receive one coat of graphite paint at factory.

Cement or composition fill, also wood hand rails, shall be furnished by others.

Design 1—Stringers shall be 12x$\frac{3}{16}$ in. bent to 10-in. channel shape or rolled steel sections.

Newels shall be 3-in. square tubing.

Railings shall be 1¼ or 1½-in. pipe, two members in height.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 2—Stringers shall be 12x$\frac{3}{16}$ in. bent to 10-in. channel shape or rolled steel sections.

Newels shall be 3-in. square tubing.

Railings shall be ⅝ or ½-in. square bars spaced 3½ or 4 in. on centers, riveted to 1x½-in. channel upper and lower members; 1¼-in. pipe hand rail on top.

Design 3—Stringers shall be 12x$\frac{3}{16}$ in. bent to 10-in. channel shape or rolled steel sections.

Newels shall be 3-in. square tubing or 4x4-in. cast iron.

Railings shall be ⅝ or ½-in. square bars, 3½ or 4 in. on centers, with every other upright a twisted bar, all securely riveted to 1x½-in. channel upper and lower members.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 4—Stringers shall be 12x$\frac{3}{16}$ in. bent to 10-in. channel shape or rolled steel sections.

Newels shall be 3-in. square tubing or 4x4-in. cast iron.

Railings shall be ⅝ or ½-in. square bars spaced in groups riveted to 1x½-in. channel upper and lower bars.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 5—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled sections with moulding on face of stringer.

Newels shall be 3-in. steel or cast iron.

Railings shall be ⅝ or ¾-in. twisted bars with ornament in center (as shown on preceding page); upper and lower bars shall be 1x½-in. channels.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 6—Stringers shall be 12x$\frac{3}{16}$ in. bent to 10-in. channel shape with or without mouldings on face of stringers.

Newels shall be 3x3-in. tubing or 4x4-in. cast iron.

Railings shall be ¼x$\frac{1}{16}$-in. flat bars woven to a 2-in. square mesh securely clinched to a 1x½-in. channel upper and lower frame.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 7—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled sections with moulding on face of stringers.

Railings shall be ⅝ or ½-in. square and twisted bars with cast iron ornaments as shown, upper and lower bars 1x½-in. channels.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 8—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled steel sections with moulding on face of stringers.

Newels shall be 4x4-in. cast iron.

Railings shall be ⅝ or ½-in. square bars in panel arrangement.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 9—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled steel sections with moulding on face of stringers.

Newels shall be 4x4-in. cast iron.

Railings shall be ½ or ⅝-in. square bars, 3 in. on centers, with rings in every third space as shown, top and lower bars of 1½x½-in. channels.

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 10—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled steel sections with moulding on face of stringers.

Newels shall be 3-in. steel or 5x5-in. cast iron.

Railings shall be ⅝ or ½-in. bars, 3½ or 4 in. on centers, with two cross bars of 1x¼-in. channels and lower bars of 1x½-in. channels, with small wrought iron or cast iron rings (as shown on preceding page).

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 11—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled steel sections with moulding on face of stringers.

Newels shall be 4x4-in. cast iron.

Railings shall be ⅝ or ½ in. square, 4 in. on centers, upper and lower rails of 1x½-in. channels.

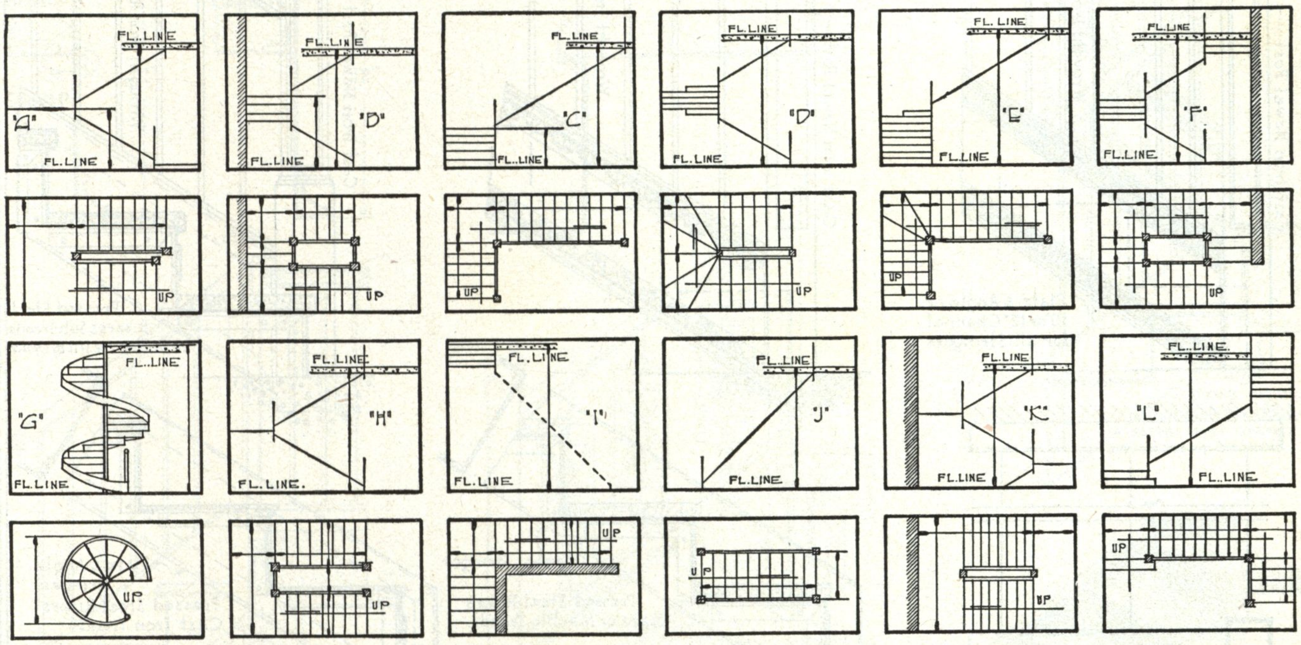
Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.

Design 12—Stringers shall be 12x$\frac{3}{16}$-in. bent plate or rolled steel sections with moulding on face of stringers.

Newels shall be 4x4-in. cast iron.

Railings shall be a combination of cast and wrought iron (as shown on preceding page).

Risers and treads shall be made of No. 12 gauge steel with Guarsteel non-slip nosing.



STATE . TYPE . OF . STAIR . . AND . . GIVE . . INDICATED . . DIMENSIONS .
WHEN . . . . REQUESTING . . . . . . QUOTATIONS .

JOHN D. MACK, President — E. J. BUDER, Engineer — M. B. FREEMAN, Secretary

THE MACK IRON AND WIRE WORKS CO.

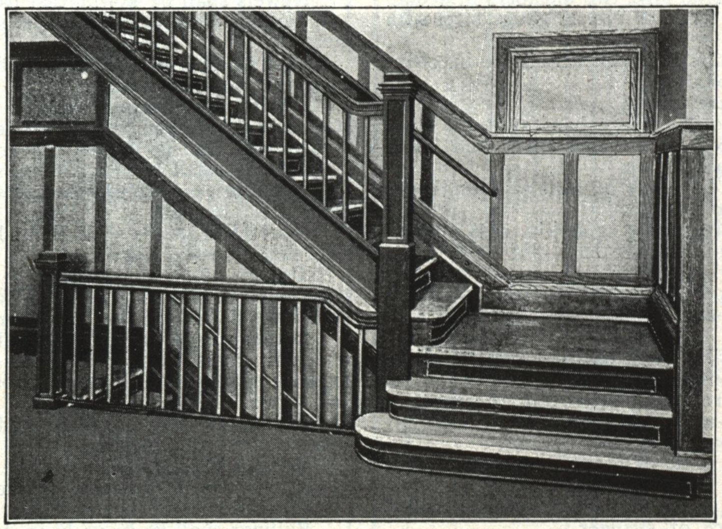
Designers and Manufacturers "Maciron" Stairs and Products

SANDUSKY, OHIO

Products

"Maciron" Steel Stairs.

Also Ornamental Iron Work, including: Spiral Stairs, Steel Ladders, Ornamental Railings, Pipe Railings, Bridge Railings, Fire Escapes, Folding Gates, Area Grating, Steel Window Guards, Grilles, Wire Partitions, Sidewalk Doors, Steel Doors, Clean-out Doors, Coal-hole Covers, Jail and Cell Work, Marquises, Iron and Brass Thresholds, Steel Settees.

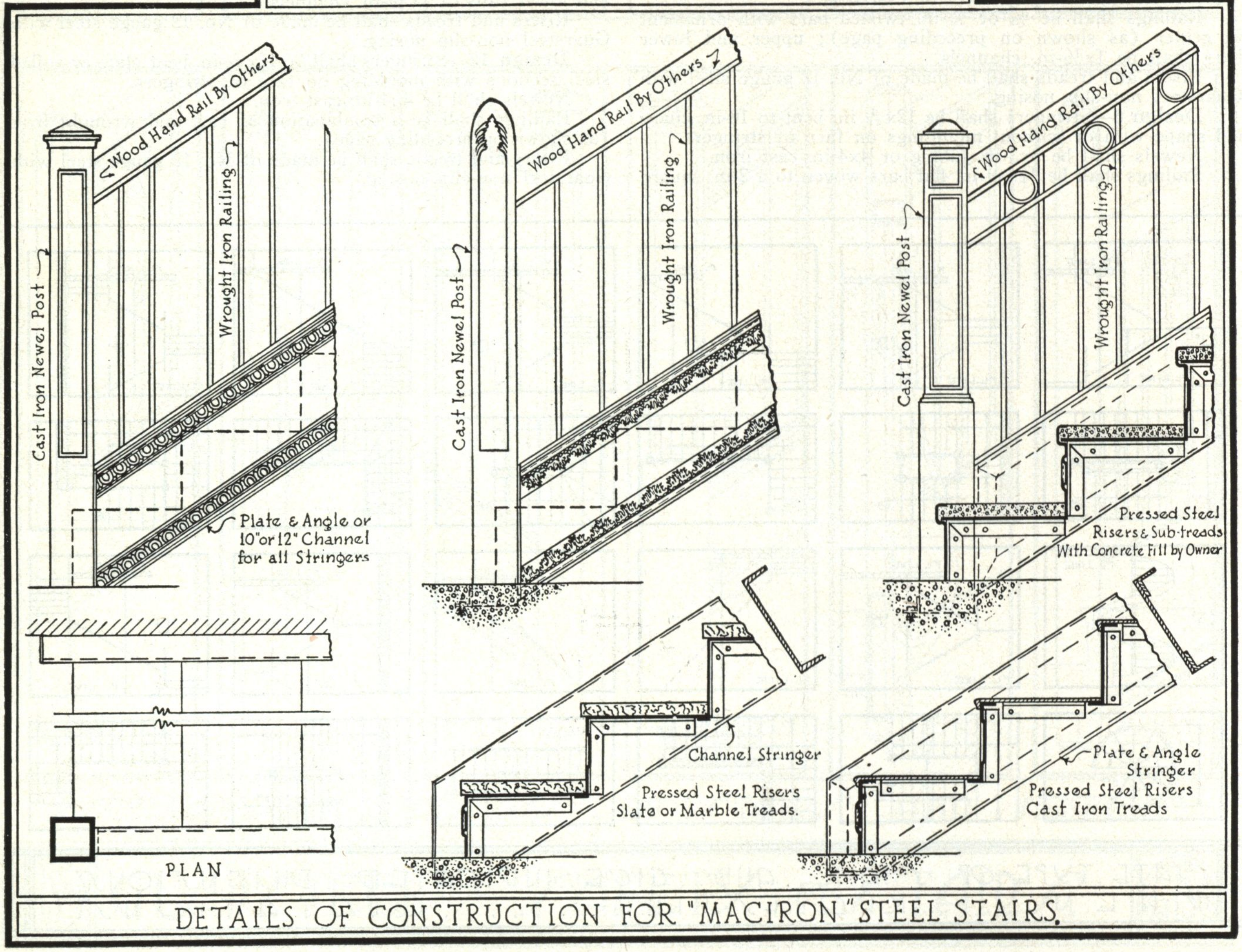


Location

In the heart of the great industrial belt of the Middle West. Five great railroads, two electric lines and boat connections for all lake points.

Facilities

The "Maciron" shop is well equipped with modern and up-to-date machinery guaranteeing the production of accurate work at lowest cost. A competent designing and engineering force is prepared to submit designs and quotations on requirements.


Wood Hand Rail By Others
Cast Iron Newel Post
Wrought Iron Railing
Plate & Angle or 10" or 12" Channel for all Stringers
Wood Hand Rail By Others
Cast Iron Newel Post
Wrought Iron Railing
Wood Hand Rail By Others
Cast Iron Newel Post
Wrought Iron Railing
Pressed Steel Risers & Sub-treads With Concrete Fill by Owner
PLAN
Channel Stringer
Pressed Steel Risers
Slate or Marble Treads.
Plate & Angle Stringer
Pressed Steel Risers
Cast Iron Treads

DETAILS OF CONSTRUCTION FOR "MACIRON" STEEL STAIRS.

MESKER BROTHERS IRON COMPANY

Combination Steel and Concrete Stairs

ST. LOUIS, MO.

Product

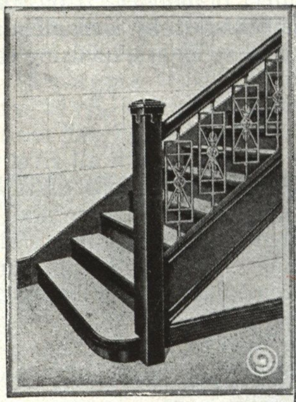
Mesker Combination Steel and Concrete Interior Stairs. For Hollow Metal and Solid Steel Windows, see pages 940-941; for Steel Casement and Basement Windows, see page 963; for Steel Sash, see pages 1000-1001.

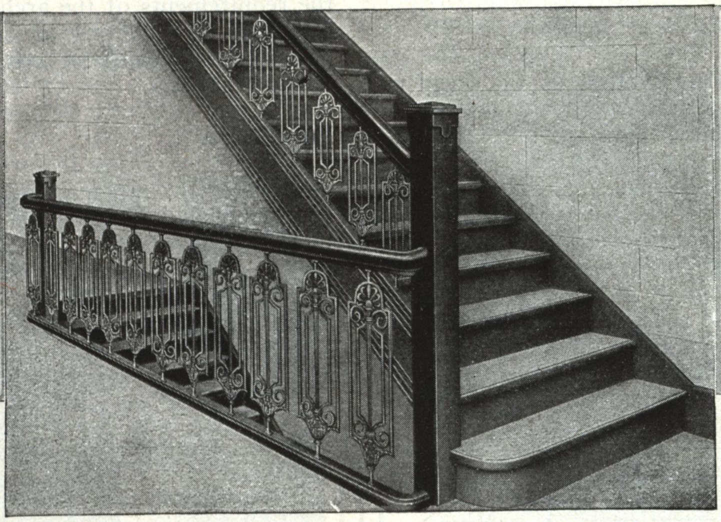
Mesker Combination Steel Concrete Stairs

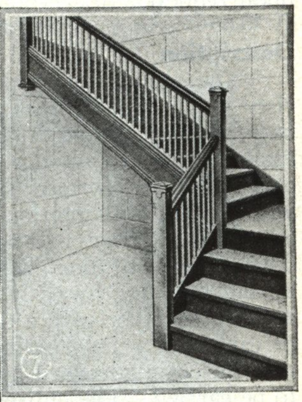
Mesker stairs are specified as a "Standard" of construction throughout the country and are installed in some of the best buildings erected within the past 15 years.

Specifications—Stringers shall be $\frac{3}{16}$-in. steel plate, bent in channel form and of width shown on plans. Treads and risers shall be made of one continuous steel plate No. 12 or No. 13 gauge, bent to form as indicated. Treads shall be supported at ends by special clamps, securely bolted to stringers with acorn heads on face strings and shall be filled with concrete or other material by others (tread filling 1½ in. more or less in thickness).

Platforms or landings, where required, shall be No. 12 or No. 13 gauge steel plates, with nosings same as treads and supported on a 2x2x$\frac{3}{16}$-in. angle frame, riveted or bolted to stringers, and reinforced with tees not over 2 ft. on centers. Newels shall be No. 12 gauge blue annealed steel with cast iron caps and pendants. Newels to be welded at corners, making a continuous one-piece seamless newel. Railings to be of design indicated on drawings. All to have a shop coat of paint.


⑨

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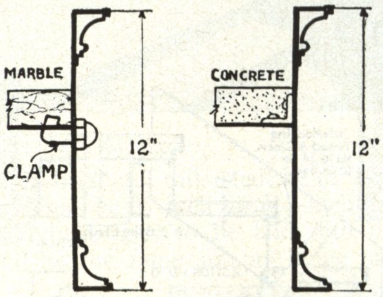
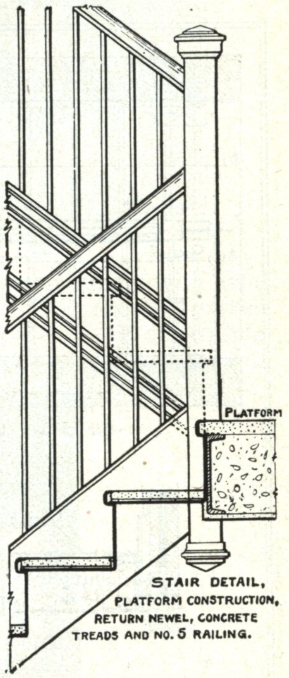
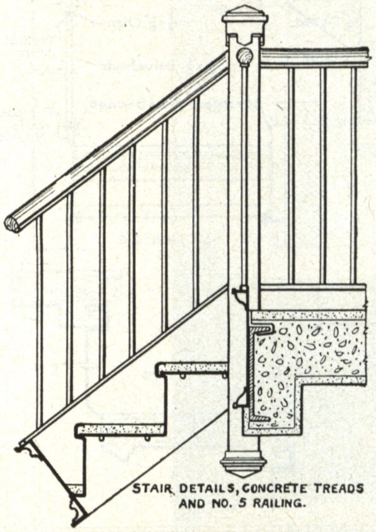
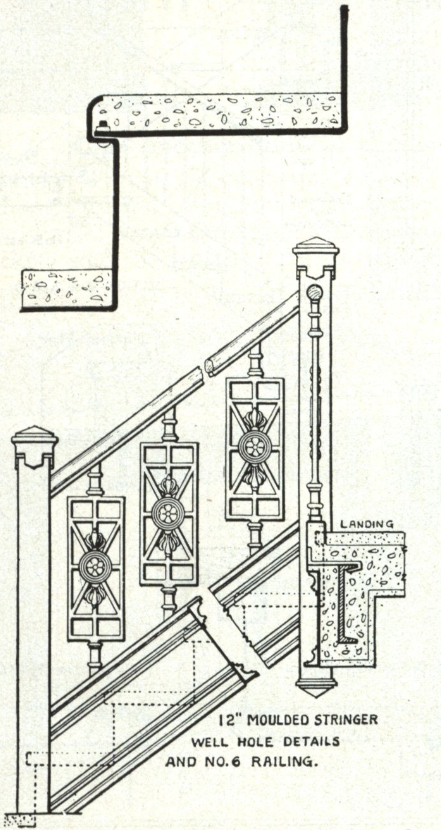


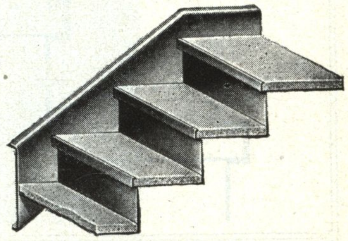


STAIR DETAIL, PLATFORM CONSTRUCTION, RETURN NEWEL, CONCRETE TREADS AND NO. 5 RAILING.


STAIR DETAILS, CONCRETE TREADS AND NO. 5 RAILING.



12" MOULDED STRINGER WELL HOLE DETAILS AND NO. 6 RAILING.



Details and Installations of Mesker Combination Steel and Concrete Stairs

THE RIESTER & THESMACHER COMPANY

Manufacturers of Bois Patented Steel Stairs

1514-1526 West 25th Street
CLEVELAND, OHIO

Products

Bois Interlocking Pressed Steel Stairs.
For Hollow Metal Doors, see page 854.

Service

A modern plant with complete equipment and an efficient organization qualified to give service. We have a thoroughly efficient estimating and draughting department and are glad to assist in construction details. Typical stair details, estimates and suggestions submitted upon request.

Description

The simple interlocking feature of the tread and riser in this stair, offers distinctive advantages in economy, rigidity, strength and rapid erection. It is also easily adapted to any desired tread material. The treads and risers are formed from one single sheet of steel with flanges that interlock at the nosing line, producing a reinforced edge that is always straight horizontally. This feature of double strength material prevents the nosing breaking away from tread filler. The stringers are tied together with a tie rod running under the angle of each nosing from stringer to stringer. The gauge of metal used is governed by the width of stair and weight to be carried. The entire construction makes for a very strong and rigid stair and the light gauge steel is not used to reduce cost with a proportionate reduction in strength. Tests of a standard Bois stair have been successfully made carrying a dead weight of 600 lb. per square foot.

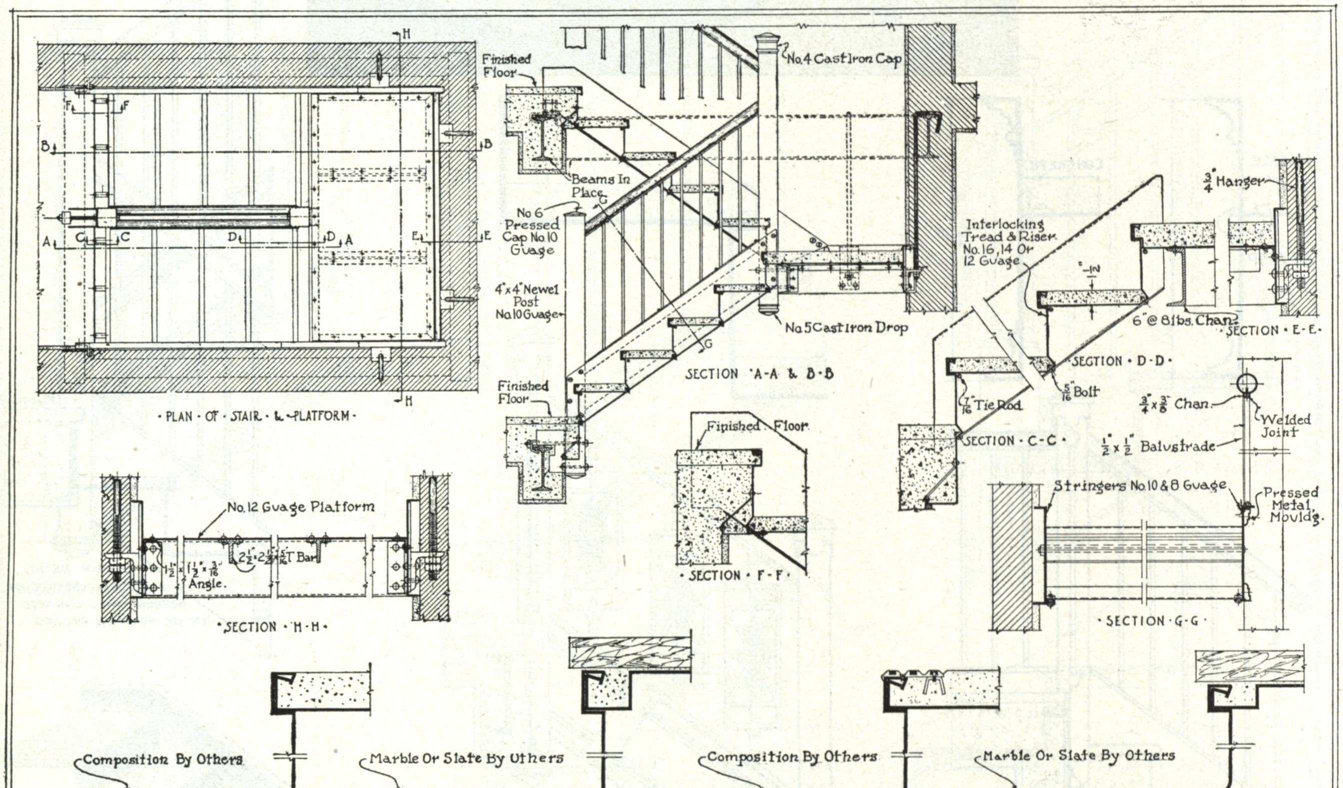
Design

This stair meets the requirements of all state and city building codes and while very simple in design is attractive in appearance and can be readily adapted to the requirements of the architect or builder. Construction may be modified or embellished by ornamenting newel posts, ends of tie rods and stringers, or using cast iron newel posts.

Installation

The interlocking feature dispenses with all riveting and makes for rapid assembling. Each flight of stairs is assembled in a complete unit in the factory and is, therefore, economically erected at the building. This also permits of the stairs being erected with the frame work of the building, giving immediate service before the installation of tread fillers.

For reference we will be glad to furnish names of architects who have specified this product or typical installations which we have made.



· PLAN · OF · STAIR · & · PLATFORM ·
A
B
C
D
E
F
H
Finished Floor
Beams In Place
No 6 Pressed Cap No.10 Guage
4"x4" Newel Post No.10 Guage
No.4 Cast Iron Cap
No.5 Cast Iron Drop
G
SECTION A-A & B-B
Interlocking Tread & Riser No.16, 14 Or 12 Guage
$\frac{3}{4}$" Hanger
6" @ 8 lbs. Chan.
SECTION · E · E ·
SECTION · D · D ·
$\frac{5}{16}$" Bolt
$\frac{7}{16}$" Tie Rod
SECTION · C · C ·
$\frac{3}{4}$" x $\frac{3}{8}$" Chan.
Welded Joint
$\frac{1}{2}$" x $\frac{1}{2}$" Balustrade
Stringers No.10 & 8 Guage
Pressed Metal Mouldg.
SECTION · G · G ·
Finished Floor
· SECTION · F · F ·
No.12 Guage Platform
$1\frac{1}{2}$" x $1\frac{1}{2}$" x $\frac{3}{16}$" Angle.
$2\frac{1}{2}$" x $2\frac{1}{2}$" T Bar
· SECTION · H · H ·
Composition By Others
· NO. 1 ·
Marble Or Slate By Others
· NO 2 ·
Composition By Others
· NO. 3 ·
Marble Or Slate By Others
· NO 4 ·
· DRAWN · BY · R. & T. CO.
NOT DRAWN TO SCALE APRIL. 13. 1925

STANDARD · DETAILS · OF · BOIS · INTERLOCKING · STEEL · STAIRS ·

TITCHENER IRON WORKS, INC.

Structural, Architectural and Ornamental Iron Work

25 Griswold Street
BINGHAMTON, N. Y.

Products

ORNAMENTAL IRON WORKS:

Iron Stairs, Fire Escapes, Spiral Stairs, Steel Ladders, Iron and Bronze Railings, Pipe Railings, Folding Gates, Area Gratings, Window Guards, Grilles, Sidewalk Doors, Coal Chutes, Coalhole Covers, Marquises, Trusses, Beams, Columns, Metal Lumber, Balconies, Flagpoles, Steel Sash, Store Fronts, Iron Fences, Entrance Gates, Wire Fences, Wire Partitions.

Stair Specifications

All iron stairs shall be pressed steel as made by TITCHENER IRON WORKS, INC., Binghamton, N. Y.

Stringers—Shall be of 10-inch channels formed from 13x$\frac{3}{16}$-inch steel plates with moulding on top and bottom flanges as detailed.

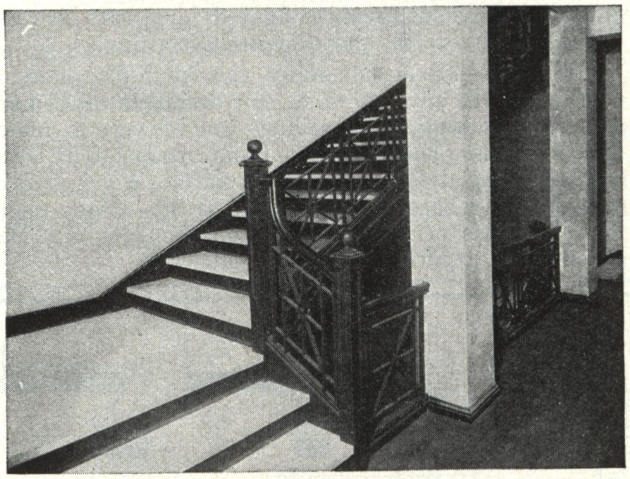
Tread and Riser—Shall be one unit formed from No. 12 gauge steel sheets with nosing and shall be recessed to receive 2 inches of composition or concrete filling. All treads and risers shall be supported by and bolted to angle iron hips which are riveted to the stringers.

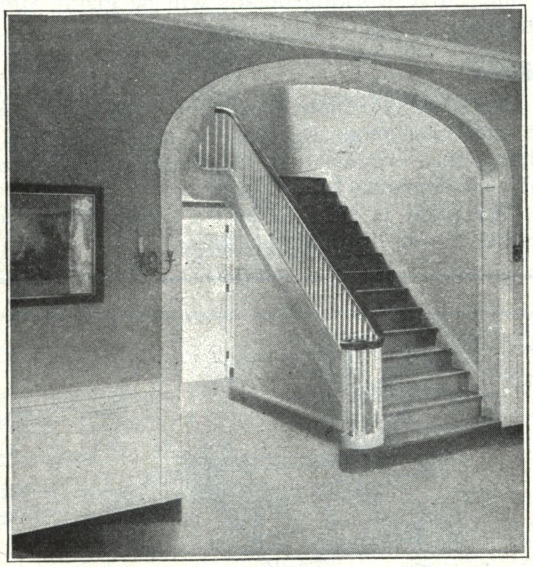
Platforms and Landings—Shall be of No. 12 gauge steel sheets supported and reinforced by structural tees and angles riveted to stringers and platform channels.

Newel Posts and Railings—Shall be as per details.

All iron work to have one shop coat of approved paint.

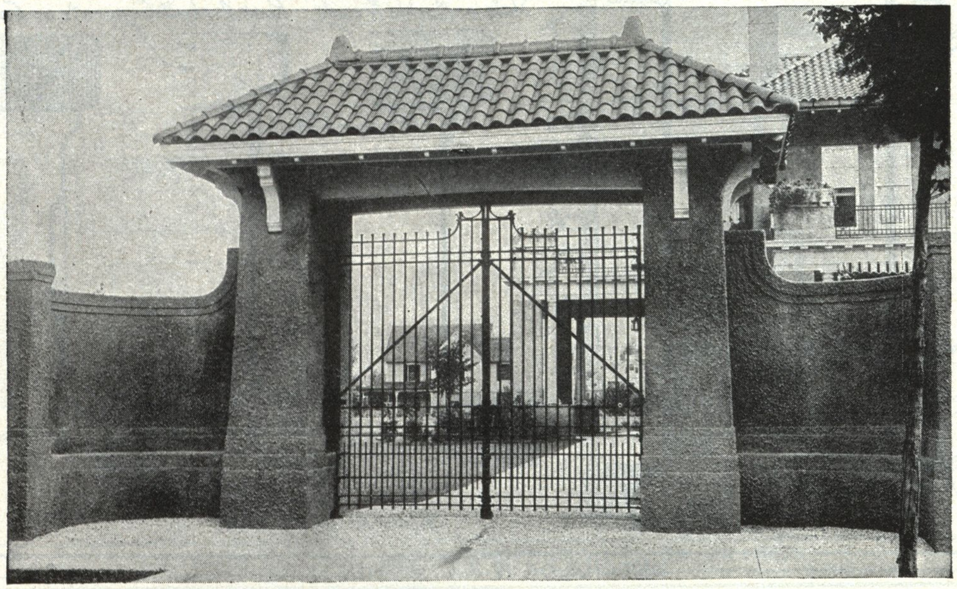
Note: The above specification may be changed to meet all architects' requirements.





Gate Specifications

Horizontal rails shall be of 2-inch channels. Hinge bars shall be ¾-inch by 2½-inch flat iron, hung on hand wrought hinges to be laid into masonry. Latch bars shall be the same size as hinge bars. Pickets shall be ¾-inch square bars spaced 5 inches on centers with hand forged top either pointed or upset. Pickets shall extend through horizontal rails and be securely hand calked into place. All to receive one shop coat of approved paint.



SEXAUER & LEMKE, INC.

Ornamental Iron Work, Steel Stairs and Door Frames

LONG ISLAND CITY, N. Y.

REPRESENTATIVES: Shults Engineering Co., Morgan Building, BUFFALO, N. Y.

Products

Manufacturers of Ornamental Iron Work, including: "S & L" Fireproof Steel Stairs, and Steel Frames for Doors and Partitions.

Also General Iron and Steel Staircase Construction; Iron Grilles; Railings; Entrance Doors, Marquises; Elevator Enclosures; Store Fronts; Gratings; Fire Escapes; Fur Racks for cold storage plants, etc.

Service

The thoroughly equipped estimating and draughting departments are at the service of architects. Estimates and suggestive working details will be gladly submitted on request.

Facilities

Our plant is complete in every respect and equipped with the most modern types of machinery and tools, enabling this organization to meet promptly and efficiently all demands for its products.

Our plant is situated at the East River and provided with own docking facilities.

Sexauer & Lemke ("S & L") Steel Stair Construction

Simple, strong, rigid, exceptionally light and easily erected, these steel stairs lend themselves admirably to every type of public office, warehouse, hospital, school and factory building construction.

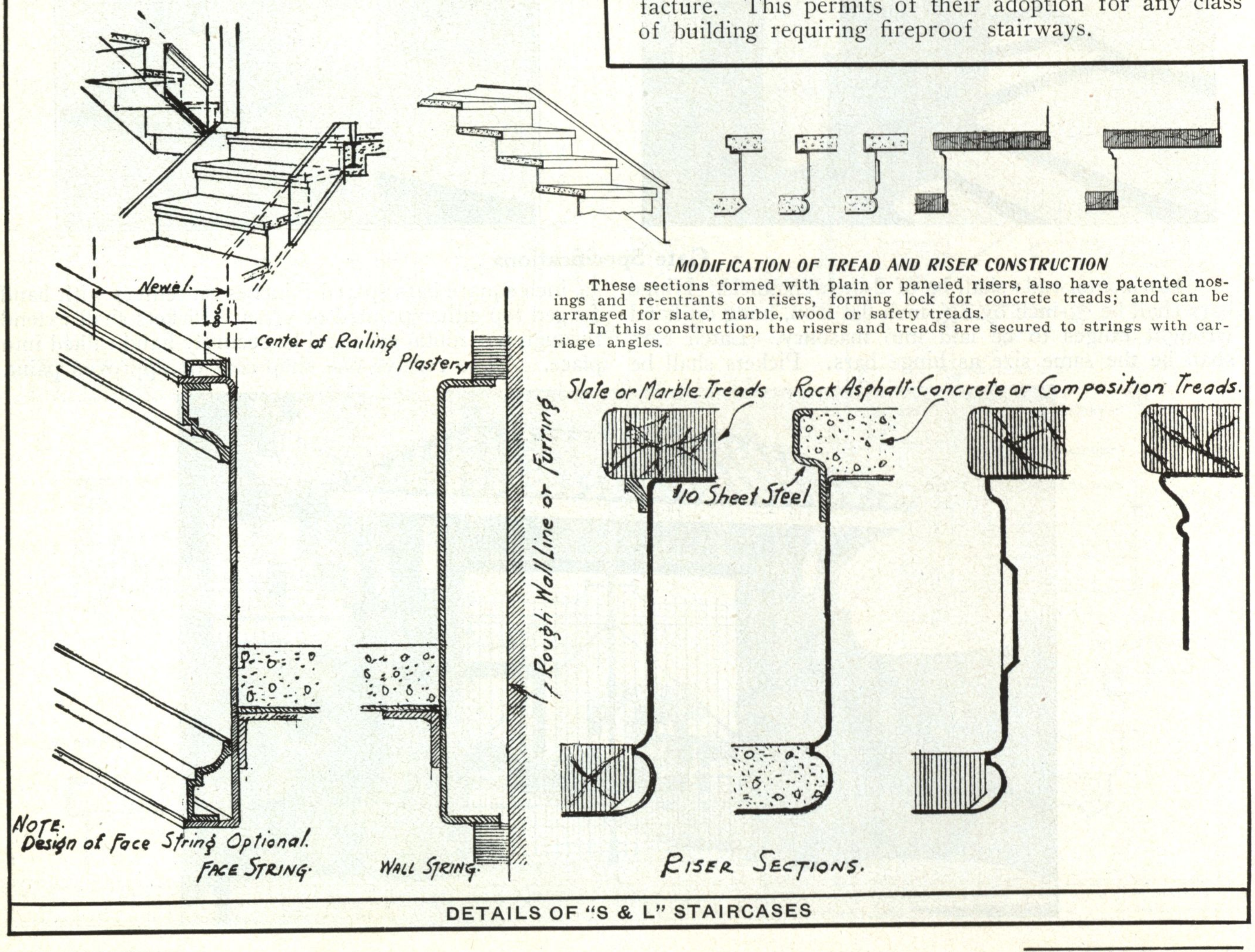
They are formed, primarily, of rolled steel stringers and bent plate steel risers and treads, securely bolted together as shown in line details herewith. The stairs can be furnished to accommodate any condition.

The strings are formed in one piece with flanges, the depth of string, thickness of metal, etc., being governed by the loading, and strings can be made either plain or ornamental with mouldings or otherwise as may be desired.

For stairs for export, the various strings, risers, etc., could be nested to insure compactness and against danger of damage.

All stair structures are figured for a safe live load of 100 lb. per sq. ft. and designed accordingly.

Design—"S & L" stairs can be built plain, or ornamented to any extent to suit architectural requirements and design, with railings and newels to match. Risers may be plain, or paneled and ornamented; treads can be arranged for either slate, marble, wood, cement, composition, ribbed steel, or safety treads of any manufacture. This permits of their adoption for any class of building requiring fireproof stairways.



MODIFICATION OF TREAD AND RISER CONSTRUCTION

These sections formed with plain or paneled risers, also have patented nosings and re-entrants on risers, forming lock for concrete treads; and can be arranged for slate, marble, wood or safety treads.

In this construction, the risers and treads are secured to strings with carriage angles.

DETAILS OF "S & L" STAIRCASES

Continued on next page

For cement or composition treads, a patented nosing and re-entrant construction is provided, which forms a pocket or lock for the treads and provides a sanitary cove treatment to the risers.

See detail drawing on preceding page.

The soffits of stairs are left open for painting, and present a neat finished appearance, but can also be arranged for plaster finish, if desired.

Installation—These stairs are particularly easy to erect, as each run is manufactured and fitted in shop before shipment or delivery. This feature insures quick and economical installation; and also permits of the stairs being erected with the framework of the building, thus insuring immediate serviceableness, before the installation of the finish treads.

General Cost and Estimates—These stairways, furnished complete with railing and newels (with concrete treads), are practically as low in cost as stairways of concrete construction with iron railings, and have the advantage of providing a neater and more durable installation. They permit, moreover, a saving in cost of structural supports, on account of special lightness. The thickness of metal employed, depth of strings, and so forth, are governed by the size of stair, loading conditions and so on.

If general layout of stairs together with memoranda of requirements is furnished, the estimating department will be pleased to submit specifications and estimates.

Steel Door Frames

These frames can be formed to meet requirements of all classes of fireproof partition construction as shown in illustration. They are formed of No. 14 or No. 12 gauge steel, and the miters and connections are all welded, making a one-piece frame.

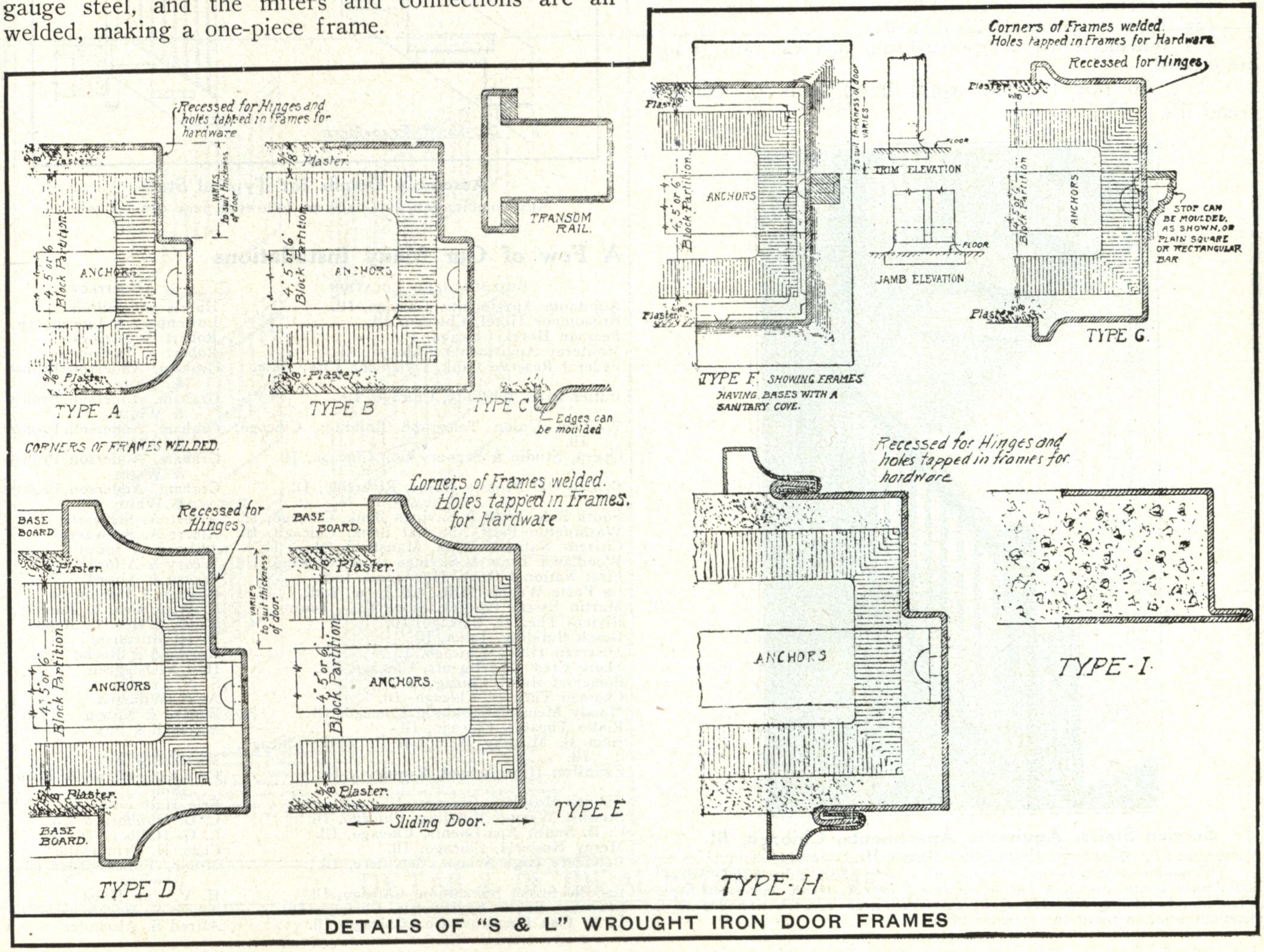
These frames can be furnished with or without transoms and to fit any size partition or style of door; also, if desired, furnished with plinth blocks or sanitary cove base particularly suited for hospitals.

The frames are provided with anchors on each side for the purpose of building into walls or partitions.

All provisions for securing hardware are made in accordance with samples furnished.

Reference Installations of Ornamental and Miscellaneous Iron Work

Liggett-Winchester-Ley Building, Madison Avenue, New York, N. Y.
Fisk Rubber Co.'s Building, Broadway, New York, N. Y.
Mt. Sinai Hospital, Fifth Avenue, New York, N. Y.
Office Buildings, 379-385 Madison Avenue, New York, N. Y.
Cunard Building, Broadway, New York, N. Y.
Brooklyn Main Telephone Building, Willoughby Street, Brooklyn, N. Y.
Brooklyn Edison Building, Willoughby Street, Brooklyn, N. Y.
Saks Department Store, Fifth Avenue, New York, N. Y.
Citizens Savings Bank, Bowery and Canal Street, New York, N. Y.
Shelton Club Hotel, Lexington Avenue, New York, N. Y.
Bowling Green Telephone Building, Broad Street, New York, N. Y.
National Surety Building, 100 Broadway, New York, N. Y.
A. G. Spalding Bros. Building, Nassau and Ann Streets, New York, N. Y.
Postum Building, 250 Park Avenue, New York, N. Y.
Hotel Syracuse, Syracuse, N. Y.
Niagara Hotel, Niagara Falls, N. Y.
Buffalo Consistory, Buffalo, N. Y.
Genesee Building, Buffalo, N. Y.
Arlington Hotel, Binghamton, N. Y.
Corning Free Academy, Corning, N. Y.
U. S. National Bank, Johnstown, Pa.
Citizens National Bank, Waynesburg, Pa.


Recessed for Hinges and holes tapped in frames for hardware
Plaster
Varies to suit thickness of door
4, 5 or 6 Block Partition
ANCHORS
TYPE A
TYPE B
TRANSOM RAIL
TYPE C
Edges can be moulded
CORNERS OF FRAMES WELDED
Corners of Frames welded. Holes tapped in Frames for Hardware
Recessed for Hinges
Plaster
To suit thickness of door VARIES
FLOOR
TRIM ELEVATION
JAMB ELEVATION
TYPE F SHOWING FRAMES HAVING BASES WITH A SANITARY COVE.
STOP CAN BE MOULDED, AS SHOWN, OR PLAIN SQUARE OR RECTANGULAR BAR
TYPE G
BASE BOARD
Recessed for Hinges
varies to suit thickness of door
Corners of Frames welded. Holes tapped in Frames for Hardware
Sliding Door
TYPE D
TYPE E
Recessed for Hinges and holes tapped in frames for hardware
TYPE-H
TYPE-I

DETAILS OF "S & L" WROUGHT IRON DOOR FRAMES

WESTERN ARCHITECTURAL IRON CO.

Manufacturers of Steel Stairs

TELEPHONE
DIVERSEY 7034, 7035

211-233 West Schiller Street
CHICAGO, ILL.

"Ideal" Steel Stairs

Advantages and Facilities—"Ideal" steel stairs are built and designed by experts, of construction which permits the utmost strength without sacrificing in any way the neat appearance that makes a building attractive.

Architects specify "Ideal" steel stairs because they can secure fireproof construction in any combination of design necessary to properly harmonize with the surroundings.

Contractors and builders like them because they know from experience that their installation is very simple.

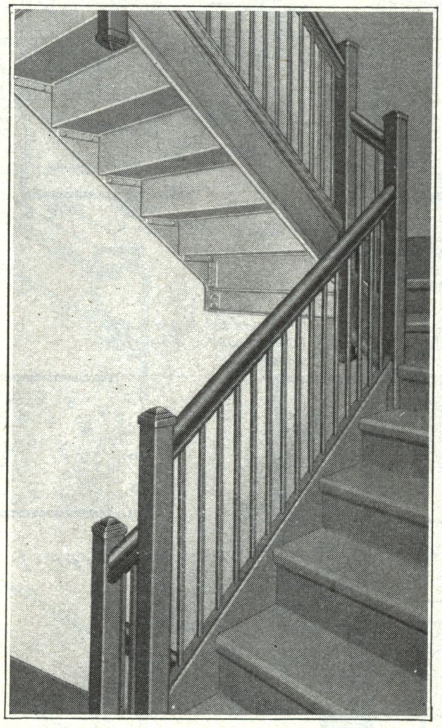
Our organization is complete in every detail. Our designers are thoroughly experienced in this field.

Erection—The installation of "Ideal" stairs is very simple, and we suggest the use of local men for erection wherever possible. We can, however, send erectors to any part of the country.

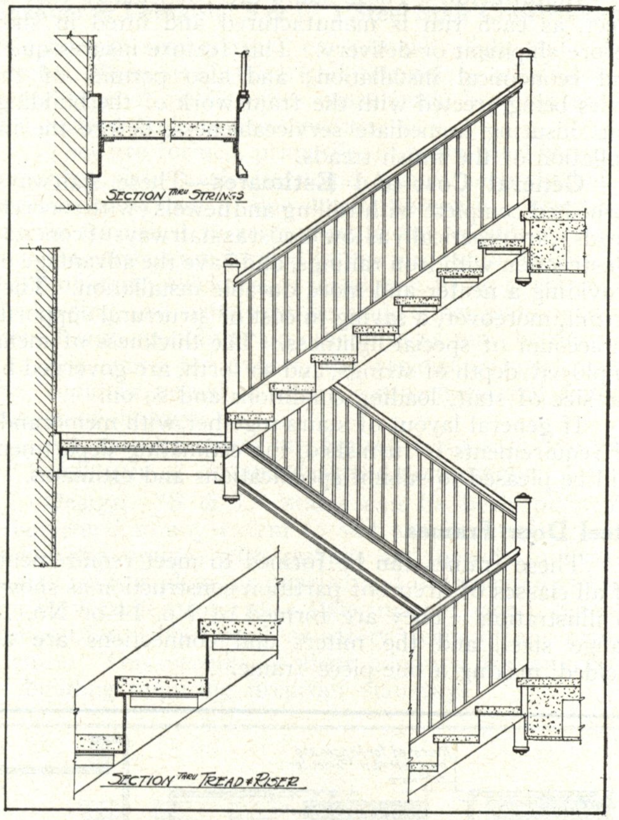
Inquiries for Estimates—To secure a proper estimate, send the following information along with your inquiry:

(1) Size of stair opening.
(2) Story heights taken to finished floors.
(3) Number of risers, or approximate height desired for risers.
(4) Construction of walls and floors around openings.
(5) Type of various details desired.
(6) Whether wood or pipe hand rails, and wall rails, if any, are desired.

We do not furnish wood hand rails or cement tread fill.



Service Stairs, Aquitania Apartments, Chicago, Ill.
RALPH C. HARRIS and BYRON H. JILLSON
This stairway is a typical example of a very plain, substantial "Ideal" installation using stringers No. 1, newels Type A, tread and riser Style No. 4, and railing No. 1. Note that the neat construction leaves a clean-cut soffit, without the expense of plaster

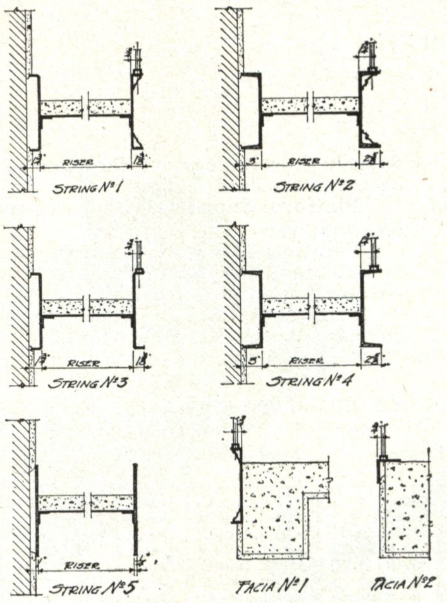


Assembly Details for Typical Stair
Any combination of details on following page can be used

A Few of Our Many Installations

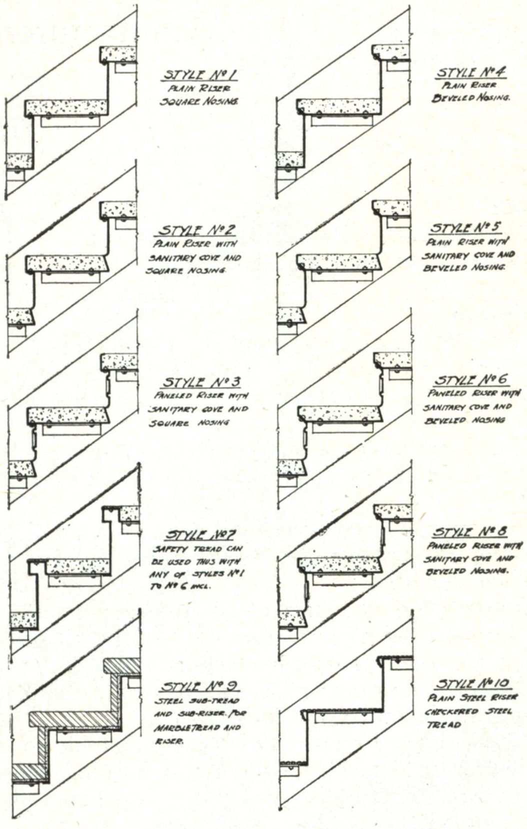
BUILDING AND LOCATION	ARCHITECT
Aquitania Apartments, Chicago, Ill.	Harris and Jillson
Broadmoor Hotel, Chicago, Ill.	Lowenberg & Lowenberg
Pearson Hotel, Chicago, Ill.	Robert S. DeGolyer
Monterey Apartments, Chicago, Ill.	Robert S. DeGolyer
Federal Reserve Bank, Oklahoma City, Okla.	Graham, Anderson, Probst & White
Butler Bros. Building, Chicago, Ill.	Graham, Anderson, Probst & White
Western Union Telegraph Building, Chicago, Ill.	Graham, Anderson, Probst & White
Opera, Studio & Scenery Co., Chicago, Ill.	Graham, Anderson, Probst & White
British Old Peoples Home, Riverside, Ill.	Graham, Anderson, Probst & White
South Side Trust & Savings Bank, Chicago, Ill.	Albert A. Schwartz
Washington Park National Bank, Chicago, Ill.	Albert A. Schwartz
Citizens National Bank, Mansfield, Ohio	Althouse & Jones
Woodlawn Trust & Savings Bank, Chicago, Ill.	Weary & Alford
First National Bank, Hammond, Ind.	Weary & Alford
La Porte Woolen Mills, La Porte, Ind.	Chatten & Hammond
Martin Estate Theater, Sioux City, Iowa	C. W. & Geo. L. Rapp
Riviera Theater, Chicago, Ill.	C. W. & Geo. L. Rapp
Beach Building, Joliet, Ill.	D. H. Burnham
Sherman Hotel, Chicago, Ill.	Holabird & Roche
Shore Crest Apartments, Chicago, Ill.	Hall & Ostegren
Somerset Hotel, Chicago, Ill.	S. N. Crowin
Chateau Theater, Chicago, Ill.	A. C. Wilmans
Moody Memorial Church, Chicago, Ill .	Fugard & Knapp
Rialto Theater, Chicago, Ill.	Marshall & Fox
John B. Murphy Memorial Building, Chicago, Ill.	Marshall & Fox
Evanston High School, Evanston, Ill.	Perkins, Fellows & Hamilton
County Hospital, Chicago, Ill.	Eric Hall
Stewart Warner Building, Chicago, Ill.	L. G. Hallberg & Co.
C. B. Smith Apartments, Chicago, Ill.	L. G. Hallberg & Co.
Mercy Hospital, Chicago, Ill.	Chas. H. Prindeville
Belvidere High School, Belvidere, Ill.	Miller, Fullenwieder & Dowling
LaSalle Street Substation, Chicago, Ill.	H. V. Von Holst
Sheridan Shore Apartments, Chicago, Ill.	Albert S. Hecht
L. C. Fish Furniture Co., Chicago, Ill.	Alfred S. Alschuler

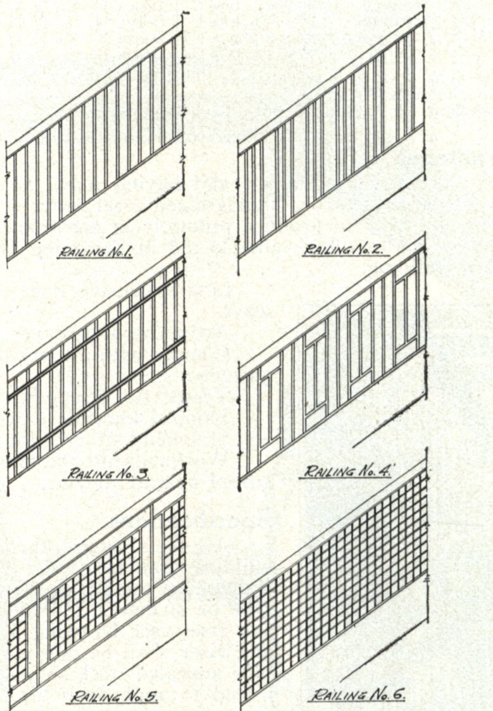
Continued on next page


RISER
STRING Nº 1
STRING Nº 2
STRING Nº 3
STRING Nº 4
STRING Nº 5
FACIA Nº 1
FACIA Nº 2

DESCRIPTION

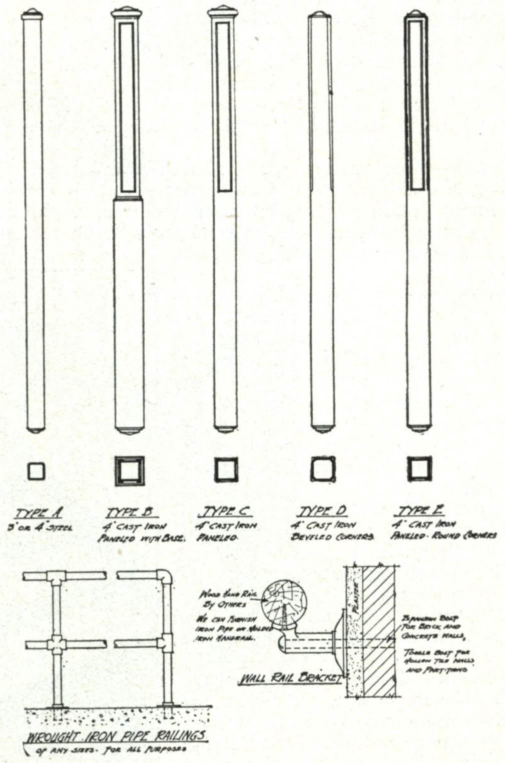
STRING No. 1: 12" × 3/16" PLATES BENT TO 10" CHANNEL SHAPE WITH STOCK MOLDING ON FACE STRING.
STRING No. 2: 10" CHANNEL (STRUCTURAL SHAPE) WITH STOCK MOLDING ON FACE STRING.
STRING No. 3: SAME AS No. 1 WITHOUT MOLDING ON FACE STRING.
STRING No. 4: SAME AS No. 2 WITHOUT MOLDING ON FACE STRING.
STRING No. 5: 12" × 1/4" PLATES. RECOMMENDED ONLY FOR STAIRS WITH PIPE RAILS.
FACIA No. 1: 12" × 3/16" PLATE BENT TO 10" CHANNEL SHAPE WITH STOCK MOLDING.
FACIA No. 2: 3" × 3" × 1/4" ANGLE TO RECEIVE RAILING AND PLASTER.


STYLE Nº 1
PLAIN RISER
SQUARE NOSING.
STYLE Nº 4
PLAIN RISER
BEVELED NOSING.
STYLE Nº 2
PLAIN RISER WITH
SANITARY COVE AND
SQUARE NOSING.
STYLE Nº 5
PLAIN RISER WITH
SANITARY COVE AND
BEVELED NOSING.
STYLE Nº 3
PANELED RISER WITH
SANITARY COVE AND
SQUARE NOSING
STYLE Nº 6
PANELED RISER WITH
SANITARY COVE AND
BEVELED NOSING
STYLE Nº 7
SAFETY TREAD CAN
BE USED THUS WITH
ANY OF STYLES Nº 1
TO Nº 6 INCL.
STYLE Nº 8
PANELED RISER WITH
SANITARY COVE AND
BEVELED NOSING.
STYLE Nº 9
STEEL SUB-TREAD
AND SUB-RISER. FOR
MARBLE TREAD AND
RISER.
STYLE Nº 10
PLAIN STEEL RISER
CHECKERED STEEL
TREAD


RAILING No. 1.
RAILING No. 2.
RAILING No. 3.
RAILING No. 4.
RAILING No. 5.
RAILING No. 6.

DESCRIPTION.

RAILING No. 1: WROT IRON SPINDLES, 1/2" SQUARE, 3" CENTERS, SET IN 1" × 1/2" CHANNEL TOP AND BOTTOM.
RAILING No. 2: WROT IRON SPINDLES, 1/2" SQUARE GROUPED AS DESIRED, SET IN 1" × 1/2" CHANNEL TOP AND BOTTOM.
RAILING No. 3: SAME AS No. 1 WITH ADDITION OF HORIZONTAL CHANNELS EACH SIDE OF SPINDLES.
RAILING No. 4: CAST OR WROT IRON PANELS OF 1/2" SQUARE MEMBERS, SET IN 1" × 1/2" CHANNEL TOP AND BOTTOM.
RAILING No. 5: PANELS OF No. 10 WIRE, 2" MESH, IN CHANNEL FRAMES, SECURED TO 5/8" SQUARE UPRIGHTS.
RAILING No. 6. CONTINUOUS PANELS OF No. 10 WIRE, 2" MESH, IN CHANNEL FRAMES.
NOTE: IN ALL CASES HANDRAIL CAN BE OF WOOD OR METAL


TYPE A
3" OR 4" STEEL
TYPE B
4" CAST IRON
PANELED WITH BASE.
TYPE C
4" CAST IRON
PANELED.
TYPE D
4" CAST IRON
BEVELED CORNERS.
TYPE E
4" CAST IRON
PANELED - ROUND CORNERS
WOOD HAND RAIL
BY OTHERS
WE CAN FURNISH
IRON PIPE OR MOLDED
IRON HANDRAIL.
PLASTER
EXPANSION BOLT
FOR BRICK AND
CONCRETE WALLS,
TOGGLE BOLT FOR
HOLLOW TILE WALLS
AND PARTITIONS
WALL RAIL BRACKET
WROUGHT IRON PIPE RAILINGS
OF ANY SIZES. FOR ALL PURPOSES

DETAILS OF "IDEAL" STEEL STAIRS

WOODBRIDGE ORNAMENTAL IRON COMPANY

TELEPHONE
DIVERSEY 5800

Manufacturers of Presteel Stairways

1521 Altgeld Street
CHICAGO, ILL.

PRESTEEL
TRADE-MARK

Product

WOODBRIDGE PATENTED PRESTEEL STAIRWAYS (Patented March 20, 1917).

Description

The Woodbridge patented Presteel stairs are manufactured in a modern factory, designed to manufacture steel stairways with the utmost economy.

Machinery and tools are of the most modern design, enabling us to meet promptly and efficiently all demands.

Our standardized construction provides a light inexpensive, strong, durable, non-combustible, and easily assembled stairway.

Construction is guaranteed to support the live load specified with a factor of safety of 4. This strength has been proven by tests conducted for us by the Westcott Engineering Co. of Chicago at the Armour Institute of Technology, Chicago.

Woodbridge Presteel stairs are adaptable to office, hotel, warehouse, factory, school and hospital construction; in fact, any building where fire resistant construction is required.

For further information not contained in this catalogue, please write for our 1925 Handbook of Presteel Stairs.

Treads and Risers—The treads and risers are multiple sections made of No. 12, 14, or 16 gauge blue annealed steel, the thickness used depending upon the safe load required and the span of treads to be installed, based upon a factor of safety of 4. A tread and riser are one unit supported by and bolted to angle iron hips which are machine riveted to the stringers.

Types—Note various types of treads and risers shown on Drawing No. 3. We have designs to suit every condition and requirement; plain or paneled risers, with or without sanitary cove; treads arranged for 2-in. composition or cement fill, or as steel subtreads for marble or slate stairways.

Stringers—Presteel stringers have proven the most satisfactory and less expensive. We construct our stringers to support the load required with a factor of safety of 4. The gauge of metal used is determined by the span. Face stringers are made either plain or ornamented with drawn steel moulding at top and bottom flange.

Types—Presteel stringers, made of universal mill plates formed into shape of channel.

Flat plate stringers, made of 10x5/16-in. universal mill plates.

Structural steel channel stringers are used to support exceptionally heavy loads.

Newels—May be plain or ornamental to suit design. Newels are furnished made of cast iron, pressed steel, or square wrought iron tubing.

Facias—Made of steel plates and paneled with steel moulding where required.

Railings—Made of wrought iron or cast iron, plain or ornamental, to suit any architectural design. For school use, plain sheet steel, or wrought iron railings are furnished. See Drawing 2 for standard designs.

Platform Supports—Made of structural steel tees and angles.

Painting—All work is given one shop coat of Battleship Gray Rust Inhibitive Metal Coating. No painting done in the field.

Prices—We will be pleased to quote prices on our stairways, either f.o.b. Chicago with freight allowed to destination, or erected in the building.

DESIGN NUMBERS, PRESTEEL STAIRWAYS

Design No.	Stringers	Newel posts	Railing	Treads and risers
1	*12″x3/16″ presteel	4″ sq. c.i., type C	Design 1	No. 12, 14 or 16 ga. steel
2	*12″x3/16″ presteel	3″ sq. w.i., type A	Design 1	No. 12, 14 or 16 ga. steel
3	*10″—15.3-lb. channel	4″ sq. c.i., type C	Design 1	No. 12, 14 or 16 ga. steel
4	*10″—15.3-lb. channel	3″ sq. w.i., type A	Design 1	No. 12, 14 or 16 ga. steel
5	12″x3/16″ presteel	4″ sq. c.i., type C	Design 1	No. 12, 14 or 16 ga. steel
6	12″x3/16″ presteel	3″ sq. w.i., type A	Design 1	No. 12, 14 or 16 ga. steel
7	10″—15.3-lb. channel	4″ sq. c.i., type C	Design 1	No. 12, 14 or 16 ga. steel
8	10″—15.3-lb channel	3″ sq. w.i., type A	Design 1	No. 12, 14 or 16 ga. steel
9	12″x3/16″ presteel	3″ sq. w.i., type A	2″o.d.pipe	No. 12, 14 or 16 ga. steel
10	10″x5/16″ flat plate	3″ sq. w.i., type A	2″o.d.pipe	No. 12, 14 or 16 ga. steel
11	10″—15.3-lb. channel	3″ sq. w.i., type A	2″o.d.pipe	No. 12, 14 or 16 ga. steel
12	†12″x3/16″ bent plate	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
13	†10″x5/16″ flat plate	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
14	†10″—15.3-lb. channel	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
15	12″x3/16″ bent plate	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
16	10″x5/16″ flat plate	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
17	10″—15.3-lb. channel	3″ sq. w.i., type A	2″o.d.pipe	3/16″ Diamond plate
21	*12″x3/16″ presteel	4″ sq. c.i., type D	Design 22	No. 12, 14 or 16 ga. steel
22	*10″—15.3-lb channel	4″ sq. c.i., type D	Design 22	No. 12, 14 or 16 ga. steel
23	*12″x3/16″ presteel	4″ sq. c.i., type C	Design 9	No. 12, 14 or 16 ga. steel
24	*10″—15.3-lb. channel	4″ sq. c.i., type F	Design 9	No. 12, 14 or 16 ga. steel
25	*12″x3/16″ presteel	4″ sq. c.i., type C	Design 13	No. 12, 14 or 16 ga. steel
26	*12″x3/16″ presteel	4″ sq. c.i., type F	Design 14	No. 12, 14 or 16 ga. steel
27	*12″x3/16″ presteel	4″ sq. c.i., type C	Design 17	No. 12, 14 or 16 ga. steel
28	*12″x3/16″ presteel	4″ sq. c.i., type G	Design 17	No. 12, 14 or 16 ga. steel

*Designs, 1, 2, 3, 4 and designs 21 to 28, inclusive, have drawn steel moulding on face strings.

†Designs 12, 13 and 14, only, have open risers.

Advantages

We are stair specialists, and having made an exhaustive study of manufacturing standardized steel stairs we are in a position not only to produce promptly in accordance with our contracts, but to offer valuable aid in designing stairways to suit any building.

Less expensive than other stairways.

Attractive appearance.

Comply with all city building requirements.

Tested for strength.

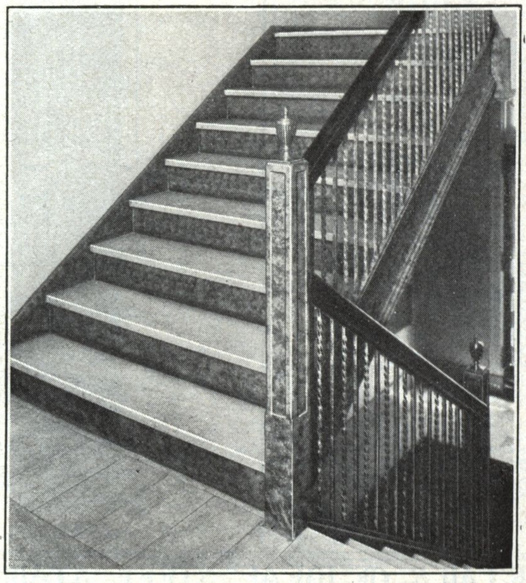
Shipped knocked down.

Simplicity of erection.

Workmanship and material guaranteed against defects.

Specifications

All metal stairs throughout the building shall be of the Woodbridge Patented Presteel construction (for type of stringers and type of treads and risers see Drawing 3). A tread and riser shall be one unit, made of blue annealed steel, supported by and bolted to angle iron hips which are riveted to the stringers. Platforms or landings shall be of blue annealed steel sheets of same gauge as treads and risers, supported and reinforced by structural steel tees and angles riveted to stringers and platform channel. Newel posts and railings shall be of design and construction as indicated on plans. All work to have one shop coat of rust inhibitive metal coating before delivery.



Sheldrake Apartments, Indianapolis, Ind.
GEORGE & ZIMMERMAN, Architects

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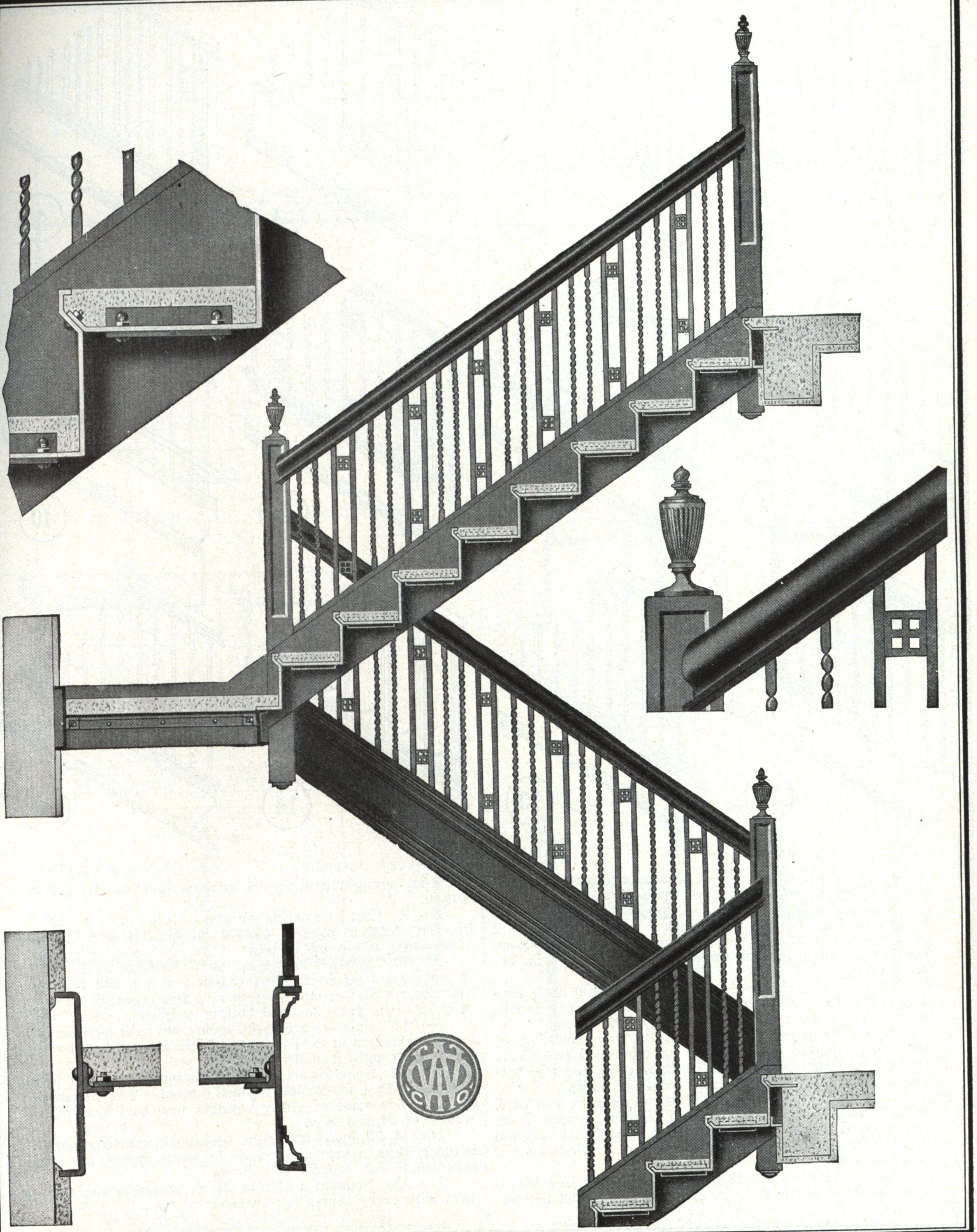
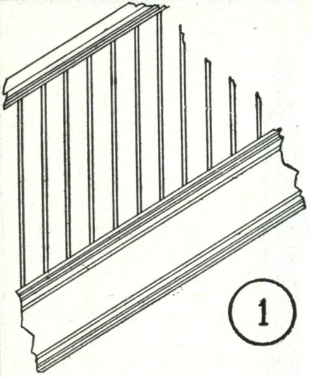


WOODBRIDGE ORNAMENTAL IRON CO.

STANDARD DESIGN NO. 28 PRESTEEL STAIRS
See opposite page for specifications

DRAWING No. 1

Continued on next page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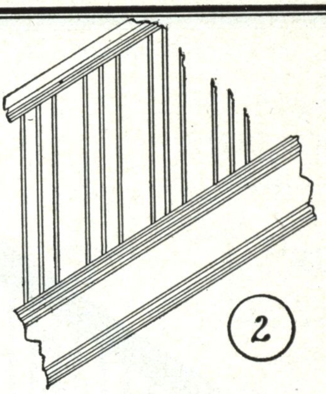
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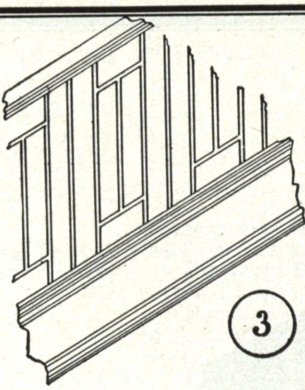
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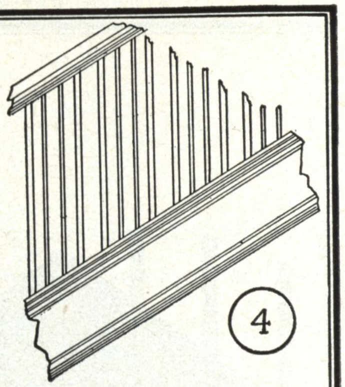
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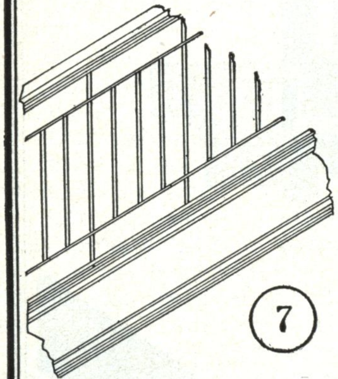
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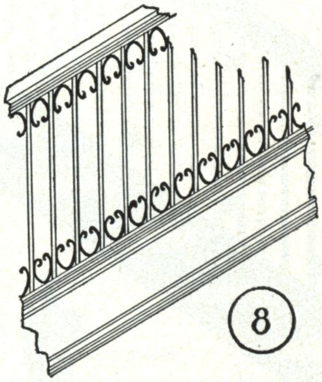
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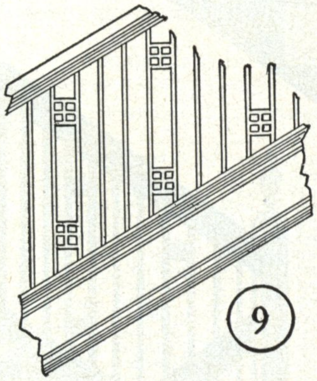
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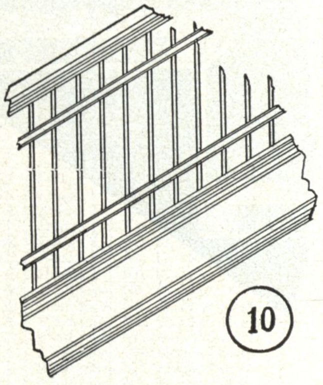
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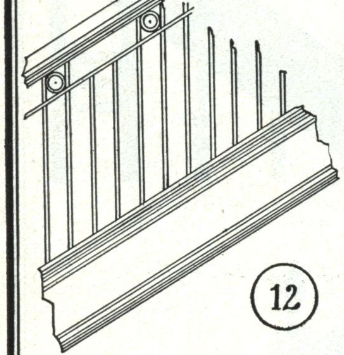
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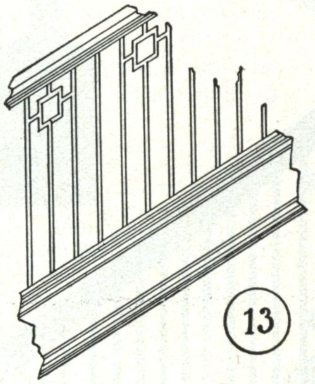
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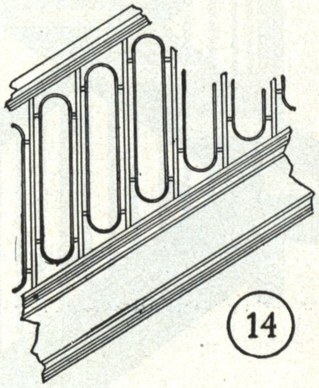
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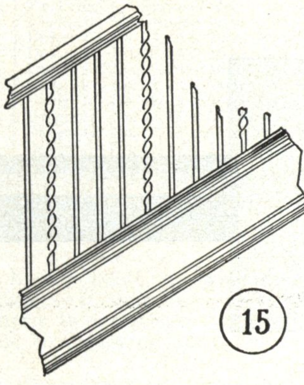
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SPECIFICATIONS

No. 1. Spindles are ½-in. square wrought iron bars 3 in. on centers, set in 1x½-in. channels at top and bottom.

No. 2. Spindles are ½-in. square wrought iron bars 2 in. on centers, set in 1x½-in. channels at top and bottom. Spindles are in groups of three with a space of 4 in. between groups.

No. 3. Spindles are ½-in. square wrought iron bars arranged in panel form with single spindle between panels. Spindles set in 1x½-in. channels at top and bottom.

No. 4. Spindles are in groups of five consisting of three ½-in. square wrought iron bars between two ⅝-in. wrought iron bars, set in 1x½-in. channels at top and bottom. Spacing of bars depends on length of stairs.

No. 7. Made of three ½-in. square wrought iron bars, set in 1¼x¼-in. flat bars top and bottom between ⅝-in. square wrought iron bars which extend through flat bars and set in 1x½-in. channels at top and bottom. Spindles are 3 in. on centers.

No. 8. Spindles are ½-in. square wrought iron bars 3 in. on centers, set in 1x½-in. channels at top and bottom; ½x⅛-in. wrought iron scrolls between spindles at top and bottom.

No. 9. Cast iron panels with two ½-in. square wrought iron bars between panels. Panels and spindles set in 1x½-in. channels at top and bottom.

No. 10. Spindles are ½-in. square wrought iron bars 3 in. on centers set in 1x½-in. channels at top and bottom. Spindles are also clamped together by two channels back to back set 3 in. from top and bottom members.

No. 12. Spindles are ½-in. square wrought iron bars 3 in. on centers set in 1x½-in. channel; the intermediate bar is 1x½ in. wrought iron flat bar.

No. 13. Spindles are ½ or ⅝-in. square wrought iron bars set in 1x½-in. channel top and bottom. The ornamental feature is made of either wrought iron bars electrically welded or of cast iron.

No. 14. Spindles are ½-in. square wrought iron bars 6 in. on centers, ornament is 3/16x⅜-in. wrought iron bar with ornamental iron separators between.

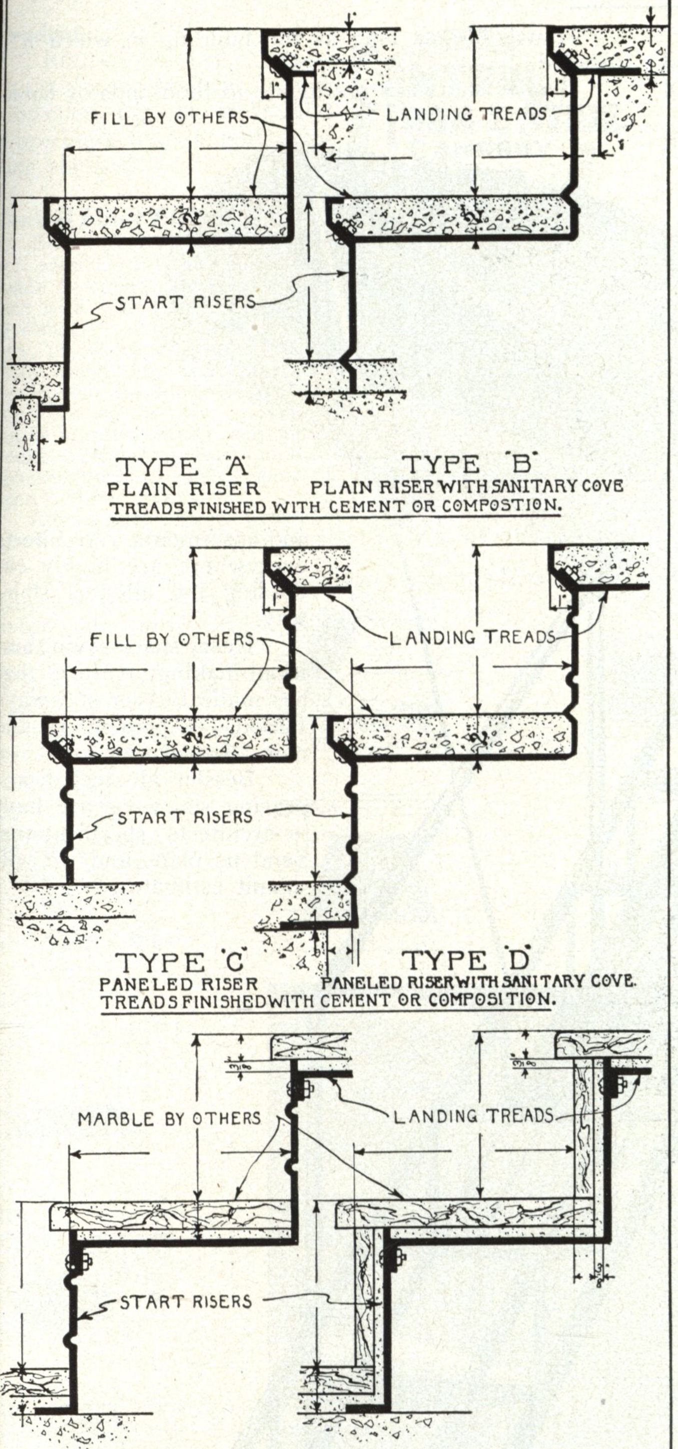
No. 15. Spindles are ½ or ⅝-in. square wrought iron bars with every fourth bar twisted.

WOODBRIDGE
ORNAMENTAL
IRON CO.

STANDARD RAILING DESIGNS USED ON
PRESTEEL STAIRS

DRAWING No. 2

Continued on next page


FILL BY OTHERS
LANDING TREADS
START RISERS
1"
1/2
MARBLE BY OTHERS
3/16
3/8

TYPE "A"
PLAIN RISER

TYPE "B"
PLAIN RISER WITH SANITARY COVE

TREADS FINISHED WITH CEMENT OR COMPOSTION.

TYPE "C"
PANELED RISER

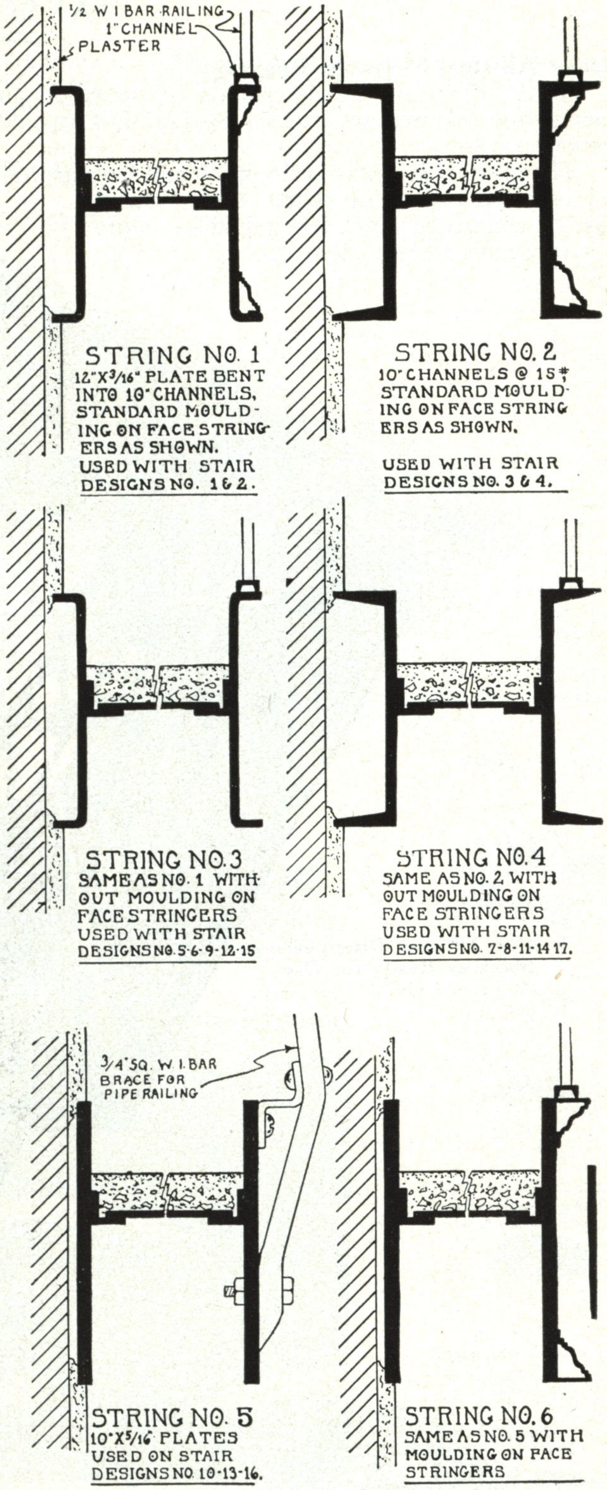
TYPE "D"
PANELED RISER WITH SANITARY COVE.

TREADS FINISHED WITH CEMENT OR COMPOSITION.

TYPE "E"
PANELED RISER WITH SLATE OR MARBLE TREADS

TYPE "F"
SLATE OR MARBLE TREADS AND RISERS WITH STEEL SUB-TREADS

1½" SCALE DETAILS OF STANDARD TYPES OF "PRESTEEL" STAIR TREADS.


1/2 W I BAR RAILING
1" CHANNEL
PLASTER
3/4" SQ. W. I. BAR BRACE FOR PIPE RAILING

STRING NO. 1
12"X3/16" PLATE BENT INTO 10" CHANNELS, STANDARD MOULDING ON FACE STRINGERS AS SHOWN.
USED WITH STAIR DESIGNS NO. 1 & 2.

STRING NO. 2
10" CHANNELS @ 15#, STANDARD MOULDING ON FACE STRINGERS AS SHOWN.
USED WITH STAIR DESIGNS NO. 3 & 4.

STRING NO. 3
SAME AS NO. 1 WITHOUT MOULDING ON FACE STRINGERS
USED WITH STAIR DESIGNS NO. 5-6-9-12-15

STRING NO. 4
SAME AS NO. 2 WITHOUT MOULDING ON FACE STRINGERS
USED WITH STAIR DESIGNS NO. 7-8-11-14 17.

STRING NO. 5
10"X5/16" PLATES
USED ON STAIR DESIGNS NO. 10-13-16.

STRING NO. 6
SAME AS NO. 5 WITH MOULDING ON FACE STRINGERS

1½ SCALE SECTIONS THRU STAIR STRINGERS

WOODBRIDGE ORNAMENTAL IRON CO.	TYPICAL TREAD, RISER AND STRINGER DETAILS FOR PRESTEEL STAIRS	DRAWING No. 3

THE BESSLER MOVABLE STAIRWAY CO.

AKRON, OHIO

Bessler All-steel Movable Stairway

Note: For complete description of operation and space saving features, see pages 1286-1287 in Carpentry Section.

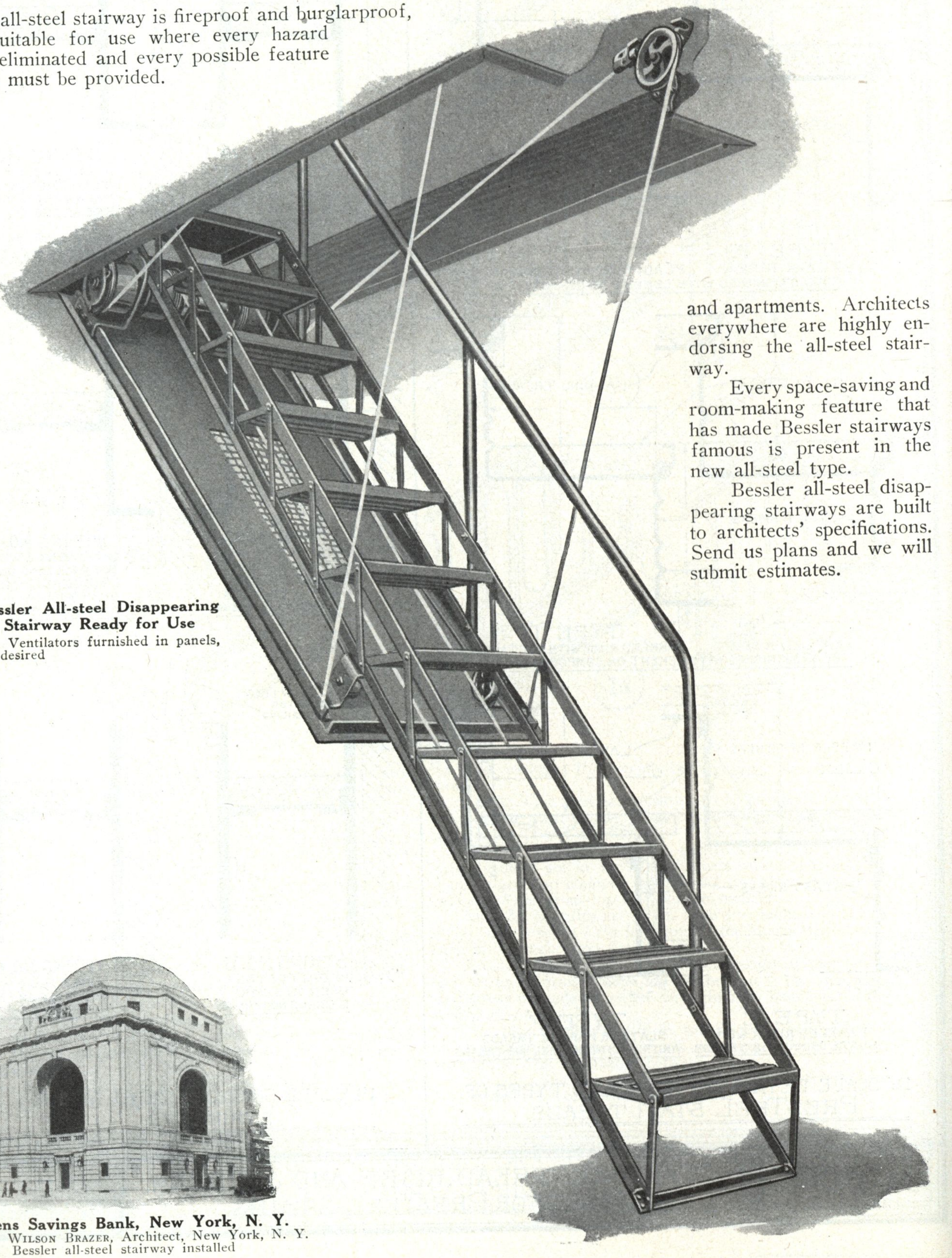
The all-steel stairway is fireproof and burglarproof, and is suitable for use where every hazard must be eliminated and every possible feature of safety must be provided.

It will last as long as the building in which it is installed.

Bessler stairways are in use in thousands of homes and apartments. Architects everywhere are highly endorsing the all-steel stairway.

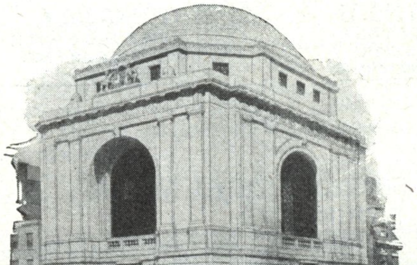
Every space-saving and room-making feature that has made Bessler stairways famous is present in the new all-steel type.

Bessler all-steel disappearing stairways are built to architects' specifications. Send us plans and we will submit estimates.



Bessler All-steel Disappearing Stairway Ready for Use

Ventilators furnished in panels, if desired



Citizens Savings Bank, New York, N. Y.

Clarence Wilson Brazer, Architect, New York, N. Y.
Bessler all-steel stairway installed

CENTRAL IRON & STEEL COMPANY

HARRISBURG, PA.

Product

ROLLED STEEL FLOOR PLATES, an economical surface protection against wear and slipperiness with a real gripping surface.

TRADE-MARK

Central Floor Plates

Uses—Central Floor Plates are suitable for all conditions, inside or outside, where the surface with which the foot comes in contact is apt to become slippery, or where it is desirable to protect the surface against wear, whether by man, beast or machine.

Due to the limited space at our command we can show but a few of the many uses to which this remarkable product can be most advantageously applied, and as actual photographs would not show up clearly in such small reproductions, we have sketched them to convey some of the more important uses of Central Floor Plates.

Advantages—First, Central Floor Plates are newly designed and naturally possess the good features of other designs, plus.

Second, Central Floor Plate design results in plates of minimum weight; even though their price per pound may be the same, their use saves from 2 to 2½% in dollars and cents when laid.

Their projections have been scientifically worked out until they are absolutely perfect as regards design and spacing. So perfectly has this been done that the foot hardly notices these projections until it starts to slip, and then it is held firmly in place.

Central Floor Plates are made in various thicknesses, widths and lengths, as in the following table:

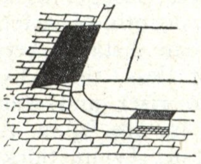
DIMENSIONS OF CENTRAL FLOOR PLATES

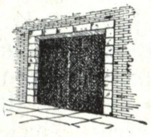
Thickness, in.	Width in inches 18	24	30	36	40	44	48	52	Approx. Weight, lbs. per sq. ft.
	Length in inches								
1/8	180	180	144	120	......	......	......	......	7.60
3/16	180	180	180	156	144	132	120	......	8.55
1/4	180	180	180	180	168	156	144	126	11.30
5/16	180	180	180	180	174	162	150	132	13.75
3/8	180	180	180	180	180	174	156	138	16.25
7/16	180	180	180	180	168	156	144	126	18.75
1/2	180	180	180	168	150	138	126	114	21.25
9/16	180	180	180	150	138	126	114	......	23.80
5/8	180	180	162	138	126	114	......	......	26.35
1/16	180	180	144	120	114	......	......	......	28.95
3/4	180	168	132	114	......	......	......	......	31.50

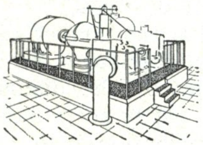
Lengths for bridge treads will be given special consideration.

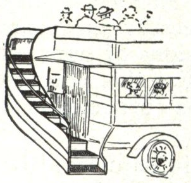
In buying Central Floor Plates you are buying from a company that has been rolling plates for over half a century; that makes and rolls its own steel; that has a solid background behind it; that is thoroughly responsible.

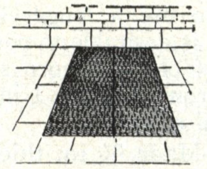
Samples and prices will be gladly sent upon request.

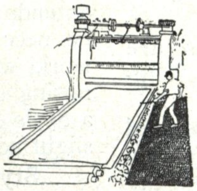


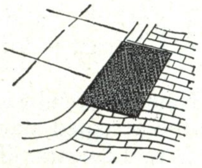


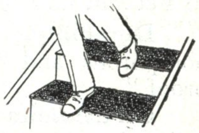


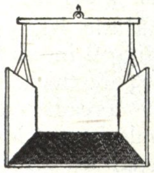


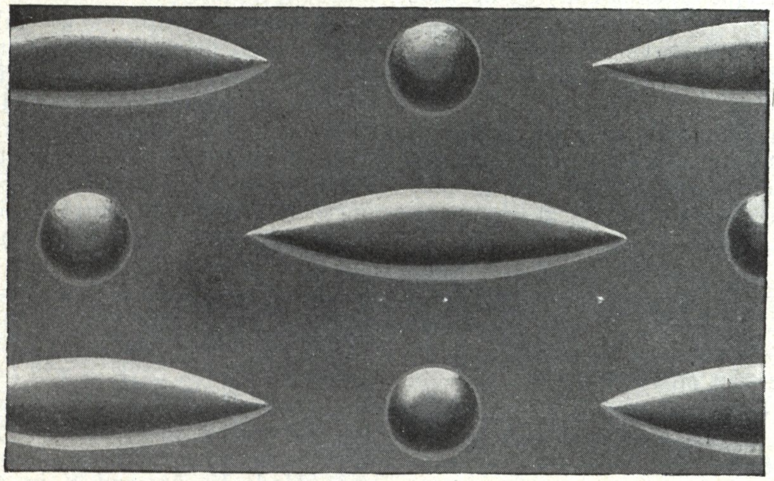






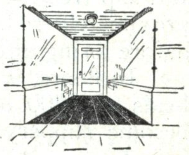


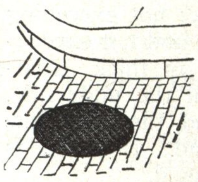


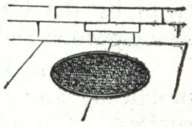


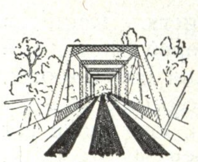
Section of Central Floor Plate (Actual Size)

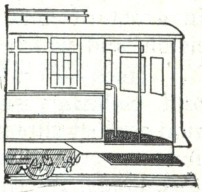
Note the remarkable gripping surface, the perfect distance between projections, the design of the gripping projections

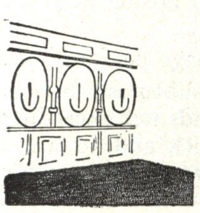


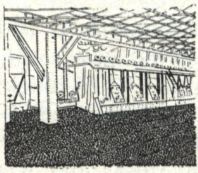


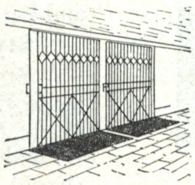


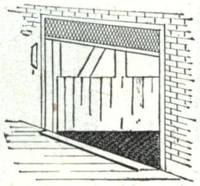


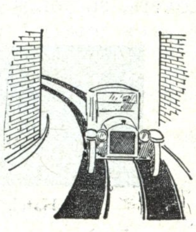












AMERICAN ABRASIVE METALS CO.

Manufacturers of Anti-Slip Tread Surfaces

Hudson Terminal Building, 50 Church Street
NEW YORK, N. Y.

TELEPHONE
CORTLANDT 7444

BRANCHES

BOSTON, 136 Federal Street
CHICAGO, Conway Building
PHILADELPHIA, Franklin Trust Building
PITTSBURGH, Farmers Bank Building

AGENCIES IN PRINCIPAL CITIES

FERALUN
Anti-Slip Treads
TRADE-MARK

Products

Manufacturers of FERALUN, BRONZALUN and ALUMALUN ANTI-SLIP TREAD SURFACES.

United States and Canadian Sales Representatives for CARBORUNDUM ANTI-SLIP TILE.

Feralun

Feralun is specially prepared iron with abrasive grit embedded in the wearing surface to provide an approved, durable and effective anti-slip tread.

This grit, embedded at the time of casting, projects slightly and bites, so that slipping is prevented. Being excelled in hardness only by the diamond and being firmly held by the metal partly surrounding each grain, the abrasive grit in combination with the metal gives to Feralun its extreme durability.

Durability—Feralun anti-slip stair treads are non-porous and "fire-proof," "rust-proof," and "slip-proof."

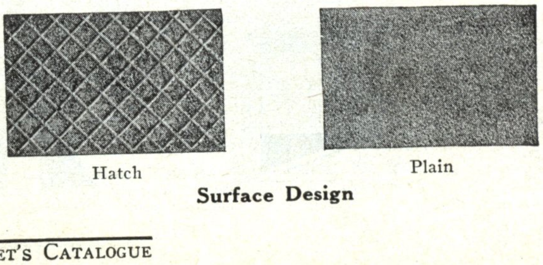
On the stairs of the New York subway and elevated railroads, where they are the accepted standard, Feralun anti-slip treads last from 5 to 12 years. They carry approximately 14,000,000 people on a stairway 30 in. wide before losing effectiveness.

In floors, 9 years' concentrated wear from trucking loads of 1200 to 1800 lbs. has not caused Feralun to become slippery.

Approval—Feralun anti-slip treads are approved without any qualifications as a fire-safe and anti-slip tread by the Underwriters' Laboratories, Inc., and by Pennsylvania and New York State Industrial Boards.

Sizes and Designs—Feralun may be obtained in practically any form in which metal is cast as a tread surface. Certain forms are so frequently demanded that they have become a standard. These are shown in a set of detail sheets from which tracings may be made, and which will be sent on request.

Uses—Feralun is especially suitable for treads and walkway surfaces where durability and protection against slipping is desired, such as stair treads, coal-hole covers, area covers, gutter plates, elevator door thresholds, freight elevator landings, floor plates, trench covers, shipping platforms, ramps, etc.


Hatch Plain

Surface Design

Feralun Stair Treads

Feralun treads are made with a plain or hatch abrasive metal surface. The anti-slip element is carried down over the nosing. No dangerous, slippery nosing edge or heel-catching grooves. Made in the following styles:

Styles A and C—Used on a subtread of concrete, iron, steel, wood, marble, etc. Made $\frac{5}{16}$ in. thick, usually 4, 4½, 5 or 6 in. wide and not exceeding 60 in. long in one piece. Longer treads furnished in sections. On new stairs, length of safety tread is usually 4 to 8 in. shorter than distance between stringers. Width should be not less than five-eighths the distance from nosing to riser and should cover nosing edge. Widths 6 to 9 in. are ⅜ in. thick; 9 to 12 in., $\frac{7}{16}$ in. thick; over 12 in., ½ in. thick. Style A standard lip extends ¼ in. from underside of tread. At times it may be necessary to use a longer lip, especially in repair work, where it is desirable to cover all signs of wear on nosing edges of old and worn steps. For this purpose a Style A lip from ½ in. to 1 in. deep is furnished at a slight additional cost.

Style D—Made ⅜ in. thick and in same widths and lengths as Styles A and C. Nosing is ¾x¾ in.

Style O—Requires no subtread. Made ⅜, $\frac{7}{16}$, ½, ⅝, or ¾ in. thick. Treads not exceeding 9 in. wide back of nosing by 60 in. long furnished ⅜ in. thick, if desired, and should be supported by risers. Treads over 9x60 in., and not exceeding 12x60 in., should be not less than $\frac{7}{16}$ in. thick and should be supported by risers. Platforms and landings in sections not exceeding 20x36 in. should be not less than ½ in. thick; not exceeding 36x48 in. should be not less than ⅝ in.; and not exceeding 42x60 in. should be not less than ¾ in. thick. Platforms usually have a truss rib cast on the underside. Style O nosing extends ¾ in. beyond the riser line and ¾ in. down from underside of tread. If nosing is required 1x1 in., Style S will be furnished.

Style R—Bolted direct to stringers. Requires no subtread. Used extensively for open stairs, fire escapes, around machinery, in engine and boiler rooms, etc. Made ½, ⅝, and ¾ in. thick, according to span and has truss rib. Treads 48 to 60 in. long made not less than ⅝ in. thick; 60 to 72 in. long, ¾ in. thick. This style is reversible, having anti-slip nosing at front and back.

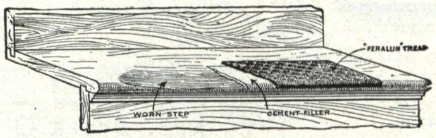
Style R-G—Same as R with drainage perforations.

Style K—Does not require a subtread and is made $\frac{7}{16}$, ½, ⅝ and ¾ in. thick. Treads not exceeding 48 in. long will be furnished $\frac{7}{16}$ in. thick and 48 to 72 in. will be ½ in. thick. When risers are omitted, treads should be ½ in. thick, and when over 42 in. and not

Continued on next page

over 60 in. long should also have a truss rib. From 60 to 72 in. long, treads should be ⅝ in. thick with a truss rib.

Styles of Treads for Repairs to Worn Steps—Styles A, C or D are applied to existing steps. If necessary to remove old steps, they may be replaced by either Style O or R, without using a subtread. If old and worn steps are to be repaired and Style A is preferred, it may be desirable to cover all signs of wear on the nosing edges. For this purpose, a lip ½ to 1 in. deep will be furnished.



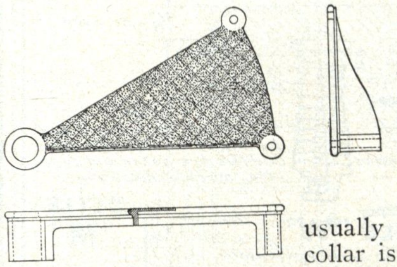
Method of Repairing Worn Wood, Concrete, Slate, Iron or Marble Steps with Style A Feralun Anti-Slip Treads

Anti-Slip Thresholds and Saddles—Styles L and T are extensively used. Made ⅜ to 1 in. thick. Sizes up to 6x60 in. should be not less than ⅜ in. thick; up to 9x72 in. should be not less than $\frac{7}{16}$ in. thick; and up to 12x108 in. should be not less than ½ in. thick.

Elevator Saddles—Made with one or two door grooves not less than ½ in. thick and not exceeding 12 in. wide and 96 in. long in one piece. Longer saddles made in sections. Grooves are ½x½ in. or $\frac{9}{16}$x$\frac{9}{16}$ in. Grooves are straight and true and free from fins. Lip at nosing is usually 2 in. over all. If a deeper lip is required the extra length is usually lap-jointed and bolted to the 2-in. piece. Door saddles without grooves are made $\frac{7}{16}$ to ¾ in. thick.

Floor Plates and Trench Covers—Made ½ in. thick, in sections not exceeding 20x36 in. Sections not exceeding 36x48 in., not less than ⅝ in. thick; 42x60 in., not less than ¾ in. thick.

Spiral Treads and Platforms—Cast complete in one piece with collar and flange, according to architects' or contractors' details. Thickness is usually $\frac{7}{16}$ to ¾ in. Hole in collar is for 3½ or 4-in. outside diameter of pipe.



Feralun Spiral Treads

Safety Coalhole and Manhole Covers and Frames—Have no heel-catching projections or depressions; flush with sidewalk. Hinges especially constructed to overcome breakage and are concealed. When open, they are enclosed on all sides and top, except toward curb where coal chute is inserted. Do not permit leakage of surface water. Made in 3 sizes: 18, 20 and 24 in.

The Feralun safety covers and frames comply with the requirements of New York City Department of Public Works.

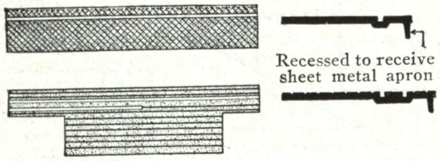
Strips for Inclines and Ramps—Made ⅜ in. thick in sizes up to 9x60 in.

Steeper ramp grades may be used, and much space saved, if Feralun is used. Firm, even traction is essential in garages. When the ramps are tracked or covered with Feralun, they give a feeling of security to every car owner, and are positive protection against the damage caused by one car skidding into another or into posts and walls.

Bronzalun

Bronzalun is a combination of bronze and abrasive grit manufactured in the same manner as Feralun. It has all the good qualities of Feralun. Architectural superiority is combined with durability and anti-slip effectiveness. It is made in either the hatch, standard fluted or bright fluted surface.

Uses—Bronzalun is largely used for tread surfaces such as entrance door saddles, elevator saddles, safety treads on marble stairs, etc.



Typical Design of Bronzalun Elevator Saddles, Showing Hatch and Fluted Surface

Alumalun

Alumalun is a combination of aluminum and abrasive grit manufactured in the same manner as Feralun and Bronzalun. It has the anti-slip effectiveness and architectural value of Bronzalun and is extremely light in weight, weighing 1 lb. per sq. ft. for each $\frac{1}{16}$-in. thickness. It is immune to the action of sea water and does not tarnish or deteriorate on account of exposure.

Uses—Alumalun is very desirable for high grade work. Its silver color makes it especially suitable to harmonize with certain decorative schemes.

Alumalun is made in hatch surface only.

Alumalun Sidewalk Doors—Light in weight, non-corrosive, durable, anti-slip. Have no projections or depressions and are flush with sidewalk. Hinges are especially strong and are concealed. Standard sizes, 3 ft. 6 in. x 3 ft. 6 in. and 4x4 ft.

Specifications for Anti-Slip Tread Surfaces

New Concrete Steps, Platforms and Landings—All new concrete steps and nosing edges of platforms and landings in (mention locations such as service stairs, fire towers, area stairs, etc.) shall be equipped with American Abrasive Metals Co.'s "Feralun" [Style A, C or D]. They shall extend continuously along the step to within .... in. (2 to 4 in.) of stringers; and shall be .... in. (at least 4, preferably 6 in.) wide, to be set flush with cement surface and firmly secured with anchors.

Marble, Slate, Wood and Old Concrete Steps and Landings—All marble, slate, wood and old concrete steps and landings in (mention locations) shall be equipped with American Abrasive Metals Co.'s "Feralun" (designate style) anti-slip treads. Treads shall extend to within 3 in. of stringers and riser. If steps are worn, worn spots shall be filled with magnesite (quick setting) cement before tread is laid.

Structural Steel Steps and Landings—All structural steel steps and landings in (mention locations) shall be equipped with American Abbrasive Metals Co.'s "Feralun" [Style D, G, K, O or R] anti-slip treads.

Thresholds—All entrance, elevator and fire door thresholds shall be equipped with American Abrasive Metals Co.'s "Feralun" [Style L, M, T, V or W], anti-slip saddles as shown on drawings.

All freight elevator openings and shipping platforms shall be equipped with "Feralun," Style W, anti-slip threshold, ... in. wide.

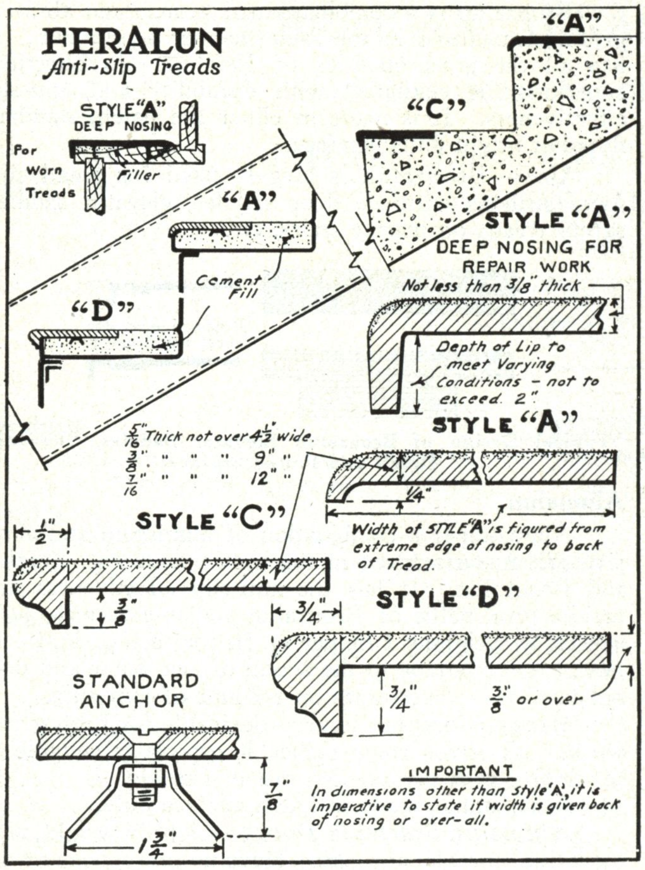
Covers—All covers for (mention location such as trenches, pits, coalholes, sidewalk doors, manholes, etc.) shall be of American Abrasive Metals Co.'s "Feralun." (Size .....)

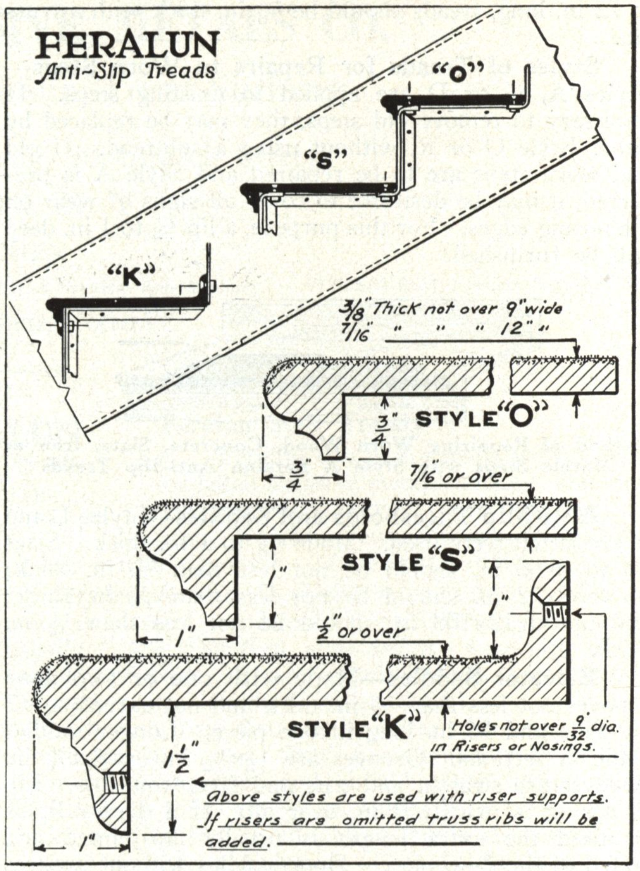
Floors, Ramps, etc.—All (mention location such as boiler room floors, floors around dangerous machinery, inclines, ramps, elevator floors, vestibules, freight corridors, etc.) shall be equipped with American Abrasive Metals Co.'s "Feralun" anti-slip treads as shown on drawings.

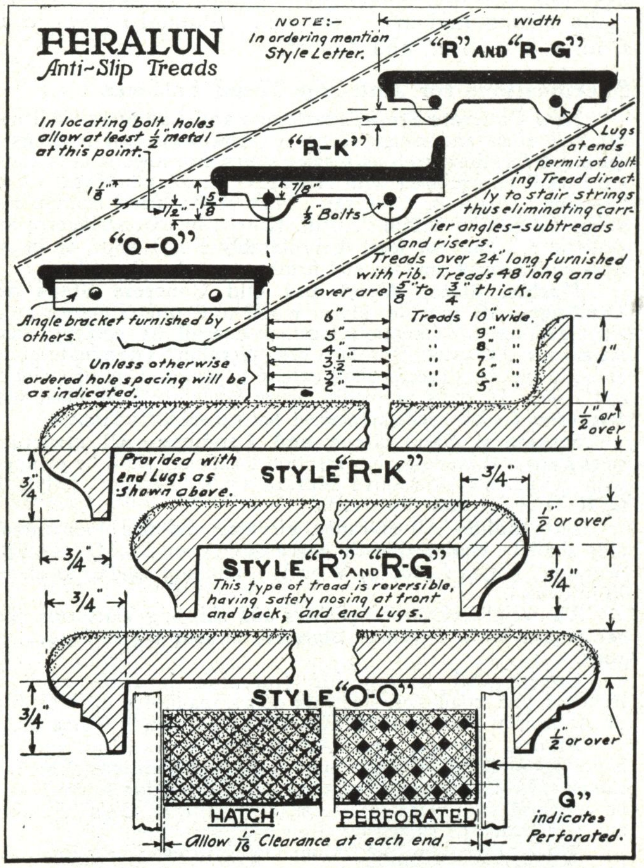
Note: "Bronzalun" or "Alumalun" instead of "Feralun" may be specified for architectural reasons.

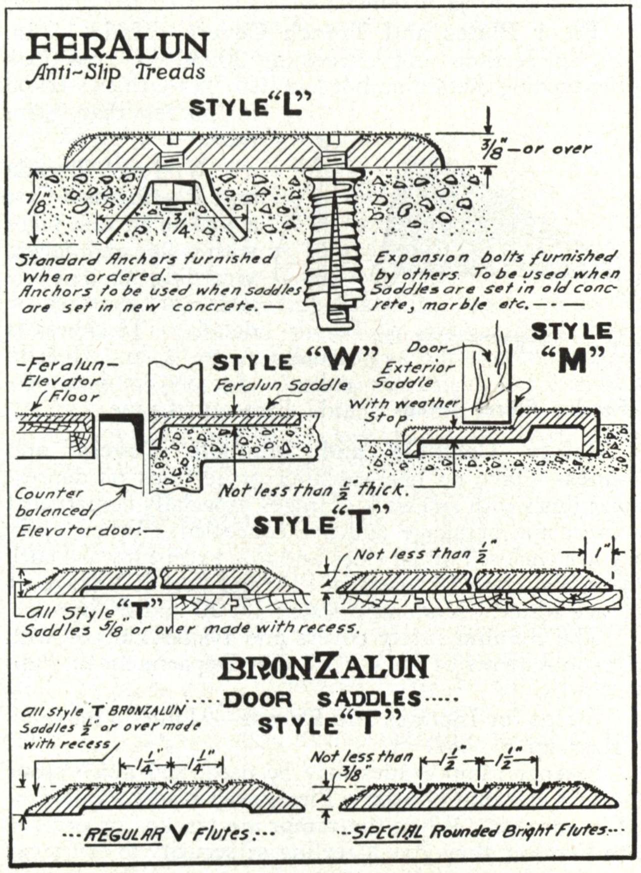
Anti-Slip Tile—For specifications for Carborundum Anti-Slip Tile see third page following.

Continued on next page


FERALUN
Anti-Slip Treads
STYLE "A" DEEP NOSING
For Worn Treads
Filler
"A"
"C"
"A"
"D"
Cement Fill
STYLE "A"
DEEP NOSING FOR REPAIR WORK
Not less than 3/8" thick
Depth of Lip to meet Varying Conditions - not to exceed 2"
STYLE "A"
5/16" Thick not over 4 1/2" wide.
3/8" " " " 9" "
7/16" " " " 12" "
1/4"
STYLE "C"
Width of STYLE "A" is figured from extreme edge of nosing to back of Tread.
1/2"
3/8"
STYLE "D"
3/4"
3/4"
3/8" or over
STANDARD ANCHOR
7/8"
1 3/4"
IMPORTANT
In dimensions other than style 'A', it is imperative to state if width is given back of nosing or over-all.

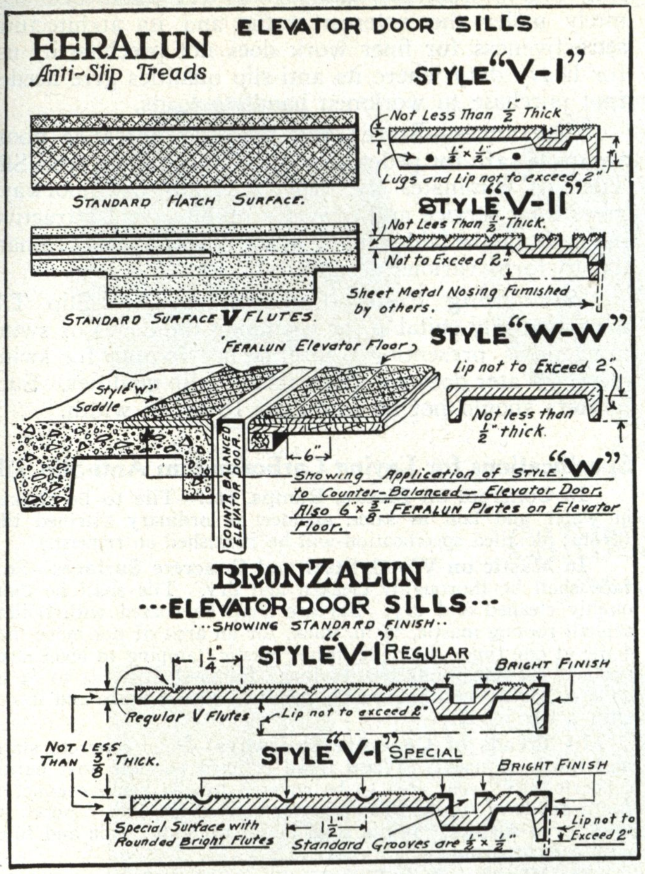

FERALUN
Anti-Slip Treads
"O"
"S"
"K"
3/8" Thick not over 9" wide
7/16" " " " 12" "
3/4"
STYLE "O"
3/4"
7/16 or over
STYLE "S"
1"
1"
1"
1/2" or over
STYLE "K"
1 1/2"
1"
Holes not over 9/32 dia. in Risers or Nosings.
Above styles are used with riser supports.
If risers are omitted truss ribs will be added.

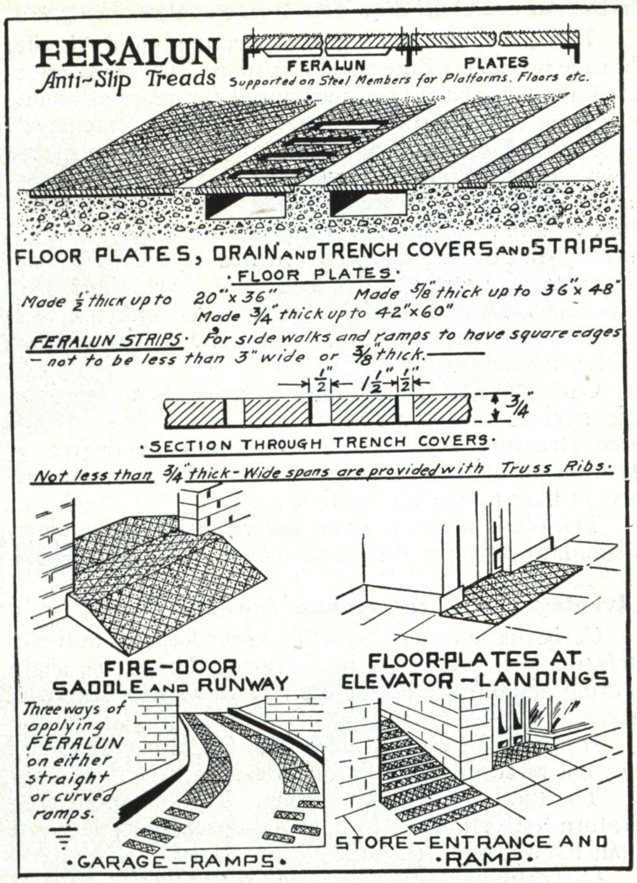

FERALUN
Anti-Slip Treads
NOTE:- In ordering mention Style Letter.
width
"R" AND "R-G"
In locating bolt holes allow at least 1/2" metal at this point.
"R-K"
Lugs at ends permit of bolting Tread directly to stair strings thus eliminating carrier angles-subtreads and risers.
Treads over 24" long furnished with rib. Treads 48" long and over are 5/8" to 3/4" thick.
1 1/8"
1/2"
1 5/8"
7/8"
1/2" Bolts
"O-O"
Angle bracket furnished by others.
6"
5"
4"
3 1/2"
3"
2"
Treads 10" wide.
" 9" "
" 8" "
" 7" "
" 6" "
" 5" "
Unless otherwise ordered hole spacing will be as indicated.
1"
1/2" or over
3/4"
Provided with end Lugs as shown above.
STYLE "R-K"
3/4"
1/2" or over
3/4"
STYLE "R" AND "R-G"
This type of tread is reversible, having safety nosing at front and back, and end Lugs.
3/4"
3/4"
STYLE "O-O"
1/2" or over
HATCH
PERFORATED
"G" indicates Perforated.
Allow 1/16" Clearance at each end.

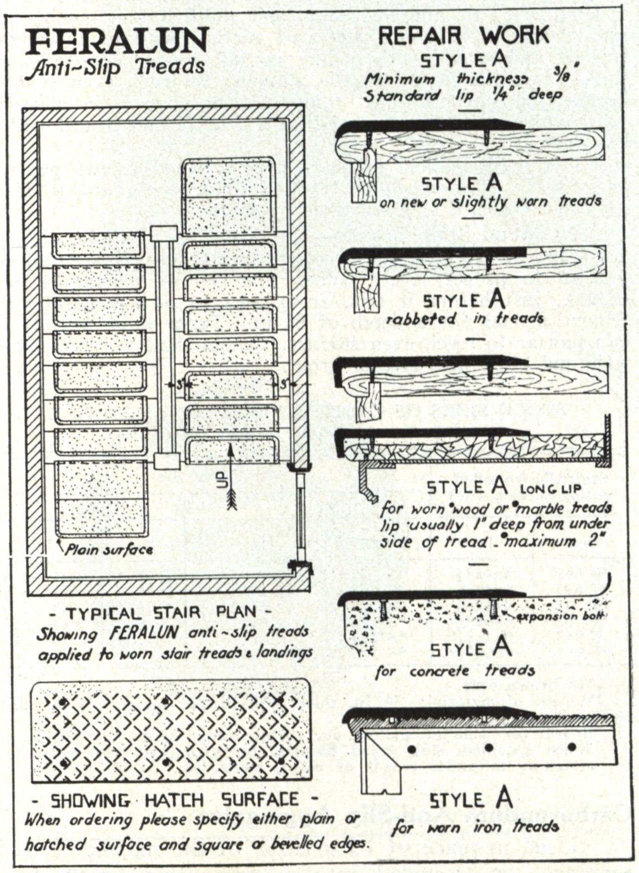

FERALUN
Anti-Slip Treads
STYLE "L"
3/8"-or over
7/8"
1 3/4"
Standard Anchors furnished when ordered.
Anchors to be used when saddles are set in new concrete.
Expansion bolts furnished by others. To be used when Saddles are set in old concrete, marble etc.
STYLE "W"
-Feralun- Elevator Floor
Feralun Saddle
Counter balanced Elevator door.
Not less than 1/2" thick.
STYLE "M"
Door
Exterior Saddle
With weather Stop.
STYLE "T"
Not less than 1/2"
1"
All Style "T" Saddles 5/8" or over made with recess.
BRONZALUN
DOOR SADDLES
STYLE "T"
All Style 'T' BRONZALUN Saddles 1/2" or over made with recess
1 1/4"
1 1/4"
Not less than 3/8"
1 1/2"
1 1/2"
REGULAR V Flutes
SPECIAL Rounded Bright Flutes

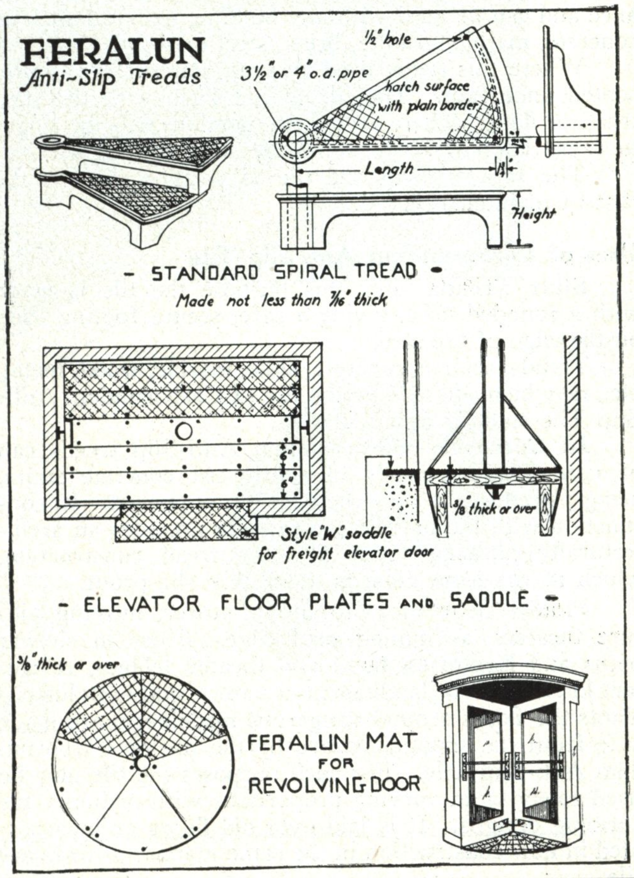
DETAIL OF STYLES AND SIZES—FERALUN ANTI-SLIP TREADS

Continued on next page


FERALUN
Anti-Slip Treads
ELEVATOR DOOR SILLS
STYLE "V-1"
Not Less Than 1/2" Thick
1/2" × 1/2"
Lugs and Lip not to exceed 2"
STANDARD HATCH SURFACE.
STYLE "V-II"
Not Less Than 1/2" Thick.
Not to Exceed 2"
Sheet Metal Nosing Furnished by others.
STANDARD SURFACE V FLUTES.
STYLE "W-W"
FERALUN Elevator Floor
Style "W" Saddle
Lip not to Exceed 2"
Not less than 1/2" thick.
6"
COUNTR BALANCED ELEVATOR DOOR.
Showing Application of STYLE "W" to Counter-Balanced—Elevator Door. Also 6" × 3/8" FERALUN Plates on Elevator Floor.
BRONZALUN
···ELEVATOR DOOR SILLS···
···SHOWING STANDARD FINISH··
STYLE "V-1" REGULAR
1 1/4"
BRIGHT FINISH
Regular V Flutes
Lip not to exceed 2"
NOT LESS THAN 3/8" THICK.
STYLE "V-1" SPECIAL
BRIGHT FINISH
Special Surface with Rounded Bright Flutes
1 1/2"
Standard Grooves are 1/8" × 1/8"
Lip not to Exceed 2"


FERALUN
Anti-Slip Treads
FERALUN PLATES
Supported on Steel Members for Platforms, Floors etc.
FLOOR PLATES, DRAIN AND TRENCH COVERS AND STRIPS.
·FLOOR PLATES·
Made 1/2" thick up to 20" × 36" Made 5/8" thick up to 36" × 48"
Made 3/4" thick up to 42" × 60"
FERALUN STRIPS· For side walks and ramps to have square edges —not to be less than 3" wide or 3/8" thick.—
1/2"
1 1/2"
1/2"
3/4
·SECTION THROUGH TRENCH COVERS·
Not less than 3/4" thick - Wide spans are provided with Truss Ribs.
FIRE-DOOR SADDLE AND RUNWAY
FLOOR-PLATES AT ELEVATOR-LANDINGS
Three ways of applying FERALUN on either straight or curved ramps.
·GARAGE-RAMPS·
STORE-ENTRANCE AND ·RAMP·


FERALUN
Anti-Slip Treads
REPAIR WORK
STYLE A
Minimum thickness 3/8"
Standard lip 1/4" deep
STYLE A
on new or slightly worn treads
STYLE A
rabbeted in treads
STYLE A LONG LIP
for worn wood or marble treads lip usually 1" deep from under side of tread maximum 2"
expansion bolt
STYLE A
for concrete treads
STYLE A
for worn iron treads
3"
3"
UP
Plain surface
- TYPICAL STAIR PLAN -
Showing FERALUN anti-slip treads applied to worn stair treads & landings
- SHOWING HATCH SURFACE -
When ordering please specify either plain or hatched surface and square or bevelled edges.


FERALUN
Anti-Slip Treads
1/2" bole
3 1/2" or 4" o.d. pipe
hatch surface with plain border
Length
Height
- STANDARD SPIRAL TREAD -
Made not less than 7/16" thick
Style "W" saddle for freight elevator door
3/8" thick or over
- ELEVATOR FLOOR PLATES AND SADDLE -
3/8" thick or over
FERALUN MAT FOR REVOLVING DOOR

SUGGESTIONS FOR THE USE OF ANTI-SLIP MATERIALS IN BUILDING CONSTRUCTION

Continued on next page

Carborundum Anti-Slip Tile

This tile is made of both Carborundum and Aloxite, abrasive products of the electric furnace. These manufactured abrasives have been recognized for years as among the greatest of all grinding materials, and are extensively used for the grinding of steel, iron, brass, bronze and other metals. Both are produced by fusing crude materials in electric furnaces at extremely high temperatures. The resultant crystal masses are taken from the furnace and are broken and crushed to standard sizes of grains or crystals. These crystals are mixed with clays and ceramic materials and moulded into the various sizes and shapes of tile. The tile are then vitrified in high temperature kilns.

Carborundum Anti-Slip Tile presents a gripping, safe surface that can not wear smooth. It is of the same structure and texture, and the same degree of hardness throughout. It retains its safe, anti-slip surface as long as the tile itself lasts.

The tile is made in white and reddish brown colors, in standard shapes and sizes as shown in the table below.

Advantages of Carborundum Anti-Slip Tile

Carborundum Anti-Slip Tile never loses its anti-slip surface and is practically non-wearing. Under the slight wearing action of traffic it literally renews its safe surface.

It is safe under all conditions. Oil, water or grease does not affect its anti-slip qualities.

The tile is remarkably strong. Tests at room temperature have shown it to have a *transverse strength* of about 5500 lbs. per sq. in.

Carborundum Anti-Slip Tile presents a fine appearance and can be used with any building material such as concrete, marble, granite, brick, steel or wood.

Where this tile is used an even, flat surface is presented underfoot. The tile is laid flush with the stair tread or floor. There are no corrugations, ribs or ridges to cause tripping or to annoy by accumulating dirt.

The resistance of the tile to wear eliminates the cost of maintenance.

Uses of Carborundum Anti-Slip Tile

Stair Treads—For this purpose the tile is made with a rounded nose, giving a safe, secure footing even on the edge of the step.

Treads, such as concrete, slate, marble, wood, metal, etc., may be made safe by the use of Carborundum Anti-Slip Tile suitably applied.

In Concrete—Carborundum Anti-Slip treads can be used advantageously in reinforced concrete stairs, being placed at the time the concrete is poured. In conjunction with tile or terrazzo this tile provides an architecturally pleasing form of stair tread construction, which at the same time is absolutely slip-proof.

Floors—Entrances to shops, stores, moving picture theaters, swimming pool edges, floors in shower baths and lavatories, hotel and theater lobbies, restaurant kitchens, floor landings at elevators, and in industrial plants the floors around dangerous machinery, are made safe from the slipping hazard by the use of Carborundum Anti-Slip Tile. For such purposes the tile may be used solely or in varying proportions with ordinary tile forming designs. It is laid over old floors or incorporated in new construction in the same manner as ordinary tile.

Ramps—In no type of walkway surface is prevention of the slipping hazard so essential as in the construction of ramps. Here the Carborundum Anti-Slip Tile is especially suitable. It will stand up indefinitely under the severest traffic and its architectural attractiveness for finer work does not preclude its use for heavy duty where its anti-slip qualities give needed foot purchase to workmen handling loads.

Entrances—Stores and building entrance floors are made safe for pedestrians by Carborundum Anti-Slip Tile. It eliminates the menace of slippery doorways, gives long service and provides architectural attractiveness. It can be laid solid or in conjunction with ordinary tile to form various designs.

Swimming Pools—Carborundum Anti-Slip Tile is particularly suitable for use along the edges of swimming pools, presenting a safe, secure footing for swimmers. Water does not affect its anti-slip qualities. Such borders should not be less than 18 in. in width.

Specifications for Laying Carborundum Anti-Slip Tile

In Concrete on Floors, Ramps, etc.—Tile to be soaked in water and laid in same manner as ordinary vitrified tile. (Note: detailed specification will be furnished on request.)

In Mastic on Wood, Steel and Concrete Surfaces—Surface shall be thoroughly cleaned and dry. Tile shall be thoroughly cleaned and dry. Surface shall be coated with boiling asphalt roofing mastic, ¼ in. thick, for an area of not more than 4 tile at one time. Lay tile in hot mastic, tamping to level, even surface, keeping joints true to line. Joints shall be 1/16 to ¼ in. wide and filled with hot mastic, trimmed with a knife and ironed with a hot jointer.

In Treads of Concrete Stairways—Pour concrete stairs and finish as usual. When tread is hard enough, just before concrete sets, from area to be covered by tile remove concrete for a depth of ⅝ in. Tamp water soaked tile into concrete to level, even surface. Joints shall be 1/16 to ¼ in. wide and filled with cement grout.

On Wooden Stair Treads—Tread shall be recessed for a depth of 13/16 in. and for length and width to suit number and size of tile to be used. Recessed surface shall be thoroughly cleaned and coated with boiling asphalt roofing mastic 1/16 in. thick. Lay tile in hot mastic, tamping to level, even surface, keeping joints true to line. Joints shall be 1/16 to ¼ in. wide and filled with hot mastic, trimmed with a knife and ironed with a hot jointer.

Tile shall be held in position by 2 wood screws per tile, or by a No. 20 gauge brass, 1x¼-in. angle, toe guard, the 1-in. leg being fastened to wood tread by screws.

On Metal Stair Treads—Metal surface shall be cleaned and a 1½-in. layer of 1:2½ cement mortar placed on tread and finished to proper level. When this bed of mortar is hard enough, just before it sets, from area to be covered by tile remove mortar for a depth of ⅝ in. Tamp water soaked tile into mortar to level, even surface. Joints shall be 1/16 to ¼ in. wide and filled with cement grout.

STOCK SIZES OF CARBORUNDUM ANTI-SLIP TILE
(Colors: white and reddish brown)

Stair tile (rounded nosing on long side)		Floor tile			
		Square		Oblong	
No.	In.	No.	In.	No.	In.
*T 642	6x4x½	S 32	3x 3x ½	R 3152	3x1½x ½
*T 643	6x4x¾	*S 62	6x 6x ½	R 632	6x3 x ½
*T 62	6x6x½	S 63	6x 6x ¾	R 633	6x3 x ¾
T 63	6x6x¾	*S 94	9x 9x1	*R 963	9x6 x ¾
T 943	9x4x¾	*S 124	12x12x1	*R 1264	12x6 x1
*T 963	9x6x¾	*S 125	12x12x1¼		

*In brown only.

Weight of material: ½ in. thick, 6¾ lb. per sq. ft.; ¾ in. thick, 10 lb. per sq. ft.

Brown tile, 1.38 oz. per cu. in. White tile, 1.25 oz. per cu. in.

When specified, stair tread tile will be made with two screw-holes for attaching to under treads of wood, metal, etc.

Carborundum Anti-Slip Aggregates

Used in place of 10 to 20% of the marble chips in terrazzo, or troweled into a granolithic finish, these aggregates, developed especially for the purpose, make such walkway surfaces satisfactorily anti-slip and more durable.

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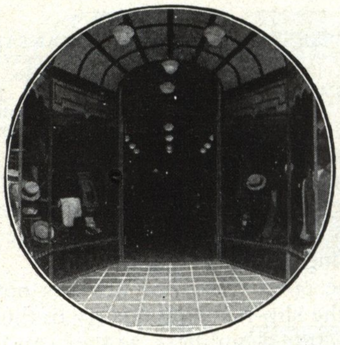
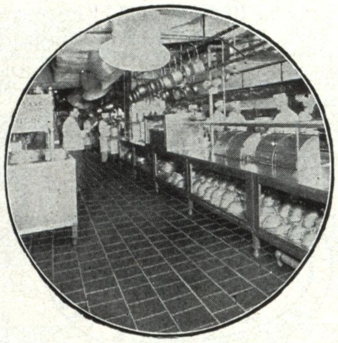
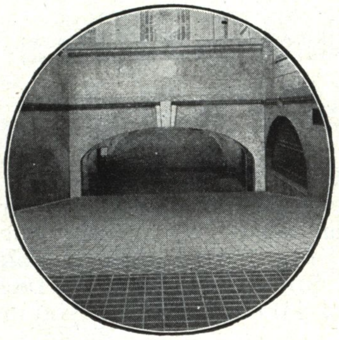


Store Front

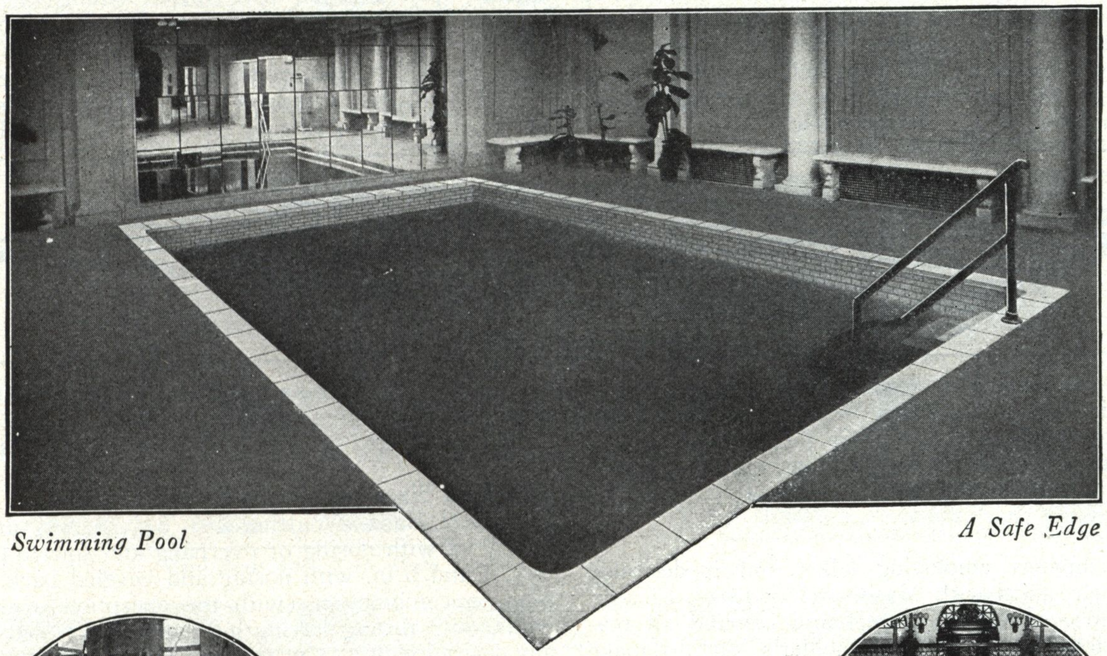


Kitchen



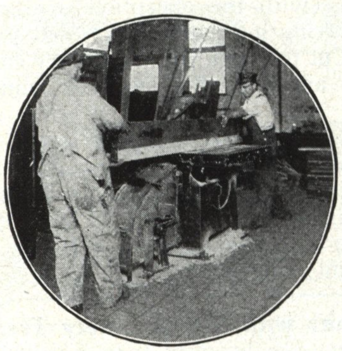
Ramp

CARBORUNDUM
Anti-Slip Tile



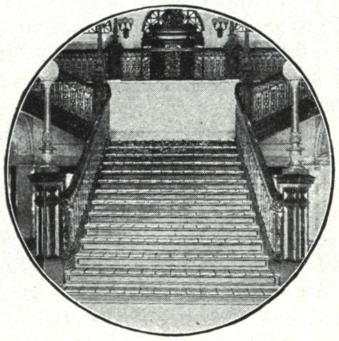
Swimming Pool

A Safe Edge



Industrial Plant

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1910



Stairway

SOME OF THE USES FOR CARBORUNDUM ANTI-SLIP TILE

AMERICAN MASON SAFETY TREAD CO.

GENERAL OFFICE AND FACTORY
LOWELL, MASS.

REPRESENTATIVES

NEW ENGLAND STATES, Metallic Equipment Co., 10 High Street, Boston, Mass.

EASTERN PENNSYLVANIA, Metallic Equipment Co., 400 Chestnut Street, Philadelphia, Pa.

GENERAL DISTRIBUTERS, Joseph T. Ryerson & Son, New York, N. Y., Chicago, Ill., St. Louis, Mo., Cleveland, Ohio, Detroit, Mich., Minneapolis, Minn., Milwaukee, Wis.

WESTERN MISSOURI, KANSAS and OKLAHOMA, John B. Ricketts, 604 Ridge Building, Kansas City, Mo.

CANADIAN REPRESENTATIVES, Darling Brothers, Ltd., Montreal; Toronto, Halifax, Ottawa, Winnipeg, Calgary, Vancouver.

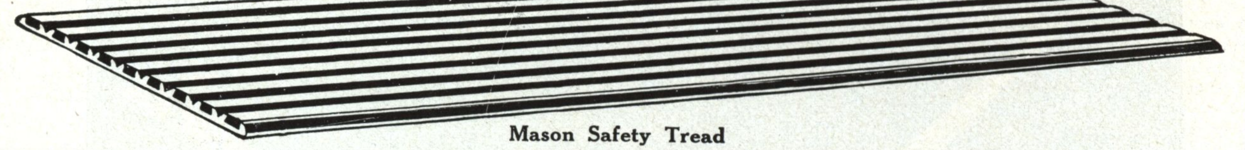
UNDERWRITERS' LABEL

Products

Mason Safety Tread (lead or carborundum filled); Stanwood Step and Tread; Stair Nosings; Mason Non-slip Ladder Shoes; Karbolith Flooring; Masonco Saftread; Mason Structural Tread.

Uses of Mason Safety Treads

Mason safety treads are adaptable to all situations, inside or outside of a building, where the surface with which the foot comes in contact is liable to become slippery or where the steps have become worn, cupped or hollowed to an uneven surface. Mason safety treads are suitable for use on granite, marble, slate, cement, iron or wood stairs. They can be installed during the construction of a building or on old stairs. Being a surface tread, Mason safety treads replace worn-out structural safety treads (so-called), without any necessity for the demolition or rebuilding of the stairway itself.



Mason Safety Tread

They are especially desirable for the equipment of stairs in school buildings, department stores and wherever the traffic is heavy; for thresholds of doors and elevators, fire doors, inclined passageways, ramps and floors around machinery.

Insurance

Establishments employing labor find it desirable to equip their stairs with Mason safety tread, as accident insurance companies expect and demand all reasonable endeavor on the policy-holder's part to make the plant safe. They endorse and recommend the use of this material.

We know of no case where damages have been claimed for injuries from slipping or tripping that has been lost to the defendant when Mason safety treads have been used as a preventive and we have a record of many cases of such claims that have been decided in the defendant's favor. Many hundreds of school buildings are equipped with these treads and not a single accident has ever been reported to us from this use.

Mason safety treads have been used constantly for over 25 years, and over 8,000,000 sq. ft. have been sold.

Description of Mason Safety Treads

Mason safety treads are made of rolled steel or extruded hard brass (delta metal) of substantial thickness ($1/4$ in.) with alternate dovetailed and U-shaped grooves. The dovetailed grooves are filled either with lead or a mixture containing a large proportion of carborundum and other abrasive substances, firmly held in place by the continuous supporting ribs of hard metal, which give long wear, preserving the non-slipping quality of the tread for a long series of years.

The open U-shaped grooves not only add to the slip-resisting quality of the tread, but facilitate cleanliness, as they can be easily swept or washed out. They also serve as a protection against the danger inherent in a flat surface tread, as they catch and hold any foreign substance which might be dropped upon them, such as pencils, burned matches, cigar ends or wads of paper, thus giving the foot a sure and effective contact.

With the Mason safety tread there can be no filling of open grooves with mushrooming or creeping lead, no jagged edges for the retention of filth or germs, and there is no abrasive top dressing to wear off and leave a polished, dangerous, slip-inviting surface.

Mason safety treads are especially desirable for use on concrete stairs, as they prevent the raw edge from chipping off. For this use, a special anchor is furnished which holds the treads firmly in place. These anchors are easily worked into the soft concrete when laid.

Standard Sizes of Mason Safety Treads

Steel Base—Widths, $2\frac{1}{2}$, $3\frac{3}{4}$, 4, $4\frac{3}{4}$ and 6 in. flat; 3 in. with nosing or overhang and square back and $3\frac{1}{2}$, 4 and 6 in. with nosing and beveled back. These sizes in combination (with the exception of the 3-in. width with nosing having a square back) will produce any desired width. Cut to order with necessary countersunk holes and with anchors when used in connection with cement.

See details on following page.

Hard Brass Base—Widths, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, 4 and 6 in. with plain front edge, same as shown above; widths, $2\frac{1}{8}$, 3, $3\frac{1}{2}$ and $5\frac{1}{4}$ in. with lip nosing, and $2\frac{1}{8}$, $2\frac{3}{4}$ and $3\frac{1}{2}$ in. with special nosing $1\frac{1}{4}$ in. deep.

See details on following page.

Repairing Worn Stairs with Mason Safety Tread

Badly worn stairs are brought to a finished condition by the use of Karbolith filling, which forms a bed for Mason safety tread.

The width of safety tread required can readily be determined by the amount of wear on the wood or marble stairs but should never be less than $7\frac{1}{2}$ in. When the stairs are so deeply worn that the nosing shown on the $3\frac{1}{2}$-in. section (Fig. 4 or 11) will not cover the edge of the filling used to restore the level, Fig. 14 or a false nosing of steel is furnished, con-

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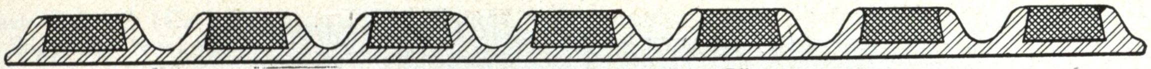
Fig. 1. Steel Base, 6 In. Wide, 7 Ribs

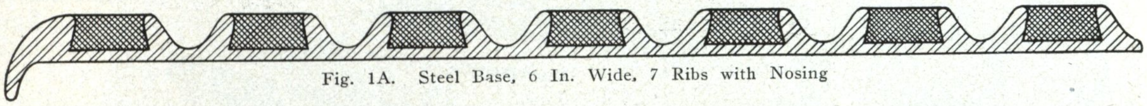
Fig. 1A. Steel Base, 6 In. Wide, 7 Ribs with Nosing

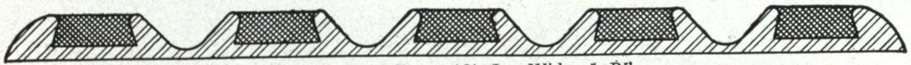
Fig. 2. Steel Base, 4¾ In. Wide, 5 Ribs

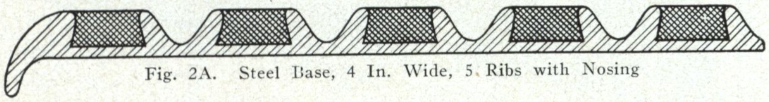
Fig. 2A. Steel Base, 4 In. Wide, 5 Ribs with Nosing

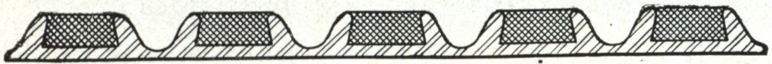
Fig. 3. Steel Base, 4 In. Wide, 5 Ribs

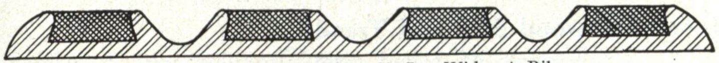
Fig. 3A. Steel Base, 3¾ In. Wide, 4 Ribs

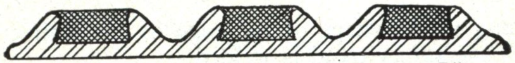
Fig. 6. Steel Base, 2½ In. Wide, 3 Ribs

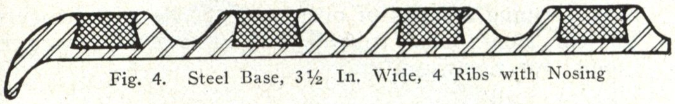
Fig. 4. Steel Base, 3½ In. Wide, 4 Ribs with Nosing

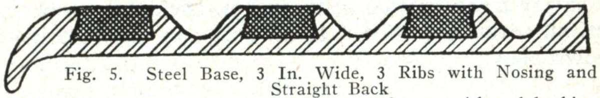
Fig. 5. Steel Base, 3 In. Wide, 3 Ribs with Nosing and Straight Back
Especially made for granolithic work for use with cork backing

Steel Base

Base is of rolled, unperforated steel with alternate U-shaped and dovetailed grooves filled with lead or carborundum

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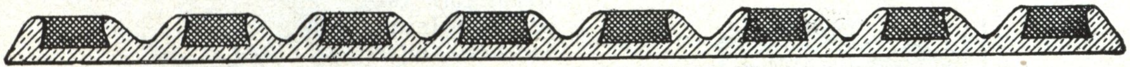
Fig. 7. Hard Brass Base, 6 In. Wide, 8 Ribs

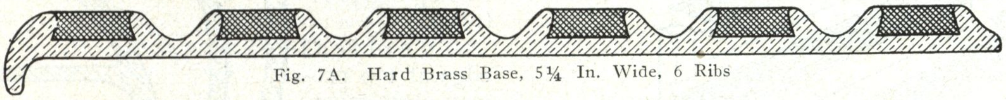
Fig. 7A. Hard Brass Base, 5¼ In. Wide, 6 Ribs

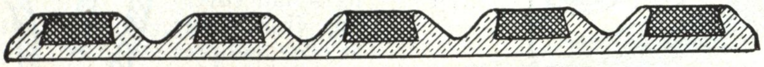
Fig. 8. Hard Brass Base, 4 In. Wide, 5 Ribs

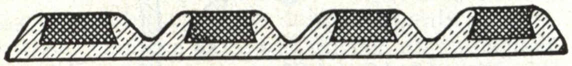
Fig. 9. Hard Brass Base, 3 In. Wide, 4 Ribs

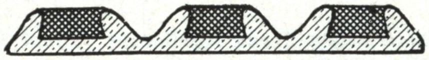
Fig. 10. Hard Brass Base, 2¼ In. Wide, 3 Ribs

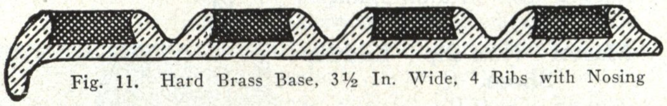
Fig. 11. Hard Brass Base, 3½ In. Wide, 4 Ribs with Nosing

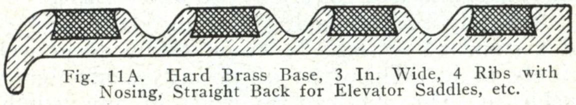
Fig. 11A. Hard Brass Base, 3 In. Wide, 4 Ribs with Nosing, Straight Back for Elevator Saddles, etc.

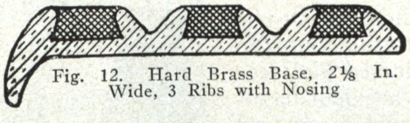
Fig. 12. Hard Brass Base, 2⅛ In. Wide, 3 Ribs with Nosing

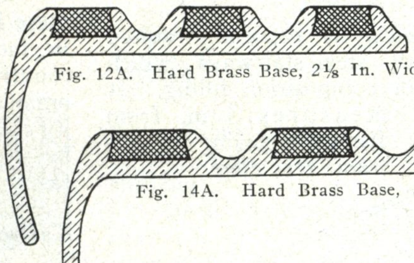
Fig. 12A. Hard Brass Base, 2⅛ In. Wide, 3 Ribs with Nosing

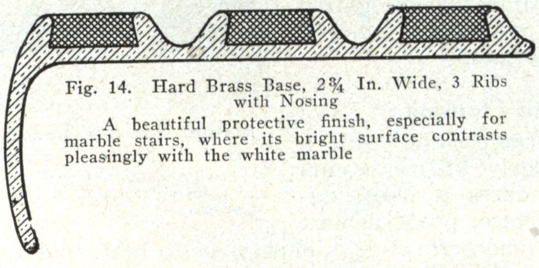
Fig. 14. Hard Brass Base, 2¾ In. Wide, 3 Ribs with Nosing

A beautiful protective finish, especially for marble stairs, where its bright surface contrasts pleasingly with the white marble

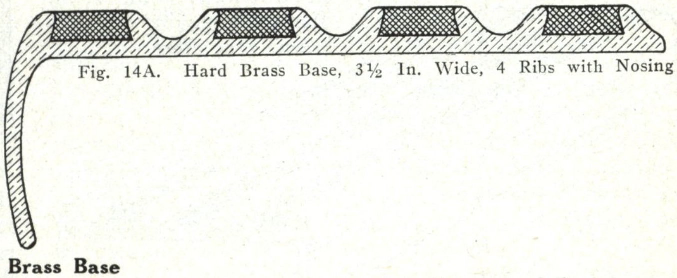
Fig. 14A. Hard Brass Base, 3½ In. Wide, 4 Ribs with Nosing

Hard Brass Base

Base is of hard extruded brass (delta metal) with alternate U-shaped and dovetailed grooves filled with lead or carborundum

Full Size Sections of Mason Safety Tread

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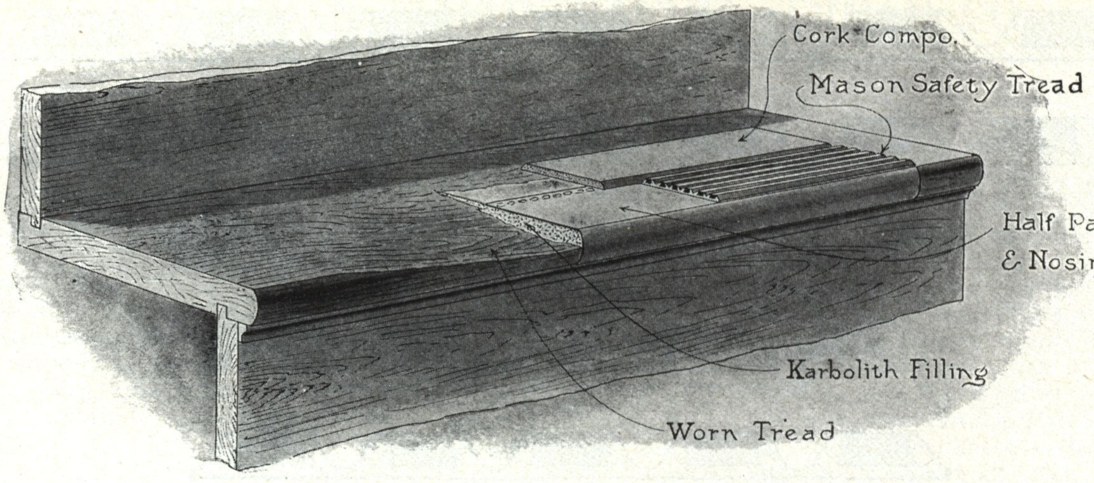


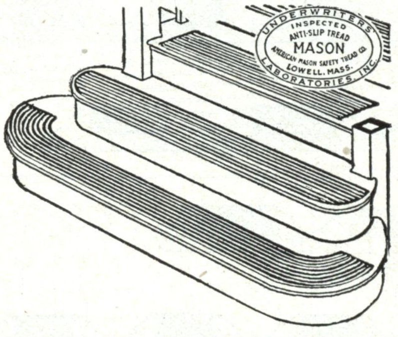
Method of Repairing Worn Treads by Use of Mason Safety Tread, Karbolith and Cork Carpet

forming to the shape of the edge of the stair tread, to which the safety tread is welded.

In many cases where economy is desired, a section of safety tread is used at the front, backed by cork carpet, all securely attached to a "half pan" and nosing as shown above.

Mason Safety Treads for Curved Stairs

Mason safety treads may be curved to any radius such as is usually specified at the bottom of a stairway.

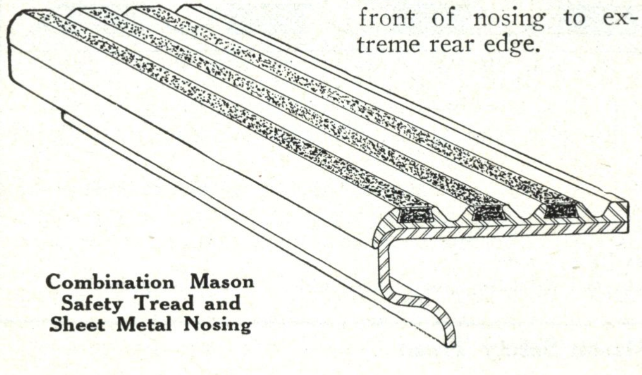


Mason Safety Tread Applied to Curved Stairs

Combination Mason Safety Tread and Nosing

A safety nosing made of 1/8-in. sheet steel plate and a standard section of Mason safety tread welded securely to it. This type of nosing is effective, reasonable in price and can be made in any length or width desired.

The type illustrated below is especially suited for use in connection with steel stairways which call for a concrete, asphalt or composition filling. It measures 3 in. from front of nosing to extreme rear edge.



Combination Mason Safety Tread and Sheet Metal Nosing

Stanwood Step and Tread

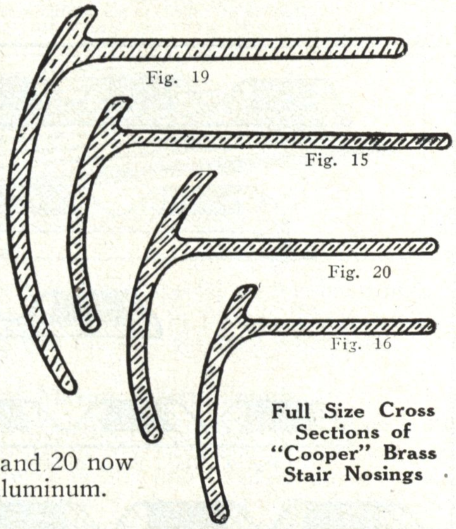
Frames of rolled steel, provided with a ledge to carry steel strips set on edge and tied together with rods, forming a series of openings. Made with hangers for car steps; also suitable for stairways to engine rooms, for areaways, etc.

"Cooper" Brass Stair Nosing

For use with safety tread, cork carpet, linoleum, rubber, interlocking tile or composition treads.

Vertical edge at top protects stair covering from wear at edge and prevents chipping. Fastened with screws through flange.

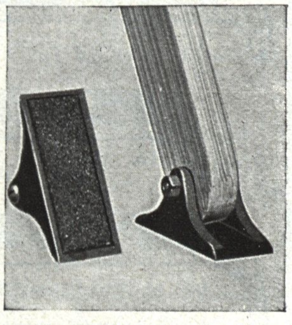
Figs. 15, 16 and 20 now stocked also in aluminum.



Full Size Cross Sections of "Cooper" Brass Stair Nosings

Mason Non-slip Ladder Shoes

Many thousands of these ladder shoes are in use in factories throughout the country. Endorsed and recommended by accident liability companies and recognized by the courts as efficient safety devices.



Mason Non-slip Ladder Shoes

Showing method of application and abrasive material in bottom of shoes

Karbolith Flooring

A composition with a base largely of magnesium that produces a hard, durable surface, proof against rats, fire and germs. It is impervious to heat, cold and dampness and will not chip, crack, tear loose or disintegrate. It can be laid over cement, iron or wood, and binds firmly to the base. We manufacture this flooring and furnish instructions for installing it.

Continued on next page

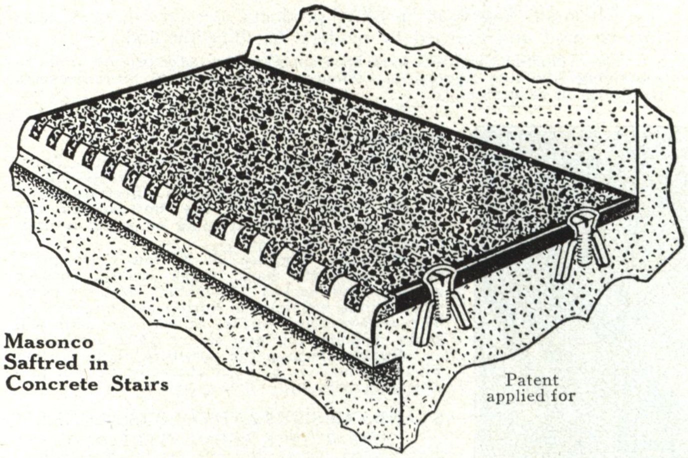
Masonco Saftred (Carborundum Filled Treads with Slipproof Nosing)

Masonco Saftred is designed to meet the present-day demand for a tread that will positively prevent accidents and combine appearance with durability.

Plain nosings of cast iron, steel or other hard materials may prove satisfactory from the standpoint of durability, but even though coated with a thin layer of abrasive, they soon become polished smooth and slippery. On the other hand, nosings which consist solely of tile or other non-slip materials may prevent slipping, but they do not possess durability.

Masonco Saftred is a perfectly flat tread with a nosing consisting of alternate hard metal and carborundum teeth. The two wear down evenly together, thus insuring both durability and non-slip qualities.

This is the only type of metal-base safety tread with a nosing which not only prevents the foot from slipping forward over the edge of the step, but prevents it from slipping sidewise as well.



Masonco Saftred in Concrete Stairs

Advantages—Whatever the size, Saftred is furnished complete in one unit, ready for installation.

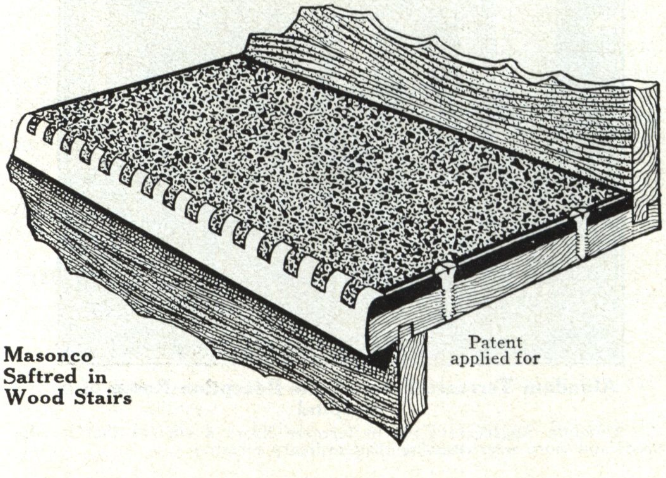
It is a flat tread with plain surface—no corrugations, projections or depressions.

Light in weight; built for durability.

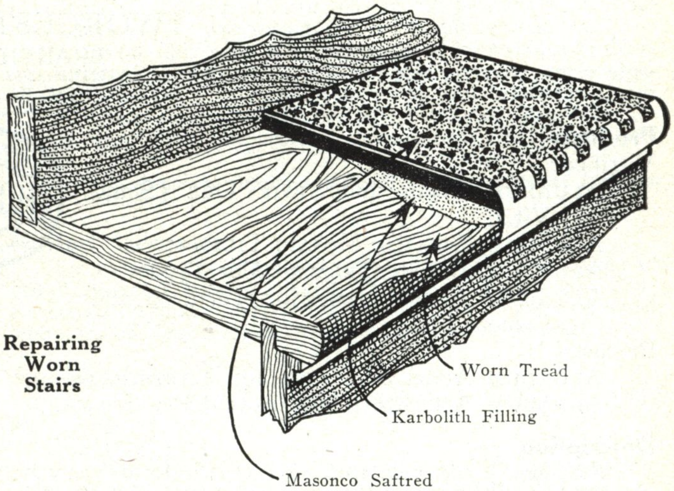
The tread remains slipproof during its entire life.

A deep nosing, furnished in any shape, is made an integral part of the stair base.

How Furnished—Masonco Saftreds are made in one piece, in widths to fit any tread, and in lengths up to 60 in. Nosings are regularly $\frac{1}{2}$ in. deep, but nosings of any special size or shape will be furnished to meet requirements. The treads are shipped with screw holes countersunk, ready for installation.



Masonco Saftred in Wood Stairs



Repairing Worn Stairs

Repairing Worn Stairs with Masonco Saftred

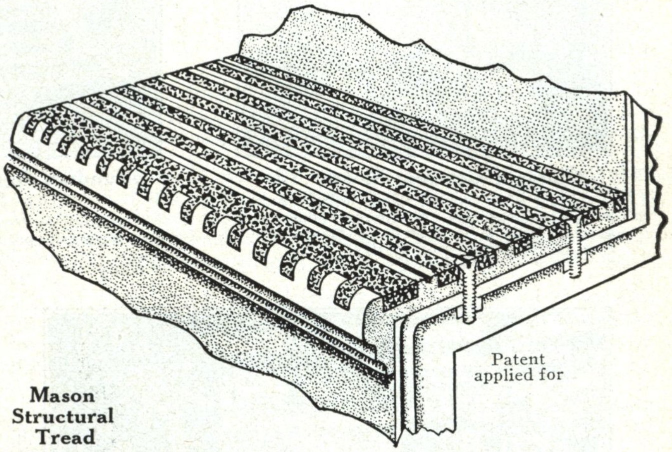
Instead of tearing out worn stairs, they can be economically and durably repaired with Masonco Saftred.

First build up the worn portions with composition filler, and then apply Masonco Saftred with slipproof nosing built to fit your stair nosing. Thus, all evidence of wear or repair will be concealed.

Mason Structural Tread (Requires no Subtread)

Mason Structural Tread is a complete step and safety tread combined. It requires no subtread, can be installed with or without a riser, and will be furnished ready to bolt to staircase stringers if so desired.

This tread consists of a channeled cast iron base, filled with Mason carborundum filling, which extends to the extreme front edge. The nosing, which is similar to that of Masonco Saftred, prevents any possibility of slipping.



Mason Structural Tread

Uses—Mason Structural Tread can be used with any type of iron stair construction. It is particularly recommended for power plants, engine or boiler rooms, factories, schools, and for all heavy traffic conditions.

How Furnished—Mason Structural Treads are furnished in any widths; in lengths up to 60 in.; and in thicknesses of $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$ and $\frac{3}{4}$ in.

The $\frac{1}{2}$-in. thickness is recommended for treads up to 36 in., the $\frac{9}{16}$-in. thickness for treads up to 40 in., the $\frac{5}{8}$-in. thickness for treads up to 48 in., and the $\frac{3}{4}$-in. thickness for treads up to 60 in. long.

NORTON COMPANY

"Norton Floors"—Alundum (Non-slip) Floor and Stair Tiles and Treads

WORCESTER, MASS.

BRANCH OFFICES

NEW YORK, N. Y., 53 Park Place
PHILADELPHIA, PA., 3208 Market Street
DETROIT, MICH., 233 West Congress Street
PITTSBURGH, PA., 338 Third Avenue
CHICAGO, ILL., 11 North Jefferson Street
HAMILTON, ONT., 3 Beach Road

Products

Vitrified:

- Alundum Floor and Stair Tile (Semi-Vit.).
- Alundum Ceramic Mosaic Tile.
- Alundum Mosaic Treads (Mat Type).
- Alundum Aggregates (for Terrazzo and Cement Floors).

Precast:

- Alundum Aggregate Tile and Thresholds.
- Alundum Aggregate Treads and Platforms.

Description

"Alundum" is the trade-mark of an electric furnace abrasive made by Norton Company and for many years used in the manufacture of grinding wheels, rubbing bricks and sticks, and numerous other kiln burned products.

Alundum Floor and Stair Tile and Alundum Ceramic Mosaic Tile—Semi-vitreous products containing "Alundum" abrasive bonded with clay and kiln baked in the same manner as Norton grinding wheels. The tiles are pressed in moulds to standard shapes and sizes.

Alundum Ceramic Mosaic Tile are furnished loose, packed in barrels, or mounted on paper 100% Alundum or in combination with vitreous tile. Bullnose run and in and out corner tile for swimming pools are also furnished.

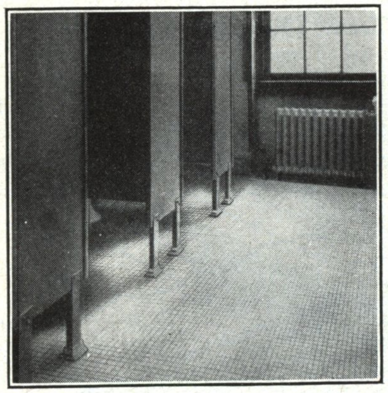
Alundum Mosaic Treads (Mat Type)—Made by pressing Alundum Ceramic Mosaic Tile into asphalt mastic strongly reinforced with a wire mesh. Sizes and shapes are furnished to detail in any standard color of Alundum Ceramic Mosaic Tile.

Alundum Aggregates—Made the same as the semi-vitreous tile except that after the pressed blocks or tile come from the kiln they are crushed and screened to standard aggregate sizes.

Alundum Aggregate Floor Tile, Thresholds, Treads and Platforms—Precast to form, sizes and shapes according to detail. These precast products contain Alundum Aggregates and marble chips cement bonded, cement coloring being used when required.

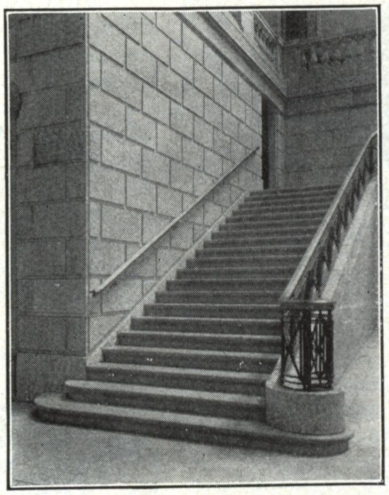
Alundum Aggregate precast products are mixed, cast, surface ground and finished by modern machine methods.

Note: Norton Licensees have been appointed to make precast products containing Alundum Aggregates. Names and addresses of these licensees furnished on request.



Alundum Ceramic Mosaic Tile

Ideal for school and other public building lavatories, swimming pools and shower baths. It permits a mosaic floor that is slip-proof—wet or dry



Alundum Aggregate Treads on a Stairway

Alundum Aggregate products make possible safe (slip-proof) and durable floor and stairs for the highest type of modern building

Features

Safe—Because of the permanently "non-slip" surface whether wet or dry. Water and oil do not decrease the slip-proof effectiveness of Norton Floors. There are no grooves nor corrugations to cause tripping or metal nosings to cause slipping.

Durable—Because all Norton Floor products contain the hard, tough electric furnace abrasive trademarked "Alundum" used for many years in the well-known Norton grinding wheels. The wear-resisting surface of Norton Floors will stand up under the most severe traffic conditions.

Quiet—Because the structure of all Norton Floor products is of such character as will prevent reverberation.

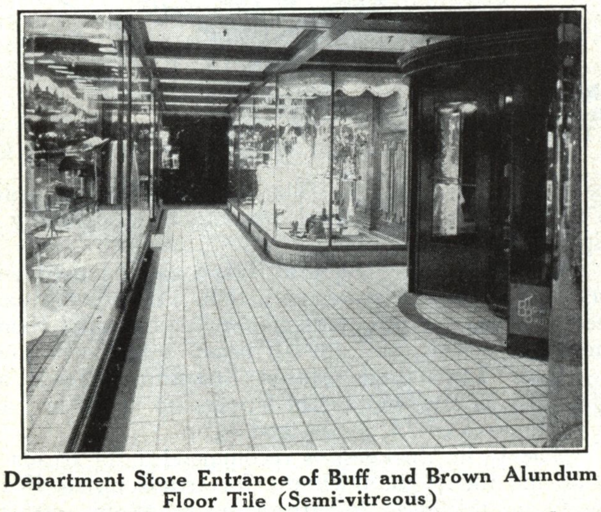
STANDARD SIZES AND COLORS ALUNDUM FLOOR TILE (SEMI-VITREOUS)

Size, in.	Colors
3x1½x½ 3x3x½ 6x3x½	Brown, buff, gray, white granite, green
6x6x½	Brown, buff, gray, green
6x3x¾ 6x6x¾	Brown, buff, gray, white granite, green
9x4x¾ 9x6x¾	Brown, buff, gray, white granite

Diagonal halves and square halves furnished.

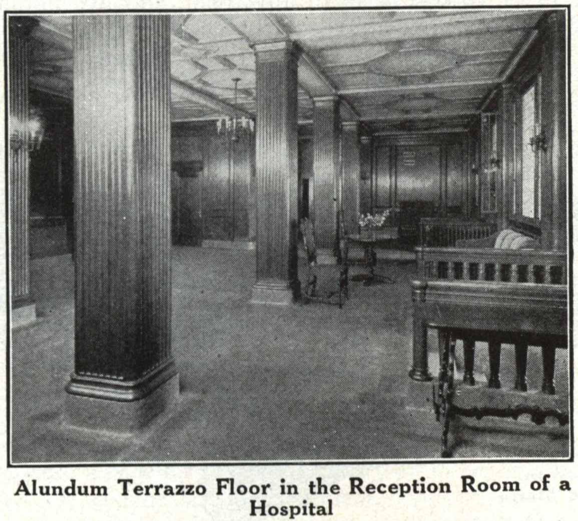
Special Sizes—7x3½ in., 9x9 in., 12x12 in., strips 7x1x¾ in., 6x1x¾ in.

Weight, net per sq. ft.: ½ in. thick, 6⅔ lb.; ¾ in. thick, 10 lb.; 1 in. thick, 13⅓ lb.



Department Store Entrance of Buff and Brown Alundum Floor Tile (Semi-vitreous)

Stormy weather creates no slipping hazards with a Norton floor and no worn hollows will appear under the heaviest traffic—even under the revolving door



Alundum Terrazzo Floor in the Reception Room of a Hospital

Alundum Aggregate gives to terrazzo floors a surface that is slip-proof and more wear-resisting than ordinary terrazzo

Continued on next page

ALUNDUM STAIR TILE (SEMI-VITREOUS)

Size, in.	Colors
6x4x½	Brown, buff, gray, green
6x6x½	Brown, buff, gray, green
6x4x¾	Brown, buff, gray, white granite, green
6x6x¾	Brown, buff, gray, white granite, green
9x4x¾	Brown, buff, gray, white granite
9x6x¾	Brown, buff, gray, white granite

Special sizes: 7x7 and 12x12 in.

Net weight of floor and stair tile: ½ in. thick, 6⅔ lb. per sq. ft.; ¾ in. thick, 10 lb. per sq. ft.; 1 in. thick, 13⅓ lb. per sq. ft.

ALUNDUM CERAMIC MOSAIC (MOUNTED OR LOOSE)

Size	Colors
¾ in. square	Brown, white granite, buff, gray, salmon, green
1 1/16 in. square	Brown, white granite, buff, gray, salmon, green
1 in. hexagonal	Brown, white granite, buff, gray, salmon, green
2¼x1 1/16 in. nosing	Brown, white granite, buff, gray, salmon, green

Thickness, ¼ in. Weight, 3⅓ lb. net per sq. ft.

ALUNDUM MOSAIC TREADS (MAT TYPE)

Width: 3⅝, 4⅞, 6, 7¼, 8⅜, 9⅝, 10¾ and 12 in.

Thickness: 7/16 in. unless otherwise specified. Reinforced. Lengths, special shapes and returned ends according to detail. Weight per sq. ft. 7/16 in. thick, approximately, 5 lb.

ALUNDUM AGGREGATES

No.	Size, in.	Colors
0	1/28—⅛	Brown, gray, buff, cream, green
1	⅛—¼	Brown, gray, buff, cream, green
2	¼—⅜	Brown, gray, buff, cream, green

Weight per cubic foot, about 70 lb.

ALUNDUM AGGREGATE FLOOR TILE (PRECAST)

Square	Rectangular	Colors
6x 6x⅝	6x12x1	Limited only by available marble chips and cement colorings.
8x 8x1	8x16x1	
9x 9x1	9x18x1	
12x12x1	12x24x1	
24x24x1		

Special sizes and shapes. Weight, net per sq. ft., 1 in. thick, approximately, 12 lb.

ALUNDUM AGGREGATE THRESHOLDS (PRECAST)

Width, in.	Thickness, in.	Length	Colors
4	1	To detail	Limited only by available marble chips and cement colorings.
6	1¼	To detail	
8	1½	To detail	

Weight, net per sq. ft., 1 in. thick, approximately, 12 lb.

ALUNDUM AGGREGATE TREADS AND PLATFORMS (PRECAST)

Sizes: 1¼ to 3 in. thick. Length, width, shape and nosing to detail. Colors limited only by available marble chips and cement colorings. Weight, net per sq. ft., 1 in. thick, approximately, 12 lb.

Physicial Properties

Results of laboratory tests of all Norton floor materials will be furnished on request.

Uses

Alundum Floor Tile (Semi-vitreous)—Suggested for use in public buildings of all kinds where traffic is extremely heavy—especially railroad stations, schools and industrial plants. Also for store entrances, elevator landings and ramps.

Alundum Stair Tile (Semi-vitreous)—Suggested for use in schools and railroad stations and other buildings where traffic is heavy and the wear on stairs especially severe.

Alundum Ceramic Mosaic Tile (Semi-vitreous)—Suggested for use anywhere that a permanent, non-slip (wet or dry) ceramic mosaic floor is desired. It is especially suitable for store entrances, swimming pools, shower baths, public toilets and washrooms, elevator landings, around lunch counters and numerous other places.

Alundum Mosaic Treads (Mat Type)—Suggested principally for application over wood stairs in repair work in schools, industrial plants, stores and similar places.

Alundum Aggregate Floor Tile, Thresholds, Treads and Platforms—Suggested for use in all types of buildings where appearance is an important consideration as well as safety and durability—such as banks, hotels, theaters, department and chain stores, churches, railroad stations, colleges and schools; also office, civic, fraternal, industrial and other buildings.

Installation

Alundum Floor Tile (semi-vitreous) should be set by experienced tile setters.

Alundum Stair Tile (semi-vitreous) should be installed by experienced tile setters, where practicable.

Alundum Ceramic Mosaic Tile should be installed by experienced tile setters.

Alundum Mosaic Treads (Mat Type) should be installed under the direction of the building contractor.

Alundum Aggregates (Terrazzo) should be installed by Norton Licensees or experienced terrazzo contractors.

Alundum Aggregates (cement floors) should be installed by experienced cement floor finishers.

Alundum Aggregate Floor Tile should be installed by Norton Licensees or experienced tile or marble setters.

Alundum Aggregate Thresholds should be installed by Norton Licensees or experienced tile or marble setters, where practicable.

Alundum Aggregate Treads and Platforms should be installed by Norton Licensees or experienced marble or slate setters.

Note: **Estimates to furnish and install should be obtained from the setting contractors.**

Norton Licensees

Licenses have been granted to responsible firms to make and install Alundum Aggregate Tile, Thresholds, Treads and Platforms, also Alundum (plastic) Terrazzo Floors. The names and addresses of these licensees will be furnished on request.

Specifications

Complete specification data (8½x11 in.) in folder will be sent on request.

Suggested form:

(1) Furnish and install where shown on accompanying drawings, Alundum products as manufactured by Norton Company, Worcester, Mass., and as below specified.

(2) Floor tile [stair tile] where shown on plans shall be Alundum Floor Tile [Alundum Stair Tile] semi-vitreous (state size, thickness, shape and color) and manufactured by Norton Company, Worcester, Mass.

Note: Recommend placing in tile specifications.

(3) Ceramic mosaic where shown on plans shall be Alundum Ceramic Mosaic Tile (state size) as manufactured by Norton Company, Worcester, Mass. Colors and design as indicated on plans or as specified.

Note: Recommend placing in tile specifications.

(4) Mosaic stair treads [mosaic floor treads] where shown on plans shall be Alundum Mosaic Treads of the mat type as manufactured by Norton Company, Worcester, Mass., the tile colors, shape of treads if special, to be as shown on plans or specified.

(5) Terrazzo floors where shown on plans shall be Alundum Terrazzo of color combination as selected, the aggregates used as manufactured by Norton Company, Worcester, Mass.

(6) Cement floors where shown on plans shall have embedded in the surface Alundum Aggregate as manufactured by Norton Company, Worcester, Mass., size and color as specified.

(7) Floor tile where shown on plans shall be Alundum Aggregate Tile as manufactured by Norton Company, Worcester, Mass., size, design and color combination as indicated on plans or as specified.

Note: Recommend placing at end of tile and next to marble specifications.

(8) Thresholds where shown on plans shall be Alundum Aggregate Thresholds as manufactured by Norton Company, Worcester, Mass., dimensions and shapes as per detail, color combination as selected, set accurately, fitted to adjacent work.

Note: Recommend placing at end of tile and next to marble specifications.

(9) Stair treads and platforms where shown on plans shall be Alundum Aggregate Treads or Platforms as manufactured by Norton Company, Worcester, Mass., thickness and nosing as per detail, in color combination as selected.

Note: Recommend placing in marble specifications.

(10) Samples—When requested and before proceeding with the work, the contractor shall submit to the architect a sample of the product as may be indicated on plans or as specified.

(11) Setting—Before proceeding with the work, the contractor shall obtain from the manufacturers complete information for satisfactory installation of the products as specified.

(12) Protection—After completion, protect all work from dirt, stain or injury until the building or work has been completed and accepted.

Literature and Samples

Literature and samples gladly sent on request.

Trade-marks

The trade-marks "Norton" and "Alundum," worldwide known and famous in the metal working industries, are now becoming recognized in the building trade as representing products of great merit and a business integrity that begets confidence and wins success.

THE SAFETY STAIR TREAD COMPANY

Wooster Safe-groove Stair Treads

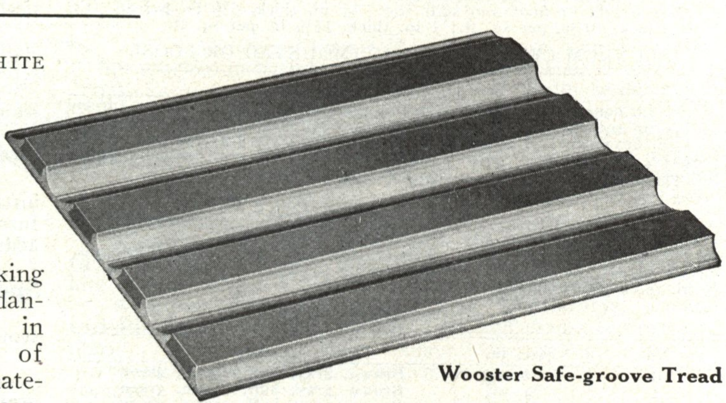
WOOSTER, OHIO

NEW YORK OFFICE: 1133 Broadway, J. W. Scott, Mgr.
CHICAGO OFFICE: 803 Transportation Building, Oscar MacNab, Mgr.
REPRESENTATIVES IN PRINCIPAL CITIES

Products

Steel Base, Yellow Brass Base and White Brass Base Wooster Safe-groove Treads.

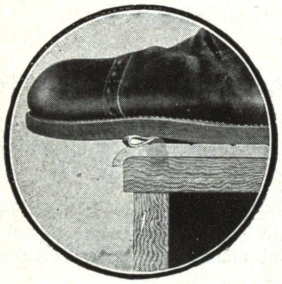
Wooster Security Nosings.



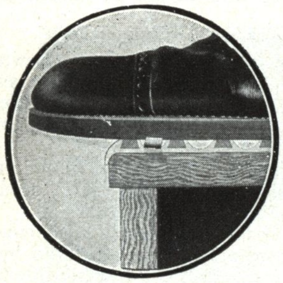
Wooster Safe-groove Tread

Wooster Safe-groove Treads

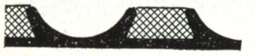
Made in three metal bases, of scientific design and proportion, to protect stairs, saddles, thresholds and other walking surfaces from becoming dangerous slipping hazards, in addition to the economy of providing the original material with a replaceable wearing surface.



The cause of many accidents on stairs unguarded by a safe surface is shown in the illustration above



Grooves provide for disposal of all debris, such as matches, that collect on stairs, leaving the surface clean and effective



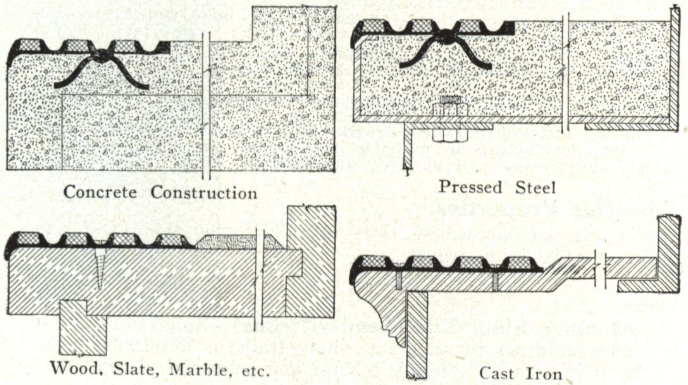
Wooster antislip extends to the base of the tread, nearly ¼ in. in thickness

Design—The design of Wooster Safe-groove Treads is that of a corrugated surface, produced in a solid and substantial base composed of alternate grooves and dovetailed recesses.

Grooves Insure Safety—The corrugated surface design offers to the foot the proper amount of antislip resistance to be of maximum efficiency. Foreign substances, such as matches, dirt and other particles that cause the foot to slip or roll when stepped on, are immediately deposited in the open grooves, leaving the antislip surface clean and effective at all times.

Construction—Wooster Safe-groove Treads are produced from the highest quality wear resisting materials. Base furnished in black steel, highly polished yellow brass or in silvery white, non-rusting and non-tarnishing white brass. Carborundum or lead antislip filler.

Specification—All stairs, platforms and landings to be provided with Wooster Safe-Groove, Carborundum (or Lead) Filled Safety Tread, to be 6 in. shorter than the entire length of the steps and to be installed according to manufacturer's specification.



Concrete Construction

Pressed Steel

Wood, Slate, Marble, etc.

Cast Iron

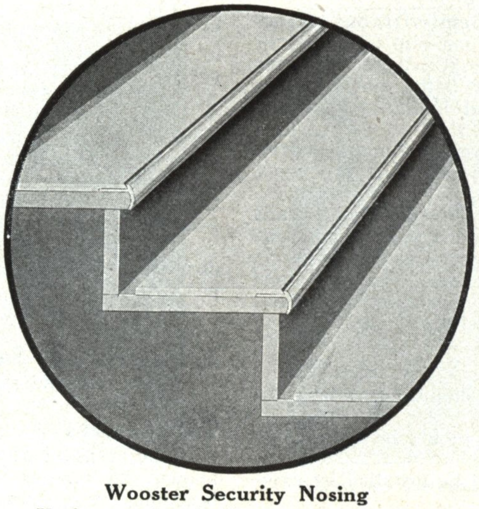
Methods of Application of Safe-groove Tread

Wooster Security Nosing

Designed to protect the edge of linoleum, composition, cork tile, cork, rubber tile or other flooring materials when used on stairs, landings, platforms or places where the edge is subjected to the destructive scuffing of foot traffic.

Foot traffic is concentrated on the front edge of a step. If the edge is not protected against this scuffing action, the material—no matter how durable otherwise—soon becomes frayed and wears away, leaving not only an unsightly but extremely dangerous installation.

Construction—Provision against this constant grind is to be found in the small upright lip which firmly grips the floor covering and shields it from the effects of both up and down traffic.



Wooster Security Nosing

Used on stairs, landings, platforms and places where the edge is subjected to the destructive scuffing of foot traffic

The horizontal flange is securely screwed to the step or projection and is completely covered by the flooring material.

Applicability—Wooster Security nosings are designed for use with any material from ⅛ to ½ in. in thickness. All nosings are cut to the length desired, polished and drilled with the proper number of screwholes for attaching.

Materials—Wooster Security nosings are produced of yellow brass and white brass metal, white brass being a strong alloy with aluminum as a base, possessing non-rusting and non-tarnishing properties which make it an ideal material with unusual low maintenance. The original silvery white luster can be restored by the occasional use of soap and water.

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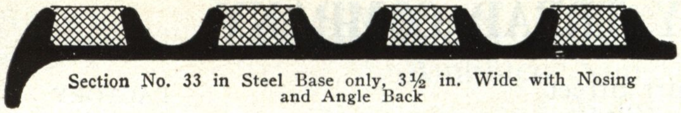
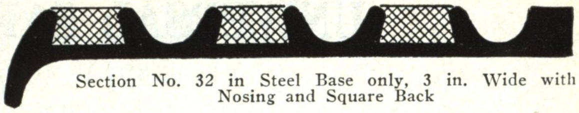
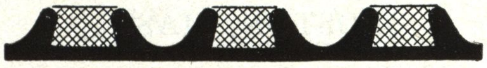
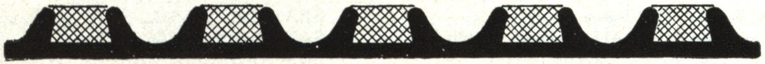
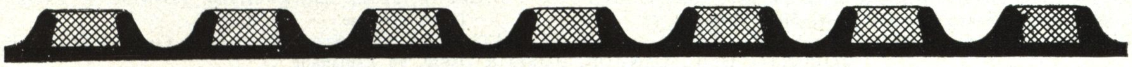

Section No. 33 in Steel Base only, 3½ in. Wide with Nosing and Angle Back


Section No. 32 in Steel Base only, 3 in. Wide with Nosing and Square Back


Section No. 31 in Steel Base only, 2½ in. Wide without Nosing

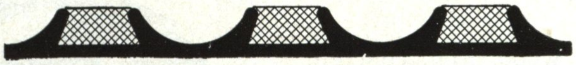

Section No. 34 in Steel Base only, 4 in. Wide without Nosing

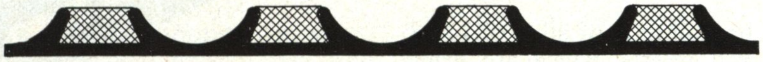

Section No. 35 in Steel Base only, 6 in. Wide without Nosing

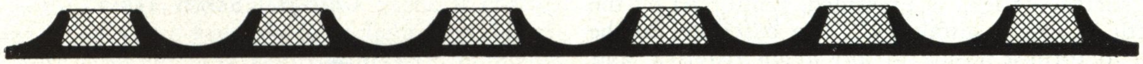
Wooster Safe-groove Tread, Steel Base, Full Size Cross Sections

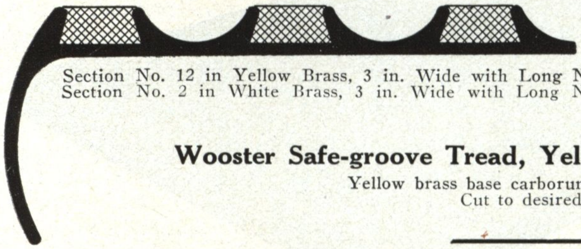
Carborundum or Lead Filled

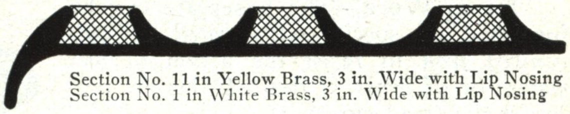
Note: Any desired width may be made by combining Standard Sections. Anchors are securely fastened to tread when it is to be placed in new concrete. Sections cut to desired lengths up to 17 ft.


Section No. 13 in Yellow Brass, 3 in. Wide without Nosing. Section No. 3 in White Brass, 3 in. Wide without Nosing


Section No. 14 in Yellow Brass, 4 in. Wide without Nosing. Section No. 4 in White Brass, 4 in. Wide without Nosing


Section No. 15 in Yellow Brass, 6 in. Wide without Nosing. Section No. 5 in White Brass, 6 in. Wide without Nosing


Section No. 12 in Yellow Brass, 3 in. Wide with Long Nosing
Section No. 2 in White Brass, 3 in. Wide with Long Nosing


Section No. 11 in Yellow Brass, 3 in. Wide with Lip Nosing
Section No. 1 in White Brass, 3 in. Wide with Lip Nosing

Wooster Safe-groove Tread, Yellow and White Brass Base, Full Size Cross Sections

Yellow brass base carborundum or lead filled; white brass base lead filled only.
Cut to desired lengths. Holes drilled and countersunk

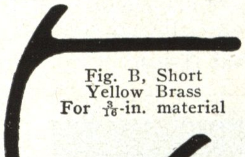


Fig. B, Short
Yellow Brass
For 3/16-in. material

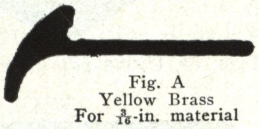


Fig. A
Yellow Brass
For 3/16-in. material

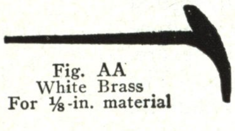


Fig. AA
White Brass
For ⅛-in. material

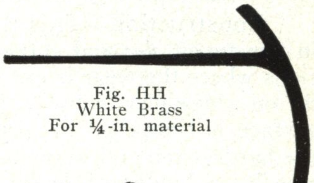


Fig. HH
White Brass
For ¼-in. material

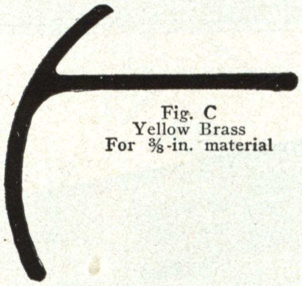


Fig. C
Yellow Brass
For ⅜-in. material

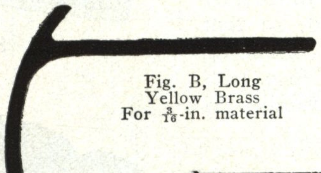


Fig. B, Long
Yellow Brass
For 3/16-in. material

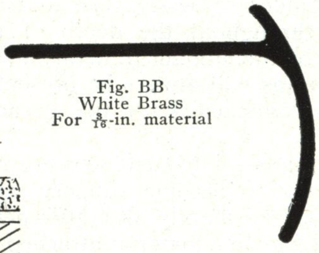
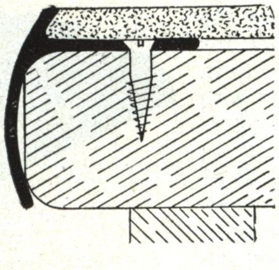


Fig. BB
White Brass
For 3/16-in. material



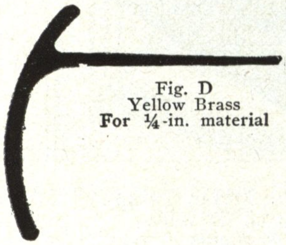


Fig. D
Yellow Brass
For ¼-in. material

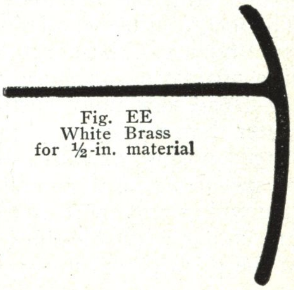


Fig. EE
White Brass
for ½-in. material

Wooster Security Nosings, Full Size Cross Sections

To protect edge of Linoleum, Cork, Rubber Tile, Composition, or Other Materials

Samples and detailed drawings furnished on request

UNIVERSAL SAFETY TREAD COMPANY

40 Court Street
BOSTON, MASS.

FACTORY
WALTHAM, MASS.

REPRESENTATIVES

NEW YORK, N. Y., Reed Iron Works, 50 Church Street
PHILADELPHIA, PA., R. R. Hammond & Co., 419 Widener Building
BALTIMORE, MD., V. D. Eastwood, 15 E. Fayette Street
CINCINNATI, OHIO, Durbrow & Otte, 206 W. Court Street
INDIANAPOLIS, IND., Hoosier Steel & Wire Co., 2230 Almont Street
ST. LOUIS, MO., W. Harding Davis, 214 N. Sixth Street
OMAHA, NEB., F. R. McConnell, 1721 Dodge Street
SEATTLE, WASH., S. W. R. Dally, 332 Pioneer Building
SAN FRANCISCO, CAL., G. H. Trask, 39 Natoma Street
LOS ANGELES, CAL., A. W. Arlin, 519 Delta Building
SIOUX CITY, IOWA, O. S. Dean, 308 Davidson Building
DALLAS, TEX., Southwestern Flooring & Sales Corp., 320 Trunk Avenue
ATLANTA, GA., Steel Specialties Co., 608 Walton Building
TORONTO, ONT., CANADA, Baines & David, 98 Esplanade

Products

Universal Safety Tread; Universal Anti-Slip Metal Tread.

Universal Safety Tread

Uses—It may be used on wood, iron, concrete or stone; on stairs and inclines in all kinds of buildings; on car steps and ladders.

Construction—The baseplate is of steel or brass, punched to receive the lead inserts, which are firmly interlocked. By this construction a continuous non-slip wearing surface of lead is presented, reinforced by the steel teeth to insure durability. The baseplate can be extended to form a nosing *of any depth required,* and the tread made in any widths up to 12 in. in one section.

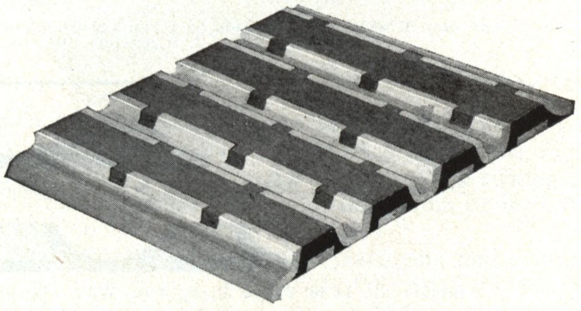
Naval Work—The baseplate can be furnished of special *alloy-coated* or *galvanized iron* to resist the action of salt water; or of *brass,* if desired, thereby rendering the tread *rustproof.*

Anchors—In concrete work special anchors for attaching the treads are furnished.

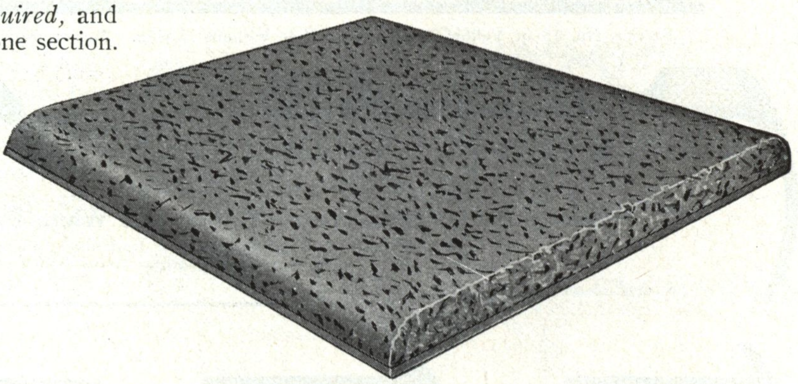
Universal Anti-Slip Metal Tread

Construction—This tread is designed in two types, *flat* and *corrugated,* for situations where the wear is exceptionally severe, as on sidewalks, subway stairs, etc. The surface is composed of grains of alundum, the hardest mineral known, held to the steel base by a binder of lead. The alundum is uniformly distributed throughout the depth of the lead, so that irrespective of the amount of wear, a surface containing numerous grains will always be presented. Hence, perfect safety combined with the greatest durability is assured.

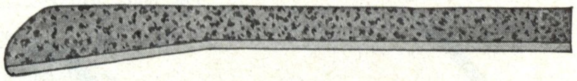
Advantages—The surface presents no steel whatever to become slippery, as the steel base is used merely as a stiffener for the non-slip abrasive material attached to it. The lead coating on all sides, combined with the tinned steel base, renders double protection against atmosphere, thereby rendering the tread absolutely rustproof, equal to or better than a galvanized product. The reinforced nosing, as illustrated, should always be specified where possible, as this construction will greatly increase the life of the tread, presenting a double-thick body of abrasive at the point of hardest wear.



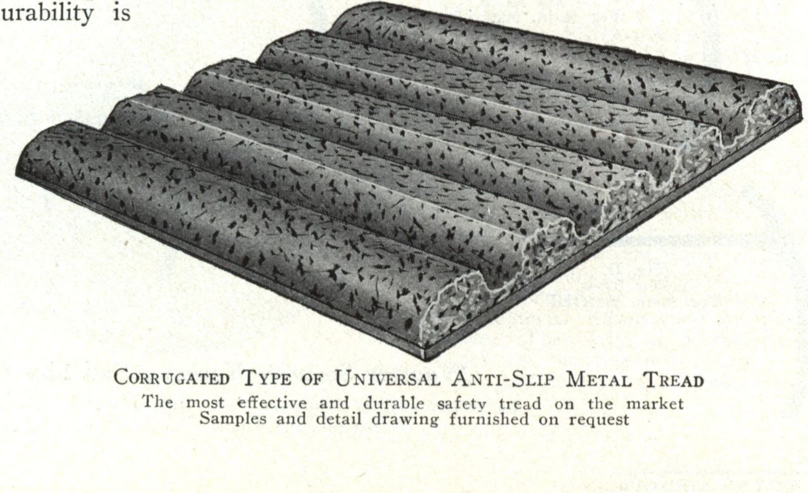
Universal Safety Tread



Flat Type of Universal Anti-Slip Metal Tread



Section of Reinforced Nosing



Corrugated Type of Universal Anti-Slip Metal Tread
The most effective and durable safety tread on the market
Samples and detail drawing furnished on request

AMERICAN BLUE STONE COMPANY

Ambluco Non-Slip Stair Treads

1 Madison Avenue
NEW YORK, N. Y.

QUARRIES AND MILLS
PORTAGEVILLE, (AMBLUCO), N. Y.

Products

Ambluco Non-Slip Stair Treads and Landings for interior steel and concrete stairways.

For Ambluco Flooring, Thresholds and Wall Base for interior and semi-interior uses, and for Genesee Valley Blue Stone for exterior uses, see page 512.

Facilities

This company has well developed quarries on its own property of about 200 acres located at Ambluco, Wyoming County, N. Y. The mills and yards are equipped with the most modern machinery so that large volumes of business can be handled without delay.

Ambluco Non-slip Stair Treads and Landings

Ambluco treads and landings established themselves wholly on their own merits, without any introduction on our part. Those who have studied their qualifications or used them, declare them to be superior to and more economical than any other type.

Color and Texture—The uniformity in color, even-grained texture and sand-sawed finish (free from saw marks and imperfections) combine to give a splendid appearance. Genesee Valley Blue Stone is characterized by a distinctive even shade of light blue, blending well with adjacent light colored surfaces, or giving a sharp clean contrast with dark materials. It is of a fine grain and even texture, being made up mostly of pure hard quartz as shown below.

Mineralogically Considered

Fine hard sand, mostly quartz	70%
Clay, as binding material	28%
Water	2%

Non-slip Property—The non-slip surface, due to the fine grained quartz, does not grip the foot to cause tripping, but gives ample security at all times against slipping without requiring resurfacing or replacing.

Durability—The extreme durability of the Ambluco treads comes from the character of the material and the steadily increasing hardness of the stone brought on by the heat of the building, causing the treads to resist wear as they age. In schoolhouses, installed as far back as 1901 they show no measurable wear and have required no maintenance. In abrasive tests it excels most other stones.

Sanitary—This great hardness prevents generation of dust and permits clean sweeping and mopping.

Strength, Weight and Fire Resistance—Few, if any, stones have a greater crushing and transverse strength than this blue stone. Likewise the stone has high tensile and shearing strengths. The following table gives the crushing strength, compared with other well-known stones:

Crushing Strength

Rockport granite (Kidder's Hand Book)	17,750 lb. per sq. in.
Vermont marble	Average 13,500 lb. per sq. in.
Genesee Valley blue stone	19,970 lb. per sq. in.

Although of great density it weighs only approximately 150 lb. per cu. ft. when cut ready to set.

It offers great resistance to extreme heat.

Cost—The initial cost of the Ambluco tread is about the same as or less than other natural stone treads and it has many and great points of superiority over them and the cheap composition and metal treads, so it can safely be adopted without first experimenting.

Accepted as Standard by Prominent Users—The City of Boston and its many suburbs adopted the Ambluco Blue Stone treads in their schools fifteen years ago. Subsequently, nearly all the rest of New England, recognizing these superior features, have done likewise. Many of the leading school architects in the Eastern, Southern and Middle-Western states specify them.

The use has not been confined to schools but has also been extended to other public buildings, such as hospitals and high class commercial buildings.

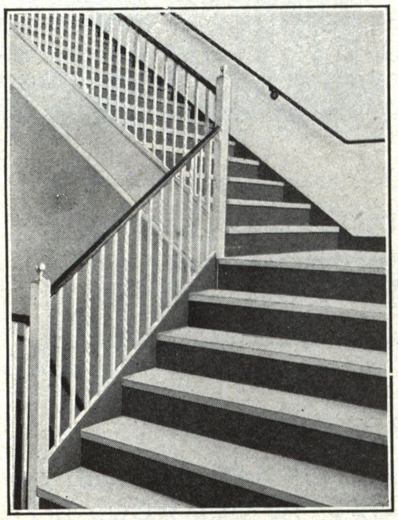
Recent Installations of Ambluco Non-slip Tread

Federal Reserve Bank, Boston, Mass., R. Clipton Sturgis, Architect; L. P. Soule & Son Co., Contractors

Jefferson School, Maplewood, N. J., Guilbert & Betelle, Architects; F. & C. Haerter, Contractors

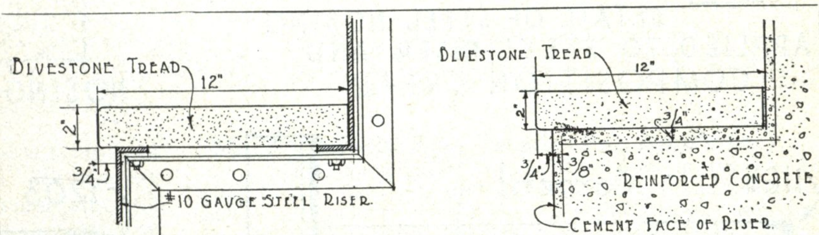
Homeopathic Hospital, Providence, R. I., Kendall Taylor & Co., Architects; J. W. Bishop Co., Contractors

St. Valentine's R. C. School, Bloomfield, N. J., Joseph A. Jackson, Architect; Jos. J. Polewka Co., Contractors.



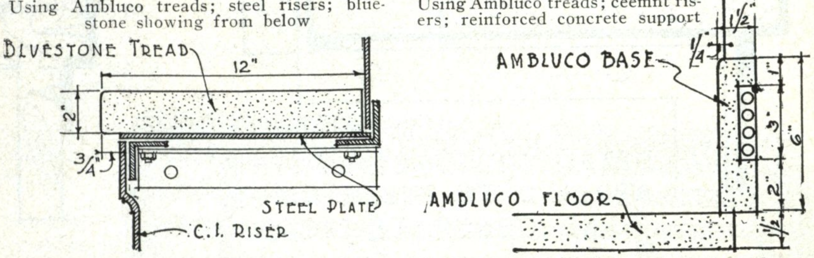
Ambluco Stair Treads, Hartford (Conn.) Fire Insurance Co. Building

Parker, Thomas & Rice, Architects
Marc Eidletz & Son, Contractors



Using Ambluco treads; steel risers; bluestone showing from below

Using Ambluco treads; ceemnt risers; reinforced concrete support



Using Ambluco treads; cast iron risers; steel subtread and steel supports

Ambluco base showing recess in back for conduits

Details of Ambluco Stair Treads

J. G. BRAUN

Manufacturer of Stair Nosings and Edgings

160 Greene Street
NEW YORK, N. Y.

609-615 So. Paulina Street
CHICAGO, ILL.

1088 Howard Street
SAN FRANCISCO, CAL.

Products

- Stair Nosings, Plain and Non-slip.
- Stair Edgings with and without nosing.
- Door Saddles, Steel and Brass.
- For Metal Mouldings, etc., see pages 734-735.

Sizes and Shipments

Can be furnished in bar lengths from 15 to 20 ft.; also cut to length, drilled and with anchors attached.

Shipments can be made from any of our three warehouses.

For further illustrations ask for Catalogue 25.

Recent Installations

Philadelphia Electric Co., Substations, John T. Windram, Philadelphia, Pa., Architect

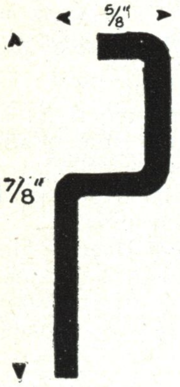
Equitable Building, Baltimore, Md., Dietrich Bros., Baltimore, Md., Contractors

Cotton Exchange Building, New York, N. Y., McDougal & Potter Co., New York, N. Y., Contractors

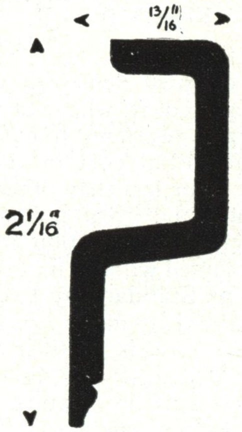
Strand Theater, York, Pa., E. C. Horn Sons, New York, N. Y., Architects

Spartanburg High School, Spartanburg, N. C., Palmer Spivey Co., Charlotte, N. C., Contractors

Hun School of Princeton, Rolf Wm. Bauhan, Princeton, N. J., Architect



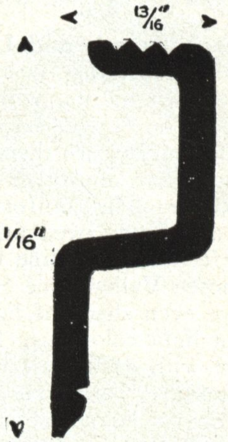
1.00 Lb.
No. 1204



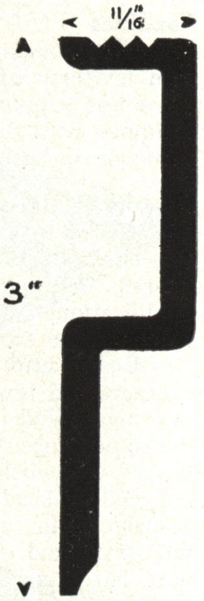
2.00 Lb.
No. 1165

UNITY OF PURPOSE-TO BE JUST
NATIONAL ASSOCIATION ORNAMENTAL IRON AND BRONZE MANUFACTURERS

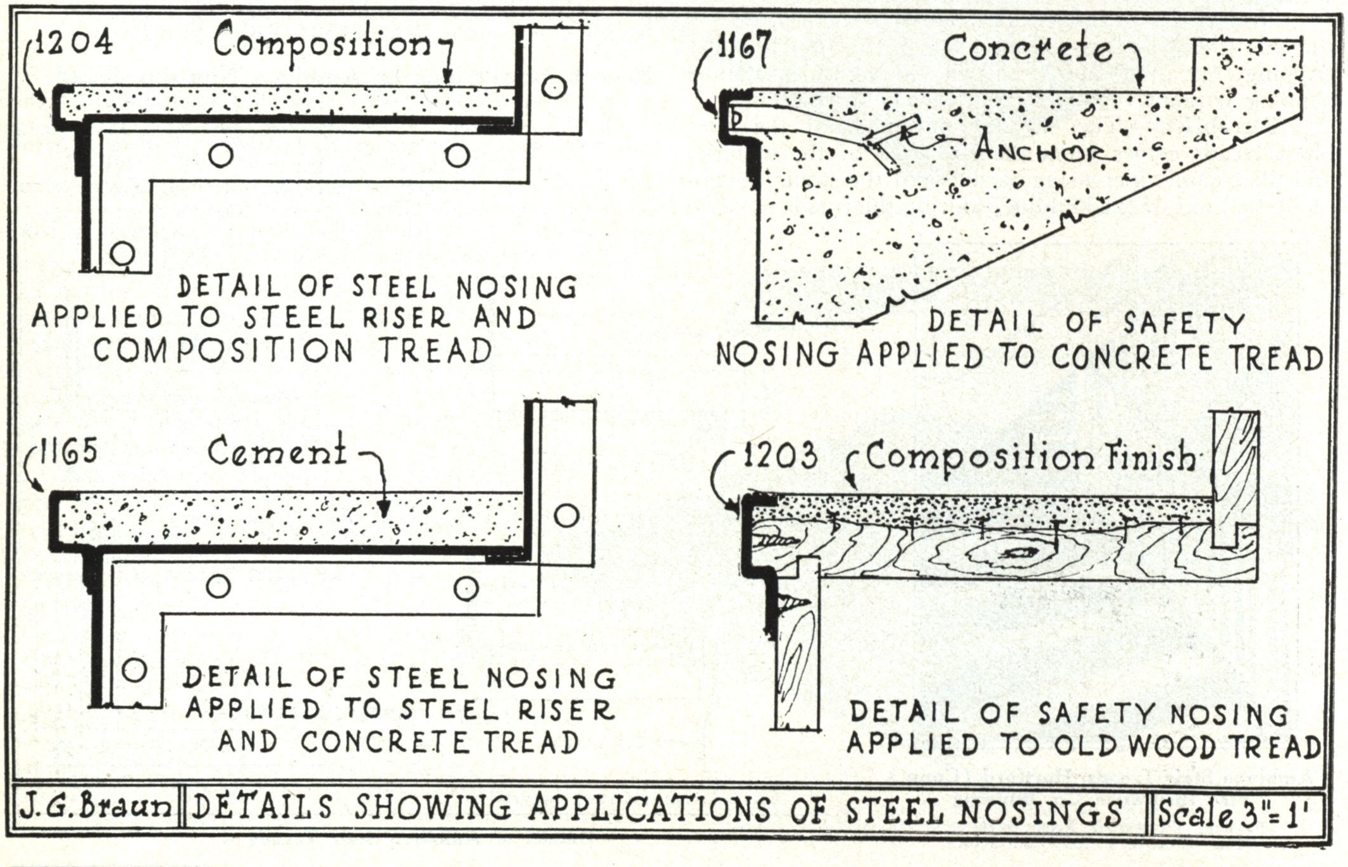
SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.



1.81 Lb.
No. 1167



2.5 Lb.
No. 1203


1204
Composition
DETAIL OF STEEL NOSING APPLIED TO STEEL RISER AND COMPOSITION TREAD
1167
Concrete
ANCHOR
DETAIL OF SAFETY NOSING APPLIED TO CONCRETE TREAD
1165
Cement
DETAIL OF STEEL NOSING APPLIED TO STEEL RISER AND CONCRETE TREAD
1203
Composition Finish
DETAIL OF SAFETY NOSING APPLIED TO OLD WOOD TREAD
J.G.Braun
DETAILS SHOWING APPLICATIONS OF STEEL NOSINGS
Scale 3"=1'

HENDRICK MANUFACTURING COMPANY

"Mitco" Interlocked Steel Grating and Shur-site Treads

51 Dundaff Street, CARBONDALE, PA.

SALES OFFICES AND REPRESENTATIVES

ATLANTA, GA., Steel Specialties Co.
BALTIMORE, MD., J. B. Embick
BOSTON 9, MASS., Universal Safety Tread Co.
CHARLESTON, W. VA., W. A. Ross Co.
DETROIT, MICH., Lon Sloan
HAZLETON, PA., Hendrick Mfg. Co.
TULSA, OKLA., W. L. Sullivan, Machinery
INDIANAPOLIS, IND., Jas. H. Carnine
LOS ANGELES, CAL., Continental Building Specialties Co.
NEW YORK, N. Y., Mitchell-Tappen Co.
PITTSBURGH, PA., Hendrick Mfg. Co.
ST. LOUIS, MO., Byron L. Ashdown
ST. PAUL, MINN., Ernest V. Walsh
SALT LAKE CITY, UTAH, Galigher Machinery Co.
SAN FRANCISCO, CAL., C. J. Waterhouse & Sons Co.
SEATTLE, WASH., Crowe-Matthews Co.
UTICA, N. Y., H. H. Frey

Products

Sole manufacturers of "Mitco" Sidewalk and Floor Grating, Driveway Grating, Concrete Armorgrid and Shur-site Treads.

Also Window Guards and Perforated Metal Screens and Grilles.

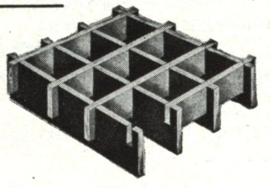


Fig. 1
Patented Interlocked Construction of "Mitco" Gratings and Treads

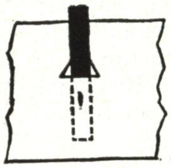


Fig. 2, Joint Prepared

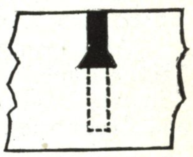


Fig. 3, Lock Completed

Bearing bars punched with dovetail slots; *transverse bars* slotted and set into place so that they stand about 1/16 in. above *bearing bars* (Fig. 2). Grating is then put under a 300-ton hydraulic press and *transverse bars* forced down flush (Fig. 3). This pressure automatically spreads metal in the dovetail slots, completely filling them and making a perfect and permanent joint. Grating panels supplied with flush sides

"Mitco" Interlocked Grating (Pat. Oct. 26, 1915)

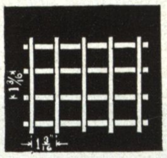
Strength—The exceptional strength and rigidity are due to the patented interlocked construction shown.

Slotting of bars does not affect carrying capacity, since dovetails are completely filled by *transverse bars* spread under pressure. Slots are above the neutral axis and are always in compression. Original strength of *bearing bars* is developed regardless of slots. *Transverse* bars, besides serving as struts, give transverse strength and firmly lock the whole construction into an integral unit, thus *distributing any concentrated load over the entire panel of grating.*

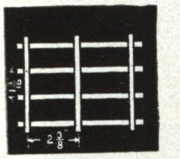
Salient Advantages—"Mitco" Grating with its rivetless construction and rectangular openings affords a rigid, well designed non-slipping floor.

Its principal advantages are: freedom from rattling; maximum lighting; maximum ventilating; non-clogging, and rust resisting; ease of upkeep and repainting; permanent rigidity and long life.

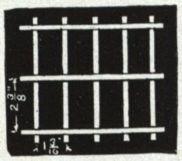
Application—"Mitco" Interlocked Steel Grating, primarily designed to meet the demand for *better* sidewalk grating, has the approval of The Transit Commission of New York City. Its field of application has constantly widened and developed to include practically every class of industry.



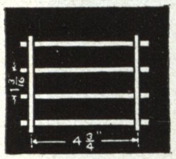
Type A



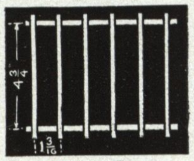
Type B



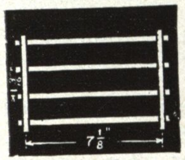
Type B Spec.



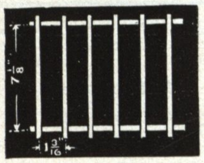
Type C



Type E



Type F



Type G

SAFE LOADS FOR "MITCO"

Safe loads in pounds per square foot based on fibre stress of 16,000 pounds per square inch

Depth, in.	Type	Bearing bars		Transverse bars		Weight per sq. ft., lb.	Span in feet										
		Size, in.	Spacing, c. to c., in.	Size, in.	Spacing, c. to c., in.		2	2½	3	3½	4	5	6	7	8	9	10
Sidewalk Gratings (for Subways. Floors, etc.)																	
1	C	1 x 3/16	1 3/16	7/8 x 1/8	4¾	7.8	835	534	370	273	208	133	93				
	E	1 x 3/16	4¾	7/8 x 1/8	1 3/16	6.3	208	133	93	68	52						
1¼	C	1¼ x 3/16	1 3/16	1 x 1/8	4¾	9.5	1410	900	627	445	352	225	157	111			
	E	1¼ x 3/16	4¾	1 x 1/8	1 3/16	6.7	352	225	156	111	88	56					
1½	C	1½ x 3/16	1 3/16	1 x 1/8	4¾	11.0	1875	1200	834	612	468	300	208	153	117	93	
	E	1½ x 3/16	4¾	1 x 1/8	1 3/16	7.1	468	300	208	153	117	75	52				
1¾	C	1¾ x 3/16	1 3/16	1 x 1/8	4¾	12.5	2560	1640	1140	838	640	410	285	210	160	127	103
	E	1¾ x 3/16	4¾	1 x 1/8	1 3/16	7.5	640	410	285	210	160	103	71	52			
2	C	2 x 3/16	1 3/16	1 x 1/8	4¾	14	3340	2140	1480	1090	834	534	371	272	208	165	133
	E	2 x 3/16	4¾	1 x 1/8	1 3/16	7.9	835	535	370	272	209	134	93	68	52		
2¼	C	2¼ x 3/16	1 3/16	1 x 1/8	4¾	15.5	4220	2700	1875	1380	1055	675	470	345	264	208	169
	E	2¼ x 3/16	4¾	1 x 1/8	1 3/16	8.2	1055	675	470	345	264	169	117	86	66		
"Mitco" Driveway* Gratings (for Heavy Traffic, Coal "Grizzlies," etc.) Can also be furnished in Type B having same strength as Type C and weighing approximately 6 lb. per sq. ft. more.																	
2¼	C	2¼ x 3/8	1 3/16	2 x 5/16	4¾	36.8	8440	5400	3750	2760	2100	1350	940	690	528	416	338
2¾	C	2¾ x 3/8	1 3/16	2¼ x 5/16	4¾	44.6	13900	8880	5640	4530	3470	2220	1540	1130	865	685	555
3¼	C	3¼ x 3/8	1 3/16	2¼ x 5/16	4¾	51.7		12400	7850	6310	4840	3100	2150	1580	1210	955	775
3¾	C	3¾ x 3/8	1 3/16	2¼ x 5/16	4¾	58.7		16500	10470	8410	6440	4120	2862	2100	1610	1272	1031
"Mitco" Armorgrids* (for Armoring Concrete Platforms and Floors)																	
1	H	1 x 3/16	2⅜	7/8 x 1/8	2⅜	5.5	416	266	186	136	104						

*Trade-mark.

For safe concentrated load at center of span multiply tabulated load by span and divide by two. This applies to all tables above. Bearing bars in all types shown, run across the page thus ←——→. Types A, B, C and F have the same strength for the same size bearing bars. Type B Special has one-half the strength of Type C for the same size bearing bars. Type G has one-sixth the strength of Type C for the same size bearing bars.

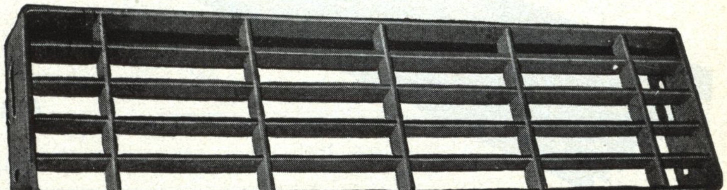
"Mitco" Shur-site Stair Treads (Pat. Appl'd for)

A non-slipping safety tread. The deep nosing bar bent back clearly emphasizes the front edge of the tread, eliminating danger of accident through misstep without in any way forming pocket to hold dirt, snow or ice. Made of 1-in. Type C "Mitco" Grating.

Standard Dimensions—*Lengths*—1 ft. 7¼ in.; 2 ft.; 2 ft. 4¾ in.; 2 ft. 9¼ in. and 3 ft. 2½ in.

Widths—6⅛, 8½ and 10⅞ in.

Bearing bars—1x3/16 in. *Transverse bars*—⅞x⅛ in., Type C. *End bars of carrier plates*—2¼x3/16 in.



Shur-site Stair Tread

IRVING IRON WORKS COMPANY

Manufacturers of Open Steel Flooring, Grating and Safety Steps

TELEPHONE
HUNTERS POINT 3342

Dutchkill Creek and Third Street
LONG ISLAND CITY, N. Y.

IRVING SUBWAY
TRADE MARK
PATENTED
REG. U.S. PAT. OFF.
THE NON-SLIPPING OPEN STEEL FLOORING

IRVING SAFSTEP
TRADE MARK
PATENTED
REG. U.S. PAT. OFF.
THE PERMANENTLY NON-SLIPPING STEP

Products

Sole manufacturers of "IRVING SUBWAY" OPEN STEEL FLOORING or GRATING, and "IRVING SAFSTEP" ALL-STEEL STAIR AND LADDER STEPS.

Also manufacturers of "Eggcrate," "Honeycomb," "Reticuline," "Sublit," "Sunway" and other forms of Grating, Grating-flooring, and Accessories.

Trade-marks

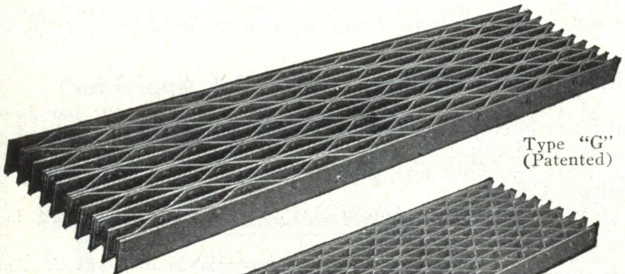
The trade-mark names "Subway," "Safstep," "Reticuline," "Sunway" and "Sublit" are registered in the U. S. Patent Office, are the exclusive property of this company, and can not be legally used in connection with any grating, grating-flooring or safety step made by any other company.

"Irving Subway" Open Steel Flooring

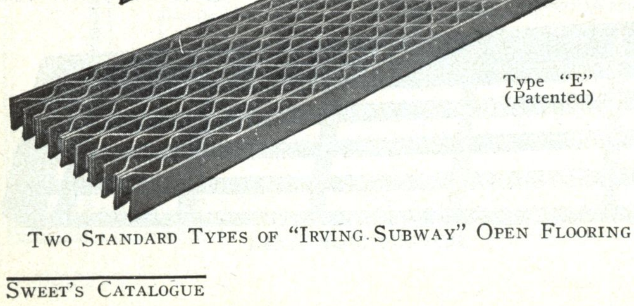
Construction—"Irving Subway" consists of alternate straight and "reticuline" bars of steel, placed on edge and solidly riveted together to form a light, nonflexible, rigid unit panel in which there is, and can be, no looseness or play or rattling, no warping or twisting. The design embodies the well-known truss principle by which a load or pressure applied to any point is distributed over a wide area and resisted by a large number of bar members. The full tensile strength of each member is usefully employed because each bar is supported at the top by the two adjoining bars.

Types—"Irving Subway" is made in the two standard types, here illustrated, and in several modifications; the latter differing from the standards only in the shape of the "reticuline" bar. Type "G" has 7-inch rivet spacing, Type "E" 3½-inch rivet spacing. The load capacity is the same for each (table on the following page), and choice between them is a matter of shape and size of "mesh," and of price.

Exclusive Advantages—A complete open floor, as smooth, comfortable and noiseless to walk or work or wheel upon as the best solid floor—and far safer; a surface permanently non-slipping under all conditions; maximum strength with minimum weight; maximum lighting and ventilation—80% open space; never loose or rattly; increases personal efficiency—no need to "watch your step"; full strength of material usefully employed; clean and sanitary; safe for those beneath; easily fitted—cuts more easily than solid plate; minimum dead load; wheels, trucks and rib-hooped barrels easily rolled in any direction—can not run through; efficient traction surface; easily installed—no drilling, tapping, bolts or screws; easily moved and rearranged.



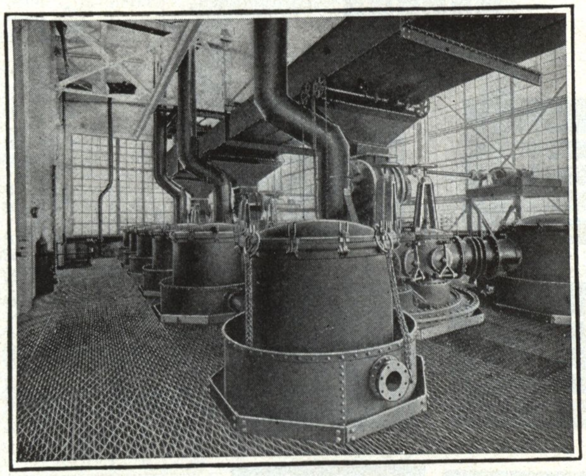
Type "G"
(Patented)



Type "E"
(Patented)

TWO STANDARD TYPES OF "IRVING SUBWAY" OPEN FLOORING

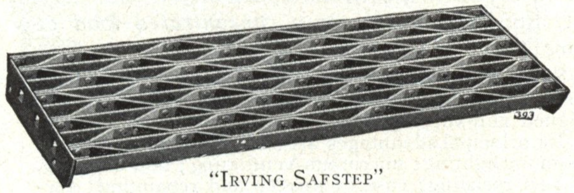
Applications—Space forbids a comprehensive listing of the applications of "Irving Subway," which would cover practically every industrial, engineering and architectural field. It is a conservative statement of fact to say that wherever a comfortable, permanently safe and non-slipping surface is wanted, to stand or walk or work or wheel upon; a ventilating, light-saving, wearproof, sanitary, efficient flooring; a flooring whose moderate first cost is its one and only cost; a convenient sectional flooring easily laid and easily rearranged when necessary—there is the obvious place for "Irving Subway."



CHEMICAL MANUFACTURING PLANT FLOORED WITH "SUBWAY"

"Safstep" Stair and Ladder Steps

Made entirely of steel, in the "reticuline" trussed construction, these safety steps are light and strong, permanently safe and non-slipping under all conditions —no safety treads or abrasive insets to wear out or work loose. 24 standard sizes and types, each a complete self-contained unit with carrier plate attached ready for mounting, as listed on following page.



"IRVING SAFSTEP"

Catalogue

Catalogue No. 4A-17 will be sent on request, and contains complete description, applications, illustrations of installations, construction drawings and details of load ratings, sizes, weights and spans.

Continued on next page

Standard Construction of "Irving Subway"

Spacing—*Types "D," "G" and "M"*—1 5/16 inches from center to center of straight bars when 3/16 inch thick; 1¼ inches from center to center of straight bars when ⅛ inch thick; rivet spacing, 7 inches center to center on straight bars.

Type "E"—1 5/16 inches from center to center of straight bars when 3/16 inch thick; 1¼ inches from center to center of straight bars when ⅛ inch thick; rivet spacing, 3½ inches center to center on straight bars.

Type "K"—15/16 inch from center to center of straight bars when 3/16 inch thick; ⅞ inch from center to center of straight bars when ⅛ inch thick; rivet spacing, 7 inches center to center on straight bars.

Standard Made-to-Order Units—All types of "Irving Subway" are also made to order for prompt shipment, to fit any opening and to meet any conditions. When made to order, "Irving Subway" is shipped in units or panels properly marked and accompanied by setting plans.

These units—in the ½, ¾ and 1-inch depths, if no larger than 24 inches wide by 72 inches long—and in the 1¼, 1½, 1¾, 2 and 2¼-inch depths, if no larger than 13½ inches wide by 72 inches long—sell at the regularly quoted square foot rates.

If larger than these sizes, there is a small extra charge. Anything smaller than these units is also standard and sells at the regularly quoted square foot rate.

We limit the size of the units, not only to simplify manufacture, but also to facilitate installation and to make removal or rearrangement easy.

Paint and Fastening Devices—Quoted prices always include one shop coat of paint, and fastening devices.

Orders—Orders should designate type, symbol and depth, to avoid mistake; thus, "Irving Subway Type G, 3S, 1¼ in. deep."

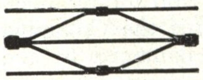
Show the supporting structure and outline the area to be covered. Let us make the "Irving Subway" layout for your approval.

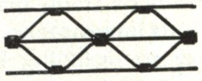
TABLE OF SAFE LOADS FOR "IRVING SUBWAY"—ALL TYPES

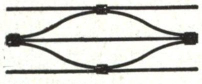
Maximum allowable fiber stress, 16,000 lb. per sq. in.

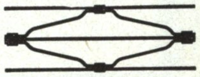
L—safe load in lb. per sq. ft.

C—deflection constant









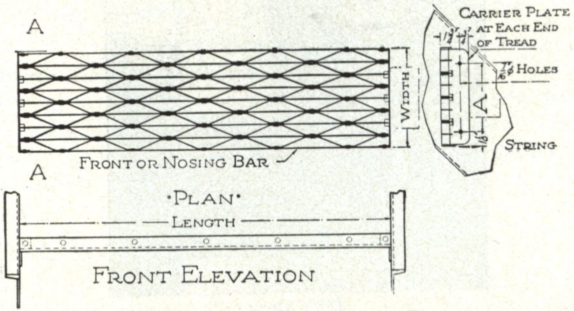
Size and symbol of flooring	Specification		1 ft.-6 in.	2 ft.	2 ft.-6 in.	3 ft.	3 ft.-6 in.	4 ft.	4 ft.-6 in.	5 ft.	5 ft.-6 in.	6 ft.	7 ft.	8 ft.	9 ft.
½ in. deep Symbol, OS	Straight bars, ½x⅛ in. Reticuline bars, ⅜x⅛ in.	L C	308 .00029	173 .00092	110 .00227	77 .0048		*Note:* Spans to right of heavy line are not recommended							
¾ in. deep Symbol, 1S	Straight bars, ¾x⅛ in. Reticuline bars, ½x⅛ in.	L C	695 .000045	390 .00011	250 .00069	173 .00143	127 .00265	97 .0040	77 .0055	63 .0083					
1 in. deep Symbol, 2S	Straight bars, 1 x⅛ in. Reticuline bars, ¾x⅛ in.	L C		695 .00012	445 .00029	308 .0006	227 .00112	173 .0019	138 .00305	112 .00465	93 .0068				
1 in. deep Symbol, 2SA	Straight bars, 1 x3/16 in. Reticuline bars, ¾x⅛ in.	L C		1040 .00008	665 .00019	460 .0004	340 .00075	260 .00127	206 .00204	167 .0031	140 .00454	116 .00645			
1¼ in. deep Symbol, 3SA	Straight bars, 1¼x⅛ in. Reticuline bars, 1 x⅛ in.	L C			700 .00015	480 .00031	358 .00057	273 .00097	215 .00155	175 .00235	143 .00348	120 .0049			
1¼ in. deep Symbol, 3S	Straight bars, 1¼x3/16 in. Reticuline bars, 1 x⅛ in.	L C			1100 .0001	730 .00021	535 .00038	410 .00065	325 .00105	265 .0016	215 .0024	185 .0033	135 .0062	100 .0105	80 .0169
1½ in. deep Symbol, 4SA	Straight bars, 1½x⅛ in. Reticuline bars, 1 x⅛ in.	L C			1020 .000087	707 .000178	516 .000333	396 .00057	314 .00091	253 .00138	210 .00203	173 .00287	130 .0053	100 .00903	77 .0145
1½ in. deep Symbol, 4S	Straight bars, 1½x3/16 in. Reticuline bars, 1 x⅛ in.	L C			1530 .00006	1050 .00012	775 .00023	595 .00038	470 .00061	380 .0009	315 .0014	265 .0019	202 .0036	150 .0061	115 .0097
1¾ in. deep Symbol, 5S	Straight bars, 1¾x3/16 in. Reticuline bars, 1 x⅛ in.	L C			2060 .00004	1435 .00008	1050 .00014	810 .00024	635 .00038	520 .00058	425 .00085	360 .0012	265 .0022	200 .0038	160 .0061
2 in. deep Symbol, 6S	Straight bars, 2 x3/16 in. Reticuline bars, 1 x⅛ in.	L C			2700 .00003	1875 .00005	1375 .00009	1055 .00016	830 .00025	675 .00039	560 .00057	470 .0008	345 .0015	265 .0026	210 .0041
2¼ in. deep Symbol, 7S	Straight bars, 2¼x3/16 in. Reticuline bars, 1 x⅛ in.	L C			3460 .00002	2400 .00004	1765 .00007	1350 .00011	1065 .00018	865 .00027	715 .0004	600 .00057	440 .0011	340 .0018	265 .0029

Deflections—To obtain the deflection under any uniform load per square foot on a given span, multiply your load per square foot by the deflection constant "C" from the table for your given span. The result will be the deflection in inches at center of span under your actual load.

Standard Sizes and Dimensions of "Irving Safsteps"

The tables in the opposite column show the standard sizes of "Irving Safsteps," which are complete units assembled with punched carrier plates attached, ready for setting.

Type "G" flooring is used for all sizes.



"Irving Safstep" Dimension Diagram

SAFSTEP NO. 1—SPECIFICATIONS

Straight bars . . . . in.	¾x⅛	Nosing bars . . . . in.	1 x¼
Reticuline bars . . . . in.	½x⅛	Carrier bars . . . . in.	2½x⅛

Width, in.	Length, ft.-in.			Distance A, in.
5⅜	1–7	1–10½	2–2	2½
7⅞	1–7	1–10½	2–2	4½
10⅜	1–7	1–10½	2–2	7

SAFSTEP NO. 2—SPECIFICATIONS

Straight bars . . . . in.	1 x⅛	Nosing bars . . . . in.	1¼x¼
Reticuline bars . . . . in.	¾x⅛	Carrier bars . . . . in.	2½x⅛

Width, in.	Length, ft.-in.		Distance A, in.
5⅜	2–5½	3–0½	2½
7⅞	2–5½	3–0½	4½
10⅜	2–5½	3–0½	7

SAFSTEP NO. 3—SPECIFICATIONS

Straight bars . . . . in.	1¼x3/16	Nosing bars . . . . in.	1½x¼
Reticuline bars . . . . in.	1 x⅛	Carrier bars . . . . in.	2½x⅛

Width, in.	Length, ft.-in.			Distance A, in.
8¼	3–7½	3–11	4–6	4½
10⅞	3–7½	3–11	4–6	7
12 3/16	3–7½	3–11	4–6	7

THE COLUMBIA IRON & WIRE WORKS COMPANY

Manufacturers of General Builders' Iron and Wire Work,
Ornamental Iron and Bronze
CANTON, OHIO

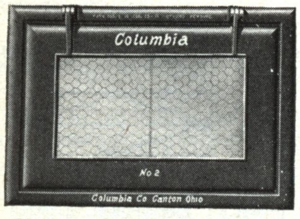
Products

Coal Windows; Grade Line Coal Chutes; Safety Sidewalk Doors; Steel Stairs; Elevator Inclosures and Cabs; Columbia Panic Bolts.

Also Miscellaneous Iron, Wire, Brass and Bronze Work.

The New 1925 Columbia Coal Windows

Now made with our latest patented roller bearing hinges, hoppers and automatic operating glass protectors. The latest construction eliminates pins, bolts, and suspending arms for hopper, etc. Body frames and door frames are made of malleable iron (unbreakable). The chute or body, hopper, glass protector and solid doors are made of alloy copper steel (rust resisting).



No. 1, 2 and 3 Glass Door Coal Window

Made in three sizes, all of the same design:

No. 1 for residences; wall opening, 24x17 in.

No. 2 for large residences and apartments; wall opening, 26x17 in.

No. 3 for public buildings; wall opening, 33x22 in.

Four combinations, viz., A, B, C and D:

A—Glass door with hopper.
B—Glass door without hopper.
C—Solid door with hopper.
D—Solid door without hopper.

All with either sloping or straight bottom bodies.

Glass doors are made of ¼-in. ribbed and wired glass.

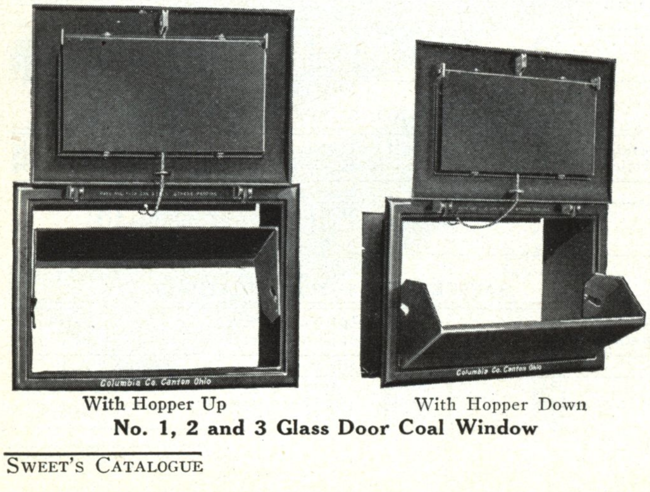
All have automatic lock and chain to open from basement or first floor.

The sloping bottom bodies are as follows: Nos. 1 and 2 for 13-in. wall and No. 3 for 17-in. wall.

Columbia
Columbia Co Canton Ohio

No. 1, 2 and 3 Solid Door Coal Window

The straight bottom bodies are as follows: No. 1-9 for 9-in. wall; No. 2-9 for 9-in. wall; No. 3-9 for 9-in. wall; No. 1-13 for 13-in. wall; No. 2-13 for 13-in. wall; No. 3-13 for 13-in. wall.



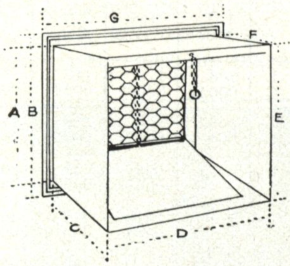
With Hopper Up

With Hopper Down

No. 1, 2 and 3 Glass Door Coal Window

Distinctive Features of the 1925 Columbia Coal Window

(1) Door opens automatically from the first floor as well as the basement. (2) Roller bearing enclosed hinges. (3) Roller pins can not be sawed, cut or removed when door is closed. (4) Automatic operating glass shield or protector. (5) Window can be used for other purposes because hopper sets at top of chute when not in use. (6) A locking device that positively locks when window is closed. (7) Glass shield and hopper do not obstruct the light to the basement. (8) Door or window can be removed quickly in process of building, if desired. (9) Glass clips hold the wired glass in perfect alignment, preventing breakage. (10) Door sets inside of frame making it weatherproof and adding much to its appearance. All working parts of the Columbia are so designed that no part can be damaged by the delivery man.



Dimension Diagram of 1925 Columbia Coal Window

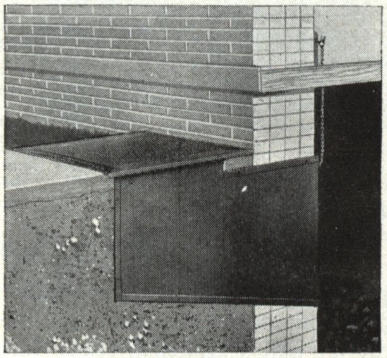
1925 COLUMBIA COAL WINDOWS

Size No.	Dimensions, in.						
	A	B	C	D	E	F	G
Sloping Bottom							
1	16	19	12	22	19	12	25
2	16	19	12	24	19	12	27
3	21	25	17	30	25	17	34
Straight Bottom							
1-9	16	19	9	22	16	9	25
2-9	16	19	12	24	19	12	27
3-9	21	25	17	30	25	17	34
1-13	16	19	12	22	19	12	25
2-13	16	19	12	24	19	12	27
3-13	21	25	17	30	25	17	34

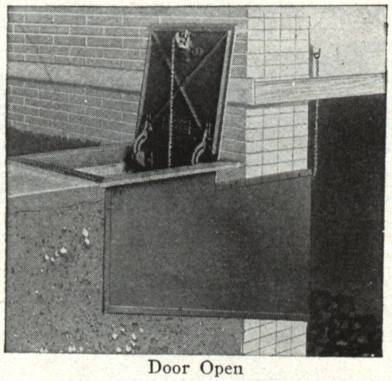
No. 4 Grade Line Chute (Patented)

Designed for service where space between outside grade and basement ceiling will not permit installation of window chute. To open, pull chain ½ in. from first floor or basement; coal man can then open door; when coal man closes door, *it locks automatically.*

Grade line coal chutes are made to suit buildings where floors are above or level with the grade on sidewalk.



Door Closed and Locked



Door Open

No. 4 Grade Line Chute

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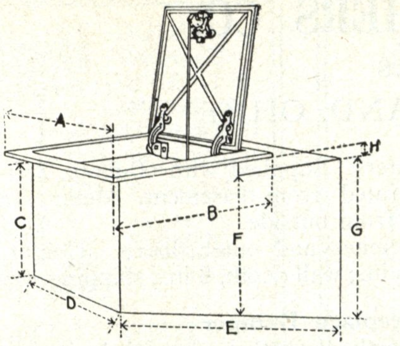


Dimension Diagram No. 4 Grade Line Chute

Door openings	Dimensions, inches							
	A	B	C	D	E	F	G	H
No. 4 20x20....	24	24	16	20	33	21	24	4
No. 5 27x27....	32	32	17	28	48	22	26	4

Columbia Safety Flush Sidewalk Door (Patented)

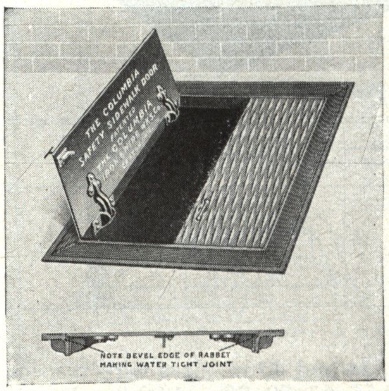
A wrought steel, diamond top sidewalk door; top is absolutely flush, and its diamond shapes eliminate danger of slipping.

Malleable iron handle on top is self-releasing, watertight and never freezes (no receptacle to catch water).

Hinges and Lock—Each hinge is concealed and works in a case filled with lubricant; does not rotate on a pin, hence it can not rust, bind or break.

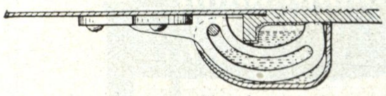
Both hinge and case are made of malleable iron; no strain on hinge at any time; no chain is required to hold doors open. (See sectional view.)

The lock on Columbia sidewalk doors can be operated with key outside or lever inside.

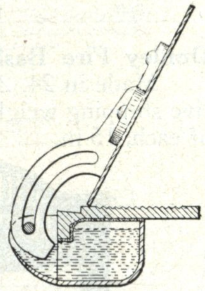

THE COLUMBIA SAFETY SIDEWALK DOOR
NOTE BEVEL EDGE OF RABBET MAKING WATER TIGHT JOINT

Columbia Double Sidewalk Door

One-half of door is open and remains open without use of chain or other sustaining device



Door Closed



Door Open

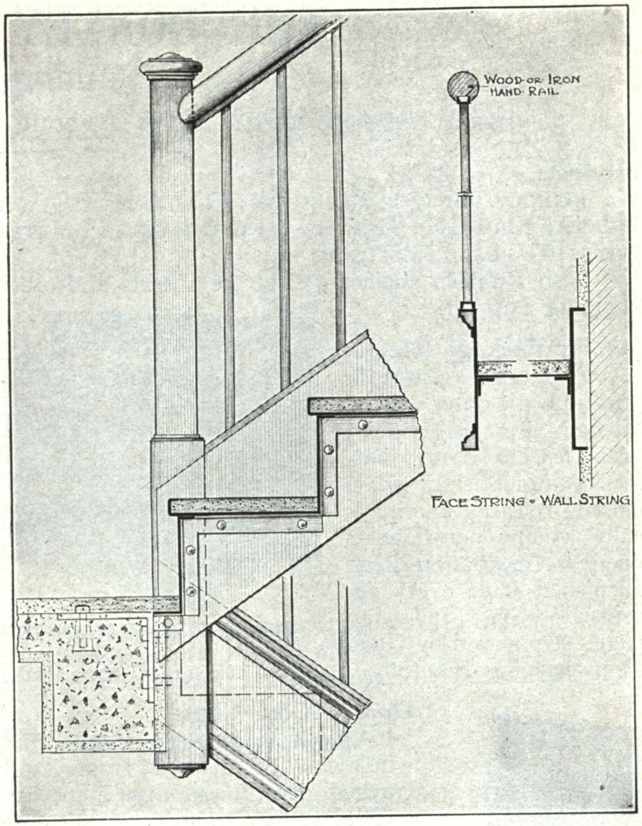
Diagrams Showing Internal Construction of Sidewalk Door Hinges

Note changed position of hinge as door is opened or closed

Columbia Elevator Fronts

Fireproof elevator fronts are made complete with sills, bucks, jambs, doors, glass, tracks, hangers, and operating devices, to suit the individual requirements of each building, and in any finish desired.

Columbia Stairs



Columbia Stairs

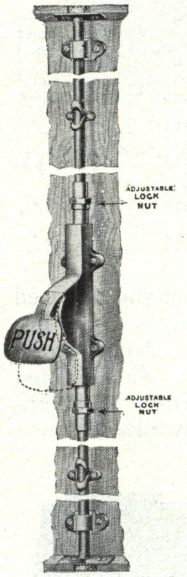
These are made to receive any kind of tread: cement, composition, slate, marble, steel or cast iron. General construction made to meet the architectural requirements of each job.

Ornamental and Miscellaneous Iron and Wire Work

We are prepared to furnish ornamental iron and bronze work of all kinds, from our own designs or in accordance with architects' details.

Bank screens, railings, grilles, marquises, etc., are among our specialties.

All types of wire work, including window guards, etc., will be supplied on order.



Panic Exit Door Bolt

Columbia Panic Exit Door Bolt

The Columbia panic exit door bolt is mechanically correct in construction and is adaptable for single or double doors. The length can be adjusted up to 1½ in. making it very convenient in setting.

Thousands of these bolts are now in use and we have received but few complaints of breakage. We claim it to be the strongest and most reliable push bolt now on the market and the cheapest in price. The Columbia bolts are all made of either bronze or brass in the various finishes.

Booklet sent on request.

STANDARD FINISHES OF DOOR BOLTS

Bronze	Brass	Copper
Natural high polish Natural brush polish Polished and oxidized Statuary	Natural high polish Natural brush polish Polished and oxidized Imitation bower barff	Natural buff Polished and oxidized Oxidized and steel blue Oxidized and mottled

ESTABLISHED 1895 INCORPORATED 1911

THE DONLEY BROTHERS CO.

Building Specialties

13932 Miles Avenue, CLEVELAND, OHIO

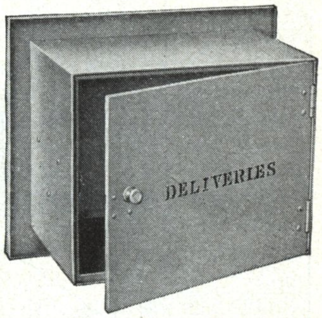
Products

Donley Package Receivers; Coal Chutes; Ash Dumps; Fireplace Dampers; Fire Baskets; Meter Boxes; Garbage Receivers.

Also Rubbish Burners, Concrete Inserts and other Building Specialties.

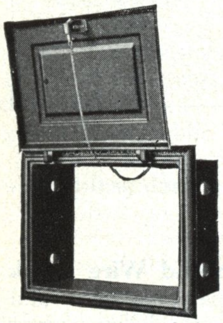
Donley Package Receiver

A steel receptacle built into the outer wall of kitchen, for delivery of groceries, etc. Outer door locks automatically when closed; released automatically when inner door is opened. Installation detail furnished with every receiver. See following page. Approved by Good Housekeeping Institute.



Donley Package Receiver

Size: Outside height, 11 in.; width, 13½ in.; wall depth, 9 in.



Donley Coal Chute

Instead of an old-fashioned coal window with marred frame and cracked glass, the modern home has a Donley coal chute. During coal delivery, the door protects the side of building, a steel shield covering the glass of the glass door models. Donley coal chutes are burglar-proof, but are easily unlatched from inside without entering coal bin. Select style and size from following description and specify by number.

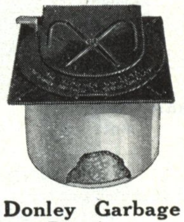
Description	Wall opening, in.	Straight body for 9-in. wall	Slanted bottom body for 13-in. wall	Slanted bottom body for 17-in. wall
Solid door, pressed steel	24x17	No. 19	....	....
Solid door, paneled, copper-steel	24x17	No. 29	No. 213*	....
Glass door, cast iron, wire glass panel	24x17	No. 39	No. 313*	....
			Straight body	
Solid door, flat steel	32x22	....	No. 513	....
Solid door, paneled, cast iron	32x22	....	No. 613	No. 617*
Glass door, cast iron, glass panel	32x22	....	No. 713	No. 717*

*Hopper optional

Grade Line Coal Chute—For low set and terraced residences. Also frequently used for stores. This improved chute has provision for drainage. Drain can be connected with sewer and has a strainer. Constructed with checkered steel door, malleable iron frame and reinforced steel chute. Latch and chain galvanized.

Donley Garbage Receiver

Prevents nuisances arising from ordinary garbage can. Consists of outer shell and inner receptacle that can be removed for emptying. Service lid of Parkerized steel operated by foot lever, which fits snugly, excluding flies. Made in 6, 10, 14, and 21-gal. capacities. Approved by Good Housekeeping Institute.



Donley Garbage Receiver

Donley Meter Box

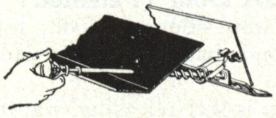
A steel cabinet built into basement wall where service wire enters. Supplied with 60-amp., 250-volt safety switch operated from basement. Meter read through glass pane from outside.

Large inner and outer doors. Height, 13½ in.; width, 16½ in.; wall depth, 8 in.; shipping weight, 30 lbs.

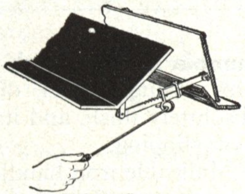
Donley Fireplace Damper

A correctly formed throat and draft regulator combined, the Donley damper simplifies correct fireplace construction and promotes clean, economical fires through proper draft regulation. Two types of control, as shown. See following page for correct damper size. For intermediate size openings use next largest damper.

Dampers crated separately. Instructions for building fireplaces and installing dampers attached to each crate.



Rotary Control as below



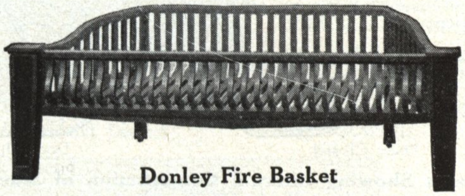
Poker Control

Donley Fireplace Damper

Damper No.		Size front, in.	Shipping weight, lb.
Rotary control	Poker control		
324	224	24	26
330	230	30	29
336	236	36	32
342	242	42	42
348	248	48	49
354	254	54	80
360	260	60	90

Donley Fire Basket

Made in 24, 28, 30, 34 and 40 in. sizes with respective shipping weights of 55, 63, 70, 78 and 90 lb. Depth of each, 15 in.



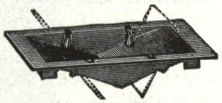
Donley Fire Basket

Meets demand for beautiful, substantial fire basket co-ordinated to wall angle that radiates most heat, as shown in plans on following page. Basket has removable ends.

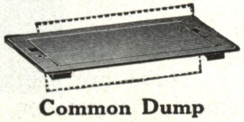
Donley Ash Dumps

Are iron trap doors in the hearth above the ash pit. Automatic, self-closing dumps are 5x7 in. in size. The Common dumps are 5x8 in.

The most convenient method of ash disposal.

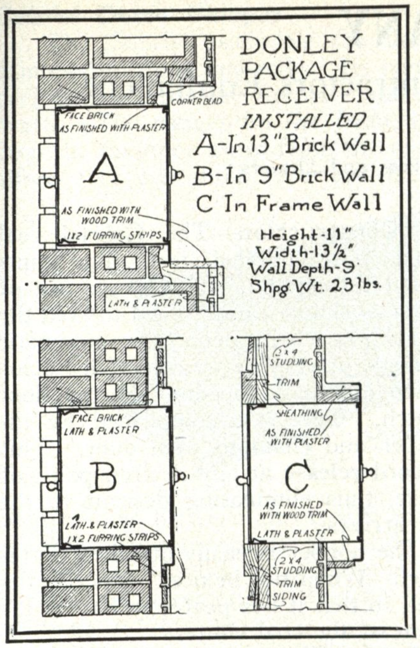


Automatic Dump

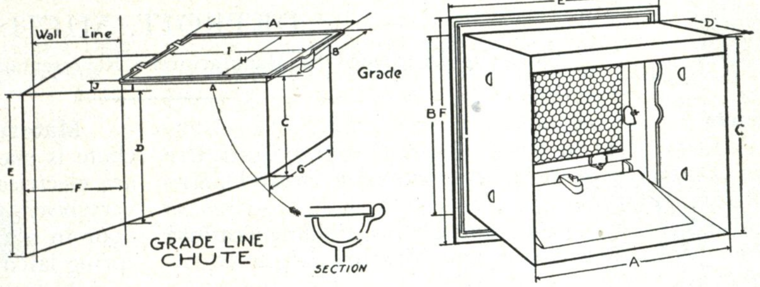


Common Dump

Continued on next page


DONLEY
PACKAGE
RECEIVER
INSTALLED
A-In 13" Brick Wall
B-In 9" Brick Wall
C In Frame Wall
Height-11"
Width-13½"
Wall Depth-9"
Shpg Wt. 23 lbs.
CORNER BEAD
FACE BRICK
AS FINISHED WITH PLASTER
A
AS FINISHED WITH WOOD TRIM
1x2 FURRING STRIPS
LATH & PLASTER
FACE BRICK
LATH & PLASTER
B
LATH & PLASTER
1x2 FURRING STRIPS
2x4 STUDDING
TRIM
SHEATHING
AS FINISHED WITH PLASTER
C
AS FINISHED WITH WOOD TRIM
LATH & PLASTER
2x4 STUDDING
TRIM
SIDING

THE DONLEY COAL CHUTE


Wall Line
A
B
I
H
J
Grade
C
D
E
F
G
GRADE LINE CHUTE
SECTION
E
D
B
F
C
A

DIMENSIONS OF DONLEY GRADE LINE COAL CHUTE IN INCHES

A	B	C	D	E	F	G	H	I	J
21	26¼	14½	19½	24½	14¼	24½	25¼	20	2½

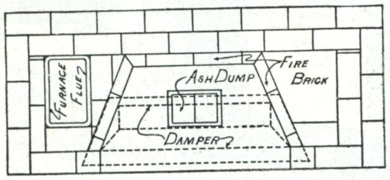
DIMENSIONS OF DONLEY STANDARD COAL CHUTE IN INCHES

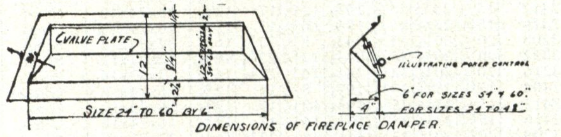
Chute No.	A	B	C	D	E	F
19, 29 and 39....	22	16	16	9	25	19
213 and 313.....	22	16	18½	12	25	19
513, 613 and 713..	30½	21	21	12	34½	24½
617 and 717.....	30½	21	24½	17	34½	24½

DONLEY FIREPLACE CONSTRUCTION

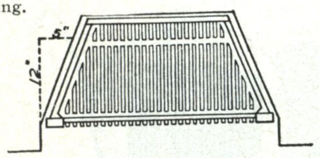
Width of opening, in.	Approximate height, in.	Use damper number		*Flue size, in.	
		Rotary control	Poker control	Regular	Round (diameter)
24	28	324	224	8½x 8½	10
28	28	330	230	8½x13	10
30	30	330	230	8½x13	12
34	30	336	236	8½x13	12
36	30	336	236	8½x18	12
40	30	342	242	8½x18	15
42	30	342	242	8½x18	15
48	33	348	248	13 x13	15
54	36	354	254	13 x18	18
60	39	360	260	18 x18	18

*Net flue area should be at least one-twelfth that of fireplace opening.

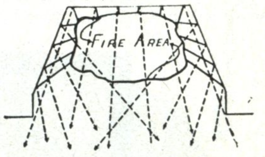

FURNACE FLUE
ASH DUMP
FIRE BRICK
DAMPER


VALVE PLATE
12"
8¼"
2¼"
1¼"
12" FOR SIZES 54" & 60" ONLY
SIZE 24" TO 60" BY 6"
ILLUSTRATING POKER CONTROL
6" FOR SIZES 54" & 60"
4" FOR SIZES 24" TO 48"

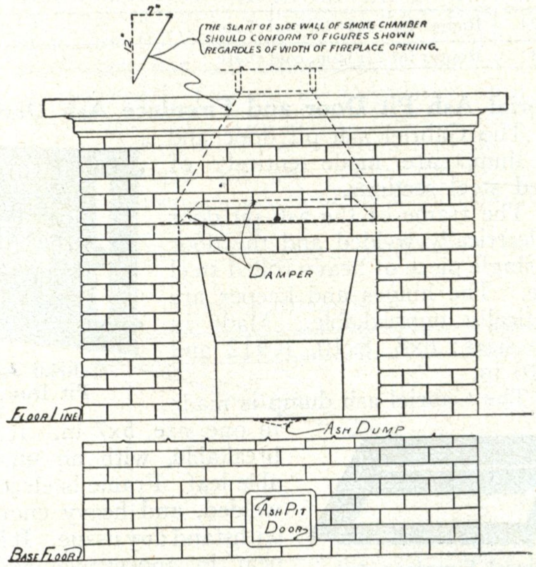
DIMENSIONS OF FIREPLACE DAMPER



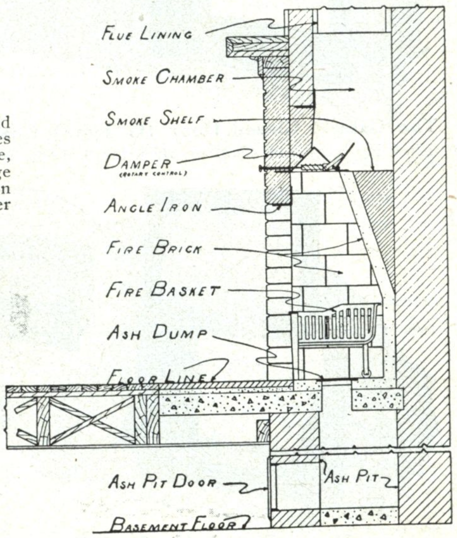
ILLUSTRATING BASKET SET IN FIREPLACE AND CORRECT SLANT OF SIDE WALLS.



SHOWING RADIATION OF HEAT FROM PROPERLY SLANTED SIDE WALL OF FIREPLACE


2"
12"
THE SLANT OF SIDE WALL OF SMOKE CHAMBER SHOULD CONFORM TO FIGURES SHOWN REGARDLES OF WIDTH OF FIREPLACE OPENING.
DAMPER
FLOOR LINE
ASH DUMP
ASH PIT DOOR
BASE FLOOR

Wall depth should be of 18 to 20 inches for small fireplace, with little advantage in depth of more than 24 inches for larger fireplace.


FLUE LINING
SMOKE CHAMBER
SMOKE SHELF
DAMPER (ROTARY CONTROL)
ANGLE IRON
FIRE BRICK
FIRE BASKET
ASH DUMP
FLOOR LINE
ASH PIT DOOR
ASH PIT
BASEMENT FLOOR

GABRIEL STEEL COMPANY

Manufacturers of Construction Hardware and Contractors Equipment

DETROIT, MICH.

Nationally Distributed by Manufacturer's Representatives, Jobbers and Dealers

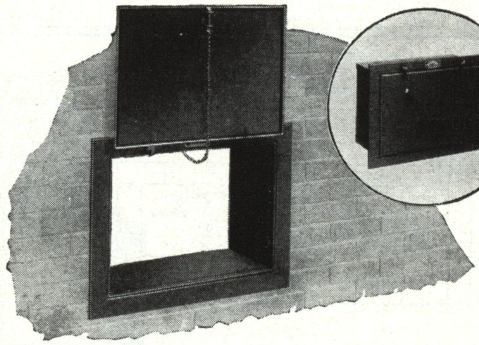
Products

GABRIEL ROLLED STEEL COAL CHUTES; ASH PIT DOORS; FIREPLACE ASH DUMPS; INSERTS; DOME DAMPERS; STEEL JOISTS.

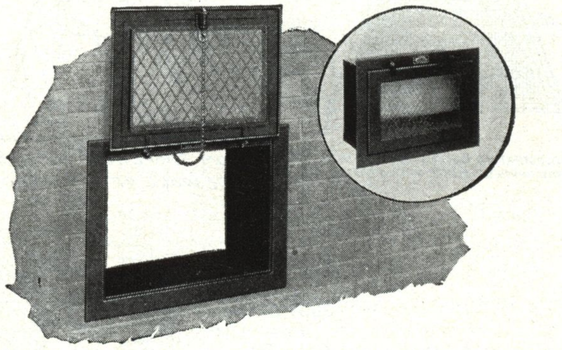
Also Reinforcing Bars and Chains, Folding Scaffold Brackets, Collapsible Horse and Masonry Legs.

Gabriel Coal Chute

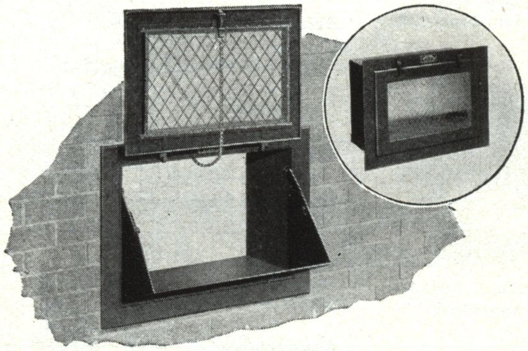
Designed especially as a coal chute, in that it performs the duties for which it is intended. The Gabriel chute, with its door hinged at the top, swings up and remains open when in use. It is a protective coal chute, one whose appearance will fit into any architectural picture and whose durability guarantees a permanent pleasing effect. Broken hinges, doors or frames are entirely eliminated.



The Gabriel Steel Door (S Type) Coal Chute
Furnished in 16x24 and 22x32-in. sizes for 8, 12½, and 17-in. walls



The Gabriel Glazed Door (G Type) Coal Chute
Furnished in 16x24 and 22x32-in. sizes for 8, 12½, and 17-in. walls



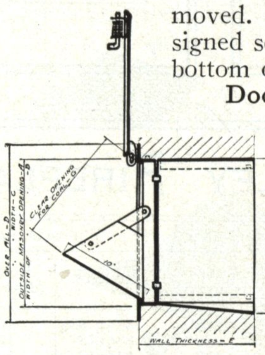
Heavy Detachable Steel Hopper
Can be furnished for all sizes and types as required

Material and Construction—The Gabriel coal chute is made of rust resisting rolled steel. The joints are electrically welded throughout. The hinges are of very heavy cold rolled steel and are designed to hold the door in a vertical position when open. The automatic spring latch is also made of very heavy cold rolled steel.

A feature is the automatic opening of the door upon release of catch. This is accomplished by the attachment of a roller and chain to each door. This permits placing of cord release at any desired point of vantage in the house, thus eliminating descent to the basement when coal arrives.

The hopper is easily attached or removed. When not in use, hopper is designed so that it lies perfectly flat on the bottom of the coal chute.

Doors—In the glazed doors, ¼-in. wired glass is attached by means of special glazing clips. Glass in glazed door is bedded and face puttied. The glass is protected on the inside by heavy wired guard rigidly bolted to the glazing frame. The Gabriel coal chute is absolutely burglarproof, even the glazed door type. It is also fireproof.



Dimension Diagram Gabriel Coal Chute

Type No.	Dimensions, in.							Approximate masonry opening, in.	Door	Weight, lb.
	A	B	C	D	E	F	G			
S2408	15⅝	23⅛	25¼	19¼	8½	17	12¾	16x24x 8	Steel	33
2412	15⅝	23⅛	25¼	19¼	12½	17	12¾	16x24x12	Steel	39
2416	15⅝	23⅛	25¼	19¼	16½	17	12¾	16x24x16	Steel	45
3208	20½	30¼	33¼	24¼	8½	22¼	16¾	22x32x 8	Steel	42
3212	20½	30¼	33¼	24¼	12½	22¼	16¾	22x32x12	Steel	50
3216	20½	30¼	33¼	24¼	16½	22¼	16¾	22x32x16	Steel	58
G2408	15⅝	23⅛	25¼	19¼	8½	17	12¾	16x24x 8	Glass	38
2412	15⅝	23⅛	25¼	19¼	12½	17	12¾	16x24x12	Glass	44
2416	15⅝	23⅛	25¼	19¼	16½	17	12¾	16x24x16	Glass	50
3208	20½	30¼	33¼	24¼	8½	22¼	16¾	22x32x 8	Glass	50
3212	20½	30¼	33¼	24¼	12½	22¼	16¾	22x32x12	Glass	58
3216	20½	30¼	33¼	24¼	16½	22¼	16¾	22x32x16	Glass	66
S24	Hopper for 16x24-in. coal chute									8½
S32	Hopper for 22x32-in. coal chute									12

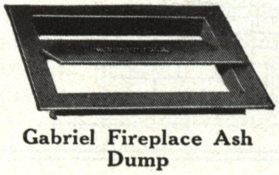
Gabriel Ash Pit Door and Fireplace Ash Dump

The Gabriel ash pit door and ash dump are made entirely of rolled steel sections.

The frame of the ash pit door is electrically welded and the door is a single piece of heavy rolled steel plate. The hinges and keeper are practically unbreakable. Made in four sizes: 8x8, 8x10, 10x12 and 12x16 in.

Gabriel Ash Pit Door

The Gabriel ash dump is made in one size, 5x7 in. It is unbreakable, with an unremovable leaf. Frame is electrically welded, and heavy enough to withstand any usage. It is very neat in appearance and will not warp or twist with use.

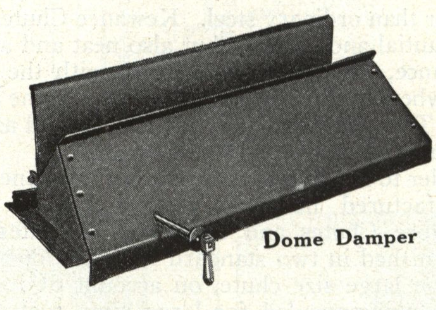


Gabriel Fireplace Ash Dump

Continued on next page

Gabriel Dome Damper

The Gabriel performs the three very important damper functions perfectly. Its construction insures a perfect draft for the fireplace and eliminates all back drafts. The flanges on the front, back and two sides keep the masonry away from the damper leaf and thus afford free operation. Vertical front flange makes a positive seal between the rough and face brick. The operating device opens the leaf wide with only a quarter turn of the handle—is positive in its action and can be adjusted to any one of the four intermediate opening positions.


Dome Damper

Hand or poker control can be furnished. The hand operator rod is adjustable up to a 9-in. breast facing.

The Gabriel is made in sizes of 24, 30, 36, 42, 48, 54 and 60 in. Sizes given are clear opening at the front of the damper.

Gabriel Steel Joist Floor System (Patents Applied for)

Gabriel rolled steel joists have been designed for use with either wood or concrete floors. They are, however, particularly adaptable to wood floor construction. This permits their use in any building of light occupancy entirely obviating building delays and inconveniences caused by the use of concrete construction.

Gabriel joists are built of standard rolled steel sections, rigidly connected at the joints by means of electric arc welding, and are really steel trusses in miniature. They weigh, approximately, only half as much per foot of length as wooden joists of equal strength and are thus economically and quickly placed. Because of their design, no diagonal bracing or bridging is necessary.

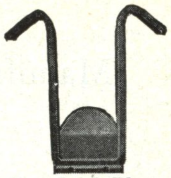
In the construction of a fireproof floor, it is simply necessary to lay the joists in place, cover them with plaster board laid flat and crossways of the joist and put down the rough flooring in accordance with the usual standard practice. The plaster board is nailed to wooden nailing strips which are attached to the joists in our shops. Metal lath and plaster can be easily attached to the bottom chord, if desired, thus affording protection to the steel joists.

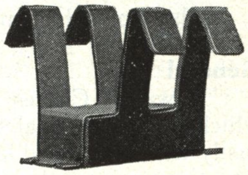
The sketch shows the general outline of the 10 type joist.

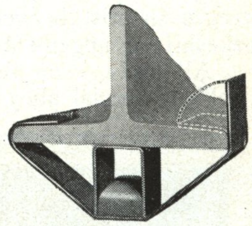
Write for our complete catalogue.

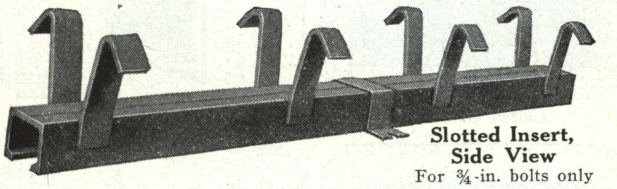
Gabriel Spot and Slotted Inserts

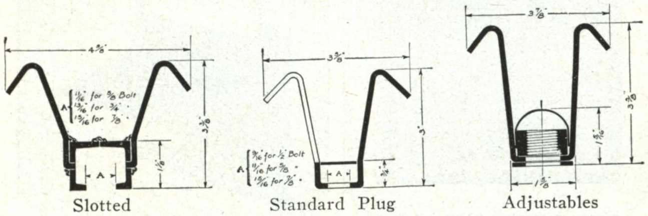
Gabriel inserts are made from structural grade new billet steel. All sections used in the fabrication of Gabriel products, except the end caps for the slotted insert and the top cap for the plug insert, are rolled sections. Pressed metals, cast and malleable irons, have been entirely eliminated except for caps. Structural sections, especially rolled, give the necessary fillets at points of maximum stress. Specially designed anchors assure a maximum holding power. The special plug inserts for use in the soffit of concrete fireproofed steel beams are made to order. The only field operation necessary is bending the one side strap down on the flange of the beam as shown by the illustration. In ordering, always state size of I-beam to which inserts attach. Height allows 2 in. of fireproofing. The adjustable insert is blanked from a single piece of heavy rolled steel with a heavy cap which provides easy and secure nailing.


Standard Plug Insert, Side View
For ¾ or ⅝-in. bolts


Adjustable Insert, Side View
For ¾, ⅝ and ½-in. bolts


Special Plug Insert, Side View
For ¾ and ⅝-in. bolts

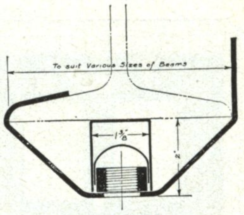

Slotted Insert, Side View
For ¾-in. bolts only



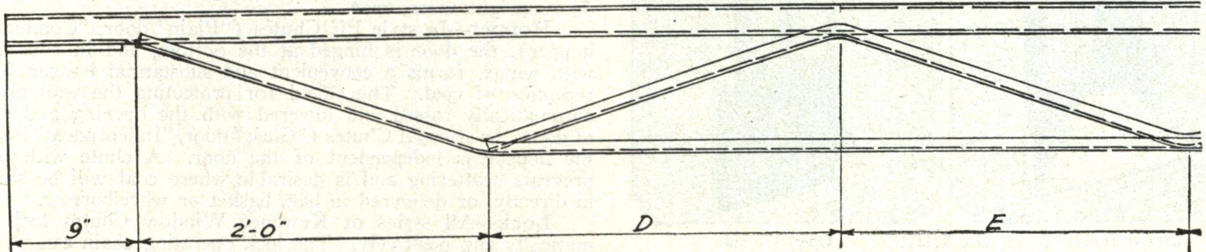
Slotted
Standard Plug
Adjustables

Section of Inserts

Average ultimate capacity of several Gabriel plug and adjustable inserts, by test, 10630 lb. each. Average ultimate capacity per foot of Gabriel slotted insert, 11580 lb. Standard lengths of 1, 2, 3, 4 and 5 ft. Furnished with or without end caps. Height of standard insert, 3⅜ in.; weight, ¾ lb. each. Height of adjustable insert, 3⅜ in.; weight, ¾ lb. each. Height of special plug insert, 2 in.; weight, variable. Height of slotted insert, $1\frac{5}{32}$ in.; weight, 2.1 lb. per ft. Anchors, 3¼ in. high.



Special Plug



Gabriel Steel Joist Floor System

KEWANEE MANUFACTURING COMPANY

Manufacturers of Non-Breakable Coal Chutes and Building Specialties

KEWANEE, ILL.

Nationally distributed through Dealers in Building Materials, Hardware and Structural Steel

Products

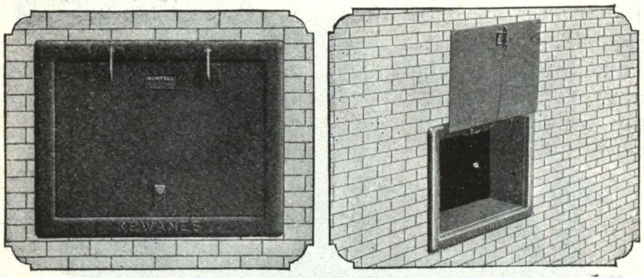
Kewanee Copper-steel Non-breakable Basement Coal Chutes: Window, Store, and Grade Line.

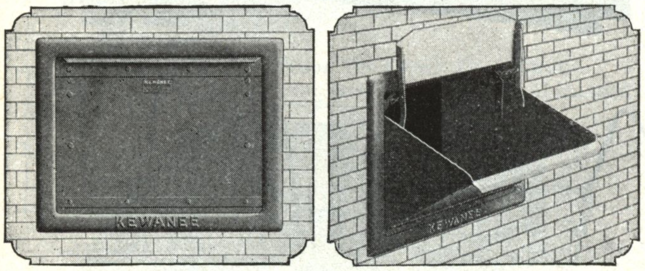
Also Portable Chutes and Equipment for coal yards.

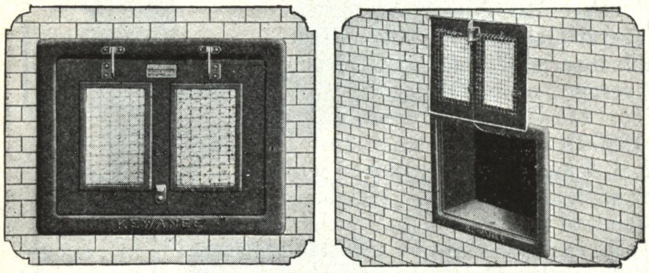
General

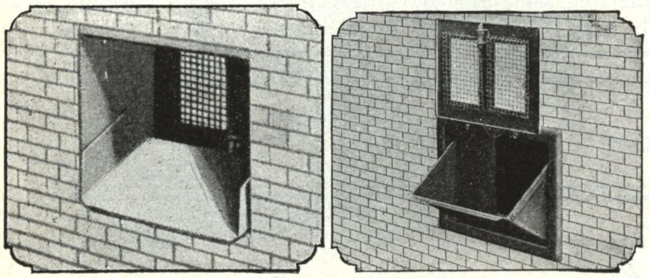
Kewanee Chutes afford efficient facilities through which to deliver coal to basements of buildings. They easily withstand hard knocks which shatter ordinary construction, protect the building from damage and defacement, and are simple and convenient to operate. The saving in repair bills alone quickly overcomes the difference in cost between a Kewanee Coal Chute and makeshift arrangements.

All parts, even the rivets, are of heavy "Copper Steel"—a special alloy which is not only rust resistant but tougher than ordinary steel. Kewanee Chutes are not only substantial and durable, but also neat and attractive in appearance, harmonizing perfectly with the foundation wall whether it be of brick, concrete, stone or other material. They can be readily installed in old as well as new buildings.


Closed Outside No. 108P Open Outside


Closed Outside No. 112PC Open Outside


Closed Outside No. 108G Open Outside


Closed Inside No. 112G1 Open Outside

Kewanee Window Coal Chutes

In order to meet various conditions, Kewanee Chutes are manufactured in three distinct types: Window Chutes, Store Chutes and Grade Line Chutes. Each type is furnished in two standard sizes and one or more styles. The large size chute, on account of its greater opening, is recommended for large lump coal and also, on account of its heavier construction, for buildings using large quantities of fuel.

Every Kewanee Coal Chute is *guaranteed* against breakage and warranted to give satisfactory service.

Kewanee Window Coal Chutes

Kewanee Window Chutes are the type most commonly used, being designed to take the place of the common basement window in buildings with foundation walls extending sufficiently above the grade line. These chutes are furnished in two sizes—with plain or glass doors, with or without hoppers, and with bodies for 8, 12 and 18-in., or thicker, foundation walls.

Advantages—Built throughout of "copper steel"—*guaranteed* against breakage.

Clean-cut and attractive appearance—the smooth lines are due to pressed steel construction.

With standard outside body dimensions, greater "throw-in" space for coal—the pressed steel frame is less bulky than brittle cast iron.

Chute bottom, where wear is greatest, pressed out of same piece of heavy "Copper Steel" as frame.

Plain door combination hopper chutes of exceptionally strong construction—readily opened and closed.

Stronger glass door construction—two smaller glass panels instead of a single large one.

Pressure evenly distributed—retaining clips bear on steel binding angle and not directly on glass panel.

¼-in. wire glass panels protected by heavy wire guards—readily removed for cleaning glass.

With all these advantages, Kewanee Window Chutes are inexpensive, some of the styles costing but little more than the frail wooden basement window.

Frame—Frame and bottom of all Kewanee Window Chutes are pressed out of one piece of heavy "Copper Steel." Frames of the regular sizes (the "100" series) chutes have a clear net opening for the delivery of coal 21 in. wide by 15½ in. high, and those of the large size (the "200" series) have a net opening 28 in. wide by 20 in. high.

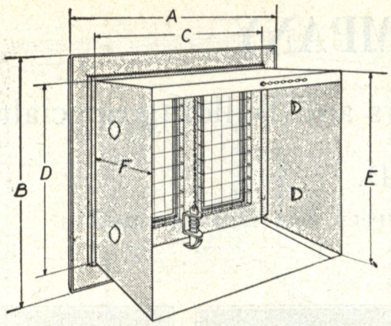
Body—Kewanee Window Chutes are regularly furnished with flat bottom bodies 8 in. deep or sloping bottom bodies 12 in. deep. Sloping bottom bodies 18 in. or more deep for extra thick foundation walls will be supplied on special orders. The upper rear edge of the body is reinforced with steel angle. Large projections in sides and screw holes in top are provisions for holding the chute firmly in foundation wall.

Door—Two styles of doors are supplied, the style P door ("Plain" door), admitting coal alone and the style G door ("Glass" door), for use where light also is required. All top hung doors have slotted hinges which automatically hold the door upright when open.

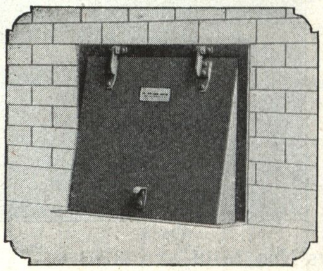
Hopper—In style PC Chutes ("Plain" door, "Combination" hopper), the door is hinged at the bottom, and in combination with wings, forms a convenient and substantial hopper for the reception of coal. The shield for protecting the wall above is automatically raised and lowered with the opening and closing of door. In style GI Chutes ("Glass" door, "Independent" hopper), the hopper is independent of the door. A chute with hopper prevents scattering and is desirable where coal will be shoveled in directly, or delivered in bag, basket or wheelbarrow.

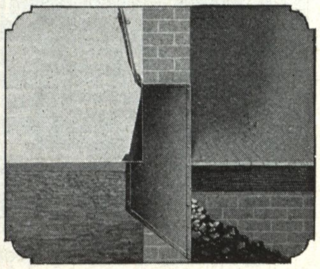
Lock—All styles of Kewanee Window Chutes lock automatically and positively. The lock operating chain can be easily extended to any place in the building.

Continued on next page



Kewanee Window Coal Chute





KEWANEE WINDOW COAL CHUTES
Body Width and Height Indicate Exact Wall Opening Required**

No.	Door	Hopper	Dimensions in inches						Net and ship. wt., lbs.	List price
			A	B	C	D	E	F		
108-P	Plain...	None.........	26	20½	21½	16	16	8	39	$ 8.25
112-P	Plain...	None.........	26	20½	21½	16	18½	12*	48	9.75
112-PC	Plain...	Combination..	26	20½	21½	16	18½	12*	64	12.00
208-P	Plain...	None.........	33	25	28½	20½	20½	8	64	12.75
212-P	Plain...	None.........	33	25	28½	20½	23	12†	75	15.00
212-PC	Plain...	Combination..	33	25	28½	20½	23	12†	98	18.75
108-G	Glass...	None.........	26	20½	21½	16	16	8	42-47	11.25
112-G	Glass...	None.........	26	20½	21½	16	18½	12*	51-56	12.75
112-GI	Glass...	Independent..	26	20½	21½	16	18½	12*	65-70	14.25
208-G	Glass...	None.........	33	25	28½	20½	20½	8	65-72	18.75
212-G	Glass...	None.........	33	25	28½	20½	23	12†	76-83	21.00
212-GI	Glass...	Independent..	33	25	28½	20½	23	12†	102-109	23.25

**The so-called "wall opening" dimensions usually quoted are inflated and misleading.

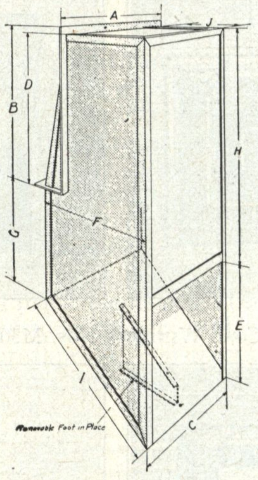
*Body 18 in. deep (19½ in. high at back) for $1.50 extra.

†Body 18 in. deep (24 in. high at back) for $2.25 extra.

Kewanee Store Coal Chutes

Kewanee Store Chutes, so termed because they are largely used in stores and buildings of that character, are adapted for use where the first floor is too near the ground level to permit the installation of the regular window chute. In the store chute, a long body extends from the mouth, downward within the wall, to an opening which discharges into the basement, just below the first floor.

These chutes are provided with convenient and automatic locking arrangements, the same as Kewanee window chutes. Slotted hinges hold the door open when it is raised to the vertical position. For supporting the chute in upright position while the foundation wall is being built around it, a foot is furnished for attachment to the sloping bottom at the time of installation.



Kewanee Store Coal Chute

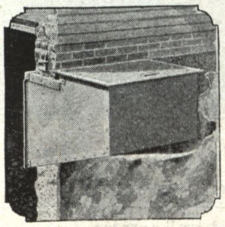
KEWANEE STORE COAL CHUTES

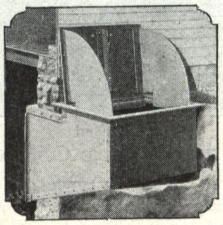
No.	Hopper	Dimensions in inches										Net and ship. wt., lbs.	List price
		A	B	C	D	E	F	G	H	I	J		
31-P	None.......	26	22	24	21	17	16½	18	29	18	12	130	$28.50
31-PI	Independent.	26	22	24	21	17	16½	18	29	18	12	145	31.50
32-P	None.......	34½	26	31½	24	17	16½	18	34	18	12	170	40.50
32-PI	Independent.	34½	26	31½	24	17	16½	18	34	18	12	190	45.00

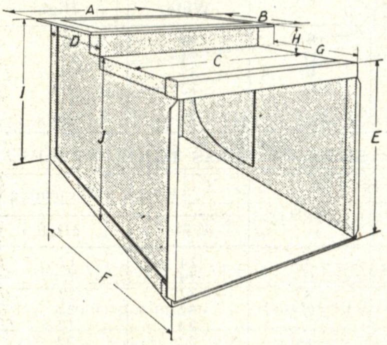
Kewanee Grade Line Coal Chutes

Kewanee Grade Line Chutes are also used in buildings with a low first floor level. In this kind of a chute, however, the mouth does not require space in the foundation wall above the grade line, but projects out from the wall, the horizontal door lying flush with the sidewalk or alley surface.

When coal is being delivered, the building is protected from damage and defacement by the door resting upright against the wall. Wings, attached to the door, form a hopper which facilitates the delivery of coal, and also safeguards the opening for passers-by. These chutes are provided with convenient and automatic locking arrangements, the same as Kewanee Window Chutes.







Kewanee Grade Line Coal Chute

KEWANEE GRADE LINE COAL CHUTES

No.	Hopper	Dimensions in inches										Net and ship. wt., lbs.	List price
		A	B	C	D	E	F	G	H	I	J		
21	....	28½	22	25½	19	25	37½	18	3	16	18½	150	$33.00
22	....	34½	28	31½	25	31	43½	18	3	19	24	225	48.00

THE MAJESTIC COMPANY

Manufacturers of Breakproof Coal Windows and Building Specialties

HUNTINGTON, IND.

DISTRIBUTED THROUGH 5000 HARDWARE, BUILDING SUPPLY AND LUMBER DEALERS

Products

Majestic Coal Windows; Grade Line Coal Chutes; Store Coal Chutes; Milk and Package Receivers; All-metal Basement Windows; Fireplace Dampers; Flue Clean-out Doors; Ash Pit Doors; Fireplace Ash Dumps; Cast Iron Flue Thimbles.

Also manufacturers of Underground Garbage Receivers, Built-in and Apartment Garbage Receivers, All-metal Flower Boxes, Manhole Doors, Cellar Wall Grates, Cistern Rings and Covers, Porch Column Bases, Rubbish Burners.

Majestic Coal Window

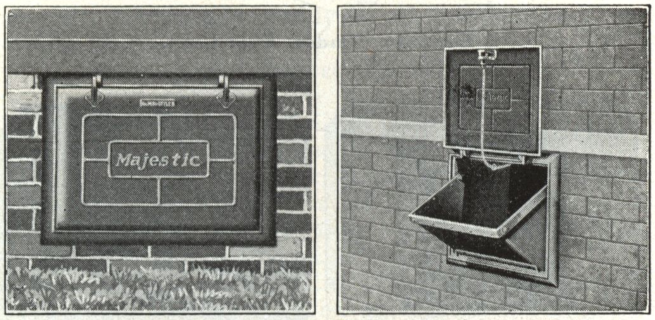
The Majestic coal window protects the entire opening and sidewall when coal is delivered, giving greatest protection above the window where it is most needed. Hence, it increases the value of the property, lessens depreciation and saves money.

There are styles and sizes for every type of house or building—all made of *certified malleable iron and Keystone copper steel.* Guaranteed breakproof—superior in quality, design and workmanship at no additional cost. All styles are self-locking and burglarproof. Residence styles have chain to latch for unlocking window from any part of basement or from room above.

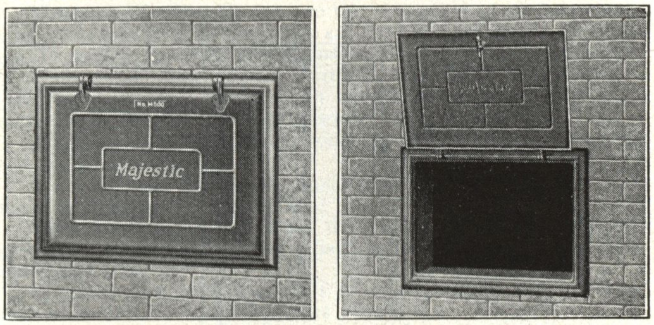
The No. M101 Majestic is the last word in coal window construction. The frame and hinges are of *certified malleable iron*—guaranteed *breakproof!* The door is of heavy, pressed steel, electro-galvanized to resist rust. The body is of Keystone copper steel (12 in. deep with sloping bottom) reinforced with angle iron. A breakproof construction throughout! Equipped with chain to gravity latch. Style B has a copper steel hopper for coal delivery with bags or wheelbarrow. Style D is without hopper. The No. M203 Majestic is the same as the No. M101, but larger in size.

The No. M500 Majestic is the biggest value ever offered in a coal window. It is the same size and made of the same quality materials as the No. M101 but with a 9-in. straight bottom body, without chain to latch and without hopper. The No. M520 Majestic is the same as the No. M500, but larger in size.

The No. M10 Majestic, is used when daylight is desired in the coal bin. The frame, door and hinges are all of certified malleable iron with a ¼-in. wire glass panel in the door. Otherwise it is the same in style and size as the No. M101. Style A is with hopper—Style C without. The No. M20 Majestic is the same as the No. M10, but larger in size. The No. M600 Majestic is another glass panel door style like the No. M10, but with a body like the No. M500. The No. M620 is the same as No. M600, but larger in size.


Closed
Open

Majestic Coal Windows Nos. M101 and M203


Closed
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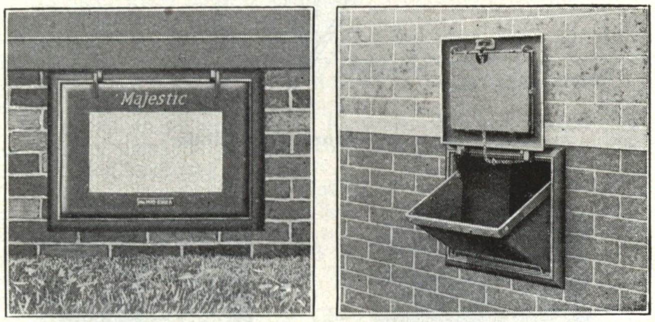
Majestic Coal Windows Nos. M500 and M520


Closed
Open

Majestic Coal Windows Nos. M10 and M20

SIZES OF STEEL DOOR STYLES

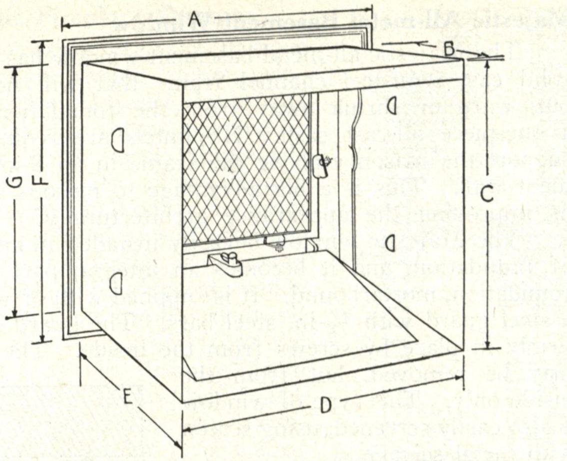
No.	Style	Rough wall opening (inches)		
		Wide	High	Deep
M101	B	24	17	12
M101	D	24	17	12
M203	B	32	22	17
M203	D	32	22	17
M500	....	24	17	9
M520	....	32	22	12

SIZES OF GLASS PANEL STYLES

No.	Style	Rough wall opening (inches)		
		Wide	High	Deep
M 10	A	24	17	12
M 10	C	24	17	12
M 20	A	32	22	17
M 20	C	32	22	17
M600	....	24	17	9
M620	....	32	22	12

See next page for detail dimensions.

Continued on next page



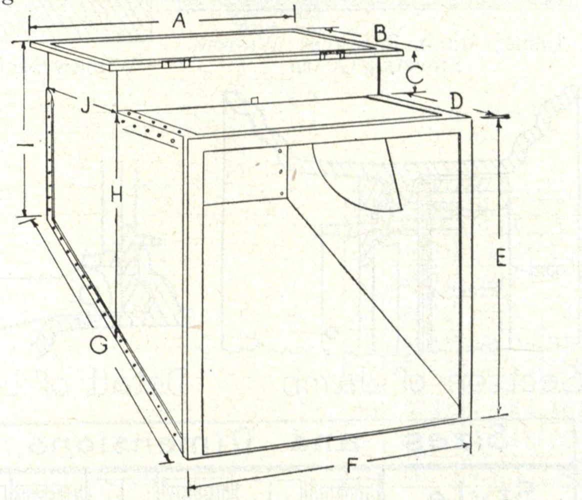
Dimension Diagram of all Styles of Majestic Coal Windows
Dimensions in inches

No.	A	B	C	D	E	F	G
M101	25	12	18	21¾	12	19	16
M203	33	17	24½	30	17	23½	20¾
M500	25	9	15½	21½	9	19	15½
M520	33	12	20½	30	12	23½	20½
M 10	25	12	18	21¾	12	19	16
M 20	33	17	24½	30	17	23½	20¾
M600	25	9	15½	21½	9	19	15½
M620	33	12	20½	30	12	23½	20½

Majestic Grade Line Coal Chute

Designed for buildings with little or no foundation above ground—such as low-set or terraced homes, apartments, store and office buildings. Door swings upward and, when raised, forms part of the hopper and becomes a shield which protects the building when coal is delivered. When closed, door locks automatically—burglarproof.

Frame is made of certified malleable iron; door of heavy wrought steel floor plate, diamond surfaced. Hinges are certified malleable iron with solid brass hinge pins. Body of Keystone copper steel, reinforced with angle iron. A breakproof construction throughout. Water drainage grooves under door prevent water from getting into basement.

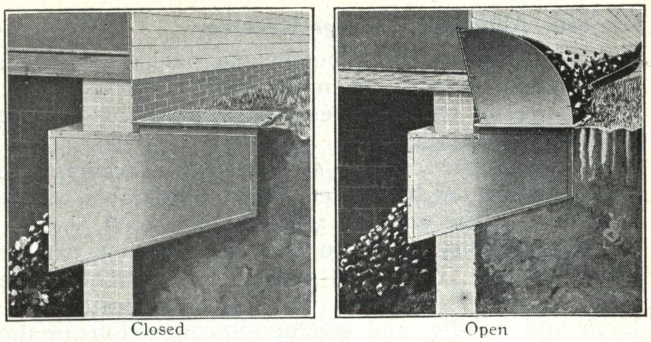


Dimension Diagram of Majestic Grade Line Coal Chutes
Dimensions in inches

No.	A	B	C	D	E	F	G	H	I	J
M16	26½	21	4	16	24¾	24½	36½	19	16¼	19½
M18	32	27	4	17	31	30	45	24	19½	25½

SIZES OF MAJESTIC GRADE LINE CHUTES

No.	Door opening, in.	Rough wall opening (inches)
M16	24x18	25 x 25
M18	30x24	31 x 31

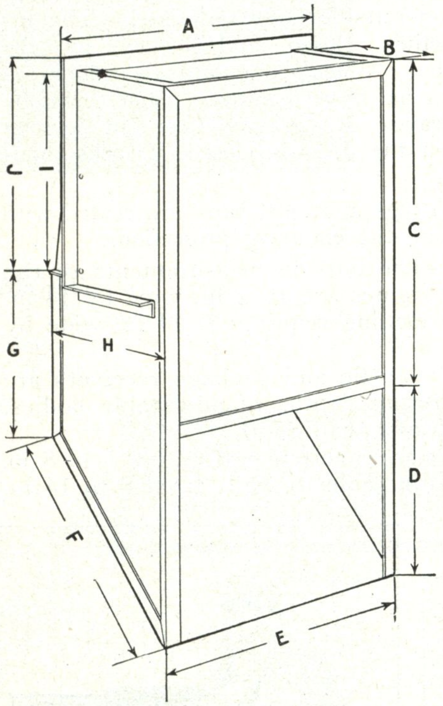

Closed Open

Majestic Grade Line Coal Chute

Majestic Store Coal Chute

Designed particularly for store and office buildings, where the first floor is on a line with the sidewalk or alley. It does away with the dangerous sidewalk coalhole and the necessity for putting up a bond for the protection of pedestrians.

The frame and hinges are of certified malleable iron. The door is of heavy gauge pressed steel, electro-galvanized to resist rust. Two sizes, with or without hopper. On special order, the store chute can be supplied with a duplex body so that coal can be deposited either under the sidewalk or in the basement as desired.

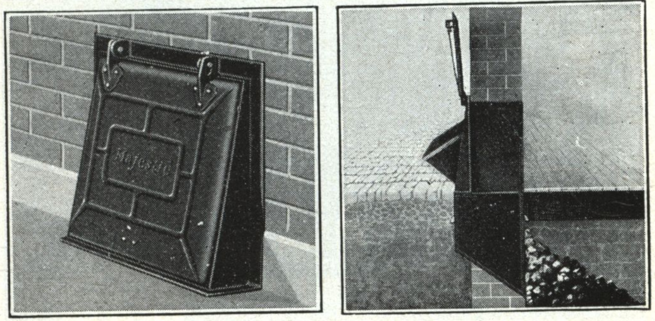


Dimension Diagram of Majestic Store Coal Chutes
Dimensions in inches

No.	A	B	C	D	E	F	G	H	I	J
M12	25	11½	26⅜	15¼	23	19½	13	15½	17	18
M15	33½	11½	30	16	30⅞	19½	13	15½	21¼	22½

SIZES OF MAJESTIC STORE CHUTES

No.	Door opening, in.	Rough wall opening (inches)	
		Above grade	Below grade
M12	21x15	23x17	23x25
M15	29x19¼	31x21¼	31x25


Closed Open

Majestic Store Coal Chute

Continued on next page

Majestic Milk and Package Receiver

The Majestic milk bottle and package receiver is designed to hold 6 or more quart bottles of milk, depending on the thickness of the building wall in which it is installed.

It is constructed of two cast iron frames and doors, connected by a steel body, adjustable to the thickness of the walls in which it is placed.

The gravity latch on the outside door can be unlocked only from the inside. The kitchen side door is provided with a nickeled refrigerator type latch and handle, and can not be opened from the outside.

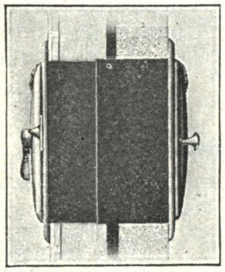
Operation—A chain attached to the gravity latch runs through three cast iron eyes to the inside frame, where a cast iron ball is suspended. When empty bottles are placed in the receiver, the ball is pulled down. Its weight and friction of the chain holds the latch on outside door unlocked. The ininside door is then closed and locked by the refrigerator latch. When the outside door is opened, the chain is drawn outward and held by friction. This leaves the gravity latch in locking position, and when the door is closed, it locks automatically.

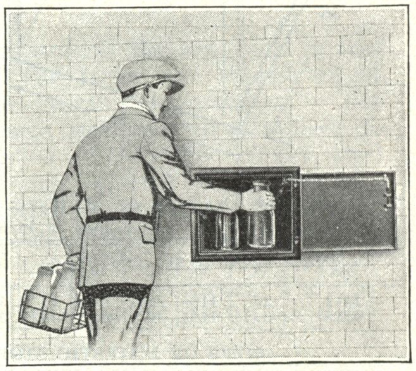
Coating—Castings and steel body are coated with Bitumastic Solution—the enduring protection.

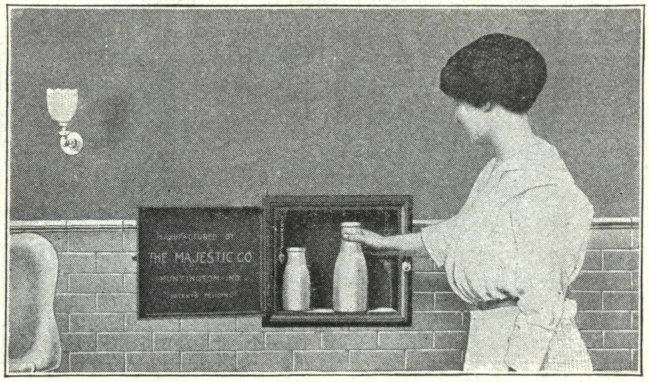
Dimensions—The outside measurements of the package receiver frames are 16¼ in. wide by 14 in. high. The wall opening required is 14 in. wide by 11½ in. high.

Majestic milk bottle and package receivers are made in two different depths of adjustable bodies, adapting them to any wall depth.

No. 1 body is adjustable to walls from 5 to 8 in. deep. No. 2 is adjustable to walls from 8 to 14 in. deep.


Section
Showing Installation in the Wall


Outside View


MANUFACTURED BY
THE MAJESTIC CO.
HUNTINGTON, IND.

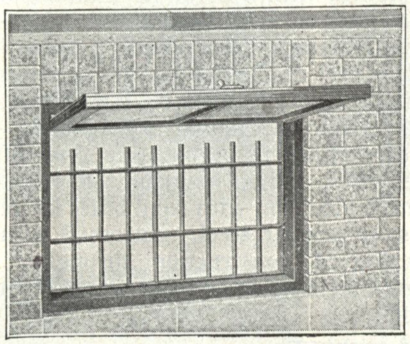
Inside View
MAJESTIC MILK AND PACKAGE RECEIVER

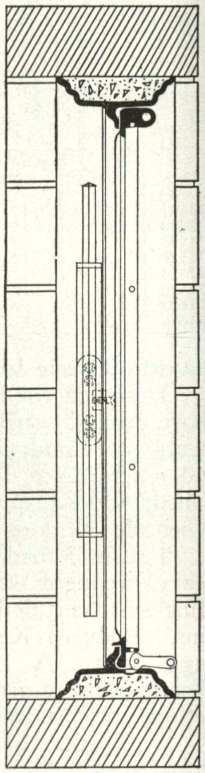
Majestic All-metal Basement Window

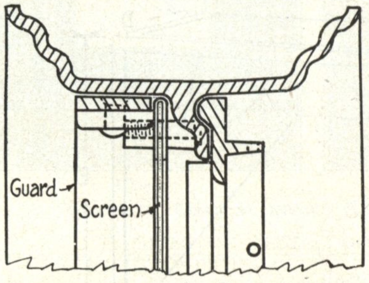
The Majestic all-metal basement window has a 5-in. solid cast semisteel channel frame that will not rust out, warp or shrink away from the foundation—also a one-piece all-cast sash. No lintels are required to support the masonry above the frame in an 8-in. basement wall. This is a big advantage to masons as well as improving the appearance architecturally.

The Majestic window is easily installed in any type of foundation, and it becomes an integral part of the foundation, mortarbound. It is supplied with or without a steel guard with ½-in. steel bars. The guard is held firmly in place by screws from the inside. The guard may be removed, but from the inside only. This type of window is also easily screened, using screen with metal selvage.

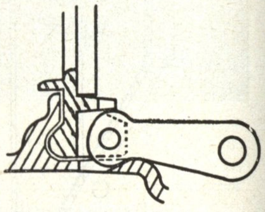
The Majestic window is burglarproof, rainproof and windproof. It can not rattle and will last indefinitely. The glass is put in with wire clips and putty as in steel sash. Holes are provided in the latch for hooks to hold window open. Brass hinge pins and brass bolts for guards are used. Coated with Bitumastic Solution.


INSIDE, METAL BASEMENT WINDOW, SHOWING GUARD


WINDOW SECTION



Section of Jamb


Detail of Lock

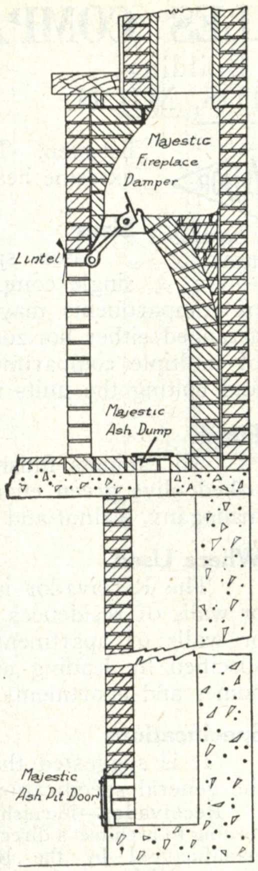
Sizes and Dimensions						
Style	2-LIGHT GUARD	2 LIGHT No GUARD	2 LIGHT GUARD	2 LIGHT No GUARD	3 LIGHT GUARD	3 LIGHT No GUARD
Majestic No.	11	12	21	22	31	32
Glass Size	12 x 18	12 x 18	14 x 20	14 x 20	10 x 12	10 x 12
Wall Opening	22 x 29	22 x 29	24 x 33	24 x 33	16 x 35½	16 x 35½

Continued on next page

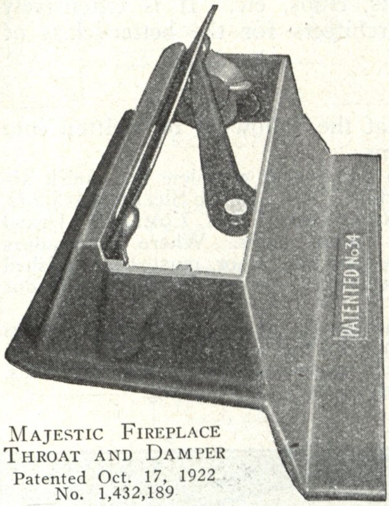
Majestic Fireplace Damper

No other fireplace damper employs the simple friction principle of the Majestic, by means of which the throat opening is subject to the most minute adjustment. It also allows damper to be easily lifted out of its bearings or replaced at will after installation. Opening is adjusted from back of the throat, which throws heat out into the room and draws the smoke off from the nearest possible distance from the face of the fireplace. The operating mechanism, which consists of a short lever, is out of sight and easily moved forward and back with a poker. No unsightly handles or knobs extend through the brickwork.

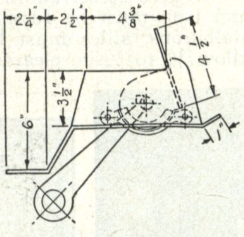
With the Majestic fireplace throat and damper, any mason can accomplish excellent results in fireplace building by following the tables and drawings.



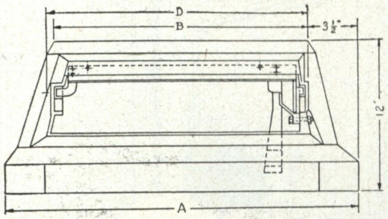
Fireplace Section Showing Application of Damper



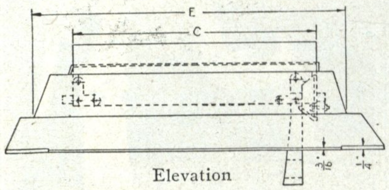
Majestic Fireplace Throat and Damper
Patented Oct. 17, 1922
No. 1,432,189



Detail of Damper Operator



Plan



Elevation

MAJESTIC DAMPER DIMENSIONS					
NO	A	B	C	D	E
26	30½	23¾	21½	24	26
30	34½	27¾	25½	28	30
34	38½	31¾	29½	32	34
38	42½	35¾	33½	36	38
42	46½	39¾	37½	40	42
46	50½	43¾	41½	44	46
50	54½	47¾	45½	48	50
54	58½	51¾	45½	52	54

MAJESTIC FIREPLACE TABLES															
MAJESTIC DAMPER NO'S	26	30	30	34	34	38	38	42	42	46	46	50	50	54	54
SHIPPING WEIGHT	45#	52	52	59	59	66	66	70	70	75	75	81	81	89	89
WIDTH OF FINISHED OPENING	26"	28	30	32	34	36	38	40	42	44	46	48	50	52	54
HEIGHT OF FINISHED OPENING	28"	29	30	30	30	31	31	31	31	32	32	32	32	32	32
DEPTH OF FIREBOX	16"	16	17	17	18	18	19	19	20	20	21	21	22	22	23
FLUE SIZES	8"x8"	8x12	8x12	8x12	8x12	12x12	12x12	12x12	12x12	12x12	12x12	12x16	12x16	12x16	12x18

Majestic Flue Clean-out

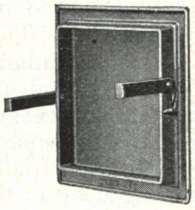
The Majestic offers many advantages over the ordinary flue clean-out. It is made of the highest quality cast iron, hand fitted. It has a malleable iron turn key, and latch that locks the door securely.

When locked, the door fits tightly and can not come open. Its anchor irons fold flat.

Made in two sizes: No. 88, 8x8 in.; No. 812, 12x8 in. No. 812 is also ample in size for an ash pit door.

Majestic
FLUE
CLEAN OUT
No 88

Front View, Door Closed



Rear View, Anchor Irons Extended

Majestic Flue Clean-out No. 88

Majestic Ash Dump

The new Majestic ash dump has the lid permanently hinged to the frame as illustrated. The lid can not fall out.

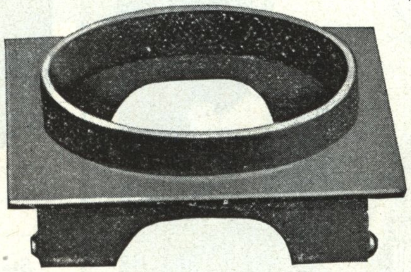
THE MAJESTIC CO.
HUNTINGTON IND.
7 X 10
MAJESTIC

Majestic Ash Dump

No.	Outside, in.	Inside, in.
6	8x8	6x6
8	10x10	8x8
9	6x9	4x7
10	7x10	5x8

Majestic Flue Thimble

The Majestic flue thimble is cast iron of the highest quality. Permanent—easy to install.



Majestic Flue Thimble

No.	Smoke collars, in.	Over all, in.
5	5	5½
6	6	6½
7	7	7½
8	8	8½
9	9	9½
10	10	10½

RECEIVADOR SALES COMPANY

417 Ashton Building
GRAND RAPIDS, MICH.

RECEIVADOR
"The Automatic Servant"
TRADE-MARK

The Receivador

Description—The Receivador is a metal parcel receiver of two or more compartments installed in the exterior or interior walls or doors of a building. Its purpose is to receive and safeguard delivered packages in the absence or pre-occupation of the owner. Each compartment has two doors, one inside and one out, provided with a non-pickable lock and operated by the simple turn of a thumb bolt. An interlocking device makes it impossible to open both doors at the same time, thereby preventing ingress through the Receivador.

Operation—The delivery man inserts the package and turns the thumb bolt which automatically engages the interlock and prevents outside door being again opened until package is removed by way of the inside door. When the inside door is closed and the thumb bolt turned, the outside lock is automatically released, permitting door to be opened. The design of the lock makes its action reliable and unfailing. The installation of the Receivador cabinet in no way interferes with the normal operation of the door.

Construction

The standard Receivador consists of two compartments, upper and lower. The lower compartment as shown below, contains a regulation suit box, shoe box and corset box with ample room for other small parcels.

The cabinet is made of sheet steel and possesses the utmost strength and rigidity. Its parts are electrically welded; no bolts or screws are used in its assembly. The doors are built up of two sheets of steel electrically welded together with a sheet of insulating material between. This insulation is effective against extreme heat and cold.

Sizes

For special requirements we furnish single compartment cabinets, or the number of compartments may be increased to three or more arranged either horizontally or vertically. The rigidity of multiple compartments is accomplished by welding and bolting the units together.

Finish

All cabinets finished with one coat best non-rust, baked olive green enamel. Special grained finishes in mahogany, walnut and quartered oak at slight extra cost.

Where Used

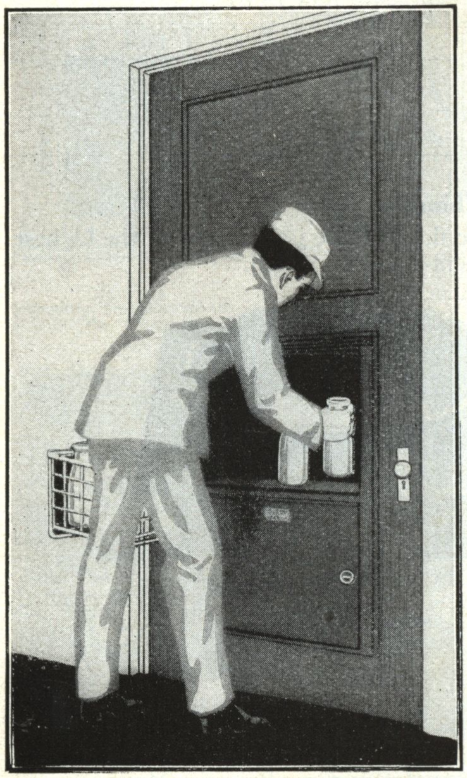
The Receivador is used in service entrance doors or walls of residences and clubs, also in corridor doors or walls of apartments, clubs, etc. It is extensively specified by leading architects for the better class of homes and apartments.

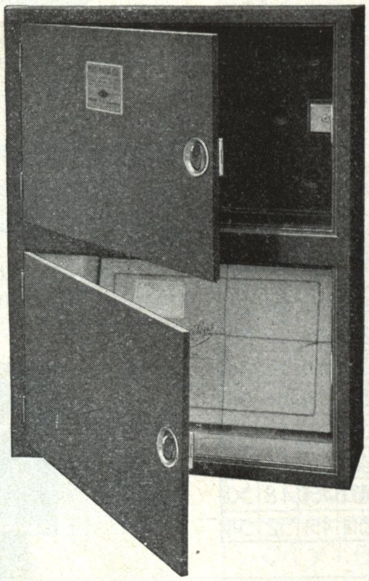
Specifications

It is suggested that the following be written into the general specifications.

Receivador—Furnish and install complete and finish according to architect's directions ...... double Steel Receivadors, manufactured by the Receivador Sales Company, Grand Rapids, Mich., as shown on the plans. Where Receivadors are to be installed in a door, the door must be furnished by the contractor with the proper opening for the Receivador Cabinet.

Where Receivadors are to be installed in a wall, frames and trim must be furnished by the contractor. For door installations, stiles must be 5 in. wide. For wall installations, allow ¼ to ½-in. clearance in the rough opening.

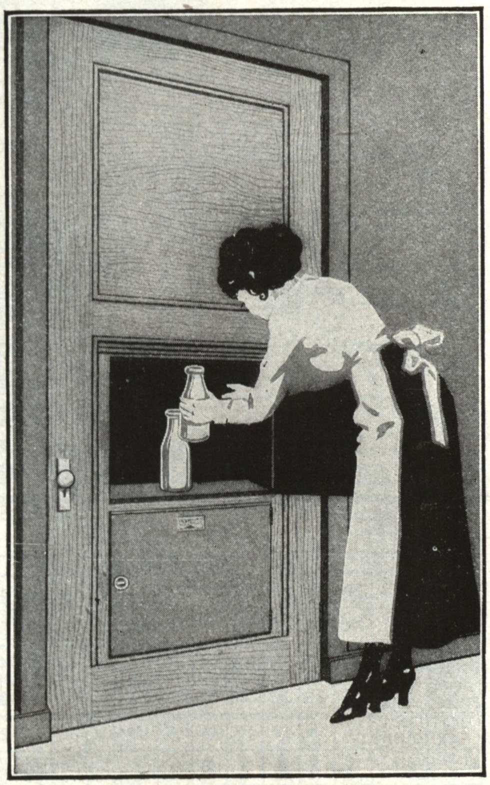




Standard Receivador Cabinet

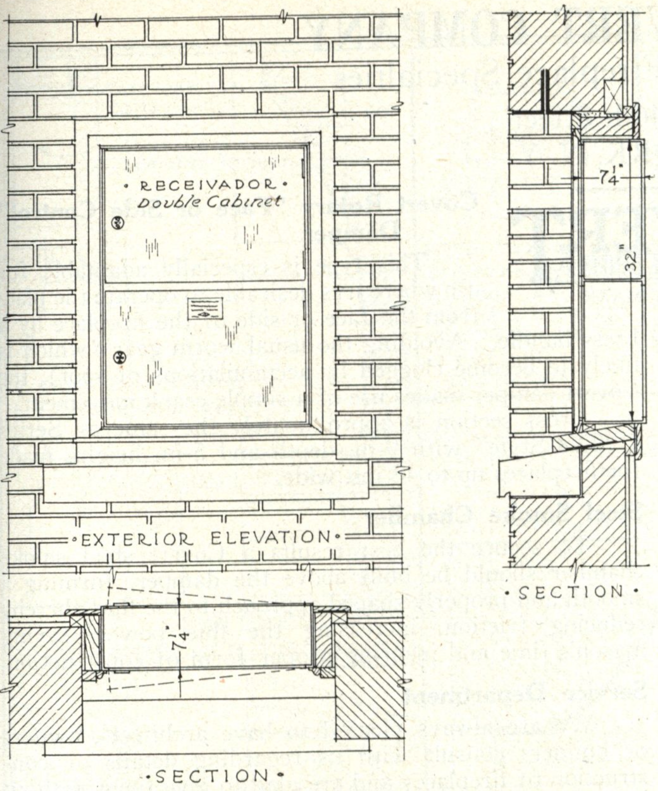
Double compartment units, in.		Single compartment units, in.		Size door, ft.-in.
Height	Width	Height	Width	
32	20	16	20	2–6
32	22	16	22	2–8
32	24	16	24	2–10
32	26	16	26	3–0

All cabinets 6¼ in. deep inside, 7¼ in. over all. Any number of compartments can be used by adding single units.



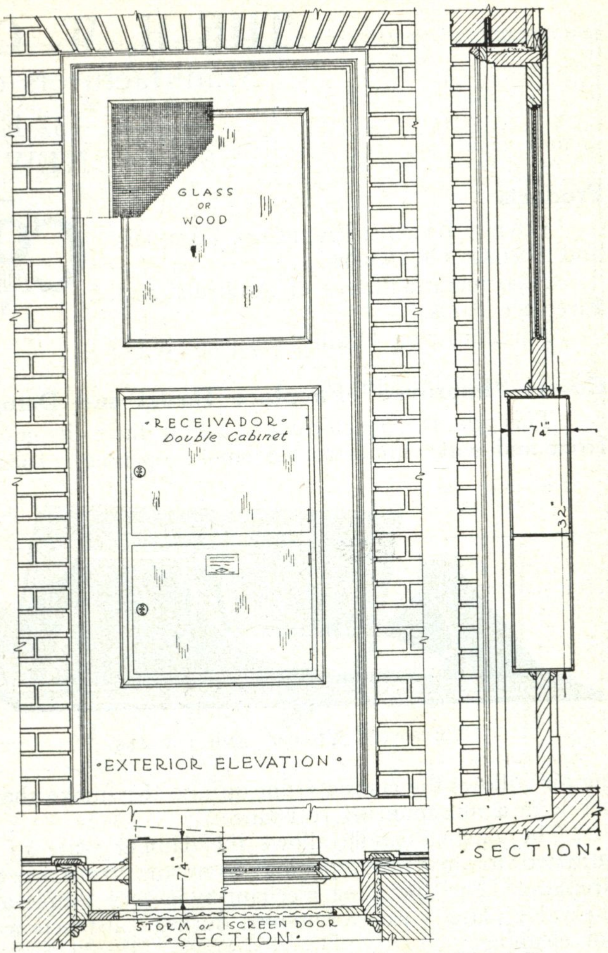
Articles Are Received Through Outside Door and Safeguarded Until Removed Through Inside Door

Continued on next page

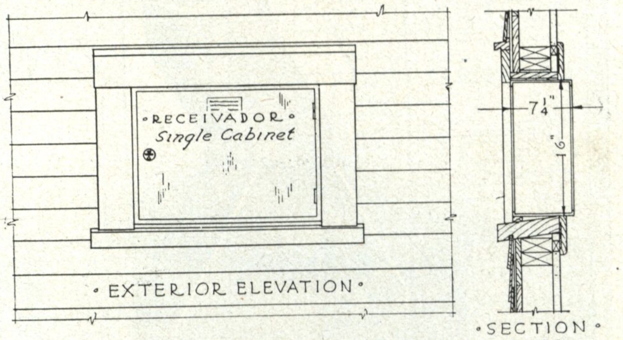

RECEIVADOR Double Cabinet
EXTERIOR ELEVATION
7¼"
32"
SECTION
7¼"
SECTION

NOTES:
FRAMES TO be MADE ½ INCH WIDER and ¼ INCH HIGHER THAN RECEIVADOR DIMENSIONS.
STANDARD FRAMES MAY be USED.
FRAMES MUST be SET SQUARE.

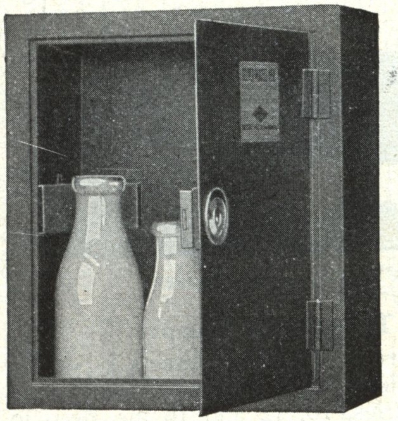
Double Receivador Cabinet in Wall of Brick Building


GLASS OR WOOD
RECEIVADOR Double Cabinet
EXTERIOR ELEVATION
7¼"
32"
SECTION
7¼
STORM or SCREEN DOOR
SECTION

Double Receivador Cabinet Installed in Wood Door


RECEIVADOR Single Cabinet
EXTERIOR ELEVATION
7¼"
16"
SECTION

Single Receivador Cabinet in Wall of Frame Building



Receivador Junior, Style No. 21

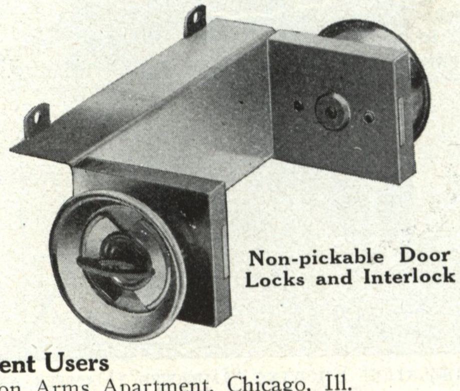
Designed especially for moderate priced homes and apartments for receiving milk and other small packages.

Same welded construction and material as the standard type with same non-pickable, automatic locks.

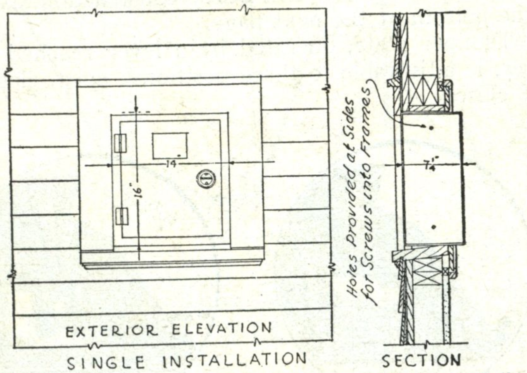
Cheaper and more sanitary than wood. Is proof against dust, vermin and storms.

Single compartment: width, 14 in.; height, 16 in.; depth through, 7¼ in.

Double compartment: width, 14 in.; height, 32 in.; depth through, 7¼ in.



Non-pickable Door Locks and Interlock


14"
16"
7¼"
Holes Provided at Sides for Screws into Frames
EXTERIOR ELEVATION
SINGLE INSTALLATION
SECTION

Receivador Junior, Style No. 21, Installed in Wall

Note: Receivador Junior fits between studding 16 in. O. C. Double installation is similar to installation of the standard type Receivador shown above

Prominent Users

Wellington Arms Apartment, Chicago, Ill.
Westbrook Apartments, Buffalo, N. Y.
Franchette Apartments, New York, N. Y.
Shorecrest Apartments, Milwaukee, Wis.
Fred Boylon, Grand Rapids, Mich.
Martin Tulgren & Sons, Milwaukee, Wis.
General Building Corporation, Detroit, Mich.
Edward Hagen Apartment, Chicago, Ill.
C. E. Reichle & Co., Detroit, Mich.
Loutellus Apartment, Pittsburgh, Pa.

THE H. W. COVERT COMPANY

Manufacturers of Fireplace Specialties

137 East 46th Street
NEW YORK, N. Y.

COVERT
FIREPLACE DAMPERS
TRADE-MARK

Products

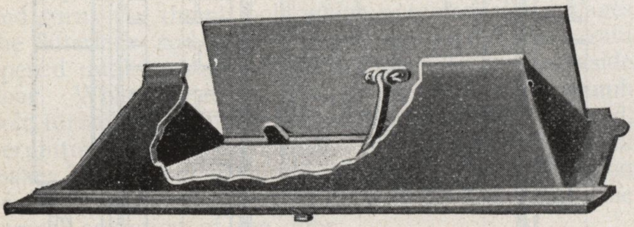
Covert Patent Fireplace Dampers and Smoke Chambers.

Also manufacturers of Andirons and Fireplace Tools.

For Anti-clog Drains, see page 1844.

Covert "Improved" Fireplace Throat and Damper

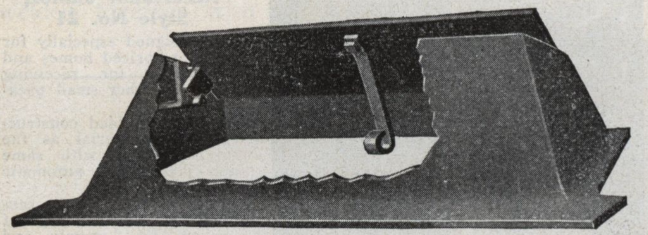
This type is very efficient in action due to its curved front and wide, unobstructed smoke opening. Inrushing air follows the curved front up into the smoke chamber with a minimum of resistance.



"Improved" Throat and Damper

The ratchet handle allows the damper plate to be adjusted to any size opening from the front of the fireplace. The operating mechanism is very simple and the valve plate is easily removed during construction or for cleaning.

Used in fireplaces 20 ins., or less, in depth at the hearth.



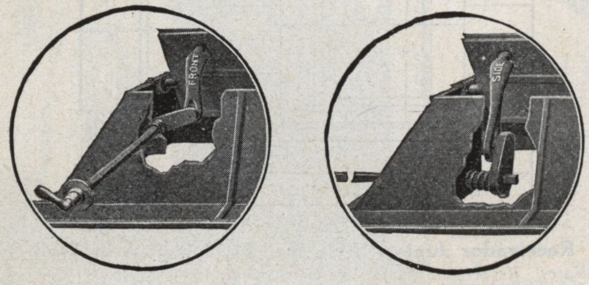
"Old-Style" Throat and Damper

Covert "Old-Style" Throat and Damper

This type is preferred by some architects, especially for use in large and deep fireplaces.

Made in three series, 10, 12 and 16 ins. deep in the base opening, of extra heavy construction, as shown at the bottom of the next page.

Damper plate, operated by a lever reached with a poker, is adjustable to three positions: open, closed and half closed.



Covert Rotary "Face or Side Control" Damper

Covert Rotary "Face or Side Control" Damper

This type is especially adaptable for use where it is desirable to operate the plate from the face or side of the fireplace by a brass handle. Avoiding the usual worm gear (which is likely to become clogged by accumulations of soot), the Covert damper makes use of a simple crank movement.

Cross section is approximately the same as Series C "Old-Style" with 9-in. depth and 5-in. height, made for fireplaces up to 48 ins. wide.

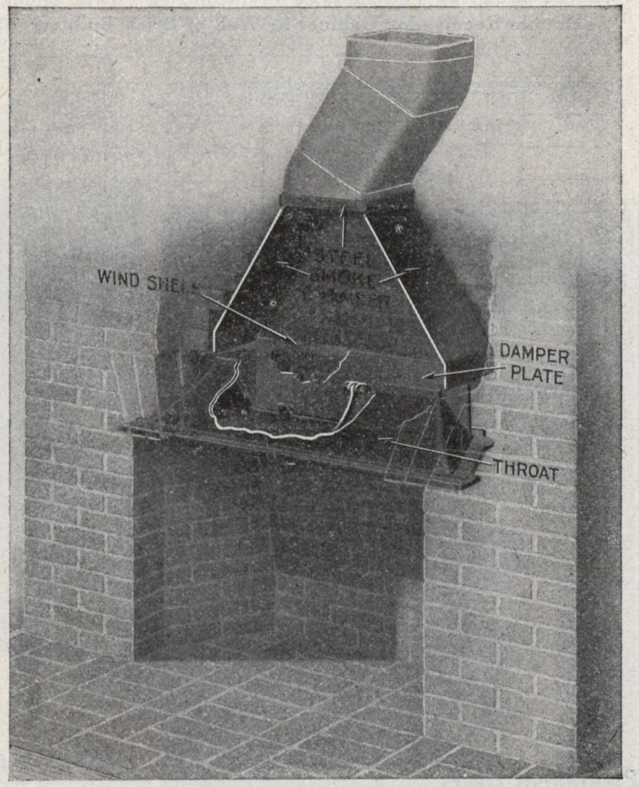
Steel Smoke Chamber

To secure the best results a Covert steel smoke chamber should be built above the damper, forming a smooth and properly shaped approach to the flue, thereby reducing friction, increasing the flue power, saving mason's time and insuring proper form of construction.

Service Department

We are always pleased to have architects, owners or builders consult with us regarding details of construction of fireplaces and are glad to give them without charge, the benefit of our long experience.

Our booklet of fireplace construction will be sent on application.



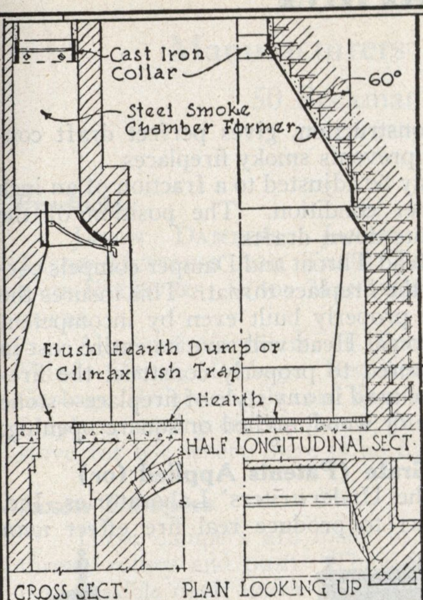
Installation Showing "Improved" Damper and Steel Smoke Chamber

Specification

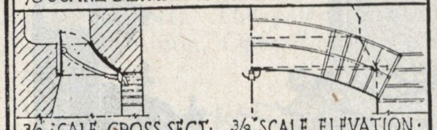
Every fireplace to have a Covert [Improved] [Old-Style] [Rotary] Damper with Covert Steel Smoke Chamber.

Contractor will confer with The H. W. Covert Company as to the selection of damper and steel smoke chamber best suited to the conditions, and the proper installation of these items.

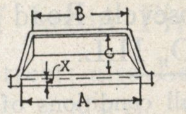
Continued on next page


Cast Iron Collar
Steel Smoke Chamber Former
60°
Flush Hearth Dump or Climax Ash Trap
Hearth
HALF LONGITUDINAL SECT.
CROSS SECT.
PLAN LOOKING UP

3/8" SCALE DETAILS OF FLAT ARCH FIREPLACE



3/8 SCALE CROSS SECT. 3/8" SCALE ELEVATION.
SEGMENTAL ARCH CONSTRUCTION



KEY PLAN
See Table

NOTE: Throat for Segmental Arch is same as for Flat Arch except that Flange X is cut off. See detail.

TABLE OF SIZES

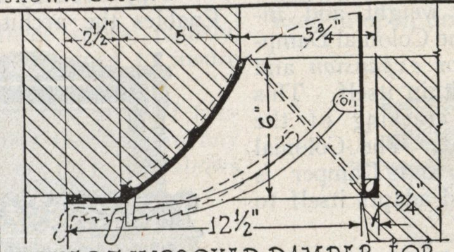
THROAT & DAMPER						FLUE		SMOKE CHAMBER FORMER	
DAMPER NO.	FRONT WIDTH OF FIREPL. OPG IN INCHES	BASE OPEN'G OF THROAT NOT INCLUDING FLANGE IN INCHES			SHIPPING WEIGHT IN POUNDS	PROPER FLUE LINING EXTERIOR DIMENSIONS	EQUIVALENT ROUND FLUE INSIDE DIAMETER	WIDTH OF SMOKE CHAMBER IN INCHES	SHIPPING WEIGHT IN POUNDS
		A	B	C					
524	24	24	18	10	33	8½ × 8½	8	19	12
530	30	30	24	10	40	8½ × 13	10	25	15
532	32	32	26	10	46	8½ × 13	10	27	20
536	36	36	30	10	52	8½ × 13	10	31	25
542	42	42	36	10	60	13 × 13	12	37	30
548	48	48	42	10	67	13 × 13	12	43	35
554	54	54	48	10	75	13 × 18	15	49	50
560	60	60	54	10	87	13 × 18	15	55	60

Area of fireplace flue always 1/10 to 1/12 of area of fireplace opening

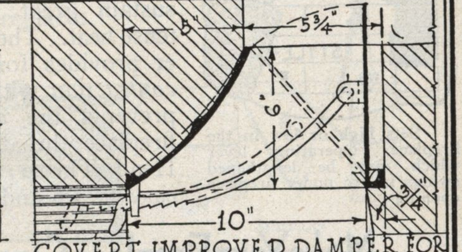
—NOTES—

Steel Smoke Chamber Former with cast iron collar of proper size with proper flue will be furnished when ordered. This furnishes a smooth passage for the smoke into the flue.

This damper is good for fireplaces not over 20 inches deep, having splayed jambs and back. For deeper fireplaces the Old Style Damper shown below is recommended.

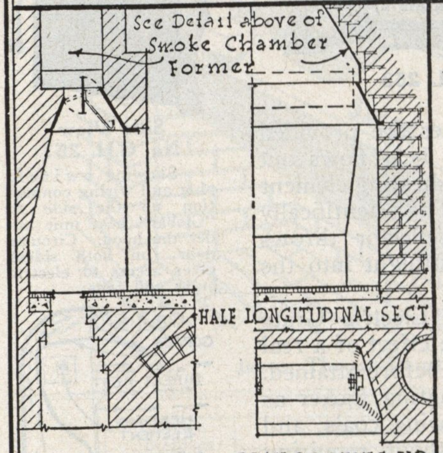

2½"
5"
5¾"
6"
10"
3/4"
12½"

COVERT IMPROVED DAMPER FOR FLAT ARCH SCALE 1½" = 1'-0"

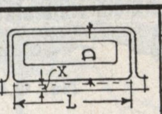

5"
5¾"
6"
10"
10"
3/4"

COVERT IMPROVED DAMPER FOR SEGMENTAL ARCH SCALE 1½" = 1'-0"

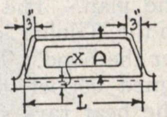
COVERT IMPROVED THROAT AND DAMPER ALSO SMOKE CHAMBER FORMER


See Detail above of Smoke Chamber Former
HALF LONGITUDINAL SECT.

CROSS SECTION PLAN LOOKING UP.
3/8" SCALE DETAILS OF FLAT ARCH FIREPLACE



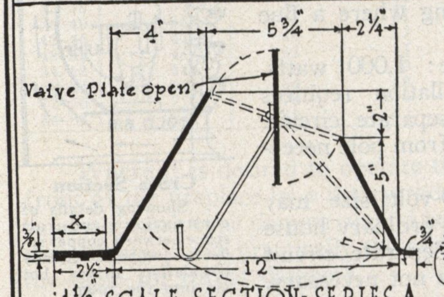
SERIES A&B



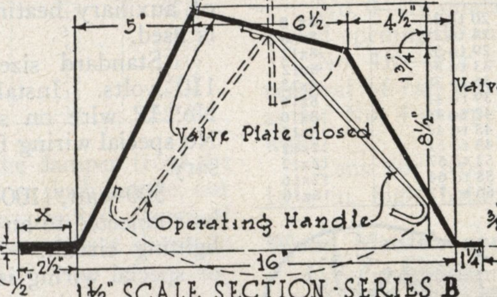
SERIES C

NOTE. Flange X removed for use with segmental arch construction. See detail. Also see general note above on improved throat and damper.

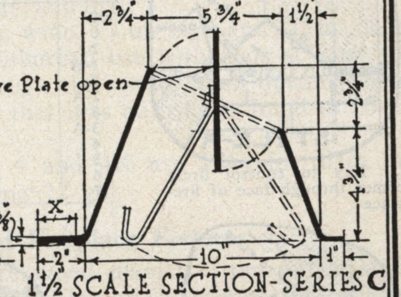
SIZE OF THROAT & DAMPER						SIZE OF FLUE		SMOKE CHAMBER FORMER	
DAMPER NO.	WIDTH OF FIREPLACE OPENING	LENGTH L INCHES	DEPTH D INCHES	SMOKE OPENING IN INCHES	WEIGHT IN POUNDS	PROPER FLUE LINING EXT DIMEN. INCHES	EQUIVALENT ROUND FLUE INSIDE DIAM	WIDTH E INCHES	SHIPPING WEIGHT POUNDS
SERIES A SQUARE ENDS									
224	2'-0"	24	12	6 × 18	26	8½ × 8½	8	19	12
230	2'-6"	30	12	6 × 24	36	8½ × 13	10	25	15
232	2'-8"	32	12	6 × 26	40	8½ × 13	10	27	20
236	3'-0"	36	12	6 × 30	46	8½ × 13	10	31	25
242	3'-6"	42	12	6 × 36	56	13 × 13	12	37	30
248	4'-0"	48	12	6 × 42	66	13 × 13	12	43	35
254	4'-6"	54	12	6 × 48	80	13 × 18	15	49	50
260	5'-0"	60	12	6 × 54	97	13 × 18	15	55	60
272	6'-0"	72	12	6 × 66	110	18 × 18	20	67	75
SERIES B SQUARE ENDS									
36½	3'-0"	36	16	6½ × 30	85	8½ × 13	10	31	25
42½	3'-6"	42	16	6½ × 36	93	13 × 13	12	36	30
48½	4'-0"	48	16	6½ × 42	105	13 × 13	12	43	35
54½	4'-6"	54	16	6½ × 48	120	13 × 18	15	46	50
60½	5'-0"	60	16	6½ × 54	130	13 × 18	15	55	60
72½	6'-0"	72	16	6½ × 66	176	18 × 18	20	67	75
84½	7'-0"	84	16	6½ × 78	210	18 × 24	22	79	90
SERIES C SPLAYED ENDS									
30	2'-6"	30	10	6½ × 24	36	8½ × 13	8	25	15
36	3'-0"	36	10	6½ × 30	46	8½ × 13	10	31	25
42	3'-6"	42	10	6½ × 36	56	13 × 13	12	37	30
48	4'-0"	48	10	6½ × 42	66	13 × 13	12	43	35


4"
5¾"
2¼"
Valve Plate open
2"
5"
X
3/4"
2½"
12"
3/4"

1½ SCALE SECTION - SERIES A


5"
6½"
4½"
1¾"
Valve Plate closed
8½"
X
Operating Handle
2½"
16"
1¼"
½"

1½" SCALE SECTION - SERIES B


2¾"
5¾"
1½"
Valve Plate open
2¼"
4¾"
X
3/8"
2"
10"
1"

1½ SCALE SECTION - SERIES C

COVERT OLD STYLE THROAT AND DAMPER ALSO SMOKE CHAMBER FORMER

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	DETAILS OF COVERT IMPROVED AND OLD STYLE FIREPLACE THROATS AND DAMPERS	SCALE 3/8 & 1½ EQUALS 1'-0" DATE-APR: 21.	DRWG 1

COLONIAL FIREPLACE COMPANY

TELEPHONE
LAWNDALE 0140

4664 West Roosevelt Road
CHICAGO, ILL.

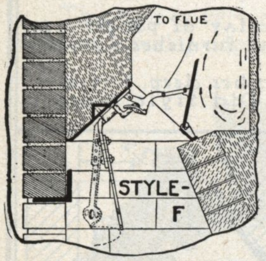
Products and Services

The IMPROVED COLONIAL HEAD THROAT and DAMPER for Fireplaces.

The GLO-HOT ELECTRIC GRATE (Patents applied for).

Also Fireplaces; Fireplace Trimmings, Fenders, Grates and Andirons; Special Brass and Wrought Iron Work for Fireplaces.

Improved Colonial Head Throat and Damper for Fireplaces

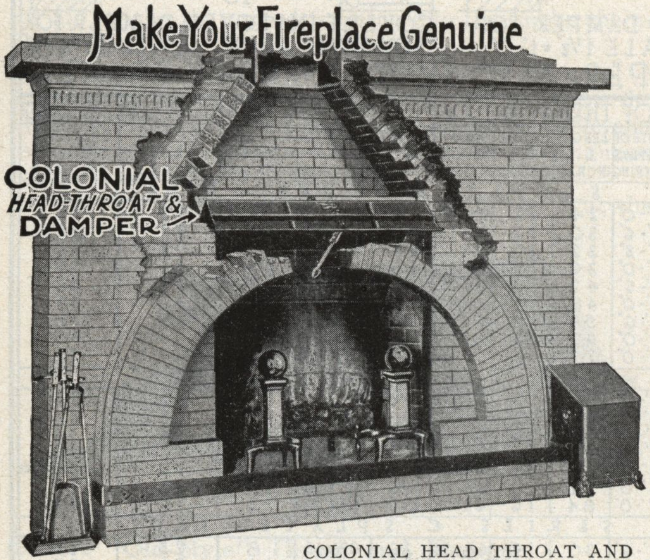


Sets high or low in the fireplace. Operating lever which may be lengthened swings in arc under fireplace opening

The Colonial Head Throat and Damper is built in sections of best grade iron castings reinforced with steel angle bar to sustain great weight and intense heat. The Colonial Damper provides for *expansion* and *contraction* within itself. This prevents the cracking of the fireplace throat. The Colonial Head Throat and Damper is easy to set and adapts itself to all conditions of construction, gives perfect draft control, saves fuel and prevents smoky fireplaces.

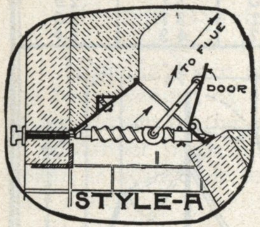
The damper may be adjusted to a fraction of an inch to meet any weather condition. The position of the damper door prevents down drafts.

The Colonial Head Throat and Damper compels correct construction of the fireplace throat. This insures the architect a fireplace properly built even by incompetent workmen. The Colonial Head will save its entire cost in labor originally required to properly construct the fireplace throat. May be used in any style of fireplace—stone or marble, brick, tile or wood, arched or square opening.

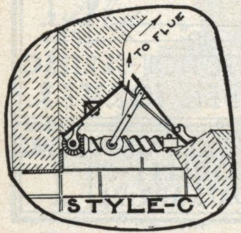


COLONIAL HEAD THROAT AND DAMPER

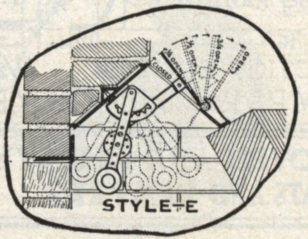
No.	Width of fireplace opening, in.	Proper size of flue, in.
00	20 to 23	8x 8
0	24 to 28	8x 8
1	29 to 32	8x12
1-A	33 to 35	8x12
2	36 to 38	8x12
2-A	39 to 41	8x16
3	42 to 44	8x16
3-A	45 to 47	8x16
4	48 to 51	12x12
5	52 to 57	12x12
6	58 to 64	12x16
7	66 to 72	16x16



Key to control draft comes through face of fireplace



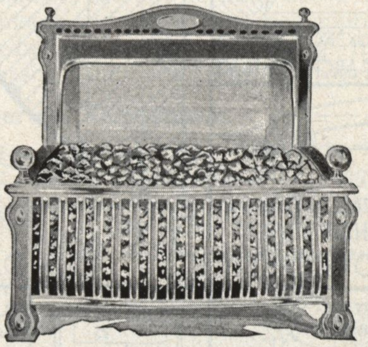
Key at right end of fireplace



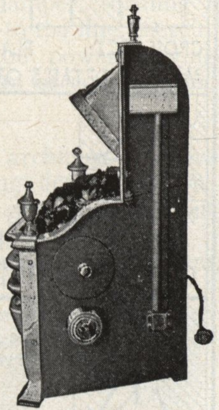
Operating lever in center of opening

Glo-Hot Electric Grate (Patents Applied for)

Approved by the Underwriters' Laboratories, Inc. Enables the architect to produce real fire effect *with heat* where no flues are provided in the plan. The heat flows out from the "Globar" heating element under the hood. The scientifically designed copper reflector throws all the heat rays straight into the room.



No. G.H. 253



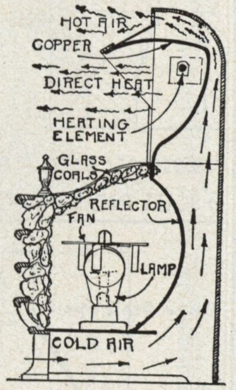
Side View
No. G.H. 251

Showing switch, plug and wiring connection up the side to "Globar" heat unit under the hood. Circular door (on both sides) gives access to electric bulbs and fans

The Glo-Hot Electric Grate comes closer to the effect of a real fireplace than ever before attained. It gives the fascinating flicker as of real fire in glowing coals, and heats as well, without requiring any flue. The cost of operation is low compared with any other type of auxiliary heating where a flue is used.

Standard size: 1,000 watts, 110 volts. Installation requires No. 12 wire on separate circuit. No special wiring from pole necessary.

500-watt, 100-volt size may be connected to an ordinary house lighting circuit. Separate circuit or special wiring is not necessary.



Cross Section

Showing details of construction and air space between copper reflector and back. Steady circulation drives hot air into the room

Service to Architects and Builders

Through years of experience, we have met all types of unusual conditions arising in fireplace construction and we will gladly put this knowledge and experience at your service.

Blue print details and full information on any Colonial products sent on request.

EDWIN A. JACKSON & BRO., INC.

Manufacturers of Jaxon Fireplaces and Building Specialties

50 Beekman Street; also Lexington Avenue, Cor. 65th Street
NEW YORK, N. Y.

Products

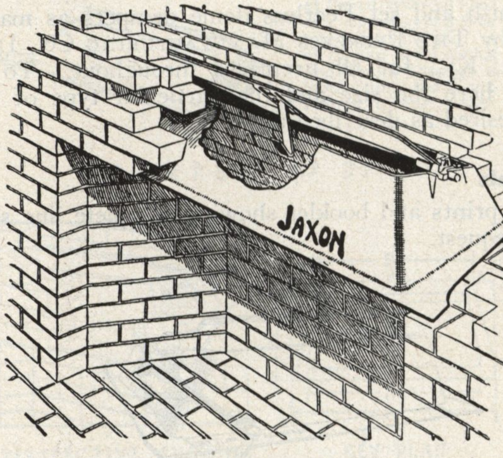
JAXON DAMPERS; JAXON SMOKE CHAMBERS; JAXON DUSTLESS ASH TRAPS, JAXON BUILT-IN GARBAGE RECEIVERS; WOOD MANTELS and FIREPLACE FIXTURES.

Also manufacturers of Jaxon Sidewalk Chutes, Windo-Shutes, Package Receivers and Underground Garbage Receivers; Jaxon Ventilating Grate, an open fireplace, heating on two floors; Jaxon Franklin, an open stove for use where there is no fireplace.

Jaxon Dampers

These dampers are made in three styles, namely, throat, rotary and push. They are designed to insure best possible draft under all conditions.

Our throat type is the latest and best style of fireplace damper. The patent arm holds the door in any desired position. Operation is by poker; no handle shows on the face.



Jaxon Throat Damper

No.	Dimensions, in.				
	Width fireplace opening	Extreme of flange			Flue size
		Front	Back	Depth	
24–28	24	28	20	12	8x 8
30–34	30	34	25	12	8x12
32–36	32	36	27	12	8x12
36–40	36	40	31	12	8x12
42–46	42	46	37	15	12x12
48–52	48	52	43	15	12x12
54–58	54	58	50	15	12x16
60–64	60	64	58	19	16x16
72–76	72	76	70	19	16x16
84–88	84	88	82	19	16x20

Where it is desired to operate the damper from the front of the fireplace by a rotary rod or push handle, our rotary or push type damper should be specified. Sizes of these dampers are practically the same as those shown in the table for throat dampers.

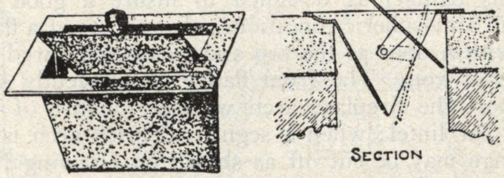
Jaxon Smoke Chambers

These metal smoke chambers are designed for the purpose of preventing irregular brickwork in the throat running from the damper to the flue. Each chamber includes two sloping sides, fitting damper below and attaching to a metal collar which fits flue above. When specifying state whether greatest dimension of flue is parallel with face of breast.

Jaxon Dustless Ash Traps

For dropping ashes from open fireplaces, kitchen ranges and coal grates to ashpit without dust. The ash trap is set with the top flush with the hearth.

The trap is operated by a rod passing through the lower part of the range or grate, permitting the ashes to be passed from the fire to the ash pit without dust entering the room. The door is easily operated and there are no springs to get out of order. The rod is not used in open fireplaces.

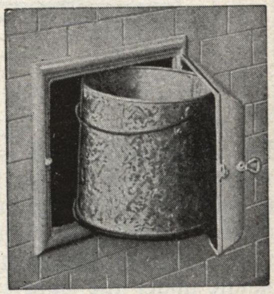


Jaxon Dustless Ash Trap

No.	Dimensions, in.		
	Outside flange	Brick opening	Trap opening
9	15 x 9	11½ x 6¼	10⅞ x 5½
6	9 x 7	7¼ x 5¾	6⅝ x 5

Jaxon Built-in Garbage Receivers

The Jaxon receiver is made of cast iron, including the doors, frame and box. The front of the receiver opens into the kitchen and is so arranged, that, when the door or doors are opened, the can is brought forward convenient for use. The door shuts tight and locks securely.



No. 3. Garbage Receiver

No. 3—This receiver has a shelf on the door carrying the can. Wall opening is 14½ in. wide, 12 in. high and 10 in. deep. When used in 6 or 8-in. wall, box can project through the wall. No. 3K has an outside door for suburban use.

No. 4—Is similar, and fits a wall opening 19 in. wide, 19 in. high and 10 in. deep.

No. 4K—For suburban use with door at back for removal of can through the yard. Wall opening same as for No. 4 except that it is adjustable for 8 to 16-in. walls.

Cans for Nos. 4 and 4K are 13½ in. diam. by 14½ in.. high, holding 12 gal.

Wood Mantels and Fireplace Fixtures

We manufacture wood mantels from either stock or architects' designs. Also other fixtures that will be needed in fireplaces, including andirons, grates, fenders, spark screens, etc.

Catalogues

Our catalogues describing in detail all of our products will be gladly sent on request.

PEERLESS MANUFACTURING CO., INC.

Fireplace Dampers and Fixtures

LOUISVILLE, KY.

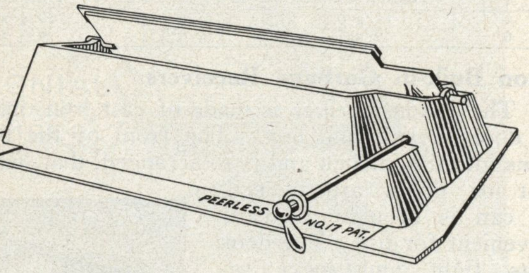
Products

Dome (Fireplace) Dampers; Coal Chutes; Ash Dumps; Cleanout Doors.

Also manufacturers of Fireplace Fixtures, including Andirons, Screens, Grates, etc.; Gas Ranges, Coal Ranges, and Combination Coal and Gas Ranges; Gas Heaters.

Peerless Dome (Fireplace) Damper

This damper is designed to insure a good draft under all atmospheric conditions. It consists of a flanged dome with a door at the top and is manufactured from select gray iron. The front flange is sufficiently strong to support the fireplace arch without the use of angle iron or bar lintel; when a segmental brick arch is used this flange may be cut off as shown on Drawing No. 1. The door is so constructed that it can be readily removed (without the use of tools) giving access to the flue at all times and is operated (a) by means of a handle attached to a shaft extending through the mantel at the front; (b) by means of a handle attached to a shaft extending through the right side of the chimney breast; (c) by means of an underslung ratchet with a handle under the right side of fireplace arch. The door is so constructed that it automatically locks itself in the position to which it is adjusted.



No. 17 Dome Damper

Types of Peerless Dome Dampers

These dampers are made in 3 types; the dimensions of each of these types, the size of the fireplace to which they are adapted and the size of the flues to be used with each are given in the table on Drawing No. 1 on following page.

Type Nos. 17 and 17B—Operated by means of a brass handle attached to a shaft extending through the face of the mantel. By means of a worm gear and cam arrangement, a three-quarter turn of the handle completely opens or closes the door. The cam is exposed inside the dome so that the damper rod may be adjusted after the fireplace is built.

Type Nos. 21 and 21B—Made in all sizes of the regular No. 17 damper, except that the door is operated by means of an underslung ratchet which operates in a pocket at the extreme right-hand side of the damper. This ratchet is notched and works through a loop; the notches engaging the loop hold the door securely in any position desired.

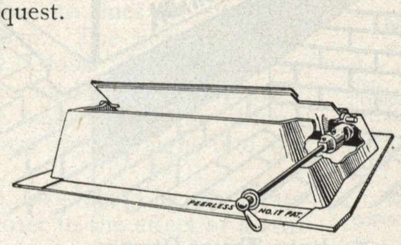
Type Nos. 22 and 22B—This damper is made in all sizes of the regular No. 17, except that the door is operated by means of a handle attached to a shaft extending through the right side of the chimney breast.

Specification for Peerless Dome Dampers—Peerless dome dampers are to be installed in accordance with detailed drawings and instructions issued by the manufacturers. Damper is to be placed immediately above the fire chamber, covering its full length, back of damper to rest on top of smoke shelf, the flange at the front of damper to act as an arch bar.

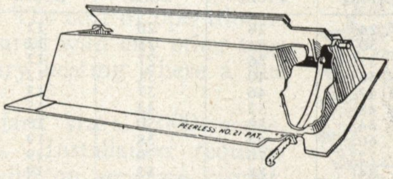
Furnish and set Peerless dome dampers as manufactured by The Peerless Manufacturing Co., Inc., Louisville, Ky., for all fireplaces throughout. To be (mention here the size and the particular type of operation desired as described above).

Blue Prints

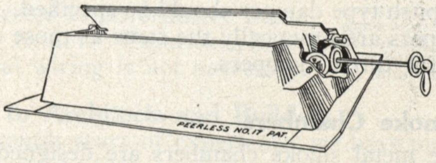
Blue prints and booklet showing complete line sent free on request.



Sectional View of No. 17 Damper
Showing operations of cam and rod



Sectional View of No. 21 Dome Damper
Showing operation of underslung attachment

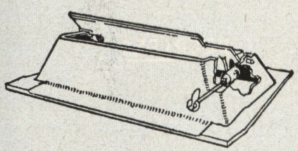


Sectional View of No. 22 Damper
Showing end or side view—opening damper through right side of chimney breast. Chimney breast must clear wall 10 in. or more.

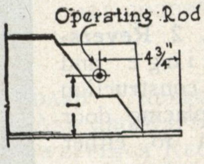
Peerless Dome Dampers

Continued on next page

The handle and casing thru which operating rod works is of brass

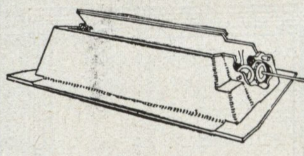


Operated by rod thru facing of mantel, cam being attached to square rod, and pinion which is fastened to door working in slotted groove of cam

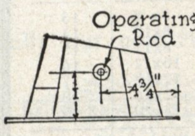

Operating Rod
4¾"

ELEVATION AT END (Showing location of operating rod)

DAMPER № 17



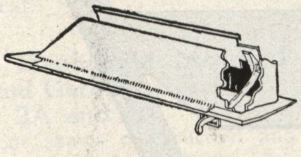
Operated by attachment thru side of Chimney Breast


Operating Rod
4¾"

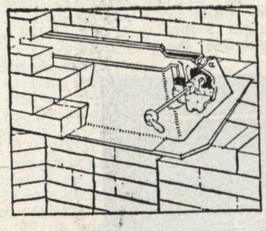
ELEVATION OF SIDE (Showing location of operating rod)

DAMPER № 22

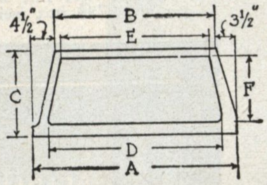
NOTE - This damper is operated by means of an underslung apparatus at the extreme right hand side operating in a side pocket. The pull is of forged steel, notched, and works through a loop under the front flange of the body



DAMPER № 21



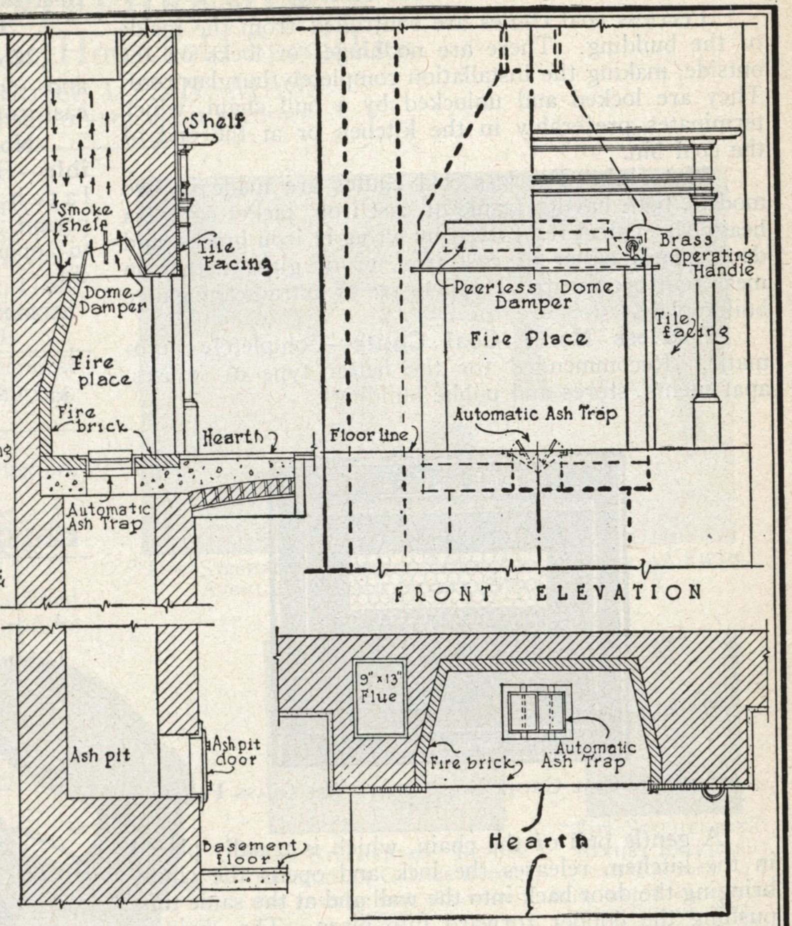
PERSPECTIVE SHOWING METHOD OF SETTING DAMPER


B
E
4½"
3½"
C
F
D
A

KEY PLAN (See Table Below for Dimensions)

Damper Number	Front Width of Fireplace in Inches	Overall Base Dimensions of Damper			Inside Dimensions at Base of Damper			Dome Dimensions			Proper Flue Lining Ext Dim	Round Flue Inside Dimen.	Shipping Weights (Boxed)
		A	B	C	D	E	F	G	H	I			
17, 21, & 22	24	28	20½	15½	24	18½	12¼	5	3½	2¾	9×13	9	38
	28	32	24½	15½	28	22	12¼	5	3½	2¾	9×13	10	40
	30	34	26¼	15½	30	24	12¼	6	4¼	3⅝	9×13	10	45
	33	37	29½	15½	33	27	12¼	6	4¼	3⅝	9×13	10	50
	36	40	32	15½	36	30	12¼	6	4¼	3⅝	9×13	10	55
	38	43	35¼	15½	38	33	12¼	6	4¼	3⅝	13×13	12	61
	42	46	38	15½	42	36	12¼	6	4¼	3⅝	13×13	12	65
	48	52	44½	15½	48	42	12¼	6	4¼	3⅝	13×13	12	68
	54	58	50¾	15½	54	48	12¼	6	4¼	3⅝	13×18	15	85
	59½	64	55¼	15½	59½	53½	14	6	4¼	3⅝	18×18	18	100
17B & 21B	22½	28	20½	13	22½	18	10¼	5	3½	2¾	9×13	8	31
	27½	31½	25½	13	27½	23	10¼	5	3½	2¾	9×13	10	34
	28	34	26	13	28	24	10¼	6	4¼	3⅝	9×13	10	36
	34	40	32	13	34	30	10¼	6	4¼	3⅝	9×13	10	43
	40	46	37½	13	40	35	10¼	6	4¼	3⅝	13×13	12	50

NOTE Above table based on fireplace height of 30 in.

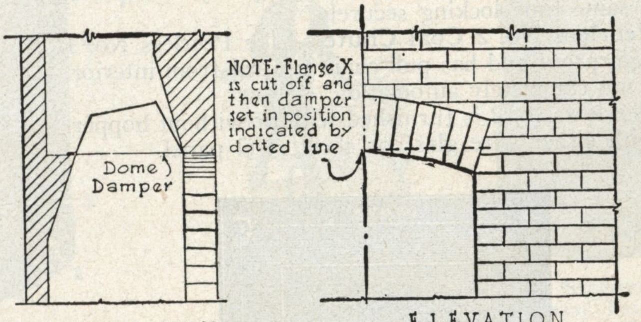

Shelf
Smoke shelf
Tile Facing
Dome Damper
Fire place
Fire brick
Hearth
Automatic Ash Trap
Ash pit
Ash pit door
Basement floor
Brass Operating Handle
Peerless Dome Damper
Tile facing
Fire Place
Automatic Ash Trap
Floor line
9"×13" Flue
Fire brick
Automatic Ash Trap
Hearth

VERTICAL SECTION

FRONT ELEVATION

PLAN

DETAILS OF FLAT ARCH FIREPLACE

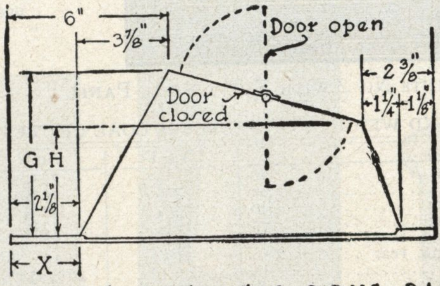

Dome Damper

NOTE - Flange X is cut off and then damper set in position indicated by dotted line

CROSS SECTION

ELEVATION

DETAILS OF SEGMENTAL ARCH FIREPLACE


6"
3⅞"
Door open
Door closed
2⅜"
1¼"
1⅛"
G H
2⅛"
X

DETAIL OF PEERLESS DOME DAMPER

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC

DETAILS OF PEERLESS DOME DAMPER

NOT DRAWN TO SCALE
DATE - AUG.'22

DRW'G 1

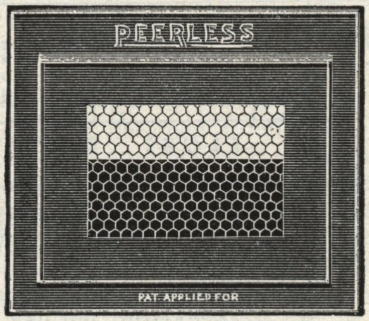
Continued on next page

Peerless Chain Operated Coal Chutes

Peerless coal chutes are controlled from the inside of the building. There are no hinges or locks on the outside, making the installation completely burglarproof. They are locked and unlocked by a pull chain, which terminates preferably in the kitchen or at the end of the coal bin.

Materials—Peerless coal chutes are made in two models, both having frame of cast iron, jacket of extra heavy sheet steel reinforced by wrought iron braces, and door panels either of cast iron, or of glass with iron mesh reinforcements. Hoppers are of extra heavy gauge boiler plate.

Peerless No. 1 Coal Chute—Completely automatic. Recommended for the better type of houses, apartments, stores and public buildings.

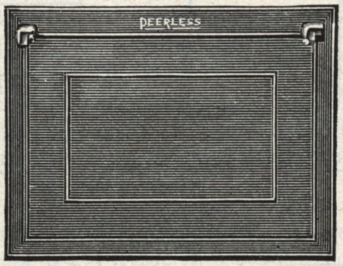


Automatic Coal Chute No. 1 with Wire Glass Panel

A gentle pull of the chain, which is usually placed in the kitchen, releases the lock and opens the chute, bringing the door back into the wall and at the same time pushing the hopper forward into place. The chain is then fastened to a peg. When the chain is released, the hopper recedes and the door swings gently into place, at the same time locking securely.

Peerless No. 2 Coal Chute—Like Peerless No. 1 is burglarproof and has pull-chain control from interior, but is not completely automatic.

Peerless No. 2 is furnished with or without hopper, and with either wire glass or sheet steel panel.



Coal Chute No. 2 with Sheet Steel Panel

DIMENSIONS AND WEIGHTS OF PEERLESS COAL CHUTES

	No. 1	No. 2
Extreme width ....in.	25½	25½
Extreme height ....in.	22½	19¾
Width of wall opening.................in.	23¼	23½
Depth of wall opening.................in.	12¼	12¼
Height of wall opening, front ....in.	19	17
Height of wall opening, rear ....in.	21	19
Door opening..........................in.	20x12	20¾x14¾
Shipping weight.......................lb.	98	70*

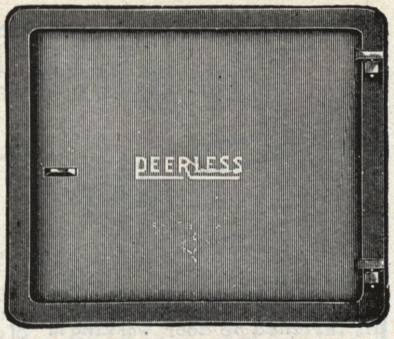
*With glass or steel door. Steel hopper, 15 lb. additional.
10 ft. of brass plated steel chain furnished with each window.

Specifications for Peerless Coal Chutes—Furnish and set where shown on drawings (or herein specified; mention location) .... Peerless No. 1 (or Peerless No. 2) coal chutes as manufactured by the Peerless Manufacturing Co., Inc., Louisville, Ky. Chutes to be securely built into the masonry.

Peerless Ash Pit Doors

No. 3—Frame and door heavy cast iron.

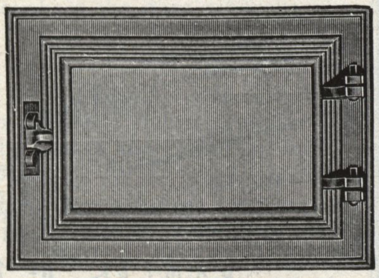
No. 2 Reversible—Hinge and latch construction permit placing door to open to either side.



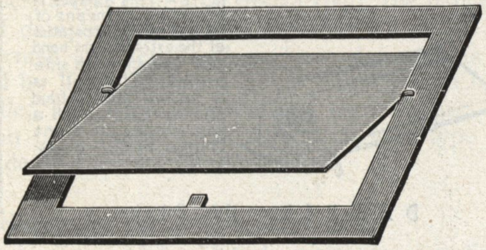
Peerless Ash Pit Door No. 3

PEERLESS ASH PIT DOORS

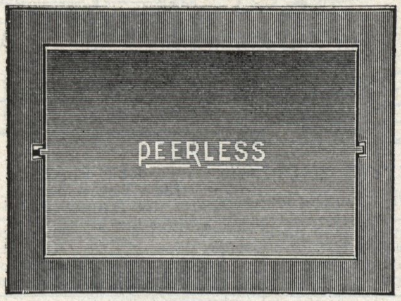
No.	Opening, in.	Shipping weight, lb.
2	8x 8	13
	8x10	14
	8x12	15
	10x12	16
	12x12	17
	12x16	20
	14x20	29
3	5x 7	5
	8x 8	6
	8x10	7
	10x12	10
	12x16	16
	14x20	21
	16x24	27



Reversible Ash Pit Door No. 2

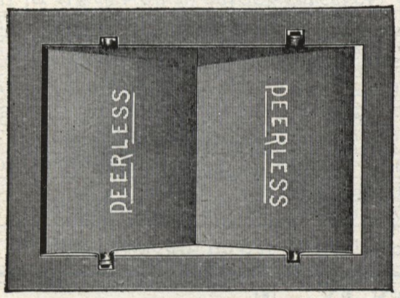


Common Ash Trap
Size, 9x11 in.; weight 5 lbs.
Size, 7x9 in.; weight 2½ lbs.



Peerless Locked Door Trap No. 8
Dimensions

Outside, in.	Inside, in.	Crated weight, lb.
9x11	7x10	4
7x10	5x 8	3



Peerless Automatic Trap No. 9
Dimensions

Outside, in.	Inside, in.	Crated weight, lb.
9x11	7x10	5
7x10	5x 8	3½

ESTABLISHED 1899

TELEPHONE
944

C. H. STEPHENSON

Manufacturer of Household Specialties

48 Furrar Street, LYNN, MASS.
ALL GOODS SOLD DIRECT FROM FACTORY

Products

"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVER; UNDERFLOOR ASH and REFUSE RECEIVERS; UNDERGROUND STREET SWEEPINGS RECEIVER; SPIRAL TRUSS RIBBED ASH BARREL; HALF-ROUND GARBAGE BUCKET; ALL-STEEL ASH BARREL TRUCK; INDOOR CHEMICAL CLOSETS.

Also manufacturers of Portable Earth and Chemical Closets with Metal Houses for contractors and campers.

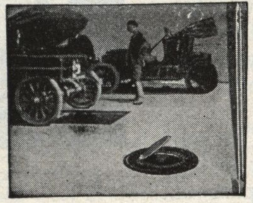
Trade-mark

Architects should note carefully our construction, and when specifying should designate all our goods by the trade-marked name "The Stephenson," giving style number. Our 20 years' practical experience, with thousands of satisfied users, has made possible this trade-mark which protects architects, their clients and us from substitution.

THE STEPHENSON
LYNN REG. U.S.A. PAT OFF MASS

Architects' specification card on request.

"THE STEPHENSON" STREET SWEEPINGS RECEIVER AT FIFTH AVENUE AND 24TH STREET, NEW YORK, N. Y.
1000 in use
Sold direct from factory



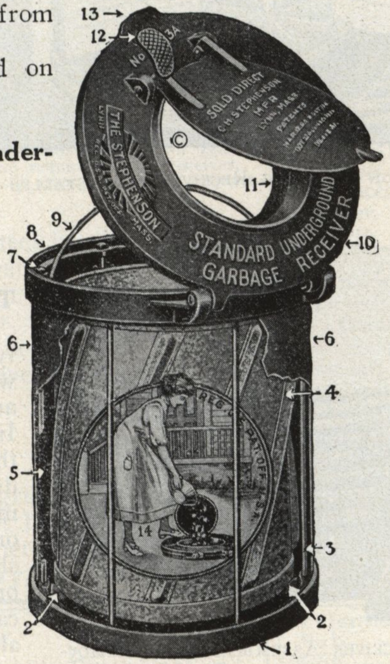
"THE STEPHENSON" REFUSE RECEIVER IN GARAGE FLOOR
For sweeping and oily waste. Fireproof
Sold direct from factory

"THE STEPHENSON" REFUSE RECEIVER IN FACTORY
Flush with floor, easy to sweep into—sanitary
Sold direct from factory

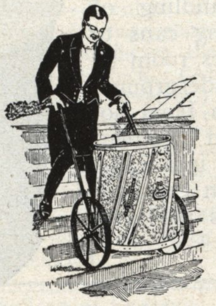
The Stephenson Standard Underground Garbage Receiver Nos. 2A and 3A

Cut shows construction and 14 vital points.

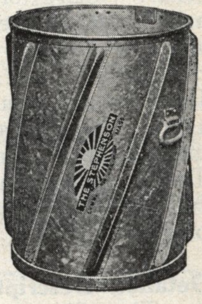
(1) Cast iron bottom ring with special three-point centering device.
(2) Two of the three lugs for centering bucket.
(3) One of the pipes connecting top and bottom rings.
(4) One of the eight special spiral truss ribs on the Stephenson inside bucket.
(5) Two-inch ventilating space—a vital feature.
(6) Outside casing broken away to show construction of receiver with the Stephenson spiral truss ribbed bucket No. 3A, 18-in. diam., 25 in. high. No. 2A bucket, without spiral truss ribs, 14-in. diam., 22 in. high.
(7) One of the connecting pipe bolts.
(8) Cast iron top ring.
(9) Bail to lift out spiral bucket.
(10) Cast iron removal cover with special conical chute 14-in. diam. at top, 9-in. diam. at bottom and 4 in. deep.
(11) This deep chute prevents any chance of garbage falling outside of the bucket.
(12) Cast iron self-closing receiving cover 14-in. diam. with special foot trip.
(13) Removal cover guard lift.
(14) Picture showing receiver in the ground with maid using foot trip, leaving both hands free to empty garbage.



"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVER
As it appears out of the ground, with casing cut open to show construction
Sold direct from factory



"THE STEPHENSON" ALL-STEEL ASH BARREL TRUCK
Wheels over steps
Sold direct from factory



"THE STEPHENSON" SPIRAL TRUSS RIBBED ASH BARREL
Note construction carefully
Sold direct from factory

Twenty years ago we believed the following to be true:

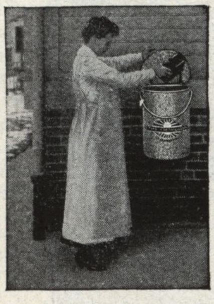
No arrangement of wood or cement should be used for storing garbage.

Both are porous, retaining moisture and grease. Thus in winter the moisture freezes and cracks the holder; in summer the heat generates noxious odors causing unsanitary conditions.

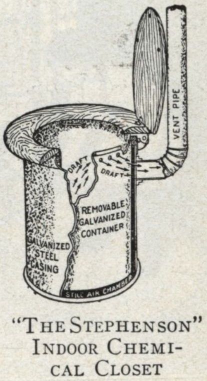
Today, after twenty years, we are still manufacturing The Stephenson Standard Underground Garbage Receiver, made of galvanized steel and cast-iron with thousands of satisfactory installations.

No 3A
SOLD DIRECT
C.H. STEPHENSON
LYNN MASS
PATENTS
STANDARD UNDERGROUND GARBAGE RECEIVER
THE STEPHENSON

"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVER
As it appears when in the ground
Sold direct from factory



"THE STEPHENSON" HALF-ROUND REFUSE OR GARBAGE BUCKET
Out of reach of cats and dogs
Sold direct from factory



"THE STEPHENSON" INDOOR CHEMICAL CLOSET
Showing wooden seat with the cover open
Sold direct from factory

SHARP ROTARY ASH RECEIVER CORPORATION

Manufacturers of Rotary Underground Ash and Underground Garbage Receivers

SPRINGFIELD, MASS.

Product

The SHARP ROTARY UNDERGROUND ASH and GARBAGE RECEIVING SYSTEM, The Modern Method of Ash and Garbage Disposal.

What It Is

The Sharp Rotary Underground Ash Receiver is a device placed partly under the heater to receive ashes. Can be installed under any kind of old or new heater. Consists of a circular pit extending partly under the heater and a number of specially shaped cans mounted on a revolving steel framework, part of which is under the ash pit. The cans and pit are covered with iron or concrete, which is level with cellar floor.

May also be used for garbage, as odors are drawn up through firebox and pass out of the chimney.

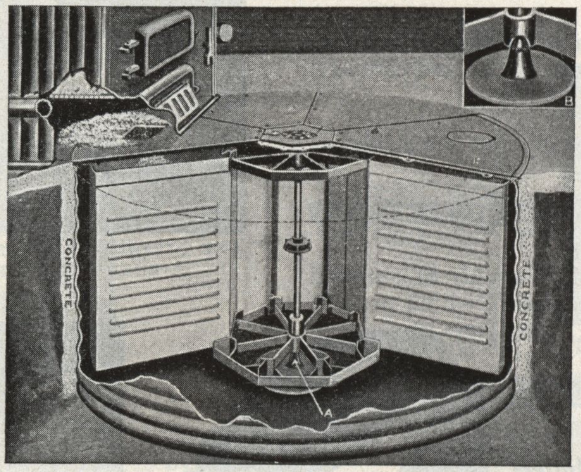


FIG. 1. SECTION SHOWING RECEIVER AS INSTALLED

What It Does

It eliminates dust from the cellar. Only one handling of ashes—that of removing cans to street when full. Saves room by having all ashes underground. Provides fire protection from hot ashes. Sweepings from basement may be swept directly into cans. Turns easily even when cans are full. Always stands perfectly plumb.

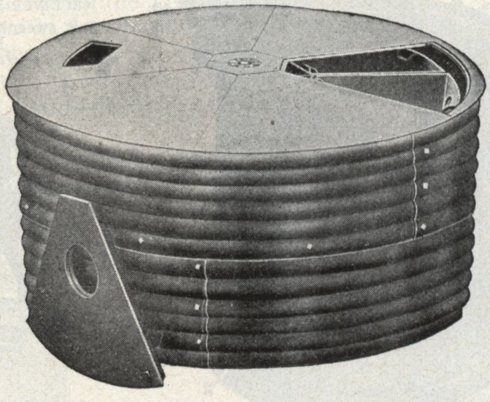


FIG. 2. RECEIVER ASSEMBLED WITH REMOVABLE COVER AT SIDE

Detailed Description

The Sharp Rotary Underground Ash Receiver consists of a number of cans mounted on a revolving iron frame in a pit. The pit is enclosed with an iron cover level with the floor. In the section of the cover which extends under boiler or furnace is a hole through which ashes are dropped into a can directly below (Figs. 1 and 3).

When can is filled, the frame within is revolved by a removable iron lever and an empty can takes its place. The cover does not revolve. A small dial indicates position of the cans. After all cans are full, they are removed through an opening made by removing a plate in the iron cover (Figs. 2 and 5).

There are two flanged wheels attached to a perpendicular shaft. The cans rest on bottom wheel and a hook on the cans holds them to the top wheel, the whole revolving on a pivot made fast on a concrete footing (Fig. 1, "A").

Types and Sizes

The company makes two types of receivers—Flush type with plain cast iron top (Fig. 5), and the Recessed type (Fig. 6). Interior construction is the same, the latter having cast iron plates dropped below floor level, and cement carried over the plates with only the removable plate and dial showing. They can be dropped 4 or 6 in. (2 in. standard). Special castings made for recessed type to allow removable plate and dial to be kept flush with the floor.

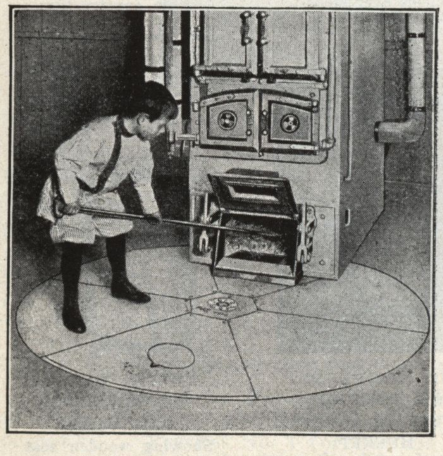


FIG. 3. ASHES ARE RAKED THROUGH HOLE IN BACK PLATE

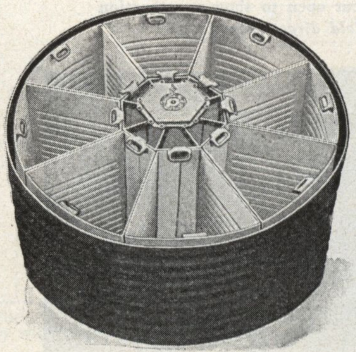


FIG. 4. INTERIOR OF RECEIVER WITH ENTIRE TOP OFF, SHOWING ARRANGEMENT OF CANS

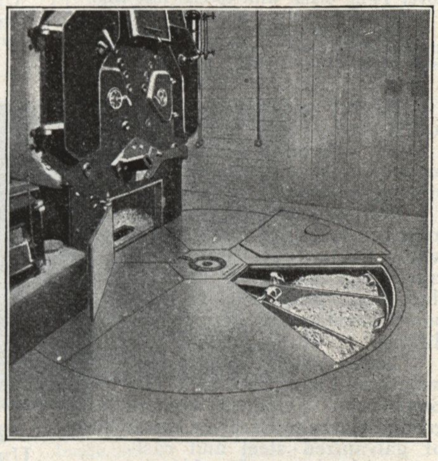


FIG. 5. REMOVABLE PLATE LIFTED OFF TO ALLOW CANS TO BE REMOVED

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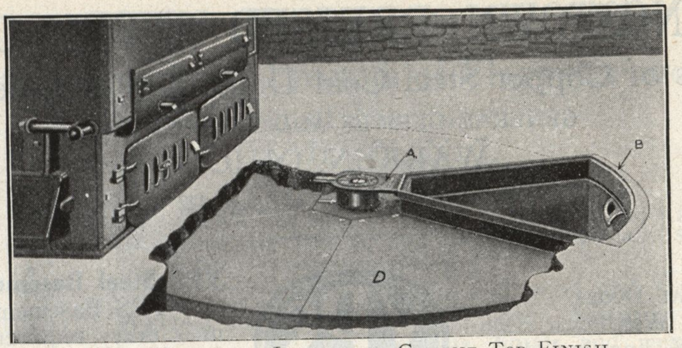


Fig. 6. Method of Installing Cement Top Finish

Block and tackle for removing cans, and a cast iron lever, are supplied with each equipment.

Receiver No. 1—A popular size for dwellings, as it holds several weeks' accumulation of ashes.

Receiver No. 2—Especially recommended for large residences, schools, churches, apartments, office buildings, etc., as it holds one dray load.

Receiver No. 15—Provided to meet conditions where obstructions in the soil necessitate the use of a shallow receiver or in cases where a can of smaller capacity is desired.

Receiver No. 5—For use in the small residence or bungalow and also adaptable for use under hot water heaters.

SIZES

Receiver No.	Corrugated steel cans	Cover plates	Capacity, bu.	Diameter, in.	Height, in.	Height of can, in.	Shipping weight, lb.
1	8	6	24	60	32	25	600
1A	8	6	24	60	34	25	565
2	12	6	33	72	32	25	800
2A	12	6	33	72	34	25	780
15	8	6	14	60	22	15	500
15A	8	6	14	60	24	15	485
5	5	1	6	44	20	16	300

Nos. 1A, 2A and 15A are made with extension castings for cement top. No. 15 is used where obstructions in soil require shallow receiver. Watertight tanks can be furnished for all sizes. Prices on request.

The Cans

Made of heavy galvanized steel heavily reinforced with an iron band and the larger ones are also corrugated to give additional strength. Hold from 1 to 3 bu. The cans fit snugly together, and very little dust can get down between them. Do not need to be cleaned out underneath them but once every 2 years. These cans usually last about 7 years. The company sells replacements.

Where Used

These Sharp Rotary Underground Ash Receivers are used in residences, apartment houses, stores, office buildings, schools, libraries and other public buildings and institutions throughout the country, for use under furnaces, boilers, ranges, and bake ovens.

Installation

After the excavation is made, the corrugated metal form is put in and 3 in. of concrete poured around it and filled level with the top. Stone base for the pivot is all that is usually required for the bottom of the pit. When the concrete is hard, cans are put in and the receiver is ready for use. Where water is present, galvanized iron or steel tanks can be furnished on order or the receiver may be installed in a waterproofed concrete pit.

Any one with an understanding of the mixing of concrete can make these installations. Complete instructions accompany each order.

How Shipped

Each receiver shipped in two parts, namely bundle of cans and castings and crate of castings f.o.b. shipping point.

Specifications

Rotary Ash Receiver—The Heating [General] Contractor shall furnish and install complete [one] No...... (here specify size and type of receiver—see table) Sharp Rotary Ash Receiver, as manufactured by the Sharp Rotary Ash Receiver Corporation, Springfield, Mass. To be located where shown on drawings [as directed by the architect] and to be installed in strict accordance with detailed directions furnished by the manufacturer.

Note: Provisions for the following work in connection with installing rotary ash receivers should be incorporated in the specifications under the proper headings:

Excavation—Do all excavation required to install rotary ash receiver as hereinafter specified.

Concrete Work—Furnish and set 12x12x6-in. thick concrete foundation under base plate of rotary ash receiver, as hereinafter specified, and incase the metal drum of the ash receiver in concrete, 3 in. thick. (Also provide 3-in. thick concrete floor under the ash receiver.)

Note: While a concrete floor is not required under the receiver, the inclusion of a concrete floor makes a neater job.

Heating—The Heating Contractor shall cut an opening of proper size in the bottom of ash pit floor to fit over rotary ash receiver as herein specified.

Concrete Floor—The finish of concrete floor shall be flush with iron cover plate, or shall be extended over top of plate, according to type selected.

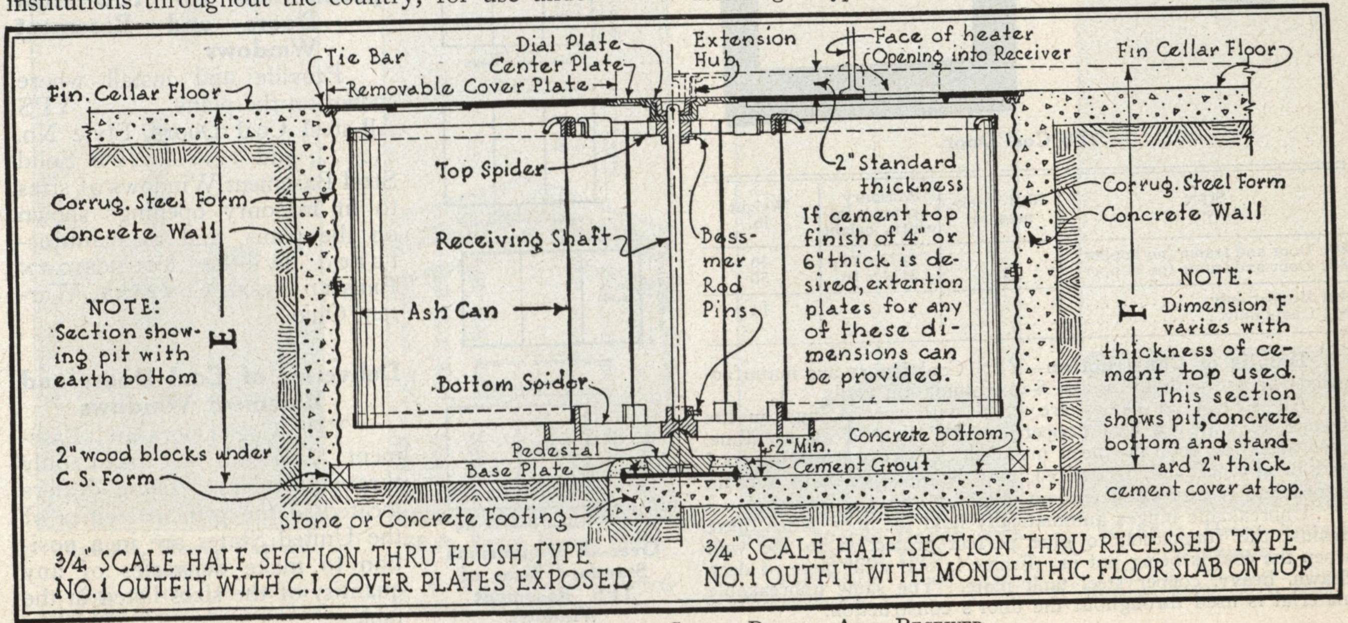

Fin. Cellar Floor
Tie Bar
Dial Plate
Center Plate
Removable Cover Plate
Extension Hub
Face of heater
Opening into Receiver
Fin Cellar Floor
Top Spider
2" Standard thickness
Corrug. Steel Form
Concrete Wall
Corrug. Steel Form
Concrete Wall
Receiving Shaft
Bessmer Rod Pins
If cement top finish of 4" or 6" thick is desired, extention plates for any of these dimensions can be provided.
Ash Can
NOTE: Section showing pit with earth bottom
F
F
NOTE: Dimension "F" varies with thickness of cement top used. This section shows pit, concrete bottom and standard 2" thick cement cover at top.
Bottom Spider
Concrete Bottom
2" wood blocks under C.S. Form
Pedestal
2" Min.
Base Plate
Cement Grout
Stone or Concrete Footing
3/4" SCALE HALF SECTION THRU FLUSH TYPE NO.1 OUTFIT WITH C.I. COVER PLATES EXPOSED
3/4" SCALE HALF SECTION THRU RECESSED TYPE NO.1 OUTFIT WITH MONOLITHIC FLOOR SLAB ON TOP

Fig. 7. Pit Details for Sharp Rotary Ash Receiver

THE YOUNGSTOWN PRESSED STEEL COMPANY

Manufacturers of Copper Steel Coal Doors and Basement Windows

GENERAL OFFICES AND FACTORIES
WARREN, OHIO
For District Offices, see page 422

YPS
TRADE-MARK

Products

YPS Copper Steel Coal Doors.
YPS Steel Basement Windows.

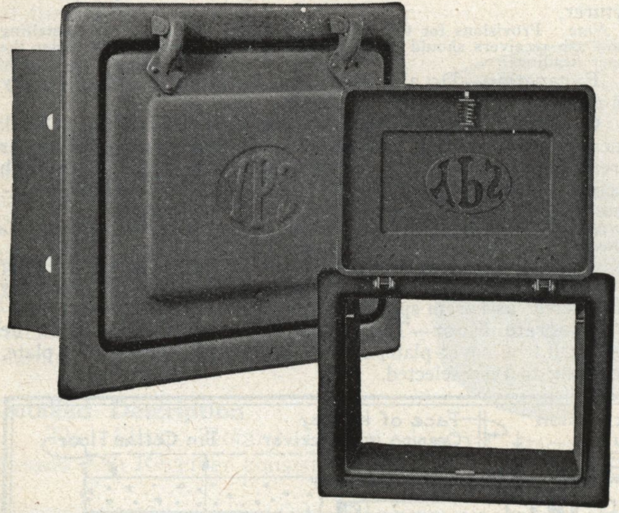
For the complete YPS line including: Metal Lath, Steel Channels, Expanded Metal, Corner Beads and Base Beads, see pages 422-423.

Value of All-steel Coal Doors

Metal coal doors have become standard equipment in modern American dwellings. Home owners are demanding them both for the protection of the foundation walls and as a guard against intruders.

A YPS Copper Steel Coal Door will prevent the unsightly marring of the window frame so noticeable in the foundations walls of buildings where coal is chuted through the ordinary cellar window.

Most home owners have been through the annoying and expensive experience of broken windows due to coal being chuted through the ordinary frame window. Broken windows are eliminated by the use of YPS Copper Steel Coal Doors.



YPS Coal Door

Style No.	Wall thickness, in.	Masonry opening, in. width, height	Weight lb.
801 Door and frame (no hopper)	8	21¾ x 16	46
802 Door and frame (no hopper)	13	21¾ x 16	50
801 Hopper only................	....	....	14
811 Chain only................	....	....	....

Details of Construction—YPS Coal Doors are manufactured for use with 13-in. and 8-in. foundation walls.

All YPS Coal Doors are fitted with special lugs on the frames to which a coal hopper can be attached at any time, even after the door has been installed. Locks are burglarproof and breakproof and, if desired, may be equipped with a chain in order to release catch without climbing over the coal pile.

Unbreakable hinges automatically hold the door, when open, against the foundation to give perfect protection to the wall when the coal is being put in. Frame is one solid piece of deep drawn, heavy, copper steel tank plate. The same unbreakable material is used throughout the door's construction.

YPS Steel Basement Windows

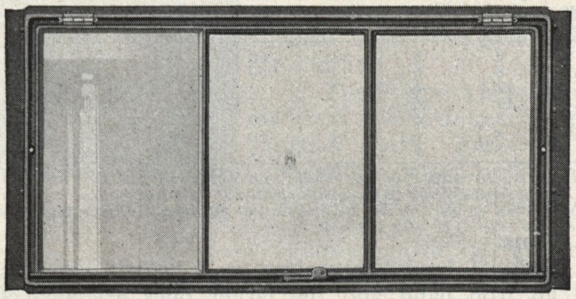
YPS Basement Windows are designed to meet every requirement for residences, apartments and store buildings.

They can be installed in any type of foundation wall and are indestructible, weatherproof, fireproof and rotproof.

They never swell, shrink, warp, stick, get "out of square," or splinter.

When closed, they will admit 60 to 80% more light and when open give greater ventilation than wooden windows of the same size masonry opening.

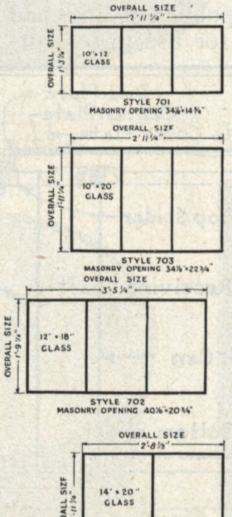
Four standard sizes.



YPS Basement Window

Style No.	Type	Glass size, in.	Masonry opening, in.	Weight, lb.
701	3-light	10x12	34⅛x14¾	21
702	3-light	12x18	40⅛x20¾	27
703	3-light	10x20	34⅛x22¾	26
704	2-light	14x20	31¾x22¾	23

Note: 702 and 704 have been particularly designed to work out satisfactorily with concrete block, which are standardized to lay up in multiples of 16 in. wide and 8 in. high.



Over-all Dimensions Standard Sizes of YPS Basement Windows

Specifications for YPS Coal Doors and Basement Windows

Provide and install where shown on the plans ...... YPS All-steel Coal Doors, Style No. ......, and ...... YPS Solid Steel Basement Windows of sizes to fit masonry openings shown on the plans, and as manufactured by the Youngstown Pressed Steel Company, Warren, Ohio.

Deliveries of Coal Doors and Basement Windows

YPS Coal Doors and Basement Windows are sold only through dealers. These dealers located in the principal cities of the United States are in a position to make deliveries of any quantity of the sizes listed in the tables.

JOHN E. LINGO & SON

Manufacturers and Erectors of Flagpoles and Masts

Foot of Elm Street
CAMDEN, N. J.

TELEPHONE
CAMDEN 487

REPRESENTATIVES

NEW YORK, N. Y., Corbett & Co., Inc., 109th Street and East River
BALTIMORE, MD., George R. Johnson, Baker Building
CHICAGO, ILL., Arrow Conductor and Mfg. Corp., 1536 West Adams Street

Products

Tubular Steel and Taper Welded Flagpoles and Fittings.

Also Tubular Steel Masts, Radio Masts and Topmasts; Telephone and Trolley Poles; Wood Flagpoles, Masts and Booms.

Experience and Service

Since 1897 this company has been actively engaged in the manufacture and erection of flagpoles.

We maintain a drafting department which cooperates closely with architects and builders, assisting them in handling their flagpole problems most satisfactorily and economically. We suggest that you send us a rough construction plan and we will submit to you without charge, complete working drawings showing the flagpoles best suited for the particular conditions.

Types of Tubular Steel Flagpoles and Masts

Heavy pattern ground set poles, 20 to 125 ft. in length
Light pattern ground set poles, 17 to 100 ft. in length
Standard heavy type roof poles, 20 to 100 ft. in length
Extra heavy roof poles, 20 to 75 ft. in length
Masts and topmasts, 50 to 200 ft. in length
Radio masts, 20 to 300 ft. in length

Continuous Taper Welded Flagpoles

Ground set and roof set poles of this type are not standardized but can be proportioned to almost any entasis as selected by the architect. We request architects to consult us before specifying.

Fittings

We manufacture a complete line of fittings for flagpoles and masts, including tubular turnbuckle and adjustable telescope braces, plain and ball bearing revolving trucks for wood and steel poles, cleats, cleat covers, halyard boxes, halyards, braces and fittings for roof settings, finials and weathervanes. Shipment can be made from stock.

Shipments and Assembly

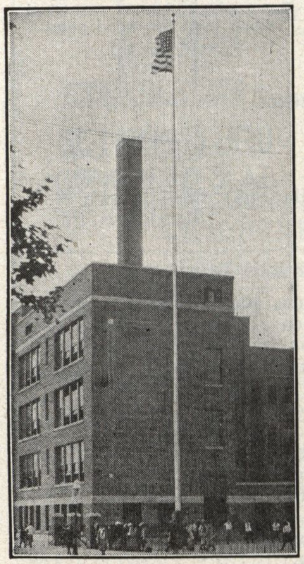
By means of our special field joints we ship our poles of any length up to car length sections. This feature of design eliminates the use of bolts, screws, rivets, lead calking, couplings, headless tap screws. Without tools, other than an ordinary calking chisel and hammer, the sections can be jointed airtight by inexperienced men in a minimum length of time. Absolute alignment and full strength are assured by the self-centering conical rest collar in the under section.

Catalogue

Catalogue containing complete details, specifications and full information gladly mailed on request.

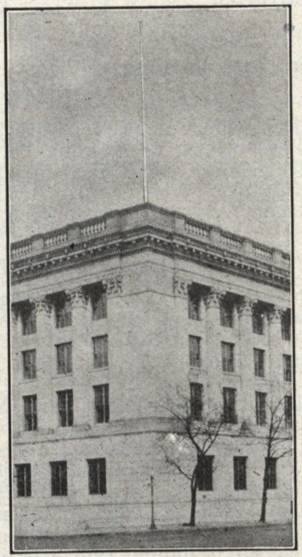
Construction

The superior appearance of our poles is due to the great number of minimum reductions employed; therefore, the joints are of the utmost importance. Every pole is made in two or more knocked down sections made up on the ground by means of our field joints. Each section may contain two or more pieces to produce the proper reduction, the joints between which are shop telescoped and shrunk. This is accomplished by reducing the hot larger pipe upon the cold smaller one in our specially designed 100-ton hydraulic press and then allowing the shrinkage to effect its removable hold. By actual test this type of joint is far in excess of the bending strength of the pipe as used in pole construction.



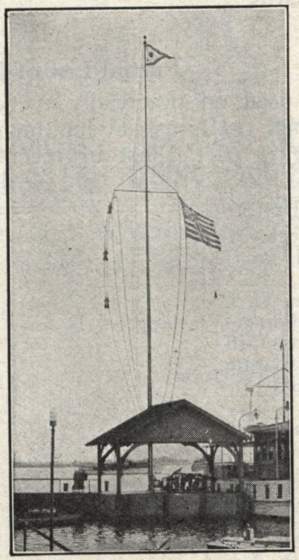
90x99-ft. Heavy Pattern Flagpole

One of the 150 manufactured and erected for the Philadelphia School Board



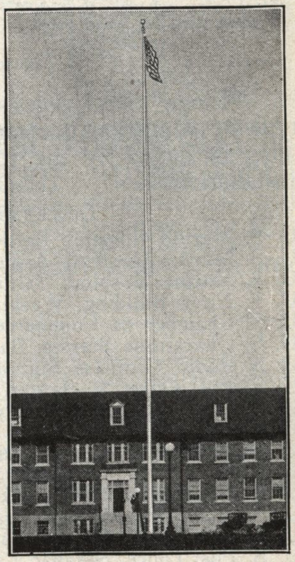
60-ft. Extra Heavy Roof Pole

U. S. Chamber of Commerce Building, Washington, D. C.



85-ft. Special Design with Signal Yard

Philadelphia Yacht Club, Essington, Pa.



80x88-ft. Heavy Pattern Flagpole

U. S. Veterans' Bureau Hospital, Battle Creek, Mich.

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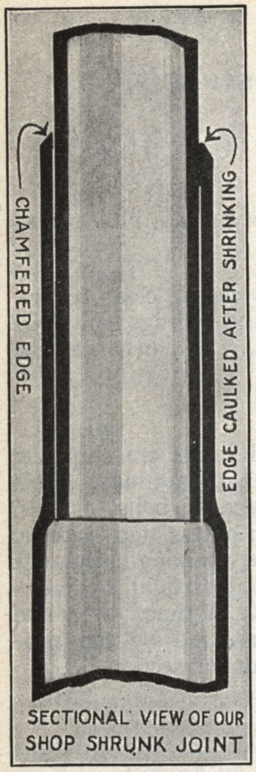
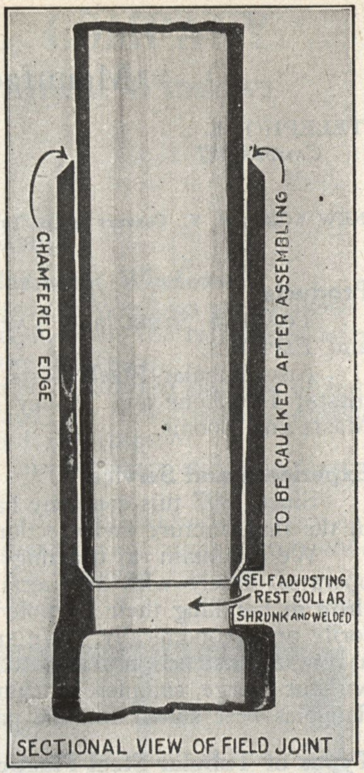


SECTIONAL VIEW OF OUR SHOP SHRUNK JOINT

The field joint is similar in appearance. The necessary hold is effected by the conical rest collar in the reduced end and the corresponding finish on the upper or inserted section. The unavoidable clearance for telescoping is compensated in the calking as indicated in the illustration. This joint equals the shrunk type in bending resistance.

We secure the rest collar, to resist the superposed weight, by shrinking and then electric welding by our own special process.

Actual tests of shrunk joints, made by us and others, have shown that while perfect for strength they are not airtight and we, therefore, have adopted the seam calking method, as illustrated, to accomplish this result. We know this to be an imperative necessity if the pole is to remain permanently free from interior corrosion. In our field joint it also acts as a strength factor.



SECTIONAL VIEW OF FIELD JOINT

Shop Joint

Our shop joint is produced as follows, for example between a 5-in. ($5\frac{9}{16}$-in. outside diameter) and 6-in. ($6\frac{5}{8}$-in. outside diameter) pipe:

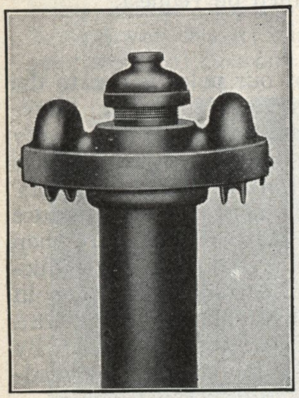
The 6-in. pipe is cut to length and chamfered. It is heated in a furnace and pushed through a die, reducing or swaging its inside diameter from 6 to $5\frac{9}{16}$ in. While hot, the swaged section of 6-in. pipe is pushed 18 in. over the cold 5-in. pipe and allowed to shrink. The chamfered edge is then calked steel to steel.

Field Joint

Our field joint is produced as follows:

The 6-in. pipe is cut to length, chamfered and swaged in a $\frac{1}{16}$-in. oversize die. The self-adjusting rest collar is shrunk and welded in place.

The chamfered edge at the top is calked with an ordinary calking tool and hammer at the time of assembling or erection, making the joint stronger than the pipe itself.

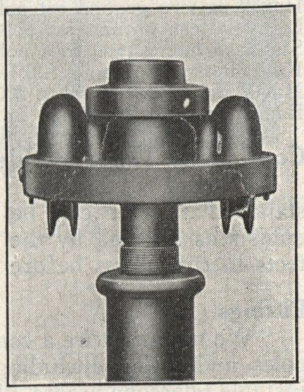

Plain Revolving Truck for Steel Poles
Steel pipe adapter furnished when used for wood poles

Plain Revolving Truck for Steel and Wood Poles

Galvanized cast iron, revolving on 1¼-in. iron pipe spindle fitted with 2 bronze sheaves for ¼ to ⅜-in. diameter halyards.

Ball Bearing Revolving Truck for Steel and Wood Poles

Cast iron galvanized, revolving on ⅜-in. bronze balls and crucible steel spindle, fitted with 2 4-in. bronze sheaves for ⅜-in. diameter halyards.


Ball Bearing Revolving Truck for Steel Poles
Steel pipe adapter furnished when used for wood poles

Partial List of Recent Installations

"Lingo" steel poles are used on practically every type of educational, commercial or industrial building This is shown by the following partial list of recent installations:

Government Buildings

U. S. Marine Hospital, Battle Creek, Mich.
U. S. Marine Hospital, Aspinwall, Pa.
U. S. Marine Hospital, Baltimore, Md.
U. S. Navy Building, Washington, D. C.
U. S. Chamber of Commerce Building, Washington, D. C.
U. S. Quarantine Station, Baltimore, Md.
U. S. Radio Compass Station, Galveston, Tex.
U. S. Post Office, Rochester, Minn.
U. S. Post Office, Carroll, Iowa
U. S. Post Office, Cherokee, Iowa
U. S. Post Office, Clinton, Ind.
U. S. Post Office, Gallipolis, Ohio
U. S. Post Office, Paris, Tex.
U. S. Post Office, Woodbury, N. J.
U. S. Post Office, St. Johnbury, Vt.
U. S. Post Office, Saranac Lake, N. Y.
U. S. Post Office, Oswego, N. Y.
U. S. Post Office, Cohoes, N. Y.
Federal Building, Des Moines, Iowa
State Capitol, Portsmouth, Ohio

Public Schools

Montebello, Cal.
New York, N. Y.
Bridgeport, Conn.
Milwaukee, Wis.
Racine, Wis.
Greensboro, N. C.
Reading, Pa.
Philadelphia, Pa.
(Over 150 installations)
Washington, N. C.
Pittsburgh, Pa.
Camden, N. J.
Pottstown, Pa.
Middletown, N. Y.
Bethlehem, Pa.

Commercial and Industrial Buildings

Public Ledger Building, Philadelphia, Pa.
Insurance Co. of North America Building, Philadelphia, Pa.
Bell Telephone Co. Buildings (over 20 installations in various states)
Hotel Roosevelt, New York, N. Y.
Capitol Building, Chicago, Ill.
American Legion Home, Cuero, Tex.
P. O. S. of A. Memorial, Washington Crossing, Pa.
Reynolds Tobacco Co. Building, Winston Salem, N. C.
Walt Whitman Hotel, Camden, N. J.
Ebensburg Fair Grounds, Ebensburg, Pa.
Elverson Building, Philadelphia, Pa.
Lulu Temple, Philadelphia, Pa.
Metropolitan Opera House, Philadelphia, Pa.
Providence Gas Co. Building, Providence, R. I.
Victor Talking Machine Co. Buildings, Camden, N. J.

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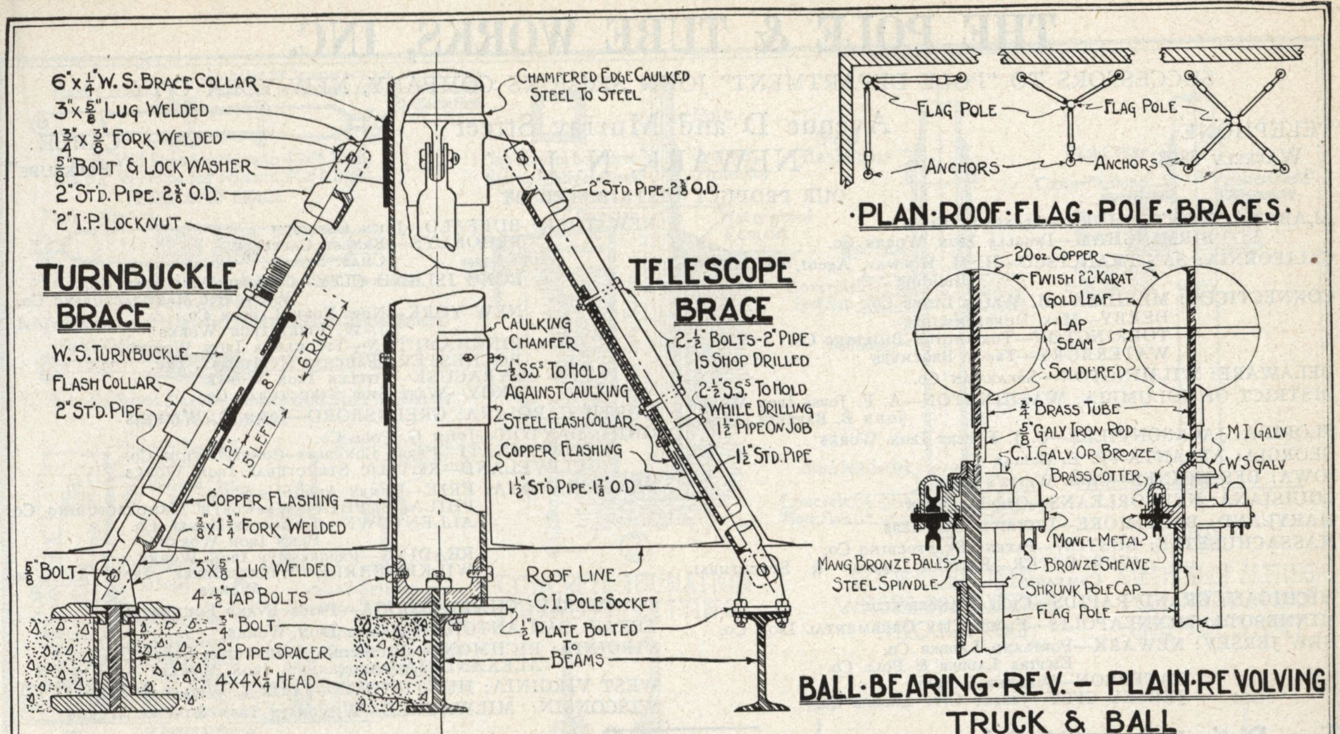
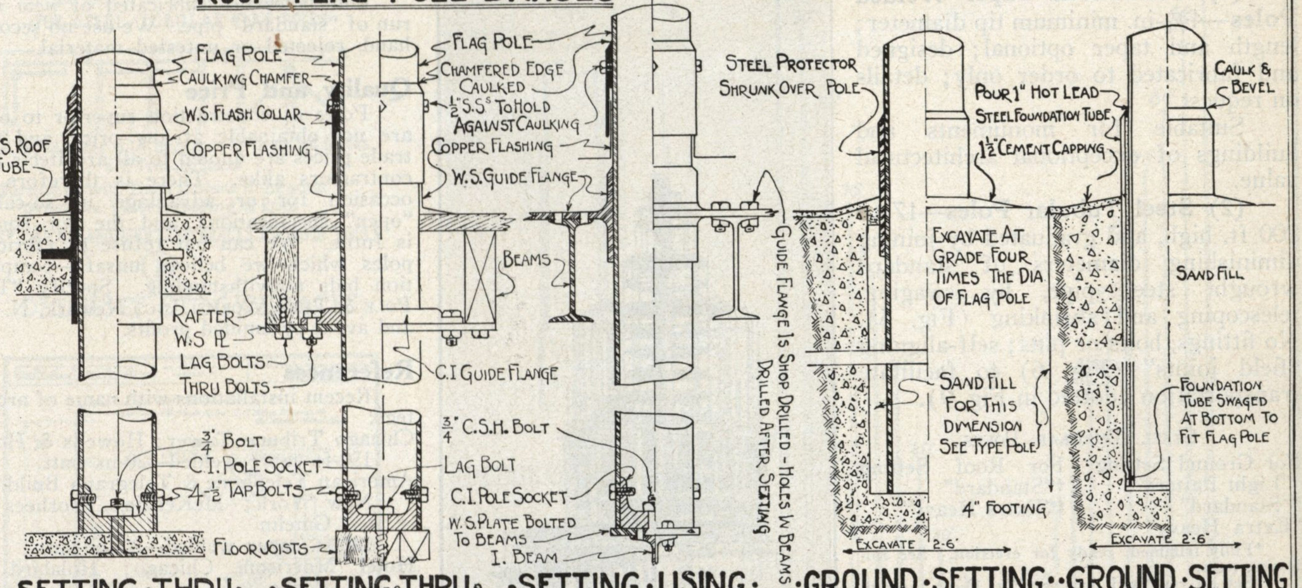

6"x¼" W. S. Brace Collar
3"x⅝" Lug Welded
1¾"x⅜" Fork Welded
⅝" Bolt & Lock Washer
2" St'd. Pipe. 2⅜" O.D.
2" I.P. Locknut
Turnbuckle Brace
W. S. Turnbuckle
Flash Collar
2" St'd. Pipe
6' Right
8'
5' Left
2'
Copper Flashing
⅜"x1¾" Fork Welded
⅝" Bolt
3"x⅝" Lug Welded
4-½" Tap Bolts
¾" Bolt
2" Pipe Spacer
4"x4"x¼" Head
Chamfered Edge Caulked Steel To Steel
2" St'd. Pipe-2⅜" O.D.
Telescope Brace
Caulking Chamfer
2-½" S.S. To Hold Against Caulking
2 Steel Flash Collar
Copper Flashing
1½" St'd Pipe-1⅞" O.D
2-½" Bolts-2" Pipe Is Shop Drilled
2-½" S.S. To Hold While Drilling 1½" Pipe On Job
1½" Std. Pipe
Roof Line
C.I. Pole Socket
½" Plate Bolted To Beams
Flag Pole
Flag Pole
Anchors
Anchors
·Plan·Roof·Flag·Pole·Braces·
20 oz. Copper
Finish 22 Karat Gold Leaf
Lap Seam
Soldered
¾" Brass Tube
⅝" Galv Iron Rod
C.I. Galv. Or Bronze
Brass Cotter
M I Galv
W S Galv
Monel Metal
Mang Bronze Balls
Steel Spindle
Bronze Sheave
Shrunk Pole Cap
Flag Pole

BALL·BEARING·REV. – PLAIN·REVOLVING

TRUCK & BALL

STEEL PIPE ADAPTER FURNISHED WHEN USED FOR WOOD POLE

ROOF·FLAG·POLE·BRACES


Flag Pole
Caulking Chamfer
W.S. Flash Collar
Copper Flashing
W.S. Roof Tube
Rafter
W.S. Pl.
Lag Bolts
Thru Bolts
¾" Bolt
C.I. Pole Socket
4-½" Tap Bolts
Floor Joists
Flag Pole
Chamfered Edge Caulked
½" S.S. To Hold Against Caulking
Copper Flashing
W.S. Guide Flange
Beams
C.I Guide Flange
¾" C.S.H. Bolt
Lag Bolt
C.I. Pole Socket
W.S. Plate Bolted To Beams
I. Beam
Guide Flange Is Shop Drilled – Holes In Beams Drilled After Setting
Steel Protector Shrunk Over Pole
Excavate At Grade Four Times The Dia Of Flag Pole
Sand Fill For This Dimension See Type Pole
4" Footing
Excavate 2'-6"
Caulk & Bevel
Pour 1" Hot Lead
Steel Foundation Tube
1½" Cement Capping
Sand Fill
Foundation Tube Swaged At Bottom To Fit Flag Pole
Excavate 2'-6"

·SETTING·THRU· ·CONCRETE·SLAB· ·SETTING·THRU· ·WOOD·ROOFS· ·SETTING·USING· ·STRUCTURAL·STEEL· ·GROUND·SETTING· USING·WOOD·BOX·FORM· ·GROUND·SETTING· ·USING·TUBE

·LIGHT·PATTERN·GROUND·SET·

Exposed Height	17'	25'	33'	41'	49½'	57½'	65½'	73'	80'	90'	100'
Foundation Depth	3'	3½'	4'	4½'	4½'	5'	6'	6'	7'	8'	8'
Total Length	20'	28½'	37'	45½'	54'	62½'	71½'	79'	87'	98'	108'
Diameter Butt	3½"	4"	4½"	5"	5 9/16"	6⅝"	7⅝"	7⅝"	8⅝"	9⅝"	10¾"
Diameter Top	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"	2⅜"
Diameter Ball	4"	4"	6"	6"	6"	8"	8"	8"	8"	10"	10"
Shipping Weight	145#	242	360	502	653	850	1100	1310	1625	2100	2600
Number Sections	3	4	5	6	7	8	9	9	10	11	12
No. K.D. Sections	1	2	2	3	3	4	4	5	5	6	6

·HEAVY·PATTERN·GROUND·SET·

Exposed Height	20'	25'	30'	40'	50'	60'	70'	75'	80'	90'	100'	125'
Foundation Depth	3'	3½'	3½'	4'	5'	6'	7'	7½'	8'	9'	10'	12'
Total Length	23'	28½'	33½'	44'	55'	66'	77'	82½'	88'	99'	110'	137'
Diameter Butt	4"	4½"	5"	5 9/16"	6⅝"	7⅝"	8⅝"	9⅝"	10¾"	11¾"	12¾"	14"
Diameter Top	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"
Diameter Ball	4"	4"	6"	6"	8"	8"	8"	10"	10"	10"	12"	14"
Shipping Weight	235	327	422	620	869	1220	1640	1920	2300	3046	3600	5300
Number Sections	3	4	5	6	7	8	9	10	11	12	13	14
No. K.D. Sections	1	2	2	3	3	4	4	5	5	6	6	7

·STD.·HEAVY·TYPE·ROOF·SET·

Exposed Height	20'	25'	30'	40'	50'	60'	70'	75'	80'	90'	100'
Foundation Depth											
Total Length											
Diameter Butt	4"	4½"	5"	5 9/16"	6⅝"	7⅝"	8⅝"	9⅝"	10¾"	11¾"	12¾"
Diameter Top	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"	2⅞"
Diameter Ball	To Suit Height Of Building										
Shipping Weight	159	245	325	500	680	990	1375	1620	1725	2500	3000
Number Sections	3	4	5	6	7	8	9	10	11	12	13
No. K.D. Sections											

·EXTRA·HEAVY·ROOF·SET·

Exposed Height	20'	25'	30'	35'	43'	51'	59'	67'	75'
Foundation Depth									
Total Length									
Diameter Butt	5"	5 9/16"	6⅝"	7⅝"	8⅝"	9⅝"	10¾"	11¾"	12¾"
Diameter Top	2⅞"	2⅞"	3½"	3½"	3½"	3½"	3½"	4"	4"
Diameter Ball	To Suit Height of Bldg.								
Shipping Weight	244	341	500	668	953	1392	1796	2465	2970
Number Sections	5	6	6	7	8	9	10	10	11
No. K.D. Sections									

Drawing B.5.	JOHN E. LINGO & SON · TUBULAR STEEL FLAG POLES CAMDEN N.J.	Scale 1"=1'-0"

THE POLE & TUBE WORKS, INC.

SUCCESSORS TO "POLE DEPARTMENT" JOHN SIMMONS COMPANY, NEW YORK CITY

TELEPHONE
Waverly 3808

Avenue D and Murray Street
NEWARK, N. J.

CABLE
"Poletube"

OUR PRODUCT DISTRIBUTED BY

ALABAMA: MONTGOMERY—Algernon Blair
BIRMINGHAM—Ingalls Iron Works Co.
CALIFORNIA: SAN FRANCISCO—H. M. Holway, Agent, 905 Hobart Building
CONNECTICUT: MERIDEN—H. Wales Lines Co.
DERBY—Max Durrschmidt
TORRINGTON—Torrington Building Co.
WATERBURY—Tracy Brothers
DELAWARE: WILMINGTON—Speakman Co.
DISTRICT OF COLUMBIA: WASHINGTON—A. F. Jorss Iron Works
John B. Barrett, Agent,
FLORIDA: JACKSONVILLE—C. J. Eppert Iron Works
GEORGIA: ATLANTA—F. E. Golian Co.
IOWA: DES MOINES—Chas. Weitz's Sons
LOUISIANA: NEW ORLEANS—Ole K. Olsen
MARYLAND: BALTIMORE—Dietrich Brothers
MASSACHUSETTS: BOSTON—Patent Scaffolding Co.
WORCESTER—Eastern Bridge & Structural Company
MICHIGAN: GRAND RAPIDS—Chas. Vandervelde
MINNESOTA: MINNEAPOLIS—Flour City Ornamental Iron Co.
NEW JERSEY: NEWARK—Portland Ladder Co.
Empire Ladder & Pole Co.
PATERSON—Walker & Eddy
JERSEY CITY—Jersey City Ladder Co.
NEW YORK: BUFFALO—John Caflisch
BROOKLYN—Ernest Cappelle
Chas. Schad
LONG ISLAND CITY—Chesebro-Whitman Co.
Walworth Manufacturing Co.
NEW YORK—New York Ladder Co.
J. W. Fiske Iron Works
BINGHAMPTON—Titchener Iron Works
ROCHESTER—Faucher-McMurray, Inc.
SYRACUSE—Thelen Iron Works
TROY—West Side Structural Co.
NORTH CAROLINA: GREENSBORO—John D. Wilkins
OHIO: DAYTON—John G. Pool Co.
CINCINNATI—Ferro Concrete Construction Co.
CLEVELAND—Republic Structural Iron Works
PENNSYLVANIA: ERIE—Henry Althof's Sons
PHILADELPHIA—Walworth Manufacturing Co.
ALLENTOWN—Tilghman-Moyer Co.
Penn Iron Works
READING—Progressive Iron Works
WILKES-BARRE—Wilkes-Barre Iron & Wire Works
TENNESSEE: CHATTANOOGA—Price Evans Foundry Co.
TEXAS: SAN ANTONIO—Alamo Iron Works
VIRGINIA: RICHMOND—Richmond Structural Steel Co.
ALEXANDRIA—Alexandria Iron Works
WEST VIRGINIA: HUNTINGTON—James J. Weiler & Sons
WISCONSIN: MILWAUKEE—Wisconsin Iron & Wire Works

Two Distinct Types of Poles

(1) Continuous Taper Welded Poles—4¾-in. minimum tip diameter; length and taper optional; designed and fabricated to order only; details on request.

Suitable for monuments and buildings of exceptional architectural value.

(2) Steel Tubular Poles—17 to 200 ft. high, and graduated by joining diminishing diameters of standard wrought steel pipe, by swaging, telescoping and shrinking (Fig. 5). No fittings, bolts or pins; self-aligning "field joints" (Fig. 6) to facilitate transportation (dotted in Fig. 9).

Steel Tubular Poles

For Ground Setting	For Roof Setting
*"Light Pattern"	†"Standard"
*"Standard"	†"Extra Heavy"
"Extra Heavy"	

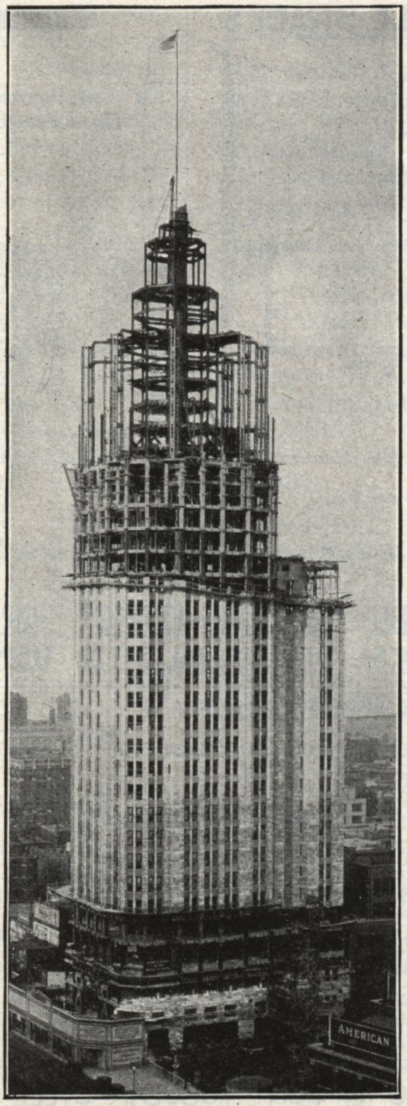
*Fully trimmed, ready for erection. See following page.
†Set on roof with braces (Fig. 1) or through roof (Figs. 7 and 8).

Experience

Extends back to the first steel pole erected in New York City and today in service. It was designed by our Manager in 1903 after over ten years of specialization on tubular structures. Total production, over 23,000 poles.

Service

On submission of roof or other building construction details, we give full installation details on request. Send for Plate W1-W2 (Wood Roof), Plate C-20 (Concrete Roof), Plate S-11 (Steel Beam Roof), and others, all printed on tracing paper (see A.I.A. No. 14F).



Chicago Tribune Tower

Materials

Our poles are fabricated of *new mill* run of "standard" pipe. We use no second-hand, rejected or untested material.

Quality and Price

Poles of construction superior to ours are not obtainable at any price, and our trade prices are quoted to all architects and contractors alike. There is therefore no occasion for or advantage in so-called "open" specifications, and the "or equal" is futile. We can but refuse to fabricate poles which we believe unsafe—competition bids notwithstanding. Specify "The Pole & Tube Works, Inc., Newark, N. J." and avoid pyramided profits.

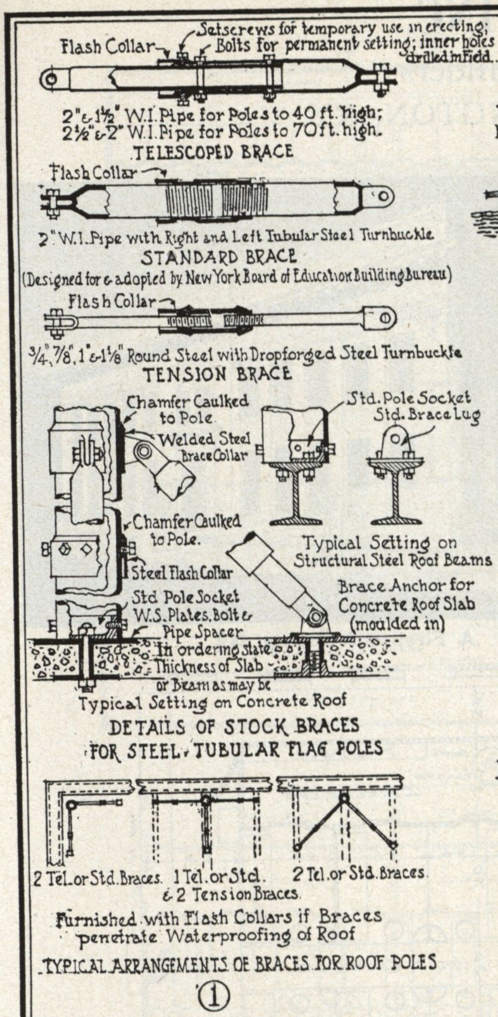
References

Recent installations with name of architect:

Chicago Tribune Tower; Howells & Hood
150-ft. taper welded—20-in. butt
American Telephone & Telegraph Building, New York; McKenzie, Voorhees & Gmelin
140-ft. taper welded—20-in. butt
Hotel Morrison, Chicago; Holabird & Roche
150-ft. taper welded—20-in. butt
Pasadena Civic Center; Bertram C. Goodhue Associates
110-ft. taper welded—18-in. butt; copper jacketed
Stamford, Conn.; Park Commission
130-ft. steel tubular—14-in. butt
U. S. Signal Corps, Salt Lake City; our design
2 300-ft. radio masts for 10,000-lb. tension
U. S. Signal Corps, various cities
40 200-ft. radio masts for 4000-lb. tension

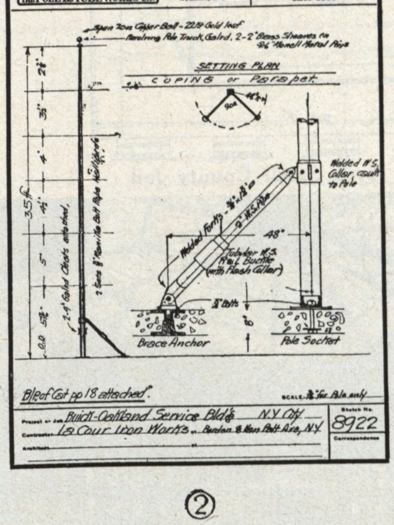
and many other installations by:
Cass Gilbert
York & Sawyer
George B. Post & Sons
Bertram C. Goodhue Associates
Guilbert & Bettelle
Western Electric Co.
Mowbray & Uffinger
Wilder & White
and others.

Continued on next page


Flash Collar
Setscrews for temporary use in erecting;
Bolts for permanent setting; inner holes drilled in Field.
2" & 1½" W.I. Pipe for Poles to 40 ft. high;
2½" & 2" W.I. Pipe for Poles to 70 ft. high.
TELESCOPED BRACE
Flash Collar
2" W.I. Pipe with Right and Left Tubular Steel Turnbuckle
STANDARD BRACE
(Designed for & adopted by New York Board of Education Building Bureau)
Flash Collar
¾", ⅞", 1" & 1⅛" Round Steel with Dropforged Steel Turnbuckle
TENSION BRACE
Chamfer Caulked to Pole
Welded Steel Brace Collar
Std. Pole Socket
Std. Brace Lug
Typical Setting on Structural Steel Roof Beams
Chamfer Caulked to Pole.
Steel Flash Collar
Std Pole Socket
W.S. Plates, Bolt & Pipe Spacer
In ordering state Thickness of Slab or Beam as may be
Brace Anchor for Concrete Roof Slab (moulded in)
Typical Setting on Concrete Roof
DETAILS OF STOCK BRACES FOR STEEL TUBULAR FLAG POLES
2 Tel. or Std. Braces.
1 Tel. or Std. & 2 Tension Braces.
2 Tel. or Std. Braces.
Furnished with Flash Collars if Braces penetrate Waterproofing of Roof
TYPICAL ARRANGEMENTS OF BRACES FOR ROOF POLES

①

DETAILS OF STOCKBRACES


THE POLE AND TUBE WORKS INC. AVE. D & MURRAY STREET NEWARK, N. J. Steel Tubular Poles exclusively since 1900

Spun 7oz. Copper Ball - 22 Kt Gold leaf
Revolving Pole Truck, Galvd. 2-2" Brass Sheaves on 9/16" Monell Metal Pins

SETTING PLAN

COPING or Parapet.

Welded W.S. Collar, caulk to Pole

Welded Forks - ¾" x 13'0"

2" W.S. Pipe

Tubular W.S. R&L Buckle (with Flash Collar)

48"

⅝" Bolts

Brace Anchor

Pole Socket

35 ft

2-9" Galvd Cleats attached,

2 Sets ⅜" Manilla Bolt Rope Halliards

B/P of Cat pp 18 attached".

SCALE ⅛" for Pole only

Project or Job Buick-Oakland Service Bld'g N.Y. City

Contractor La Cour Iron Works Borden & Hans Polt Ave, N.Y

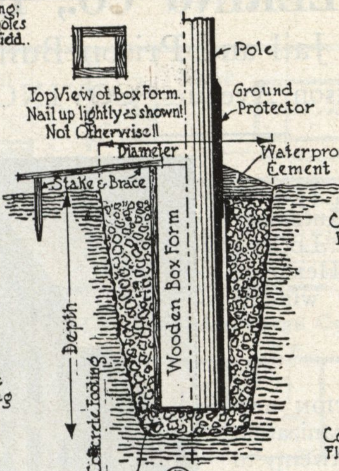
Architect

Sketch No. 8922

Correspondence

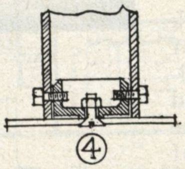
②

SAMPLE OF WORKING DETAIL WHICH WE SUBMIT FOR APPROVAL


Top View of Box Form. Nail up lightly as shown! Not Otherwise!!
Pole
Ground Protector
Diameter
Waterproof Cement
Stake & Brace
Depth
Wooden Box Form
4" Concrete Footing

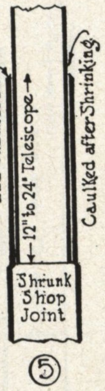
③

CONCRETE FOUNATION FOR GROUND SETTING



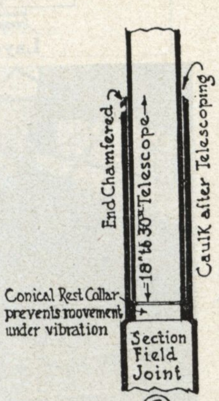
④

DETAIL OF POLE SOCKET


End Chamfered
12" to 24" Telescope
Caulked after Shrinking
Shrunk Shop Joint

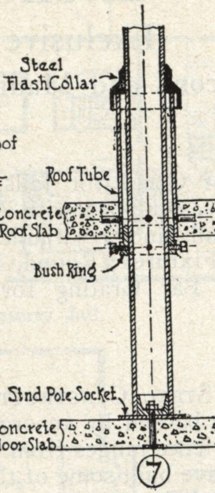
⑤

DETAIL OF SHOP JOINT


End Chamfered
18" to 30" Telescope
Caulk after Telescoping
Conical Rest Collar prevents movement under vibration
Section Field Joint

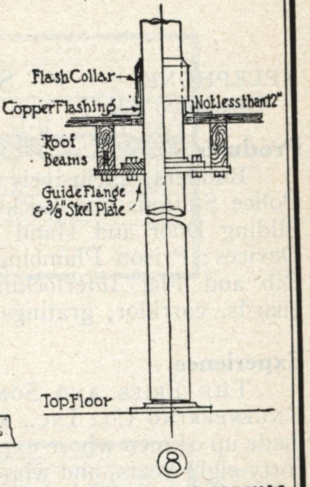
⑥

DETAIL OF FIELD JOINT


Steel Flash Collar
Roof Tube
Concrete Roof Slab
Bush Ring
Stnd Pole Socket
Concrete Floor Slab

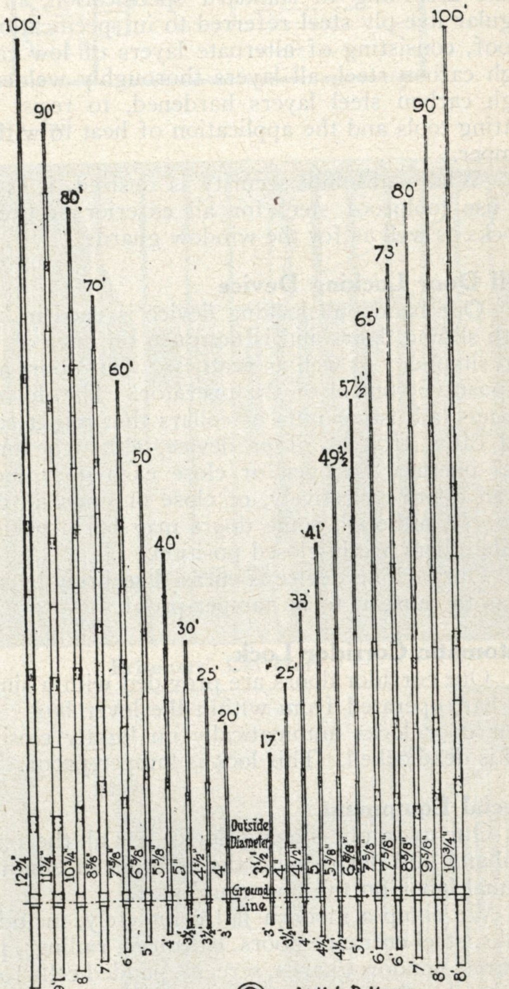
⑦

ROOF TUBE USED WHERE POLE EXTENDS THROUGH ROOF


Flash Collar
Copper Flashing
Not less than 12"
Roof Beams
Guide Flange & ⅜" Steel Plate
Top Floor

⑧

METHOD OF SETTING POLE THROUGH ROOF INTO TOP STORY


100'
90'
80'
70'
60'
50'
40'
30'
25'
20'
12¾"
11¾"
10¾"
8⅝"
7⅝"
6⅝"
5⅝"
4½"
4"
10
9
8
7
6
5
4
3½
3½
3
Outside Diameter
Ground Line
Standard
17'
25'
33'
41'
49½'
57½'
65'
73'
80'
90'
100'
3½"
4"
4½"
5"
5⅝"
6⅝"
7⅝"
8⅝"
9⅝"
10¾"
3
3½
4
4½
4½
5
6
6
7
8
8
Light Pattern

⑨

DETAILS OF STANDARD & LIGHT PATTERN POLES

DRAWN FOR THE POLE & TUBE WORKS INC	DETAILS OF THE POLE AND TUBE WORKS TUBULAR STEEL FLAG POLES	NOT DRAWN TO SCALE DATE: SEPT. '23	DRWG 1

THE FRIES AND SON STEEL CONSTRUCTION AND ENGINEERING CO., INC.

Exclusive Jail and Prison Builders

TELEPHONE
Covington 1635

Second and Madison Avenues, COVINGTON, KY.

Products

Builders, exclusively, of Cells for Jails, Prisons, Police Stations and Lockups, equipped with Automatic Sliding Door and Hand Pull, and Hydraulic Locking Devices; Prison Plumbing Fixtures; Round, Hexagon, Rib and Flat Interlocking Bar Grating for window guards, corridor, gratings.

Experience

The Fries and Son Steel Construction and Engineering Co., Inc., are backed by an organization made up of men whose experience ranges from twenty to forty-eight years, and who have built some of the largest jails and prisons in the United States.

Toolproof Steel

We use nine-ply toolproof steel for all grated work made according to standard specification, in place of regular five-ply steel referred to in specification as toolproof, consisting of alternate layers of low carbon and high carbon steel, all layers thoroughly welded and the high carbon steel layers hardened, to resist action of cutting tools and the application of heat to withdraw the temper.

Where absolute security is desired, it is advisable to use toolproof steel for all exterior sections of cell blocks as well as for the window guards.

Cell Door Locking Device

Our hand pull locking device is used in connection with sliding doors and is designed on lines of durability and simplicity as well as neatness. Our doors are always in positive control of the operator. The device has no springs, adjusting nuts or collars that might come loose and cause trouble. Our device, although simple, permits operator to open or close each door individually or all doors collectively, or close or open all doors *collectively*, although some doors may be in open position while others are in closed position.

Our locking device is encased securely by steel plate so as to cause it to be tamper-proof.

Automatic Corridor Lock

Our corridor doors are provided with a simple locking bar, operated from within the lever box. The corridor door locks automatically on lightly closing same, and is deadlocked. This lock is tamper-proof.

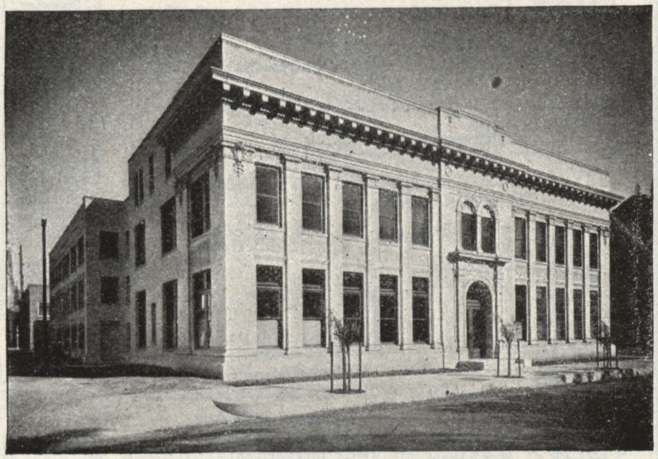
Special Equipment

Our hydraulic locking device has all the features of the hand pull device with the addition of eliminating all manual labor on the operators' part.

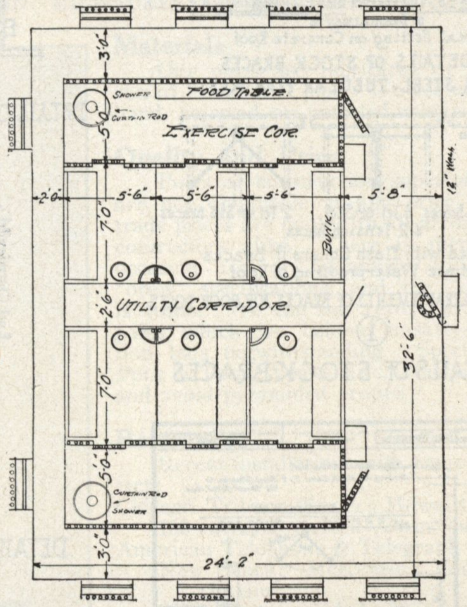
We equip a modern jail completely, including steel bunks, steel entrance doors, balconies, railings, plumbing fixtures, window guards, screens, padded cells for insane, visiting booths, steel stairs, etc.

Engineering Department

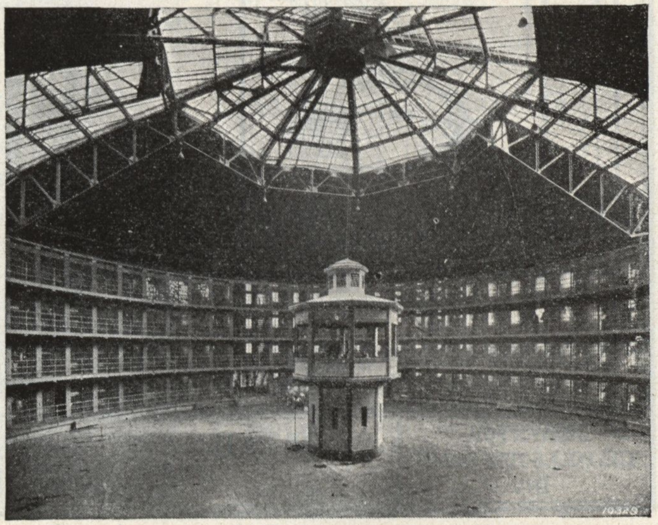
Our Engineering Department will gladly assist architects, engineers and officials who are contemplating any jail or prison construction. We will furnish modern layouts, together with detail drawings and specifications and estimates, which completely cover this work.



A Fireproof County Jail

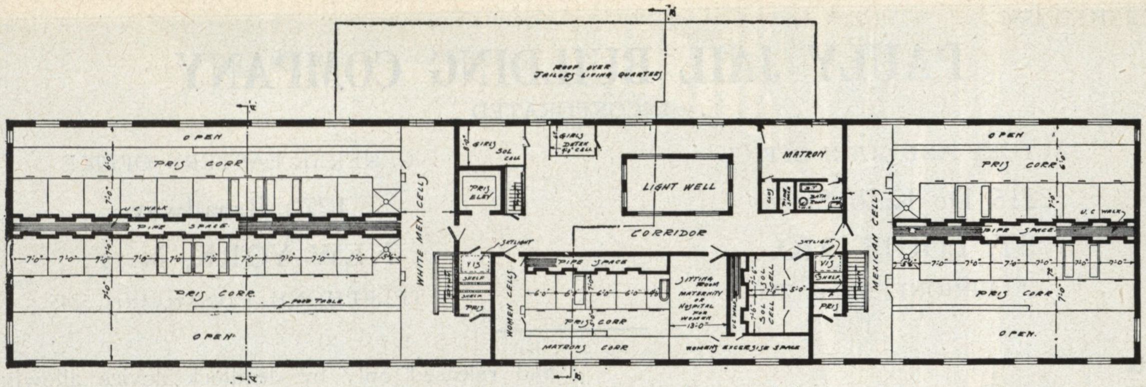


Layout for a Small County Jail

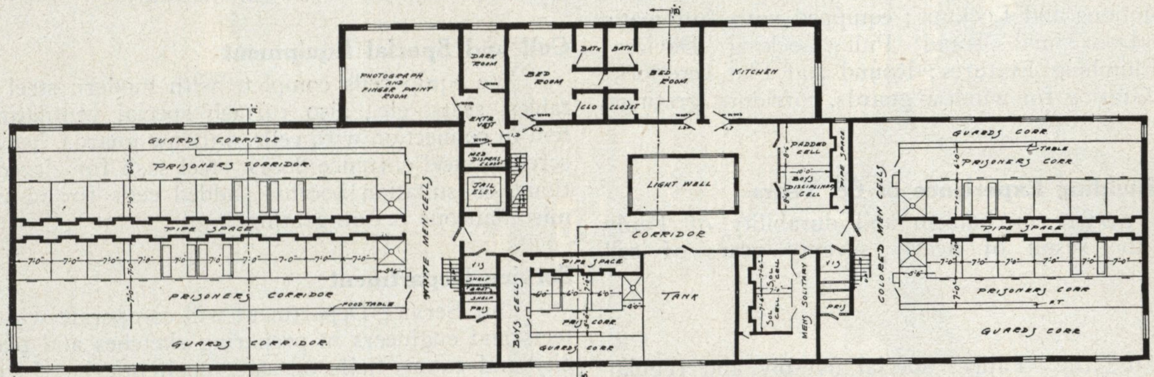


New Design in Prison Construction

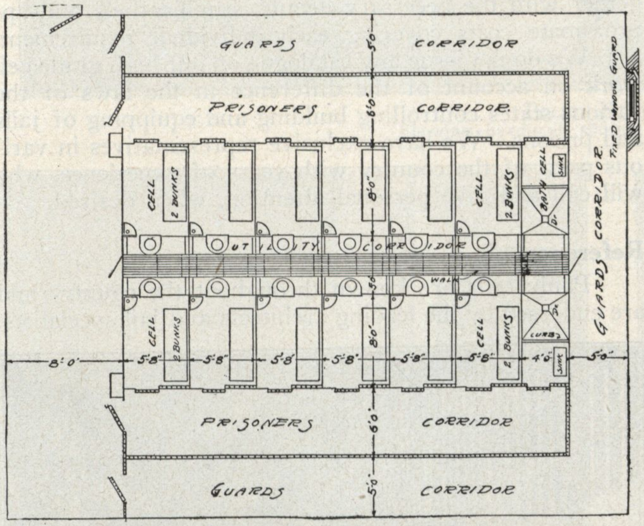
Continued on next page


ROOF OVER JAILORS LIVING QUARTERS
OPEN
PRIS CORR
U C WALK
PIPE SPACE
PRIS CORR
FOOD TABLE
OPEN
WHITE MEN CELLS
GIRLS SOL CELL
GIRLS DETEN CELL
PRIS ELEV
LIGHT WELL
MATRON
BATH ROOM
CORRIDOR
SKYLIGHT
VIS
SHELF
PRIS
WOMEN CELLS
PIPE SPACE
PRIS CORR
MATRONS CORR
SITTING ROOM MATERNITY OR HOSPITAL FOR WOMEN
SOL CELL
WOMENS EXCERSISE SPACE
MEXICAN CELLS
OPEN
PRIS CORR
U C WALK
PIPE SPACE
PRIS CORR
OPEN

Second Tier Plan of a Large County Jail

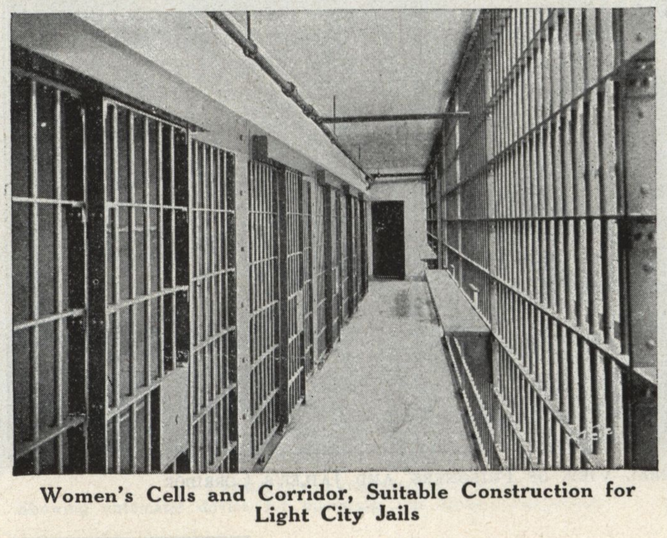

PHOTOGRAPH AND FINGER PRINT ROOM
DARK ROOM
BED ROOM
BATH
BATH
CLO
CLOSET
BED ROOM
KITCHEN
ENTR VEST
MED DISPENS CLOSET
JAIL ELEV
GUARDS CORRIDOR
PRISONERS CORRIDOR
PIPE SPACE
PRISONERS CORRIDOR
FOOD TABLE
GUARDS CORRIDOR
WHITE MEN CELLS
LIGHT WELL
PADDED CELL
BOYS DISCIPLINARY CELL
PIPE SPACE
CORRIDOR
VIS
SHELF
PRIS
BOYS CELLS
PIPE SPACE
PRIS CORR
GUARDS CORR
TANK
SOL CELL
MENS SOLITARY
COLORED MEN CELLS
GUARDS CORR
TABLE
PRISONERS CORR
PIPE SPACE
PRISONERS CORR
GUARDS CORR

First Tier Plan of Above County Jail

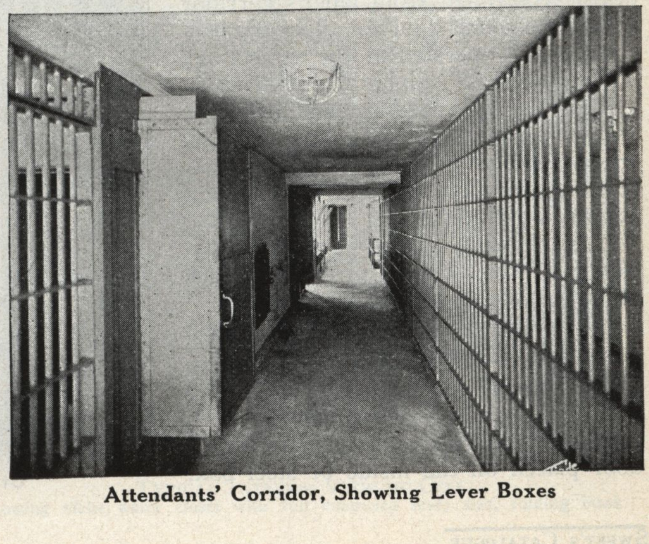

GUARDS
CORRIDOR
PRISONERS
CORRIDOR
CELL
2 BUNKS
BATH CELL
SINK
UTILITY CORRIDOR
WALK
GUARDS CORRIDOR
PRISONERS
CORRIDOR
GUARDS
CORRIDOR
8'0"
5'8"
4'5"
5'0"
8'0"
6'0"

Medium Size County Jail

Prisoners' Corridor



Women's Cells and Corridor, Suitable Construction for Light City Jails



Attendants' Corridor, Showing Lever Boxes

ESTABLISHED 1856

PAULY JAIL BUILDING COMPANY

INCORPORATED

FACTORY AND MAIN OFFICE
2215 De Kalb Street
ST. LOUIS, MO.
TELEPHONE, SIDNEY 246

GENERAL EASTERN OFFICE
1270 Broadway
NEW YORK, N. Y.
TELEPHONE, PENNSYLVANIA 5245

Products

Builders, exclusively, of CELLS for Jails, Prisons, Police Stations and Lockups; equipped with Automatic Sliding Door and Hand Pull Locking Devices; Prison Plumbing Fixtures; Round and Flat Interlocking Bar Grating for window guards, corridors, gratings, etc.

A Cell Building Experience of 68 Years

The perfect mechanism and durability of Pauly cells is the result of nearly seventy years of cell building.

Steel

We use the "Pauly" special five-ply and regular five-ply toolproof steel for all grated work, consisting of alternate layers of high carbon and low carbon steel. All layers thoroughly welded, and the high carbon layers hardened to resist action of cutting tools.

The "Pauly" special five-ply toolproof steel is heat resisting.

Exterior Plate and Grated Work

We advocate toolproof steel plates and toolproof grating for all exterior sections of cell blocks, where absolute security is desired.

Niches

We are the originators and builders of the niche system of cell plumbing.

Cell Door Locking Device

Cell doors operated on the sliding principle by an automatic lever locking device, controlled from jailer's corridor so that any one door or all doors in a row can be operated at the same time. This device is simple in construction and yet durable, needing very little care and attention, as there are no springs, wires, cogs or small parts to wear out, requiring adjustment and replacement at frequent intervals.

All locking device parts fully enclosed in steel casing protecting same from prisoners.

Automatic Corridor Door Lock

Corridor entrance doors secured with automatic device arranged with series of hardened steel bolts to each door placed on the inside of steel box, and released only by deadlock device allowing doors to be opened and closed automatically.

Cell and Special Equipment

We equip cells complete with modern steel bunks, tables, seats, etc., also furnish special ventilating system in connection with cells, window guards, heavy wire screens, steel entrance doors, steel sash for glazed partitions, consultation booths, padded cells for insane and miscellaneous prison grating.

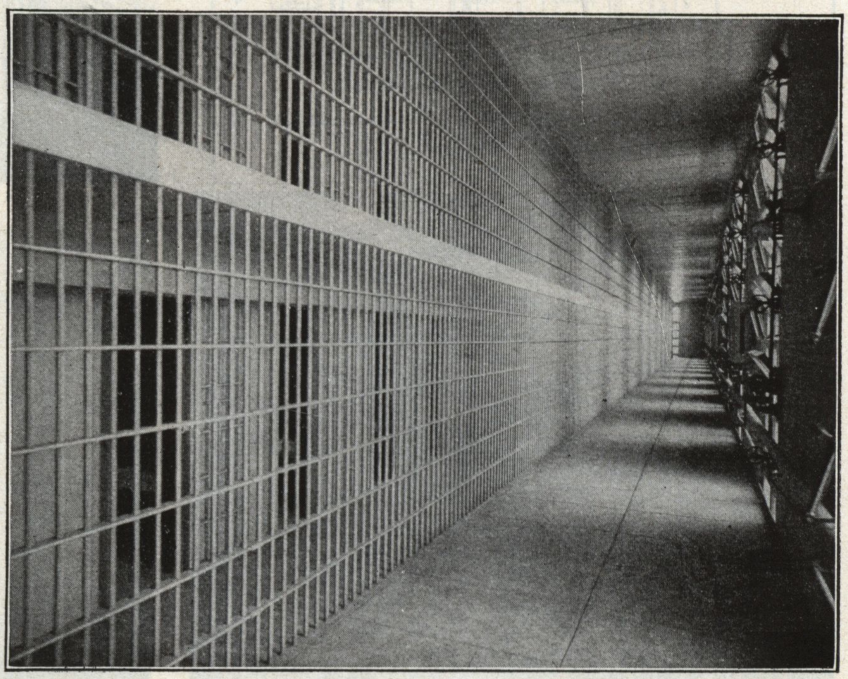
Service Department

Our Service Department will co-operate with architects and engineers in preparing sketches and plans for city and county jails or state penitentiaries, furnishing them with drawings of modern cell arrangement, together with the necessary details, specifications and approximate costs covering each individual requirement.

We do not issue any catalogue on our high grade cell work on account of the difference in the laws of the various states controlling building and equipping of jails and prisons. We have exclusive representatives in various parts of the country with years of experience, who will call and give personal attention, when desired.

Reference

Pauly cells are known throughout the country and are endorsed by the leading architects and jail specialists.



GENERAL VIEW OF PRISONERS' AND JAILER'S CORRIDOR

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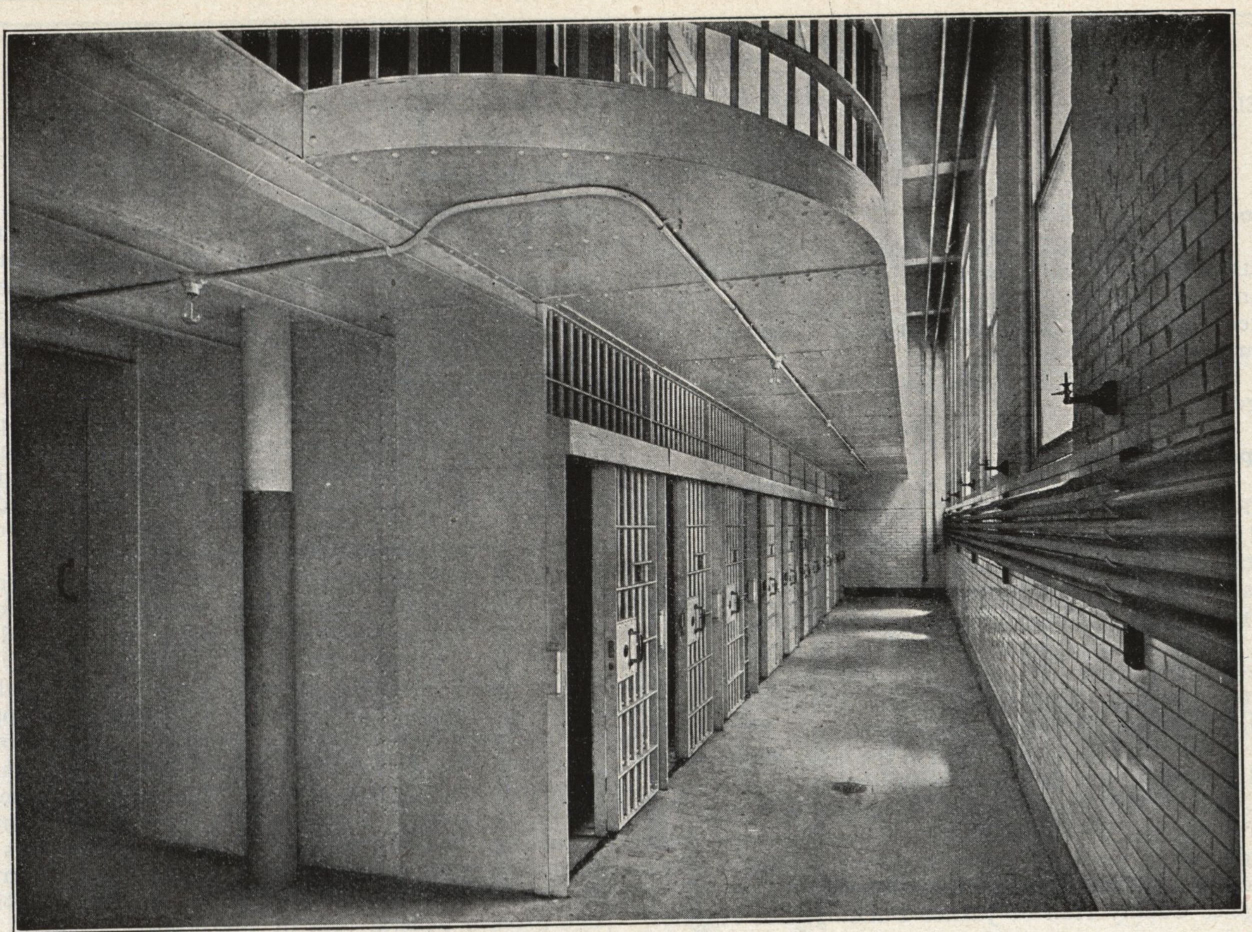
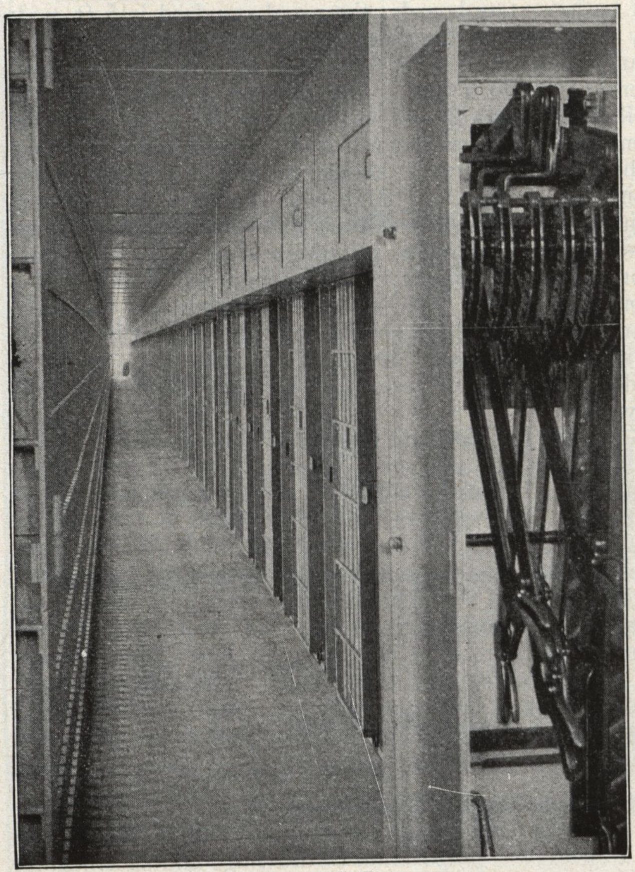
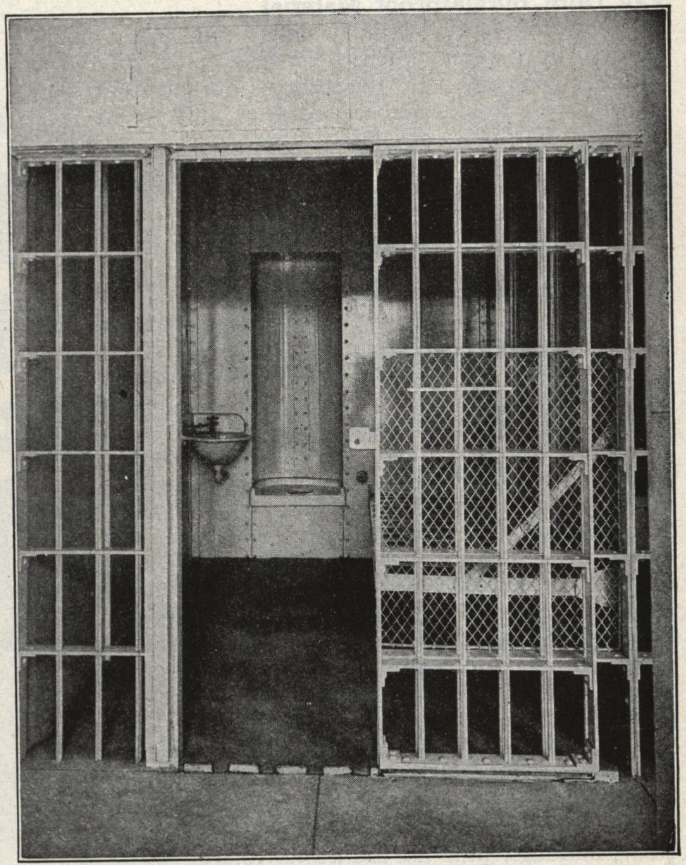


Police Station Cells
Showing hand-pull sliding door with automatic lock



Prisoners' Corridor
Showing automatic device for operating and locking cell doors



Typical Interior View of Cell
Showing niche water closet with full enameled seat; also, folding bunk

THE VAN DORN IRON WORKS COMPANY

Jail and Prison Builders

TELEPHONE
Randolph 6630

2685 East 79th Street
CLEVELAND, OHIO

Products

Manufacturers of Van Dorn Steel Jail and Prison Cells (White Diamond Burglarproof Materials, Van Dorn Keyless Sliding Door Locking Device, Patented Interlocked and Counterlocked Grating Construction).

For Steel Joist Hangers, Post Caps and Bases, see page 619.

Experience

The Van Dorn Iron Works Company have been known as expert jail builders and manufacturers of steel jail and prison cell work for over 40 years. They have installed work of this character in some of the largest and most important penal institutions in the United States, Canada, Mexico, Cuba, Hawaii, and the Philippines.

There are 352 Van Dorn jail cells in the Tombs Prison, New York City; also over 1000 cells, Maryland State Prison, Baltimore; 540 cells, Allegheny County Jail, Pittsburgh; and numerous others.

There have been completed in the last twelve months 648 steel cells for the Indiana Reformatory at Pendleton, Ind. (near Indianapolis), equipped with the Van Dorn Keyless Locking Device. There has also been completed in the last twelve months the largest single purchase of steel cells ever made, for the new Los Angeles County Hall of Justice Building, Los Angeles, Cal.

Van Dorn Burglarproof Material

The Van Dorn White Diamond steel bar is manufactured by a special patented process, and is offered by no other company. By this process burglarproof work is made with an exterior coat of steel, uniform in thickness and hardness, absolutely sawproof and fileproof, the core or center part being soft iron. The hard steel on the exterior of the bar makes it impossible for the prisoner to mutilate it in any way; every inch of the bar can be tested after erection.

Class of Buildings for Jail Equipment

There are five (5) general classes of buildings which will require jail equipment, as follows:

Class No. 1, Village Lockup or Calaboose—The smallest village lockup or calaboose requires at least 2 steel cells. The standard size of each is 5 ft. wide, 7 ft. long, by 7 ft. high. The building should be of fireproof construction, including roof. The cement floor could act as the floor of the cells, to which they would be anchored. The cell enclosures would be steel plate, except the fronts and possibly the tops, which would be bar work. The lockup entrance door should be steel plate, the windows protected with steel bar guards. Cells have been made as narrow as 4 ft. and as wide as 7 ft. Each cell is provided with one bunk and water closet, or in the absence of sewerage connections, a special night soil bucket.

Class No. 2, Town Halls or Municipal Buildings Equipped with Cells—Such buildings should be provided with 3 lockup departments, 1 each for male, female and juvenile prisoners, located preferably in the first story, although they are sometimes placed in the basement. Standard cells would be 5 ft. wide, 7 ft. long, by 7 ft. high, of solid steel plate, except the fronts and tops of bar work, each provided with one bunk and sewerage connected water closet. Cell room doors should be of steel plate, and the windows protected with bar work. The room walls, floor and ceilings should be fireproof construction, the cells anchored to the cement floor.

Class No. 3, Police Station Cells—Police headquarters buildings and station houses should also provide separate quarters for male, female and juvenile prisoners. Cell sizes can be varied to suit size of rooms, but should be at least standard, 5 ft. wide, 7 ft. long, by 7 ft. high. Cell rooms should be fireproof construction, including cement floor to which cell can be anchored. Cell enclosures should be steel plate, except fronts and possibly tops, which should be bar work. Proper windows, protected with bar guards, should be provided for light and ventilation. Doors entering the various departments and the guards' corridors should be steel plate construction. Each cell should be equipped with one bunk and water closet connected with sewerage.

Class No. 4, County Jails—County jails must necessarily provide for absolute segregation, i.e., separate departments or ranges of cells for male and female (white and black) and juvenile prisoners; witness or detention rooms; hospital cells or rooms for both male and female; padded cell for the insane. The opposite page gives a general idea of the proper layout of the various departments necessary in a modern county jail. Cell sizes vary somewhat, according to the requirements of various state boards; the usual standard is 5 ft. wide by 8 ft. high in the clear; prisoners' exercise corridors vary from 4 ft. 6 in. to 6 ft. wide, according to the number of cells in a row. The building, especially for the jail departments should be absolutely fireproof, with 4-in. cement floor over the cell and corridor steel flooring. The jail cell contractor should lay and be responsible for this concrete flooring. Male cells should be extra strong, with toolproof steel bar work; also the prisoners' exercise corridor, window guards, and certain steel plate portions. Department entrance doors should be steel—double doors for male cell rooms, single for other departments. Each cell should be properly ventilated with a register connecting into a utility vent shaft, and provided with water closet and lavatory connected with sewerage.

Class No. 5, State Prison or Penitentiary Cells—These cells are arranged in tiers in the center of the building, with utility corridor, vent and plumbing shaft between. Minimum cell size 5 ft. wide, 8 ft. long, by 8 ft. high. Each cell equipped with one bunk and water closet and lavatory connected with sewerage. Each cell to be ventilated through register opening into utility vent shaft. Cell enclosures to be solid steel plate, except fronts and doors to be bar work, as should the enclosure of guards' corridors or balconies. The cell contractor should lay and be responsible for a 4-in. concrete flooring over the steel floor construction of the cells and prisoners' corridors.

Van Dorn Service Department

Special expert jail representative is at the service of architects in preparation of drawings and specification data. Special prison catalogue sent on request.

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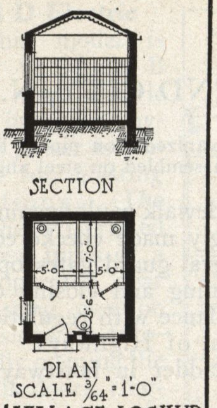
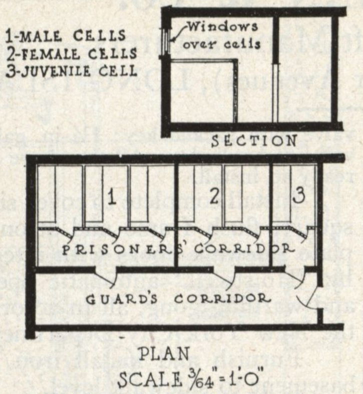
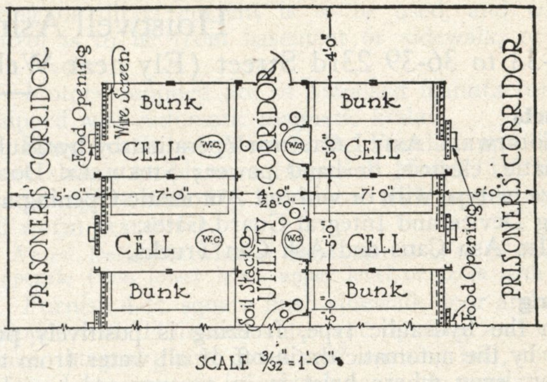

SECTION
PLAN
SCALE 3/64"=1'-0"
5'-0"
7'-0"
6'-6"

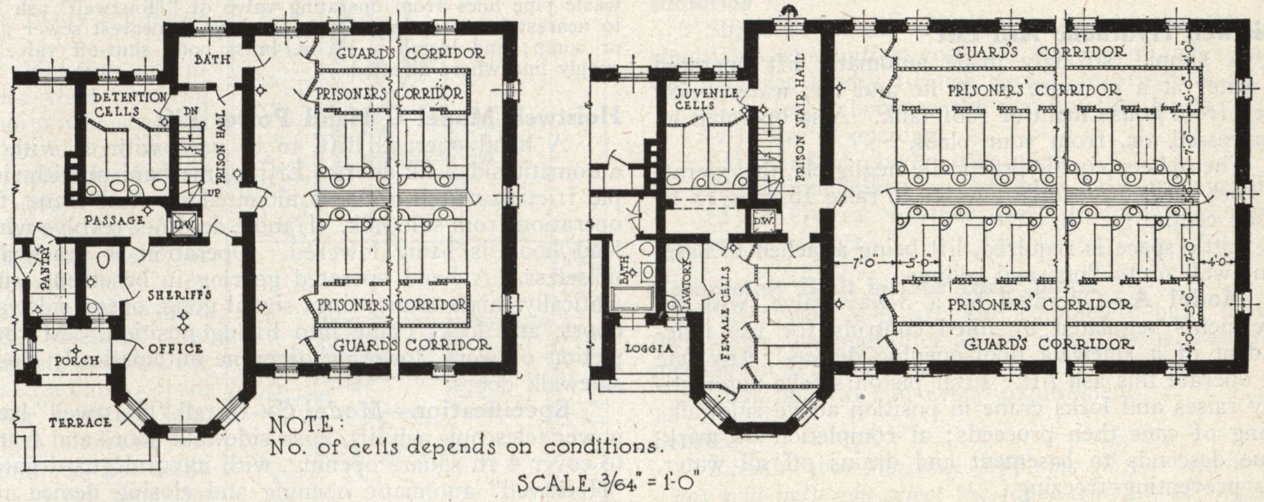
CLASS 1. VILLAGE LOCKUP MINIMUM REQUIREMENTS


1-MALE CELLS
2-FEMALE CELLS
3-JUVENILE CELL
Windows over cells
SECTION
1
2
3
PRISONERS' CORRIDOR
GUARD'S CORRIDOR
PLAN
SCALE 3/64"=1'-0"

CLASS 2. TOWN HALLS EQUIPPED WITH CELLS

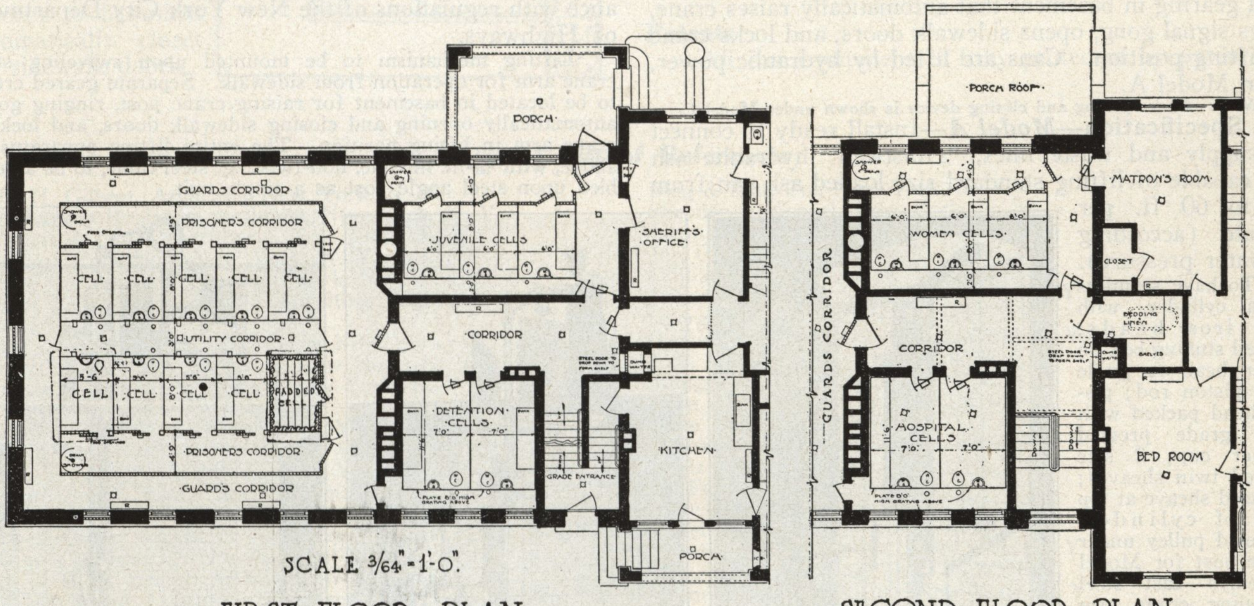

PRISONERS' CORRIDOR
Food Opening
Wire Screen
Bunk
CELL
W.C.
CELL
Bunk
UTILITY CORRIDOR
Soil Stack
Bunk
CELL
CELL
Bunk
Food Opening
PRISONERS' CORRIDOR
5'-0"
7'-0"
2'-8"
4'-0"
SCALE 3/32"=1'-0"

CLASS 3. POLICE STATION CELLS.


BATH
DETENTION CELLS
DN
UP
PRISON HALL
PASSAGE
D.W.
PANTRY
SHERIFF'S OFFICE
PORCH
TERRACE
GUARDS' CORRIDOR
PRISONERS' CORRIDOR
PRISONERS' CORRIDOR
GUARDS' CORRIDOR
JUVENILE CELLS
PRISON STAIR HALL
D.W.
BATH
LAVATORY
LOGGIA
FEMALE CELLS
GUARD'S CORRIDOR
PRISONERS' CORRIDOR
PRISONERS' CORRIDOR
GUARD'S CORRIDOR
7'-0"
5'-0"
4'-0"
NOTE:
No. of cells depends on conditions.
SCALE 3/64"=1'-0"

FIRST FLOOR PLAN

SECOND FLOOR PLAN


PORCH
GUARDS CORRIDOR
PRISONER'S CORRIDOR
CELL
CELL
CELL
CELL
CELL
UTILITY CORRIDOR
CELL
CELL
CELL
CELL
PADDED CELL
PRISONERS CORRIDOR
GUARD'S CORRIDOR
JUVENILE CELLS
SHERIFF'S OFFICE
CORRIDOR
DETENTION CELLS
7'-0"
7'-0"
PLATE 8'-0" HIGH GRATING ABOVE
GRADE ENTRANCE
KITCHEN
PORCH
SCALE 3/64"=1'-0".
PORCH ROOF
GUARDS CORRIDOR
WOMEN CELLS
MATRON'S ROOM
CLOSET
BEDDING LINEN
SHELVES
CORRIDOR
STEEL DOOR TO DROP DOWN TO FORM SHELF
DUMB WAITER
HOSPITAL CELLS
7'-0"
7'-0"
PLATE 8'-0" HIGH GRATING ABOVE
DOWN
BED ROOM

FIRST FLOOR PLAN

SECOND FLOOR PLAN

CLASS 4. SHOWING TWO TYPES OF COUNTY JAILS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC..	CLASSES 1,2,3&4 LOCKUPS FOR VILLAGE, TOWN HALL AND COUNTY	SCALE-3/64" & 3/32" EQUALS-1'-0" DATE-AUG. '20	DRWG 1

FRANK ELIAN & CO.

Hoistwell Ash Lift Manufacturers

36-33 to 36-39 23rd Street (Ely near Webster Avenues), LONG ISLAND CITY, N. Y.

Products

Hoistwell Ash Lifts, for operation by hydraulic, pneumatic, electric, or hand power; Sidewalk Doors any size or type with or without Automatic Opening and Closing Device and Integral Guard Gates.

Also Ash Cans and Ash Can Trucks.

Freezing

In the hydraulic type, freezing is positively prevented by the automatic drain off of all water from the cylinder, even where hoist is in an exposed position. The entire working mechanism is so arranged that no part carrying water is subjected to freezing temperature.

Hoistwell Hydraulic Ash Lift

A simple, strongly made automatic lift operated by water at a pressure of 30 lb. and up; water being taken from house main or roof tank. Also operated by compressed air, from your plant.

The upkeep cost is practically negligible, the operating cost very low—cost of water to raise 15 cans 15 ft. is one cent.

Little space is required, lift being attached to basement wall or to floor and ceiling.

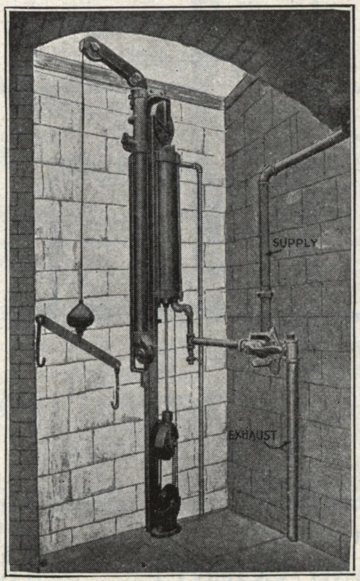
Model A—Operated by a 3-way valve, with all movements regulated by fixed controls for use independent of a sidewalk door-opening device. Any one can operate this ash lift. First piston stroke automatically raises and locks crane in position above sidewalk; lifting of cans then proceeds; at completion of work, crane descends to basement and drains off all water, thus preventing freezing.

Model B—Similar to Model A, with a hand operated gearing in basement that automatically raises crane, rings signal gong, opens sidewalk doors, and locks crane in lifting position. Cans are lifted by hydraulic power, as in Model A.

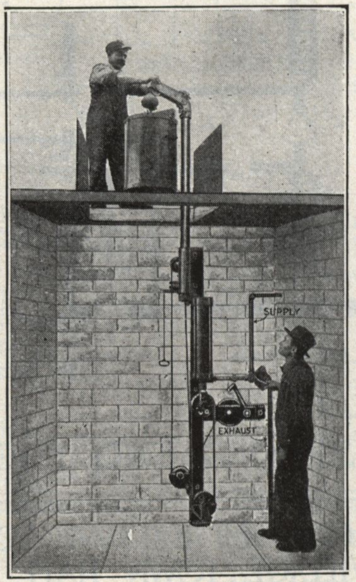
Note: Door opening and closing device is shown under Model C.

Specification—*Model A*—Install ready to connect to supply and waste lines, "Hoistwell" hydraulic ash lift capable of lifting standard size loaded ash can from 30 to 60 ft. per minute (according to water pressure).

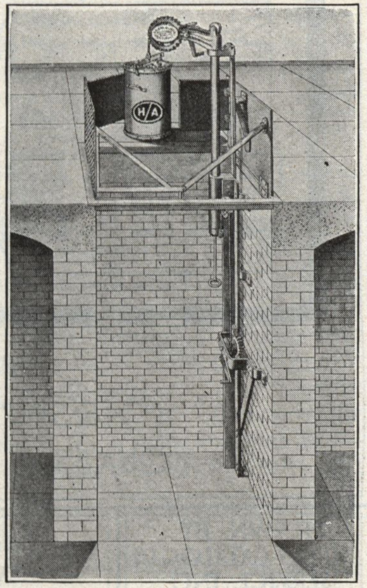
To have seamless brass cylinder, with cast iron heads; packed stuffing box on lower head to guide steel piston rod; piston head packed with high grade pressed leather cup; 2 sets housed twin sheaves; (housed sheave at top head of cylinder, socketed pulley under crane post for Model A only) cast steel swiveling crane arm on telescopic steel crane post; steel automatic locking device for holding crane in lifting position; continuous $\frac{5}{16}$-in. non-twisting flexible cable; weighted lifting hooks; heavy 3-way brass body operating valve with packed key; 1¼-in. galvanized iron piping between valve and cylinder. All the above assembled on steel angle post ready to install.



Model A, Hydraulic



Model B, Hydraulic



Model C, Hand Power

Hoistwell Ash Lifts

Install complete to cover sidewalk vault opening 4 ft. square, flush frame and strongly made checkered steel plate sidewalk doors with integral guard gates operated by "Hoistwell" automatic opening and closing device, and warning gong, all in accordance with regulations of the New York City Department of Highways.

Furnish and install iron ladder in hoistway from basement to sidewalk level.

Water connection, additional to above, to be included in plumbing specification if not to be done by us, as follows:

Furnish and connect 1¼-in. galvanized iron supply and waste pipe lines from operating valve of "Hoistwell" ash lift to nearest house main or tank line and to nearest sewer pipe or sump; and install a 1¼-in. brass body shut-off valve in supply line where directed.

Hoistwell Model C Hand Power Lift

A hand operated lift, to be used with or without automatic sidewalk doors. Lifting mechanism with simple friction clutch brake is mounted on steel crane, for operation from sidewalk. Handle does not revolve when load hook is being lowered. Operation is practically noiseless. A hand operated gearing in basement automatically raises crane, rings signal gong, opens sidewalk doors, and locks crane into lifting position. At completion of work, lowering of crane automatically closes sidewalk doors.

Specification—*Model C*—Install "Hoistwell" hand power telescopic ash lift, flush sidewalk doors and frame to cover 4 ft. square opening, with integral guard gates, "Hoistwell" automatic opening and closing device and warning bell, complete and ready to operate in accordance with regulations of the New York City Department of Highways.

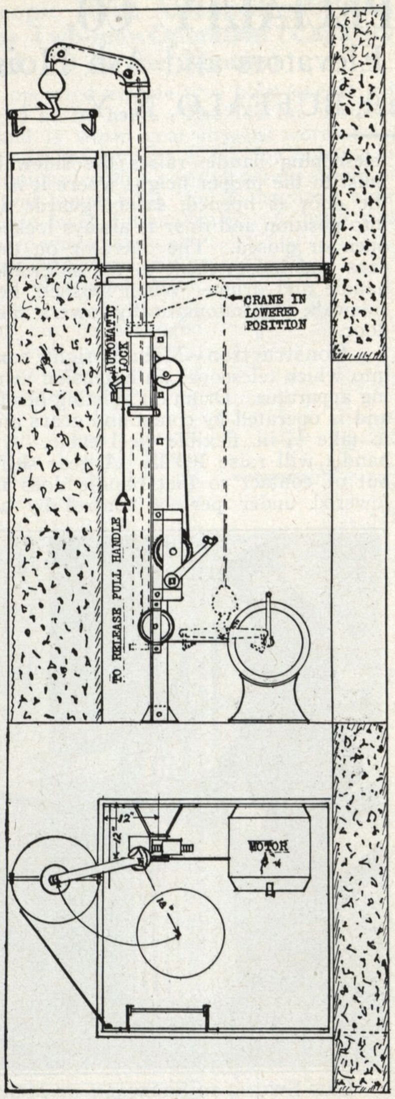
Lifting mechanism to be mounted upon swiveling steel crane arm for operation from sidewalk. Separate geared crank to be located in basement for raising crane post, ringing gong, automatically opening and closing sidewalk doors, and locking crane arm in lifting position. The entire lifting apparatus as above, with $\frac{5}{16}$-in. flexible, non-twisting, steel cable, to be assembled upon steel angle post as a single unit.

Continued on next page

Model D Electric

This model is similar to Model B except that electric power instead of hydraulic power is employed for hoisting operations. The crane head is raised by a few turns of a hand operated gear to hoisting position above sidewalk automatically opening the sidewalk doors, ringing warning gong in its ascent, and locking the crane in position ready for hoisting.

Hoisting operations then proceed from power supplied by an electric motor conveniently located in basement, and controlled from either basement or sidewalk level, or can be supplied with both basement and sidewalk controls for operation from either level at will. When hoisting is completed, the crane is released from its fixed position and its descent to basement automatically closes the sidewalk doors.



When specifying this model, state whether alternating or direct current is to be used, and whether control is to be from basement or sidewalk, or from both levels.

Motors supplied are of standard manufacture and equipped with automatic magnetic brake.

Specifications—*Model D*—Furnish and install, where shown on plans, a Hoistwell Model "D" electric hoist complete with 1½ hp. motor with magnetic brake and worm gear drive.

Note: Designate whether hand control is to be furnished to operate from lower level, upper level or from both levels.

Furnish 4-ft. square flush sidewalk door and frame equipped with Hoistwell automatic opening and closing device, integral guard gates, and warning bell, complete and ready to operate in accordance with regulations of the New York City Department of Highways.

Inquiries

Slight variations frequently occur under different conditions which affect cost; for that reason, when making inquiries kindly furnish correct information as to:

(1) Height between the two hoisting levels.
(2) Size of opening.
(3) Kind of power to be used.
(4) If pneumatic or hydraulic, pressure available.
(5) If electric, whether direct or alternating current and line of voltage.

Completely Built in Our Own Shops

"Hoistwell" ash lifts are completely built in our own shops; we guarantee all equipment to be free from mechanical defects.

Lifts built to suit every requirement.

Service

Submit your hoisting problems to our engineers. They will help you select the types which best meet the conditions involved.

Patents

All our equipment is fully protected by patents.

Partial List of References

C. P. H. Gilbert, Architect, New York, N. Y.
F. DeLancey Robinson, Architect, New York, N. Y.
Schwartz & Gross, Architects, New York, N. Y.
Board of Education, New York, N. Y.
Turner Construction Co., New York, N. Y.
Dwight P. Robinson & Co., Consulting Engineers, New York, N. Y.
Sibley & Featherstone, Architects, New York, N. Y.
Herbert R. Mainzer, Architect, New York, N. Y.
Clarence S. Howell, Architect, New York, N. Y.—Assoc. Mem. Am. Soc. C.E.
William N. Smith, Architect, New York, N. Y.
H. E. Abbott, Architect, Stamford, Conn.
Frank S. Howell, Architect, New York, N. Y.—Assoc. Mem. Am. Soc. C.E. and Assoc. Mem. Am. Soc. M.E.
Sugarman-Hess, Berger, Architects, New York, N. Y.
Cross & Cross, Architects, New York, N. Y.
J. E. R. Carpenter, Architect, New York, N. Y.
M. L. & H. G. Emery, Architects, New York, N. Y.
F. T. H. Bacon, Consulting Engineer, New York, N. Y.
Pease & Elliman, New York, N. Y.
Park Operating Corp., New York, N. Y.
Edinburgh Realty Corp., New York, N. Y.
Gresham Realty Co., New York, N. Y.
J. V. Schaefer Construction Co., New York, N. Y.
Eyrich & Ward, New York, N. Y.
John Lowry, Jr., New York, N. Y.
Bing & Bing Co., New York, N. Y.
Shroder & Koppel, New York, N. Y.
Jacob & Youngs, New York, N. Y.
Jos. G. Siegel, Inc., New York, N. Y.
William Crawford, New York, N. Y.
Julius Tishman & Sons, New York, N. Y.
George Backer, Inc., New York, N. Y.
G. Richard Davis & Co., New York, N. Y.
J. L. Murphy, Inc., New York, N. Y.
Manger Hotels, New York, N. Y.
Lehn & Fink, New York, N. Y.
State Banks, New York, N. Y.
Brooklyn Manhattan Transit, Brooklyn, N. Y.
Eagle Iron Works, Brooklyn, N. Y.
St. Paul's Church, Brooklyn, N. Y.
State Banks, Brooklyn, N. Y.
Hotel Lucerne, New York, N. Y.
Hotel Peter Stuyvesant, New York, N. Y.
Hungerford Building, New York, N. Y.
Grand Street Boys' Club, New York, N. Y.
Church of The Blessed Sacrament, New York, N. Y.
A. F. Wagner Architectural Iron Works, Milwaukee, Wis.
Sheridan Iron Works, Sheridan, Wyo.
Western Union Building, St. Louis, Mo.
Y. M. C. A. Building, Flushing, N. Y.
South Street Realty Co., Stamford, Conn.

C. K. ERNST SPECIALTY CO.

Manufacturers of Sidewalk Elevators and Ash Hoists

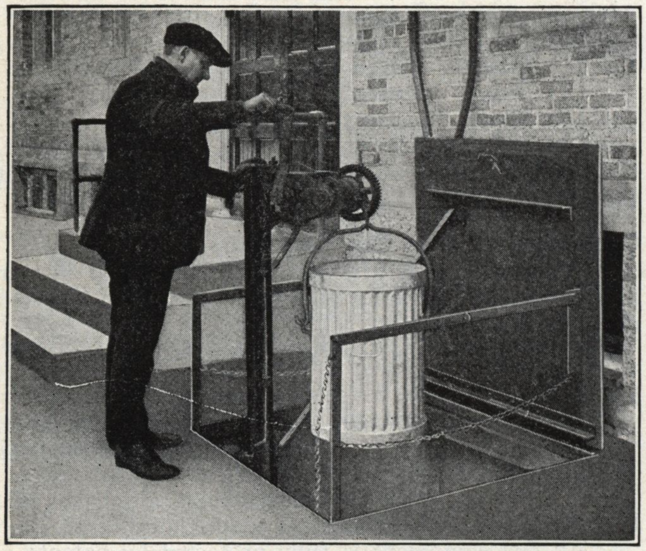
998-1006 East Ferry Street, BUFFALO, N. Y.

Products

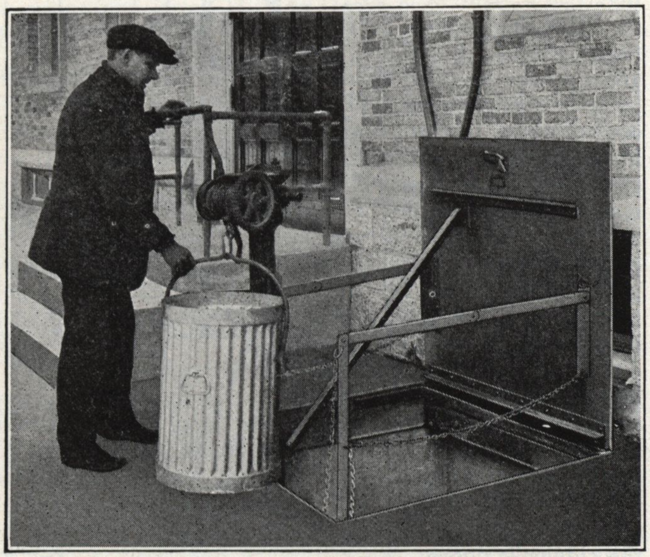
Platform Sidewalk Lifts, hand and electric; Telescopic Ash Hoists, hand and electric; Cellar Window Ash Lifts; Automatic Safety-guarded and Counterbalanced Sidewalk Doors with Opening and Closing Attachment, Ash Can Trucks.

Ernst Hand Operated Combination Telescopic Ash Hoist and Doors, with Door Opening, Closing and Locking Mechanism (Capacity, 500 lb.; Speed, 30 to 40 ft. per Minute)

Designed principally for one-man removal of ashes but can also be used for raising and lowering kegs, crates, boxes, etc. Especially recommended for use in schools, apartment houses, churches, banks, office and other public buildings. Hoist can be obtained without doors if so desired.

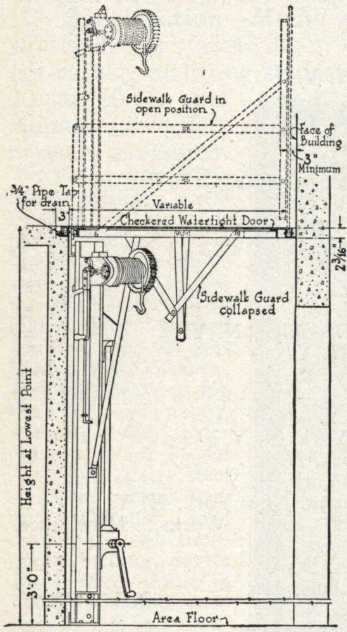


Ash Can Hoisted to Sidewalk Height Ready to be Swung to the Sidewalk without Lifting the Can

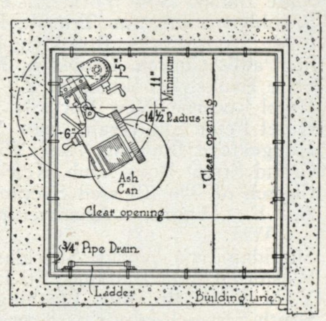


Can Swung to Sidewalk by Means of the Swinging Head of the Hoist

Double rail guards now furnished on each side of door



Section

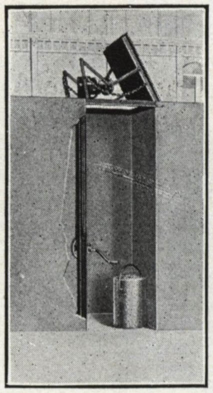


Plan

Details of Ernst Hand Operated Telescopic Ash Hoist and Safety-guarded Sidewalk Door Operated by a Machine Cut Rack and Pinion

Operation—Hoist will operate through a door 3 ft. square but we recommend an opening 4 ft. square as more desirable, as it will allow room for 4 to 6 ash cans in the areaway. Hoist telescopes below sidewalk door. A few turns of the telescoping handle raises the sidewalk door and elevates the hoist to the proper height where it is automatically locked. As the door is opened, safety guards are automatically brought into position and door is always locked at any position whether open or closed. The operator on the sidewalk hooks on the cans and hoists them to the sidewalk by means of the crank handle and drum. When finished, hoist is lowered below the sidewalk and automatically lowers and locks the flush sidewalk door.

Construction—Main upright consists of a 6-in. channel into which telescopes an extension arm which carries the hoisting apparatus. Drum on hoisting head revolves on ball bearings and is operated by compound gears and a handle; it is grooved to take ¼-in. flexible steel cable. A pressure of 7 lb. at the handle will raise 100 lb. A gear shifting device throws gears out of contact so that handle does not revolve when load is lowered under perfect control by a brake. All gears are machine cut and entire hoist made in the most substantial manner. Telescopic arm is raised by an improved rack and pinion by bevel geared winch. Hoist is painted at factory, except working parts which are greased. One extra coat of paint is recommended after installation.



Hoist and Door Automatically Raised in a Single Operation by Operator from the Cellar

Door locked in any position

Installation—Hoist shipped assembled with exception of hoisting head. Hoist is bolted to door frame and base plate bolted to floor of areaway.

Specification—Provide and install, where indicated on plans, one Ernst Telescopic Hoist with automatic gear shifting and brake device, complete with Ernst Safety-guarded Sidewalk Door with automatic door operating device. Door to be checkered ⅛-in. steel plate reinforced (recommend 4x4 ft.), to have concreted frame of flush type for complete one-man operation. Provide also one Ernst ash can truck, also Ernst swing bail galvanized ash cans, size 18x26 in. (state number desired) (special watertight frame can be furnished when so required to drain water to cellar). Telescope of improved rack and pinion.

Also provide and install an Ernst wrought iron ladder from floor to sidewalk with connections to door frame.

Note: A safety spring gate can be furnished when desired to protect door opening on front side of door, so that whole opening is safety-guarded. Bell-ringing alarm can be furnished to warn pedestrians when outfit is being used.

Continued on next page

Ernst Electric Telescopic Hoist Arranged with Control for One- or Two-man Operation (Capacity, 300 lb.; Speed, 70 ft. per Minute)

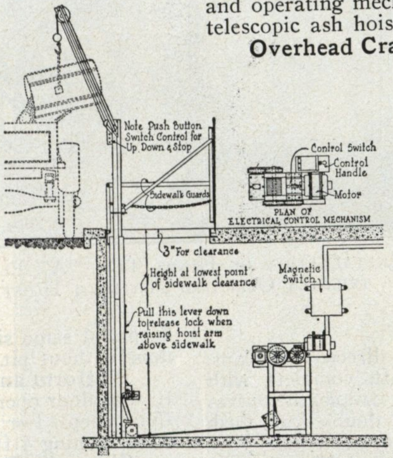
Similar to the hand operated vehicle type hoist except it is operated by motor instead of by hand. The 1½ hp. motor is mounted in the cellar and is worm gear driven, worm being bathed constantly in oil. It has but one speed for hoisting or lowering. The hoist is equipped with a positive acting automatic limit switch for upper and lower limit, and a magnetic brake which stops can at proper level automatically. A hand controller or push button three-way switch permits operator to start, stop or reverse motor at any desired height. Overhead crane mounted on ball bearings.

Control—The hoist can be arranged for one-man operation, with push button control located on the extension arm or with hand starter. Also arranged for two-man control.

Specification—Provide and install, where shown on plans, an Ernst Electric Telescopic Hoist, complete with 1½ hp. motor with magnetic upper and lower limit switch, magnetic brake and worm gear drive.

Note: Designate whether hoist is to have hand controller for two men to operate or push button control for one man to operate. Hoist furnished with or without overhead crane for wagon unloading. Designate to what level hoist is to raise, whether to sidewalk or to wagon.

Provide also an Ernst 4x4-ft. Safety-guarded Sidewalk Door with watertight frame of flush type, having concealed frame, door to have automatic door operation. Provide also one Ernst ash can truck, iron ladder and 12 swing bail ash cans.


Note Push Button Switch Control for Up Down & Stop
Sidewalk Guards
3" For clearance
Height at lowest point of sidewalk clearance
Pull this lever down to release lock when raising hoist arm above sidewalk
Control Switch
Control Handle
Motor
PLAN OF ELECTRICAL CONTROL MECHANISM
Magnetic Switch

Ernst Electrically Operated Vehicle Type Telescopic Ash Hoist, Door Combination and Operating Device

Ernst Hand Operated Vehicle Type Telescopic Ash Hoist and Door Combination with Door Opening, Closing and Locking Mechanism (Capacity, 300 lb.; Speed, 35 ft. per Minute)

This type of hoist possesses the same features of safety and convenience to the operator as the telescopic sidewalk hoist.

The principal feature is the addition of the overhead crane or extension arm which permits operator to hoist cans from cellar floor directly to height of wagon 9 ft. 6 in. or more above grade. Also, ash cans to be swung over wagon or truck and emptied, this being done by one man. Cans are lowered by gravity. Operator hoists cans 35 ft. per minute with but a 7-lb. pressure at the handle for every 100 lb. of load.

Location of Sidewalk Door—The areaway should be located near curb or alley so that wagon or truck can drive alongside to make it convenient to load cans directly into wagon. Size of door opening recommended is 4x4 ft. Door and operating mechanism is the same as described for standard telescopic ash hoist.

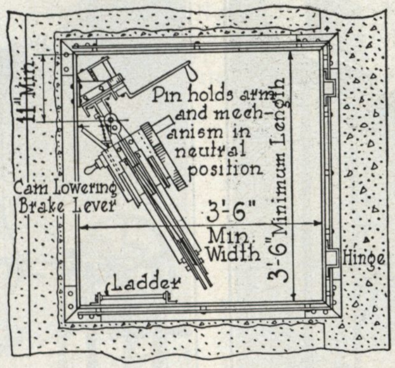
Overhead Crane—Consists of an extra heavy arm mounted on top of upper hoisting winch, swinging on ball bearings so that to unload, operator tilts the swing bail can directly on to wagon.

Gear Shifting Device—After swinging crane and can back over hatchway, operator throws gears out of mesh and lowers can by gravity, controlled by a hand brake. Hoisting handle does not revolve when gear shifting device is used, and gears are automatically thrown into mesh when gear shift is not used.

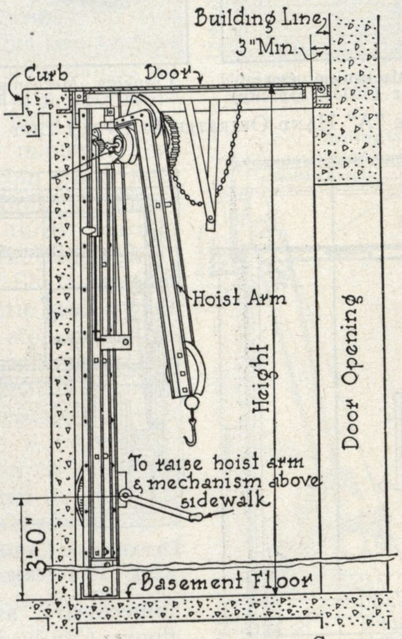
Sidewalk Door and Door Operating Device—Same as used for standard telescopic ash hoist, having same opening, locking and safety devices operated by a rack and pinion.

Specification — Provide and install, where indicated on plans, an Ernst Telescopic Vehicle Ash Hoist with gear shifting device complete with an Ernst Safety-guarded Sidewalk Door, with watertight flush type frame (size recommended, 4 ft. square) for complete one-man operation. Provide also an Ernst ash can truck (state number), Ernst swing bail ash cans, size 18x26 in. and an Ernst iron ladder from floor to sidewalk with connections to door frame. Safety spring gate to protect front side of door opening automatically, extra. Telescope raised by rack and pinion.

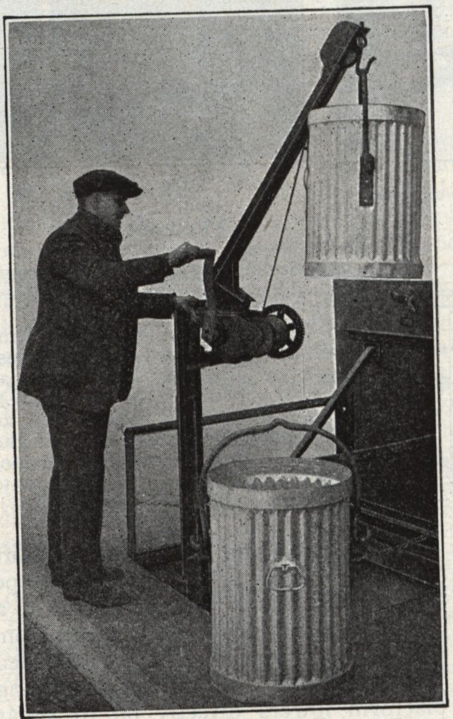
Note for Painting Specification: Ash hoist, with the exception of working parts, to be given one field coat of black graphite paint after erection.


11" Min.
Pin holds arm and mechanism in neutral position
Cam Lowering Brake Lever
3'-6" Min. Width
3'-6" Minimum Length
Hinge
Ladder

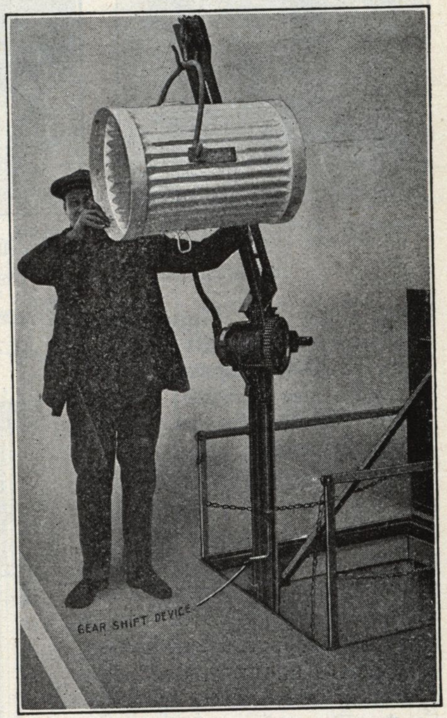
3/8-in. Scale Plan


Building Line
3" Min.
Curb
Door
Hoist Arm
Height
Door Opening
To raise hoist arm & mechanism above sidewalk
3'-0"
Basement Floor

Section Through Areaway Showing Hoisting Arm Lowered Below Door



Ernst Hand Operated Vehicle Type Hoist with Can Raised 9 Ft. Above Grade


GEAR SHIFT DEVICE

Ernst Hand Operated Vehicle Type Hoist with Overhead Crane Swung and with Can Tilted to Empty Directly Into Wagon

Crane swings on ball bearings

Continued on next page

Ernst Type "A" Electric Platform Lift (Capacity, 500 and 700 lb.; Speed, Approximately, 20 Ft. per Minute; One-man Operated)

Similar in construction to the hand operated lift described below but is operated by a 1½ hp. motor directly connected to hoisting stand. Requires little current. Platform made any size to 4x4 ft.

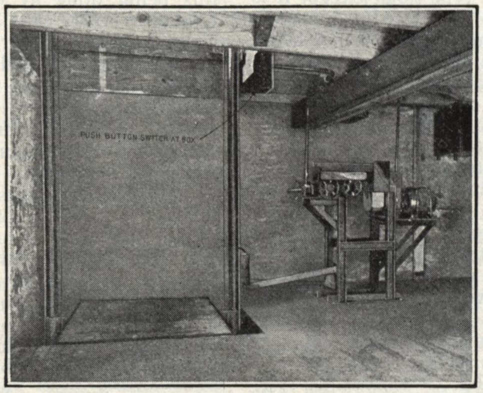
Push Button Control—With two push button switches, one in cellar and other located near sidewalk level, so that operator can operate lift from either floor level or go up and down with platform, as may be desired.

Automatic Upper and Lower Limit—Lift furnished with an automatic limit switch and magnetic brake which stops platform at cellar floor level or grade level automatically.

Motor worm gear driven; worm gear bathed in oil; shaft bearings bronze bushed; gears enclosed by guards.

To Specify—Furnish and install, where directed on plans, one Ernst Type "A" Electric Platform Lift, complete with necessary motor, limit switch and brake for automatic operation, with 2-3 button switches; also an Ernst double-leaf, flush type sidewalk door; also bow on platform to open doors.

Note: For details of door opening and pit sizes, see drawings shown below.



INSTALLATION OF ERNST TYPE "A" ELECTRICALLY OPERATED PLATFORM HOIST

Construction—Consists of a platform operated by a winch and running between 3-in. iron pipe guides. All materials are of the strongest and most durable obtainable. Uprights secured to plates bolted to door frame and floor of areaway. Platform constructed of 2-in. continuous angle, reinforced with stiffener plates at four corners and on which a heavy gauge galvanized iron sheet is riveted and heavily cross braced. Platform slides are nonbinding and have roller bearing riding on the pipe guides. Platform is raised by single ⅜-in. flexible steel cable. Winch has compound gears, machine cut. Pinion gear made of steel. Drum is grooved for cable and has safety ratchet made of steel. Operating wheel, 24 in. in diameter. Powerful hand brake (lined) permits lowering of platform by gravity. Safety ratchet automatically locks platform to any desired height.

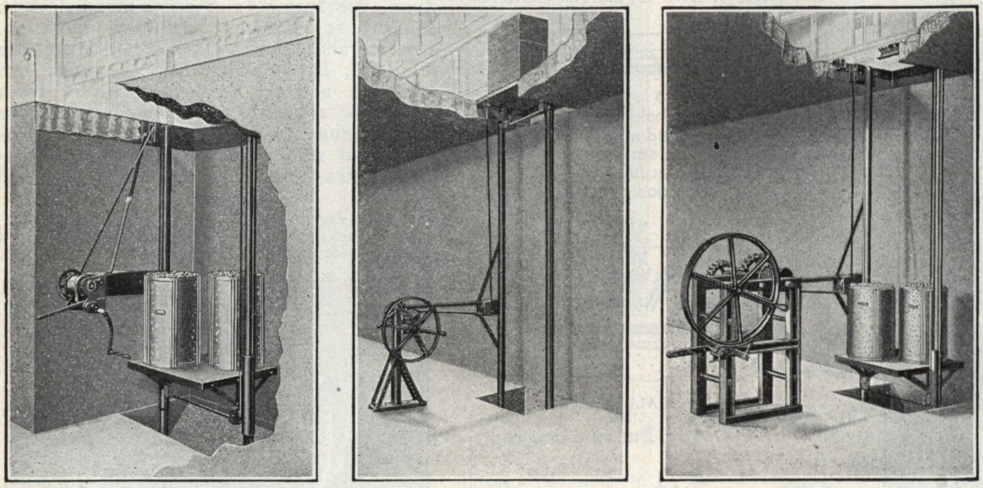
Cranking Mechanism—May be located as shown in illustrations. It can be attached to wall or extended in cellar, leaving full width open to operator. Winch bolted to floor. Width of winch, 14 in.

Pit—If desired, should be 15 in. deep and same size as door opening. Platform is 15 in. above floor without pit.

Platform and Door—For 500-lb. capacity, use platform 3x3 ft. with door opening 3 ft. 9 in. x 3 ft. 2 in., pit the same size and 15 in. deep. For 750-lb. capacity use platform up to 4x4 ft. with door opening 4 ft. 9 in. x 4 ft. 2 in. See clearances on plan.

Sidewalk Doors—Ernst double leaf sidewalk door furnished with bow or guard rail is recommended. Doors have our concealed type angle iron frame embedded in concrete. Furnished with inside locking device.

Specification—Provide and install, where indicated on plans, Ernst Type "A" Platform Lift (state capacity), platform to be (state size). State if to have pit. Also furnish an Ernst double leaf sidewalk door and frame of proper size to accommodate above size platform and bow to open sidewalk door automatically.

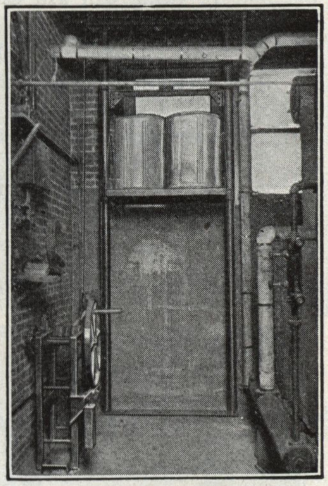


Cranking Mechanism on Wall of Areaway (500-lb. capacity)

Cranking Mechanism Operated from Cellar (500-lb. capacity)

Cranking Mechanism Operated from Cellar (750-lb. capacity)

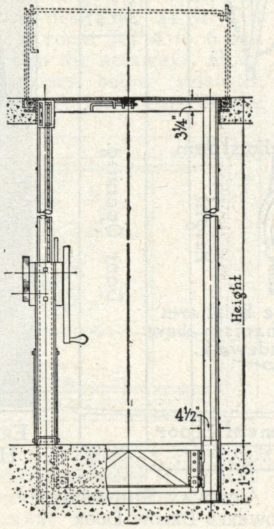
INSTALLATIONS OF ERNST TYPE "A" HAND OPERATED PLATFORM LIFT

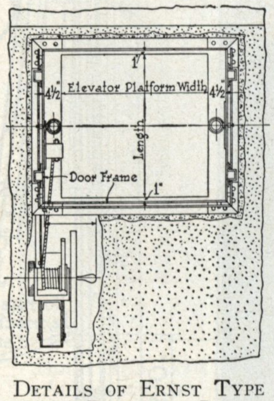


ERNST TYPE "B" HAND OR ELECTRICALLY OPERATED PLATFORM LIFT

Ernst Type "A" Hand Operated Platform Lift (Capacity, 500 lb., Speed, 18 to 20 Ft. per Minute; Capacity, 750 lb., Speed, 12 Ft. per Minute)

An inexpensive, strong, dependable, fast and easily operated platform lift designed for use in an areaway. Handles merchandise as well as ash cans. Designed expressly for use in stores, banks, apartment houses, etc., where an expensive, slow operating elevator is not desired. Two sizes: 500-lb. capacity, speed, 18 to 20 ft. per minute; 750-lb. capacity, speed, 12 ft. per minute.





DETAILS OF ERNST TYPE "A" PLATFORM LIFT

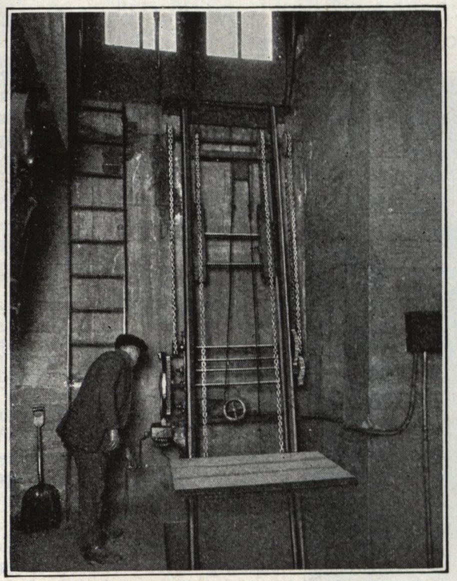
Ernst Type "B" Platform Lift

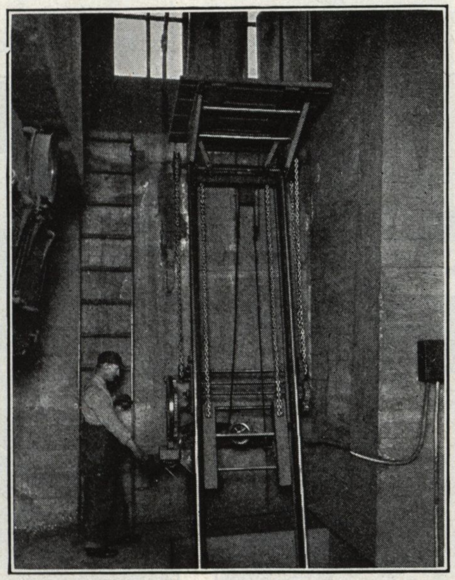
This lift is similar to Type "A" but is for use inside of a building. Uprights extend from cellar floor to ceiling, with added feature of pit in basement being unnecessary, as platform lowers directly on to cellar floor. Can be furnished for hand power as well as electric. Makes an excellent 4-can ash lift.

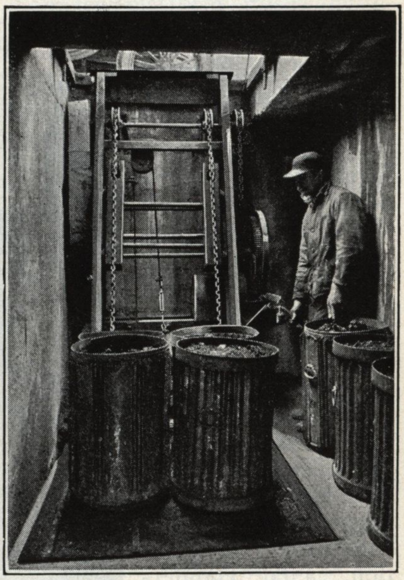
Continued on next page

Ernst Electric Self-raising Platform Lift (One-man Operated; Capacity 1000 lb.; Speed, 20 Ft. per Minute)

One of the finest, simplest and most economical motor driven platform lifts made. Requires but a 2 hp. motor which operates at a speed of 20 ft. per minute, and but one man to operate. Very popular in schools and used in many other mercantile buildings where a heavy elevator is not necessary. Convenient for raising or lowering boxes, barrels, etc., beside being used as an ash hoist. Accommodates 4 cans at one time. Very economical to operate as it takes but little current.


Ernst Electric Platform Lift Installed in School No. 8, Buffalo, N. Y.


Lift in School No. 8, Buffalo, N. Y., Showing Platform with 4 Cans Raised to Grade Level in Less Than a Minute (Entirely Automatic)


Lift Installed in Areaway with Pit for Platform and Room at Side for Operator

Motor and Limit Switch—The installation is very compact with all parts accessible as the motor and limit switch, magnetic brake, worm gear drive are mounted on a stand built in between the uprights. Platform is counterweighted and runs on roller bearings on two channels of uprights. It is suspended on two endless chain drives requiring no drums; eliminates danger of falling as either chain will hold platform, giving a double factor of safety. Lift capacity, 1000 lb. 2 hp. motor operates at speed of 20 ft. per minute. Two push buttons permit operation of lift from either floor level. Worm gear drive and magnetic brake on motor locks platform at any height. Two end thrust bearings of ball bearing type are provided on worm pinion shaft, with flexible coupling on motor shaft. Shaft bearings babbited, assuring long life. A magnetic wall switch with magnetic brake and limit switch, stop motor instantly when platform has reached limit of travel. Lift is simple to install, and practically foolproof, with nothing to get out of order. A most serviceable and economical installation.

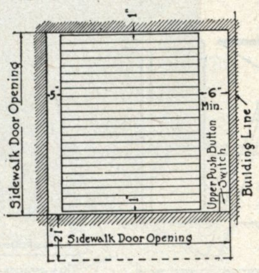
Construction—Lift is supported on two uprights of 7-in. channels which are self-supported so that only four bolts are required to bolt lift securely in place, making it very easy to install. Platform is made of oak, 2 in. thick, securely bolted to frame. The quadruple gears are machine cut and key-seated to steel shafts.

The powerful magnetic brake on motor operates automatically.

Lift may be arranged with a pit so that platform can be lowered level with floor as shown in drawing.

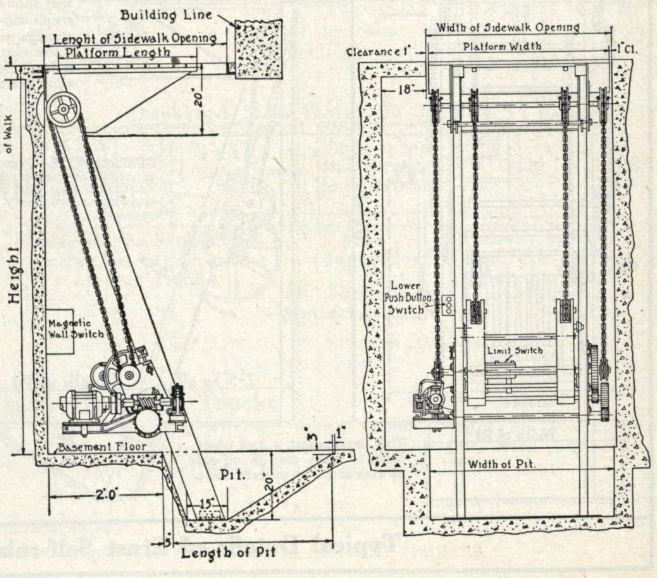
Lift may be used for rise of 26 ft. It can be used in connection with areaway or directly inside the building, as illustrated.

Specification—Provide, where shown on plans, an Ernst Electric Self-raising Platform Lift with automatic control and necessary 2 hp. motor, limit switch and brake, for raising 1000-lb. capacity at a rate of 20 ft. per minute and suitable for operation by one man; also an Ernst double-leaf sidewalk door.


Sidewalk Door Opening
5'
6" Min.
Upper Push Button Switch
Building Line
Sidewalk Door Opening

Plan, Section and Elevation of Ernst Electric Self-raising Platform Lift

Made for operation by electricity. One-man operated. Detail shows space requirements


Building Line
Lenght of Sidewalk Opening
Platform Length
20'
Thickness of Walk
Height
Magnetic Wall Switch
Basement Floor
Pit
20
2'0"
15"
5"
1"
Length of Pit
Width of Sidewalk Opening
Clearance 1"
Platform Width
1" Cl.
18"
Lower Push Button Switch
Limit Switch
Width of Pit

Continued on next page

Ernst Self-raising Hand Operated Platform Lift (Capacity, 1000 lb.; Speed, 10 to 12 Ft. per Minute)

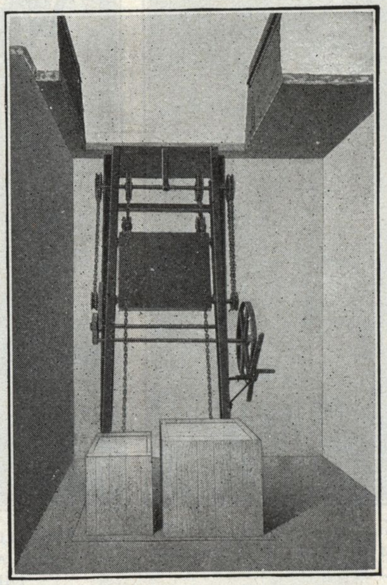
A platform lift of unusual merit. It has a counterbalanced platform to eliminate one-half the cranking and time ordinarily required for heavy duty work. Platform automatically raises to grade level when empty without cranking—an exclusive feature. Loads of 300 to 1000 lb. can be lowered to cellar by gravity, while platform raises to grade ready for use, controlled by operator.

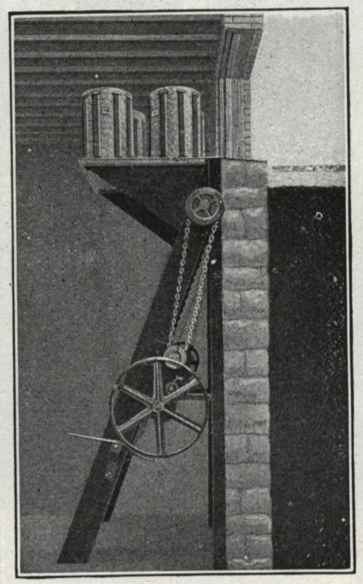
Operation—Lift is operated by endless chain drive (one each side of lift) fitted into pocket wheels. Winch is attached direct to uprights, with no working parts in pit. Winch can be provided either side of platform.

Platform—Runs on roller bearings running on channel flanges. With the elimination of friction, and counterbalanced platform, it operates extremely easy.

Pit—Height of platform is only 20 in. above floor but can be lowered flush by use of a pit, or a ramp can be used to run up to it.

Construction—Uprights made of two 7-in. channels attached by plates to door frame and cellar floor. Quadruple gearing furnished; gears all machine cut and key-seated to steel shafts. Platform made of oak, 2 in. thick, securely bolted to platform frame. The 24-in. hand wheel is furnished with powerful lined brake. Safety rachet locks platform to any desired height.


Lift Used in Areaway and Showing Platform Level with the Floor
Will raise automatically to grade level when platform is emptied


Lift Installed at Window Makes an Excellent Four-can Ash Lift Operated by one man

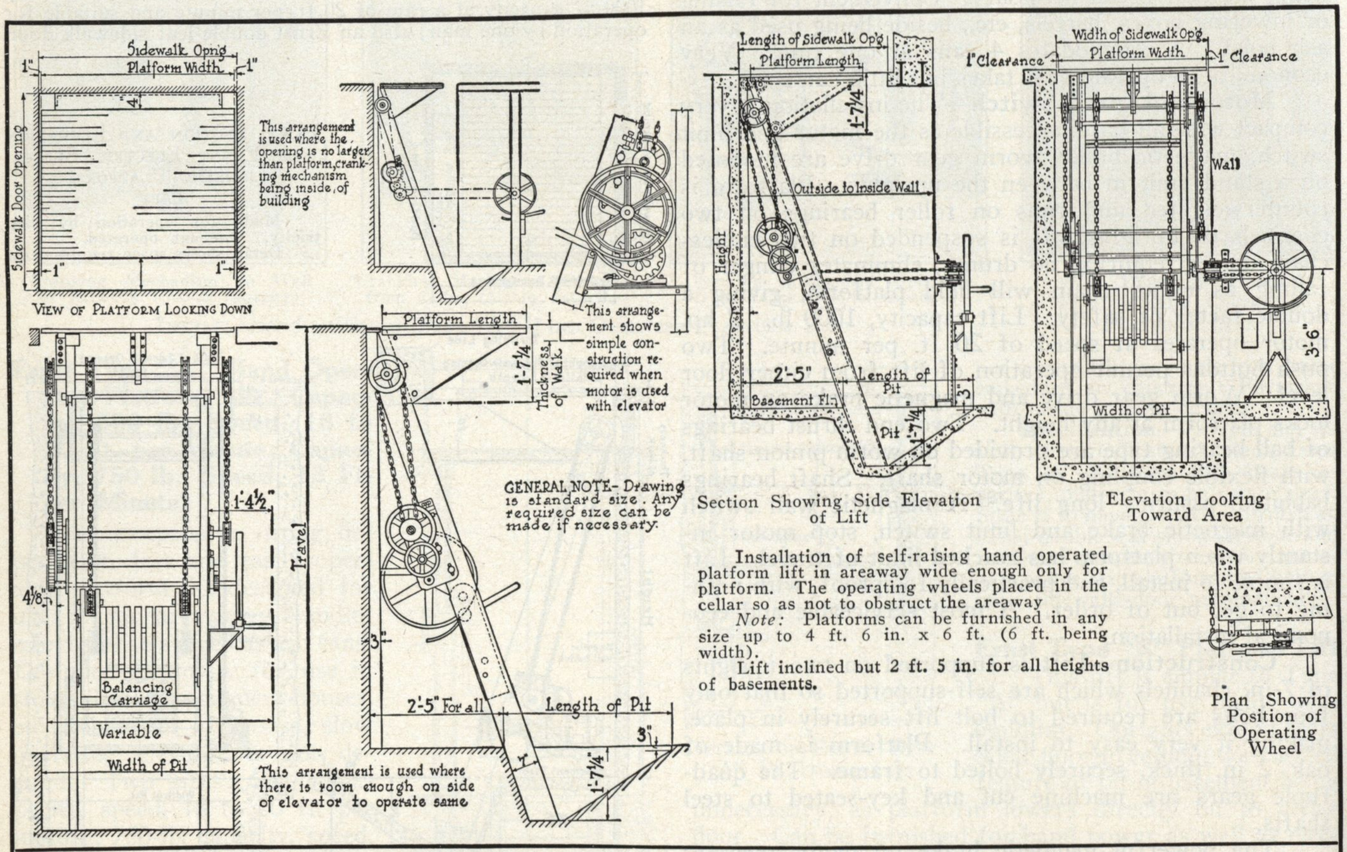
TYPICAL INSTALLATIONS OF ERNST SELF-RAISING PLATFORM LIFTS

Specification—Provide, where shown on plans, Ernst Self-raising Platform Lift of 1000-lb. capacity with counterbalanced platform. Provide areaway 2 ft. wider than size of sidewalk door used (for operating space). Platform shall be ...... ft. long by ...... ft. wide.

Note: Platform can be furnished up to 4 ft. 6 in. square. A 4-ft. square double leafed sidewalk door will accommodate a platform 3 ft. 10 in. wide by 3 ft. long.

Tilting Platform for Extra Large Boxes—A tilting device can be provided to allow extra large boxes to pass through opening.

Window Type Self-raising Lift—Where there is a basement window 3 ft. in height, lift can be placed inside a building without an areaway. Platform can be raised to height of window sill and ash cans can be taken directly through window opening.


Sidewalk Opn'g
Platform Width
1"
4"
Sidewalk Door Opening
VIEW OF PLATFORM LOOKING DOWN
This arrangement is used where the opening is no larger than platform, cranking mechanism being inside, of building
Platform Length
1'-7¼"
Thickness of Walk
This arrangement shows simple construction required when motor is used with elevator
GENERAL NOTE- Drawing is standard size. Any required size can be made if necessary.
1'-4½"
Travel
4⅛"
Balancing Carriage
Variable
Width of Pit
3"
2'-5" For all
Length of Pit
This arrangement is used where there is room enough on side of elevator to operate same
Length of Sidewalk Op'g
Outside to Inside Wall
Height
2'-5"
Length of Pit
Basement Fl.
Pit
1'-7¼"
Width of Sidewalk Op'g
1" Clearance
Wall
3'-6"

Section Showing Side Elevation of Lift

Elevation Looking Toward Area

Installation of self-raising hand operated platform lift in areaway wide enough only for platform. The operating wheels placed in the cellar so as not to obstruct the areaway

Note: Platforms can be furnished in any size up to 4 ft. 6 in. x 6 ft. (6 ft. being width).

Lift inclined but 2 ft. 5 in. for all heights of basements.

Plan Showing Position of Operating Wheel

Typical Details of Ernst Self-raising Hand Operated Platform Lift

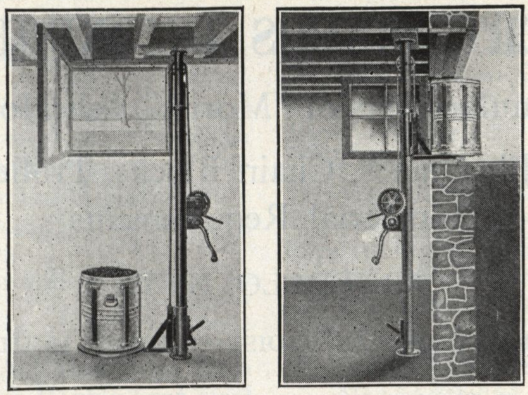
Continued on next page

Ernst Perfection Cellar Window Hand Operated Ash Lift (Capacity, 300 lb.; Speed, 25 Ft. per Minute)

Permits the use of a cellar window through which to take ashes, especially where building has no other access to grade. Furnished for any height basement. Size of window governs size of ash can. We recommend a window 30 in. wide and 30 in. high clear opening, permitting the use of ash cans of all standard makes.

Easy to Operate—The lift operates at a speed of 25 ft. per minute and can easily be operated by a woman or boy. The can is placed on a round platform and, by turning a crank, the platform is raised to window height, where platform is automatically stopped. Platform can then be swung through window and can removed. Empty can is lowered by gravity.

By use of a ladder, operator can perform the entire operation of hoisting full cans to grade, removing cans and lowering of empty cans to cellar.


Ash Can on Platform Ready to be Hoisted to the Window

Ash Can Raised to Window Height with the Platform Swung Through Window

Ernst Perfection Cellar Window Ash Lift in Operation

Platform lowers to within 1½ in. from floor and requires no pit.

Construction—Made entirely of metal. Consists of a 3-in. iron pipe upright securely anchored to floor and ceiling by flanges. On this rides a 21-in. diameter platform raised by a ⅜-in. flexible steel cable winding on a grooved steel drum by means of a powerfully geared cranking mechanism attached to upright.

A powerful brake on drum permits lowering of cans by gravity.

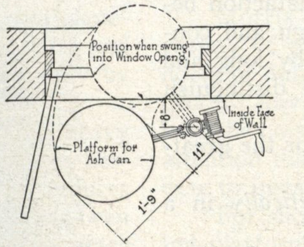
A handy ash can truck for wheeling ash cans from furnace to ash lift platform can be furnished, avoiding pulling of cans and resultant noise. Lengthens life of cans.

Specification—Provide, where located on plans, an Ernst Perfection Cellar Window Ash Lift to have capacity of 300 lb. and hoisting speed of 25 ft. per minute.

Exact height for lift to be taken by the contractor at the building.

Also provide Ernst Ash Can Truck and Iron Ladder.

Note: To order, give height from floor to ceiling.



Plan of Perfection Ash Lift

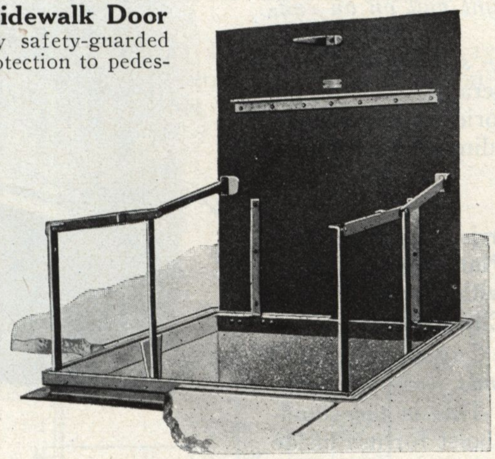
Ernst One-piece Safety-guarded Sidewalk Door

Our sidewalk door is automatically safety-guarded and counterbalanced to offer the best protection to pedestrians when door is open. The guards open and close automatically and are invisible when door is closed.

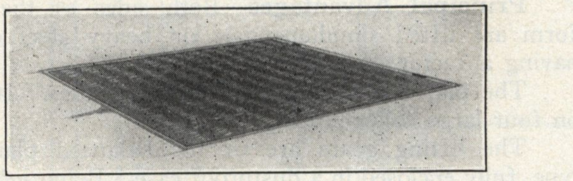
Constructed of a 3-in. high by 2-in. wide angle and one-piece checkered top (non-slip) steel plate ¼ in. thick, strongly reinforced by stiffener angles and hinges to withstand loads of 300 lb. per sq. ft. Hinges are concealed, but ¼ in. of the frame is visible. An inside lock is furnished. Heavy counterbalanced weights allow easy opening and closing of door. Has no middle seams to bend down and leak.

How to Specify—Furnish and install in concrete sidewalk, where shown on plans, an Ernst One-piece Flush Type Sidewalk Door, with concealed door frames embedded in concrete, complete with Automatic Safety Guards, of size indicated on plans.

Note: All doors hinged on side nearest to wall of building. Specify on which side door is to be hinged. Allow 3 in. for door frame at building side.


One-piece Safety-guarded Sidewalk Door Showing Complete Guard Rail and Concealed Frame

A rod encloses front side of door


Ernst One-piece Safety-guarded Sidewalk Door Closed

Note concealed frame, flush with walk and neat appearance of door closed. Rail guards invisible

Sizes—Made in all sizes. Stock sizes are as follows: 3 ft. square; 3 ft. x 3 ft. 6 in.; 3 ft. 6 in. x 4 ft.; 3 ft. 6 in. square; 4 ft. square; 4 ft. x 4 ft. 6 in.; 4 ft. x 5 ft. and 4 ft. 6 in. square.

Double Leaf Safety-guarded Sidewalk Doors

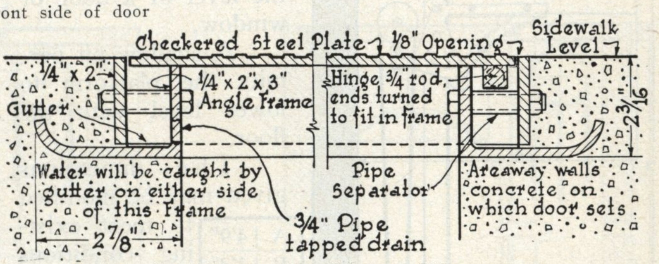
Where a platform lift will be required, we recommend the use of our double leaf door, which has the same flush frame, general construction and automatic safety guards as the one-piece door.

Also made for the same size openings as single doors.

Ernst Special Watertight Door Frame

Where required, we can furnish our special forged watertight door frame which catches surface water on the door plate as well as all water that may leak through the concrete around the door frame.

It is provided with gutters to drain water to cellar through a ¾-in. pipe connection.


Checkered Steel Plate
1/8" Opening
Sidewalk Level
1/4" x 2"
Gutter
1/4" x 2" x 3" Angle Frame
Hinge 3/4" rod, ends turned to fit in frame
2 3/16"
Water will be caught by gutter on either side of this Frame
Pipe Separator
Areaway walls concrete on which door sets
3/4" Pipe tapped drain
2 7/8"

3-in. Scale Detail of Special Watertight Door and Frame

Ernst Ash Can Trucks

Our strong, 2-wheeled hand truck, fitting all makes of standard ash cans, is recommended for use with our lifts. Saves labor; eliminates noise; lengthens life of cans.

Catalogue

A complete catalogue sent on request.

HERBERT MORRIS INCORPORATED

Manufacturers of "Morris" Ash Hoists

Also Overhead Cranes, Jib Cranes, Chain Blocks, Trolleys and Runways for All Industrial Requirements

BUFFALO, N. Y.

IN CANADA: THE HERBERT MORRIS CRANE AND HOIST COMPANY, LIMITED, NIAGARA FALLS, ONTARIO

Foreword

Morris ash hoists give the greatest satisfaction because they embody four principles of design and construction which have been proven correct by long and strenuous service. These four principles distinguish Morris ash hoists from all others:

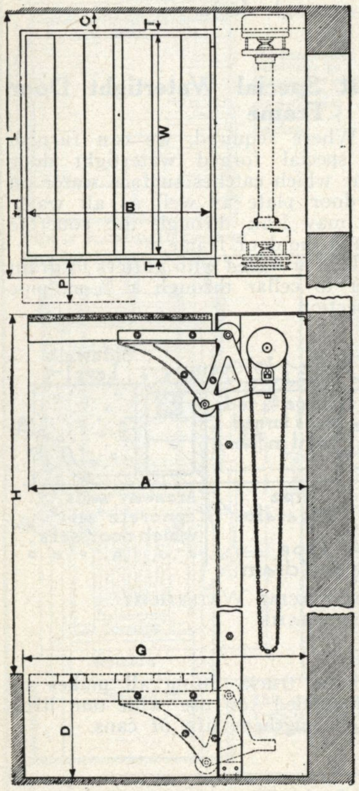
(1) *The load is lifted on steel chain,* for the greatest strength and flexibility.

(2) *The lifting effort is exerted vertically* in a straight line, not around a series of pulleys.

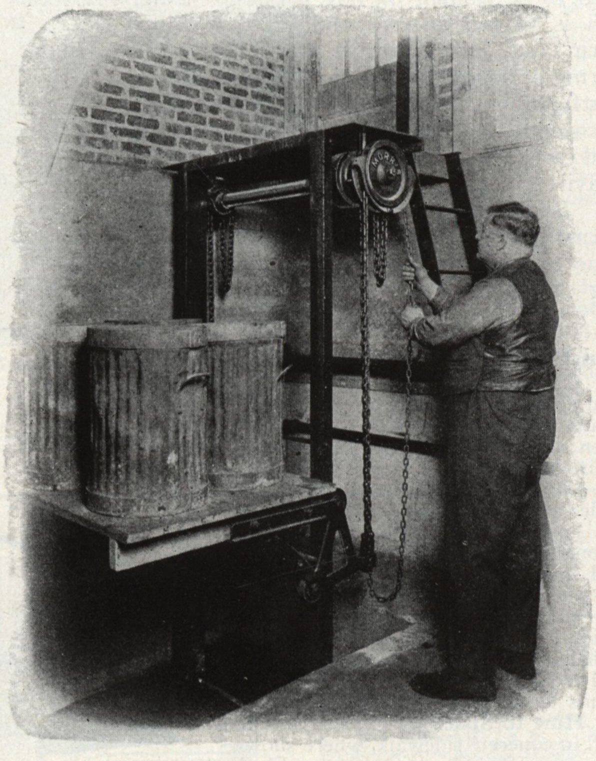
(3) The operating effort is reduced to the easiest possible motion, one which can be maintained the longest without tiring the operator—*a straight pull on an endless hand-chain.*

(4) *The load is automatically sustained* at any point, without dependence on the operator.

Morris ash hoists and accessories may be conveniently specified by using the headings which appear in **black face type.**



Basement Type



Basement Type

Morris Basement Type Platform Ash Hoist with Twin Lift Chain Block

Capacity, 1000 pounds.

This is the standard hoist for use inside the basement, raising four cans at a time to the level of a door or window.

A shallow pit permits the platform to lower level with the floor.

The dimensions given may be modified to meet existing conditions and either right-hand or lefthand operation supplied.

A	4'9"
B	3'2"
C	2½"
D	1'9"
G	4'10"
L	4'5"
P	1'6"
T	1"
W	3'10"

When space is limited note that the platform lowers level with and forms part of the floor, the guide angles projecting only 18 inches from the wall.

A light hand-chain pull raises the platform. The automatic brake sustains the load at any point. Lowering practically by gravity.

Principal Advantages—Both sides of the platform are lifted simultaneously on heavy steel chains having a factor of safety of 20.

The platform cannot bind on the guides. It *rolls* on four large roller-bearing wheels.

The lifting gears are of the balanced planetary type, fully enclosed in a dustproof case. Being mounted directly under the steel top plate and back of the platform, no floor space is used.

Installation is a very simple matter requiring not over half a day for two men. The mechanism is shipped almost completely assembled; four bolts hold it in place.

Continued on next page

Morris Pitless Type Platform Ash Hoist with Twin Lift Chain Block

This type of hoist occupies the minimum basement space.

The platform is placed *between* the guides and is supported by roller-bearing plate-steel brackets which permit it to lower within 2 inches from the floor. *No pit is required.* The hoist mechanism is placed above the door or window opening, a space of 10 inches being sufficient to keep the opening clear.

The hoist may be arranged for either right-hand or left-hand operation.

Morris Sidewalk Type Platform Ash Hoist with Twin Lift Chain Block and Morris Double Leaf Steel Doors

Under conditions which are particularly detrimental to wire rope and winch operated machines, the Morris hand operated, platform hoist with fully enclosed planetary gears, heavy steel load chains, direct line lift and roller bearing platform, gives service equalled only by the most expensive electric elevators.

The hoist frame is built integral with the heavy door frame. This feature of construction ensures perfect alignment between platform and doors, and reduces the work of installation. When the door frame has been placed in position all that remains to be done is (a) attach the twin lift chain block and the two guides, (b) plumb the guides and anchor them, (c) place the platform on the guides and connect the lifting chains.

The dimensions given are standard but can be modified to suit special conditions. Right-hand operation is regularly supplied unless left-hand is specified.

A pit is required the full size of the sidewalk opening and 1 foot 9 inches deep to permit the platform to lower level with the basement floor.

Condensation Gutter and Drain—

Incorporated with the door frame when watertight doors are required.

Automatic Door Opening and Closing Device—

The platform may be fitted with a steel bow which *automatically unlocks and opens* the doors as the platform rises, and *automatically closes and locks* them as the platform is lowered.

The doors may be arranged to open either parallel with or at right angles to the sidewalk.

Spring Guard Safety Gates—

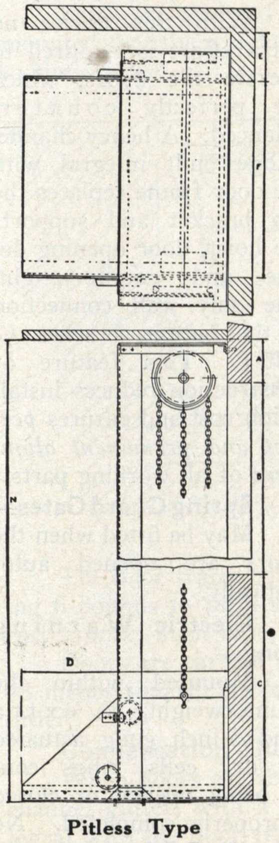
May be fitted at either or both open ends when the doors are operated automatically. They are arranged to open outward only, on strong spring hinges.

Other Applications—

Morris Platform Hoists are in use for a great variety of purposes. They may be installed either indoors or out, the enclosed gears being perfectly weatherproof. Any wall forms a suitable support and four bolts hold the hoist in place. The mechanism requires no more attention than an ordinary chain block and is almost as easy to install.

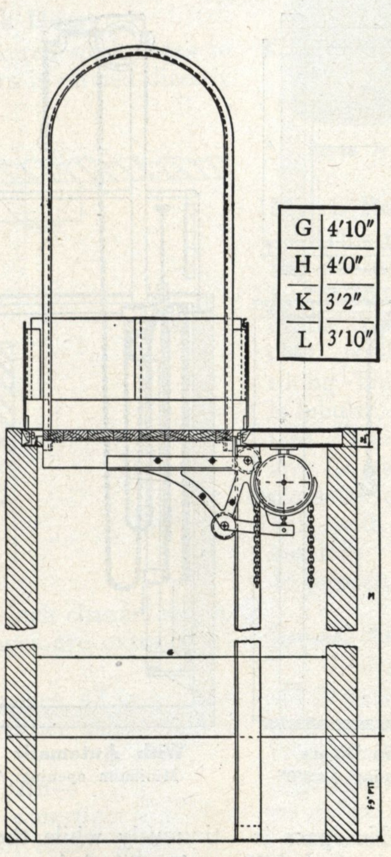
For such purposes as raising floor trucks to a loading platform, raising packages to a balcony, or outside the building, for lifting loads to the second floor level, Morris Platform Hoists are simple, economical and "fool-proof."

We are always ready to prepare layouts showing the application of any Morris hoist to special conditions.



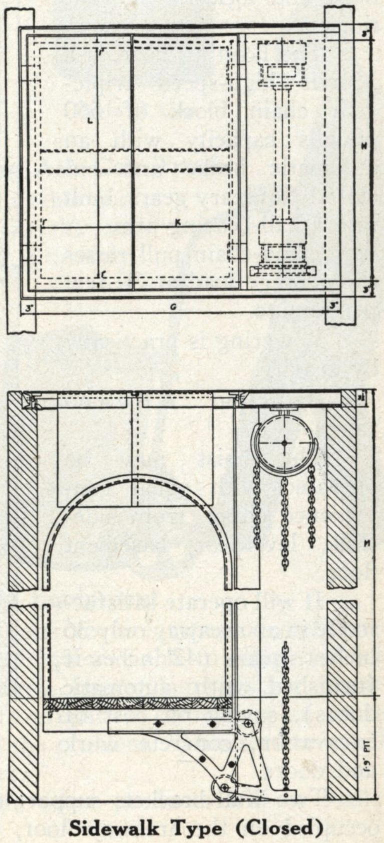
Pitless Type

A=10″ D=3′7″ E=6″



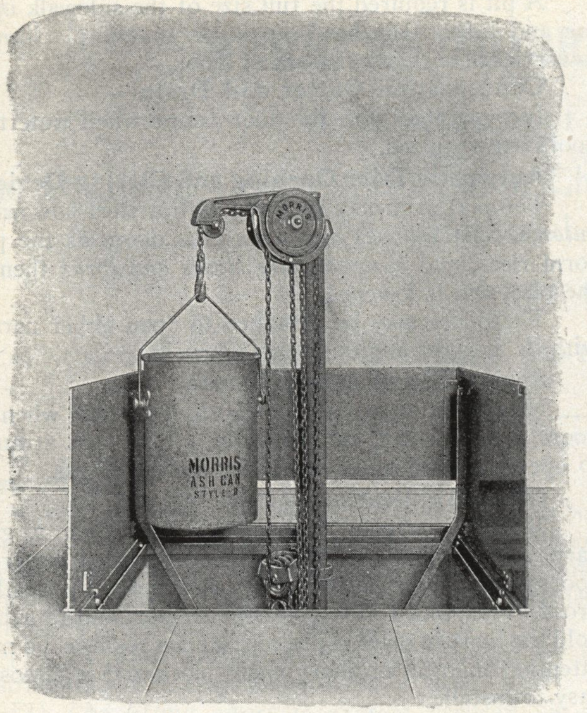
Sidewalk Type (Open)

G	4′10″
H	4′0″
K	3′2″
L	3′10″

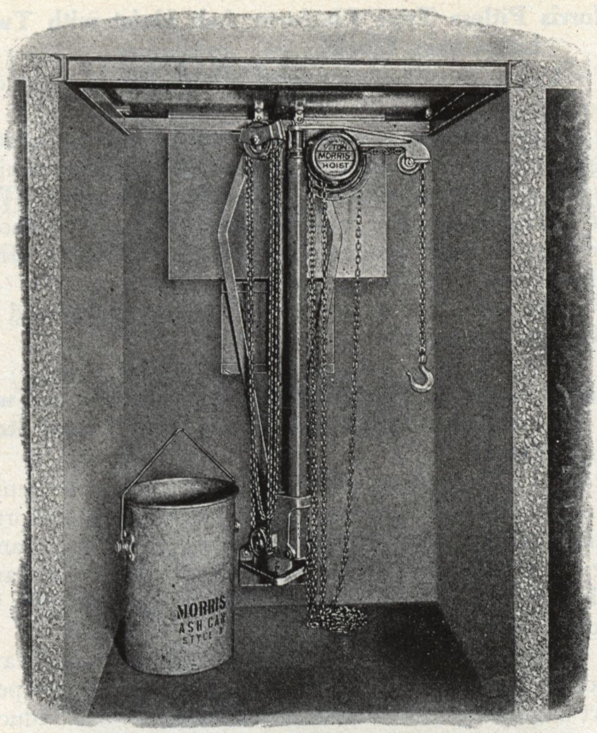


Sidewalk Type (Closed)

Continued on next page



With Automatic Doors (Open)



With Automatic Doors (Closed)

Morris Telescopic Ash Hoist with High Speed Chain Block, to Lift Cans to Sidewalk Level (Alternative: To Lift Cans to Wagon Height)

This hoist is simple, strong and easy to operate. A light hand-chain pull elevates the telescoping mast and locks it in position.

The hoisting head is a Morris high-speed triple-gear chain block of 560 pounds capacity with an automatic brake and enclosed planetary gears, built into a ball-bearing arm. A light hand-chain pull raises the average load at 30 feet per minute.

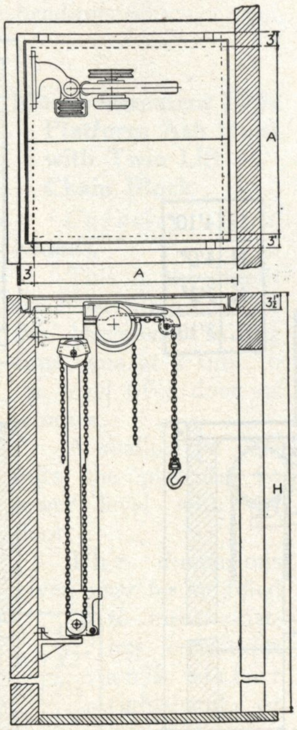
Lowering is practically by gravity.

Principal Advantages—

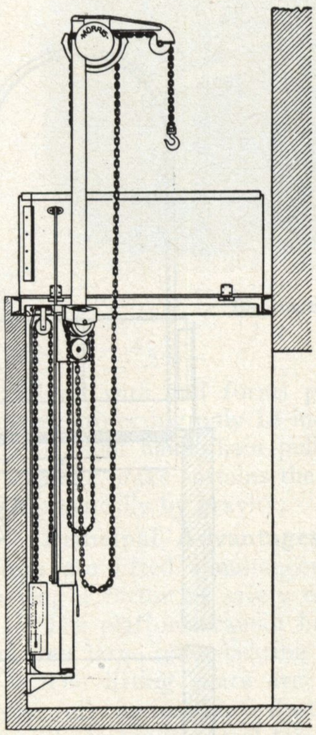
The hoist may be operated with equal convenience either from sidewalk level or basement floor.

It will operate satisfactorily in an areaway only 36 inches square (42 inches if furnished with automatic doors), saving on cost of excavation, concrete work and doors.

Two wall brackets support the hoist. No space is occupied on the areaway floor, which is left clear for the operator.



With Plain Doors
Minimum opening A=3′0″



With Automatic Doors
Minimum opening A=3′6″

Morris Double-leaf Steel Sidewalk Doors— (See details of construction on next page.)

Condensation Gutter and Drain— Built into the door frame when watertight doors are required.

Automatic Door Opening and Closing Device—

With this device no extra effort is required to operate the doors, which are perfectly counterbalanced. A heavy channel bridge built integral with the door frame replaces the top bracket and supports the hoist, door opening device and counterweight. The only wall connection is the bottom bracket (2 bolts). This feature of construction reduces installation cost and ensures *perfect and permanent alignment* of all working parts.

Spring Guard Gates— May be fitted when the doors are opened automatically.

Electric Warning Gong—

Mounted within the counterweight, an extra loud 5-inch gong actuated by dry cells, rings continuously while the doors are being opened or closed and until their movement is properly completed. No wiring—no extra time required to install.

Continued on next page

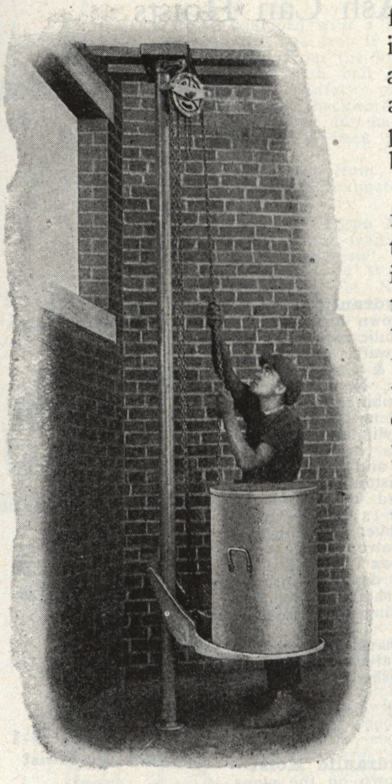
Morris Window Ash Hoist with Chain Block

This is the simplest Morris ash hoist, yet it has all those features which distinguish our other models for safety and ease of operation. The platform has roller bearings. It is lifted on a strong steel chain and sustained at any point by an automatic brake.

The mast turns freely on self-aligning top and bottom bearings. A touch swings the platform out through the window, which may be flush with the ceiling and only high enough to pass an ash can.

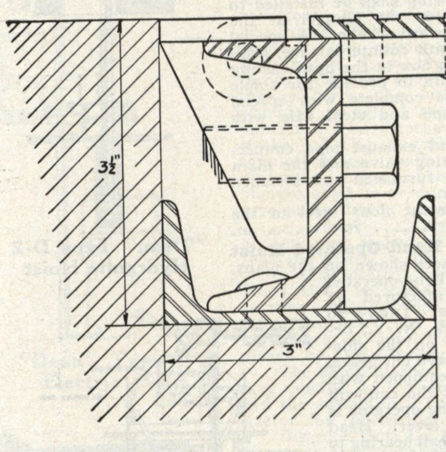
The capacity is 280 pounds and the lifting speed 30 feet per minute.

The chain block is a standard Morris high speed hoist. It can be readily unhooked from the mast and used for miscellaneous lifting purposes.


Window Type

Morris Double-Leaf Steel Sidewalk Doors

These are made of heavy checkered steel plates so mounted that the weight on the doors is carried directly to the frame.



The door frame consists of a 3-inch channel weighing 6 pounds to the foot. The hinges are extra-heavy cast bronze, flush type, removable.

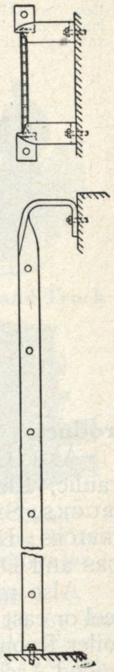
Doors are carried in stock 36 inches, 42 inches and 48 inches square, inside measure. Other sizes made to order.

Condensation Gutter and Drain—

When doors are required to be watertight a welded channel gutter, with a ¾-inch drain elbow is built integral with the door frame.

Morris Steel Ladder with Safety Non-slip Treads

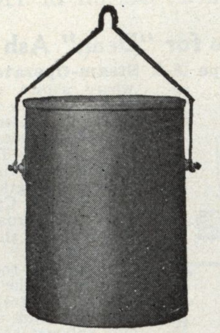
Much of the operator's time is saved by providing a safe and convenient means of access between basement and sidewalk. The rungs are especially formed to prevent slipping.



Morris Seamless Ash Cans Drawn from No. 12 Gage Steel, Style A with the Morris Ash Can Bail (Alternative: Style B with Attached Bail)

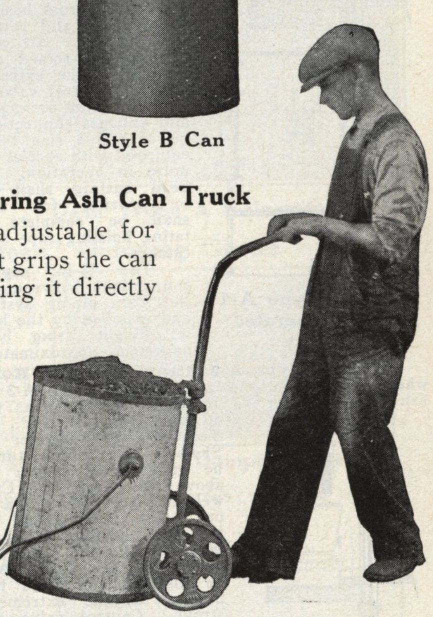
These cans are drawn from a single piece of steel. The bottoms retain the full thickness of the plate, the sides are reduced to not less than No. 16 gage. There are no rivets, no seams, no sharp corners. Handles or trunnions are cast steel, brazed on. These cans will outlast dozens of the riveted kind and never look dilapidated. Size inside, 16x24 inches. Weight, 45 pounds. *Style A:* With side handles. *Style B:* with bail which stays put. (When Style A cans are used, a *Morris Ash Can Bail* is required, as illustrated.)

Style A Can


Style B Can

Morris Roller Bearing Ash Can Truck

This truck is adjustable for any size ash can. It grips the can by the top rim, lifting it directly off the floor, without preliminary tilting. The frame is tubular, galvanized. The wheels are 10 inches in diameter and fitted with roller bearings. Weight 35 pounds.



Special Ash Handling Equipment

Where the conditions require types of equipment not illustrated, we are frequently able to offer modifications of standard Morris hoists, runways, or cranes. We are always glad to prepare a complete plan on receipt of particulars of the problem. This service entails no obligation whatever.

Catalogues of our other products will be mailed to anyone interested.

WASHBURN & GRANGER, INC.

Manufacturers of Grate Bars, Incinerators and Ash Can Hoists

50 Church Street

NEW YORK, N. Y.

WORKS: MYERSTOWN, PA.

Products

Ash Can Hoists: Telescopic, Air, Steam, Hydraulic, Electric or Hand Power; Ash Cans; Hand Trucks; Sidewalk Safety Doors and Door Opening Devices; Dumping and Shaking Grates; Incinerators and Destructors.

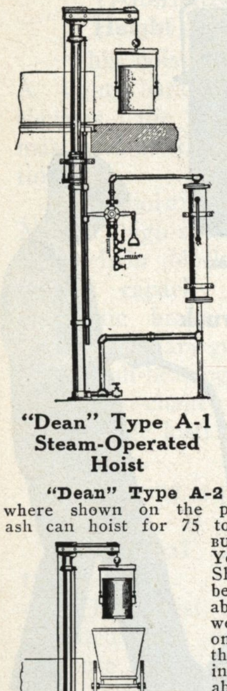
Also manufacturers of Boiler Castings and Fronts, steel or cast iron; Fire Brick Linings for boiler furnaces; Boiler Room Floor Plates; Ash Hopper Gates; Flat Suspended Arches; Blast Gates; Manhole, Trench and Sump Pit Covers, Frames and Plates; Ash Pit or Cleanout Doors; Metal Ladders; Wood Patterns; Cast Iron Industrial Track; Cut-off or Hopper Valves.

Specifications for "Dean" Ash Can Hoists

"Dean" Type A-1 Steam-Operated Hoist—Furnish and install where shown on the plans, one model A-1 "Dean" steam-operated ash can hoist, for 75 to 125-lb. pressure, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be of 5-in. Shelby steel tubing, turned and polished, and be of sufficient length to raise the can to the sidewalk level. Cylinder shall be of lap-welded pipe. The cross head shall be mounted on a ball bearing and rotate independently of the steel piston. An automatic stop shall be installed to retard the speed and stop the plunger at the extreme limit of the upward stroke. Control valve shall be simple in construction and arranged for suitable pressure and exhaust connections. The reservoir shall be of ample size for the lift required, and equipped with special port castings to eliminate noise in operation. The stuffing box in the head casting shall be of generous depth to provide for ample packing. Hoist shall be complete with special, non-rotating hoisting rope and steel bale with safety catches.

The ½-in. supply and exhaust pipe connections between the operating valve and the main piping system are to be furnished and installed by the heating contractor.

Height from basement floor level to pavement approximately.........ft.........in.

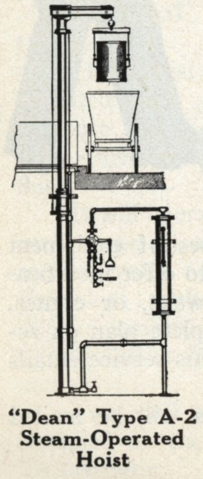


"Dean" Type A-1 Steam-Operated Hoist

"Dean" Type A-2 Steam-Operated Hoist—Furnish and install, where shown on the plans, one model A-2 "Dean" steam-operated ash can hoist for 75 to 125-lb. pressure, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be 5-in. diameter Shelby steel tubing turned and polished, and be of sufficient length to raise the can 6 ft. above the pavement. Cylinder shall be of lap-welded pipe. The cross head shall be mounted on a ball bearing and rotate independently of the steel piston, from the position of hoisting through the area opening to a position above the ash cart. An automatic stop shall be installed to retard the speed and stop the plunger at the extreme limit of the upward stroke. Control valve shall be simple in construction and arranged for suitable pressure and exhaust connections. The reservoir shall be of ample size for the lift required and equipped with special port castings to eliminate noise in operation. The stuffing box in the head casting shall be of generous depth to provide for ample packing. Hoist shall be complete with special, non-rotating hoisting rope and steel bale with safety catches.

The ½-in. supply and exhaust pipe connections between the operating valve and the main piping system are to be furnished and installed by the heating contractor.

Height from basement floor level to pavement approximately .... ft. .... in.

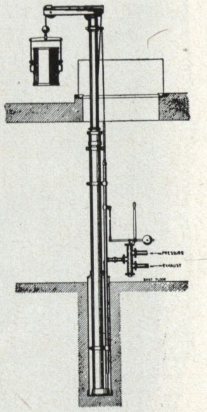


"Dean" Type A-2 Steam-Operated Hoist

"Dean" Type D-1 Hydraulic Hoist—Furnish and install where shown on the plans, one model D-1 "Dean" hydraulic ash can hoist, to operate on 75 to 125-lb. water pressure, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be 5-in. Shelby steel tubing, turned and polished and to be sufficient length to raise the can to the sidewalk level. Cylinder shall be of lap-welded pipe. The cross head shall be mounted on ball bearings and rotate independently of the steel piston. An automatic stop shall be installed to retard the speed and stop the plunger at the extreme limit of the upward stroke. Furnish a special 3-way operating valve with counterbalance. The stuffing box in the head casting shall be of generous depth to provide for ample packing. Hoist shall be complete with special non-rotating hoisting rope and steel bale with safety catches.

The 2-in. supply and exhaust pipe connections between the operating valve and the main piping system are to be furnished and installed by the heating contractor.

Distance from basement floor level to pavement approximately .... ft. .... in.

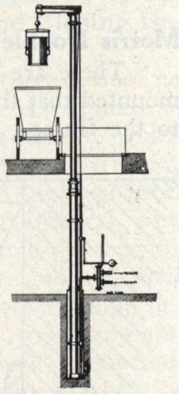


"Dean" Type D-1 Hydraulic Hoist

"Dean" Type D-2 Hydraulic Hoist—Furnish and install where shown on the plans, one model D-2 "Dean" hydraulic ash can hoist, for 75 to 125-lb. water pressure, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be 5-in. Shelby steel tubing, turned and polished and shall be of sufficient length to raise the can 6 ft. above the pavement. Cylinder shall be of lap-welded pipe. The cross head shall be mounted on ball bearings and rotate independently of the steel piston, from the position of hoisting through the area opening to a position above the ash cart. An automatic stop shall be installed to retard the speed and stop the plunger at the extreme limit of the upward stroke. A special 3-way operating valve, with counterbalance, shall be installed. The stuffing box in the head casting shall be of generous depth to provide for ample packing. Hoist shall be complete with special non-rotating hoisting rope and steel bale with safety catches.

The 2-in. supply and exhaust pipe connections between the operating valve and the main piping system are to be furnished and installed by the heating contractor.

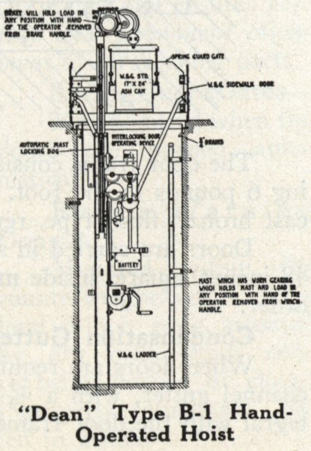
Distance from basement floor level to the pavement approximately .... ft. .... in.



"Dean" Type D-2 Hydraulic Hoist

"Dean" Type B-1 Hand-Operated Hoist—Furnish and install where shown on the plans, one "Dean" model B-1 hand-operated ash can hoist, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y., designed to place the can on the sidewalk only. Hoist shall have cut gears, bronze bushings and be equipped with a brake arranged so that the can will not drop if the hand of the operator is removed from the brake lever. Head shall be provided with a ball bearing to facilitate easy turning. Safety pawls shall be furnished to prevent backward rotation. Winch for raising the mast shall be a worm actuated self-locking device, and be capable of holding the mast and also the load in any position on the up or down stroke with the hand of the operator removed from the winch handle.

Distance from basement floor level to pavement approximately .... ft. ...... in.


BRAKE WILL HOLD LOAD IN ANY POSITION WITH HAND OF THE OPERATOR REMOVED FROM BRAKE HANDLE
SPRING GUARD GATE
W.&G. STD. 17" X 24" ASH CAN
W.&G. SIDEWALK DOOR
INTERLOCKING DOOR OPERATING DEVICE
¾" DRAINS
AUTOMATIC MAST LOCKING DOG
BELL
BATTERY
MAST WINCH HAS WORM GEARING WHICH HOLDS MAST AND LOAD IN ANY POSITION WITH HAND OF THE OPERATOR REMOVED FROM WINCH HANDLE
W.&G. LADDER

"Dean" Type B-1 Hand-Operated Hoist

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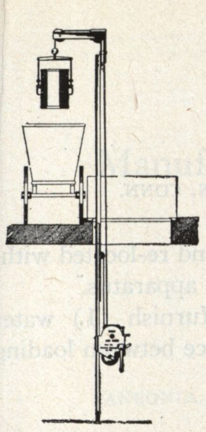
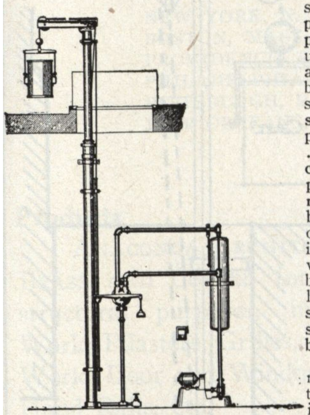
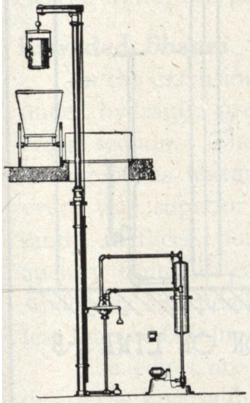


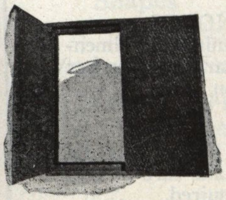
"Dean" Type B-2 Hand-Operated Hoist



"Dean" Type F-1 Electric Hoist



"Dean" Type F-2 Electric Hoist



"Dean" Sidewalk Doors

"Dean" Type B-2 Hand-Operated Hoist—Furnish and install where shown on the plans, one model B-2 "Dean" hand-operated ash can hoist as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Hoist shall be capable of raising the can 5 ft. above the pavement so that the contents may be dumped directly into a wagon. Hoist shall have cut gears, bronze bushings, and be equipped with a brake arranged so that the can will not drop if the hand of the operator is removed from the brake lever. Head shall be provided with ball bearings to facilitate easy turning. Safety pawls shall be furnished to prevent backward rotation, and a locking device to automatically lock the mast when it has been raised to its proper position.

Distance from basement floor level to pavement approximately .... ft. .... in.

"Dean" Type F-1 Electric Hoist—Furnish and install where shown on the plans, one Model F-1 "Dean" electric ash can hoist, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be 5-in. diameter Shelby steel tubing, turned and polished and of sufficient length to raise the can to the sidewalk level. Cylinder shall be of lap-welded pipe. The cross head shall be mounted on ball bearings and rotate independently of the steel piston. An automatic stop shall be provided to retard the speed and stop the plunger at the extreme limit of the upward stroke. A by-pass and operating valve with counterbalance shall be installed. The necessary pressure required to raise the plunger shall be produced by a positive pressure pump driven by a 2 hp. .... current .... phase .... cycle .... volt motor of approved make. The pump, motor and reducing gears to be mounted on one bed plate and to be located as shown on plans. A reservoir of ample capacity shall be furnished and installed on wall where shown on plans. Hoist shall be complete with special non-rotating hoisting rope and steel bale with safety catches. An enclosed safety starting switch of approved make shall be furnished.

The above starting switch and the necessary conduit and wiring between the motor and the switch shall be installed by the contractor for the wiring.

Distance from basement floor line to pavement approximately..........ft. ....in.

"Dean" Type F-2 Electric Hoist—Furnish and install where shown on the plans, one Model F-2 "Dean" electric ash can hoist, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Plunger shall be 5-in. diameter Shelby steel tubing turned and polished, and of sufficient length to raise the can 6 ft. above the pavement. Cylinder shall be lap-welded pipe. The cross head shall be mounted on ball bearings and rotate independently of the steel piston, from the position of hoisting through the area opening to a position above the ash cart. An automatic stop shall be provided to retard the speed and stop the plunger at the extreme limit of the upward stroke. A by-pass and operating valve with counterbalance shall be installed. The necessary pressure required to raise the plunger shall be produced by a positive pressure pump driven by a 2 hp. ....current ....phase.......cycle.......volt motor of approved make. The pump, motor and reducing gears to be mounted on one bed plate and located where shown on plans. Hoist shall be complete with special non-rotating hoisting rope and steel bale with safety catches. An enclosed safety starting switch of approved make shall be furnished by this contractor.

The above starting switch and the necessary conduit and wiring between the motor and the switch shall be installed by the contractor for the wiring.

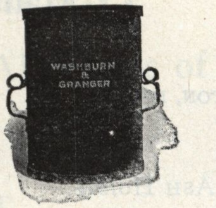
Distance from the basement floor level to pavement approximately .... ft. .... in.

Specification for Sundry "Dean" Equipment for Ash Hoists—Furnish the following "Dean" equipment: One steel, watertight sidewalk frame and doors, to have opening of 4 ft. x 3 ft. 8½ in.; doors shall be ¼-in. diamond top steel plates, brass hinges, set flush, and provided with mechanism so that they may be opened and closed from the boiler room floor level; frame shall be tapped for ¾-in. drain connection. Frame to be set by the contractor for the pavement.

Specification for "Dean" Ash Cans—Furnish 12 "Dean" ash cans, 17 in. in diameter and 24 in. high, to be made of No. 16 gauge steel with reinforced bottoms. Provide wrought steel handles with eye for connection to hoisting bale.

Specification for "Dean" Hand Truck—Furnish one "Dean" ash can truck, of tubular construction, suitable for the above size cans.

Specification for "Dean" Steel Ladder—Furnish and install in the hatchway one steel ladder, side strips ⅜x2 in., ¾-in. diam. rungs on 12-in. centers, to be 14 in. wide and ....ft. long.



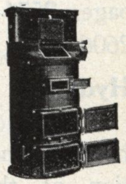
"Dean" Ash Can

"Dean" Hand Truck

Specification for Type E "Dean" Incinerator

Furnish and install where shown on the plans, one type E "Dean" incinerator, 36-in. diam., 6 ft. 4 in. high, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Capacity 75 lb. of garbage per hour. Incinerator shall be lined with 4-in. fire brick, insulated with Cil-O-Cel insulation powder and have a drying arch of fire brick, also a shaking grate complete with operating handle.

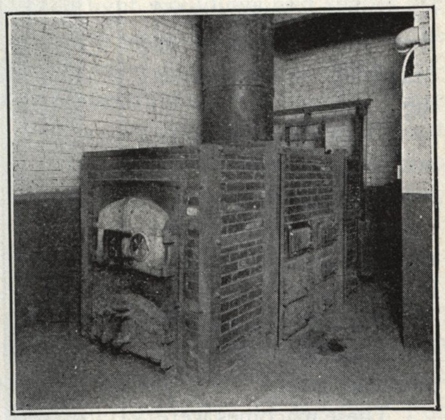
Furnish and install an 8-in. diameter flue connection between the incinerator and the boiler flue. Incinerator flue to be of ⅛-in. steel sheets. Incinerator to have 1 coat of shop paint prior to shipment and 1 coat after erection.



"Dean" Type E Incinerator

Specification for "Dean" Type A Incinerator

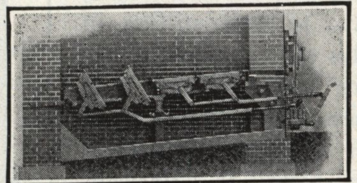
Furnish and build on foundation to be installed by the owner, one type A "Dean" incinerator as built by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Width, 6 ft. 1 in.; height, 6 ft.; length, 10 ft. Incinerator to have structural steel reinforcement consisting of angle irons on the corners and four horizontal angles on all four sides of the setting. Buckstays to be 4-in. channels placed back to back, and held in position at the top with 1-in. diameter tie rods. Charging chute 18 in. in diameter, No. 8 gauge. Incinerator to be complete with grates, drying arches, fire brick, damper complete with suspension frame and counterweight. Capacity 200 lb. an hour.



"Dean" Type A Incinerator

Specification for "Dean" Dumping Grates

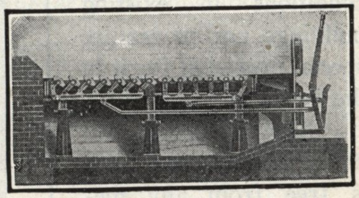
Furnish and install under each boiler......square feet of "Dean" dumping grates, for ......anthracite coal, as manufactured by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Bars shall tip to an angle of 65° and be supported at both ends by a rectangular frame braced in the middle. Bars shall have overlapping ends to prevent loss of fuel, and shall be complete with rods, levers, links and malleable iron studs and handles, slotted steel pins with flat riveted keys.



"Dean" Dumping Grate

Specification for "Dean" Shaking Grates

Furnish and install under each boiler, a full set of "Dean" shaking grates with......square feet, as manufacturd by Washburn & Granger, Inc., 50 Church Street, New York, N. Y. Air space shall be proportioned for the use of......coal. Entire grate shall rest on adjustable shoes on the ash pit floor, permitting grate to be pitched to the rear if desired. Bars shall be on 8-in. centers, have self-locking journals and shall be arranged so that the front half can be shaken independently of the rear section.



"Dean" Shaking Grate

F. S. PAYNE CO.

Manufacturers of Hydraulic Ash Hoists

CAMBRIDGE, MASS.

BRANCH OFFICES

BOSTON, MASS. LOWELL, MASS. NEW HAVEN, CONN.

PAYNE

TRADE-MARK

Product

HYDRAULIC ASH HOISTS.

For Passenger and Freight Elevators, see pages 2574-2575; for Dumbwaiters, see pages 2606-2607.

Hydraulic Ash Hoist

Payne hydraulic ash hoist is the ideal solution of the ash hoist problem where permanence, economy of operation and maintenance are considered.

After years of actual operation in varied uses, it has been conclusively demonstrated that this equipment is practically self-maintaining.

It is the most economically operated hoist ever designed, as the water consumption is invariably less than 2 cu. ft. a trip.

Skilled attention is not essential to satisfactory operation.

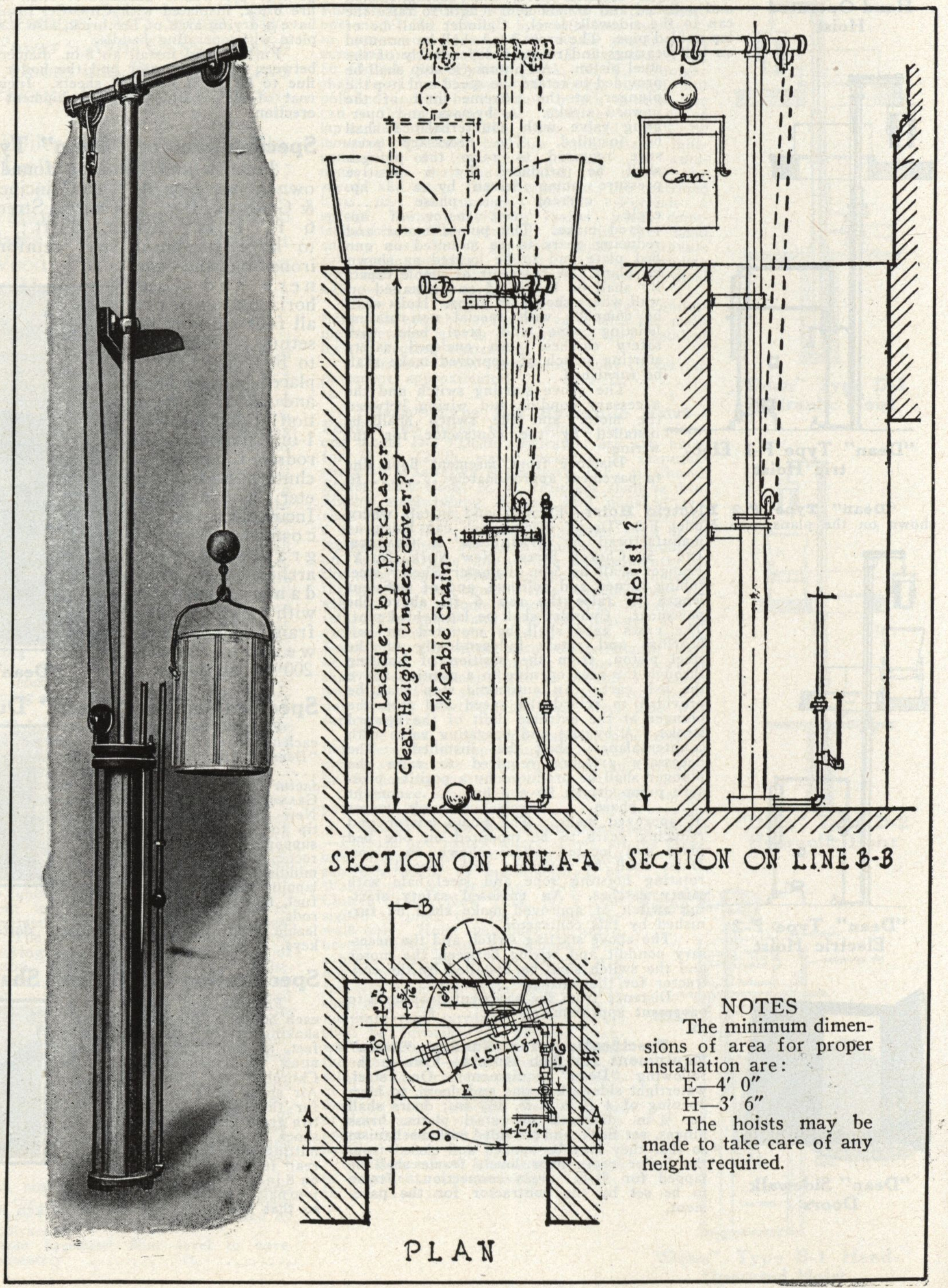
These machines were originally designed for use in schoolhouses and, due to their success in this service, are now being used wherever it is necessary to raise ashes or other materials from basement to sidewalk level.

The machine is designed not to disturb conditions in existing buildings nor to require special provision for it in the building.

Any mechanic can install this machine, as it is free from any mechanical complications and detailed instructions are furnished for the erection of the apparatus.

The hoist can be moved and re-located without sacrificing any part of the apparatus.

When ordering, please furnish (1) water pressure available; (2) distance between loading and unloading levels.



NOTES

The minimum dimensions of area for proper installation are:
E—4' 0"
H—3' 6"

The hoists may be made to take care of any height required.

DETAILS OF PAYNE HYDRAULIC ASH HOIST (PATENTED)

THE AMERICAN BRASS COMPANY

Manufacturers of Copper, Bronze and Brass in All Forms of Sheet, Wire, Rods and Tubes

GENERAL OFFICES
WATERBURY, CONNECTICUT

MILLS AND FACTORIES
ANSONIA, CONN.
TORRINGTON, CONN.
WATERBURY, CONN.
HASTINGS-ON-HUDSON, N. Y.
KENOSHA, WIS.
BUFFALO, N. Y.

CANADIAN MILL: ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO

OFFICES AND AGENCIES
NEW YORK, N. Y., 25 Broadway
BOSTON, MASS., 201 Devonshire Street
PROVIDENCE, R. I., 131 Dorrance Street
PHILADELPHIA, PA., Widener Building
PITTSBURGH, PA., Oliver Building
NEW ORLEANS, LA., Hibernia Bank Building
CHICAGO, ILL., 111 W. Washington Street
CLEVELAND, OHIO, Union Trust Building
CINCINNATI, OHIO, Dixie Terminal Building
DETROIT, MICH., General Motors Building
ST. LOUIS, MO., Planters Building
SAN FRANCISCO, CAL., 2 Pine Street

ANACONDA
from mine to consumer
TRADE MARK

Products

Anaconda Architectural Bronze, Brass and Copper for ornamental and structural purposes, including Cornice Work, Pilasters, Grilles, Wickets, Counter Work, Door and Window Trim, Screens, Hand Rails, etc.

For Anaconda Brass and Copper Pipe and Benedict Nickel Pipe, see page 1794; for Sheet, Roll and Strip Copper, see page 1124; for Ambrac Metal and Bronze Screen Wire, see page 939.

Extruded Shapes

In the extrusion process a billet of bronze is forced under hydraulic pressure through a die of the proper cross section. The shape obtained is of remarkably homogeneous texture, very strong and durable, and in every way superior to a bronze casting. There are no sandy surfaces, porosities or any of the defects frequently found in castings. The tensile strength of an Anaconda Extruded Architectural Bronze Shape is never less than 50,000 lb. to the square inch.

The edges are sharp and clean, so that the effect desired is invariably obtained.

Standard Patterns and Special Designs of Extruded Shapes

A large selection of stock patterns, covering all general uses, offers a wide variety to choose from. A few selected shapes are illustrated on the following pages. Where required, dies for new designs will be furnished at cost and held for the exclusive use of the customer.

Since Anaconda Extruded Shapes are produced from billets weighing 100 lbs. or more, it is not practical to execute orders for a smaller quantity than that obtained from a single billet.

Cold Drawn Shapes

When light mouldings and shapes are required with walls 1/8 in. and thinner, the cold drawn process is used to produce Anaconda Architectural Bronze Shapes. These cold drawn shapes are used for a great variety of architectural purposes, such as interior trim, window frames, show cases, store fronts, etc.

Colors

Anaconda Architectural Bronze Shapes, whether made by the extrusion process or cold drawn, have a natural golden color. After exposure the metal darkens and assumes the characteristic color of bronze. For interior use, the metal can be artificially colored to obtain any effect desired.

Estimates and Co-operative Service

The Service Department of The American Brass Company offers full co-operation in furnishing estimates and determining the suitability of Anaconda Extruded shapes for various uses. While estimates can usually be prepared from detailed blue prints and specifications, a representative of The American Brass Company will be sent at any time to consult with architects or fabricators whenever such consultation is requested.

Facilities

The American Brass Company is equipped for extensive production of Anaconda Extruded Architectural Shapes. The Company has complete facilities for serving the East from its mill at Ansonia, Conn., and the West from its mill at Kenosha, Wis. Inquiries or orders should be sent to the nearest mill.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

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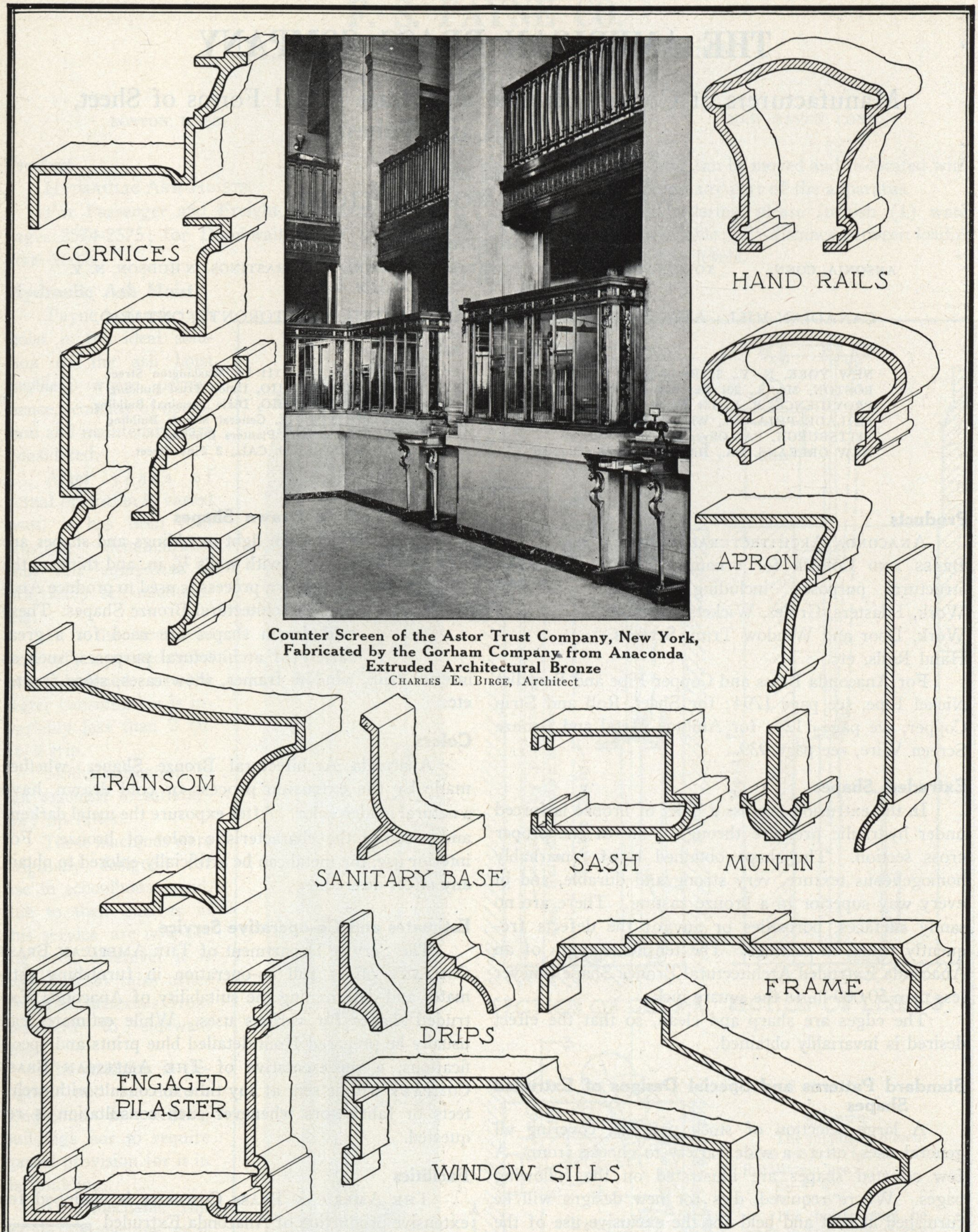

CORNICES
HAND RAILS
APRON
TRANSOM
SANITARY BASE
SASH
MUNTIN
FRAME
DRIPS
ENGAGED PILASTER
WINDOW SILLS

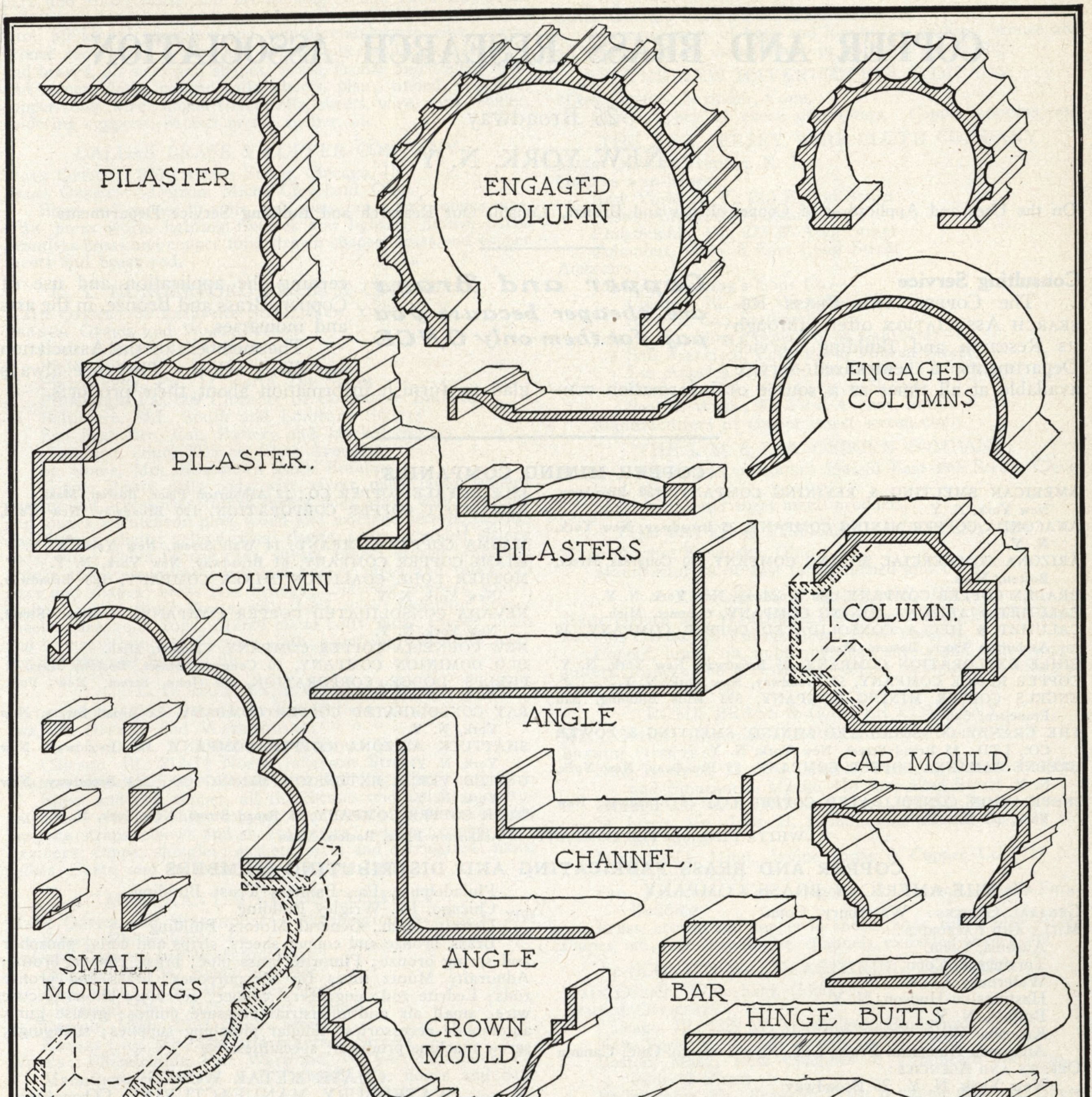
Counter Screen of the Astor Trust Company, New York, Fabricated by the Gorham Company from Anaconda Extruded Architectural Bronze
CHARLES E. BIRGE, Architect

ANACONDA from mine to consumer

ANACONDA EXTRUDED BRONZE SHAPES FOR ORNAMENTAL AND STRUCTURAL PURPOSES

SCALE HALF FULL SIZE
DATE JULY, 24
DR'W'G 4

Continued on next page


PILASTER
ENGAGED COLUMN
ENGAGED COLUMNS
PILASTER.
PILASTERS
COLUMN
COLUMN.
ANGLE
CAP MOULD.
CHANNEL
SMALL MOULDINGS
ANGLE
BAR
HINGE BUTTS
CROWN MOULD.
DOOR SADDLES
BAR
DOOR FRAME
STAIR TREAD NOSING
SMALL MOULDINGS

ANACONDA
from mine to consumer

ANACONDA EXTRUDED BRONZE SHAPES FOR ORNAMENTAL AND STRUCTURAL PURPOSES

SCALE HALF FULL SIZE
DATE JULY,24

DR'WG 5

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

Consulting Service

The Copper and Brass Research Association offers, through its Research and Building Service Departments, a centralized service available at all times as a source of information concerning the application and use of Copper, Brass and Bronze, in the arts and industries.

Copper and Brass are cheaper because you pay for them only ONCE

The members of the Association are listed below. They are always glad to furnish information about their products.

COPPER MINING COMPANIES

AMERICAN SMELTING & REFINING COMPANY, 120 Broadway, New York, N. Y.
ANACONDA COPPER MINING COMPANY, 25 Broadway, New York, N. Y.
ARIZONA COMMERCIAL MINING COMPANY, 50 Congress Street, Boston, Mass.
BRADEN COPPER COMPANY, 120 Broadway, New York, N. Y.
CALUMET & ARIZONA MINING COMPANY, Calumet, Mich.
CALUMET & HECLA CONSOLIDATED COPPER COMPANY, 12 Ashburton Place, Boston, Mass.
CHILE EXPLORATION COMPANY, 25 Broadway, New York, N. Y.
COPPER RANGE COMPANY, 52 Broadway, New York, N. Y.
ENGELS COPPER MINING COMPANY, 393 Mills Building, San Francisco, Cal.
THE GRANBY CONSOLIDATED MINING, SMELTING & POWER CO., LTD., 25 Broad Street, New York, N. Y.
GREENE CANANEA COPPER COMPANY, 25 Broadway, New York, N. Y.
INSPIRATION CONSOLIDATED COPPER CO., 25 Broadway, New York, N. Y.
ISLE ROYALE COPPER CO., 12 Ashburton Place, Boston, Mass.
KENNECOTT COPPER CORPORATION, 120 Broadway, New York, N. Y.
MAGMA COPPER COMPANY, 14 Wall Street, New York, N. Y.
MIAMI COPPER COMPANY, 61 Broadway, New York, N. Y.
MOTHER LODE COALITION MINES COMPANY, 120 Broadway, New York, N. Y.
NEVADA CONSOLIDATED COPPER COMPANY, 25 Broad Street, New York, N. Y.
NEW CORNELIA COPPER COMPANY, Calumet, Mich.
OLD DOMINION COMPANY, 50 Congress Street, Boston, Mass.
PHELPS DODGE CORPORATION, 99 John Street, New York, N. Y.
RAY CONSOLIDATED COPPER COMPANY, 25 Broad Street, New York, N. Y.
SHATTUCK ARIZONA COPPER COMPANY, 120 Broadway, New York, N. Y.
UNITED VERDE EXTENSION MINING CO., 233 Broadway, New York, N. Y.
UTAH COPPER COMPANY, 25 Broad Street, New York, N. Y.
WHITE PINE COPPER COMPANY, 12 Ashburton Place, Boston, Mass.

COPPER AND BRASS FABRICATING AND DISTRIBUTING MEMBERS

THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Conn.
Mills and Factories:
- Ansonia, Conn.
- Torrington, Conn.
- Waterbury, Conn.
- Hastings-on-Hudson, N. Y.
- Buffalo, N. Y.
- Kenosha, Wis.
- Anaconda American Brass, Ltd., New Toronto, Ont., Canada

Offices and Agencies:
- New York, N. Y., 25 Broadway
- Boston, Mass., 201 Devonshire Street
- Providence, R. I., 131 Dorrance Street
- Philadelphia, Pa., 828 Widener Building
- Pittsburgh, Pa., 1821 Oliver Building
- Cincinnati, Ohio, 604 Union Central Building
- Cleveland, Ohio, 1562 Union Trust Building
- Chicago, Ill., 111 West Washington Street
- Detroit, Mich., 3-132 General Motors Building
- St. Louis, Mo., 1042 Planters Building
- San Francisco, Cal., 326 Oceanic Building
- New Orleans, La., 509 Hibernia Bank Building

Copper products: bottoms, flats, pipes, tubes; cable—bare, weatherproof and insulated; lead covered power cable; drawn shapes, rods and bars; rolls; sawed copper; hot and cold rolled sheets; polished and tinned sheets and circles; wire of all kinds. Brass and bronze products: angles, channels; architectural shapes; extruded metal; pressed metal parts; rods; brazed and seamless tubes and pipes; sheets; wire. Nickel silver products: angles, channels; rods, seamless tubes; sheets; wire.

BRIDGEPORT BRASS COMPANY

Main Office: East Main Street, Bridgeport, Conn.
Branch Offices:
- New York, N. Y., Pershing Square Building
- Philadelphia, Pa., Bankers Trust Building
- Chicago, Ill., Wrigley Building
- Detroit, Mich., General Motors Building

Brass, bronze and copper sheets, strips and coils; phosphor and spring bronze; Plumrite brass pipe; brass, copper, bronze, Admiralty Muntz tubes for all purposes; brass and bronze rods; Ledrite rod; engravers' copper; ferrules; phono-electric wire; small air and industrial pressure pumps; grease guns, automobile accessories; tubular plumbing supplies; stampings; screw machine products; specialties.

CHASE METAL WORKS
WATERBURY MANUFACTURING CO.

(Divisions of Chase Companies, Inc.)

Main Office: Waterbury, Conn.
Branch Offices:
- New York, N. Y., 134 Lafayette Street
- Boston, Mass., 79 Milk Street
- Philadelphia, Pa., 931 City Center Building
- Rochester, N. Y., Commerce Building
- Pittsburgh, Pa., Union Trust Building
- Cleveland, Ohio, Ohio Chase Co., 2094 East 19th Street
- Chicago, Ill., Union Trust Building
- St. Louis, Mo., 513 Star Building, 12th and Olive Streets
- Denver, Colo., Room 211 Ideal Building
- Atlanta, Ga., 304 Rhodes Building, P. O. Box No. 265
- San Francisco, Cal. (Chase Companies of California, Inc.), 678 Second Street
- Los Angeles, Cal. (Chase Companies of California, Inc.), 2461-63 East Eighth Street

Brass, bronze, nickel silver and copper in sheet, wire, rod and extruded shapes; seamless and brazed pipes and tubes.

T. E. CONKLIN BRASS & COPPER CO., INC.

Main Office: 54-60 Lafayette Street, New York, N. Y.

Brass rolls and sheets, all gauges, widths, tempers and mixtures, architectural and commercial bronze rolls, sheets,

Continued on next page

bars and rods; brass and bronze angles and channels; brass rods of all kinds, strips, hoops; brass sawed and drawn; brass wire, all kinds; phosphor and commercial bronze wire; naval bronze rod; brass, bronze and copper tubes and pipes, seamless and brazed, all sizes and shapes; brass, bronze and copper filter and screen cloth; copper rolls, sheets, plain, tinned, polished; copper rods, wire; nickel silver rolls, sheets, wire, rods; solder, soldering coppers; babbitt metal, spelter, etc.

DALLAS BRASS & COPPER COMPANY

Main Office: 820 Orleans Street, Chicago, Ill.
Sales Offices: Detroit, Mich., Cleveland, Ohio

Brass and copper in rolls, lock seam brass and copper tube, draw press work, lighting fixtures and lighting fixture parts. Seamless brass and copper tube, drawn shapes, brass and copper sheets and brass rod.

U. T. HUNGERFORD BRASS & COPPER CO.

Main Office: 80 Lafayette Street, New York, N. Y.
Branch Office and Warehouses:
Boston, Mass., 411 D Street
Philadelphia, Pa., 510 Arch Street
Philadelphia, Pa., 17 North 7th Street
Pittsburgh, Pa., 609 Chamber of Commerce Building
Baltimore, Md., South and Lombard Streets
San Francisco, Cal., Battery and Market Streets
Cleveland, Ohio, 3035 St. Clair Avenue
St. Louis, Mo., Boatmen's Bank Building

Copper sheets, rolls, rods, wire, rivets, nails, tacks, leaders, gutters and accessories; brass sheets, rods, rolls, wire, channels and angles, escutcheon pins, wood and machine screws, railings and fittings, chain; yellow metal sheets, rolls, extruded shapes, rods, wire; Tobin bronze rods, sheets, tubes; brazed brass and bronze tubes; seamless brass and copper pipes and tubes; all sizes and shapes; brass pipe fittings; soldering coppers, solder, spelter; nickel silver sheets, rolls, rods, wire; phosphor bronze sheets, wire, rods, rope; Muntz metal bolts, nuts; copper, brass and bronze strainer and screen cloth; plumbing specialties; copper shingles and Spanish tile.

C. G. HUSSEY & COMPANY

Main Office: 2850 Second Avenue, Pittsburgh, Pa.
Branch Offices and Warehouses:
New York, N. Y., 504 West 24th Street
Chicago, Ill., 212-14 North Jefferson Street
Branch Office: First National Bank Building, Cincinnati, Ohio

Sheet and roll copper, all thicknesses and finishes; corrugated and crimped sheet copper; conductor pipe, eaves trough, hangers, straps, elbows and shoes; miters; ridging; copper wire strainers; copper shingles; gaskets, plain and corrugated; nails, spikes, rivets, and washers; sawn copper bars.

MERCHANT & EVANS COMPANY

Main Office and Warehouses: Washington Avenue at 21st Street, Philadelphia, Pa.
Branch Offices and Warehouses:
Chicago, Ill., 347 Sheldon Street
New York, N. Y., 242 Water Street
Cleveland, Ohio, 3125 Perkins Avenue
Detroit, Mich., 2733 Quoin Street
Kansas City, Mo., 24th and Jefferson Streets
Works: Philadelphia, Pa.; Warwood, W. Va.; Lancaster, Pa.

Manufacturers of M & E "Almetl" fire doors and Star ventilators.

Copper gutters, leaders and accessories, nails, rivets, rods, rolls, sheets, tacks; brass sheets, rods, rolls, wire, channels and angles, escutcheon pins; yellow metal sheets, rods, nails, architectural bronze sheets, rolls, rods, wire; Tobin bronze rods, sheets, tubes, brazed brass and bronze tubes; seamless brass and copper pipes and tubes, all sizes and shapes; solder, spelter; soldering coppers; nickel silver sheets, rolls, rods, wire; phosphor bronze sheets, wire, rod, tubes; Muntz metal bolts, nuts; copper shingles and Spanish tile; Benedict nickel tubing; tinners' and roofers' supplies and machinery.

THE MICHIGAN COPPER & BRASS COMPANY

Main Office: Detroit, Mich.

Sheet brass; sheet copper; copper and brass in coils; brass rod; brass wire; brazed brass tube; extruded metal shapes.

THE NATIONAL BRASS & COPPER COMPANY

Main Office: Lisbon, Ohio
Branch Office: 30 Church Street, New York, N. Y.

Copper sheets, soft and cold rolled, plain, tinned and polished; plates; strips; circles; segments; pattern sheets; copper in rolls; copper conductor pipe; eaves trough; gutters, elbows, shoes.

NEW ENGLAND BRASS COMPANY

Main Office: Park Street, Taunton, Mass.

Manufacturers of high and low brass; gilding; bronze and all percentages of nickel silver in rolls and sheets only.

THE NEW HAVEN COPPER COMPANY

Main Office: Seymour, Conn.

Sheet copper of every description. Copper bottoms, etc.

THE NEW JERSEY WIRE CLOTH COMPANY

Main Office: Trenton, N. J.
Offices and Stores:
New York, N. Y., 210 Fulton Street
Boston, Mass., 93-95 Pearl Street
Philadelphia, Pa., 223-27 Arch Street
Columbus, Ohio, 8 East Long Street
Agencies:
John A. Roebling's Sons Co.—
Chicago, Ill., 165 West Lake Street
Atlanta, Ga., Station A
John A. Roebling's Sons Co. of California—
San Francisco, Cal., 624-46 Folsom Street
Los Angeles, Cal., 216 So. Alameda Street
Portland, Ore., 487 Lovejoy Street
Seattle, Wash., 900 First Avenue, South

Manufacturers of copper insect screen cloth.

THE J. M. & L. A. OSBORN COMPANY

Main Office and Warehouse: 1541-51 East 38th Street, Cleveland, Ohio

Sheet metal and sheet metal products.

THE PAPER & TEXTILE MACHINERY CO.

Main Office: Sandusky, Ohio

Manufacturers of cast tubes, turned and bored.

RICHARDS & COMPANY, INC.

Main Office and Warehouse: Battery Wharf, Boston, Mass.
Branch Office: 81 Fulton Street, New York, N. Y.

Copper, brass, tin, antimony, lead sheets and rolls; copper gutters, leaders and accessories; copper shingles; all kinds of sheet metal products.

ROME BRASS & COPPER COMPANY

Main Office: Dominick and Bouck Streets, Rome, N. Y.
Branch Offices:
New York, N. Y., S. J. Marble, Pershing Square Building and Finucane & Macfie, 110 East 42nd Street
Chicago, Ill., M. K. Williams, Mgr., 3649 So. Racine Avenue
St. Louis, Mo., John H. Heimbuecher Metals Co., 514 No. 3rd Street
Minneapolis, Minn., Irvine Brass & Copper Co., 117 No. Second Street
San Francisco, Cal., Osgood & Howell, Wells-Fargo Building

Brass, bronze and copper in sheets, rods, tubes, pipe, rivets, shapes, etc., including angles, channels, extruded shapes, etc.

SCOVILL MANUFACTURING COMPANY

Main Office: Waterbury, Conn.
Branch Offices:
Chicago, Ill., 1229 W. Washington Boulevard
New York, N. Y., 280 Broadway
Boston, Mass., New Chamber of Commerce Building, 8 Federal Street
Philadelphia, Pa., Franklin Trust Building, 15th and Chestnut Streets
Atlanta, Ga., McGlawn-Bowen Building, 45 Fairlie Street
Cleveland, Ohio, 1213 West Third Street
Pacific Coast Agent: Engle-Reid Co.
Los Angeles, Cal., Terminal Sales Building
San Francisco, Cal., 149 California Street

Brass in sheets, wire and tubing; brass goods, finished or partly finished, of every description.

TAUNTON-NEW BEDFORD COPPER COMPANY

Main Office: 267 West Water Street, Taunton, Mass.
Branch Offices:
Rolling Mills at Taunton, Mass., and New Bedford, Mass.
New York, N. Y., 35 Howard Street
Boston, Mass., 61 Batterymarch Street

Sheets: copper, roll copper, commercial and naval brass, Muntz metal, commercial and manganese bronze. Plates: copper, Muntz, naval brass, manganese bronze, all thicknesses, widths to 110 in. Sheathing: copper and Muntz metal sheathing and nails for ships. Rods: copper, Muntz, naval brass, manganese bronze, usual sizes and shapes. Cut copper, Muntz metal, brass nails; copper, commercial bronze tacks; soldering coppers; copper shingles and Spanish tile.

JULIUS BLUM & CO.

Wrought Iron Mouldings and Steel Tubing

TELEPHONE
Watkins, 7044, 7045, 7046, 7047

532-540 West 22nd Street
NEW YORK, N. Y.

MILLS AT BORDENTOWN, N. J.

Products

Dealers in and manufacturers of Hot Rolled (Wrought Iron) Mouldings, Plain and Ornamented; Rolled Steel Door Sills; Bridge and Hand Rails; All-steel Stair Posts; Square and Rectangular Mechanical Steel Tubing.

Also, Concrete or Asphalt Step Nosings; Sash Bars, Skylight Bars; Light Angles, Channels, Tees, Zees; Drop Forged Fence Pickets; Rosettes, Leaves, Cups, Shields, Flowers, hand hammered and drop forged; Seamless Drawn Round Steel Tubing; Flexible Metal Hose and Tubing; Architectural Bronze Hand Rails and Door Sills.

Special Rolled Steel Shapes

We will roll to order any section, no matter how difficult. Inquiries are solicited for difficult rolling propositions.

Rolled Steel (Wrought Iron) Mouldings

Especially adapted for the construction of store fronts, steel stairways, elevator enclosures and cars, iron doors and door jambs, fences, marquises, partitions, sash and skylight work, furniture, and all other ornamental iron work.

Mouldings are rolled true and smooth with sharp lines, of best wrought iron or soft steel. They are capable of being bent, formed and forged. Bars are 18 to 20 ft. long and are thoroughly straightened. A large variety of shapes is carried in stock. Some typical designs are shown on the opposite page.

Wrought iron mouldings are cleaner in appearance and are cheaper than cast iron. They are free from blemishes and sand holes, which is important when polishing or plating is desired.

They are fireproof, can not break, and are lighter in weight than cast iron, which means a big saving in freight and trucking charges.

Square and Rectangular Steel Tubing

A large variety of sizes and gauges (running from ½ in. square to 4 in. square) carried in stock.

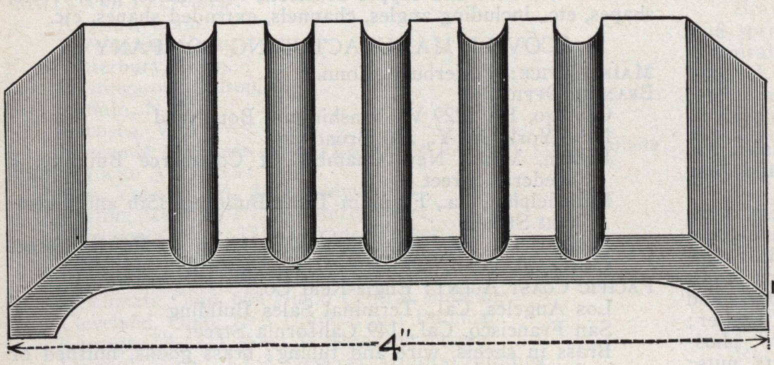
This tubing is especially adapted for door constructions, elevator work and glass partitions.

Special hardware to fit square and rectangular tubing carried in stock.

All-steel Stair Posts

Special $\frac{3}{16}$-in. wall square steel tubing for stair posts. Pressed steel tops and drops carried in stock. Complete posts furnished to specified lengths.

All-steel stair posts are stronger than cast iron posts; are fireproof, sanitary and neat in appearance. On account of their greater strength, smaller diameter posts may be used, thereby gaining space on stairways and saving weight.



Rolled Steel Door Sills

Rolled Steel Door Sills

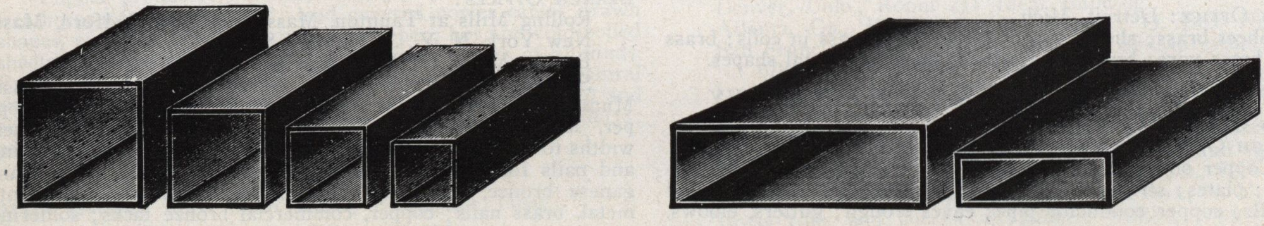
These door sills can be furnished from stock as follows:

No. 4500—7 in. wide.
No. 4501—5½ in. wide.
No. 4502—4 in. wide.

Also in architectural bronze, 6 and 4½ in. wide.

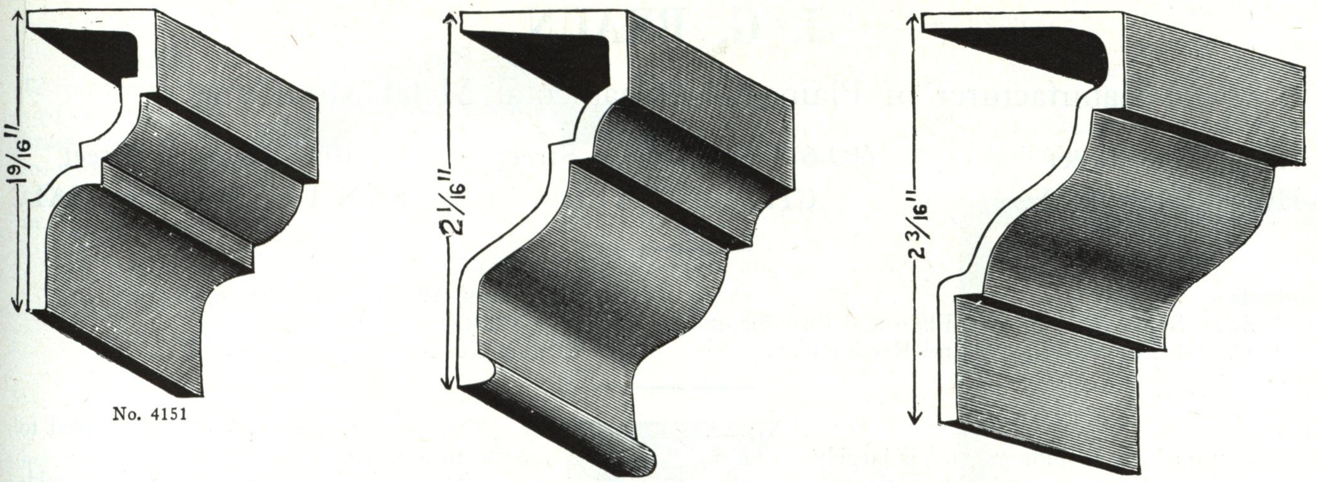
Catalogue

Catalogue mailed on request, free of charge.



Cold Drawn Mechanical Steel Tubing

Continued on next page

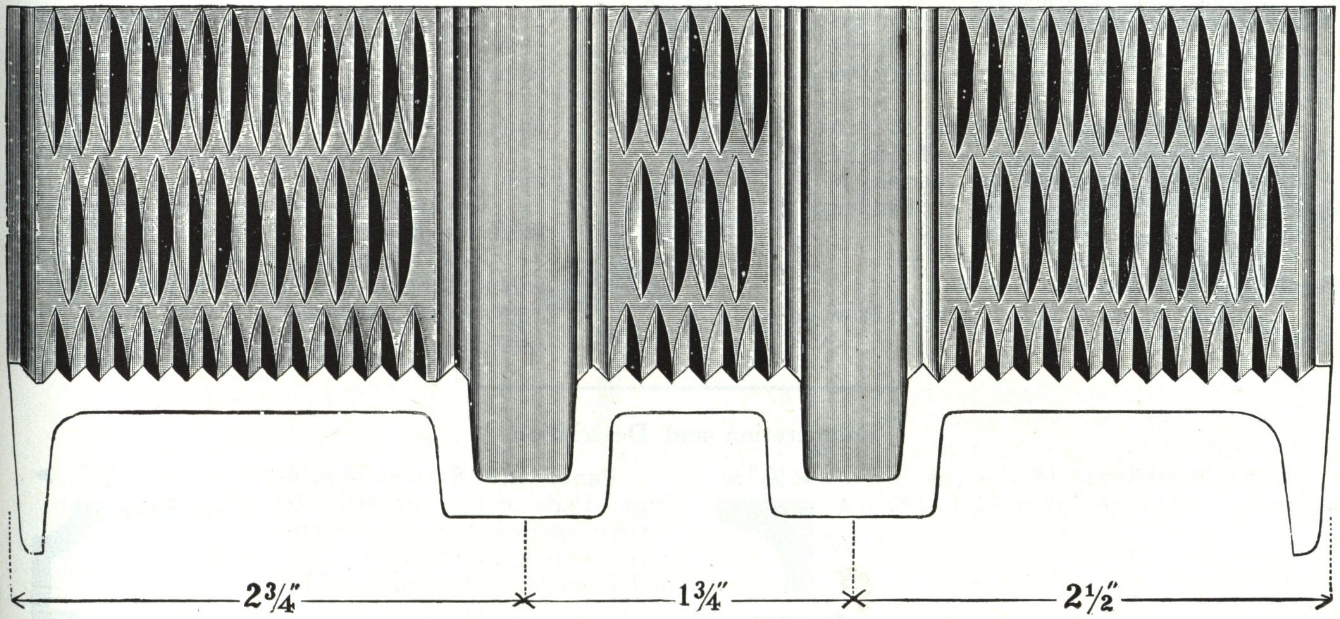

1 9/16"
2 1/16"
2 3/16"

No. 4151

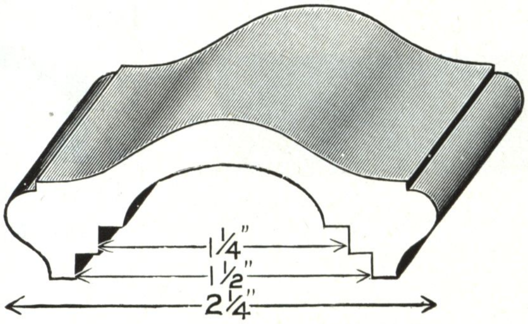
No. 4152

No. 4153

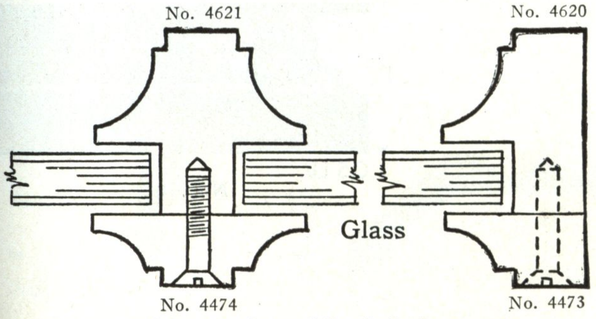
Rolled Steel (Wrought Iron) Mouldings



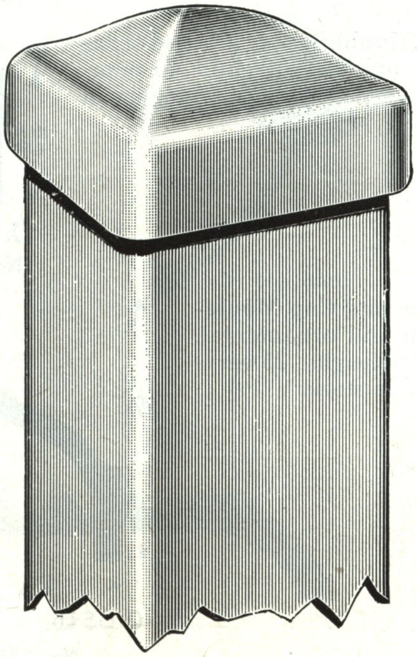
Rolled Steel Elevator Saddle No. 4517



No. 4441 Rolled Steel Hand Rail


No. 4621
No. 4620
Glass
No. 4474
No. 4473

Construction of Steel Sash



All-steel Stair Post

J. G. BRAUN

Manufacturer of Plain and Ornamental Metal Mouldings

160 Greene Street
NEW YORK, N. Y.

609-615 So. Paulina Street
CHICAGO, ILL.

1088 Howard Street
SAN FRANCISCO, CAL.

Products

Rolled Steel Mouldings, Plain and Ornamental.
Pipe and Tubing, Square and Rectangular.
Ornaments, Wrought and Stamped.
Fence Pickets and Balls.
For Stair Nosings, etc., see page 670.

Uses

The use of our mouldings, etc., is largely in connection with ornamental iron work such as stairs, elevator and store fronts, bulletin boards, bank screens, facias, fences and railings, marquises, etc. They also find advantageous employment in console tables, mirrors, lighting fitments, tables and chairs, and other decorative items.

Our mouldings and ornaments, etc., are not restricted to the items mentioned, for the great variety of shapes and sizes permits of endless variants in the design of building work.

Catalogues, Lengths and Service

Moulding is furnished in lengths of from 14 to 20 ft.

UNITY OF PURPOSE-TO BE JUST
NATIONAL ASSOCIATION ORNAMENTAL IRON AND BRONZE MANUFACTURERS

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

Our Service Department is prepared to assist in any arising problem.

Catalogue No. 25 illustrates all mouldings, pipe and tubing, pickets, etc., carried in stock.

Catalogue No. 22 is an abbreviated issue of No. 25 and shows the most frequently used patterns.

Catalogue No. 18, drop forged and wrought ornaments.

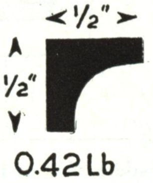
Catalogue No. 20, stamped iron ornaments.

Shipments can be made from any of our three warehouses.

New catalogue No. 25 greatly revised will appear with this issue of Sweet's Architectural Catalogue. Please write for copy.

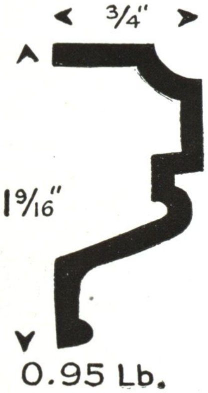
Enumeration and Description

Cove Mouldings—15 designs in various types and sizes from ⅜ to 1⅜ in.



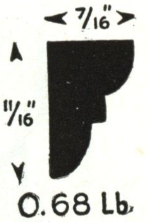
No. 215

Panel and Scribe Mouldings—Plain and ornamental. 60 patterns carried in various designs. Sizes from ¾ to 3¾ in. in height and from ½ to 1¾ in. in width.



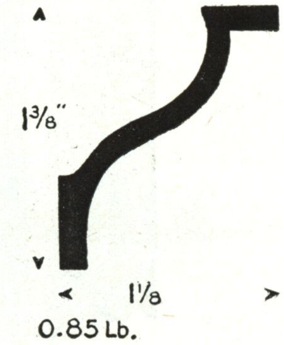
No. 192

Panel Mouldings—Plain and ornamental. Practically all solid. 40 numbers in numerous executions ranging in sizes from ⅜ to 2¼ in.

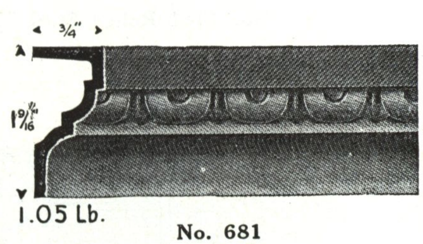


No. 120

Cornice and Cap Mouldings—Plain and ornamental. 1⅛ to 6 in. in height. 25 varying numbers in stock.



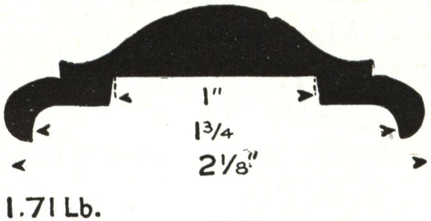
No. 181



No. 681

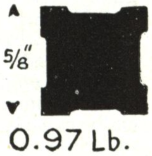
Continued on next page

Handrails—12 numbers carried in steel and brass. 1¾ to 2¾ in. wide to fit top rails of ¾ to 2¼ in.



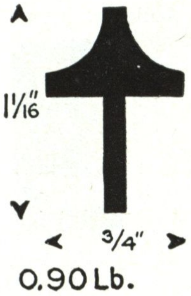
No. 1144

Balusters and Columns—24 varying types and sizes, plain and ornamental. ½ to 2 in. in thickness.



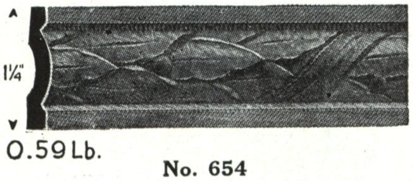
No. 59

Glass Fillet Bars and Caps—35 types and sizes for sashes, doors, windows and casements.



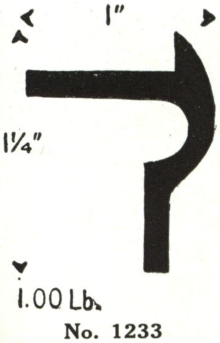
No. 1231

Astragals and Facings—Plain and ornamental, solid and perforated. An array of 150 patterns of beautiful designs. Widths from ¼ to 5 in.

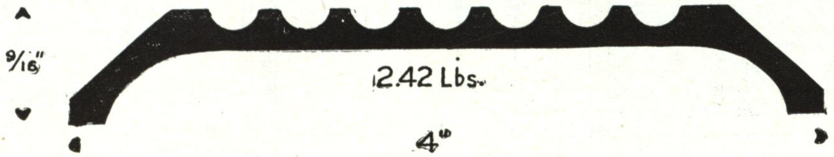


No. 654

Saddles, Nosings and Edgings—Carried in steel and brass. 20 patterns for varying stair tread and door sill problems. See also our page (670) for stair nosings.



No. 1233

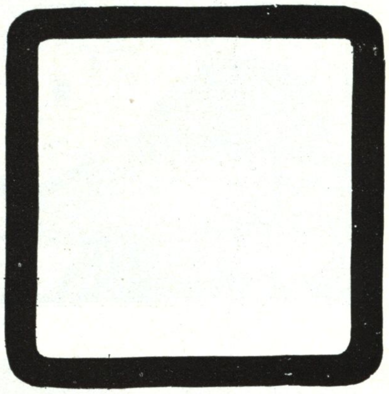


No. 1200

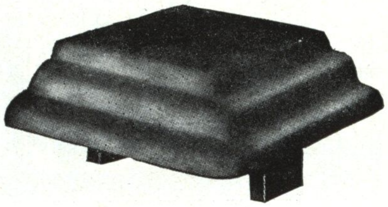
Corner Beads—6 numbers excellently suited for protecting corners of plaster and similar walls. Can be furnished cut to length with anchors for concrete.

Angles, Tee, Zee and Channel Iron—A great variety of the aforementioned shapes in *square root* of special interest in building construction.

Tubing and Pipe—Square and rectangular ranging from ⅜ to 4 in. square and 1x2 to 2x3 in. rectangular. Suitable for newels, rails, door frames, etc. We also carry various types of caps and drops for newels, also locks and hinges for doors.



Tubing and Pipe



Newel Caps and Drops

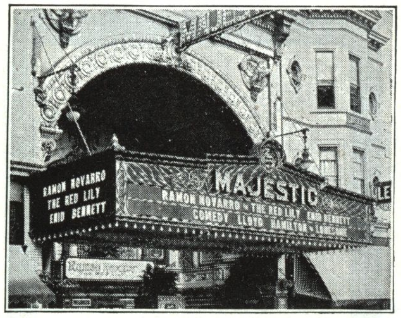
Ornaments—Drop forged and stamped in over 3500 exquisitely wrought patterns, such as leaves, husks, rosettes, flowers, etc., in many period designs, a great many suggesting handwork.

No. 446

THE PROBERT SHEET METAL CO.

Manufacturers of Marquises
COVINGTON, KY.

For Metal Covered Doors, see page 879


RAMON NOVARRO
THE RED LILY
ENID BENNETT
MAJESTIC
RAMON NOVARRO · THE RED LILY · ENID BENNETT
COMEDY · LLOYD HAMILTON · LOWE'S NEWS

Majestic Theater, Louisville, Ky.

B. F. Keith's Rialto, Louisville, Ky.

TEMPLE
TEMPLE

Temple Theater, Hinton, W. Va.

Marquises for All Classes of Buildings

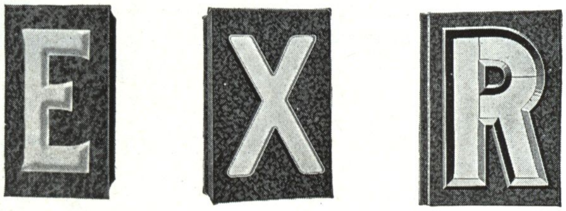
Many years of experience in the manufacturing of marquises for all types of buildings have given us a great fund of practical knowledge on the subject. We design and construct marquises for theaters, hotels, banks, apartment houses, etc. We furnish and erect, any place in the country, all standard steel framing and use galvanized Armco ingot iron or sheet copper on all marquises furnished by us. We also build marquises according to architects' plans.

In our well illustrated marquise catalogue which we will gladly send on request, are shown many of our representative installations. Marquises suitable for buildings of all kinds are included. From these, suggestions of design and practice can be obtained.

Our engineering and architectural departments are composed of men who have specialized on marquises and are especially capable to solve any problem relating to their design or installation. They are at all times ready to submit sketches and estimates.

When making inquiries, give the following information: width of marquise across front of building and projection over sidewalk; select design from our catalogue or submit sketches; whether wiring is required on underside; specify reading of fixed letter signs; type of construction of building.

Signs, when furnished, are made as an integral part of the marquise with cornices, brackets and all mouldings applied. Wiring is complete with leads ready to connect to wiring in building. Letters furnished as follows:



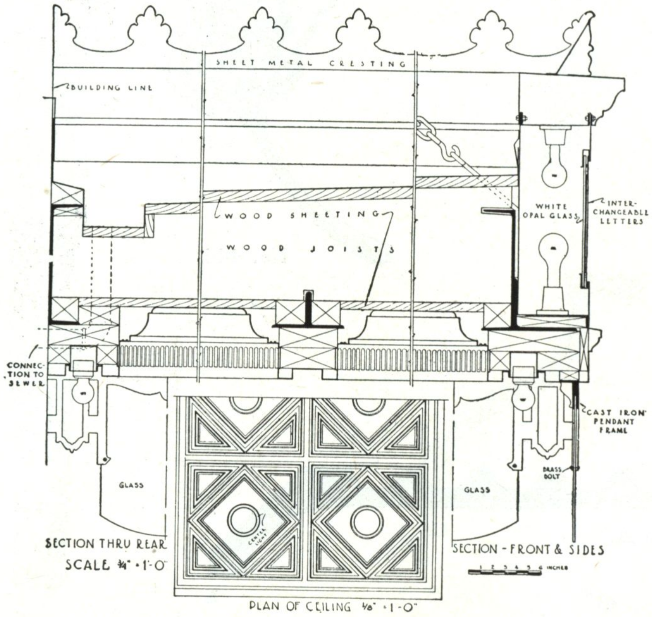
No. 1 No. 2 No. 3

Interchangeable Letters for Marquise Signs

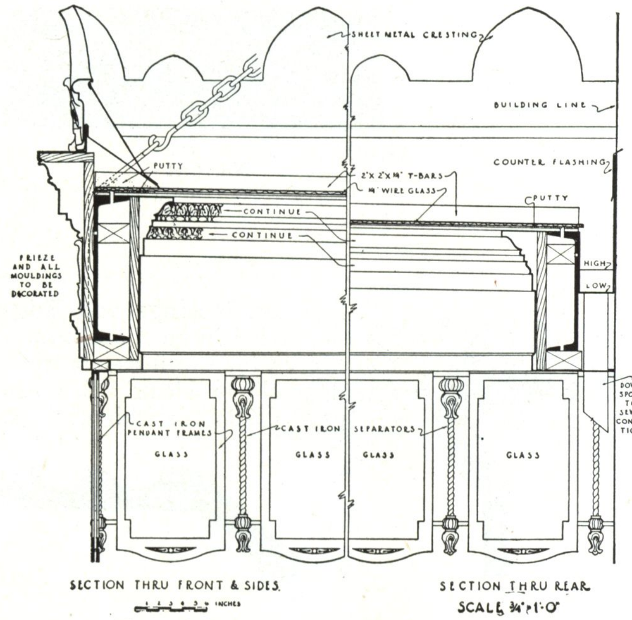
No. 1, a raised glass letter contained in a special frame, sizes from 4 to 12 in. No. 2 has a raised channel of metal outlining the letter, the metal being the only part removed for changing the reading. No. 3, similar to No. 2, either copper or zinc with bright facing on outline of letter. Nos. 2 and 3 in 8 and 12-in. sizes only.

Letters for interchangeable letter signs are furnished in sets of the proper assortment. "In," "and," "the," periods, quotation marks and sufficient blank spaces in assorted sizes are included.

Letters similar in construction to Nos. 1 and 2 and the exposed bulb channel type are furnished for signs having fixed letters


SHEET METAL CRESTING
BUILDING LINE
WOOD SHEETING
WOOD JOISTS
WHITE OPAL GLASS
INTER-CHANGEABLE LETTERS
CONNEC-TION TO SEWER
CAST IRON PENDANT FRAME
BRASS BOLT
GLASS
GLASS
CENTER LIGHT
SECTION THRU REAR
SCALE ¾" = 1'-0"
SECTION - FRONT & SIDES
1 2 3 4 5 6 INCHES
PLAN OF CEILING ⅛" = 1'-0"

Typical Detail for All Marquises Using Interchangeable Letter Signs


SHEET METAL CRESTING
BUILDING LINE
COUNTER FLASHING
PUTTY
2"X 2"X ¼" T-BARS
¼" WIRE GLASS
PUTTY
CONTINUE
CONTINUE
FRIEZE AND ALL MOULDINGS TO BE DECORATED
HIGH
LOW
DOWN SPOUT TO SEWER CONNECTION
CAST IRON PENDANT FRAMES
CAST IRON SEPARATORS
GLASS
GLASS
GLASS
GLASS
SECTION THRU FRONT & SIDES
1 2 3 4 5 6 INCHES
SECTION THRU REAR
SCALE ¾" = 1'-0"

Typical Detail for All Marquises Having Glass Ceilings

ALUMINUM COMPANY OF AMERICA

Manufacturers of Aluminum and Aluminum Alloys

PITTSBURGH, PA.

Product

Aluminum for Ornamental Metal Work.

For Aluminum Roofing, see page 1139; for Aluminum Paint, see page 1719.

Aluminum for Ornamental Metal Work

Aluminum is applicable to ornamental metal work ranging from the finest grades to the commercial grades and forms. Because of its light toned permanent color, high resistance to corrosion, non-staining properties, light weight, uniformity and easy working properties, it is finding increasing use in the architectural field for general sheet metal and ornamental metal purposes.

Physical Characteristics of Aluminum

Color—The permanent silvery gray color makes aluminum very desirable as a decorative material and the various alloys furnish a considerable range in strength and workability.

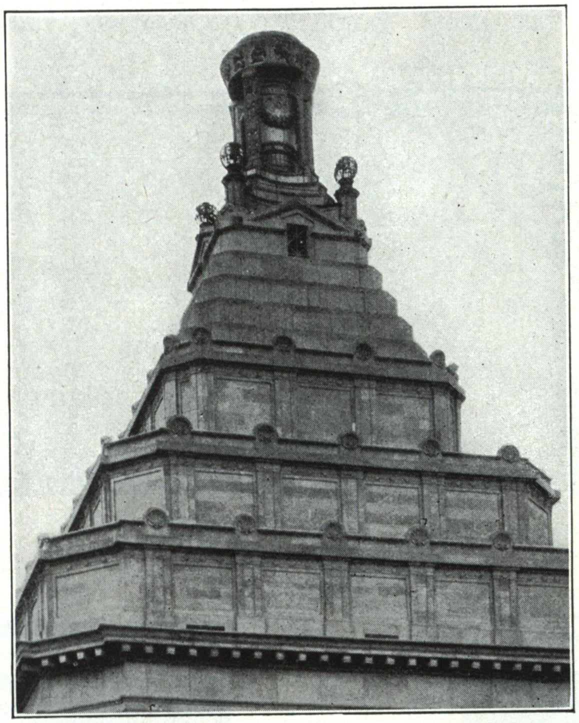
Resistance to Corrosion—The resistance of aluminum to atmospheric corrosion is very good as is witnessed by installations of varied forms ranging in location from tropical to high latitude conditions.

Light Weight—Aluminum has a specific gravity of approximately 2.8 and weighs $\frac{1}{10}$ lb. per cu. in. As this is one-third the weight of other commonly used metals, ease of erection is a natural consequent.

Will Not Discolor Adjoining Materials—Aluminum forms no colored salts and does not discolor surrounding or supporting structures from drip or splash of watershed.

Strength—Specifications of aluminum range from fully annealed 2S0 pure metal (12000 lb. per sq. in. tensile strength, 25% elongation in 2 in., Brinnell hardness, 22) to special 17S alloy (65000 lb. per sq. in., 20% elongation in 2 in., Brinnell hardness, 92).

Easily Worked—Aluminum machines easily and is capable of taking and holding a high polish.



Finial of Standard Oil Building, New York, N. Y. Made of Aluminum Sheets, Casting and Rivets
Carrere & Hastings; Shreve, Lamb & Blake, Associated Architects

Cost

The cost of installing aluminum is of course dependent on the design and quality of work, and compares with the cost of installing high grade materials.

Actual cost of aluminum per unit of weight is divisible by three for comparison by bulk with cost of other similarly used metals.

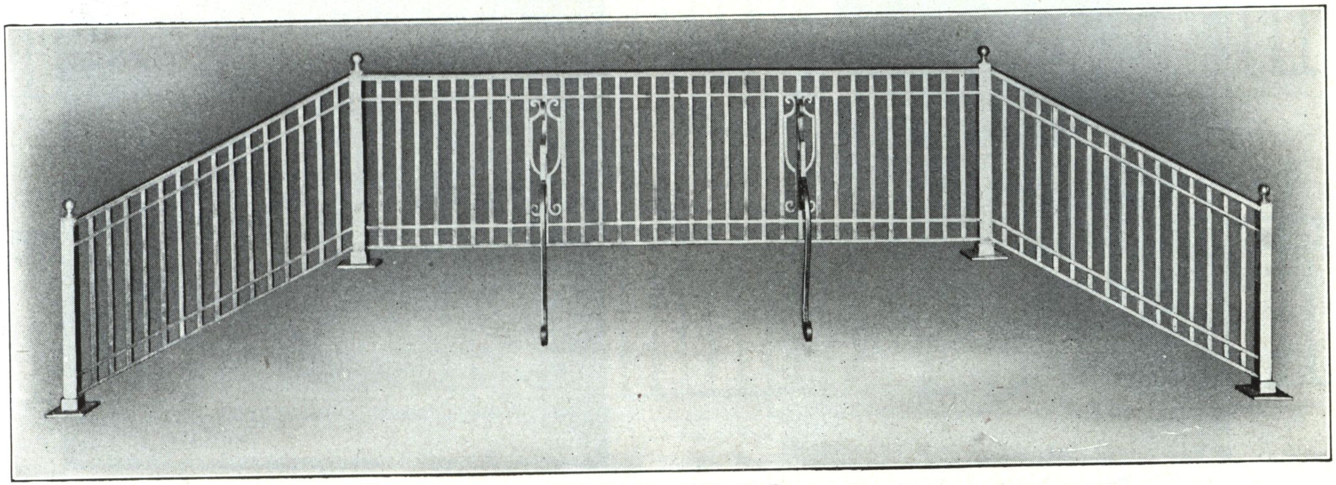
Marketable Forms

Aluminum and aluminum alloys are obtainable in the form of ingots, sheets, rods, bars, tubing, rivets, bolts, extruded moulding and structural shapes for fabrication.

Literature

The following booklets will be mailed on application:

Aluminum Casting Alloys
Strong Aluminum Alloys
Machining Wrought Aluminum



Aluminum Stair Rail

THE BALDWIN BRASS WORKS

Architectural and Ornamental Bronze and Steel

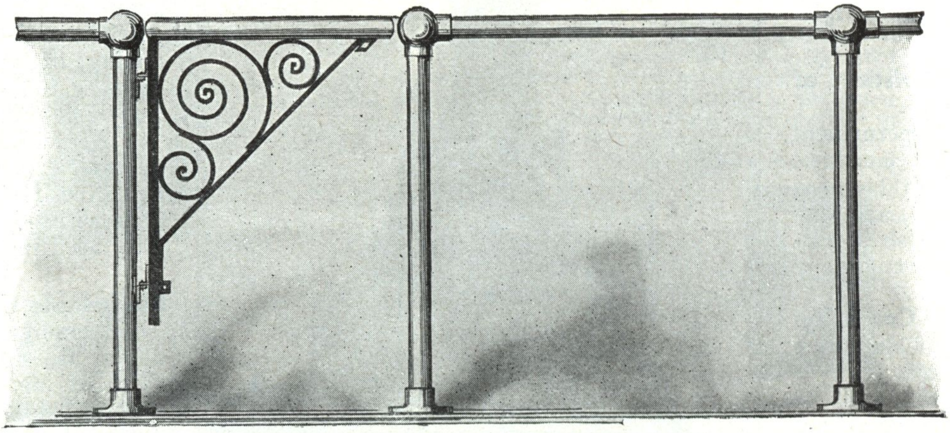
411 South Clinton Street

CHICAGO, ILL.

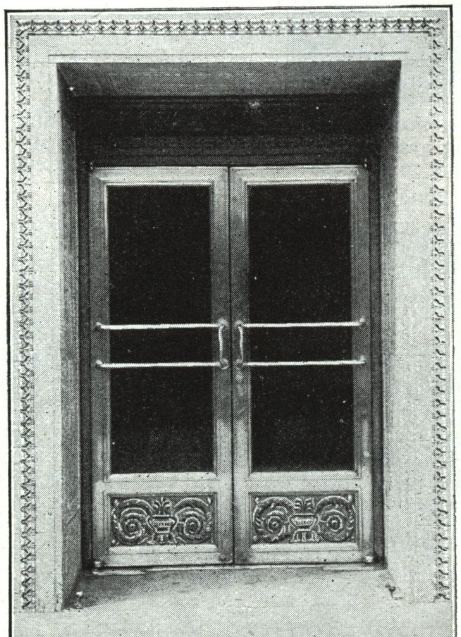
TELEPHONE
State 4880

Products

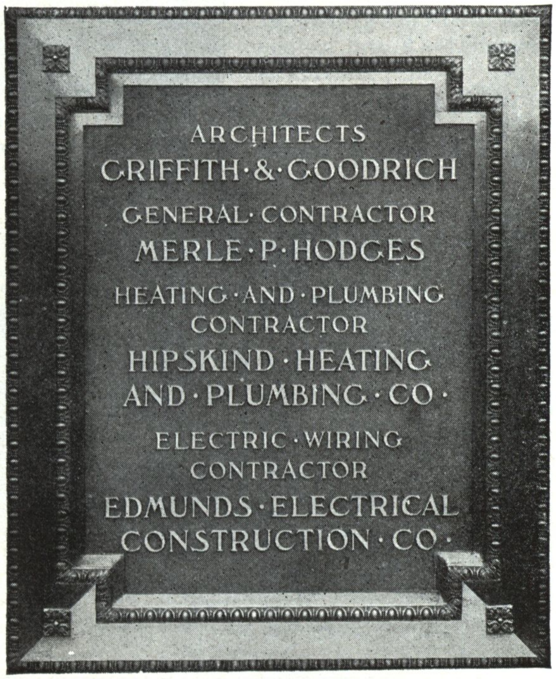
Ornamental Metal Work:
- Ornamental Bronze and Brass Entrance Doors.
- Mausoleum Doors.
- Grilles, Wickets and Cagework for banks and offices.
- Brass Railings.
- Swimming Pool Ladders.
- Bronze Lamps and Brackets.
- Bronze Signs and Tablets.
- Thresholds.
- Kick Plates.
- Door Bars.



Brass Railing



Bronze Entrance Door


ARCHITECTS
GRIFFITH · & · GOODRICH
GENERAL · CONTRACTOR
MERLE · P · HODGES
HEATING · AND · PLUMBING
CONTRACTOR
HIPSKIND · HEATING
AND · PLUMBING · CO ·
ELECTRIC · WIRING
CONTRACTOR
EDMUNDS · ELECTRICAL
CONSTRUCTION · CO ·

Cast Bronze Tablet

BARNES WIRE FENCE CO.

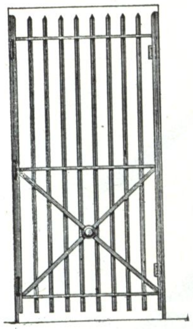
Ornamental Iron and Wire Work and Wire Signs

10371 Northlawn Avenue
DETROIT, MICH.

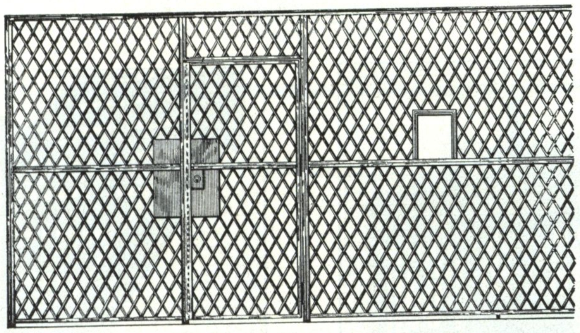
Products

Fences (Wire and Iron) for all purposes: Folding, Sliding and Swing Gates; Wire Partitions: Iron Porch Railings: Wire and Iron Window Guards.

Also Waste Paper Consumers.

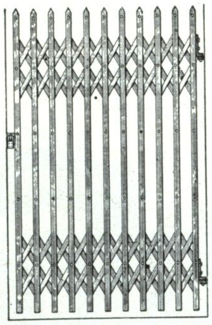


No. 31 Wrought Iron Bar Gate



No. 40 Wire Factory Partition

Made of round steel wire crimped and interwoven (varies from 1 to 2 in.) diamond mesh with channel iron frame. Black finish

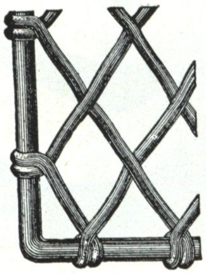


No. 50 Wrought Iron Folding Gate

Made of flat iron usually ⅝ in. x ⅛ in.

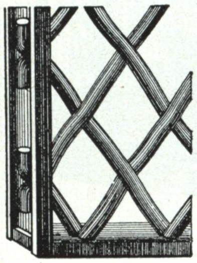
No. 10 Wire Guard with Round Frame

No. 10 guard is particularly suitable for school windows or for basement and bulkhead windows. It is usually secured to wood frame with staples and to steel sash with "J" bolts



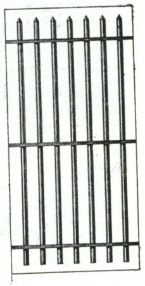
No. 12 Wire Guard with Channel Frame

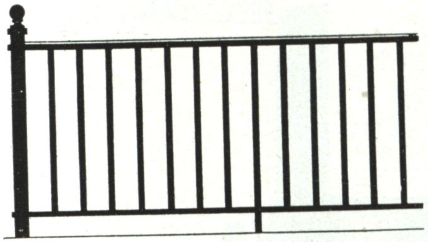
No. 12 guard is particularly suited for installation where heavy construction is desired, such as store and factory windows. It is secured to wood frame with wood screws, and to brick jamb with expansion bolts



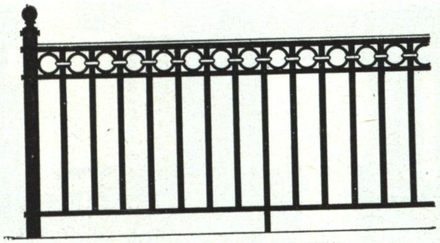
No. 30 Wrought Iron Guard

No. 30 is particularly applicable where maximum protection is desired, such as in bank, store or factory windows. It is usually anchored in masonry when building is under construction. It is generally secured to brick jamb with expansion bolts. No. 30 is usually made of ⅝-in. round upright iron bars spaced 3½ in. apart.

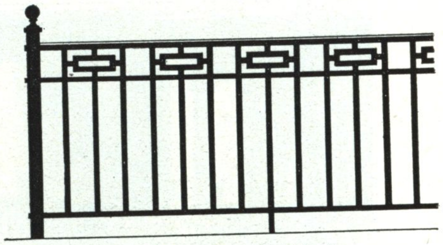




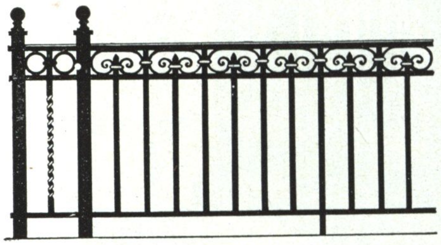
No. 4 Iron Porch Rail



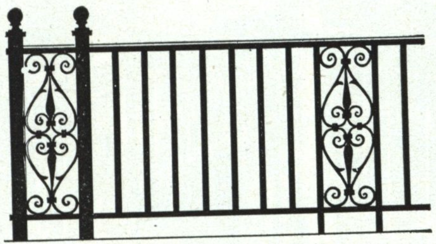
No. 2 Iron Porch Rail



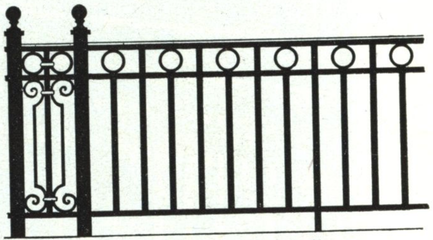
No. 5 Iron Porch Rail



No. 19 Iron Porch Rail



No. 20 Iron Porch Rail



No. 21 Iron Porch Rail

Barnes Iron Porch Railings

These railings are usually made of ½-in. square bars spaced 4 in. apart with channel iron rails and half oval cover bar. Height, 26 in. Other designs offered upon application

THE BUILDING PRODUCTS CO.

Ornamental Iron Workers

Summit Street and Sandusky Avenue
TOLEDO, OHIO

BRANCH OFFICES: COLUMBUS AND DAYTON, OHIO
REPRESENTATIVES:—PRINCIPAL CITIES

Products

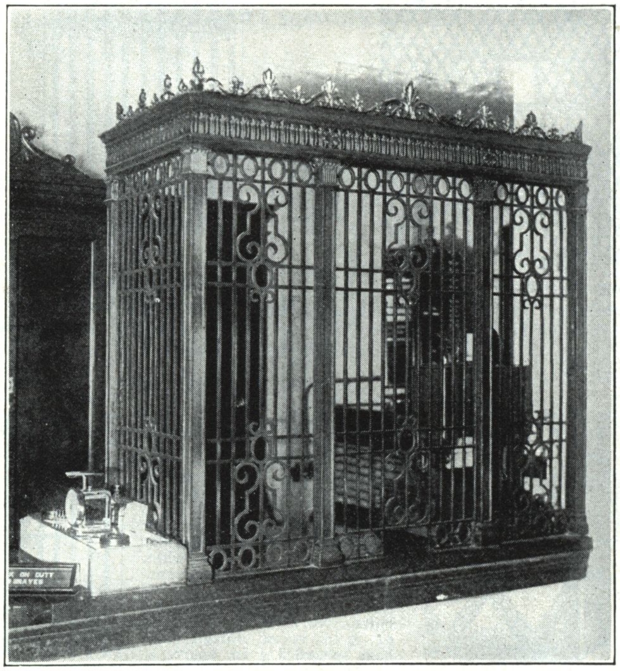
Ornamental Ironwork, including Elevator Enclosures, Fire Escapes, Pipe Railings, Store Fronts, Ornamental Grilles, Area Gratings, Sidewalk Doors, Ladders, Fences, etc.

Pressed Steel Stairs.

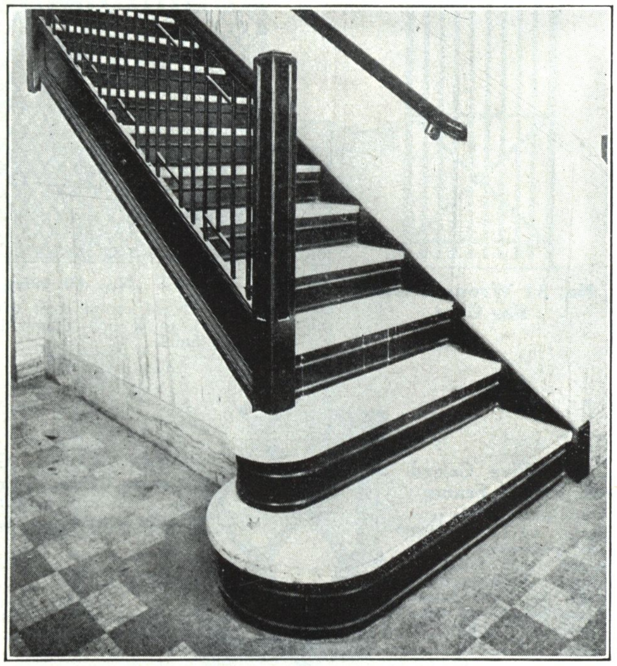
Service to the Architect

Our engineering staff is entirely at your service for suggestions, sketches and estimates.

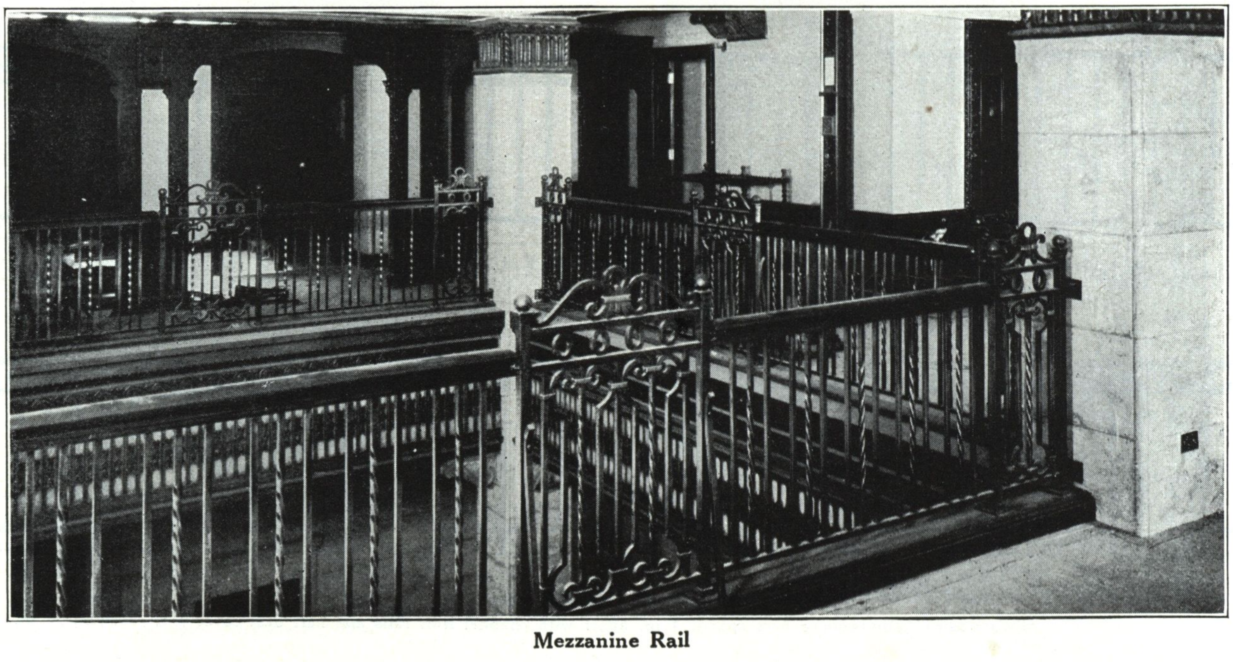
Where specifications are furnished our organization is prepared and qualified to carry them out to the last detail.



Cashier's Cage

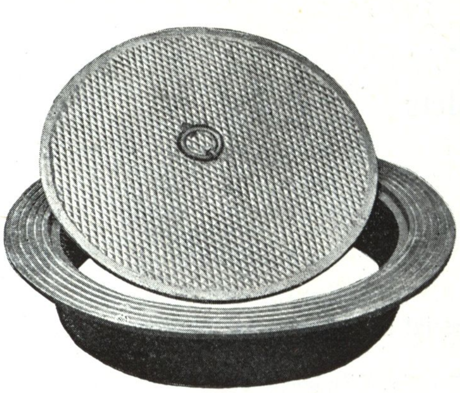


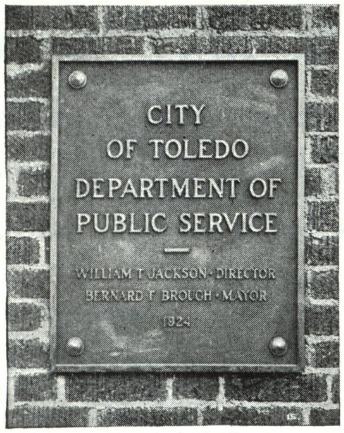
Pressed Steel Stairs



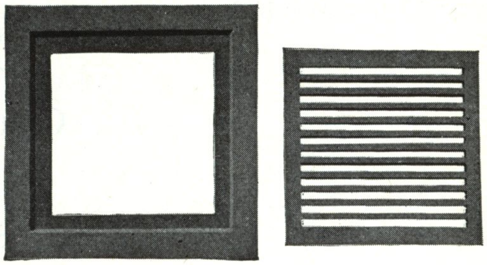
Mezzanine Rail

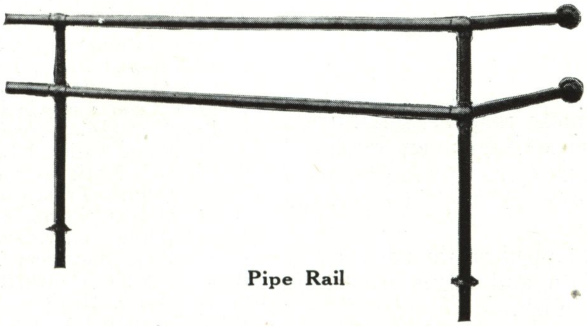
Continued on next page

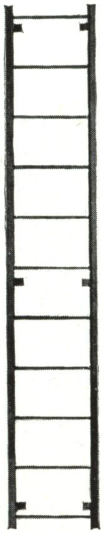

Manhole Cover

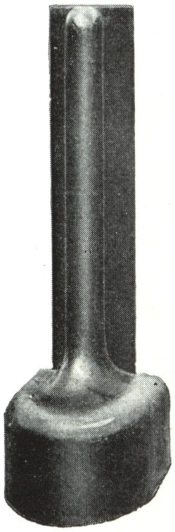


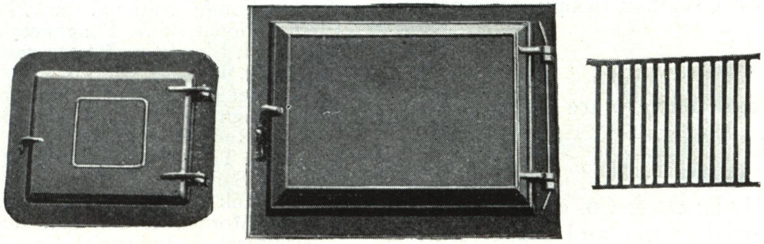
Bronze Tablet


Sump Pit Frame and Cover


Pipe Rail


Ladder


Wheel Guard


Large and Small Cleanout Doors and Vent Grating

A Few Commissions Recently Executed

Building	Contractor	Architect
Toledo Club, Toledo, Ohio	Henry J. Spieker Co., Toledo, Ohio	Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio
U. S. Veterans Memorial Hospital, Kings Park, N. Y.	M. Kantrowitz, Albany, N. Y.	S. W. Jones, State of New York
Mearick Building, Dayton, Ohio	H. R. Blagg Co., Dayton, Ohio	Schenck & Williams, Dayton, Ohio
St. Ignatius Church, Cleveland, Ohio	John Grant & Son, Cleveland, Ohio	E. T. P. Graham, Boston, Mass.
Aquinas College, Columbus, Ohio	Frank O'Hare Co., Inc., Chicago, Ill.	Fred E. Gilson, Columbus, Ohio
St. Vincents Hospital, Toledo, Ohio	J. H. Berkebile & Sons, Toledo, Ohio	Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio
St. Patricks School, Watervliet, N. Y.	Great Lakes Construction Co., Chicago, Ill.	O'Brien & Bial, Watervliet, N. Y.
Women's Dormitory, Granville, Ohio	Hodges-Erwin Co., Cincinnati, Ohio	A. W. Brunner, New York, N. Y.
Providence Hospital, Sandusky, Ohio	Walsh & Braun, Sandusky, Ohio	Millott & Parker, Sandusky, Ohio
Fort Meigs Hotel, Toledo, Ohio	A. Bentley & Sons Co., Toledo, Ohio	Sidney Aftel, Toledo, Ohio
Commercial Bank & Savings Co., Bowling Green, Ohio	Leo. Herman, Edgerton, Ohio	Simons, Brittain & English, Pittsburgh, Pa.
Gymnasium and Administration Building, Newark, Ohio	O. J. Hawkins & Son, Newark, Ohio	Vernon Redding & Associates, Mansfield, Ohio
Ohio Soldiers and Sailors Home, Xenia, Ohio	McCurran Bros., Xenia, Ohio	Herbert B. Briggs, Columbus, Ohio
Childrens Hospital, Cincinnati, Ohio	Hodges-Erwin Co., Cincinnati, Ohio	Elzner & Anderson, Cincinnati, Ohio
Galion High School, Galion, Ohio	Alfred Schnurr, Sandusky, Ohio	Althouse & Jones, Mansfield, Ohio
Immaculate Conception School, Ottoville, Ohio	Baker & Shindler Contr. Co., Defiance, Ohio	DeCurtin & Rawson, Lima, Ohio
Hudson Apartments, Toledo, Ohio	Watts-Suhrbier Co., Toledo, Ohio	Bollinger & Hayes, Toledo, Ohio
Findlay High Schools, Findlay, Ohio	Orr & Miller, Lima, Ohio	T. D. McLaughlin, Lima, Ohio
Flower Hospital, Toledo, Ohio	Watts-Suhrbier Co., Toledo, Ohio	Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio
Notre Dame Novitiate, Toledo, Ohio	Henry J. Spieker Co., Toledo, Ohio	Bates & Gamble, Toledo, Ohio

ESTABLISHED 1878 INCORPORATED 1899

C. H. BUCK & CO.

Cast Bronze Letters and Tablets

743 East Sixth Street
SOUTH BOSTON, MASS.

Products

Stock Cast Bronze Letters in Architectural, Gothic and Scotia Styles.

Also Tablets, Cast or Fabricated, for banks, churches and memorials.

Showcases of bronze and copper for exterior use.

Metal Signs and Name Plates.

Desk Signs.

Federal Reserve Bank Signs.

Cast Bronze Letters

Style "A" is carried in more than 35 sizes, from 1 to 15 inches high and in condensed, regular and extended widths. Included in the various fonts are the long-tail "R" and broad "C," "G," "O" and "Q." Gothic and Scotia styles are also stocked.

All letters are drilled and tapped on the back, ready for immediate shipment. Face and edges of letters larger than 6 inches are sand finish.

Designs and Estimates

Work of special or irregular design estimated on specifications.

Service

Prompt attention and delivery are foremost in the execution of contracts.

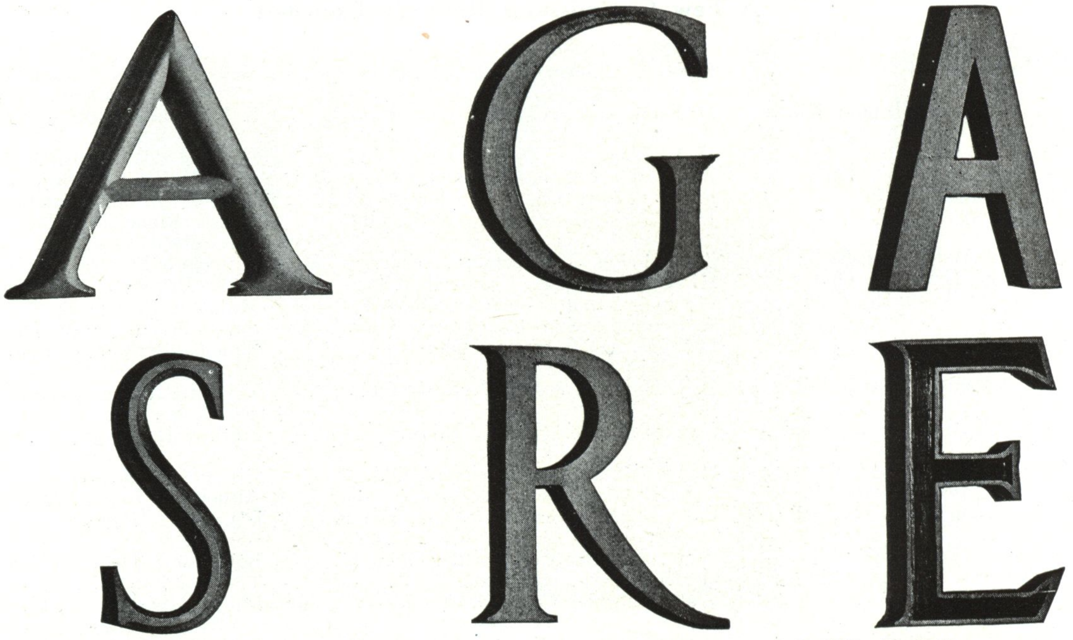
Facilities for Special Work

The shops of C. H. Buck & Co. are equipped for the manufacture of special bronze and copper work as well as the standard stock productions.

Customers

Users of special and stock cast bronze letters and tablets:

Concrete Brick & Tile Co., Glendale, Cal.
Union League Club, San Francisco, Cal.
Riverside Trust Co., Hartford, Conn.
First National Bank, Monticello, Ill.
Woman's Relief Corps, Ashburnham, Mass.
Atlantic National Bank, Boston, Mass.
Federal National Bank, Boston, Mass.
First National Bank, Boston, Mass.
City Departments, Boston, Mass.
Chelsea Trust Co., Chelsea, Mass.
Dedham Institution for Savings, Dedham, Mass.
Safety Fund National Bank, Fitchburg, Mass.
Old Lowell National Bank, Lowell, Mass.
Bristol County Trust Co., Taunton, Mass.
Besse System Stores, New England and other States
Liggett Drug Co., New England and other States
United Shoe Machinery Corp., New England and other States
Banco de Sonora Sucursal, Mexico
O. A. Carles, Mexico
Administration Building, Yucatan, Mex.
Jacklin Gymnasium, University of Missouri
Carroll County Trust Co., Conway, N. H.
Cayuga County National Bank, New York State
First National Bank, Poughkeepsie, N. Y.
Andrew J. Lloyd Co., Boston and Worcester, Mass., and Providence, R. I.
The Outlet Department Store, Providence, R. I.
Sunset Sign System, San Antonio, Tex.
City of Rutland, Rutland, Vt.
Hawaiian Trust Co., Honolulu, T. H.
Chase & Sanborn, United States and Canada
Union Bank of Halifax, Nova Scotia
Sanchez-Morales & Co., San Juan, P. R.
Agricultural & Industrial Co., Del Paraiso Novillero, South America



Cast Bronze Letters for Banks, Hospitals, Libraries and Public Buildings

ESTABLISHED 1844

THE CINCINNATI MFG. CO.

Ornamental Bronze and Iron Work

MAIN OFFICE AND FACTORY

Corner Evans and Gest Streets

CINCINNATI, OHIO

Products

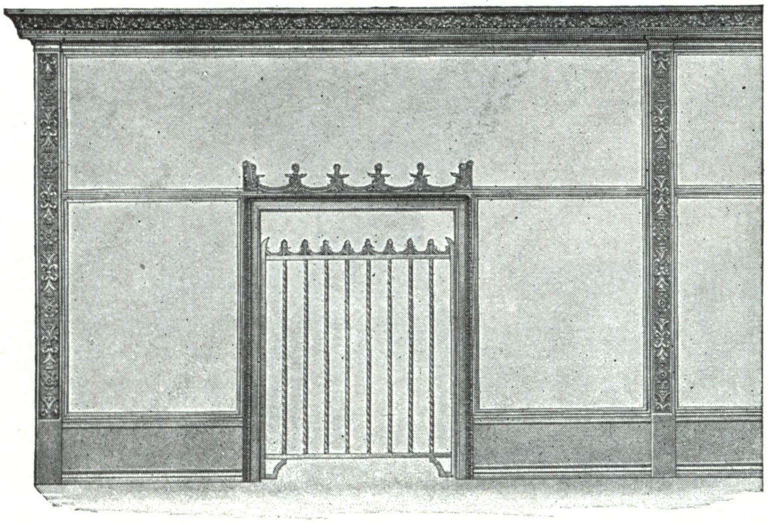
High grade ARCHITECTURAL and ORNAMENTAL WORK in BRONZE, BRASS and IRON, including:

Metal Work for Banks; Mausoleum Bronze; Memorial Tablets and Bronze Signs; Elevator Enclosures and Cars; Wire and Iron Work; Railings; Wickets and Grilles; Check Desks; Tubular Railings; Tellers' Cages; Window Guards; Machinery Guards; Collapsing Gates.

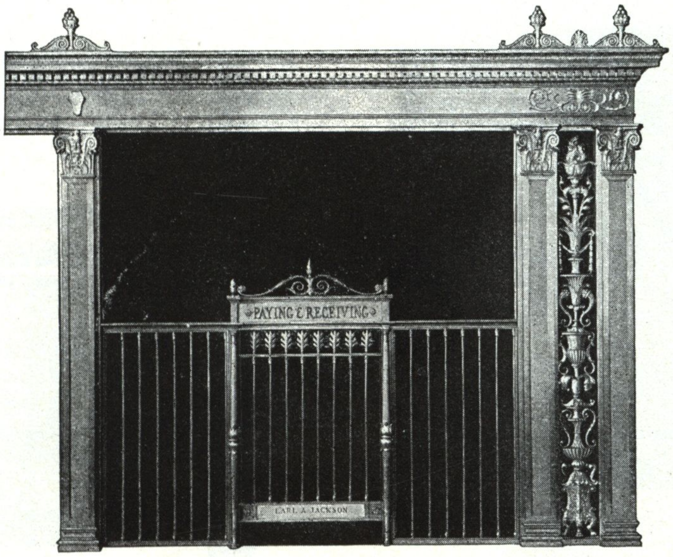
For Kalamein and Hollow Metal Doors, see page 868.

Bank Work

Catalogue No. 50, illustrating some of the work executed by this company from architects' drawings and our own designs, and illustrating some stock specialties, sent on request.



BRONZE AND GLASS COUNTER SCREEN, GUARANTEE TITLE & TRUST CO., COLUMBUS, OHIO
FRANK L. PACKARD, Architect Executed by THE CINCINNATI MFG. CO.



BRONZE AND GLASS COUNTER SCREEN, ASHLAND NATIONAL BANK, ASHLAND, KY.
SCHENCK & WILLIAMS, Architects Executed by THE CINCINNATI MFG. CO.

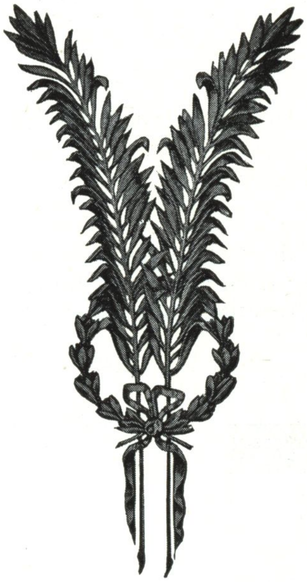
Continued on next page

Mausoleum and Memorial Bronze

Designs modeled and cast. Work executed includes mausoleum doors, window guards, gates, catacomb handles and rosettes, tee handles, floor lifts, ceiling hangers, frames for glass panels, vent grilles, etc.

Memorial and honor roll tablets, insignia, wreaths, urns and vases.

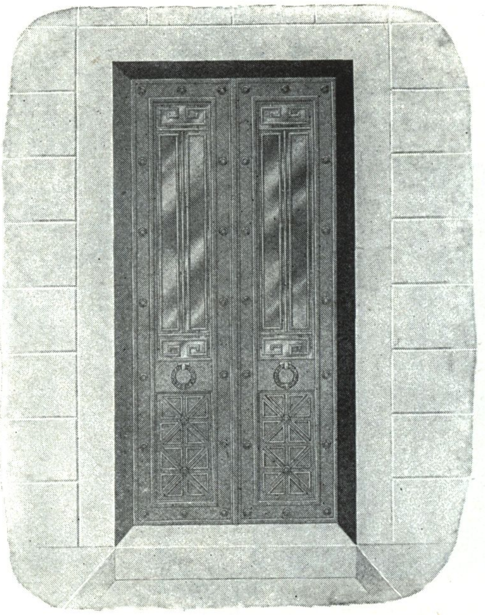
Catalogue No. 52 sent on request.



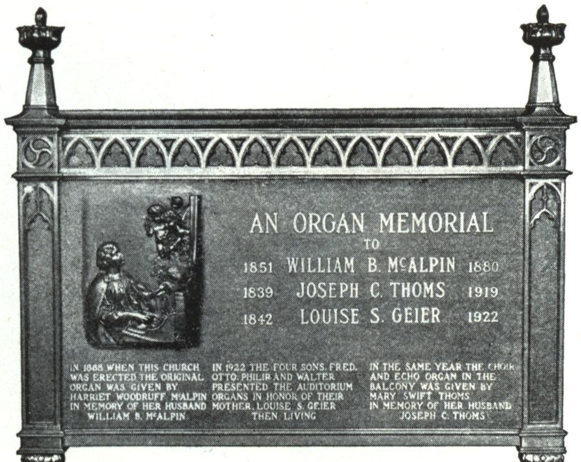
Bronze Palm Leaves with Wreath

Cast Bronze Eagle and Base
Schenck & Williams, Architects

Cast Bronze Urn



No. 798. Mausoleum Door


AN ORGAN MEMORIAL
TO
1851 WILLIAM B. McALPIN 1880
1839 JOSEPH C. THOMS 1919
1842 LOUISE S. GEIER 1922
IN 1868 WHEN THIS CHURCH WAS ERECTED THE ORIGINAL ORGAN WAS GIVEN BY HARRIET WOODRUFF McALPIN IN MEMORY OF HER HUSBAND WILLIAM B. McALPIN
IN 1922 THE FOUR SONS, FRED, OTTO, PHILIP AND WALTER PRESENTED THE AUDITORIUM ORGANS IN HONOR OF THEIR MOTHER, LOUISE S. GEIER THEN LIVING
IN THE SAME YEAR THE CHOIR AND ECHO ORGAN IN THE BALCONY WAS GIVEN BY MARY SWIFT THOMS IN MEMORY OF HER HUSBAND JOSEPH C. THOMS

Cast Bronze Tablet

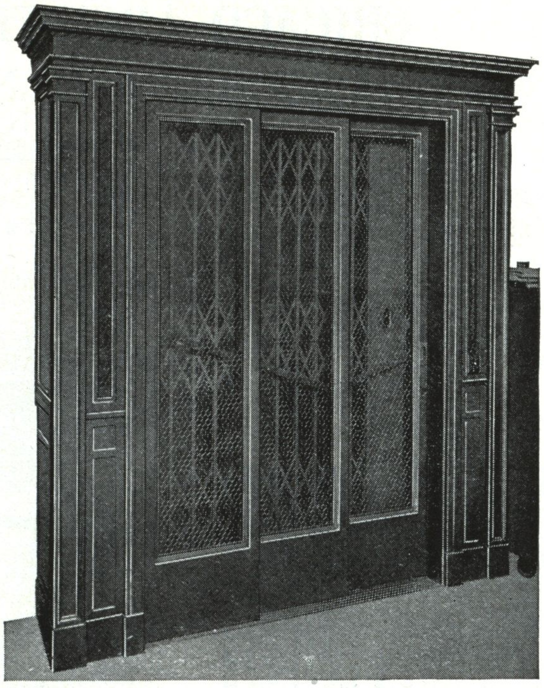
Continued on next page

Elevator Enclosures and Cars

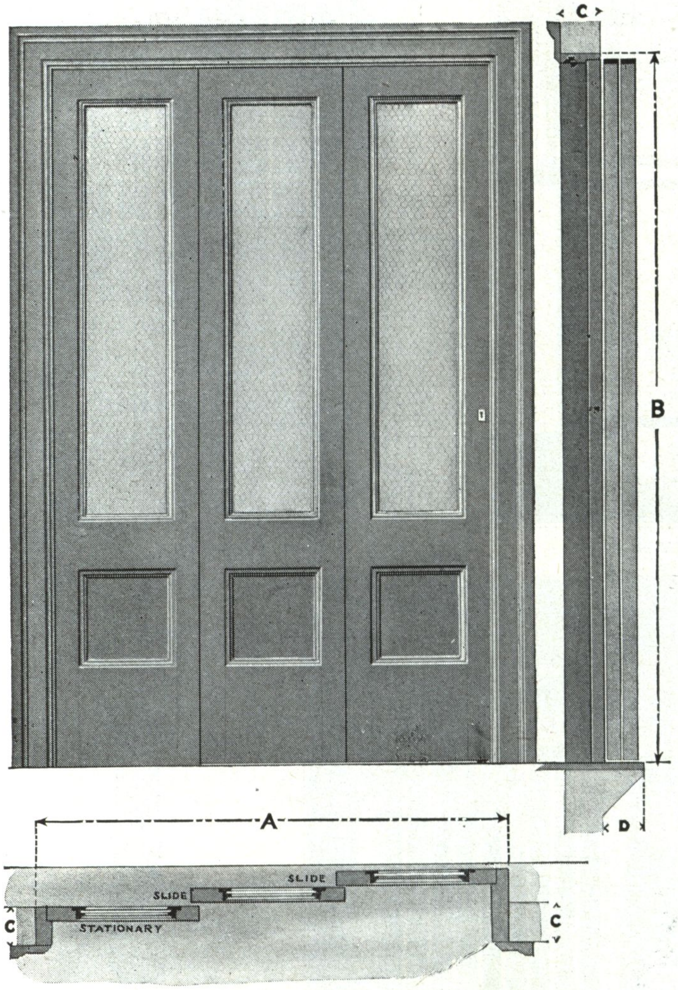
Elevator enclosures in grille designs or with wire glass panels, made in kalamein or hollow metal construction, with collapsing gates. Made in any wood finish desired.

Elevator cars to match, made of Armco polished furniture steel, finished in baked enamel in any wood finish desired.

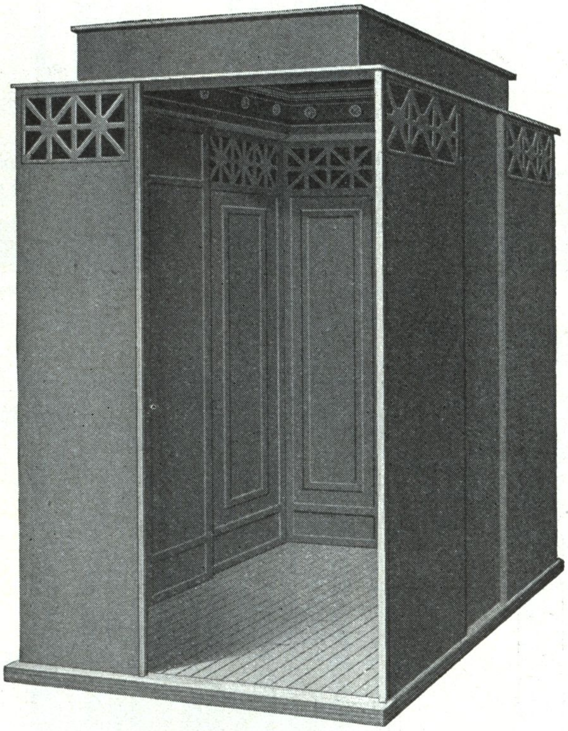
Catalogue No. 54 sent on request.



Elevator Enclosure—Push Button Type with Collapsing Gates



Elevator Doors—Two-thirds Opening Sliding Doors



No. C-152. Elevator Car

CHICAGO ARCHITECTURAL BRONZE CO.

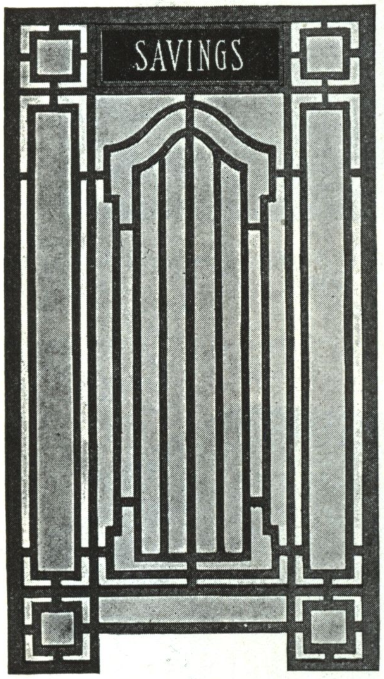
TELEPHONE
RAVENSWOOD 8945

4740-4742 North Clark Street
CHICAGO, ILL.

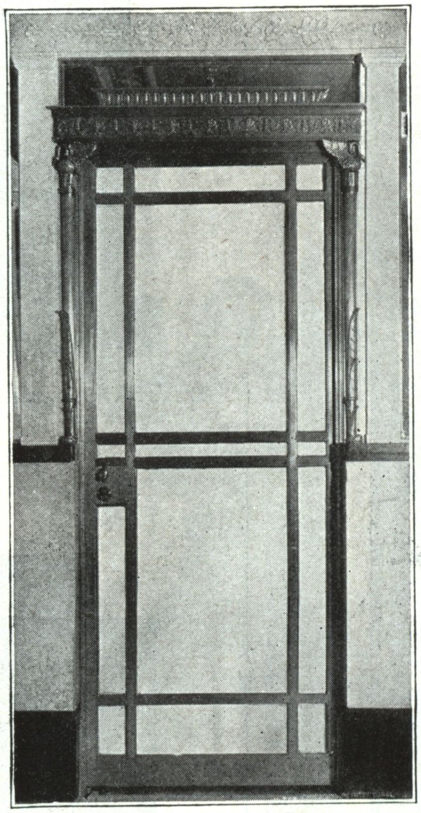
Products

Manufacturers of high grade ARCHITECTURAL BRONZE WORK, including:

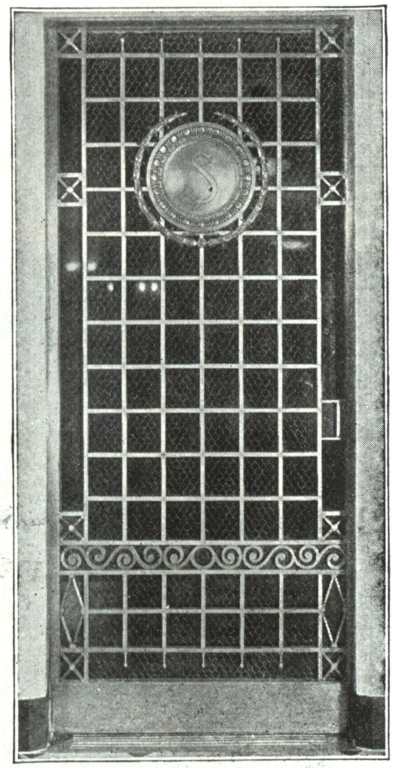
Bank Counter Screens, Grilles, Wickets and Gates.
Memorial Bronze Tablets and Honor Rolls.
Brass and Bronze Railings.
Bronze Lamps.
Cast Bronze Signs and Desk Name Plates.
Mausoleum Doors and Equipment.
Bas-relief and Statuary.
Bronze Entrance Doors and Grilles.
Threshholds and Kick Plates.
Cast Bronze Letters.



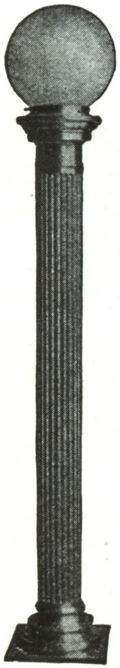
BRONZE WICKET



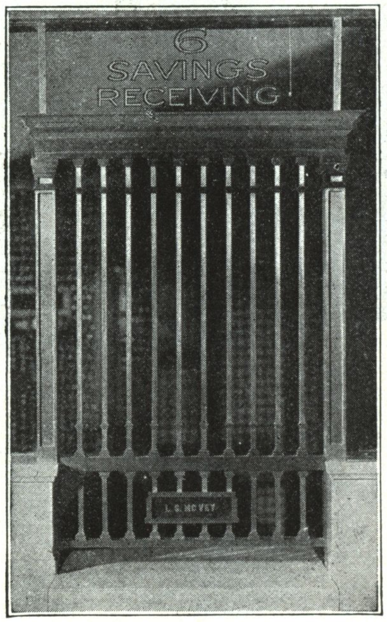
BRONZE MIRROR DOOR



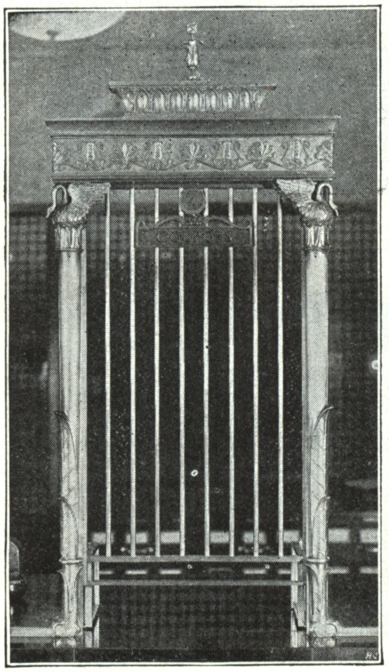
BRONZE ELEVATOR DOOR



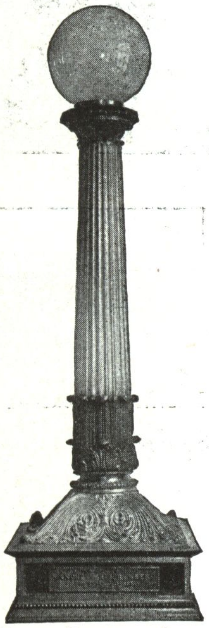
CAST BRONZE LAMP STANDARD



BRONZE WICKET



BRONZE WICKET



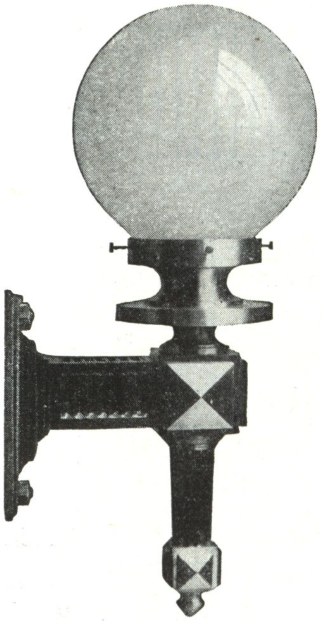
CAST BRONZE LAMP STANDARD

Continued on next page

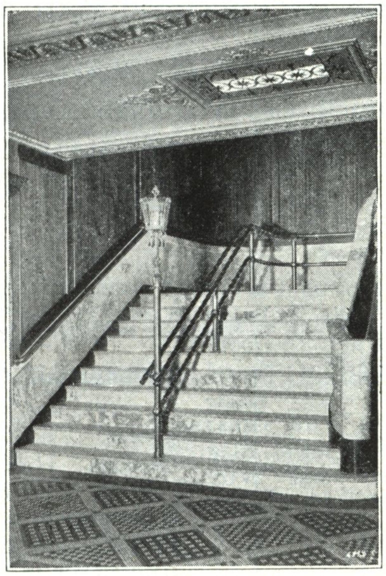
Facilities

The shops of the Chicago Architectural Bronze Co. are equipped for the exclusive manufacturing of high grade bronze work, from the plainest to the most ornate.

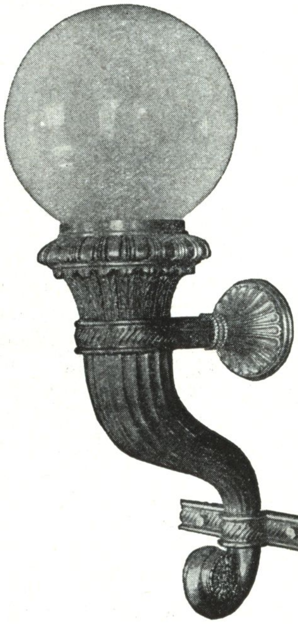
Competent designers and sculptors are on the staff. Skilled chasers give exceptional care to finishing.



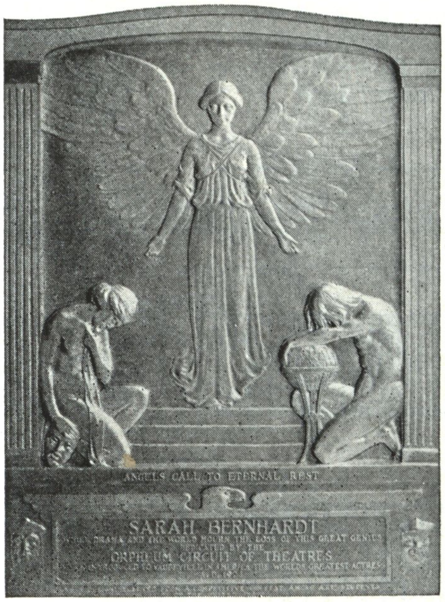
Bronze Bracket Lamp



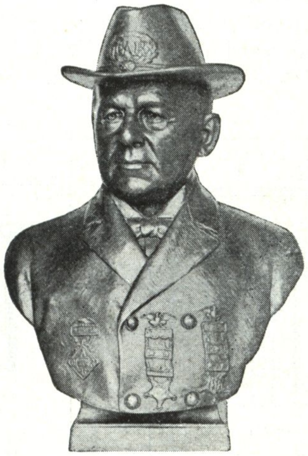
Bronze Railings



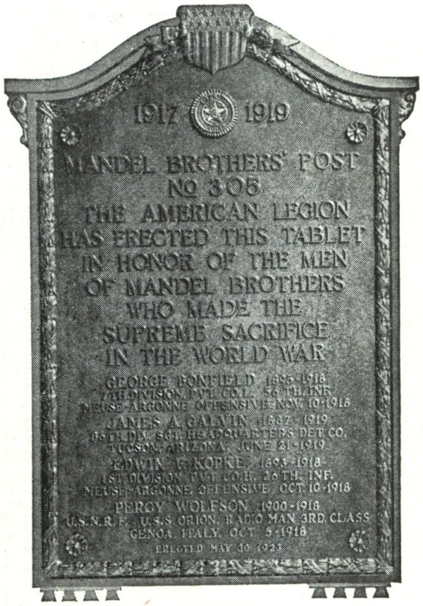
Bronze Bracket Lamp


ANGELS CALL TO ETERNAL REST
SARAH BERNHARDT
ORPHEUM CIRCUIT OF THEATRES

Bronze Memorial Tablet

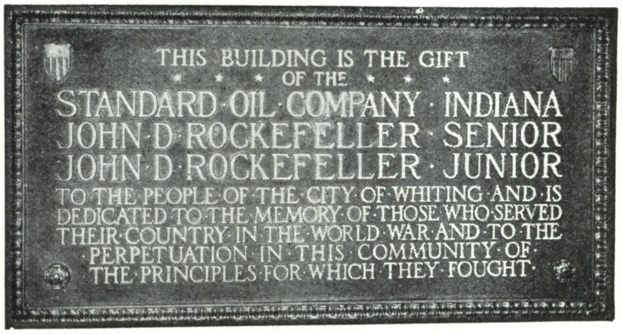


Bronze Bust


1917 1919
MANDEL BROTHERS' POST
No 305
THE AMERICAN LEGION
HAS ERECTED THIS TABLET
IN HONOR OF THE MEN
OF MANDEL BROTHERS
WHO MADE THE
SUPREME SACRIFICE
IN THE WORLD WAR
PERCY WOLFSON 1900-1918
U.S.S. ORION RADIO MAN 3RD CLASS
GENOA ITALY OCT 5-1918

Bronze Memorial Tablet

Cast Bronze Honor Roll Tablet


THIS BUILDING IS THE GIFT
OF THE
STANDARD·OIL·COMPANY·INDIANA
JOHN·D·ROCKEFELLER·SENIOR
JOHN·D·ROCKEFELLER·JUNIOR
TO·THE·PEOPLE·OF·THE·CITY·OF·WHITING·AND·IS
DEDICATED·TO·THE·MEMORY·OF·THOSE·WHO·SERVED
THEIR·COUNTRY·IN·THE·WORLD·WAR·AND·TO·THE
PERPETUATION·IN·THIS·COMMUNITY·OF
THE·PRINCIPLES·FOR·WHICH·THEY·FOUGHT·

Cast Bronze Tablet

ESTABLISHED 1883

THE COLUMBUS WIRE & IRON WORKS CO.

Ornamental and Architectural Wire and Iron Work

MAIN OFFICE AND PLANT
Poplar and Michigan Avenues
COLUMBUS, OHIO

Products

ORNAMENTAL and MISCELLANEOUS IRON and WIRE WORK: including Stair, Balcony and Porch Railings; Grilles; Wire and Iron Window Guards; Entrance Doors and Gates; Steel Folding Gates; Bank Screens; Spiral Stairs; Fire Escapes; Pipe Railings; Area Gratings; Columbus Standard Wire Partitions; Wire Signs; Skylight Guards; Cold Air Screens; Flagpoles, Flag Stands; and many other Light Steel and Wire Products.

Facilities

We have a complete Engineering and Designing Department and are prepared to submit designs and specifications for special work. We also furnish estimates on architects' plans and specifications, giving complete estimate on all work required for entire building as covered by ornamental iron specifications.

Our plant covers 22000 sq. ft. of floor space and is equipped with best of modern metal working machinery. We employ mechanics of long experience.

Our own private switch connects with all railroads in and out of Columbus, which is a natural railroad center.

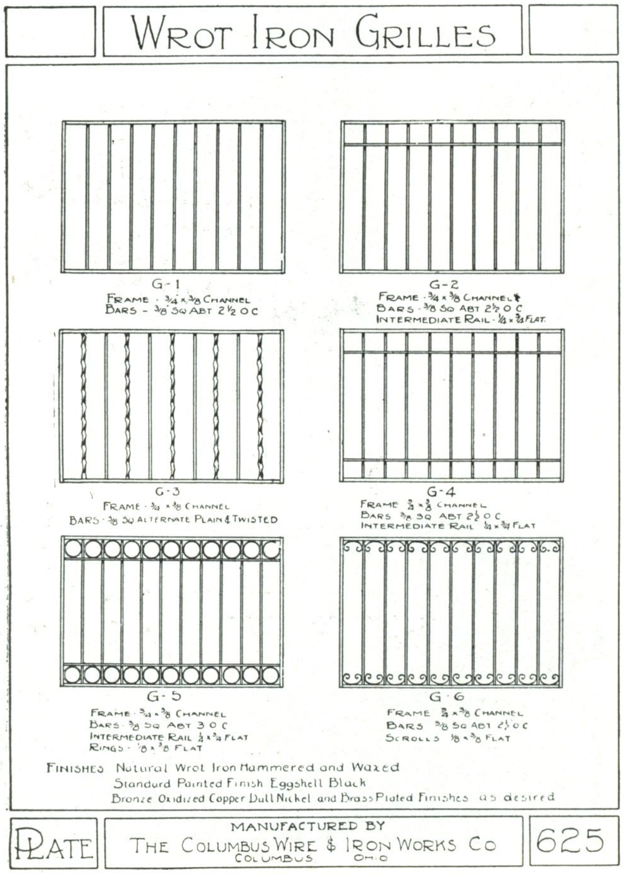
Railings and Grilles

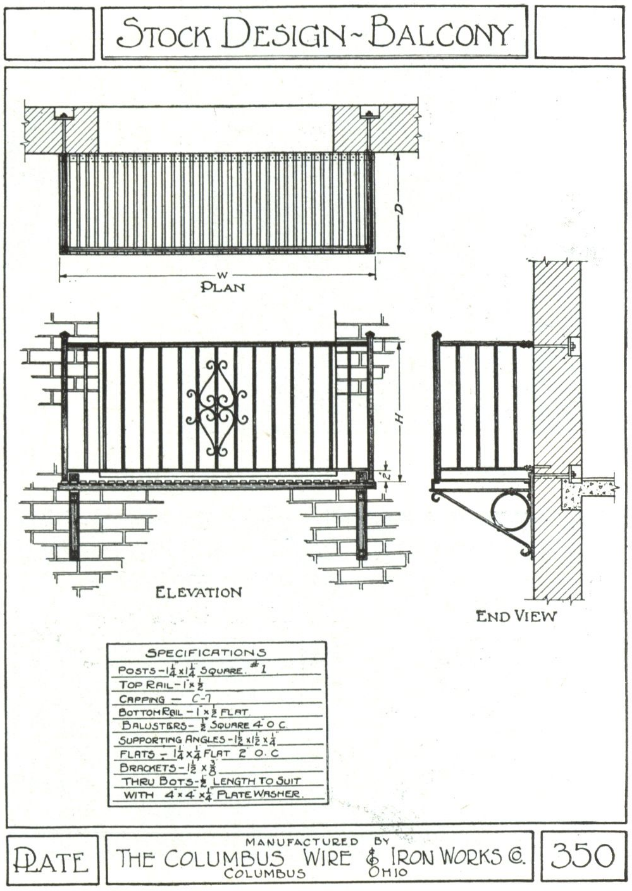
We specialize on ornamental iron railings and grilles. The following plates show some of our stock designs. These and many others of special designs to suit the different periods of architecture may be used with pleasing effect. We furnish these railings and grilles in the natural iron hammered and waxed finish, painted, or in the wide range of plated finishes.

Additional Plates of Stock Designs

For additional plates of our stock designs, refer to your files under "Ornamental Iron and Wire Work." If not there, send for your copy.

UNITY OF PURPOSE-TO BE JUST
NATIONAL ASSOCIATION ORNAMENTAL IRON AND BRONZE MANUFACTURERS

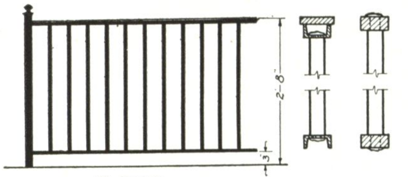

WROT IRON GRILLES
G-1
FRAME - 3/4 x 3/8 CHANNEL
BARS - 3/8 SQ ABT 2½ O C
G-2
FRAME - 3/4 x 3/8 CHANNEL
BARS - 3/8 SQ ABT 2½ O C
INTERMEDIATE RAIL - 1/4 x 3/4 FLAT
G-3
FRAME - 3/4 x 3/8 CHANNEL
BARS - 3/8 SQ ALTERNATE PLAIN & TWISTED
G-4
FRAME 3/4 x 3/8 CHANNEL
BARS 3/8 SQ ABT 2½ O C
INTERMEDIATE RAIL 1/4 x 3/4 FLAT
G-5
FRAME - 3/4 x 3/8 CHANNEL
BARS 3/8 SQ ABT 3 O C
INTERMEDIATE RAIL 1/4 x 3/4 FLAT
RINGS - 1/8 x 3/8 FLAT
G-6
FRAME 3/4 x 3/8 CHANNEL
BARS 3/8 SQ ABT 2½ O C
SCROLLS 1/8 x 3/8 FLAT
FINISHES Natural Wrot Iron Hammered and Waxed
Standard Painted Finish Eggshell Black
Bronze Oxidized Copper Dull Nickel and Brass Plated Finishes as desired
PLATE
MANUFACTURED BY
THE COLUMBUS WIRE & IRON WORKS Co
COLUMBUS OHIO
625


STOCK DESIGN~BALCONY
D
W
PLAN
H
ELEVATION
END VIEW
PLATE
MANUFACTURED BY
THE COLUMBUS WIRE & IRON WORKS Co.
COLUMBUS OHIO
350

SPECIFICATIONS
POSTS - 1¼" x 1¼" SQUARE. #1
TOP RAIL - 1" x ½
CAPPING — C-7
BOTTOM RAIL - 1" x ½ FLAT
BALUSTERS - ½" SQUARE 4" O C
SUPPORTING ANGLES - 1½ x 1½ x ¼"
FLATS - 1¼ x ¼ FLAT 2" O. C
BRACKETS - 1½ x 3/8
THRU BOTS - ½ LENGTH TO SUIT
WITH 4" x 4" x ¼" PLATE WASHER.

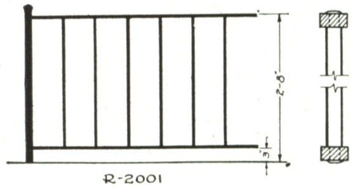
Continued on next page

STOCK DESIGNS~RAILINGS



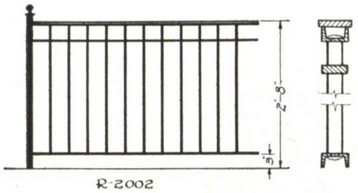
R-2000

SPECIFICATIONS.
POST - 1"x1" SQUARE #3
TOP RAIL - 1"x½" CHANNEL.
CAPPING - 1¼"x¼" FLAT
BARS - ½"x½" SQUARE 4" O.C
BOTTOM - 1"x½" CHANNEL.



R-2001

SPECIFICATIONS.
POST - 1¼"x1¼" SQUARE #1
TOP RAIL - 1"x½" FLAT
BARS - ⅝"x⅝" SQUARE 7" O.C.
BOTTOM - 1"x½" FLAT.

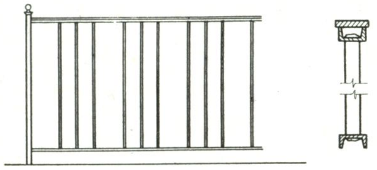


R-2002

SPECIFICATIONS.
POST - 1"x1" SQUARE #3
TOP RAIL - 1"x½" CHANNEL
CAPPING - 1¼"x¼" FLAT
INTERMEDIATE RAIL - 1"x¼" FLAT
BARS - ½"x½" SQUARE 4" O C.
BOTTOM RAIL - 1"x½" CHANNEL

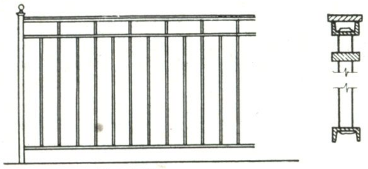
PLATE | MANUFACTURED BY THE COLUMBUS WIRE & IRON WORKS CO COLUMBUS OHIO | 403

STOCK DESIGNS~RAILINGS



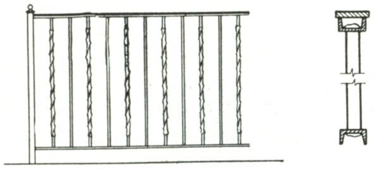
R 2003

SPECIFICATION
TOP RAIL - 1x½ CHANNEL
CAPPING - ¼x1¼ FLAT
BAR - ½ SQ BARS 4"-4 & 6 OC
BOTTOM RAIL - 1x½ CHANNEL
POST - 1" SQUARE #3



R 2004

SPECIFICATION
TOP RAIL - 1x½ CHANNEL
CAPPING - ¼x1¼ FLAT
BAR - ½ SQUARE 4" O C
BOTTOM RAIL - 1x½ CHANNEL
POST - 1" SQUARE #3
INTERMEDIATE RAIL - ⅜"x1" FLAT

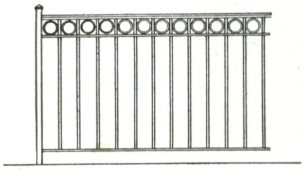


R-2005

SPECIFICATION
TOP RAIL - 1"x½ CHANNEL.
CAPPING - ¼"x1¼ FLAT
BARS TWISTED & STRAIGHT
½ SQUARE
BOTTOM RAIL - 1 x ½ CHANNEL
POST - 1" SQUARE #3

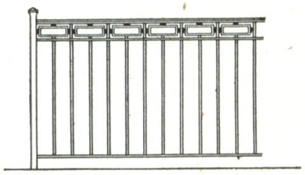
PLATE | MANUFACTURED BY THE COLUMBUS WIRE & IRON WORKS CO COLUMBUS OHIO | 404

STOCK DESIGNS~RAILINGS



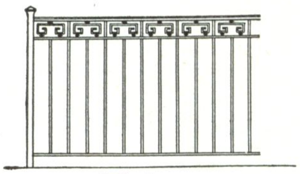
R-2006

SPECIFICATIONS.
POST - 1¼"x1¼" SQUARE #1
TOP RAIL - 1"x½" FLAT.
BARS - ½"x½" SQUARE 4" O.C.
INTERMEDIATE RAIL - 1"x¼" FLAT.
BOTTOM RAIL - 1"x½" FLAT.
RINGS - 3/16"x⅜ FLAT



R-2007

SPECIFICATIONS.
POST - 1¼"x1¼" SQUARE. #1
TOP RAIL - 1"x½" FLAT
BARS - ½"x½" SQUARE 4" O.C.
INTERMEDIATE RAIL - 1"x¼" FLAT.
BOTTOM RAIL - 1"x½" FLAT.
RECTANGLES - 9/16"x⅜" FLAT.

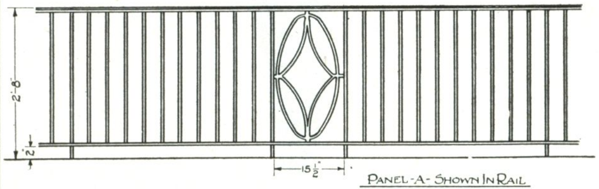


R-2008

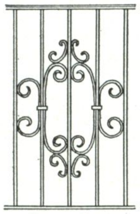
SPECIFICATIONS
POST - 1¼"x1¼" SQUARE #1
TOP RAIL - 1"x½" FLAT
BARS - ½"x½" SQUARE 4" O.C.
INTERMEDIATE RAIL - 1"x¼" FLAT
BOTTOM RAIL - 1"x½" FLAT
SCROLL - 3/16"x⅜" FLAT

PLATE | MANUFACTURED BY THE COLUMBUS WIRE & IRON WORKS CO COLUMBUS OHIO | 405

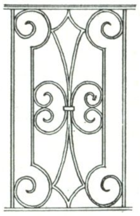
STOCK DESIGNS~RAILING PANELS



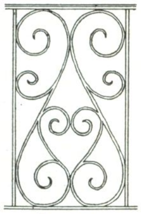
PANEL-A- SHOWN IN RAIL



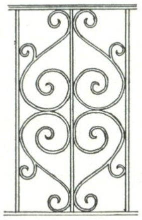
PANEL-B-



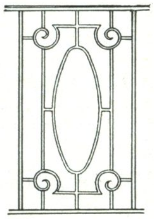
PANEL - C



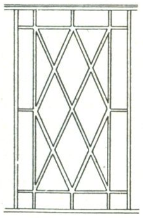
PANEL D



PANEL -E-



PANEL -F-



PANEL G

PLATE | MANUFACTURED BY THE COLUMBUS WIRE & IRON WORKS CO. COLUMBUS OHIO | 402

ORNAMENTAL BRASS AND BRONZE

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

Ornamental Uses

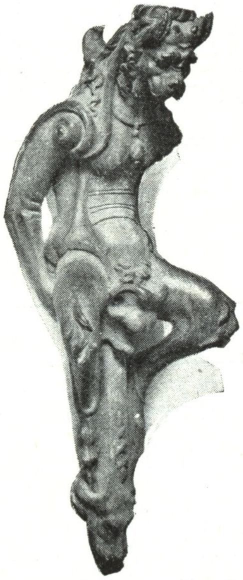
For purposes that are ornamental as well as practical, brass and bronze are the standard metals.

Practical application of these metals in an ornamental way are suggested in the table appearing below.

This Association maintains a Building Service Department which may be consulted concerning the adaptability and application of the metals, and also a Research Department which will advise about composition and kindred subjects.

The Association has literature concerning the coloring of copper and other technical matters and a directory covering more than a score of bronze products made by over one hundred manufacturers. These may be had on request.

Copper and Brass are cheaper because you pay for them only ONCE



Ornamental Bronze Bracket
Firenze—Pallazzo Vecchio, Quartiere degli Elementi. Il Diavolino. (Gior. Bologna—1530-1608)

Base of Bronze Standard
Venezia—Piazza S. Marco. Base di un Porta-Stendardo. (Bronzo di Aless. Leopardi—d. 1545)

SOME ORNAMENTAL USES OF COPPER, BRASS AND BRONZE

1. BALUSTRADES
2. BANK CAGES
3. CHURCH BELLS
4. CHURCH ORNAMENTS
5. DRINKING FOUNTAINS
6. ARCHITECTURAL BRONZE
7. FLAGPOLE BASES
8. GATES
9. GRILLES
10. MAIL BOXES
11. MAIL CHUTES
12. MEMORIALS
13. RAILINGS
14. STAIR NOSINGS AND TREADS
15. SUNDIALS
16. WEATHERVANES

ESTABLISHED 1878

CROWN IRON WORKS COMPANY

Manufacturers of Ornamental Iron and Bronze Work; Fabricators of Structural Steel

MINNEAPOLIS, MINN.

Products

Ornamental Iron, Brass or Bronze Work.
Also Fabricated Structural Steel.

Scope

Below is to be found a list which indicates the general scope of products which we are prepared to furnish:

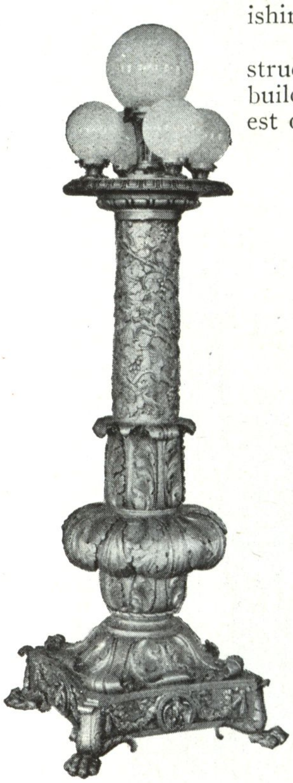
Area gratings
Automobile turntables
Bronze tablets
Coalhole covers
Elevator enclosures and cabs
Fences
Fire escapes
Folding and ornamental iron gates
Joist and wall hangers
Marquises
Metal ladders
Ornamental iron and bronze lamps and brackets
Sidewalk, ash pit, entrance and elevator doors
Steel flagpoles
Stairs, cast iron or steel
Transom bars, cast iron or steel
Wall anchors
Wheel guards
Wire window guards

All kinds of fabricated structural steel.
Distributers for Page Fence Products.

Facilities

Our plant consists of modernly equipped shops and departments: such as modeling, pattern shop, foundry, structural shop, machine and finishing shops.

This enables us to produce structural steel for large and small buildings, as well as the very finest ornamental work.



Bronze Lamp Standard for Administration Building, University of Minnesota
C. H. Johnston, Architect

Territory

We are prepared to furnish and erect our work in the United States and Canada.

Service

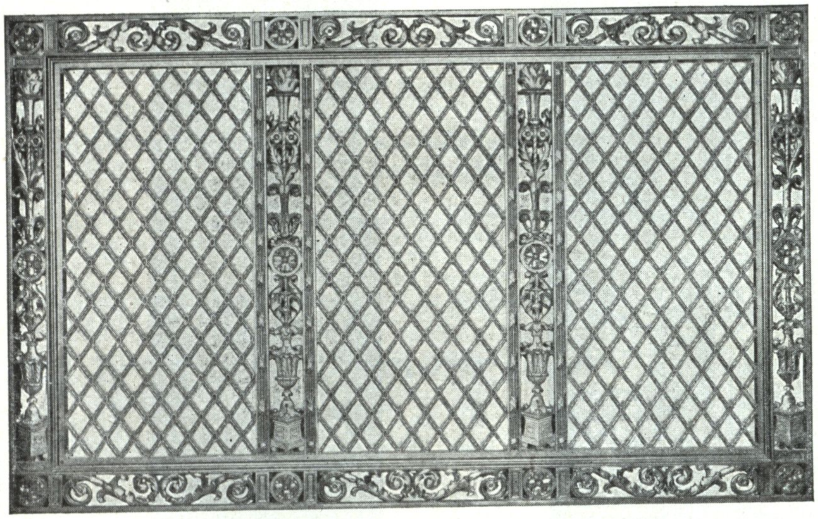
The Engineering and Estimating Departments are always at the service of architects and contractors.

References

Forty-five years of successful business experience are back of us and we have done satisfactory work for nearly every architect in this territory and for many of the leading architects in the east.

Below are given a few of the many buildings for which we have furnished ornamental work and any number of references will be furnished on request:

Lincoln National Bank, Minneapolis, Minn., Long, Lamoreaux & Thorshov, Architects
Hibbing High School, Hibbing, Minn., W. T. Bray, Architect
Valley National Bank, Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects
Mines Building, Music Building, Engineering Building, Millard Hall, Anatomy Building, Library Building and Administration Building of the University of Minnesota, C. H. Johnston, Architect
Woodbury County Courthouse, Sioux City, Iowa, William L. Steele and Purcell & Elmslie, Associated Architects
Chemistry Building of the University of Nebraska, Coolidge & Hodgdon, Architects
World-Herald Building, Omaha, Neb., Thos. R. Kimball, Architect
Northwestern National Life Insurance Co., Minneapolis, Minn., Hewitt & Brown, Architects
Liberty Building, Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects



Cast Iron Grille for Library Building, University of Minnesota
C. H. Johnston, Architect

DETROIT MAUSOLEUM EQUIPMENT WORKS

CHARLES BOVENSIEP, PROPRIETOR

Designers and Manufacturers of U. S. Standard Bronze Doors and Bronze Equipment for Mausoleums; Bronze Tablets and Honor Rolls

Fourteenth Avenue and Baker Street
(Post Office Box 574)
DETROIT, MICH.

Products

BRONZE DOORS for Public and Private Mausoleums.

CAST BRONZE TABLETS and HONOR ROLLS.

CAST BRONZE LETTERS for Building Exteriors in any style, size or shape.

Also manufacturers of Window Grilles and Frames for Glass; Catacomb Handles and Rosettes; Ceiling Hangers; Ventilators; Gates and all Bronze Equipment used in mausoleum construction; Decorative Bronze Work of all kinds; Bas-reliefs.

Bronze Mausoleum Doors

Construction—Doors are all of the "built-up" type construction. Standard thickness is 1 in., although they can also be made 1⅛, 1¼ and 1⅜ in., or thicker.

Bronze sheets not lighter than No. 14 gauge are riveted with $\frac{3}{16}$-in. bronze rivets placed 3 in. on centers to each side of a substantial core or framing of *solid bronze*. Rivet heads are perfectly countersunk on both sides and hand finished smooth with door surface.

Equipment—Cast bronze door frames or jambs are used occasionally, but doors are usually hung direct to granite jambs. Arranged to swing inward or outward as may be required. Hinges are of heavy cast bronze of the pivotal type.

Cast bronze threshold at bottom. Slam bar over center joint. Slide bolts at top and bottom of left-hand door. Heavy handle on each door.

Rear of grille openings is fitted with plate glass shutters fitted with hinges and turn button lockers. A device at bottom of shutters holds them securely at any angle when opened for ventilation.

Lock is of special heavy type, all-bronze, five tumblers, operating with flat german silver keys. Three keys are furnished.

All screws, bolts and expansion jackets are furnished by us.

Finish—Doors are usually finished in a light statuary bronze finish. The door stiles and all flat parts are hand rubbed with fine emery and pumice to a soft satin finish. The cast ornate parts are given a sanded finish with crevices and recessed portions in a darker tone. All outlines are hand tooled clean and sharp.

Workmanship—Doors are constructed by carefully trained skilled mechanics in a thorough, painstaking manner. Miters, joints, and all connections are neat and accurate. Applied ornaments are all secured from rear of door or "blind screwed."

Guarantee—These doors are constructed of best U. S. Standard Bronze. They are absolutely rigid, level and true, and beautifully finished. They are guaranteed to endure practically for all time.

All work is carefully boxed to insure safe delivery.

Service—All work is made to order, in any size or shape. Architects' special designs and ideas will be carefully followed. The usual time required for execution is 4 to 6 weeks.

Our many years' experience in this field is at your service.

Catalogue—On application.

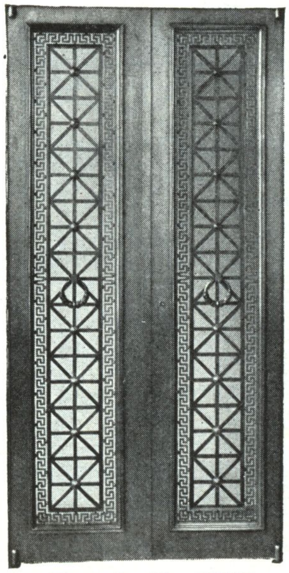


Illustration No. SW100

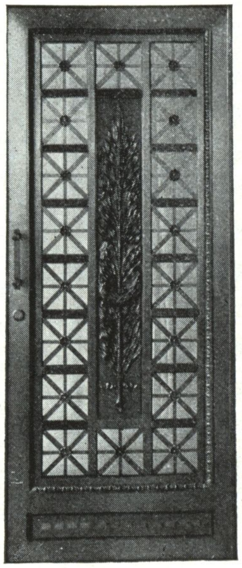


Illustration No. SW101

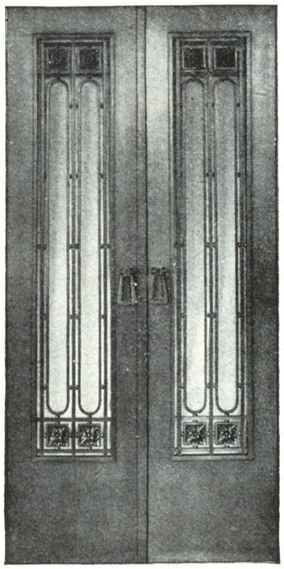


Illustration No. SW102

U. S. Standard Bronze Doors for Mausoleums

Continued on next page

Cast Bronze Tablets

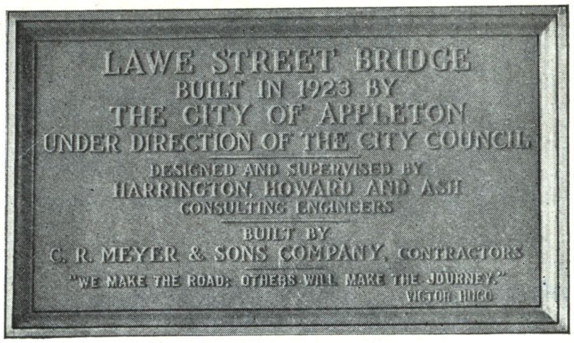
We make a specialty of bronze memorial tablets. These are furnished in stock patterns or are made from architects' details.

General Specifications for Architects—Tablets to be cast in one piece of best genuine U. S. Standard Bronze averaging not less than $\frac{3}{16}$-in. thickness in body. Lettering to be heavily raised and of appropriate size and arrangement. Rubbing or full size detail to be furnished for architect's approval.

Face and edge of border and face of lettering to be finished in a fine satin hand finish. Background or lettering field to have a finely pebbled surface, finished in dark statuary bronze. The outlines of all lettering and borders to be carefully hand tooled clean and sharp. Furnish bronze expansion screws with non-corroding lead expansion jackets for attaching tablet to wall. Heads of screws to be covered with neat rosette with threaded stem entering head of screw.

Note: If tablet is placed indoors, specify "To be heavily lacquered with best quality lacquer." If placed outdoors, specify "To be waxed or oiled."

Note: Background of tablet can be finished in a "Hand Hammered" surface at slightly additional cost.


LAWE STREET BRIDGE
BUILT IN 1923 BY
THE CITY OF APPLETON
UNDER DIRECTION OF THE CITY COUNCIL
DESIGNED AND SUPERVISED BY
HARRINGTON, HOWARD AND ASH
CONSULTING ENGINEERS
BUILT BY
C. R. MEYER & SONS COMPANY, CONTRACTORS
"WE MAKE THE ROAD; OTHERS WILL MAKE THE JOURNEY."
VICTOR HUGO

Design No. SW104

Typical Plain Design for Bronze Tablet

Made in any shape or size desired

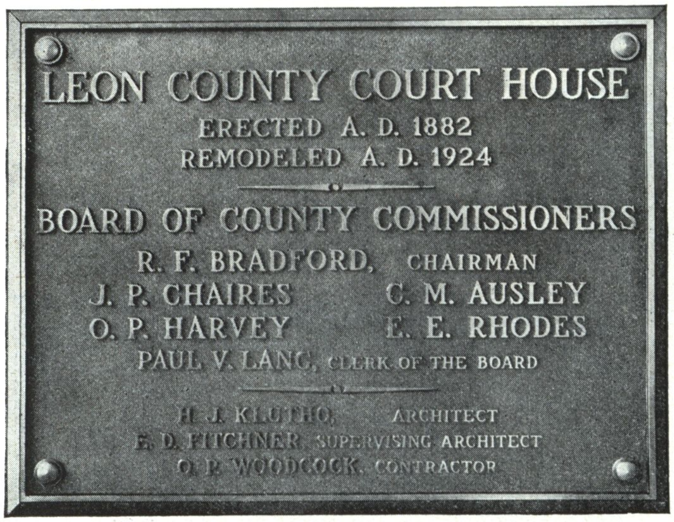

LEON COUNTY COURT HOUSE
ERECTED A. D. 1882
REMODELED A. D. 1924
BOARD OF COUNTY COMMISSIONERS
R. F. BRADFORD, CHAIRMAN
J. P. CHAIRES
C. M. AUSLEY
O. P. HARVEY
E. E. RHODES
PAUL V. LANG, CLERK OF THE BOARD
H. J. KLUTHO, ARCHITECT
E. D. FITCHNER, SUPERVISING ARCHITECT
O. P. WOODCOCK, CONTRACTOR

Illustration No. SW103

Typical Design of Bronze Tablet for Public Buildings

Moulded border and Roman stock style raised lettering.
Made in any shape or size desired

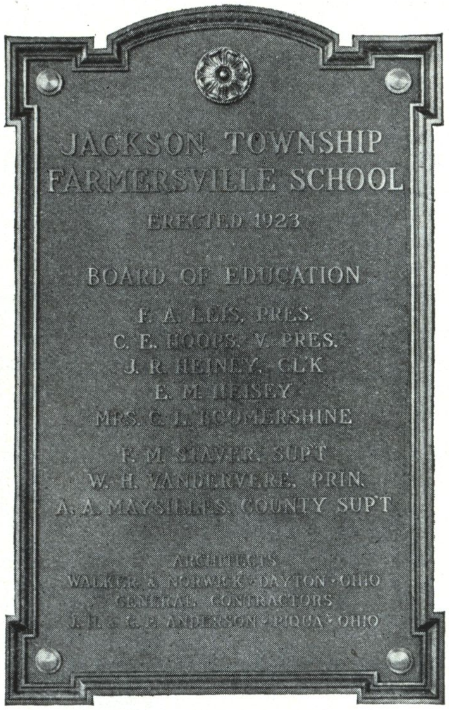

JACKSON TOWNSHIP
FARMERSVILLE SCHOOL
ERECTED 1923
BOARD OF EDUCATION
F. A. LEIS, PRES.
C. E. HOOPS, V. PRES.
J. R. HEINEY, CL'K
E. M. HEISEY
MRS. C. L. BOOMERSHINE
F. M. STAVER, SUPT
W. H. VANDERVERE, PRIN.
A. A. MAYSILLES, COUNTY SUPT
ARCHITECTS
WALKER & NORWICK · DAYTON · OHIO
GENERAL CONTRACTORS
J. H. & G. P. ANDERSON · PIQUA · OHIO

Illustration No. SW105

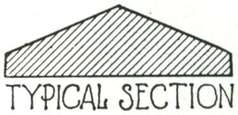
Typical Design of Bronze Tablet for Public Building

Ornate leaf design, Roman stock style raised lettering.
Made in any shape or size desired

Cast Bronze Letters

The style letter illustrated is most generally used and we have adopted it as our standard.

When writing for prices send a scaled sketch showing size of letters desired and length of space where the letters are to be set.


TYPICAL SECTION

Letters can be made flat face, rounded face, incised face, convex or with any other section.

Usually bronze letters are fitted with bronze washers on the rear, so the backs of letters set ½ to 1 in. from surface of wall.

Architects' details for special designs and shapes will be carefully followed.

General Specifications for Architects—Letters to be cast of best U. S. Standard Bronze of size indicated on plans. To be finished in fine sanded statuary bronze and fitted with substantial bronze anchors on rear for cementing to brick, stone, tile, etc. Special cement and liquid to be furnished for setting. Spacing of letters to be approved by architect before setting.

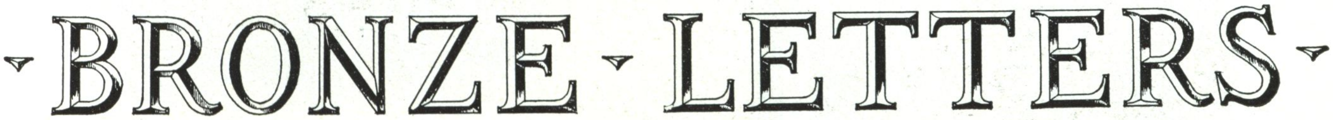

BRONZE LETTERS

Illustration No. SW106

Individual Cast Bronze Letters for Buildings

Standard Roman architectural style

EASTERN BRIDGE & STRUCTURAL CO.

Ornamental and Architectural Iron Work

WORCESTER, MASS.

OFFICE AND FABRICATING SHOPS, 88 Crescent Street, WORCESTER, MASS.

Products

Architectural Iron Work, which includes:

Hand Forged Balustrades, Railings, Grilles, Doors, Finials, Marquises, etc.

Plain and Ornamental Fencing and Gates.

Entrance Doors, Elevator Enclosures.

Bronze and Brass Work, including: Bank and Office Screens, Railings, Check Desks, etc.; Directory Frames, Memorial Tablets; Mausoleum Work; Lamp Standards and Brackets; Entrance Doors; Thresholds, etc.

Plain or Light Iron Work, including: Gratings, Door and Window Guards, Fire Escapes, Folding Gates, Ladders, Pipe Railings, Sheet Steel Doors, Door Bucks, etc.

Stair Construction.

For Steel Structures, see page 19.

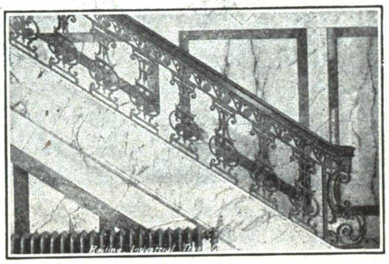
Facilities

The only large concern in New England who are structural fabricators as well as manufacturers of ornamental iron work and take complete contract for both branches of the business.

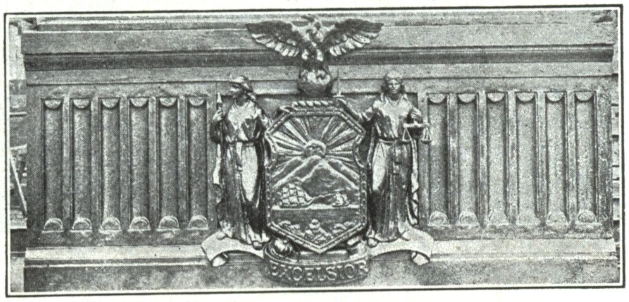
References

The following is a partial list of representative structures built by this company, with names of architects or engineers:

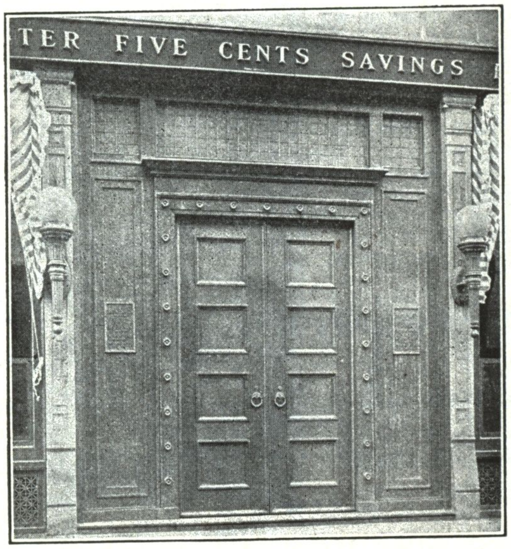
Williams College Infirmary, Allen & Collens
Morris Pratt Memorial, Rich & Mathesius
Industrial Trust Co. Building, Stone, Carpenter & Sheldon
Park Building, Cross & Cross
Garden Theater, A. H. Bowditch
Union College Science Building, Geo. B. Post & Son
Taunton High School, Kilham & Hopkins
Worcester Y. M. C. A., Louis E. Jallade
Troy Y. W. C. A., Chas. C. Grant
Wingdale Prison, Lewis F. Pilcher
Wilby English High School, Louis A. Walsh
Hempstead Town House, Steward Wagner



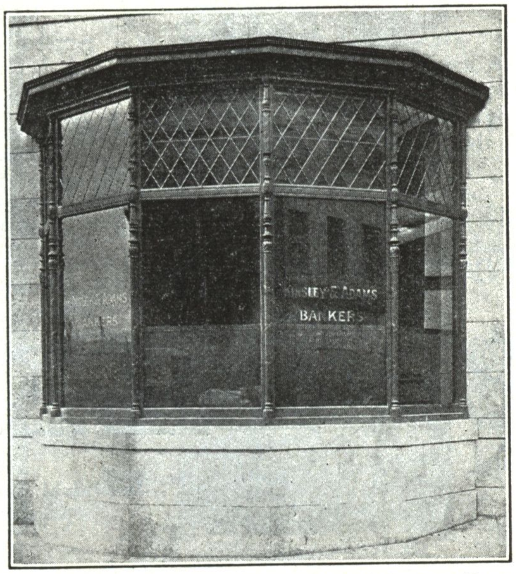
Railing, Industrial Trust Co., Providence, R. I.



Shield, Wingdale Prison, Wingdale, N. Y.



Bronze Doors, Worcester Five Cent Savings Bank, Worcester, Mass.



Cast Iron Windows, Worcester National Bank, Worcester, Mass.

ELLISON BRONZE COMPANY

FOUNDED 1911

Architectural and Decorative Products in Bronze

JAMESTOWN, N. Y.

Products

Ornamental Bronze Work, which includes:

- Architectural and Decorative Castings.
- Bank Screens and Fitments.
- Bulletin and Directory Cases.
- Check Desks.
- Display Cases.
- Doors and Entrances.
- Elevator Fronts.
- Grilles and Guards.
- Hollow Bronze Doors and Partitions.
- Lamps.
- Letters and Figures.
- Mausoleum Equipment.
- Memorial Tablets.
- Plaques.
- Seats.
- Signs.
- Statuary.
- Urns and Vases.
- Ventilators.
- Window Frames and Casements.
- Special Hardware.

Equipment

Our equipment comprises a most completely equipped establishment, devoted exclusively to the manufacture of bronze products.

Facilities

These include designing, engineering and drafting departments, modeling and pattern departments for plaster, wood and metal patterns.

We have also a completely equipped foundry, machine shop, chasing and finishing departments, and a special hardware department.

This complete organization, covering a lifetime of experience and personal supervision, offers expert engineering and drafting service requiring a minimum of supervision on the part of the architect.

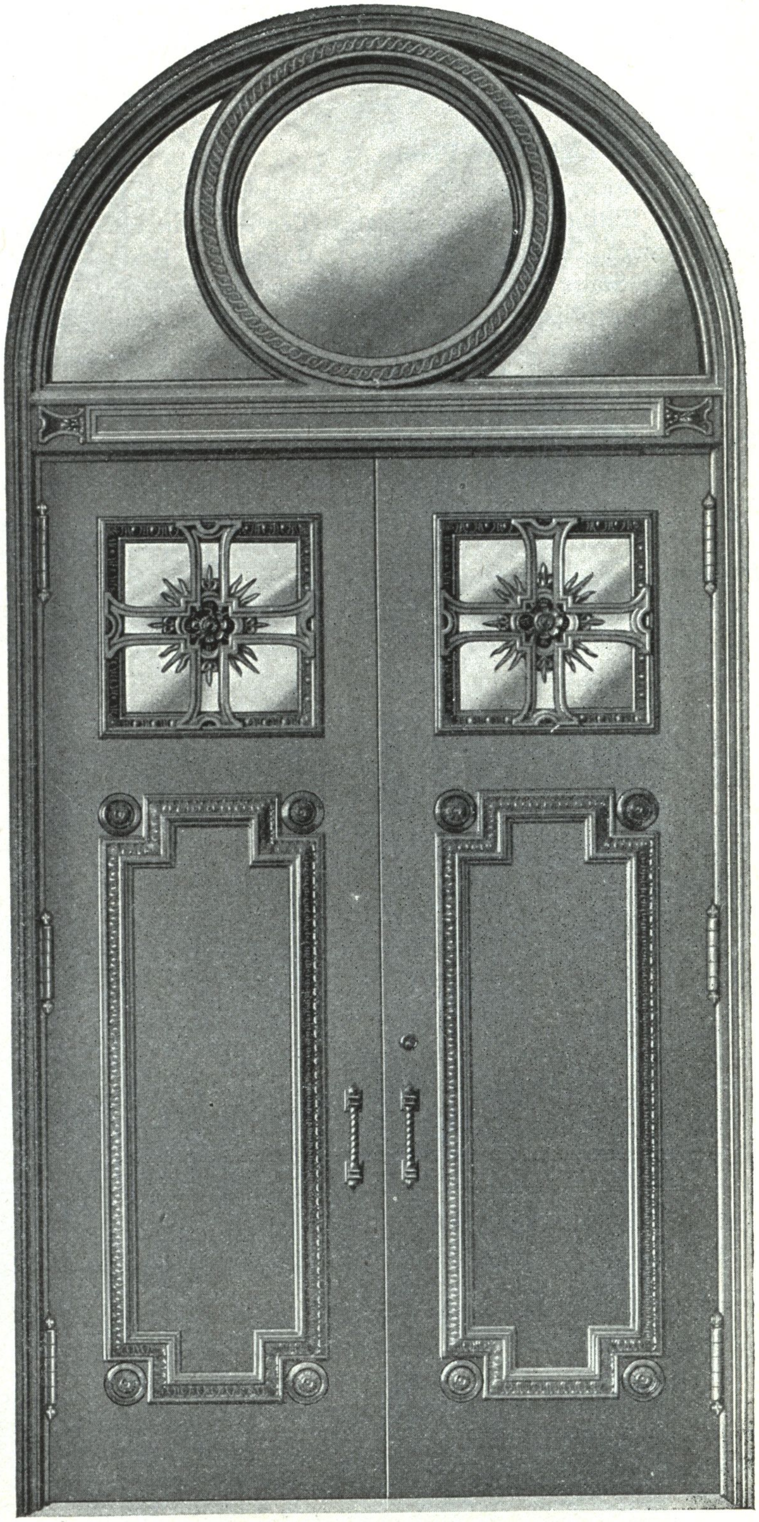
References

Any bank or banker in Jamestown, N. Y.

Dun or Bradstreet Mercantile Agency, New York, N. Y.

Literature

Catalogues gladly mailed on application.



Cast Bronze Entrance Doors and Transom, National Shrine of Our Blessed Lady of Victory, Lackawanna, N. Y.

Emile M. Uhlrich, Architect

AUGUST FEINE & SONS COMPANY

INCORPORATED

Ornamental and Structural Steel Work

BUFFALO, N. Y.

General Office and Light Iron Plant, 140-152 Terrace, corner Erie Street
Structural Steel Plant, Baraga Street and D. L. & W. R. R.

Products of Light Iron Plant

ORNAMENTAL IRON WORK: Ornamental Grilles; Railings; Entrance Doors and Gates; Fences; Lanterns and Lantern Brackets; Balconies; Marquises; Porte Cocheres; Stairs; Spiral Stairs; Elevator Enclosures; Fire Escapes; Pipe Railings; Folding Gates; Bank Partitions; Day Gates for Safety Vaults; Balustrades; Flagpoles; Store Fronts; Vent Grilles.

Products of Structural Steel Plant

All kinds of STRUCTURAL STEEL for buildings, Trusses, Girders, Columns, Bridges and Towers.

Facilities

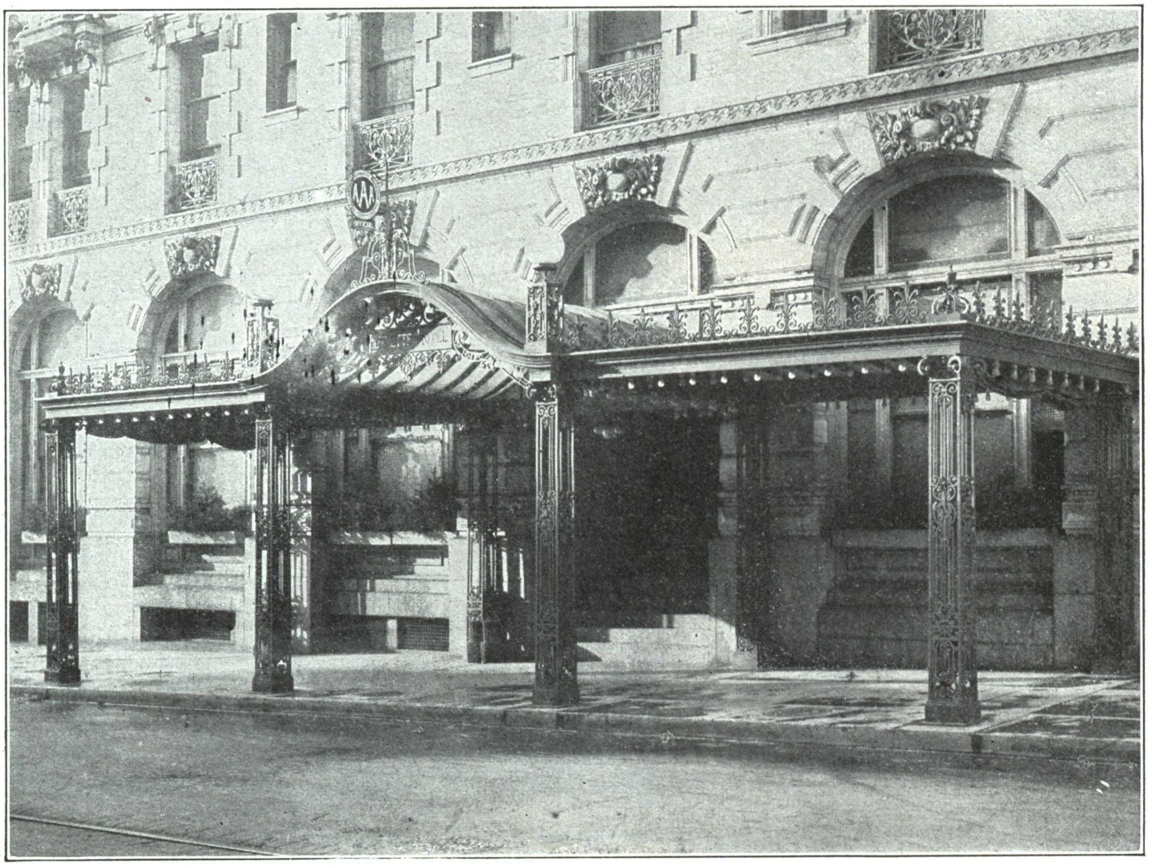
We maintain a capable Engineering, Designing and Drafting Department. In addition to the products mentioned above, we contract for furnishing and erecting anywhere in United States, structural and ornamental steel work for any size buildings.

Estimates

For estimates, etc., send sketches, drawings and specifications to our General Office. Prices will be quoted to you promptly.

Service

Our plants are equipped with every modern facility, and a force of skilled craftsmen, ably directed, is at all times ready to perform with despatch whatever work we may be favored with by architects and others.



Porte Cochere, Lafayette Hotel, Buffalo, N. Y.

FREDERICK W. BERGMUELLER, President

FERRO STUDIO INC.

Designers and Craftsmen in Wrought Iron

228 East 150th Street
NEW YORK, N. Y.

REPRESENTATIVES
DETROIT, MICH., Acme Wire & Iron Works, Canfield Avenue and Moran Street
PITTSBURGH, PA., A. L. Weaver, Jr., 42 Vandergrift Building

Products

We execute Artful Wrought Iron Work for any purpose and building, such as churches, government and business buildings, banks and residences.

Equipment

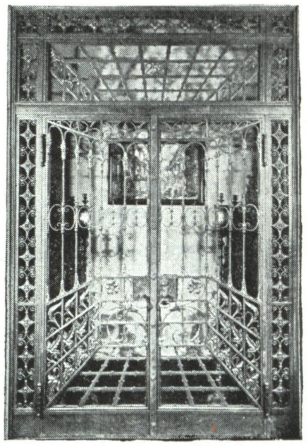
We are equipped to furnish estimates from architects' sketches, drawings and specifications and where requested will also furnish the sketches needed.

A well trained staff of artisans is prepared to handle all problems under the personal direction of the president.

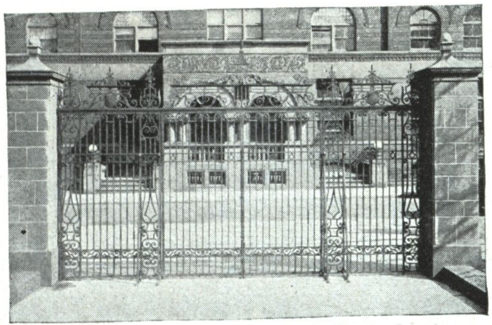
Service

Our workmanship and the spirit in which we finish our contracts have earned us the highest commendations from noted architects.

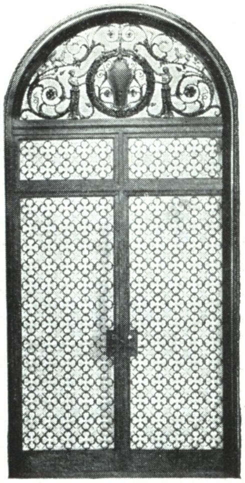
Wrought Iron Lantern
Designed by Frederick W. Bergmueller



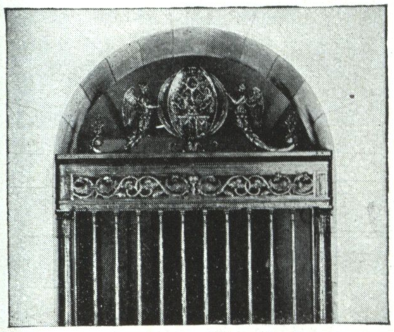
Wrought Iron Entrance
Designed by Frederick W. Bergmueller



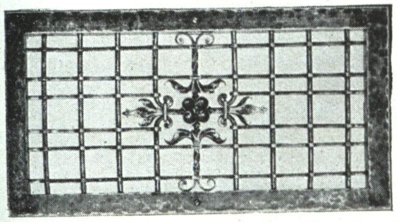
Wrought Iron Park Entrance, Pratt Institute, Brooklyn, N. Y.
John Mead Howells, Architect



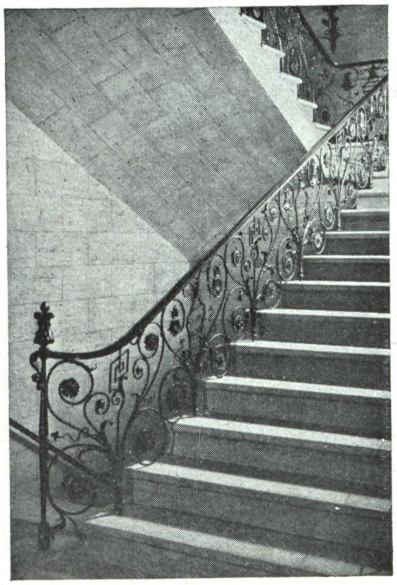
Wrought Iron Entrance, Andrew Freedman Home
Joseph H. Freedlander, Architect



Wrought Iron Chapel Screen
Edward F. Fanning, Architect



Wrought Iron Ventilating Grille, Fred W. Green Residence, Ionia, Mich.
Harry L. Mead, Architect



Wrought Iron Main Stair Railing, Shelton Hotel, New York, N. Y.
Arthur Loomis Harman, Architect

Wrought Iron Emblem, Cardinal's Residence, New York, N. Y.
Robert J. Reiley, Architect

ESTABLISHED 1858

J. W. FISKE IRON WORKS

Ornamental Iron, Brass, Bronze, Wire and Zinc Work

69-71 Park Place
NEW YORK, N. Y.

Products

Ornamental Metal Work and Fencing as follows: Ornamental Entrance Doors, Window Guards, Lamps and Lamp Standards; Metal Stairs; Memorial Tablets; Fountains; Iron Railings and Entrance Gates; Woven Wire and Climbproof Chain Link Fencing; Sanitary Stable and Barn Equipment.

Also, Brass and Bronze Railings; Andirons and Fire Sets; Fire Escapes; Flagpole Bases; Balls and Trucks; Folding Gates; Leader Shoes; Marquises; Garden and Park Furniture; Sundials; Tree Guards; Wire Partitions.

Fiske Quality

The quality of Fiske products is best evidenced by installations for the United States Government, states, cities and leading commercial organizations, and upon many of America's largest private estates.

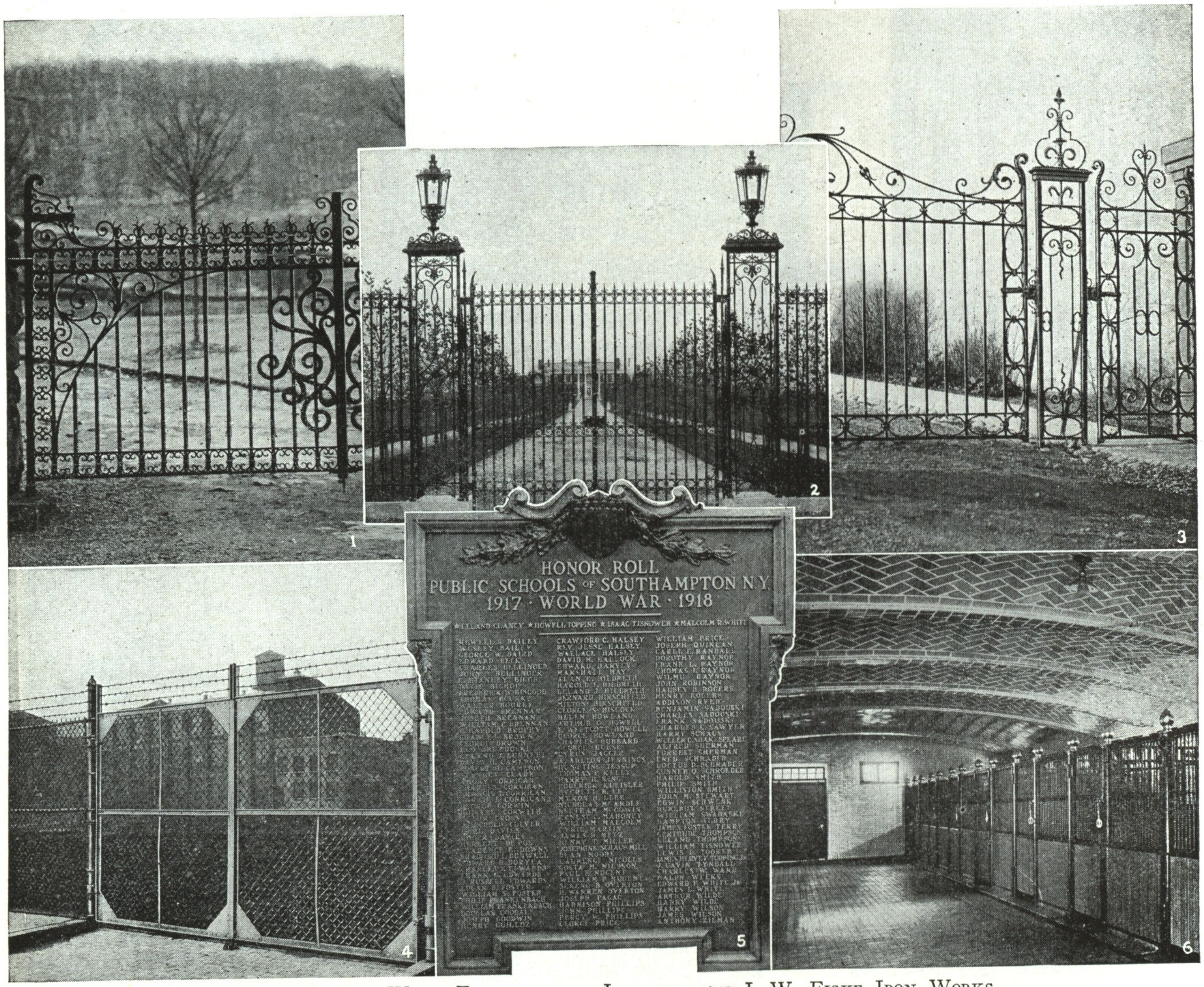
Co-operative Service

The J. W. Fiske Iron Works will submit estimates for products either delivered or erected complete. A well organized engineering staff is maintained, and contracts for designing and erection complete are made when desired. Co-operation with the architect, contractor or owner in executing unusual specifications is a specialty.

Where material is delivered only, instructions and drawings will be furnished to enable local mechanics to erect the work. Sketches and designs will be furnished on request, and full information as to sizes and weights will be given.

Entrance Gates, Fencing, etc.

This company will carry out any design in ornamental entrance gates, iron fencing, window guards, metal stairs and similar work, or will prepare and submit designs for such work.



Illustrations of Work Finished and Installed by J. W. Fiske Iron Works

No. 1—Entrance Gate, South Kortright, N. Y.
No. 2—Entrance Gate, Oakdale, L. I., Ernest Flagg, Architect
No. 3—Entrance Gate, Montclair, N. J.
No. 4—Chain Link Fence, Paterson Parchment Paper Co., Passaic, N. J.
No. 5—Bronze Memorial Tablet
No. 6—Interior Stable, Wm Zeigler, Jr., Noroton, Conn., H. P. Knowles, Architect

Continued on next page

"Set-in-concrete" Posts

All Fiske fence posts are set in concrete footings and this construction is strongly recommended by this company. This method keeps the posts from being thrown out of alignment by frost, and prevents them from rusting off at the ground line.

Chain Link Fencing

All Fiske chain link woven wire fencing is extra heavy galvanized by the hot dip spelter process. This is the heaviest and most durable type of wire fence made. Fiske woven steel wire fabric is made in widths from 60 to 96 in. and when erected in connection with Fiske standard "set-in-concrete" posts, provides a fence from 5 ft. 2 in. to 8 ft. 2 in. high. This height can be increased to 10 ft. with diagonal arms and 3 strands of barbed wire.

Foundry Work

This company is prepared to undertake any ornamental casting in iron, brass or bronze according to submitted designs or models, or from designs originated by its own organization.

Sanitary Stable and Barn Fittings

The J. W. Fiske Iron Works make a specialty of complete sanitary fittings for stables, cow barns, etc., and are pleased to co-operate with architects in writing specifications.

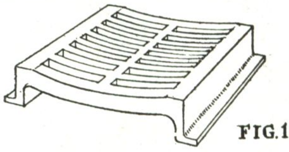


FIG. 159A K

HIGHWAY CATCH BASIN FRAME & GRATING
(Very Heavy)
24" long, 22½" wide, 5½" deep,
Grating only, 20½"×20", 2½" thick in center

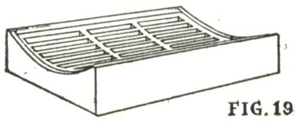


FIG. 196E K

LIGHT GUTTER BASIN & GRATE
For lawns & carriage drives, not for street use.
18" wide × 24" long × 5" deep
Grating only, 16"× 22"

HEAVY GUTTER BASIN & GRATE
For roadways, streets, parks, cemeteries etc
No. 2 - 18" wide × 24" long × 5" deep
Grating only, 16" × 22"
No. 1 - 9" × 15" × 3" for use in draining small areas. The outlet is so designed that it can be used on 4", 6", 8", or 10" pipe.

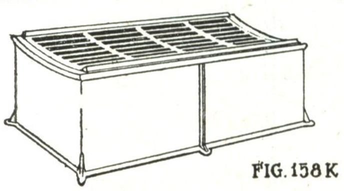


FIG. 158 K

ROAD BOX
For public or private roadways, etc.
No. 1 - Top: 25" long, 14½" wide, 10" deep
Grating only 23" long, 13¾" wide
No. 1A - Top: 25" long, 14½" wide, 4" deep
No. 2 - Top: 32" long, 14½" wide, 4" deep

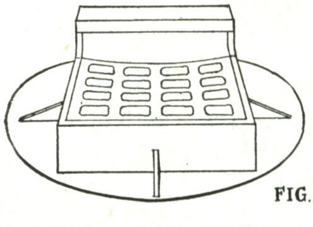


FIG. 162A K

CATCH BASIN INLET
Top 23"×32", bottom flange 42" diameter. Grating is concave at rear

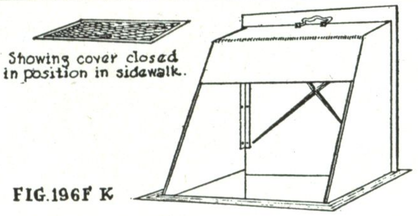
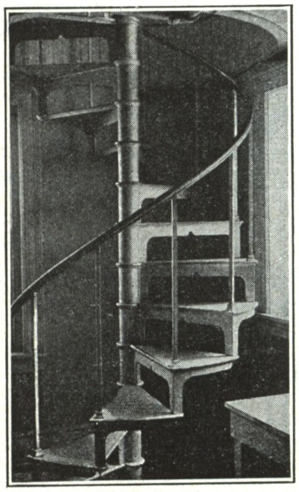


FIG. 196F K

SAFETY COAL HOLE COVER & FRAME

	Cover	Frame
No. 1 -	18" × 18"	23" × 23"
No. 2 -	22" × 22"	27" × 27"
No. 3 -	30" × 30"	35" × 34"



SPIRAL STAIRS
Furnished for all floor heights with following diameters: 4'-0", 4'-6", 5'-0", 5'-6", 6'-0", 7'-0"

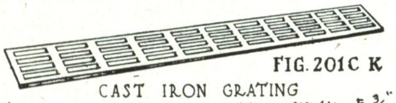


FIG. 201C K

CAST IRON GRATING
For concrete or iron gutter Width - 5¾"

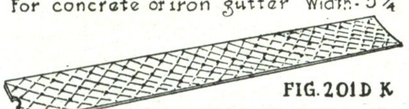


FIG. 201D K

GUTTER COVER
For concrete gutter

Wide	Thick	Wide	Thick
3½"	⅜"	7"	½"
4	⅜"	8"	½"
5	½"	9"	½"
6	½"	9"	⅝"

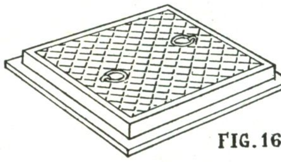


FIG. 161B K

MANHOLE FRAME & COVER, FOR CONCRETE.

	Top of frame	Depth	Cover
No. 1	12"×12"	3"	10¾"×10¾"
No. 2	18"×18"	3"	16⅝"×16⅝"
No. 3	26"×26"	3"	24⅝"×24⅝"
No. 4	32"×26"	3"	30⅝"×24⅝"

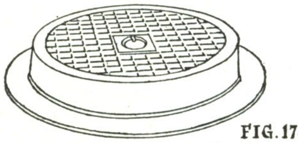


FIG. 173A K

MANHOLE FRAME & COVER

Opening	Depth	Diam. on bottom	Cover
20" (light pattern)	4"	26½"	20½"
20" (deep pattern)	6½"	28¾"	20½"
20" (heavy pattern)	4¾"	27"	20½"
24" (light pattern)	6"	31½"	24¼"
24" (heavy pattern)	6"	31½"	24¼"

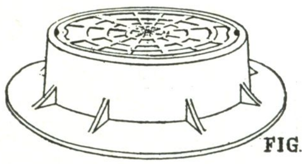


FIG. 163 K

MANHOLE FRAME & COVER
Diam. of top - 25"; Diam. of bottom flange - 36"; Diam. of cover, 22½"

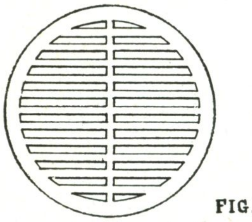


FIG. 173B K

GRATING
To fit in bell ends of soil pipe

Size of pipe	Grating	Size of pipe	Grating
8"	10"	18"	20⅝"
10"	12"	20"	23¼"
12"	14¾"	24"	27¾"
15"	17¾"		

A FEW OF J. W. FISKE IRON WORKS SPECIALTIES

AUG 1922

THE GORHAM COMPANY

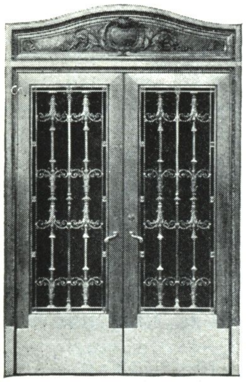
BRONZE DIVISION
576 Fifth Avenue, NEW YORK, N. Y.
MAIN OFFICE AND WORKS AT PROVIDENCE, R. I.

Products

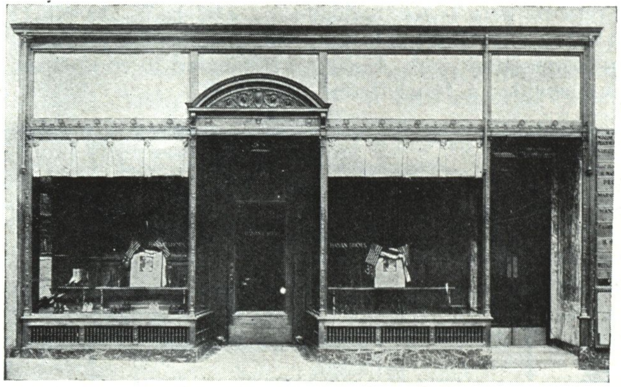
Architectural Bronze, of the highest grade: Statuary; Tablets; Lamp Standards; Mausoleum Doors; Bank Screens; Elevator Cars; Store Fronts; Windows; Ecclesiastical Wares.

Special Service

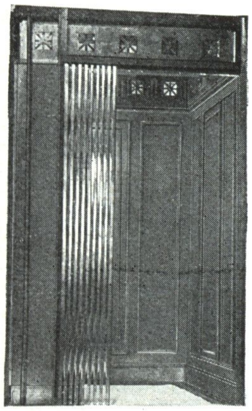
Architects are invited to make use of the great Gorham collection of die shapes and ornamental patterns. Any desired effect can be secured without cost for special tools and models—usually from metal in stock.



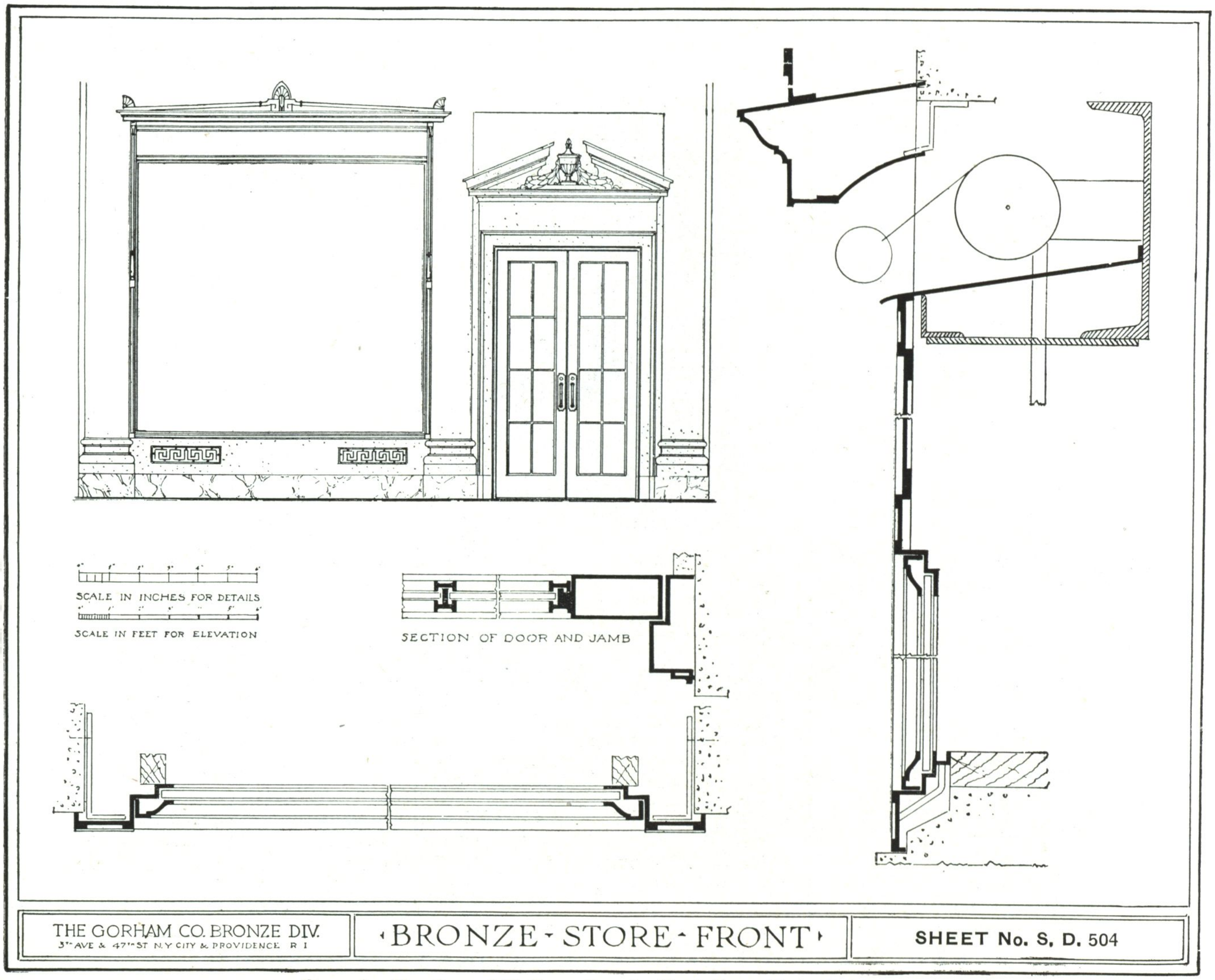
Ornamental Bronze Entrance Door



Bronze Store Front of Hanan & Sons, Fifth Avenue, New York, N. Y.
Seymour & Schonewald, Architects



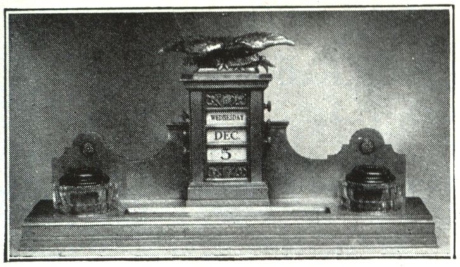
Bronze Elevator Cab
Gorham design



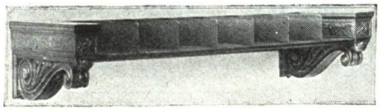
SCALE IN INCHES FOR DETAILS
SCALE IN FEET FOR ELEVATION
SECTION OF DOOR AND JAMB
THE GORHAM CO. BRONZE DIV.
3rd AVE & 47th ST N.Y. CITY & PROVIDENCE R.I.
·BRONZE·STORE·FRONT·
SHEET No. S. D. 504

One of a Number of Gorham Standardized Store Front Designs

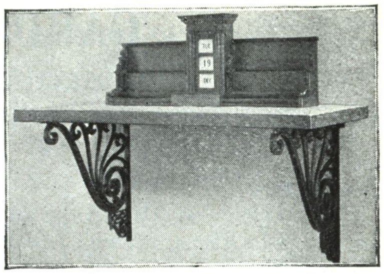
Continued on next page



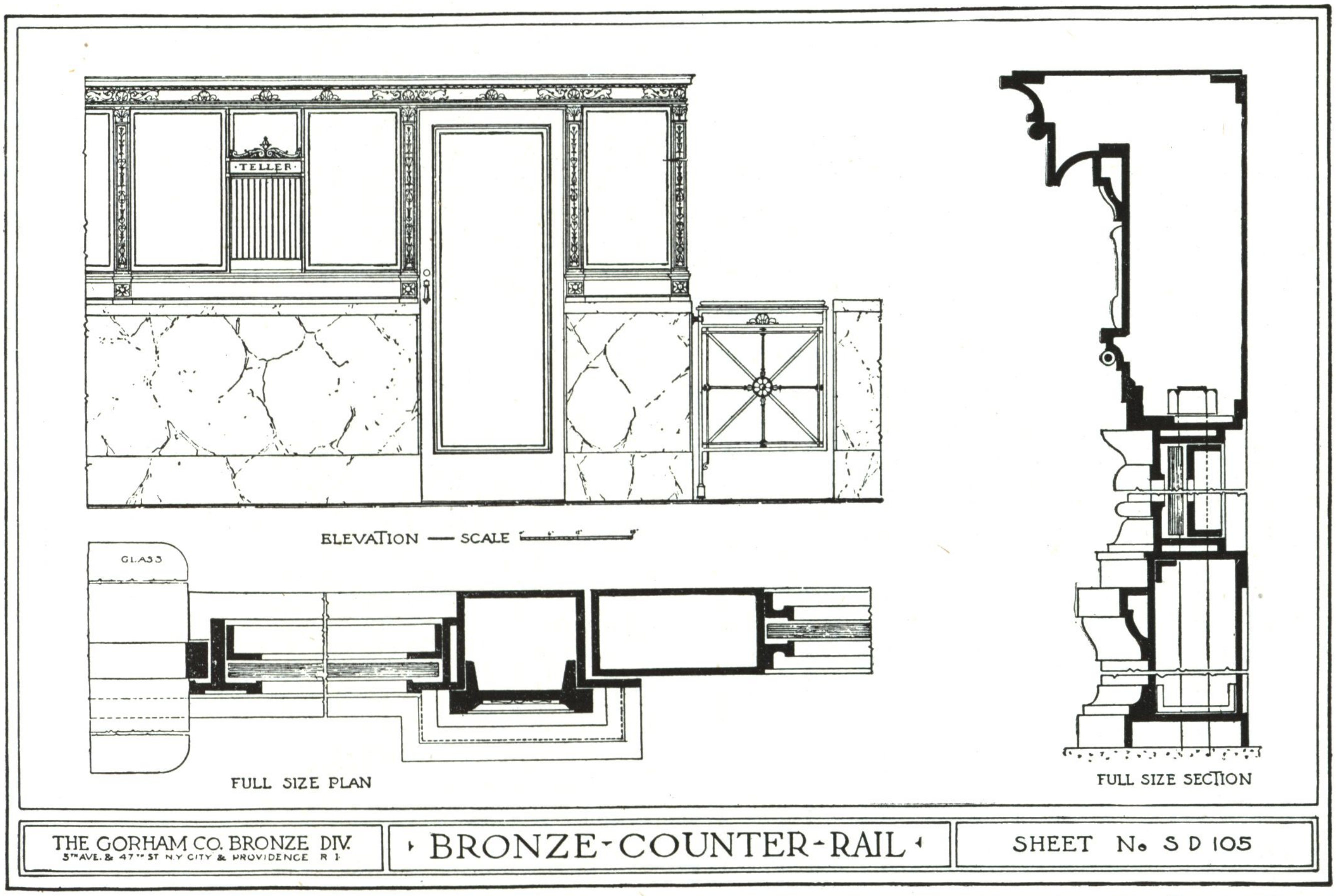
Bronze Inkstand and Calendar Case
Gorham design



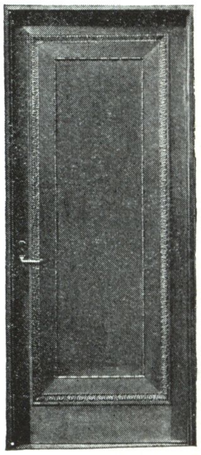
Bronze Wall Check Desk
A standard design of THE GORHAM COMPANY



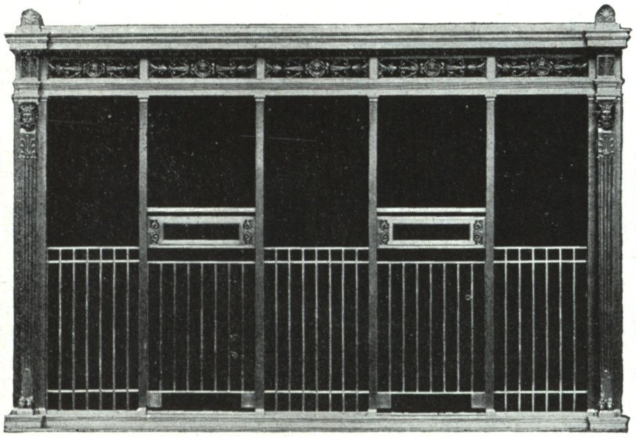
Bronze Check Desk and Calendar Case
A. C. BOSSOM, Architect


TELLER
ELEVATION — SCALE
GLASS
FULL SIZE PLAN
FULL SIZE SECTION
THE GORHAM CO. BRONZE DIV.
5TH AVE. & 47TH ST N Y CITY & PROVIDENCE R I
BRONZE-COUNTER-RAIL
SHEET No. S D 105

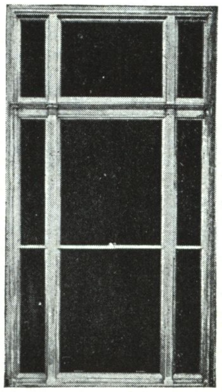
Note: Similar plates are available of THE GORMAN COMPANY'S Standard Designs of Counter Screens, Check Desks, Gates, Safety Deposit Grilles and Elevator Enclosures



Bronze Door, Hartford Fire Insurance Co., Hartford, Conn.
PARKER, THOMAS & RICE, Architects



Bronze Counter Screen, Astor Trust Co.
CHARLES E. BIRGE, Architect



Double Hung Bronze Window, First National Bank, Boston, Mass.
YORK & SAWYER, Architects

GARDEN CITY PLATING & MFG. CO.

Manufacturers of Grilles and Wickets; Lighting Reflectors

1430 South Talman Avenue, CHICAGO, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

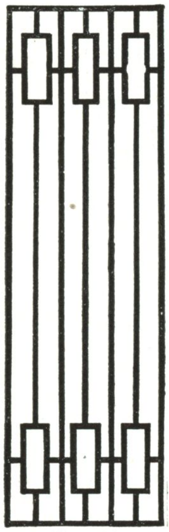
Grilles and Wickets, and all Metal Work for Banks and Offices. *Write for Ornamental Metal Work Bulletin.*

Lighting Reflectors: Showcase, Bank, Wall-case, etc. *Write for reflector bulletin.*

For Garment Carriers, Adjustable Shelving Devices and Disappearing Door Hardware, see pages 2746-2747.

Grilles and Wickets

For banks, stores, offices, etc. Made of steel, brass or bronze, in any finish. The designs shown here are only a few of the wide variety we produce. Our selection offers standard designs to harmonize with any style of architecture. Usually made of $\frac{5}{16}$-in. round or square bars. All ornaments made of brass.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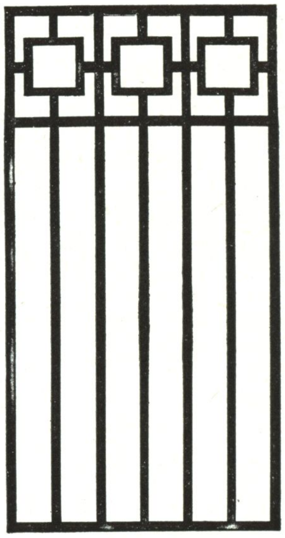
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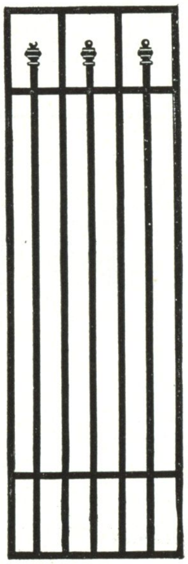
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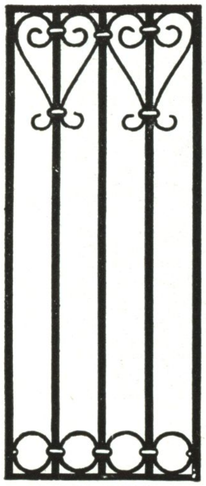
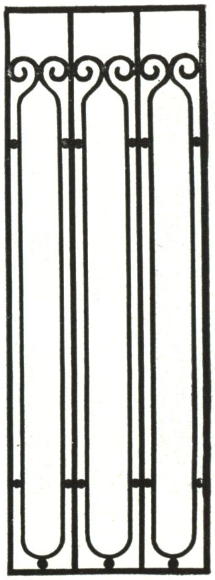
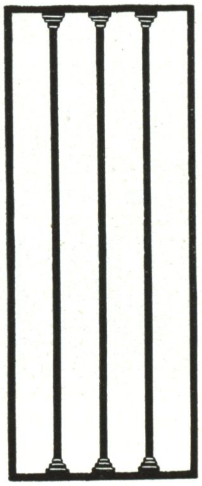

No. 1337

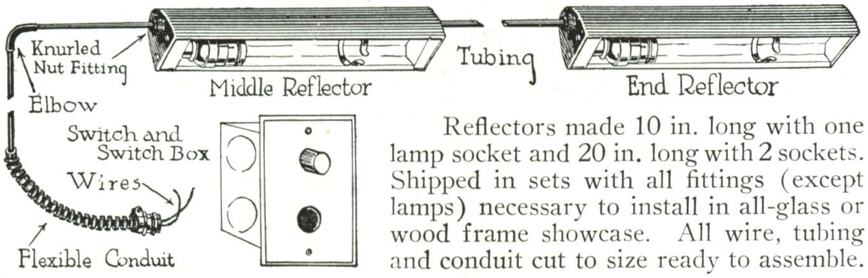

No. 1325


No. 1341

Garcy Reflectors for Showcases, Wall Cases, Banks, etc.

Made any size and shape for any purpose. Scientifically designed to give a strong, evenly diffused light. Approved by National Board of Fire Underwriters, recommended by leading store fixture designers and used by the largest department stores. Made with any outside finish. Inside lined with mirror, opal glass, nickeloid or white enamel. When specifying: state outside length, width of face, finish and lining desired.

Showcase Reflectors with Fittings—


Knurled Nut Fitting
Elbow
Switch and Switch Box
Wires
Flexible Conduit
Middle Reflector
Tubing
End Reflector

Reflectors made 10 in. long with one lamp socket and 20 in. long with 2 sockets. Shipped in sets with all fittings (except lamps) necessary to install in all-glass or wood frame showcase. All wire, tubing and conduit cut to size ready to assemble.

SHOWCASE REFLECTORS WITH FITTINGS
Lined with nickeloid

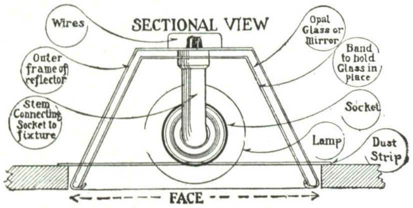
Reflector No.	Outside finish	Length of showcase	Reflectors, 2 in. face	
			Number	Length
Y3147S	Statuary bronze	5 ft.	2	10 in.
Y3147AF	Aluminum finish	5 ft.	2	10 in.
Y3148S	Statuary bronze	6 ft.	2	20 in.
Y3148AF	Aluminum finish	6 ft.	2	20 in.
X3147S	Statuary bronze	6 ft.	3	10 in.
X3147AF	Aluminum finish	6 ft.	3	10 in.

When specifying: state inside length, height and depth of showcase. Unless reflectors are specified for all-glass case, they will be sent to fasten to wood frame showcase.

Wall Case Reflectors—Lined with german silver mirror glass, opalescent glass or aluminum finished. Wired ready to install.

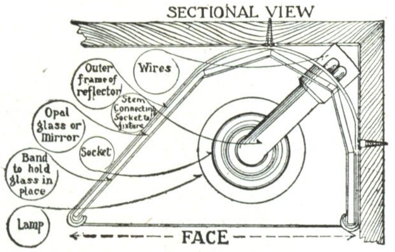
No. 3109 made with metal strip all around, ⅞ in. from bottom. This keeps it in place in ceiling of wall case and prevents dirt from getting in.

Metal bands are furnished with No. 3107. These are screwed in place and then bent around reflector.


SECTIONAL VIEW
Wires
Outer frame of reflector
Stem Connecting Socket to fixture
Opal Glass or Mirror
Band to hold Glass in place
Socket
Lamp
Dust Strip
FACE

No. 3109 Wall Case Reflector

Face 3 in. or more


SECTIONAL VIEW
Outer frame of reflector
Wires
Stem Connecting Socket to fixture
Opal glass or Mirror
Socket
Band to hold glass in place
Lamp
FACE

No. 3107 Wall Case Reflector

Face 3 in. or more

Concealed Lighting—Many beautiful effects and a diffused light approaching daylight in quality may be obtained in banks, churches, stores, theaters, etc., by reflectors concealed in coves, wall boxes, etc. Reflectors for this purpose should be designed to fit individual conditions. Recommendations furnished on request, without obligation.

Co-operation—We will be glad to submit estimates and special designs of reflectors to fit your plans. Our expert staff of designers is always at your service.

FOUNDED 1876

HECLA IRON WORKS

GENERAL OFFICE

118 North 11th Street
BROOKLYN, N. Y.

TELEPHONE
GREENPOINT 0490

Products

IRON, BRONZE and STEEL WORK:
- Stairs, Elevator Enclosures, Elevator Cabs.
- Counter Screens, Cages, Gates, Guards, Grilles, Gratings.
- Window Frames, Entrances, Doors.
- Store Fronts, Marquises.
- Railings, Fences, Balconies.
- Lamps with Standards or Brackets.
- Door Bucks, Saddles, Sills, Light and Heavy Frame Work.
- Radiator Enclosures and Register Faces.
- Directory and Bulletin Board Frames.
- Sidewalk Doors, Coalhole Covers, Chutes, Trap Doors.
- Column Casings.
- Elevator Doors, Frames and Hangers.
- Bronze Work of the best grade.
- Heavy and Light Forging.
- Bronze and Brass Special Tubing.
- Architectural and Miscellaneous Work of every kind for buildings.

Facilities

Construction, engineering and drafting forces.

Studio with modelers of various schools.

Pattern shops for wood, plaster and wax.

Grey iron and bronze foundries of large capacity.

Fitting shops in five departments for different kinds of work.

Machine, draw bench and tube, power press, shearing, bending, electric and gas welding, polishing and grinding shops; steam hammer forging, light and heavy blacksmithing shops.

Electroplating and metal finishing shops—all fully equipped with modern and special machines and tools.

Works are located to receive and ship material quickly by rail or boat.

Equipment of modern machinery and tools to meet all requirements.

Organization

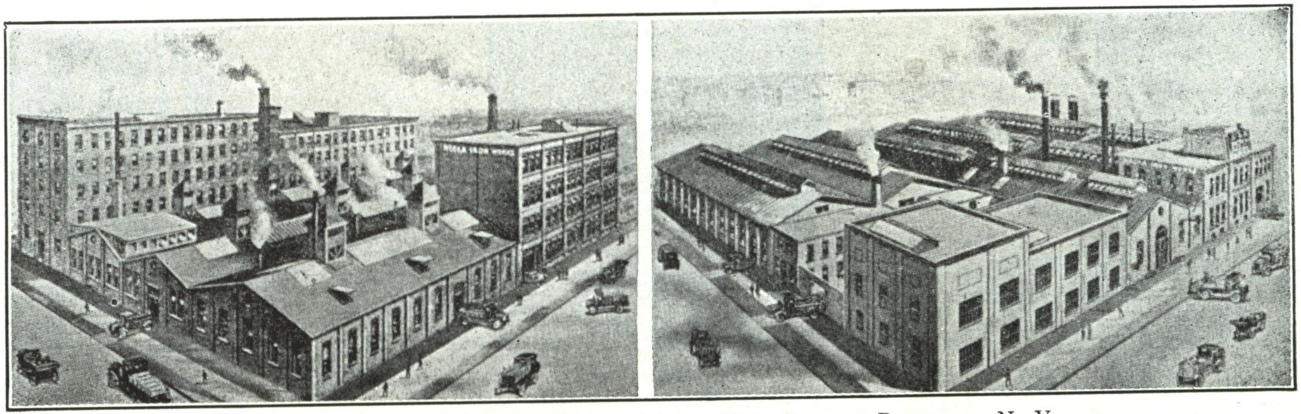
The result of close application and a continuous operation of plant for 49 years.

Work erected by experienced men in any part of this or foreign countries.

Work made and shipped complete ready for others to erect.

Recent Installations

BUILDING AND LOCATION	ARCHITECTS
Employers Liability Building, Boston, Mass.	Coolidge & Shattuck
Municipal Building, Brooklyn, N. Y.	McKenzie, Voorhees & Gmelin
Old Town National Bank, Baltimore, Md.	Frederic A. Fletcher
Metropolitan Building, Detroit, Mich.	Weston & Ellington
Buhl Building (shop windows), Detroit, Mich.	Smith, Hinchman & Grylls
J. L. Hudson Department Store, Detroit, Mich.	Smith, Hinchman & Grylls
United States Mortgage Bond Co., (bronze), Detroit, Mich.	Harry S. Angell
Griest Building, Lancaster, Pa.	C. Emlen Urban
Bank of Bay Biscayne (addition), Miami, Fla.	Weary & Alford Co.
Spang Chalfont (bronze), Etna, Pa.	The Hunting Davis Co.
John Wanamaker Store (addition), New York, N. Y.	John Wanamaker's Dept. of Design and Engineering
Lawyers Title & Trust Co., Brooklyn, N. Y.	G. B. Beaumont Co.



HECLA IRON WORKS, NORTH 10TH TO NORTH 12TH STREETS, BROOKLYN, N. Y.

THE JOHN HARSCH BRONZE & FOUNDRY CO.

Manufacturers of Distinctive Architectural and Memorial Bronze and Iron Work

Madison Avenue (West 116th to 117th Streets)
CLEVELAND, OHIO

Products

ARCHITECTURAL and MEMORIAL BRONZE and IRON WORK including:

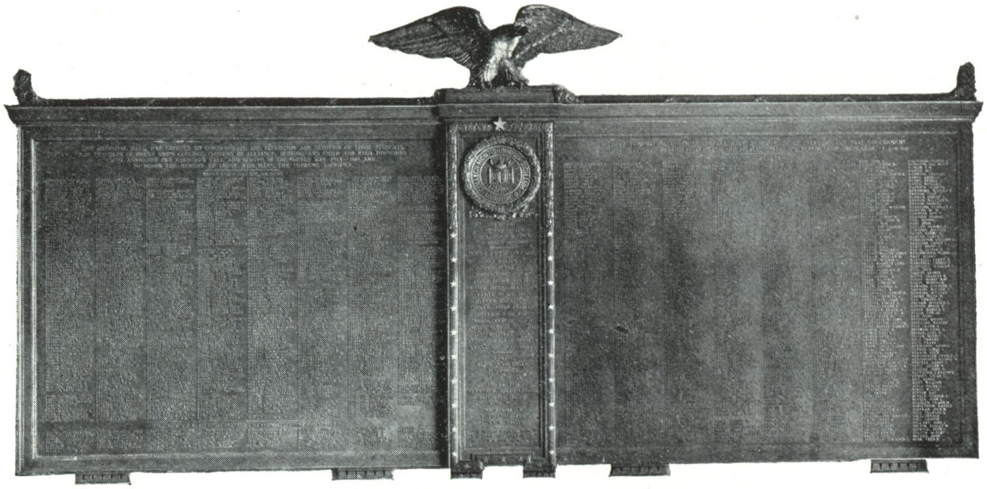
- Bank Screens
- Tablets
- Grilles
- Lamps
- Doors
- Stair Railings
- Store Fronts
- Marquises
- Mausoleum Equipment
- Statuary
- Bas Reliefs
- Honor Rolls
- Emblems
- Traffic Towers

Facilities and Services

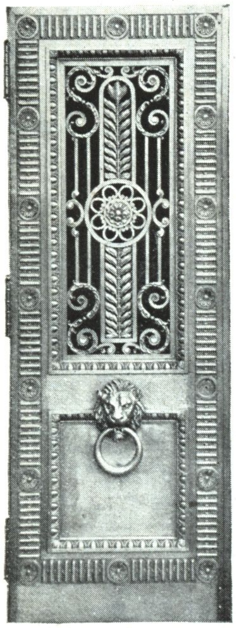
Our plant is fully equipped with modern machinery for fabricating bronze and architectural iron work of the *better quality.*

The capacity of our foundry is practically unlimited and we can produce castings weighing up to 6000 pounds each.

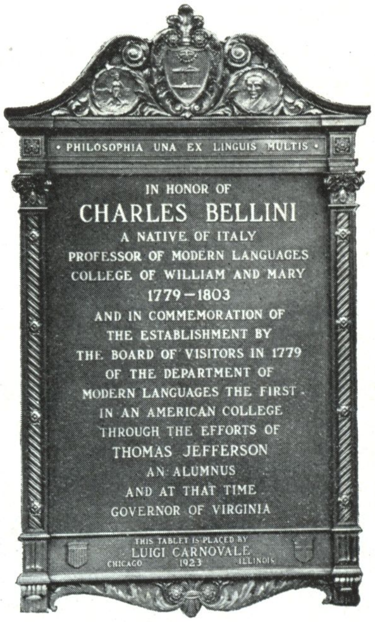
A competent designing department will furnish designs of any character. Architects' details followed with absolute accuracy.



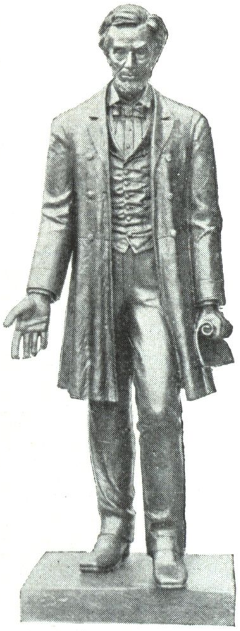
Bronze Tablet Erected at Mt. Union College, Alliance, Ohio
Size, 5x14 ft.



Cast Bronze Door
Size, 2 ft. 10 in. x 9 ft.
J. MILTON DYER,
Architect

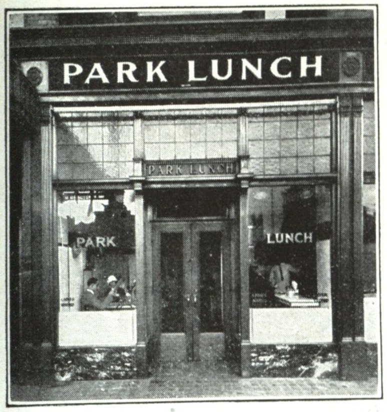

PHILOSOPHIA UNA EX LINGUIS MULTIS
IN HONOR OF
CHARLES BELLINI
A NATIVE OF ITALY
PROFESSOR OF MODERN LANGUAGES
COLLEGE OF WILLIAM AND MARY
1779–1803
AND IN COMMEMORATION OF
THE ESTABLISHMENT BY
THE BOARD OF VISITORS IN 1779
OF THE DEPARTMENT OF
MODERN LANGUAGES THE FIRST
IN AN AMERICAN COLLEGE
THROUGH THE EFFORTS OF
THOMAS JEFFERSON
AN ALUMNUS
AND AT THAT TIME
GOVERNOR OF VIRGINIA
THIS TABLET IS PLACED BY
LUIGI CARNOVALE
CHICAGO 1923 ILLINOIS

Cast Bronze Tablet

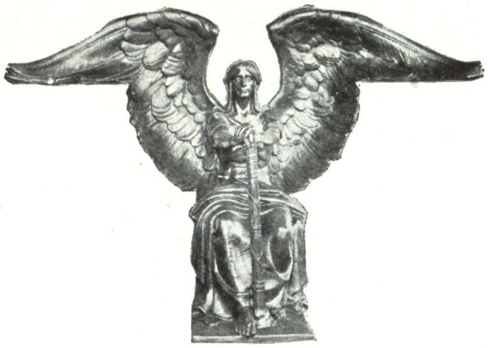


Lincoln Statue
9 ft. high
One of a group of 5 statues erected at Alliance, Ohio

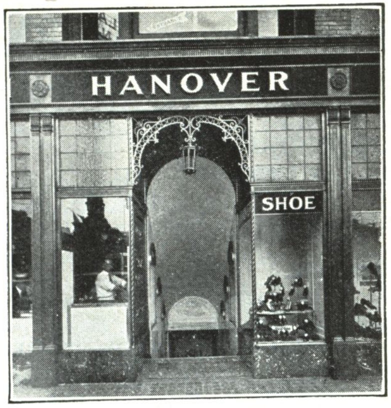
Continued on next page


PARK LUNCH
PARK LUNCH
PARK
LUNCH

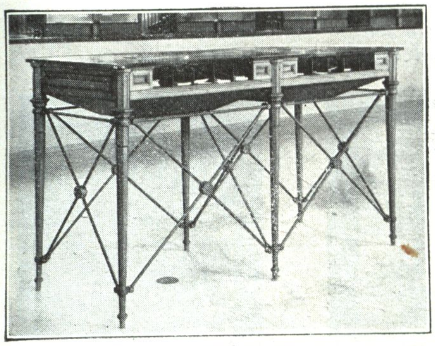
Bronze Store Front



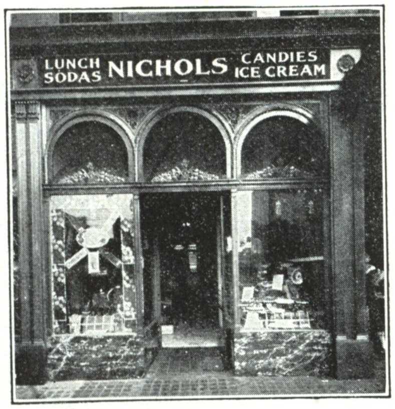
Statue in Lakeview Cemetery, Cleveland, Ohio
Herman N. Matzer, Sculptor
Cleveland, Ohio


HANOVER
SHOE

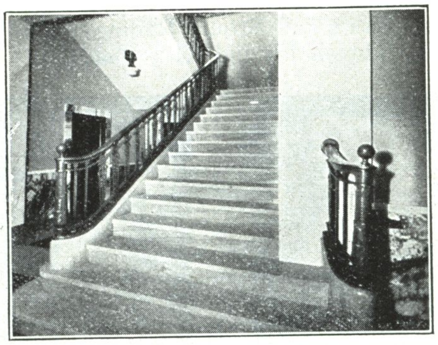
Bronze Store Front



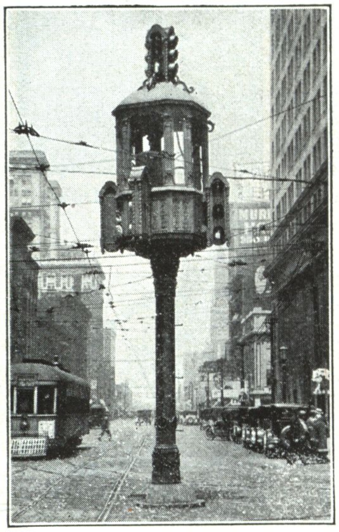
Bronze Check Desk


LUNCH SODAS
NICHOLS
CANDIES ICE CREAM

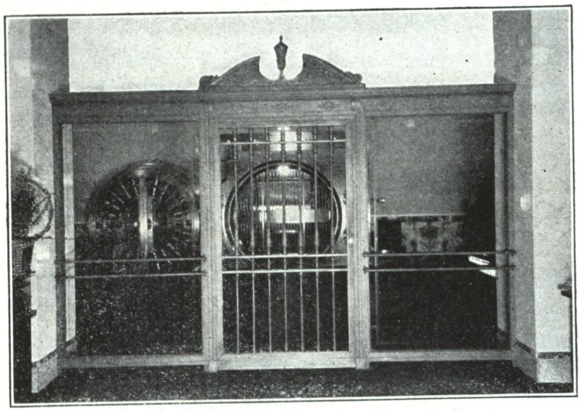
Bronze Store Front



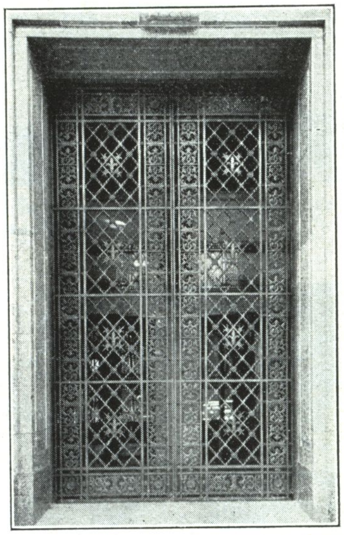
Bronze Stair Railing



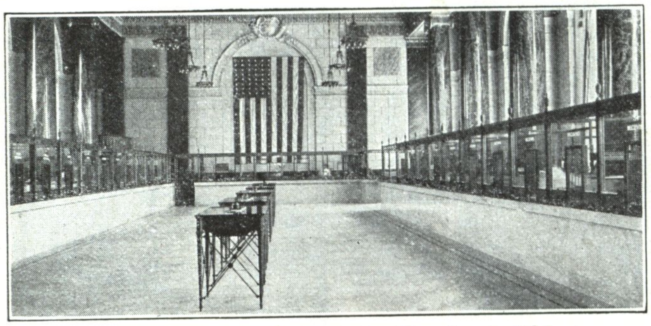
Bronze Traffic Tower, Cleveland, Ohio
Over-all height, 27 ft.



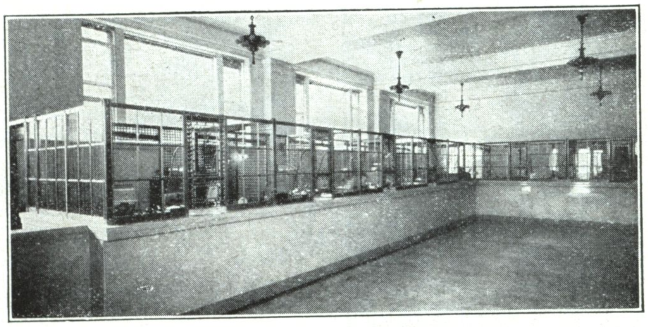
Safe Deposit Vault Grille, United Bank, Cleveland, Ohio
Walker & Weeks, Architects



Bronze Entrance Doors, United Bank, Cleveland, Ohio
Size, 8 ft. 6 in. x 15 ft.
Walker & Weeks, Architects



Bank Screen, United Bank, Cleveland, Ohio
Walker & Weeks, Architects, Cleveland, Ohio



Counter Screen, Equity Savings Bank, Cleveland, Ohio
Hubbell & Benes, Architects, Cleveland, Ohio

ILLINOIS BRONZE & IRON WORKS

Architectural Bronze Work

TELEPHONE
Van Buren 6040, 4962

917-19 South Keeler Avenue
CHICAGO, ILL.

Products

Manufacturers of Architectural Bronze Work including:

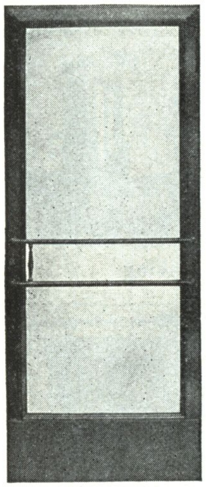
- Bank Counter Screens, Grilles, Wickets and Gates.
- Bronze Entrance Doors, Frames and Grilles.
- Mausoleum Doors and Equipment.
- Bronze Window Sash.
- Vault Grilles
- Brass and Bronze Railings.
- Thresholds and Kick Plates.
- Cast Bronze Letters, Tablets.
- Special Wrought Iron Work.
- Special Cast Iron Work.

Specialties and Facilities

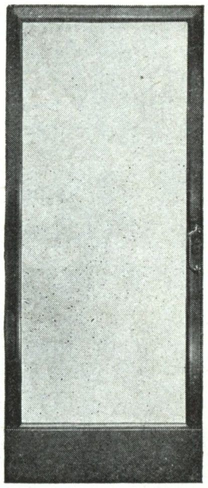
Contracts taken in all parts of the United States.

Our plant is equipped to handle large contracts as well as small.

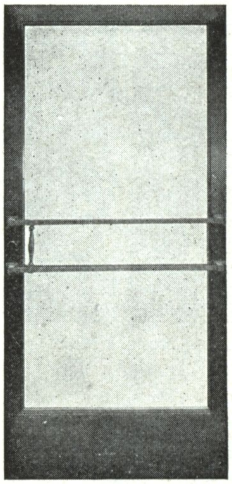
We specialize on bronze doors for bank and office buildings and mausoleums.



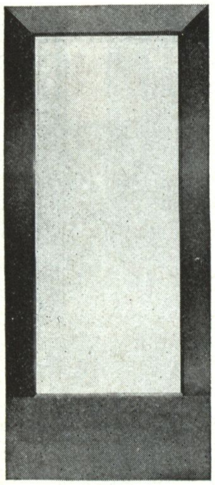
Cast Bronze Door



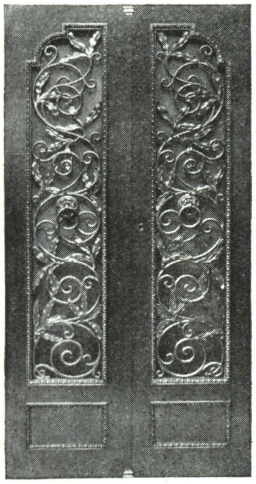
Paneled Stile Door of Drawn Bronze



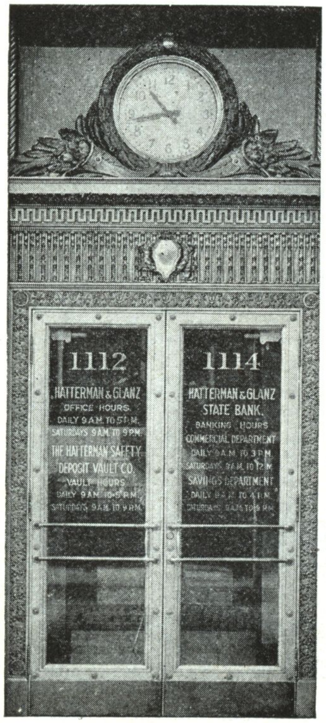
Bronze Tubing Door
Standard stiles 1½x3 in. and 2x3 in.



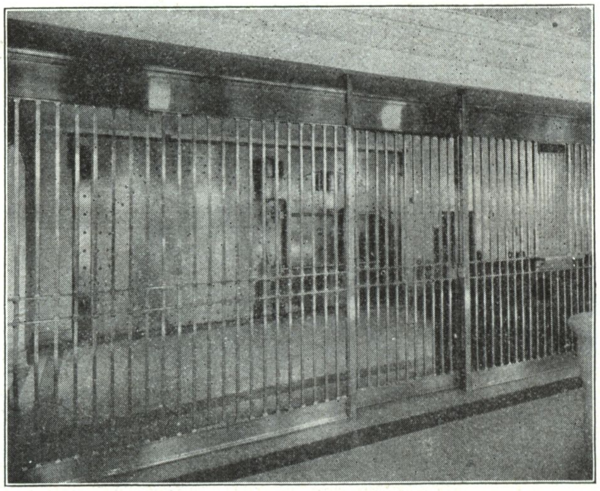
Bronze Kalamein Door



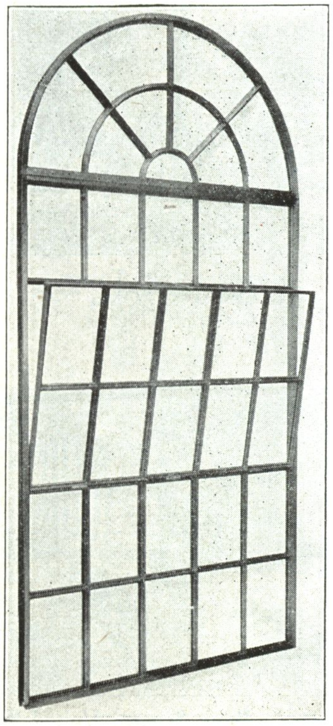
Mausoleum Doors



Cast Bronze Entrance



Bronze Vault Grille
Can be made in steel



Standard Bronze Sash
Made in all sizes

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Ornamental Bronze and Iron Work for Buildings

2 West 47th Street
NEW YORK, N. Y.

CHICAGO OFFICE, 318 North Michigan Avenue

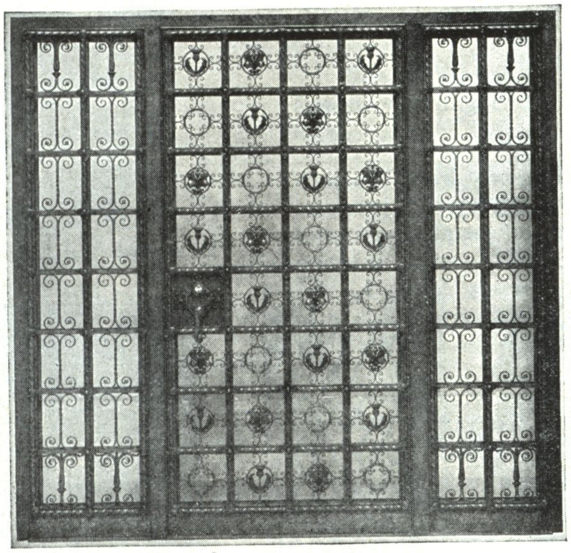
FOUNDRY AND SHOPS, 335 Carroll Street, BROOKLYN, N. Y.

Products

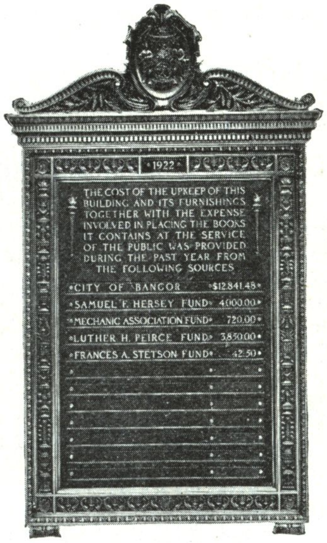
ORNAMENTAL BRONZE and IRON WORK, which includes:

Doors, Tablets, Lamps, Bank Screens, Check Desks, Clocks, Entrance Doors, Driveway Gates, Stair Railings, Elevator Fronts, Marquises, Candelabras, Fireplace Fixtures and Mantels.

For Stone Mantels, see page 300; for Tile and Swimming Pools, see page 477; for Bronze and Iron Windows, see page 982.

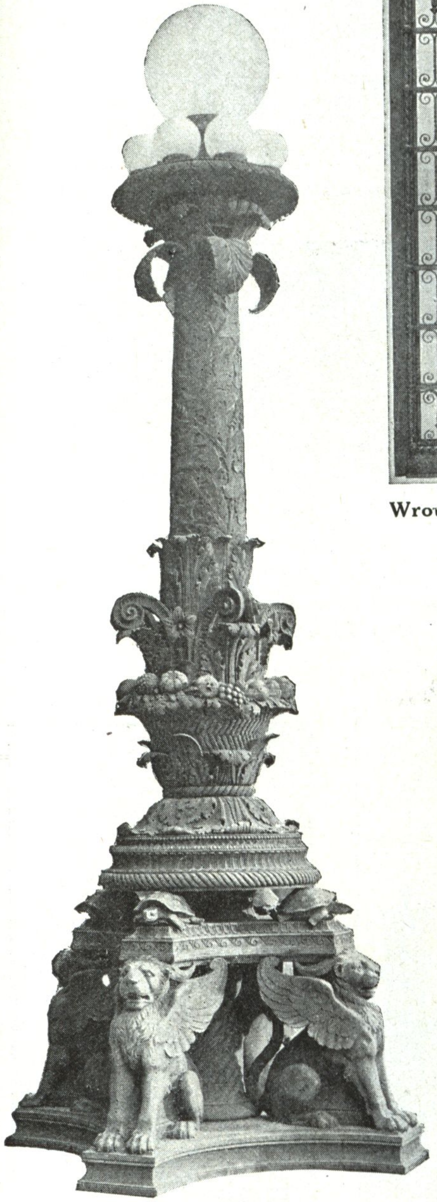


Wrought Iron Vestibule Screen, Residence of E. P. Harwell, Tulsa, Okla.
WIGHT & WIGHT, Architects

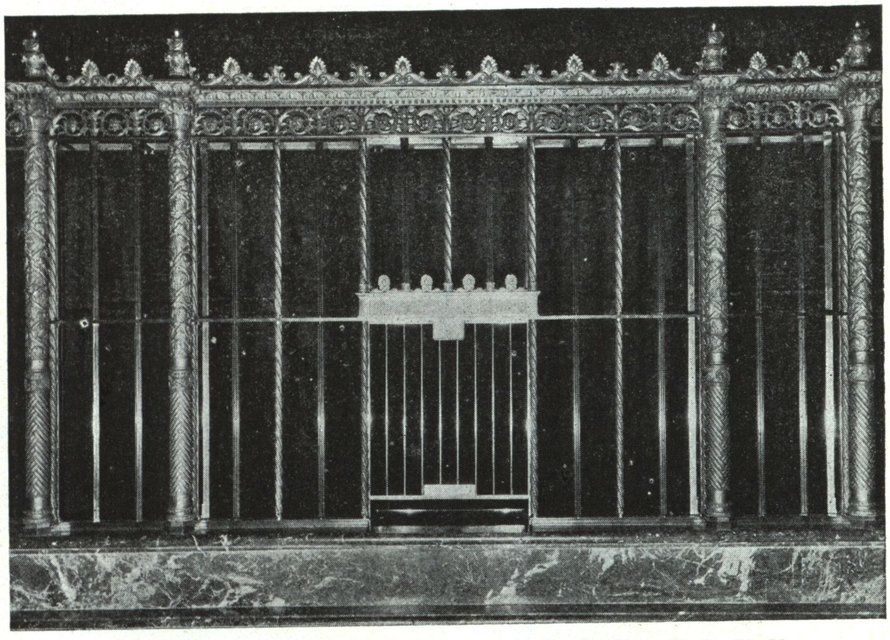


1922
THE COST OF THE UPKEEP OF THIS BUILDING AND ITS FURNISHINGS TOGETHER WITH THE EXPENSE INVOLVED IN PLACING THE BOOKS IT CONTAINS AT THE SERVICE OF THE PUBLIC WAS PROVIDED DURING THE PAST YEAR FROM THE FOLLOWING SOURCES
CITY OF BANGOR $12,841.48
SAMUEL F. HERSEY FUND 4,000.00
MECHANIC ASSOCIATION FUND 720.00
LUTHER H. PEIRCE FUND 3,850.00
FRANCES A. STETSON FUND 42.50

Cast Bronze Tablet
Size, 3 ft. x 5 ft. 7 in.



Cast Bronze Lamp Standard, Brooklyn Trust Co., Brooklyn, N. Y.
YORK & SAWYER, Architects



Bronze Counter Screen, Bowery Savings Bank, New York, N. Y.
YORK & SAWYER, Architects

ESTABLISHED 1876 INCORPORATED 1885

LOGAN CO.

FORMERLY THE DOW CO.

Ornamental Iron, Bronze and Wire Work

209 North Buchanan Street
LOUISVILLE, KY.
REPRESENTATIVES IN PRINCIPAL CITIES

Products

Ornamental Bronze and Iron Work: including Elevator Enclosures and Cars, Gates, Fire Escapes, Railings, Stairs, Marquises, Iron Fencing, Doors (Entrance) Bronze or Iron, Grill Work.

Wire Work: including Guards, Gates, Partitions and Railings.

Facilities

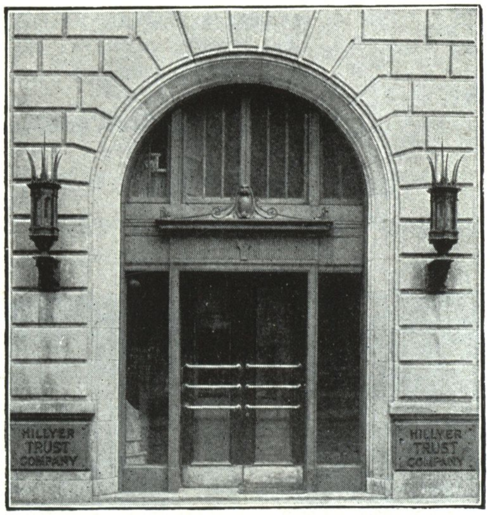
An old established firm with a modern plant, equipped to execute all contracts in a prompt, efficient and accurate manner.

Catalogues

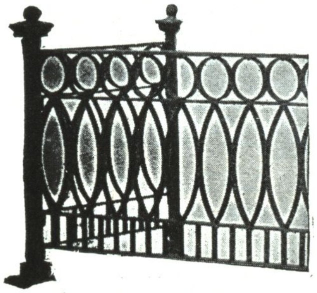
Catalogue and photographs showing many designs sent on request.

Ornamental Metal and Miscellaneous Iron Work

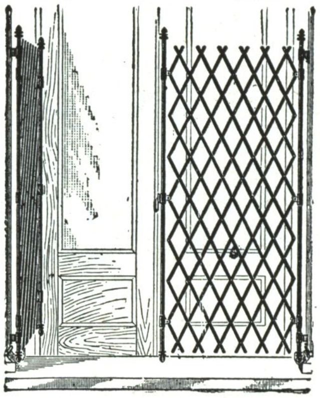
Ornamental gates made of wrought iron, brass or wire; collapsing gates. Ornamental metal doors and lamps executed in any design or shape. Iron and pipe railings for areas, stairs and balconies can be manufactured of iron or brass in any shape.



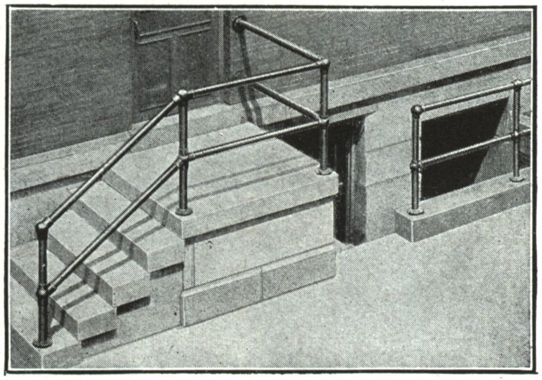
Dow Cast Iron Entrance Doors, Framing and Lamps



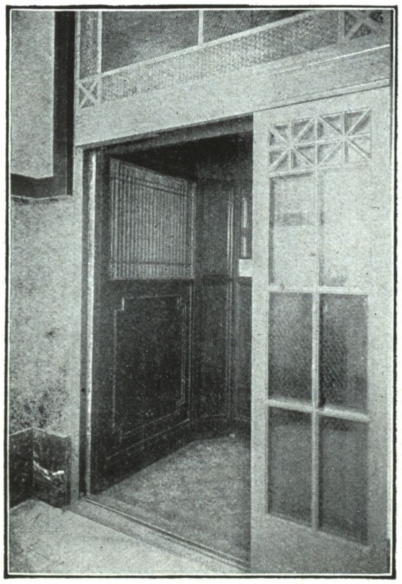
Dow Iron Fencing



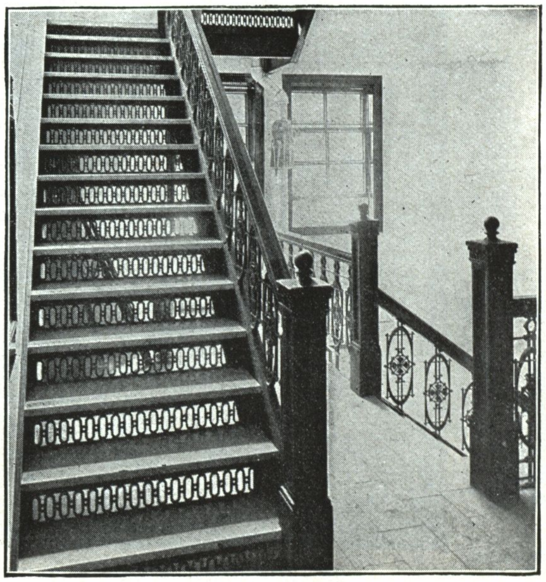
Dow Collapsing Gate



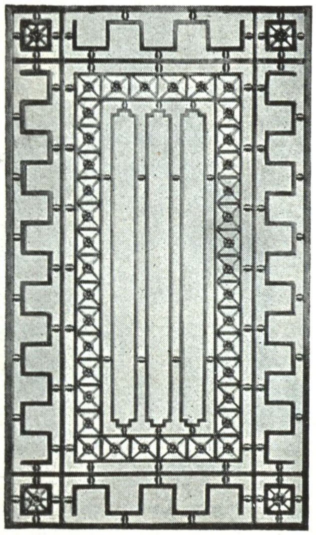
Dow Pipe Railings



Dow Elevator Enclosure and Car

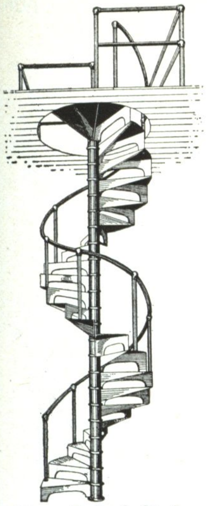


Dow Iron Stairs and Railing

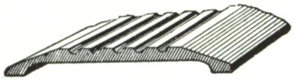


Dow Ornamental Grill

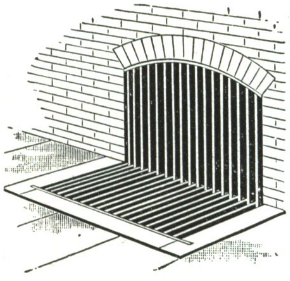
Continued on next page



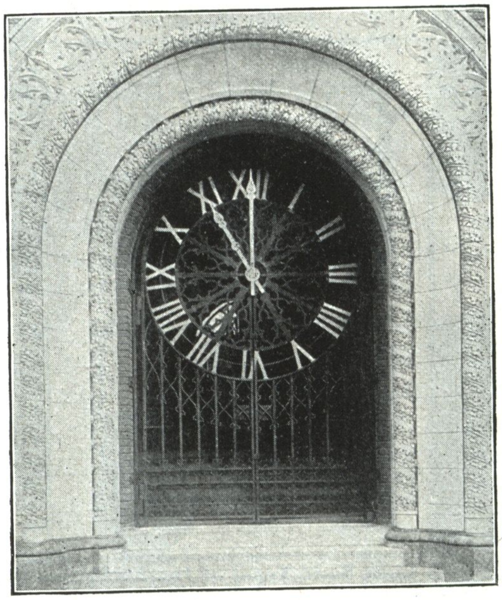
Dow Spiral Stairs



Dow Threshold
Made of iron, brass or bronze



Dow Sidewalk Grating and Window Guard



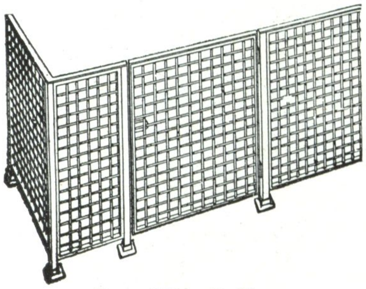
Dow Emblem Design Ornamental Gate
Installed at the Elks Club, Atlanta, Ga.

Wire Work

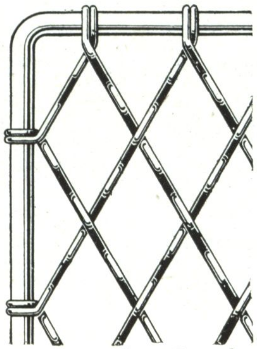
Wire Door and Window Guards—Are made any size and of either round iron or channel iron frames.

A special booklet showing different size meshes with wire shown to full size, sent on request.

Wire Partitions—These standard partitions, of No. 10 wire in 1½-in. mesh woven to 1-in. channel frames, are 4x8 ft. in size and are adapted principally to stockroom enclosures. Special sizes can be made.



Dow Wire Railing
Made of flat or round wire in square or diamond mesh



Dow Window Guard

Standard Step Fire Escapes

These fire escapes are made to comply with any city or state law. Give a sketch of arrangement and give location of windows to be connected.

Special catalogue and specifications of many types sent on request.

Dow Spiral Slide Fire Escapes

This escape, made entirely of steel, consists of a smooth galvanized spiral slide enclosed in a cylinder 5 ft. in diameter, equipped with automatic entrance and exit doors. It rests on its own foundation and does not depend on the building walls for support. It may be erected either on the exterior of a building, as shown in the accompanying illustration, or incorporated within the walls of the building as detailed below.

Advantages—It has no steps; consequently there is no stumbling or falling.

Being wholly enclosed, it is impossible for rain or snow, smoke or fire to enter.

Capacity—Over 150 persons a minute, which is the equal of 3 ordinary stairways.

Specifications—The fire escape shall be the Dow Spiral Slide made by Logan Co., Louisville, Ky., or equal. It shall be placed on a concrete foundation.

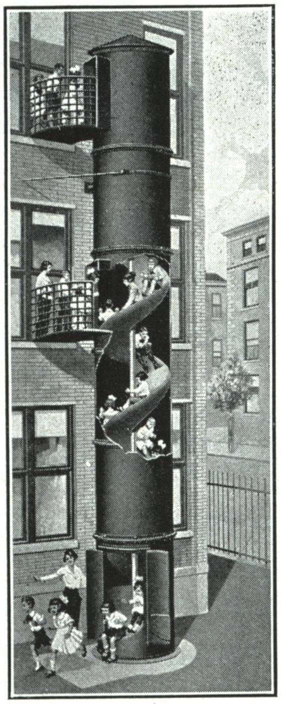
The escape proper shall be entirely of steel, 5 ft. diameter, placed as shown on plans, and shall have one entrance at each floor above the first.

The cylinder shall be of No. 12 U. S. Standard gauge sheet steel, for the first 18 in.; the next 6 ft. of No. 14 gauge, and the remainder of No. 16. The spiral slide shall be of No. 16 gauge galvanized sheet securely attached to a center core of 3-in. inside diameter standard black pipe.

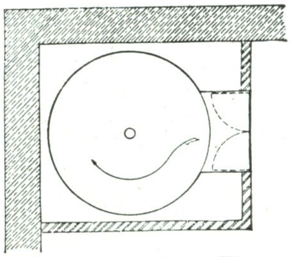
An enclosed vestibule shall be provided at each entrance with entrance doors in two leaves each, arranged to swing in, and provided with torsion springs of phosphor bronze. Doors shall be set away from cylinder far enough to clear same when swung open.

Exit doors shall be in two leaves opening outward and provided with brass automatic inside latch with touch-plate to operate by pressure by the smallest child.

The entire escape shall be manufactured in assembled sections about 7 ft. high, with an angle ring at the top and bottom of each section. It shall be set up at the factory to insure proper fitting, and each section properly marked to correspond with a setting diagram to be furnished by manufacturers.



The "Dow Spiral" as Installed on Exterior of Building



Entrance to Dow Fire Escape—Interior Installation

ESTABLISHED 1912 INCORPORATED 1920

THE McCOY BRONZE COMPANY, INC.

Architectural and Ornamental Bronze Work

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Monumental, Ecclesiastical, Architectural and Commercial Bronze Work in all the branches.

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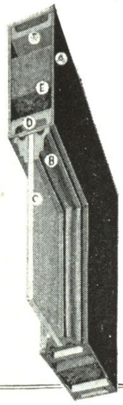
For Bronze Casements, see pages 970-971.

LIKE THE PYRAMIDS ~ LASTS FOR AGES
Pyramid
TRADE MARK
BRONZE

Hollow Bronze Doors

Carefully and rigidly constructed of best drawn bronze panels, and extruded bronze. Made in all standard types. Special designs made to order. The door to use where permanence and appearance are important.



A—Rail
B—Panel moulding
C—Glass or metal panel
D—Channel reinforcement
E—Cork filler

Service

Estimates furnished from architects' plans and specifications.

Suggestions, designs or models will be furnished when desired. We solicit your inquiries.

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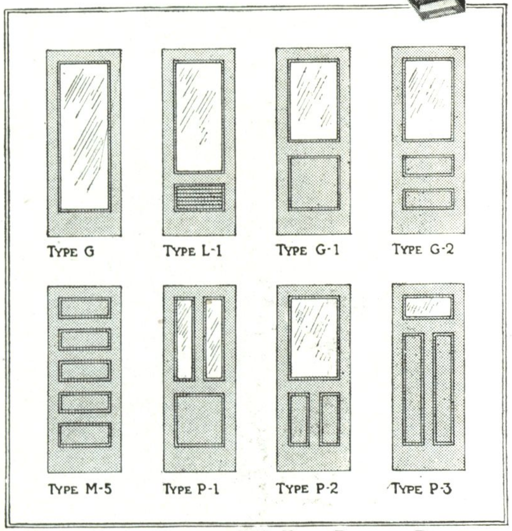
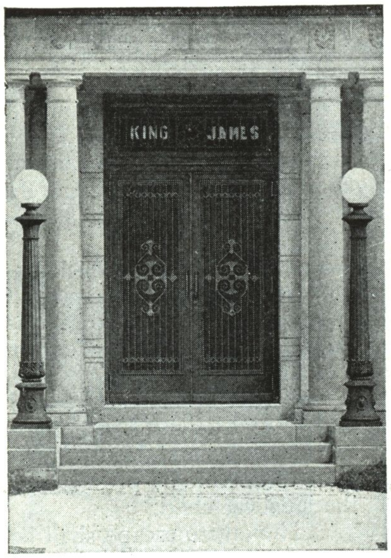
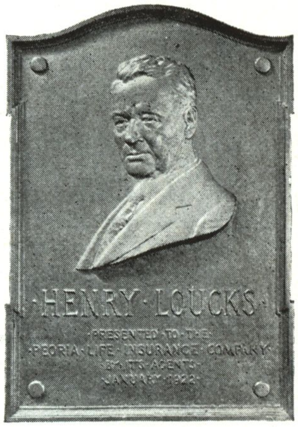
With 12 years of experience behind it, our organization is a capable one, working in a complete modern plant.



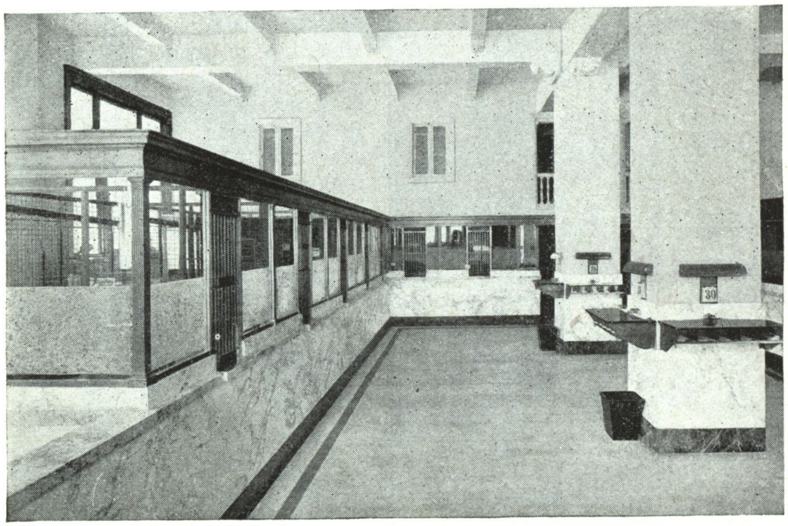
Eight Basic Types of Hollow Bronze Doors
Metal may be substituted in place of glass panels



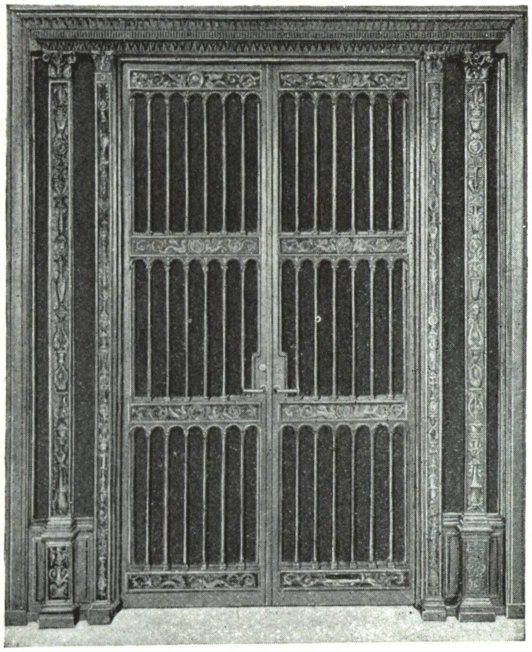
Bronze Entrance Doors, King James Apartments



Bronze Portrait Tablet



Bronze Bank Enclosures, Check Desks, etc., in Bank & Trust Co. of West Philadelphia, Pa.



Cast Bronze Doorway, Kinsel Residence, Detroit, Mich.
Louis Kamper, Architect

JAS. H. MATTHEWS & CO.

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PITTSBURGH, PA

Products

Bronze Memorial Tablets; Bronze Building Tablets; Overhead Bronze Letters; Bronze Commercial Signs; Bronze Bank Signs; Statuary Bronze; Bronze Tablets with Bas-Relief Studies. Individual conceptions either of architects or our own, or tablets made from combinations of our many master borders and designs.

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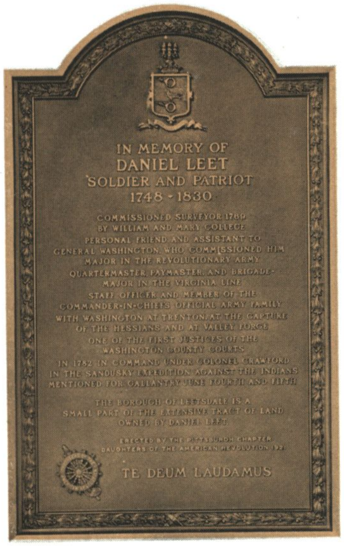
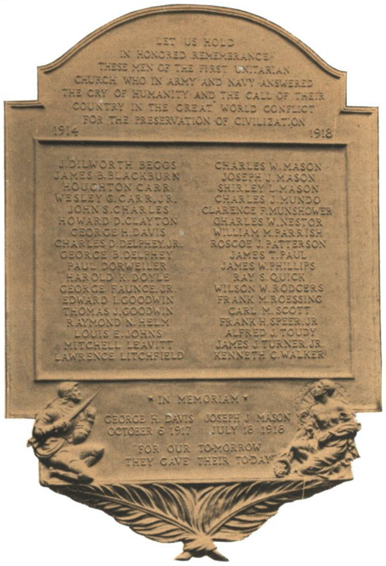
Full size drawings, photographs, suggestions and quotations promptly furnished on receipt of an outline of your need.

Community Honor Roll


IN MEMORY OF
DANIEL LEET
SOLDIER AND PATRIOT
1748 - 1830
COMMISSIONED SURVEYOR 1769
BY WILLIAM AND MARY COLLEGE
PERSONAL FRIEND AND ASSISTANT TO
GENERAL WASHINGTON, WHO COMMISSIONED HIM
MAJOR IN THE REVOLUTIONARY ARMY
QUARTERMASTER, PAYMASTER, AND BRIGADE-
MAJOR IN THE VIRGINIA LINE
STAFF OFFICER AND MEMBER OF THE
COMMANDER-IN-CHIEFS OFFICIAL ARMY FAMILY
WITH WASHINGTON AT TRENTON, AT THE CAPTURE
OF THE HESSIANS AND AT VALLEY FORGE
ONE OF THE FIRST JUSTICES OF THE
WASHINGTON COUNTY COURTS
IN 1782 IN COMMAND UNDER COLONEL CRAWFORD
IN THE SANDUSKY EXPEDITION AGAINST THE INDIANS
MENTIONED FOR GALLANTRY JUNE FOURTH AND FIFTH
THE BOROUGH OF LEETSDALE IS A
SMALL PART OF THE EXTENSIVE TRACT OF LAND
OWNED BY DANIEL LEET
ERECTED BY THE PITTSBURGH CHAPTER
DAUGHTERS OF THE AMERICAN REVOLUTION 1921
TE DEUM LAUDAMUS

Historical Memorial Tablet


LET US HOLD
IN HONORED REMEMBRANCE
THESE MEN OF THE FIRST UNITARIAN
CHURCH WHO IN ARMY AND NAVY ANSWERED
THE CRY OF HUMANITY AND THE CALL OF THEIR
COUNTRY IN THE GREAT WORLD CONFLICT
FOR THE PRESERVATION OF CIVILIZATION
1914
1918
J. DILWORTH BEGGS
JAMES B. BLACKBURN
HOUGHTON CARR
WESLEY G. CARR, JR.
JOHN S. CHARLES
HOWARD D. CLAYTON
GEORGE H. DAVIS
CHARLES D. DELPHEY, JR.
GEORGE B. DELPHEY
PAUL DORWEILER
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EDWARD I. GOODWIN
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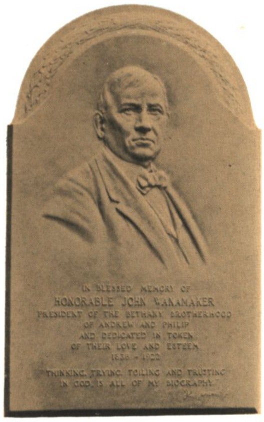
ALFRED J. TOUDY
JAMES J. TURNER, JR.
KENNETH C. WALKER
IN MEMORIAM
GEORGE H. DAVIS
OCTOBER 6 1917
JOSEPH J. MASON
JULY 18 1918
"FOR OUR TO-MORROW
THEY GAVE THEIR TO-DAY"

Specially Modeled Honor Roll

Bronze Figure for Patriotic Memorial

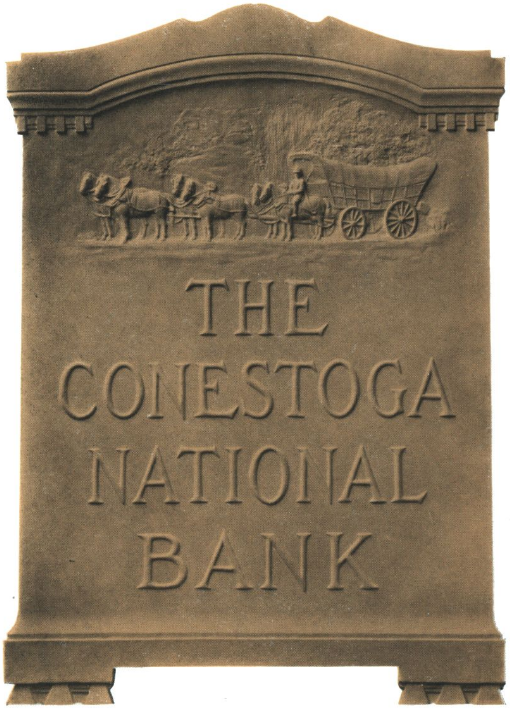

IN BLESSED MEMORY OF
HONORABLE JOHN WANAMAKER
PRESIDENT OF THE BETHANY BROTHERHOOD
OF ANDREW AND PHILIP
AND DEDICATED IN TOKEN
OF THEIR LOVE AND ESTEEM
"THINKING, TRYING, TOILING AND TRUSTING
IN GOD, IS ALL OF MY BIOGRAPHY."

Modeled Bas-Relief Individual Memorial

Architectural Service

We are specially desirous of co-operating with architects in supplying bronze tablets of unusual distinction and beauty—not only by working out to the fullest advantage the special designs of the architect himself, but by placing our designing staff freely at his service. In this way the architect can conveniently be sure of securing bronze tablets strictly in harmony with the building and his own esthetic requirements.

Continued on next page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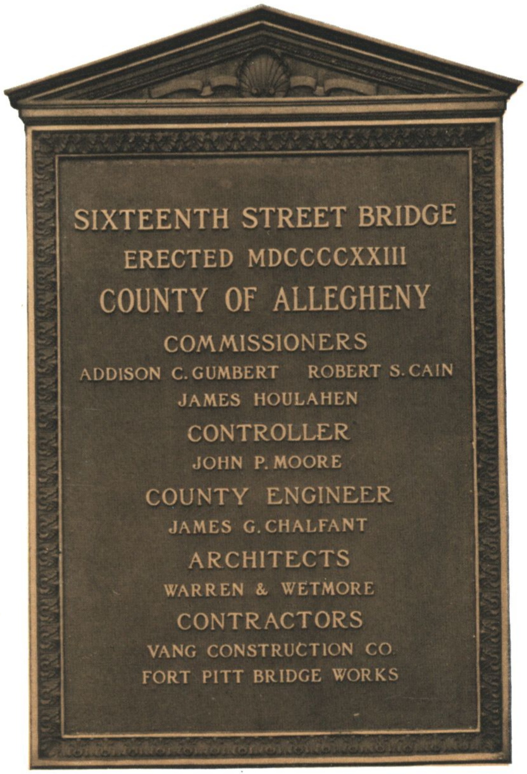
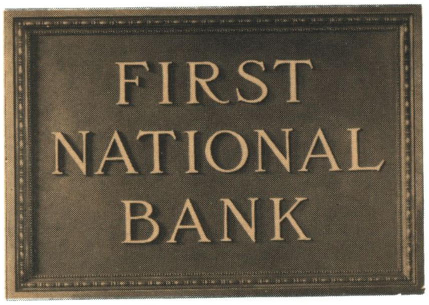
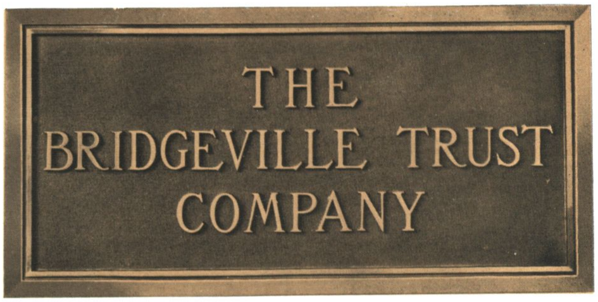
Specially Modeled Bank Sign
An excellent example of a specially modeled commercial bank sign—combining historical interest with practical service


SIXTEENTH STREET BRIDGE
ERECTED MDCCCCXXIII
COUNTY OF ALLEGHENY
COMMISSIONERS
ADDISON C. GUMBERT
ROBERT S. CAIN
JAMES HOULAHEN
CONTROLLER
JOHN P. MOORE
COUNTY ENGINEER
JAMES G. CHALFANT
ARCHITECTS
WARREN & WETMORE
CONTRACTORS
VANG CONSTRUCTION CO
FORT PITT BRIDGE WORKS

Cast Bronze Bridge Tablet
Made by us to design and specification of the architect


FIRST
NATIONAL
BANK

Cast Bronze Bank Signs
Illustrates one of our specially designed letter fonts combined with our master Chippendale border


THE
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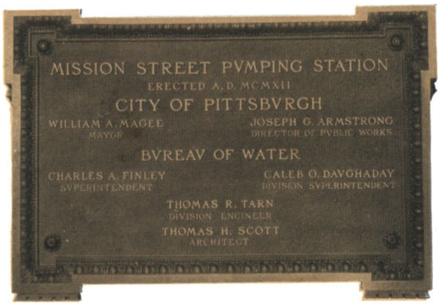
Cast Bronze Bank Signs
The simple border and beautiful lettering of this bank tablet may be applied to any need and size the architect may have


MISSION STREET PVMPING STATION
ERECTED A. D. MCMXII
CITY OF PITTSBVRGH
WILLIAM A. MAGEE
MAYOR
JOSEPH G. ARMSTRONG
DIRECTOR OF PVBLIC WORKS
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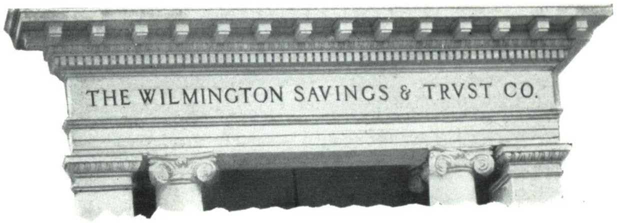
Generally our master borders and designs can be effectively and economically used for this need. However, individual conceptions will be gladly developed where required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Overhead Architectural Letters
We have facilities for supplying any design or size required—either to our master patterns or to your individual specifications

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Private siding and location of Albany on direct overnight water route to New York and South, and direct rail routes to New England, West, Southwest and South make delivery convenient and prompt to customers.

Large pattern stock of ornamental details effects economies in design. Ability to furnish plain and carved patterns, fitted as well as unfinished castings make for completeness of service.

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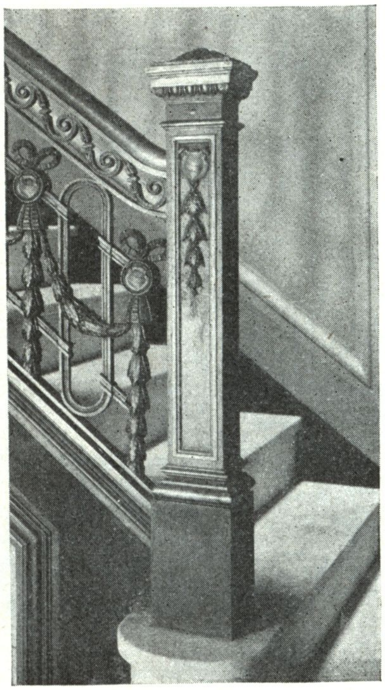
Seventy years of experience, and pattern makers, moulders and fitters trained for this special work, have made our products well known for the quality of their ornamentation and finish.

Sharp Ornamental Relief


Faithfulness to Design

Delicate Tracery

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Ornamental Bronze and Brass Work for Architectural and Memorial Purposes.

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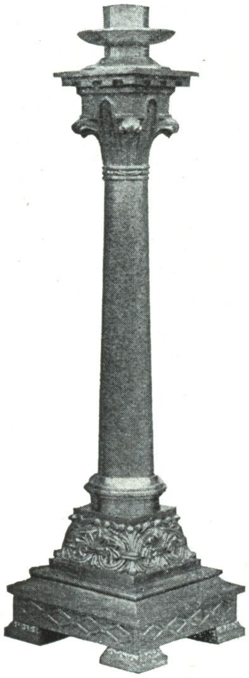
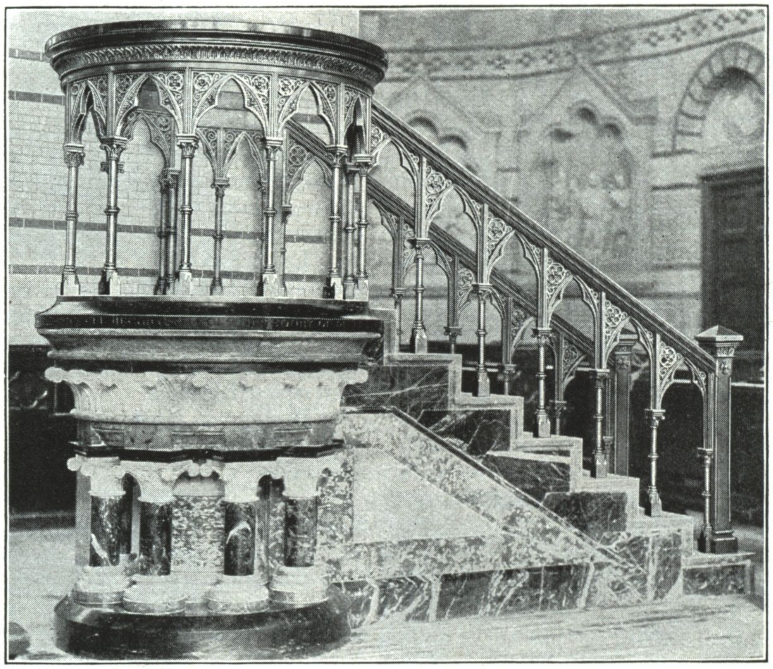
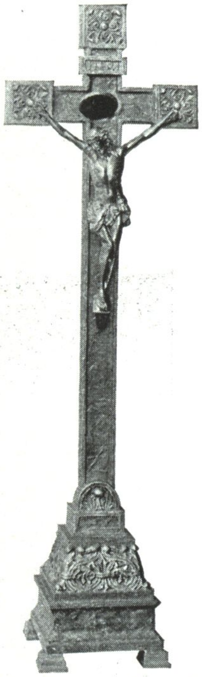


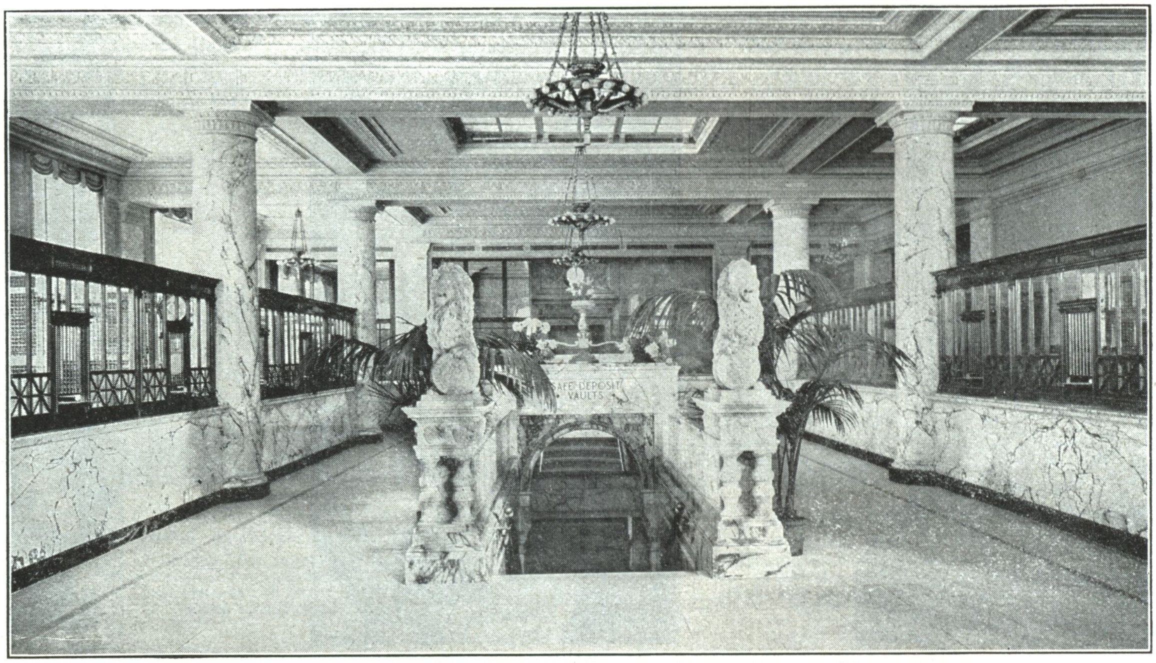
4-ft. Bronze Candlestick, St. Paul's Church, Cambridge, Mass.



Bronze Pulpit Rail Placed at Church of St. Edward the Confessor, Baltimore, Md.
G. A. Audsley, Architect



5-ft. Bronze Crucifix, St. Paul's Church, Cambridge, Mass.



United States Trust Company Banking Room, Boston, Mass.
Blackall, Clapp & Whittemore, Architects

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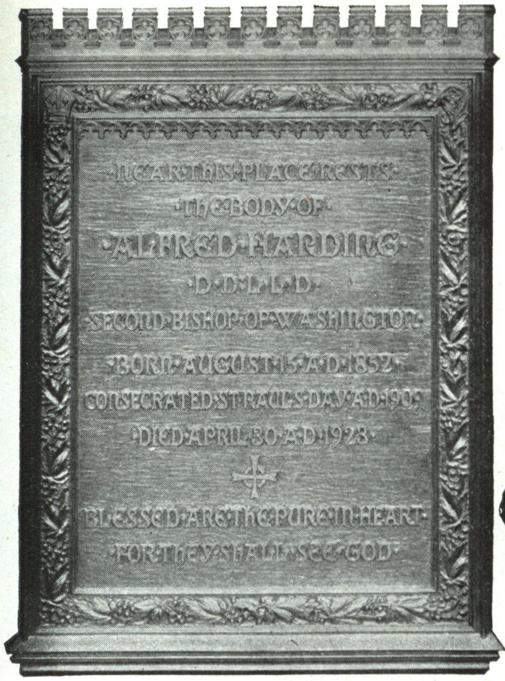
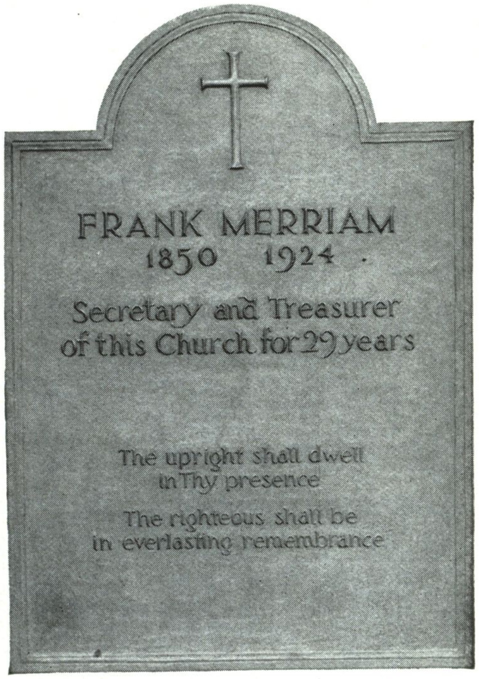
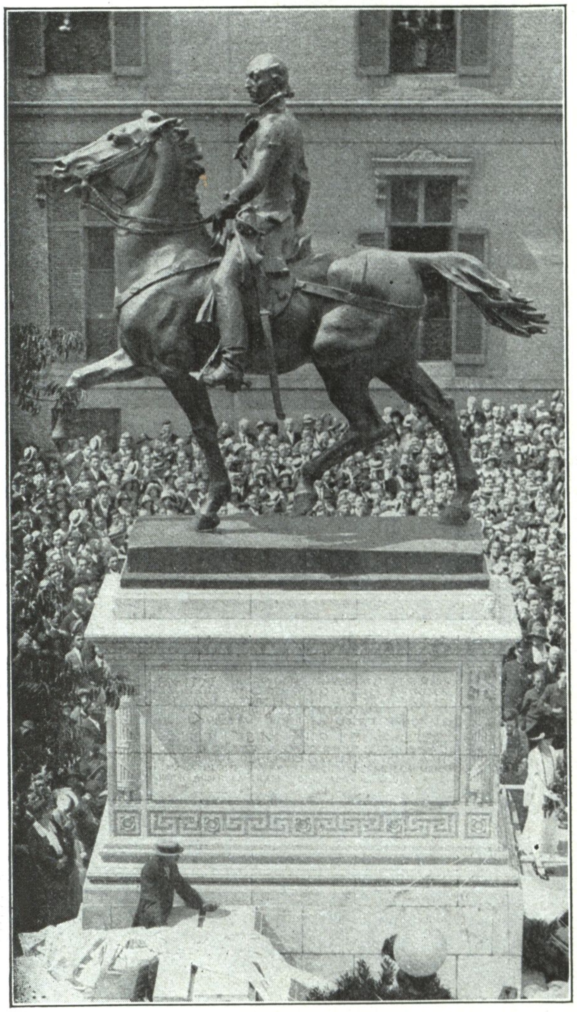

NEAR THIS PLACE RESTS
THE BODY OF
ALFRED HARDING
D·D·L·L·D
SECOND BISHOP OF WASHINGTON
BORN AUGUST 15 A·D 1852
CONSECRATED ST PAULS DAY A·D 1909
DIED APRIL 30 A·D 1923
BLESSED ARE THE PURE IN HEART
FOR THEY SHALL SEE GOD

Placed at Episcopal Cathedral, Washington, D. C.
Frohman, Robb & Little, Architects

9-ft. Bronze Figure, Pilgrim Maid, Placed at Plymouth, Mass.

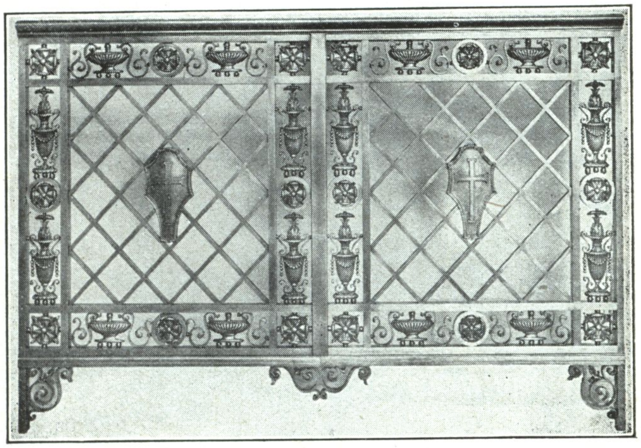

FRANK MERRIAM
1850 1924
Secretary and Treasurer
of this Church for 29 years
The upright shall dwell
in Thy presence
The righteous shall be
in everlasting remembrance

Modeled Bronze Tablet Placed at Nahant, Mass.
Andrews, Jones, Biscoe & Whitmore, Architects



18-ft. Bronze Equestrian Statue of Lafayette Placed at Baltimore, Md.
Andrew O'Connor, Sculptor

Life Size Bronze Busts



Bronze Altar Gates
Charles R. Greco, Architect

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Manufacturers of ORNAMENTAL and ARCHITECTURAL BRONZE, BRASS, IRON, STEEL and WIRE PRODUCTS, including:

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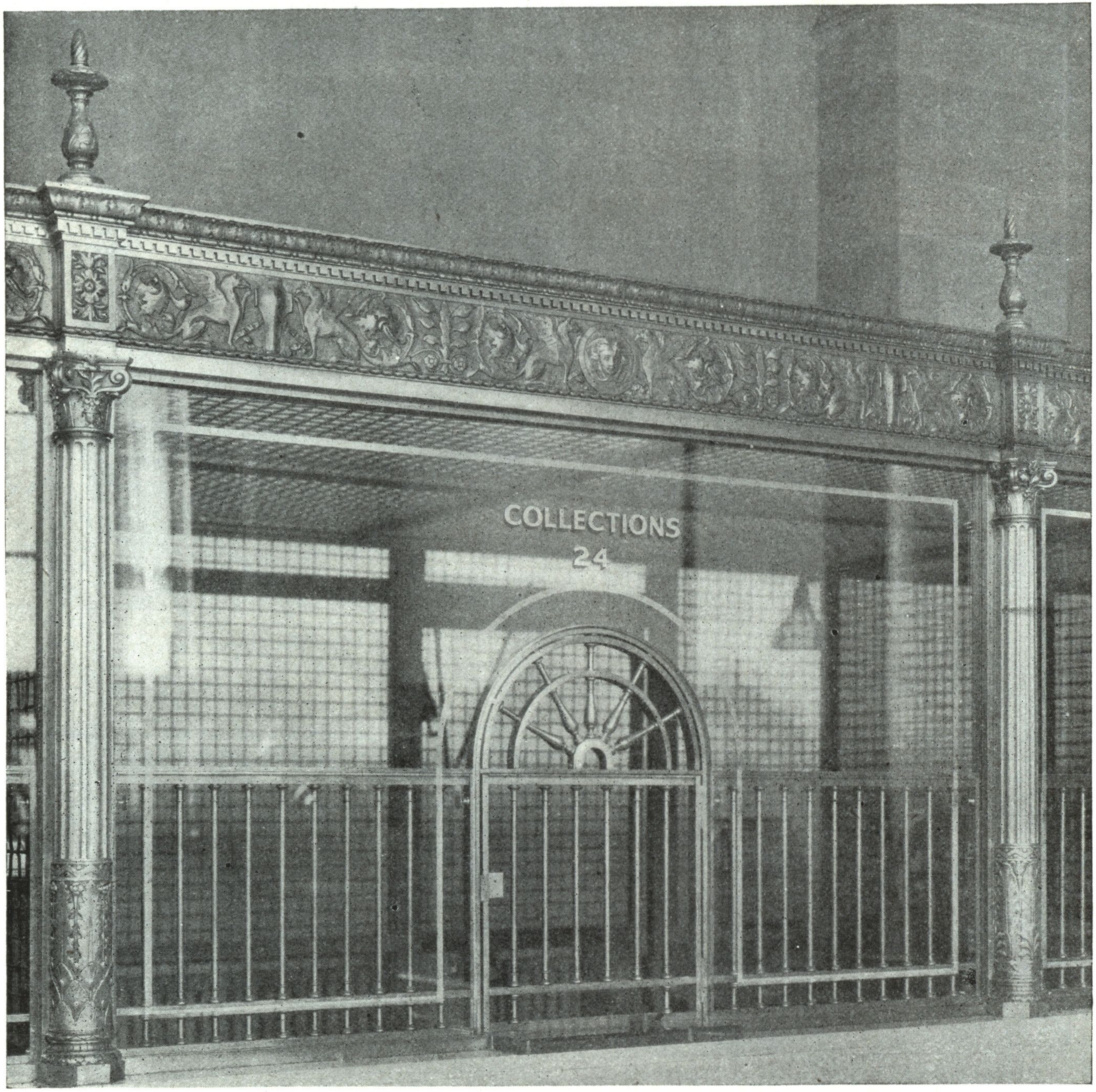
Our designing, engineering and estimating departments are available for service at all times.

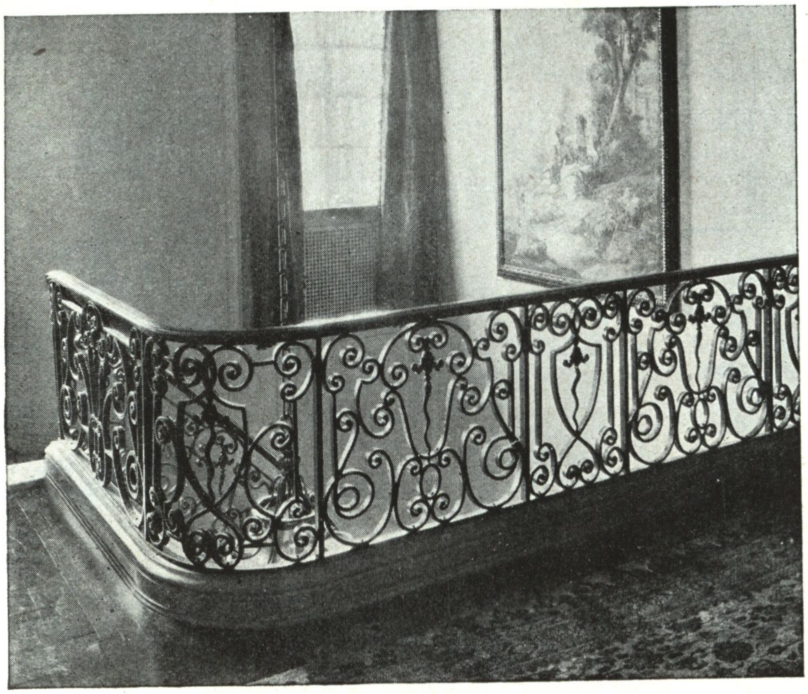


Detail of Bronze Counter Screen

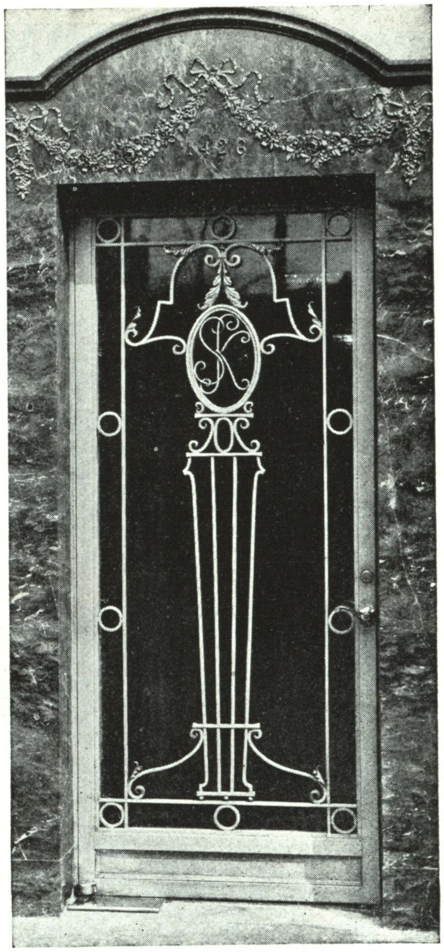
Continued on next page

Period and Modern Work

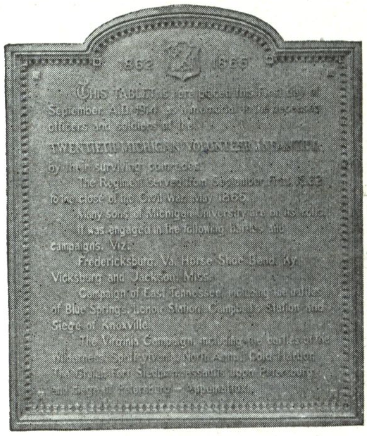
We are prepared to do ornamental metal work in all metals, either in period or modern designs.



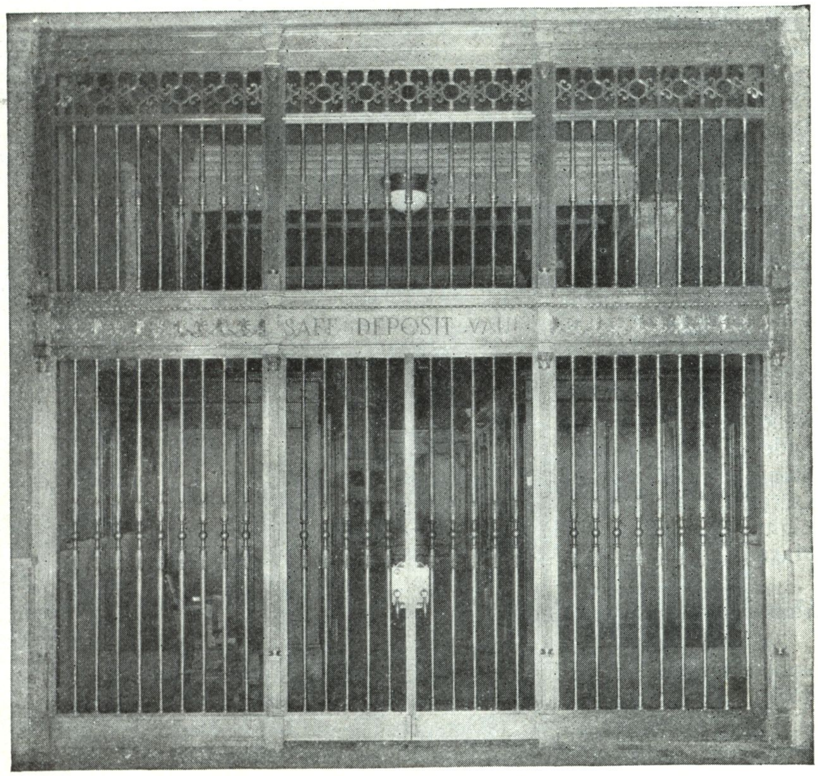
Stair Rail



Entrance Door



Memorial Tablet


SAFE DEPOSIT VAULT

Safe Deposit Vault Grille

MERCHANTS
NATIONAL
BANK

Commercial Tablet

FOUNDED 1882

NEWMAN MANUFACTURING CO.

Architectural and Ornamental Brass, Bronze, Steel and Iron

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CINCINNATI, OHIO

CHICAGO, ILL., 68 West Washington Street

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Architectural and Ornamental Metal Work of every description, including Cast, Formed, Extruded and Built-up Fixtures, Hardware, etc., for banks, theaters, churches, public buildings, etc., of Brass, Bronze, Copper, Electroplated Steel and Wrought Iron, comprising: Doors, Railings, Grilles, Wickets, Thresholds, etc.

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- Balustrades
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- Bank Screens
- Brackets
- Building Directories
- Bulletin Boards
- Cabs (elevator)
- Cages (woven)
- Cafeteria Fixtures
- Canopies
- Check Desks
- Collapsible Gates
- Cornices
- Counter Screens
- Desks (check)
- Directories
- Doors (solid, hollow and kalamein)
- Door and Window Guards
- Door Pulls
- Elevator Enclosures
- Entrances
- Exit Signs
- Fences (steel and bronze)
- Fittings (all kinds)
- Foot Rails
- Frames (lobby)
- Gates (all kinds)
- Guards
- Hand Rails
- Kick Plates
- Ladders (brass)
- Lamp Standards
- Letters (cast)
- Lighting Units (special)
- Marquise
- Mausoleum Doors, Gates and Grilles
- Memorial Plates
- Mirror Frames
- Mouldings
- Nameplates
- Newels
- Nosings and Edgings
- Office Rails and Partitions
- Partitions (all kinds)
- Pipe Fittings
- Pilasters
- Plates (brass, bronze)
- Pool Stairs
- Posts (brass, bronze)
- Push and Pull Plates
- Railings (all kinds)
- Registers
- Rope Rails
- Safety Treads
- Sidewalk Gratings
- Sills
- Slide Poles
- Stair Rails
- Standards (cast)
- Tablets (bronze)
- Ticket Booths
- Treads (stair)
- Tubing (all kinds)
- Turnstiles
- Vault Doors
- Velour Ropes
- Ventilators
- Wickets (all kinds)
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- Woven Wire Work

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Jefferson Bank, St. Louis, Mo.
Franklin Trust Co., Philadelphia, Pa.
Pearl-Market Bank, Cincinnati, Ohio
American Exchange National Bank, Greensboro, N. C.
First National Bank, Darby, Pa.
Bank of Perkasie, Perkasie, Pa.
Mahanoy City National Bank, Mahanoy City, Pa.
Fourth National & First Savings Bank, Nashville, Tenn.
Metropolitan Trust Co., Philadelphia, Pa.
Ames National Bank, Ames, Iowa
Logan Square Bank, Chicago, Ill.
Community State Bank, Chicago, Ill.
Marine Trust Co., Atlantic City, N. J.
Bank of Overlea, Overlea, Md.
Canton National Bank, Baltimore, Md.
Peoples Trust & Savings Bank, Galesburg, Ill.
Richmond Trust Co., Richmond, Va.
Fulton National Bank, Atlanta, Ga.
Commonwealth Bank, Baltimore, Md.

Theaters

New Stanley Theater, Philadelphia, Pa.
Palace Theater, Cincinnati, Ohio
Howard Theater, Atlanta, Ga.
American Theater, Terre Haute, Ind.
Rialto Theater, Omaha, Neb.
Grand Victory Theater, Detroit, Mich.
Loew's Theaters, New York, N. Y.; Washington, D. C.; Memphis, Tenn.; Indianapolis, Ind.; St. Louis, Mo.
Ascher Bros. Circuit (15 theaters)
Lubliner & Trinz Circuit (10 theaters)
Balaban & Katz Circuit (4 theaters)
Jones, Linick & Schaefer Circuit (6 theaters)
Schoenstadt & Sons Circuit (3 theaters)

Hotels

Drake Hotel, Chicago, Ill.
Hotel Cleveland, Cleveland, Ohio
Hotel Sinton, Cincinnati, Ohio
Somerset Hotel, Chicago, Ill.

Miscellaneous

St. Coleman's Church, Cleveland, Ohio
Ashtabula High School, Ashtabula, Ohio
Water Board Building, New Orleans, La.
Britling System of Cafeterias, Atlanta, Ga.
United States Post Offices at Columbia, S. C.; El Paso, Tex.; Huntington, W. Va.; Chadron, Neb.; Rockville, Conn.

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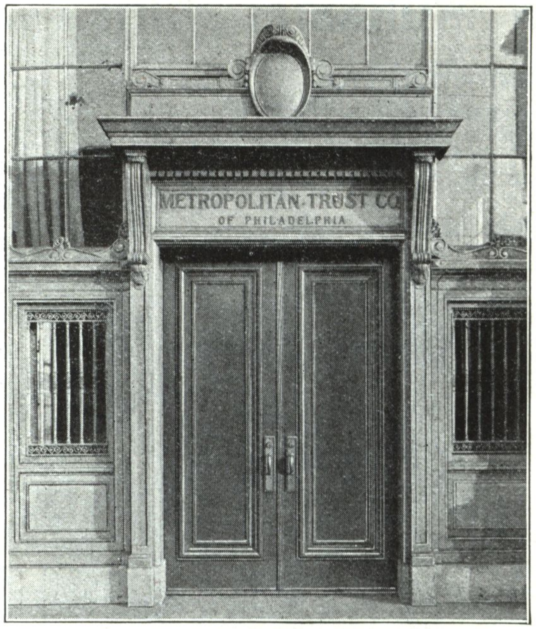
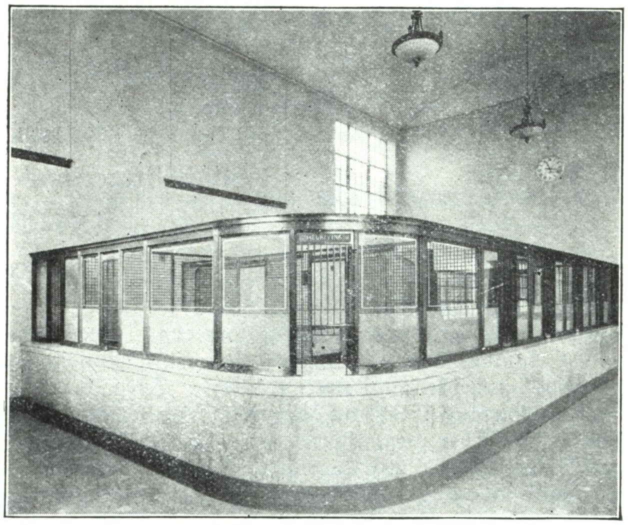
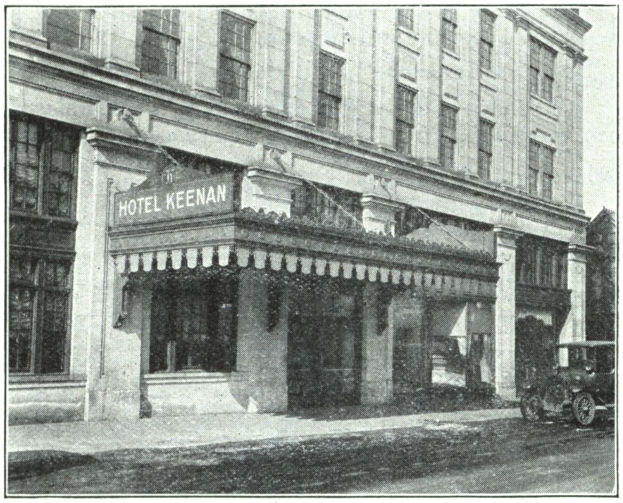

METROPOLITAN TRUST CO
OF PHILADELPHIA

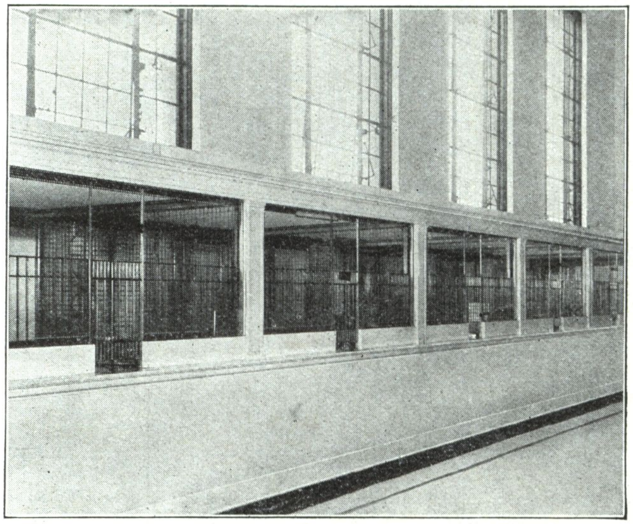
Bronze Doors, Metropolitan Trust Co., Philadelphia, Pa.



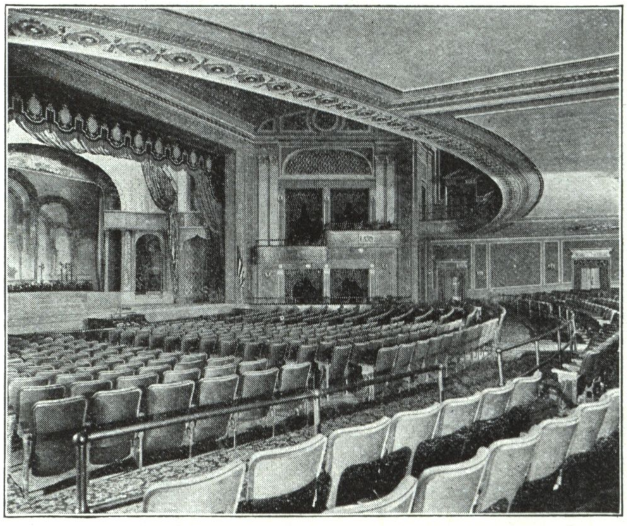
Extruded Bronze Counter Screen, Canton National Bank, Baltimore, Md.


HOTEL KEENAN

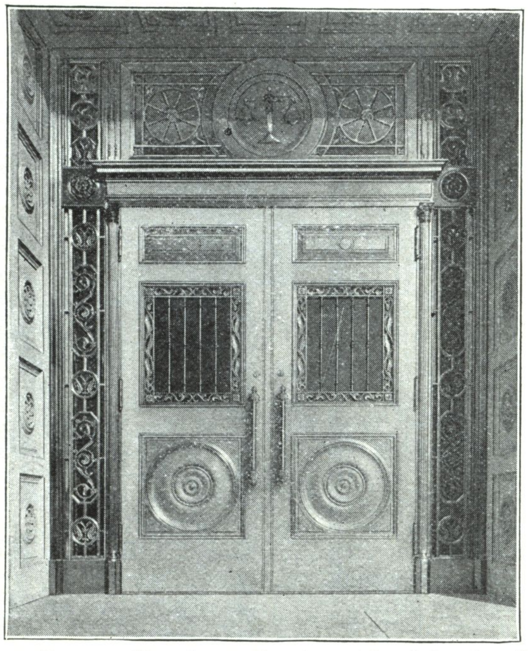
Marquee, Hotel Keenan, Fort Wayne, Ind.



Bronze Grilles and Cages, Richmond Trust Co., Richmond, Va.



Brass Railings, Logan Theater, Philadelphia, Pa.



Bronze Entrance, Mesa County Courthouse, Grand Junction, Colo.

Typical Newman Installations

ESTABLISHED 1910

NEW CITY IRON WORKS

Structural Steel and Ornamental Iron

OFFICE AND WORKS
49th Street and South Racine Avenue
CHICAGO, ILL.

TELEPHONE
Boulevard 6040, 6041, 6042

Products and Services

Structural Steel and Ornamental Iron Work: Steel Columns, Trusses, Girders, Beams, Channels, Entrance Doors, Iron Stairs, Railings, Area Gratings, Window Guards, Cast and Wrought Iron Grilles, Canopies and Fire Escapes.

Miscellaneous and Cast Iron Work in general.

Steel Bending: specializing in Stair Stringers and Risers, and other Steel Sections.

Facilities

We carry a large stock of structural steel and are prepared to execute orders promptly.

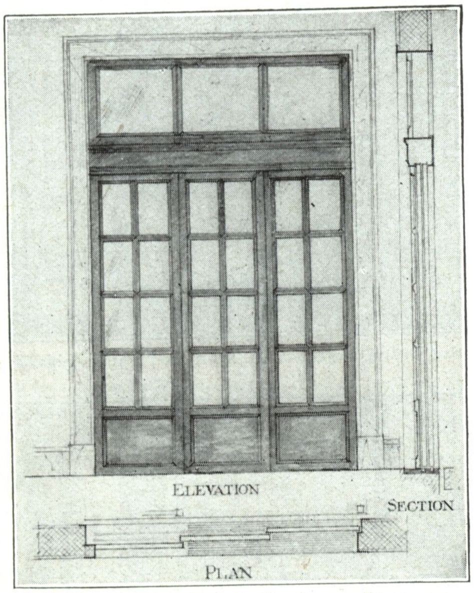
Erection

We employ our own structural and ornamental workmen and prefer to take care of the work we fabricate.

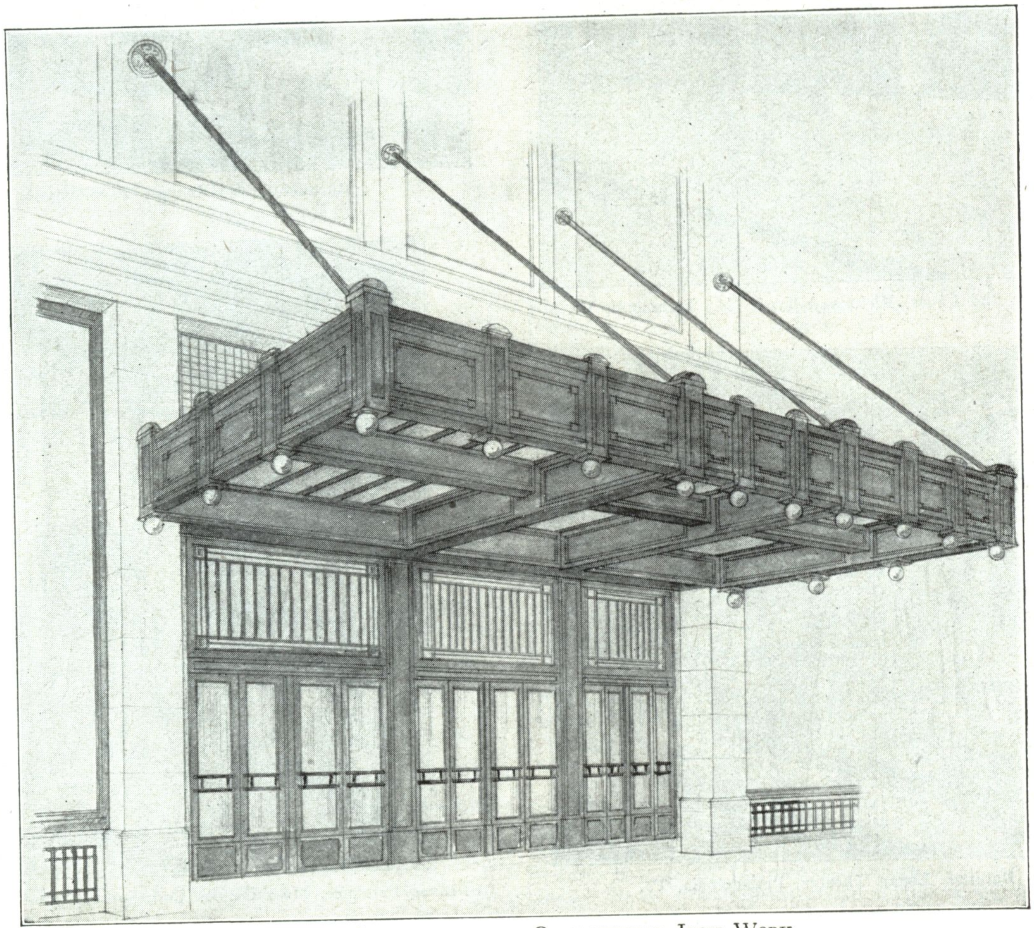
Estimates and Designs

Estimates made from architects' plans and specifications; designs also submitted on application.

We are glad to submit suggestions and stock designs when desired, to save expense of making new patterns.



Construction of Elevator Door



Complete Installation of Ornamental Iron Work

JOHN POLACHEK BRONZE & IRON CO., INC.

Distinctive Metal Work

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LONG ISLAND CITY, N. Y.

Products

ARCHITECTURAL and ORNAMENTAL BRONZE, BRASS, GERMAN SILVER and IRON WORK:

Banking Fixtures, Counter Screens, Check Desks, Railings, Balustrades, Gates, Doors, Elevator Fronts, Grilles, Screens, Windows, Store Fronts, Fences, Marquises, Lamp Standards, Tablets, Signs, Letters, Honor Rolls, Memorials, Mausoleum Work.

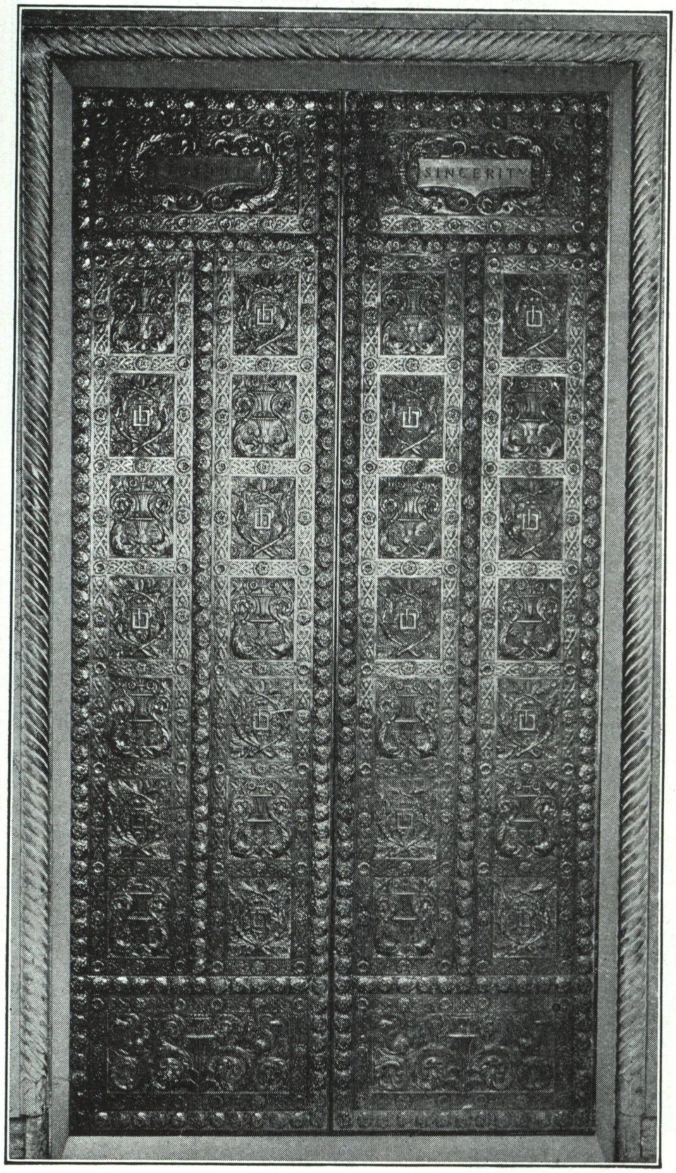
Windows

We have developed, patented and placed on the market, a double hung metal window with two-point contact, metal to metal. We believe this is the only double hung window employing this system. Our window always operates easily and is absolutely weather-tight. This window was pronounced the best on the market and adopted for the largest bronze double hung window installation in this country.

We have also developed important improvements on casement type windows, including three-point contact all around the opening and at the meeting stiles.

During the past year these windows have been used for a number of important buildings, among them the Prudential Insurance Building, Cass Gilbert, architect; the New York County Courthouse, Guy Lowell, architect; the Mutual Benefit Life Insurance Building, John H. & Wilson C. Ely, architects; the Clark Library, Robert D. Farquhar, architect, and others.

To those interested, complete details and samples will be sent on request.



Bronze Elevator Doors, Pershing Square Building, New York, N. Y.
YORK & SAWYER, Architects

A Few of the Contracts being Executed in our Plant between July, 1924, and July, 1925

BUILDING AND LOCATION	ARCHITECTS
Prudential Building, Newark	Cass Gilbert
Chamber of Commerce, Washington	Cass Gilbert
W. Virginia State Capitol, Charleston	Cass Gilbert
Franklin Savings Bank, New York	York & Sawyer
1 Park Ave. Building, New York	York & Sawyer
First National Bank, Boston	York & Sawyer
New York County Courthouse	Guy Lowell
Bank of America, New York	Trowbridge & Livingston
Nebraska State Capitol, Lincoln	Bertram G. Goodhue
Liberty Memorial, Kansas City	H. Van Buren Magonigle
First National Bank, Youngstown	Walker & Weeks
Roosevelt Hotel, New York	Geo. B. Post & Sons
Madison Belmont Building, New York	Warren & Wetmore
Vanderbilt Ave. Building, New York	Warren & Wetmore
Monroe County Bank, Rochester	Mowbray & Uffinger
Lincoln Trust Co., Jersey City	Mowbray & Uffinger
Butler County Bank, Butler, Pa.	Mowbray & Uffinger
Ozone Park National Bank, N. Y.	Mowbray & Uffinger
Boston Five Cent Savings Bank	Parker, Thomas & Rice
Bank of Bay Biscayne, Miami	Weary & Alford Co.
First National Bank, Hammond, Ind.	Weary & Alford Co.
Newburg Savings Bank, N. Y.	Weary & Alford Co.
First National Bank, Huntington	Hopkins & Dentz
First National Bank, Canton	Alfred Hopkins
Home Savings Bank, White Plains	Holmes & Winslow
Embassy Theater, New York	Thomas W. Lamb
Loew Theater, St. Louis	Thomas W. Lamb
Italian Savings Bank, New York	C. P. H. Gilbert
First National Bank, Frackville, Pa.	Ritter & Shay
Federal American Bank, Washington	Alfred C. Bossom
Clark Library, Los Angeles	Robert D. Farquhar
Best & Co. Store, New York	Necarsulmer & Lehlbach
Harriman National Bank, New York	G. A. & H. Boehm
Philadelphia Co. Building, Pittsburgh	Joseph F. Kuntz
Shell Building, St. Louis	Jamieson & Spearl
24 W. 40th St. Building, New York	Buchman & Kahn
16 E. 34th St. Building, New York	Buchman & Kahn
Central Medical Building, Philadelphia	Hahn & Mucklow
Murray Hill Building, New York	Rouse & Goldstone
Dennis Hotel, Atlantic City	Walter T. Smedley
City Savings Bank, Albany	Marcus T. Reynolds
Central Building, Worcester	Lockwood, Green & Co.
Union Mortgage Building, Cleveland	Harry D. Hughes

PENN BRASS & BRONZE WORKS

HENRY J. LANDOLT'S SONS

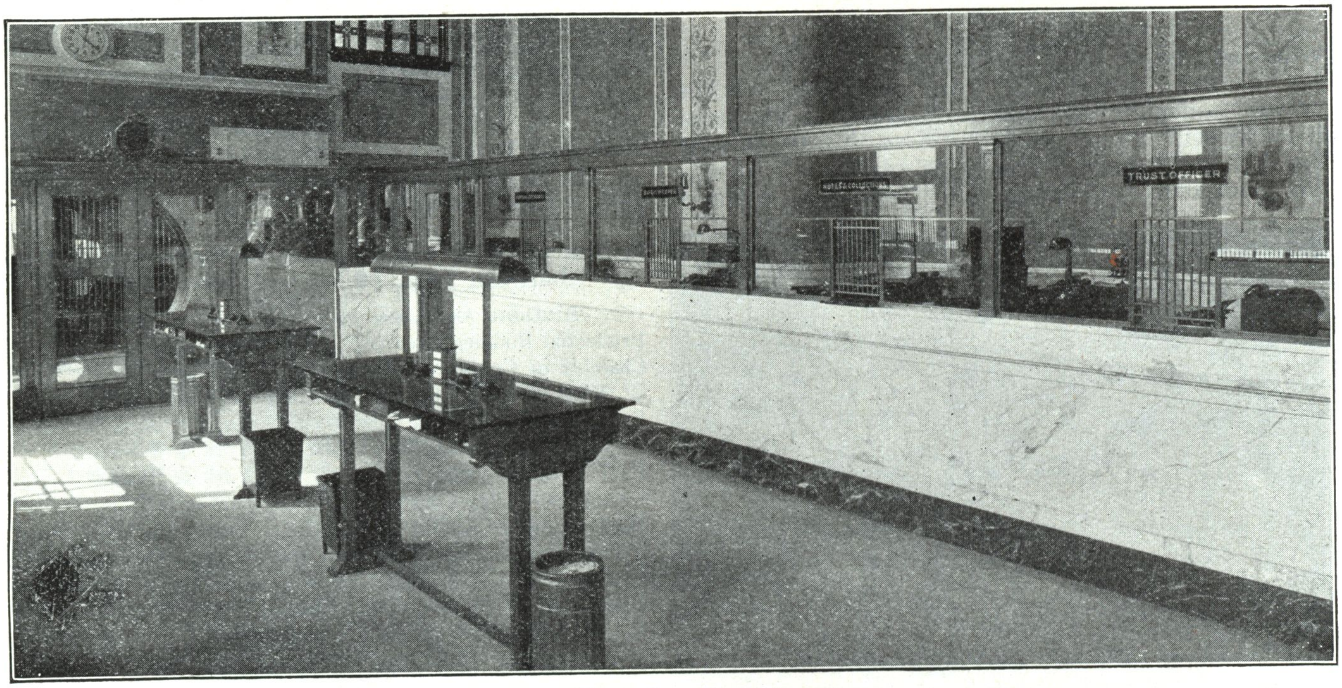
Manufacturers of Architectural Brass and Bronze Work

105-117 Dobbin Street
BROOKLYN, N. Y.

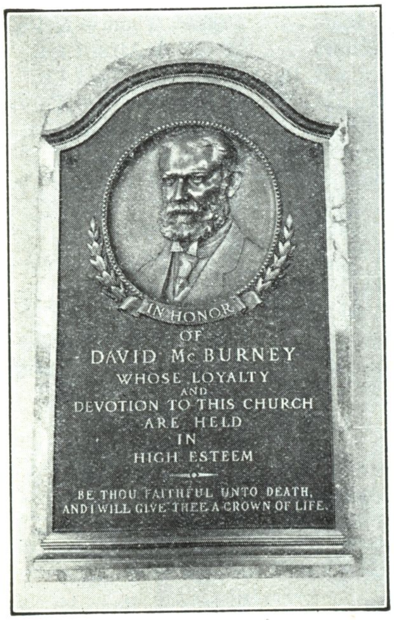
Products

ORNAMENTAL BRONZE and BRASS WORK of every description, for private and public buildings:

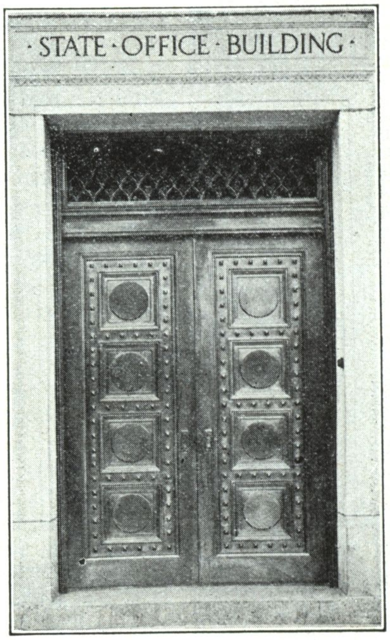
Doors, Entrances, Balustrades, Newels, Stair Rails, Interlocking Windows, Grilles, Theater Railings, etc.; Cast Bronze Letters, Numerals and Signs for buildings; Gates, Folding Gates, Marquises, Mausoleum Doors and Supplies, Bank Enclosures, Counter Screens, Check Desks, Elevator Enclosures, Fences, Balconies, Lamp Standards, Brackets, Tablets, Push Plates, Kick Plates, Brass and Bronze Saddles, Door and Window Guards, Special Hardware, Special Castings (all Alloys), etc.


TRUST OFFICER

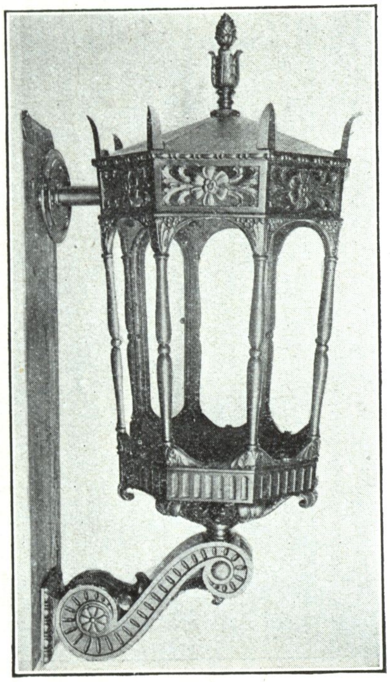
Miners Trust Co., Nanticoke, Pa.
AUGUSTIN REILLY, Architect


IN HONOR
OF
DAVID McBURNEY
WHOSE LOYALTY
AND
DEVOTION TO THIS CHURCH
ARE HELD
IN
HIGH ESTEEM
BE THOU FAITHFUL UNTO DEATH,
AND I WILL GIVE THEE A CROWN OF LIFE.

Memorial Tablet
HERMAN MILLER, Architect


·STATE·OFFICE·BUILDING·

State Office Building Doors, Richmond, Va.



Bronze Lantern
HELMLE & CORBETT, Architects

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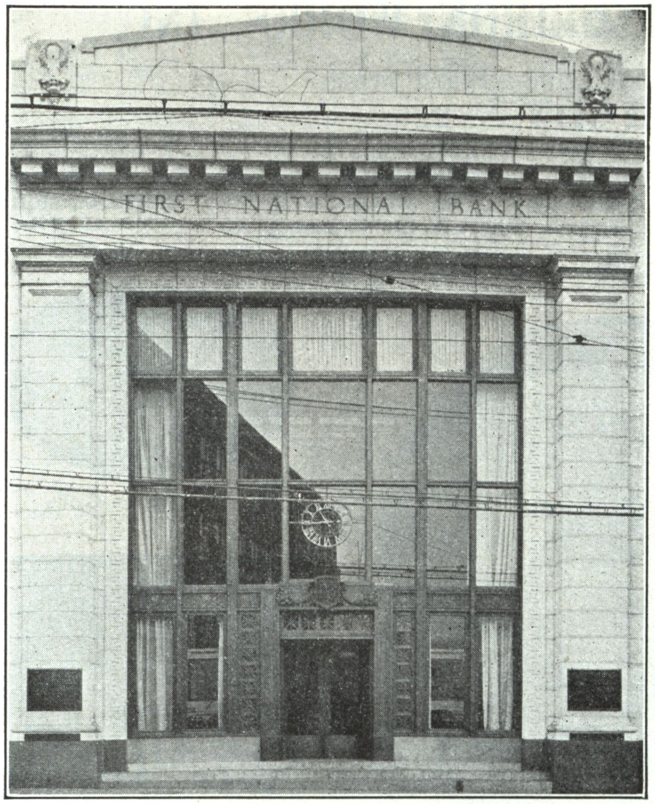
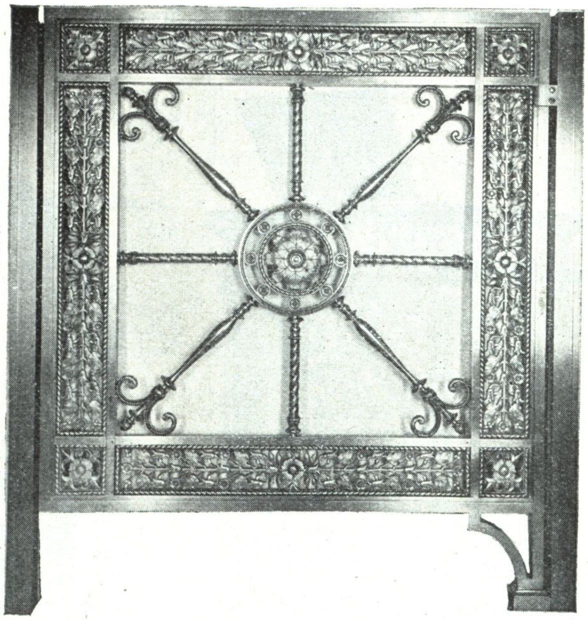
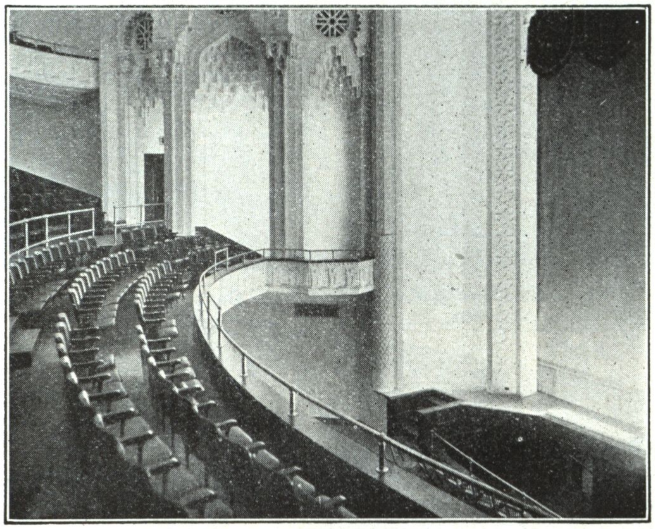


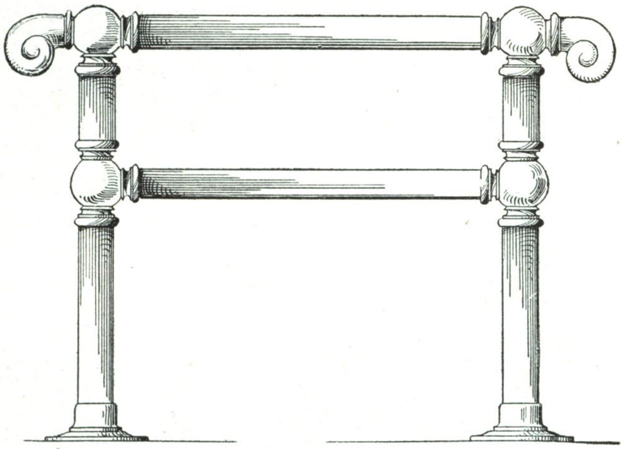
Cast and Wrought Bronze Front, First National Bank, Nanticoke, Pa.
McCormick & French, Architects



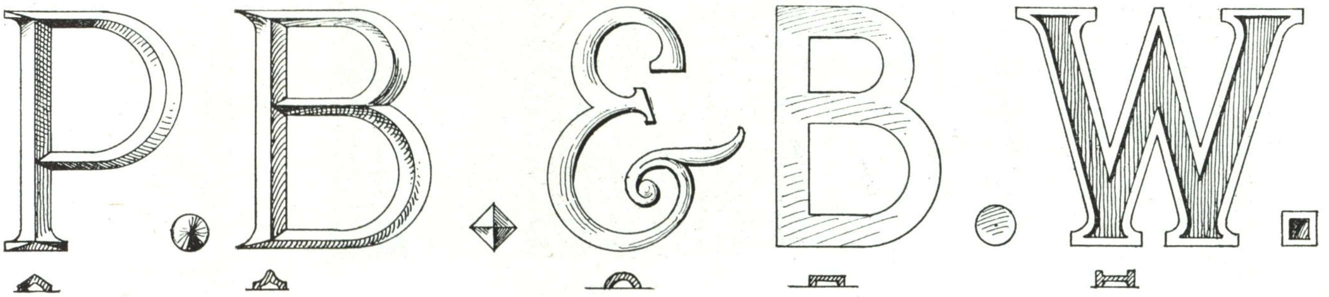
Ornamental Cast Bronze Gate for Bank Counters, Made for Ohio Valley Bank
Albert Kahn, Architect



Bronze Rails, etc., for Mecca Temple, N. Y.
Clinton & Russell, Architects



Brass and Bronze Rail
Made up for all purposes with gates, plain and ornamental fittings, scroll ends and finials



Cast Bronze Letters
All sizes; made from architects' details and also from stock patterns. Cast bronze name plates, signs and tablets

RENAISSANCE BRONZE & IRON WORKS, INC.

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Stillwell 9230

Van Pelt Street—Foster Avenue—Hulst Street
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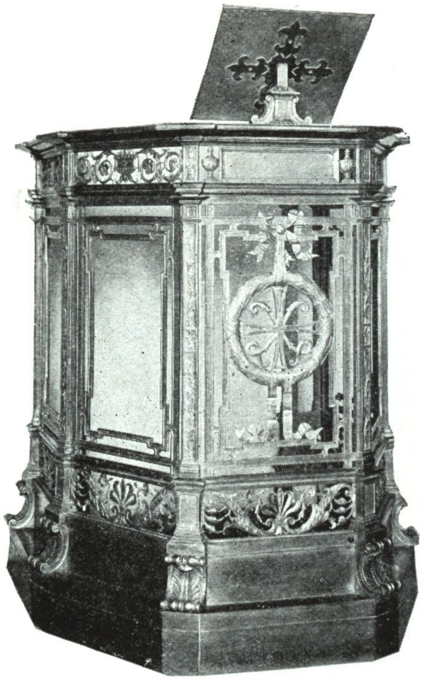
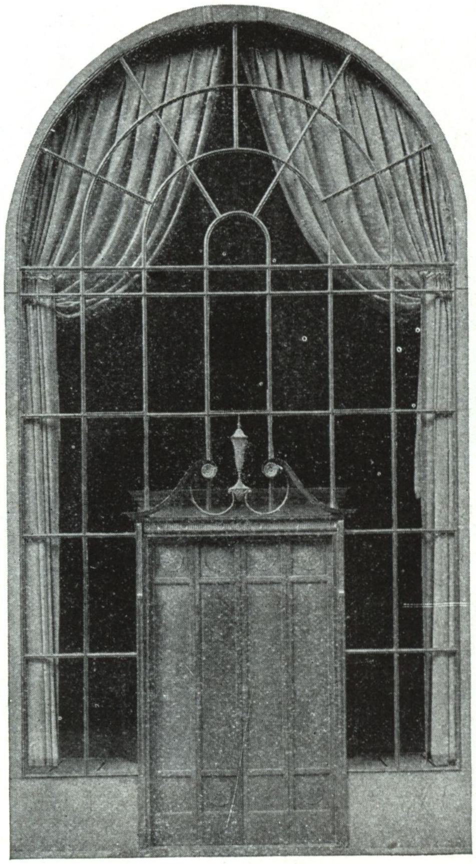
Products

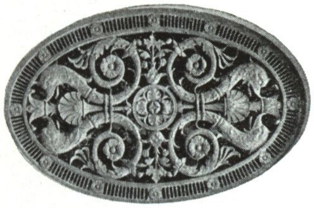
Designers, Founders and Fabricators of Architectural, Ornamental, Statuary and Memorial Work in Bronze, Brass, Iron, Nickel and Silver for banks, public and office buildings, hotels, residences, stores, theaters, churches, mausoleums, etc.



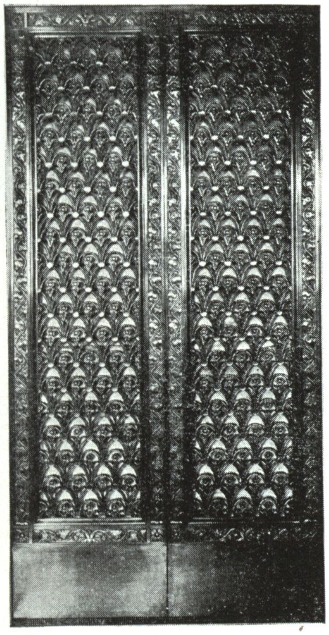
Cast Bronze Pulpit
Cross & Cross, Architects



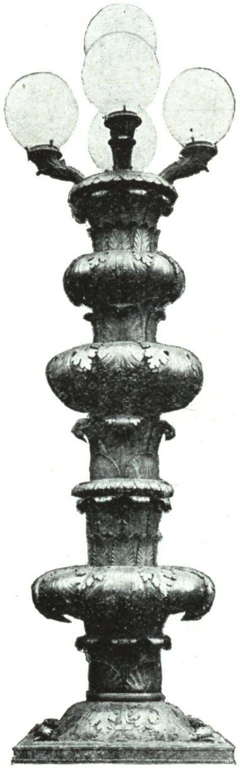
Bronze Store Front and Entrance
Severance & Van Allen, Architects



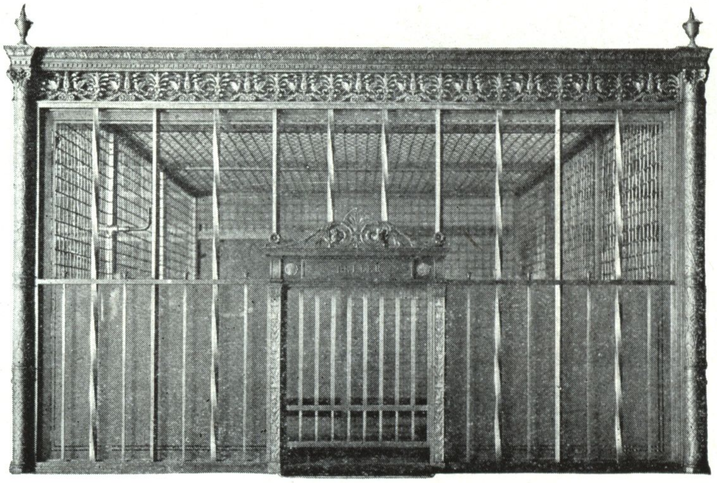
Cast Bronze Grille



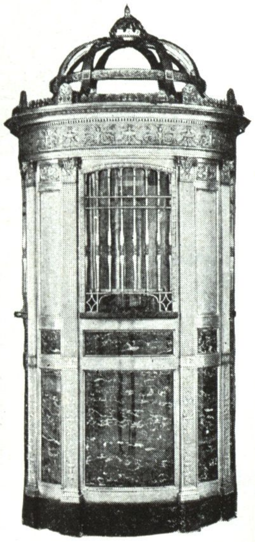
Cast Bronze Door
Albert Kahn, Architect



Bronze Candelabra
Carl L. Otto, Architect



Bronze Counter Screen
Holmes & Winslow, Architects



Bronze Ticket Booth
Eugene De Rosa, Architect

SMYSER-ROYER COMPANY

Ornamental and Architectural Iron Work

MAIN OFFICE AND WORKS
YORK, PA.

PHILADELPHIA, PA., Sales Office and Studios, 1609 Sansom Street
BALTIMORE, MD., Jas. P. Lynch, Representative, 811 Park Avenue

Products

Ornamental and Architectural Metal Work for buildings, including Stairs, Store Fronts, Entrances, Elevator Enclosures, Window Frames, Marquises, Railings, Fences and Grilles.

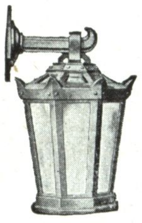
Facilities

Complete drafting and engineering departments. Designing studio. Pattern shops. Two foundries. Extensive machine and fitting shops. Estimates promptly furnished from architects' plans, and drawings submitted for unusual needs.

Exterior Lighting Fixtures

Smyser-Royer line of exterior lighting fixtures include over 300 designs of lamp standards, lanterns and brackets suitable for every need.

TRADE-MARK



Lantern

Catalogues

The Smyser-Royer Company issues the following, which will be furnished on request:

Booklet S—Spiral Stairs
Catalogue "J"—Complete line of lamp standards, brackets and lanterns. Issued August 1, 1925.

References

A few of the many large buildings for which we have furnished the ornamental iron work are:

John Hancock Building, Boston, Mass.
Public Ledger Building, Philadelphia, Pa.
Inquirer Building, Philadelphia, Pa.
Integrity Trust Co. Building, Philadelphia, Pa.
New State Penitentiary, Rock View, Pa.
Ambassador Hotel, Atlantic City, N. J.
Elverson Building, Philadelphia, Pa.
Delaware Bridge, Philadelphia, Pa.

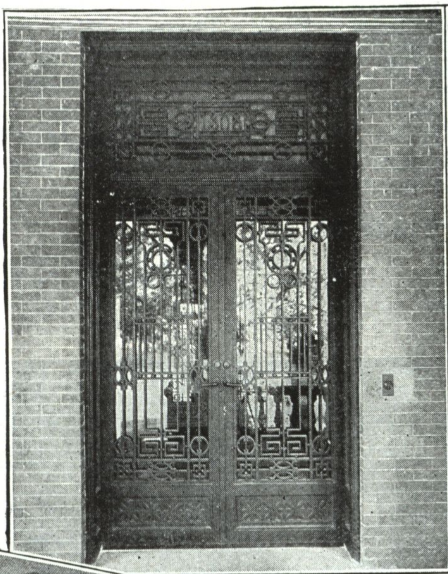


Fig. 1

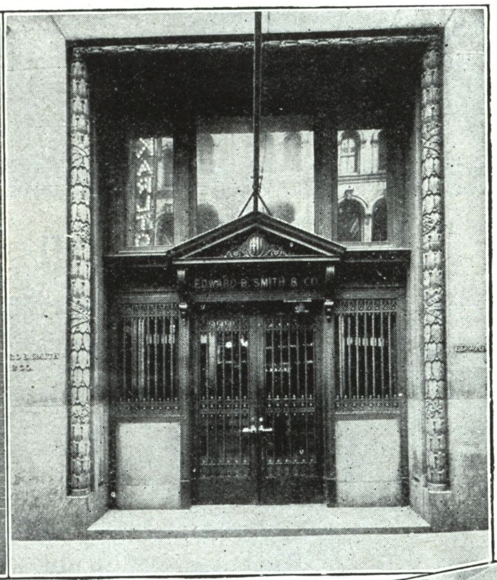


Fig. 2

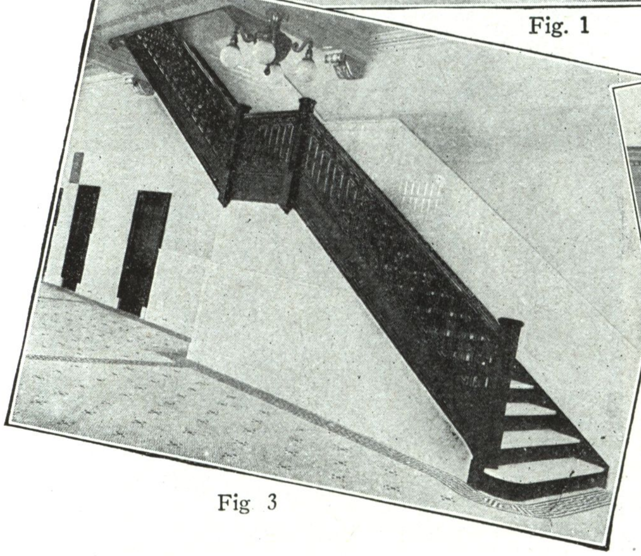


Fig 3

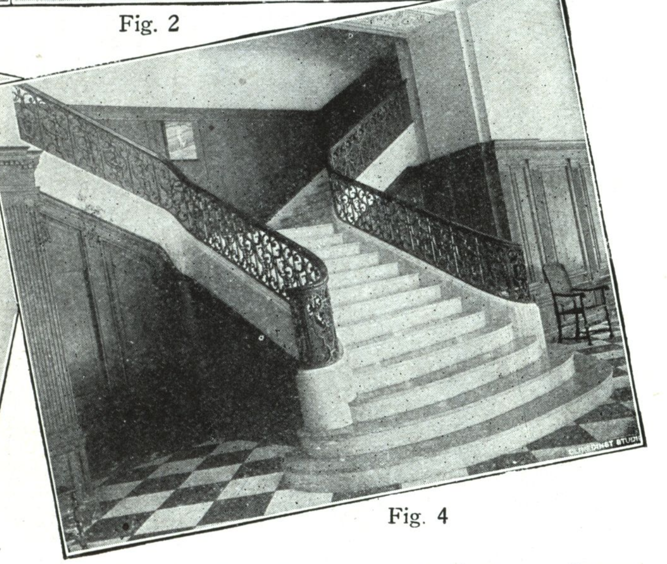


Fig. 4

Fig. 1. Entrance Doors in Residence of E. J. Buckner, Wilmington, Del.

Fig. 3. A Typical Smyser-Royer Company Stairway

Fig. 2. Cast Iron Entrance, 1441 Chestnut Street, Philadelphia, Pa.

Fig. 4. Wrought Iron Stair Railing, Ford Building, Washington, D. C.

F. P. SMITH WIRE AND IRON WORKS

ESTABLISHED 1884

Manufacturers of Ornamental Iron and Bronze Work

CHICAGO, ILL.

GENERAL OFFICES, SHOPS, FOUNDRY AND WAREHOUSE: CLYBOURN, FULLERTON AND ASHLAND AVENUES, AND CHESTER STREET—TELEPHONE, LINCOLN 7000

Private Exchange all Departments

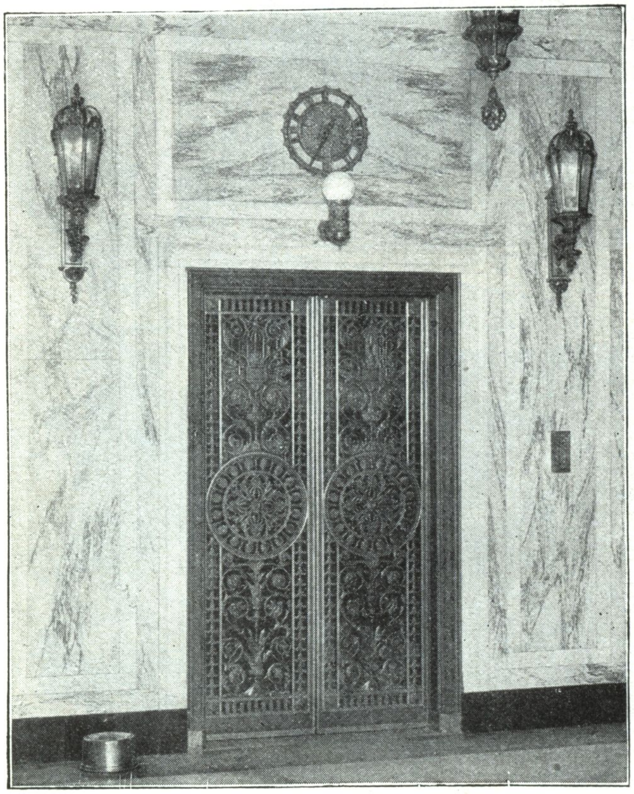
Products

Manufacturers of ORNAMENTAL IRON, BRONZE, BRASS and WIRE WORK of High Grade:

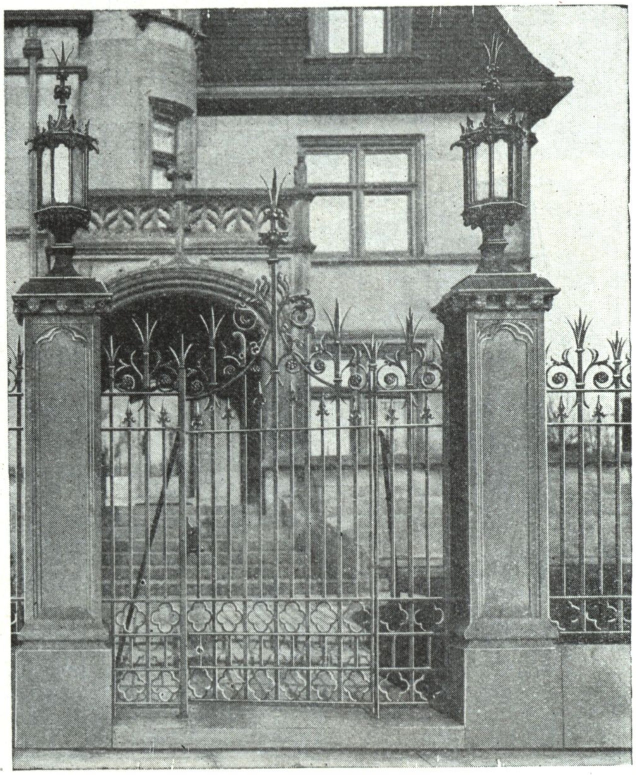
- Area Gratings
- Balustrades
- Bars: Corner Post, Transom
- Castings: Iron, Brass, Bronze
- Cemetery Vault Doors, Tablets (Bronze)
- Coalhole Covers
- Doors: Entrance, Sidewalk
- Elevator Enclosures, Cabs, Gates, Doors
- Entrances: Iron and Bronze
- Fences: Iron, Wire, Wire Netting
- Fire Escapes
- Flagpoles: Steel
- Fronts: Store, Building
- Gates: Iron, Wire and Folding
- Grille Work
- Guards: Iron and Wire—Window, Stall, Wheel, Machinery, Skylight
- Hangers: Joist, Wall, I-beam
- Hitching Posts
- Jail Work
- Lamp Brackets
- Lamps: Iron
- Lawn Furniture, Settees, Chairs, etc.
- Lockers: Wire, Iron
- Marquises
- Metal Ladders
- Partitions, Wire
- Pipe Railing
- Porte-cochères
- Post Caps
- Railings: Bank, Theater, Iron, Brass, Wire, Pipe
- Roof Crestings
- Shutters
- Stable Fixtures: Hay Racks, Feed Boxes, Water Troughs, Stall Posts, Gutters, Cesspools, Harness Brackets, Box Stall Hinges and Latches, Floors and Pans, Oats Cleaners
- Stairs, Iron
- Stairs, Pre-Cast Concrete Tread and Riser, Licensed under Babcock-Davis Co.'s Patent.
- Standpipes for fire escapes
- Tower Ornaments
- Vases, Iron
- Wall Ties
- Weathervanes
- Wickets
- Wire: Lath, Signs, Netting
- Wire Cloth: Steel, Galvanized Iron, Brass, Copper

Catalogues

Send for our No. 90 General Catalogue.



TYPICAL FIRST FLOOR BRONZE ELEVATOR ENCLOSURE, KAHL OFFICE AND THEATER BUILDING, DAVENPORT, IOWA
C. W. and GEO. L. RAPP, Architects



FENCE, GATES AND LAMPS, JOHN R. THOMPSON RESIDENCE, CHICAGO, ILL.
H. R. WILSON, Architect

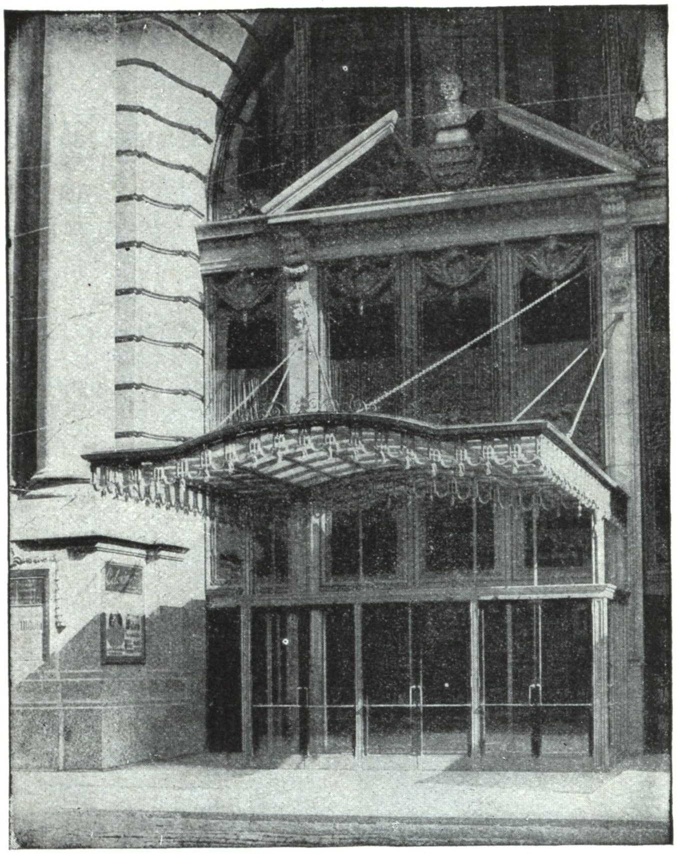
Continued on next page

References

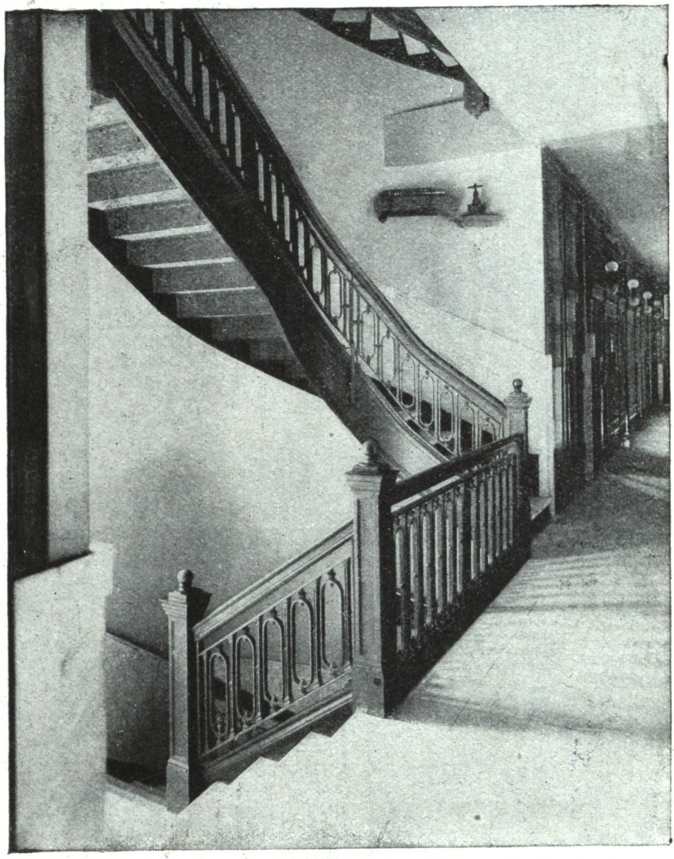
Following is a partial list of buildings in which representative installations of our work have been made:

Building, Location and Architect

Monroe Building, Chicago, Ill., Holabird & Roche
National Life Insurance Co., Chicago, Ill., Jenney, Mundie & Jensen
"Chicago" Building, Chicago, Ill., Holabird & Roche
Advertising Building, Chicago, Ill., W. C. Zimmerman
Borland Building, Chicago, Ill., Charles S. Frost
Webster Building, Chicago, Ill., A. S. Alschuler
Farmers' Security Bank Building, South Bend, Ind., Perkins, Fellows & Hamilton
McKay Building, Chicago, Ill., Huehl, Schmidt & Holmes
Sharpe Building, Kansas City, Mo., H. R. Wilson
Overland Stores Building, Kansas City, Mo., Mills, Rhines, Bellman & Nordhoff
Stewart Building, Houston, Tex., Jonas & Rue
Cosden Building, Tulsa, Okla., Henry F. Hoit
Rand-McNally Co. Building, Chicago, Ill., Holabird & Roche
Harper Memorial Building, University of Chicago, Chicago, Ill., Shepley, Rutan & Coolidge
Sisters of Providence, College and Music Building, St. Mary's, Ind., D. A. Bohlen & Son
Seminary Building, Archdiocese of Chicago, Z. T. Davis
U. S. Post Office Buildings (over 45), James Knox Taylor
U. S. Naval Training Station (15 buildings), Lake Bluff, Ill., Jarvis Hunt
City of Chicago Police Stations, Fire Engine Houses, Chicago, Ill., Chas. W. Kallal
School Buildings—A large number for Board of Education, Chicago, Ill., D. H. Perkins, A. F. Hussander and John C. Christensen
Iowa State College, Central Building, Ames, Iowa, Proudfoot & Bird
Y. W. C. A. and Y. M. C. A., Nashville, Tenn., Shattuck & Hussey
Y. M. C. A. College Building, Chicago, Ill., Emery S. Hall
Lying-in Hospital, Chicago, Ill., Richard E. Schmidt, Garden & Martin
Henry Ford Hospital, Detroit, Mich., Albert Wood
Research and Educational Hospital for the State of Illinois, Chicago, Ill., Edgar Martin; Schmidt, Garden & Martin
Michael Reese Hospital, Chicago, Ill., Schmidt, Garden & Martin
Commonwealth-Edison Co. (5 buildings), Chicago, Ill. Shepley, Rutan & Coolidge
Commonwealth-Edison Co., N. W. Station, Chicago, Ill., Holabird & Roche
Montgomery Ward & Co., Chicago, Ill., Richard E. Schmidt, Garden & Martin
Popular Mechanics Company Building, Chicago, Ill., Marshall & Fox
Masonic Temple, Davenport, Iowa, Clausen & Kruse
Banco de San Luis Potosi, San Luis Potosi, Mex., Henri E. M. Guindon
Kahl Building, Davenport, Iowa, Rapp & Rapp
Chicago Trust Co., Chicago, Ill., Holabird & Roche
Sisson Apartment Building, Chicago, Ill., H. R. Wilson & Co.
B. A. Eckhart Residence, Chicago, Ill., Marshall & Fox
Goetz Apartment Building, Chicago, Ill., P. J. Weber
Chas. Lange Building, Chicago, Ill., Clarence Hatzfeld
Hotel Sherman, Chicago, Ill., Holabird & Roche
Fort Dearborn Hotel, Chicago, Ill., Holabird & Roche
Severin Hotel, Indianapolis, Ind., Vonnegut & Bohne
Blackhawk Hotel, Davenport, Iowa, Temple & Burrows
Mayflower Hotel Building, Washington, D. C., Warren & Wetmore
Blackstone Hotel and Theater, Chicago, Ill., Marshall & Fox
Illinois Theater, Chicago, Ill., Wilson & Marshall
Star and Garter Theater, Chicago, Ill., Dodge & Morrison
Shubert Theater, St. Paul, Minn., Marshall & Fox
Hippodrome Building, Cleveland, Ohio, Knox & Elliott
Woods Theater and Office Building, Chicago, Ill., Marshall & Fox
State & Lake Theater, Chicago, Ill., C. W. & Geo. L. Rapp
Chicago National League Ball Park, Chicago, Ill., Davis & Davis
Apollo Theater, Chicago, Ill., Holabird & Roche
James Theater and Office Building, Columbus, Ohio, C. Howard Crane
Keith's Theater, Cleveland, Ohio, C. W. & Geo. L. Rapp
Selwyn-Harris Theater Buildings, Chicago, Ill., C. Howard Crane and Kenneth Franzheim
Schueneman's Recreation Building, Chicago, Ill., Michaelson & Rognstad



Marquise and Vestibule for Colonial Theater, Chicago, Ill.
Marshall & Fox, Architects



Main Stairs, 3rd to 15th Floors, "Chicago" Building, Chicago, Ill.
Holabird & Roche, Architects

TAYLOR & DEAN

PITTSBURGH IRON AND WIRE WORKS
(ESTABLISHED 1842)

Ornamental Iron and Bronze Work, Builders Iron Work, Wire Work

2418-2428 Penn Avenue at 25th Street
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Products

Ornamental Iron and Bronze Work, including Ornamental Grilles, Railings, Entrance Doors and Gates, Fencing, Stairs, Elevator Enclosures, Bank Screens; Spiral Stairs, Fire Escapes, Pipe Railings, Folding Gates, Iron Shutters, Fireproof Porches, etc.

Wire Work, including Fencing, Partitions, Tennis Court Enclosures, Tool Room Enclosures, Window Guards, Machinery Guards, Gear Wheel Guards, etc.

Spiral Stairways

Taylor & Dean spiral stairways are recommended for durability and economy of space and cost.

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Taylor & Dean are extensive manufacturers, distributers and erectors of the above mentioned products. Eighty years' experience in this line makes them well qualified to handle, in an expert manner, any work of this character.

Co-operative Service

An engineering department is maintained, which is at the service of the architect or owner for supplying complete information on design and uses of any Taylor & Dean products. Estimates and information are freely given.

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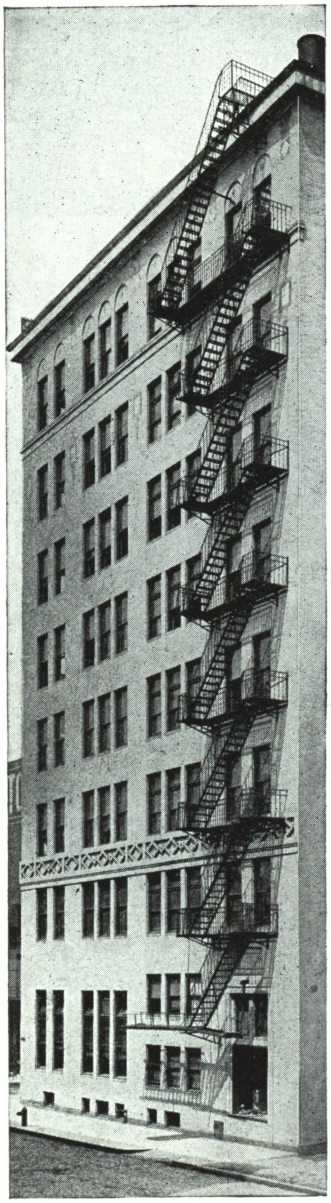
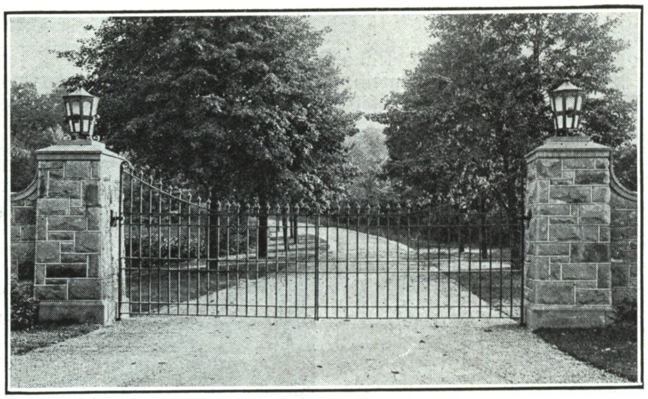
Taylor & Dean fabricate and erect approved fire escapes of all types.

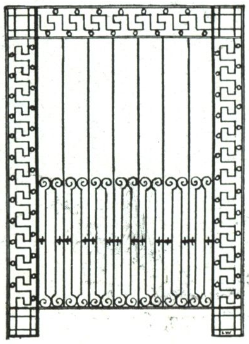
All work is guaranteed to meet the requirements of the law.



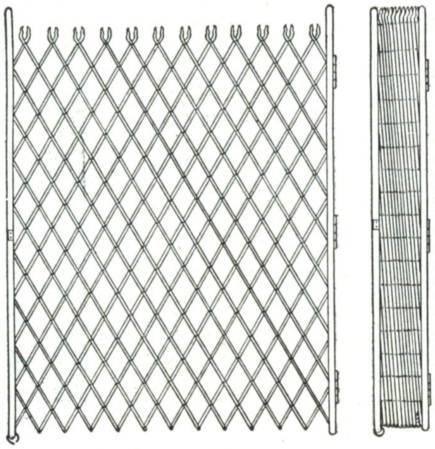
Fire Escape



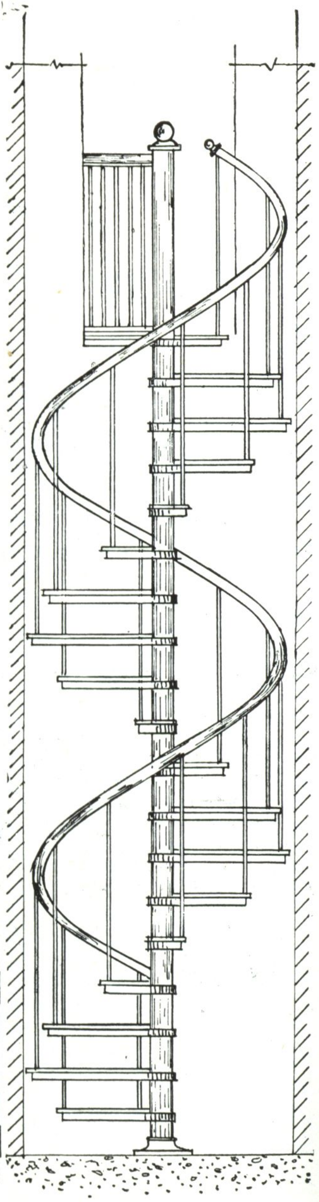
Ornamental Iron Gate and Lamps



Grille No. 43



Folding Gate



Spiral Stairway

TIFFANY STUDIOS

Ornamental Bronze and Iron, Lighting Fixtures, Interior Decorations, Fine Furniture, Oriental Rugs

391 Madison Avenue, NEW YORK, N. Y.

Products

- ORNAMENTAL BRONZE and IRON WORK.
- LIGHTING FIXTURES.
- SMALL BRONZE ARTICLES.
- INTERIOR DECORATIONS and FURNISHINGS.
- FINE FURNITURE.
- ORIENTAL RUGS.
- LAMPS and LAMP SHADES.

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A complete factory and bronze foundry equipped with modern machinery, efficient drafting and designing departments with an organization of experts, enable this company to execute all requirements of architects or sculptors in ornamental bronze and iron work. This includes doors, gates, bank screens, marquises, check desks, entrances, tablets, clocks, stair railings, elevator fronts and cars, etc.

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Lighting fixture schemes and estimates prepared from architects' drawings for banks, hotels, public buildings and residences, including entrance torcheres, standards, chandeliers, wall brackets, TIFFANY STUDIOS' bronzes, lamps, desk sets, portrait frames, candlesticks, cigarette boxes, ash trays, etc.

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TIFFANY STUDIOS are equipped to submit estimates, suggestions and complete schemes for all interior decorations including lighting effects, draperies, wall hangings, painting and woodwork for banks, public buildings, hotels and residences. Church work a specialty.

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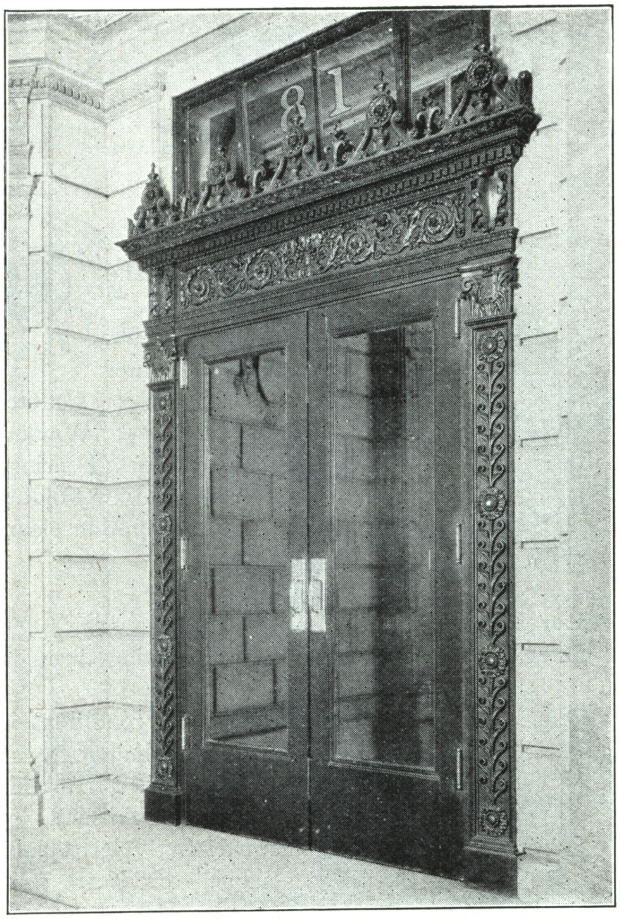
Reproductions of English, Italian and French originals. A complete stock of fine furniture for all requirements.

Oriental Rugs and Tapestries

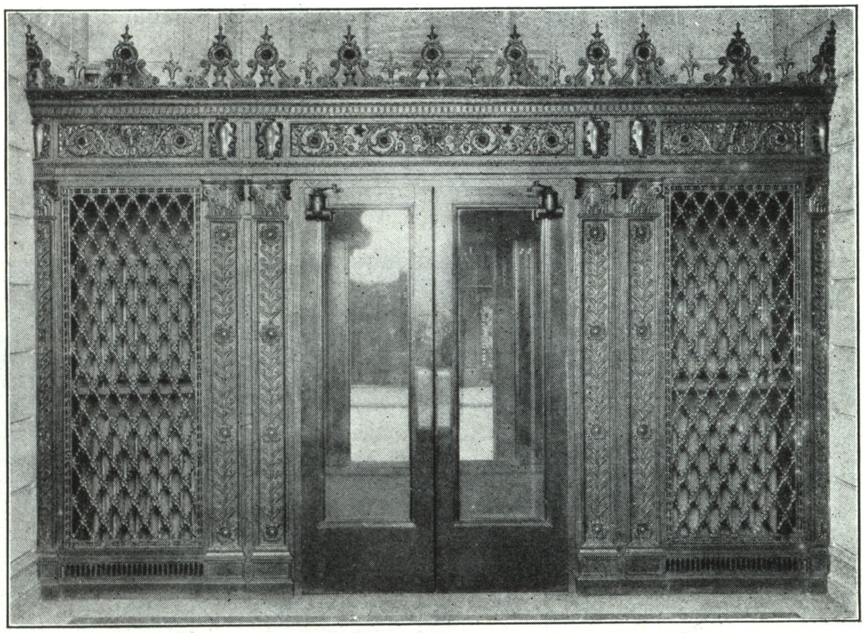
A large collection of unusual Oriental rugs, antique and modern, also fine antique and modern tapestries and needlepoint.

Prices

An opportunity is solicited to estimate, in proof that our prices compare favorably with those of other firms doing work of a like quality.



Entrance Door, Standard Oil Building, New York, N. Y.
CARRERE & HASTINGS, Architects



Entrance Door, Standard Oil Building, New York, N. Y.
CARRERE & HASTINGS, Architects

THE TYLER COMPANY

Elevator Entrances and Cars

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 247 Park Avenue
CHICAGO, ILL., 310 South Michigan Avenue
BOSTON, MASS., 68 Devonshire Street
PHILADELPHIA, PA., 260 South Broad Street

TRADE-MARK

Products

FIREPROOF ELEVATOR ENTRANCES and CARS.

Also Bronze Tablets; Bank, Office, Vault, Stair, Balcony, Altar, Veranda and Counter Railings; Stairs; Store Fronts; Marquises; Counter Screens; Lamp Standards and Brackets; Window Guards and Grilles; Porte-cocheres; Corridors; Fencing; Gates; Wickets; Signs; Electroliers; Self-closing Folding Gates; Bronze and Iron Entrance Doors; Mausoleum Doors.

Elevator Entrances and Cars

Made of all-metal fireproof construction throughout.

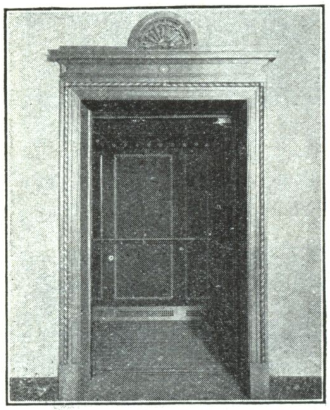
Can be supplied to suit the hatchway conditions in new or old buildings.

Furnished in a wide variety of finishes, including: electroplate, enamel bronzes, solid baked colors or grained to match any kind of wood.

Also made in solid bronze.

We build all parts entering into the construction of entrances and cars, including all hardware and mechanism, in our own factory.

This insures perfect operation and undivided responsibility.



Two-panel Front, Two-speed Doors Open, Showing Car

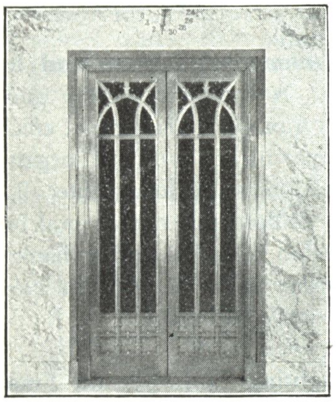
Door Construction

Made in single sliding, two-speed, center-opening and other types as required; capable of quiet, high speed operation.

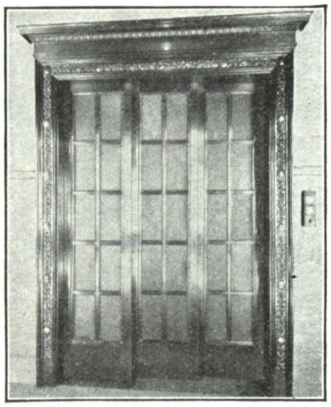
Door panels are made of heavy gauge material, reinforced to withstand the peculiar strains and stresses to which they are subjected.

Engineering Service

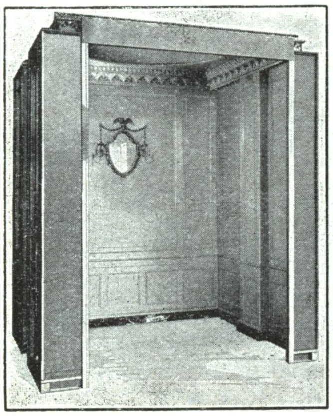
The Company's engineers will gladly assist architects and owners in selecting the type of equipment best suited to any type of building. Designs and estimates will also be submitted when requested.



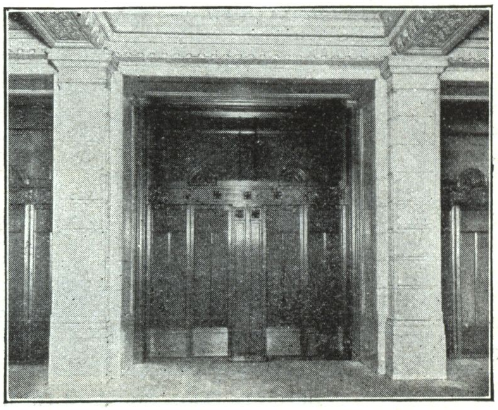
Two-panel Front, Center Opening Doors



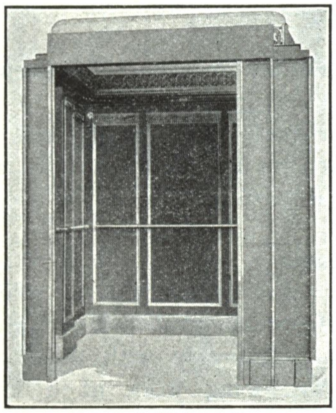
Three-panel Front, Two-speed Doors and Stationary Panel



Typical Tyler Car



Showing Transom Treatment



Typical Tyler Car

VULCAN RAIL & CONSTRUCTION COMPANY

Manufacturers of Pipe Railings

MAIN OFFICE AND WORKS
Grand Street and Garrison Avenue, MASPETH, N. Y.
BRANCH OFFICE AND SHOPS: 39th Street and A. V. R. R., PITTSBURGH, PA.

Products

Pipe, Stair, Bridge and Boardwalk Railings; Angle Railing Fittings; Lamp Brackets.

Also manufacturers of Picket Fencing, Steel Gratings, Walkways, Ladders and Stairs for boiler houses, etc., Special Pipe Bends, Racks for Fur Storage, Trunk Racks and Rug Racks, and anything special constructed with Pipe.

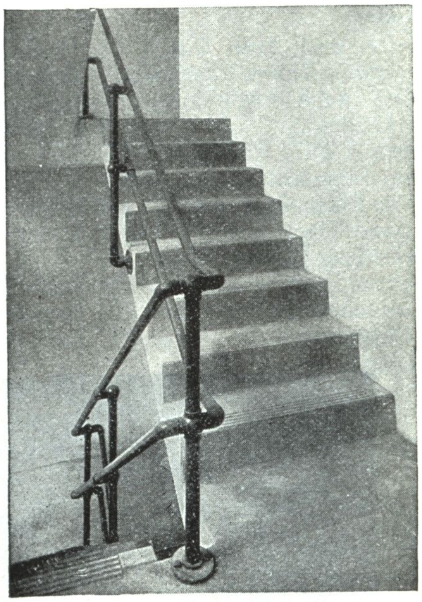
For Underwriters' Steel Fire Doors, see page 828.

VULCAN
RAIL & CONSTRUCTION
COMPANY

TRADE-MARK

Facilities

A large, fully equipped plant, together with adequate railroad sidings and a force of skilled and experienced workmen, assure prompt and efficient execution and shipment of all orders.



Standard Pipe Stair Rail

Service

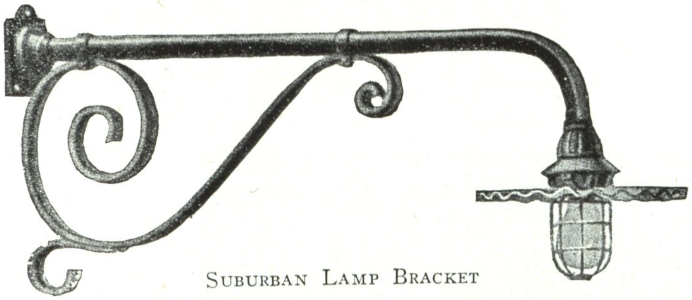
We have the largest and most complete stock of pipe rail fittings in the United States. In addition to carrying all of the regular railing fittings, we stock special angle malleable iron fittings for 1, 1¼, 1½ and 2-in. pipe, for stairs, ramps and inclines, from 26° to 48° from the horizontal.

We have a very complete pattern shop and can make up special fittings on short notice.

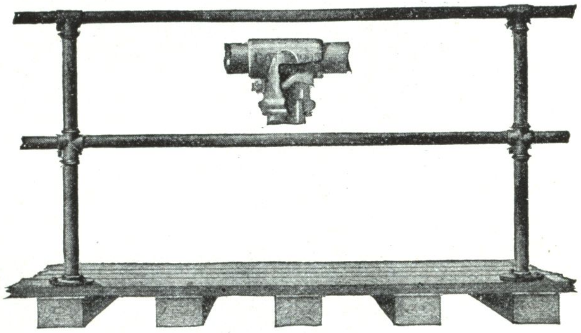
Angle Railing Fittings

Specific Information

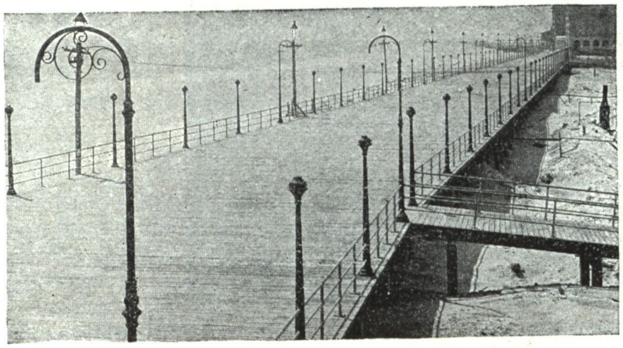
Complete information, including estimates and preliminary designs for any of the products illustrated below or listed under Products, will be promptly supplied on request. Catalogue sent on application.



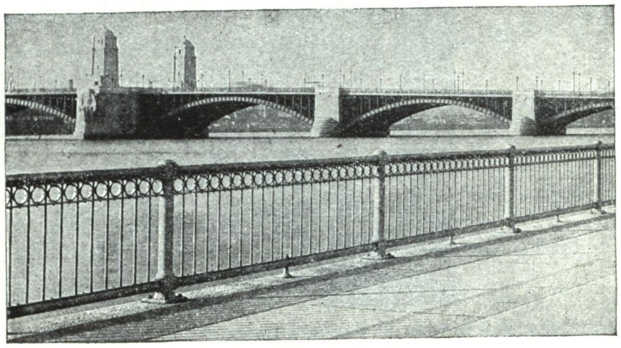
Suburban Lamp Bracket



Elevated Railroad Railing with "Vulcan" Malleable Iron Anti-rattle Fittings



Boardwalk Railing with Lamp Posts



Typical Bridge Railing

JNO. WILLIAMS, INC.

Manufacturers of Ornamental Bronze and Iron Work for Buildings

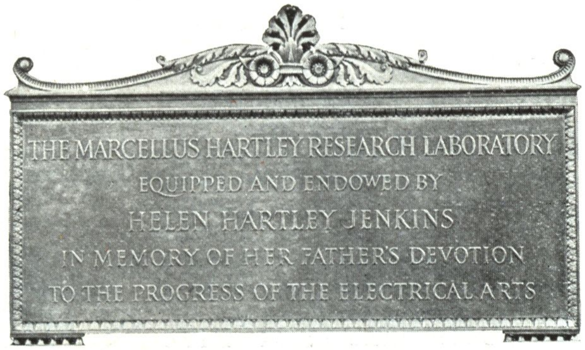
TELEPHONE
CHICKERING 10300

556 West 27th Street, NEW YORK, N. Y.

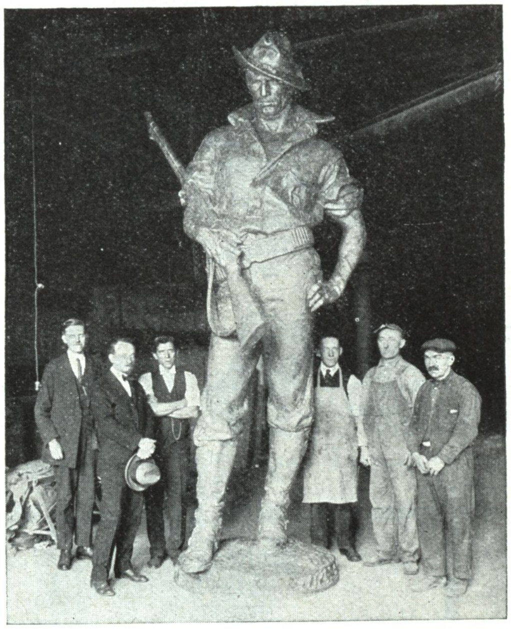
Products

ORNAMENTAL BRONZE, IRON and WIRE WORK, including:

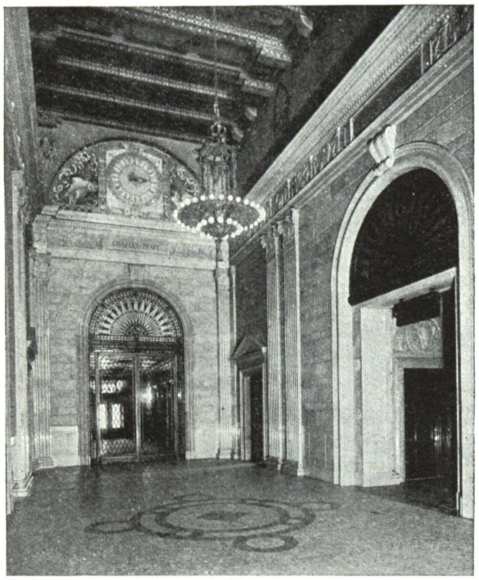
- Bronze and Iron Entrance Doors
- Door and Window Grilles
- Stair and Tube Railings
- Lamp Standards
- Bank Fittings, Screens and Enclosures
- Wire Mesh Work
- Elevator Enclosures
- Mausoleum Doors and Fittings
- Memorial Tablets
- Honor Roll Tablets
- Bronze Signs and Letters
- Fine Bronze Castings
- Statues, Figures and Portraits
- Busts and Medallions
- Monumental Bronze Work
- Fountains and Sundials
- Iron Driveway Gates
- Fencing and Grille Work


THE MARCELLUS HARTLEY RESEARCH LABORATORY
EQUIPPED AND ENDOWED BY
HELEN HARTLEY JENKINS
IN MEMORY OF HER FATHER'S DEVOTION
TO THE PROGRESS OF THE ELECTRICAL ARTS

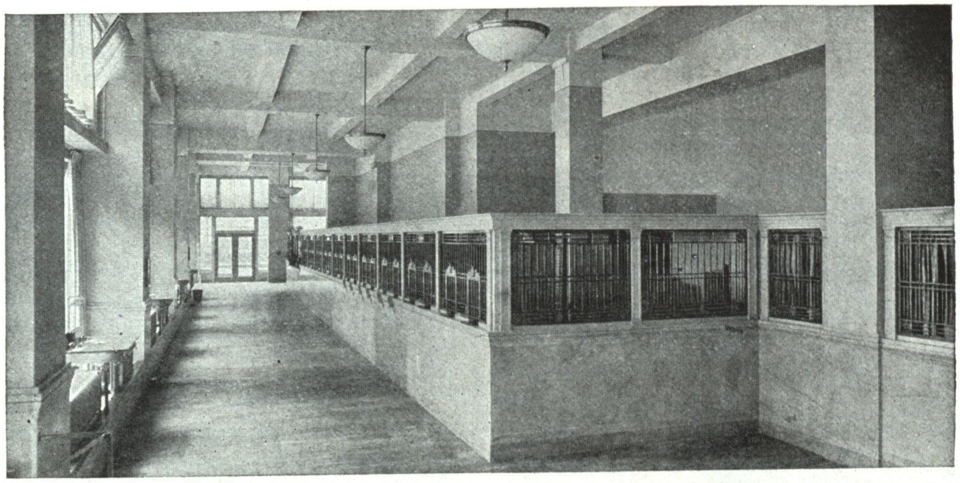
Cast Bronze Tablet, Columbia University, New York, N. Y.
4 ft. x 2 ft. 4 in.
McKIM, MEAD & WHITE, Architects



Colossal Bronze Statue "The Hiker," 12 Ft. High, Erected in Schenley Park, Pittsburgh, Pa.
ALLEN G. NEWMAN, Sculptor
Cast by JNO. WILLIAMS, INC.



Main Corridor, Standard Oil Building, New York, N. Y.
CARRERE & HASTINGS and SHREVE, LAMB & BLAKE, Architects
Hand wrought and cast iron work by JNO. WILLIAMS, INC.



Emigrant Industrial Savings Bank, New York, N. Y., Grand Central Branch, Lexington Avenue and 43rd Street
JAMES S. HUNTER, Space Engineer and Architect
Bronze work made and installed by JNO. WILLIAMS, INC.

WICKWIRE SPENCER STEEL COMPANY

Manufacturers of Wire and Iron Fences and Gates

41 East 42nd Street
NEW YORK, N. Y.

OFFICES AND WAREHOUSES

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CHICAGO, ILL., 208 So. La Salle Street
LOS ANGELES, CAL., 316 Market Street
BUFFALO, N. Y., River Road

DETROIT, MICH., 3044 W. Grand Boulevard
SAN FRANCISCO, CAL., 114 Townsend Street
SEATTLE, WASH., 214 Maritime Building
CLEVELAND, OHIO, 508 Leader News Building

Products

Rustproof Ornamental Wire Fences and Gates; Rustproof Chain Link Fences and Gates; Ornamental Iron Fences and Gates.

For Electrically Welded Wire Fabric for Concrete Reinforcement, see pages 62-65; for Wire Lath, see pages 425-429; for Welded Sheathing, see pages 432-434.

EXCELSIOR
HOT GALVANIZED AFTER WEAVING
WIRE FENCES
TRADE-MARK

Advisory and Erection Service, Estimates, etc.

Architects, engineers and contractors are invited to write our service department for any assistance in helping to solve their fence problems. We will be glad to furnish estimates in accordance with architect's designs or our own standard construction or special design. Complete fence catalogue and specifications for standard designs will be gladly mailed on request.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST 1912

Excelsior Rustproof Chain Link Wire Fences

The pioneer chain link wire fence, hot galvanized after weaving, woven from special drawn wire of extra high tensile strength. Framework made from standard full weight galvanized steel pipe.

Specifications—

Type 40—*Height*—3½, 4, 5, 6, 7 or 8 feet.

Fabric—2-inch mesh No. 9 or No. 6 gauge (W & M) wire. Hot galvanized after weaving.

Line Posts—2½-inch outside diameter. Standard spacing 10 feet apart.

Top Rail—1⅝-inch outside diameter. Fitted with coupling or sliding sleeves and passing through top ornaments on line posts, thus forming continuous brace from end to end of each section of fence.

Additional Brace Rails—When desired, middle or bottom brace rails can be furnished with necessary fittings for attaching to line posts.

End and Corner Posts—3-inch outside diameter complete with all necessary fittings, including 1⅝-inch outside diameter tubular brace and wire truss brace.

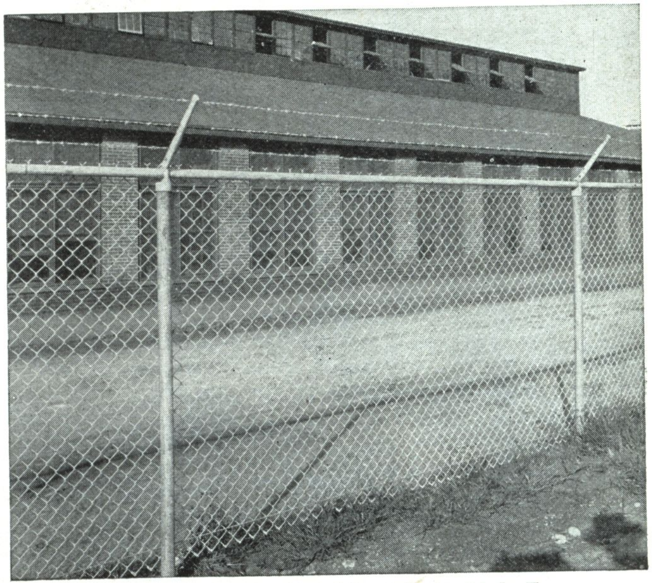
Gate Posts—3-inch outside diameter for single gates 6 feet and double gates 12 feet or less in width of opening; 4-inch outside diameter for single gates over 6 feet in width and double gates over 12 feet in width.

On extra wide gates special posts are provided, the size in proportion to the width of opening.

Gates—The gates are constructed of T-section frame, strongly reinforced and pressed, filled with fabric to match fence. Equipped with adjustable hangers, locking device, back catches for holding in place when open, and on double gates heavy center rest for supporting the gates when closed.

Type 43—Specifications same as for Type 40, except 3 strands of barbed wire are furnished for stretching above fabric, supported on heavy galvanized pressed steel extension arms carrying the barbed wire in or outside of line of fence. Barbed wire composed of two strands of No. 12 gauge galvanized steel wire with barbs spaced approximately 3 inches apart, four-point pattern.

Types 45 and 46—Can be supplied with 5 and 6 strands of barbed wire above fabric, respectively.



Factory Installation Excelsior Chain Link Fence

With or without barb wire overhang for all purposes: industrial, park, playground, athletic field, school, cemetery, tennis court, and residential

Excelsior Rustproof Chain Link Residential Fencing

On fences 5 feet or less in height, we can furnish our Type 20, using framework as follows:

Line posts, 2-inch outside diameter, standard spacing 10 feet apart.

Top brace rail, 1⅜-inch outside diameter.

End, corner and gate posts, 2½-inch outside diameter.

Excelsior Rustproof Chain Link Tennis Court Enclosures, Backstops, etc.

We are prepared to furnish several different types of enclosures and backstops, and will be glad to forward complete specifications on request.

AMERICAN FENCE CONSTRUCTION CO.

Woven Wire Fences and Iron Railings

TELEPHONE
CHICKERING 3580, 3581, 3582

130-132 West 34th Street
NEW YORK, N. Y.
REPRESENTATIVES IN PRINCIPAL CITIES

TRADE-MARK

Products

ENTRANCE GATES of Ornamental Iron; IRON and WIRE FENCES of all kinds for city or country; TENNIS COURT ENCLOSURES; heavy NON-CLIMBABLE FENCES for mills and factories.

Also Fencing for Poultry and Kennel Runs, Arches, Grape Arbors, Tree Guards, Window Guards, Interior Wire Partitions, Machinery Guards, Flying Cages.

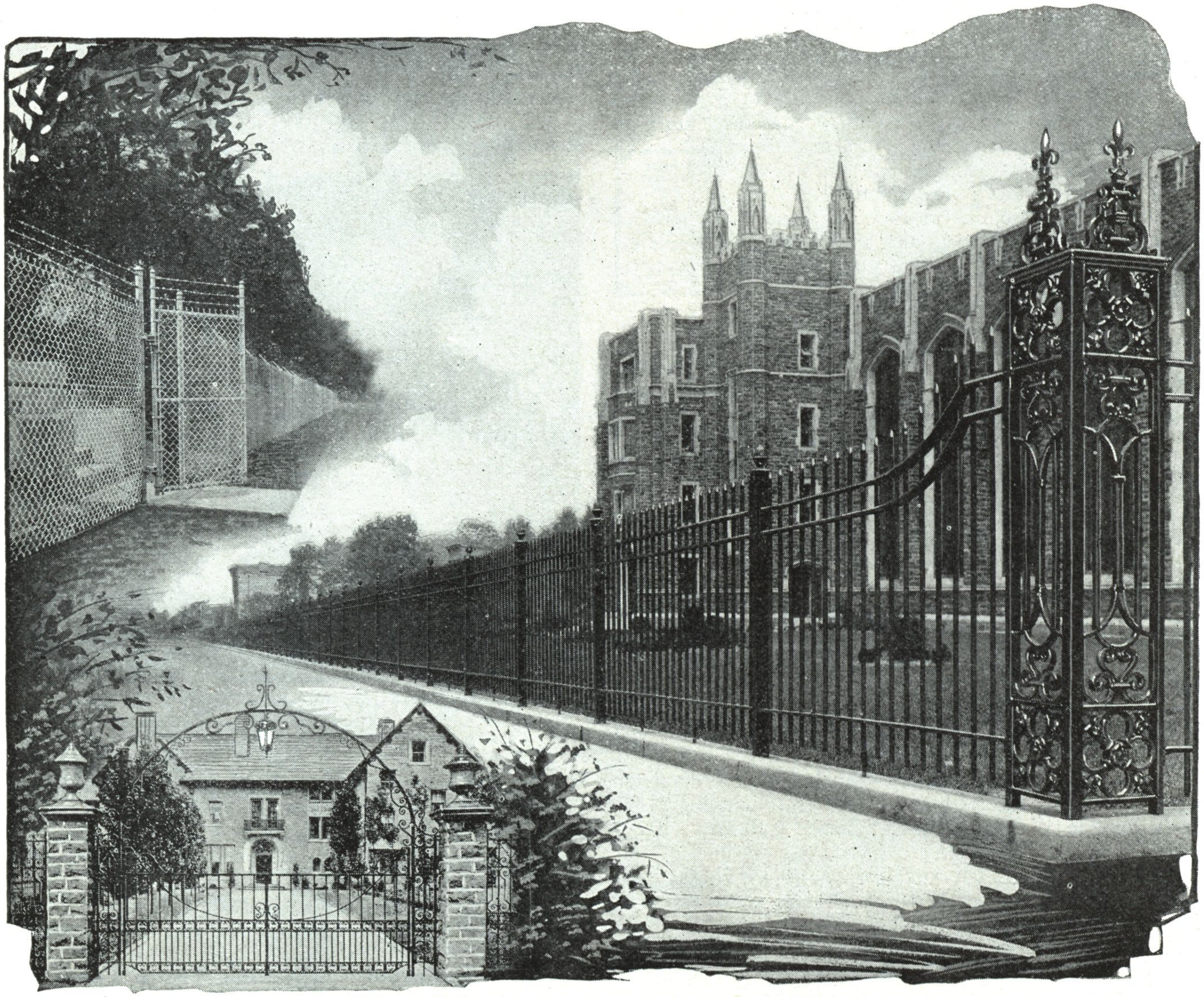
Estimates and Service

The company is prepared to give estimates on material or completely erected fences and gates of every type, or to work with the architect in preparing specifications which will adapt standard size material to the needs of special designs.

This service is available through the home office and district representatives at many points throughout the Eastern, Central and Southern States, without charge. Blue prints of stock designs are always available.

In writing for estimate, it is important that a diagram be included, showing length of each line of fence, also width and location of each gate.

Afco fences are shipped to all parts of the United States and Canada either for erection by the company's construction department, or complete with instruction drawings for erection by others.



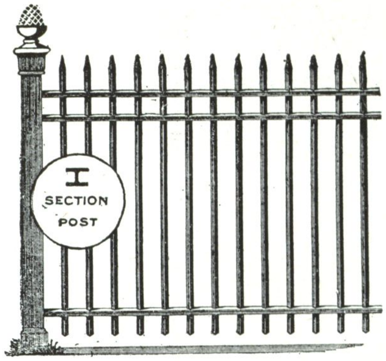
Afco Wrought Iron and Chain Link Fences and Gates

(Upper) 6-ft. No. 913 non-climbable chain link fence at Academy of St. Ursula, New York, N. Y.

(Lower) Special Afco wrought iron gate for the estate of Rufus C. Burton, Zanesville, Ohio, after design by ALFRED H. GRANGER, Architect, Chicago, Ill.

No. 151A Wrought Iron Fence enclosing grounds of the Messenger of the Sacred Heart at Fordham University. 5 ft. high; 3-in. I-beam post with pineapple top; ¾-in. square pickets on 5-in. centers; 2x⅝-in. 3-rib channel rails, and designed newel posts of appropriate weight.

Continued on next page

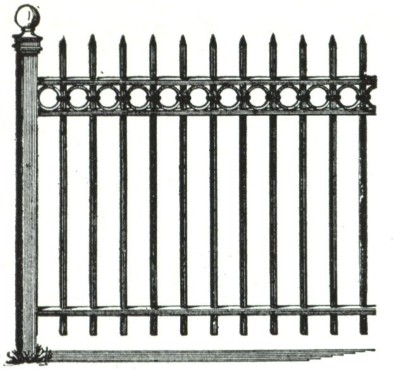


3-Rail Wrought Ornamental Fence

No.	Pickets, in. sq.	Channel rail, in.	Height, ft.
150A	⅝	1½ x ½	3, 3½, 4, 4½, 5
151A	¾	2 x ⅝	3, 3½, 4, 4½, 5, 6
152A	⅞	2 x ⅝	3, 3½, 4, 4½, 5, 6

Pickets spaced on 5-in. centers

Post, 3-in. I-beam with "pineapple" top. Set in concrete

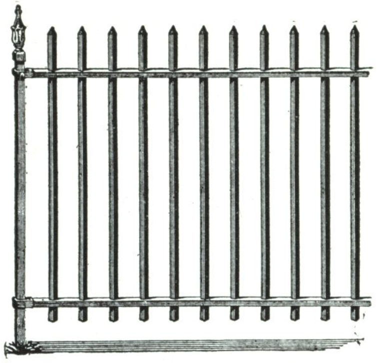


3-Rail Ornamental Fence

No.	Pickets, in. sq.	Channel rail, in.	Height, ft.
153A	½	1¼ x ½	3, 3½, 4
154A	⅝	1½ x ½	3, 3½, 4, 4½, 5
155A	¾	2 x ⅝	3, 3½, 4, 4½, 5, 6

Pickets 4-in. spacing on 153A, and 5-in. spacing on others

Post No. 16B, 2-in. square shaft with ball top



2-Rail Wrought Iron Fence

No.	Pickets, in. sq.	Channel rail, in.	Height, ft.
107A	⅝	1½ x ½	3, 3½, 4, 4½, 5
108A	¾	2 x ⅝	3, 3½, 4, 4½, 5, 6
109A	⅞	2 x ⅝	3, 3½, 4, 4½, 5, 6

Pickets spaced on 5-in. centers

Post No. 1-A 1 in. square with back-brace and ornamental top

Wrought Iron Fence and Gates

The fences and gates pictured on the preceding page illustrate typical Afco installations. The Company has been very successful in executing gates to the designs of architects and offers its services in adapting standard structural members to special purposes. Many standard gate designs are also available.

Wrought iron railing of the types illustrated, as well as other designs, commend themselves for many purposes. They combine pleasing dignity and sturdy construction.

Afco Chain Link Fence for Residential Purposes, Schools and Playgrounds, Institutions, etc.

Standardized fences, in heights from 3 ft. 6 in. to 10 ft. and in three weights.

Suburban Lawn Fence—For residential purposes, where strains are not excessive, built on 1⅝-in. outside diameter pipe posts and set with drive blade anchors. End, corner and gate posts 2-in., and top rail of 1⅜-in. outside diameter standard weight pipe. Fabric of 2-in. mesh chain link weave, of Nos. 9 or 11 wire, *galvanized after weaving.*

Guardian Fence—For estates and where 4 to 6-ft. heights are required, built on 2-in. outside diameter pipe posts and set with drive blade anchors. End, corner and gate posts 2½-in. and top rail 1⅜-in. outside diameter standard weight pipe. Fabric of 2-in. mesh chain link weave of Nos. 6 or 9 wire *galvanized after weaving.* Barbed wire overhang where desired.

Bulwark Fence—For schools, institutions, fair grounds, where maximum strength is needed, built on 2½-in. outside diameter pipe posts set in concrete footings 36 in. deep. End, corner and gate posts 3-in. and top rail 1⅝-in. outside diameter standard weight pipe. Chain link fabric of No. 6 or 9 wire, *galvanized after weaving.*

Single or Double Gates—Are of rigid frame construction, being built of tubular members welded at all joints. Standard sizes for either fence, to meet all normal conditions.

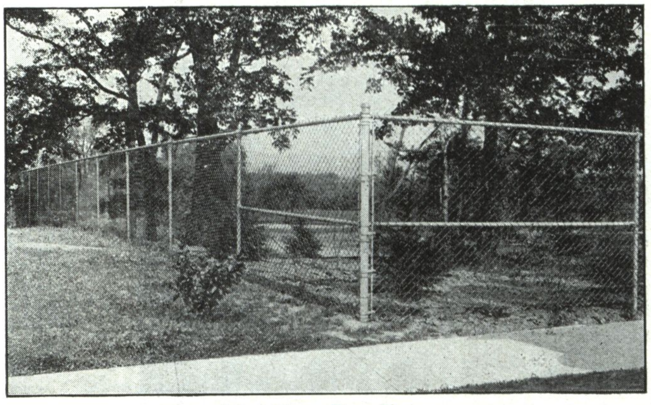
Afco Tennis Enclosures

Heights 10 and 12 ft. Standard fabric 2-in. chain link of No. 11 wire, or 1½-in. mesh hexagon netting of No. 16 wire, built on 2-in. outside diameter pipe posts, with end, corner and gate posts of 2½-in. outside diameter pipe set in 36-in. concrete footings. All materials hot dip galvanized. Available as complete enclosure, backstop and wings or backstop only.

For public playgrounds an extra heavy specification can be furnished. Line posts 2½-in., end and corner posts 3-in. outside diameter pipe.

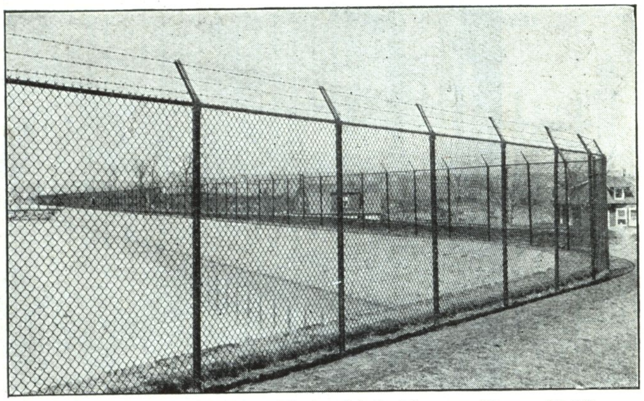
Afco Chain Link Factory Fence

The heaviest chain link fence, used as a non-climbable barrier where absolute protection is essential. Built on steel angle posts, with integral overhanging arm carrying 3 strands of heavy barbed wire. Set in concrete. Described fully in Sweet's Engineering Catalogue—or printed specification sheets can be had on request.



Afco Guardian Fence

5 ft. high, 2-in. chain link mesh of No. 6 wire, *galvanized after weaving,* for park or estate protection. Other heights are available



Afco Non-climbable Chain Link Fence, Type 1103

Galvanized after weaving. Steel angle line posts and standard heavy construction for industrial or other property protection

ANCHOR POST IRON WORKS

Manufacturers of Wire Fences, Iron Railings and Entrance Gates

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ORNAMENTAL IRON ENTRANCE GATES; WELDED RAILINGS and FENCES.

WIRE and IRON FENCES of all kinds and in several heights, for country places, residences, parks, playgrounds, institutions, factories, mills, railroads, reservoirs, etc.

TENNIS COURT and ATHLETIC GROUND ENCLOSURES; KENNEL, POULTRY and STOCK PADDOCK FENCES; expert designing and construction of special ENCLOSURES for game, birds, etc.; IRON and WIRE ARBORS, ARCHES and TRELLISES.

Also manufacturers of Enclosures for clothes drying yards; Lawn and Flower Bed Guards; Clothes Posts, Sign Posts, and Tennis Net Posts.

Estimates and Catalogues

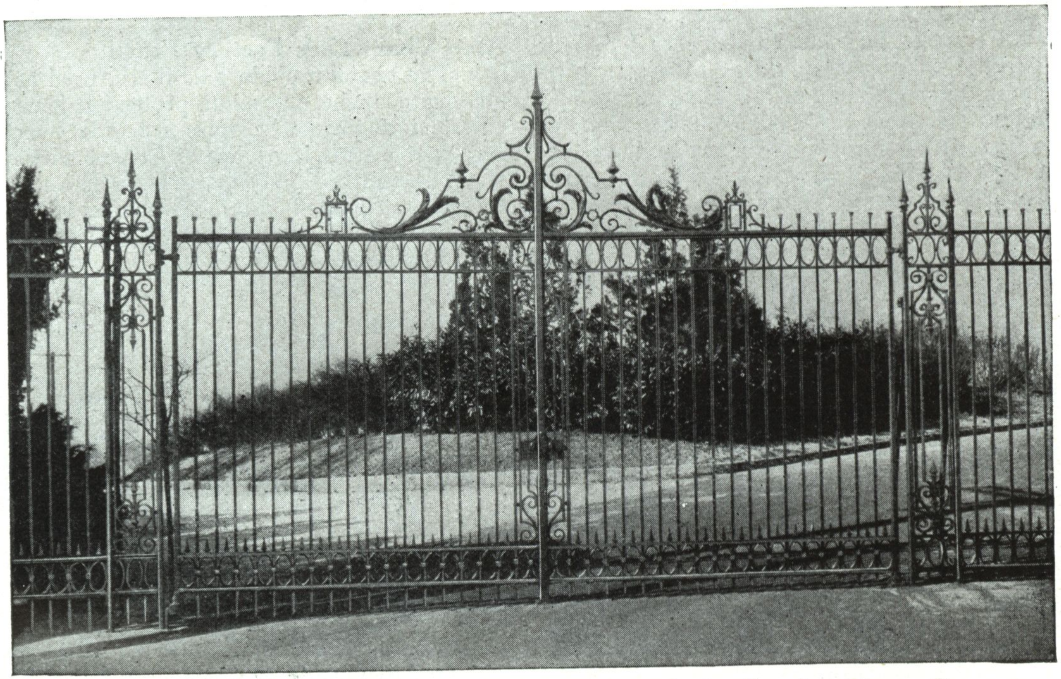
Estimates given for products delivered and set complete in any part of the country. In requesting estimates, send, if possible, a diagram giving dimensions, location of gates, ends and corners.

We maintain a force of experienced fence mechanics trained in erecting our work.

Where material only is supplied, full instructions and drawings are furnished, enabling local mechanics to do the work. Complete information on our products contained in our free catalogue and specification manual, "Fences, Gates and Railings."

Services and Facilities

This company will furnish sketches, designs and full information as to sizes and weights of material without obligation. If desired, we will make surveys for grades and measurements and take entire charge of the work. Shops, at Garwood, N. J., on the Central Railroad of New Jersey, and at Euclid, Ohio, a suburb of Cleveland, have every facility for handling large and small contracts at the lowest possible cost.



Ornamental Iron Entrance Gate on the Estate of Asa G. Candler, Jr., Atlanta, Ga.
This installation also includes 5700 ft. of Anchor Chain Link Fence, Type DOA-1, 7 ft. high

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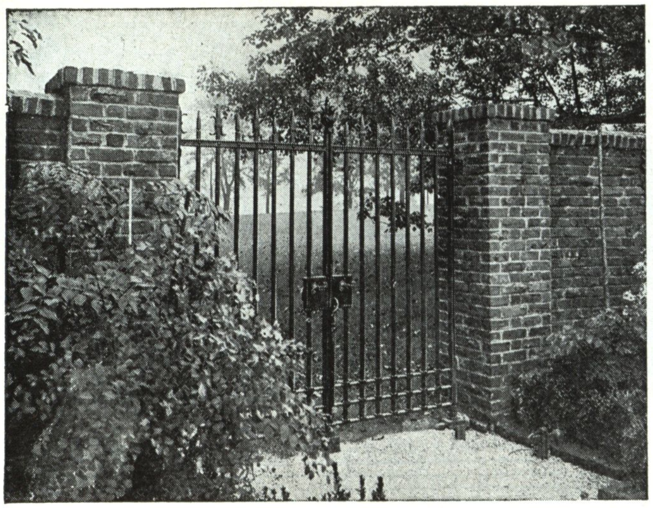


Garden Gate on Private Estate

Anchor-Weld Railing, Type RA-2
On property of Mrs. Louis E. Stoner, Hartford, Conn.

Iron Railings and Entrance Gates

Long experience enables this company to manufacture railings and ornamental gates properly proportioned and designed, and correctly made in all details. Special or stock designs furnished.

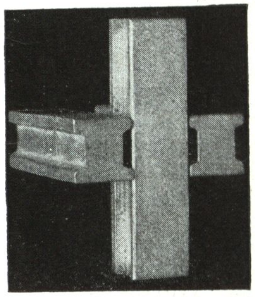
Anchor-Weld Railings and Gates

The Anchor Post Iron Works has secured the right to manufacture railings and gates by the *electric-weld process*. As shown in the illustrations, we use grooved square bars: ½, ⅝ and ¾ in. square. The rails consist of these bars in horizontal pairs the length of a panel. Welded between these pairs, and at right angles to them, are the pickets. All welding is done on the flange sides of rails and pickets.

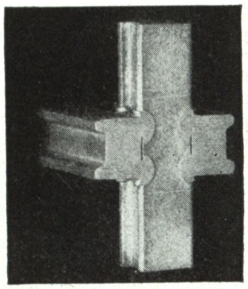
The strength of this type of construction is enormous. Not only does it permit the making of panels as long as 10 ft., but the center support—so necessary with ordinary railings—is dispensed with entirely.

Even when supporting an additional weight of several hundred pounds at the center, the rails show little or no deflection. Neither can the pickets become loose and fall. Gates, made in the same manner as the railing, require no disfiguring diagonal braces to maintain rigidity.

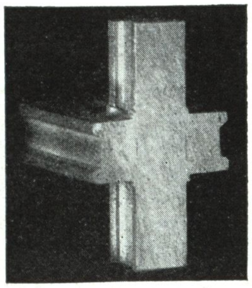
Elaboration is possible: circles, scrolls, ellipses, and other special features may be introduced, double top or bottom rails may be used, and highly ornamental iron posts or brick, stone, concrete, or cast iron columns may be employed.



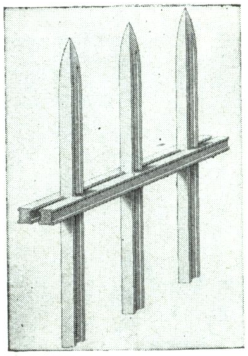
Grooved Square Rods of Open Hearth Steel



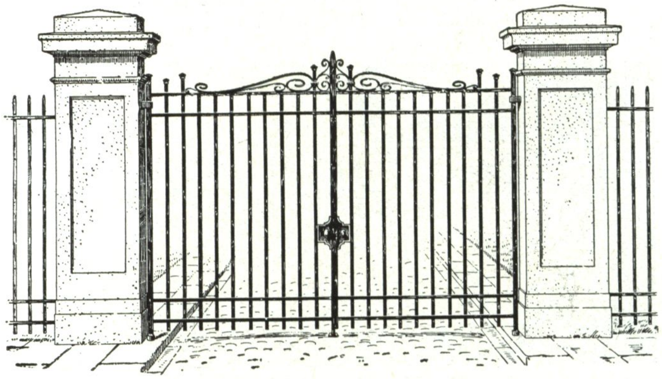
Electrically Welded Under Tons of Pressure



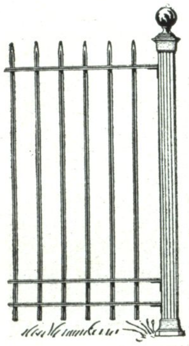
Forming One Solid Piece at Each Intersection



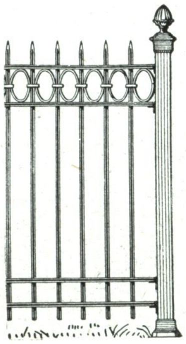
Perfect Union of Pickets and Rails



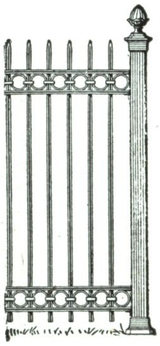
Double Gate, Type GD2-1
⅝-in. grooved square pickets



RC1



RD2 Oval



RD3 Ring

A number of other designs of both railings and gates are shown in our catalogue

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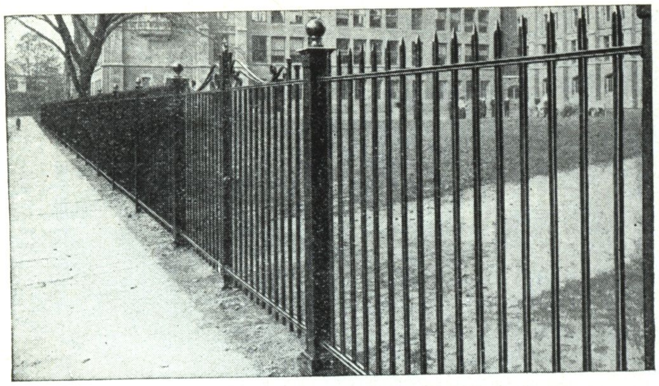
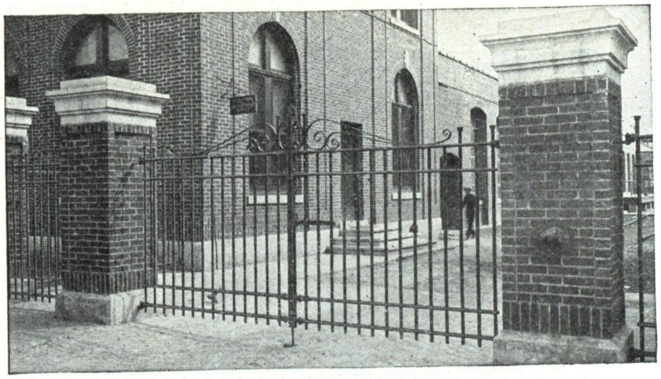


Anchor-Weld Railing and Type RA-3 Gate
Erected for the Hartford Public High School, Hartford, Conn.

Height	6 ft.
Pickets	¾-in. grooved square
Rails	¾-in. grooved square double rails
Posts	3-in. I-beam, set with drive anchors
Panels	Standard length, 10 ft.



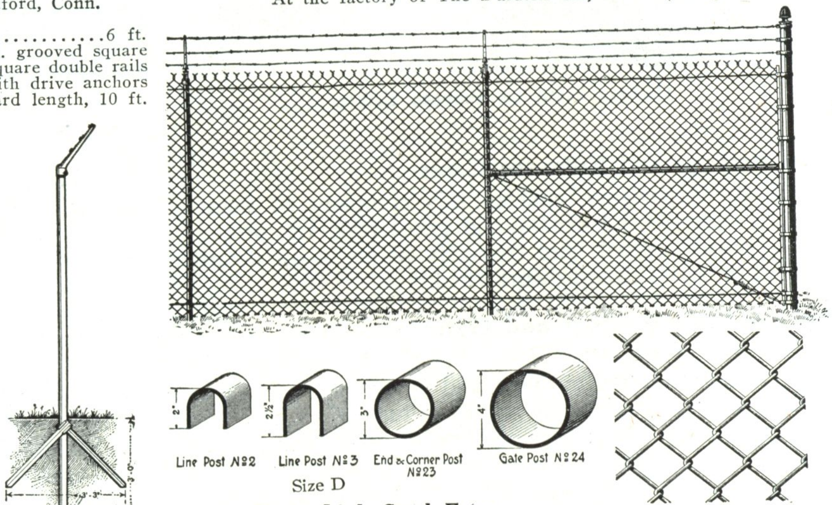
Anchor-Weld Double Gate
At the factory of The Duratex Co., Newark, N. J.

Chain Link Steel Fences

Anchor Chain Link Fabric is of best quality copper-bearing steel wire *galvanized after weaving*. Affords maximum rust resistance. Made of No. 9 and No. 6 gauge wire, the latter being more commonly used. Made in heights up to 10 ft. The small mesh affords no foothold for climbers.

This fence can be furnished with or without top rail of galvanized pipe and with or without barbed wire topping.

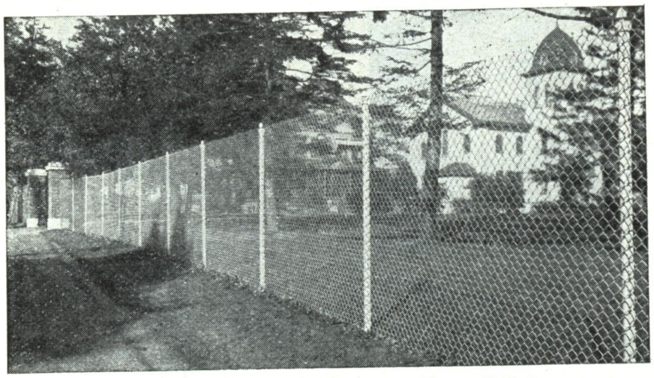
All parts are galvanized by the hot-dip spelter process, affording a uniformly heavy coat of galvanizing throughout.



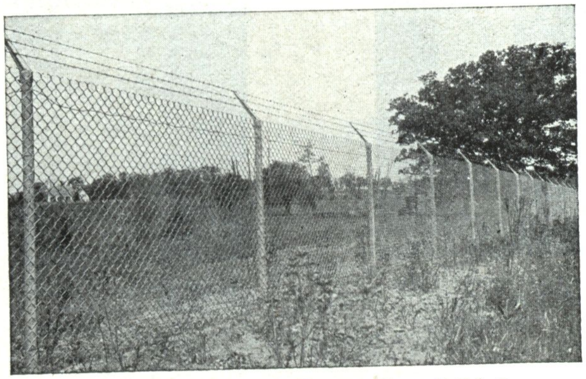
Size D

Chain Link Steel Fence

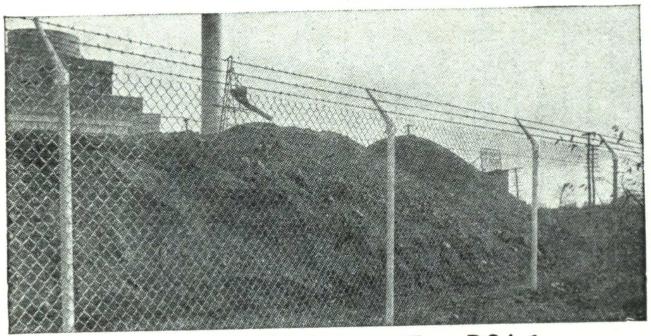
Fabric	Copper-bearing steel wire, galvanized *after* weaving
Line posts	Galvanized Anchor Posts, size D, 2½-in. steel U-bar, set on 10-ft. centers
End and corner posts	3-in. steel pipe
Gate posts	4-in. steel pipe



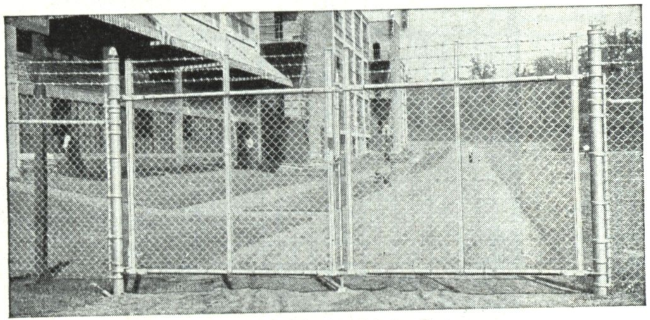
Anchor Chain Link Fence, Type DO-1
Part of an installation of 2980 ft. at the Soldiers' Home, Noroton, Conn.



Anchor Chain Link Fence, Type DOA-1
Part of an installation of 1740 ft. on the property of A. A. Marsters, Morristown, N. J.



Anchor Chain Link Fence, Type DOA-1
Part of an installation of 2125 ft. at the plant of The United Color & Pigment Co., Newark, N. J.



Double Chain Link Gate
Installed at plant of Fox Motors Co., Philadelphia, Pa.
Single gates of this general design are made for openings from 4 to 20 ft.; double gates, for openings 8 to 40 ft.

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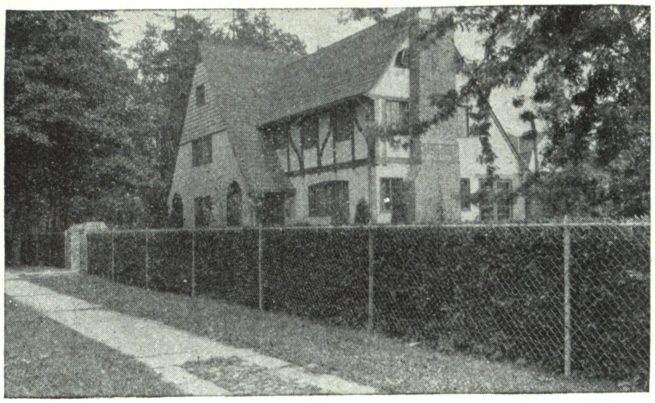
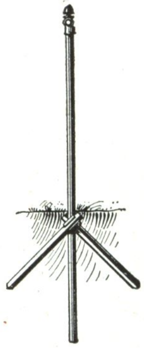
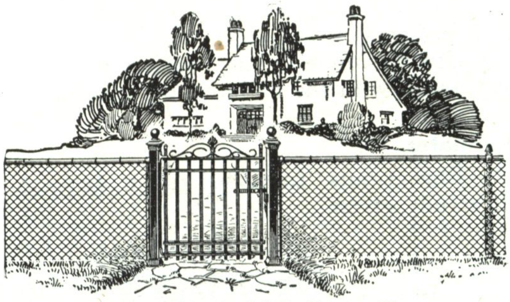


Anchor Chain Link Lawn Fence

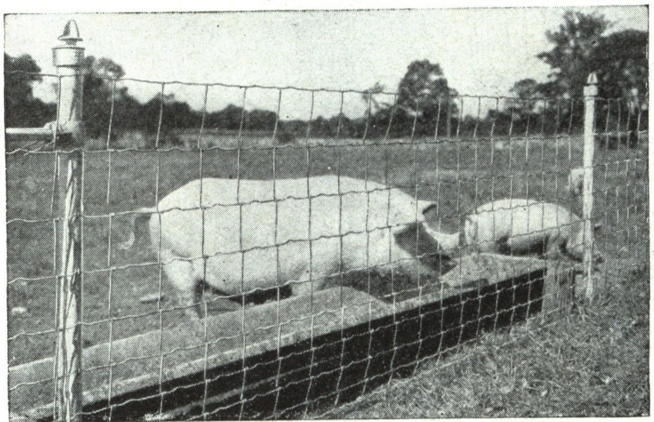
On the property of Miss E. A. Bogue, Montclair, N. J.





Anchor Chain Link Lawn Fence

Made in heights from 3 ft. 1 in. up to 4 ft. 1 in. Iron picket or chain link wire gates; electrically welded frames

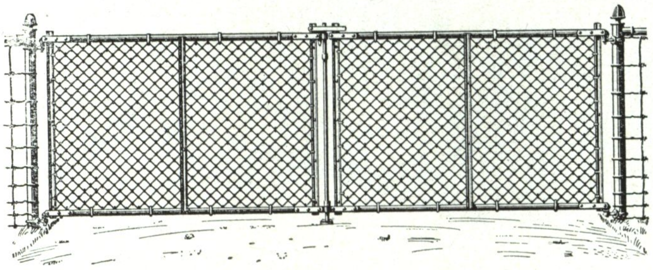


Square Mesh Farm and Pasture Fence, Type CO-5

Similar to the high fence used to enclose cattle pastures. Made in 3 ft. 6 in., 4 ft. 0 in., and 4 ft. 10 in. heights, without arms or barbed wire

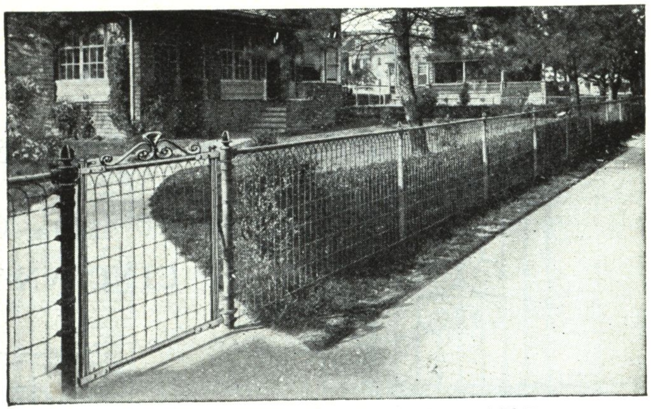
Anchor Electric-Weld Farm Gates

Great strength is secured for Anchor welded farm gates by joining the top and bottom rails to double uprights of steel channel, by means of channel corner plates electrically welded to the uprights.



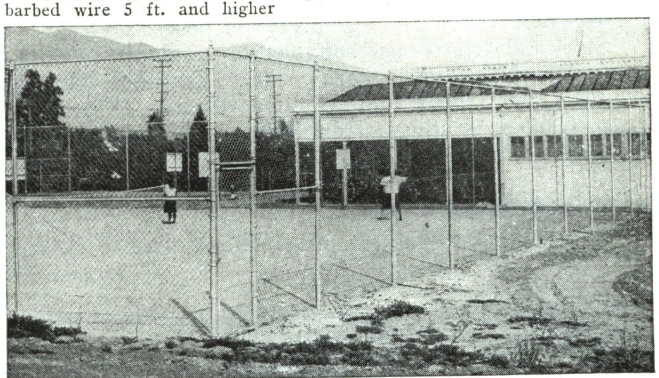
Double Farm Gate, Type "J"

Made in the following widths: 12 ft. 1 in., 13 ft. 10½ in., 15 ft. 10½ in. Other types to suit any width opening



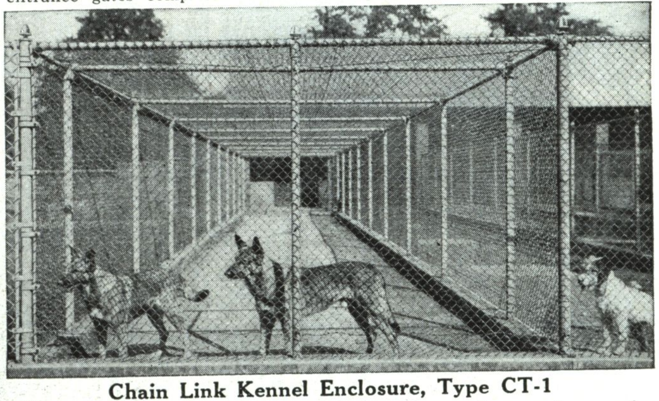
Woven Picket Lawn Fence, Type AT-2

3 ft. 2 in. to 7 ft. 1 in. high. Can be furnished with arms and barbed wire 5 ft. and higher



Anchor Chain Link Tennis Enclosure, Type DT-1

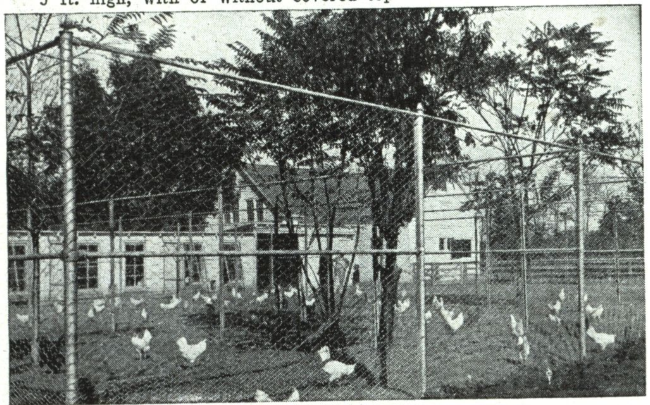
Installed on grounds of high school, Pasadena, Cal. Built up to 12 ft. high, with adequate bracing of corners and firm anchorage. Narrow entrance gates comprised in enclosure proper



Chain Link Kennel Enclosure, Type CT-1

This kennel enclosure offers a clean runway, ample room for exercise and absolutely guards the dogs against escape, injury or theft.

5 ft. high, with or without covered top



Chicken Run Enclosure, Type CT-4

These poultry fences are not only better looking, but will last two or three times as long as those built with wood framework. Ratproofing the outside of the enclosure is always advisable. A fine wire cloth is buried in the ground in such a way that rats can not burrow under it; a slight charge is made for this addition.

Specification for any size enclosure can be furnished on application

CINCINNATI IRON FENCE COMPANY

Manufacturers of Ornamental Iron and Wire Work

3330 Spring Grove Avenue
CINCINNATI, OHIO

Products

Ornamental and Plain Iron and Wire Work of every description and for every purpose.

Steel and Iron Fence suitable for residences, cemeteries, school grounds, parks, etc.; Entrance Gates, Folding Gates, Door and Window Guards, Sidewalk Doors, Grilles, Gratings, Iron Shutters, Wire Window Guards and Partitions, etc.

Design and Construction

The dominant features of Cincinnati Iron Fencing are its rugged strength, coupled with attractive design.

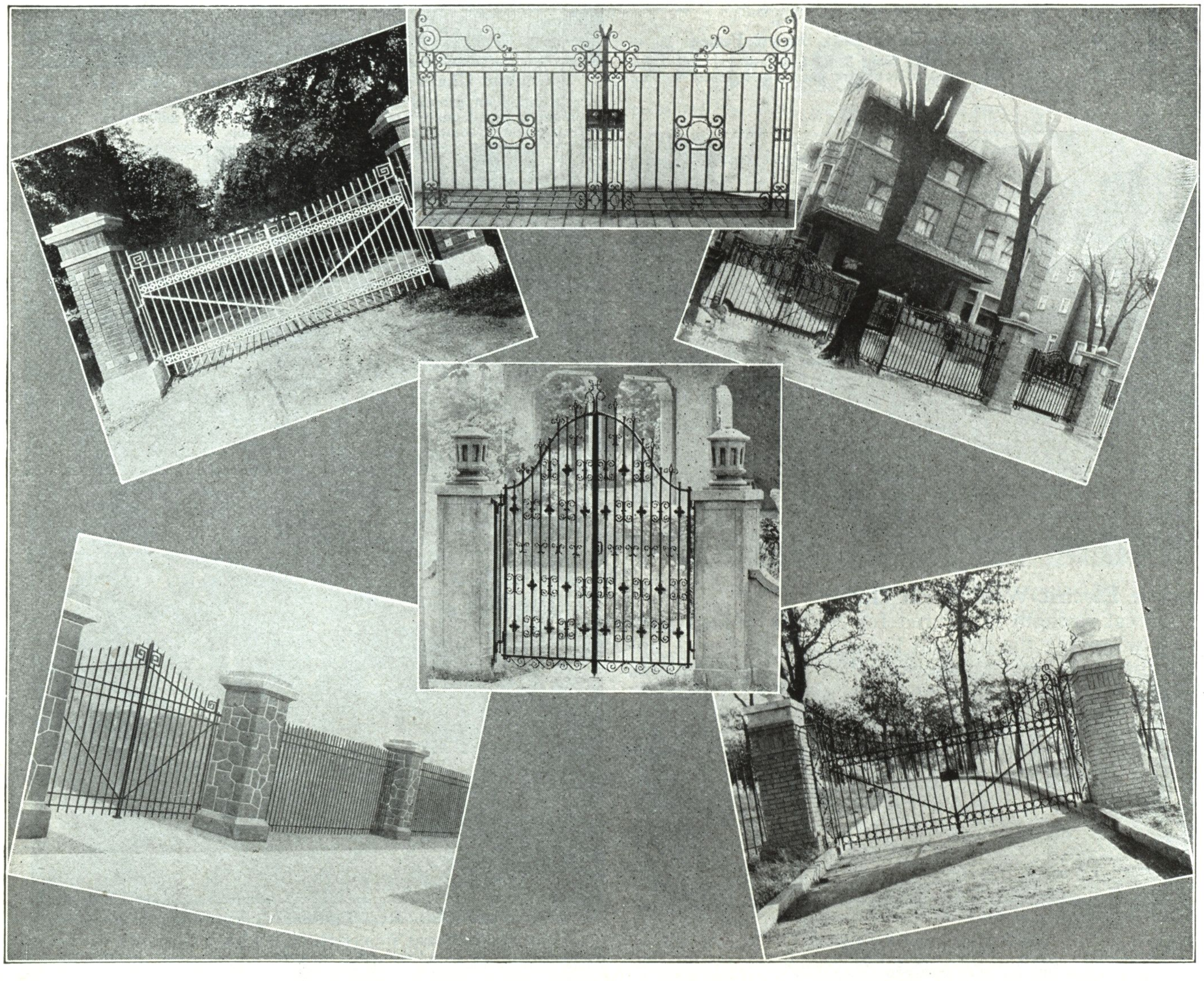
Rails—Made of channel, angle or flat sections.

Pickets—Square, round, flat or angle, suitable thickness according to height required, pointed or tipped with malleable iron heads.

Posts—Made in large variety of sizes and styles to harmonize with the architectural surroundings.

Estimates

Blue prints furnished upon request. Estimates cheerfully given.



Ornamental Iron Fence and Gates

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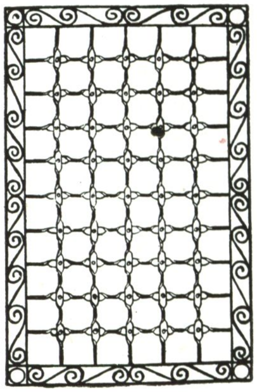
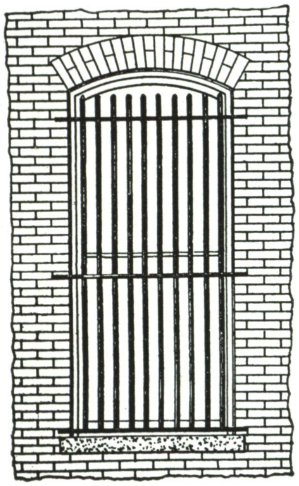
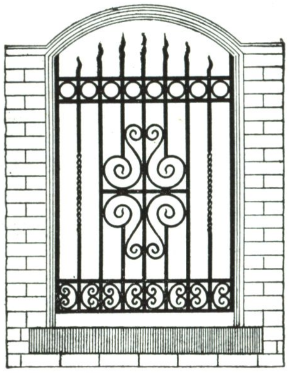
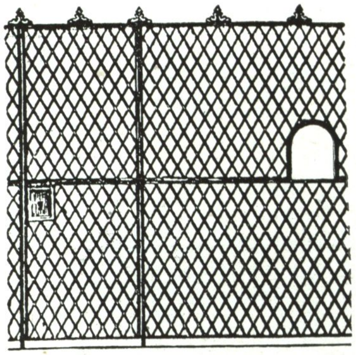
Iron and Wire Work for a Wide Range of Utility

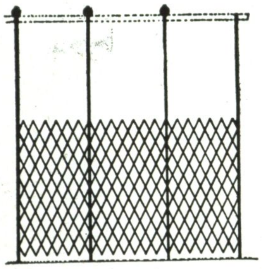
Cincinnati iron and wire specialties are used extensively where the requirements call for a dependable product. They are made by skilled mechanics in a plant fully equipped with every modern appliance for the production of first quality work.

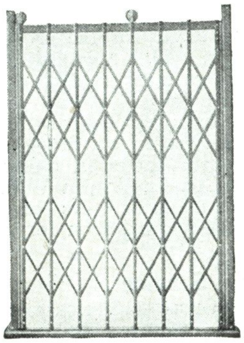

Heavy Twist and Riveted Panel Door Grille

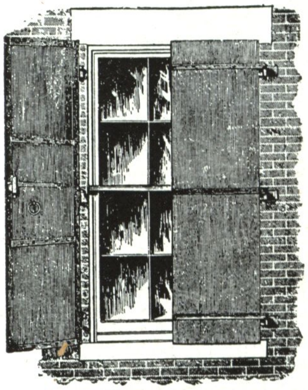

Iron Window Guard

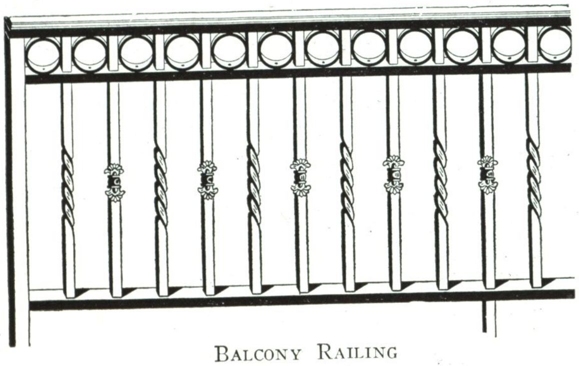

Ornamental Iron Window Guard

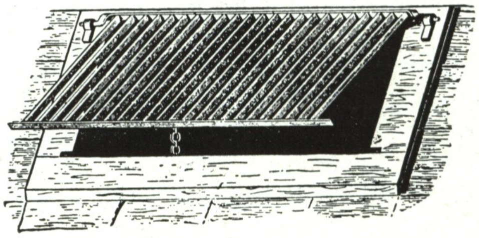

Wire Partition with Door and Wicket

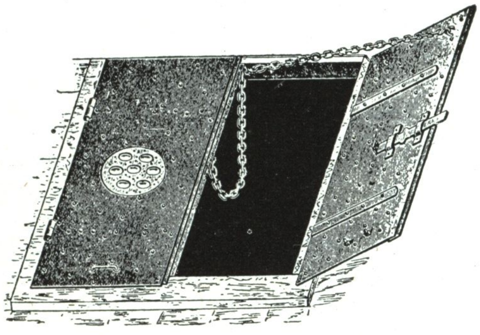

Lattice Type Folding Gates


Bostwick Folding Gate


Iron Shutters with Single Lock


Balcony Railing


Cellar Grating


Iron Cellar Door, Non-slip Surface and One Light

CYCLONE FENCE COMPANY

Manufacturers of Fencing and Gates in Wire and Iron

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PORTLAND, ORE., Northwest Fence & Wire Works

Products

THE MARK OF QUALITY FENCE AND SERVICE

"Galv-After" Chain Link Fence Fabric of copper-bearing wire for country estates, country clubs, golf grounds, suburban homes, city residences, public and private parks, schools, athletic fields, churches, cemeteries, city, county, State and National institutions.

Iron Fence, Iron Entrance Arches and Gates, Iron Railings, etc.

Fencing for factories, industrial housing communities, power and pumping stations, transformer stations, reservoirs and filtration plants.

Enclosures and Back Stops for tennis courts; also kennels, animal cages, bird cages, and poultry yards.

Road-guard for the protection of motor traffic at dangerous curves, bridge approaches, grades, etc. Fabric is of heavy No. 6 gauge steel wire, 2-in. mesh, galvanized after weaving. Standard height, 24 in., for posts 36 in. high.

Swinging, Sliding, and Folding Gates.

Wire Work of all kinds: Wire Partitions (built-in-sections) for factories, offices and stockrooms; Window and Skylight Guards, Woven Wire Entrance and Display Signs.

Also manufacturers of Special Fencing and Entrance Gates in Wire and Iron for any purpose.

Cyclone Service

The Cyclone Fence Company places at the disposal of architects, engineers and contractors the benefit of its many years' experience in building and installing fencing for every purpose. Blue prints, designs and estimates; also construction details and information concerning materials used in any Cyclone Fence will be furnished on request. This service is without charge or obligation.

When desired, and at reasonable charge, experienced construction superintendent will be furnished to supervise installation of fence anywhere. If preferred, this company will contract to erect fence complete.

From the time your order is placed until fence is installed, the Cyclone Fence Company assumes complete responsibility for every detail of the manufacture and installation of Cyclone Fence.

"Galv-After" Chain Link Fence Fabric

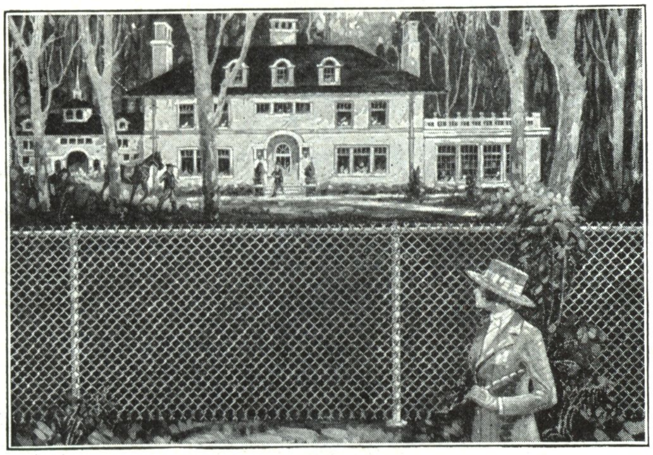
Cyclone "Galv-After" Fence is made of copper-bearing wire, heavily zinc-coated (or hot-galvanized) by hot-dipping process *after* weaving. About five times as much zinc coating is applied to Cyclone "Galv-After" Chain Link Fence Fabric as was practical under the old method of zinc-coating (or galvanizing) wire *before* weaving. In other words, approximately 135 lbs. of zinc is applied to each ton of "Galv-After" fabric, whereas only 25 to 30 lbs. is usually applied to commercially galvanized wire. Fabric is uniformly zinc-coated, even the cut ends. There are no *lumps,* frozen (or soldered) links or intersections.

Preece tests made by the Robert W. Hunt Company, engineers of national reputation, show that Cyclone "Galv-After" Chain Link Fence Fabric stands eight 1-minute dips in a copper sulphate solution before any evidence of copper is apparent on the wire. The test to which standard telegraph wire is subjected requires only four 1-minute dips.

Cyclone "Galv-After" fabric does not require annual painting.

Safeguard Chain Link Fence

Standard height, 6 ft. Built in heights, 4 to 10 ft. Fabric, "Galv-After" chain link copper-bearing wire heavily zinc-coated (or hot-galvanized) by hot-dipping process *after* weaving. No. 6 or No. 9 gauge, 2-in. mesh. Row of barbs projects 1 in. above top rail, or selvage furnished with knuckled finish to dress below top rail. Bottom selvage barbed. Posts, braces, etc., full weight tubular steel, hot-dipped galvanized.



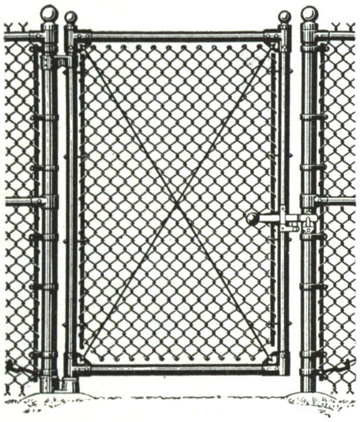
Safeguard Chain Link Fence

Cyclone Standard Construction

Cyclone specifications stipulate full standard weight tubular steel for posts, top rail and braces. The outside diameter size; also weight per foot are specified. Figures are taken from the full standard weight schedule adopted by manufacturers. The permissible variation is 5% either way.

It is recommended that all posts be set in concrete foundations and that Cyclone standard specifications be used to insure maximum satisfactory service.

Fabric made of Nos. 6, 9 and 11 gauge copper-bearing wire woven in various sizes of mesh and in heights up to, and including, 10 ft.



Walk Gate Used with Safeguard Fence

Equipped with knob latch and ball-and-socket pivot hinge. Hinges can not twist or turn

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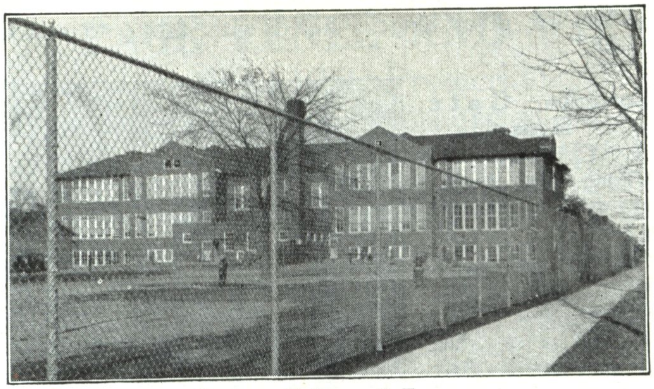
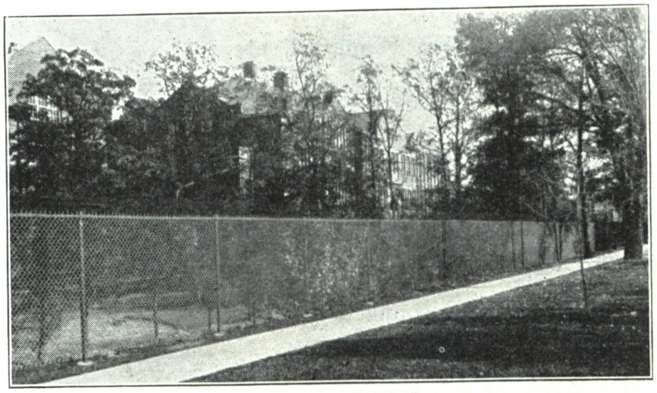
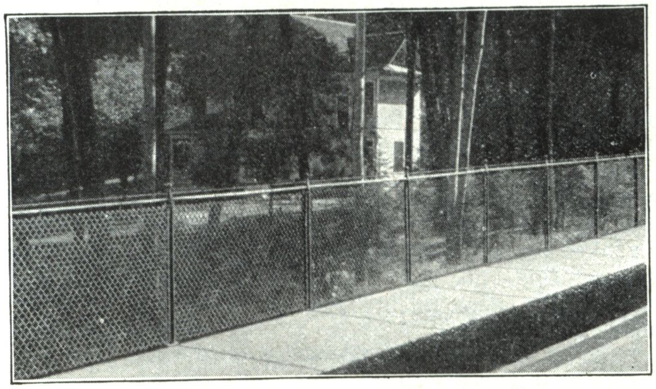


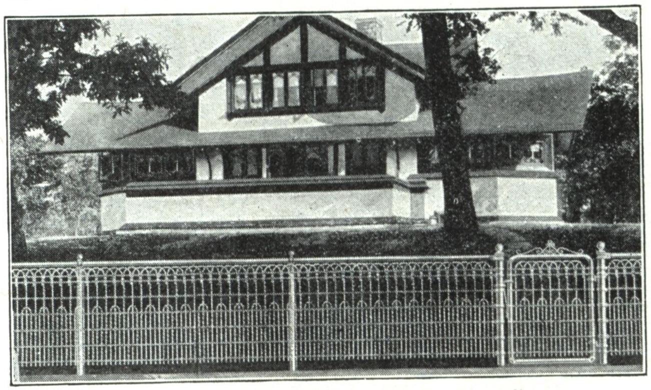
Cyclone Safeguard Fence
Standard for schools, playgrounds, parks, etc.; strong, durable; will stand rough usage



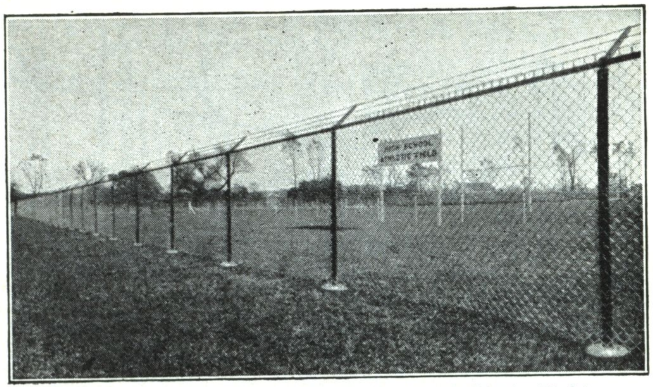
Cyclone Safeguard Fence
Extensively used for colleges, institutions, church property, public and private grounds of all kinds



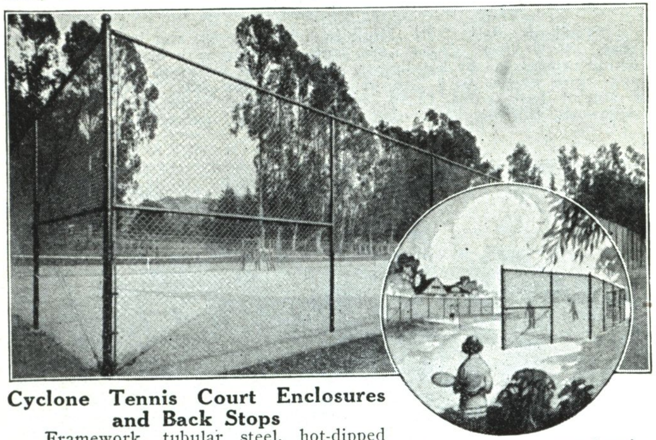
Cyclone Majestic "Complete Fence"
Standard heights: 48, 54 and 60 in. Framework, tubular steel, hot-dipped galvanized. Line posts made of two tubular steel uprights. Fabric, "Galv-After" Chain Link, made of No. 9 gauge copper-bearing wire woven in a 2-in. mesh



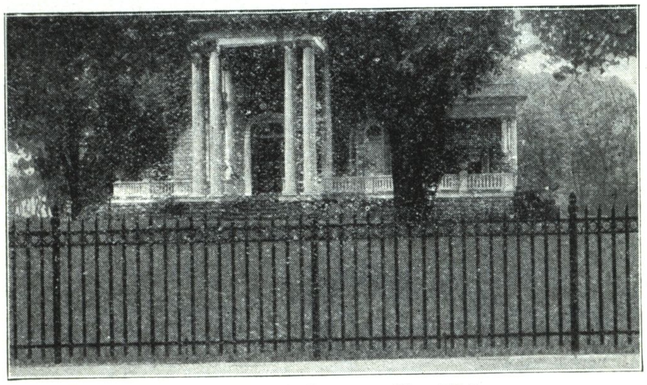
Cyclone Colonial "Complete Fence"
Standard heights: 36, 42, 48 and 54 in. Framework, tubular steel, hot-dipped galvanized. Fabric, style "F." Pickets spaced 3 in. apart at top, 1⅜ in. apart at bottom



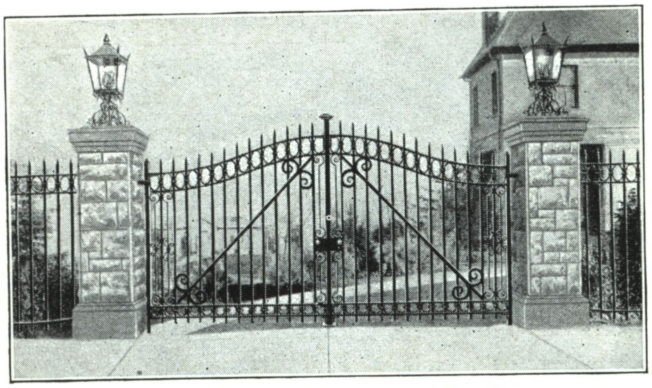
Cyclone Invincible Fence Enclosing Athletic Field
Built in heights up to and including 11 ft. Fabric, "Galv-After" Chain Link, made of copper-bearing wire. Pressed steel extension arms carry three rows of barb wires along entire top of fence



Cyclone Tennis Court Enclosures and Back Stops
Framework, tubular steel, hot-dipped galvanized. Fabric, "Galv-After" Chain Link, No. 11 gauge copper-bearing wire woven in a 2-in. mesh. Standard height, 10 ft.

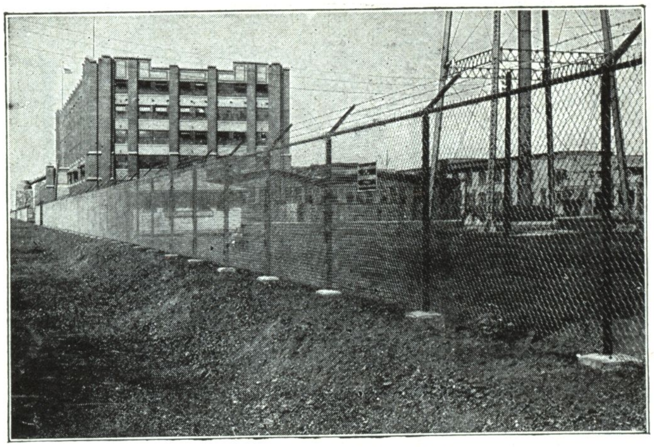


Iron Fence, Pattern No. 508
One of the most popular patterns. Built in heights from 37 to 72 in. Square pickets. When desired, Cyclone Iron Fence will be built in special designs from architect's drawings, or from designs which our designers will gladly prepare



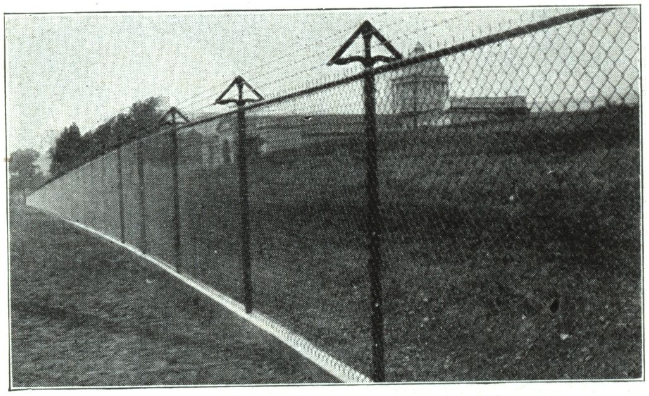
Iron Entrance Gate, Pattern No. 501
Cyclone Iron Fence and Entrance Gates built in a variety of heights and handsome patterns from which fencing appropriate for any purpose may be selected

Continued on next page



Cyclone Invincible Chain Link Fence

Standard height, 7 ft. Built in heights up to, and including, 11 ft. Fabric, "Galv-After" Chain Link, copper-bearing wire heavily zinc-coated (or hot-galvanized) by hot-dipping process *after* weaving. No. 6 or No. 9 gauge wire woven in a 2-in. mesh. Extension arms carry three rows of 4-point barb wires 12 in. in or out from fence line. Posts and framework, full weight tubular steel, hot-dipped galvanized

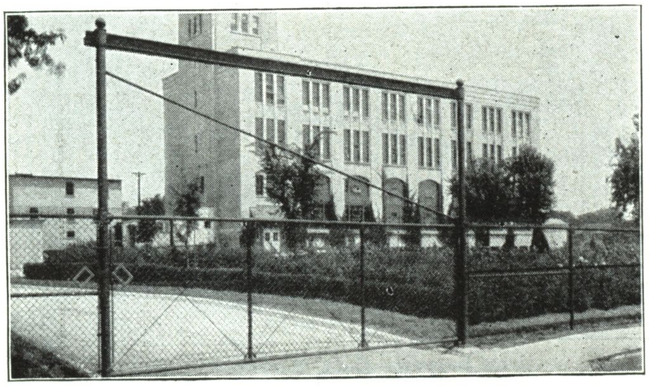


Cyclone Non-Climbable Chain Link Fence

Standard height, 7 ft. Built in heights up to, and including, 11 ft. Fabric, "Galv-After" Chain Link, copper-bearing wire heavily zinc-coated (or hot-galvanized) by hot-dipping process *after* weaving. No. 6 or No. 9 gauge wire woven in a 2-in. mesh. Extension arms carry five rows of 4-point barb wire $9\frac{1}{2}$ in. in and out from fence line. Posts and framework, full weight tubular steel

Gates

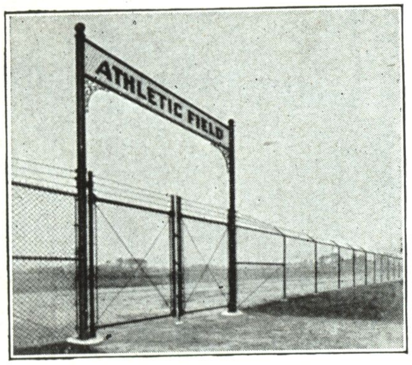
Frames, heavy tubular steel, 2-in. outside diameter, hot-dipped galvanized. Built in single and double swing types; also sliding gates. Furnished in standard heights for any opening size. Swing gates arranged to swing in or out, to lock from either side. Sliding gates operate on overhead enclosed steel track. All Cyclone Gates are firmly braced and trussed to prevent sagging. Swing gates operate on ball-and-socket pivot hinge. Filled with fabric to match fence.



Single Sliding Gate

Entrance Gate Signs

Cyclone entrance Gate Signs are made of heavy channel iron frames. Letters of wood with bronze finish. Fabric, woven wire diamond mesh. Any lettering that will fit in panel will be furnished.



Cyclone Entrance Sign

Prices, Information Required, etc.

Prices on fence job erected complete, or services of construction superintendent, quoted on application.

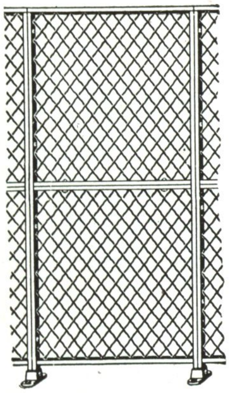
When writing, send a diagram or blue print of proposed fence lines, giving measurements of each stretch and total measurements. Make an "O" where corner, end or gate posts are to be placed. State whether single, double swing type or sliding gates are wanted, and give opening size.

Quotation on complete job will follow by return mail.

Wire Work of All Kinds

(Built - in - Sections) Partitions—Built in standard size sections 4 ft. wide by 8 ft. high. Frames are 1-in. channel iron. Fabric is No. 10 gauge wire woven in $1\frac{1}{2}$-in. diamond mesh. Furnished with either swinging or sliding gates. Handholes or wickets provided where needed. Floor flanges furnished for either wood or concrete floors. Sections are interchangeable, movable; can be taken out and used elsewhere—no refitting—no loss. Quick changes in departments can be made any time.

Send blue print or layout of partition work wanted.

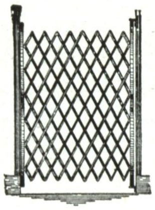


Partition Section

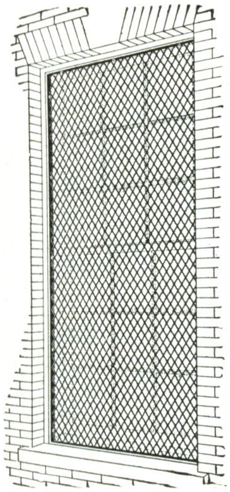
Window and Skylight Guards—Frames are 1-in., $\frac{3}{4}$-in. channel, or $\frac{3}{8}$-in. round iron. Fabric is No. 10 gauge wire woven in $1\frac{1}{2}$-in. diamond mesh.

Channel iron frames fit into openings. Round iron frames usually allow $\frac{3}{4}$ in. on all sides for lap. Special guards built with either channel or round iron frames, using size of wire and mesh desired.

Folding Gates—Built for any width or height. Take up minimum space. Fold out of the way.



Folding Gate



Diamond Mesh Window Guard

PAGE FENCE AND WIRE PRODUCTS ASSOCIATION

Wire Link Protection Fences, Gates and Panel Partitions

215 North Michigan Avenue
CHICAGO, ILL.

Comprising the Following Organizations Specializing in the Construction and Erection of Wire-Link Enclosures Manufactured by the Page Steel and Wire Company, Associate Company of the American Chain Company, Inc., Bridgeport, Conn.

ALABAMA: BIRMINGHAM—Ingalls Iron Works
CALIFORNIA: LOS ANGELES—Southern California Fence Construction Co.
SAN FRANCISCO—Michel & Pfeffer Iron Works
COLORADO: DENVER—Stearns-Rogers Mfg. Co.
CONNECTICUT: HARTFORD—Adams Fence & Wire Co., Inc.
NEW HAVEN—The John P. Smith Co.
FLORIDA: ST. PETERSBURG—William J. La Grange
GEORGIA: ATLANTA—Whitman & Brandt
SAVANNAH—Savannah Iron and Wire Works
ILLINOIS: CHICAGO—Chicago Fence & Wire Co.
INDIANA: INDIANAPOLIS—Hoosier Fence Co.
IOWA: DES MOINES—Des Moines Steel Co.
KENTUCKY: LOUISVILLE—Logan Co.
LOUISIANA: NEW ORLEANS—Orleans Steel Products Co., Inc.
SHREVEPORT—Meriwether Supply Co.
MARYLAND: BALTIMORE—Maryland Culvert & Metal Co.
MASSACHUSETTS: BOSTON—C. A. Gates & Co.
MICHIGAN: DETROIT—Barnes Wire Fence Co.
MINNESOTA: MINNEAPOLIS—Crown Iron Works Co.
MISSOURI: KANSAS CITY—Kansas City Wire & Iron Works
ST. LOUIS—Sears and Piou
NEBRASKA: OMAHA—Gate City Iron Works
NORTH CAROLINA: CHARLOTTE—General Equipment Co.
NEW YORK: BINGHAMTON—Titchener Iron Works, Inc.
BUFFALO—Buffalo Fence Construction Co.
NEW YORK—Brook Iron Works, Inc.
RENSSELAER—Wm. J. La Grange
OHIO: ASHVILLE—J. S. Roof
CINCINNATI—The Davis & Siehl Co.
CLEVELAND—The Betz-Pierce Co.
WASHINGTON C. H.—W. W. Wilson & Sons
ZANESVILLE—The F. Wilking Sons Co.
OKLAHOMA: TULSA—Sherman Machine & Iron Works
OREGON: MEDFORD—Gaddis & Dixon
PENNSYLVANIA: PHILADELPHIA—Horace T. Potts & Co.
PITTSBURGH—Stewart-Holland Co., Inc.
SCRANTON—The Bittenbender Co.
SOUTH CAROLINA: CHARLESTON—Cameron & Barkley Co.
TENNESSEE: CHATTANOOGA—James Supply Co.
MEMPHIS—Tri-State Iron Works
TEXAS: DALLAS—Columbia Fence & Wire Co., Inc.
SAN ANTONIO—Southern Steel Co.
UTAH: WOODS CROSS—Burnham Manufacturing Co.
VIRGINIA: DANVILLE—Voss Mobley Hardware Co.
LYNCHBURG—The Hubard Foundry & Machine Works, Inc.
RICHMOND—Richmond Machinery & Equipment Co.
WASHINGTON: SPOKANE—Spokane Culvert & Tank Co.
WEST VIRGINIA: HUNTINGTON—James J. Weiler & Sons
PARKERSBURG—Parkersburg Supply Co.
WISCONSIN: MILWAUKEE—Wisconsin Iron & Wire Works

MADE IN CANADA BY DOMINION CHAIN CO., LTD., NIAGARA FALLS, ONT.
MONTREAL—Montreal Wire Works, Ltd.
ST. JOHNS, N. B.—Gandy & Allison, Ltd.
WINNIPEG—J. H. Ashdown Hardware Co.

Products

Wire-Link Fencing and Entrance Gates of Steel or Armco Ingot Iron for all protection and ornamental purposes: styles for factories, and all types of industrial plants; residences, estates and country clubs; public institutions; schools; athletic fields, playgrounds, etc.; parks, fairgrounds, cemeteries, church properties.

Special Wire-Link Enclosures for tennis courts, ball parks, prisons; electrical equipment or dangerous machinery; animal enclosures for fur farms or zoo, etc.

Standard Wire-Link Panel Partitions for stockrooms, machine-shops, offices, warehouses, etc.

Also manufacturers of Wire-Link Specialties: Window and Skylight Guards, Display Signs, etc.

STEEL AND WIRE PAGE QUALITY PRODUCTS

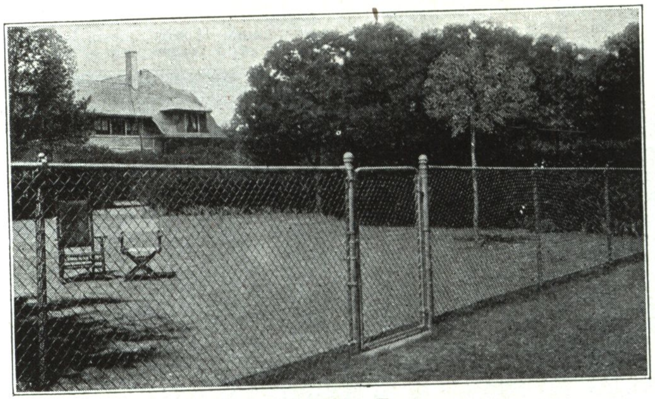
ARMCO Ingot Iron

TRADE-MARKS

Page Facilities for the Manufacture and Erection of Fences

The woven wire fence industry was initiated by J. Wallace Page, who made the first fence of this material in 1883. The company has steadily progressed since that date, until now it controls all processes of manufacture, drawing, processing, weaving and galvanizing its own wire, which permits unusual control of quality and uniformity.

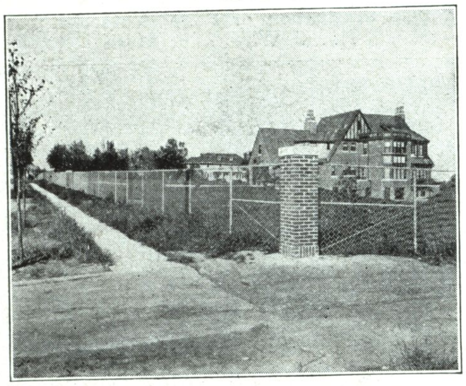
The Page Distribution Plan, choosing experienced and responsible companies to sell and erect fences in various territories gives property owners, architects and engineers dependable local service in the matter of planning, designing and erecting enclosures.



Page-Reliable Fence

2-in. mesh, No. 9 wire; heights 36 to 60 in. Exactly the same as standard Page protection fence, except that posts and top rail are somewhat lighter.

Furnished with either a top rail, as shown, or with heavy lateral wire, top and bottom. Fabric protected with Page super-heavy zinc coat, applied after weaving. Line posts are tubular construction, 2-in. outside diameter, spaced 8 ft. apart and set 2½ ft. below grade line. End, corner and gate posts are 2⅜-in. outside diameter, set 3 ft. below grade line



Page Style O-TR Protection Fence Enclosing an Estate

6 ft. high over all, combining positive protection with beauty. Sturdy, unclimbable. Because of its simplicity and neatness of design, ideal protection for estates, parks, schools and athletic fields.

Page is the only wire-link in which the pickets are *formed* to fall naturally into perfect squares, enabling easy erection and alignment. The fabric conforms readily with any treatment of entrances and posts

Continued on next page

Styles of Page Protection Fence

There are six distinct types of Page protection fence, classified according to barbed wire arms and strands. All but one of these types may be had with, or without top rail between posts, resulting in eleven styles as follows:

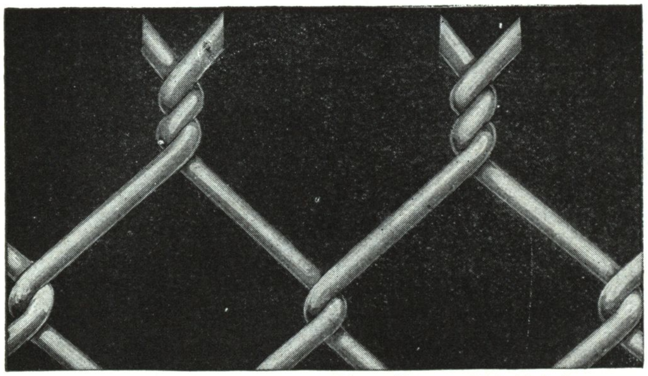
O-W— without barbed wire or top rail
O-TR— without barbed wire with top rail
3-W— 3 strands barbed wire without top rail
3-TR— 3 strands barbed wire with top rail
5-W— 5 strands barbed wire without top rail
5-TR— 5 strands barbed wire with top rail
6-W— 6 strands barbed wire without top rail
6-TR— 6 strands barbed wire with top rail
3-TR-V— 3 strands barbed wire on vertical arm with top rail
3-W-V— 3 strands barbed wire on vertical arm without top rail
3-TR-LF—3 strands barbed wire with special arm for lighting fixture

After deciding on barbed wire protection, it is then simply a matter of height, gauge of wire, mesh and metal. Page fence is regularly furnished in heights of 3 to 12 ft. For most protection purposes, the mesh is 1½ or 2 in. in No. 9 wire, or 2 in. in No. 6 wire. The metal is either high grade steel or Armco Ingot Iron. Page is the only fence that can be made of Armco Ingot Iron, thus furnishing to fence users a metal of unequalled purity and rust resistance.

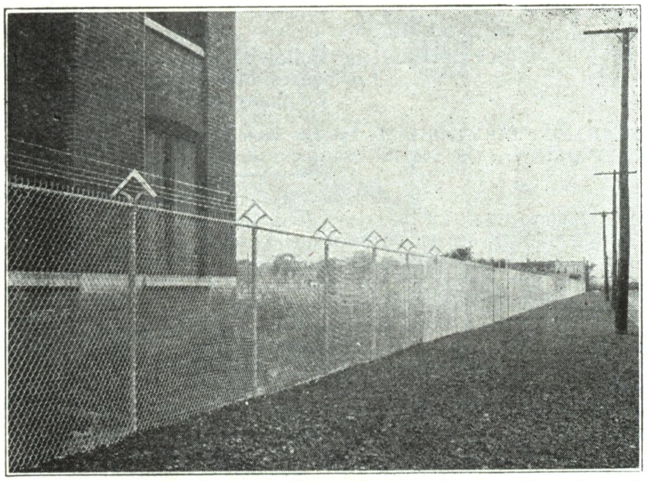
Page Fabric

Page fabric is flat woven without the usual outward curvature between picket intersections. The result is improved appearance and the links take their position naturally without undue stretching.

This matter is of importance because of the constant strain on posts and fittings when tight stretching is necessary to align fabric properly.


Half Size Illustration of Page Protection Fabric No. 6 Wire 2-in. Mesh

Page fabric is to be had in 1½ or 2-in. mesh, and in standard 6, 9, 11, 12, 14 "steel wire gauge" wire in either steel or Armco Ingot Iron. It is all woven in Page mills under expert supervision, and protected by the Page super-heavy zinc coat.


Page Wire-Link Industrial Fence Equipped with Five Strands of Barbed Wire

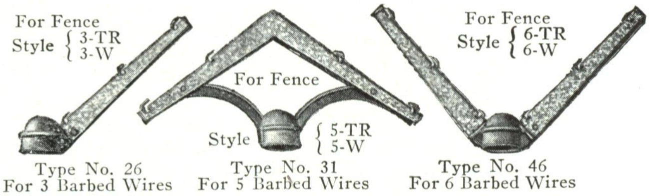
This style of Page fence, using five strands of barbed wire and with posts set in concrete, conforms to government specifications on protection fence.

This arm gives maximum protection. The barbed wire, extending on both sides of the fence line, makes practically an impassable barrier

Page Super-heavy Zinc Coat

A special mechanical process is used by Page mills to coat wire-link fabric *after weaving*. This process results in a uniform coat of rust-resisting zinc, approximately five times as thick as that on ordinary galvanized wire.

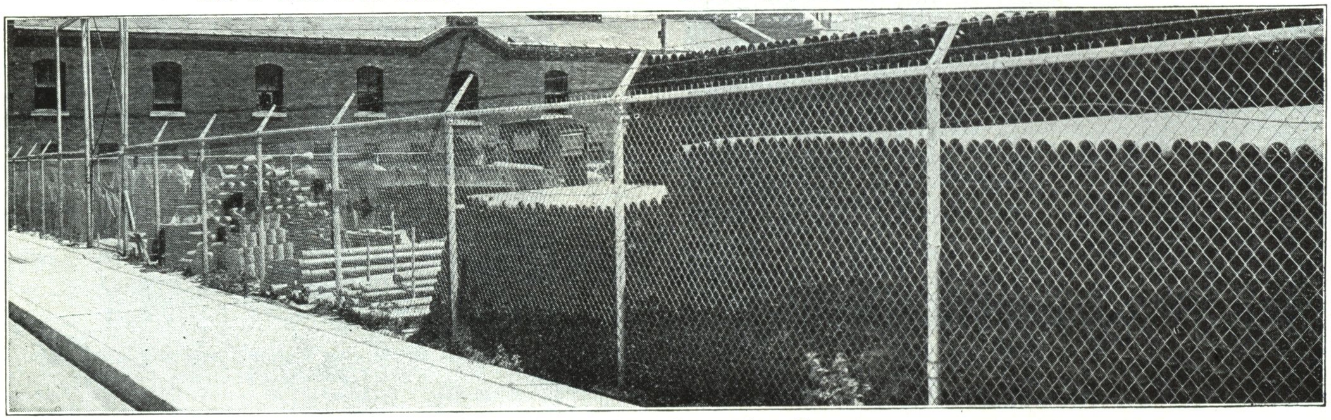
This coat covers every part of the surface of the fabric firmly. Tests indicate that fabric so treated will last several times as long as ordinary galvanized wire. Page fabric, galvanized by ordinary dipping methods, after weaving, has been in service for more than 12 years and is still in excellent condition.


For Fence Style { 3-TR 3-W
For Fence Style { 5-TR 5-W
For Fence Style { 6-TR 6-W
Type No. 26 For 3 Barbed Wires
Type No. 31 For 5 Barbed Wires
Type No. 46 For 6 Barbed Wires

Styles of Corner Arms for Carrying Barbed Wire

The three styles may be used in connection with any type of Page Protection fence illustrated in these pages.

In asking for estimates please specify gauge of wire, mesh, height of fence, length, style of arm, and preferably send rough plan of property


Style 3-TR Page Protection Fence

This shows Page fence Style 3-TR, 7 ft. high over all, surrounding the material yard of the Dallas Power & Light Co., Dallas, Tex.

The Page super-heavy zinc coat, applied-after-weaving, with approximately *5 times the weight* of zinc on ordinary wire link, insures lasting fence protection at its lowest cost per year

Continued on next page

Page Posts and Fittings

"Yard-deep" Page posts are of tubular steel, 2-in. diameter for fence under 6 ft. in height; 2½-in. diameter for fence 7 ft. or higher. All line posts are set 3 ft. in solid concrete footings. End and gate posts are 3 in. (except gate wings 7 in. or more where 3½-in. posts are used) and set 3½ ft. deep in solid concrete footings.

Tubular steel is the strongest and most resilient section. Posts are protected from corrosion by moisture-proof metal cap at top and carefully sloped footings at bottom.

Page tension bands are heavy beveled edge steel; fabric bands are beveled and of non-rusting metal; barbed wire arms are of hot-dip galvanized Armco Ingot Iron and firmly riveted to malleable caps.

Hinges, gate stops, gate keepers, etc., are of heavy malleable iron. Hinges are of offset center type and permit gate to open back against fence.

Page posts and fittings are regularly furnished in 2 finishes:

(A) Complete galvanized; all posts, fittings, braces, etc., hot-dip galvanized.

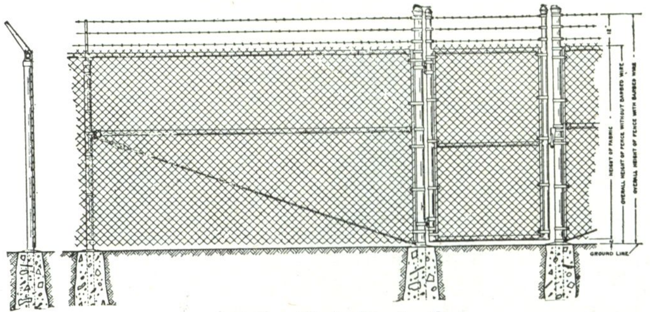
(B) Painted; all posts, fittings, braces, etc., dip-painted with special iron paint. Wire arms are always galvanized but will be painted also on specification with finish B.

Page Gates

Are of all-weld construction in standard sizes, and of either swinging or sliding types. Special sizes are made with malleable fittings riveted through frame.

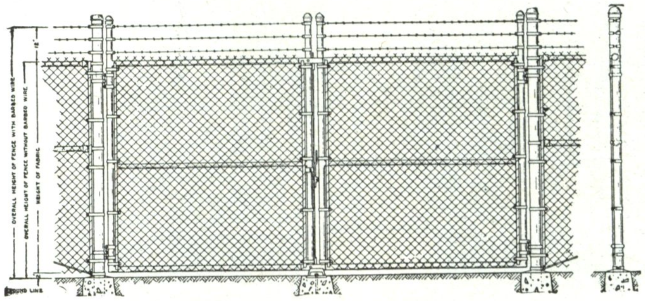
Gates furnished with or without wire arms. Large gates securely braced with special cross bracing. All parts are of malleable metal.

Wide gates have special latches fastening at top, bottom and center, with lock accessible from either side. All gate parts are extra heavy to maintain proper alignment in severest service.


12"
HEIGHT OF FABRIC
OVERALL HEIGHT OF FENCE WITHOUT BARBED WIRE
OVERALL HEIGHT OF FENCE WITH BARBED WIRE
2"
GROUND LINE

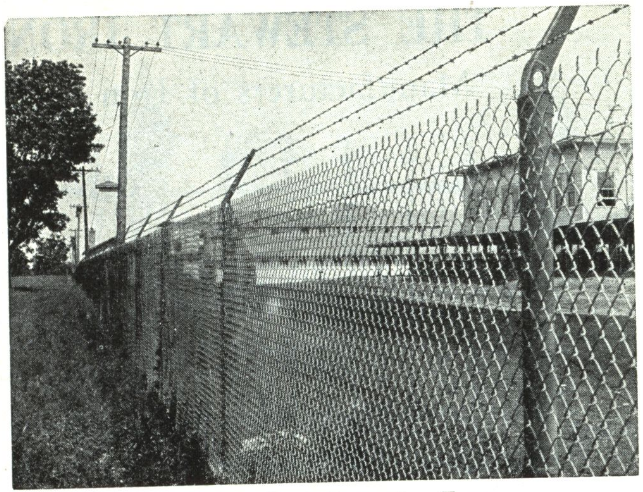
Page Wire-Link Single Gate

Construction for single gate having opening of 4, 6, 7, 9 and 12 ft. Single gates with 9 and 12-ft. openings are furnished with one additional upright brace. Gates may be had without barbed wire


OVERALL HEIGHT OF FENCE WITH BARBED WIRE
OVERALL HEIGHT OF FENCE WITHOUT BARBED WIRE
HEIGHT OF FABRIC
12"
2"
GROUND LINE

Page Wire-Link Double Gate

Construction for double gate having opening 8, 12, 14, 18 and 24 ft. Double gates with 18 and 24-ft. openings are furnished with one additional upright brace in each wing. Gates may be had without barbed wire



Style 3-W Page Protection Fence

Exactly like Style 3-TR except that a tension wire is used between line posts instead of top rail. All styles of Page fence can be supplied with wire as illustrated, instead of rail, and at lower cost

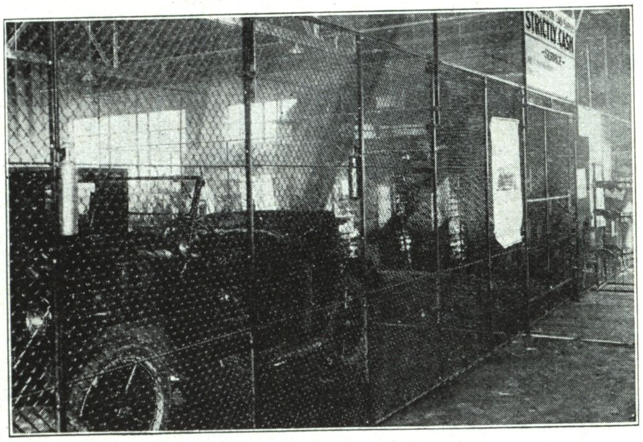
Page Specifications

Are furnished with estimates and rigidly adhered to by erecting organizations. Copies of specifications, complete, are in Page catalogue, furnished on request. They are so prepared that specification work is greatly simplified for property owners, architects and engineers. Standard specifications of this type make it possible for purchasers to specify complete fence in one short paragraph.

Page Standard Panel Partitions

Are of No. 10 gauge wire, galvanized and painted black. Mesh is interlocked—not diamond—and can not be forced apart. Panels are furnished in sizes of 8x4, 8x3, 8x2 and 8x1 ft. Frames of 1x1½x⅛-in. channel bar, reinforced with ⅜-in. round rods. They come complete with fittings, ready to bolt together, and are very easily installed. Doors are 8x4 or 8x8 ft. and interchangeable with panels. Either swing or sliding type, and furnished with wide guard locks. Standard wickets are 18 in. wide, 12 in. high; hinged so they may be raised and locked. Larger wickets can be provided. Compartments can be made larger or smaller as occasion demands, or panels removed and reinstalled in different locations. Panels always have 100% salvage value.

Especially adapted to stockrooms, shop floors, etc. No interference with light, air or vision. Occupy little space, are fireproof and sanitary. No tendency for dirt to collect in corners.



Page Standard Panel Partitions

Theftproof enclosures for tool and stockrooms in stores, offices, garages. No interference with light, air or vision. Standard, interchangeable panels in sizes of 4x8, 3x8, 2x8, and 1x8 ft. with holes for bolting made to fit with panels placed in either vertical or horizontal position, permit construction of any shape or size compartment. Removed or re-located at will—100% salvage value

THE STEWART IRON WORKS COMPANY, INC.

Manufacturers of Iron and Chainlink Wire Fences and Gates

780 Stewart Block
CINCINNATI, OHIO

Products

Plain and Ornamental Iron Gateways and Fences; Chainlink Wire Fence.

Also Iron Railings, Iron Grilles, Bronze and Iron Lanterns and Lamp Standards, Lawn Furniture, Folding Gates, Window Guards, General Ornamental Iron and Wire Work.

Facilities

This company, "The World's Greatest Iron Fence Builders," with its unsurpassed facilities for the manufacture of iron fences and gates, has a factory containing 350,000 sq. ft. of floor space and covering an area of 8 acres; an equipment of the most modern machinery; an experience of more than 38 years; a complete organization of specialists in engineering and landscape architecture and a large force of skilled mechanics and draughtsmen.

This equipment insures the highest standard of work and enables The Stewart Iron Works Company, Inc., to give prompt service at proper prices.

Specialties

This company specializes in the building of highgrade ornamental iron fences and entrance gates, either from the designs of its own draughtsmen or from drawings and specifications submitted by customers or their architects.

They give particular study to the correct designing, proportioning and construction of enclosures and entrances of country houses and estates, as well as the simpler or more pretentious town house.

Special attention has also been given to designing simple and artistic enclosures for yards in the rear of city and suburban dwellings, providing security and eliminating the feeling of confinement produced by solid fences; with the added advantages of maximum sunlight, elimination of dark corners which conceal rubbish; and making the many small plots of green into a community garden for the enjoyment of all.

From its experience, this firm is qualified to advise as to the type of fence best adapted to particular conditions, and to aid in the most satisfactory and economical solution of fencing problems.

All types of plain and ornamental fences and gates, light or heavy, in iron or chainlink wire, for factories, public institutions, etc.

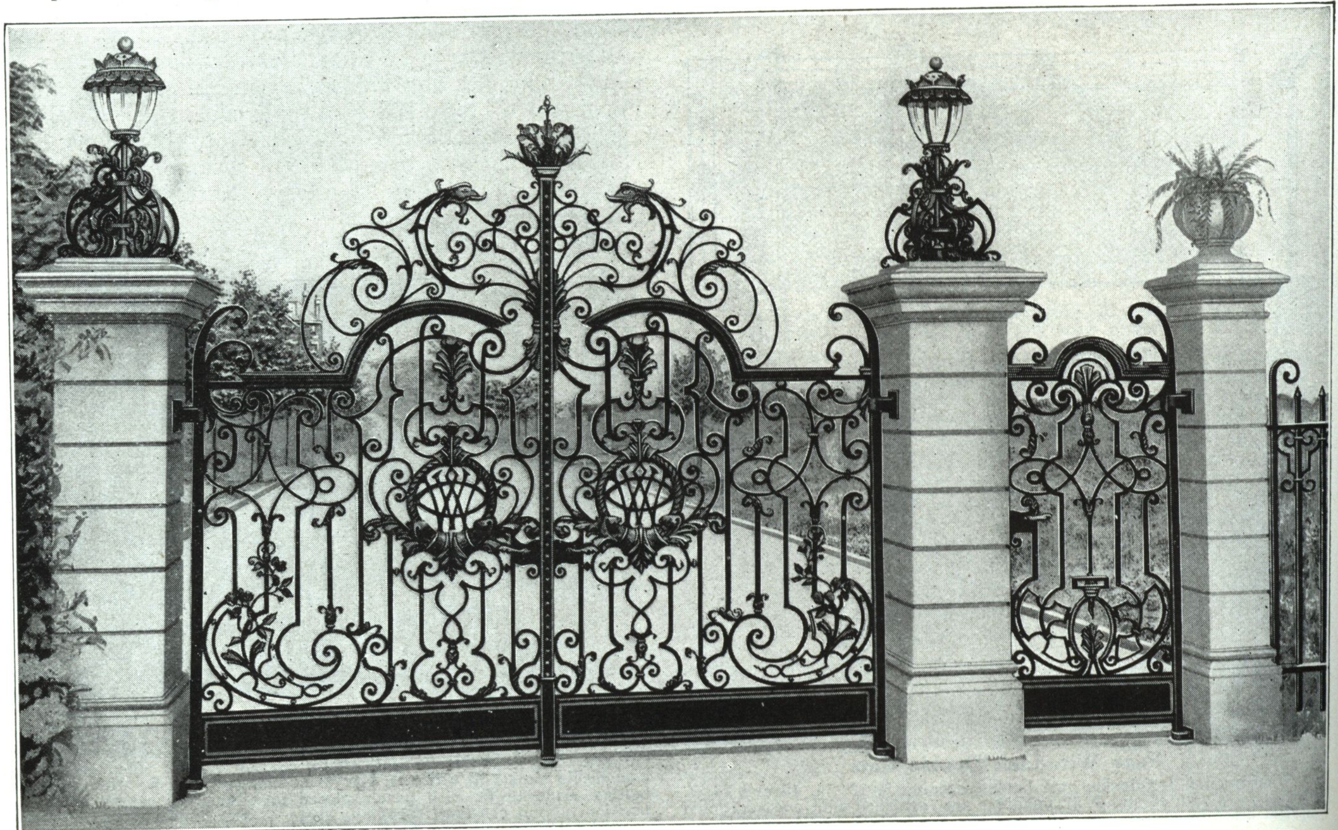
Decorative Iron Work

At innumerable points in the modern home the architect and builder find the use of interior stair railing, balconies, solarium grilles, terrace railing and other decorative iron work as developed by this Company necessary to give the final touch of beauty as well as utility to the interior and exterior.

Designs

The illustrations here are but a few of the many designs shown in this company's catalogues. Plain stock designs are featured in their Catalogue No. 50-A; special ornamental designs in "Book of Designs C."

These catalogues will be sent to architects and prospective purchasers on request.



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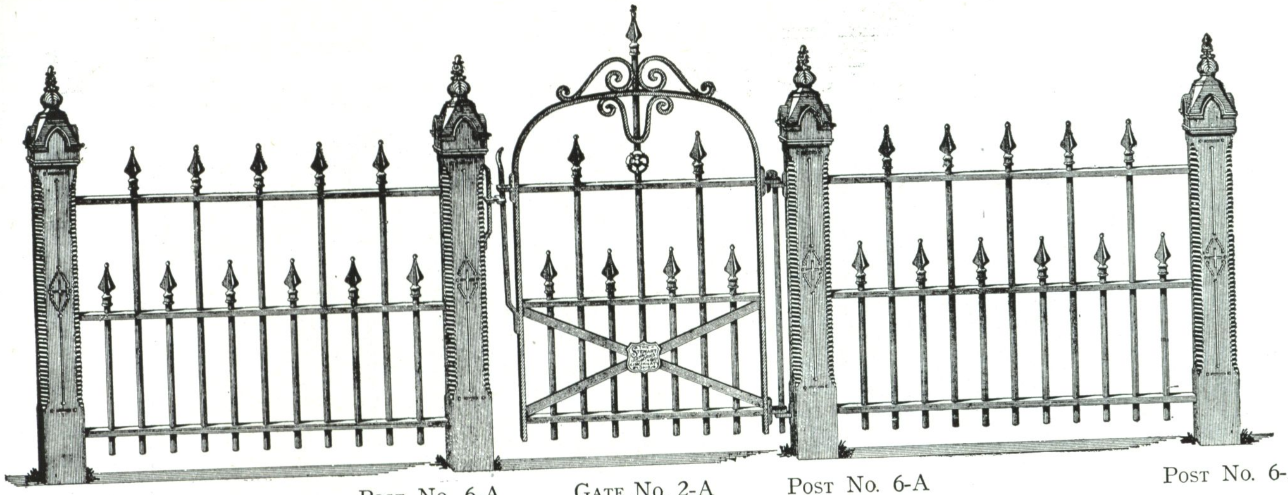
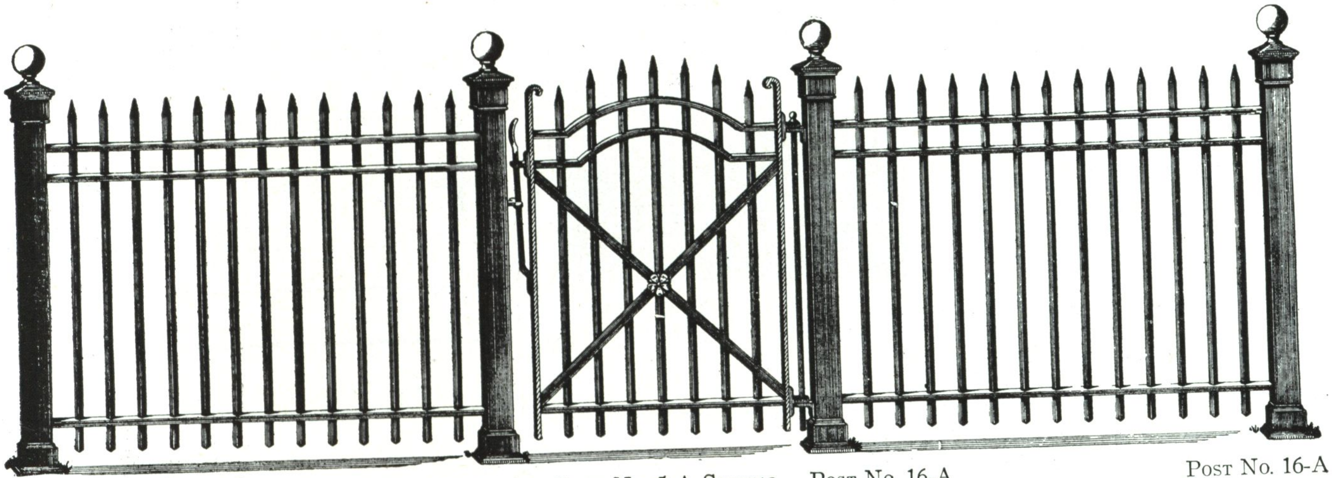


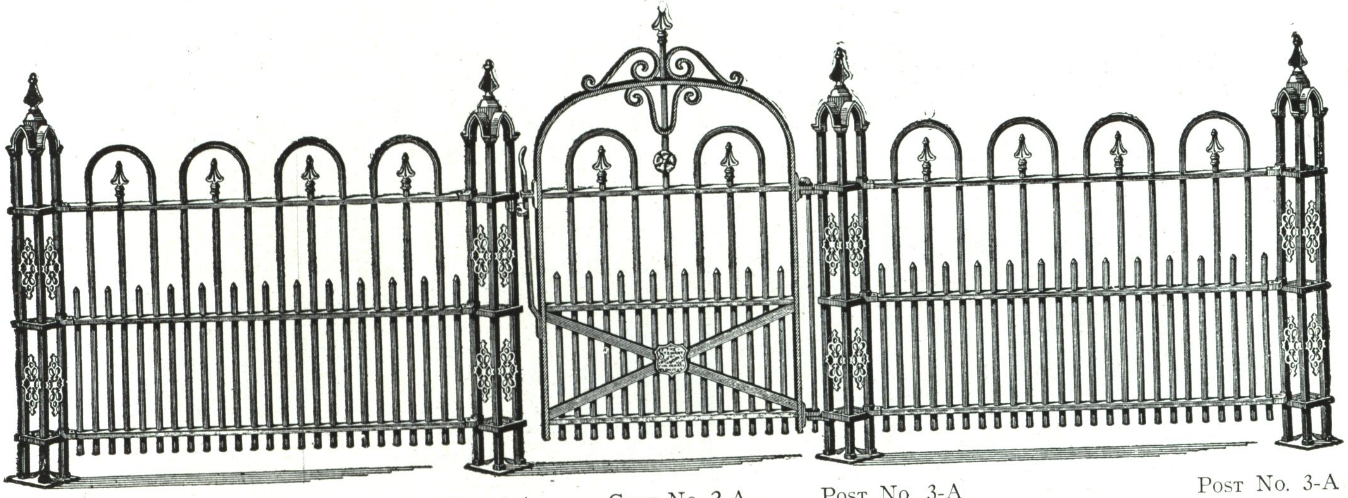
Post No. 6-A Post No. 6-A Gate No. 2-A Post No. 6-A Post No. 6-A

No. 71-A—3/8-in. round pickets, 4 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.
No. 72-A—½-in. round pickets, 4 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.
No. 73-A—5/8-in. round pickets, 5 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42, 48, 54 and 60 in.
No. 74-A—¾-in. round pickets, 5 in. on centers; 1½x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42, 48, 54, 60 and 72 in.



Post No. 16-A Post No. 16-A Gate No. 5-A Special Post No. 16-A Post No. 16-A

No. 148-A—3/8-in. square pickets, 4 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.
No. 149-A—½-in. square pickets, 4 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.
No. 150-A—5/8-in. square pickets, 5 in. on centers; 1½x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42, 48, 54 and 60 in.
No. 151-A—¾-in. square pickets, 5 in. on centers; 2 x5/8-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42, 48, 54, 60 and 72 in.
No. 152-A—7/8-in. square pickets, 5 in. on centers; 2 x5/8-in. Stewart patent 4-rib channel rail; height from ground, set, 37, 42, 48, 54, 60 and 72 in.



Post No. 3-A Post No. 3-A Gate No. 2-A Post No. 3-A Post No. 3-A

No. 33-A—3/8-in. round pickets, 2 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.
No. 34-A—½-in. round pickets, 2 in. on centers; 1¼x½-in. Stewart patent 3-rib channel rail; height from ground, set, 37, 42 and 48 in.

Iron Fence and Entrance Gates

Continued on next page

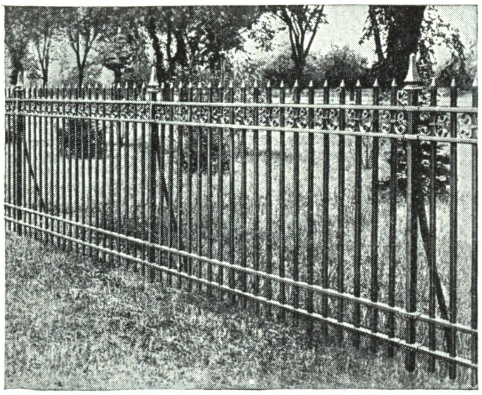
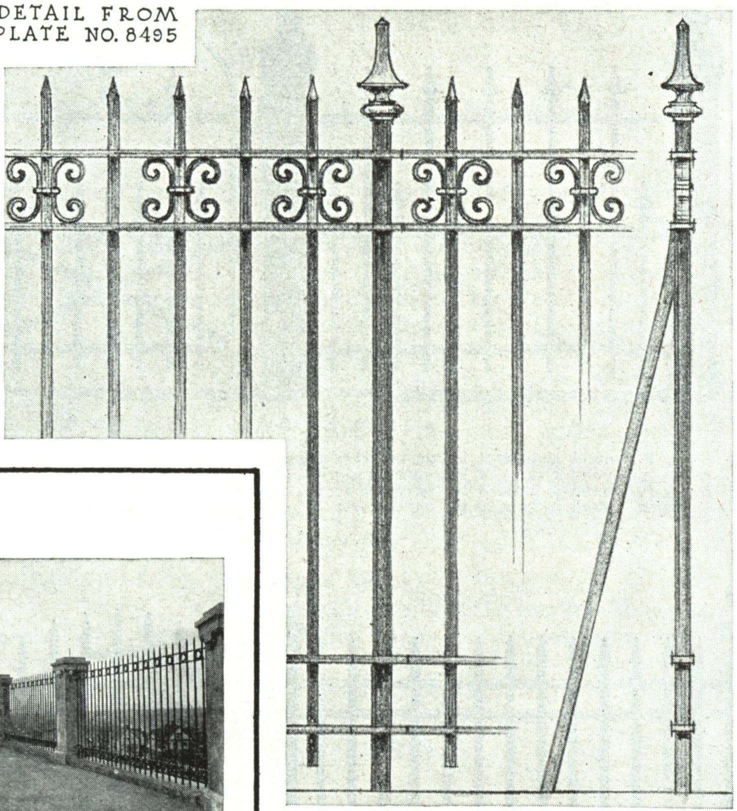


PLATE NO. 8495
ORNAMENTAL IRON FENCE

DETAIL FROM
PLATE NO. 8495



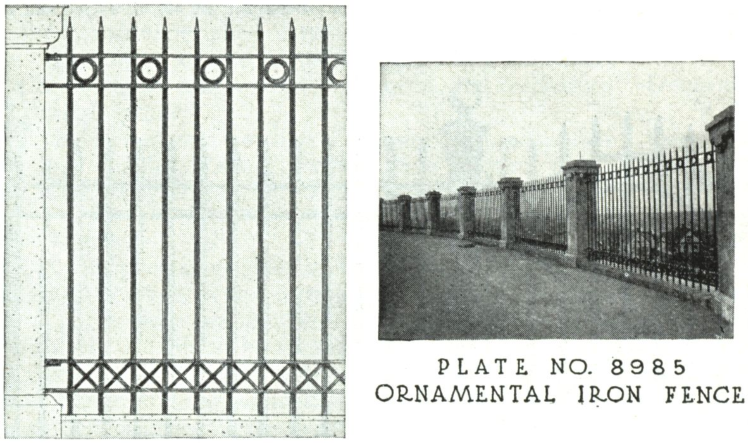
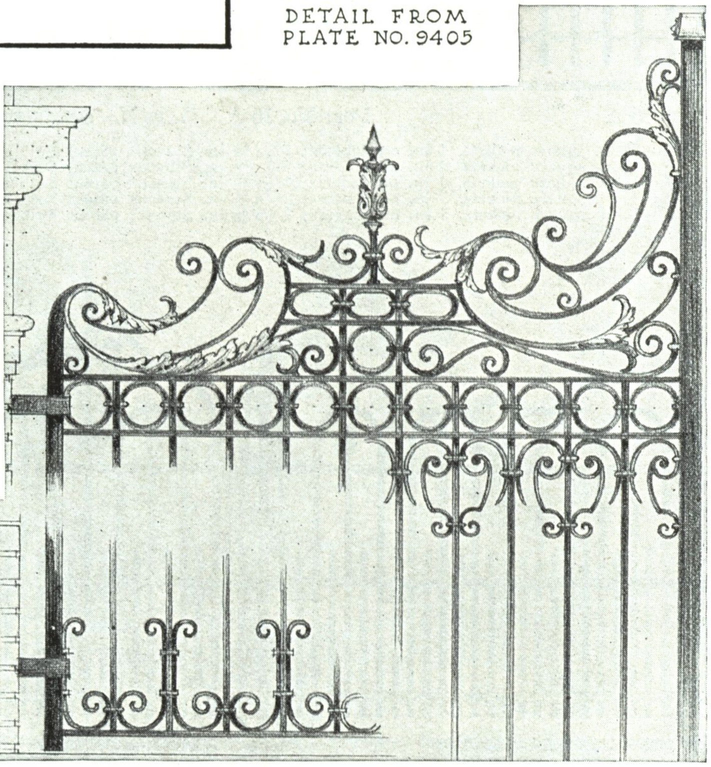
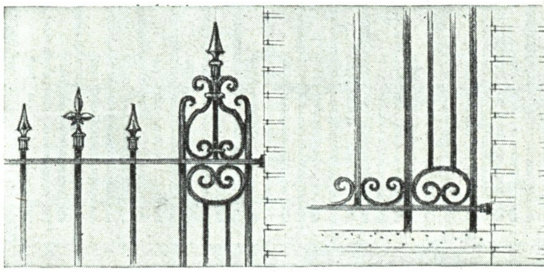


PLATE NO. 8985
ORNAMENTAL IRON FENCE

DETAIL FROM
PLATE NO. 9405





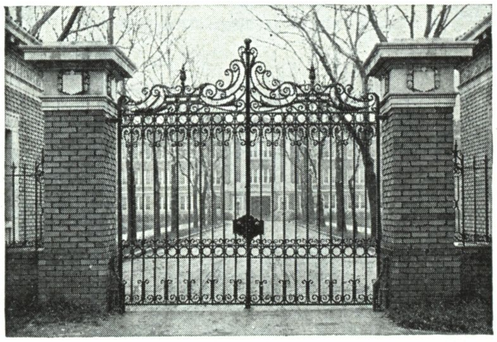


PLATE NO. 9405
ORNAMENTAL IRON ENTRANCE GATE

ORNAMENTAL IRON FENCE AND ENTRANCE GATES.

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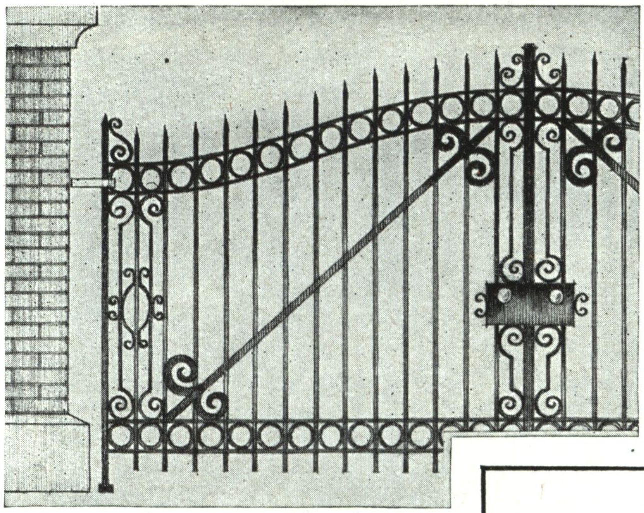


DETAIL FROM
PLATE NO. 54-A

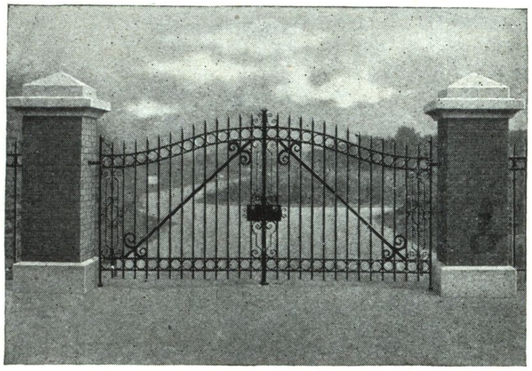
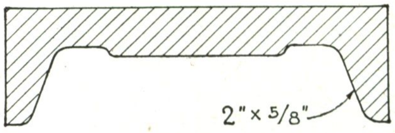


PLATE NO. 54-A
ORNAMENTAL IRON ENTRANCE GATES



NOTE:-
This type of channel is preferable in all cases, but other types are used when specified Our standard patented channels are $1\frac{1}{4}$"x$\frac{1}{2}$", $1\frac{1}{2}$"x$\frac{1}{2}$" and 2"x$\frac{5}{8}$".

DETAIL OF PATENTED THREE-RIB CHANNEL

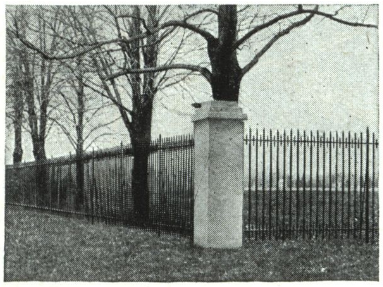
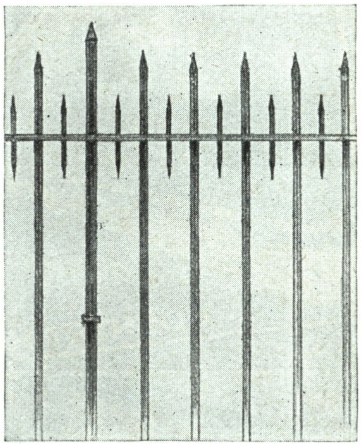
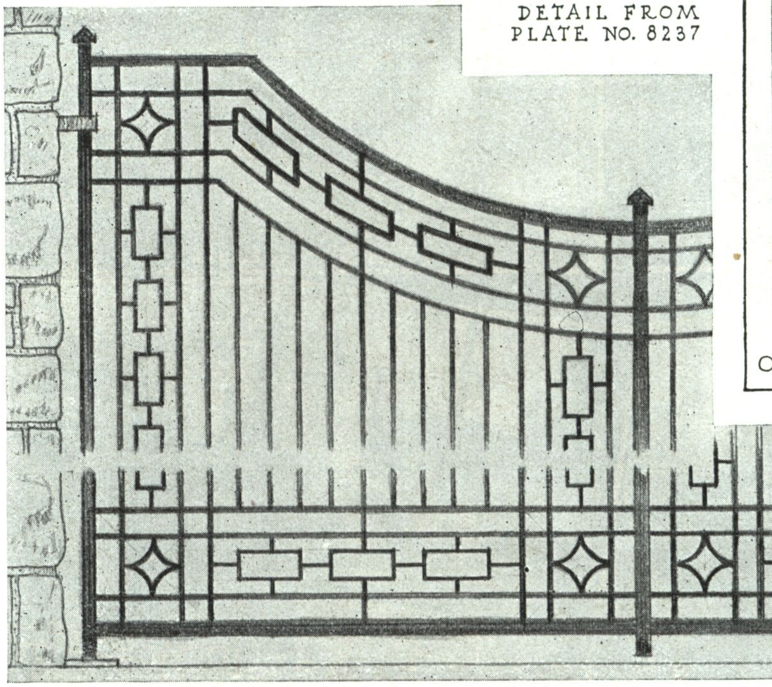


PLATE NO 6603
ORNAMENTAL IRON FENCE



DETAIL FROM
PLATE NO. 8237



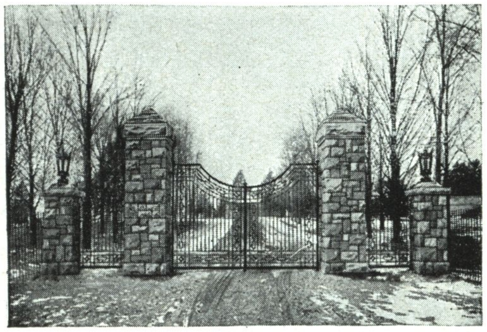
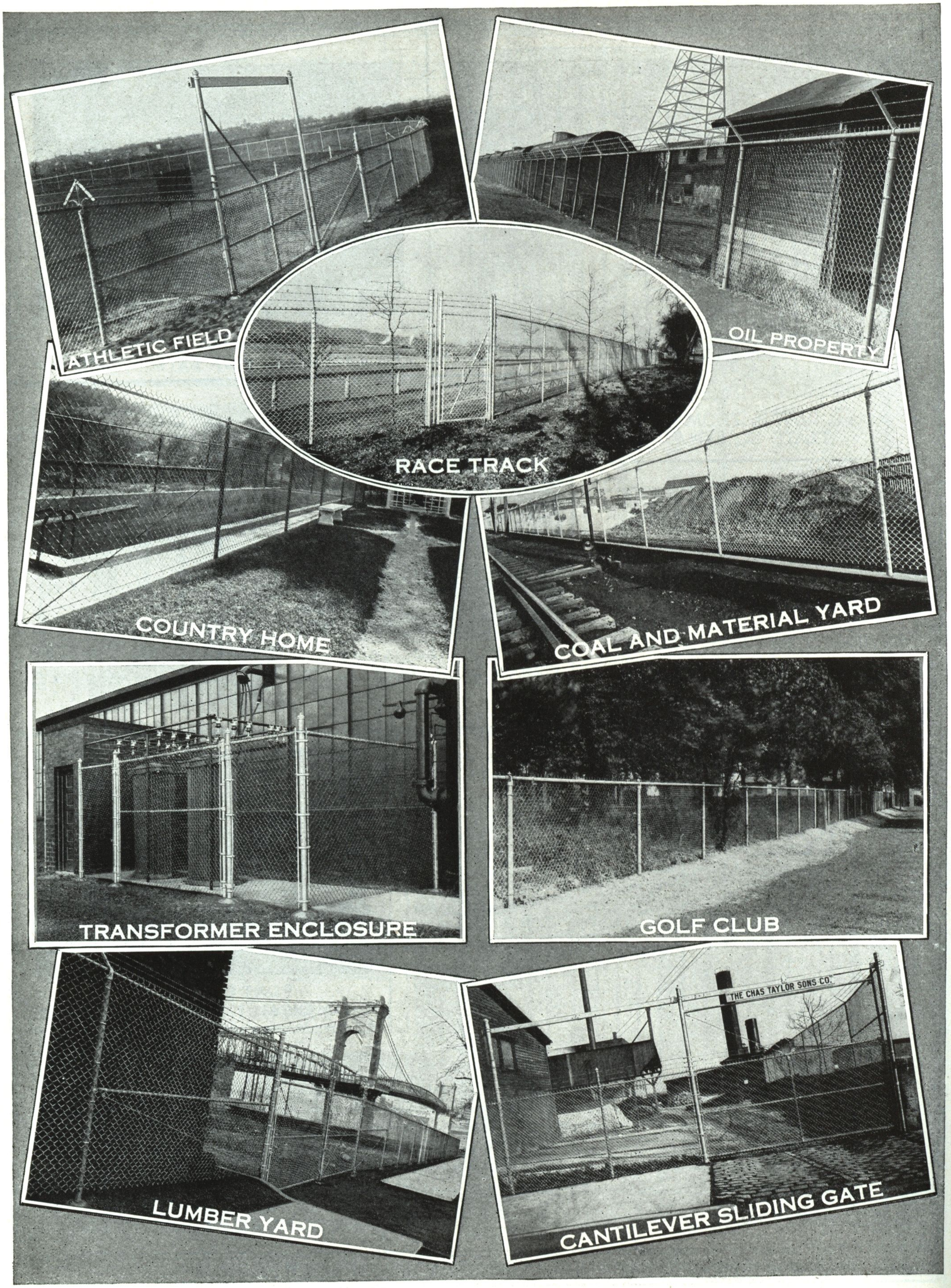


PLATE NO. 8237
ORNAMENTAL IRON ENTRANCE GATE

ORNAMENTAL WROUGHT IRON FENCES AND ENTRANCE GATE

Continued on next page

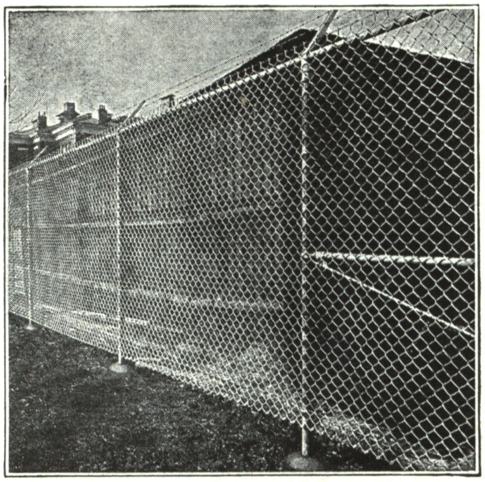

ATHLETIC FIELD
OIL PROPERTY
RACE TRACK
COUNTRY HOME
COAL AND MATERIAL YARD
TRANSFORMER ENCLOSURE
GOLF CLUB
"THE CHAS TAYLOR SONS CO."
LUMBER YARD
CANTILEVER SLIDING GATE

Chain Link Wire Fences

Continued on next page

Stewart's Wire Fence and Gates

In our Wire Fence Division we make a full line of Chainlink fence and are prepared to furnish a full line of fencing made of this fabric from many different specifications.



STANDARD TYPE WIRE FENCE 3T

Our many years' experience has gained for us a preeminent position as builders of high grade fences. Skillfully designed, practical and durable fittings for gate assembly and proper connections for posts are assured. These parts are made of either pressed steel or malleable iron and are designed to be readily replaced when replacements are necessary because of accidental breakages.

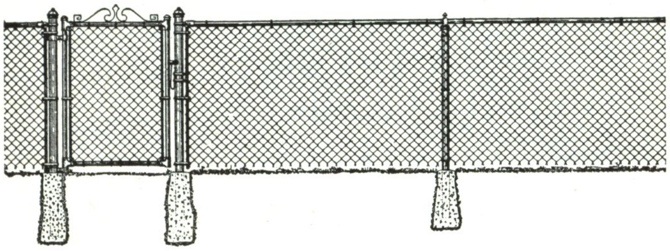
Extension arms for supporting barbed wire strands are designed to permit rapid replacement of wire without the slightest injury to the arms. They positively lock the barbed wire but permit absolute freedom for contraction and expansion.

Standard Type 3T Fence—As illustrated here, this type is very generally used around industrial property, where maximum protection is desired. This fence is made and carried in stock at the factories in Cincinnati, Ohio, at Goodfield, Ill., and in many parts of the country by dealers, who, like ourselves, are equipped to give complete erection service. It is usually 7 or 8 ft. high over all, including either 3 or 5 strands of barbed wire above the fabric. (Illustration shows 7-ft. fence over all.) This fence has 2-in. mesh No. 9 gauge fabric with barbed selvages at both top and bottom. The intermediate posts are tubular steel, 2½-in. diameter and are painted or hot galvanized. They should be set 10 ft. apart, 3 ft. below grade and are made to set in concrete or with drive anchors, as preferred. We recommend concrete footings for permanence.

Stewart's Chainlink Fabric—Either woven of hot galvanized open hearth steel wire, or woven first and *galvanized after* weaving. Every architect and builder has had opportunity to test the comparative merits of the latter process in connection with the ordinary hexagon poultry netting. This fence is also furnished without the barbed wires above, and in this case we use ornamental post tops, W-8 with top rail.

This fence is equally unclimbable without the top rail but not nearly so rigid. Where top rail is omitted we use coiled spring wire No. 6 gauge at both top and bottom of the fabric for added reinforcement; otherwise this is used along the bottom only. The *top rail* is 1⅝-in. diameter and is connected by expansion sleeve couplings of special design to take care of contraction and expansion due to temperature changes. Fabric is attached to posts and top rail with *galvanized* iron bands and links.

Stewart's Chainlink Lawn Fence—Superior to ordinary types of wire fence and is used where cost of the more expensive wrought iron fence would be prohibitive or fence would look too massive. It is stocked in 42, 48 and 60-in. heights in the 2-in. mesh No. 9 gauge fabric but can be furnished in any other mesh or gauge. Intermediate posts are 2-in. diameter with top rail 1⅜ in. Posts are spaced 8 or 10 ft. apart. End, corner and gate posts are 2⅜-in. diameter.

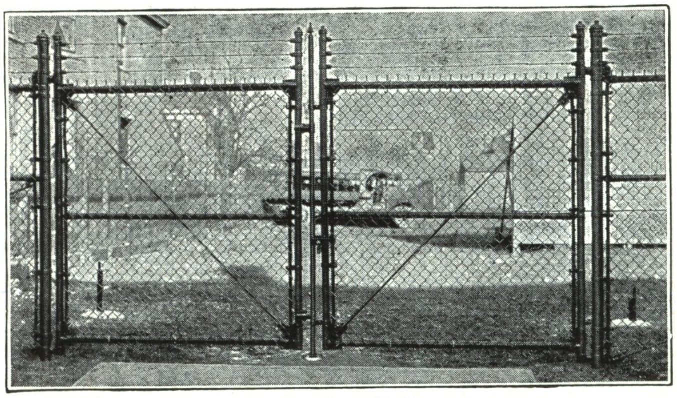


STEWART'S CHAINLINK LAWN FENCE

Often excellent artistic and practical results are obtained around residences by using the Chainlink lawn fence in combination with wrought iron entrance gates or drive gates with brick or stone piers, or some other attractive feature treatment at the most conspicuous points.

For fencing around the less pretentious homes, our complete fence, as shown herein, combines beauty with practicability and durability. Can be painted or had with all-hot galvanized finish.

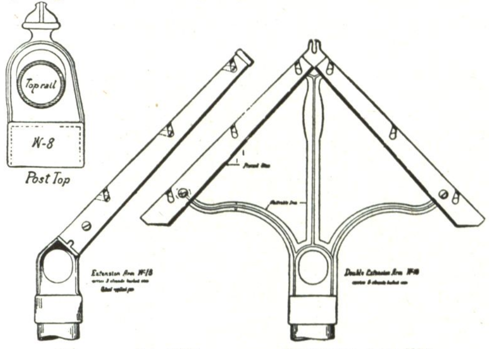
"Heavy Duty" Gates—Furnished in any width, although we carry in stock the sizes most commonly used. We can also furnish sliding gates. These gates have $1\frac{9}{10}$-in. outside diameter steel tube frames joined with pressed steel corners. They have horizontal cross members and ½-in. solid round steel brace rods. We guarantee them sagless. The hinges are forged steel, located below the bottom rail and above the top rail, thus rendering maximum efficiency. From our two score years of gate building experience we know that the gate is the most abused portion of any fence, and we have, therefore, built in superstrength.



"HEAVY DUTY" GATES

The Double Gate Latch Device—Very simple and effective. It permits opening the left-hand gate independently of the right. It is locked by means of a padlock which can be operated from either side of the gate.

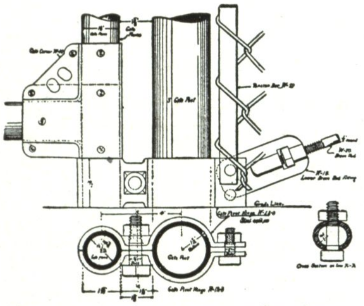
Gate Equipment—Includes a center stop for setting in concrete and automatic backstops to hold the gates in open position.



Post Top

EXTENSION ARM W15
Carries 3 strands barbed wire

EXTENSION ARM, W16
Carries 5 barbed wires



DETAIL OF STEWART'S FENCE AND GATE POST

WILLIAM R. PITT COMPOSITE IRON WORKS

548 West 27th Street
NEW YORK, N. Y.

TELEPHONE
Chickering 6560-6561

Products

Manufacturers of Folding Gates and Guards for every purpose:

"Pitt-Bostwick" Folding Gates
"Pitt" Lazy Tong Folding Gates
"Pitt" Composite Folding Gates
"Pitt" Driveway and Entrance Gates
"Pitt" Car Gates
"Pitt" Folding Window Guards

Pitt-Bostwick Folding Gates to Protect

Banks and trust companies
Homes and apartments
Public school corridors
Storehouses and warehouses
Department stores
Safe deposit companies
Show windows and entrances

Folding Gates and Guards a Specialty

This company is the original manufacturer of the "Bostwick" gate, and the originator of most of the standard folding gates, developing their uses through specialization.

This department is therefore, by training, experience and facilities, prepared to meet the demands of architects, builders and the iron trade.

"Pitt" gates are internationally famous for their quality, and are found in every state and many foreign countries.

The initial cost is not high. They are strong, durable and easy working and take up very little space when not in use.

Quality of Work

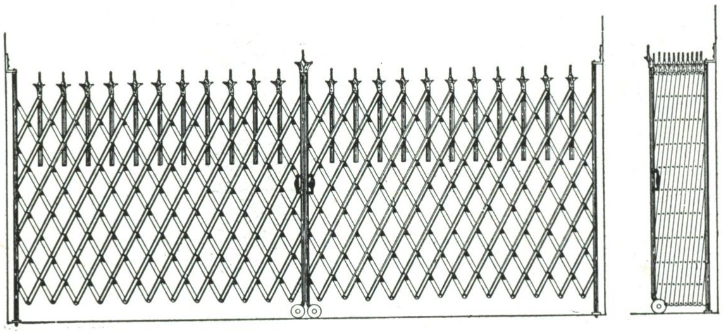
Every "Pitt" product is of the highest grade workmanship and materials, economically produced under modern conditions.

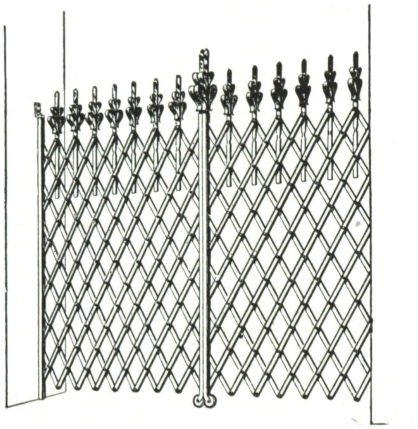
Specifications

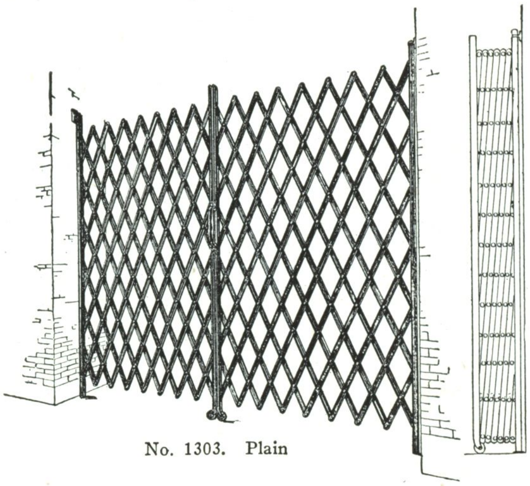
Copy the *number* and *description* of *gate desired* from the illustrations on this and the page following, *or* submit requirements for our advice and special blue *prints* or *designs.*

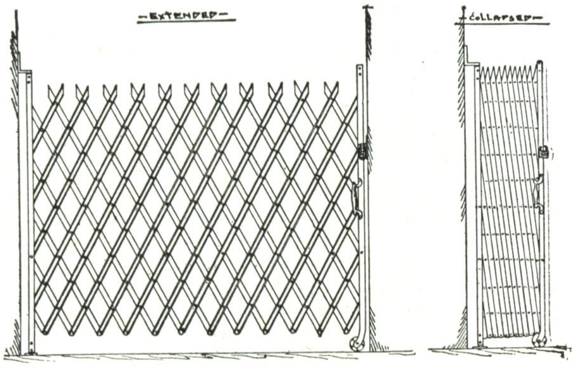
Estimates

Folding Gates—Send *plans* and *specifications,* or a *sketch* showing *width* and *height,* and *where* gate is to *set.* State *purpose* for which gate is *intended.*


No. 1254-A. With Wrought Pickets


No. 1246. With Ornamental Pickets and Ball Rivets

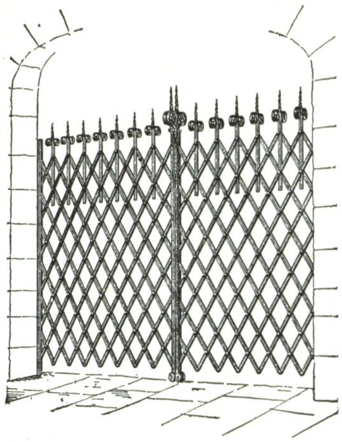

No. 1303. Plain



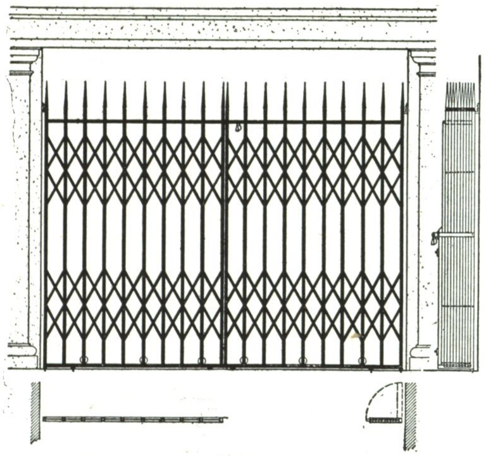
No. 1303-A. With Pointed Scissors Top

"Pitt" Lazy Tong Folding Gates for Entrances, etc.

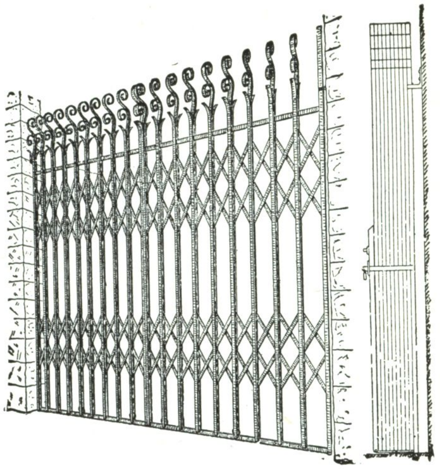
Continued on next page



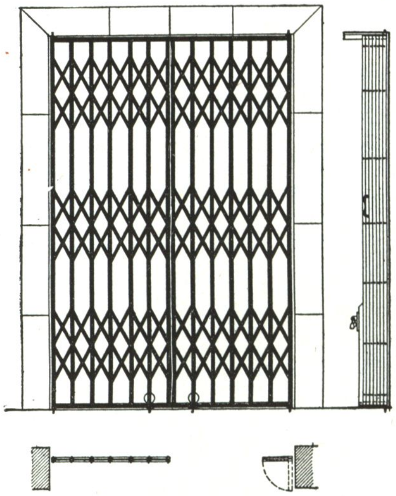
No. 1254. "Pitt" Gate, with Ornamental Wrought Pickets



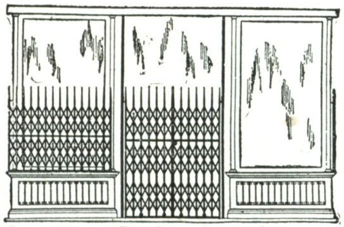
No. 1262-A. "Pitt-Bostwick" Gate with Cast Spear Pickets, Hinged Stiffening Bars and Hinged Lifting Bottom Tracks



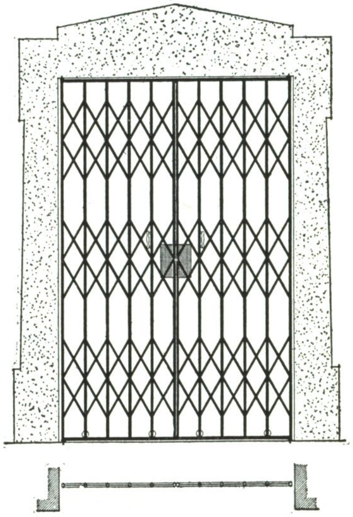
No. 1260. "Pitt-Bostwick" Gate with Ornamental Wrought Pickets, Hinged Stiffening Bars and Hinged Lifting Bottom Tracks



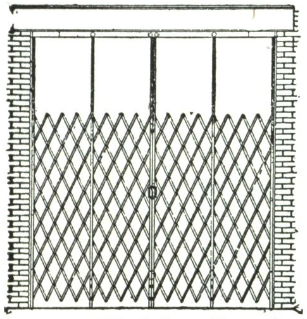
No. 1284. "Pitt-Bostwick" Vestibule or Window Gate with Stationary Top and Hinged Lifting Bottom Tracks



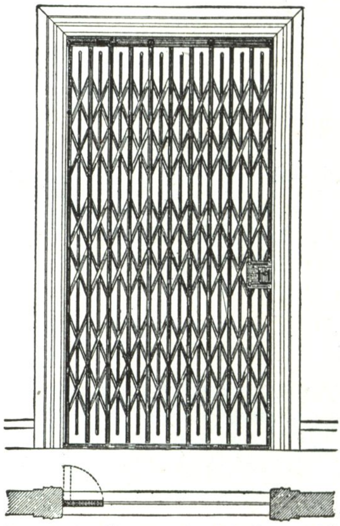
No. 1273. "Pitt-Bostwick" Gate and Window Guard for Store Front



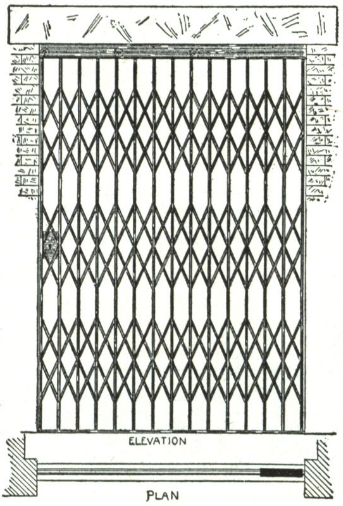
No. 1267-A. "Pitt-Bostwick" Guard for Window with Stationary Tracks Top and Bottom



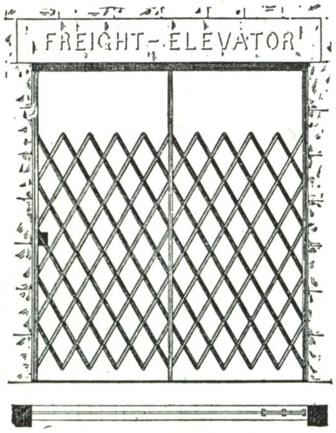
No. 1302. "Pitt" Lazy Tong Gate for Driveway Entrances



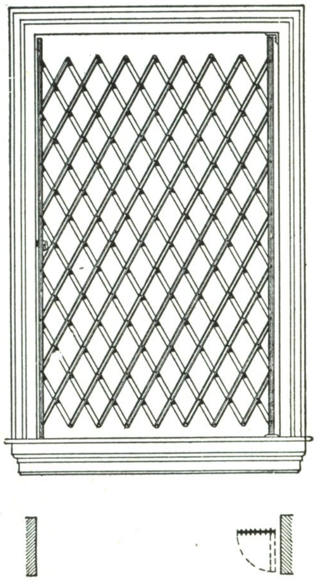
No. 1245. Close Mesh "Pitt-Bostwick" Elevator Gate for Shaft Openings



No. 1261. "Pitt-Bostwick" Folding Elevator Gate



No. 1300. "Pitt" Lazy Tong Folding Elevator Gate



No. 1316. "Pitt" Lazy Tong Guard for Windows. No Tracks

Standard Types of Folding Gates

Special designs submitted on request

BADGER WIRE & IRON WORKS

1210-1226 25th Avenue

MILWAUKEE, WIS.

Products

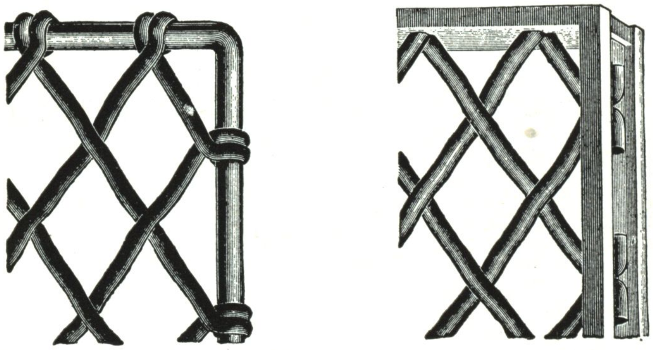
Ornamental Iron and Wire Work:

Window Guards, Wire Partitions, Railings, Tool Room Enclosures, Fences, Grilles, Panels, Wire Signs, Skylight Guards, Iron Gratings, Folding Gates, Balcony Railings, Sidewalk Doors, Marquises, Fire Escapes, Iron Stairs, Elevator Enclosures, Fireproof Stairway Enclosures, Entrance Gates, Flagpoles and Lawn Furniture.

Service

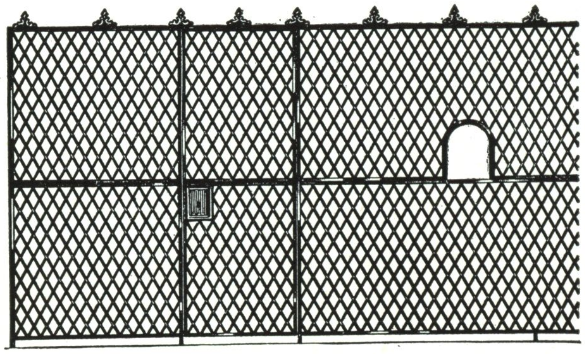
Ornamental iron and wire work according to design to be submitted, or this Company will furnish details of their standard construction. Inquiries will be given prompt and careful attention.

Badger Wire & Iron Works own and operate a new plant, where, with ample space and facilities, they will be able to give prompt and satisfactory service.



Wire Window Guards

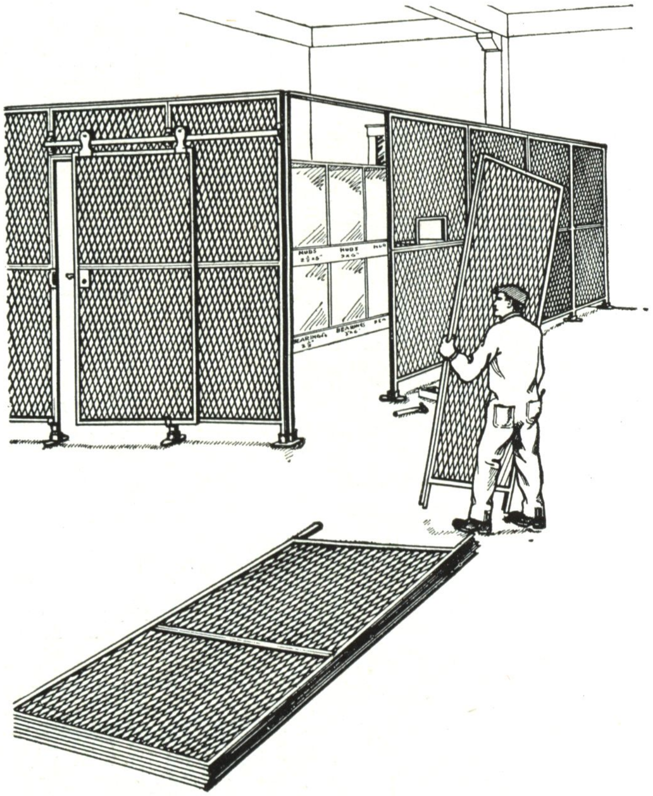
A particular specialty is made of the manufacture of wire window guards and these can be furnished at minimum prices. Inquiries should specify quantities and sizes, as well as gauge of wire, size of mesh and style of frame



Wire Partition

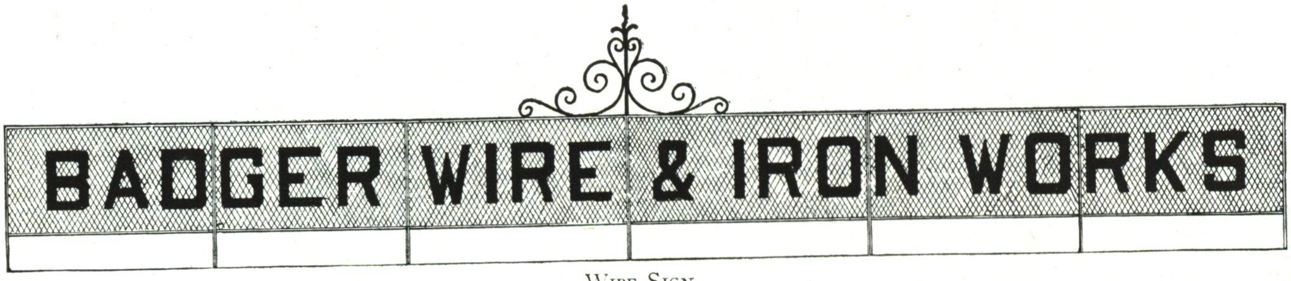
Used extensively where it is desirable to enclose a space effectively without obstructing the light.

Generally made of No. 10 wire, 1½-in. diamond mesh, 1x½x⅛-in. channel frames; cover bar and cast pickets at top as shown



Standard Sectional Wire Partitions

Principally for tool and stock room enclosures. Interchangeable, so that re-arrangement is possible without drilling or fitting. Standard partitions are made 4x7, 5x7, 4x8, and 5x8 ft. They are made of No. 10 wire, 1½-in. diamond mesh, 1x½x⅛-in. channel frames, horizontal bar through center, 1½-in. channel cover bar at top; swinging or sliding doors; also service windows, equipped with necessary hardware



Wire Sign

A specialty is made of the manufacture of wire signs and Badger Wire & Iron Works have furnished some of the largest in use. In writing for price state length, height and lettering wanted, also the position of the sign so that the proper bracing may be figured. Complete specifications will be submitted in quoting

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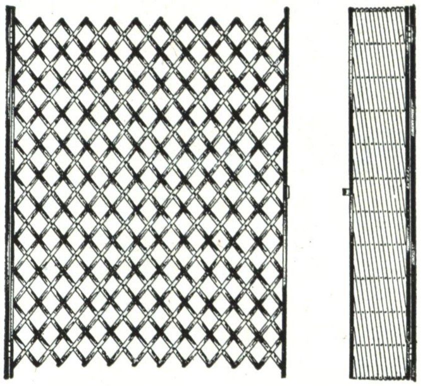
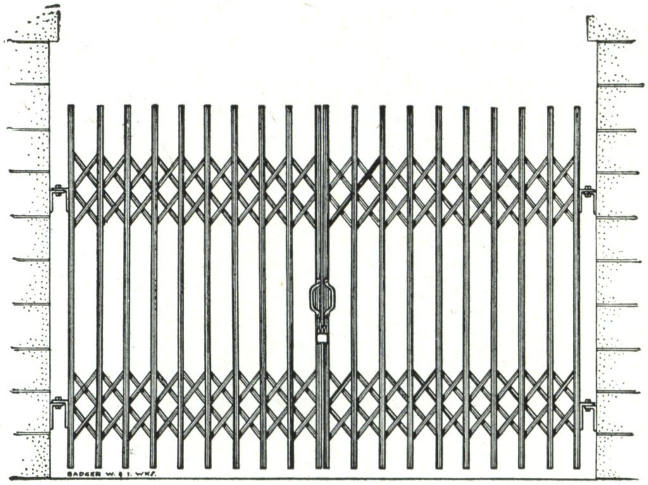
Folding Gates

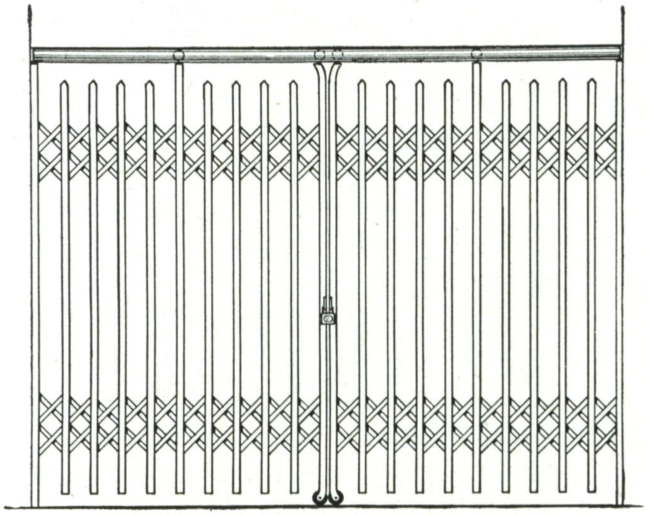
Below are shown three styles of our folding gates.



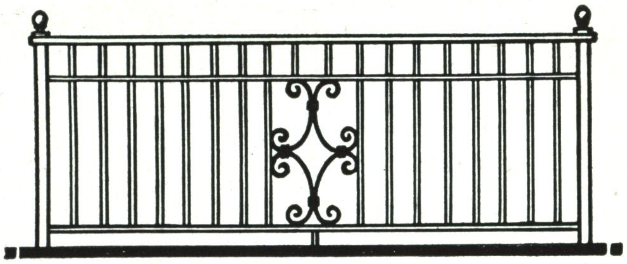
No. 25 Single Folding Gate



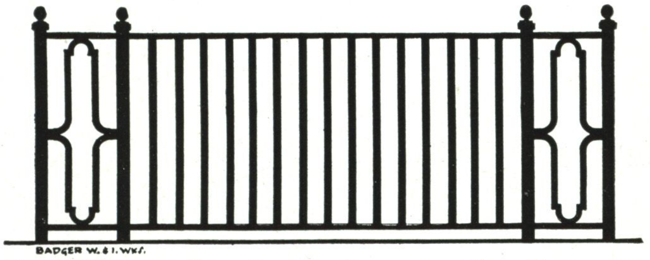
No. 27 Double Folding Gate



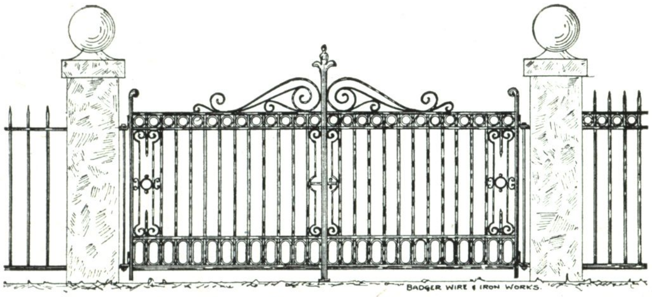
No. 28 Double Folding Gate with Overhead Track



No. 65 Wrought Iron Balcony Rail



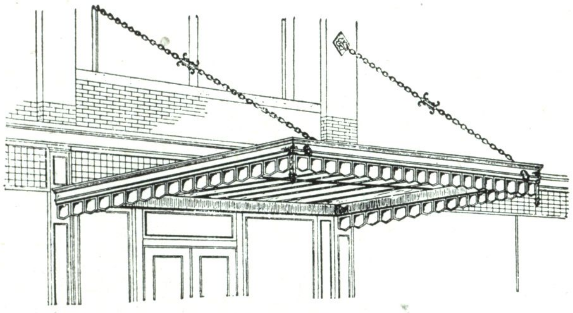
No. 66 Wrought Iron Balcony Rail with Cast Ornaments



Iron Gate and Fence

In this department exceptionally good service is given, and low prices consistent with the quality of the product are quoted.

Catalogue showing a number of styles will be sent on application. Special designs furnished



Marquise

Generally manufactured according to special designs, but prints of styles the company have already made will be submitted

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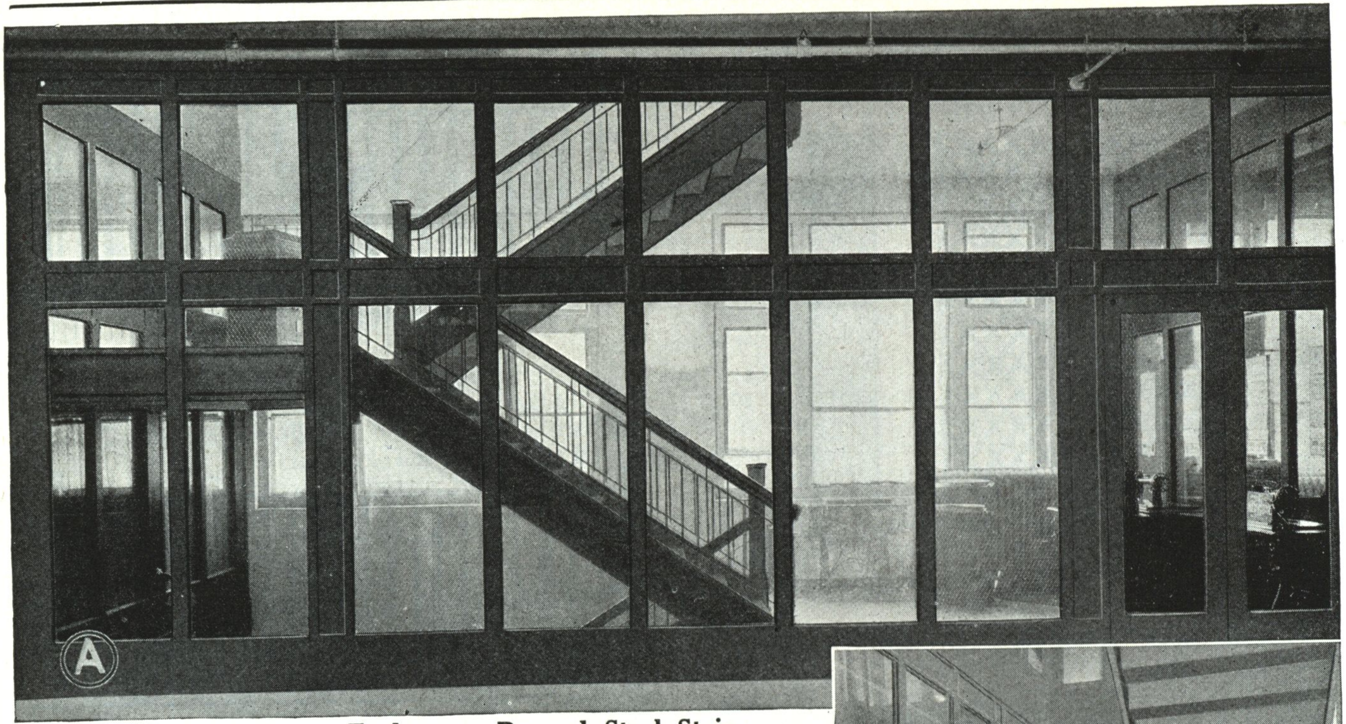


Fireproof Stairway Enclosures, Pressed Steel Stairs and Elevator Enclosures

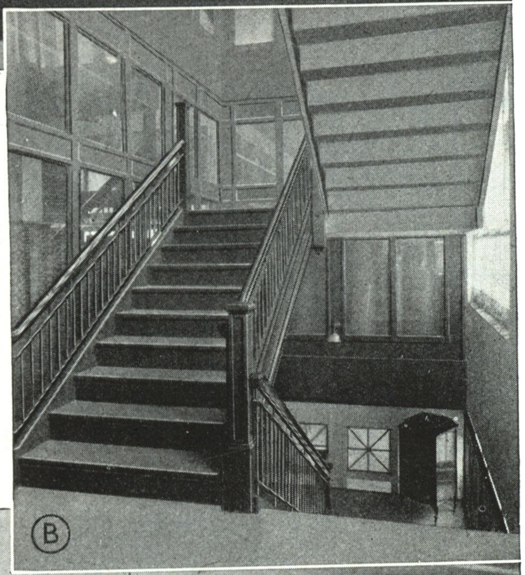
Here are shown fireproof stairway enclosures, Badger pressed steel stairs and elevator enclosures, furnished by this company and installed at the H. C. Prange Co. Store Building, Sheboygan, Wis., W. C. Weeks, Architect.

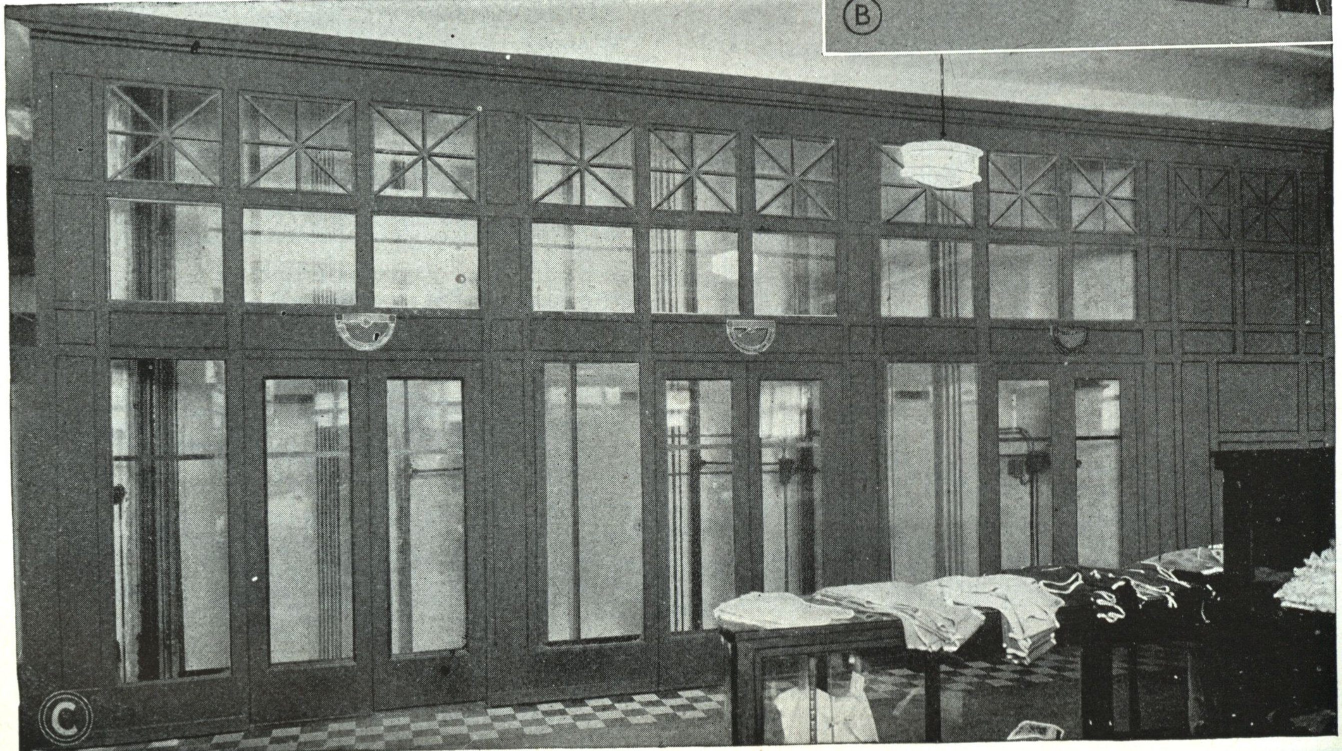
A—Wrought iron fireproof stairway enclosures with polished plate wire glass, particularly adapted for department store buildings, hospitals and schools, avoiding the necessity of exterior fire escapes.

B—Wrought iron fireproof stairway furnished with enclosure "A." Details of construction furnished on request.

C—Wrought iron fireproof elevator enclosure with cast iron cornice moulding at ceiling.

Either stair or elevator enclosures can be furnished complete or without glass.





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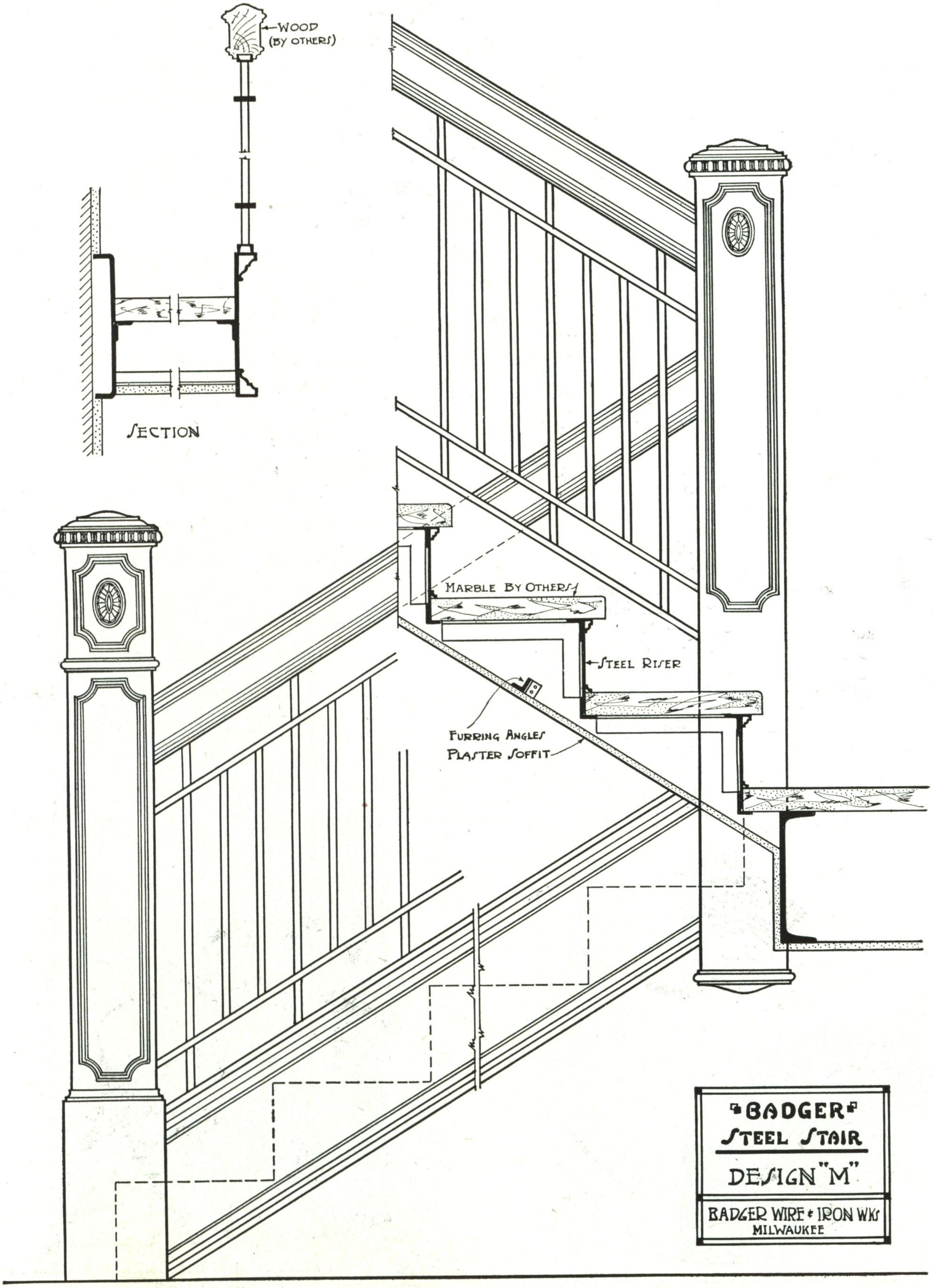
Badger Steel Stairs

Design "M" is one of the recent installations by the Badger Wire & Iron Works. A great variety of other types have been fabricated. Details of any will be furnished on request.


WOOD (BY OTHERS)
SECTION
MARBLE BY OTHERS
STEEL RISER
FURRING ANGLES
PLASTER SOFFIT
BADGER
STEEL STAIR
DESIGN "M"
BADGER WIRE & IRON WKS
MILWAUKEE

PARKER RUST-PROOF COMPANY

WIRE AND IRON WORKS DIVISION

Rust-proofed Partitions, Guards, Railing and Ornamental Iron Work

Milwaukee Avenue at Dubois
DETROIT, MICH.

TELEPHONE
EMPIRE 3377

Products

RUST-PROOFED METAL PRODUCTS which include:

Office and Factory Partitions, Guards, Railing, Balconies, Fences, Grills, Marquises, and Ornamental Iron Work.

Rust-Proofed
By the Famous
PARKER PROCESS

Demand for Rust-Proofed Products

The Wire and Iron Works Division of the PARKER RUST-PROOF COMPANY was established to meet an insistent and growing demand for Parkerized ornamental iron and wire work. We find that those interested in building construction, either as contractors or owners, are fast coming to realize the necessity of protection against rust. The number of architects who are specifying Parkerizing as an effective protection against rust for exposed iron and steel on stone or marble buildings is growing daily.

The Parker Process of Rust-Proofing

The PARKER RUST-PROOF COMPANY is the sole licensor of the famous Parker Process. There are today approximately one hundred and fifty of the leading manufacturers of the country Parkerizing their own products under its license. The PARKER RUST-PROOF COMPANY maintains at Detroit a Parkerizing Service Department not only for experimental purposes, but to serve manufacturers desiring to use the Parker Process, but whose volume of work does not warrant the installation of their own plant. In other parts of the country, licensed Parker Process plants are furnishing similar service.

Parkerizing is a chemical process which changes the surface of the material treated from metallic iron to iron phosphate, which is permanent in the air, and under all ordinary conditions impervious to rust. This method produces a good matte black finish. It also provides a wonderful base for paint or enamel.

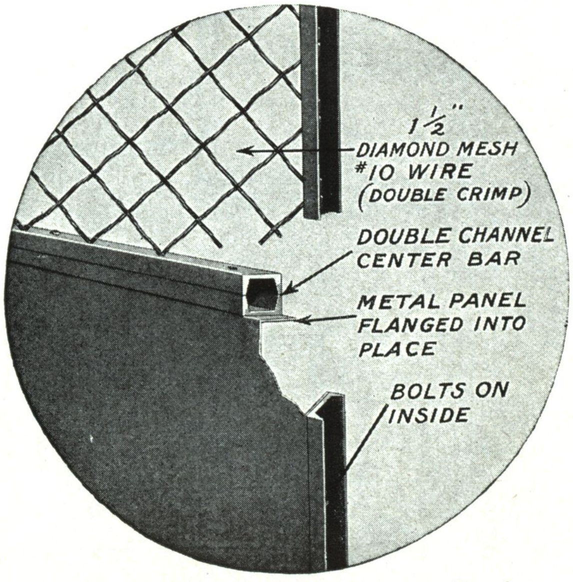
Parker Rust-Proofed Metal Products

Each succeeding year has brought such an increased volume of work on architects' and contractors' specifications for partitions, frames, fire escapes, window guards, flagpoles, roof ladders, pipe railings, etc., that we have now added considerable floor space to our factory and have entered extensively into the manufacture of all material of this character. We are fully organized from both the engineering and equipment standpoint to build from specifications, and Parkerize before shipping, any work in lengths up to 18 ft.

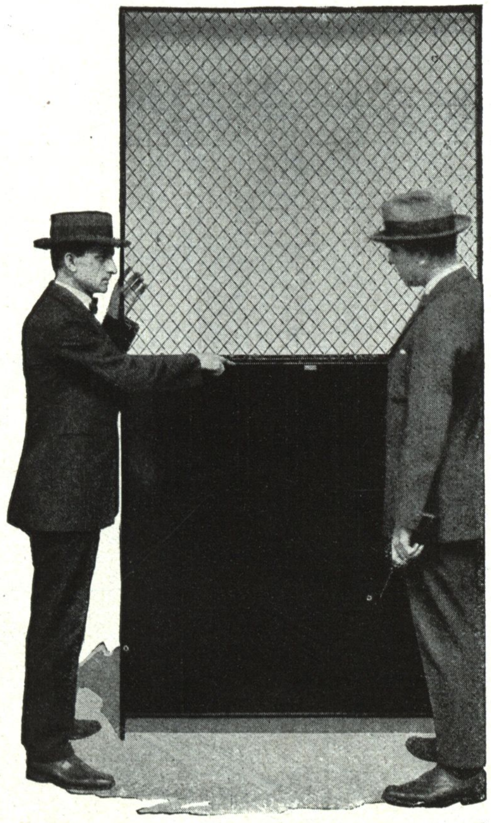
If you are interested in anything in wire or iron work and will submit details, we will be glad to advise with you and submit estimates.

Parker Rust-Proofed Standard Section Partitions

The advantage of building standard sections, which are interchangeable and can be fabricated on a volume production basis, is obvious to any manufacturer.


1½" DIAMOND MESH #10 WIRE (DOUBLE CRIMP)
DOUBLE CHANNEL CENTER BAR
METAL PANEL FLANGED INTO PLACE
BOLTS ON INSIDE

Construction of the Parker Partition Panels



Pointing Out the Flush Joint Which Characterizes the Parker Partition Section

Continued on next page

Parker Metal Partitions are not only naturally fireproof but have the added quality of being rust-proof.

Our manufacturing facilities and volume of production enable us to give this added quality without increasing our prices over the market on the ordinary type.

Partition Specifications

Height—Standard sections are regularly 8 ft. high.

Additional Height—Provided for by adding special panels at top, or by ordering sections 9 or 10 ft. high.

Width of Partitions—Standard sections are regularly 4 ft. wide. This will give maximum strength and saves in cost of installation over narrower sections.

Special Panels—Special panels of any width can be supplied to fill in at ends or corners, or to fit any special opening.

Cutouts—Cutouts, or special shaped panels, can be furnished as required.

Door Sections—Standard door sections are 4 ft. wide and 7 ft. high with transom panel overhead, or any height to match partitions ordered. Door sections are interchangeable with the other sections. Either sliding or swinging styles are furnished.

Locks—Master-keyed locks, carried in stock, are furnished at a slight additional cost.

Hangers—All sliding doors are equipped with ball bearing hangers.

Capping Bar—1¼x$\frac{3}{16}$-in. steel capping bar extending from center of one panel to center of next, thereby breaking joints.

Bracing—The capping bars will carry a reasonably long partition, depending, of course, somewhat upon conditions. On long stretches, it is best to have them braced to ceiling. In most cases a simple form of bracing can be taken care of by the purchaser.

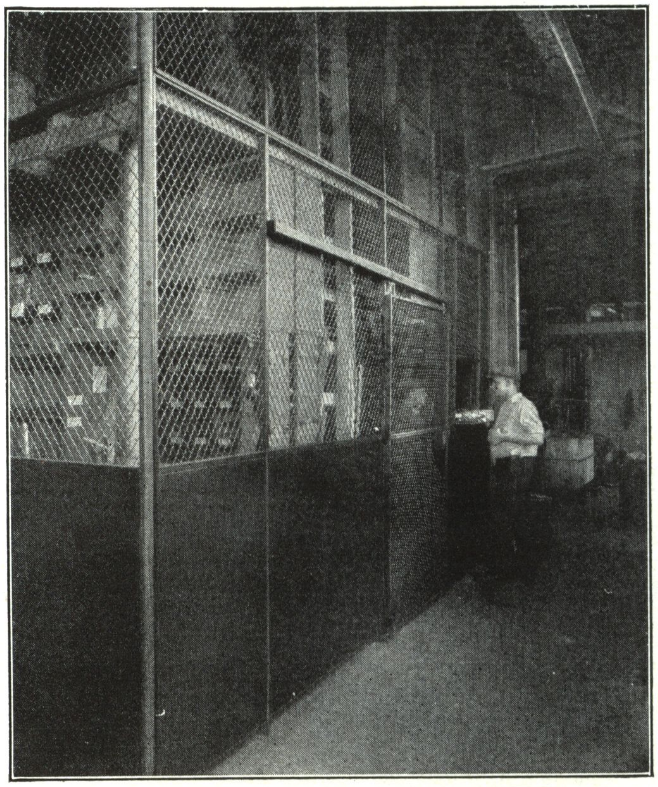
Floor Sockets—2½ in. high to allow for adjustment where floors are uneven.

Corner Posts—Corners are turned by bolting an extra channel to end section, forming a 1-in. square post.

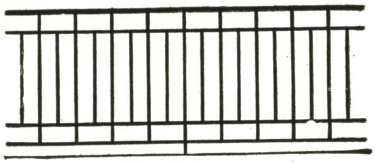
General Hardware—All hardware that is subject to strain is made of malleable iron.

Paint—Standard black graphite unless otherwise specified. Special colors may be had at a slight additional cost. All sections rust-proofed before painting.

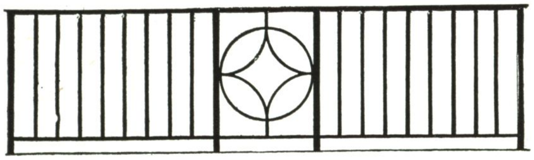
Erection—Diagram and complete setting instructions sent with each order.



Typical Stockroom Installation of Parker Partitions



No. B-52



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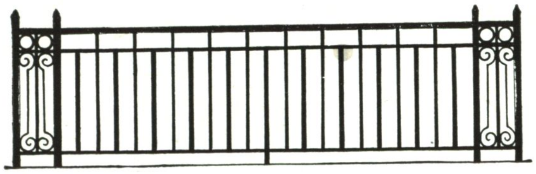

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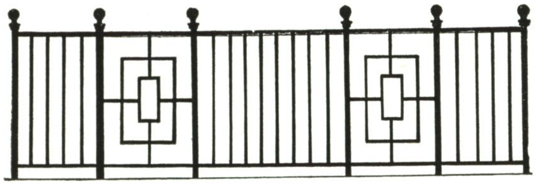

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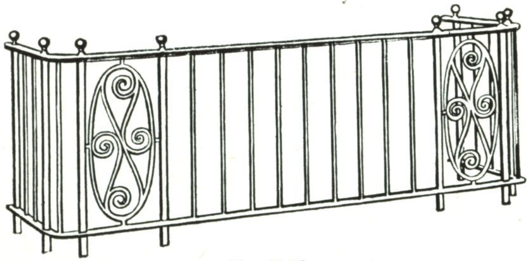

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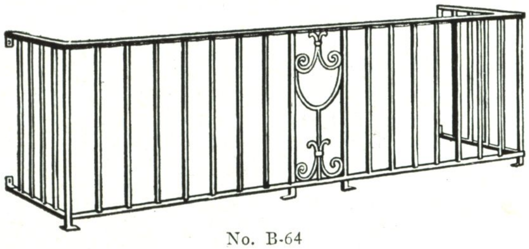

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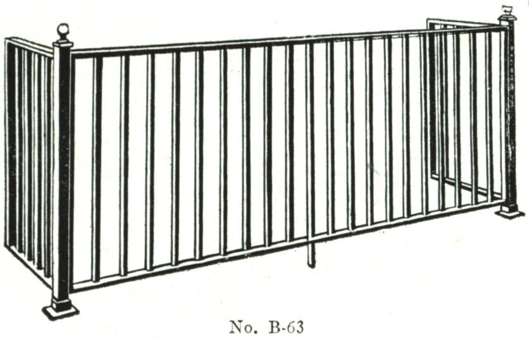


No. B-63

Railings and Balconies

STANDARD IRON & WIRE WORKS

Manufacturers of Ornamental Iron and Wire and Colonial Hardware

510 East 10th Street
CHATTANOOGA, TENN.

Products

Hand Forged Ornamental Iron Fixtures:

Andirons, Bridge Lamps, Door Knockers, Fire Lighters, Fire Screens, Fire Sets, Foot Scrapers, Hinges, Lanterns, Latches, Lighting Devices, Nails, Panels, Signs and Smoking Sets in period and contemporary models.

Ornamental Iron Work and Wire Work:

Iron and Wire Window Guards; Wire Partitions for all purposes; Skylight Guards; Wire Signs; Elevator Enclosures and Cabs; Fire Escapes; Iron Gates; Grilles and Guards for windows and doors; Railings; Brackets; Iron Ladders; Cast Iron Gratings; Wall Anchors; Tie Rods; Folding Gates; Sidewalk Doors and a general line of miscellaneous Iron Work for buildings.

Services and Facilities

We are equipped to manufacture plain and ornamental iron work of every sort. Where requirements can not be met from stock, we are glad to co-operate with architects and builders in the development of special designs to meet any architectural requirement.

Our facilities include a modern plant, skilled artisans, and an organization with many years of practical experience. Thus, we can promise prompt and satisfactory service. Correspondence is solicited regarding any phase of the work.

Hand Forged Ornamental Iron Fixtures

In the making of hand forged fixtures, where the interesting surfaces and natural air of the old models must be combined with modern accuracy, the skill of the craftsman is all-important. In this respect, we can specially recommend our hand wrought hardware, fireplace accessories and lighting fixtures. They are hand wrought by experienced craftsmen in Colonial, Renaissance, Byzantine and other period and national designs, as well as from contemporary models.

Most of our work is the execution of architects' plans for individual installations, and consists of items which will probably never be duplicated. In other cases we personally design fixtures in keeping with the style of a particular building. In still other cases, where the type of construction does not warrant special designs, we can furnish stock items, a few of which are illustrated on the opposite page.

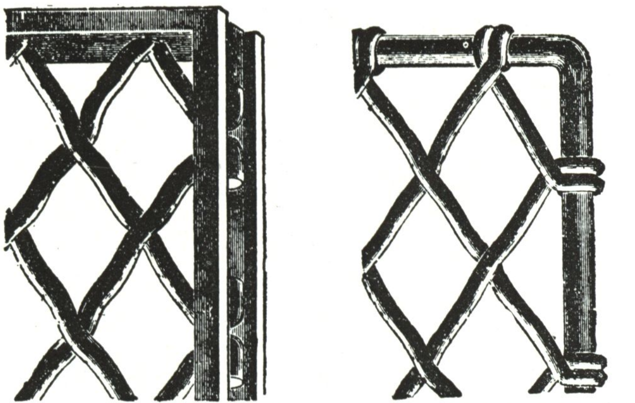
Wire Window Guards

Windows may be opened for ventilation, breakage of glass is minimized and burglary is prevented. Guards are made with either round iron or channel iron frames.

Material Specifications—In the majority of instances, wire window guards are made of No. 10 wire crimped and woven to $1\frac{1}{2}$-in. diamond mesh and put in $\frac{3}{4}$-in. steel channel frame like No. 577, or they may be furnished in the $\frac{3}{8}$-in. round iron frame like No. 576.

If smaller mesh is desired, use No. 12 B.G. wire, woven to 1-in. diamond mesh. For larger mesh use Nos. 8 or 6 wire woven to 2-in. diamond mesh.

When No. 6 wire is used, we recommend that 1-in. channel be used for the frame in the No. 577 type.



No. 577. Method of Securing Wire in Channel Frame

No. 576. Method of Securing Wire Around Iron Frame

Wire Window Guards

Elevator Enclosures

These enclosures are made in all styles for apartment house, office building or factory.

Wire Partitions

These partitions are best for factories where subdivisions of space must be made for protection of tools, etc. Wire partitions do not obstruct light or ventilation, are strong and durable, and can be moved readily if needed.

Material Specifications—Type No. 603 is generally made of No. 10 B. G. wire, $1\frac{1}{2}$-in. diamond mesh for the lower panels, and $\frac{5}{16}$ in. by No. 16 gauge flat wire, $1\frac{1}{2}$-in. square mesh for the upper panels. All put in $1 \times \frac{1}{2}$-in. steel channel frames. The sliding door is fitted with solid bronze lock No. 220 which operates by key only from the outside, and thumb bolt on the inside. Gravity track and hangers.

Type No. 556 is generally made of No. 10 B. G. wire, $1\frac{1}{2}$-in. diamond mesh for both the upper and lower panels, and the frames are of 1-in. steel channels. The swing door is fitted with steel butts and bronze mortise night latch No. 11. Can also be fitted with a cylinder night latch of either the mortise or rim type.

Openings can be placed in these partitions where desired for pass baskets, cash holes, or other purposes, and hinged wickets can be furnished in these openings.

The lower half of these partitions can be made of solid steel sheet if preferred.

Estimates

Estimates will be gladly furnished on receipt of plans, sketches, specifications or data.

We make wire guards of any size wire and mesh and in any type of frame desired, and will be glad to give data and suggestions to any one interested.

Give us the requirements and let us suggest the best and most economical construction to use.

All iron work made in accordance with architects' drawings and specifications.

Catalogue

Will be sent on request.

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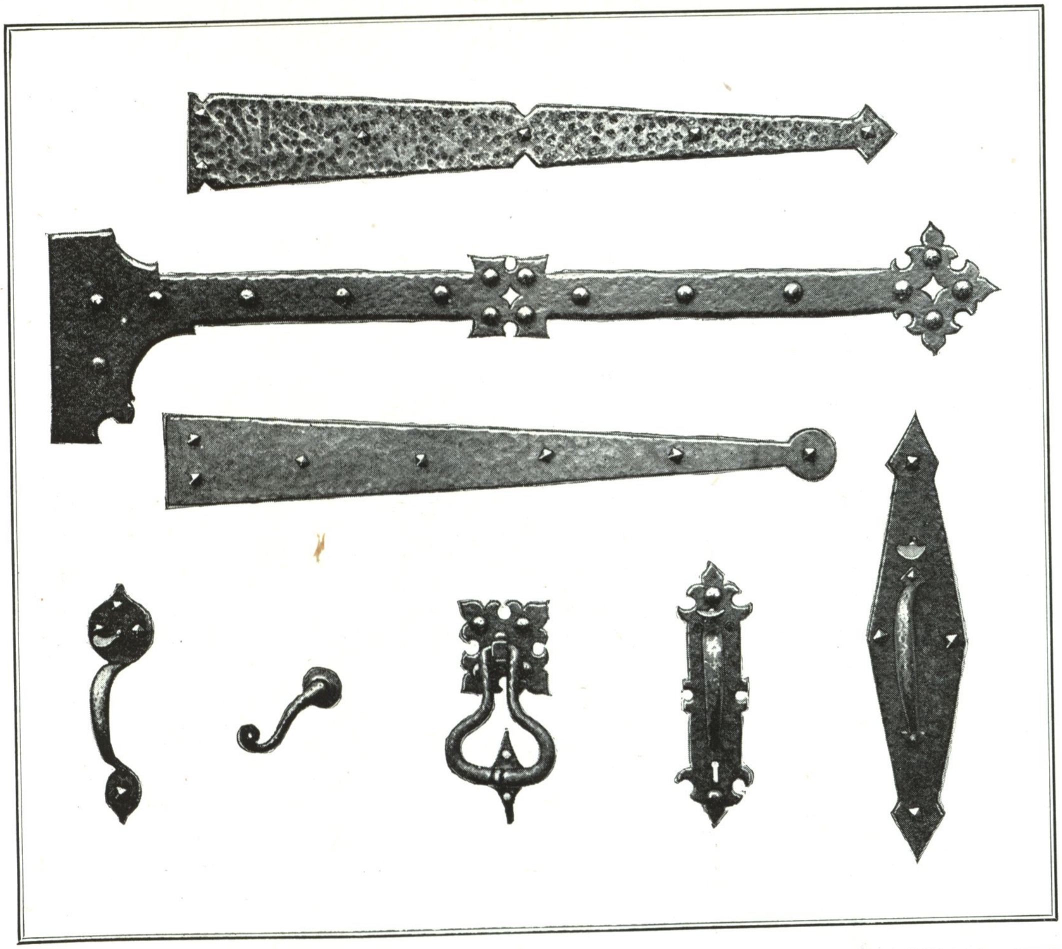
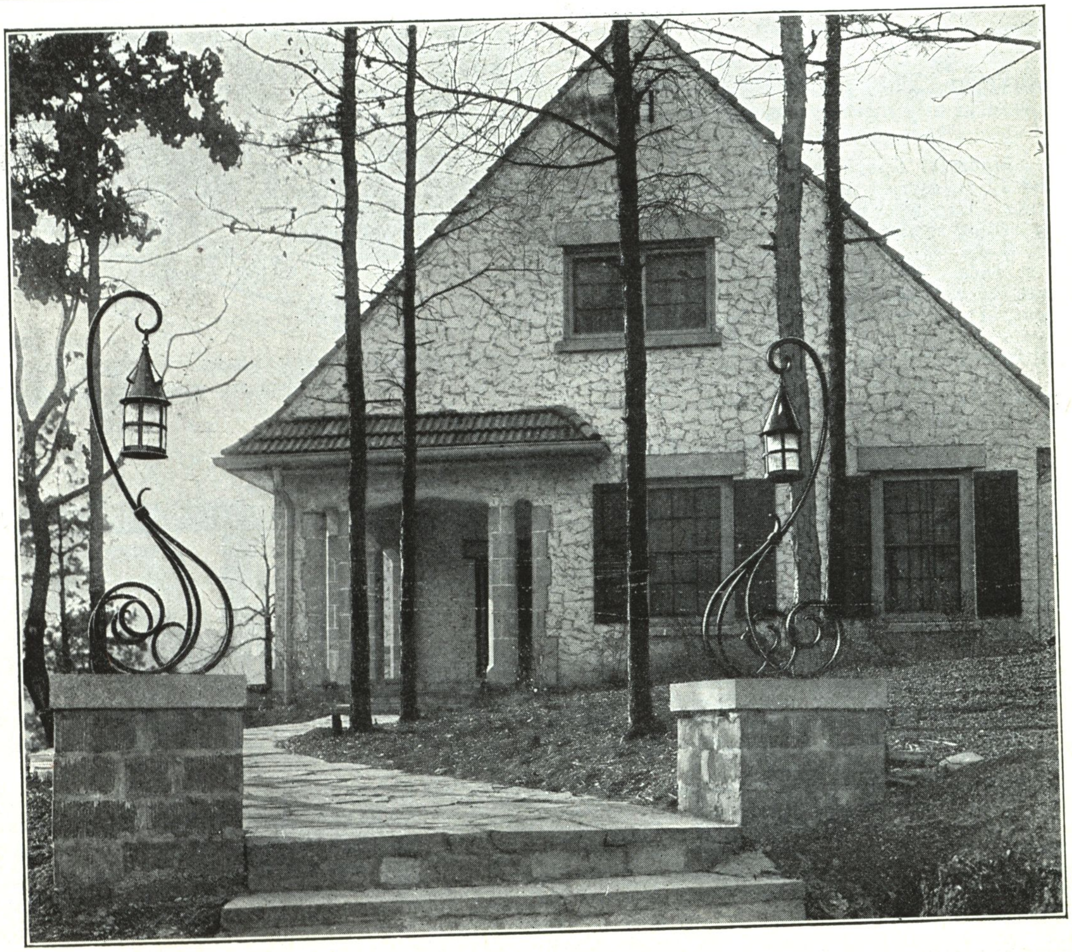


A Few Stock Designs of Colonial Hardware

Hardware specialties of rare handiwork and beauty also to order to fit any surroundings



Colonial Hand Wrought Iron Lamps

Installed on the estate of H. B. Springer, Chattanooga, Tenn.

CRUTCHFIELD & GOSNELL, Architects

ACORN WIRE AND IRON WORKS

Unit Sectional Wire Partitions, Wire Cages and Wire Window Guards

TELEPHONE
Normal 1895

5906 Lowe Avenue
CHICAGO, ILL.

Products

Manufacturers of Acorn Unit Sectional Diamond Mesh Partitions; Cages for Banks and Offices; Diamond Mesh Window Guards.

Also manufacturers of Skylight Guards, Machinery Guards; Elevator Enclosures, Wickets and Grilles; Railings for Stairs, Porches, Balconies and Windows; Area Gratings and Sidewalk Doors; Wire Signs and Collapsible Folding Gates.

Important Recommendation to Architects

It is suggested that architects secure our quotation direct. Copies thereof will be gladly furnished to contractors when this work is to be included in another contract. To be protected against inferior service and workmanship, the architect should include in his specifications:

"As made by the Acorn Wire and Iron Works, Chicago, *or equal.*"

Acorn Unit Sectional Diamond Mesh Partitions

A fireproof partition which allows free circulation of air and unobstructed light is a requisite for every industrial plant.

Acorn unit partitions give systematic effectiveness—the aim of every factory executive; they eliminate loss of tools and supplies, and do away with petty thievery.

They are 100% interchangeable. They can be rearranged, added to or moved quickly and by inexperienced workmen. They permit the forming of a corner at any intersection and the placing of doors between any two sections.

Material Specifications—*Height*—7, 8, 9 and 10 ft. carried in stock; other heights to order. Can also be increased to any height by adding special panels at top.

Width of Sections—Standard sections are 5 ft. wide. This extra width is used to eliminate the weakness caused by too many connections. It also saves from 15% to 20% installation cost. Special width sections furnished to fill in where necessary.

Cut-outs and Special Panels—Cut-outs, or special size or shape panels furnished to meet special conditions.

Door Sections—Standard door sections are 3 ft., 3 ft. 6 in., and 4 ft. wide, and of height to match partitions. Doors are 6 ft. 6 in. high with transom panel overhead. Door sections interchangeable with other sections. Either sliding or swinging types furnished. Sliding doors up to 4 ft. wide made self-closing without extra cost. Special sizes when necessary.

Locks—Made of brass, operated with pin tumbler cylinders from outside, and recessed knob from inside. Master-keyed locks furnished at slight additional cost. Doors equipped with hasp for padlock instead of regular lock with reduction in cost.

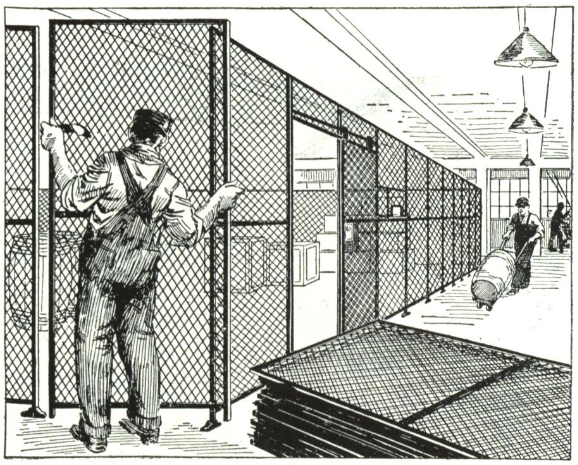
Service Windows—See illustrations of details.

Hangers—All sliding doors equipped with ball bearing hangers.

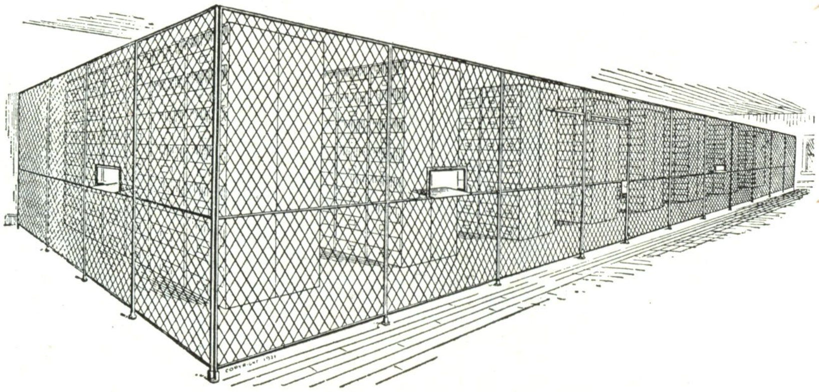
Wire, Web and Mesh—No. 10 (⅛-in.) open hearth steel wire used. Entire web in one piece with wires passing through center stiffening bar, eliminating unnecessary joints. Mesh is 1⅝-in. diamond mesh.

Framing and Stiffening Bar—Framing, 1x½-in. steel channel. Center stiffening bar, 1x⅜-in. channel steel securely riveted to frame.

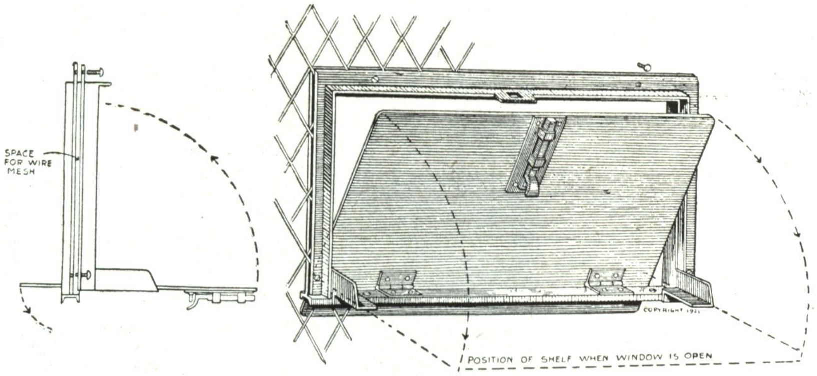
Capping Bar—2x$\frac{9}{16}$-in. steel channel extending from center of one panel to center of next, thereby breaking joints.



Acorn Unit Sectional Diamond Mesh Partitions



Standard Interchangeable Sections Adaptable to Any Use
An excellent arrangement for tool or stock room



Combination Service Window and Shelf

Shelf swings up, closing opening, and is locked from inside with improved dead locking push bolt. After it is locked, a spring back of bolt lodges the band into recess when it can not be opened until bolt is pressed against plate. Installed before shipment or after partition is in place. Special service windows furnished to suit requirements.

2 sizes; "A," 15 in. wide by 9 in. high, "B," 24 in. wide by 15 in. high. Each fitted with metal shelf extending about 2 in. on outside, and 9 in. and 15 in., respectively, on inside.

Continued on next page

Bracing—While capping bars will carry a reasonably long partition, simple methods of bracing can be effected by use of wire strands from top of partition slantwise to ceiling.

Floor Sockets—2½ in. high to allow for adjustment where floors are uneven.

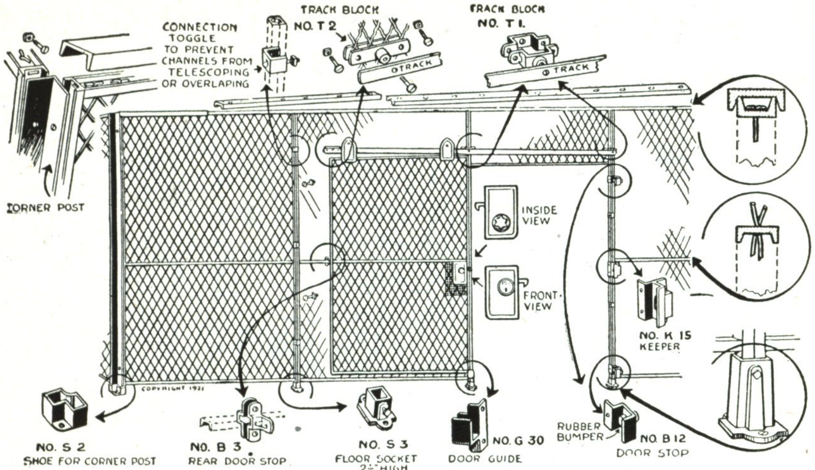
Corner Posts—1x1-in. steel angle with floor socket. This permits the making of corner at any intersection.

Connection Toggles—In addition to the regular bolts furnished for bolting panels together, 3 special toggles are furnished at each intersection to prevent channels from telescoping or overlapping, thereby overcoming the difficulty otherwise experienced in erection.

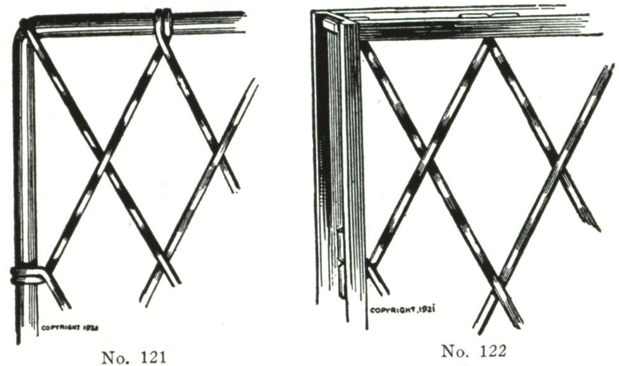
General Hardware—All hardware that is subject to strain is made of malleable iron or wrought steel to prevent breaking. The balance is made of soft grey iron.

Paint—Standard factory green unless otherwise specified. Special colors may be had at slight additional cost.

Erection—Many original and exclusive features make Acorn partitions extremely easy to erect. No experience or special skill is necessary. Diagram and complete setting instructions sent with each order.


TRACK BLOCK
NO. T 2
TRACK BLOCK
NO. T I.
CONNECTION TOGGLE TO PREVENT CHANNELS FROM TELESCOPING OR OVERLAPING
TRACK
TRACK
CORNER POST
INSIDE VIEW
FRONT VIEW
NO. K 15
KEEPER
COPYRIGHT 1921
NO. S 2
SHOE FOR CORNER POST
NO. B 3
REAR DOOR STOP
NO. S 3
FLOOR SOCKET 2½" HIGH
NO. G 30
DOOR GUIDE
RUBBER BUMPER
NO. B 12
DOOR STOP

DETAILS OF ACORN UNIT SECTIONAL DIAMOND MESH PARTITIONS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No. 121 No. 122

DETAILS SHOWING CONSTRUCTION OF SCREENS

No. 121 guard has round steel frame of $\frac{5}{16}$ or ⅜-in. diameter according to size of guard. Furnished in either stationary or hinged type. Hinged type permits washing windows.

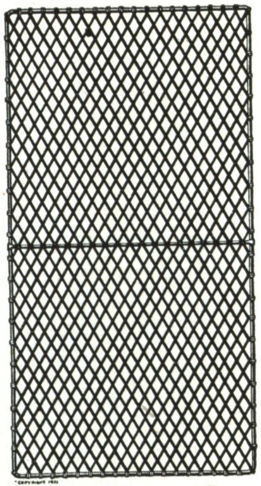
No. 122 guard has channel frame varying from ¾ to 1 in. wide. These are satisfactory when designed to fit opening, but are not recommended when outer grooved edge is exposed to view.

Acorn Diamond Mesh Window Guards

They permit the opening of windows for ventilation without danger of burglary or damage to material or tools, and safeguard windows against accidental or intentional breaking.

Material Specifications—Made of three principal specifications: 1¼-in. mesh, No. 12 wire; 1½-in. mesh, No. 10 wire; 2-in. mesh, No. 8 wire. The 1½-in. mesh, No. 10 wire is most used, being the meeting point of burglary and glass protection. Guards can be furnished in any wire or mesh desired.

No. H-5 hinge and No. H-6 hasp, of malleable iron, are recommended. They afford an excellent means of fastening and are adaptable to any style window frame by reversing same where necessary. Hinges are fastened to window by lag screws making it difficult to remove from outside. Hasps are locked to a heavy screweye which can not be removed when padlock is in place.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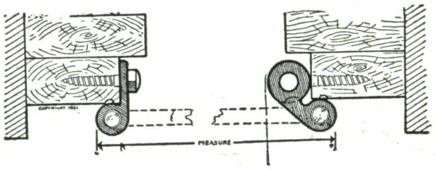
No. 121 WINDOW GUARD


COPYRIGHT 1921
MEASURE

H-5 HINGE AND H-6 HASP

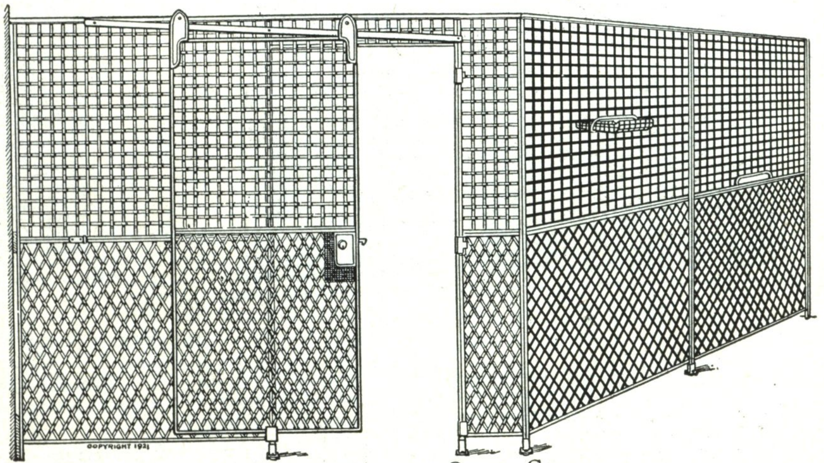
Cages for Banks, Offices, etc.

The ACORN WIRE AND IRON WORKS have developed and are using the press crimp type of construction in bank and office cages (see detail). This type of crimp adds much to the character and distinctiveness of the work. The old type double crimp can still be furnished when it is necessary to match old work.

Press crimp can be furnished in either square or flat wire, but because of its greater utility and rigidity, square wire is recommended (see typical specification following).

Nos. 142 and 143 cages are commonly used in offices and small banks.

The upper part is made either of ⅛-in. square wire or ¼-in. flat wire, 1½-in. square mesh. The ⅛-in. square wire is preferable because of its greater strength. Wires are pressed at each intersection, making a neat and pleasing appearance. The lower part is made of round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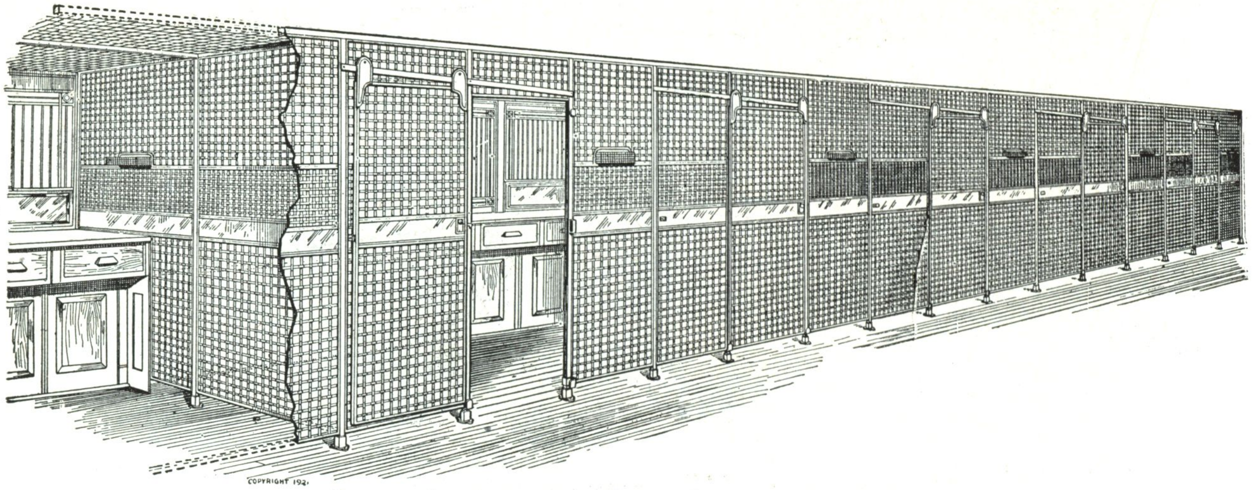
ACORN BANK OR OFFICE CAGE

No. 142, upper part square wire. No. 143, upper part flat wire

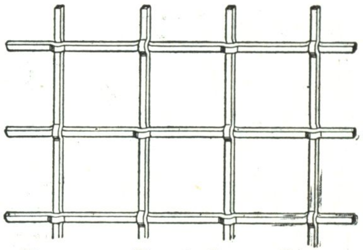
Continued on next page



Typical Arrangement of Bank Cage Design No. 147
Same as Design No. 146 except that ¾-in. square mesh panels 1 ft. high are fitted at top of solid panels

wire, 1½-in. diamond mesh.

Doors furnished either sliding or swinging type; sliding doors being made self-closing unless otherwise specified. Doors fitted with cylinder locks operating with key from outside and knob from inside.

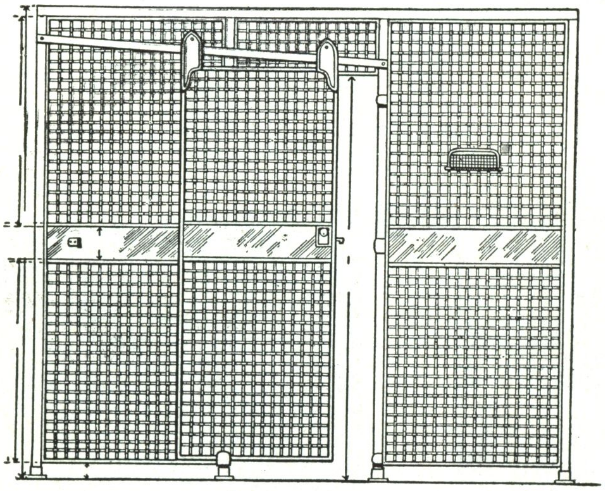


Detail of Press Crimp Construction

Typical Specifications—Cages shall be of a height to conform to front fixture and shall be made of ⅛-in. square wire, 1½-in. square mesh of press crimped type. Framing to be of 1x½-in. channel, tenoned and riveted at corners. Posts at doors and at each intersection shall be of 1¼-in. square Shelby tubing No. 14 gage in thickness. The same tubing shall be used to finish top of cages. (See Design No. 146, Catalogue 200, Acorn Wire and Iron Works, Chicago.)

Note: If flat wire is specified, ¼x$\frac{1}{16}$-in. wire, 1½-in. square mesh is recommended.

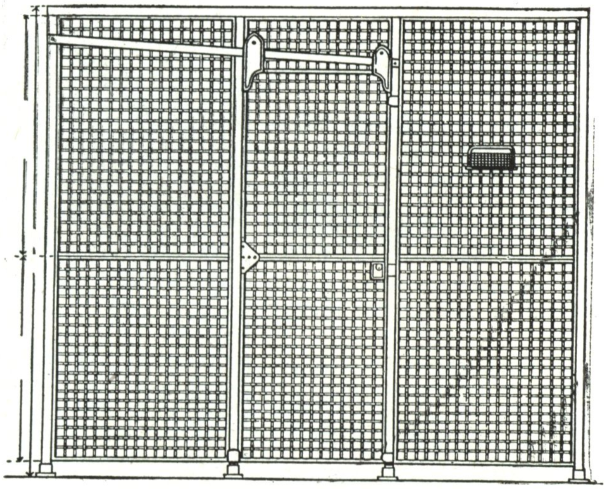
Each section, including doors, to be fitted with metal panel 7 in. wide; bottom of panel to be flush with top of counter.



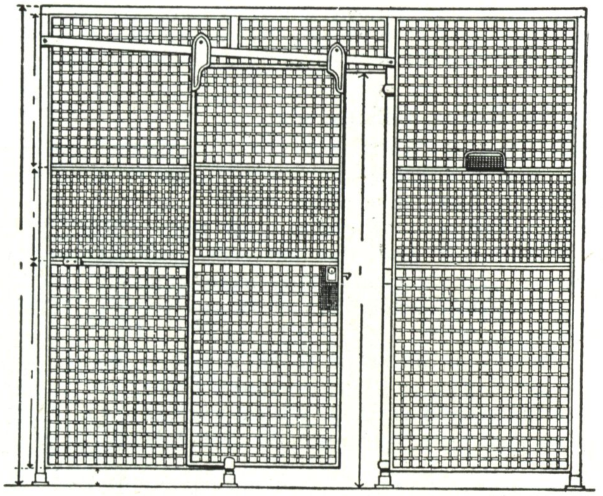
Bank Cage Design No. 146

Doors to be of sliding gravity, self-closing type hung on ball bearing hangers and fitted with Yale master-keyed cylinders; master keys to be of series different from balance of building.

Pass baskets 8 in. wide, 10 in. long shall be included for each division. Pass baskets 8x8 in. shall be included for the rear of each cage. Basket to be fitted flush with outside of cage.



Bank Cage Design No. 144
Same as Design No. 146 except that solid metal panels are eliminated



Bank Cage Design No. 145
Same as Design No. 146 except that ¾-in. square mesh panels 1 ft. 6 in. high are substituted for solid panels

Finish—Usually furnished in flat black, verde green, or natural bronze, but can be furnished in any finish desired.

Catalogue

Complete catalogue sent on request.

PEREY MANUFACTURING COMPANY, INC.

Manufacturers of Turnstiles
101 Park Avenue
NEW YORK, N. Y.

Products

TURNSTILES, BAFFLE GATES, PASSIMETERS, and DEVICES for REGISTERING HUMAN BEINGS.

A Perey Turnstile for Every Purpose

For the past 13 years we have been solely engaged in manufacturing turnstiles and our organization is composed of specialists of wide experience.

We do not install our turnstiles, but furnish blue prints from which they can be readily installed.

We show below only a few standard models. Our line is complete and we can furnish turnstiles for every conceivable purpose.

Where Perey Turnstiles Can Be Used

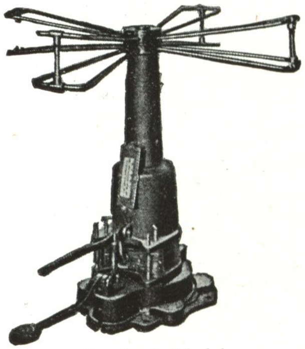
Railroad, trolley and bus terminals, subway stations, amusement parks, bathing establishments, stadiums, athletic fields, ferries, or wherever a fare or an admission is charged and an accurate record of the number of admissions is required (see standard and automatic models shown below). Also made in coin controlled type.

Libraries, museums, botanical gardens, zoos, recreation centers and the like where an accurate record of attendance is required without an attendant (see non-attendant model shown below).

Cafeterias, self-service stores, Y. M. C. A.'s, libraries and the like, where patrons are required to enter at a given place and to leave at another (see No. 11 wooden arm turnstile shown below).

Advantages of Installing Perey Turnstiles

(1) Control crowds. (2) The wages of ticket takers and attendants, and the cost of tickets are saved. (3) An accurate record of the number of admissions is obtained. (4) Many years of dependable operation at insignificant cost is assured. (5) Labor savers. (6) Prevent collusion. (7) Immunity from breakdown is assured.

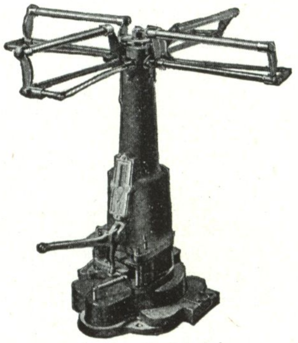


Standard Model

Suitable for railroads, ferries, amusement parks, baths or wherever a congested crowd is liable to collect and the collection of fares or admissions in a minimum space of time is desired.

Equipped with compression carrying throw, shock absorber, unbeatable recording meter, hand and foot control, solid brass arms of the spread type and automatic locking device.

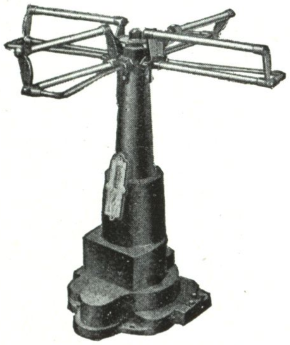
Suitable for right or left-hand operation



Automatic Model

Suitable for railroads, ferries, amusement parks, baths or wherever the collection of fares or admissions in minimum time is desired. Automatically operated by patron, but cashier can, if necessary, prevent patron from passing. Speed is limited only by ability of cashier in making change.

Equipped with compression spring throw, shock absorber, unbeatable recording meter, solid brass arms of the spread type and automatic locking device

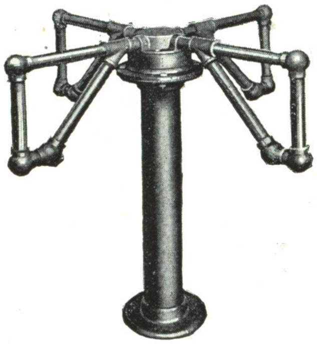


Non-attendant Model

Especially suited for museums, libraries, social centers, parks and public institutions or wherever accurate automatic registration of attendance is required. Automatically released by the patron and registers on each quarter revolution. Locks itself.

Requires no attendant.

Equipped with automatic locking and unlocking device, compression spring throw, shock absorber, unbeatable recording meter and brass arms of the spread type



Perey No. 10 Turnstile

A durable and reliable turnstile of the non-registering type suitable for outdoor or indoor installations at payroll windows, factories, steamship lines, parks or wherever an exit is desired to be barred against entrance or entrance against exit.

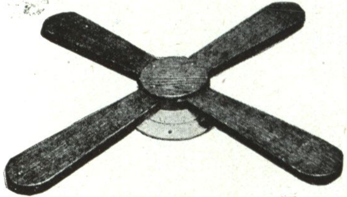
Sturdily built of best materials. Workmanship is same as in our other turnstiles. Attractive design. Arms of metal. Finished in aluminum bronze.

Equipped with double ratchet and pawl, making it easy to change direction of rotation.

Net weight, 100 lb. Spread of arms, 40 in. Height to top of arms, 36 in. Height to bottom of arms, 23 in.

Perey Registering Turnstiles

The above three models are capable of passing 50 people per minute. Equipped with unbeatable registers with 5 digits, and automatically return to zero after registering 99,999. Sturdy construction makes them immune from breakdowns. Net weight of these three models, 240 lb.



Perey No. 11 Wooden Arm Turnstile

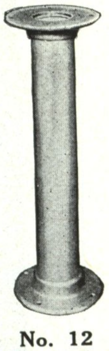
A non-registering type suited for libraries, self-service stores, cafeterias, Y. M. C. A.'s, museums, etc., where patrons enter at a given point and exit at another.

Will turn in one direction only, but can be made to rotate in the opposite direction, if necessary, without the purchase of additional parts.

Base finished in aluminum. Arms are of solid oak highly polished in golden oak finish.

Can readily be screwed to counter with lag screws, or, if desired, our No. 12 stand (see opposite illustration) can be furnished for this turnstile.

Net weight, 27 lb. Spread of arms, 40 in. Height to top of arms, 4 in.

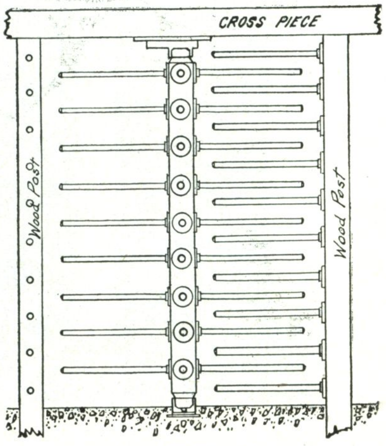


No. 12 Turnstile Stand

Net weight, 43 lb.
Height, 31 in.

Perey Baffle Gate

Suitable for railroad stations, bath houses, amusement parks or wherever it is desired to provide an exit and to bar entrance. We furnish top and bottom bearings and ratchet only (suitable for any size gate or opening), also blue prints from which any mechanic can construct the gate.



Perey Baffle Gate

VULCAN RAIL & CONSTRUCTION COMPANY

Manufacturers of Underwriters' Fire Doors

Grand Street and Garrison Avenue, MASPETH, N. Y.

BRANCH OFFICE AND SHOPS: 39th Street and A. V. R. R., PITTSBURGH, PA.

VULCAN
RAIL & CONSTRUCTION
COMPANY

TRADE-MARK

Products

Vulcan "All-Steel" Fire Doors.

For Pipe, Stair and Bridge Railings, Steel Gratings, Pipe Bends, etc., see page 791.

Underwriters' Approval

The steel fire doors and frames manufactured by this company, and described below, are made in accordance with the specifications of Underwriters' Laboratories, Inc., are inspected by them and carry their Class "C" label.

Vulcan "All-Steel" Fire Doors

Use—These doors are designed for the protection of corridor and partition openings. They are especially suitable for installation in compartment openings in furniture storage warehouses.

Equipment—This type door is furnished with buck and hardware complete, except padlock.

Construction—The entire door, frame and hardware is of steel construction, and all material is painted one shop coat before shipping.

The door sheet is made of blue annealed steel, securely fastened to an angle iron frame, suitable provision being made for expansion in case of fire. This angle frame is braced at intervals of not over 20 in. by cross angles riveted to the door sheet.

Hardware consists of four strap hinges and a three-point latch with spring to hold latches in their keepers. Latch handles extend through the door to permit opening from both sides.

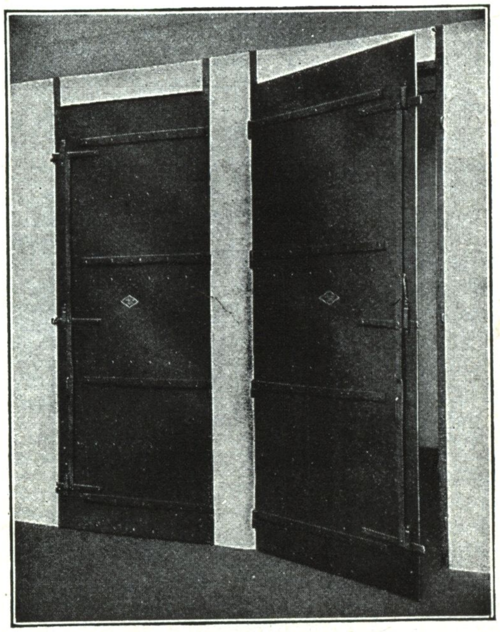
Buck is made of standard rolled steel channel and is furnished 1 in. wider than partition. It runs from the finished floor to the ceiling and is securely fastened to both. Hinge pintles and latch keepers are riveted to channel jambs in the shop. Doors are usually made 3 ft. x 8 ft. 4 in. or 3 ft. 4 in. x 8 ft. 4 in. but can be furnished any size up to 4 ft. x 10 ft.

Further Information

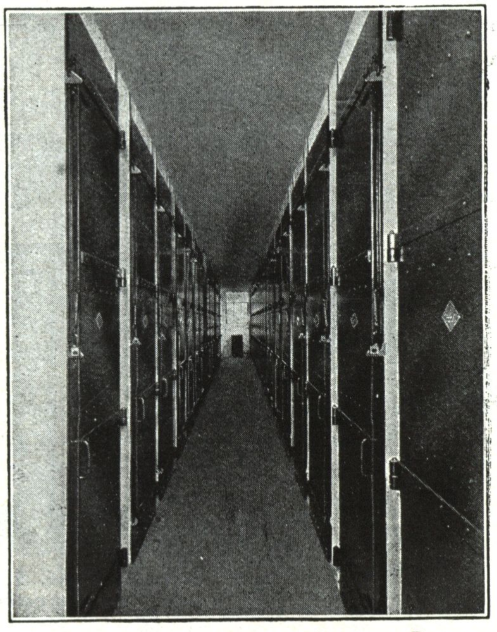
Complete detailed drawings, together with further information and prices of these doors will be gladly sent on request.

Some Recent Installations

Metropolitan Fireproof Warehouse, New York, N. Y.
Knickerbocker Storage Warehouse Co., New York, N. Y.
Manhattan Storage & Warehouse Co., New York, N. Y.
Job De Camp, Inc., Newark, N. J.
Security Storage Co., Washington, D. C.
Thomas F. Healey & Son, Inc., Brooklyn, N. Y.
Neal Fireproof Storage Co., Cleveland, Ohio
Long Island Storage Warehouse, Brooklyn, N. Y.
Lansing Storage Co., Lansing, Mich.
George B. Holman & Co., Inc., Hackensack, N. J.
W. H. Strang Storage Warehouse, Brooklyn, N. Y.
Flushing Storage Warehouse Co., Flushing, L. I., N. Y.
Neptune Storage Warehouse Co., New Rochelle, N. Y.
O'Brien Express Co., New Rochelle, N. Y.
Eldredge Express & Storage Warehouse Co., Atlantic City, N. J.
Rochester Casting Co., Rochester, N. Y.
Estate of Orrin E. Jones, Providence, R. I.
King-Parker, Inc., New York, N. Y.
Interstate Warehouse Co., Philadelphia, Pa.



Two Standard Vulcan Doors
One closed and the other partly open



Typical Installation of Vulcan Doors
On both sides of corridor in a furniture storage warehouse

ART METAL CONSTRUCTION COMPANY

Hollow Metal Doors and Trim

HOME OFFICE AND FACTORIES
JAMESTOWN, N. Y.
For Branch Offices, see page 2660.

TRADE-MARK

Products

Hollow Metal Doors and Building Trim; Elevator, Stair and Dumbwaiter Enclosures; Corridor and Office Partitions and Cabinet Work in Steel and Bronze.

For Steel and Bronze Interior Equipment, see pages 2660-2663.

Facilities

Largest and most modernly equipped plants devoted to the manufacture of hollow metal products and building equipment.

Service

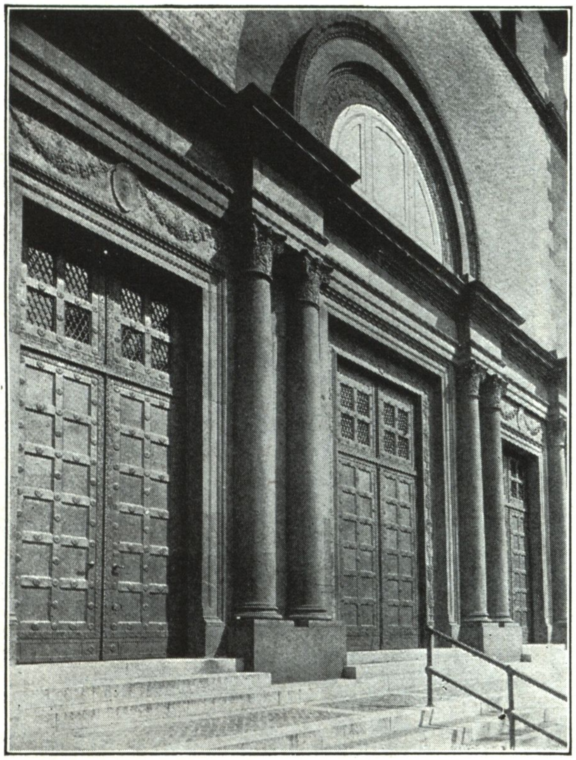
Main and branch offices maintain competent engineers, whose services are free to architects, engineers, and builders.

Materials

All materials used in Art Metal products are the best of their respective kinds, for their particular purposes. All steel and ingot iron are the best grades commercial furniture stock of U. S. standard gauge. All bronze is best grade commercial stock of Brown and Sharpe gauge, of suitable hardness and uniform color.

Workmanship

The work is executed by craftsmen, employing the latest principles of construction and the most modern methods of manufacture.



Art Metal Bronze Entrance Doors, St. Matthews Church, Washington, D. C.

C. Grant LaFarge, Architect
Davis, Wick Rosengarten Co., Contractors

General Description

Doors and Sash—Stiles and rails are formed of No. 18 gauge stock with cold drawn panel mouldings securely keyed thereto. Stiles are provided with compressed cork inserts.

Joints are fitted, reinforced, welded and dressed to produce invisible connections.

Metal panels consist of two plates of No. 20 gauge stock and ¼-inch heat retarding insulation.

Glass panels are retained by removable cold drawn moulding frames closely fitted and secured to panel mouldings by No. 6-32 countersunk oval head screws.

Muntins are constructed of cold drawn interlocking shapes fitted and welded to panel mouldings.

Astragals are of cold drawn interlocking shapes welded to stiles.

Jambs—For openings in walls up to 7½ inches thick, jambs are formed of No. 18 gauge stock; over 7½ inches No. 16 gauge with ½-inch plain or moulded stops for regular units and ¾-inch for Fire Underwriters' units. Jambs are secured to bucks by No. 8-32 screws.

Casings—Of No. 18 gauge cold drawn shapes, corners accurately mitered, welded and dressed to produce invisible joints. Casings are secured to jambs by concealed method.

Pressed Steel Bucks—Of knocked down construction of No. 14 gauge stock provided with anchor retainers and plaster bonds, corners accurately fitted, reinforced and provided with interlocking screw connections. Spreaders of 2x¾-inch by No. 14 gauge channels with No. 12 gauge gussets are secured to bottoms. No. 18 gauge corrugated adjustable anchors are furnished for each 25 inches of opening height.

Bucks for walls of plaster block construction are furnished with struts when called for. Struts are of ¼x3-inch bars having 6x6-inch by No. 12 gauge flanged gusset ceiling connection.

Bucks for opening more than 3 feet 6 inches wide in tile or brick walls are furnished with arched masonry supports when called for where lintels are not provided. Supports are of 4-inch by No. 12 gauge stock welded to head at ends.

Frames—Combination buck and jamb frames are formed of No. 10, 12, 14 or 16 gauge stock. Corners accurately fitted, welded and dressed to produce invisible rigid joints. Trim members are pressed into frames or of drawn shapes applied by concealed method. Frames are provided with spreaders, anchors, struts and masonry supports as specified for bucks.

Trim Mouldings—Chair rail, staff or scribe, picture and wire mouldings are of No. 18 gauge cold drawn shapes, secured to walls by concealed method.

Bases—Constructed of No. 18 gauge stock with plain or moulded profiles, and secured to walls by concealed method. When called for, bases are fitted with bronze sanitary coves.

Window Trim—Jambs and mullions are of No. 18 gauge stock, plain or paneled, and provided with adjustable moulded stops secured by No. 6-32 countersunk oval head screws.

Stools—Of No. 16 gauge stock with returns accurately mitered, welded and dressed. Stools are se-

Continued on next page

cured by No. 8-32 countersunk oval head screws.

Casing and Aprons—Of No. 18 gauge cold drawn shapes with corners and returns accurately mitered, welded and dressed, and secured by concealed method.

Partitions—Of sectional type with units of sizes allowing for flexibility of arrangement. Units proper are constructed of formed and drawn shapes of No. 18 gauge stock, reinforced and so assembled as to produce invisible connections. Owing to the perfected construction, installation is simple and can be performed economically and expeditiously.

Hardware—Hollow metal work is prepared and reinforced for the proper reception of all hardware and appliances. Ordinarily the hardware is furnished under separate contract, but applied at our plant.

Bronze Work

The foregoing description covers our standard products in steel. Bronze work is executed similarly, except that materials are two gauges heavier, joints are made by riveting, screwing and brazing, and finish is produced in accordance with standard methods for durability and desired effects.

Art Metal Partitions

A glimpse in the new Art Metal equipped offices of the Union Trust Co., Cleveland, Ohio

Fire Underwriters' Requirements

The National Board of Fire Underwriters have tested and approved Art Metal products, authorizing their labels for the following situations:

Class "A," Units in Division Walls Between Separate Buildings or Sections of Buildings—Limitations: swinging type; single doors for openings not exceeding 4x7 feet, and doors in pairs not exceeding 5x7 feet, all steel with approved hardware.

Class "B," Units in Enclosures to Vertical Communications Through Buildings—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 8x10 feet, all steel with approved hardware.

Class "C," Units in Corridor and Room Partitions—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 8x10 feet, with or without panels of standard wire glass. Exposed area of individual lights not exceeding 1296 square inches.

Class "D," Units in Exterior Walls Subject to Severe Fire Exposure—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 6x10 feet, with or without panels of standard wire glass. Exposed area of individual lights not to exceed 720 square inches, lights not to exceed 54 inches in height.

Finish

Material is thoroughly cleaned, primed and filled, followed by subsequent coats as required to produce a durable finish of color selected. Each coat is uniformly applied, baked, and sanded, with final coat rubbed to an eggshell gloss.

The following finishes are standard and grouped according to class:

STANDARD FINISHES OF ART METAL DOORS

Class	Finish
No. 1	Olive "F"
No. 2	No. 29 Brewster green No. 30 Stone green No. 51 Medium green No. 52 Brown No. 53 Tan Maroon Black
No. 2½	No. 1 Dull bronze, light No. 2 Dull bronze, medium No. 3 Dull bronze, dark French gray
No. 3	No. 36 Dark mahogany, straight grain No. 36B Light mahogany, straight grain No. 54 Gold bronze No. 55 Silver bronze
No. 3	White Ivory Cream
No. 4	No. 36 Dark mahogany, crotch grain No. 61 Brown mahogany
No. 5	No. 57 Plain oak, medium No. 58 Quartered oak, medium
No. 6	No. 59 Light American walnut No. 60 Dark American walnut Circassian walnut
No. 7	No. 56 Verdigris green, stippled No. R-228 Mottled green, stippled

The Work of Art Metal Today

There can be no better index to the position of Art Metal in the field of hollow metal work than the fact that prominent architects, engineers and contractors are today selecting Art Metal for their projects, as evidenced by the following list of installations:

Federal Reserve Bank, New York, N.Y., York & Sawyer, Architects; Marc Eidlitz & Sons, Inc., Contractors

Federal Reserve Bank, Cleveland, Ohio, Walker & Weeks, Architects; John Gill & Son, Contractors

John Hancock Mutual Life Insurance Co., Boston, Mass., Parker, Thomas & Rice, Architects; L. P. Soule & Sons, Contractors

First National Bank of Boston, Boston, Mass., York & Sawyer, Architects; Stone & Webster, Contractors

Union Electric Light & Power Co., St. Louis, Mo., McClellan & Junkersfeld, Engineers and Contractors

Cunningham Piano Co., Philadelphia, Pa., Andrew J. Sauer & Co., Architects; Hughes-Foulkrod Co., Contractors

Dexter Horton National Bank, Seattle, Wash., John Graham, Architect; Puget Sound Bridge & Dredging Co., Contractors

N. Y. Edison Co., 140th Street Station, New York, N. Y., W. Whitehill, Architect; Kenn Well Construction Corp., Contractors

Buffalo Athletic Club, Buffalo, N. Y., Edward B. Green & Sons, Architects; John W. Cowper Co., Contractors

New York County Courthouse, New York, N. Y., Guy Lowell, Architect; John T. Brady & Co., Contractors

Ford Hospital, Detroit, Mich., Albert Kahn, Architect; Otto Misch Co., Contractors

Portland Telephone Exchange Building, Portland, Me., Densmore, LeClaire & Robins, Architects; F. W. Cunningham & Sons, Contractors

Edison Electric Illuminating Co., Boston, Mass., Bigelow & Wadsworth, Architects; Geo. B. H. Macomber Co., Contractors

Hudson Building, Detroit, Mich., Smith, Hinchman & Grylls, Architects; Bryant & Detwiler Co., Contractors

Selig Building, Indianapolis, Ind., Vonnegut, Bohn & Mueller, Architects; R. W. Bauman & Co., Contractors

First National Bank Building, Hammond, Ind., Weary & Alford, Architects

Utica Gas & Electric Light Co., Utica, N. Y., Thos. Murray, Architect; H. R. Beebe, Inc., Contractors

Herman Kiefer Hospital, Detroit, Mich., Albert Kahn, Inc., Architect; Culvertson & Kelly, Contractors

St. Vincents Hospital, Montclair, N. J., Crow, Lewis & Wick, Architects; M. C. Tredennick Co., Contractors

Saks Building, New York, N. Y., Starrett & Van Vleck, Architects; Cauldwell-Wingate Co., Contractors

Exchange National Bank, Pittsburgh, Pa., Weary & Alford, Architects and Contractors

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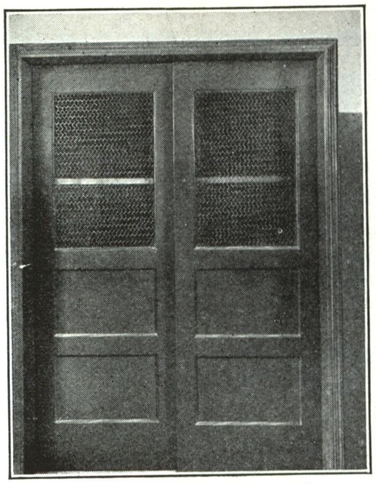
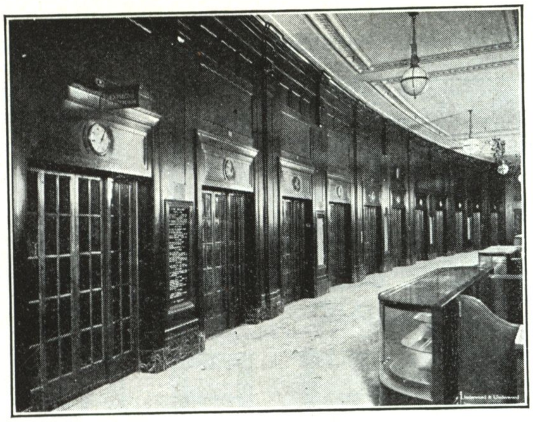
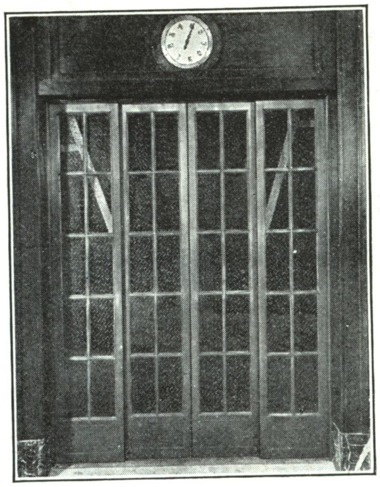
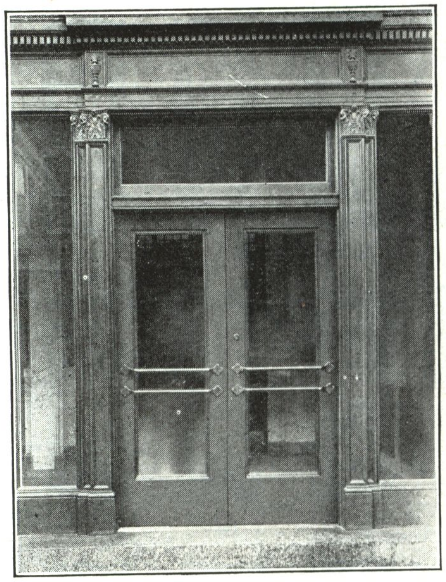




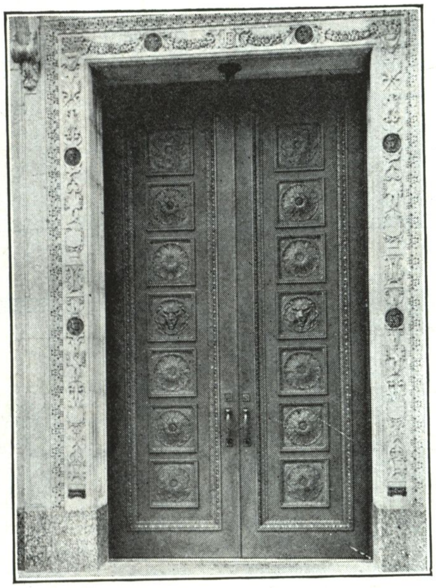
First Floor Battery of Passenger Elevators



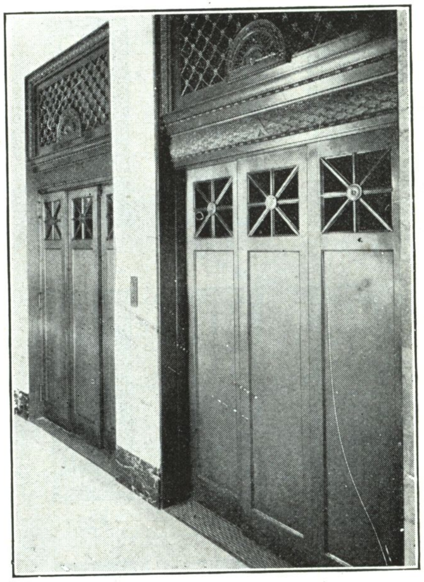
ART METAL ELEVATOR DOORS FOR SAKS & COMPANY BUILDING, NEW YORK, N. Y.
A typical steel freight unit is shown at the left and a typical bronze passenger unit at the right



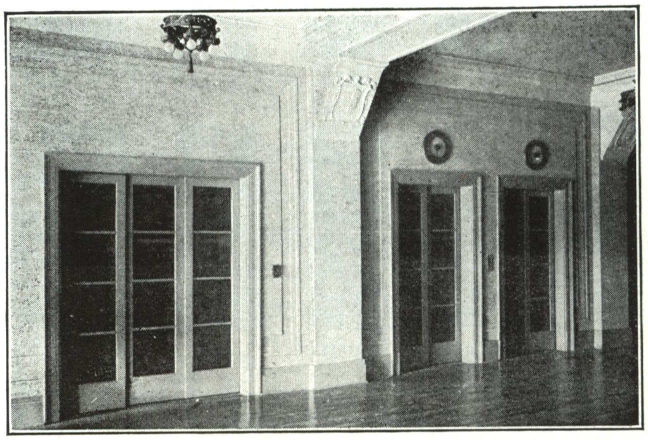
ART METAL BRONZE ENTRANCE DOORS
State Bank of Orlando & Trust Co.,
Orlando, Fla.



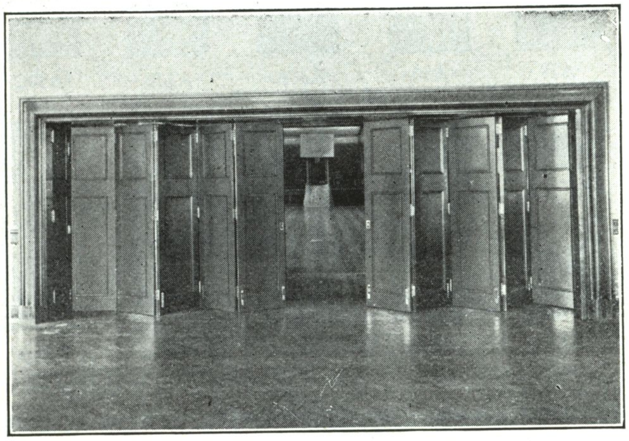
ART METAL BRONZE ENTRANCE DOORS
First National Bank, Fort Wayne, Ind.



ART METAL BRONZE ELEVATOR ENCLOSURES
United Cigar Stores Building, Akron, Ohio



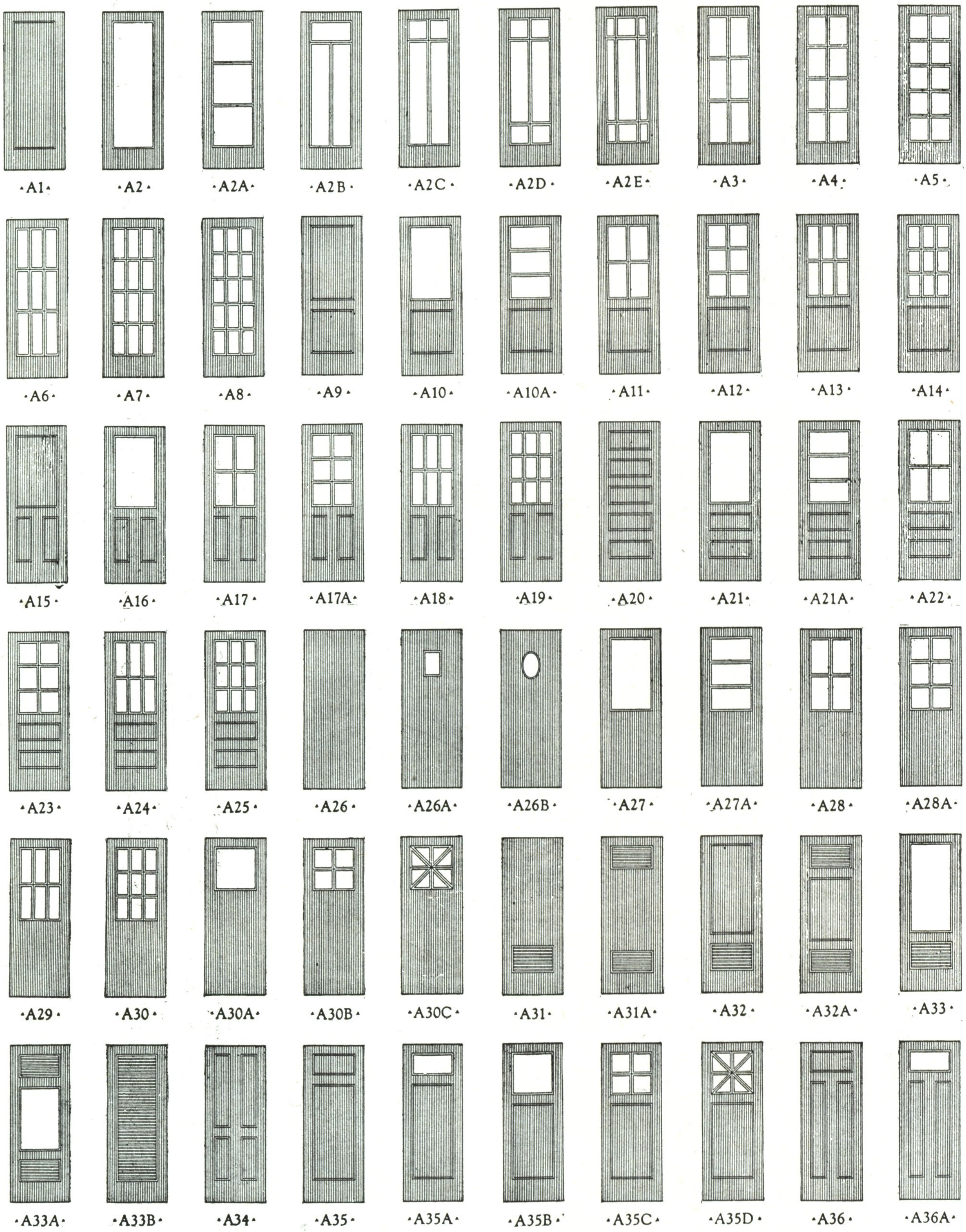
ART METAL ELEVATOR ENCLOSURES
Cunningham Piano Co., Philadelphia, Pa.



ART METAL ACCORDION DOORS
Federal Reserve Bank, Cleveland, Ohio

Typical Installations of Art Metal Entrance and Elevator Enclosures

Continued on next page

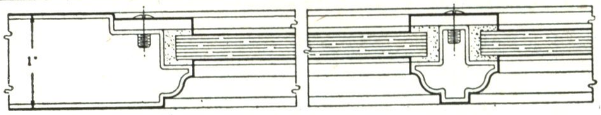

A1
A2
A2A
A2B
A2C
A2D
A2E
A3
A4
A5
A6
A7
A8
A9
A10
A10A
A11
A12
A13
A14
A15
A16
A17
A17A
A18
A19
A20
A21
A21A
A22
A23
A24
A25
A26
A26A
A26B
A27
A27A
A28
A28A
A29
A30
A30A
A30B
A30C
A31
A31A
A32
A32A
A33
A33A
A33B
A34
A35
A35A
A35B
A35C
A35D
A36
A36A

STYLES OF DOORS

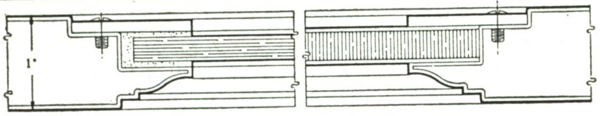
STANDARD · DETAILS ·
· ART · METAL · CONSTRUCTION · CO ·

· DRAWING · NO 1
· DATE · AUG. 25.

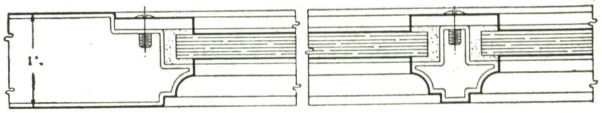
Continued on next page



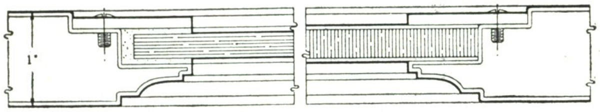
TYPE · 74



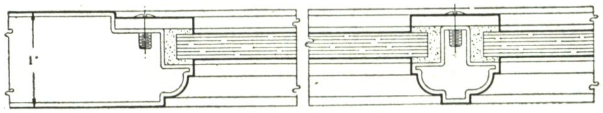
TYPE · 75



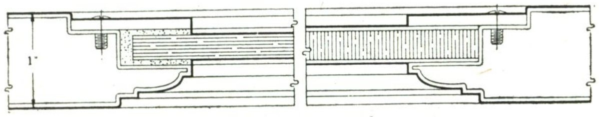
TYPE · 84



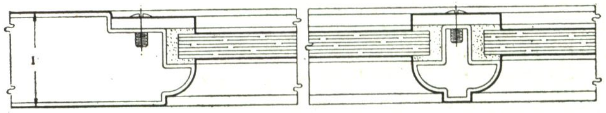
TYPE · 85



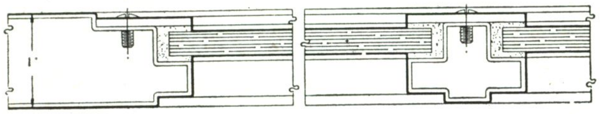
TYPE · 79



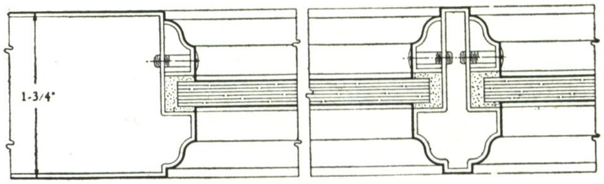
TYPE · 80



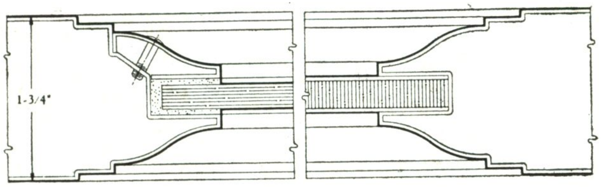
TYPE · 96



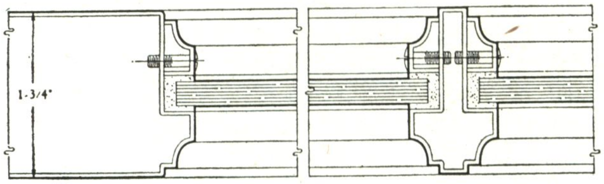
TYPE · 105



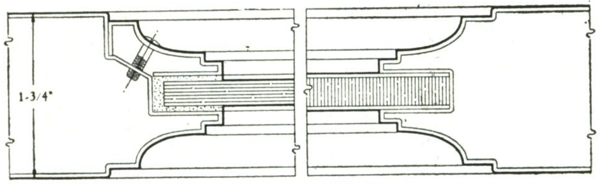
TYPE · 50



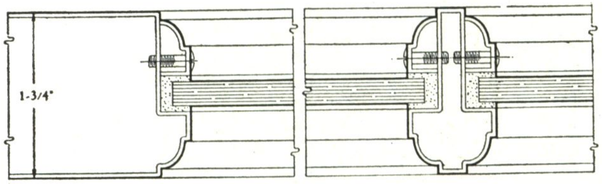
TYPE · 52



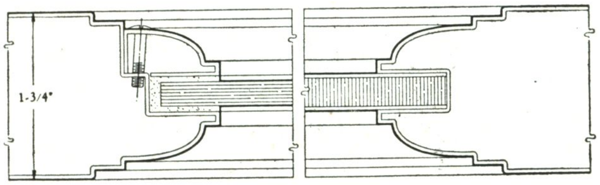
TYPE · 56



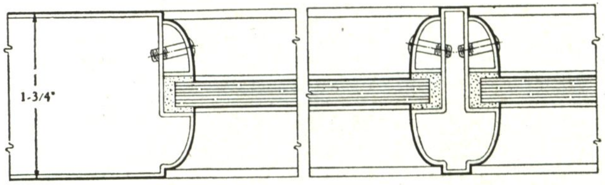
TYPE · 57



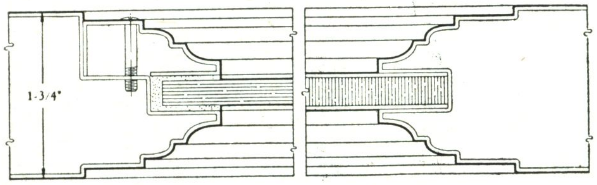
TYPE · 54



TYPE · 53



TYPE · 89



TYPE · 90

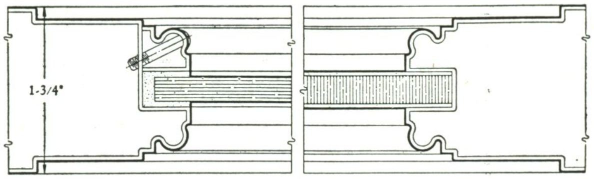
TYPES OF DOORS

Art Metal
Jamestown New York
U.S.A.

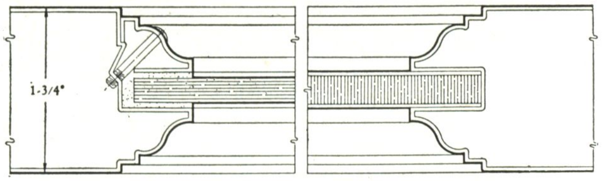
STANDARD · DETAILS ·
ART · METAL · CONSTRUCTION · CO ·

DRAWING · NO · 2
SCALE
DATE · AUG. 25.

Continued on next page



TYPE 55



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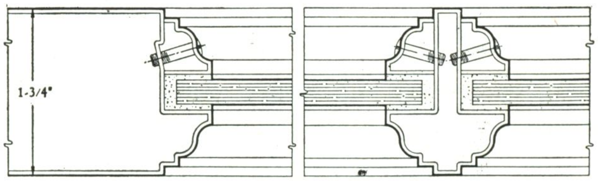
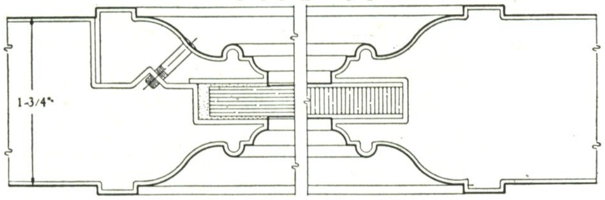
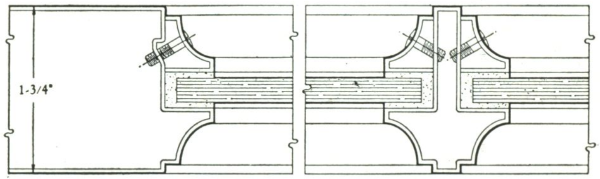


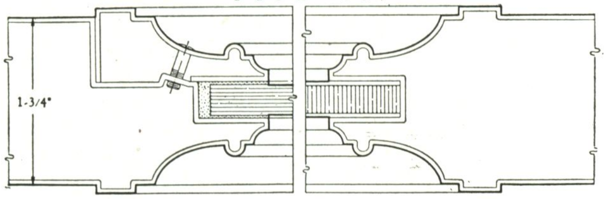
TYPE 95



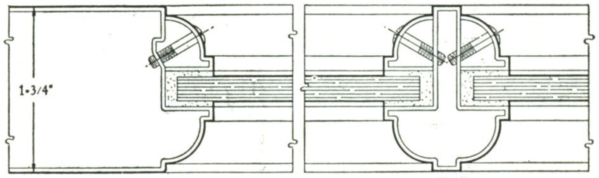
TYPE 63



TYPE 58



TYPE 66



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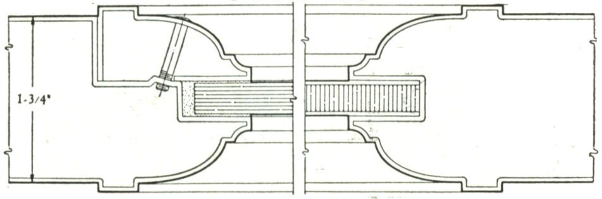

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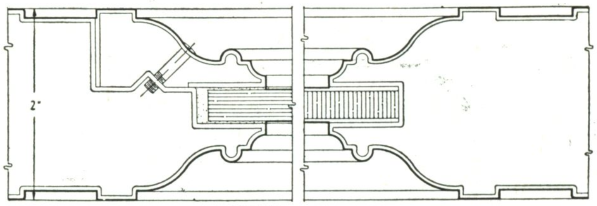

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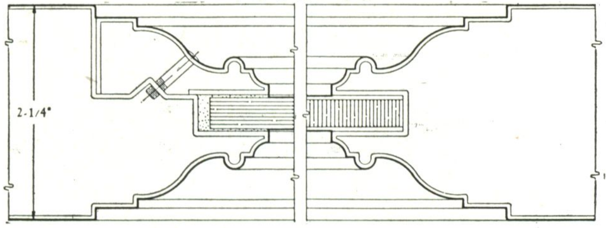

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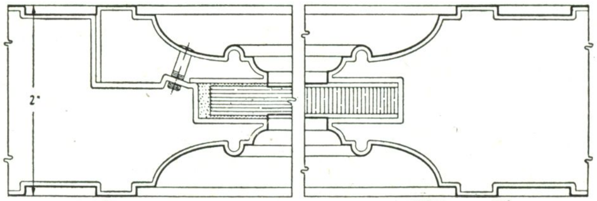
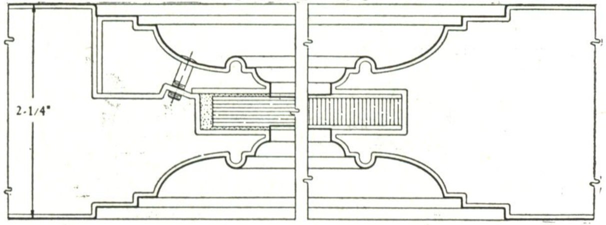
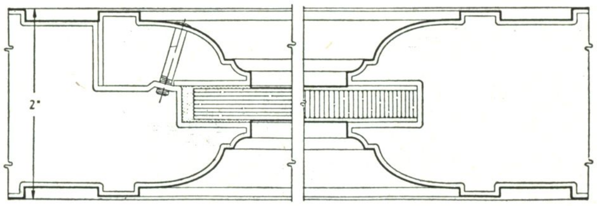


TYPE 67



TYPE 68



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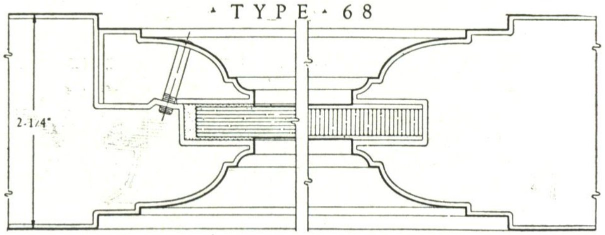


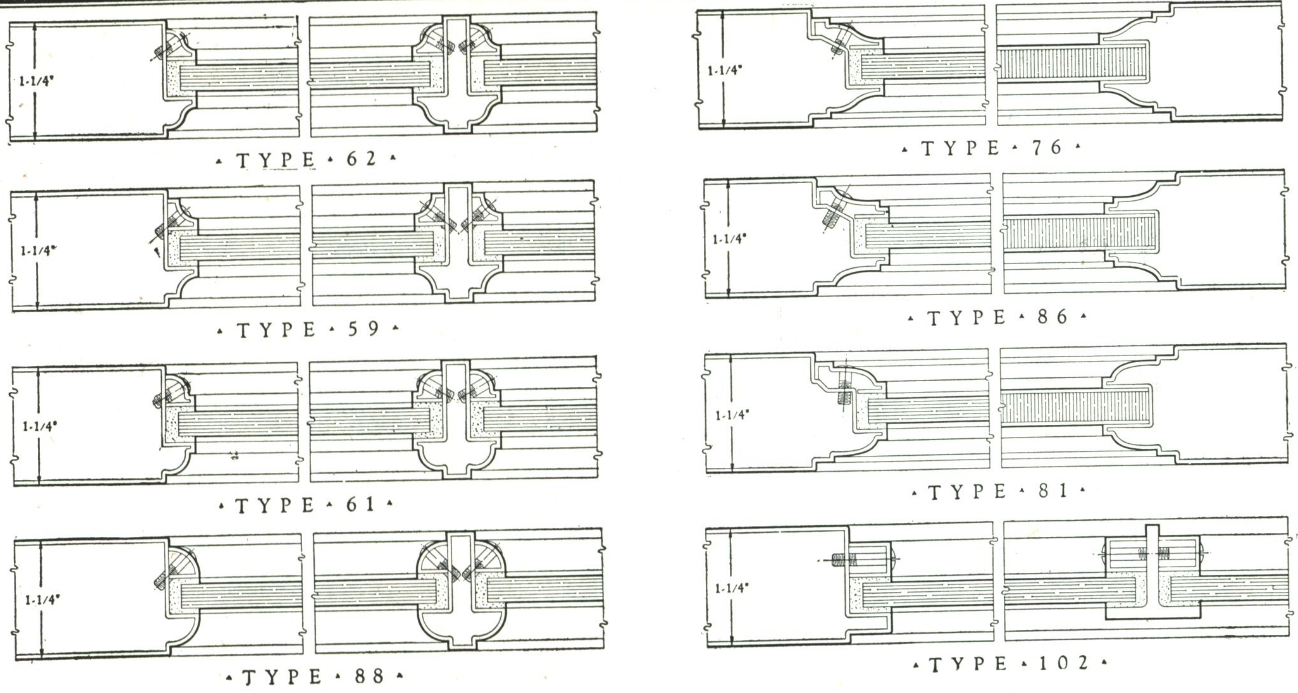
TYPE 71

TYPES OF DOORS

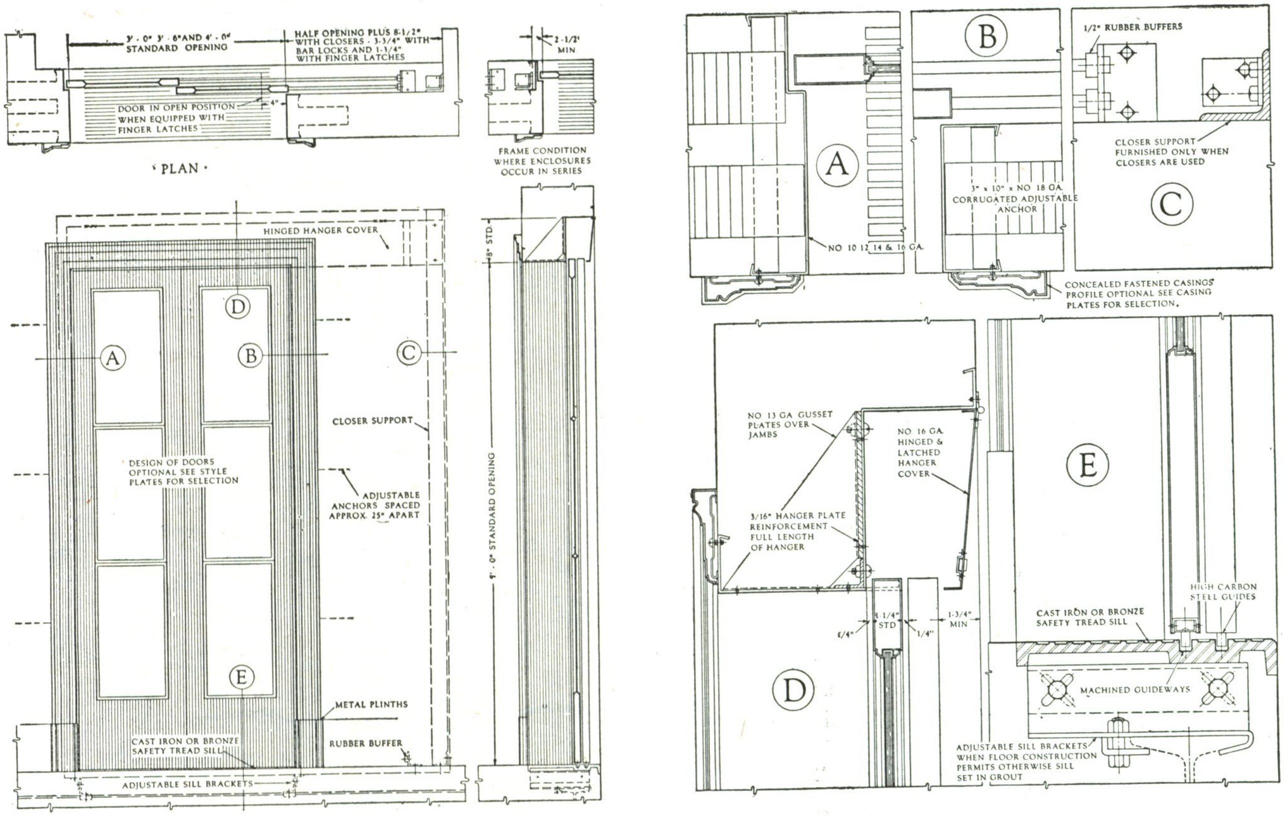
STANDARD DETAILS
ART METAL CONSTRUCTION CO

DRAWING NO. 3
SCALE
DATE AUG. '23.

Continued on next page


1-1/4"
TYPE 62
TYPE 59
TYPE 61
TYPE 88
TYPE 76
TYPE 86
TYPE 81
TYPE 102

TYPES OF DOORS


3' - 0" 3' - 6" AND 4' - 0" STANDARD OPENING
HALF OPENING PLUS 8-1/2" WITH CLOSERS - 3-3/4" WITH BAR LOCKS AND 1-3/4" WITH FINGER LATCHES
DOOR IN OPEN POSITION WHEN EQUIPPED WITH FINGER LATCHES
4"
PLAN
2-1/2" MIN
FRAME CONDITION WHERE ENCLOSURES OCCUR IN SERIES
HINGED HANGER COVER
8" STD
A
B
C
D
E
CLOSER SUPPORT
DESIGN OF DOORS OPTIONAL SEE STYLE PLATES FOR SELECTION
ADJUSTABLE ANCHORS SPACED APPROX. 25" APART
7' - 0" STANDARD OPENING
METAL PLINTHS
RUBBER BUFFER
CAST IRON OR BRONZE SAFETY TREAD SILL
ADJUSTABLE SILL BRACKETS
NO 10 12 14 & 16 GA.
3" x 10" x NO 18 GA. CORRUGATED ADJUSTABLE ANCHOR
1/2" RUBBER BUFFERS
CLOSER SUPPORT FURNISHED ONLY WHEN CLOSERS ARE USED
CONCEALED FASTENED CASINGS PROFILE OPTIONAL SEE CASING PLATES FOR SELECTION.
NO 13 GA GUSSET PLATES OVER JAMBS
NO. 16 GA. HINGED & LATCHED HANGER COVER
3/16" HANGER PLATE REINFORCEMENT FULL LENGTH OF HANGER
1/4"
1-1/4" STD
1/4"
1-3/4" MIN
CAST IRON OR BRONZE SAFETY TREAD SILL
HIGH CARBON STEEL GUIDES
MACHINED GUIDEWAYS
ADJUSTABLE SILL BRACKETS WHEN FLOOR CONSTRUCTION PERMITS OTHERWISE SILL SET IN GROUT

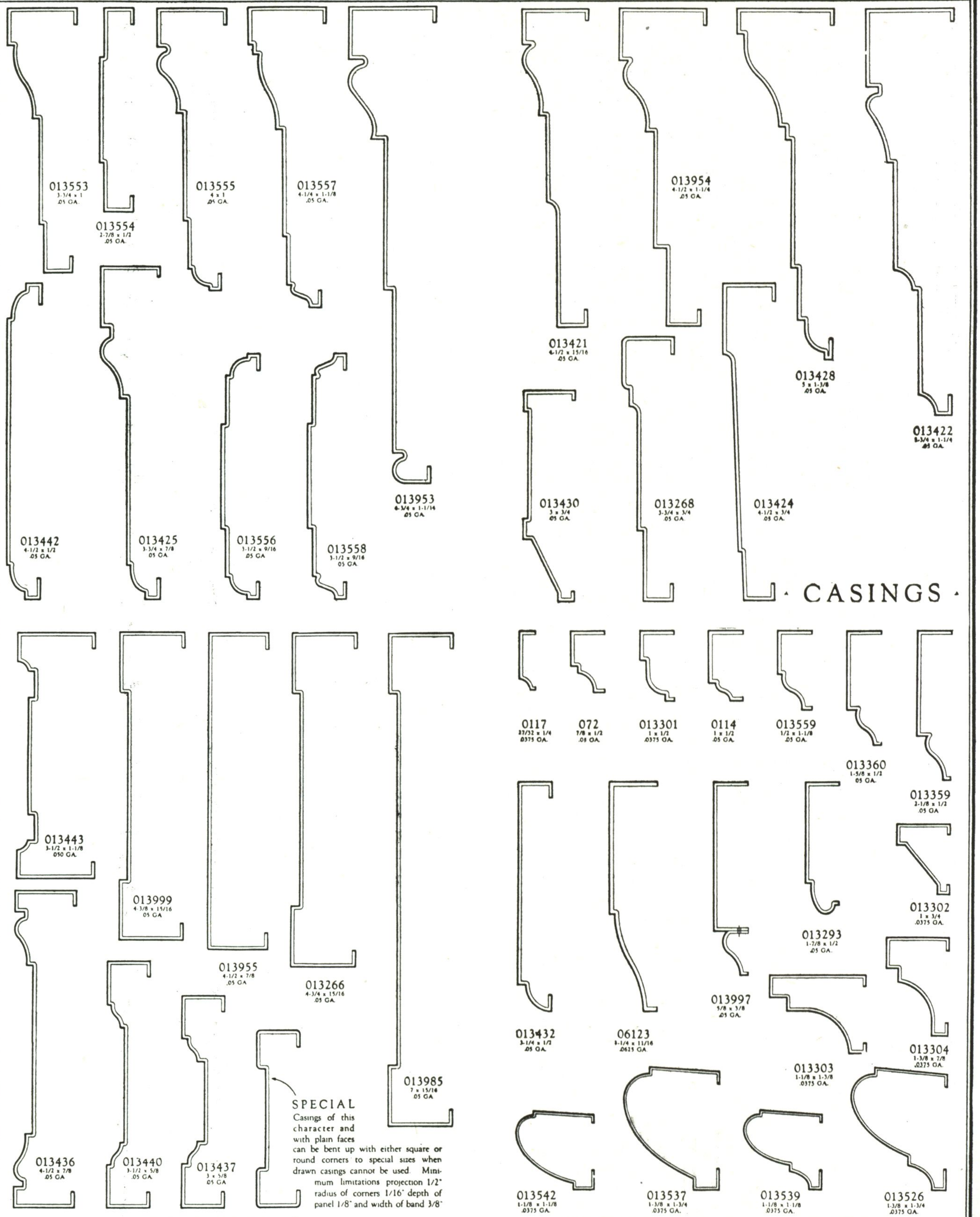
DETAILS FOR TWO SPEED ELEVATOR ENCLOSURE

Art Metal
Jamestown, New York
U.S.A.

STANDARD DETAILS
ART METAL CONSTRUCTION CO

DRAWING NO 4
SCALE 1/2" 1" 3"
DATE AUG:25.

Continued on next page


013553
3-3/4 x 1
.05 GA.
013554
2-7/8 x 1/2
.05 GA.
013555
4 x 1
.05 GA.
013557
4-1/4 x 1-1/8
.05 GA.
013954
4-1/2 x 1-1/4
.05 GA.
013421
4-1/2 x 15/16
.05 GA.
013428
5 x 1-3/8
.05 GA.
013422
5-3/4 x 1-1/4
.05 GA.
013953
6-3/4 x 1-1/16
.05 GA.
013430
3 x 3/4
.05 GA.
013268
3-3/4 x 3/4
.05 GA.
013424
4-1/2 x 3/4
.05 GA.
013442
4-1/2 x 1/2
.05 GA.
013425
3-3/4 x 7/8
.05 GA.
013556
3-1/2 x 9/16
.05 GA
013558
3-1/2 x 9/16
.05 GA.
013443
3-1/2 x 1-1/8
.050 GA.
013999
4-3/8 x 15/16
.05 GA
013955
4-1/2 x 7/8
.05 GA
013266
4-3/4 x 15/16
.05 GA.
013985
7 x 15/16
.05 GA
013436
4-1/2 x 7/8
.05 GA
013440
3-1/2 x 5/8
.05 GA
013437
3 x 5/8
.05 GA
0117
27/32 x 1/4
.0375 GA.
072
7/8 x 1/2
.05 GA.
013301
1 x 1/2
.0375 GA.
0114
1 x 1/2
.05 GA.
013559
1/2 x 1-1/8
.05 GA.
013360
1-5/8 x 1/2
.05 GA.
013359
2-1/8 x 1/2
.05 GA
013302
1 x 3/4
.0375 GA.
013293
1-7/8 x 1/2
.05 GA.
013997
5/8 x 3/8
.05 GA.
013432
3-1/4 x 1/2
.05 GA.
06123
3-1/4 x 11/16
.0625 GA.
013303
1-1/8 x 1-3/8
.0375 GA.
013304
1-3/8 x 7/8
.0375 GA.
013542
1-1/8 x 1-1/8
.0375 GA.
013537
1-3/8 x 1-3/4
.0375 GA.
013539
1-1/8 x 1-1/8
.0375 GA.
013526
1-3/8 x 1-3/4
.0375 GA.

· CASINGS ·

SPECIAL

Casings of this character and with plain faces can be bent up with either square or round corners to special sizes when drawn casings cannot be used. Minimum limitations projection 1/2" radius of corners 1/16" depth of panel 1/8" and width of band 3/8"

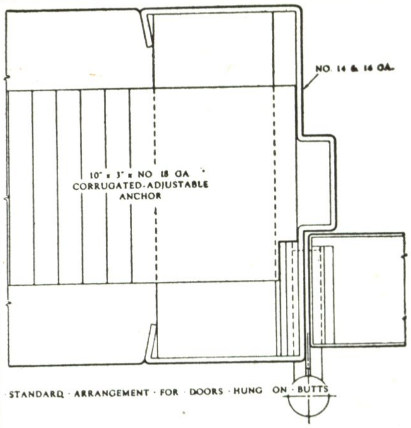
· CASINGS ·

· STOPS · AND · SCRIBES ·

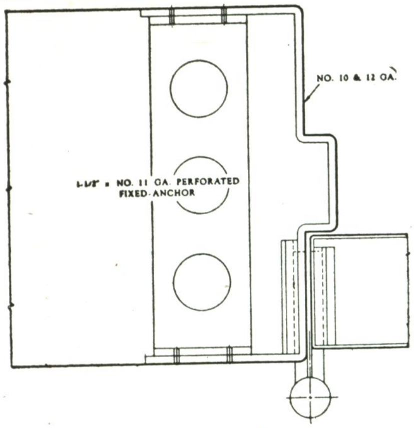
· STANDARD · DETAILS ·
·ART · METAL · CONSTRUCTION · CO ·

·DRAWING · NO ·
·SCALE
·DATE · AUG. 25.
5

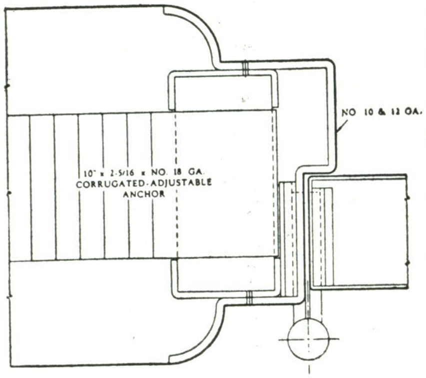
Continued on next page


NO. 14 & 16 GA.
10" x 3" x NO 18 GA CORRUGATED-ADJUSTABLE ANCHOR
STANDARD · ARRANGEMENT · FOR · DOORS · HUNG · ON · BUTTS

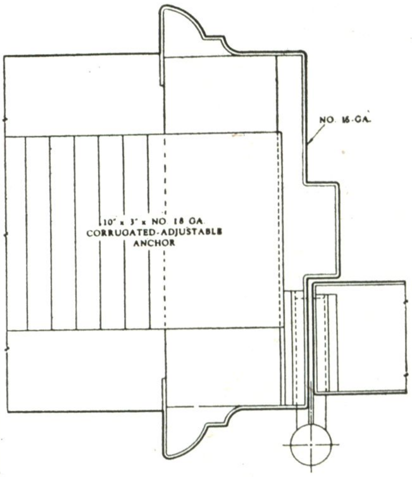
· COMBINATION · BUCK · & · JAMB ·
· FRAME · TYPE · B2 ·


NO. 10 & 12 GA.
1-1/2" x NO. 11 GA. PERFORATED FIXED-ANCHOR

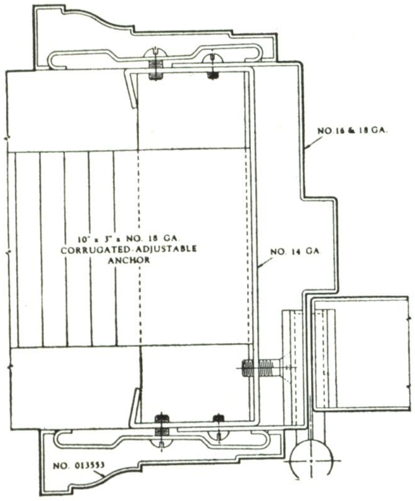
· COMBINATION · BUCK · & · JAMB ·
· FRAME · TYPE · C2


NO. 10 & 12 GA.
10" x 2-5/16 x NO. 18 GA CORRUGATED-ADJUSTABLE ANCHOR

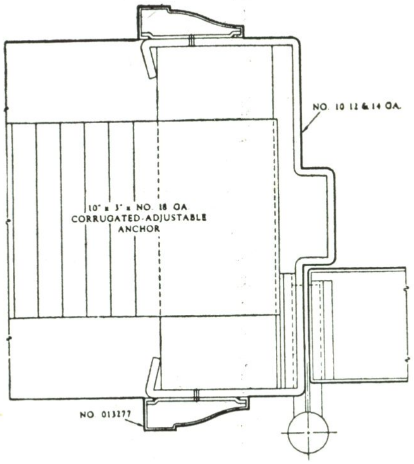
· COMBINATION · BUCK · & · JAMB
· FRAME · TYPE · E2 ·


NO. 16 GA.
10" x 3" x NO 18 GA CORRUGATED-ADJUSTABLE ANCHOR

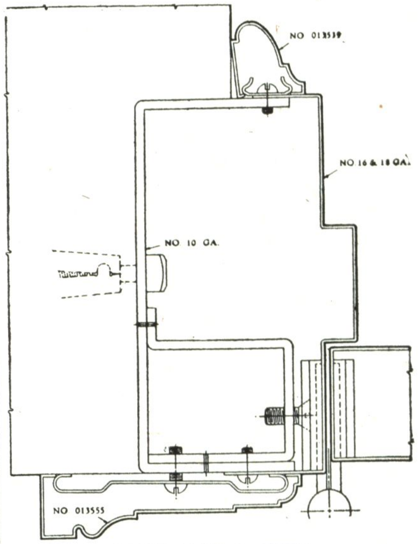
· COMBINATION · BUCK · JAMB · & · TRIM
· FRAME · TYPE · F2 ·


NO. 16 & 18 GA.
10" x 3" x NO. 18 GA CORRUGATED-ADJUSTABLE ANCHOR
NO. 14 GA
NO. 013553

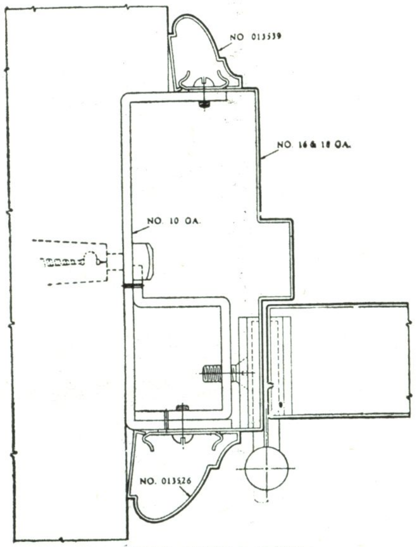
· BUCK · JAMB · & · CASING ·
· FRAME · TYPE · J2 ·


NO. 10 12 & 14 GA.
10" x 3" x NO. 18 GA CORRUGATED-ADJUSTABLE ANCHOR
NO. 013277

· COMBINATION · BUCK · JAMB · & · TRIM ·
· FRAME · TYPE · H2 ·


NO. 013539
NO. 16 & 18 GA.
NO. 10 GA.
NO. 013555

· BUCK · JAMB · & · TRIM ·
· FRAME · TYPE · L2 ·


NO. 013539
NO. 16 & 18 GA.
NO. 10 GA.
NO. 013526

· BUCK · JAMB · & · TRIM ·
· FRAME · TYPE · N2

- STANDARD - DETAILS -
- ART - METAL - CONSTRUCTION - CO. -

- DRAWING NO -
- SCALE [illegible]
- DATE AUG.'25
6

DAHLSTROM METALLIC DOOR COMPANY

EXECUTIVE OFFICES AND FACTORIES
JAMESTOWN, N. Y.

BRANCH OFFICES
NEW YORK, N. Y. CHICAGO, ILL. DETROIT, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES

TRADE-MARK

Products

Metal Doors and Trim; Elevator Inclosures; Conduo-Base.

Also manufacturers of Adjustable Steel Partitions, Hose Cabinets, Switch Box Panels and General Trim for office buildings, hotels, apartments, hospitals, schools, banks and theaters.

Dahlstrom Metal Doors and Trim

Design—Originators and largest manufacturers of metal doors and trim in the world. Dahlstrom metal doors were originated by the founder of this Company and perfected by us. Twenty years of designing and manufacturing doors and trim to meet various conditions have given our product the well earned title of "The Specified Standard."

Construction—Dahlstrom metal doors and trim do not contain a combustible core, which is evidence in itself that they are fire retarding. No portion of the product can burn.

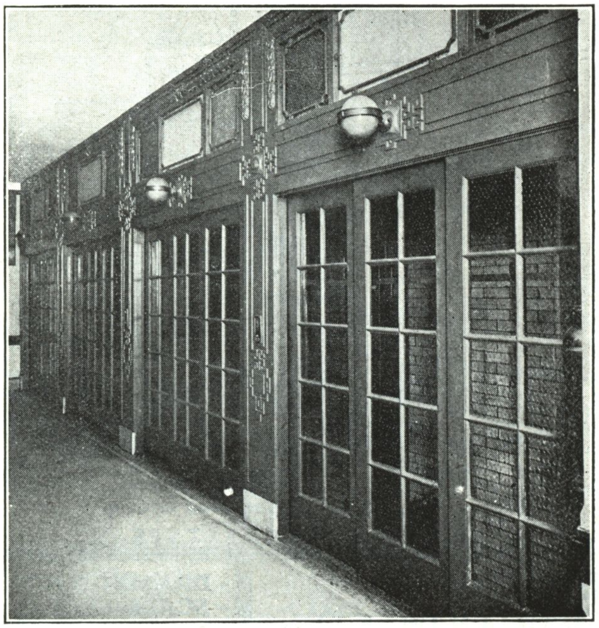
All joints are carefully welded. Reinforcements are also welded to the construction members. The whole design of Dahlstrom metal doors is for rigidity, stability, fire protection and elegance.

Door frames are fabricated from Nos. 10 to 14 gauge metal, according to the size of the opening and the service required.

Finish—All surfaces are thoroughly cleaned before finish is applied. Each coat of paint or enamel is carefully baked and properly treated to secure the superior finish for which Dahlstrom products are noted. The same care and attention is given all finishes whether plain colors, stipples or reproduction of wood graining.

Quality—Dahlstrom products enjoy a good reputation for their superior quality. Only expert workmanship and first-class materials enter into their manufacture.

Undoubtedly a semblance of Dahlstrom products can be produced at lower cost, but any inferiority makes the substitution dear at any price.



Emigrant Bank Building, New York, N. Y.
Thos. E. Murray, Inc., Designing and Constructing Engineers
Equipped with Dahlstrom metal doors and trim

Hardware—To facilitate quick delivery and avoid undue delay, hundreds of templates of standardized hardware have been obtained from different manufactures, so that most ordinary demands for samples can be met. Thus a suitable model is almost sure to be found in the sample room of this company, from which the hollow metal work can be fitted and time saved.

Three-point Lock—One of the requirements of the Board of Fire Underwriters is that swinging fire doors for stair halls and similar locations must be locked at not less than three points, to prevent the doors from warping away from the frames in case of fire, which would allow the flames to pass through.

The multiple gravity latch is another Dahlstrom product of unusual merit, entirely contained within the metal doors. This locking device is approved by the Underwriters' Laboratories, Inc.

Panic Bar and Checking Device—An improved panic bar can be furnished in connection with the three-point locking device: also a checking device for use on automatically closing double doors to prevent the service door from closing until the opposite door is in place in the opening. Both of these devices are Dahlstrom developments.

Specifications—Complete specifications of hollow metal work consist of 25 or more sub-divisions. By indicating the class of work under consideration, an architect will receive, on request, complete specifications covering the different parts, including finish. This Company is ready to offer suggestions for specifications covering any special feature desired.

Classification of Finishes—In order to make it clearly understood that the kind of finish required will affect prices, a list of standard classifications is given below:

Class A—Plain colors, such as No. 10 dark green, No. 11 dark olive, No. 15 maroon, No. 17 chocolate, No. 19 black, No. 30 sea green, No. 33 dark brown.

Class B—Plain colors, such as No. 13 white, No. 18 light gray, also cream, light blue, and any light color except carmine.

Class C—Stippled enamel, such as No. 24 copper verde antique, No. 26 bronze verde antique, No. 28 light olive, No. 29 slate and No. 32 dark tan.

Class D—Grained finishes, such as No. 1 light mahogany, No. 2 tuna mahogany, No. 3 dark mahogany, No. 8 dark birch and cherry.

Class E—Grained finishes, such as No. 4 medium oak, No. 5 light oak, No. 6 dark oak, No. 7 circassian walnut, No. 9 light ash, No. 31 dark circassian walnut, pine and straight oak.

Class G—Grained finishes, such as fumed oak, silver oak, crotch mahogany, marble, teak; also rough stippled and dull black.

Slight variations of all shades are permissible.

Continued on next page

Conduo-Base

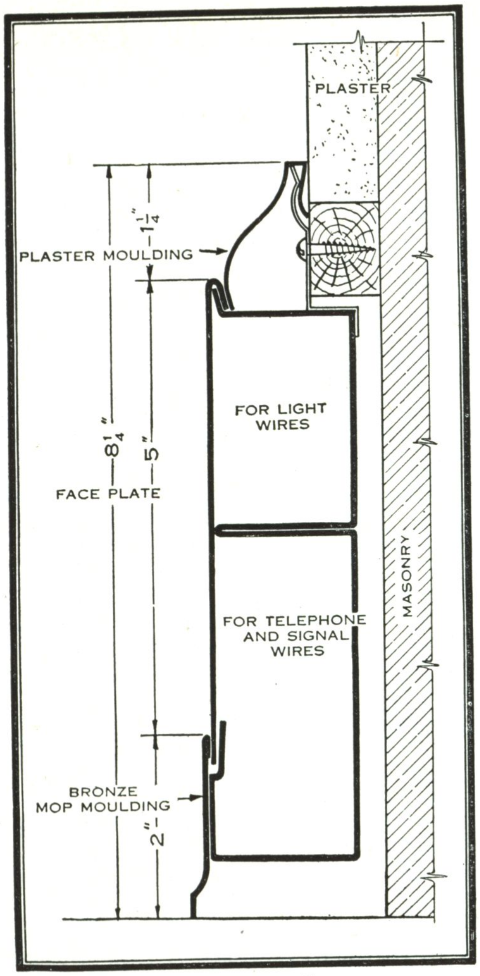
Conduo-Base is a combination metal base and electric conduit for high and low tension wires, in the form of a continuous electric outlet box.

As a base, it is handsome, sanitary and fireproof. It can be finished to match any wood, marble or metal and is provided with a natural bronze floor moulding to prevent rubbing off the finish of the base from cleaning.

As an electrical device, it is provided with two large concealed raceways for high and low tension wires. These raceways are easily accessible by removing the face plate.

Conduo-Base will more than pay for its cost in the saving it makes by eliminating extensive conduits and wiring for prefixed base outlets and by eliminating changes of wiring for tenants.

There is no damage to the walls and floors, as the wires are all carried in the base. It is an easy, simple, clean matter to remove the face of the base, pick out the required wires, make the connections and notch the face for the receptacle. The face of the base is then re-attached and the work is completed. The Conduo method is the only way to provide convenient outlets, conveniently located, no matter what the tenant's requirements may be.



Quarter Size Cross Section of Conduo-Base

High and low tension receptacle and bushings in place

Design—Conduo-Base is so designed as to make it possible to place a number of electric receptacles and low tension current outlets along any point of the base, and at any time desired, with extreme ease, instead of extending numerous conduits to a number of prefixed base outlets, none of which may suit each tenant's requirements. By installing Conduo-Base and extending in the floor-fill one low tension wiring conduit from main wiring shaft to any convenient point in Conduo-Base, and extending ½-in. conduit from wall switch box to Conduo-Base, any number of high and low tension wires can be extended at any time in the Conduo-Base raceways, and any number of outlets for fans, desk lights, dictaphones, motors, telephones, intercommunicating telephones, district telegraph call bells, buzzers, etc., can be installed and connected at any desired points whenever wanted.

Conduo-Base Eliminates—(1) Guesswork as to each future tenant's electric outlet requirements.

(2) The necessity of predetermining the exact location of outlets before the offices are rented.

(3) The cost of extensive conduits and wires, outlet boxes, etc., required for all prefixed outlets.

(4) The cost of large wire moulds for low tension wires.

(5) Unsightly exposed wires tacked along all wall trim and hanging in a maze of network.

(6) The cost of constant changes for each new tenant's requirements, and the cost of cutting and patching of floors and walls for each change.

Conduo-Base Provides—(1) A safe, fireproof and concealed raceway for all wires needed in a modern building.

(2) All the outlets each tenant wants, just when and where he wants them, with minimum cost and without marring the building.

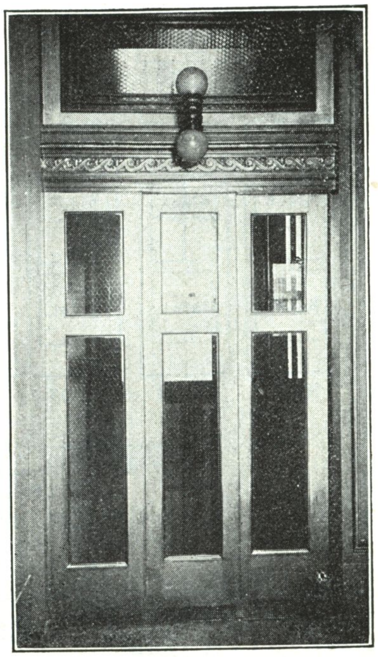
Metal Elevator Inclosures

Just as the internal combustion engine made the automobile possible, so the development in elevator engineering made the skyscraper possible. With the skyscraper came apprehension as to safety from fire hazards, and attention was drawn to the menace of the open elevator shaft as a means of rapidly spreading a fire from floor to floor and providing a veritable chimney draft. The timely appearance of the Dahlstrom door provided a solution to this problem, and it is a pleasure to check up at this time the efficient service still rendered by the early elevator inclosures of twenty years ago. In fact, ninety per cent of the early installations were for elevator inclosures, which speaks well for the adaptability of the then new Dahlstrom construction.

The weight of the door permitted easy operation, while the general design gave fire protection and beauty. With these features the problem on inclosing elevator shafts was solved.

The years of experience in designing and manufacturing these doors for many hundreds of buildings have given this Company valuable data and information as to the proper type of inclosure for various types of openings. Standard types and designs have been worked out which will suit practically any type of opening. Should special designs be desired our Engineering Department will gladly work with you in designing inclosures to meet special conditions.

Dahlstrom elevator inclosures receive that same high standard of workmanship and finish for which Dahlstrom products are noted.



Dahlstrom Elevator Inclosure Installed in 1906

Porter Building (formerly Wells-Fargo Building), Portland, Ore.

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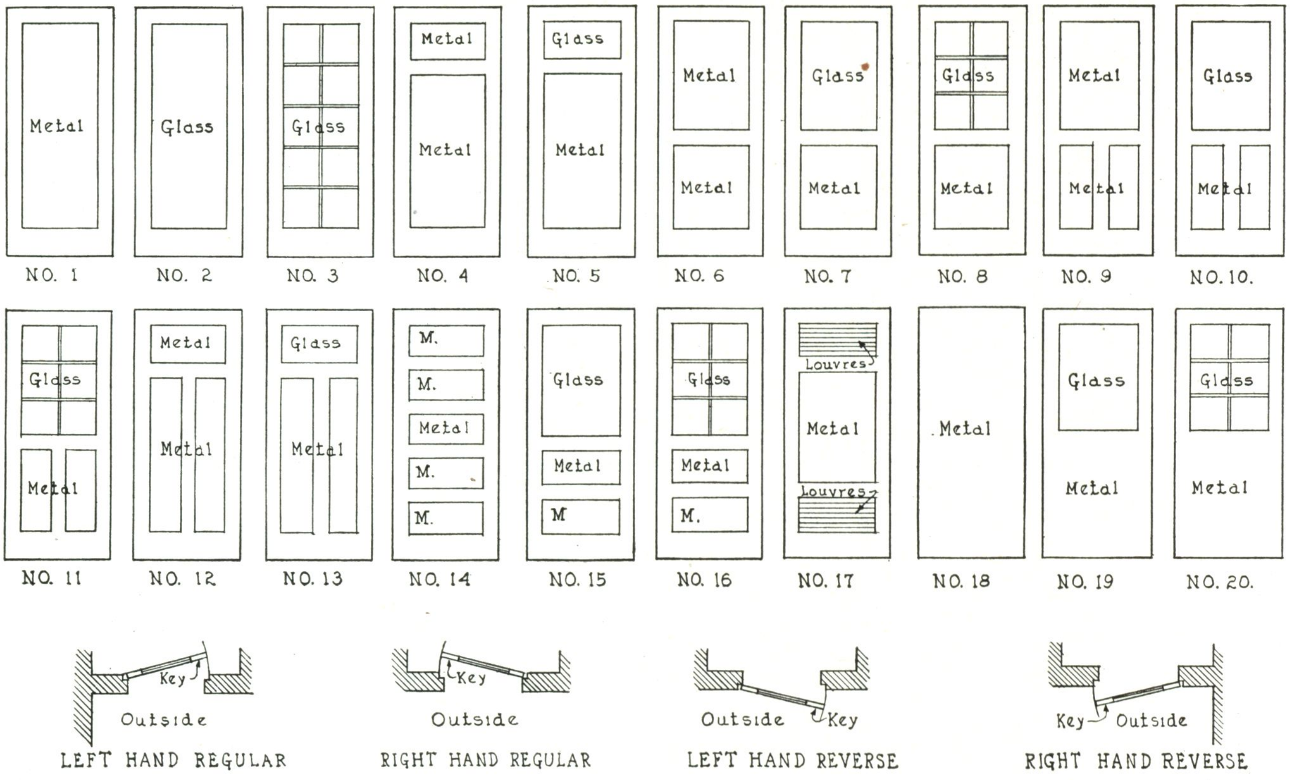
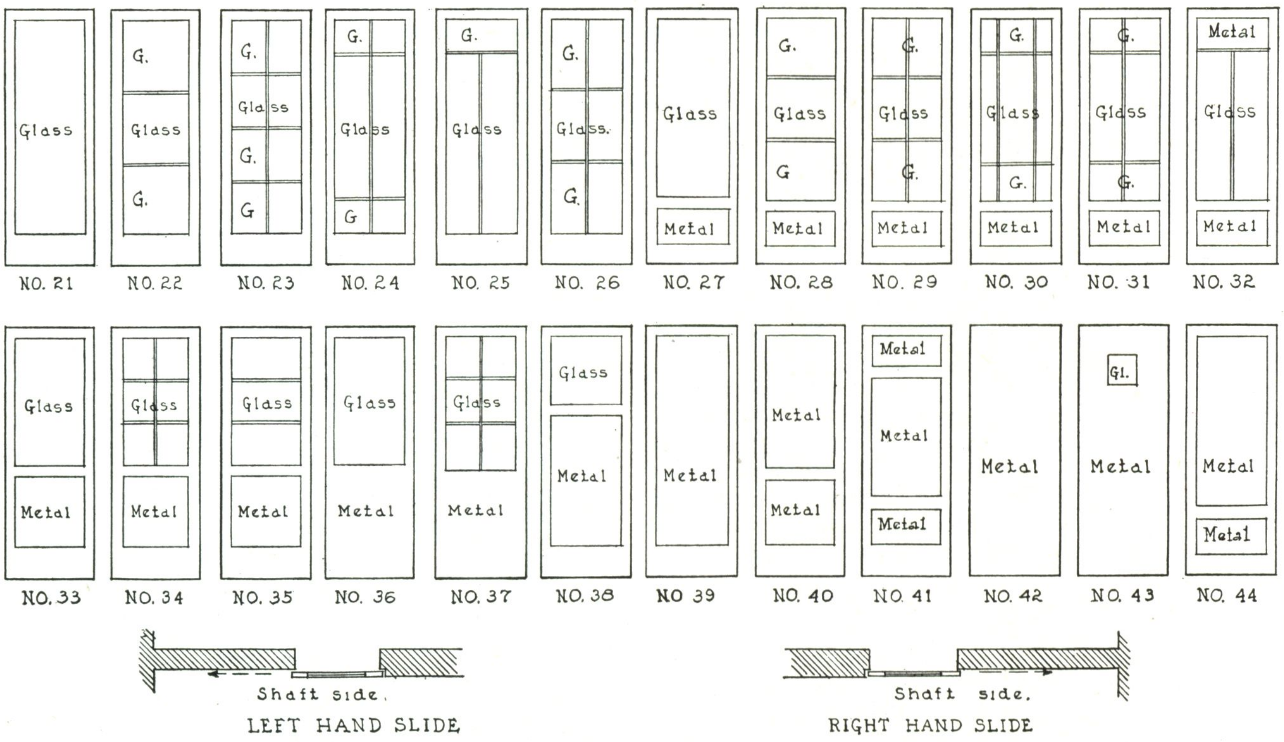

Metal
NO. 1
Glass
NO. 2
Glass
NO. 3
Metal
Metal
NO. 4
Glass
Metal
NO. 5
Metal
Metal
NO. 6
Glass
Metal
NO. 7
Glass
Metal
NO. 8
Metal
Metal
NO. 9
Glass
Metal
NO. 10.
Glass
Metal
NO. 11
Metal
Metal
NO. 12
Glass
Metal
NO. 13
M.
M.
Metal
M.
M.
NO. 14
Glass
Metal
M
NO. 15
Glass
Metal
M.
NO. 16
Louvres
Metal
Louvres
NO. 17
Metal
NO. 18
Glass
Metal
NO. 19
Glass
Metal
NO. 20.
Key
Outside
LEFT HAND REGULAR
Key
Outside
RIGHT HAND REGULAR
Outside
Key
LEFT HAND REVERSE
Key
Outside
RIGHT HAND REVERSE

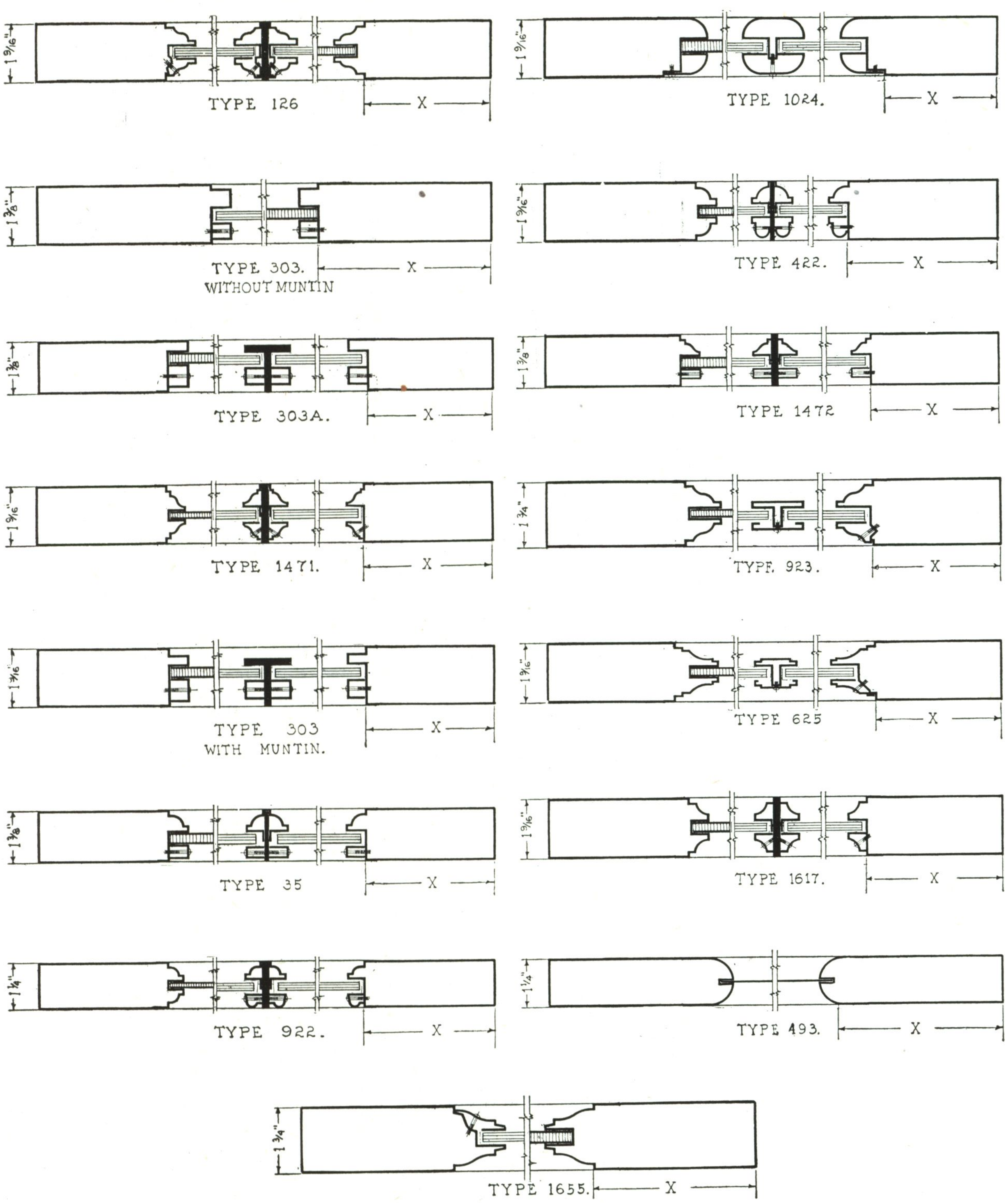
DESIGNS OF DAHLSTROM STANDARD DOORS


Glass
NO. 21
G.
Glass
G.
NO. 22
G.
Glass
G.
G
NO. 23
G.
Glass
G
NO. 24
G.
Glass
NO. 25
G.
Glass.
G.
NO. 26
Glass
Metal
NO. 27
G.
Glass
G
Metal
NO. 28
G.
Glass
G.
Metal
NO. 29
G.
Glass
G.
Metal
NO. 30
G.
Glass
G.
Metal
NO. 31
Metal
Glass
Metal
NO. 32
Glass
Metal
NO. 33
Glass
Metal
NO. 34
Glass
Metal
NO. 35
Glass
Metal
NO. 36
Glass
Metal
NO. 37
Glass
Metal
NO. 38
Metal
NO 39
Metal
Metal
NO. 40
Metal
Metal
Metal
NO. 41
Metal
NO. 42
Gl.
Metal
NO. 43
Metal
Metal
NO. 44
Shaft side.
LEFT HAND SLIDE
Shaft side.
RIGHT HAND SLIDE

DESIGNS OF DAHLSTROM STANDARD ELEVATOR DOORS.

DAHLSTROM METALLIC DOOR COMPANY	DESIGNS OF DAHLSTROM STANDARD METAL DOORS	NOT DRAWN TO SCALE DATE AUG '24	DRWG 1

Continued on next page


1 9/16"
TYPE 126
X
1 9/16"
TYPE 1024.
X
1 3/8"
TYPE 303.
WITHOUT MUNTIN
X
1 9/16"
TYPE 422.
X
1 3/8"
TYPE 303A.
X
1 3/8"
TYPE 1472
X
1 9/16"
TYPE 1471.
X
1 3/4"
TYPE 923.
X
1 9/16"
TYPE 303
WITH MUNTIN.
X
1 9/16"
TYPE 625
X
1 3/8"
TYPE 35
X
1 9/16"
TYPE 1617.
X
1 1/4"
TYPE 922.
X
1 1/4"
TYPE 493.
X
1 3/4"
TYPE 1655.
X

NOTE:- "X" Represents width of door style.
We recommend 3" for minimum width.

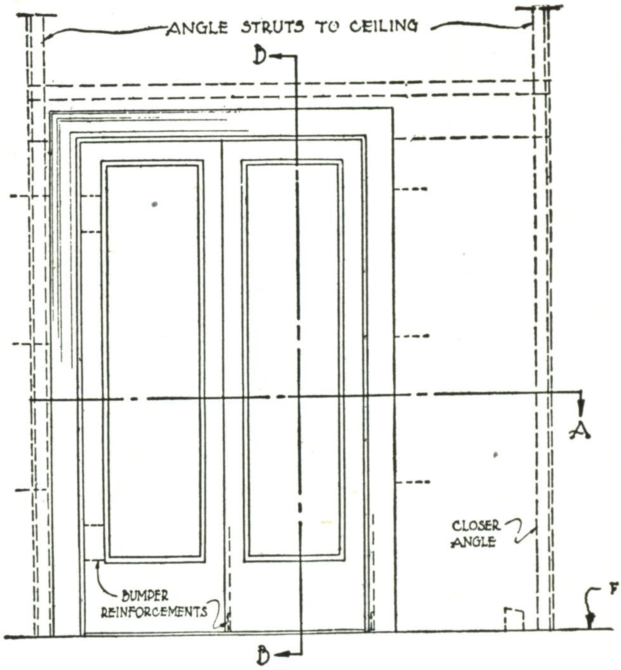
DAHLSTROM
METALLIC DOOR
COMPANY

STANDARD DETAILS OF
DAHLSTROM METAL DOORS.

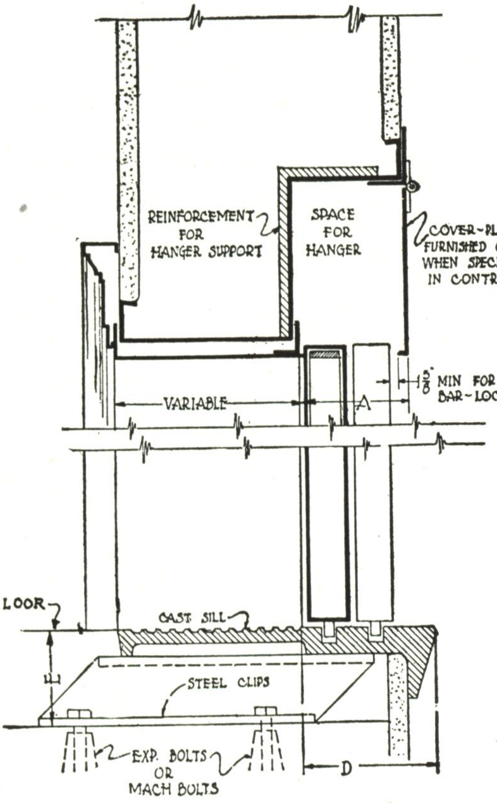
SCALE 0'-3"
EQUAL 1'-0"
DATE AUG.'24

DR'WG
2

Continued on next page


ANGLE STRUTS TO CEILING
B
A
CLOSER ANGLE
FIN. FLOOR
BUMPER REINFORCEMENTS
B

• ELEVATION • OF • UNIT •

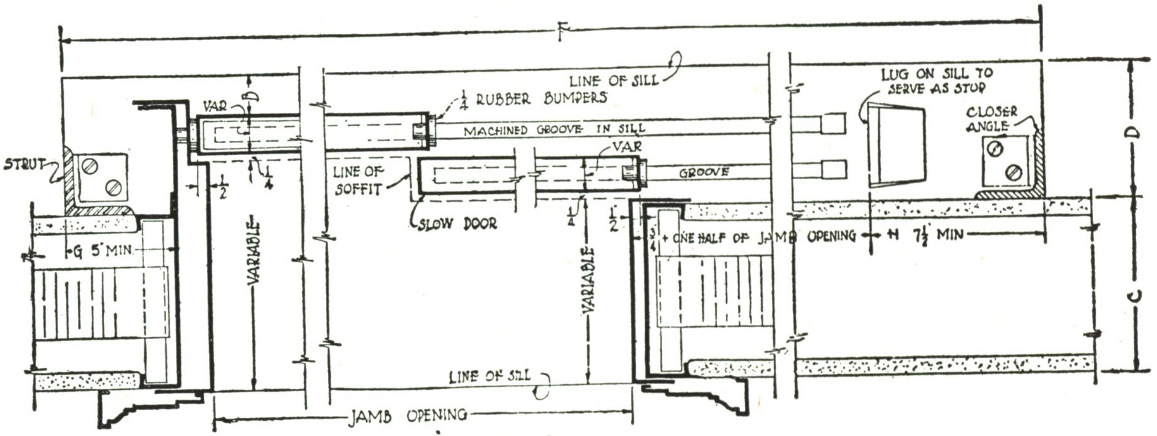

REINFORCEMENT FOR HANGER SUPPORT
SPACE FOR HANGER
COVER-PLATE FURNISHED ONLY WHEN SPECIFIED IN CONTRACT
VARIABLE
A
5/8" MIN FOR BAR-LOCK
CAST SILL
E
STEEL CLIPS
EXP. BOLTS OR MACH BOLTS
D

SECTION • B-B •

•INDEX • TO • LETTERS • SHOWN • FOR • DIMENSIONS •

"A"— DETERMINED BY TYPE OF HANGER USED
"B"— NOT LESS THAN $1\frac{3}{4}$ WHEN BAR LOCK OR CLOSING DEVICE IS USED
"C"— DETERMINED BY THICKNESS OF FINISHED WALL
"D"— DETERMINED BY DISTANCE FROM WALL TO PLATFORM OF CAR
"E"— DETERMINED BY DISTANCE FROM FINISHED FLOOR TO CONCRETE OR STRUCTURAL BEAM
"F"— MAXIMUM OVERALL WIDTH OF UNIT

$$\text{JAMB OPENING} = 2\left[\frac{F-(G+\frac{3}{4}+H)}{3}\right]$$


F
LINE OF SILL
LUG ON SILL TO SERVE AS STOP
VAR
B
1/4 RUBBER BUMPERS
MACHINED GROOVE IN SILL
CLOSER ANGLE
D
STRUT
VAR
GROOVE
LINE OF SOFFIT
1/2
1/4
SLOW DOOR
1/4
1/2
3/4 + ONE HALF OF JAMB OPENING
H 7 1/2" MIN
G 5" MIN
VARIABLE
VARIABLE
C
LINE OF SILL
JAMB OPENING

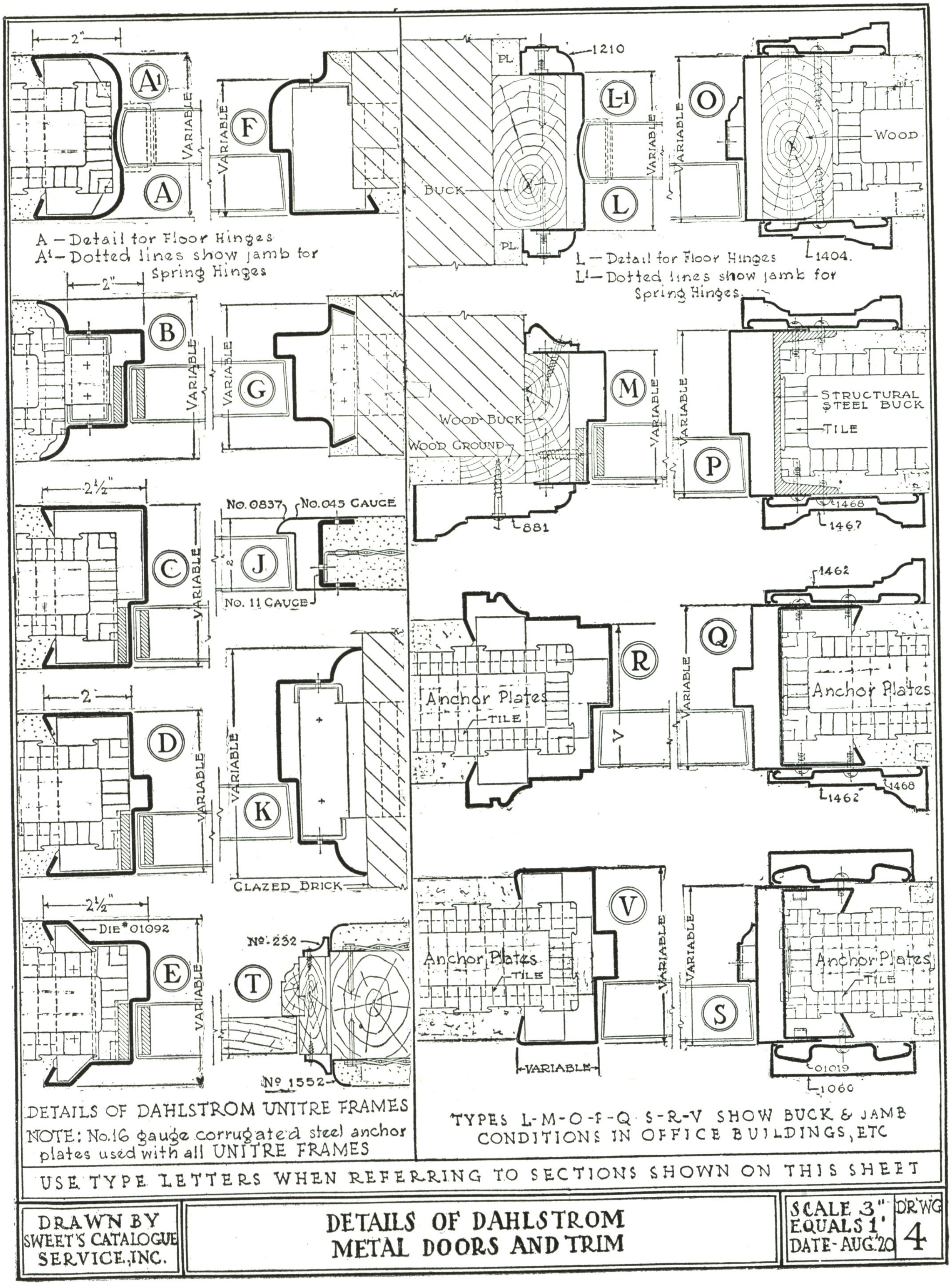
• SECTION • A-A •

DAHLSTROM
METALLIC DOOR
COMPANY

STANDARD DETAILS OF DAHLSTROM TWO-SPEED
METAL ELEVATOR DOORS

SCALE 1½" EQUAL 1'-0"
DATE AUG. 24
DRWG 3

Continued on next page


2"
A1
A
F
VARIABLE
VARIABLE
1210
PL.
PL.
L-1
L
BUCK
VARIABLE
VARIABLE
O
WOOD
1404.
2"
B
G
VARIABLE
VARIABLE
M
WOOD BUCK
WOOD GROUND
881
VARIABLE
VARIABLE
P
STRUCTURAL STEEL BUCK
TILE
1468
1467
2½"
C
VARIABLE
No. 0837
No. 045 GAUGE
J
No. 11 GAUGE
1462
R
Q
VARIABLE
V
Anchor Plates
TILE
Anchor Plates
1462
1468
2
D
VARIABLE
K
VARIABLE
GLAZED BRICK
2½"
DIE #01092
E
VARIABLE
T
No. 232
No 1552
V
VARIABLE
VARIABLE
S
Anchor Plates
TILE
Anchor Plates
TILE
VARIABLE
01019
1060

A — Detail for Floor Hinges
A1 — Dotted lines show jamb for Spring Hinges

L — Detail for Floor Hinges
L1 — Dotted lines show jamb for Spring Hinges

DETAILS OF DAHLSTROM UNITRE FRAMES
NOTE: No. 16 gauge corrugated steel anchor plates used with all UNITRE FRAMES

TYPES L-M-O-P-Q S-R-V SHOW BUCK & JAMB CONDITIONS IN OFFICE BUILDINGS, ETC

USE TYPE LETTERS WHEN REFERRING TO SECTIONS SHOWN ON THIS SHEET

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

DETAILS OF DAHLSTROM
METAL DOORS AND TRIM

SCALE 3" EQUALS 1'
DATE - AUG. '20
DR'WG 4

GROSS METAL PRODUCTS COMPANY

Manufacturers of Hollow Metal Doors, Trim and Metal Specialties

Syndicate Avenue and Bohn Street
ST. PAUL, MINN.

AGENCIES

MINNEAPOLIS, MINN., H. O. Johnson, 640 Builders Exchange
MILWAUKEE, WIS., Philip Gross Hardware & Supply Co.
DULUTH, MINN., Walker Jamar Co., 365 South First Avenue, E.
LOS ANGELES, CAL., Maritzen Company, Delta Building

Products

Hollow Steel and Bronze Doors, Frames and Trim; Elevator Inclosures and Cabs.

Also Toilet and Shower Partitions; Cabinets; Basement Windows; Metal Specialties.

Service

Competent engineers are at the disposal of architects or contractors for special information or detail.

Gross Hollow Metal Doors

The doors are designed and built on a quality basis. The design is original, and the material used is the best. There is no better built door, and the finish is the very finest.

Material

Material used is a No. 1 furniture steel, manufactured by the open hearth process, full pickled, full cold rolled, reannealed, stretcher leveled, and oiled.

General Description

All doors and frames have gas or electric welded joints, all perfectly ground after welding. Rails and stiles are constructed of No. 18 gauge steel properly reinforced for hardware, with compressed cork inserted to deaden metallic sound. Panels are two thicknesses of No. 20 gauge steel, with $\frac{5}{16}$-in. asbestos between. Mouldings are of one piece and firmly locked to stiles and rails, no screws being used except for loose glass mould. Hinge stiles have continuous reinforcing from top to bottom.

All frames, unless otherwise specified, are constructed of No. 14 gauge steel, welded and reinforced for necessary hardware. Six anchors are regularly furnished for a standard sized frame, more where required.

Finish

All surfaces of metal are first thoroughly cleaned of all grease and other foreign material, then each coat as applied is baked and sanded. Any finish can be applied, whether primed, enameled solid color, or grained to match woodwork adjacent to metal doors or trim.

The personnel of our finishing department is composed of highly skilled metal finishers, and all work is given expert attention.

In asking for quotations, the color and nature of finish should be carefully described.

Installations

Following is a partial list of installations executed by us:

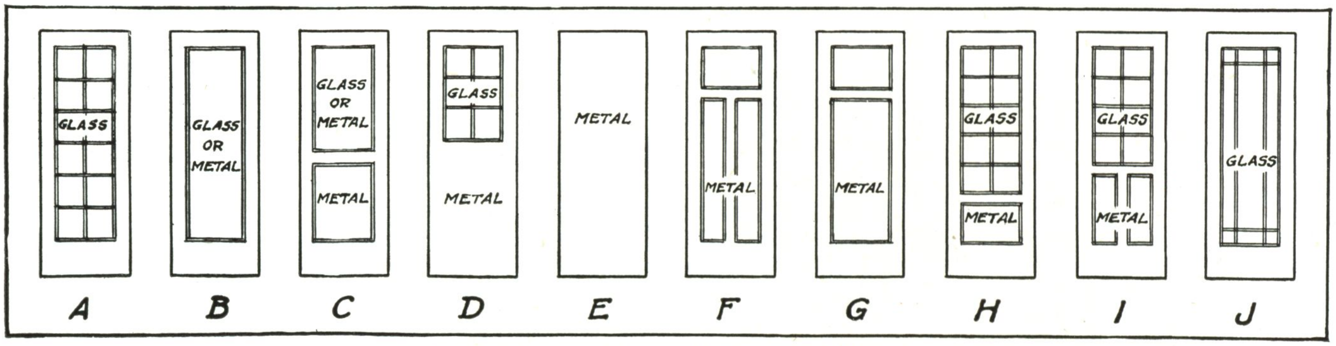
Acquitania Apartments, Chicago, Ill., Harris & Jilson, Architects, Chicago, Ill.

Library, University of Minnesota, C. H. Johnston, Architect, St. Paul, Minn.

Herman Hospital, Houston, Tex., Berlin & Swern, Architects, Chicago, Ill.

High School, Hibbing, Minn., W. T. Bray, C. H. Smith, Architects, Duluth, Minn.

High School, Rapid City, So. Dak., Perkins & McWayne, Architects, Sioux Falls, So. Dak.



Various Types of Gross Hollow Metal Doors

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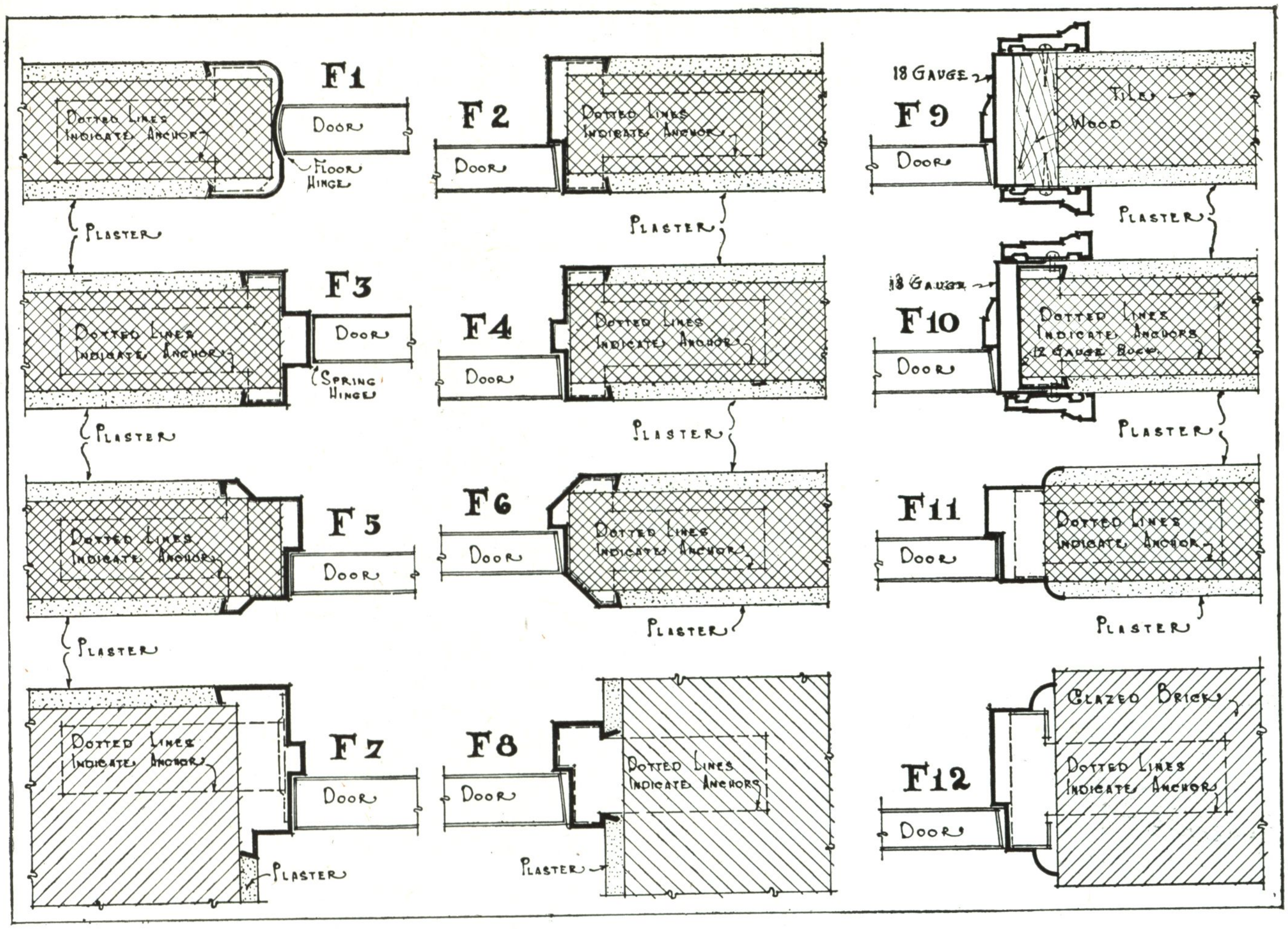
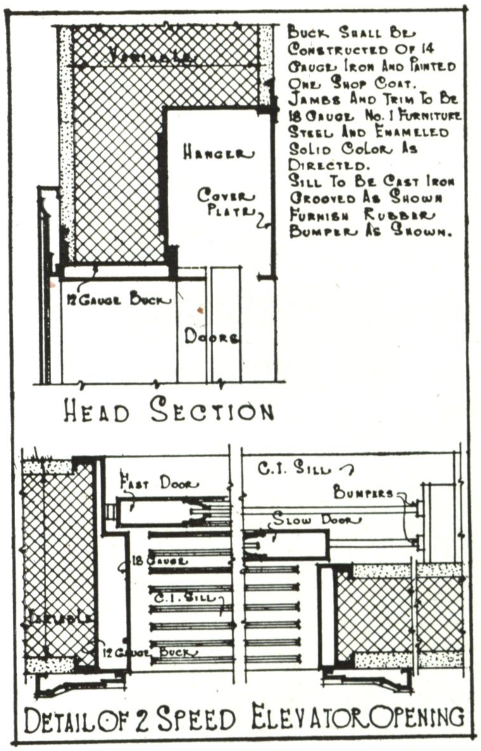

F1
Dotted Lines Indicate Anchor
Door
Floor Hinge
Plaster
F2
Dotted Lines Indicate Anchor
Door
Plaster
F9
18 Gauge
Tile
Wood
Door
Plaster
F3
Dotted Lines Indicate Anchor
Door
Spring Hinge
Plaster
F4
Dotted Lines Indicate Anchor
Door
Plaster
F10
18 Gauge
Dotted Lines Indicate Anchors
12 Gauge Buck
Door
Plaster
F5
Dotted Lines Indicate Anchor
Door
Plaster
F6
Dotted Lines Indicate Anchor
Door
Plaster
F11
Dotted Lines Indicate Anchor
Door
Plaster
F7
Dotted Lines Indicate Anchor
Door
Plaster
F8
Door
Dotted Lines Indicate Anchors
Plaster
F12
Glazed Brick
Dotted Lines Indicate Anchor
Door

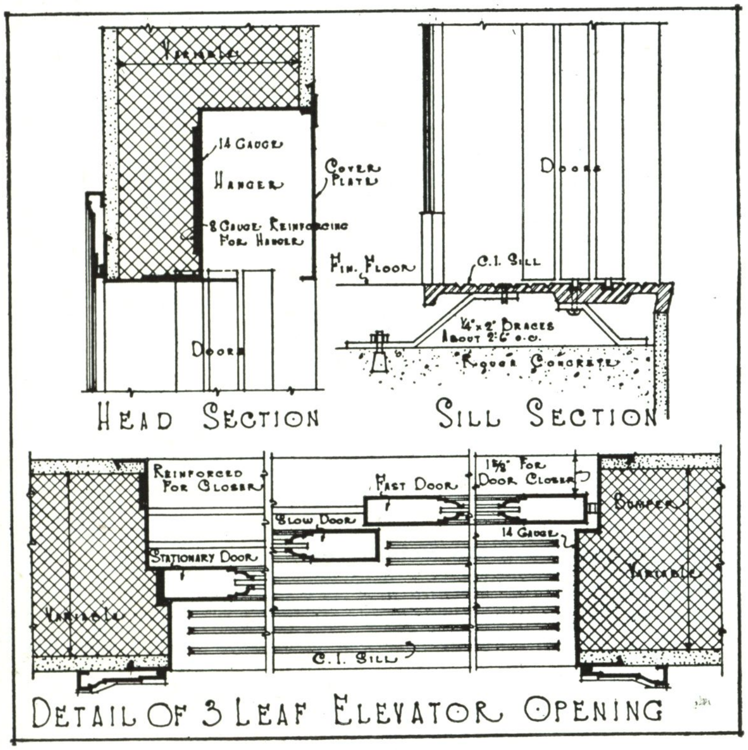
Typical Details of Frames


Variable
Hanger
Cover Plate
12 Gauge Buck
Doors
Fast Door
C.I. Sill
Bumpers
Slow Door
18 Gauge
C.I. Sill
Variable
12 Gauge Buck

Buck Shall Be Constructed Of 14 Gauge Iron And Painted One Shop Coat. Jambs And Trim To Be 18 Gauge No. 1 Furniture Steel And Enameled Solid Color As Directed. Sill To Be Cast Iron Grooved As Shown Furnish Rubber Bumper As Shown.

HEAD SECTION

DETAIL OF 2 SPEED ELEVATOR OPENING


Variable
14 Gauge
Hanger
Cover Plate
8 Gauge Reinforcing For Hanger
Doors
Fin. Floor
C.I. Sill
Doors
¼"x2" Braces About 2'6" o.c.
Rough Concrete
Reinforced For Closer
Fast Door
1⅝" For Door Closer
Bumper
Slow Door
14 Gauge
Stationary Door
Variable
Variable
C.I. Sill

HEAD SECTION SILL SECTION

DETAIL OF 3 LEAF ELEVATOR OPENING

BETZ BROS., INC.

Hollow Metal Doors and Steelbilt Toilet Partitions

FACTORY AND OFFICE
James Avenue and Howell Street
JERSEY CITY, N. J.
REPRESENTED IN ALL PRINCIPAL CITIES

TELEPHONE
Bergen 570, 571, 4924

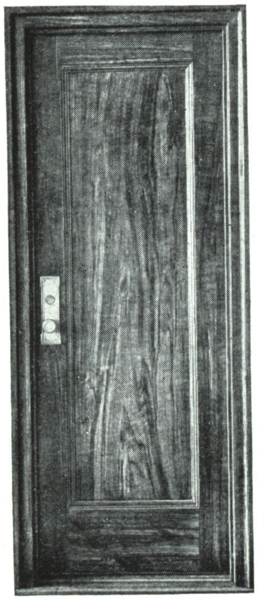
Products

Hollow Steel Doors, Trim and Mouldings; Pressed Steel Buck and Combination Frames.

Hollow Steel Toilet Partitions.

Brief Specifications for a Hollow Steel Door

No. 18 U. S. gauge panels, stiles and rails, all open hearth process, full cold rolled, full pickled, patent leveled, re-squared, re-annealed and oiled furniture steel. Mouldings are of No. 18 gauge cold rolled steel. Stiles and rails are welded together by the acetylene gas and electric processes. Panel and panel mouldings are keyed to the stiles and rails by a patented construction and panel mouldings are mitered at the corners and gas-welded. For glazed panels, the loose stops may be either snapped in place with concealed fasteners or attached by means of oval head machine screws. Reinforcements of properly designed plates and bars are welded in where required for hardware. Stiles, rails and panels are insulated with sound deadening cork and fiber.


Steelbilt Door with Pressed Steel Metal Buck

Finishing of doors made to our standard sample colors and finishes, and baking is accomplished in ovens at a temperature of 280° F. up, as may be required for the most satisfactory production of the various colors and finishes.

Buck and Combination Frame

Nos. 10, 12, 14, 16 and 18 U. S. gauge cold rolled, roller leveled, re-squared, re-annealed, and oiled steel as used in the production of our rough bucks and combination frames. Plate anchors are provided where bucks or frames are built into masonry, unifying the masonry and steel. Combination frames are gas-welded at corners and are properly reinforced for hardware. Combination frames are furnished in a primed and filled finish and are shipped to the building in one complete unit. Where a finished frame is required, we advocate a cabinet jamb and separate trim installation.

Cabinet Jamb

No. 18 U. S. gauge steel as specified for doors with plain or moulded stops, reinforced as required for hardware. Shipped knocked down.

Trim Sets

Trim sets are made in units welded at mitered corners. Scribe mouldings can be also furnished in units where dimensions given are accurate, or may be shipped knocked down and fitted in the field. Trim sets and scribe mouldings may be secured to frames by either concealed spring clips or exposed oval head screws.

Door and Steelbilt Partition References

American Radiator Co., 40 West 40th St., New York, N. Y.
Mecca Temple, West 55th and 56th Sts., New York, N. Y.
Evening Journal Building, Sip Ave., Jersey City, N. J.
Roosevelt Hotel, Madison Ave., 45th to 46th Sts., New York, N. Y.
First National Bank, Exchange Place, Jersey City, N. J.
Bankers Trust Co., 57th St. and Madison Ave., New York, N. Y.
American Bank & Trust Co., Hazleton, Pa.
Apartment House, northwest corner 88th St. and Broadway, New York, N. Y.
Realty Managers Office Building, northwest corner 36th St. and 5th Ave., New York, N. Y.
Loft Building, 112 West 38th St., New York, N. Y.

Steelbilt Sanitary Toilet Partitions

Specifications—*Partitions*—Made of steel with all parts electrically and oxy-acetylene welded. Practically indestructible. All surfaces where dust or dirt might collect have been eliminated. Made of No. 16 gauge cold rolled, patent leveled furniture steel. Front is made with a standard which fits into a metal base at floor allowing for vertical adjustment. Rear end of partition fits over and is welded to a tee shape member which is fastened to wall, allowing for a vertical and lateral adjustment to meet variable wall conditions.

BETZ
Steelbilt
TRADE MARK
TOILET PARTITIONS
Patented

Doors—Stiles and rails are heavy gauge drawn steel and are mitered and oxy-acetylene welded at corners, being properly reinforced for hardware. When required, where partitions are of another material, we can furnish doors only.

Fittings and Bases—All fittings such as wall flanges, railing clips and corners are of our own special design, of neat appearance and strongly built. Bases made of special composition non-corrosive metal and are fastened in a concealed manner to standards.

Hardware—Hardware is of our own special design and make. For each compartment—one latch, two rubber bumpers, white metal door pull and two special hinges.

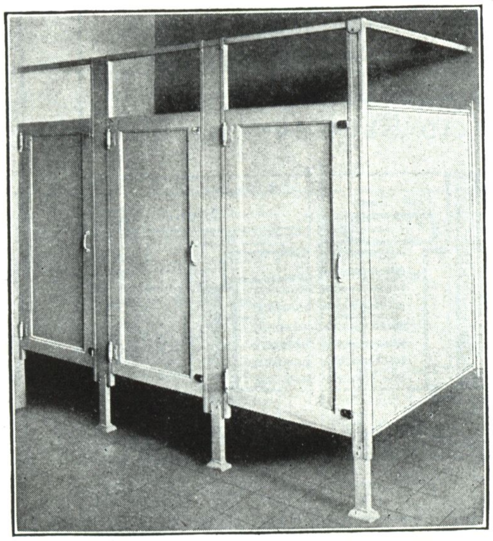
Finish—Furnished with one prime coat applied, or with our standard finishes such as olive green, gray or maroon. Finish is baked on same as for our hollow steel doors. Our standard olive green enamel finish is recommended where service and durability are special requirements. Where required, we can furnish and quote prices on special metal finishes such as for hollow steel doors.

Erection—Partitions and doors are delivered ready for erection. We will erect partitions, or they can be erected by customer's mechanic. They are easily erected and do not require specially trained men.

PARTITIONS AND DOORS IN STOCK

Partition		Door	
Width, ft. in.	Height, ft.	Width, ft.	Height, ft.
3-6 4-0 4-6	6 from top of partition to floor	2	5

Above are sizes in stock, but standard sizes other than those mentioned can be furnished. Also special sizes and requirements, to suit conditions.


Steelbilt Sanitary Toilet Partitions

JAMESTOWN METAL DESK COMPANY, INC.

Hollow Metal Doors and Trim

JAMESTOWN, N. Y.

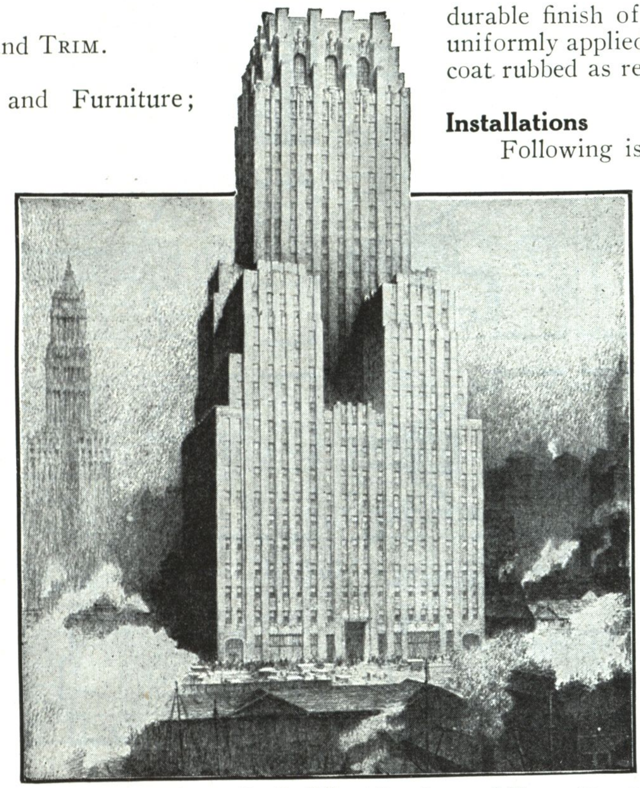
BRANCH OFFICES

NEW YORK, N. Y., 15 East 40th Street
BOSTON, MASS., Chamber of Commerce
LOS ANGELES, CAL., 1026 South Olive Street
DETROIT, MICH., Morgan Building

REPRESENTATIVES IN PRINCIPAL CITIES

Products

HOLLOW METAL DOORS and TRIM.
ELEVATOR ENCLOSURES.
Also Office Partitions and Furniture; Metal Desks.



New York Telephone Co. Building, Barclay and Vesey Streets, New York, N. Y.

Elevator Enclosures for this Building manufactured by JAMESTOWN METAL DESK COMPANY, INC.

MCKENZIE, VOORHEES & GMELIN, Architects New York, N. Y.

MARC EIDLITZ & SON, INC. Contractors New York, N. Y.

General Description

The stiles and rails are formed from a single sheet of No. 18 gauge steel. All joints and miters are made a continuous weld with acetylene gas process. Panel mouldings electric welded to the stiles and rails, insuring perfect alignment and rigidity.

Cork insulation strips are inserted in the stiles and rails to deaden the metallic ring of hollow metal. Panels are insulated with ¼-in. thick asbestos.

Reinforcing plates are placed inside, backing up all hardware. All drilling and tapping for hardware is done at factory.

Combination bucks and jambs are made of No. 18, 16, 14 or 12-gauge steel as required. Corners are mitered and gas welded and provided with anchors.

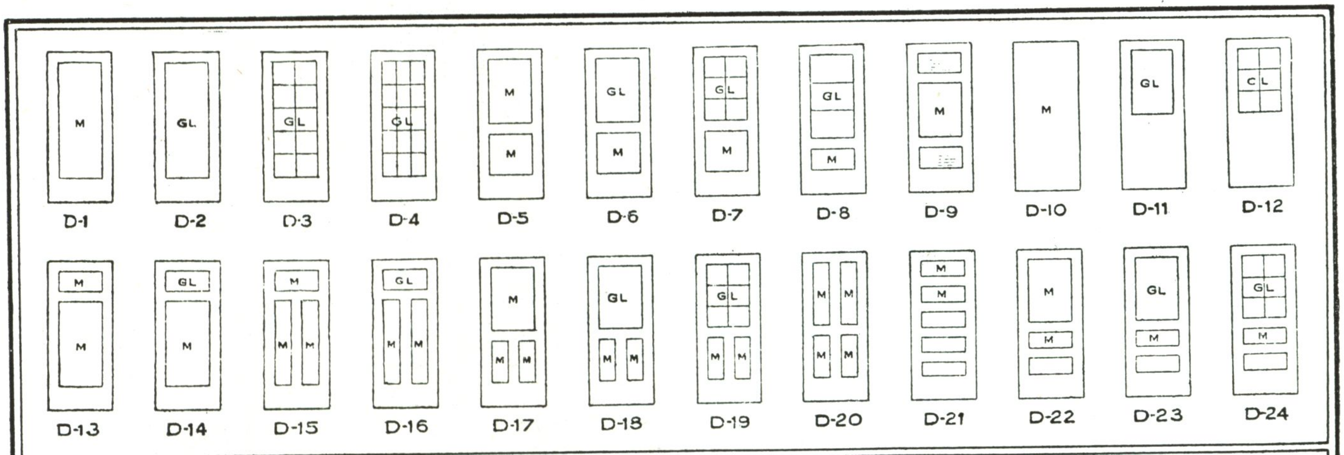
Trim is made of No. 18 gauge steel drawn cold through rolls. Mitered corners are gas welded. Trim is secured with concealed fasteners or with special oval head screws.

All finished products are thoroughly cleaned, primed and filled, followed by required coats to produce a durable finish of color desired. Each coat is uniformly applied, baked, and sanded with final coat rubbed as required.

Installations

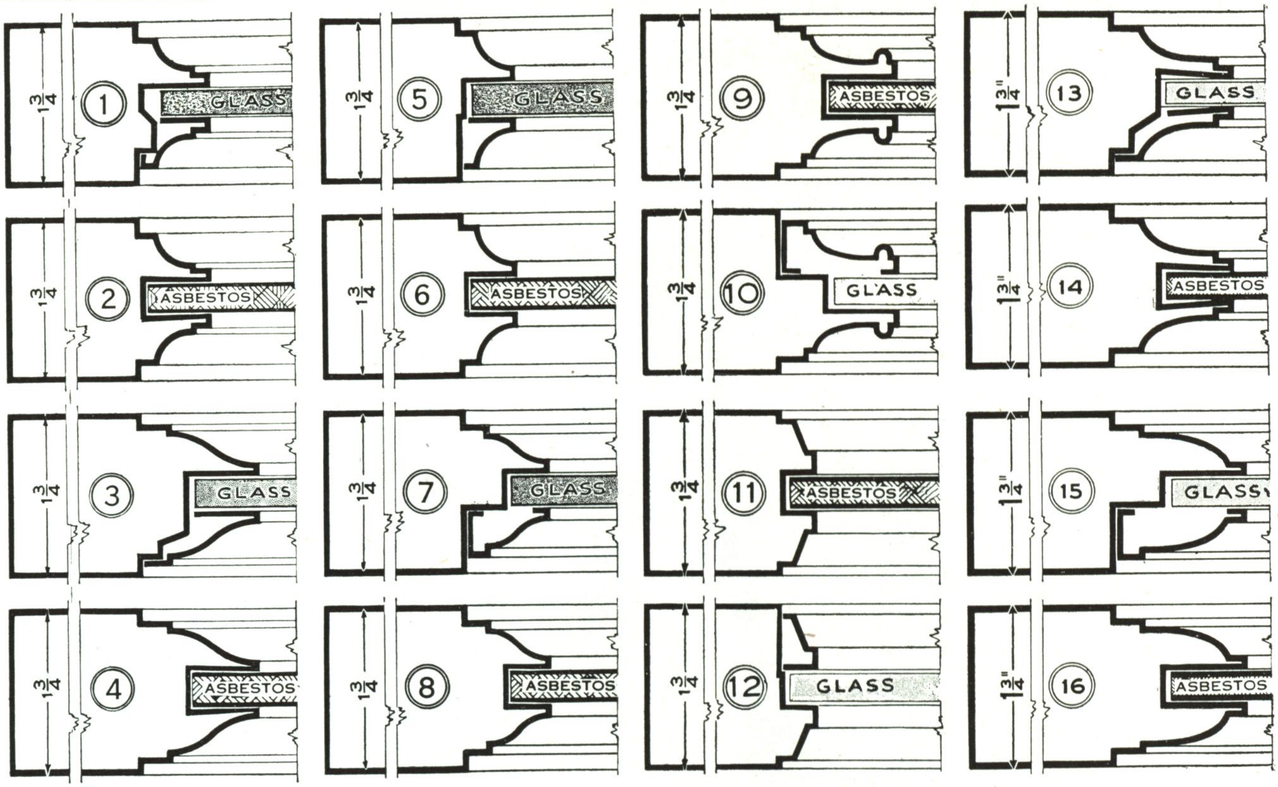
Following is a partial list of installations executed by the JAMESTOWN METAL DESK COMPANY, INC.

New York Times Annex, New York, N. Y., Ludlow & Peabody, Architects; Geo. A. Fuller Co., Contractors
Roosevelt Hospital, New York, N. Y., York & Sawyer, Architects; Marc Eidlitz & Sons, Contractors
Mellon National Bank, Pittsburgh, Pa., Trowbridge & Livingston, Architects; Mellon-Stuart Co., Contractors
Bank of Buffalo, N. Y., McKim, Mead & White, Architects; John W. Cowper Co., Contractors
Keith Theater & Office Building, Cleveland, Ohio, C. W. & Geo. L. Rapp, Architects; Lundoff-Bicknell Co., Contractors
Federal Reserve Bank, Minneapolis, Minn., Cass Gilbert, Architect; C. F. Haglin & Sons, Contractors
Biltmore Hotel, Los Angeles, Cal., Schultze & Weaver, Architects
Office Building for First Baptist Church, Houston, Tex., C. D. Hill & Co., Architects; Thos. Tellepsen, Contractor.
Life Insurance Co. of Virginia, Richmond, Va., Clinton & Russell, Architects; John R. Wilson & Co., Contractors
Detroit Free Press, Detroit, Mich., Albert Kahn, Architect; Crowell Little Construction Co., Contractors
Liberty Bank of Buffalo, Buffalo, N. Y., Alfred C. Bossom, Architect; John Gill & Sons, Contractors

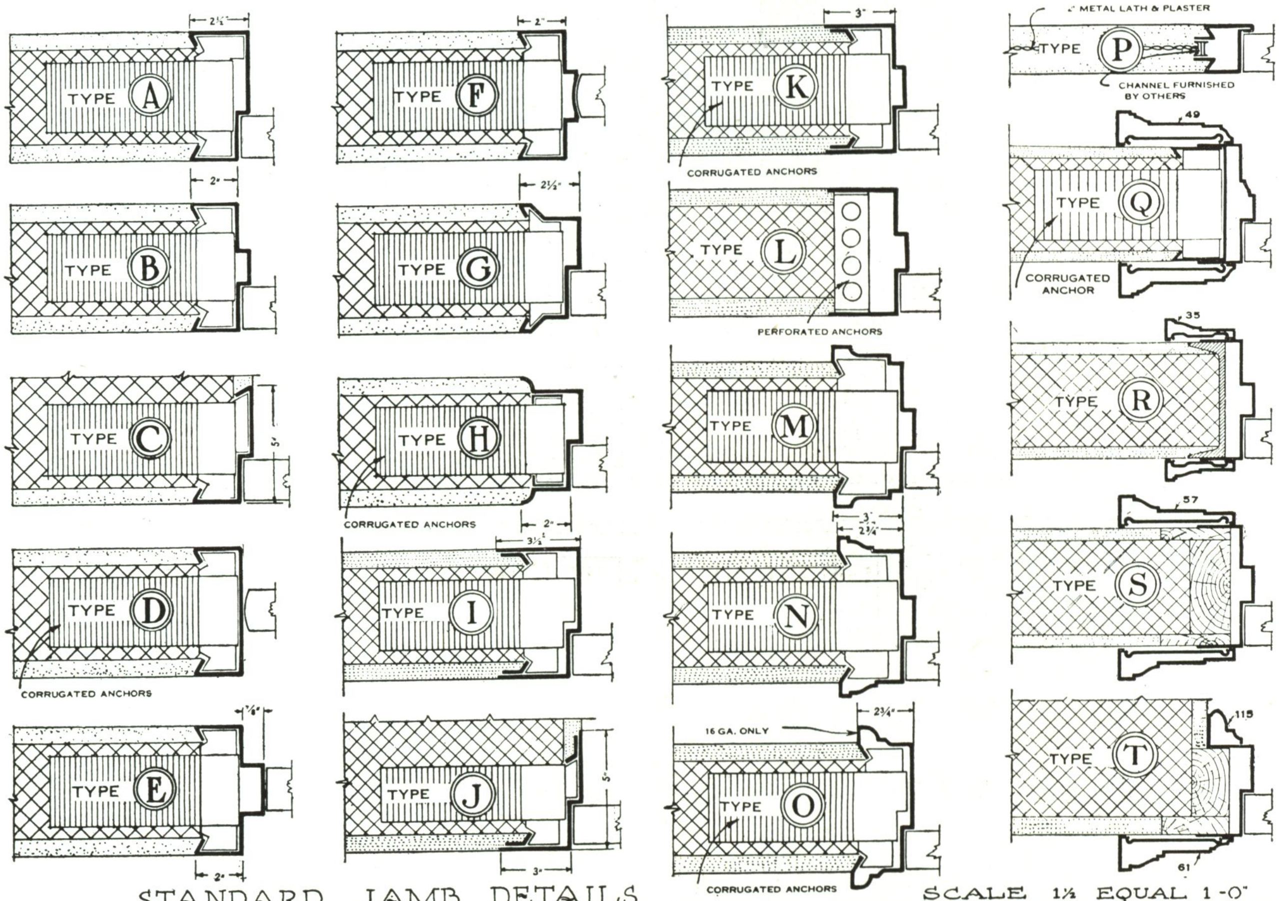


STANDARD STYLES OF DOORS

Continued on next page


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
1¾
1¾"
GLASS
ASBESTOS

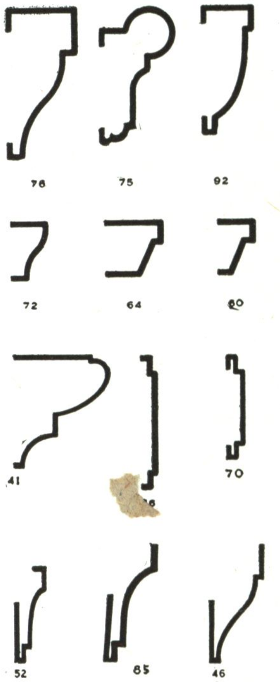
STANDARD · DOOR · SECTIONS · HALF SIZE


TYPE A
TYPE B
TYPE C
TYPE D
TYPE E
TYPE F
TYPE G
TYPE H
TYPE I
TYPE J
TYPE K
TYPE L
TYPE M
TYPE N
TYPE O
TYPE P
TYPE Q
TYPE R
TYPE S
TYPE T
2¼"
2"
2½"
3"
3½"
2¾"
⅞"
5"
CORRUGATED ANCHORS
PERFORATED ANCHORS
CORRUGATED ANCHOR
16 GA. ONLY
METAL LATH & PLASTER
CHANNEL FURNISHED BY OTHERS
49
35
57
115
61

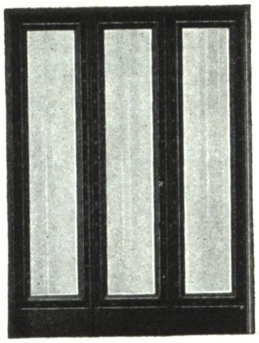
STANDARD JAMB DETAILS SCALE 1½ EQUAL 1-0"

JAMESTOWN METAL DESK COMPANY	DETAILS OF HOLLOW METAL DOORS & TRIM	MEDESCO DRAWING-1

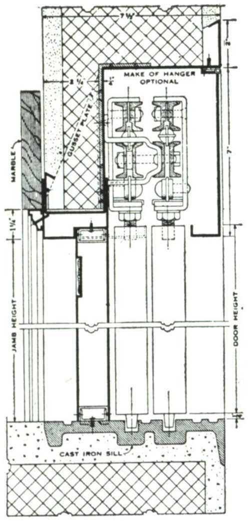
Continued on next page

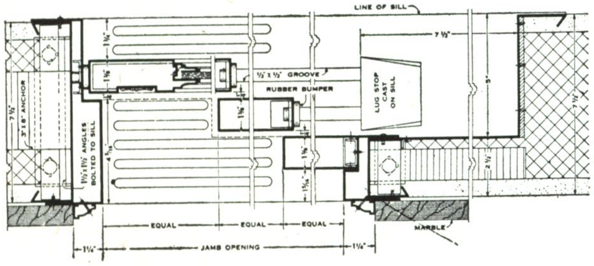

76
75
92
72
64
60
41
70
52
65
46

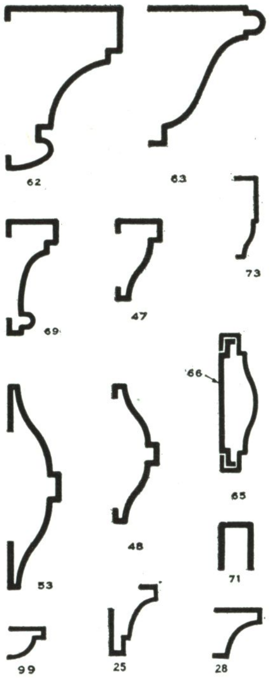
PANEL & SCRIBE MOULDINGS



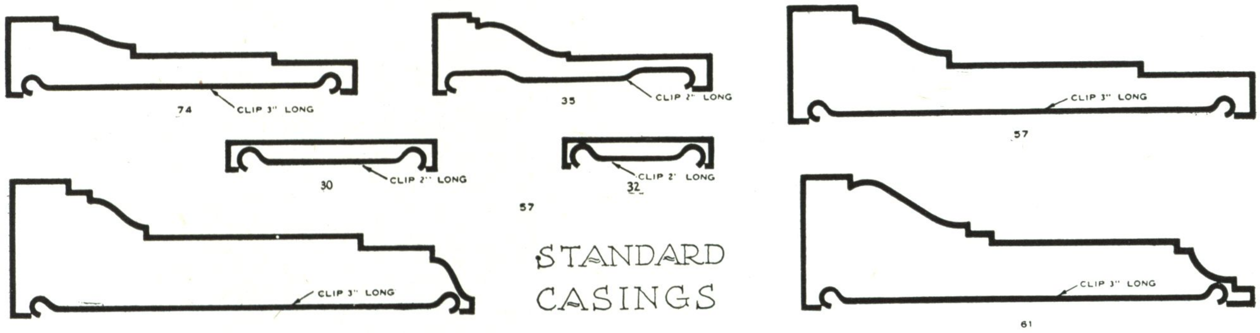
Two-Speed and Stationary Panel Elevator Door Unit. The illustration shows our design D-2 Doors Special, with paneled stiles and rails and applied ornaments. Any design door and any type moulding and finish can be applied to meet architects' specifications. Materials, quality and workmanship are maintained throughout all designs and types of our products.


7½"
MAKE OF HANGER OPTIONAL
MARBLE
JAMB HEIGHT
DOOR HEIGHT
CAST IRON SILL

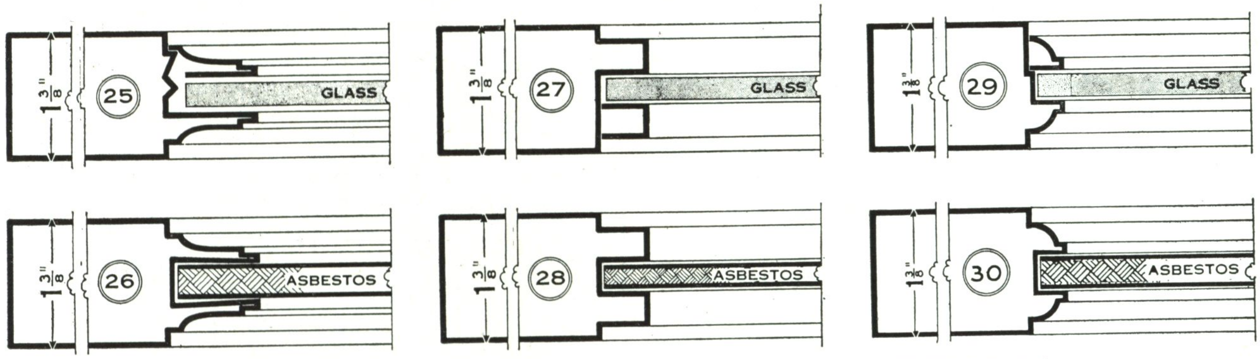

LINE OF SILL
7½"
½" x ½" GROOVE
RUBBER BUMPER
LUG STOP CAST ON SILL
ANCHOR
ANGLES BOLTED TO SILL
EQUAL
EQUAL
EQUAL
JAMB OPENING
MARBLE
1¼"
1¼"


62
63
69
47
73
66
53
48
65
71
99
25
28

PANEL & SCRIBE MOULDINGS


74
CLIP 3" LONG
35
CLIP 2" LONG
57
CLIP 3" LONG
30
CLIP 2" LONG
32
CLIP 2" LONG
57
CLIP 3" LONG
61
CLIP 3" LONG

STANDARD CASINGS


1⅜"
25
GLASS
1⅜"
27
GLASS
1⅜"
29
GLASS
1⅜"
26
ASBESTOS
1⅜"
28
ASBESTOS
1⅜"
30
ASBESTOS

· STANDARD · ELEVATOR · DOOR SECTIONS ·

JAMESTOWN METAL DESK COMPANY

DETAILS OF HOLLOW METAL DOORS & TRIM

MEDESCO
DRAWING 2

LAWTON-STEPHENS CO., INC.

SUCCESSORS TO GRINDEN ART METAL CO.

Hollow Metal Doors, Drawn Steel Mouldings, Sheet Steel Specialties

SALES OFFICES AND PLANT
427 Marcy Avenue, BROOKLYN, N. Y.

REPRESENTATIVES

LOS ANGELES, CAL., Fire Proof Metal Products Co., 300 E. Ninth Street
CLEVELAND, OHIO, George Kimble, 605 Swetland Building
PITTSBURGH, PA., Fireproof Materials Co., 337-39 Second Avenue
MIAMI, FLA., W. L. Rocke, % George R. Brewer, Calumet Building
WASHINGTON, D. C., R. T. McKnew, 607 Lenox Building
BOSTON, MASS., W. J. Grosvenor & Co., 8 Beacon Street
HOUSTON, TEX., F. B. Walcott, 322 West Building
BALTIMORE, MD., Consolidated Supply Co., 10 West Chase Street
SAN ANTONIO, TEX., George E. Ginter, M. E., Calcasieu Building
DENVER, COLO., George P. Heinz & Co., 1740 Champa Street
MEMPHIS, TENN., Gerber Building Material Co., Room 7, Memphis Cotton Exchange Building
PHILADELPHIA, PA., R. C. Kratz, 419 Perry Building
DETROIT, MICH., Ray W. Springer, 544-46 David Whitney Building
DALLAS, TEX., Samuel A. Ellsberry Co., 1716 Carter Street
DAYTON, OHIO, Building Products Co., 1030 Riebold Building
COLUMBUS, OHIO, Building Products Co., 975 W. Goodale Street
SCRANTON, PA., Foote & Becker, 517 Lackawanna Avenue
HARTFORD, CONN., George F. Smart & Co., 372 Trumbull Street
ROCHESTER, N. Y., Swalbach Building Products Co., 200 Central Trust Building
ENGLAND: Railway Supplies Co., Ltd., 68 Victoria Street, Westminster, LONDON, S. W. 1

Products and Services

Hollow Steel Doors; Combination Bucks, Jambs and Trim; Cabinet Jambs and Trim; Borrowed Lights; Metal Base; Wire Moulding; Picture Moulding; Chair Rail, etc.

Also complete Elevator Enclosures, consisting of Doors, Frames, Trim, Saddles, Hardware, etc.; Railway Car Doors; Drawn Mouldings from stock dies or made to special details, including extensive lines of Panel Moulding; Trim; Automobile Moulding; Channels; Angles, and Special Shapes of various kinds adapted to the manufacturer's special requirements.

The Lawton-Stephens Co., Inc. cordially invites architects and engineers to use its Sales Department Services. Without obligation of any kind, it will be glad to submit tentative designs and specifications, and co-operate in any way regarding methods of construction or problems where products of this nature are contemplated.

Hardware Templets and Samples

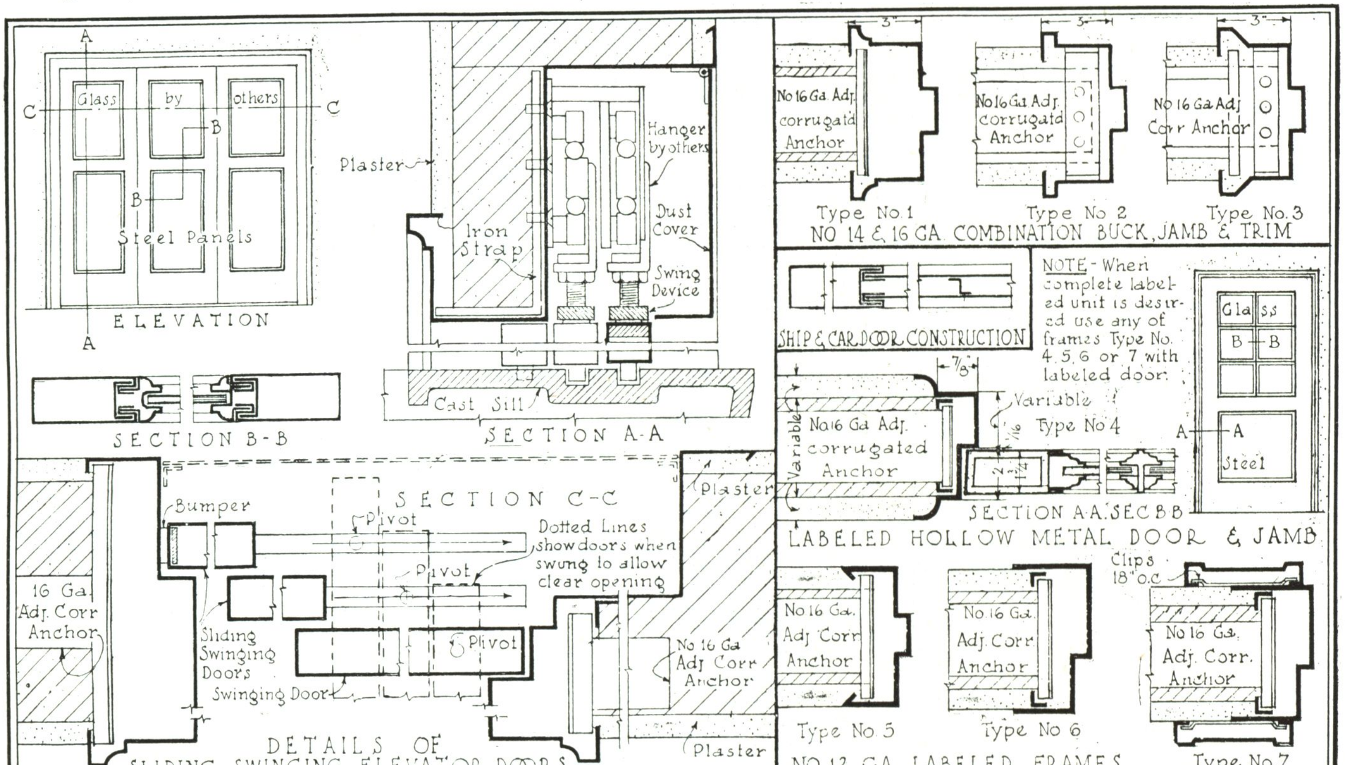
Our stockroom contains templets and samples of all leading hardware manufacturers, thereby avoiding unnecessary delay in filling orders.

Doors

The Lawton-Stephens hollow metal doors are made in a variety of styles and sizes, not only as required for the modern fireproof structure, but also as used on ocean-going steamships; battleships; subway, passenger, baggage and parlor cars; louver ventilating doors; folding doors for telephone booths and other special purposes.

Its standardized hollow steel doors are constructed with care, and represent years of study in this field. They are adapted to meet all conditions where the best and most durable type of fireproof construction is required, such as in hotels, hospitals, residences, apartment houses, office buildings, etc.

Specifications—All doors to be of size and design as shown on door schedule and drawings, of Lawton-Stephens Co., Inc. manufacture or equal, constructed throughout of open hearth, cold rolled, patent leveled furniture steel. They shall be 1¾ in. thick, 5-in. stiles and rails, except bottom rail which shall be 10 in. in height, and be welded at all points of intersection. Stiles and rails to be of No. 18 gauge steel, with suitable asbestos or cork filler; panels to comprise two sheets of No. 18 gauge steel with suitable asbestos or other filler, and mouldings to be cold drawn of No. 20 gauge steel. Mouldings should be interlocked with and into these stiles and rails and where doors are


Glass by others
Steel Panels
ELEVATION
SECTION B-B
Plaster
Iron Strap
Hanger by others
Dust Cover
Swing Device
Cast Sill
SECTION A-A
3"
No 16 Ga Adj corrugatd Anchor
No 16 Ga Adj corrugatd Anchor
No 16 Ga Adj Corr Anchor
Type No 1
Type No 2
Type No 3
NO 14 & 16 GA. COMBINATION BUCK, JAMB & TRIM
SHIP & CAR DOOR CONSTRUCTION
NOTE - When complete labeled unit is desired use any of frames Type No. 4, 5, 6 or 7 with labeled door.
Glass
Steel
7/8"
Variable
Variable
No 16 Ga Adj. corrugated Anchor
Type No 4
SECTION A-A SEC B-B
LABELED HOLLOW METAL DOOR & JAMB
Clips 18" o.c.
No 16 Ga. Adj. Corr Anchor
No 16 Ga. Adj. Corr Anchor
No 16 Ga. Adj. Corr. Anchor
Type No 5
Type No 6
Type No 7
NO 12 GA. LABELED FRAMES
SECTION C-C
Bumper
Pivot
Pivot
Pivot
Dotted Lines show doors when swung to allow clear opening
16 Ga. Adj. Corr Anchor
Sliding Swinging Doors
Swinging Door
Plaster
No 16 Ga Adj Corr Anchor
Plaster
DETAILS OF SLIDING SWINGING ELEVATOR DOORS

1½" SCALE DETAILS OF LAWTON-STEPHENS HOLLOW METAL DOORS & TRIM

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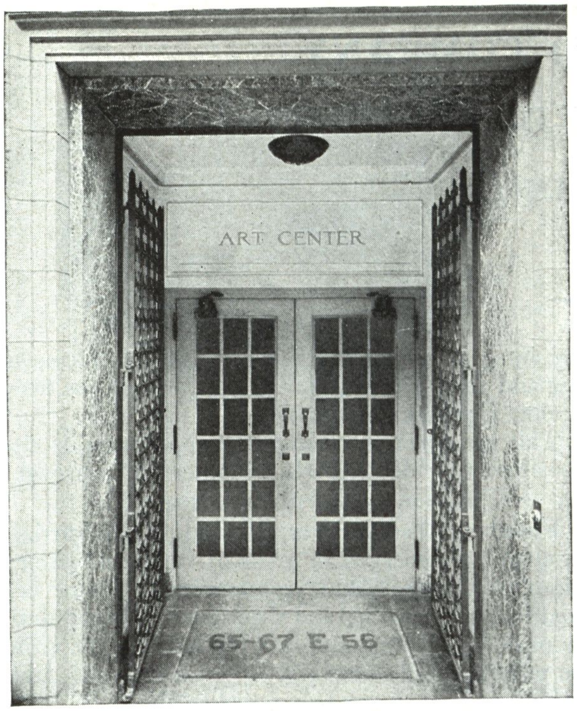


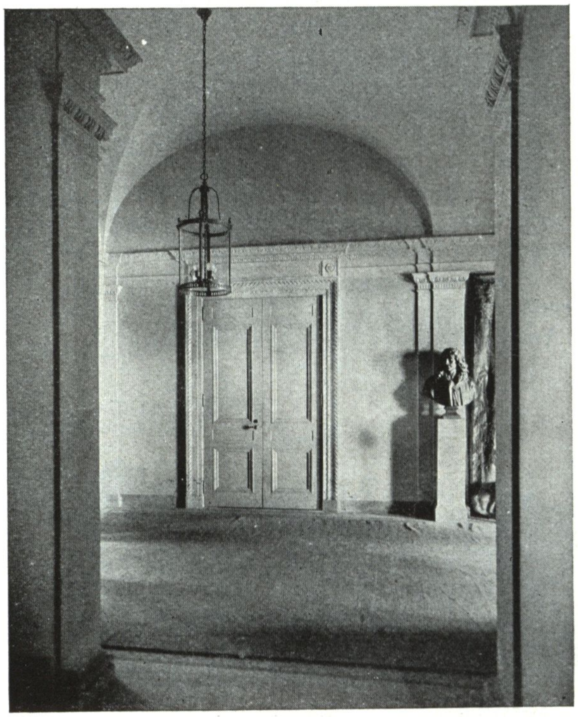
Steel Doors Installed in Art Center Building, New York, N. Y.

glazed be provided with loose steel stops arranged to receive the glass.

Note: If Underwriters' doors are required, they should be so specified, in which event, stiles and rails are lined with asbestos, with Z-bar or other suitable spreader.

Jambs may be No. 12, 14 or 16 gauge, one-piece combination buck and frame, or No. 18 gauge and installed over No. 12 gauge steel bucks or over wooden bucks. With the last named construction, trim is separate and can carry, as with the jambs, baked enamel finish, either plain or grained as desired.

Door transoms, base, chair rail, picture or wire mouldings may be had either in prime finish and finished afterwards at the building by the painting contractor, or in baked enamel finishes, either plain color, stippled or grained to imitate wood.

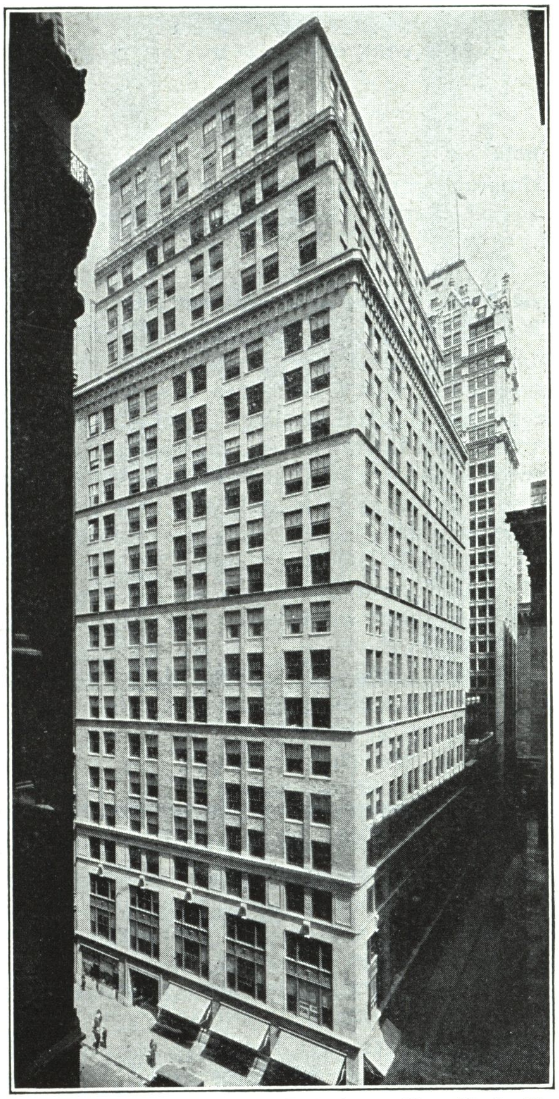


Steel Doors Installed in Academy of Arts & Letters Building, New York, N. Y.

McKim, Mead & White, Architects

Other Products

This Company manufactures drawn formed steel and bronze mouldings, and small assembled parts adapted to a variety of purposes. Many of the moulding shapes can be furnished from stock. It is also prepared to roll to order mouldings of any shape, simple or difficult, when orders for reasonable quantities are placed.



Westinghouse Building, 150 Broadway, New York, N. Y.

Starrett & Van Vleck, Architects Fred T. Ley & Co., General Contractors

Equipped throughout with hollow metal doors and trim base, picture wire moulding, elevator enclosures, etc., by Lawton-Stephens Co., Inc.

Installations with Names of Architects

Mountainside Hospital, Glen Ridge, N. J., York & Sawyer
Somerset Hospital, Somerville, N. J., Crow, Lewis & Wick
Seton Hospital, New York, N. Y., I. E. Ditmars
Biltmore Hotel, New York, N. Y., Warren & Wetmore
Kings County Lighting Building, Brooklyn, N. Y., J. D. Blauvelt
Roosevelt Memorial House, New York, N. Y., Theodate Pope
St. James Building, New York, N. Y., D. Everett Waid
Bank of Africa, New York, N. Y., Kenneth Murchison
Various Telephone Exchanges, New York, N. Y., McKenzie, Voorhees & Gmelin.
N. Y. Edison Co., Substations, William Whitehill
Childs Restaurants, William Westervelt
Albee Theater, Brooklyn, N. Y., Thomas W. Lamb
Brensinger School, Phillipsburg, N. J., Ritcher & Eiler
Beacon Telephone Exchange, East Haven, Conn., Gray & Lawrence
Powell Building, New Haven, Conn., W. R. Foote
Baptist Temple, Rochester, N. Y., Gordon & Kaelber
Hotel Bermudiana, Bermuda, Warren & Wetmore
East Denver High School, Denver, Colo., Geo. H. Williamson
Woodrow Wilson High School, San Diego, Cal., T. C. Kister & Co.

J. C. McFARLAND COMPANY

Hollow Metal Doors

LAPORTE, IND.

NEW YORK OFFICE, 10 West 46th Street

CHICAGO OFFICE, 1414 Strauss Building

Products

Manufacturers of Hollow Metal Fireproof Doors and Trim; Combination Buck, Jamb and Trim.

Hollow Metal Doors and Interior Trim

The McFarland door is constructed entirely of No. 18 gauge full finished sheets, ordinarily termed metallic furniture stock, which are given a special process of pickling, annealing and leveling. The stiles are formed in one piece, and the rails in two pieces, interlocking with continuous channel. This interlocking channel is drawn and is so attached as to become a reinforcing member. Both the top and bottom rails are reinforced with channels, vertically and horizontally.

The panel construction consists of No. 18-gauge steel with an insert of asbestos and felt between the two sheets of steel.

The panel moulding and panel channels are drawn in one piece. The miters are milled so as to fit perfectly, and then pressed on to the panel.

Miters of the panel moulding are continuously welded on the underside, and practically form a door construction in itself.

Stiles and rails are snapped to the panel construction and all joints between stiles and rails are thoroughly welded so as to procure a maximum of stiffness and rigidity. Doors are notched and reinforced in manner required for hardware application.

No. 18-gauge steel is used throughout the construction of jambs and trim.

Elevator Doors—We have given careful study to the subject of elevator door construction. They must be rigidly built to withstand the hard usage of constant operation.

We construct the stiles and rails of elevator doors of a No. 14 gauge lining and a No. 18 gauge outer shell. These are lapped and electrically welded together to form integral members. The combined thickness of lining and shell is more than 1/8 in., forming the heaviest and most rigid door obtainable.

This construction permits the application or change in position of closers, pulls or other hardware at any time. No additional reinforcing is required.

Finish—All surfaces are thoroughly cleaned. The door then is submerged in a vat of rustproof paint; all sections of the door being communicative, same is permitted to fill with paint, and then drawn out and drained. This provides a foundation for the finish coats, either in plain colors, stippled metallic or grained wood finishes, each coat or color being baked separately.

Labels—J. C. McFarland Company metal doors bear the label of the Underwriters' Laboratories, Inc., and are inspected and approved by them.

Combination Buck, Jamb and Trim Frames

These frames are rolled from No. 16 gauge, full finished strip steel. Corners are acetylene-welded and ground smooth. Reinforcing, mortising, drilling and tapping for hardware is done from templets.

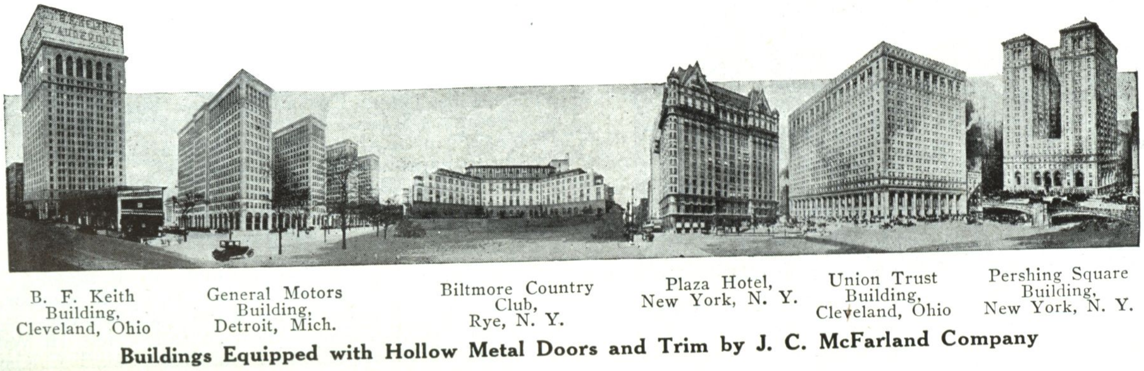
Frames are shipped with prime on ground coat finish. Being of one piece of metal they are far more sanitary than wood, and are fireproof and verminproof, but the price is competitive with wood.

The entire frame is erected at one time. It is not necessary to have a carpenter first erect a buck, later the jambs and trim, and then cut out for hardware. This effects a considerable saving in the time of the completion of the building and makes their use far more economical than wood.

These frames are used extensively in apartment houses, hotels and hospitals. More than 9000 frames are now being installed in one new Chicago hotel alone.

Reference

Any prominent architect or contractor.



B. F. Keith Building, Cleveland, Ohio
General Motors Building, Detroit, Mich.
Biltmore Country Club, Rye, N. Y.
Plaza Hotel, New York, N. Y.
Union Trust Building, Cleveland, Ohio
Pershing Square Building, New York, N. Y.

Buildings Equipped with Hollow Metal Doors and Trim by J. C. McFarland Company

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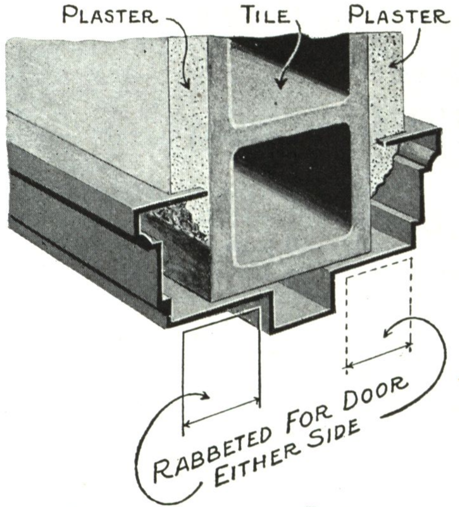
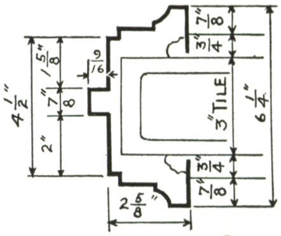
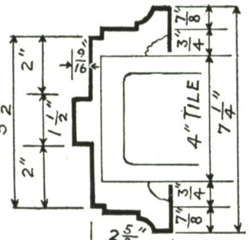

PLASTER
TILE
PLASTER
RABBETED FOR DOOR EITHER SIDE

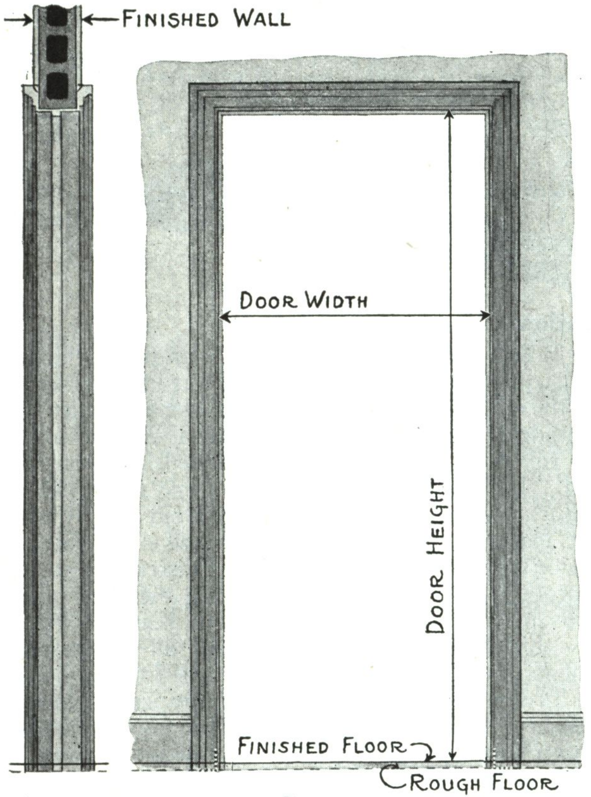
ISOMETRIC PLAN


4 1/2"
1 5/8"
9/16
7/8"
2"
7/8"
3/4"
3" TILE
6 1/4"
3/4"
7/8"
2 5/8"

FOR 3" TILE

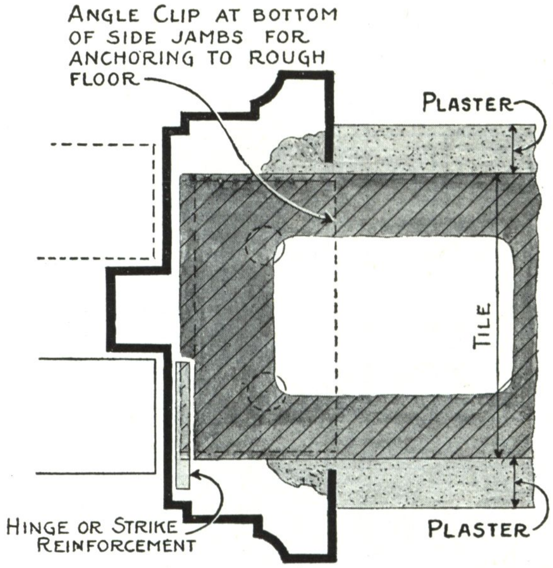

5 1/2"
2"
9/16
1 1/2"
2"
7/8"
3/4"
4" TILE
7 1/4"
3/4"
7/8"
2 5/8"

FOR 4" TILE


FINISHED WALL
DOOR WIDTH
DOOR HEIGHT
FINISHED FLOOR
ROUGH FLOOR

SECTION

ELEVATION


ANGLE CLIP AT BOTTOM OF SIDE JAMBS FOR ANCHORING TO ROUGH FLOOR
PLASTER
TILE
PLASTER
HINGE OR STRIKE REINFORCEMENT

SECTION THRU JAMB
TYPICAL ALSO FOR HEAD

GENERAL NOTE

THE COMBINATION BUCK-JAMB & TRIM **ELIMINATES** THE NECESSITY OF A **LINTEL** OVER OPENING- COLD ROLLED FROM **16 GAUGE STEEL**- IT WITHSTANDS AND ABSORBS THE SHOCK OF THE HEAVIEST DOOR.

ELIMINATES SEPARATE WOOD OR STEEL **BUCKS, JAMBS** AND **TRIM**, AND THEREBY **REDUCES** ERECTION **COST TWO THIRDS**, AS THE ENTIRE UNIT IS INSTALLED AT ONE TIME.

UNITS MADE FOR EITHER RIGHT, OR LEFT HAND **SINGLE DOORS, DOUBLE DOORS, TRANSOM OPENINGS**, ETC. JAMBS **REINFORCED SECURELY FOR** APPLICATION OF **HARDWARE**.

FURNISHED IN PRIME FILLER COAT **READY FOR FINISH PAINTING**.

PROMPT SHIPMENT, LOW IN COST, AND **EASY TO INSTALL**.

COMBINATION • BUCK • JAMB AND TRIM
MANUFACTURED BY
J. C. McFARLAND CO. LAPORTE, IND.

THE RIESTER & THESMACHER COMPANY

Hollow Metal Doors and Trim

1514-1526 West 25th Street
CLEVELAND, OHIO

Products

Hollow Metal Doors, Partitions, Elevator Fronts, Combination Bucks and Jambs, Metal Base and Picture Mould.

For Steel Stairs, see page 642.

Construction

The R & T hollow metal door with its interlocking joint construction has been developed through fifteen years in the door business. The doors are constructed of first grade No. 18 gauge furniture steel, full pickled, full cold rolled, re-annealed, patent leveled, re-squared and oiled. Jambs and casings are of same gauge material. Bucks or frames are fabricated from No. 10 to 14 gauge material in accordance with size of opening and service required. All joints in construction are electric process welded, practically making the door one continuous piece of metal. Proper reinforcements are welded within the door to take care of all hardware requirements and the entire design makes for rigidity, stability, fire protection and neat appearance. These doors can be fitted to either the cabinet jamb design or combination buck and jamb. R & T hollow metal doors, having no combustible material within the door, are fire retarding and fully meet the requirements of the National Board of Fire Underwriters and bear their label, when specified.

Finish

Before assembly, all parts are paint dipped in order to protect the interior of the door. Before final finish, all surfaces are thoroughly cleaned to remove grease or oil.

Each coat of paint or enamel is carefully baked and properly treated to secure the highest possible finish. Doors are finished in prime coat, plain color enamels, stipples and wood graining reproductions.

Hardware

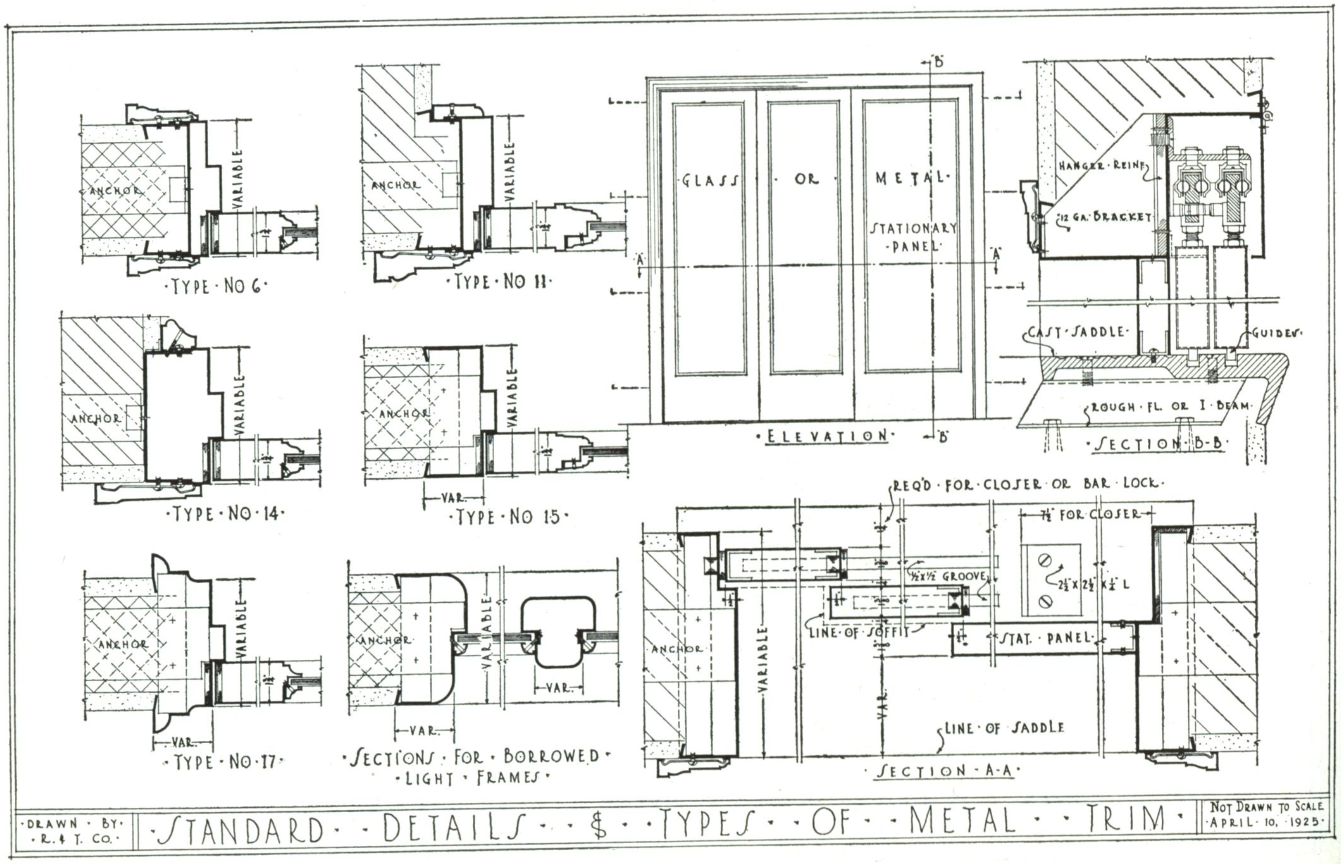
Hardware, as selected and furnished by the owner, is applied at the factory, and we have a good selection of templates of standardized hardware which facilitates delivery and avoids undue delay.

Upon request we are glad to furnish typical details and stock mouldings in order to assist in designing metal trim.

References

A few buildings of varied types in which we have recently made installations of metal trim:

Cleveland Public Auditorium, Cleveland, Ohio
Weymouth Power Station, Boston, Mass.
Maternity and Children's Hospitals, Cleveland, Ohio
Burton Abstract and Title Co., Detroit, Mich.
Elyria Savings & Trust Co., Elyria, Ohio


ANCHOR
VARIABLE
TYPE NO 6
TYPE NO 11
GLASS OR METAL
STATIONARY PANEL
A
B
ELEVATION
HANGER REINF.
12 GA. BRACKET
CAST SADDLE
GUIDES
ROUGH FL. OR I BEAM
SECTION B-B
TYPE NO 14
VAR.
TYPE NO 15
REQ'D FOR CLOSER OR BAR LOCK
7¼ FOR CLOSER
½x½ GROOVE
2¼x2¼x¼ L
LINE OF SOFFIT
STAT. PANEL
LINE OF SADDLE
SECTION A-A
TYPE NO 17
SECTIONS FOR BORROWED LIGHT FRAMES
DRAWN BY R. & T. CO.
STANDARD DETAILS & TYPES OF METAL TRIM
NOT DRAWN TO SCALE
APRIL 10, 1925

THE SYKES COMPANY

Fabricated Steel Products to Specification

2302 West 58th Street
CHICAGO, ILL.

Products

Hollow Metal Doors; Integral Steel Door Buck and Trim.

Windows, Steel Mouldings, Breeching Spouting Chutes, Hoppers, Bins, Gates—all types of sheet products fabricated to specification.

Hollow Metal Doors

Sykes Hollow Metal Doors are made of satin finish cold rolled furniture steel, and are welded in all joints forming a rigid unit that will not warp or sag under any atmospheric conditions or under the abuse to which such doors are often subjected.

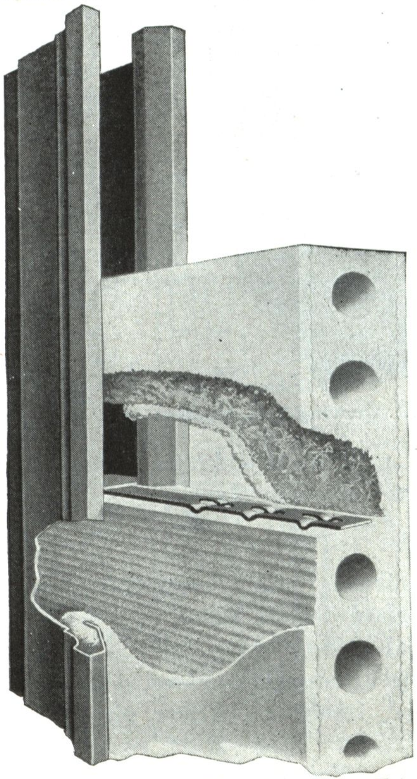
All Sykes Fire Resisting Doors are insulated with asbestos and deadened with cork. When fire resisting qualities are not necessary, insulation and deadening material may be eliminated.

Sykes Hollow Metal Doors are made in sizes and styles to suit the most exacting conditions where appearance, sanitation, and fire resisting qualities are of prime consideration. They are used for stairways, elevator enclosures, corridors and partitions, rooms and offices, in office buildings, hotels, hospitals, apartments, schools, dormitories, clubs and other buildings.

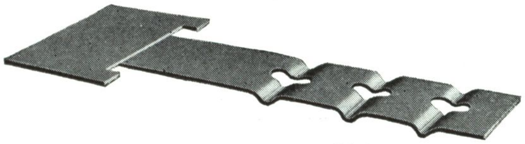
Each Sykes Door is thoroughly examined before leaving our factory, and carries the underwriter's label.

Integral Steel Door Buck and Trim

The Sykes Steel Door Buck and Trim, is made from one piece of steel, formed through roller dies, and drawn into shape from the flat metal with one pulling operation. The material used is No. 16 gauge ($\frac{1}{16}$ in.) thick, cold rolled, drawn steel, with smooth finished surface which is sufficiently strong to resist damage by abuse. The miters are butt welded so that the outside surface is always true and smooth; being of steel, they do not sag, shrink or warp. Dampness does not affect them. They are sanitary, fireproof, and not distorted by the weight of masonry. The standard finish is a shop coat of paint, air dried. Special finishes can be furnished, consisting of a primary coat baked on as a base and any finishing coat required.



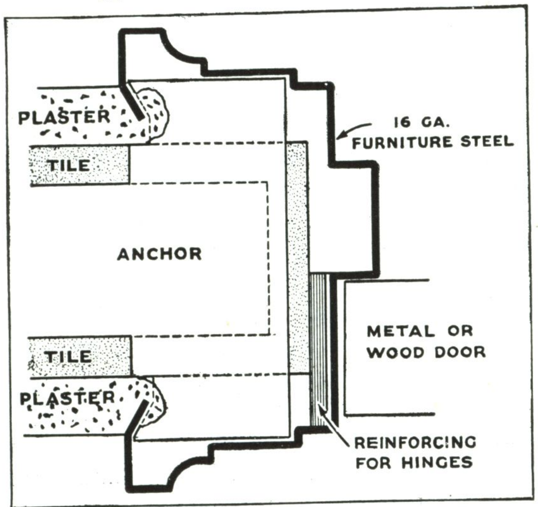
Phantom View of Complete Door Trim



Anchor for Door Trim

The door bucks are set up and fastened in the partition by insertion of tile or macolite clear into the back of the jamb. Adjustable anchors are provided so as to be inserted at intervals in the points of the tile, thereby insuring a permanent rigid installation. Special designs to conform with other trim can be made if desired, although we have several standard designs which conform to architectural practice.

Economy—We claim a great saving of field labor over the practice followed in the installation of wood jambs, buck and trim. When the steel buck is satisfactorily built in, all work in connection with the door opening is completed. Sykes Integral Door Buck and Trim costs approximately 20% less to install. They are cheaper than wood, more easily installed, fireproof, sanitary, rigidly built, made in one piece, no moulding or strips to attach.



One of the Standard Types of Sykes Integral Steel Door Buck and Trim

Architects' Service

Our Engineering Department will gladly assist architects whenever possible. Do not hesitate to ask us for co-operation.

Bulletins

We have available Bulletins Nos. 34, 134 and 234 which completely describe the Sykes Integral Steel Door Buck and Trim, its uses and the savings effected.

THE UNITED METAL PRODUCTS COMPANY

Manufacturers of Hollow Metal Doors and Trim

EXECUTIVE OFFICES AND FACTORY

CANTON, OHIO

DISTRICT OFFICES OR SALES REPRESENTATIVES IN ALL IMPORTANT CITIES

Products

Hollow Metal Doors and Trim.

Hollow Metal Elevator Doors and Enclosures Complete.

Conduo-Base (for carrying electric wires).

"United" Metal Partition.

"United" Frames (Buck, Jamb and Trim in one piece).

Mouldings of all descriptions (Base, Picture Wire, etc.).

Plant and Facilities

"United" doors are manufactured in the largest plant in the world devoted exclusively to the manufacture of hollow metal doors, frames, trim, and the interior metal finish for buildings.

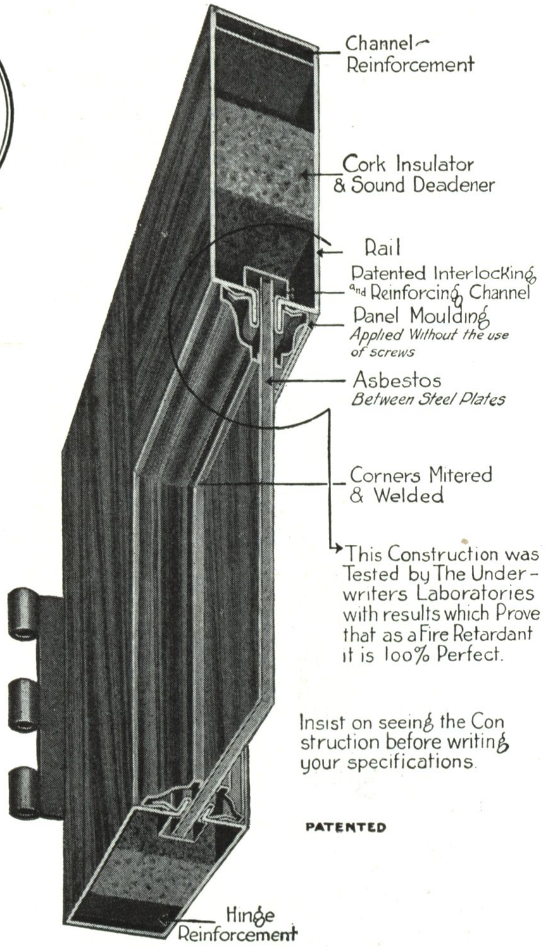
This plant is equipped to handle any size contracts, or number of contracts, and as it is located in the heart of the steel producing industry, we enjoy unusual facilities in deliveries of raw material. In this plant will be found the very latest machinery and methods of producing the finest type of interior metal trim.

Underwriters' Approval

The United Metal Products Company is granted the right to manufacture and label fire wall doors made from No. 18 gauge steel and of hollow construction. This door is of the all-metal type and, while of special construction, it can be divided into any number of panels and grained to match any finish desired.

The U.M.P. fire wall door displaces the old time unsightly tin clad type. It can be hung in place with ordinary everyday butts, to a regular standard No. 16 gauge jamb attached to an ordinary No. 10 gauge buck. All of which have been tested, and approved by The Underwriters' Laboratories, Inc. The only item of hardware needed on the U.M.P. inspected fire wall door in excess of what is required on any other door is a three-point lock.

We are prepared to execute orders for fire wall doors and frames in any volume and any size up to and including 4 ft. in width by 8 ft. in height for a single door, to 8 ft. in width by 8 ft. in height for a pair of doors.


Channel Reinforcement
Cork Insulator & Sound Deadener
Rail
Patented Interlocking and Reinforcing Channel
Panel Moulding Applied Without the use of screws
Asbestos Between Steel Plates
Corners Mitered & Welded
This Construction was Tested by The Underwriters Laboratories with results which Prove that as a Fire Retardant it is 100% Perfect.
Insist on seeing the Construction before writing your specifications.
PATENTED
Hinge Reinforcement

Detail Showing Construction of U.M.P. Door

Description

The following brief description shows how the U.M.P. standard door is built:

Material—No. 18 gauge (U. S. Standard) furniture stock steel thoroughly pickled, double annealed and patent leveled, free from blisters, pits or other imperfections.

Doors are 1¾ in. thick.

Continued on next page

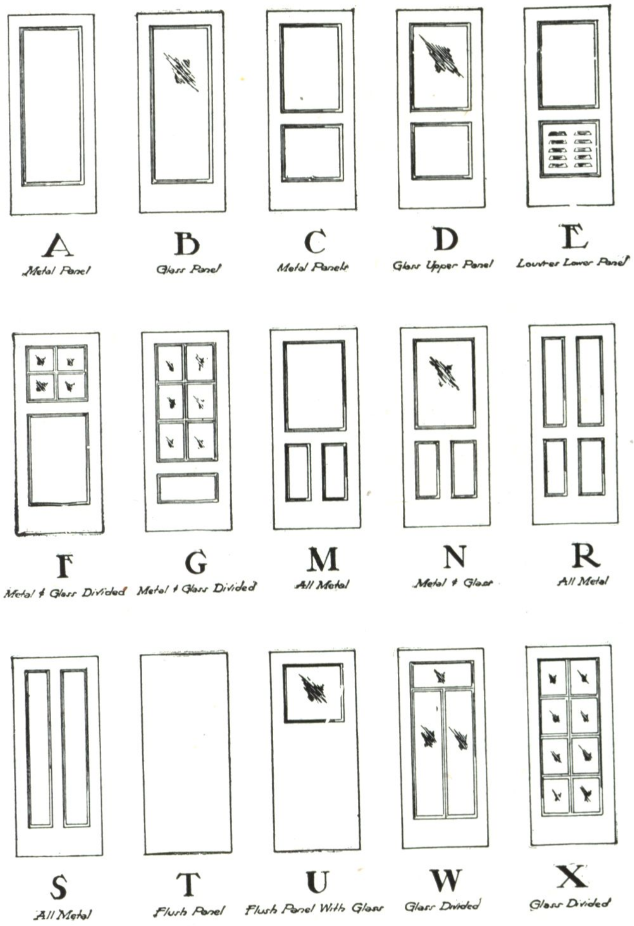
Stiles and Rails—Formed to the required width and thickness and joined together with the "oxy-acetylene" process. All joints are made perfectly level and invisible. A cork insert is placed in the stiles and rails for the purpose of deadening the metallic sound.

Panels—Constructed of two sheets of No. 18 gauge furniture stock steel, between which there is an asbestos filler ¼ in. in thickness. The panels are joined to stiles and rails with an interlocking reinforcing key of such design as to form a deep channel recess for the reception of panel.

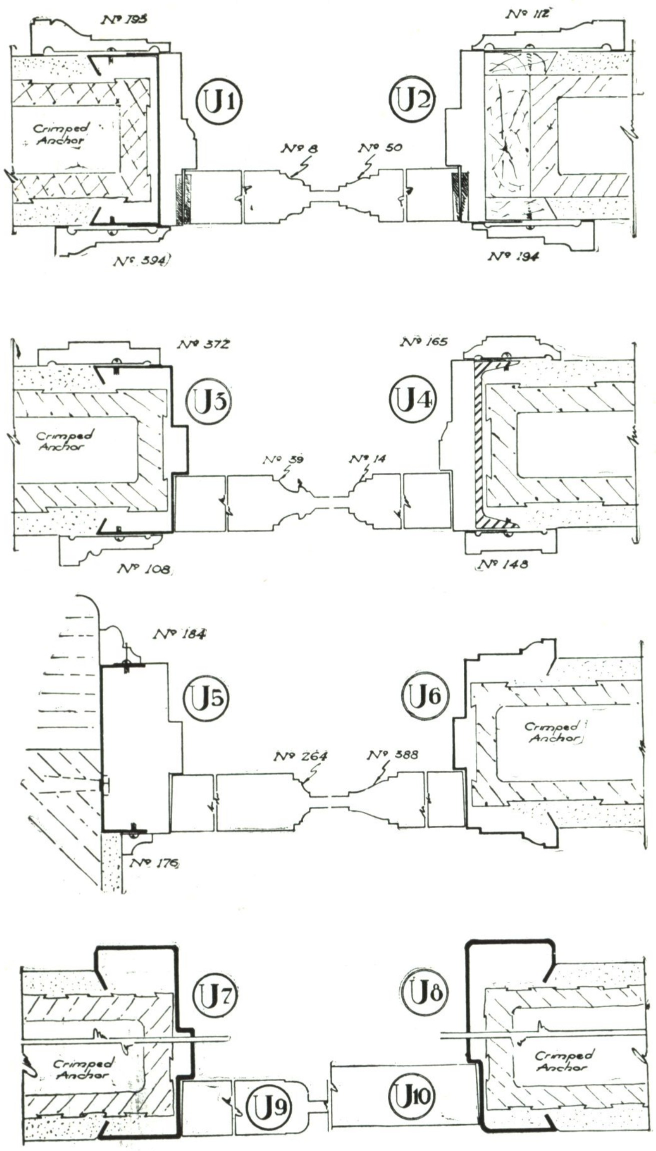
This construction has merited the approval of the Underwriters' Laboratories, Inc., it having withstood a fire test of unusual severity without the slightest indication of failure.

We invite investigation and inspection of the U.M.P. standard door and with special reference to the panel construction. We will be glad to furnish a *corner section* of this door to any one interested, and suggest that a comparison be made of its construction with the old system of a rectangular stile and rail with the panel mouldings simply screwed or spot-welded to it.

Investigation will show as fire tests have proved that the construction of the U.M.P. standard hollow metal door is 100% perfect and a fire retardant without equal.


A
Metal Panel
B
Glass Panel
C
Metal Panels
D
Glass Upper Panel
E
Louvre Lower Panel
F
Metal & Glass Divided
G
Metal & Glass Divided
M
All Metal
N
Metal & Glass
R
All Metal
S
All Metal
T
Flush Panel
U
Flush Panel With Glass
W
Glass Divided
X
Glass Divided

Standard U.M.P. Types


Nº 195
Nº 112
U1
U2
Crimped Anchor
Nº 8
Nº 50
Nº 394
Nº 194
Nº 372
Nº 165
U3
U4
Crimped Anchor
Nº 59
Nº 14
Nº 108
Nº 148
Nº 184
U5
U6
Crimped Anchor
Nº 264
Nº 588
Nº 176
U7
U8
Crimped Anchor
Crimped Anchor
U9
U10

Details of U.M.P. Standard Jamb Constructions

Reinforcements—Doors are reinforced for all necessary hardware. The reinforcement for hinges is made of ¼-in. steel and is spot-welded to the stile and offset where hinges occur. Where cut-out for lock occurs the stile is thoroughly reinforced and the door made perfectly rigid.

All doors are reinforced for checks whether specified in hardware schedule or not.

Jambs—Made of material similar to that described for door. No. 18 gauge steel (U. S. Standard) is used where the thickness of wall does not exceed 5½ in. Where walls are in excess of this thickness No. 16 gauge steel is used. Jambs are notched and reinforced for all necessary hardware.

Casings—Manufactured from cold rolled strip steel .050 in. in thickness. All miters are process-welded and ground off to insure invisible joints.

Transom Sash—Constructed of No. 18 gauge steel and reinforced for such hardware as is necessary.

Continued on next page

Picture Mould, Chair Rail, and Base Mouldings

Manufactured from cold rolled strip steel .050 in. in thickness.

Rough Bucks

Usually formed from No. 14 gauge steel but can be made from No. 12 or 10 gauge steel if required. With rough bucks we furnish adjustable crimped or corrugated anchors which can be built into the walls. Rough bucks receive a dip coat of rust resisting mineral paint before shipment.

Unit Frames

Combined buck, jamb, stop and casing can be made from No. 18, 16 or 14 gauge steel. The standard for this type of frame is No. 16 gauge. Hospital type bucks are made of No. 12 or 10 gauge steel as required. All bucks and frames are prepared for hardware and heavily reinforced where necessary. Unit frames receive a dip, filler and prime coat before shipment.

Hardware

Applied at the factory before materials are shipped, except in cases where crating might be interfered with. Drilling and tapping for such items of hardware as door checks, transom adjusters, etc., must be done at the building after materials are erected.

Standard Finish

After fabrication of doors has been completed, all metal is thoroughly cleansed of oil, grease and other foreign substances. The doors are then immersed in a vat of rust resisting enamel, all parts being filled with the liquid. After excess liquid has drained off, the materials are placed in baking ovens and the dip-coat thoroughly fired. The filler coat is then applied and after being properly baked the work is sanded to a perfectly smooth surface. Two coats of high grade mineral paint are then applied, each coat baked on separately, after which the graining is done. All grained finish receives two coats of best baking varnish, each coat baked on separately. All finished work is rubbed to an eggshell gloss.

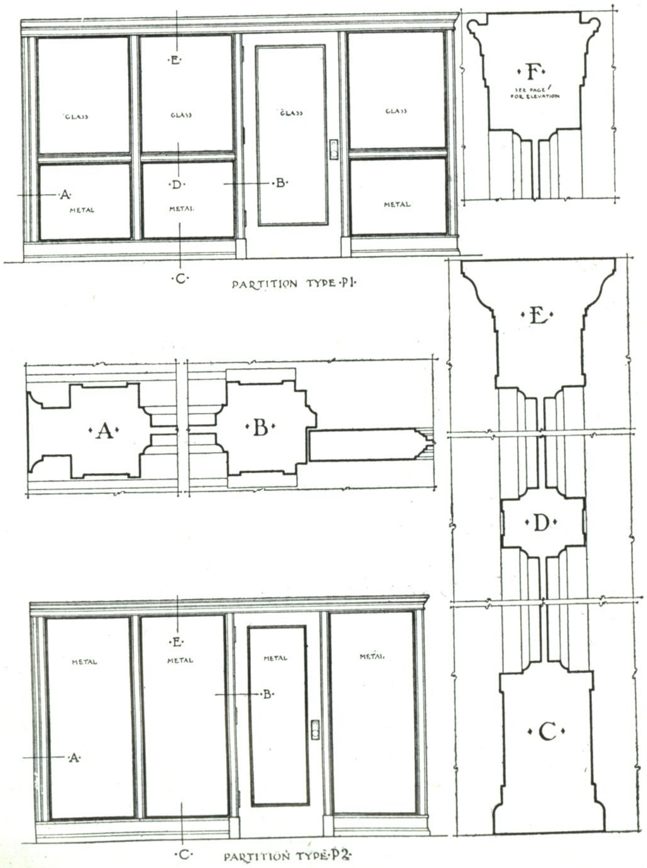
Jambs, casing, mouldings and other materials are finished in a manner similar to that described for doors.

Shop Drawings

Shop drawings, illustrating all work in detail, prepared and submitted for the architects' approval before any materials are fabricated.

United Metal Partition

The United Metal Products Company has perfected and patented an inexpensive metal partition for the subdividing of either office or warehouse space.



Standard "United" Partition Types and Constructions

The panels are made from two sheets of furniture stock steel, with a layer of asbestos between and joined together under hydraulic pressure. The mullions, top, bottom and intermediate rails are of hollow construction all drawn to detail with sharp reveals and pleasing architectural profiles.

The bottom member of partition can be fitted to receive Conduo-Base where desired, so that the electric and telephone wires may be distributed throughout the rooms without the necessity of floor conduits; thus enabling the contractor to put in the finished floors and ceilings throughout the entire floor, subdividing the floor space afterward to suit tenant requirements.

The "United Metal Partition" can be set up and taken down without damage to walls, floors or ceilings. The parts can be moved and stored in a very small space, and can be reset without damage to the finish or waste of the material. Adjustment to varying conditions is also a special feature.

The high cost and scarcity of building labor, together with the inconvenience and expense of pulling down and rebuilding tile and plaster walls in an occupied office or warehouse building, make it imperative that the architect and building owner investigate the "United Metal Partition" before deciding on the type of subdividing wall material to be used in the building.

Continued on next page

Elevator Enclosures

General specifications governing the manufacture of standard elevator enclosures in brief are as follows:

Doors—Manufactured of No. 18 gauge full finished steel of similar construction to swing doors, heavily reinforced for attachment of all hardware and provided with special noiseless easy sliding guides at bottom of door to run in sill groove.

Frames—May be of either rough buck, cabinet jamb construction, or of the combination frame type, and are heavily reinforced for attachment of hardware. Crimped plate anchors are furnished with all combination frames and rough steel bucks.

Trim—Manufactured from No. 18 gauge strip steel of stock design or profile, and fastened to frame with concealed clips.

Cover Plates—For protecting hangers from dirt and dust. They are furnished of No. 14 or 12 gauge metal depending on size, and are provided with hinges and latches for easy access.

Facia Plates—When specified, facia plates are furnished of No. 14 and 12 gauge steel extending from the top of the cover plate to the sill above and 6 in. wider on each side than the jamb opening. Numerals furnished when specified.

Sills—Will be furnished of either cast iron with fluted surface, or Feralun sills with grooves milled straight and true, in order that the friction of guide pin and groove be reduced to the minimum.

Hanger and Closing Device—Will be furnished of the type specified and we suggest careful choice in this specification, as poor equipment of this nature will ruin an otherwise perfect installation. It is generally customary to use in connection with closers the electric interlocks that control the movement of the car, and also the emergency release switches in connection with this electric interlock, foot trips in the car and striker plates at first floor doors. Rack and pawl are fixed to the sill and to the doors to prevent the doors from being opened before the closer arm has assumed a closed position. Rubber bumpers are furnished in all instances where required, whether or not they are specified.

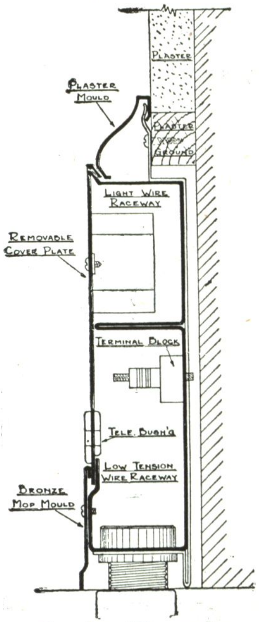
Elevator enclosures with Underwriters' labels can be furnished, but owing to the difference in construction it is necessary to mention distinctly in the specification that the elevator doors are to bear the Underwriters' label and be manufactured in accordance with the standard construction of The United Metal Products Company.

Complete Specifications—Complete elevator specification and list of installations will be mailed on request.

Conduo-Base

Conduo-Base is not intended to replace the entire conduit system of the building, it is an extension of this system and provides within the rooms a means of carrying the high and low tension wires to any point desired.

The wires are carried in feeder conduits (located in the floor fill) running from the cable shaft or panelboard, to a point inside the room where these conduits are connected to the Conduo-Base. The wires are then carried around the room in the "Conduo-Base" raceway, and are made accessible for outlets where required.



Section Through Conduo-Base

Raceway—Is made of one piece of metal and formed into two separate compartments. The upper compartment is used exclusively for light or power wires up to 300 volts, and the lower compartment for telephone or other low tension signal or communicating wires.

Cover Plate—Is constructed so that it can be easily removed when additional outlets are required or when access to the raceway is necessary.

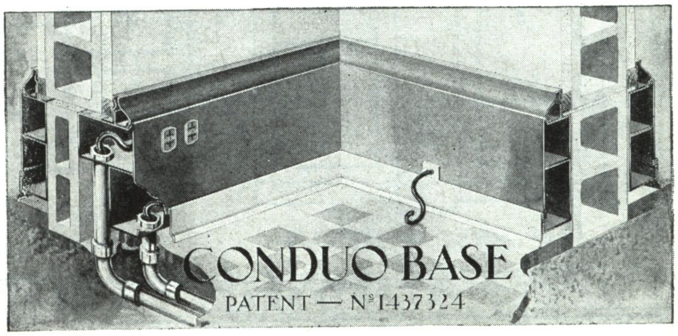
Plaster Mould—The plaster mould or top member is easily clipped in place. No screws or other visible fixing is required.

Mop Mould—The mop mould or bottom member is made of bronze and rests on the floor or carpet.

This member is fixed to the raceway with machine screws and provides protection against damage to the base when floors are being swept or scrubbed.

Especially Desirable for Subdivision—When United Metal partitions are used for the subdivision of space, Conduo-Base is especially desirable for the reason that it not only provides a neat, artistic and sanitary base for the partition itself, but it also provides a raceway, or conduit for the distribution of light and telephone wires within the rooms, and is absolutely fireproof.

The combined use of *United Metal Partition* and *United Conduo-Base* simplifies the task of the architect and the building manager, in so far as providing for future tenant wiring requirements are concerned. The convenience and economy resulting, make the use of this modern building combination both desirable and necessary.



ESTABLISHED 1893

A. C. CHESLEY CO.

Manufacturers of Standardized Fireproof Metal Covered Doors

MAIN OFFICE AND FACTORY
704 East 133rd Street
NEW YORK, N. Y.

TELEPHONE
LUDLOW 1321, 1322

BRANCH OFFICES
DETROIT, MICH. PITTSBURGH, PA. WASHINGTON, D. C.

Products

CHESLEY STANDARDIZED FIREPROOF METAL COVERED DOORS, DOOR TRIM and DOOR FRAMES.

Also, Metal Covered Work of the Highest Quality in Bronze, Brass, Copper, Long Terne (Kalamein) and Galvanized Iron; Tin Clad Fire Doors; Hollow Metal Windows.

Chesley Standardized Fireproof Doors

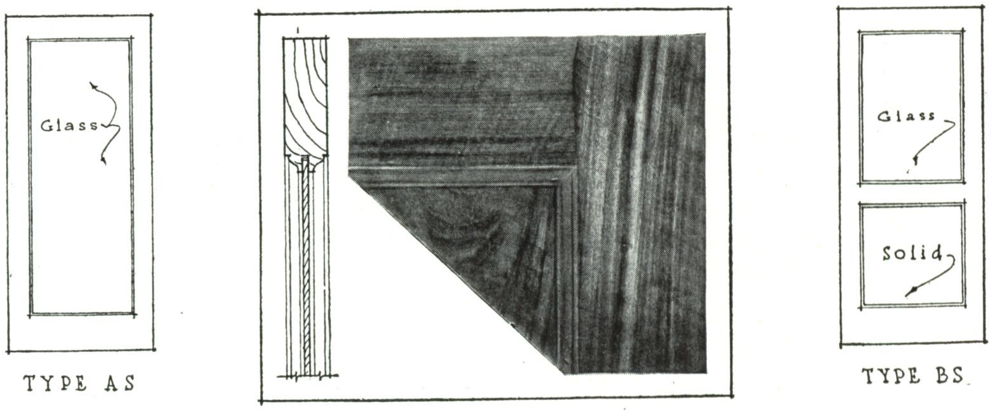
Shipped from Stock—These doors are produced in large quantities, thus cutting cost to a minimum. Large stocks are carried in various distributing points throughout the country, giving the advantage of *immediate delivery.*

Standardized—Chesley fireproof doors are standardized as to construction, sizes and styles.

Construction—Cores are made of well seasoned, kiln dried white pine with stiles and rails mortised and tenoned and glued together. Solid panels are lined with asbestos compo. Panel moulds are integral with the stiles and rails. All joints are *lock* joints with no bolts, rivets or screws (excepting for muntins) used in the construction. Every part of the wood core is covered, and there is no possibility of water or moisture getting into contact with the wood to cause swelling. In glazed construction the glazing strips are placed on the interior with the integral mouldings on the exterior, thus preventing mouldings becoming loose due to exposure. Joints between stiles and rails are *lock* joints with the surface joint soldered and smoothed off, producing practically an invisible connection (see detail showing the superiority of the Chesley lock joint over the ordinary method of construction). The mouldings are clean cut, producing a neat, light, strong door.

Uses and Approval—Chesley doors are for use wherever fireproof doors are required for the following locations: From corridors to rooms; staircase enclosures; elevator shafts. When required, the Underwriters' Laboratory, Inc. label can be furnished.

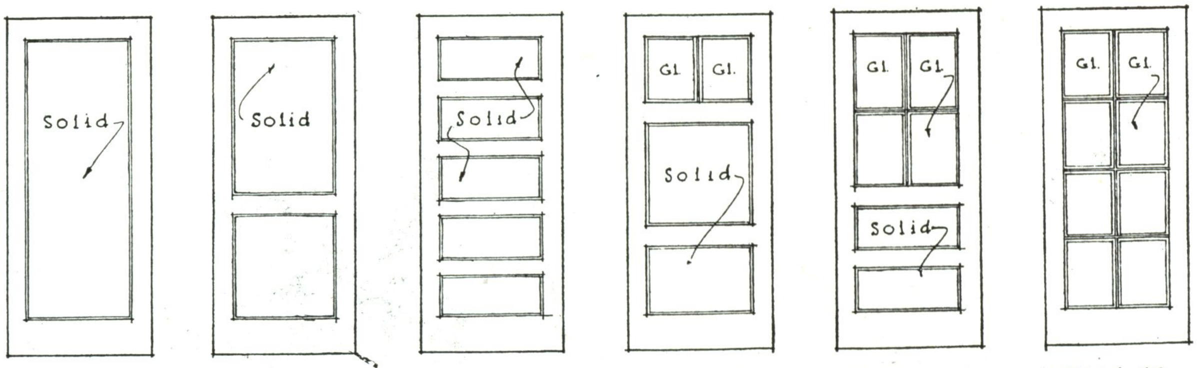
These doors have been extensively used in office



TYPE AS

DETAIL OF CHESLEY FIREPROOF DOOR

TYPE BS



TYPE A TYPE B TYPE D TYPE CS TYPE ES TYPE FS

CHESLEY STANDARD FIREPROOF (METAL COVERED) DOORS

Continued on next page

buildings, apartment houses, hospitals, schools, industrial plants, etc.

Appearance—In appearance, Chesley doors when painted or grained differ hardly at all from wood doors but afford the absolute fire protection of solid steel doors. Cost less than one-third more than the common wood door and from 50% to 100% less than hollow metal doors.

Types—Made in 8 standard types (see illustrations). Detached astragals which can be easily applied at the job are furnished for double doors (see detail).

Sizes—Made in 8 standard sizes as indicated in the following table. The dimensions given are the actual out and out sizes of the door. *Allowance should be made for saddles in setting door frames.*

Door size 2 ft. 6 in. x 7 ft. x 1¾ in.
Door size 2 ft. 8 in. x 7 ft. x 1¾ in.
Door size 2 ft. 10 in. x 7 ft. x 1¾ in.
Door size 3 ft. 0 in. x 7 ft. x 1¾ in.
Door size 3 ft. 2 in. x 7 ft. x 1¾ in.
Door size 3 ft. 4 in. x 7 ft. x 1¾ in.
Door size 3 ft. 6 in. x 7 ft. x 1¾ in.
Door size 3 ft. 8 in. x 7 ft. x 1¾ in.

Material of Covering—Chesley doors are covered with No. 26 gauge long terne plate (commonly known as kalamein iron) or with No. 26 gauge galvanized iron. Galvanized iron work is recommended for exterior work only.

Hardware and Glazing—Any type of hardware can be easily fitted at the job by any competent carpenter. Where ordered, hardware can be furnished and applied at the factory.

No glass is furnished by the Chesley Co. Any type of glass can, of course, be easily set at the job.

Priming—Chesley doors (also stock trim and door frames) are primed at the factory with the best quality metallic priming coat.

Standardized Metal Covered Trim and Door Frames

Chesley standardized metal covered trim is made ⅞ in. thick by 3 in. wide with rounded edges (see detail). It has mitered heads, built up at factory, and is of dimensions to accurately fit Chesley doors.

Chesley standardized metal covered door frames are solid rabbeted frames, 1¾ in. thick by 5¾ in. wide and dimensions to accurately fit Chesley doors. ¾ in. quarter-round cover moulds are furnished for plaster or masonry jambs where required.

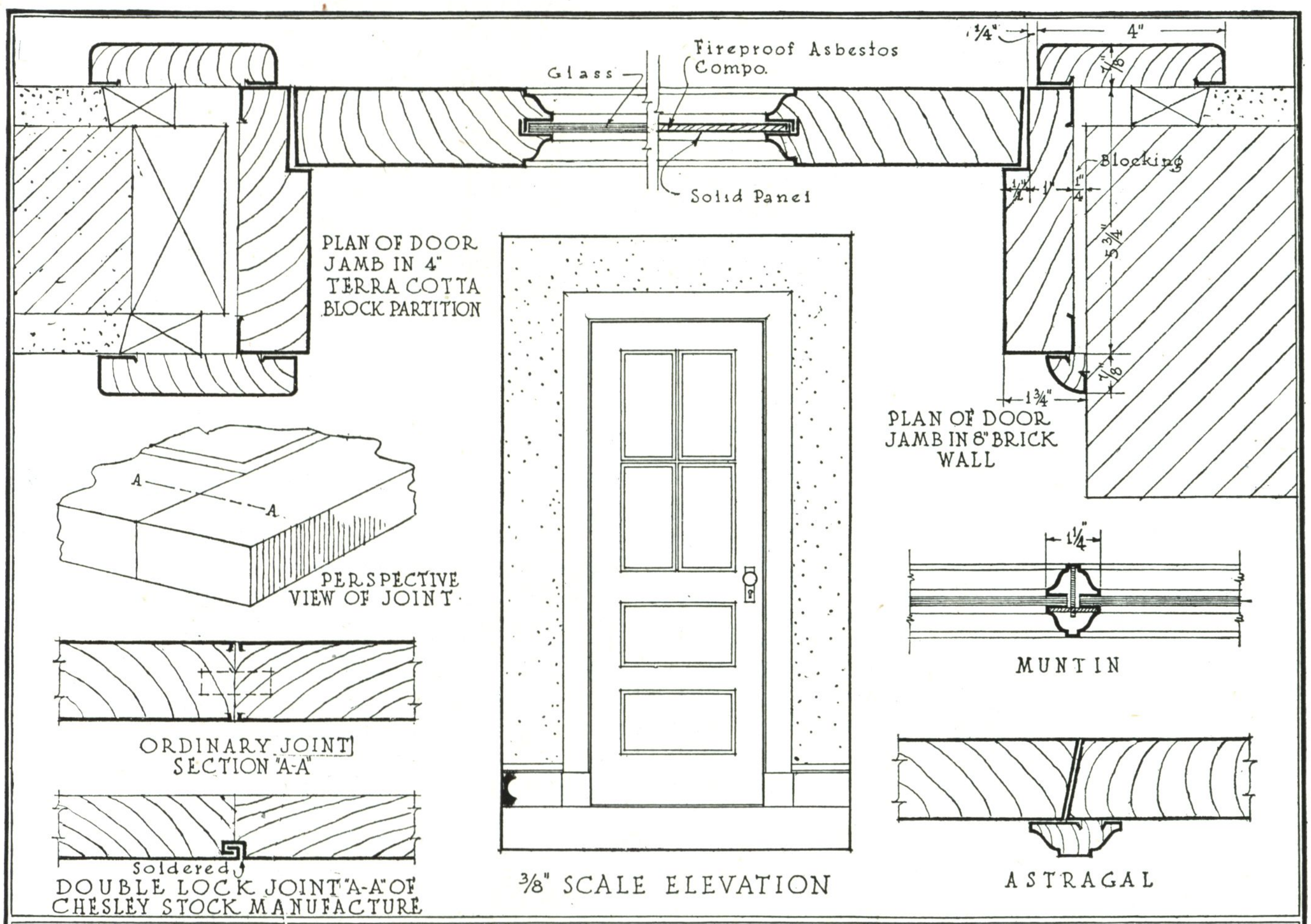
Trim and frames are also made to suit any condition according to architect's details.

Stock trim is not furnished with plinths. Plinths can be furnished at small extra charge.

Specifications

Fireproof Doors—All fireproof doors throughout (mention location) (or marked "FP" on drawings) shall be metal covered doors as manufactured by A. C. Chesley Co., 704 East 133rd Street, New York, N. Y., of dimensions indicated on the drawings. (Architect should refer to table for stock sizes.) Doors marked "GL" on drawings shall be Type (mention type). Solid doors shall be Type (mention type). Interior doors shall be covered with long terne plate. Exterior doors shall be covered with galvanized iron. Doors to be hung by and all hardware to be furnished and fitted by the (carpenter contractor). All glazing and painting, excepting priming coat, to be done by the (painting and glazing contractor).

Metal Covered Trim and Door Frames—All fireproof doors to have Chesley metal covered, stock trim and door frames consisting of ⅞x4-in. trim on each side (or trim on one side and ¾-in. cover mould on the other side) and 1¾x5¾-in. metal covered door frames.


Glass
Fireproof Asbestos Compo.
Solid Panel
¼"
4"
⅞
Blocking
¼"
1"
1"
¼
5¾
⅞
1¾"
PLAN OF DOOR JAMB IN 4" TERRA COTTA BLOCK PARTITION
PLAN OF DOOR JAMB IN 8" BRICK WALL
A
A
PERSPECTIVE VIEW OF JOINT
1¼"
MUNTIN
ORDINARY JOINT SECTION "A-A"
Soldered
DOUBLE LOCK JOINT "A-A" OF CHESLEY STOCK MANUFACTURE
⅜" SCALE ELEVATION
ASTRAGAL

3 INCH SCALE DETAILS OF CHESLEY STOCK KALAMEIN DOORS

COBURN TROLLEY TRACK MFG. CO.

Metal Covered Doors, Windows and Finish

HOLYOKE, MASS.

BRANCHES

NEW YORK, N. Y., 10 East 43rd Street
BOSTON, MASS., 108 Broad Street
PHILADELPHIA, PA., 422 Commerce Street

Products

Manufacturers of METAL COVERED DOORS and FINISH for general interior use; METAL COVERED DOUBLE HUNG WINDOWS.

Also Bronze and Copper Entrances, Metal Covered Dumbwaiter Doors.

For Tin Clad Fire Doors and Shutters, see pages 886-887; for Sliding Door Hardware, see pages 1460-1465.

Facilities and Shipping

This company is prepared to handle orders of any size for all parts of the country. A large modern plant, with direct rail connection, insures the fabrication and delivery of all work promptly and in a satisfactory manner.

Metal Covered Doors and Trim

Coburn metal covered doors are furnished both labeled and unlabeled for use in office buildings, hospitals, public buildings, hotels, theaters, stores, residences, etc. These include stair, elevator, fire escape, tower, corridor and partition doors for general interior work, and entrance doors in copper, bronze, and brass.

Coburn standard doors are made with kiln dried white pine cores; rails are tenoned into stiles; panels are grooved into stiles and rails. Cores are covered with form steel, kalamein or galvanized iron, bronze, copper or brass.

For standard details and application of labeled and unlabeled doors showing mouldings and panels, see drawing No. K1.

Underwriters' Labeled Kalamein Doors

Coburn underwriters' labeled kalamein doors when installed as specified below for the purposes indicated, will give maximum protection and procure minimum rates for the insuring of the building and its contents.

Standard Stair and Elevator Doors—Labeled for single doors up to 48 in. wide and in pairs up to 96 in. wide. Panels to be solid. Hung on angle iron frames for brick walls and channel or pressed steel frames for tile walls or for metal lath and plaster partitions, with strap hinges and latches or butts and lock sets. Doors to stairs should be made self-closing. Doors can not be hung on metal covered jambs.

Fire Escape and Tower Doors—Labeled for single doors up to 4 ft. wide, 10 ft. high and for pairs up to 8 ft. wide, 10 ft. high; can include glass panels not exceeding 720 sq. in. in area. Must be hung in the same manner as stair and elevator doors.

Corridor and Partition Doors—Labeled to receive 9 sq. ft. of wire glass. Labeled up to 4 ft. wide, 10 ft. high for single doors and 8 ft. wide, 10 ft. high for pairs.

Specifications for Kalamein and Metal Covered Work

Cores—All woodwork used in the manufacture of door and window frames, jambs, doors, sash and trim to be seasoned, clear, kiln dried white pine. Stiles more than 6 in. wide to be built up of strips glued together. All door and sash members to be mortised and tenoned together.

Trim—Trim for doors to be shipped knocked down and fitted in the field so that any irregularities may be taken up at the job, or cabinet trim assembled before shipping.

Metal—All covering to be of 16-oz. to 48-oz. copper or bronze, or of No. 26 or No. 24 kalamein or galvanized iron, or No. 26 to No. 20 form steel.

Note: Doors may be covered with bronze, copper, kalamein iron, galvanized iron or furniture steel. For high class work No. 24 gauge furniture steel may be used, finished to resemble any suitable wood or in Duco. Copper and bronze may be finished in antique or other suitable designs.

Covering of Cores—*Unlabeled Doors*—The metal is to be applied directly over the cores. All metal must fit closely to the wood cores. All surfaces and edges are to be straight and true; mouldings to be as per details. Bench marks are to be avoided as much as possible and cut ends at miters are to be covered with the same metal as used on mouldings. Thickness of door is 1¾ in.

Labeled Doors—Are to be covered in the same manner as the unlabeled doors except as shown on detail on following page. Thickness of door is 1⅞ in.

All joints of metal to be locked and soldered so that no moisture can gain entrance to the cores.

Hardware

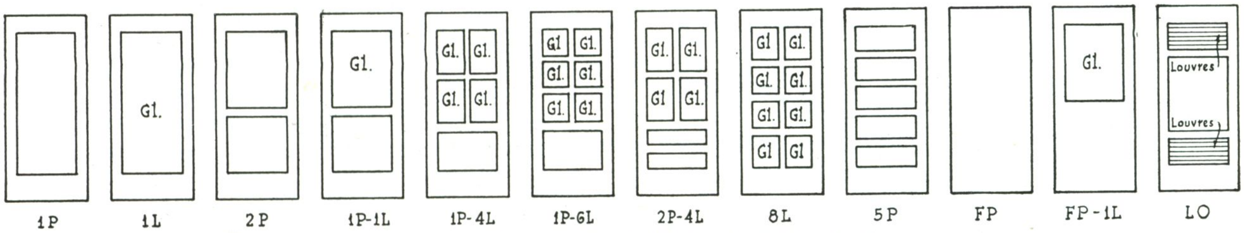
Hardware is not included in quotation, except on request with full information and specifications. Where desired, complete sets of approved hardware can be furnished, in which case information as to number of butts to each door and location of all hardware to be applied to doors should be given.

Double Hung Window

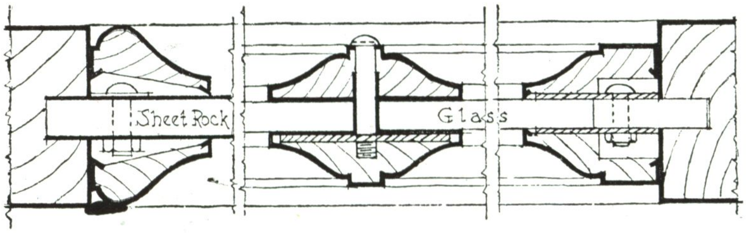
Style S—A high grade fire resisting window. All members drawn to dies, giving uniformity of size and ease of operation without loose play. Made in any suitable metal preferably kalamein and copper or bronze. Provided with overhead or side pulleys with or without fusible link for automatic closing in case of fire.

Style W—Designed for conditions requiring extreme weathertightness. Similar to Style S, except with integral weatherstrip. Absolutely weathertight at all points. All windows furnished with sectional weights and chain suitable for width and height of window. Frame and weight box made standard size to take 2¼x2¼-in. weights. Sash, 1¾ in. thick.

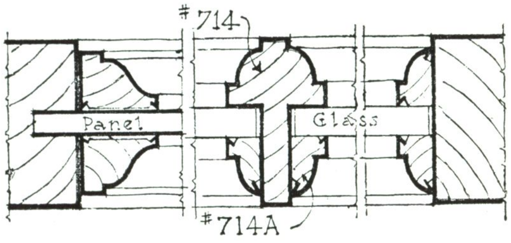
Continued on next page


G1.
G1.
G1.
G1.
G1.
G1.
1P
1L
2P
1P-1L
1P-4L
1P-6L
2P-4L
8L
5P
FP
FP-1L
LO
Louvres
Louvres

STANDARD KALAMEIN DOORS

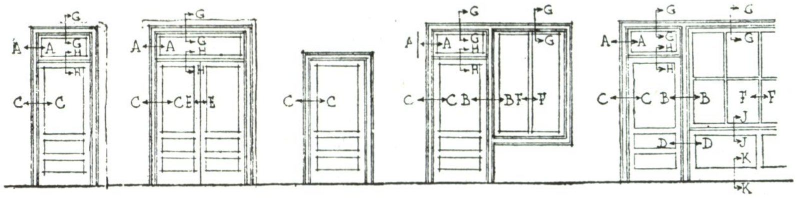

Sheet Rock
Glass

ONE-HALF FULL SIZE DETAILS OF UNDERWRITERS' LABELED DOOR

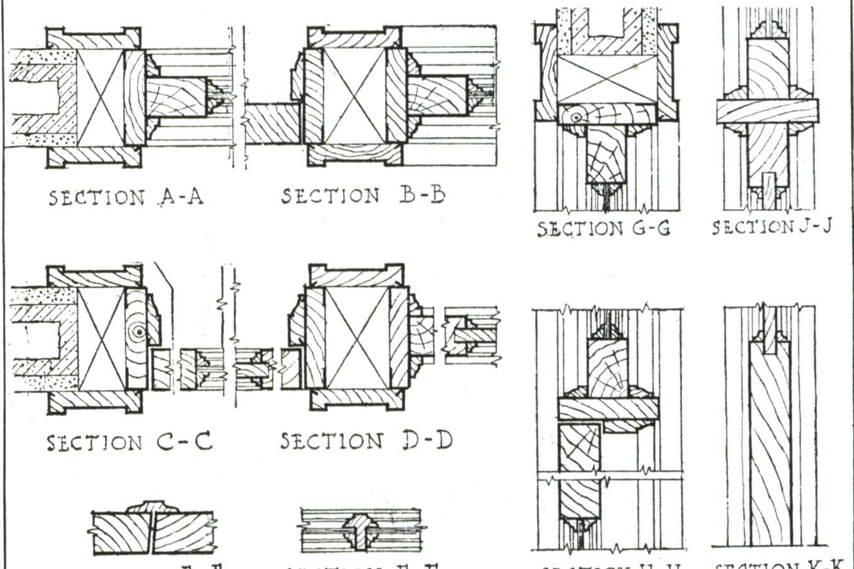

#714
#714A
Panel
Glass

ONE-HALF FULL SIZE DETAILS OF UNLABELED STANDARD METAL-COVERED DOOR

FOR DETAILS OF MUNTINS, PANEL MOULDINGS, ETC., SEE DRAWING OF STANDARD SECTIONS.


A
G
H
C
E
B
F
J
D
K

TYPICAL ELEVATIONS OF VARIOUS TYPES OF DOORS AND PARTITION CONDITIONS



SECTION A-A

SECTION B-B

SECTION G-G

SECTION J-J

SECTION C-C

SECTION D-D

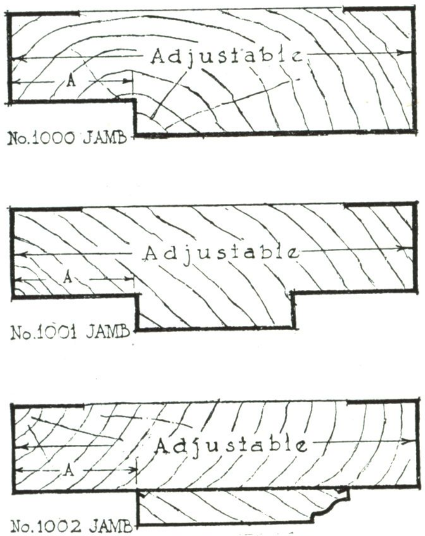
SECTION E-E

SECTION F-F

SECTION H-H

SECTION K-K

1½" SCALE DETAILS OF STANDARD KALAMEIN DOOR AND SASH


Adjustable
A
Adjustable
A
Adjustable
A

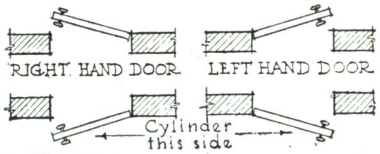
No.1000 JAMB

No.1001 JAMB

No.1002 JAMB

"A" is 2" for St'd Labeled Doors, & is 1⅞" for St'd Unlabeled Doors. This dimension can be varied for special heavy doors.

ONE-HALF FULL SIZE DETAILS OF STANDARD JAMBS


Cylinder this side

RIGHT HAND DOOR

LEFT HAND DOOR

RT. H REV BEVEL

LT H REV BEVEL

DESIGNATIONS OF DOOR-SWINGS.

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

DETAILS OF TYPICAL COBURN METAL COVERED DOORS AND SASH.

SCALE 1½" & 6" EQUALS 1'-0"
DATE, MAY 23

DR'WG K-1

Continued on next page

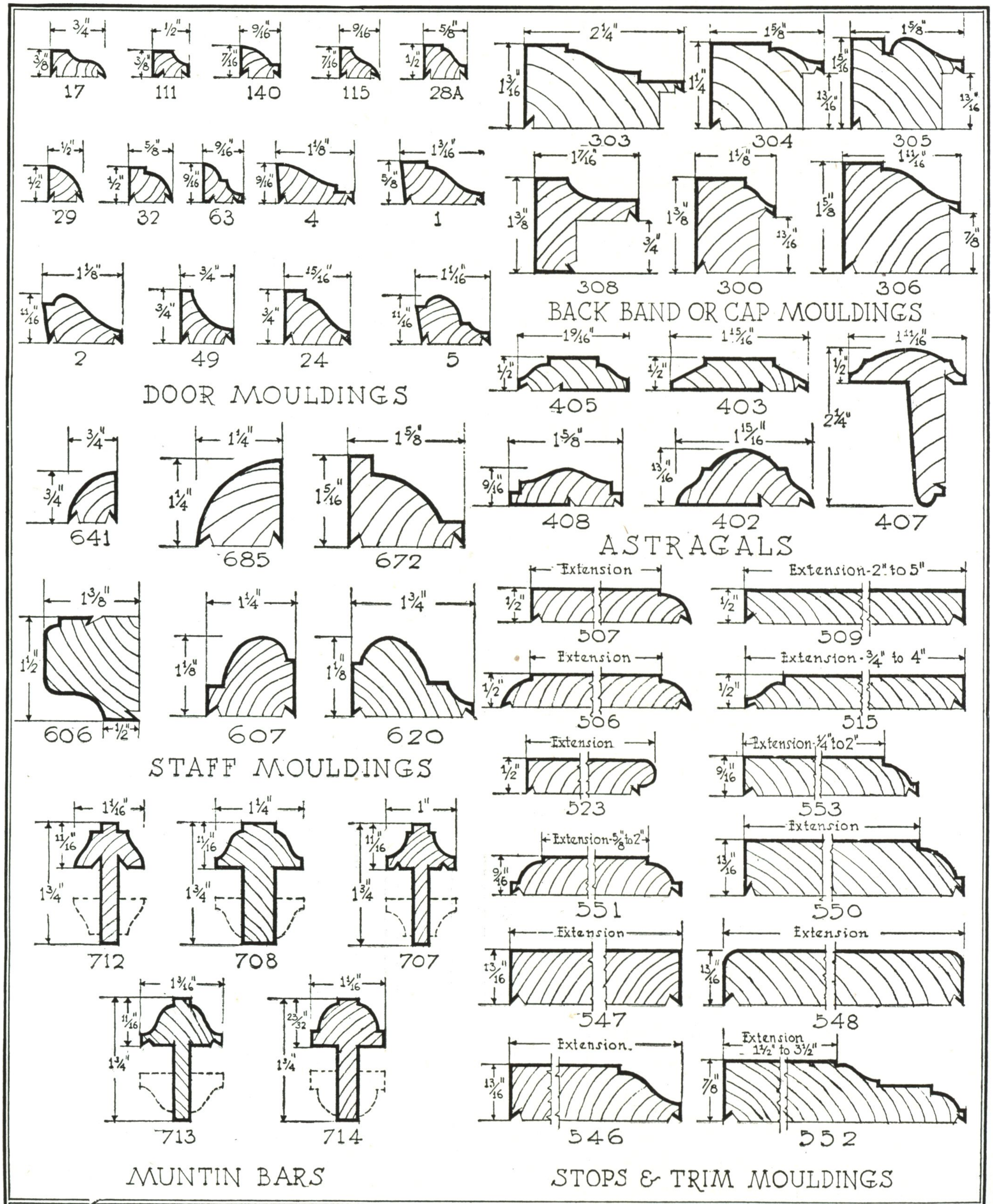
Metal Covered Mouldings, Trim, Staff Beads, Back Bands, etc.

The shapes shown below are only a few representative styles selected from a large assortment which is available for every requirement.

On labeled construction, designs are restricted to those shapes which have been furnished for test and approved by the underwriters.

For non-labeled doors and windows a wide range is offered for selection. Special designs not in our regular assortment which can be made by special dies and cutters will be made on order at a nominal charge.

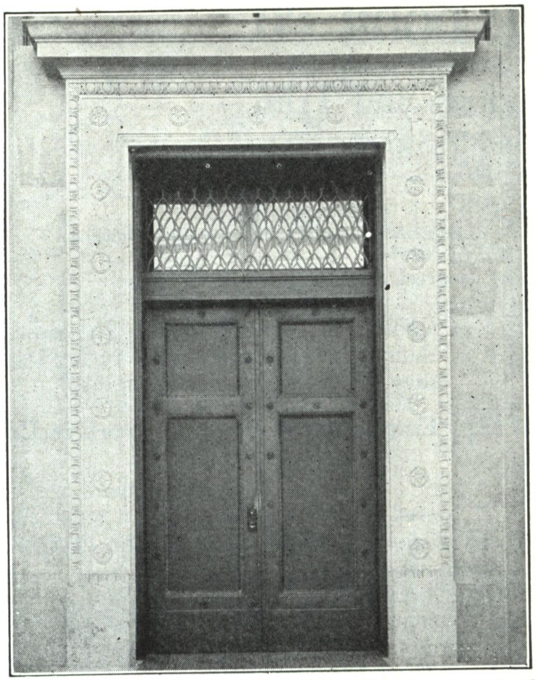
All shapes shown and many others are carried in stock.



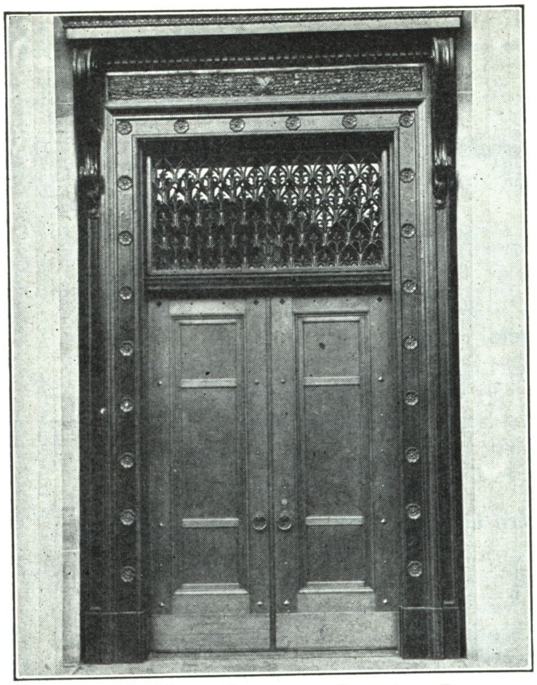
3/4" 3/8" 17
1/2" 3/8" 111
9/16" 7/16" 140
9/16" 7/16" 115
5/8" 1/2" 28A
1/2" 1/2" 29
5/8" 1/2" 32
9/16" 9/16" 63
1 1/8" 9/16" 4
1 3/16" 5/8" 1
1 1/8" 11/16" 2
3/4" 3/4" 49
15/16" 3/4" 24
1 1/16" 11/16" 5
DOOR MOULDINGS
3/4" 3/4" 641
1 1/4" 1 1/4" 685
1 5/8" 1 5/16" 672
1 3/8" 1 1/2" 1/2" 606
1 1/4" 1 1/8" 607
1 3/4" 1 1/8" 620
STAFF MOULDINGS
1 1/16" 11/16" 1 3/4" 712
1 1/4" 11/16" 1 3/4" 708
1" 11/16" 1 3/4 707
1 3/16" 11/16" 1 3/4" 713
1 1/16" 23/32" 1 3/4 714
MUNTIN BARS
2 1/4" 1 3/16 303
1 5/8" 1 1/4" 13/16 304
1 5/8" 1 5/16 13/16 305
1 7/16" 1 3/8" 3/4" 308
1 1/8" 1 3/8 13/16 300
1 11/16" 1 5/8" 7/8" 306
BACK BAND OR CAP MOULDINGS
1 9/16" 1/2" 405
1 15/16" 1/2" 403
1 11/16" 1/2" 2 1/4" 407
1 5/8" 9/16" 408
1 15/16" 13/16 402
ASTRAGALS
Extension 1/2" 507
Extension-2" to 5" 1/2" 509
Extension 1/2" 506
Extension-3/4" to 4" 1/2" 515
Extension 1/2" 523
Extension-1/4" to 2" 9/16 553
Extension-5/8" to 2" 9/16" 551
Extension 13/16 550
Extension 13/16 547
Extension 13/16 548
Extension. 13/16 546
Extension 1 1/2" to 3 1/2" 7/8" 552
STOPS & TRIM MOULDINGS

6" SCALE DETAILS OF COBURN METAL COVERED MOULDINGS

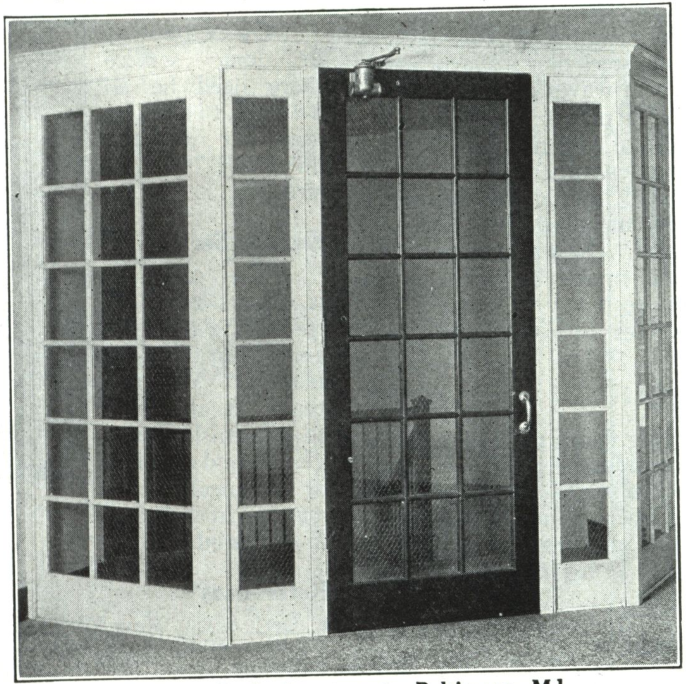
Continued on next page



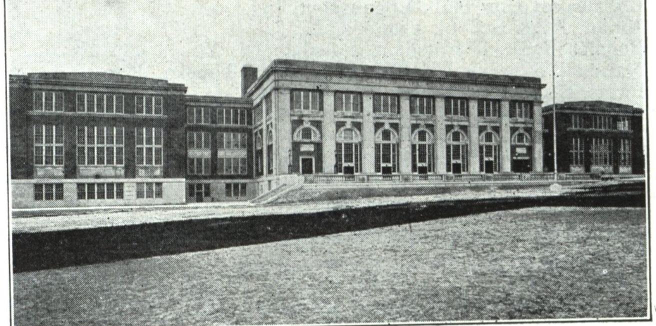
American Security & Trust Co., Washington, D. C.
Attention is called to symmetry of design between 40-oz. copper doors and masonry frame



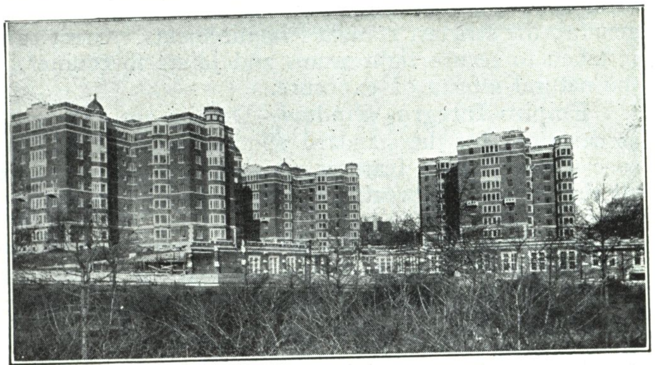
Lincoln Trust Company, Scranton, Pa.
Bronze doors corresponding in finish and design to rest of opening



Wyman Park Apartments, Baltimore, Md.
Illustrating application of kalamein doors to stairwell



Clifton Park Junior High School, Baltimore, Md.
Entire interior in kalamein as well as exterior copper and weather-proofing furnished by Coburn



Alden Park Manor, Brookline, Mass.
Elevator doors, kalamein stairwell doors and basement doors in three units furnished by Coburn

EMPIRE FIREPROOF DOOR CO.

EMPIRE KALAMEIN CO., INC., SUBSIDIARY

Metal Covered Doors, Windows and Trim

Southern Boulevard at 145th Street
NEW YORK, N. Y.

BRANCH OFFICES
CHICAGO, ILL., 140 North Dearborn Street
CLEVELAND, OHIO, 605 Swetland Building
REPRESENTATIVES IN ALL PRINCIPAL CITIES
Write to Home Office for Address of Nearest Agent

METAL COVERED EMPIRE DOORS & WINDOWS
KALAMEIN PRODUCTS
TRADE-MARK
(Registered)

Products

Metal Covered Doors, Windows, Door Frames and Trim, Elevator Fronts, Smoke Screens and Partitions.

Also manufacturers of Underwriters' Labeled Tin Clad Fire Doors.

"Empire Commercial" Metal Covered Doors

Through years of specialization in the manufacture of metal covered work, we have evolved a product in which we take just pride—the "Empire Commercial" metal covered door, suitable for any class of fireproof work.

Details—*Cores*—Sound kiln dried white pine or cypress milled in one piece, sanded and finished accurately, for cores of stiles and rails.

Covering—Long terne or galvanized, Nos. 26 and 28 gauge. Drawn on through steel dies; sharp angles and arrises; tight and free from waves and buckles.

Panels—⅜ in. thick, built up of a special fiber board of three ply laminated wood core meeting requirements of city and state building departments, with No. 28 gauge sheets on both sides glued tight under flat press.

Assembly—Doors are mortised and tenoned, wedged and glued or doweled. Seams soldered and scraped, producing a perfect and smooth surface. Under ordinary use seams are guaranteed not to split.

Finish—All material receives one coat of special metallic primer.

Underwriters' Labeled Doors

Paneled metal clad swinging doors may be used for openings in vertical shafts, corridor or room partitions, exterior walls, and fire escape exits when provided with special hardware. Size when mounted singly, not exceeding 3 ft. 9 in. x 8 ft. In pairs, not exceeding 7x8 ft. Doors must be hung to iron jamb, angle, channel or hollow metal.

Empire Metal Covered Windows

Double hung or casement type windows are made in our standard design, or they will be manufactured to meet special conditions. The construction follows, in general, the strictest standard requirements. Great care is taken to secure tight seams and joints to counteract the natural effects of exposure.

Empire Integro Window—Details are the same as described for the standard window, with addition of special interlocking features which combine to produce all the effect of a weatherstripped window.

Empire Metal Covered Smoke Screens and Partitions

For enclosing stair halls, corridors, or for use in subdividing office space. We manufacture in any design and size to meet any condition.

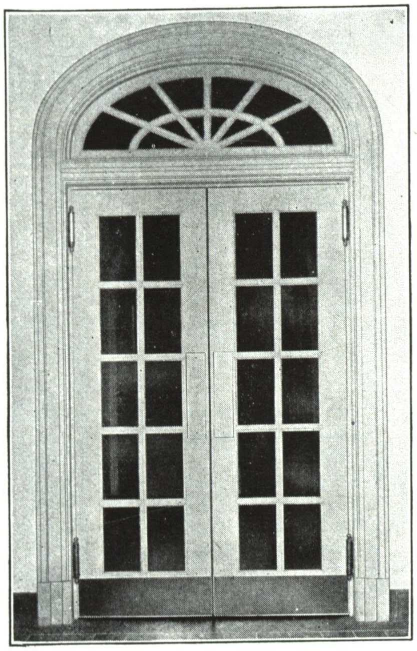
Empire Metal Covered Elevator Fronts

Years of use have proved these practical and substantial in every respect. In addition to their lightness and easy operating features, they are an effective fire retardant.

Empire Metal Covered Work in Copper or Bronze

We especially recommend metal covered bronze or copper as a substitute for more costly materials (such as rolled or cast bronze) where price is a factor. Details, except for covering, are the same as described for "Empire Commercial" doors.

On account of its long service there need be no hesitation in using it where durability is desired.



Doors in Dutch Reformed Church, Brooklyn, N. Y.
Meyer & Mathieu, Architects
Walter Kidde Co., Builders

Empire Service

The company is always ready to co-operate with the architectural profession. We are ready at all times to furnish suggestive details or technical information in relation to our products.

References

E. Gerli & Co., New York, N. Y.
Washington National Bank, Washington, Ind.
Vermilion County Courthouse, Newport, Ind.
Butler Savings & Trust Bank, Butler, Pa.
Monongahela National Bank, Brownsville, Pa.
Fourth National Bank, Atlanta, Ga.
State Bank of Carthage, Carthage, Ind.
Logansport City Hall, Logansport, Ind.
Junior High School, Camden, N. J.
Peoples Bank of Potsdam, Potsdam, N. Y.
National Reserve Life Insurance Co., Topeka, Kan.
Paseo High School, Kansas City, Mo.
Central Junior High School, Kansas City, Mo.
Northport Trust Co., Northport, L. I., N. Y.
Falls National Bank, Niagara Falls, N. Y.
First National Bank, Wytheville, Va.
Galena Signal Oil Co., Galena, Tex.
Y. M. C. A., Asheville, N. C.
Jerome High School, Phoenix, Ariz.
University of Wyoming, Casper, Wyo.
Adams School, Youngstown, Ohio
James Madison High School, Brooklyn, N. Y.
James Monroe High School, New York, N. Y.
Girls Commercial High School, Brooklyn, N. Y.
Julia Richman High School, New York, N. Y.

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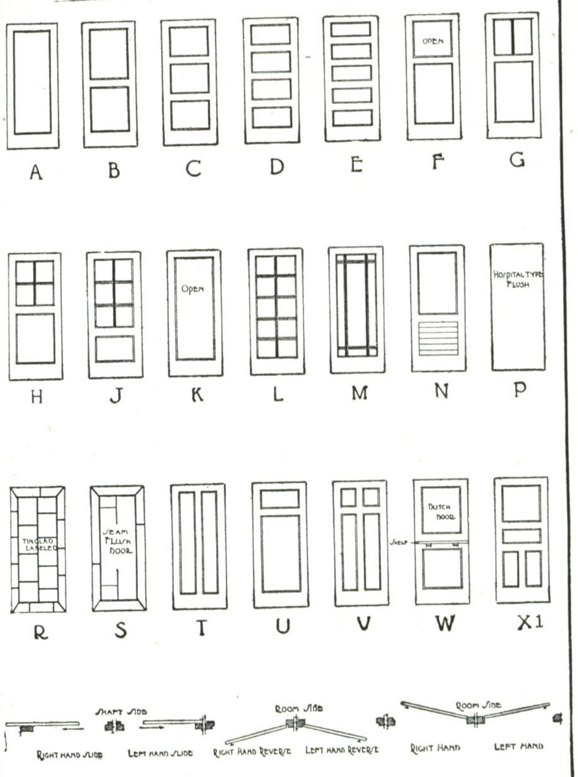
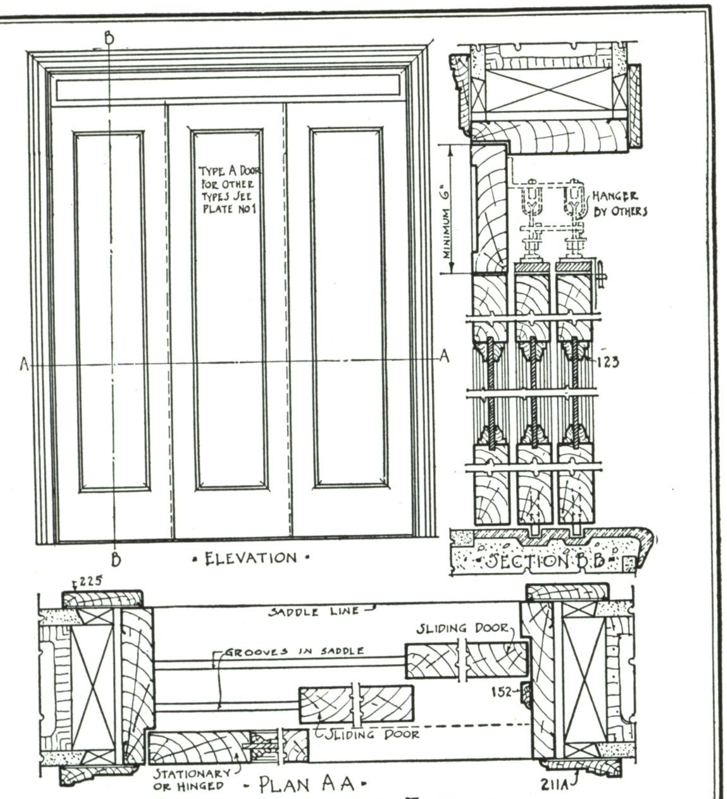
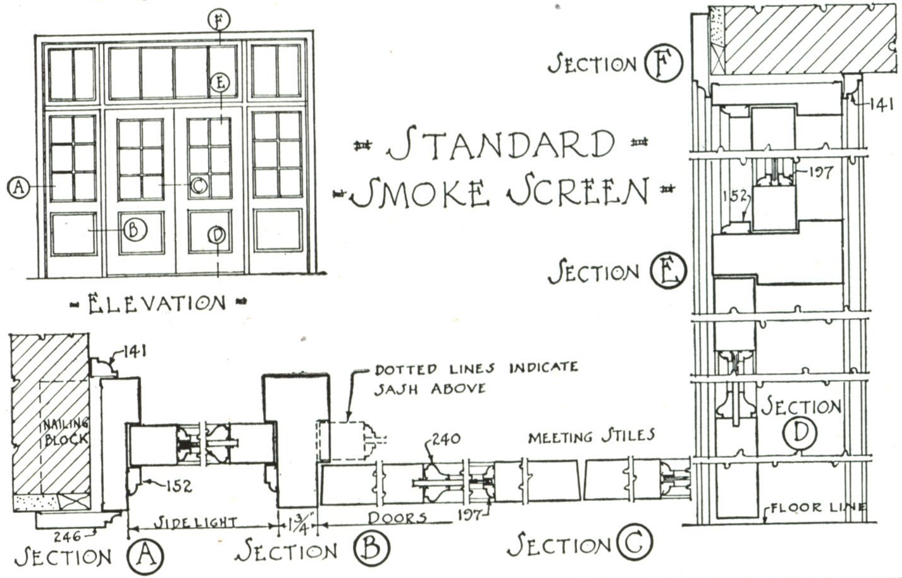

A
B
C
D
E
F
G
OPEN
H
J
K
L
M
N
P
OPEN
HOSPITAL TYPE FLUSH
R
S
T
U
V
W
X1
TIN CLAD LABELED
SEAM FLUSH DOOR
DUTCH DOOR
SHELF
SHAFT SIDE
ROOM SIDE
ROOM SIDE
RIGHT HAND SLIDE
LEFT HAND SLIDE
RIGHT HAND REVERSE
LEFT HAND REVERSE
RIGHT HAND
LEFT HAND

STANDARD DOORS

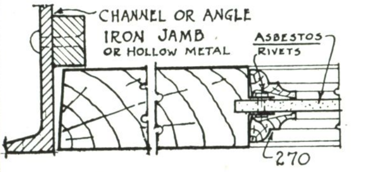

B
TYPE A DOOR FOR OTHER TYPES SEE PLATE NO 1
A
A
B
• ELEVATION •
MINIMUM 6"
HANGER BY OTHERS
123
• SECTION B-B •
225
SADDLE LINE
SLIDING DOOR
GROOVES IN SADDLE
152
SLIDING DOOR
STATIONARY OR HINGED
• PLAN A A •
211A

"EMPIRE" ELEVATOR FRONTS

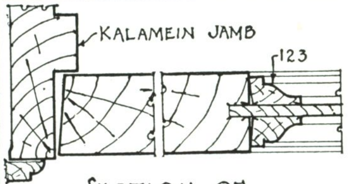
• STANDARD 2 SPEED DOORS WITH ARM •


F
E
A
C
B
D
• ELEVATION •
SECTION F
141
197
152
SECTION E
SECTION D
FLOOR LINE
141
NAILING BLOCK
152
246
DOTTED LINES INDICATE SASH ABOVE
240
MEETING STILES
SIDE LIGHT
1 3/4"
DOORS
197
SECTION A
SECTION B
SECTION C

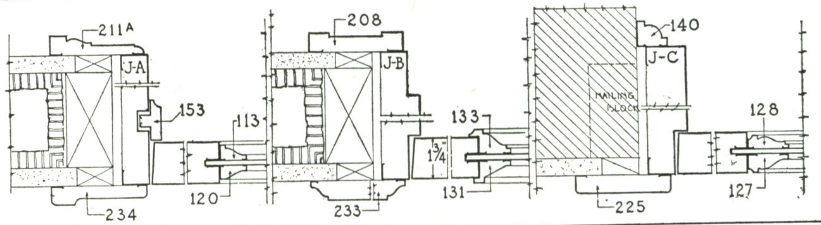
STANDARD SMOKE SCREEN


CHANNEL OR ANGLE IRON JAMB OR HOLLOW METAL
ASBESTOS
RIVETS
270

• SECTION OF •
• UNDERWRITERS KALAMEIN DOOR •


KALAMEIN JAMB
123

• SECTION OF
• STANDARD KALAMEIN DOOR •


211A
J-A
153
113
234
120
208
J-B
133
1 3/4
233
131
140
J-C
NAILING BLOCK
225
128
127

STANDARD JAMB SECTIONS

DRAWN BY EMPIRE FIREPROOF DOOR CO., INC.	STANDARD DETAILS EMPIRE FIREPROOF DOOR CO., INC.	SCALE 1½" & 3" EQUALS 1 FT. DATE JUNE '25	DR'WG. 1

THE CINCINNATI MFG. CO.

Kalamein and Hollow Metal Doors

CINCINNATI, OHIO

Products

Hollow Metal and Kalamein Doors and Trim, all types and designs.

Hollow Metal Doors, bearing Underwriters' Laboratories, Inc., label of approval.

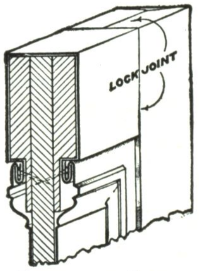
For Ornamental Iron and Bronze Work, see pages 743-745.

Kalamein Doors

These doors are constructed with a wood core over which sheet metal is applied. This kalamein will not warp or bulge, as expansion and contraction are allowed for in a special lock seam.

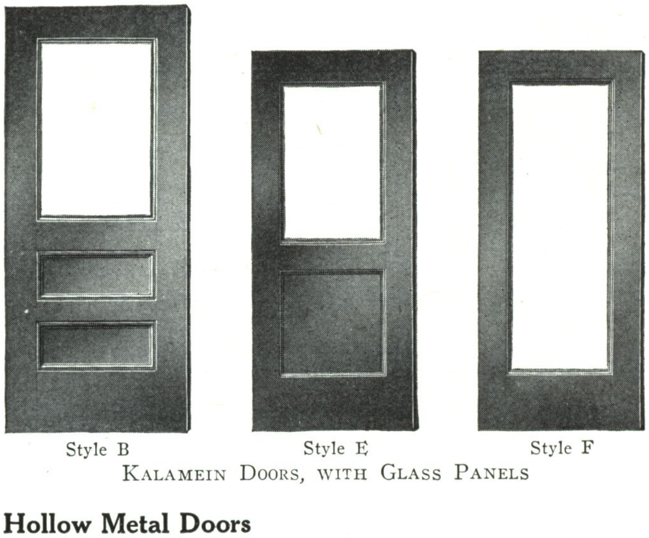
They can be furnished in a variety of stock designs. Catalogue sent on application.

In addition to doors, kalamein trim, mouldings, muntin bars, astragals, and stop strips are manufactured by this company in either stock or special designs.



Detail of Construction for Kalamein Door

Specification Data—Core of thoroughly kiln dried lumber, tongue and groove joined, and clinch nailed. Stamp panels and rails in separate pieces, of metal specified. All joints are blind nailed and lock seamed securing covering to core in a manner which allows for expansion and contraction of metal. Doors exposed to weather covered with galvanized steel or sheet copper. Interior doors covered with Armco steel, bronze or copper. Steel doors finished with one coat gray priming paint, or baked enamel in imitation of wood, to be specified.

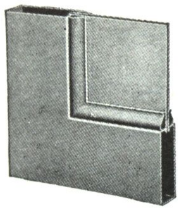

Style B Style E Style F

Kalamein Doors, with Glass Panels

Hollow Metal Doors

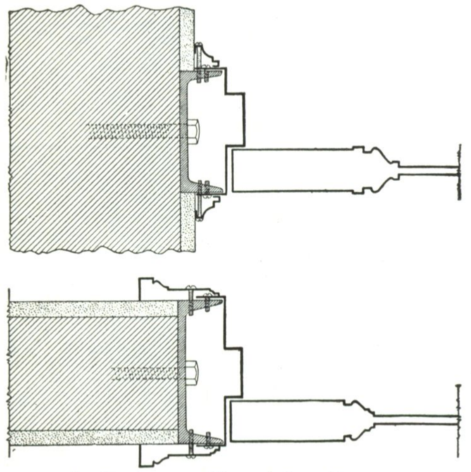
Made to architect's designs in special finishes permitting a wide range of individual expressions, or in stock patterns and standard finishes. Thoroughly insulated throughout to insure an efficient fire retardant and to prevent metallic sound. The construction obviates necessity of installing jamb during erection of walls, and permits hanging and adjusting of doors independently of frames. The Underwriters' Laboratories, Inc., have tested and approved these doors and their label is affixed to them, for all classes of openings.

Complete information should be given when asking for estimates, as they are based on the requirements of each particular installation.

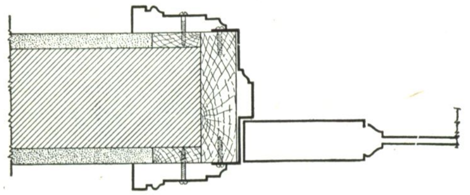


Corner Section Hollow Metal Door

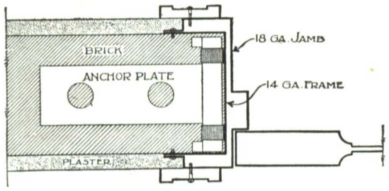
Specification Data—Doors of highest grade No. 18 gauge Armco open hearth steel specially treated. All surfaces true, level, and free from all imperfections. Parts interlocked and welded with invisible seams and joints. Insulate stiles, rails, and panels throughout with asbestos. Apply baked enamel finish in imitation of wood specified. Frames of No. 14 gauge steel, welded at joints to form one piece. Attach to walls by means of adjustable anchor plates. Jambs, furnished in separate pieces, fit over frames.



Applications to Channel Iron Frames



Application to Wooden Frames



Application to Cinmanco Approved Frame with Adjustable Anchor Plates

Section Through Door Jambs Showing Approved Buck Jamb and Casing Constructions for Hollow Metal Doors

Catalogue

Catalogue No. 53 sent on request.

E. H. FRIEDRICH COMPANY

Manufacturers of Metal Covered Doors, Windows, Partitions and Trim

HOLYOKE, MASS.

REPRESENTATIVES

BOSTON, MASS., W. J. GROSVENOR, 8 Beacon Street
NEW HAVEN, CONN., A. R. KIRSCHNER CO., Plymouth Building
HARTFORD, CONN., L. S. KNOEK & CO., 188 State Street
NEW YORK, HAEFNER & HARDING, 562 Broadway, ALBANY, N. Y.
MAINE, NEW HAMPSHIRE AND VERMONT, DYER-MARSTON, INC., PORTLAND, ME.
BALTIMORE, MD., CONSOLIDATED SUPPLY CO., 10 West Chase Street
CHARLOTTE, N. C., CHARLOTTE STEEL & IRON CO., Latonia Building

Products

High grade KALAMEIN (METAL COVERED) WOODWORK for fireproof and sanitary purposes, including Doors and Trim, Windows, Partitions, etc., in Kalamein, Copper, Bronze and Steel; FIREPROOF HOLLOW METAL WINDOWS with Underwriters' label.

Also manufacturers of a general line of Building Sheet Metal Work.

Facilities and Workmanship

Our factory is especially well equipped to produce any design in high grade metal covered woodwork or hollow metal windows suitable for buildings such as banks, public office and school buildings.

This work can be executed promptly and efficiently.

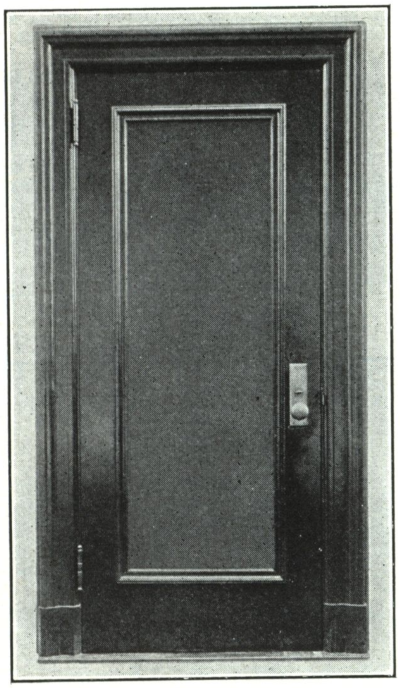
High Grade Metal Covered Entrance Doors

The manufacturing of highest grade metal covered entrance doors is our specialty. They are made in copper or commercial bronze.

Finish

All bronze and copper work is properly cleaned with acid and oiled or oxydized before it leaves the factory to prevent corrosion, or finished to comply with architect's requirements.

TRADE-MARK



A FRIEDRICH METAL COVERED DOOR
Hardware applied at factory

Kalamein products are cleaned and painted with one coat of special metal primer.

Metal Covered Mouldings

In order to economize in designing metal covered work, a number of standard stock mouldings for panels, trim, etc., have been shown at the scale of 3 in. to the foot.

By using these mouldings the cost of special dies is saved.

Kalamein Elevator Doors

We make a specialty of metal covered elevator doors in kalamein, copper or bronze.

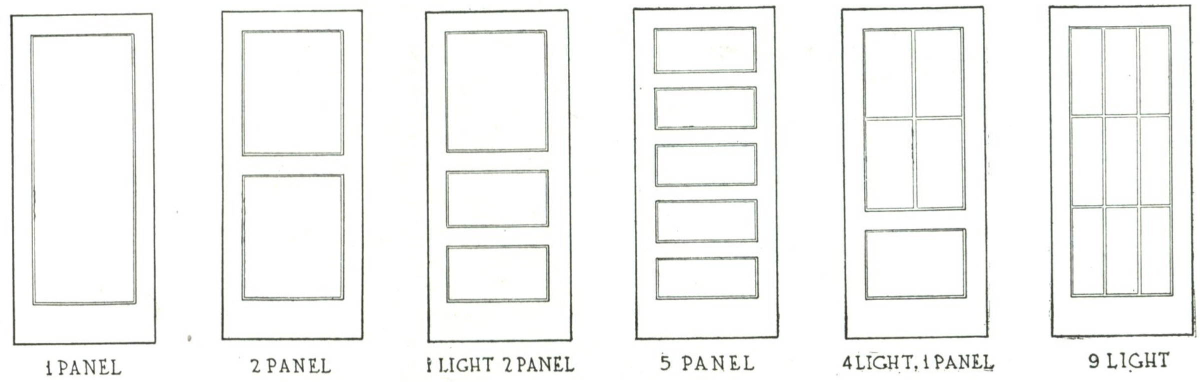
These are furnished in three types: swing, slide, or combination slide and swing, and in any design. Mouldings to be standard to fit our dies.

Doors can be furnished complete with hardware.

Specifications for Kalamein Doors and Smoke Screens

Where indicated on plans, doors, jambs, trim, side lights, transoms, etc., shall be kalamein.

All metal used for covering shall be "Keystone" copper steel. No. 24 gauge to be used for stiles, rails, jambs and panels, and No. 26 gauge for all sash and trim, and No. 28 for all moulding.



Note:-Special Designs made to order

DETAILS SHOWING STOCK KALAMEIN DOOR DESIGNS

Continued on next page

All cores shall be made up from clear kiln dried white pine, free from loose knots, sap and shakes.

All cores shall be milled true to form. All stiles over 6 in. wide shall be built up of small strips glued together. All door stiles and rails shall be mortised, tenoned, and glued together.

All door stiles, sash, jambs, mouldings, muntins and trim shall be drawn through steel dies. All mouldings and edges shall be clean, sharp and true to detail with metal fitting closely to wood cores.

Special care must be used in assembling to avoid bench marks as much as possible.

All joints between metal shall be filled with solder and scraped flush.

After work is assembled all metal surfaces shall be thoroughly cleaned, with oxide of iron, of grease and all foreign substances, and given one coat of special metallic primer sprayed on even and smooth.

Hollow Metal Windows

A complete line of hollow metal windows, underwriters' label, of all types is manufactured by this company.

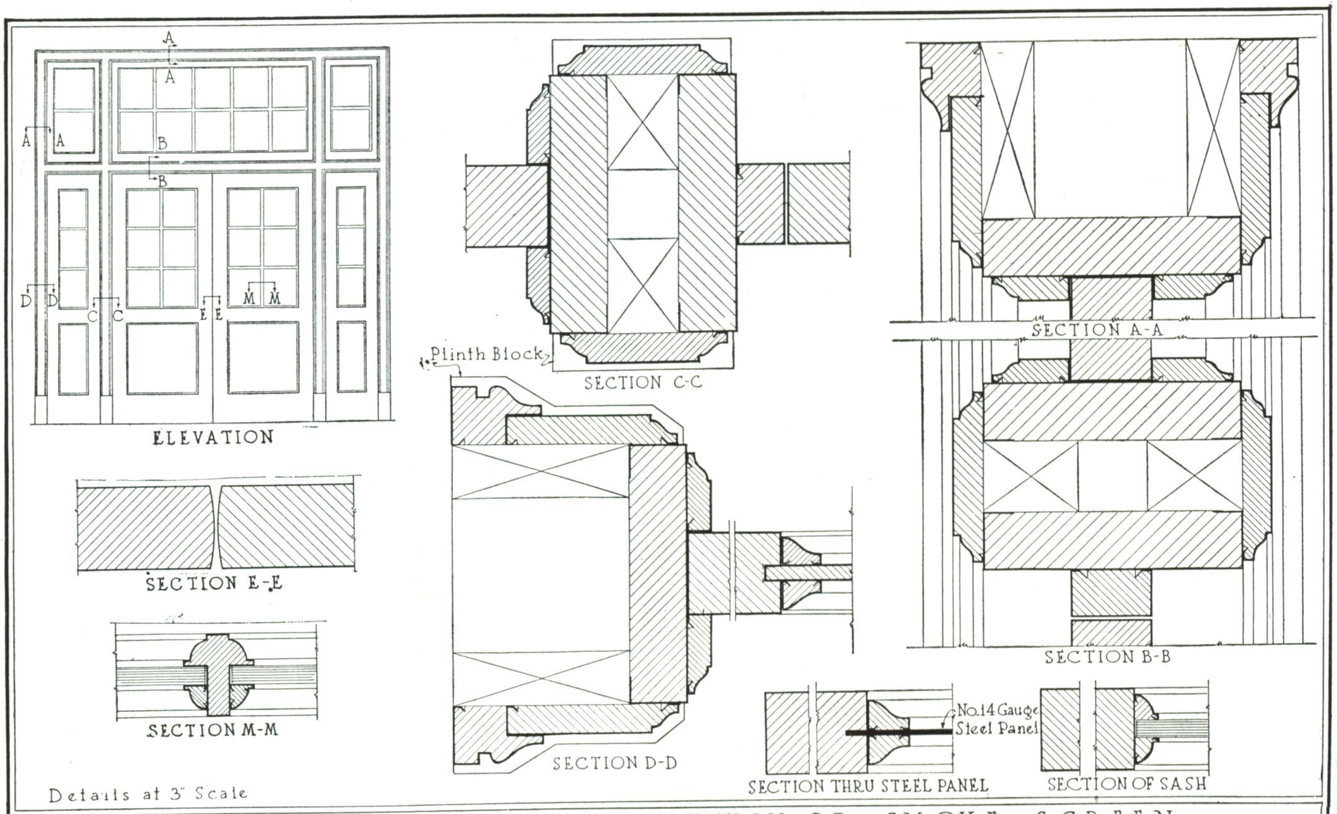
This includes double hung stationary, pivoted, and combinations of these types.

All windows are made with cutting and forming dies which insure the fitting of every member when assembled and a perfect operating window. Made in standard No. 24 gauge, also Heavy Type No. 20 gauge.

Specifications and details sent on request.

Recent Contracts

Vanderbilt University Hospital, Nashville, Tenn.
Doctors Building, Cincinnati, Ohio
Jewish Hospital, Cincinnati, Ohio
Auditorium and Market House, Memphis, Tenn.
Western Medical Reserve College, Cleveland, Ohio
Meyers Department Store, Greensboro, N. C.
Daily News Building, Greensboro, N. C.
Homeopathic Hospital, Providence, R. I.
Fire Alarm Signal Station, Boston, Mass.
Insurance Exchange Building, Boston, Mass.
West Roxbury Courthouse, Boston, Mass.
Peabody Museum, Yale University, New Haven, Conn.
Lapham Field Club House, Yale University, New Haven, Conn.
Sage School of Forestry, Yale University, New Haven, Conn.
Powell Building, New Haven, Conn.
Augusta Louise Troupe School, New Haven, Conn.
Albany Police Headquarters, Albany, N. Y.
Public School No. 20, Albany, N. Y.
Thirteenth Ward School, Albany, N. Y.
City Bank Trust Co., Syracuse, N. Y.
Mortuary Chapel, St. Joseph's Cemetery, Utica, N. Y.
Mortuary Chapel, Assumption Cemetery, Syracuse, N. Y.
Fort Plain National Bank, Fort Plain, N. Y.
Besse Security Building, Springfield, Mass.
Tarbell Watters Building, Springfield, Mass.
Hudson River Connecting R. R., Selkirk, N. Y.
Berkshire County Savings Bank, Pittsfield, Mass.
County Building, Canton, N. Y.
Enfield High School, Enfield, Conn.
Morris Plan Bank, Schenectady, N. Y.
General Baking Co., New Haven, Conn.
Hudson River Hospital, Poughkeepsie, N. Y.
Smith College Dormitory, Northampton, Mass.
Library and York Dormitory, Yale University, New Haven, Conn.
Masonic Temple, Springfield, Mass.
Masonic Temple, Poughkeepsie, N. Y.
Maple Grove School, Des Moines, Iowa
New Willard Hotel, Washington, D. C.



DETAILS OF METAL COVERED PARTITION OR SMOKE SCREEN

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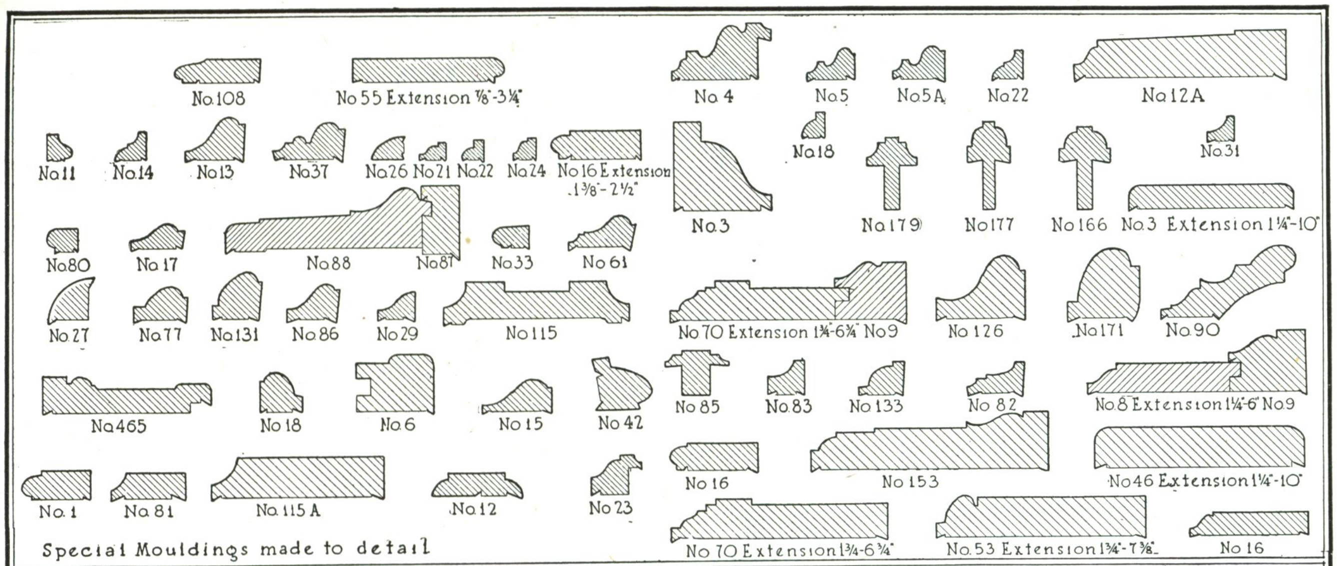
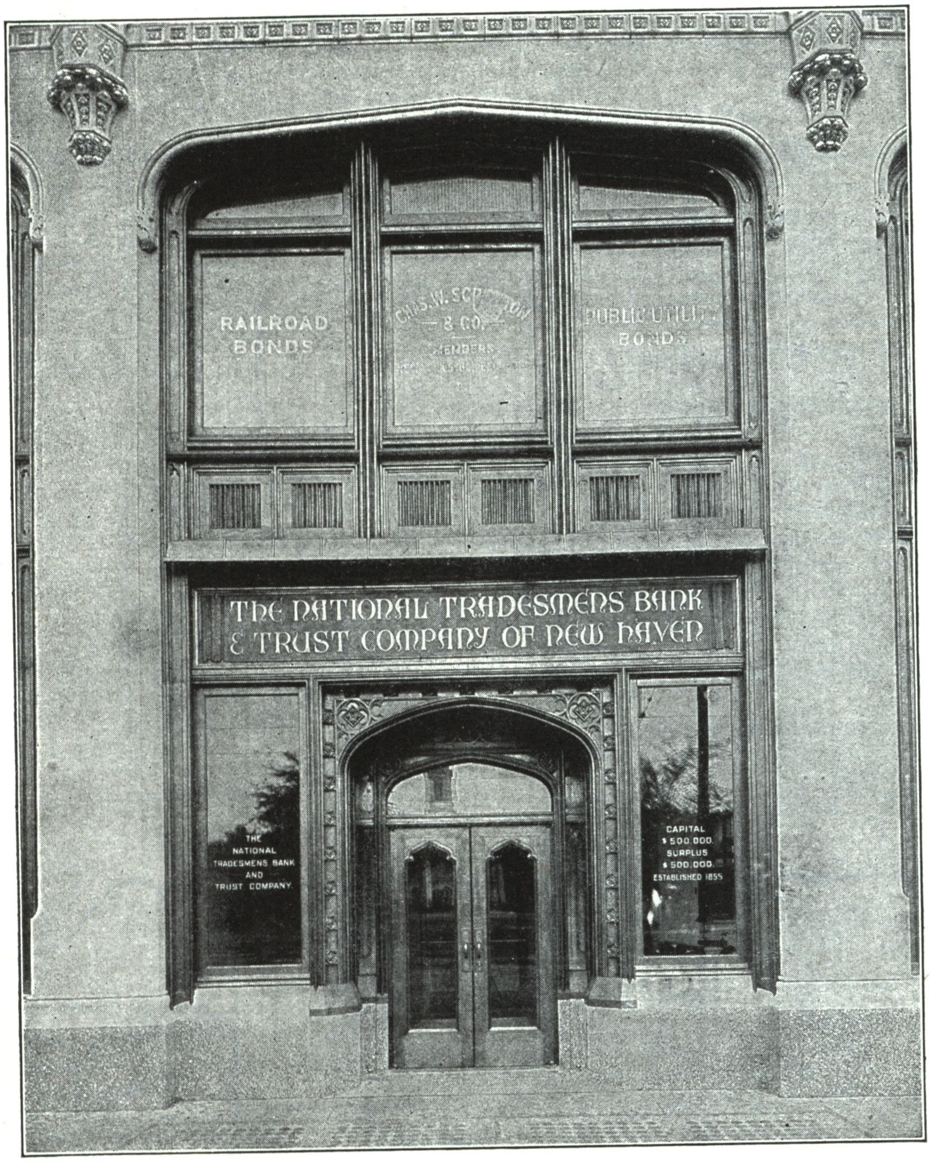

No.108
No 55 Extension 7/8"-3¼"
No 4
No.5
No.5A
No.22
No.12A
No.11
No.14
No.13
No.37
No.26
No.21
No.22
No.24
No.16 Extension 1⅜"-2½"
No.3
No.18
No.179
No.177
No.166
No.31
No.3 Extension 1¼"-10"
No.80
No.17
No.88
No.87
No.33
No.61
No.27
No.77
No.131
No.86
No.29
No.115
No.70 Extension 1¾-6¾" No.9
No.126
No.171
No.90
No.465
No.18
No.6
No.15
No.42
No.85
No.83
No.133
No.82
No.8 Extension 1¼-6" No.9
No.16
No.153
No.46 Extension 1¼"-10"
No.1
No.81
No.115 A
No.12
No.23
No.70 Extension 1¾-6¾"
No.53 Extension 1¾"-7⅜"
No.16
Special Mouldings made to detail

3" SCALE DETAILS OF STANDARD METAL COVERED MOULDINGS


RAILROAD BONDS
CHAS. W. SCRANTON & CO. MEMBERS
PUBLIC UTILITY BONDS
THE NATIONAL TRADESMENS BANK & TRUST COMPANY OF NEW HAVEN
THE NATIONAL TRADESMENS BANK AND TRUST COMPANY
CAPITAL $500,000 SURPLUS $500,000 ESTABLISHED 1855

Bronze Kalamein Entrance for National Tradesmen's Bank,
Powell Building, New Haven, Conn.
R. W. Foote, Architect

HOWELL FIELD & GODDARD, INC.

Metal Covered Doors, Windows, Steel Bucks and Trim

Review Avenue, Young and Gilbert Streets
LONG ISLAND CITY, N. Y.

TELEPHONES: OFFICE AND FACTORY, HUNTERS POINT 1901, 1902

Products

STANDWELL METAL COVERED DOORS.

ALL-STEEL COMBINATION BUCKS, JAMBS and TRIM, plain or moulded.

ELEVATOR FRONTS, all-steel and metal covered.

ALL-STEEL and METAL COVERED JAMBS and TRIM.

Also manufacturers of Metal Covered and Steel Base Picture and Wire Moulding; Tubular Steel Elevator Doors; Metal Covered Doors of bronze and copper.

Standwell Metal Covered Doors (Patented)

In the Standwell construction, the metal covering is of Nos. 22 and 24 gauge selected steel, made in tubular form entirely covering the wood cores. The metal is joined together and to the panels by welding, making the basic construction of the door one piece, which insures effective fire retardation.

The joints between stiles and rails are locked by a patented process (section AA below). This method makes the strongest joint possible to produce, also insuring that the metal surfaces of stiles and rails are flush and smooth without the use of a plastic filler. The joints, being filled with solder in the process, are polished over and are practically invisible.

The white pine cores used in the Standwell door serve a double purpose: making an absolute sound deadener (there being no metallic rattle to a Standwell door), also preventing any warping if door is subjected to fire. It also makes the application of hardware a simple matter, as templates are not required in advance as on all-steel doors.

Standwell doors are particularly suited for vertical shaft protection such as stairs and elevators where Underwriters' labels are required.

Doors of types 1, 3 and 4, will be carried in stock for immediate delivery in sizes as shown by schedule.

When ordering by schedule, note that jamb opening size is between jambs and from head jamb to finished floor. Allowance on finished door size is made for joint and for saddle.

Architects can, by using Standwell doors of sizes and designs shown, make a distinct saving for their clients, and owing to the H. F. G. standardized methods of manufacture be assured always of a uniform high quality and quick delivery.

STANDWELL DOOR SIZES FOR SWING DOORS

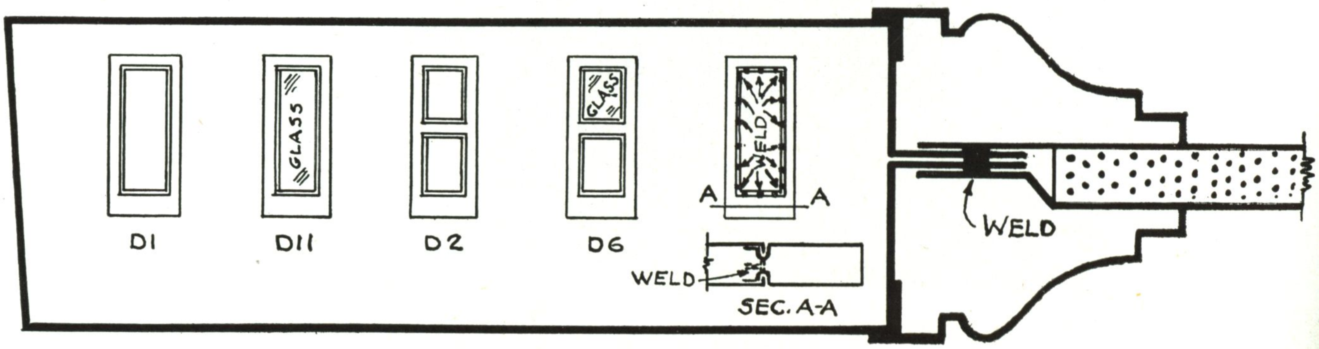
WIDTHS

Single Doors				Pirs of Doors			
Jamb opening, ft.	in.	Finished door, ft.	in.	Jamb opening, ft.	in.	Each finished door, ft.	in.
*2	6	2	$5\frac{13}{16}$	*5	0	2	$5\frac{13}{16}$
2	7	2	$6\frac{13}{16}$	5	2	2	$6\frac{13}{16}$
*2	8	2	$7\frac{13}{16}$	*5	4	2	$7\frac{13}{16}$
2	9	2	$8\frac{13}{16}$	5	6	2	$8\frac{13}{16}$
*2	10	2	$9\frac{13}{16}$	*5	8	2	$9\frac{13}{16}$
2	11	2	$10\frac{13}{16}$	5	10	2	$10\frac{13}{16}$
*3	0	2	$11\frac{13}{16}$	*6	0	2	$11\frac{13}{16}$
3	1	3	$0\frac{13}{16}$	6	2	3	$0\frac{13}{16}$
*3	2	3	$1\frac{13}{16}$	*6	4	3	$1\frac{13}{16}$
3	3	3	$2\frac{13}{16}$	6	6	3	$2\frac{13}{16}$
*3	4	3	$3\frac{13}{16}$	*6	8	3	$3\frac{13}{16}$
3	5	3	$4\frac{13}{16}$	6	10	3	$4\frac{13}{16}$
*3	6	3	$5\frac{13}{16}$	*7	0	3	$5\frac{13}{16}$
3	7	3	$6\frac{13}{16}$	7	2	3	$6\frac{13}{16}$
3	8	3	$7\frac{13}{16}$	7	4	3	$7\frac{13}{16}$

HEIGHTS

Jamb opening, ft.	in.	Finished door, ft.	in.	Jamb opening, ft.	in.	Finished door, ft.	in.
6	8	6	$7\frac{5}{16}$	7	2	7	$1\frac{5}{16}$
6	9	6	$8\frac{5}{16}$	7	3	7	$2\frac{5}{16}$
*6	10	6	$9\frac{5}{16}$	7	4	7	$3\frac{5}{16}$
6	11	6	$10\frac{5}{16}$	7	5	7	$4\frac{5}{16}$
*7	0	6	$11\frac{5}{16}$	7	6	7	$5\frac{5}{16}$
7	1	7	$0\frac{5}{16}$				

*Carried in stock.



Standard Designs for Standwell Doors

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All-steel Combined Bucks, Jambs and Trim

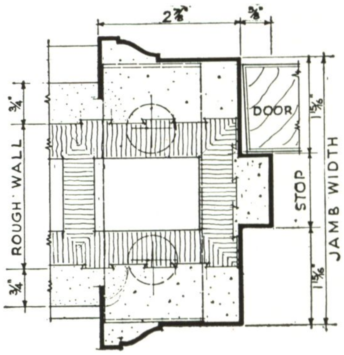
Bucks of Design 26, 27DT, 27DF, 28 and 29, made from No. 16 gauge steel, are suitable for all interior openings in the best types of buildings. Being of steel they are fireproof, and when used for fireproof openings, in conjunction with Standwell Steel Covered Doors, procure the lowest insurance rate.

They are suitable for non-fireproof openings where wood doors are used, being more economical than wood jambs and trim. The steel buck being erected as a unit, eliminates the extra cost of erecting separate bucks, jamb and trim.

All trim miters are welded, which eliminates the shrinkage and opening of miters found in wood trim.

All trimmed members are formed with sharp, clean corners, that for architectural beauty can not be excelled.

Note: In order to produce the best results in all-steel bucks, architects should specify that when partition blocks are laid, all open spaces between the end and sides of partition blocks and the steel buck should be slushed with mortar. If this is done there will never be any cracking of plaster around the buck.

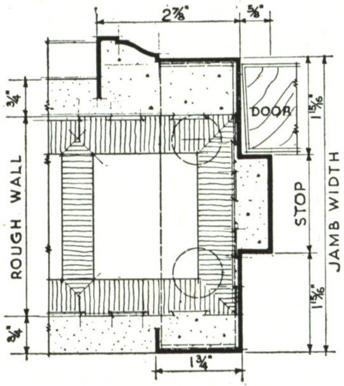


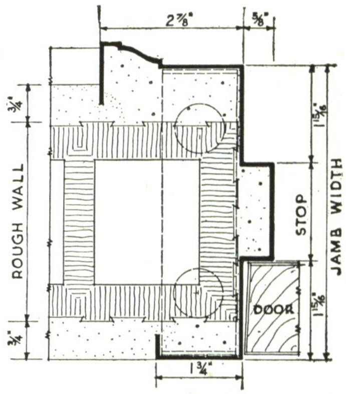
DESIGN 26

Type No.	Rough wall, in.	Jamb width, in.	Stop, in.
2605⅜	3	5⅜	1½
2606⅜	4	6⅜	2½
2608⅜	6	8⅜	4½

DESIGN 27DT

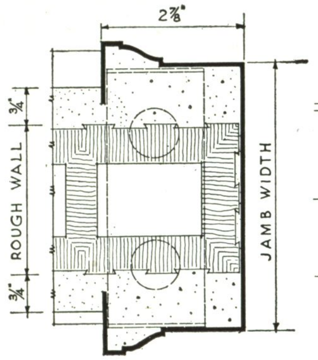
Type No.	Rough wall, in.	Jamb width, in.	Stop, in.
2704⅞	3	4⅞	1
2705⅞	4	5⅞	2
2707⅞	6	7⅞	4





DESIGN 27DF

Type No.	Rough wall, in.	Jamb width, in.	Stop, in.
2704⅞	3	4⅞	1
2705⅞	4	5⅞	2
2707⅞	6	7⅞	4

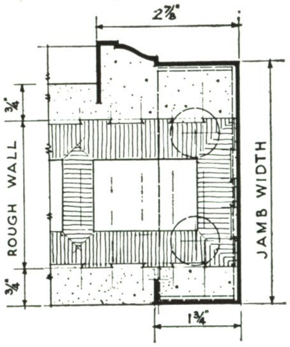


DESIGN 28

Type No.	Rough wall, in.	Jamb width, in.
2805⅜	3	5⅜
2806⅜	4	6⅜
2808⅜	6	8⅜

DESIGN 29

Type No.	Rough wall, in.	Jamb width, in.
2904⅞	3	4⅞
2905⅞	4	5⅞
2907⅞	6	7⅞



Buck Sizes

All-steel bucks, also metal covered jambs, are made to jamb opening sizes as shown on Standwell door schedule.

Complete Elevator Fronts

All-steel combination elevator bucks and complete elevator fronts, including saddles, bucks and doors and hardware, furnished and erected.

We will send on request complete information and specifications showing standard types of installation, covering wall and shaft conditions, for both metal covered and all-steel elevator door openings.

Noteworthy H. F. G. Door and Buck Installations

14-story Hotel Times Square, 43rd Street and 8th Avenue, New York City, Gronenberg and Leuchtag, Architects
20-story Hotel Pennsylvania, Seventh Avenue and West 33rd Street, New York City, McKim, Mead and White, Architects
18-story Hotel Statler, Buffalo, N. Y., Geo. B. Post & Sons, Architects
12-story Hotel Syracuse, Syracuse, N. Y., Geo. B. Post & Sons, Architects
20-story Hotel Roosevelt, Madison Avenue, 45th and 46th Streets, New York City, Geo. B. Post & Sons, Architects
31-story Hotel Shelton, 49th Street and Lexington Avenue, New York City, Arthur Loomis Harmon, Architect
19-story Hotel Alamac, 71st Street and Broadway, New York City, Maynicke & Franke, Architects
22-story Berkley Office Building, 19 West 44th Street, New York City, Starrett & Van Vleck, Architects
23-story National Association Building, 25 West 43rd Street, New York City, Starrett & Van Vleck, Architects
25-story Fisk Building, 57th Street and Broadway, New York City, Carrere & Hastings, Architects
22-story Liggett-Winchester-Ley Building, 42nd Street and Madison Avenue, New York City, Carrere & Hastings, Architects
21-story Canadian-Pacific Building, 43rd Street and Madison Avenue, New York City, Starrett & Van Vleck, Architects
16-story Muriel-Arms Apartments, Kingsbridge Road and Grand Concourse, New York City, Margon & Glasner, Architects
17-story Broadway View Apartments, Broadway and 104th Street, New York City, Carrere & Hastings, Architects
16-story Apartment Hotel, 12 East 86th Street, New York City, Schwartz & Gross, Architects
10-story Concourse Plaza Apartments, 161st Street and Grand Concourse, New York City, Maynicke & Franke, Architects
14-story Apartment Hotel, 85th Street and Broadway, New York City, Gronenberg & Leuchtag, Architects

THE R. C. MAHON COMPANY

Kalamein Doors
6548 St. Aubin Avenue
DETROIT, MICH.

Product

Kalamein Doors.
For Mahon Roof Sumps, see page 1853.

Mahon Fireproof Doors Made in Standard Sizes for Immediate Delivery

Fireproof doors in standard sizes are carried in stock ready to ship. We make all designs.

These sizes include: 2 ft. 6 in. x 6 ft. 8 in.; 2 ft. 8 in. x 6 ft. 8 in.; 2 ft. 8 in. x 6 ft. 10 in.; 2 ft. 10 in. x 6 ft. 8 in.; 2 ft. 10 in. x 6 ft. 10 in.; 3 ft. x 6 ft. 8 in.; 3 ft. x 6 ft. 10 in.; 3 ft. x 7 ft.

Designs shown below are carried in stock for immediate shipment.

Jambs—Jambs in 5½-in. widths for standard doors, also trim and mould of standard patterns are also carried in stock.

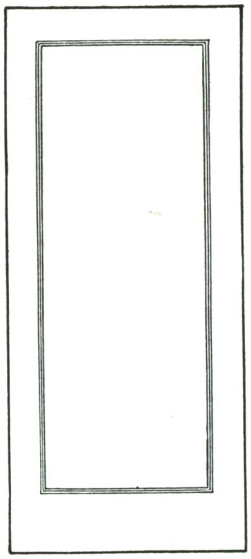
Facilities for Special Designs

Our modern facilities place us in position to fabricate special type doors, jamb, trim or moulding as desired.

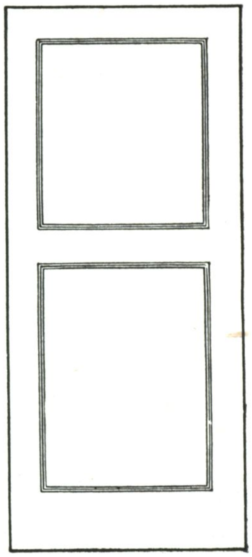
Services

Our engineering department is at your service at all times, especially when confronted by unusual or special problems in which you care to have our assistance.

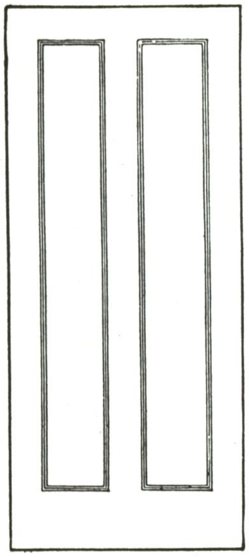
Manufactured in Underwriters' Labeled and Non-Labeled Types



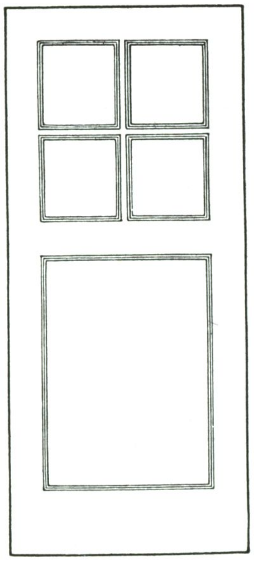
1P=1 Panel
1PG=1 Panel Glass



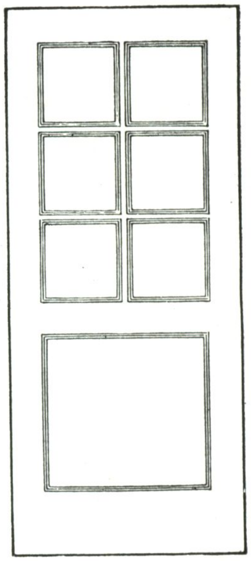
2P=2 Panel
2PG=2 Panel Glass



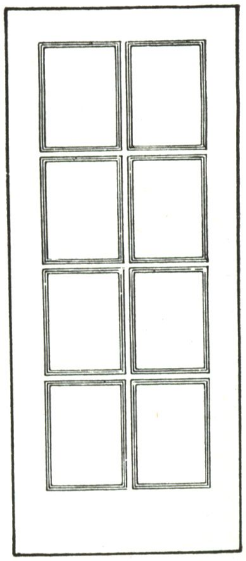
2VP=
2 Vertical Panel



2P4G=2 Panel
4 Glass



2P6G=2 Panel
6 Glass



1P8G=1 Panel
8 Glass

NEWARK SHEET METAL & KALAMEIN CO.

Manufacturers of Sheet Metal Work

211-217 Coit Street

IRVINGTON, N. J.

TELEPHONE
BIGELOW 3044

Products

High grade SHEET METAL WORK, including KALAMEIN DOORS, SASH, TRIM and MOULDINGS; UNDERWRITER'S FIRE DOORS.

Also, Metal Covered Partitions, Metal Store Fronts, Ornamental Marquises, Cornices, Roofs, Ventilators, and other types of Architectural Sheet Metal Work.

Quality and Underwriters' Indorsement

In the construction of its products the NEWARK SHEET METAL & KALAMEIN CO. has adopted the highest standards of construction, which are as a rule, and especially when so required, entirely in accordance with the requirements of the National Board of Fire Underwriters.

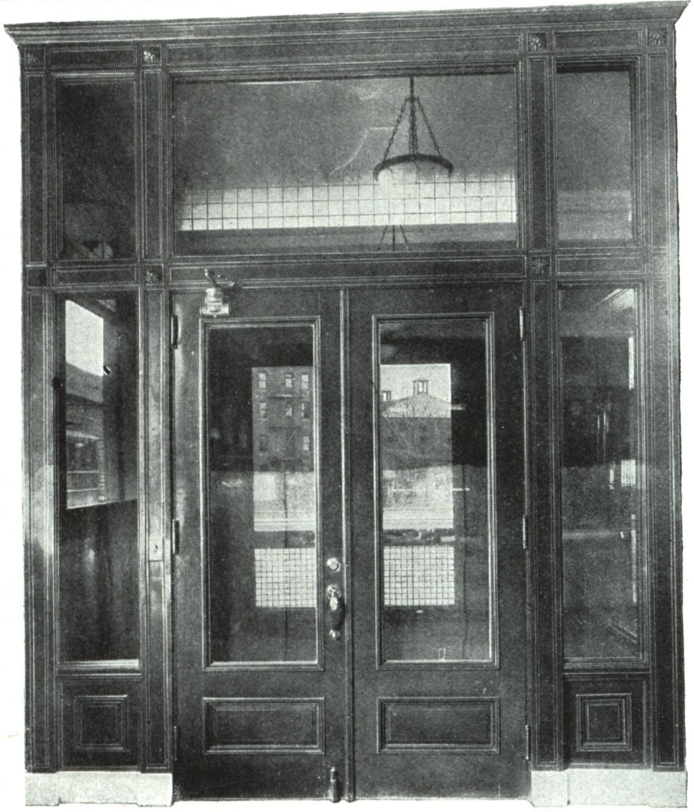
Service and Facilities

This organization is prepared to install any of its products in any part of the United States when size of contract warrants. The grade of work solicited demands the employment of only highly skilled workers and a shop equipment of latest and most efficient machinery and tools.

The service department invites consultation during and after the preparation of plans and will gladly give suggestions or other information required.

Kalamein Work

The following suggested specifications will indicate the methods practiced by this concern in the manufacture of its kalamein work. Contracts of any size can be handled by its efficient force. Hardware will be applied or provision made for it. Fire doors — swinging, sliding, or hung—can be equipped with any type of control.



Vestibule Enclosure, Public Service Commercial Building, Elizabeth, N. J.

Specifications for Kalamein Work

Material—All woodwork used in the manufacture of door and window frames, jambs, doors, sash and trim to be of seasoned clear kiln dried white pine. Stiles more than 6 in. wide must be built up of strips and glued together.

All metal to be of 16-oz. copper [commercial bronze] [low brass] [No. 28 kalamein iron] [galvanized iron].

Covering—All woodwork must be covered by machine, except on panels (whether of wood or asbestos) metal must be glued on. All metal must fit closely to wood cores, the surfaces to be straight and true without blisters, cracks or rough edges; edges to be straight and true; mouldings to be as per details, with sharp, square corners, showing true lines. Special care must be taken in assembling to avoid bench marks as much as possible and to get a true fit at the miters, cut ends at miters to be covered with same metal as used for mouldings.

Assembling—All members of doors, sash, etc., must be mortised and tenoned, and put together with hardwood wedges, or doweled with hardwood dowels and special gluing process.

All trim, where practical, shall be mitered and put together at shop, all joints and miters thoroughly brazed and each cleated with metal clips. Trims and mouldings, wherever possible, must be back screwed, thus avoiding defacing surface by nails or screws.

Exterior Work—On all work exposed to weather, joints must be properly brazed; and all joints where water or snow can lodge or that are subjected to steam or moisture to any extent, must be completely filled with solder and brazed so that no moisture can gain entrance to cores.

Cleaning—After kalamein work is erected, all surfaces of copper, commercial bronze or low brass must be thoroughly cleaned of solder or other foreign matter and a coat of lacquer applied. Galvanized or kalamein iron surfaces must be painted with 1 heavy coat of Sherwin-Williams paint, known as galvanized iron primer, or other paint equally approved. Before painting is done, however, metal must be thoroughly cleaned with benzine and bran, of grease or other foreign matters to prepare surface for a good adhesion of paint to surface.

Applying Hardware—Special care must be taken to apply hardware; it must be done by men experienced in kalamein work. Metal work must be cut to allow a clinch around butts or any other hardware where it is necessary to let same into finished work, so that no wood may be exposed and no moisture allowed to penetrate the wood core.

RELIANCE FIREPROOF DOOR CO.

Manufacturer of Fire Retardant Products

73 to 103 Dobbin Street and 80 to 110 Banker Street
BROOKLYN, N. Y.

REPRESENTATIVES

PHILADELPHIA, PA., F. J. Wilson, Otis Building
BOSTON, MASS., H. A. Seeley Co., 73 Tremont Street
ROCHESTER, N. Y., Building Specialties Co., 61 Mill Street
ATLANTA, GA., S. R. Hewett, National City Building
BALTIMORE, MD., Kemp & Jackson, 15 E. Fayette Street
WASHINGTON, D. C., R. T. McKnew, 607 Lenox Building
ST. LOUIS, MO., H. C. Uulenhaut, Railway Exchange Building
CINCINNATI, OHIO, Builders Material Co., 600 Lincoln Building
FT. WORTH, TEX., Collinsville Mfg. Co., 1009 East Front Street
OKLAHOMA CITY, OKLA., Bissell Builders Supply Co., Colcord Building
BILLINGS, MONT., F. W. Richardson, Electric Building
DENVER, COLO., Builders Service Bureau, 1729 Champa Street
REPRESENTATIVE FOR ORIENT: W. H. Daub & Co., Inc., Alaska Building, SEATTLE, WASH.

Products

Drawn Metal Covered Doors, Windows, Partitions and Trim; Furniture Steel Doors and Frames; Bronze Store Fronts; Extruded Bronze Windows.

Also Extruded Bronze Doors and Bank Screens.

All-weld Doors and Frames constructed under supervision of National Board of Fire Underwriters.

Metals Used

Bronze from Nos. 14 to 23 gauge. Copper from 14 to 32 oz. to the sq. ft. Furniture steel Nos. 12 to 22 gauge. Extruded bronze, .125 and heavier.

Facilities

Our new and modern manufacturing plant, containing 50,000 sq. ft. of working space and 25,000 sq. ft. of storage space, is equipped with the latest and most improved metal and wood working machinery, most of which has been specially designed to meet every requirement of producing only the highest standards of quality in all-metal fireproof products. All orders, large or small, can be promptly executed.

Prices furnished on receipt of schedule covering the following data (unless plans and specifications are furnished to us):

Doors: Size and style of each.

Jambs: Width and thickness required.

Casings: Moulded or flat; state width and whether one or both sides of opening, with or without plinths.

Specifications for Metal Covered Doors, Jambs and Trim

Metal Covering—All wood forming parts of doors, jambs and trim to be covered with metal as follows:

If Kalamein Iron Covered—Doors and jambs, Nos. 22 to 26 gauge and trim No. 26 gauge.

If Furniture Steel Covered—Doors and jambs Nos. 20 to 24 gauge and trim No. 26 gauge.

If Copper Covered—Doors and jambs, 16 to 32 oz.; mouldings and trim, 14 or 16 oz.

If Bronze Covered—Doors and jambs, Nos. 14 to 20 gauge; mouldings and trim, No. 23 gauge.

Cores—All wood in doors, jambs and trim shall be clear white pine and shall be thoroughly seasoned, kiln dried and free from shakes, sap, loose or large knots, or any defects impairing strength or durability. Doors to be made, 1⅛, 1¼, 1⅜, $1\frac{13}{16}$, 2¼ in., or heavier, if required. If doors are either $1\frac{13}{16}$ or 2¼ in. thick, stiles, top and cross rails are to be 5 in. wide and bottom rail is to be 10 in. high.

Jambs to be made 1⅜ or 1¾ in. thick, by width shown on drawings, if rabbeted; or ⅞ or 1⅛ in. with loose stop applied.

Trim moulded or plain as shown.

Finishing—All kalamein or galvanized iron material to receive a priming coat of paint in our shop before delivery.

If finish painting is desired, finish to be solid or grained in colors as selected, in air dried enamel finish.

Bronze and copper work to receive an oxidized finish of color as selected.

Underwriters' Labels—Underwriters' labels can be secured for doors leading to stairways, corridors and partitions, fire escapes and fire tower openings, which, when installed in accordance with the following specifications, will procure minimum insurance rate for building and contents.

Stair and Elevator Doors—Labeled for single doors up to 45 in. wide and in pairs up to 72 in. wide; made with solid panels hung on channel iron or combination steel frames with 5x5-in. full surface butts, mortise cylinder locks with ¾-in. throw bolt; stair doors should be made self-closing either by coil spring or door check.

Fire Escape and Tower Doors—Labeled for the same size openings as stair and elevator doors, and can be constructed to receive wire glass, not exceeding 5 sq. ft.; hung in the same manner as stair doors.

Corridor and Partition Doors—Constructed to receive 8 sq. ft. of wire glass and bearing the underwriters' label; may be hung to metal covered jambs when stair and elevator doors are labeled.

Specifications for Metal Covered Frames and Sash

Metal Covering—All wood forming parts of window frames and sash to be covered with metal. Each member covered with metal is to be drawn through steel dies before assembling and all mouldings and edges are to be sharp and true as detailed.

If Kalamein Iron Covered—No. 28 gauge for glass mouldings; No. 26 gauge for all other parts of frame and sash, except sill which will be No. 24 gauge.

If Copper Covered—14 oz. for glass mouldings; 16 oz. for all other parts of frame and sash, except sill which will be 20 oz.

If Bronze Covered—No. 27 gauge for glass mouldings; No. 23 gauge for all other parts of frame and sash, except sills, which will be No. 20 gauge.

Wood Cores—Cores of all window frames and sash shall be thoroughly seasoned dry white pine, free from loose or large knots. Cores shall be milled and constructed in the best manner, built up in strict accordance with the details, all mouldings shown on drawings being accurately followed.

Members of Window Frames—Unless otherwise shown on drawings, sizes of different members shall be as follows:

Sills, 2⅜ in. in thickness; pulley stiles and outside casings, 1⅛ in.; inside casings, ⅞ in.; back linings, ¾ in.; parting strips ¾x1⅛ in.; staff beads, sizes vary. Sills shall be double rabbeted. Inside stops shall be ½ in. by width desired. Sections of pulley stiles to be removable to give access to weights.

Frames for double hung sash to be box frames provided with weight separators. Sills to be plowed out on underside and provided with ⅛x2 in. galvanized iron water bar.

Note: All of our windows are equipped with our integral weather strips, which are made part of the construction.

Members of Sash—Unless otherwise shown on drawings, sizes shall be as follows: Stiles and top rails, $1\frac{13}{16}$x2⅜ in. Bottom rails, $1\frac{13}{16}$x3¾ in. Meeting rails, 1¾ in. thick. Rails shall be coped to stiles and screwed together with 5-in. screws for sash up to 4 ft. wide and with 6-in. screws for sash over 4 ft. Joints to be well filled with solder and filed smooth.

Specifications for Furniture Steel Door Frames

Frames to be made of furniture steel of not lighter than No. 16 gauge U. S. Standard with all miters and joints to be welded and made smooth. Reinforcement for application of necessary hardware to be electrically welded and of proper size to insure rigid construction. Wall anchors to be provided and spaced approximately 2 ft. apart to insure rigidity. Each frame to be provided with spreaders for parallel alignment. Templates for all hardware will be furnished in reasonable time prior to the manufacture of these frames.

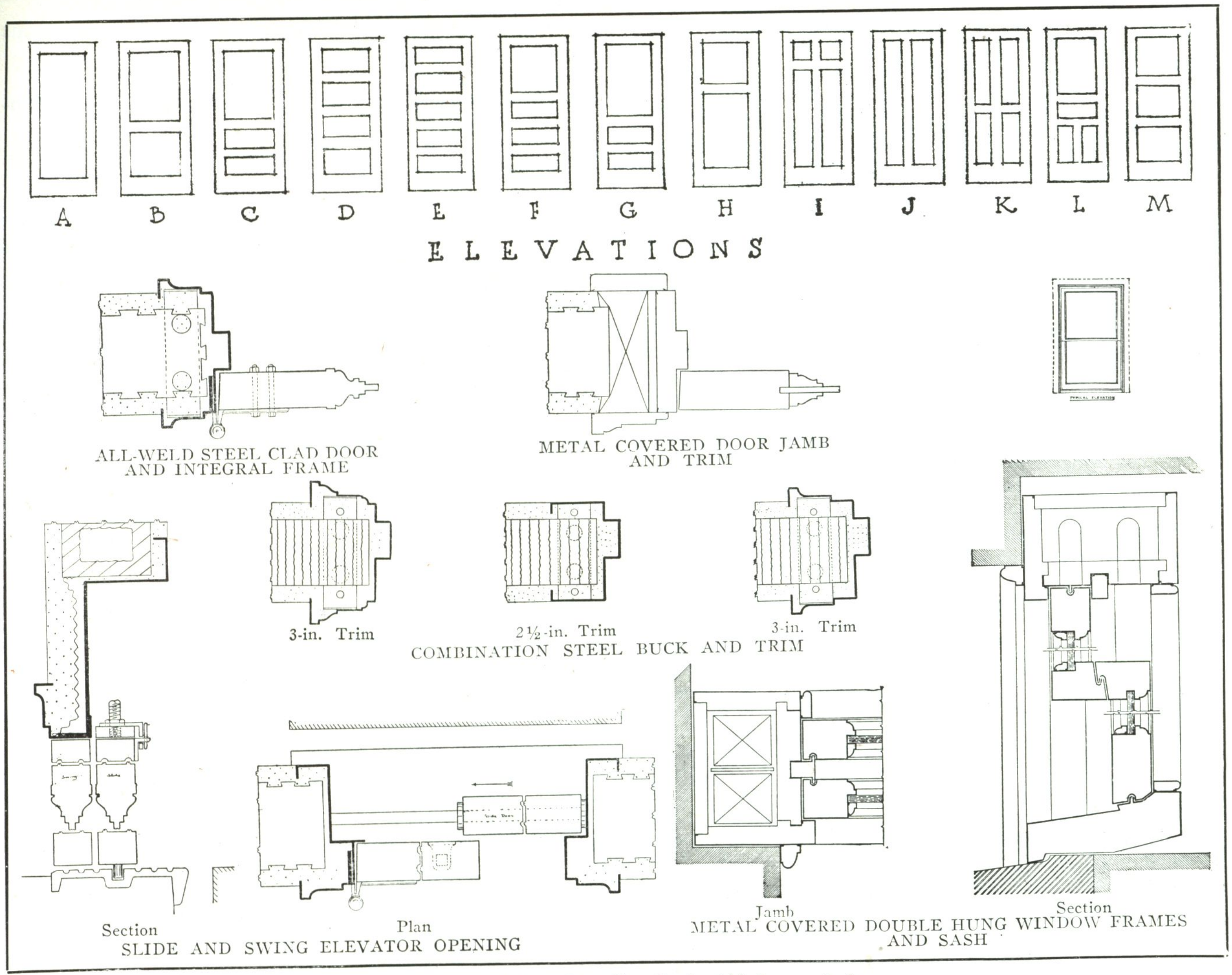
All frames to receive one shop coat of the best metallic primer and applied in a first-class workmanlike manner to ensure a complete covering on all surfaces, inside and outside.

Note: If required, underwriters' labels can be secured for openings in vertical shafts, exterior walls, and for openings in corridor and room partitions. No. 14 gauge steel must be specified.

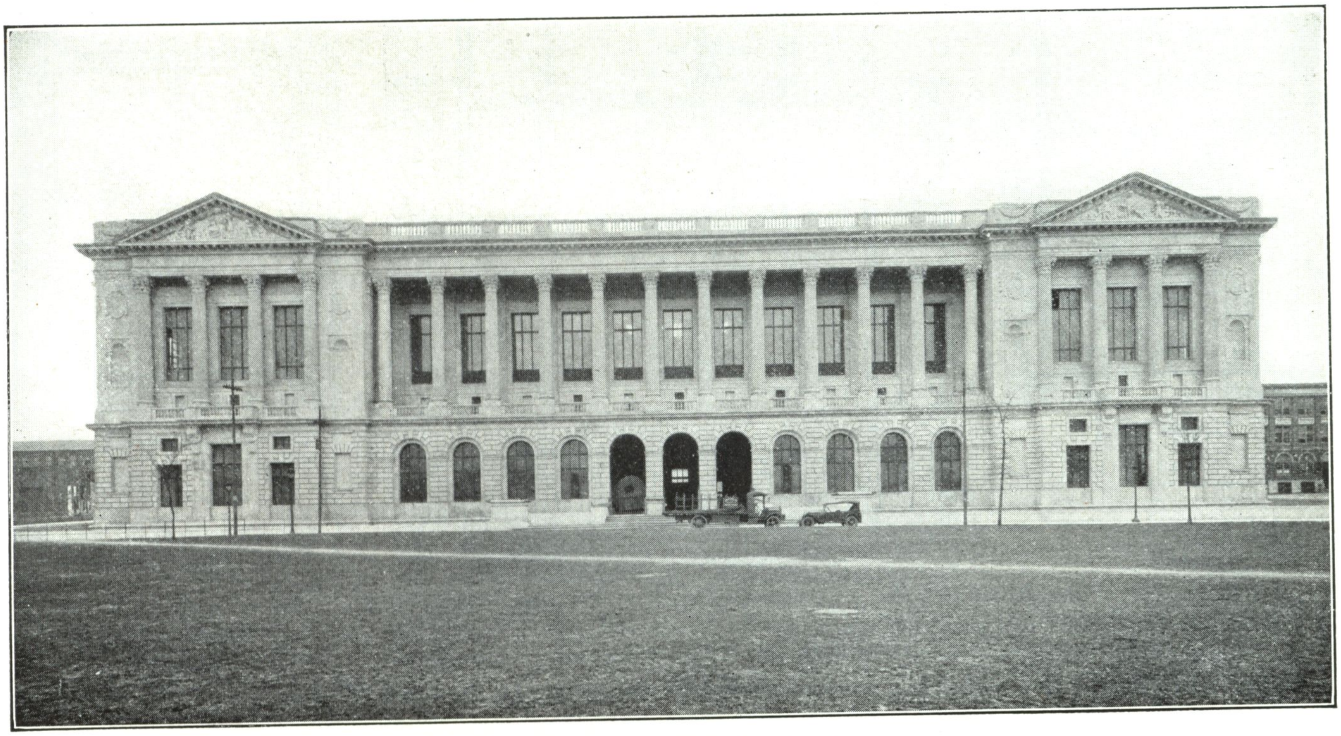
Further Information

Architects are requested to send for full size details of any of these products.

Continued on next page


A
B
C
D
E
F
G
H
I
J
K
L
M
ELEVATIONS
ALL-WELD STEEL CLAD DOOR AND INTEGRAL FRAME
METAL COVERED DOOR JAMB AND TRIM
3-in. Trim
2½-in. Trim
3-in. Trim
COMBINATION STEEL BUCK AND TRIM
Section
Plan
SLIDE AND SWING ELEVATOR OPENING
Jamb
Section
METAL COVERED DOUBLE HUNG WINDOW FRAMES AND SASH

Door and Window Details—Scale 1½ in. = 1 ft.



Free Library of Philadelphia, Pa.

Horace Trumbauer, Architect P. H. Kelly Construction Co., Contractors

Continued on next page

Reliance Extruded Bronze Windows and Casements

The extruded bronze sections are especially designed to meet the requirements of this class of work.

These windows are the result of many years of practical experience in the window business.

In designing the sections we have combined watertight qualities with an architectural design suitable for most of the important buildings where windows of the highest quality would be used. The use of extruded bronze ensures sharpness of detail, straight lines, clear surfaces and a beautiful finish. It also eliminates the cost of upkeep and insures the building being free from rust or paint stains.

Reliance Extruded Bronze Double Hung Windows

Reliance extruded bronze windows of the double hung type are guaranteed weathertight in the most exposed situations. The sections have been designed without any hollow spaces or channels which collect dirt and moisture. All of the surfaces of the sash are flat and of ample strength to resist warping or bending by undue strain or careless usage.

Reliance Extruded Bronze Mullioned Casement Windows

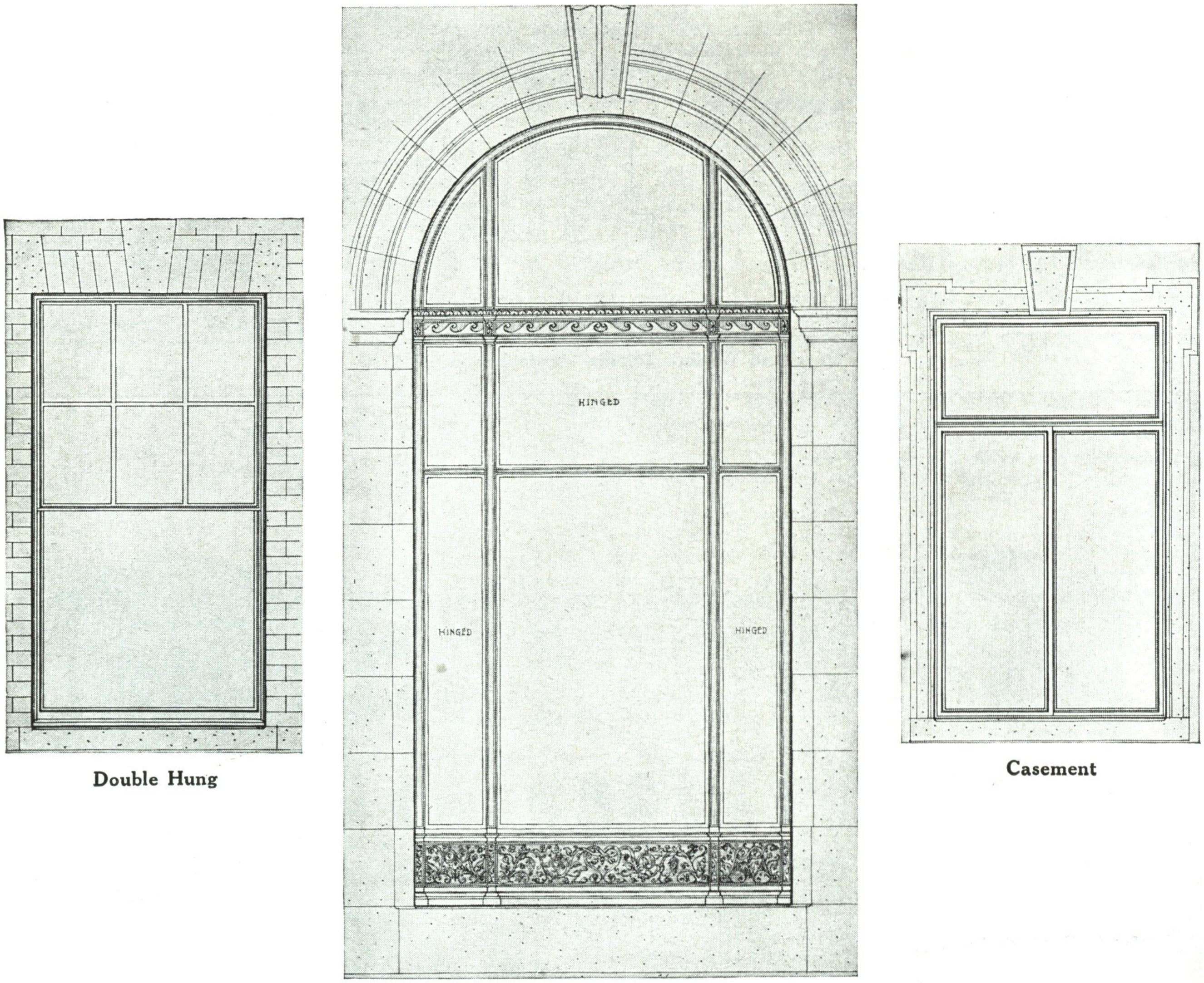
Reliance extruded bronze windows of the mullioned casement type have been designed for use especially in high class buildings. These include libraries, banks, insurance buildings, memorial buildings, cathedrals and buildings of a similar character where windows of the highest quality and permanence are a requisite.

The sash sections have been especially designed of tube form to give strength to the sections and also to give to the sash a solid appearance, when opened.

Reliance Extruded Bronze Casement Windows

Reliance extruded bronze casements are recommended for high class residences or where the highest class of work is required.

Upkeep and painting are eliminated where these windows are used. They can be constructed to suit any style of masonry.



Double Hung

Casement

Typical Reliance Extruded Bronze Double Hung and Casement Windows

THE PROBERT SHEET METAL CO.

Manufacturers of Metal Covered Doors

COVINGTON, KY.

For Marquises, see page 736

ProBert Metal Covered Doors

ProBert metal covered doors are made of thoroughly kiln dried cores of non-resinous lumber covered with either galvanized iron, furniture stock steel, cold rolled copper or sheet bronze. Cores are constructed so as to absolutely prevent twisting or warping after assembling and the metal is glued to the cores with special casein glue under a pressure of two tons to the square foot, consequently, ProBert doors are absolutely smooth, tight and free from buckles. All seams are soldered and scraped.

ProBert metal covered doors are furnished labeled or unlabeled, glazed or unglazed, with or without hardware. We will apply customer's hardware if it is sent to our factory with all carrying charges prepaid.

Doors receive one shop coat of priming paint, and are finished in any color desired.

Unless otherwise specified, all doors are furnished 1¾ in. thick and jambs are furnished 5¼ in. wide with single rabbet.

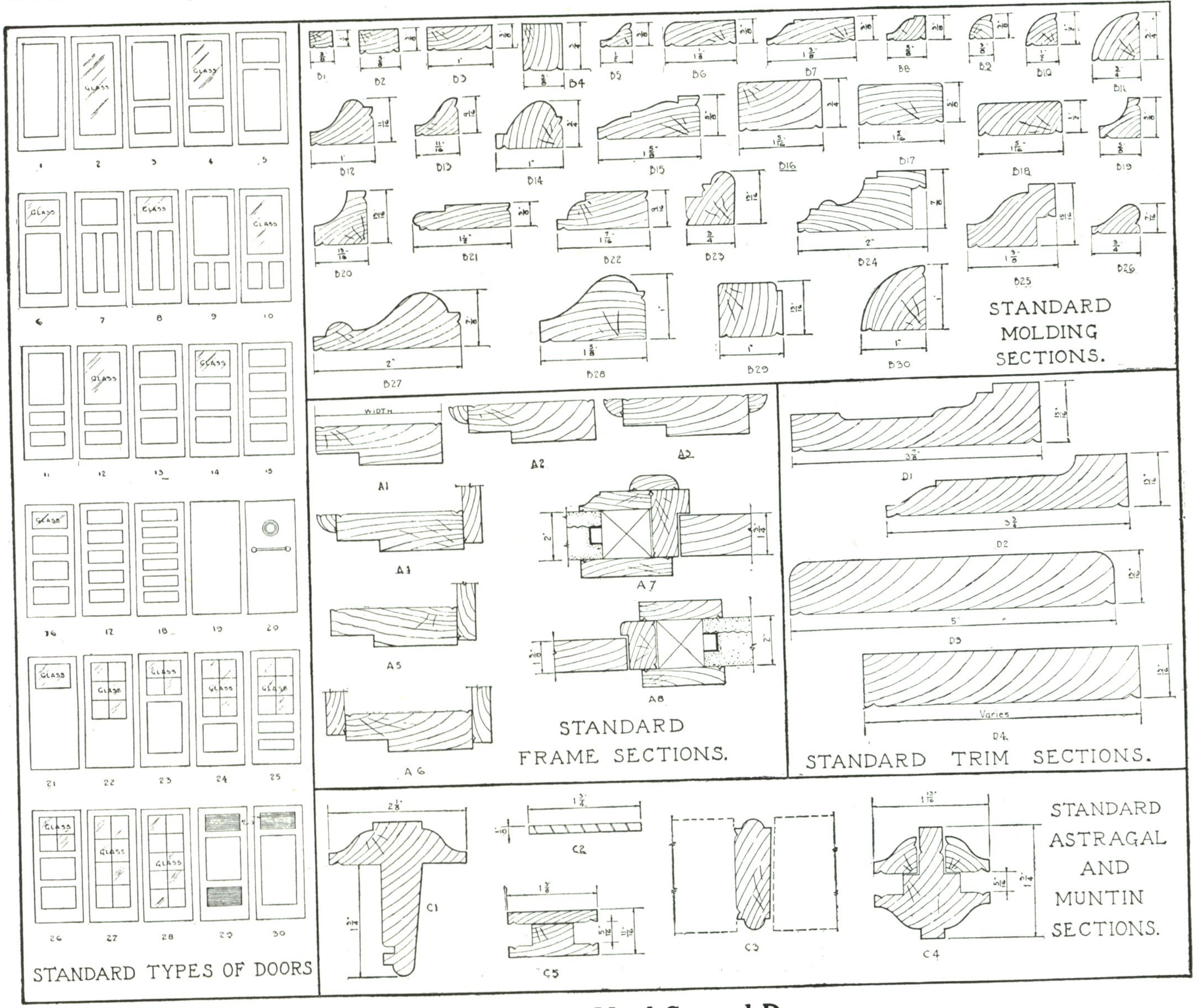
In addition to the doors illustrated, we make special high grade copper or bronze covered entrance doors, from either architects' or our own designs.

Complete schedules or details are submitted for approval before work is started on orders.

Information Required for Estimates

Estimates will be submitted on receipt of plans and specifications, or on receipt of the following information:

Type of doors, paneling and size (see types 1 to 30 below). Type and size of jamb. Size of transom, number of lights and whether stationary, hinged or pivoted. Type and size of double doors, whether single or double acting, type of meeting stiles and if astragal is required.


GLASS
STANDARD TYPES OF DOORS
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11
B12 B13 B14 B15 B16 B17 B18 B19
B20 B21 B22 B23 B24 B25 B26
B27 B28 B29 B30
STANDARD MOLDING SECTIONS.
WIDTH
A1 A2 A3 A4 A5 A6 A7 A8
STANDARD FRAME SECTIONS.
D1 D2 D3 D4
Varies
STANDARD TRIM SECTIONS.
C1 C2 C3 C4 C5
STANDARD ASTRAGAL AND MUNTIN SECTIONS.

Details of ProBert Metal Covered Doors

SYRACUSE FIRE DOOR CORPORATION

INC.

Manufacturers of Metal Covered Doors and Trim and Tin Clad Fire Doors

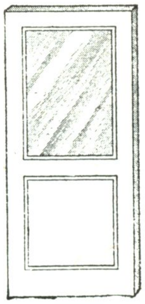
900 Canal Street
SYRACUSE, N. Y.

Products

KALAMEIN DOORS; HOLLOW METAL BUCKS, FRAMES and JAMBS; TIN CLAD FIRE DOORS and SHUTTERS.

Also manufacturers of Underwriters' Labeled Fire Door Hardware; Channel and Angle Iron Door Frames; Kalamein Office Partitions and Smoke Screens.

Syracuse Kalamein Doors



These doors are made in a variety of standard designs for use in office buildings, public buildings, schools, theaters, stores, hospitals, etc.

The wood used in the cores is thoroughly seasoned and air dried before going through the factory. Panels are carefully built up and covered with metal, both sides glued, and placed under heavy pressure to insure good contact and eliminate any buckling. Mouldings are drawn true and accurately mitered. All joints are welded and scraped to smooth surface.

Doors are 1¾ in. thick, the standard for metal doors.

We finish our doors with one coat of shop paint. Special designs may be had to accord with any architectural plans.

We make kalamein jambs, casings and mouldings, all carefully drawn.

Labeled Kalamein Doors

We specialize in labeled kalamein doors.

All doors shown below can be labeled excepting doors marked "B," "W" and "X."

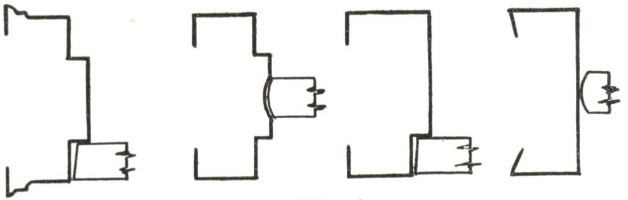
Pressed Steel Bucks and Frames

Frames and bucks are made of heavy sections formed from cold rolled steel. Thickness of metal varies from 16 to 18 gauge, depending upon conditions governing installation.

All joints on frames are accurately mitered, oxy-acetylene welded and ground down to a smooth surface. Frames are neatly cut for installation of hinges and lock-keeper, and reinforced by welding on back. Reinforcements are tapped to receive screws.

Suitable wall anchors are provided to build frame into masonry.

Frames are made any size or design to accurately fill any condition of architectural details.



Metal Jambs
Any style or shape

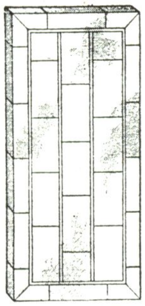
These steel frames and bucks are unexcelled for economy of installation, durability and appearance. They eliminate the time spent in construction and fitting rough bucks, separate jambs and plaster grounds.

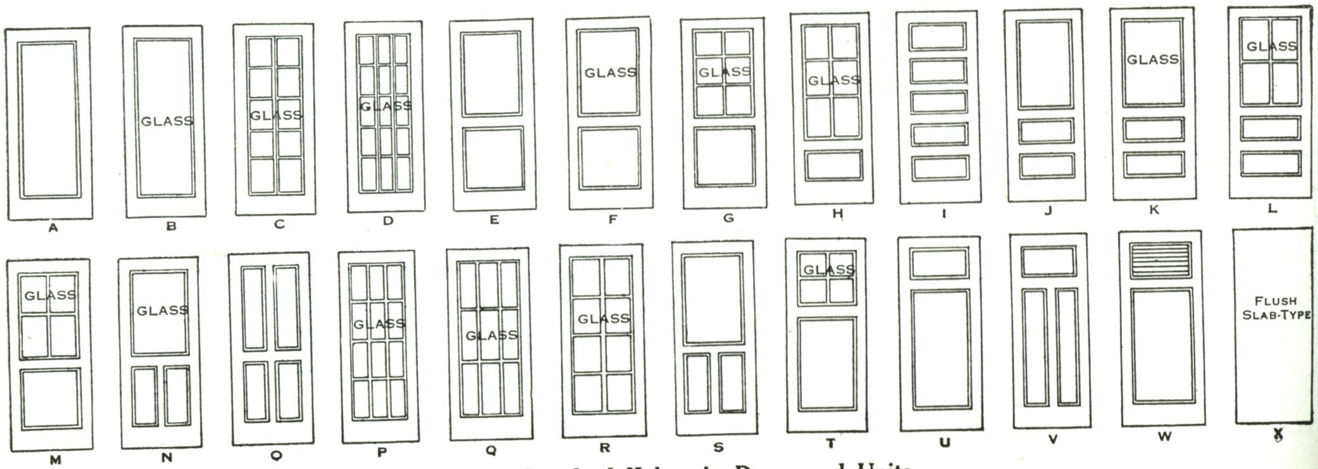
All frames and bucks receive one coat of metallic shop paint primer applied carefully to thoroughly cover all surfaces, inside and out.

Tin Clad Fire Doors and Shutters

All types of labeled and unlabeled, two-ply and three-ply tin clad fire doors and shutters to fill conditions imposed by insurance and building requirements. First class materials, careful workmanship developed by many years of experience, and the most modern and efficient machinery serve to make these building necessaries of most approved design.

Those regularly inspected, bear the label of the National Board of Fire Underwriters, which is in itself a warranty of their superior workmanship and demonstrated worth as fire retardants.





Syracuse Standard Kalamein Doors and Units

THORP FIRE PROOF DOOR CO.

1600 Central Avenue
MINNEAPOLIS, MINN.

Products

THORP FIREPROOF DOORS and TRIM, HOLLOW METAL FRAMES, SMOKE SCREENS; STAIR, ELEVATOR and FIRE ESCAPE DOORS; BRONZE and COPPER ENTRANCES.

Facilities and Service

The THORP FIRE PROOF DOOR CO. is the pioneer in this line of work, and all our facilities are devoted exclusively to this line. Our draftsmen and estimators are at the service of any builder or architect at any time. We have agents in all the principal cities who are ready to serve and are glad to be called on for this service.

Construction and Material

The Thorp doors are made on the basis of the Underwriters' standard; a three-ply built-up pine core, asbestos lined and metal covered. The door covering is locked or welded into one sheet for each side of the door, the two sheets are locked together on all four edges of the door. No dependence is put on a mortise-and-tenon joint or lag screw to hold the door or parts together. No soldered joints to open up later.

Thorp standard paneled doors are covered with No. 24 gauge metal, the panels being sunk by hydraulic pressure, a single sheet to cover each side of a door.

Thorp special detail doors are made to the architects' design, the panel mouldings forming an integral part of the stiles and rails; not loose mouldings nailed in, as in some types of doors. The sheet is assembled with flush welded joints, polished down, making a single sheet to each side, without joints or cracks or applied mouldings.

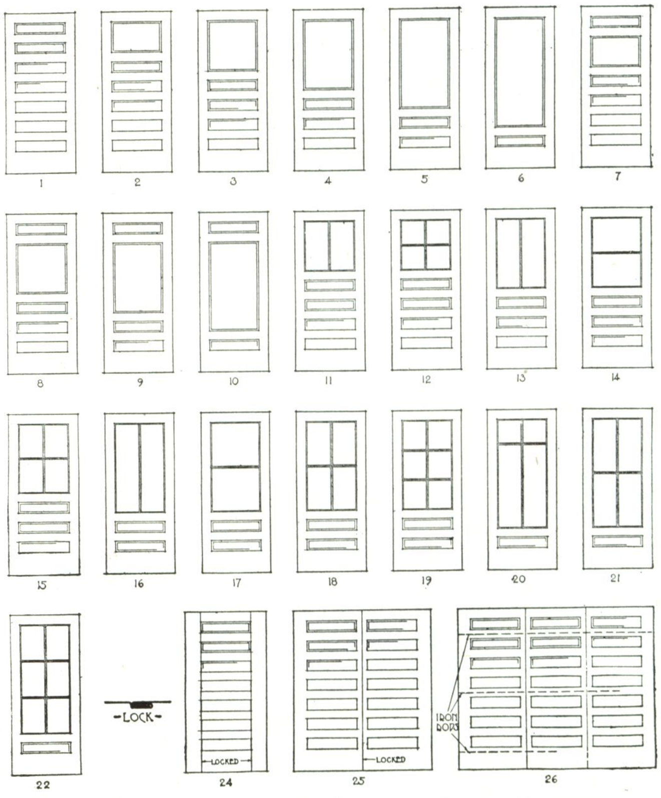


FIG. 1. SOME OF THORP STANDARD PANEL LAYOUTS

No. 1 furniture steel is used throughout our products. The stiles and rails are generally No. 24 gauge with No. 20 gauge panels, but the entire covering may be specified No. 20 gauge if desired.

Labeled Service

Either the Thorp standard or special paneled door may be labeled in the Underwriters' classifications B, C, or D, when desired, provided certain regulations relating to hardware and inspection are complied with.

Hollow Frames

We make any type of all-steel frame for brick, concrete, plaster or tile walls, either with or without the doors. Hollow steel frames of the hospital type are very economical and sanitary, and especially adapted for wood doors in hospitals, schools, and public buildings. See Sections Nos. 11 and 12 on Fig. 2.

Entrance Doors

Thorp doors in bronze or copper make the most durable, economical, and handsome of entrances for all kinds of public buildings—schools, university buildings, churches, etc. Whenever a pretentious entrance is desired, the Thorp way and service can supply the demand. No entrance is too elaborate for our craftsmen, and no entrance too simple to have our best in workmanship, service and personal interest.

Finish

All work is given one coat of shop paint unless otherwise specified. We finish doors, frames and trim with either air dried or baked enamel, in any color, or grained to match any kind of wood finish.

Illustrations

We can show only a few reduced suggestions of the detail of our work in this space. Fig. 1 shows some of the standard panel layouts; Fig. 2 shows a few of our jamb sections, both in the kalameined and hollow types. Fig 3 shows a typical fire smoke screen for schools and public buildings. Fig. 4 shows only a very few of our mouldings and casings.

We show three views of entrances which are typical of the scope of our work. The Yeates job shows a bronze entrance in a cast frame. The Commercial Bank job shows bronze entrance doors, frames, and grilles. The Houghton School job shows a serviceable copper entrance for schools or public buildings.

These illustrations are simply to indicate the character and scope of the Thorp doors.

Catalogue

Our new reference book will be sent on request to any architect, builder, or owner. We have brought the book down to date, and enlarged it with much new material and information about the Thorp doors for those interested in fireproof doors and finish.

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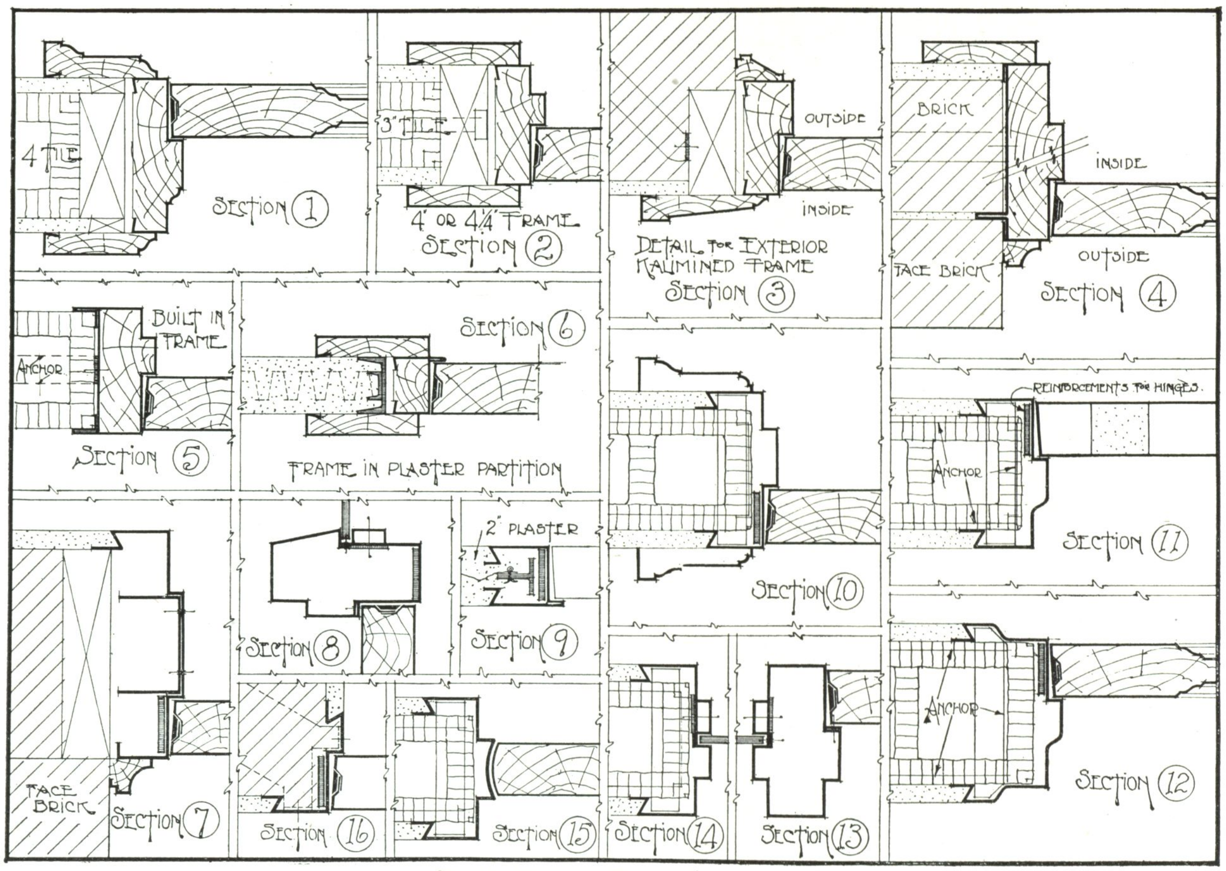
4" TILE
SECTION ①
3" TILE
4" OR 4¼" FRAME
SECTION ②
OUTSIDE
INSIDE
DETAIL FOR EXTERIOR KALAMINED FRAME
SECTION ③
BRICK
INSIDE
FACE BRICK
OUTSIDE
SECTION ④
BUILT IN FRAME
ANCHOR
SECTION ⑤
SECTION ⑥
FRAME IN PLASTER PARTITION
REINFORCEMENTS FOR HINGES
ANCHOR
SECTION ⑩
SECTION ⑪
2" PLASTER
SECTION ⑧
SECTION ⑨
FACE BRICK
SECTION ⑦
SECTION ⑯
SECTION ⑮
SECTION ⑭
SECTION ⑬
ANCHOR
SECTION ⑫

FIG. 2. TYPICAL FRAME SECTIONS

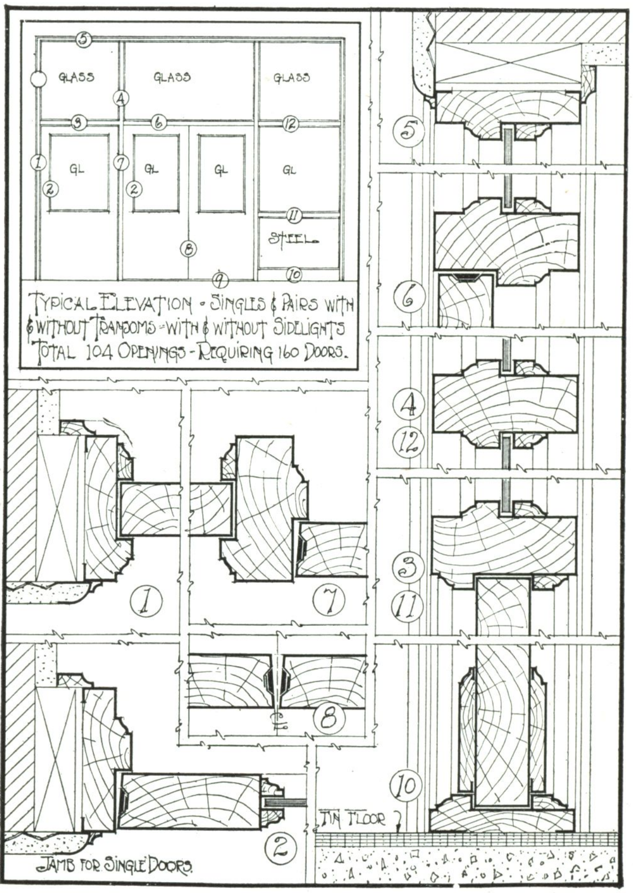
GLASS
GLASS
GLASS
GL
GL
GL
GL
STEEL
TYPICAL ELEVATION - SINGLES & PAIRS WITH & WITHOUT TRANSOMS - WITH & WITHOUT SIDELIGHTS
TOTAL 104 OPENINGS - REQUIRING 160 DOORS.
①
②
⑦
⑧
⑤
⑥
④
⑫
③
⑪
⑩
TIN FLOOR
JAMB FOR SINGLE DOORS

FIG. 3. TYPICAL SMOKE SCREEN, USED IN WEAVER HIGH SCHOOL, HARTFORD, CONN.
FRANK IRVING COOPER CORP., Architects

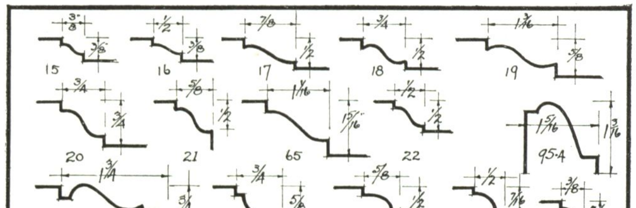
15
16
17
18
19
20
21
65
22
95·4
46
23
24
30
17·2
17·18
19·15
24·1
24·5
65·1
46·1
24·7
54·1
52·8
7·1
38·5
30·1
9·6
52·7

FIG. 4. MOULDINGS AND CASINGS

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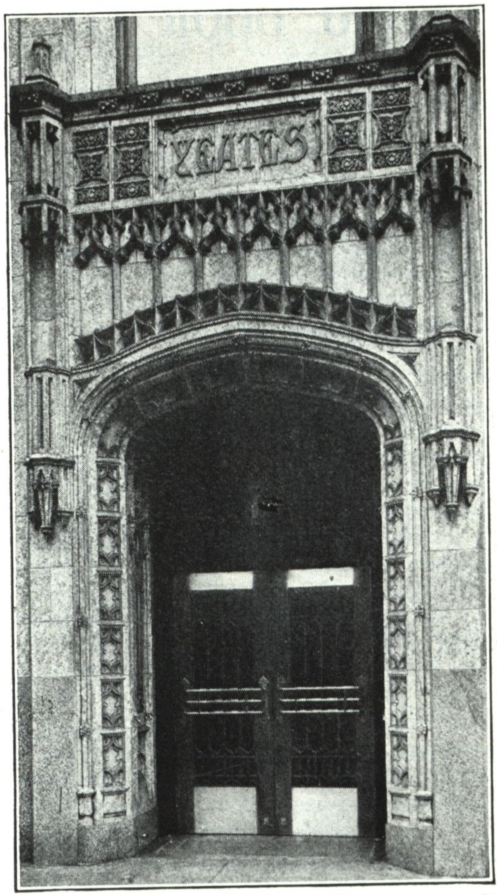
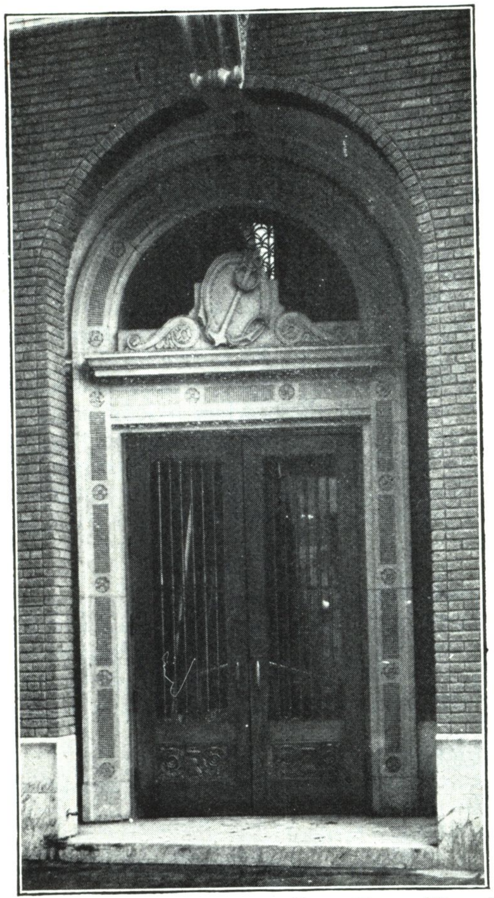
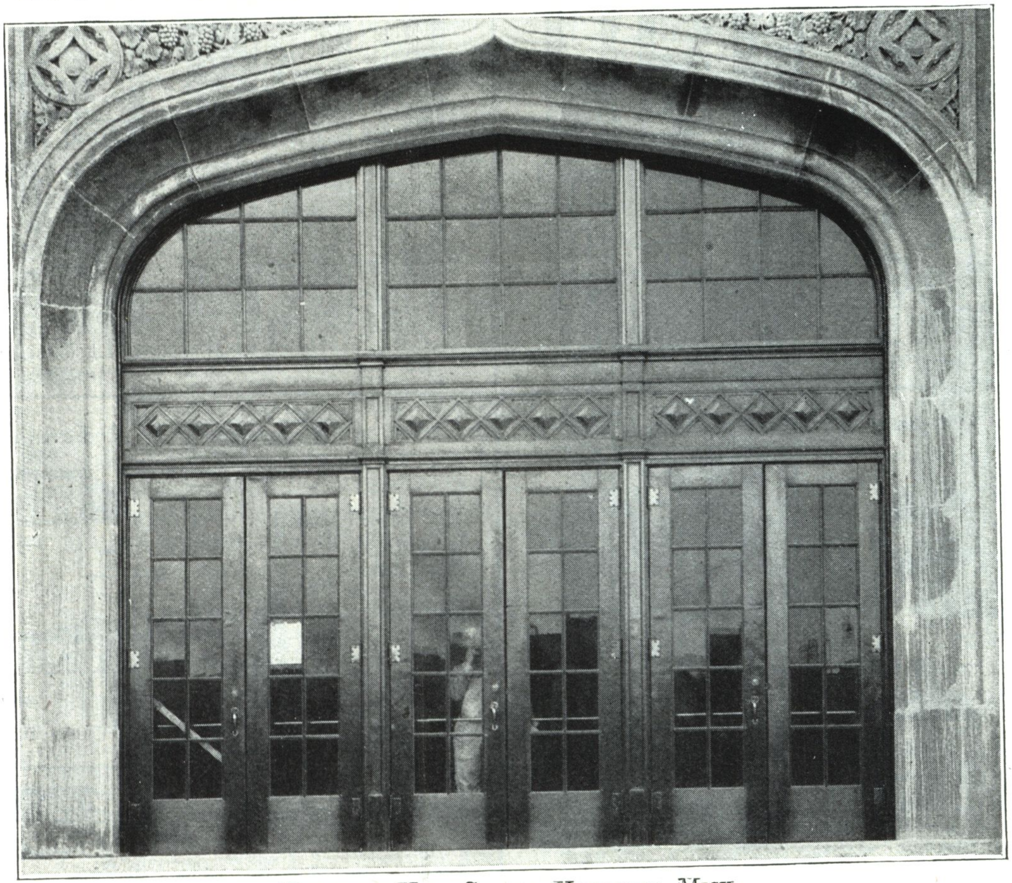


Main Entrance, Yeates Building, Minneapolis, Minn.
Long & Lamoreaux, Architects



Commercial Bank Building, Blue Field, West Va.
Alex B. Mahood, Architect



Houghton High School, Houghton, Mich.
Schilling, Keough & Reynolds, Architects

THE COMPOUND AND PYRONO DOOR CO.

SUCCESSORS TO PYRONO PROCESS COMPANY

Manufacturers of Fireproof Veneered Doors and Trim

ST. JOSEPH, MICH. COLUMBUS, OHIO

Py-ro-no
TRADE MARK
REGISTERED

Products

PYRONO FIREPROOF DOORS and TRIM.

Process of Construction

The PYRONO process is a mechanical method of fireproofing wood cores in the manufacture of doors and trim.

In PYRONO construction, cores of non-resinous wood are used and these when assembled are covered with pure, long fiber asbestos sheathing mechanically bonded to their surfaces, excluding oxygen, thus preventing ignition, and assuring against spread of flame from the place of origin to other parts of a building—the one essential province of a fire door.

Appropriate Use

PYRONO doors are used for stairways, elevators, corridors and partitions, in office buildings, hotels, hospitals, apartments, schools, dormitories and similar types of fireproof buildings.

Fully Tested

PYRONO, first introduced in 1910, has fully demonstrated in official tests and actual fires its perfect efficiency as a fire retardant.

Designs

Flush doors with or without inlay. Panel doors, any arrangement of panels. Sash doors with glass lights not exceeding 720 sq. in. PYRONO doors and trim furnished in all cabinet woods used in interior finish.

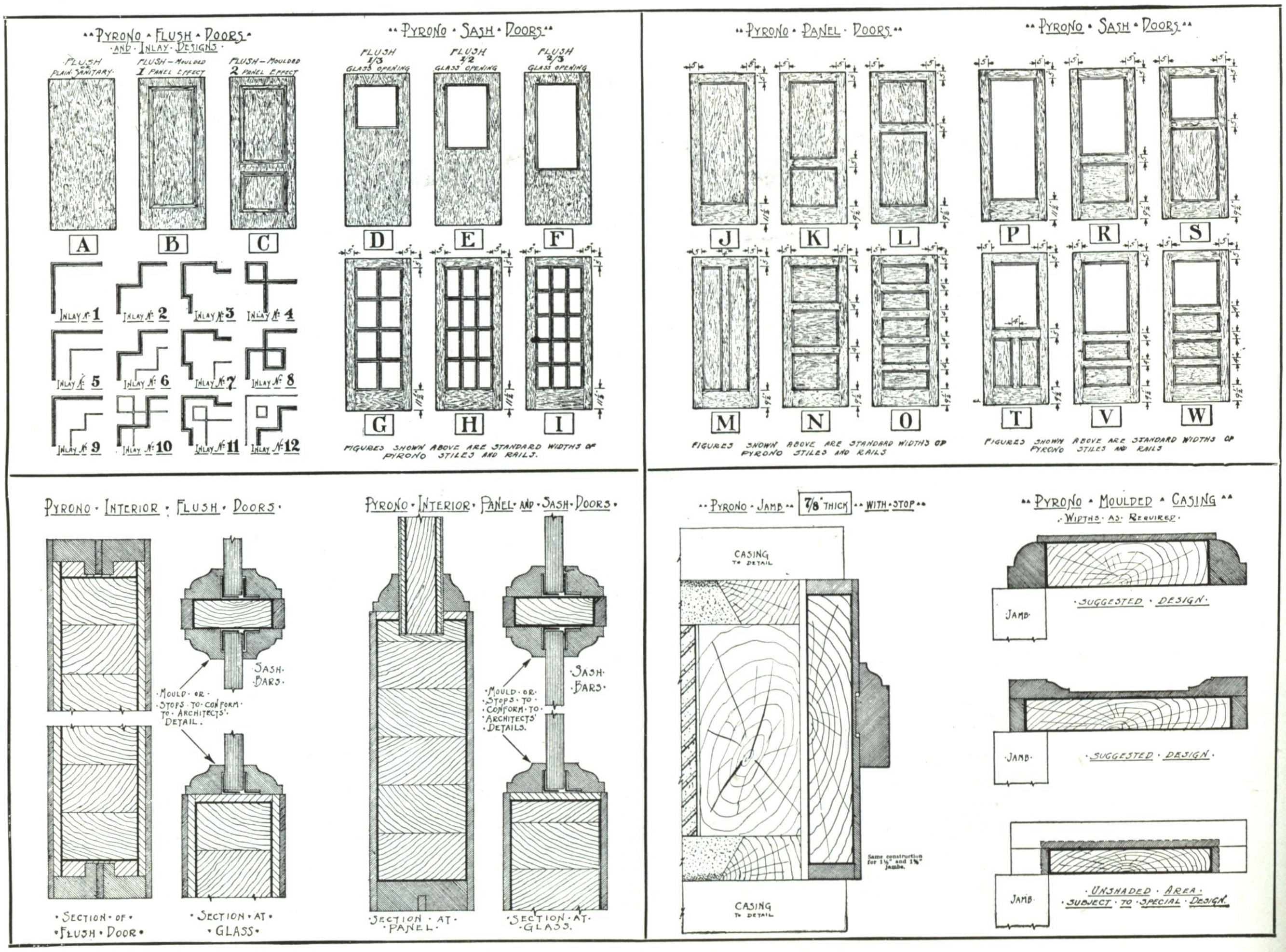
Specification

PYRONO products should be specified under carpentry work as follows:

All openings indicated as fireproof shall be furnished and erected by the carpenter contractor. The doors, frames and trim for same, except those marked tin clad, shall be PYRONO doors, frames and trim as manufactured by THE COMPOUND AND PYRONO DOOR CO. of St. Joseph, Michigan. Hardware will be furnished to the carpenter, under hardware allowance, who will fit and apply the same. Painter's finish and wire glass will be furnished by the contractor for painting and glazing.

Identification

PYRONO doors are identified by the narrow strip of contrasting wood inserted in the edges of all PYRONO doors.


PYRONO · FLUSH · DOORS · AND · INLAY · DESIGNS
FLUSH OR PLAIN · SANITARY
FLUSH — MOULDED 1 PANEL EFFECT
FLUSH — MOULDED 2 PANEL EFFECT
A
B
C
INLAY No. 1
INLAY No. 2
INLAY No. 3
INLAY No. 4
INLAY No. 5
INLAY No. 6
INLAY No. 7
INLAY No. 8
INLAY No. 9
INLAY No. 10
INLAY No. 11
INLAY No. 12
PYRONO · SASH · DOORS
FLUSH 1/3 GLASS OPENING
FLUSH 1/2 GLASS OPENING
FLUSH 2/3 GLASS OPENING
D
E
F
G
H
I
FIGURES SHOWN ABOVE ARE STANDARD WIDTHS OF PYRONO STILES AND RAILS.
PYRONO · PANEL · DOORS
J
K
L
M
N
O
FIGURES SHOWN ABOVE ARE STANDARD WIDTHS OF PYRONO STILES AND RAILS
PYRONO · SASH · DOORS
P
R
S
T
V
W
FIGURES SHOWN ABOVE ARE STANDARD WIDTHS OF PYRONO STILES AND RAILS
5"
4"
9½"
11½"
PYRONO · INTERIOR · FLUSH · DOORS ·
SASH · BARS ·
· MOULD · OR · STOPS · TO · CONFORM · TO · ARCHITECTS' · DETAIL ·
· SECTION · OF · FLUSH · DOOR ·
· SECTION · AT · GLASS ·
PYRONO · INTERIOR · PANEL · AND · SASH · DOORS ·
· MOULD · OR · STOPS · TO · CONFORM · TO · ARCHITECTS' · DETAILS ·
· SASH · BARS ·
· SECTION · AT · PANEL ·
· SECTION · AT · GLASS ·
PYRONO · JAMB · 7/8" THICK · WITH · STOP
CASING TO DETAIL
CASING TO DETAIL
Same construction for 1⅛" and 1⅜" Jambs.
PYRONO · MOULDED · CASING
· WIDTHS · AS · REQUIRED ·
JAMB ·
· SUGGESTED · DESIGN ·
· JAMB ·
· SUGGESTED · DESIGN ·
JAMB ·
· UNSHADED · AREA · SUBJECT · TO · SPECIAL · DESIGN ·

Details of Pyrono Construction

DUSING AND HUNT, INC.

Standard Tin Clad and Metal Covered Doors; Elevator Safety Gates

386 Michigan Avenue, BUFFALO, N. Y.

Products

TIN CLAD and METAL COVERED DOORS:

Including Underwriters' Labeled Tin Clad Heavy Duty Fire Doors; Bi-swing Elevator Doors; Counterbalanced Doors; Kalamein Doors and Trim; Steel Door Frames.

ELEVATOR SAFETY GATES.

Also Standard Projection Booth Shutters; Light Iron Work.

Service

Our Engineering Department, solving special fire door problems for 25 years, invites architects and builders to refer such matters to them. Our well-equipped factory enables us to give unusually speedy delivery, and we can erect doors built for service in any part of the United States.

Tin Clad Heavy Duty Fire Doors

Types—Swinging, sliding, vertical sliding, bi-swing, bi-folding; in fact, any type to meet the various conditions.

Hardware—All doors which we make are equipped with the approved hardware, designed for heavy duty to give unlimited service. We furnish strap hinges ⅜ in. thick, heavy malleable iron keepers, and pintels with ¾ in. steel pins; and for swinging doors extra heavy 3-point latches. Automatic closing device, simple in design yet unfailing (patented by DUSING AND HUNT, INC.).

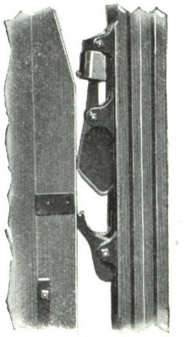
Approval—Labels can be obtained for tin clad sliding doors not exceeding 120 sq. ft.; height or width not exceeding 12 ft. For single swing doors not exceeding 6 ft. wide or 12 ft. high. For swinging doors in pairs not exceeding 10 ft. wide or 12 ft. high.

Steel Frames for Swinging Doors—Heavy steel frames of channel or angle iron construction, made especially for labeled tin clad fire doors are furnished with automatic closing device and all other hardware attached.

Elevator Safety Gates

Approval and Use—Our elevator safety gates are approved and recommended by State Labor Departments, and meet all rules and regulations required for buildings having elevator shafts built prior to 1913 and hatchways not protected by doors.

Type—Gates are furnished in single and double blade types. The single blade is used where headroom over gate can be obtained to slide gate up; the double blade, made in two sections, is used where the room is insufficient to slide gate up in single unit and give required opening.



Locking Device

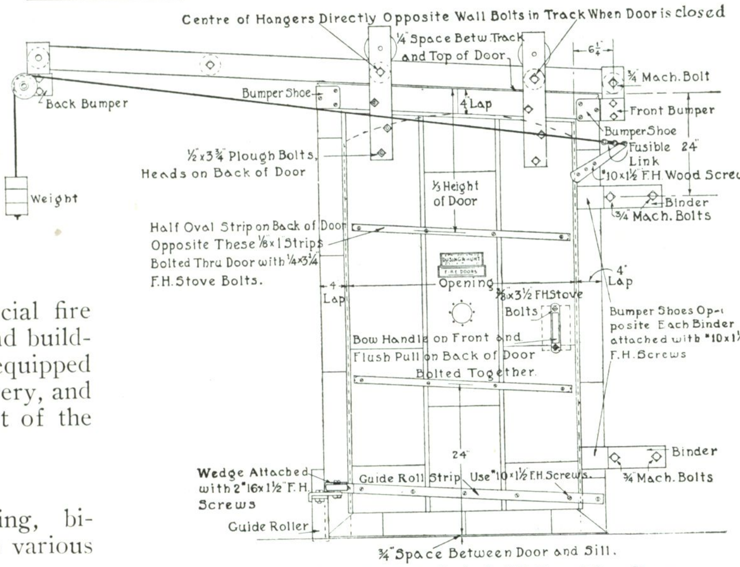
Construction—Frame of gate is made of well-seasoned, first class oak. Side and head members securely bolted together with heavy oak reinforcing cross members. Slats of ¼x1¾-in. oak stock are securely bolted to gate frame and protected by cross members from breakage.

Hardware—Including steel guides and guide shoes and specially designed malleable iron castings for gate machines, is all of heavy construction, yet perfect in operation. Mechanism is all enclosed in gate posts box, together with weights for counterbalancing.

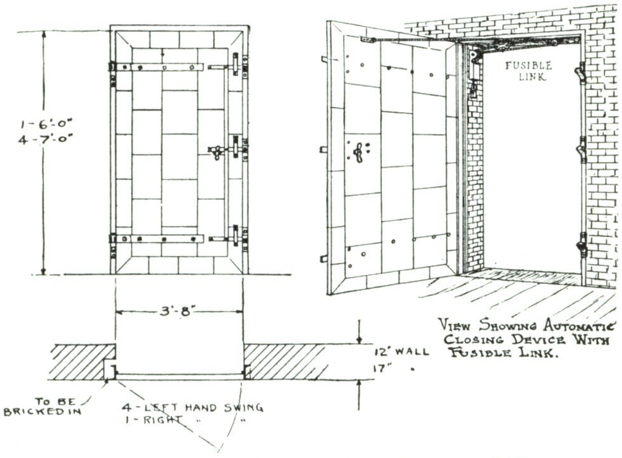
Approved Automatic Locking Device—The locking device, which locks gate automatically when elevator car leaves opening and automatically unlocks when car returns, is our own patent device and is furnished complete for all installations.

Special locking devices will be designed for gates which are already in place.

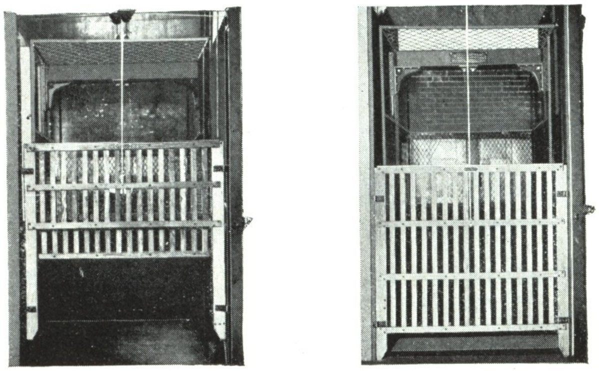
Complete Details—For elevator gates and automatic locking devices, will be furnished by our engineering department upon request.


Centre of Hangers Directly Opposite Wall Bolts in Track When Door is closed
¼ Space Betw. Track and Top of Door
6¼
¾ Mach. Bolt
Back Bumper
Bumper Shoe
4 Lap
Front Bumper
Bumper Shoe
Fusible Link 24"
10x1¼ F.H. Wood Screws.
Binder
¾ Mach. Bolts
½x3¾ Plough Bolts, Heads on Back of Door
Weight
⅓ Height of Door
Half Oval Strip on Back of Door Opposite These ⅛x1 Strips Bolted Thru Door with ¼x3¼ F.H. Stove Bolts.
4 Lap
Opening
⅜x3½ F.H. Stove Bolts
4" Lap
Bumper Shoes Opposite Each Binder attached with #10x1¼ F.H. Screws
Bow Handle on Front and Flush Pull on Back of Door Bolted Together
24"
Binder
Wedge Attached with 2" 16x1½ F.H. Screws
Guide Roll Strip Use #10x1½ F.H. Screws
¾ Mach. Bolts
Guide Roller
¾ Space Between Door and Sill.

Detail of Standard Labeled Sliding Fire Door


1-6'-0"
4-7'-0"
3'-8"
12" WALL
17"
TO BE BRICKED IN
4-LEFT HAND SWING
1-RIGHT " "
FUSIBLE LINK
VIEW SHOWING AUTOMATIC CLOSING DEVICE WITH FUSIBLE LINK.

Standard Labeled Swinging Fire Door and Frame



Single Blade

Double Blade

Elevator Safety Gates

COBURN TROLLEY TRACK MFG. CO.

Standard Tin Clad Fire Doors and Shutters

HOLYOKE, MASS.

BRANCHES
NEW YORK, N. Y., 10 East 43rd Street
BOSTON, MASS., 108 Broad Street
PHILADELPHIA, PA., 422 Commerce Street

Products

A complete line of STANDARD LABELED and UNLABELED TWO-PLY and THREE-PLY, DOUBLE and SINGLE LOCK JOINT TIN CLAD FIRE DOORS and SHUTTERS.

Also manufacturers of Overhead Track Conveying Systems, Swing Fire Door Iron Jamb Frames, Fire Door Fusible Link Fixtures, Rolling Ladders for high shelving.

For Standard Metal Covered Doors and Trim, see pages 862-865; for Sliding Door Hardware, see pages 1460-1465.

Advice of Local Inspection Department

It is recommended that the insurance inspection department having jurisdiction be consulted before fire doors or shutters are specified or provided for.

Labeled Doors

Manufactured, inspected and labeled under the supervision of the Underwriters' Laboratories, Inc.

Construction—Three-ply (2½ in. thick), two-ply (1¾ in. thick). Both are covered with 14x20-in. I. C. 113-lb. tin plates with double lock joints.

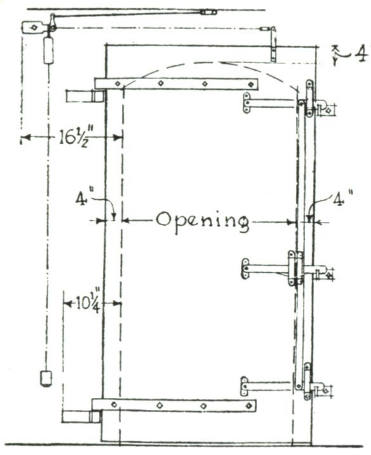
Unlabeled Doors and Shutters

Construction—Same as for labeled doors, except for covering which is 14x20 in. 108-lb. tin plates with single lock joints.

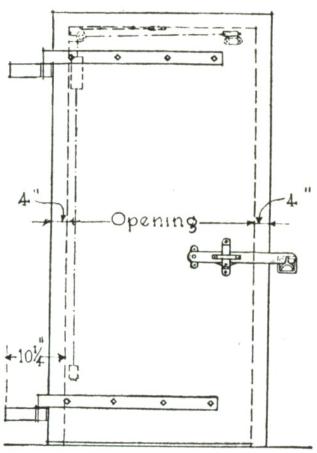
Fixtures

A complete line of standard size approved fixtures, fittings, frames, etc., manufactured by this company, is available for all types and styles of doors.

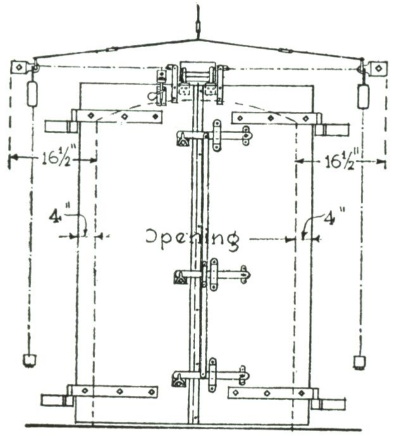
Catalogues sent on request.



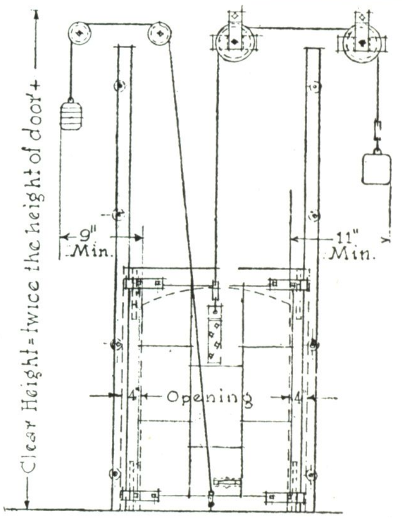
REGULAR STYLE "N" FIXTURES



REGULAR STYLE "R"



REGULAR STYLE "NN" FIXTURES



REGULAR "H"

HEADROOM REQUIRED FOR GRAVITY SLIDE SINGLE DOORS STYLE "A"

ARCHED TOP OPENINGS		FLAT TOP OPENINGS	
Width of Opening	Headroom Required	Width of Opening	Headroom Required
3'-0"	1'-5"	3'-0"	1'-6"
4-0	1-6	4-0	1-7 ⅜
5-0	1-7	5-0	1-8 ¾
6-0	1-8	6-0	1-10 ⅛
7-0	1-0	7-0	1-11 ½
8-0	1-10	8-0	2-1
9-0	1-11	9-0	2-2 ¼
10-0	2-0	10-0	2-3
11-0	2-1	11-0	2-5
12-0	2-0	12-0	2-6 ⅜

Headroom required for Gravity Slide Doors: Style "Sure Closer" same as Style "A".

Headroom required for Gravity Slide Doors: Style No. 5 same as Style "A".

Headroom required for Gravity Slide Doors: Style No. 6 same as Style "A".

Headroom required for Level Slide Doors: Design "C": 1'-2"

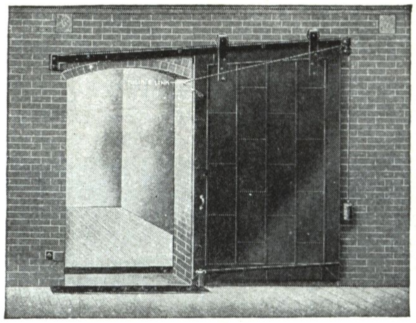
Headroom required for Level Slide Doors: Design "D": 6"

HEADROOM REQUIRED FOR GRAVITY DOUBLE SLIDE DOORS

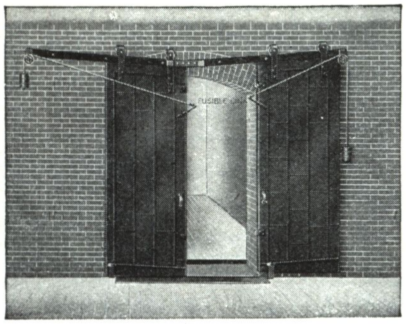
Width of Opening	Headroom Required	Width of Opening	Headroom Required
4'-0"	16½"	9'-0"	18⅜
5-0	16⅞	10-0	18¾
6-0	17¼	11-0	19⅛
7-0	17⅝	12-0	19½
8-0	18		

COBURN FIRE SHUTTERS AND AUTOMATIC SWINGING SINGLE AND DOUBLE FIRE DOORS

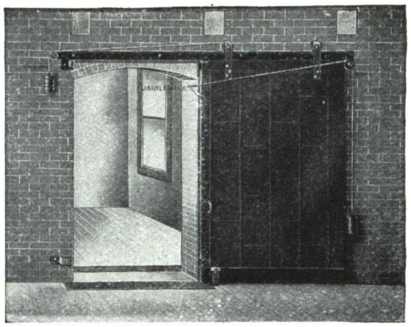
Continued on next page



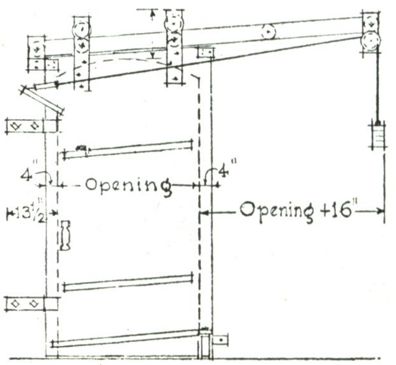
REGULAR STYLE "A"
FOR INCLINE SLIDING DOOR



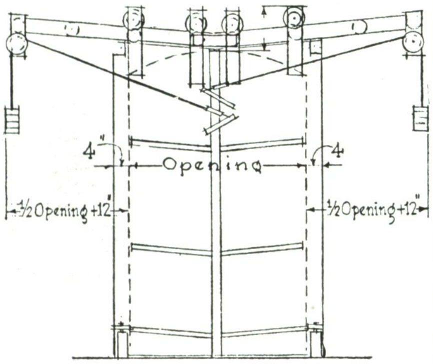
REGULAR STYLE "B"
DOUBLE DOORS ON INCLINE TRACK



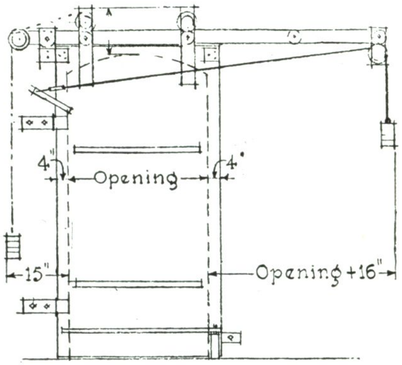
STANDARD STYLE "C"
FOR LEVEL SLIDE. STYLE "C-C" FOR DOUBLE DOORS


4"
Opening
4"
13½"
Opening +16"

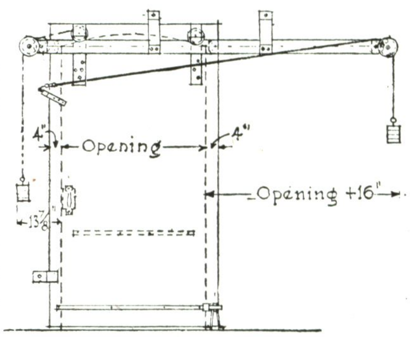
NATIONAL STYLE "A"
INCLINE SLIDE
INSPECTED & LABELLED


4"
Opening
4
½ Opening +12"
½ Opening +12"

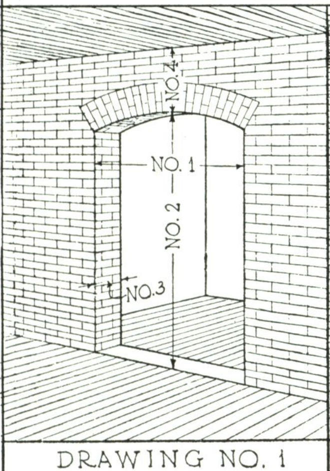
LABELED STYLE "B"
INCLINE SLIDE
INSPECTED & LABELED


4"
Opening
4"
15"
Opening +16"

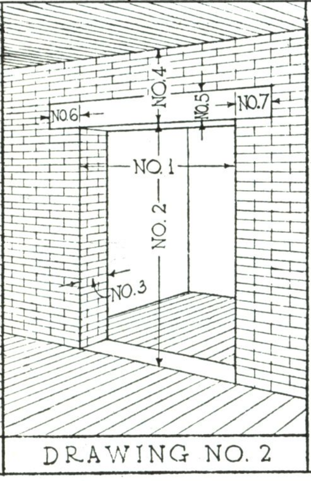
STANDARD STYLE "C"
LEVEL SLIDE
LABELED


4"
Opening
4"
13½"
Opening +16"

REGULAR STYLE "D"
LEVEL SLIDE
NOT LABELED


NO.4
NO.1
NO.2
NO.3

DRAWING NO. 1


NO.6
NO.4
NO.5
NO.7
NO.1
NO.2
NO.3

DRAWING NO. 2

NO. 1 Width of Opening.
" 2 Height of Opening.
" 3 Thickness of Wall
" 4 Headroom
" 5 Height of Lintel
" 6 Extension of Lintel to the Left.
" 7 Extension of Lintel to the Right.

DIMENSIONS REQUIRED FOR SLIDE DOORS AND HARDWARE.

NOTES: For single door, top binder should take impact as door closes. For double doors center stop should take impact as door closes. All hardware, screws and bolts necessary to erect these doors are furnished except wall bolts which are supplied only when specified.

DRAWN BY SWEETS CATALOGUE SERVICE INC.	COBURN SINGLE AND DOUBLE AUTOMATIC SLIDING TIN CLAD FIRE DOORS	SHEET NO. A11 SCALE 3/16" EQUALS 1'-0"

FIRECRAFT CORPORATION

FORMERLY THE GILMORE MANUFACTURING COMPANY

Manufacturers of Fireproof Doors

2229-2233 South Ogden Avenue
CHICAGO, ILL.

TELEPHONE
Seeley 6490, 10082

Products

Underwriters Labeled Fire Doors.

"Firecraft Alstele" Doors.

"Firecraft Balanced" Doors for Freight Elevators.

Also Passenger Elevator Doors; Firecraft Louvers; Firecraft Kalamein Doors; Firecraft Hollow Metal Doors; Interior Metal Doors and Trim; Tin Clad Doors and Frames.

"Firecraft Alstele" Doors (Patented)

Construction—Doors are constructed of two layers of cross-layed steel sheets, galvanized and corrugated, interlined with asbestos. The edges are riveted to heavy galvanized steel stiles and rails. Made in all types—swinging, sliding, slide-up and turn-over.

Advantages—"Firecraft Alstele" doors are fireproof, strong, rigid, and comparatively light in weight, and as easily operated as ordinary wood doors.

Not subject to dry rot, as in case of tin clad doors.

Specification for "Firecraft Alstele" Doors

(1) To all openings in firewall, vertical shaft, exterior walls, etc., as noted, furnish and install Firecraft Alstele Doors of Firecraft Corporation, 2229 South Ogden Avenue, Chicago, Ill., including all necessary hardware.

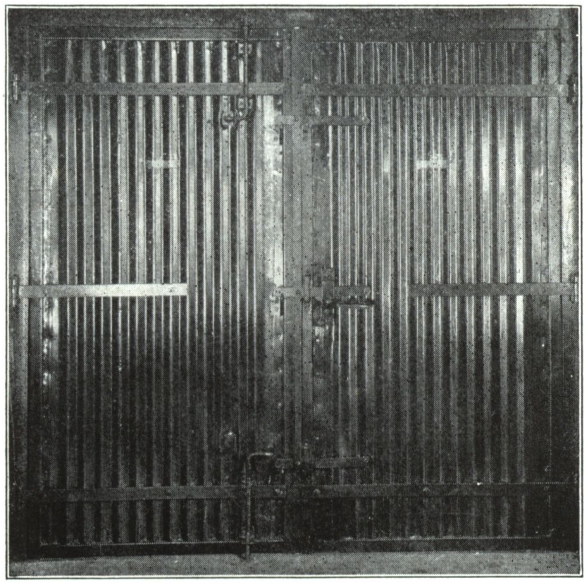
(a) Frames and sills, if wanted, specify: "Openings to be provided by this contractor with steel frames and sills as shown."

(2) Doors are to be made of No. 24 gauge galvanized corrugated panels, with No. 18 gauge galvanized pressed steel frames, labeled by the *Underwriters' Laboratories, Inc.*, of the National Board of Fire Underwriters, or Mutuals if desired.

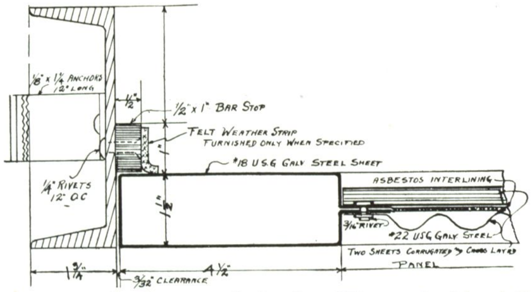
Note: Labeled doors can be furnished for stairways, fire escapes or exterior walls only with glass panels.

(a) Panels for glass, if wanted, specify: "Doors to be paneled for glass in upper part, size ...... x...... in.; glass and glazing by others."

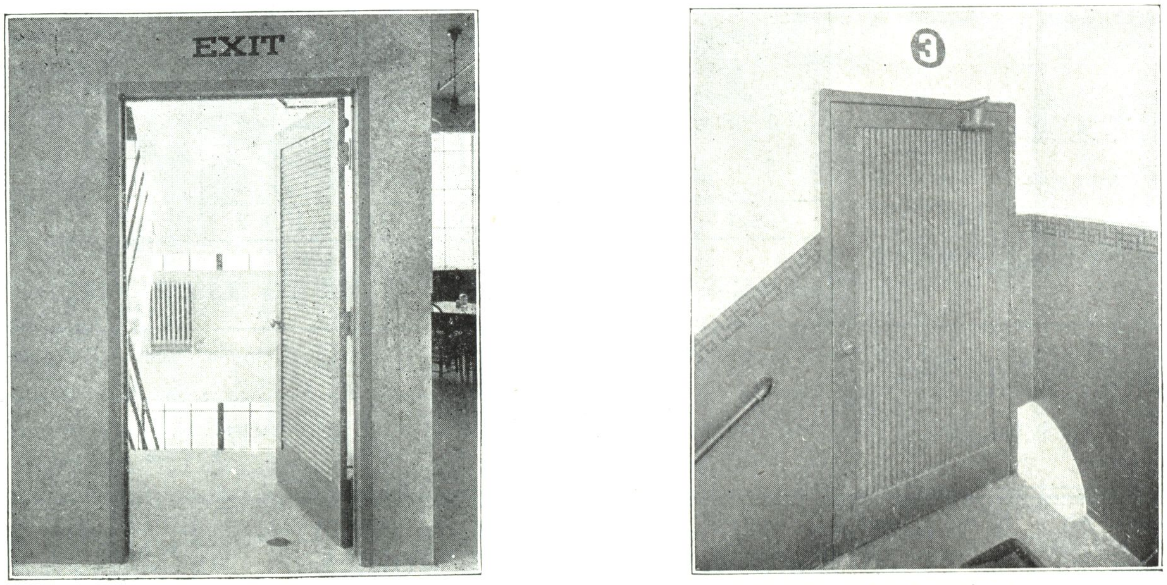
(3) Doors to be provided with fuse link automatic gravity closing devices (or checks for stair doors if preferred).



Pair "Alstele" Swinging Doors Type 310
(Patented)


1/8" x 1 1/4 ANCHORS 12" LONG
1/2"
1/2" x 1" BAR STOP
FELT WEATHER STRIP FURNISHED ONLY WHEN SPECIFIED
#18 U.S.G GALV STEEL SHEET
ASBESTOS INTERLINING
1/4" RIVETS 12" O.C
1 1/2"
3/16" RIVET
#22 USG GALV STEEL
TWO SHEETS CORRUGATED & CROSS LAYED
PANEL
1 3/4"
3/32" CLEARANCE
4 1/2"

Section Through Door and Jamb, "Firecraft Alstele" Door Type 500



Open Position

Closed position

"Alstele" Stair Door Type No. 500

Continued on next page

Firecraft Balanced Truckable Elevator Doors (Patented)

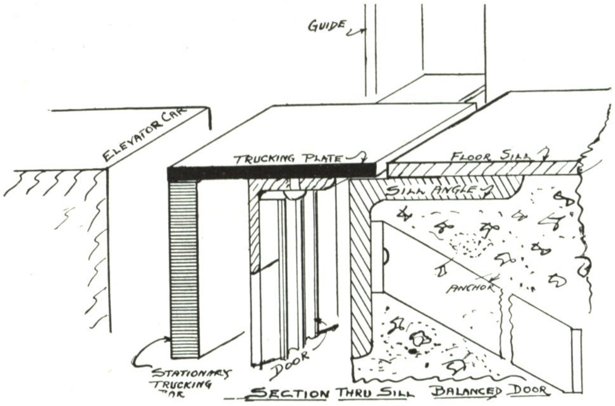
For openings in freight elevator shafts.

Operation—Opened manually, the two halves divide in the center and slide, one up and one down. Each section is equipped with four antifriction clips at each corner, moving in heavy Z-bar guides that hold the door in rigid alignment. As each section is equal in weight, the operating effort need only be enough to overcome the slight friction.

Construction—Mounted inside of shaft, entirely out of the way, giving clear opening with minimum space occupied. The two halves are connected with strong flexible steel chains, traveled on roller bearing sheaves. The center latch locks door securely from the inside, the trucking bar acting as stop and support for the door when opened. Made with panels of corrugated steel, tin clad, kalamein or hollow metal construction, either in single type or pass type (double guide) construction.

Advantages—Extra heavy guides, sheaves, and latch mechanism. Antifriction clips with adjustment for wear. All parts easily lubricated. No small grooves employed to catch dirt or cause friction.

A special feature is the trucking bar that supports the trucking plate when the door is in an open position, so that all trucking weight is taken off the door itself and carried by the floor sill and trucking bar. This permits a truck of any size or load to pass on or off the elevator cars without disturbing the door.



Detail of Trucking Plate

The trucking plate rests upon floor sill and a bar extending across shaft on inside. Both edges of trucking plate are thus supported independently of door. Trucking bar can be made sufficiently strong to support any practical load. Depth can be increased to practically the same width as door itself. The other edge of trucking plate is supported by the floor itself and can not be deflected by loads passing over it. This trucking plate affords a smooth trucking surface at all times for trucks passing in and out of car

This door is labeled by the *Underwriters' Laboratories, Inc.*, in *single guide* construction and also in *double guide* or *pass type* construction for openings 8 ft. wide to 10 ft. high, maximum. Doors can be provided with vision lights, if desired.

DIMENSIONS OF DOORS FOR VARIOUS FLOOR HEIGHTS USING SINGLE GUIDE CONSTRUCTION

Height of door openings		Distance floor line to floor line	
ft.	in.	ft.	in.
5	0	8	2
5	6	8	11
6	0	9	8
6	6	10	5
7	0	11	2
7	6	11	11
8	0	12	8
8	6	13	5
9	0	14	2

Double guide construction permits of door opening heights practically the same of floor heights.

Specifications for "Firecraft Balanced" Freight Elevator Door

(1) To all openings in freight elevator shaft, as noted, furnish and install "Firecraft Balanced" Door, as made by the Firecraft Corporation, 2229 South Ogden Avenue, Chicago, Ill., including truckable sill, guides, roller bearing sheaves, latch and necessary hardware to make a complete installation.

All doors and truckable sill to be supported by building sill and bar so that all weight is removed from chain when doors are open and carried by building sill and trucking bar.

Truckable sill is to carry maximum load of .... lb.

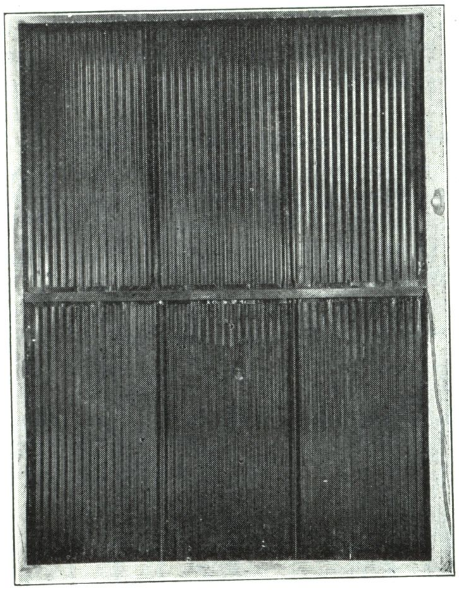
(2) (a) Doors are to be made of No. 22 gauge corrugated panels with 1½-in. angle frames, labeled by the *Underwriters' Laboratories, Inc.*

(b) Or, specify: Doors to be kalamein, hollow metal, etc., either paneled or plain.

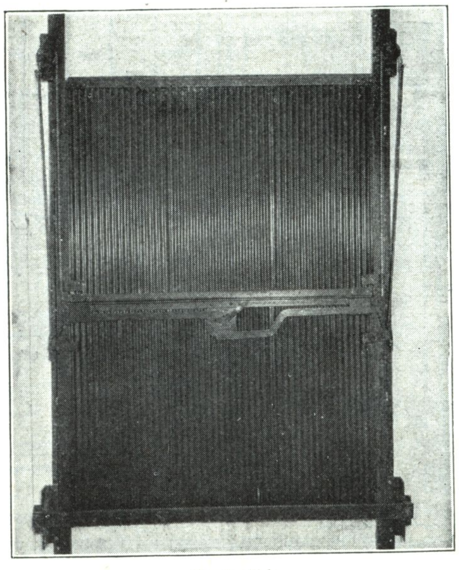
(c) Vision panel, if wanted, specify: Doors to have polished wire glass vision panel 12x12 in.

(3) Doors to be manually operated and automatically closing as car leaves the floor or have electric contact so that car can not be started until door is closed.

Basement door is to be provided with a key so it can be opened from the floor.



Floor Side



Shaft Side

"Firecraft Balanced" Freight Elevator Door

BABCOCK-DAVIS CORPORATION

Manufacturers of Counterbalanced Elevator Doors with Safety Gate

474 Dorchester Avenue
BOSTON, MASS.

Products and Services

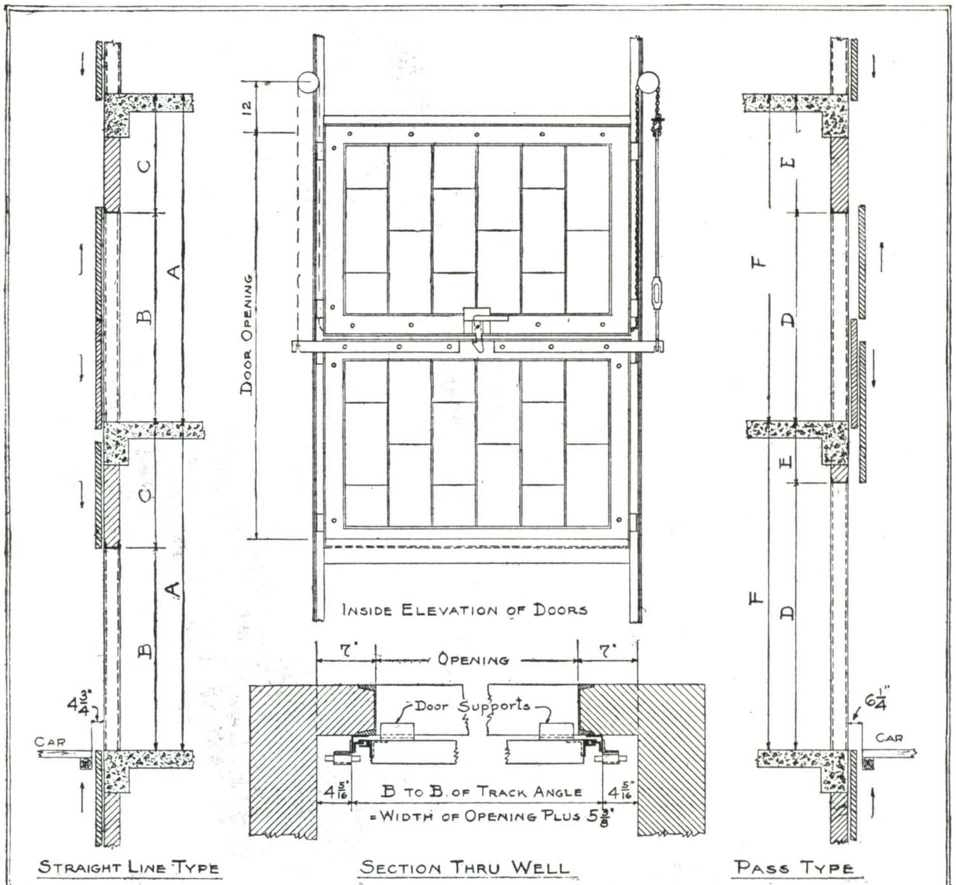
Babcock-Davis Counterbalanced Elevator Fire Door with Truckable Seating Threshold and Safety Gate. (Patent pending.)

Our Engineers invite consultation during preparation of plans and will gladly send working drawings to fit your requirements.

For Pre-cast Concrete Stairs and Ornamental Iron Work, see page 629.

Babcock-Davis Counterbalanced Doors

The accompanying details are descriptive of the two types of counterbalanced doors manufactured by us known as Babcock-Davis "Shock Threshold" Counterbalanced Door and Babcock-Davis "Plain Type" Counterbalanced Door.



BABCOCK-DAVIS PLAIN TYPE COUNTERBALANCED DOOR

Babcock-Davis "Plain Type" Counterbalanced Door

This type opens vertically from the center, the two halves being equally balanced, operates quickly and easily and is supported when open on the floor threshold and serves to bridge the opening from floor threshold to car platform. See detail on this page.

Specifications—(1) To all openings in freight elevator shaft, as noted, furnish and install "Babcock-Davis Plain Type Counterbalanced Door" as made by Babcock-Davis Corporation, 474 Dorchester Avenue, Boston, Mass., including truckable sill, guides, ball bearing sheaves, latch, and necessary hardware to make a complete installation.

All doors and truckable sill to be supported from building sill by hangers so that all weight is removed from chain when doors are open and carried by building sill.

Truckable sill is to carry a maximum load of ...... lb.

(2) (a) Doors are to be 2-ply white pine I. C. terne tin covered, labeled by "Factory Mutual" or Underwriters' Laboratories, Inc.

(b) Or, specify—Doors to be kalamein, hollow metal, etc., either paneled or plain.

(c) Vision panel, if wanted, specify: Doors to have polished wire glass Vision Panel, 12x12 in.

(3) Doors to be manually operating and have electric contact so that car can not be started until door is closed.

Basement door is to be provided with a key so it can be opened from the floor.

Babcock-Davis "Shock Threshold" Counterbalanced Door (Patented)

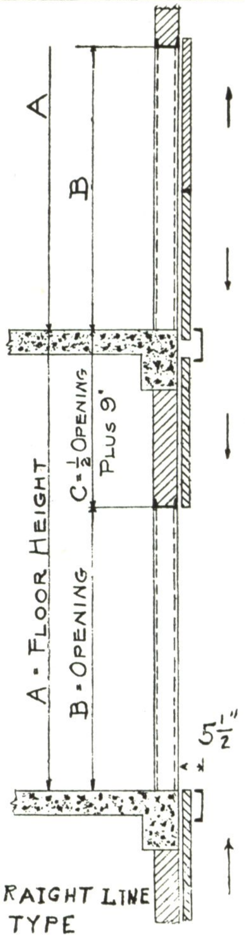
This door is built for heavy duty trucking.

Doors open vertically from the center and operate between floor threshold and auxiliary "shock threshold" in the elevator well. The object of this threshold is to take the shock so that the load from car does not land on door.

Door threshold forms a positive seating between "shock" and floor thresholds, making a flat even surface to truck over.

A safety gate may be applied to our shock threshold and fire door held open by fusible link. This allows the doors to be left open at all times for ventilation, etc., and light safety gate, only, operated. See detail on following page.

Continued on next page



STRAIGHT LINE TYPE

SPECIFICATIONS FOR BABCOCK-DAVIS "SHOCK THRESHOLD" COUNTERBALANCED DOOR

(1) To all openings in freight elevator shaft, as noted, furnish and install "Babcock-Davis Shock Threshold Counterbalanced Door," with Seating Threshold (state if safety gate is wanted), as made and patented by BABCOCK-DAVIS CORPORATION, 474 Dorchester Avenue, Boston, Mass., including "Shock," door and floor threshold, 6-in. wide. Hatchway guides, ball bearing sheaves, latch and necessary hardware.

Shock Threshold is to carry a maximum load of ...... lb.

(2) (a) Doors are to be 2-ply white pine, I. C. terne tin covered, labeled by "Factory Mutual" or Underwriter's Laboratories, Inc.

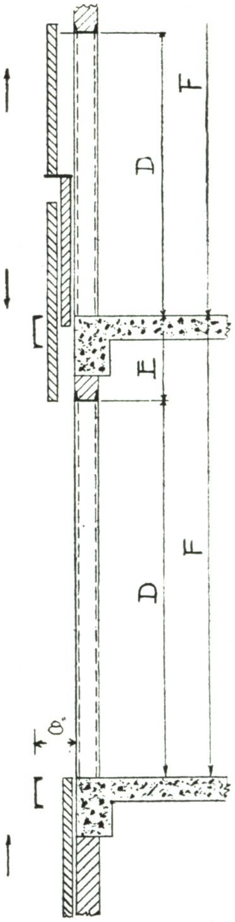
(b) Or, specify—Doors to be kalamein, hollow metal, etc., either paneled or plain.

(c) Vision panel, if wanted, specify:

Doors to have polished wire glass Vision Panel, 12x12 in.

(3) Doors to be manually operating and have electric contact so that car can not be started until door is closed.

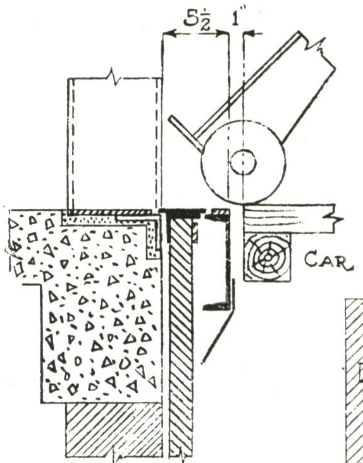
Basement door is to be provided with a key so it can be opened from the floor.



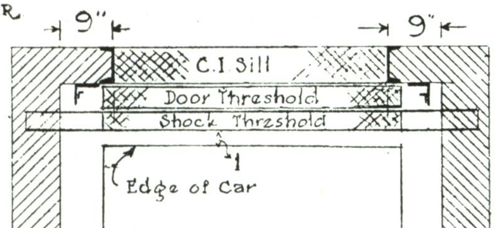
PASS TYPE

SCHEDULE OF HEIGHTS

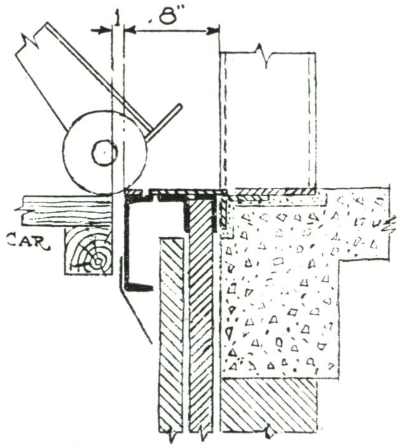
A	B	C	A	B	C
11'-3"	7'-0"	4'-3"	13'-6"	8'-6"	5'-0"
11'-7½"	7'-3"	4'-4½"	13'-10½"	8'-9"	5'-1½"
12'-0"	7'-6"	4'-6"	14'-3"	9'-0"	5'-3"
12'-4½"	7'-9"	4'-7½"	14'-7½"	9'-3"	5'-4½"
12'-9"	8'-0"	4'-9"	15'-0"	9'-6"	5'-6"
13'-1½"	8'-3"	4'-10½"	15'-4½"	9'-9"	5'-7½"



DETAIL AT SILL
STRAIGHT LINE TYPE



MINIMUM SPACE
REQUIRED IN WELL



DETAIL AT SILL
PASS TYPE

BABCOCK-DAVIS SHOCK THRESHOLD COUNTERBALANCED DOOR

ESTABLISHED 1866

MERCHANT & EVANS CO.

POWELL EVANS, President

Manufacturers of Fire Doors and Shutters

PHILADELPHIA, PA.

OFFICES AND WAREHOUSES

PHILADELPHIA, PA. NEW YORK, N. Y. CHICAGO, ILL. DETROIT, MICH. CLEVELAND, OHIO
WHEELING, W. VA. KANSAS CITY, MO.

WORKS: PHILADELPHIA, PA.; LANCASTER, PA.; WHEELING (WARWOOD), WEST VA.

M & E
TRADE MARK
"ALMETL"
REG. U.S. PAT. OFF.
FIRE DOORS
&
SHUTTERS

Products

M & E "Almetl" Fire Doors and Shutters.

For "Star" Ventilators, see page 1194.

Service

Approximately 300 responsible and experienced contracting and erecting "Licensees" everywhere.

Complete installations to meet the requirements of Underwriters' Inspection Bureaus throughout the United States.

The Company's engineering department is always at the service of architects and others for the solution of fire door problems.

Approvals

M & E "Almetl" fire doors and shutters are fully approved and labeled by Underwriters' Laboratories, Inc., of Chicago, the Factory Mutual Laboratories of Boston, and are additionally approved by over 250 national, state and municipal fire and safety control authorities directly interested in fire protection and prevention affairs.

Types

Single sliding, double sliding, single swinging, double swinging, vertical sliding and horizontal lifting. Furnished with wicket gates and hollow metal sashes for window lights and of irregular shape or recessed for passage of conveyor tracks through openings.

Hardware

Approved and labeled hardware of special design furnished for any of the above types.

Sizes

Doors for openings not exceeding the following dimensions are furnished with labels of Underwriters' Laboratories, Inc., and with labels of the Factory Mutual Laboratories:

Single sliding doors for openings not more than 120 sq. ft. with neither width nor height exceeding 12 ft.

Openings for single swinging doors not exceeding 6 ft. in width and 12 ft. in height and swinging doors in pairs for openings not exceeding 10 ft. in width and 12 ft. in height.

For openings exceeding these dimensions a certificate of inspection that doors have been built according to standard rules, can be furnished when so required, if asked for at time order is given.

Insurance Rebate

Maximum reduction in insurance rates is granted for approved installations of M & E "Almetl" doors and shutters.

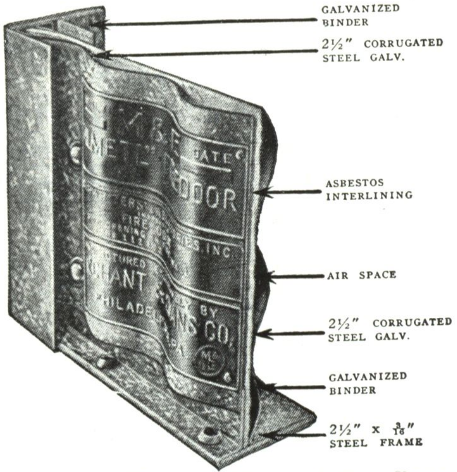
General Description

The construction is shown in the accompanying illustration: a *double* panel of heavy corrugated galvanized steel (2½-in. corrugations) with an interlining of the highest grade of sheet asbestos and bound in a rigid continuous frame of $\frac{3}{16}$x2½-in. bar steel.

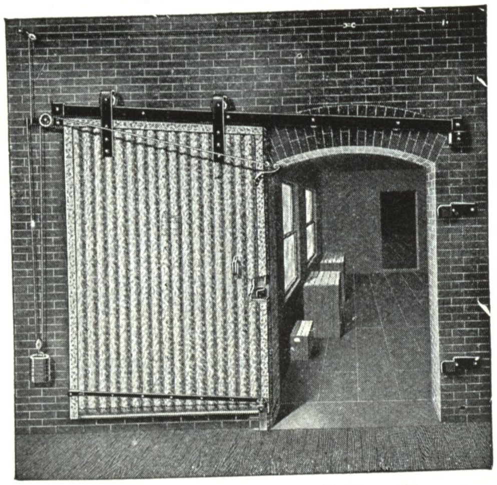
The frame is reinforced on all edges by an extra heavy binder of galvanized steel, thus forming a box for the panel and insurance against abuse that edges of fire doors generally encounter.

Ample provision is made for expansion and contraction to prevent distortion or warping of the door.

Made entirely of steel and asbestos, their life is everlasting. There are no maintenance or renewal charges so well known to users of wood core doors such as the rapid deterioration of the core and failure of the coverings to withstand the abuse such doors are subjected to.



Sectional View of "Almetl" Fire Door
Weight 5 lbs. to the square foot



Gravity Sliding "Almetl" Fire Door

THE OVERHEAD DOOR CORPORATION

HARTFORD CITY, IND.

Overhead Door—The Ideal All-Purpose Door

This door is made in all sizes and in various designs for new and old garages, warehouses, factories, boathouses, etc.

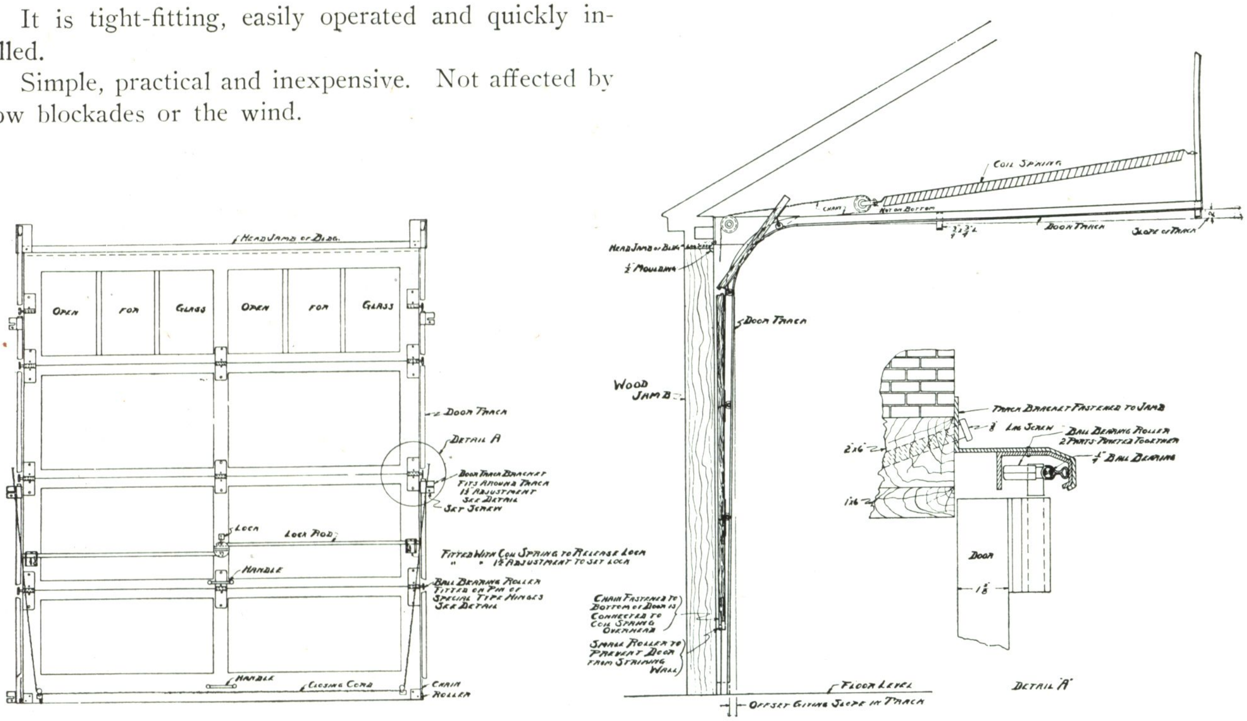
It is pulled up from the bottom and lies flat overhead, completely out of the way, affording clear entrance and exit.

It is tight-fitting, easily operated and quickly installed.

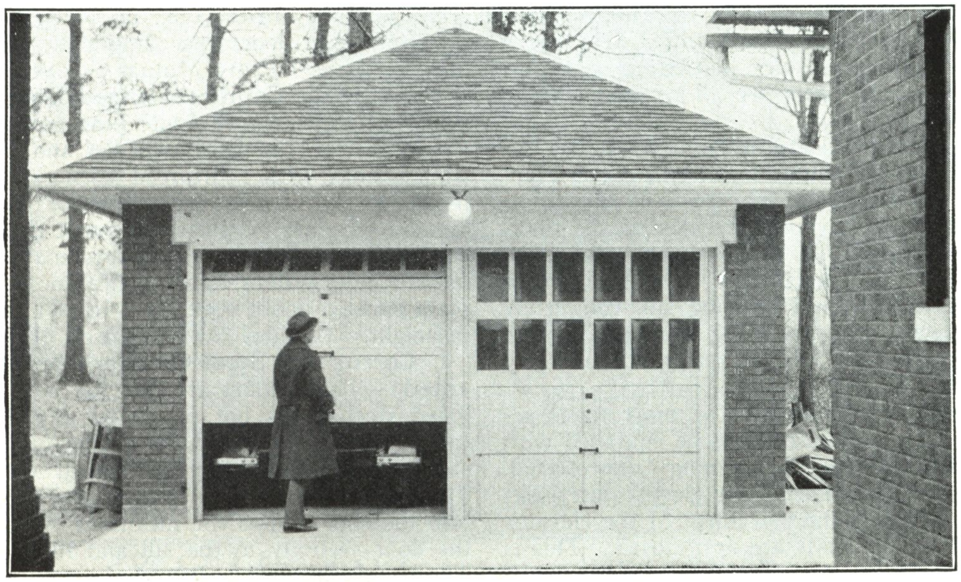
Simple, practical and inexpensive. Not affected by snow blockades or the wind.

Permits building up to the property line. No changes in plans are necessary; simply give us the size of the opening and we will submit designs to fit.

Each Overhead Door is furnished complete with woodwork, track, hardware and lock, fitted and assembled in units. The average carpenter can install and have them in operation in two hours.


Head Jamb of Bldg.
Open
for
Glass
Open
for
Glass
Door Track
Detail A
Door Track Bracket Fits Around Track 1½" Adjustment See Detail
Set Screw
Lock
Lock Rod
Fitted With Coil Spring to Release Lock
" " 1½" Adjustment to Set Lock
Handle
Ball Bearing Roller Fitted on Pin of Special Type Hinges See Detail
Handle
Closing Cord
Chain
Roller
Coil Spring
Chain
Nut on Bottom
Door Track
Slope of Track
Head Jamb of Bldg.
½" Moulding
Door Track
Wood Jamb
Chain Fastened to Bottom of Door is Connected to Coil Spring Overhead
Small Roller to Prevent Door from Straining Wall
Floor Level
Offset Giving Slope in Track
Track Bracket Fastened to Jamb
Lag Screw
Ball Bearing Roller 2 Parts Riveted Together
¼" Ball Bearing
2"x6"
1"x6"
Door
1⅜"
Detail "A"

Details of the Overhead Door



Garage Equipped with Overhead Doors

THE PEELLE COMPANY

TELEPHONE
STAGG 0366

Stewart Avenue and Harrison Place
BROOKLYN, N. Y.

DISTRICT OFFICES

BOSTON, 18 Tremont Street—Telephone, Fort Hill 747
CLEVELAND, 605 Caxton Building—Telephone, Main 4053
CHICAGO, 742 South Wabash Avenue—Telephone, Harrison 4040
DETROIT, 701 Lincoln Building—Telephone, Cadillac 4920

AGENCIES IN ALL PROMINENT CITIES IN THE UNITED STATES AND CANADA

Products

PEELLE COUNTERBALANCED TRUCKABLE ELEVATOR DOORS.

PEELLE TEL-CO-DOR (2-section Slide-up Door).

PEELLE HORIZONTAL BI-FOLD CANOPY or JACK KNIFE TYPE DOORS.

PEELLE STANDARD STEEL PLATE COUNTERBALANCED DUMBWAITER DOORS.

Peelle Counterbalanced Truckable Elevator Doors

Recommended for openings in freight elevator shafts and made in three types:

Regular Type (details showing operation on the following page).

Pass Type (details showing operation on the following page).

Self-sealing Pass Type (details showing operation on the second page following).

These three types are manufactured by this company under the direct supervision of the Underwriters' Laboratories, Inc., and may be had in kalamein, corrugated steel, or tin clad.

Operation—The door is opened manually; the two sections slide, one up and the other down; each section is equipped with antifriction shoes working in substantial steel guides mounted at jambs on shaft side of opening. Both sections being equal in weight, the door is self-counterbalancing; the amount of effort required for operation need be only enough to overcome the friction of the moving parts.

Construction—The door is mounted on the inside of the elevator shaft giving a clear opening for loading and unloading car. The two sections are connected by strong flexible flat link chains which travel over heavy double race ball bearing sheaves housed in malleable steel brackets. Wearing parts are all of extra heavy design.

Truckable Feature (Patented)—The top of the lower panel of the Peelle counterbalanced door is especially reinforced. A heavy bar which serves as part of this reinforcing extends beyond the sides of the door. When the door is open, this bar rests on solid stops fastened to the guide rails, keeping it in rigid alignment with the floor of the car and building sill, completely filling the gap between and presenting a smooth surface to truck wheels. This bar can be made to carry any specified load.

Electric Interlock—The laws of most states require that all doors to elevator shafts be equipped with a safeguard against leaving the openings unprotected. For ordinary use we recommend our electric interlocking system which prevents the movement of the elevator car until all doors in the shaft are first closed. This is accomplished by means of an individual switch at each opening. An emergency switch in glass covered box can be installed in elevator car, to operate car with doors open, in an emergency.

Elevator cars not having a full magnetic control are equipped with the Peelle mechanical interlock making it possible to interlock any type or make of car.

Peelle Electric Full Automatic Doors—Peelle doors may be equipped with a motor driven device located in the pent house. This device opens and closes the doors by operating a switch in the elevator cab. This switch is so arranged that if the operator removes his hand, opening and closing of the doors stops instantly. All doors are inoperative except at the specific landing where car is located.

In case of emergency a lever is pulled which disconnects the doors from the machine. The doors may then be manually operated.

Sills—Some form of fireproof sill should be used securely anchored in place.

Underwriters' Label—The aforementioned three types of Peelle counterbalanced elevator doors, when specified, bear the label of the Underwriters' Laboratories, Inc., and the Factory Mutual Insurance Companies on doors up to 8 feet in width and 10 feet in height. Doors exceeding these dimensions can, however, be made according to label specifications and labeled by the Factory Mutual Companies only.

Tin Covered Counterbalanced Doors—Panels are made of two thicknesses of white pine, covered with the best I.C. terne tin, set and bolted into angle iron frames with reinforced corners. Tin clad panels are used when maximum strength, rigidity, durability and fire protection are required. Labeled by the Underwriters' Laboratories, Inc., up to 8 feet in width and 10 feet high. Doors exceeding these dimensions can be labeled by the Factory Mutual Companies only.

Kalamein Counterbalanced Doors—Panels made of two thicknesses of white pine covered with smooth kalamein iron tightly drawn, set and bolted into angle iron frames with reinforced corners. Design can be made to harmonize with interior trim. Maximum amount of glass permitted by most departments is 720 square inches but exterior doors may frequently have more. Underwriters' Laboratories, Inc., label furnished on plain paneled doors not over 8 feet in width and 10 feet in height. No label can be had on glass paneled doors.

Corrugated Steel Counterbalanced Doors (Patented)—These doors are built of No. 18 gauge corrugated steel sheets but panels of any desired thickness can be built to order. Underwriters' labeled corrugated steel paneled doors are reinforced with our patented T-bar traveling rail and binder shoe; the rail dovetails into the shoe and is the means of tying both panels of the door securely to the sill and lintel of the opening. The panels are held tightly to the wall when the door is in closed, open or partly open position.

Continued on next page

Regular Type of Peelle Counterbalanced Elevator Door

(See detail for clearances.)

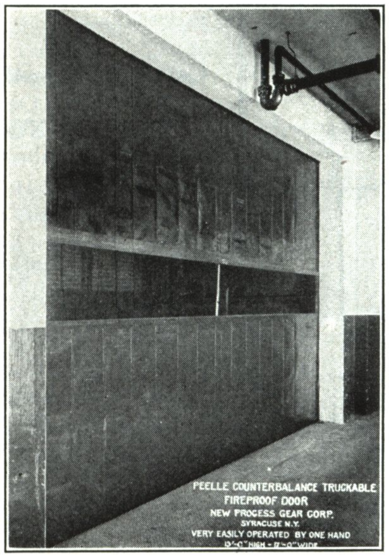
This type of door is the most commonly used. The two sections slide, one up and the other down, leaving the full width and height of the opening clear when loading or unloading car.

Pass Type Peelle Counterbalanced Elevator Door

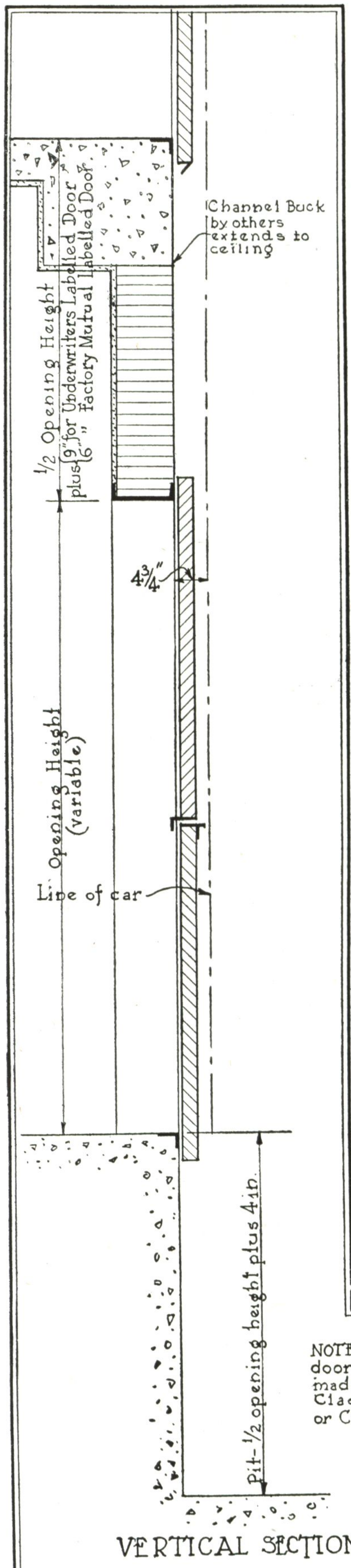
(See detail for clearances.)

This door is used in buildings having high door openings and low story heights, where the regular type can not be used. They can be installed wherever the vertical distance between openings is 12 inches or more, and require no special construction.

The operation is the same as the regular type, except that the panels are staggered and run on separate guides; by this arrangement, the upper panel when open occupies a position directly alongside of the lower panel of the door above. The lower panel likewise lapping the upper panel of the door below (see detail). The gap formed at the lintel is effectually closed by a movable lintel which operates automatically and is so constructed as to allow the lower panel of the door above to pass as required.

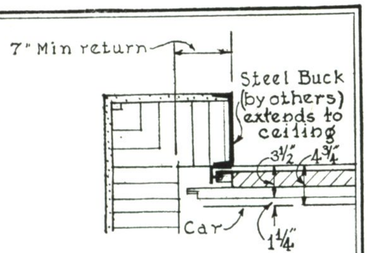

PEELLE COUNTERBALANCE TRUCKABLE
FIREPROOF DOOR
NEW PROCESS GEAR CORP.
SYRACUSE N.Y.
VERY EASILY OPERATED BY ONE HAND

Peelle Counterbalanced Elevator Door, New Process Gear Corp., Syracuse, N. Y.


Channel Buck by others extends to ceiling
1/2 Opening Height plus 9" for Underwriters Labelled Door; 6" Factory Mutual Labelled Door
4¾"
Opening Height (variable)
Line of car
Pit-1/2 opening height plus 4 in.

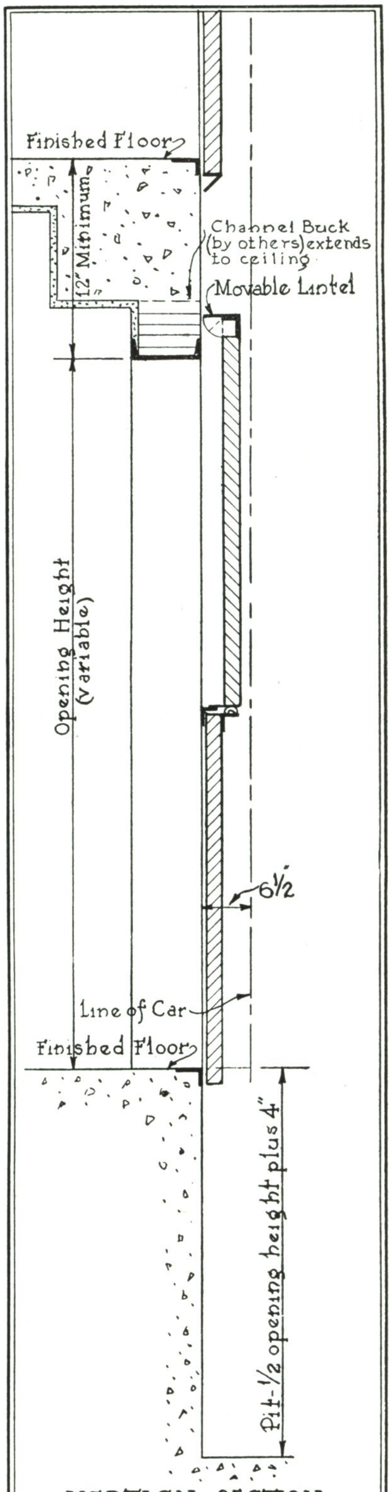
NOTE—These doors can be made in Tin Clad, Kalamein or Corrugated Steel

VERTICAL SECTION

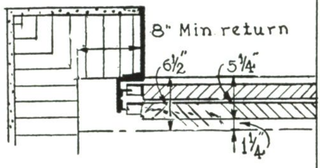

7" Min return
Steel Buck (by others) extends to ceiling
3½
4¾
Car
1¼"

PLAN SECTION AT JAMB

REGULAR TYPE
PEELLE ELEVATOR DOOR


Finished Floor
12" Minimum
Channel Buck (by others) extends to ceiling
Movable Lintel
Opening Height (variable)
6½
Line of Car
Finished Floor
Pit-1/2 opening height plus 4"

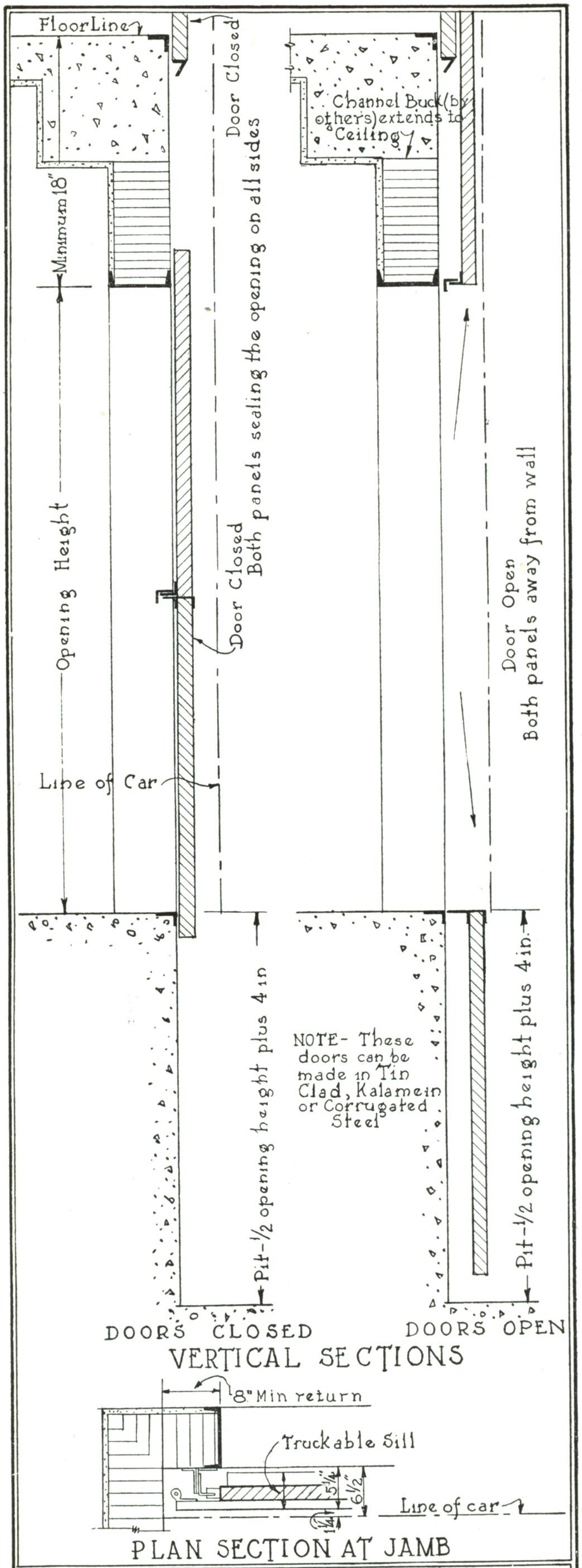
VERTICAL SECTION


8" Min return
6½"
5¼"
1¼"

PLAN SECTION AT JAMB

PASS TYPE
PEELLE ELEVATOR DOOR

Continued on next page


Floor Line
Minimum 18"
Opening Height
Line of Car
Door Closed
Door Closed Both panels sealing the opening on all sides
Channel Buck (by others) extends to Ceiling
Door Open Both panels away from wall
Pit-½ opening height plus 4 in
Pit-½ opening height plus 4 in
DOORS CLOSED
DOORS OPEN
VERTICAL SECTIONS
8" Min return
Truckable Sill
5¼
6½
1¼
Line of car
PLAN SECTION AT JAMB

NOTE- These doors can be made in Tin Clad, Kalamein or Corrugated Steel

PEELLE SELF SEALING PASS TYPE ELEVATOR DOORS

Self-sealing Pass Type Peelle Counterbalanced Elevator Door

(See detail for clearances.)

This door is designed for uses under conditions similar to those described in connection with the regular pass type door, the difference being in the self-sealing feature. When this door is in a closed position, the angle iron frame of each section comes into true contact with the door jamb, completely sealing the opening even against the passage of smoke.

These doors possess all the advantages of the regular type of Peelle counterbalanced doors.

Standard Specifications for Counterbalanced Elevator Doors

For all openings in the freight elevator shaft furnish and install in complete working order Peelle Counterbalanced Elevator Doors as manufactured by The Peelle Company, 47 Stewart Avenue, Brooklyn, N. Y.

The panels to be tin clad [kalamein] [corrugated steel] labeled by the Underwriters' Laboratories, Inc. [the Factory Mutual Insurance Companies] (architect to choose).

The doors to be divided horizontally in the center, each half balancing the other. At the upper edge of the lower section, provide a reinforced truckable sill support on each side of the opening by adjustable stops, to carry a trucking load of ...... pounds.

The doors to hang on heavy flat link chain running over 4½-in. double race ball bearing sheaves and operating on the inside of the shaft on malleable steel shoes working in steel guides to eliminate friction.

All doors to be manually operated and equipped with the Peelle Electric Interlocks on each door, and an emergency switch in the car.

These doors to be guaranteed for a period of two years after date of completion against defects in workmanship and materials.

Counterbalanced Elevator Door References

R. H. Macy & Co. (old and new building) 34th Street and Broadway, New York, N. Y., Robert D. Kohn and Associates, Architects

Dodge Brothers, Hamtramck, Mich., Smith, Hinchman & Grylls, Detroit, Mich., Architects

Federal Reserve Annex, Richmond, Va., Carneal & Johnston, Richmond, Va., Architects

American Can Co., Chicago, Ill.

Alexander Smith & Sons Carpet Co., Yonkers, N. Y.

Potter Drug & Chemical Co., Malden, Mass., R. W. Wambolt, Architect

Indianapolis Athletic Club Building, Indianapolis, Ind., Robert Frost Daggett, Indianapolis, Ind., Architect

Wm. Filene's Sons Co., Boston, Mass., Richard Brunel, Engineer

Moore Walton Dry Goods, San Francisco, Cal., Geo. W. Kelham, Architect

Astrup Awning Co., Cleveland, Ohio, Allen Osborn Co., Architects

Student Express Building, Berkeley, Cal., James W. Plachek, Architect

Ford Motor Co., Iron Mountain, Mich., Albert Kahn, Detroit, Mich., Architect

U. S. Navy Yard Machine Shop, Washington, D. C.

Stoehr & Fister Building, Scranton, Pa., Davis & Lewis, Architects

Pennsylvania Hotel, New York, N. Y., McKim, Mead & White, New York, N. Y., Architects

American Laundry Machinery Co., Rochester, N. Y., John F. Strobel, Architect

Peabody Museum, Yale University, New Haven, Conn., Day & Klauder, Architects

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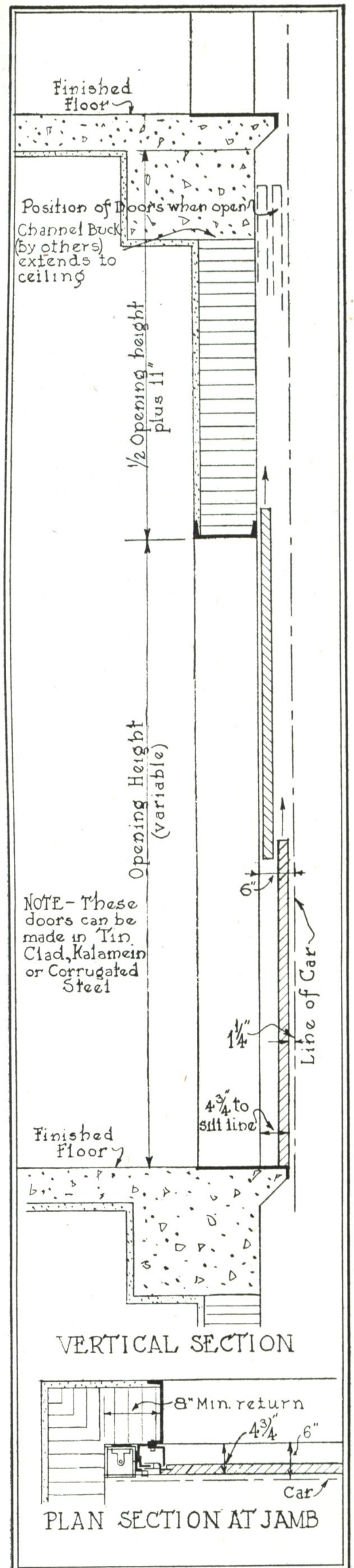

Finished Floor
Position of Doors when open
Channel Buck (by others) extends to ceiling
1/2 Opening height plus 11"
Opening Height (variable)
NOTE- These doors can be made in Tin Clad, Kalamein or Corrugated Steel
6"
1¼"
Line of Car
4¾" to sill line
Finished Floor
VERTICAL SECTION
8" Min. return
4¾"
6"
Car
PLAN SECTION AT JAMB

UNDERWRITERS LABELLED TEL-CO-DOR

Westinghouse Office Building, Philadelphia, Pa., Carson & Carson, Architects

Gulf Refining Co., West Port Arthur, Tex., Edward B. Lee, Pittsburgh, Pa., Architect

Doubleday, Page & Co., Garden City, L. I., Oscar Cadmus, New York, N. Y., Architect

Firestone Tire & Rubber Co., Hamilton, Ont., B. H. Prack, Architect

The G. Edwin Shoe Company, Columbus, Ohio

Peelle Tel-Co-Dor

(See details for clearances.)

This door is made for two distinct uses:

The small Tel-Co-Dor is built for use as an elevator door. The large Tel-Co-Dor is built for large exterior openings and is used in warehouses, loading platforms, etc.

All doors of this type are reinforced with our patented T-bar traveling rail and dovetail binder shoes—one or more to the door according to size.

This door is a counterweighted door divided horizontally in the center; the two panels thus formed, in operation travel upward, both panels arriving at the lintel simultaneously.

Tel-Co-Dor (Elevator)—This door can be made in tin clad, kalamein, or corrugated steel, but for general use corrugated steel is recommended. Labeled by the Underwriters' Laboratories, Inc., and acceptable to all State and labor departments.

Tel-Co-Dor (Warehouse)—This door can be made to any size desired and can be made in tin clad, kalamein, corrugated steel or wood.

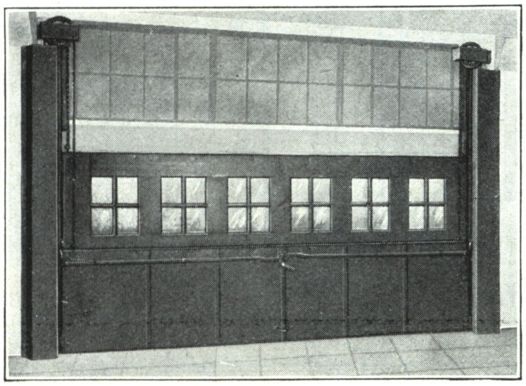
Installation

All Peelle doors are erected by mechanics experienced in the installation of our product.

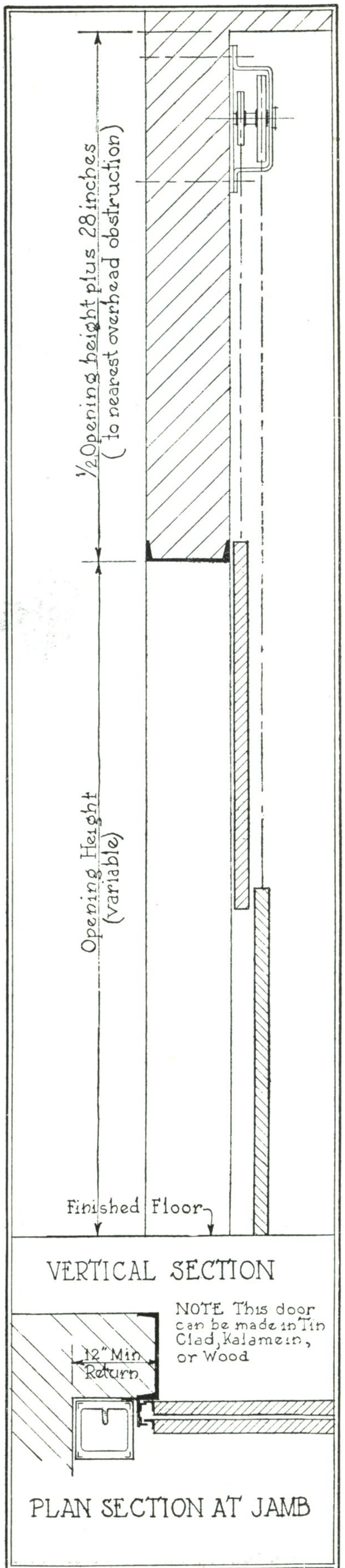
Painting

All parts are given a heavy priming coat of metallic paint by this company before leaving the factory.

Additional coats of paint after erection should be specified to be done by painting contractor.



Large Type Tel-Co-Dor


1/2 Opening height plus 28 inches (to nearest overhead obstruction)
Opening Height (variable)
Finished Floor
VERTICAL SECTION
NOTE This door can be made in Tin Clad, Kalamein, or Wood
12" Min. Return
PLAN SECTION AT JAMB

PEELLE LARGE TYPE TEL-CO-DOR

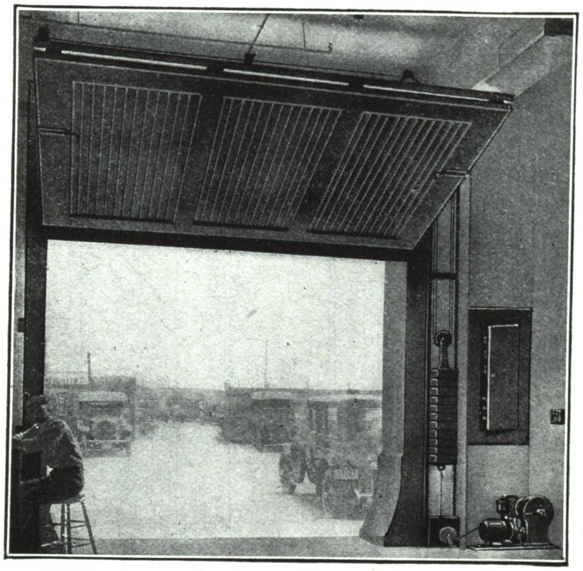
Continued on next page

Peelle Folding Canopy Doors

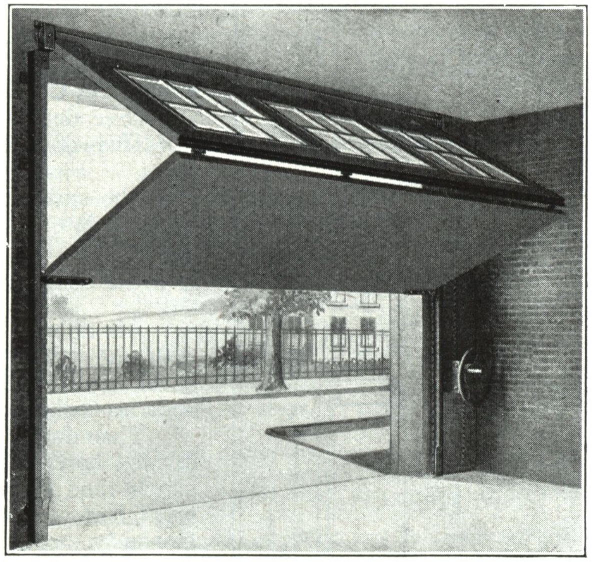
(See detail for clearances.)

Installed on either inside or outside of opening and can be operated by means of chain hoist and counterweights, electric full automatic machine, or differential geared hoist.

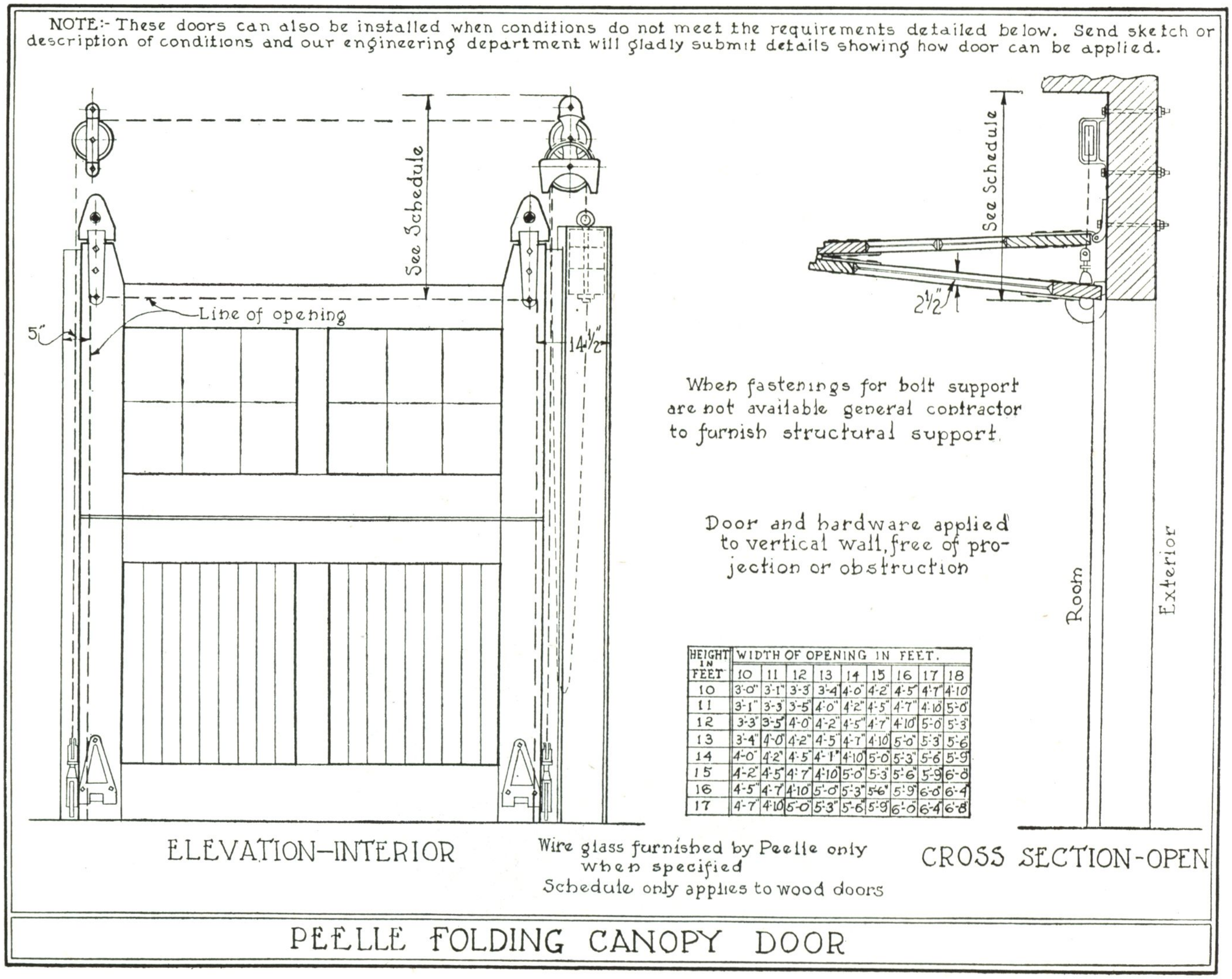
Panels made to any specification of design or construction. These doors can also be installed when conditions do not meet the requirements detailed below. Send sketch or description of conditions and our engineering department will gladly submit details showing how door can be applied.



Electrically Operated Folding Canopy Door
Installed in Packard Automobile Service Station, L. I. City, N. Y.



Peelle Folding Canopy Door
Winch type, partly open



NOTE:- These doors can also be installed when conditions do not meet the requirements detailed below. Send sketch or description of conditions and our engineering department will gladly submit details showing how door can be applied.

When fastenings for bolt support are not available general contractor to furnish structural support.

Door and hardware applied to vertical wall, free of projection or obstruction

HEIGHT IN FEET	WIDTH OF OPENING IN FEET.								
	10	11	12	13	14	15	16	17	18
10	3'-0"	3'-1"	3'-3"	3'-4"	4'-0"	4'-2"	4'-5"	4'-7"	4'-10"
11	3'-1"	3'-3"	3'-5"	4'-0"	4'-2"	4'-5"	4'-7"	4'-10"	5'-0"
12	3'-3"	3'-5"	4'-0"	4'-2"	4'-5"	4'-7"	4'-10"	5'-0"	5'-3"
13	3'-4"	4'-0"	4'-2"	4'-5"	4'-7"	4'-10"	5'-0"	5'-3"	5'-6"
14	4'-0"	4'-2"	4'-5"	4'-7"	4'-10"	5'-0"	5'-3"	5'-6"	5'-9"
15	4'-2"	4'-5"	4'-7"	4'-10"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"
16	4'-5"	4'-7"	4'-10"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"	6'-4"
17	4'-7"	4'-10"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"	6'-4"	6'-8"

Wire glass furnished by Peelle only when specified
Schedule only applies to wood doors

Continued on next page

Peelle Standard Steel Plate Counterbalanced Dumbwaiter Doors

(See detail for clearances.)

Our standard steel plate dumbwaiter doors are manufactured in the stock sizes indicated below, and shipped fully assembled ready for setting and operation. Necessary fastenings are attached to the frame for anchoring in brick, terra cotta, or concrete partitions. Doors may be equipped with small light of glass, if desired. These doors are labeled by the Factory Mutual Insurance Companies.

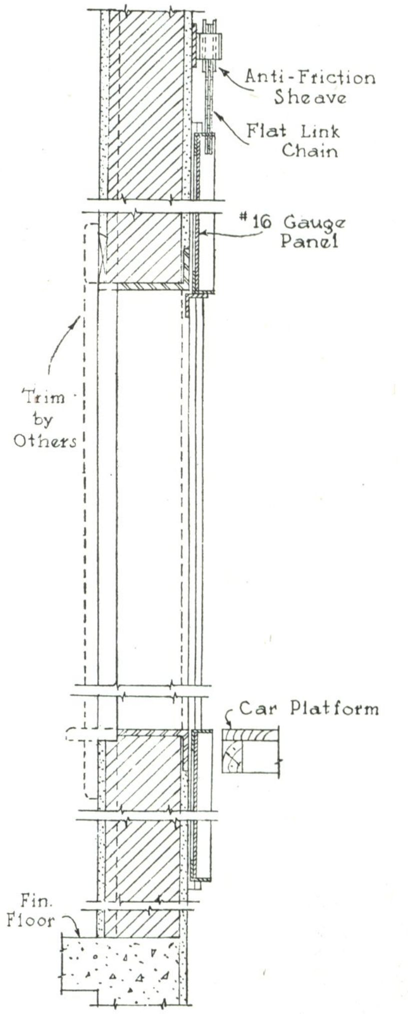
Operation—The doors operate vertically, one-half sliding up and the other down, one counterbalancing the other, thus eliminating the use of costly counterweights and greatly reducing the number of working parts, which means less wear and tear. It will be noted particularly that complete frames are included with each set of doors. (See construction details). More rugged in construction than the ordinary metal clad doors, neat in appearance, and easily operated in steel guides, this door is, in addition, less expensive and more durable than others. We recommend standard steel plate dumbwaiter doors especially for factories and apartment buildings.

Specifications—To all openings in dumbwaiter shaft, except as otherwise noted, furnish and install in complete working order Peelle Patented Standard Steel Plate Counterbalanced Dumbwaiter Doors, as manufactured by The Peelle Company, Stewart Avenue and Harrison Place, Brooklyn, N. Y.

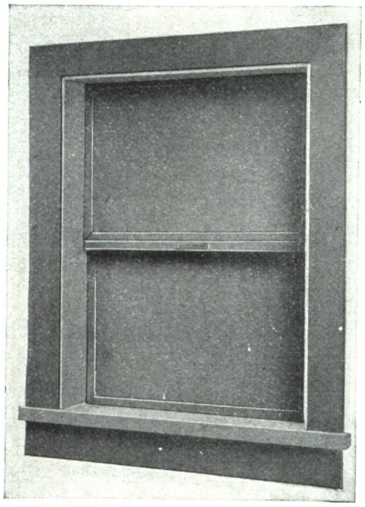
(1) These doors are to be made of No. 16 gauge flat steel, riveted into steel frames hung on Morton steel chain running over double race ball bearing pulleys, and operating on the inside of the shaft in substantial steel guides. All doors are to be completely assembled by the subcontractor and are to be shipped to the building as directed by the general contractor ready for setting in place, setting to be done by the mason contractor.

(2) All doors are to be guaranteed by the subcontractor against defects in workmanship and material for a period of two years from date of installation.

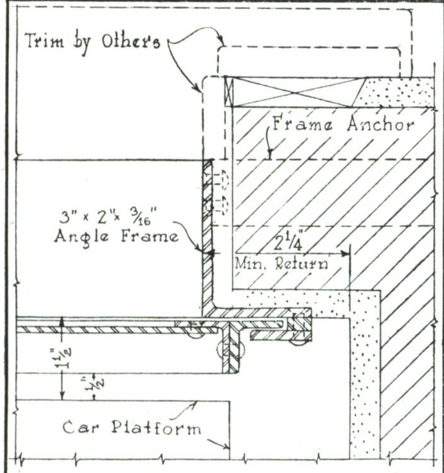
Advantages—No steel frames are required to be furnished by any other sub-contractor. No erection is required in the field. The door being assembled to the frame in complete working order, is set into place and the enclosure is built around the door in the same manner that any door frame is built into the wall.



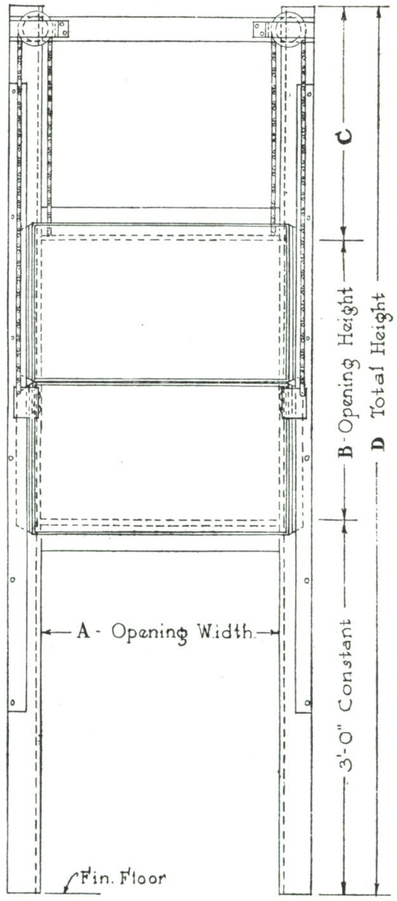
VERTICAL SECTION THROUGH DOOR
Showing Door Open



PEELLE STANDARD DUMBWAITER DOOR



HORIZONTAL SECTION THROUGH DOOR
Showing Plan at Jamb



ELEVATION OF SHAFT SIDE
With Door Closed

SIZES OF STOCK TYPES

TYPE	A	B	C	D
D-S	2'-0"	2'-11"	2'-0"	7'-11"
D-M	2'-6"	3'-5"	2'-3"	8'-8"
D-L	3'-0"	3'-11"	2'-6"	9'-5"

DETAILS OF PEELLE STANDARD COUNTERBALANCED DUMBWAITER DOORS

RICHMOND FIREPROOF DOOR CO.

RICHMOND, IND.

NEW YORK, N. Y. CHICAGO, ILL. BALTIMORE, MD.
LOS ANGELES, CAL. HOUSTON, TEX. ST. LOUIS, MO.
PHILADELPHIA, PA. CLEVELAND, OHIO BOSTON, MASS.
CINCINNATI, OHIO LOUISVILLE, KY. MIAMI, FLA.
SYRACUSE, N. Y. MINNEAPOLIS, MINN. PITTSBURGH, PA.

Agents Located in 50 Principal Cities and Territories Throughout the United States, Including the Above

Products

Tin Clad Fire Doors.

Steel and Tin Clad Storage Room Doors.

Counterbalanced and Vertical Telescoping Elevator Doors.

Horizontal Bi-folding Doors.

Kalamein or Metal Covered Doors and Trim.

Also Tin Clad Fire Shutters; Underwriters' Iron Fire Doors; Horizontal Trolley and Vertical Sliding Warehouse Doors; Door and Shutter Hardware.

Foreword

This company has been engaged continuously for the past 32 years in the manufacture, sale and erection of tin clad fire doors, counterbalanced and telescoping freight elevator doors of all types, various kinds of industrial doors of wood and metal construction, also kalamein doors and trim.

Richmond doors are labeled by the Underwriters' Laboratories, Inc. of Chicago when they are of a type and size permissible under the Underwriters' regulations.

The accompanying illustrations show a number of these products, but it is difficult to encompass within these pages all the technical data necessary for proper selection to suit conditions, also architectural data for layout. Our representative in your city or vicinity is prepared to provide all necessary information and assistance in this connection.

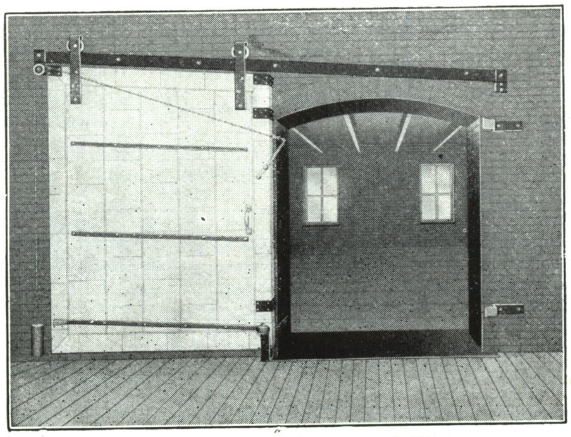
Richmond Door Hardware

We manufacture all our own fire door hardware, also hardware for industrial doors. The design is simple but sturdy, and the quality is excellent.

Sliding Tin Clad Fire Doors

The gravity type of sliding tin clad fire door is illustrated. Similar doors may also be obtained with level top. Richmond hardware of our own manufacture is available for both of these types, and, in addition, for the special drop bracket type required for very limited headroom conditions.

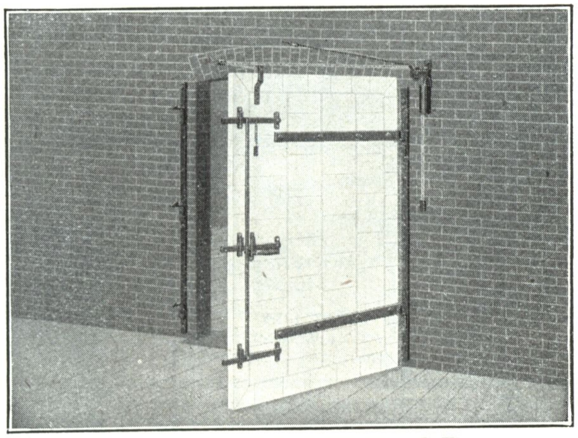
Doors of all types may also be had in both single sliding and center-meeting double sliding forms.



No. 200. Sliding Doors and Fixtures

Swinging Tin Clad Fire Doors

These are made either singly or in pairs, with automatic self-closing fire door hardware. They may be used with rabbetted iron or masonry jambs. Also furnished in lap type suitable for use in cases where there are plain masonry openings and no special provision has been made for framing.



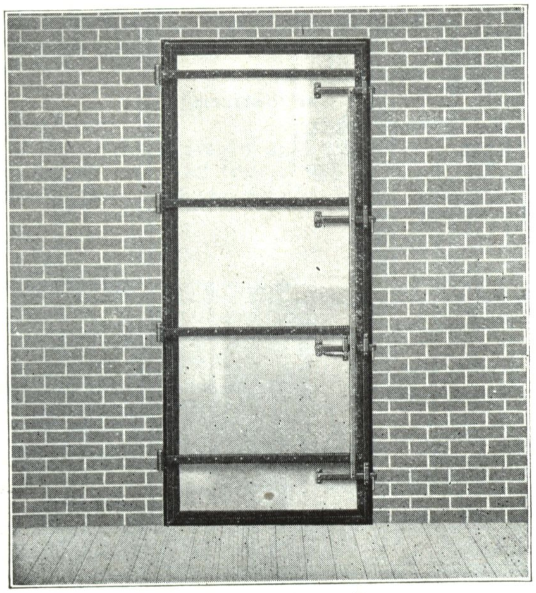
No. 120. Single Swing Door and Fixtures

Steel and Tin Clad Storage Room Doors

Supplied complete with frame, hinges and latch. Especially suited to the furniture warehouse and have been widely specified during the past two years.

Richmond doors of this type possess many advantages not to be secured in any other door. For those who prefer it, we also make a tin clad storage room door.

Both of these types are labeled by the Underwriters.



Steel Storage Room Door

Continued on next page

Counterbalanced Elevator Doors

Made in tin clad, kalamein and corrugated steel types, and furnished with or without Underwriters' labels. In addition to the ordinary form of construction, we make the single guide and pass types for use where headroom is limited. The corrugated steel type with angle iron frame may be used in cases where saving in cost is essential.

Counterbalanced doors are particularly suited for use in elevator shafts, as they provide maximum clear opening and take up no floor space. They are mounted on the inside of the elevator shaft and are made in two sections divided horizontally along the center, one-half sliding up and the other half sliding down. The guides are angles bolted to the wall.

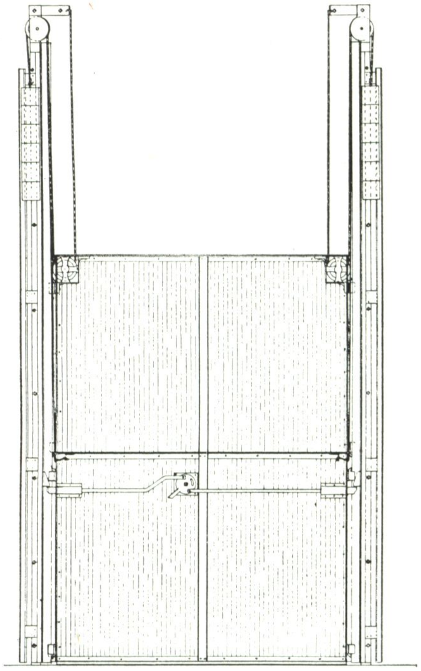
These doors may be had for manual operation, semiautomatic closing or electric interlocking.

Detailed blue prints sent on request.

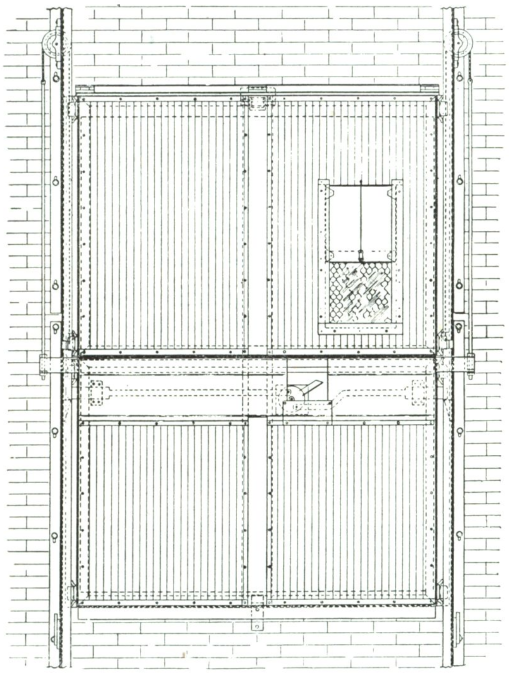
Vertical Telescoping Elevator Doors

Made in tin clad, kalamein and corrugated steel types, for manual operation, semiautomatic closing or electric interlocking. Furnished with or without Underwriters' labels. Usually installed on inside of elevator shaft. Made in 2 vertically sliding sections, bottom section traveling at twice the speed of upper section. Distance from floor to floor should be one-half more than height of opening, plus 8 in. Where saving in cost is essential, the corrugated steel type with angle iron frame is recommended. The latter type slides on double angle iron track bolted to the walls and is supported by means of a chain or cable operating over roller bearing sheaves fastened to the track and upper section. The tin clad and corrugated steel types are frequently used for shipping platforms because they take up very little floor space.

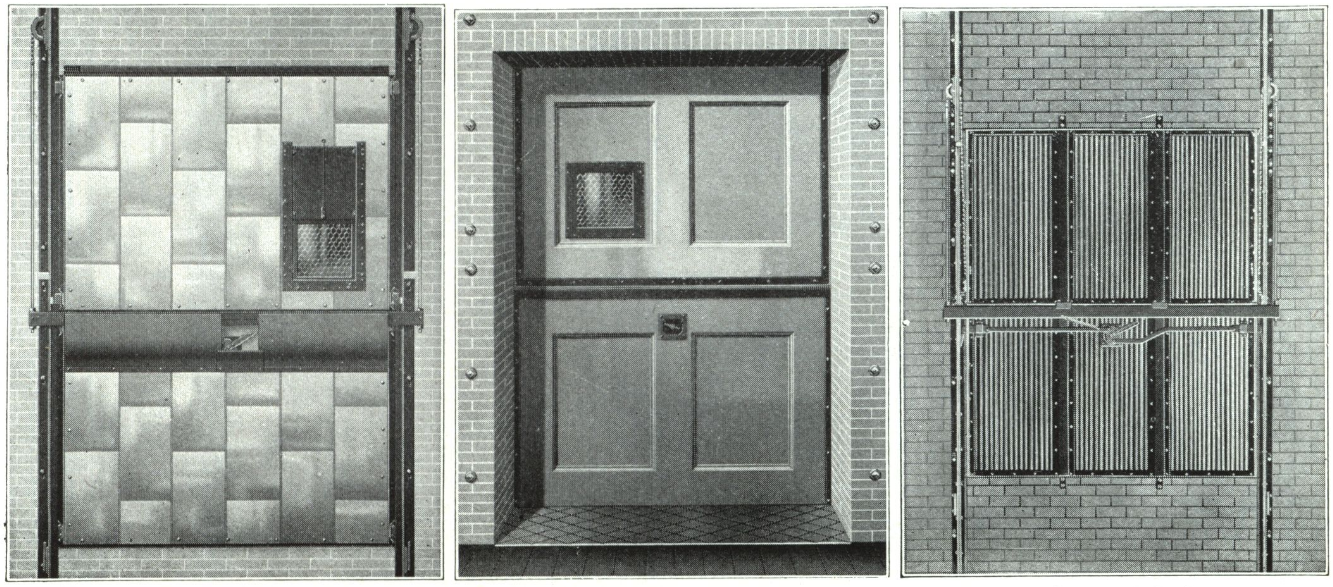
Detailed blue prints sent on request.



Details of Counterbalanced Elevator Door



Details of Vertical Telescoping Elevator Door



Tin Clad

Kalamein

Corrugated Steel

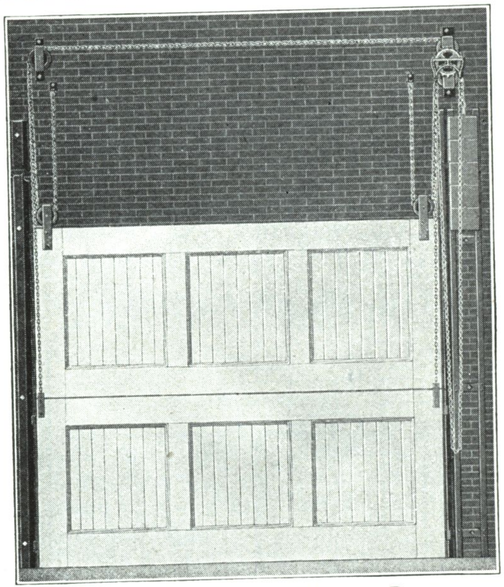
Richmond Counterbalanced Elevator Doors

Continued on next page

Richmond 2-Section Slide-up Doors

Used for shipping platforms and driveways where there is plenty of headroom.

Construction and operation is similar to vertical telescoping doors, except that they are operated by chain hand hoist.



Richmond 2-Section Slide-up Door

Richmond Horizontal Bi-folding Doors

May be obtained in wood, metal covered, steel plate or corrugated iron construction. These doors are widely used for driveways and shipping platforms because they fold up and out of the way.

They may be paneled for glass in the upper section, providing excellent light within the building.

Doors are counterbalanced with iron weights in suitable metal weight boxes, and are actuated by chain hand hoist.

For the typical installation, **15 in.** are required inside one jamb and 5 in. inside the other, with a clear headroom varying according to the size and weight of door. This may be brought as low as 12 to 15 in. but there should be at least 24 in. for the most successful installation.

SCHEDULE OF OVERHEAD CLEARANCES FOR RICHMOND BI-FOLDING DOORS

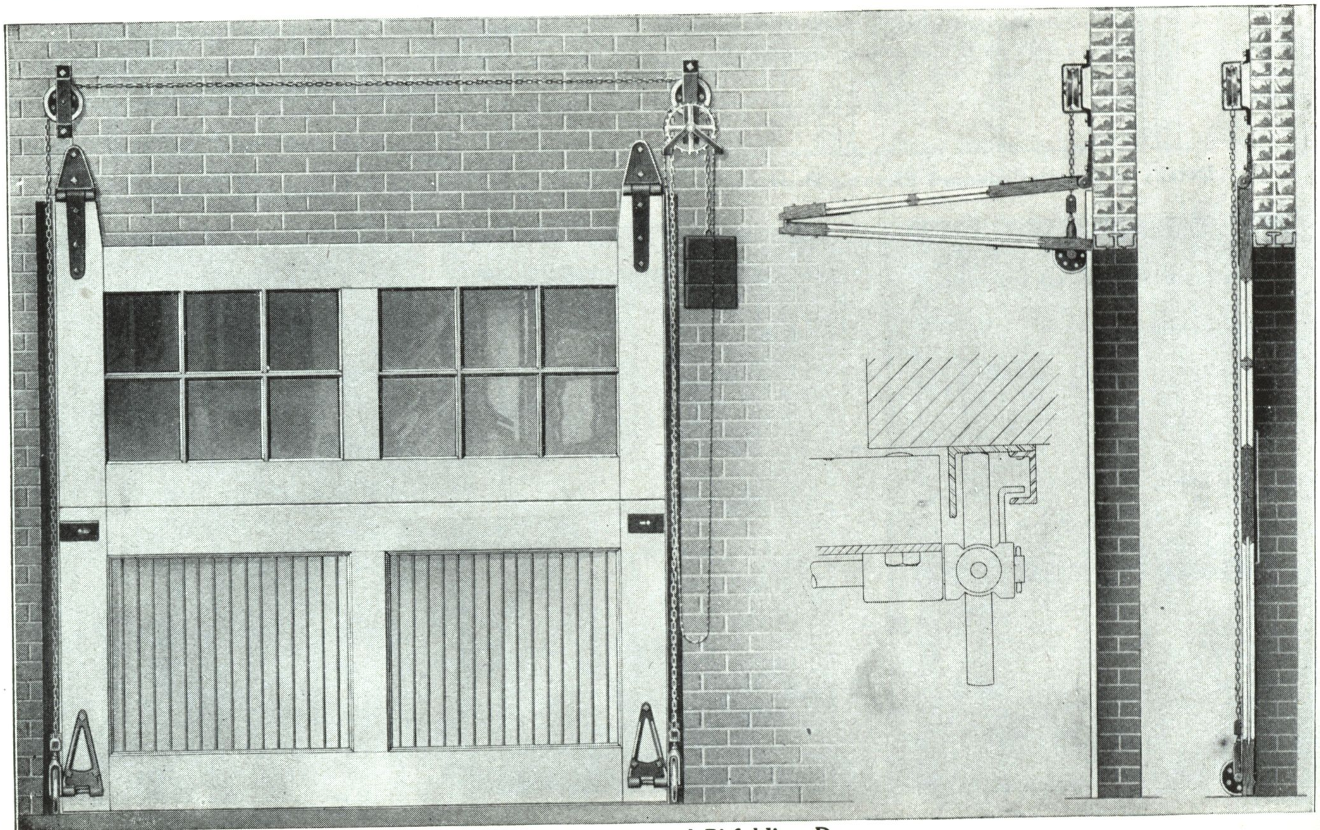
"A," height, and "B," width, of opening

For Wood Doors

"B"	"A"										
	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'
8'	2'-5"	2'-6"	2'-7"	2'-8"	2'-9"	2'-10"	2'-11"	3'-1"	3'-2"	3'-3"	3'-4"
9'	2'-6"	2'-7"	2'-8"	2'-9"	2'-11"	3'-0"	3'-1"	3'-2"	3'-3"	3'-5"	3'-6"
10'	2'-7"	2'-8"	2'-9"	2'-11"	3'-0"	3'-1"	3'-3"	3'-5"	3'-6"	3'-7"	3'-8"
11'	2'-8"	2'-9"	2'-11"	3'-0"	3'-1"	3'-3"	3'-5"	3'-7"	3'-8"	3'-9"	3'-10"
12'	2'-8"	2'-9"	2'-11"	3'-1"	3'-3"	3'-4"	3'-7"	3'-7"	3'-9"	3'-11"	4'-0"
13'	2'-9"	2'-11"	3'-1"	3'-3"	3'-5"	3'-7"	3'-8"	3'-9"	4'-1"	4'-2"	4'-3"
14'	2'-11"	3'-1"	3'-2"	3'-5"	3'-7"	3'-8"	3'-11"	4'-1"	4'-2"	4'-3"	4'-5"
15'	2'-11"	3'-1"	3'-3"	3'-5"	3'-7"	3'-9"	4'-1"	4'-2"	4'-3"	4'-5"	4'-8"
16'	3'-1"	3'-3"	3'-5"	3'-7"	3'-9"	3'-11"	4'-3"	4'-4"	4'-5"	4'-7"	4'-11"

For Metal Covered Doors

8'	2'-11"	3'-1"	3'-3"	3'-7"	3'-9"	3'-11"	4'-1"	4'-3"	4'-5"	4'-7"	4'-11"
9'	3'-1"	3'-3"	3'-7"	3'-9"	3'-11"	4'-1"	4'-5"	4'-7"	4'-9"	4'-11"	5'-3"
10'	3'-3"	3'-7"	3'-9"	3'-11"	4'-1"	4'-3"	4'-7"	4'-11"	5'-1"	5'-3"	5'-7"
11'	3'-5"	3'-7"	3'-11"	4'-3"	4'-5"	4'-7"	4'-11"	5'-1"	5'-5"	5'-7"	5'-11"
12'	3'-7"	3'-11"	4'-1"	4'-5"	4'-7"	4'-9"	5'-1"	5'-5"	5'-9"	6'-1"	6'-5"
13'	3'-9"	4'-1"	4'-3"	4'-7"	4'-11"	5'-3"	5'-5"	5'-9"	6'-1"	6'-5"	6'-9"
14'	3'-11"	4'-3"	4'-7"	4'-11"	5'-1"	5'-7"	5'-9"	6'-1"	6'-5"	6'-9"	7'-1"
15'	4'-1"	4'-5"	4'-9"	5'-1"	5'-5"	5'-9"	6'-1"	6'-5"	6'-9"	7'-1"	7'-5"
16'	4'-3"	4'-7"	4'-11"	5'-5"	5'-7"	6'-1"	6'-7"	6'-9"	7'-3"	7'-7"	7'-11"



Richmond Horizontal Bi-folding Door

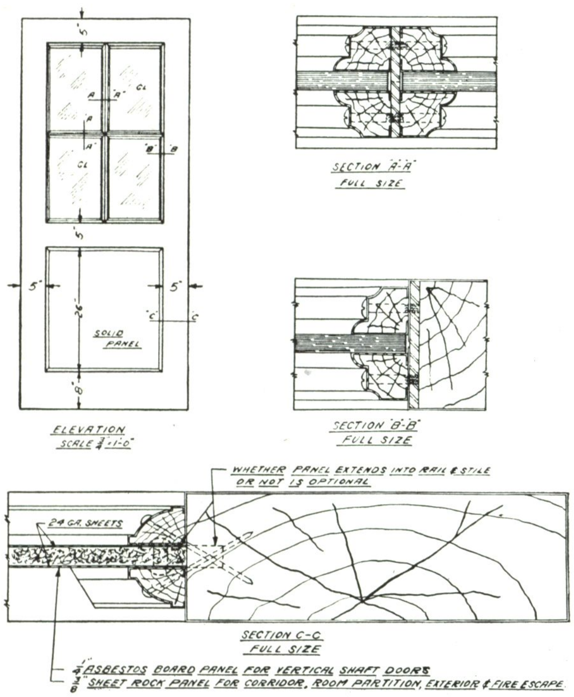
Continued on next page

Kalamein or Metal Covered Doors and Trim

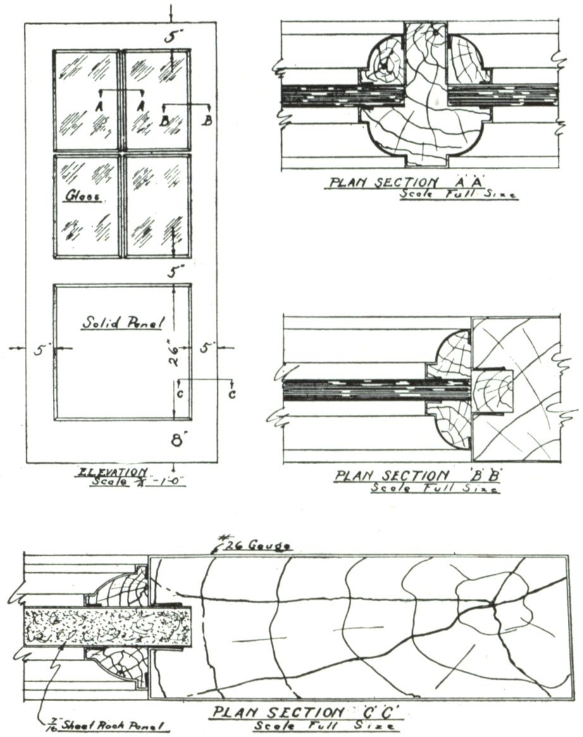
We are prepared to furnish kalamein or metal covered doors and trim in both standard and labeled construction, in any panel arrangement, and in all the usual designs with either metal covered frames and trim or combination pressed steel bucks. Our modern facilities enable us to efficiently handle special types of work.

Our engineering department is always at the service of those interested in fireproof door products and we are at all times glad to assist in handling any unusual problems which may be presented.

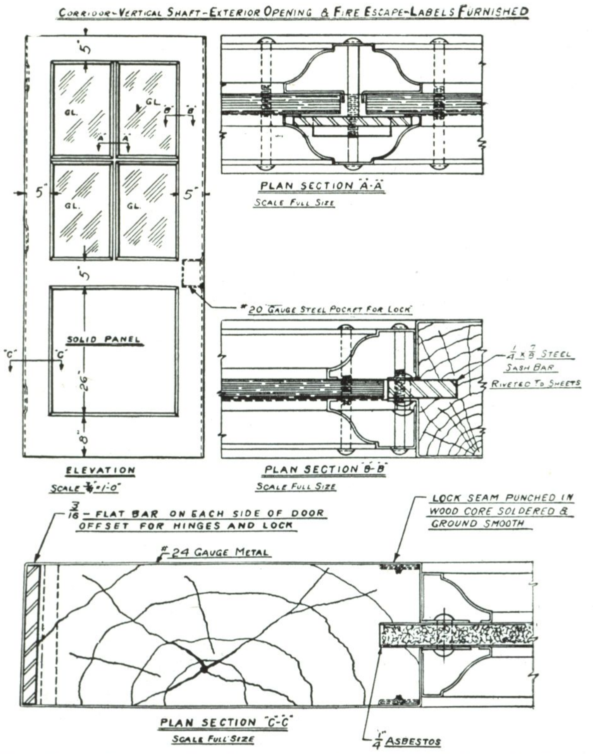
Our complete general catalogue, also detail drawings will be promptly mailed on request. Blue prints showing full size profiles of mouldings will also be sent on request.


SECTION "A-A" FULL SIZE
SOLID PANEL
ELEVATION SCALE 3/4"=1'-0"
SECTION "B-B" FULL SIZE
WHETHER PANEL EXTENDS INTO RAIL & STILE OR NOT IS OPTIONAL
24 GA. SHEETS
SECTION C-C FULL SIZE
1/4" ASBESTOS BOARD PANEL FOR VERTICAL SHAFT DOORS
3/8" SHEET ROCK PANEL FOR CORRIDOR, ROOM PARTITION, EXTERIOR & FIRE ESCAPE

Details of Underwriters' Labeled Kalamein Door


Glass
Solid Panel
ELEVATION Scale 3/4"-1'-0"
PLAN SECTION "A'A" Scale Full Size
PLAN SECTION "B'B" Scale Full Size
#26 Gauge
7/16" Sheet Rock Panel
PLAN SECTION "C'C" Scale Full Size

Details of Non-labeled Kalamein Door


CORRIDOR-VERTICAL SHAFT-EXTERIOR OPENING & FIRE ESCAPE-LABELS FURNISHED
PLAN SECTION "A-A" SCALE FULL SIZE
#20 GAUGE STEEL POCKET FOR LOCK
SOLID PANEL
1/4 x 7/8 STEEL SASH BAR RIVETED TO SHEETS
ELEVATION SCALE 3/4"=1'-0"
PLAN SECTION "B-B" SCALE FULL SIZE
3/16 - FLAT BAR ON EACH SIDE OF DOOR OFFSET FOR HINGES AND LOCK
LOCK SEAM PUNCHED IN WOOD CORE SOLDERED & GROUND SMOOTH
#24 GAUGE METAL
PLAN SECTION "C-C" SCALE FULL SIZE
1/4 ASBESTOS

Details of Special Underwriters' Labeled Kalamein Door

SECURITY FIRE DOOR CO.

Counterbalanced Truckable and Other Fireproof Freight Elevator Doors

3036-3048 Lambdin Avenue
ST. LOUIS, MO.

AGENCIES

ALBANY, N. Y., 106 State Street
ATLANTA, GA., 101 Marietta Street
BALTIMORE, MD., Maryland Avenue and 22nd Street
BOSTON, MASS., 333 Washington Street
CHICAGO, ILL., 8 So. Dearborn Street
CINCINNATI, OHIO, 534 Main Street
CLEVELAND, OHIO, 605 Swetland Building
DALLAS, TEX., 2916 Maple Avenue
DAYTON, OHIO, 26 Mutual Home Building
DENVER, COLO., 1740 Champa Street
DES MOINES, IOWA, Securities Building
DETROIT, MICH., 1758 Penobscot Building
INDIANAPOLIS, IND., 631 So. Delaware Street
LOS ANGELES, CAL., 653 So. Clarence Street
LOUISVILLE, KY., 2434 Frankfort Avenue
MILWAUKEE, WIS., 1311 Majestic Building
NASHVILLE, TENN., 1025 Hamilton Street
NEW ORLEANS, LA., Maison Blanche Building
NEW YORK, N. Y., 404 East 34th Street
PHILADELPHIA, PA., 1215 Frankford Avenue
PITTSBURGH, PA., 303 Bowman Building
PORTLAND, ORE., 247 Fifth Street
SAN FRANCISCO, CAL., 409 New Call Building
SEATTLE, WASH., 314 Seneca Street
WASHINGTON, D. C., 607 Lenox Office Building

Products

"HORIFOLD" WAREHOUSE, FREIGHT HOUSE SHIPPING PLATFORM and GARAGE DOOR.

"SEC-TEL" CORRUGATED and KALAMEIN TWO-SECTION SLIDE-UP FREIGHT ELEVATOR DOOR.

"SECO" CORRUGATED, TIN CLAD and KALAMEIN COUNTERBALANCED FREIGHT ELEVATOR DOOR.

TRADE-MARK

Underwriters' Approval

All "Sec-Tel" and "Seco" freight elevator doors are inspected and labeled by Underwriters' Laboratories, Inc., and Factory Mutuals.

Service

Let us assist in solving your door problems. Our engineering department is at your service and will cooperate with architects, engineers and contractors. Write for details.

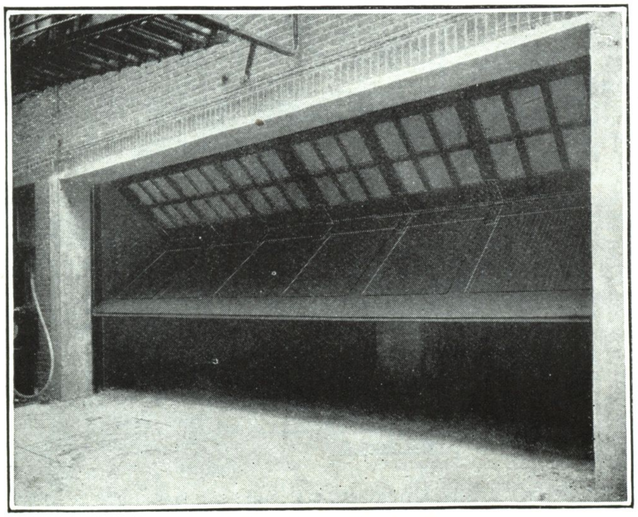
Safety Devices

We recommend for use with our "Sec-Tel" and "Seco" doors, our *safety electric interlocking switches*, which prevent the operation of the elevator car until all doors in the shaft are closed.

Semiautomatic devices can also be furnished on small doors.

"Horifold" Door

The "Horifold" is a horizontal folding-up door and can be made of wood, corrugated steel, tin clad or paneled wood metal covered sections.



"Horifold" Door Partly Open

"Horifold" doors are of rigid construction, operate with ease, and are unexcelled for withstanding severe weather conditions.

"Horifold" doors are specially adapted for shipping platforms of warehouses, factory buildings, freight houses and garages.

"Horifold" doors can be arranged to fold out, forming a canopy over the opening.

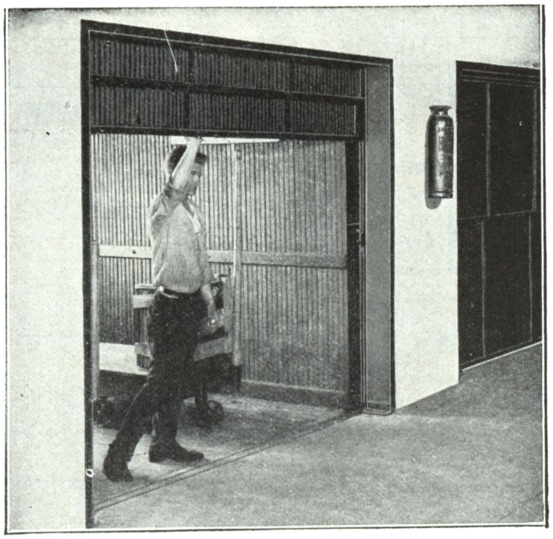
"Horifold" doors can be arranged for glass in upper half to admit light, and with a wicket door in lower section.

Write for detail drawings and further data.

"Sec-Tel" Door

The "Sec-Tel" door is a two-section slide-up or vertical telescoping elevator door. "Sec-Tel" doors permit the use of the permanent building sill for trucking over on to the elevator car.

Double race ball bearing or roller bearing sheaves and special antifriction door guides assure ease of operation.



"Sec-Tel" Door

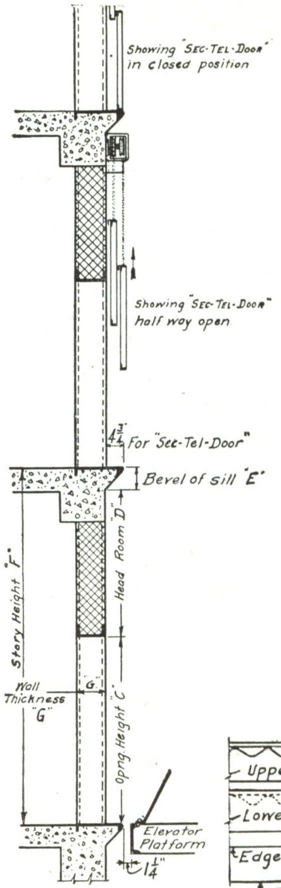
Advantages of "Sec-Tel" Door—The "Sec-Tel" door is a combination fire door and safety gate, and no safety gate is required when the "Sec-Tel" door is used.

The "Sec-Tel" door is made in two sections which slide up above the lintel out of the way.

The use of "Sec-Tel" doors reduces fire and accident insurance. "Sec-Tel" doors are of simple but rigid construction and will stand up under constant use.

They are built for service.

Continued on next page

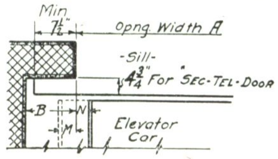

Showing "Sec-Tel-Door" in closed position
Showing "Sec-Tel-Door" half way open
$4\frac{3}{4}$" For "Sec-Tel-Door"
Bevel of sill "E"
Head Room "D"
Story Height "F"
Wall Thickness "G"
G
Opng. Height "C"
Elevator Platform
$1\frac{1}{4}$"

Section Through Opening Showing "Sec-Tel" Door

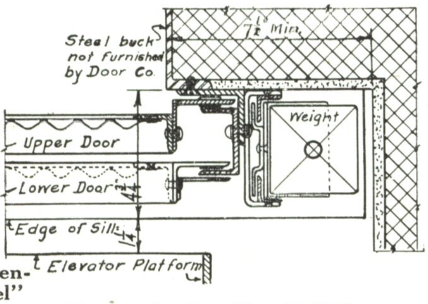
SCHEDULE OF OPENING HEIGHTS "SEC-TEL" DOORS

For Various Floor Heights Allowing 4 in. for Bevel of Sill

Opening height "C" ft.	in.	Minimum headroom "D" ft.	in.	Story height "E" ft.	in.
6	0	3	5	9	9
6	6	3	8	10	6
6	8	3	9	10	9
6	10	3	10	11	0
7	0	3	11	11	3
7	6	4	2	12	0
8	0	4	5	12	9
8	6	4	8	13	6
9	0	4	11	14	3
9	6	5	2	15	0
10	0	5	5	15	9


Min $7\frac{1}{2}$"
Opng. Width A
-Sill-
$4\frac{3}{4}$" For "Sec-Tel-Door"
B
N
M
Elevator Car

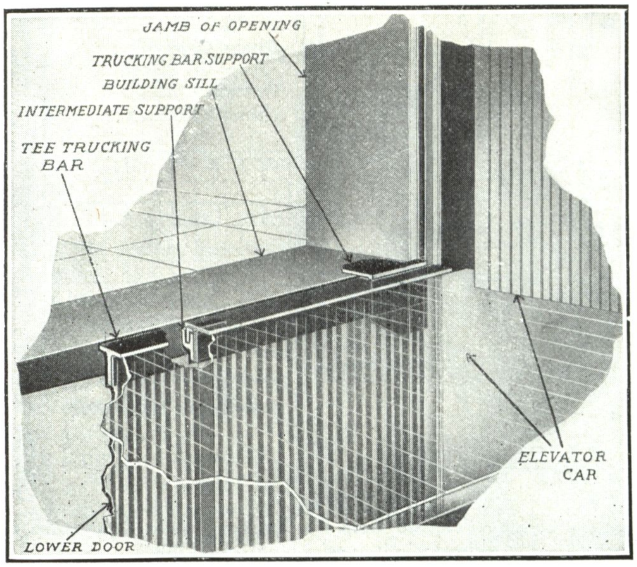
Plan of Shaft at Jamb


$7\frac{1}{2}$" Min.
Steel buck not furnished by Door Co.
Weight
Upper Door
Lower Door
Edge of Sill
Elevator Platform

Plan at Jamb—"Sec-Tel" Door

"Seco" Door

A counterbalanced elevator door, with either corrugated, tin clad or kalamein sections.


JAMB OF OPENING
TRUCKING BAR SUPPORT
BUILDING SILL
INTERMEDIATE SUPPORT
TEE TRUCKING BAR
ELEVATOR CAR
LOWER DOOR

Corrugated "Seco" Door with Tee Trucking Bar

Open lower door providing trucking surface between building sill and elevator car

"Seco" doors are equipped with heavy steel trucking bars on top of the lower half and with special *Self-aligning Trucking Bar* supports to take load off guides and chains when door is open for trucking over.

Advantages of "Seco" Door—"Seco" door is an improved counterbalanced freight elevator door which is the result of fifteen years' careful study and experience.

The *Tee Trucking Bar* on our corrugated "Seco" door is the acme of perfection.

"Seco" doors are constructed to prevent deflection into shaft from trucks passing over same.

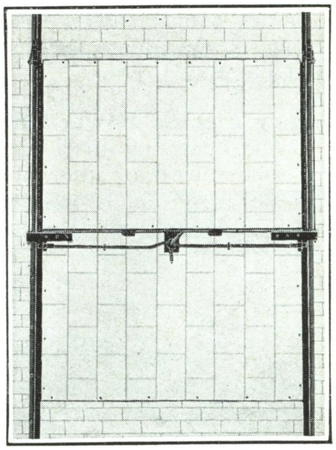
All "Seco" doors are provided with self-aligning sill stops.

"Seco" doors are designed for rough usage.

Pass Type "Seco" Door

Where low story heights do not permit the use of the regular type "Seco" door, we recommend our Pass Type "Seco" door, which can be installed for opening heights up to 18 in. less than the story height.

These doors bear the Underwriters' label, if desired.

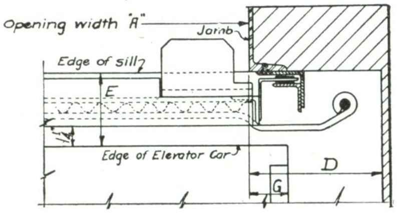


Tin Clad "Seco" Door

SCHEDULE OF MAXIMUM OPENING HEIGHTS "SECO" DOORS

For Various Floor Heights

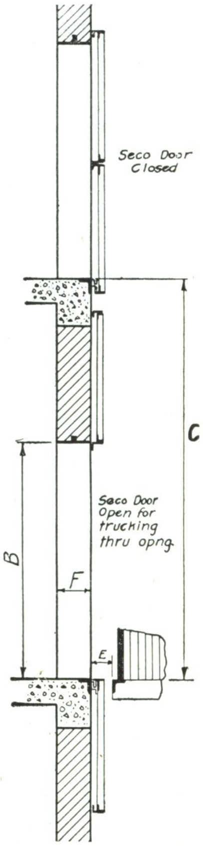
Opening height "B" ft.	in.	Minimum for regular type ft.	in.	Minimum for pass type ft.	in.
6	0	9	9	7	6
6	6	10	6	8	0
6	8	10	9	8	2
6	10	11	0	8	4
7	0	11	3	8	6
7	6	12	0	9	0
8	0	12	9	9	6
8	6	13	6	10	0
9	0	14	3	10	6
9	6	15	0	11	0
10	0	15	9	11	6


Opening width "A"
Jamb
Edge of sill
E
Edge of Elevator Car
D
G

Plan of Shaft at Jamb—"Seco" Door

CLEARANCE REQUIRED FOR "SECO" DOOR

Corrugated "Seco" Door	D, in.	E, in.
Regular type	7	$4\frac{1}{4}$
Pass type	7	$5\frac{1}{2}$
Tin Clad "Seco" Door	**D, in.**	**E, in.**
Regular type	$7\frac{1}{2}$	$4\frac{1}{2}$
Pass type	$7\frac{1}{2}$	$6\frac{1}{2}$


Seco Door Closed
C
Seco Door Open for trucking thru opng.
B
F
E

Section Through Opening Showing "Seco" Door

QUINCY ELEVATOR GATE CO.

Manufacturers of Power Operators for Elevator Doors and Gates

QUINCY, ILL.

Products

Freight Elevator Door Operators for opening and closing landing gates, counterbalanced doors, steel rolling doors and riding car gates.

Freight Elevator Gates.

Also manufacturers of Operators for opening and closing garage doors, telescoping fire doors and steel rolling entrance doors.

Quincy Electric Power Unit

The operating machine shown in Fig. 1 is made for either direct or alternating current. It occupies a floor space of about 4 ft. square and weighs 800 lb. The cable drum is driven by a reversible motor and a worm reducing mechanism and is stopped instantly by a magnet-controlled brake applied to a flanged coupling between the motor and the mechanism.

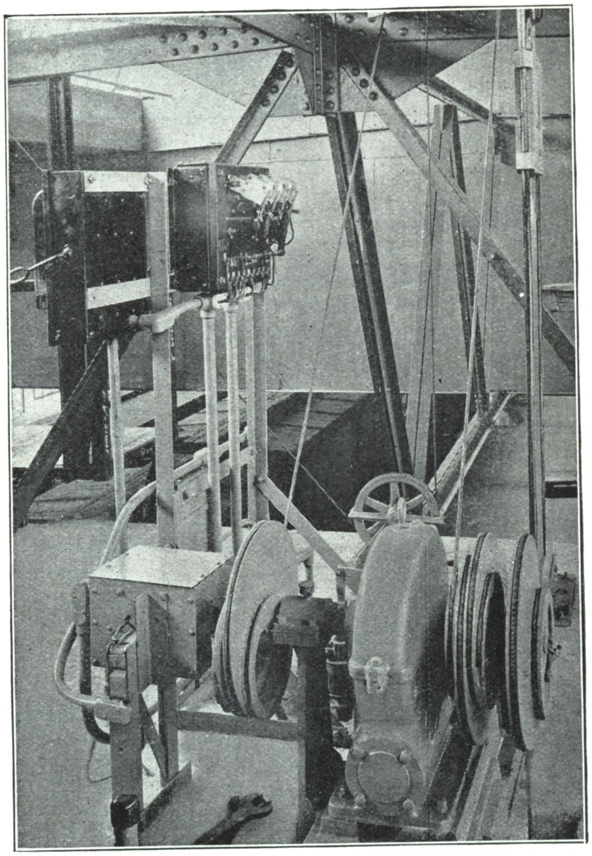


Fig. 1. Typical Quincy Equipment in Penthouse

Push Button Control—The machine is started and stopped from a push button station which can be located anywhere in the elevator or building, as the distance of the station from the operator does not affect its control.

The opening and closing of the gate or door is controlled by the operator. By pressing the "stop" button, the door may be instantly stopped while opening or closing.

Quincy Friction Grip System for Power Operation of Counterbalanced Elevator Doors

A force exerted on either section will cause a corresponding equal force to be exerted in the opposite direction on the other section of the door. The Quincy friction grip system has been perfected to perform this operation mechanically.

The Quincy friction grip system consists of two rods (one on each side of the shaft) connected to cables which pass over drums in the penthouse.

To each side of the top section of counterbalanced door a friction block is attached.

Operation—The operation of the doors is controlled by the car operator. Push button signals advise the operator of the stop to be made. When reaching the signaled floor the car operator presses the

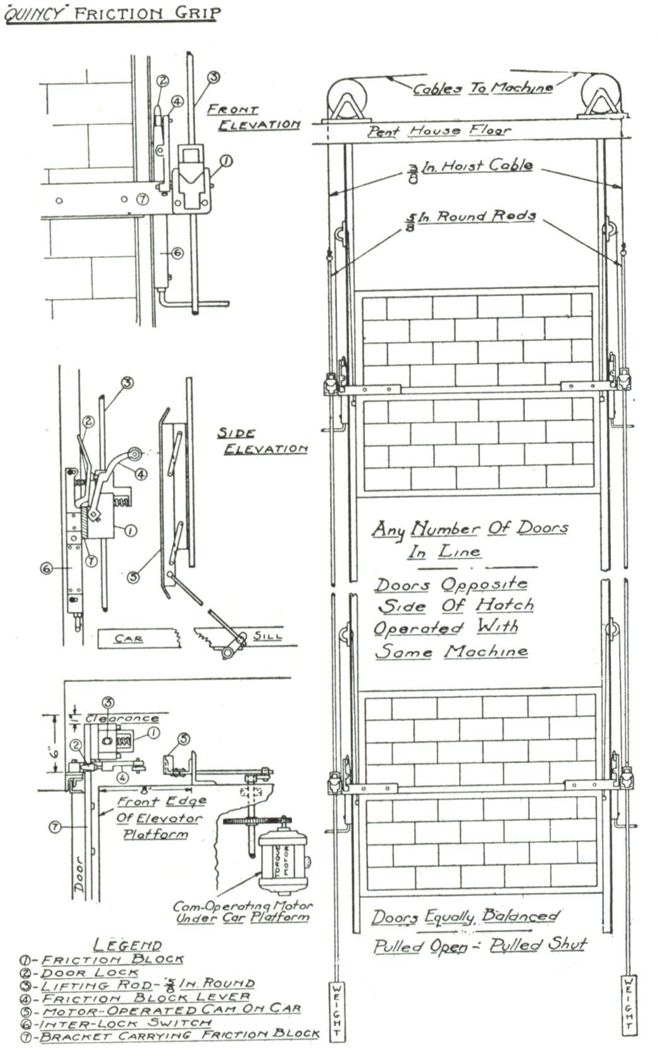

"QUINCY" FRICTION GRIP
FRONT ELEVATION
SIDE ELEVATION
Cables To Machine
Pent House Floor
3/8 In. Hoist Cable
5/8 In. Round Rods
Any Number Of Doors In Line
Doors Opposite Side Of Hatch Operated With Same Machine
Doors Equally Balanced
Pulled Open - Pulled Shut
WEIGHT
WEIGHT
CAR
SILL
Clearance
6"
8"
Front Edge Of Elevator Platform
Door
TORQUE MOTOR
Cam-Operating Motor Under Car Platform
LEGEND
①-FRICTION BLOCK
②-DOOR LOCK
③-LIFTING ROD-5/8 IN. ROUND
④-FRICTION BLOCK LEVER
⑤-MOTOR-OPERATED CAM ON CAR
⑥-INTER-LOCK SWITCH
⑦-BRACKET CARRYING FRICTION BLOCK
①
②
③
④
⑤
⑥
⑦

Fig. 2. Quincy Friction Grip System for Power Operation of Counterbalanced Elevator Doors

When door is closed, the door lock (2) engages the lever (4) on the friction block (1) which prevents it from gripping the lift bar (3). As the push bar cam (5) on the elevator engages the friction block lever (4), the cam not only unlocks the door but causes the friction blocks to grip the lift rods, which then connect the door with the cables leading to the drum of the power operator. Thus the friction grip system not only prevents any door from being opened, except when the elevator is at the same floor level as that of the landing, but automatically locks and unlocks the two sections of the door. Combination of interlock (6) and lock (2) prevents operation of elevator when door is unlocked or open

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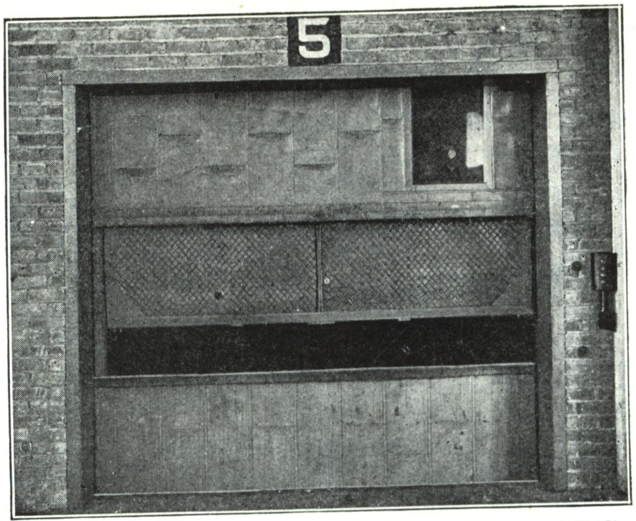


Fig. 3. Counterbalanced Freight Elevator Doors and Riding Car Gates Operated by Same Power Unit

control button, after which the doors are opened electrically by the Quincy friction grip system. Automatic openers furnished on self-leveling elevators.

Fig. 2 shows two doors, both in closed position. To open the top door, the operator presses the "open" button which starts the torque motor under the car, throwing out the car cams and unlocking the door. The machine in the penthouse starts simultaneously. Unlocking the doors causes the friction block to engage the vertical lifting rods.

A friction block can only engage with the vertical rod when the car is at its landing, thus the vertical rods slip through the open friction blocks on the lower door so that only the upper door is opened.

The combination lock and interlock is mechanical in operation and positively prevents operation of the elevator when any door is opened or unlocked.

Doors remain evenly balanced. Any one or more doors can be quickly changed to manual operation, remaining doors can continue to be operated by electric machine.

Quincy Universal Lift Bar System

A simple system for power operation of any type of elevator door or gate (except the counterbalanced door).

This system operates doors or gates only when the elevator has arrived at the various landings.

The lifting device consists of a long, flat lifting bar placed vertical in the elevator shaft at one side of the car and running the entire length of the shaft. This lifting bar is counterweighted and connected to a cable which in turn is attached to a drum in the penthouse. There is a slot in the lifting bar at each landing, into which a pawl engages for the purpose of lifting the pawl and consequently the elevator door or gate.

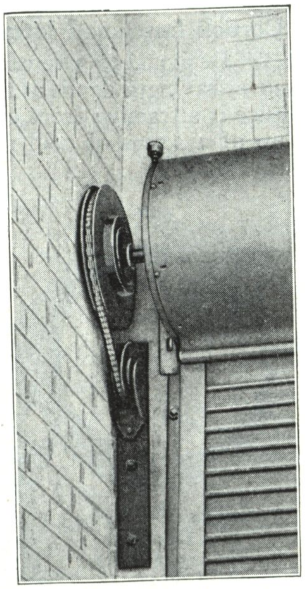


Fig. 4. Rolling Steel Elevator Door Equipped with Lift Bar System

Elevator Landing Gates Operated by Universal Lift Bar System

One-piece Gates—Where the height of the ceiling will permit the use of one-piece gates, we recommend our "Welbilt" slatted gate made of clear white oak, filled, oiled and varnished. This type of gate can be used as a landing gate or as a riding car gate.

Collapsible Gates—Where the ceiling is low or a high clearance under the raised gate is desired, we recommend our "Safety First" collapsible gate, as these are substantially constructed for service.

The rails are made of laminated oak with cypress core, separated by steel tongs held together with heavy steel studs.

When raised, this gate with 9 rails and sheaves occupies only 30 in. It may be covered with canvas.

Note: Car gates are power operated with same machine as landing gates. Selectively operated to raise only with adjacent landing gates, if desired.

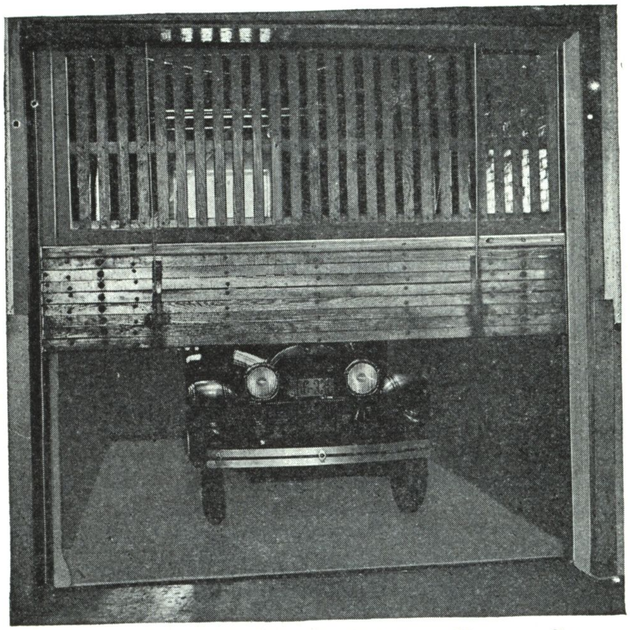


Fig. 5. Typical Installation of Quincy Elevator Gates
"Safety First" landing gate, "Welbilt" car gate

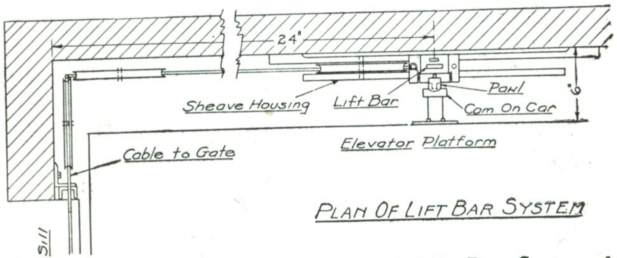


Fig. 6. Plan Showing Application of Lift Bar System to Elevator Gates

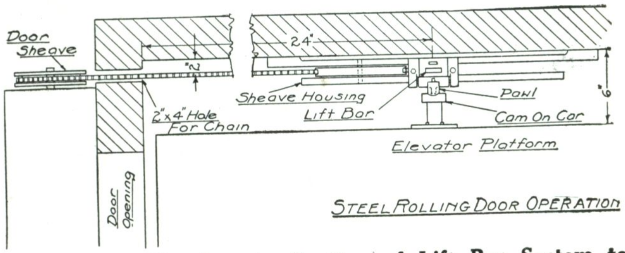


Fig. 7. Plan Showing Application of Lift Bar System to Rolling Steel Elevator Door

ESTABLISHED 1846

CORNELL IRON WORKS, INC.

Steel Rolling Shutters and Doors; Underwriters' Labeled Fire Doors and Shutters

71-79 Marion Street
LONG ISLAND CITY, N. Y.
BRANCH OFFICE, 26th Street and 11th Avenue, NEW YORK, N. Y.
REPRESENTATIVES IN THE PRINCIPAL CITIES

Products

CORNELL IMPROVED INTERLOCKING SLAT and DEEP CORRUGATED TYPES of STEEL ROLLING SHUTTERS and DOORS, handle, chain, or motor operated, for residences, office buildings, garages, wharves and piers, warehouses, elevator shafts, store fronts, craneway openings, etc.

UNDERWRITERS' LABELED FIRE DOORS and SHUTTERS.

Location

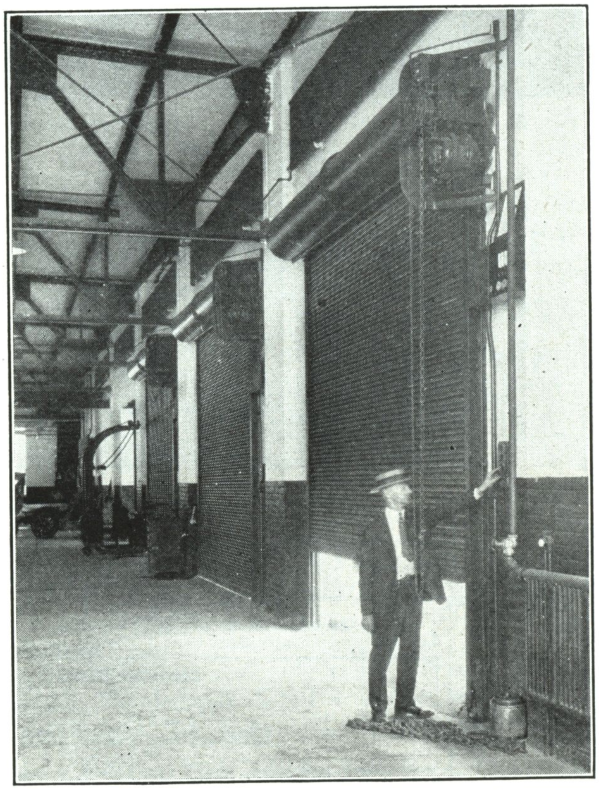
Cornell doors are manufactured in Greater New York.

Unexampled shipping facilities by all railroads, as well as water routes to all points on the east, south and west coasts, and the Great Lakes.

Experience

The CORNELL IRON WORKS is the oldest rolling door manufacturer in the United States. Cornell doors have been in use for 50 years and more.

See our catalogue.



Cornell Motor Driven Doors, Cleveland, Ohio
Note compact, self-contained motor brackets

Description

Cornell steel rolling doors are designed for the closure of all types of openings. They offer fire and burglar protection, combined with neat appearance and economy of space.

The curtains slide in vertical side guides, and coil around a horizontal shaft above the opening.

The weight of the curtain is counterbalanced by springs in or on the shaft, which permit it to remain stationary in any position.

Send for pamphlet telling why our doors are better, etc.

Operation

There are four typical methods of operation:

Self-coiling Type—Standard for openings up to 8x10 ft. Push up and pull down by handles on the bottom bar. The quickest acting construction possible.

Hand Chain and Gearing Type—Standard for larger openings. Shaft revolved by endless hand chain, acting through single, or compound, gearing, on an overhead gear bracket.

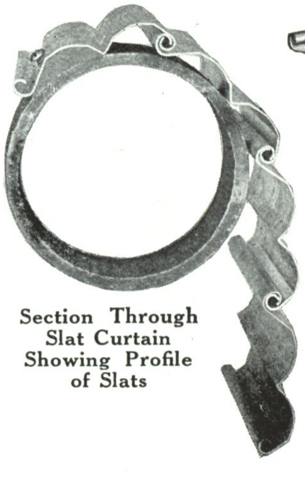
Motor Drive Type—Standard for the largest openings, up to 45 ft. in width.

Automatic Closing Type—Controlled by fusible links. Made to Underwriters' standards.

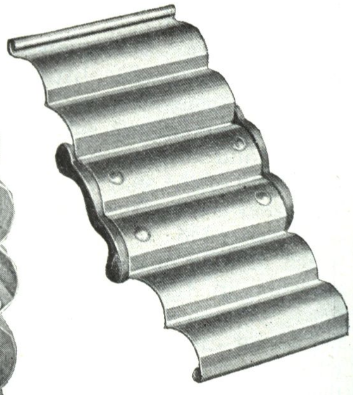
Special Cases—Worm and bevel gear drives, operating from either side of openings, with hand crank, or chain, are provided for special cases.

Cornell Improved Interlocking Steel Slat Curtains

Designed to give unusual rigidity against wind pressure, having a depth at the crown of 7/8 in. The appearance is attractive from either side, as the curtain is made up of a series of cold rolled steel mouldings with deep relief.



Section Through Slat Curtain Showing Profile of Slats

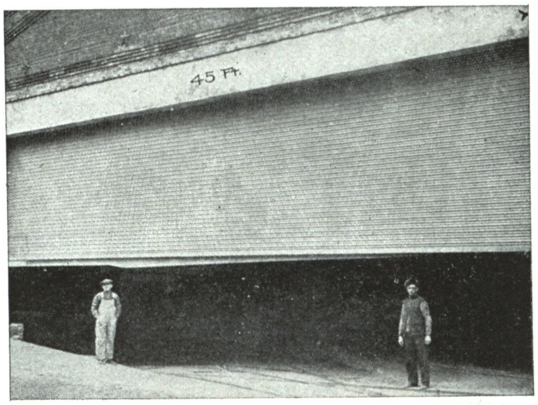


Front View of Slats Showing Malleable Iron End Locks

Continued on next page

The joint of the slat is so designed that there is practically no lost motion, which means that the curtain will not bulge, and a self-coiling or push-up door will operate without objectionable play between slats.

The end locks are made of malleable iron, designed for maximum wear and strength.



Widest Rolling Door Ever Made—45 ft., Motor Driven

Furnished in gauges from No. 16 to 22, cold rolled and galvanized.

Non-corroding Curtains

Of cold rolled bronze, aluminum or zinc, interlocking slats.

An original Cornell product. Require no painting. Of great service in resisting coal gas, acid fumes, severe salt water exposure, etc.

Give a very handsome finish at comparatively small extra cost.

Cornell Non-corroding Curtain Bottoms

Experience proves that all exposed doors and shutters of steel corrode fastest at the bottom.

To neutralize this, Cornell Iron Works, Inc. has originated the feature of using 12 to 18 in. of bronze bottom slats for exposed doors.

The extra cost is small and the life of the installation may often be more than doubled by this method.

Patented. Write for special circular.

Cornell Deep Corrugated Steel Curtains

A continuous sheet of deeply corrugated, special shaped, galvanized, resilient steel. The edges are protected by malleable iron shields which take up any wear in the side guides. Easily repaired when injured. Not difficult to erect. Will last a lifetime if properly cared for. More economical than slat curtains.

Lighter, since no extra metal is needed to make joints. A widely used type and very successful when manufactured by an experienced and skilled organization.

Motor Driven Units

Cornell motor drives are made in a self-contained unit, completely assembled in the shop. The gears can not get out of alignment.

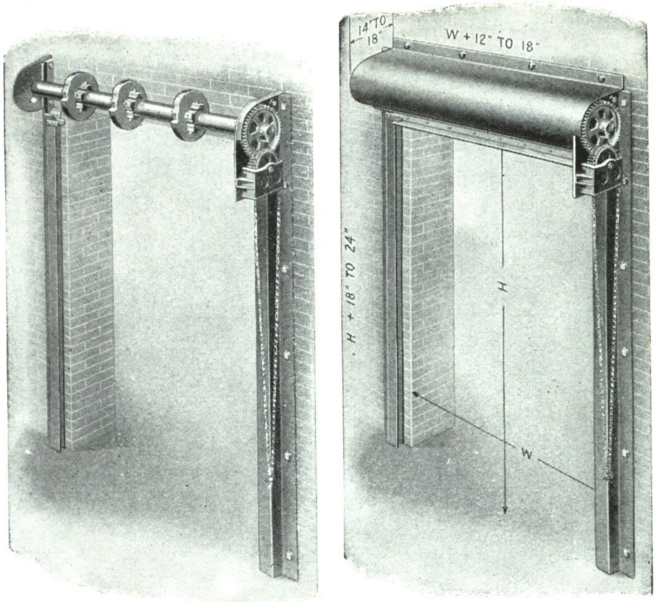
The worm is placed under the worm wheel, is completely enclosed, and runs in an oil bath.

The travel of the door is automatically stopped, at top and bottom, by limit switches.

Automatic starters are furnished with all installations.

Electric brakes are furnished where required.

Equipment is G-E material.



No. 1 No. 2

Two Steps in the Erection of a Cornell Rolling Steel Door

No. 1—Brackets in place, bolted to side guides; shaft in place, enclosing the counterbalancing springs, and bearing in a bracket at either end.

No. 2—Hood in place, fastened by expansion bolts, and covering the coiled curtain, raised to the lintel by means of hand chain.

Note neat appearance and economy of floor space; also maximum clearance

Underwriters' Labeled Fire Doors

Cornell rolling doors have been thoroughly tested by Underwriters' Laboratories, Inc., Chicago, and carry their label for the following types of openings:

Fire Wall Doors—Made of No. 16 gauge and labeled up to 80 sq. ft. in size—Class A.

Vertical Shaft Doors—Made of No. 20 gauge and labeled up to 80 sq. ft. in size—Class B.

Corridor and Room Partition Doors—Made of No. 20 gauge and labeled up to 80 sq. ft. in size—Class C.

Exterior Doors and Shutters—Made of No. 22 or No. 20 gauge and labeled up to 100 sq. ft. in size—Class D.

Note: Doors larger than the above limits can be made to Underwriters' specification and a certificate of inspection furnished.

Important Features of Cornell Construction—All Doors

(1) ¼-in. thick zee bar guides (very strong).

(2) Steel armor plate type supporting brackets (unbreakable, no cast iron).

(3) Brackets bolted to guides (self-contained, means accurate erection).

(4) Heavy steel pipe shafts (no light tubing).

(5) Bronze and graphite oilless bushings (no attention needed).

(6) Gears on outside of brackets (easy to grease and accessible).

(7) Slats all ⅞ in deep, 3½ in. wide (few joints and strong).

(8) Spring adjusting wheel (convenient to operator).

(9) Galvanizing to standard test (proof of protection).

(10) Non-corrodible curtain bottom, extra (doubles life of door).

Catalogue

Catalogue will be sent free to any one whose letterhead or position would indicate a legitimate use.

ESTABLISHED 1900 INCORPORATED 1906

GEO. W. JOHNSON MFG. CO.

Standard Underwriters' Labeled Fire Doors and Utility Doors

ST. LOUIS, MO. KANSAS CITY, MO.

Products

Steel Rolling Fire Doors and Shutters.

Steel Coil Service Doors for warehouses, piers and industrial buildings.

Also manufacturers of Counterbalanced Truckover Elevator Doors, Steel Air-space Fire Doors and Shutters, Tin Clad Fire Doors and Shutters, Metal Covered Doors, Vertical Sliding Counterbalanced Telescope Doors, Bakery Proof-rooms, Doors, Frames and Special Proof-room Door Latches, Dufold or Jack-knife Doors, Boiler Plate Doors, Steel Panel Doors, Pressed Metal Labeled Door Frames.

Service

Our engineering department will be pleased to cooperate in working out details and furnishing recommendations for the treatment of special conditions, and is ready at all times to render this assistance which the experience of over twenty years in the treatment of openings in buildings of all types has made possible.

Complete literature descriptive of any of the above types will gladly be furnished on request.

Types

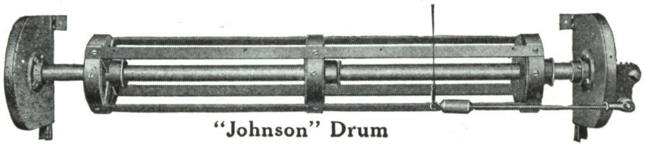
Underwriters' labeled steel rolling fire doors and shutters for protection of openings where insurance rates are a consideration. They are classified according to location in the building, are built in strict accordance to requirements and specifications of the Underwriters' Laboratories, Inc., and are inspected and labeled by their representative at our factory.

Service steel coil doors for use on openings where labels are not required.

Design

Full-floating roller bearing drums revolving on a stationary center shaft supported by malleable, reinforced brackets.

Counterbalancing mechanism consisting of a series of high quality oil tempered motor springs of proper widths, lengths and gauges, distributed along the center shaft and housed in spring-cases which are connected and rigidly reinforced by four flat steel bars to form the drum.

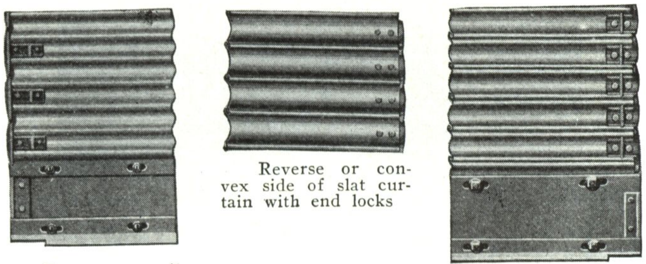


"Johnson" Drum

Galvanized sheet metal hoods with strengthening beads furnished with all doors to cover and protect the rolls.

Curtains are built of interlocking steel slats formed from rust resisting, low carbon steel, heavily galvanized, or of our corrugated curtain stock rolled from special analysis steel billets and heavily galvanized and deeply corrugated. Interior Underwriters' labeled doors are furnished with slat curtains of gauges as required by the Underwriters' Laboratories, Inc., and are provided with malleable iron endlocks; exterior labeled doors are furnished with either slat curtains or corrugated curtains, as preferred or required, and are also protected with endlocks.

Bottom plates of Johnson doors are built of 5-in. plate with reinforcing angles on both sides.

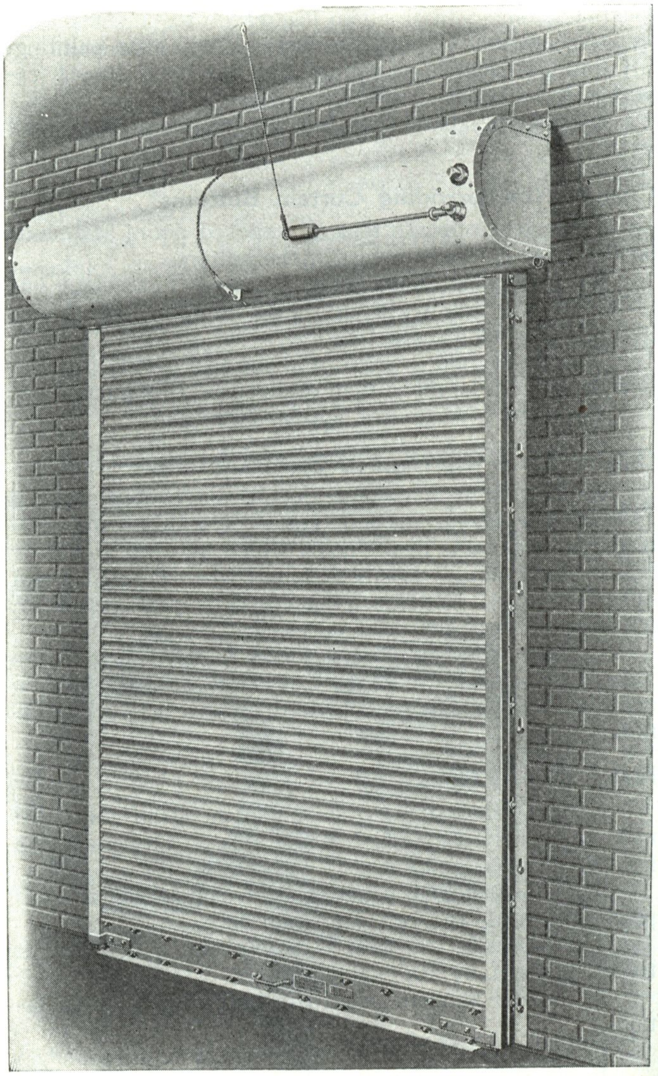


Front or coil side of corrugated curtain with edge guards and bottom plate

Reverse or convex side of slat curtain with end locks

Front, coil or concave side of slat curtain with end locks and bottom plate

Details of Curtains



Johnson Face of Wall Automatic Fire Door

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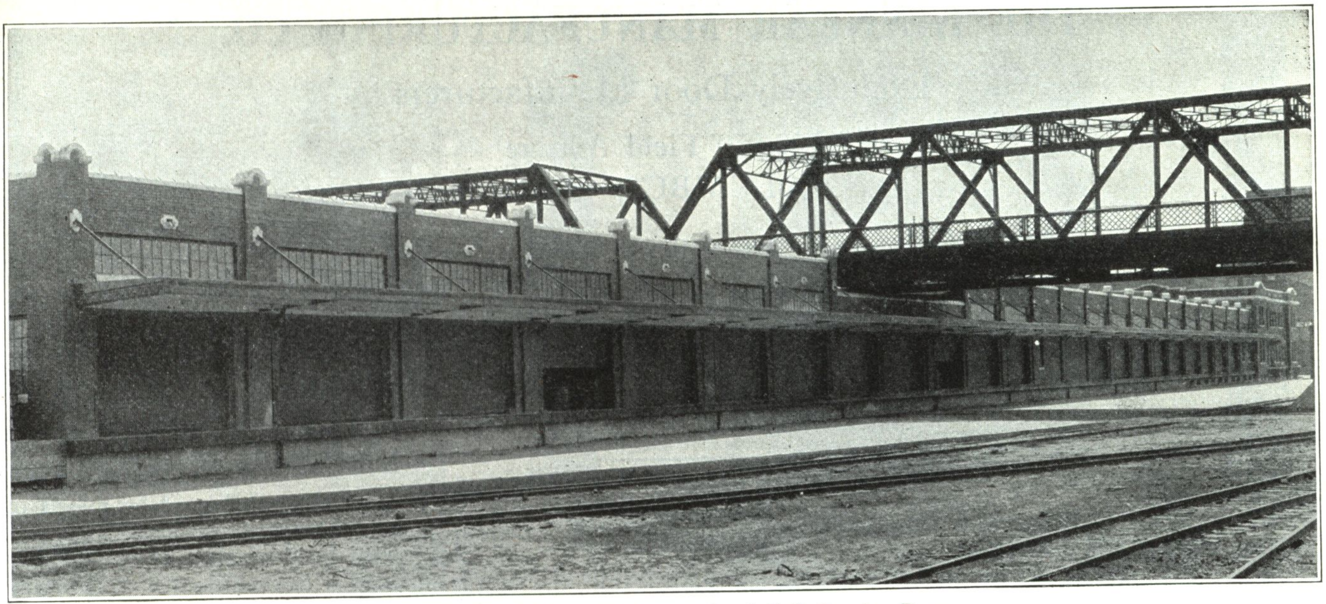


Typical Installation of Johnson Steel Coil Service Doors

Operation

Manually, by means of handles on the bottom plates of doors of nominal sizes.

By endless chain, sprocket and gears on the door side of the wall or on opposite side of the wall where required.

By crank shafting and gears from one or both sides of the wall.

By motor operators.

Note: Johnson doors can be operated at all times without interference with the automatic mechanism. Motor operated doors are provided with emergency hand chain operation.

Installation

Face of Wall—Brackets and drum mounted on face of wall above the lintel; guides on wall at jambs.

Between Jambs—Where required by structural conditions, either by placement within the existing opening, or by preparation of opening by provision of pockets to receive the brackets and rabbeted jambs to receive the guides.

TYPE SPECIFICATION NUMBERS OF JOHNSON DOORS

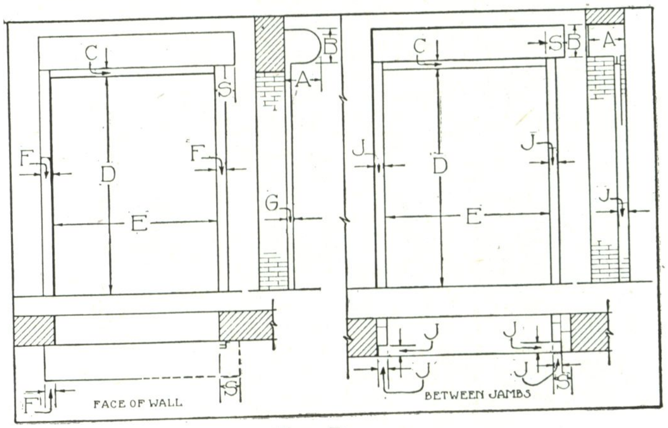
UNDERWRITERS LABELED STEEL ROLLING FIRE DOORS AND SHUTTERS

Location of opening	Type of installation	Automatic and operated by			Non-automatic and operated by		
		Hand	Chain	Crank	Hand	Chain	Crank
Fire wall or division wall	Face of wall	240	245	255			
	Between jambs	250	205	215			
Vertical shaft or corridor or room partitions	Face of wall	230	280	275	135	145	155
	Between jambs	305	290	310	165	175	185
Exterior wall	Face of wall	125-door 190-shutter	160-door 200-shutter	195-door and shutter	120-corrugated 210-slat	140-corrugated 260-slat	180-corrugated 300-slat
	Between jambs	225-door and shutter	170-door 265-shutter	295-door and shutter	130-corrugated 220-slat	150-corrugated 270-slat	235-corrugated 285-slat

SERVICE STEEL COIL DOORS AND SHUTTERS

Type No.	Type of installation	Operated by	Curtain	Designed for	Note
100	Face of wall or between jambs if required	Hand	Corrugated or slat curtains as preferred	Openings of nominal size	Specify installation and type of curtain
110 110-G		Chain Crank		For large openings	
100-C. O. 110-C.O.		Hand Chain		For core ovens and dry kilns	
100-A 110-A		Hand Chain		Automatic, non-labeled installations	

DIMENSIONS FOR INSTALLATION OF UNDERWRITERS LABELED STEEL ROLLING DOORS, STANDARD CONSTRUCTION



KEY DIAGRAM

Opening height ft.	"A," bracket dimension, in.	"B," bracket dimension, in.
5	15	14
6	15	14
7	16	15
8	16	15
9	17	16
10	17	16
11	17	16
12	17	16

"C"—4 in. distance from lintel to bottom of hood, face of wall construction; 4 in. from bottom of bottom plate of curtain to bottom of hood, between jamb construction.

"D"—Clear opening height, sill to lintel in face of wall construction; floor to bottom plate of door in between jamb construction.

"E"—Clear opening width, jamb to jamb of opening.

"F"—Width of guides (over all), 4 in. for openings up to 8 ft. wide; 4½ in. for openings 8 to 10 in., and 5 in. for openings 10 to 12 in.

"G"—Projection of guides in face of wall construction, regular at 2¾ in. In between jamb construction, the guides are set in the 4½-in. rabbets provided for them.

"J"—Width and depth of rabbet provided for guides, between jamb construction.

"S"—Distance, measured from jamb line, on automatic or mechanical operation side, for automatic or mechanical operator. Regular at 8½ in. both face of wall and between jamb constructions.

Note: The above dimensions are for standard construction; they can be modified to meet special structural requirements.

THE KINNEAR MANUFACTURING CO.

Exclusively Door Manufacturers

820-870 Field Avenue
COLUMBUS, OHIO

BRANCH OFFICES

BOSTON, MASS., 294 Washington Street
NEW YORK, N. Y., 342 Madison Avenue
PHILADELPHIA, PA., 503 Wesley Building
WASHINGTON, D. C., 1135 Investment Building
PITTSBURGH, PA., 617 Oliver Building
NEW ORLEANS, LA., 730 Hibernia Bank Building

CLEVELAND, OHIO, 528 Union Building
CINCINNATI, OHIO, 528 Walnut Street
DETROIT, MICH., 709 Ford Building
CHICAGO, ILL., 844 Rush Street
KANSAS CITY, MO., 503 Railway Exchange
SAN FRANCISCO, CAL., 444 Market Street

AGENTS IN PRINCIPAL CITIES

KINNEAR ROLLING · DOORS

TRADE-MARK

Products

- Steel Rolling Doors and Shutters.
- Fire Doors and Shutters.
- Wood Rolling Doors for Roundhouses.
- Wood Rolling Interior Partitions.
- Wood Bifolding Doors.
- Steel Bifolding Doors.
- Vertical Sliding Doors.
- Steel Rolling Doors and Shutters for service purposes.

Types

Kinnear steel rolling doors and shutters are manufactured and sold under two distinct classifications, viz., Service and Labeled Types. Service doors are designed entirely for such openings as do not require underwriters' label and where insurance rates are not a consideration.

Construction of Steel Rolling Doors

Kinnear steel rolling doors are constructed of the highest class of materials by mechanics especially trained in the exclusive manufacture of doors.

Curtain proper on all Kinnear doors is made of open hearth interlocking steel slats galvanized and equipped with malleable iron endlocks. Curtain is coiled upon barrel journalled in heavy cast iron brackets and travels in steel guides mounted at sides of openings.

Curtain is counterbalanced by means of helical springs which are enclosed in barrel.

Galvanized hood of steel of suitable design is supplied with each door.

Method of Installing Rolling Doors

Service doors in general are mounted on face of wall with brackets and coil entirely above the bottom of lintel and with inside face of guides flush with face of brick or concrete jamb.

Where headroom is limited and door can not be mounted on face of wall, it can be mounted in the opening, in which case the brackets and coil would be mounted directly under lintel and guides would be located on the jamb.

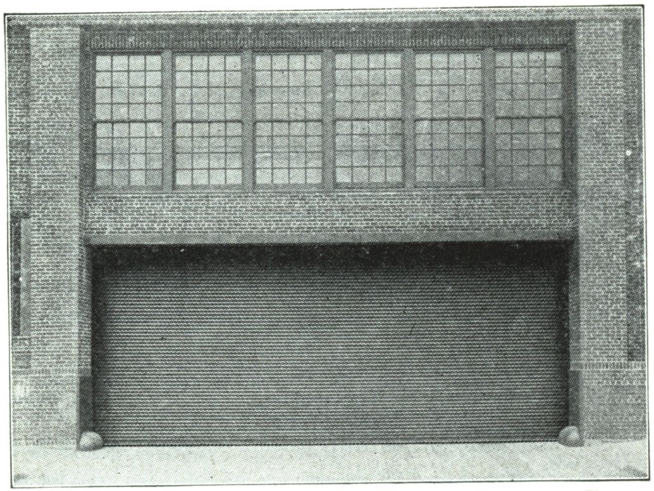
Operation of Rolling Doors

Doors may be operated as follows:

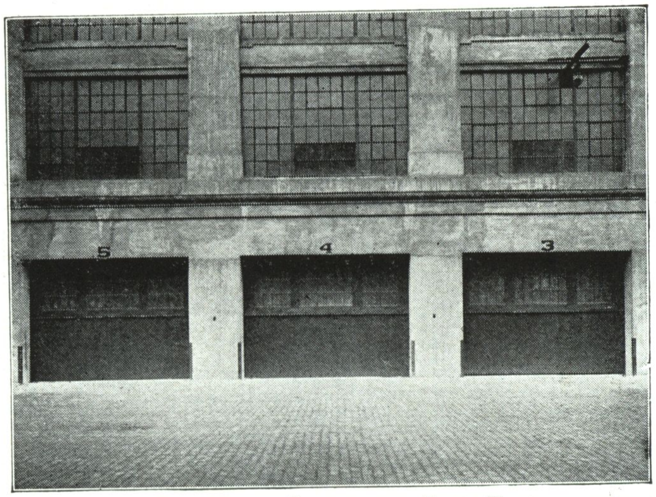
Push-up type of doors for openings not exceeding 100 sq. ft. can be operated in the same manner as window shade, being perfectly counterbalanced and same can be opened from either side.

Doors can be operated by means of reduction gearing and endless chain, or by means of crank, shafting and gear.

Where motor operation is desired, it is necessary to have complete description of current and drawing showing clearances and general conditions.

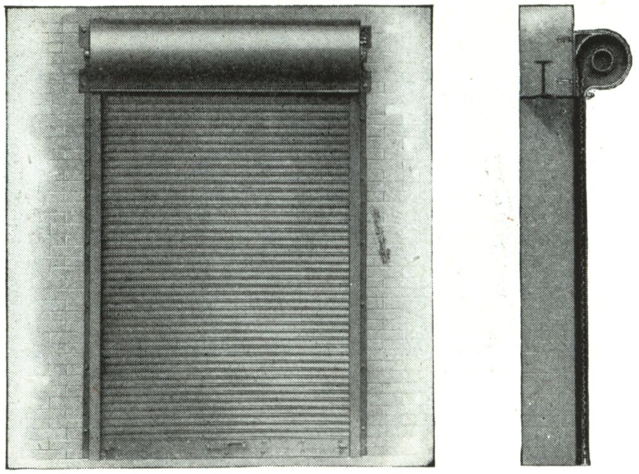


Steel Rolling Door in Driveway of the Color Press Building, Chicago Tribune, Chicago, Ill.



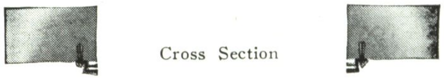
Bifolding No. 3 Doors Closing the First Floor of the Boston Army Supply Base—130 in All

Continued on next page



Elevation

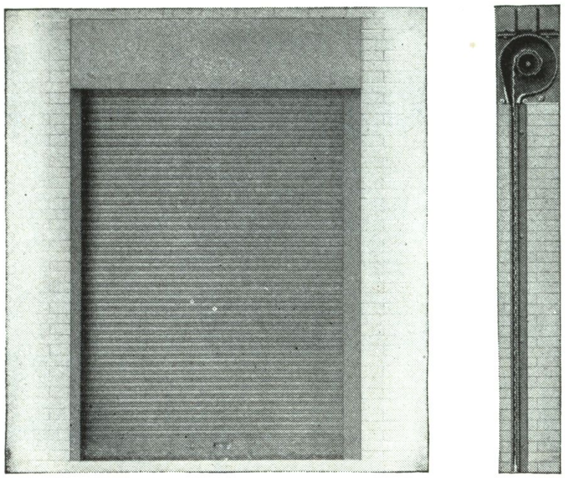
Vertical Section



Cross Section

F.M. 10. Construction

Mounted on face of wall.
Push-up type, entirely counterbalanced.
Can be opened or closed from either side.
Provided with suitable lock.
Available for openings not in excess of 100 sq. ft.



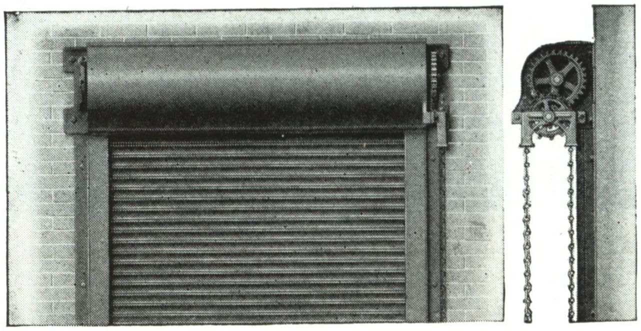
Elevation

Vertical Section

Cross Section

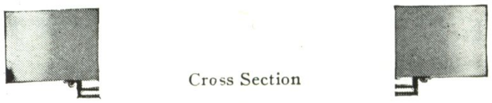
B.M. 10. Construction

Mounted in opening.
Can be opened or closed from either side.
Curtain entirely counterbalanced.
Paneled hoods can be provided



Elevation

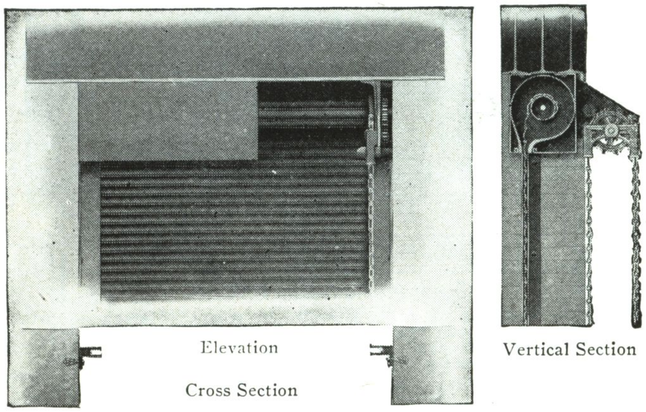
End View



Cross Section

Construction No. F.H. 20

Mounted on face of wall; counterbalanced by springs.
Operated by means of endless chain, sprocket and gear



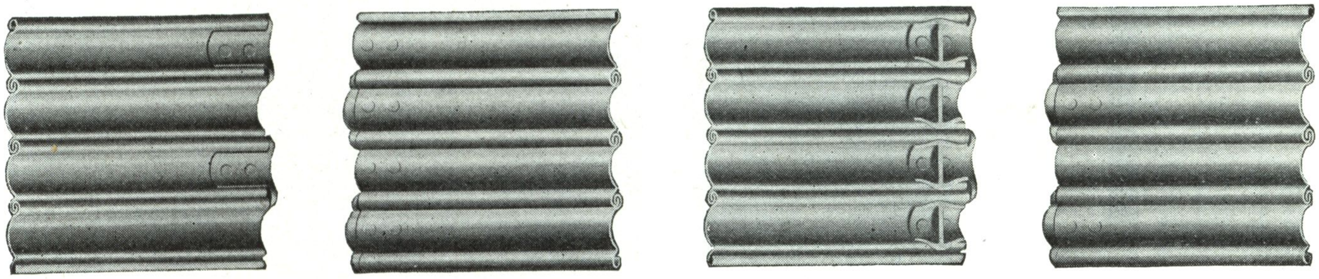
Elevation

Vertical Section

Cross Section

Construction No. B.H. 20

Mounted in opening; counterbalanced by springs.
Operated by means of endless chain, sprocket and gear



Concave and Convex Sides of Interlocking Steel Slat No. 2

Illustrations to the left show **slat No. 2** fitted with alternate endlocks; those to the right, fitted with continuous endlocks. Slat No. 2 is 1⅞ in. wide on centers; depth of crown, ½ in. Made in gauges Nos. 24, 22, 20, 18 and 16.

Especially adaptable to shutters equipped with mechanical operating device.

In cases of extremely wide openings, Kinnear No. 4 slat is used. This type of slat is larger than the **No. 2** slat

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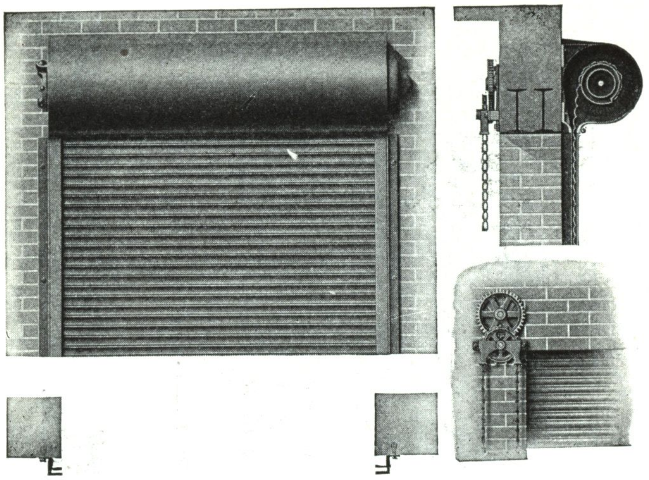
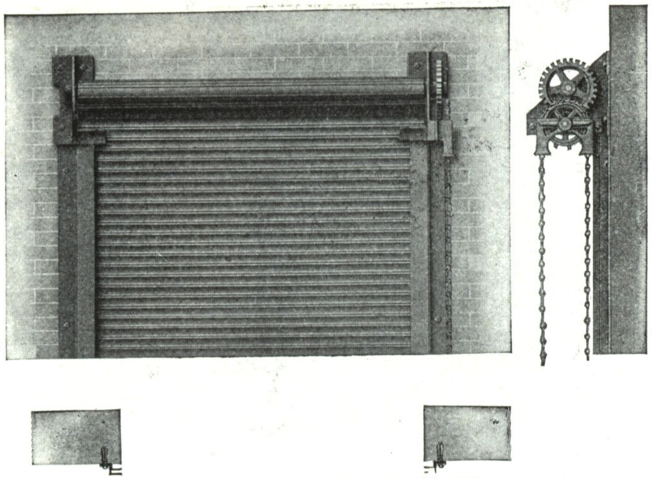


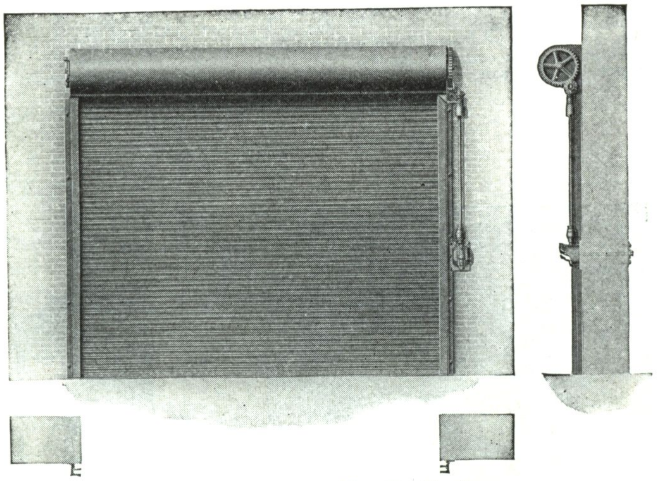
CONSTRUCTION No. F. H. 61

Door mounted on exterior face of wall. Operated from within building by means of endless chain, sprocket and gear, and by shaft extending through the wall. May be locked on inside by means of a chain lock



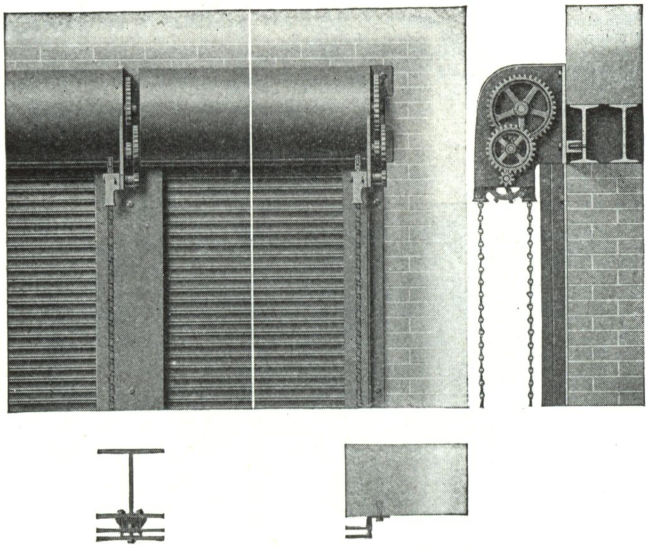
CONSTRUCTION No. F. H. 30

Mounted on interior face of wall; not furnished with hood. Open type of bracket facilitates erection. After brackets are in place, curtain barrel can be dropped into bearings. Closed brackets necessitate erection of both brackets and barrel together



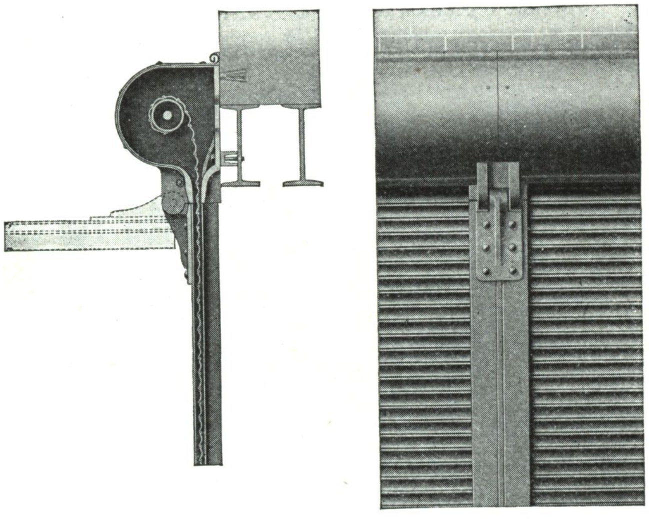
CONSTRUCTION No. F. C. 20

Mounted on face of wall. Operated by means of crank, imparting movement to the curtain barrel through shaft and suitable gear. Can be made to operate from either inside or outside of building, or both.
Operation from one side only is standard arrangement



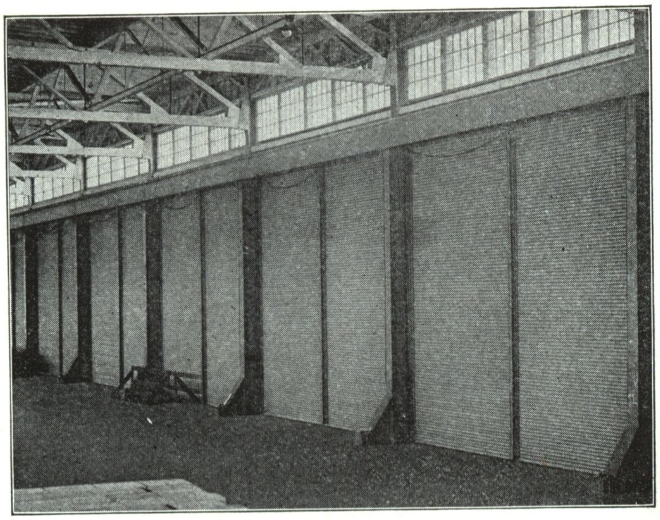
CONSTRUCTION No. F. H. 23

Modification of construction No. F. H. 20. A compact design well adapted to large openings, separated by narrow post



INTERMEDIATE MOVABLE POSTS

Wide openings can be frequently more economically closed by a number of small doors, than by a single large one, using, between doors, movable posts hinged to brackets. After doors are open, posts are swung up out of the way by ropes and pulleys



INTERIOR OF PIER 32, SAN FRANCISCO

Steel rolling doors arranged with movable intermediate posts shown above, making entire opening available

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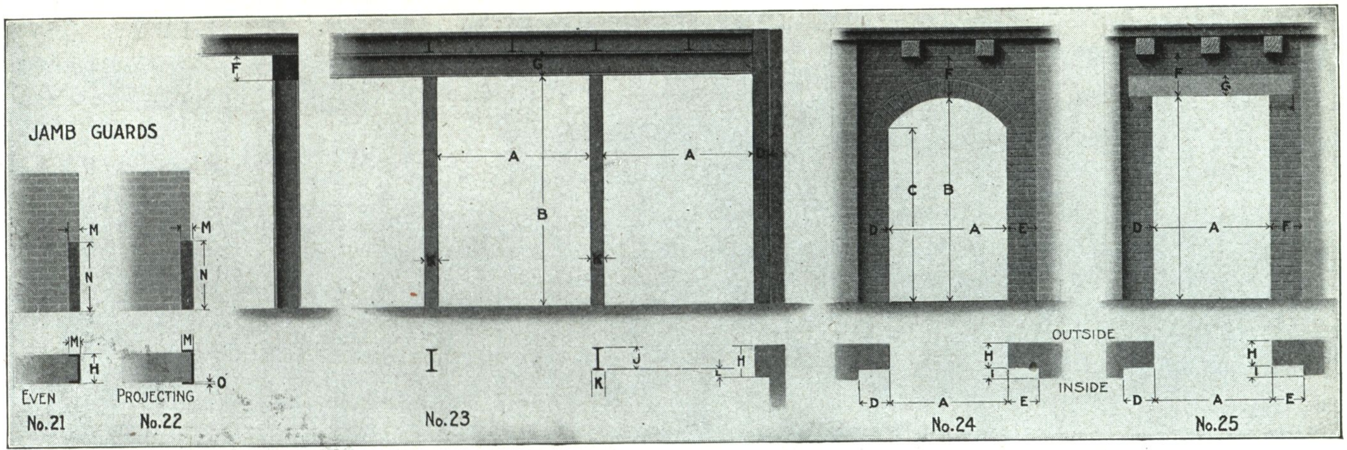
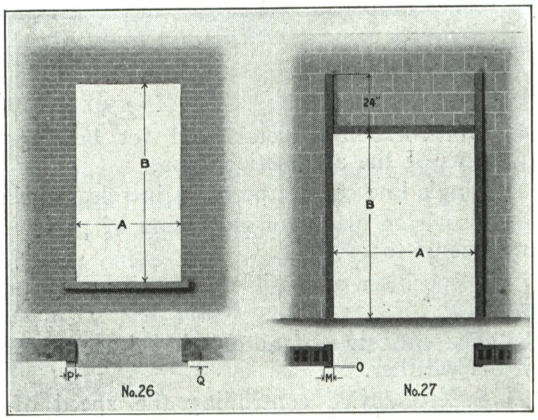


Openings for Kinnear Rolling Shutters

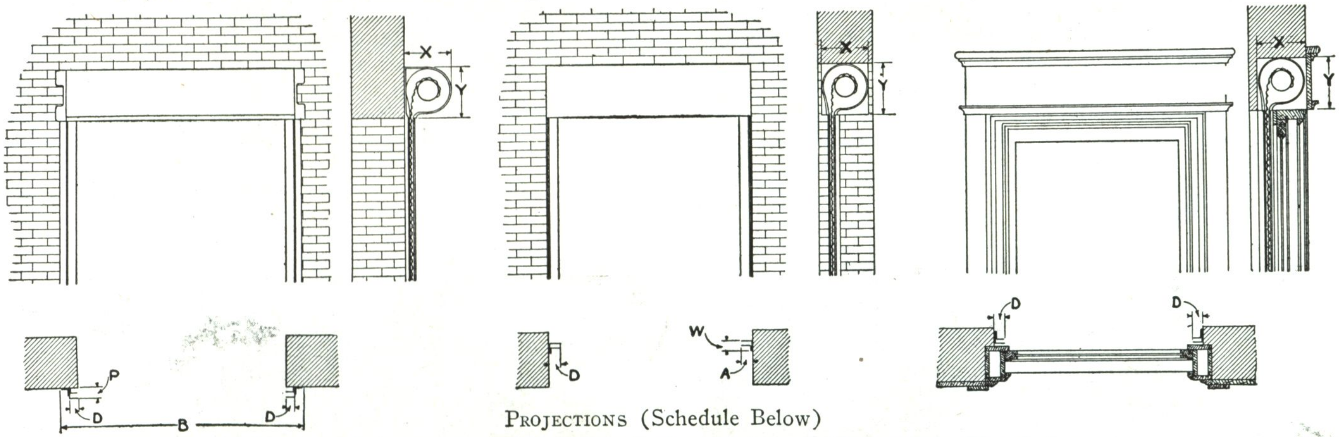


Openings for Kinnear Rolling Shutters

Information and Measurements Required

Illustrations show essential measurements. In giving information, describe lintel, shapes and sizes of parts composing it, accompanying same with sketch showing cross section. Essential measurements are as follows:

A—Width; if door is mounted in opening, give width at top and bottom.
B and C—Height of opening.
D and E—Projection in close proximity to opening.
F—Clearance between top of opening and floor beams, or ceiling.
G—Height of lintel.
H—Thickness of wall.
I—Projection of some part of wall near opening.
J—Depth of column; give shape and sizes of parts composing column.
K—Width of column.
L—Distance from column to inner face of wall.
M—Lap of guard.
N—Height of guard.
O—Projection of guard.
P—Lap of guard.
Q—Projection of sill.



Projections (Schedule Below)

Above are indicated the salient dimensions of usual sizes of standard service types of Kinnear steel rolling shutters.

View to the left shows shutter placed on face of wall; central view shows shutter placed between jambs, and that to the right shows curtain with concealed coil. The following dimensions are for shutters of height and width indicated:

Height ft.	Width 3 to 7 ft. Groove depth "D", 2 in.					Width 7 to 11 ft. Groove depth "D", 2½ in.					Width 11 to 14 ft. Groove depth "D", 3 in.					Width 14 to 20 ft. Groove depth "D", 3½ in.				
	X in.	Y in.	P in.	A in.	W in.	X in.	Y in.	P in.	A in.	W in.	X in.	Y in.	P in.	A in.	W in.	X in.	Y in.	P in.	A in.	W in.
6	12¾	14	2¾	4	3	13½	15	2¾	4½	3½										
8	14¼	16	2¾	4	3	16½	18	2¾	4½	3½										
10	15¼	17	2¾	4	3	17½	19	2¾	4½	3½										
12	17½	19	2¾	4	3															
6	11	13	2½	4	3	11	13	2½	4½	3½	12¾	14	2½	5	4	15	17	3½	8	4½
8	11	13	2½	4	3	11¼	13	2½	4½	3½	12¾	14	3½	5	4	15	17	3½	8	4½
10	11¾	13½	3½	4	3	11¾	13½	3½	4½	3½	13½	15	3½	5	4	15½	18	4	8	4½
12	13½	15	3½	4	3	13½	16	3½	4½	3½	13½	16	3½	7	4	17	19	4	8	4½
14	14¼	16	3½	4	3	14¼	16½	3½	4½	3½	15¼	17	3½	7	4	17½	19	4	8	4½
16	15¼	17	3½	4	3	15¼	17	3½	7	3½	16¼	18	4	7	4	20	22	4	8	4½
18	15¼	17	3½	4	3	15½	18	3½	7	3½	17	19	4	7	4	22	24	4	8	4½

Sizes above division line apply to shutters operated by handle in bottom of curtain. Those below division line apply to shutters operated by endless chain or crank and bevel gear. Dimension "P" applies only to face of wall constructions. Dimension "W" only to "between jamb" constructions. Dimension "D" in the between jamb section applies only to manually operated shutters. Use projection "A" for both sides where chain operation is used. Dimension "B" should always be at least 8 in. wider than width of door opening for moderate sized shutters, and for very large shutters 10 or 12 in. and more if possible. We do not recommend manually operated construction for curtains of larger area than approximately 100 sq. ft.; chain hoist should be used on larger sizes. Above does not apply to automatic construction; for clearance on automatic or any other special construction. Any unusual sizes, direct correspondence is advisable.

Continued on next page

ROLLING ELEVATOR DOOR
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC
No 9233
ROLLING FIRE DOOR
INSPECTED BY
UNDERWRITERS' LABORATORIES, INC
No 216
UNDERWRITERS' LABORATORIES, INC.
INSPECTED
FIRE DOOR
FOR OPENING IN FIRE WALL
No 75042
ROLLING FIRE SHUTTER
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC
No 245

Underwriters' Labels

Fire Doors and Shutters

Constructed under the supervision of the Underwriters' Laboratories, Inc., and labeled as above.

Important Features—Kinnear fire doors and shutters are specially designed for fire protection.

Details of construction have been carefully developed. The following are some of the important features:

(1) An auxiliary or inner hood is automatically dropped and closes the space between the barrel and outer hood, thereby preventing the passage of flame over the barrel.

(2) Special endlocks closing the concaved ends of slats and preventing the passage of flame around the edge of the curtain.

(3) Fusible washers employed in the construction of grooves which melt and allow the members composing the grooves to expand without buckling.

(4) Non-corrodible metal used for bearings and contact points of the automatic release.

(5) Single line contact bearings in releasing levers.

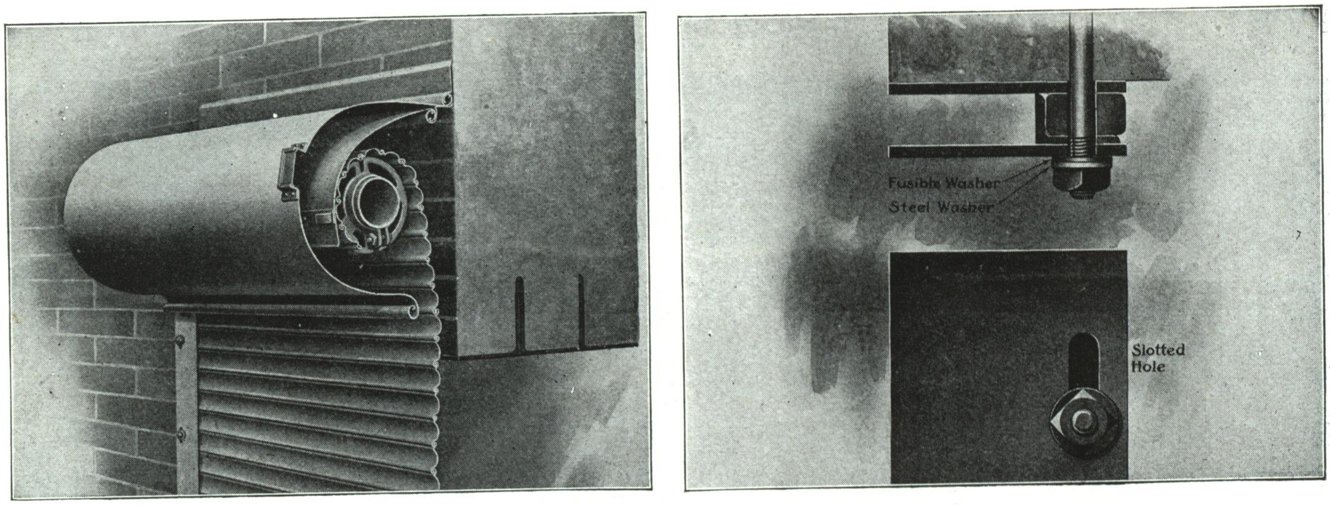
(6) Provision made for expansion of parts for all temperatures up to 2000° F.

(7) Disposition of fusible links, insuring prompt closing.

(8) The enclosure of automatic release, protecting it from the weather.

(9) Safety device controlling the speed of curtain in automatic closure.

Catalogues—General Catalogue No. 51 and the special Fire Door Catalogue No. 53 illustrate many additional types and their applications. These doors and shutters are designed to obtain easy operation in normal service, and are easily opened and reset by a single person after automatic closure.


Fusible Washer
Steel Washer
Slotted Hole

Salient Features of Kinnear Fire Doors and Shutters

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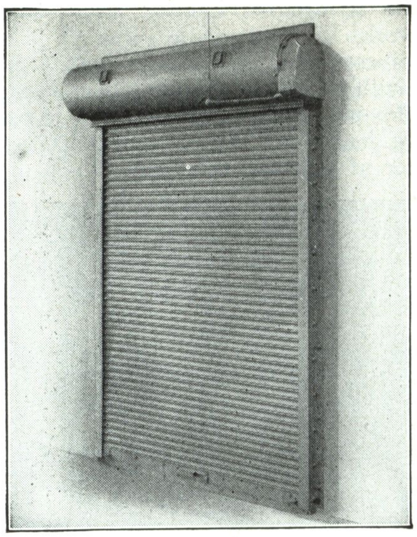
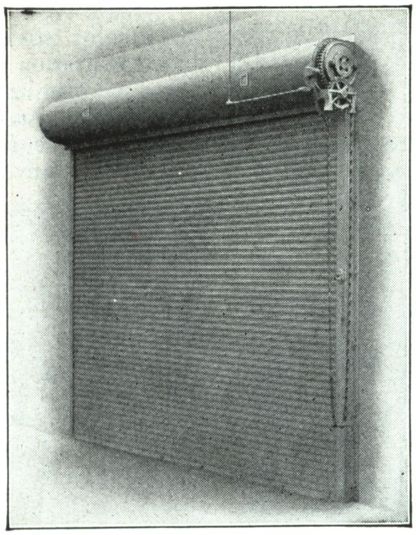
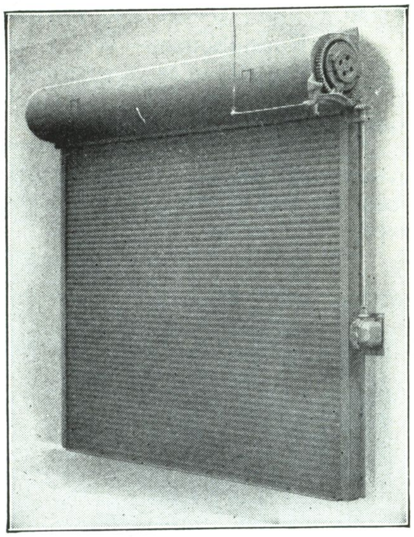


Manual Operation



Chain Operation



Crank and Shaft Operation

A FEW TYPES OF AKBAR CONSTRUCTION

Salient Features of Akbar Construction, a Distinctive Kinnear Product

(1) The automatic closing of this type of door is insured by a powerful starting force which diminishes as door is set in motion.

(2) A special safety device is provided on each door which controls drop of door in automatic closure and which eliminates every element of danger, as well as the violent impact common to other types.

(3) Can be opened and reset without difficulty after automatic closure.

(4) Are available for service purposes at all times and will close automatically from any open position.

Types—Akbar doors are made in the following types:

Akbar No. 1, manual operation
Akbar No. 2, chain operation.
Akbar No. 3, crank operation.

The above three types are labeled for openings in vertical shafts, partition walls, bridge and tunnel entrances where openings do not exceed 80 sq. ft. and where width or height does not exceed 12 ft.

Akbar No. 4, manual operation
Akbar No. 6, chain operation
Akbar No. 7, crank operation
Akbar No. 8, crank operation

The above four types are labeled for openings in fire walls not in excess of 80 sq. ft. and where width or height does not exceed 12 ft.

Akbar No. 9, chain operation
Akbar No. 10, crank operation

The above two types are labeled for openings in exterior walls for openings not in excess of 100 sq. ft., and where width or height is not in excess of 12 ft.

Other types similar to Akbar manual operation are available for exterior openings.

Salient Features of Superior No. 1 and No. 2 Constructions

Labeled for exterior window openings not in excess of 100 sq. ft., neither dimension exceeding 12 ft.

Normally remains in open position, closing automatically by means of fusible link.

Actuated by a powerful starting force which diminishes as shutters are set in motion.

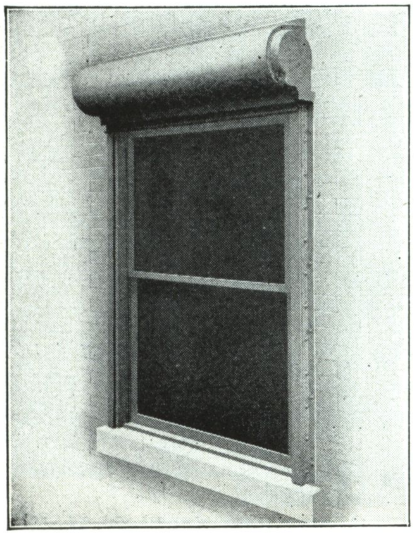
Equipped with *safety device* which controls drop of door in automatic closure, eliminating all danger, as well as impact on sill.

Equipped with testing device by which periodical tests can be made as often as desired.

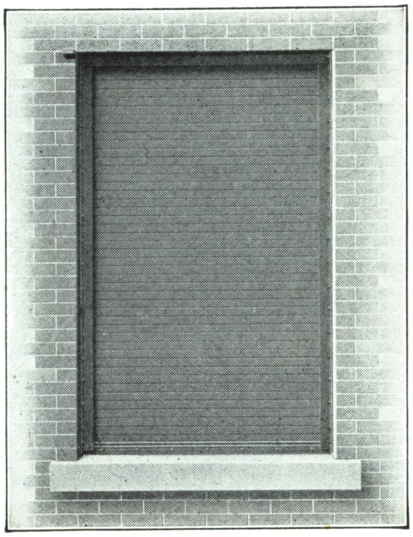
Can be raised after automatic closure with least possible difficulty.

After lever is reset, can be pushed and locked in any open position without adjustment.

Superior No. 1 to be mounted on face of wall.
Superior No. 2 to be mounted in opening.



SUPERIOR No. 1



SUPERIOR No. 2

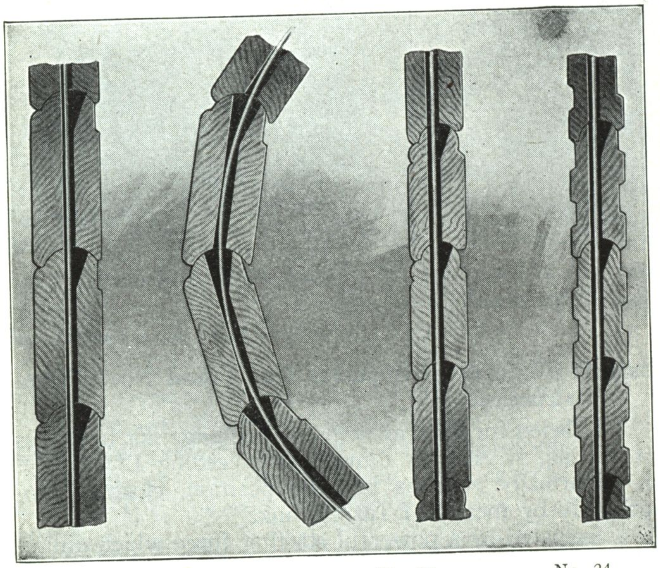
Continued on next page

Wood Rolling Doors and Partitions

For Roundhouses—Wood rolling doors are particularly desirable in cases where chemical action is liable to deteriorate steel. This is particularly true in roundhouses and chemical plants.

These doors are constructed of wood slats assembled on phosphor bronze ribbons placed at proper intervals. Slats are made of cypress and treated with a coat of wood preservative.

Slat No. 27 is used on exterior doors.



No. 27 No. 27 No. 26 No. 24

Sections of Wood Slats

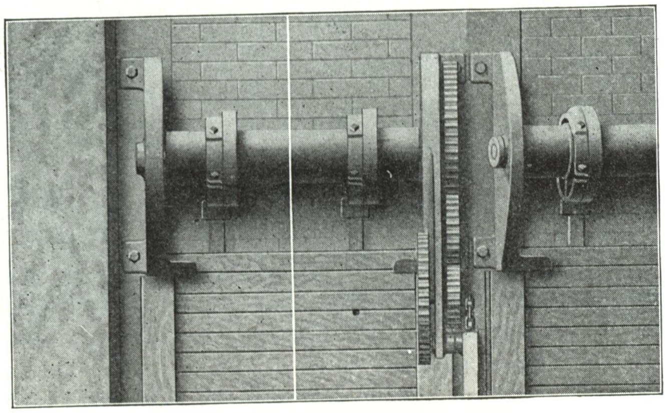
For Schools, Churches, etc.—Curtains are composed of slats assembled on phosphor bronze ribbons.

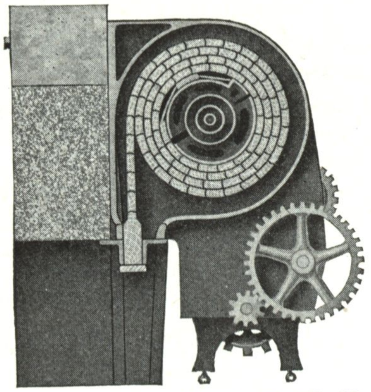
Made in long leaf yellow pine, cypress, quarter sawed oak and birch.

Slats Nos. 24 and 26 are for interior work; slat No. 27 for exterior work.

Illustration shows cross section through slats.

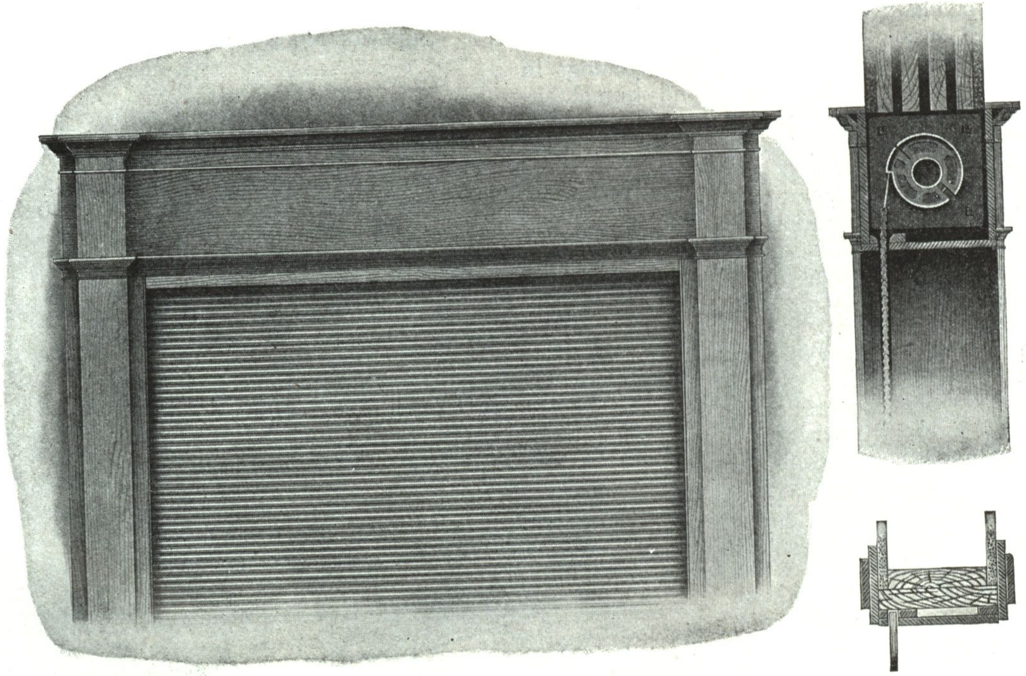
The opening through which the ribbon passes is so shaped that, during flexure of the curtain, there is no change in the relative length of the slats or curtain; nor is there any danger of pinching the ribbon.





Construction No. F. H. W. 22

Designed especially for roundhouses. Doors mounted on face of wall above opening; travel in grooves at sides. Counterbalanced by springs; operated by means of endless chain and reduction gear



Construction No. W. B. M. 10

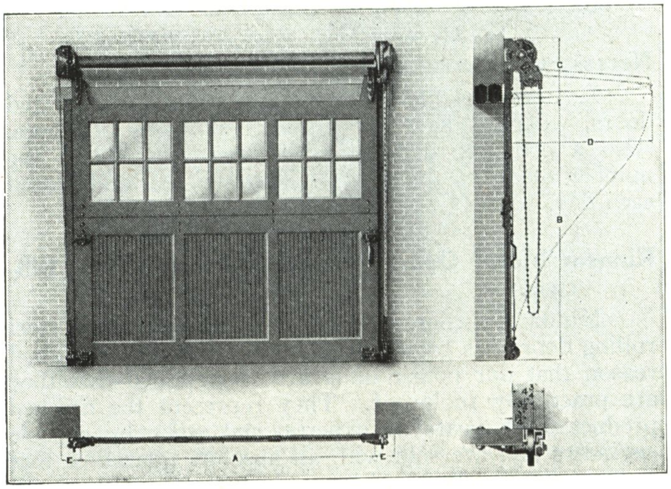
Application of wood rolling door for interior partition. Coil is concealed under lintel; operated by means of handle in bottom of rail. Mechanical operating devices are arranged for large doors. Can be concealed within the casing. Casing and grooves are not supplied, but should be included in general carpenter work

Continued on next page

Bifolding Doors, Wood or Steel

In cases where light is desired through doors, the bifolding type lends itself readily to such condition. These doors may be constructed either of wood or steel, and are of two sections hinged at the center and pivoted at top of opening. The upper panel may be fitted with sash, giving a glass area of about two-thirds the total area of the panel.

Bifold No. 5—This is without doubt the most practical bifolding door now on the market, requiring less clearance at both head and sides of opening than do most other types.



Bifold No. 5

CLEARANCES REQUIRED FOR BIFOLD NO. 5

Height										
B	6′ 0″	7′ 0″	8′ 0″	9′ 0″	10′ 0″	11′ 0″	12′ 0″	13′ 0″	14′ 0″	15′ 0″
C	26½″	26½″	26½″	26½″	28½″	31″	33″	35″	35″	37″
D	3′ 10″	4′ 4″	4′ 10″	5′ 4″	5′ 11″	6′ 6″	7′ 1″	7′ 8″	8′ 2″	8′ 9″
E	8″	8″	8″	8″	8″	10″	10″	10″	10″	10″

Dimension A should not exceed 18 ft; dimension B should not exceed 15 ft.

Kinnear Bifold No. 5 is designed with a spring counterbalance, eliminating the heavy counterweights usually used on this type of door. Steel cables connect the door to the counterbalancing device at the top of the opening. Bottom panel is fitted with rollers which travel in guides attached to wall and transmit the thrust.

The simplicity and sturdiness of the mechanism reduces maintenance to a negligible factor and renders quick and easy operation. Less side clearance is required as there are no counterweights. Send us a sketch showing conditions as they actually exist and we will show how this flexible construction adapts itself to other than standard conditions.

Kinnear panels are fabricated in our own factory from extra heavy materials and are built on a purely quality basis. Write for prices and catalogue.

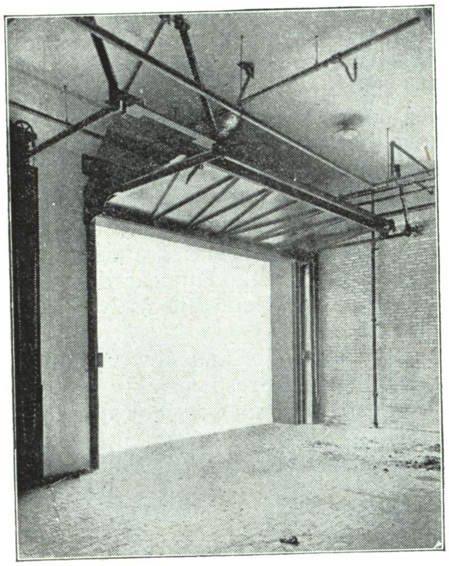
Bifold No. 3—Designed for large openings. Panels are built in two sections. Upper section may carry glass if desired.

In operating, the lower section rises to half the height of opening. The door then breaks, and both sections move simultaneously, the lower edge vertically, the upper edge horizontally, on suspended tracks to a position above the opening.

Panels are entirely counterweighted and operated by means of reduction gearing and endless chain.

This type of door was used in the Boston, Brooklyn, and Charleston army bases by the United States government.

Panels can be constructed either of wood or steel.



Bifold No. 3 in Open Position

Vertical Sliding Doors

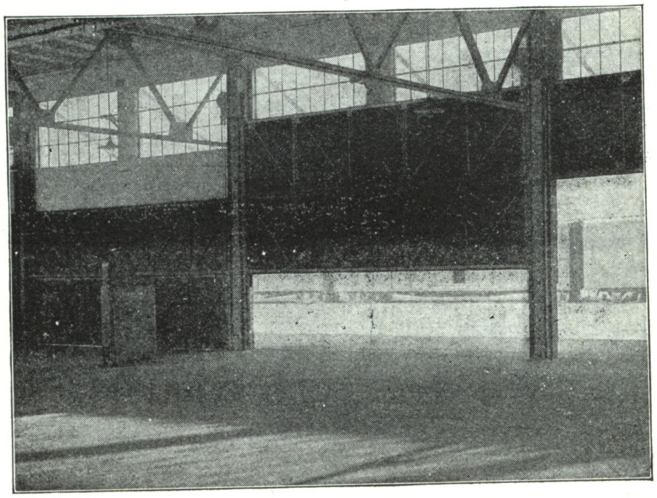
This type of door is particularly suitable for freight houses, piers and warehouses where light is essential through doors.

The door comprises two or more sections consisting of trussed frame covered with corrugated iron, hung independently with chains connected with counterbalance weights. Operated by means of endless chain and suitable reduction gearing.

Where doors are mounted on steel columns, guides and weight boxes should be incorporated as a part of the column, and should be supplied by the steel contractor, according to details supplied by our Engineering Department.

This type can also be supplied to be mounted on the face of the wall, in which case we furnish weight box and guides as part of the equipment.

It is advisable to procure definite information from the factory in connection with the above type of door.



Vertical Sliding Doors
Installed in Santa Fe freight shed

Continued on next page

Kinnear Power Units

The Kinnear Manufacturing Co., to meet a constantly growing demand for power operation in connection with Kinnear steel rolling doors when applied to openings of extreme sizes, and where frequent operation is required, have developed three distinct types of power units. While fundamentally the same in operation, the three types afford the opportunity of selecting a type most suitable for the condition in hand.

Kinnear power units are available for small openings on garages or mercantile establishments where frequent operation is desired, and on large railroad openings or crane openings where manual operation would be very difficult or entirely impossible.

Motor operation necessitates a door properly designed and carefully built. Kinnear doors, because of their sturdy character, lend themselves especially to motor operation.

We supply our doors and power units as a complete unit, assuming full responsibility not only for the quality of the material employed, but also for the workmanship, and for the erection and proper working of same where Kinnear erectors put up the work in the field.

Construction of Kinnear Power Units

Each power unit comprises motor, limit switches, reduction gear, manual (or emergency) operating mechanism, automatic starter, reversing and service switches; also a magnetic brake which is an integral part of the unit.

Limit Switches—Of our own design and manufacture and susceptible of precise adjustment.

Control the travel of the curtain, stopping it at the proper time; also actuate the magnetic brake and the automatic starter which breaks the circuit, stopping the motor.

Reduction Gear—Suitable reduction gearing enclosed in heavy cast iron housing. Cast iron and steel cut teeth, running in oil bath, the spray lubricating all bearings.

Bearings—All heavy bearings are bushed with bronze. Light bearings are babbitted.

Service Switches—Enclosed type of knife switches externally operated, safety type, are supplied as our standard equipment.

Kinnear Power Unit No. 1

This unit is designed for excessive loads and is so constructed that either power or manual operation is secured through the same gear. Either method may be employed without the shifting of clutches. The emergency chain is always in position to be used in absence of power.

Designed for extremely large openings.

Kinnear Power Unit No. 2

This type is designed for average sized openings.

In general it is similar to power unit No. 1, except that it is smaller and, further, that this type is essentially a power drive; manual operation is intended for emergency only. The emergency chain can be placed on sprocket in case of emergency, but when motor is employed, the chain should be removed.

Kinnear Power Unit No. 3

This unit is small and very compact and can be supplied in two designs, one mounted on bracket and the other to be mounted on wall or steel members.

It is designed for small openings in garages and buildings of a similar character.

Accessories

Wire, wiring, fuses or conduit are never included in our equipment and must be supplied and installed by others.

Necessary Information

In order to quote intelligently on motor operated doors, we must have the number and sizes of doors. Also a complete description of the current and the number of times the doors will be opened and closed each day.

Kinnear Motor Operated Doors—Practical and Efficient

Motor operation in connection with Kinnear steel rolling doors has grown in popularity for the very good reason that our power units are so designed that they are practically foolproof. They represent the finished product after years of experimental work by capable engineers and are sold with an absolute guarantee that if correctly installed and properly maintained they will render a service 100% efficient.

One power unit will operate one door or a group of doors as a unit. Where hinged posts are used in dividing large openings, power units can also be employed in operating them. Through interlocking switch and automatic locking devices, the entire side of a building may be opened up from any point desired by means of switches.

Push button control is available for individual doors, or for a group of doors operated as a unit. However, where doors and posts are both to be electrically operated we recommend the enclosed type of knife switches externally operated. Push button control is particularly suitable for garages where doors are operated frequently as the stations can be placed in office, or at any other suitable point, and can be operated by any class of help, being as nearly foolproof as it is possible to make it. There is no chance of making a mistake; each operation follows in its logical sequence.

The doors under ordinary conditions will operate at the rate of 1 ft. per second.

In General

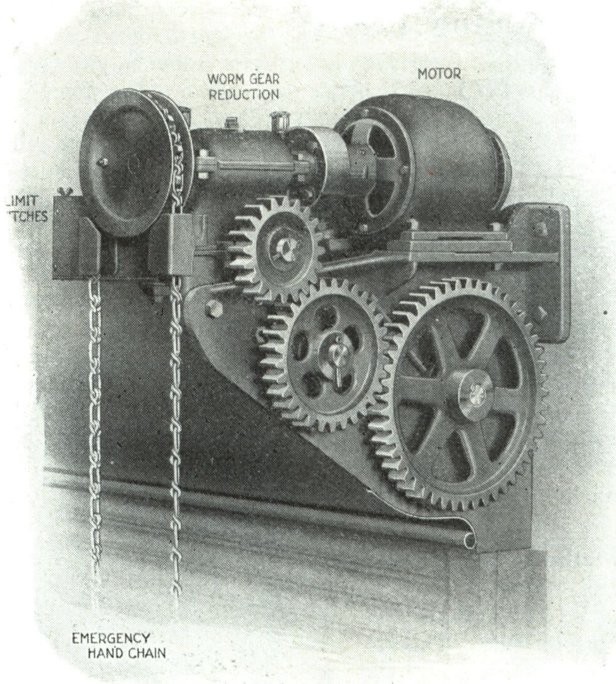
Kinnear power units are the result of years of painstaking effort, are compact, sturdy, and are long past the experimental stage.

Kinnear motor operated doors are in general use everywhere and are great time savers on large openings.

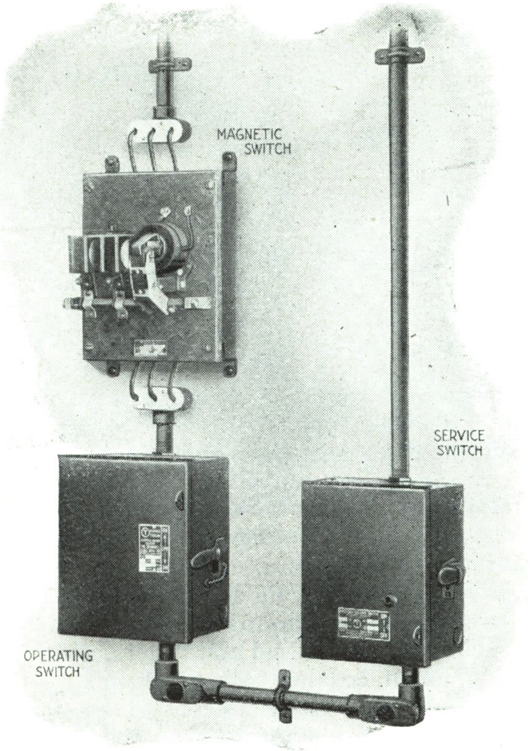
If you have door problems it will give us pleasure to help develop them.

Write for detailed information.

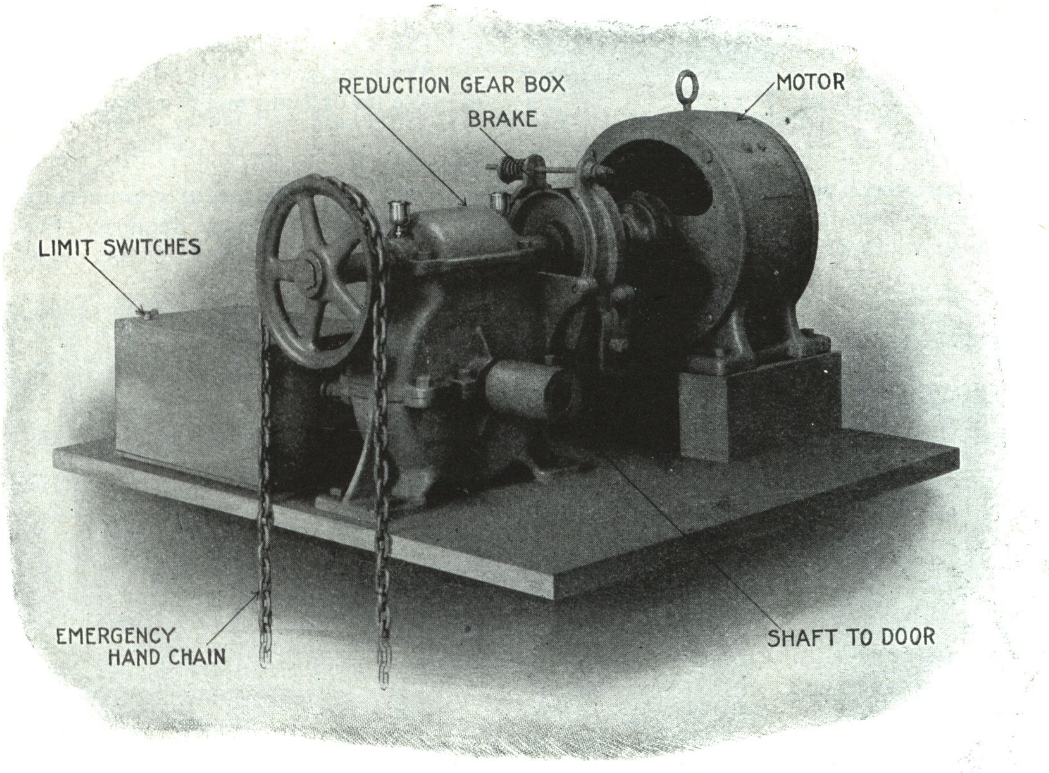
Continued on next page


WORM GEAR REDUCTION
MOTOR
IMIT
TCHES
EMERGENCY HAND CHAIN

Kinnear Power Unit No. 3
Can be supplied as shown or mounted on wall, being flexible enough and compact enough to be used almost anywhere


MAGNETIC SWITCH
SERVICE SWITCH
OPERATING SWITCH

Enclosed Type of Switches
Supplied as part of Kinnear equipment


REDUCTION GEAR BOX
BRAKE
MOTOR
LIMIT SWITCHES
EMERGENCY HAND CHAIN
SHAFT TO DOOR

Kinnear Power Unit No. 2
For large openings. Rugged, compact and complete; out of sight and out of the way. A silent servant ever ready to respond to the touch

THE MOESCHL-EDWARDS CORRUGATING CO., INC.

Manufacturers of Steel Rolling Doors

CINCINNATI, OHIO

MECCO

TRADE-MARK

Products

"Mecco" Steel Rolling Doors.

"Mecco" Fireproof Kalamein Doors.

"Mecco" Fireproof Hollow Metal Windows.

Also manufacturers of Tin Clad Doors; Kalamein Smoke Screens; "Mecco" Spanish Metal Tile; Garages, Marquise, Shingles (tin, galvanized or copper), Painted and Galvanized Roofing, Siding and Corrugated Sheets.

Advantages of "Mecco" Steel Rolling Doors

All-steel rolling doors have certain recognized general advantages over doors of other types. "Mecco" doors have other points of superiority that have won general recognition and are of special interest to architects, engineers, owners and contractors, viz.:

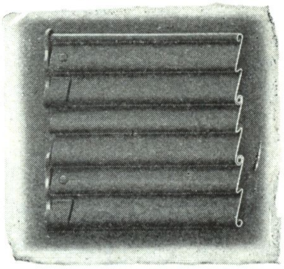
(1) Ease of erecting "Mecco" doors.
(2) Ease of operating "Mecco" doors.
(3) Extremely low maintenance cost.

Slat Construction

"Mecco" slats are rolled from galvanized copper bearing open hearth steel of best grade, with easy curves to prevent crystallization.

The modified Z-form makes this slat unusually strong and able to resist great pressure.

"Mecco" slats are extra wide, thus reducing the joints by 50%—a real advantage needing no explanation.



Slats with Malleable End Locks Attached

Underwriters' Approved Type No. 100

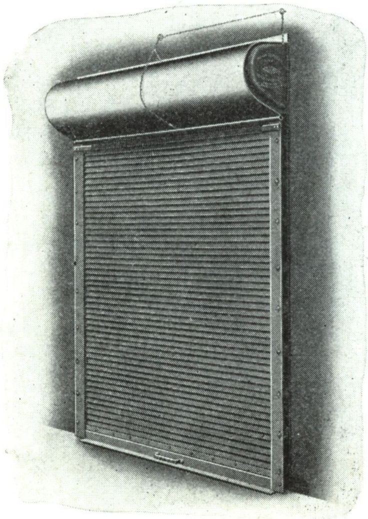
Labeled for interior opening not exceeding 80 sq. ft. in area or 12 ft. in width or height.

This type for erection on face of wall.

Operated by handle on bottom bar, also automatic closing under control of fusible link melting at 150°.

Curtains for class "A" openings No. 16 gage galvanized steel; for class "B" No. 20 gage.

Two doors required for class "A" openings, one door on class "B" openings to secure full insurance credit.

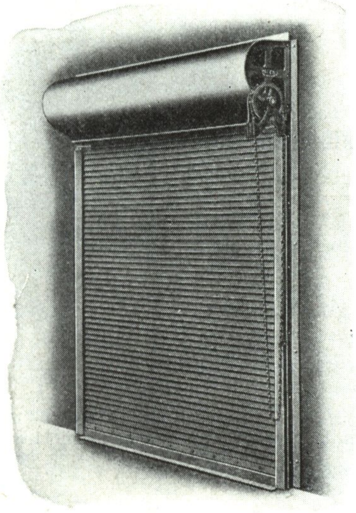


Type No. 100

Types of Installation

The type of installation most frequently used has the coil mounted on the face of the wall above the opening. Where headroom is limited, the coil and the brackets are mounted under the lintel and guides placed on the jambs.

A large opening may be filled with several doors using removable posts.



Type No. 6

Erected on face of wall, operation by chain and gear

Methods of Operation

(1) Handle on bottom bar. This is the push-up type, operated like a window shade. May be operated from either side of the opening.

The area for the push-up type should not exceed 100 sq. ft.

(2) Operation by reduction gears and an endless chain.

(3) Operation by gears, shafting and crank.

(4) We also build electric motor operated doors.

We must have a complete description of the current to quote on or build motor equipment.

Services

Our engineers are at your service at all times to give any data you may require. Quotations will be furnished on any quantity or type. Get "Mecco" service and quality.

Installations

The following are a few of the users of "Mecco" doors:

Cleveland Fruit Auction House, Big Four R. R., Cleveland, Ohio
Postal Terminal Building, Cincinnati, Ohio
National Biscuit Co., Cincinnati, Ohio
Atlantic Coast Line R. R. Co., machine and erection shops, Montgomery, Ala.
Louisville & Nashville R. R. Co., freight house, Covington, Ky.
Donaldson Lithographing Co., Newport, Ky.
B. F. Goodrich Co., Akron, Ohio
Northern Ohio Traction & Light Co., Akron, Ohio
Penn Public Service Corporation, Johnstown, Pa.
Allis-Chalmers Co., Cincinnati, Ohio
Wm. Powell Co., Cincinnati, Ohio
Henke Building, Houston, Tex.
Geo. L. Williams Building, Cleveland, Ohio
U. S. Industrial Alcohol Co., Peoria, Ill.
F. W. Albrecht Grocery Co. Warehouse, Akron, Ohio

Continued on next page

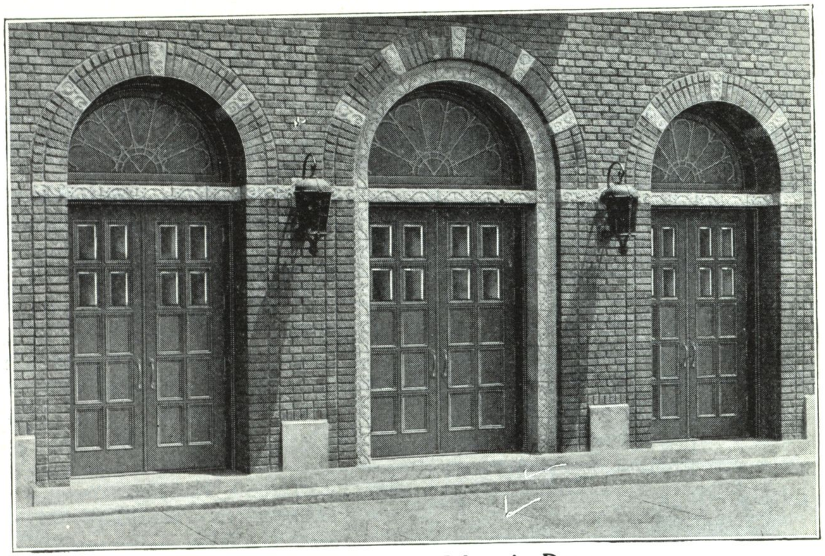
"Mecco" Kalamein Doors

We manufacture a complete line of kalamein doors, covered with stretcher leveled kalamein iron, copper or bronze. Frames may be wood core, metal covered, or of steel, either hollow or solid.

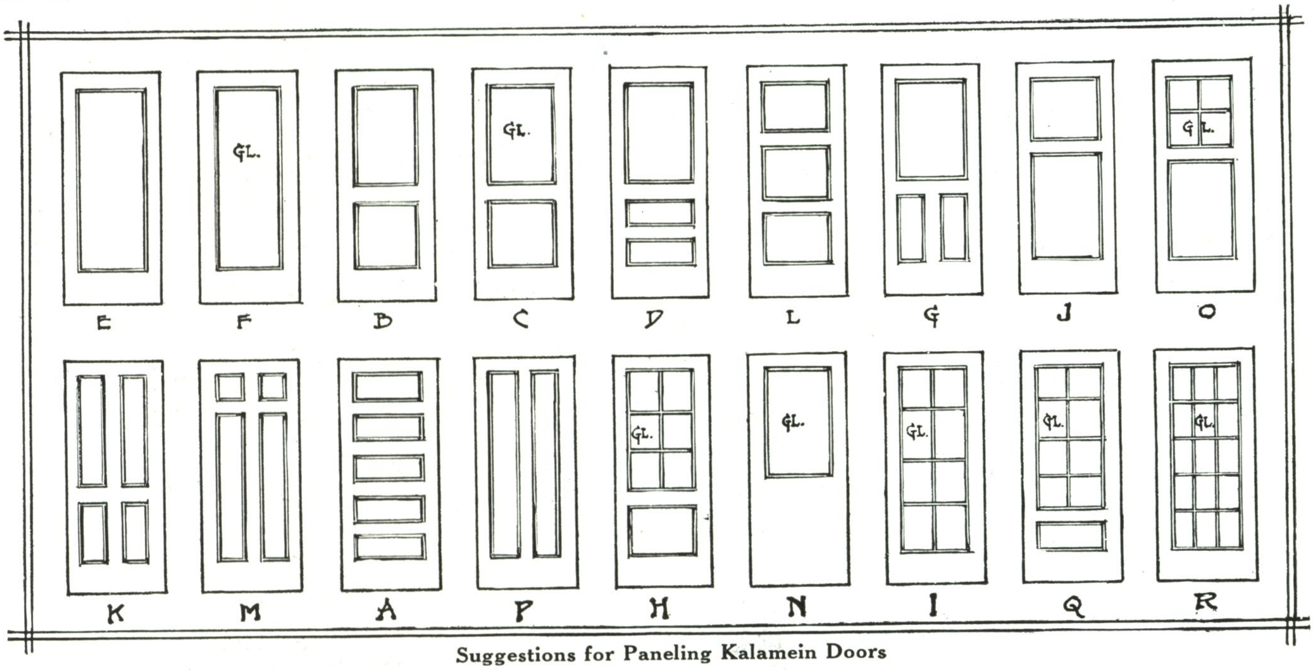
Doors covered with kalamein iron are ordinarily supplied with a prime coat of paint. We, however, can supply any desired enamel finish, or doors grained in imitation of any kind of wood. Cut shown to right is of doors covered with No. 20 gauge bronze.

Labeled Kalamein Doors

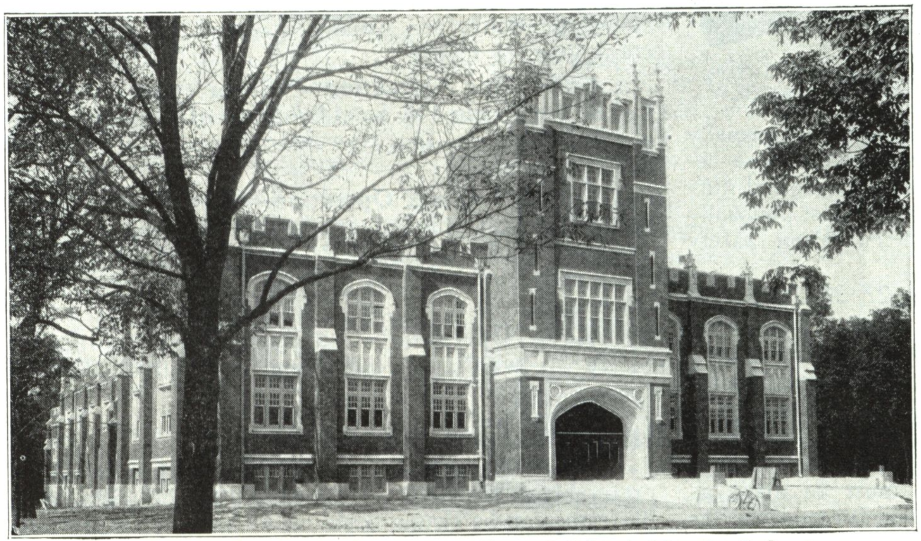
We can supply labeled kalamein doors or frames. Doors with metal panels may be labeled for "Vertical Shaft," "Corridor" openings or "Fire Escape" openings. Doors with glass can not be labeled for vertical shaft.



Installation of Bronze Kalamein Doors



Suggestions for Paneling Kalamein Doors



Ball Gymnasium, Indiana State Normal School, Muncie, Ind.

"Mecco" Hollow Metal Windows

We manufacture a complete line of hollow metal windows of every type, labeled by the National Board of Fire Underwriters.

Double Hung Type—The cut to the left shows an installation of "Mecco" double hung windows.

We have hundreds of such installations in high class office buildings, terminal buildings, stores and other semipublic and private structures.

The sash of windows are made to slide perfectly and yet the design and workmanship are such as to exclude the elements. "Mecco" windows are labeled.

ESTABLISHED 1876

THE J. G. WILSON CORPORATION

Manufacturers of Rolling Steel and Wood Doors and Shutters; Horizontal Folding and Fireproof Airkore Doors

TELEPHONE
Caledonia 8970, 8971, 8972
CABLE
"Lydian, New York"

GENERAL OFFICES
11 East 36th Street
NEW YORK, N. Y.

FACTORY
NORFOLK, VA.

BRANCH OFFICES

ATLANTA, J. M. Van Harlingen
BALTIMORE, The J. G. Wilson Corporation
BOSTON, The J. G. Wilson Corporation
BUFFALO, The J. G. Wilson Corporation
CHICAGO, H. B. Dodge & Co.
CLEVELAND, The J. G. Wilson Corporation
DALLAS, The J. G. Wilson Corporation
LOS ANGELES, The J. G. Wilson Corporation
PHILADELPHIA, The J. G. Wilson Corporation
PITTSBURGH, H. H. Charles
RICHMOND, J. S. Archer
ROANOKE, The J. G. Wilson Corporation
ROCHESTER, The J. G. Wilson Corporation
ST. LOUIS, The J. G. Wilson Corporation
SAN FRANCISCO, The J. G. Wilson Corporation

AGENTS IN PRINCIPAL CITIES

Products

Rolling Steel Doors and Shutters, Wilson Standard and Underwriter Labeled.

Rolling Wood Doors and Shutters.

Horizontal Folding Doors (Steel or Wood); Fireproof Airkore Doors.

For Blinds and Awnings, see page 1300; for Partitions and Wardrobes, see pages 1318-1321.

TRADE-MARK

Where Wilson Rolling Steel Doors Are Used

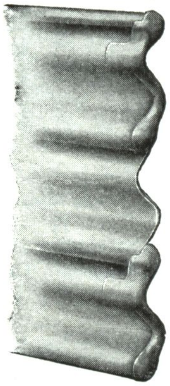
Wilson rolling steel doors and shutters are designed to meet all classes of service; first, effective closure of openings against weather and intrusion, second, closure of openings where fire doors are required.

Wilson Interlocking Slat Curtain

The Wilson curtain, that part of the door closing the opening, is formed of a series of interlocking steel slats, electro-galvanized (or copper bearing).

They are galvanized by the modern electro-galvanizing process.

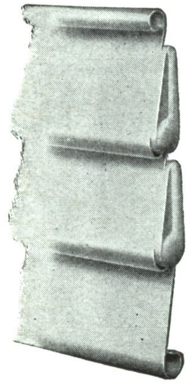
Wilson interlocking slats are made in the three following types:


"Big 4" Interlocking Slat

"Big 4" Interlocking Slat—This slat has the advantage of deep corrugations which materially increase the rigidity and strength of the curtain. The shape of the slat is so designed as to protect the interlock from abrasion on both sides of the door.

The "Big 4" type is especially recommended for large openings because of its lateral strength and durability. This slat will resist unusually severe winds when Wilson safety anchors are used.

Made in Nos. 22, 20, 18 and 16 U. S. standard gauges.


No. 2 Interlocking Slat

"Little 4" Interlocking Slat—Similar to the "Big 4" slat in appearance, but the depth of corrugation is slightly less.

Used in small doors for openings where coil space must be made as small as possible and for underwriter labeled exterior wall doors.

Made in Nos. 22 and 20 U. S. standard gauges.

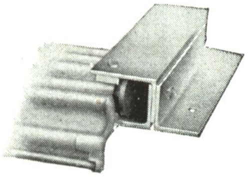
No. 2 Interlocking Slat—Especially designed for use on underwriter labeled fire doors.

Made in Nos. 20, 18 and 16 U. S. standard gauges.

The curtains of the underwriter type are equipped with fire stops on the edges of slats, baffle plates in the hood, and (where permitted) automatic devices which cause them to close in case of fire.

Safety Anchors—Wilson patented safety anchors may be used on small openings and are always used on doors over 14 ft. wide. They fit into specially constructed rabbeted grooves and prevent curtain from blowing out of grooves when subjected to heavy wind pressure. No door subjected to severe wind or particularly hard service should be without safety anchors.

This is a distinctive Wilson feature.


Safety Groove and Anchor

Operation of Wilson Rolling Steel Doors

Wilson rolling steel doors may be operated from either one or both sides of opening. Small doors are usually raised and lowered by handles on the bottom bar, and large doors are usually operated by chain gear, crank gear, or motor.

Self-coiling Operation—Wilson types S. C. 11 and 22 are operated by hand by means of handles on bottom bar of door. This type is usually best for openings 8x10 ft. or less.

Chain or Crank Operation—Should be used for doors larger than the limitations of self-coiling operation. Wilson types C. G. 11 and 22 are operated by means of chain and gear. Wilson type K. G. 11 is operated by crank gear.

Motor Operation—Usually used on doors over 14 ft. in width, or containing more than 200 sq. ft.

Hinged Wicket Doors

Standard size, 2x5 ft. May be placed in any door, preferably at the side. Designed so that the wicket with its frame can be swung back out of the way before raising the curtain.

Continued on next page

Wilson Rolling Steel Fire Doors (Underwriter Labeled)

Exceptionally durable and equipped with special fire protective devices. Close automatically in case of fire and are approved and labeled by the Underwriters' Laboratories, Inc. for the following services:

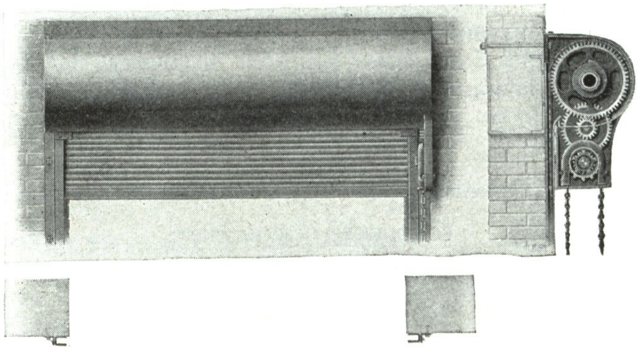
Vertical Shafts, Corridors and Room Partitions—Area of opening not to exceed 80 sq. ft.; neither width nor height of opening to exceed 12 ft. Curtains may be hung on face of wall or between jambs, self-coiling or crank operation, and where required are automatic closing in case of fire. Specify Wilson type Nos. 21 to 26, inclusive, interlocking slat No. 2, No. 20 gauge.

Fire Walls—Area of wall opening not to exceed 80 sq. ft.; neither width nor height to exceed 12 ft. Two doors are required and may be hung on face of wall or between jambs, self-coiling or crank operation, and close automatically in case of fire. Specify Wilson type Nos. 31 to 35, inclusive, interlocking slat No. 2, No. 16 gauge.

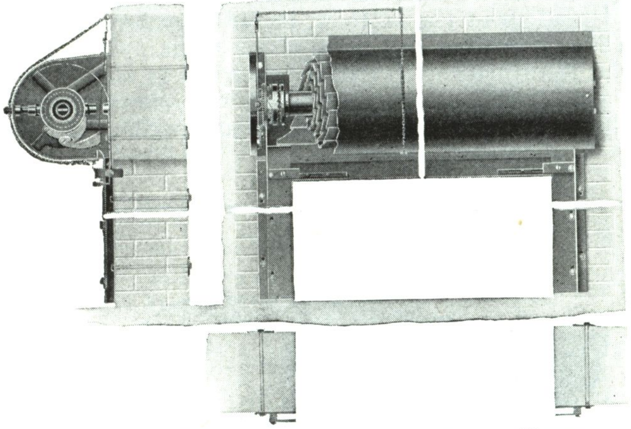
Exterior Walls—Area of wall opening not to exceed 100 sq. ft.; neither width nor height to exceed 12 ft. Curtain may be hung on face of wall or between jambs, self-coiling, chain or crank operation, and, where permitted, may be automatic closing in case of fire. Specify Wilson type Nos. 41 to 51, inclusive, interlocking slat "Little 4," No. 22 gauge.

Automatic Closing Device—Where required, doors close automatically by the fusing of one of two links located at the head or side of opening, and near the ceiling.

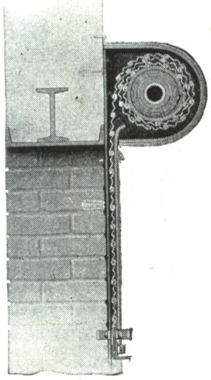
Doors close easily on the sill and can be raised



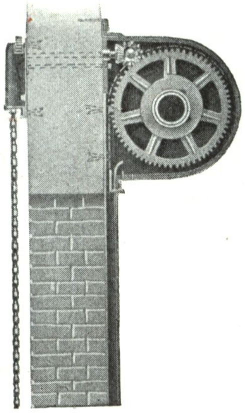
CHAIN GEAR OPERATION, TYPE C. G. 11



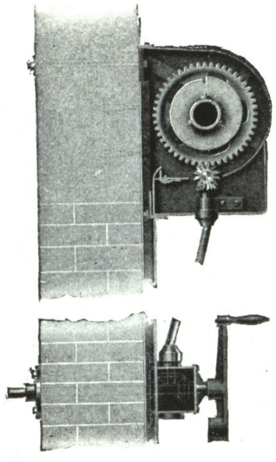
TYPICAL APPLICATION OF WILSON UNDERWRITER LABELED DOOR



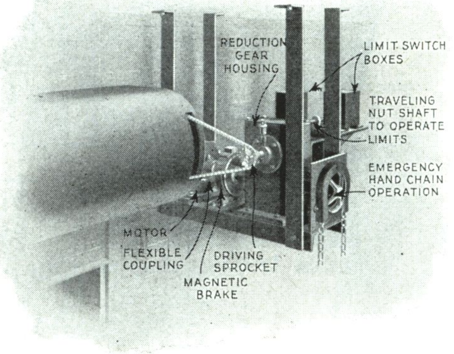
SELF-COILING OPERATION, TYPE S. C. 11



CHAIN OPERATION THROUGH WALL, TYPE C. G. O. 11



CRANK OPERATION, TYPE K. G. 11



MOTOR OPERATION, TYPE M. O. 11

Coils and grooves are shown on face of wall but can be located between jambs if desired

SCHEDULE OF COIL AND GROOVE CLEARANCES

Underwriter Labeled Doors				Self-coiling Operation Wilson Standard Doors				Chain or Crank Operation Wilson Standard Doors			
Height opening, ft.	Diameter coil, in.	Width opening, ft.	Depth groove, in.	Height opening, ft.	Diameter coil, in.	Width opening, ft.	Depth groove, in.	Height opening, ft.	Diameter coil, in.	Width opening, ft.	Depth groove, in.
6	15½			6	14½			10	16½		
8	16½	3 to 6	6	8	15½	3 to 6	6	12	18½		
10	18½	7 to 12	6½	10	15½	7 to 10	6	14	19½		
12	19½			12	18½			16	21½	6 to 12	6½
								18	22½	13 to 15	7½
								20	23½	16 to 20	7½
								22	24½		
								24	25½		
								26	26½		

Dimensions shown are recommended standard sizes, subject to modification.

Details of Wilson Rolling Steel Doors

Continued on next page

immediately after without difficulty. Automatic device can be reset and new link inserted without removing the hood or dismantling the door.

Grooves and bottom bar of door are provided with slotted holes to allow for expansion. Fusible washers are used with bolts securing grooves to wall, allowing freedom of movement during expansion. Bolts for brackets and grooves are bolted through wall or attached to iron inserts furnished and installed by others.

Installation

The J. G. Wilson Corporation has a corps of experienced erectors, equipped to properly install Wilson doors in the least possible time. Erection is a service which is generally supplied, even though Wilson doors can easily be installed by competent mechanics. All Wilson doors should operate properly at all times, and the service of Wilson erectors is always available to this end.

Wilson Rolling Wood Doors and Shutters

Especially made to withstand the corrosive fumes so destructive to iron and steel. Recommended for roundhouses, powerhouses, chemical plants, refrigerating plants, etc.

Heavy Slat Doors—Made of wood slats 2 in. wide and about 1⅛ in. thick, threaded on bronze bands running from top to bottom about 18 in. apart. Each band is riveted to top slat and attached at bottom to a strong spiral spring anchor of phosphor bronze. This construction allows for shrinking and swelling of door due to atmospheric changes.

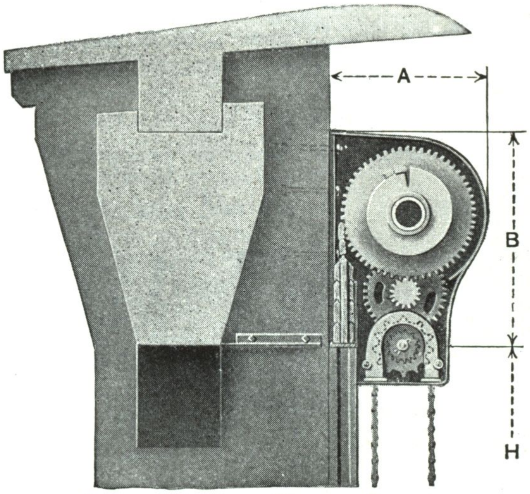
When door is 5 ft. from the lintel it will proceed automatically from this point until it reaches the lintel. This prevents the door being pulled up short of the lintel and becoming damaged by an engine striking it. It requires less than one minute to raise or lower the door.

The doors are treated with carbolineum, reducing to a minimum any expansion or contraction, and acting as a preservative.

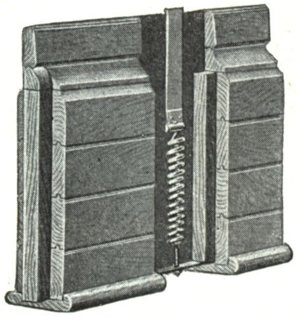
Light Slat Doors—Similar to heavy slat type except slats are $\frac{13}{16}$ in. thick. Used on smaller openings or where not subjected to as heavy wear as the heavy slat door.

SCHEDULE OF COIL SIZES

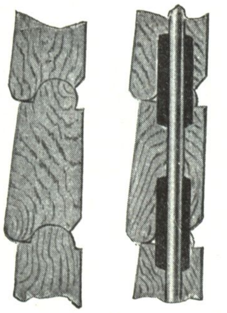
Height of opening, ft.	Heavy slat, in.		Light slat, in.	
	A	B	A	B
8	18	26½	14	20½
10	18	26½	15	21½
12	21	29½	16	22½
14	22	30½	16	22½
16	23	31½	18	24½
18	23	31½	19	25½



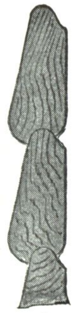
Section Through Head of Opening



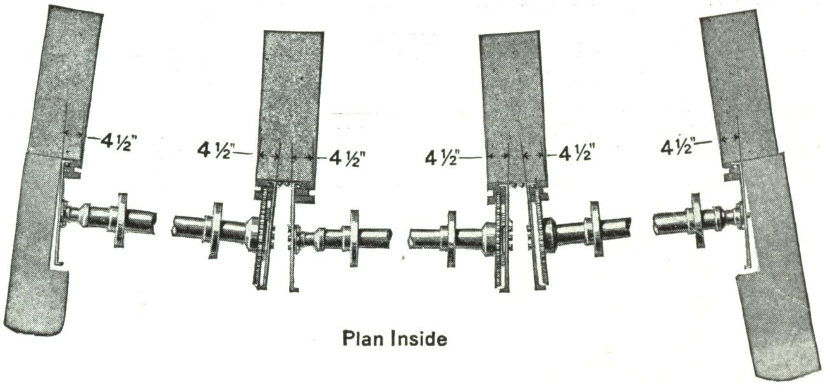
Section of Bottom Bar Showing Bronze Anchor Spring and Band



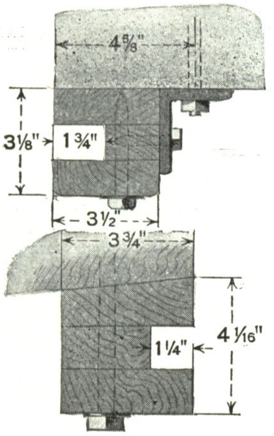
Heavy Slat



Light Slat



Plan Inside



Section Through Light and Heavy Slat Door Grooves

Details of Wilson Rolling Wood Doors

Continued on next page

Wilson Horizontal Folding Doors

Usually used for piers, warehouses, freight sheds, etc., and where the admission of light is essential.

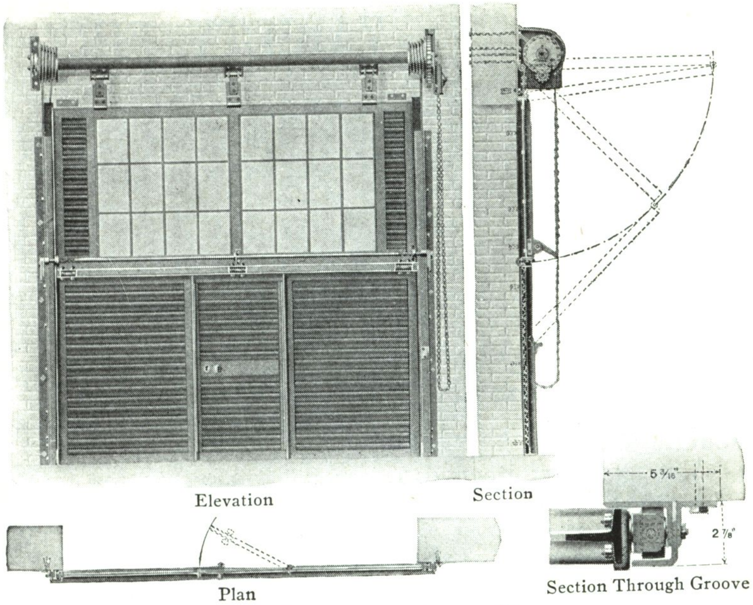
Made of steel or of wood, with or without glass.

Chain operated (see details), also motor operated, if desired. Equipped with wicket door where necessary.

Steel doors are made of T-iron frames and interlocking slats as shown.

Details and prices will be furnished on application.

Specifications—Furnish and install Wilson horizontal folding doors made of steel [wood] as per details [manufacturer's standard construction]. To be hand [motor] operated.



Wilson Horizontal Folding Door

Wilson Fireproof Airkore Doors

These doors are made of channel iron frames covered with No. 24 U. S. S. gauge sheet steel, spot-welded to frame. They are reinforced by vertical steel channels to which sheet metal is fastened, as shown in section. Outer channel frames have 3/8-in. holes top and bottom to allow for free circulation of air and its expansion in case of fire.

Doors are made in single and double swinging and sliding types, the sliding type having either horizontal or sloping track.

All types are equipped with automatic closing devices, including fusible links and weights.

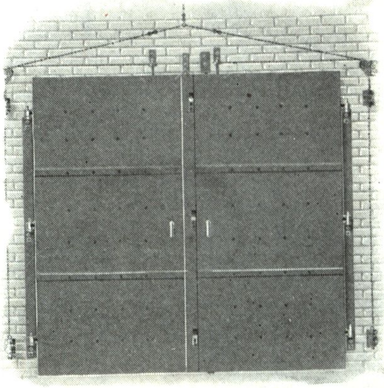
Approved and labeled by Underwriters' Laboratories, Inc., as follows:

Single swinging type for interior openings not exceeding 6 ft. in width and 12 ft. in height; for exterior openings not exceeding 4 ft. in width and 12 ft. in height.

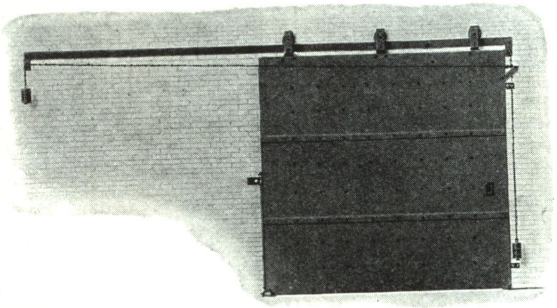
Double swinging type for interior openings not exceeding 10 ft. in width and 12 ft. in height; for exterior openings not exceeding 6 ft. in width and 12 ft. in height.

Sliding type for openings not exceeding 120 sq. ft. in area, neither width nor height to exceed 12 ft.

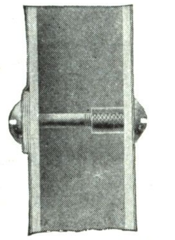
Suitable for all fire wall openings or wherever protection against fire is desired.



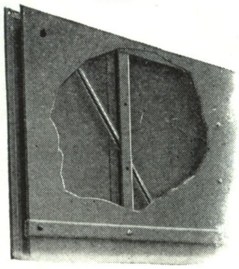
Wilson Fireproof Airkore Doors—Double Swinging Type
Also made in single swinging type



Wilson Fireproof Airkore Door—Single Sliding Type
Also made in double sliding type

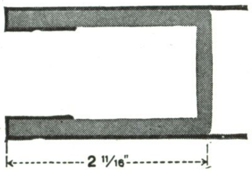


Section Through Center of Door
Showing vertical steel channel, lap joint and method of fastening cover sheets



Galvanized Steel Plates Are Bolted Through Vertical Channels

A diagonal brace in each swinging door prevents sagging



Section Through Outer Frame of Door
Showing cover sheets lapped and spot-welded to frame, inside and outside

Details of Wilson Fireproof Airkore Doors

VARIETY FIRE DOOR CO.

Manufacturers of All Kinds of Fireproof Doors

Sacramento and Carroll Avenues
CHICAGO, ILL.

BOSTON, MASS.
DALLAS, TEX.
DAVENPORT, IOWA
DENVER, COLO.
DETROIT, MICH.
EL PASO, TEX.
HELENA, MONT.
HOUSTON, TEX.
INDIANAPOLIS, IND.
JACKSONVILLE, FLA.
LOS ANGELES, CAL.
LOUISVILLE, KY.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEW YORK, N. Y.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
RICHMOND, VA.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
SPOKANE, WASH.
TACOMA, WASH.

Products

Variety Steel Rolling Doors and Shutters.

Vamanco and Varclad Counterbalanced Freight Elevator Doors.

Hollow Metal Fireproof Doors and Trim.

Kal-O-Mine Metal Covered Fireproof Doors and Trim.

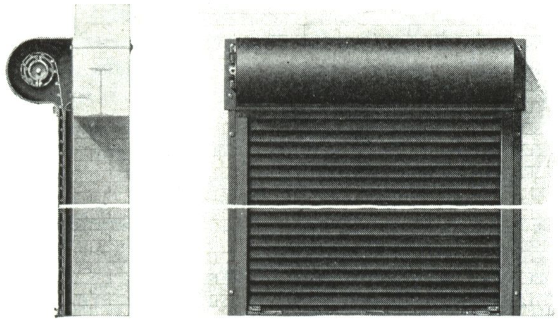
Also manufacturers of Cross Horizontal Folding Doors, Saino Fire Doors and Shutters, Tin Clad and Metal Covered Doors and Trim.

Variety Steel Rolling Doors

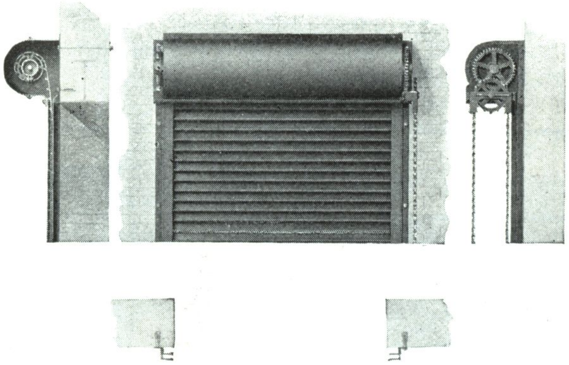
Recommended for use in the following openings:

Non-labeled—Types Nos. 20 and 41. On exterior openings.

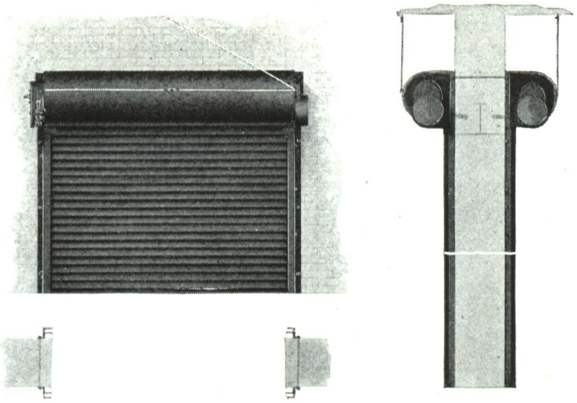
Labeled—Types Nos. 60 and 61 for exterior openings. Type No. 33 for vertical hatches. Type No. 33-33 for fire walls.



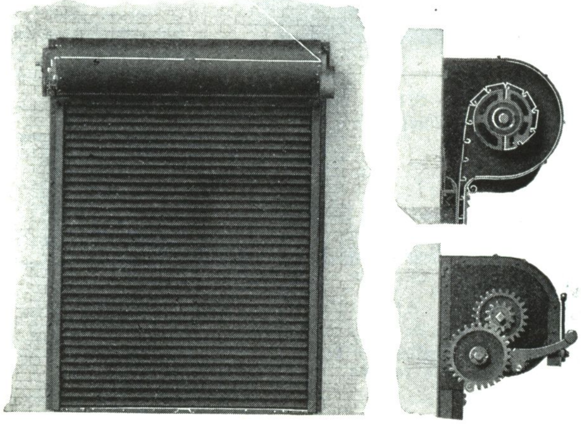
No. 20DM—Non-labeled, Manually Operated



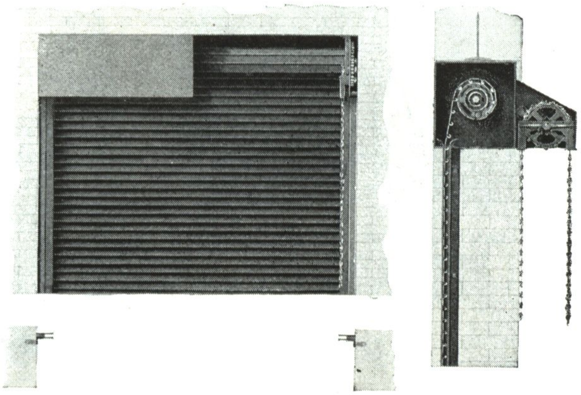
No. 20DH—Non-labeled, Chain Operated



No. 33-33—Labeled, Fire Wall, Manually Operated



No. 33DM—Labeled, Manually Operated, Automatic Closing



No. 41UH—Non-labeled, Exterior, Chain Operated

Variety Steel Rolling Doors

Continued on next page

Specifications for Counterbalanced Freight Elevator Doors—Vamanco Varclad Doors

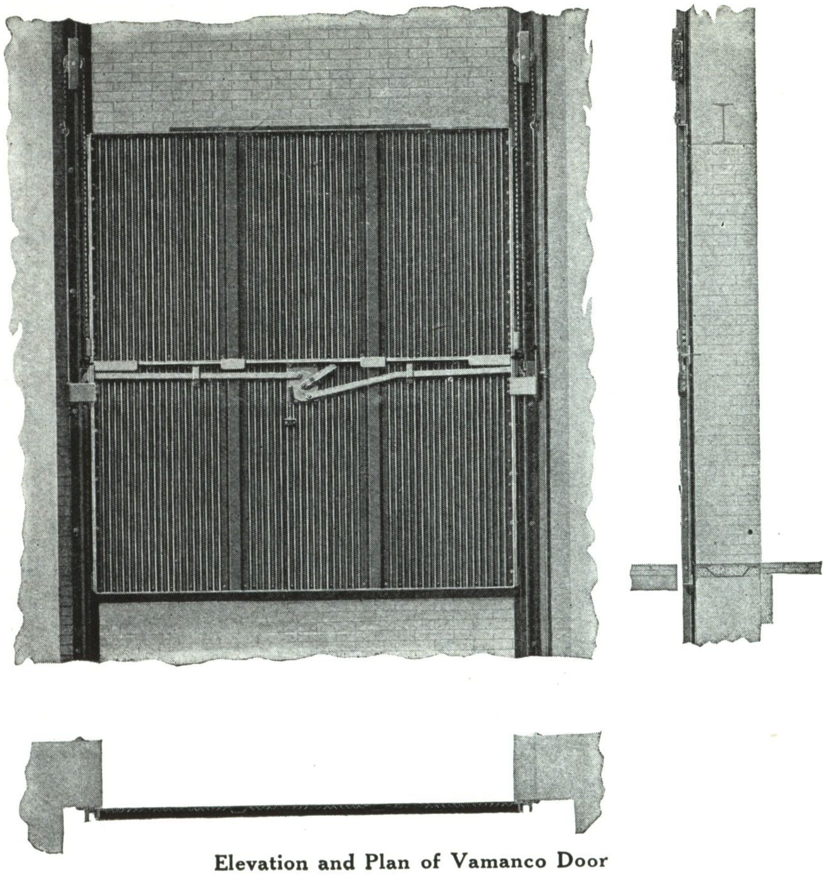
(1) Freight Elevator Doors—All door openings to freight elevator, except penthouse doors, shall be counterbalanced doors as sold by Variety Fire Door Co. and shall be type known as [Vamanco] [Vamanco Hollow Metal] [Varclad] [Varclad Kal-O-Mine].

(2) Work Furnished by Manufacturer—The manufacturer shall furnish, freight allowed to freight station nearest building site: (a) all doors complete with guides, ball bearing sheaves, bar locks, trucking sills, bolts, anchors and all necessary hardware to properly secure doors to walls of shaft; (b) drawings and full directions required for erection; (c) all parts to receive priming coat of metallic paint at factory.

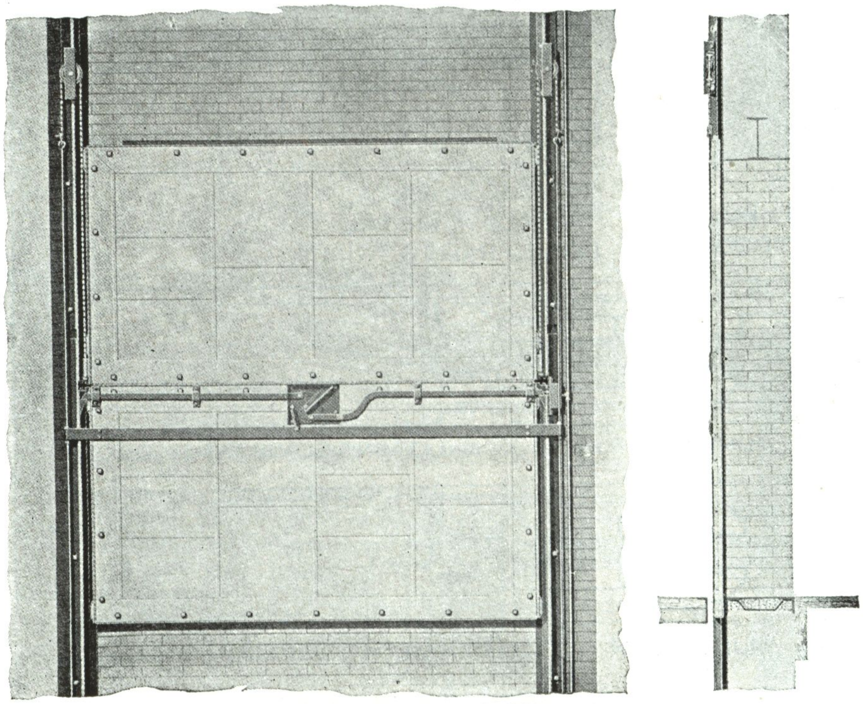
(3) Underwriters' Label—All doors shall be approved and labeled by Underwriters' Laboratories, Inc., for "Fire Door for Vertical Shaft."

(4) Special Lock—Special lock shall be provided at (ground) floor to permit access to elevator shaft when all doors are closed.

(5) Operation—Doors to be manually opened and closed: (a) If electric interlocks are desired add: Each door to be provided with a Varlock operated by bar locks so that when door is *unlocked* the current will be cut off from the car and it will be impossible to run the car until all doors are closed and locked. (b) If full automatic operation is desired add: Door contractor to furnish mechanical operating device to open and close doors automatically by simply pressing button when car is at landing. This device to be full circuit type and to contain interlocks cutting current from car when door is unlocked.



Elevation and Plan of Vamanco Door



Elevation of Varclad Door

(6) Trucking Sills—All doors shall be provided with special design trucking sills (state if for heavy or light duty) so that no part of load passing over doors will be sustained by door mechanism or guides, but will be carried entirely by sill of building.

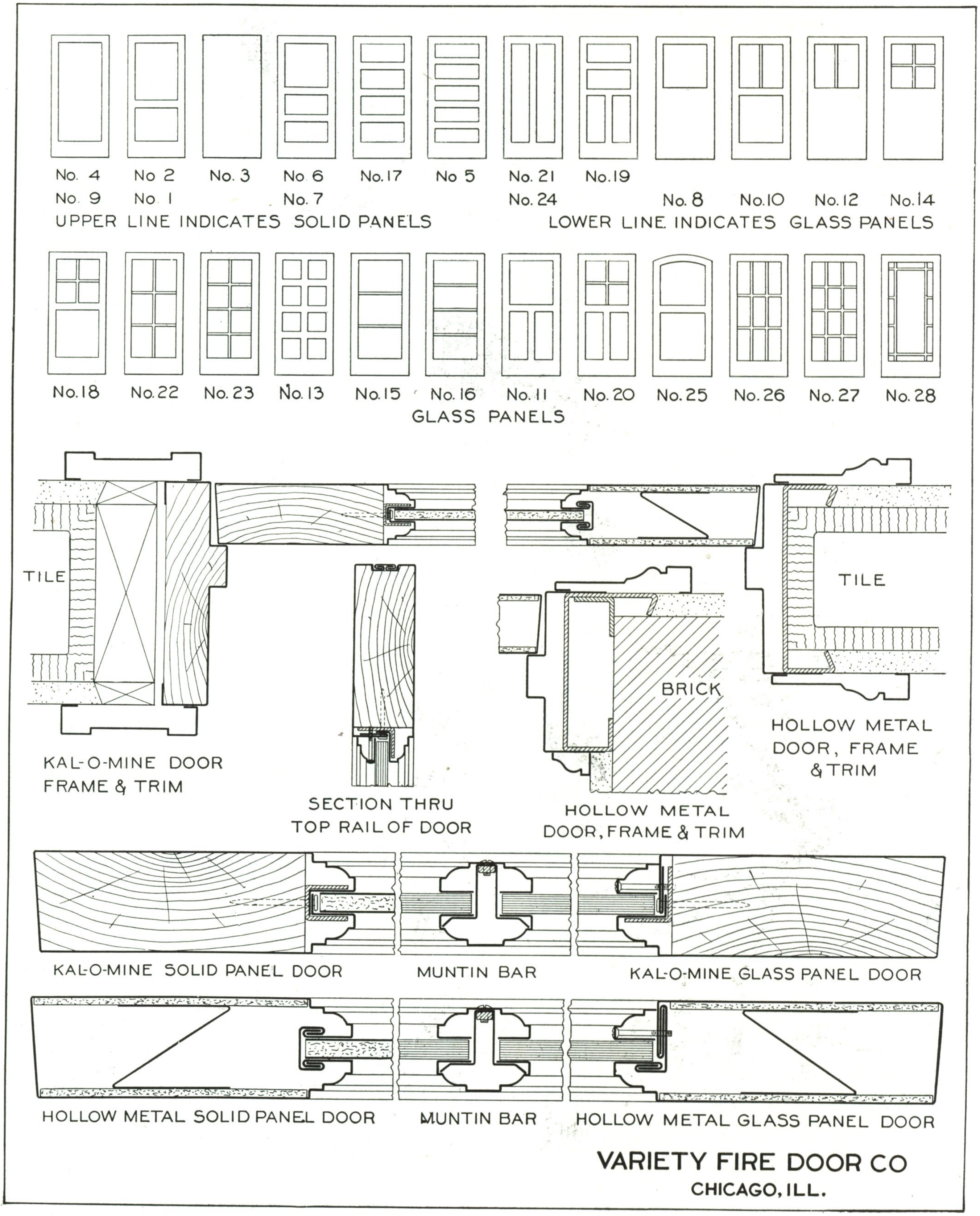
(7) Glass Panels—Each door shall be equipped with a panel 12 in. square, arranged to receive ¼-in. wire glass (glass by glazing contractor). The glass panels are to be backed by a sliding metal panel, with fuse link for automatic closing and doors must bear the Underwriters' label.

(8) Clearance—There shall be not more than 1½-in. clearance between door and elevator car at all floors. In case there is any inequality of construction of shaft that will not allow this, the architect will decide whether to cut the masonry or put extension on doors to make correction of same, which is to be charged to contractor who built the shaft.

(9) Erection—The manufacturer shall erect the entire equipment in a substantial manner and shall leave the installation in perfect working order.

(10) Painting—The contractor shall apply 2 coats lead and oil paint to all parts exposed to view, in colors selected by the architect, as specified under "painting."

Continued on next page


No. 4
No 2
No. 3
No 6
No. 17
No 5
No. 21
No. 19
No. 9
No 1
No. 7
No. 24
No. 8
No. 10
No. 12
No. 14
UPPER LINE INDICATES SOLID PANELS
LOWER LINE INDICATES GLASS PANELS
No. 18
No. 22
No. 23
No. 13
No. 15
No. 16
No. 11
No. 20
No. 25
No. 26
No. 27
No. 28
GLASS PANELS
TILE
KAL-O-MINE DOOR FRAME & TRIM
SECTION THRU TOP RAIL OF DOOR
BRICK
HOLLOW METAL DOOR, FRAME & TRIM
TILE
HOLLOW METAL DOOR, FRAME & TRIM
KAL-O-MINE SOLID PANEL DOOR
MUNTIN BAR
KAL-O-MINE GLASS PANEL DOOR
HOLLOW METAL SOLID PANEL DOOR
MUNTIN BAR
HOLLOW METAL GLASS PANEL DOOR
VARIETY FIRE DOOR CO
CHICAGO, ILL.

Details of Variety Hollow Metal and Kal-O-Mine Fireproof Doors and Trim

ALLEN & DREW, INC.

Manufacturers of Electrically Driven Doors

80 Boylston Street
BOSTON, MASS.

Products

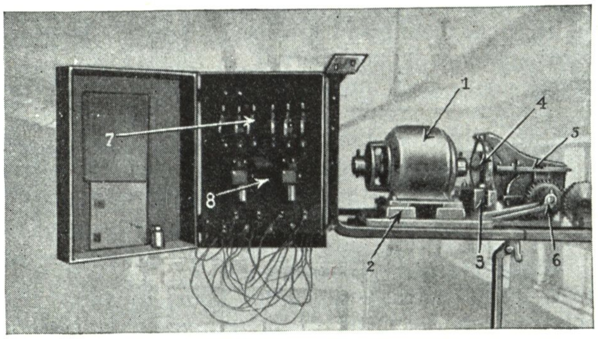
Electrical Door Operating Units and Doors, including Horizontal Sliding, one or two-piece; Fold-up; Turnover; Vertical Sliding, one and two-piece and two-speed; Folding, Sliding and Swinging; Crane Runway; Rolling Steel and Counterbalanced Elevator Doors; Gates (all types).

Engineering Service

All types of installations listed in this catalogue are standard. Aside from the standard products we will furnish complete plans and specifications on any special type of electrically operated door or gate. Special installations are sometimes necessary where the standard electrically operated doors can not be used because of insufficient clearances.

Electric Operating Units

All units are remotely controlled from push button stations and are fully automatic, including directly connected limit switches and solenoid brake. The drives are made standard up to 15 hp.

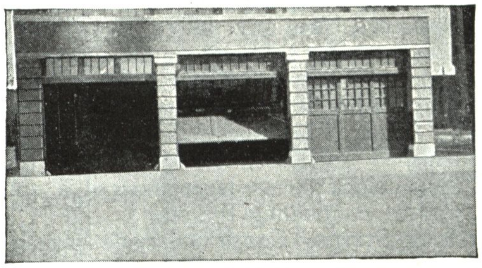


The Operating Assembly

The electric operating units are shipped f. o. b. Boston, complete with erection prints where it is desired to use our machines in conjunction with doors and hardware furnished and erected by others. When devices are shipped in this way they are guaranteed against defect in workmanship and material for a period of one year.

Electrically Operated Fold-up Doors

A real remotely controlled fold-up door. Door automatically unlocks and breaks at the center when the open button is closed. The door then opens at an even rate and automatically cuts out at a full open position. The closed button will fully close the door, lock it and automatically cut out. The weight of the door and counterweight is evenly distributed by the use of an overhead equalizing shaft, eliminating any uneven stretching of cross cables which cause the door to sag at one side.



Installation of Fold-up Doors

Electrically Operated Horizontal Sliding Doors

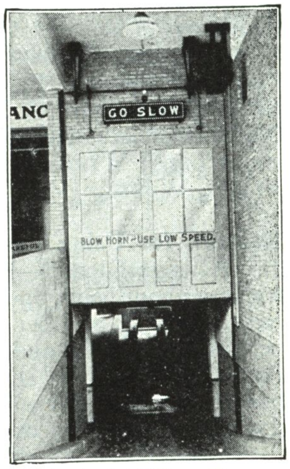
Horizontal sliding doors are electrically operated in either one or two sections. The two-section door may be either two-way, i. e., sliding to each side of the opening; or a two-piece one-way, which is a two-speed door, both halves taking an open position at one side of the opening.

Folding, sliding, swinging and horizontal sliding are all operated by a direct connected drive unit and open the door at a speed of approximately one to two feet per second, according to size and weight conditions under which the door is to be used.

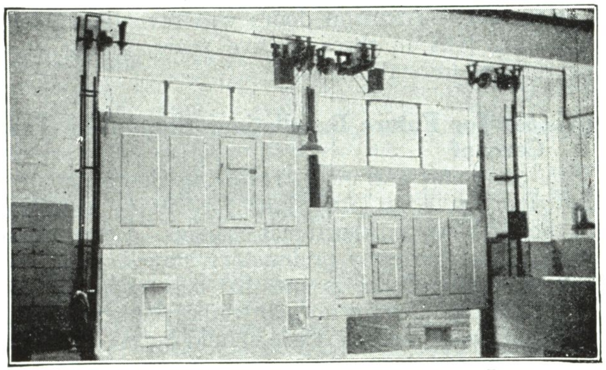
Electrically Operated Vertical Sliding Doors

These doors constructed in either one or two-piece according to the clearances about the opening. The two-piece door furnished either one or two-speed.

The illustration below shows a two-piece, two-speed installation, the two doors being entirely independent of each other and yet covering one opening at ramps leading to two different floor levels. By the use of special telescoping tracks a double opening may be obtained and the usual center mullion omitted.



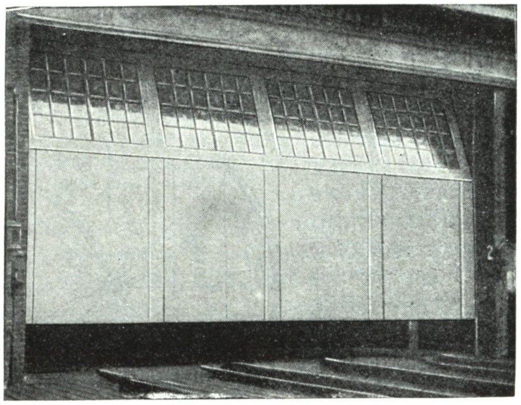
Vertical Sliding Door



Two-piece, Two-speed Vertical Sliding Doors

Guarantee

Electrically operated door installations which are made by Allen & Drew, Inc. are guaranteed for a period of one year from date of installation.



Turnover Door Installation

Partial List of Installations

Ginn & Co. Warehouse, Cambridge, Mass.
Washington Heights Garage, Brighton, Mass.
Charlesgate Garage, Boston, Mass.
Maxwell Service Station, Boston, Mass.
Museum Square Garage, Boston, Mass.
Jordan Marsh Garage, Boston, Mass.
Alden Park Manor, Brookline, Mass.
Kendall Square Garage, Cambridge, Mass.

THE ATCHISON REVOLVING DOOR CO.

MAIN OFFICE AND FACTORY
INDEPENDENCE, KAN.

AGENCIES IN ALL OF THE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA
Write the Main Office or Consult City or Telephone Directory for Name of Nearest Representative

Products

Atchison Revolving Doors: "Curved Wing" and "Straight Wing," Full-folding Standard Type PB, Semi-folding Type C, Safety-exit or Panicproof Type NLD, complete with Enclosures (or Vestibules) and connections; Wings only, for marble enclosures; Connected Work in Metal or Wood.

Reasons for Using Revolving Doors

Always Closed—No other type entrance will pass traffic without being open to the outside cold and drafts. Regardless of weather conditions and the number of persons passing in and out, the lobbies are warm and rentable. Less effort is required to go through an Atchison revolving door than even one set of heavy checked doors, let alone two or three sets.

Capacity—2000 to 3000 persons per hour each way, the traffic being automatically divided. This capacity is far greater than that of swing doors.

Economy—Atchison doors will save their cost in the heating bills in three to five years, giving at the same time additional comfort.

Provisions for Future Installations Should Be Taken Care of

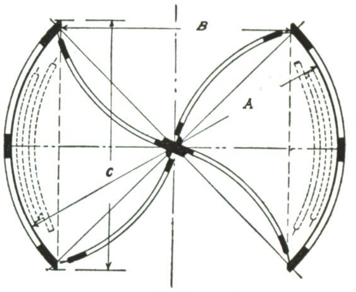
In designing entrances, revolving doors should be included or, at least, provisions for future installation with the slightest constructional changes. Let us submit suggestions at the early preliminary stages.

The ideal entrance is one that has revolving doors of sufficient capacity for normal traffic, flanked by single or pairs of swing doors. Care should be taken to allow enough space for doors, estimating capacity at 3000 persons per hour, each way.

General Data

Materials—All cabinet woods; bronze or steel, Nos. 10-12 gauge on steel frames, Nos. 16-24 gauge on wood cores; copper, 16-20 oz. on wood only. Enclosure work and connections in ornamental cast bronze and iron.

Metal Wings—For these, wood core construction is strongly urged instead of hollow metal because of (1) greater stiffness (to meet twisting strains many times greater than found with any regular swing door), (2) less weight for the needed stiffness (essential to avoid undesirable momentum and inertia effects), (3) lower cost, (4) greater fire resistance ("standard construction wings of No. 16 gauge bronze plate veneer—laid with reinforced joints and waterproof adhesive on laminated hardwood cores" will withstand fire heat hours longer than hollow metal, without warping or distorting).



No. 164. "Curved-wing" Door Floor Plan

Note folded position of wings

Dimension Table

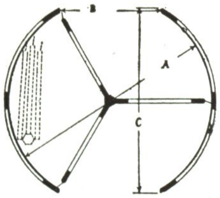
A	B	C
6′ 0″	4′ 2½″	4′ 7½″
6′ 6″	4′ 6¾″	4′ 11¾″
7′ 0″	4′ 11″	5′ 4″
7′ 6″	5′ 3¼″	5′ 8¼″
8′ 0″	5′ 7½″	6′ 0½″

Wood Doors—All doors are veneered, so cheap soft woods make no saving, but can be furnished.

Screen Doors—Light D. A. screen or fly doors may be hung directly to ends of walls with removable hanging strips without interfering with the wings. This feature is possible only with the Atchison door, and is often used. See drawing No. 165 (next page).

Size—4-wing doors should not be smaller than 6 ft. in inside diameter, and if conditions permit only such a small door, then the "curved wing" is best. Standard diameters are 6 ft. 6 in. and 7 ft., except for hotels, where 7 ft. 6-in. or even 8-ft. doors give more room for hand baggage. Inside height should be from 7 to 8 ft.

3-wing doors can be as small as 4 ft. 6-in. diam., and are used where space will not permit a 4-wing door, for interior air-lock and toilet room purposes. Practical only for limited traffic, as in-and-out traffic is not fully divided. Can be furnished with wings to fold aside (drawing No. 166) or with 1 wing hinged only.



No. 166. 3-Wing Door Floor Plan

Dimension Table

A	B	C
4′ 6″	2′ 2½″	4′ 2″
5′ 0″	2′ 5½″	4′ 7″
5′ 6″	2′ 8½″	4′ 2″

Glass Height—Glass should not be lower than 20 in. from floor, to allow braces to clear when dropped; 24 in. minimum is better, to give higher bracing point and reduce racking strains.

"Flush Veneered" Walls—Made with improved cores at a cost lower than the old style vertical T&G linings, and show beautiful matched veneer effects. Used for all solid wall enclosures. See design No. 167.

Marble Enclosures—Atchison wings are ideal for use with marble enclosures, as no ceiling slot is needed, and slabs can be supported from the bearing channel which lies directly over it. Only a 1¾-in. center hole is needed—no other provision whatever prior to placing the wings, except access to space overhead.

Motor Drive—Greatly simplified with Atchison doors because the center bearing is stationary and does not move aside on a wheeled carriage. All mechanism is mounted on the main supporting channel. Three speeds. Continuous operation, push button, or floormat control; ¼ hp. required. Uses any power or lighting current. Friction clutch drive is safe and simple, allowing stopping either the door or motor without injury, and acting as the best possible brake against overspeeding.

Speed Control Brakes—Of the liquid check type can be furnished when desired. Usually the proper setting of the air-lock strips is considered a simple and efficient way of controlling the speed.

Air-lock Strips—Consist of wide bottom rubbers for flexibility, thick felt top strips and tapered moulded side rubbers with felt edges, all especially selected and developed for maintaining the air-lock with only the proper amount of friction.

Patents—Cover the "curved wing" and other Atchison features. No infringement suits need be feared. This company will guarantee against any loss or damage therefrom.

Continued on next page

The "Curved Wing"

The "curved wing" is the first and only improvement ever made which affects or increases the revolving value, and so is far more important than all other secondary improvements which have to do merely with locking, folding, collapsing, etc. It makes passage through the door more than one-fourth easier, because the user pushes naturally against the outer stile, causing the center of the "curved wing" to be 6 in. farther from the body. This gives more walking space in front, where it is useful, and permits a more natural, upright, easy step than is possible with the straight wing. No mysterious trick increases the area of the circle, but the space is simply made more useful for walking through, and every user is benefited.

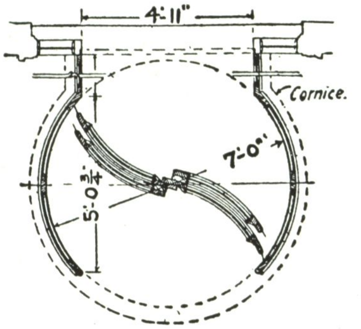
The "curved wing" is quoted at the actual extra cost, under a fixed policy, and is the best part of a revolving door investment.

Breakage—Breakage of "curved wing" glass is extremely rare. A replacement plate may be carried, or can be furnished promptly from stock, at cost.

Special Features of Full-folding Standard Type PB Doors

Folding—Standard folding Type PB wings fold aside in pairs, on pivots, in 30 seconds or less, as easily as ordinary swing doors, *without overhead ceiling slots* or carriages or floor casters, and lie entirely back of the enclosure wall points or chord line (drawing No. 164). Folded wings are always in place ready for instant use, yet are as much out of the way as if removed entirely, and take up none of the open passage space.

Locking Wings—Wings lock or unlock from inside or outside, in the diagonal position shown in drawing No. 92, at top and bottom, and each side, proof against entrance or injury by racking. They can also be fastened (to the ceiling only) in crosswise, quartering or lengthwise positions. Cylinder locks (master-keyed if desired) are standard equipment. These control the operation of the folding pivot locks.



No. 92. Floor Plan

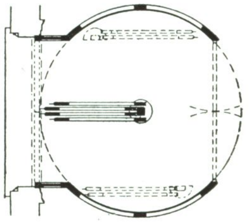
Semi-folding Type C Doors

Type C wings fold into one plane and fasten to ceiling only in a cross position for locking purposes, or lengthwise for passing traffic or objects. When revolving, they have exactly the same value as the more expensive types, and yet are low enough in price to be available where traffic does not justify the investment in the other type doors.

Type NLD Safety-exit Collapsible or "Panicproof" Doors

For entrances that are the sole exits for public assemblages or massed crowds (*not* offices, banks or hotels) use Type NLD doors, which can be opened under panic conditions, without knowledge of the mechanism, by simple and positive means, but which will positively not release under wind pressure or accidental jarring. Elsewhere these more expensive NLD wings should not be specified needlessly, as they are not in any way more up-to-date or more valuable for revolving or folded use. Instead of automatic releasing braces (which *can not* hold against wind pressure and jars, and at the same time give way under panic pressure), this type has a push-bar-release cable brace, with toggle tightener which takes up all slack in the braces and prevents rattling and breaking of braces.

Type NLD wings are carried by a novel link hinge, and can also be folded aside in pairs, just as the standard PB wings.



No. 165. Floor Plan Type NLD Safety Exit Door
Showing screen doors

See drawing No. 165, showing wings in folded and collapsed positions.

Specifications

"Furnish and install, where shown, Atchison 'curved [straight] wing' standard folding [safety-exit Type NLD] revolving doors, with mechanism to permit folding wings aside in pairs to lie entirely within curvature of enclosure walls, without projection at any point, as made by The Atchison Revolving Door Co., Independence, Kan. Hardware to be solid cast bronze, plain heavy design, polished [brushed] finish. Glazing to be American polished plate [$\frac{3}{16}$-in. crystal sheet]."

If collapsible doors are needed, specify in addition:

"'Wings' and mechanism to be the Atchison Type NLD safety-exit with push-bar-release cable brace and tightener, permitting egress under panic conditions without revolving."

Facilities

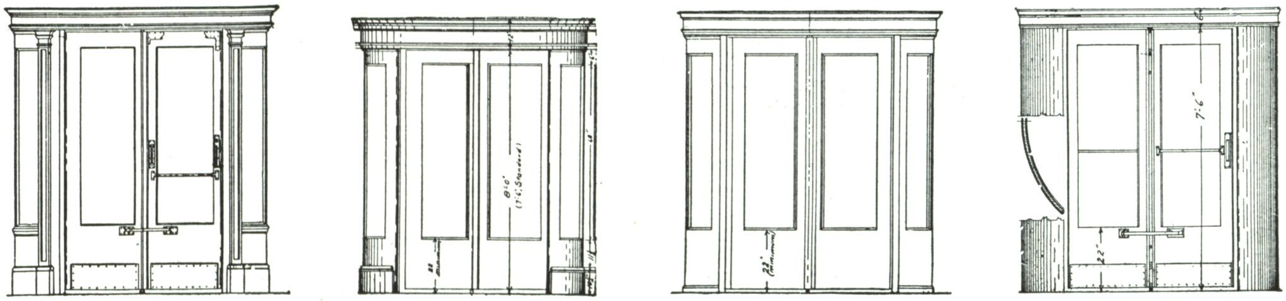
This company's plant is the largest revolving door factory in the world. It is of the sawtooth, concrete, motor drive type; and by reason of central location and favorable manufacturing conditions, it can ship advantageously to any part of the United States.

Estimates and Ordering

Agents can generally quote direct on stock designs or those shown below, but special doors must be quoted by factory. Send rough floor plan sketch of entrance and kind of material and finish. All doors are made to order because of numerous variations, and this company urges the placing of orders during spring and summer to get good deliveries and avoid the seasonal rush of fall and early winter.

References

Lists of thousands of doors all over the country, and Catalogue B, will be mailed on request.



No. 7 No. 91 No. 95 No. 167

Elevation Designs of Atchison Revolving Doors

VAN KANNEL REVOLVING DOOR CO.

TELEPHONES
Columbus 7623, 7624, 7625

250 West 54th Street
NEW YORK, N. Y.

REPRESENTATIVES

ALBANY, N. Y., 119 State St.
ATLANTA, GA., 227 Peachtree St.
BILLINGS, MONT., Fratt Bldg.
BIRMINGHAM, ALA., 848 Brown-Marx Bldg.
BOSTON, MASS., 1042 Little Bldg.
BUFFALO, N. Y., 519 Jackson Bldg.
CANTON, OHIO, 715 Shorb Ave., N. W.
CHARLESTON, W. VA., 209 Hale St.
CHATTANOOGA, TENN., 103 E. Sixth St.
CHICAGO, ILL., Tribune Tower
CINCINNATI, OHIO, 534 Main St.
CLEVELAND, OHIO, Keith Bldg.
COLUMBIA, S. C., 17 Carolina Bank Bldg.
COLUMBUS, OHIO, 145 North Front St.
DALLAS, TEX., 616 Slaughter Bldg.
DAYTON, OHIO, Schwind Bldg.
DENVER, COLO., 1740 Champa St.
DES MOINES, IOWA, 337 Insurance Exchange Bldg.
DETROIT, MICH., 400 Penobscot Bldg.
EL PASO, TEX., Neff-Stiles Co.
FARGO, N. D., 217 Broadway.
FORT WAYNE, IND., 312 Greeley St.
GREENSBORO, N. C., 113 E. Gaston St.
HARRISBURG, PA., 18th and Mulberry Sts.
INDIANAPOLIS, IND., 509 Lemcke Bldg.
JACKSONVILLE, FLA., 210 St. James Bldg.
KANSAS CITY, MO., 1532 Cherry St.
KNOXVILLE, TENN., P. O. Box 350.
LIMA, OHIO, 417 Opera House Block
LITTLE ROCK, ARK., 218 West 2nd St.
LOS ANGELES, CAL., 800 Hibernian Bldg.
LOUISVILLE, KY., 114 South Fourth St.
MEMPHIS, TENN., 216 Madison Ave.
NASHVILLE, TENN., 1025 Hamilton St.
NEW ORLEANS, LA., 319 Dryades St.
NORFOLK, VA., 235-37 Monticello Arcade Bldg.
OKLAHOMA CITY, OKLA., 200¼ West Reno Ave.
OMAHA, NEB., 707 South 27th St.
PHILADELPHIA, PA., 613 Otis Bldg.
PHOENIX, ARIZ., P. O. Box 145
PITTSBURGH, PA., 508 Century Bldg.
PORTLAND, ME., 31½ Exchange St.
PORTLAND, ORE., 61-7 Albina Ave.
RALEIGH, N. C., 313 South Wilmington St.
RICHMOND, VA., 203 Real Estate Exchange Bldg.
ROANOKE, VA., 522 McBain Bldg.
ROCHESTER, N. Y., Roesch Engineering Corp.
ST. LOUIS, MO., Century Bldg.
ST. PAUL, MINN., Builders Exchange Bldg.
SALT LAKE CITY, UTAH, 204 Dooly Bldg.
SAN ANTONIO, TEX., R. J. De Wees Co.
SAN FRANCISCO, CAL., C. J. Waterhouse & Sons Co., 55 New Montgomery St., Telephone, Garfield 6480
SEATTLE, WASH., 211 Douglas Bldg.
SHREVEPORT, LA., 310 Ricou-Brewster Bldg.
SIOUX FALLS, S. D., Boyce-Greeley Bldg.
SPRINGFIELD, ILL., 219 South Fourth St.
SYRACUSE, N. Y., 807 South Salina St.
WASHINGTON, D. C., 1756 M St., N. W.
WILKES-BARRE, PA., Miners Bank Bldg.
WINNIPEG, CAN., 145 Market St.

FOREIGN AGENT

UCHIDA TRADING CO., LTD., 291 Broadway, N. Y. (Agents for Japan and Korea)

Products

Three distinct types of Revolving Doors, known under the following terms: Automatic Collapsible, Panicproof Type; Standard "C" Rigid Brace Arm Type; Standard "N" Rigid Brace Arm Type.

Van Kannel Revolving Doors are manufactured in various styles, using the above types. The styles of doors are as follows: 3-Wing Revolving Door; 4-Wing Revolving Door and 6-Wing Revolving Door.

Also manufacturers of Van Kannel Revolving Pantry Windows (Patented).

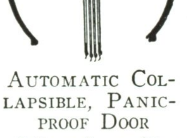
Original Patentee

This company is the pioneer manufacturer and original patentee of revolving doors; its patents cover every practical improvement and substantial feature.

Architects may spare their clients expense and embarrassment from patent litigation by specifying Van Kannel doors.

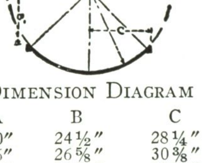
Van Kannel Revolving Doors

Automatic Collapsible, Panicproof Type—This type of door has 3, 4, or 6 wings hung independently of each other on a central shaft of metal and wings are held together by flexible cables. This type of door is rapidly superseding the old rigid brace arm type, owing to its feature of absolute safety at all times and under all conditions. Its safety feature lies in the fact that the revolving wings are so arranged that by application or pressure to any part of the revolving structure, slightly more than necessary to revolve door, the revolving wings will instantly and automatically collapse and fold outwardly in line of egress, leaving a free, unobstructed passageway.



Automatic Collapsible, Panicproof Door

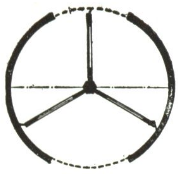
Collapsed position. Wings folded in line of egress in case of fire or panic



Dimension Diagram

A	B	C
6′0″	24½″	28¼″
6′6″	26⅝″	30⅜″
7′0″	28¾″	32½″
7′6″	30¾″	34⅝″
8′0″	32⅞″	36¾″

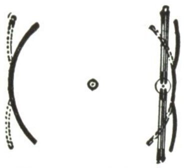
3-Wing Revolving Door—The 3-wing revolving door is especially adapted for entrances that are too small to accommodate a 4-wing door at least 6 ft. in diameter. It is being used to a great extent in entrances to toilet rooms in schools, institutions and public buildings and the company has installed 34 of these doors for the new Prudential building, Newark, N. J. Approximately, 5 ft. diameter.



3-Wing Revolving Door

Rigid Brace Arm Type, Styles "C" and "N"—These two types consist of either 3, 4 or 6 wings, held together in their radial position by rigid braces; wings are collapsed only by means of pressing a spring when it is desired to have doors open in the middle, or pushed to one side for a wide open passageway. These types, although collapsible as to folding of wings, are not automatically so, as in case of automatic collapsible, panicproof type of door previously described.

Hinged Wall Construction—The hinged wall construction may be used wherever greater exit space is desired. The hinged sections flex back automatically, and when used in connection with the automatic collapsible revolving wings represent the most perfect type of revolving door.



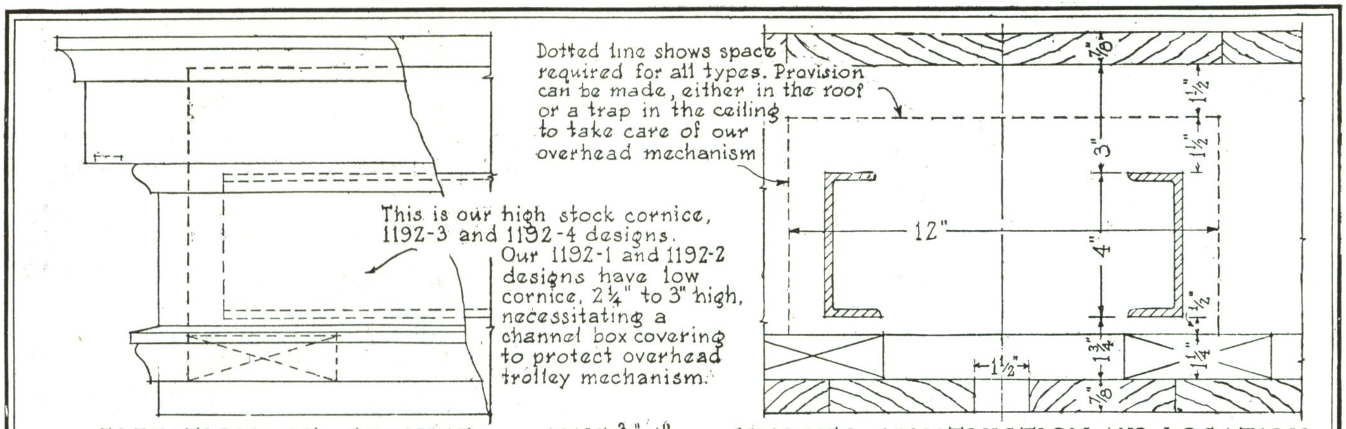
Hinged Wall Construction

Full open position. The position used for a wide open passageway and for moving in freight or for summertime use

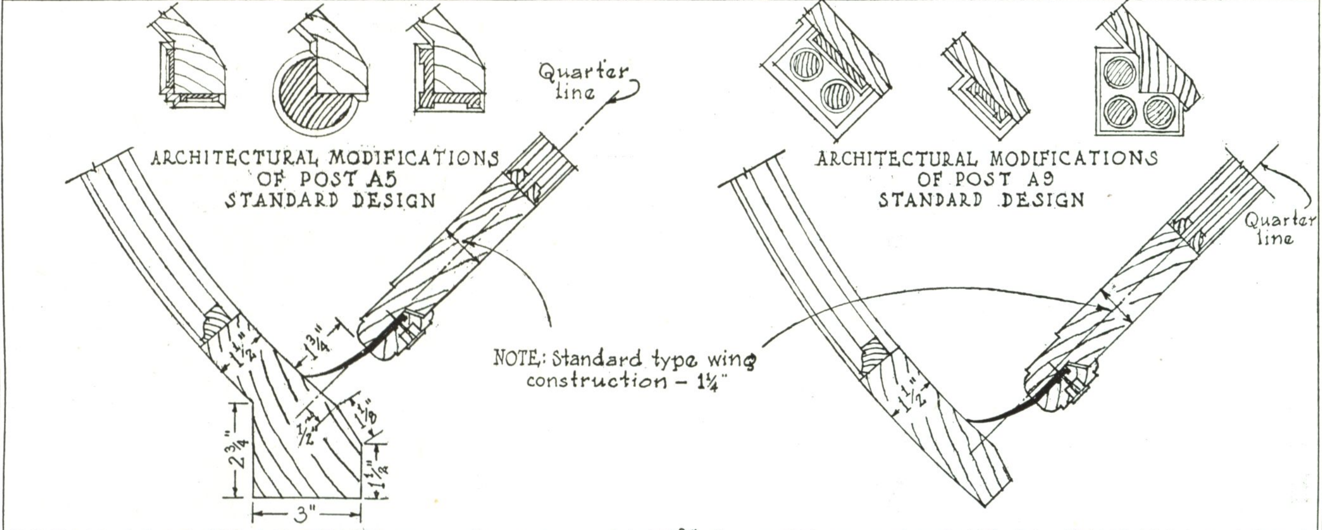
Materials—Materials used for entire construction are any kind of hardwood, bronze or steel on a metal frame or wood core covered with various gages of metals in either copper, steel or bronze, using the following gages—Nos. 24, 20, 16. Revolving door vestibules may be made of other materials such as marble, tile or cement, as may be needed in order to carry out architectural treatments.

Stock Designs—Several stock designs are carried on hand in plain oak and birch, on which practically immediate delivery can be quoted. See stock series and stock special doors as illustrated.

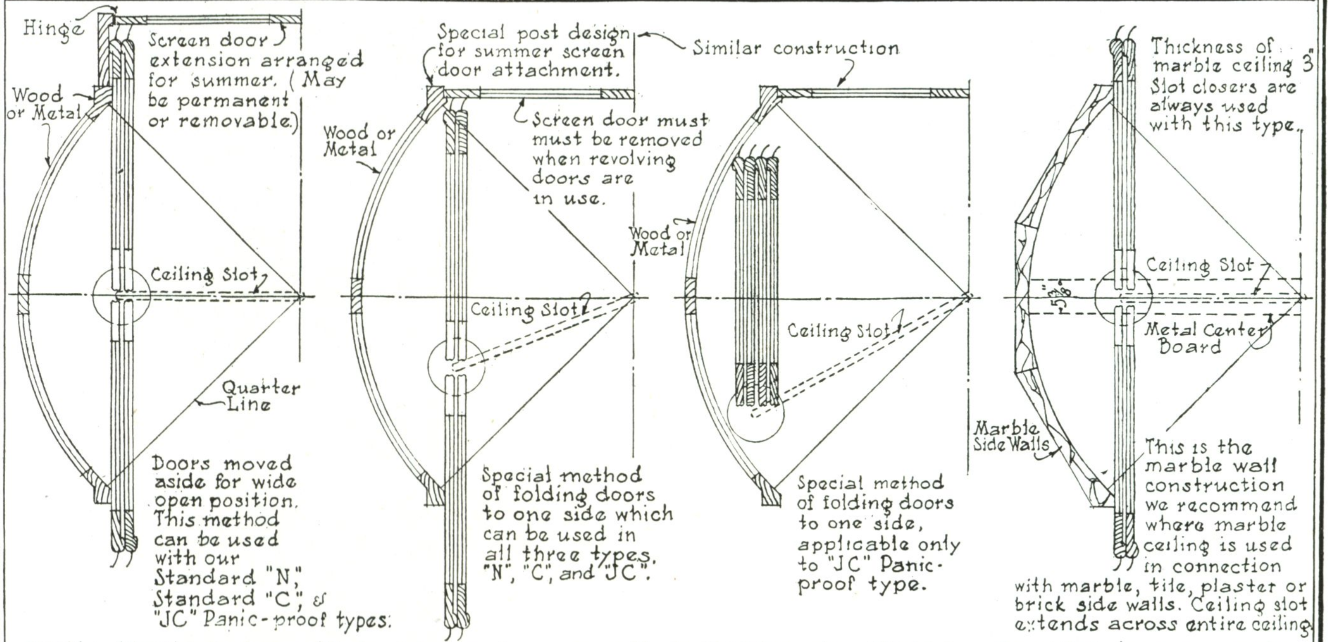
Continued on next page


Dotted line shows space required for all types. Provision can be made, either in the roof or a trap in the ceiling to take care of our overhead mechanism
This is our high stock cornice, 1192-3 and 1192-4 designs.
Our 1192-1 and 1192-2 designs have low cornice, 2¼" to 3" high, necessitating a channel box covering to protect overhead trolley mechanism.
7/8"
1½"
3"
1½"
12"
4"
1½"
1¾"
1¼"
1½"
7/8"

ELEVATION OF CORNICE SCALE 3/16"=1" CHANNEL CONSTRUCTION AND LOCATION


ARCHITECTURAL MODIFICATIONS OF POST A5 STANDARD DESIGN
Quarter line
ARCHITECTURAL MODIFICATIONS OF POST A9 STANDARD DESIGN
Quarter line
NOTE: Standard type wing construction – 1¼"
1¾"
1½"
1½"
1⅛"
2¼"
1¼"
3"
1½"

DETAIL OF POST A5 STANDARD DESIGN SCALE 3/16"=1" DETAIL OF POST A9 STANDARD DESIGN


Hinge
Screen door extension arranged for summer. (May be permanent or removable)
Wood or Metal
Ceiling Slot
Quarter Line
Doors moved aside for wide open position. This method can be used with our Standard "N", Standard "C", & "JC" Panic-proof types.
Special post design for summer screen door attachment.
Similar construction
Screen door must must be removed when revolving doors are in use.
Wood or Metal
Ceiling Slot
Special method of folding doors to one side which can be used in all three types, "N", "C", and "JC".
Wood or Metal
Ceiling Slot
Special method of folding doors to one side, applicable only to "JC" Panic-proof type.
Thickness of marble ceiling 3" Slot closers are always used with this type.
Ceiling Slot
5⅝"
Metal Center Board
Marble Side Walls
This is the marble wall construction we recommend where marble ceiling is used in connection with marble, tile, plaster or brick side walls. Ceiling slot extends across entire ceiling.

NOTE: Standard size vestibule giving maximum capacity is 7'-0" diameter, 7'-0 high. Revolving doors are made in 3-wing and 4-wing types. The 3-wing type vestibule ranges from 4'-8" to 6'-0" diameter, and the 4-wing type ranges from 6'-0" to 8'-0" diameter. Normal diameter 7'-0". We also make 6-wing type doors, but do not advocate their use.

VARIOUS TYPES OF VESTIBULE CONSTRUCTION TO PERMIT CONVENIENT FOLDING OF WINGS

CONSTRUCTION DETAILS OF THE VAN KANNEL REVOLVING DOOR

Continued on next page

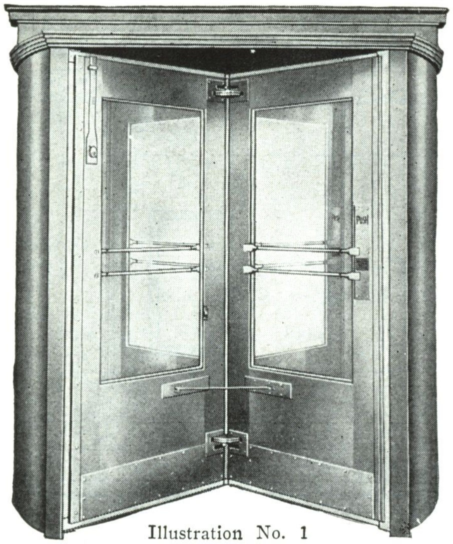


Illustration No. 1
Type JC Automatic Collapsible
Standard Design 1192-1
Material: bronze
Design 1192-1-U: vestibule finished inside only

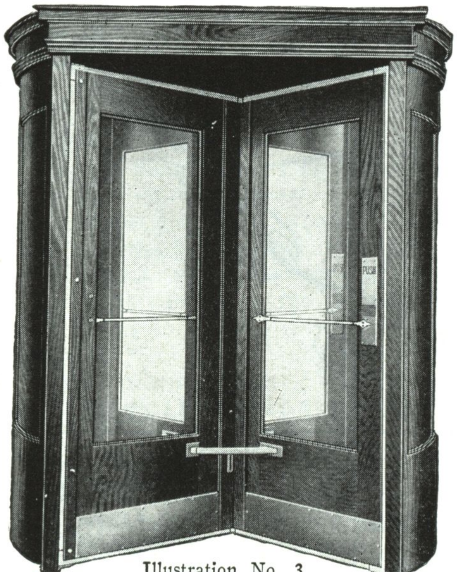


Illustration No. 3
Type C Rigid Brace Arm (Collapsible)
Standard Design 1192-3
Material: oak

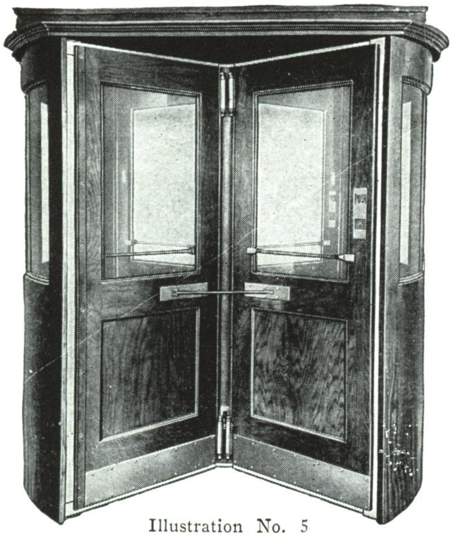


Illustration No. 5
Type Stock "VK" (Collapsible)
Design 6
Design 5: wood panels in sidewalls instead of glass
Material: birch or oak

Specifications for Standard Equipment

The revolving door contract to include the revolving wings, circular walls, ceiling and cornice, together with all necessary mechanism, hardware, push bars, push plates, key locks and kick plates. All glass, either bent or flat, to be best selected American polished plate.

Type JC, Illustrations No. 1 and 2—Furnish and install where shown on plans, revolving doors of the Van Kannel Revolving Door Co. make, Design [1192-1] [1192-2] [1192-3] [1192-4] (see illustrations 1 to 4) Automatic Collapsible. Material: (if wood) the kind selected to match surrounding trim; (if metal) either kalamein plate on wood core construction or hollow metal.

Type C, Illustration No. 3—Furnish and install where shown on plans, revolving doors of the Van Kannel Revolving Door Co. make, Design [1192-1] [1192-2] [1192-3] [1192-4] (see illustrations 1 to 4) Collapsible. Material: (if wood) the kind selected to match surrounding trim: (if metal) either kalamein plate on wood core construction or hollow metal.

Stock "Special" Illustration No. 4—Furnish and install where shown on plans, revolving doors of the Van Kannel Revolving Door Co. make, Design Stock "Special" Automatic Collapsible Panic Proof mechanism. Woodwork to be birch. Finish to match surrounding trim.

Stock "VK" Illustration No. 5—Furnish and install where shown on plans, revolving doors of the Van Kannel Revolving Door Co. make, Design Stock "VK" [6 S. P.] [5 S. P.] Collapsible, or Design Stock "VK" [6 A. P.] [5 A. P.] Automatic Collapsible. Woodwork to be plain oak or birch. Finish to match surrounding trim.

Stock "Series" Illustration No. 6—Furnish and install where shown on plans, revolving doors of the Van Kannel Door Co. make, Design Stock "Series" [No. 1S] [No. 2S] Collapsible. Woodwork to be white pine. Finish to match surrounding trim.

Type "N" Fixtures

This type of fixture may be applied to any 4-wing design of Van Kannel Revolving Door, made of any material. The four wings are held in their revolving position by means of metal brace arms in the form of hooks. When it is desired to fold the wings for any reason it is only necessary to unhook the brace arms and hook them back against the fixed wings, since all the four brace arms are attached to these wings by means of sockets. After the brace hooks are caught back, as above mentioned, the two hinged wings can be folded and the revolving door may assume positions illustrated on following page.

Literature

Send for our 24-page "Manual of Revolving Door Construction and Architectural Design."

Positions Assumed by Wings

Note on following page position assumed by wings of various types here shown.

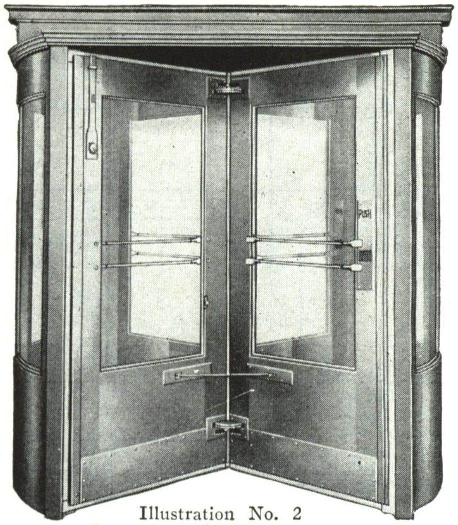


Illustration No. 2
Type JC Automatic Collapsible
Standard Design 1192-2
Material: bronze

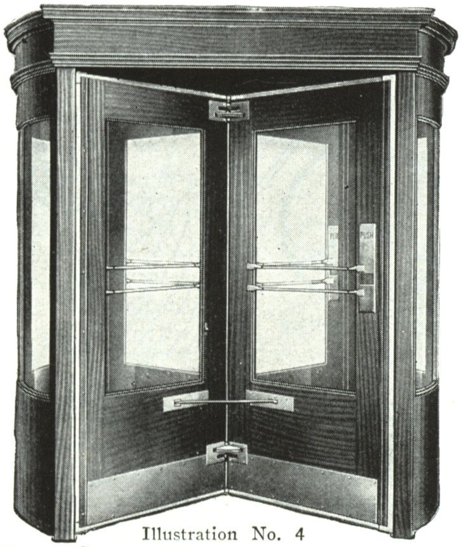


Illustration No. 4
Type Stock "Special" JC Automatic Collapsible Hardware
Standard Design 1192-4
Material: birch

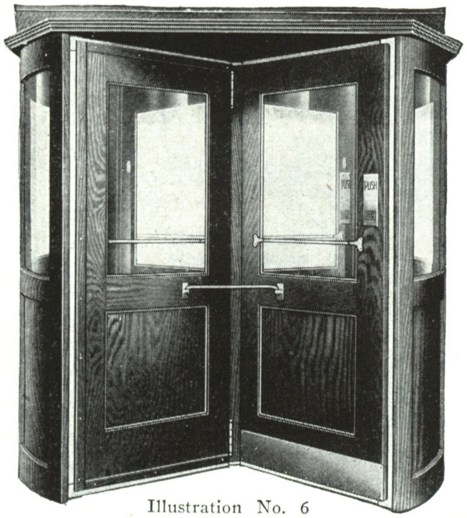


Illustration No. 6
Type Stock "Series" (Collapsible)
Design 2-S
Design 1S: wood panels in sidewalls instead of glass
Material: white pine

Continued on next page

Positions Assumed by Wings

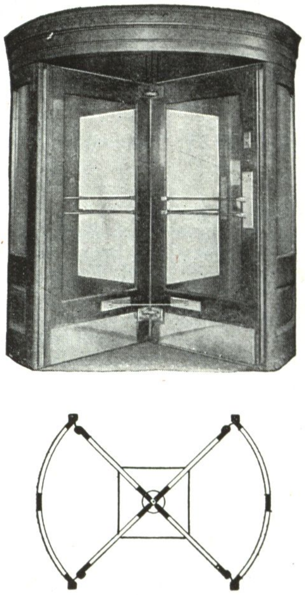


Fig. 1

Revolving Position

Four wings extended, permitting persons to pass in and out, at the same time excluding noise, rain and snow, heat and cold, wind and dust

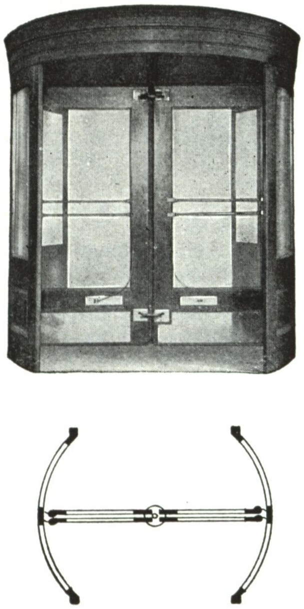


Fig. 2

Locked Position

Four wings folded in pairs and placed across vestibule, securely locked or bolted. Lock operates from both sides

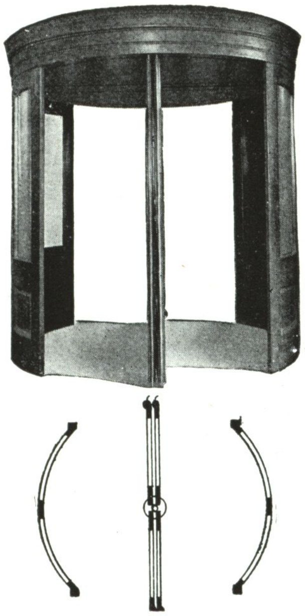


Fig. 3

Central Open Position

Wings folded flat in pairs and held in position by folding bars, making two passages separating traffic

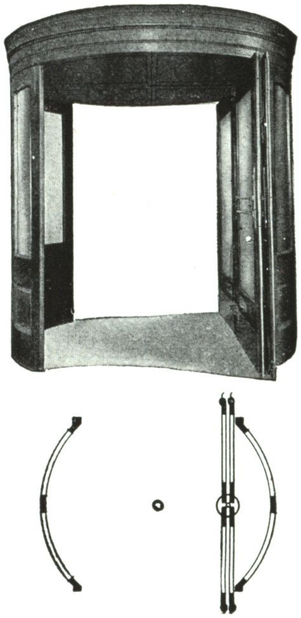


Fig. 4

Full Open Position

Wings folded and moved aside, making available full width of entrance

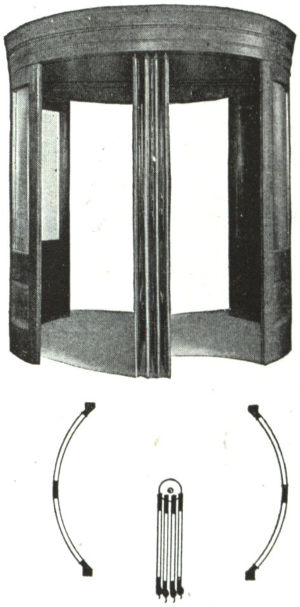


Fig. 5

Panic Collapsed Position

Wings folded on each other in outward position, dividing traffic into two streams

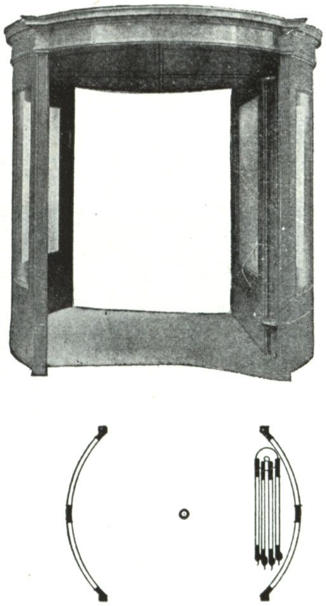


Fig. 6

Full Open Position with Wings Collapsed

Wings folded on each other and moved to one side making available full width of entrance

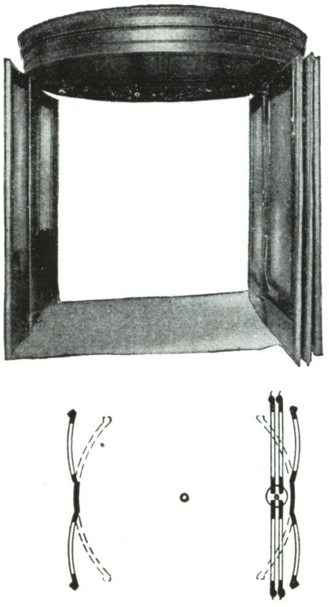


Fig. 7

Full Open Position with Flexed Walls

Wings folded and moved aside with hinged walls flexed for added space

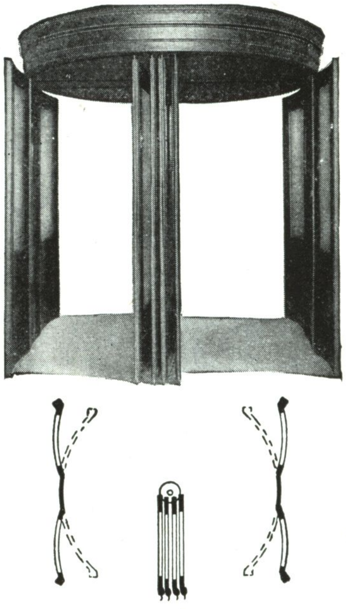


Fig. 8

Panic Collapsed Position with Flexed Walls

Wings folded on each other in outward position with walls flexed for added space

Positions Assumed by Wings—All Types of Doors

Note: One wing may also be folded at a time if desired.

Type Stock "Series"—Positions Nos. 1, 2, 3 and 4 assumed by wings.

Type Stock "VK"—Positions Nos. 1, 2, 3 and 4 assumed by wings.

Type Stock "Special"—Positions Nos. 1, 2, 3, 4 and 5 assumed by wings.

Type C Collapsible—Positions Nos. 1, 2, 3 and 4 assumed by wings.

Type N Collapsible—Positions Nos. 1, 2, 3 and 4 assumed by wings.

Type JC Automatic Collapsible—Positions Nos. 1, 2, 3, 4 and 5 assumed by wings.

Note A—Special trolley construction can be furnished which will permit wings to assume position shown in Fig. 6.

Flexed Walls—In order to provide added entrance space where desired, flexed wall construction can be furnished which will permit wings to assume postions shown in Figs. 7 and 8.

REVOLVING DOORS, INC.

TELEPHONE
CHICKERING 10300

556 West 27th Street
NEW YORK, N. Y.

OFFICERS

A. H. BURGESS, President   J. F. SCHWAB, Vice-President and Secretary   J. H. VALENTINE, Treasurer

DIRECTORS

A. H. BURGESS and W. D. MITCHELL (Directors of Jno. Williams, Inc.), and JOHN E. CARLSON (Manhattan Wood Working Co.)

Products and Services

Revolving Doors of every description and of any desired material.

Specialists in all Mechanical Devices as applied to Revolving Doors. Complete installations contracted for anywhere in the United States and Canada.

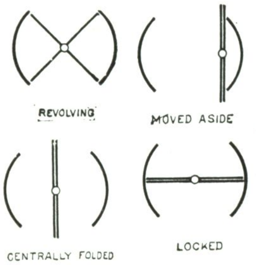
This company supplies Fixtures for Revolving Doors to manufacturers of cabinet work, kalamein work, hollow steel and architectural bronze work, together with construction details and, if desired, assembling and erecting labor.

Automatic Panicproof Revolving Door

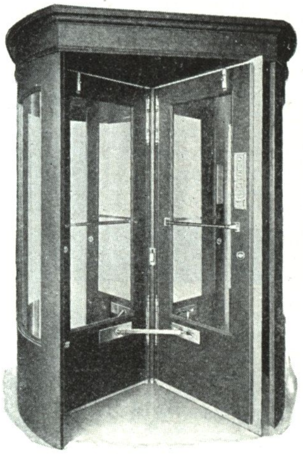
Wings are suspended from a universal ball bearing located in a dustproof oil chamber mounted on a carriage running on tracks. The wings can be folded centrally and moved to one side in the usual manner.

Each wing is hung to the center post with spring hinges, which hold it under spring control when the braces are detached, preventing slamming of the wings against each other and breaking the glass, which happens in other panicproof revolving doors.

The Slip-bar—The braces which hold the wings in rotating position are the vital feature of a panicproof door. This company uses neither cables nor chains, but manufactures the only slip-bar brace that pushes or pulls out under undue pressure. Brace is positive in action, durable, and conforms to all building and fire department regulations.



Diagrams of Different Positions of Wings



Standard Design No. 106, Panicproof Slip-bar Construction

Adaptable to slight architectural changes. Any material; any wood or hardware finish; kick plates and key locking bolts when desired

Some 1924-1925 Installations

See also previous issues of Sweet's.

New York, N. Y.

New York County Court House (5 doors), Center, Worth, Baxter and Pearl Streets, Guy Lowell, Architect—installed for John Polachek Bronze & Iron Co.

Madison-Belmont Building, Madison Avenue and 34th Street, Warren & Wetmore, Architects—Merchants & Manufacturers Exchange of New York, Contractors

Hotel Weylin, 54th Street and Madison Avenue, Schwartz & Gross, Architects

New York, N. Y.—(Continued)

Postum Building, 250 Park Avenue—National Park Bank, Donn Barber, Architect and J. H. Thorpe & Co.'s Store, Hiss & Weeks, Architects; Todd, Robertson, Todd Engineering Corp., Contractors.

Italian Savings Bank, Lafayette and Spring Streets, C. P. H. Gilbert, Architect; Lignante & Udall, Inc., Contractors

National City Bank, Park Avenue and 57th Street, Walker & Gillette, Architects

National Butchers & Drovers Bank, 685 Broadway, Wolins & Bull, Contractors

Seaboard National Bank, 20 E. 45th Street, Walker & Gillette, Architects

Silver's Cafeterias: 23 Beaver St., and Prudence Building, 43rd St. and Madison Ave., Benjamin H. Whinston, Architect

Brooklyn, N. Y.

Dime Savings Bank of Williamsburg, 209 Havemeyer Street, Dennison & Hirons, Architects; Roberts-Nash & Co., Contractors

Squibb Building, Columbia Heights, Doughty and Vine Streets, Russell G. Gory, Architect; Turner Construction Co., Contractors

Fulton Savings Bank, 375 Fulton Street, Lauritz Lauritzen, Architect; George N. Morrison Building Co., Contractors

Other Localities

Mineola, Long Island—Garden City Bond & Mortgage Co., Ernest S. Randall, Architect; Gillies, Campbell Co., Contractors

Atlantic City, N. J.—Ritz Carlton Hotel and Segal Building

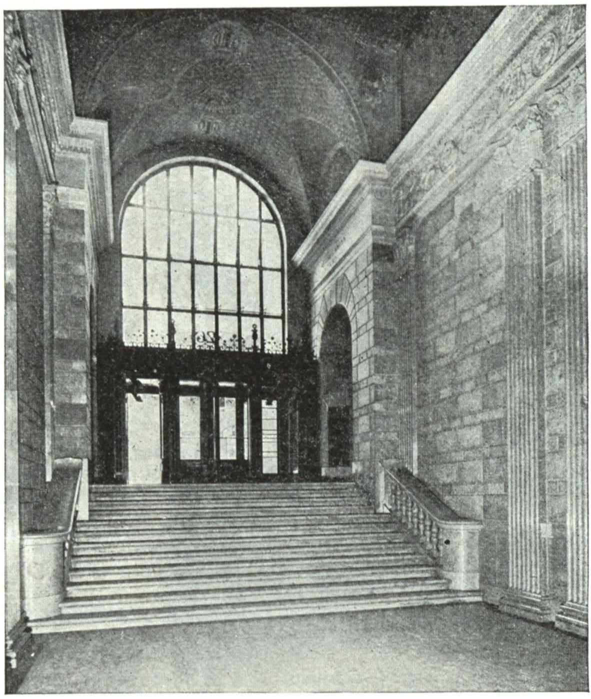
Toledo, Ohio—Security Savings Bank—installed by Dahlstrom Metallic Door Co.

Lancaster, Pa.—Griest Building, C. Emlen Urban, Architect; The Foundation Co., Contractors

Englewood, N. J.—Citizens National Bank, Geo. B. Post & Sons, Architects; R. H. Mackenzie, Contractor

Evansville, Ind.—Old National Bank Building

Windber, Pa., Eureka Stores Building, Windber Lumber Co., Contractors



Standard Oil Building, 26 Broadway, New York, N. Y.

Carrère & Hastings, Shreve, Lamb & Blake, Architects
One of the three steel revolving doors
Hand wrought and cast iron work by Jno. Williams, Inc.

THE AMERICAN BRASS COMPANY

Manufacturers of Ambrac Metal and Antique and Golden Bronze Screen Wire

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CHICAGO, ILL., 111 W. Washington Street
CLEVELAND, OHIO, Union Trust Building
CINCINNATI, OHIO, Dixie Terminal Building
DETROIT, MICH., General Motors Building
ST. LOUIS, MO., Planters Building
SAN FRANCISCO, CAL., 2 Pine Street

ANACONDA
from mine to consumer

Products

AMBRAC METAL (trade-mark registered U. S. Pat. Off.); ANACONDA ANTIQUE and GOLDEN BRONZE SCREEN WIRE.

For Anaconda Extruded Architectural Bronze Shapes, see pages *727-729*; for Anaconda Brass and Copper Pipe and Benedict Nickel Pipe, see page 1794; for Sheet, Roll and Strip Copper, see page 1124.

Ambrac Metal

Ambrac Metal is composed principally of copper and nickel. It is highly resistant to corrosion and as strong as mild steel. Its composition is accurately controlled, with the result that its structure is uniform and homogeneous.

Ambrac Metal was developed by THE AMERICAN BRASS COMPANY, after years of experimentation, to fill a long-felt need for a strong white metal highly resistant to corrosion.

Appearance—Ambrac Metal is white clear through, with a smooth surface and fine grain structure that will take an exceptionally high polish. It is slow to tarnish and easy to clean. On exposure it takes a silver-green tint that harmonizes with stone, brick and terra cotta.

Workability—Ambrac Metal, unlike many alloys sold for similar purposes, is not refractory, but very ductile and can be drawn, spun, or formed into any desired shape.

Engaging parts, such as window frames, can be made weathertight because the smooth surface permits easy sliding without binding.

Uses—Ambrac Metal is used for window, door and screen frames, grill work, kick plates, linings for sinks, cupboards, bins and similar case or cabinet work, and general metal trim.

Ambrac Metal is also used for washing machine cylinders and parts, and for other equipment coming in contact with alkalis, dilute acids, saline solutions and high temperatures.

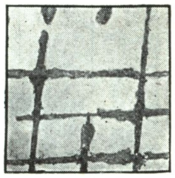
Bronze Wire for Screens

Anaconda Antique and Golden Bronze Wire is strong, tough and resists corrosion indefinitely. Developed over forty years ago by THE AMERICAN BRASS COMPANY, it has since been used by leading manufacturers for their best quality screens. Although THE AMERICAN BRASS COMPANY manufactures copper screen wire that gives very satisfactory service, the use of Anaconda Antique and Golden Bronze Wire is recommended for screens because of its greater strength.

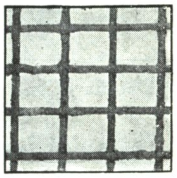
With reasonable care, screens made of Anaconda Antique and Golden Bronze Wire will last a lifetime. Instances where they have been in service over twenty-five years and are still in excellent condition, are not uncommon.

Comparative Corrosion Tests—Samples of various screen cloths were subjected to the continuous action of salt spray solution for six weeks, a test exceeding the most severe weather conditions.

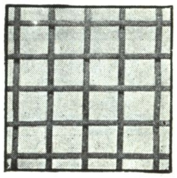
After six weeks of exposure to this test of weather resistance, the unpainted iron wire was completely destroyed by rust, and the galvanized iron was greatly weakened and unfit for service, but after the same period of exposure the Anaconda Bronze Wire was found to be strong and serviceable.



Unpainted Iron



Galvanized Iron



Anaconda Bronze

MESKER BROTHERS IRON COMPANY

Solid Steel and Hollow Metal Windows

ST. LOUIS, MO.

Products

Combination Hollow Metal and Solid Section Steel Windows, Double Hung and Counterbalanced, Labeled and Non-labeled.

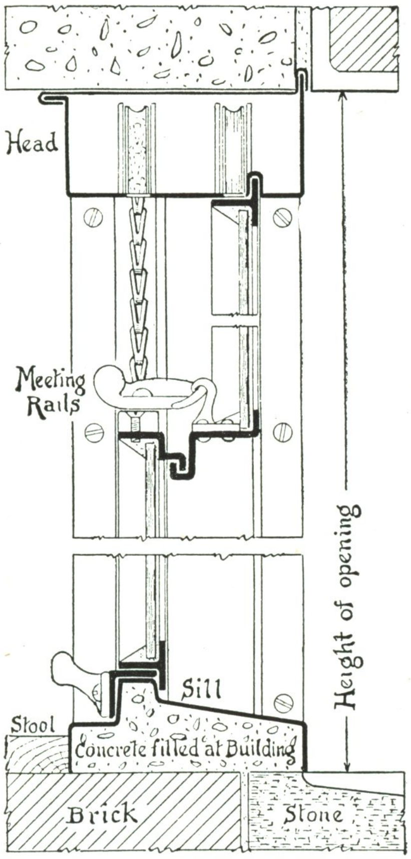
Underwriters' Labeled Hollow Metal Windows, Double Hung, Counterbalanced, Pivoted, Top Hinged and Casement.

For Steel and Concrete Stairs, see page 641; for Steel Casement and Basement Windows, see page 963; for Steel Sash, see pages 1000-1001.

Mesker Combination Solid Section and Rolled Steel Window, Double Hung Type

This class of window is recognized as being most desirable for large business houses. Also institutional, educational, and residential buildings.

Type—The double hung windows have sash properly balanced, and hung on heavy chains that pass over pulleys in the head and are secured to weights in the jambs.



Details of Installation of Non-labeled Window

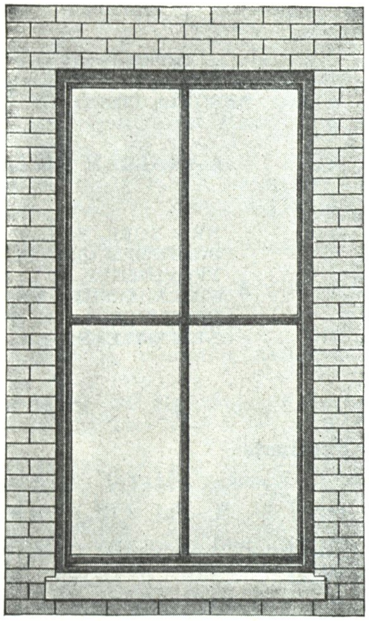
Construction—The frames are made of No. 16 to No. 20 gauge blue annealed steel or No. 24 gauge galvanized steel, or 18 to 48-oz. cold rolled copper. Sash are of solid section rolled steel, or solid, rolled bronze.

Sash Operation and Weathering—A plate is provided in the face of each jamb having grooves to receive the projecting flanges of the sash. The sash operating vertically in these grooves with silent movement have perfect weathering against wind, dust, and rain.

Weights—Access to weights is obtained by the removal of the groove plates in the jambs.

Glass — Long vertical lights, without horizontal muntins are permitted in non-labeled windows. One pane to each sash may be used, but two or three panes is preferable for large openings. The glass is held in place with steel glazing clips and steel sash putty.

Hardware—Plated or solid bronze hardware is furnished as desired or specified.



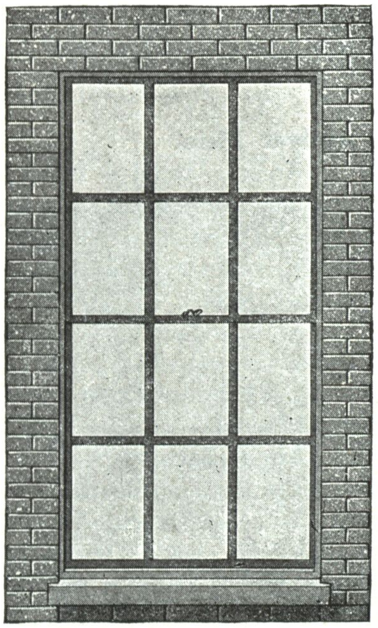
Mesker Non-labeled Window

Mesker Underwriters' Labeled Combination Rolled Steel Window Double Hung

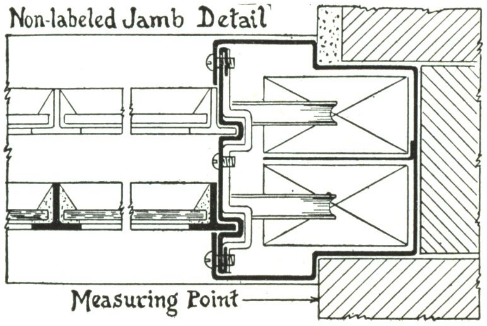
Frames are of No. 15 gauge steel or No. 24 gauge galvanized steel. Sash are of solid section rolled steel.

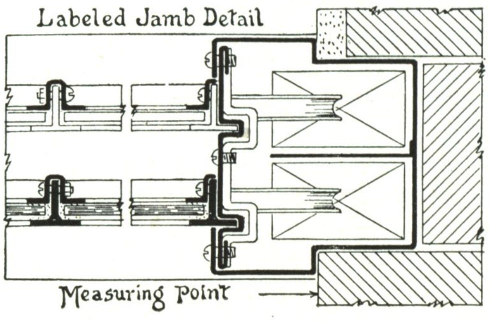
Labels—These windows are specially designed and constructed to meet the requirements of the National Board of Fire Underwriters' specifications. Each window is rigidly inspected at the factory before the label is attached.

Glass—Horizontal and vertical muntins are necessary in labeled windows to divide the lighting area into panes not to exceed 350 sq. in. each.



Mesker Labeled Window





Glazing Caps—Special steel glazing caps are provided for holding the glass in labeled sash. These are secured to the muntins with bolts or split rivets.

Painting — Windows receive one priming coat of paint before leaving the factory.

Continued on next page

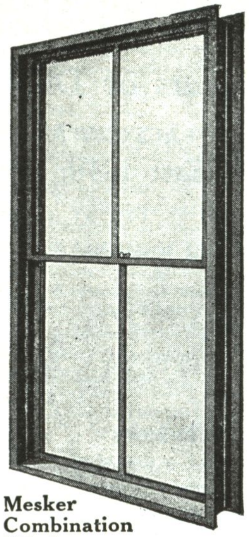
Mesker Combination Solid Section and Rolled Steel Window, Counterbalanced Type

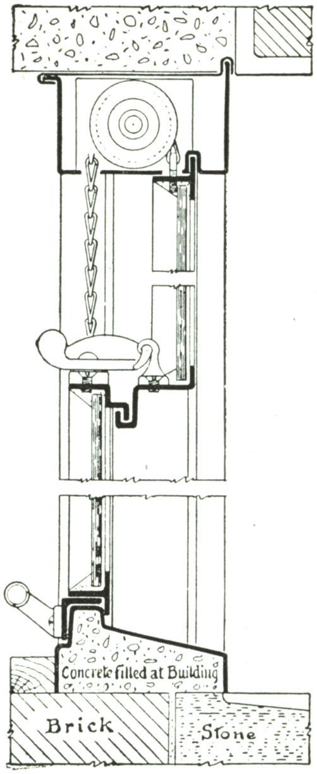
Types—Counterbalanced type, labeled or non-labeled, as may be desired.

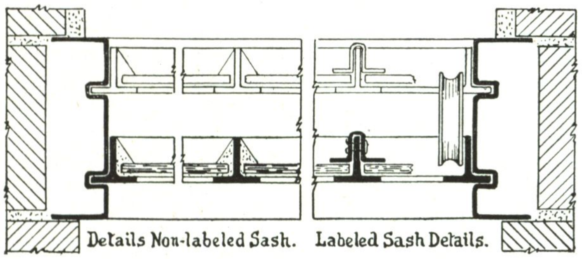
Material—Frames of labeled window are made of No. 15 gauge blue annealed steel. Sash are of solid section rolled steel. Frames of non-labeled windows are of No. 24 gauge galvanized steel or No. 16 gauge blue annealed steel.

Desirableness—The promptness of the general public to adopt the counterbalanced window for lighting and ventilating large or small buildings is accounted for by the practical operation and the ready ventilation of the window itself. The sash are balanced one against the other over pulleys in the head, requiring no counterweights. They permit 50% ventilation.

Glass and Glazing—Non-labeled sash have large lights, glazed with steel clips and putty, but labeled windows have panes not exceeding 350 sq. in. and are glazed with steel caps and split rivets.


Mesker Combination Window


Concrete filled at Building
Brick
Stone
Vertical Cross Section Counterbalanced Window


Details Non-labeled Sash.
Labeled Sash Details.

Mesker Fireproof Hollow Metal Windows

Approved by the National Board of Fire Underwriters. Suitable for new and old buildings. Designed along the same lines and contain the same glass area as wood windows. Frames and sash of No. 24 gauge galvanized steel or 20-oz. copper. Concreting of subsill must be done at building.

Underwriters' label is a guarantee that windows comply with every requirement and are accepted everywhere by rating bureaus as standard. Removal and replacement of sash is accomplished as easily as in wood windows, an important cost factor.

Glass—Must not exceed 720 sq. in. exposed area per light and no light longer than 54 in., except for windows in street elevations where such light is limited to 2916 sq. in.

Transoms—Hinged, pivoted or stationary types may be used over all windows or multiples. Transom bars are all sheet metal for windows 10 ft. high and under.

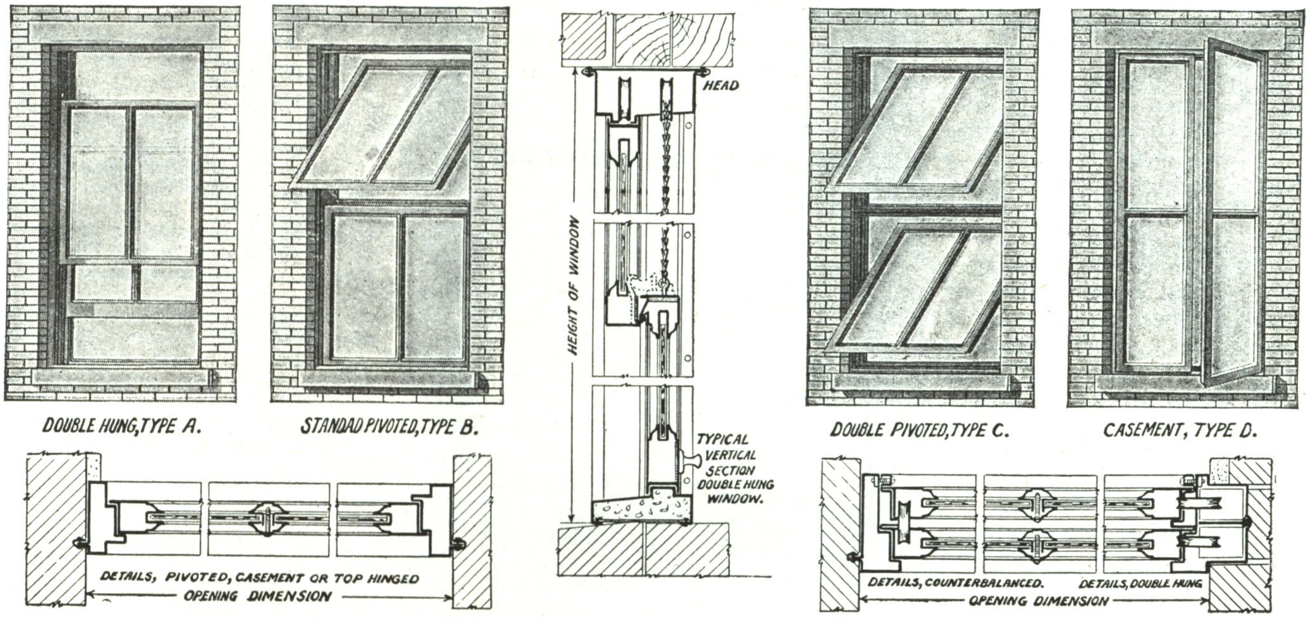
Mullions—Non-bearing character. Made of No. 16 gauge galvanized steel and limited to 12 ft. high. They must extend 3 in. down into sills and same distance up into brick arches where segments are used.

For square head windows, mullions must be attached to lintels with knees and bolts.

Hardware—Windows supplied complete, including hardware, sash weights and chains, fusible links for pivoted windows, ¼-in. rough ribbed maze, prism or polished wire glass cut accurately to size and boxed separately.

TYPES AND MAXIMUM OPENINGS

Type A double hung	5x10 ft.	Type D double casement	5x10 ft.
Type B standard pivoted	5x10 ft.	Type E single pivoted	5x 5 ft.
Type C double pivoted	5x10 ft.	Type F single top hinged	5x 5 ft.


DOUBLE HUNG, TYPE A.
STANDAD PIVOTED, TYPE B.
HEAD
HEIGHT OF WINDOW
TYPICAL VERTICAL SECTION DOUBLE HUNG WINDOW.
DOUBLE PIVOTED, TYPE C.
CASEMENT, TYPE D.
DETAILS, PIVOTED, CASEMENT OR TOP HINGED
OPENING DIMENSION
DETAILS, COUNTERBALANCED.
DETAILS, DOUBLE HUNG
OPENING DIMENSION
Mesker Fireproof Hollow Metal Windows

S. H. POMEROY CO., INC.

Manufacturers of Double Hung Metal Windows

FACTORY AND GENERAL OFFICES
282-296 East 134th Street, NEW YORK, N. Y.

LOCAL REPRESENTATIVES

BOSTON, MASS., Skillman & Sunderland Co., 1042 Little Building
BUFFALO, N. Y., E. H. Wood, 316 Jackson Building
CINCINNATI, OHIO, L. D. Zellner, 516 Mercantile Library Building
CLEVELAND, OHIO, The Mills Co., 5320 St. Clair Avenue
DETROIT, MICH., J. W. Rollinson, 712 Polk Directory Building
LOS ANGELES, CAL., J. A. Fraters Co., 440 Commercial Street
NORFOLK, VA., W. L. Rocke & Co., 636 Law Building
PHILADELPHIA, PA., Thos. S. Gassner Co., 4545 Wayne Avenue
PITTSBURGH, PA., Larsen, Brown & Co., 507 Ferguson Building
RICHMOND, VA., James S. Archer, 202 Davis Building
ST. LOUIS, MO., H. C. Morrison Co., 2011 Railway Exchange Building
WASHINGTON, D. C., and BALTIMORE, MD., A. B. Gilbert, 712 Insurance Building

Pioneer Manufacturers of Metal Windows

The S. H. Pomeroy Co. Inc., was a pioneer manufacturer of metal windows, and has been engaged in perfecting their design and adaptability for over 25 years, during which time many prominent installations have been made.

"Superior" Double Hung Metal Window

Superior Metal—This window is made throughout of hot dipped galvanized copper-bearing steel. It is painted with a special galvanized iron primer made to our order. Pulleys are bronze brushed. Chains are sherardized steel. Lifts are solid bronze. Locks are malleable iron sherardized and plated to finish desired. *The "Superior" window is also made in bronze metal.*

Note: Of copper-bearing steel the American Society for Testing Materials in 1921 made the following report:

"Copper-bearing metal shows marked superiority in rust resisting properties as compared to non-copper-bearing metal of substantially the same general composition, from which superiority we may truly anticipate a marked increase in the service life for copper-bearing metals under atmospheric exposure of uncoated sheets."

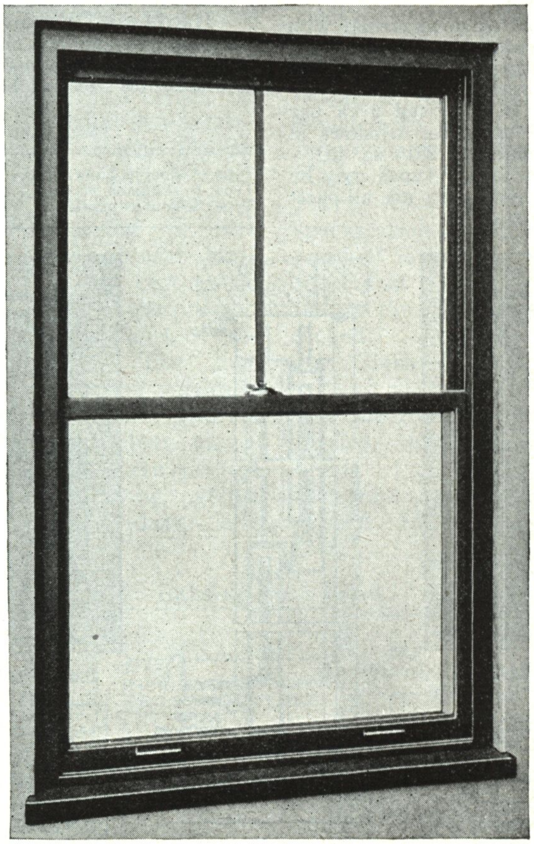
Superior Distribution of Metal—The sill is of No. 16-gauge; side rails of sash and inside muntin cap of No. 18-gauge; pulley stiles of No. 22-gauge and balance of window of No. 24-gauge galvanized steel. This is a correct distribution of metal. It places heavy metal where it is required—that is in the sill and working portions of the sash—and light metal where it is sufficient for the purpose it performs.

Heavy metal throughout a window, regardless of the function it has to perform, is a waste of metal and money.

Superior Weathering—Each side rail has an inside and outside weatherstrip operating in corresponding grooves in pulley stile. The upper and lower sashes have inside and outside point of contact with head and sill. Meeting rails are interlocking with two points of contact, one inside and one outside.

Superior Light—Face of hanging stile 1⅛ in. wide. Face of sash rail 1¼ in. wide. Total distance from mason jamb to glass line 2⅜ in. Distance from lintel to glass line of upper sash 3¼ in.; width of meeting rail 1¾ in.; height of glass line of lower sash above sill 4 in.; making a total light loss of only 9 in.

Width of standard muntin 1 in. Width of Underwriters' muntin 1¾ in.



"Superior" Double Hung Metal Window, Interior View

Superior Appearance—The illustration shows the narrowness and simplicity of the lines throughout. The thickness of the sash is 1¼ in., in which is incorporated a mould adding a simple character to the window. Also the absence of rivets, screw heads and bolts—Interior screws are countersunk.

Superior Economy—In the "Superior" window we offer to the building public, wherever located, a double hung metal window of unequaled merit and at a price so surprisingly close to wood windows that their use must now become universal.

Specifications for "Superior" Double Hung Metal Window

General—The contractor shall provide and install where shown on the drawings, hollow metal double hung windows, they shall be "Superior" Type as manufactured by S. H. Pomeroy Co. Inc., of New York City.

Material—Sills shall be constructed of No. 16-gauge, side rails of sash and inside muntin caps of No. 18-gauge, pulley stiles of No. 22-gauge and balance of No. 24-gauge, all of copper-bearing hot dipped galvanized steel.

Frame Construction—Head, jambs and sill shall each be constructed of one piece of metal exclusive of closure strips. All members shall be formed straight and true, neatly mitred, lapped and properly interlocked to their respective intersecting parts. Outside hanging stile of jamb shall be flat and 1⅛ in. wide. The room side of jamb shall be flat and 3¾ in. wide. The frame shall be 6⅝ in. from inside to outside.

Pulley stiles shall be formed with deep weathering grooves and shall be removable to permit of access to weight boxes and pulleys. Pulley stiles shall be held in position by three (3) flat head countersunk screws. These screws shall be in the center of the pulley stile and pass through reinforcing plates spanning the inside of the jamb. Besides these three screws no other screws, nuts, bolts or rivets shall appear in the inner face of the jamb or soffit of the head with the exception of the screws holding the pulleys in position.

Continued on next page

Sash Construction—Sash shall be 1¼ in. thick. Side rails shall extend 1¼ in. beyond the inner face of the jamb making the total distance from the masonry jamb to the sight line of glass 2⅝ in. Stiles and rails shall be constructed of one piece of metal neatly mitered, lapped and properly interlocked. Side rails shall be of open construction with each flange projecting into and operating in the weathering grooves of pulley stiles. Top and bottom sash rails shall be formed with flanges which shall engage in weathering grooves in the soffit of the head and on the top of the sill. Meeting rails shall be 1¾ in. wide and be constructed with flanges forming interlocking contact.

Side and bottom rails of sash shall have glazing grooves ¾ in. deep. Upper rails shall have grooves 1⅜ in. deep.

Where sash have single lights, the side rails shall be constructed with removal inside glazing beads which shall be held in place by flathead countersunk machine screws.

Muntins—Exterior members shall be moulded and shall be reinforced with No. 14-gauge steel lugs. Interior caps shall be flat and held in place by flat head countersunk machine screws passing through the reinforcing lugs of the exterior member.

Hardware Equipment—Frames shall be equipped with bronze bushed pulleys held in place by fillister head screws in upper portion of jamb face. Sash shall be hung on substantial sherardized steel sash chain and properly balanced by cast iron weights. Sash shall be equipped with one pair of solid bronze moulded lifts, malleable iron bronze plated sash lock and pole socket.

Painting—Frames and sash throughout shall be given one priming coat of approved metallic paint before delivery.

Note: If Underwriters' label is desired the following paragraph should be added.

"Windows shall be constructed in accordance with the requirements of the National Board of Fire Underwriters and shall bear their label of approval as well as the label of the manufacturer."

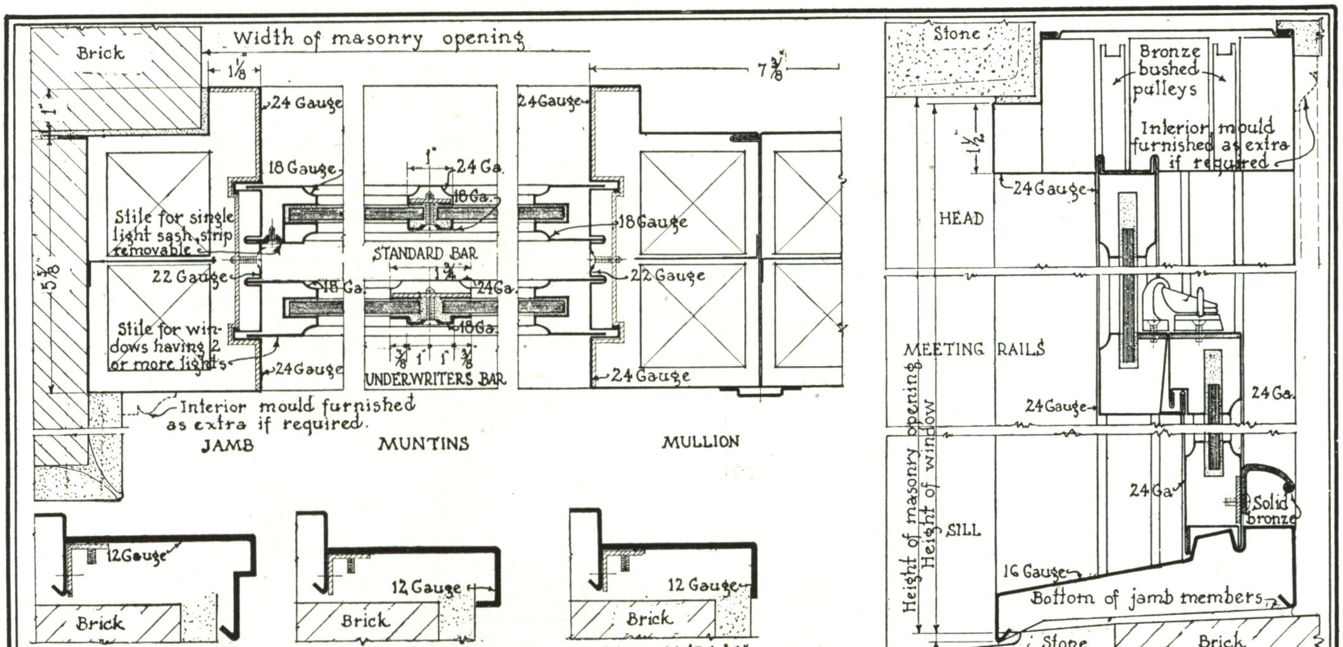
Note: Where windows are to be made of bronze, substitute the following paragraph for "Material."

"Sills shall be constructed of No. 15 B&S gauge; side rails of sash and inside muntin caps of No. 16 B&S gauge; pulley stiles of No. 19 B&S gauge; balance of window of No. 22 B&S gauge bronze with the exception of head closure strip and dividing strip between weights which shall be of No. 24 gauge black iron."

PROMINENT INSTALLATIONS OF "SUPERIOR" WINDOWS

Type	Building and location	Number of windows	Architect	Builder
Bank Buildings	Farmers Loan & Trust Co., 41st St. and 5th Ave., New York, N. Y.	*850	Starret & Van Vleck	Rheinstein Const. Co.
	Harriman National Bank, 44th St. and 5th Ave., New York, N. Y.	291	G. A. & H. Boehm	Emil Diebitsch
	Passaic National Bank, Passaic, N. J.	140	H. L. Walker	Hegeman-Harris Co.
	Peoples Trust Co., Flatbush, Brooklyn, N. Y.	104	Ludlow & Peabody	John Lowry, Inc.
Office Buildings	Silk Centre, Fourth Ave. and 32nd St., New York, N. Y.	644	McKim, Meade & White	Todd, Robertson & Todd
	578 Madison Avenue, New York, N. Y.	510	Donn Barber	Fred T. Ley & Co.
	Park Pl. and East Park St., Newark, N. J.	898	Polhemus & Coffin	Military Park Const. Co.
	Court and Remsen Sts., Brooklyn, N. Y.	1065	Schwartz & Gross	Bricken Const. & Imp. Co.
	Furniture Exchange, 33rd St. and Lexington Ave., New York, N. Y.	900	Buchman & Kahn	G. Richard Davis & Co.
	Aeolian Bldg., 5th Ave. and 54th St., New York, N. Y.	*227	Warren & Wetmore	James Baird Co. Inc.
	Real Estate Board Bldg., 10-14 E. 41st St., New York, N. Y.	344	Starret & Van Vleck	G. Richard Davis & Co.
	Professional Bldg., Pittsburgh, Pa.	334	L. N. Davis	Henry Shenk Co.
	1 State St., Boston, Mass.	319	Mowll & Rand	Olympia Const. Co.
	44th St. and Madison Ave., New York, N. Y.	251	Jardine, Hill & Murdock	Fred T. Ley & Co.
	232 Madison Ave., New York, N. Y.	612	Polhemus & Coffin	Arthur Greenbaum
	Security Insurance Bldg., New Haven, Conn.	144	Henry Killam Murphy	C. T. Wills, Inc.
Loft Buildings	8th Ave., 36th to 37th Sts., New York, N. Y.	1350	Schwartz & Gross	Frank & Frank
	38th St. and 8th Ave., New York, N. Y.	900	Gronenberg & Leuchtag	Lanabel Realty Co.
	56 W. 47th St., New York, N. Y.	673	Schwartz & Gross	Bricken Const. & Imp. Co.
	245-49 W. 27th St., New York, N. Y.	656	Wm. I. Hohauser	Estey Const. Co.
	President Monroe Bldg., Prince and Lafayette Sts., New York, N. Y.	587	Sugarman & Berger	Jos. G. Siegel
	8th Ave. and 26th St., New York, N. Y.	520	Geo. & Edw. Blum	26th St. & 8th Ave. Corp.
	236 W. 30th St., New York, N. Y.	454	Geo. & Edw. Blum	Henry M. Weitzner
Apartment Houses	510 Park Avenue, New York, N. Y.	800	F. H. Dewey-Y. Matsui	Starret Bros.
	Rittenhouse Apartments, Philadelphia, Pa.	79	Sugarman, Hess & Berger	Longacre Eng. & Const. Co.
Hotels	Cornish Arms Hotel, 311-23 W. 23rd St., New York, N. Y.	653	Walter H. Jackson	Equity Construction Co.
	National Bible Institute, 340 W. 55th St., New York, N. Y.	448	McKenzie, Voorhees & Gmelin	John Lowry, Inc.
	Whitehall Hotel, Palm Beach, Fla.	346	M. L. Hampton & E. A. Ehman	Longacre Eng. & Const. Co.
	Campbell Hotel, Poughkeepsie, N. Y.	252	C. W. Edwards	Geo. D. Campbell
	Hendrick Hudson Hotel, Troy, N. Y.	130	Clarence L. Harding	Ernest F. Carlson Co.

*Note: These windows are in bronze metal.


Width of masonry opening
Brick
1⅛
7⅞
1"
5⅝"
24 Gauge
18 Gauge
24 Ga.
18 Ga.
1"
18 Gauge
Stile for single light sash, strip removable
STANDARD BAR
1¾
22 Gauge
18 Ga.
24 Ga.
22 Gauge
Stile for windows having 2 or more lights
18 Ga.
24 Gauge
⅜ 1 1 ⅜
UNDERWRITERS BAR
24 Gauge
Interior mould furnished as extra if required
JAMB
MUNTINS
MULLION
12 Gauge
Brick
STOOL & APRON TYPE A
12 Gauge
Brick
STOOL TYPE B
12 Gauge
Brick
STOOL TYPE "C"
Stone
Bronze bushed pulleys
Interior mould furnished as extra if required
1½
24 Gauge
HEAD
MEETING RAILS
24 Gauge
24 Ga.
Height of masonry opening
Height of window
24 Ga.
Solid bronze
SILL
16 Gauge
Bottom of jamb members
Stone
Brick

3 IN. SCALE DETAILS OF POMEROY ~"SUPERIOR"~ DOUBLE HUNG METAL WINDOW

VOIGTMANN & COMPANY

Manufacturers of Metal Windows

TELEPHONE
Spaulding 1015

4158-4220 Schubert Avenue
CHICAGO, ILL.

Products

Metal Windows, all types; labeled by Underwriters' Laboratories, Inc.

New Type No. 24 Gauge Double Hung Metal Window with Narrow Margins, Labeled by the Underwriters

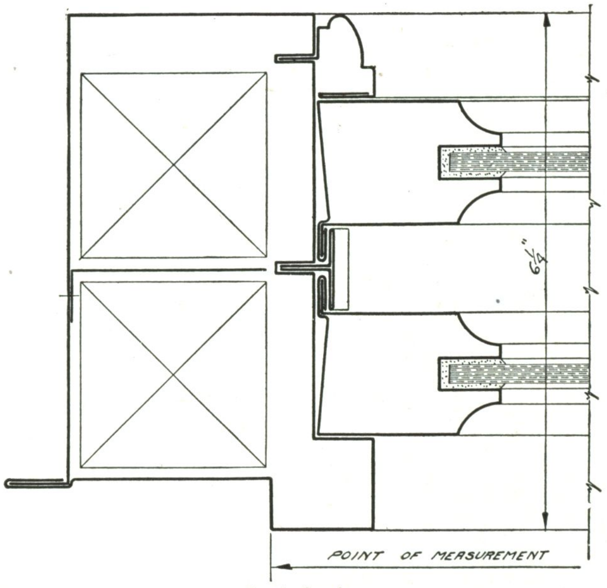
Voigtmann & Company now offer this improved hollow metal window as an addition to their well-known line of metal windows.

There has been a demand for a hollow metal double hung window of small and neat members thereby getting away from the old style, bulky appearing windows that have been on the market for years. In designing this window our Engineering Department has met this demand by combining neat members and narrow margins of metal, making a window that presents an architecturally correct and attractive appearance in every way.

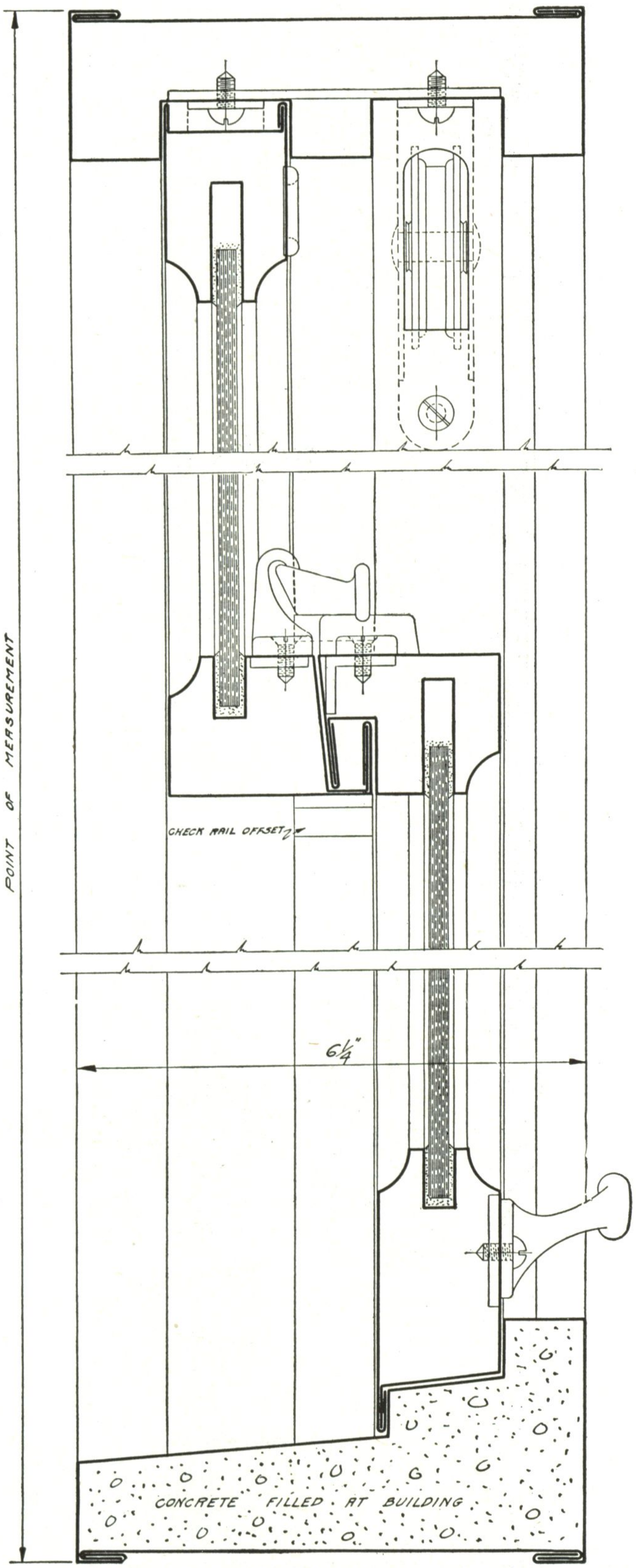
A careful study of the accompanying detail will show an excellent system of weathering and scheme of operation, superior to the ordinary types of hollow metal windows now on the market.

Hardware—Voigtmann special removable pulleys. Sash locks, lifts and pole socket malleable iron brass plated. Special hardware can be furnished at slight additional cost.

Specifications—All frame and sash members made of No. 24 gauge tight coated hot galvanized steel. Sash weights hung on extra heavy steel chain. Sashes to operate easily and be weathertight.



Jamb Section



Vertical Section

Details of the Voigtmann No. 24 Gauge Double Hung Window

Continued on next page

No. 14 Gauge Metal Window—Hot Galvanized

This window has been developed by Voigtmann & Company to meet the demand for a high grade heavy gauge metal window of moderate cost, combined with weathertightness and correct architectural appearance. Sash operates easily, which makes it especially suitable for all classes of modern buildings.

Particular attention is called to the brass running guides and weatherstripping as shown on jamb detail. This particular feature insures excellent weathering and easy operation.

Hardware—Voigtmann special removable pulleys, sash lock, lifts and pole socket, malleable iron, brass plated. Special hardware can be furnished in accordance with architects' specifications at slight additional cost.

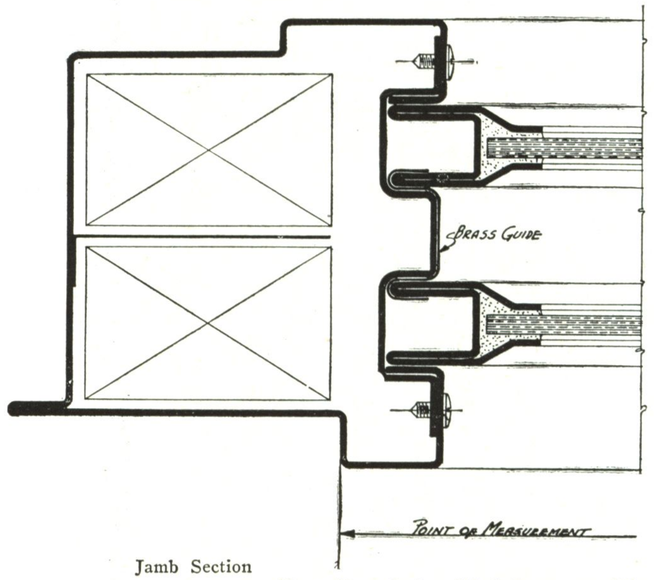
Services and Estimates

Voigtmann & Company offer the services of competent engineers and draftsmen who will be able to aid with suggestions for incorporating Voigtmann work in plans and specifications. The services of this department are at the disposal of architects to aid in solving problems in connection with hollow metal windows.

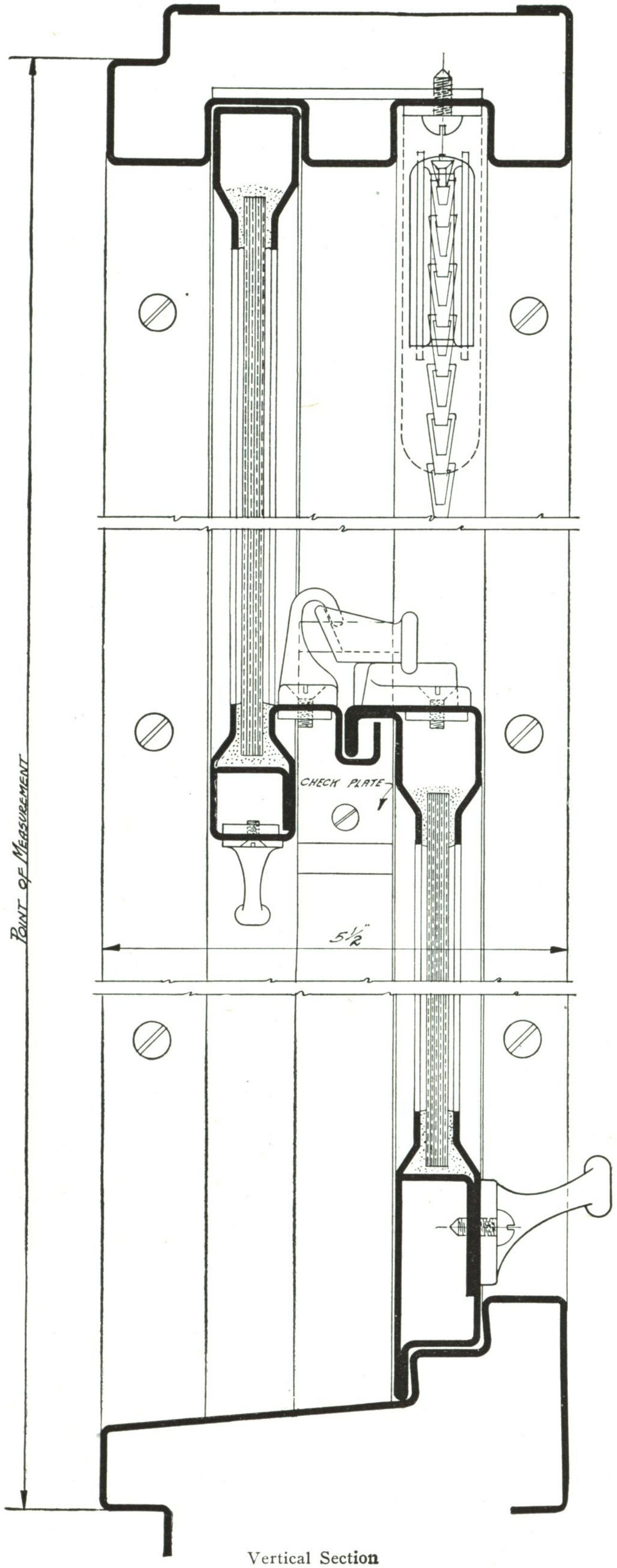
A Few Recent Installations

Including number of windows installed:

Mayo Hotel, Tulsa, Okla.; George Winkler, Architect, 864
Sherman House, Chicago, Ill.; Holabird & Roche, Architects; George A. Fuller Co., Builders, 409
Temple Building, Chicago, Ill.; Holabird & Roche, Architects; John Griffiths & Sons Co., Builders, 310
Detroit Free Press, Detroit, Mich.; Albert Kahn, Architect; Crowell & Little Construction Co., Builders, 803
Pacific Telephone & Telegraph Company, Fresno, Cal.; Bliss & Faville, Architects, 122
Fireman's Fund Insurance Building, San Francisco, Cal.; Weeks & Day, Architects, 199
Public Service Building, Los Angeles, Cal.; Loy L. Smith, Architect, 404
Pacific Finance Building, Los Angeles, Cal.; Curlett & Beelman, Architects; Scoffield Engineering and Construction Co., Builders, 607
Barker Brothers Building, Los Angeles, Cal.; Curlett & Beelman, Architects, 323
Metropolitan Building, Detroit, Mich.; Rapp & Rapp, Architects; Lundoff-Bicknell Company, Builders, 286
Abraham Lincoln Hotel, Springfield, Ill.; Helmle & Helmle, Architects; Caldwell & Evans Construction Co., Builders, 426
Michigan Bell Telephone Co., Kalamazoo, Mich.; Smith, Hinchmann & Grylls, Architects; A. J. Dekoning, Builder, 128
Michigan Bell Telephone Co., Detroit, Mich.; Smith, Hinchmann & Grylls, Architects; W. E. Wood Company, Builders, 161



Jamb Section



Vertical Section

Details of the Voightmann Type "A" Double Hung Window

THE WILLIS MANUFACTURING COMPANY

INCORPORATED 1891

Manufacturers of Hollow Metal Windows and Tin Clad Fire Doors

HOME OFFICE and FACTORY

GALESBURG, ILL.

Products

Hollow Metal Windows of all types; Tin Clad Fire Doors and Hardware.

Approvals

All types of Willis hollow metal windows and tin clad fire doors have been tested and approved by the National Board of Fire Underwriters.

Hollow Metal Windows

The Willis hollow metal window is made in all types including, double hung, single pivoted, double pivoted, top hinged, casement and stationary. Double hung with pivoted, hinged or stationary transoms.

Our approved mullion may be employed when it is necessary to use more than one single unit in an opening.

Tin Clad Fire Doors

Two-ply and three-ply, wood core, tin clad doors of the sliding or swinging type for any kind of opening.

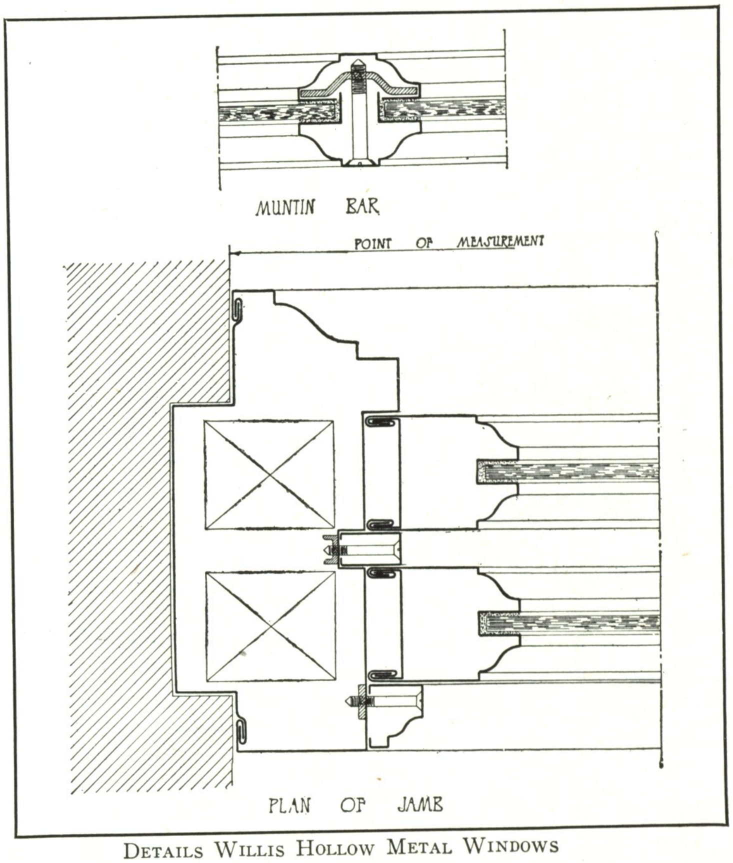
Specifications for Hollow Metal Windows

All hollow metal windows shall be those manufactured by The Willis Manufacturing Company of Galesburg, Ill., or such other make that will comply in every respect with their design and construction.

Metal used throughout shall be No. 24 gauge tight coated galvanized, as required by the Underwriters' Laboratories, Inc., and shall be copper bearing. Heads, jambs and all sash rails shall be constructed of one piece of metal each, excepting back covers. All covers to be carefully and securely locked to their respective members. Heads and jambs shall have a moulded brick or staff bead and shall be properly constructed for building into brick, stone or terra cotta walls. All members must be carefully formed and miters neatly cut, lapped and riveted. Where two sash members lap on an exposed surface, the under member shall be offset the thickness of the metal to permit of a smooth and even surface to insure perfect operation of the sash.

Pulley stiles shall each be formed accurately to provide for perfect operation of the sash. Each jamb to have a weight pocket of ample size to permit of easy application of the sash weights. Weight pockets to have a removable cover which will fit tight and which will not offer obstruction to the sash in their operation.

Sash rails to be neatly mitered and riveted. All sash to be carefully fitted into the frames at the factory to insure perfect operation and a weathertight job. Meeting rails to lock tightly together when both sash are closed to insure strength and weathertightness. Glass rabbets on all side and bottom rails to be ¾ in. deep and on top rails 1½ in. deep. Sash to be divided with muntin bars into lights as required by the Underwriters' Laboratories, Inc., or as shown on the plans. Muntins to have re-



Details Willis Hollow Metal Windows

Continued on next page

movable caps to permit of glazing without removing sash from the frames. The outside section of the muntin to be securely fastened to the sash rails by rivets and reinforced every 12 in. with a steel, tapped plate. The inside muntin section to be secured to the outside section by means of screws passing through the reinforcing plates. Both sections of the muntin to be moulded to conform with the sash rails.

Hardware to consist of substantial ball bearing pulleys fastened in place in the jambs by means of screws passing through plates riveted on the inside of jambs. Sash shall be hung on heavy sherardized sash chain, approved by the Underwriters' Laboratories, Inc., and counterbalanced with sectional weights. All pulleys shall be placed in jambs in such a manner that they may be removed and replaced without disturbing other parts of the window. Sash shall be equipped with pole socket, bar lifts and underwriters' approved malleable iron lock, dead black, bronze or brass plated finish. Plates to be attached inside sash rails with rivets for attaching hardware.

Sash shall be glazed with ¼-in. wire glass (specify kind) thoroughly embedded in putty.

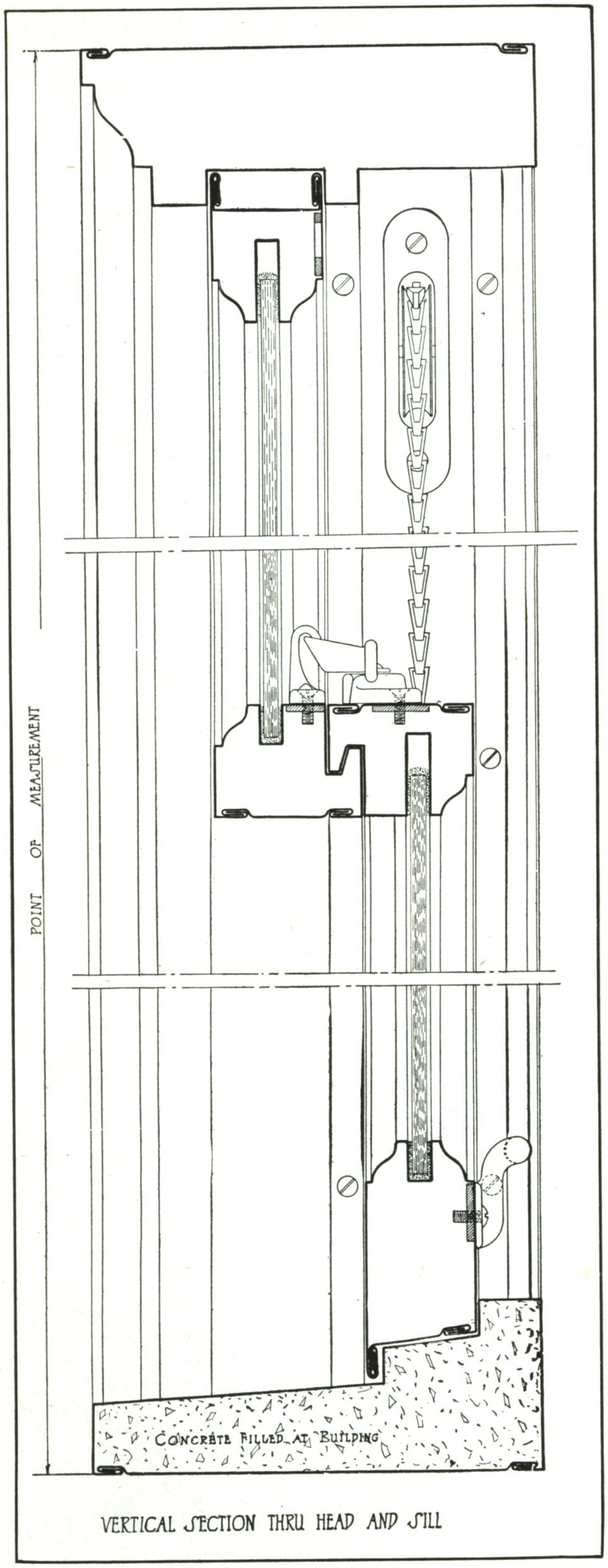
All metal shall have one shop coat of an approved metallic paint before leaving the factory.

All windows shall be constructed in accordance with the specifications of the National Board of Fire Underwriters and shall meet their requirements in every respect. All windows shall bear the underwriters' labels as well as those of the manufacturer.

Note: In sending in specifications be sure to furnish all necessary information such as type of window wanted, brick opening size, style of head, whether square or segment, division of glass in sash and kind of glass wanted.

Installations

Insurance Exchange Building, Des Moines, Iowa
Masonic Temple Building, Davenport, Iowa
Gordon Square Buildings, Cleveland, Ohio
La Salle Hotel, La Porte, Ind.
Warden Apartment Building, Ft. Dodge, Iowa
Tri-State Hotel, Memphis, Tenn.
State National Bank Building, Houston, Tex.
Elks Club Building, Philadelphia, Pa.
Elks Club Building, Wichita, Kan.
Arlington Hotel, Hot Springs, Ark.
Trenton Trust Building, Trenton, N. J.
Broad Street Bank Building, Trenton, N. J.
Rockford National Bank Building, Rockford, Ill.
Kentucky Hotel, Louisville, Ky.
Scottish Rite Building, Wichita, Kan.
Penn Hotel, Houston, Tex.
First National Bank Building, Huntington, W. Va.
Venetian Hotel, Miami, Fla.
Floridian Hotel, Miami, Fla.


POINT OF MEASUREMENT
CONCRETE FILLED AT BUILDING
VERTICAL SECTION THRU HEAD AND SILL

Details Willis Hollow Metal Window

CRITTALL CASEMENT WINDOW COMPANY

DETROIT, MICH.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue
CLEVELAND, OHIO, Builders' Exchange
ATLANTA, GA., 1520 Healey Building
CINCINNATI, OHIO, 708 Gerke Building
LOS ANGELES, CAL., 616 South Utah Street
KANSAS CITY, MO., 409 Orear-Leslie Building
CHICAGO, ILL., 105 West Monroe Street

Products

Crittall Solid Steel and Bronze Universal Casement Windows.

Crittall Standard Steel Casements.

Crittall Reversible Windows.

CRITTALL PATENTED 50 UNIVERSAL
TRADE-MARK

Catalogs

Architects are welcome to the following catalogs:

No. 25 Universal Casements (76 pages)
No. 2-24 Standard Steel Casements (20 pages)
No. 1-24 Reversible Windows (20 pages)

Crittall Solid Steel and Bronze Casements

Uses—For banks, public buildings, residences, churches, universities, office buildings, clubs, hospital operating rooms, etc.

Material—The weight of sections, heavy or medium, shall be determined by manufacturer's best standards as set forth on page 46 of catalog 25. All steel used in the manufacture of these sash shall be Crittalloy—the copper bearing steel—containing not less than 0.15% nor more than 0.30% copper in order to resist rust. All bars shall be hydraulically straightened and free from hammer marks or other imperfections.

Painting—All steel shall receive two coats of rust resisting paint, each coat baked on separately.

Weathering—The sections shall be so designed as to give double contact on all sides without the use of pressed or screwed on fillets or strips of any kind.

Welding—All corners shall be mitered and electrically welded. Plates to receive hardware must be securely welded to the casement sections.

Hardware—All hardware shall be solid bronze, government mixture, toned a dark coinage color, this color secured without the use of plating or chemicals. (Transoms in [describe location] shall be fitted with mechanical operators to operate from floor.)

Note: Specially designed hardware in bronze or hand wrought iron may be specified when desired.

Glazing—All sash shall be fitted with *solid* rolled steel glazing stops for glazing from the inside. Glazing stops shall be mitered at the corners and shall be held in place by countersunk brass screws. (Alternate: All sash shall be fitted with copper covered spring clips for putty glazing from the outside.)

Design—Sash shall be made to the design and sizes shown on the elevations and details. Ventilating units are marked on elevations with dotted diagonal lines; all other units to be fixed or stationary.

Erection—These windows shall be set by the manufacturer and all joints between the steel sash and the collateral construction are to be made tight with the use of Crittall Mastic Cement neatly painted on the exterior.

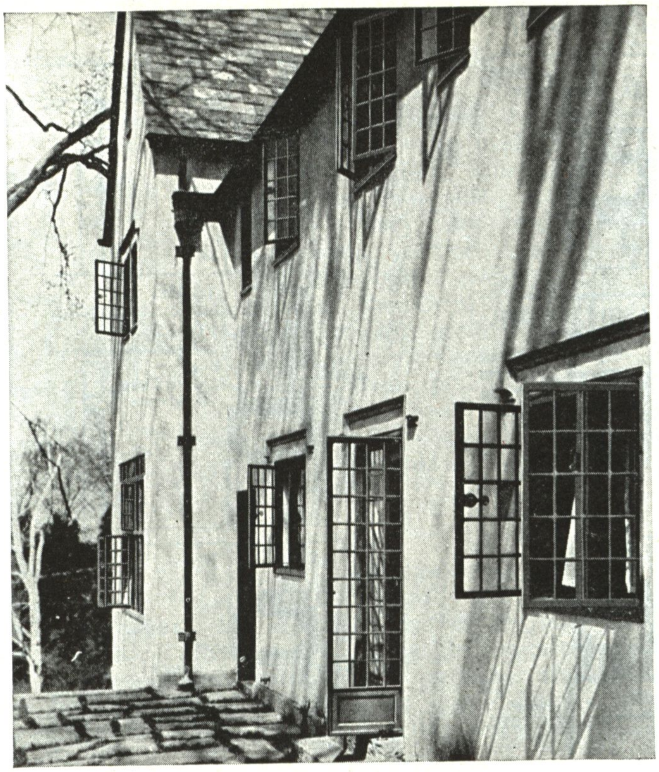
(Describe here whether the windows set in 3/8-in. rabbeted stone, wood or cast iron frames, or are fitted with angle fin for setting directly into masonry, or are to set into rabbeted No. 12 gauge pressed metal frames to be furnished by the casement manufacturer but to be built in as the walls go up.)

NATIONAL MANUFACTURERS BANK

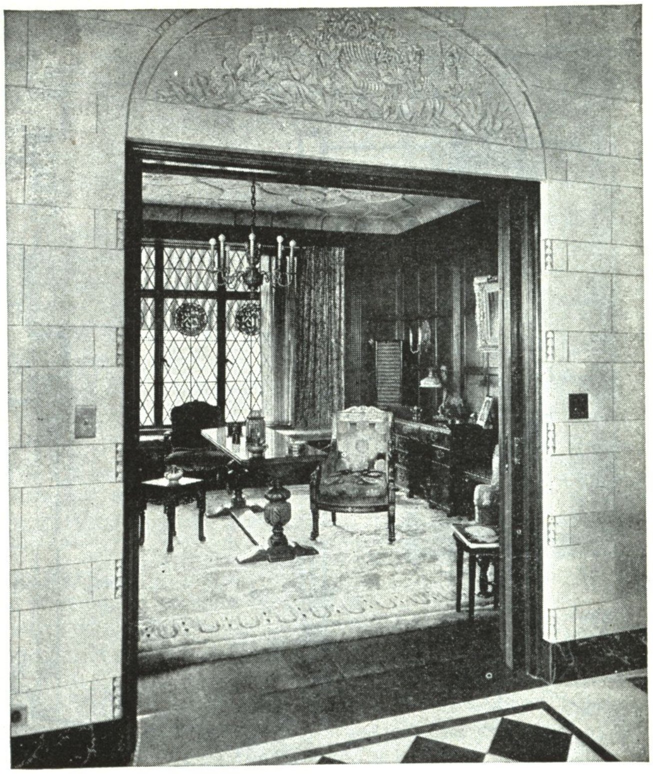
National Manufacturer's Bank
Neenah, Wis.

Childs & Smith,
Architects

Continued on next page

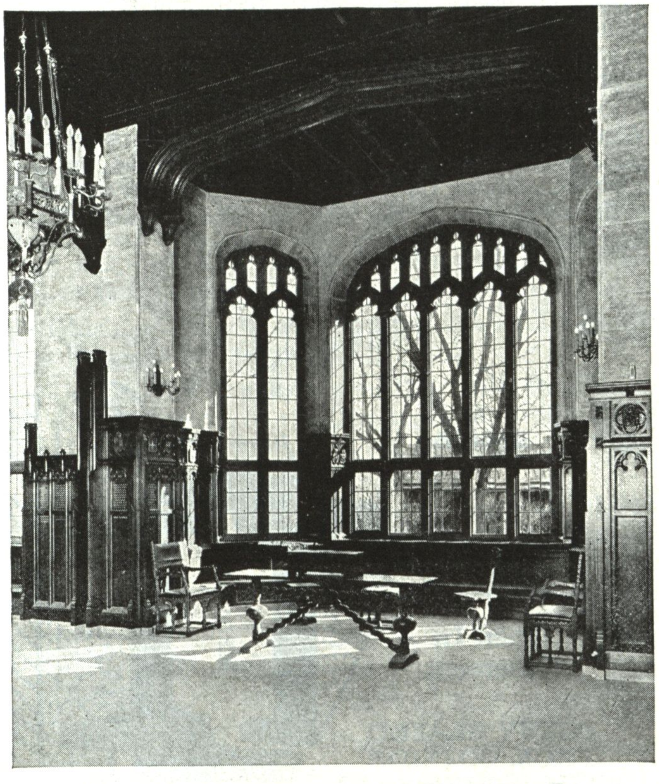


R. F. Hermann, Residence, Tarrytown, N. Y.
E. J. Lang, Architect



John A. Hoagland, Residence, Newark, N. J.
Charles A. Luckhurst, Architect

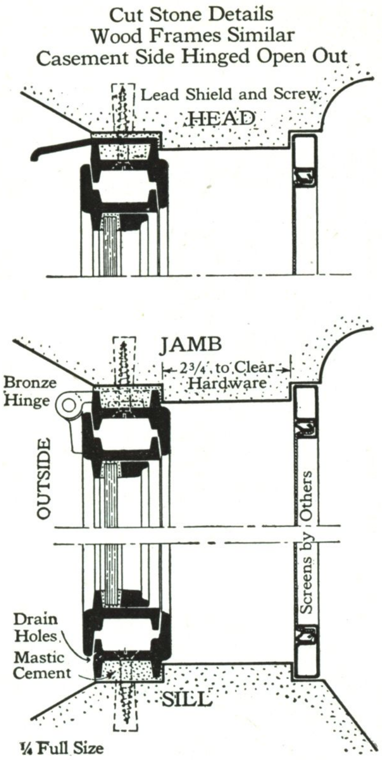
A FEW TYPICAL INSTALLATIONS OF CRITTALL STEEL CASEMENTS



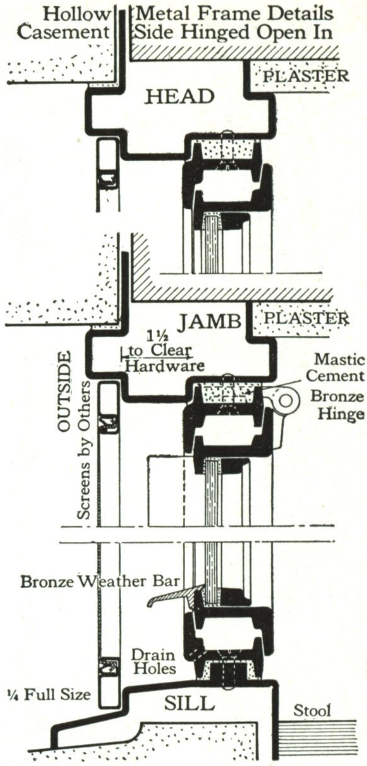
Memorial Hall, Hill School, Pottstown, Pa.
Hewitt & Ash, Architects

Great Hall, Cunard Building, New York, N. Y.
Benjamin W. Morris and Carrere & Hastings, Architects

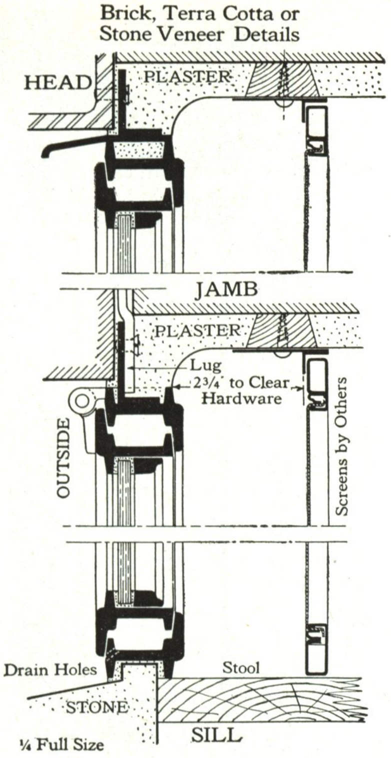
Continued on next page


Cut Stone Details
Wood Frames Similar
Casement Side Hinged Open Out

Lead Shield and Screw
HEAD
JAMB
2¾" to Clear Hardware
Bronze Hinge
OUTSIDE
Screens by Others
Drain Holes
Mastic Cement
SILL
¼ Full Size


Hollow Metal Frame Details
Casement Side Hinged Open In

PLASTER
HEAD
JAMB
PLASTER
1½ to Clear Hardware
Mastic Cement
Bronze Hinge
OUTSIDE
Screens by Others
Bronze Weather Bar
Drain Holes
¼ Full Size
SILL
Stool


Brick, Terra Cotta or
Stone Veneer Details

HEAD
PLASTER
JAMB
PLASTER
Lug
2¾" to Clear Hardware
OUTSIDE
Screens by Others
Drain Holes
Stool
STONE
SILL
¼ Full Size

Details—The details shown above can be varied to suit any given conditions. Wood frames, mullions and transom bars may be used in a detail very similar to the cut stone shown.

In place of the 12 gauge hollow metal frames shown in the second detail ornamental cast iron frames may be used where expense is not a primary consideration.

The third detail is economical and suitable wherever a narrow sight line is sought.

Special Hardware—While standard hardware is of solid bronze, of government mixture, toned a dark statuary color in pleasing and substantial designs, specially designed hardware may always be obtained when desired.

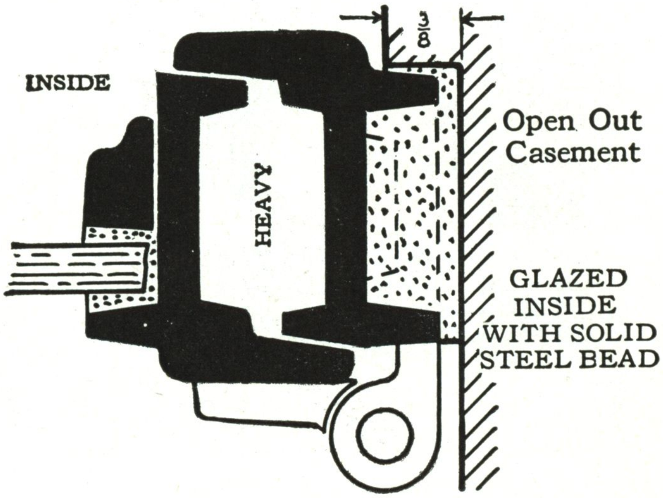
Such special hardware may be of bronze of hand wrought iron, or of bronze nickel, silver or gold plated, to our own or to the architects' designs.

Operating Devices—Mechanical operating devices are available to meet all requirements.

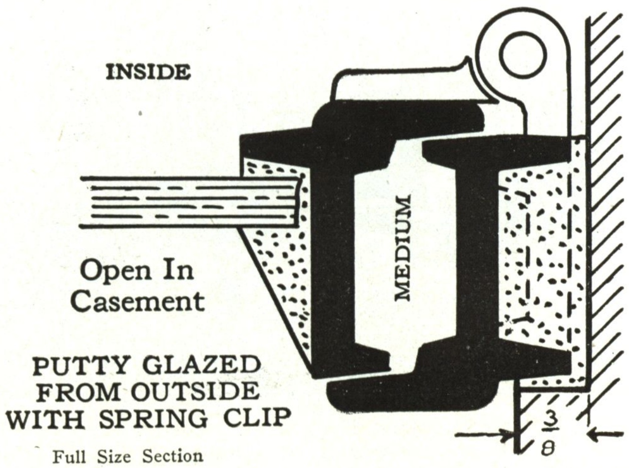
These can range from a simple but effective cam stay for the pole operation of a hinged-at-top-to-open-out casement to a power driven operator for groups of sash.

Shades, Screens and Draperies—In laying out the windows it is always advisable to make provision for shades (if used), drapes and screens and it is recommended that the casement manufacturer be consulted in reference to these three items while the job is still in a preliminary stage.

Co-operative Service—The Crittall Casement Window Company has seven branch offices in principal cities and has over fifty representatives. There is usually a branch office or representative near an architect eager to be of service in the way of details, drawings and suggestions.


$\frac{3}{8}$
INSIDE
HEAVY
Open Out Casement
GLAZED INSIDE WITH SOLID STEEL BEAD

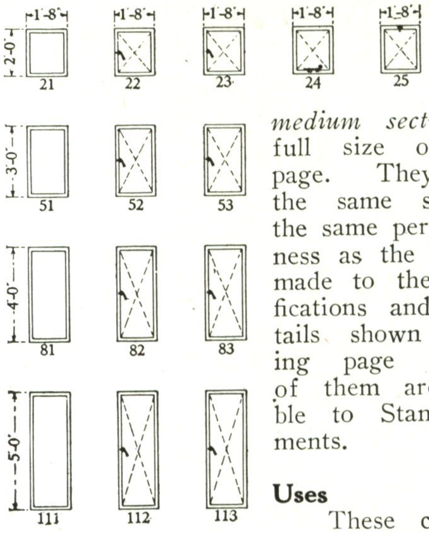
Full Size Section


INSIDE
MEDIUM
Open In Casement
PUTTY GLAZED FROM OUTSIDE WITH SPRING CLIP
$\frac{3}{8}$

Full Size Section

Continued on next page

Crittall Standard Steel Casements



Quality

Standard Steel Casements are made of the *medium section* illustrated in full size on the preceding page. They are made of the same section and have the same perfect weather tightness as the Crittall Casements made to the architect's specifications and sizes. The details shown on the preceding page and modifications of them are equally applicable to Standard Steel Casements.

Uses

These casements are designed especially for use in residences where the architect desires to use the best but needs the saving effected by standardization. Where small panes are desired the architect may use attractive leaded glass in varied designs or the casements may be glazed with clear sheets of plate glass.

Sizes and Types

The sizes given above are standard and the operation of types is as follows:

Types 21, 51, 81, 111 are stationary.

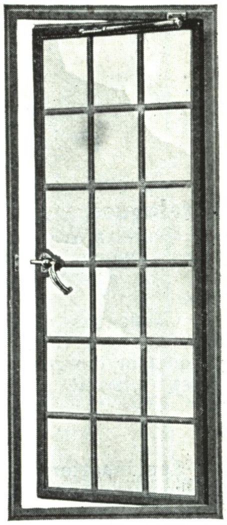
Types 22, 52, 82, 112 are hinged at side to open out.

Types 23, 53, 83, 113 are hinged at side to open in.

Type 24 is hinged at top to open out at bottom.

Type 25 is hinged at bottom to open in at top.

It is possible to join two or more types by means of a small T mullion or transom bar, to secure various opening sizes.


Type 82

Hardware

Hardware on side hung types consists of a solid bronze lever handle of government mixture bronze, toned a dark statuary color, and a friction stay at the head. Outward opening side hung casements may be fitted with cleaning hinges when desired. Top hung type 24 is fitted with a solid bronze peg stay and bottom hung transom type 25 has a bronze spring catch.

Crittall Reversible Windows

Uses—For office buildings, public buildings, schools, hospitals, etc.

Material—All steel used in the manufacture of these sash shall be Crittalloy—the copper bearing steel—containing not less than 0.15% nor more than 0.30% copper in order to resist rust. All bars shall be straightened and free from hammer marks or other imperfections.

Weathering—The solid sections must give double contact on all sides without screwed or pressed on strips.

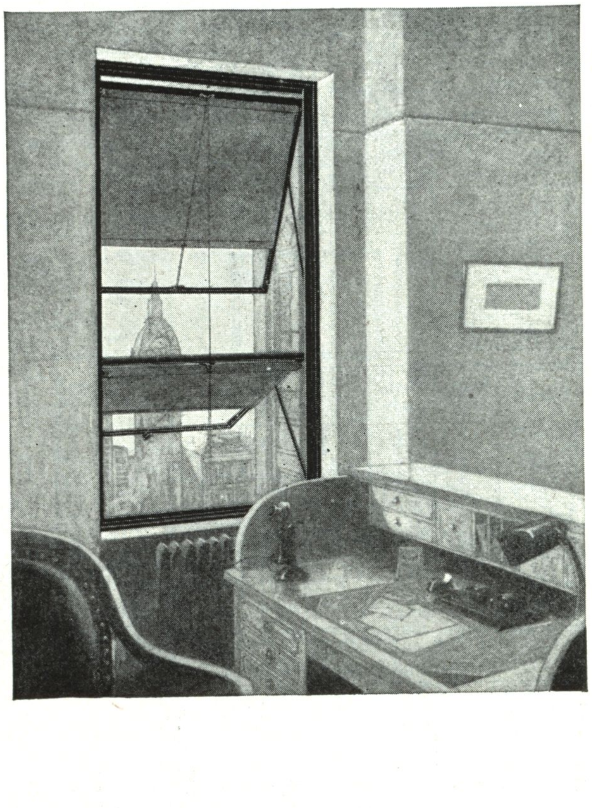
Welding—All corners shall be mitered and electrically welded.

Hardware—Shall be solid bronze of government mixture, finished a dark coinage color. It shall include a lever handle at the main sill, a pole catch at the meeting rail, and shade brackets and shade cord stop pulleys on each leaf.

Glazing—All sash shall be fitted with steel angle glazing stops for glazing from the inside.

Design and Construction—The sash shall be so designed and constructed that the ventilators will reverse for cleaning from the inside. Each leaf shall operate independently.

Painting—All steel shall receive two coats of rust resisting paint, each coat baked on separately.



DETROIT STEEL PRODUCTS COMPANY

Manufacturers of Fenestra Steel Casement and Basement Windows

2250 East Grand Boulevard
DETROIT, MICH.

FACTORIES: DETROIT, MICH., OAKLAND, CAL. and TORONTO, ONT., CANADA
25 WAREHOUSES, 150 BRANCHES AND AGENTS; DEALERS IN ALL CITIES AND TOWNS
For Architectural, Industrial, Institutional and Utility Steel Windows, see pages 1002-1006

Catalogues

Fenestra Windows include a variety of types, among which are windows suitable for any type of building you may plan.

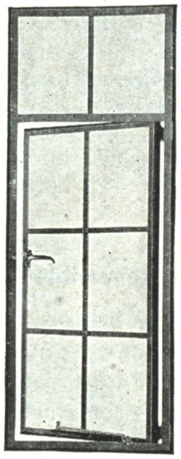
Catalogues, photographs, and detailed drawings covering any specific Fenestra product or design will be sent free on request, without any obligation on your part.

Fenestra
for homes and apartments
schools and institutions
commercial buildings
all industrial structures
TRADE-MARK

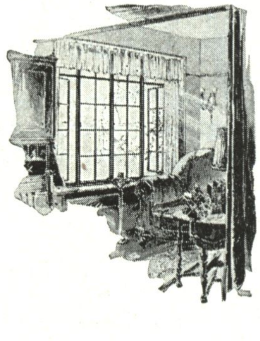
Service

Stock types and sizes of Fenestra Casement, Basement and Utility Windows can be secured through any reputable lumber and building material dealer, many of whom carry these windows in warehouse for immediate delivery. Dealer stocks are supplied from twenty-five company warehouses which are maintained at strategic shipping centers.

Residential Fenestra-Steel Casements for Homes and Apartments



Two of the 27 Stock Types of Casements Shown on this Page
Cost as little as wood windows



Specifications—All casement windows shall be Fenestra Casements of English design made by Detroit Steel Products Company from bars of solid rolled steel with heavy fillets to increase rigidity.

Frame bars shall be pivot-ended and welded.

All casements shall be equipped with extension hinges for easy cleaning from inside and with removable hinge pins held by setscrews. Locking handles shall be attached by friction clevises to prevent loosening. Fenestra peg and stay operator (or sliding stay or "Underscreen Operator") shall be furnished. All hardware shall be malleable iron with dull black, rust resisting finish (or bronze hardware).

Two-point flat contact weathering shall be around each opening, further protected by baffles. Handles shall close against bronze strike plate with cam action to draw swing leaf tight against the frame.

All casement leaves shall open out, screening effected on the inside. Swinging, sliding or rolling screens shall be used as specified.

Mastic shall be supplied by casement manufacturer without extra charge, for use at head jambs and sill in accordance with Fenestra details.

Glass shall be set in casement putty containing not less than 50% pure linseed oil. Sufficient litharge shall be supplied (without extra charge) and shall be mixed in by glazier to insure rapid set.

SYMMETRICAL COMBINATIONS

Heights	Panes high	Units high	Panes high, per unit	Horizontal mullion
2′ 3¼″	2	1	2	0
3′ 3½″	3	1	3	0
4′ 3¾″	4	1	4	0
4′ 6⅝″	4	2	2, 2	1
5′ 4″	5	1	5	0
5′ 6⅞″	5	2	3, 2	1
6′ 7⅛″	6	2	3, 3	1
6′ 7⅛″	6	2	4, 2	1
7′ 7⅜″	7	2	4, 3	1
8′ 7⅝″	8	2	4, 4	1

Widths	Panes wide	Units wide	Panes wide, per unit	Vertical mullion
1′ 7⁵⁄₁₆″	2	1	2	0
3′ 1⁷⁄₁₆″	4	1	4	0
3′ 2¾″	4	2	2, 2	1
4′ 7½″	6	1	6	0
4′ 10³⁄₁₆″	6	3	2, 2, 2	2
6′ 3″	8	2	4, 4	1
6′ 4⁵⁄₁₆″	8	3	2, 4, 2	2
6′ 5⅝″	8	4	2, 2, 2, 2	3
7′ 10⅜″	10	3	2, 6, 2	2
7′ 10⁵⁄₁₆″	10	3	4, 2, 4	2
8′ 1¹⁄₁₆″	10	5	2, 2, 2, 2, 2	4

Symmetrical height and width dimensions are shown above. Any height may be combined with any width.

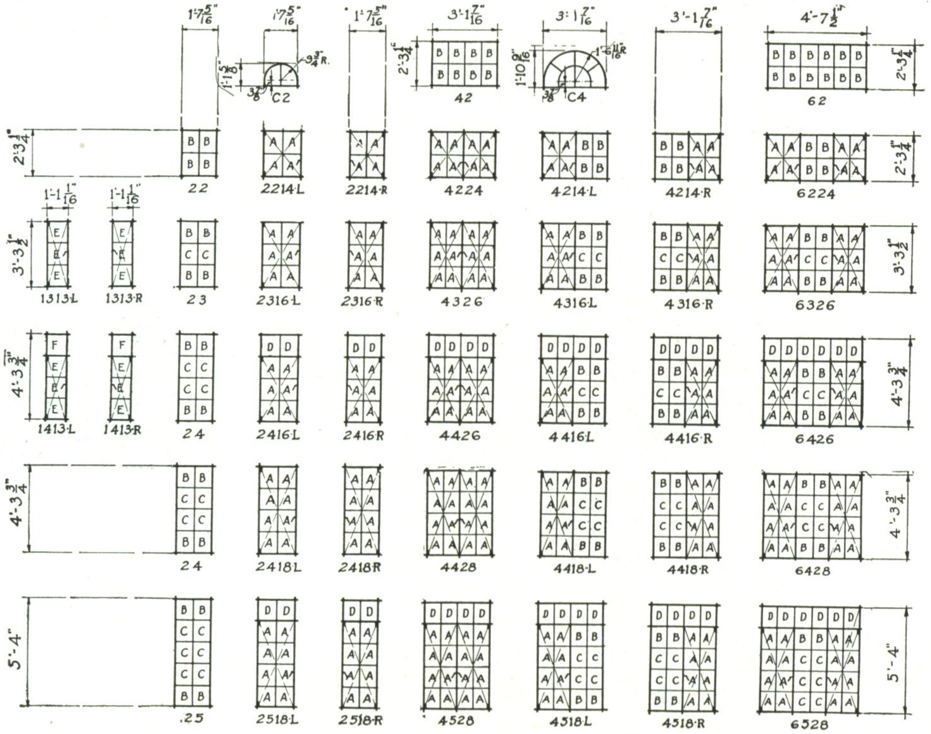
GLASS SIZES

The letters in the center of each glass light indicate the size of glass to be used

Letter in center of glass	Glass size indicated
A	8″ x 12″
B	8¹¹⁄₁₆″ x 12⅝″
C	8¹¹⁄₁₆″ x 12″
D	8¹¹⁄₁₆″ x 11¾″
E	10″ x 12″
F	11″ x 11¾″

Note: A left-hand window is one which, viewed from the outside, has its hinges on the left side. A right-hand window, viewed from the same position, has hinges on the right side.

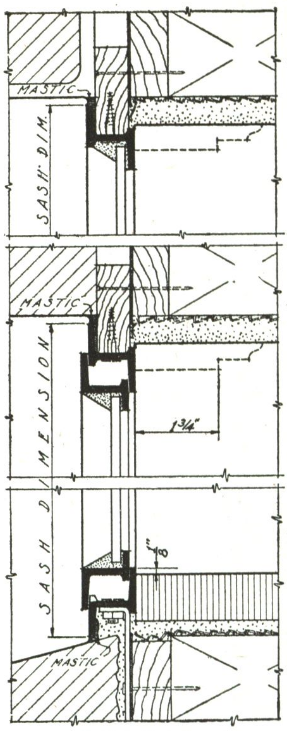
Always specify "right" or "left."



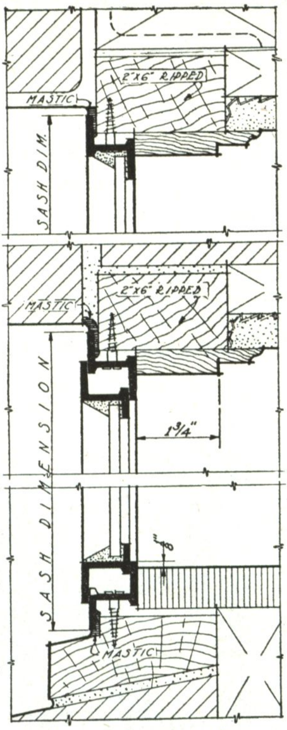
Standard Types and Sizes of Fenestra Casements

Continued on next page

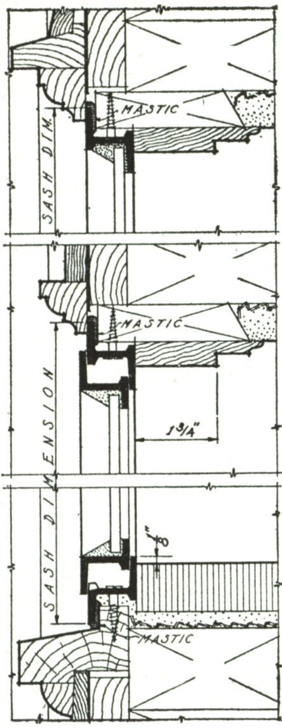
Residential Fenestra-Casement Installation Details, One-fourth Scale


MASTIC
SASH DIM.
MASTIC
SASH DIMENSION
1¾"
⅛"
MASTIC

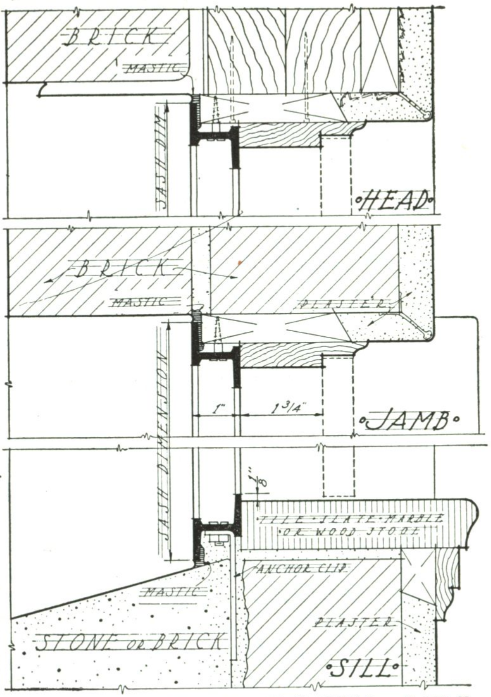
Solid Brick


MASTIC
2"x6" RIPPED
SASH DIM.
MASTIC
2"x6" RIPPED
SASH DIMENSION
1¾"
⅛"
MASTIC

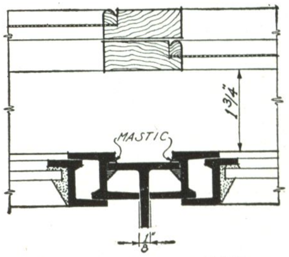
Frame Construction


MASTIC
SASH DIM.
MASTIC
SASH DIMENSION
1¾"
⅛"
MASTIC

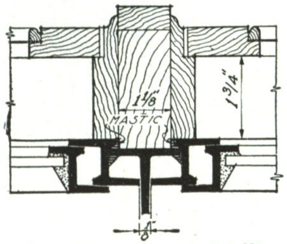
Wood Frame


BRICK
MASTIC
SASH DIM.
HEAD
BRICK
MASTIC
PLASTER
SASH DIMENSION
1"
1¾"
JAMB
⅛"
TILE-SLATE-MARBLE OR WOOD STOOL
ANCHOR CLIP
MASTIC
STONE OR BRICK
PLASTER
SILL

Brick Veneer, Showing Full Width of Wall



Fenestra T-bar Mullion

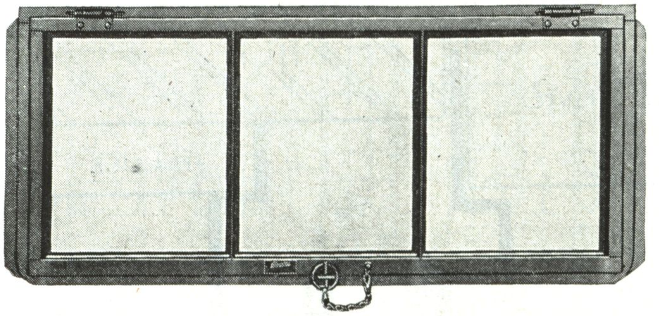

1⅛"
MASTIC
1¾"
⅛"

Wood Trim Inside Mullion

Installation—Fenestra Casements (as illustrated by details above) are easily set in any type of construction. At the left are shown two mullion details. One illustrates Fenestra T-bar mullion with sliding screens; and other, wood trim inside Fenestra mullion for use with hinged screens. Where casements are installed in solid masonry walls it is always advisable to insert wood blocks in the masonry at head and sill as a ground for attachment of screen strips.

Fenestra Casements are particularly adapted to erection in prepared openings. These openings, correct in size and design, based on sash dimension with sufficient clearances, should be left when walls are laid up. This obviates the drawbacks attendant on building in the casements as the walls are erected

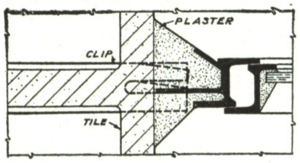
Residential Fenestra-Steel Basement Windows, Installation Details, One-fourth Scale



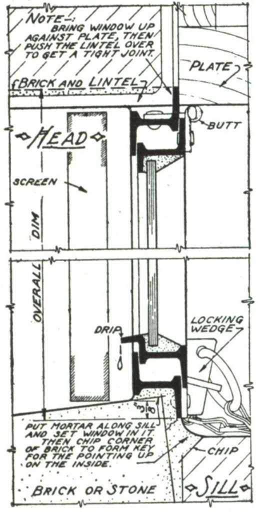
Solid rolled steel casement type sections, with sill and jambs in one piece, insuring maximum rigidity. Double contact weathering between frame and ventilator, all around. Sash, frame and hardware already assembled and painted; no extra frames; no fitting or hanging of sash. Ventilator removable for glazing. Sill of ventilator has projecting lip to guide away water. Self-centering wedge-pin lock.

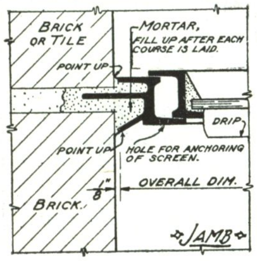
Glazed from the inside, after bed puttying. Spring glazing clips, which are supplied without extra charge, may be used if desired.

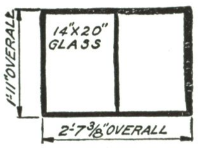
The jambs are channel shaped with a fin projecting from the center; see detail at the right. The fin embeds ¾ in. into the wall, providing anchorage. The edges of the channel provide a guide line for the mason in laying up both inside and outside wall.


PLASTER
CLIP
TILE

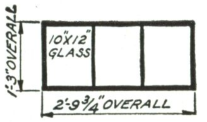
Note: Clip for installation in tile, as shown, is supplied without extra charge when specified.


NOTE— BRING WINDOW UP AGAINST PLATE, THEN PUSH THE LINTEL OVER TO GET A TIGHT JOINT.
PLATE
BRICK AND LINTEL
BUTT
HEAD
SCREEN
DIM
OVERALL
DRIP
LOCKING WEDGE
PUT MORTAR ALONG SILL AND SET WINDOW IN IT. THEN CHIP CORNER OF BRICK TO FORM KEY FOR THE POINTING UP ON THE INSIDE.
CHIP
BRICK OR STONE
SILL

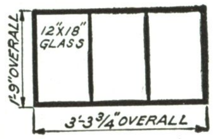

BRICK OR TILE
MORTAR, FILL UP AFTER EACH COURSE IS LAID.
POINT UP
DRIP
POINT UP
HOLE FOR ANCHORING OF SCREEN.
OVERALL DIM.
⅛"
BRICK
JAMB


14"x20" GLASS
1'-11" OVERALL
2'-7⅜" OVERALL

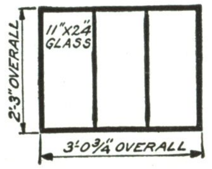
This size works out well with concrete block construction, fitting an opening 2 blocks wide and 3 blocks high with a trowel finished sill


10"x12" GLASS
1'-3" OVERALL
2'-9¾" OVERALL

For houses with low grade lines, we recommend this size, which provides maximum daylight with minimum height


12"x18" GLASS
1'-9" OVERALL
3'-3¾" OVERALL

This three-light window works out well with either brick or concrete block and is the one most used in the average type of construction


11"x24" GLASS
2'-3" OVERALL
3'-0¾" OVERALL

This size works out particularly well with the 24-in. block. The sash is equal to 1½ blocks in width and to 4 blocks in height with a sill

INTERNATIONAL CASEMENT CO., INC.

Solid Rolled Steel and Bronze Casement Windows and Austral Windows

JAMESTOWN, N. Y.

SALES OFFICES

NEW YORK, N. Y., 101 Park Avenue
ST. LOUIS, MO., Chemical Building
CHICAGO, ILL., 58 E. Washington Street
CLEVELAND, OHIO, Insurance Center Building
BOSTON, MASS., 201 Devonshire Street
MINNEAPOLIS, MINN., Phelps Building

Products

INTERNATONAL CASEMENTS and WINDOWS in solid rolled steel and drawn bronze; STANDARD COTTAGE WINDOWS; AUSTRAL SOLID STEEL WINDOWS.

Also Casement Hardware and Leaded Glass.

Specifications for International Steel Casement Windows Set to Rabbeted Wood Fames or Cut Stone

Solid rolled steel casement windows as manufactured by INTERNATIONAL CASEMENT CO., INC., or equal in the opinion of the architect. Steel sections of suitable design and weight, metal to metal contact, no loose strips. Bars hydraulically straightened, corners accurately machined, electrically welded and cleaned free from flux.

Casement manufacturer shall furnish and apply at the factory all hardware and operating devices, which shall be of solid bronze. Side hinged casements of 5-ft. and over shall have double grip bolt in addition to fastener. Transoms out of reach from floor shall have operators that can be worked from the floor.

Sash shall be fitted with moulded steel glazing beads (glass stops) set with brass screws. Corners mitered and neatly fitted.

All steel work cleaned free from rust and scale, painted one coat filler, two coats rust resisting paint, each coat separately baked on.

The casement window contractor shall set the casement sash, using brass screws. Frames to be bedded and pointed (inside and out) with approved mastic cement, finished in a workmanlike manner and guaranteed absolutely weathertight. If set to stone rabbets, lead expansion shields to be used.

Not included: glass, glazing, painting after erection, screens or preparation for same.

Specifications for International Composite Windows Set to Masonry Reveals

Sub-frames of pressed steel No. 12 gauge [No. 11 gauge, ingot iron] of size and contour as shown by scale details. If both dimensions exceed 7 ft. they shall be assembled at the factory, taken down and shipped knocked down. If under this size, corners shall be electrically welded and cleaned free from flux.

Steel work painted two heavy priming coats of rust resisting paint, each coat baked on.

The sub-frames are to be delivered to the building site by the casement manufacturer but must be set and built in by the mason. The masonry contractor will be required to set frames plumb and level, in close contact with masonry reveal at sides and head, and resting solidly on sill.

After setting, wood spreaders or braces shall be placed in the frames to keep them true and square.

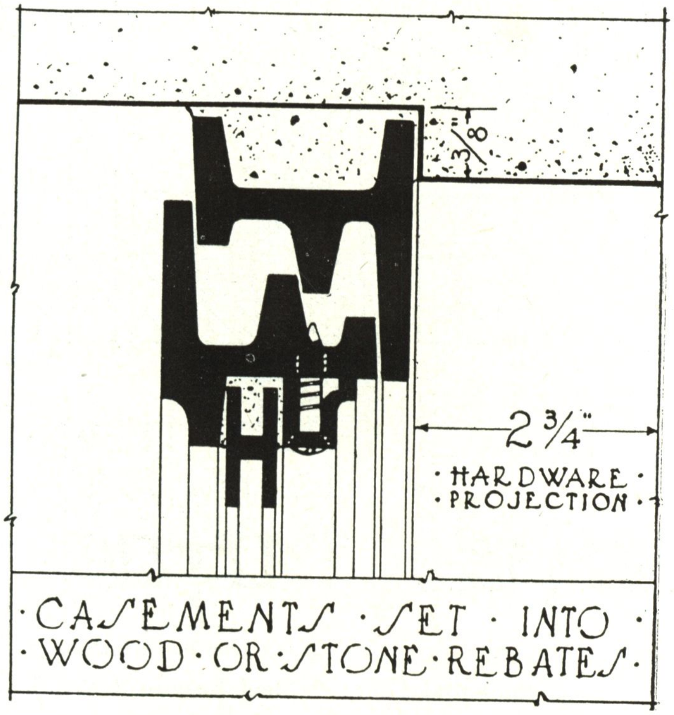
Calking—The calking between masonry and subframe to be covered under separate heading.

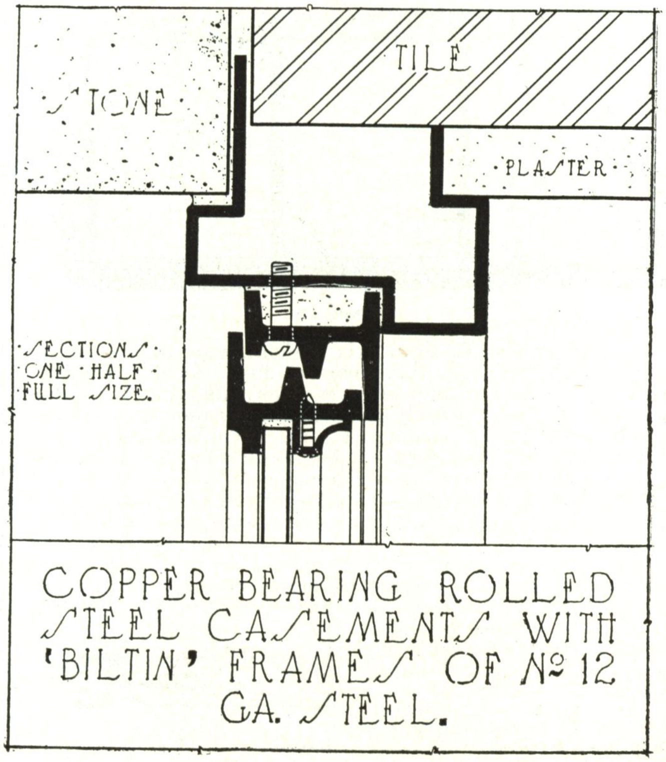
Casement Sash—Shall be of suitable design and weight, etc. (Copy specification.)

Literature and Drawings

The following catalogues contain scale and full size details, photographs and measured drawings:

No. 6. International Austral Windows.
No. 7. International Casements (224 pages).
No. 10. International Standard Casements.




TILE
STONE
PLASTER
SECTIONS ONE · HALF · FULL SIZE.
COPPER BEARING ROLLED STEEL CASEMENTS WITH 'BILTIN' FRAMES OF No 12 GA. STEEL.

Continued on next page

INTERNATIONAL STANDARD CASEMENTS, NEW TYPE. CAN BE FURNISHED FROM STOCK EITHER WITH STEEL MUNTINS, OR WITH STANDARD LEADED GLASS: HEAVY TWO POINT SECTION STEEL CASEMENTS GUARANTEED WEATHERTIGHT.

SPECIFICATIONS:-

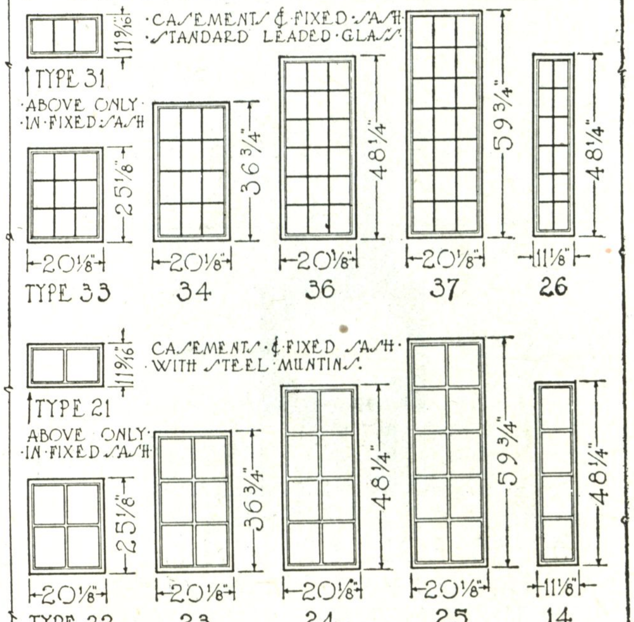
PAR. 1. CASEMENTS AS INDICATED ON ELEVATIONS, TO BE INTERNATIONAL STANDARD CASEMENTS, MEDIUM TWO POINT STEEL SECTIONS (NOT COTTAGE SECTIONS) FITTED WITH BRONZE HARDWARE OF STANDARD DESIGN AND PAINTED TWO COATS, EACH COAT BAKED.

PAR. 2. FURNISH LEADED GLASS OF STANDARD SIZES AND DESIGN, FIRST QUALITY D.S.A. GLASS, ½" LEAD CAMES, ALL HORIZONTAL CAMES STEEL REINFORCED.

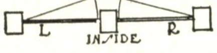
PAR. 3. IF STEEL MUNTINS REQUIRED OMIT PAR. 2. & SPECIFY STEEL MUNTINS TO BE FURNISHED.

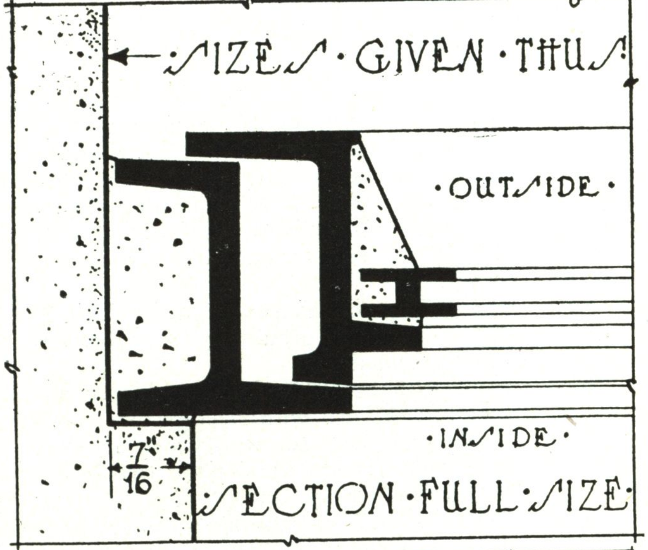
PAR. 4. THE WHOLE TO BE SET BY SASH CONTRACTOR & GUARANTEED WEATHERTIGHT.

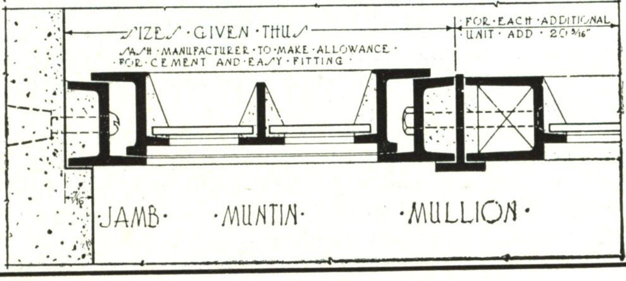
STANDARD TYPES AND SIZES


CASEMENTS & FIXED SASH
STANDARD LEADED GLASS
11 9/16"
TYPE 31
ABOVE ONLY IN FIXED SASH
25 1/8"
36 3/4"
48 1/4"
59 3/4"
48 1/4"
20 1/8"
20 1/8"
20 1/8"
20 1/8"
11 1/8"
TYPE 33
34
36
37
26
CASEMENTS & FIXED SASH WITH STEEL MUNTINS.
11 9/16"
TYPE 21
ABOVE ONLY IN FIXED SASH
25 1/8"
36 3/4"
48 1/4"
59 3/4"
48 1/4"
20 1/8"
20 1/8"
20 1/8"
20 1/8"
11 1/8"
TYPE 22
23
24
25
14

STEEL MULLION AND TRANSOM BARS FURNISHED SO THAT ANY OF THE ABOVE CAN BE BOLTED TOGETHER TO MAKE COMPOSITE WINDOWS. TO DENOTE FIXED SASH ADD "F" AFTER NUMERAL. TO DENOTE SWING OF CASEMENTS ADD "R" OR "L" AFTER NUMERAL. RIGHT OR LEFT SWING DETERMINED THUS.

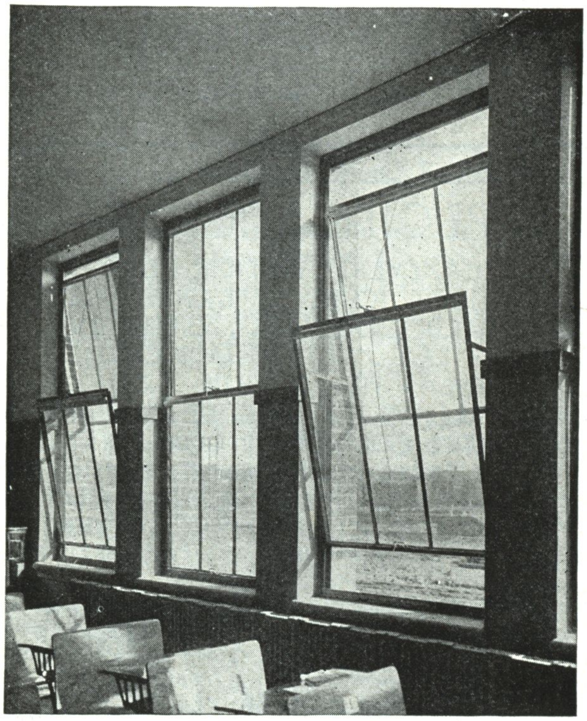



SIZES · GIVEN · THUS
· OUTSIDE ·
· INSIDE ·
7/16
SECTION · FULL · SIZE ·


SIZES · GIVEN · THUS
SASH · MANUFACTURER · TO · MAKE · ALLOWANCE · FOR · CEMENT AND · EASY · FITTING ·
· FOR · EACH · ADDITIONAL · UNIT · ADD · 20 3/16"
7/16"
· JAMB ·
· MUNTIN ·
· MULLION ·

Continued on next page

· INTERNATIONAL · AUSTRAL · WINDOWS · IN STEEL · AND · BRONZE · FOR · OFFICE · BUILDINGS · & SCHOOLS ·



Evanston Township High School, Evanston, Ill.
Perkins, Fellows & Hamilton, Architects

International Austral Windows

Specifications—

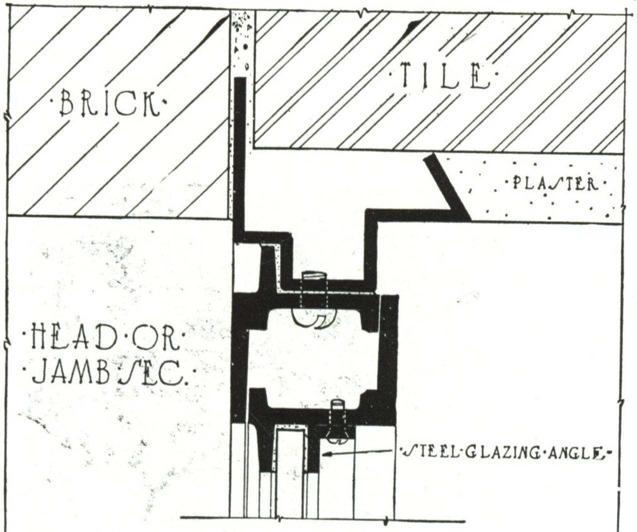
Windows where marked on plans to be copper-steel with Austral balance arms as manufactured by the International Casement Co., Inc., Jamestown, N. Y. Sub-frames of No. 12 gauge steel, with welded corners, painted two priming coats, each coat baked on, to be delivered to building site, but same to be set up, built in and calked by mason contractor.

Sash to be of special shapes, made of copper bearing steel. All bars hydraulically straightened, corners electrically welded.

Frames and sash carefully fitted to insure absolute weathertightness. Fit with steel glazing beads (glass stops) set with brass screws. Clean all steel work free from rust and scale and paint two heavy priming coats, each coat baked on.

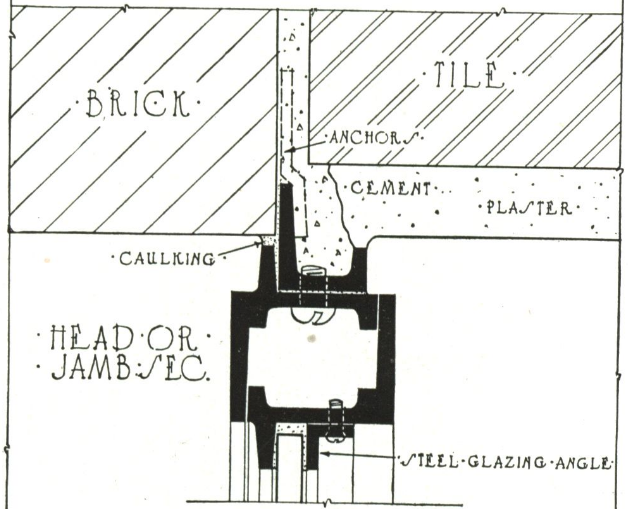
This contractor shall furnish all necessary hardware and fittings as follows: galvanized drop-forged steel window cleaner's bolts, shade brackets for both upper and lower sash with roller guides to hold cords. Polished cast bronze automatic cam catch and pull.

The sash shall be erected by this contractor after the plastering is completed. Same to be bedded and pointed in mastic cement and secured to subframe by machine screws. All to be finished in a workmanlike manner and guaranteed weathertight.



· No. 12 · GA. · PRESSED · STEEL · FRAME · BUILT · INTO · MASONRY · OPENINGS · FOR · INTERNATIONAL · AUSTRAL · ROLLED · STEEL · SASH ·

· ONE · HALF · FULL · SIZE · DETAILS ·



· No. 86 · ROLLED · STEEL · CHANNEL · SECTION · SET · WITH · INTERNATIONAL · AUSTRAL · ROLLED · STEEL · SASH ·

HENRY HOPE & SONS

MAKERS OF

Metal Casements, Steel Windows, Leaded Glazing and Leadwork

103 PARK AVENUE
NEW YORK, N.Y.
Telephone: MURRAY HILL 1514

STEEL & BRONZE WINDOWS suitable for Residences, Universities, Colleges, Public Buildings, Schools, etc.

SECTIONS as illustrated full size, based upon over 100 years' experience, provide two points of contact, with ample interior cavity to prevent capillary attraction. This system has proved weathertight in the most exposed situations throughout the world. These three sections are of universal application, and can be made to open outwards, inwards, or to pivot horizontally or vertically. We recommend as a general rule that casements should open outwards.

GLAZING & SETTING

HARDWARE. Our hardware is of the highest class, made from BRONZE to U.S.A. Naval Specification, all working parts machined with ample bearing surfaces for everlasting wear. All hinges are of solid bronze, and horizontally and vertically pivotted casements are hung on our patent solid bronze cup pivots, which afford perfect security, easy working, and exclusion of the weather.

QUALITY. We make three qualities: No. 1 fitted with Hope's bronze hardware; No. 2, with iron hardware (the steel for both these qualities is finished with two coats of anti-corrosive paint); Quality No. 1A is finished with a stoved coat of enamel in addition.

We keep a staff of fully qualified workmen, and undertake contracts including setting and glazing complete.

HOPE'S WINDOWS

BUSH HOUSE, ALDWYCH
LONDON

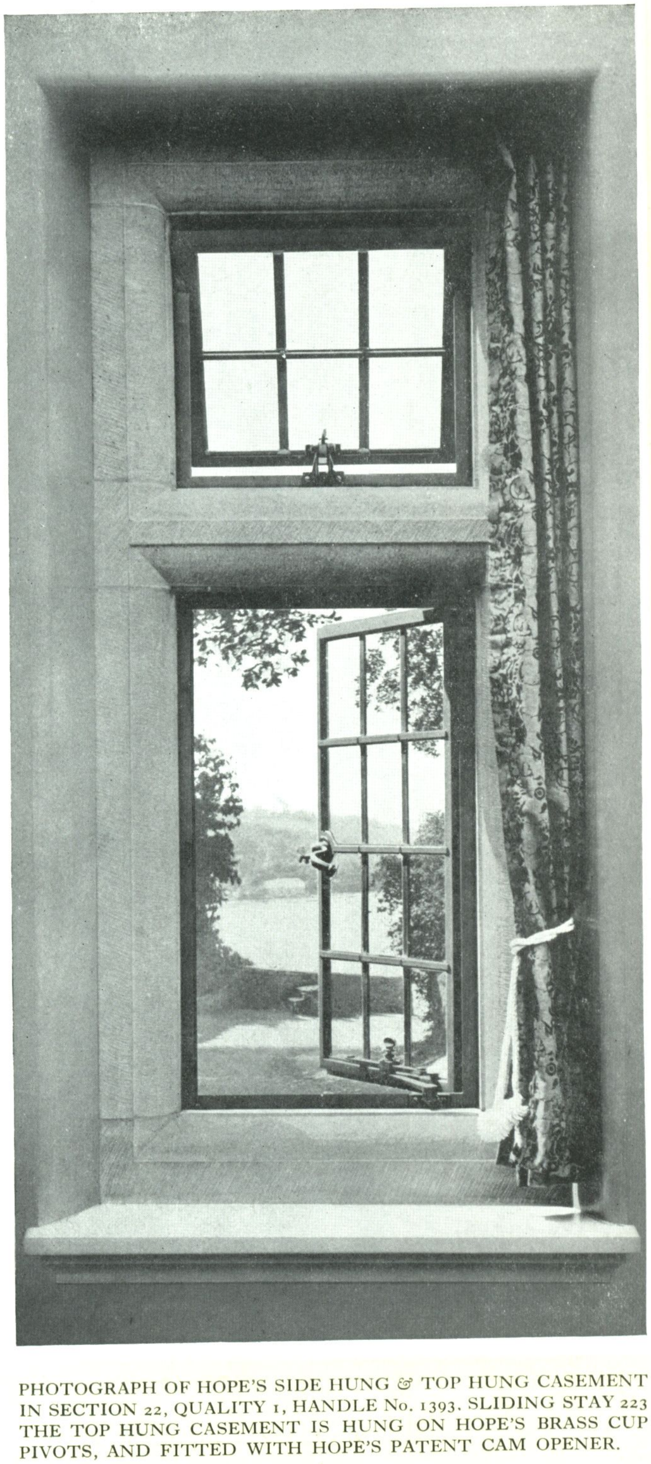
Helmle & Corbett, Architects

The finest buildings throughout the world are fitted with HOPE'S Casements

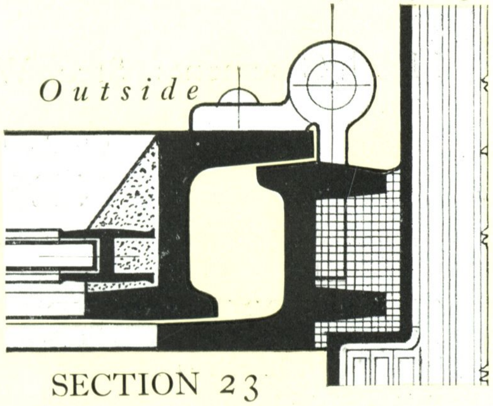
Continued on next page

HOPE'S STEEL & BRONZE WINDOWS

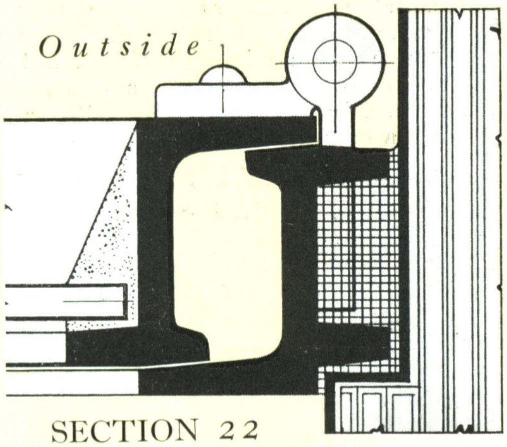
FULL SIZE DETAILS AT JAMBS *of* SECTIONS No. 21, 22, 23



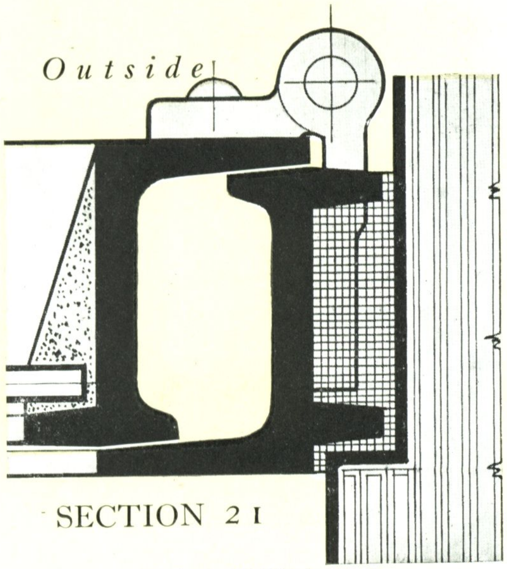
PHOTOGRAPH OF HOPE'S SIDE HUNG & TOP HUNG CASEMENT IN SECTION 22, QUALITY 1, HANDLE No. 1393. SLIDING STAY 223 THE TOP HUNG CASEMENT IS HUNG ON HOPE'S BRASS CUP PIVOTS, AND FITTED WITH HOPE'S PATENT CAM OPENER.



SECTION 23



SECTION 22

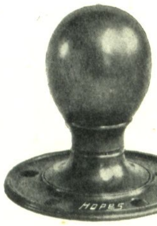


SECTION 21

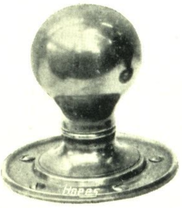
FOR THE HIGHEST CLASS OF WORK WE RECOMMEND THE USE OF SOLID BRONZE. IT IS EVERLASTING IN WEAR, HAS A BEAUTIFUL SURFACE, AND IMPROVES IN COLOUR WITH AGE. WE MAKE ALL OUR SECTIONS IN THIS METAL, AND WILL FURNISH SAMPLES AND ESTIMATE OF THE COST WHEN DESIRED.

Continued on next page

HOPE'S HARDWARE *in* BRONZE *or* BRASS



NO. 619



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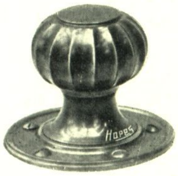

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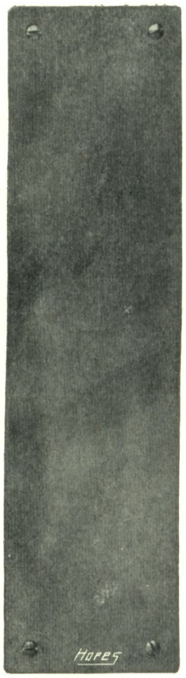
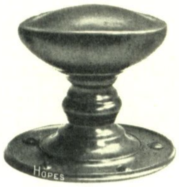
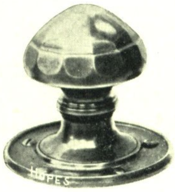


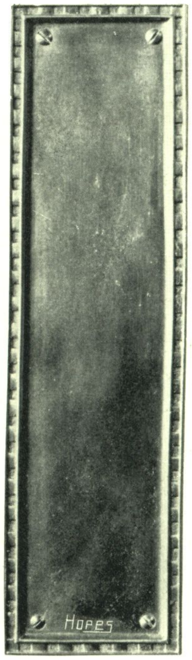
NO. 622



NO. 807



NO. 618



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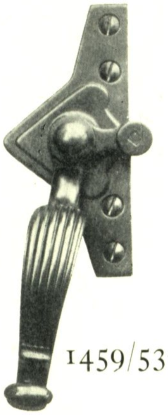
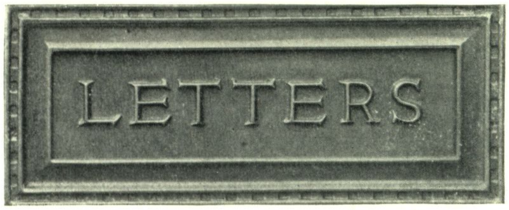
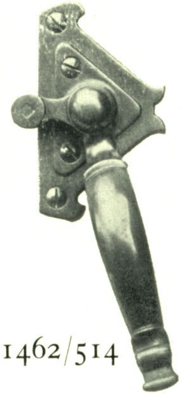
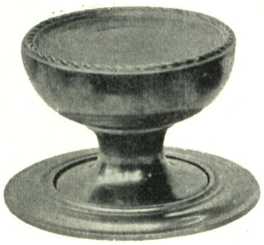




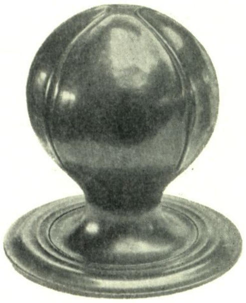
LETTER PLATE NO. 808



1459/539 HANDLES FOR WOOD CASEMENTS 1462/514



NO. 1342



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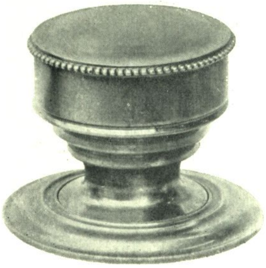


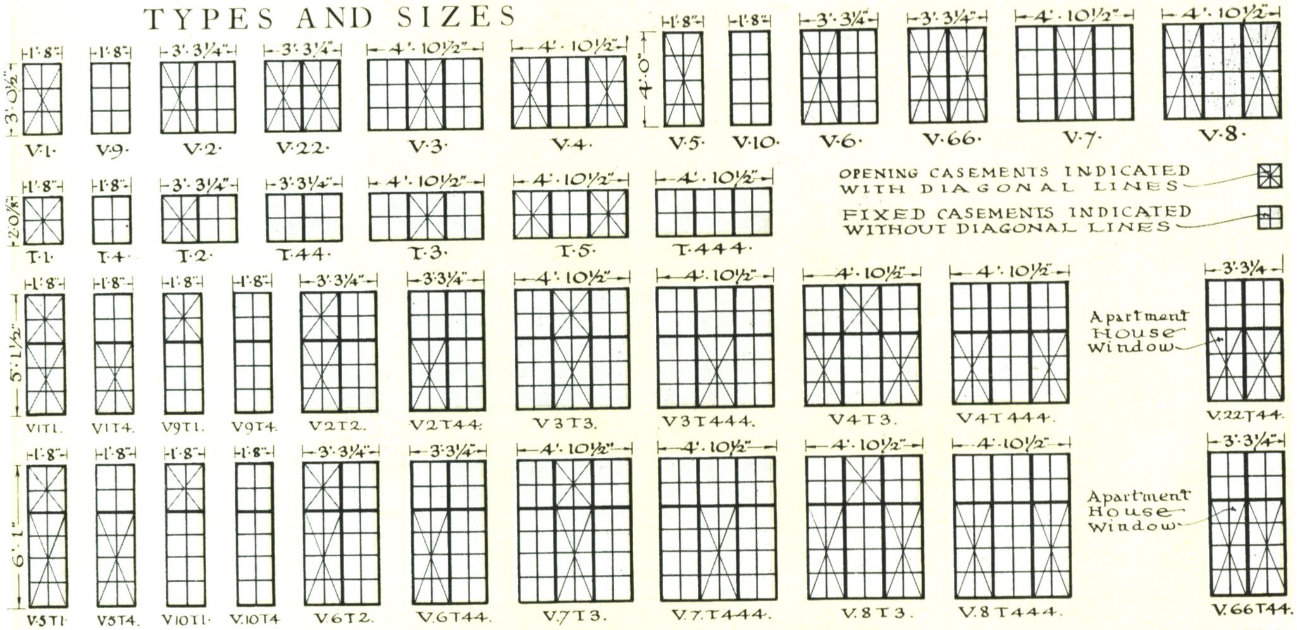
NO. 643

CENTRE DOOR KNOBS

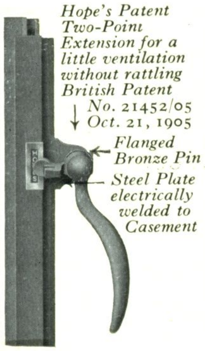
Continued on next page

HOPE'S STANDARD STEEL CASEMENTS

TYPES AND SIZES


1'8"
1'8"
3'3¼"
3'3¼"
4'10½"
4'10½"
1'8"
1'8"
3'3¼"
3'3¼"
4'10½"
4'10½"
3'0½"
4'0"
V.1.
V.9.
V.2.
V.22.
V.3.
V.4.
V.5.
V.10.
V.6.
V.66.
V.7.
V.8.
2'0⅛"
T.1.
T.4.
T.2.
T.44.
T.3.
T.5.
T.444.
OPENING CASEMENTS INDICATED WITH DIAGONAL LINES
FIXED CASEMENTS INDICATED WITHOUT DIAGONAL LINES
5'1½"
VIT1.
VIT4.
V9T1.
V9T4.
V2T2.
V2T44.
V3T3.
V3T444.
V4T3.
V4T444.
V.22T44.
Apartment House Window
6'1"
V5T1.
V5T4.
V10T1.
V10T4.
V6T2.
V6T44.
V7T3.
V7T444.
V8T3.
V8T444.
V.66T44.
Apartment House Window

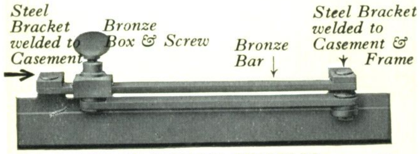
NOTE:– Transome Ventilators and Type T Windows Hinged at Top to Open Out – All other Casements are Side Hung – All types shewn are stocked in New York.


Hope's Patent Two-Point Extension for a little ventilation without rattling British Patent No. 21452/05 Oct. 21, 1905
Flanged Bronze Pin
Steel Plate electrically welded to Casement

TWO-POINT HANDLE

BRASS PINTLE

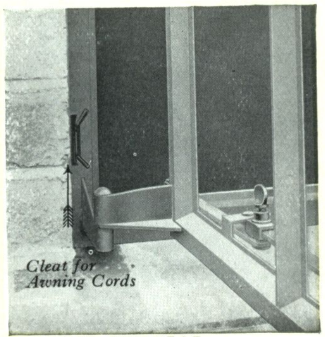
HINGE


Steel Bracket welded to Casement
Bronze Box & Screw
Bronze Bar
Steel Bracket welded to Casement & Frame

SAFETY SLIDING STAY No. 223c

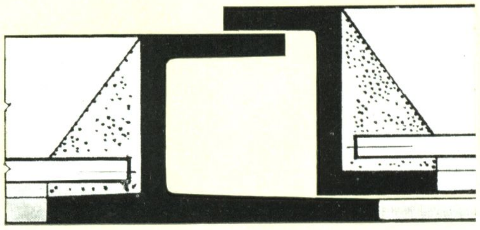
For use with Side Hung Casements.

Top Hung Casements are fitted with Iron Peg Stays.

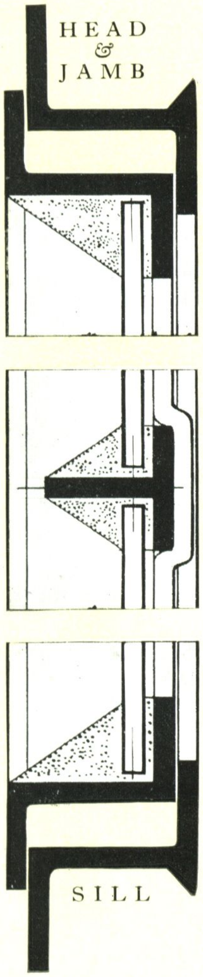

Cleat for Awning Cords

HOPE'S SPECIAL CLEANING HINGE

INTERIOR PHOTOGRAPH OF A STANDARD WINDOW. These windows are made for building in as the work proceeds. They are practically indestructible and adaptable to brick, concrete, or wood construction. The fittings provide a wide range of ventilation without rattling. Curtain brackets are supplied, thus avoiding all plugging to walls. These windows are practical and pleasant in any situation, cheaper than wood, low first cost, and no repairs.



DETAIL *of* MULLION

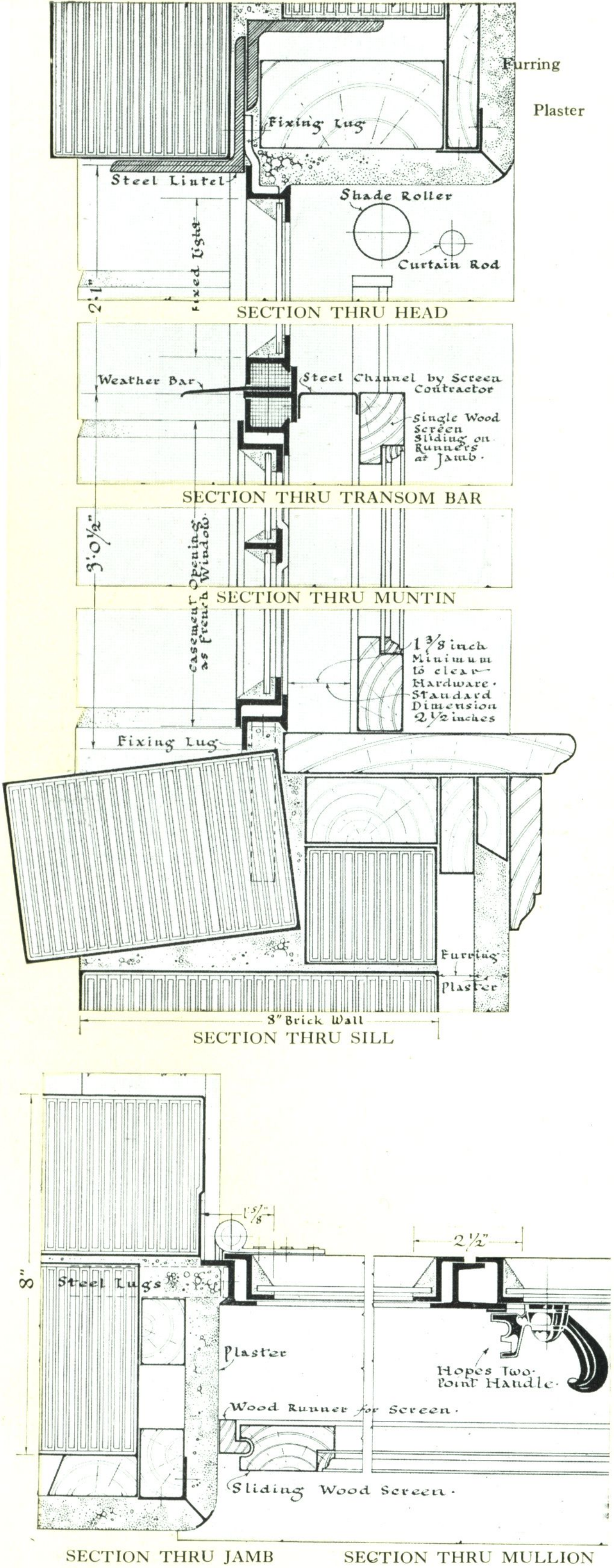

HEAD & JAMB
SILL

FULL SIZE DETAILS

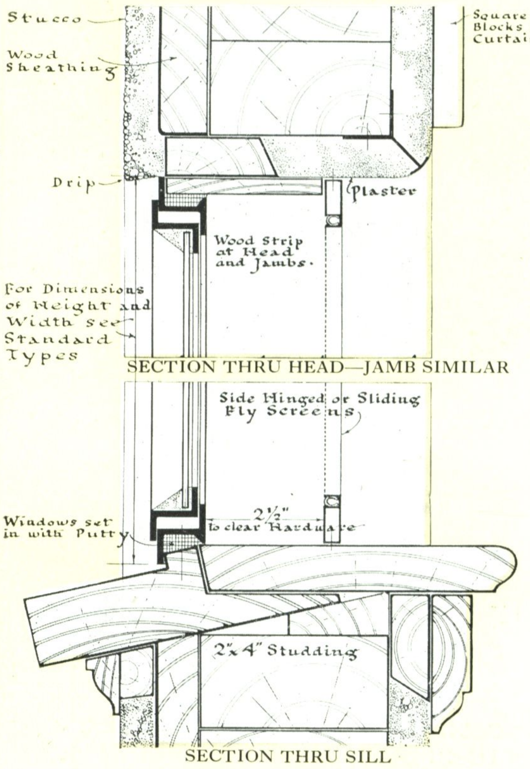
Continued on next page

HOPE'S STANDARD STEEL CASEMENTS

TYPICAL INSTALLATION OF STANDARD STEEL CASEMENTS IN VARIOUS TYPES OF WALL CONSTRUCTION


Furring
Plaster
Fixing Lug
Steel Lintel
Shade Roller
Curtain Rod
Fixed Light
2'-1"
SECTION THRU HEAD
Weather Bar
Steel Channel by Screen Contractor
Single Wood Screen Sliding on Runners at Jamb.
SECTION THRU TRANSOM BAR
3'-0½"
Casement Opening as French Window
SECTION THRU MUNTIN
1⅜ inch Minimum to clear Hardware. Standard Dimension 2½ inches
Fixing Lug
Furring
Plaster
8" Brick Wall
SECTION THRU SILL
8"
1⅝"
2½"
Steel Lugs
Plaster
Hopes Two-Point Handle.
Wood Runner for Screen.
Sliding Wood Screen.
SECTION THRU JAMB
SECTION THRU MULLION

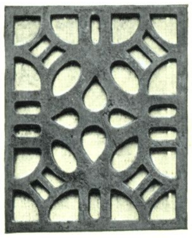
3" SCALE DETAILS OF TYPE V.22 T.44 STANDARD CASEMENT WITH MULLION AND FIXED TRANSOM IN BRICK WALL


Stucco
Wood Sheathing
Square Corner Blocks to Mount Curtain Rods.
Drip
Plaster
Wood Strip at Head and Jambs.
For Dimensions of Height and Width see Standard Types
SECTION THRU HEAD—JAMB SIMILAR
Side Hinged or Sliding Fly Screens
2½" to clear Hardware
Windows set in with Putty
2"x 4" Studding
SECTION THRU SILL

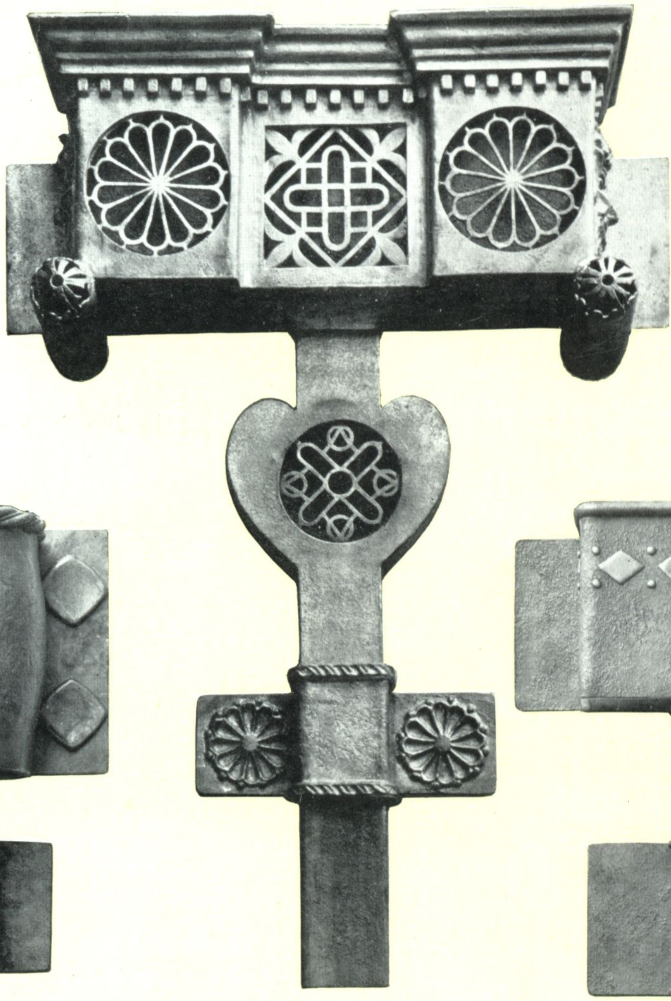
3" SCALE DETAILS OF STANDARD CASEMENT WITHOUT TRANSOM IN STUCCO FINISH IN FRAME WALL

Continued on next page

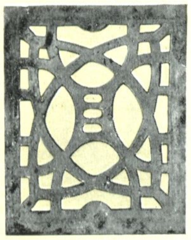
HOPE'S HAND-WROUGHT LEADWORK



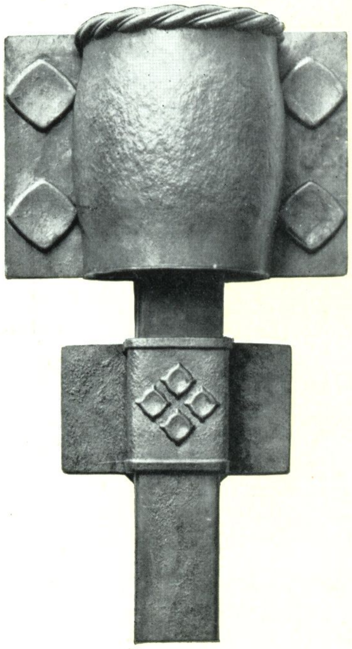
LEAD FRET NO. 11



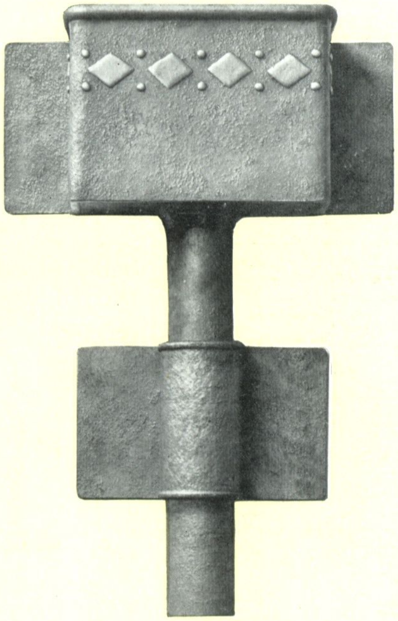
LEAD HEAD NO. 681
WIDTH OVER EARS 30½″



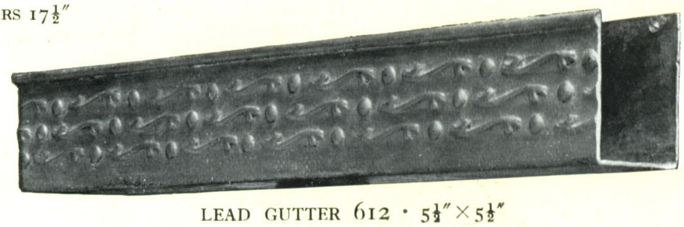
LEAD FRET NO. 10



LEAD HEAD NO. 601
WIDTH OVER EARS 17½″



LEAD HEAD NO. 600
WIDTH OVER EARS 19½″



LEAD GUTTER 612 · 5½″×5½″

WE SHALL BE PLEASED TO PRICE ANY SCHEMES FOR QUANTITIES OR TO SUPPLY SPECIAL DESIGNS AND PRICES FOR CISTERN HEADS, PIPES, GUTTERS, GARDEN VASES, CISTERNS, FINIALS, SUNDIALS, ETC.

Printed in England at The Kynoch Press

MESKER BROTHERS IRON COMPANY

Solid Section Steel Casement and Basement Windows

ST. LOUIS, MO.

Products

Solid Section Steel Casement Windows, Weatherstripped; Steel Basement Windows.

For Steel and Concrete Stairs, see page 641; for Hollow Metal and Solid Steel Windows, see pages 940-941; for Steel Sash, see pages 1000-1001.

Mesker Solid Section Steel Casement Windows

Units—The systematic combination of the Mesker three standard units of casement windows provides for openings of any dimensions.

Abundant light and ventilation is afforded, and the installation is a simple matter with the use of Mesker patent tongue and groove mullions.

Transoms—Where transom sash are used they may be stationary, side hinged or extending out, which latter serves as an awning as well as ventilation.

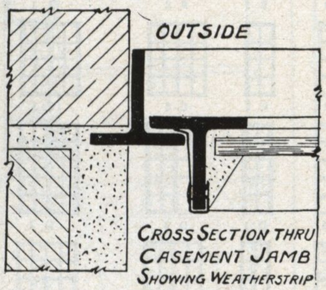
Installation—Casements are installed from the interior after the walls are up. When open, 100% ventilation is obtained. The sash do not project into the room to interfere with screens, shades, or curtains.

They are attractive in appearance and add style to the building—more durable than wood and more economical in cost.

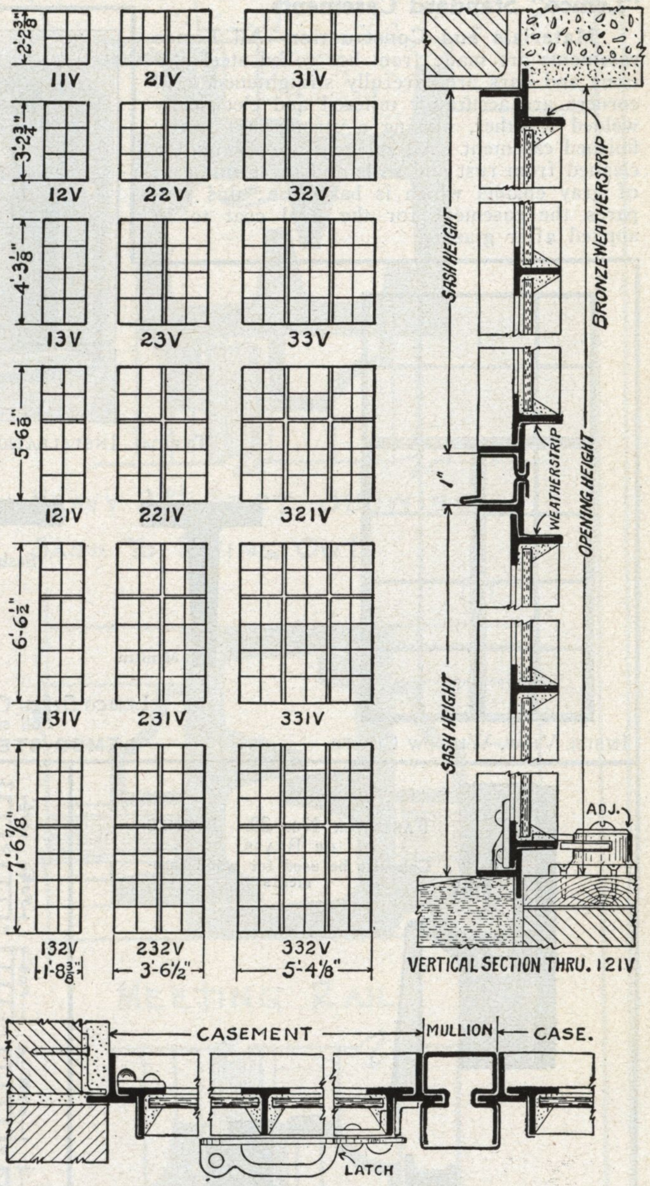
Hardware—A friction adjuster holds the sash open at any angle and it is locked by a suitable latch when closed. Plated or solid bronze hardware is furnished as desired.

Weatherstrips — The Mesker Casements are equipped with bronze weatherstripping (patented) which effectively prevents the passage of wind, rain or dust and affords noiseless closing.

Typical Casement Installation



CROSS SECTION THRU CASEMENT JAMB SHOWING WEATHERSTRIP



VERTICAL SECTION THRU. 121V

Standard Sizes and Combinations of Mesker Solid Section Steel Casement Windows

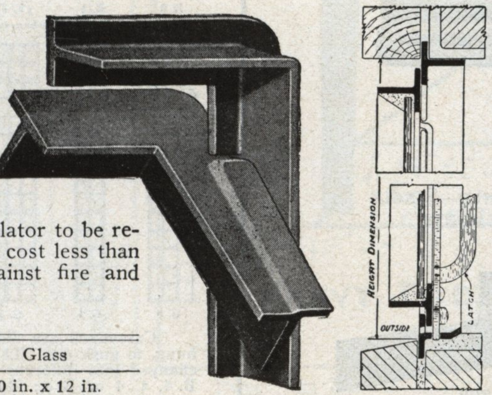
Mesker Steel Basement Windows

A new and very desirable feature has been added to the construction and convenience of the Mesker Steel Basement Window, by the adoption of a specially formed trough sill member for the sash. This trough collects the dripping of interior moisture which gathers on the glass, and conveys it directly to the outside of the window.

These windows have the Mesker patent pivot which does not rust tight and allows the ventilator to be removed for convenience of glazing if needed. They cost less than wood, more readily installed and are proof against fire and intrusion.

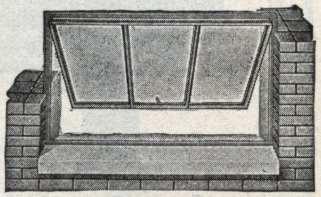
Made in 5 standard sizes:

No.	Size	Lights	Glass
31.130A	2 ft. 8¾ in. x 1 ft. 2 in.	3	10 in. x 12 in.
31.130B	3 ft. 2¾ in. x 1 ft. 8 in.	3	12 in. x 18 in.
21.120C	2 ft. 6⅜ in. x 1 ft. 10 in.	2	14 in. x 20 in.
31.130D	2 ft. 8¾ in. x 1 ft. 4 in.	3	10 in. x 14 in.
31.130E	2 ft. 8¾ in. x 1 ft. 10 in.	3	10 in. x 20 in.

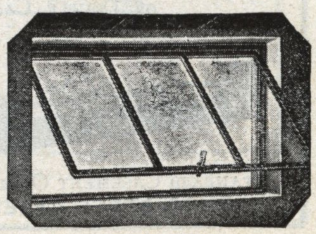


Mesker Patented Pivot

No Hinges, No Cotter Pins, No Bolts or Nuts



Exterior View



Interior View

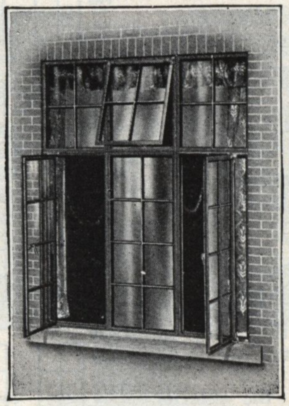
LUNDELL-ECKBERG MANUFACTURING CO., INC.

"Lemco" Steel Casements and Hardware for Wood and Steel Casements

JAMESTOWN, N. Y.

"Lemco" Standard Casements

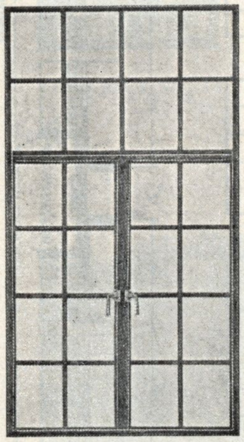
Materials and Construction—All Lemco casements are made from hot rolled steel sections and bars are carefully straightened. All corners are accurately mitered and electrically welded together, making a strong and neatly finished casement. All surfaces are thoroughly cleaned from rust and scale and given one coat of gray enamel which is baked on; this prepares the casement for the final coat to be applied after glazing.



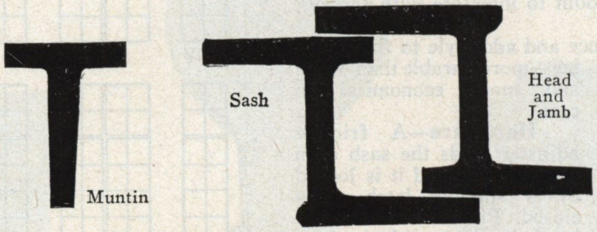
Typical Installation of Lemco Casements

Weatherproof Construction—Lemco construction provides two-point weathering contact throughout, and casements, if properly erected, are guaranteed to be absolutely weatherproof.

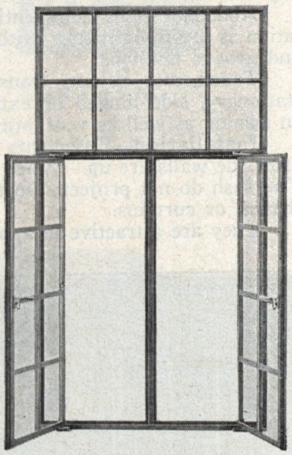
Hardware—All standard casements are equipped throughout with solid bronze or brass hardware. Single casements are hung on Lemco Patented Safety Cleaning Hinges which permit the cleaning of the exterior of the glass from inside the room. These hinges also have a friction pivot feature which holds the sash in any desired position and eliminates the use of adjusters.



Inside View, Window Closed

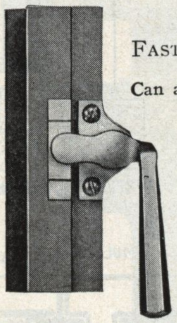


Lemco Steel Casement Members
Full size sections

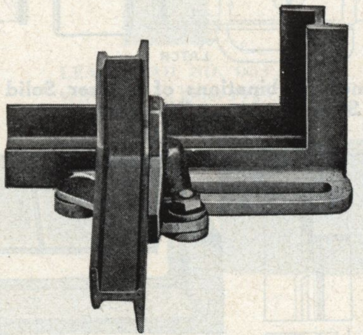


Outside View, Window Open

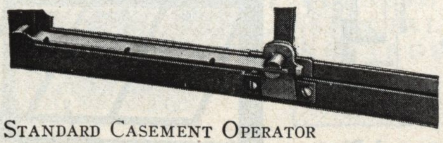
LEMCO STEEL CASEMENT



Fastener No. 20. Bronze or Brass
Can also be used for wood casements

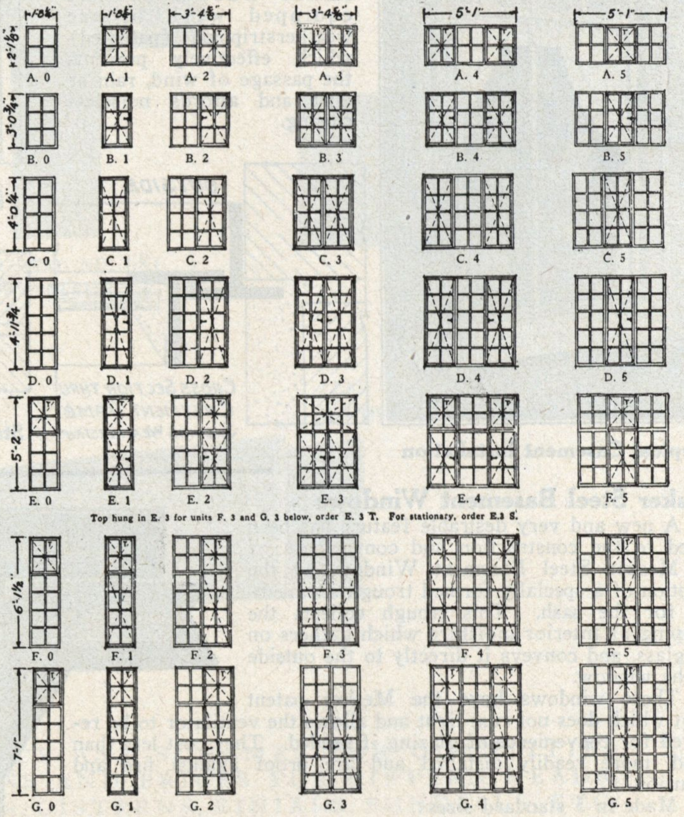


Safety Cleaning Hinge—Single or Double Casements



Standard Casement Operator

LEMCO STEEL CASEMENT HARDWARE

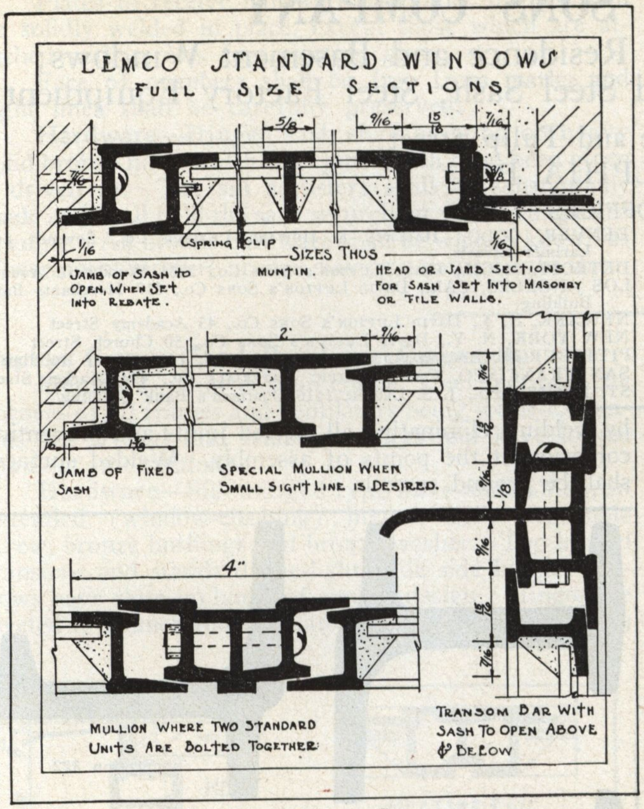


Top hung in E. 3 for units F. 3 and G. 3 below, order E. 3 T. For stationary, order E. 3 S.

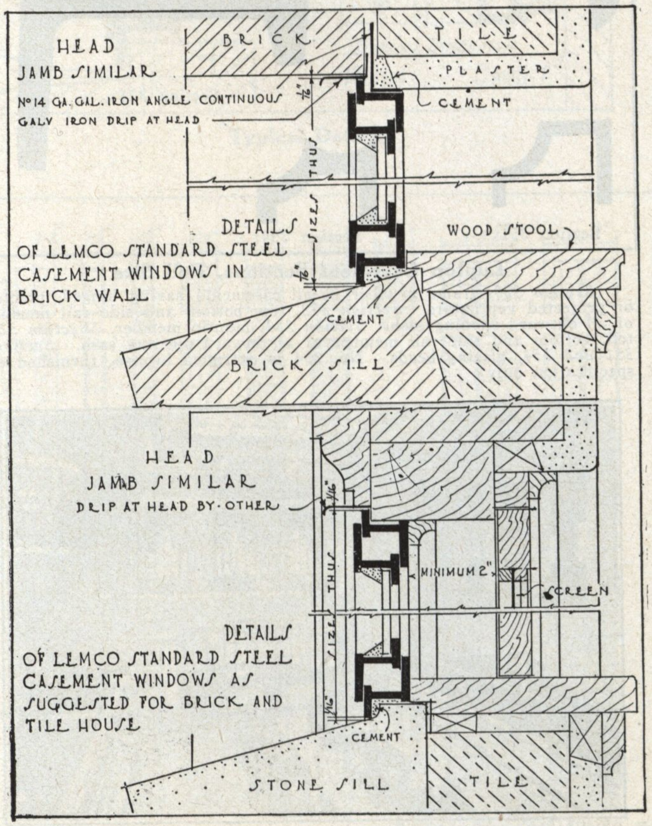
Casements are side hung to open out, except Type A which are top hung, to push out. These are made side hung to order. Above units can be changed into different combinations; for example: A. 5 can be placed over B. 4, C. 4 or D. 4; also the top hung in E. 3 may be had fixed instead of as A. 3

SIZES OF LEMCO STEEL CASEMENTS

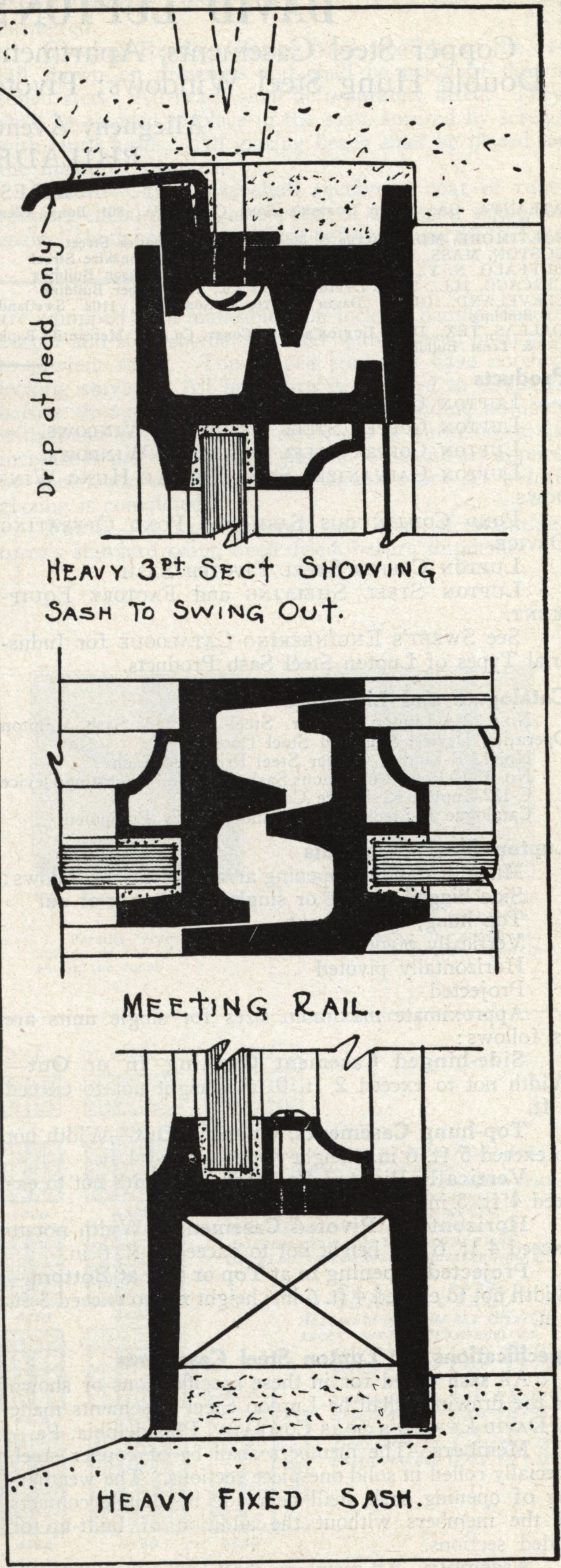
Continued on next page


LEMCO STANDARD WINDOWS
FULL SIZE SECTIONS
5/8"
9/16"
15/16"
7/16"
7/16"
1/16"
1/16"
SPRING CLIP
SIZES THUS
JAMB OF SASH TO OPEN, WHEN SET INTO REBATE.
MUNTIN.
HEAD OR JAMB SECTIONS FOR SASH SET INTO MASONRY OR TILE WALLS.
2"
7/16"
1/16"
1/16"
JAMB OF FIXED SASH
SPECIAL MULLION WHEN SMALL SIGHT LINE IS DESIRED.
4"
MULLION WHERE TWO STANDARD UNITS ARE BOLTED TOGETHER
TRANSOM BAR WITH SASH TO OPEN ABOVE & BELOW

Detail of Lemco Sections


HEAD
JAMB SIMILAR
No 14 GA. GAL. IRON ANGLE CONTINUOUS
GALV IRON DRIP AT HEAD
BRICK
TILE
PLASTER
CEMENT
SIZES THUS
DETAILS
OF LEMCO STANDARD STEEL CASEMENT WINDOWS IN BRICK WALL
WOOD STOOL
CEMENT
BRICK SILL
HEAD
JAMB SIMILAR
DRIP AT HEAD BY OTHER
MINIMUM 2"
SCREEN
SIZES THUS
DETAILS
OF LEMCO STANDARD STEEL CASEMENT WINDOWS AS SUGGESTED FOR BRICK AND TILE HOUSE
CEMENT
STONE SILL
TILE

Three-inch Scale Details of Typical Installations


Drip at head only
HEAVY 3PT SECT SHOWING
SASH TO SWING OUT.
MEETING RAIL.
HEAVY FIXED SASH.

Full Size Detail of Heavy Three-point Sections

LEMCO WINDOW DETAILS

DAVID LUPTON'S SONS COMPANY

Copper Steel Casements, Apartment, Residence and Basement Windows; Double Hung Steel Windows; Pivoted Steel Sash; Steel Factory Equipment

Allegheny Avenue and Tulip Street
PHILADELPHIA, PA.

SALES OFFICES

ATLANTA, GA., David Lupton's Sons Const. Co., 801 Bona Allen Building
BALTIMORE, MD., Walter S. Brauns, 509 N. Charles Street
BOSTON, MASS., David Lupton's Sons Co., 161 Devonshire Street
BUFFALO, N. Y., David Lupton's Sons Co., 329 Jackson Building
CHICAGO, ILL., David Lupton's Sons Co., 1114 Steger Building
CLEVELAND, OHIO, David Lupton's Sons Co., 1102 Swetland Building
DALLAS, TEX., David Lupton's Sons Const. Co., 601 Mercantile Bank & Trust Building
DENVER, COLO., Hallack & Howard Lumber Co., Seventh and Larimer Streets
DETROIT, MICH., David Lupton's Sons Co., 2631 Woodward Avenue
LOS ANGELES, CAL., David Lupton's Sons Co., 317 Merchants Bank Building
NEWARK, N. J., David Lupton's Sons Co., 45 Academy Street
NEW YORK, N. Y., David Lupton's Sons Co., 50 Church Street
PITTSBURGH, PA., David Lupton's Sons Co., 1416 Oliver Building
SAN FRANCISCO, CAL., Pacific Materials Co., 444 Market Street
ST. LOUIS, MO., J. S. Crowl, 1616 Boatmen's Bank Building

Products

Lupton Copper Steel Casements.

Lupton Copper Steel Residence Windows.

Lupton Copper Steel Basement Windows.

Lupton Galvanized Steel Double Hung Windows.

Pond Continuous Sash and Pond Operating Device.

Lupton Copper Steel Pivoted Sash.

Lupton Steel Shelving and Factory Equipment.

See Sweet's Engineering Catalogue for Industrial Types of Lupton Steel Sash Products.

Catalogues and Literature

No. 12-A-Lupton Copper Steel Pivoted Sash, Lupton Operating Device, Standard Steel Doors
No. 12-B-Lupton Copper Steel Projected Sash
No. 12-C-Pond Continuous Sash and Pond Operating Device
C-122-Lupton Residence Casements
Catalogue D-Steel Shelving and Factory Equipment

Lupton Steel Casements

Made in standard opening arrangements as follows:
Side hinged, double or single, opening in or out
Top hung, opening out
Vertically pivoted
Horizontally pivoted
Projected

Approximate maximum sizes for single units are as follows:

Side-hinged Casement Opening In or Out—Width not to exceed 2 ft. 9 in.; height not to exceed 8 ft.

Top-hung Casements, Opening Out—Width not to exceed 5 ft. 6 in.; height not to exceed 4 ft.

Vertically Pivoted Casements—Width not to exceed 4 ft. 3 in.; height not to exceed 8 ft.

Horizontally Pivoted Casements—Width not to exceed 4 ft. 6 in.; height not to exceed 4 ft. 6 in.

Projected, Opening in at Top or Out at Bottom—Width not to exceed 4 ft. 6 in.; height not to exceed 3 ft. 6 in.

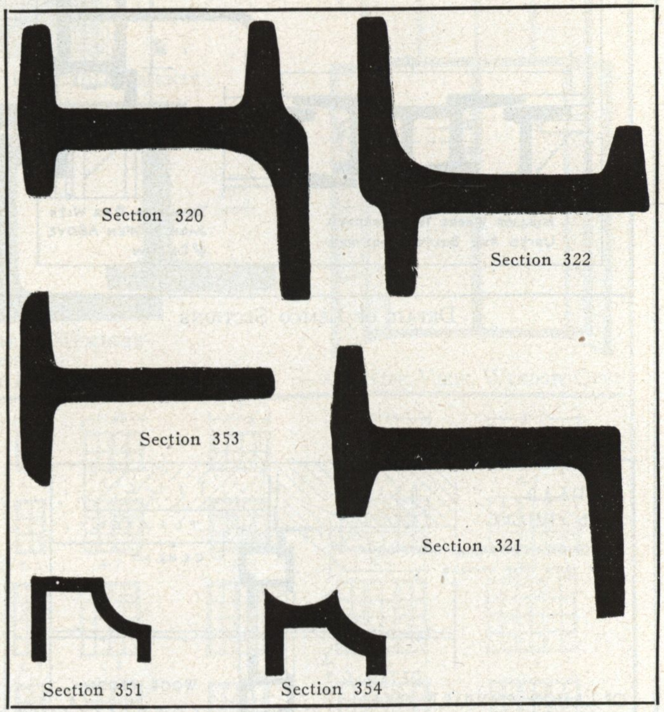
Specifications for Lupton Steel Casements

All sash called for in these specifications or shown on the drawings shall be Lupton Steel Casements made by David Lupton's Sons Company, Philadelphia, Pa.

Members—The members shall be of copper steel, specially rolled in solid one-piece sections. The weathering of opening sash shall be made by double contacts of the members without the addition of built-up or added sections.

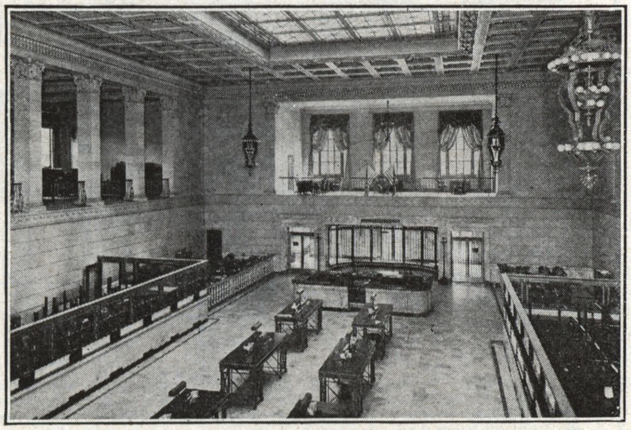
Assembly—All members shall be process straightened and shall be cleaned of rust and scale.

All members, except muntins, shall be assembled by welding, eliminating all riveted joints and preventing corrosion at the points of assembly. Welded surfaces shall be ground smooth.



Lupton Casement Sections, Full Size

Section 320, frame member of all casements having hinged, pivoted or projected ventilators. *Section 322,* top, bottom and side rail member of all outward opening sash. *Section 353,* muntin member. *Section 321,* top, bottom and side rail member of all inward opening sash. *Sections 351 and 354,* glazing beads. No. 354 is extruded bronze, furnished on specification only



Lupton Steel Casement in the Washington Park National Bank, Chicago, Ill.

Albert E. Schwartz, Architect

Continued on next page

Plates to receive hardware and other fittings shall be solidly welded in place, except those which are attached with screws for inserting glass.

Face of members shall be free from marks and sight lines shall be carefully preserved.

Hardware—Hinged sash shall be hung on heavy solid bronze hinges with steel pins which have been given a driven fit. The sill adjusters shall be substantially made and shall hold the sash securely at various angles of opening. All bronze hardware shall be what is known as Government mixture bronze, having a natural light statuary or "coinage" tone, which shall be polished but not lacquered.

Glazing Beads—Glazing beads shall be of the detail shown on drawings and shall be made of drawn rolled steel. All beads shall be accurately fitted. They shall be shipped in place in the sash, secured by screws with lentil heads. All glazing beads shall be placed on the inside of the sash.

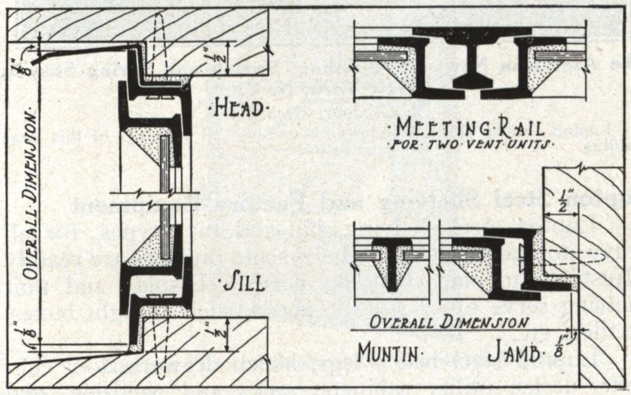
Paint—Casements shall receive a coat of rust-resisting metal primer, also a coat of dark gray semigloss enamel (both coats oven dried) before leaving the factory.

Lupton Copper Steel Residence Casements

Members—Low carbon copper steel sections, the corners of all frames and ventilators being welded. Muntins are riveted into frame members and have locked joints at intersections.

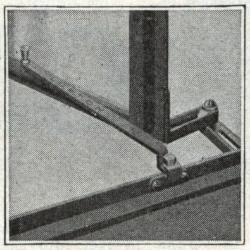
Hardware—Side hinged type have malleable iron extended (window-cleaning) hinges, with removable screw, bronze bushings and bronze washer. Top hinged transoms and standard one-light wide side hinged windows have close-up hinge of similar design. Hinges are riveted to frames and ventilators. Side hinged windows are equipped with malleable iron locking handle, bronze keeper and steel staybar adjuster with tapered brass peg to prevent rattle. Top hinged transoms have notched locking staybar. All hardware is attached to windows before shipment. Bronze handles and sliding adjuster with brass slide and thumb screw can be furnished at an increase in price. They are shipped loose and are applied by contractor or owner after windows are set before glazing is completed.

Paint—All sash receive one coat of manufacturer's standard paint, oven dried, before shipment.



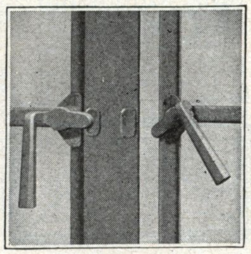
HEAD
MEETING RAIL FOR TWO VENT UNITS
SILL
OVERALL DIMENSION
OVERALL DIMENSION
MUNTIN
JAMB
⅛"
½"
½"
⅛"
⅛"

Typical Details



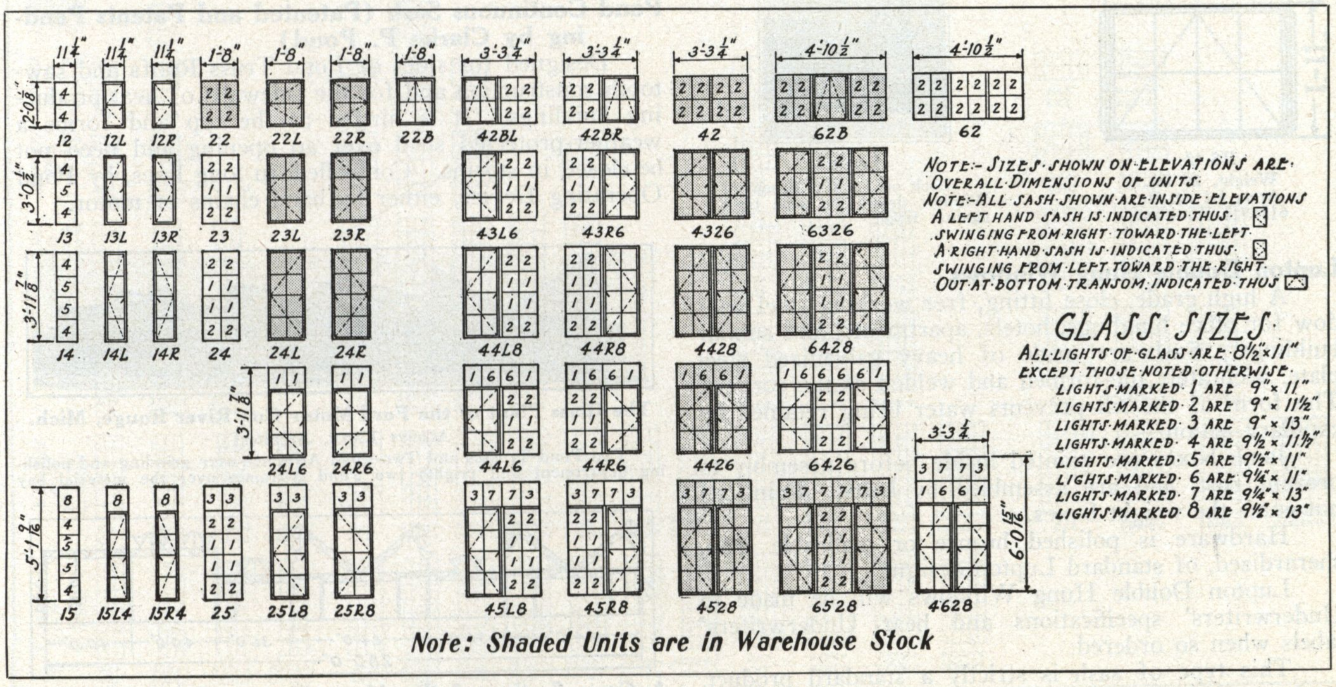
The Improved Lupton Hinge

Permits reaching the outside of the glass from within the room



The Handles of Lupton Residence Casements

Pleasing in appearance and fasten the sash securely



11¼"
11¼"
11¼"
1'-8"
1'-8"
1'-8"
1'-8"
3'-3¼"
3'-3¼"
3'-3¼"
4'-10½"
4'-10½"
2'-0⅝"
3'-0½"
3'-11⅞"
3'-11⅞"
5'-1 9/16"
3'-3¼"
6'-0 15/16"
12
12L
12R
22
22L
22R
22B
42BL
42BR
42
62B
62
13
13L
13R
23
23L
23R
43L6
43R6
4326
6326
14
14L
14R
24
24L
24R
44L8
44R8
4428
6428
24L6
24R6
44L6
44R6
4426
6426
15
15L4
15R4
25
25L8
25R8
45L8
45R8
4528
6528
4628

NOTE:- SIZES SHOWN ON ELEVATIONS ARE OVERALL DIMENSIONS OF UNITS.
NOTE:- ALL SASH SHOWN ARE INSIDE ELEVATIONS
A LEFT HAND SASH IS INDICATED THUS ▨
SWINGING FROM RIGHT TOWARD THE LEFT.
A RIGHT HAND SASH IS INDICATED THUS ▨
SWINGING FROM LEFT TOWARD THE RIGHT.
OUT AT BOTTOM TRANSOM INDICATED THUS ▭

GLASS SIZES.

ALL LIGHTS OF GLASS ARE 8½" × 11"
EXCEPT THOSE NOTED OTHERWISE.
LIGHTS MARKED 1 ARE 9" × 11"
LIGHTS MARKED 2 ARE 9" × 11½"
LIGHTS MARKED 3 ARE 9" × 13"
LIGHTS MARKED 4 ARE 9½" × 11½"
LIGHTS MARKED 5 ARE 9½" × 11"
LIGHTS MARKED 6 ARE 9¼" × 11"
LIGHTS MARKED 7 ARE 9¼" × 13"
LIGHTS MARKED 8 ARE 9½" × 13"

Note: Shaded Units are in Warehouse Stock

Standard and Warehouse Stock Sizes

Continued on next page

Lupton Copper Steel Basement Windows

Made in two types:

Standard—Hinged at top, opening in from bottom.

Security—Same movement as Standard type, but has several small lights and can be locked partly open as well as when closed.

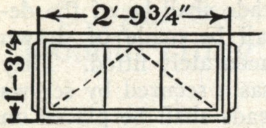
Made of solid copper steel members, with welded assembly.

Sash may be removed from frame by removing the split hinge pins.

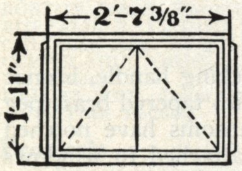
Extra weathertight because the sides of the frame project into the masonry and the bottom member is, by its design, a steel drip which sheds water readily.

All hardware is shipped with the unit, which is given a coat of manufacturer's paint, oven dried.

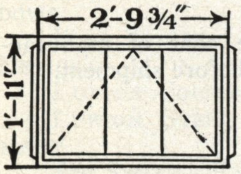
Sizes are shown at left.



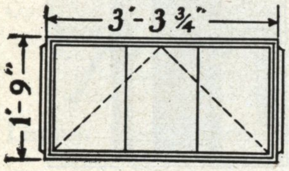
HW 31
Weight, 20 lbs.
Area, 4 sq. ft.
10x12 in. glass



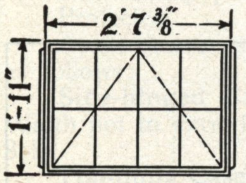
HY 21
Weight, 21 lbs.
Area, 5.1 sq. ft.
14x20 in. glass.



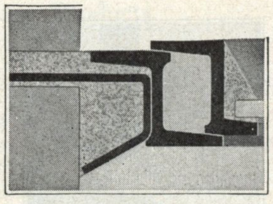
HR 31
Weight, 24 lbs.
Area, 5.4 sq. ft.
10x20 in. glass



HX 31
Weight, 26 lbs.
Area, 5.8 sq. ft.
12x18 in. glass

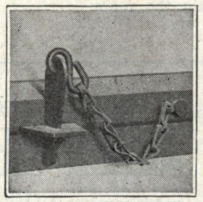


HS 42
Weight, 26 lbs.
Area, 5.1 sq. ft.
6$\frac{13}{16}$x9$\frac{13}{16}$ in. glass



Anchors

Continuous anchors at sides of the frame project into the masonry, giving a weathertight job



Lock

Lock on Lupton Basement Window draws the sash tight against frame

Lupton Double Hung Windows

A high grade, close fitting, free working steel window for office buildings, hotels, apartments, and similar buildings. Sash are made of heavy galvanized steel plate, accurately die-formed and welded at the corners. The form of the sill prevents water being retained by capillary action.

Jamb boxes are painted inside before assembly to prevent rust, and are assembled by bolts. Rain can not enter the weight boxes.

Hardware is polished bronze or malleable iron, sherardized, of standard Lupton design.

Lupton Double Hung Windows will be made to Underwriters' specifications and bear Underwriters' labels when so ordered.

This type of sash is strictly a standard product. Its low cost is possible because of quantity production, which requires strict adherence to the details. Sizes are specified by the architect.

The American News Co. Building, Varick and Spring Streets, New York, N. Y.

R. G. Cory, Architect

Lupton Double Hung Windows are used in all openings of this large building

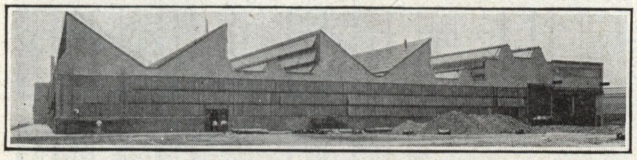
Lupton Steel Shelving and Factory Equipment

Lupton steel shelving, bin and rack types, for all heavy storage purposes. Shelves and dividers are readily adjustable to suit changing needs. Display and unit shelving serve other storage needs, such as light boxes, textiles, etc.

Lupton steel bench legs, bench drawers, tool cabinets, desks, utility cabinets, racks and partition, and doors for all purposes. Fully described in Catalogue D.

Pond Continuous Sash (Patented and Patents Pending by Clarke P. Pond)

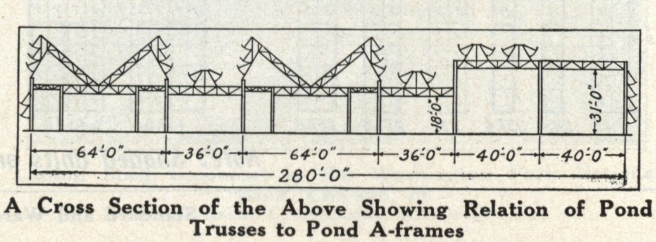
Designed for sides of Pond Truss Roofs and sawtooth construction and for the sidewalls of heat producing buildings. It is hinged at the top and forms a weather-protected shed over an opening and need not be closed in storms. Controlled, in long lines, by Pond Operating Device, either by hand chains or motor.



The Glass Plant of the Ford Motor Co., River Rouge, Mich.

Albert Kahn, Architect

Two Pond Trusses and Two Pond A-frames over grinding and polishing department and (right) two Pond A-frames over the material bay



A Cross Section of the Above Showing Relation of Pond Trusses to Pond A-frames

Continued on next page

Lupton Pivoted Sash

Frame Member—An angle section (No. 308) which is set into the masonry or framework 5/8 in. at head and jambs, and overlaps the sill by the same amount.

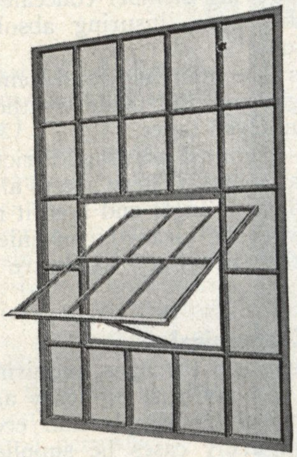
Nominal Sash Sizes—Sizes are taken to imaginary measuring lines 5/8 in. inside outer edges of frame members. Hence sash sizes and opening sizes are equal. Add 2 in. to width of multiple openings for each mullion used.

Mullions—Are standard T-bars, having 2¼-in. flanges, and stems, respectively, 1½ and 2¼ in. deep. The longer stems are used for the larger sash units.

Mullion Flanges—Always set outside of sash. The stems may project inside or outside.

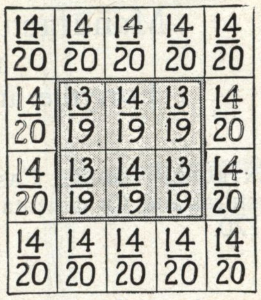
Standard Sizes—Lupton Pivoted Sash is made for either 12x18-in. or 14x20-in. glass lights, the latter being in warehouse stock. See tables of both sides on this page.

Lights in Ventilators—Are reduced 1 in. in height or width or both, to allow for the space taken by the weathering around ventilators. See table opposite.



Lupton Pivoted Sash, with Ventilator Open

Walls—Except for special reasons, walls should be built before sash are erected. Complete details for all wall conditions are shown in our Catalogue No. 12-A. Information is also given regarding the design of the walls for unusual conditions.

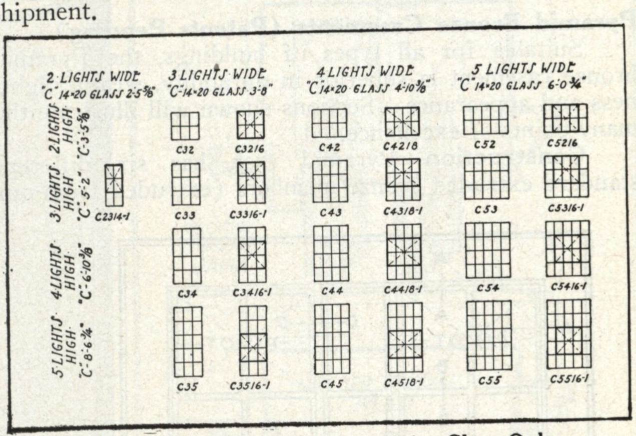


14/20	14/20	14/20	14/20	14/20
14/20	13/19 ▨	14/19 ▨	13/19 ▨	14/20
14/20	13/19 ▨	14/19 ▨	13/19 ▨	14/20
14/20	14/20	14/20	14/20	14/20

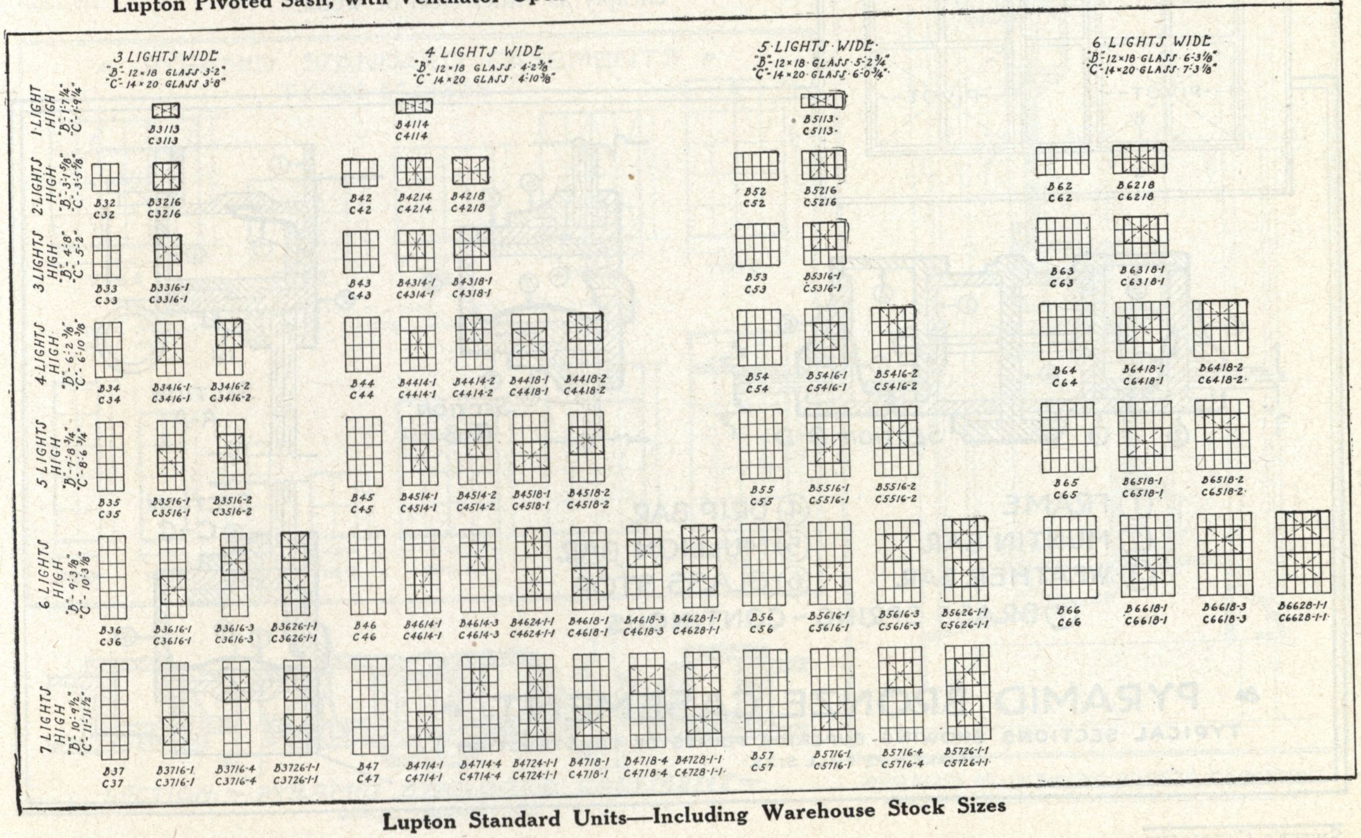
Glass Sizes

Shaded portion is the ventilator

Underwriters' Labels—Lupton Pivoted Sash can be furnished to conform to Underwriters' specifications if specified in the order. They can not be altered after shipment.


2 LIGHTS WIDE "C" 14×20 GLASS 2'-5⅝"
3 LIGHTS WIDE "C"-14×20 GLASS 3'-8"
4 LIGHTS WIDE "C" 14×20 GLASS 4'-10⅜"
5 LIGHTS WIDE "C" 14×20 GLASS 6'-0¾"
2 LIGHTS HIGH "C"-3'-5⅝"
3 LIGHTS HIGH "C"-5'-2"
4 LIGHTS HIGH "C"-6'-10⅜"
5 LIGHTS HIGH "C"-8'-6¾"
C32
C3216
C42
C4218
C52
C5216
C2314-1
C33
C3316-1
C43
C4318-1
C53
C5316-1
C34
C3416-1
C44
C4418-1
C54
C5416-1
C35
C3516-1
C45
C4518-1
C55
C5516-1

Warehouse Stock Sizes, 14x20 in. Glass Only


3 LIGHTS WIDE "B"-12×18 GLASS 3'-2" "C"-14×20 GLASS 3'-8"
4 LIGHTS WIDE "B" 12×18 GLASS 4'-2⅜" "C" 14×20 GLASS 4'-10⅜"
5 LIGHTS WIDE "B"-12×18 GLASS 5'-2¾" "C"-14×20 GLASS 6'-0¾"
6 LIGHTS WIDE "B"-12×18 GLASS 6'-3⅛" "C"-14×20 GLASS 7'-3⅛"
1 LIGHT HIGH "B"-1'-7¼" "C"-1'-9¼"
2 LIGHTS HIGH "B"-3'-1⅝" "C"-3'-5⅝"
3 LIGHTS HIGH "B"-4'-8" "C"-5'-2"
4 LIGHTS HIGH "B"-6'-2⅜" "C"-6'-10⅜"
5 LIGHTS HIGH "B"-7'-8¾" "C"-8'-6¾"
6 LIGHTS HIGH "B"-9'-3⅛" "C"-10'-3⅛"
7 LIGHTS HIGH "B"-10'-9½" "C"-11'-11½"
B3113 C3113
B4114 C4114
B5113 C5113
B32 C32
B3216 C3216
B42 C42
B4214 C4214
B4218 C4218
B52 C52
B5216 C5216
B62 C62
B6218 C6218
B33 C33
B3316-1 C3316-1
B43 C43
B4314-1 C4314-1
B4318-1 C4318-1
B53 C53
B5316-1 C5316-1
B63 C63
B6318-1 C6318-1
B34 C34
B3416-1 C3416-1
B3416-2 C3416-2
B44 C44
B4414-1 C4414-1
B4414-2 C4414-2
B4418-1 C4418-1
B4418-2 C4418-2
B54 C54
B5416-1 C5416-1
B5416-2 C5416-2
B64 C64
B6418-1 C6418-1
B6418-2 C6418-2
B35 C35
B3516-1 C3516-1
B3516-2 C3516-2
B45 C45
B4514-1 C4514-1
B4514-2 C4514-2
B4518-1 C4518-1
B4518-2 C4518-2
B55 C55
B5516-1 C5516-1
B5516-2 C5516-2
B65 C65
B6518-1 C6518-1
B6518-2 C6518-2
B36 C36
B3616-1 C3616-1
B3616-3 C3616-3
B3626-1-1 C3626-1-1
B46 C46
B4614-1 C4614-1
B4614-3 C4614-3
B4624-1-1 C4624-1-1
B4618-1 C4618-1
B4618-3 C4618-3
B4628-1-1 C4628-1-1
B56 C56
B5616-1 C5616-1
B5616-3 C5616-3
B5626-1-1 C5626-1-1
B66 C66
B6618-1 C6618-1
B6618-3 C6618-3
B6628-1-1 C6628-1-1
B37 C37
B3716-1 C3716-1
B3716-4 C3716-4
B3726-1-1 C3726-1-1
B47 C47
B4714-1 C4714-1
B4714-4 C4714-4
B4724-1-1 C4724-1-1
B4718-1 C4718-1
B4718-4 C4718-4
B4728-1-1 C4728-1-1
B57 C57
B5716-1 C5716-1
B5716-4 C5716-4
B5726-1-1 C5726-1-1

Lupton Standard Units—Including Warehouse Stock Sizes

ESTABLISHED 1912 INCORPORATED 1920

THE McCOY BRONZE COMPANY, INC.

Manufacturers of Pyramid Bronze Casements

FACTORY AND GENERAL OFFICES
Forsythe and Holden Streets, DETROIT, MICH.

Products

Pyramid Extruded Bronze Casements.

For Architectural and Ornamental Bronze Work, see page 770.

Facilities

A complete modern plant manned with experienced and capable workmen.

Service

Estimates will be furnished from architects' plans and specifications. Suggestions and designs or models will be furnished when desired. We solicit your inquiries.

Pyramid Bronze Casements (Patents Pending)

Suitable for all types of buildings, the Pyramid bronze casement is superior in durability, weathertightness and appearance. Sections shown will illustrate the many points of excellence.

Construction—Pyramid sash has six different standard extruded bronze members (extruded from our own dies) with a combination of which we are able to make up any form of bronze sash.

This construction, making for economy and uniformity, creates unbroken architectural lines both inside and outside.

The glass mould and frame mould are applied in a novel manner, concealing and permanently retaining all putty.

Pyramid bronze sash, unlike others, is absolutely weatherproof, the construction being proven and decidedly efficient.

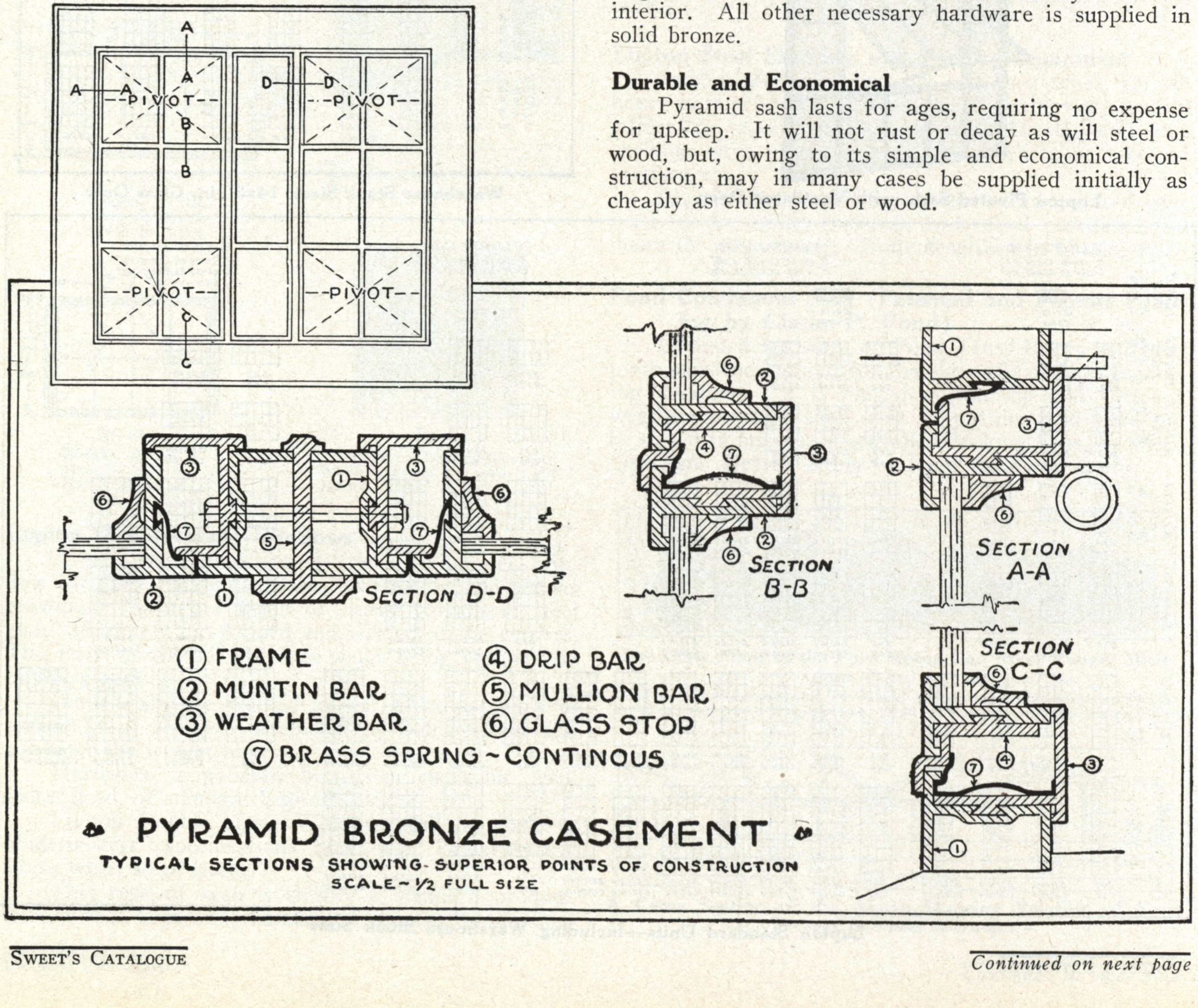
The third point which must not be confused with the ordinary added weatherstrip, is a continuous flexible phosphor bronze spring member concealed and fastened in a dovetailed groove, insuring absolute protection under all conditions.

All corners are mortised and tenoned together, automatically tightened and made weatherproof with a concealed, driven-keyed taper.

Hardware—Pyramid adjustable friction hinges are supplied on all casements. These hinges allow the sash to be open to any desired angle and hold it rigidly, permitting the window to be cleaned conveniently from the interior. All other necessary hardware is supplied in solid bronze.

Durable and Economical

Pyramid sash lasts for ages, requiring no expense for upkeep. It will not rust or decay as will steel or wood, but, owing to its simple and economical construction, may in many cases be supplied initially as cheaply as either steel or wood.

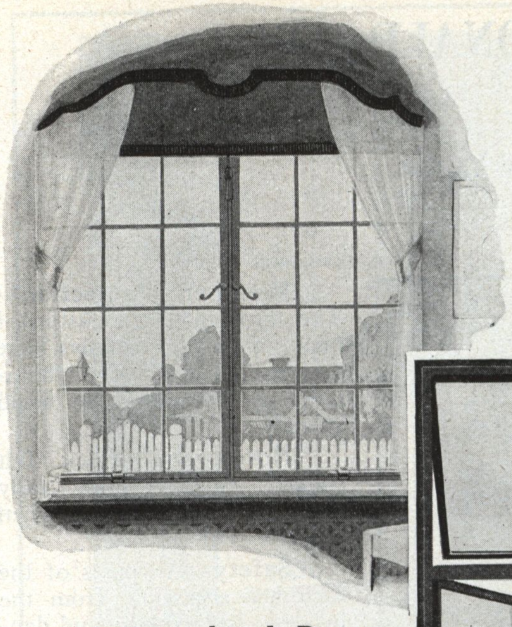


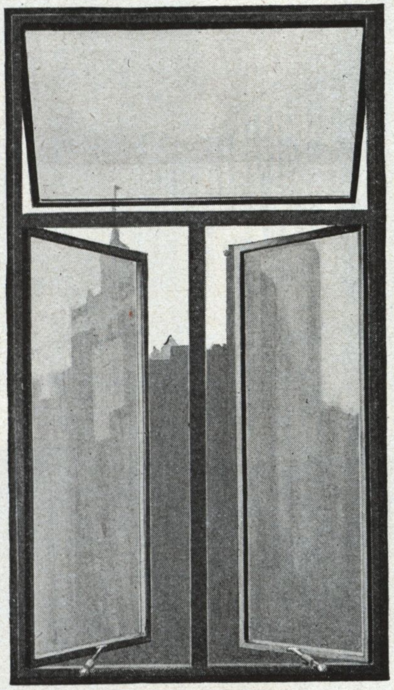
PYRAMID BRONZE CASEMENT

TYPICAL SECTIONS SHOWING SUPERIOR POINTS OF CONSTRUCTION

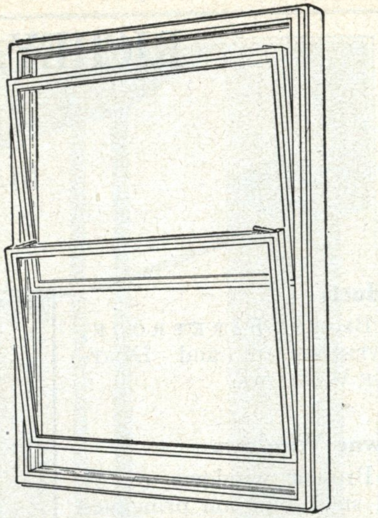
SCALE ~ 1/2 FULL SIZE

Continued on next page





Residential and Office Type Pyramid Bronze Casements Mullions are used in these particular cases, but may be omitted



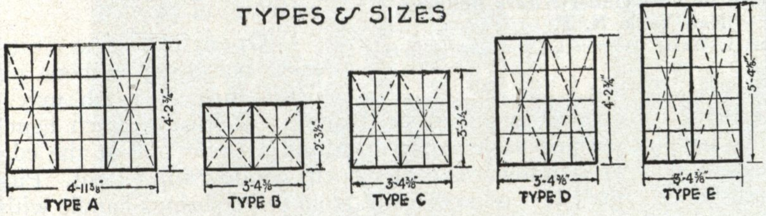
Perspective View of Pyramid Double Hung Casement (Open)

Pyramid Standard Bronze Casements (Patents Pending)

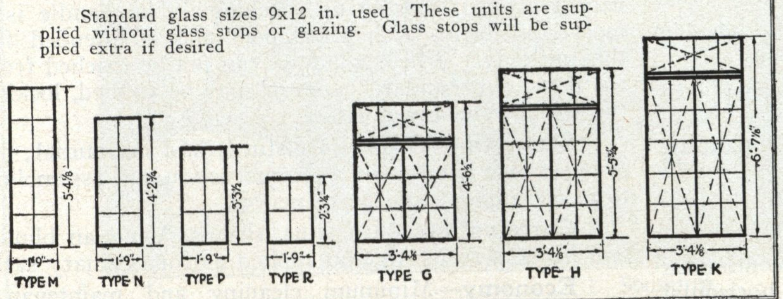
These are made in lighter cross section for use in cottage type sash (types and sizes shown below). Larger sizes may be built up by using mullions and supporting crossbars. These units have three points of weathering and are of the same caliber as our heavier sash.

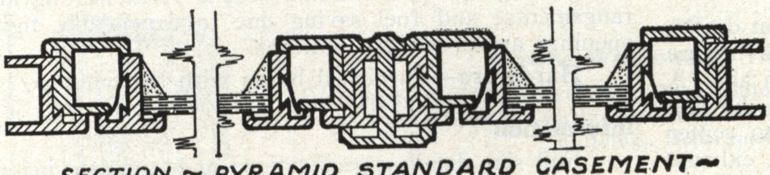
They are the ideal where economy in first cost is essential and Pyramid permanence is desired.

PYRAMID STANDARD CASEMENTS
TYPES & SIZES

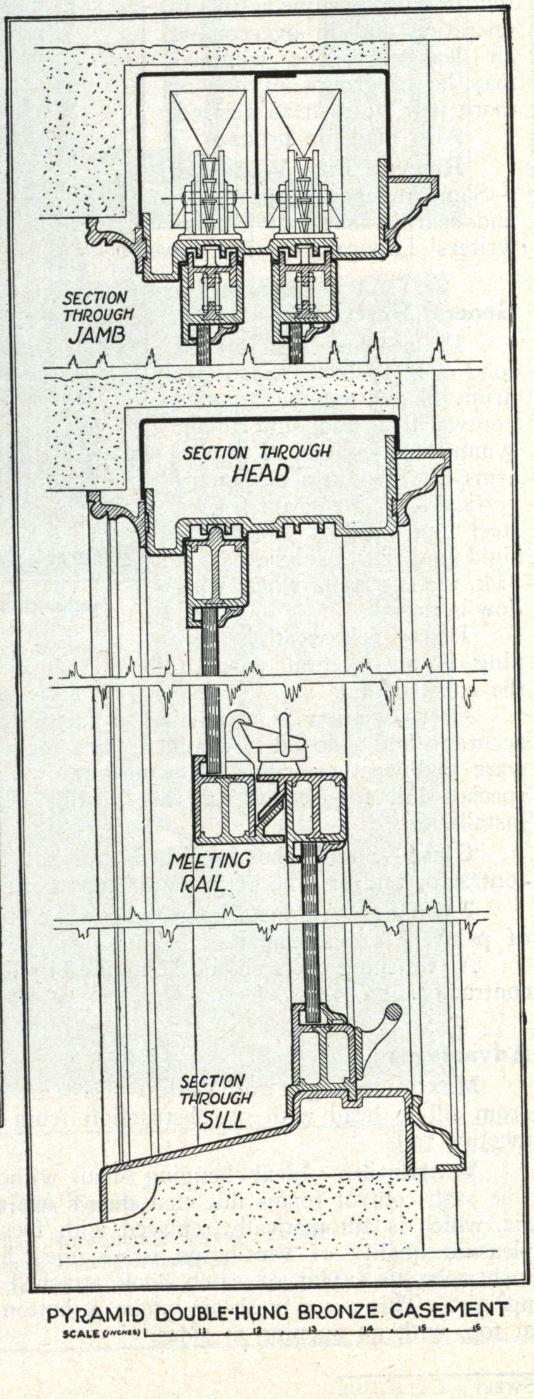

4'-2⅜"
4'-11⅜"
TYPE A
2'-3½"
3'-4⅜
TYPE B
3'-3½"
3'-4⅜"
TYPE C
4'-2¾"
3'-4⅜"
TYPE D
5'-4⅛"
3'-4⅜"
TYPE E

Standard glass sizes 9x12 in. used These units are supplied without glass stops or glazing. Glass stops will be supplied extra if desired


5'-4⅛
1'-9"
TYPE M
4'-2¾
1'-9"
TYPE N
3'-3½
1'-9"
TYPE P
2'-3¾"
1'-9"
TYPE R
4'-6½
3'-4⅛
TYPE G
5'-5⅜"
3'-4⅛"
TYPE H
6'-7⅛"
3'-4⅛
TYPE K



SECTION ~ PYRAMID STANDARD CASEMENT~
SCALE ~ ½ FULL SIZE


SECTION THROUGH JAMB
SECTION THROUGH HEAD
MEETING RAIL
SECTION THROUGH SILL

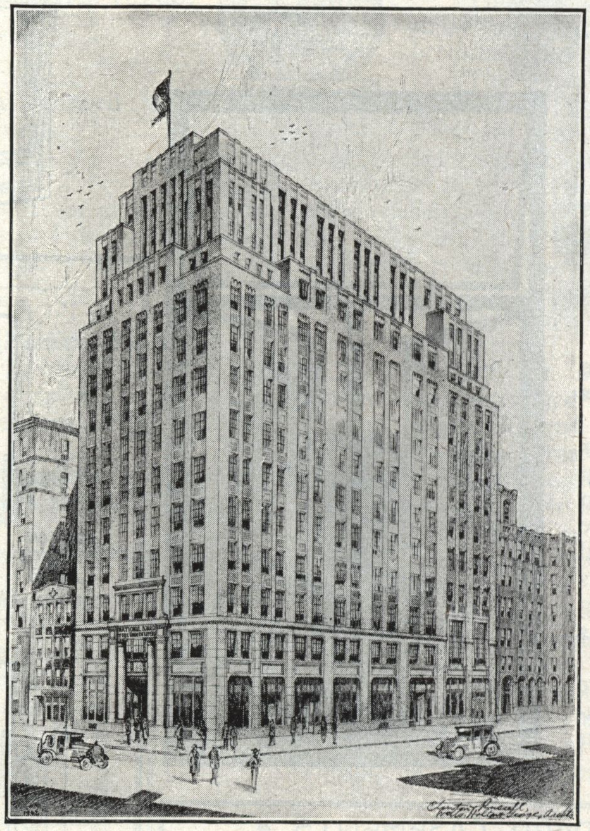
PYRAMID DOUBLE-HUNG BRONZE CASEMENT

SCALE (INCHES) 11 12 13 14 15 16

RICHEY, BROWNE & DONALD, INC.

2101 Flushing Avenue
MASPETH, CITY OF NEW YORK

AGENTS IN PRINCIPAL CITIES



National Board of Fire Underwriters Building, New York, N. Y.
Clinton & Russell, Wells, Holton & George, Architects

Products

Browne Fireproof, Weatherproof and Dustproof Windows.

Browne Windows

Browne windows are of solid steel, built on principles that produce positive results in operation and in overcoming air leakage. The windows may be in groups of one or more pair of sash as desired.

Also made in bronze.

Browne Fire Windows—Same in general appearance, and bearing labels of Underwriters' Laboratories, Inc.

General Description

Frames and sash are of solid rolled steel. Sash are firmly hinged together to open (outwardly) and shut under symmetrical control of hinged arms attached to a stationary vertical bar. Arms are forged steel and afford absolutely rigid support. A simple catch lock fastens sash when window is closed.

Heavy felt weatherstripping is an integral part of the construction.

Every window is assembled at factory, tested for accuracy and shipped a complete unit including hardware and weatherstrips. Browne windows require no special skill for setting and are readily glazed after installation.

Glass—Should be furnished and set by glazing contractor and may be of grade or type desired.

Painting—All metal parts receive one shop coat of paint before shipment.

All finishing coats should be applied by the painting contractor.

Advantages

Maximum Light and Vision—Sash are continuous from sill to head with no obstruction from horizontal meeting rails.

Ventilation—Ideal changing of air without drafts. The sash control forms flue that draws out all impure air, which is automatically replaced with fresh air. A pleasant quality of ventilation is obtained by bowing sash open to extent of catch hook attached to center upright. This gives fresh air intake at bottom, exhaust at top, with no opening at sides.

Weather Protection—The airtight and dustproof qualities of the windows have been established under laboratory test of 140-mile wind velocity.

Noiseproof—Thick felt contact cushions practically shut out street noises when window is closed.

Safety—All parts of the sash are accessible from the inside. The expense and danger of outside window cleaning and painting are eliminated.

Simplicity—No track mechanism for the accumulation of dirt and water. No weight boxes to invite drafts and annoyance from noise; no chains, weights or pulleys to get out of order; no rattling of parts when open or closed.

Contact—No metal to metal weathering contact. The contact in all cases is metal to felt.

Service—Continuous and lasting, with no danger of sagging, warping, racking, or wearing off paint.

Operation—Smooth, easy, noiseless; without physical effort the sash may be opened to any desired angle. Releasing catch handle, pushing sash partly open and a slight pull at the edges of sash towards center opens window full extent. Pushing edges of sash away from center brings handle within easy reach for closing and locking. The handle is a most convenient latch attachment and is intended for this use only. Where windows can not be reached from the floor, our standard operator may be applied, locking the window in any position.

Strength—All parts are sturdy and substantial; the greatest care is taken in the construction and assembling to insure rigidity and permanence.

Curtains, etc.—Curtains, shades, Venetian blinds, and inside screens may be applied as for ordinary sash.

Economy—Minimum cleaning and maintenance costs; assurance of maximum results from heating arrangements; and fuel saving due to dependably tight openings are prominent features.

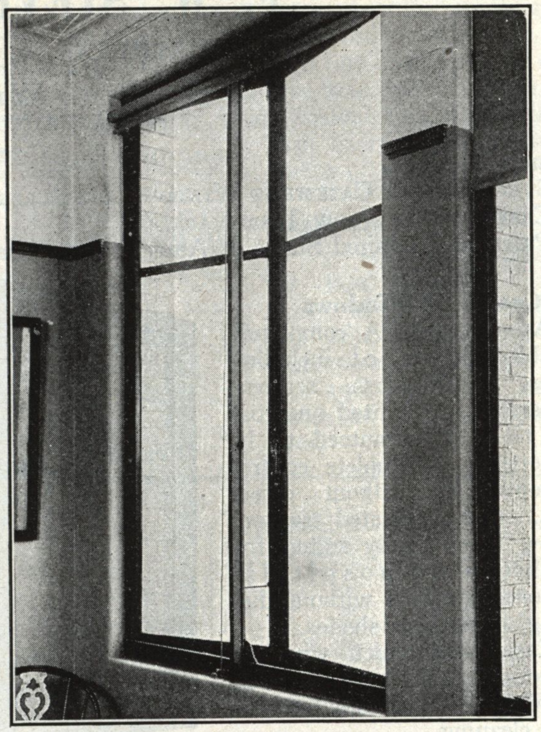
Hardware—Furnished by us with the window.

Information

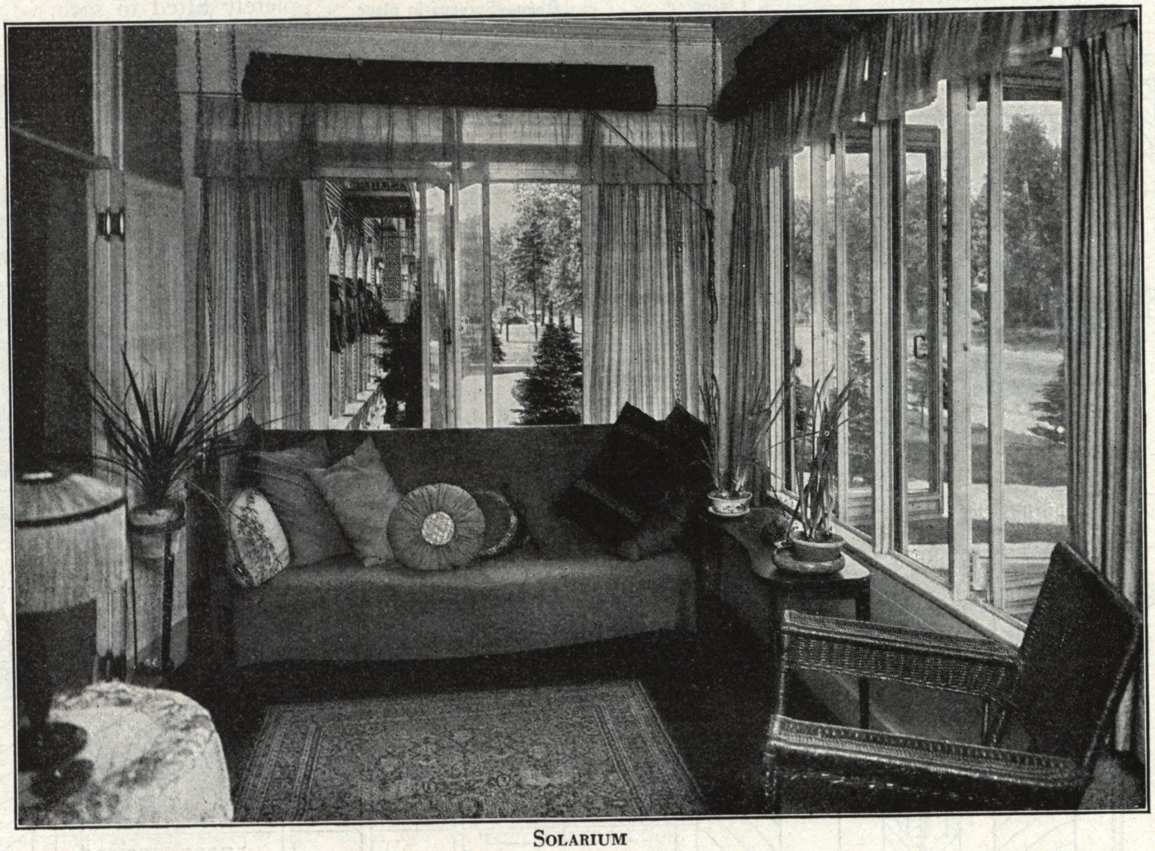
Full size details, specifications and complete information furnished on request.

Continued on next page

Apartment



Office Building



Solarium

Browne Windows of Various Types

Appropriate in Design for Homes, Office Buildings, Apartments, Schools, Public Buildings, Hospitals, University Buildings, Hotels, Industrial Buildings, Department Stores

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

F. W. STEVENS & SON, INC.

Manufacturers of Unit Casement Windows

8 Warren Terrace
NEWTON CENTER, MASS.

Products

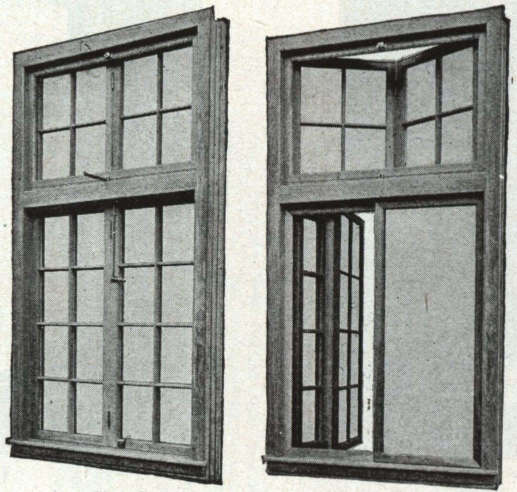
Stevens Unit Casement Windows and Screens.
Casement Window Hardware.
Patented in United States of America and Canada.

Unit Casement Windows

Advantages—A completely assembled product including frames, sash, glass, screens, weatherstrips. Painted one coat outside. Guaranteed to be weathertight. Complete control of ventilation without direct drafts. Our ventilated transom window is especially suited for schoolhouses and hospitals. Transoms operated without disturbing screens or shades.

Ease with which windows can be cleaned on the outside from within—this eliminates danger in cleaning.

Simplicity of construction.


Closed Open—Screens in place
Ventilating Hospital Window

Suitable for all kinds of construction, and architect's details.

Can be installed in old frames without disturbing interior finish.

Materials — ***Frames***—Either for brick or wood construction from good seasoned white pine made to our standard details.

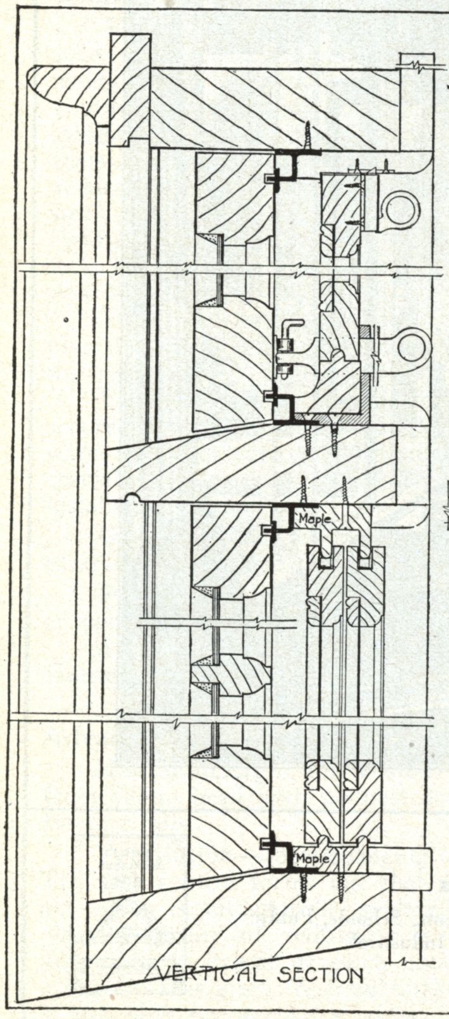
Sash—1¾ in. thick from best white pine.

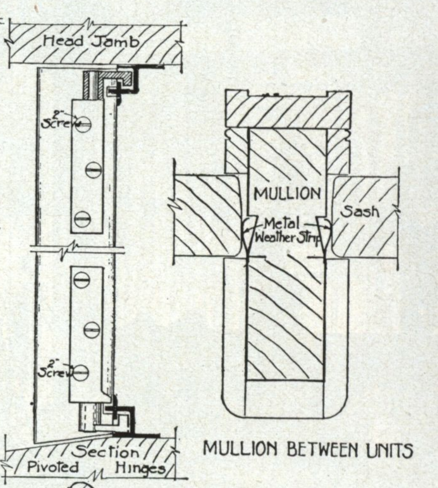
Glass—Selected quality in the varying thicknesses.

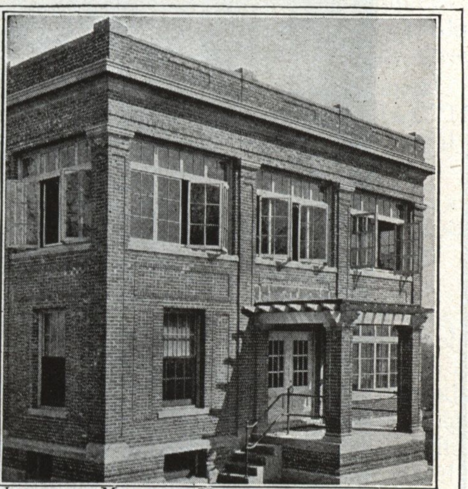
Glazing—All sash glazed with the best glazing compound.

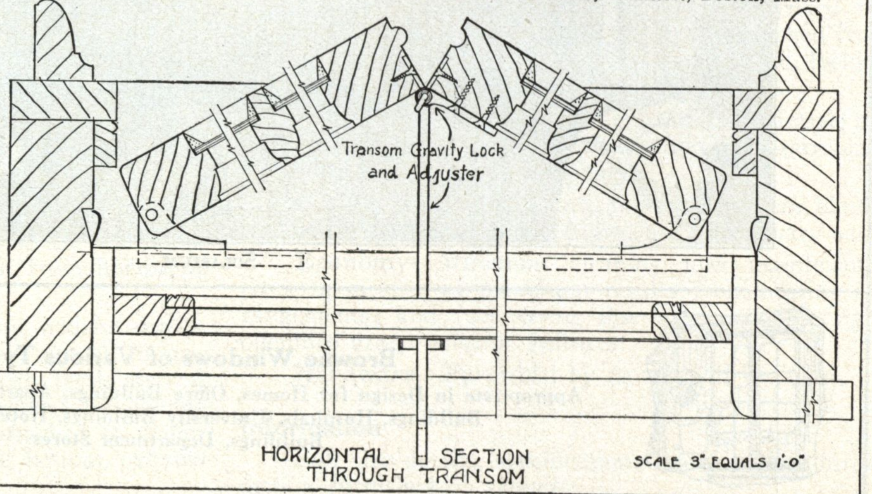
Screens—Made from best of white pine, wired with 16-mesh copper screen cloth.

Hardware—All solid brass to our special detail, and completely fitted to sash.


Maple
Maple
VERTICAL SECTION


Head Jamb
2" Screw
2" Screw
Section Pivoted Hinges
MULLION
Sash
Metal Weather Strip
MULLION BETWEEN UNITS


Lawrence Memorial Hospital, Medford, Mass.
Chas. B. Dunham, Architect, Boston, Mass.

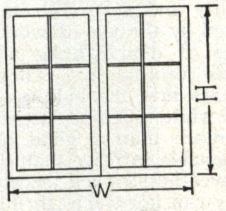

Transom Gravity Lock and Adjuster
HORIZONTAL SECTION THROUGH TRANSOM
SCALE 3" EQUALS 1'-0"

Details of Stevens Unit Casement Windows with Transom

Continued on next page

Installation—Windows are delivered at the building assembled, and carpenter has only to set units in openings designated on the plans. This completes the job in-so-far as the operation of sash and screens is concerned. We do not furnish interior trim. For frame construction make rough openings 5 in. wider and higher than standard size of sash to be used.

Operation of Sash—A slight outward push in the center of each pair of sash will make the units fold together; they can then be slid to either side, making one large unobstructed opening or they may be placed in any position so as to give as little ventilation as desired. The windows are held firmly in any position, and irrespective of the wind velocity will not rattle. For single sash or groups of three, five, etc., the odd single sash opens similar to the units, except that one of the pivoted corner hinges is replaced by an arm, one end of which is secured to sash, other being fastened to jamb, allowing sash to remain rigid in outswung position.



12-light Unit

STOCK SASH HEIGHTS (H), inches

Number of lights high	Glass heights						
	8	9	10	11	12	13	14
3	29½	32½	35½	38½	41½	44½	47½
4	38	42	46	50	54	58	62
5	46¼	51¼	56¼	61¼	66¼	71¼	76¼

STOCK SASH WIDTH (W), inches

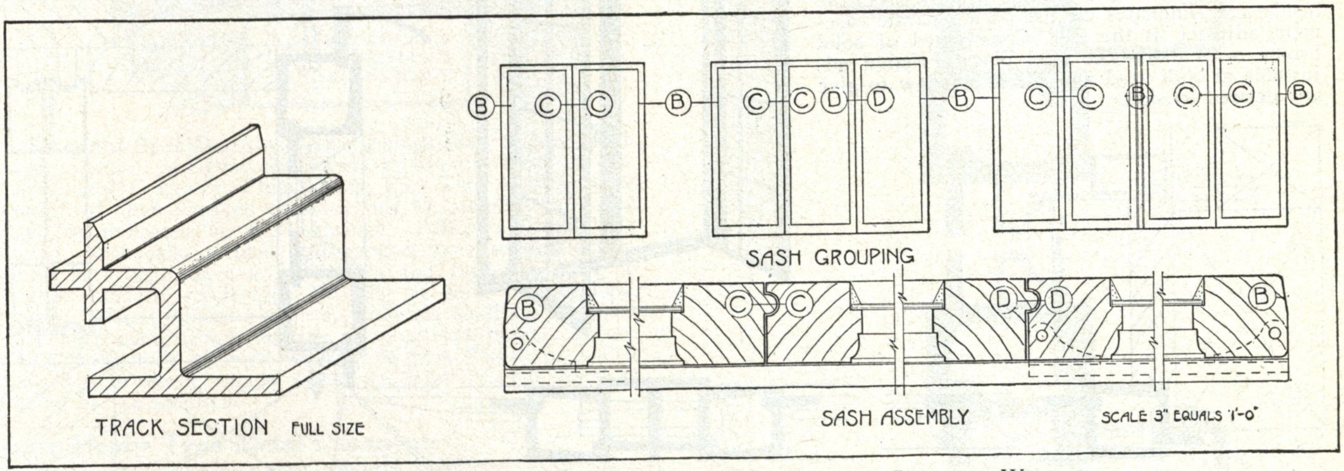
Number of lights wide	Glass width				
	6	7	8	9	10
4	32	36	40	44	48

Note: 16 and 20-light units are similar to 12-light unit illustrated.

Over-all heights and widths vary in accordance with the above tables.

Hardware

It is obvious that only the best materials can be used with satisfaction on this type of window. The illustrations show the various units. These can be furnished in any finish desired.



Detail Shows the Practical Groupings for Stevens Unit Casement Windows

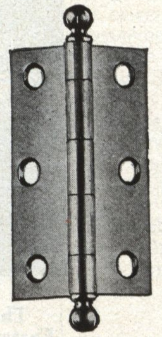


Figure 6

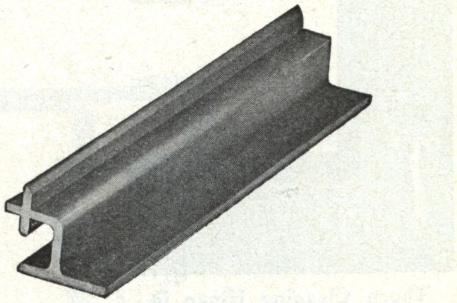


Figure 1

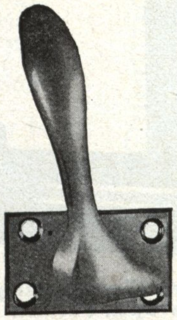


Figure 3

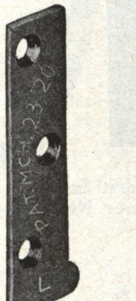


Figure 2

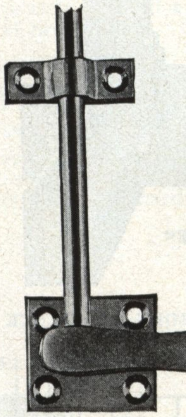


Figure 4

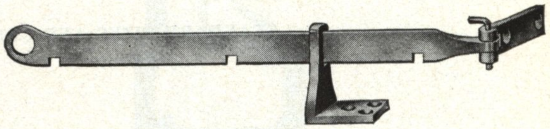


Figure 5

Hardware for Stevens Unit Casement Windows

The extruded brass track, Fig. 1, is screwed to stool and head jamb the entire width of each opening; the horizontal projecting tongue of track acts as a weatherstrip, fitting into a groove in the sash. The pivoted hinges, Fig. 2, are of cast brass; each hinge slides in extruded track from which it is impossible to become disengaged. Commercial spring bronze weatherstrips are furnished full length for each pair of jambs. Butts are 3x2 in. and are solid wrought brass; two or more being required for each pair of sash, depending on height of sash. The polished cast brass handle and lock, Fig. 3, is used as a handle to open and close the windows and as a lock, a slight turn securely fastening the sash. Fig. 4, a polished cast brass top lock for use on high sash; one lock required for each pair of sash. Fig. 5, transom gravity lock and adjuster for operating transom only. Fig. 6, loose pin butt

A Few Installations and Their Architects

Essex County Tuberculosis Hospital, Middleton, Mass., John H. Bickford Co.
Free Hospital for Women, Brookline, Mass., Coolidge & Shattuck
Rhode Island Hospital, Providence, R. I., Kendall, Taylor Co.
Infirmary School for Boys, Shirley, Mass., Densmore & LeClear
Deaconess Hospital, Boston, Mass., E. W. Dearing
Central New England Sanatorium, Rutland, Mass., Stevens & Lee
Geo. F. Geisinger Memorial Hospital (Private Pavilion and Operating Building), Danville, Pa., Stevens & Lee
Harrisburg Hospital, Harrisburg, Pa., Stevens & Lee
Heywood Memorial Hospital, Gardner, Mass., Stevens & Lee
Mary Lane Hospital, Ware, Mass., Stevens & Lee
Notre Dame Hospital, Montreal, Que., Stevens & Lee
Ottawa Civic Hospital, Ottawa, Ont., Stevens & Lee
Springfield Hospital (Nurses' Home), Springfield, Mass., Stevens & Lee
New Britain General Hospital, New Britain, Conn., Stevens & Lee
Kingston General Hospital, Kingston, Ont., Stevens & Lee
St. Luke's Hospital, New Bedford, Mass., Stevens & Lee
Nurses' Home, Fall River Hospital, Fall River, Mass., E. M. Corbett
Children's Hospital, Washington, D. C., Stevens & Lee
Freeman Hospital, Joplin, Mo., E. W. Dearing

J. S. THORN COMPANY

Manufacturers of Solid Steel Casement Windows

20th and Allegheny Avenues, PHILADELPHIA, PA.

NEW YORK, N. Y., 21 East 40th Street
BOSTON, MASS., 161 Devonshire Street

Products

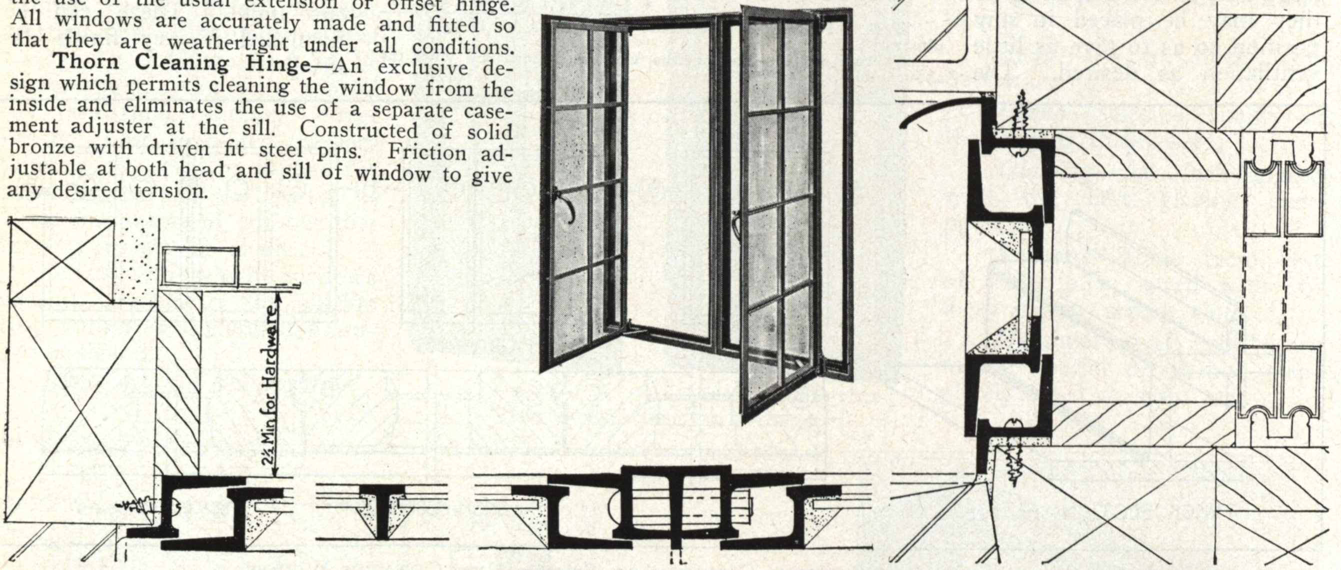
Thorn Metal Casements for residences, apartments, institutional buildings, etc.

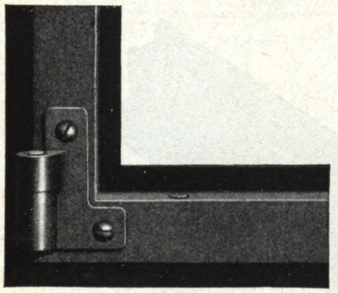
Thorn Residence Type Metal Casements

Made of specially rolled steel casement sections of substantial weight, and designed to produce a most rigid construction. The members are mitered and electrically welded at the corners and fitted with either solid bronze or malleable iron fasteners of pleasing design. Hinges are of solid bronze and designed to permit cleaning of windows from the inside without the use of the usual extension or offset hinge. All windows are accurately made and fitted so that they are weathertight under all conditions.

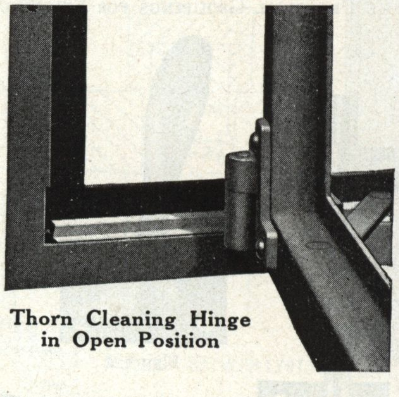
Thorn Cleaning Hinge—An exclusive design which permits cleaning the window from the inside and eliminates the use of a separate casement adjuster at the sill. Constructed of solid bronze with driven fit steel pins. Friction adjustable at both head and sill of window to give any desired tension.

Advantages—Thorn metal casements provide a distinctive quality and an architectural appearance which can not be obtained by the use of wood windows. They have all the advantages of double hung windows and in addition they provide 100% ventilation. They control ventilation by conducting breezes into the building and to a certain extent will exclude rain while the windows are open. They are economical, costing no more than a good quality wood casement and are more reasonable in price than double hung windows. They need not be weatherstripped because of their watertight construction. They can not warp, shrink, or swell as do wood windows.

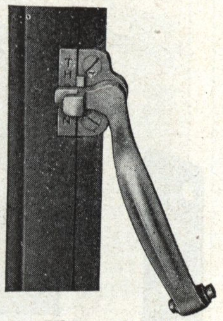




Thorn Cleaning Hinge in Closed Position

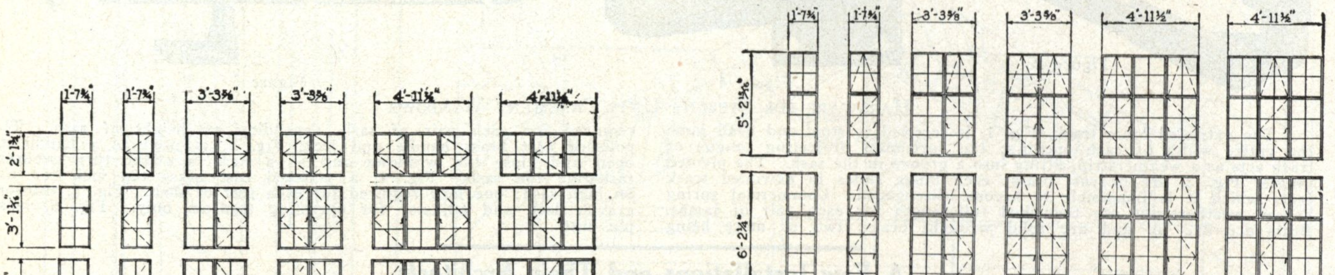


Thorn Cleaning Hinge in Open Position



Thorn Scroll Fastener No. 200

STANDARD SIZES AND COMBINATIONS OF THORN RESIDENCE CASEMENTS
Special sizes made as required



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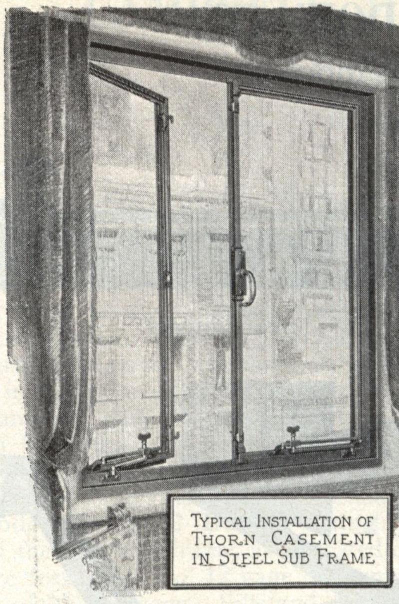


Typical Installation of Thorn Casement in Steel Sub Frame

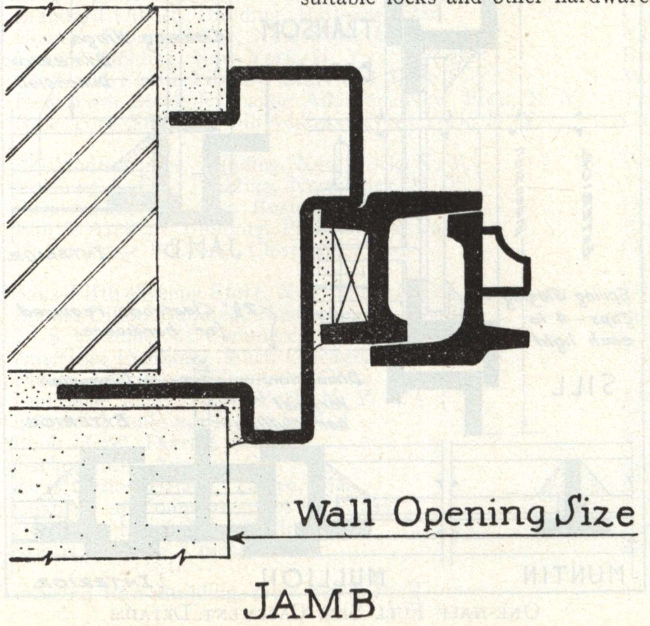
Standard Specifications—All openings shall be fitted with Thorn standard residence casements as manufactured by the J. S. Thorn Company, Philadelphia, Pa. They shall be constructed of their various combinations of standard units as shown or indicated on the drawings. All corners shall be mitered, electrically welded and ground to a smooth finish, muntin bars shall have a ⅝-in. face and fasteners shall be Thorn's standard scroll type No. 200 of solid bronze, light statuary finish. Where required, windows shall be equipped with Thorn solid bronze friction cleaning type hinge. Before leaving the factory, all windows shall be given 2 coats of Thorn standard gray elastic enamel either air dried or oven baked as directed by the architect.

Thorn Heavy Type Metal Casements

For use in more elaborate residences, churches, banks, office buildings, etc. Constructed of heavy 2-point specially rolled steel casement section. Constructed with the same care and accuracy as Thorn light casements. Glazing may be provided for by the use of putty only or glass may be held in place with drawn steel glazing beads which are accurately mitered at the corners and held in place with brass oval head screws. Solid bronze hardware is used throughout.

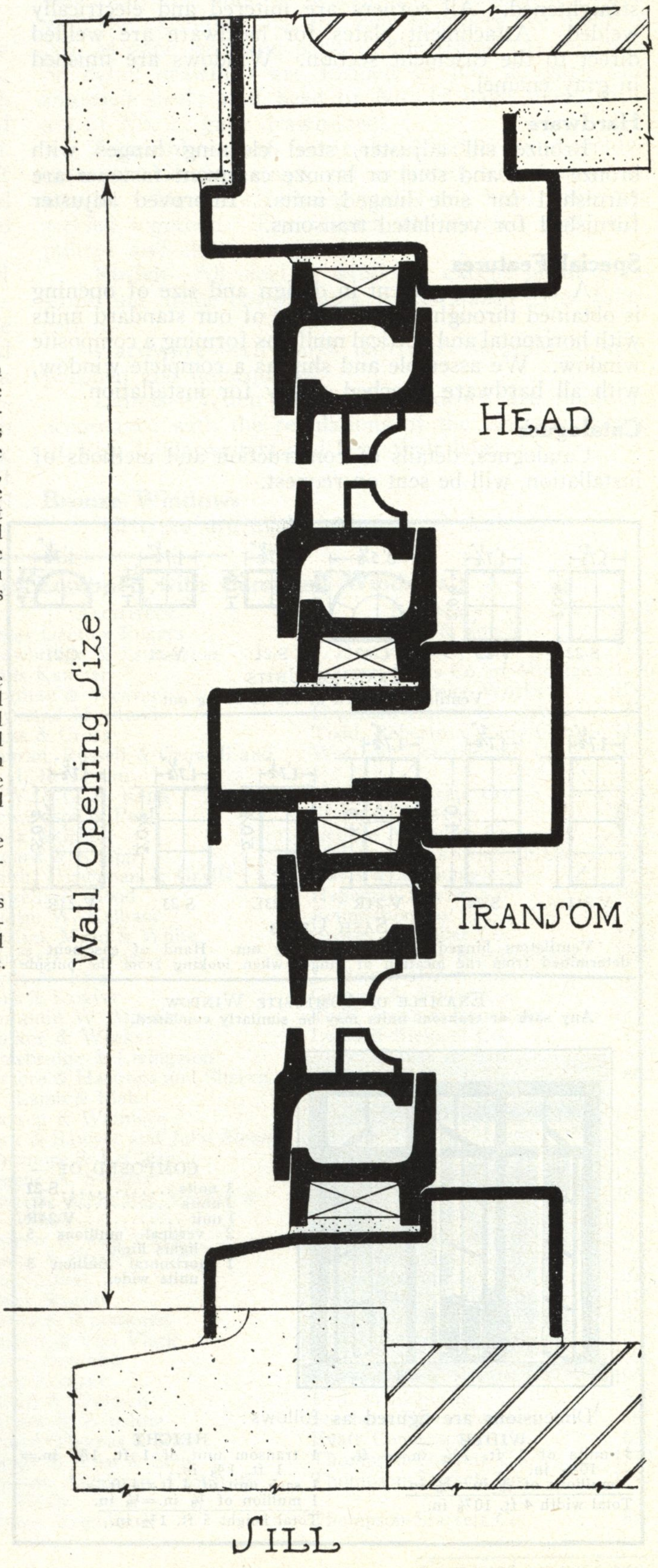
Where desired, Thorn heavy type metal casements may be provided with a metal subframe which is built in and the windows placed after openings are prepared.

Made to open outward or inward. These larger sections lend themselves admirably to the construction of French casements or doors with bronze thresholds, steel kick panels and suitable locks and other hardware.



Architectural Service

In designing buildings in which Thorn metal casements are to be installed, it is always well to detail the openings to receive the windows after masonry work is completed. We will at all times be glad to co-operate with architects, owners and builders in the proper preparation of details and will forward on request our booklet covering usual installation conditions for Thorn standard units.



STANDARD STEEL WINDOW CO.

Solid Rolled Steel Casement Windows

WASHINGTON, D. C.

General Description

Standard steel casement windows are made of solid rolled steel sections, two-point contact, process straightened. All corners are mitered and electrically welded. Attachment plates for hardware are welded direct to the casement section. Windows are finished in gray enamel.

Hardware

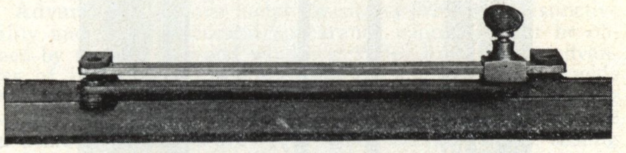
Bronze sill adjuster, steel cleaning hinges with bronze pins, and steel or bronze casement fastener are furnished for side hinged units. Improved adjuster furnished for ventilated transoms.

Special Features

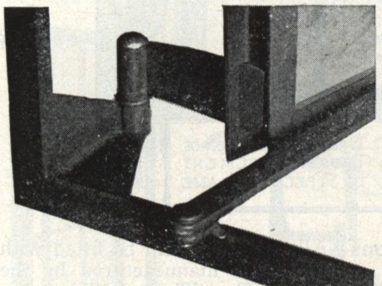
A wide arrangement in design and size of opening is obtained through the combining of our standard units with horizontal and vertical mullions forming a composite window. We assemble and ship as a complete window, with all hardware attached, ready for installation.

Catalogues

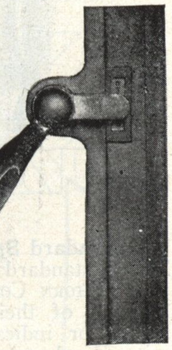
Catalogues, details of construction and methods of installation, will be sent on request.



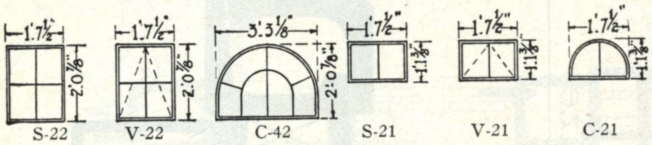
Sill Adjuster



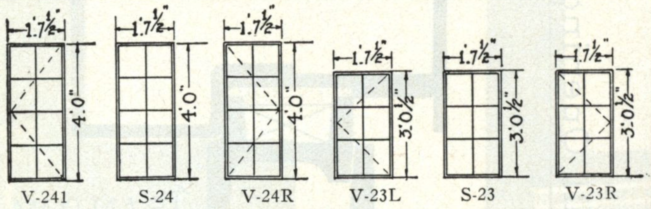
Cleaning Hinge
Note: These hinges permit cleaning glass from within and allow easy access to awning ropes



Fastener

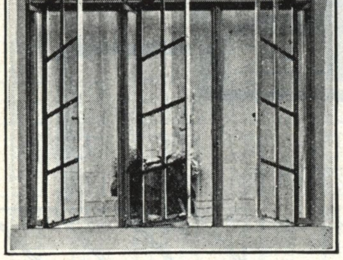

1′ 7½″
2′ 0⅞″
S-22
1′ 7½″
2′ 0⅞″
V-22
3′ 3⅛″
2′ 0⅞″
C-42
1′ 7½″
1′ 1⅜″
S-21
1′ 7½″
1′ 1⅜″
V-21
1′ 7½″
1′ 1⅜″
C-21

Transom Units
Ventilators hinged at top to swing out


1′ 7½″
4′ 0″
V-241
1′ 7½″
4′ 0″
S-24
1′ 7½″
4′ 0″
V-24R
1′ 7½″
3′ 0½″
V-23L
1′ 7½″
3′ 0½″
S-23
1′ 7½″
3′ 0½″
V-23R

Sash Units
Ventilators hinged at side to swing out. Hand of casement is determined from the location of hinges when looking from the outside

Example of Composite Window
Any sash or transom units may be similarly combined.

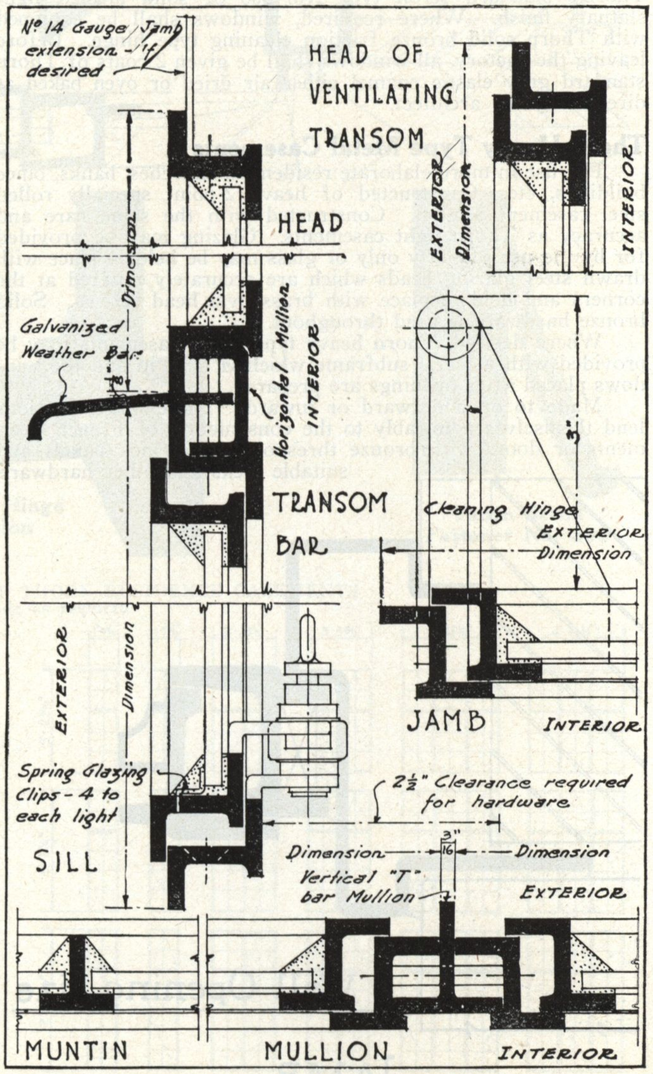


COMPOSED OF:—
3 units S-21
2 units V-24L
1 unit V-24R
2 vertical mullions 5 lights high.
1 horizontal mullion 3 units wide.

Dimensions are figured as follows:

WIDTH
3 units of 1 ft. 7½ in.=4 ft. 10½ in.
2 mullions of $\frac{3}{16}$ in.=⅜ in.
Total width 4 ft. 10⅞ in.

HEIGHT
1 transom unit of 1 ft. 1⅜ in.= 1 ft. 1⅜ in.
1 sash unit of 4 ft.=4 ft.
1 mullion of ⅛ in.=⅛ in.
Total height 5 ft. 1½ in.


No 14 Gauge Jamb extension if desired
HEAD OF VENTILATING TRANSOM
EXTERIOR
Dimension
INTERIOR
HEAD
Dimension
Horizontal Mullion
INTERIOR
Galvanized Weather Bar
3″
TRANSOM BAR
Cleaning Hinge
EXTERIOR
Dimension
EXTERIOR
Dimension
JAMB
INTERIOR
Spring Glazing Clips - 4 to each light
2½″ Clearance required for hardware
SILL
Dimension
$\frac{3}{16}$″
Dimension
Vertical "T" bar Mullion
EXTERIOR
MUNTIN
MULLION
INTERIOR

One-half Full Size Casement Details

CAMPBELL METAL WINDOW CORPORATION

Pershing Square Building
NEW YORK, N. Y.
BALTIMORE, MD., Bush and Hamburg Streets

Products

Campbell Solid Metal Windows, Double Hung.

Campbell Solid Metal Windows

The Campbell Metal Window Corporation is the successor to the Campbell Architectural Iron Co., Inc., established in 1889 by Harry E. Campbell, which has furnished metal windows, ornamental iron and bronze in many buildings throughout the United States. The Campbell window meets all the requirements of modern buildings in durability, ease of operation and weathertightness. Campbell window details are patented in the United States, England and Canada.

Model No. 98-C Double Hung Window—All parts of the sash and frame, as indicated on detail drawings, are formed of No. 12 gage blue annealed steel, the balance of No. 16 gage. Sills and stools are an integral gray iron casting, inside edge of stool finished with a moulded nosing as detailed. Sash weights are single-unit castings. Chains are of steel, hot galvanized, with galvanized connectors to sash and weights. Rubbing strips on each jamb at ends of meeting rails are of bronze. Screws are standard machine No. 10-24 steel with heads as detailed.

Model No. 97 Double Hung Window—Materials entering into the construction of Model No. 97 are essentially the same as described for Model No. 98-C, with the exception that the sash members are made of No. 14 gage steel and parts of the frame (as indicated on detail drawing) are formed of No. 20 gage blue annealed steel; staff bead of No. 12 gage steel. Sills are of No. 12 gage drawn steel.

Assembly—Sash frames have mitered and welded corners. Glazing strips are mounted with screws on interior. Members forming jambs and head boxes are welded together. The frames are shipped with sash, pulleys and chains installed.

Finish—All steel in windows, except inside glass stops and inside cover plates, is galvanized after fabrication.

Hardware—All finish hardware is solid bronze, polished and unlacquered.

Labels—When required, windows are made in accordance with the regulations of the National Board of Fire Underwriters and bear their label.

Bronze Windows

All types are made in bronze if desired.

A Few of the Prominent Buildings Equipped with Campbell Windows

Building and Location	Architect	Builder	Windows
Columbia Presbyterian Hospital, New York, N. Y.	James Gamble Rogers	Marc Eidlitz & Son	3745
Bank of America Building, New York, N. Y.	Trowbridge & Livingston	J. Henry Miller, Inc.	1137
Book Building Tower, Detroit, Mich.	Louis Kamper	Starrett Dilks Co. of Michigan	1396
Subway Terminal Building, Los Angeles, Cal.	Schultze & Weaver	Forderer Cornice Works	1743
American Radiator Building, New York, N. Y.	Raymond M. Hood	Hegeman-Harris Co., Inc.	551
Postum Building, New York, N. Y.	Cross & Cross	Todd, Robertson, Todd Corp.	1153
St. Louis Telephone Office & Equipment Building, St. Louis, Mo.	Mauran, Russell & Crowell and I. R. Timlin	Westlake Construction Co.	2384
Randolph Hotel, Chicago, Ill.	C. W. & G. L. Rapp	Hegeman-Harris Co.	1588
Insurance Co. of N. A., Philadelphia, Pa.	Stewardson & Page	Stone & Webster	1146
Engineers Bank, Cleveland, Ohio	Knox & Elliot	George A. Fuller Co.	1318
Chicago Produce Mart, Chicago, Ill.	Fugard & Knapp	McLennan Construction Co.	1784
Buhl Building, Detroit, Mich.	Smith, Hinchman & Grylls	Davis & McGonigle Co.	1585
Tribune Tower, Chicago, Ill.	Howells & Hood	Hegeman-Harris Co.	1023
Los Angeles Standard Oil, Los Angeles, Cal.	George W. Kelham	Foundation Co.	425
Hotel Pennsylvania, New York, N. Y.	McKim, Mead & White	George A. Fuller Co.	3340
Broadway & 38th St. Building, New York, N. Y.	Schwartz & Gross	Bricken Const. & Imp. Corp	1279
Standard Oil Co. Building, Baltimore, Md.	Clyde N. Friz	J. Henry Miller, Inc.	930
Bowery Savings Bank, New York, N. Y.	York & Sawyer	George A. Fuller Co.	781
Cunard Building, New York, N. Y.	Benjamin W. Morris	Todd, Irons & Robertson	2344
Cleveland Public Library, Cleveland, Ohio	Walker & Weeks	Lundoff-Bicknell Co.	486
New York Stock Exchange Addition, New York, N. Y.	Trowbridge & Livingston	Marc Eidlitz & Son	570
New York Standard Oil Addition, New York, N. Y.	Carrère & Hastings and Shreve, Lamb & Blake	Charles T. Wills, Inc.	862
200 Madison Ave. Building, New York, N. Y.	Warren & Wetmore	Dwight P. Robinson & Co.	1509
Pershing Square Building, New York, N. Y.	York & Sawyer and John Sloan	Charles T. Wills, Inc.	1150
Park Square Building, Boston, Mass.	Densmore & LeClear	W. A. & H. A. Root	1368
19th & Arch St. Building, Philadelphia, Pa.	Eugene A. Stopper	Wark Co.	1136
Union Trust Building, Cleveland, Ohio	Graham, Anderson, Probst & White	Geo. A. Fuller Co.	3845
Saks-Fifth Avenue Store, New York, N. Y.	Starrett & Van Vleck	Cauldwell-Wingate Co.	822
Bennie-Dillon Building, Nashville, Tenn.	Asmus & Clark	Foster & Creighton Co.	729
U. S. Chamber of Commerce, Washington, D. C.	Cass Gilbert	James Stewart & Co.	326
American Furniture Mart, Chicago, Ill.	Henry Raeder	Wells Bros. Const. Co.	1415
Phelps Apartment, Cincinnati, Ohio	Garber & Woodward	Ohio Building & Const. Co.	827
Equitable Society, New York, N. Y.	Starrett & Van Vleck	Thompson-Starrett Co.	2207
Industrial Building, Newark, N. J.	Henry Baechlin	Thompson-Starrett Co.	1006
Book Hotel, Detroit, Mich.	Louis Kamper	Starrett Bros.	1962
Garland, Los Angeles, Cal.	Curlett & Beelman	P. J. Walker Co.	539
First National Bank, Tampa, Fla.	Holmes & Winslow	Southern Ferro-Concrete Co.	587
Chamber of Commerce, Boston, Mass.	Parker, Thomas & Rice	Evatt Construction Co.	653
Roosevelt Hotel, New York, N. Y.	George B. Post & Sons	Thompson-Starrett Co.	1710
Straus Building, Chicago, Ill.	Graham, Anderson, Probst & White	Thompson-Starrett Co.	1741
Evening Post Building, New York, N. Y.	Horace Trumbauer	Thompson-Starrett Co.	918

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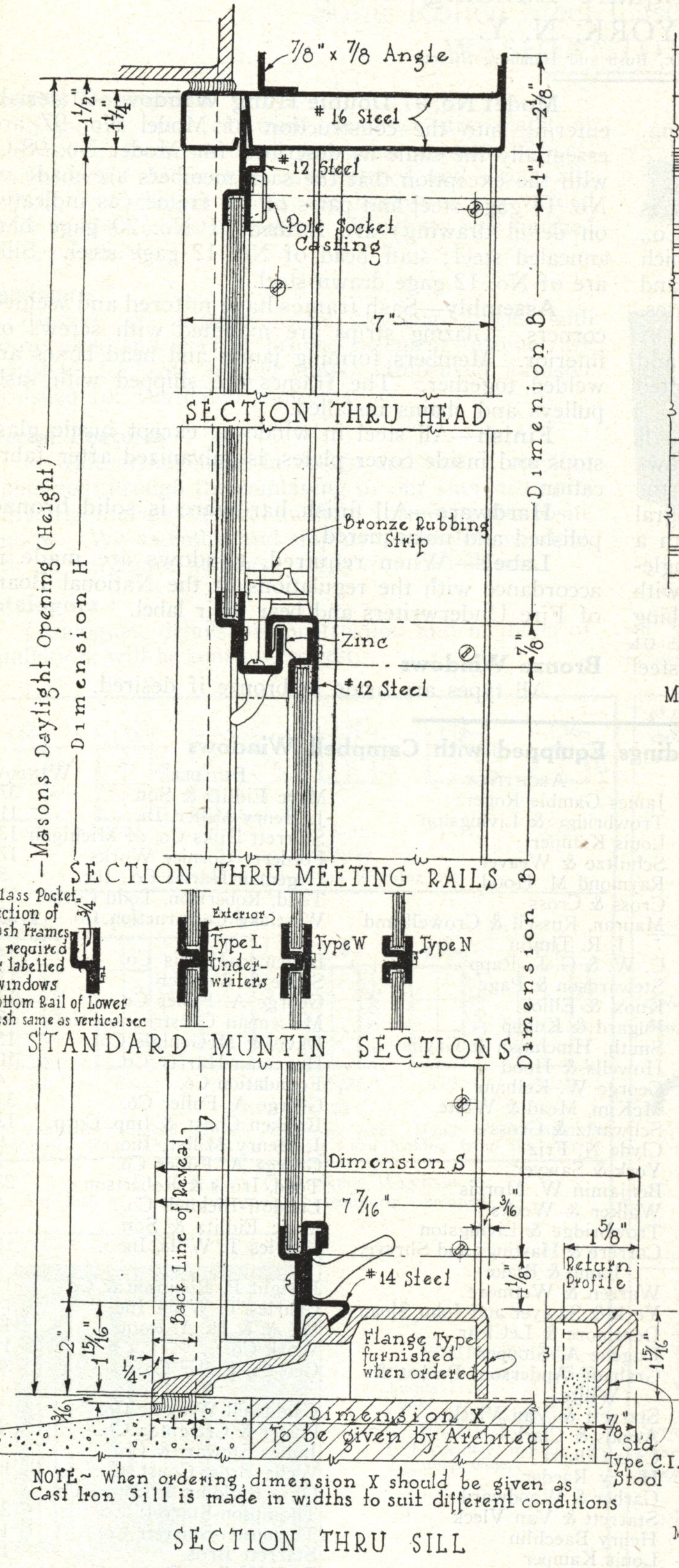
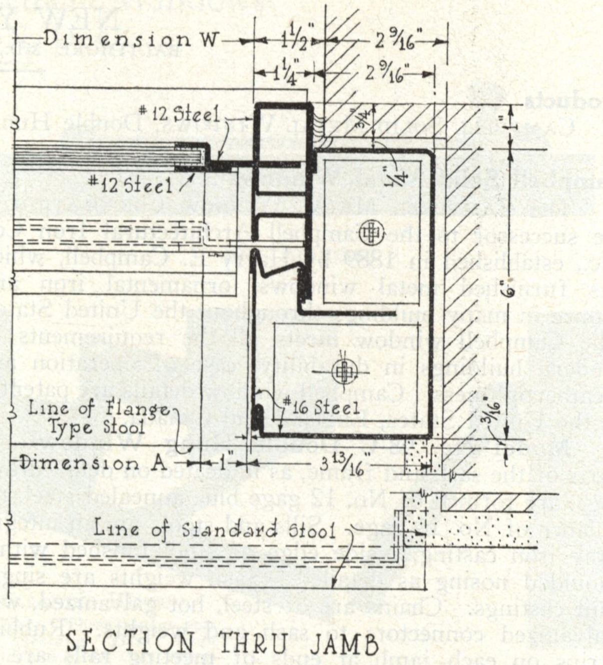

7/8" x 7/8 Angle
1 1/2"
1 1/4"
2 1/8"
#16 Steel
#12 Steel
1"
Pole Socket Casting
7"
SECTION THRU HEAD
Dimension B
Masons Daylight Opening (Height)
Dimension H
Bronze Rubbing Strip
Zinc
7/8"
#12 Steel
SECTION THRU MEETING RAILS
Dimension D
Glass Pocket Section of Sash Frames as required for labelled windows
Bottom Rail of Lower Sash same as vertical sec
3/4
Exterior
Type L Underwriters
Type W
Type N
STANDARD MUNTIN SECTIONS
Dimension S
Dimension U
Back Line of Reveal
7 7/16"
3/16"
5/8"
Return Profile
#14 Steel
2"
1 5/16"
1/4"
3/16
Flange Type furnished when ordered
1 5/16"
Dimension X
To be given by Architect
7/8"
Std Type C.I. Stool

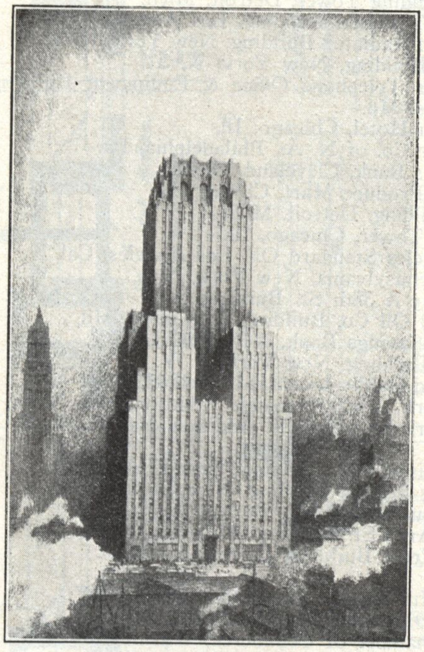
NOTE ~ When ordering, dimension X should be given as Cast Iron Sill is made in widths to suit different conditions

SECTION THRU SILL


Dimension W
1 1/2"
2 9/16"
1 1/4"
2 9/16"
#12 Steel
#12 Steel
3/4
1/4
1"
6"
Line of Flange Type Stool
#16 Steel
3/16
Dimension A
1"
3 13/16"
Line of Standard Stool

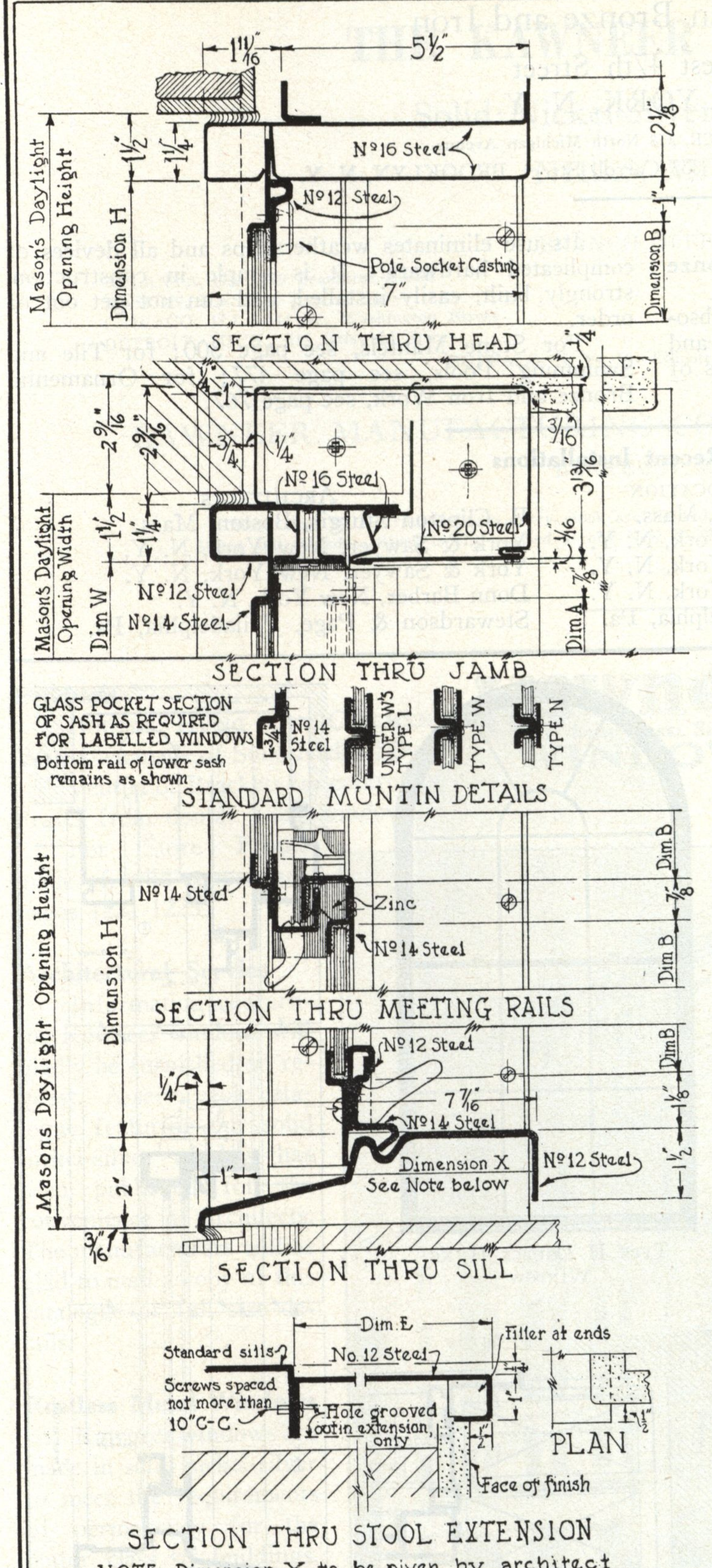
SECTION THRU JAMB

NOTE
Mullion Details are similar to those shown for Model No 97 - other drwg.

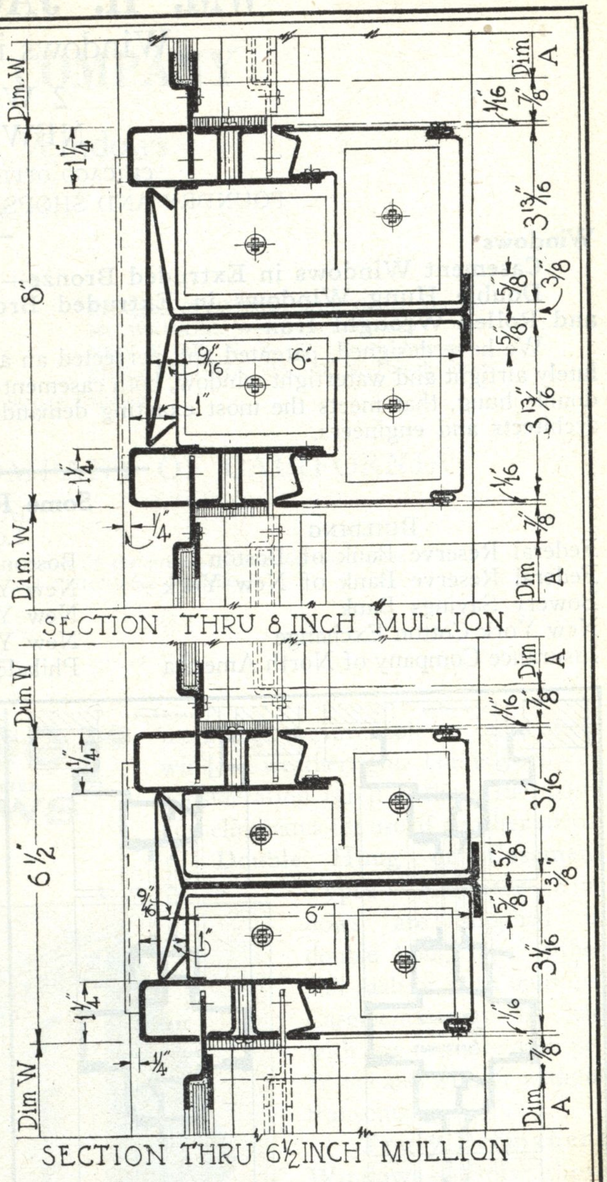


BARCLAY-VESEY TELEPHONE BUILDING
1933 CAMPBELL METAL WINDOWS
McKENZIE, VOORHEES & GMELIN ARCHITECTS.
MARC EIDLITZ & SON BUILDER.

DRAWN BY SWEETS CATALOGUE SERVICE INC.	STANDARD DETAILS OF CAMPBELL SOLID METAL WINDOW DOUBLE HUNG MODEL NO. 98 C	SCALE 3 IN. EQUALS 1 FT. DATE JULY '25	DRWG 1


1 1/16"
5 1/2"
Nº 16 Steel
Nº 12 Steel
Pole Socket Casting
7"
2 1/8"
1"
Dimension B
Masons Daylight Opening Height
Dimension H
1 1/2
1 1/4
SECTION THRU HEAD
1"
6"
2 9/16"
3/4
1/4
Nº 16 Steel
3/16
3 1/4
Nº 20 Steel
1/16
7/8
Dim A
Masons Daylight Opening Width
Dim W
Nº 12 Steel
Nº 14 Steel
SECTION THRU JAMB
GLASS POCKET SECTION OF SASH AS REQUIRED FOR LABELLED WINDOWS
Bottom rail of lower sash remains as shown
Nº 14 Steel
UNDER W'S TYPE L
TYPE W
TYPE N
STANDARD MUNTIN DETAILS
Nº 14 Steel
Zinc
Nº 14 Steel
Dim B
7/8
SECTION THRU MEETING RAILS
Nº 12 Steel
1/4"
7 7/16
Nº 14 Steel
Dimension X See Note below
Nº 12 Steel
1/8
1 1/2
2"
1"
3/16"
SECTION THRU SILL
Dim E
Standard sills
No. 12 Steel
Filler at ends
Screws spaced not more than 10" C-C.
Hole grooved out in extension only
Face of finish
PLAN
1/2"
SECTION THRU STOOL EXTENSION

NOTE Dimension X to be given by architect (only when stool extension is used)


Dim W
Dim A
1/16
7/8
1 1/4
3 13/16
8"
5/8
3/8
9/16
6"
1"
1/4
SECTION THRU 8 INCH MULLION
6 1/2"
3 1/16
SECTION THRU 6 1/2 INCH MULLION

PALMER HOUSE ~ CHICAGO, ILL.
3411 CAMPBELL METAL WINDOWS

HOLABIRD & ROCHE ARCHITECTS

THOMPSON-STARRETT CO. BUILDERS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

STANDARD DETAILS OF CAMPBELL SOLID METAL WINDOW DOUBLE HUNG MODEL Nº 97

SCALE 3" EQUALS 1'-0" DATE JULY '24

DRWG 2

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Windows in Bronze and Iron

2 West 47th Street
NEW YORK, N. Y.

CHICAGO OFFICE, 318 North Michigan Avenue
FOUNDRY AND SHOPS, 335 Carroll Street, BROOKLYN, N. Y.

Windows

Casement Windows in Extruded Bronze—
Double Hung Windows in Extruded Bronze and Rolled Wrought Iron—

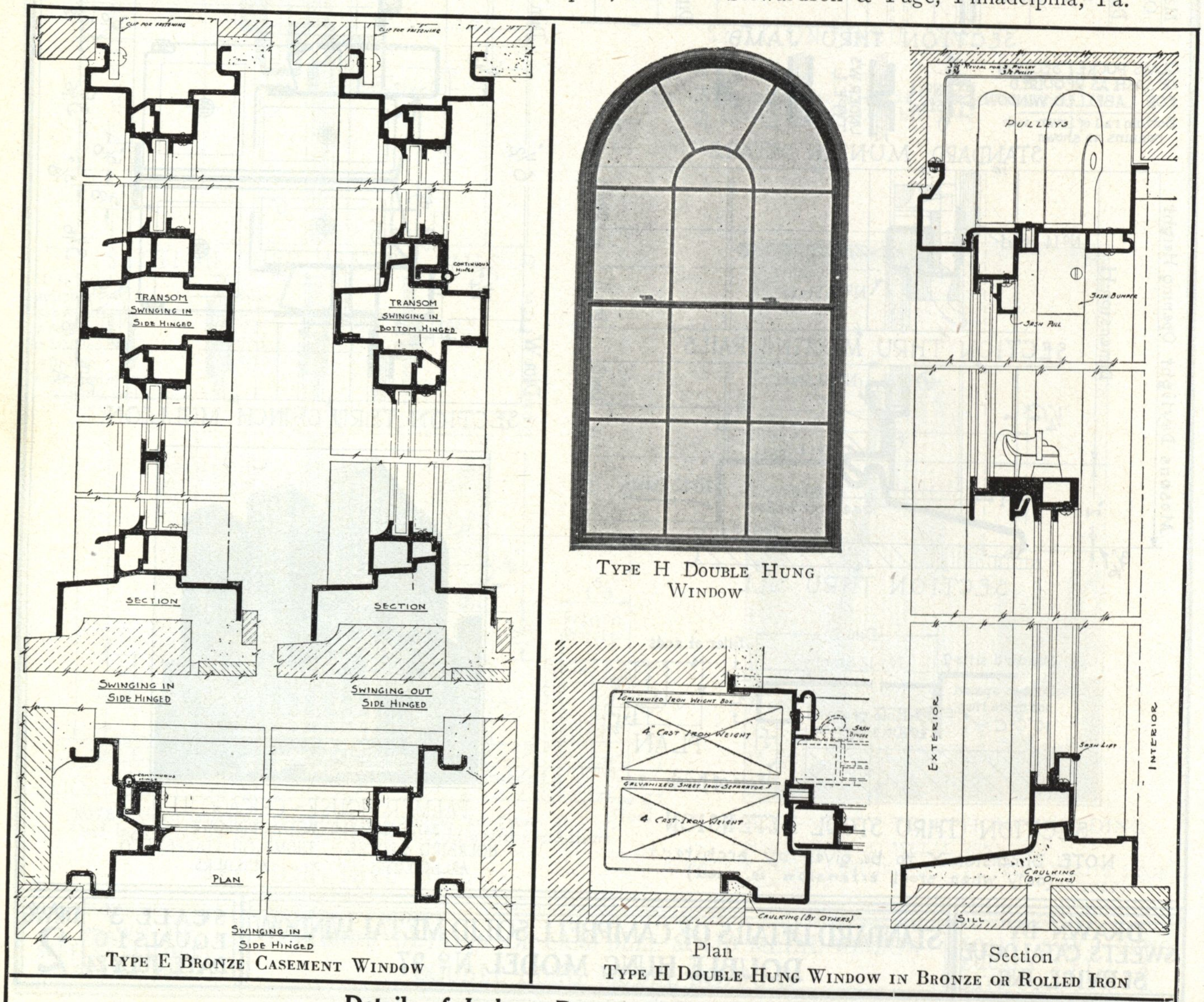
We have designed, patented and perfected an absolutely airtight and watertight window, both casement and double hung, that meets the most exacting demands of architects and engineers.

Its use eliminates weatherstrips and all devices of complicated hardware. It is simple in construction, strongly built, easily installed, and can not get out of order.

For Stone Mantels, see page 300; for Tile and Swimming Pools, see page 477; for Ornamental Bronze and Iron Work, see page 767.

Some Recent Installations

Building	Location	Architects
Federal Reserve Bank of Boston	Boston, Mass.	R. Clipston Sturgis, Boston, Mass.
Federal Reserve Bank of New York	New York, N. Y.	York & Sawyer, New York, N. Y.
Bowery Savings Bank	New York, N. Y.	York & Sawyer, New York, N. Y.
New York Cotton Exchange	New York, N. Y.	Donn Barber, New York, N. Y.
Insurance Company of North America	Philadelphia, Pa.	Stewardson & Page, Philadelphia, Pa.


Clip for fastening
Clip for fastening
Transom Swinging in Side Hinged
Continuous Hinge
Transom Swinging in Bottom Hinged
Section
Section
Swinging in Side Hinged
Swinging out Side Hinged
Continuous Hinge
Plan
Swinging in Side Hinged
3¼ Reveal for 3 Pulley
3¾ " 3½ Pulley
Pulleys
Sash Bumper
Sash Pull
Exterior
Interior
Sash Lift
Caulking (By Others)
Sill
Galvanized Iron Weight Box
4" Cast Iron Weight
Galvanized Sheet Iron Separator
4" Cast Iron Weight
Sash Binder
Caulking (By Others)

Type E Bronze Casement Window

Type H Double Hung Window

Plan

Section

Type H Double Hung Window in Bronze or Rolled Iron

Details of Jackson Bronze and Iron Windows

THE KAWNEER COMPANY

Solid Nickel-Silver Windows

NILES, MICH.

BRANCH OFFICES

ATLANTA, GA., 129 Peachtree Street
BOSTON, MASS., 6 Beacon Street
CHICAGO, ILL., 111 W. Washington Street
DETROIT, MICH., 615 Griswold Street
KANSAS CITY, MO., 903½ Grand Avenue
MILWAUKEE, WIS., 490 Broadway
NEW YORK, N. Y., 233 Tenth Avenue
PHILADELPHIA, PA., 10 N. Fourth Street
BUFFALO, N. Y., 591 Ellicott Square Building

KAWNEER MANUFACTURING COMPANY OF CALIFORNIA

BERKELEY, CAL.

More than 80 Distributers who carry stock are located in most of the principal cities in the United States and Canada. Stock is also carried at our New York and Philadelphia Branches

---

Kawneer
Solid Nickel Silver
WINDOWS

Products

Double Hung and Casement Windows made of Solid Nickel-Silver.

Ventilator Brackets for controlling drafts from double hung windows.

For Store Fronts made of solid copper, see pages 1221-1223.

Architectural Service

Information concerning Kawneer windows will gladly be furnished on request. A serviceable catalogue featuring our solid nickel-silver window has been published for the convenience of architects. The manufacturers will be glad to mail a copy of this catalogue or full size details.

Rustless Metal Windows

Kawneer windows are made in solid nickel-silver to meet the requirements of permanency for the better class of buildings. They are made from heavy cold rolled mouldings, all joints being mitered or coped and securely welded. With our method of forming mouldings we are able to build these windows weathertight. This is worthy of consideration for it reduces fuel costs and eliminates the use of weather strips.

United States Mortgage Bond Co., Ltd., Detroit, Mich.
Harry S. Angell, Architect

Double Hung or Casement Types — Kawneer windows are supplied in double hung type, either full sash or with muntins. Casements may be had with one or more sash per frame and with or without transoms.

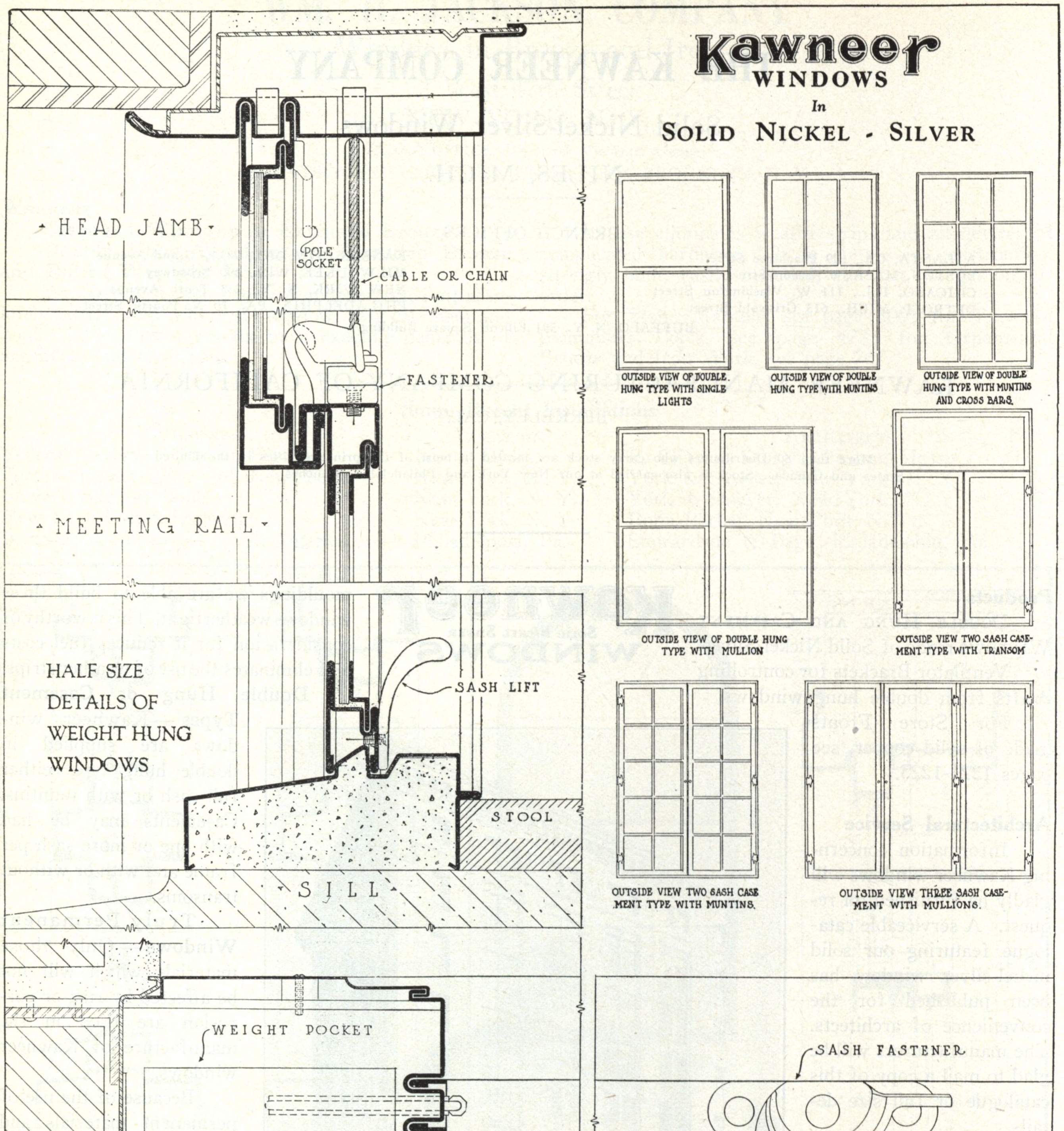
Truly Permanent Windows — Only those materials which will not be affected by rust or corrosion are used in the manufacture of Kawneer windows.

Because of the use of permanent materials and the specially designed sturdy mouldings used, Kawneer windows are built to last the lifetime of a building.

Upkeep costs are thus restricted to a minimum. Kawneer nickel-silver windows do not require painting on the outside or inside but may be finished to correspond with decorative schemes.

Continued on next page

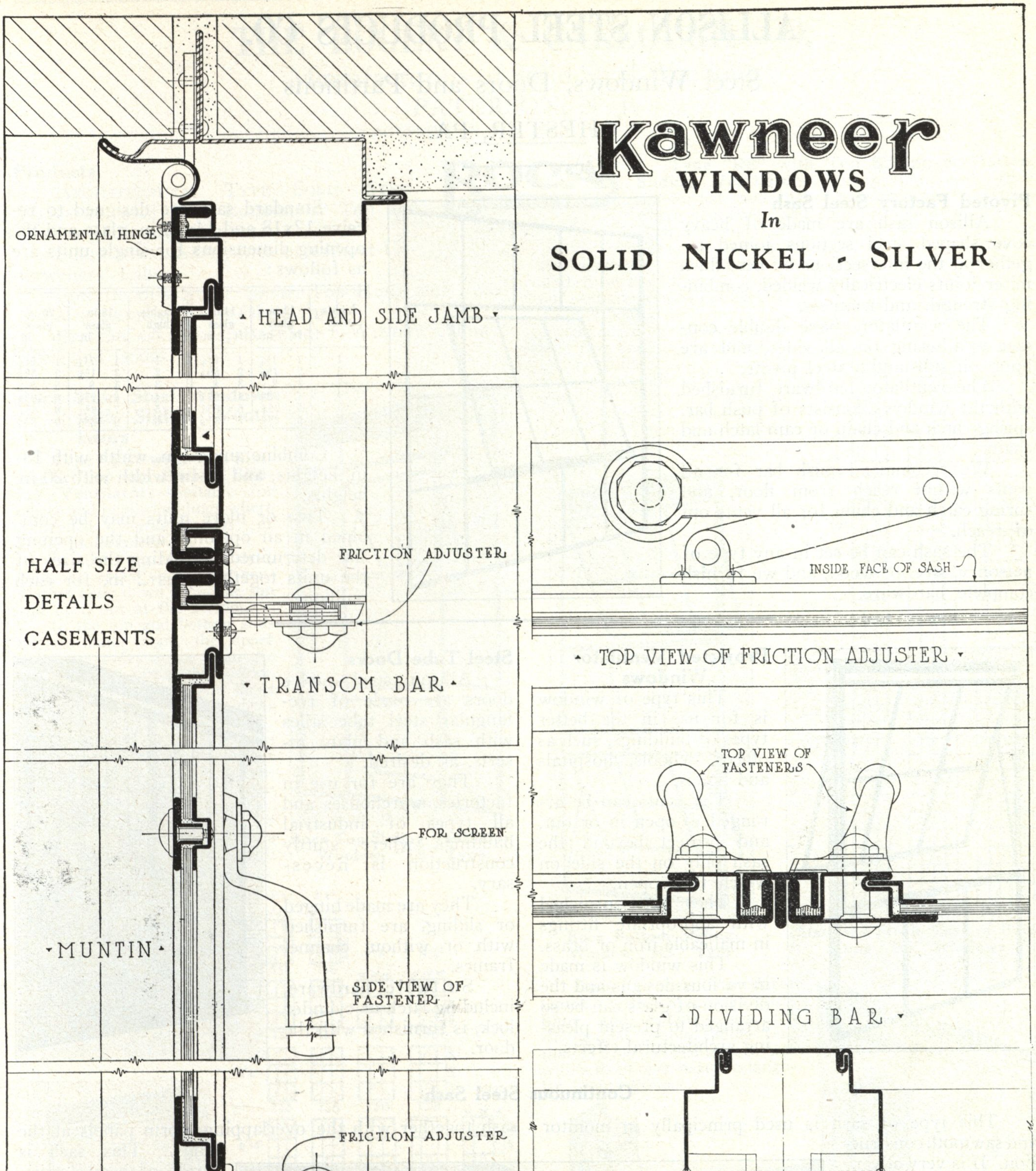
Kawneer WINDOWS In SOLID NICKEL - SILVER


HEAD JAMB
POLE SOCKET
CABLE OR CHAIN
FASTENER
MEETING RAIL
SASH LIFT
HALF SIZE DETAILS OF WEIGHT HUNG WINDOWS
STOOL
SILL
WEIGHT POCKET
SASH FASTENER
SIDE JAMB
MUNTIN
OUTSIDE VIEW OF DOUBLE HUNG TYPE WITH SINGLE LIGHTS
OUTSIDE VIEW OF DOUBLE HUNG TYPE WITH MUNTINS
OUTSIDE VIEW OF DOUBLE HUNG TYPE WITH MUNTINS AND CROSS BARS.
OUTSIDE VIEW OF DOUBLE HUNG TYPE WITH MULLION
OUTSIDE VIEW TWO SASH CASEMENT TYPE WITH TRANSOM
OUTSIDE VIEW TWO SASH CASEMENT TYPE WITH MUNTINS.
OUTSIDE VIEW THREE SASH CASEMENT WITH MULLIONS.

Details of Kawneer Double Hung Windows

Continued on next page

Kawneer
WINDOWS
In
SOLID NICKEL - SILVER


ORNAMENTAL HINGE
HEAD AND SIDE JAMB
HALF SIZE
DETAILS
CASEMENTS
FRICTION ADJUSTER
TRANSOM BAR
FOR SCREEN
MUNTIN
SIDE VIEW OF FASTENER
FRICTION ADJUSTER
STOOL
SILL
INSIDE FACE OF SASH
TOP VIEW OF FRICTION ADJUSTER
TOP VIEW OF FASTENERS
DIVIDING BAR
MULLION

Details of Kawneer Casements

ALLISON STEEL PRODUCTS CO.

Steel Windows, Doors and Partitions

CHESTER, PA.

Pivoted Factory Steel Sash

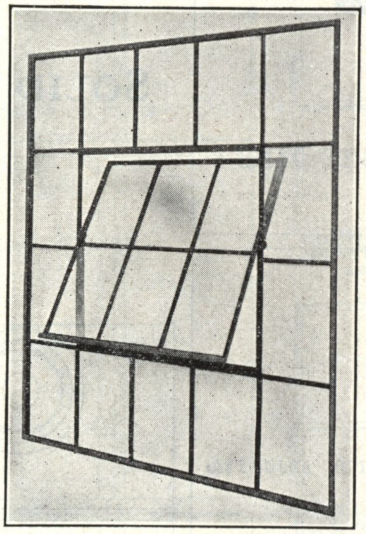
Allison sash are made of heavy cove shaped steel sections joined together at the intersections by neat flush miter joints electrically welded, combining strength and neatness.

The ventilators have double contact weathering on all sides, and are hung on substantial steel pivots.

The ventilator hardware furnished with the windows consists of push bar, spring catch and chain or cam latch and chain.

We recommend push bar for all vents within reach from floor, and spring catch and chain for all vents out of reach.

The sash can be set in any type of masonry, steel or wood, and we furnish complete hardware.

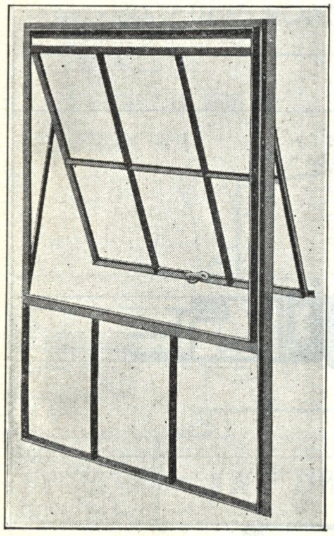


Standard sash are designed to receive 12x18 and 14x20-in. glass and the opening dimensions for single units are as follows:

Lights wide	12-in. glass		14-in. glass		Lights high	18-in. glass		20-in glass	
	ft.	in.	ft.	in.		ft.	in.	ft.	in.
1	1	1¼	1	3¼	1	1	7¼	1	9¼
2	2	1⅝	2	5⅝	2	3	1⅝	3	5⅝
3	3	2	3	8	3	4	8	5	2
4	4	2⅜	4	10⅜	4	6	2⅜	6	10⅜
5	5	2¾	6	0¾	5	7	8¾	8	6¾
6	6	2⅜	7	3⅛	6	9	3⅛	10	3⅛

Combine any 12-in. width with 18-in. heights, and 14-in. width with 20-in. heights.

Two or more units may be combined in an opening, and the opening size determined by adding the sizes of the units together plus 2 in. for each mullion.



Projected Ventilator Windows

This type of window is for use in the better types of buildings, such as offices, schools, hospitals and hotels.

The vents can be arranged to open in or out, and project beyond the sash only on the side on which they open.

They are furnished with appropriate fittings in malleable iron or brass.

This window is made in various designs and the division of glass can be so arranged to present pleasing architectural effects.

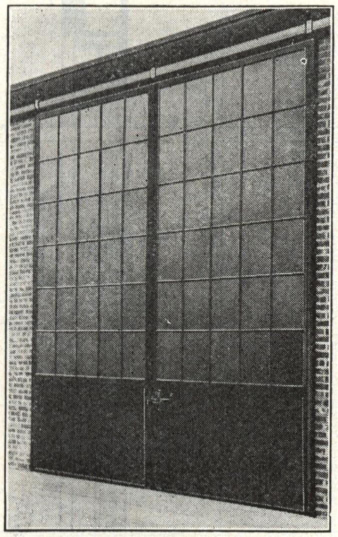
Steel Tube Doors

Allison steel tube doors are made of rectangular steel tube stiles with sash and plate inserts, as desired.

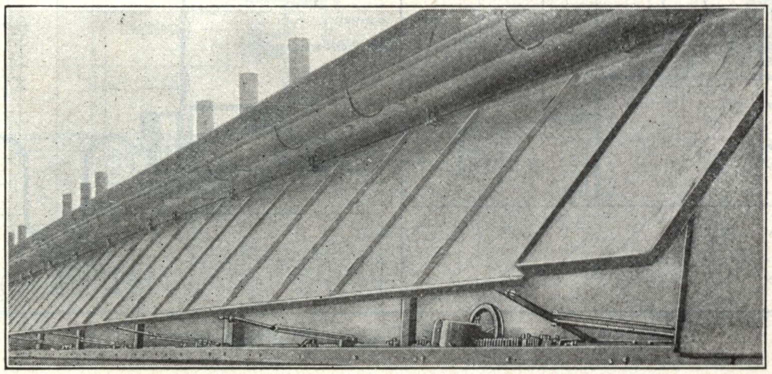
They are for use in factories, warehouses and all types of industrial buildings where sturdy construction is necessary.

They are made hinged or sliding, are furnished with or without channel frames.

Suitable hardware, including latch or cylinder lock, is furnished with the door.



Continuous Steel Sash



This type of sash is used principally in monitor and sawtooth construction. It is very advantageous for natural lighting in wide buildings, and by means of its ventilating possibilities it is very useful in carrying off gases, impure air or smoke.

It can be kept open in storms which do not reach the driving stage, due to the awning-like effect of sash together with the overlapping storm panels at the ends. This sash is made of heavy structural members solidly riveted together. Sill section is so constructed that condensation is carried off without use of metal gutters.

Made stationary and ventilated. Ventilated type is operated by Allison operator.

Complete catalogue will be mailed on request.

THE BOGERT & CARLOUGH CO.

Manufacturers of Solid Steel Windows
PATERSON, N. J.
AGENCIES IN ALL PRINCIPAL CITIES

BOCA
SOLID STEEL SASH
TRADE-MARK

Products

Architectural Type Solid Steel Windows with Top, Bottom, or Top and Bottom Sliding Ventilators.

Solid Steel Sash, with or without Underwriters' Label.

Continuous Steel Sash, Top Hung and Fixed.

Mechanical Sash Operators.

Steel Casements, Basement Windows, Partitions and Doors.

Boca Solid Steel Windows with Sliding Ventilators

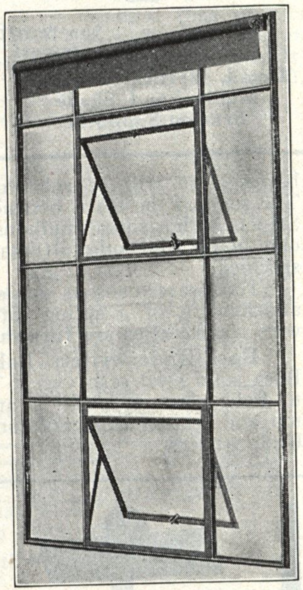
Type "TS" with Top Sliding or Top and Bottom Sliding Ventilators—Suitable for offices and public buildings where controlled ventilation is of prime importance.

In the top sliding style, both the upper and lower ventilators slide down from the top and open out at the bottom.

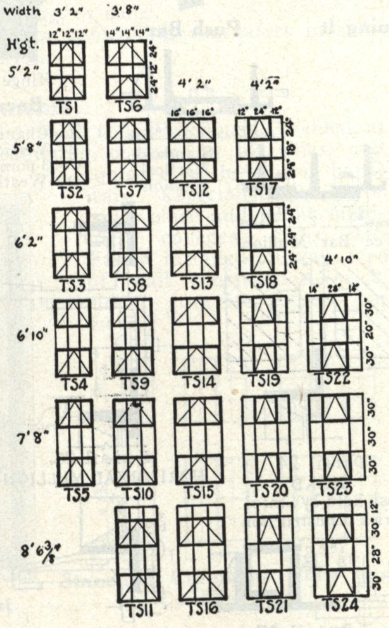
In the top and bottom sliding ventilator style, the upper ventilator slides down from the top and opens out at the bottom, and the bottom ventilator slides up from the bottom and opens in at the top.

Direct and indirect ventilation and weather protection are thus secured at all times. Ventilators can be tilted for cleaning from the inside.

Standard hardware for upper ventilators: bronze pole ring and spring catch with bronze latch bolt; for lower ventilator: bronze cam handle and bracket (bronze strike plate for cam furnished for lower ventilator when specified).

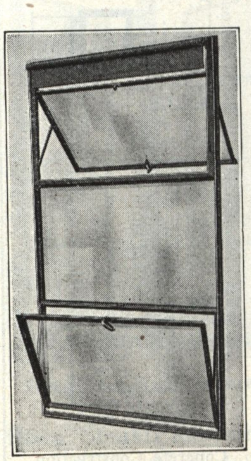


Boca Top Sliding Ventilator Window, "TS" Type


Width 3' 2" 3' 8"
12" 12" 12"
14" 14" 14"
H'gt.
5'2"
24" 12" 24"
TS1
TS6
4' 2"
4' 2"
16" 16" 16"
12" 24" 12"
5'8"
24" 18" 24"
TS2
TS7
TS12
TS17
6'2"
24" 24" 24"
TS3
TS8
TS13
TS18
4'10"
14" 28" 14"
6'10"
30" 20" 30"
TS4
TS9
TS14
TS19
TS22
7'8"
30" 30" 30"
TS5
TS10
TS15
TS20
TS23
8'6 3/8"
30" 28" 30" 12"
TS11
TS16
TS21
TS24

Standard Stock Sizes of Boca Type "TS" Windows

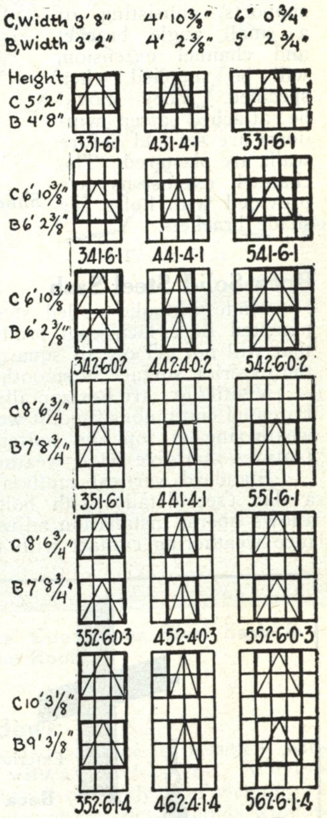
Sizes TS1 to TS16 inclusive are supplied without vertical muntin bars, if desired. Glazing angles supplied only when specified



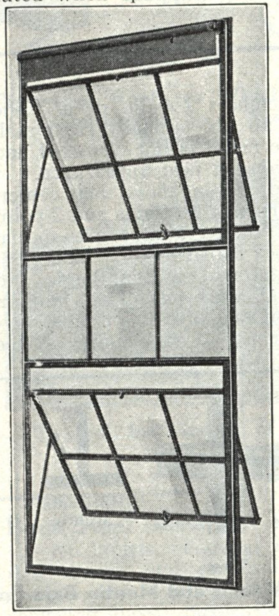
Boca Top and Bottom Sliding Ventilator Window "TS" Type

Type "RS" with Top Sliding or Bottom Sliding Ventilators—For schools, also office, commercial and light manufacturing buildings where ventilation and light are important factors. Both top and bottom ventilators are either top sliding or bottom sliding. These windows are of the same type and dimensions as Boca solid steel sash described on the following page, taking 14x20 or 12x18-in. glass, but ventilators must not exceed 3 lights wide.

Standard iron hardware: pole ring and spring catch for upper ventilator; cam or spring catch of slightly different design for lower ventilator. Bronze hardware, same as for Type "TS" windows, substituted when specified.

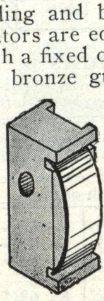

C,Width 3'8" 4' 10 3/8" 6' 0 3/4"
B,Width 3'2" 4' 2 3/8" 5' 2 3/4"
Height
C 5'2"
B 4'8"
331-6-1
431-4-1
531-6-1
C 6' 10 3/8"
B 6' 2 3/8"
341-6-1
441-4-1
541-6-1
C 6' 10 3/8"
B 6' 2 3/8"
342-6-0-2
442-4-0-2
542-6-0-2
C 8' 6 3/4"
B 7' 8 3/4"
351-6-1
441-4-1
551-6-1
C 8' 6 3/4"
B 7' 8 3/4"
352-6-0-3
452-4-0-3
552-6-0-3
C 10' 3 1/8"
B 9' 3 1/8"
352-6-1-4
462-4-1-4
562-6-1-4

Standard Stock Sizes of Boca Type "RS" Windows

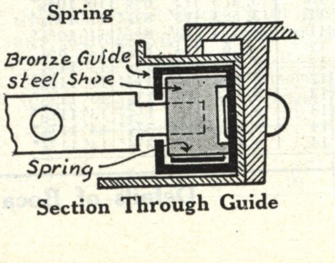


Boca Bottom Sliding Window "RS" Type

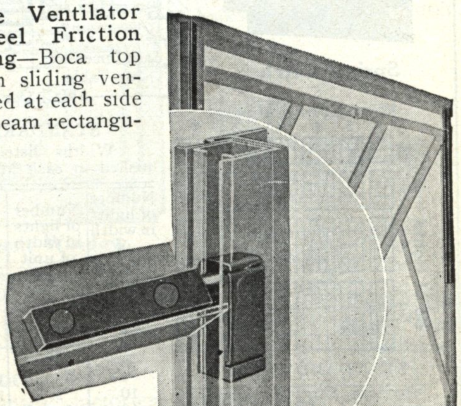
Boca Bronze Ventilator Guide with Steel Friction Shoe and Spring—Boca top sliding and bottom sliding ventilators are equipped at each side with a fixed open-seam rectangular bronze guide.



Steel Friction Shoe and Spring


Bronze Guide
steel Shoe
Spring

Section Through Guide

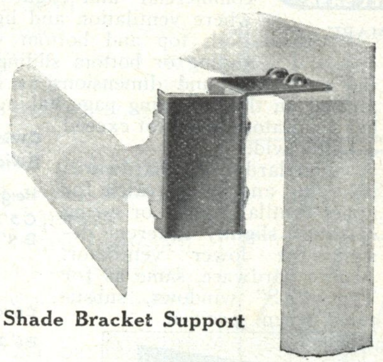


Boca Bronze Ventilator Guide with Steel Friction Shoe and Spring

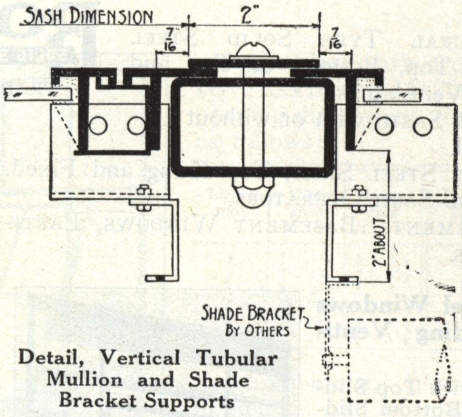
Continued on next page

These guides contain a steel friction shoe and spring, which produce free and uniform operation of the ventilator and hold it open at any desired angle. Being of bronze, these guides do not rust and do not require painting. The shoe and spring contained within them maintain proper operating friction, require no adjustment and at all times assure free and easy operation of the ventilator. These Boca features are new and exclusive (patent applied for). The guides prevent the shoes from slipping out, the operating arms from bending and the ventilator from falling out of the window when subjected to sudden and severe strains.

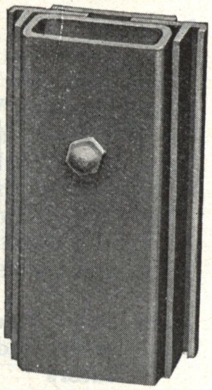
Shade Bracket Supports—Both "TS" and "RS" types of Boca windows permit the free use of window shades. Shade bracket supports, consisting of a small angle bracket and channel extension, will be supplied when specified. They should be attached after windows are set and before walls are plastered. The channel extensions are provided with holes for shade brackets.


Shade Bracket Support

Boca Tubular Mullions—We supply vertical and horizontal tubular mullions when they are specified. Their rich paneled effect adds greatly to the architectural beauty of Boca windows. Unusually strong and self-enclosed; no extra surfacing required. They have a double surface contact with the outstanding parts of the sash frame members. The single line of bolts with cap nuts allows field adjustment and reduces cost of installation.



Detail, Vertical Tubular Mullion and Shade Bracket Supports


Boca Vertical Tubular Mullion

Boca Solid Steel Sash

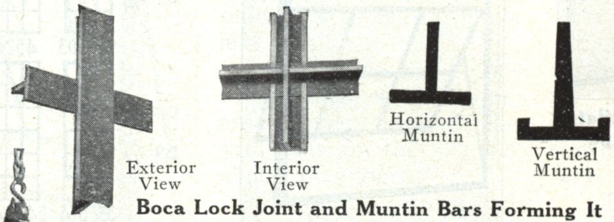
Made of solid rolled steel members 1¼ in. deep. The patented Boca lock-joint produces an exceptionally rigid sash that will not get out of square; the metal is not distorted and the exterior surface is smooth and has a neat appearance.

Ventilators are horizontally pivoted 2 in. above their center. Patented continuous 3-point weathering at the sides and 2-point weathering at top and bottom of the ventilator are special features that give 100% weatherproof construction.

Standard vertical mullion consists of a 2-in. angle and a flat (see detail) with bolts and washers. This mullion allows liberal installation adjustment and provides double surface weathering contact with frame bar of sash units. A tee bar mullion will be substituted when specified (see detail). The stem of the tee is occasionally reversed with stem outside. Structural horizontal mullions for supporting sash units placed one above the other (detail 26) are only supplied when specified.

Hardware consists of either a notched push bar with attachments, or a spring catch and chain. Four spring steel wire glazing clips are furnished for each light.

Boca Underwriters' Labeled Solid Steel Sash—Same as Boca solid steel sash except that glazing angles are furnished to hold glass in position and special clips are provided at top and bottom of ventilators. Inspected and labeled by the Underwriters.

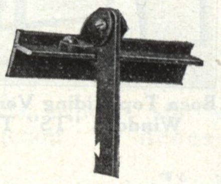

Exterior View

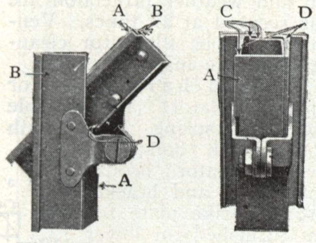
Interior View

Horizontal Muntin

Vertical Muntin

Boca Lock Joint and Muntin Bars Forming It


Push Bar

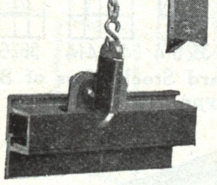


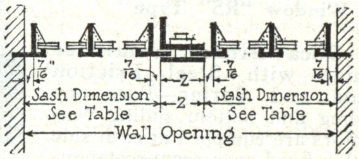
Hinge Open

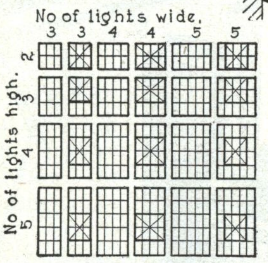
Hinge Closed

Boca Ventilator Hinge

A—Channel weathering section 104.
B—Vertical tee section 101.
C—3-point weathering.
D—Weathering overlap


Spring Catch





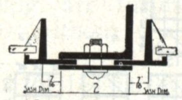
STANDARD HEIGHTS

Number of lights high	14"x20" glass	12"x18" glass
	Height of sash	
2	3′ 5⅝″	3′ 1⅝″
3	5′ 2″	4′ 8″
4	6′ 10⅜″	6′ 2⅜″
5	8′ 6¾″	7′ 8¾″
6	10′ 3⅛″	9′ 3⅛″
7	11′ 11½″	10′ 9½″

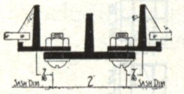
STANDARD WIDTHS

Widths listed below are furnished in sash heights given at left

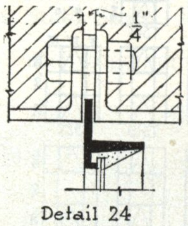
Number of lights in width of opening	Number of lights in width of unit	14"x20" glass	12"x18" glass
		Width of sash	
3	3	3′ 8″	3′ 2″
4	4	4′ 10⅜″	4′ 2⅜″
5	5	6′ 0¾″	5′ 2¾″
6	6	7′ 3⅛″	6′ 3⅛″
6	3, 3	7′ 6″	6′ 6″
8	4, 4	9′ 10¾″	8′ 6¾″
9	3, 3, 3	11′ 4″	9′ 10″
10	5, 5	12′ 3½″	10′ 7½″
10	3, 4, 3	12′ 6⅜″	10′ 10⅜″
11	3, 5, 3	13′ 8¾″	11′ 10¾″
11	4, 3, 4	13′ 8¾″	11′ 10¾″
12	6, 6	14′ 8¼″	12′ 8¼″
12	4, 4, 4	14′ 11⅛″	12′ 11⅛″
12	3, 6, 3	14′ 11⅛″	12′ 11⅛″
13	4, 5, 4	16′ 1½″	13′ 11½″
13	5, 3, 5	16′ 1½″	13′ 11½″
14	5, 4, 5	17′ 3⅞″	14′ 11⅞″
14	4, 6, 4	17′ 3⅞″	14′ 11⅞″



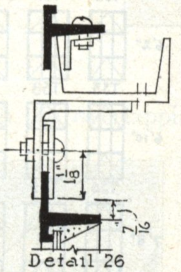
Standard Vertical Mullion



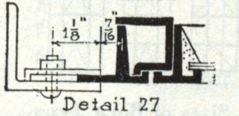
Tee Bar Mullion



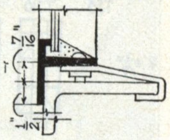
Detail 24
HEAD
Sash held by Lintel
Brick Construction



Detail 26
HORIZONTAL MULLION

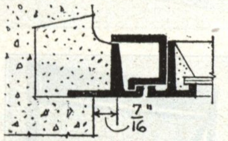


Detail 27
JAMB

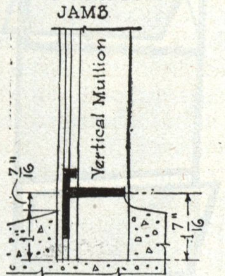


Detail 28
SILL

Steel Construction



Detail 20
JAMB



Detail 22
SILL
Concrete Construction

Details of Boca Solid Steel Sash

Continued on next page

Boca Continuous Solid Steel Sash

Top hung and fixed types, for monitor, sawtooth, A-frame, foundry and other types of roofs, also sidewalls. May be placed either vertical or sloping, or one above the other as in sidewall construction.

Made of solid rolled steel members. Standard panels are 20 ft. long and 3, 4 and 5 ft. high. Special lengths of 10, 12, 14, 16 or 18 ft. can be supplied. Standard glass widths are 23 and 24 in., combined as needed to make the desired panel length. (See table for glass heights.)

Angles riveted to bottom rail of top hung sash permit attachment of mechanical sash operator arms. All joints are acetylene-welded, giving strong and durable construction. Coppered steel wire glazing clips are supplied.

Expansion mullions joining the panels provide double surface weathering for these joints and allow for seasonal expansion and contraction (see details).

A storm panel 2 ft. wide is placed directly back of the end light of the top hung panel. Forming part of this is a fixed panel, the width of which varies to meet the opening dimension This construction gives weathering protection against slanting rains and at the same time permits sash to remain open for ventilation (see details).

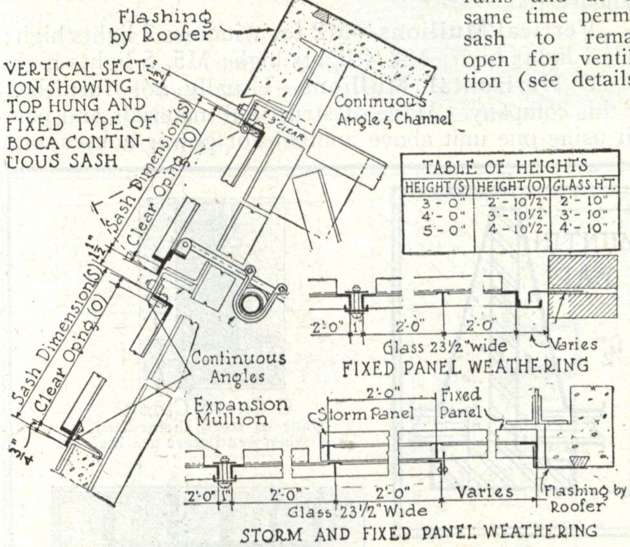
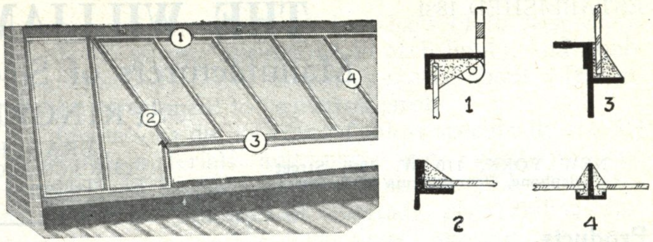

Flashing by Roofer
VERTICAL SECTION SHOWING TOP HUNG AND FIXED TYPE OF BOCA CONTINUOUS SASH
Continuous Angle & Channel
Sash Dimension (S)
Clear Opng. (O)
Continuous Angles
Expansion Mullion
3/4"
2'-0"
1"
Glass 23½" wide
Varies
FIXED PANEL WEATHERING
Storm Panel
Fixed Panel
Flashing by Roofer
Glass 23½" Wide
STORM AND FIXED PANEL WEATHERING

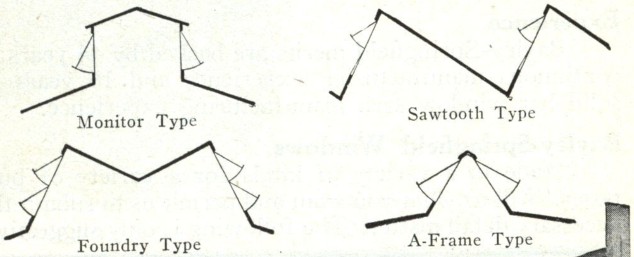
TABLE OF HEIGHTS		
HEIGHT (S)	HEIGHT (O)	GLASS HT.
3 - 0"	2' - 10½"	2' - 10"
4' - 0"	3' - 10½"	3' - 10"
5' - 0"	4 - 10½"	4' - 10"

Details of Boca Continuous Steel Sash

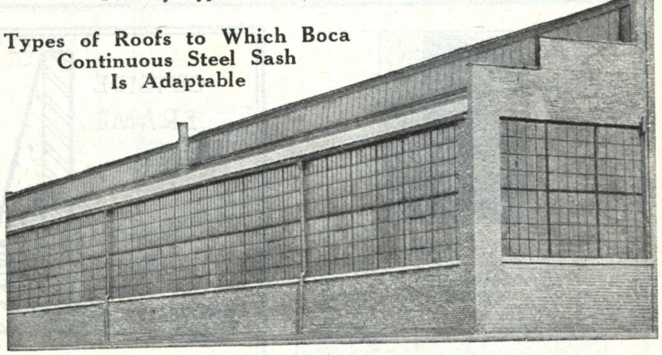


Weathering Features of Boca Steel Sash

(1) Top rail and hinge. These weather back of girt angle at head of opening.
(2) End bar of panel. Weathering flat used only at end of run.
(3) Bottom rail of sash closes against girt angle at sill forming weathering.
(4) Interior muntin bar welded to top and bottom rails


Monitor Type
Sawtooth Type
Foundry Type
A-Frame Type

Types of Roofs to Which Boca Continuous Steel Sash Is Adaptable



Typical Installation of Boca Continuous Steel Sash in Monitor Roof

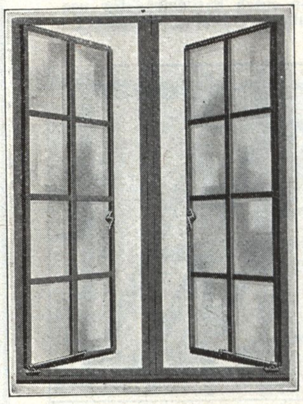
Boca Mechanical Sash Operators

Rack and Pinion Type—For operating continuous sash in any length, height of opening, or slope.

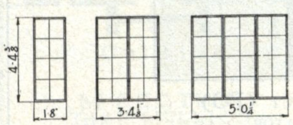
Rocker Shaft Type—For controlling ventilators in sidewall sash in runs or batteries.

Boca Solid Steel Casements

Made from Boca solid steel rolled sections. Welded at corners, have 2-point weathering contact on all sides, and equipped with bronze hardware. Especially suitable for bank, office and public buildings, colleges, clubs, etc. Easily installed in any type of wall construction—brick, stone, concrete, stucco or wood.



Boca Double Casement


3'-4"
4'-4⅜"
1'-8"
3'-4⅛"
5'-0¼"

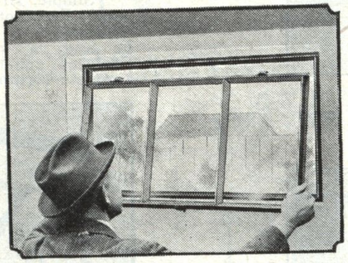
Standard Casement Units and Combinations

Boca Steel Partitions

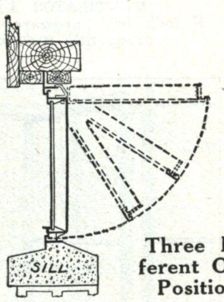
Constructed of regular Boca steel sash units joined by mullions, with sheet steel panels in the lower sections. Built to meet the requirements of any building condition.

Boca Steel Basement Windows

No hinges, no pins. A decided advance in basement window design and an exclusive Boca development. Window easily removed from frame (from inside only) for cleaning or replacing glass. Suspension device automatically holds window open in any of three positive positions without use of chains or hooks. A specially designed catch automatically locks window when closed.



Boca Basement Window



Three Different Open Positions

Type	Wall Openings		Lights glass
	Width	Height	
C3	2' 9½"	1' 3"	3-10"x12"
D3	2' 9½"	1' 9"	3-10"x18"

Boca Steel Doors

For powerhouses, factories, foundries, garages, etc., or wherever steel doors with glass panels are required. Swing and sliding types. Made in the following standard sizes:

Single Swinging		Double Swinging		Single Sliding		Double Sliding	
Width ft.	Height ft.	Width ft.	Height ft.	Width ft.	Height ft.	Width ft.	Height ft.
3	7	6	7	3	7	8	10
4	7	8	7	4	7	10	10
4	8	8	8	4	8	10	12
4	10	8	10	6	8	12	12

ESTABLISHED 1881

THE WILLIAM BAYLEY CO.

Manufacturers of Steel Windows and Doors

SPRINGFIELD, OHIO

BRANCH OFFICES

NEW YORK, 110 W. 40th Street
Telephone, Pennsylvania 0968, 0969

CHICAGO, 310 South Michigan Avenue
Telephone, Harrison 6194, 6195

BOSTON, 73 Tremont Street
Telephone, Haymarket 3285

SALES AGENTS IN 60 AMERICAN CITIES

Products

Pivoted Ventilator Windows.
Continuous and other forms of Monitor Windows.
Window Operators.
Steel and Glass Sidewalls and Partitions.
Steel Doors and Basement Windows.

Experience

Bayley-Springfield merits are backed by 44 years of continuous manufacturing experience and 16 years of solid bar window sash manufacturing experience.

Bayley-Springfield Windows

Made in a variety of kinds for a variety of purposes. Tell us what you want and permit us to submit the necessary detail matter. The following is only suggestive.

Bayley-Springfield Sidewall Windows, Warehouse Stock

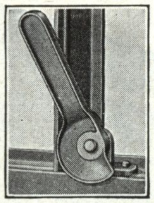
Immediate Shipment—50 kinds and sizes in 14x20 and 12x18-in. glass layout, bars 1½ in. deep, and constructed the same as made-to-order windows.

Ventilators—Center pivoted (CP). Have double weathering contact 1⅝ in. deep at sides and 1¾ in. deep at top and bottom. Exceptionally strong and tight.

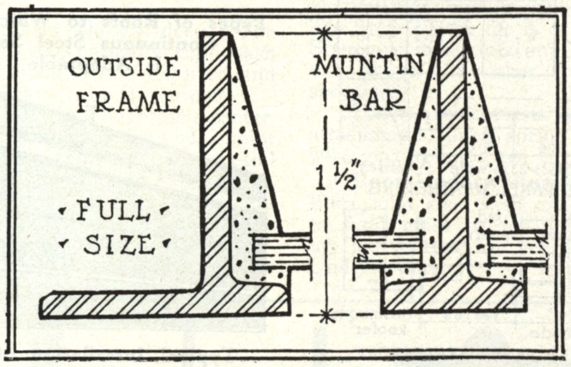
Paint—One shop coat of Bayley-Springfield standard red.

Vertical Mullions—M2 for windows 2 lights high; M3, 3 lights high; M4, 4 lights high; M5, 5 lights high.

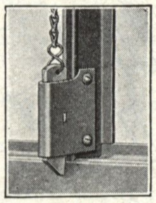
F Horizontal Mullions—Usually not furnished by this company. Made of structural materials and permit using one unit above another for power houses, etc.



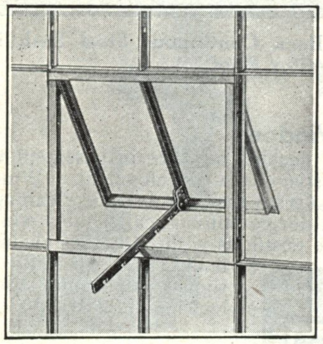
H Cam
Two used with push bars. Alternate for F lock bar at additional cost



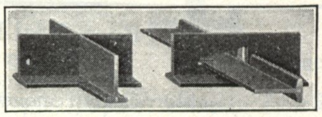
Principal Bars
Full size sections



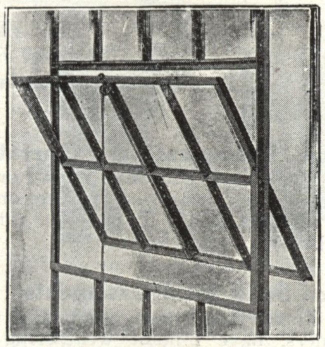
C Chain Catch
Made of steel, sherardized. Used when ventilators are high up



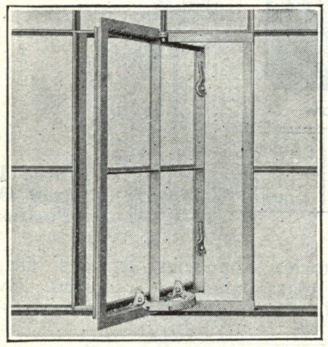
Ventilator TPO
F lock bar hardware—the most frequently used kind



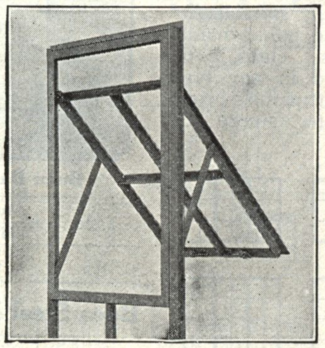
Intersection
Simple, strong, pleasing appearance. Bars not bent or manipulated in assembling, therefore, steel can be and is of strong character. Surfaces get-at-able for easy and complete repainting



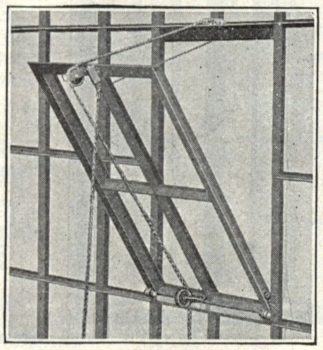
Ventilator CP
Chain catch hardware—for use above reaching distance



Vertically Pivoted (VP) Ventilator
With usually furnished hardware



Projected Out (PO) Ventilator
The kind here shown has many merits of other kinds and some individual ones. Users of steel windows may well give it careful consideration



Bottom Pivoted Inswinging (BP) Ventilator
With usually furnished hardware

BAYLEY-SPRINGFIELD SIDE WALL WINDOWS

Continued on next page

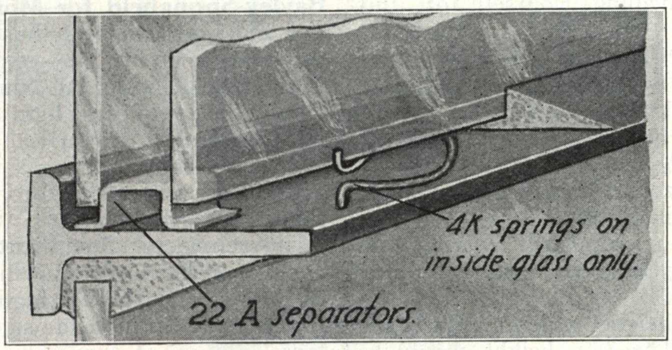
Anchorage—Secured in masonry openings by embedding the outside frame member in cement fill, or by the use of Economy inserts. Windows may be clamped to structural steel by use of clips and bolts which are furnished when specified. Type of head, sill and jamb must be stated.

When Writing for Quotations—Avoid delay by giving complete information as follows:

Type of units; number of units; number and kind of mullions, if any; kind of hardware (lock bar, push bar and 2 cams, chain catch). If chain catch hardware is desired give distance from sill of window to floor. If to be installed in structural steel (anchors consequently required), state where anchors are needed. State when shipment is required.

Quotations — Cover window units complete with or without ventilators as specified. M mullions as required, with necessary clips and bolts, F lock bars (1 to each ventilator), 4K glazing springs (4 to each light), and (only when specified) 3A or 66A clips spaced about 2-ft. centers for attachment to structural steel.

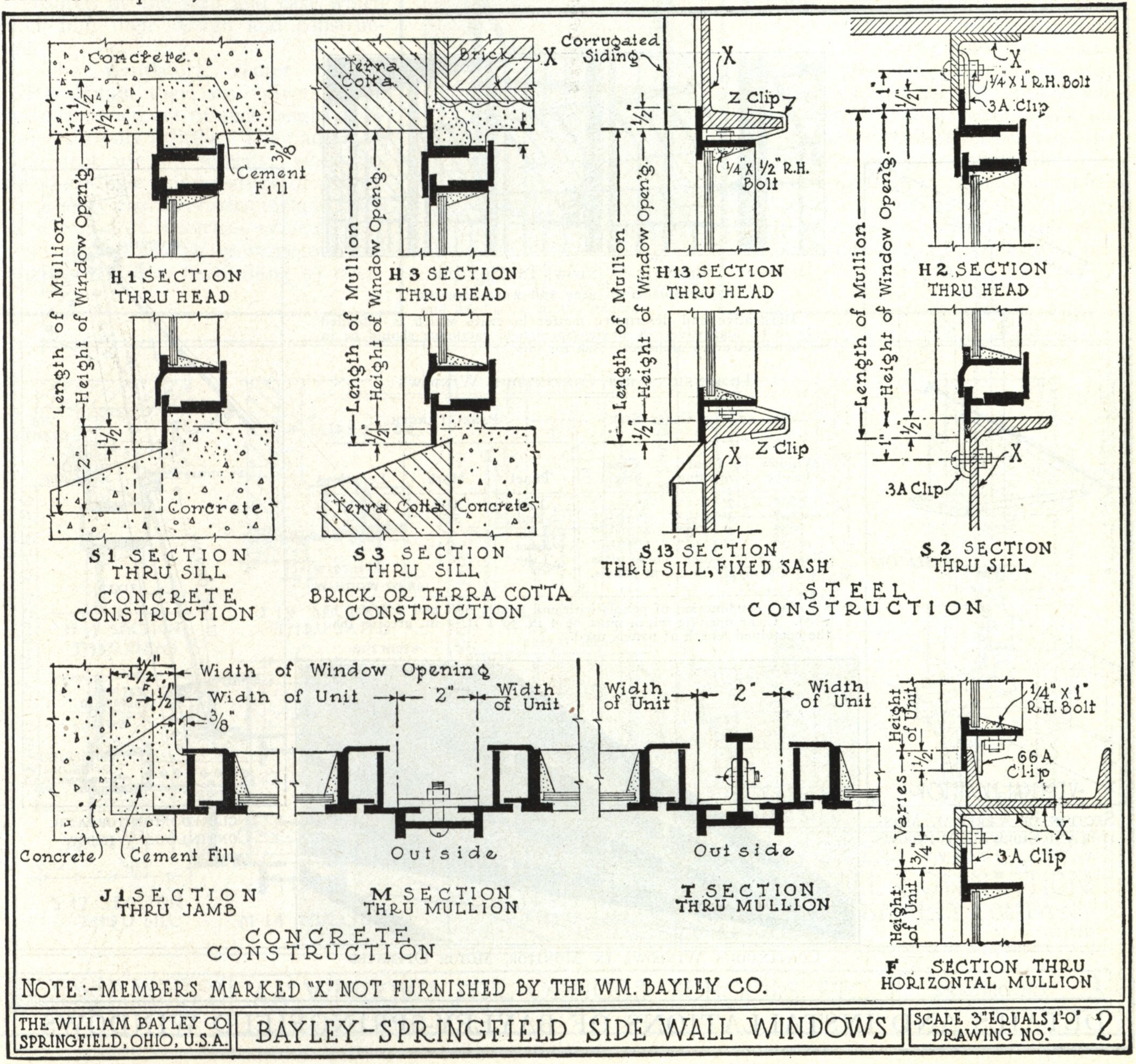
Quotations do not cover (unless specifically stated) structural materials and parts not established and standardized as parts of steel windows and recognized as such in the practices of the trade, glass, putty, erections, glazing or other labor, etc.


4K springs on inside glass only.
22 A separators.

Method of Double Glazing

Double Glazing—As a means of promoting comfortable living conditions in summer and conserving heat in winter, is effectively provided for in Bayley-Springfield.

The excessive depth of the bars admits of sufficient dead air space between two panes of glass and entirely eliminates objectionable features.


Concrete
1½"
½"
3/8"
Cement Fill
Length of Mullion
Height of Window Openg
H1 SECTION THRU HEAD
½"
2"
Concrete
S1 SECTION THRU SILL
CONCRETE CONSTRUCTION
Terra Cotta
Brick
X
H3 SECTION THRU HEAD
Terra Cotta
Concrete
S3 SECTION THRU SILL
BRICK OR TERRA COTTA CONSTRUCTION
Corrugated Siding
X
Z Clip
¼"X½" R.H. Bolt
H13 SECTION THRU HEAD
Z Clip
X
S13 SECTION THRU SILL, FIXED SASH
¼"X1" R.H. Bolt
3A Clip
1"
H2 SECTION THRU HEAD
3A Clip
S2 SECTION THRU SILL
STEEL CONSTRUCTION
1½"
Width of Window Opening
Width of Unit
2"
Width of Unit
Concrete
Cement Fill
Outside
J1 SECTION THRU JAMB
M SECTION THRU MULLION
CONCRETE CONSTRUCTION
Width of Unit
2"
Width of Unit
Outside
T SECTION THRU MULLION
Height of Unit
¼"X1" R.H. Bolt
66A Clip
Varies
¾"
3A Clip
X
Height of Unit
F SECTION THRU HORIZONTAL MULLION
NOTE:-MEMBERS MARKED "X" NOT FURNISHED BY THE WM. BAYLEY CO.
THE WILLIAM BAYLEY CO. SPRINGFIELD, OHIO, U.S.A.
BAYLEY-SPRINGFIELD SIDE WALL WINDOWS
SCALE 3" EQUALS 1'-0" DRAWING NO. 2

Continued on next page

Continuous Windows

Continuous windows here pictured and described for use in roof construction, are suited to use in side walls and are frequently so used. They are particularly desirable in positions where utility or convenience may be served by mechanically opening a large glass area. Engineers thoroughly versed in the details of the product itself and its use, are at your service either from Springfield or from one of our branch offices. You incur no obligation in availing yourself of this service.

They differ from other Bayley-Springfield in the material of which made and in the details of construction. Their glass is inserted from the outside.

Their top and bottom horizontals are 2x2x$\frac{3}{16}$-in. angles; vertically 1¼x1¼x$\frac{3}{16}$-in. tees.

They have an extra horizontal 1¼x1¼x$\frac{3}{16}$-in. angle for attachment of mechanical operators.

They are made in four standard lengths with provision for field splicing to meet practically any requirement.

They are made in four heights which may be combined one above another. The 3-ft. height should be used for the hinged panels. Hinges, heavy steel butts with bronze pins properly spaced and securely riveted to top horizontals, are positioned not to interfere with flashing materials. See catalogue for more details.

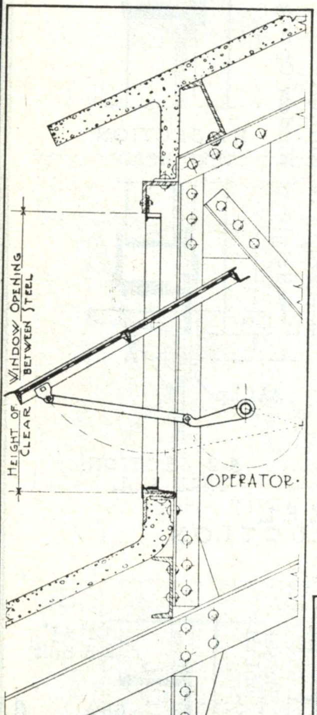
Weathertightness is provided by lapping, shingle fashion, the tops under, the bottoms over, throughout their entire length, and by the use of underlying storm panels at the ends.

Bayley-Springfield for Monitor and Sawtooth Roofs

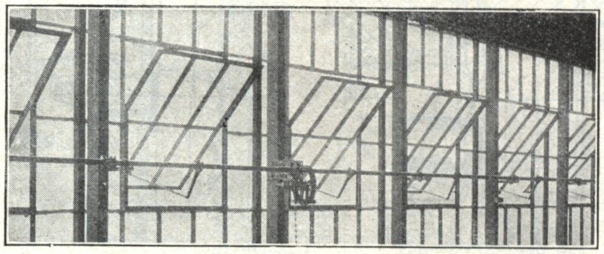
Sidewall windows thus used (see section at left) afford opportunity for simplicity and economy. They are means by which all windows of a building may be alike, at least, in glass light sizes and ventilators. They must be used in the vertical position.

Continuous windows as shown below and in section at right are better suited to many of the larger installations.

Architects' Specifications—Use wording which appears on the third following page with proper insertion of words "Bayley-Springfield continuous windows," or "Bayley-Springfield sidewall windows for monitors."



Section of Vertical Monitor and Sidewall Windows



Sidewall Windows in Monitor

Bayley-Springfield gear and worm operator

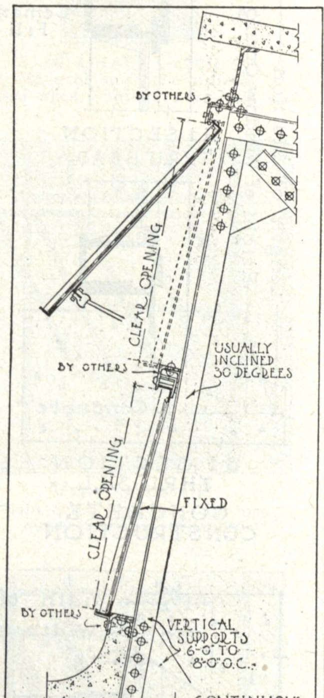
Illustrative and descriptive matter herewith which is intended only to be suggestive. A Bayley-Springfield catalogue should be in the hands of every architect. Ask for one

Dimensions for Continuous Windows

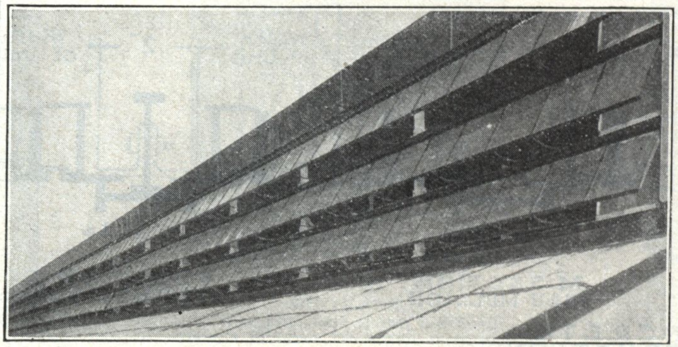
Height and Glass Size			Panel Length		
Window height	Clear opening	Glass height	Panel	Mark	Length
3′ 0″	2′ 10½″	2′ 10½″	End	S6R	13′ 3⅞″
4′ 0″	3′ 10½″	3′ 10½″	End	S6L	13′ 3⅞″
5′ 0″	4′ 10½″	4′ 10½″	Line	C6	12′ 3″
6′ 0″	5′ 10½″	5′ 10½″	Line	C4	8′ 2″
			Line	C2	4′ 1″

Glass is 2′ 0″ wide. These glass sizes also apply to storm panels.

Any combination of panels with end panels S6R and S6L can be used. Clear opening width must be 4 in. to 1 ft. 4 in. greater than the combined length of panels used.


BY OTHERS
CLEAR OPENING
USUALLY INCLINED 30 DEGREES
BY OTHERS
CLEAR OPENING
FIXED
BY OTHERS
VERTICAL SUPPORTS 6'-0" TO 8'-0" O.C.
CONTINUOUS TOP HUNG SASH
THE WILLIAM BAYLEY CO SPRINGFIELD OHIO

Nclined Monitor and Continuous Window



Continuous Windows in Monitor, Motor Operated

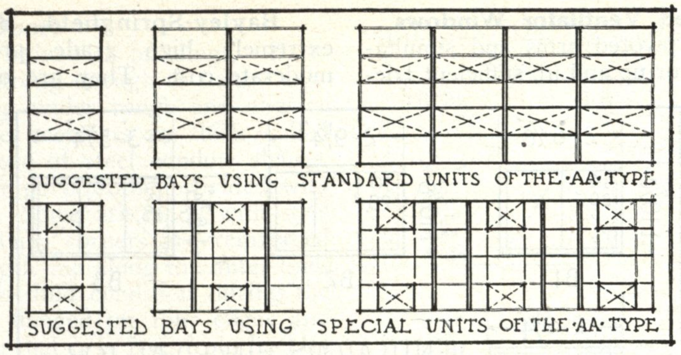
DETAILS AND INSTALLATIONS OF BAYLEY-SPRINGFIELD WINDOWS

Continued on next page

Bayley-Springfield AA Windows

Wide, with low ventilators.

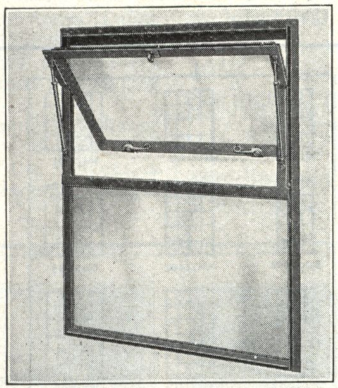
High Quality Windows for Offices—Windows for finished buildings should be of good appearance, convenient to operate and weathertight; three well established features of Bayley-Springfield AA windows. The plain steel members, skillfully designed hardware, concealed hinges, are factors in their good appearance. The wide, low ventilators are easy to operate. They have well proportioned two-point contact members which make them weathertight. The horizontals are 1¾ in. and the verticals 1⅝ in. deep.


SUGGESTED BAYS USING STANDARD UNITS OF THE·AA·TYPE
SUGGESTED BAYS USING SPECIAL UNITS OF THE·AA·TYPE

Combinations Using Mullions M13 and M14
Bayley-Springfield AA Windows
Wide, with low ventilators

High quality in these windows is ensured by the skill and care which enter into their design and construction.

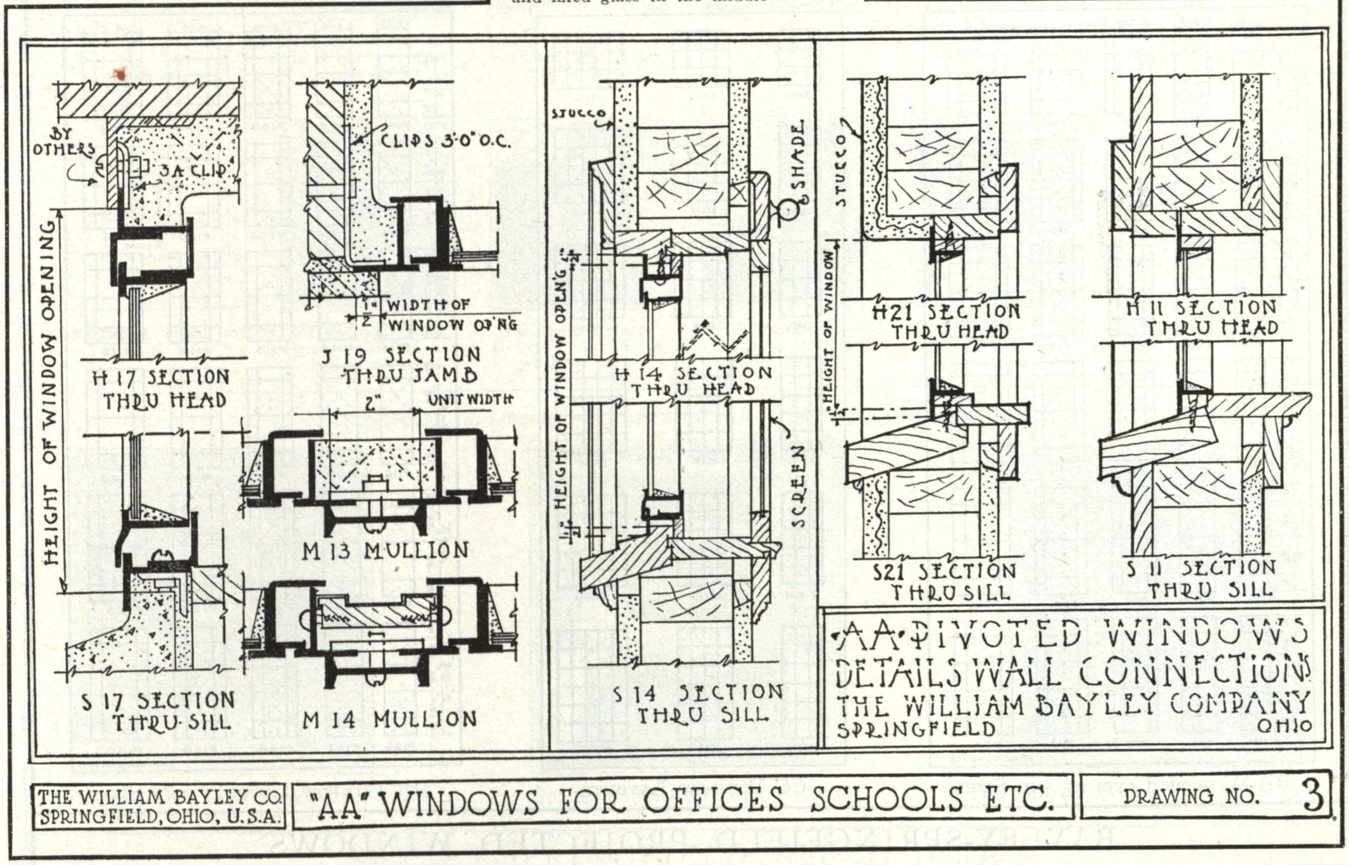
The ventilators, center pivoted (CP) though they are (pivots 3 in. above centers), are of such height as to project in only a little. They admit of convenient use of screens; when installed in single unit openings, of shades. The quality characteristics include careful selection of materials, extreme care in cutting and machining, inspection and gauging of parts, hand filing to overcome minor inaccuracies of machine work, inspection by skilled mechanics, welding of ventilator and ventilator opening corners, glazing stops, polished brass hardware, including two friction adjusters and two cam fastenings to each ventilator and pole eye when necessary. The friction adjuster has, under test, withstood 30,000 operations, the equivalent of 40 years of service. Ventilators are made in basic glass widths, 36¾ and 49⅛ in. and basic glass heights, 16 and 20 in.—four sizes.



AA Window Vented 50%
A more frequently used type has a ventilator at top and one at bottom and fixed glass in the middle

Ventilator glass is trimmed 1 in. on each side, actual sizes are therefore 2 in. less than those above.

Steel Windows for Use in Schools—Are continually receiving increasing attention. Among the many reasons is that some state laws require such large percentage of glass area that architects can not use old types of windows, with their large wood areas, and have enough space left for brick or other masonry to properly satisfy the questions of appearance. Bayley-Springfield AA windows combine all of the necessities of school construction and merit the attention of the architectural profession.

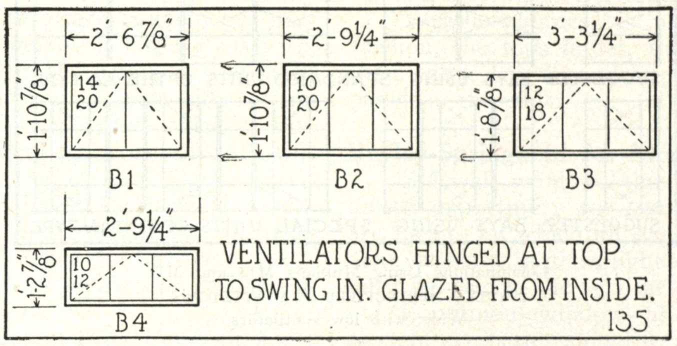

BY OTHERS
3A CLIP
HEIGHT OF WINDOW OPENING
H 17 SECTION THRU HEAD
S 17 SECTION THRU SILL
CLIPS 3'0" O.C.
1" 1/2 WIDTH OF WINDOW OP'NG
J 19 SECTION THRU JAMB
2"
UNIT WIDTH
M 13 MULLION
M 14 MULLION
STUCCO
SHADE
HEIGHT OF WINDOW OPEN'G
½"
H 14 SECTION THRU HEAD
SCREEN
S 14 SECTION THRU SILL
STUCCO
HEIGHT OF WINDOW
H21 SECTION THRU HEAD
S21 SECTION THRU SILL
H 11 SECTION THRU HEAD
S 11 SECTION THRU SILL
AA PIVOTED WINDOWS
DETAILS WALL CONNECTIONS
THE WILLIAM BAYLEY COMPANY
SPRINGFIELD OHIO
THE WILLIAM BAYLEY CO.
SPRINGFIELD, OHIO, U.S.A.
"AA" WINDOWS FOR OFFICES SCHOOLS ETC.
DRAWING NO. 3

Continued on next page

Bayley-Springfield Projected Ventilator Windows

Ventilators balance on pivoted arms and simultaneously move down and out, or up and in, sufficient friction being provided to hold them in any desired position. Sliding mechanism parts are of brass.

Bayley-Spingfield CC Windows with Projected Ventilators—Are a highly standardized manufactured product, the merits of which have produced a demand sufficient to permit quantity production and, with it, high quality and low cost. Standard sizes are shown below, drawings 125 and 126.

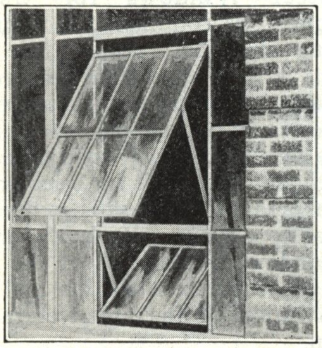

2'-6 7/8"
1'-10 7/8"
14
20
B1
2'-9 1/4"
1'-10 7/8"
10
20
B2
3'-3 1/4"
1'-8 7/8"
12
18
B3
2'-9 1/4"
1'-2 7/8"
10
12
B4
VENTILATORS HINGED AT TOP
TO SWING IN. GLAZED FROM INSIDE.
135

Bayley-Springfield Basement Windows—Ventilated 100%

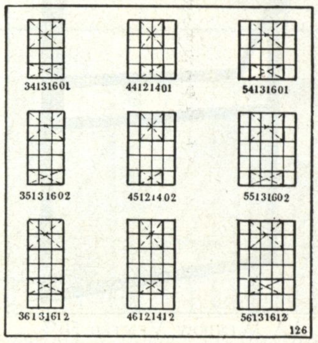
Immediate shipment. Masonry openings and glass sizes, see drawing No. 135. Have a heavy stiff frame. Have a strong ventilator with 1½ in. deep muntins. Easily removable and replaceable. For use in wood, brick, concrete or tile. Inexpensive, cost no more than wood

Bayley-Springfield BB Windows—Are an extremely high grade product at a surprisingly moderate cost. They are of layouts shown in drawings 119 and 120 and incorporate such structural and quality features as welding of corners of both ventilators and ventilator openings, glazing stops, solid bronze hardware and preparation for attachment of shade brackets.

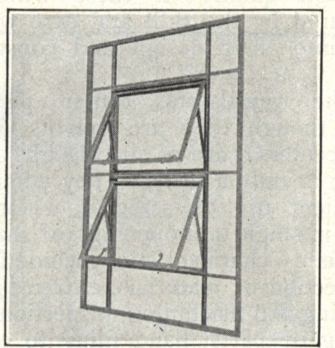
These windows lend themselves readily to screening and may be prepared for steel screens at but slight additional cost.



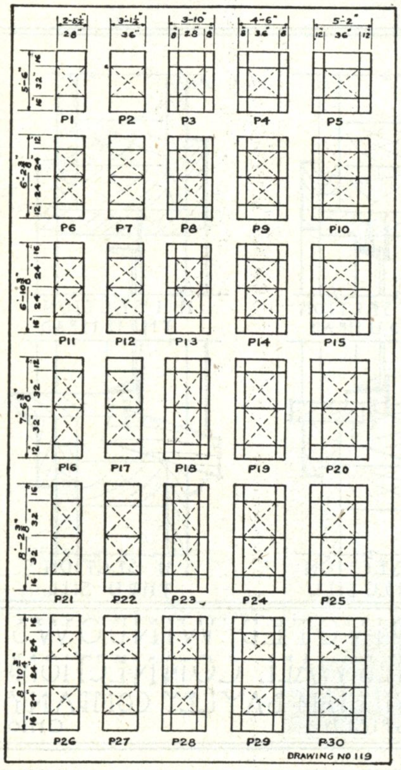
CC Projected Ventilators


34131601
44121401
54131601
35131602
45121402
55131602
36131612
46121412
56131612
126

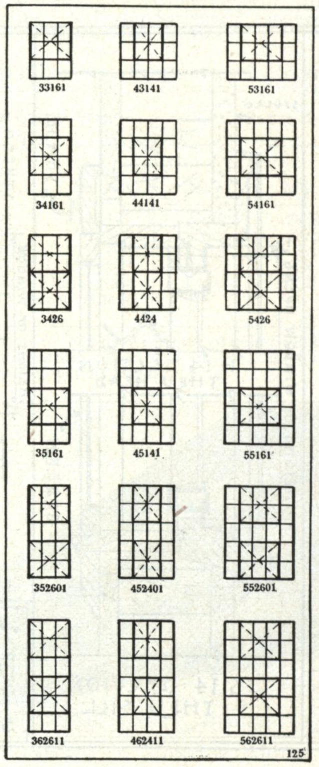
CC Window Layouts



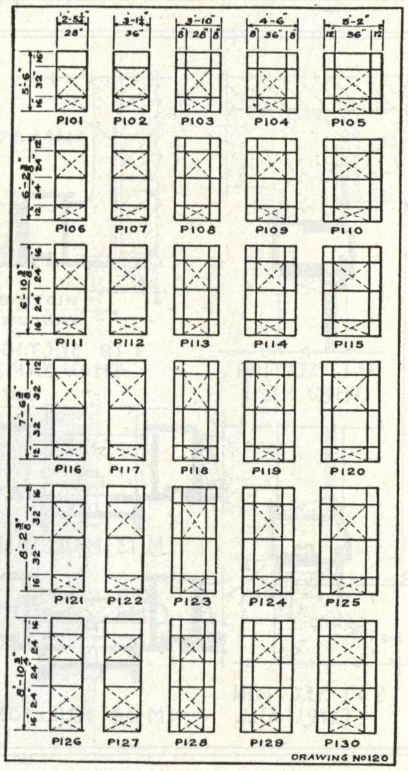
BB Unit 3'10"x6'2⅜"


2'-5¼"
28"
3'-1¼"
36"
3'-10"
8
28
8
4'-6"
8
36
8
5'-2"
12
36
12
5'-6"
6'-2⅜"
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P13
P14
P15
P16
P17
P18
P19
P20
P21
P22
P23
P24
P25
P26
P27
P28
P29
P30
DRAWING NO 119

BB Window Layouts and Sizes


33161
43141
53161
34161
44141
54161
3426
4424
5426
35161
45141
55161
352601
452401
552601
362611
462411
562611
125

CC Window Layouts


P101
P102
P103
P104
P105
P106
P107
P108
P109
P110
P111
P112
P113
P114
P115
P116
P117
P118
P119
P120
P121
P122
P123
P124
P125
P126
P127
P128
P129
P130
DRAWING NO 120

BB Window Layouts and Sizes

BAYLEY-SPRINGFIELD PROJECTED WINDOWS

Continued on next page

Bayley-Springfield Steel Doors

Primarily for use in industrial buildings. Parts heavy enough and details strong enough to insure continued, satisfactory working under rough and abusive conditions of service. Outer members are thick walled steel tubing. Filling is made of steel window shapes. Usually glazed in the upper portion and provided with a steel plate in the lower. Some are made with steel plates in both portions. Tube corners are reinforced (see BEB below) for strength and along the miter lines to hold the metal heated to fluid condition during the welding process. Plate is flanged on four edges and stretched during riveting so that it is free from buckles and serves as a truss.

Frames for hinged doors are usually channels and contemplate the sills being of concrete. Send sketches of openings for recommendations. Frames for sliding doors usually not required.

Architects' Specifications

The standard of quality adopted for the steel doors is that established by The William Bayley Co., Springfield, Ohio, in the manufacture of Bayley-Springfield steel doors, and bidders are required to base their proposals upon the use of this Bayley product.

"Any bidder may submit an alternate on another make of steel doors, but in doing so must give the name and address of the manufacturer, together with evidence that the product is equal to the adopted standard in strength, permanency, design, finish and workmanship."

*STANDARD SIZES OF BAYLEY-SPRINGFIELD STEEL DOORS

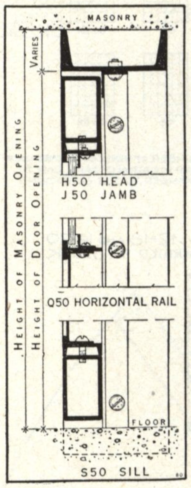
Single		Double	
Width	Height	Width	Height
Type D1—Hinged			
3′0″	7′0″	6′0″	7′0″
3′6″	7′0″	7′0″	7′0″
3′0″	8′0″	6′0″	8′0″
3′6″	8′0″	7′0″	8′0″
4′0″	8′0″	8′0″	8′0″
5′0″	10′0″	10′0″	10′0″
Type D11—Sliding			
2′10″	6′10″	5′8″	6′10″
3′4″	6′10″	6′8″	6′10″
2′10″	7′10″	5′8″	7′10″
3′4″	7′10″	6′8″	7′10″
3′10″	7′10″	7′8″	7′10″
4′10″	9′10″	9′8″	9′10″

*Hinged doors: measure between frames for width and from underside of frame at head to sill for height; for clear openings, deduct width of stop angles.

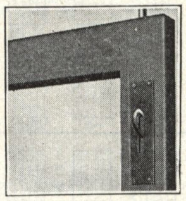
Sliding doors: measure clear opening.

The William Bayley Co. has manufactured metal architectural products, both structural and ornamental, since 1881, and has manufactured Steel Windows since 1910. These years of experience are the test of Bayley-Springfield products today.

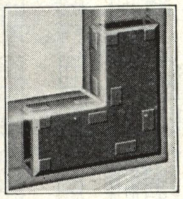
The descriptions of these windows and doors here presented is of necessity brief. A more complete understanding can be had through one of our catalogues. Ask for a copy.



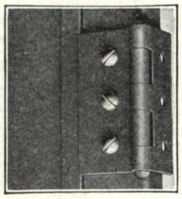
Sectional Detail of Hinged Door



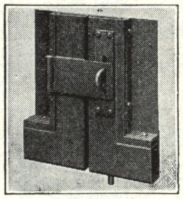
Y70 Extension Bolt for Hinged Double Doors



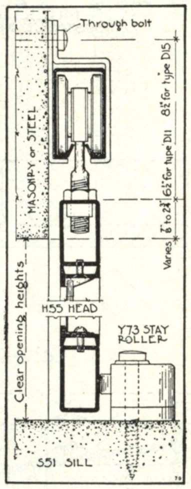
BEB Corner Reinforcement tubes are welded



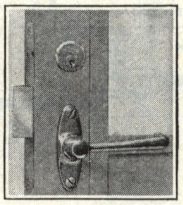
24A Hinge



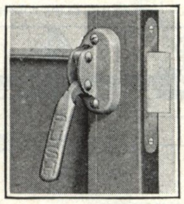
Y72 Hasp Bolt for Double Doors



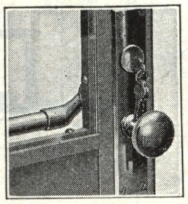
Sectional Detail of Sliding Door



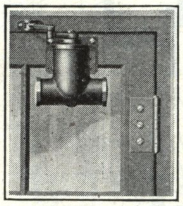
Y1 Cylinder Lock
Heavy solid brass working parts



Y5 Panic Release
Heavy solid brass working parts

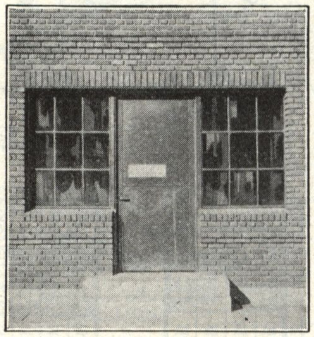


Y55 Panic Release
Outside lock may be omitted

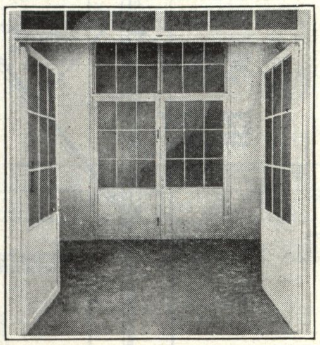


Y61 Door Check
for Inswinging or Outswinging Doors

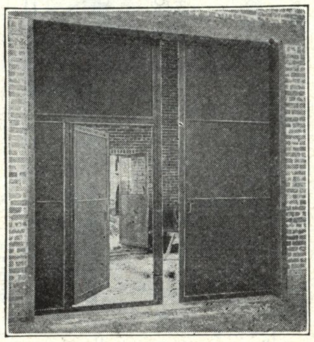
Steel Doors in Detail—Evidence of Strength and Good Appearance



Single Door, Plate Throughout
Most are made with glass



Standard Hinged Double Door



D11 Double Door Filled with Plate
With D1 pass door

BAYLEY-SPRINGFIELD STEEL DOORS

FEDERAL STEEL SASH COMPANY

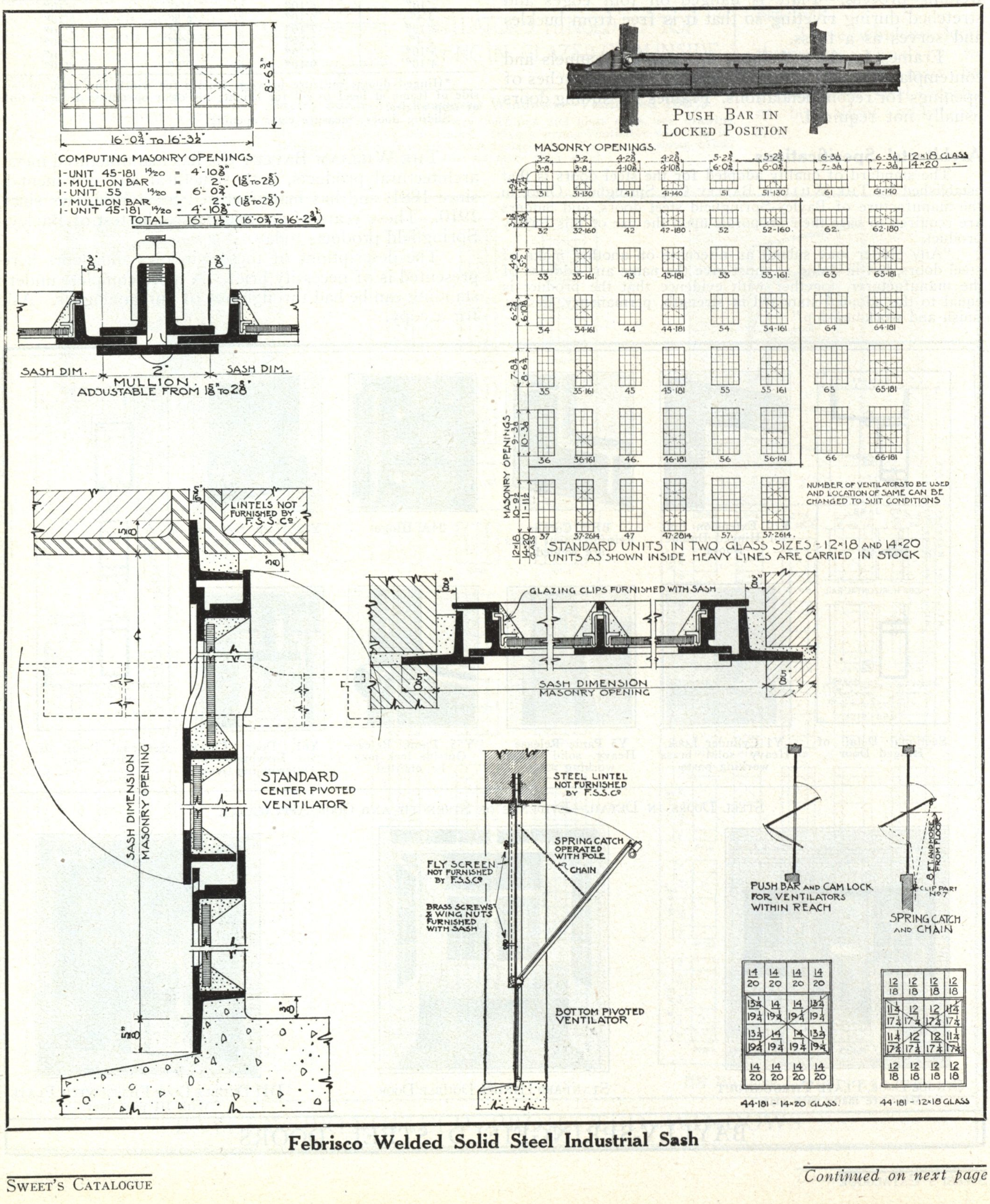
Manufacturers of Febrisco Welded Solid Steel Sash

WAUKESHA, WIS.

Sales Representatives in Principal Cities—Consult Telephone Directory

Products

- Welded Solid Steel Industrial Sash.
- Welded Solid Steel Architectural Projected Sash.
- Welded Solid Steel Store Front and Show Window Sash.
- Solid Steel Ridge Ventilated Skylights.
- Welded Tubular Steel Doors.


8'-6¾"
16'-0¾" TO 16'-3½"
COMPUTING MASONRY OPENINGS
1-UNIT 45-181 14/20 = 4'-10⅜"
1-MULLION BAR = 2" (1⅝" TO 2⅝")
1-UNIT 55 14/20 = 6'-0¾"
1-MULLION BAR = 2" (1⅝" TO 2⅝")
1-UNIT 45-181 14/20 = 4'-10⅜"
TOTAL 16'-1½" (16'-0¾" TO 16'-2¾")
⅜"
⅜"
SASH DIM.
2"
SASH DIM.
MULLION.
ADJUSTABLE FROM 1⅝" TO 2⅝"
PUSH BAR IN LOCKED POSITION
MASONRY OPENINGS.
3-2 3-8
3-2 3-8
4-2⅜ 4-10⅜
4-2⅜ 4-10⅜
5-2¾ 6-0¾
5-2¾ 6-0¾
6-3⅛ 7-3⅛
6-3⅛ 7-3⅛
12×18 GLASS
14×20
1-9¼ 1-7¼
3-1⅜ 3-5⅜
4-8 5-2
6-2⅜ 6-10⅜
7-8¾ 8-6¾
MASONRY OPENINGS 9-3⅜ 10-3⅜
10-9½ 11-11½
12×18 14×20 GLASS
31
31-130
41
41-140
51
51-130
61
61-140
32
32-160
42
42-180
52
52-160
62
62-180
33
33-161
43
43-181
53
53-161
63
63-181
34
34-161
44
44-181
54
54-161
64
64-181
35
35-161
45
45-181
55
55-161
65
65-181
36
36-161
46
46-181
56
56-161
66
66-181
37
37-2614
47
47-2814
57
57-2614
NUMBER OF VENTILATORS TO BE USED AND LOCATION OF SAME CAN BE CHANGED TO SUIT CONDITIONS
STANDARD UNITS IN TWO GLASS SIZES - 12×18 AND 14×20
UNITS AS SHOWN INSIDE HEAVY LINES ARE CARRIED IN STOCK
LINTELS NOT FURNISHED BY F.S.S.Co
⅝"
5⅛"
3⅛"
3⅛"
5⅛"
SASH DIMENSION
MASONRY OPENING
STANDARD CENTER PIVOTED VENTILATOR
GLAZING CLIPS FURNISHED WITH SASH
3⅛"
5⅛"
5⅛"
SASH DIMENSION
MASONRY OPENING
STEEL LINTEL NOT FURNISHED BY F.S.S.Co
SPRING CATCH OPERATED WITH POLE
CHAIN
FLY SCREEN NOT FURNISHED BY F.S.S.Co
BRASS SCREWS & WING NUTS FURNISHED WITH SASH
BOTTOM PIVOTED VENTILATOR
PUSH BAR AND CAM LOCK FOR VENTILATORS WITHIN REACH
8 FT. AND MORE FROM FLOOR
CLIP PART No 7
SPRING CATCH AND CHAIN
14/20 14/20 14/20 14/20
13¾/19¼ 14/19¼ 14/19¼ 13¾/19¼
13¾/19¼ 14/19¼ 14/19¼ 13¾/19¼
14/20 14/20 14/20 14/20
44-181 - 14×20 GLASS.
12/18 12/18 12/18 12/18
11¾/17¼ 12/17¼ 12/17¼ 11¾/17¼
11¾/17¼ 12/17¼ 12/17¼ 11¾/17¼
12/18 12/18 12/18 12/18
44-181 - 12×18 GLASS

Febrisco Welded Solid Steel Industrial Sash

Continued on next page

Febrisco Welded Solid Steel Industrial Sash

Febrisco construction of solid rolled steel with welded joints insures not only the greatest possible strength, but, what is equally important, a sash absolutely square and true; one which can not be racked out of shape by careless and rough handling, or warped by settlement of the building walls or foundation.

All joints are welded, making the sash one solid steel structure. The individual pieces are assembled in a fixed form before joints are welded, ensuring perfect squareness and accurate dimensions.

The weather side, which withstands the action of the elements, is flush and smooth. This improves the appearance of the sash and prevents dirt and dust collecting, and the rusting of steel in inaccessible places.

Ventilator Operation—By push bar or spring catch and chain, as desired. The push bar is attached to the ventilator by a substantial double hinge. When closed, bar folds back against the sash, slips over a locking piece and securely locks the ventilator. The spring catch is operated by a chain and when the ventilator closes it is at once locked.

Underwriters' Labeled Sash—Underwriters' sash with glazing angles are furnished in this type.

Febrisco Welded Solid Steel Architectural Projected Ventilator Sash

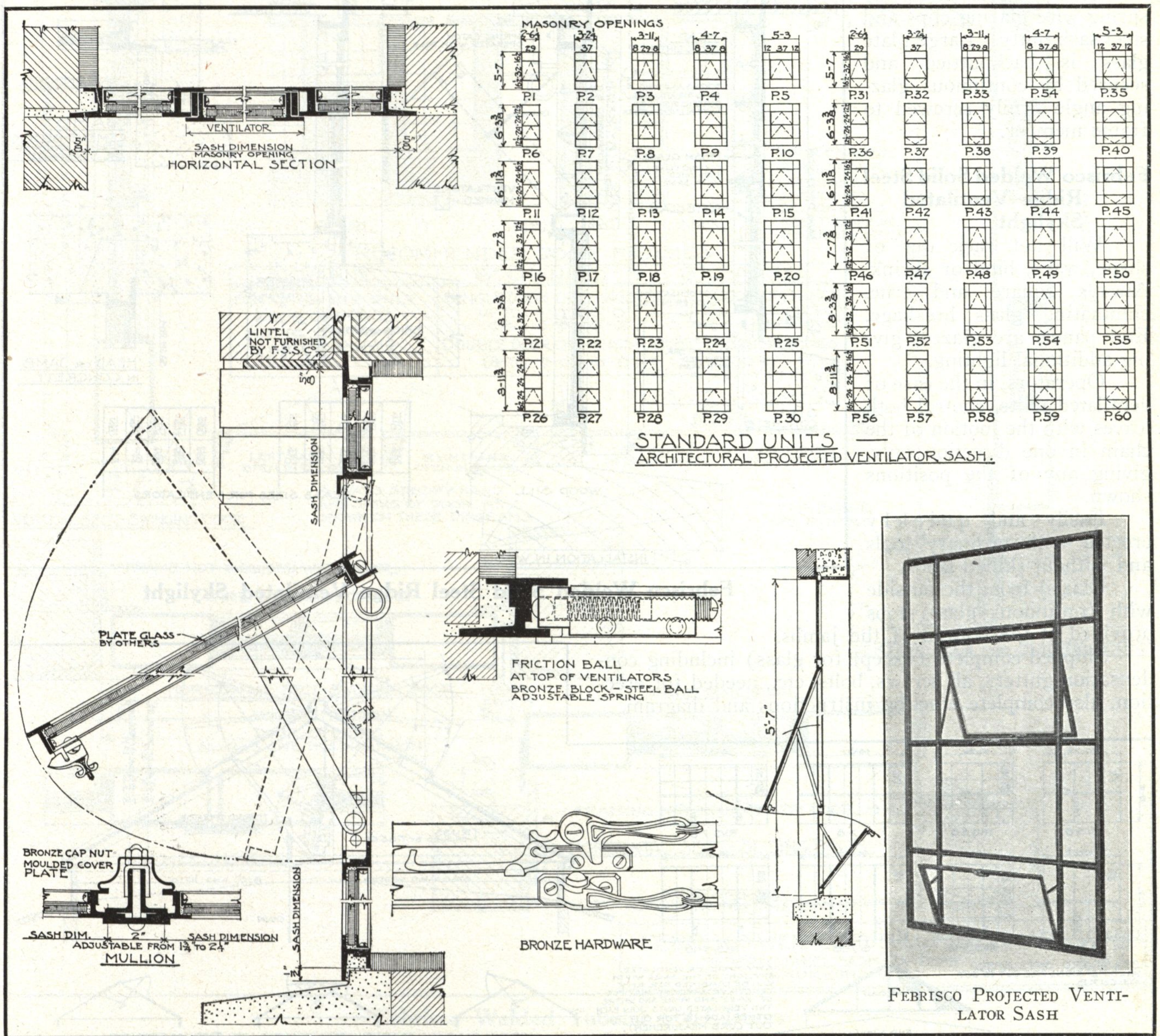
Designed for public and semipublic buildings, such as hospitals, courthouses, schools, libraries, hotels, apartment buildings and similar structures. They have all the advantages of the solid steel industrial type of sash, and at the same time their lines permit the architect to give a pleasing effect to the window openings.

Ventilators open from the head down and project from the sill out.

Double contact weathering surface all around between the ventilator and the sash gives absolute security against leakage both of water and air. The head of the ventilator is also provided with a wide drip plate.

The distinguishing feature of Febrisco Projected Ventilator Sash is the adjustable steel friction ball. At each corner of the ventilator head are fitted bronze blocks, invisible except when the ventilator is opened. These blocks carry a compression spring, the pressure of which is adjustable by means of an adjustment screw, which bears against a hardened steel ball. This ball, forced by the action of the spring, bears against the inside surface of the jamb member of the frame, and as the ventilator is opened or closed, rolls against this member. This amount of friction is easily varied by turning the adjusting screw in or out with an ordinary screwdriver.

The only point of contact between ventilator, when open, and the frame, is the narrow line contact between the ball and the frame jamb member; consequently the protective paint covering of the sash is not scraped off in operating the ventilator, the frame will not rust and the ventilator will not stick or work hard or jerkily.


VENTILATOR
5"
SASH DIMENSION
MASONRY OPENING
HORIZONTAL SECTION
MASONRY OPENINGS
2-6½
3-2½
3-11
4-7
5-3
5-7
6-3⅜
6-11⅜
7-7⅜
8-3⅜
8-11⅜
P.1 P.2 P.3 P.4 P.5 P.31 P.32 P.33 P.54 P.35
P.6 P.7 P.8 P.9 P.10 P.36 P.37 P.38 P.39 P.40
P.11 P.12 P.13 P.14 P.15 P.41 P.42 P.43 P.44 P.45
P.16 P.17 P.18 P.19 P.20 P.46 P.47 P.48 P.49 P.50
P.21 P.22 P.23 P.24 P.25 P.51 P.52 P.53 P.54 P.55
P.26 P.27 P.28 P.29 P.30 P.56 P.57 P.58 P.59 P.60
STANDARD UNITS —
ARCHITECTURAL PROJECTED VENTILATOR SASH.
LINTEL NOT FURNISHED BY F.S.S.Co.
SASH DIMENSION
PLATE GLASS BY OTHERS
FRICTION BALL
AT TOP OF VENTILATORS
BRONZE BLOCK - STEEL BALL
ADJUSTABLE SPRING
5'7"
BRONZE CAP NUT
MOULDED COVER PLATE
SASH DIM.
2"
SASH DIMENSION
ADJUSTABLE FROM 1½ TO 2¼"
MULLION
BRONZE HARDWARE

Febrisco Projected Ventilator Sash

Febrisco Welded Solid Steel Architectural Projected Ventilator Sash

Continued on next page

Febrisco Welded Solid Steel Store Front and Show Window Sash

Made of solid rolled steel, all joints electrically welded into one solid structure insuring a rigid unit and eliminating glass breakage. Gives maximum light and reduces area of plate glass required.

All ventilators double-weathered and have pole operated latches. Can be screened without interfering with ventilator.

Has no ledges or projections to collect dirt or moisture or interfere with painting. Can be combined or added to by adding mullions to give combinations to meet local conditions.

Small lights held by spring wire glazing clips and steel sash putty. Large plate glass is backputtied and secured by continuous glazing angle firmly screwed to frame member.

Febrisco Welded Solid Steel Ridge Ventilated Skylight

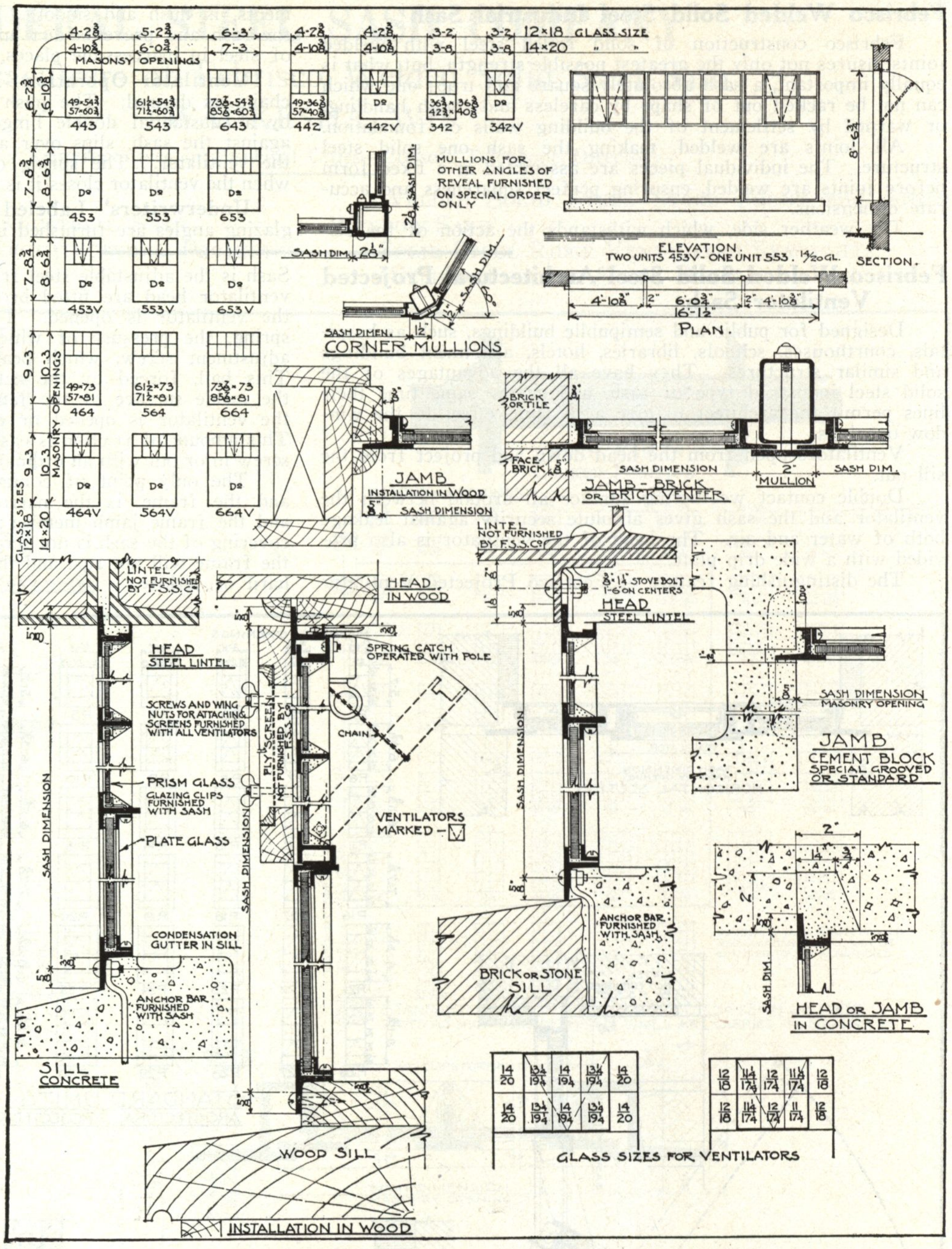
Will not rack out of shape, warp, bind or shrink. Always square and true, eliminating glass breakage. End panels are glazed, giving additional lighting.

Operators, in the case of ventilated units, control both leaves with the motion of the chain in one direction only, giving any of the positions shown.

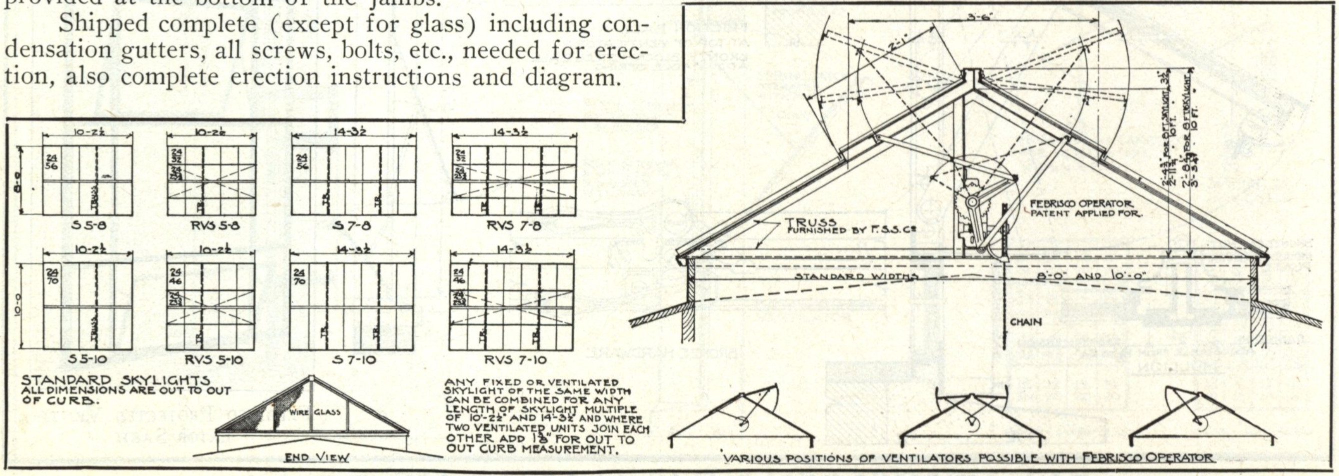
Easily and quickly erected with ordinary tools and without skilled labor.

Glazed from the outside with continuous glass stops provided at the bottom of the jambs.

Shipped complete (except for glass) including condensation gutters, all screws, bolts, etc., needed for erection, also complete erection instructions and diagram.

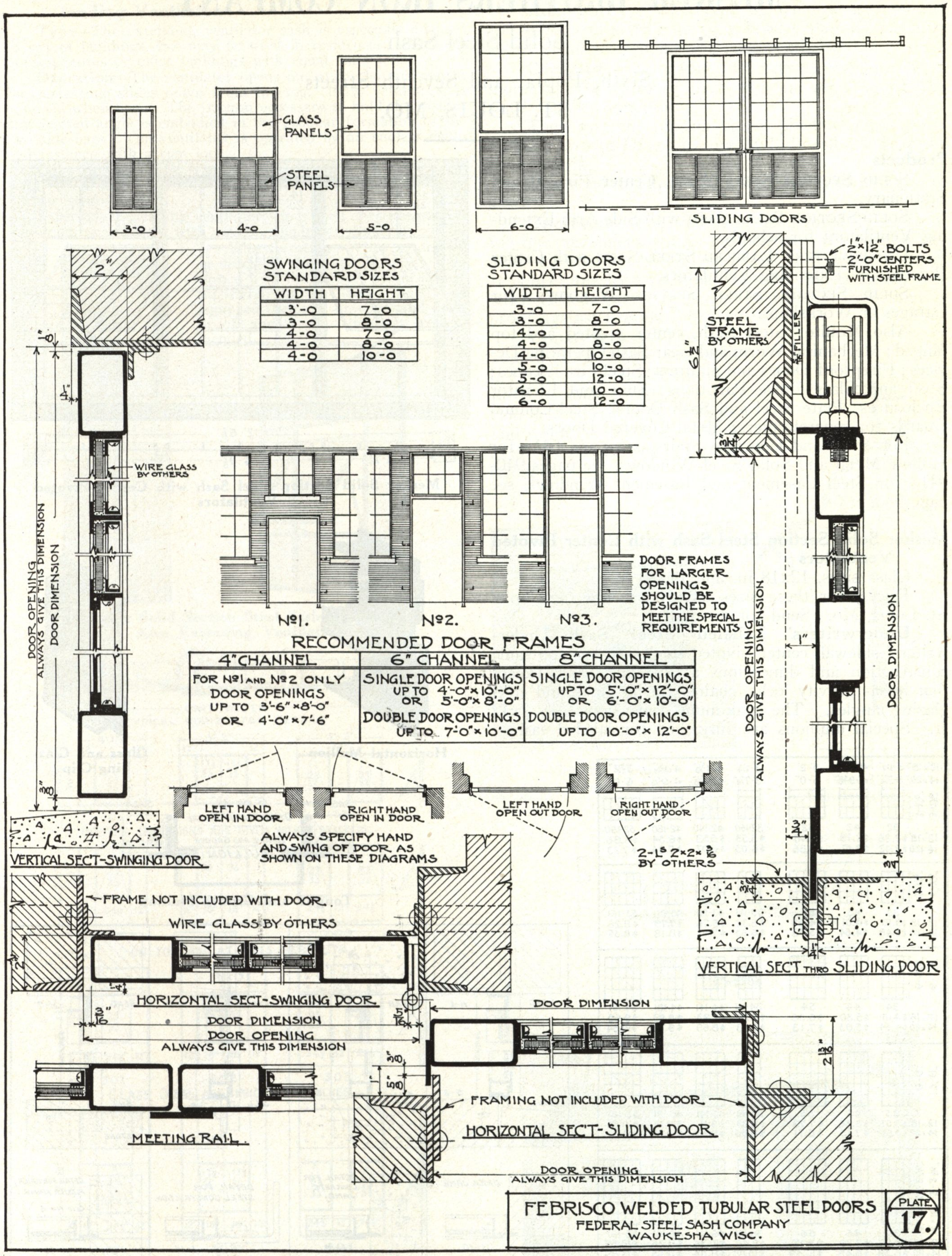

4-2⅜
4-10⅜
5-2¾
6-0¾
6-3⅝
7-3
MASONSY OPENINGS
6-2⅜
6-10⅜
49×54¾
57×60¾
61½×54¾
71½×60¾
73⅝×54¾
85⅝×60¾
443
543
643
49×36¾
57×40⅞
442
442V
342
342V
3-2
3-8
36¾×36¾
42¾×40⅞
12×18 GLASS SIZE
14×20
Dº
7-8¾
8-6¾
453
553
653
453V
553V
653V
9-3
10-3
MASONRY OPENINGS
49×73
57×81
61½×73
71½×81
73⅝×73
85⅝×81
464
564
664
464V
564V
664V
GLASS SIZES 12×18 14×20
MULLIONS FOR OTHER ANGLES OF REVEAL FURNISHED ON SPECIAL ORDER ONLY
SASH DIM.
2⅛"
SASH DIMEN.
1½"
CORNER MULLIONS
ELEVATION
TWO UNITS 453V - ONE UNIT 553. 14/20 GL.
8'-6¾"
SECTION.
4'-10⅜"
2"
6'-0¾"
16'-1½"
PLAN.
JAMB
INSTALLATION IN WOOD
SASH DIMENSION
BRICK OR TILE
FACE BRICK
JAMB - BRICK OR BRICK VENEER
MULLION
LINTEL NOT FURNISHED BY F.S.S.Cº
HEAD STEEL LINTEL
SCREWS AND WING NUTS FOR ATTACHING SCREENS FURNISHED WITH ALL VENTILATORS
PRISM GLASS
GLAZING CLIPS FURNISHED WITH SASH
PLATE GLASS
CONDENSATION GUTTER IN SILL
ANCHOR BAR FURNISHED WITH SASH
SILL CONCRETE
HEAD IN WOOD
SPRING CATCH OPERATED WITH POLE
FLY SCREEN NOT FURNISHED BY F.S.S.Cº
CHAIN
VENTILATORS MARKED - ☒
WOOD SILL
INSTALLATION IN WOOD
⅜" 1¼" STOVE BOLT 1'-6" ON CENTERS
BRICK OR STONE SILL
SASH DIMENSION MASONRY OPENING
JAMB CEMENT BLOCK SPECIAL GROOVED OR STANDARD
HEAD OR JAMB IN CONCRETE
14/20
13¼/19¼
14/19¼
12/18
11¼/17¼
12/17¼
11/17¼
GLASS SIZES FOR VENTILATORS

Febrisco Welded Solid Steel Ridge Ventilated Skylight


3-6"
2-1"
2'-4¾" FOR 8 FT. SKYLIGHT 3'-¾" 10 FT.
2'-8¾" FOR 8 FT. SKYLIGHT 3'-3¾" 10 FT.
FEBRISCO OPERATOR PATENT APPLIED FOR.
TRUSS FURNISHED BY F.S.S.Cº
STANDARD WIDTHS 8'-0" AND 10'-0"
CHAIN
10-2½
14-3½
8-0
10-0
24/56
24/70
TRUSS
T.R.
S5-8
RVS 5-8
S7-8
RVS 7-8
S5-10
RVS 5-10
S7-10
RVS 7-10
STANDARD SKYLIGHTS ALL DIMENSIONS ARE OUT TO OUT OF CURB.
WIRE GLASS
END VIEW
ANY FIXED OR VENTILATED SKYLIGHT OF THE SAME WIDTH CAN BE COMBINED FOR ANY LENGTH OF SKYLIGHT MULTIPLE OF 10'-2½" AND 14'-3½" AND WHERE TWO VENTILATED UNITS JOIN EACH OTHER ADD 1⅜" FOR OUT TO OUT CURB MEASUREMENT.
VARIOUS POSITIONS OF VENTILATORS POSSIBLE WITH FEBRISCO OPERATOR

Febrisco Welded Solid Steel Ridge Ventilated Skylights

Continued on next page


GLASS PANELS
STEEL PANELS
3-0
4-0
5-0
6-0
SLIDING DOORS
2"x12" BOLTS 2'-0" CENTERS FURNISHED WITH STEEL FRAME
STEEL FRAME BY OTHERS
$\frac{1}{4}$" FILLER
6$\frac{1}{2}$"
3$\frac{1}{4}$"
2"
$\frac{1}{8}$"
1"
WIRE GLASS BY OTHERS
DOOR OPENING ALWAYS GIVE THIS DIMENSION
DOOR DIMENSION
3/8"
VERTICAL SECT-SWINGING DOOR
No1.
No2.
No3.
LEFT HAND OPEN IN DOOR
RIGHT HAND OPEN IN DOOR
LEFT HAND OPEN OUT DOOR
RIGHT HAND OPEN OUT DOOR
2-L^s 2x2x$\frac{1}{4}$ BY OTHERS
VERTICAL SECT THRO SLIDING DOOR
FRAME NOT INCLUDED WITH DOOR.
WIRE GLASS BY OTHERS
HORIZONTAL SECT-SWINGING DOOR
DOOR DIMENSION
DOOR OPENING ALWAYS GIVE THIS DIMENSION
MEETING RAIL.
FRAMING NOT INCLUDED WITH DOOR.
HORIZONTAL SEC'T-SLIDING DOOR
2$\frac{1}{8}$"

SWINGING DOORS STANDARD SIZES

WIDTH	HEIGHT
3'-0	7-0
3-0	8-0
4-0	7-0
4-0	8-0
4-0	10-0

SLIDING DOORS STANDARD SIZES

WIDTH	HEIGHT
3-0	7-0
3-0	8-0
4-0	7-0
4-0	8-0
4-0	10-0
5-0	10-0
5-0	12-0
6-0	10-0
6-0	12-0

DOOR FRAMES FOR LARGER OPENINGS SHOULD BE DESIGNED TO MEET THE SPECIAL REQUIREMENTS

RECOMMENDED DOOR FRAMES

4" CHANNEL	6" CHANNEL	8" CHANNEL
FOR No1 AND No2 ONLY DOOR OPENINGS UP TO 3'-6" x 8'-0" OR 4'-0" x 7'-6"	SINGLE DOOR OPENINGS UP TO 4'-0" x 10'-0" OR 5'-0" x 8'-0" DOUBLE DOOR OPENINGS UP TO 7'-0" x 10'-0"	SINGLE DOOR OPENINGS UP TO 5'-0" x 12'-0" OR 6'-0" x 10'-0" DOUBLE DOOR OPENINGS UP TO 10'-0" x 12'-0"

ALWAYS SPECIFY HAND AND SWING OF DOOR AS SHOWN ON THESE DIAGRAMS

FEBRISCO WELDED TUBULAR STEEL DOORS
FEDERAL STEEL SASH COMPANY
WAUKESHA WISC.

PLATE 17.

Febrisco Welded Tubular Steel Doors

MESKER BROTHERS IRON COMPANY

Solid Steel Sash

Sixth, Poplar and Seventh Streets
ST. LOUIS, MO.

Products

Solid Section Steel Sash, Center Pivoted and Stationary.

Solid Section Steel Sash with Side Arm Extending Ventilators for schools.

Underwriters' Labeled Steel Sash with Center Pivoted and Extending Ventilators.

Solid Section Steel Service Windows, for Garages or Workshops.

Also Monitor Steel Sash, center pivoted and top hinged; Mechanical Worm and Gear Sash Operating Devices; Fireproof Doors and Shutters; Steel Fire Escapes; Steel and Glass Office Partitions; Stair and Elevator Enclosures; Plate Steel and Sash Doors; Steel Column Guards for concrete piers; Metal Covered Doors.

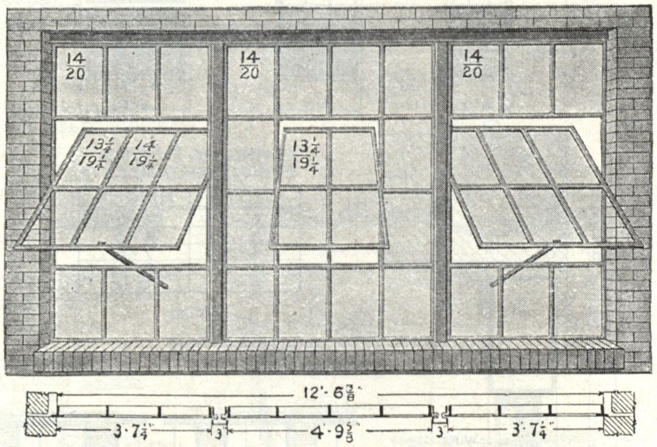
For Steel and Concrete Stairs, see page 641; for Hollow Metal and Solid Steel Windows, see pages 940-941; for Steel Casement and Basement Windows, see page 963.

Mesker Solid Section Steel Sash with Center Pivoted Ventilators

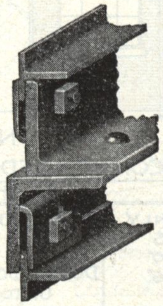
Glass sizes, 12x18 in. and 14x20 in.

Prices, for these sizes as given below, are f.o.b. St. Louis, Mo. Send for discounts.

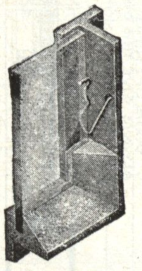
Underwriters' Labeled Steel Sash—Underwriters' sidewall center pivoted steel sash has the same construction and dimensions as standard sash, except that it has gravity locks, chains, fusible links and steel glazing angles. The maximum dimensions are 7x12 ft. Special mullions are furnished for labeled sash.


14
20
14
20
14
20
13¼
19¼
14
19¼
13¼
19¼
12'-6⅞"
3'-7¼"
3
4'-9⅝"
3
3'-7¼"

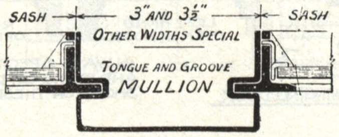
Mesker Solid Section Steel Sash with Center Pivoted Ventilators



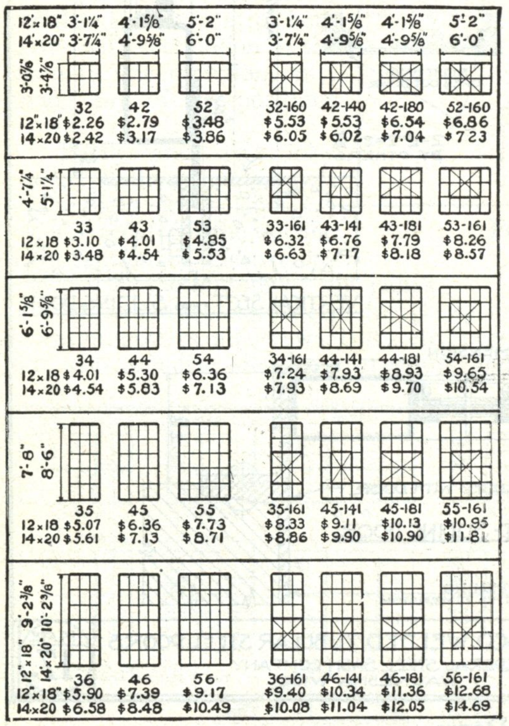
Horizontal Mullion



Glass and Glazing Clip

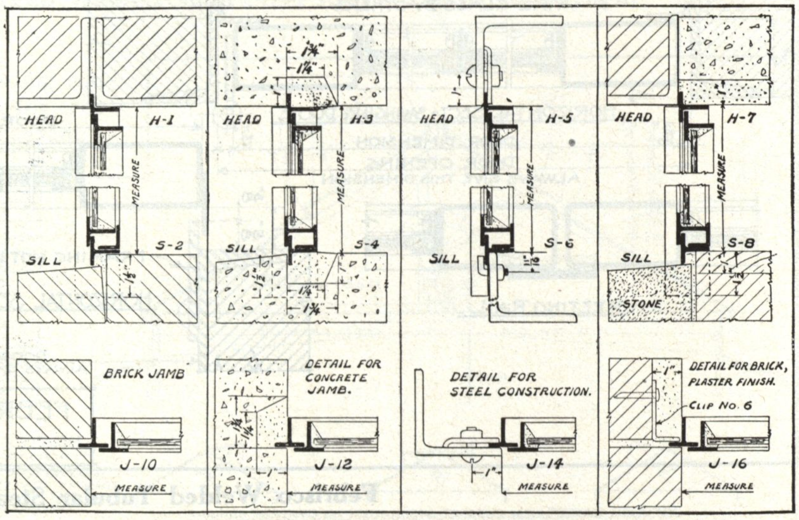

SASH
3" AND 3½"
SASH
OTHER WIDTHS SPECIAL
TONGUE AND GROOVE
MULLION

Tongue and Groove Mullion



12"×18" 14"×20"	3'-1¼" 3'-7¼"	4'-1⅝" 4'-9⅝"	5'-2" 6'-0"	3'-1¼" 3'-7¼"	4'-1⅝" 4'-9⅝"	4'-1⅝" 4'-9⅝"	5'-2" 6'-0"
3'-0⅞" 3'-4⅞"	32	42	52	32-160	42-140	42-180	52-160
12"×18"	$2.26	$2.79	$3.48	$5.53	$5.53	$6.54	$6.86
14×20	$2.42	$3.17	$3.86	$6.05	$6.02	$7.04	$7 23
4'-7¼" 5'-1¼"	33	43	53	33-161	43-141	43-181	53-161
12×18	$3.10	$4.01	$4.85	$6.32	$6.76	$7.79	$8.26
14×20	$3.48	$4.54	$5.53	$6.63	$7.17	$8.18	$8.57
6'-1⅝" 6'-9⅝"	34	44	54	34-161	44-141	44-181	54-161
12×18	$4.01	$5.30	$6.36	$7.24	$7.93	$8.93	$9.65
14×20	$4.54	$5.83	$7.13	$7.93	$8.69	$9.70	$10.54
7'-8" 8'-6"	35	45	55	35-161	45-141	45-181	55-161
12×18	$5.07	$6.36	$7.73	$8.33	$9.11	$10.13	$10.95
14×20	$5.61	$7.13	$8.71	$8.86	$9.90	$10.90	$11.81
12"×18" 9'-2⅜" 14"×20" 10'-2⅜"	36	46	56	36-161	46-141	46-181	56-161
12"×18"	$5.90	$7.39	$9.17	$9.40	$10.34	$11.36	$12.68
14×20	$6.58	$8.48	$10.49	$10.08	$11.04	$12.05	$14.69

Standard Sizes of Mesker Solid Section Steel Sash with Center Pivoted Ventilators


HEAD
H-1
MEASURE
S-2
SILL
1½"
HEAD
H-3
1¼"
1¼"
MEASURE
SILL
S-4
1"
1½"
1¼"
1¼"
HEAD
H-5
1"
MEASURE
S-6
SILL
1 1/16"
HEAD
H-7
1"
MEASURE
S-8
SILL
1"
1½"
STONE
BRICK JAMB
J-10
MEASURE
DETAIL FOR CONCRETE JAMB.
1¼"
1¼"
1"
J-12
MEASURE
DETAIL FOR STEEL CONSTRUCTION.
1"
J-14
MEASURE
DETAIL FOR BRICK, PLASTER FINISH.
1"
CLIP NO. 6
J-16
MEASURE

Mesker Standard Installation Details—Solid Section Steel Sash

Continued on next page

Mesker Solid Section Steel Sash with Side Arm Extending Ventilator

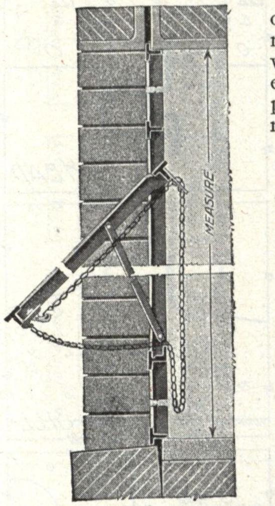
Type—The extending ventilator sash is especially adapted to school buildings, but may be used in residences, apartment houses, stores or office buildings with equal satisfaction.

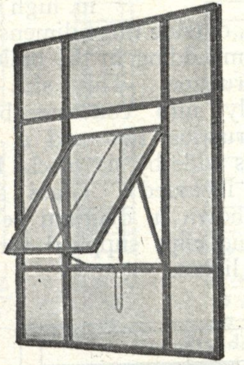
Operation—The ventilator opens out at the bottom and at the same time slides down from the top. 100% ventilation is obtained when open. The friction necessary to hold the sash at any desired angle is embodied in the peculiar formation of the two side bars. The ventilator is operated by an endless chain and fastened with a cam lock.

Construction—The frames and ventilators are made from solid rolled steel sections. The outer frames are of one continuous steel bar.

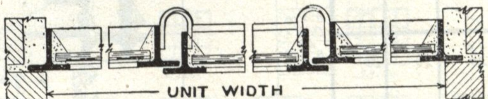
Interior—Extending ventilator when open does not project into room to interfere with screens, shades or draperies.

Weatherstrip—When so desired or specified, these ventilators are furnished with the Mesker patent bronze weatherstripping; and when so equipped they are airproof and dustproof and are particularly recommended.

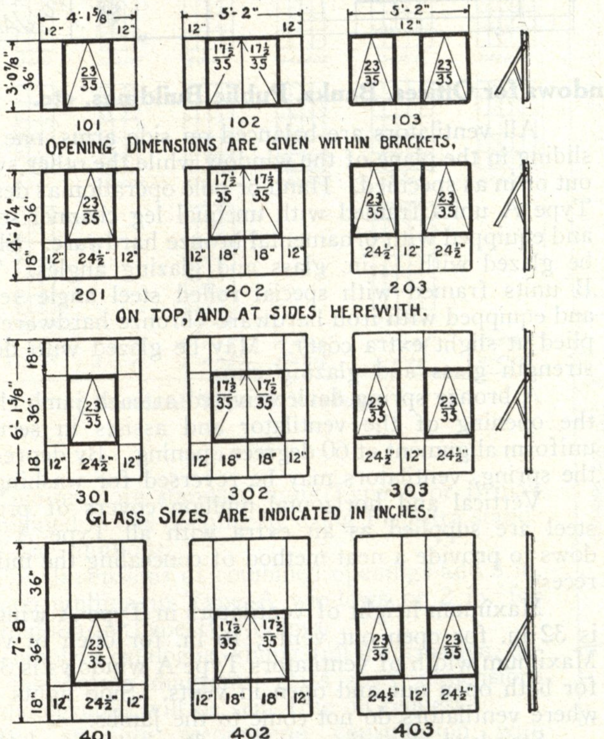




Mesker Solid Section Steel Sash with Side Arm Extending Ventilators



TYPICAL HORIZONTAL DETAILS


4'-1 5/8"
12"
12"
3'-0 7/8"
36"
23/35
101
5'-2"
12"
12"
17½/35
17½/35
102
5'-2"
12"
23/35
23/35
103
OPENING DIMENSIONS ARE GIVEN WITHIN BRACKETS,
4'-7¼"
36"
18"
23/35
12"
24½"
12"
201
17½/35
17½/35
12"
18"
18"
12"
202
23/35
23/35
24½"
12"
24½"
203
ON TOP, AND AT SIDES HEREWITH.
6'-1 5/8"
18"
36"
18"
23/35
12"
24½"
12"
301
17½/35
17½/35
12"
18"
18"
12"
302
23/35
23/35
24½"
12"
24½"
303
GLASS SIZES ARE INDICATED IN INCHES.
7'-8"
36"
36"
18"
23/35
12"
24½"
12"
401
17½/35
17½/35
12"
18"
18"
12"
402
23/35
23/35
24½"
12"
24½"
403
VENTILATOR LIGHTS ARE SMALLER.

Standard Sizes of Mesker Solid Section Steel Sash with Side Arm Extending Ventilators

Mesker Garage and General Service Steel Sash

Adaptability—This type of window is intended for public and private garages, service stations, machine shops, small storerooms and roof ventilators.

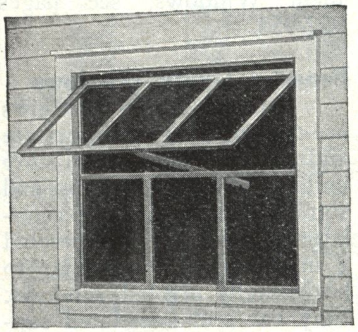
Capacity—The garage or service windows give more lighting capacity than wooden windows of the same opening dimensions.

They have the Mesker patent pivot which is not a hinge or an attachment, of any kind. It will not wear out or rust tight.

This window affords 50% ventilation of its lighting area.

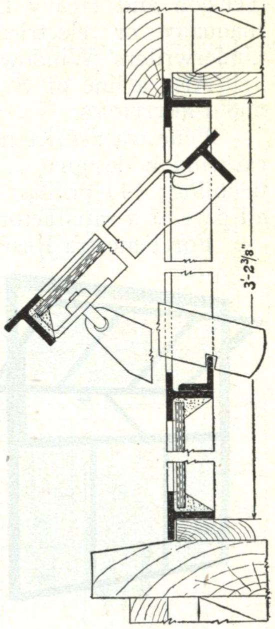
Operation—The ventilator is pivoted 1 in. from the top, and opens out at the bottom. No portion extends into the interior, which is a very desirable feature. It is operated by a push bar adjuster and is locked fast when closed, perfectly excluding wind or rain, and is proof against fire and intrusion.

Construction—The service window frame and sash are made from one continuous piece of solid rolled steel section bent round at the corners and welded at the ends, which assures a sash of greatest strength.

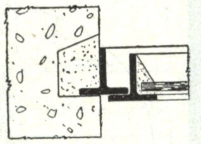


Service Window

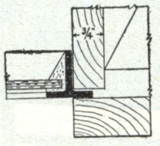
One size only—3 ft. 2¾ in. x 3 ft. 2⅜ in.



Wood Construction

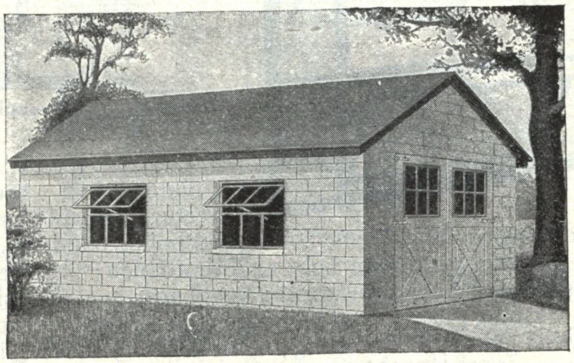


Concrete



Wood

Details



Mesker Garage Window Fits Well into Concrete

DETROIT STEEL PRODUCTS COMPANY

Manufacturers of Fenestra Architectural, Industrial and Institutional Steel Windows

2250 East Grand Boulevard
DETROIT, MICH.

FACTORIES: DETROIT, MICH., OAKLAND, CAL., and TORONTO, ONT., CANADA
25 WAREHOUSES, 150 BRANCHES AND AGENTS; DEALERS IN ALL CITIES AND TOWNS

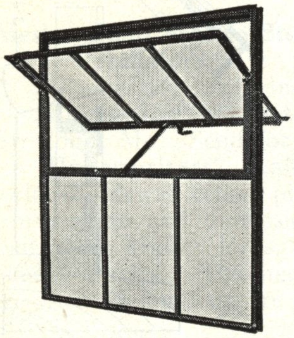
Products and Service

Fenestra Window Products include: Reversible Ventilator Windows; Utility Windows; Counterbalanced Windows; Horizontally and Vertically Pivoted Windows; Monitor Sash, top or bottom hung; Tortion, Tension and Heavy Duty Operators, manually or electrically controlled; Underwriters' Windows; Detention Sash.

Also a line of Steel Doors, swinging or sliding; and Partitions.

Fenestra Service includes: (1) correct and economical window designs; (2) prompt estimates; (3) accurate detailing; (4) prompt shipment; (5) proper erection—all part of a satisfactory window installation.

For Fenestra Residential Steel Casement and Basement Windows, see pages 952-953.

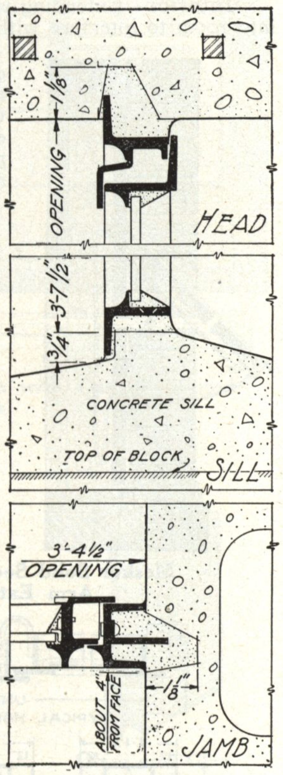


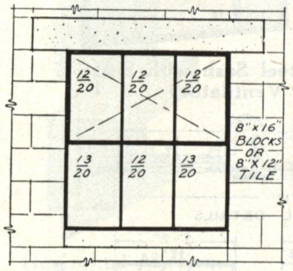
Fenestra
for homes and apartments
schools and institutions
commercial buildings
all industrial structures
TRADE-MARK

Fenestra Utility Windows

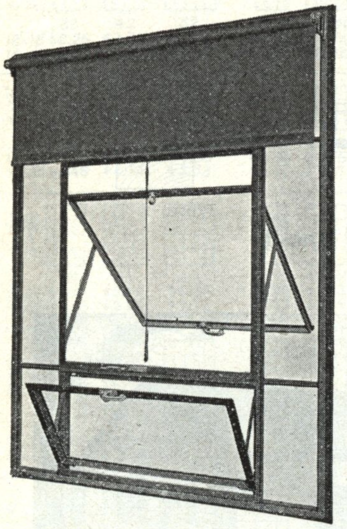
Fenestra Utility Windows are designed for use in private and public garages, small store buildings, filling stations and similar structures. The ventilator is one-light high, pivoted 2 in. above center similar to horizontally pivoted windows. Stay bar and cam latch supplied as standard. Opens 20, 40, or 60 degrees.

Only one size is manufactured: 3 ft. 4½ in. wide by 3 ft. 7½ in. high with ½ in. outside these dimensions for embedding in the building construction. This size fits readily into concrete block construction two and a half blocks wide by six blocks high (sill included). Glass sizes are shown in diagram below. Glazing clips supplied for all glass lights.





Architectural Fenestra-Reversible Ventilator Windows for Offices, Banks, Public Buildings, etc.



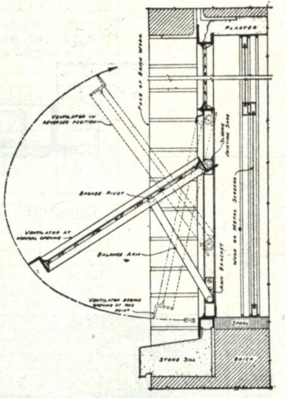


Diagram of Reversible Ventilator

Designed for buildings of architectural quality such as offices, banks, schools, hotels, and public buildings.

Admits maximum light and ventilation; provides a finished and neat appearance; ventilators are reversible for washing; lower ventilator opens in (Type A) acting as wind guard; fire resisting; easily shaded; wide variety of types to suit architectural designs.

All ventilators are balanced on side arms, one edge sliding in the plane of the window while the other swings out or in as specified. Hand or pole operation as desired. Type A units framed with unequal leg channel section and equipped with ornamental bronze hardware. Should be glazed with ¼-in. glass and glazing angles. Type B units framed with special rolled steel angle section and equipped with iron hardware (bronze hardware supplied at slight extra cost). May be glazed with double strength glass and glazing clips.

A bronze spring device riveted at each jamb checks the opening of the ventilator and assists in securing uniform alignment at 60 degrees opening. By depressing the spring, ventilators may be reversed for washing.

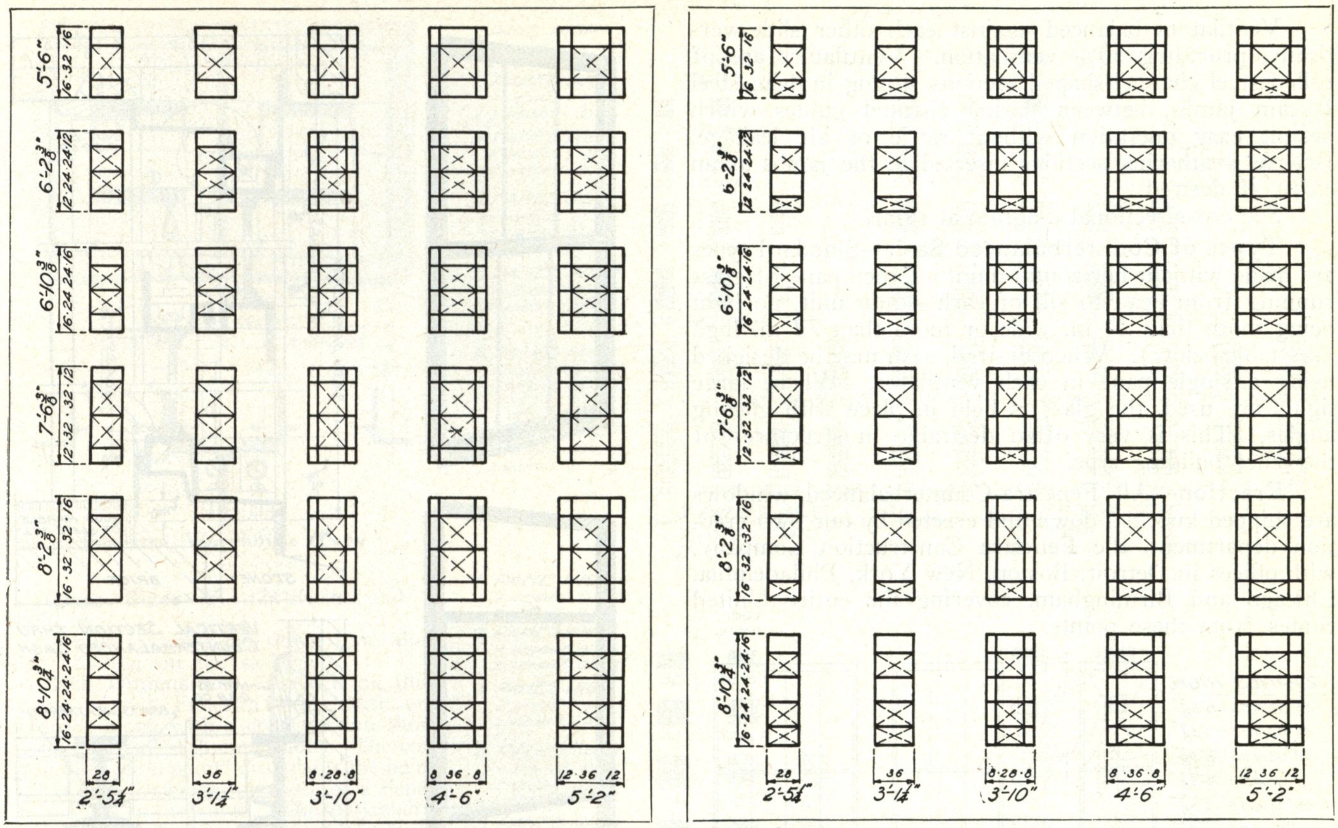
Vertical and horizontal mullion covers of pressed steel are supplied as an extra with all Type A windows to provide a neat method of concealing the mullion recess.

Maximum height of ventilators in Type A windows is 32 in. for open out vents; 16 in. for open in vents. Maximum width of ventilators Type A windows is 36 in. for both open out and open in vents. Side lights used where ventilators do not come to the jambs.

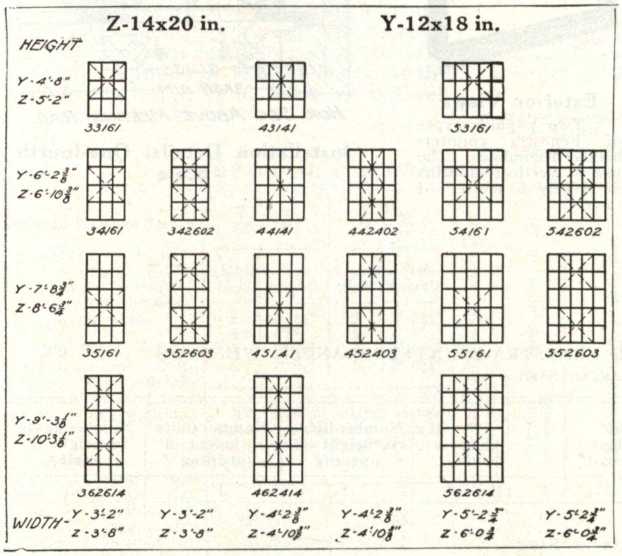
Standard glass sizes in Type B windows are 12x18 in. and 14x20 in. Maximum ventilator size, Type B is six lights of 14x20-in. glass.

Continued on next page

Architectural Fenestra-Reversible Windows—Standard Types


5'-6"
16·32·16
6'-2⅜"
12·24·24·12
6'-10⅜"
16·24·24·16
7'-6⅜"
12·32·32·12
8'-2⅜"
16·32·32·16
8'-10¾"
16·24·24·24·16
28
2'-5¼"
36
3'-1¼"
8·28·8
3'-10"
8·36·8
4'-6"
12·36·12
5'-2"

Standard Type A Windows


Z-14x20 in.
Y-12x18 in.
HEIGHT
Y-4'-8"
Z-5'-2"
33161
43141
53161
Y-6'-2⅜"
Z-6'-10⅜"
34161
342602
44141
442402
54161
542602
Y-7'-8¾"
Z-8'-6¾"
35161
352603
45141
452403
55161
552603
Y-9'-3⅛"
Z-10'-3⅛"
362614
462414
562614
WIDTH-
Y-3'-2"
Z-3'-8"
Y-3'-2"
Z-3'-8"
Y-4'-2⅜"
Z-4'-10⅜"
Y-4'-2⅜"
Z-4'-10⅜"
Y-5'-2¾"
Z-6'-0¾"
Y-5'-2¾"
Z-6'-0¾"

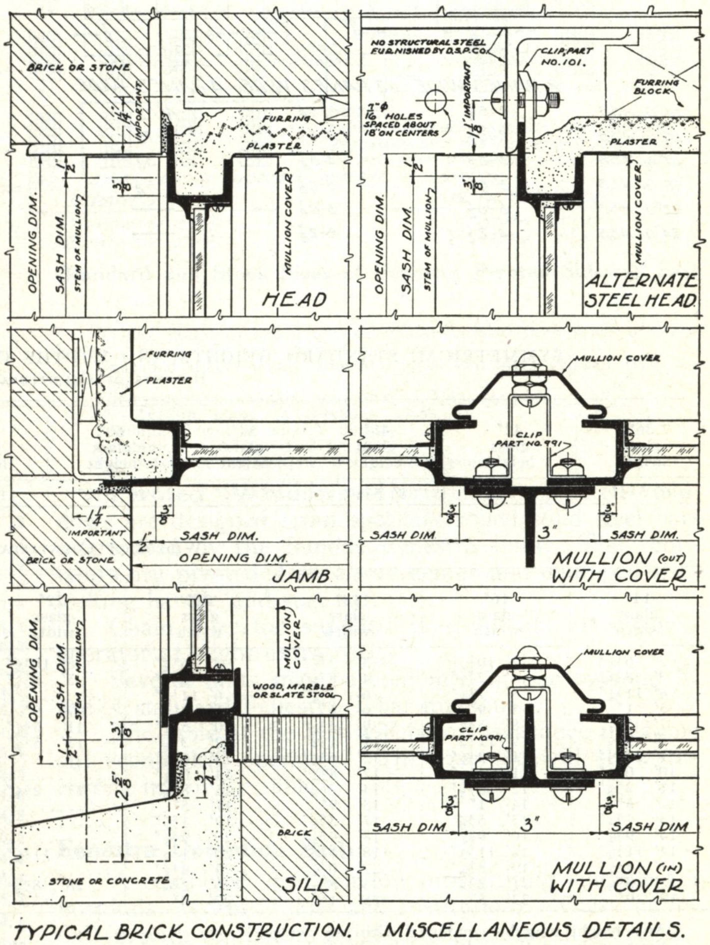
Standard Type B Windows

Two or more standard units Type A or B may be combined in one opening by using Fenestra standard T-bar mullions.

For dimensions of combined openings add 3 in. for each mullion in Type A windows or 2 in. for each mullion in Type B windows.

Complete catalogue, giving full information, details, installation diagrams, glass sizes, dimensions and photographs will be sent free on request.

We strongly recommend consultation with our sales engineers when designing window openings.


BRICK OR STONE
IMPORTANT
FURRING
PLASTER
OPENING DIM.
SASH DIM.
STEM OF MULLION
MULLION COVER
HEAD
NO STRUCTURAL STEEL FURNISHED BY D.S.P.CO.
CLIP, PART NO. 101.
FURRING BLOCK
HOLES SPACED ABOUT 18" ON CENTERS
IMPORTANT
PLASTER
ALTERNATE STEEL HEAD
FURRING
PLASTER
IMPORTANT
SASH DIM.
OPENING DIM.
BRICK OR STONE
JAMB
MULLION COVER
CLIP PART NO. 991
SASH DIM
3"
SASH DIM.
MULLION (OUT) WITH COVER
MULLION COVER
WOOD, MARBLE OR SLATE STOOL
BRICK
STONE OR CONCRETE
SILL
MULLION COVER
CLIP PART NO. 991
SASH DIM
3"
SASH DIM
MULLION (IN) WITH COVER

TYPICAL BRICK CONSTRUCTION. MISCELLANEOUS DETAILS.

Type A—Installation Details, One-fourth Scale

Continued on next page

Architectural Fenestra-Counterbalanced Windows for Schools, Offices and Public Buildings

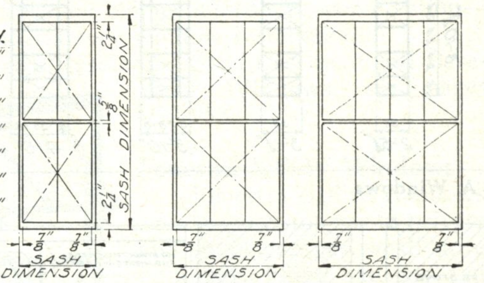
Ventilators balanced against each other slide vertically, providing 50% ventilation. Ventilators are of rolled steel channel-shaped sections sliding in 4-in. steel I-beam jambs, between flaring channel guides which permit easy operation without rattle or air leakage. Bronze weathering sections inserted at the jambs as an extra, if desired.

See cross-sectional diagram at right.

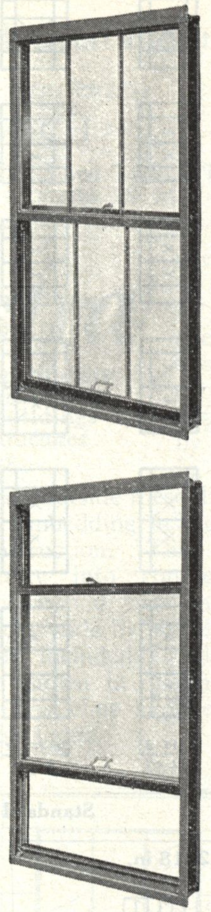
Types of Counterbalanced Sash—Standard types are made without horizontal muntins, each pane of glass running from head to sill of each siding unit, no light being more than 24 in. wide or more than 72 in. high (see table below). When desired, sash may be designed using a single pane in each ventilator. Where large lights are used, the glass is held in place with glazing angles. This is very often desirable in structures of the office building type.

Erection—All Fenestra-Counterbalanced windows are shipped knocked down and erected by our own erection department, the Fenestra Construction Company, with offices in Detroit, Boston, New York, Philadelphia, Chicago and Birmingham, covering the entire United States from these points.

2 PANES HIGH.	
36" GLASS	6'-5⅞"
42" GLASS	7'-5⅞"
48" GLASS	8'-5⅞"
54" GLASS	9'-5⅞"
60" GLASS	10'-5⅞"
66" GLASS	11'-5⅞"
72" GLASS	12'-5⅞"

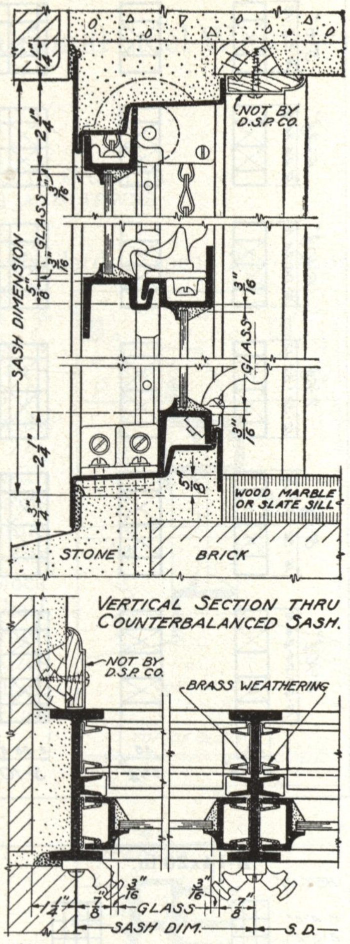


	2 PANES WIDE.	3 PANES WIDE.	4 PANES WIDE.
14" GLASS	2'-6½"	3'-8⅞"	4'-11¼"
16" GLASS	2'-10½"	4'-2⅞"	5'-7¼"
18" GLASS	3'-2½"	4'-8⅞"	6'-3¼"
20" GLASS	3'-6½"	5'-2⅞"	6'-11¼"
22" GLASS	3'-10½"	5'-8⅞"	—
24" GLASS	4'-2½"	6'-2⅞"	—



Exterior Views

Two popular types of Fenestra counterbalanced windows. The use of vertical muntins is largely a matter of taste



VERTICAL SECTION THRU COUNTERBALANCED SASH.

HOR. SEC. ABOVE MEETING RAIL.

Installation Details, One-fourth Scale

SYMMETRICAL STANDARD HEIGHTS AND WIDTHS OF FENESTRA-COUNTERBALANCED WINDOWS

HEIGHTS OF COUNTERBALANCED SASH

36" glass height	42" glass height	48" glass height	54" glass height	60" glass height	66" glass height	72" glass height	Number lights in height of opening	Number units in height of opening	Number lights in height of unit
6' 5⅞"	7' 5⅞"	8' 5⅞"	9' 5⅞"	10' 5⅞"	11' 5⅞"	12' 5⅞"	2	1	2

WIDTHS OF COUNTERBALANCED SASH

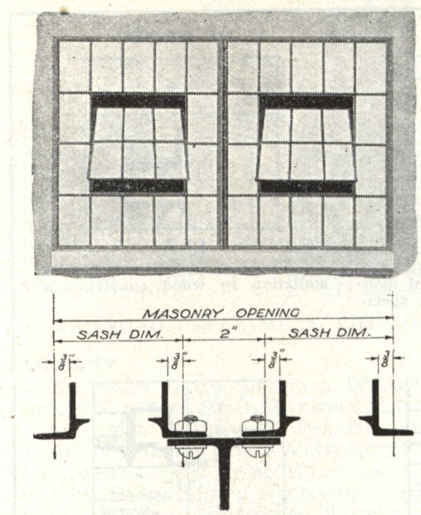
14" glass width	16" glass width	18" glass width	20" glass width	22" glass width	24" glass width	Number lights in width of opening	Number units in width of opening	Number lights in width of units
2' 6½"	2' 10½"	3' 2½"	3' 6½"	3' 10½"	4' 2½"	2	1	2
3' 8⅞"	4' 2⅞"	4' 8⅞"	5' 2⅞"	5' 8⅞"	6' 2⅞"	3	1	3
4' 11¼"	5' 7¼"	6' 3¼"	6' 11¼"	....	....	4	1	4
5' 1"	5' 9"	6' 5"	7' 1"	7' 9"	8' 5"	4	2	2, 2
7' 5¾"	8' 5¾"	9' 5¾"	10' 5¾"	11' 5¾"	12' 5¾"	6	2	3, 3
8' 9⅞"	9' 11⅞"	11' 1⅞"	12' 3⅞"	13' 5⅞"	14' 7⅞"	7	3	2, 3, 2
9' 10½"	11' 2½"	12' 6½"	13' 10½"	....	....	8	2	4, 4
10' 0¼"	11' 4¼"	12' 8¼"	14' 0¼"	....	....	8	3	2, 4, 2
11' 2⅝"	12' 8⅝"	14' 2⅝"	15' 8⅝"	17' 2⅝"	18' 8⅝"	9	3	3, 3, 3
12' 5"	14' 1"	15' 9"	17' 5"	....	....	10	3	3, 4, 3
13' 7⅜"	15' 5⅜"	17' 3⅜"	19' 1⅜"	....	....	11	3	4, 3, 4
14' 9¾"	16' 9¾"	18' 9¾"	20' 9¾"	....	....	12	3	4, 4, 4
14' 11½"	16' 11½"	18' 11½"	20' 11½"	22' 11½"	24' 11½"	12	4	3, 3, 3, 3
17' 4¼"	19' 8¼"	22' 0¼"	24' 4¼"	....	....	14	4	3, 4, 4, 3
18' 8⅜"	21' 2⅜"	23' 8⅜"	26' 2⅜"	28' 8⅜	31' 2⅜"	15	5	3, 3, 3, 3, 3
19' 9"	22' 5"	25' 1"	27' 9"	....	....	16	4	4, 4, 4, 4

Any height may be combined with any width.

First, pick out the width and height dimensions that suit the purpose. Then follow across in a horizontal line to the right and find the number of lights in an opening of those dimensions, and the number and kind of units needed.

Continued on next page

Industrial Fenestra-Pivoted Ventilator Windows for Factories and Mills


MASONRY OPENING
SASH DIM.
2"
SASH DIM.
3/8"
3/8"
3/8"
3/8"

Fenestra Warehouse Type

Glass Sizes—Y, 12x18 in. and Z, 14x20 in.

Ventilator lights cut down 1 in. along edge abutting on the sash.

Sash Dimensions—Above is an illustration of two Fenestra Warehouse type windows, along with a cross section showing mullion and sash dimensions. The term "sash dimension point" designates the points from which the height or width of a Fenestra window is measured. The outstanding leg on all outside bars embeds in the building construction ½ in. In measuring, therefore, we disregard the embedded part and make the dimensions exactly the same as the masonry opening. This places the sash dimension point ½ in. in from the tip of the outstanding leg, or ⅜ in. out from the web of the outside bar.

SYMMETRICAL COMBINATIONS

How to Use the Table

Given — A window opening 7 ft. high by approximately 15 ft. wide to be filled with stock sash.

To Find — The number of units needed, their height and width, and the number of mullions necessary.

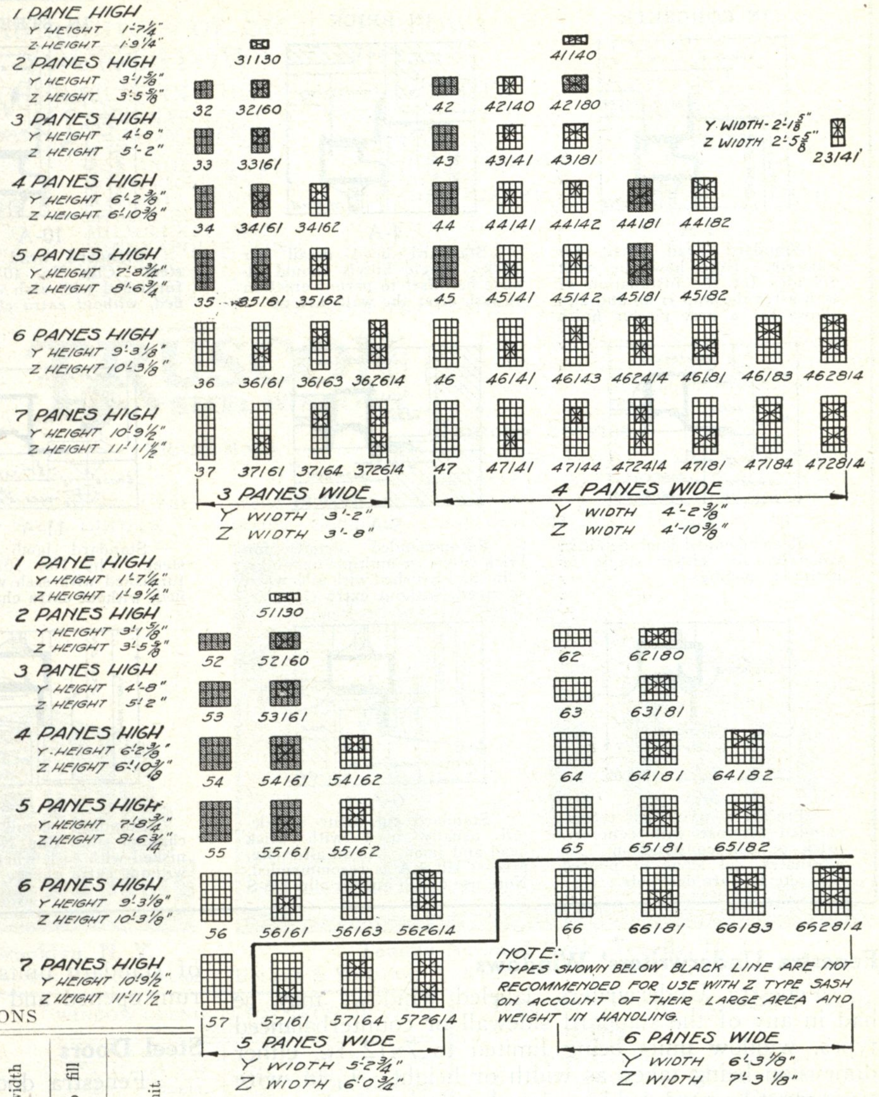
Solution — You probably would use the 14x20-in. size glass, if possible, because the larger size reduces the cost of the sash per square foot. In the column headed "Z Glass (14x 20 in.)," you will find a height dimension of 6 ft. 10⅜ in. This is probably close enough to 7 ft. to serve the purpose. A glance down the same column shows an over-all width dimension of 14 ft. 11⅛ in., and opposite the figures 12; 3; 4, 4, 4. These indicate that the bay will be 12 lights wide divided into 3 units of 4 lights each. Therefore, use three units of Z-44181 Fenestra sash and two Z-4 mullions.

Y Glass (12" x 18")		Z Glass (14" x 20")	
Lights high	Sash heights	Lights high	Sash heights
2	3′1⅝″	2	3′ 5⅝″
3	4′8″	3	5′ 2″
4	6′2⅜″	4	6′10⅜″
5	7′8¾″	5	8′ 6¾″

The over-all widths shown below (except when starred) may be had in any of the above heights.

Y Glass	Z Glass	Number of lights in total width of opening.	Number of sash units to fill opening.	Number of lights in each unit.
*2′ 1⅝″	*2′ 5⅝″	2	1	2
3′ 2″	3′ 8″	3	1	3
4′ 2⅜″	4′10⅜″	4	1	4
5′ 2¾″	6′ 0¾″	5	1	5
6′ 6″	7′ 6″	6	2	3, 3
8′ 6¾″	9′10¾″	8	2	4, 4
9′10″	11′ 4″	9	3	3, 3, 3
10′ 7½″	12′ 3½″	10	2	5, 5
10′10⅜″	12′ 6⅜″	10	3	3, 4, 3
11′10¾″	13′ 8¾″	11	3	3, 5, 3
12′11⅛″	14′11⅛″	12	3	4, 4, 4
13′11½″	16′ 1½″	13	3	4, 5, 4
13′11½″	16′ 1½″	13	3	5, 3, 5
14′11⅞″	17′ 3⅞″	14	3	5, 4. 5
15′ 2¾″	17′ 6¾″	14	4	3, 4, 4, 3
16′ 0¼″	18′ 6¼″	15	3	5, 5, 5
17′ 3½″	19′11½″	16	4	4, 4, 4, 4
19′ 4¼″	22′ 4¼″	18	4	4, 5, 5, 4
20′ 7½″	23′ 9½″	19	5	5, 3, 3, 3, 5
21′ 5″	24′ 9″	20	4	5, 5, 5, 5

*Two-light-wide windows in Y and Z glass sizes are carried in warehouse in three lights high only.


1 PANE HIGH
Y HEIGHT 1'-7¼"
Z HEIGHT 1'-9¼"
2 PANES HIGH
Y HEIGHT 3'-1⅝"
Z HEIGHT 3'-5⅝"
3 PANES HIGH
Y HEIGHT 4'-8"
Z HEIGHT 5'-2"
4 PANES HIGH
Y HEIGHT 6'-2⅜"
Z HEIGHT 6'-10⅜"
5 PANES HIGH
Y HEIGHT 7'-8¾"
Z HEIGHT 8'-6¾"
6 PANES HIGH
Y HEIGHT 9'-3⅛"
Z HEIGHT 10'-3⅛"
7 PANES HIGH
Y HEIGHT 10'-9½"
Z HEIGHT 11'-11½"
31130
32 32160
33 33161
34 34161 34162
35 35161 35162
36 36161 36163 362614
37 37161 37164 372614
3 PANES WIDE
Y WIDTH 3'-2"
Z WIDTH 3'-8"
41140
42 42140 42180
43 43141 43181
44 44141 44142 44181 44182
45 45141 45142 45181 45182
46 46141 46143 462414 46181 46183 462814
47 47141 47144 472414 47181 47184 472814
4 PANES WIDE
Y WIDTH 4'-2⅜"
Z WIDTH 4'-10⅜"
Y WIDTH - 2'-1⅝"
Z WIDTH 2'-5⅝"
23141
1 PANE HIGH
Y HEIGHT 1'-7¼"
Z HEIGHT 1'-9¼"
2 PANES HIGH
Y HEIGHT 3'-1⅝"
Z HEIGHT 3'-5⅝"
3 PANES HIGH
Y HEIGHT 4'-8"
Z HEIGHT 5'-2"
4 PANES HIGH
Y HEIGHT 6'-2⅜"
Z HEIGHT 6'-10⅜"
5 PANES HIGH
Y HEIGHT 7'-8¾"
Z HEIGHT 8'-6¾"
6 PANES HIGH
Y HEIGHT 9'-3⅛"
Z HEIGHT 10'-3⅛"
7 PANES HIGH
Y HEIGHT 10'-9½"
Z HEIGHT 11'-11½"
51130
52 52160
53 53161
54 54161 54162
55 55161 55162
56 56161 56163 562614
57 57161 57164 572614
5 PANES WIDE
Y WIDTH 5'-2¾"
Z WIDTH 6'-0¾"
62 62180
63 63181
64 64181 64182
65 65181 65182
66 66181 66183 662814
NOTE: TYPES SHOWN BELOW BLACK LINE ARE NOT RECOMMENDED FOR USE WITH Z TYPE SASH ON ACCOUNT OF THEIR LARGE AREA AND WEIGHT IN HANDLING.
6 PANES WIDE
Y WIDTH 6'-3⅛"
Z WIDTH 7'-3⅛"

Standard and Stock Sizes of Fenestra Pivoted Sidewall Sash

Shaded diagrams above are stock sash carried in a score of warehouses. Fixed light sash carried in Z size only.

Unshaded diagrams are standard types and sizes shipped from the factories.

For symmetrical combinations of stock sash, see table.

Y—12x18-in. glass. Z—14x20-in. glass.

Combine Y widths with Y heights.

Combine Z widths with Z heights.

For details of installation, see following page

Pivoted Windows—Horizontally pivoted windows are designed from specially rolled solid steel bars interlocked by the famous Fenestra joint. The ventilators are pivoted 2 in. above center and equipped with locking handle and stay bar.

Chain operator supplied if specified. Mechanical operator at slight extra cost.

Several units may be combined in one opening by use of standard Fenestra T-bar mullions.

The table at the left will be of assistance in laying out economical openings. The example will show the correct use of the table.

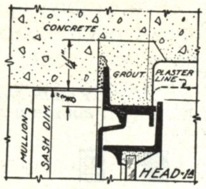
Fenestra Detention Sash

A combined steel window and grating suitable for hospitals, asylums, jails and institutions. Glass lights, 6x9 in. with ventilators 1-light high, pivoted in the center. Ventilators operated singly or in banks.

Continued on next page

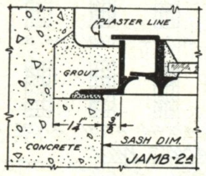
Industrial Fenestra-Pivoted Windows, Installation Details One-fourth Scale

IN CONCRETE


CONCRETE
GROUT
PLASTER LINE
1/4"
MULLION
SASH DIM.
3/8"
HEAD-1A

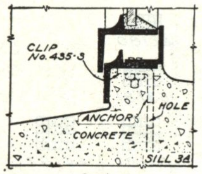
1-A

Standard head detail for concrete. Note how the soffit provides for the installation of sash after the wall is up and also allows for a neat plaster finish


PLASTER LINE
GROUT
1/4"
3/8"
CONCRETE
SASH DIM.
JAMB-2A

2-A

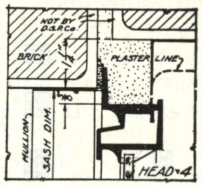
Recommended jamb detail in concrete, for either single or multiple openings


CLIP No. 435-S
ANCHOR
HOLE
CONCRETE
SILL 3A

3-A

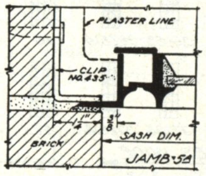
Precast concrete sill recommended for use with concrete, brick or tile construction. As alternates, cut stone or poured concrete sills are desirable

IN BRICK


NOT BY D.S.P.Co.
BRICK
1/4"
PLASTER LINE
3/8"
MULLION
SASH DIM.
HEAD-4

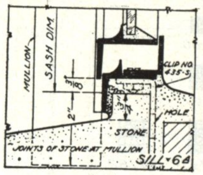
4-A

Standard head detail for brick. Angle lintels should always be offset to permit erection of sash after the walls are up


PLASTER LINE
CLIP NO. 435
1/4"
3/8"
BRICK
SASH DIM.
JAMB-5A

5-A

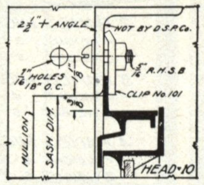
Recommended detail for brick single or multiple openings. Clip 435 furnished with sash when specified, without extra charge


MULLION
SASH DIM.
3/8"
2"
CLIP NO. 435-S
3/4"
HOLE
STONE
JOINTS OF STONE AT MULLION
SILL-6A

6-A

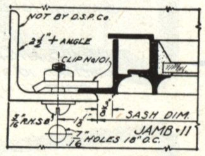
Standard cut stone sill detail usually used with brick head and jamb. As an alternate, precast sill 3-A is recommended. Note use of sill anchor clip 435-S

IN STEEL


2 1/2" + ANGLE
NOT BY D.S.P.Co.
7/16" HOLES 18" O.C.
1 1/8"
5/16 R.H.S.B
CLIP No. 101
3/8"
MULLION
SASH DIM.
HEAD-10

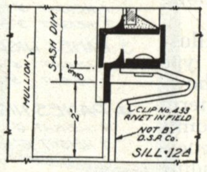
10-A

Standard head detail for steel. Clip No. 101 and bolt furnished with sash where specified, without extra charge


NOT BY D.S.P.Co
2 1/2" + ANGLE
CLIP No. 101
5/16" R.H.S.B
1 1/8"
3/8"
SASH DIM.
7/16" HOLES 18" O.C.
JAMB-11

11-A

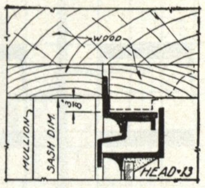
Standard jamb detail for steel. Clip No. 101 and bolt furnished with sash where specified, without extra charge


MULLION
SASH DIM.
3/8"
2"
CLIP No. 433 RIVET IN FIELD
NOT BY D.S.P. Co.
SILL-12A

12-A

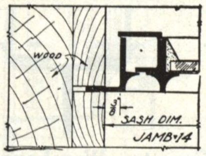
Standard detail for steel channel sill. Clip No. 433 furnished with sash where specified, without extra charge

IN WOOD


WOOD
3/8"
MULLION
SASH DIM.
HEAD-13

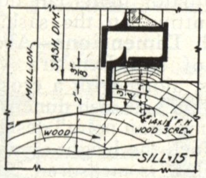
13-A

Standard head detail for installation in wood construction


WOOD
3/8"
SASH DIM.
JAMB-14

14-A

This jamb detail is standard in wood construction


MULLION
SASH DIM.
3/8"
3/4"
2"
14x1" F.H WOOD SCREW
WOOD
SILL-15

15-A

This detail provides a satisfactory sill installation in wood construction

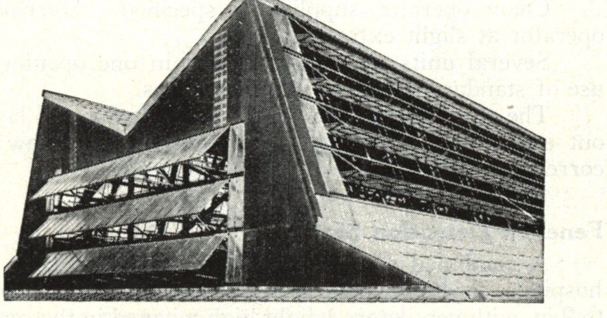
Fenestra Underwriters' Windows

Fenestra Underwriters' labeled windows may be had in any of the standard sidewall or counterbalanced types, window units being limited to 7x12 ft., either dimension being taken as width or height. ¼-in. wire glass must be used, held in place by glazing angles.

Our catalogue section No. 5 gives complete details and limitations. Free on request.

Fenestra Continuous Sash

For monitor and sawtooth roof construction especially desirable for all types of "hot" buildings. Designed to be top hung, center pivoted or stationary. Made from special solid rolled steel sections in units 20 ft. wide and in 3, 4, 5 and 6-ft. heights. Any number of standard units may be joined to form a continuous run, opened and closed mechanically from one station.



Fenestra Continuous Sash

Steel Doors

Fenestra doors of heavy steel U-shaped channels are made to fit the following openings: *3x7, 3x8, 4x7, 4x8, 4x10* and *5x10 ft.*

Fenestra tubular doors of heavy square steel tubes, mitered and welded at corners are made 5x12, 6x10 and 6x12 ft. Both types are made either single or double, to either swing or slide as specified. Lower panels are filled with steel kick plates, upper panels being glazed. Full information on request.

Interchangeable Partitions

Designed for use in industrial structures. Made from solid steel sections with mullions and frames of No. 16 gauge formed steel plate. Base plates of steel to a height of 36 in. Upper portions glazed. Full details on request.

Fenestra Mechanical Sash Operating Devices

Built each for the particular work it is intended to perform, and of three general types:

(1) Fenestra Continuous Operator (manually or electrically operated) for Fenestra continuous sash.

(2) Fenestra Worm and Gear Operator for Fenestra horizontally pivoted sash.

(3) Fenestra Tension Operator designed particularly for long runs where pivoted sidewall sash is used.

Complete information on each type furnished on request.

TRUSCON STEEL COMPANY

Manufacturers of Steel Windows

YOUNGSTOWN, OHIO

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SCRANTON, PA.
SEATTLE, WASH.
SOUTH BEND, IND.
SPRINGFIELD, MASS.
SYRACUSE, N. Y.
TAMPA, FLA.
TOLEDO, OHIO
WASHINGTON, D. C.

RAILROAD DEPARTMENT, CHICAGO, ILL.

FOREIGN TRADE DEPARTMENT, NEW YORK, N. Y.

Products

Standard Steel Sidewall Windows; Counterbalanced Steel Windows; Double Hung Steel Windows; Pressed Steel Frames; Projected Steel Windows; Donovan Awning Type Steel Windows; Continuous Steel Sash; Mechanical Sash Operators; Steel Doors and Frames; Standard Steel Casements and Basement Windows; Standard Steel Lintels.

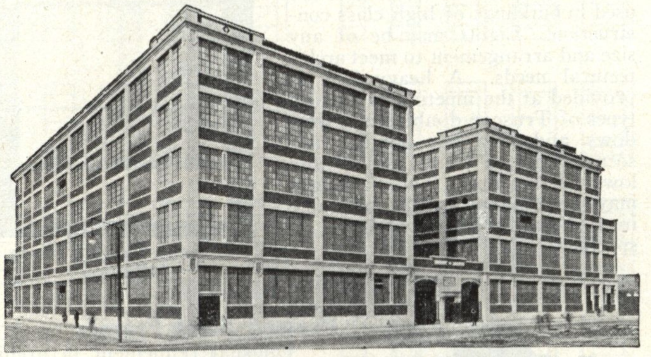
TRUSCON
STEEL WINDOWS
TRUSCON STEEL CO.

TRADE-MARK

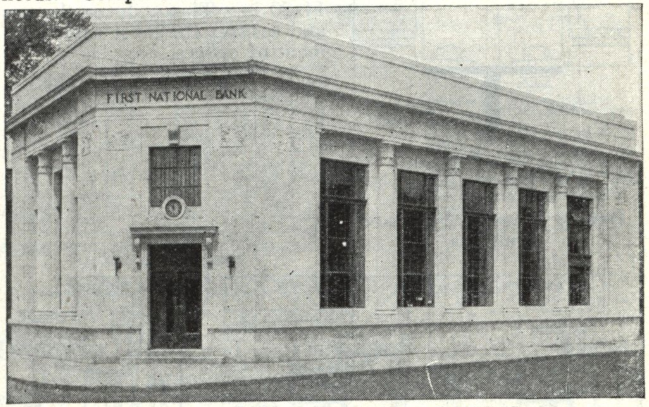
For Reinforcing Steel and Building Specialties, see pages 60-61; for Metal Lath and Steel Joists, see pages 418-420.

Truscon Service

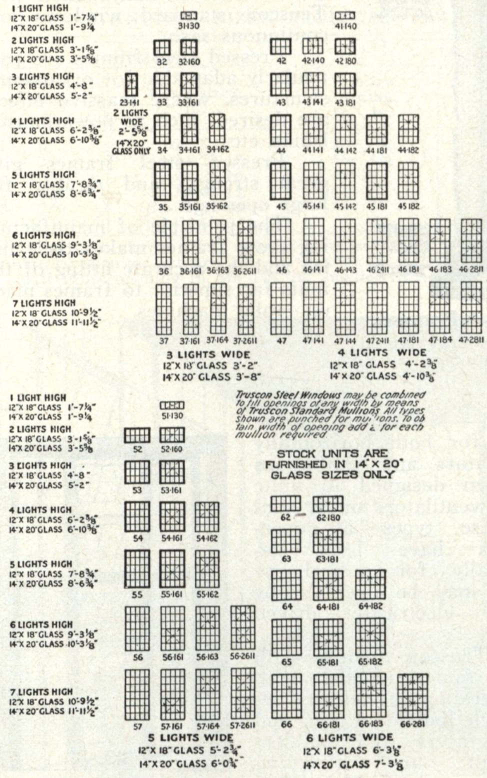
Truscon Engineers, expert in daylighting and ventilating, are located in above cities to assist in securing the best and most economical design for your needs. Complete information and literature sent on request.



Sapolin Works, Gerstendorfer Bros., Brooklyn, N. Y.
Russell G. Cory, Architect — John W. Ferguson Co., Contractor


FIRST NATIONAL BANK

Tenafly National Bank, Tenafly, N. J.
Holmes & Winslow, Architects — R. H. Mackenzie, Contractor


1 LIGHT HIGH
12"X 18" GLASS 1'-7¼"
14"X 20" GLASS 1'-9¼
2 LIGHTS HIGH
12"X 18" GLASS 3'-1⅝"
14"X 20" GLASS 3'-5⅝
3 LIGHTS HIGH
12"X 18" GLASS 4'-8"
14"X 20" GLASS 5'-2"
4 LIGHTS HIGH
12"X 18" GLASS 6'-2⅜"
14"X 20" GLASS 6'-10⅜"
5 LIGHTS HIGH
12"X 18" GLASS 7'-8¾"
14"X 20" GLASS 8'-6¾"
6 LIGHTS HIGH
12"X 18" GLASS 9'-3⅛"
14"X 20" GLASS 10'-3⅛"
7 LIGHTS HIGH
12"X 18" GLASS 10'-9½"
14"X 20" GLASS 11'-11½"
31130
41140
32
32160
42
42140
42180
23141
33
33161
43
43141
43181
2 LIGHTS WIDE
2'-5⅝"
14"X20" GLASS ONLY
34
34161
34162
44
44141
44142
44181
44182
35
35161
35162
45
45141
45142
45181
45182
36
36161
36163
362611
46
46141
46143
462411
46181
46183
462811
37
37161
37164
372611
47
47141
47144
472411
47181
47184
472811
3 LIGHTS WIDE
12"X 18" GLASS 3'-2"
14"X 20" GLASS 3'-8"
4 LIGHTS WIDE
12"X 18" GLASS 4'-2⅜"
14"X 20" GLASS 4'-10⅜"
51130
52
52160
53
53161
54
54161
54162
55
55161
55162
56
56161
56163
562611
57
57161
57164
572611
62
62180
63
63181
64
64181
64182
65
65181
65182
66
66181
66183
66281
5 LIGHTS WIDE
12"X 18" GLASS 5'-2¾"
14"X 20" GLASS 6'-0¾"
6 LIGHTS WIDE
12"X 18" GLASS 6'-3⅛"
14"X 20" GLASS 7'-3⅛"

Truscon Steel Windows may be combined to fill openings of any width by means of Truscon Standard Mullions. All types shown are punched for mullions. To obtain width of opening add 2" for each mullion required.

STOCK UNITS ARE FURNISHED IN 14"X 20" GLASS SIZES ONLY

Stock and Standard Type Truscon Steel Windows

WINDOW OPENINGS FOR TRUSCON STEEL WINDOWS

Glass sizes 12" x 18" Height, ft. in.	Glass sizes 14" x 20" Height, ft. in.	Number of lights high
1— 7¼	1— 9¼	1
3— 1⅝	3— 5⅝	2
4— 8	5— 2	3
6— 2⅜	6—10⅜	4
7— 8¾	8— 6¾	5
9— 3⅛	10— 3⅛	6
10— 9½	11—11½	7

Be sure to combine heights for 12"x18" glass with widths for 12"x18" glass and heights for 14"x20" glass with widths for 14"x20" glass.

Figures in bold type are for stock windows.

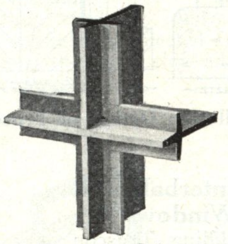
Any width may be had in any of above heights

Width ft. in. (12" x 18")	Width ft. in. (14" x 20")	Number of lights wide	Number of sash units	Number of mullions required
	2— 5⅝	2	1	None
3— 2	3— 8	3	1	None
4— 2⅜	4—10⅜	4	1	None
5— 2¾	6— 0¾	5	1	None
6— 3⅛	7— 3⅛	6	1	None
6— 6	7— 6	6	2	1
8— 6¾	9—10¾	8	2	1
9—10	11— 4	9	3	2
10— 7½	12— 3½	10	2	1
10—10⅜	12— 6⅜	10	3	2
11—10¾	13— 8¾	11	3	2
12— 8¼	14— 8¼	12	2	1
12—11⅛	14—11⅛	12	3	2
13— 2	15— 2	12	4	3
13—11½	16— 1½	13	3	2
13—11½	16— 1½	13	3	2
14—11⅞	17— 3⅞	14	3	2
15— 2¾	17— 6¾	14	4	3
16— 0¼	18— 6¼	15	3	2
16— 6	19— 0	15	5	4
17— 0⅝	19— 8⅝	16	3	2
17— 3½	19—11½	16	4	3
17— 6⅜	20— 2⅜	16	5	4
18— 1	20—11	17	3	2
18— 6¾	21— 4¾	17	5	4
19— 1⅜	22— 1⅜	18	3	2
19— 4¼	22— 4¼	18	4	3
19— 7⅛	22— 7⅛	18	5	4
19—10	22—10	18	6	5
20— 7½	23— 9½	19	5	4
20— 7½	23— 9½	19	5	4
21— 5	24— 9	20	4	3
21— 5	24— 9	20	4	3
21— 7⅞	24—11⅞	20	5	4
21—10¾	25— 2¾	20	6	5

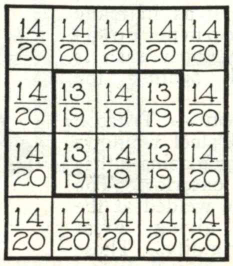
Truscon Stock Standard Windows

Stock windows in 25 types and sizes to meet practically all industrial needs ready for immediate delivery from Truscon warehouses in principal distribution centers. Stock types are in heavy lines in diagrams and tables. Other types shown are standard units for which parts are stocked in Youngstown for immediate assembly.

The Truscon Joint—The intersection of the horizontal and vertical muntins is formed by a special dovetailed mitered interlocking of the bars so that they run continuously from the head to sill and from jamb to jamb. Joint has extreme rigidity and no unsightly projections. This feature is important in securing maximum strength in the window's construction



Truscon Joint



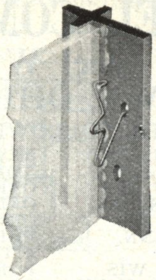
Sizes of Lights

Continued on next page

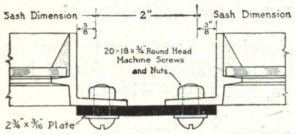
and at the same time secures a smooth, finished appearance that adds to the window's attractiveness.

Glass Sizes—Designated glass sizes occur only in stationary portion of windows. All lights at top and bottom of ventilators must be 1 in. shorter and all lights at sides of ventilators must be 1 in. narrower than in stationary portion of the windows.

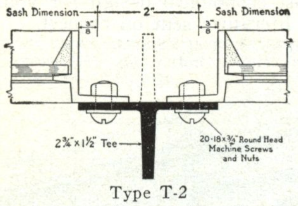
Glazing—Truscon standard windows are glazed from the inside, each light being held in place by means of spring glazing clips. Putty is applied in the usual way. Be sure to use steel sash putty, as ordinary putty will not harden satisfactorily on steel.



Glazing Clip


Sash Dimension
2"
Sash Dimension
3/8
3"/8
20-18 x ¾" Round Head Machine Screws and Nuts
2¾" x 3/16" Plate

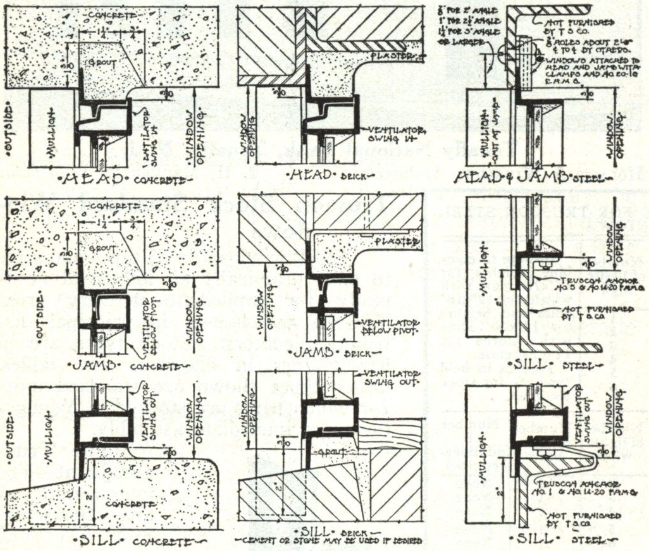
Mullion Type T-1
Used with windows not over 3 lights high


Sash Dimension
2"
Sash Dimension
3"/8
3"/8
2¾" x 1½" Tee
20-18 x ¾" Round Head Machine Screws and Nuts

Type T-2
Used with windows 3 to 7 lights high

Details Truscon Standard Mullions

Multiple Units—By the use of Truscon mullions any width of opening that is desired can be easily obtained. Although the size and arrangement of the glass lights may be readily varied to meet the particular architectural treatment and design architects and engineers are urged to adhere to standard glass sizes, i. e., 12x18 in. or 14x20 in. This reduces the cost and assures the most rapid shipment of orders.

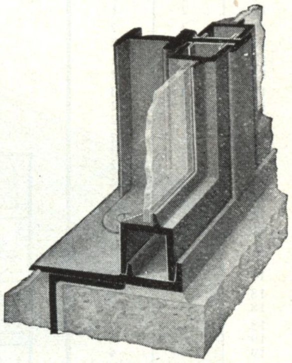

CONCRETE
GROUT
OUTSIDE
MULLION
VENTILATOR SWING UP
WINDOW OPENING
HEAD CONCRETE
PLASTER
VENTILATOR SWING UP
HEAD BRICK
⅝" FOR 2" ANGLE
1" FOR 2½" ANGLE
1¼" FOR 3" ANGLE OR LARGER
NOT FURNISHED BY T. S. CO.
⅜" HOLES ABOUT 2'-0" C TO C BY OTHERS.
WINDOWS ATTACHED TO HEAD AND JAMB WITH CLAMPS AND NO. 20-18 F.A.M.S.
MULLION OMIT AT JAMB
HEAD & JAMB STEEL
VENTILATOR BELOW PIVOT
JAMB CONCRETE
JAMB BRICK
TRUSCON ANCHOR NO. 5 & NO. 14-20 F.A.M.S.
NOT FURNISHED BY T. S. CO.
SILL STEEL
VENTILATOR SWING OUT
SILL CONCRETE
SILL BRICK
CEMENT OR STONE MAY BE USED IF DESIRED
TRUSCON ANCHOR NO. 1 & NO. 14-20 F.A.M.S.
NOT FURNISHED BY T. S. CO.
SILL STEEL

Typical Installation Details of Truscon Standard Windows

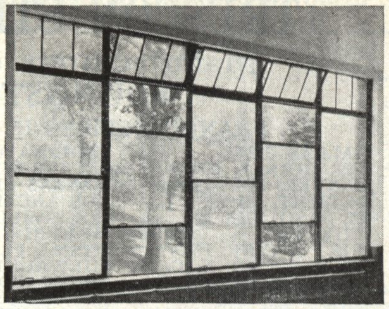
Truscon Counterbalanced Steel Windows

Vertically sliding, Truscon counterbalanced windows are used in schools, offices, stores, hospitals, as well as in many industrial and commercial buildings. The upper sash is counterbalanced against the lower.

Construction — Truscon counterbalanced steel windows are furnished for glazing either on interior or exterior. The sliding units are welded at the corners thus giving great strength and rigidity. These units slide in heavy rolled steel jamb sections, accurately aligned. Double contact weathering shuts out storms and rain. Where ordered, additional two-point contact, spring-copper weathering is furnished as an extra.



Type G
Typical Sill Section at Mullion



Truscon Counterbalanced Window with Hopper Ventilator at Top

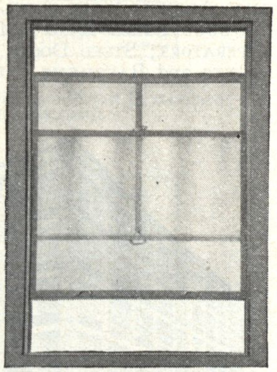
Types — Truscon counterbalanced windows are furnished with single light sash as illustrated, or with sash divided in a number of lights to meet individual requirements.

Sizes and arrangements of lights can be varied as desired.

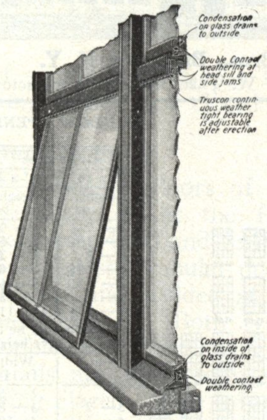
Furnished to be glazed on the interior or exterior. All corners of the sliding units are welded, giving greater strength and rigidity.

Double Hung Windows

In Truscon double hung steel windows, each sliding sash is counterweighted and operates independently. They are furnished with pressed steel frames and are used in buildings of high class construction. Lights may be of any size and arrangement to meet architectural needs. A heavy lock is provided at the meeting rail of all types of Truscon double hung windows and two lift handles are securely bolted to the sill of the lower sliding unit. This hardware may be obtained with malleable iron, sherardized steel or brass, as specified.



Truscon Double Hung Window


Condensation on glass drains to outside
Double Contact weathering at head sill and side jams
Truscon continuous weather tight bearing is adjustable after erection
Condensation on inside of glass drains to outside
Double contact weathering

Pressed Steel Frames
Sectional view through typical panel with continuous sash

Pressed Steel Frames

Unusual refinement in architectural design of windows is afforded by use of pressed steel frames in conjunction with Truscon standard windows and continuous sash.

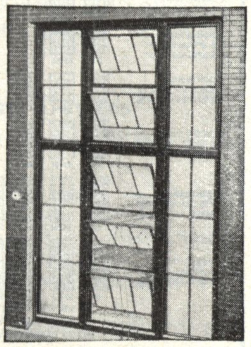
Pressed steel frames are particularly adaptable for ornamental structures, where massive effects are desired, such as powerhouses, banks, etc.

Pressed steel frames give great strength and rigidity for large openings.

The principle of manufacturing these frames makes their finish and the accurate fitting of the units far superior to frames made on brake machines.

Operation — Mechanical operating devices for both horizontally pivoted ventilators and continuous sash have been designed to unite large bays of ventilators under unit control. These types of operating devices have been designed especially for powerhouse windows and may be operated by hand or by electrically driven motors.

Service—Truscon windows with pressed steel frames, together with mechanical operating devices, are designed for each individual job, and architects, engineers and builders should consult our engineering service before completing their construction plans.



Typical Bay

Continued on next page

Truscon Projected Steel Windows

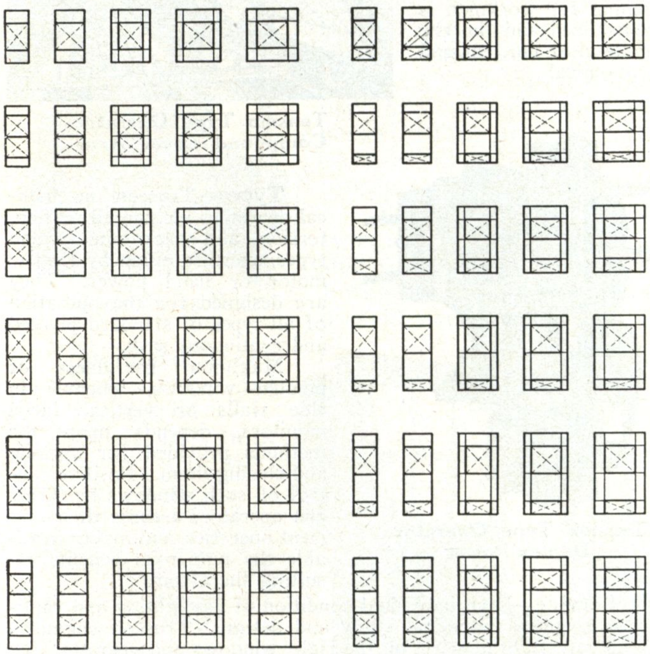
There are a large variety of types and sizes that will fill practically every requirement of architectural or industrial buildings.

Standard Architectural Types—Truscon projected windows are particularly suitable for schools, hospitals, offices and apartments.

The ventilators operate entirely outside of the window frame on sliding tension pivots, which hold them in any desired position. An exception to this is the hopper ventilator at the bottom, which swings inward.

The architectural type of projected window is the most refined design and is fully equipped with brass hardware. All joints are electrically welded and ground smooth, and the sash are glazed with steel glazing angles of pleasing design.

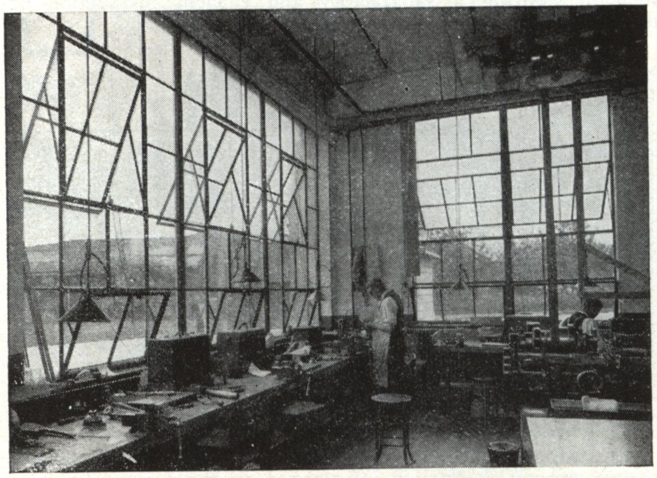
The outside frame is a heavy solid rolled steel channel section.



STANDARD SIZES PROJECTED WINDOWS

Heights		Widths	
Window opening, ft. in.	Glass sizes, in.	Window opening, ft. in.	Glass sizes, in.
5— 6	16-32-16	2— 5¼	28
6— 2⅜	12-24-24-12	3— 1¼	36
6—10⅜	16-24-24-16	3—10	8-28-8
7— 6⅜	12-32-32-12	4— 6	8-36-8
8— 2⅜	16-32-32-16	5— 2	12-36-12
8—10¾	16-24-24-24-16		

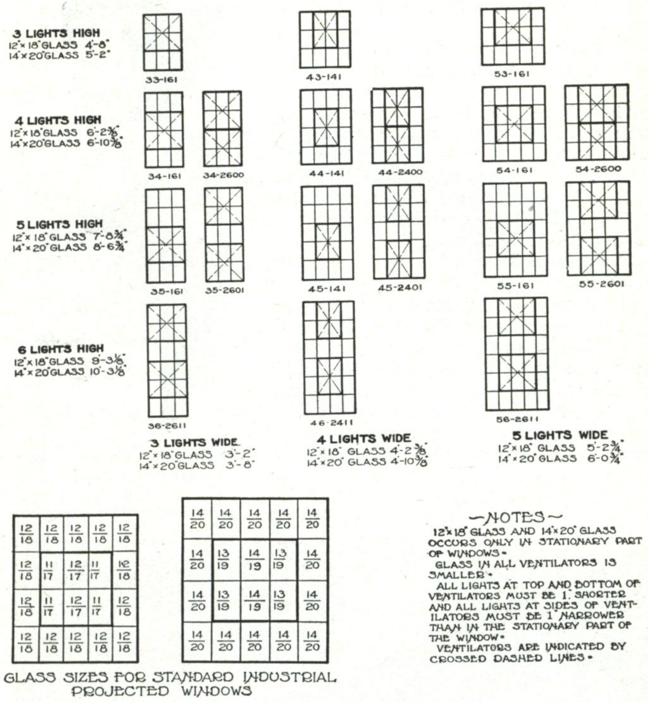
Glass sizes shown occur only in stationary part of windows. Glass in ventilators opening out are 1¾ in. smaller in widths and heights. Glass in small vents opening in are 1¾ in. smaller in heights and widths.



Truscon Projected Steel Windows—Industrial Type

Standard Industrial Types—The industrial type of projected window is constructed of rolled steel sections with angle frame and malleable hardware.

The sash are glazed with putty or may be furnished with underwriters' glazing angles.


3 LIGHTS HIGH
12"×18" GLASS 4'-8"
14"×20" GLASS 5'-2"
4 LIGHTS HIGH
12"×18" GLASS 6'-2⅜"
14"×20" GLASS 6'-10⅜"
5 LIGHTS HIGH
12"×18" GLASS 7'-8¾"
14"×20" GLASS 8'-6¾"
6 LIGHTS HIGH
12"×18" GLASS 9'-3⅛"
14"×20" GLASS 10'-3⅛"
33-161
43-141
53-161
34-161
34-2600
44-141
44-2400
54-161
54-2600
35-161
35-2601
45-141
45-2401
55-161
55-2601
36-2611
46-2411
56-2611
3 LIGHTS WIDE
12"×18" GLASS 3'-2"
14"×20" GLASS 3'-8"
4 LIGHTS WIDE
12"×18" GLASS 4'-2⅜"
14"×20" GLASS 4'-10⅜"
5 LIGHTS WIDE
12"×18" GLASS 5'-2¾"
14"×20" GLASS 6'-0¾"
12/18 12/18 12/18 12/18 12/18
12/18 11/17 12/17 11/17 12/18
12/18 11/17 12/17 11/17 12/18
12/18 12/18 12/18 12/18 12/18
14/20 14/20 14/20 14/20 14/20
14/20 13/19 14/19 13/19 14/20
14/20 13/19 14/19 13/19 14/20
14/20 14/20 14/20 14/20 14/20
GLASS SIZES FOR STANDARD INDUSTRIAL PROJECTED WINDOWS
—NOTES—
12"×18" GLASS AND 14"×20" GLASS OCCURS ONLY IN STATIONARY PART OF WINDOWS.
GLASS IN ALL VENTILATORS IS SMALLER.
ALL LIGHTS AT TOP AND BOTTOM OF VENTILATORS MUST BE 1" SHORTER AND ALL LIGHTS AT SIDES OF VENTILATORS MUST BE 1" NARROWER THAN IN THE STATIONARY PART OF THE WINDOW.
VENTILATORS ARE INDICATED BY CROSSED DASHED LINES.

Standard Industrial Types—Projected Windows

Donovan Awning Type Windows

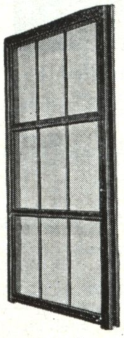
The Donovan awning type window has been particularly developed for use in schools, but is also suitable for hospitals, offices, public buildings, etc. Made of copper steel, this fireproof window protects the children from the menace of fire, and its permanence prevents deterioration and repairs.

The sashes when open are entirely outside; each sash is self-balanced in any position. Merely moving the bottom sash opens or closes the upper sashes.

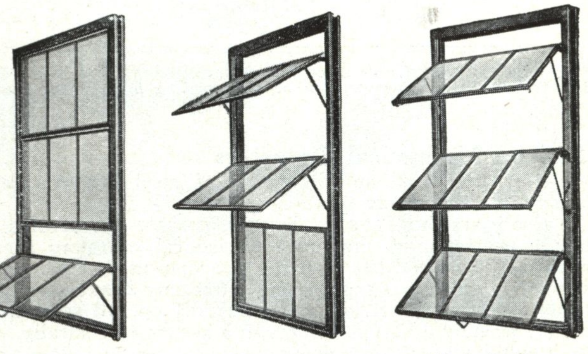
All sash may be fully or partly open, permitting fresh air in any amount. The bottom sash may be closed and the upper sash open, or vice-versa. The awning shape stops rain and wind while admitting air.

The full window opening is available for daylight and ventilation.

By attaching shades to each sash and opening the window, daylight is reflected from the window to the ceiling of the room, thus admitting daylight as well as fresh air.



Window Closed



Lower Sash Open

Two Upper Sash Open

All Sash Open

Donovan Awning Type Windows

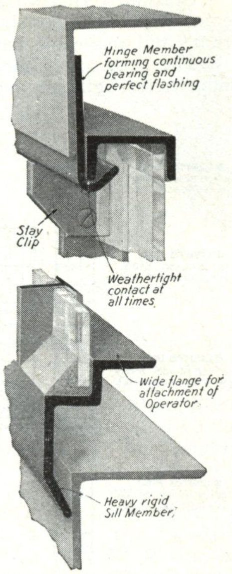
Continued on next page

Truscon Continuous Steel Sash

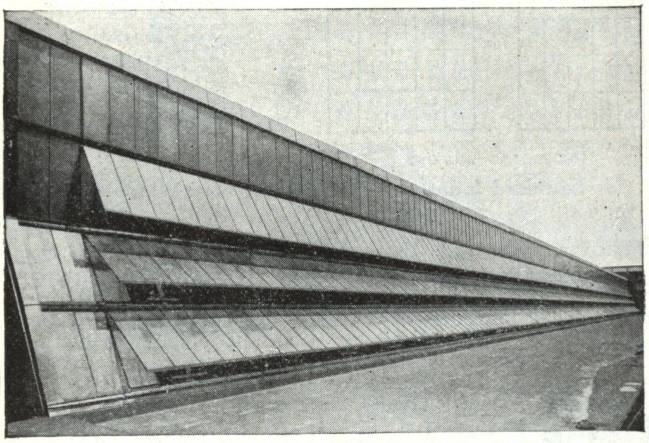
Truscon continuous sash are used in monitors, sawtooths and sidewalls to afford maximum daylighting and ventilation. Runs of great length are readily opened and closed by the Truscon mechanical operators.

Types—Truscon continuous sash is used with equal efficiency in a vertical or sloping plane. Types furnished are top hung, bottom hung, center pivoted and fixed light, or any combination of them. Selection of the right type of sash depends upon individual conditions. Truscon engineers will gladly co-operate fully in solving your problems.

Construction—All members are solid rolled copper-bearing steel sections assembled by means of mortise and tenon joints, which are welded and riveted. An improved method of support, consisting of continuous bearing, eliminates hinges, evenly distributes the weight throughout its length and provides an absolute weathertight contact, with no openings for rain or snow to enter.


Hinge Member forming continuous bearing and perfect flashing
Stay Clip
Weathertight contact at all times
Wide flange for attachment of Operator
Heavy rigid Sill Member

Sectional Views Continuous Sash



800-ft. Runs of Truscon Continuous Sash Controlled by Truscon Mechanical Operators at the Studebaker Foundry, South Bend, Ind.

Four rows (three shown open) can be operated simultaneously or independently

STANDARD SIZES CONTINUOUS STEEL SASH

Height of sash, ft.	Height of opening, ft. in.	Glass sizes		
		Standard panel, in.	Fixed panel, in.	Storm panel, in.
3	2—10½	23⅜x32¾	22⅜x32¾	24x32¾
4	3—10½	23⅜x44¾	22⅜x44¾	24x44¾
5	4—10½	23⅜x56¾	22⅜x56¾	24x56¾
6	5—10½	23⅜x68¾	22⅜x68¾	24x68¾

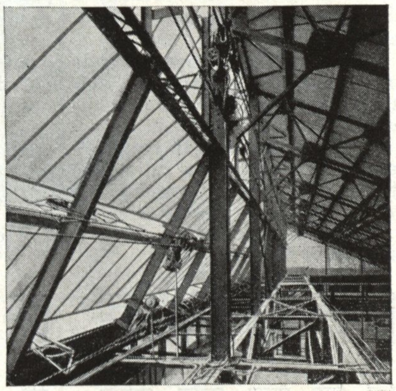
Units are generally designed for a truss spacing of 20 ft. on centers. The various units, however, can be combined to fit any length of run.

Truscon Mechanical Operators

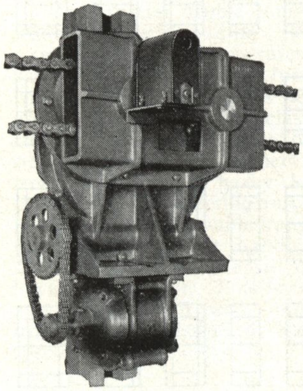
The success of an installation of steel windows depends largely on their proper operation.

For years the Truscon Steel Company has devoted itself to the perfection of improved mechanical operators for steel windows. So rapid has been the development that where but a short time ago it was possible to control only 200 ft. of windows, today 800-ft. runs of sash are electrically opened and closed by merely pushing a button. Through a system of centrally located push button stations, it is now possible to open and close a whole series of runs (200,000 sq. ft. of sash) by merely pushing a lever, or to control one run of sash from several distant points. In fact, the only limit upon the amount of windows electrically controlled from a single master station is the amount of sash in the entire plant.

This same principle of operation has revolutionized the use of what is commonly known as continuous sash, used in sawtooth, monitor, valley-roof and "A" frame construction, and likewise placed them under control from central stations. By the adoption of motorized control of sash, with centrally located stations, it is possible to place all ventilation in the hands of certain individuals. Thus the responsibility for the proper air conditioning for workmen is centralized and thereby made more efficient and economical.



Tension Type Operator Compound Lever Arm



Tension Type Operator Duplex Power

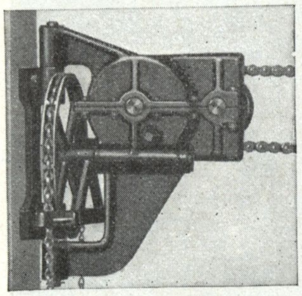
Types—Truscon mechanical operators include all tension, torsion and rack and pinion types, operated either by electric motor or hand power. They are designed for the operation of all types of standard pivoted and continuous sash.

Maximum usefulness of pivoted windows, whether in side walls or vertical faced monitors, depends upon the methods provided for opening and closing them. Positive control of such windows by Truscon operators assures their efficient operation and makes available the numerous benefits resulting therefrom.

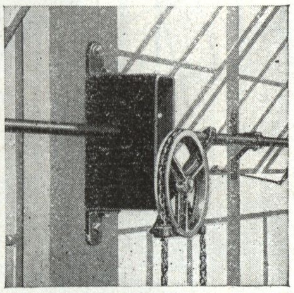
Service—Each individual condition of daylighting and ventilation requires individual study and design. Truscon engineers co-operate fully in selecting the right windows and operators for the requirements. Their wide experience is placed at your disposal free of obligation.

With branch offices located in all parts of the country where expert information is promptly available, the Truscon organization stands ready to offer suggestions to you wherever you may be located. These will be invaluable in making your installations of mechanically operated steel windows fit the conditions of building.

Installation—To insure absolutely perfect operation of the steel windows, Truscon National Erection Service will make the installation of operators as well as the windows. Truscon's skilled engineers meet the special natural ventilation problem where it arises and solve it with a special installation. The proper selection of the operating mechanism is an important item in securing a satisfactory and efficient installation of mechanically operated steel windows.



Tension Type Operator Hand Power



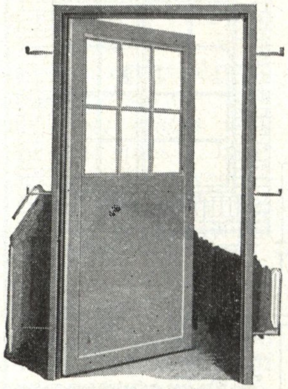
Torsion Type Operator Hand Power

Catalogue—Truscon mechanical operator catalogue contains a vast amount of detailed information on the various types of Truscon mechanical operators; sent free to architects.

Continued on next page

Truscon Steel Doors and Frames

Truscon steel doors and frames furnish fire protection and withstand hard usage. Truscon steel doors are made of carefully formed steel sections, reinforced at the corners and the joints electrically welded. Easy to open and close and always fit snugly in the door frame because they will not warp, swell or get out of alignment. Door rails of 1⅝x3¾-in. heavy gauge copper-bearing steel made by special dies on huge presses mean strength and accuracy.

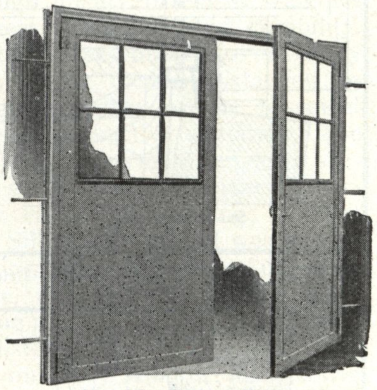


Single Swing Door

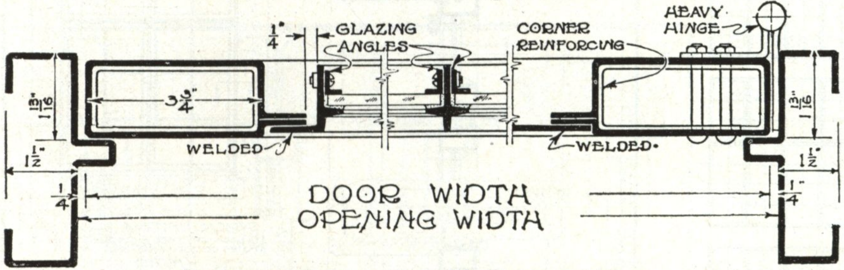
Truscon steel doors and frames are carried in stock for immediate delivery. They are specially recommended for factories, warehouses, filling stations, service entrances, and all other conditions where fire protection and durability under hard usage are both needed. They are low in cost because of standardization. Sturdy, durable and well made.

Types—Doors may be swinging or sliding, double or single, solid or with glass. Furnished with or without pressed steel frame.

Standard Sizes—*Single Leaf*—3x7 ft.; 3 ft. 2⅜ in. x 7 ft. 9 in.; 3 ft. 10¾ in. x 7 ft. 9 in.; 4 ft. 10¾ in. x 9 ft. 9 in. *Double Leaf*—6 ft. ⅜ in. x 7 ft.; 6 ft. 5⅛ in. x 7 ft. 9 in.; 7 ft. 9⅞ in. x 7 ft. 9 in.; 9 ft. 9⅞ in. x 9 ft. 9 in.



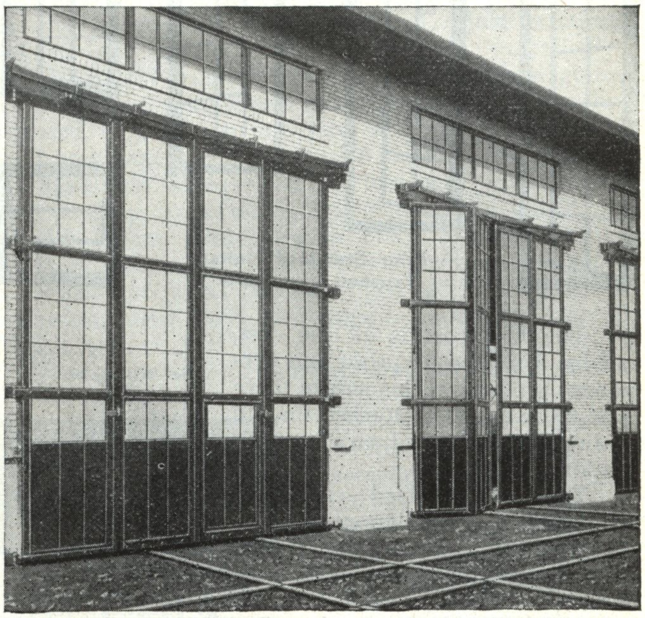
Double Swing Door


1/4"
GLAZING ANGLES
CORNER REINFORCING
HEAVY HINGE
3 3/4"
1 13/16"
WELDED
WELDED
1 13/16"
1 1/2"
1 1/2"
1/4
1/4"
DOOR WIDTH
OPENING WIDTH

Horizontal Section Through Door and Frame

Truscon Steel Railroad Doors and Frames

These doors are of the heavy tubular rail type and are furnished in sizes to admit the largest type of car or locomotive. They stay where placed and are not affected by the wind. They will not sag, warp or stick, and are neat in appearance and economical in first cost. On account of their rigid construction, the maintenance cost is almost negligible. They are exceptionally rigid, long-lived and fireproof.

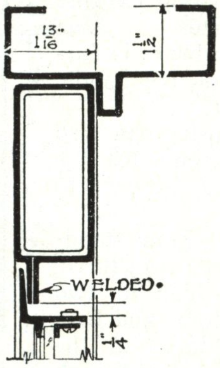


Truscon Steel Railroad Doors for Gulf & Ship Island Railroad Shops, Gulfport, Miss.

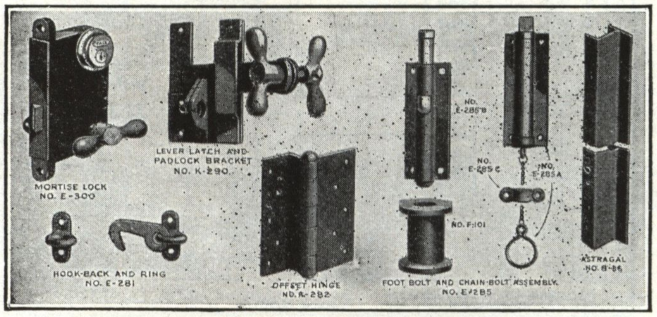
Furnished solid or with steel sash for glazing. Made to fit any opening.

Types—Doors may be sliding, swinging or double folding, as illustrated. Specially made substantial hardware is furnished for all doors.

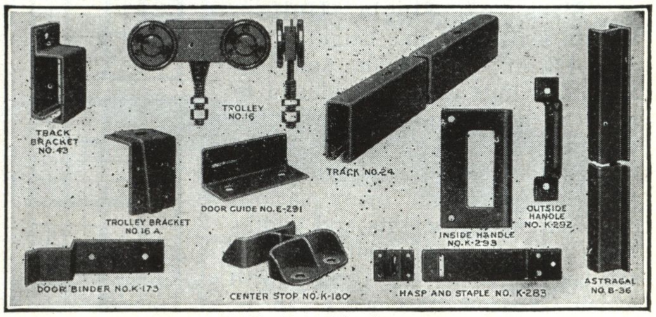
Service—Truscon's engineers will be glad to furnish detailed suggestions and estimates on railroad doors and frames of special types and sizes to meet particular requirement. There is no door requirement that we cannot meet satisfactorily.


1 13/16
1 1/2"
WELDED
1/4"

Section Through Top Rail and Frame


MORTISE LOCK NO. E-300
LEVER LATCH AND PADLOCK BRACKET NO. K-290.
NO. E-285 B
NO. E-285 C
NO. E-285 A
NO. F-101
HOOK-BACK AND RING NO. E-281
OFFSET HINGE NO. K-282
FOOT BOLT AND CHAIN-BOLT ASSEMBLY. NO. E-285
ASTRAGAL NO. B-86

Swing Door Hardware


TRACK BRACKET NO. 43
TROLLEY NO. 16
TRACK NO. 24
TROLLEY BRACKET NO. 16 A.
DOOR GUIDE NO. E-291
OUTSIDE HANDLE NO. K-292
INSIDE HANDLE NO. K-293
DOOR BINDER NO. K-173
CENTER STOP NO. K-180
HASP AND STAPLE NO. K-283
ASTRAGAL NO. B-36

Slide Door Hardware

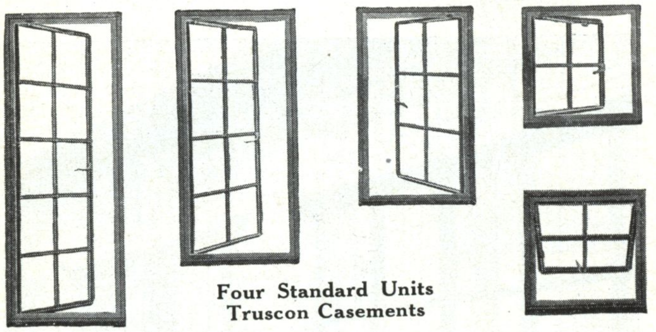
Hardware for Standard Industrial Steel Doors

All doors are equipped with suitable hardware as illustrated. Furnished without hardware if desired

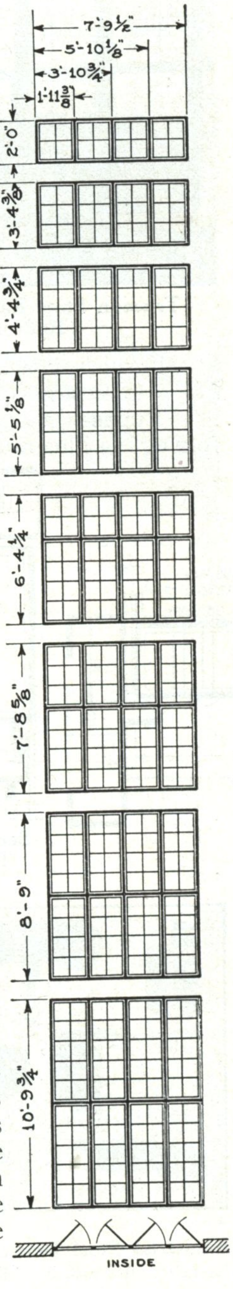
Continued on next page

Truscon Copper Steel Standard Casements

Exceptional manufacturing facilities and large scale production insure quality products at an economical price. Truscon standard casements are attractive in appearance and add charm to the home. They harmonize with any type of architectural treatment. They put the finishing touch to the interior; are readily draped and screened.



Four Standard Units Truscon Casements


7'-9½"
5'-10⅛"
3'-10¾"
1'-11⅜"
2'-0"
3'-4⅜"
4'-4¾"
5'-5⅛"
6'-4¼"
7'-8⅝"
8'-9"
10'-9¾"
INSIDE

The first cost is all the cost, and for a refined fireproof and permanent product of this nature there is no more expense attached than to an investment in ordinary wooden windows.

Truscon standard casements give twice the ventilation of ordinary sliding windows, are always easily opened and closed, never stick or warp. Double contact weathering effectively shuts out rain, snow and wind.

Truscon casements are fireproof, long-lived, simple to install and easy to screen. Truscon standard casements are furnished complete in frame eliminating expense of fitting sash to frame.

All necessary hardware is furnished, including attractive handle and casement adjuster.

A casement adjuster can also be supplied which eliminates the necessity of opening screen to operate sash.

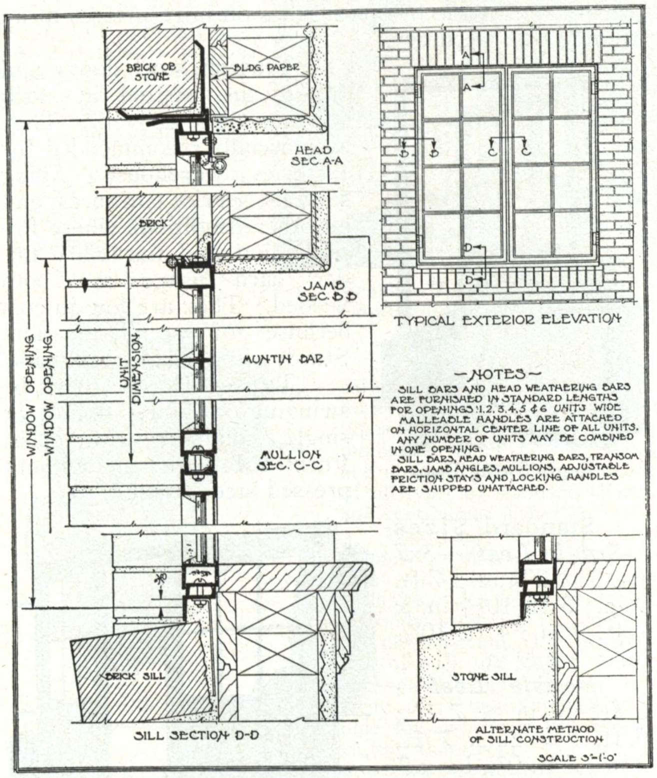
Standard Sizes—Four standard units are furnished: two, three, four and five lights high of two lights wide. Three, four, and five-light windows are hinged at the side to open out; two-light high swings at either side or top, opening out.

Sizes of Single Units—Width, 1 ft. 11⅜ in.; height, 2 ft., 3 ft. 4⅜ in., 4 ft. 4¾ in. and 5 ft. 5⅛ in. Units can be combined in width or height in any way desired to fit larger sized opening.

Note—The accompanying diagram illustrates the many various combinations in heights and widths from one to four units. These are suggestive of the facility with which Truscon Casements can be adapted to the filling of any size opening.

Installation—Truscon standard casements are easily installed in any type of wall construction—brick, masonry, veneer, stucco, concrete block or frame.

Service—Catalogues and large scale details of Truscon casements furnished free. Offices located in principal cities will furnish personal service. Truscon casements are carried in stock in Truscon warehouses in principal centers as well as by dealers everywhere.


BRICK OR STONE
BLDG. PAPER
HEAD SEC. A-A
BRICK
JAMB SEC. B-B
MUNTIN BAR
MULLION SEC. C-C
WINDOW OPENING
WINDOW OPENING
UNIT DIMENSION
BRICK SILL
SILL SECTION D-D
TYPICAL EXTERIOR ELEVATION
STONE SILL
ALTERNATE METHOD OF SILL CONSTRUCTION
SCALE 3"=1'-0"

—NOTES—

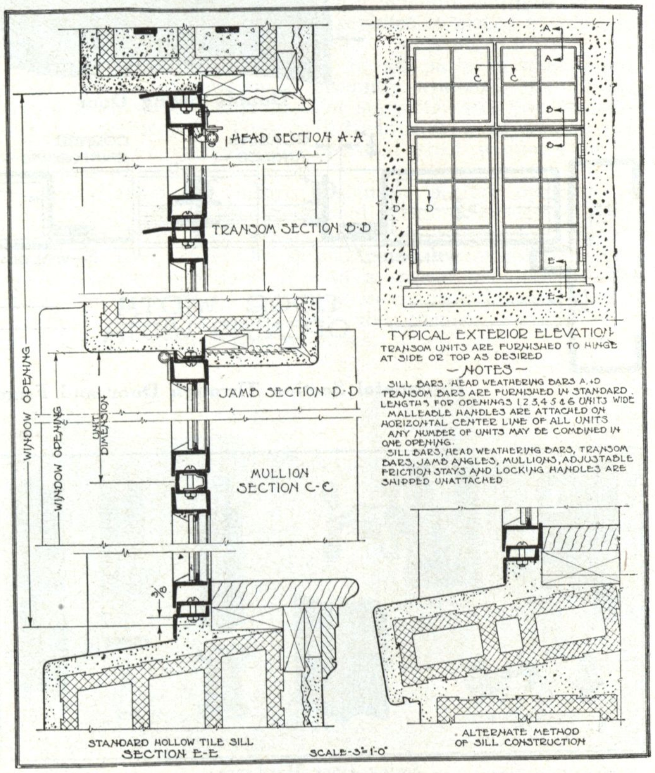
SILL BARS AND HEAD WEATHERING BARS ARE FURNISHED IN STANDARD LENGTHS FOR OPENINGS 1, 2, 3, 4, 5 & 6 UNITS WIDE

MALLEABLE HANDLES ARE ATTACHED ON HORIZONTAL CENTER LINE OF ALL UNITS.

ANY NUMBER OF UNITS MAY BE COMBINED IN ONE OPENING.

SILL BARS, HEAD WEATHERING BARS, TRANSOM BARS, JAMB ANGLES, MULLIONS, ADJUSTABLE FRICTION STAYS AND LOCKING HANDLES ARE SHIPPED UNATTACHED.

Typical Details—Brick Veneer


HEAD SECTION A-A
TRANSOM SECTION B-B
JAMB SECTION D-D
MULLION SECTION C-C
WINDOW OPENING
WINDOW OPENING
UNIT DIMENSION
TYPICAL EXTERIOR ELEVATION
STANDARD HOLLOW TILE SILL SECTION E-E
ALTERNATE METHOD OF SILL CONSTRUCTION
SCALE 3"=1'-0"

TRANSOM UNITS ARE FURNISHED TO HINGE AT SIDE OR TOP AS DESIRED

—NOTES—

SILL BARS, HEAD WEATHERING BARS A, +D TRANSOM BARS ARE FURNISHED IN STANDARD LENGTHS FOR OPENINGS 1 2 3, 4 5 & 6 UNITS WIDE

MALLEABLE HANDLES ARE ATTACHED ON HORIZONTAL CENTER LINE OF ALL UNITS

ANY NUMBER OF UNITS MAY BE COMBINED IN ONE OPENING.

SILL BARS, HEAD WEATHERING BARS, TRANSOM BARS, JAMB ANGLES, MULLIONS, ADJUSTABLE FRICTION STAYS AND LOCKING HANDLES ARE SHIPPED UNATTACHED

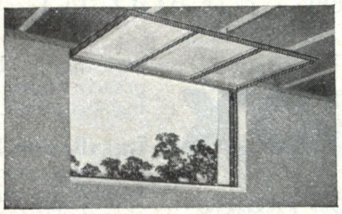
Typical Details—Stucco on Hollow Tile

Construction Details Truscon Steel Casements

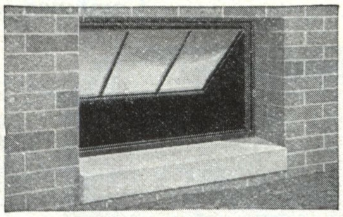
Continued on next page

Truscon Copper Steel Basement Windows

Truscon basement windows are made from solid rolled steel sections and are completely equipped ready to install, with sash accurately fitted to frame and lock and hinges attached. They give double the daylight of wood windows, are indestructible, fireproof and will not swell, warp or stick. Double contact weathering effectively shuts out rain, snow and wind. They are equipped with automatic spring lock and heavy hinges with removable pins. Their cost is as little as wood—in fact, is actually less when based on daylight area.



In Concrete Foundation



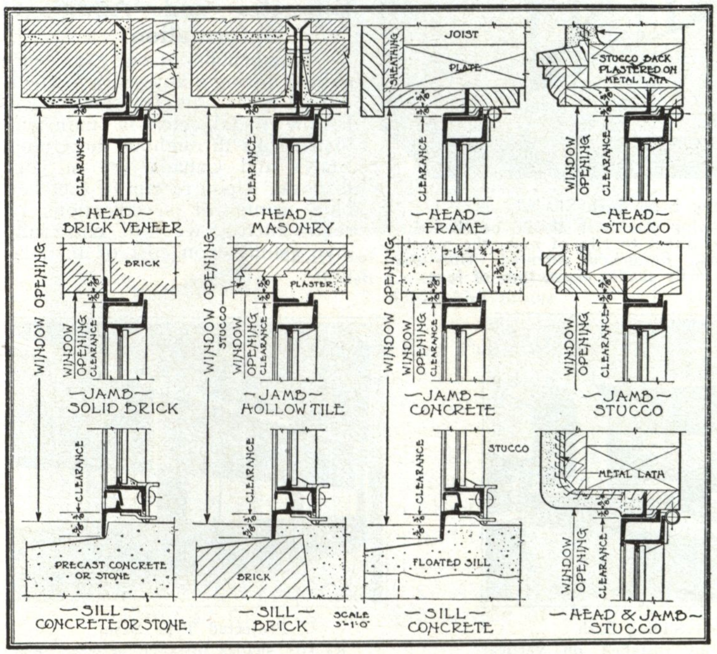
In Brick Foundation

Truscon Copper Steel Basement Windows

Truscon basement windows are an item of permanent construction now within the reach of any home builder. Truscon standardization and quantity production result in lowered costs. These high quality basement windows please people by their neat appearance and durability.

Standardization in three sizes makes for economy and facilitates delivery. They mean satisfaction to clients through doubling the utility of the basement with economical, durable and attractive windows. The main points regarding Truscon basement windows are: (1) Head, double contact weathering; continuous anchorage. (2) Jamb, double contact weathering; positive guide for masonry. (3) Sill, double contact weathering. (4) Glazing, positive spring clip for glass (use steel sash putty). (5) Hinge, welded to frame and sash; has removable $\frac{5}{16}$-in. spring pin. (6) Corner, continuous outside frame; will not distort.

Truscon is stamped on every window for positive identification.



Typical Installation Details of Truscon Copper Steel Basement Windows

Truscon basement windows are handled by dealers everywhere and are also stocked in Truscon warehouses in principal cities.

Installation—Truscon basement windows may be installed in any type of foundation, brick, stone or concrete; ⅝-in. anchorage into the construction insures absolute weathertightness on all sides.

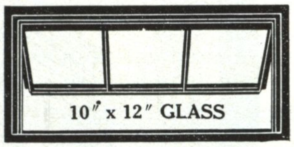
Screening—It is easy to screen Truscon basement windows. Two screws at each jamb hold the screen flush against the sash frame so there are no crevices for insects to enter. Can not distort. Just as strong and sturdy at corners as elsewhere.

Glazing—Truscon basement windows are glazed like most wood sash, except that steel spring glazing clips are used. Be sure to use steel sash putty. Ordinary wood sash putty will not harden on steel.

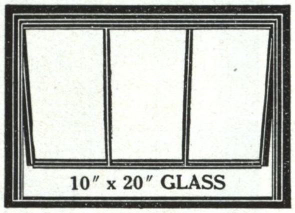
Standard Sizes—Truscon basement windows are made in three sizes and stocked generally in 10x12 and 10x20-in. glass sizes; also in many localities in the 14x20-in. glass size. Dimensions shown are measured to the same points as "window opening" in details. All dimensions allow ⅝-in. anchorage in construction on all sides.

Jamb allows ¼-in. clearance and assures easy opening and closing of window.

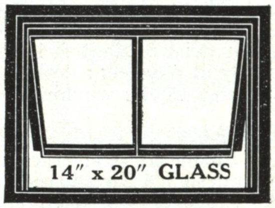
The sizes offered meet every basement window requirement. The two-light, 14x20 in. glass window is particularly designed for use with the popular cement block foundation wall.



Width, 2 ft. 9¾ in. Height, 1 ft. 3 in.



Width, 2 ft. 9¾ in. Height, 1 ft. 11 in.



Width, 2 ft. 7⅜ in. Height, 1 ft. 11 in.

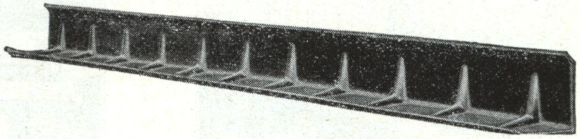
Standard Sizes of Truscon Copper Steel Basement Windows

Truscon Copper Steel Standard Lintels

Truscon standard lintels with cross ribs have great strength, are light in weight, easy to handle and rust resisting. Used over openings of all kinds, including fireplaces, to support brick work.

When used in solid masonry walls, two single lintels are placed together back to back.

Truscon lintels can be placed on the walls at the desired height without interfering with the bonding of the masonry. In veneer or solid walls, with steel doors and windows, in plain openings and flat anchorages or with ordinary wooden windows and doors, Truscon standard lintels take care of every need.



Truscon Standard Steel Lintel

Standard Sizes—Stocked in four standard sizes: 2 ft. 6 in., 3 ft. 6 in., 4 ft. 6 in. and 5 ft. 6 in. These lengths are over all and bearing should be allowed for masonry at each end.

HOUGH SHADE CORPORATION

INDUSTRIAL SHADE DIVISION
Steel Sash Ventilating Window Shades
160 North La Salle Street, CHICAGO, ILL.
FACTORY, JANESVILLE, WIS.

RA·TOX

OFFSET WOOD FABRIC SHADES for STEEL SASH

Product

Ventilating Wood Fabric Shades developed especially for application to all types of sash used in industrial buildings; particularly designed for the factory workroom and office, schools, hospitals, etc.

Shade Fabric

Ra-Tox shades staunchly constructed of beautifully and permanently stained wood strips, woven parallel with hard twist seine twine. Weatherproof, sunfast oil stains are employed. Constructed of stained wood strips, Ra-Tox shades function as non-conductors of heat (a very important feature, especially in plants equipped with large areas of steel sash). Filtering the heat and glare from the sun's rays Ra-Tox shades allow fully 30 to 40% more light and air to enter the shaded area than other shades. Their staunch construction insures satisfaction for 20 years or longer.

Fixtures

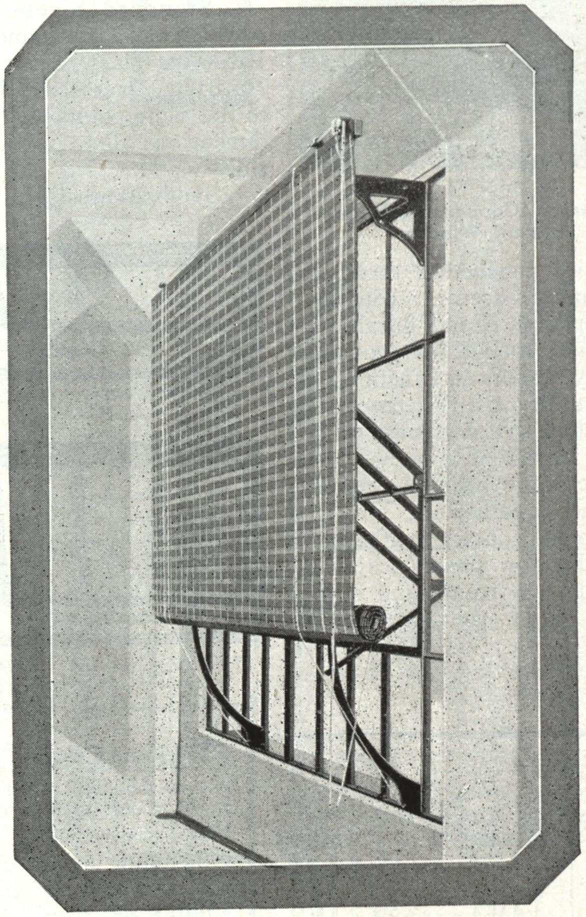
Raised and lowered by means of especially designed and patented fixtures, Ra-Tox shades are easy to operate. A slight twist of the roll-up cord to the right unlocks the cord grip and allows you to raise or lower the shade. A slight twist to the left locks it securely at any point desired within the area of the window opening.

Brackets

Enameled steel brackets have been designed for all types of sash. All brackets are baked enameled in a color that harmonizes with the color of shade fabric selected. The illustration to the right shows method employed when shading center swing type of sash used so extensively in modern factory construction.

Installation

By employing tools especially developed and controlled only by the Hough Shade Corporation, perforations are made directly in the ribs of the sash, making it possible to secure the enameled steel brackets directly to the sash. No drilling or boring of concrete is necessary. This method of installation greatly reduces installation costs when shading steel sash.



Center Swing Steel Sash Shaded

Showing how center swing steel sash should be shaded. *Note:* brackets secured direct to ribs of sash, the metal-to-metal permanent installation. Equipment patented. Only shading equipment that satisfactorily shades above type of sash

Installation Service

Trained crews of installation men are located in all industrial centers. If purchaser desires, we will install at moderate charge.

Combined Features Found Only in Ra-Tox Equipment

The features listed below are the result of concentrated successful effort to definitely solve the shading problems of industrial buildings. The strong installation, the provision for ventilation and light, the ease of operation, and the durable construction, all represent Ra-Tox superiority.

Seven Advantages You Get in Ra-Tox

(1) Offset brackets permit independent freedom of movement for center swing type ventilators—insure perfect ventilation without drafts and wind.

(2) Twenty years and more of shade satisfaction.

(3) Permanent metal-to-metal installation—prevents all loosening due to vibration of walls or ceiling.

(4) 30 to 40% more light and air.

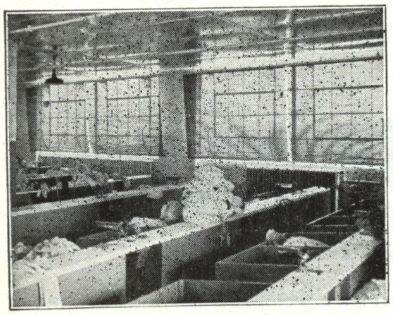
(5) Quick, simple, fool-proof operation.

(6) Made of selected basswood strips, woven parallel with hard twist seine twine; attractive fast colors add smart, business-like appearance.

(7) Reduces room temperature 10 to 20 degrees.

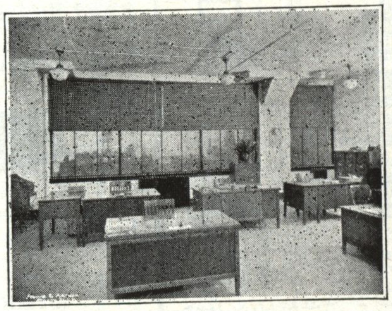
Estimates and Additional Information

The benefits of our experience gained during many years in shading all types of sash—steel, wood, hollow metal, etc.—in industrial institutions throughout the United States and Canada are at your disposal. Upon receipt of sketches, blue prints, or specifications of requirements, we will cheerfully give estimate on cost of installation.



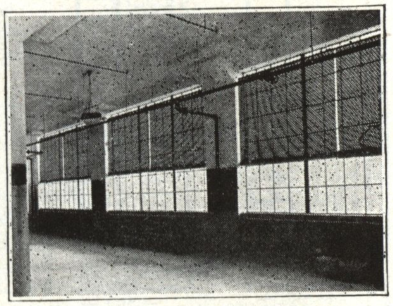
Center Pivoted Sash

Shade extended into room at top and guided around center swing ventilator at base. Shades overlap pilaster to eliminate side angles of light



Vertical Sliding Sash

Ra-Tox shades installed on vertical sliding sash



Projected Type Sash

Ra-Tox shades installed between pilasters close to sash. Offset feature not required here

Illustrating a Few Typical Ra-Tox Shade Installations

THE T. J. CALLAHAN CO.

Manufacturers of Sash Operating Apparatus

941 South Perry Street
DAYTON, OHIO

T.J. CALLAHAN COMPANY
A Callahan Product
TRADE MARK
DAYTON-OHIO

Product

Sash Operating Apparatus, hand and electrically controlled, for steel or wood sash in factories, foundries, machineshops, central stations, powerhouses, theaters, churches, gymnasia, exhibition buildings, etc.

Also special types for greenhouses.

Types

The 300 Series is the lowest priced operator—an open type power particularly adapted to bays or short runs of center pivoted sash. Manual operation.

The 500 Series is similar to but larger than the 300 Series. Its capacity is much greater than the 300 Series, easily handling much longer runs of sash than the usual open type power.

The 700 Series comprises manually operated powers, either chain or shaft drive, for long runs of top hung as well as center pivoted sash. Gears enclosed in case packed with grease.

The 900 Series consists of motorized drives, far superior to anything else on the market where easy and central control of long runs of sash is desired, or for simultaneous ventilation over a large floor area.

Part of Callahan Motor Driven Sash Control Installation at Ohio University

Direct-action Principle

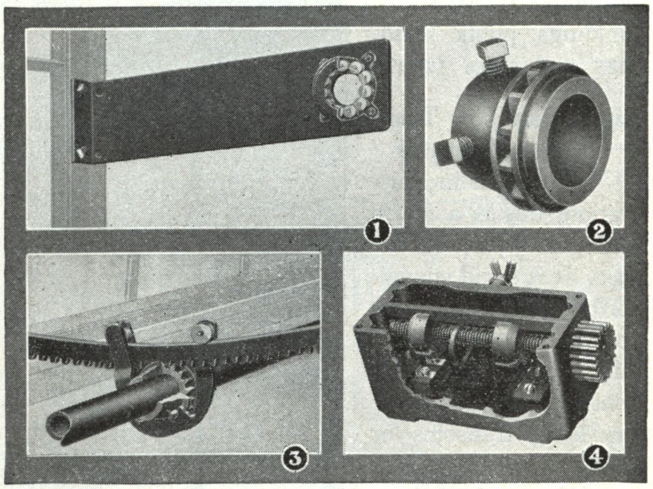
Callahan sash operators employ the direct-action principle; that is: (a) there is no lost motion, (b) the direction of force is always in a vertical plane, so that there is no wrenching and twisting of sash, (c) the distance from the shaft to the pitch line of the sash arm is constant and a minimum, resulting in the least possible torque in the pipe shaft.

As a result of these three basic features, combined with roller bearing construction, die-cut arms and careful workmanship, the shaft rolls so freely in its supports that extraordinarily long and heavy loads are operated with ease.

The line of power transmission is exceptionally direct, passing as it does through a reinforced pinion to the die-cut toothed arm attached to the sash. These arms have the same travel radius over the pinions as has the sash itself. The result is an accurately controlled angle of opening with an entire absence of sash distortion.

These advantages give Callahan sash control apparatus decided superiority in opening long runs of top hung or heavy center pivoted sash, and this in turn reduces the number of operating stations required, centralizing the control and lowering cost of installation.

The 900 Series of motorized powers fulfill completely the demand for a simple, dependable system of ventilation for large areas with a central control. With it, the opening and closing of long runs of sash or sash that are located in difficult and hard-to-reach places, are but a matter of pressing the button at the control panel. The Callahan limit switch gives a positive, automatic control over the open and closed positions of the sash. It is compact, sturdy, easily set and dependable in operation.



Callahan Sash Operating Mechanism

(1) Callahan roller bearing hanger, which so reduces friction that little strength is required to open unusually long runs of sash.
(2) Note the reinforced pinion gear attached to shaft by two heavy setscrews.
(3) Callahan yoke assembly—without an equal for ease of operation.
(4) Callahan limit control switch—compact—positive—practical

Engineering Service

The range of types offered in Callahan operators is such as to meet all demands. These four Bulletins will give you complete information: (1) Sash Control in Power Plants. (2) Sash Control in Industrial Plants. (3) Simplifying Sash Control. (4) Sash Control in Gymnasia and Halls.

Our Engineering Department will gladly co-operate and advise with you or your contractors. Your inquiry is solicited.

HITCHINGS & CO.

Sash Operating Devices for Hinged and Pivoted Sash

ELIZABETH, N. J.

Products

SASH OPERATING DEVICES for operating either hinged or pivoted wood or steel sash of any arrangement; TRANSOM OPERATORS.

For Greenhouse Construction, see page 2839.

Types of Sash Operating Devices

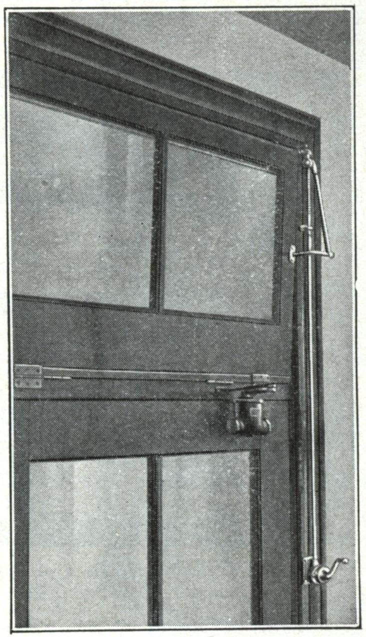
Our heavy type of operating device is used for operating sash in foundries, machineshops, powerhouses, factories, pier sheds and steamships.

The lighter and more compact type of operator is used in connection with sash in schools, banks, hospitals, Y. M. C. A buildings, public buildings and store fronts.

Light Sash or Transom Operator

As shown in illustration, this is a worm and gear operated device. It is small enough to be placed on narrow trim, yet powerful enough to easily control heavy bottom or top hung transoms or sash.

We make these small ornamental operators for all purposes and will be glad to furnish complete information and details for any special work.

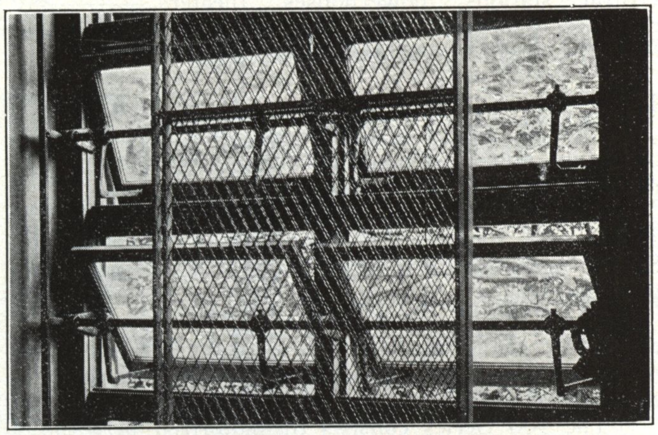


Transom Operator

Hitchings Heavy Sash Operating Devices

Our self-locking worm and gear device consists mainly of a rocking or line shaft supported by shaft bearers, the shaft extending across each line of sash. Connection between the sash and the line shaft is made by means of arms and rods, the arms being secured to the line shaft, and the rods secured to the sash by means of sash bearers. The shaft is rocked or turned by means of a cut worm and gear, the worm being held stationary by an adjustable yoke secured to the main bearer.

The solid cold rolled steel operating rod which operates the gear may be carried in any direction by using miter gears and universal joints.



Bank of "Jallade Type" Pivoted Sash in Single Window
Operated by one control

Our worm and gear device is adaptable for either handwheel or sprocket wheel and chain control.

Erection

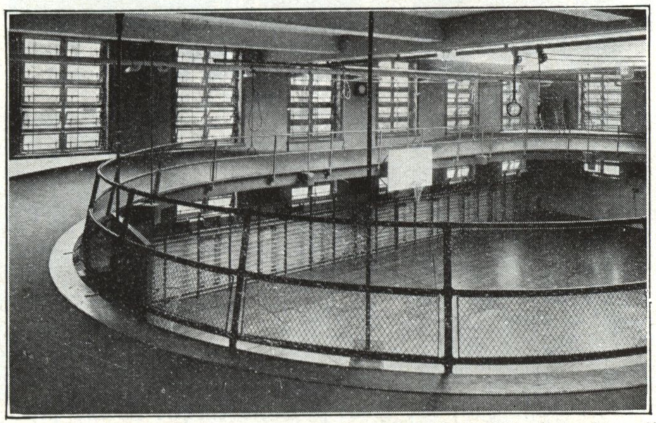
By means of working drawings furnished with materials, our sash operating devices can easily be installed by your local mechanics.

Suggestions and Estimates

On receipt of a rough sketch or blue print showing the location, size and type of windows to be operated, we will be pleased to furnish suggestions for arrangement of sash operating devices, together with estimate of their cost.

Estimates furnished on solid bronze and plated apparatus.

Catalogue mailed on request.



Arrangement of Sash Operating Device for "Jallade Type" Windows in Y. M. C. A., Plainfield, N. J.
LOUIS E. JALLADE, Architect
Each group of windows has individual control

DAVID LEVOW

"Fitrite" Skylight Gearing and "Fitrite" Bronze Strainers

542 West 23rd Street
NEW YORK, N. Y.

TELEPHONE
Chelsea 2400, 2401

*"Fitrite" Skylight Gearing

Skylights should be used to furnish not only light but ventilation. For this purpose specify turret skylights equipped with "Fitrite" Skylight Gearing.

"Fitrite" Skylight Gearing can be easily installed on any type of turret skylight and is especially designed to make it easy to open the skylight for ventilation and to hold it in any position without rattling.

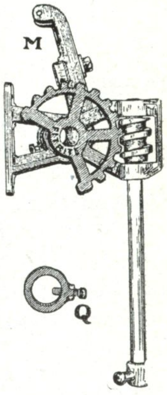
Material—Made of the best quality gray iron unless specified in solid bronze.

On copper skylights bronze "Fitrite" Skylight Gearing should always be specified.

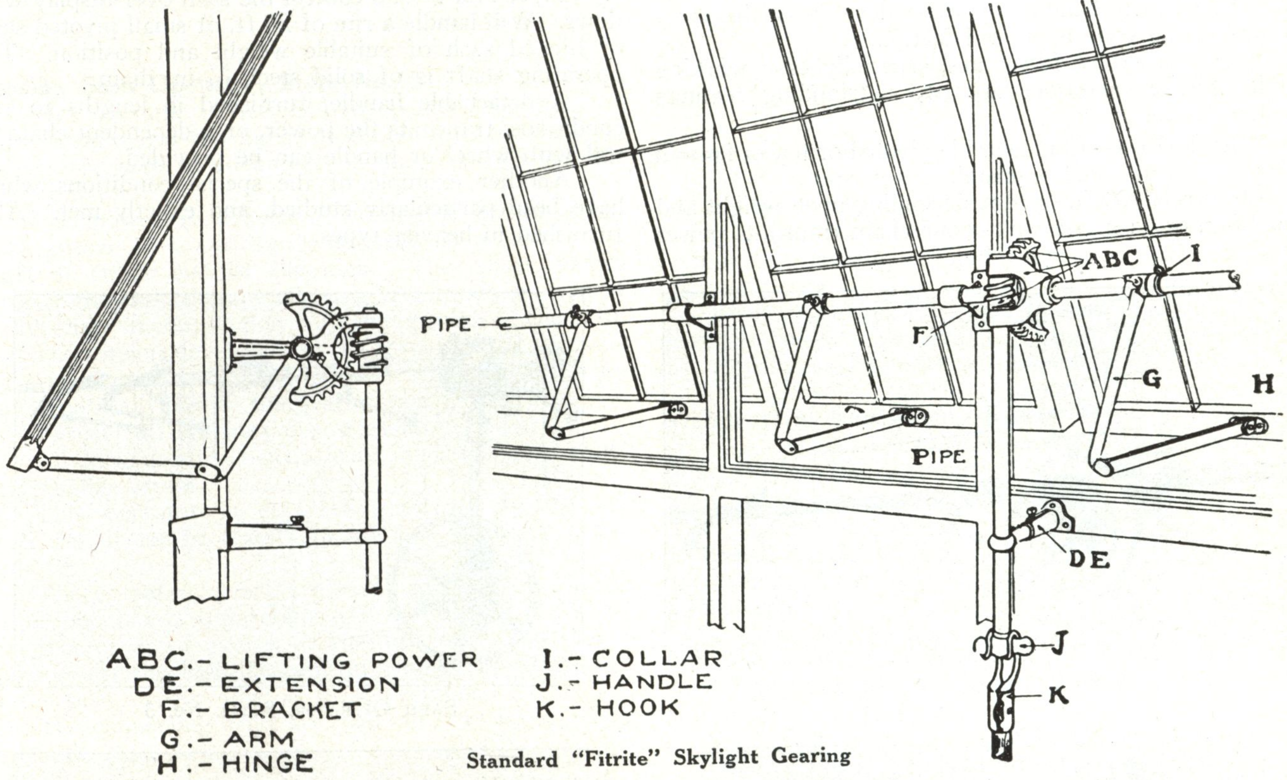
Sizes—Usually made in standard ½-in. iron pipe size, but where very small skylights are used it is furnished in the ⅜-in. iron pipe size.

Features—"Fitrite" Skylight Gearing has special oval pipe holes on the arms, "G," also on the gear "B" of the lifting power which insures a much better grip of the pipe, holding it in three points instead of only on the one point of the setscrew where the pipe holes are made round.

Type "M" for Individual Skylights—For very small skylights having only one sash to open "Fitrite" Skylight Gearing, Type "M," is a very convenient lifting device as it requires no horizontal runs of pipe. It is neat and easy to put up. The Type "M" Gearing is used quite often where more than one sash is to be opened as it is very convenient to use on concrete work. It can be fastened to the curb of the skylights and, as it needs no extensions, saves the difficulty of fastening the extension to the walls.



Type "M" Gearing



Standard "Fitrite" Skylight Gearing

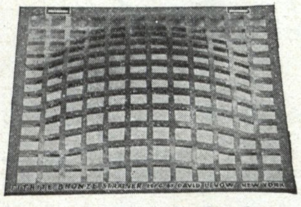
"Fitrite" Bronze Strainers for Roof Leaders

Neat in appearance and highly recommended by architects and the trade in general.

Construction—Made of solid bronze ¼ in. thick, this strainer is practically unbreakable under ordinary use; will not rust and will support the weight of 2 or 3 men easily.

The strainer has 2 hinges so that it can be easily attached to the leader box by a copper strip.

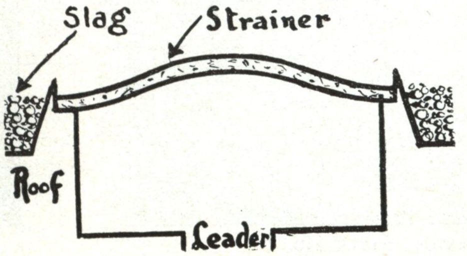
The small crown design allows leaves to easily slide off without making the strainer too high to be an obstruction on the roof.



"Fitrite" Bronze Strainer

Illustration at right shows application to slag roofs

Uses—This strainer is especially designed for flat tile or slag roofs having inside leaders and is made to fit over the copper leader box. On slag roofs, it can be placed in the leader box as shown in the illustration.



Sizes—"Fitrite" Strainers are made in four sizes:
12-in. size, exactly 11¾x11¾ in.
10-in. size, exactly 9¾x 9¾ in.
8-in. size, exactly 8 x 8 in.
6-in. size, exactly 6 x 6 in.

Prices—Due to quantity production, this strainer is offered at a cheaper price than anything similar made by hand.

---

*Trade-mark registered.

METALLIC SASH-OPERATOR CO.

Geared Sash Operating Devices for Wood and Metal Sash

Twenty-third and Chestnut Streets
ST. LOUIS, MO.

CHICAGO REPRESENTATIVES: Universal Steel Products Co., 111 Jackson Boulevard

Products

"Metallic" Geared Sash Operating Devices, to control any style or arrangement of sash.

Geared Sash Operators

This company manufactures devices of especial strength and smooth operating characteristics—the result of long and thorough study. Several standard styles are illustrated, but in addition the company makes special styles, meeting every condition.

All styles embody worm and gear, thus automatically locking the sash in any position. Inquiries are invited for devices to meet special conditions not here provided for. Runs of extreme length and great weight have been easily handled by these devices—such installations giving continuous satisfaction.

A large safety factor and especially easy working under severe conditions are two outstanding features of the devices.

Style No. 1—Controls side pivoted or top or bottom hinged sash of wood or metal.

Controls 100 ft. or less, depending upon weight and condition of sash. A continuous chain transmits power from the hand to the gear; all parts are of substantial construction.

Gears are furnished in 4 different sizes, connecting arms in 3 sizes, and wrought shaft brackets can be provided in almost any desired length.

Very practical and simple; will give permanent satisfaction.

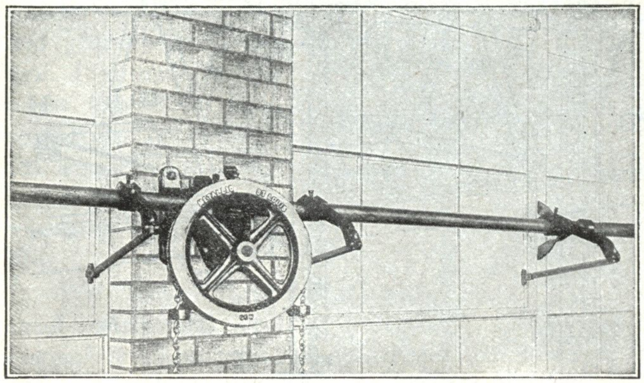
Style No. 2—Same equipment as Style No. 1, excepting that power is transmitted by horizontal hand wheel through a ¾-in. round steel rod.

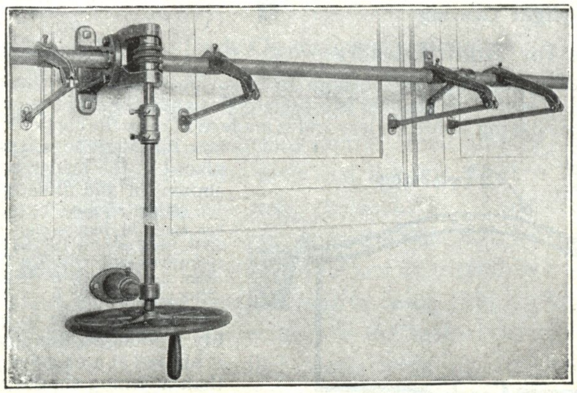
Style No. 3—A bevel gear is here added to place the hand wheel in vertical position. Otherwise this style is identical with style No. 2.

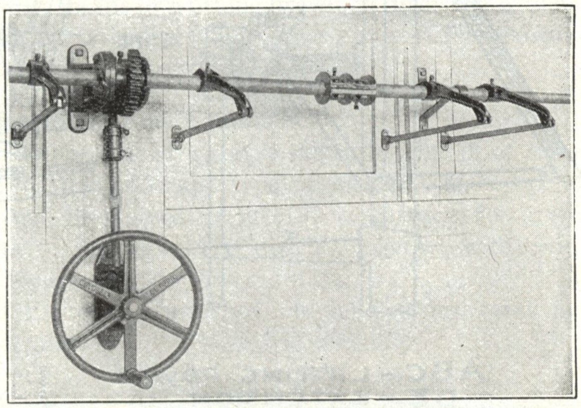
Style No. 6—To control the sash over display windows. Will handle a run of 20 ft. of small pivoted sash, or hinged sash of suitable weight and position. The operating shaft is of solid steel, ¾-in. diam.

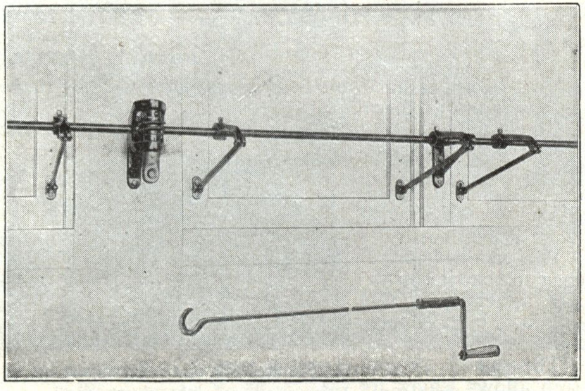
A detachable handle, furnished in lengths to suit conditions, transmits the power, or a dependent chain or rod with wheel or handle can be provided.

Another example of the special conditions which have been particularly studied, and exactly met. Also furnished in heavier types.


Sash Operator, Style No. 1


Sash Operator, Style No. 2


Sash Operator, Style No. 3


Sash Operator, Style No. 6

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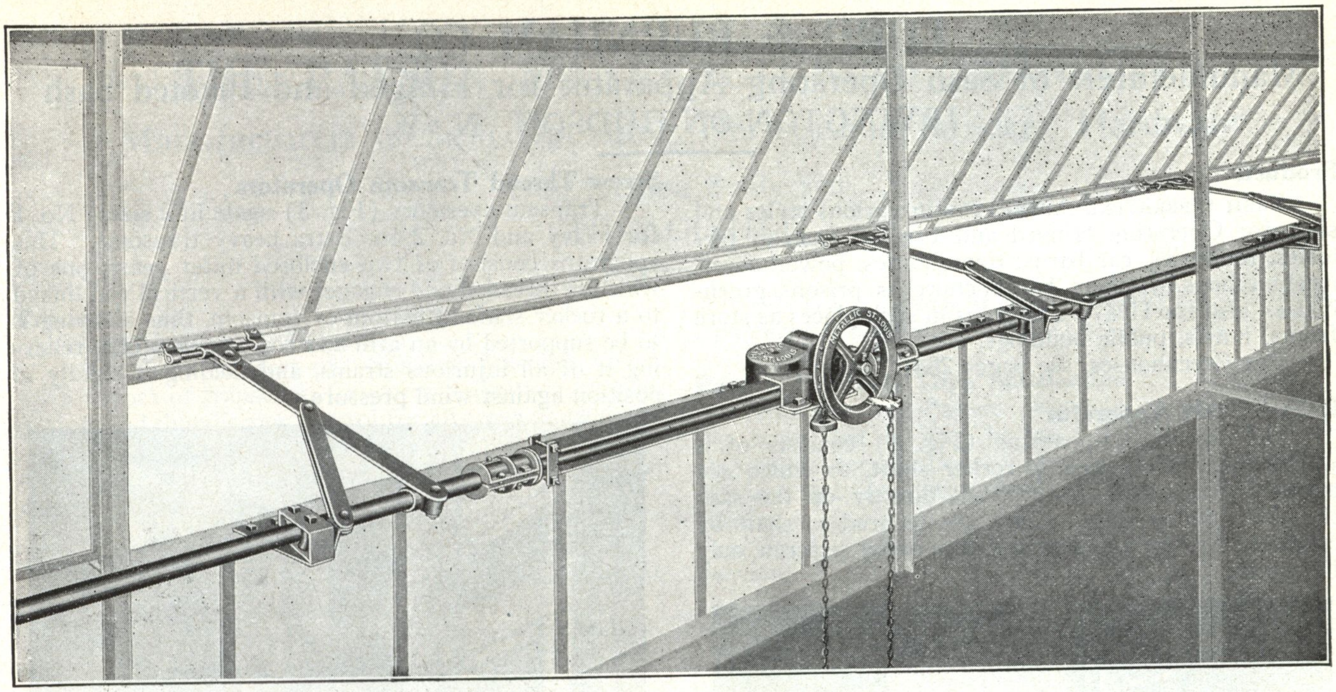


Tension Sash Operator, Style No. 9
(Patented July 18, 1916, and October 9, 1917)

Tension Sash Operator, Style No. 9

This operator is designed to operate long runs of heavy, continuous top hung, or center pivoted sash. It can also be used to advantage on long runs of individual ventilators.

The power is delivered through a worm, worm gear, pinion, rack and thrust bearings connected to the shaft at either end of the rack. The shaft passes through the rack, thereby allowing free rotary movement of the shaft in conjunction with the opening of the sash.

The torsion developed by the thrust of the connecting arms on the sash is stopped at each individual arm, and is not delivered to the gear station in any way.

Thrust ball bearings insure easy operation.

All parts are made extra heavy and strong, to resist any possible strain.

This operator is ordinarily attached to the sill angle, but it can be readily fastened to any part of the building.

The operating gears are made in two sizes. The larger one has a connection which automatically stops the generation of power at the full open and closed positions of the sash, thereby preventing any breakage of the sash, or operator, at these positions.

The connecting arms are made in sizes up to 48 in. in length.

Rack and Pinion Operator, Style No. 10

This operator is of the rack and pinion or straight push type and can be used to operate sash hung in most any position. Side pivoted, bottom or top hinged or continuous sash shafting is operated in torsion principle and distance from center line of shafting to pitch line of racks is reduced to 1⅛ in. and is constant which reduces torque to a minimum.

Racks are ¼x¾ in. cold rolled steel and are made straight, thereby being of much greater strength than the curved type of rack and more able to withstand strains put upon them. All teeth in racks and pinions are cut and generated to insure perfect mesh and elimination of friction as found when die cut or cast teeth are used.

Cuts and descriptive circulars covering rack and pinion type operators will be furnished on application.

Co-operative Service

As practically every installation embodies some special conditions, the amount of engineering necessary becomes an important factor. The company's engineering organization is complete and fully experienced in sash operator design.

Economical and efficient arrangements will be suggested or laid out in detail by this co-operative service department, and requests are invited for this assistance.

Architectural Engineering Service

The Metallic Sash-Operator Co. is in the nature of an engineering organization with ample manufacturing facilities for executing the designs produced by its staff. Adequate experience in the production of sash operating devices for both wood and metal sash of every description, places the Company in a position to render valuable service.

Having been called upon to develop equipment for practically every sort of sash, our designs, which long experience and practical operation have proved to be best adapted to the work required of them, cover a wide range of applications all over the United States.

The Company possesses a manufacturing plant sufficient to guarantee prompt and dependable service, and to insure a quality of workmanship and materials which will be in every way satisfactory.

Some Typical Installations

White Automobile Co., Cleveland, Ohio
Aluminum Ore Co., East St. Louis, Ill.
American Steel & Wire Co., Cleveland, Ohio, and Donora, Pa.
Goodyear Tire & Rubber Co., Akron, Ohio
Hoyt Metal Co., Granite City, Ill.
Santa Fe Shops, Albuquerque, N. M.
Holt Mfg. Co., East Peoria, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Missouri Pacific R. R. Roundhouses
Fairbanks, Morse & Co., Beloit, Wis.
Haughton Elevator Co., Toledo, Ohio
Springfield High School, Springfield, Ill.

LORD & BURNHAM CO.

Manufacturers of Sash Operating Apparatus for Hinged and Pivoted Sash

IRVINGTON-ON-HUDSON, N. Y.

Products

SASH OPERATING APPARATUS in various styles and sizes for Operating Hinged and Pivoted Sash in factories, foundries, car barns, roundhouses, powerhouses, machineshops, steamers, banks, churches, prisons, greenhouses, also for Heavy Transoms in such places as store fronts, hotels, public buildings, etc.

For Greenhouses, see pages 2841-2843.

Rocker Shaft Apparatus

Our standard apparatus (Fig. 1) consists of a worm and gear to turn a rocker shaft, to which are attached arms that, in turn, act directly on the sash through suitable rods. Arms are secured to shaft by combined bolting and setscrew cap, or by setscrew only if desired.

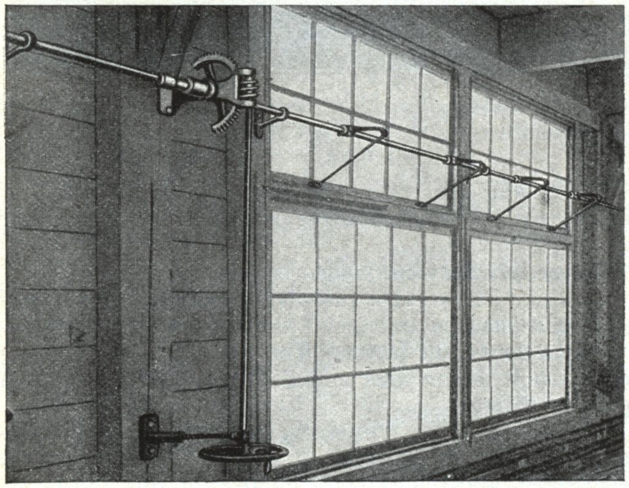


FIG. 1. ROCKER SHAFT APPARATUS

Rack and Pinion Apparatus

This type of apparatus (Fig. 2) is intended primarily for long runs of heavy hinged sash. On account of the small pitch radius of the pinion ($1\frac{1}{2}$ in.) the leverage on shaft is so much reduced that torsion in the shaft is reduced to a minimum. The simplicity of this apparatus is a strong point in its favor. The direct horizontal thrust given to the sash prevents all harmful strains.

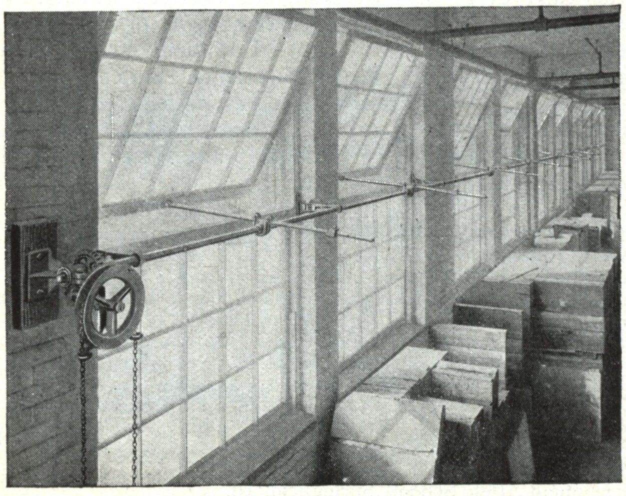


FIG. 2. RACK AND PINION APPARATUS

Screw Thread Transom Operators

Transom operators (Fig. 3) made in 2 sizes: No. 1 for heavy and No. 2 for extra heavy transoms. This apparatus consists of two enclosed miter gears, one of which is threaded and engages with a vertical rod linked to a rocker shaft at bottom of transom, thus allowing it to be supported by an arm and rod at either end, relieving it of all injurious strains, and holding it rigidly in position against wind pressure.

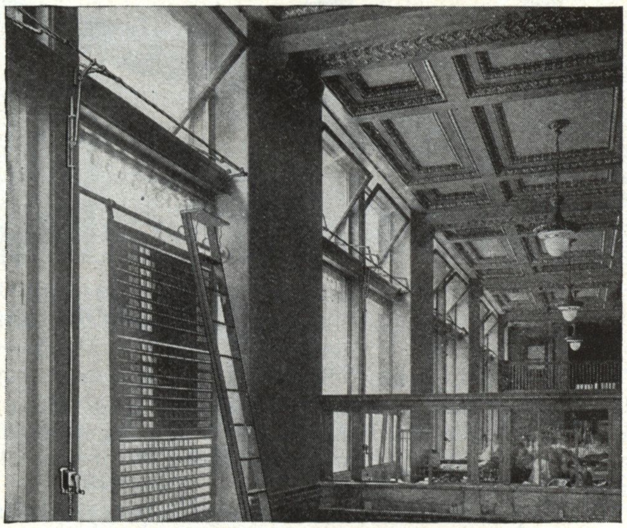


FIG. 3. SCREW THREAD TRANSOM OPERATORS

Tension Lever Apparatus

Fig. 4 for runs too long or too heavy for practical operation with either our rocker shaft or rack and pinion type. Special circular on request.

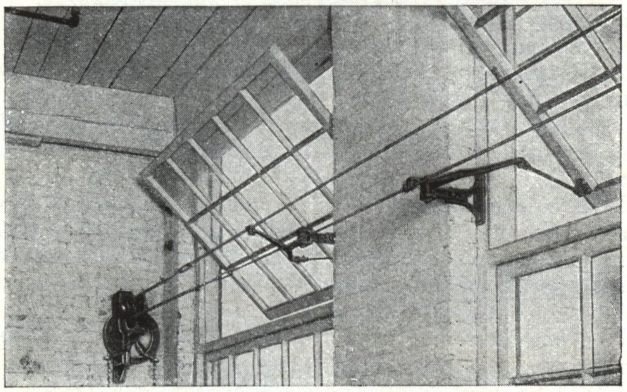


FIG. 4. TENSION LEVER APPARATUS

Erection

Full directions for erecting are sent with apparatus so that it can be easily installed by any mechanic.

Estimates and Co-operative Service

On receipt of data giving description of sash and that part of the building where it is intended to install the apparatus, we will gladly submit sketches, suggestions, and estimates for furnishing our stock apparatus, or one specially designed to meet unusual conditions; also, estimates for erecting the apparatus when desired.

Catalogue

Catalogue giving full and detailed description of each apparatus sent on request.

ESTABLISHED 1875

THE PAYSON MANUFACTURING COMPANY

Manufacturers of Sash Operating Devices and Builders' Hardware

2920 Jackson Boulevard
CHICAGO, ILL.

Products

Sash Operating Devices.

Also manufacturers of: Simplex Transom Lifter, for all types of transoms; Casement Adjusters, friction, geared, and thumbscrew control for all types of casement sash; Signal Sash Lock, for double hung windows; No. 49 Harris Concealed Transom Lifter, for transoms where concealed device is required.

Types of Payson Sash Operating Devices

Torsion Type Using Levers to Sash—Ideal, chain control, for pivoted sash.

Superior, hand wheel control, for pivoted sash.

Triumph, hand wheel control, for pivoted sash in monitors, also for store front transoms.

Torsion Type Using Racks and Pinions to Sash—Reliance, chain or hand wheel control, for top hinged or heavy pivoted sash.

Screw Type Using Levers to Sash—Crown, for short runs of bottom hinged sash opening in.

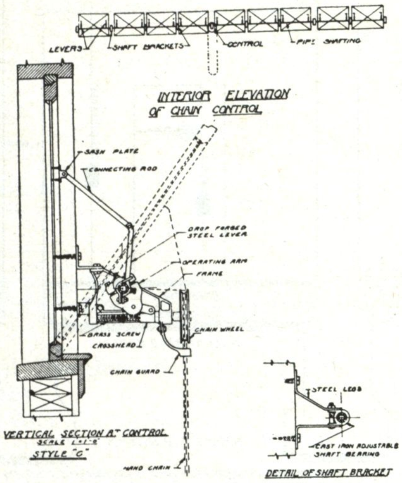
Duplex, for heavy transoms.

Signet, (new) for long runs of bottom hinged sash opening in.

Tension Types—Peerless, chain control for top hinged continuous steel sash.

Victor, chain wheel control for vertically pivoted sash.

Monarch, for short runs of vertically pivoted or side hinged sash.


LEVERS
SHAFT BRACKETS
CONTROL
PIPE SHAFTING
INTERIOR ELEVATION OF CHAIN CONTROL
SASH PLATE
CONNECTING ROD
DROP FORGED STEEL LEVER
OPERATING ARM
FRAME
BRASS SCREW
CROSSHEAD
CHAIN WHEEL
CHAIN GUARD
HAND CHAIN
VERTICAL SECTION AT CONTROL
SCALE 1"=1'-0"
STYLE "C"
STEEL LEGS
CAST IRON ADJUSTABLE SHAFT BEARING
DETAIL OF SHAFT BRACKET

Signet Sash Operator Adapted to Use on Bottom Hinged Sash, Opening in

All types furnished with electric or pneumatic equipment if desired.

Payson Products Give Satisfaction

This list of Payson products is selected with the hope that it may be used freely by architects in writing specifications. The list contains standard articles that are guaranteed to give perfect satisfaction.

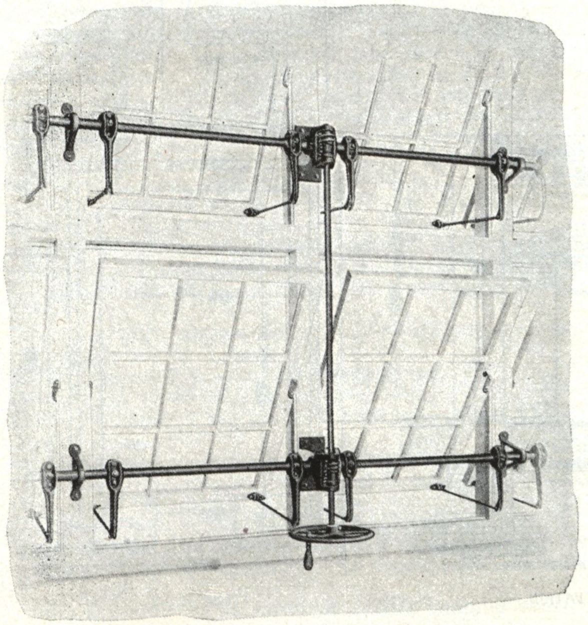
Service

Payson sash operating devices are made to order, using measurements taken from the plans and checked at the building. Every job is exhaustively studied by Payson engineers, and a drawing showing the scheme thought most satisfactory is prepared and submitted to the architect for approval as to layout and general design. After this approval is obtained, if there is any question as to measurements, drawings are forwarded to the building to be checked.

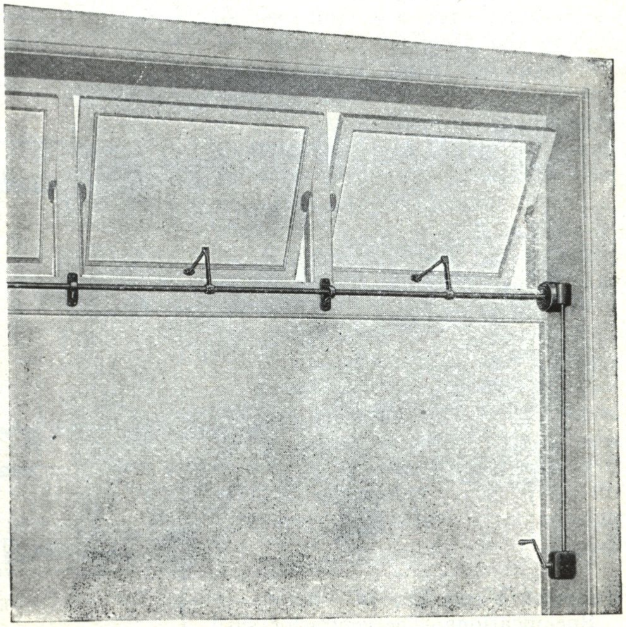
Time is really saved in this way, because the operators can then be erected from the blue print with the certainty that every part will fit the place for which it is intended.

Catalogue

We have a very complete catalogue of Payson products which we would be glad to forward on request.



Superior B-B Sash Operator for Tandem Control



Superior A-E Transom Operator for Store Fronts

THE HALL'S SAFE CO.

FACTORY AND GENERAL OFFICE
Spring Grove Avenue (P. O. Box 846)
CINCINNATI, OHIO

CABLE ADDRESS
"HALL'S SAFE, N. Y."

Products

FIREPROOF and BURGLARPROOF VAULT DOORS, SAFES, etc.:

For Banking Institutions in All Branches: Fireproof and Burglarproof Vault Doors, Emergency Doors, Fireproof Book Vault and Storage Vault Doors of various styles and thicknesses; Steel Vault Linings; Steel Partitions, Mirror Partitions, Grilles and Grille Partitions; Safety Deposit Boxes; Key Cases, and Bases; Tellers' Chests, heavy Burglarproof Chests; Manganese Safes, Filing Safes; Omnibuses, Messenger Boxes; Combination Locks, Key Locks, Finish Plates and Burglar Alarm Wiring.

For Offices, Business Houses, Hotels, Churches, Residences and Apartment Houses: Fireproof Vault Doors of various styles; Steel Vault Linings; Fireproof Safes, light weight Filing Safes with Metal Cabinet; Burglarproof Safes (jewelers' style), Manganese Safes; Burglarproof Chests, Fireproof Safes with Burglarproof Chests installed; Deposit Boxes for hotels having jewelry salesman's storage compartment; Skeleton or Coin Safes; Silver Safes; Silk, Fur and Garment Safes of various styles; Lockers; Altar and Tabernacle Safes, Poor Boxes; Wall Safes; Cabinet Filing Units in wood or metal.

Also Special Safes and Doors, etc., of every description.

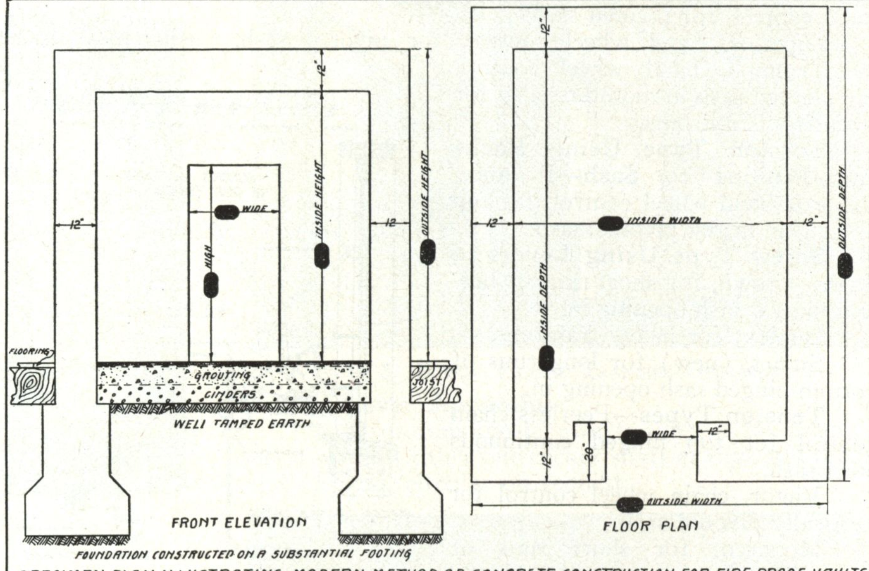
Service and Quality

Our engineering department has been created for the purpose of assisting the architect in connection with proposed vault work, equipment, installation, etc., and the company invites inquiries and will be pleased to furnish plans, layouts and specifications on request without charge or obligation. Charts, cuts and photographs are on hand fully describing in detail the various elements of our work.

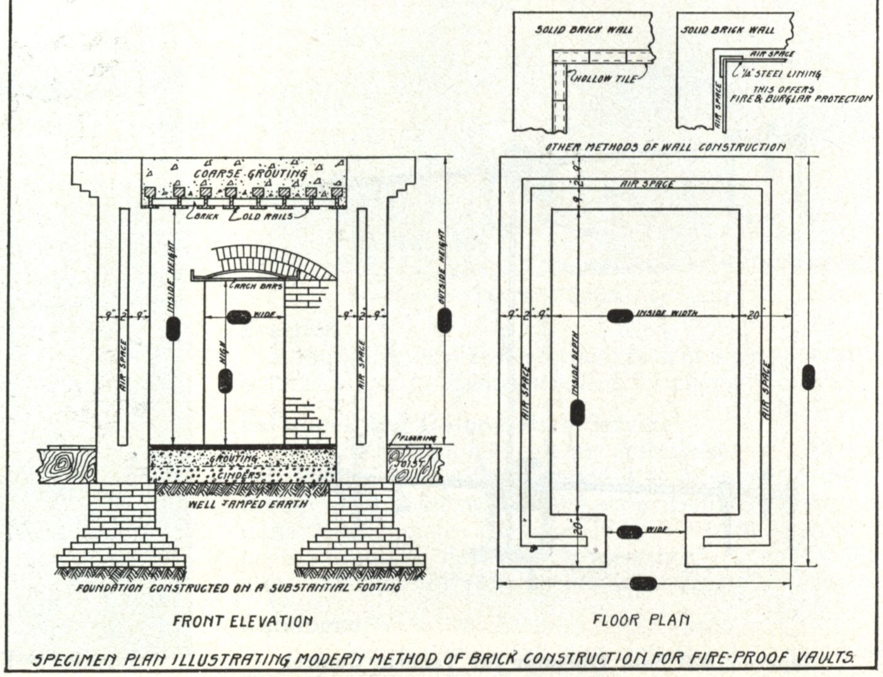
The 20th Century line of vault and bank work reflects a distinctive advance in protective equipment and problems. Our plant and organization is devoted exclusively to the manufacture of the above described work which is made with utmost skill and care, from the highest grade materials of their respective kinds.

Fireproof Vault Doors

Specifications—The contractor shall furnish and install a HALL'S SAFE CO. No. 1-AA style fireproof vault door designed for wall opening 79 in. high, 32 in. wide and 20 in. thick finished wall. Clear opening through doorway 76 in. high, 26 in. wide. Outer door to be $\frac{3}{16}$ in. thick solid open hearth steel plate, reinforced at all edges with 2x2x$\frac{3}{16}$-in. steel angles making door $\frac{3}{8}$ in. thick on edge. Door to be secured by 4 horizontal 1 up and 1 down locking bolts 1-in. diameter cold drawn steel and checked by a 4-tumbler combination lock having innumerable changes in its combination. Vestibule to be No. 16 gauge steel plates securely fastened to front and rear angle frames. Inner doors to be of heavy gauge steel reinforced with panel bars, and when opened to swing back against vestibule on each side. When closed these inner


FLOORING
GROUTING
CINDERS
JOIST
WELL TAMPED EARTH
12"
12"
12"
WIDE
HIGH
INSIDE HEIGHT
OUTSIDE HEIGHT
FRONT ELEVATION
FOUNDATION CONSTRUCTED ON A SUBSTANTIAL FOOTING
12"
12"
12"
INSIDE WIDTH
INSIDE DEPTH
OUTSIDE DEPTH
20"
12"
WIDE
OUTSIDE WIDTH
FLOOR PLAN

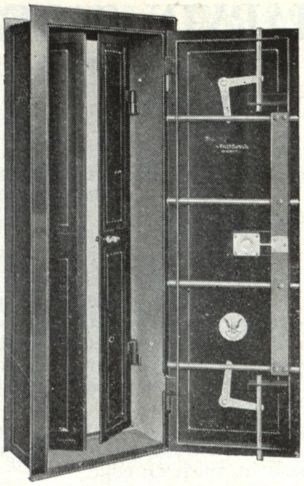
SPECIMEN PLAN ILLUSTRATING MODERN METHOD OF CONCRETE CONSTRUCTION FOR FIRE-PROOF VAULTS.


SOLID BRICK WALL
HOLLOW TILE
SOLID BRICK WALL
AIR SPACE
3/16 STEEL LINING
THIS OFFERS FIRE & BURGLAR PROTECTION
AIR SPACE
OTHER METHODS OF WALL CONSTRUCTION
COARSE GROUTING
BRICK
OLD RAILS
ARCH BARS
WIDE
HIGH
INSIDE HEIGHT
OUTSIDE HEIGHT
9" 2" 9"
9" 2" 9"
AIR SPACE
AIR SPACE
FLOORING
JOIST
GROUTING
CINDERS
WELL TAMPED EARTH
FOUNDATION CONSTRUCTED ON A SUBSTANTIAL FOOTING
FRONT ELEVATION
AIR SPACE
9" 2" 9"
INSIDE WIDTH
20"
INSIDE DEPTH
AIR SPACE
AIR SPACE
20"
WIDE
FLOOR PLAN

SPECIMEN PLAN ILLUSTRATING MODERN METHOD OF BRICK CONSTRUCTION FOR FIRE-PROOF VAULTS.

Continued on next page

doors to overlap and to be secured by flat up and down bolts operated by a lever handle and checked by a flat key lock having duplicate keys. Vault door to have flanges overlapping the walls, both inside and outside. Inside flange to be attached to rear of vestibule by screws so that they can be removed for setting vestibule in place, or removed at any or all times from opening without injury to plaster or vault. All handles, tips, dials and bolts to be polished and heavily nickelplated. Inner and outer doors to be painted black with gold ornamentation and varnished. Door to weigh 635 lb.



No. 1-AA Fireproof Vault Front Right-hand Swing Door

To fit opening in wall 79 in. high, 32 in. wide, 20 in. deep. Clear opening through doorway 76 in. high, 26 in. wide

Installation — These vault fronts are so constructed that they can readily be placed in position by any individual after the vault walls are built.

This is accomplished by removing back bars as described above.

All vault fronts are set up and tested in our factory, thus eliminating ill fitting.

FIREPROOF VAULT DOORS

No.	Wall opening, in.			Clear opening, in.		Door plate, in.	Door on edge, in.	Bolts			Bolt frames, in.	Door	Weight, lb.
	High	Wide	Deep	High	Wide			Cross	Up	Down			
Tile A....	76	26	13½	73½	20	3/16	3/8	2	1	1	Angle, 2x2x3/16	Single	500
1-AA...	79	32	20	76	26	¼	7/16	4	1	1	Angle, 2x2x3/16	Single	635
15-AA...	79	36	20	76½	30	¼	7/16	4	1	1	Angle, 2x2x3/16	Single	750
10-AA...	82	44	24	78½	38	¼	7/16	8	2	2	Angle. 2x2x3/16	Double	1000

Construction Data for Fireproof and Burglarproof Vaults (Insurance Requirements)

Classifications—Vault for 1½-in. thick door should have masonry walls lined throughout with ¼-in. thick steel or constructed of concrete 12 in. thick.

Vault for 2½-in. thick door should have walls lined throughout with ½-in. thick steel or constructed of *non-reinforced* concrete 18 in. thick, or of *reinforced* concrete 12 in. thick.

Vault for 3½-in. thick door should have walls lined throughout with ½-in. steel or constructed of *non-reinforced* concrete 36 in. thick or of *reinforced* concrete 18 in. thick.

Vault for 5½-in. thick door same as preceding rule.

Vault for 6-in. thick door should have walls lined throughout with 1-in. thick steel, or walls constructed of *non-reinforced* concrete 36 in. thick or *reinforced* concrete 18 in. thick.

Vault for 7-in. thick door should have walls lined throughout with 1-in. thick steel, or walls constructed of *non-reinforced* concrete 36 in. thick or *reinforced* concrete 18 in. thick.

Vault for 9½-in. thick door should have walls lined throughout with 1½-in. thick steel or walls constructed of *non-reinforced* concrete 54 in. thick or *reinforced* concrete 27 in. thick.

In vault walls constructed of *non-reinforced* concrete or stone:

12-in. thick wall equals ¼-in. steel lining.
18-in. thick wall equals ½-in. steel lining.

Each additional 9 in. of wall thickness equals additional ¼-in. steel lining.

In vault walls constructed of *reinforced* concrete:

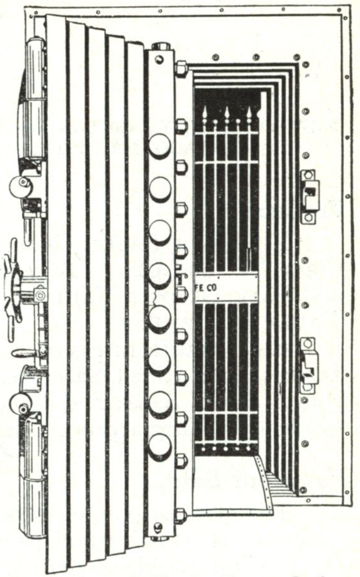
12-in. thick wall equals ½-in. steel lining.
18-in. thick wall equals 1-in. steel lining.
27-in. thick wall equals 1½-in. steel lining.

Vault Roofs and Floors—Should coincide with wall construction. Therefore it shall not be necessary to particularly specify construction of same.

Vaults are entirely independent of the building walls and floor construction.

Burglarproof Vault Fronts

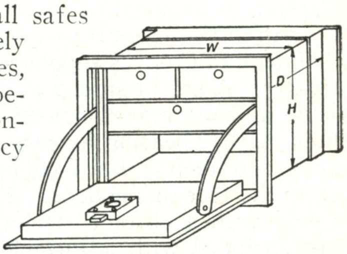
We are in the position to build any special style or size vault doors other than our standard to meet requirements, and on receipt of specification will be pleased to quote our best prices and time of delivery. No work too large or too small to handle, as our past record needs no comment. Our vaults are made to meet the requirements of insurance companies, thus carrying lowest possible rate of insurance. Consult us without obligation as we are at the disposal of architects and others seeking information.



Burglarproof Vault Front Left-hand Swing Door

Fireproof Wall Safes

The present day wall safes have been used extensively in homes, apartment houses, hotels and offices. This special type of safe affords convenience, protection, secrecy and is indispensable to those who appreciate the real qualities that such a safe affords. They are designed for brick or concrete walls thus economizing floor space. Also made in special sizes to meet requirements.

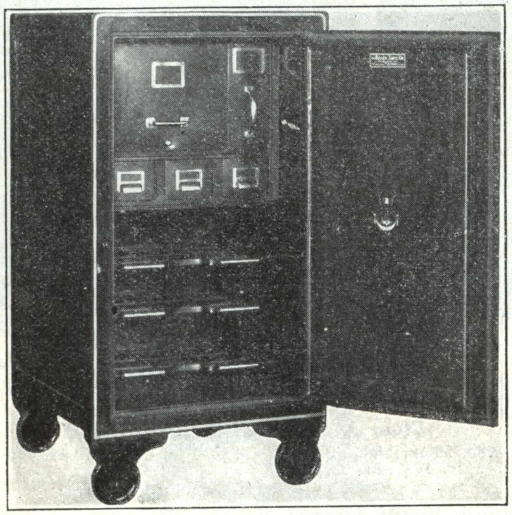


Fireproof Wall Safe

No.	High, in.	Wide, in.	Deep, in.	Width flange, in.	Door, thick, in.
1	10	10	8	13	½
2	12	10	8	13	1¼
3	12	16	8	19	1¼

Filing Safes

Security with convenience. Constructed to successfully withstand the extreme heat of destructive fires, built in larger and smaller sizes, with various arrangements of interior to suit the customer's requirements.



Fireproof Safe No. 4 with Steel Filing Equipment

Outside measure: 49 in. high, 25¾ in. wide, 27½ in. deep.
Inside measure: 36 in. high, 20 in. wide, 19½ in. deep

HERRING-HALL-MARVIN SAFE CO.

GENERAL SALES OFFICE AND FACTORIES

HAMILTON, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 400 Broadway
BOSTON, MASS., 165 Devonshire Street
BIRMINGHAM, ALA., 2124 First Avenue No.
CHICAGO, ILL., 223-225 West Lake Street
SAN FRANCISCO, CAL., 214 California Street

Products

FIREPROOF SAFES, Underwriters' Laboratories, Inc., Class "A" and Class "B" Label; BURGLARPROOF BANK and SAFE DEPOSIT VAULTS; FIREPROOF VAULT DOORS; VAULT EQUIPMENTS.

Also manufacturers of Filing Devices; Safe Deposit Boxes; Steel Lined Safe Deposit Safes for hotels and clubs; Silver Safes and Special Safes and Vaults for residences; Burglarproof Chests, Messenger Boxes, etc.

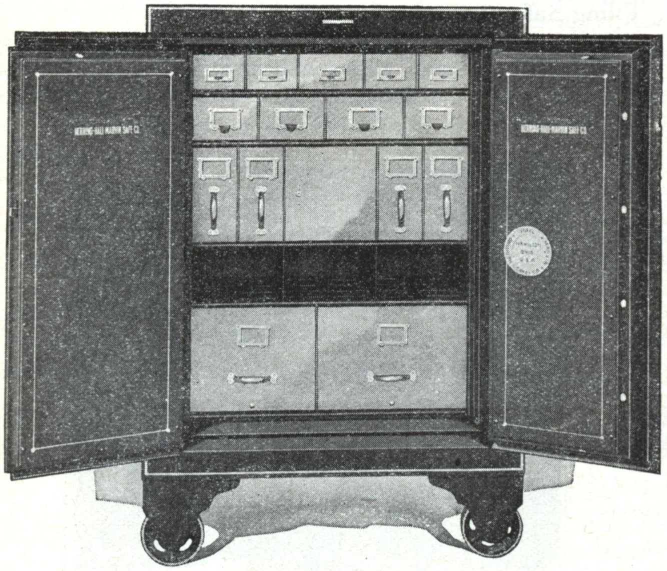
Fireproof Safes

The greatest possible structural strength is built into these safes. Angles and panel bars are of heavy steel and are fully welded together.

The insulation is of monolithic type and its engagement with the outer and inner walls of the safes is such as to consolidate strength and maximum heat resistivity. Perfect engagement of the doors with the safe structure is assured through pressed steel jambs with interlocking tongues and grooves supplemented with interlocking rear flanges. A patent strip seals the entire joint between the jamb and the rear flange of the doors. The doors are hung on ball bearing hinges. Heavy round steel locking bolts and their related connections are fully insulated from the face of the door. The combination lock is protected with a chrome steel drillproof plate. All safes are equipped with adjustable filing devices installed in accordance with specific requirements.

A selection of fifteen sizes is provided in the Class "A" safes and ten sizes in the Class "B" safes, ranging from 38⅓ cu. ft. to 1¼ cu. ft. in capacity.

Standard finish is olive green.



Class A Fireproof Safe No. 4030

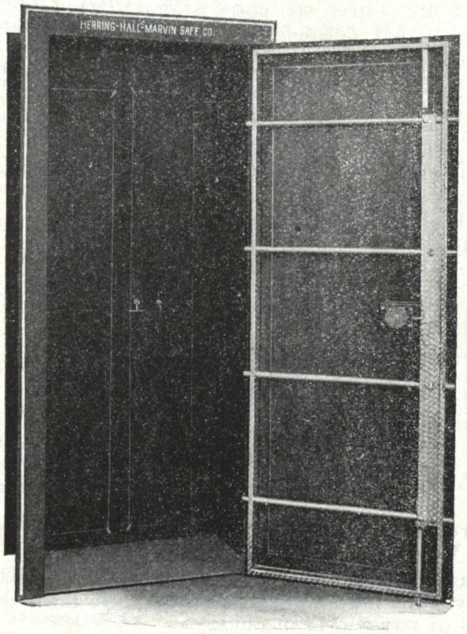
Outside, 58 in. high, 40½ in. wide, 30 in. deep. Inside, 40 in. high, 30½ in. wide, 19¼ in. deep

Fireproof Vault Fronts

Specifications—Sides and top No. 16, bottom ⅛-in. sheet steel. Front frame formed of 3⅞x3/16-in. open hearth steel bars, riveted at the bottom into 2½x¼-in. sill bars, fastened at the top by bar clips.

The rear frame is formed of 1¼x1¼x3/16-in. open hearth angles, securely fastened to the vestibule. Removable bars 4x3/16 in. are fastened on the back of the rear angles. These bars may be removed until the vestibule is set into the wall, after which they are to be replaced, thus holding the vestibule securely in position.

Outer door plate formed of 3/16-in. open hearth steel, reinforced on sides, top and bottom by 2x¼-in. bars, making doors 7/16 in. thick on edge.

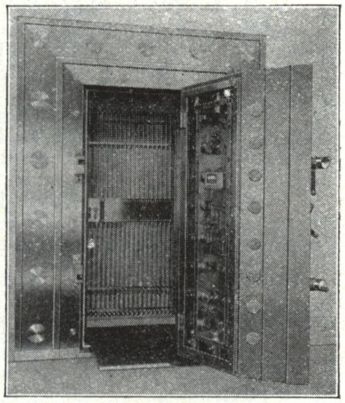


Fireproof Vault Front No. 21

Outside 80½ in. high, 33½ in. wide, and 20 in. deep. Wall opening required, 81½ in. high, 34½ in. wide. Clear opening through vestibule, 77¾ in. high, 29⅝ in. wide

Burglarproof Vault Equipments

Factories are fully equipped to manufacture both the simplest and cheapest, and the heaviest and most elaborate vault equipments of every description. The record and reputation established through a period of continuous service, covering eighty years, are so well known as to require no comment



Burglarproof Vault Door

Co-operative Service

The Engineering Department is at the disposal of architects and customers, and will gladly submit designs, specifications and estimates promptly. All inquiries will receive immediate attention.

THE CONSOLIDATED EXPANDED METAL COMPANIES

Armor Mat Vaults

GENERAL OFFICES AND WORKS

BRADDOCK, PA.

SALES OFFICES

PHILADELPHIA, PA. CHICAGO, ILL. NEW YORK, N. Y. PITTSBURGH, PA.
DETROIT, MICH. MINNEAPOLIS, MINN. CLEVELAND, OHIO

Product

"STEELCRETE" EXPANDED METAL for the construction of burglarproof and mobproof vaults.

Steelcrete

TRADE-MARK

For "Steelcrete" Expanded Metal Concrete Reinforcement, Floor Binders and Beam Wrappers, see page 54; for "Steelcrete" Expanded Metal Plastering Lath, Corner Beads and Cold Rolled Channels, see page 405.

"Steelcrete" Armor Vaults

The new principle on which vaults are now constructed is namely—"Given sufficient time and tools—any vault can be penetrated." The question of comparative resistance is, therefore, one of comparative time. The weight and size and number of tools required to penetrate are also factors and should be considered. The most accessible and most dangerous tools are: (1) explosives; (2) the cutting flame.

Concrete resists the cutting flame, hence the new principle of embedded Armor Mat is to so place the steel that it can not be attacked with a flame. Armor Mat Construction has been shown to be practically drillproof and by almost inconceivable tenacity to resist attacks by explosives.

Vault designing has always been many years ahead of the tools of penetration. It is, therefore, only vaults in new buildings that are being designed to provide this "new safety." One of the oldest principles of protection which has never been surpassed is that of entanglement. "Steelcrete" Armor Mats are entanglements embedded in flintlike concrete. The design of these entanglements on account of their structural character are problems for engineers familiar with the application and design of concrete.

Construction Details

The high, uniform grade of steel, cold drawn, possesses great unit strength and high elastic limit. In mass, as used in vault construction, it is admirably suited to resist the force of powerful explosives. A grille work of chiselproof rods is closely threaded through the mat and binds it on all sides.

Specifications

Complete specifications and typical details furnished any architect on request.

Services

We furnish all the mesh and bars necessary to construct the vault complete.

We furnish all necessary working drawings.

We give lump sum estimates.

We (by arrangement) supervise the installation of the "Steelcrete."

Send for "Vault Book."

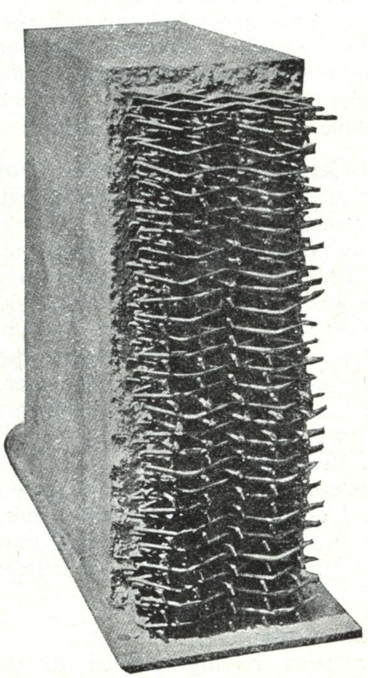
Installations

Probably the largest and strongest vault man ever attempted to construct is the new stronghold installed in the Federal Reserve Bank of New York. This financial institution was the first to use "Steelcrete" as Vault Protection. The vault has walls several feet in thickness, is three stories in height and an entire city block in length.

"Steelcrete" Armor Vault Protection has been used in the New Federal Reserve Branch Banks at Nashville, Tenn., Oklahoma City, Okla., New Orleans, La., and Jacksonville, Fla.

Following are a few of the more important buildings for which has been adopted "Steelcrete" Armor Vault Protection:

American Exchange Bank, Milwaukee, Wis.
Greenwich Savings Bank, New York, N. Y.
Manufacturers and Traders National Bank, Buffalo, N. Y.
Peoples Bank & Trust Co., Passaic, N. J.
First National Bank, Braddock, Pa.
National Tradesmen's Bank, New Haven, Conn.
Bowery Savings Bank, New York, N. Y.
Pennsylvania Trust Co., Pittsburgh, Pa.
Jefferson Standard Life Insurance Co.'s Building, Greensboro, N.C.
United States Trust Co., New York, N. Y.
Highland National Bank, Pittsburgh, Pa.
Mechanics & Metals Bank, New York, N. Y.
First National Bank of Boston, Boston, Mass.
National Life & Accident Insurance Co.'s Building, Nashville, Tenn.



Section of a "Steelcrete" Armor Mat

THE RIVET-GRIP STEEL CO.

Rivet-Grip System of Bank Vault Reinforcement
2735 Prospect Avenue, CLEVELAND, OHIO

For Steel Joists, see pages 444-445

Balanced Protection for Bank Vaults

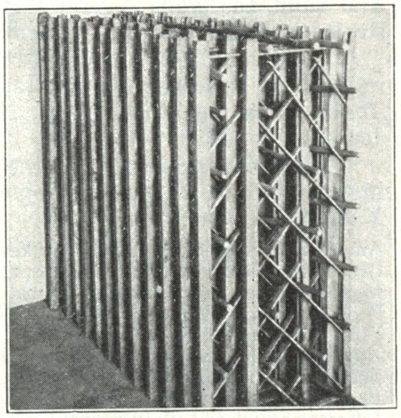
The first requisite for security in a bank vault is *balanced protection*—equal protective strength throughout. In other words, the walls, floor and roof should be no less secure than the vault door.

In the Rivet-Grip System this balanced protection is obtained through a new system of steel reinforcement, which is fabricated in various sizes to give the walls and slabs a protective value equivalent to that of any particular door from 4 to 48 in. in thickness.

Rivet-Grip System of Bank Vault Reinforcement

The Rivet-Grip System consists of an interlocking network of shop-fabricated frames and plain round bars, embedded and interlocked through practically the full thickness of the concrete work.

The Rivet-Grip frames are composed of two parallel Rivet-Grip main sections joined at close intervals by lighter diagonals, which form the web of the frames. The joint, or Rivet-Grip, is formed under a 30-ton pressure which forces the metal in the main sections around the knobs on the diagonals, joining these members so securely that the diagonals will break in tension before loosening at the Rivet-Grip.



Rivet-Grip Reinforcement Type B-763 —2½-in. Spacing of Frames
An 18-in. concrete wall with this reinforcement will take No. 10 insurance rating without a lining

The loose bars are laced through the frames perpendicular to the plane of the web members. They are held in position automatically and need not be wired.

All Rivet-Grip reinforcement is accurately fabricated and comes to the job true to detail.

Why Rivet-Grip Insures Balanced Protection

To penetrate a vault wall reinforced with Rivet-Grip steel frames requires a long period of time, a great variety of equipment and frequent changes in the attacking operations. Drills must be used to penetrate the concrete, explosives are required to break up the concrete, chipping tools are necessary to separate the concrete from the steel, and torches must be used to cut the heavy Rivet-Grip sections. Moreover, the disposition of steel in a Rivet-Grip wall is such that all these operations must be repeated many times through the thickness of the wall.

There are no weak points in a Rivet-Grip protected vault. The frames interlock at all corners. The door connections are as strong as the vault door itself. The scientific design of Rivet-Grip reinforcement insures balanced protection throughout.

Sandy Hook Tests

Former tests having proved unsatisfactory, an exhaustive series of experiments on different vault wall constructions was conducted for a group of Federal Reserve Banks at Sandy Hook, N. J., in 1921.

In these tests Rivet-Grip walls were shown to be impregnable to attack by burglars. Under conditions simulating an attack by mob in times of anarchy or riot, they showed the maximum resistance for any vault wall which can be built commercially for banks.

As result of the Sandy Hook tests, Rivet-Grip System was adopted for eight Federal Reserve bank buildings, including the banks at Cleveland, St. Louis, Minneapolis and San Francisco, and the Federal Reserve branches at Louisville, Pittsburgh, Little Rock, and Salt Lake City. Rivet-Grip System has also been used for over two hundred national and state banks (see brief list on following page).

Structural and Economic Advantages

In addition to its protective value, many structural and economic advantages help to explain the wide choice of Rivet-Grip System:

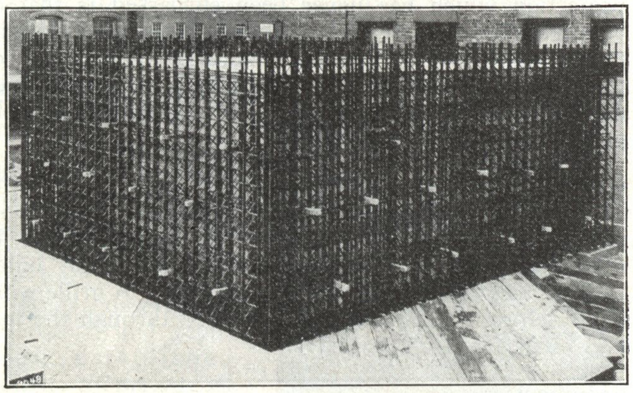
Structural Strength—Rivet-Grip frames form an efficient structural reinforcement, and allow vault walls and slabs to be designed for carrying heavy building columns, or with clear spans up to 40 ft.

Flexibility of Arrangement—The spacing and general arrangement of the frames may be varied to give the exact degree of protection desired.

Ease of Installation—All material is completely shop-fabricated and ready to place before shipping. To unload the reinforcement from trucks and place it in its proper position in the vault requires only 5 to 8 man-hours per ton.

Lowest Insurance Ratings—Rivet-Grip walls and slabs receive the lowest insurance ratings.

Economy—Being produced on a quantity basis in large modern shops, Rivet-Grip reinforcement can be marketed at a surprisingly low figure.



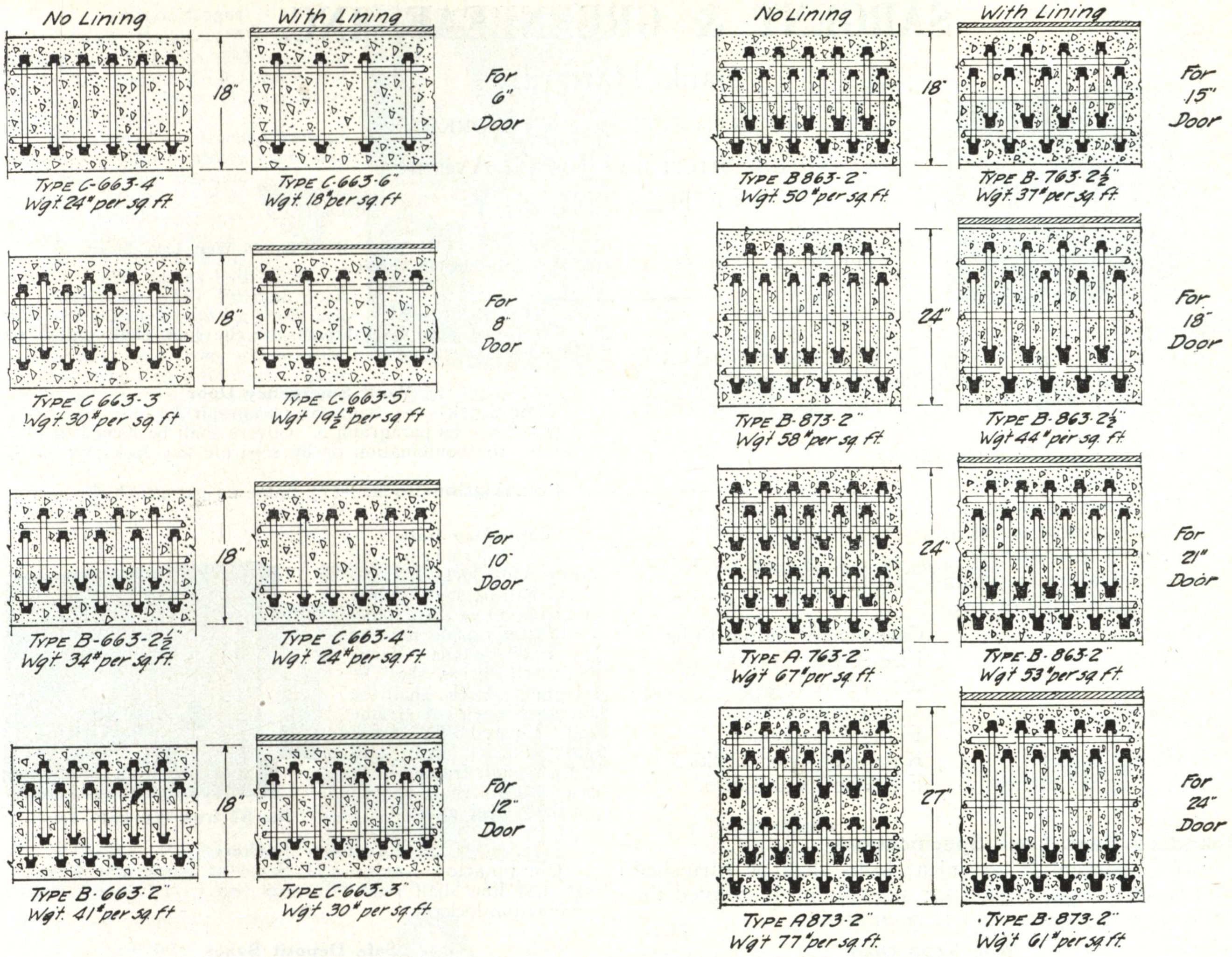
Rivet-Grip Vertical Type C-663—6-in. Spacing
Reinforcement for light vault—ready for outside forms and concrete

Made in Vertical and Horizontal Types

Vertical type Rivet-Grip Systems are used in walls from 12 to 30 in. thick, in connection with vault doors ranging from 4 to 24 in. The drawings and specifications on the following page apply to this vertical form of reinforcement.

Horizontal type Rivet-Grip Systems are used for heavy walls from 27 to 60 in. thick, in connection with vault doors ranging from 18 to 48 in.

Continued on next page


No Lining
With Lining
18"
For 6" Door
Type C-663-4"
Wgt. 24# per sq. ft.
Type C-663-6"
Wgt. 18# per sq. ft.
18"
For 8" Door
Type C 663-3"
Wgt. 30# per sq. ft.
Type C-663-5"
Wgt. 19½# per sq. ft.
18"
For 10" Door
Type B-663-2½"
Wgt. 34# per sq. ft.
Type C 663-4"
Wgt. 24# per sq. ft.
18"
For 12" Door
Type B-663-2"
Wgt. 41# per sq. ft.
Type C-663-3"
Wgt. 30# per sq. ft.
No Lining
With Lining
18"
For 15" Door
Type B 863-2"
Wgt. 50# per sq. ft.
Type B-763-2½"
Wgt. 37# per sq. ft.
24"
For 18" Door
Type B-873-2"
Wgt. 58# per sq. ft.
Type B-863-2½"
Wgt. 44# per sq. ft.
24"
For 21" Door
Type A-763-2"
Wgt. 67# per sq. ft.
Type B-863-2"
Wgt. 53# per sq. ft.
27"
For 24" Door
Type A873-2"
Wgt. 77# per sq. ft.
Type B-873-2"
Wgt. 61# per sq. ft.

Types of Rivet-Grip to Balance Various Vault Doors

These types of reinforcement, when used in concrete walls of indicated thickness, will take the same insurance rating as the doors opposite which they are listed

Designing and Estimating Service

The drawings on this page will prove useful as a guide for selecting the proper type of Rivet-Grip reinforcement to use with any particular vault door. However, other factors besides the vault door thickness help to determine the degree of reinforcement required, and for this reason we prefer to make a study of each individual problem and then present a solution and design to suit the particular case. Our Engineering Department will submit preliminary designs and estimates on short notice, without obligation.

When writing for information, send plans or dimensioned sketches of the vault. Give thickness of vault door; also thickness of steel lining, if any.

Specifications for Bank Vault Reinforcement

Reinforcement—The reinforcement shall be the "Rivet-Grip System of Bank Vault Reinforcement" consisting of special shop-fabricated steel frames and plain round bars as produced by The Rivet-Grip Steel Co., Cleveland, Ohio. All steel to be of structural grade, conforming to standard specifications of the American Society for Testing Materials.

The arrangement of Rivet-Grip frames and plain round bars shall conform to that shown on page 1027 of Sweet's Architectural Catalogue, Twentieth Edition, for Type ...... spacing of frames. The reinforcement shall be detailed for walls .... in., floor slab ..... in. and roof slab .... in. thick. Plain round bars ⅝ in. in diameter shall be laced horizontally through the frames at 6 in. on centers near outside face, (.... in. on centers in the middle) and 12 in. on centers near inside faces of walls or slabs.

All units shall interlock at all intersections of walls, and of walls and slabs, and special provision shall be made at door openings to strengthen the connections between door frames and vestibules and the reinforced concrete walls.

All units shall be completely shop fabricated and shipped ready to place. They shall all be tagged with an erection mark corresponding to the marks on the drawings furnished by the manufacturer.

Note: This specification applies only to the vertical type. Specification covering our horizontal type is especially written for each individual vault.

Drawings—The Rivet-Grip Steel Co. shall furnish complete placing drawings showing the exact location of each frame and spacer bars. Two sets of prints of approved placing plans and detail shall be furnished for use in placing steel.

Concrete—Shall be proportioned of 1 part portland cement, 2 parts clean, siliceous sand, and 3½ parts quartz gravel or crushed stone. The use of crushed stone is not recommended where frames are spaced closer than 2 in. on centers.

A Few Installations

Eight Federal Reserve Banks (see preceding page)
Bank of America, New York, N. Y.
Mellon National Bank, Pittsburgh, Pa.
Bank of Manhattan Co. (10 branches), New York, N. Y.
Corn Exchange Bank (7 branches), New York, N. Y.
First National Bank, Youngstown, Ohio
United Banking & Trust Co., Cleveland, Ohio
Citizens National Bank, Washington, Pa.
Essex County Trust Co., East Orange, N. J.
Farmers Loan & Trust Co., New York, N. Y.
Capitol Building & Loan Association, Topeka, Kan.
The Union Trust & Savings Bank, Dubuque, Iowa
Union Bank & Trust Co., Huntington, W. Va.
Nashville Trust Co., Nashville, Tenn.

SARGENT & GREENLEAF, INC.

Bank Hardware

GENERAL OFFICES AND WORKS
Norton Street and Joseph Avenue
ROCHESTER, N. Y.

NEW YORK OFFICE, 70 Fifth Avenue
CHICAGO OFFICE, 166 West Lake Street
SPRINGFIELD, MASS., OFFICE, 360 Worthington Street

Products

TIME, COMBINATION, SAFE DEPOSIT and KEY LOCKS for Banks: for Vault Doors and Gates, Cashiers' Lockers, Safe Deposit Boxes, Grille Gates, Tellers' Cages and Wickets.

CABINET and LOCKER LOCKS.
GEM NIGHT BOLTS.
LAVATORY HARDWARE.

Also manufacturers of:
Locks for Wire Workers
Locks for Sliding Doors and Gates
Locks for Special Purposes

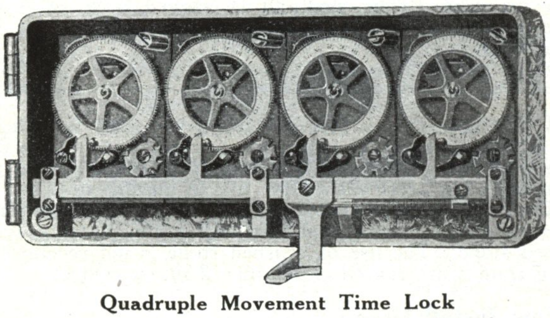
Jail Locks
Door Pulls
Push Plates
Door Stops
Desk Locks
Mausoleum Locks
Mortise Night Latches
Casement Window Pulls
Fire Alarm Trap Locks
Metal Box Locks
Mail Chute Locks
Filing Case Locks
Kalamein Door Locks
Elevator Door Locks

Standard Bank Lock Specifications

(1) Sargent & Greenleaf locks shall be furnished unless written permission for substitution is granted the contractor before his bid is submitted.

Main Vault Door

Time Lock—(2) Furnish one 72-hour quadruple movement time lock, all parts including the movement to be made by lock manufacturer in its own factory. Hair springs shall be non-corrosive and non-magnetic. Each movement shall have a reserve power to lift at least fifteen pounds when movement is at zero. Strength of "train" to be proportioned to spring power.



Quadruple Movement Time Lock

Manufacturer shall furnish guaranty against defects in material or workmanship for one year after which period an inspection and cleaning service is to be maintained.

Finish of all exposed parts of the lock shall match the bolt work.

(3) *Note:* Should a triple or double movement be desired, substitute the one desired in preceding paragraph.

Combination Lock—(4) Furnish two four-wheel, key-changing combination locks having a minimum of one hundred million changes and having extension bolts of positive actuating mechanism and outside spindle drive. Wheels shall be of "positive locking" type. Bolt actuating mechanism to have no springs or friction tubes.

Dials and dial rings shall be cast bronze with black enamel finish and with one hundred numbers and graduations filled with white enamel.

Finish of all exposed parts of the lock shall match the bolt work.

Vault Emergency Door

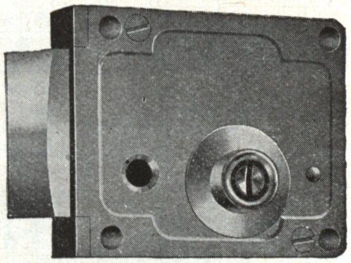
Time Lock—(5) Same as paragraph 2.

(6) Same as paragraph 3. Covers shall be locked in place by either the combination or by separate key locks set in the covers.

Combination Locks—(7) Same as paragraph 4.

Vault Day Gate

(8) Furnish one spring bolt lock No. 57. Lock shall be steel bushed and operative by push knob from inside and by key from outside. Tumblers and fences shall be serrated. Lock shall be mounted back of frame and covered by finish plate outside. Bolt shall pass through frame. Lock case finish shall match polished steel gate.



No. 57 Iron Workers' Lock

Cashiers' Lockers

Combination Locks—(9) Same as paragraph 4, except that first line shall read "Furnish two C-71-E key changing combination locks."

Safe Deposit Boxes

Locks for Boxes 2 in. Deep and Larger—(10) Furnish No. 359½ changeable key safe deposit locks or 4259½ single horn. Case shall be cast bronze with cast bronze horn, cast integral with lock cover. Tumblers and fence shall have serrated edges. Tumbler gating shall be sawed, not punched.

Locks for 1½ and 1¾-in. Boxes—(11) Furnish one safe deposit lock No. 260 for each door. Case shall be cast bronze with cast bronze horn cast integral with lock cover. Tumblers and fence shall have serrated edges. Tumbler gating shall be sawed, not punched.

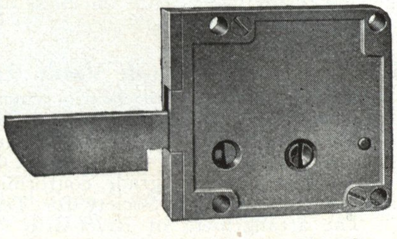
(12) *Note:* When installation contains large and small boxes use both paragraphs 10 and 11 and add to paragraph 11, "These locks shall be set to same preparatory key as the No. 359½ lock specified in paragraph 10."

Note: For locks with double horns see Bank Lock Catalog.

Grille Gates

Swinging Gates—(13) Furnish one spring bolt lock No. 57 which shall be steel bushed with key operative both sides. Tumblers and fences shall be serrated. Locks shall be master-keyed as instructed.

Lock shall be mounted back of frame and covered by finish plates both sides. Bolt shall pass through the frame. Case finish shall match polished steel gate.



No. 57½ Iron Workers' Lock

Sliding Gates—(14) Furnish spring bolt lock No. 57½ steel bushed. Locks shall be operated by key both sides and master-keyed as instructed.

Locks shall be attached back of frame with bolt passing through frame. Bolt shall be guarded against lifting with any thin instrument inserted in jamb. Finish plates on both sides. Key horns shall extend through the plates.

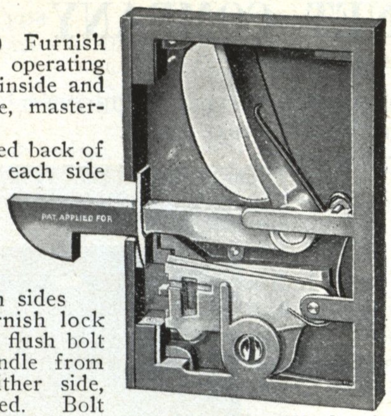
Continued on next page

Tellers' Cages

Sliding Gates—(15) Furnish spring bolt lock No. 222 operating by sunken handle from inside and by key from either side, master-keyed as instructed.

Locks shall be attached back of frame with finish plates each side and with bolt passing through frame. Bolt shall be guarded against lifting with any thin instrument inserted in jamb. Finish plates both sides

Alternate—(16) Furnish lock No. 226 with self-locking flush bolt operating by sunken handle from inside and key from either side, master-keyed as directed. Bolt shall be guarded against lifting with any thin instrument inserted in jamb. Finish plates on both sides.



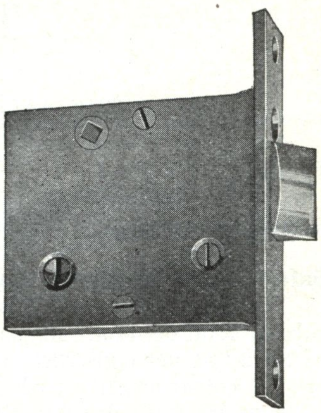
No. 222 Wire Workers' Lock

Swing Gates—(17) Furnish mortise latch No. 11 with spring bolt operating by knob from inside and key from outside, master-keyed as instructed. Tumblers and fences shall be serrated. Finish plates on both sides of gate.

Tellers' Wickets

Swing Wickets—(18) Furnish spring latch No. 310½ key operating inside only. Tumblers and fences shall be serrated.

Alternate—(19) Furnish one lock No. 310-R with interlocking striker and key operating inside only.



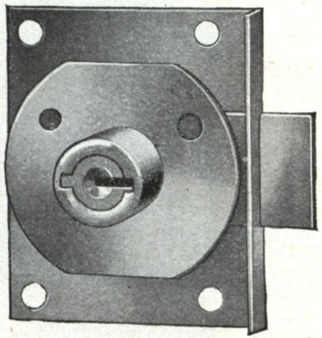
No. 11 Wire Workers' Lock

Cabinet Locks

The No. 028 cabinet lock is used for cabinets of all kinds especially in schools on manual training benches or other places where it is desired to use locks in sets with a master key for each set and all sets being grand master-keyed.

These locks have cast bronze cases, are 1⅞x2⅛ in. and have a bolt throw of ⅜ in. Made for various thicknesses of wood.

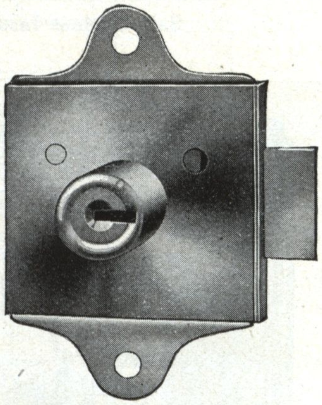
This lock has four tumblers with sufficient changes for all practical purposes.



No. 028 S. & G. Cabinet Lock

Locker Locks

These are exceptionally strong and secure locks, with cast bronze cover and horn, heavy bolt, six tumblers capable of thousands of changes, master-keyed as desired.



S. & G. Locker Lock

Builders' Hardware Trimmings

S. & G. push plates, door pulls, sash lifts, door stops, etc., are of heavy cast bronze and of highest quality. Write for illustrated pamphlet.

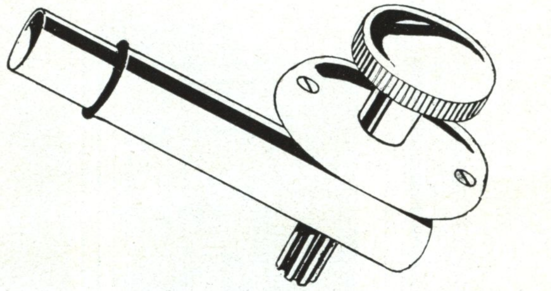
Prison Locks

S. & G. prison locks are on Sing Sing Prison at Ossining, N. Y.

For full information write for catalogue.

Gem Night Bolts

The Gem night bolt is simple and effective for final security. The knob and rose are of bronze or brass. The bolt is of cold rolled steel and it has sufficient throw so that a jimmy can not force it. The action is on the rack and pinion principle, assuring reliable operation.

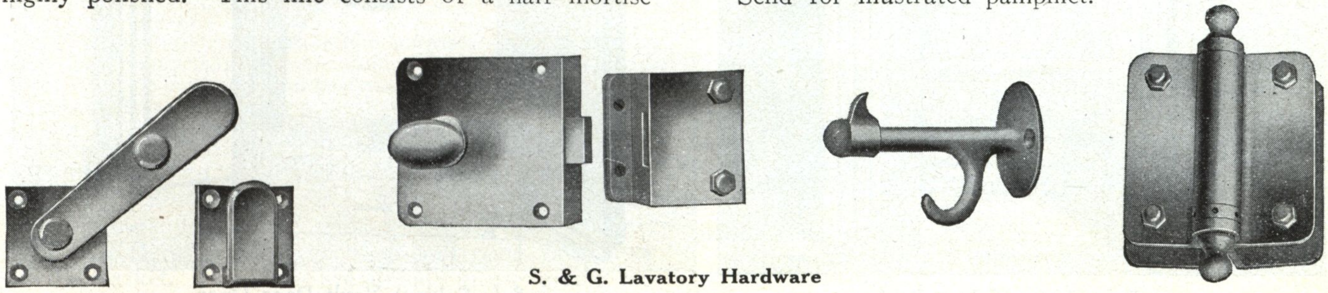


Gem Night Bolt

Lavatory Door Hardware

S. & G. lavatory door hardware is made of very heavy cast bronze or brass with a heavy nickel plate highly polished. This line consists of a half mortise bolt, a throw latch and strike, spring hinges, a combination coat hook and door bumper, and an indicator plate.

Send for illustrated pamphlet.



S. & G. Lavatory Hardware

THE SAFE-CABINET COMPANY

234 Green Street, MARIETTA, OHIO
THE SAFE-CABINET COMPANY OF CANADA, LIMITED, TORONTO, ONT.
BRANCHES AND AGENCIES IN 150 PRINCIPAL CITIES

Product

The Safe-Cabinet Insulated Door, a Certified Vault Door affording *permanent protection.*

Safe-Cabinet Insulated Vault Doors

Construction and Advantages—Safe-Cabinet insulated vault doors are insulated on the proven principles of Safe-Cabinet construction and built with tongue and groove construction on all four edges of both doors. Gaskets break the direct contact of metal on metal. This insures a tight, uniform joint.

Safe-Cabinet Insulated Vault Doors are handsome, massive and well balanced. The standard finish is a rich olive green with gold striping. Special finishes are available.

A foot bridge which is hinged and can be folded back when doors are to be closed, provides a smooth surface for omnibuses.

The clear width of the entrance is 32 inches—several inches more than in most vault doors.

The high heat-resistance of Safe-Cabinet Insulated Vault Doors makes inner or vestibule doors unnecessary—obviously, a great advantage.

Severe Exposure Type

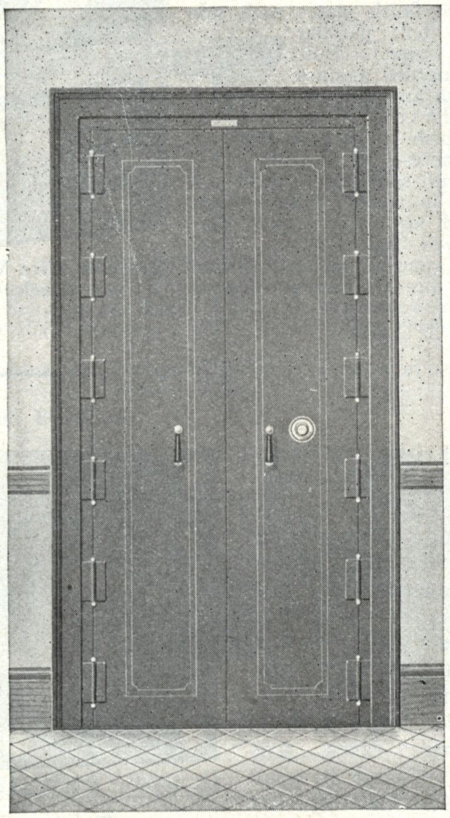
Over-all Dimensions—47 inches wide, $87\frac{9}{16}$ inches high.

Net Dimensions of Door Opening—32 inches wide, 76 inches high.

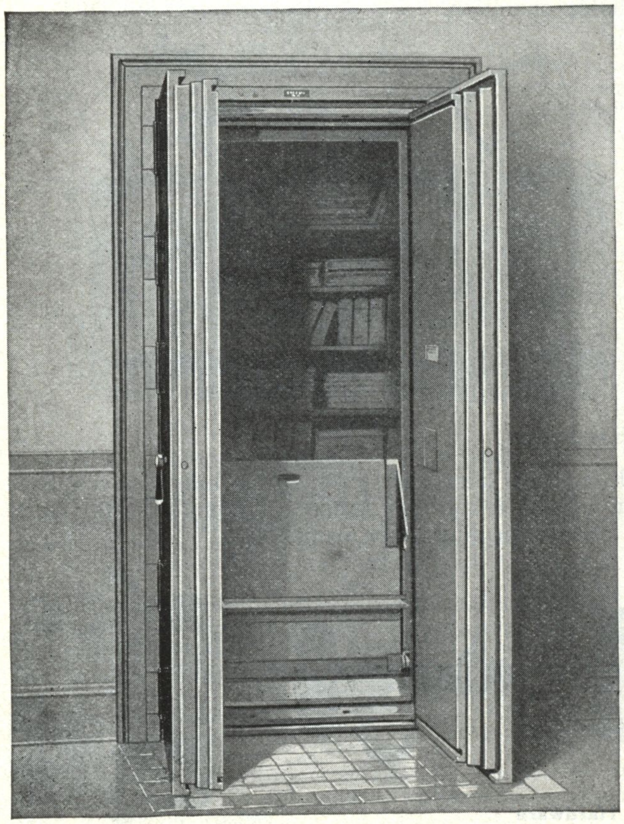
Door Thickness—5½ inches.

Lock—Yale 4-tumbler combination lock.

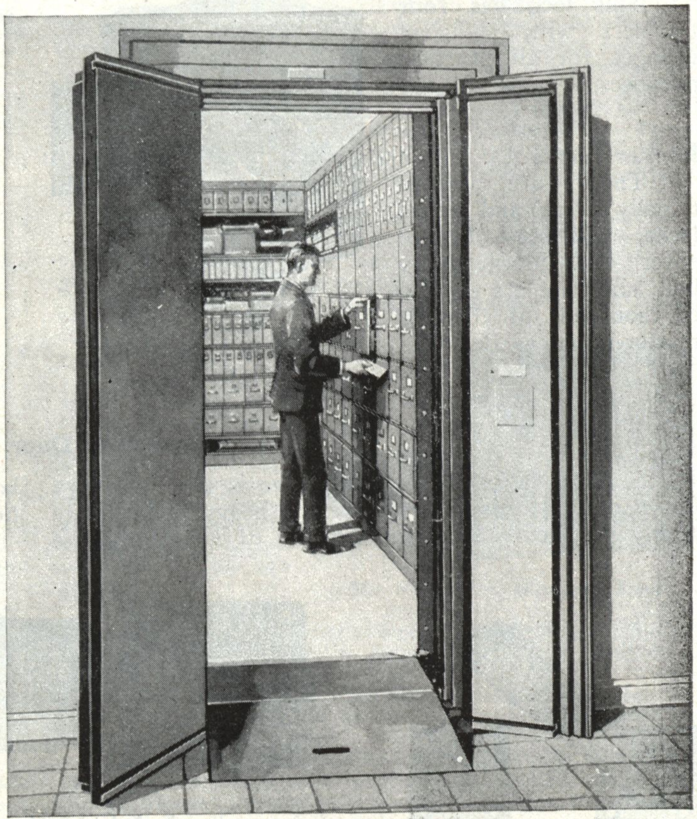
Laboratory Label—Bears Severe Exposure (S.E.) Label.



Safe-Cabinet Insulated Vault Door



Foot Bridge Folded Back



Safe-Cabinet Vault Door Open

Continued on next page

Medium Exposure Type

Over-all Dimensions—47 inches wide, $87\frac{9}{16}$ inches high.

Net Dimensions of Door Opening—32 inches wide, 77 inches high.

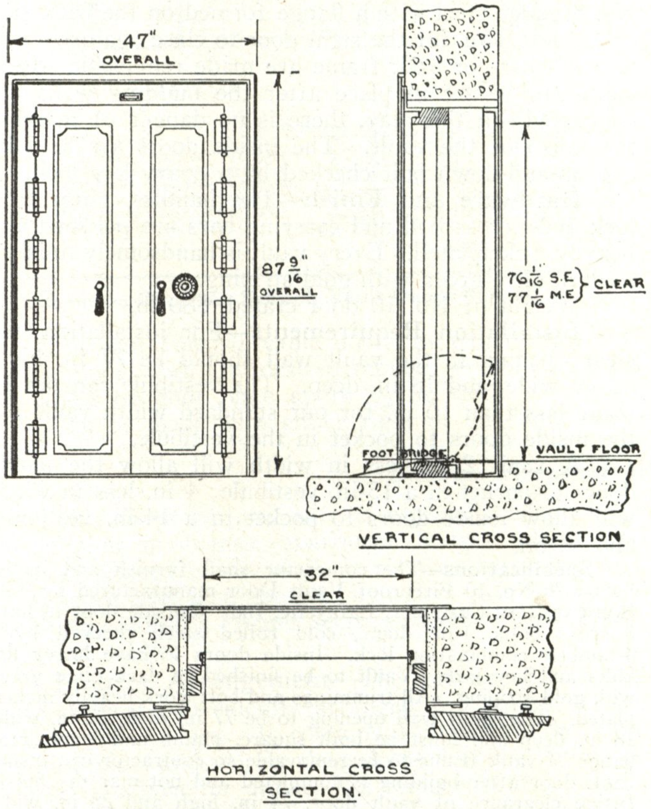
Door Thickness—4 inches.

Lock—Yale 4-tumbler combination lock.

Laboratory Label—Bears Medium Exposure (M.E.) Label.

Why Safe-Cabinet Doors Are Recommended

No one would recommend an entire vault built with outer walls of $\frac{1}{4}$-inch steel plates, inner walls of No. 14 gauge steel, cracks at every joint, and only air space for insulation. Such construction would not make a good vault, *and can not possibly make a good vault door. For a chain is no stronger than its weakest link.*



Dimension Diagram

Among the very first constructive acts of the Committee on Protection of Records, appointed in 1923 by The National Fire Protection Association, was the recognition of fundamental weaknesses in the ordinary type vault door.

The National Fire Protection Association official convention report for 1924 says:

> "There is grave doubt as to the adequacy of many ordinary non-insulated steel vault doors, even of the vestibule type, to resist long continued exposure to high temperatures in a way that will assure the safety of the vault contents which they are intended to protect.
>
> "For practical record protection purposes, there is genuine need for commercially available vault doors at reasonable price which shall be comparable in heat resisting quality to the form of construction that has been developed for fire resistive safes of the better quality, and in various classes as to duration of resistance to heat attack."

The Safe-Cabinet Company, through its unequalled facilities for research, long ago recognized this need, and in July, 1923, announced the Safe-Cabinet Insulated Door, the first certified protection vault door on the market. Hundreds are already in use, giving satisfaction and needed security to large and small businesses, the records of which they protect.

Specification

The following specification assures a modern insulated, certified protection vault door. Degree of heat resistance being the essential factor, this specification is primarily for tested performance rather than for material technique:

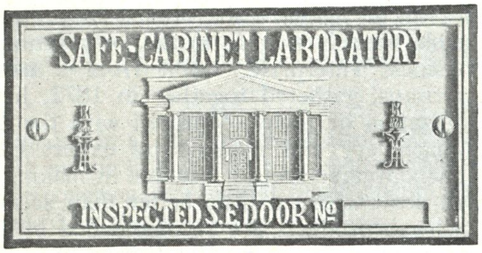
Vault Door—

(1) Vault door is to be of insulated type bearing label of certification as to:

(1-A) That doors of the type designated by label are effective in withstanding, after free moisture (moisture evaporatable at normal temperatures) in insulation has been reduced to less than 1%, standard fire tests for vault doors as follows: Uniform exposure to heat on face of door, according to standard test schedule, reaching 2000° F. at end of three hours.

Rated heat resistance of the door to be the period of above test before temperature *inside* the vault chamber reaches 300° F.

Each bid to be accompanied by the manufacturer's test chart for the door bid upon, showing temperatures prevailing against the outer face of door and also inside the vault chamber during test.



Label for Safe-Cabinet (S. E. Type)

Note: Select quality grade desired from two specifications following: Door to be capable of withstanding *extra hazardous exposure* (Safe-Cabinet S.E. Type). Weight of vault door complete with vestibule and all parts is not to exceed 50 pounds per square foot of surface in over-all face of door and frame.

Door to be capable of withstanding *moderately hazardous exposure* (Safe-Cabinet M.E. Type). Weight of vault door complete with vestibule and all parts not to exceed 40 pounds per square foot of surface in over-all face of door and frame.

SAFE-CABINET LABORATORY
INSPECTED M.E. DOOR No

Label for Safe-Cabinet (M. E. Type)

(1-B) Insulation used shall be free from rust producing elements.

(2) Door—To be equipped with folding footbridge to permit easy ingress and egress for vault omnibus.

(3) Finish to be as follows: All exposed parts, three coats baked on enamel; color to be a standard olive green (or to match sample herewith): front face and inside face of doors to be hand rubbed. Inside surfaces of doors exposed to insulation to be two coats pure red lead and pure linseed oil baked on.

(4) Lock—To be non-drivable pinion, Yale & Towne, four-tumbler combination type.

(5) Door opening—To be 32 inches wide and at least 76 inches high, *in the clear.*

(6) Wall opening—The front opening 40 inches wide by 84 inches high. One-half inch pit beginning at the front face of the wall and extending for the full thickness of the wall should be built into the lower side of the opening. There is to be a difference in floor levels of 3 inches in the M. E. and $3\frac{9}{16}$ inches in the S. E. between the main floor and the vault floor. This dimension does not include the $\frac{1}{2}$-inch pit.

(7) The opening should be plumb and a good level surface furnished at the bottom.

Information

For further data see your file "Vault Doors—Insulated—18G," or write to us.

THE SCHWAB SAFE COMPANY

Fireproof Safes and Vault Doors

LAFAYETTE, IND.

TRADE-MARK

Products

Fireproof Vault Doors for offices, business buildings.

Fireproof Wall Safes for offices, homes, apartment houses.

Fireproof Filing Safes for offices, etc.

Also manufacturers of Filing Specialties, and Desk Safes.

The Company and Its Products

The high quality of the products and service offered by this company is attested by its record of a half century of commercial development. The Schwab Safe Company was founded to give the rapidly expanding commerce of the country the utmost in protection for the valuable records that form the very foundation of every business enterprise. And from a handful of skilled artisans, gathered together in 1872, has grown the organization of today, equipped with the most up-to-date machinery and manned by expert craftsmen, many of whom have spent a lifetime in making Schwab protective devices just a little better than seems necessary. Schwab products are recommended by our fifty years of experience, progress and stability.

Schwab Vault Door, Style No. 10

This style vault door has met with great success and is in growing demand.

Outside Door—The outside door is constructed of No. 10 gauge Bessemer steel plate, stiffened on the edges by 2x2x$\frac{3}{16}$-in. steel angle frame solid welded at all corners, making a very rigid door. The lock rail extends from front angle to rear angle and is made of 4x$\frac{1}{4}$-in. steel. Bolt work on the outside door consists of 3 horizontal bolts, 1-in. diam., made of cold drawn steel, and is checked by a 4-tumbler OB combination lock with an indirect dogging device. The outside door is hung on heavy pin hinges securely fastened to the frame and door, and is finished with ornamental hinge tips. The outer frame or sill bars are constructed of $3\frac{1}{2}$x$\frac{3}{16}$-in. steel bars solid welded at all corners. These sill bars are connected to the vestibule by $1\frac{1}{2}$x$1\frac{1}{2}$x$\frac{3}{16}$-in. angles, having a 1x$\frac{3}{8}$-in. steel bar between frame and angle, forming a steel flange for a bumper on the top, bottom and front. A recess is formed between the outer sill bar and angle at the back to correspond with a projection on the door to interlock the door and frame together when the door is shut.

Vestibule—The vestibule is constructed of No. 16 gauge steel plates overlapping at the corners and securely fastened to the frames which are made of $1\frac{1}{2}$x$1\frac{1}{2}$x$\frac{3}{16}$-in. steel angles.

Inside Doors—The inside doors are made in pairs and pocket into the vestibule. They are constructed of No. 8 gauge steel with a flange formed on the back side of the left door for the right door to close against. The rear sill bars or back frame are made removable so the vault can be set in place after the building walls are completed—in this way, there is no danger of marring the finish of the vault. The inside doors are held by one up-and-down bolt checked by a heavy key lock.

Hardware and Finish—The handles, hinge tips, lock dials, cross bolt and carrying bars are polished and heavily nickelplated. Every vault is handsomely finished in dark olive green with gold striping.

Weight of No. 10 door crated, 580 lb.

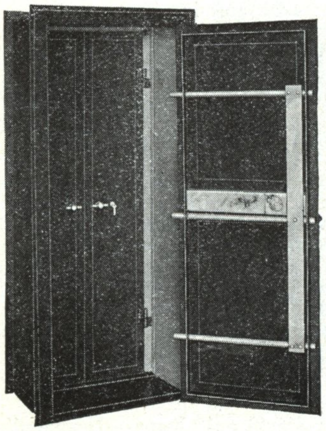
Installation Requirements—For installation, the clear opening in the vault wall should be 77 in. high, 32 in. wide, and 18 in. deep. The vestibule can not be made less than 16 in. for our standard width vault for the inside doors to pocket in the vestibule.

A vault 2 in. less in width will allow the inside doors to pocket in a 15-in. vestibule; 4 in. less in width will allow inside doors to pocket in a 14-in. vestibule, and so on.

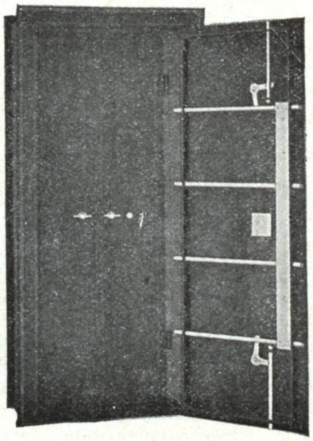
Specifications—The contractor shall furnish and install Schwab's No. 10 Fireproof Vault Door manufactured by The Schwab Safe Company, Lafayette, Ind. Outside door to have 3 cross bolts, 1-in. diam., cold rolled steel, checked by a 4-tumbler combination lock. Inside doors to have heavy flat bolts and key lock. Vault to be finished in dark olive green with gold striping. All trimmings and bolt work heavily nickelplated. The vault wall opening to be 77 in. high, 32 in. wide, 18 in. deep and must be built square, plumb and level; rear flange of vault frame to be removable so contractor can install vault door after building is completed and not mar the finish. Inside clearance of vault door, 74 in. high and 28 in. wide. Approximate weight, 580 lb.

Schwab Vault Door, Style No. 20

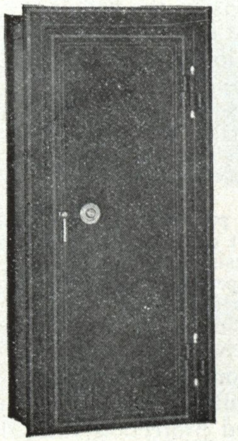
This style is similar in construction to the No. 10 vault door. Bolt work on this door, however, consists of 4 horizontal bolts, and one up and one down bolt, 1-in. diam., of cold drawn steel. Crated weight, 620 lb.



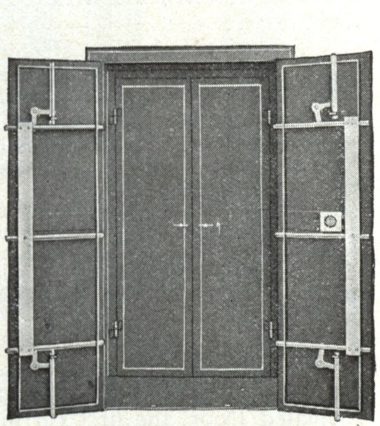
Style No. 10



Style No. 20, Open



Style No. 20, Closed



Style No. 25 Double Vault Doors

Schwab Vault Doors

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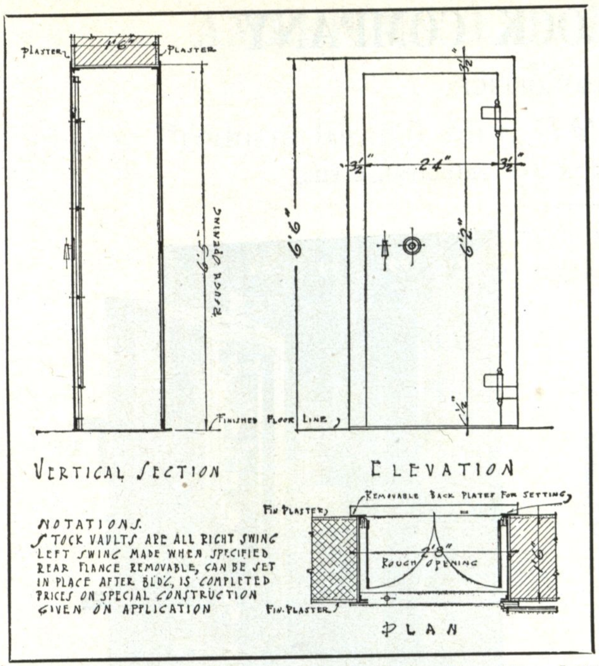

PLASTER
1'6"
PLASTER
6'5" ROUGH OPENING
FINISHED FLOOR LINE
VERTICAL SECTION
3½"
2'4"
3½"
6'6"
6'2"
½"
ELEVATION
NOTATIONS.
STOCK VAULTS ARE ALL RIGHT SWING
LEFT SWING MADE WHEN SPECIFIED
REAR FLANGE REMOVABLE, CAN BE SET
IN PLACE AFTER BLD'G, IS COMPLETED
PRICES ON SPECIAL CONSTRUCTION
GIVEN ON APPLICATION
FIN. PLASTER
REMOVABLE BACK PLATES FOR SETTING
2'8"
ROUGH OPENING
1'6"
FIN. PLASTER
PLAN

Dimension Diagram, Schwab Vault Doors Nos. 10 and 20

We can furnish vault doors in either double or single door, with any desired number of bolts and any thickness of door plate up to ½ in. thick.

Can be made with either right or left-hand swing doors and proper size to fit any vault wall opening.

Send for complete information and prices.

Schwab Filing Safes

This company manufactures a full line of filing safes and cabinets in convenient stock sizes, or to special order. These products bear the approval of the Underwriters' Laboratories, Inc., and have withstood the severest tests in actual use.

We quote herewith a letter from a user, a doctor, to indicate how well our product stood an actual test:

> "The disastrous fire of Jan. 12, which destroyed the Ruff Building, destroyed everything in my office except what I had in my No. 27 Filing Safe. This safe fell from the second floor to the basement.
>
> I had thousands of dollars worth of accounts and records as well as other valuables in this safe.
>
> This was a severe test as the building was completely destroyed, and I must confess I was somewhat concerned about the safe's heat-resisting qualities, but on opening it I was more than delighted to find the contents in perfect condition. The safe has measured up to all claims made for it by your Mr. Meyers, and I heartily recommend the Schwab line of Fireproof Safes and Filing Safes to any one contemplating the purchase of a safe or filing safe. I have ordered a duplicate of the first one."

Services

We maintain at all times a carefully selected group of experts in our line and will be glad to receive correspondence covering any special requirements as well as our standard products.

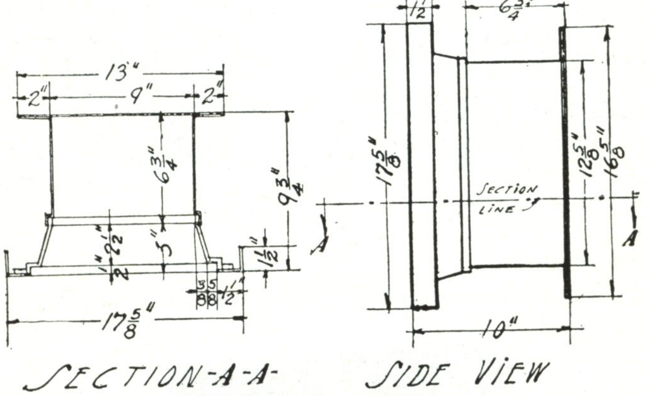
Catalogues will be sent on request without obligation.

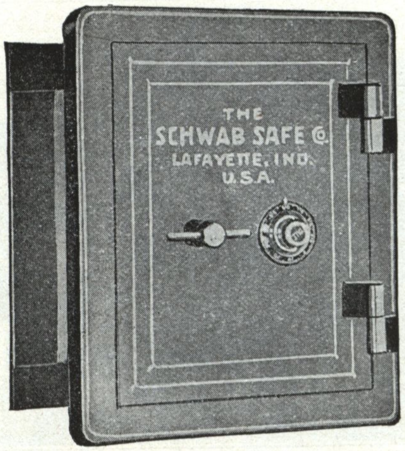
Schwab Fireproof Wall Safe, Style No. 10

This fireproof wall safe is especially adapted for installation in homes, apartment houses, offices and hotels. Placed in the wall, it releases for other uses floor space otherwise occupied by a floor safe and, at the same time, affords greater secrecy together with protection and safety.

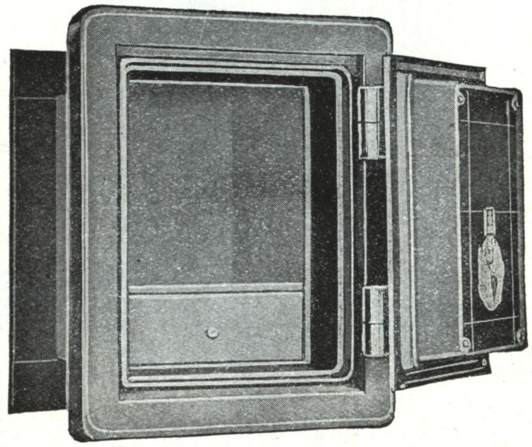
Interior Arrangement—The interior of this wall safe is most conveniently arranged for utmost service and facility of use. It contains 1 drawer, 3 in. high, 8½ in. wide, and 6½ in. deep, located at the bottom of the safe. Above the drawer is a compartment for books or other articles that is 8 in. high, 8½ in. wide, and 7 in. deep.

Construction—This safe is sturdily constructed throughout. The door is insulated 2½ in. thick, and has regular T-handle and combination lock, and tongue and grooved door and frame. There is a $\frac{3}{16}$-in. back plate to anchor in the wall, and to prevent tampering from the back. The approximate weight of the safe is 75 lb.


13"
2"
9"
2"
6¾"
9¾"
2½"
3"
2"
1½"
⅜ ⅝ ½"
17⅝"
A
SECTION-A-A-
½
6¾"
17⅝"
12⅝"
16⅝"
SECTION LINE
A
10"
SIDE VIEW


THE
SCHWAB SAFE Co.
LAFAYETTE, IND.
U.S.A.

Schwab Fireproof Wall Safe, Closed
Outside dimensions: height, 16¾ in.; width, 14 in.; depth, 10 in.



Schwab Fireproof Wall Safe, Open
Inside dimensions: height, 11½ in.; width, 8½ in.; depth, 7 in.

YORK SAFE AND LOCK COMPANY

FACTORY AND HOME OFFICE

YORK, PA.

BRANCH OFFICES AND SALESROOMS IN ALL PRINCIPAL CITIES

Bank and Safe Deposit Vaults

We are designers and builders of bank and safe deposit vaults, large and small; safes, safe deposit boxes and other vault equipment.

Established standard sizes and styles usually in stock for quick shipment. Especially constructed vaults in minimum time.

Fireproof Vault Doors

All sizes and styles. Catalogue on request.

Safes

Fireproof, and fire-and-burglar-proof safes. All styles and sizes for every required use. New types are constantly being designed and built for special purposes—for wholesale and retail jewelers, for furriers, for silk dealers, and for other trades whose stock being portable and extremely valuable must be protected from fire and thieves.

New Type of Safe for Gasoline Stations

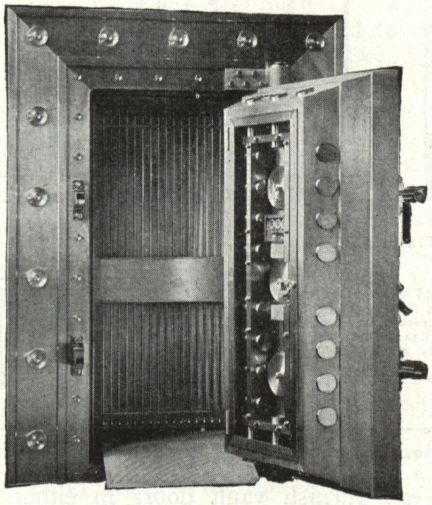
We have just designed an entirely new type of safe for gasoline stations, for theaters, for restaurants, and all businesses where large sums of money are taken in throughout Saturday afternoon and night and throughout Sundays and holidays, and which can not be deposited in bank before the following day. This type of safe is now meeting with a large sale.

Plans and Specifications

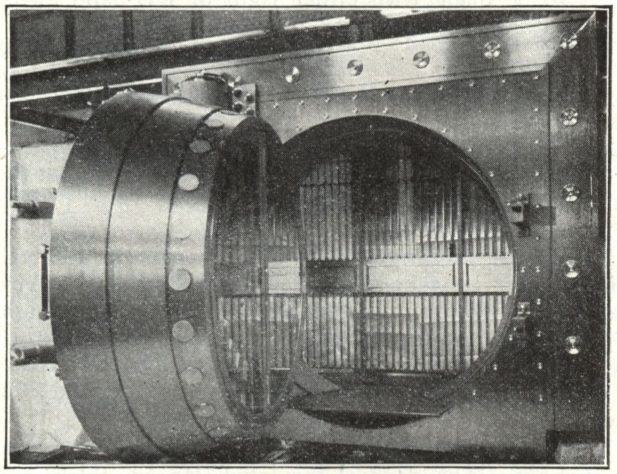
Inquiries from architects solicited. Plans and specifications to suit requirements furnished without charge or other obligations.

Illustrations

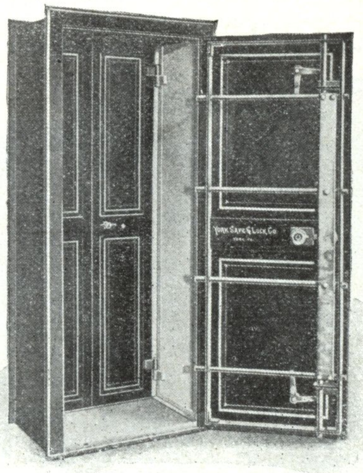
Standard and especially constructed types shown.



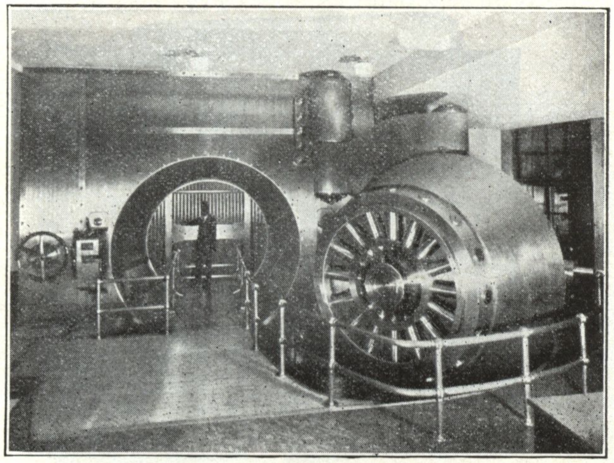
Standard Bank and Safe Deposit Vault Door
Rectangular type. Made in door thicknesses from 6 to 36 in.



Standard Bank and Safe Deposit Vault Door Circular Type
Made in thicknesses from 8 to 48 in.



Fireproof Vault Door
Standardized to fit wall opening 78½ in. high, by 31½ in. wide, and for walls 20 in. thick, including finish.
Wall thickness can be increased or reduced to suit requirements



Circular Main Entrance, 48 in., Federal Reserve Bank, Cleveland, Ohio

AMERICAN TAR PRODUCTS COMPANY

INCORPORATED

Coal Tar Products for Roofing, Waterproofing, Wood Preserving and Paving

GENERAL OFFICES

Union Trust Building
PITTSBURGH, PA.

ST. LOUIS, MO. MILWAUKEE, WIS. YOUNGSTOWN, OHIO BIRMINGHAM, ALA. STEUBENVILLE, OHIO ROCKTON, ILL. CHICAGO, ILL.

Products

ROOFING MATERIALS:

For flat roofs: AMERICAN SPECIFICATION, a Built-up Roof Covering.

For steep roofs: ATP PREPARED ROOFING, smooth or slate surface.

FELTS, insulating and deadening.

OLD STYLE PITCH, for Roofing, Waterproofing and Paving.

Also Tar-Mac, a bituminous Road Binder for Paving.

ATP Wood Preserver, a pure coal tar creosote, highly refined, for preservation of timber.

ATP Roof Cement, a tough adhesive, elastic waterproof cement.

ATP Fiber Coating, especially designed for the coating of old roofs.

ATP Metal Paint, prepared for the preservation and protection of iron and steel.

Specifications and Information

Copy of American specifications and complete information on any of our products sent on request.

The American Specification

This is a built-up roof covering for use over boards or concrete.

It is approved by the Underwriters' Laboratories, Inc. Standard Class A.

TRADE-MARK

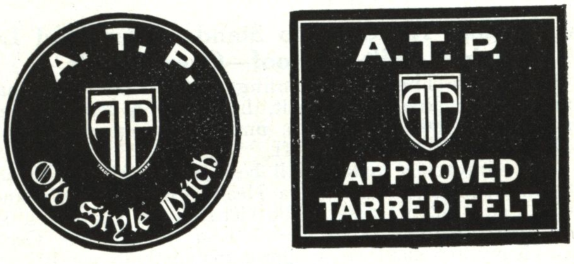
Tarred Felt

Made from the best quality of dry felt. Saturated with just the proper amount of pure dehydrated coal tar, thereby insuring a finished product of uniformity and maximum lasting qualities.

Thoroughly seasoned before shipment.

ATP Approved Tarred Felt, put up in rolls of 432 sq. ft. each, 32 in. wide and weighing approximately 65 lb. per roll.

ATP Tarred Felt, put up in rolls of 432 sq. ft. each, 32 in. wide and weighing approximately 55 lb. per roll.


A. T. P.
ATP
Old Style Pitch
A.T.P.
ATP
APPROVED
TARRED FELT

LABELS

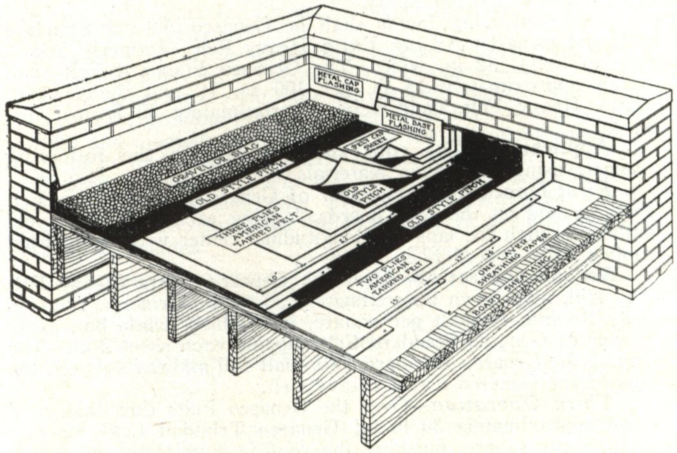
ATP Old Style Pitch

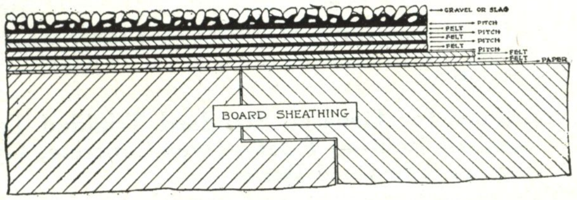
A pure coal tar product. Distilled under the most modern and scientific methods, insuring the highest binding efficiency and greatest durability. Our supply of crude tar from large sources insures a uniform product.

ATP Old Style Pitch is put up in barrels (light or heavy cooperage) weighing approximately 400 to 600 lb. each.

Inspection

Thorough inspection is made of all felt and pitch before shipping.


METAL CAP FLASHING
METAL BASE FLASHING
FELT CAP SHEET
GRAVEL OR SLAG
OLD STYLE PITCH
OLD STYLE PITCH
OLD STYLE PITCH
THREE PLIES AMERICAN TARRED FELT
TWO PLIES AMERICAN TARRED FELT
ONE LAYER SHEATHING PAPER
BOARD SHEATHING
22"
10"
17"
36"
15"


GRAVEL OR SLAG
PITCH
FELT
PITCH
FELT
PITCH
FELT
PITCH
FELT
FELT
PAPER
BOARD SHEATHING

DETAILS AND ENLARGED SECTION OF AMERICAN SPECIFICATION BUILT-UP ROOFING OVER BOARDS (5-PLY)

THE BARBER ASPHALT COMPANY

Asphalt Built-up Roofing, Shingles and Waterproofing

PHILADELPHIA, PA.

NEW YORK, N. Y., Woolworth Building
PITTSBURGH, PA., Peoples Savings Bank Building
ST. LOUIS, MO., International Life Building
SAN FRANCISCO, CAL., Phelan Building
KANSAS CITY, MO., Finance Building
CHICAGO, ILL., Union Trust Building

Products

Genasco Standard Trinidad Lake Roofing Asphalt.

Genasco Asphalt Saturated Felt.

Genasco Ready Roofings (Smooth and Slate Surface).

Genasco Latite Shingles.

Genasco Waterproofing Felts and Fabrics.

Genasco Asphalt Mastic.

Genasco Industrial Paint; Genasco Acid-proof Paint.

Also producers of Trinidad Lake Asphalt; Bermudez Road Asphalt; Gilsonite; Genasco Waterproofing Asphalts (solid and liquid); Genasco Asphalt Tile Cement; Genasco Asphalt Pipe Coating; Genasco Asphalt Fibre Coating; Genasco Asphalt Roof Coating; Genasco Battery Paint; Genasco Battery Seal Asphalt; Genasco Asphalt Putty; Genasco Deadening Felt; Genasco Insulating Paper; Genasco Red Sheathing Paper; Genasco Stringed Felt; Genasco Wall Lining; Genasco Sealbac Shingles (individual and strips); Genasco Stucco Base; Genasco Elastic Boiler Cement.

Reg. U. S. Pat. Off.

TRADE-MARKS

Specifications for Genasco Standard Trinidad Lake Asphalt Built-up Roof—Over Boards

Materials—The waterproofing factor shall be Genasco Trinidad Lake Roofing Asphalt, heated to a temperature of approximately 400° to 500° F., uniformly mopped, using approximately 30 lb. per 100 sq. ft.

The reinforcing factor shall be Genasco All-rag Standard Felt and Genasco All-rag Extra Heavy Felt (formerly known as Cap Felt), 32 in. wide. The Genasco Standard Felt shall weigh approximately 15 lb. per 100 sq. ft. and the Genasco Extra Heavy Felt shall weigh approximately 30 lb. per 100 sq. ft.

Application—The roof shall be laid in the following manner, using the above materials:

First Operation—1 layer of Genasco Extra Heavy Felt shall be laid on the roof boards, lapping each sheet 2 in. and nailing through the laps and longitudinal center with broad head roofing nails, spaced 12 in. apart.

Second Operation—Over the Genasco Extra Heavy Felt thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 2 layers of Genasco Standard Felt, lapping each sheet 17 in. and mopping the full width of the lap, using approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square.

Third Operation—Over the Genasco Felts thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, finishing the roof in a uniform and workmanlike manner.

APPROXIMATE QUANTITIES OF MATERIAL FOR 100 SQ. FT. OF ROOF SURFACE

1 layer Genasco Extra Heavy Felt	30 lb.
2 layers Genasco Standard Felt	30 lb.
3 layers Genasco Trinidad Lake Roofing Asphalt	90 lb.
	150 lb.

This roof contains 122 lb. of waterproofing factor and 28 lb. of reinforcing factor, or 81% waterproofing factor and 19% reinforcing factor.

Specifications for Genasco Standard Trinidad Lake Asphalt Built-up Roof—Over Concrete, Gypsum or Tile Roof Decks

Materials—The primer shall be Genasco Concrete Primer.

The waterproofing factor shall be Genasco Trinidad Lake Roofing Asphalt, heated to a temperature of approximately 400° to 500° F., uniformly mopped, using approximately 30 lb. per 100 sq. ft.

The reinforcing factor shall be Genasco All-rag Standard Felt and Genasco All-rag Extra Heavy Felt (formerly known as Cap Felt), 32 in. wide. The Genasco Standard Felt shall weigh approximately 15 lb. per 100 sq. ft. and the Genasco Extra Heavy Felt shall weigh approximately 30 lb. per 100 sq. ft.

Application—The roof shall be laid in the following manner, using the above materials:

First Operation—After the roof deck has become thoroughly dry and set hard, prime the concrete with Genasco Concrete Primer, using approximately 10 lb. (1¼ gal.) per square.

Second Operation—Over the concrete thus primed, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 1 layer of Genasco Extra Heavy Felt, lapping each sheet 2 in.

Third Operation—Over the Genasco Extra Heavy Felt thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 2 layers of Genasco Standard Felt, lapping each sheet 17 in., mopping the full width of the lap, using approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square.

Fourth Operation—Over the Genasco Felts thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, finishing the roof in a uniform and workmanlike manner.

APPROXIMATE QUANTITIES OF MATERIAL FOR 100 SQ. FT. OF ROOF SURFACE

1 layer Genasco Concrete Primer	10 lb.
4 layers Genasco Trinidad Lake Roofing Asphalt	120 lb.
2 layers Genasco Standard Felt	30 lb.
1 layer Genasco Extra Heavy Felt	30 lb.
	190 lb.

This roof contains 162 lb. of waterproofing factor and 28 lb. of reinforcing factor, or 85% waterproofing factor and 15% reinforcing factor.

Specifications for Genasco Economy Trinidad Lake Asphalt Built-up Roof—Over Boards

Materials—The waterproofing factor shall be Genasco Trinidad Lake Roofing Asphalt heated to a temperature of approximately 400° to 500° F., uniformly mopped, using approximately 30 lb. per 100 sq. ft.

The reinforcing factor shall be Genasco All-rag Standard Felt and Genasco All-rag Extra Heavy Felt (formerly known as Cap Felt), 32 in. wide. The Genasco Standard Felt shall weigh approximately 15 lb. per 100 sq. ft. and the Genasco Extra Heavy Felt shall weigh approximately 30 lb. per 100 sq. ft.

Application—The roof shall be laid in the following manner, using the above materials:

First Operation—One layer of Genasco Extra Heavy Felt shall be laid on the roof boards, lapping each sheet 2 in. and nailing through the laps and longitudinal center with broad head roofing nails, spaced 12 in. apart.

Second Operation—Over the Genasco Extra Heavy Felt thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 1 layer of Genasco Standard Felt, lapping each sheet 2 in. The laps of the Genasco Standard Felt shall fall midway between the laps of the Genasco Extra Heavy Felt.

Third Operation—Over the Genasco Felts thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, finishing the roof in a uniform and workmanlike manner.

Continued on next page

APPROXIMATE QUANTITIES OF MATERIAL FOR 100 SQ. FT. OF ROOF SURFACE

1 layer Genasco Extra Heavy Felt	30 lb.
1 layer Genasco Standard Felt	15 lb.
2 layers Genasco Trinidad Lake Roofing Asphalt	60 lb.
	105 lb.

This roof contains 84 lb. of waterproofing factor and 21 lb. of reinforcing factor, or 80% waterproofing factor and 20% reinforcing factor.

Specifications for Genasco Economy Trinidad Lake Asphalt Built-up Roof—Over Concrete

Materials—The primer shall be Genasco Concrete Primer.

The waterproofing factor shall be Genasco Trinidad Lake Roofing Asphalt, heated to a temperature of approximately 400° to 500° F., uniformly mopped, using approximately 30 lb. per 100 sq. ft.

The reinforcing factor shall be Genasco All-rag Standard Felt and Genasco All-rag Extra Heavy Felt (formerly known as Cap Felt), 32 in. wide. The Genasco Standard Felt shall weigh approximately 15 lb. per 100 sq. ft. and the Genasco Extra Heavy Felt shall weigh approximately 30 lb. per 100 sq. ft.

Application—The roof shall be laid in the following manner, using the above materials:

First Operation—After the roof deck has become thoroughly dry and set hard, prime the concrete with Genasco Concrete Primer, using approximately 10 lb. (1¼ gal.) per square.

Second Operation—Over the concrete thus primed, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 1 layer of Genasco Extra Heavy Felt, lapping each sheet 2 in.

Third Operation—Over the Genasco Extra Heavy Felt thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, into which, while hot, apply 1 layer of Genasco Standard Felt, lapping each sheet 2 in. The laps of the Genasco Standard Felt shall fall midway between the laps of the Genasco Extra Heavy Felt.

Fourth Operation—Over the Genasco Felts thus laid, mop down approximately 30 lb. of Genasco Trinidad Lake Roofing Asphalt per square, finishing the roof in a uniform and workmanlike manner.

APPROXIMATE QUANTITIES OF MATERIAL FOR 100 SQ. FT. OF ROOF SURFACE

1 layer Genasco Concrete Primer	10 lb.
3 layers Genasco Trinidad Lake Roofing Asphalt	90 lb.
1 layer Genasco Extra Heavy Felt	30 lb.
1 layer Genasco Standard Felt	15 lb.
	145 lb.

This roof contains 124 lb. of waterproofing factor and 21 lb. of reinforcing factor, or 85% waterproofing factor and 15% reinforcing factor.

Specifications for Genasco Membrane Waterproofing

Materials—The primer shall be Genasco Concrete Primer.

The waterproofing factor shall be Genasco Waterproofing Asphalt.

The reinforcing factor shall be Genasco Waterproofing Cloth weighing approximately 8 lb. per 100 sq. ft.

Application—Genasco Membrane Waterproofing shall be laid in the following manner, using the above materials:

First Operation—Prime the surface to be waterproofed with Genasco Concrete Primer, using approximately 10 lb. (1¼ gal.) per square.

Second Operation—Over the surface thus primed, mop down approximately 40 lb. of asphalt per square.

Third Operation—Into the hot asphalt apply 3 layers of Genasco Waterproofing Cloth lapping each sheet two-thirds of its width and mopping the full width of the lap, using approximately 40 lb. of asphalt per square for each mopping.

Fourth Operation—Over the 3 layers of Genasco Waterproofing Cloth thus laid, mop down approximately 40 lb. of asphalt per square, finishing the membrane in a uniform and workmanlike manner.

APPROXIMATE QUANTITIES OF MATERIAL FOR 100 SQ. FT. OF SURFACE

1 layer Genasco Concrete Primer	10 lb.
4 layers Genasco Waterproofing Asphalt	160 lb.
3 layers Genasco Waterproofing Cloth	24 lb.
	194 lb.

Note: For use above ground level where temperatures are variable use Genasco Waterproofing Asphalt "B."

This system contains 185 lb. of waterproofing factor and 9 lb. of reinforcing factor, or 95% waterproofing factor and 5% reinforcing factor.

Where 2 plies are desired, lap cloth one-half of its width.

Specifications for Genasco Asphalt Mastic Floors

Base—The concrete or other base shall be prepared ready to receive the mastic surfacing ..... inches below and parallel to the final finished floor grade with proper slopes established to take care of any required drainage. (If the floor is to be laid over wood, first lay one thickness of building paper and flash at all posts, walls, etc., with a paint coat of Genasco Priming Paint.)

Materials—The block shall be a Genasco Asphalt mastic as produced by The Barber Asphalt Company. The flux shall be Native Trinidad Lake Asphalt of proper penetration for the work involved. The sand shall be fairly sharp, free from loam or any foreign matter of vegetable origin and shall be well graded from coarse to fine, all passing a 10-mesh sieve and not over 3% passing a 200-mesh sieve. The coarse aggregate shall be a gravel, crushed trap rock, crushed gravel or other crushed sound stone, all passing a ⅜-in. screen and retained on a 10-mesh sieve.

A formula giving the proportions of mastic block, flux, sand and coarse aggregate for the proposed mixture to be submitted to the engineer or architect, together with a sample of the sand and coarse aggregate which the contractor proposes to use.

Construction—On the base, as above specified, lay a Genasco Asphalt Mastic Floor, not less than ..... inches in thickness, laid in .... layer. The Genasco Asphalt Block shall be brought to the site of the work, broken and melted in suitable kettles, together with the proper amount of flux, sand and coarse aggregate (the two latter previously dried and heated) in proportions satisfactory to the engineer or architect. (The Barber Asphalt Company will give its opinion, if requested, as to formulæ for mastic mixes for various conditions, provided samples of the aggregate to be used for the work are submitted for examination.)

After sufficient heating and stirring, the mixture shall be spread on the established base to a uniform thickness of ..... inches and worked under wooden floats until it is free from voids. A half and half mix of fine sand and portland cement shall then be sprinkled on the floor and the surface rubbed smooth.

The mastic mixture is to be laid in approximately 6-ft. strips. In making joints the hot mastic shall overlap the preceding strip about 4 in. so that the edge of the cold strip will become soft, thus allowing the finisher to make a perfect joint after the surplus material spread over the cold strip has been cut away.

Note: Thickness of mastic to be according to conditions and service to which floor is subjected. Where acid conditions exist Genasco Acid-proof Mastic Block and silicious aggregate must be used. Where mastic is to be more than 1 in. thick, it is to be applied in 2 layers of ...... inches, each with joints in top layer so made as not to coincide with joints in bottom layer. Top layer only to be rubbed with the sand-portland cement mix.

Genasco Latite Asphalt Shingles

Slate surfaced asphalt shingles, of unique and distinctive design. Finished with a double butt, and applied in honeycomb design. Present a "shadow line" and depth of texture not found in ordinary asphalt shingles. Genasco Latite shingles lock together tightly on the roof, by means of a metal band or key in the butt of each shingle, so that wind or rain can not penetrate.

They are particularly adapted for re-roofing operations, being applied directly over old, worn out surfaces. Made in three colors—red, green or blue-black natural color slate; and in two sizes—16x16 and 12x12 in. "They Weather all Weather."

Our booklet, with illustrations in color and complete data, sent on request.

Genasco Roll Roofings

Made of highest quality all-rag felt, thoroughly saturated, and then coated on both sides with Trinidad Lake asphalt cement. The waterproof and weatherproof qualities of Trinidad Lake asphalt give them exceptional durability.

Manufactured in several types: smooth surface, medium, heavy and extra heavy, slate surface, red, green or blue-black color. Kant Leak Kleets, the most scientific and efficient roof fastening device made, furnished with each roll.

Genasco Asphalt Paints and Coatings

The several types of Genasco asphalt paints and coatings are manufactured under strict laboratory supervision. Each is designed to meet the exacting requirements of the particular purpose for which it is recommended.

There are Genasco asphalt paints for preserving metal or prepared roofs, for painting machinery or other industrial uses, for resisting acids and gases, for priming, and many other purposes.

THE BARRETT COMPANY

Manufacturers of Roofing Materials

BIRMINGHAM, ALA. CHICAGO, ILL. DALLAS, TEX. MINNEAPOLIS, MINN.
BOSTON, MASS. CLEVELAND, OHIO KANSAS CITY, MO. NEW YORK, N. Y.
PHILADELPHIA, PA. SALT LAKE CITY, UTAH ST. LOUIS, MO.

THE BARRETT COMPANY, LIMITED, MONTREAL, QUE.

Products

ROOFING MATERIALS:

For flat surfaces: BARRETT SPECIFICATION PITCH and BARRETT SPECIFICATION FELT; BLACK DIAMOND PITCH and BLACK DIAMOND FELT. For detailed specifications see Volume I, Barrett Architects' and Engineers' Built-Up Roofing Reference Series.

For steep surfaces: BARRETT SPECIFICATION FELT, BARRETT SPECIFICATION PITCH, ANCHOR ASPHALT, and S. I. S. ROOFING. For detailed specifications see Volume II, Barrett Architects' and Engineers' Built-Up Roofing Reference Series.

For Flashings for Brick and Concrete Walls, see page 1052, also Volume III, Barrett Architects' and Engineers' Built-Up Roofing Reference Series; for Roof Leader and Roof-Vent Connections, see page 1851.

WATERPROOFING:

For foundations, reservoirs, swimming pools, subways, tunnels, floors, etc., special specifications submitted.

INSULATING and BUILDING PAPERS:

For sheathing, lining, etc.

DAMPPROOFING and PRESERVATIVE PAINTS, WOOD PRESERVATIVES, FLOORING.

The Barrett Specification Roof

A roof that is guaranteed by a twenty-year or ten-year surety bond, as desired.

A roof that passes the most rigid inspection.

A roof that is scientifically and mechanically correct in every detail.

A roof that contains more than twice as much actual waterproofing material as is generally used in other built-up roofing.

A roof that has a wearing surface which resists all sorts of abuse and the most severe weather conditions.

A roof that is fire retardant; it carries Class "A" rating by the Underwriters' Laboratories, Inc.

A roof that takes the base-rate of fire insurance.

A roof that needs no repairs or paint.

A roof that costs less per year of service than any other roofing suitable for flat surfaces.

The Guaranty Bond

A 20-year Guaranty Bond is offered on Barrett Specification Type "AA" Roofs and a 10-year Guaranty Bond on Barrett Specification Type "A" Roofs by THE BARRETT COMPANY without charge in accordance with Note 1 of The Barrett Specifications hereinafter printed. Guarantees and bonds do not keep out water, but The Barrett Guaranty Bond differs from every other roofing guarantee or bond, in that this Company does not apply the roof and has no contractor's profit as a motive for cheapening the roofing. When applied by experienced and reliable roofing contractors, and carefully inspected by competent inspectors, Barrett Specification Roofs applied in accordance with the specifications are just as economical and serviceable without the bond as with it.

Barrett Specification Roofs
TRADE-MARK

The Barrett Company
TRADE-MARK

THE BARRETT COMPANY has prepared an inspection manual, known as "Requirements Covering Application and Inspection of Barrett Specification Roofs," for use by architects, engineers, and owners where the Company's inspection service is not available.

The Barrett Specification, Type "AA" Roof—for Use over Board Sheathing—5 Plies

Bonded for 20 years.

See Note 1.

Incline—This Specification shall not be used where the roof incline exceeds two (2) inches to one (1) foot.

Roof-deck—The roof-deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knotholes, and free from loose material. If roof-deck is inclined, it shall be properly graded to outlets.

Roofing—*First*—Lay one (1) thickness of sheathing paper or unsaturated felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

Second—Over entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining felt is laid.

Third—Coat the entire surface uniformly with Specification Pitch.

Fourth—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inches on each sheet, so that in no place shall felt touch felt.

Such nailing as is necessary shall be done so that all nails will be covered by not less than two (2) plies of felt.

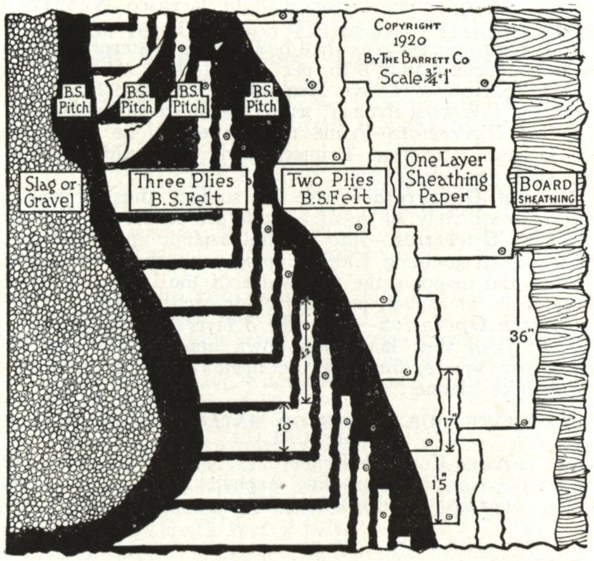


DIAGRAM SHOWING BARRETT SPECIFICATION, TYPE "AA" ROOF OVER BOARDS
Bonded for 20 years

Continued on next page

Fifth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt.

General—The felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of Specification Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the pitch shall not be heated above 400° Fahr.

The roof shall be applied by a roofing contractor approved by The Barrett Company. He shall furnish The Barrett Company's Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Co., of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

20-year Guaranty Bond—*Note No. 1*—The Barrett Company will give its 20-year Guaranty Bond on all jobs of 5000 sq. ft. or more, in the United States and Canada, where its Inspection Service is available, providing the roof is laid by a roofing contractor approved by The Barrett Company, in strict accordance with the above Specification and subject to Barrett inspection and approval.

Condensed Specification—*Roofing*—Shall be a Barrett Specification Roof, Type "AA," laid in accordance with The Barrett Specification (for use over Board Sheathing), dated Nov. 1, 1922, by a roofing contractor approved by The Barrett Company. The roofing contractor shall furnish The Barrett Company's Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said Specification.

The Barrett Specification, Type "AA" Roof—for Use over Concrete—4 Plies

Bonded for 20 years.

See Note 1.

Incline—This Specification shall not be used where the roof incline exceeds one (1) inch to one (1) foot.

Roof-deck—The roof-deck shall be smooth, firm, dry, and free from loose material. If roof-deck is inclined, it shall be properly graded to outlets.

Roofing—*First*—Coat the concrete uniformly with Specification Pitch.

Second—Over the entire surface lay four (4) plies of Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Specification Pitch the full twenty-four and one-half (24½) inches on each sheet, so that in no place shall felt touch felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry, and free from dirt.

General—The felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the pitch shall not be heated above 400° Fahr.

The roof shall be applied by a roofing contractor approved by The Barrett Company. He shall furnish The Barrett Company's Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company, of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

20-year Guaranty Bond—*Note No. 1*—The Barrett Company will give its 20-year Guaranty Bond on all jobs of 5000 sq. ft. or more, in the United States and Canada, where its Inspection Service is available, providing the roof is laid by a roofing contractor approved by The Barrett Company, in strict accordance with the above Specification and subject to Barrett inspection and approval.

Condensed Specification—*Roofing*—Shall be a Barrett Specification Roof, Type "AA," laid in accordance with The Barrett Specification (for use over Concrete), dated Nov. 1, 1922, by a roofing contractor approved by The Barrett Company. The roofing contractor shall furnish The Barrett Company's Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said Specification.

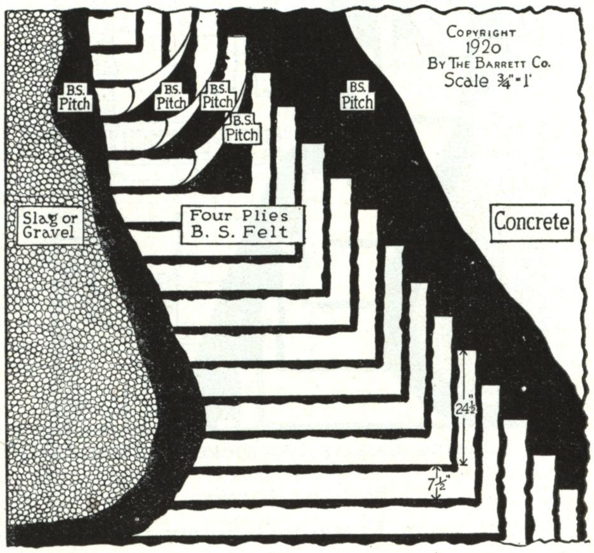


Diagram Showing Barrett Specification, Type "AA" Roof Over Concrete

Bonded for 20 years

The Barrett Specification, Type "A" Roof—for Use over Board Sheathing—4 Plies

Bonded for 10 years.

See Note 1.

Incline—This Specification shall not be used where the roof incline exceeds two (2) inches to one (1) foot.

Roof-deck—The roof-deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knotholes, and free from loose material. If roof-deck is inclined, it shall be properly graded to outlets.

Roofing—*First*—Lay one (1) thickness of sheathing paper or unsaturated felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

Second—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining felt is laid.

Third—Coat the entire surface uniformly with Specification Pitch.

Fourth—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inches on each sheet so that in no place shall felt touch felt. Such nailing as is necessary shall be done so that all nails will be covered by not less than one (1) ply of felt.

Fifth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt.

Continued on next page

General—The felt shall be laid without wrinkles or buckles. Not less than one hundred and twenty-five (125) pounds of pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the pitch shall not be heated above 400° Fahr.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company, of Baltimore, covering a period of ten (10) years from date of completion, in accordance with Note No. 1.

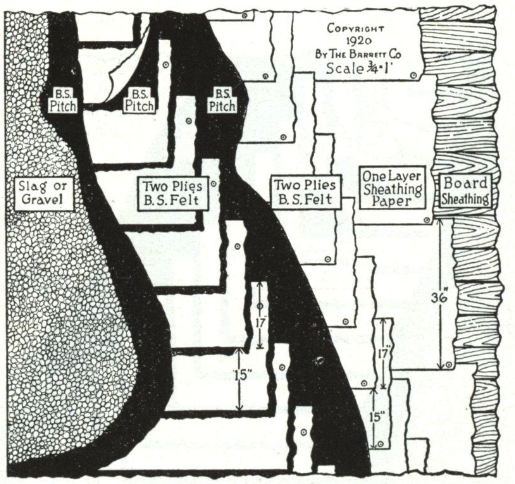


DIAGRAM SHOWING BARRETT SPECIFICATION, TYPE "A" ROOF OVER BOARDS
Bonded for 10 years

10-year Guaranty—*Note No. 1*—THE BARRETT COMPANY will give its 10-year Guaranty Bond on all jobs of 5000 sq. ft. or more, in the United States and Canada, where its Inspection Service is available, providing the roof is laid by a roofing contractor approved by THE BARRETT COMPANY, in strict accordance with the above Specification and subject to Barrett inspection and approval.

Condensed Specification—*Roofing*—Shall be a Barrett Specification Roof, Type "A," laid in accordance with The Barrett Specification (for use over Board Sheathing), dated Nov. 1, 1922, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for ten (10) years, in accordance with Note No. 1 of said Specification.

The Barrett Specification, Type "A" Roof—for Use over Concrete—3 Plies

Bonded for 10 years.

See Note 1.

Incline—This Specification shall not be used where the roof incline exceeds one (1) inch to one (1) foot.

Roof-deck—The roof-deck shall be smooth, firm, dry, and free from loose material. If roof-deck is inclined, it shall be properly graded to outlets.

Roofing—*First*—Coat the concrete uniformly with Specification Pitch.

Second—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inches on each sheet so that in no place shall felt touch felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry, and free from dirt.

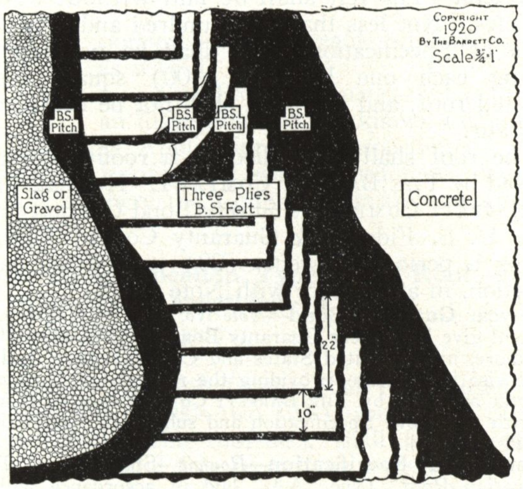


DIAGRAM SHOWING BARRETT SPECIFICATION, TYPE "A" ROOF OVER CONCRETE
Bonded for 10 years

General—The felt shall be laid without wrinkles or buckles. Not less than one hundred and seventy-five (175) pounds of pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the pitch shall not be heated above 400° Fahr.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company, of Baltimore, covering a period of ten (10) years from date of completion, in accordance with Note No. 1.

10-year Guaranty Bond—*Note No. 1*—THE BARRETT COMPANY will give its 10-year Guaranty Bond on all jobs of 5000 sq. ft. or more, in the United States and Canada, where its Inspection Service is available, providing the roof is laid by a roofing contractor approved by THE BARRETT COMPANY, in strict accordance with the above Specification and subject to Barrett inspection and approval.

Condensed Specification—*Roofing*—Shall be a Barrett Specification Roof, Type "A," laid in accordance with The Barrett Specification (for use over Concrete), dated Nov. 1, 1922, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for ten (10) years, in accordance with Note No. 1 of said Specification.

Roofing for Steep Surfaces

Barrett built-up steep roofing specifications for sawtooth, monitor, umbrella, butterfly, hopper, plain hip, and other types of steep roof construction. Bonded for 10 years when applied in accordance with Note No. 1 in Volume II, Architects' and Engineers' Built-up Roofing Reference Series.

CERTAIN-TEED PRODUCTS CORPORATION

ROOFING DIVISION
GENERAL OFFICES
100 East 42nd Street
NEW YORK, N. Y.

For Branch Offices and Mills, see page 590

Products

Asphalt Roofing (smooth surfaced and slate surfaced).

Asphalt Shingles (Individual, 4-width, Cut-out, Hexagonal Slabs), red, green, blue-black, or color-blend slate surfaced.

Insulating Paper.

Asphalt Felt.

Sheathing Paper.

Deadening Felts.

Asphalt Roof Coating.

Also, Tarred Felts, Slaters' Felts, Stringed Felts, Asphalt Cement, Pitch, Lap Cement.

For Gypsum Products, see pages 363-365; for Linoleum, see pages 590-591; for Paints and Varnishes, see pages 1672-1673.

Facilities and Distribution

Certain-teed products are handled by jobbers and dealers throughout the United States and in principal countries throughout the world.

Certain-teed—Highest Quality

Nothing is omitted which can safeguard the quality of Certain-teed products. They are manufactured according to tried and proved formulas under the watchful supervision of experts. Only the best materials are used and each is carefully tested to make certain that it is of the required quality. You can rely on products bearing the Certain-teed label—it is a sure guide to satisfaction.

There is a Certain-teed roofing for every type of building—from temporary shelters to the most extensive structures.

Certain-teed Roofing—Talc Surfaced

Certain-teed roofing is the first grade product manufactured by the Certain-teed Products Corporation. Millions of squares are giving satisfactory service in all parts of the world and under all conditions—from the extreme cold of the arctic to the intense heat of the tropics.

Over 7 acres of Certain-teed roofing shelters the large plant of the Owens Bottle Machine Co., at Charleston, W. Va. There are many other large Certain-teed roofs, such as the Pullman Shops, General Motors Co., St. Louis, Mo., etc.

Owners, architects and builders of such roof areas as these insist upon knowing before it is laid that the roofing will give long years of protection. They can rely on Certain-teed, the highest quality possible to manufacture, as long years of service and world-wide use have proved.

Put up in rolls of 108 sq. ft. Nails and cement are enclosed in the roll. Packed one square per roll—enough to cover 100 sq. ft. of roof surface with 8 sq. ft. for laps.

No. 1, light, about 35 lb. per square, guaranteed 5 years.
No. 2, medium, about 45 lb. per square, guaranteed 10 years.
No. 3, heavy, about 55 lb. per square, guaranteed 15 years.

Certain-teed Slate Surfaced Roll Roofing

Made from the same high grade felt used in Certain-teed talc surfaced roofing. Surfaced with non-fading red, green and blue-black crushed slate. It is widely used on residences, bungalows, garages, etc., where a decorative roof at minimum expense is desired. Guaranteed ten years. Put up in rolls of 108 sq. ft. Weight about 90 lb.

Certain-teed Asphalt Felt

It is used extensively under slate, tile, asbestos shingles and other roofing materials requiring the use of a waterproof liner before laying the finished roof. It can be used for sheathing and insulating purposes as it is absolutely waterproof and verminproof. It is also preferable to tarred felt as the felt layer in built-up roofs. It has the advantage of longer life than tarred felt and is less brittle.

Certain-teed asphalt felt is made in the following weights:

No. 1, about 20 lb. per 100 sq. ft., 216 sq. ft. per roll.
No. 2, about 15 lb. per 100 sq. ft., 324 sq. ft. per roll.
No. 3, about 12 lb. per 100 sq. ft., 500 sq. ft. per roll.

Certain-teed Shingles

The modern roof for homes is one that is both attractive and economical. Certain-teed shingles give such a roof. Their red, green or blue-black tones harmonize perfectly with any surroundings and give to the finished structure an added touch of beauty. Surfaced with natural crushed slate, they will not fade. The color tones are the non-fading red, green, or blue-black colors of crushed slate with which the shingles are surfaced. They lend themselves to any color scheme.

Certain-teed shingles are not expensive. They save not only in the cost of material, but also on the superstructure necessary to support the roof, as they are lighter in weight than other forms of decorative roofing. The upkeep cost of Certain-teed shingles is practically nothing.

Each shingle is fully guaranteed for ten years.

Certain-teed Hexagonal Slab Shingles—A shingle of beauty and strength. Gives the effect of hexagonal shaped shingles. The beauty of the variegated effect obtainable is enhanced by the prominent shadow line. This shingle also made in the color-blend—as the name implies, a harmonious blending of colors.

Designed to give extra protection against weathering.

Red, green, blue-black and color-blend. Size, 11½x36 in:; 86 shingles per square (2 bundles per square).

Certain-teed 4-width Shingles—Four shingles in one. The slate surfacing is separated into four equal areas by ½-in. black strips from which slate has been removed. The only strip shingle giving two complete thicknesses at all points. Complete with illustrated directions for laying. Made in the following sizes:

Approximately, 10 x36 in.; wt., about 200 lb. per square (two packages).
Approximately, 12½x36 in.; wt., about 255 lb. per square (three packages).

Certain-teed Cut-out Shingles—Standard square-butt cut-out shingle. Cut-outs are 4-in. deep. Put up two packages per square. Made in following sizes:

Approximately, 10 x36 in.; wt., about 200 lb. per square (two packages).
Approximately, 12½x36 in.; wt., about 255 lb. per square (three packages.)

Certain-teed Individual Shingles—Beautiful vari-colored effects may be had by blending shingles of the red, green and blue-black surfacings. Each color packed separately and blending may be done to suit individual requirements.

Regular size: 9x12 in.; wt. about 240 lb. per square (4 packages)
Jumbo size: 12x16 in.; wt. about 300 lb. per square (4 packages)

Certain-teed Insulating Paper

For insulating and sheathing against heat, cold, sound or moisture. A product superior to ordinary sheathing paper which is not moisture-proof, tarred saturated paper, etc. Saturated and coated; jet black and has a glossy finish. Waterproof, verminproof and tasteless. When used for house lining, between double floors, etc., it saves fuel in winter and keeps out heat in summer. Used for residences, stores and industrial structures. Also used for refrigerator linings in dairies, refrigerators and icehouses. 36 in. wide, put up in rolls containing, approximately, 500 sq. ft. Made in two weights: Medium, about 35 lb. per roll; Heavy, about 50 lb. per roll.

Certain-teed Sheathing Paper (Red Rosin Sized)

An inexpensive, non-waterproof sheathing paper used as a liner under clapboards, shingles, siding, etc. Put up in rolls of approximately 500 sq. ft. in the following weights:

No. 20 about 20 lb.; No. 25 about 25 lb.; No. 30 about 30 lb.; No. 35 about 35 lb.; No. 40 about 40 lb.

Certain-teed Deadening Felt

A thick felt for laying between double floors and in walls for insulating against sound, heat and cold. It is made in 50 yard rolls in the following weights:

No. 40, about ¾ lb. per sq. yd., 40 lb. to roll.
No. 50, about 1 lb. per sq. yd., 50 lb. to roll.
No. 75, about 1½ lb. per sq. yd., 75 lb. to roll.

Certain-teed Asphalt Roof Coating

For re-saturating asphalt roofing (smooth surfaced). Renews the life of the roofing and, if applied at intervals of from three to five years, will preserve the roofing almost indefinitely.

For waterproofing exterior of basement walls. Cellar walls may be waterproofed by applying the coating on the outside of the walls below grade. The walls should be free from dirt or other foreign substance before applying.

THE PHILIP CAREY COMPANY

Manufacturers of Roofing

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES
FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

Carey PRODUCTS
REG. U.S. PAT. OFF.
TRADE-MARK

Products and Services

Carey Built-up Roofs.

Carey Felts for Waterproofing, Weatherproofing and Roofing purposes.

Carey Asphalt Pitch.

Contracts taken to furnish and apply Carey Built-up Roofs in all locations.

For Waterproofing and Dampproofing, see pages 96-97; for Expansion Joints, see page 571; for Asphalt Shingles, see page 1101; for Pipe Coverings, see pages 2280-2281.

Experience and Facilities

Established in 1873, The Philip Carey Company has furnished millions of squares of roofing, distributed and applied to buildings of every description throughout the world.

The Carey mills are modern, and facilities for handling large business are maintained at a high standard.

Carey Roofs

Carey roofs are laid strictly in accordance with the Carey specifications for various weights and thicknesses adapted to meet the requirements of the roof structure, and the conditions to which the roofing will be subsequently exposed.

Carey Felts

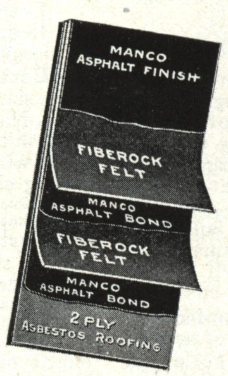
Carey felts consist of the best grade of stock, carefully prepared and saturated in asphalt to insure absolute waterproofing protection and permanent flexibility.

Fiberock (Asbestos Asphalt Impregnated Felt)—Used in Carey built-up roof specifications, also for waterproofing and weatherproofing work. Put up in rolls containing 324 sq. ft.; width, 36 in.; weight about 45 lb. per roll.

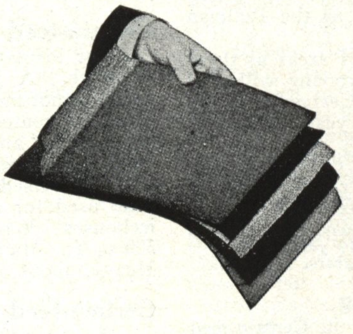
Feltex (Asphalt Saturated Felt)—Used in Carey built-up roofs, waterproofing and weatherproofing work. Furnished in rolls containing 324 sq. ft.; width 36 in.; weight, about 45 lb. per roll.

Manco (Carey Asphalt)

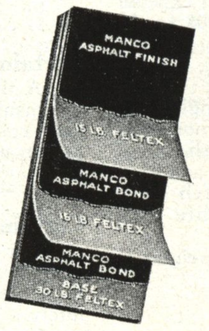
More than 40 years' experience in asphalt refining is back of Carey Manco. For roofing purposes, no other asphalt can equal its splendid qualities. If interested in high grade asphalt, write to this company, stating requirements.



CAREY ASBESTOS BUILT-UP ROOFING



CAREY FLEXIBLE CEMENT ROOFING



CAREY FELTEX BUILT-UP ROOFING

Carey Flexible Cement Roofing

The Carey flexible cement roofing is a solid, compact and indivisible sheet of roofing. Its foundation consists of a rag felt, manufactured from the best grade of materials and saturated with asphalt so as to render it waterproof and permanently flexible. A heavy body of asphalt cement is laid over the felt foundation. The top reinforcement consists of a strong Calcutta burlap embedded into the asphalt composition, giving great tensile strength to the roofing sheet. The weight of Carey flexible cement roofing, without any completing materials, is approximately 90 lb. per square.

This roofing was placed on the market in 1885. Since that time it has been extensively used on buildings of every description, in all climates, proving by actual time test its practicable and durable qualities. Furnished in rolls, 1 square each, with necessary materials for proper application. For specifications and method of laying, see following pages.

Carey Asbestos Built-up Roofs

This roof is specified for the most permanent construction, including all types of buildings, flat or steep surfaces, particularly the sawtooth type of construction, where it has been proved in common practice that the ordinary roof covering fails to meet the necessary requirements.

The smooth asphalt finished surface of this roof (see illustration), constantly washed by the rains, always presents a clean and uniform appearance.

Carey Feltex Built-up Roofs

This roofing is constructed of Carey high grade Feltex (asphalt saturated felt), and Manco Asphalt Pitch. It is suitable for buildings of every description, except those having very steep roof surfaces. Manco Asphalt is prepared with a high melting point, and is therefore not affected by any temperature of the sun's heat. It is made to three Carey specifications as illustrated and specified on the following pages.

Correspondence

Information and advice respecting the adaptability of Carey roofing specifications to meet any particular requirements will be furnished on request. Write for samples and further information.

Continued on next page

Specifications for Carey Roofings

(1) Work by Other Trades—Provision for the following work should be included under the proper specification headings:

(2) *Preparation of Wood Surfaces*—Roof surface is to be prepared and made ready for the application of Carey Roofing with dry seasoned sheathing boards of uniform thickness, closely laid. On permanent buildings, tongue and grooved sheathing 6 to 8 in. wide, is recommended. All sheathing boards to be surfaced nailed with at least two nails to each purlin in addition to any blind nailing. Sheathing boards to be placed on building horizontally. Remove or hammer down all projecting nail heads; cover all knotholes, etc., in the sheathing and sweep the sheathing clean before the roofing is applied.

(3) *Preparation of Concrete, Tile or Gypsum Surfaces*—All concrete, tile or gypsum surfaces shall be prepared for the application of Carey Roofing with a comparatively smooth, hard finish, free from holes and loose particles of sand and cement, and the expense of rectifying any extensive irregularities, such as depressions in the plane of the roof surface, which must be filled, shall be chargeable to (—Contractor). All sharp angles to be rounded out so as to avoid rough or sharp edges. On steep surfaces provision shall be made for anchoring the roofing sheets, the anchor strip to consist of a wood strip embedded into the concrete surface at the ridge. All down-spout openings must be sufficient size and the gutters properly graded by the cement contractor, so that water will not stand at any point.

(4) *Sheet Metal Work*—Counterflash all walls with No. 26 gauge galvanized iron, or if preferred, copper or Carey Fiberock counterflashing may be used. Metal counterflashing to be firmly attached to wall with suitable plugs and portland cement. (If furnished by the roofing contractor, both material and labor of installation shall be charged to the acceptor of this proposal as an extra, unless otherwise specifically stated in proposal.)

(5) *Nailing Strips*—(General Contractor) to provide nailing strip in wall for roof flashings not more than 12 in. nor less than 6 in. above roof line.

Specification C—Carey Flexible Cement Roofing, Style "C" (Over Wood Sheathing)

(1) Work Proposed—This specification contemplates furnishing all material and labor required to apply the roofing and base flashing and line the gutters. (No metal work included.)

Sheathing must be dry before applying the roofing.

(2) Materials—Carey Flexible Cement Roofing, Style "C," 90 lb. per square. Carey Fibre Coating (1½ gal.) 15 lb. per square. Carey Fibre Coating (½ gal. for laps), or 6 lb. Manco Asphalt, 6 lb. per square. 1-in. large head roofing nails, 1¼ lb. per square.

Weight per square, when applied, to be approximately 112 lb.

(3) Application—The roof surface shall be covered with Carey Flexible Cement Roofing, lapping the sheets 2 in. at the joints and 4 in. at the cross seams, and cementing between the sheets at the joints and cross seams with Carey Fibre Coating or Manco Asphalt.

Roofing sheets shall be nailed at the joints and cross seams with large head roofing nails, to be driven not more than 2 in. apart. Care should be taken to avoid driving nails into cracks or knotholes.

The patent lap shall be securely cemented down over all joints and nailheads with Carey Fibre Coating or Manco. No nailheads must be left exposed.

(4) Gutters and Valleys—First line with a single sheet of saturated felt, mopping the same in solid, then mop in solid over the felt a full length sheet of roofing cut to a width of not over 18 in. Lay the sheets lengthwise with the valley or gutter so that joints will not occur in the center. All gutter and valley sheets to be applied as specified under "Application."

Note: All concrete or brick walls to be flashed, to be primed to full height of flashing with Carey Asphalt Primer.

(5) Flashing—The roofing sheets shall be cut so that they will extend up on all fire walls, skylights, curbs, chimneys and other vertical surfaces to a height of 3 in. A sheet of Carey Roofing, full length and cut to a width of 9 in., to be applied along the vertical surface, extending 3 in. on the roof proper and 6 in. on the wall, being securely cemented and nailed to the roof surface and to the nailing strip in the fire wall. (Also see details for flashing where cricket is used.)

(6) Counterflashing—See under "Work by Other Trades."

(7) Roof Finish—The entire surface of the roofing applied shall be coated with Carey Fibre Coating, evenly spread to a uniform finish.

Specification No. 2—Carey Flexible Cement Roofing, Built-up (Over Wood Sheathing)

(1) Work Proposed—Use paragraph 1, Specification C.

(2) Materials—Carey Flexible Cement Roofing, Style "C," 90 lb. per square. Carey Manco Asphalt Pitch, 30 lb. per square. Carey Fiberock Felt or Feltex, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. 1-in. large head roofing nails, 1¼ lb. per square.

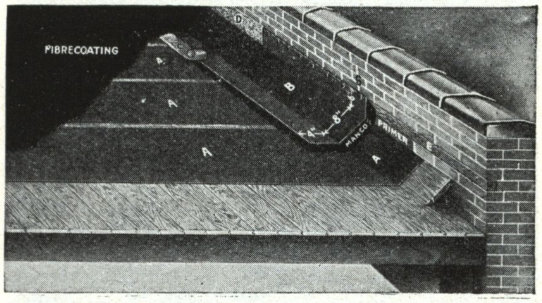
Weight per square, applied, to be approximately 161 lb.

(3) Application—The roof surface shall be covered with Carey Flexible Cement Roofing, lapping the sheets 2 in. at the joints and 4 in. at the cross seams. (The patent lap is not to be used but covered entirely by the succeeding sheet.)

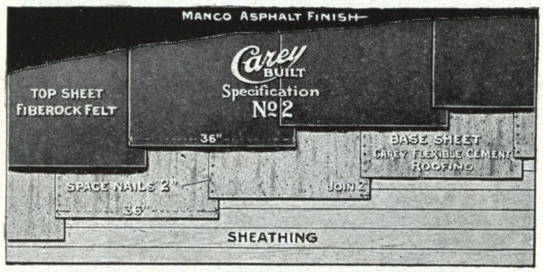
Roofing sheets shall be nailed at the joints and cross seams with large head roofing nails, to be driven not more than 2 in. apart. Nails must be driven straight and care used to avoid driving nails into cracks or knotholes.

The Carey Roofing surface shall then be mopped with Carey Manco Asphalt Pitch, into which, while hot, embed 1 layer Carey Fiberock Felt, lapping the sheets about 2 in. and laying the Fiberock sheets crosswise of the Carey Roofing sheets or with the Carey Roofing sheets, as best suits the type of roof construction.

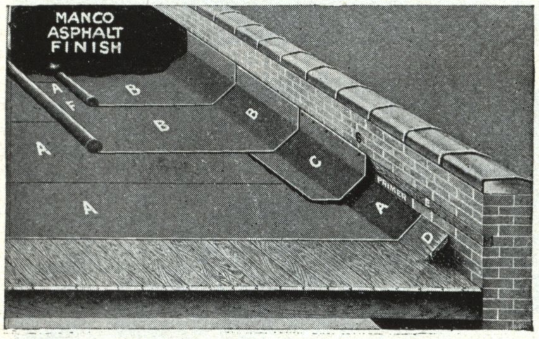
(4) Gutters and Valleys—Apply 1 sheet of Carey Flexible Cement Roofing, cut to a width of not over 18 in., mopping this sheet solid, then apply over the sheet of Carey Roofing, 1 sheet of Carey Fiberock Felt, thoroughly mopping same to the top surface of the Carey Roofing. Lay all sheets lengthwise with the gutters or valleys so that joints will not occur in the center. All gutter sheets are to be applied as specified under "Application."



APPLICATION OF CAREY FLEXIBLE CEMENT ROOFING, STYLE "C" (OVER WOOD SHEATHING)



APPLICATION OF CAREY FLEXIBLE CEMENT ROOFING —— SPECIFICATION NO. 2



METHOD OF FLASHING CAREY FLEXIBLE CEMENT ROOFING —— SPECIFICATION NO. 2

CAREY FLEXIBLE CEMENT ROOFING

Continued on next page

Note: All concrete or brick walls to be flashed, should be primed to full height of flashing.

(5) **Flashing**—Allow Carey Roofing Sheets from main deck to lap on to cricket. Cut cap strip of Carey Roofing sufficient width and cement same in solid, nailing the upper edge to wood strip in wall. The Fiberock Felt from main roof to run to wall only, in case cricket is not used in angle of wall.

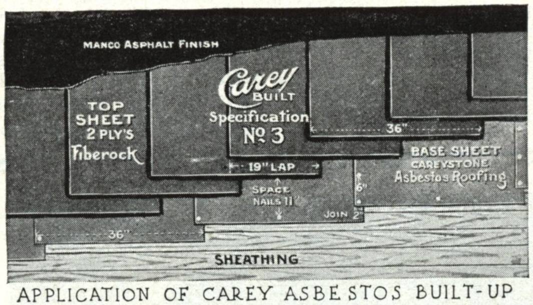
(6) **Counterflashing**—See under "Work by Other Trades."

(7) **Roof Finish**—The entire surface of Fiberock Felt shall be mopped with Carey Manco Asphalt Pitch, applied in a light thin coat, less than 1/16 in. thick, and spread to a uniform finish.

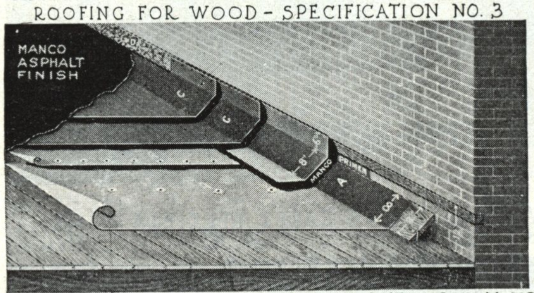
Specification No. 3—Carey Asbestos Built-up Roof (Over Wood Sheathing)

(1) **Work Proposed**—Use paragraph 1, Specification C.

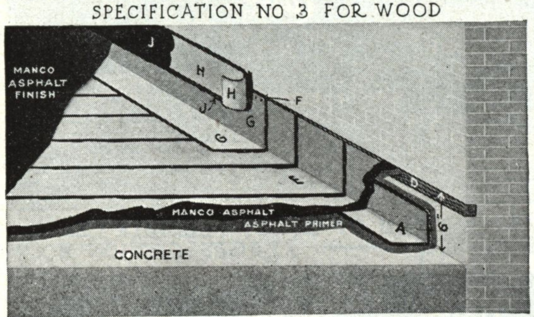
(2) **Materials**—One roll (108 sq. ft.) 2-ply Fiberock Roofing, weight 40 lb. 30 lb. Carey Fiberock Asphalt Impregnated Asbestos Felt. 80 lb. Carey Manco Asphalt Pitch. 1 lb. 7/8-in. nails. 3/4 lb. flat tin caps.


MANCO ASPHALT FINISH
TOP SHEET 2 PLY'S Fiberock
Carey BUILT Specification Nº 3
36"
BASE SHEET CAREYSTONE Asbestos Roofing
19" LAP
SPACE NAILS 11
6"
JOIN 2"
36"
SHEATHING

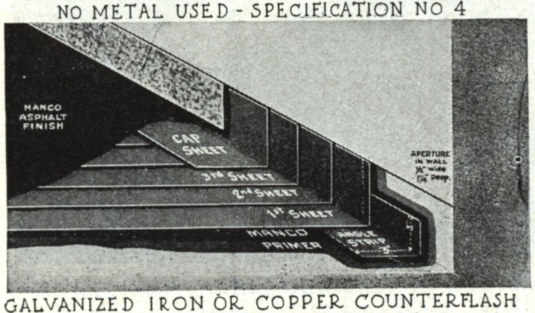
APPLICATION OF CAREY ASBESTOS BUILT-UP ROOFING FOR WOOD - SPECIFICATION NO. 3



METHOD OF FLASHING CAREY ASBESTOS BUILT-UP SPECIFICATION NO 3 FOR WOOD



CAREY FIBEROCK ASBESTOS COUNTERFLASH NO METAL USED - SPECIFICATION NO 4



GALVANIZED IRON OR COPPER COUNTERFLASH CAREY SPECIFICATION NO 4

CAREY ASBESTOS BUILT-UP ROOFING

(3) **Application**—Roof surface shall be covered with 2-ply Fiberock Asbestos Roofing, laid next to sheathing boards. All joints to be lapped 2 in., cap-nailing sheets at joints securely to the sheathing board every 6 in. with one additional row of nails and caps 11 in. apart through the center of the sheet. This surface to be mopped with Carey Manco Pitch and on to this surface shall be laid 2 layers of 1-ply Fiberock Asphalt Impregnated Asbestos Felt, cementing solid between these sheets so that at no place shall felt touch felt; each sheet to overlap the previous sheet so that 17 in. are left exposed. After these materials are applied spread over the entire surface a coating of Carey Manco Asphalt Pitch in an even, uniform manner.

(4) **Flashing**—The 2-ply Fiberock base sheet shall extend from main deck to lap the full height of cricket. A strip of 2-ply Fiberock (18 in. wide, more or less, depending on conditions) shall be nailed to top edge of nailing strip in wall and this asbestos strip to be thoroughly cemented over cricket and same to lap on to main roof deck at least 4 in. The final 2 plies of Fiberock from main roof are then run to top edge of flashing, each being cemented in solid over cap sheet. Height of flashing, width of cricket and flashing material, may be regulated to suit height of wall and other prevailing conditions.

(5) **Counterflashing**—See under "Work by Other Trades."

Specification No. 4—Carey Asbestos Built-up Roof (Over Concrete or Tile)

(1) **Work Proposed**—This specification contemplates furnishing all material and labor required to apply the roofing and base flashing and line the gutters. (No metal work included.) The concrete, or roof base, must be thoroughly dry and clean before the roofing is applied.

(2) **Materials**—1 gal. Carey Asphalt Primer. 45 lb. Carey Fiberock Asphalt Impregnated Asbestos Felt. 120 lb. Carey Manco Asphalt Pitch.

(3) **Application**—The roof surface shall first be coated with Carey Asphalt Primer applied cold and thoroughly brushed in. Then mop entire surface with Carey Manco Asphalt Pitch into which while hot embed 3 layers of Carey Fiberock (Asphalt Impregnated Asbestos Felt) each layer of which is thoroughly bonded with Manco Asphalt so that at no place shall felt touch felt; each sheet to overlap the previous sheet so that 11 in. are left exposed. After proper application of such materials the entire surface is given a light coating of Carey Manco Asphalt Pitch spread in an even, uniform manner.

(4) **Flashing**—All walls to be flashed shall be given a coat of Carey Asphalt Primer. Cement strip of Fiberock Felt 6 in. wide in angle of wall, 3 in. to wall and 3 in. to flat deck. The Fiberock sheets from main roof to be cut so they will extend up on all fire walls, skylights and other vertical surfaces to a height of 6 in.; this extension to be cemented to vertical surface. A cap sheet of Fiberock Felt cut 12 in. wide to be cemented in 6 in. to wall and 6 in. to flat deck.

(5) **Counterflashing**—See under "Work by Other Trades."

Specification No. 5—Carey Feltex Built-up Roofing (Over Wood Sheathing)

(1) **Work Proposed**—Use paragraph 1, Specification C.

(2) **Materials**—Carey Feltex, 30 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. Carey Feltex, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. 7/8 or 1-in. large head nails, 1 lb. per square.

Weight per square, when applied, to be approximately 96 lb.

(3) **Application**—The roof surface shall be covered with 1 sheet of Carey Feltex, 36 in. wide, weighing about 30 lb. per square. Lap the sheets not less than 2 in., then nail the sheets at the joints with large head 7/8 or 1-in. nails on 6-in. centers, with one additional row of large head nails spaced 11 in. apart lengthwise through the center of the sheet. After the 30-lb. Feltex sheet has been completed in accordance with above instructions, proceed to cover the same with 1 layer of Carey Feltex, 36 in. wide and weighing about 15 lb. per square. The 15-lb. sheet to be cemented with Manco Asphalt securely to the 30-lb. sheet, lapping the top sheets not less than 2 in. between the joints of the lower sheet—no nails to be used through the top sheet.

(4) **Gutters**—Line all gutters in the same manner as described under "Application."

In certain types of construction it is desirable to reinforce all gutters and valleys with an extra sheet of felt, weighing not less than 15 lb. per square, well mopped with Manco Asphalt Pitch. (This extra reinforcement, if required, to be charged for as an extra on time and material basis.)

Note: All concrete or brick walls to be flashed should be primed to full height of flashing.

Continued on next page

(5) Flashing—(General Contractor or Owner) to provide suitable nailing strips in the walls at time of construction—usual size about 2x4 in.; also provide crickets for bridging angle of wall and roof deck.

Note: Height of flashing, width of cricket and flashing materials may be regulated to suit height of wall and other conditions prevailing.

(6) Counterflashing—See under "Work by Other Trades."

(7) Roof Finish—The entire surface of the roof applied shall be mopped with Manco Asphalt Pitch, applied hot, and spread to a uniform finish.

Specification No. 7—Carey Feltex Built-up Roofing (Over Wood Sheathing)

(1) Work Proposed—Use paragraph 1, Specification C.

(2) Materials—Carey Feltex, 30 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. Carey Feltex, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. Carey Feltex, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. ⅞ or 1-in. large head nails, 1 lb. per square.

Weight per square, when applied, to be approximately 136 lb.

(3) Application—The roof surface shall be covered with sheets of Carey Feltex, 36 in. wide, weighing about 30 lb. per square. Lap the sheets not less than 2 in., then nail the sheets at the joints with large head ⅞ or 1-in. nails on 6-in. centers, with one additional row of large head nails spaced 11 in. apart lengthwise through center of sheet.

After the 30-lb. Feltex sheets have been completed in accordance with the above instructions, proceed to cover the same with 2 layers of Carey Feltex, weight about 15 lb. per square each, cementing solid between sheets and joining same to the 30-lb. sheet so that at no place shall felt touch felt, each sheet to overlap the previous sheet so that 17 in. are left exposed, making a continuous 2-ply built-up over the 30-lb. base Feltex sheet—no nails to be used through the top sheets.

(4) Gutters—Use paragraph 4, Specification No. 5.

(5) Flashing—Use paragraph 5, Specification No. 5.

(6) Counterflashing—Use paragraph 6, Specification No. 5.

(7) Roof Finish—Use paragraph 7, Specification No. 5.

Specification No. 8—Carey Feltex Built-up Roofing (Over Concrete, Tile or Gypsum Block)

(1) Work Proposed—Use paragraph 1, Specification 4.

(2) Materials—Carey Asphalt Primer (1 gal.), 9 lb. per square. Carey Manco Asphalt Pitch, 50 lb. per square. Carey Feltex Felt, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. Carey Feltex Felt, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square. Carey Feltex Felt, 15 lb. per square. Carey Manco Asphalt Pitch, 25 lb. per square.

Weight per square, when applied, to be approximately 179 lb.

(3) Application—The concrete shall be coated with Carey Asphalt Primer, applied cold, and thoroughly brushed in. The surface shall be mopped with Carey Manco Asphalt Pitch, into which, while hot, embed 3 layers of Carey Feltex (Asphalt Saturated Felt), cementing solid between the sheets so that at no place shall felt touch felt; each sheet to overlap the previous sheet so that 11 in. are left exposed, making 8 courses of asphalt and felt.

(4) Gutters—Apply 3 layers of Carey Feltex Felt lengthwise with the gutter. Each sheet to overlap the previous sheet so that one-third of its length is left exposed. (Use sheets cut to uniform length.)

All gutter sheets shall extend on the roof surface sufficiently to be properly lapped with the main roofing sheets and are to be applied as specified under "application."

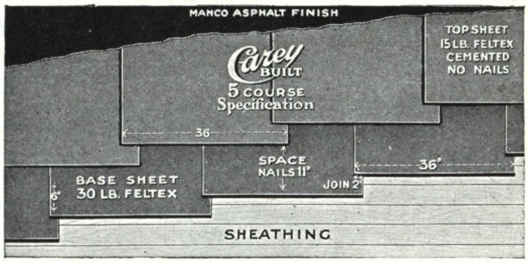
Note: All concrete or brick walls to be flashed should be primed to full height of flashing with Carey Asphalt Primer.

(5) Flashing—Cement strip of Feltex 6 in. wide in angle of wall, 3 in. to wall and 3 in. to flat deck. The Feltex sheets from main roof to be cut so they will extend up on all fire walls, skylights and other vertical surfaces to a height of 6 in.; this extension to be cemented to vertical surface. A cap sheet of Feltex cut 12 in. wide to be cemented in 6 in. to wall and 6 in. to flat deck.

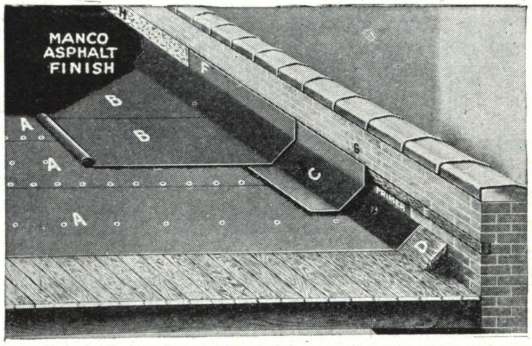
General Contractor to leave opening in the walls for inserting counterflash.

(6) Counterflashing—See under "Work by Other Trades."

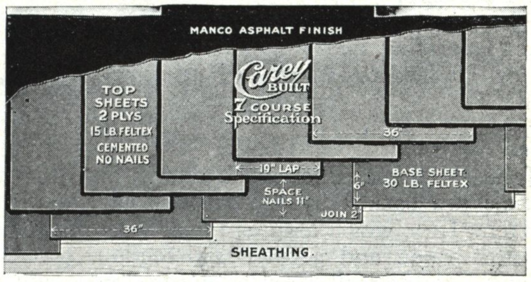
(7) Roof Finish—The entire surface of the roofing applied shall be mopped with Carey Manco Asphalt Pitch, applied hot, evenly spread to a uniform finish.


MANCO ASPHALT FINISH
TOP SHEET 15 LB. FELTEX CEMENTED NO NAILS
Carey BUILT
5 COURSE Specification
36
SPACE NAILS 11"
36"
BASE SHEET 30 LB. FELTEX
6"
JOIN 2"
SHEATHING

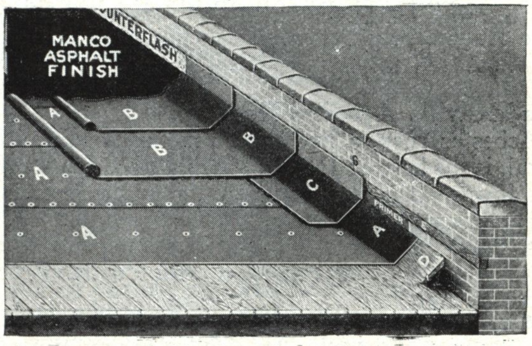
CAREY FELTEX BUILT-UP ROOFING, SPECIFICATION NO. 5 (OVER WOOD SHEATHING)


MANCO ASPHALT FINISH
A
B
C
D
PRIMER

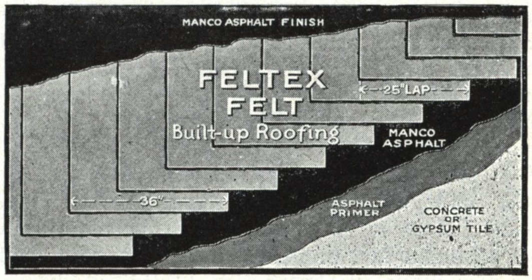
METHOD OF FLASHING CAREY FELTEX ROOFING —— SPECIFICATION NO. 5


MANCO ASPHALT FINISH
TOP SHEETS 2 PLYS 15 LB. FELTEX CEMENTED NO NAILS
Carey BUILT
7 COURSE Specification
36"
19" LAP
SPACE NAILS 11"
BASE SHEET 30 LB. FELTEX
6"
JOIN 2"
36"
SHEATHING.

CAREY FELTEX BUILT-UP ROOFING, SPECIFICATION NO. 7 (OVER WOOD SHEATHING)


COUNTERFLASH
MANCO ASPHALT FINISH
A
B
C
D
PRIMER

METHOD OF FLASHING CAREY FELTEX ROOFING —— SPECIFICATION NO. 7


MANCO ASPHALT FINISH
FELTEX FELT
Built-up Roofing
25" LAP
MANCO ASPHALT
36"
ASPHALT PRIMER
CONCRETE OR GYPSUM TILE

CAREY FELTEX BUILT-UP ROOFING, SPECIFICATION NO. 8 (OVER CONCRETE, TILE, OR GYPSUM)

CAREY FELTEX BUILT-UP ROOFING

JOHNS-MANVILLE INC.

Miners of Asbestos, Manufacturers of Asbestos and Allied Products

EXECUTIVE OFFICES

292 Madison Avenue, at 41st Street
NEW YORK, N. Y.

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Please communicate with nearest Division Sales Office

Products

Asbestos Shingles (Rigid); Slate Surfaced Shingles (Flexible).

Asbestos Roofings: Built-up, Corrugated, and Ready-to-Lay Forms.

Housline Building Insulation; Acoustical Correction; Pipe and Boiler Insulations; Underground System of Pipe Insulation; Radiator and Steam Traps; Waterproofing; Industrial Flooring.

Also manufacturers of Insulating Sheets and Blocks, Insulating and Refractory Cements.

For Underfloor Electric Wire Duct System, see page 2367.

Service

Johns-Manville Roofing, Building and Insulating Materials are backed by the responsibility of Johns-Manville Inc., which assures the architect better service, better value and greater satisfaction, because of the long, economical service which they will give clients. Full details, specifications, drawings and consultation will be gladly furnished without obligation by the Engineering Service Department of our nearest branch.

Johns-Manville Asbestos Roofings

Asbestos rock, a fireproof, practically imperishable mineral, is the base of Johns-Manville Asbestos Roofings, in all forms. By a special manufacturing process this rock is fabricated into rugged, fire-safe, weather-resisting sheets, thoroughly saturated with a durable combination of natural asphalts, or combined with Portland cement, as the case may be.

Asbestos Built-up Roofing—Smooth surface; for application to roof decks of wood, concrete or gypsum; for flat roofs or those with a moderate pitch; affords a clean, quick draining surface, free from slag or gravel. Made of sheets of asbestos felt which are mopped together with hot asphalt cement. Accompanied with flashings made of asbestos felts—cap and base—thus eliminating metal. Specially reinforced in valleys and flashings. Takes base insurance rates.

Asbestos Ready-to-Lay Roofing and Siding—In rolls 32″ wide, in three forms: smooth, black surface both sides; slate surfaced red, green, or blue-black one side, or white surface one side. Black or white surfaced roofing also made in sheets.

For application on decks where pitch is 1½″ to the foot or over (white surface is only laid on a minimum of 3″ to the foot). Shipped in rolls or sheets ready for application.

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT
TRADE-MARK

Corrugated Asbestos Roofing and Siding—In two forms: Johns-Manville Transite Corrugated Asbestos Roofing and Siding, an all-mineral material for application over skeleton frame construction. Made of asbestos fibers and Portland cement united under hydraulic pressure into dense, homogeneous, structurally strong, rigid sheets, 42″ wide by 4′, 5′, 6′, 7′ and 8′ long by ¼″ or ½″ thick. A fireproof, economical, practically everlasting material.

Transite Asbestos Wood (Flat)—An all-mineral product made of asbestos fibers and Portland cement, united under hydraulic pressure into dense, homogeneous, rigid sheets. Furnished flat in sheets 36″x48″, 42″x48″ and 42″x96″. Thickness ranges from ⅛″ to 2″. For use wherever a fireproof, economical and durable building material is required.

Slatekote Rag-Felt Shingles

Made of durable felts saturated with natural asphalt and surfaced with red, green or blue-black crushed slate. Two types: individual, 8″x12¾″; strips, 10″x32″ and 12½″x32″.

Giant Slatekote Shingles, extra heavy, extra durable, extra rugged-appearing, same material as above. Sizes: individual, 10″x16″; strips (notched to represent three shingles), 32″x12″.

Johns-Manville Asbestos Shingles, Standard and "Colorblende"

Made of asbestos rock fiber and Portland cement, united under hydraulic pressure. Of relatively high tensile strength, tough and resilient, these shingles are unaffected by climatic conditions, except that they become more durable as they age on the roof.

Because of their construction, they are fireproof and waterproof; and require no painting. They are comparatively light in weight and do not need heavy supporting construction. They can be applied by any roofer, slater or carpenter on new decks or on top of old wooden shingles.

Made in four colors—Natural Gray, Indian Red, Autumn Brown and a composite of four shades of brown known as Conglomerate Brown. To the latter, when laid alone or in combination with Indian Red or Natural Gray, the registered name of "Colorblende" has been given.

These shingles are made in various sizes, with smooth or rough texture surface finish, ⅛″ thick with smooth edges or ¼″ thick with rough edges. Conglomerate Brown shingles made only in ¼″ thickness, rough edge, with either smooth or rough exposure.

Continued on next page

Johns-Manville Housline Building Insulation

A sidewall, roof and floor insulating material composed of a heavy layer of cleansed and sterilized cattle hair, secured between sheets of tough building paper and waterproof felt. The crossing and recrossing of the fibers, at every conceivable angle, form innumerable small cells, in which the air is sealed and deadened, producing an insulating cushion more effective than many layers of building paper. Proof against rot, moisture and vermin; slow burning; and will not settle, dry out or split. Shipped in rolls of 250 sq. ft.

Johns-Manville Acoustical Service

Confusion of sound or poor acoustics in buildings, otherwise creditable from an architectural standpoint, is due, in many instances, to recent developments in fireproof construction. The use of harder wall, ceiling, and flooring materials, and of hard surfaced equipment, has increased reverberation appreciably. In offices, another factor has been the elimination of interoffice partitions, and the grouping of typewriters and other noise producers as demanded by modern efficiency.

The problems involved in correcting these conditions are technical, and for their satisfactory solution the expert knowledge of the specialist is indispensable.

In the Acoustical Department of JOHNS-MANVILLE INC., the advice of the best acoustical authorities in the country, and the services of competent acoustical engineers, are available to architects and others who have difficulties to overcome either in designing new buildings or in correcting existing ones.

Johns-Manville Waterproofing

Membrane method; using saturated fabrics and asbestos felt as reinforcing agents in as many plies as is necessary to meet the requirements, all cemented and bonded together in asphalt waterproofing cement.

Johns-Manville Underground System of Pipe Insulation

The Johns-Manville underground system of pipe insulation provides a permanent, efficient and economical means of placing underground and insulating pipes conveying steam or hot water.

The high initial efficiency of this system is maintained over a long period on account of the character of the materials used in the construction of the system.

Johns-Manville Pipe and Boiler Insulation

One of the most important results of the development of asbestos by Johns-Manville has been the saving of heat through insulation. Johns-Manville have developed materials, built on asbestos as a base, that retard the escape of heat from boilers, furnaces, pipes and flues. Years of specialization, directed by the highest engineering talent, has enabled Johns-Manville to develop and produce insulations of exceptional efficiency and durability under every service condition.

Asbesto-Sponge Felted, for example—a remarkable insulation which combines the high insulating value of sponge with the endurance of asbestos—ranks first in efficiency among commercial steam pipe insulation; or 85% Magnesia, Improved Asbestocel, Zero, Anti-Sweat, or Brine and Ammonia Insulations. Whatever the need, it can be met efficiently with one of the Johns-Manville insulations tabulated in the next column.

PIPE AND BOILER INSULATIONS

SERVICE	TYPE OF INSULATION	INSULATION RECOMMENDED
Steam pipes, all high pressures	Sectional	High Temperature Combination; Asbesto-Sponge Felted; 85% Magnesia
Medium pressure steam pipes	Sectional	Asbesto-Sponge Felted; 85% Magnesia
Low pressure and hot water pipes	Sectional	Improved Asbestocel
Anti-freezing	Built-up or sectional	Built-up Hair Felt; Zero
Brine and ammonia pipes	Built-up	Brine and Ammonia
Cold water pipes	Sectional	Anti-Sweat
Boiler insulation	Sheet and block and Cement	Asbesto-Sponge; Improved Asbestocel; 85% Magnesia; Cements, Nos. 302, 400, 85% Magnesia
Stack lining	Sheet	Vitribestos

Johns-Manville Radiator Trap

This device permits the free discharge of water from the radiator without loss of steam, on atmospheric or vacuum return line systems. The action is direct; that is, the operation of the trap depends on the movement of the water flowing into it, rather than the temperature or the pressure of the steam. Thus the capacity of the trap does not vary.

The principle of operation is the same for all types and models.

There is just one moving part—a ball, which is held against the discharge bushing by unbalanced pressure and which rises when water flows into the chamber. After the water level reaches a point slightly above the discharge orifice, the buoyant force of the water rolls the ball up and exposes part of the discharge orifice, allowing free escape of water and air. As the water level lowers, the ball settles back and closes the discharge orifice, and the water seal which is maintained prevents steam leakage.

The operation of the Johns-Manville trap is continuous, for it discharges the water as received.

Johns-Manville Steam Trap

This trap is made for power plants and generally used in sizes with connections from 3/4" to 2", inclusive, and is similar to the Johns-Manville Radiator Trap in principle.

Johns-Manville Industrial Flooring

This flooring is in the nature of an asphaltic concrete and consists of a binder, or cement, made up of a combination of natural asphalts and a well graded mineral aggregate of crushed stone, torpedo gravel and sand, with particles ranging in size from those passing a 3/4" mesh screen down to those which pass a 200-mesh screen.

Johns-Manville Industrial Flooring can be laid in any consistency between extreme hardness and softness.

Adds greatly to comfort and efficiency of employees in shops, factories, and other industrial buildings. It is a protection against ailments common to dampness.

This is essentially a floor that is "made to fit"; therefore, each installation should be treated as an individual problem and a specification written to meet the exact requirements. A brief description of conditions sent to any of our Branch Engineering Departments will bring immediate response.

THE NATIONAL ROOFING CO.

Manufacturers of Asphalt Roofing
185 Fillmore Avenue
TONAWANDA, N. Y.

TRADE-MARK

Products

Security Wide Weld Asphalt Roofing, a Ready-to-lay Roofing for flat or steep roofs.

Security Wide Lap Asphalt Strip Shingles.

Natroco Individual Asphalt Shingles.

How to Obtain Our Roofings

Our roofings can be obtained from our distributers and jobbers or direct from factory. Full directions for application accompany each roll. By following directions carefully, competent workmen will secure thoroughly satisfactory results.

Security, the 6-in. Joint Roofing for Flat or Steep Roofs

Security Wide Weld asphalt roofing is a patented ready-to-lay, gravel, or slate surfaced asphalt roofing, used on flat or steep roofs.

The 6-in. Patented Joint—Security Wide Weld roofing is made with a patented 6-in. wedge-shaped joint that can not leak, welds the whole roof into one continuous piece, and covers all nailheads with the full thickness of roofing (see illustration), a feature not found in any other type of ready-to-lay roofing.

The joint is made by lapping each sheet of roofing 6 in. over the one that lies next below it on the roof, and welding the two together with hard, natural mineral asphalt cement, heated to 350° F. As will be noted the union is made between two smooth surfaces, a 6-in. ungraveled margin being left along one edge for this purpose.

Built Up in Three Layers—Security Wide Weld roofing is built up in three layers as follows:

A—One layer of asphalt saturated wool felt 36 in. wide.
B—One layer of natural mineral asphalt 32 in. wide.
C—Layer fine sea gravel or crushed slate.

Over the last 2 in. of layer "B," which forms a part of the 6-in. weld, is laid a strip of thin tissue paper tape, which prevents sticking in the roll. This dissolves entirely in the process of welding.

No Coal Tar—Security roofing is made of special high grade, long fibered wool felt, saturated with natural mineral asphalt, which is refined by our own formula, the result of over 25 years' experience. Not a particle of coal tar or pitch in any form enters into the composition of any of our roofings.

Surfacing—The surfacing of Security roofing is a heavy layer of natural mineral asphalt cement, into which, while hot, is permanently embedded a final layer of white sea gravel, or crushed red or green slate. This adds to the durability, weatherproofing and fire resisting qualities, and obviates all need of painting and repairs. The color may be changed by using our "Asphaltus" Coating.

Security Roofing Is Durable—This roofing has lasted long periods of time, not only without renewals, but without any attention whatever. Ten, twelve and fifteen-year-old roofs are still in good condition and will apparently remain so for many years to come.

Underwriters' Approval—Security Wide Weld roofing is approved by the National Board of Fire Underwriters.

Styles—Security roofing is made in two styles; sea-gravel surface and crushed slate. It can also be furnished with burlap insertion for siding, or for roofs over one-half pitch. Security roofing is satisfactory for all classes of roofs, and easily applied by any intelligent workman. The gravel surface is used extensively as a non-slip stair tread.

Specifications for Security Wide Weld Roofing

Roofing on Concrete or Tile Surfaces—(1) ***Work Done by Others***—All roof surfaces will be graded to properly drain to gutters or down-spouts. All saddles, crickets, cant strips and flashing strips will be provided where required. (When roof is more than one-third pitch wood nailing strips not more than 15 ft. apart will be provided.) The roof surface will be smooth and thoroughly cleaned. The above work will be done by others under the instructions of this (Roofing) Contractor.

(2) ***Materials***—All materials shall be of The National Roofing Co's. National Asphalt Primer, Natronite MC Asphalt Mopping Cement and Security Wide Weld Roofing.

(3) ***Application of Materials***—The roof surface shall be thoroughly primed with National Asphalt Primer, applied cold and well brushed in.

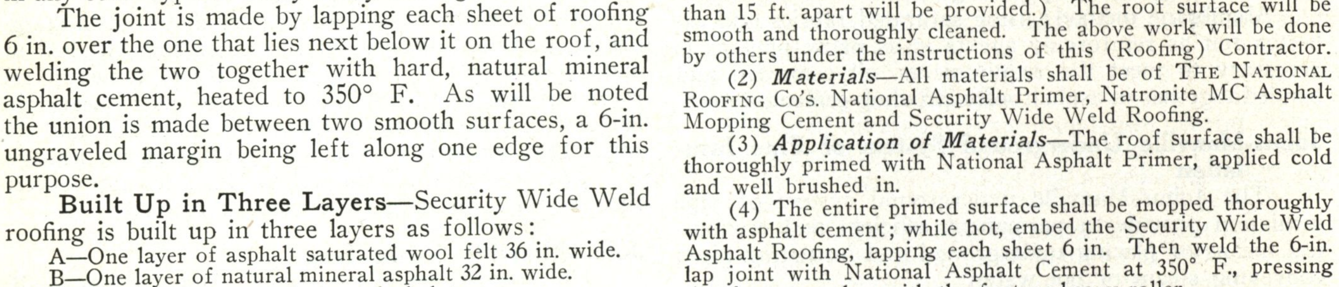
(4) The entire primed surface shall be mopped thoroughly with asphalt cement; while hot, embed the Security Wide Weld Asphalt Roofing, lapping each sheet 6 in. Then weld the 6-in. lap joint with National Asphalt Cement at 350° F., pressing the sheets together with the foot or heavy roller.

(5) ***Gutters and Valleys***—Lay the sheets lengthwise with the gutter or valley. No joints to occur at center.

(6) To reinforce gutter, lay one or two sheets of National Asphalt Saturated Felt over which is spread a uniform layer of asphalt cement; while hot, embed a full length sheet of Security Wide Weld Roofing cut to width.

(7) ***Flashing***—Security Roofing shall be cut lengthwise into strips to extend up on all vertical surfaces to the height of wood flashing strip (provided by others). The roofing strips shall be cemented to the walls, and finished at the top with a narrow cleat nailed through the roofing to wood nailing strip and sealed with hot cement.

(8) ***Counterflashing***—Security Roofing (or No. 26 galvanized iron or copper) shall be used, let into wall at least 4 in. and turned up 1 in. in wall. The remaining 3 in. shall be turned down over the base flashing.



Detail Showing Construction and Laying of Security Wide Weld Asphalt Roofing

Continued on next page

Roofing Over Wood Sheathing—(9) ***Work Done by Others***—All roof surfaces shall be graded to properly drain to gutters or down-spouts. Roofing boards shall be well seasoned and the ends of each board shall rest on and be properly secured to joists and purlins. If edges of sheathing boards are curled up, they shall be drawn down and secured firmly to joists or purlins, eliminating all projecting nailheads and other projections. All saddles, cant strips and flashing strips shall be provided where required. All loose knots and other flaws shall be removed and all holes filled or covered. The roof deck shall be smooth and thoroughly cleaned. The above work shall be done by others under the instructions of the roofing contractor.

(10) ***Materials***—The materials used shall be THE NATIONAL ROOFING Co's. Natronite MC Asphalt Mopping Cement and Security Wide Weld Roofing.

(11) ***Application of Materials***—Lay Security Gravel Surface Wide Weld Roofing next to the sheathing, lapping each sheet at joint allowed for this purpose, nailing the upper edge through the 2-in. white tape every 2 or 3 in., then weld the entire 6-in. joint with Natronite MC Asphalt Cement at 350° F., pressing sheets together with the foot or heavy roller.

(12) Care shall be exercised that no spaces or skips occur in welding the joint. Roofing sheets shall be laid parallel to and not cross the sheathing boards.

Note: For gutters, flashing, etc., copy paragraphs 5, 6, 7 and 8.

Security Wide Lap Strip Shingle (for Slanting Roofs)

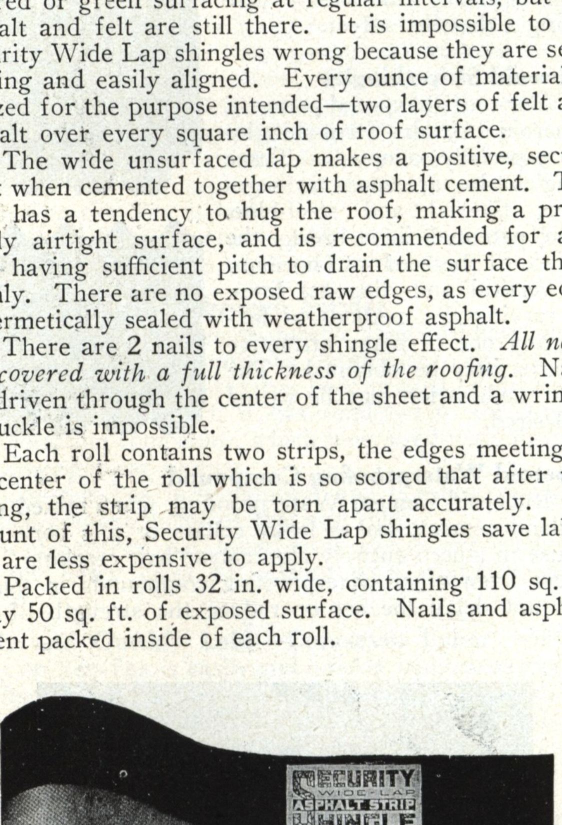
Made of the same high grade, long fibered asphalt felt, asphalt binder and surfacing as Security Wide Weld roofing described on preceding page, and in the same colors and quality of workmanship. The celebrated Security 6-in. joint Wide Weld roofing was taken as a model, the joint modified and the surfacing placed in such a relative position that an individual shingle effect is produced. This effect is produced by omitting the red or green surfacing at regular intervals, but the asphalt and felt are still there. It is impossible to lay Security Wide Lap shingles wrong because they are self-spacing and easily aligned. Every ounce of material is utilized for the purpose intended—two layers of felt and asphalt over every square inch of roof surface.

The wide unsurfaced lap makes a positive, secure joint when cemented together with asphalt cement. The strip has a tendency to hug the roof, making a practically airtight surface, and is recommended for any roof having sufficient pitch to drain the surface thoroughly. There are no exposed raw edges, as every edge is hermetically sealed with weatherproof asphalt.

There are 2 nails to every shingle effect. *All nails are covered with a full thickness of the roofing.* Nails are driven through the center of the sheet and a wrinkle or buckle is impossible.

Each roll contains two strips, the edges meeting at the center of the roll which is so scored that after unrolling, the strip may be torn apart accurately. On account of this, Security Wide Lap shingles save labor and are less expensive to apply.

Packed in rolls 32 in. wide, containing 110 sq. ft. to lay 50 sq. ft. of exposed surface. Nails and asphalt cement packed inside of each roll.



Security Wide Lap Strip Shingle

How to Specify Security Wide Lap Strip Shingles—(1) ***Preparation of Wood Sheathing***—Roof surface shall be graded to properly drain into gutters or down-spouts. Sheathing boards shall be nailed securely and closely (not less than 1 in. apart), swept clean and free from projecting nailheads, splinters and other obstructions.

(2) ***Materials***—The sheathing shall be covered with THE NATIONAL ROOFING Co's. Security Wide Lap Strip Shingles (specify surfacing and color).

(3) ***Application***—Two thicknesses of strip shingles shall be laid at the eaves, supported by wood or metal strips where shingles project. Along gable and dormer edges, lower ends of strips shall be nailed at the edge. Nail each shingle along the tape with 2 galvanized broad head nails. Where the ends of two rolls abut, a flashing strip of unsurfaced asphalt impregnated felt shall be laid directly under this joint. This strip shall be fastened with 2 nails at both upper and lower edges and shall run the full width of the strip shingles over it. In this manner a continuous 2-ply roofing is obtained. To the unsurfaced lap of the first double course, apply a coating of asphalt cement (furnished with each roll) heated to 350° F., and press the laps together with the foot or heavy roller. Then lay the next course, bringing the surfaced edges of the top strip flush wtih the surfacing of the next lower strip. Care should be taken that no cement be applied so thickly that it will run down on the surfacing of the lower strips.

Note: If a black marginal or shadow line effect is desired between the strips, the surfaced edges of the top strips are not brought down flush with the surfaced edges of the lower strips. The width of this marginal line is determined by the pitch of roof—the steeper the roof the closer the surfaced edges are brought together.

(4) ***Flashings***—For all valleys, hips, ridges, dormers, pipes, etc., flashings shall be provided consisting of THE NATIONAL ROOFING Co's. Security Wide Weld Roofing of the same surfacing and color as the shingles (or metal, if desired).

Natroco Individual Asphalt Shingles

Made of high grade felts, impregnated with asphalt, and surfaced with red, green or blue-black crushed slate. Each individual fiber in the *center of the edges* is protected by the asphalt used in saturation and the impregnation is so thorough that it is not necessary to apply to the bottom a coat of asphalt with a dust finish. This leaves Natroco shingles free to adhere to each other under the action of the sun.

The heavy bodied layer of asphalt on the base felt insures smooth, thorough embedding of the mineral surfacing and controls expansion so that the sides and ends of the shingles tend to bend toward the roof rather than curl away from it.

Size, 8 in. wide by 12¾ in. long. It requires 424 Natroco shingles, laid 4 in. to the weather, ½ in. apart, to cover 100 sq. ft. of surface, thus providing 3 thicknesses of shingles with 4 thicknesses at the butt. Regularly shipped, 106 shingles per box, for covering 25 sq. ft. of surface. Weight, 240 lb. to 100 sq. ft. of surface covered. Approved and listed (Class C) by Underwriters' Laboratories, Inc.

How to Specify Natroco Shingles—(1) ***Preparation of Wood Sheathing***—Roof surface shall be graded to properly drain water freely into gutters and down-spouts. Sheathing boards shall be thoroughly dry, nailed securely and closely (less than 1 in. apart), swept clean and free from projecting nailheads, splinters and other obstructions.

(2) ***Materials***—Sheathing shall be covered with THE NATIONAL ROOFING Co's. Natroco Asphalt Shingles (state color).

(3) ***Application***—A double row of shingles shall be laid at the eaves, supported by metal or wood strips where they project, and nailed as closely as possible to the lower end. Along gable and dormer edges, lower ends of shingles shall be nailed at the edge. Joints of shingles shall be broken one-third the width of the shingle below so as to insure 3 thicknesses of shingles at all places on the roof. Shingles shall be laid about ½ in. apart so as to provide expansion. To insure perfect alignment, a straightedge or chalk line along the lower edge of the shingles shall be used. When laid 4 in. to the weather, shingles shall be nailed with galvanized broad head nails 5 in. from lower end, 2 nails to each shingle. Nails shall be driven in straight and into sound wood (not into knots or cracks).

(4) ***Flashings***—Flash all valleys, hips, ridges, dormers, pipes, etc., with mineral surfaced roll roofing of the same color as the shingles (or metal, as desired).

THE RUBEROID CO.

Manufacturers of Ruberoid Weatherproofing Products

95 Madison Avenue
NEW YORK, N. Y.

CHICAGO, ILL.
BOSTON, MASS.

TRADE-MARK

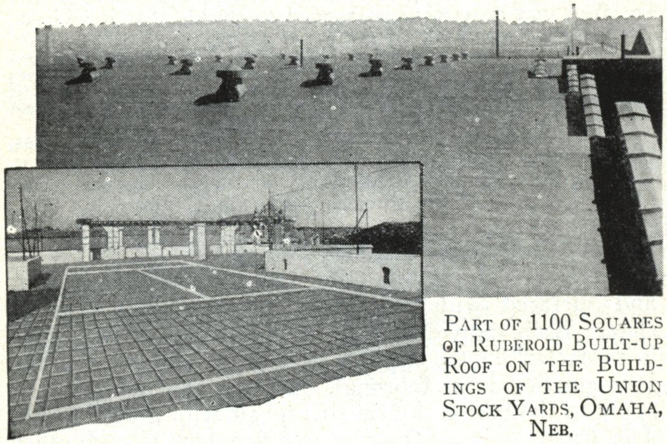
Products

Built-up Roofing; Asphalt Shingles (Strips, Giant and Standard-size Units); Waterproofing Compound.

Also Roll-roofing (Smooth-surfaced and Mineralized), Building Papers and Felt.

Ruberoid Built-up Roofing

A Ruberoid Built-up Roof consists of one layer of Ruberoid Asphalt Felt and two layers of Ruberoid Cap-sheet bonded together with Ruberoid Solid-cement. Every part is made of time-tested materials.



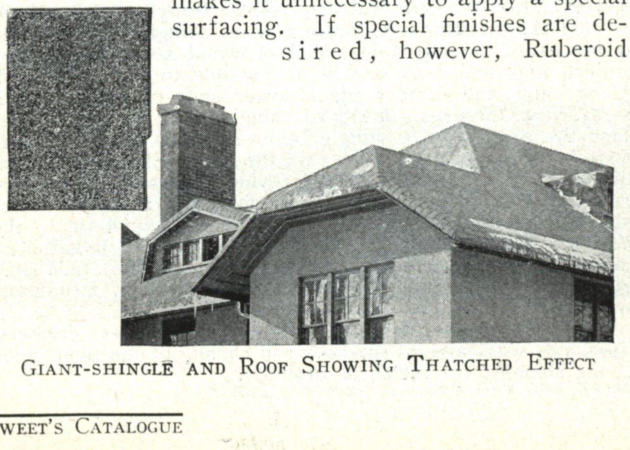
Part of 1100 Squares of Ruberoid Built-up Roof on the Buildings of the Union Stock Yards, Omaha, Neb.

Ruberoid Roof Showing Special Tile Finish

Ruberoid Cap-sheet in itself is a mechanically perfect barrier against the ravages of the weather. The felt, saturant and coating are the same as those used in Ruberoid Roll-roofing which has stood the test of service for more than thirty years. The fact that the asphalt coating is applied by machine in our factories reduces the risk from human error or negligence in application, and permits the use of a tougher, denser and more durable asphalt than could possibly be handled on the job by labor.

The bonding material, Ruberoid Solid-cement, is 98.5% pure. It is practically smokeless and free from dirt. Roofers' kettles seldom need cleaning until the job is finished. It heats readily to mopping consistency but will stand unusually high temperatures without flashing or altering in composition.

The heavy weather coating of Ruberoid Cap-sheet makes it unnecessary to apply a special surfacing. If special finishes are desired, however, Ruberoid Built-up Roofs are adaptable to a wide range of treatments. They may be painted with green or red Ruberoid Roof-coating or finished with slag, gravel, tile, etc.



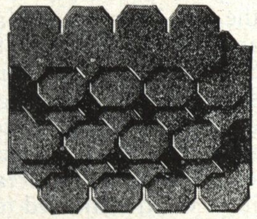
Giant-shingle and Roof Showing Thatched Effect

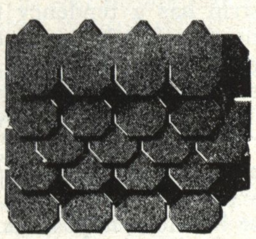
Ruberoid Giant-shingles

Ruberoid Giant-shingles combine unusual durability with unique features of economy. They make a roof which is rugged in appearance and unquestionably the most durable of its kind. They measure 10x14 in. and are intended to be laid 5 in. to the weather. They are self-spacing. These features reduce the application cost nearly 50% over that of ordinary individual shingles.

Moreover, the resulting roof is 60 pounds heavier per square.

Ruberoid Giant-shingles make distinctively attractive roofs. They are surfaced with natural crushed slate in sage-green, tile-red, steel-blue and purple. An attractive color blend may be procured by mixing green and steel-blue shingles in a ratio of two-to-one, according to which predominating color is desired. By using Ruberoid Shingle-stains, a tapestry effect may be obtained. The ruggedness of the shingles makes them especially suitable for producing a thatched effect.



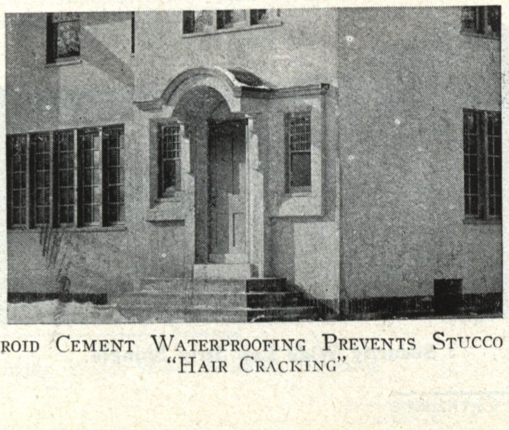


Ruberoid Strip-shingles

For roofs in special patterns, Ruberoid Octab Strip-shingles are especially adapted. These shingles also are made in sage-green, tile-red and steel-blue. Their patented form breaks the surface of the roof into horizontal, vertical and diagonal lines. By varying the methods of laying, any one of many attractive patterns may be obtained. The color combination may be varied as desired.

Ruberoid Waterproofing Compound

Ruberoid Cement Waterproofing, when mixed with portland cement, makes leaky cellars or pits bone dry. Its use in stucco entirely eliminates "hair cracking." It differs from other waterproofing compounds in that it does not delay the set or reduce the strength of the mortar.



Ruberoid Cement Waterproofing Prevents Stucco from "Hair Cracking"

WILLIAM L. BARRELL CO. OF N. Y., INC.

Cotton Duck—Converted Fabrics

93 Worth Street
NEW YORK, N. Y.

CON-SER-TEX
CANVAS
ROOFING
TRADE-MARK

Product

Con-Ser-Tex, a covering for roofs and floors.

Con-Ser-Tex—An Ideal Roof and Floor Covering

Con-Ser-Tex is a specially woven, chemically treated, tough cotton duck which meets the exacting requirements of an ideal covering for roofs and floors of porches, sleeping balconies, piazzas, etc.

Con-Ser-Tex is also an ideal floor covering for kitchens, laundries, garages, etc.

Con-Ser-Tex is so woven that there is absolutely no tendency to curl, as is the case with ordinary cotton fabrics. Con-Ser-Tex lies flat permanently, as is essentially necessary.

Con-Ser-Tex will never split, not even under severe vibration or strain. It is comfortable under foot and may be turned up to form a sanitary, verminproof and waterproof base, integral with the floor.

Immune to Dry Rot and Mildew

Con-Ser-Tex is subjected to a chemical treatment in which every fiber is impregnated with a special composition which protects it against the elements. This renders it permanently waterproof and immune to the ravages of dry rot and mildew. The effectiveness of the process is proved by the great endurance of the similarly bitumen soaked mummy cloths of the ancient Egyptians.

This chemical treatment also exercises a distinct rot preventive and antiseptic effect upon the wood over which Con-Ser-Tex is laid.

The chemical treatment also overcomes the detrimental oxidizing action of the oil in the paint.

Durability Proved Through Service

Con-Ser-Tex is more durable than ordinary wood shingles or tin and nearly as durable as copper. The durability of Con-Ser-Tex has been proved by the many years of service which it has rendered to the largest transportation companies, which have used it exclusively for passenger car roofing.

Con-Ser-Tex is soundproof and non-heat-radiating and is a non-conductor of heat and cold.

Con-Ser-Tex has found wide use in every climate and for every class of service with complete satisfaction.

Easily and Quickly Laid—Conserves Labor

Con-Ser-Tex is easily and quickly laid, consequently it effects great savings in time and labor. It can be applied at one-half the cost of laying other materials on the same surface and area.

A Lower Grade of Lumber May Be Used

In the construction of porch floors, sleeping balconies, etc., it has been customary to use clear pine owing to its durable nature. With the aid of Con-Ser-Tex, however, a lower grade of lumber can be used with equally satisfactory results, because Con-Ser-Tex protects the lumber from the action of the elements and a surface so covered will have greater life than would an unprotected clear pine surface.

How to Lay Con-Ser-Tex

Dress the surface to be covered with Con-Ser-Tex by eliminating rough places and sharp edges, after which apply a heavy coating of white lead thinned in linseed oil as a bedding (see note below). Over this bedding (while still wet) lay the Con-Ser-Tex, slightly stretching it so as to insure a close adhesion to the wood surface, taking care to arrange laps so as to permit free drainage.

If Con-Ser-Tex is to be laid in parallel courses with the building, the strips start from the outer or lower edge of the surface to be covered. Con-Ser-Tex should be turned up or flashed 4 to 6 in. at walls to insure a watertight result.

While Con-Ser-Tex is stretched, fasten with copper or galvanized tacks ¾ in. apart, and then apply the next strip, allowing a lap of not less than 1½ in.

After Con-Ser-Tex is laid and set, apply a light coat of good quality lead-and-oil paint, and a second or heavier coat after the first is thoroughly dry.

Note: If desired, we can furnish a special bedding paint which has greater adhesive qualities than ordinary white lead and oil.

Grades of Con-Ser-Tex

Grade E—A light weight grade, suitable for roofing small porches and for floors where traffic is light.

Grade G—A medium weight grade, suitable for larger porch floors and roofs on residences and public buildings.

Grade I—The heaviest grade, used principally for public buildings and all places where severe conditions exist.

Reasonable in Cost

The first cost of Con-Ser-Tex is reasonable and its upkeep practically nil, requiring painting only as often as the rest of the house.

LIST PRICE OF CON-SER-TEX PER LINEAL YARD

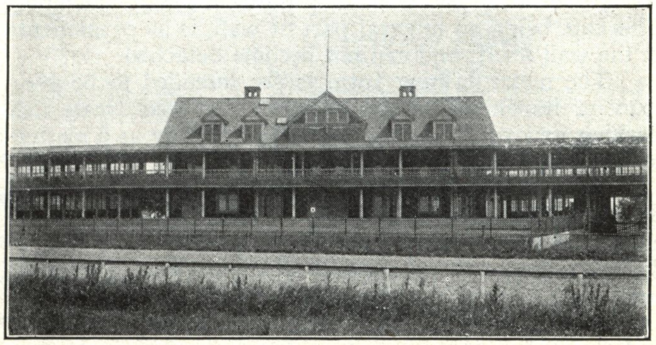
Width, in.	Grade E	Grade G	Grade I
30	$1.17	$1.38	$1.47
36	1.39	1.60	1.78

Discounts furnished on request.

Consult Us Regarding Economical Laying

On receipt of dimensions of the surface to be covered, we will submit an estimate of cost, also a diagram showing the most economical method of laying Con-Ser-Tex, eliminating to the greatest possible extent all waste in cutting.

There is no charge for this service.



Club House of the Empire City Race Track, Mt. Vernon, N. Y.

Con-Ser-Tex is giving service on the porch floor and roof

THE BARRETT COMPANY

Flashings for Brick and Concrete Walls

40 Rector Street
NEW YORK, N. Y.
For Branch Offices, see page 1038

Products

Flashing Block for Brick Walls (Patented), Flashing Form for Concrete Walls (Patented), Plastic Elastigum for Flashings.

For Roofing, see pages 1038-1040; for Roof Leader and Roof Vent Connections, see page 1851. For detailed description and specifications, see Volume III, Barrett Architects' and Engineers' Built-Up Roofing Reference Series.

Essential Features of Barrett Flashings

Barrett Flashings, which are the result of nearly three-quarters of a century of successful roofing experience, embody all of the following essential features:

(1) They provide amply for expansion and contraction. (2) Their elasticity takes care of settlement or shrinkage. (3) All joints are watertight under every weather condition. (4) They will not pull away from either roof or wall. (5) They are practical and easy to install. (6) They are adaptable to every complex wall construction. (7) They are durable and require no maintenance or repair. (8) They eliminate division of responsibility between contractors. (9) Their cost is moderate.

Barrett Flashing Blocks and Flashing for Brick Walls

These blocks provide a permanent, upwardly inclined flashing groove in the wall, which performs the function of a cap and weather protection for the flashing. This cap, being an integral part of wall, is as permanent as the wall itself, and can not become detached.

The flashing material is installed over one unbroken plane, eliminating the buckling, tearing, pocketing, and special wear which so frequently occur where flashings are set in at right or acute angles. The cant construction provides support from below throughout the extent of the flashing, hence there is no strain from wind and gravity.

For detailed specifications see Volume III, Architects' and Engineers' Built-up Roofing Reference Series.

Barrett Flashing Form and Flashing for Concrete Walls

This flashing form is identical in principle with the flashing blocks described above. The metal flashing form, shown at right, provides a permanent, upwardly inclined flashing groove in the wall, which performs the function of a cap and weather protection for the flashing. This cap, being an integral part of wall, is as permanent as the wall itself, and can not become detached.

The metal flashing form is not intended to be permanent, its only function being to shape or create the flashing groove. It is left in the wall merely as a matter of convenience.

The flashing material is installed over one unbroken plane, eliminating the buckling, tearing, pocketing, and special wear, which so frequently occur where flashings are set in at right or acute angles. The cant construction provides support from below throughout the extent of the flashing, hence there is no strain from wind and gravity.

For detailed specifications see Volume III, Architects' and Engineers' Built-Up Roofing Reference Series.

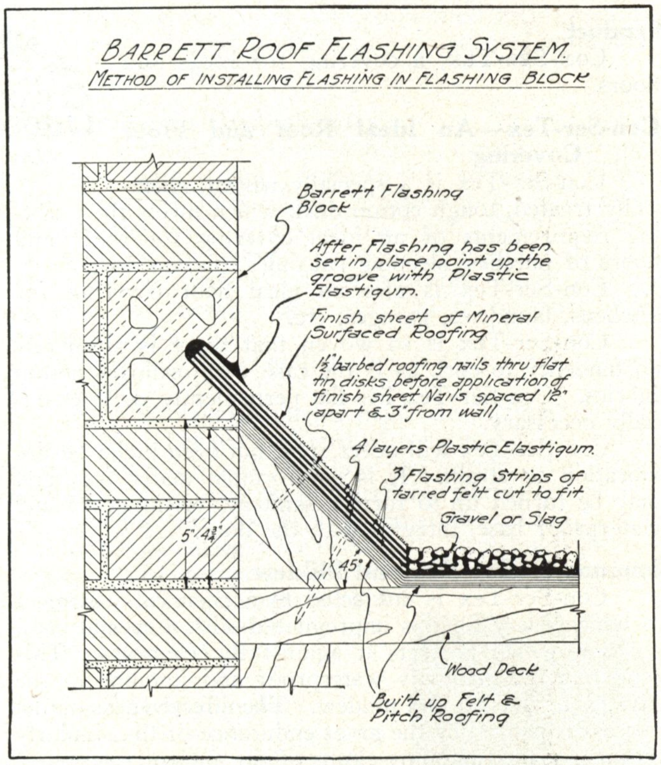

BARRETT ROOF FLASHING SYSTEM.
METHOD OF INSTALLING FLASHING IN FLASHING BLOCK
Barrett Flashing Block
After Flashing has been set in place point up the groove with Plastic Elastigum.
Finish sheet of Mineral Surfaced Roofing
1½" barbed roofing nails thru flat tin disks before application of finish sheet Nails spaced 12" apart & 3" from wall
4 layers Plastic Elastigum.
3 Flashing Strips of tarred felt cut to fit
Gravel or Slag
5' 4½"
45°
Wood Deck
Built up Felt & Pitch Roofing

Diagram Showing Barrett Flashing Blocks and Flashing for Brick Walls

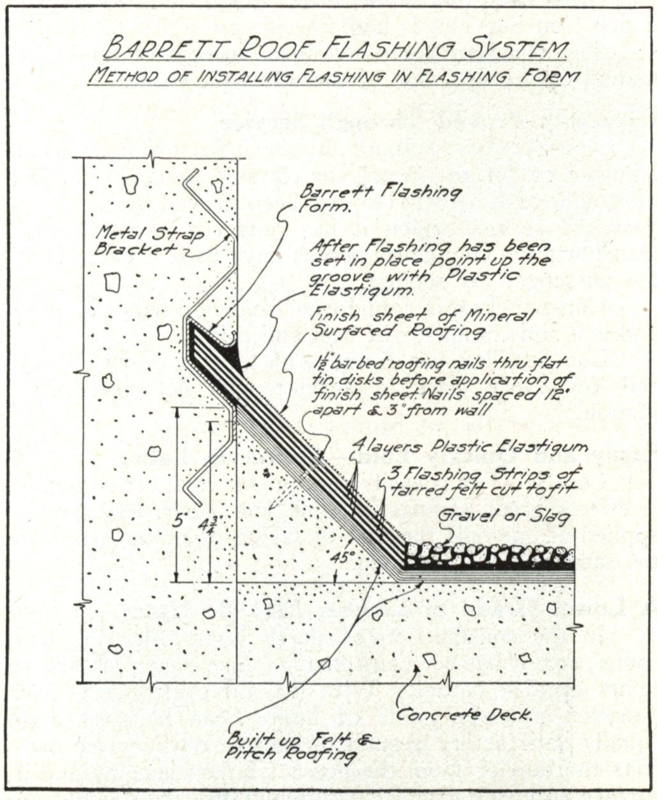

BARRETT ROOF FLASHING SYSTEM.
METHOD OF INSTALLING FLASHING IN FLASHING FORM
Barrett Flashing Form.
Metal Strap Bracket
After Flashing has been set in place point up the groove with Plastic Elastigum.
Finish sheet of Mineral Surfaced Roofing
1½" barbed roofing nails thru flat tin disks before application of finish sheet Nails spaced 12" apart & 3" from wall
4 layers Plastic Elastigum
3 Flashing Strips of tarred felt cut to fit
Gravel or Slag
5' 4½"
45°
Concrete Deck.
Built up Felt & Pitch Roofing

Diagram Showing Barrett Flashing Form and Flashing for Concrete Walls

ESTATE OF J. G. HETZEL

Manufacturers of Roofing Cements and Paints

CABLE ADDRESS
"Hetzel, Newark"

67 Maine Street
NEWARK, N. J.

Products

Hetzel's Elastic Roof Cement for all kinds of roofs, glass skylights, coping stones, etc.

Hetzel's Plastic Roof Compound and Fibrous Koting.

Hetzel's "R.O.P." Cement Coating.

Hetzel's Pipe Joint Compound.

Hetzel's Damp Resisting Paint for brick walls.

Also Hetzel's Asphalt Paints; Hetzel's "Rub-on" Roofing Paint; Hetzel's Enamel Paint for boiler fronts and steam pipes; Hetzel's Acidproof Paint for metal work, ammonia tanks and gas tanks; Hetzel's Structural Paint for exposed surfaces.

TRADE-MARK

Hetzel's Elastic Roof Cement

Hetzel's elastic roof cement, which has been in general use throughout the United States and Europe for many years, is especially valuable for covering and repairing all holes, cracked joints, breaks, or leaks in roofs of all kinds. It is also used for pointing around chimneys, skylights, and dormer windows; for repairing coping stones, gutters, wood and stone work which requires to be made watertight; and for laying and bedding slate and tile roofs.

Asphalt shingles laid in Hetzel's cement will not curl, nor can snow or rain blow under them.

Colors: brown, gray, black, white, green and red. It is also made to order to suit every purpose, and is the only slaters', tinners' and tile roofers' cement.

Hetzel's elastic roof cement is equally well adapted for use on slate, tin, asbestos, glass, wood and metal roofs; is permanent; does not run or loosen from joints or cracks, and is not affected by any extreme of temperature or climatic changes. It does not harden, but preserves its completed elasticity even when exposed to extreme heat, cold, dryness or humidity.

Hetzel's Plastic Roof Compound and Fibrous Koting (Liquid)

Specially prepared compounds for repairing and painting old wood, tin, iron or felt roofing; for repairing leaky chimneys; for waterproofing walls below and above grade, etc.

Hetzel's "R.O.P." Cement Coating

For stucco, brick, concrete surfaces, and cement floors.

Impervious to moisture, and positively unaffected by any of the alkalis in cement and brick materials.

It dries hard and is proof against oil, grease or water.

Made in 8 different colors.

Pipe Joint Compound (Red and Gray)

This compound is used for joints of gas, steam, water, and air pipes. It will not harden, and prevents joints from rusting. It will make absolutely tight joints, which can be disconnected at any time, without injury to fittings.

Hetzel's Damp Resisting Paint

A compound black paint for dampproofing foundations and walls above and below grade. When applied to inner side of exterior walls, forms a good dampproof surface for direct application of plaster, rendering plaster stainproof, and saving cost of furring and lathing.

Specifications for the Use of Hetzel's Elastic Roof Cement

All nailholes and joints between the slates shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the Estate of J. G. Hetzel, Newark, N. J., in such quantities as to hold the slates in position should they break, or the nails rust away. (Fig. 1.)

The joints of all tiles shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the Estate of J. G. Hetzel, Newark, N. J. To prevent leaking, the hip and ridge rolls shall be sealed in a like manner. (Fig. 2.)

All cap flashings shall be carefully pointed up with Hetzel's Elastic Roof Cement as manufactured by the Estate of J. G. Hetzel, Newark, N. J. (Fig. 3.)

The joints of all copings shall be set and sealed with Hetzel's Elastic Roof Cement as manufactured by the Estate of J. G. Hetzel, Newark, N. J. (Fig. 4.)

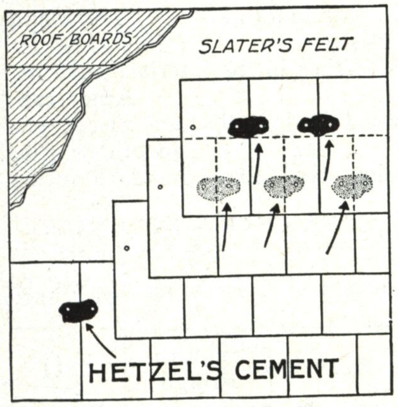


Fig. 1. For Slate Roofs

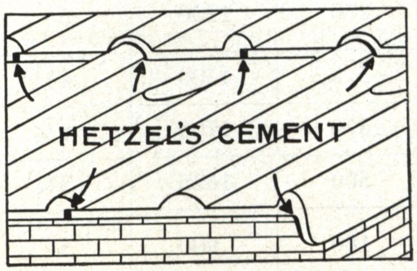


Fig. 2. For Spanish and Flat Tile Roofs

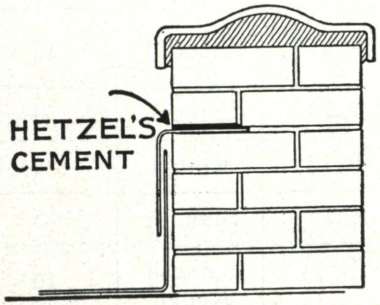


Fig. 3. For Pointing Up Cap Flashings

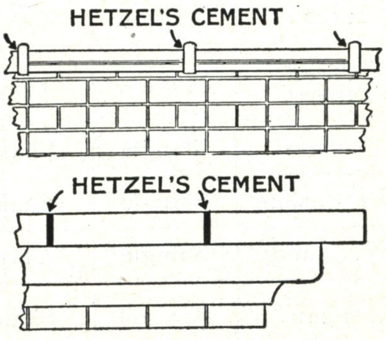


Fig. 4. For Tile and Stone Copings

Applications of Hetzel's Elastic Roof Cement

B. MIFFLIN HOOD BRICK COMPANY

Manufacturers of Roof Tile, Floor Tile, Brick and Chemical Stoneware

ATLANTA, GA.

SALES OFFICES

DAISY (HAMILTON COUNTY), TENN., Roof Tile and Floor Tile
ATLANTA, GA., 154 Greenwood Avenue, Brick and Chemical Stoneware

BRANCHES

CHARLOTTE, N. C., 1206 So. Boulevard
CHATTANOOGA, TENN., Post Office, Daisy, Tenn.
GREENVILLE, S. C., 206 Bruce Building
MEMPHIS, TENN., 386 Shrine Building
NEW ORLEANS, LA., 406 Canal-Commercial Bank Building
RALEIGH, N. C.

REPRESENTED BY LEADING ROOFERS, TILE AND BRICK DEALERS IN PRINCIPAL CITIES

Products

TRUE MISSION ROOF TILE; TAPERED MISSION ROOF TILE; FLAT ENGLISH SHINGLE TILE; QUARRIE TILE; PROMENADE TILE.

Also manufacturers of Brick for all architectural and structural uses, Fireplaces, Steps, Briquettes, Landscape Tile, Garden and Terrace Tile, Heavy Traffic Tile, Non-slip Ramps, Brick and Stucco Inserts, Chemical Stoneware, Cylindrical Spiral Ring Tower Packing.

Roof Tile

Mission Tile—*"Riviera"*—A true reproduction of the old Spanish Mission roof tile as seen along the Mediterranean, produced in a soft mingling of fire flashed (autumn foliage) shades and also rugged enough in manufacture to relieve the mechanical straight line and painted color effect of ordinary red tile.

Mission tile is made in 15-in. lengths, 11 in. exposure to weather. Can also be laid in random courses with varying weather exposures. Specials: eave closures, starter tile, and eave pan tile with water opening for concealed gutter. Regular field tile is used for saddling hips and ridge. No terminal pieces are used.

Textures—"Riviera" is manufactured, either in the smooth or vertical combed rough texture.

Body—Made from shale hard burned and well vitrified.

"Habana"—A straight barrel mission type like "Riviera" in size and shape, but especially made of a porous clay body, in a very soft range of pastel shadings from light buff, through the reds to dark chocolate browns; to simulate the color and texture of the old handmade Cuban Tiles.

Texture—One texture only, a dull, scraped die surface, non-reflecting.

Special Fittings—Same special fittings as used for "Riviera."

"Habana Tapered"—A tapered mission tile like old handmade Cuban tapered, manufactured in full range of soft weathered shades like colors of Habana Straight Barrel Mission.

Texture—One texture only, a dull surface, non-reflecting.

Body—Clay.

Shingle Tile—*"Sussex"*—Smooth, flat English shingle; shale body; hard burned; same fire flashed colors as "Riviera"; 9x12 in. (See chart for data.)

"Devonshire"—Rough combed texture. Otherwise same as "Sussex." (See chart for data.)

"Normandy"—Smooth, flat shingle; clay body; colors same as "Habana" Mission. Made of same material; 6x13 in. (See chart for data.)

American "S" (or Spanish "S")—Pan and roll in one piece; shale body; red and fire flashed colors; smooth or rough texture. (See chart for data.) All standard fittings also furnished.

DATA CHART—ROOF TILE

NAME	KIND	BODY	SIZE, IN.	TEXTURE	EXP. TO WEATHER, IN.	PIECES PER SQUARE	WEIGHT PER SQUARE, LB.	WEIGHT EACH, LB.
"Riviera"	Mission	Shale	8x15	Smooth Rough	11	230	1400	6
"Habana"	Mission	Clay	8x15	Smooth	11	230	1400	6
"Habana Tapered"	Mission	Clay	7½x15	Smooth	12	250	1250	5
"Sussex"	Shingle	Shale	9x12	Smooth	4½	370	1700	4½
"Devonshire"	Shingle	Shale	9x12	Rough	4½	370	1700	4½
"Normandy"	Shingle	Clay	6x13	Smooth	5	500	1625	3¼
American "S"	Pan-roll	Shale	10x13	Smooth Rough	10½	180	900	5

Complete Data Sheet cheerfully furnished on request.

Continued on next page

"Pottry" Floor Tile

Quality—"Pottry" tile is made from pulverized pottery, mixed with high grade shale. TRADE POTTRY MARK

Textures — "Pottry" Quarrie products are made in 4 textures, as follows:

(B) ***Smooth Surface, Wire-cut Edge***—With corrugated backs.

Texture B is a smooth surface with wire-cut edge and corrugated back. Used extensively to replace repressed tile.

(C) ***Flemish Texture***—Die surface coarse grog.

Texture C, Old Flemish, is a comparatively smooth texture surface with a wire-cut edge. It is made with Old Flemish one side, matt or Oriental texture other side.

(D) ***Matt Texture***—Fine wire-cut.

Texture D, matt texture, is a fine wire-cut surface and edge. Coarser than Old Flemish.

(E) ***Oriental Texture***—Coarse wire-cut.

Texture E, Oriental texture, is coarse wire-cut, particularly adapted to conditions where a non-skid surface is desired, or for fireplaces or brick and stucco inserts.

Shades—Hood's "Pottry" tile are unique in color as well as texture value. They are made in a number of rich dull shades, as follows:

(2) Red, light.
(3) Red, medium.
(4) Red, dark.
(5) Red with slight flash.
(6) Fire flashed autumnal blends.

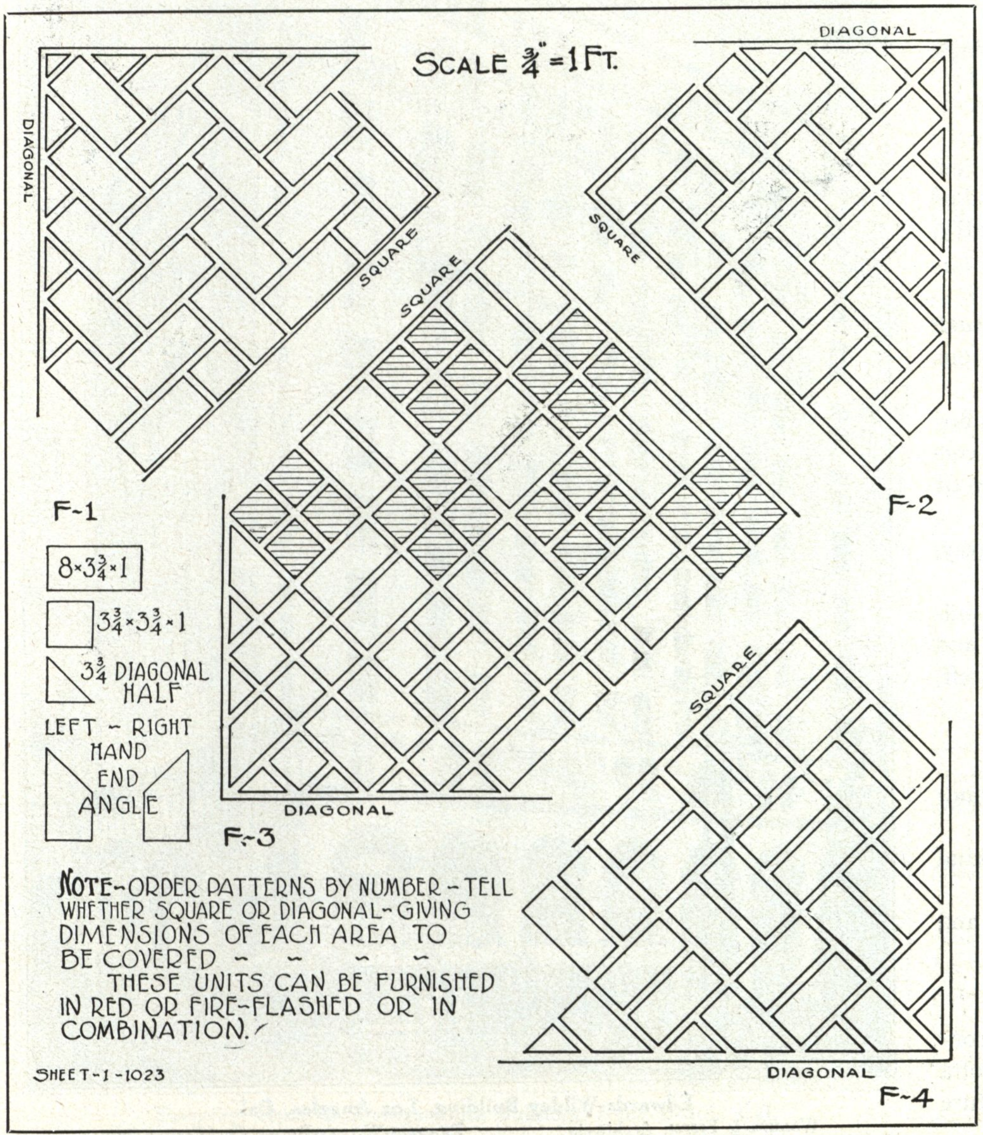
The blended colors (shade No. 6) resemble autumn foliage: fire flashed reds, browns, bronzes, coppers, greens, and bluish purples.

DATA CHART—FLOOR TILE

SIZES AND THICKNESSES OF "POTTRY" TILE

SQUARE		RECTANGLE		TRIANGLE	
Size, in.	Thickness, in.	Size, in.	Thickness, in.	Size, in.	Thickness, in.
8 x8	2	12x6	1½	8 x8	2
6 x6	¾ and 2	8x4	1½	6 x6	¾ and 2
4 x4	½, ¾ and 2	8x3¾	¾	4 x4	¾ and 2
3¾x3¾	¾	6x3	½	3¾x3¾	¾
3 x3	½ and ¾	6x2¾	¾	2¾x2¾	¾
2¾x2¾	¾	6x2¼	1	8 x3¾	¾
2 x2	1	8x2¼	1	6 x2¾	¾
1⅝x1⅝	¾	4x2¼	1		
1 x1	1 and 2	8x1	1		
		6x1	1 and 2		
		2x1	2		

SQUARE EDGED AND NOSED FOR STEP TREADS		STEP RISERS			
Size	Thickness	Size	Thickness		
6x12	1½	6x12	1½		



NOTE-ORDER PATTERNS BY NUMBER-TELL WHETHER SQUARE OR DIAGONAL-GIVING DIMENSIONS OF EACH AREA TO BE COVERED - - - -

THESE UNITS CAN BE FURNISHED IN RED OR FIRE-FLASHED OR IN COMBINATION.

Brick Shaped Tile Showing Few of Many Possible Designs

Grades — Hood's "Pottry" tiles are made in 4 grades, as follows:

Standard — Representing the standard of Hood's manufacture, reasonably perfect and uniform in color.

Select—A special hand selection from the standard grade.

Commercial—A good quality of tile with minor imperfections and defects.

Rubble Random—Tile of odd and irregular shapes possessing exceptional color value resembling autumn foliage. Comes in uniform thickness. Many artistic settings are made with Rubble Random.

Shapes—See chart above.

Special shapes, other than stock specials, will be executed in accordance with the architect's designs.

Guarantee—This product is guaranteed to stand Canadian winters. It is used extensively in acid tower construction, because it is insoluble in boiling nitric and sulphuric acids. Due to its vitrification and toughness it is used as a lining for ladles in steel plants.

Literature—We shall be glad to forward Architect's Service Sheets and Data Sheets on Roofing Tile at your request.

LOS ANGELES PRESSED BRICK COMPANY

Largest Manufacturers of Clay Products in the West

Frost Building, Second Street and Broadway
LOS ANGELES, CAL.

PRINCIPAL SALES AGENCIES

SAN FRANCISCO, CAL., Gladding McBean Co., 660 Market Street
PORTLAND, ORE., Pacific Building Materials Co., 210 Thompson Street
SEATTLE, WASH., Savage-Scofield Co., 1733 Westlake Avenue, North
PHOENIX, ARIZ., Vernon L. Clark, 343 North First Avenue
SALT LAKE CITY, UTAH, Carver Sheet Metal Works, 134 West Broadway
BUTTE, MONT., Richardson-Adams Company
SPOKANE, WASH., D. E. Fryer & Co.
HONOLULU, HAWAII, Lewers & Cooke

Member of American Face Brick Association

Products

- Face Brick: Wire Cut, Dry Pressed and Enameled.
- Fire Clay Refractories.
- Architectural Terra Cotta.
- Hollow Tile.
- Roofing Tile.
- Also manufacturers of:
- Promenade or Quarry Tile.
- Drain Tile.
- Flue Lining.
- Terra Cotta Pipe and Fittings.
- Radial Chimney Blocks.

Face Brick

Sizes—The size of wire cut brick is 2⅜x8⅜x3⅞ inches, and of pressed or enameled brick 2⅜x8⅜x4 inches.

Styles—

Wire Cut Brick, Smooth Texture—In buff, gray and various tones of flashed.

Rough Texture—Ruffled (horizontal texture) and rug (vertical texture) in a wide variety of colors.

Dry Press—Buff, cream, gray, old gold and red.

Enameled—White, ivory, pulsichrome, mottled, red, green and blue; also transparent glaze in buff, cream, gray and red.

Fire Clay Refractories

Machine and hand made standard sizes.

Special shapes of any kind made to order.

We also furnish fire clay and grog.

Architectural Terra Cotta

We are prepared to handle contracts for architectural terra cotta of any size, in any desired texture or color.

Hollow Tile

Sizes—2x12x12 in. to 12x12x12 in.

Load-bearing type in Denison Interlocking tile and Heath Unit tile.

SODA
Thorne Drug Co.
HOTEL

Edwards-Wildey Building, Los Angeles, Cal.
Walker & Eisen, Architects — Edwards-Wildey-Dixon Co., Contractors
Architectural terra cotta; gray granitex finish

Continued on next page

Roofing Tile

This company enjoys the distinction of manufacturing the widest variety of patterns and colors in roofing tile.

Roofing tile are made in different designs.

Colors—The Spanish, Italian and Shingle are made in the various shades of red only and the Mission and Granada are made in shades of old gold, purple and gunmetal, as well as red (known as "varicolor").

Trim—Hips, hip starters, ridges, finials, rakes, eave closures and end bands are made in various styles to fit the different designs of tile.

Specifications for "Varicolor" Granada Roofing Tile —Random Laid

Work Required—Includes all pitched roof surfaces, unless otherwise noted.

Material—Tile shall be terra cotta, the arc of a circle in cross section, about 8 inches wide and 17½ inches long, as manufactured by the LOS ANGELES PRESSED BRICK COMPANY. They shall be hard burned, free from fire cracks, or other defects, and of a texture and varied color approved by the architect. These colors to include red, old gold, purple and gun-metal in all cover tile.

The same tile shall be used for field, hips and ridges.

Felt shall be asphalt impregnated rag felt, weighing not less than 30 pounds per 100 square feet. Strips hereinafter specified shall be of sound durable wood 1x4 rough O.P. under field tile and 2x5½ under hips and ridges.

Nails for securing tile shall be heavily galvanized slate nails, using 4d for pan tile, 6d and 8d for cover tile; also use not less than 8d for hips and ridges.

Workmanship—The entire roof surface shall be covered with felt, laid in horizontal courses, lapping at least 3 inches and securely fastened with broad headed, galvanized nails. Continuous wood strips under field tile shall be laid over the felt at right angles to the eaves, carefully and uniformly spaced, about 11 inches on centers, and securely nailed to roof sheathing at least every 2 feet. Hip and ridge strips shall be properly located, and nailed similarly to those under field tile. Cant strips at eaves shall be of proper thickness and securely nailed in place.

Cover tile shall be laid irregularly, 6 to 14 inches to the weather. Cover tile at eaves shall be doubled, using a tile about 6 to 8 inches long for the bottom one. Each tile shall be nailed with not less than one nail.

Hips and ridges shall be laid irregularly and carefully pointed with 1 to 3 portland cement mortar. Bed the butt of each hip and ridge tile in the lap with same mortar. Color the mortar with a wash of "Clinton" or other approved mortar color after placing.

All tile in contact with mortar shall be wet before applying mortar.

Sample—At the start of the work the roofing contractor shall lay a sample of not less than one-half square of tile for approval of the architect before proceeding further with the work.

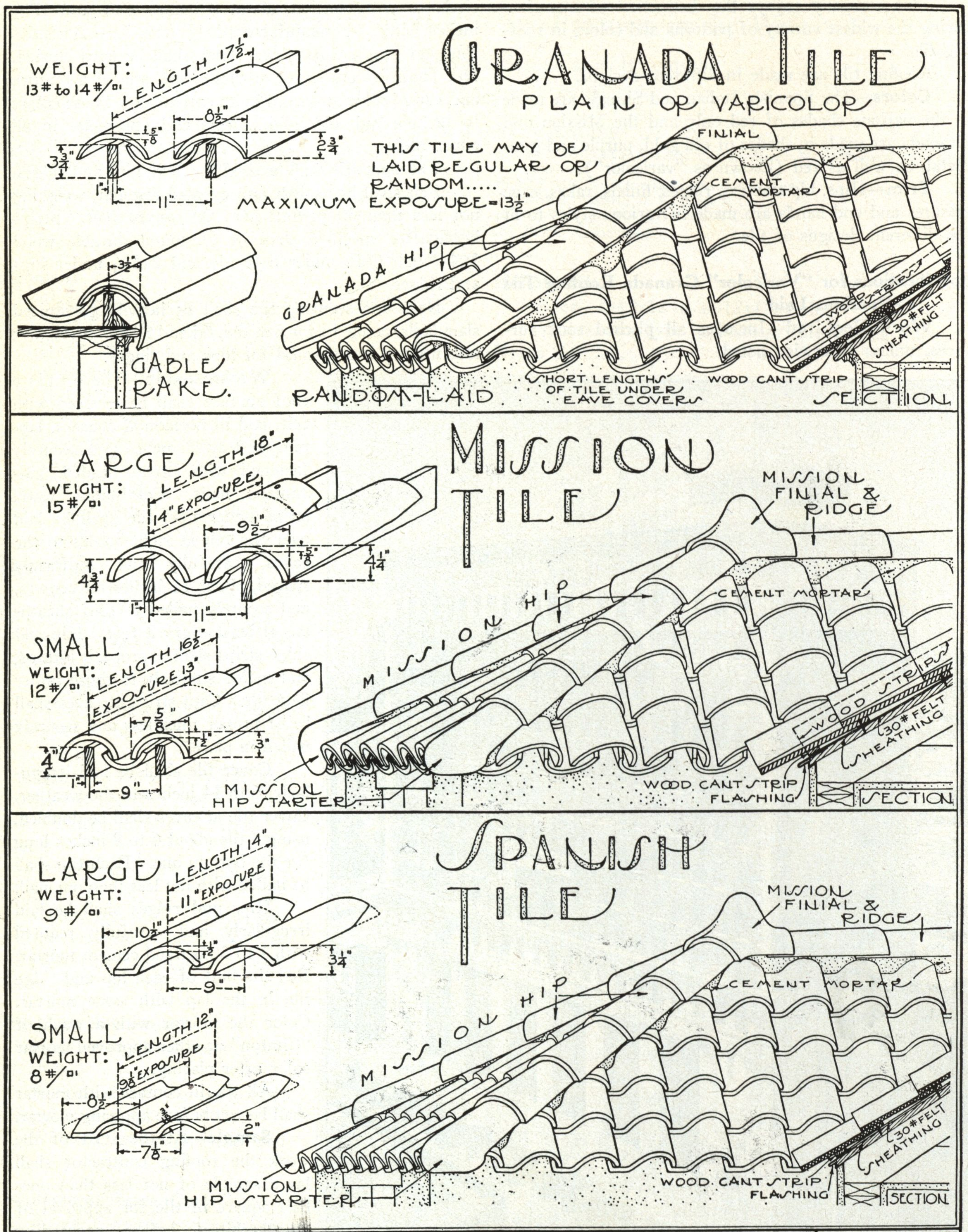
Note: For specifications covering other styles of roof tile, write for our specification book.

Security Trust & Savings Bank Building, Long Beach, Cal.

ALECK CURLETT and CLAUD BEELMAN, Architects J. V. McNEIL & Co., Contractors

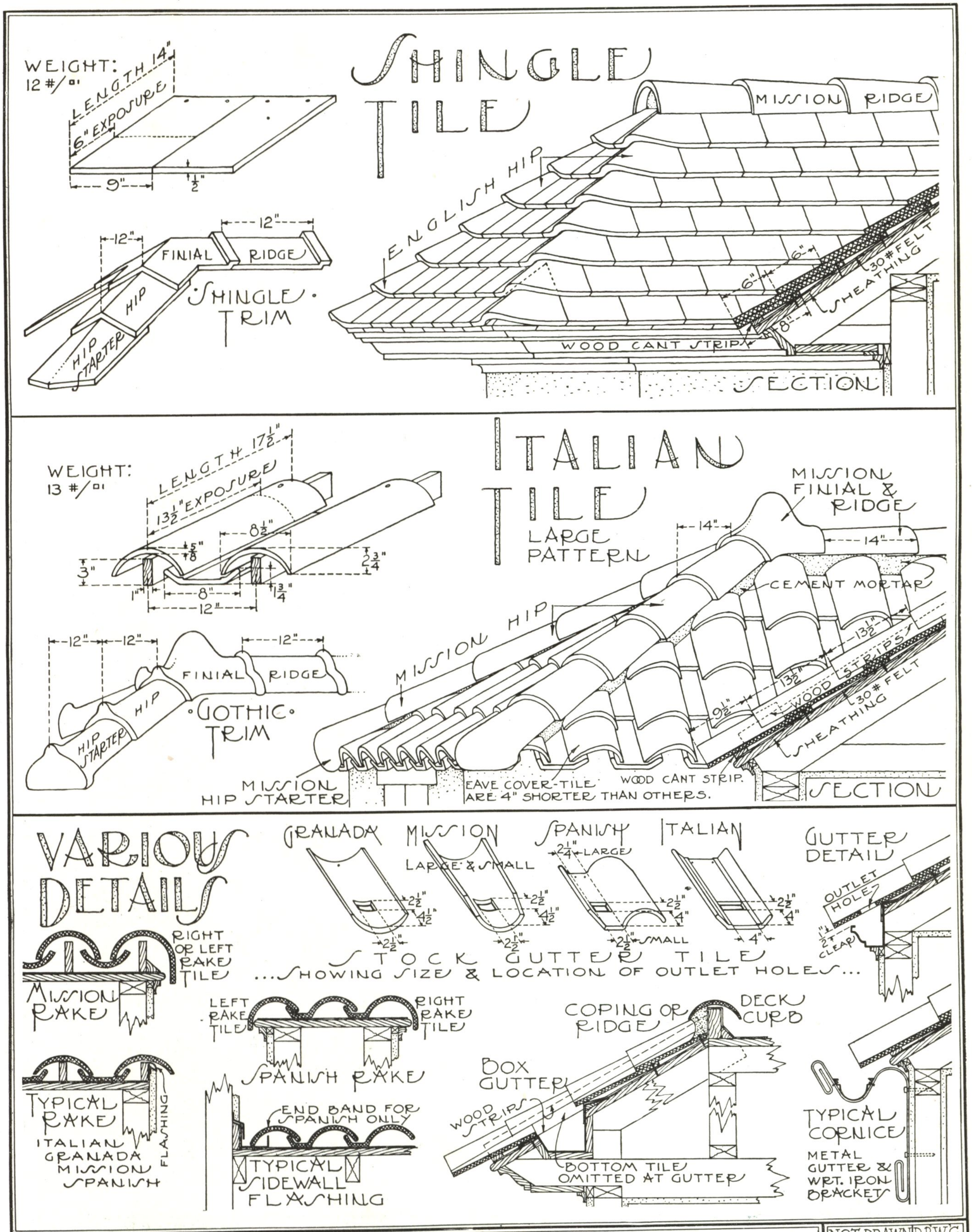
"Varicolor" Granada tile roof; gray standard terra cotta; old rose ruffle face brick

Continued on next page


GRANADA TILE
PLAIN OR VARICOLOR
WEIGHT: 13# to 14#/□'
LENGTH 17½"
8½"
1⅝"
2¾"
3¾"
1"
11"
THIS TILE MAY BE LAID REGULAR OR RANDOM.....
MAXIMUM EXPOSURE=13½"
FINIAL
CEMENT MORTAR
GRANADA HIP
3½"
GABLE RAKE.
RANDOM-LAID
SHORT LENGTHS OF TILE UNDER EAVE COVERS
WOOD CANT STRIP
WOOD STRIP
30# FELT
SHEATHING
SECTION
MISSION TILE
LARGE
WEIGHT: 15#/□'
LENGTH 18"
14" EXPOSURE
9½"
1⅝"
4¼"
4¾"
1"
11"
SMALL
WEIGHT: 12#/□'
LENGTH 16½"
EXPOSURE 13"
7⅝"
1½"
3"
4"
1"
9"
MISSION HIP STARTER
MISSION HIP
MISSION FINIAL & RIDGE
CEMENT MORTAR
WOOD STRIP
30# FELT
SHEATHING
WOOD CANT STRIP
FLASHING
SECTION
SPANISH TILE
LARGE
WEIGHT: 9#/□'
LENGTH 14"
11" EXPOSURE
10½"
1½"
3¼"
9"
SMALL
WEIGHT: 8#/□'
LENGTH 12"
9⅛" EXPOSURE
8½"
⅜"
2"
7⅛"
MISSION HIP STARTER
MISSION HIP
MISSION FINIAL & RIDGE
CEMENT MORTAR
30# FELT
SHEATHING
WOOD CANT STRIP
FLASHING
SECTION

LOS ANGELES PRESSED BRICK COMPANY	STANDARD SHAPES OF ROOFING TILE	NOT DRAWN TO SCALE	DRWG. 1

Continued on next page


SHINGLE TILE
WEIGHT: 12 #/□'
LENGTH 14"
6" EXPOSURE
9"
½"
12"
12"
FINIAL
RIDGE
HIP
HIP STARTER
SHINGLE TRIM
MISSION RIDGE
ENGLISH HIP
6"
6"
30# FELT
SHEATHING
8"
WOOD CANT STRIP
SECTION
ITALIAN TILE
LARGE PATTERN
WEIGHT: 13 #/□'
LENGTH 17½"
13½" EXPOSURE
8½"
5/8"
3"
2¾"
1"
8"
12"
1¾"
12"
12"
12"
FINIAL
RIDGE
HIP
HIP STARTER
GOTHIC TRIM
MISSION FINIAL & RIDGE
14"
14"
CEMENT MORTAR
MISSION HIP
13½"
13½"
WOOD STRIPS
9½"
30# FELT
SHEATHING
MISSION HIP STARTER
EAVE COVER-TILE ARE 4" SHORTER THAN OTHERS.
WOOD CANT STRIP.
SECTION
VARIOUS DETAILS
GRANADA
MISSION
LARGE & SMALL
SPANISH
2¼" LARGE
ITALIAN
2½"
4½"
2½"
2½"
4½"
2½"
2½"
4"
2½" SMALL
2½"
4"
4"
STOCK GUTTER TILE
...SHOWING SIZE & LOCATION OF OUTLET HOLES...
GUTTER DETAIL
OUTLET HOLE
½" CLEAR
RIGHT OR LEFT RAKE TILE
MISSION RAKE
LEFT RAKE TILE
RIGHT RAKE TILE
SPANISH RAKE
COPING OR RIDGE
DECK CURB
TYPICAL RAKE
ITALIAN
GRANADA
MISSION
SPANISH
FLASHING
END BAND FOR SPANISH ONLY
TYPICAL SIDEWALL FLASHING
BOX GUTTER
WOOD STRIPS
BOTTOM TILE OMITTED AT GUTTER
TYPICAL CORNICE
METAL GUTTER & WRT. IRON BRACKETS

LOS ANGELES PRESSED BRICK COMPANY	STANDARD SHAPES AND DETAILS OF ROOFING TILE	NOT DRAWN TO SCALE	DRW'G 2

IMPERIAL ROOFING TILES

Made by

LUDOWICI-CELADON COMPANY

GENERAL OFFICES
104 South Michigan Avenue
CHICAGO, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 565 Fifth Avenue
WASHINGTON, D. C., 738 15th Street, N. W.
PHILADELPHIA, PA., 1315 Walnut Street
PITTSBURGH, PA., 355 Fifth Avenue

CLEVELAND, OHIO, 1836 Euclid Avenue
CINCINNATI, OHIO, Schmidt Building
ST. LOUIS, MO., 700 Chestnut Street
KANSAS CITY, MO., 214-A East 10th Street

FACTORIES

NEW LEXINGTON, OHIO
COFFEYVILLE, KANSAS
PERU, KANSAS

Product

"IMPERIAL" SHALE ROOFING TILES.

Description

We manufacture vitreous shale roofing tiles in all standard shapes.

Four regular stock patterns are shown here, in addition to which the "IMPERIAL Roman," the "IMPERIAL Greek," the "IMPERIAL" slab shingle, the "IMPERIAL" English and other special shapes are manuactured. These are produced in a natural red color or in glazes of almost any color.

Specifications

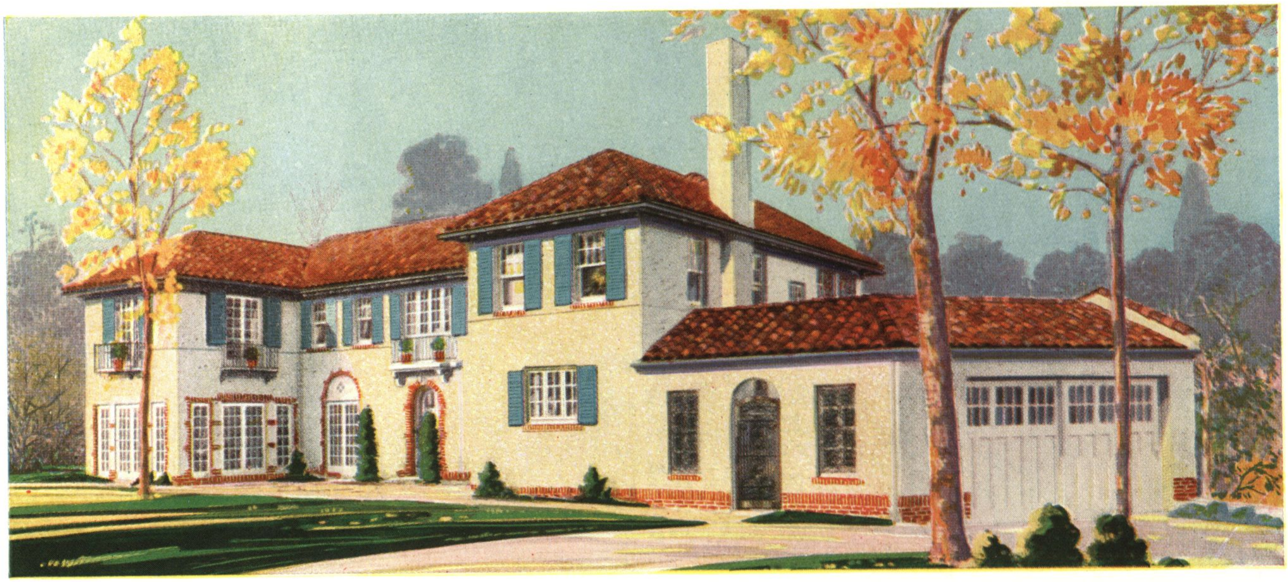
All pitched roofs shall be covered with (insert name of pattern) tiles made by the LUDOWICI-CELADON COMPANY with stock fitting suitable for each pattern. The tiles as specified above must be hard burned of ...... color, and in accordance with samples deposited in the office of the architects.

Before the roofer is sent for, the owner or general contractor should construct roofs in strict accordance with plans, sheath the roofs *tight*, have all chimneys and walls above roof line completed, have all vent lines put through roofs, furnish all strips of required width used under hip rolls, furnish any strips that may be used under tile at eaves, and have all scaffolding ready for roofer's use. The metal contractor should have all gutters in place on the roof (gutters, whether box, hanging or secret), to extend over the roof sheathing and run under the felt and tile at least 8 inches and should also have in place all valley metal, the width of which must be not less than 24 inches with both edges turned up ¼ inch, the entire length of the valley. The valley metal to be fastened with clips and never nailed or punctured in any manner. The valley metal must be laid over one layer of felt running lengthwise the entire distance of the valley. The metal contractor must have in readiness all flashing metal used alongside and in front of dormers, gables, skylights, towers, perpendicular walls, also around vent pipes and chimneys, and place same after arrival of the tile roofer and in accordance with the requirements of the tile.

After the roofs have thus been prepared to receive the felt and tile, the tile roofer shall cover the sheathing of the roofs with one thickness of asphalt roofing felt weighing not less than 30 pounds to the square, laying same with a 2½-inch lap and securing in place with capped nails. The felt should be laid parallel with the eaves and lapped over all valley metal about 4 inches and laid under all valley metal about 6 inches.

The roof having thus been prepared, the tile layer is to fasten tile with copper nails. The roofer shall see that the tiles are well locked together and lay smoothly, and no attempt shall be made to stretch the courses.

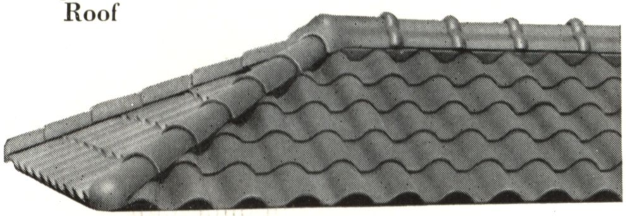
The tiles must be laid so that the vertical lines are parallel with each other and at right angles to the eaves. The tiles that verge along the hips should be cut close against the hip board, and a watertight joint made by cementing cut hip joint to hip board with elastic cement. Each piece of hip roll shall then be nailed to the hip board, and the hip rolls cemented where they lap each other. The interior spaces of hip and ridge rolls must not be filled with the pointing material.



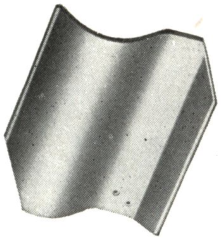
RESIDENCE OF E. P. SEDGWICK, HIGHLAND PARK, ILL.
R. E. PINGREY, CHICAGO, ILL., ARCHITECT
Roofed with "IMPERIAL" Straight Barrel Mission Tiles
in a mixture of Reds, Browns,
Purples and Buffs

Continued on next page

"IMPERIAL" Spanish Roof

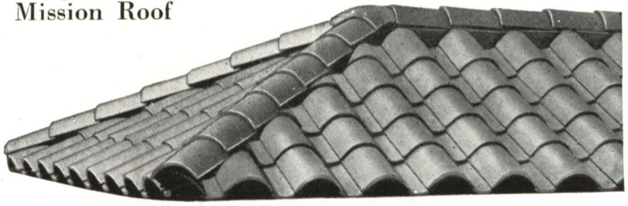


With 102 Hip Roll, 152 Hip Starters, 206 Ridge and Plain Terminal

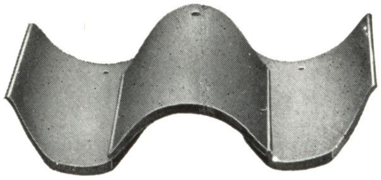


Length	13¼ inches
Width	9¾ inches
Average exposure	8¼x10¼ inches
Average pieces per square	171
Actual weight per square	950 pounds
Shipping weight per square, with fittings	1050 pounds

"IMPERIAL" Straight Barrel Mission Roof

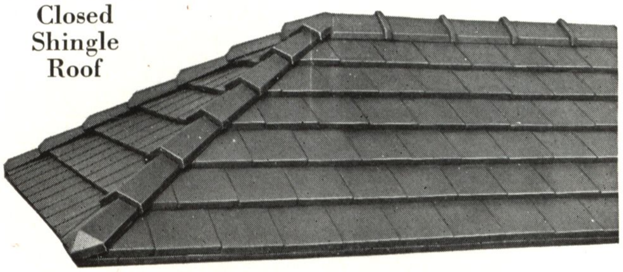


With Cover Tile Used for Hip and Ridge Treatment. Plain Terminal

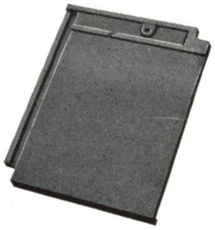


Average exposure in length	11¼ inches
Width, center to center of covers	11½ inches
Average pieces per square	224
Actual weight per square	1200 pounds
Shipping weight per square, with fittings	1300 pounds

"IMPERIAL" Closed Shingle Roof

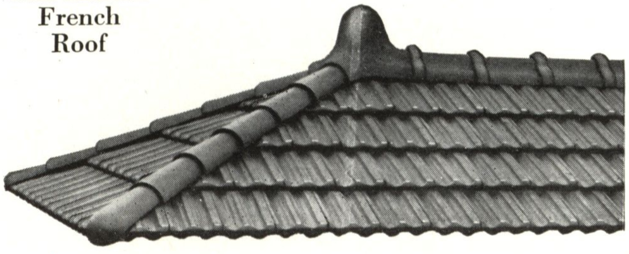


With 118 Hip Roll, 168 Hip Starters, 211 Ridge and Plain Terminal

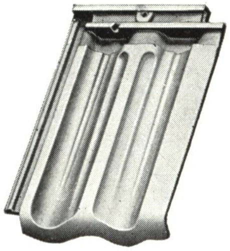


Length	11 inches
Width	8¾ inches
Average exposure	8x8 inches
Average pieces per square	225
Actual weight per square	900 pounds
Shipping weight per square, with fittings	1000 pounds

"IMPERIAL" French Roof



With 102 Hip Roll, 152 Hip Starters, 206 Ridge and 405 Terminal

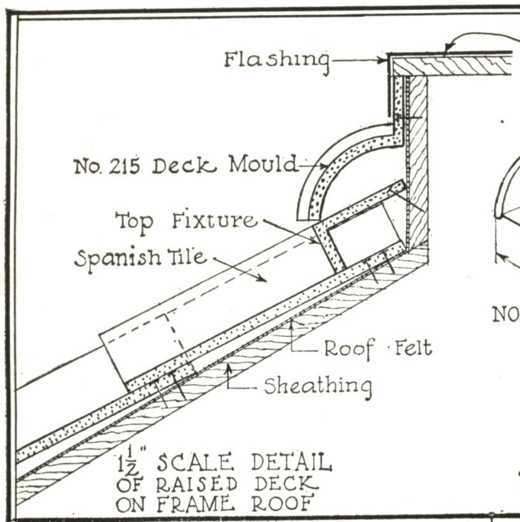


Length	16¼ inches
Width	9 inches
Average exposure	8⅛x13⅜ inches
Average pieces per square	133
Actual weight per square	925 pounds
Shipping weight per square, with fittings	1025 pounds

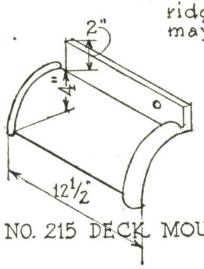
Continued on next page

STANDARD DETAILS

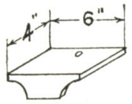
NOTE - Height of ridge and deck may vary.


Flashing
No. 215 Deck Mould
Top Fixture
Spanish Tile
Roof Felt
Sheathing

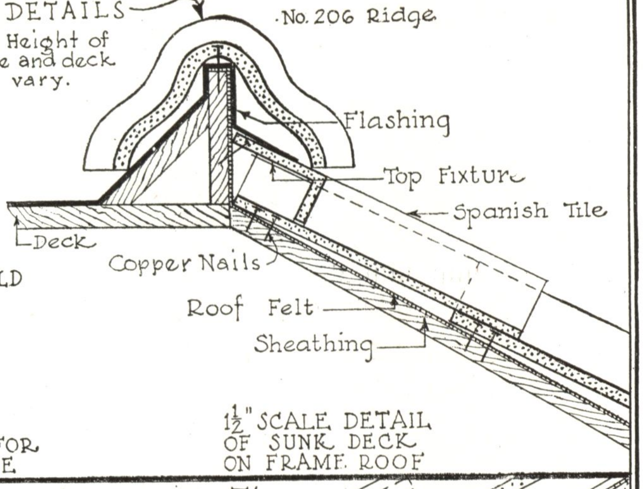
1½" SCALE DETAIL OF RAISED DECK ON FRAME ROOF



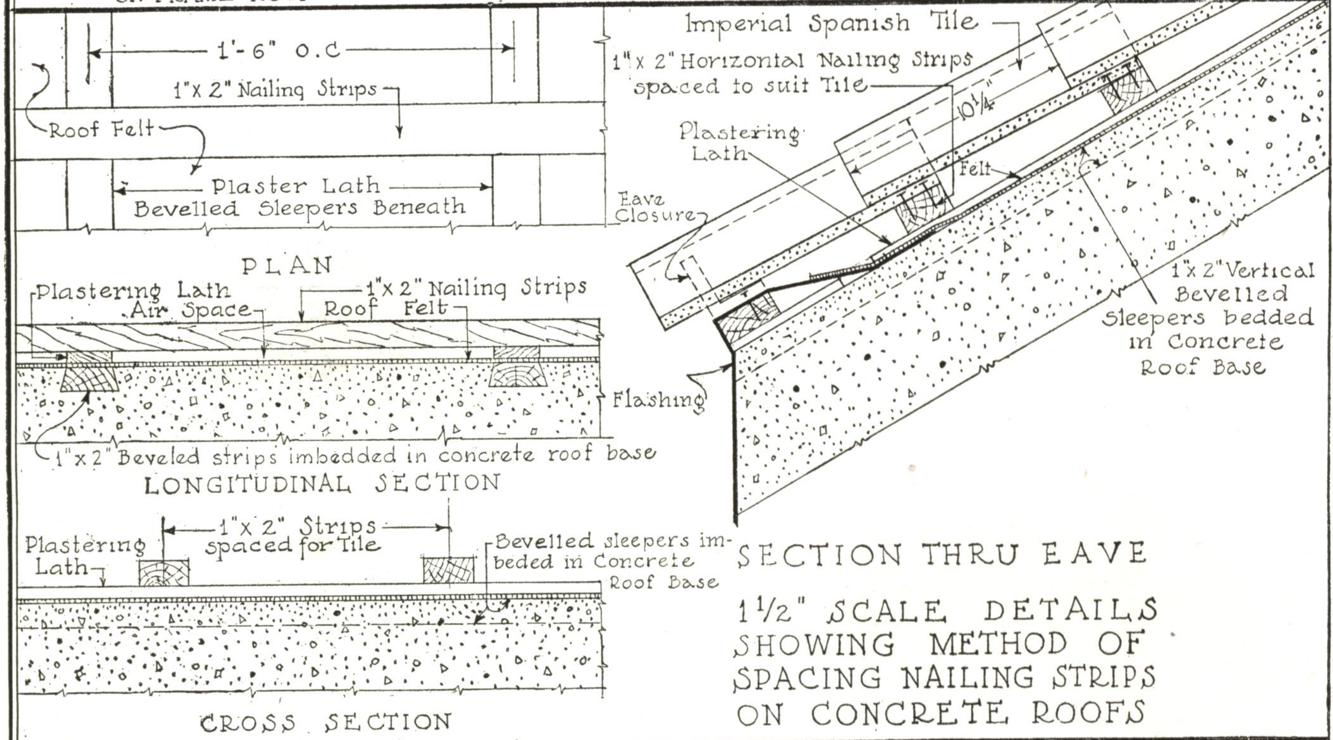
NO. 215 DECK MOULD



TOP FIXTURE FOR SPANISH TILE


No. 206 Ridge
Flashing
Top Fixture
Spanish Tile
Deck
Copper Nails
Roof Felt
Sheathing

1½" SCALE DETAIL OF SUNK DECK ON FRAME ROOF


1'-6" O.C
1"x 2" Nailing Strips
Roof Felt
Plaster Lath
Bevelled Sleepers Beneath
Eave Closure
Plastering Lath
Air Space
1"x 2" Nailing Strips
Roof Felt
Flashing
1"x 2" Beveled strips imbedded in concrete roof base
Plastering Lath
1"x 2" Strips spaced for Tile
Bevelled sleepers imbeded in Concrete Roof Base
Imperial Spanish Tile
1"x 2" Horizontal Nailing Strips spaced to suit Tile
10¼"
Plastering Lath
Felt
1"x 2" Vertical Bevelled Sleepers bedded in Concrete Roof Base

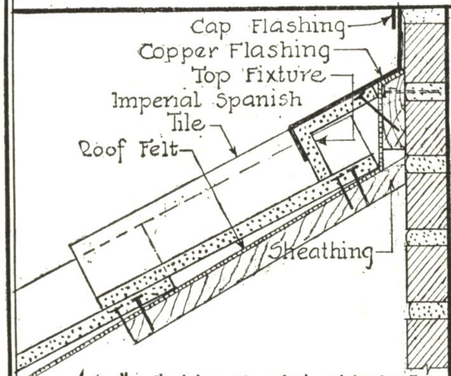
PLAN

LONGITUDINAL SECTION

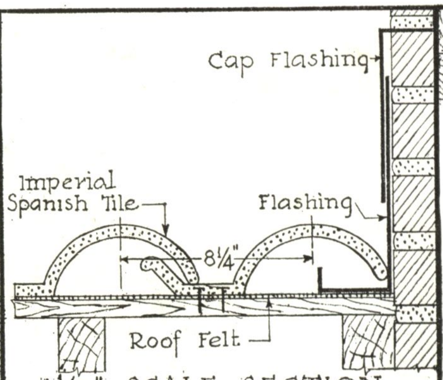
CROSS SECTION

SECTION THRU EAVE

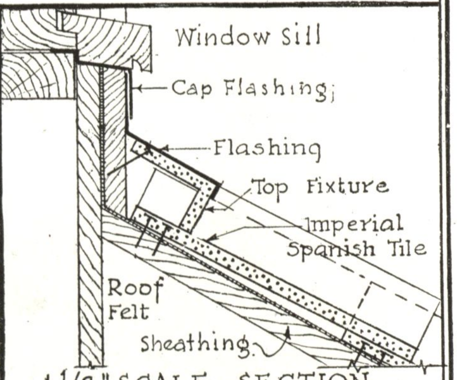
1½" SCALE DETAILS SHOWING METHOD OF SPACING NAILING STRIPS ON CONCRETE ROOFS


Cap Flashing
Copper Flashing
Top Fixture
Imperial Spanish Tile
Roof Felt
Sheathing

1½" SCALE SECTION THRU TOP OF ROOF AT BRICK WALL


Cap Flashing
Imperial Spanish Tile
Flashing
8¼"
Roof Felt

1½" SCALE SECTION THRU EDGE OF ROOF AGAINST BRICK WALL


Window Sill
Cap Flashing
Flashing
Top Fixture
Imperial Spanish Tile
Roof Felt
Sheathing

1½" SCALE SECTION THRU SILL OF DORMER IN FRAME ROOF

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

VARIOUS ROOF DETAILS SHOWING USE OF "IMPERIAL" SPANISH TILE

SCALE ¾", 1½ EQUALS 1 FT.
DATE JUNE '20

DRWG 3

INCORPORATED 1902

MOUND CITY ROOFING TILE COMPANY

3301 Morganford Road
ST. LOUIS, MO.

Mound City Roofing Tile Is Made of Finest Grade of Shale

Our shale is of the finest grade, making a roofing tile of superior quality and color, burned a solid red throughout at a temperature of 2000 degrees Fahrenheit. Our machinery is the most modern and our plant the most up-to-date in the country.

Colors

Our tile is made regularly in the various shades of red, also in dull and full green, and brown glazes. Our red tile is called Vitreous Face tile. This class of tile is preferred by a great many architects for several reasons; namely, being vitrified on the exposed surface it will not absorb any moisture from the outside and prevents the possibility of dripping caused through condensation at certain seasons of the year; it will not gather soot and dirt, but remains clean.

We also produce sage, oak, burgundy and sumac shades, which can be assembled with the red, producing the beautiful autumn foliage roofs so much in vogue at the present time. We are equipped to make any shape and color of tile or trimming the architect desires.

Awards

Highest Award, Gold Medal, World's Fair, St. Louis, Mo., 1904.

Gold Medal, Panama-Pacific Exposition, San Francisco, Cal., 1915.

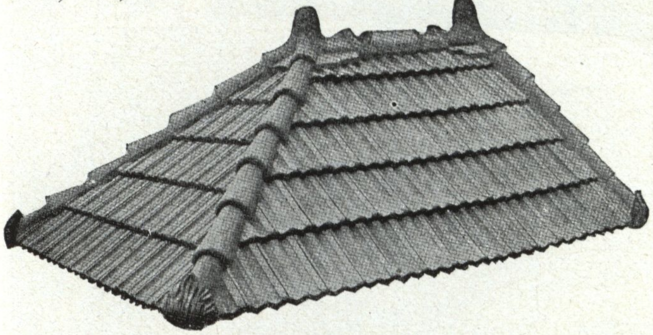
General Specifications

Cover all pitch roofs with one layer of asphalt felt weighing not less than thirty pounds per square. Same to be laid parallel with the eaves, each layer lapped at least three inches and nailed with capped or large-headed nails. The felt shall lap the valley metal at least six inches and on upright walls it shall lap under the tile at least four inches.

The metal contractor shall then place all valley metal, same to be held in place with clips fastened to the metal. The metal shall be bent over 1 by 2 strips running parallel on each side of the valley and must not be punctured in any manner. All eave strips and strips for hips and ridge shall be on hand ready for the roofer.

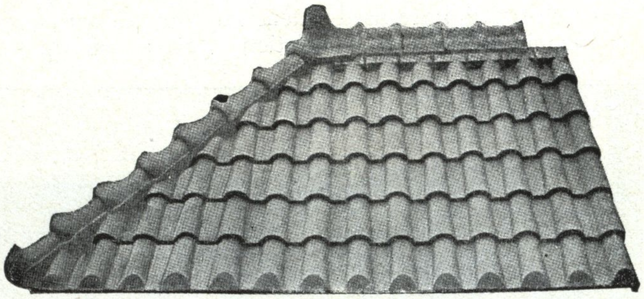
Cover all roofs so prepared with Mound City hard burned red (or green) ...... pattern tile with trimmings as designated by the manufacturer. All tile to be fastened with copper nails.

No attempt shall be made to stretch the courses. The tile shall be so laid that the vertical lines are parallel with each other and at right angles to the eaves. The tile that verge along the hip shall be cut close to the hip board and a water tight job made by cementing the cut tile to the hip board with elastic cement. The joints of the hips and ridge should be cemented, but the interior space of the hips and ridge must not be filled with the pointing material. After roofer has completed his work he shall remove all broken and damaged tile.



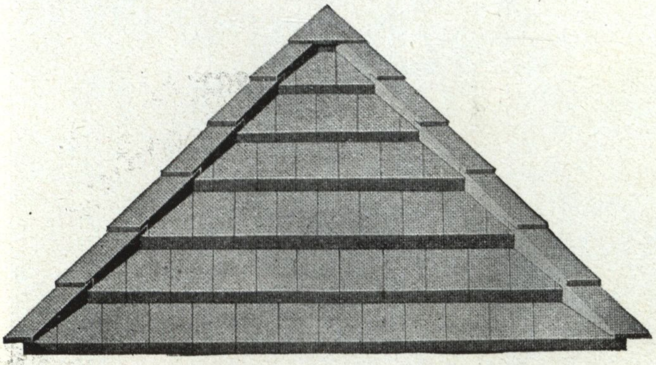
"A" INTERLOCKING TILE

With No. H-5 hip and H-5 hip-starter, No. R-5 ridge and No. T-3, 2-way terminal.
Size of tile, 9x15½ in.
Shipping weight, including trimmings, 1000 lb. per square



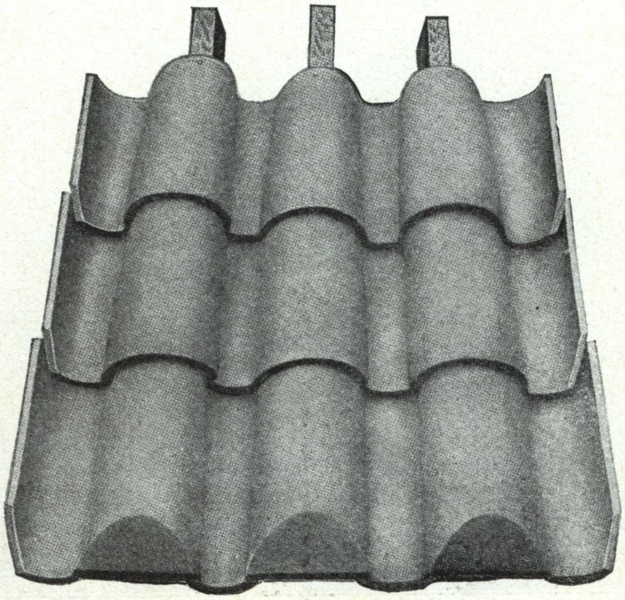
"C" SPANISH TILE

With No. H-3 hip and H-3 ornamental hip-starter, No. R-1 ridge and No. T-3, 2-way terminal.
Size of tile, 12½x9½ in.
Shipping weight, including trimmings, 1100 lb. per square



CLOSED PANAMA TILE

With No. H-8 hip and H-8 plain hip-starter, No. R-6 ridge and No. T-2, 2-way terminal.
Size of tile, 8½x13¾ in.
Shipping weight, including trimmings, 1250 lb. per square



MISSION TILE

Size of tile, 15½x7¾ in.
Gauge, 9½x12 in.
Shipping weight, including trimmings, 1400 lb. per square

THE UNITED STATES ROOFING TILE CO.

Manufacturers of Promenade Tiles for Roofing

PARKERSBURG, W. VA.

FACTORIES: PARKERSBURG, W. VA., EAST SPARTA, OHIO

BRANCH OFFICES

NEW YORK, N. Y., DAVID LEVOW (Roofing Grade), 542 W. 23rd Street;
W. B. CHERRY (Floor Grade), 432 Hudson Terminal Building
PHILADELPHIA, PA., ROSSE CLAY PRODUCTS CORP., 2315 Walnut Street
BALTIMORE, MD., B. A. STONE, 934 Chauncey Avenue
CHICAGO, ILL., J. T. WILLIAMS, Room 800, 59 East Adams Street;
F. R. MATSON, Room 1036, 122 So. Michigan Boulevard
MT. VERNON, OHIO, H. G. BEAM
GLENDALE, CAL., GLADDING, MCBEAN & CO.
CLEVELAND, OHIO, J. A. GILLETTE, Room 220, 5005 Euclid Avenue

Products

PROMENADE TILES for Roofing and Flooring.

For Floor Tiles, see pages 508-509.

U. S. Tiles—Roofing Grade

In handling our fine grade 6x6-in. floor tiles, described on page 508 as Select and Standard grades, many become slightly chipped on the edges and corners and cannot be used for fine floor work. These are put into our roofing grade, as the slight defects do not in any way disqualify them for use for roofing purposes. They are free from fire checks and have the same low absorption and high wearing qualities as our Select and Standard grades. They are selected to size but not to shade. They are not selected with as much care as to level surface and regular lines, but will make a satisfactory low cost roof and are used extensively for this purpose.

Owing to large accumulation, we are willing to absorb the extra cost of laying these 6x6-in. tiles in comparison with 6x9-in. tiles, so that the roofer can lay our 6x6-in. tiles for as low a price as the 6x9-in. tiles and at the same time make a better job.

Guarantee

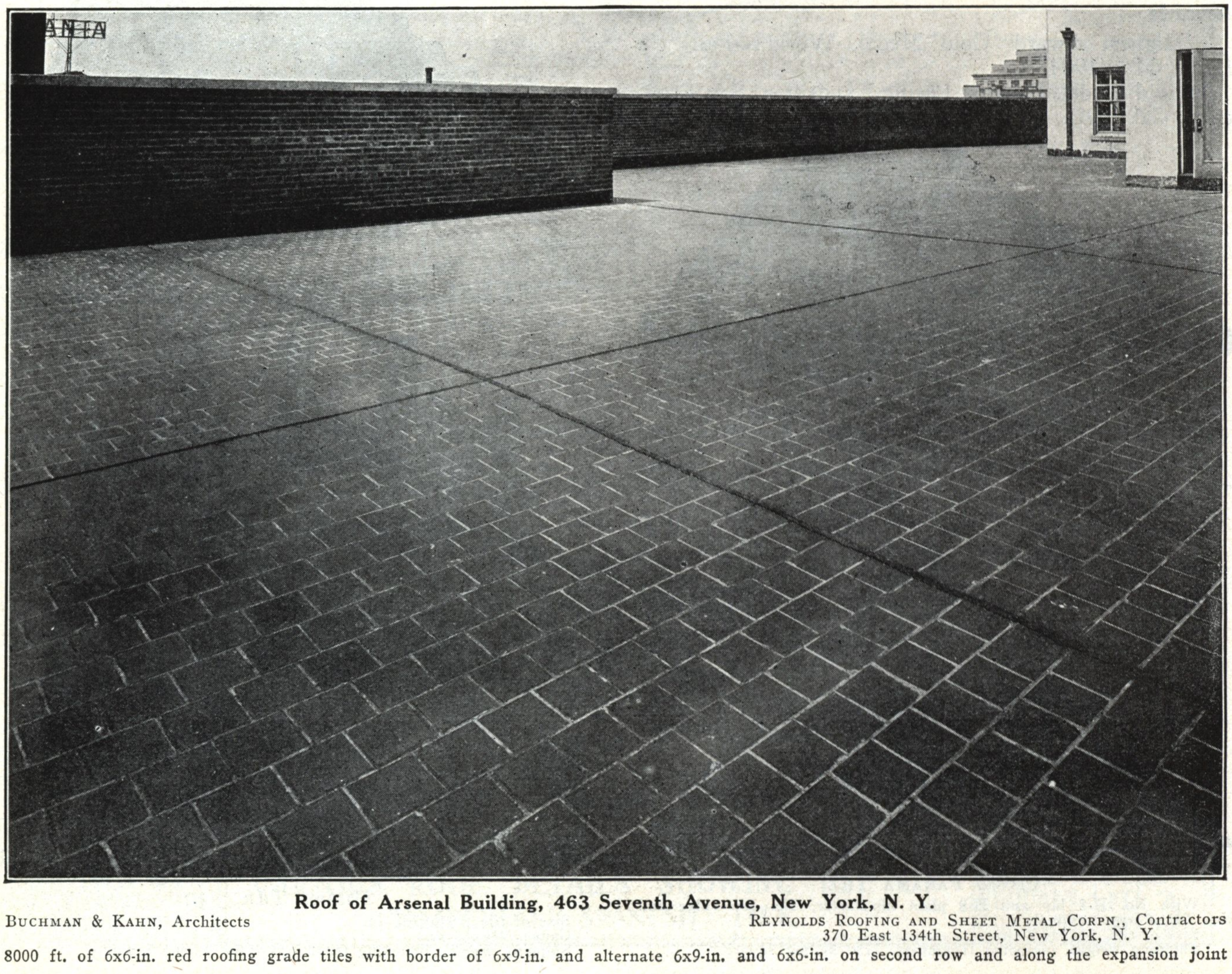
We guarantee our roofing grade tiles against disintegration because of climatic changes and, in the event that any of them do disintegrate for this reason, we will not only furnish new tiles, but pay the cost of replacing the old tiles in the roof.

Specifications for Laying U. S. Quarry Tiles on Flat Roofs

General—Concrete roof surfaces to be flushed with straightedge and left even and true.

The roof slab to be thoroughly dry and seasoned at least six days before roofing is applied.

Rear of parapet walls above roof line to be left in good condition for the application of flashings.



Roof of Arsenal Building, 463 Seventh Avenue, New York, N. Y.

BUCHMAN & KAHN, Architects

REYNOLDS ROOFING AND SHEET METAL CORPN., Contractors
370 East 134th Street, New York, N. Y.

8000 ft. of 6x6-in. red roofing grade tiles with border of 6x9-in. and alternate 6x9-in. and 6x6-in. on second row and along the expansion joint

Continued on next page

Felt—Mop the surface of the concrete with a filler prepared by The Barrett Company, or its equal, thoroughly filling all the pores. Over same lay 4 plies of No. 2 Tarred Roofing Felt, weighing not less than 14 lb. Each layer to be rolled in and heavily mopped with asphalt, just ahead of roll. Each layer to be exposed and lapped 7½ in.

The asphalt used for this mop work to be Johns-Manville or The Barrett Company asphalt.

Felt along walls to turn up at least 6 in. and the wall back of same to be well mopped.

Flashing—Mop the roof slab for a distance of 8 to 10 in. at time flashing is applied.

Use sheet lead 4 lb. per sq. ft. and turn lead on roof 4 in. and carry up on walls 6 to 10 in. and into joint on masonry work. Where no joint can be found a raglet to be cut 1¼ in. deep by ⅜ in. wide.

Caulk the lead into joint with lead wool or No. 1 slater's cement made of linseed oil and iron pigment.

Mop the exposed lead on roof, and cover same with a 6-in. strip of felt. Mop again and lay over same an 8-in. strip of felt. Mop again and lay over same a 10-in. strip of felt.

Along all walls and where expansion joints occur, use a strip of No. 8 duck canvas, 6 in. wide, same to be dipped in raw linseed oil and spread over felt in center of expansion joints.

Bed for Tiles—All tiles to be laid in cement mortar. Mortar to be 1 part portland cement and 2 parts clean, sharp sand, free from loam. Spread same on roof 1 in. thick. Mortar to be mixed only in such quantities as can be handled properly without setting. No re-tempering of mortar will be permitted.

Tiles—Into this mortar bed lay 6x6x¾-in. U. S. Roofing Grade Quarry Tiles, allowing a joint of ⅜ to ½ in. All lines to be true.

The tiles to be laid in bays and not more than 400 sq. ft. will be permitted to each bay, thereby permitting each bay to expand and contract.

A ⅞x2-in. surfaced wood strip to be placed between the bays as laid, and to extend down to canvas strip. These wood strips to remain in position until the tile have thoroughly set, so that removing them will not disturb tiles. After tiles have set so that walking on them will not shift them, all joints except bay joints, will be filled with a grout of two parts portland cement and 1 part sand. Flush the entire surface of tile until the joints are filled. Surplus cement to be cleaned off before cement is fully set.

When the tiles are clean, remove the wood strips along walls and bays and paint the sides of tiles with roof filler; then fill the joint to within ⅛ to ¼ in. of top with asphalt mixed with cement and sand to proper consistency to form a perfect mastic.

References

Some recent jobs where 6x6-in. U. S. Roofing Grade Tiles have been used:

21st Street Lexington Avenue Apartment House, New York, N. Y., Robert T. Lyons, Architect; Bing & Bing, Builders

141 West 86th Street Apartment House, New York, N. Y., J. M. Felson, Architect

Church and School of Our Lady of Refuge, 196th Street and Briggs Avenue, New York, N. Y., Wm. H. Jones, Yonkers, Architect

Runkels Cocoa Factory, 31st Street and 10th Avenue, New York, N. Y., Geo. F. Pelham, Architect

57th Street and Sixth Avenue Apartment, New York, N. Y., N. Korn, Architect; H. H. Uris, Builder

Furniture Exchange Building, 33rd Street and Park Avenue, New York, N. Y., Buchman & Kahn, Architects

North East Corner Seventh Avenue and 38th Street Loft Building, New York, N. Y., Henry Ives, Architect; Jos. M. Brody, Builder

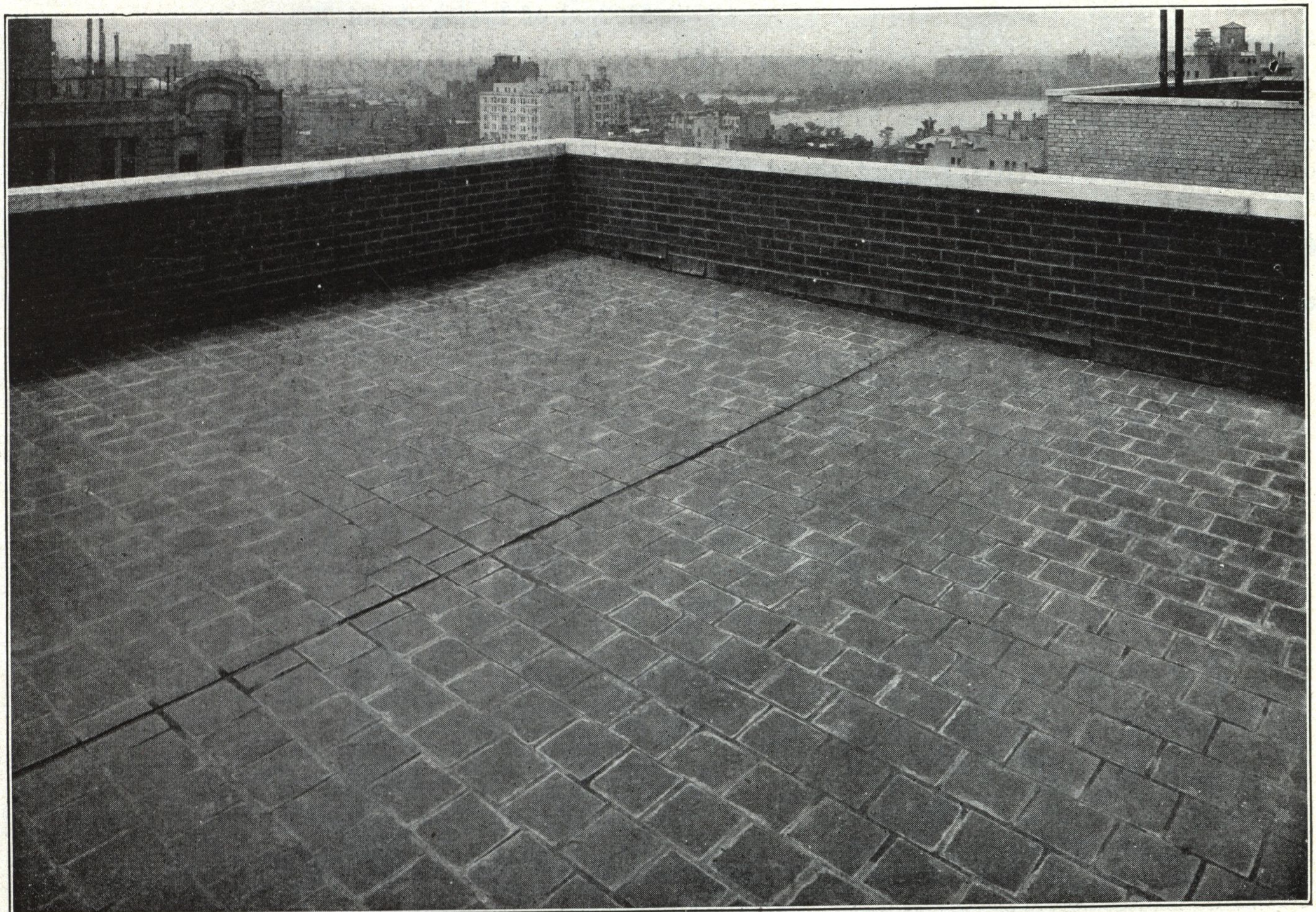
Some of the many jobs where U. S. Roofing Grade Tiles have been used for roofing are as follows:

Roosevelt Hotel, New York, N. Y., George B. Post & Sons, Architects

331 W. 78th Street Apartment House, New York, N. Y., Sommerfeld & Sass, Architects

Public Schools, New York, N. Y.

- No. 10, Queens
- Erasmus Hall High School
- No. 205, Brooklyn
- No. 57, Bronx
- No. 180, Brooklyn
- No. 79, Bronx
- High School of Commerce
- No. 126, Queens
- No. 47, Manhattan
- No. 11, Manhattan



Roof of Apartment House 93rd Street and Park Avenue, 6x6-in. U. S. Tile, Roofing Grade

Emery Roth, Architect — Geo. H. Backer & Co., Builders — New York Roofing Co., Contractors

AMBI ROOFING TILE CORPORATION

Manufacturers of Concrete Roofing Tile

18 Avenue D
NEWARK, N. J.

Ambi Roofing Tile

Ambi tile is a moderately priced concrete roofing tile that is beautiful, permanent and fireproof. It is the result of many years of painstaking effort to produce an ideal roofing material which would give entire satisfaction to the architect, builder and owner.

AMBI
Newark

Ambi roofing tile is not an experiment but has been used for over twenty-five years on hundreds of thousands of buildings in countries where the most exacting requirements for building and roofing materials are enforced. A great deal of study has been devoted to the design and methods of laying, with the result that, where Ambi tile is used, greater material value with less labor cost is obtained than with any other type of roofing material.

Colors and Finishes

The many beautiful colors, plain or variegated, and the smooth or rough surfaces in which Ambi tile is made assure a wide range of unusually beautiful color effects. Only the best and most reliable colors are used and they are so mixed and incorporated into the tile as to permanently withstand the attacks of the most severe climatic conditions.

Shapes and Trim

Ambi roofing tile is made in French, Spanish and double interlocking shapes. All special pieces such as hips, hip starters and finishers, ridges, finials, rakes, etc., are furnished in any desired color. The data sheet on the following page gives standard shapes, sizes, etc.

Outstanding Features of Ambi Tile

Absolute protection against elements of weather and of fire.
Permanence.
Beautiful and artistic coloring.
Variety of color combinations and surfaces.
Lowest fire insurance rates.
Perfect insulating properties.
Enhances appearance and value of building.
Eliminates leakage.
Easy to apply.
Ideal for re-roofing.
No repair or replacement costs.

Construction Requirements

Ambi tile requires no stronger roof construction than ordinarily used for other roofing materials, or as specified in the building codes of the various districts throughout the country. 2x6-in. rafters spaced 18 to 20 in. on centers are sufficient supports. For re-roofing, Ambi tile can be laid over old shingle or composition roofs.

Ambi tile can also be used on open construction, without sheathing or roofing felt. In such cases, cleats should be laid horizontally over the rafters. For open construction, horizontal joints of tiles should be well pointed underneath with portland cement. This method is often used for farm buildings, garages, summer houses, etc.

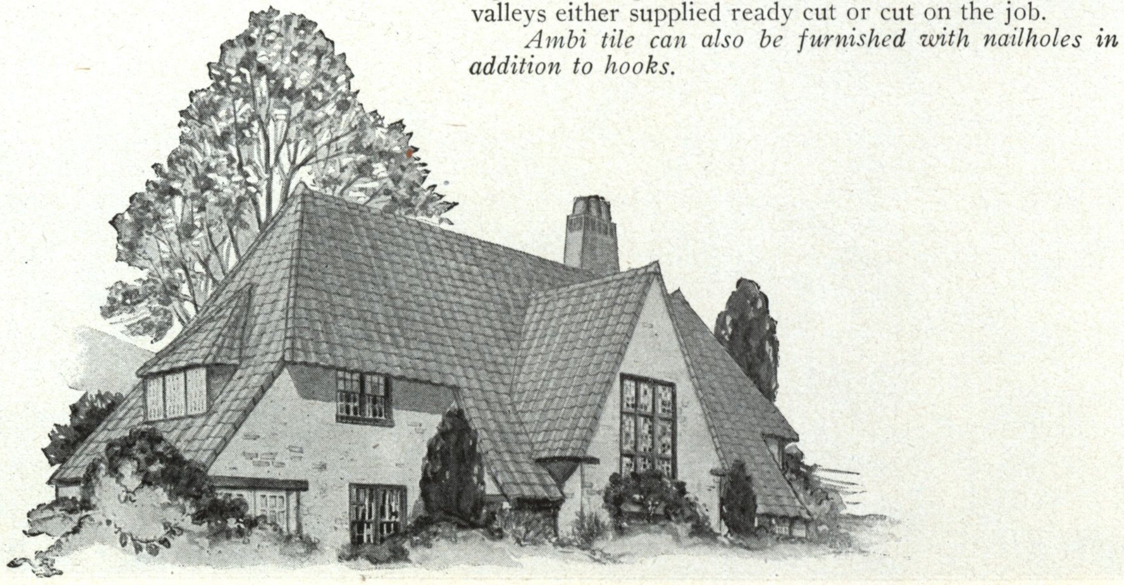
Method of Laying Ambi Tile

The roof to be covered with horizontal layers of good quality felt, lapping about 2½ in. horizontally and 4 in. vertically at joints, to be nailed through vertical weeper strips (common lath 1½x⅜ in.) with galvanized or copper nails.

Horizontal cleats 1½x⅞ in. to be nailed to roof, spaced 11¾x13¼ in. according to type of tile. Lowest cleat at eave to be 3 to 4 in. high. Ridge stringers about 4x1 in. and hip stringers about 3x1 in. to be built up. Furring strips about 1½x⅞ in. to be nailed vertically at gables.

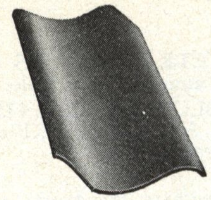
Tiles are stacked on roof then hung on cleats, starting at the eave (right-hand side). Ridge and hip rolls, right and left gable rakes to be nailed. Tiles at hips and valleys either supplied ready cut or cut on the job.

Ambi tile can also be furnished with nailholes in addition to hooks.



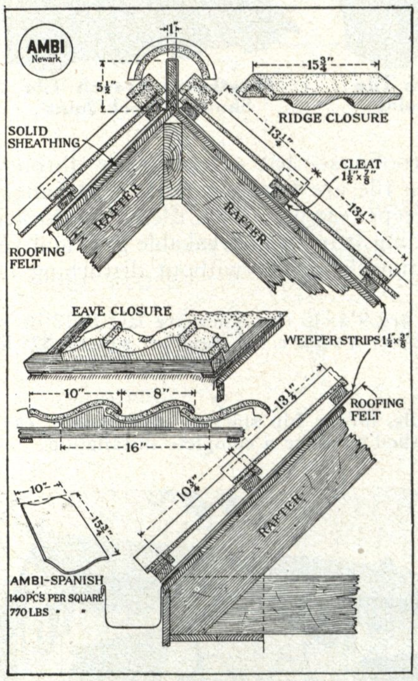
A Typical Ambi Tile Roof Installation

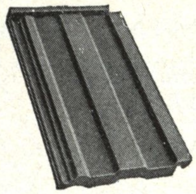
Continued on next page



Ambi Spanish Tile

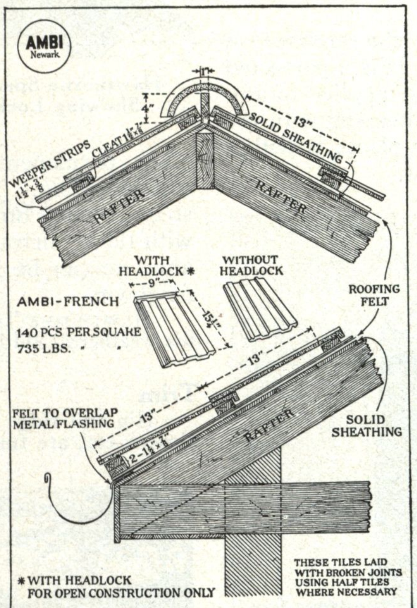
Size of tile, in	15¾x10
Approx. exposure, in	13¼x7¾
Tiles per square	140
Weight per square, lb	770
Spacing of cleats on roof, c. to c., in.	13¼

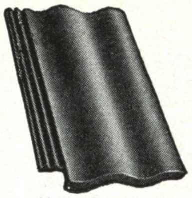

AMBI Newark
1"
5½"
15¾"
RIDGE CLOSURE
SOLID SHEATHING
13¼"
CLEAT 1½"×⅞"
13¼"
RAFTER
RAFTER
ROOFING FELT
EAVE CLOSURE
WEEPER STRIPS 1½"×⅜"
10"
8"
16"
13¼"
ROOFING FELT
10¾"
RAFTER
10"
15¾"
AMBI-SPANISH
140 PC'S PER SQUARE
770 LBS



Ambi French Tile

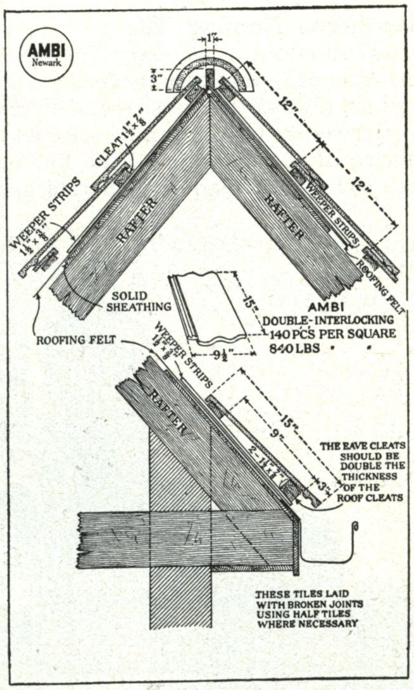
Size of tile, in	15¼x9
Approx. exposure, in	13x7⅛
Tiles per square	140
Weight per square, lb	735
Spacing of cleats on roof, c. to c., in.	13

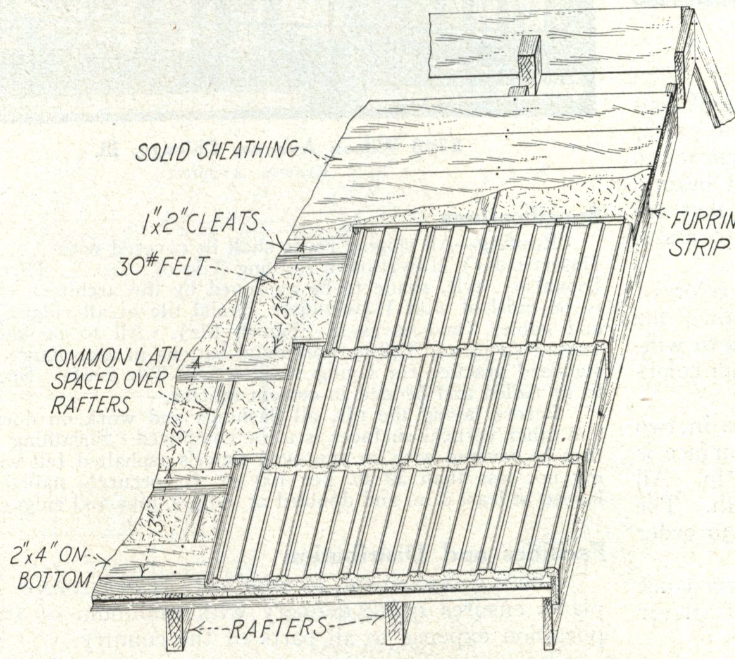

AMBI Newark
1"
4"
WEEPER STRIPS 1½"×⅜"
CLEAT 1½"×⅞"
SOLID SHEATHING
13"
RAFTER
RAFTER
WITH HEADLOCK *
WITHOUT HEADLOCK
9"
15¼"
AMBI-FRENCH
140 PCS PER SQUARE
735 LBS.
ROOFING FELT
13"
13"
FELT TO OVERLAP METAL FLASHING
2-1½"×⅞"
RAFTER
SOLID SHEATHING
THESE TILES LAID WITH BROKEN JOINTS USING HALF TILES WHERE NECESSARY
* WITH HEADLOCK FOR OPEN CONSTRUCTION ONLY



Ambi Double Interlocking Tile

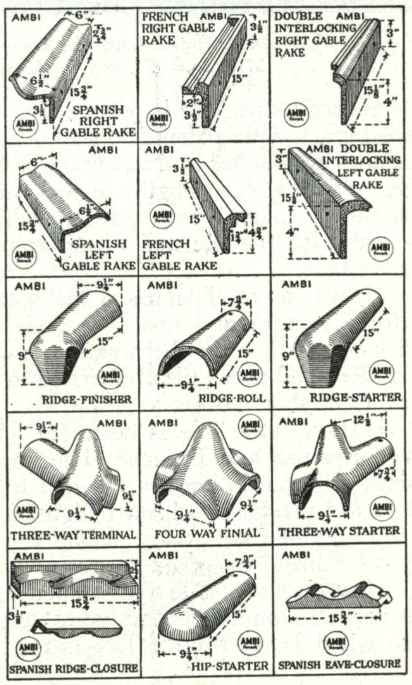
Size of tile, in	15x9½
Approx. exposure, in	12x8½
Tiles per square	140
Weight per square, lb	840
Spacing of cleats on roof, c. to c., in.	12


AMBI Newark
1"
3"
12"
12"
CLEAT 1½"×⅞"
WEEPER STRIPS 1½"×⅜"
RAFTER
RAFTER
WEEPER STRIPS
ROOFING FELT
SOLID SHEATHING
15"
9½"
AMBI
DOUBLE-INTERLOCKING
140 PCS PER SQUARE
840 LBS
ROOFING FELT
WEEPER STRIPS 1½"×⅜"
RAFTER
15"
9"
2-1½"×1"
3"
THE EAVE CLEATS SHOULD BE DOUBLE THE THICKNESS OF THE ROOF CLEATS
THESE TILES LAID WITH BROKEN JOINTS USING HALF TILES WHERE NECESSARY


SOLID SHEATHING
1"x2" CLEATS
30# FELT
FURRING STRIP
COMMON LATH SPACED OVER RAFTERS
13"
13"
13"
2"x4" ON BOTTOM
RAFTERS

Standard Roof Construction with Ambi French Tile

Illustrating the simplicity of applying Ambi Roofing Tile


AMBI
6"
2¾"
6½"
15¾"
3½"
SPANISH RIGHT GABLE RAKE
FRENCH RIGHT GABLE RAKE
3½"
15"
2"
3½"
DOUBLE INTERLOCKING RIGHT GABLE RAKE
3"
15⅛"
4"
6"
6½"
15¾"
SPANISH LEFT GABLE RAKE
3½"
15"
1¾"
4¾"
FRENCH LEFT GABLE RAKE
AMBI DOUBLE INTERLOCKING LEFT GABLE RAKE
3"
15⅛"
4"
9¼"
9"
15"
RIDGE-FINISHER
7¾"
15"
9¼"
RIDGE-ROLL
9"
15"
RIDGE-STARTER
9¼"
9¼"
9¼"
THREE-WAY TERMINAL
9¼"
9¼"
FOUR WAY FINIAL
12½"
7¾"
9¼"
THREE-WAY STARTER
2½"
15¾"
3⅛"
SPANISH RIDGE-CLOSURE
7¾"
15"
9¼"
HIP-STARTER
15¾"
SPANISH EAVE-CLOSURE

Ambi Special Forms

Types and Applications of Ambi Roofing Tile

HAWTHORNE ROOFING TILE

MANUFACTURED BY

HAWTHORNE ROOFING TILE CO.
2136 South 48th Avenue, Cicero, Ill. (Chicago Suburb)
NORTHWESTERN HAWTHORNE ROOFING TILE CO.
Gilfillan Block, St. Paul, Minn.
HAWTHORNE ROOFING TILE CO. OF MICHIGAN
Box 125, Ferndale Branch, Detroit, Mich.
SOUTH HILLS HARDWARE CO.
1018 W. Warrington Avenue, Pittsburgh, Pa.

WESTERN CONCRETE PRODUCTS CO.
1155 W. Fifth Avenue, Denver, Colo.
CONSOLIDATED BLOCK & TILE CO.
702 N. E. Second Avenue, Miami, Fla.
TAMPA BLOCK & TILE CO.
Tampa, Fla.
HAWTHORNE ROOFING TILE CO. OF TEXAS
Lovefield, Dallas, Tex.

CONCRETE STRUCTURAL UNITS CO., 1733 Northlake Place, Seattle, Wash.

Product

HAWTHORNE ROOFING TILE.

Hawthorne Roofing Tile

HAWTHORNE Roofing Tile offers the architect a permanent tile roof at a moderate cost. It is a perfected product, always true to shape, that can be applied to any sloping roof. Colors can be selected in keeping with the balance of the design, and the low cost places it within the reach of the man of moderate means.

Loyola Catholic Church, Denver, Colo.
MOUNTJOY & FREWEN, Architects

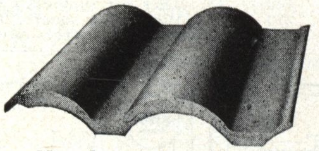
HAWTHORNE Tile is permanent. It is made of concrete by a unique patented method on automatic power machines producing a tile at reasonable cost, superior to other roofings in strength, imperviousness and beauty. The tile is colored with pure metallic oxides that are integral with the tile and are guaranteed not to craze, dust or fade.

HAWTHORNE Tile has a brilliant, lasting color of uniform texture and quality. It is proof against the attacks of the hot Southern sun or severe Northern winters. Red and green tile are carried in stock, other colors to order at short notice.

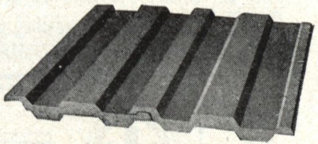
HAWTHORNE Tile is beautiful. It is made in two styles, Spanish and French. The impervious surface is always clean; rain washes the dirt off and not in. All colors are produced with a delightful matt finish. The wide range of color tones enables the architect to order any color blend effect he desires.

HAWTHORNE Tile is economical. Maintenance expense is eliminated and re-roofing problems never arise when HAWTHORNE Tile is used.

Laying



Hawthorne Spanish Tile Showing Lock Joint



Hawthorne French Tile Showing Lock Joint

HAWTHORNE Tile is laid by the interlocking method without nails. This avoids one of the big troubles of other permanent roofings—that of breakage through faulty nailing. The tile are hung on horizontal hanger strips, resting on weeper strips. Each tile is interlocked with those surrounding it in an unbreakable grip and yet any one can be removed quickly without disturbing its neighbor.

HAWTHORNE Tile are 9¼x15 in. They are laid 8x12 in. to the weather; 150 tile cover a square. Weight per square, 825 lb.

Trim

Hip and ridge rolls, finials, hip starters, gable rakes, eave closers, etc., are furnished to make a complete installation.

2748 Wilson Avenue, Chicago, Ill.
A. L. KLEWER, Architect

Specifications

Roofing—All sloping roofs shall be covered with .... (insert color) HAWTHORNE Roofing Tile of .... [French] [Spanish] style, shade to be approved by the architect. Roof to be finished with HAWTHORNE special tile at all ridges, hips and gables (and eaves in Spanish tile). All to be laid on weeper strips and 1x2-in. horizontal battens in accordance with standard practice for laying HAWTHORNE Tile roofs. Specials to be nailed and bedded in cement mortar.

Before laying the tile, all flashings and work on dormers and other vertical surfaces is to be completed. Sheathing shall then be covered with an approved slater's asphalted felt weighing not less than 30 lb. per 100 sq. ft., securely nailed and lapped at least 3 in. and doubled at valleys, hips and ridges.

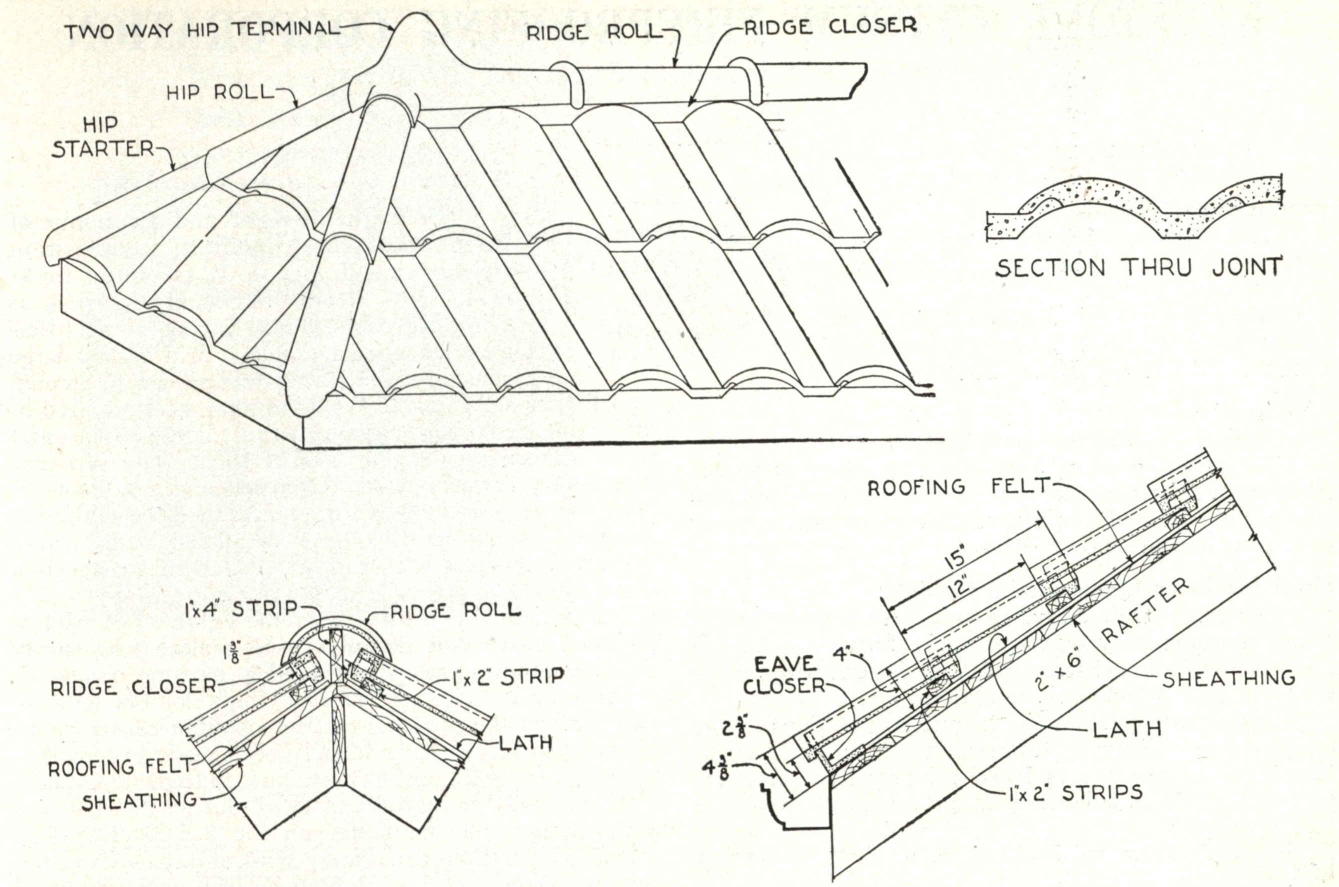
Facilities and Distribution

The geographical location of HAWTHORNE Tile plants ensures quick delivery with minimum of transportation expense to all parts of the country.

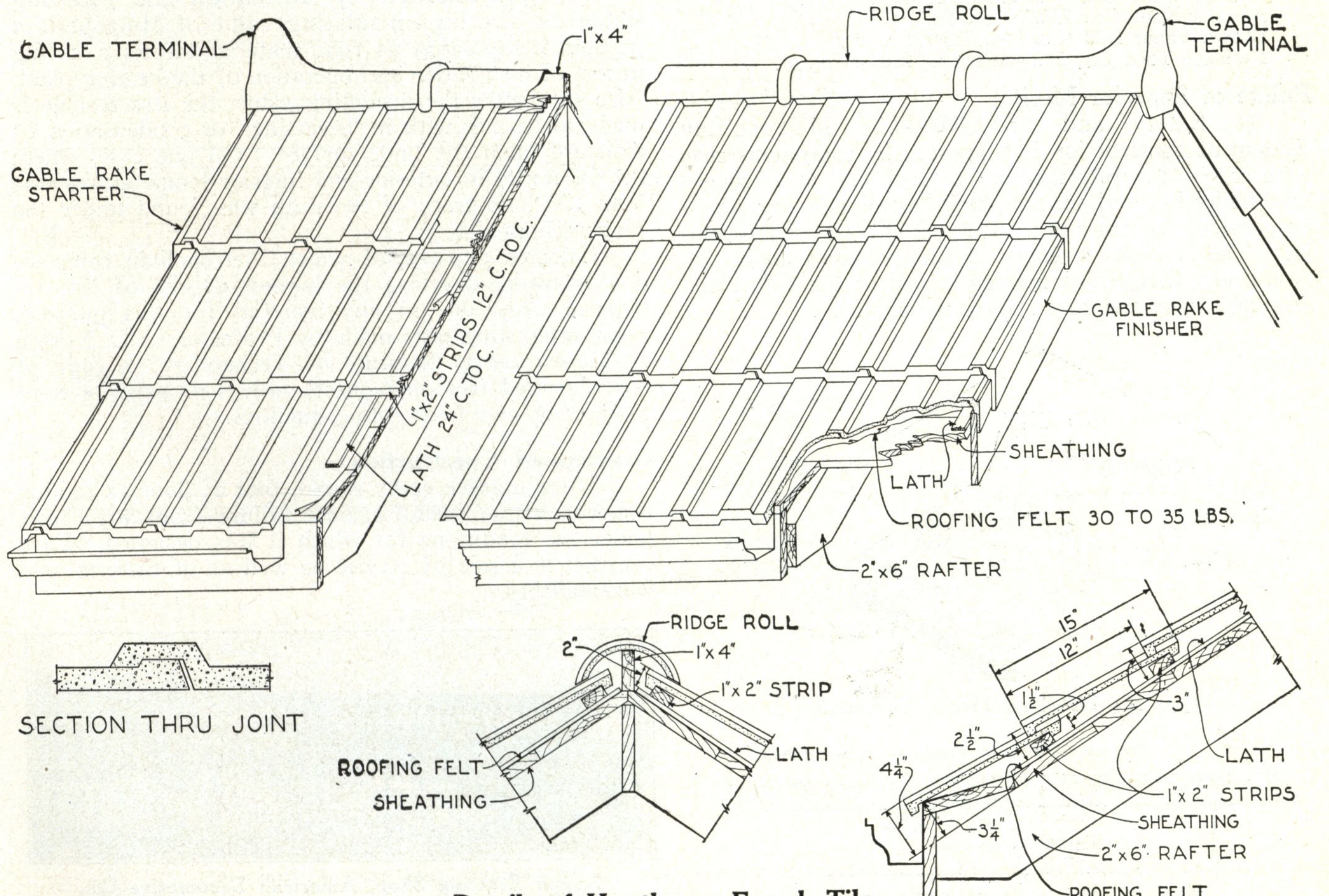
Catalogue

Illustrated catalogue and full details of standard practice in laying tile can be obtained on application.

Continued on next page


TWO WAY HIP TERMINAL
RIDGE ROLL
RIDGE CLOSER
HIP ROLL
HIP STARTER
SECTION THRU JOINT
ROOFING FELT
15"
12"
RAFTER
1"x4" STRIP
RIDGE ROLL
1 3/8"
RIDGE CLOSER
1"x2" STRIP
LATH
ROOFING FELT
SHEATHING
EAVE CLOSER
4"
2"x6"
SHEATHING
LATH
2 3/8"
4 3/8"
1"x2" STRIPS

Details of Hawthorne Spanish Tile


GABLE TERMINAL
1"x4"
RIDGE ROLL
GABLE TERMINAL
GABLE RAKE STARTER
1"x2" STRIPS 12" C. TO C.
LATH 24" C. TO C.
GABLE RAKE FINISHER
SHEATHING
LATH
ROOFING FELT 30 TO 35 LBS.
2"x6" RAFTER
SECTION THRU JOINT
RIDGE ROLL
2"
1"x4"
1"x2" STRIP
LATH
ROOFING FELT
SHEATHING
15"
12"
1 1/2"
3"
2 1/2"
LATH
4 1/4"
1"x2" STRIPS
SHEATHING
3 1/4"
2"x6" RAFTER
ROOFING FELT

Details of Hawthorne French Tile

KEYSTONE GYPSUM FIREPROOFING CORPORATION

Marbridge Building, 34th Street and Broadway
NEW YORK, N. Y.

BRANCH OFFICES

PHILADELPHIA, PA., North American Building
WASHINGTON, D. C., Real Estate Trust Building
TORONTO, ONT., 65 Victoria Street
MONTREAL, QUE., 306 New Birks Building

METROPOLITAN
SYSTEM
FLOORS AND ROOFS

TRADE-MARK

Products and Service

The erection of METROPOLITAN SYSTEM of GYPSUM FIREPROOF FLOOR and ROOF CONSTRUCTION.

Also, erection of Gypsum Blocks for Fireproof Partitions, Wall Furring and Column Protection; Book Tile for steep roofs.

Description of Metropolitan System

The Metropolitan System of gypsum fireproof floor and roof construction consists of calcined gypsum composition, poured-in-place, reinforced with wire, using the suspension principle.

Used for Over Quarter of a Century

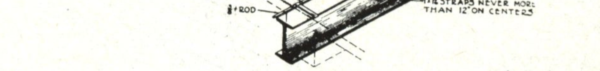
For more than 30 years this system has demonstrated its practical advantages on installations scattered all over the United States and Canada, enduring under wide extremes of climatic conditions.

Repeat orders from the largest corporations in the country bear convincing testimony to its superior qualities; 72% of the orders booked yearly have been repeat orders. The following important installations are representative:

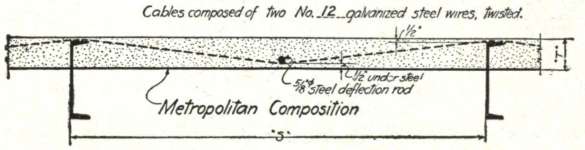
Bureau of Yards and Docks U. S. Navy, 15 installations, 1,556,000 sq. ft.
Bethlehem Steel Co., 24 installations, 1,629,000 sq. ft.
Baldwin Locomotive Works, 15 installations, 1,391,000 sq. ft.
Midvale Steel Co., 6 installations, 468,000 sq. ft.
Atwater-Kent Co., 250,000 sq. ft.
Brown Paper Mill Co., Inc., 250,000 sq. ft.
National Tube Co., 2 installations, 230,000 sq. ft.

Points of Superior Merit

(1) Safety and Strength—The Metropolitan System of construction is supported by continuous steel wire cables, securely fastened at each end and brought into deflection and tension, thus forming a system of suspension. Stresses are calculated by approved formulae. The crushing strength of the gypsum composition is entirely disregarded making it one of the safest and strongest floor and roof slab constructions.


FORM "B"
CABLES OF 2 Nº 12 GALV. STEEL WIRE, TWISTED
ALTERNATE FOR CHANNELS
⅜" STEEL DEFLECTOR ROD
METROPOLITAN COMPOSITION
⅜" ROD
1"×⅛" STRAPS NEVER MORE THAN 12" ON CENTERS

Type B. Fireproof Floor Construction



Type C. Fireproof Roof Construction

(2) Light Weight and Economy of First Cost—Metropolitan composition weighs but 4 lb. per sq. ft. per in. of thickness. For floors, minimum thickness is 4 in.; for roofs, 3 in. Saving of steel thus afforded is remarkable. In a certain large structure, the saving was shown to amount to 4 lb. per sq. ft. or 25% of the total steel required in original design. Light weight permits lighter beams and wider spacing thus saving tons of steel. The fact that Metropolitan gypsum composition sets within 30 minutes after slab is poured and forms can be dropped within 60 minutes, leaving slab good for calculated loads, makes for rapid construction—a prime factor in construction economy.

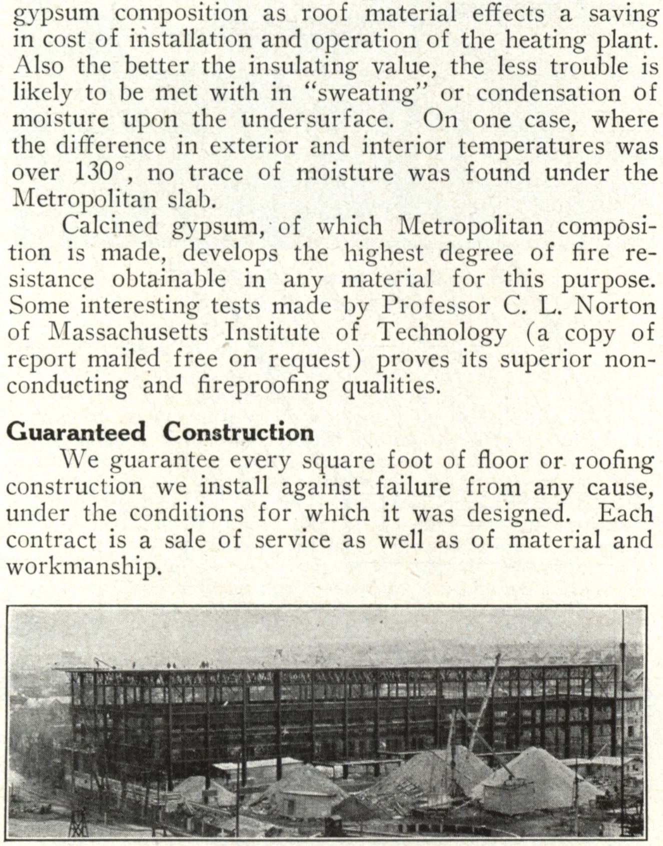
In existing structures, extreme lightness of Metropolitan construction permits us to replace less sturdy floors without either strengthening existing frame or overloading it. Neither extremely high nor low temperatures affect the progress of Metropolitan construction. Many installations have actually been made in temperatures as low as 25° below zero, and, indeed, this system of roofing was successfully installed during the rigors of a northern Canadian winter on the $15,000,000 plant of the Abitibi Pulp and Paper Mills at James Bay (not far from Hudson Bay) in Ontario in a temperature of 35° below zero.

(3) Non-conductivity, Insulation and Fire Resistance—The high insulating value of Metropolitan gypsum composition as roof material effects a saving in cost of installation and operation of the heating plant. Also the better the insulating value, the less trouble is likely to be met with in "sweating" or condensation of moisture upon the undersurface. On one case, where the difference in exterior and interior temperatures was over 130°, no trace of moisture was found under the Metropolitan slab.

Calcined gypsum, of which Metropolitan composition is made, develops the highest degree of fire resistance obtainable in any material for this purpose. Some interesting tests made by Professor C. L. Norton of Massachusetts Institute of Technology (a copy of report mailed free on request) proves its superior non-conducting and fireproofing qualities.

Guaranteed Construction

We guarantee every square foot of floor or roofing construction we install against failure from any cause, under the conditions for which it was designed. Each contract is a sale of service as well as of material and workmanship.



Repair Erecting Shop, American Locomotive Co., Schenectady, N. Y.

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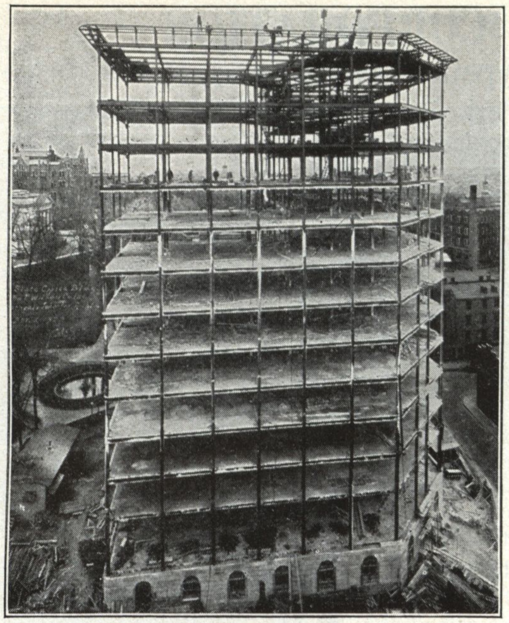


Metropolitan System Being Installed, State Office Building, Richmond, Va.

Carneal & Johnston, Architects John T. Wilson, Inc., Contractors

TABLE OF TOTAL LOADS

Metropolitan System of Fireproof Floor and Roof Construction

Cables composed of 2-No. 12 Cold Drawn Galvanized Steel Wires Twisted

Cable = 2 × .00874 @ 20000#□" = 350#

20000#□" $W = \frac{.1152\,Td}{bL\sqrt{L^2+16d^2}}$ NO. 12.

	SLAB THICKNESS	CABLE SPACING	CLEAR DISTANCE BETWEEN FLANGES OF BEAMS													
			3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
ROOFS	3	1	450	345	273	221	183	154	131	114						
		1¼	360	276	218	177	147	124	105	91						
		1½	301	230	182	147	123	103	88	76						
		1¾	258	197	156	126	104	88	75	65						
		2	225	172	137	110	92	77	65	57						
		2¼	200	153	122	99	82	68	58	51						
		2½	180	138	109	88	74	61	53	46						
		2¾	164	125	100	80	67	57	48	41						
		3	150	115	91	74	61	52	44	38						
	3½	1	556	430	340	275	227	193	165	141	124	109	96			
		1¼	445	343	272	220	182	154	132	113	99	87	77			
		1½	370	285	226	184	152	128	110	95	82	73	64			
		1¾	317	245	192	155	130	110	94	82	71	62	55			
		2	278	215	169	138	114	96	82	71	61	55	48			
		2¼	247	191	150	123	102	85	73	63	54	49	42			
		2½	222	171	136	110	91	77	66	57	50	44	38			
		2¾	202	155	124	101	83	70	59	52	45	39	35			
		3	185	143	113	92	76	64	55	47	41	36	32			

← ROOFS

	SLAB THICKNESS	CABLE SPACING	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
FLOORS	4	1	658	508	403	330	270	230	195	169	148	129	115	102	93	83
		1¼	527	406	322	264	216	184	156	135	118	103	91	82	75	67
		1½	438	338	268	220	180	153	130	112	98	86	77	69	62	56
		1¾	376	290	230	188	154	131	111	97	84	74	66	59	53	48
		2	328	254	201	165	135	115	98	84	74	64	57	52	46	41
		2¼	292	226	178	147	120	102	87	75	65	57	51	46	41	37
		2½	264	203	165	131	108	91	78	67	58	52	46	41	37	34
		2¾	240	185	147	120	98	83	71	61	54	47	42	37	34	31
		3	219	169	134	110	90	77	65	57	49	43	38	35	31	28
	4½	1	757	583	466	382	313	264	226	195	172	150	134	120	107	97
		1¼	605	467	373	305	251	212	181	155	137	121	107	96	86	78
		1½	505	389	310	255	209	177	150	130	114	101	89	79	72	64
		1¾	432	334	266	218	179	151	129	111	98	86	77	69	61	56
		2	378	292	233	190	157	132	113	97	85	76	67	60	54	48
		2¼	336	260	207	169	140	118	101	86	76	67	59	54	48	43
		2½	303	234	186	152	126	106	90	78	68	60	54	48	43	38
		2¾	275	213	170	139	114	96	82	71	62	56	49	43	39	35
		3	252	194	155	127	104	88	75	65	57	50	45	40	35	32
	5	1	853	660	528	433	358	302	259	224	196	173	153	136	122	111
		1¼	682	528	423	347	286	242	207	179	156	138	123	109	98	89
		1½	569	441	352	288	239	201	172	150	130	115	102	91	81	74
		1¾	487	378	302	247	205	172	147	128	111	98	87	78	70	63
		2	427	330	264	216	179	151	129	112	98	86	77	68	61	56
		2¼	380	294	235	193	159	134	115	100	86	77	68	60	55	50
		2½	341	265	212	173	144	120	104	90	78	69	61	55	49	44
		2¾	310	241	192	157	130	109	94	82	71	62	56	50	45	40
		3	284	220	176	144	120	101	86	75	65	58	51	45	41	37
	5½	1	944	738	592	483	402	340	290	252	220	193	171	153	138	125
	6	1	1032	807	648	531	442	374	321	278	243	214	190	170	153	138

Information for Designing

Services of Engineering Department—Our Engineering Department should be consulted before steel design of building is completed. We will gladly send our engineers to confer with you without expense or obligation.

In submitting bids our engineers will guarantee the estimate they make of structural steel tonnage saved by the use of our system.

Economical Spans—The construction can be installed between supports spaced up to 10 ft. in clear. Our experience has shown that under average conditions a spacing of 6 ft. 6 in. to 7 ft. is the most economical. For monitor roofs an extremely simple design is shown in lower illustration.

Waterproof Roofing—Any standard type of waterproof roofing may be successfully applied to our poured-in-place system. The form most generally applied, however, is a 3-ply built-up roofing.

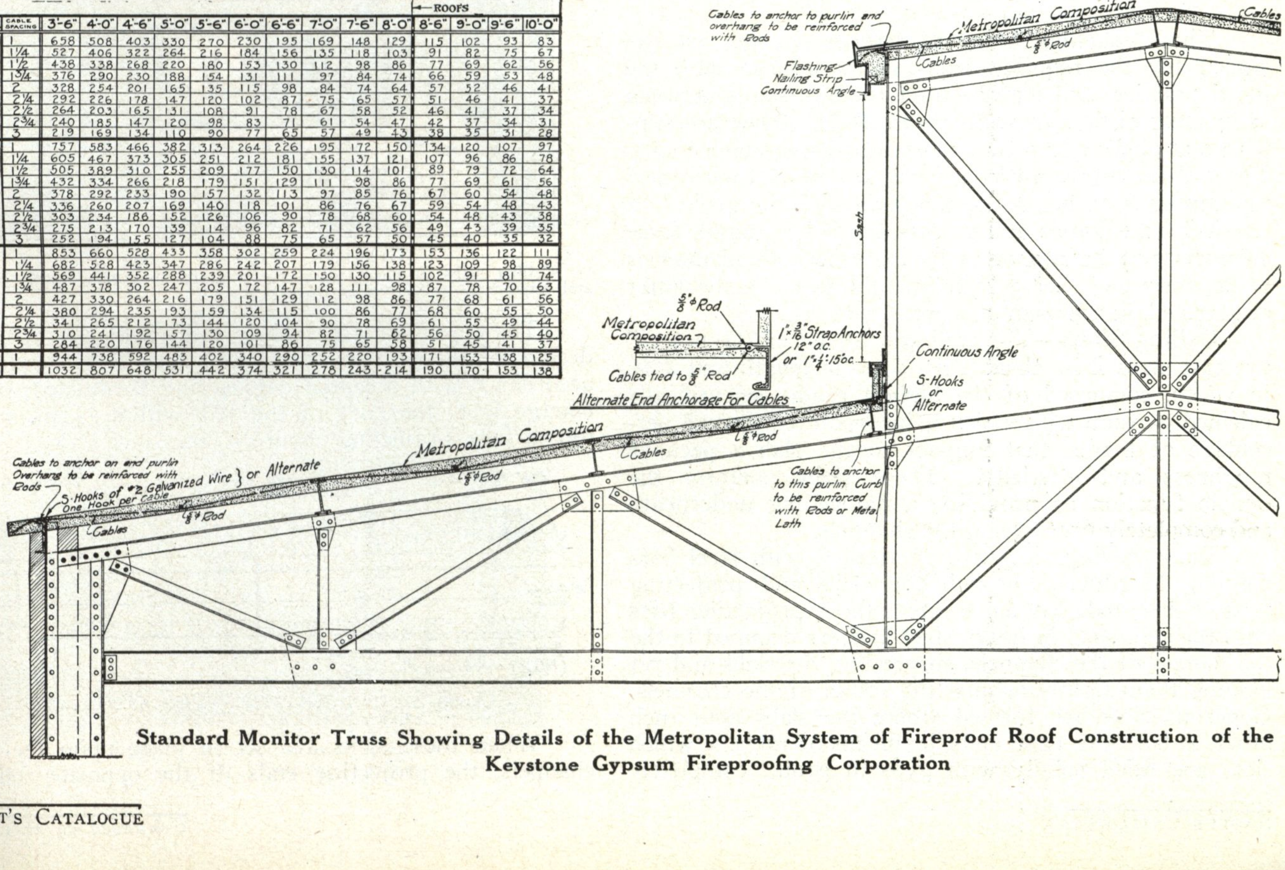
Specifications

Fireproof Floors and Roofs—Cables, each composed of two No. 12 (or equivalent) galvanized wires twisted, shall be carried over the tops of the beams or purlins to outside wall beams or end purlins and be secured to them by strong hooks or anchors. These cables shall be laid parallel, 1 to 3 in. apart, according to spans and loads, and shall pass under round iron bars, midway between the purlins, so as to cause the cables to deflect uniformly. Forms or centers shall be put in place about 1 in. below the round iron bars mentioned above. The Metropolitan composition shall then be poured-in-place, and brought to an even surface about ½ in. above the top of the beams, forming a slab ready to receive [sleeper fill or grading] [finished roofing or grading] and with the underside left as smooth as practicable. The slab shall be designed to carry safely the live load with a factor of safety of 4.

Note—For fireproof floors, fireproofing beams and girders (not trusses) shall be used, according to the local building laws.

Recent Floor Installations

State Office Building, Richmond, Va.
Marywood College, Scranton, Pa.
Norristown-Penn Trust Co., Norristown, Pa.
High School Building, Carbondale, Pa.
First National Bank, Altoona, Pa.


Cables to anchor to purlin and overhang to be reinforced with Rods
Metropolitan Composition
Cables
5/8" ϕ Rod
Cables
Flashing
Nailing Strip
Continuous Angle
Sash
5/8" ϕ Rod
Metropolitan Composition
1" × 3/16" Strap Anchors 12" o.c. or 1" × 1/4" 15" o.c.
Cables tied to 5/8" Rod
Alternate End Anchorage For Cables
Continuous Angle
S-Hooks or Alternate
Cables to anchor to this purlin Curb to be reinforced with Rods or Metal Lath
Metropolitan Composition
Cables
5/8" ϕ Rod
Cables to anchor on end purlin Overhang to be reinforced with Rods
S-Hooks of #2 Galvanized Wire } or Alternate One Hook per Cable
5/8" ϕ Rod
Cables

Standard Monitor Truss Showing Details of the Metropolitan System of Fireproof Roof Construction of the Keystone Gypsum Fireproofing Corporation

STRUCTURAL GYPSUM CORPORATION

Manufacturers and Erectors of Gypsum Floors and Roofs

Dodge Building, 53 Park Place
NEW YORK, N. Y.

BRANCH OFFICES

ALLENTOWN, PA., 444-46 Union Street
BOSTON, MASS., 115 Federal Street
BUFFALO, N. Y., Jackson Building
EASTON, PA., 31 No. Fourth Street
PHILADELPHIA, PA., Real Estate Trust Building
PITTSBURGH, PA., 302 Ferguson Building
RICHMOND, VA., Real Estate Exchange Building
SCRANTON, PA., Board of Trade Building
SYRACUSE, N. Y., 207 Comstock Avenue

FACTORY: AKRON, N. Y.

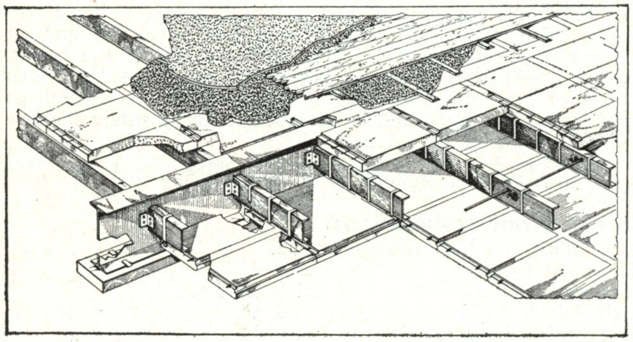
GYPSTEEL
TRADE MARK

Product

Manufacturers and erectors of "Gypsteel" Pre-cast and Poured-in-place Floors and Roofs.

"Gypsteel" Pre-cast Long Span Floors (Patented)

"Gypsteel" pre-cast floors economically combine the calculable strength of structural steel with the unequalled fire protection and lightness of gypsum. This floor construction consists of *standard sections of rolled steel channels,* spaced 30 in. on centers, on which are laid pre-cast gypsum floor slabs 2½ in. thick, and from which are suspended ceiling slabs of the same material, 2 in. thick.



"Gypsteel" Pre-cast Floor

These channels, being of structural steel, are designed for the required loads in accordance with the usual practice, and may be used for any spans between supporting girders or walls up to 24 ft. They are supported at girders by means of standard web connections. These channels are *not coped,* but are framed with their top flanges 2 in. below the top flanges of the girder.

Where columns and girders are not required, these channels may be supported by the exterior and interior walls, their ends being built into the walls as the latter are erected, in the usual manner.

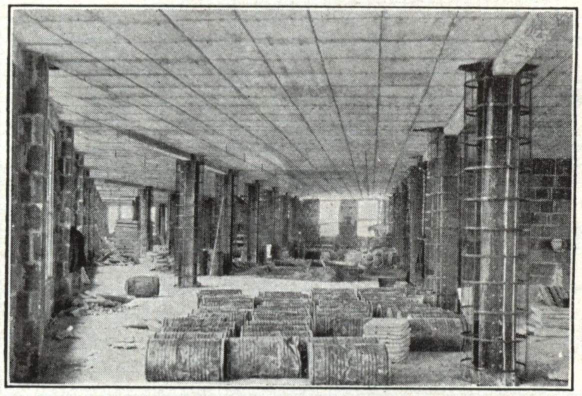
Ceiling Slabs—The ceilings consist of "Gypsteel" pre-cast slabs 2 in. thick, 2 ft. 6 in. in length and 2 ft. in width, composed of the highest grade, scientifically calcined gypsum with which is incorporated a small percentage of binder that imparts to the slab a peculiar toughness and elasticity. These slabs perform the double function of providing a flat ceiling underneath and completely *fireproofing* the channels.

These ceiling slabs are reinforced with steel bars running lengthwise through the slabs and projecting from either end. When erected, these projecting bars pass through slots in heavy steel hangers clamped to the top flanges of the channels, suspending the slabs and yet holding them tightly against the soffits of the channels. Generous slots are formed where the slabs abut each other, at both sides and ends, by means of rabbets, which slots are filled solidly with gypsum grout, completely sealing them and preventing the passage of any heat through the joints.

The ceiling is then immediately ready for brown and finish coats of plaster—*no scratch coat being necessary* as required for metal lath and other materials.

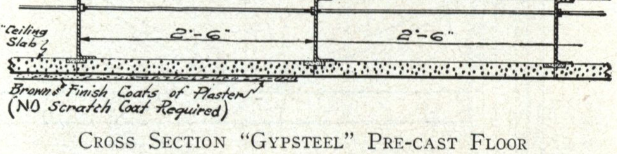
Floor Slabs—"Gypsteel" floor slabs consist of the same composition as the ceiling slabs. Like the latter, they are pre-moulded at the factory and shipped to the job ready to erect. They are 2½ in. thick, 2 ft. in width and 2 ft. 6 in. in length.

Erection of "Gypsteel" Ceiling Slabs
Grouting to follow



"Gypsteel" Pre-cast Floor
Ceiling slabs in place ready for plaster; floor slabs ready for fill and finish

These slabs are reinforced with $\frac{3}{16}$-in. cold drawn wire rods (uniformly and accurately located in accordance with accepted engineering formulae), which emerge from the ends of the slab within ½ in. of the top surface, projecting about 2½ in.

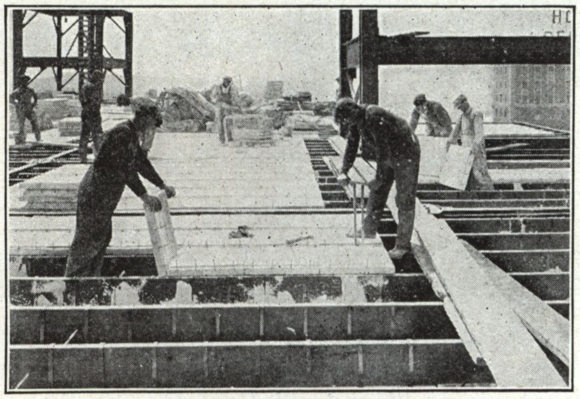

2½" FLOOR SLAB
FINISHED FLOOR Wood, Cement, etc
CINDER FILL
2" Ceiling Slab
2'-6"
2'-6"
Brown & Finish Coats of Plaster
(NO Scratch Coat Required)

Cross Section "Gypsteel" Pre-cast Floor

When these slabs are set in place upon the steel channels, the projecting ends of the opposite rods in

Continued on next page

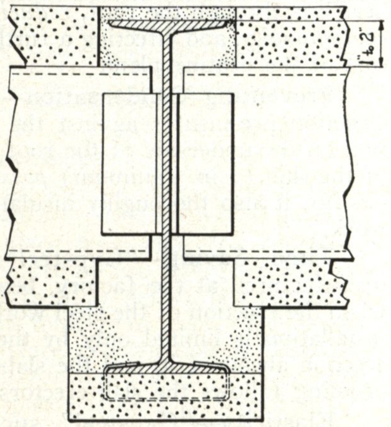
abutting slabs are tied together by a mechanical device which draws them up taut at these connections, *making the reinforcement continuous.*



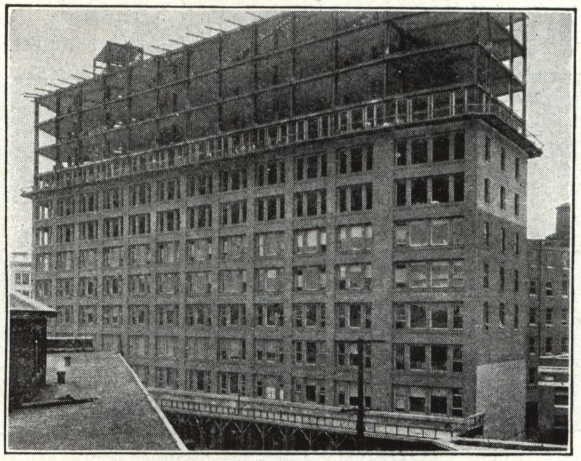
"Gypsteel" Pre-cast Floor
Floor slabs being erected; those in background grouted

As the ends of the slabs are rabbetted where the rods emerge, these ties lie in a depression which is filled with a gypsum grout, firmly embedding the ties and smoothed off flush with the top surface of the slabs. The floor is then ready to receive cinder fill and cement finish, or wood sleepers and wood floor, as desired.

Girder Fireproofing—Where the floor channels are supported by girders, the projecting webs and flanges of the latter are fireproofed by means of "Gypsteel" pre-cast slabs, 2 in. in thickness, applied to the soffits of the girders. These slabs have embedded in them ¾x⅛-in. flats, the ends of which project through the upper surfaces and are clamped over the girder flanges. Plastic gypsum is then deposited in the space between the top surfaces of these soffit-slabs and the adjacent ceiling slabs, and is troweled off square and flush with the outside edges of the soffit-slabs.



Cross Section at Girder "Gypsteel" Pre-cast Floor
Showing girder fireproofing in place



"Gypsteel" Pre-cast Floor
General view during construction

Principal Advantages of "Gypsteel" Pre-cast Floors

Economy—They are the most economical type of first class fireproof floor construction which can be employed where flat ceilings are required.

Strength—Their load carrying capacity is accurately calculated upon the strength of the supporting rolled steel channels, spaced 30 in. on centers. The ability of the "Gypsteel" pre-cast floor slabs to transmit the load to these channels was conclusively proven by tests conducted by Columbia University Testing Laboratory for the Bureau of Buildings, New York City, in which *concentrated loads* were applied by machine at the *third points* of one of the 2 ft. 6-in. spans for the full width of the slab. Failure did not occur until the load had reached *1482 lb. per sq. ft.,* equal, approximately, to 2000 lb. per sq. ft. uniformly distributed. These floors may, therefore, be safely designed for total loads up to 250 lb. per sq. ft. *with a factor of safety of 6 on the third-point loading,* or a factor of safety of approximately 8, based upon a uniform loading.

Fire Resistance—"Gypsteel" pre-cast floors have successfully passed the standard fire, load and water tests required by the principal cities of the United States for first class fireproof floor construction. These tests consist of the subjection of the floor to a fire for 4 hours at 1700° F., carrying a live load of 150 lb. per sq. ft., followed by the application, for 10 minutes, of a hose stream from a 1⅛-in. nozzle at 60-lb. nozzle pressure. The following is quoted verbatim from the official report of the Columbia University Testing Laboratory to the Bureau of Buildings of New York City, viz.:

"The floor slabs proper were not affected by the heat. The maximum temperature reached during the test on the underside of these slabs (the space between the floor and ceiling slabs) was about 315° F. A short piece of wood, 1x2 in. in cross section, found between the floor and ceiling slabs, and which had been there during the entire test, was only blackened in part, giving further proof of the low temperature during the test directly above the 2-in. ceiling."

The maximum deflection recorded during this test, at the center of the 18-ft. floor span was .82 in. Fifteen minutes after the water was applied, this had recovered to .62 in. After the removal of the load of 150 lb. per sq. ft. the final deflection was .19 in.

Lightness—"Gypsteel" precast floor construction (including channels) is usually not only lower in first cost than any other type of fireproof floor with flat ceiling underneath for a given span and load, but its extreme lightness in weight invariably permits of a substantial saving in the tonnage of girders and columns.

TABULATION OF DEAD LOADS

	Lb. per sq. ft.
Channels (average)	5
"Gypsteel" floor slabs	12
"Gypsteel" ceiling slabs	9
2-in. cinder fill	10
Wood floor	4
Plastering (no scratch coat)	4
Total	44

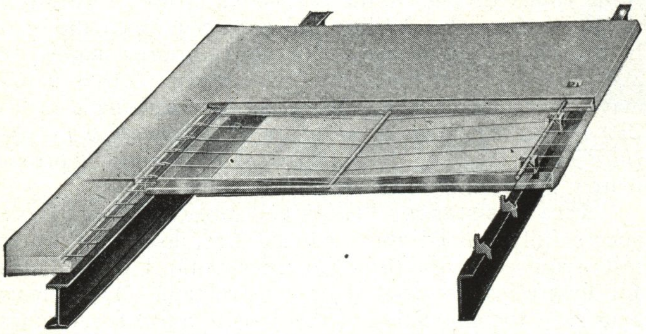
Note: If cement finish instead of wood floor is used add 8 lb. per sq. ft.

Time Saving—The "Gypsteel" floor and ceiling slabs being in standard sizes, are carried in stock at the factory and arrive at the job dry and ready to erect. There is *no form work.* As the slabs are dry when set, the *ceiling could be plastered the same day,* if desired. And as there is *no water* entering into the construction (except the small amount used in the grouting), there is *no drying out to delay the finishing of the building.*

Continued on next page

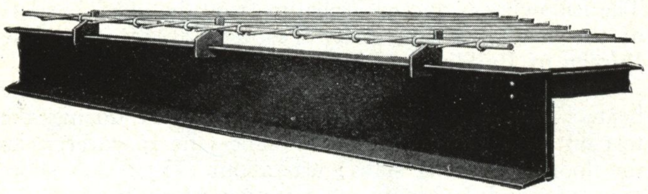
"Gypsteel" Pre-cast Roofs (Patented)

"Gypsteel" pre-cast roof construction is designed upon the suspension-bridge principle. It is, in effect, a monolithic roof after the erection is completed. The slabs are moulded in steel forms, into which the steel cables are placed and put into uniform deflection and tension by means of deflection rods restrained at the sides of the moulds. The cables are securely anchored to the moulds at points beyond the ends of the slabs, being removed from this anchorage when the gypsum has set, each cable emerging from the ends of the slab within ½ in. of the top surface, and projecting about 2 in.



"Gypsteel" Pre-cast Roofs

Details of design, cable ties, anchorage, grouted end and side joints and anchor slots



"Gypsteel" Pre-cast Roofs

Showing perfect mechanical anchorage of steel in slabs to the steel framework of building, independent of the gypsum

When these slabs are set in place on the purlins, with their ends abutting, the projecting ends of the opposite cables in each slab are tied together by a mechanical device which draws them up taut at these connections; and as the ends of the slabs are rabbetted where the cables emerge, these ties lie in a depression filled with a grout of the same composition, firmly embedding the ties and troweled off flush with the top surface of the slab.

Innumerable load tests which have been made on "Gypsteel" pre-cast roof construction have shown in every instance, that it will develop more than the factor of safety of 4 upon which the supporting steel cables are designed, the cable ties holding firmly until the ultimate strength of the steel in tension has been reached.

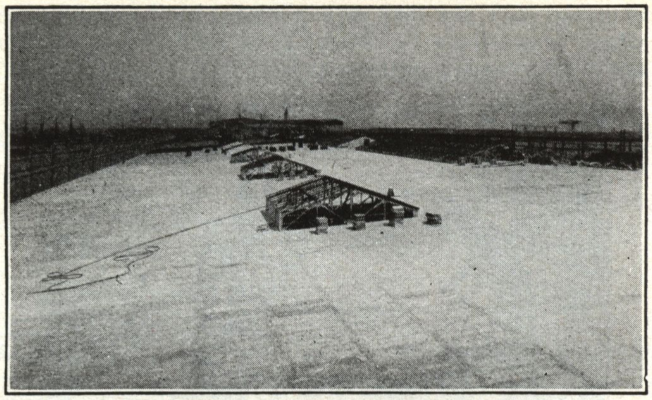
SAFE LOADS PER SQUARE FOOT, PRE-CAST ROOF CONSTRUCTION

Slab width, in.	Cable spac. in.	Number cables per slab	Distance between supports center to center, ft.-in.												
			4–0	4–3	4–6	4–9	5–0	5–3	5–6	5–9	6–0	6–3	6–6	6–9	7–0
24	4	6	136	122	108	98	88	80	72	66	61				
	3.43	7	159	142	126	114	102	93	84	78	72				
21	4.2	5									59	54	50	46	
	3.5	6									70	64	59	55	
	3	7									82	76	70	65	
	2.62	8									94	87	80	74	
18	3.6	5												54	50
	3	6												65	60
	2.57	7												76	70

$W=1152\ Td \div bL\sqrt{L^2+16d^2}$ where W=safe load; T=cable strength=0.0274 (area of $\frac{3}{16}$-in. cold drawn steel-wire rods)×20,000 (unit working stress)=552 lb.; d=deflection of wires in inches; b=cable spacing in inches and L=clear span in inches.

Slab thickness in all cases, 3 in., weight 14 lb. per sq. ft.

Note: While this table is not extended beyond the usual range of roof loads, slabs will be designed and furnished for any greater load capacities which may be desired, in order to meet special conditions. This is accomplished by decreasing the cable spacing for any given span.



"Gypsteel" Pre-cast Roof

On Porter Street Pier No. 84, Philadelphia, Pa. Slabs grouted, ready for waterproofing

Advantages of "Gypsteel" Roof Construction

Economical First Cost—Its extreme lightness in weight and adaptability to wide purlin spacings effect substantial savings in the total steel tonnage of the purlins, trusses and columns, making it the most economical of any first class type of roof construction.

Saving in Heating—The "Gypsteel" composition used in the slab is the most remarkable non-conductor of heat of any known structural material. It thus minimizes heat loss through the roof, *reducing the consumption of coal annually,* and effecting a further saving in the initial cost of the heating plant.

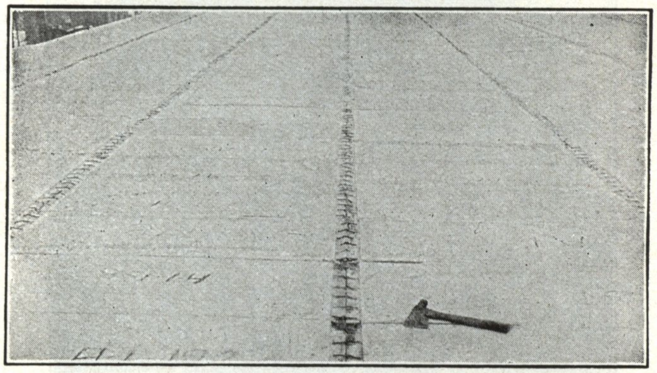
Preventing Condensation—"Gypsteel" roof construction pre-insures against the forming of condensation on the underside of the roof; and as the full depth of the slab (3 in. minimum) *passes over the tops of the purlins,* it also thoroughly insulates the supporting steel work.

Time Saving—"Gypsteel" pre-cast slabs are manufactured at the factory, being ready for shipment when the erection of the steel work begins. The speed of installation is limited only by the progress of the steel erection ahead of it, and the slabs being dry the waterproofing follows the slab erectors just as closely.

Elasticity—"Gypsteel" successfully resists the most severe vibrations without cracking.

Corrosionproof—"Gypsteel" composition has been proved by more than 20 years' experience to be a perfect preservative of the incased steel against corrosion.

Non-expansive—"Gypsteel" roofs will neither expand nor contract, and are therefore free from cracks, spalling and internal stresses which frequently occur from this cause in concrete and other similar materials.



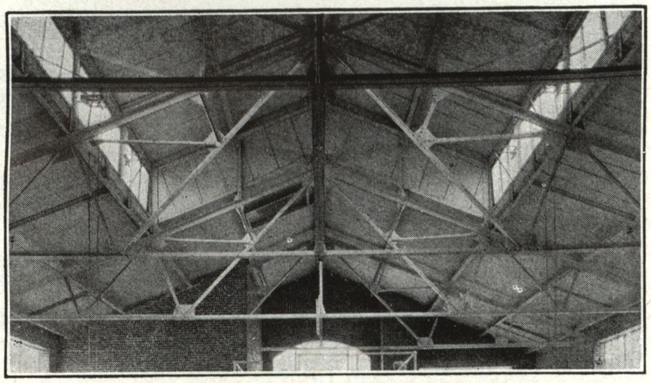
"Gypsteel" Pre-cast Roof

Close up view of table ties. Note that grouting is used in the *side* as well as end joints, giving in effect, a monolithic slab construction

Continued on next page

Attractive Appearance—"Gypsteel" roofs give a much more attractive appearance underneath than any other type of roof remaining unplastered, since the slabs are factory moulded on rubber mats, leaving a smooth, even surface underneath.

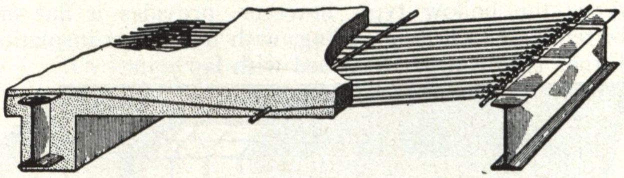
Replacement of Old Roofs—The replacement of old roofs is readily accomplished by the use of "Gypsteel" pre-cast construction with a minimum of annoyance to the work in process below. Its lightness in most cases renders increased steel work unnecessary over that which would be required for the support of wood, etc.



"GYPSTEEL" PRE-CAST ROOF
Senior-Junior High School Group, Harrisburg, Pa.
C. HOWARD LLOYD, Architect
One of five units with connecting galleries covered with "Gypsteel" slabs, underside painted

Poured-in-place Construction

Where flat ceilings are not required and floor or roof beams may be spaced not to exceed 8 ft. on centers, "Gypsteel" poured-in-place floor and roof construction combines the highest degree of fire resistance with economy. Its lightness (12 to 16 lb. per sq. ft.) permits of a substantial saving in the tonnage of steel. The design of "Gypsteel" poured-in-place construction is based upon the *principle of the suspension bridge.* Cables of cold drawn steel wire are spaced from 1 to 3 in. apart (depending upon the spans and loads) and are securely anchored at both ends of a series of beams by means of bars and anchors of a section of metal sufficiently heavy to develop the ultimate strength of the cables in tension. The cables are put into uniform deflection and tension between each pair of beams by means of continuous steel deflection rods.



TYPE 2. POURED-IN-PLACE FLOOR OR ROOF

"Gypsteel" composition is then poured-in-place between the beams, upon wood forms or centering, and is brought to a level surface about ½ in. above the top flanges of the purlins. It is then ready to receive the fill and finished floor on top. The projecting webs and flanges of the beams and girders are also incased in the same composition poured at same time as the floor slab.

This "Gypsteel" composition consists of the highest grade, scientifically calcined gypsum with which is incorporated wood fiber or chips to serve as a binder and impart to the slab its peculiar toughness and elasticity.

The strength of a "Gypsteel" poured-in-place floor or roof can be proved by accepted engineering formulæ, as the desired live and dead *load capacity* of the slab *is calculated upon the structural value of the securely anchored steel cables, in suspension,* under a factor of safety of 4.

Installation

"Gypsteel" construction is installed by our own field organization under competent foremen and superintendents of many years' experience. When desired, however, contracts will be taken for furnishing "Gypsteel" pre-cast slabs f.o.b. cars factory, with freight allowed to destination—we loaning one of our experienced working foremen to the contractor or owner to supervise the erection, for which no charge is made other than his actual time and expenses.

Estimates and Designs

Complete proposals for furnishing and installing "Gypsteel" floors and roofs will be promptly furnished on request. When it can be done conveniently, we suggest sending plans to our nearest sales office. This permits our Engineering Department to go over all of the details of the steel design and incorporate in our proposal an estimate of the total tonnage of steel which can be saved by reason of the lightness in weight of "Gypsteel."

Where plans have not yet been drawn, our Engineering Department will gladly co-operate in the preparation of the steel design to develop the maximum economy by the use of "Gypsteel" construction. This service is gratis, and imposes no obligation whatsoever upon the architect, engineer or owner.

Bulletins

Complete bulletins, containing full designing details, will be gladly sent on request.

References

The following is a brief list of representative "Gypsteel" installations:

Floors

Bloomingdale Brothers, Department Store (Extension), New York, N. Y., Starrett & Van Vleck, Architects
Bristol Hospital, Bristol, Conn., Chas. S. Palmer, New Haven, Conn., Architect
Christopher Columbus High School, Binghamton, N. Y., Tiffany & Kaley, Architects
Hens & Kelly Department Store, Buffalo, N. Y., Bley & Lyman, Architects
Hotel East Orange, East Orange, N. J., E. V. & C. F. Warren, Newark, N. J., Architects
Hotel Pennsylvania (Additional Floors), New York, N. Y., McKim, Mead & White, Architects
Sibley, Lindsay & Curr Department Store (Additional Floors), Rochester, N. Y., J. Foster Warner, Architect
State & City Bank & Trust Co., Richmond, Va., Clinton & Russell, New York, N. Y., Architects

Roofs

American Radiator Co.	23 Contracts
American Car & Foundry Co.	13 Contracts
Bethlehem Steel Corporation	13 Contracts
General Electric Co.	8 Contracts
International Paper Co.	11 Contracts
United Gas Improvement Co.	7 Contracts
U. S. War and Navy Departments	23 Contracts
Western Electric Co.	4 Contracts
Youngstown Sheet & Tube Co.	6 Contracts

UNITED STATES GYPSUM COMPANY

Reinforced Roof Tile and Monolithic Floors and Roofs

205 West Monroe Street CHICAGO, ILL.

For Sales Offices, see page 374

Products

Manufacturers and erectors of PYROBAR REINFORCED ROOF TILE (made of "Structolite") for roof decks; PYROFILL MONOLITHIC FLOOR and ROOF CONSTRUCTION.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339; for Sheathing, see page 1361.

Service

Twenty-six producing mills, located at advantageous points, insure prompt delivery for any quantity.

An Engineering and Construction Department is maintained for the purpose of assisting engineers and architects in designs and estimates. We will gladly submit erected bids on Pyrobar or Pyrofill roofs for new, re-roofing jobs or placing an insulation deck on your present roof.

Pyrobar Reinforced Roof Tile

Description—Pyrobar roof tile are made of "Structolite," a specially prepared dense structural gypsum, reinforced with steel mats and designed to carry the full required roof load. Manufactured in two general types: long span, either hollow or channel sections, and 30-in. type, either solid or hollow.

Long span tile are made with or without lap joint, the lap being designed chiefly to meet construction where sufficient flange bearing has not been provided in steel work to support properly the standard end tile.

Advantages—*Strength*—Pyrobar roof tile are designed to carry 50 lb. per sq. ft. total uniform load, with a factor of safety of 4.

Fireproof—Gypsum is acknowledged to be one of the best fire resisting materials known. Gypsum will not support combustion or conduct heat; neither has it appreciable contraction or expansion; consequently, it will not warp, buckle, or spall under severe fire.

Minimizes Condensation—Superior insulation is a dominant quality in Pyrobar tile. Tests give the following units of B.t.u. transmitted per square foot per hour, per degree Fahrenheit difference in temperature, for various roof deck materials:

	B.t.u.
2-in. yellow pine plank	0.385
3-in. solid concrete slab (1-2-4)	0.750
1¼-in. solid cement tile	0.990
3-in. solid gypsum roof tile	0.250
4-in. hollow gypsum roof tile	0.200

Less heat is transmitted through gypsum than through any other structural material. On account of its low conductivity, the undersurface of Pyrobar roof deck remains at practically the same temperature as the interior of the building, regardless of outside temperature. Under moist air conditions no "sweating" or "dripping" can occur and condensation is eliminated.

Heat Saving—The superior insulation value shows a decided saving in heat and heating equipment, as compared to a concrete slab. This means an accumulating saving in fuel cost as well as a saving in initial cost of heating plant installation.

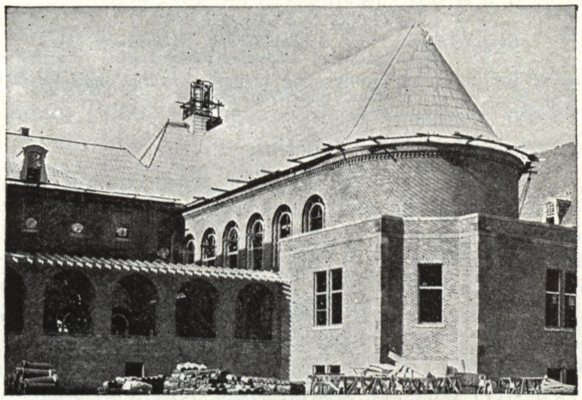
Light Weight—Are 50% lighter than concrete per square foot of surface for equal thickness, which results in considerable saving in steel framing, supporting members and material throughout the building.

Adaptability—Suited to any form of roof design, flat or pitched, and easily cut to fit around difficult architectural design, involving dormers, gables, etc. Slate or ornamental tile may be nailed directly to several types of Pyrobar tile as an extra thick or extra dense tile is furnished for this purpose.

Quickly Erected—The large, light weight units are very quickly installed during any weather conditions and their erection does not interfere with plant operations during re-roofing.

Light Diffusion—The undersurface of the roof is white, smooth, and reflects any quality of light, relieving certain phases of the lighting problem.

Permanency—The permanency of Pyrobar tile has been established through many years of use. They are not affected by chemical action of smoke or deteriorating action of fumes from sulphurous acids. Thus is maintenance cost reduced to a negligible minimum.

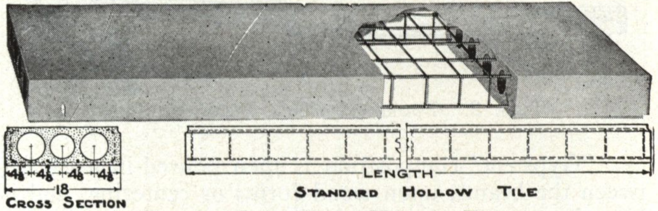


DIOCESAN SEMINARY, NEW ORLEANS, LA.
A roof framing difficulty overcome with Pyrobar Tile

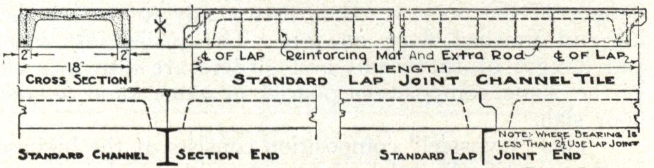
Pyrobar Long Span Roof Tile

Long Span Channel Type—This type of tile is manufactured in 4 ft. to 6 ft. 6 in. lengths. The tile are laid directly on steel or wood framing.

Long Span Hollow Type—The "hollow" type tile are manufactured in the same lengths as the "channel" type; the hollow type, however, provides a flat and better light reflecting ceiling, with maximum insulation. Either type can be furnished with lap joint.



PYROBAR LONG SPAN HOLLOW TYPE


X
2"
2"
18"
CROSS SECTION
℄ OF LAP
Reinforcing Mat And Extra Rod
℄ OF LAP
LENGTH
STANDARD LAP JOINT CHANNEL TILE
STANDARD CHANNEL SECTION END
NOTE:- WHERE BEARING IS LESS THAN 2½ USE LAP JOINT
STANDARD LAP JOINT END

PYROBAR LONG SPAN TYPE WITHOUT AND WITH LAP JOINT

Continued on next page

PURLIN TABLE FOR LONG SPAN CHANNEL OR HOLLOW TYPE TILE, OR 30-IN. TILE ON TEES

Total uniform dead load of 50 lb. per sq. ft.

		PURLIN SPAN	8'-0"		10'-0		12'-0		14'-0		16'-0		18'-0		20'-0		22'-0		24'-0	
		SHAPE	I	[	I	[	I	[	I	[	I	[	I	[	I	[	I	[	I	[
SLAB - SPAN!	4'0"	DEPTH-.INS	3	4	4	4	4	5	5	6	5	7	6	7	7	8	7	9	8	10
		WT. PER FT. LB.	5½	5¼	7½	5¼	7½	6½	9¾	8	9¾	9¾	12¼	9¾	15	11¼	15	13¾	18	15
	5'0"	DEPTH-.INS	3	4	4	5	5	6	5	7	6	7	7	8	7	9	8	10	8	10
		WT. PER FT. LB.	5½	5¼	7½	6½	9¾	8	9¾	9¾	12¼	9¾	15	11¼	15	13¾	18	15	18	15
	6'0"	DEPTH-INS.	4	4	4	5	5	6	6	7	6	8	7	9	8	10	8	10	9	12
		WT. PER FT. LB	7½	5¼	7½	6½	9¾	8	12¼	9¾	12¼	11¼	15	13¾	18	15	18	15	21	20½
	7'0"	DEPTH-INS.	4	5	5	6	5	7	6	8	7	9	8	9	8	10	9	12	9	12
		WT. PER FT.-LB.	7½	6½	9¾	8	9¾	9¾	12¼	11¼	15	13¾	18	13¾	18	15	21	20½	21	20½
	8'0"	DEPTH-INS.	4	5	5	6	6	7	6	8	7	9	8	10	9	12	9	12	10	12
		WT. PER FT.-LB.	7½	6½	9¾	8	12¼	9¾	12¼	11¼	15	13¾	18	15	21	20½	21	20½	22	20½

WEIGHTS, LONG SPAN CHANNEL AND HOLLOW TYPE TILE

	Channel Tile		Hollow Tile	
Length	0' to 6'3"	6'3" to 6'6"	0' to 6'3"	6'3" to 6'6"
Depth, "X"	5"	6"	5"	6"
Wt. per sq. ft., lb.	17	19	20	25

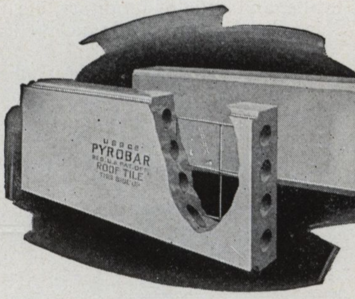
DESIGNING DATA

Spans for various T-irons spaced 30¾ in. on centers

Span	Up to 5' 3"	5' 3" to 5' 10½"	5' 10½" to 6' 5½"	6' 5½" to 8'
Size T-iron	2¼"x2¼"-4.1 lb.	2¼"x2¼"-4.9 lb.	2½"x2½" -5.5 lb.	3"x3"-6.7 lb.

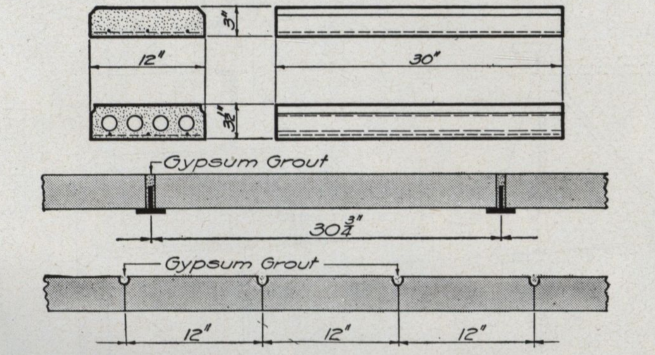
Pyrobar Roof Tile, 30-in. Type

Made with surface measurements 12x30 in., in 3-in. solid and 3½ and 4-in. hollow. (The 4-in. hollow is furnished on special order only.) Particularly adapted for curved or other intricate roof design and easily cut to fit any requirement. The tile are placed on T-iron subpurlins spaced 30¾ in. on centers, or light rail spaced 31¼ in. Curbs or walls for monitors and sawtooth sash are built of 3-in. solid Pyrobar tile; the end walls of monitors and sawteeth are similarly built, the roof coverings being extended to cover curbs and end walls.



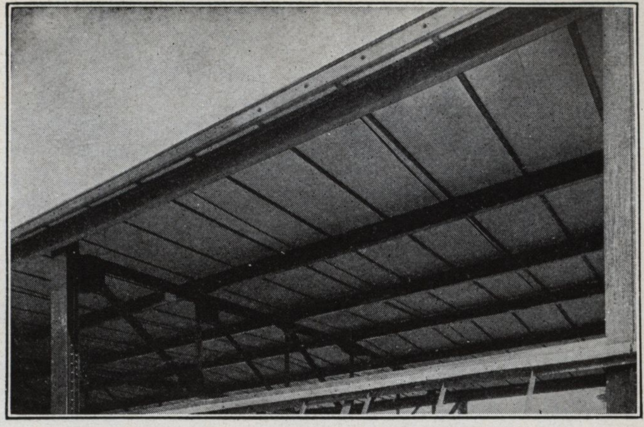
30-inch Pyrobar Roof Tile

	Solid	Hollow
Depth	3"	3½"
Length	30"	30"
Weight, sq. ft.	15 lb.	15 lb.



Sections of 30-inch Tile Showing Joints of Gypsum Grout

Pyrofill drainage system may be used when drainage fill is required.



Showing Smooth Undersurface of Sheetrock-Pyrofill Roof Construction

Specifications for Pyrobar Roof Tile

Long Span Type (Channel Section or Hollow Section) Roofs—All roofs as shown on drawings, unless otherwise noted, shall be constructed of Pyrobar (state type and depth of long span channel or long span hollow section) Roof Tile as manufactured and erected by the United States Gypsum Company.

Note: Where it is desired to nail roof covering directly to the roof deck, the specifications should read: "To be constructed of 3x12x30-in. Extra Dense Pyrobar Roof Tile." (For erection, curb, end walls and completion specifications see under 30-in. tile.)

Short Span 30-in. Type Roofs—All roofs as shown on drawings, unless otherwise noted, shall be constructed of Pyrobar (state type of tile, whether 3-in. solid, 3½ or 4-in. hollow) Roof Tile, as manufactured and erected by the United States Gypsum Company, laid on subpurlins of size indicated on drawing.

Note: Where it is desired to nail composition or shingle roofing, copper or tin sheathing, or other light roof covering directly to the Pyrobar roof deck, we recommend 3-in. solid Pyrobar and a square cut nail having not less than 1½-in. penetration into the tile. For rough slate, Spanish Tile, etc., a square cut nail having not less than 2-in. penetration into the tile is recommended.

Nailing strips should be applied to roofs of 45° pitch and over.

Erection—Tile are to be placed directly on roof supports, without mortar and with sides tight together, bearing at each end upon purlins or subpurlins to be not less than ¾ in. (1¼ in. for long span). All purlins to be drawn into true alignment with tie rods by the structural steel contractor before any tile are placed. All joints on top surface only of roof are to be pointed with gypsum mortar composed of 1 part of unfibred gypsum cement plaster and not more than 2 parts of clean sharp sand.

Curbs—Curbs under monitors and sawtooth sash shall be constructed of 3-in. Solid Pyrobar Curb Tile (or gutter tile) set in gypsum cement mortar, joints to be well bedded and struck.

End Walls—All end walls of monitors, A-frames, etc., shall be constructed of 3-in. solid Pyrobar Curb Tile. Steel contractor to provide sufficient steel framing to allow for proper anchoring of wall.

Completion—All Pyrobar roof decks to be left with as smooth a finish as practicable to receive the roofing contractor's covering, which shall be applied within 30 days after completion of the roof deck.

Note: When desired, the United States Gypsum Company will contract for the furnishing and erecting of the necessary T-iron or rail subpurlins for the short span construction.

Pyrofill Monolithic Floor and Roof Construction

There are two economical forms of poured-in-place construction. The first is designed according to the suspension bridge formula. Formwork is provided the same as for concrete slabs. The live loads are transferred to steel cables anchored at both ends and brought in tension by deflection rods, the gypsum acting principally as a filler. This is the well-known Metropolitan system for poured roof and floors, which has been in satisfactory use for the past twenty-five years. Weight of roof slabs: 3 in., 12 lb.; 3½ in., 14 lb.; 4 in., 16 lb.; 4½ in., 18 lb.; 5 in., 20 lb.

The second is the Sheetrock-Pyrofill construction, consisting of a reinforced gypsum slab poured on permanent Sheetrock forms. ⅜-in. Sheetrock, in lengths equal to the purlin spacing, is supported on the bottom

Continued on next page

flanges of light rail or T-iron subpurlins, which are spaced 32½ in. on center and clipped to the roof purlins. A gypsum slab of required thickness, reinforced with electrically welded steel fabric is poured directly on the Sheetrock. All joints being concealed by the purlins, the underside of this roof has more the appearance of a finished ceiling than a roof deck. This system eliminates the end bay bracing required for the poured suspension system, and the Sheetrock undersurface is dustproof and can be readily painted if necessary.

Specifications for Pyrofill Monolithic Roofs and Floors

Unless otherwise shown all slabs shall be constructed of Poured Gypsum in accordance with the system of the United States Gypsum Company known as Pyrofill Monolithic Slab Construction. This contractor shall provide necessary forms, reinforcing cables, Pyrofill and all labor required for his work.

Forms—The forms shall be made in workmanlike manner, of suitable material, and shall be carefully leveled up so as to insure a uniform depth of slab. Forms shall be cleaned before each re-use. All openings in slabs for down-spouts, soil pipes, vents, etc., shall be located by purchaser before the slab is poured, as no cutting of cables will be permitted after slabs are poured.

Reinforcing—Reinforcing shall consist of galvanized steel cables made by twisting two No. 12 wires. These cables shall be calculated to take the entire slab load and shall be fastened at their ends in such manner as to develop the full strength required. In no case shall the stress in the cables exceed 20,000 lb. per sq. in. The spacing of these cables and the depth of slabs shall conform to the standards of the United States Gypsum Company. The cables shall be drawn tight and fastened to suitable anchors and brought to uniform tension. Care shall be used in placing the tension rods to see that the cables shall not be brought closer than ½ in. to the undersurface of the slab. After cables are in place all workmen of this and other contractors shall be prohibited from walking thereon.

Composition—The Pyrofill composition used shall consist of a uniform mixture of calcined gypsum and water, into which is stirred, not over 15 lb. by weight, wood planer shavings to every 100 lb. of calcined gypsum. The top surface of the slab shall be screeded to as smooth a surface as possible to receive the waterproof covering.

If the underside of the slab is to be plastered or painted, such work shall not be done until the waterproof covering has been applied and the slab is thoroughly dry.

Curbs, etc.—All curb walls, ends of monitors, etc., shall be constructed of 3-in. Solid Pyrobar Curb Tile, neatly laid up in gypsum mortar, or of poured construction similar to the roof slabs.

Openings—The steel contractor shall provide steel framing around all openings more than 12 in. in diameter, and such steel bracing as is required to take the horizontal pull of cables where anchored, such as at end bays of buildings and all openings.

Covering—The waterproof covering shall be applied preferably within 20 days after completion of roof slab. Plank runways shall be laid on the slab before any wheeling whatever is done. Plank supports shall be laid from purlin to purlin to take any heavy or concentrated loads which may be applied to the slab.

Insert in Steel Specifications—Steel contractor shall submit drawings to the United States Gypsum Company for checking, to insure that all details are properly taken care of.

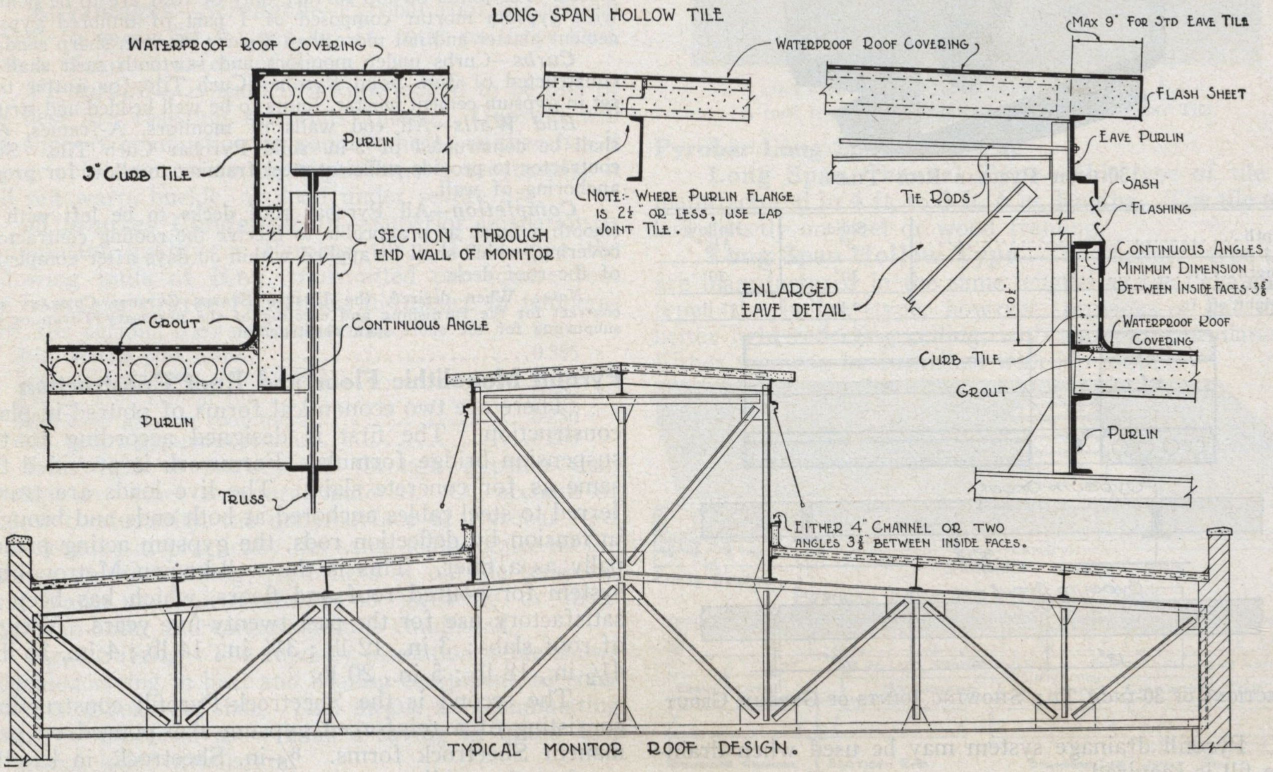
Specifications for Sheetrock-Pyrofill Roof Decks

Unless otherwise shown or noted, all roof slabs shall be of the thickness shown on plans and shall be constructed according to the United States Gypsum Company's system of Sheetrock-Pyrofill Construction. This contractor shall provide all Sheetrock, subpurlins, reinforcing material, Pyrofill and all labor required for his work. Light rails or T-iron subpurlins shall be laid and fastened to the main purlins by clips or bolts. The subpurlins shall be so spaced as to accommodate the size of Sheetrock used. The Sheetrock shall be laid on and supported by the bottom flange of the subpurlins and on the boards shall be laid an electrically welded galvanized steel reinforcing mat of the proper sectional area to carry the specified roof load. The main reinforcing wire of this mat shall run at right angles to the subpurlins.

The Pyrofill composition used shall consist of a uniform mixture of calcined gypsum and water into which is stirred not over 12% by weight (12 lb. by weight) of wood planer shavings to every 100 lb. of calcined gypsum and shall be poured directly on the Sheetrock to the required thickness and screeded to as smooth a surface as practicable. The roofing contractor shall lay thereon the waterproof roofing covering.

All openings in slabs for down-spouts, soil pipes, vents, etc., shall be accurately located by the purchaser before the slab is poured. All curb walls, and ends of monitors, etc., shall be constructed of 3-in. Solid Pyrobar Curb Tile, neatly laid up in gypsum mortar.

The waterproof roofing covering shall be applied as soon as possible after the slab is erected, preferably within 20 days.



Construction Details Showing Typical Designs of Pyrobar Roof Tile

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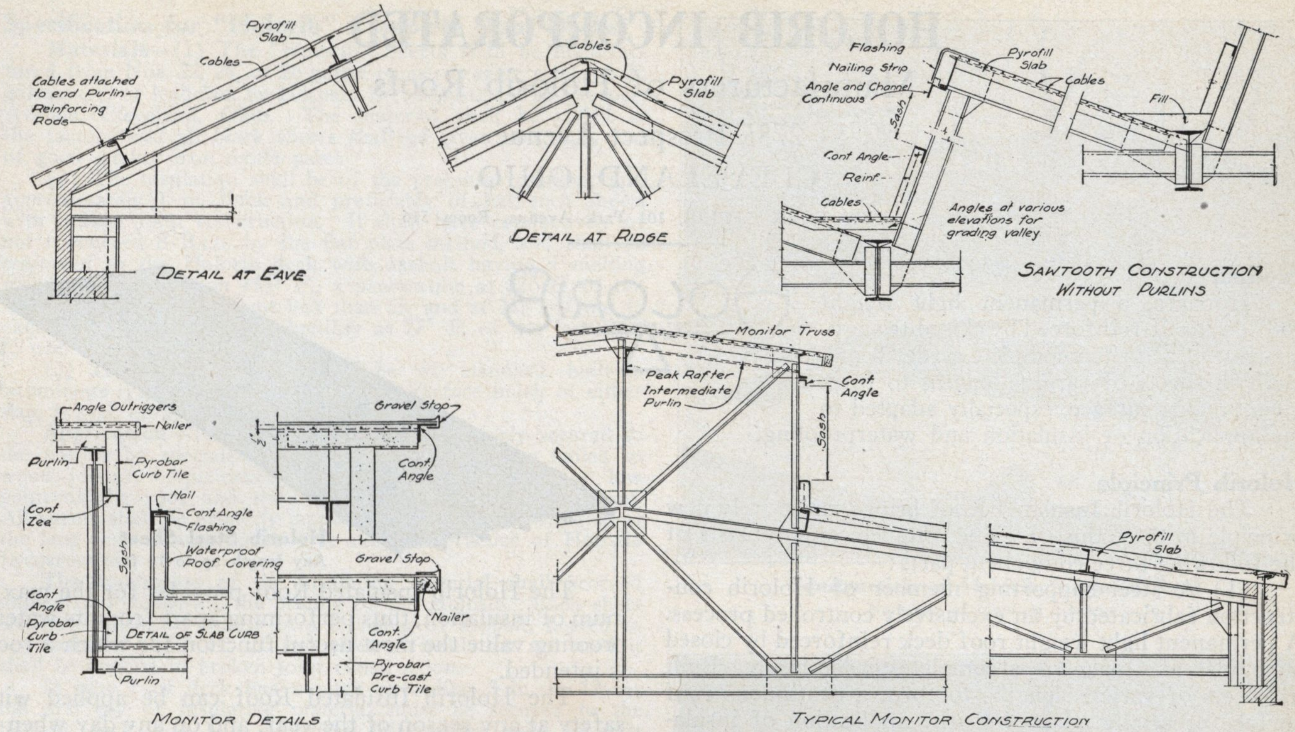
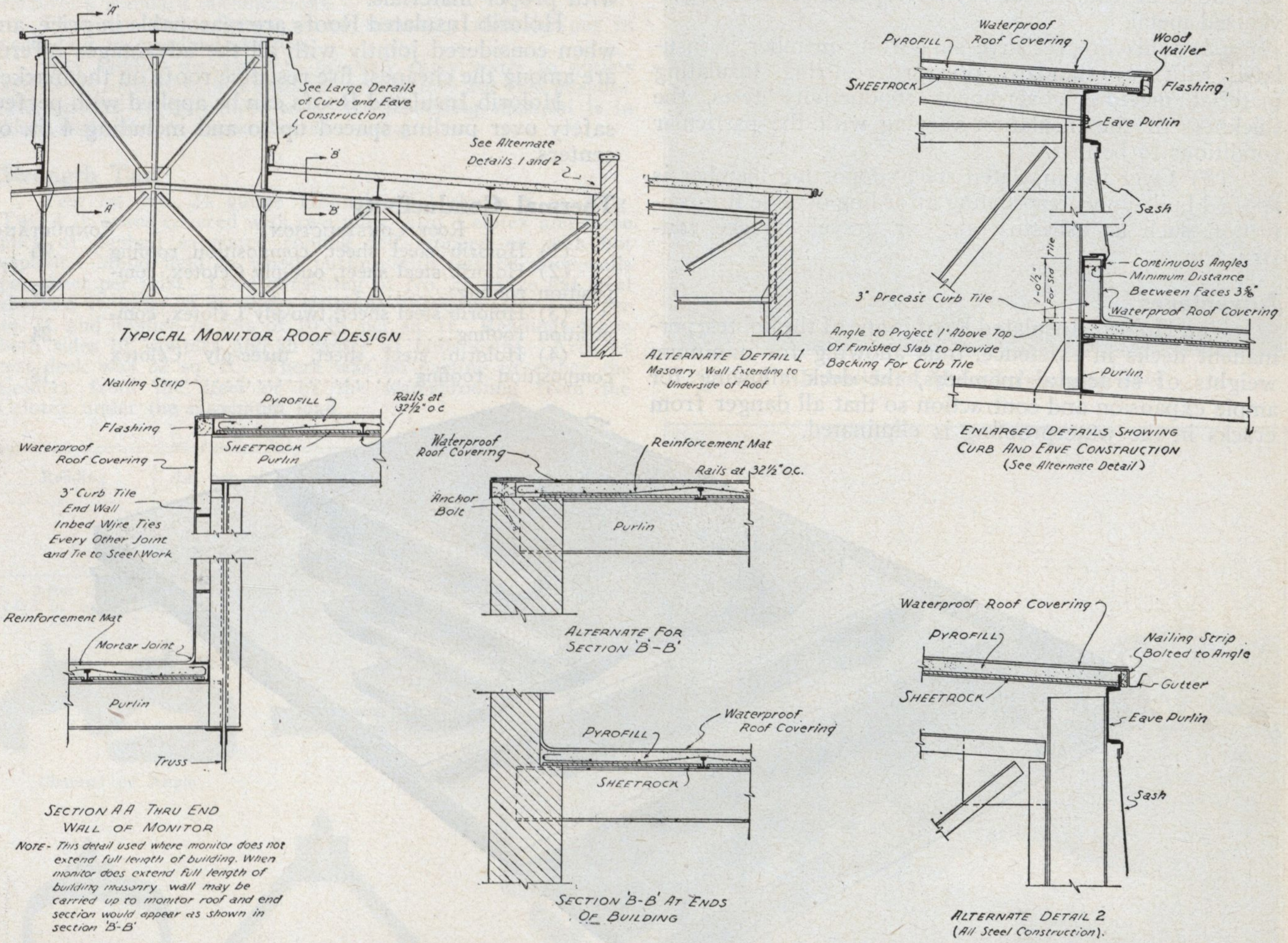

Pyrofill Slab
Cables
Cables attached to end Purlin
Reinforcing Rods
Detail at Eave
Cables
Pyrofill Slab
Detail at Ridge
Flashing
Nailing Strip
Angle and Channel Continuous
Pyrofill Slab
Cables
Fill
Sash
Cont Angle
Reinf.
Cables
Angles at various elevations for grading valley
Sawtooth Construction Without Purlins
Angle Outriggers
Nailer
Purlin
Pyrobar Curb Tile
Nail
Cont Zee
Cont Angle
Flashing
Sash
Waterproof Roof Covering
Cont Angle
Pyrobar Curb Tile
Detail of Slab Curb
Purlin
Gravel Stop
Cont Angle
Gravel Stop
Nailer
Cont. Angle
Pyrobar Pre-cast Curb Tile
Monitor Details
Monitor Truss
Peak Rafter
Intermediate Purlin
Cont Angle
Sash
Pyrofill Slab
Typical Monitor Construction

CONSTRUCTION·DETAILS·SHOWING·TYPICAL·DESIGNS·OF·MONOLITHIC·ROOF·CONSTRUCTION


'A'
'A'
See Large Details of Curb and Eave Construction
See Alternate Details 1 and 2
'B'
'B'
Typical Monitor Roof Design
Alternate Detail 1
Masonry Wall Extending to Underside of Roof
Pyrofill
Waterproof Roof Covering
Wood Nailer
Sheetrock
Flashing
Eave Purlin
Sash
For Std Tile
1'-0½"
Continuous Angles
Minimum Distance Between Faces 3⅜"
3" Precast Curb Tile
Waterproof Roof Covering
Angle to Project 1" Above Top Of Finished Slab to Provide Backing For Curb Tile
Purlin
Enlarged Details Showing Curb And Eave Construction
(See Alternate Detail)
Nailing Strip
Pyrofill
Rails at 32½" O.C.
Flashing
Waterproof Roof Covering
Sheetrock
Purlin
3" Curb Tile
End Wall
Inbed Wire Ties Every Other Joint and Tie to Steel Work
Reinforcement Mat
Mortar Joint
Purlin
Truss
Section A-A Thru End Wall of Monitor
Note - This detail used where monitor does not extend full length of building. When monitor does extend full length of building masonry wall may be carried up to monitor roof and end section would appear as shown in section 'B-B'
Waterproof Roof Covering
Reinforcement Mat
Rails at 32½" O.C.
Anchor Bolt
Purlin
Alternate For Section 'B-B'
Pyrofill
Waterproof Roof Covering
Sheetrock
Section 'B-B' At Ends Of Building
Waterproof Roof Covering
Pyrofill
Nailing Strip Bolted to Angle
Sheetrock
Gutter
Eave Purlin
Sash
Alternate Detail 2
(All Steel Construction).

CONSTRUCTION·DETAILS·SHOWING·TYPICAL·DESIGNS·OF·SHEETROCK·PYROFILL·ROOF·CONSTRUCTION

HOLORIB INCORPORATED

Manufacturers of Holorib Roofs

2735 Prospect Avenue
CLEVELAND, OHIO

NEW YORK OFFICE, 101 Park Avenue, Room 516

Product

Holorib, a permanent light weight roof deck self-reinforced by closed triangular ribs. Each rib a complete girder beam. Built in sheets of various lengths to form a continuous surface, especially adapted to the application of insulation and waterproofing.

Holorib Principle

The Holorib Insulated Roof brings an entirely new principle to the industry. The complete unit consists of the following three component parts:

(1) A steel supporting member of Holorib construction fabricated by an exclusively controlled process. A permanent light weight roof deck reinforced by closed triangular ribs, each rib a complete girder beam. Built in sheets of various lengths to form a continuous roof surface especially adapted to the application of insulation and waterproofing. The standard Holorib steel sheets are furnished in Nos. 22, 24 and 26 gauge copper bearing steel, painted, and baked in our ovens. We also roll sheets in lead-treated steel or special processed galvanized metal.

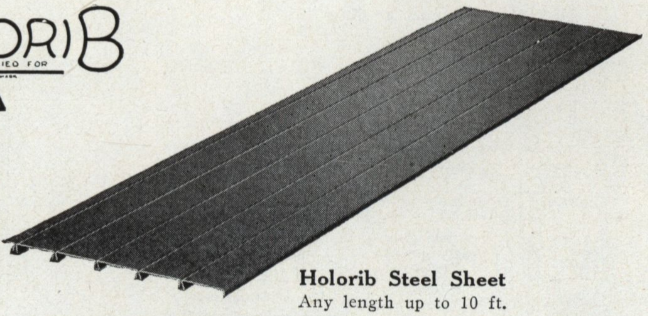
(2) This fire resistive supporting member is insulated with any standard, pressure resisting, insulating material meeting government conductivity tests, the thickness of the insulation varying with the particular conditions to be met.

(3) Over the insulated steel supporting member is applied built-up waterproofing affording outside fire protection such as asbestos, slag or gravel surface construction.

Advantages

The Holorib Insulated Roof is one of the lightest permanent decks in existence, thus allowing for minimum weights of structural members, the deck allowing for ample expansion and contraction so that all danger from cracks in the waterproofing is eliminated.

HOLORIB
PATENT APPLIED FOR
TRADE MARK



Holorib Steel Sheet
Any length up to 10 ft.

The Holorib Insulated Roof provides for the maximum of insulation, thus performing apart from its waterproofing value the most useful function for which a roof is intended.

The Holorib Insulated Roof can be applied with safety at any season of the year, and on any day when it is not actually snowing or raining.

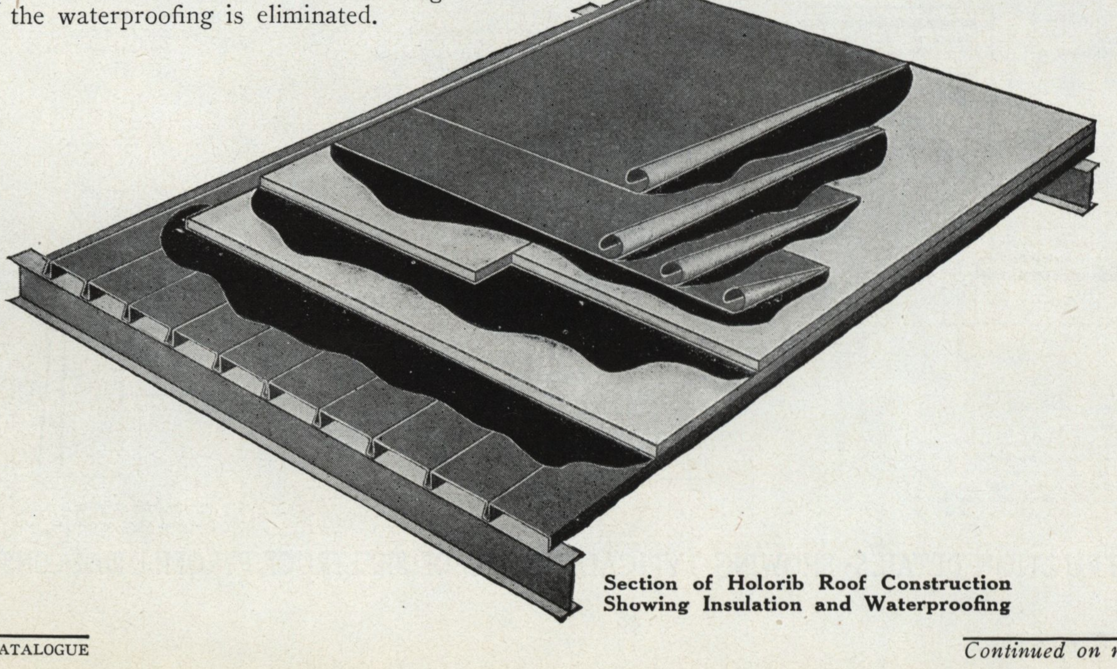
The Holorib Insulated Roof is highly fire resistive from below and also from above when waterproofed with proper materials.

Holorib Insulated Roofs are reasonable in price, and when considered jointly with all the advantages offered are among the cheapest fire resistive roofs on the market.

Holorib Insulated Roofs can be applied with perfect safety over purlins spaced up to and including 4 ft. on centers.

Thermal Conductivity

Roof Construction	Conductance
(1) Holorib steel sheet, composition roofing	.96
(2) Holorib steel sheet, one-ply Celotex, composition roofing	.39
(3) Holorib steel sheet, two-ply Celotex, composition roofing	.24
(4) Holorib steel sheet, three-ply Celotex composition roofing	.18



Section of Holorib Roof Construction Showing Insulation and Waterproofing

Continued on next page

Specification for "Holorib" Complete Roof Decks

Materials—(1) The "Holorib" Sheets shall be manufactured from Nos. 22, 24, or 26 gauge copper bearing steel, black, galvanized, or leadclad, by Holorib Incorporated, 2735 Prospect Avenue, Cleveland, Ohio. The material shall be rolled at the factory and all black sheets shall be given one shop coat of good quality iron oxide paint.

(2) The insulation shall be of the pressure resisting type, approximately 1 in. thick and preferably of half-inch sheets with broken joint construction. It shall have conductivity of not to exceed 8 B.t.u. by the flat plate method, and shall be cemented to the Holorib deck with asphalt having a melting point of not less than 155° F., a penetration at 32° F. of not less than 10, at 77° of not less than 25, and at 115° of not to exceed 100. It shall have ductility at 77° F. of not less than 25 c.m. Dow test.

(3) The waterproofing shall be of standard built-up bituminous type of good quality with a surface finish of either slag, gravel, or asbestos.

Application—The Holorib shall be thoroughly secured to the purlins by specially designed Holorib clips (or nailed to wood joists). Application shall start at the eaves or low point of the roof and shall proceed toward the high point. All sheets shall be properly lapped at the sides and shingled at the butt ends in accordance with standard practice of Holorib Incorporated.

The application of the insulating material shall proceed immediately following the placing of the Holorib. Each sheet shall be embedded solidly in a mopping of asphalt, heated to approximately 375° F. If two plies of insulation are used it shall be applied in broken joint construction.

In case roof deck has a pitch exceeding 3 in. in 12 in., the first ply of insulating material must be secured to the Holorib deck with 1-in. American felt roofing nails, at least six to be used to each sheet of insulating material in addition to the standard mopping of bituminous material.

After the insulating material is in place the surface shall be waterproofed as described above and according to the manufacturer's standard specifications.

Flashings and edgings where necessary shall be put in according to standard practice.

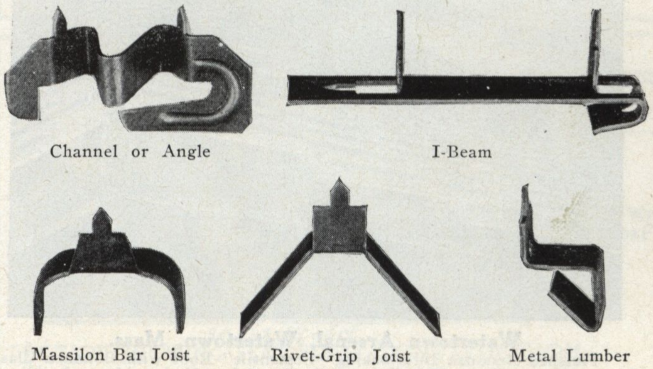
Any saddles necessary to properly carry water to outlets are to be formed with a material satisfactory for this purpose. The saddles to be poured after the insulating material is in place, but prior to application of roofing.

Strength Test

Test on No. 24 gauge Holorib steel sheets 8 ft. long. Two 4 ft. spans covered with two plies ½-in. Celotex and three plies of asphalt saturated roofing felt mopped on with hot asphalt. Metal held to wood purlins with two 8d wire nails per sheet per joist. Load consisting of No. 24 gauge flat steel sheets 8 ft. long, 26 in. wide, weighing approximately 1 lb. per sq. ft. and applied in lots of 10 lb. per sq. ft. Readings taken both sides of samples and in center of both spans. Area of test deck was 32 sq. ft. There was no parting of either the Celotex from the steel or of the waterproofing from the Celotex under the maximum load.

Reading	Lb. per sq. ft.	Total load on deck, lb.	Mean deflection, in.
1	40	1,324	.1475
2	80	2,645	.31
3	120	3,834	.4673
4	160	5,146	.63

After total load was removed the deck returned .5825 in. or to within .1475 in. of starting point.



Channel or Angle

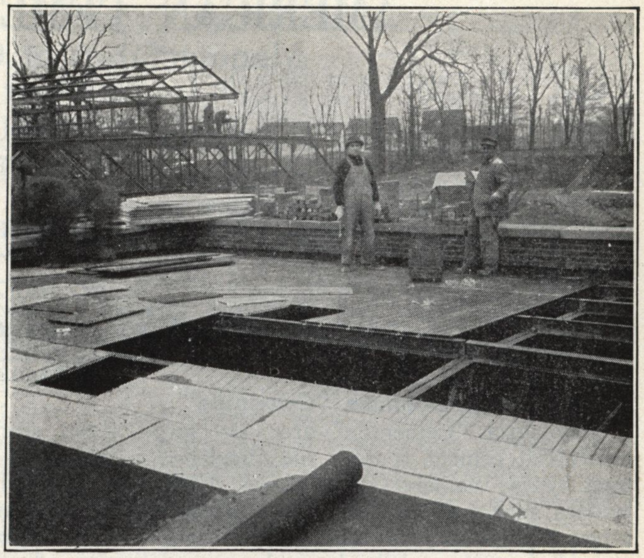
I-Beam

Massilon Bar Joist

Rivet-Grip Joist

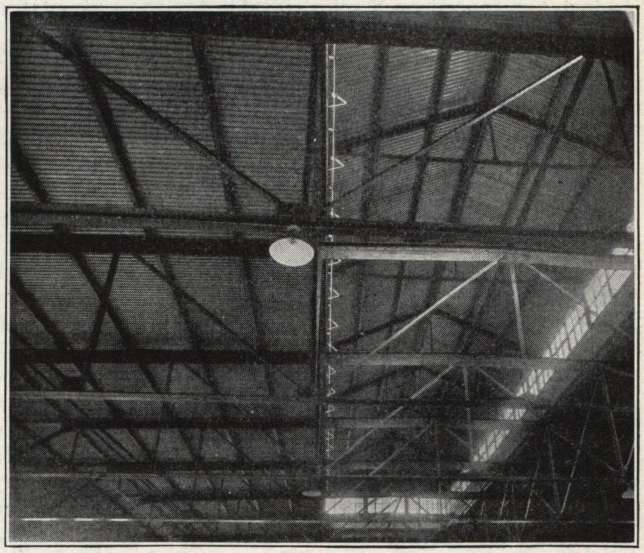
Metal Lumber

Standard Holorib Clips

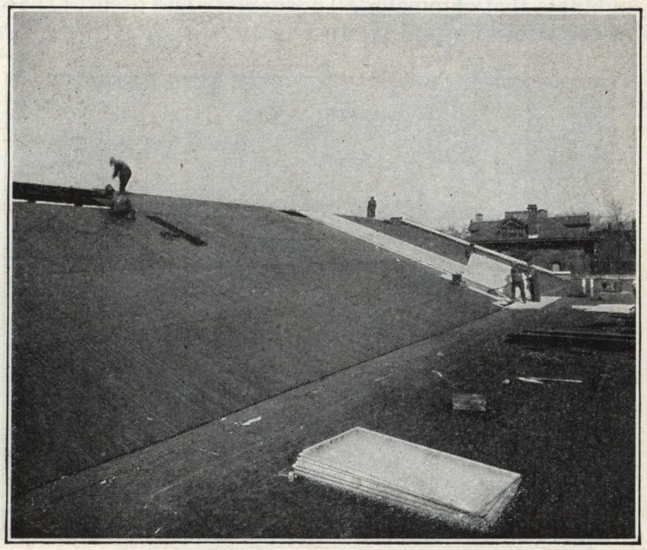


Construction of Holorib Insulated Roof

Note use of clips on I-beams



Underside of Holorib Insulated Roof



Construction of Holorib Insulated Roof

Note the laying of steel sheets, insulating material and roofing felts at the same time

AMERICAN CEMENT TILE MFG. CO.

Manufacturers of Cement Tile Roofing
Oliver Building
PITTSBURGH, PA.

BRANCH OFFICES
NEW YORK, N. Y., 50 Church Street
PHILADELPHIA, PA., 1827 Arch Street
BIRMINGHAM, ALA., 2700 North 23rd Street
ATLANTA, GA., 1007 Candler Building
WORKS: WAMPUM, PA.; LINCOLN, N. J.; BIRMINGHAM, ALA.

BONANZA—
CEMENTILE
TRADE-MARK

Products

Manufacturers of Bonanza "Cementile"—a reinforced cement tile roofing.

Description of Bonanza "Cementile"

Bonanza "Cementile" are very large, light, steel reinforced cement roofing tile furnished in three distinct types; namely, Interlocking, Flat, and Channel, besides such necessary fittings as ridge tile of various types, skylight or glass insert tile, flashing tile, collar tile, etc., all factory made and cured—a specialized product, brought to its highest state of development.

The tile are laid directly on open steel roof purlins (which are spaced on a span suitable for the type of tile selected).

In no case is sheathing or other base support required. This eliminates excessive weight and insures greatest economy in design of the supporting structure.

All in all, Bonanza "Cementile" roofs are roofs of economy and quality, speedily laid, with guaranteed results backed by our established reputation as manufacturing and contracting engineers, over a period exceeding 23 years.

Bonanza Interlocking "Cementile" are designed for pitched roofs. Laid directly on purlins spaced approximately 4 ft. apart, they are fireproof and waterproof, the finished surface having a particularly pleasing red Spanish tile effect. Like Bonanza Flat "Cementile" and Bonanza Channel "Cementile" they are very strong and light.

Bonanza Flat and Bonanza Channel "Cementile" are designed for flat roof construction, or for pitched roofs where it is desired to waterproof with composition covering. These tile are laid directly on purlins; the 1½-in. Bonanza Flat "Cementile" for spans approximately 5 ft., and the Bonanza Channel "Cementile" for the longer spans, are a combination of tremendous strength and lightness that eliminates all form work and assures speed in erection with positive results.

Advantages of Bonanza "Cementile"

Economy—Being laid directly on the roof purlins, the absence of roof boarding, nailing strips and other forms of fastenings makes the initial cost reasonable. Maintenance charges are eliminated, thus making the first cost usually the last.

Weight—These tile are designed along economical lines, reducing the dead load on the steel structure to a minimum.

Strength—In conformity with the standard purlin spacing, Bonanza "Cementile" roofs will sustain such roof loads as are usually encountered. Breaking load tests made at Columbia University for the New York Building Department, showed as high as 350 lb. per sq. ft. under a uniformly distributed load on the standard spacing.

Adaptability—Bonanza "Cementile" will be found suitable for any type of roof construction and of any size.

Erection—An experienced and capable field force insures absolute satisfaction. "Cementile" roofs can be laid regardless of temperature or climatic conditions, thus eliminating delays.

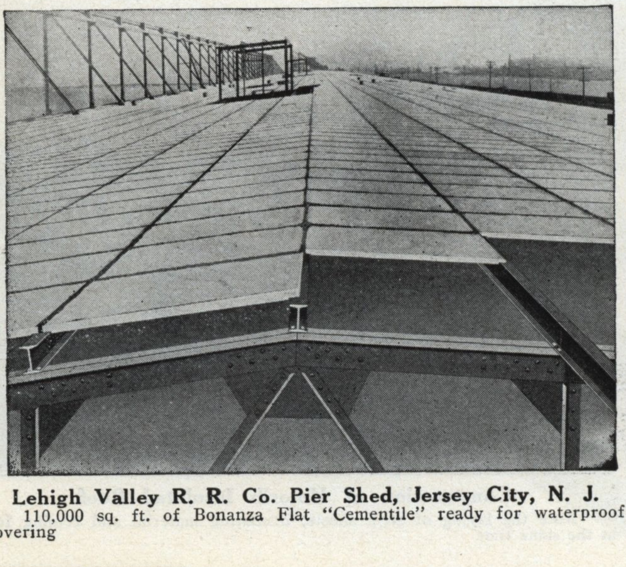
Weatherproof and Fireproof—Bonanza "Cementile" are impervious to water and the elements, are proof against fire, and are everlasting under ordinary conditions.

Interlocking "Cementile"

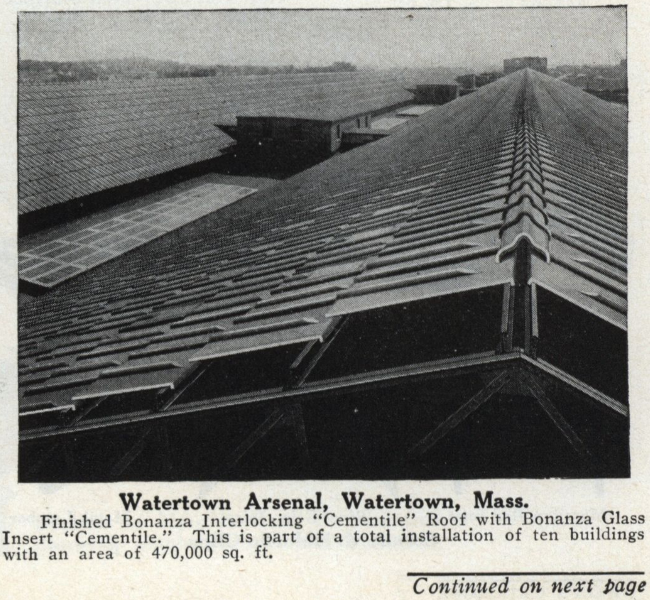
Designed for pitched roofs, forming in itself a finished, watertight and fireproof covering.

Standard tile is 26 in. wide by 52 in. long (24x48 in. exposed surface) and 1 in. thick, properly reinforced with a galvanized steel fabric. It develops an ultimate breaking load capacity of 350 lb. per sq. ft.

The tile are made up as single units with no loose connections. The side "roll" of one tile overlaps the "rabbet" of the adjacent tile. All joints are properly sealed with "Lastik" Cement. A 4-in. lap is provided on



Lehigh Valley R. R. Co. Pier Shed, Jersey City, N. J.
110,000 sq. ft. of Bonanza Flat "Cementile" ready for waterproof covering



Watertown Arsenal, Watertown, Mass.
Finished Bonanza Interlocking "Cementile" Roof with Bonanza Glass Insert "Cementile." This is part of a total installation of ten buildings with an area of 470,000 sq. ft.

Continued on next page

each row of tile by the row above, which is staggered. The tile are hooked in place on purlin flanges by means of a continuous 1-in. offset at top of each tile. The Bonanza Wire Glass Insert Interlocking "Cementile," which interchange with the standard tile, provide any lighting effect demanded.

Guaranteed to carry a uniformly distributed load of 250 lb. per sq. ft. over a 4-ft. span.

DIMENSIONS AND WEIGHTS OF INTERLOCKING "CEMENTILE"

Size of tile	26x52 in.
Thickness of tile	1 in.
Surface exposed	24x48 in.
Weight per sq. ft.	14 lb.
Weight per sq. ft. of finished roofing	16 lb.
Number of tile per square of roof (100 sq. ft.)	12½

Roof Design—Minimum pitch desirable for slope of roof is 1/6, which is 4 in. to 1 ft.

In order to arrive at the proper purlin spacing always start at the eaves; then use standard spacing of 3 ft. 10 in. to 4 ft. ½ in., as conditions call for. Any short spacing should be placed at the ridge; should this spacing be less than 1 ft. 4 in., special 60-in. tile should be used at the eaves. Steel channel purlins should be provided, held in alignment by sag rods.

Flat "Cementile"

Designed for both flat and pitched roofs; the application of a standard composition roofing is required to make roof watertight.

Standard Bonanza Flat "Cementile" are 1½ in. thick, 24 in. wide and 60 in. long. Standard purlin spacing is 5 ft.; where necessary, special tile are provided for spacing over or under 60 in.

Ends have an offset which is laid on flange of I-beam purlins, after which joints are properly pointed, preparatory to application of composition roofing. Bonanza Flat "Cementile" are properly reinforced.

Guaranteed to carry a uniformly distributed load of 200 lb. per sq. ft. over a span of 5 ft.

DIMENSIONS AND WEIGHTS OF FLAT "CEMENTILE"

Thickness of tile	1½ in.
Size of standard tile	24x60 in.
Surface exposed	24x60 in.
Weight per sq. ft.	17 lb.
Weight per square of roof	1700 lb.

Channel "Cementile"

Designed to meet the demands of the present tendency to use extra wide spans in flat roof construction. Also used extensively on sawtooth roofs.

Standard Bonanza Channel "Cementile" is 18 in. wide and 96 in. long; channels are 1⅝ in. thick at flanges and 1 in. thick at web. Special tile are furnished for spans over or under 96 in.

Ends are laid directly on flange of I-beam purlins, joints are then properly pointed and entire roof deck covered with some form of composition roofing. Bonanza Channel "Cementile" are properly reinforced.

DIMENSIONS AND WEIGHTS OF CHANNEL "CEMENTILE"

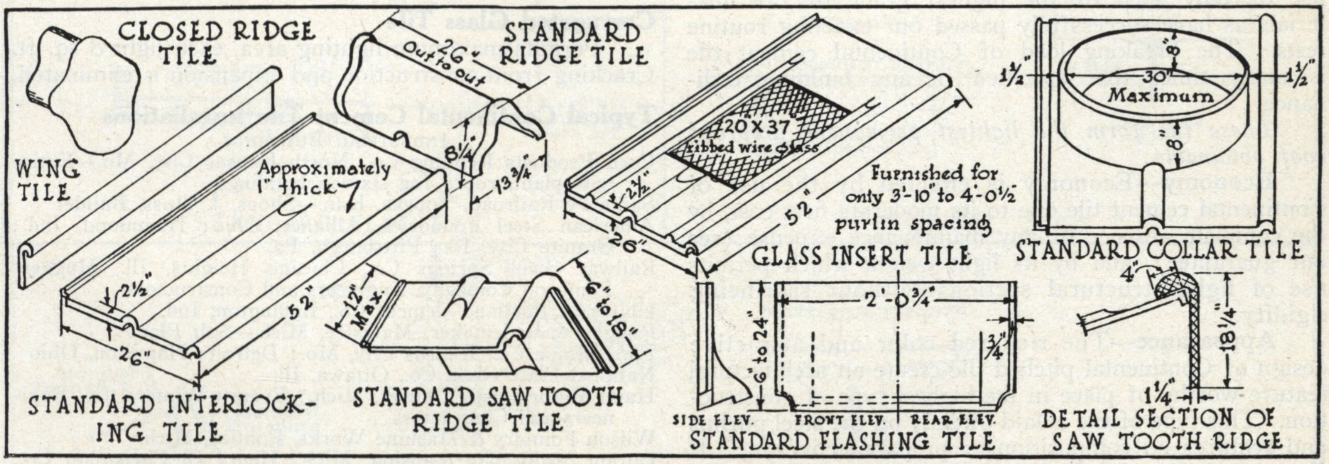
Depth of tile	3½ in.
Thickness of tile	Flanges 1⅝ in., web 1 in.
Size of standard tile	18x96 in.
Surface exposed	18x96 in.
Weight per sq. ft.	20 lb.
Weight per square of roof	2000 lb.

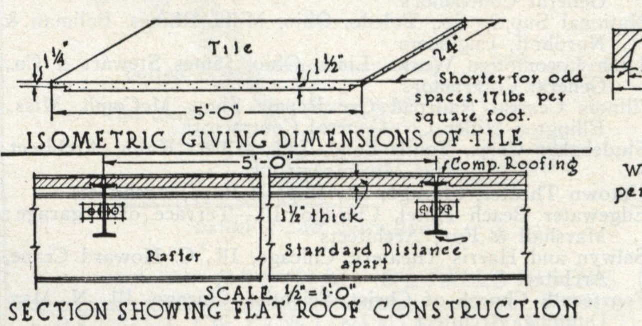
Service

Our engineering department renders free service to owners, engineers, architects and contractors whenever desired. Send your problems and preliminary plans during the early stages of the work. Our experience of 23 years allows us to offer suggestions as to the most economical purlin layout. Upon receipt of preliminary or finished drawings, either approximate or definite proposals will be furnished, as may be desired.

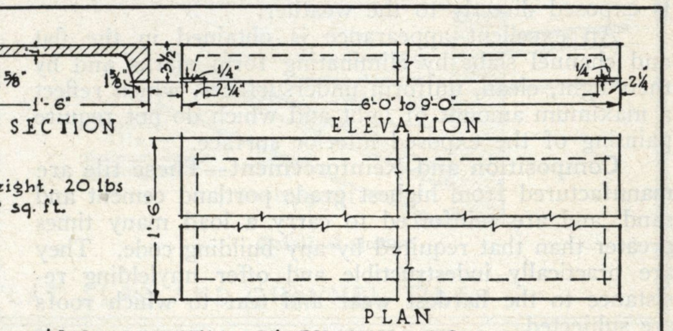
Bonanza "Cementile" roofs are erected preferably by experienced and efficient crews maintained by the company.

All materials and workmanship fully guaranteed.


CLOSED RIDGE TILE
STANDARD RIDGE TILE
26" Out to out
8¼"
13¾"
WING TILE
Approximately 1" thick
2½"
26"
52"
STANDARD INTERLOCKING TILE
12" Max.
6" to 18"
STANDARD SAW TOOTH RIDGE TILE
20"X37" ribbed wire glass
2½"
26"
52"
Furnished for only 3'-10" to 4'-0½" purlin spacing
GLASS INSERT TILE
1½"
30" Maximum
8"
8"
1½"
STANDARD COLLAR TILE
2'-0¾"
6" to 24"
¾"
SIDE ELEV.
FRONT ELEV.
REAR ELEV.
STANDARD FLASHING TILE
4"
18¼"
1¼"
DETAIL SECTION OF SAW TOOTH RIDGE


Tile
1¼"
1½"
24"
Shorter for odd spaces. 17 lbs per square foot.
5'-0"
ISOMETRIC GIVING DIMENSIONS OF TILE
5'-0"
Comp. Roofing
1½" thick
Rafter
Standard Distance apart
SCALE ½"=1'-0"

SECTION SHOWING FLAT ROOF CONSTRUCTION


Weight, 20 lbs per sq. ft.
1⅝"
1⅝"
3½"
1'-6"
SECTION
¼"
2¼"
6'-0" to 9'-0"
¼"
2¼
ELEVATION
1'-6"
PLAN

3/4" SCALE DETAIL OF CHANNEL TILE.

CONTINENTAL CEMENT TILE COMPANY

Manufacturers of Reinforced, Pre-cast Cement Tile Roofing

TELEPHONE
HARRISON 9644, 9645

310 South Michigan Boulevard
CHICAGO, ILL.
BRANCH OFFICES IN PRINCIPAL CITIES

WORKS
BLUE ISLAND, ILL.

Product

Manufacturers of CONTINENTAL PRE-CAST REINFORCED CEMENT TILE ROOFING: STANDARD PITCHED TILE; FLAT SLABS; CHANNEL SLABS and TRIMMINGS; CORRUGATED GLASS TILE.

Services

The CONTINENTAL CEMENT TILE COMPANY *manufactures* and *erects* cement tile roofs for all types of industrial buildings, theaters, auditoriums, schools, railroad terminals, etc. This Company maintains a corps of competent engineers, whose services are, without obligation, at the disposal of engineers and architects. It will, upon receipt of blue prints and specifications, prepare approximate estimates or definite proposals for furnishing and erecting Continental cement tile roofs.

Give all possible information when requesting estimates.

Plant

The plant of the CONTINENTAL CEMENT TILE COMPANY is fully equipped with the most modern machinery for the production of a uniformly high grade product.

Continental Cement Tile

Endurance—Endurance is assured by our production of slabs of great strength and density by skilled workmen under rigid supervision, and by the use of only such of the highest grade of raw materials as have successfully passed our exacting routine tests. The breaking load of Continental cement tile is many times that specified in any building ordinance.

These tile form the lightest permanent fireproof roof obtainable.

Economy—Economy is effected by the use of Continental cement tile due to its moderate first cost, by the complete absence of any maintenance expense (see our guarantee), and by its light weight which permits use of light structural sections without sacrificing rigidity.

Appearance—The rich red color and attractive design of Continental pitched tile create an architectural feature worthy of place in the highest type of construction. This type of tile is laid directly on the steel purlins and requires no composition or prepared covering. It is exposed directly to the weather.

An excellent appearance is obtained in the flat and channel slabs by eliminating form marks and by their light, clean, uniform undersurfaces, which reflect a maximum amount of light and which do not require painting of the exposed interior surface.

Composition and Reinforcement—These tile are manufactured from highest grade portland cement and sand, and are reinforced to carry a load many times greater than that required by any building code. They are practically indestructible and offer unyielding resistance to the hardest wear and tear to which roofs are subjected.

PERMANENT
CONTINENTAL ROOF TILE
TRADE-MARK

Continental Flat Tile Slabs

For roofs of slight pitch, flat slabs are laid directly on steel purlins, expansion joints taking care of contraction and expansion. Five-foot centering is the standard purlin spacing. Standard size is 5x2 ft. x 1⅝ in. and weighs 18 lb. per sq. ft. These tile are made in lengths from 5 to 6 ft.

Continental Pitched Tile

Continental cement tile for pitched roofs do away with the necessity of applying any composition or prepared covering as they lie directly exposed to the weather and form a roof of excellent appearance on the exterior and interior. The outer color is a permanent rich red.

The standard purlin spacing required is 4 ft. on centers. Each tile is 52x23⅞ in. The tile interlock, are self-adjusting and require no sheathing or fastening. All joints are hermetically sealed with elastic cement. Special lengths are furnished where odd spacings are unavoidable. Ridge coping and finishing tile for gable ends are also made.

Continental Channel Slab

Where long spans are required between purlins, channel slabs are recommended. Purlins may often be dispensed with, the slabs being laid directly on the trusses or rafters spaced 6 to 10 ft. on centers.

These slabs are made in lengths ranging from 6 to 10 ft. x 18 in. wide, and weigh 21 lb. per sq. ft. Standard stock lengths are 8 and 10 ft.

Corrugated Glass Tile

Permits maximum lighting area, each light 8 sq. ft. Cracking from construction and expansion is eliminated.

Typical Continental Cement Tile Installations

INDUSTRIAL BUILDINGS

Corn Products Refining Co., North Kansas City, Mo.—Entire new plant, roofs for sixteen buildings
Santa Fe Railroad, Topeka, Kan.—Shops, J. Moss, Builder
American Steel Foundries, Alliance, Ohio; Hammond, Ind.; Granite City, Ill.; Pittsburgh, Pa.
Railway Steel Springs Co., Chicago Heights, Ill., Hughes-Foulkrod Company, Engineers and Constructors
Universal Portland Cement Co., Buffington, Ind.
Ruggles & Rademaker, Manistee, Mich.—Salt Plant
Ford Motor Co., Kansas City, Mo.; Detroit; Hamilton, Ohio
National Plate Glass Co., Ottawa, Ill.
Hupp Motor Corp., Detroit, Mich.; Everett-Winters Co., Engineers and Contractors
Wilson Foundry & Machine Works, Pontiac, Mich.
Durant Motor Co., Lansing, Mich., Henry G. Christman Co., General Contractors
National Supply Co., Toledo, Ohio, Mills, Rhines, Bellman & Nordhoff, Engineers
Lima Locomotive Works, Lima, Ohio, James Stewart & Co., General Contractors
Illinois Central Railroad Car Repair Shop, McComb, Miss., Ellington-Miller Co., General Contractors
Studebaker Corp., South Bend, Ind., Albert Kahn, Architect

MISCELLANEOUS

Uptown Theater, Chicago, Ill., Rapp & Rapp, Architects
Edgewater Beach Hotel, Chicago, Ill.—Terrace over garage; Marshall & Fox, Architects
Selwyn and Harris Theaters, Chicago, Ill., C. Howard Crane, Architect
Fourteenth Church of Christ, Scientist, Chicago, Ill., N. Max Dunning, Architect

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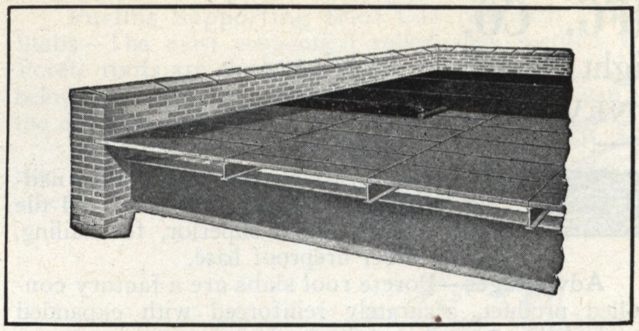
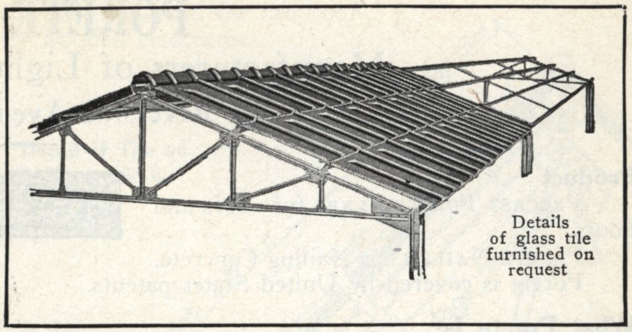
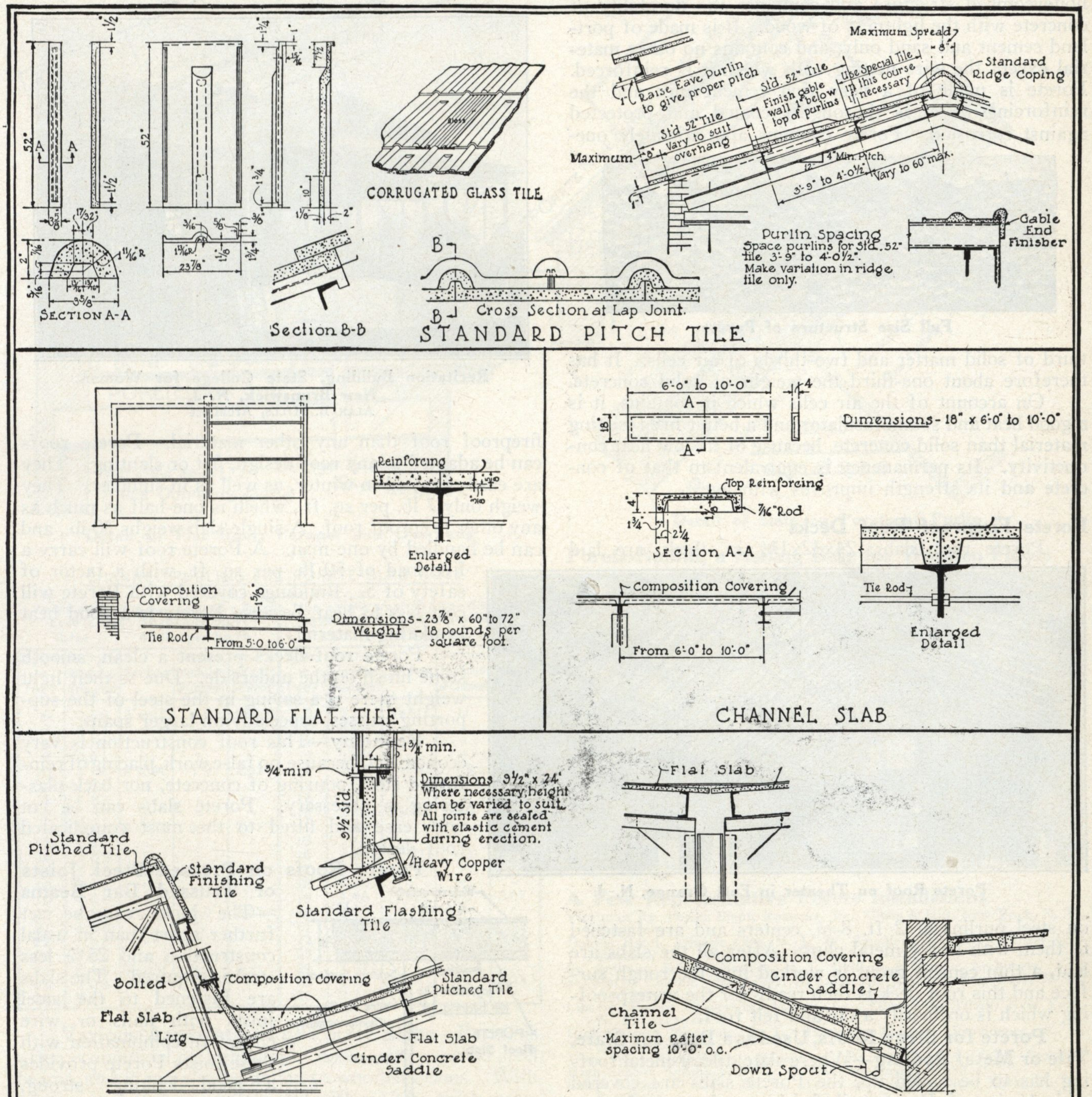


FIG. 1. CONTINENTAL FLAT SLAB LAID DIRECTLY ON STEEL PURLINS



Details of glass tile furnished on request

FIG. 2. STANDARD PITCHED TILE CONSTRUCTION, REQUIRES NO COVERING



SECTION A-A
Section B-B
CORRUGATED GLASS TILE
Cross Section at Lap Joint
STANDARD PITCH TILE
Maximum Spread
Standard Ridge Coping
Raise Eave Purlin to give proper pitch
Std. 52" Tile
Finish gable wall 1" below top of purlins
Use Special Tile in this course if necessary
Std 52" Tile
Vary to suit overhang
Maximum
4" Min. Pitch
Vary to 60" max.
3'-9" to 4'-0½"
Purlin Spacing
Space purlins for Std. 52" tile 3'-9" to 4'-0½". Make variation in ridge tile only.
Gable End Finisher
Reinforcing
Enlarged Detail
Composition Covering
Tie Rod
From 5'-0 to 6'-0
Dimensions - 23⅞" x 60" to 72"
Weight - 18 pounds per square foot.
STANDARD FLAT TILE
6'-0" to 10'-0"
Dimensions - 18" x 6'-0" to 10'-0"
Top Reinforcing
7/16" Rod
Section A-A
Composition Covering
Tie Rod
Enlarged Detail
From 6'-0" to 10'-0"
CHANNEL SLAB
1¾" min.
¾" min
Dimensions 9½" x 24"
Where necessary, height can be varied to suit. All joints are sealed with elastic cement during erection.
9½" Std.
Heavy Copper Wire
Standard Pitched Tile
Standard Finishing Tile
Standard Flashing Tile
Bolted
Composition Covering
Standard Pitched Tile
Flat Slab
Lug
Flat Slab
Cinder Concrete Saddle
Detail of Saw Tooth Roof
Flat Slab
Composition Covering
Cinder Concrete Saddle
Channel Tile
Maximum Rafter spacing 10'-0" o.c.
Down Spout
Detail at Gutter
SPECIAL DETAILS USING FLAT SLAB AND CHANNEL TILE

• DETAILS OF CONTINENTAL CEMENT TILE AND METHODS OF CONSTRUCTION •

PORETE MFG. CO.

Manufacturers of Lightweight Concrete Products

346 Riverside Avenue, NEWARK, N. J.

Product

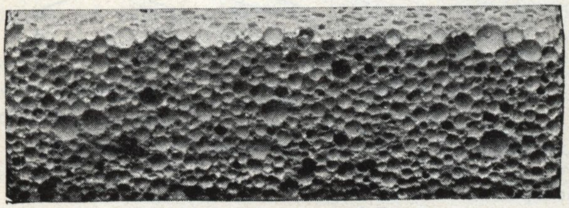
Precast Porete Slabs for roofs and floors.

Porete-Nailfill, a Nailing Concrete.

Porete is covered by United States patents.

What Porete Is

Porete is portland cement concrete of uniformly honeycombed structure and combines the durability of concrete with the lightness of wood. It is made of portland cement and sand only, and contains no other material except the wire netting with which it is reinforced. Porete is made of a very rich cement mix and the reinforcing metal is thoroughly coated and protected against corrosion. Porete contains approximately one-third of solid matter and two-thirds of air cells. It has therefore about one-third the weight of solid concrete.



Full Size Structure of Porete

On account of the air cells which it contains, it is a good heat and sound insulator and a better fire resisting material than solid concrete, because of its low heat conductivity. Its permanency is equivalent to that of concrete and its strength improves with age.

Porete Fireproof Roof Decks

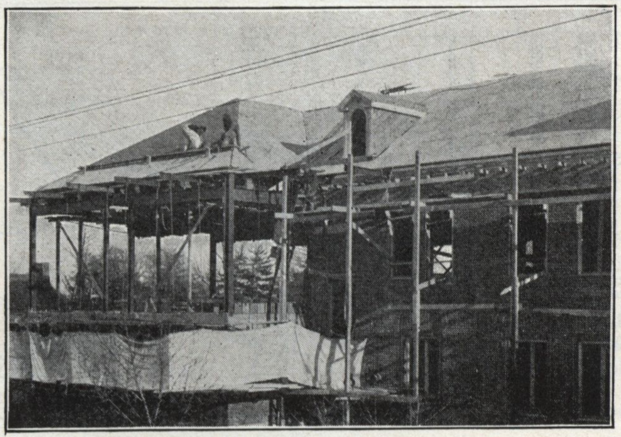
Porete roof slabs, 24x32x1¼ in. thick, are laid on steel purlins at 2 ft. 8-in. centers and are fastened to them with heavy metal clips. After all the slabs are laid, a thin cement grout is worked into the rough surface and this roof deck is then ready for the waterproofing which is ordinarily a tar and felt roof.

Porete Roof on Theater in East Orange, N. J.

Porete for Steep Roofs, Used as a Base for Slate, Tile or Metal Roofing—Where slate, tile or metal roofing has to be nailed up, the Porete slabs are covered with ½ in. of Porete-nail finish, a mixture of portland cement and sand with a fibrous fireproof mineral material, that forms a tough resilient sheet which becomes integral with the Porete, greatly adding to its initial strength.

This finish provides an excellent nailing base which experienced slate and tile roofers have found superior, for nailing, to any other fireproof base.

Advantages—Porete roof slabs are a factory controlled product, accurately reinforced with expanded metal of the proper size. In combination with a cement finish which is applied in the field, they make a lighter fireproof roof than any other material. Porete roofs can be adapted to any roof design, flat or slanting. They are easily erected in winter, as well as in summer. They weigh only 7 lb. per sq. ft., which is one-half as much as any other fireproof roof. A single slab weighs 30 lb., and can be handled by one man. A Porete roof will carry a live load of 50 lb. per sq. ft. with a factor of safety of 5. Buildings covered with Porete will cost less to heat, because Porete is a good heat insulating material.

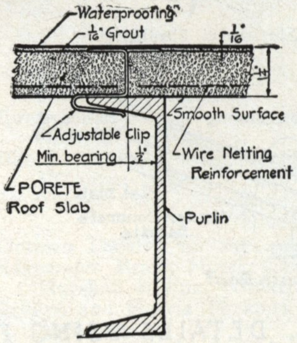


Recitation Building, State College for Women, New Brunswick, N. J.
Alan B. Mills, Architect

Porete roof decks present a clean, smooth stone finish on the underside. Due to their light weight there is a saving in the steel of the supporting trusses, especially on larger spans.

Economy—This roof construction is very economical, because no false work, placing of reinforced steel, pouring of concrete, nor back-plastering is necessary. Porete slabs can be cut with ease and fitted to the most complicated roof design.

Porete Roofs on Pressed Steel Joists or Trussed Bar Beams—The joists can be set further apart than in usual construction and 25% less steel is required. The slabs are fastened to the steel joists with nails or wire clips. In combination with these joists Porete provides a good looking, strong, durable, lightweight, fireproof concrete roof in which the reinforcing metal is well protected from rusting.

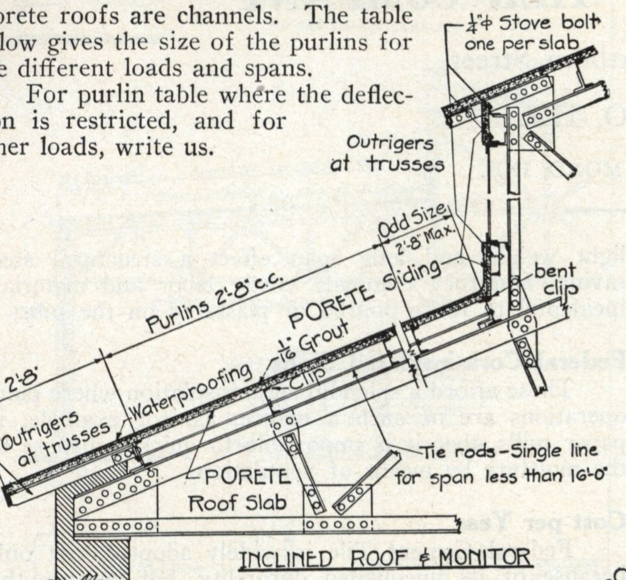


Detail of Porete Slab Roof at Purlin

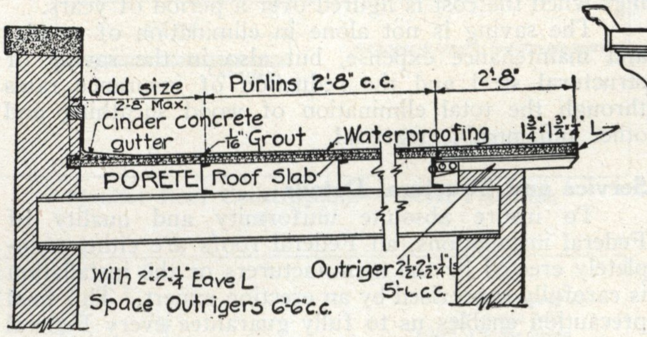
Continued on next page

Purlins Supporting Roof Covered with Porete Slabs—The most economical rolled steel sections for Porete roofs are channels. The table below gives the size of the purlins for the different loads and spans.

For purlin table where the deflection is restricted, and for other loads, write us.


1/4" Stove bolt one per slab
Outrigers at trusses
Odd Size 2'-8" Max.
bent clip
Purlins 2'-8" c.c.
PORETE Siding
1/16" Grout
Clip
2'-8"
Waterproofing
Outrigers at trusses
Tie rods-Single line for span less than 16'-0"
PORETE Roof Slab
INCLINED ROOF & MONITOR

Detail of Porete on Inclined Roof and Monitor


Odd size 2'-8" Max.
Purlins 2'-8" c.c.
2'-8"
Cinder concrete gutter
1/16" Grout
Waterproofing
1 3/4"×1 3/4"×1/4" L
PORETE Roof Slab
With 2-2-1/4" Eave L
Space Outrigers 6'-6" c.c.
Outriger 2 1/2×2 1/2×1/4 L 5'-l c.c.

Detail of Flat Roof; Parapet and Overhang

CHANNEL PURLINS FOR PORETE-SLAB ROOF

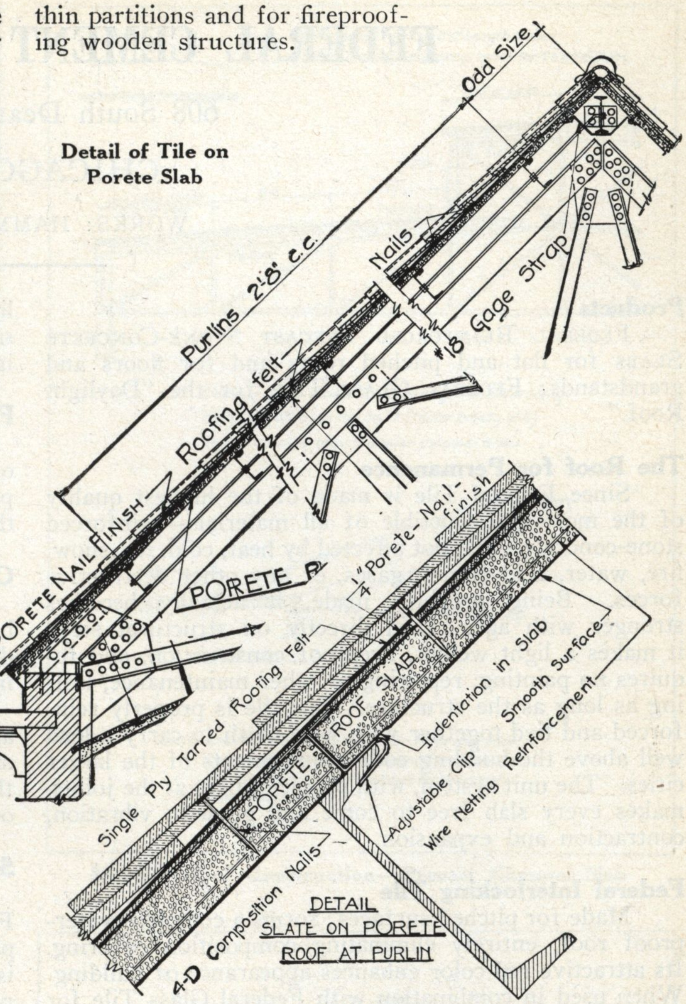
Purlins Spaced 2'-8" c.c.

Weight per Sq Ft of Purlins 3 lbs + Porete 7 lbs + Waterproofing 5 lbs. = 15 lbs. Total

Live Load 30 lbs per Sq. Ft. Total 45 lbs. per Sq. Ft					Live Load 40 lbs. per Sq. Ft. Total 55 lbs. per Sq. Ft.				
Span in Feet	Section Modulus Required	Section	Section Modulus of Channel	Wt. of [per sq. Ft. of Roof	Span in Feet	Section Modulus Required	Section	Section Modulus of Channel	Wt. of [per. sq. Ft. of Roof
6	0.40	3"×4.1[	1.1	1.54 lbs	6	0.49	3"×4.1[	1.1	1.54 lbs
7	0.55	"	"	"	7	0.68	"	"	"
8	0.72	"	"	"	8	0.88	"	"	"
9	0.91	"	"	"	9	1.11	"	"	"
10	1.12	4"×5.4[	1.9	2.02"	10	1.38	4"×5.4[	1.9	2.02"
11	1.36	"	"	"	11	1.66	"	"	"
12	1.62	"	"	"	12	1.98	"	"	"
13	1.90	"	"	"	13	2.32	5"×6.7[	3.0	2.51"
14	2.20	5"×6.7[	3.0	2.51"	14	2.69	"	"	"
15	2.53	"	"	"	15	3.10	"	"	"
16	2.88	"	"	"	16	3.52	6"×8.2[	4.3	3.07"
17	3.25	6"×8.2[	4.3	3.07"	17	3.97	"	"	"
18	3.64	"	"	"	18	4.46	"	"	"
19	4.06	"	"	"	19	4.96	7"×9.8[	6.0	3.67"
20	4.50	7"×9.8[	6.0	3.67"	20	5.50	"	"	"
21	4.96	"	"	"	21	6.06	"	"	"
22	5.45	"	"	"	22	6.65	8"×11.5[	8.1	4.31"
23	5.95	"	"	"	23	7.27	"	"	"
24	6.48	8"×11.5[	8.1	4.31"	24	7.92	"	"	"
25	7.03	"	"	"	25	8.59	9"×13.4[	10.5	5.02"
26	7.61	"	"	"	26	9.30	"	"	"

Various Applications of Porete Slabs—Porete is often economical on lightweight floors with exposed steel beams, and it can also be nailed to wooden beams. With purlins on 2 ft. 8-in. centers and with a ½-in. thick wearing coat, these floors are good for 100 lb. live load per sq. ft.

Porete is used also as a base for stucco or frame dwellings, for furring brick and concrete walls, for thin partitions and for fireproofing wooden structures.


Odd Size
Nails
Purlins 2'-8" c.c.
#18 Gage Strap
Roofing felt
PORETE NAIL FINISH
3" PORETE
PORETE
4" Porete-Nail-Finish
Tarred Roofing Felt
Single Ply
PORETE ROOF SLAB
Indentation in Slab
Smooth Surface
Adjustable Clip
Wire Netting Reinforcement
4-D Composition Nails
DETAIL SLATE ON PORETE ROOF AT PURLIN

Detail of Tile on Porete Slab

Detail of Slate on Porete at Purlin

Porete-Nailfill, a Nailing Base for Wooden Floors

Porete-Nailfill is an approved mineral compound to be mixed with portland cement and sand. This forms a fireproof, verminproof, permanent base in which nails will hold, so that the wooden flooring can be nailed up to it. It eliminates wooden sleepers and cinder fill. This material is sold in bags to be mixed and applied on the job.

Co-operative Service

Our Engineering and Estimating Departments are at the service of engineers and architects. It is advisable to consult us when laying out the roof steel and we will be glad to co-operate and give price estimates for the roof erected. We have an experienced force which is ready to lay roofs anywhere in the United States.

A Few Representative Porete Installations

Virginian Ry. Power Plant, Roanoke, Va., Gibbs & Hill, New York, N. Y., Engineers
Dennis Hotel, Atlantic City, N. J., W. Smedley, Architect; Turner Construction Co., Philadelphia, Pa., Builders
St. Antonius School, Newark, N. J., Guilbert & Betelle, Architects
St. Mary's Church, Jersey City, N. J., Robert J. Reilly, New York, N. Y., Architect
Library, Emory University, Atlanta, Ga., Edward L. Tilton, New York, N. Y., Architect
High School, Warwick, R. I., Harry A. Slocomb, Providence, R. I., Architect
Wm. Penn High School, Harrisburg, Pa., C. Howard Lloyd, Architect
High School, Salisbury, N. C., G. Gadsden Sayre, Architect
Pump Station, Fulton, N. Y., Hazen & Whipple, New York, N. Y., Engineers
Radio Corp. of America, Bound Brook, N. J., Clinton B. MacKenzie, New York, N. Y., Architect
Alexander Hamilton Hotel, Paterson, N. J., F. W. Wentworth, Architect
Powerplants in Atlantic City, N. J., Scranton, Pa., Rockford, Ill., etc., American Gas & Electric Co., 50 Church Street, New York, N. Y., Engineers
State Hospital Buildings, Alan B. Mills, Architect

FEDERAL CEMENT TILE COMPANY

608 South Dearborn Street
CHICAGO, ILL.

WORKS: HAMMOND, IND.

Products

Federal Reinforced Precast Stone-Concrete Slabs for flat and pitched roofs and for floors and grandstands; Federal Glass Tile for the "Daylight Roof."

The Roof for Permanence

Since Federal Tile is made of the highest quality of the most indestructible of all materials—reinforced stone-concrete—it is not affected by heat, cold, ice, snow, fire, water, acid fumes, gases, or any other destructive forces. Being properly made, it actually becomes stronger with age. Laid directly on structural steel, it makes a light weight, fireproof construction, and requires no painting, repairing or other maintenance, lasting as long as the structure. The tile is properly reinforced and tied together with wire mesh to carry a load well above the building code requirements of the larger cities. The unit system, with plastic cement at the joints, makes every slab free to come and go with vibration, contraction and expansion.

Federal Interlocking Tile

Made for pitched surfaces; forms a complete waterproof roof, entirely eliminating composition covering. Its attractive red color enhances appearance of building. When used in combination with Federal Glass Tile for top lighting, an ideal "daylight roof" is obtained. These glass tile interlock with the remainder of the slabs forming the roof, and can be so distributed as to admit light over the entire floor space or concentrated on any technical or exacting operation.

Federal Flat Slabs and Channel Slabs

Designed for flat and pitched roofs. These types require some form of composition covering. Their light weight and long span effect a structural steel saving, and they eliminate costly labor and materials incidental to roofs poured or plastered on the job.

Federal Cork-insulated Slabs

These afford a splendid superinsulation where plant operations are of such a nature, as, for example, in paper mills, that it is impossible to quickly dispose of the moisture by means of ventilation.

Cost per Year

Federal Cement Tile is widely adopted, not only because of its unequalled durability, but because this durability makes it the most economical of all roof coverings when the cost is figured over a period of years.

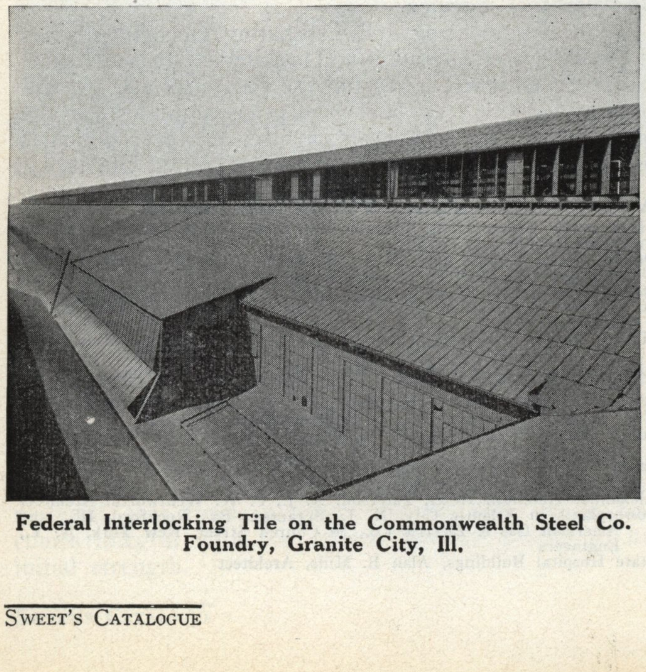
The saving is not alone in elimination of repairs and maintenance expense, but also in the saving of structural steel and the reduction of insurance rates through the total elimination of wood sheathing and other inflammable material.

Service and Structural Details

To insure absolute uniformity and quality of Federal installations, all Federal roofs are either completely erected by the manufacturers or the installation is carefully supervised by an erection expert. This final precaution enables us to fully guarantee every Federal roof.

Federal engineers are structural experts and will assist architects and engineers in laying out steel work to carry Federal Tile, making no charge for this service. Interesting details of roof construction are shown on the next page.

Note: The Federal Blue Print Book, "Roof Standards," covering roof construction in complete detail, will be mailed on request.

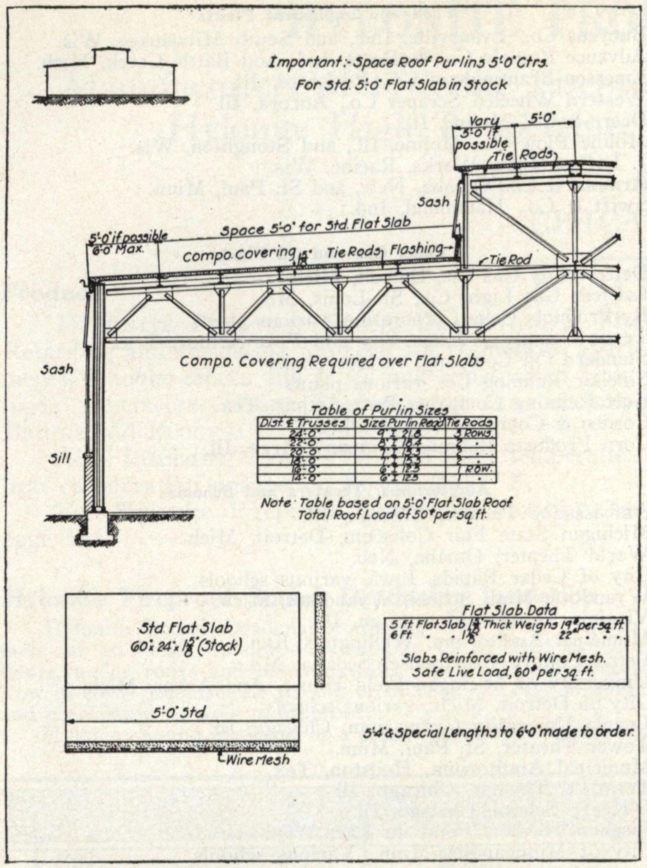


Federal Interlocking Tile on the Commonwealth Steel Co. Foundry, Granite City, Ill.

Federal Cement Tile on the Michigan State Fair Coliseum, Detroit, Mich.

Federal Red Interlocking Tile and Glass Tile form "The Daylight Roof"

Continued on next page


Vary
5'-0" if possible
5'-0"
Tie Rods
Sash
Space 5'-0" for Std. Flat Slab
5'-0" if possible
6'-0" Max.
Compo. Covering
Tie Rods
Flashing
Tie Rod
Sash
Sill
Std. Flat Slab
60" x 24" x 1⅝" (Stock)
5'-0" Std
Wire Mesh

Important:- Space Roof Purlins 5'-0" Ctrs. For Std. 5'-0" Flat Slab in Stock

Compo. Covering Required over Flat Slabs

Table of Purlin Sizes

Dist. ℄ Trusses	Size Purlin Req'd	Tie Rods
24'-0"	9" I 21.8	3 Rows.
22'-0"	8" I 18.4	2 "
20'-0"	7" I 15.3	2 "
18'-0"	7" I 15.3	2 "
16'-0"	6" I 12.5	1 Row.
14'-0"	6" I 12.5	1 "

Note: Table based on 5'-0" Flat Slab Roof
Total Roof Load of 50# per sq. ft.

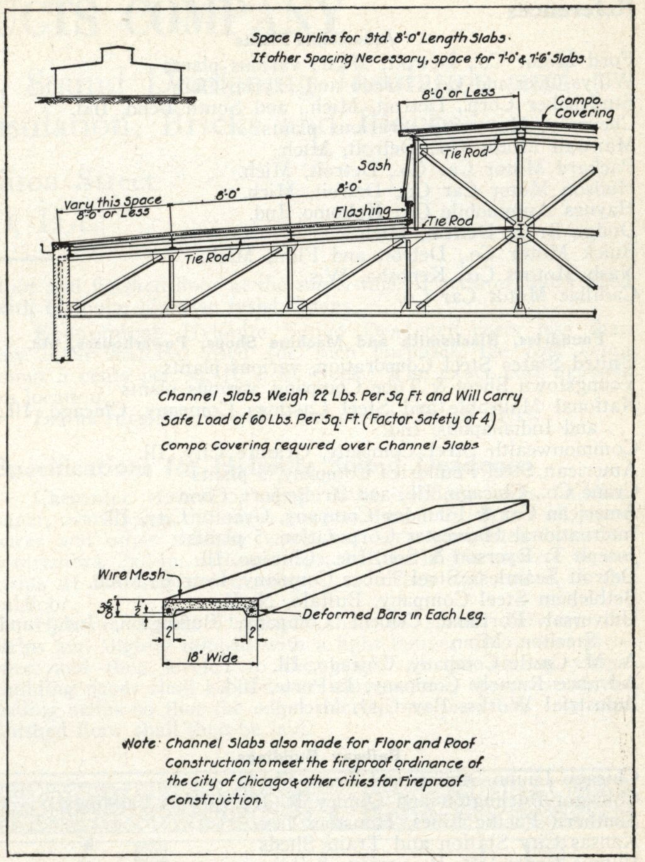
Flat Slab Data

5 Ft. Flat Slab 1⅝" Thick Weighs 19# per sq. ft.
6 Ft. " " 1⅞" " " 22# " " "

Slabs Reinforced with Wire Mesh.
Safe Live Load, 60# per sq. ft.

5'4" & Special Lengths to 6'-0" made to order.

Monitor Roof Construction—Precast Flat Slab


8'-0" or Less
Compo. Covering
Tie Rod
Sash
Vary this Space
8'-0" or Less
8'-0"
8'-0"
Flashing
Tie Rod
Tie Rod
Wire Mesh
3⅝"
1"
2"
2"
Deformed Bars in Each Leg.
18" Wide

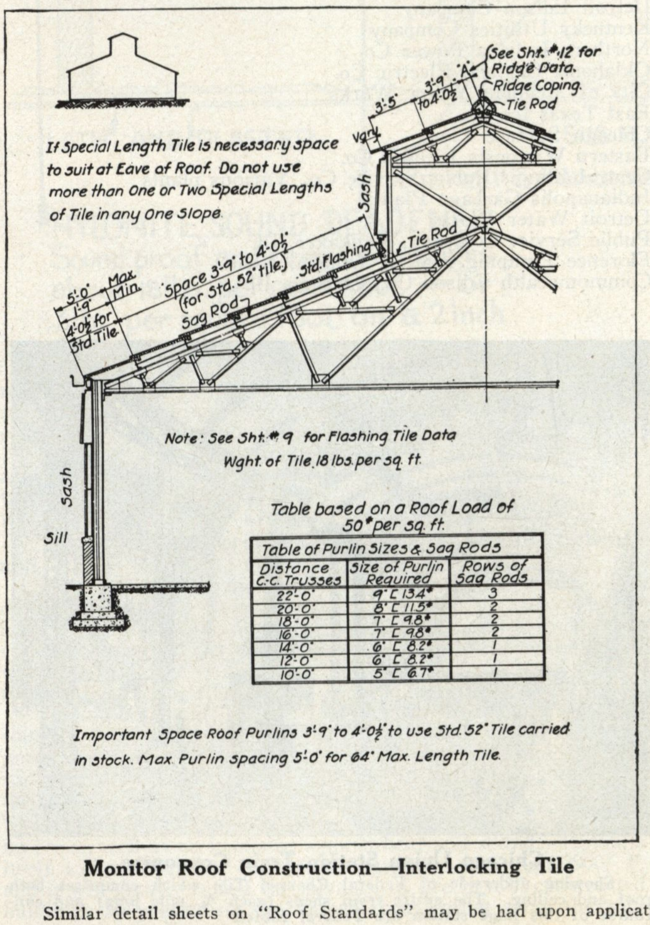
Space Purlins for Std. 8'-0" Length Slabs.
If other Spacing Necessary, space for 7'-0" & 7'-6" Slabs.

Channel Slabs Weigh 22 Lbs. Per Sq. Ft. and Will Carry Safe Load of 60 Lbs. Per Sq. Ft. (Factor Safety of 4)

Compo Covering required over Channel Slabs

Note: Channel Slabs also made for Floor and Roof Construction to meet the fireproof ordinance of the City of Chicago & other Cities for Fireproof Construction.

Monitor Roof Construction—Precast Channel Slab


See Sht. #12 for Ridge Data.
Ridge Coping.
Tie Rod
3'-5"
3'-9" to 4'-0½"
Vary
Sash
Tie Rod
Std. Flashing
Space 3'-9" to 4'-0½" (for Std. 52" tile)
Sag Rod
5'-0" Max
1'-9" Min.
4'-0½" for Std. Tile
Sash
Sill

If Special Length Tile is necessary space to suit at Eave of Roof. Do not use more than One or Two Special Lengths of Tile in any One Slope.

Note: See Sht. #9 for Flashing Tile Data

Wght. of Tile. 18 lbs. per sq. ft.

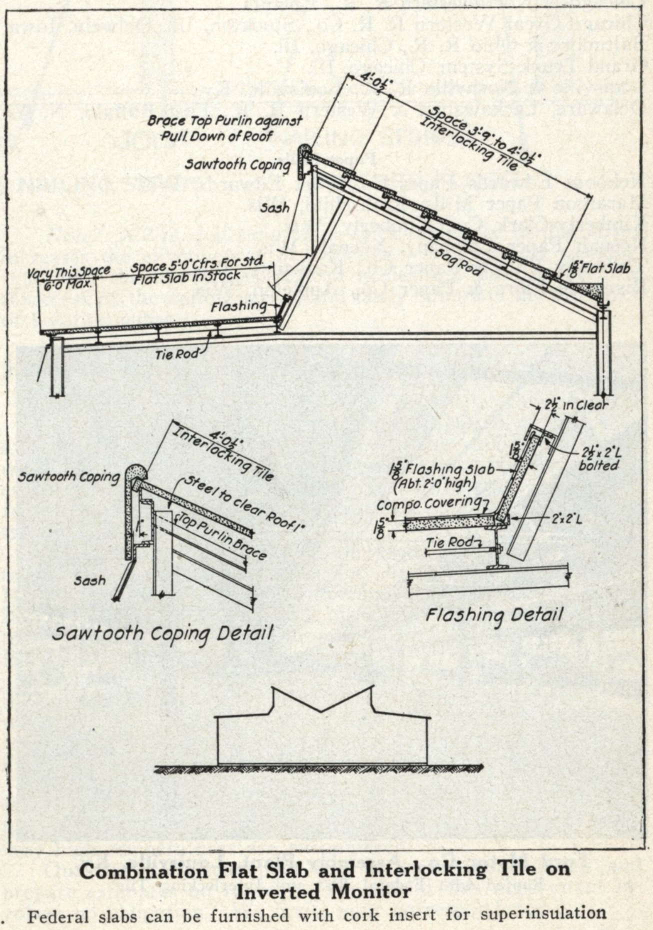
Table based on a Roof Load of 50# per sq. ft.

Table of Purlin Sizes & Sag Rods

Distance C.-C. Trusses	Size of Purlin Required	Rows of Sag Rods
22'-0"	9" [13.4#	3
20'-0"	8" [11.5#	2
18'-0"	7" [9.8#	2
16'-0"	7" [9.8#	2
14'-0"	6" [8.2#	1
12'-0"	6" [8.2#	1
10'-0"	5" [6.7#	1

Important Space Roof Purlins 3'-9" to 4'-0½" to use Std. 52" Tile carried in stock. Max. Purlin spacing 5'-0" for 64" Max. Length Tile.

Monitor Roof Construction—Interlocking Tile


4'-0½"
Space 3'-9" to 4'-0½" Interlocking Tile
Brace Top Purlin against Pull Down of Roof
Sawtooth Coping
Sash
Sag Rod
1⅝" Flat Slab
Vary This Space 6'-0" Max.
Space 5'-0" Ctrs. For Std. Flat Slab in Stock
Flashing
Tie Rod
4'-0½"
Interlocking Tile
Sawtooth Coping
Steel to clear Roof
Top Purlin Brace
Sash
2½" in Clear
2½" x 2" L bolted
1⅝" Flashing Slab (Abt. 2'-0" high)
Compo. Covering
2" x 2" L
Tie Rod
1⅝"

Sawtooth Coping Detail

Flashing Detail

Combination Flat Slab and Interlocking Tile on Inverted Monitor

Similar detail sheets on "Roof Standards" may be had upon application. Federal slabs can be furnished with cork insert for superinsulation

Continued on next page

References

Automobile Plants

Ford Motor Co., Detroit, Mich., various plants
Willys-Overland Co., Toledo and Elyria, Ohio
Studebaker Corp., Detroit, Mich., and South Bend, Ind.
Chevrolet Motors Co., various plants
Maxwell Motor Co., Detroit, Mich.
Packard Motor Car Co., Detroit, Mich.
Hudson Motor Car Co., Detroit, Mich.
Haynes Automobile Co., Kokomo, Ind.
Dodge Bros., Detroit, Mich.
Buick Motor Co., Detroit and Flint, Mich.
Nash Motors Co., Kenosha, Wis.
Cadillac Motor Car Co.

Foundries, Blacksmith and Machine Shops, Powerhouses, etc.

United States Steel Corporation, various plants
Youngstown Sheet & Tube Company, various plants
National Malleable and Steel Castings Company, Chicago, Ill., and Indianapolis, Ind.
Commonwealth Steel Company, Granite City, Ill.
American Steel Foundries Company, 5 plants
Crane Co., Chicago, Ill., and Bridgeport, Conn.
American Car & Foundry Company, Granite City, Ill.
International Harvester Corporation, 5 plants
Joseph T. Ryerson & Son, Inc., Chicago, Ill.
Detroit Seamless Steel Tubes Company, Detroit, Mich.
Bethlehem Steel Company, Buffalo, N. Y.
Universal Portland Cement Company, Buffington, Ind., and Steelton, Minn.
A. M. Castle Company, Chicago, Ill.
Advance Rumely Company, LaPorte, Ind.
Industrial Works, Bay City, Mich.

Railway Buildings

Chicago Union Station and Train Sheds
Chicago, Burlington and Quincy R. R., various buildings
Southern Pacific Lines, Houston, Tex.
Kansas City Station and Train Sheds
Illinois Central R. R., various buildings
Pennsylvania R. R., Chicago, Ill., and Indianapolis, Ind.
Elgin, Joliet & Eastern Ry., Joliet, Ill., and Gary, Ind.
Chicago & Northwestern R. R., 3 plants
Chicago Great Western R. R. Co., Stockton, Ill., Oelwein, Iowa
Baltimore & Ohio R. R., Chicago, Ill.
Grand Trunk System, Chicago, Ill.
Louisville & Nashville R. R., Louisville, Ky.
Delaware, Lackawanna & Western R. R., East Buffalo, N. Y.

Paper Mills

Nekoosa Edwards Paper Co., Port Edwards, Wis.
Marathon Paper Mills, Rothschild, Wis.
Kimberly-Clark Co., Kimberly, Wis.
Neenah Paper Company, Neenah, Wis.
Thilmany Pulp & Paper Co., Kaukauna, Wis.
Riverside Fibre & Paper Co., Appleton, Wis.

Food and Implement Plants

Bucyrus Co., Evansville, Ind., and South Milwaukee, Wis.
Advance Rumely Co., LaPorte, Ind., and Battle Creek, Mich.
Emerson-Brantingham Co., Rockford, Ill.
Western Wheeled Scraper Co., Aurora, Ill.
Deere & Co., Moline, Ill.
Moline Plow Co., Moline, Ill., and Stoughton, Wis.
J. I. Case Plow Works, Racine, Wis.
Armour & Co., Omaha, Neb., and St. Paul, Minn.
Swift & Co., Hammond, Ind.

Coke, Gas and Oil Plants

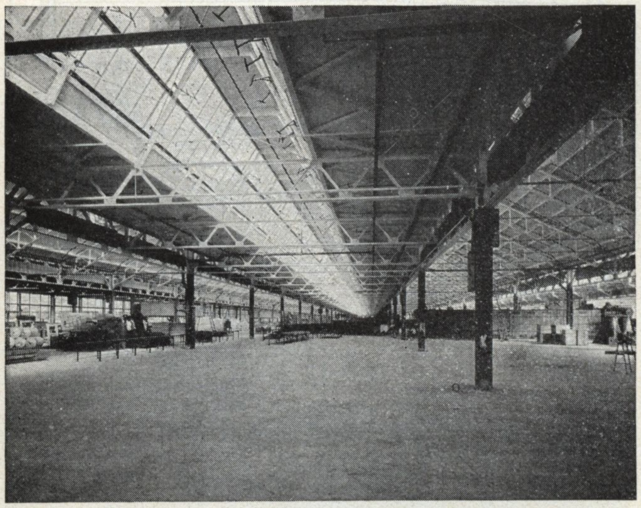
Detroit City Gas Co., Detroit, Mich.
LaClede Gas Light Co., St. Louis, Mo.
By-Products Coke Corporation, various plants
Texas Company, Texas City and Port Arthur, Tex.
Standard Oil Company, various plants
Sinclair Refining Co., various plants
Gulf Refining Company, Port Arthur, Tex.
Cosden & Company, Tulsa, Okla.
Corn Products Refining Company, Argo, Ill.

Auditoriums, Theaters and Schools

Ambassador Theater, Chicago, Ill.
Michigan State Fair Coliseum, Detroit, Mich.
World Theater, Omaha, Neb.
City of Cedar Rapids, Iowa, various schools
Wyandotte High School, Wyandotte, Mich.
Virginia Theater, Champaign, Ill.
Municipal Auditorium, Wellington, Kan.
Pettis County Courthouse, Sedalia, Mo.
University of Michigan Field House, Ann Arbor, Mich.
City of Detroit, Mich., various schools
Loyola University Gymnasium, Chicago, Ill.
Tower Theater, St. Paul, Minn.
Municipal Auditorium, Houston, Tex.
Terminal Theater, Chicago, Ill.
O'Keefe School, Chicago, Ill.
Fischer Theater, Fond du Lac, Wis.
City of Minneapolis, Minn., Various schools

Public Utilities

St. Paul Gas Light Company
Detroit Edison Company
Kentucky Utilities Company
Northern Indiana Power Co.
Oklahoma Gas and Electric Co.
City of Memphis Water Works
East Texas Ice Co.
Chicago Surface Lines
Eastern Wisconsin Electric Co.
Central Illinois Public Service Co., Various plants
Indianapolis Garbage Plant
Detroit Water Works
Public Service Company, Kankakee, Ill.
Florence Pumping Station, Omaha, Nebr.
Commonwealth Edison Co., Chicago, Ill.



Ford Motor Co., Assembly Plant, Louisville, Ky.
Roofed with Federal Flat and Interlocking Tile

Chicago Union Station Train Concourse
Showing underside of Federal Channel Tile which comprises both roof and ceiling. The entire train sheds (each ¾ mile long) and concourse of this huge station are Federal roofed

HYLONITE PRODUCTS COMPANY

Manufacturers of Hylonite Fireproof, Sound Deadening Insulation and Hylonite High Temperature Insulation, Bricks and Blocks

1107-1117 Addison Street
CHICAGO, ILL.

Products

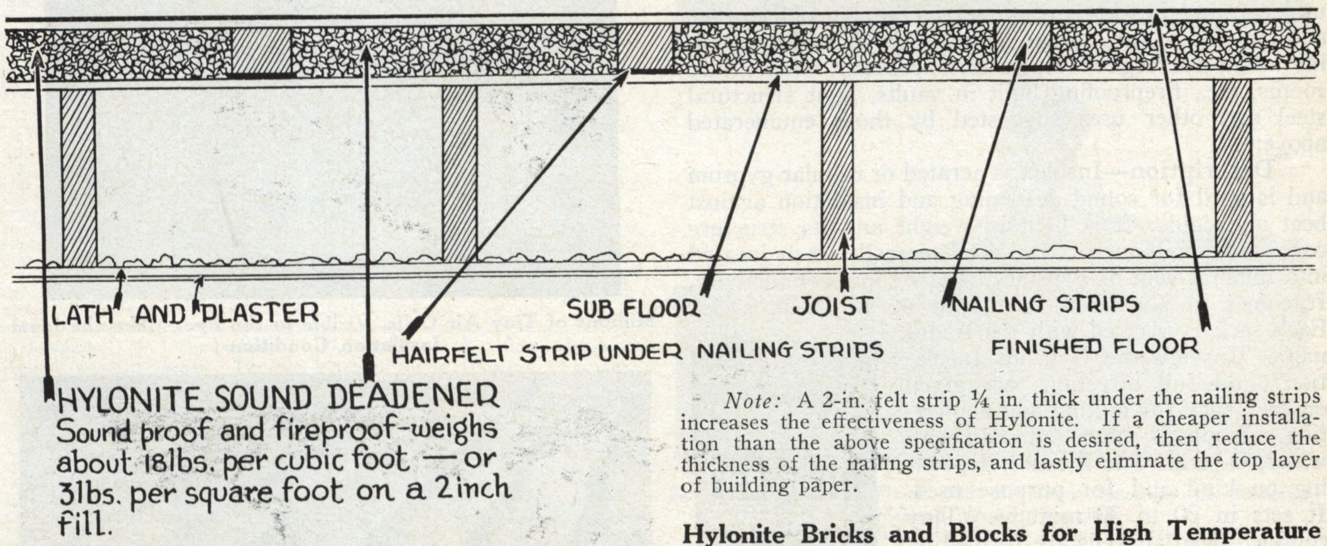
Hylonite Fireproof Sound Deadening, a Fire Retarding and Insulating Material for residences, apartments, schools, offices and other mill constructed buildings; Hylonite High Temperature Insulation; Bricks and Blocks.

Also Insulating Powder for all high temperature heat conservation purposes. Resists 2900° F.

For Hylonite Fireproof Monolithic Flooring, see page 534.

Hylonite Fireproof Sound Deadening Insulation

Hylonite Sound Deadener conforms with every requirement of an ideal soundproof insulation to be used between floors, under roofs and between walls. It is light in weight. Low in cost. Requires no nailing or mixing. Is easy to apply and everlasting as well as fireproof.


LATH AND PLASTER
SUB FLOOR
JOIST
NAILING STRIPS
HAIRFELT STRIP UNDER NAILING STRIPS
FINISHED FLOOR
HYLONITE SOUND DEADENER
Sound proof and fireproof-weighs about 18lbs. per cubic foot — or 3lbs. per square foot on a 2inch fill.

Hylonite Sound Deadener is a coarse powdered mixture of materials the chief ingredient being *Hylonite,* a mineral substance of minute cellular structure conceded to be the most effective insulator against heat or sound.

Hylonite Sound Deadener is easily handled. Simply open a bag and spread the dry material over the subfloor and gently tamp, then level to the height of the nailing strips. No other work is necessary.

The Ideal Material for Insulating Floors, Ceilings and Walls—

Soundproof well insulated buildings are in demand. The days of eliminating sound deadening in order to reduce building costs, are rapidly disappearing. This is especially true of residences, apartment buildings, schools and office buildings where considerable annoyance is caused by noises which are transmitted through floors, ceilings and walls.

Hylonite Sound Deadener will absorb and break up all sound waves. A room protected by Hylonite means a soundproof room, it means a warmer room in winter and a cooler room in summer as Hylonite is a perfect insulator against heat and cold as well as an insulator against sound.

A Fire Retarder—Hylonite Sound Deadener is a fire retarder as well as an insulator against heat and sound. Hylonite itself will not burn or melt at temperatures less than 2900° F. and it will greatly retard the advance of fire in mill constructed buildings by preventing the flames from eating away the subfloor and finished floor at the same time. Partition floors filled with Hylonite likewise resist flames.

Economical—Hylonite Sound Deadener costs less than any other material used for such purposes, the cost being about 5 cents per sq. ft. 2 in. thick. The exact cost depends on location.

Let us furnish you with a sample and list of users.

Specifications for Hylonite Sound Deadener

Carpenter contractor shall cover subfloor with building paper, overlapping the edges not less than 1 in. After all pipes, wires and other subfloor work has been completed by other contractors, 2x2-in. nailing strips shall be laid crosswise to the strips of building paper every .... inches and nailed to the subfloor.

Hylonite Sound Deadener shall be spread between the strips and slightly tamped with a light tamper or by foot pressure, and then leveled to the height of the nailing strips. Building paper shall be laid over this surface, crosswise to the nailing strips so that the edges overlap not less than 1 in. and finished floor shall then be laid.

Note: A 2-in. felt strip ¼ in. thick under the nailing strips increases the effectiveness of Hylonite. If a cheaper installation than the above specification is desired, then reduce the thickness of the nailing strips, and lastly eliminate the top layer of building paper.

Hylonite Bricks and Blocks for High Temperature Insulation

Hylonite bricks and blocks are manufactured of Hylonite, a silicious mineral substance of very minute cellular structure which scientists claim contains millions of tiny air spaces to the cubic inch. This material can also be had in coarse powdered form for use as a filler in the dead air spaces often left between walls conveying heat.

Hylonite Bricks and Blocks represent the highest development of insulating materials for high temperature work. Hylonite resists 2900° F.; its melting point being upward of 2929°F. This high fusion point makes it possible to handle any temperature you may have to control with Hylonite Bricks or Blocks.

Hylonite Bricks and Blocks are light in weight owing to the natural cellular structure of the material. They will not warp or change their structure and will not disintegrate or stratify. They can be applied to any heated surface, whether flat or cylindrical.

Power plant and industrial engineers will find Hylonite Bricks, Blocks or Insulating Powder very effective on superheat, or on any heat treating apparatuses or appliances where very high temperatures are encountered.

Our Service Department will make recommendation and prepare estimates on request. The use of this department involves no obligation. We invite your correspondence.

UNIVERSAL GYPSUM COMPANY

Manufacturers of Insulex, a Gypsum Insulation

Conway Building
CHICAGO, ILL.
For Sales Offices, see page 377

Product

INSULEX, the Gypsum Insulation.

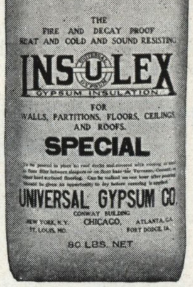
For Gypsum Plaster and Plaster Board, see pages 377-379; for Gypsum Wall Board, see page 1340.

Insulex

Insulex is aerated or cellular gypsum, a fire-, vermin- and decay-proof insulation and sound deadener, employed on roofs, floors, sidewalls and ceilings of residences, commercial and industrial buildings, and for industrial uses such as pipe and boiler covering, cold storage work, etc. Insulex is used as a light weight fill for reducing dead load in structures.

Main Uses—Insulation against heat and cold. Sound deadener. Light weight fill for floors and roofs. Fireproofing. Industrial uses such as insulating coke ovens, bake ovens, enameling ovens, dryers, roofs of clay plants, lumber kilns, boilers, hot water tanks, high pressure steam pipes, pipe chases, outside water towers, underground heating mains, refrigerators, cold storage and ice plants, fur storage vaults, cigar humidors, cooling rooms for vegetables, bakeries, constant temperature rooms, etc., fireproofing built in vaults, light structural steel and other uses suggested by those enumerated above.

Description—Insulex is aerated or cellular gypsum and is used for sound deadening and insulation against heat and cold. It is light in weight and its structure consists of millions of tiny dead air cells, each incased in a mineral wall of gypsum, itself of low conductivity. It comes in powdered form, put up in 80-lb. sacks. Each sack is marked with the tradename "Insulex the Gypsum Insulation" and full directions are given on each sack for mixing and application. Insulex, when mixed with water, expands 3 to 7 times, depending on kind and for purpose used. It sets in 20 to 30 minutes. Tiny confined dead air cells are formed by millions, creating a remarkable resistance to heat, cold and sound. Any desired thickness or shape can be installed.



Insulex is supplied to make different finished weights per cubic foot—12, 18, 24 and 30 lb. per cu. ft. being the usual standards. The numbers on the sack indicate the number of pounds of that kind of Insulex powder required to make 1 cu. ft. of Insulex in place.

Advantages—Insulex is fire-, vermin- and decay-proof and does not disintegrate in any way with time or moisture. Composed entirely of mineral matter, it can not decay; being of a refractory nature, it cannot burn. Insulex is not of vegetable or animal origin, consequently will not harbor or attract vermin or rodents. These advantages, together with its ease and low cost of application, make Insulex attractive. Insulex does not require any skilled labor or expensive equipment to apply. It bonds perfectly with concrete and other structural materials. It can be installed in old as well as new buildings.

When poured in place, Insulex expands and flows easily into the smallest crevices and cracks and it clings tightly to all joists and studding, thus effectively sealing the structure from heat losses through uninsulated cracks.

The advantage of using Insulex as a floor fill, to enable the architect and engineer to reduce dead load in any structure, is given by the analysis of a typical panel below:

Panel 21 ft. 10 in. by 23 ft.

Concrete rib construction, 12-in. joists with 2-in. top and 3-in. concrete fill floated to finish vs. concrete rib construction with 12-in. joists 2-in. top 2¼-in. Insulex Special Floor Fill and ¾-in. cement finish. All materials are based on known markets.

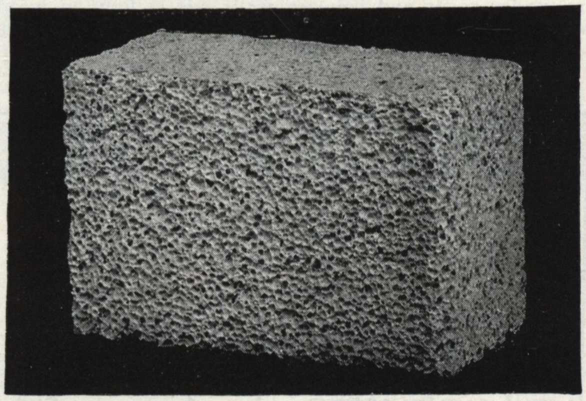
$$\text{Concrete Fill 12-in. joists } \frac{12\times12\times5\times22}{144} = 110 \text{ cu. ft.}$$

$$\text{slab } \frac{5\times23\times22}{12} = \frac{210 \text{ cu. ft.}}{320 \text{ cu. ft.}} = 11.85 \text{ cu. yd.}$$

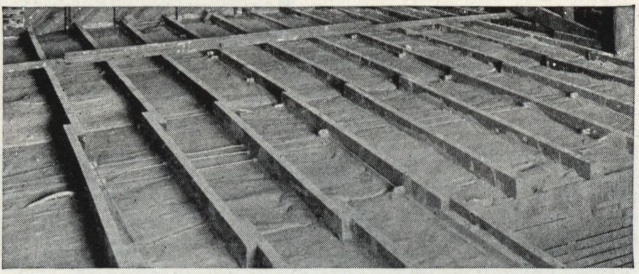
$$\text{Insulex Fill 12-in. joists } \frac{12\text{x}10\text{x}5\text{x}22}{144} = 91.6 \text{ cu. ft.}$$

$$\text{slab } \frac{2.5\text{x}23\text{x}22}{12} = \frac{105 \text{ cu. ft.}}{196.6 \text{ cu. ft.}} = 7.3 \text{ cu. yd.}$$

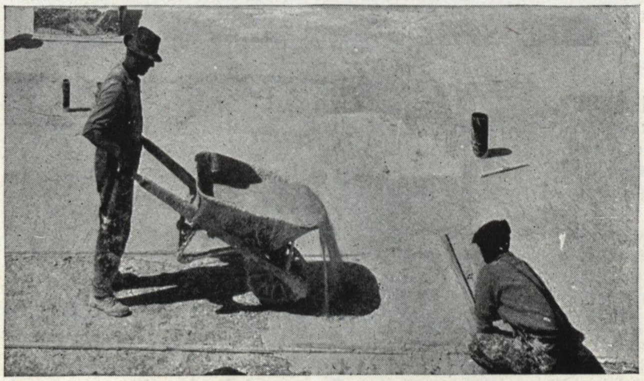
$$\begin{array}{rcr} 11.85 \text{ x}21.00 & = & \$249.00 \\ 7.3 \text{ x}21.00 & = & 153.00 \\ \hline (4.55) & & \$\ 96.00 \end{array}$$



Millions of Tiny Air Cells, Visible to the Eye, Make the Ideal Insulation Condition



Insulex No. 12 Application for Ceiling Insulation



Insulex Application Over Concrete or Wood Deck for Insulation or to Build Up Slopes and Saddles

Continued on next page

Insulex $\frac{2x23x22}{12x27}$ = 3.13 cu. yd. 3.13x11.00 = $ 34.43

$ 61.57 Saving

Reinforcing Steel 12-in. joists, rods $\frac{5}{4}$ x 22 ft. = 28 ft. long

(Concrete Fili) 2 x 28 x 2.04 x 12 = 1370 lb. x (.045) = $61.70
(Insulex Fill) 28 x (2.04 + 1.50) x 12 = 1190 x (.045) = 53.50

$ 8.20 Saving

Structural Steel $\frac{2x70x23}{2000}$ = 1.61 x 115.00 = $185.00
$\frac{2x65x23}{2000}$ = 1.49 x 115.00 = $173.00

$ 12.00 Saving

Total Saving

Concrete	$61.57
Reinforcing steel	8.20
Structural steel	12.00
	$81.77 Panel

Structural steel (erected)	$115.00	per ton
Floor concrete (in place)	21.00	per cu. yd.
Reinforcing steel (set)	0.045	per lb.
Insulex (in place)	11.00	per cu. yd.

Tests—Insulex has been tested by the U. S. Bureau of Standards, Armour Institute and other recognized institutions. Below are given certain tests.

In each roof considered below it has been assumed that a 5-ply tar and gravel roofing was used. The results are expressed in B. t. u's lost per hour per square foot of roof surface per degree temperature difference between the inside and the outside air.

Construction	Heat Loss B. t. u's., per hour
2-in. Concrete, with 5-ply roof	0.57
3-in. Concrete, with 5-ply roof	0.53
2-in. Concrete, 1-in. Insulex, 5-ply roof	0.30
2-in. Concrete, 2-in. Insulex, 5-ply roof	0.20
2-in. Concrete, 3-in. Insulex, 5-ply roof	0.15
3-in. Concrete, 1-in. Insulex, 5-ply roof	0.29
3-in. Concrete, 2-in. Insulex, 5-ply roof	0.19
3-in. Concrete, 3-in. Insulex, 5-ply roof	0.15

In case it is desired to express the heat loss per day instead of per hour, it is only necessary to multiply the figures in the above table by 24.

We submit herewith results of tests conducted on slabs of different dimensions, made from No. 24 Insulex base and mortar (1 to 3) top covering. Slab was supported on steel plate and load applied as noted to top of mortar.

No.	Slab, in.	Thickness Insulex base, in.	Thickness mortar covering, in.	Load applied	Load, lb.	Failed
1	10x10	1¼	¾	2x2 roller	2180	Slab broke
2	12x12	1⅝	⅝	2½x2¼ long	1400	Slab broke
3	8x 4½	1¼	¾	1x1	1100	Slab broke
4	14x14	2⅜	⅝	1x1	2300	Punched hole in mortar

The results of these tests would indicate that No. 24 Insulex has ample strength to be used as a base for floors for office buildings or hospitals when a ¾-in. cement mortar is used for a wearing surface.

The following results were obtained from test of Insulex designated No. 24. Mixed and cast 4x4x6 in. Tested two weeks later for compression. Compression measured by travel of head.

Load, lb.		Compression		Load, lb.		Compression	
Actual	sq. in.	Inches	Per inch	Actual	Sq. in.	Inches	Per inch
80	5	0.003	0.0005	1600	100	0.0125	0.0021
112	7	0.004	0.0007	1760	110	0.013	0.0022
240	15	0.005	0.0008	2240	140	0.014	0.0023
320	20	0.006	0.0010	2560	160	0.015	0.0025
400	25	0.007	0.0012	3200	200	0.017	0.0028
640	40	0.008	0.0013	3660	228	0.018	0.0030
960	60	0.009	0.0015	4200	263	0.019	0.0032
1200	75	0.010	0.0016	4800	300	0.021	0.0035
1280	80	0.011	0.0018	5600	350	0.026	0.0043
1440	90	0.012	0.0020				

Specification Data

Roof Insulation—For roof insulation on top of wood or concrete flat roofs, Insulex No. 24 is recommended. Insulex should never be applied less than 1-in. thickness; thickness to be from 1 to 4 in., as conditions require.

Preparation of the Roof—Remove all loose material and rubbish from the roof surface. All drain connections should be set to proper grade and protected by the plumbing contractor so that Insulex will not flow into and clog them. No priming or mopping of the roof deck is required.

In the case of wood roof only, if the deck is not watertight and if damage to the floor below is likely to result should some Insulex leak through, cover the roof with sized building paper, edges lapped 2 in. where it joins.

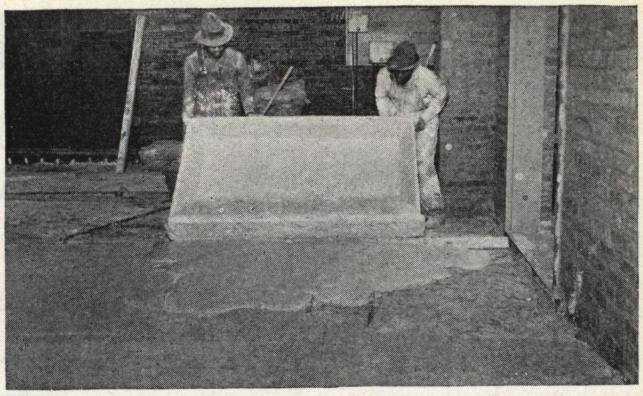
About 3 ft. from the parapet wall on one side of the roof, lay the first screed strip of the thickness the insulation is desired—the strip to extend across the roof. Mix and pour the Insulex according to the manufacturer's instructions printed on every bag, and screed to level with a short straightedge.

After the roof is covered in this manner, allow the Insulex to dry thoroughly and apply roofing.

Floors—For insulation, sound deadening, or for floor fill between concrete slabs and finished wood floors, or between rough wood floors and finished wood floors.

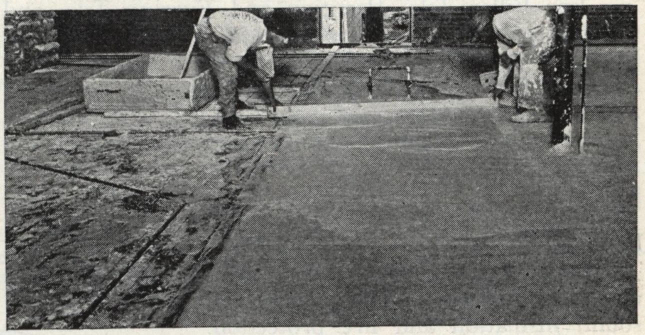
Preparation of the Floor—Remove all loose material and rubbish from floor. In case of rough wood floors only, cover floor entirely with sized building paper, lapped 2 in. where it joins—flash the paper 2 in. at the walls. On top of paper set proper leveled wood sleepers to receive finished wood floors. The sleepers will act as screeding strips for the Insulex. Mix in accordance with instructions printed on every bag and pour the Insulex in place between sleepers. Immediately after pouring, strike off with a straightedge, so notched that the surface of the Insulex will be about ¼ in. below the edge of the sleepers. Continue this process until the floor is covered. Allow sufficient time for Insulex to dry out thoroughly before laying the finished wood floors.

For hard surface flooring such as cement, terrazzo, art marble, tile, etc., the foregoing specifications for wood floors will apply except that no sleepers are required. The cement, terrazzo, art marble, tile, etc., top may be laid as soon as the Insulex has properly set.



Pouring Insulex for Floor Fill Over Rough Wood Floor or Over Tile or Concrete Arches

No grouting necessary around pipes or conduits



Screeding Insulex Floor Fill to Receive Hard Surfaced Flooring

Screeding Insulex Floor Fill Between Sleepers to Receive Finished Wood Flooring

Note Insulex fills all voids around sleepers

Co-operative Service

We have standard drawings and specifications for the use of Insulex printed in looseleaf pamphlet form, suitable for filing or reference. We will gladly furnish these upon application. We also have a well equipped Engineering Staff who will be glad to go into the solution of your problem if it involves insulation, sound deadening or reduction in dead load.

UNITED STATES GYPSUM COMPANY

Pyrocell Fireproof Insulation

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see pages 374

Product

Pyrocell, Fireproof Insulation.

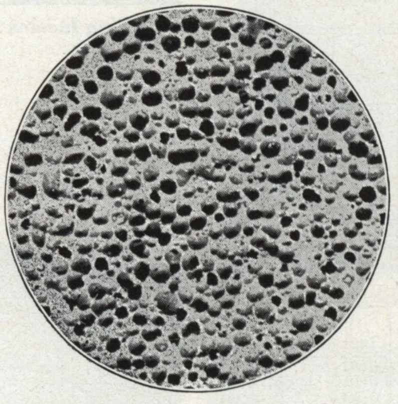
For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Wall Board, see page 1339; for Sheathing, see page 1361.

Pyrocell

Description—Pyrocell is a gypsum material which combines remarkable heat, cold, and sound insulation and fire protection. It is manufactured as a fine powder and is packed in 80-pound paper bags. When mixed with water, Pyrocell expands to three or four times its original bulk and is honeycombed with myriads of tiny air cells, each completely surrounded by a wall of gypsum. As confined air, next to a vacuum, is the best insulator known, and as gypsum will not readily transmit heat, the insulating value of Pyrocell is extremely high.

Advantages—Pyrocell can not burn and it is an effective barrier to fire. When used on frame buildings, it protects the wood with a gypsum covering and makes the entire structure fire resistive.

Because Pyrocell combines confined air cells—the essential of a good insulator—with the additional insulative qualities of gypsum, its use insures unsurpassed insulating efficiency.



From an Actual Photograph of Pyrocell

The illustration shows the confined air cells in Pyrocell which insure maximum heat, cold and sound insulation. Notice the thick uniform cell walls

Pyrocell reduces sound transmission to a minimum because it combines the natural sound deadening qualities of gypsum with the remarkable sound resistance of confined air cells.

As the weight of Pyrocell is only a fraction of that of concrete, floor loads can be tremendously reduced by using Pyrocell as fill instead of concrete or cinders.

Pyrocell can be easily mixed by unskilled labor with ordinary equipment and, as it can be poured into the space which is to be insulated, its installation is quick and economical.

Uses—Pyrocell should be used wherever insulation against heat, cold or sound is required. Among its many uses the following are especially important:

(1) As insulation and fire protection between wooden studs or joists. (2) As a sound deadener, insulator, and fire protection in floors and partitions. (3) In fireproof construction, as fill between screeds in floors instead of cinder fill. (4) As a base for terrazzo or tile flooring. (5) As a fill on concrete roof decks. (6) For insulation and fire protection on roofs.

Pyrocell makes economical insulation for gas and oil tanks, steam pipes, boilers, hot water tanks, underground heating mains, and pipe chases in large buildings.

Pyrocell Colors, Weights, and Uses

Pyrocell is furnished in four weights to meet the varying requirements of its different uses. Naturally, the lightest weight has the highest insulating value because it contains the greatest number of air cells, but, for the same reason, it has less structural strength. For the convenience and protection of Pyrocell users each weight is colored differently.

Colors, weights, approximate covering capacity, and other valuable information is given in the following table:

No.	Color	Dry material required to make 1 cu. ft. lb.	Approximate covering capacity per ton in sq. ft., 1 in. thick
12	White	12	2000
18	Slate	18	1335
24	Terra cotta	24	1000
30	Tan	30	800

Each color is adapted to the use indicated below:

White and slate for fireproof insulation of walls above ground level, and ceilings.

Terra cotta for filling and sound deadening of floors and insulating of basements inside walls. Insulation of oil tanks, heating mains, etc.

Tan for insulation and fireproofing of roofs.

Directions for Mixing

Pyrocell should be mixed with water in the approximate proportion of 2 parts of Pyrocell to 1 part of water, by bulk. This is about two 12-qt. pails of water to each 80-pound bag of Pyrocell. Just sufficient water should be used to give the material an easy flow.

The Pyrocell must be added to the water at a single operation and must never be poured in slowly. Mix thoroughly and quickly until all lumps disappear and pour the mixture at once. *This is important.*

Specifications and directions for use are printed on every bag.

ASBESTOS SHINGLE, SLATE & SHEATHING CO.

MAIN OFFICE AND FACTORY
AMBLER, PA.

BRANCH OFFICES

BALTIMORE, MD.
BOSTON, MASS.
CLEVELAND, OHIO
CINCINNATI, OHIO
BUFFALO, N. Y.
CHICAGO, ILL.
TORONTO, ONT.
MINNEAPOLIS, MINN.
OMAHA, NEB.
PHILADELPHIA, PA.
WILKES-BARRE, PA.
MILWAUKEE, WIS.
NEW YORK, N. Y.
HAVANA, CUBA
PITTSBURGH, PA.
WASHINGTON, D. C.
DETROIT, MICH.

SOUTHWESTERN DISTRIBUTER: R. V. Aycock Co., Kansas City, Kan.; St. Louis, Mo.; Tulsa, Okla.; Houston, Tex.

SOUTHERN DISTRIBUTERS: Dixie Asbestos Co., Birmingham, Ala.; Berry Asbestos Co., Atlanta, Ga.

WESTERN DISTRIBUTER: J. A. Drummond, San Francisco, Los Angeles, Fresno, Cal.

PACIFIC COAST DISTRIBUTER: H. G. Sperry Co., Seattle, Wash.; Salt Lake City, Utah

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Products

Ambler Asbestos Shingles for roofs and sidewalls, Ambler Asbestos Corrugated Roofing and Siding; Ambler Asbestos Roofing Cement.

For Ambler Linabestos (Asbestos) Wall Board, Ambler Linabestos (Asbestos) Siding, and Ambler Asbestos Building Lumber, see page 1338.

The Company and Its Products

This Company supplies all the necessary appurtenances required in the installing of its products. All nails, clips, etc., exposed to the weather are heavy gauge copper, and the concealed nails are triply galvanized. Copper driving nails supplied if desired.

Ambler Asbestos Shingles

Ambler asbestos building products are absolutely fireproof and waterproof, made of selected asbestos fibers and portland cement scientifically combined in water and formed under enormous hydraulic pressure.

Colors—Ambler asbestos shingles in their natural color are a beautiful gray, known as Newport gray; they are also made in solid and veneered permanent colors of slate black, brown, Indian red and green. The green shingle is the result of more than 10 years' research and is truthfully the only permanent green asbestos shingle manufactured.

The ¼-in. thick American method shingles are made in a variety of reds, browns, purples, buffs, and grays to be laid according to the architect's specifications as to color design.

The colors used in all colored Ambler asbestos shingles are permanent mineral pigments and can not fade or deteriorate.

Specifications for French or Diagonal and Honeycomb Methods of Laying Ambler Asbestos Shingles

Sheathing—All roofs specified to be covered with asbestos shingles, to be tightly sheathed with well seasoned tongued and grooved boards not more than 9 in. wide, free from loose knots and to be well spiked to the rafters.

Felt—Over roof boards lay 1-ply slater's felt, tacked on with 4-in. lap, and on hips and valleys with at least 1-ft. lap.

Ambler Asbestos Shingles—Over the felt, apply Ambler asbestos shingles (give color), as manufactured by the Asbestos Shingle, Slate & Sheathing Co., according to the "French" or diagonal method, following the manufacturer's details. Nail $\frac{3}{16}$x1-in. cant strip flush with lower edge of roof board. Apply 1 course of No. 16 shingles end to end laterally, overhanging the eaves 1½ to 1¾ in., over which lay 1 course of No. 46 shingles, entirely covering the No. 16 to break joints. Starter No. 35 to be laid over this, exposing one-half the lower double course. Balance of roof to be covered with No. 3 shingles, 16x16 in., laid diagonally as directed and exposed 13x13 in. to the weather. Each shingle to be nailed with two 1¼-in. galvanized iron needle point nails, and the No. 3 to be fastened down at the tip with the patented copper "Storm" nails. All No. 3 shingles to be laid showing diagonal lines on a 45° angle with eaves. Hips and ridges to be covered with Ambler asbestos ridge and hip roll, properly flashed and fastened in place to hip or ridge pole of sufficient height, rabbeted to fit hip or ridge, with regular copper fasteners made for this purpose. All hips and ridges to be made watertight previous to the application of the ridge roll.

Flashing—At all hips, valleys, chimneys, and against all abutting sidewalls, except as otherwise specified, flash and counterflash with each course of Ambler asbestos shingles, using ....

Note: Approximate weight per square 290 lb.

Specifications for American Method of Laying Ambler Asbestos Shingles

Sheathing—See under French method.

Felt—See under French method.

Ambler Asbestos Shingles—Over the felt, apply Ambler asbestos shingles (give color), as manufactured by the Asbestos Shingle, Slate & Sheathing Co., according to the American, or straight laid, method, following the manufacturer's details. Nail $\frac{3}{16}$x1-in. cant strip flush with the lower edge of roof board. Apply 1 course of No. 16 shingles end to end laterally, overhanging the eaves 1½ to 1¾ in. Over this lay 1 course of No. 16 shingles with long edge at right angles to eave line breaking joints. Lay next course in the same way, allowing 6-in. exposure. Balance of roof to be covered with No. 16 shingles 8x16 in., laid perpendicularly, breaking joints and exposed 7 in. to the weather. Each shingle to be nailed with two 1¼-in. galvanized iron needle point nails as indicated by the nailhole in the shingles, nails not to be driven down too tight. Hips and ridges to be covered with Ambler asbestos ridge and hip roll, properly flashed and fastened to hip or ridge pole of sufficient height, rabbeted to fit hip or ridge, with regular copper fasteners made for this purpose. All hips and ridges to be made watertight previous to the application of the ridge roll. (Hip and ridge can be covered according to regular Boston hip scheme if desired.)

Flashing—See under French method.

Note: Approximate weight per square 425 lb.
If owner desires Ambler mixed color ¼-in. asbestos shingles, specify whether with straight or broken butts.
Approximate weight per square 675 lb.

Ambler Asbestos Corrugated Roofing and Siding

This material is similar to the Ambler asbestos shingles in its structure and qualities. It is made in a corrugated form in sheets 27½ in. wide and in lengths from 3 to 10 ft. Its weight is about the same as No. 14 or No. 15 corrugated iron and it is used for similar services.

Send for Engineer's Data Book giving full data for application, etc.

Ambler Asbestos Roofing Cement

We recommend the use of this cement for ridge rolls and flashings. It is put up in 1-lb., 5-lb., and 50-lb. tins.

THE BEAVER PRODUCTS COMPANY, INC.

Vulcanite Roofing Materials

BUFFALO, N. Y.

THOROLD, ONT. LONDON, ENG.

Products

Vulcanite Shingles: Hexagon Slab Shingles, Red, Green, Blue-black and Autumn Blend; Self-spacing Individual Shingles, Red, Green, Blue-black and Autumn Blend; Beaver-Lok Shingles, Red, Green and Blue-black; 4-in-1 Slab Shingles; and Standard Individual Shingles.

Vulcanite Roll Roofings: Smooth Surfaced; and Slate Surfaced, plain and mosaic.

Vulcanite "Built-to-order" Roofs; Building Felts and Papers; Paint and Cements.

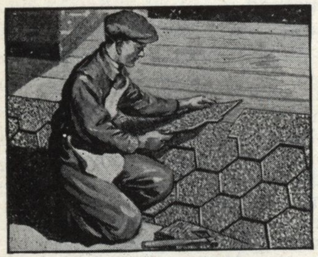
For Beaver American Wall Plasters and other Gypsum Products, see pages 356-359; for Beaver "Bestwall" (plaster wall board) and Beaver Fiber Wall Board, see pages 1336-1337.

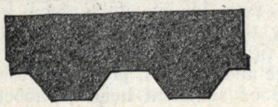
Manufacture

Beaver Vulcanite roofings are built of rag felt of first grade, made in Vulcanite mills, exceptionally well saturated with the finest, pure Mexican asphalt, and firmly surfaced with crushed slate, sand, mica or talc, according to the style and use.

Vulcanite Hexagon Slab Shingle

This slab shingle builds a roof of two thicknesses of tightly nailed material at every point and triple-thick over half the area. It spaces automatically and can not be incorrectly laid. It allows no slots and no overlapping or exposed joints. Each joint is offset to further insure a tight seal. It makes a wide overlap and this, plus the double seal it provides, makes it the ideal re-roofing shingle.





Note the Amount of Material in This Shingle

It is 36 in. long and 12¾ in. deep. See how easily it is laid and what a tight roof it builds

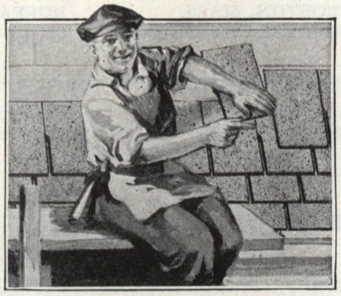
The Hexagon slab is furnished in two weights: Standard, approximately, 200 lb. to the square, packed 48 shingles to the bundle, 2 bundles to the square; Jumbo, 270 lb. to the square, packed 48 shingles to the bundle and 2 bundles to the square. It comes surfaced with crushed slate, red, green, blue-black or in the new Autumn Blend color.

The New Autumn Blend—The Autumn Blend Hexagon slab, is of Jumbo weight, a big, tough, beautiful shingle. It gives a blend of autumn colors on the roof, that makes any home more attractive. There is absence of checkerboard effect as each slab has a variegated pattern of blending colors. It weighs, approximately, 270 lb. and is packed 2 bundles of 48 shingles each to the square.

Vulcanite Self-spacing Shingle

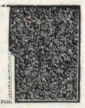
An individual shingle with two unusual features. It eliminates the open slot, and makes spacing automatic by means of the special shoulder. This means that rain and snow can not blow through, the heat of the sun can not work under, and loss of heat through the roof in winter is checked. Also, it results in a saving of time in laying the roof and in a perfect roof pattern. Laid 4¼ in. to the weather, it builds a roof triple thick except at the slots and even there double thickness is secured. The Standard size is 8½ by 12¾ in. and is supplied 408 shingles in four bundles, 240 lb. to the square. It is supplied with red, green, or blue-black crushed slate.

TRADE MARK



No Room for Rain or Snow to Blow in Here

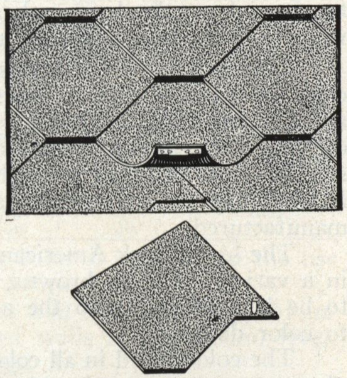
Jumbo—Made extra thick and extra large; it measures 11x15 in., and weighs 300 lb. to the square. It is packed to lay 5½ in. to the weather, 60 shingles to the bundle and 4 bundles to the square. Finished in crushed slate, red, green, blue-black, or Autumn Blend. This husky shingle builds a fine roof for the home.



Jumbo Shingle

Beaver-Lok Shingle

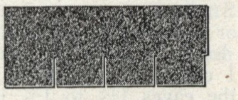
A most practical and economical shingle for re-roofing or for the new building—a real development in locked-down shingles. Provides a wide weather back and lays rapidly. Each shingle is automatically locked to the one beneath by a simple motion of laying and without bending or cutting of the shingle itself. The complete, non-rusting locking device is attached at the factory, requiring no special tools and no extra time in locking when the roof is laid. There are only 100 shingles to the square, and, though each shingle is held down in five places, only two nails are driven per shingle. And it builds a beautiful roof.



Every Metal Tab Is Stamped with the Name "Beaver-Lok" and the Beaver Trade-mark to Identify the Genuine

Vulcanite 4-in-1 Slab Shingle

Made 32 in. long and in two widths, 10 and 12½ in. Built of the same quality as other Vulcanite shingles and gives long, economical service. The 10-in. slab is packed in 2 bundles to the square, 56 shingles to the bundle, 190 lb. to the square. The 12½-in. slab is packed 2 bundles to the square, 56 shingles to the bundle, 240 lb. to the square. Surfaced in red, green, or blue-black crushed slate.



4-in-1 Slab Shingle

It is interesting to compare this with other strip shingles, as to quality

Continued on next page

Vulcanite Roll Roofings

Beaver Vulcanite roll roofings are furnished in a variety of weights and finishes to meet every requirement of cost and service. Each is put up in standard width rolls of 32 in., and in a single strip of 40½ ft., sufficient material to cover a square of roofing surface, allowing 2 in. for laps.

STAND ON END
BEAVER
VULCANITE
ROOFING
SLATE SURFACED
RED
INSTRUCTIONS FOR LAYING

Vulcanite Roll Roofing

Among others of the advertised "Six Daring Tests," that demonstrate the durability of Vulcanite, there is the scuff test which proves the permanence of the slate surfacing on this roofing

Slate Surfaced, Plain—Made of high grade rag felt and asphalt. Surfaced in red, green, or blue-black crushed slate, firmly embedded. Galvanized nails and cement included in each roll. Made in two weights: Standard, 85 lb. to the square; Jumbo, 105 lb. to the square. This is an all around roll roofing—suitable for the home, factory, barn, or any other building of a pitched roof.

Mosaic Style—Vulcanite slate surfaced rolls are also made in standard shingle design, combining the economy of roll roofing with the attractiveness of shingles. Its pattern is built up with red or green crushed slate outlined permanently with inlaid black lines going through into the base of the roofing itself. It is supplied complete with galvanized nails and cement.

Smooth Surfaced—Vulcanite smooth surfaced roll roofings are supplied surfaced in mica, talc or sand, and in weights from 35 to 90 lb. to the square. Each is tough and durable. Each gives the utmost in service per dollar of cost.

Vulcanite Sheathing

Vulcanite house sheathing is put up in rolls of 200 sq. ft., weighing 50 lb. to the roll. Vulcanite red rosin sized sheathing comes in rolls of 500 sq. ft., and in weights of 20, 25, 30, 35 and 40 lb.

Vulcanite Insulating Papers

Come in rolls of 500 sq. ft., and weights of 35 or 45 lb. Well saturated, give excellent insulation, preferred by builders.

Vulcanite Deadening Felt

Vulcanite deadening felt is of extra fine quality. It does not pack or thin down hard and lose its insulating properties against sound, when applied. Furnished in two weights, 1 and 1½ lb., in 450-sq. ft. rolls, weighing 50 and 75 lb. to the roll, respectively.

Vulcanite Roof Paints and Cements

Beaver Vulcanite Asbestos Cement and Liquid Asbestos Coating, are leaders of a complete line of Vulcanite roof cements and paints. The one is for trowel application and the other for brush, and each is used in large quantities for renewing and repairing old roofs. Asphalt roof paint, jet black roofing cement, and red and green roof paints of first quality, are other items of this line. They are furnished in containers of convenient sizes from one-pound cans to barrels.

BEAVER
VULCANITE
LIQUID ASBESTOS COATING

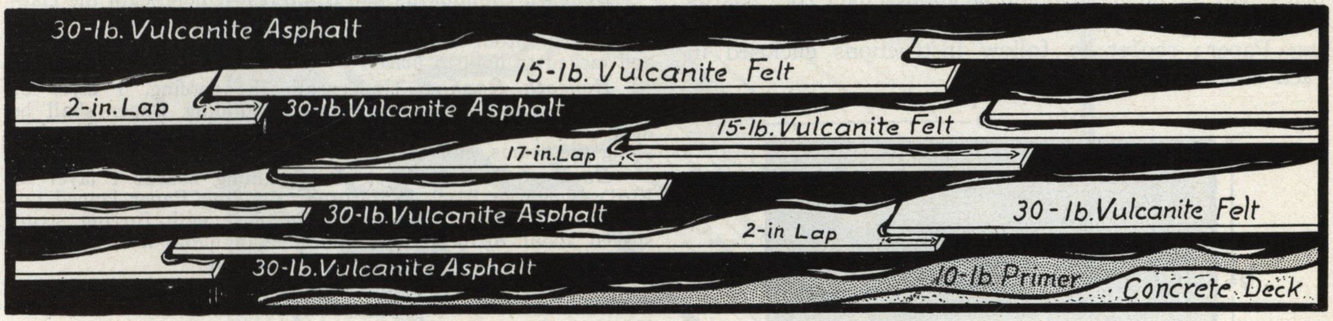
Beaver Vulcanite Liquid Asbestos Coating

The sturdy drum in which Beaver Vulcanite Liquid Asbestos Coating is supplied. Also smaller containers and barrels

Vulcanite "Built-to-order" Roofs

Vulcanite "Built-to-order" roofs include the use of the high quality Vulcanite Saturated Rag Felt and pure Vulcanite Specification Mexican Asphalt and are applied according to specifications proved by long use and approved by leading architects, builders and research laboratories. Below is illustrated Vulcanite "Built-to-order" Specification "C-75," one of a series for concrete decks. Others for wood decks will be supplied on request. These specifications have given the best of results on business and factory buildings of first importance.

Write for complete (file size) Specifications for both wood and concrete decks.



Vulcanite "Built-to-order" Specification "C-75"

BIRD & SON, inc.

Manufacturers of Roofings, Building Papers and Wall Board

MILLS AND GENERAL OFFICES

EAST WALPOLE, MASS.

CHICAGO OFFICE AND PLANT: 1472 West 76th Street

NEW YORK OFFICE: 295 Fifth Avenue

BIRD & SON, LTD.: HAMILTON, ONT.

Products

Bird's Neponset Twin Shingles, Bird's Super Twin Shingles, Paroid Roofing, Neponset Board, Neponset Black Building Paper.

Experience and Facilities

Bird & Son, inc., was established in 1795, and after years of experience in the manufacture of paper, the company was one of the pioneers in turning its efforts to the manufacture of waterproof building paper and felt roofing.

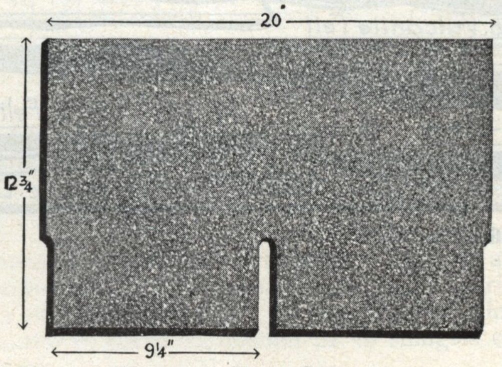
The highest quality of materials is maintained through the most up-to-date machinery and methods and a highly efficient personnel. The several mills of the company provide for prompt shipment anywhere.

Bird's products have been distributed and applied to buildings of every description throughout the world and have long been known to be of the highest grade.

Neponset Twin Shingles

Neponset Twin Shingles are extra high grade. The depth of 12¾ inches gives 3 full layers of coverage with ¾-inch overreach to catch the nailing of the second higher course. The arched cut-out (a distinctive Bird feature) prevents tearing at the point of nailing.

Weight, a full 250 pounds per square, packed in 4 bundles of 45 shingles each. Red, green and blue-black slate surfacing. Should be applied over roof boards laid close together, sheathed with Neponset Black Building Paper; roofer to follow instructions enclosed in each bundle of shingles.



Neponset Twin Shingle

Bird's Super Twin Shingles

An extra heavy twin shingle combining the features of Neponset Twins with extra weight and massive appearance. 12¾x20 inches.

Paroid Roll Roofing

Paroid Roll Roofing is of the highest quality, with a special talc surfacing of bright gray color. It comes in rolls of either 108 or 216 square feet, with lap cement and nails. Made in two weights —55 pounds and 65 pounds per square. Roofer should apply according to directions in each roll.

Neponset Black Building Paper

Neponset Black Building Paper has been known and specified by architects for years as a waterproof building paper of the highest grade. A strong bodied paper thoroughly saturated with asphalt, protected with asphaltic coating on both sides, giving an absolutely waterproof paper. Recommended particularly for use:

(1) Under all kinds of roofing.
(2) Behind clapboards and shingles or stucco on the walls of buildings.
(3) Between floors.
(4) Between double floors that extend over an open porch.
(5) Within walls of house, store or factory in place of backplaster.
(6) For cellar lining.
(7) For cold storage work.

Put up in rolls 36 inches wide containing 500 square feet, weighing 50 pounds per roll.

Specifications for use of Bird's Neponset Black Waterproofing Building Paper—

Beneath Clapboards and Shingles—Underneath the clapboards or shingles shall be applied 1 layer of Bird's Neponset Black Waterproof Building Paper, lapped not less than 2 inches and tacked to hold in place.

Beneath Roofing—Underneath the roofing, 1 layer of Bird's Neponset Black Waterproof Building Paper shall be applied; paper to be lapped not less than 2 inches and tacked along the seams, sufficient to hold in place.

Back of Stucco—Over the sheathing boards 1 layer of Bird's Neponset Black Waterproof Building Paper lapped not less than 2 inches. Hold paper in place with furring strips spaced about 16 inches on center. Nail metal lath firmly to furring strips and apply stucco to the lath.

Beneath Double Floors—Between the double floors or underneath the parquetry shall be placed 1 layer of Bird's Neponset Black Building Paper. Paper to be lapped not less than 2 inches and tacked sufficiently to hold in place.

Neponset Wall Board, Cream White Finish

Neponset Board is a high grade laminated fibre board that will not chip or crack. The finish is a beautifully embossed cream white surface thoroughly moistureproofed. The reverse is a tan color, waxed to keep out moisture. The cream white surface may be painted for any desired effect. Neponset Board comes in sheets 32 or 48 inches wide, 7 to 12 feet long. Nailhole positions are indicated by dents along the edge of the boards.

Continued on next page

Bird's Paroid Built-Up Roof

Bird's Paroid *Built-Up* Roof, built up of successive layers of asphalt felt, asphalt compound applied hot, and Paroid Cap Sheet, gives a heavy, impenetrable mass of absolutely weatherproof materials, capped with the well-known Paroid Smooth Surfaced Roofing. There is no slag or gravel to fall off and clog the gutters.

The illustration and specification which follow are for the most usual type of Paroid Built-Up Roof over sheathing board. We will furnish on request specifications as follows:

(1) Bird's Paroid Built-Up Roof, light, over sheathing boards.

(2) Bird's Paroid Built-Up Roof, standard, over sheathing boards. (See specification below.)

(3) Bird's Paroid Built-Up Roof, extra heavy, over sheathing boards.

(4) Bird's Paroid Built-Up Roof, light, over non-combustible roof decks.

(5) Bird's Paroid Built-Up Roof, standard, over non-combustible roof decks.

(6) Bird's Paroid Built-Up Roof, extra heavy, over non-combustible roof decks.

Specifications for Bird's Paroid Built-Up Roof, Standard for Application over Sheathing—

Preparation of Sheathing—The roof shall be laid upon seasoned sheathing preferably tongued and grooved, not over 6 inches in width. All rubbish and uneven places shall be removed from the roof by the contractor preceding the roofer. The ends of all sheathing shall rest on rafters or purlins, properly nailed and secured. The sheathing shall be reasonably free from knots and holes, and where holes do occur these shall be covered with metal securely nailed. The roof shall be properly graded to outlets and all drainage connections set to permit the free flow of water. All this work to be done by the general contractor preceding the roofing contractor. Triangular wood strips about 2 inches high shall be installed by owner or general contractor in all angles formed by the roof and a vertical surface.

Flashings—All brick or concrete walls, etc., shall be primed with Bird's Asphalt Primer before flashing with the roofing material. Where not otherwise shown on plans, walls and all elevations above the roof such as skylights, curbs, etc., shall be flashed at least 6 inches high. The flashings to be built up in the same manner and of the same material as the roof itself. Flashings shall be reinforced by a base flashing of Bird's Cap Sheet 9 inches wide, mopped 6 inches up the wall and 3 inches on the roof. An approved metal counterflashing shall extend down over the wall flashing at least 4 inches, and where pipes, vents, etc., come through the roof, they shall be flashed with a lead collar, both to be furnished and installed by the general contractor or owner.

Material—Materials required per 100 square feet of completed roof surface—gross weights:

2 layers Bird's 14-lb. Asphalt Felt (36-inch width)	31 pounds
2 layers Bird's Built-Up Roof Compound	50 pounds
1 layer Bird's Paroid Cap Sheet (coated one side only, 36-inch width)	37½ pounds
Flexible extra large head Roofing Nails (⅞ inch long)	1 pound
Total weight of finished roof	119½ pounds

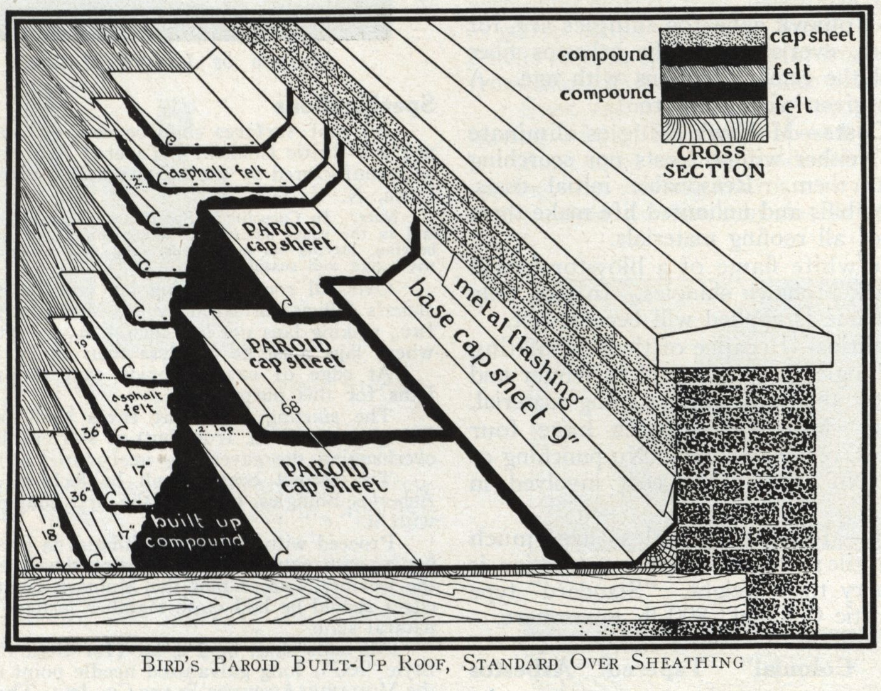
The quantities above stated do not include the material necessary for flashings nor do they include wastage.

Note: Many roofers recommend the use of a layer of sheathing paper to be used next to the sheathing boards. This is especially good over roof boards that contain pitch or sap.

Application—First: A sheet of Bird's Asphalt Felt 18 inches wide shall be laid along the lowest edge of the roof. This felt shall be mopped with Bird's Compound heated to not less than 400° F. and while hot a second sheet of asphalt felt 36 inches wide shall be rolled into same. Similarly succeeding sheets of asphalt felt 36 inches wide shall be laid lapping each sheet 19 inches until the surface of the roof shall be covered with two layers of asphalt felt mopped together with hot compound, so that felt does not touch felt. Flexible large head roofing nails shall be used, nailing 4 inches apart along the lower edge of each sheet, as applied.

Second: The Bird's Asphalt Felt along the lower edge 36 inches wide shall be mopped with Bird's Compound heated to not less than 400° F. and while hot a sheet of Bird's Paroid Cap Sheet 36 inches wide rolled into same. The cap sheet must follow mop closely to insure a perfect bond. In a similar manner the second and succeeding sheets of Bird's Cap Sheet 36 inches wide shall be mopped in, overlapping the preceding sheet 2 inches. All cross laps of the cap sheet shall be mopped and lapped 4 inches.

The surfaced side of Bird's Cap Sheet shall be laid to the weather.



Bird's Paroid Built-Up Roof, Standard Over Sheathing

MOHAWK ASBESTOS SLATE CO., INC.

Manufacturers of Tapered Asbestos Shingles

FACTORY
ONEIDA, N. Y.
OFFICES: UTICA, N. Y., and 120 East 41st Street, NEW YORK, N. Y.
DISTRIBUTERS IN ALL PRINCIPAL CITIES

MOHAWK
TAPERED
ASBESTOS SHINGLES

Products

Tapered Asbestos Shingles, "Rustic Colonial" and "Standard" Types. Extra Heavy and Random Widths on specification.

Asbestos Ridge Roll, or shingles, for hip and ridge.

Materials Used in Manufacture

Mohawk Tapered Asbestos Shingles are made of pure asbestos fiber and best grade portland cement, compressed by a patented process which gives them their distinctive features. Colored with pure iron oxide.

Distinctive Features of Mohawk Tapered Asbestos Shingles

Beauty—Mohawk shingles impart a beauty to a roof that is exceeded by no other roofing material. They are tapered like wood shingles (an exclusive feature for asbestos shingles) with heavy butts that cast a desirable natural shadow line. Their surface is rough with a pleasing age-weathered appearance. In the "Rustic Colonial" type shingles this effect is still further increased by hand roughing the butt, giving each shingle an absolutely individual appearance.

Variety in Colors—Mohawk shingles come in the following shades, which lend themselves to many attractive color combinations: gray, dark gray, purple, buff, brown, red and black. All are sufficiently restrained so that they do not dominate the residence or other building upon which they are used.

Permanency—Mohawk asbestos shingles are, for all practical purposes, everlasting. The asbestos fiber is indestructible and the cement hardens with age. A written guarantee is given with every roof.

Low Upkeep Costs—Mohawk shingles eliminate roof upkeep bills. Neither winter frosts nor scorching summer heat affects them. Reasonable initial costs, elimination of upkeep bills and unlimited life make them the least expensive of all roofing materials.

Fireproof—The white flame of a blowtorch will neither burn nor crack Mohawk shingles. In fact, only the spot where the flame is applied will become hot.

Insulating Qualities—Because of their insulating qualities Mohawk shingles keep out cold in winter and heat in summer better than any other roofing material.

Easy to Apply—Mohawk shingles have four countersunk nail holes, ready to apply. No punching or sorting necessary. No extra labor cost involved in their use.

Light Weight—Mohawk shingles are much lighter than slate or tile; ordinary roof construction is strong enough to carry their weight. "Standard" type average 650 lb., "Rustic Colonial" 800 lb. per square.

Mohawk "Rustic Colonial" Tapered Asbestos Shingles

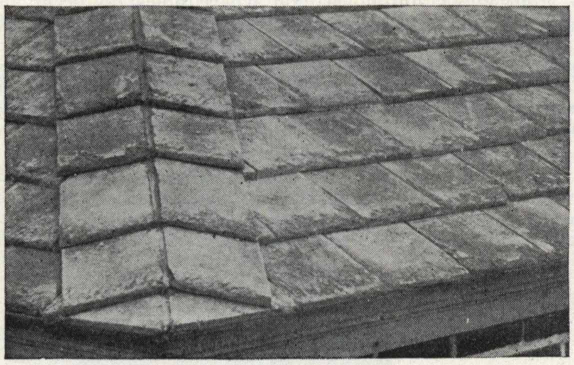
Every shingle is tapered and hand finished along the weather edge to give it a rustic, weather-aged appearance. Made 8x16 in. with heavy butt 5/8 in. thick. When laid 7 in. to the weather 260 shingles are required per square. Average weight, 800 lb. Colors: gray, dark gray, purple, buff, brown, red and black.

Mohawk "Standard" Tapered Asbestos Shingles

Tapered, with thick butt, producing an artistic shadow line. Made 8x16 in., 3/8 in. thick at butt. When laid 7 in. to the weather 260 shingles are required per square. Average weight per square, 650 lb. Colors: gray, dark gray, purple, buff, brown, red and black.

Mohawk Asbestos Hip and Ridge Roll

Made of same materials as the shingles, and in same colors; sections 16 in. long. 93 sections of ridge roll cover 100 lin. ft. of ridge or hip.



Method of Laying Mohawk Shingles

Specifications

All roof surfaces shall be covered with Mohawk ["Standard"] ["Rustic Colonial"] Tapered Asbestos Shingles, 8x16 in., as manufactured by the Mohawk Asbestos Slate Co., Inc., of Utica, N. Y.

Note: In Carpenter's Specification specify that roof boards shall be laid in the usual manner, breaking joints and nailing securely at every bearing, leaving no loose ends. All roof sheathing shall be of narrow width and well seasoned.

Over all roof sheathing lay one thickness of good quality slater's felt as furnished by the Mohawk Asbestos Slate Co., Inc., making laps not less than 4 in., except on hips and valleys, where laps must be not less than 10 in.

At edge of eaves provide cant strips, using 3/8-in. thick laths for this purpose.

The starting course at eaves shall be Mohawk Asbestos Shingles, cut 11 in. from butt as starters, laid parallel with and overhanging the eaves 1½ in.

The second course shall be 8x16-in. Mohawk "Tapered" Asbestos Shingles, covering the first course and breaking joints with it.

Proceed with laying the shingles in precisely the same manner as with natural slate, exposing the asbestos shingles 7 in. to the weather, except that the Mohawk Shingles having bevelled edges should be laid close together instead of separated as with natural slate.

All nails shall be 1¼ in. (for Style "A") or 1½ in. (for Style "RC") long galvanized needle point nails as furnished by the Mohawk Asbestos Slate Co., Inc. The nails shall be driven flush with the asbestos shingle surface, but not down too tight.

For all hips and ridges provide Asbestos Ridge Rolls as manufactured by the Mohawk Asbestos Slate Co., Inc.

THE PHILIP CAREY COMPANY

Manufacturers of Asfaltslate Shingles

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

FACTORIES: LOCKLAND. OHIO, AND PLYMOUTH MEETING, PA.

Products

Carey Shingles.

For Waterproofing and Dampproofing, see pages 96-97; for Expansion Joints, see page 571; for Built-up Roofing, see pages 1042-1045; for Pipe Coverings, see pages 2280-2281.

Carey Shingles

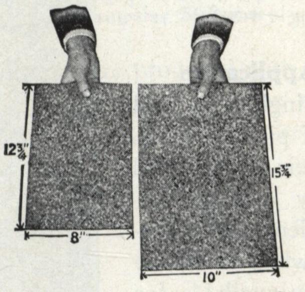
Asfaltslate, Standard, Asbestos, Strip Shingles, and Asbestos Strip Shingles are produced in the same factories from the highest obtainable grades of material.

Carey Asfaltslate Shingles—Composed of a heavy rag felt base, thoroughly saturated with a highly refined asphalt saturant and coated on both sides with a uniform layer of pure asphaltic cement.

Carey shingles are surfaced with a uniform layer of natural crushed slate thoroughly rolled into the hot coating under roller pressure.

Asfaltslate shingles are made in two sizes—8x12¾ in. and 10x15¾ in. The regular size is laid 4 in. to the weather, and weighs, approximately, 245 lb. per square. The large size is exposed 5 in. to the weather and weighs, approximately, 300 lb. per square.

Carey Standard Shingles—Similar to regular size Asfaltslate shingles, except that they are lighter in weight, weighing 235 lb. to the square.



Large Size Carey Asfaltslate Shingles Compared with an Ordinary Size Shingle

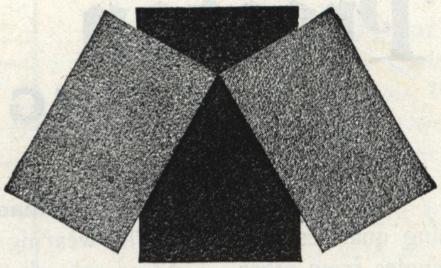
Carey Asbestos Shingles—Built upon an exceedingly heavy asbestos felt base, thus insuring an exceptionally fire resisting shingle. Size 8x12¾ in., approximate weight, 245 lb. per square.

Carey Strip Shingles—Made to represent 4 shingles. Are laid exposing 4 in. to the weather. Made in two sizes—32x10 in. and 32x12½ in. Weight, approximately, 190 and 240 lb. per square, respectively.

Carey Asbestos Strip Shingles—Made on an extra heavy asbestos base. Size—32x10 in. Weight, approximately, 210 lb. per square.

Carey SHINGLES

TRADE-MARK



Carey Shingles

Furnished in three colors
Red, green and blue-black

Package

Carey individual shingles are packed in bundles containing one-eighth square, or metal strap packages containing one-quarter square. One square of shingles packed for shipment occupies 7 cu. ft. of space. Carey strip shingles 32x10 in. are packed two bundles per square; 32x12½, three bundles per square.

Official Approval

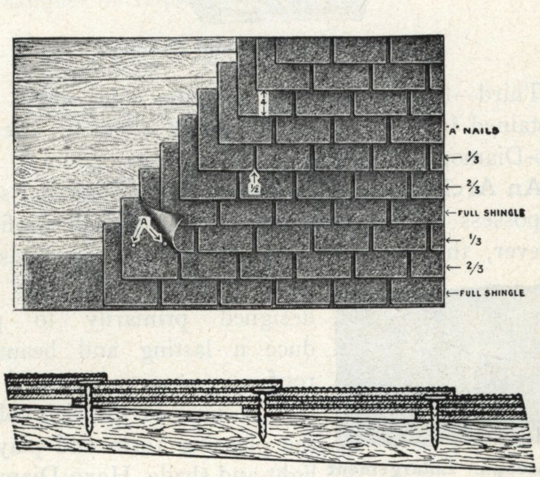
Carey shingles are tested and approved by the Underwriters' Laboratories, Inc. The asbestos shingle carries the underwriters' Class "B" label, while all other Carey shingles bear the underwriters' Class "C" label.

Specifications

Shingles shall be Carey (state brand here) shingles, and shall be delivered on the job in packages bearing Carey labels. Sheathing boards must be thoroughly dried, not over 6 in. wide and laid parallel with eaves. Line valleys with valley lining, 18 in. wide, nailing 4 in. in from either side (nails 12 in. apart); do not nail in center. Lay 9-in. wide starter strips along eaves, extending over ½ in. Nail 1 in. from lower edge, nails 6 in. apart. Begin with full sized shingle parallel to and flush with outer edge of roof, lower end flush with lower edge of starter strips. Use large headed 1-in. galvanized nails, 2 nails to each shingle, 4½ in. from lower end and 1 in. from sides. Allow ½ in. space between shingles.

Start second row using two-thirds width shingle, leaving 4 in. of first row exposed.

Start third row using one-third width shingle, same spacing. In starting fourth row use a full size shingle and continue as shown in sketch below.



Method of Applying Carey Asfaltslate Shingles

KEYSTONE ROOFING MANUFACTURING CO.

Manufacturers of Preston Asphalt Shingles and Roll Roofing

YORK, PA.

DISTRIBUTION THROUGH REGIONAL DISTRIBUTERS AND THEIR REPRESENTATIVES

Preston
ROOFING

Products

Individual Slate Surfaced Asphalt Shingles, in Hexo-Diamond and Rectangular Shapes.

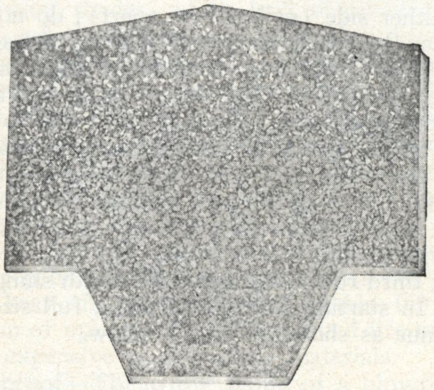
Roll Roofing, Slate or Talc Surfaced.

Preston Hexo-Diamond Shingles

Briefly, there are three outstanding qualities that distinguish Preston Hexo-Diamond shingles from other makes of asphalt shingles:

First—their unusual thickness, which is practically a solid body of asphalt.

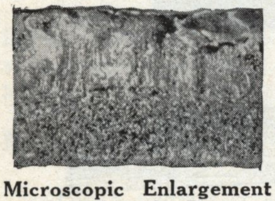
Second—the Hexo-Diamond design, which gives double thickness at the butts, creates the definite shadow line demanded by architects for high grade work.



Preston Hexo-Diamond Shingle

Third—the unusual and pleasing color effect that is obtained by the use of the sunset blend of Preston Hexo-Diamond shingles.

An Architectural Product—Hexo-Diamond shingles possess the inherent economy of asphalt roofings. However, they are not manufactured on a basis of price competition; they are designed primarily to produce a lasting and beautiful roof.



Microscopic Enlargement of the Edge of a Preston Shingle

Because of the rich colors, the pleasing form and play of light and shade, Hexo-Diamond shingles lend themselves to a variety of architectural treatments. They add a note of distinctiveness to roofs where formerly, on account of price consideration, it was considered impossible.

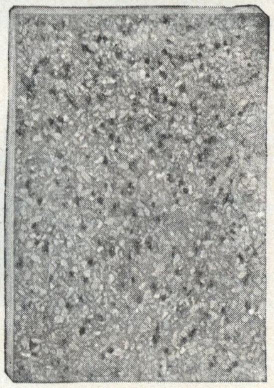
Used for Permanent Roofs

The wearing qualities of Preston shingles are dependent not only on the quality, but also on the quantity of asphalt which each shingle contains.

If you examine the edge of a Preston shingle you will notice that it is practically a solid body of asphalt.

This feature of Preston shingles accounts for their remarkable wearing qualities.

Moreover, the thickness of Preston shingles is unusual. The "Extra Heavy" weight is, approximately, as thick as a Standard No. 1 slate shingle, while the "massive" weight is much thicker than other asphalt shingles and, approximately, one-third thicker than a Standard No. 1 slate shingle. This unusual thickness of asphalt explains the permanence of Preston shingle roofs.



Preston Rectangular Shingle

Universal in Application

Preston shingles are used for all sorts of pitched roofs. Because of their beauty and durability, they can be employed for residences of a pretentious type, while their low cost makes them available for simple bungalows and cottages.

The Sunset Shade

The natural colors of slate and stone particles are blended in the Preston Sunset shade to produce a continual, intriguing play of color. The effect is like the soft warm shades of an autumn hillside.

Every roof laid with Preston Sunset shade is individual.

There is no assorting of colors necessary and no possibility of discord in the color combinations.

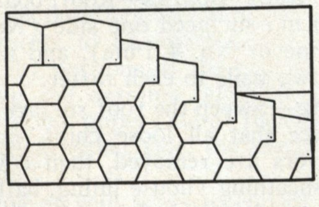
Continued on next page

Three Other Colors

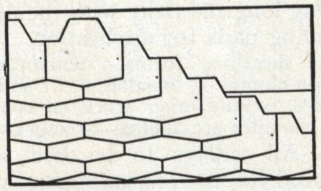
In addition to the Sunset shade, Preston shingles are produced in three solid colors—red, blue-black and green. All Preston colors are produced from crushed slate and stone, and hence are permanent.

Preston Roofing Is Easy to Lay

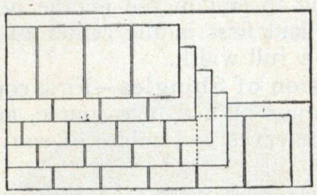
Preston Hexo-Diamond shingles can be laid two ways. With the points upward, a series of hexagons is formed; with the points down, an entirely different pattern is produced. The roof then gives a thatched effect. Both patterns are produced with the same number of shingles. In both patterns the roof is covered with two or more thicknesses of shingles over its entire surface.



Hexo-Diamond Shingles Laid with Points Up



Hexo-Diamond Shingles Laid with Points Down



Rectangular Shingles

Methods of Applying Preston Hexo-Diamond and Rectangular Shingles

Preston Hexo-Diamond shingles are self-spacing. Any one experienced in applying ordinary shingles will find them extremely simple to lay.

Grades and Weights of Preston Roofing

The following grades of roll roofing and shingles comprise the lines of Preston Roofing:

GRADES, WEIGHTS AND COLORS OF HEXO-DIAMOND SHINGLES

Grade	Approx. wt. per square, lb.	Colors
Heavy standard	250	Red, blue-black, sunset, green
Extra heavy	350	Red, blue-black, sunset, green
Massive	500	Red, blue-black, sunset

Extra heavy weight is, approximately, as thick as a Standard No. 1 slate shingle. Massive weight is approximately one-third thicker than a Standard No. 1 slate shingle.

Rectangular Shingles—Preston Rectangular shingles are made in two weights, Extra Heavy and Massive. Sizes, 10x15½ in., 280 shingles to the square, laid 5 in. to the weather, ¼-in. spacing. We wish to call especial attention to the size of Preston Rectangular shingles.

When laid 5 in. to the weather, the entire roof is covered with not less than two thicknesses.

Approximate weight of Extra Heavy Shingles, 350 lb. per square. Approximate weight of Massive Shingles 500 lb. per square.

Talc Surface Roofing—Put up in rolls containing 108 sq. ft.

A sufficient quantity of nails and cement are included in each roll for laying.

APPROXIMATE WEIGHTS OF TALC SURFACE ROOFING

No.	Approx. weight lb. per 108 sq. ft.
35	35
45	45
55	55
65	65
75	75

No. 35 is for temporary use; No. 45 for light construction

Slate Surface Roofing—Put up in rolls containing 108 sq. ft. in colors: red, green and blue-black. Approximate weight, 90 to 95 lb. per 108 sq. ft.

Sufficient quantity of nails and cement included in each roll for laying.

We shall be glad to supply additional information and samples on request.

ESTABLISHED 1868 INCORPORATED 1901

THE H. M. REYNOLDS SHINGLE COMPANY

Originators of the Asphalt Shingle

GRAND RAPIDS, MICH.

Products

- Reynolds Individual Shingles.
- Titan Shingles.
- Multiple (Strip) Shingles.
- Mineral Surfaced Roll Roofings.

All Reynolds Products are made in Red, Green and Blue-black Slate Colors; Individual Shingles, and Roll Roofings also made with Green Rock Surfacing.

Reynolds Individual Shingles

These are made in 8x12½-in. size, packed 106 shingles to the package, 4 packages to the square, or 424 individual shingles. When laid 4 in. to the weather, and ½ in. apart, will cover 100 sq. ft. surface measure. They usually weigh from 250 to 260 lbs. per square.

Titan Shingles

These are made in 10x16-in. size, packed 67 shingles to the package, 4 packages to the square, or 268 individual shingles. When laid 5 in. to the weather, and ¾ in. apart will cover 100 sq. ft. surface measure. They weigh approximately 300 lbs. per square.

10-inch Multiple (Strip) Shingles

Standard weight strips, 4-tab style. Cutouts, 4x¾ in. Tabs, 8¼ in. between cutouts. Strips are 36 in. long; 100 strips to the square; 2 bundles to the square; 5 nails to the strip. Red, green or blue-black.

12½-inch Multiple (Strip) Shingles

Made with 4 tabs to the strip. Strips are 36 in. long; 100 strips to the square; packed in 3 bundles; 5 nails to the strip. To be laid 4 in. to the weather.

Mineral Surfaced Roofings

All mineral surfaced roofings are made in 36-in. width, furnished regularly with galvanized nails and cement for application. Can be furnished on specification with Pyramid Kaps and nails for application. All roofings furnished in plain sheets without selvage edge. Sufficient roofing in each roll to cover 100 sq. ft. surface measure. All roofings usually weigh from 80 to 90 lbs. per roll.

Fire-safe

Reynolds products have proven themselves to be fire retardants, and are approved by the Underwriters' Laboratories, Inc., and obtain a preferred insurance rating.

Guarantee

Reynolds shingles when laid in accordance with printed directions, are guaranteed for a period of ten years.

Specifications for Applying Reynolds' Individual Shingles

Note: This same specification can be used for applying Reynolds' Titan Shingles, with the exception that these shingles are to be laid 5 in. to the weather and ¾ in. apart.

APPROVED BY THE TRADE MARK H.M.R. ESTABLISHED 1868 UNDERWRITERS LABORATORIES

Colors—The roof to be covered with H. M. Reynolds Individual (color as selected: Green Rock, Green Slate, Red Slate, or Blue-black Slate) Shingles, according to the following specifications:

Roof Boards—Roof boards to be well seasoned, 1x6 in., surfaced one side (No. 1 Fir, No. 2 Fir, No. 3 Pine or No. 4 Pine), and are to be nailed with at least two nails to each rafter.

Sheathing—Sweep the roof surface clean. Inspect carefully to see that all loose chips, protruding nails, knots and slivers are removed, then cover entire roof surface with sheathing (house lining, half-ply sheathing, 15 or 30-lb. asphalt felt). Line all valleys first, using a full width sheet, then cover the roof surface, applying all sheathing longitudinally with the deck. Use ⅞-in. large head roofing nails for application.

Note: The sheathing forms a temporary roof until all masonry work on chimneys, installation of soil pipes, all stucco work on dormers, or any other work on roof has been completed, then the shingles are applied directly over the sheathing.

Valleys—All valleys to be laid with Reynolds' Mineral Surfaced Roofing, harmonizing in color with the shingles used. It shall be laid in two thicknesses. The roll roofing, which is thirty-six (36) in. wide, is to be split from end to end in the middle of the sheet and a half width laid first in the center of the valley and covered with a full width.

Application of Shingles—First course of shingles at the eaves must be a double course, and is to extend ⅜ in. over the eaves and gables of roof, so as to form a drip edge.

After the double course has been completed, start applying shingles, using a one-third shingle to start on the first course, a two-thirds on the second course, and a full shingle on the third course and continue in the same manner alternating one-third, two-thirds and full over the entire roof. Always lay shingles 4 in. to the weather, and ½ in. apart.

Courses are to be kept straight and true. This can be accomplished by the use of a straightedge, or a chalk line. Do not drive nails through exposed portion of shingles to support staging.

Ridges and Hips—Cover all ridges and hips with Reynolds Shingles in the same color as the roof. Shingles to be laid in full width in a straight line along the ridges and hips, exposing 4 in. to the weather, nailing them firmly about 1 in. from the edge.

Nails—Use galvanized nails made from No. 12 steel wire, from 1 to 1⅛ in. long, with 5/16-in. heads. Two nails must be used in each shingle, placing them as near 4½ in. from the lower end as possible, and about 1½ in. from edges of shingle.

Gables and Eaves—Care to be taken to have the edges of the shingles at the gables and eaves in a straight line.

Metal Flashings—All flashings around chimneys, sidewalls, dormers and vent pipes to be [..... oz. cold rolled copper] [..... gauge galvanized iron] [..... gauge Old Style Tin]. For making up to brick walls, the base flashings to be at least 8 in. wide and the length

Continued on next page

of the shingle. The pieces bent so that one portion projects at least 4½ in. over the roofing, and the other 3 to 6 in. up the wall. Make the pieces fast by nailing along the upper edges into joints in the brickwork. The counterflashing to overlap the base flashing at least 2 in. The upper edge set into a joint in the brickwork in a raggle.

For making up to clapboards, use a strip of metal that will cover the shingles at least 4½ in., and extend up under the clapboards.

The sides of the chimneys to be flashed in the same manner as the walls. The upper side to be finished with a single sheet of metal bent so as to extend under the shingles for a distance of 12 in. and up the side of the chimney at least 6 in. The lower side finished in the same manner with flashing over the shingles. The upper edges of the sheets to be inserted into a joint in the brickwork and the portions of the roof to be made fast with nails along the extreme outer or covered edges. Build a saddle on the upper side of the chimney so as to throw the water on either side, the metal being formed over the saddle.

The flashing at vent pipes to consist of a sheet of metal 18 in. square with a hole cut to fit over the vent pipes. To this piece, fit, rivet and solder a collar which will fit closely around the pipe and extend up the pipe to near the top and counterflashed. The sheet to fit under the shingles above the pipe and over the shingles below the pipe. The sheet to be held in position by nails driven through the covered edges.

Care of Roof Covering

Do not do masonry or stucco work after shingles have been applied without first covering shingles with heavy felt paper.

Do not drive nails in the exposed portion of the shingle.

Do not walk on roof except when it is absolutely necessary.

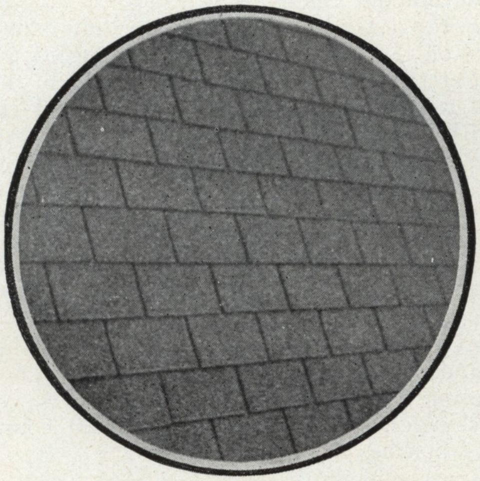
Do not drop tools, lumber, or other building materials on the finished roof.

Do not apply metal flashing (galvanized iron or Old Style Tin) until both sides are well painted, using good grade linseed oil paint.

Do not figure roof is complete until it has been swept clean, removing all pieces of shingles, loose nails and other refuse.

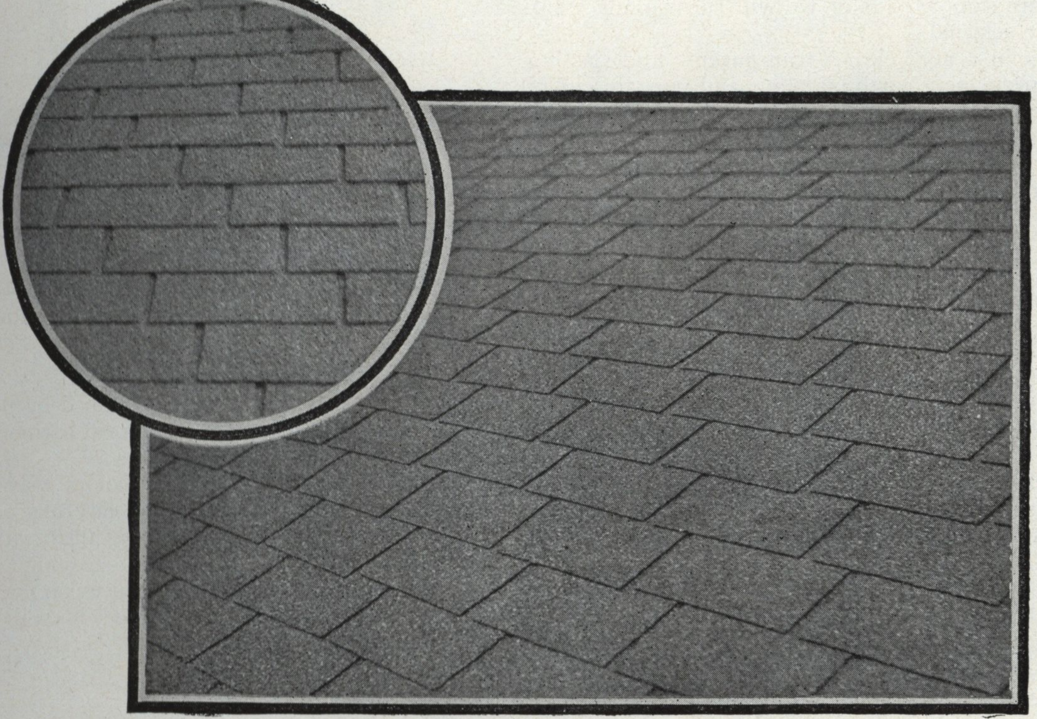
Architects' Abbreviated Specifications

The roof to be covered with H. M. Reynolds Individual (color as selected) Shingles, in accordance with THE H. M. REYNOLDS SHINGLE COMPANY's printed specifications as of June 1, 1923.



A 15-YEAR OLD REYNOLDS ROOF

Actual photograph of Reynolds shingles after 15 years of service. Note the uniform appearance and flat-laying quality of the shingles. An excellent roof, weatherproof, fire resisting, durable and beautiful



CLOSE-UP OF A 10-YEAR OLD REYNOLDS ROOF

Photographs showing close-up views of the Reynolds individual shingle roof on the office building of THE H. M. REYNOLDS SHINGLE COMPANY. This roof is ten years old, and the shingles look as though just recently applied

BARCREST COMPANY

Manufacturers of Barcrest Stained Shingles

3201 Bellevue Avenue
DETROIT, MICH.

Products

BARCREST CREOSOTED STAINED SHINGLES.

BARCREST CREOSOTE STAINS for red cedar shingle roofs and sidewalls.

Barcrest Stained Shingles

Barcrest stained shingles bear our trade-mark stamped on the bandstick of each bundle.

Barcrest XXXXX 16-in. length, 5/2-in. thickness, random widths, are individually dipped and creosoted using 100% vertical grain and 100% clear red cedar shingles. They are packed 20/20 courses per bunch, 4 bunches to the square.

Barcrest Royals 24-in. length, 4/2-in. thickness, random widths, are individually dipped and creosoted using 100% vertical grain and 100% clear red cedar shingles. They are packed 13/14 courses per bunch, 3 bunches to the square.

Barcrest Perfections 18-in. length, 5/2¼-in. thickness, random widths, are individually dipped and creosoted using 100% vertical grain and 100% clear red cedar shingles. They are packed 20/20 courses per bunch, 4 bunches to the square.

Barcrest Colors and Stains

Barcrest Stains are made from colors ground in our own factory using our own formulas.

Any color or range of colors may be selected from our miniature sample pads or we will furnish any colors that may be selected.

The colors are clear, transparent and lasting. Strongest, permanent earth pigments and pure linseed oil and deodorized creosote are used in the manufacture of Barcrest stains.

Many architectural effects and pleasing color combinations may be secured by combining several of our colors.

Process of Treating Barcrest Stained Shingles

Barcrest stained shingles are creosoted and color-treated by our exclusive process insuring uniformity and lasting of color. Each shingle is individually dipped and then bundled ready for use.

Barcrest stained shingles are carefully graded, closely packed and rigidly inspected after being thoroughly creosoted and color-treated. They will not curl up but lie flat on the roof, giving many years of service.

Barcrest Information for Specification Writers

A short and definite way of specifying Barcrest stained shingles is furnished below so that architects, lumber dealers, contractors and owners may be assured that Barcrest stained shingles will be furnished as intended. Barcrest stained shingles and stains have a reputation second to none manufactured anywhere.

Barcrest Royals stained shingles color No..... as selected by the........, 24-in. length, 4/2-in. thickness, random widths, to be laid 10 in. to the weather for sidewalls. (For roofs we advise a lesser exposure.)

Barcrest Perfections stained shingles color No..... as selected by the........, 18-in. length, 5/2¼-in. thickness, random widths, to be laid 5½ in. to the weather for roofs. (For sidewalls a wider exposure is used.)

Barcrest XXXXX stained shingles color No..... as selected by the........, 16-in. length, 5/2-in. thickness, random widths, to be laid 5 in. to the weather for roofs. (For sidewalls a wider exposure is used.)

Covering Capacity

One square of Barcrest XXXXX stained shingles, 16-in. length, will cover 100 sq. ft. of roof surface at 5-in. exposure.

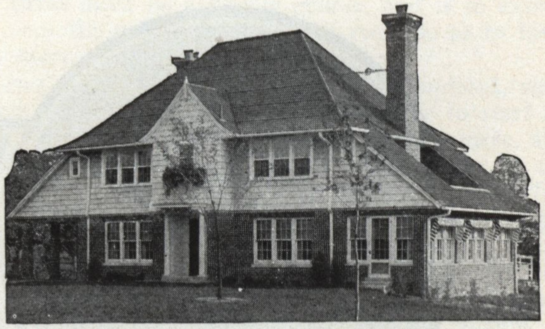
On sidewalls one square of Barcrest XXXXX will cover 120 sq. ft. laid at 6-in. exposure to the weather.

One square of Barcrest Perfections stained shingles, 18-in. length, will cover 100 sq. ft. of roof surface at 5½-in. exposure.

On sidewalls one square of Barcrest Perfections will cover 136 sq. ft. laid at 7½-in. exposure to the weather.

One square of Barcrest Royals stained shingles, 24-in. length, will cover 100 sq. ft. of sidewall surface laid at 10-in. exposure to the weather.

On roofs one square of Barcrest Royals stained shingles will cover 75 sq. ft. laid at 7½-in. exposure to the weather.



Residence with Barcrest Shingle Roof

Barcrest Variegated Roofs

A rich, soft roof may be obtained by using a number of different shades of Barcrest harmoniously combined in a roof.

Any number of different colors may be selected to be packed in the same bundle, carefully assorted, saving any extra labor cost in laying them on the roof or sidewalls.

This method of packing assures an even color texture for the roof or sidewalls and adds a distinctive and pleasing mottled effect.

Barcrest Samples

Samples of Barcrest stained shingles will be sent for the asking or estimates will be promptly furnished from plans sent us.

Write for a list of a few Barcrest shingled homes.

SAMUEL CABOT, INC.

Stained Shingles

141 Milk Street
BOSTON, MASS.

For Branch Offices and Agencies, see page 1726

Products

CABOT'S CREOSOTE-STAINED SHINGLES.

For Building Insulation, see pages 1342-1343; for Paints, Stains and Wood Preservatives, see pages 1726-1727.

Cabot's Creosote-stained Shingles

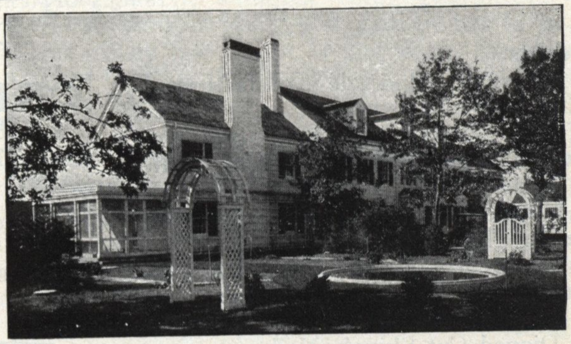
Description—The highest grade red cedar shingles, conforming to the strictest specifications of the Shingle Manufacturers Associations, ready-stained with Cabot's Creosote Shingle Stains.

Sound live wood; uniform thickness; straight grain; even butts; do not warp or curl. Thoroughly preserved by complete immersion in Cabot's Creosote. Sold in original bundles, as packed at the mill, guaranteeing full count. The warmest, the most economical and the most picturesque house finish.

Covering Capacity—Covering capacity per square of Cabot's Creosote-stained Shingles at all the different exposures commonly used, shown in table.

Standard Colors—*Weathering Browns*—Give the weatherbeaten brown effect under action of the weather.

Light and Dark Bungalow Browns, Bark Brown, Warm Brown; Light and Dark Tile Reds, Maroons, etc.—A complete range of these handsome and durable colors for roofs and walls.



Roof Stained with Cabot's Creosote Stains, Walls and Chimney with Cabot's Old Virginia White

CHARLES A. PLATT, Architect, New York

24-in.
Royals
18-in.
Perfections
16-in. XXXXX

Cabot's Creosote Stained Shingles

Light, Dark and Medium Moss-Greens and Silver and Weathered Grays—Our moss greens have a richness and depth of color such as can only be produced by the strongest and purest pigments. Our grays range from the shimmery silver-gray to the darker and beautiful seashore grays.

White Shingles—Cabot's Shingles are also furnished ready-stained with No. 1166 White Primer, to be finished after the shingles are laid, either with (1) a brush coat of No. 1166, (2) one or two brush coats of Cabot's Old Virginia White or (3) one or two coats of Cabot's Double-White. See pages 1726-1727 for description of these materials.

Blended Roofs—Every variety of blended or variegated roof coloring easily produced in Cabot's Stained Shingles.

Samples—Samples of standard colors sent on request.

Deliveries—Prompt deliveries from staining plants in Boston, Chicago, Baltimore, Newark, New Rochelle, Dayton, Cleveland, Los Angeles, etc., and from warehouses at all central points.

Sizes—24-in. "Royals," 18-in. "Perfections" and 16-in. "XXXXX," the highest grade shingles made, are used exclusively for Cabot's Creosote-stained Shingles.

"Royals" for walls, laid with 10 to 12-in. exposure, are much more artistic than dressed siding, much warmer and the cost is actually lower. "Perfections" and "XXXXX" are the standard regular sized shingles for walls and roofs.

COVERING CAPACITY OF CABOT'S CREOSOTED SHINGLES, SQUARE FEET PER SQUARE AT VARIOUS EXPOSURES—STANDARD GRADES—RANDOM WIDTHS

	Approx. weights per square, lbs.	4-in. exp.	4½-in. exp.	5-in. exp.	5½-in. exp.	6-in. exp.	6½-in. exp.	7-in. exp.	7½-in. exp.	8-in. exp.	8½-in. exp.	9-in. exp.	10-in. exp.	11-in. exp.	12-in. exp.
1 square of 16 in. (4 bun. 20/20 pack)	160	80	90	**100**	110	120	130	140	150	...	...	...	...	...	...
1 square of 18 in. (4 bun. 18/18 pack)	180	...	...	...	**100**	109	120	129	138	148	157	...	...	...	...
1 square of 24 in. (3 bun. 14/14 pack)	167	...	...	...	...	...	...	...	75	80	85	90	**100**	110	120

Note: This table is based on 100 sq. ft. to each square. But Cabot's Shingles are all sold in the original bundles as packed at the shingle mills under the Official Grading and Packing Rules of the Shingle Manufacturers Association and the tables of the Red Cedar Shingle Bureau show that *our* square actually covers from 3% to 8% more than *our* table claims.

CREO-DIPT COMPANY, INC.

STANDARD STAINED SHINGLE CO.

Manufacturers of Stained Shingles

GENERAL OFFICES
NORTH TONAWANDA, N. Y.

FACTORIES
NORTH TONAWANDA, N. Y. MINNEAPOLIS, MINN. KANSAS CITY, MO. VANCOUVER, B. C.
SALES OFFICES IN PRINCIPAL CITIES
In CANADA: Creo-Dipt Company, Ltd., General Office, TORONTO, ONT.

"CREO-DIPT"
TRADE-MARK
(Reg. U. S. Pat. Off.)

Products

Originators and sole manufacturers of "Creo-Dipt" Stained Shingles for both roofs and sidewalls thoroughly preserved; delivered to the job all bundled; stained any shade desired.

"Creo-Dipt" Thatch Stained Shingles to produce the Thatched Effect.

"Creo-Dipt" Shingle Stains, including "Creo-Dipt" Dixie White Stain.

Also "Creo-Dipt" Zinc Coated Hot Dipped Cut Shingle Nails.

Shingles are Shipped to All Parts of the Country

"Creo-Dipt" stained shingles are shipped in perfect safety to all parts of the United States from our North Tonawanda, N. Y., Minneapolis, Minn., Kansas City, Mo., and Vancouver, B. C. plants.

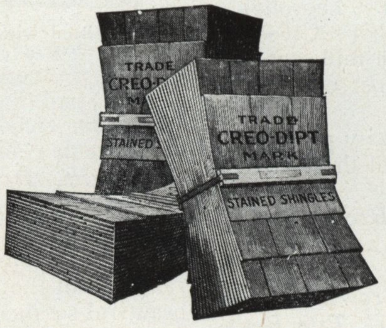
Originators and Sole Manufacturers of "Creo-Dipt" Stained Shingles

Creo-Dipt Company, Inc., with general offices at North Tonawanda, N. Y., and factories at North Tonawanda, N. Y., Minneapolis, Minn., Kansas City, Mo., and Vancouver, B. C., is the pioneer in the production of stained shingles. It is the only concern manufacturing stained shingles exclusively and is the originator and sole manufacturer of "Creo-Dipt" stained shingles. The latter have been on the market for over 17 years and have stood the test against all conditions.

"Creo-Dipt" stained shingles are being specified by leading architects throughout the country, indorsed by responsible contractors, approved by home builders, and the most prominent lumber dealers are recommending and selling them to their customers for both roofs and sidewalls.

Co-operative Service

A service department is maintained to co-operate with architects, contractors and home builders. We go over plans carefully, criticising them if requested, and offering suggestions, giving approximate quantity of "Creo-Dipt" stained shingles required and other information which is of necessary assistance in obtaining the very best results, especially for thatched roofs.



"Creo-Dipt" Stained Shingles

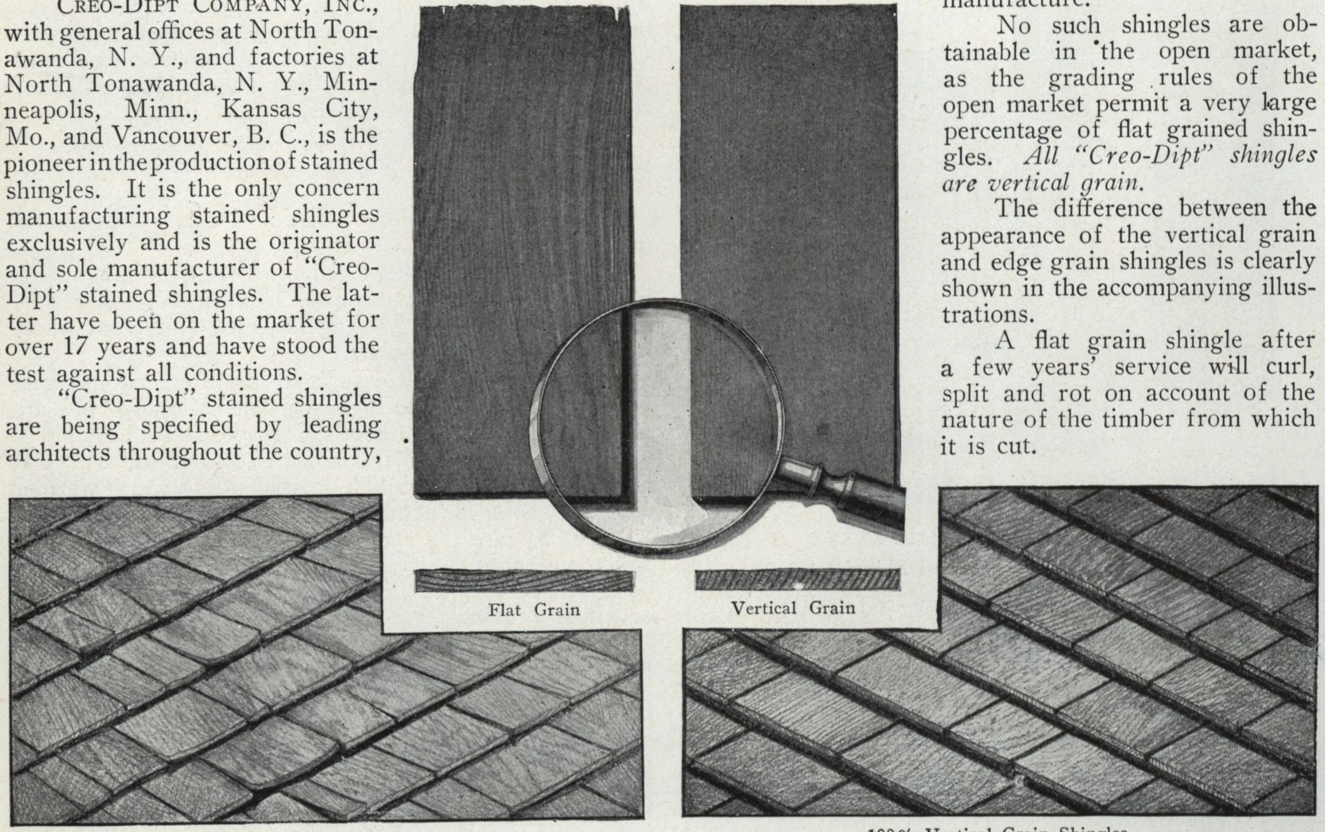
Why 100% Vertical Grain Shingles Should Be Used for Both Roofs and Sidewalls

"Creo-Dipt" 100% vertical grain shingles are the best grade shingles obtainable. The timber is sound and free from imperfections and the shingles are as nearly perfect as is possible to manufacture.

No such shingles are obtainable in the open market, as the grading rules of the open market permit a very large percentage of flat grained shingles. *All "Creo-Dipt" shingles are vertical grain.*

The difference between the appearance of the vertical grain and edge grain shingles is clearly shown in the accompanying illustrations.

A flat grain shingle after a few years' service will curl, split and rot on account of the nature of the timber from which it is cut.



Flat Grain

Vertical Grain

Flat Grain Shingle
After a few years' service it curls, splits and rots

100% Vertical Grain Shingles
Sound and free from imperfections, they will not rot, split nor curl

Comparison of Flat Grain and Vertical Grain Shingles

Continued on next page

Creosoting Shingles to Preserve Them

Creosote is the best known wood preservative. Wood treated with it is not subject to dry rot or other decay, and no process of wood preserving is better established than the process that "Creo-Dipt" stained shingles undergo. "Creo-Dipt" stained shingles will last twice as long as shingles painted, brush coated or treated in any other manner. "Creo-Dipt" stained shingles are dipped by our process so that each shingle is entirely protected by the creosote and other preserving oils.

Superiority of Our Factory Dipped Shingles Over Shingles Dipped on the Job or in Any Other Manner

Shingles, in order to properly absorb the creosote, must be perfectly dry before being dipped. Shingles dipped on the job are rarely if ever dry before being dipped. This damp condition prevents the proper penetration of the creosote and the coloring pigment, even though the dipping is carefully superintended. The preserving qualities are therefore diminished and the shades are not permanent.

"Creo-Dipt" stained shingles are all seasoned and kept perfectly dry before being dipped. Our process of creosoting and coloring "Creo-Dipt" stained shingles causes each one to be treated separately. The creosote, by this method, has perfect conditions for penetrating and the preserving is sure and thorough. The coloring pigments are carried into the wood so that the shades are uniform and durable.

Guaranteed Quality of "Creo-Dipt" Stained Shingles

All sizes and grades of "Creo-Dipt" stained shingles are guaranteed 100% vertical grain best quality red cedar shingles. They are sawed from logs cut from the best portions of selected first growth live timber and not from stumpage left in the forest. Shingles cut from old stumps (cheap grades of shingles) will always curl and rot. "Creo-Dipt" stained shingles are all parallel widths and free from sap and imperfections.

Economy of Using "Creo-Dipt" Stained Shingles

Labor Saving—"Creo-Dipt" stained shingles are handled more easily and quickly than shingles stained on the job. The bundles can be carried intact to the place where they are required, greatly reducing the labor of handling as required by loose dipped shingles. They save the labor of dipping and the cost of an additional brush coat which is usually necessary when shingles are treated on the premises.

Cost—"Creo-Dipt" stained shingles cost 25% less than shingles dipped on the premises or which are painted. They cost at least 50% less to lay; the results are as anticipated and not a disappointment, as is often the case when the shingles are treated in any other manner.

Quality—The shingles, being guaranteed clear and 100% vertical grain best quality red cedar, are superior to any that can be bought in the open market. All "Creo-Dipt" stained shingles are parallel widths and free from imperfections.

Sizes and Covering Capacity of "Creo-Dipt" Stained Shingles

We have only one quality of shingles—100% vertical grain clear shingles. The difference in the names refers to the difference in the lengths and thicknesses and not to any grading rules of the open market.

Sizes—In specifying, the name indicating the thickness should be given in addition to the length of the shingles.

"Creo-Dipt" Aristocrats—24 in. long; random widths; 1 in. in thickness at the thick end.

"Creo-Dipt" Royals—24 in. long; random widths; ½ in. in thickness at the thick end.

"Creo-Dipt" Perfections—18 in. long; random widths; 5 shingles will measure 2¼ in. in thickness at the thick end.

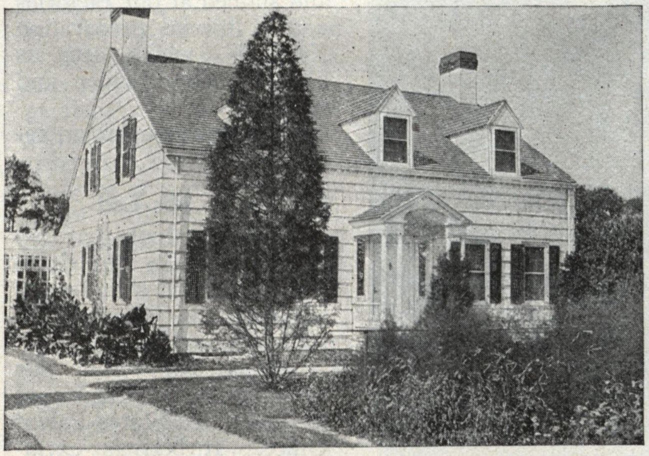
"Creo-Dipt" Eurekas—18 in. long; random widths; 5 shingles will measure 2 in. in thickness at the thick end.

"Creo-Dipt" XXXXX Clears—16 in. long; random widths; 5 shingles will measure 2 in. in thickness at the thick end.

"Creo-Dipt" XXX Clears—16 in. long; random widths; 6 shingles will measure 2 in. in thickness at the thick end.

"Creo-Dipt" Thatch Shingles—16 in. long; random widths; 5 shingles will measure 2 in. in thickness at the thick end. Sawed in various patterns to produce the thatched effect.

Covering Capacity—All shingles are sold on the basis of the square (100 sq. ft.). The table on the following page gives the covering capacities of a square of shingles at various exposures.

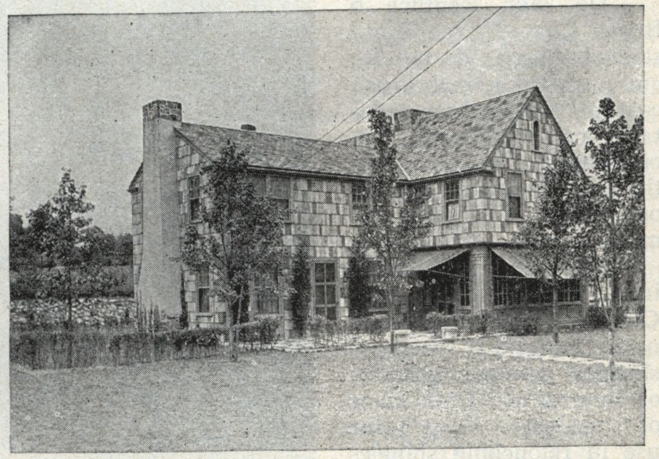


Old Long Island Type of Farm House

Alfred Hopkins, Architect, 101 Park Avenue, New York, N. Y.

24-in. "Creo-Dipt" stained shingles, for wide shingle exposure used on side walls. Color, Dixie White.

18-in. "Creo-Dipt stained shingles on roof. Color, weathered gray



Residence of Dr. George W. Hawley, Bridgeport, Conn.

Edward B. Caldwell, Jr., Architect, Bridgeport, Conn.

The wall "Creo-Dipt" stained shingles are 24 in. long for the wide shingle exposure and are of variegated color effect of white, gray, green and black. On the roof, "Creo-Dipt" 16-in. stained shingles are laid, using the same colors as on the walls, with the addition of red and yellow

Continued on next page

Note: All "Creo-Dipt" stained shingles for the regular shingle work have square butts, but can be obtained with butts sawed irregular for the thatched and for the old fashioned shingle effect at a slight additional cost.

The thatched shingles for the thatched roof effect are sawed in special patterns for this type of roof construction.

COVERING CAPACITY OF "CREO-DIPT" STAINED SHINGLES PER SQUARE FOR VARIOUS EXPOSURES, IN SQUARE FEET

Name	Length, in.	Exposure to weather, inches									
		5	5½	6	6½	7	7½	8	10	10½	11
Aristocrats Royals	24	....	....	....	....	....	75	....	100	105	110
Perfections Eurekas.......	18	....	100	111	120	129	138	148	....	....	....
XXXXX Clears XXX Clears...	16	100	110	120	130	140	....	....	....	....	....

24-in. "Creo-Dipt" Stained Shingles for Sidewalls

The larger "Creo-Dipt" stained shingles have come very much into favor with architects and home builders who are designing and building homes a little different from the ordinary shingled house or bungalow. The butts are very heavy and give the appearance of the old-fashioned shingles of colonial days, and are especially suited to the colonial style of architecture. They are usually laid 10 in. to the weather on sidewalls and 7½ in. on roofs.

"Creo-Dipt" Colors Are Lasting

The colors used in the creosoting and staining of "Creo-Dipt" stained shingles are the strongest and most expensive pure pigments, ground to the finest possible condition in pure linseed oil in our own mills. They are then suspended in a vehicle of creosote and other preserving oils and binders, which are especially refined so they will properly carry the colors without injuring them.

They will thoroughly preserve the wood against dry rot and other decay.

Colors Lasting—"Creo-Dipt" stained shingles, being perfectly dry at the time of creosoting, allow the wood to absorb more of the preservative. The ground colors are taken up into the pores in a much greater quantity, obtaining a lasting color that is impossible to procure by the old method of treating on the premises where the shingles have been exposed to the weather and dampness before staining.

Do Not Require a Brush Coat—"Creo-Dipt" stained shingles do not require an additional brush coat in greens, browns or reds, and we do not recommend it for grays, as the effect from our process on grays is highly admired.

Stain for Retouching, Patching and Cutting—With every order for "Creo-Dipt" shingles, a small quantity of stain to match the color of shingles is shipped for use in retouching shingles which have to be trimmed or cut to fit flashings, valleys and other roofing conditions.

Home at Riverside, N. Y.

Dwight J. Baum, Architect, Riverdale-on-Hudson, N. Y.

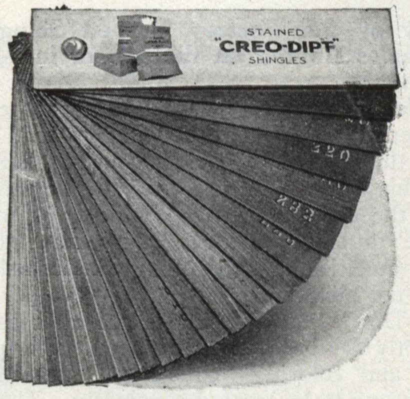
24-in. "Creo-Dipt" stained shingles used on sidewalls for wide shingle exposure. Color, Dixie White for true Colonial white effect. 16-in. 5X "Creo-Dipt" stained shingles used on roof. Color, moss green

30 Regular Shades

"Creo-Dipt" stained shingles are manufactured in 30 regular shades.

We will make any special shades and submit samples without charge.

A color pad showing all regular shades on red cedar shingles will be sent to architects on request. Shades are shown on shingles sawed 2½x10 in. put up as shown, for convenient handling.



"Creo-Dipt" Color Pad

Variegated Effects

Many architects are now specifying "Creo-Dipt" stained shingles for the variegated color effect which is obtained by using two or more shades of "Creo-Dipt" stained shingles. The shingles being stained in any proportion of each shade selected, are packed in this proportion promiscuously in each bundle. "Creo-Dipt" stained shingles are then laid by the workmen as received.

These effects are most artistic, and it is impossible to obtain them in any other manner.

"Creo-Dipt" Dixie White

"Creo-Dipt" Dixie White is a successful white shingle stain. Two brush coats give the desired Colonial white effect to the "Creo-Dipt" stained shingles after they are laid, they having been creosoted and stained at our factories with a special preparation No. 207, which acts as filler, primer, binder and preservative.

Special samples on request.

Do Not Be Mis-Led

Do not think that *any* stained shingles are "Creo-Dipt" stained shingles or as good as "Creo-Dipt" stained shingles.

"Creo-Dipt" is our trade-mark. It is registered in the United States Patent Office. It belongs exclusively to us—no one else can use it, no concern or individual can state or intimate that stained shingles

Continued on next page

are "Creo-Dipt" stained shingles unless they are manufactured by us and bear our trade-mark.

We are the pioneers in the stained shingle business. "Creo-Dipt" stained shingles have been on the market for 17 years. Over this period of years they have been specified by leading architects throughout the country, endorsed by contractors and approved by home builders.

There is enough difference between "Creo-Dipt" stained shingles and other stained shingles to make it worth your while to be sure that you get the original. Our trade-mark is on the binder of every bundle.

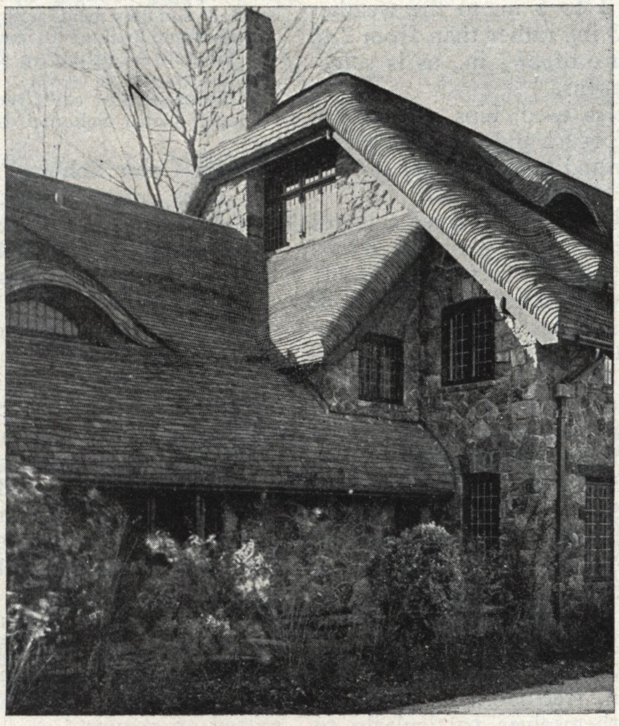
Important When Specifying

We advise incorporating in specifications the full wording "'Creo-Dipt' stained shingles (giving color, number, grade, and length desired) manufactured only by Creo-Dipt Company, Inc., of North Tonawanda, N. Y., Minneapolis, Minn., Kansas City, Mo., or Vancouver, B. C." This will avoid misunderstanding and substitution.

Instructions for Designing and Constructing a "Thatch Roof" with Special "Creo-Dipt" Stained Shingles

Special "Creo-Dipt" stained shingles are furnished for thatched effect roofs, ready for application. If our instructions and details are adhered to, there should be absolutely no trouble in obtaining the desired results. This has been the experience of the architects and contractors who have built this type of roof on hundreds of buildings in all sections of the country.

The details of the various sections of a thatched roof shown will enable architects and contractors to construct the roof and lay "Creo-Dipt" stained shingles so as to carry out the true thatched idea.



Home at Scarsdale, N. Y.
Designed by W. Stanwood Phillips, New York, N. Y.
Showing how the true Thatched Roof effect is obtained with "Creo-Dipt" stained shingles

Consultation—When the thatched roof is contemplated, we recommend that plans and specifications be sent to our general offices at North Tonawanda, N. Y., where we maintain a service department to co-operate with architects, contractors and home builders.

The plans will be gone over carefully, criticised, if requested, and valuable suggestions offered. We also estimate approximate quantities of "Creo-Dipt" stained shingles required and give other information which will assist in obtaining best and most artistic results.

No charge for service.

Proper Blocking—At the gables blocking should be constructed with the greatest care and covered with 1x2-in. shingle strips running with the roof rafters, which carry the general convex line of roof to meet the running verge board. Shingle strips 1x2 in. should also be used on valleys and hips running from eaves to ridges and on eaves running at right angles to rafters.

At the rounding of the gables blocking should be brought well forward to the verge board and then returned against it, forming in section the arc of a circle. This rounding of the gables is greatest at the apex and diminishes towards the eaves.

Roof Framing—On the main roof, when a decided softening of the gables is wanted, it is often advisable to drop the roof rafters gradually at the ridge for a distance of 3 or 4 ft. back from the verge board. To be effective, the drop at verge board must necessarily be sudden. This roll at gables should be constructed with the greatest care. It has been the fault of some architects and contractors who have used the thatched roof with special "Creo-Dipt" stained shingles to make the roll at gables too short.

The accompanying details on the following pages illustrate the most successful methods of constructing the roof and the proper radius for various conditions. These will make the laying of the special "Creo-Dipt" stained shingles easier and produce the best results.

Properly Laying the Shingle Lath—Caution should be used in building the rounded and flat surfaces, to lay the shingle lath or roof boarding with sufficient spacing to allow for ventilation, as a roof properly ventilated will dry off more quickly after rains and greatly increase the life of the "Creo-Dipt" stained shingles. Do not use roofing paper, felt or any other material, except flashing in the proper places, that will prevent proper ventilation.

With good ventilation, the roof will last as long as the house it covers.

Bent Shingles—On the rounding of the gables, eaves, and quick turns of the angle between the sidewalls of the dormer, it is necessary to use bent "Creo-Dipt" stained shingles. If the blocking used in rounding the hips and valleys is constructed to a 20-in. radius, the flat shingles will lend themselves properly to this radius.

On the first course at eaves, square butt "Creo-Dipt" stained shingles bent to a 20-in. radius are used in double thickness, the inside of the butts to be on a plane parallel with the wall of the building. This point is the beginning of a curve using bent "Creo-Dipt" stained shingles, the radius of which is to be not less than 20 in. to the point of merging with the roof line.

"Creo-Dipt" stained shingles, or any other shingles, can not be bent against the grain or crosswise to a radius of less than 20 in. Our machinery is constructed to bend to this radius, and plans must be drawn accordingly.

Continued on next page

"Creo-Dipt" stained shingles bent with the grain or lengthwise can be used on the gables or sharp turns and can be bent to a 10-in. radius. They are more or less flexible and can be used on almost any radius, whereas those bent against the grain or crosswise are not as flexible.

Nailing Shingles on Rounded Surfaces—On the rounded surfaces of the eaves, use 6d "Creo-Dipt" zinc coated, hot dipped cut nails, nailing as closely to the exposed part of the butt as possible. On the balance of the roof, the 3½d "Creo-Dipt" zinc coated, hot dipped cut nails should be used.

Producing the Thatched Effect—One of the best features of the thatched effect roof is the texture produced by the special thatch "Creo-Dipt" stained shingles being laid out of the horizontal. This produces long, irregular waves, so that the courses vary in exposure to the weather from 1 to 5 in. and with an average exposure of 3 in., or from 2 to 5 in. with an average exposure of 3½ in.

To produce these long, irregular waves, "Creo-Dipt" stained shingles are sawed at the butts in a variety of our special thatch patterns, and are laid with the long side of each shingle to the short side of the previous one until the maximum exposure is reached. To bring the course down again to the minimum exposure, this procedure is reversed, i. e., the short side of each shingle is laid to the long side of the previous one. This manner of laying "Creo-Dipt" stained shingles is carried out on each course of the entire roof surface with the exception of the first at eaves. There should be no uniformity in the courses—that is, the wave of each course should vary.

The best effect on the eaves is gained by laying special "Creo-Dipt" stained shingles from 1 to 3 in. to the weather until the flat portion of the roof is reached.

The thatched effect is better gained on the flat portion of the roof and gable ends by laying the "Creo-Dipt" stained shingles from 1 to 5 in. to the weather with an average exposure of 3 in., rather than from 2 to 5 in. with an average exposure of 3½ in., as is sometimes done for economical reasons.

But if 3½-in. exposure is used, hips and valleys must still be laid with 3-in. exposure and it will be necessary to weave in a course now and then, in order to keep to this exposure.

On the rounded ridges, "Creo-Dipt" stained shingles can be used as shown in section B (Detail No. 3) or they can be capped with a suitable metal, preferably copper, rounded to appear from below as a continuance of the "Creo-Dipt" stained shingles. Metal would be somewhat cheaper, but not quite so artistic as the "Creo-Dipt" stained shingles.

We advise the construction of the gutter as shown in our detail, as this arrangement does not hide the rounded eaves, and when painted to match the "Creo-Dipt" stained shingles, it accentuates the droop at the eaves when seen at a distance.

It requires a few more special "Creo-Dipt" stained shingles for a thatched roof than for a regular "Creo-Dipt" stained shingle roof, but it is more durable, as the average exposure is less.

Always use the special "Creo-Dipt" 16-in. XXXXX red cedar shingles, random width, for thatched roofs. They are 100% vertical grain, free from sap, and not wedge shaped. They lend themselves particularly to the process required and since the average exposure is less than for ordinary roofing purposes, they are more economical and suitable.

Standard Specifications for "Creo-Dipt" Thatched Effect Roofs

Shingles—All roof surfaces to be covered with thatched "Creo-Dipt" stained shingles as furnished by the CREO-DIPT COMPANY, INC., of North Tonawanda, N. Y., to produce the thatched effect, following carefully details shown in SWEET'S ARCHITECTURAL CATALOGUE (Twentieth Edition).

All eaves, gables, valleys, hips and ridges to be covered with bent "Creo-Dipt" stained shingles to carry out the curved idea at all points, as follows: "Creo-Dipt" stained shingles bent across grain or crosswise, for eaves and ridges, to be on a radius of 20 in. Those bent with grain or lengthwise, for valleys, hips and gables, to conform with the ridge lines.

The first course at the eaves to be laid double with "Creo-Dipt" square butt shingles bent with a 20-in. radius. The balance of the eaves to be covered with special thatched butt "Creo-Dipt" stained shingles bent across the grain, laid in long irregular waves at varying exposure of 1 to 3 in.

Flat surfaces to be laid with special thatched butt "Creo-Dipt" stained shingles in long, irregular waves, with exposure varying from 1 to 5 in. (average exposure 3 in.), with variation of wave in each course, avoiding uniformity. This effect is produced by laying the long side of each shingle to the short side of one previously laid, until the maximum exposure is reached, then reversing the procedure, i. e., laying short side to the long side until minimum exposure is reached.

Furring—*Note: Do not include specifications for furring unless it is to be used in the construction of the roof.*

All furring to be constructed with the greatest care so that roof be given a slightly convex surface by furring each rafter from 4 to 6 in. in height in center of roof, and diminishing the furring to nothing at ridges and eaves.

Blocking—Blocking at gables to be covered with 1x2-in. shingle strips running with the roof rafters, and brought well forward to the verge board and then returned against it, forming in section the arc of a circle. Arc to be greatest at apex and diminish towards eaves.

Blocking at valleys and hips to be covered with 1x2-in. shingle strips running from eaves to ridges. All rafters to be rounded at eaves and ridges to a 20-in. radius and covered with 1x2-in. shingle strips running across rafters.

Sufficient space must be allowed in laying the shingle lath or roof boarding to insure proper ventilation.

Nailing—All nails used for laying shingles shall be "Creo-Dipt" zinc coated, hot dipped cut nails of following sizes: for rounded surfaces of eaves use 6d nails, nailing the shingles as closely as possible to the butt; on balance of roof use 3½d nails.

Capping—Ridges to be capped by using "Creo-Dipt" stained shingles bent with the grain, or with copper strips, rounded and painted to conform to color of roof.

Gutters—Gutters to be suspended from and centering on first course at eaves.

Color—Color of "Creo-Dipt" stained shingles to be (see "Special Color Scheme" below).

Special Color Scheme for Thatched Roofs

It is intended that thatched "Creo-Dipt" stained shingles have the texture and softness of thatch without gross imitation, and that the color should not be uniform to produce the most effective results.

For thatched roofs we usually furnish "Creo-Dipt" stained shingles in 5 shades, known as our thatch colors, A, B, C, D, and E.

The orders are stained 30% color A, 30% color B, 30% color C, 5% color D, and 5% color E, and packed in this proportion promiscuously in the bundles and laid by the workmen as received.

The colors A, B and C were matched to some straw that had weathered to various hues during a period of 9 years. Color D is a soft shade of green, and E is a medium shade of red, which add life and warmth to colors A, B and C.

This color effect is warm, variegated and full of life, individuality and texture, and is entirely different from regular conventional shingle stain shades. It has been truthfully reproduced on paper and will be submitted on request.

Colors other than the above furnished in any shade or shades desired, and can be selected from our color pad, which also will be sent on request.

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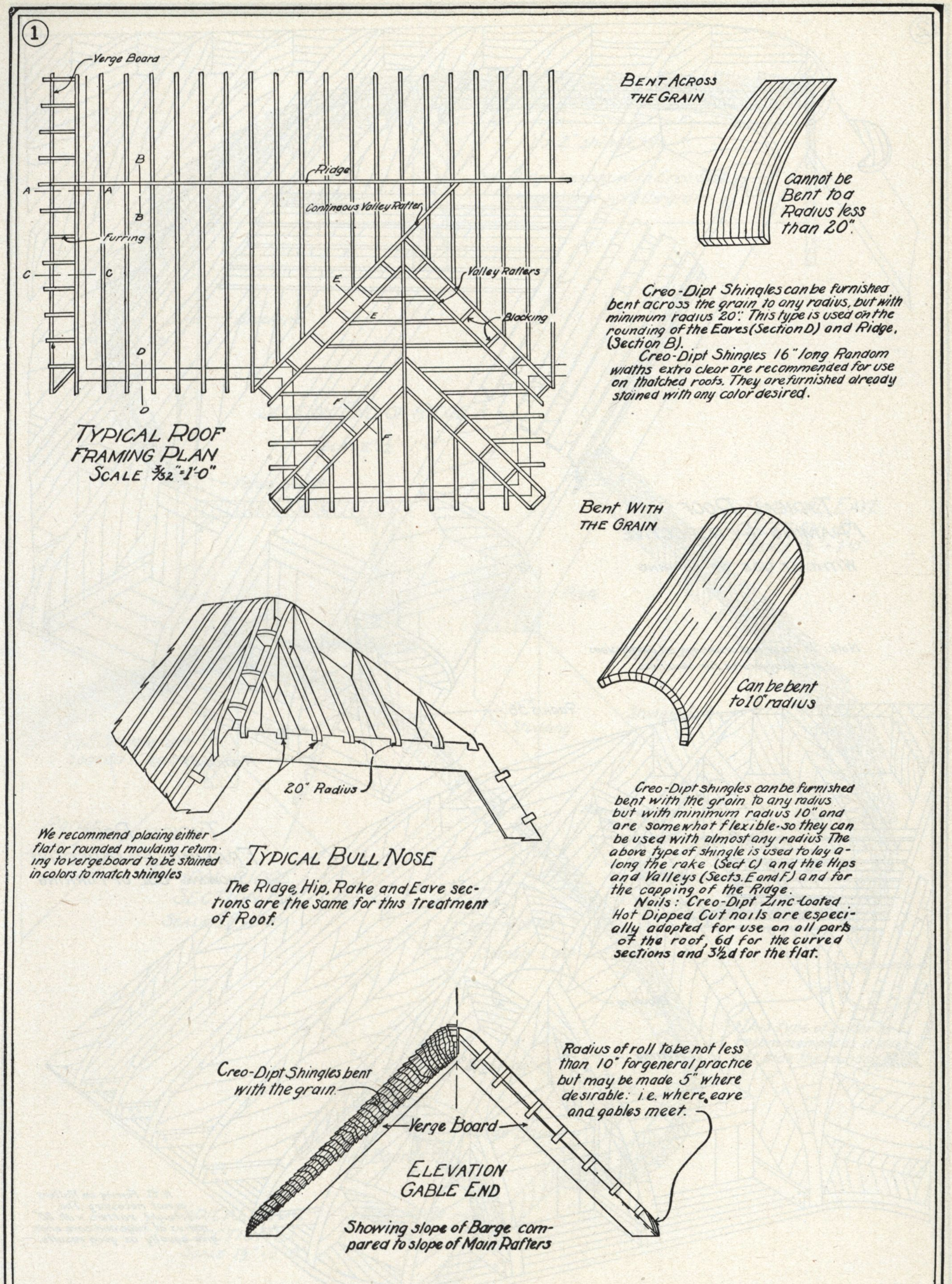
①
Verge Board
Ridge
Continuous Valley Rafter
Furring
Valley Rafters
Blocking
A
A
B
B
C
C
D
D
E
E
F
F
BENT ACROSS THE GRAIN
Cannot be Bent to a Radius less than 20".
Bent WITH THE GRAIN
Can be bent to 10" radius
20" Radius
Creo-Dipt Shingles bent with the grain.
Verge Board

TYPICAL ROOF FRAMING PLAN
SCALE 3/32" = 1'-0"

Creo-Dipt Shingles can be furnished bent across the grain to any radius, but with minimum radius 20". This type is used on the rounding of the Eaves (Section D) and Ridge, (Section B).

Creo-Dipt Shingles 16" long Random widths extra clear are recommended for use on thatched roofs. They are furnished already stained with any color desired.

We recommend placing either flat or rounded moulding returning to verge board to be stained in colors to match shingles

TYPICAL BULL NOSE

The Ridge, Hip, Rake and Eave sections are the same for this treatment of Roof.

Creo-Dipt shingles can be furnished bent with the grain to any radius but with minimum radius 10" and are somewhat flexible-so they can be used with almost any radius The above type of shingle is used to lay along the rake (Sect C) and the Hips and Valleys (Sects. E and F) and for the capping of the Ridge.

Nails: Creo-Dipt Zinc-Coated Hot Dipped Cut nails are especially adapted for use on all parts of the roof, 6d for the curved sections and 3½d for the flat.

Radius of roll to be not less than 10" for general practice but may be made 5" where desirable: i.e. where eave and gables meet.

ELEVATION
GABLE END

Showing slope of Barge compared to slope of Main Rafters

Typical Roof Framing Details of Gables for "Creo-Dipt" Thatched Roofs

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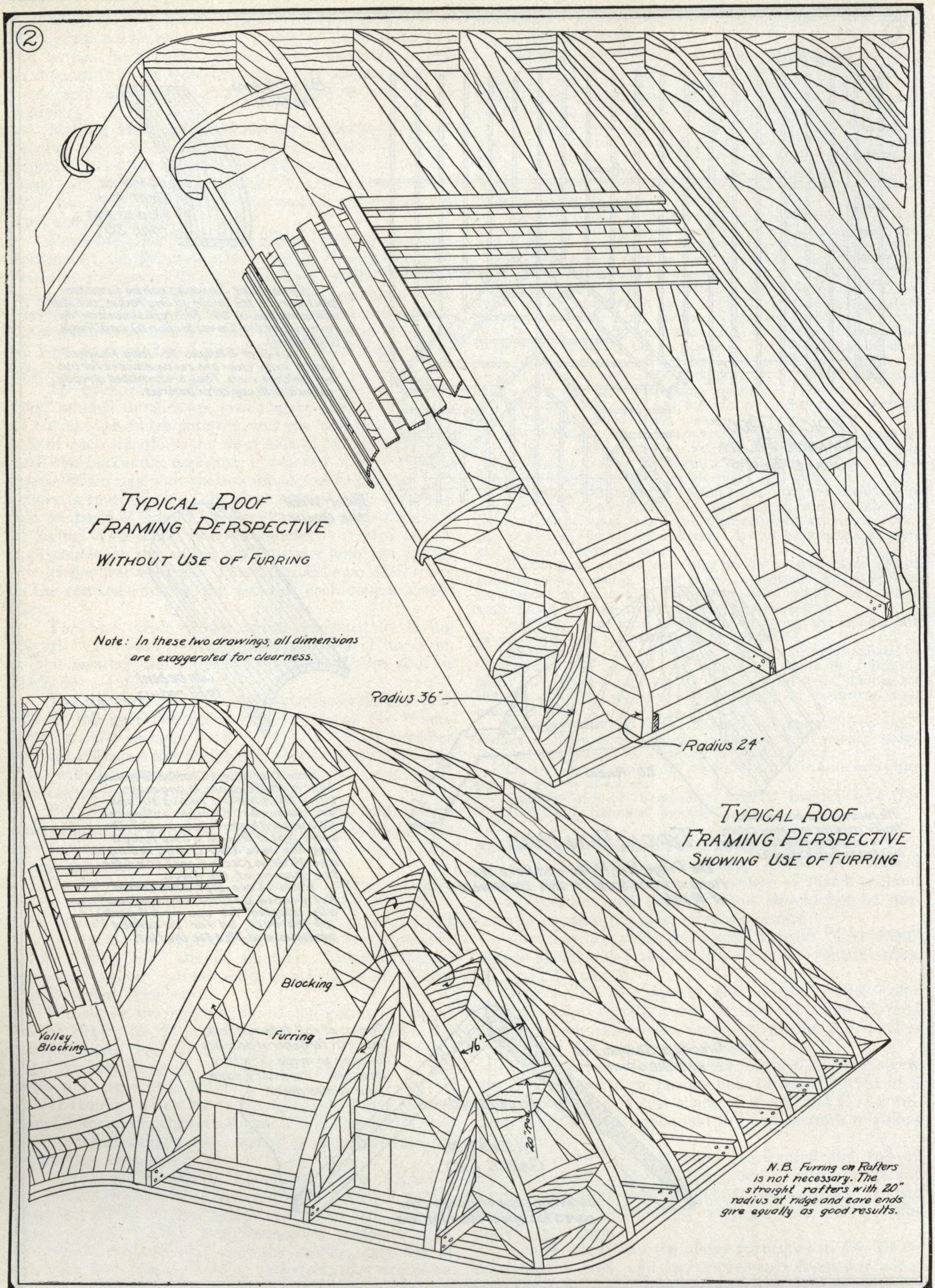
②
Radius 36"
Radius 24"
Blocking
Furring
Valley Blocking
16"
20" Rad.

TYPICAL ROOF FRAMING PERSPECTIVE
WITHOUT USE OF FURRING

Note: In these two drawings, all dimensions are exaggerated for clearness.

TYPICAL ROOF FRAMING PERSPECTIVE
SHOWING USE OF FURRING

N.B. Furring on Rafters is not necessary. The straight rafters with 20" radius at ridge and eave ends give equally as good results.

Typical Roof Framing Details with and without Furring for "Creo-Dipt" Thatched Roofs

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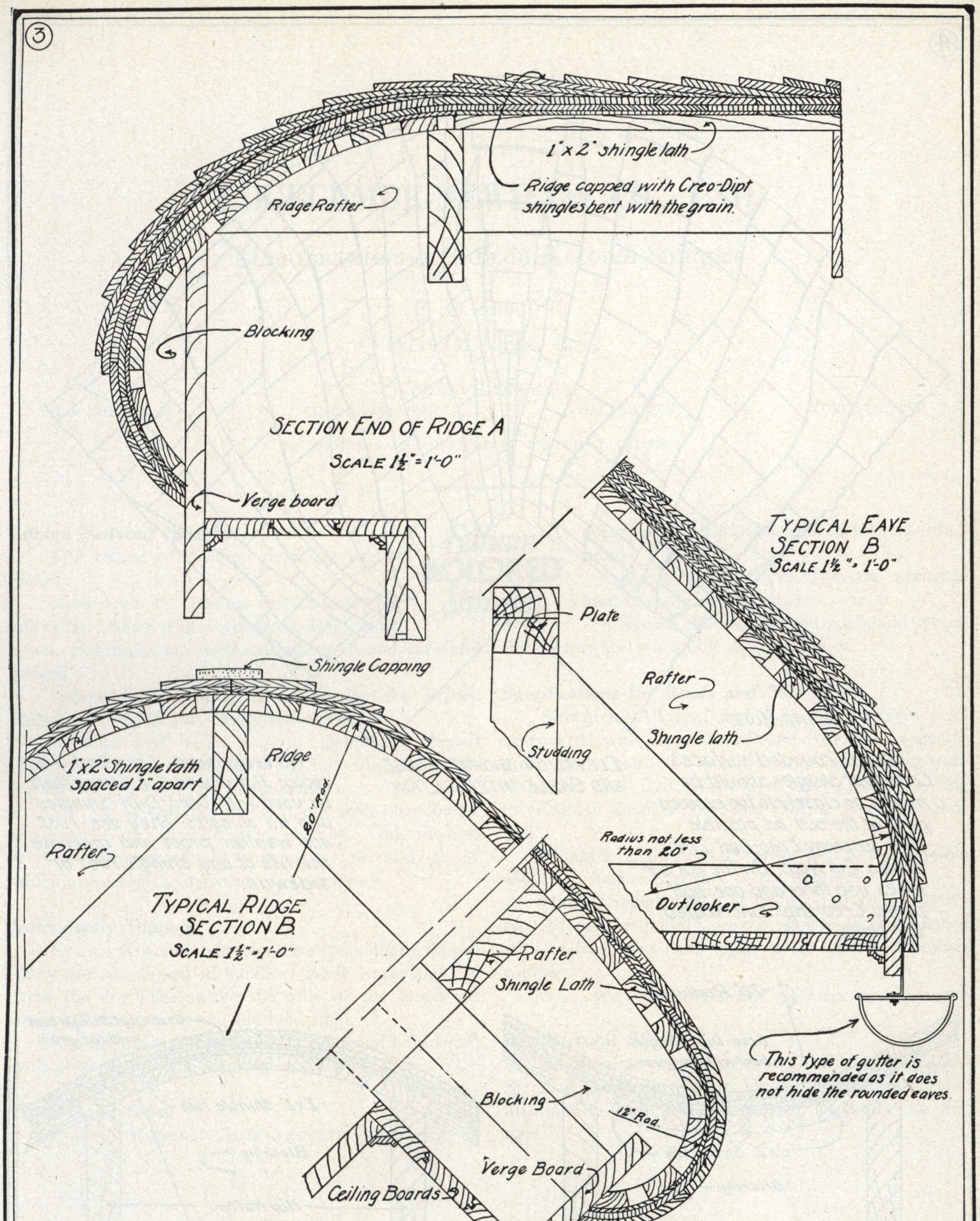
③
1" x 2" shingle lath
Ridge capped with Creo-Dipt shingles bent with the grain.
Ridge Rafter
Blocking
SECTION END OF RIDGE A
SCALE 1½" = 1'-0"
Verge board
TYPICAL EAVE SECTION B
SCALE 1½" = 1'-0"
Plate
Shingle Capping
Rafter
Studding
Shingle lath
1"x2" Shingle lath spaced 1" apart
Ridge
20" Rad.
Rafter
Radius not less than 20"
Outlooker
TYPICAL RIDGE SECTION B.
SCALE 1½" = 1'-0"
Rafter
Shingle Lath
This type of gutter is recommended as it does not hide the rounded eaves.
Blocking
12" Rad.
Verge Board
Ceiling Boards
Bed Mould
TYPICAL RAKE SECTION C
SCALE 1½" = 1'-0"

Typical Details of Furring of Ridge and Eaves for "Creo-Dipt" Thatched Roofs

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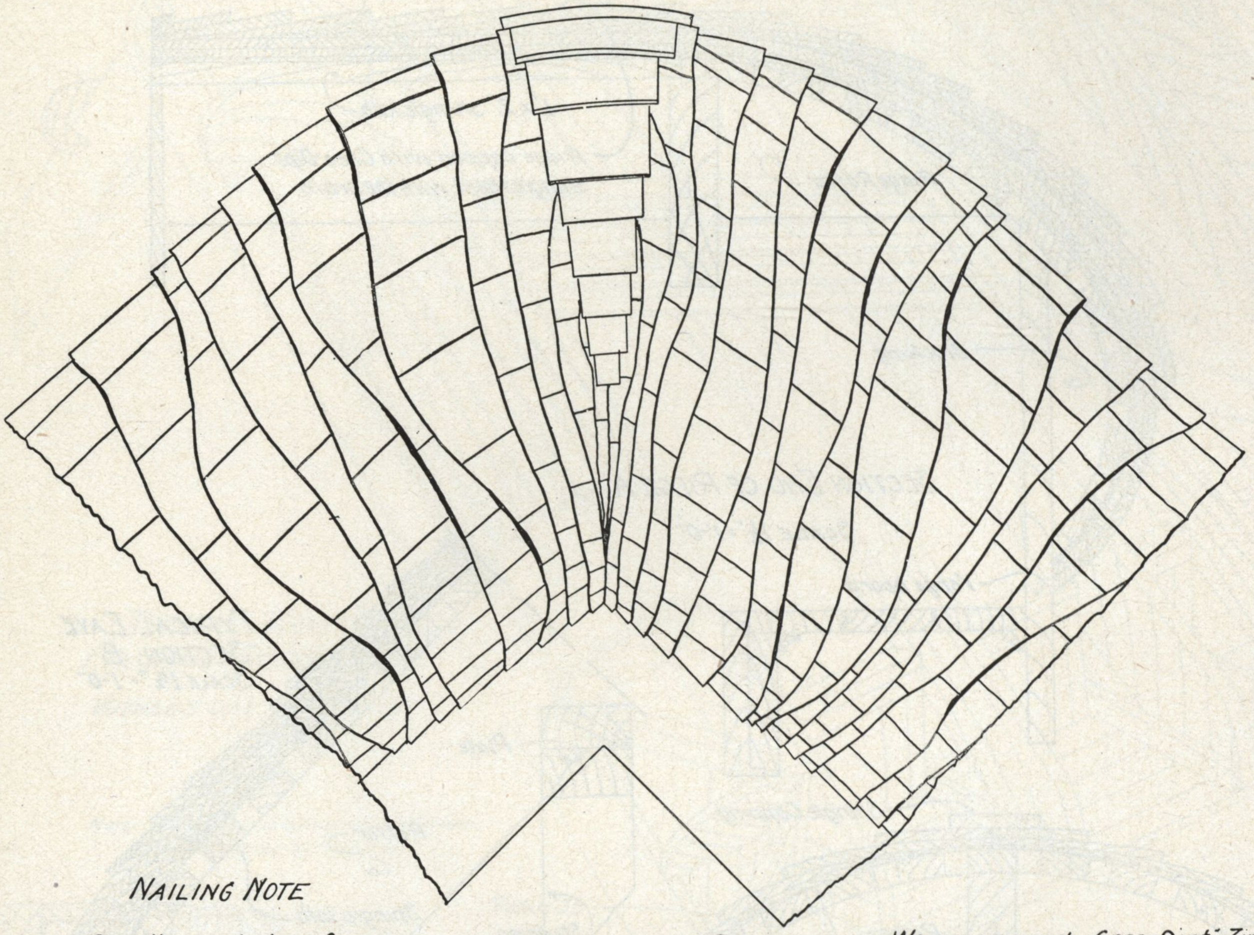
④

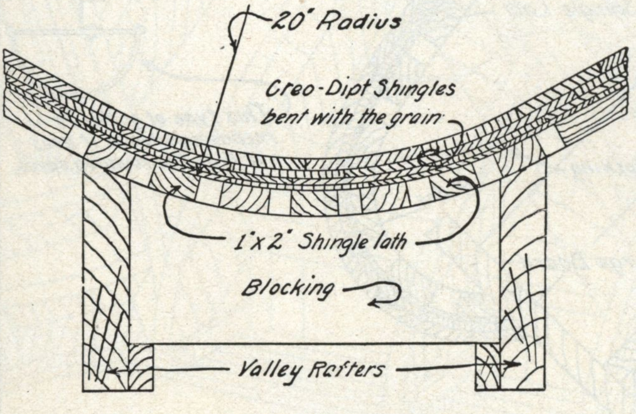


NAILING NOTE

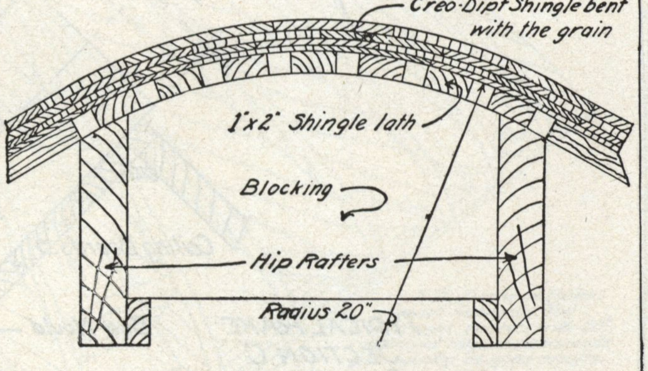
On all rounded surfaces Creo-Dipt shingles should be nailed as closely to the exposed part of the butt as possible with six penny "Creo-Dipt" Zinc-coated Cut Nails. On the flat surfaces use three and one-half penny "Creo-Dipt" Zinc-coated Cut Nails

ELEVATION SHOWING RIDGE AND GABLE INTERSECTION

We recommend Creo-Dipt" Zinc-coated Hot-dipped Cut Shingle Nails be used with Creo-Dipt shingles and all shingles. They are rust and weather proof and increase the life of any shingle roof or sidewall.


20" Radius
Creo-Dipt Shingles bent with the grain
1"x2" Shingle lath
Blocking
Valley Rafters

TYPICAL VALLEY SECTION E
SCALE 1½"-1'-0"


Creo-Dipt Shingle bent with the grain
1"x2" Shingle lath
Blocking
Hip Rafters
Radius 20"

TYPICAL HIP SECTION F
SCALE 1½"=1'-0"

Typical Details for Valley, Hip and Ridge for "Creo-Dipt" Thatched Roofs

EDGECUMBE-NEWHAM CO., LTD.

Manufacturers of Edham Kolored Shingles

P. O. Box 190
VANCOUVER, B. C.

BRANCH OFFICES

NEW YORK, N. Y. CINCINNATI, OHIO DALLAS, TEX. TORONTO, ONT.

OTHER SALES OFFICES IN PRINCIPAL CITIES

Edham **KOLORED** *Shingles*

Edham Kolored Shingles

The choice of leading architects everywhere.

Made from the famous British Columbia red cedar. Sawn edge-grain from clear, sound wood, free from sap, well manufactured and carefully graded.

Independently inspected and bearing the British Columbia "Edg-Grain" inspection mark.

Manufactured from log to completely dipped shingle under one roof, allowing for close inspection during every process of manufacture.

Edham Stains are made at our own plant under the direction of a qualified color chemist. Only the best creosote oils, linseed oils and colors are used, all of which are carefully inspected for purity.

Individually Dipped

Edham Kolored Shingles are individually dipped (they are not dipped in bundles) while warm and dry from the dry kilns, while the cells of the wood are open and ready to receive and hold stain.

The natural water moisture in the wood is replaced with preservative oils, insuring long life.

Grades and Sizes

Edham Kolored Shingles are procurable in every grade, thickness and length manufactured.

Standard grades and colors are carried in lumber yards in most cities.

Special shades, thatched roofs and special thicknesses are procurable at short notice.

Specifications for Roofs and Side Walls

Shingles—All roof and side wall surfaces shall be covered with Edham Kolored Shingles (specify grade and color) as manufactured by Edgecumbe-Newham Co., Ltd., Vancouver, B. C., and bearing the Edham Kolored label and Edham Kolored bandstick.

Shingles shall be laid with well broken joints with......inches exposure to the weather.

Nails—Shingles shall be nailed with (here specify type of nails required). Each shingle shall be nailed with at least two nails under cover of the following course.

Note: We recommend Zinclad, pure zinc or copper nails.

Architectural Service

A complete service goes with Edham Kolored Shingles and architects are invited to write for specific information, samples and special literature at any time.

WEATHERBEST STAINED SHINGLE COMPANY, INC.

Manufacturers of Red Cedar Creosoted Stained Shingles
NORTH TONAWANDA, N. Y.
FACTORIES: NORTH TONAWANDA, N. Y. AND MINNESOTA TRANSFER, MINN.

Weatherbest STAINED-SHINGLES
TRADE-MARK

Products

WEATHERBEST CREOSOTED EDGE GRAIN STAINED SHINGLES for roofs and sidewalls; WEATHERBEST 24-IN. COLONIAL WHITE STAINED SHINGLES; WEATHERBEST THATCHED EFFECT STAINED SHINGLES; WEATHERBEST "DOUBL-THIK" STAINED SHINGLES; WEATHERBEST CREOSOTE STAIN.

Used on Roofs and Sidewalls

WEATHERBEST stained shingles are used on sidewalls as well as roofs and are adaptable to practically every type and style of building—from the small cottage or bungalow to the stately country home. The soft, semi-transparent colors add much to the attractiveness of a home. WEATHERBEST stain emphasizes the grain in the wood just enough so that the flat tone of a painted surface is absent. WEATHERBEST stained shingle sidewalls cost 30% to 50% less than walls of bevel or Colonial siding and will last fully as long. A WEATHERBEST stained shingle roof laid with zinc coated nails will give perfect service for over 50 years.

Reliability

WEATHERBEST stained shingles and stain have been on the market for the past 16 years and can be thoroughly relied upon to give entire satisfaction. Each bundle of WEATHERBEST stained shingles carries the green WEATHERBEST label and is our guarantee of perfect material and lasting colors.

Quality of Weatherbest Shingles

Only the finest grade of all clear, strictly 100% edge (vertical) grain, British Columbia red cedar is used in the manufacture of WEATHERBEST stained shingles. Every shingle is perfect from tip to butt. Extreme care is exercised that all shingles are entirely free from any trace of dampness before being subjected to the WEATHERBEST process of staining.

Quality of Weatherbest Stain

WEATHERBEST stain consists of the strongest color pigments obtainable, high grade wood creosote preservatives and pure linseed oil as binder. These ingredients are mixed in our factories by our color and oil experts in the correct proportion to insure colors that are rich and soft in tone, and, above all—durable.

Weatherbest Staining Process

All shingles are unbundled at our factories and stained separately — not bundle-dipt as is the case with many other stained shingles. The WEATHERBEST process treats each shingle so thoroughly and perfectly that additional brush coating after they are laid is unnecessary. After staining, the shingles are dried and re-bundled ready to lay.

Always Lie Flat

Because they are 100% edge (vertical) grain and because of the WEATHERBEST preserving solution, WEATHERBEST stained shingles always lie flat. They will not check, crack or curl during their many years of service. The edge grain is also, to a large degree, responsible for the exceptionally long life of WEATHERBEST colors, as edge grain allows the color pigments to enter deep into the pores of the wood.

Sizes, Colors and Covering Capacity

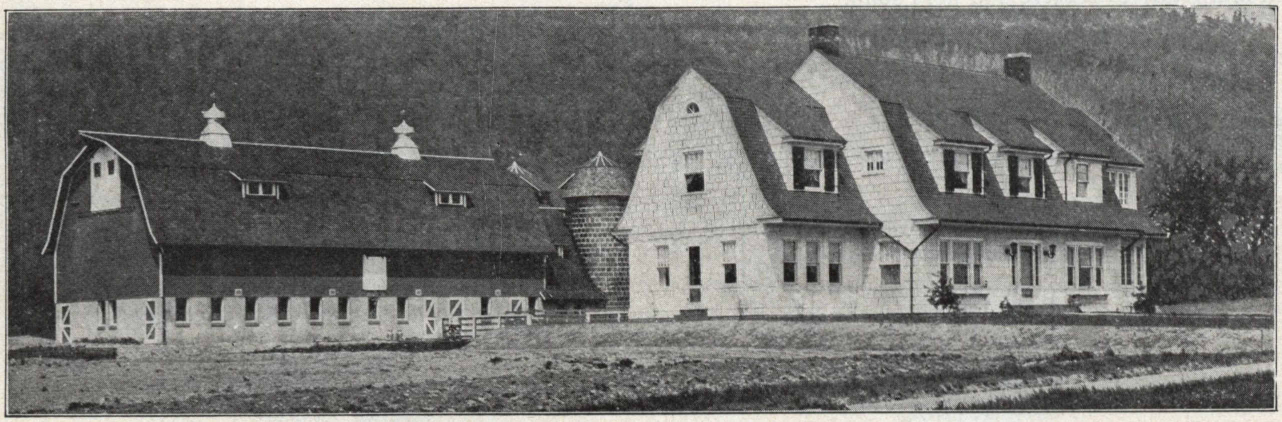
WEATHERBEST stained shingles are furnished in following sizes:

12 in.	WEATHERBEST B. C. XXXXX	5 butts to 2 in.
16 in.	WEATHERBEST B. C. XXXXX	5 butts to 2 in.
16 in.	WEATHERBEST B. C. XXX	6 butts to 2 in.
16 in.	WEATHERBEST "Doubl-Thik" B. C.	5 butts to 3½ in.
18 in.	WEATHERBEST B. C. Eurekas	5 butts to 2 in.
18 in.	WEATHERBEST B. C. Perfections	5 butts to 2¼ in.
24 in.	WEATHERBEST B. C. No. 1 Royals	½ in. butts
24 in.	WEATHERBEST B. C. "Doubl-Thik" No. 1 Royals	1 in. butts

The standard WEATHERBEST colors consist of 20 different shades of greens, browns, reds and grays. WEATHERBEST stained shingles are also furnished in a color combination similar to weathered straw for WEATHERBEST thatched effect roofs, and in many variegated color schemes. Special colors are also furnished without extra charge. Color samples on request.

NUMBER OF SQUARE FEET A SQUARE OF WEATHERBEST STAINED SHINGLES WILL COVER WHEN LAID AT VARIOUS EXPOSURES

Size of shingles, inches	Exposure to the weather, inches									
	4½	5	5½	6	6½	7	7½	8	10	11½
12	84	92	100	.....	.....	.....	.....	.....	.....	.....
16	90	100	110	121	131	141	151	.....	.....	.....
18	.....	.....	100	110	120	129	138	148	.....	.....
24	.....	.....	.....	.....	.....	.....	76	80	100	115



Country Estate of Marvin Olcott at Big Flats, N. Y.

Both house and barn are roofed with 16-in. WEATHERBEST Moss Green Stained Shingles and on the sidewalls of the house 24-in. WEATHERBEST Colonial White Stained Shingles were also used. A very pleasing color treatment

Continued on next page

Weatherbest Variegated Color Roofs

Weatherbest stained shingles in several shades of one color, or different colors, may be used on roofs with decidedly pleasing results. For this purpose, there are standard Weatherbest variegated color schemes in browns, greens, reds, grays, etc., worked out to just the correct proportion of colors. No extra labor is required to lay as the different colored shingles are mixed and then re-bundled at our factories so that the carpenter lays them as received. Correct reproductions of these color combinations have been achieved in a booklet, copy of which will be mailed on request.

24-in. Weatherbest Colonial White Shingles

The large 24-in. heavy butt, Weatherbest Colonial white stained shingles are used extensively on sidewalls for the wide course effect. The wide exposures possible (10 in. and 11½ in.), and the pure, non-glaring white of Weatherbest Colonial white stain combine to make a sidewall that is far more attractive than the monotonous white of a painted clapboard siding. Weatherbest Colonial white stained shingles are first treated at our factories with a filler coat of our No. 500 white preserving stain. After they are laid on the sidewalls, the shingles should then receive two light brush coats of Weatherbest Colonial white stain to produce the true whitewashed effect.

Weatherbest Standard Specifications

To guard against substitution of inferior material, we advise incorporating the following in specifications:

Shingles: To be (insert size and color) Weatherbest, all clear, all edge grain stained shingles, as manufactured by Weatherbest Stained Shingle Company, Inc., of North Tonawanda, N. Y., and Minnesota Transfer, Minn.

Weatherbest Thatched Straw Effect Roofs

Combining attractiveness with long life, a Weatherbest thatched effect stained shingle roof offers the means of a radical but artistic departure from the conventional sharp angle roof.

Weatherbest thatched stained shingles are furnished ready for application. They come bent with the grain (lengthwise) to a 20-in. radius for the rounded surface of hips and valleys and for capping the ridges; bent with the grain to a 10-in. radius for the curves or roll at rakes; bent to a 20-in. radius against the grain (crosswise) for the curve at eaves and rounding of ridges, and flat for the flat surfaces of the roofs. On all Weatherbest thatched stained shingles except for the double first course at eaves, butts are specially sawn so that when laid, irregular, wavy courses will result.

Weathered Straw Color

Colored in three shades of weathered straw with an occasional spot of dull red and brownish green, the Weatherbest color scheme is a true reproduction of weathered straw. The different colored shingles come properly mixed and are laid as received. Weatherbest thatched stained shingles are also furnished in other color combinations if desired. One very pleasing color treatment is the Weatherbest method of graduating colors so that a roof may be green at eaves and gradually shade into a brown at ridges.

Thatched Effect Instruction Book and Service

Full information for constructing a Weatherbest thatched effect stained shingle roof is given in our book, "The Construction of Weatherbest Thatch Roofs," which is furnished on request. This book is complete in every respect, showing actual photographs of Weatherbest thatched effect roofs, working drawings showing rafter construction, furring, blocking, and method of laying shingles to secure the true thatched effect.

When thatched effect roofs are specified we ask that a set of plans be sent to us in order that we may estimate the quantities required of the different shingles.

Standard Specifications for a Thatched Effect Roof

The following specifications are standard for a Weatherbest thatched effect roof and should form part of the general specifications when this type roof is planned. Adherence to these specifications will insure complete satisfaction in finished roof by avoiding substitution of improperly bent, inferior flat grain shingles.

Special Rafter Construction—All rafter construction at ridges, rakes or gable ends, hips, valleys and eaves is to be in accordance with the instructions and detail drawings appearing in the book, "Construction of Weatherbest Thatch Roofs," furnished on request by the Weatherbest Stained Shingle Company, Inc., of North Tonawanda, N. Y.

Furring of Rafters—(While desirable to accentuate the convex appearance of the roof, it is not entirely essential and may be omitted.) Main rafters to be furred to a height of 5 to 6 in. midway between eaves and ridges, diminishing to nothing at eaves and ridges where it merges with curves. Ridge board to be furred to height of 5 or 6 in. at center of roof diminishing to nothing at apex of gables.

Shingle Lath—Rafters at eaves and ridges and blocking at valleys, hips, rakes or gable ends to be covered with 1x2-in. shingle lath, spaced 1 in. apart, running parallel with rafters at rakes or gable ends, hips and valleys and at right angles to rafters at eaves and ridges.

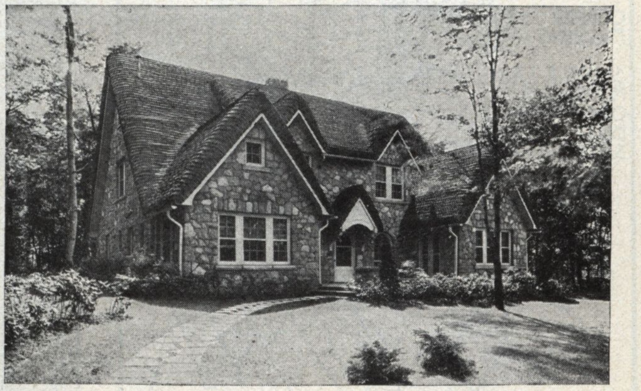
Roof Shingles—All roof surfaces shall be covered with Weatherbest thatch stained shingles as manufactured and supplied by the Weatherbest Stained Shingle Company, Inc., of North Tonawanda, N. Y., and Minnesota Transfer, Minn.

At eaves lay one double course of square butt Weatherbest stained shingles bent against the grain. Cover the curve at eaves with Weatherbest thatch stained shingles bent against the grain. Flat Weatherbest thatch stained shingles are to be used on all flat surfaces of roof and those bent with the grain to a radius conforming with curve for hips and valleys. Cover roll at rakes or gable ends with Weatherbest thatch stained shingles bent with the grain to a 10-in. radius. Cover curve of roof on each side of ridge board with Weatherbest thatch stained shingles bent against the grain, capping the ridge with those bent with the grain to a 20-in. radius.

Exposure of Shingles—Lay all shingles in irregular, wavy courses following procedure given in Weatherbest instruction book. Exposure to be from 1 to 3 in. (average 2 in.) on curve at eaves and 1 to 5 in. (average 3 in.) on all other sections of roof.

Nailing—Nail all shingles bent against the grain (at eaves and ridges) with 6d zinc coated nails, nailing 3 in. from the butt. Shingles on all other portions of the roof to be nailed with 3½d zinc coated nails in regular manner.

Color of Shingles—Color of shingles to be Weatherbest weathered straw. (If other color scheme is desired change to color number shown in our samples, or "to match.............")



Weatherbest Thatched Straw Effect Roof, Residence of A. G. Sharp, Ottawa Drive, Youngstown, Ohio

M. M. Miley and Leo Croell, Architects

Color: Dark Straw

COPPER ROOFINGS AND FLASHINGS

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

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Copper Roofing

The merits of copper for roofing purposes and especially for roof drainage systems, are well known. Detailed methods of application of copper roofing and copper flashings are set forth in "Copper Roofings"—a manual (third edition), and "Copper Flashings"—a hand book (second edition), complete with specifications.

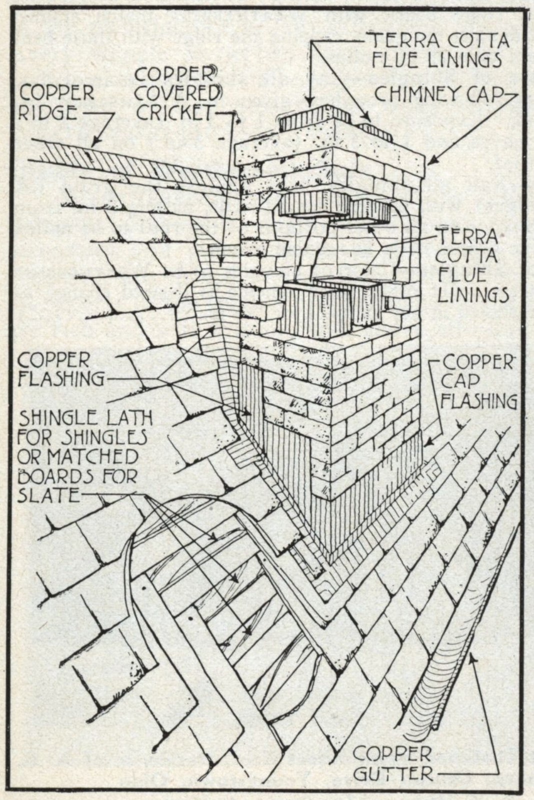
These books are furnished by the Association on request.

Excerpts from "Copper Flashings" appear on the following page. General sheet metal uses are shown in the table below.

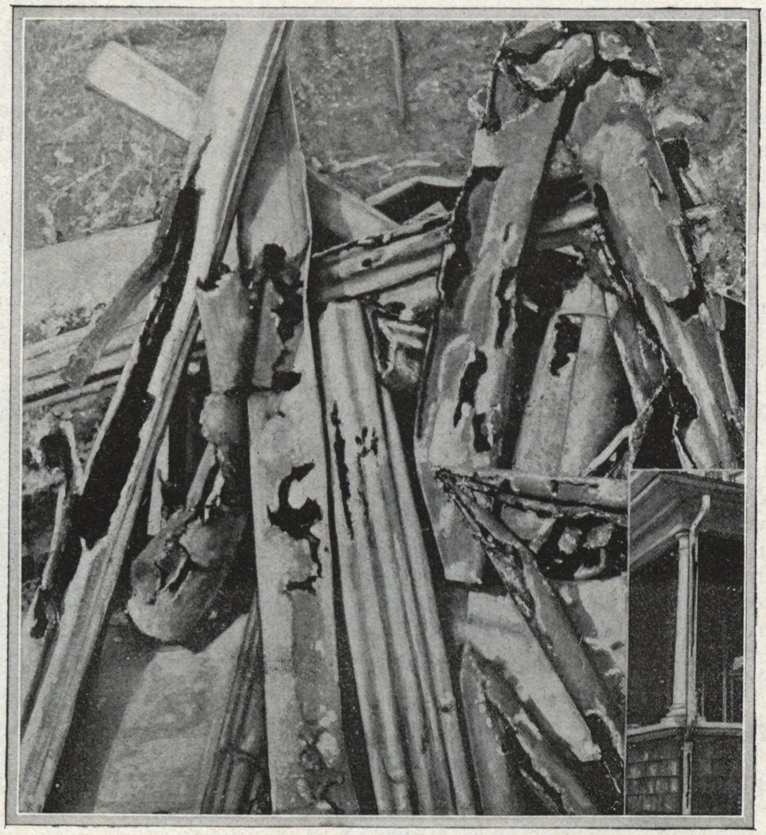
Copper and Brass
are cheaper because you
pay for them only ONCE

CONSULTING SERVICE COVERS THESE USES

1. Cornices
2. Eaves Troughs
3. Flashings
4. Gutters
5. Leaders
6. Roofing—Sheet
7. Roofing—Shingles
8. Roofing—Spanish Tile
9. Skylights
10. Ventilators


TERRA COTTA FLUE LININGS
COPPER COVERED CRICKET
COPPER RIDGE
CHIMNEY CAP
TERRA COTTA FLUE LININGS
COPPER FLASHING
COPPER CAP FLASHING
SHINGLE LATH FOR SHINGLES OR MATCHED BOARDS FOR SLATE
COPPER GUTTER

The Roof and Chimney



A Costly Heap of Copper Substitutes

Continued on next page

Size of Seams

The development of a standing seam is shown in Fig. 72. To form a standing seam the sheets of copper are prepared by turning the edges of the sheets at right angles, 1¼ in. on one edge and 1½ in. on the other. Then (1), two sheets are placed together on the roof with the 1¼-in. face of one against the 1½-in. face of the other. (2) The projecting ¼ in. of the 1½-in. face is turned completely back (180°) on the 1¼-in. face of the other. (3) The two sheets thus formed are then turned again 90° and, (4) then again 90° and the folds pressed tightly together. The seam thus formed finishes 1 in. high. A ¾-in. finished standard seam is made by turning the edges 1, and 1¼ in.

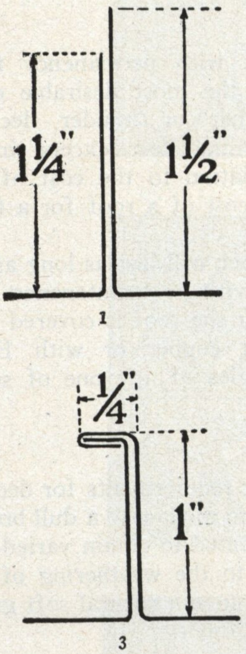

1¼"
1½"
1
1¼"
2
¼"
1"
3
¼"
1"
4

Fig. 72. The Standing Seam

A double-lock flat seam or copper-lock is shown in Fig. 73. To avoid confusion the cleats necessary to hold the seams to the roofing are omitted. The steps in forming this seam are as follows: (1) Bend the edges of the sheets at right angles, one edge 1¼ in., the other 1½ in. (2) Place the sheets together, a 1¼-in. edge against a 1½-in. edge. (3) Turn the 1½-in. edge 180° down on the 1¼-in. edge. (4) Turn both together again in the same direction, another 180° and then, (5) turn both in the same direction 90° down on the roof sheet, mallet together and, on flat roof work, tip the outer edge with solder.

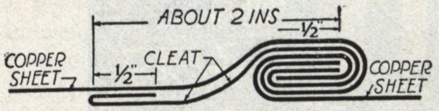

ABOUT 2 INS
½"
COPPER SHEET
CLEAT
½"
COPPER SHEET

Fig. 73. A Double or Copper-lock Seam

The method of securing copper sheets by cleats and a single-lock flat seam is shown in Fig. 74. The steps are as follows: (1) Tin the edges of the sheet. (2) Bend the edges of the sheets at right angles. (3) Place the sheet with the short bend on the roof. (4) Place the cleat against the sheet and nail it to the roof and turn the end back over the nails. (5) Place the second sheet in position and, (6) turn the edge of the second sheet and the cleat 180° down over the edge of the first sheet. Then, (7) turn all together 90° in the same direction down on the first sheet, flatten and solder.

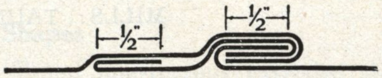


Fig. 74. A Single-lock Flat Seam and Cleat

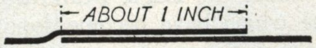
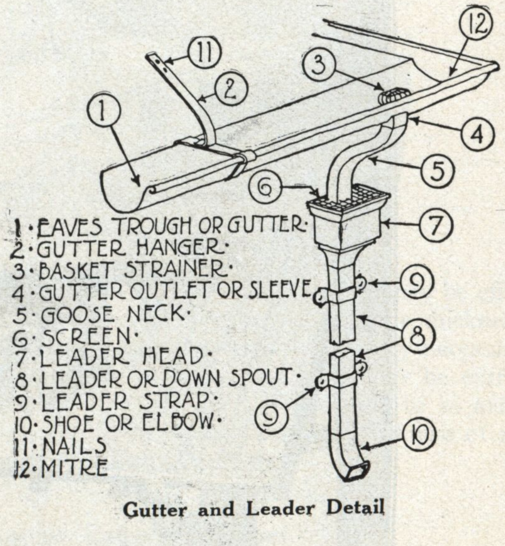

ABOUT 1 INCH

Fig. 75. A Lap Seam

Fig. 75 illustrates the lap seam. The edges of the sheets are tinned 1½ in., placed in position and soldered. Lap seams are often made less than 1 in. wide and in places where there is little or no strain on the seam, a ½-in. lap may well prove sufficient. All lap seams on flashings where there is any likelihood of strain should not be less than 1 in.


1·EAVES TROUGH OR GUTTER·
2·GUTTER HANGER·
3·BASKET STRAINER·
4·GUTTER OUTLET OR SLEEVE·
5·GOOSE NECK·
6·SCREEN·
7·LEADER HEAD·
8·LEADER OR DOWN SPOUT·
9·LEADER STRAP·
10·SHOE OR ELBOW·
11·NAILS
12·MITRE
1
2
3
4
5
6
7
8
9
9
10
11
12

Gutter and Leader Detail

ESTABLISHED 1826 INCORPORATED 1831

TAUNTON-NEW BEDFORD COPPER CO.

Brass, Copper and Yellow Metal Rolling Mills

TAUNTON, MASS.

BRANCH SALES OFFICES AND WAREHOUSES

NEW YORK, N. Y., 35 Howard Street
BOSTON, MASS., 61 Batterymarch Street

MILLS: TAUNTON AND NEW BEDFORD, MASS.

Products

Eagle Brand Copper, Brass, Architectural Bronze, Yellow (Muntz Metal) in Sheets, Shapes and Rods as used by the building trade—also Copper Shingles, cut Copper and Brass Nails and Tacks.

Trade-mark

Since 1826 the Taunton-New Bedford Copper Co. has supplied non-ferrous metals for the building trade. The products have been marketed under the Eagle Brand trademark and name which have become synonymous with quality and service.

TAUNTON-NEW BEDFORD COPPER CO. AMERICA

TRADE MARK REG U S PAT OFF

EAGLE BRAND

Copper for Roofs

"A roof should not cost too much yet should cost enough to insure perfect service forever."

One word—permanency—expresses the first and most desirable requirement of any roofing material. Next in importance is appearance—beauty. Cost must be considered, but with permanency fixed firmly in mind as the most desirable quality, the wise owner or builder declines to consider the initial cost except in its proper place in relation to the cost of upkeep and the final cost of a roof for a fixed period of time.

A roof of copper will last as long as the building it covers with no maintenance cost. This is true whether the roof is covered with Eagle Brand sheet copper or with Eagle Brand copper shingles of any one of seven different patterns.

Beauty of Copper Roofs

Copper has in itself all the requirements for decoration. It may be oiled and left to mellow to a dull bronze color, or it may be specially treated to obtain varied and beautiful effects. When left to the weathering of the atmosphere it will gradually assume a natural soft green color, as beautiful as it is permanent.

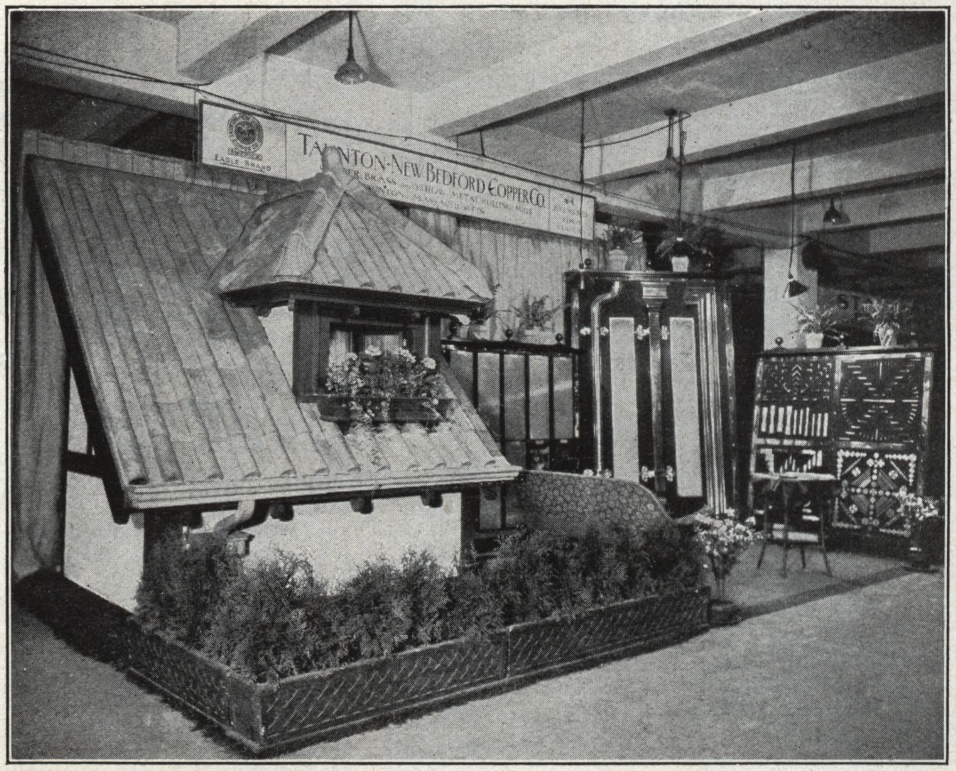
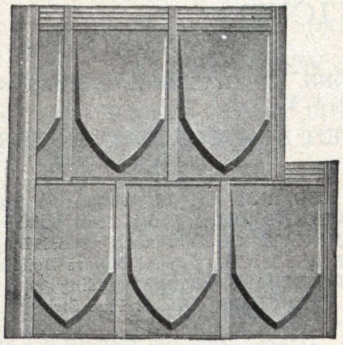


Exhibit of "Eagle Brand" Spanish Copper Tile and Miscellaneous Products, Architectural and Allied Arts Exposition, New York, N. Y., 1925

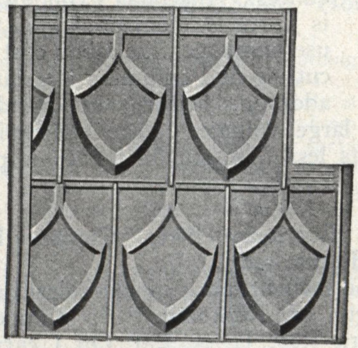
Continued on next page

Eagle Brand Copper Shingles

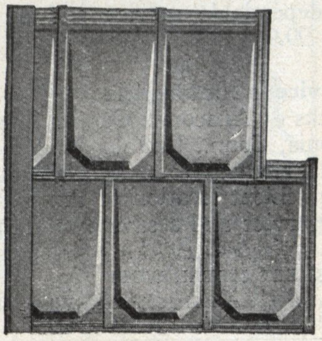
Like other Eagle Brand products these shingles are essentially quality merchandise and assure exceptional service.



Excelsior



Jersey



Octagon

Eagle Brand Copper Shingles

Eagle Brand copper shingles are the outgrowth of a widespread demand for a permanent roofing material which is reasonable in price and at the same time artistic in effect and pleasing in design.

Light in weight, permitting economies in construction; easy to apply, reducing labor cost of laying to a minimum; free to contract and expand; completely fireproof; impervious to the action of the elements, thus preventing costly repairs and replacements—the Eagle Brand copper shingles have met with instant approval among architects.

We show here three styles of our shingles fabricated from Eagle Brand sheet copper. Illustrations of other styles and structural data will be cheerfully furnished on request.

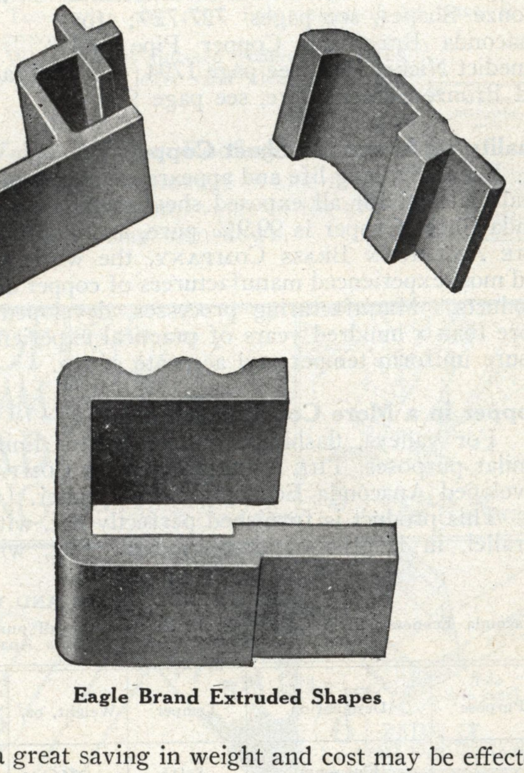
Cut Brass and Copper Nails

The owner is fast realizing the fallacy of using anything but copper and brass where metal is exposed to the weather or other corroding action.

Eagle Brand cut brass nails are strong and stiff and drive easily. They are made from a special mixture of metals and are guaranteed to last as long as the roofing material they hold in place.

Extruded Shapes

Eagle Brand non-ferrous extruded shapes afford the architect, and the manufacturer of building details, suitable and economical material for the construction of exterior or interior finish and hardware. Extruded shapes are much stronger than cast shapes, in consequence a great saving in weight and cost may be effected by the reduction that may be made in the thickness of the walls of the desired section. It is only necessary to bear in mind that while some shapes may be extruded with a thickness of $\frac{3}{32}$ in. it is desirable to so arrange the design that $\frac{1}{8}$ in. is the minimum thickness of metal in any part of the cross section.



Eagle Brand Extruded Shapes

Estimates on Extruded Shapes

Upon the receipt of drawings showing the desired cross section, estimates will be cheerfully made and, if necessary, suggestions given in order that the architect and fabricator may enjoy to the fullest extent the many advantages obtained by the use of Eagle Brand extruded shapes.

THE AMERICAN BRASS COMPANY

Manufacturers of Sheet, Roll and Strip Copper

GENERAL OFFICES
WATERBURY, CONNECTICUT

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ST. LOUIS, MO., Planters Building
SAN FRANCISCO, CAL., 2 Pine Street

Products

Anaconda Sheet Copper, Roll Copper and Economy Strip Copper.

For Anaconda Extruded Architectural Bronze Shapes, see pages *727-729*; for Anaconda Brass and Copper Pipe and Benedict Nickel Pipe, see page 1794; for Ambrac Metal and Bronze Screen Wire, see page 939.

Quality of Anaconda Sheet Copper

Economy, long life and appearance make copper the ideal material for all exposed sheet metal work. Anaconda Sheet Copper is 99.9% pure, and guaranteed by The American Brass Company, the world's largest and most experienced manufacturers of copper and brass products. Manufacturing processes, developed during more than a hundred years of practical experience, also insure uniform temper and accurate gauge.

Copper in a More Convenient Form

For valleys, flashings, gutters, gutter linings and similar purposes, The American Brass Company has developed Anaconda Economy Strip Copper.

This product is furnished perfectly flat, with edges parallel, in lengths of 6, 8, and 10 feet, widths of 6 to 16 inches, and weights of 16 and 14 ounces. Anaconda Economy Strip Copper is correctly tempered for forming. Its use eliminates the labor cost of flattening, cutting and trimming standard sheets. In addition, because of standardized production in large volume, Economy Strip Copper costs less than standard sheet copper.

Anaconda Economy Strip Copper Is Trade-marked

As a permanent mark of identification, every length of Economy Strip Copper (Trade-mark Reg. U. S. Pat. Off.) carries the Anaconda trade-mark rolled in the metal. This mark is an assurance of dependable service and a guarantee of purity equal to 99.9%.

Anaconda Service is Nationwide

Large stocks of Anaconda Copper Sheets, Rolls and Strips at Ansonia, Conn., Buffalo, N. Y., and Kenosha, Wis., enable distributors to meet any unusual requirement. The convenient location of these shipping points means prompt service and a saving in freight.

RECOMMENDED SIZES AND WEIGHTS OF COPPER FOR SHEET METAL WORK

Anaconda Economy Strip Copper should be used for all purposes where the required width does not exceed 16 inches. Where the required width exceeds 16 inches Anaconda Standard Sheet Copper should be used.

Purpose	Designation	Temper	Weight, oz.	Sizes	Number strips packed to crate	Area or length covered
Roofs	Flat seam	Soft	*16	14 x 20-in.	112	180 sq. ft.
				10 x 14-in.		82 sq. ft.
	Standing seam	Soft	*16	20 x 96-in.	25	284 sq. ft.
				30 x 96-in.		448 sq. ft.
	Ribbed seam	Soft	*16	20 x 96-in.	25	284 sq. ft. outside of battens
				30 x 96-in.		448 sq. ft. outside of battens
				6 in. x 6, 8, or 10-ft.	25 or 50	50 lin. ft., 8 sq.ft. for 2 x 3-in. ribs
Flashings and Gutter Linings	Base	Soft	*16	12, 14, 16 or 18-in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Cap	Soft	*16	10 in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Valley	Soft	*16	18 in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Gutter linings	Soft	*16	12, 14, 16, or 18-in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Shafts	Soft	*16	12, 14, 16, or 18-in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Skylight base	Soft	*16	12, 14, 16, or 18-in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.
	Window heads, etc.	Soft	*16	6 or 8-in. x 6, 8, or 10-ft.	25 or 50	150, 200, 250, 300, 400 or 500-lin. ft.

Note: For flat seam roofs use 4 cleats to each sheet with 2 nails to each cleat.
For standing seam roofs use 9 cleats to each sheet with 2 nails to each cleat.
For ribbed seam roofs use 10 cleats to each sheet with 2 nails to each cleat.
*16-oz. copper meets all ordinary conditions, but in special cases heavier or lighter weights are sometimes used.

THE NEW JERSEY ZINC COMPANY

ESTABLISHED 1848

Manufacturer of Zinc Roofing

PRODUCTS DISTRIBUTED BY

THE NEW JERSEY ZINC SALES COMPANY

160 Front Street
NEW YORK, N. Y.

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CHICAGO, ILL.

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PITTSBURGH, PA.

1531 Guardian Building
CLEVELAND, OHIO

1205 Merchants Exchange Building
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Products

STANDING SEAM "HORSE HEAD" ZINC ROOFING.

For "Horse Head" Rolled Zinc, and history and advantages of zinc installations, see page 1144; for Paint Pigments, see page 1691.

New Jersey Zinc

TRADE-MARK

Instructions for Laying Standing Seam "Horse Head" Zinc Roofing

(1) Standing Seam "Horse Head" Zinc Roofing can be used on any roof that slopes not less than 2 in. to the foot.

(2) See that the roofing surface is properly sheathed with thoroughly seasoned lumber, laid close, free from ridges and well nailed with the nailheads flush with the surface.

(3) Standing Seam "Horse Head" Zinc Roofing must not be applied when the roofing boards are wet or damp.

(4) The roofing surface should first be covered with a good quality of red building paper or equal, properly nailed with galvanized nails.

(5) Start the zinc strips from ridge to eaves and form the standing seams as shown in diagram.

(6) Put clips every 8 to 10 in.

(7) If strips must be joined end to end, use a locked and soldered seam.

(8) Soldering should be done as follows: Use half-and-half solder, cut or killed acid flux and a *moderately* hot iron. Do not have iron in contact with zinc longer than is necessary to cause the solder to flow.

(9) Standing Seam "Horse Head" Zinc Roofing should not be laid when the temperature is less than 40° F.

(10) All flashings, gutter linings, etc., *used on masonry* should be laid on waterproof sheathing paper.

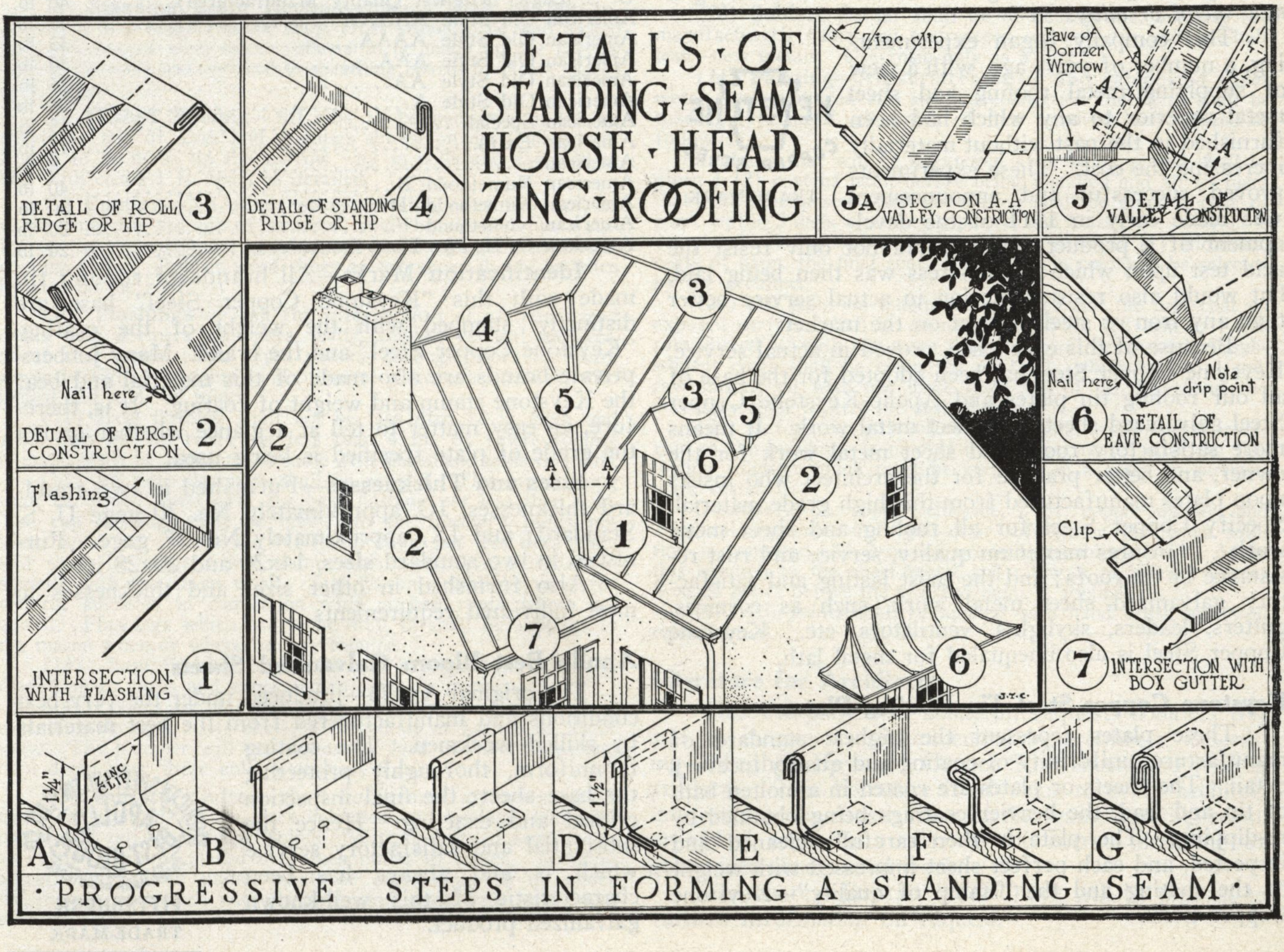
(11) To render the roof lightningproof be sure it is properly *grounded.*

(12) When job is finished remove all nails and scrap pieces and leave roof clean and ship-shape.

Scrap Value of Zinc Roofing

An important advantage in zinc roofing consists of its high scrap value in the event of the building being torn down.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1915


DETAILS OF STANDING SEAM HORSE HEAD ZINC ROOFING
DETAIL OF ROLL RIDGE OR HIP 3
DETAIL OF STANDING RIDGE OR HIP 4
Zinc clip
SECTION A-A VALLEY CONSTRUCTION 5A
Eave of Dormer Window
A
A
5 DETAIL OF VALLEY CONSTRUCTION
Nail here
DETAIL OF VERGE CONSTRUCTION 2
Flashing
INTERSECTION WITH FLASHING 1
3
4
5
2
3
5
6
A
A
2
1
2
7
6
Nail here
Note drip point
6 DETAIL OF EAVE CONSTRUCTION
Clip
7 INTERSECTION WITH BOX GUTTER
J.T.C.
1¼"
ZINC CLIP
1½"
A
B
C
D
E
F
G
PROGRESSIVE STEPS IN FORMING A STANDING SEAM

AMERICAN SHEET AND TIN PLATE COMPANY

Manufacturers of Sheet and Tin Mill Products

PITTSBURGH, PA.

DISTRICT SALES OFFICES

CHICAGO, ILL. PHILADELPHIA, PA. NEW ORLEANS, LA. DENVER, COLO. ST. LOUIS, MO.
DETROIT, MICH. CINCINNATI, OHIO PITTSBURGH, PA. NEW YORK, N. Y.

EXPORT REPRESENTATIVES

NEW YORK, N. Y., UNITED STATES STEEL PRODUCTS COMPANY

PACIFIC COAST REPRESENTATIVES

SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE, UNITED STATES STEEL PRODUCTS COMPANY

Products

KEYSTONE COPPER STEEL ROOFING TIN PLATES.

APOLLO BEST BLOOM and APOLLO-KEYSTONE COPPER STEEL GALVANIZED SHEETS for Sheet Metal Work.

Also manufacturers of Sheet and Tin Mill Products for all purposes, Corrugated Sheets and Formed Roofing and Siding Products, Black and Galvanized Sheets, Special Sheets, Fire Door Stock, etc.

Keystone Copper Steel

Keystone Copper Steel is an alloy made by adding a certain amount of copper to well made steel, thereby giving it greatest possible rust resistance. Copper thus added to steel is *not* an impurity, any more than copper is an impurity in brass and bronze. It becomes *thoroughly diffused* through the steel—thus forming a *new metal or alloy.*

This company began experimenting, a number of years ago, with a view of supplying metal roofing and sheet metal superior to any which had been furnished in the past without materially increasing the cost. These experiments proved successful and announcement was made early in 1911 of the development of a product which would not only resist the acid test upon which much stress was then being laid, but would also resist corrosion in actual service better than any iron or steel product on the market.

KEYSTONE
COPPER STEEL
TRADE-MARK

Because of this excellence, proved in actual service, Keystone Copper Steel has been adopted for the base of all our roofing tin plates and Apollo-Keystone Copper Steel galvanized sheets for sheet metal work. It means more satisfactory roofs and sheet metal work for the owner, and better practice for the architect who insists upon plates manufactured from this high grade material. Specify Copper Steel for all roofing and sheet metal work. It insures maximum quality, service and rust resistance in tin roofs; and the most lasting and satisfactory galvanized sheet metal work, such as cornices, gutters, leaders, skylights, ventilators, etc. Keystone Copper Steel is also unequaled for metal lath.

Keystone Copper Steel Tin Roofing Plates

These plates represent the highest standard of manufacture, uniformity of coating and quality in every detail. The sheets or plates are coated in a molten bath of tin and lead, the heavier coatings being obtained by re-dipping. The plate is then carefully cleaned and inspected, and each perfect sheet impressed with weight of the coating and the "stamp of quality"—Keystone Copper Steel.

Brands—The durability of any tin roof depends primarily on the weight of the coating. Keystone Copper Steel is manufactured with standard amounts of coating used by the trade, from 8 to 40 lb. Plates carrying less than 20 lb. should not be used for permanent buildings; 30 to 40 lb. coating is recommended.

MF Brand—32-lb. coating. This brand has been made continuously since 1822, and unquestionably is the most popular roofing tin manufactured. The coating is applied by hand dipped pure palm oil process.

MF
32 POUNDS COATING
IC
KEYSTONE
COPPER STEEL
TRADE-MARK

Other Brands—Other high grade roofing tin with Copper Steel base is made under the following brands:

Brand	Coating
U. S. Eagle (Highest Quality Manufactured)	40 lb.
American Old Style AAAAA	40 lb.
American Old Style AAAA	35 lb.
American Old Style AAA	30 lb.
American Old Style AA	25 lb.
American Old Style A	20 lb.
American Special	15 lb.
American Extra	12 lb.
American	8 lb.
American Numethodd B	40 lb.
American Numethodd D	30 lb.
American Numethodd F	20 lb.
American O. H. Fire Door Stock	20 lb.

Identification Marks—All brands of roofing tin made with this "Keystone Copper Steel" base are distinctly stamped with the weight of the coating, "Keystone Copper Steel" and the brand. Many jobbers' private brands are also made of this material and bear the Keystone stamp and weight of coating. It is, therefore, an easy matter to tell at a glance whether or not the grade of plate specified is being used.

Sizes and Thicknesses—Furnished in two standard thicknesses, IC, approximately No. 30 gage U. S. Standard; and IX, approximately No. 27 gage. Furnished in two standard sizes, 14x20 and 20x28 in.

Also furnished in other sizes and thicknesses to meet individual requirements.

Apollo Best Bloom Galvanized Sheets

The original Apollo—produced under the very best conditions and manufacturered from the best materials by skilled workmen. The coating is uniform, thoroughly protecting the base sheet; the final inspection critical and exacting. Hence the substantial and satisfactory service which is and always has been characteristic of this well-known galvanized product.

AMERICAN SHEET AND TIN PLATE CO.
APOLLO
BEST BLOOM
TRADE MARK REGISTERED
PITTSBURGH
TRADE-MARK

Continued on next page

Apollo-Keystone Copper Steel Galvanized Sheets

This product, like the roofing tin, has the highly rust resisting Keystone Copper Steel base. It is made in standard sizes and gages of flat sheets for all sheet metal work; and in standard patterns, such as corrugated sheets, V-crimped roofing, standing seam roofing, plain roll roofing, etc.

KEYSTONE
COPPER STEEL
TRADE-MARK

Standard Tin Roofing and Sheet Metal Specifications

(1) **Material**—*Tin Roofs*—Where tin roofs are required by the drawings, all tin for roof and surfaces, including flashings, counterflashings, gutter linings, crickets, etc., shall be MF [U. S. Eagle, American, or American Numethodd] Brand, Keystone Copper Steel, with 32 [25, 30, 35, 40] lb. coating. No substitute will be allowed and each sheet shall be stamped with name of brand and weight of coating.

(2) All tin unless otherwise specified shall be IC thickness.

(3) *Sheet Metal*—All sheet metal for sheet metal cornices, hanging gutters, down-spouts, skylights, ventilators, etc., shall be No. 24 gage Apollo-Keystone [Apollo Best Bloom] Galvanized Sheets.

(4) **Guarantee**—All material and workmanship in connection with roof coverings—including all flashings, counterflashing, ventilators, scuttles, or similar work—shall be guaranteed to be the materials specified and the workmanship up to approved standard.

(5) **Sheathing Paper**—Roof sections, where tin is required, to be covered with rosin-sized building paper weighing at least 6 lb. per 100 sq. ft. and laid with 2-in. lapped joints.

(6) **Flat Seam Roofing**—Edges of sheets shall be turned under ½ in.; all seams shall be well locked and well soaked with solder. Sheets to be fastened to sheathing boards by cleats spaced 8 in. apart, cleats locked into seams and fastened to roof with two 1-in. tinned barbed wire nails; no nails to be driven through sheets.

(7) **Standing Seam Roofing**—Sheets shall be put together in long lengths in the shop, cross seams to be well locked and well soaked with solder; sheets to be made up the narrow way in the rolls and fastened to sheathing boards by cleats spaced 1 ft. apart.

(8) **Ribbed Roofing**—All ribs to be securely nailed to sheathing and of sizes and spacings shown on detail drawings. Sheets to be made up the narrow way in rolls and fastened to ribs with cleats 1 ft. apart as detailed.

(9) **Caution**—No unnecessary walking over tin roof, or using same for storage of material, shall be allowed. In walking on the tin, care must be taken not to damage paint nor break coating of tin. Rubber soled shoes or overshoes should be worn by men on the roof.

(10) **Flashings**—Flash the intersection of all roofs and decks with dormers, chimneys, walls, and all vertical surfaces, about roof cants, about pipes passing through roofs to insure a weathertight job, using kind of metal elsewhere specified, with locked and soldered joints.

(11) Base flashing shall not be less than 12 in. high and shall turn out on roofs not less than 4 in., or where roofing is metal shall be connected to same with locked and soldered joints.

(12) All base flashings shall be capped. The cap flashing shall be turned down over the base flashing not less than 4 in. The cap flashing shall be built into the masonry joints not less than 2 in., or into the reglets in stone not less than 1 in., and shall be secured into same with metal plugs leaded in smooth with the stone work. Step flashing shall be used for vertical surfaces in connection with pitched roofs where required. Flashings which are to be built in shall be supplied to the mason when or where he may require.

(13) Base flashing of shafts and skylights must be extended up to curbs and connected to eaves or gutters.

(14) Collars or flashing about plumbing and other pipes extending through roofs shall be turned up at least 8 in. about same. The plumber will calk aprons of lead in hub of pipe and turn down over these collars at least 6 in.

(15) **Gutters**—Gutters shall be formed at eaves of all roofs as required, of the sizes indicated on drawings, laid with continuous fall to drainage points. Wire baskets of same metal as gutters shall be placed over each outlet to leader. Hanging gutters and gutter linings shall be carried up 10 in. under the roofing, connected with flashings and roofs with locked and soldered joints.

(16) Hanging gutters shall be made with clamped, riveted and soldered joints with roll on outer rim entirely covering continuous ⅝-in. galvanized iron bar which shall be placed therein, supported at least every 4 ft. in length by straps with edges rolled on themselves to stiffen them. They shall be wrapped around the roll and iron bar on outer edge of gutter and riveted. All rivets, screws, straps, etc., shall be of same metal as gutters.

(17) **Leaders**—Leaders shall be of ample capacity and same metal as gutters (except where otherwise specified) and shall be set to all roofs and gutters as shown, hereinbefore specified or necessary.

(18) Interior leaders put in to take the discharge from roof cesspools will be of cast or wrought iron (as provided for under "Plumbing") extended to within 18 in. (or as near as practical) of cesspool outlet and finished with hub end. These shall be connected to gutters and roof cesspools with brass ferrules and 6-lb. lead tubes heavily soldered. Connecting tubes shall have graduated increase of 1 in. in diameter to top.

(19) **Down-spouts**—Sheet metal down-spouts shall be as designed. They shall be flanged and soldered to the gutters and secured to the building with tinned conductor hooks or with metal strips ⅛x½ in. in cross section soldered to the down-spouts and fastened to woodwork with screws and to masonry by screws and lead sleeves. Straps and screws shall be galvanized.

(20) Where down-spouts connect with underground drainage system a suitable conductor head shall be provided (by the plumber) at the upper end of the drain pipe to receive the down-spout, and the joint between conductor head and drain pipe made with cement mortar well worked into place and finished smooth by the sheet metal contractor.

(21) **Metal Cornice**—Furnish and set complete, sheet metal cornice as shown on detail drawings. To be of No. 26 [No. 24] gage Apollo-Keystone Galvanized Sheets with ornamental work stamped out of heavy zinc.

(22) The cornice shall be built up on heavy galvanized forms bent to correct profiles and firmly anchored in place. All joints, angles, miters and fittings to be thoroughly well made and finished. Ornamental work, modillions, etc., shall be planted on watertight backings.

(23) **Solder**—Solder shall be of best grade, bearing the manufacturer's name and guaranteed one-half tin and one-half lead—new metals. Use rosin only as a flux.

(24) **Painting**—All surfaces of tin and galvanized sheet metal work and iron and steel in connection therewith shall be thoroughly cleaned, all traces of flux removed, and painted as follows:

Surfaces that will be unexposed after being placed shall be given 1 [2] coat of paint before being installed and all surfaces that will be exposed after installation shall be given 1 coat of paint within 3 days after being placed, and before the contract is completed all exposed surfaces shall be given 2 [1] additional coats of paint, the final coat to be tinted in colors to be selected by the architect.

(25) All paint on unexposed surfaces and the first coat on exposed surfaces shall be composed of 15 lb. red lead to 1 gal. raw linseed oil with not more than ½ pt. oil dryer, and all subsequent coats shall be composed of 15 lb. white lead to 1 gal. raw linseed oil with not more than 5% of oil dryer and the necessary color to give the desired tint.

(26) Before the galvanized sheet metal work on the exterior of the buildings is painted it must be treated with the following solution which must be prepared in a glass or earthenware vessel:

Dissolve 2 oz. copper chloride, 2 oz. copper nitrate, and 2 oz. sal ammoniac in 1 gal. clear soft water, and when solution is complete add 2 oz. of crude hydrochloric acid. Apply this solution to the sheet metal and allow it to become dry at least 24 hours before the red lead paint is applied.

(27) All paints shall be applied with hand brush and well rubbed in.

Literature for Architects

This company will send, on request, booklets 8½ x11 in. in size, as recommended by architects, describing fully their Keystone Copper Steel sheets and roofing products. This literature is of value to every architect interested in the construction of flat seam, standing seam, or ribbed seam tin roofs; or the correct detailing of galvanized sheet metal work.

The nearest District Sales Office will be pleased to furnish information on request.

THE AMERICAN ROLLING MILL CO.

Producers of ARMCO Ingot Iron

GENERAL OFFICES
MIDDLETOWN, OHIO

DISTRICT OFFICES

NEW YORK, N. Y., 50 Church Street
CHICAGO, ILL., People's Gas Building
PHILADELPHIA, PA., Franklin Trust Building
DETROIT, MICH., General Motors Building

HOUSTON, TEX., 407 First National Bank Building
PITTSBURGH, PA., Oliver Building
ST. LOUIS, MO., Boatmen's Bank Building

CLEVELAND, OHIO, B. F. Keith Building
CINCINNATI, OHIO, Union Trust Building
SAN FRANCISCO, CAL., Tenth and Bryant Streets

Products

"ARMCO" INGOT IRON SHEETS: "Armco" Ingot Iron Galvanized Sheets, "Armco" Ingot Iron Galvanized Corrugated Sheets, "Armco" Ingot Iron Black Sheets, "Armco" Ingot Iron Blue Annealed Sheets.

Properties

ARMCO Ingot Iron is the purest iron made. It is a metal with unique physical and chemical properties. The sum of carbon, sulphur, silicon, phosphorus, manganese, copper, hydrogen, oxygen, and nitrogen is less than 16-100ths of 1%. ARMCO Ingot Iron has five points of superiority over ordinary ferrous metals: (1) purity; (2) *rust resistance;* (3) welding quality; (4) enameling property, and (5) electrical conductivity.

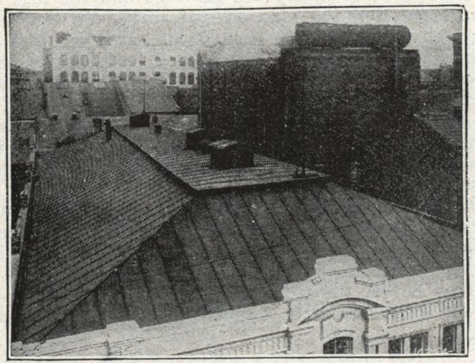
For many years this durable iron has been giving satisfaction under the most severe service conditions. It has proved itself "less costly than copper, more durable than steel."

Cost

Galvanized ARMCO Ingot Iron costs slightly more than ordinary galvanized steels. The labor cost is the big item in sheet metal construction. Costly repairs and replacements are postponed when ARMCO Ingot Iron is used.

Under all ordinary conditions, galvanized ARMCO Ingot Iron for roofs, roof drainage parts, etc., will last the life of the building at less than one-quarter the materials cost of copper or lead and one-half the cost of zinc.

ARMCO Ingot Iron is the metal *of lowest cost per year.*



18-year-old ARMCO Roll Roofing on the Old Sazerac Building, New Orleans, La.

It is still in excellent condition

Standard Specifications for Sheet Metal Work

(1) Furnish material and labor for completion of all sheet metal work required by drawings and specifications. All such work, unless otherwise specified, shall be made from ARMCO Ingot Iron galvanized sheets as manufactured by THE AMERICAN ROLLING MILL CO., Middletown, Ohio, and of ...... gauge (see recommended gauges for different classes of work) except for parts otherwise indicated on drawings.

(2) The iron shall be galvanized with a high grade zinc coating. This coating shall be clean and free from blisters and other mechanical defects.

(3) Each sheet shall be stenciled with the Blue ARMCO Ingot Iron trade-mark showing the gauge of the metal.

(4) All work that is to be furnished hereunder shall be installed at the proper time and as rapidly as the progress of the surrounding work requires or permits.

(5) The sheet metal contractor shall verify all measurements given and shall obtain at the building such additional measurements, sizes and other required information for the correct installation of this work.

(6) All cutting, drilling, tapping or fitting of sheet metal work required for its installation or to receive or accommodate the work of other contractors shall be done in an accurate manner.

RECOMMENDED GAUGES FOR DIFFERENT CLASSES OF WORK

Installation	Gauge No. for residences	Gauge No. for offices and public buildings	Gauge No. for factories and warehouses
Roofing	26	26	18 to 26
Siding	....	....	20 to 26
Cornices	24 to 27	24 to 27	22 to 26
Skylights	24 to 26	20 to 26	20 to 26
Ventilators	24 to 26	18 to 24	16 to 24
Heating and ventilating ducts	22 to 26	16 to 26	16 to 26
Eaves troughs	26	24 to 26	22 to 24
Leaders	26	24 to 26	22 to 26
Flashing	26	26	same gauge as roof
Valleys	26	24 to 26	same gauge as roof
Ridge roll	26	26	same gauge as roof
Window frames	22 to 24	22 to 24	22 to 24
Window sash	24	24	24

The heavy gauges shown above should be used where unusually severe corrosive conditions are present.

Standard Gauges and Sizes

ARMCO *Ingot Iron Galvanized Sheets* are carried in stock in the following sizes: Gauges 14, 16, 18, 20, 22, 24, 26, 27 and 28. Widths, 24, 26, 28, 30 and 36 in. Lengths, 60, 72, 84, 96, 108 and 120 in.

ARMCO *Ingot Iron Black Sheets* are carried in stock in the same gauges and sizes as galvanized.

ARMCO *Ingot Iron Corrugated Sheets* for roofing and siding purposes are made with 5, 3, 2½, 1¼ and 3/16-in. corrugations. For general building purposes we recommend and carry in stock a 2½-in. corrugated sheet, 26 in. wide (after corrugating) for siding, and 27½ in. wide (after corrugating) for roofing. This size covers 24 in. in the width and allows for a one corrugation lap for siding and a one and one-half corrugation lap for roofing.

These sheets may be had from stock in the following sizes: Gauges, 20, 22, 24, 26, 27 and 28. Widths, 26 and 27½ in. Lengths, 60, 72, 84, 96, 108 and 120 in.

All of the above sizes are termed standard sizes because they are carried in stock and used most frequently. All grades of sheets may be had in special sizes when an order is placed for 2000 lbs. or more of a size.

APPROXIMATE THICKNESS AND WEIGHT OF GALVANIZED ARMCO INGOT IRON

Gauge No.	Weight per sq. ft., lb.	Approximate thickness, in.	Approximate thickness in decimal parts of an in.	Gauge No.	Weight per sq. ft., lb.	Approximate thickness, in.	Approximate thickness in decimal parts of an in.
28	.781	1/64	.015625	21	1.531	11/320	.034375
27	.844	11/640	.0171875	20	1.656	3/80	.0375
26	.906	3/160	.01875	18	2.156	1/20	.05
25	1.031	7/320	.021875	16	2.656	1/16	.0625
24	1.156	1/40	.025	14	3.281	5/64	.078125
23	1.281	9/320	.028125	12	4.531	7/64	.109375
22	1.406	1/32	.03125	10	5.781	9/64	.140625

LYON, CONKLIN & CO. INCORPORATED

Manufacturers of Lyonore Metal Products

BALTIMORE, MD.

WASHINGTON, D. C., 930-932 E Street, N. W.

Products

"Lyonore Metal" Terne Roofing Plates.

"Lyonore Metal" Galvanized Sheets, Conductor Pipe, Eaves Trough, etc.

Lyonore Metal

TRADE-MARK

Lyonore Metal—Corrosion Resistance

A knowledge of the resistance of the alloy Lyonore metal to chemical influences is of considerable practical importance. Nearly all articles of metal are exposed to the action of gases contained in the atmosphere; besides nitrogen, there are oxygen, carbonic acid and aqueous vapors, such as steam and fog. In inhabited localities there is nearly always present sulphur, ammonia, etc. These gases together with moisture, rain or snow, readily create a condition that makes a metal exposed to them subject to the influence of electrolysis, the cause of rust, corrosion or disintegration.

Lyonore metal is an alloy that is electrically balanced, the constituents being of such a nature and proportionately combined as not to be unduly influenced by electrolysis. Its ability to resist the corrosive action generated by the gases mentioned above proves Lyonore metal to be the most perfectly balanced alloy that science has been able to compose up to this period.

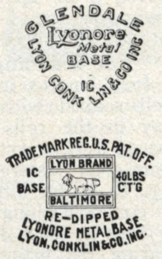
Several of the constituents entering into the composition of Lyonore metal are of the same substance as the metal that was used by the Egyptians in the joints of the stone work of the Pyramids in Egypt. This metal has resisted corrosion for more than five thousand years.

"Lyonore Metal" Terne Roofing Plates

These high grade plates are made with the greatest care and by the most approved methods. They have given satisfactory service for many years and are endorsed by leading architects and the trade everywhere because of their remarkable durability and resistance to corrosion.

Lyonore Metal base is heavily coated with a genuine terne mixture of virgin tin and new lead by the pure palm oil process, no acid flux being used.

Furnished in two weights of coating: Lyon Brand and Glendale Brand, and in two thicknesses: IC and IX.



TRADE-MARKS

The accompanying trade-marks are stamped on every sheet.

"Lyonore Metal" Conductor Pipe and Eaves Trough

Conductor pipe and eaves trough made of Lyonore Metal base and scientifically coated with pure spelter by the most approved process. Is made in U. S. S. gauge Nos. 27 to 24, inclusive.

Standard Specifications for Lyonore Metal Standing Seam Tin Roofing

All tin roofing on this building shall be Lyonore Metal Base, Glendale Brand [Lyon Brand 40-lb. Coated] IC thickness for all roofing, and IX thickness for valleys and gutters.

Shop Work—Sheets, 20x28 in., shall be put together in long lengths, 20 in. wide, in the shop. The cross seams shall be locked together and well soaked with solder, using rosin as a flux, and shall be well painted 1 coat on the underside with pure metallic brown oxide or Venetian red as a pigment.

Applying to Roof—The tin shall be fastened with cleats spaced not more than 1 ft. apart. One edge of the tin shall be turned up 1¼ in. at right angles, the cleats inserted and nailed, and the adjoining edge of the tin shall be turned up 1½ in. Both edges shall be locked together and seamed so as to form a rounded edge when finished. All courses shall be laid flat seam 60 in. or more back from the eaves, according to the pitch of the roof.

Valleys, Box Gutters and Flashings—Valleys and box gutter, if any, shall be formed with flat seams. Flashing shall be set into joints of brick or stone work and cemented. If counterflashings are used, the lower edge of the counter part shall be kept at least 3 in. above the roof.

Painting—When finished, the roof surface shall be carefully cleaned of all rosin and dirt and immediately painted. A second coat shall be applied to the roof, valleys and gutters two weeks after first coat is applied.

Sheathing Boards—The general contractor shall furnish well seasoned dry pine lumber of narrow widths (not over 6 in.), free from holes and of even thickness. Boards are to be laid with tight joints, or tongued and grooved, with nailheads well driven in.

Sheathing Paper—Paper containing tar, pitch or similar substances shall not be allowed to come in contact with this tin and no paper shall be used unless necessary in the opinion of the sheet metal contractor.

Standard Specifications for Lyonore Metal Flat Seam Tin Roofing

All tin roofing on this building shall be Lyonore Metal, Glendale Brand [Lyon Brand 40-lb. Coated] IC thickness for all roofing and IX thickness for valleys and gutters.

Flat Seams—If sheets are laid singly, their size shall be 14x20 in. The sheets shall be fastened to the sheathing boards with cleats, using 3 to each sheet, 2 on the long side and 1 on the short side. Two 1-in. barbed wire nails shall be used for fastening each cleat, no nails to be driven through the sheets.

Shop Work—If roofing is put on in rolls, the sheets shall be made up into long lengths in the shop. The cross seams shall be well locked together and well soaked with solder, using rosin as a flux, and painted 1 coat on the underside with pure metallic brown oxide or Venetian red as a pigment. The rolls shall be applied the narrow way and fastened to the roof with cleats spaced 8 in. apart. The cleats shall be locked into the seam and fastened to the roof with two 1-in. barbed wire nails to each cleat.

Valleys, Box Gutters and Flashings—Same as specifications for standing seam roofing.

Painting, Sheathing Boards and Sheathing Paper—Same as specifications for standing seam roofing.

Standard Specifications for Lyonore Metal Galvanized Sheet Metal Work

All galvanized sheet metal on this building shall be Lyonore Metal of gauges specified for each class of work.

Note: For best results, we recommend that the following gauges be specified for various classes of sheet metal work:

For conductor pipes, hanging gutters and eaves trough	No. 27 gauge
For cornices	No. 26 gauge
For skylights	No. 24 gauge
For gravel strips and flashings	No. 26 gauge
For ventilating ducts and dust conveyors (inside work), specify gauge number according to size of duct as follows:	
Smaller than 12-in. diameter	No. 27 gauge
12 to 16-in. diameter	No. 26 gauge
18-in. diameter	No. 24 gauge
Larger than 18-in. diameter	No. 22 gauge
For paneling and moulding	No. 24 gauge
For special work	No. 24 gauge

Literature and Samples

We will submit samples of various forms of Lyonore Metal and literature bearing on its use.

N. & G. TAYLOR COMPANY

Manufacturers of Tin Plate of all Kinds

ESTABLISHED 1810
116TH YEAR

Chestnut and Third Streets
PHILADELPHIA, PA.

WORKS
CUMBERLAND, MD.

BRANCH OFFICES
CHICAGO, ILL., 208 South La Salle Street
LOS ANGELES, CAL., 845 Seward Street

Products

"TARGET AND ARROW" BRAND OF ROOFING TIN, formerly known as "Taylor's Old Style."

"Taylor's Extra Coated 40-lb. Copper Bearing, Open Hearth"; "Taylor's Fire Protection Terne"; with other brands of Roofing Tin, Ternes, Bright Tin Plate and Black Plate.

Advantages of Tin Roofing

These can be summed up briefly as follows:

(1) Durable. (2) A time-tried, long established material. (3) Easily applied. (4) Adaptable to any kind of surface. (5) Moderate first cost. (6) Low cost of maintenance. (7) Easily and quickly repaired if damaged. (8) Loses nothing in appearance with age. (9) Light in weight. (10) Weatherproof. (11) Not affected by heat or cold. (12) Gives protection against lightning. (13) Incombustible and prevents spread of fire. (14) Can be painted any color.

Maintenance

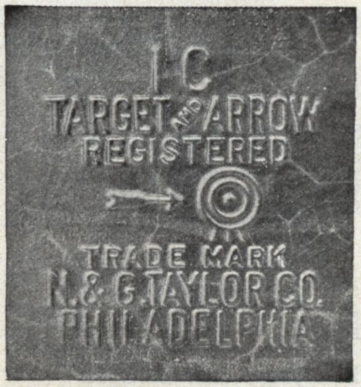
A coat of paint every four or five years, to keep the surface in first class condition. Use for first coat only metallic brown, Venetian red, iron oxide, red lead, or white lead, with pure linseed oil. Afterward any color to suit the color scheme of the building.

Each painting restores the roof to its original condition. With this slight attention a "Target and Arrow" tin roof will usually outlast the building it covers.

"Target and Arrow" Brand Roofing Tin

This is our highest grade and the same durable quality of roofing tin that this company has supplied to the American sheet metal roofing trade for more than 70 years. It is an old specialty, made by a process handed down from the early days of our business. The base plate is a special quality, developed in our complete works, following the best practice of former years.

Extreme durability is obtained by an oldtime coating process of ours, by which an exceptionally heavy coating is applied, rich in pig tin. The black sheets used are cut accurately to the finished standard size, 14x20 in. or 28x20 in. before tinning, to prevent uncoated edges. The finished sheets are closely inspected, and only the primes or perfect sheets are stamped with the "Target and Arrow" trade-mark.



TRADE-MARK STAMPED ON EACH SHEET

This tin has in many cases lasted in good condition on the roof for more than 60 years.

Furnished in standard thicknesses, known as IC (pronounced *eyesee*), approximately No. 30 gage U. S. Standard; IX (pronounced *one-cross*), approximately No. 28 gage. Odd sizes can be made to order.

This brand is carried in stock by leading wholesale hardware and sheet metal jobbers throughout the United States.

For Fireproof Buildings

The small amount of wood required for a light deck, supported by steel roof framing, and covered with tin, represents so small a fire risk as to be negligible in the case of fireproof buildings. The tin roofing protects the roof from exposure risks, and in the case of fire within the building prevents the flames from breaking through. Moreover, there is a considerable saving in using this type of roof in contrast with heavy, costly forms of roof construction.

Specifications for Standing and Flat Seam Roofing

Form recommended by the National Association of Sheet Metal Contractors for the use of architects:

Tin Roofing Work—All tin used on this building shall be Taylor's "Target and Arrow" brand. No substitute for this brand will be allowed. Use IC thickness for roof proper, decks, etc., and IX thickness for valleys, gutters, flashings and spouts, as required by design. One coat of red or white lead, iron oxide, metallic brown, or Venetian red paint, with pure linseed oil, shall be applied to underside of tin before laying.

For Flat Seam Roofing—Edges of sheets to be turned ½ in.; all seams to be locked together and well soaked with solder. Sheets to be fastened to sheathing boards by cleats spaced 8 in. apart; cleats locked into seams and fastened to roof with two 1-in. barbed wire nails; no nails to be driven through the sheets.

For Standing Seam Roofing—Sheets to be put together in long lengths in shop; cross seam to be locked together and well soaked with solder. Sheets to be made up the narrow way in the rolls and fastened to sheathing boards by cleats spaced 1 ft. apart. Valleys and gutters to be formed with flat seam well soldered; sheets to be laid the narrow way. Flashings to be let into joints of brick or stonework, and cemented. If counterflashings are used, lower edge of counterpart shall be kept at least 3 in. above roof. Solder to be of best grade, bearing the manufacturer's name, and guaranteed one-half tin and one-half lead—new metals. Use rosin only, as a flux—never use acid.

Caution—No unnecessary walking over tin roof or using it for storage of material shall be allowed. In walking on the tin, care must be taken not to damage paint nor break coating of tin. Rubber soled shoes or overshoes should be worn by men on the roof.

Painting Tin Work—All painting of tin work to be done by roofer, using red or white lead, iron oxide, metallic brown, or Venetian red paint, with pure linseed oil. No patent dryer or turpentine to be used.

All paints to be applied with a hand brush and well rubbed on. Tin to be painted immediately after laying. A second coat shall be applied in a similar manner, two weeks later.

No deviation from these specifications shall be made unless authority be given in writing by the architect. Only a first class roof will be accepted.

Note: Extra copies of this form ready for insertion in building specifications will be sent on request.

UNITED ALLOY STEEL CORP'N

STARK DIVISION

Manufacturers of Toncan Metal Rust and Corrosion Resisting Sheets, Roofing, Siding and Accessories

MILLS AND MAIN OFFICE
CANTON, OHIO

TONCAN METAL
TRADE-MARK

Products

TONCAN METAL, BLACK, BLUE ANNEALED, and GALVANIZED SHEETS.

TONCAN METAL ROOFING: Roll, V-Crimped, Pressed Standing Seam and Corrugated.

TONCAN METAL SIDING: Corrugated, and Reproductions of Rock Faced Stone, Rock Faced Brick and Lapped Weatherboard.

Also Toncan Metal Corrugated Sheets, straight and curved, for use with concrete work and other special purposes.

Description and Uses

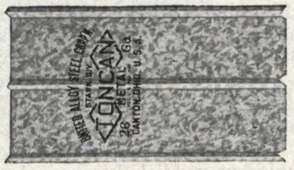
Toncan is a carefully made commercially pure iron alloyed with copper to obtain the greatest possible resistance to rust and corrosion. Its long life and easy working qualities are a matter of common experience.

Toncan Metal is widely used for expanded metal lath, eaves trough, conductor pipe, ridge roll, valleys, flashing, cornice, balcony, marquise, window frames, skylights, tanks, ventilation, refrigeration—in fact, for every purpose which demands a durable sheet metal.

UNITED ALLOY STEEL CORP'N
STARK DIV
TONCAN

ROLL ROOFING

Painted or galvanized. Excellent for low pitched roofs. Covering width, 24 in. Each roll lays 100 sq. ft. on the building

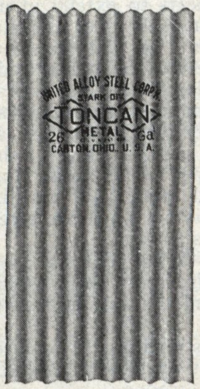


THREE V-CRIMP ROOFING

An attractive form of Toncan roofing, covering width 24 in.; gauges, No. 20 and lighter; also made with 2 and 5 V-form

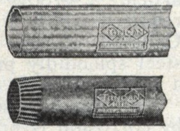
Expanded Metal Lath

Many architects specify Toncan Metal lath for all lath work as an extra assurance of lasting service. It should always be used for stucco and other exterior or exposed work.



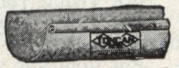
CORRUGATED SHEETS FOR ROOFING AND SIDING

Gauges No. 10 and lighter; 1¼ and 2½-in. corrugations are standard



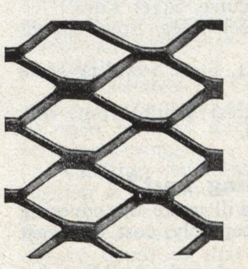
TONCAN METAL CONDUCTOR PIPE

Round corrugated, square corrugated, and plain round conductor pipe. Lengths, 8 and 10 ft. All diameters. Elbows, miters and cut-offs to match



TONCAN METAL EAVES TROUGH

Length, 10 ft. All widths; and gauges Nos. 28, 26 and 24



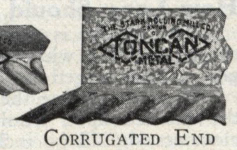
TONCAN METAL EXPANDED LATH

Made in standard weights of 2.2, 2.5, 3.0 and 3.4 lb. per sq. yd. Sheets, 24x96 in., 9 sheets or 16 sq. yd. per bundle

TONCAN
METAL

CORRUGATED RIDGE ROLL

2½ or 1¼-in. corrugations. Lengths, 27 and 96 in.



CORRUGATED END WALL FLASHING

Flat side on wall, 2 in. Corrugated apron, 4 in. Lengths, 27 and 96 in.

Advantages

In Toncan Metal lies the architect's most satisfactory solution for the sheet metal problem. It enables him to specify a moderate priced sheet metal of unquestionable durability—a durability proved by many years of use in thousands of structures and in every form of severe sheet metal service.

Identification

The trade-mark shown above is stamped in two or three places on every Toncan Metal sheet and die stamped on all eaves trough, conductor pipe, elbows, etc.

Sources of Supply

Jobbers and tinners everywhere sell Toncan Metal sheets and products. On request, we will supply names of manufacturers or dealers who can furnish any special Toncan Metal product you may have in mind.

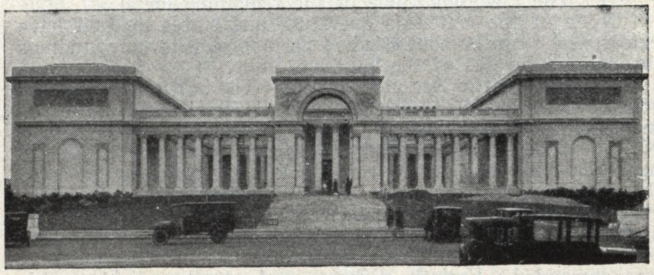
Specification Data

"All sheet metal work shall be of Toncan Metal manufactured by the UNITED ALLOY STEEL CORP'N, of Canton, Ohio," is a safe specification; for Toncan meets all the requirements of modern sheet metal practice. For trough and pipe, we recommend No. 26 gauge. For gutter, flashing, valleys, etc., No. 24 or, better still, No. 22 gauge. Roofing may be No. 26, 24 or 22 gauge. The heavier gauges should always be used where corrosive conditions are severe as along the sea coast or in a smoky atmosphere. Further information on Toncan Metal will be supplied promptly on request.

References

Thousands of installations in all parts of the country are proving the lasting qualities of Toncan Metal. A few are mentioned below. Ask for others.

Kansas City Star Building, Jarvis Hunt, Architect
Building for Stewart-Warner Speedometer Co., Chicago, Ill., L. G. Hallberg & Co., Architects
Commons Building, New Hampshire College, Prof. E. T. Huddleston, Architect.
Aragon Hotel, Jacksonville, Fla., Rutledge Holmes, Architect
Lynchburg National Bank, Lynchburg, Va., Alfred C. Bossom, New York, N. Y., Architect
Grand Central Palace, New York, N. Y., Warren and Wetmore, Architects
Industrial Arts Building, Eastern States Exposition, Springfield, Mass., McClintock & Craig, Architects
Republic National Bank Building, Dallas, Tex., C. D. Hill & Co., Architects
U. S. Chamber of Commerce, Washington, D. C., Cass Gilbert, Architect



CALIFORNIA PALACE OF THE LEGION OF HONOR, SAN FRANCISCO, CAL.
G. A. APPLEGARTH, Architect
30,000 sq. ft. of Toncan Skylight used here

SHEET STEEL TRADE EXTENSION COMMITTEE

Representing over 70% of the Sheet Steel Making Capacity of the United States

Oliver Building
PITTSBURGH, PA.

For list of Supporting Companies, see page 1204

For Cornices, see page 1134; for Ceilings, see page 1204; for Sheet Steel for Interior Uses, see page 1148

ROOF COVERINGS FOR STEEP PITCH ROOFS

A Timely Intimate Analysis

Roofs serve primarily to keep out the weather, and also, where visible, as exceedingly important parts of the architectural and color schemes. They must withstand without irreparable damage to their appearance, not only the weather and all its effects but also the consequences of being walked upon, being hit by stones and balls, even struck by lightning, by flames and firebrands.

They must so age as to always be in color harmony with the aging exterior of the building and of its changeable surroundings. Or, they must be capable of easy color modification to suit.

They have long to serve. For even a temporary building lasts anywhere up to about twenty-two years and those classed as permanent from twenty-two to fifty years. And, as shown by the analysis captioned "How Long Shall a Roof Covering Last?" only one roof covering, and not a succession of coverings, should serve a building for its whole life.

Permanence—How then shall time and the elements be defied as regards both protection and appearance? Time alone means nothing where the elements are not at work, but where they work feverishly—as they do on the roof covering—then to those who are sufficiently well informed to know that no roofing material whatever now available can serve fifty years, or even less, in our climates without pronounced wear and deterioration, there are just two methods of overcoming their effects, viz:

First: By supplying at the outset a sufficient thickness of homogeneous material so that despite its wearing away, at the end of the building's life there is still a reasonably dependable covering left.

Second: By rejuvenating from time to time, a protecting outer skin on an unyielding and incombustible covering.

The action of the elements on materials intended to resist by the first method is clearly shown in the analysis on "The Two Great Destroyers," given below. The interesting operation of the second is shown immediately thereafter.

Results by the First Method—Most of the homogeneous brittle materials, because of the large thickness necessary, have high first cost and require expensive roof and wall framing to prevent sagging under their great weight. They are not free from dangers of breakage or falling off and in general can not be repaired without the patches marring their appearance. Poorer and substitute materials do not serve as well in resistance to the weather and still less in keeping a good appearance. While these materials will resist sparks, the high localized temperatures caused by large firebrands or sweeping flames readily cause their destruction. None have a longer life than that of the poorly protected nails which hold them on or the resistance of the material around those nails.

Self-protecting metals have high service costs because of:

(a) The large first cost of sufficient thickness to overcome their extensive wasting away in service and still leave enough section at their low unit strength to make satisfactory covering at end of the building's life.

(b) The wastage of the metal in service; and

(c) The low junk value of the remaining metal.

None of the materials operating under this method have colors which can be controlled to harmonize with surroundings throughout the life of the building.

Results by the Second Method—The resistance of these roof coverings to the weather, where the details and the workmanship have been proper, where in general not less than No. 26 gauge U. S. standard and in no case less than No. 28 has been used, and where reasonable care has been given to the protecting skin, has been all that can be desired. Seventy-year old painted metal coverings exposed to salt air conditions and still in splendid condition are not infrequent. Still older ones can be shown. Their appearance has been as good as was demanded. Entirely different and equally reliable architectural and color effects are now available. This method produces roof coverings that last, that withstand fire and lightning unharmed, that are most economical because of low first cost, small maintenance cost and light loads onto the structure, coverings whose color can be easily varied.

Care Is Not Weakness—The hope of doing something which will last forever; the idea that a big first outlay for some best material and workmanship can produce something which can be neglected and trusted to of itself function properly for as long as desired—these assume a perfection of every overlying, underlying and connecting part of the structure and a freedom from accidentals which is not consistent with the facts.

Care is the ounce of prevention that saves the pound of repair. Washing away the dirt which gives mold opportunity to rot, is care. Realigning adjustable gutters to eliminate water-holding sags is care. Both involve only a little attention from some one who knows how. Rejuvenating the paint coat on a sheet steel roof once in five years or more is care in the same sense.

The old time roof paint was a very rough compound of metallic oxide and linseed oil. It generally lasted three to four years. The better made later forms of it lasted longer—five or more years and had a brighter color. Still later kinds of coatings have given eight to ten years between necessary redressings. These have far better surface appearance and are made in several pleasing colors which are quite permanent, at this time. Other colors and many new coatings are now available and the comparative tests cause confident expectation of still longer times between necessary redressings.

Caution: The life of conductor pipe unprotected by a proper skin on the inside of the pipe, does not furnish a comparable condition or correct criterion for the lasting of sheet steel roof covering, properly skin protected.

Line and Color—The old time painted metal roof with uniform reddish brown color and rippled flat surface relieved at most only by widely separated standing seams is not the best appearing product now available under this second method. Today there are Spanish tile, light, yet substantial in appearance, strong, durable, with all the relief and texture of the antique article; V-groove sheets to extend in unbroken reveals of any required width from peak to eaves; standing seam sheets for Colonial effects, that lie flat between seams, all in sheet steel splendidly protected by matte and semi-matte finishes in a variety of soft colors and of proven durability.

If standing seam copper roofing which has turned green by corrosion is pretty why is not the same color green on any other standing seam metal roofing of the same dimensions just as pretty? If a striped Venetian awning cloth is in good taste, why is not a striped metal roof also in good taste, especially where the stripes (as on V-groove steel roofing) can be made of widths and colors to suit?

What Is Best—What material meets these usual and unusual service requirements with sufficient *permanence,* the greatest *economy* and the *best appearance* at all times? Why not,

For visible roofs on massive architecture, Steel Tiles.

For visible roofs on institutions, Steel Tiles, Steel Standing-seam or Steel V-groove.

For domestic architecture, Steel Tiles, Steel Standing-seam and Steel V-groove.

For storehouses and sheds, the lightest weight roof, corrugated steel sheets laid on open purlins.

How Long Should a Roof Covering Last?

The answer is, for that time which will make the covering of the building while doing its work acceptably, cost the least per year, averaged for its whole life.

First determine the total cost of covering the building for the decided upon whole life of the building. The following elements should be included:

(1) The first cost (or sum of the first cost) of the roof covering or coverings necessary.

(2) Costs of the repairs to coverings.

Continued on next page

(3) Costs of care of coverings.

(4) Costs of insurance against all dangers and damages from which the best conceivable roof covering can shield occupants, contents, building and the business or family life therein pursued. This extends far beyond all usual or possible insurances and recognizes possible heavy losses, some of them financial and some sentimental. Include allowance for the risks of financing the replacement of the roof covering at some financially inconvenient or impracticable time.

(5) Interest on the moneys invested in each of the above from time of investment to end of life of building, charged at the borrowing cost of the money.

(6) Taxes on the portion of the value of the property represented by the roof covering.

(7) The damage and loss attended upon any necessary replacement while the building is in use or the loss of putting it out of use during roof replacement.

(8) Add the cost of making the visible roof maintain a pleasing appearance.

Subtract from the above, the net salvage value of the roof covering at demolition, namely what the available junk dealer, if any, will give for it, less costs of bargaining, advertising, extra care, etc. Or deduct the extra amount that the building wrecker can be expected to give for the whole building because of the junk value of the roof covering. Note how small a fraction, if any, of the materials part of the cost of the finished roof covering, this junk value is, ordinarily.

This whole preceding plain statement logically forces the conclusion that the covering which will amply last for the whole life of the building is advisable in preference to that which must be renewed. And that a covering which has required a largely increased first cost investment to have a length of life considerably in excess of that of the building is inadvisable. But that a covering of moderate first cost and of general acceptability whose life and appearance can be indefinitely prolonged by care at a reasonable cost, is especially advisable.

The Two Great Destroyers, Water and the Heat of the Sun, When Intermittently Applied

Solvent Action—Water so applied, is the greatest of roof destroyers. It alters by dissolving constituent parts, carrying some of them away, leaving some when it evaporates, as an unsightly efflorescence upon the outer surface of the weakened covering, and others to recrystalize within the upper part of the covering itself which by their great expansive force, they crack and disintegrate. Hence all coverings containing soluble salts are weak.

Frost—It penetrates all cracks, even the most nearly invisible, widening them by expansion in every freezing, into splits and final disintegration. Hence a covering which crazes or checks in the least is weak. It lifts with enormous force when freezing, the outer end of all scalelike roof coverings and where the scale is tightly held down by a fastening nearer its upper end, it either springs the scale, pulls the fastening or cracks off the scale. Under these conditions, brittle coverings which are held down closely and strongly, generally show some breakage; ductile, inelastic materials, take a permanent uptilt which sometimes increases from year to year while strong resilient materials take no harm.

It similarly by freezing, progressively lifts and loosens embedded particles which project beyond the surface of a coating. Hence embedded color and protective coatings are not permanent.

Absorption—It swells in the weakest direction, all substances that absorb it except a very few whose strength is too great. If the swelling be strongly resisted by fastenings or abutting material, the covering bulges up and cracks. If fastened when in a partly swelled condition, it upon drying out, either pulls over the fastenings or splits itself. No amount of seasoning overcomes this tendency. Any absorbent covering is weak.

Brittleness——The gradual drying out of the boarding under the covering and the warping which then usually happens in open boarded deckings, frequently causes the splitting of brittle coverings.

Curling—Sunlight is the next most destructive agency. Raising a maximum temperature at the extreme outside surface, it dries out the constituents of and permanently contracts that surface and in a progressively lesser degree, the materials deepen down so that all exposed edges curl upward, leaving places for the weather to beat in. From less than three years for some coverings to about twelve years for others, is required to progressively give a permanent set of one-half inch or more of opening.

Loss of Color—It brings about in time new chemical combinations which have less or different colors. It thus greatly fades all usual artificial surface colorings in less than five to six years, and most natural colors in a somewhat longer time.

Surface Crazing—It causes in brittle materials which lack in any considerable degree perfect equality of expansion movement for both temperature and moisture between surface and backing, small craze cracks to rapidly appear, as the result of the movement of surface relative to backing. Freezing water deepens these, disintegration removes the debris and exposes the softer backing to rapid destruction by water.

Metallic Expansion—The effects of expansion and contraction of metals by heat and cold, are destructive unless provided for by expansion joints. Laying as shingles or tiles with small dimensions to each piece minimizes the over-all effect but multiplies the number of joints, each of which is a weak point compared with the solid covering.

Expansion Joints for solid sheet metal coverings devised many years ago and proven perfectly reliable by many instances of over three-fourths of a century service, provide for expansion and contraction without injurious strain to the metals of least expansion. The best available figures, and these approximate only, give for United States conditions 200° F. difference between the coldest cold night temperature and the hottest hot day sunlight surface temperature.

The following table gives the total contraction of sheets of the length given if laid in the hottest weather:

	Length between Expansion Joints		
	2 ft.	20 ft.	100 ft.
Total contraction for steel......	.03 ″	5/16″	1 9/16″
Total contraction for copper....	.043″	7/16″	2⅛″
Total contraction for zinc......	.078″	¾″	3 15/16″

On the least expansible metal these variations can be readily taken up entirely in the special joints, leaving the covering flat and true of surface at all times.

Wasting Away of Exposed Metal—Chemists know that there is no metal which when exposed in a clean metallic state to water, does not dissolve to some extent. And therefore there is no metal whose clean surface is not subject to wasting away.

Oxide Protection—Some metals form oxides or other chemical coatings which adhere quite strongly and which being insoluble protect the metal against solution or further corrosion. On some metals the oxide coating requisite to prevent further wasting away, is so exceedingly thin that the metal shows through. Apparently such metals do not tarnish—but this is only apparent.

Surface Losses—The oxides or other salt coatings formed by most metals do not adhere strongly against all atmospheric acids, erosion of water, expansion and contraction, etc. As some of the protecting salt washes away, more is formed. The metal is thus corroded away, while the surface itself may give little indication of the fact.

Self-protecting Metals—Metals which furnish self-protection must be of a thickness proportioned to the years of service they are required to give and to the conditions they have to withstand. This is difficult to determine in advance except by experience, for such metals, as roof coverings, cut through only where the water trickles over the surface, leaving plenty of thickness elsewhere to be thrown away when replacement is required. Iron does not furnish self-protection. That is by some considered its weakness. It has, however, the advantage of always advertising the first least impairment of its strength.

The Rejuvenated Skin—Skins of far greater strength and tenacity of hold upon the underlying metal are formed by the very fine grinding of suitable metallic oxides in those vegetable oils that gum upon drying. This is paint. Under the action of sunlight and air but almost not at all in the absence of light, the gum dries out, hardens, segregates into islands (called alligatoring) and eventually cracks, turns chalky and washes away. A first class paint properly applied usually takes about five years to crack in the light. Paint coats on the underside of metal coverings are found perfectly good after seventy years of service. If, before it has hardened to the extent of cracking, the gummy character is restored by a surface dressing of oil or preferably oil in the form of paint, the skin is rejuvenated for another five years. Other types of paint besides oil paint act somewhat similarly.

Requirements of the Covering Material—To be effective, the underlying material must be strong and unyielding. For on a stretchable material the outer skin would be free to crumple and would not last. Obviously, it should be incombustible. Used in this way ferrous metals and paint can be made to last indefinitely long Seventy-year old sheets in perfect preservation are frequently removed in making alterations.

SHEET STEEL TRADE EXTENSION COMMITTEE

Representing over 70% of the Sheet Steel Making Capacity of the United States

Oliver Building, PITTSBURGH, PA.

For list of Supporting Companies, see page 1204

For Roofing, see pages 1132-33; for Ceilings, see page 1204; for Sheet Steel for Interior Uses, see page 1148

SHEET STEEL CORNICES

Sheet Steel Cornices Permit—

Any projection with entire safety.
Any desired design whatever, without exception.
Any desired appearance, color or surface texture.
Any desired later change or alteration with greatest ease.

Sheet Steel Cornices Insure—

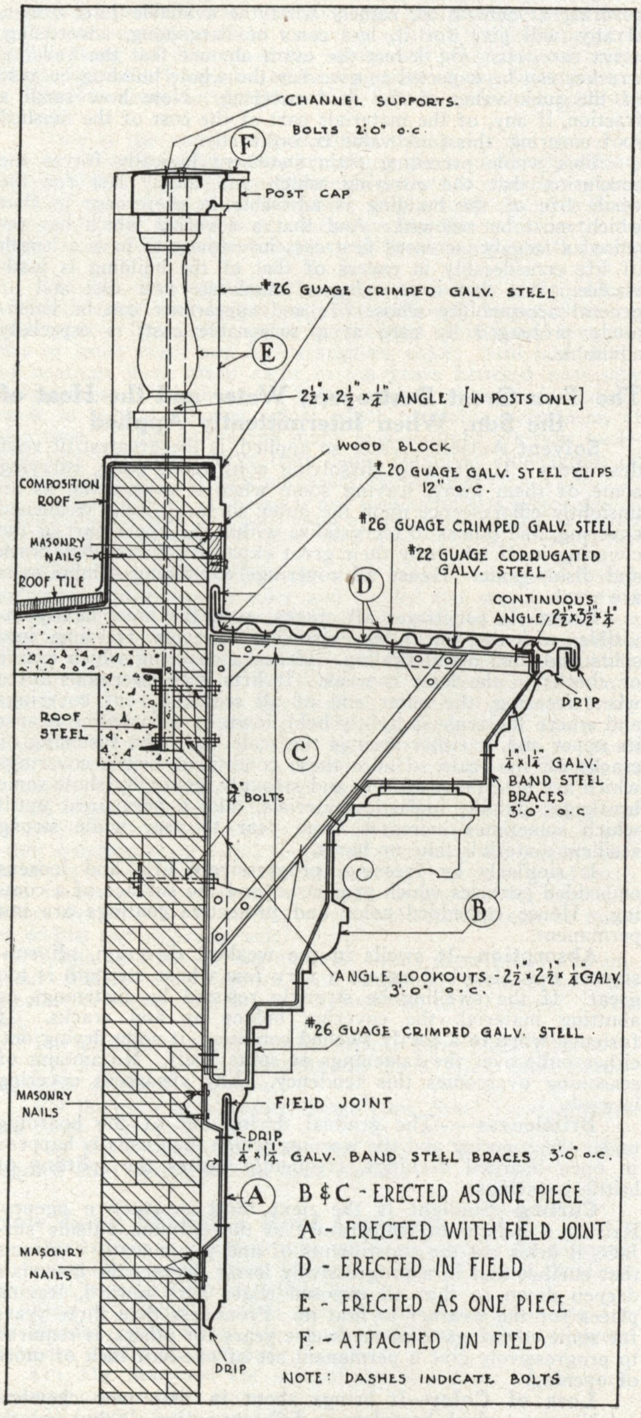
Life equal to that of the building.
Plenty of fifty-year old examples.
Incombustibility.
Freedom from falling in fire and earthquake.
Freedom from being damaged by lightning or fire.
Lightest possible weight.
Greatest strength and hence greatest safety.
Lowest first cost and lowest fixed and maintenance charges.
Colors that last splendidly 8 to 10 years between paintings.
Against the multiplied dangers of leakage in setback construction.
Against self-destruction from temperature expansion.

Sheet Steel Cornices Prevent—

All buckling, sagging, bagging or warping of cornice members.
All streaks from joints, all chipping and breakage.
All water from entering parapet walls and hence all consequent:
Efflorescence or stain on outside of upper walls.
Staining, cracking and falling of sidewall and ceiling plastering.

Sheet Steel Cornices Should Be—

Galvanized as heavily as seaming and forming will permit.
Made only of Master TEC Brand Sheets.
Made of No. 26 gauge U. S. standard (.02 in.) or heavier at every point.
Made on all flat or long members, of crimped sheets.
Anchored and supported by steel only.
In contact with no other metal than steel or zinc.
Braced adequately but simply.
Riveted lockseamed or dovetailed as well as soldered at all shop joints.
At all field joints:
(a) Rigidly supported.
(b) Dripped so water can not enter.
(c) Protected against holding water by capillary attraction.
Painted immediately after erection with one of the several approved makes of paint which will not peel, blister or crack.
Made in accordance with the Cornice Specification Clauses, which insure construction that is practical, economical and lasting. The Cornice Specification Clauses will be sent to practicing architects and specification writers on request.


CHANNEL SUPPORTS.
BOLTS 2'-0" o.c
F
POST CAP
#26 GUAGE CRIMPED GALV. STEEL
E
2½" x 2½" x ¼" ANGLE [IN POSTS ONLY]
WOOD BLOCK
#20 GUAGE GALV. STEEL CLIPS 12" o.c.
COMPOSITION ROOF
#26 GUAGE CRIMPED GALV. STEEL
MASONRY NAILS
#22 GUAGE CORRUGATED GALV. STEEL
ROOF TILE
D
CONTINUOUS ANGLE 2½"x3½"x¼"
DRIP
ROOF STEEL
C
¼"x1¼" GALV. BAND STEEL BRACES 3'-0" - o.c
¾" BOLTS
B
ANGLE LOOKOUTS.-2½"x2½"x¼" GALV. 3'-0" o.c.
#26 GUAGE CRIMPED GALV. STELL
MASONRY NAILS
FIELD JOINT
DRIP
¼"x1¼" GALV. BAND STELL BRACES 3'-0" o.c.
A
B & C - ERECTED AS ONE PIECE
A - ERECTED WITH FIELD JOINT
D - ERECTED IN FIELD
E - ERECTED AS ONE PIECE
F. - ATTACHED IN FIELD
MASONRY NAILS
DRIP
NOTE: DASHES INDICATE BOLTS

THE INTERNATIONAL NICKEL COMPANY

Monel Metal and Nickel and Allied Products

EXECUTIVE OFFICES
67 Wall Street
NEW YORK, N. Y.

MINES AND SMELTER: Copper Cliff, Ont., Canada
ROLLING MILL & REFINERY: Huntington, W. Va.
REFINERY: Port Colborne, Ont., Canada

Products

Monel Metal and Rolled Nickel: Rod—hot rolled and cold drawn; Sheet—hot rolled and cold rolled; Wire, Wire Cloth; Strip, Tubing; Shot, Forgings, Castings, etc.

INCO
MONEL METAL
TRADE MARK

Monel Metal

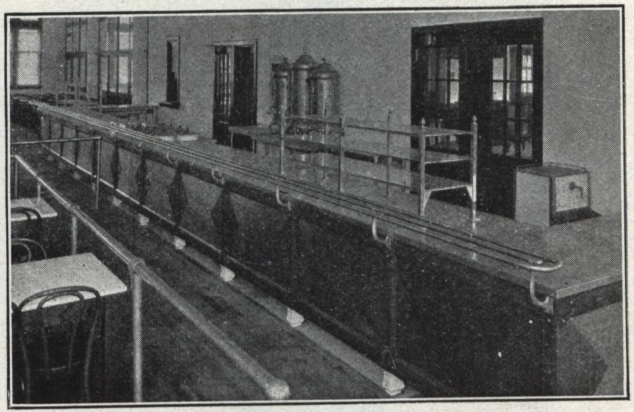
Monel Metal is a technically controlled, uniform nickel-copper alloy of high nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company. The name "Monel Metal" is a registered trade-mark.

The special advantages of Monel Metal of interest to the architect are as follows:

- Rustproof
- Corrosion resistant
- Strong and tough as steel
- Silvery white color
- Sanitary and easy to keep clean
- Obtainable in most all commercial forms
- Readily fabricated

Technical Assistance

The International Nickel Company maintains a technical staff and research laboratories for the testing of Monel Metal and Nickel under various service conditions and for the results to be anticipated in specific applications. This staff is at the service of architects for any desired technical co-operation.



Food Service Equipment at the Forest Park High School, Baltimore, Md.
Monel Metal serving counter, coffee urn stand, back bars, ice cream cabinet and steam table

Food Service Equipment

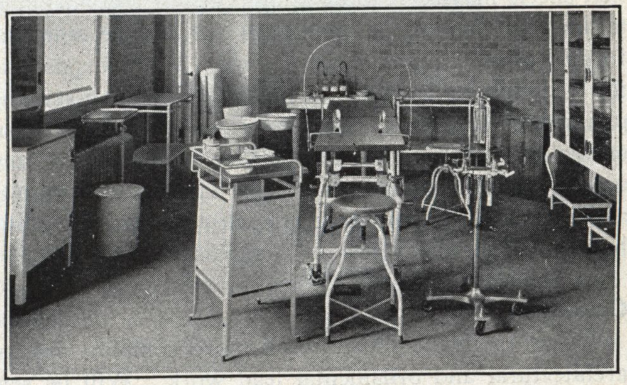
The combined properties of Monel Metal, particularly the ease of cleaning its attractive nickel finish, are responsible for its universal specification in schools, hospitals, hotels, restaurants and cafeterias for such typical uses as—

- Steam tables
- Cook's tables
- Sinks
- Drainboards
- Counters
- Slicing machines
- Tray slides
- Urn stands
- Urn liners
- Hoods
- Shelving
- Roll warmers
- Dishwashing machines

Hospital Equipment

Sanitary and antiseptic cleanliness are of prime consideration in selecting hospital equipment. The ease with which Monel Metal surfaces are kept clean and aseptic, as well as the fact that there is no coating to chip, crack or wear off, make it the ideal metal for clinical equipment such as—

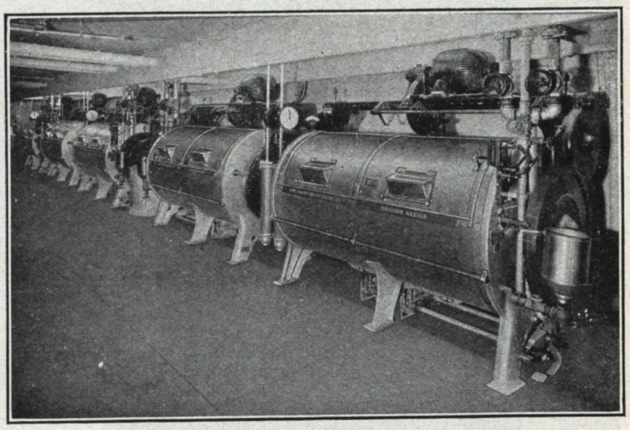
- Operating tables
- Instrument stands
- Nurses' desks
- Dressing stands
- Medicine cabinets
- Bed pan sterilizers
- Instrument sterilizers
- Shelving
- Solution, wash, pus basins, etc.



Monel Metal Operating Table, Instrument Stands, etc., in the Operating Room of the Julia L. Butterfield Memorial Hospital, Cold Spring-on-the-Hudson, N. Y.

Laundry Equipment

The largest manufacturers of laundry machinery have standardized on Monel Metal for washing machines because Monel Metal does not stain the wash, resisting the corrosive action of soaps, sours and bleaches. Monel Metal is also used for the laundry trucks, chutes, utensils and sorting tables.



Monel Metal Washing Machines in the Laundry of the Hotel Roosevelt, New York, N. Y.

Information for Your Files

Send for "List B" of literature giving technical and service information on Monel Metal and Nickel.

HOYT HARDLEAD PRODUCTS

UNITED LEAD CO.
111 Broadway
NEW YORK, N. Y.

Products

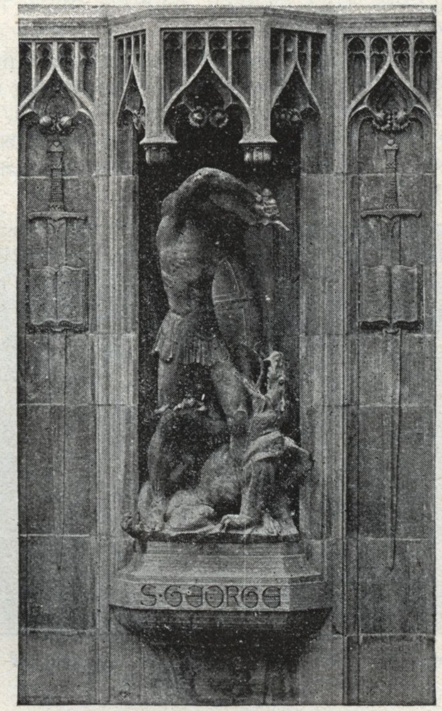
Leader Pipes, Leader Heads, Gutters, Finials, Spandrels, Statuary; Ornamental Lead Work of every description; Lead Sheets for roofing purposes, X-ray rooms and fume ducts and all purposes where sheet metal is practical.

Hoyt Hardlead

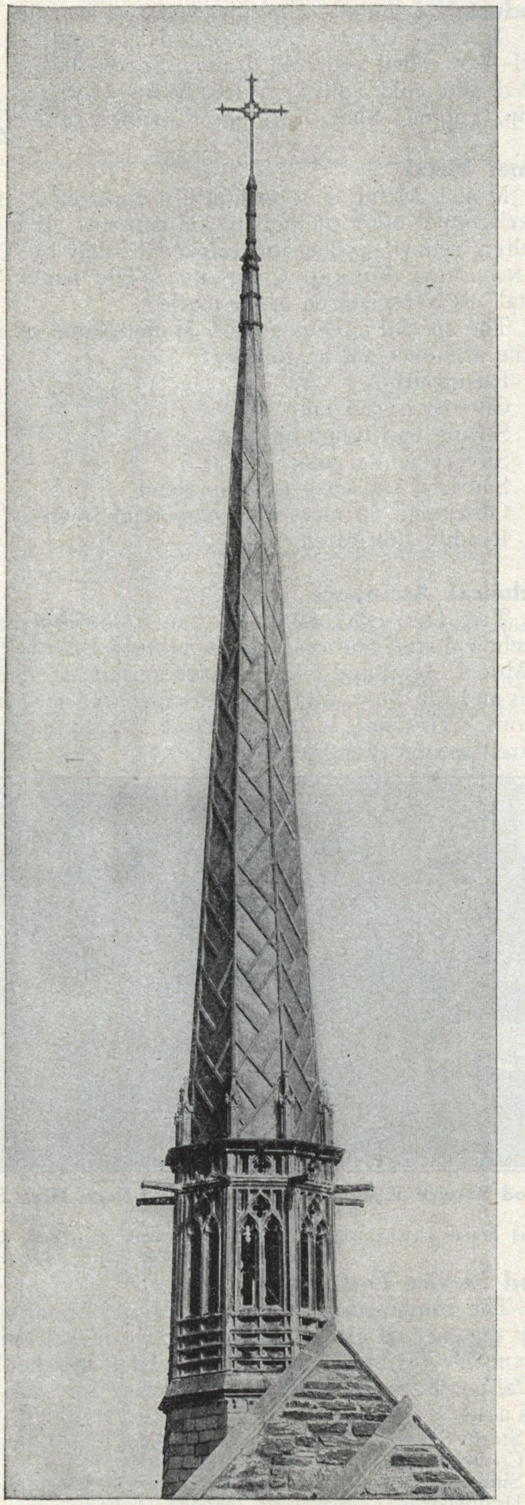
Hoyt Hardlead has a much greater tensile strength than soft lead, which permits its use in comparatively thin sheets making it thoroughly practical and adaptable to modern building construction. It can be stamped, formed or cast in any shape desired. When exposed to the atmosphere it takes on a soft gray, non-staining patina that brings out the true value of adjacent materials and gives a balance to these materials that can not be obtained with other metals. It will lend dignity and character to any structure where permanence and beauty is desired.

Catalogue

Our catalogue illustrates a more complete line of architectural and ornamental lead work. Will be sent to Architects on request.



Lead Statuary, Howard Henry and Foulke Dormitory, Princeton University, Princeton, N. J., Cast in Hoyt Hardlead Casting Metal



Hoyt Hardlead Spire, First Presbyterian Church, Ardmore, Pa.

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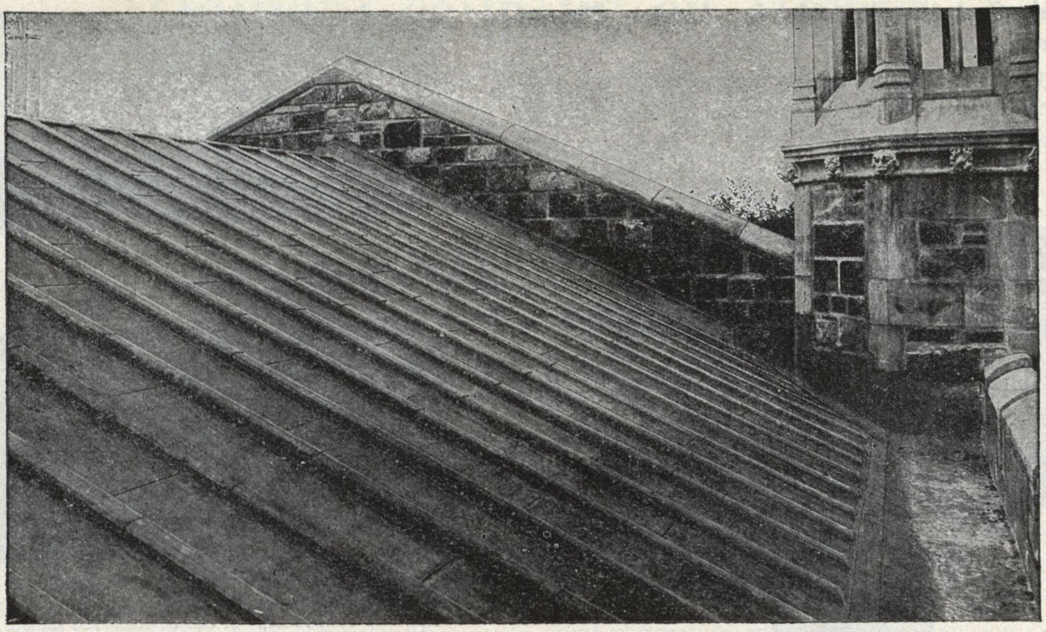


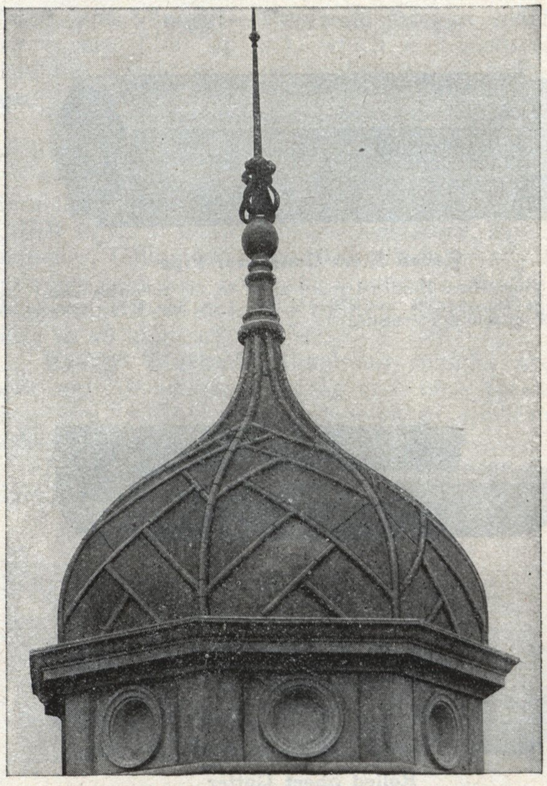
Hoyt Hardlead Roof, University of Michigan, Ann Arbor, Mich.

Hoyt Hardlead Made Especially for Roofing Purposes

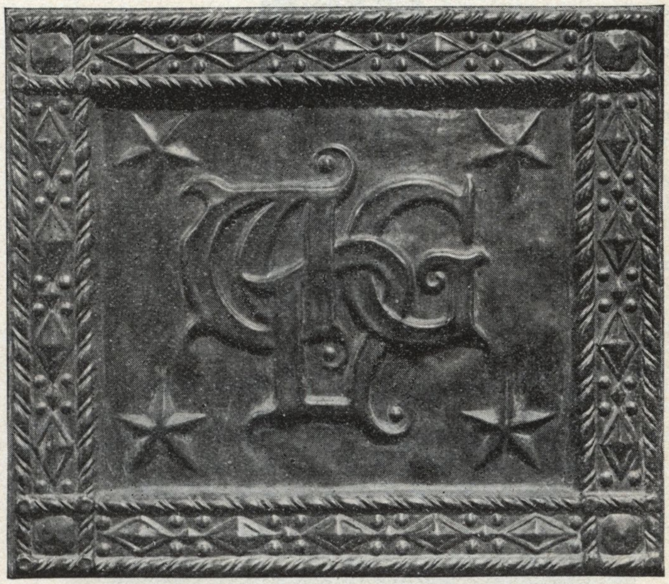
It is used for roofing, flashings, cornice coverings and other building purposes where it is practical to use sheet metal.

It is rolled in sheets 24 in., 30 in., and 36 in. wide and 96 in. long, weighing 2½, 3, 4, 6 and 8 pounds to the square foot.

The proper weight of Hoyt Hardlead sheets depends upon the purpose for which they are to be used. For roofing, cornice coverings and base flashings generally, the 3-lb. sheet is recommended, and for cap flashings and batten roofs where the battens are spaced 18 in. or less on centers the 2½-lb. sheet may be used.



Hoyt Hardlead Dome, University of Michigan, Ann Arbor, Mich.



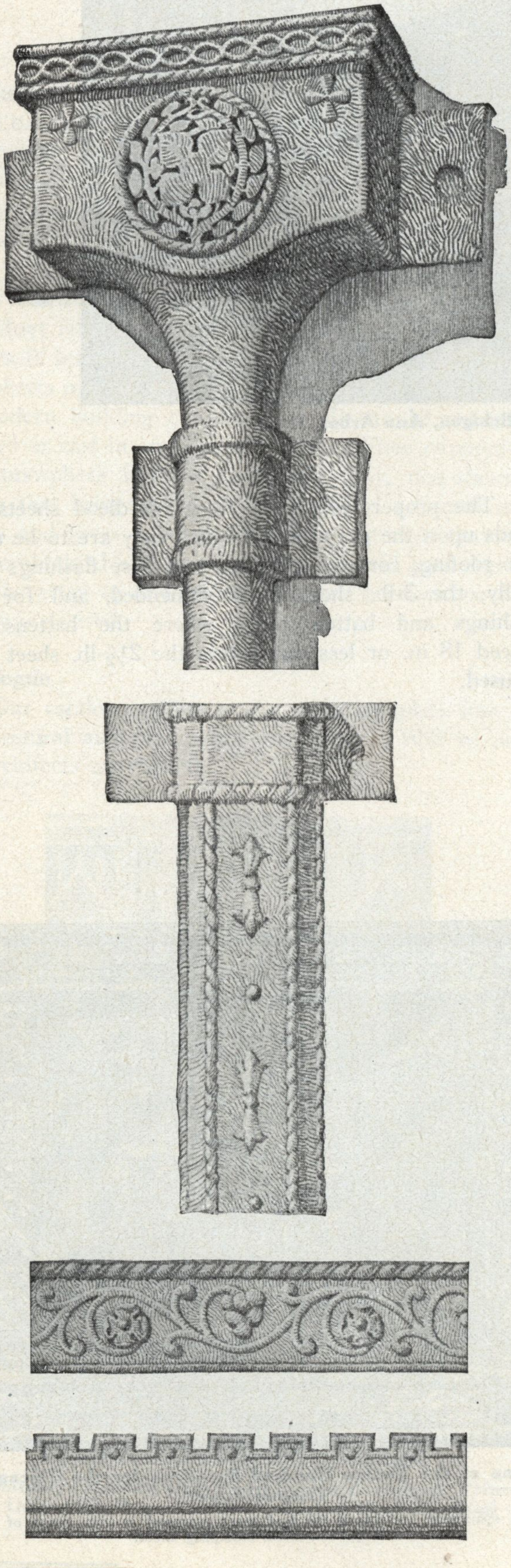
One of the Twelve Hundred Spandrels for the Chicago Tribune Tower

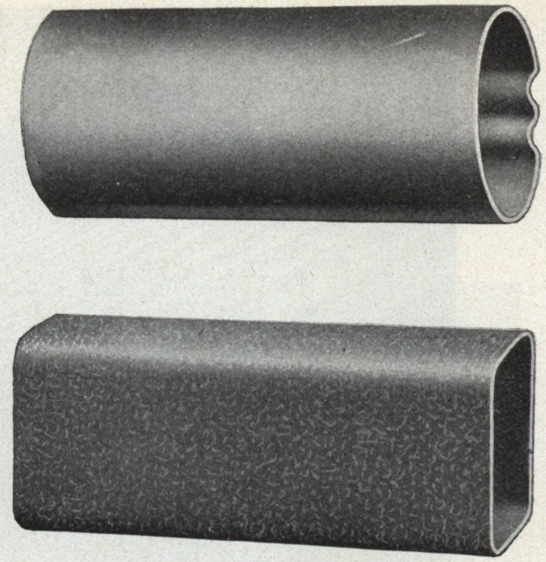
These spandrels are 33x38 in. and were stamped in one piece of 4-lb. Hoyt Hardlead stamping metal

Continued on next page

Ornamental Cast Leader Heads, Leader Pipes, Gutters, etc.

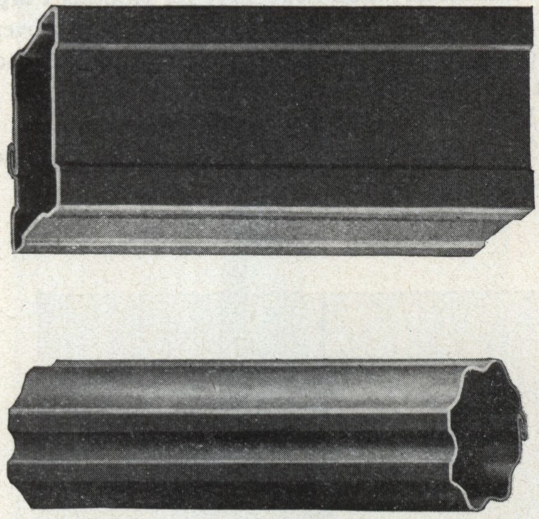
A number of designs are carried in stock and we are prepared to execute special designs in accordance with architects' drawings.





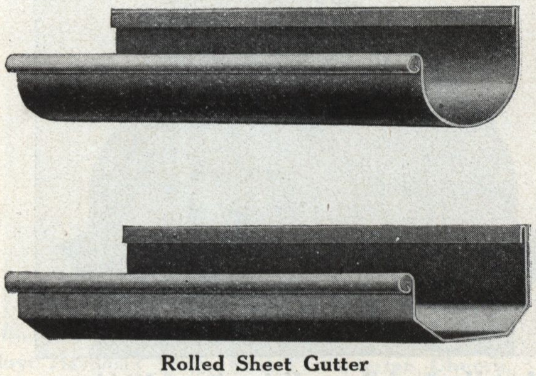
Seamless Conductor Pipe

Made from Hoyt Hardlead in the following sizes: 2x3 in., 3x4 in., 3 in. round, and 4 in. round. It can be furnished smooth or finished with a hammered or rough cast surface, as desired



Rolled Sheet Conductor Pipe

Made from Hoyt Hardlead rolled sheet in the following sizes: 2x2 in., 3½x3½ in., 2½x3¼ in., 2½x4¼ in., 3 in. and 4 in. octagon and 3 in. and 4 in. round, corrugated



Rolled Sheet Gutter

Made from Hoyt Hardlead rolled sheet with reinforced beaded edge in the following sizes: 3 in., 4 in., 5 in. and 6 in., half round and octagon

ALUMINUM COMPANY OF AMERICA

Manufacturers of Aluminum Roofing

PITTSBURGH, PA.

Products

Aluminum Roofing including Shingles, Flashings, Hip and Ridge Coverings, Valleys, Gutters and Downspouts.

For Aluminum and Aluminum Alloys, see page *737*; for Aluminum Paint, see page 1719.

Aluminum Shingles

Aluminum shingles, as manufactured by the Aluminum Company of America, are fabricated from No. 24 B & S. gauge (.0201 in.) aluminum sheets, in plain and ribbed patterns. Size, 9¼x24⅞ in. over all.

There is no exposed nailing and an air space beneath each shingle permits the drying of condensed moisture and affords a desirable heat insulation layer of dead air.

Colors

Aluminum shingles are made in natural finish which weathers to a soft, neutral, silver-gray tone; also in two standard colors (dark red and dark green), or in special colors. The standard colors are sprayed on, not dipped, a special grade of paint being used.

Advantages of Aluminum Shingles

Resistance to Corrosion—Aluminum shingles successfully resist the effects of moisture, salt-laden air, sulphur, sulphuric acid fumes, certain organic acids and other corrosive agents found in the atmoshere.

Light Weight—Aluminum shingles weigh 50 lb. *per square (100 sq. ft.), which is considerably less than the weight of other roofing materials in general* use.

Durability—In addition to their durability because of their non-corrodable properties, aluminum shingles are more rigid than some other metal shingles, and the durability is further increased by the use of thick metal (.0201 in.). Possible damage from snow, hail, ice, tree branches, falling bricks and the like is greatly reduced. Extreme cold does not make aluminum shingles brittle; they retain their strength, rigidity, toughness and ductility in all kinds of weather.

Easily Worked—Aluminum shingles are easily bent and cut without cracking and, once formed, hold their shape. This speeds up work of application and reduces expense.

Pleasing Appearance—The appearance of an aluminum shingle roof is pleasing with its silver-gray tint and pronounced relief. The ⅝-in. butts and heavy vertical ridges give a light-and-shadow texture without approaching an ornate pattern.

Non-staining—Aluminum forms no colored salts, consequently it will not discolor adjoining materials from drip or splash of watershed.

Weathertight—Weather sealing and expansion and contraction are taken care of in aluminum shingle roof construction. A roof with a pitch as low as 3 in. to 1 ft. is practicable with aluminum shingles.

How Aluminum Shingles Are Laid

Aluminum shingles are laid 8x24 in. to the weather, giving 1¼ in. horizontal and ¾ in. vertical interlocking joint connection with complete provision for expansion and contraction, drainage, and waterseal against capillary attraction. The height of the butt is ⅝ in.

Seventy-five full size (9¼x24⅞ in.) aluminum shingles are required to lay one square (100 sq. ft.).

One-third pound of 1-in. No. 12 gauge aluminum roofing nails are required to lay one square of aluminum shingles on a new roof and one-half pound of 1½-in. No. 12 gauge nails over a wood shingle roof. Sufficient nails are included with each package of shingles.

Other Aluminum Roofing Materials

In addition to shingles, aluminum roofing materials are also available in the form of flashings, hip and ridge coverings, valleys, gutters and downspouts to form a complete, non-corrodable, durable, light weight roofing *job.*

How to *Specify* Aluminum Shingles

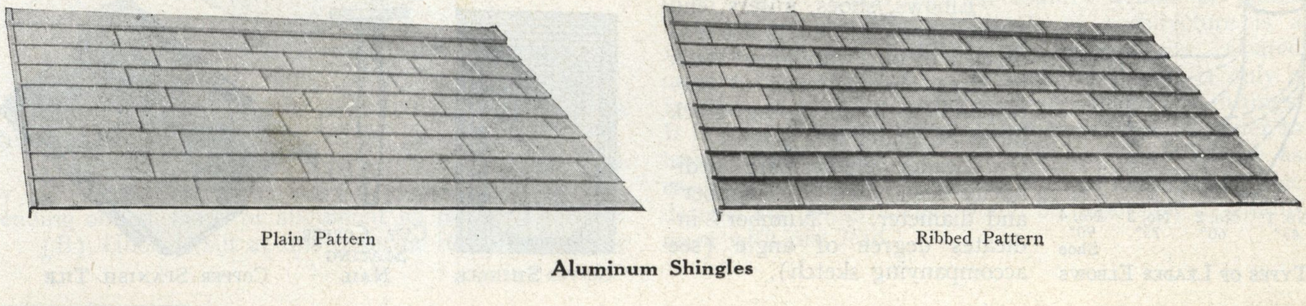
All roof surfaces shall be covered completely with full size aluminum shingles, three-quarter size starter shingles, eaves starting strips, right and left-hand side finish pieces, valley sheets and valley flashing, ridge cover and ridge flashing, hip cover and counter-flashing around all walls, chimneys, etc., as required to produce a roof of proper mechanical construction in accordance with the manufacturers' standard instructions.

All aluminum shingles and flashing to be fastened with aluminum nails, also ⅞-in. hip and ridge boards, for properly applying hip and ridge covering.

Sheathing—All roof sheathing shall be good common boards of equal thickness laid horizontally or diagonally without open joints and securely nailed and properly spaced to insure secure nailing.

Entire roof sheathing shall be covered with 15-lb. asphalt saturated felt, lapped 2 in. and secured with 1 in. aluminum roofing nails.

Note: No felt is required when laying aluminum shingles over wood shingles where non-aluminum nails are covered.



Plain Pattern

Ribbed Pattern

Aluminum Shingles

U. T. HUNGERFORD BRASS & COPPER CO.

Copper Roofing Materials

Hungerford Building, Lafayette, White and Franklin Streets
NEW YORK, N. Y.

BRANCH OFFICES AND WAREHOUSES

BOSTON, MASS., 411-429 D Street
PHILADELPHIA, PA., 510 Arch Street
CLEVELAND, OHIO, 3035 St. Clair Avenue
ST. LOUIS, MO., Boatmen's Bank Building
PITTSBURGH, PA., Chamber of Commerce Building
BALTIMORE, MD., Lombard and South Streets
SAN FRANCISCO, CAL., 22 Battery Street

Products

COPPER LEADERS, ELBOWS, SHOES, STRAPS, STRAINERS, HEADS.

COPPER GUTTERS: MITERS, END PIECES, CAPS, OUTLETS and HANGERS.

SHEET COPPER; ROOFING NAILS; COPPER SHINGLES; COPPER SPANISH TILE.

Also, Snow Guards; Copper Ridge Caps, Rolls, Valleys and Flashings; Brass and Bronze Railings; Grilles; Ornamental Wire Work.

For Bronze and Copper Screen Cloth, see page 1407; for Seamless Brass and Copper Plumbing Pipe and Fittings, see page 1803.

TRADE-MARK

Hungerford Star Brand Copper Leaders

Only full weight, pure copper will give the satisfactory long life and permanently trim, neat appearance that rightfully should be and is expected of copper leaders and gutters.

Every length of our Star Brand leader and gutter is clearly embossed with our name and the net weight of hard rolled, roofing temper pure sheet copper from which it is made. Our name and brand mark on a length of copper leader or gutter is positive assurance of full net weight, standard quality material. All Hungerford Star Brand copper products are unconditionally guaranteed.

In order to meet requirements of the building trades for prompt service we carry on hand in our warehouses, ready for *immediate* shipment an extensive stock of our Star Brand copper leaders comprising the following sizes and kinds:

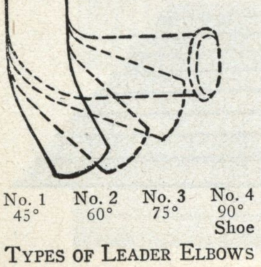
Copper leader	Weight of copper, oz.	Lengths, ft.	Diameter, in.
Plain round	16	10	2, 3, 4, and 5
Corrugated round	16	10	2, 3, 4, 5 and 6
*Corrugated square	16	10	2, 3, 4, and 5

*From long custom this type of leader is termed "square," whereas it is in reality rectangular in shape. Sizes carried in our stock as noted above are standard. Actual measurement of 2-in. "square" corrugated leader is 1¾x2¼ in.; 3 in.=2⅜x3¼ in.; 4 in.=2¾x4¼ in.; 5 in.=3¾x5 in.

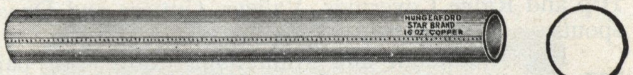
Hungerford Star Brand Copper Leader and Gutter Fittings and Accessories

Elbows, shoes, miters, end pieces, caps and outlets are also carried in our warehouse stock in sizes and patterns to correspond with foregoing stock items of leader and gutter.

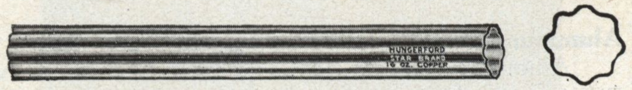
Leader elbows are ordinarily designated by "number" and diameter. "Number" indicates degree of angle (see accompanying sketch).



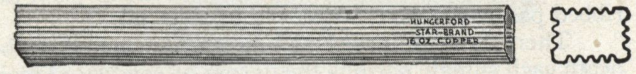
TYPES OF LEADER ELBOWS


HUNGERFORD STAR BRAND 16 OZ. COPPER

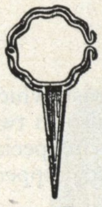
ROUND PLAIN COPPER LEADER


HUNGERFORD STAR BRAND 16 OZ. COPPER

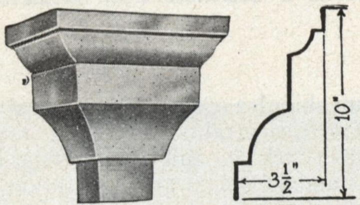
ROUND CORRUGATED COPPER LEADER


HUNGERFORD STAR BRAND 16 OZ. COPPER

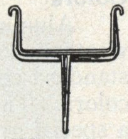
SQUARE CORRUGATED COPPER LEADER



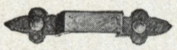
BRICK DRIVE TINNED IRON LEADER HOOK



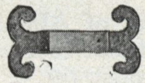
NO. 14. COPPER LEADER HEAD
Also made in any special pattern



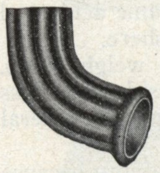
WOOD DRIVE TINNED IRON LEADER HOOK



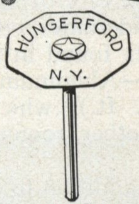
STYLE B COPPER LEADER STRAP



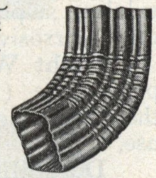
STYLE C COPPER LEADER STRAP



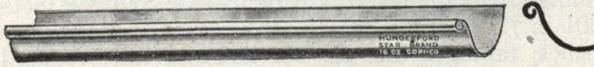
ROUND CORRUGATED SHOE



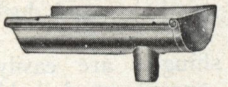
COPPER STORM NAIL FOR ASBESTOS SHINGLES



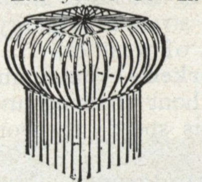
SQUARE CORRUGATED ELBOW


HUNGERFORD STAR BRAND 16 OZ. COPPER

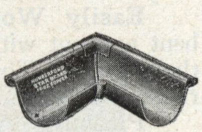
SINGLE BEAD LAP JOINT COPPER GUTTER



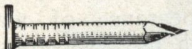
GUTTER END PIECE WITH CAP AND OUTLET



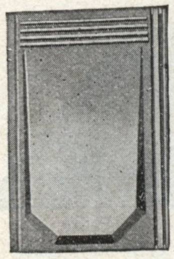
COPPER WIRE LEADER STRAINER
Also made for round leader



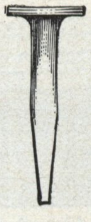
OUTSIDE CORNER COPPER GUTTER MITER



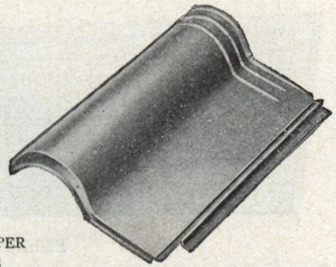
COPPER WIRE SHINGLE NAIL



COPPER SHINGLE



CUT COPPER SLATING NAIL



COPPER SPANISH TILE

Continued on next page

Hungerford Star Brand Copper Gutter

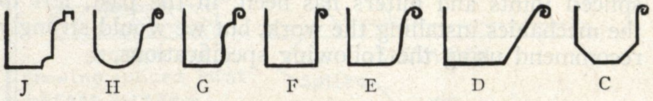
Single bead, lap joint half round. Stock sizes: 16-oz. copper, 10-ft. lengths, 4, 5, and 6-in. diam.

Double bead, half round gutter, also double or single bead, *slip* joint types can be furnished promptly to special order.

While it is possible for a skilled metal worker to make satisfactory quality copper gutter, this practice leaves the architect without positive means of knowing that full weight, 16-oz. copper has been installed on a residence, in accordance with specifications.

Like our "Star Brand" copper leader we advocate the use of *factory made* material and for purposes of quick identification and as our positive guarantee of full weight standard quality, every length of genuine Hungerford "Star Brand" copper gutter is indelibly die stamped with our name, "Star" trade-mark and the full net weight of copper from which it is made.

To meet special requirements a variety of "OG" and other types of copper gutters can be made to order promptly. The following suggested patterns give some idea of our facilities in this direction.



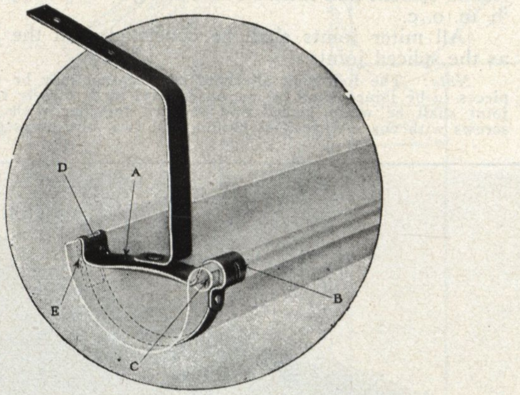
STYLES OF SPECIAL COPPER GUTTERS

End or contour views showing some types of "OG" and special patterns of copper gutters that can be made promptly to special order (not drawn to scale). These designs may be varied in any particular to conform with architects' plans and can be made in any size desired

Copper Gutter Hangers

Copper hangers should of course always be used with copper gutters and it is also important that copper nails be used; iron nails of any type should never be driven through or allowed to come in contact with copper; galvanic action which is sure to result from such practice will quickly disintegrate and destroy the nails.

Rex Strap Copper Gutter Hangers—In the Rex hanger, simplicity of construction and ease with which it can be installed are outstanding features.



REX COPPER GUTTER HANGER

Note the following five points of superiority in the Rex hangers:

(A) Reinforced truss type of crossbar $\frac{5}{64}$ in. thick by ⅝ in. wide supports sides of gutter and prevents bending out of shape or alignment by painters' ladders.

(B) Hook is slit at this point to facilitate bending and will automatically adjust itself to any variation in size of bead. This feature insures tight fit.

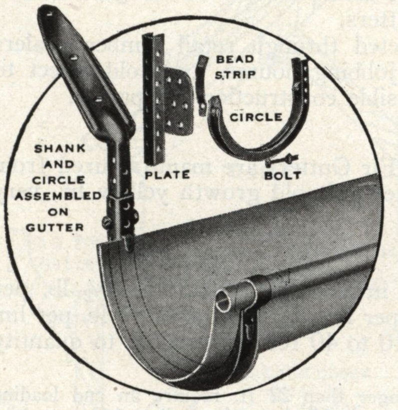
(C) Spur on understrap slips up under bead and forms a lock when strap is bent around gutter.

(D) Hole is punched for nailing through gutter and hanger into facia board. Prevents gutter from tipping over.

(E) Adjustable locking feature permits pulling strap to a snug, tight fit all around gutter.

Monarch Shank, Plate and Circle Gutter Hanger

Built on an entirely new principle that overcomes the limitations and disadvantages of old-fashioned numbered shank and circle gutter hangers:



MONARCH SHANK AND CIRCLE GUTTER HANGER

Monarch shanks are adjustable; only one type of shank required for any pitch of roof.

Monarch plates, for use on facia boards and overhanging rafters, are reversible, which permits either right or left fastening; plates are adjustable up or down, same as the shanks.

A secure fastening can also be made by using the Monarch circle alone, nailing direct to the rafter or facia board; no other circle can be used alone in this manner.

In stock, ready for immediate delivery, in pure copper and galvanized iron for 4, 5 and 6-in. gutters.

Hungerford Star Brand Sheet Copper

Has a fifty-year old reputation with the roofing and sheet metal working trades as a dependable, uniformly satisfactory product.

Every step in the production of Star Brand sheet copper from mine to ingot and from ingot to the rolled sheet is carried out in full accordance with present day standards and improved methods. Star Brand sheet copper is as near 100% pure as any sheet copper can be made.

By writing "Hungerford Star Brand Sheet Copper" into specifications you will have the satisfaction of knowing that you are providing for material with a thoroughly tried and proved reputation for quality.

Hungerford "Old English" Lead Coated Sheet Copper

For roofs, valleys, flashings, leaders, gutters and other outside metal trim on country houses or public buildings where "English" style of architecture is a feature. Can be furnished in any required size. Coated on one or both sides, as desired. The cost is only a fraction of that of hard sheet lead or cast lead fittings. It is much lighter than pure lead and therefore easier to handle and support. It will not dent and damage as easily as pure lead. It can be worked into innumerable designs and patterns that would be impossible of attainment with cast lead.

E. M. LONG & SONS

Fir Gutter Specialists

CADIZ, OHIO

TRADE E.M. LONG & SONS CADIZ · OHIO IMPROVED O.G. FIR GUTTERS MARK
REG. U.S. PAT. OFFICE

Products

Improved O.G. Fir Gutters.

Used on all types of buildings where exposed or hanging gutters are contemplated.

Plant, Capacity and Distribution

Our plant located in Cadiz, Ohio, carries in stock a half million feet of assorted sizes and lengths of Improved O.G. Fir Gutters.

They are marketed through retail lumber dealers and sash and door jobbing houses, and sold direct to railroads and responsible construction companies.

Material

Improved O.G. Fir Gutters are manufactured from No. 2 clear and better soft old growth yellow fir, very strong and durable.

Sizes and Weights

They are made in stock sizes 3x5 in. 1½ lb. per lin. ft., 4x6 in. 2 lb. per lin. ft., and 5x7 in. 3 lb. per lin. ft. in lengths from 10 to 40 feet (according to quantity shipped).

Note: Lengths longer than 22 ft. require an end loading car and such car is not obtainable from the Railroad Co. on shipments less than 1500 lb.

Description

Improved O.G. Fir Gutters are rapidly replacing metallic gutters on all types of buildings as they will not corrode or disintegrate when exposed to the elements, smoke or acid fumes.

There are numerous instances where Old Growth Fir Gutters have lasted over 25 years without any attention. They cost less than copper, galvanized iron or best tin and will last much longer.

They have architectural merit on account of their form or design. The architect can readily include the gutter as a part of the cornice profile, thus eliminating the unsightly appearance of the common hanging gutter.

A number of the largest railway systems in the United States and Canada are using these gutters because of their appearance, long life and economy.

In New England, wooden gutters have been and are in general use and have proved very durable.

They are adaptable to both new and old buildings.

How to Install O.G. Fir Gutters

We recommend setting all gutters level for architectural and practical reasons. Architecturally—so that straight horizontal lines can be retained. Practically—because water will always seek its own level, and find its outlet at the leader spouts. Short length gutters require one leader. Long length gutters require two or more leaders according to the roof area to be drained. If desired, the gutters can be set with slight pitch at the sacrifice of architectural appearance; this can be done by setting the leader end of gutter slightly lower; or another method is to spring the gutter slightly lower at both ends than it is at the center, which can be readily done due to the long lengths of our gutters with a leader at each end.

The method of connecting down-spouts, making spliced joints and miters has been, in the past, left to the mechanics installing the work, but we would strongly recommend using the following specifications.

Specifications

General—The Contractor shall provide and install ..x.. in. Improved O. G. Fir Gutters as manufactured by E. M. Long & Sons, Cadiz, Ohio.

Material—The gutters shall be manufactured from No. 2 clear and better soft old growth yellow fir.

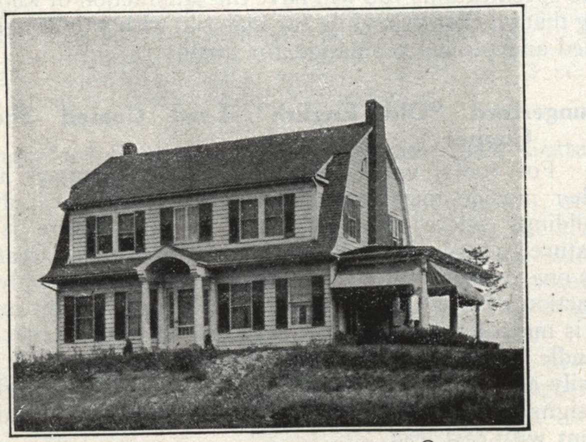
Priming—When specifying, state whether gutters are to be furnished unprimed or treated with creosote wood preservative.

Splice and Miter Joints—All gutters whose finished length will require joints shall be spliced as follows:

The two pieces to be joined shall be cut on a bevel to fit closely together and the joint shall be white leaded and secured together with two 3-in. brass screws with coarse thread at bottom and two ¾-in. brass screws at top. The screw heads shall be countersunk and puttied. The ends shall be rebated for a distance of 1½ in. on each side of the joint to a depth equal to the thickness of the sheet-lead flashing. The sheet lead shall be 3 in. wide by the length required to fit the rebate the full length of the joint, and shall be embedded in the rebate with elastic cement and tacked around edges with copper tacks about ¾ in. o. c.

All miter joints shall be constructed in the same manner as the spliced joints.

Note: The following alternate specification may be used: The two pieces to be joined shall be cut on a bevel to fit closely together and the joint shall be white leaded and secured together with two 3-in. brass screws with coarse thread at bottom and two 3-in. brass screws at top.



Residence at New Philadelphia, Ohio

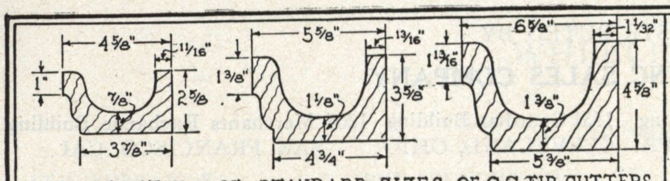
Atlantic Coast Line R. R. Co. Freight Depot, Richmond, Va.

Continued on next page

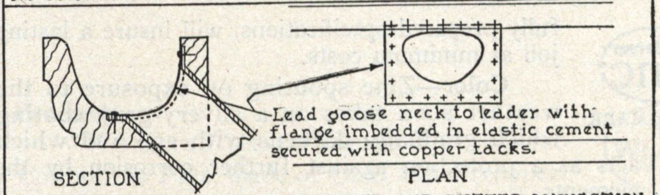
Leader Down-spouts—Where located on the drawings provide and install leader down-spouts.

Provide a hole in the gutter the size of the outside diameter of the lead down-spout; the gutter shall be rebated for a square flange not closer than ¾ in. from edge of hole to depth equal to the thickness of the lead flange. The gutter end of the lead down-spout shall be flanged to fit the square rebate and shall be embedded in the rebate with elastic cement and tacked around edges with copper tacks about ¾ in. o. c.

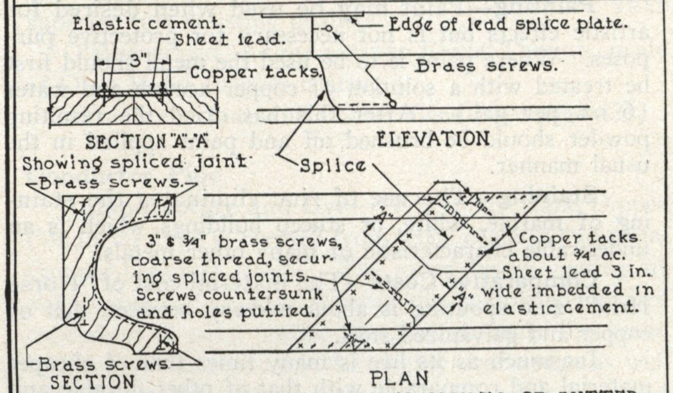
Note: Copper down-spouts can be provided, if desired, but must be constructed in a similar manner to lead construction.


4⅝"
1 1/16"
1"
7/8"
2⅝"
3⅞"
5⅝"
1 3/16"
1⅜"
1⅛"
3⅝"
4¾"
6⅝"
1 1/32"
1 13/16"
1⅜"
4⅝"
5⅞"

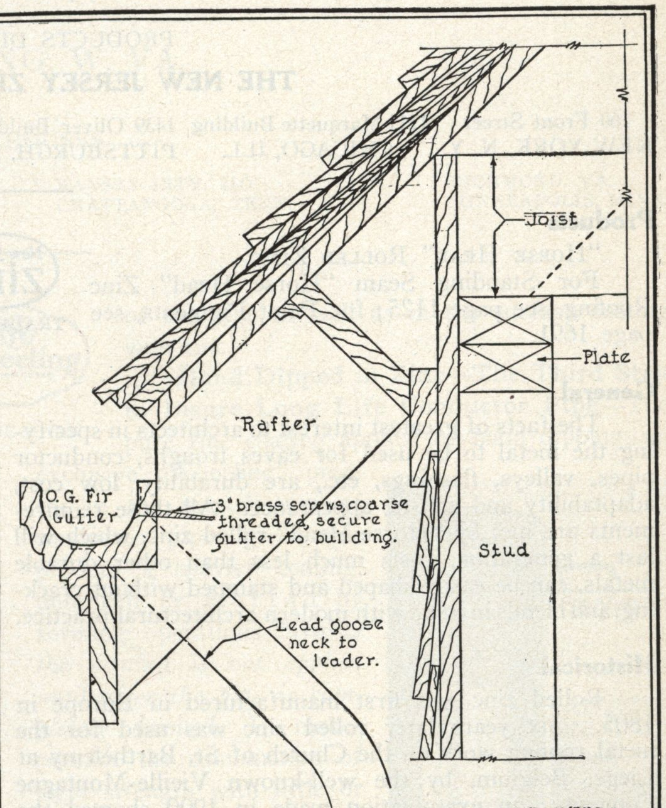
1½" SCALE DETAILS OF STANDARD SIZES OF O.G. FIR GUTTERS.


Lead goose neck to leader with flange imbedded in elastic cement secured with copper tacks.
SECTION
PLAN

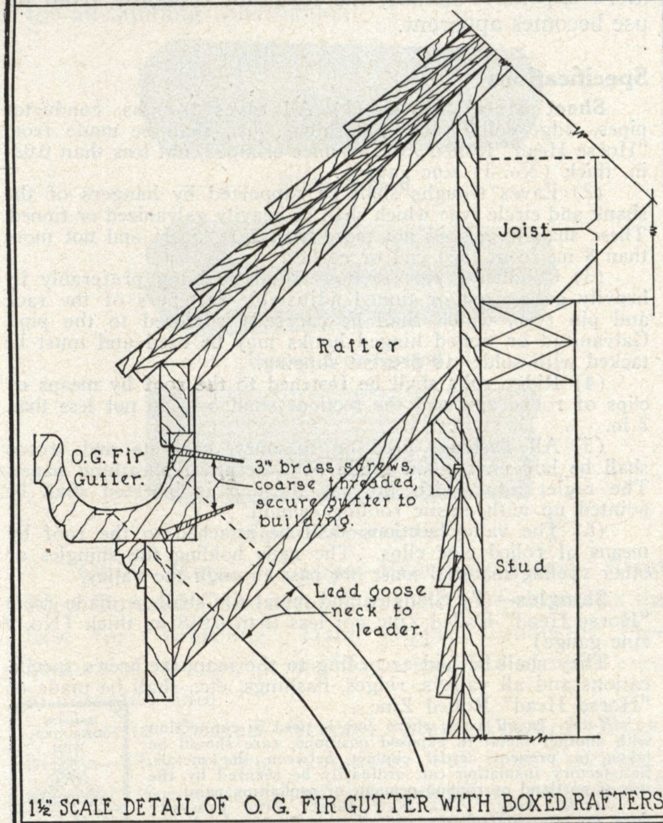
1½" SCALE DETAILS SHOWING LEADER AND GUTTER CONNECTION.


Elastic cement.
Sheet lead.
3"
Copper tacks.
SECTION "A-A"
Showing spliced joint
Edge of lead splice plate.
Brass screws.
ELEVATION
Splice
Brass screws.
3" & ¾" brass screws, coarse thread, securing spliced joints. Screws countersunk and holes puttied.
Copper tacks about ¾" o.c.
Sheet lead 3 in. wide imbedded in elastic cement.
A
A
Brass screws
SECTION
PLAN

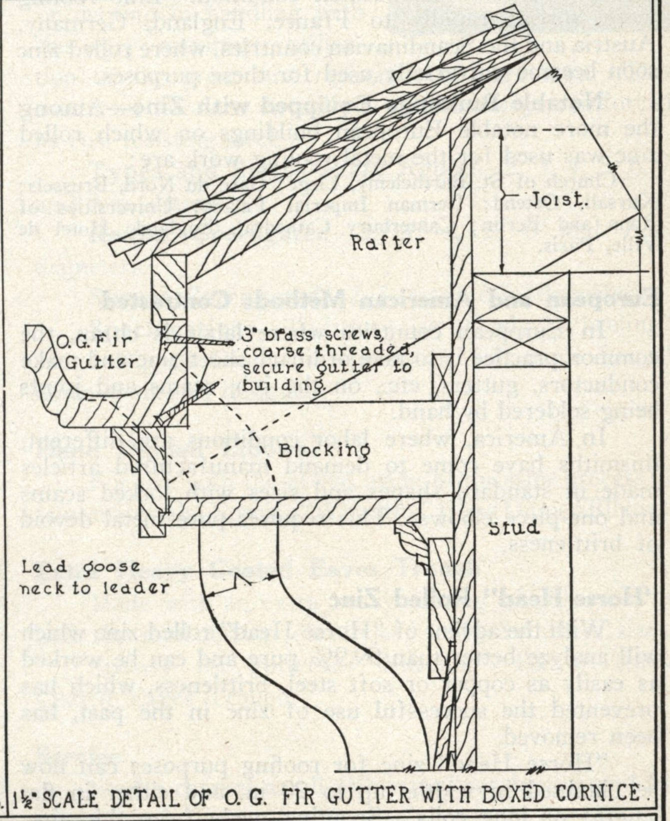
1½" SCALE DETAILS SHOWING SPLICED JOINTS OF GUTTER.


Joist
Plate
Rafter
O.G. Fir Gutter
3" brass screws, coarse threaded, secure gutter to building.
Stud
Lead goose neck to leader.

1½" SCALE DETAIL OF O. G. FIR GUTTER WITH OPEN RAFTERS.


Joist
Rafter
O.G. Fir Gutter.
3" brass screws, coarse threaded, secure gutter to building.
Stud
Lead goose neck to leader.

1½" SCALE DETAIL OF O. G. FIR GUTTER WITH BOXED RAFTERS.


Joist
Rafter
O.G. Fir Gutter
3" brass screws, coarse threaded, secure gutter to building.
Blocking
Stud
Lead goose neck to leader

1½" SCALE DETAIL OF O. G. FIR GUTTER WITH BOXED CORNICE.

DETAILS SHOWING APPLICATION OF IMPROVED O.G. FIR GUTTERS.

THE NEW JERSEY ZINC COMPANY

ESTABLISHED 1848

Manufacturer of "Horse Head" Rolled Zinc

PRODUCTS DISTRIBUTED BY

THE NEW JERSEY ZINC SALES COMPANY

160 Front Street
NEW YORK, N. Y.

1111 Marquette Building
CHICAGO, ILL.

1439 Oliver Building
PITTSBURGH, PA.

1531 Guardian Building
CLEVELAND, OHIO

1205 Merchants Exchange Building
SAN FRANCISCO, CAL.

Products

"Horse Head" Rolled Zinc.

For Standing Seam "Horse Head" Zinc Roofing, see page 1125; for Paint Pigments, see page 1691.

New Jersey zinc
TRADE-MARK

General

The facts of greatest interest to architects in specifying the metal to be used for eaves troughs, conductor pipes, valleys, flashings, etc., are durability, low cost, adaptability and artistic appearance. All these requirements are met by "Horse Head" rolled zinc, which will last a generation, costs much less than other durable metals, can be easily shaped and stamped without cracking, and blends in color with modern architectural practice.

Historical

Rolled zinc was first manufactured in Europe in 1805. Six years later rolled zinc was used for the metal roofing work on the Church of St. Barthelemy at Liege, Belgium, by the well-known Vieille-Montagne Company; an examination made in 1900 showed the metal to be still in excellent condition. Zinc roofing work spread rapidly to France, England, Germany, Austria and the Scandinavian countries, where rolled zinc soon became universally used for these purposes.

Notable Buildings Equipped with Zinc—Among the more notable European buildings on which rolled zinc was used for the metal roofing work are:

Church of St. Barthelemy, Liege; Gare du Nord, Brussels; Kursall, Ostend; German Imperial Palace; Universities of Bonn and Berlin; Canterbury Cathedral, England; Hotel de Ville, Paris.

European and American Methods Contrasted

In European countries where labor is cheap, the common practice is to take ordinary sheet zinc and make conductors, gutters, etc., on the job, seams and joints being soldered by hand.

In America, where labor conditions are different, tinsmiths have come to demand manufactured articles made in standard shapes and sizes with locked seams and one-piece elbows. This requires pure metal devoid of brittleness.

"Horse Head" Rolled Zinc

With the advent of "Horse Head" rolled zinc which will analyze better than 99.9% pure and can be worked as easily as copper or soft steel, brittleness, which has prevented the successful use of zinc in the past, has been removed.

"Horse Head" zinc for roofing purposes can now be obtained in widths up to 20 in. and either in flat lengths or long coils. Spouting made from this zinc, when erected in accordance with the following carefully prepared specifications, will insure a lasting job at minimum costs.

Color—Zinc spouting on exposure to the weather soon takes on a silvery-gray coating which gradually darkens with age and which acts as a protection against further corrosion by the elements.

Painting—Paint may be used when desired for artistic effects but is not necessary for protective purposes. Where paint is to be used the metal should first be treated with a solution of copper acetate and water (6 oz. per gal.). After this has dried the resulting powder should be brushed off and paint applied in the usual manner.

Staining—The use of zinc eliminates the staining of marble, white, or stucco buildings which is an undesirable characteristic of many other metals.

Comparative Costs—The material cost of "Horse Head" zinc spouting is about midway between that of copper and galvanized steel.

Inasmuch as its life is many times that of cheaper material and comparable with that of other durable and more expensive metals, the resultant economy from its use becomes apparent.

Specifications

Sheet Metal Work—(1) All eaves troughs, conductor pipes, ridge rolls, valleys, flashings, etc., shall be made from "Horse Head" Rolled Zinc, cornice crimped, not less than 0.024 in. thick (No. 11 zinc gauge).

(2) Eaves troughs shall be supported by hangers of the shank and circle type which shall be heavily galvanized or tinned. These shall be spaced not more than 2 ft. apart and not more than 8 in. from each end or corner.

(3) Conductor pipe sections shall be hung preferably by heavily galvanized or tinned adjustable fasteners of the rack and pin type, which shall be carefully soldered to the pipe. Galvanized or tinned hinged hooks may be used and must be tacked with solder to prevent slipping.

(4) Ridge rolls shall be fastened to the roof by means of clips of rolled zinc and the sections shall overlap not less than 2 in.

(5) All flashings used on masonry, concrete and stucco shall be laid on a good grade of waterproof sheathing paper. The reglet into which the cap flashing is inserted shall be pointed up with elastic roofing cement.

(6) The valley sections shall be attached to the roof by means of rolled zinc clips. The nails holding the shingles or other roofing material must not pass through the valley.

Shingles—(7) Shingles and metal tile shall be made from "Horse Head" Rolled Zinc not less than 0.018 in. thick (No. 9 zinc gauge).

They shall be laid according to the manufacturer's specifications and all valleys, ridges, flashings, etc., shall be made of "Horse Head" Rolled Zinc.

Note: In all cases where zinc is used in connection with another metal in exposed positions, care should be taken to prevent actual contact between the metals. Satisfactory insulation can ordinarily be secured by the use of portland or roofing cement, or asphaltum paint.

Special Note: The New Jersey Zinc Company does not recommend the use of zinc leaders and gutters, elbows, flashings or valleys on buildings which are roofed with red cedar or redwood shingles.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

WHEELING CORRUGATING COMPANY

Manufacturers of Hand Dipped Conductor Pipe

WHEELING, W. VA.

WAREHOUSES

NEW YORK, N. Y.
CHICAGO, ILL.
PHILADELPHIA, PA.
ST. LOUIS, MO.
KANSAS CITY, MO.
CHATTANOOGA, TENN.
RICHMOND, VA.
MINNEAPOLIS, MINN.

TRADE-MARK

Products

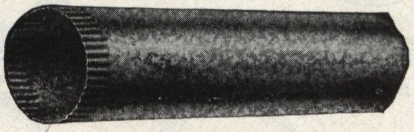
"WHEELING" HAND DIPPED ZINC COATED CONDUCTOR PIPE, made of Ohio Metal (copper-bearing), a new galvanized conductor pipe of superior rust resisting quality.

"WHEELING" EXTRA COATED EAVES TROUGH, made of Ohio Metal (copper-bearing).

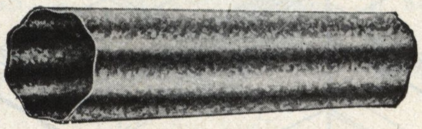
For Metal Lath and Corner Beads, see page 421.

Conductor Pipe

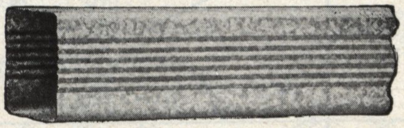
Manufacture and Use—"Wheeling" Hand Dipped Conductor Pipe is formed from terne coated Ohio metal (copper-bearing) sheets. The extra heavy coating of zinc is obtained by hand dipping this completely formed conductor in pure molten zinc, which seals the seam, inside and out, and coats thoroughly every edge as well on inside and outside surfaces. This conductor is used for all building construction.



Plain Round



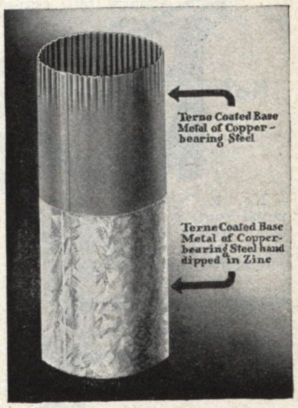
Round Corrugated



Square Corrugated

Ohio Metal (Copper-Bearing Steel)—First Step Toward Conductor Durability—Selected as the base for "Wheeling" Hand Dipped Conductor Pipe because of its superior merit as a long life material even in uncoated state.

Terne Coated—Second Step Toward Durability—This coating eliminates the acid "pickling" necessary for most galvanizing operations, removing all possibility of acid remaining in seams. The terne coating also acts as a non-corrosive flux in sealing the seam of the pipe as well as in the surface coating with zinc.


Terne Coated Base Metal of Copper-bearing Steel
Terne Coated Base Metal of Copper-bearing Steel hand dipped in Zinc

Hand Dipped in Zinc—The Third Step to Insure Long Life Conductor Pipe—The pure zinc coating applied by hand dipping, an exclusive "Wheeling" process in the manufacture of conductor pipe, gives this product a heavier coating, unbroken or marred by forming operations *because the coating is not applied until after the pipe is completely formed.* It makes possible the combination of rigid strength with little or no susceptibility to crushing or denting in handling with the very maximum utilization of the great rust resistance of pure zinc. This conductor becomes virtually a pure zinc pipe reinforced by rust resisting steel.

Types and Sizes—***Plain Round***—2, 3, 4, 5, 6, 7 and 8-in. diameters.

Round Corrugated—2, 3, 4, 5, 6 and 7-in. diameters.

Square Corrugated—2, 3, 4 and 5-in. diameters.

Specifications—To insure use of only "Wheeling" Hand Dipped Conductor specify by full name for all down-spouts as designed.

Hand Dipped Elbows

For use with the above, made by the same process of same materials. Specify "Wheeling" Hand Dipped Elbows.

Extra Heavy Coated Eaves Trough

Made with an extra heavy coating of pure zinc in both slip joint and lap joint styles; 4, 4½, 5 and 6-in. sizes.

Specify for gutters: "Wheeling" Extra Heavy Coated Eaves Trough.

Service

Stocks carried at all Wheeling warehouses and by prominent jobbers.

Samples gladly supplied architects on request.

BERGER BROTHERS COMPANY

Gutter Hangers and Conductor Pipe Fasteners

229-237 Arch Street
PHILADELPHIA, PA.

TRADE
-BB-
MARK

Products

Gutter Hangers and Conductor Pipe Fasteners, of malleable iron, wrought iron, solid cast bronze and stamped copper.

Also a general line of Sheet Metal Workers' Requirements.

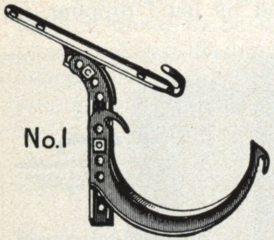
The Mark of Quality Which Protects the Purchaser

We are the originators, designers and manufacturers of the best grade of gutter hangers and conductor pipe fasteners on the market.

Our registered trade-mark appears on all products manufactured by us. This mark represents dependability, durability and strength and protects the purchaser against inferior imitations.

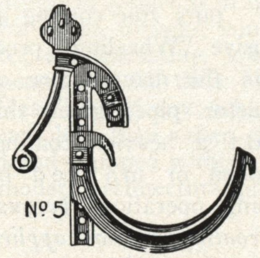
When specifying, full protection is assured by insisting that our trade-mark appear on every piece.

How Furnished—Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), solid cast bronze and stamped copper. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks. Free samples on request.



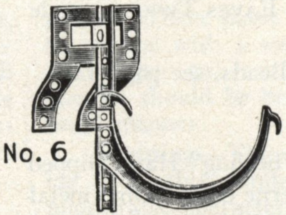
No.1

No. 1. Clamped direct to metal roof, requiring only one bolt through the iron. Especially suitable for awnings and corrugated roofs



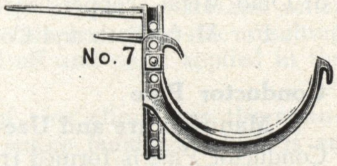
Nº5

No. 5. Will span over various shaped mouldings and is easily bent larger or smaller before nailing to eave



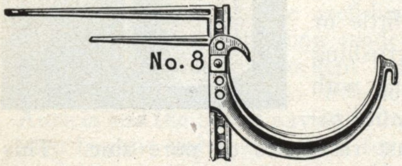
No. 6

No. 6. For nailing against O. G. mouldings. The two stays are made to fit in the cove and can be bent to suit variation



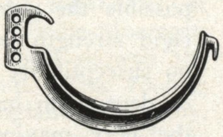
No.7

No. 7. For driving from 3 to 4 in. square in cornice. Lower prong forms a brace for the upper and makes it strong and firm

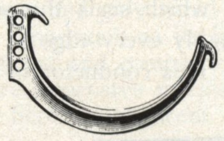


No.8

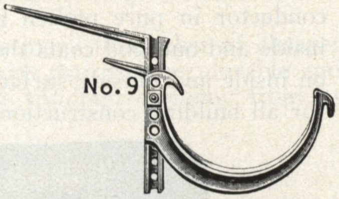
No. 8. For driving from 3 to 6 in. square in cornice. Intended for eaves where shingles project over the cornice



Penn Gutter Circle. For double bead gutters. Sizes, 3½, 4, 4½, 5, 6, 7 and 8 in.



Gem Gutter Circle. For single bead gutters. Sizes, 3½, 3¾, 4, 4½, 5, 6, 7 and 8 in.

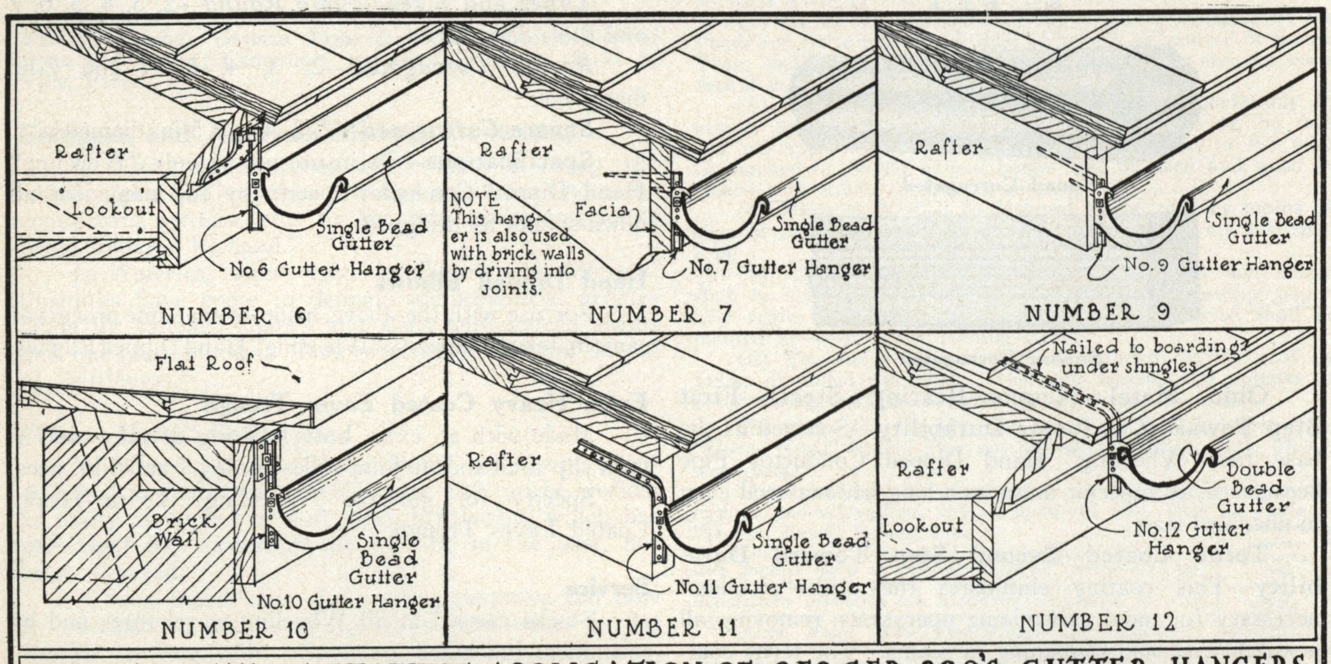


No.9

No. 9. For driving with the pitch of the roof. Suitable for narrow moulded cornice

Circles are applicable to any B. B. hanger

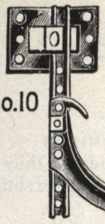
B. B. Gutter Hangers


Rafter
Lookout
Single Bead Gutter
No.6 Gutter Hanger
NUMBER 6
Rafter
NOTE This hanger is also used with brick walls by driving into Joints.
Facia
Single Bead Gutter
No.7 Gutter Hanger
NUMBER 7
Rafter
Single Bead Gutter
No. 9 Gutter Hanger
NUMBER 9
Flat Roof
Brick Wall
Single Bead Gutter
No.10 Gutter Hanger
NUMBER 10
Rafter
Single Bead Gutter
No.11 Gutter Hanger
NUMBER 11
Nailed to boarding under shingles
Rafter
Lookout
Double Bead Gutter
No.12 Gutter Hanger
NUMBER 12

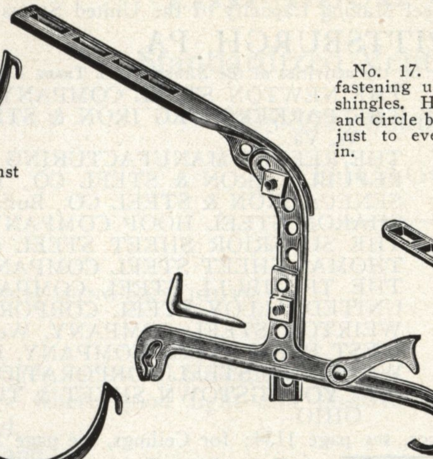
TYPICAL DETAILS SHOWING APPLICATION OF BERGER BRO'S. GUTTER HANGERS

Continued on next page

No.10

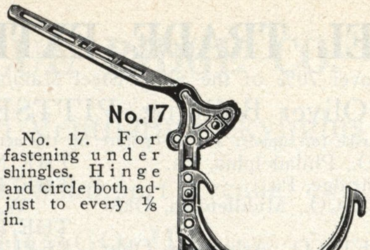


No. 10. For nailing against square box cornice



Clamp Gutter Hanger. Strong, convenient and simple. Will adjust to any pitch of roof. Sizes, 4, 5 and 6 in.

No.17

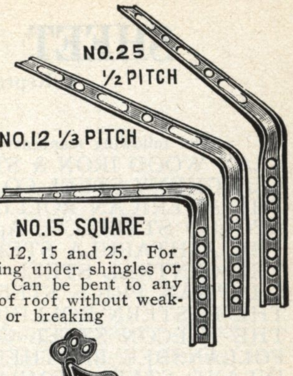


No. 17. For fastening under shingles. Hinge and circle both adjust to every ⅛ in.

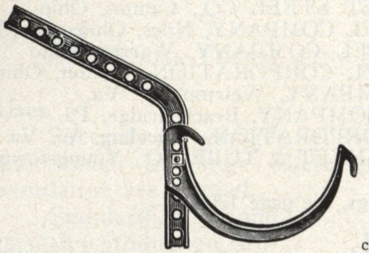
NO.25 ½ PITCH

NO.12 ⅓ PITCH

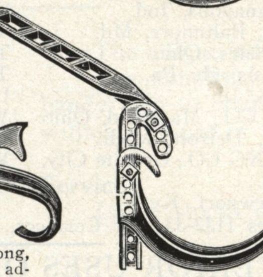
NO.15 SQUARE



Nos. 12, 15 and 25. For fastening under shingles or slate. Can be bent to any pitch of roof without weakening or breaking

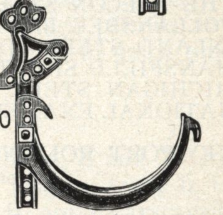


No. 11. For nailing to the side of exposed rafters



No. 16. For fastening under shingles

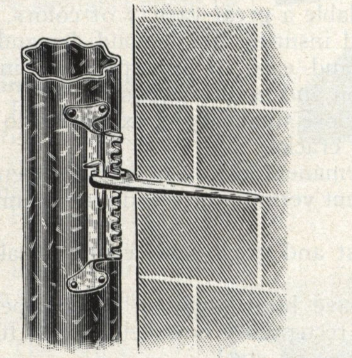
No.20

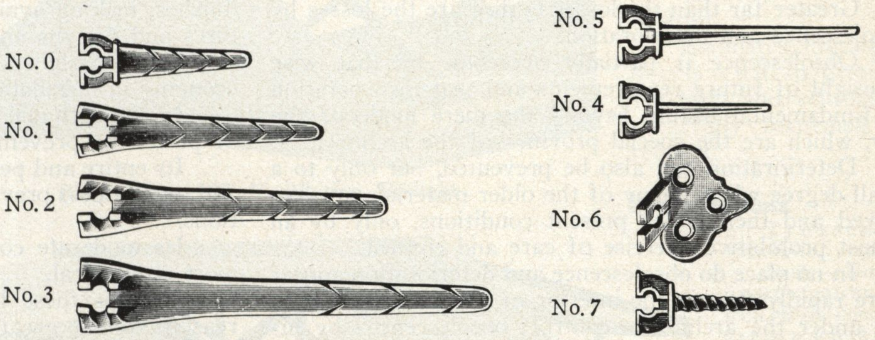


No. 20. For nailing or screwing to various shaped mouldings at any angle desired. Hinged for any pitch of roof

B. B. Gutter Hangers

Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), solid cast bronze and stamped copper. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks. Free samples on request

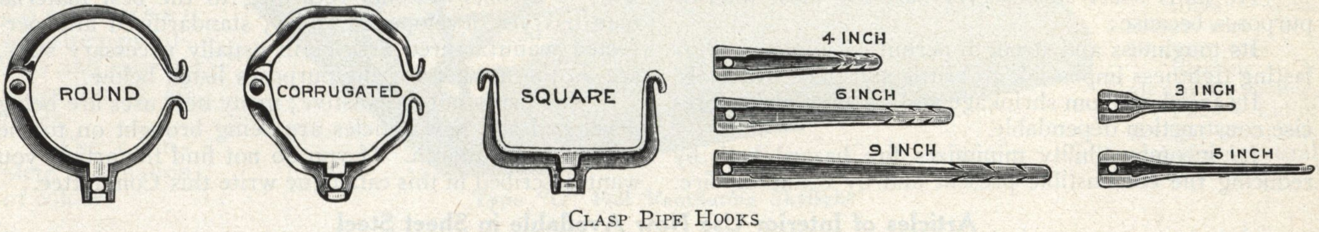




Pipe Fasteners

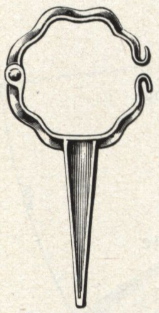
For fastening all kinds of conductor pipes at any distance from the wall. Used in any position and allow enough variation to let pipe slip together until tight in the joints. Needs no close measuring on wall to find a joint for the drive

No. 0. For brick, 3 in. No. 1. For brick or stone, 4½ in. No. 2. For stone, 6 in. No. 3. For stone, 9 in. No. 4. For wood, 3 in.
No. 5. For wood, 5 in. No. 6. To nail on wood. No. 7. To screw in wood.

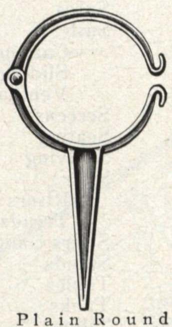


Clasp Pipe Hooks

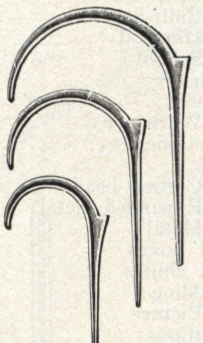
For fastening conductor pipe to wood, brick or stone at any distance from the wall. Length drives: 3 and 5 in. for wood; 4, 6 and 9 in. for brick and stone



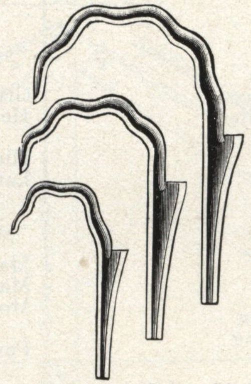
Round Corrugated Hinged Pipe Hook. With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.



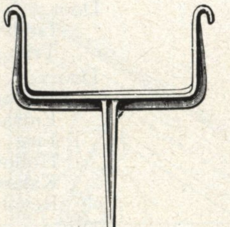
Plain Round Hinged Pipe Hook. With brick drive in 2, 3, and 4 in., and wood drive in 2, 3 and 4-in. sizes.



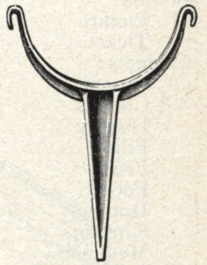
Plain Sickle Pipe Hooks. With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.



Corrugated Sickle Pipe Hooks. With wood and brick drive. Sizes, 2, 3 and 4 in.



Square Wired Pipe Hook. With wood and brick drive. Sizes, 3, 4, 5 and 6 in.



Round Wired Pipe Hook. With wood drive. Sizes, 3 and 4 in.

B. B. Conductor Pipe Fasteners and Hooks

Made of tinned malleable iron and of solid cast bronze

SHEET STEEL TRADE EXTENSION COMMITTEE

Representing over 70% of the Sheet Steel Making Capacity of the United States

Oliver Building, PITTSBURGH, PA.

The following manufacturers subscribe to, support and co-operate in, the activities of the SHEET STEEL TRADE EXTENSION COMMITTEE

ALAN WOOD IRON & STEEL CO., Philadelphia, Pa.
ALLEGHENY STEEL CO., Brackenridge, Pa.
THE AMERICAN ROLLING MILL CO., Middletown, Ohio
APOLLO STEEL CO., Apollo, Pa.
THE ASHTABULA STEEL SHEET CO., Ashtabula, Ohio
THE CENTRAL STEEL CO., Massillon, Ohio
CHAPMAN PRICE STEEL CO., Indianapolis, Ind.
THE EASTERN ROLLING MILL CO., Baltimore, Md.
THE FALCON STEEL COMPANY, Niles, Ohio
FOLLANSBEE BROTHERS CO., Pittsburgh, Pa.
INLAND STEEL COMPANY, Chicago, Ill.
MANSFIELD SHEET & TIN PLATE CO., Mansfield, Ohio
MICHIGAN STEEL CORPORATION, Detroit, Mich.
NATIONAL ENAMELING & STAMPING CO., Granite City, Ill.
NEWPORT ROLLING MILL CO., Newport, Ky.
THE NEWTON STEEL COMPANY, Youngstown, Ohio
THE PARKERSBURG IRON & STEEL CO., Parkersburg, W. Va.
THE REEVES MANUFACTURING CO., Dover, Ohio
REPUBLIC IRON & STEEL CO., Youngstown, Ohio
SENECA IRON & STEEL CO., Buffalo, N. Y.
SHARON STEEL HOOP COMPANY, Sharon, Pa.
THE SUPERIOR SHEET STEEL CO., Canton, Ohio
THOMAS SHEET STEEL COMPANY, Niles, Ohio
THE TRUMBULL STEEL COMPANY, Warren, Ohio
UNITED ALLOY STEEL CORPORATION, Canton, Ohio
WEIRTON STEEL COMPANY, Weirton, W. Va.
WEST PENN STEEL COMPANY, Brackenridge, Pa.
WHEELING STEEL CORPORATION, Wheeling, W. Va.
THE YOUNGSTOWN SHEET & TUBE CO., Youngstown, OHIO

For Roofing, see pages 1132-33; for Cornices, see page 1134; for Ceilings, see page 1204

INTERIOR USES OF SHEET STEEL

The Architect's Control of the Future

Attainment of value in the building and prevention of its early loss are two of the prime reasons for the architect's existence.

Greater far than the losses by fire are the losses by obsolescence and deterioration.

Obsolescence is partially overcome by that wise foresight of future requirements and that incorporation of fundamental beauty beyond the mere mode of the day, which are the special province of the architect.

Deterioration can also be prevented, but only to a small degree where many of the older materials are employed and then under present conditions, only by an almost prohibitive exercise of care and control.

In no place do obsolescence and deterioration appear more rapidly than in the interior of the building. Both are under the architect's control; obsolescence—by his artistic, economic and analytical faculties; deterioration—by his knowledge of materials, methods and the ways of men who build.

He finds *sheet steel* serves best for most interior purposes because:

Its toughness and strength permit of joints of everlasting tightness impossible to brittle and thick materials.

Its freedom from shrinkage and warping makes precise construction dependable.

Its incombustibility minimizes fire hazard both by reducing the combustible present and by confining fire.

Its lightness for its strength and its ductility make possible dimensions unattainable in any other economical material.

Its perfect surface takes and holds the most durable finishes, making available a great variety of colors, textures and designs and insuring life beyond demand.

Its workability and ease of incorporation insure economy in installation and in alterations.

Its strength and close similarity of expansion to that of plastering prevent cracks.

Its entire and permanent lack of hospitable openings and its hardness prevent vermin, mice and dirt accumulations.

Its moderate cost and great serviceability make it most economical.

Perhaps these have been some of the compelling reasons for the great recognition now being given to the well proven faithfulness of steel.

Daily it is being put to new uses, new replacements of materials whose weaknesses have been demonstrated. This is a sober rational returning to the best material man has yet developed. Today, standardized and perfected manufactured articles in usually necessary sizes, are on the market for the purposes listed below.

The list is not exhaustive; many new uses are being developed and new articles are being brought on to the market every month. If you do not find the article you want described in this catalogue write this Committee.

Articles of Interior Use Now Available in Sheet Steel

- Base:
  - Mould
  - Conduit
- Bins
- Bookcases
- Bookstacks
- Booths:
  - Picture
  - Ticket
- Cabinets:
  - Broom
  - Clothes
  - Display
  - Filing
  - Fruit
  - Food
  - Ironing
  - Kitchen
  - Medicine
  - Storage
- Ceilings
- Chair Rail
- Chutes:
  - Clothes
  - Delivery
- Columns
- Cornices
- Counters
- Desks:
  - Flat top
  - Reference
  - Typewriter
- Door:
  - Jamb
  - Trim
- Doors:
  - Elevator
  - Entrance
  - Fire
  - Hollow
  - Kalamein
  - Revolving
- Dryers:
  - Laundry
- Ducts:
  - Blower
  - Ventilator
  - Warm air
- Elevator inclosures
- Furniture:
  - Bedroom
  - Built-in
  - Hospital
  - School
- Grilles
- Heaters:
  - Warm air
- Humidifiers
- Lath:
  - Corner beads
  - Expanded metal
  - Metal
- Mail boxes
- Mail chutes
- Moulding:
  - Picture
- Partitions:
  - Bath
  - Dwarf
  - Folding
  - Full height
  - Toilet
- Pilasters
- Placques and Ornaments
- Racks
- Radiator covers
- Refrigerators
- Safes
- Sash:
  - Casement
  - Sliding
  - Ventilating
- Screens
- Seating
- Shelving
- Stair:
  - Risers
  - Treads
- Stairs complete
- Stands
- Tables
- Tanks
- Tiling:
  - Wall
  - Ceiling
- Transoms
- Wainscoting
- Waste baskets
- Window trim

THE BLUE RIDGE CO.

Standardized Ventilating Skylights

3935-3943 Southport Avenue
CHICAGO, ILL.

Product

Blue Ridge Ventilating Skylights.

Uses

Specially for garages, industrial buildings, laundries and similar buildings where good light and positive ventilation are wanted.

Standardization and quantity production provide unusually low costs which make Blue Ridge ventilating skylights adaptable to any building where skylights might be used.

Distinctive Features

Perfect light and positive ventilation in one installation. No maintenance cost.

Heavy gauge, No. 18, galvanized iron used, insuring a life as long as the building.

The steel trussed underframe provides alignment and consequent weatherproofness and ease of operation at all times.

The complete elimination of solder.

The unique built-in self-locking operating device.

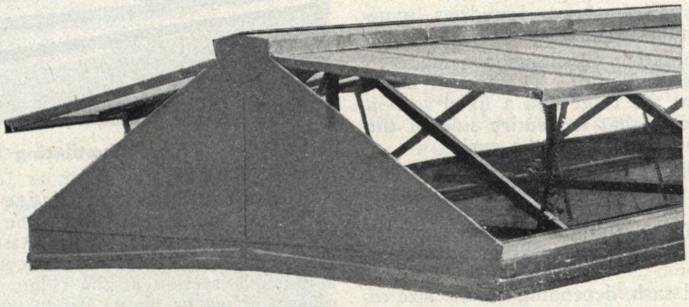
The simplicity of construction which permits any handy men to erect Blue Ridge skylights in quick time without the use of any special tools.

Service

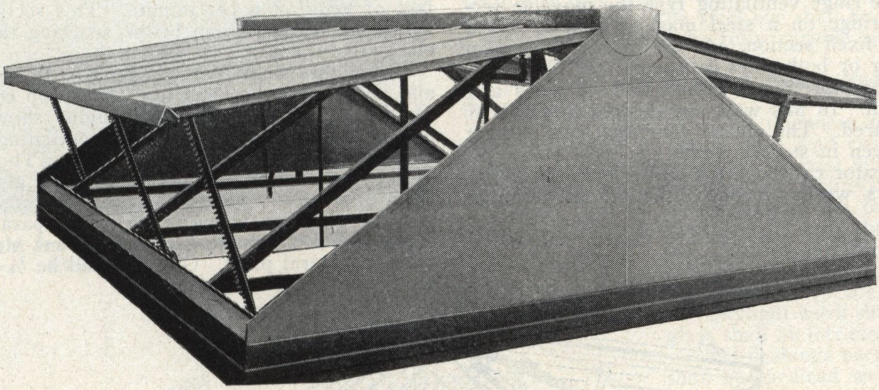
Large stocks of standard widths, 6, 8 and 10 ft., and lengths from 6 to 220 ft. are always available for immediate shipment. Shipped knocked down ready for erection with or without glass.

Erected by us when desired.

Estimates, literature, details and suggestions for light and ventilation cheerfully furnished on request.



Ridge Type "R" Ventilating Skylight



Type "G" Full Ventilating Skylight

Specifications

Trusses—2x 1½x⅛-in. angles.

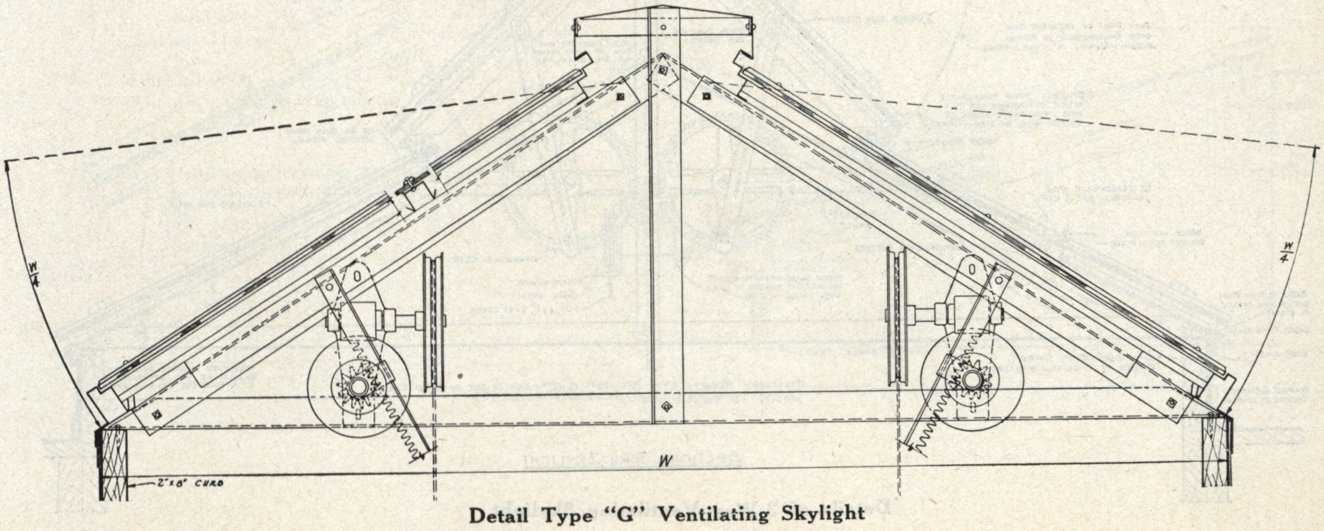
Sash—No. 18 gauge galvanized iron with condensation gutters throughout.

Operator—Self-locking rack type.

Glass—¼-in. ribbed wire; No. 18 gauge caps.

Flashing—3-ply asphalt roofing.

Paint—Entire skylight given one coat of red mineral paint at factory.



Detail Type "G" Ventilating Skylight

AMERICAN 3 WAY-LUXFER PRISM CO.

Skylight Engineers

1303-1311 South 55th Court
CICERO, ILL.

37-28 30th Street
LONG ISLAND CITY, N. Y.

For Branches and Sales Representatives, see page 598

Products

3-Way Ventilating Skylights.
Steelead Skylights.
For Reinforced Concrete Constructions, see pages 598-601.

3-Way Ventilating Skylights

This advanced construction meets every demand of the architect. It gives a full measure of daylight and provides a perfectly controlled full measure of ventilation as well.

Because of this double value these skylights are ideal installations for public garages, laundries, shops, foundries, gymnasiums, schools, public auditoriums, etc.

Construction—3-Way Ventilating Skylights are made in two types: the ridge vent and the full vent. The former has a ventilating or movable section at the ridge and a fixed section below; the latter is so constructed that the entire side of the skylight, hinged at the ridge is raised from the curb.

3-Way Ventilating Skylights are made of No. 18 gauge galvanized sheet steel, pressed into shape. This very heavy construction not only gives an added strength to the skylight but it doubles its life. The shape of the glazing bars provides a deep seat for the glass and ample condensation gutters as well.

Bars are made up into rigid sash, depending on the size of the skylight as to length, so that erection is simple; merely a case of assembling and glazing.

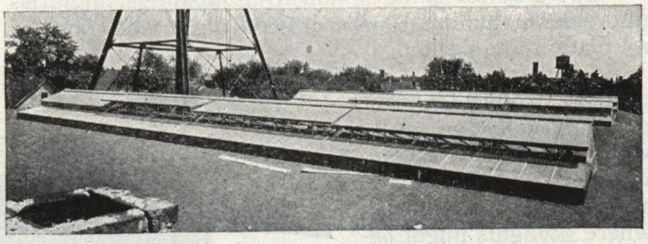
Operation—In the ridge ventilating type the movable section is raised at the ridge on a steel mast so that it has a steeper pitch than the fixed section. At the mast, this section is hinged so that either or both sides can be raised. The continuous hand chain operator moves either or both sides and stops them at any point. In this way, any desired measure of ventilation can be secured. The glazed vent sash can be kept open, on the leeside even in stormy weather.

This patented operator can be fitted with electric drive, if desired. As it always works in one direction no terminal switch is needed.

All parts, both fixed and movable, are glazed with wired glass so that full 100% daylight is secured.

In the full ventilating type each side of the skylight is made in a full movable sash or section. Hinged at the ridge this is raised from the curb. Independent operators are provided for each side.

Either type of ventilation is secured in hip skylights or gable end skylights; can also be adapted to lean-to or single pitch or sawtooth skylights.



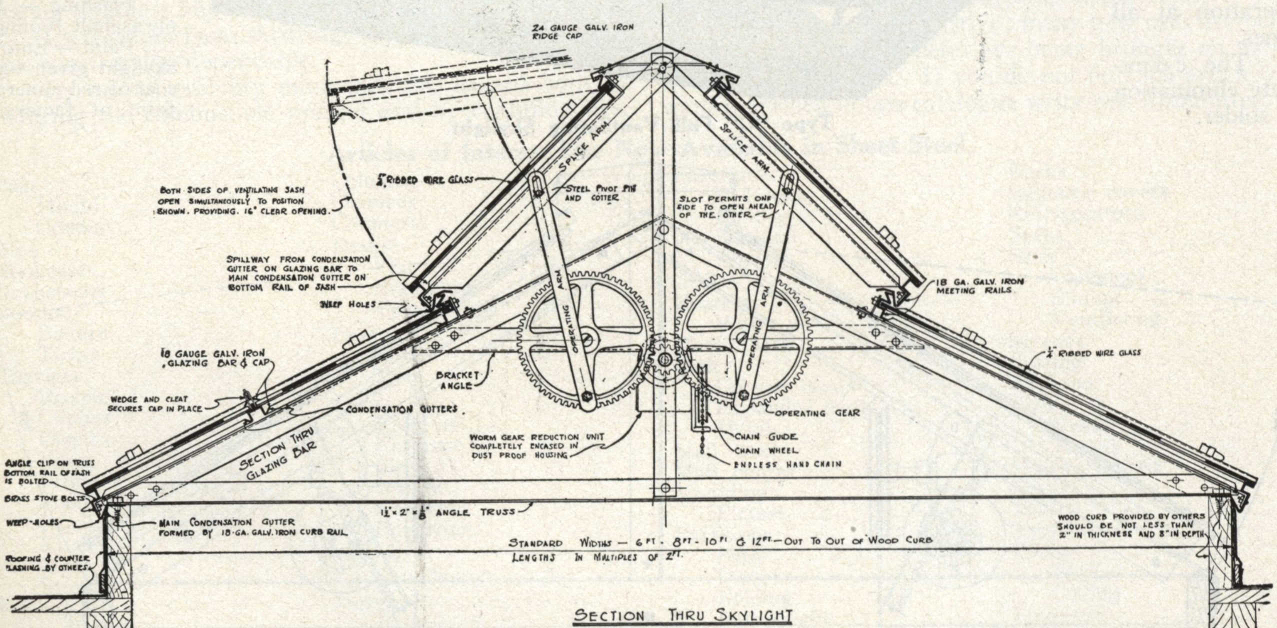
3-Way Ventilating Skylight Installed

Specifications—*For Ridge Vent Type "F"*—Skylights shown on plans shall be of the type known as 3-Way Ridge Ventilating as made by the American 3 Way-Luxfer Prism Co. These skylights shall be composed of a fixed section and a movable section at the ridge, both glazed with ¼-in. wired glass (ribbed or plain) set in putty and capped on the glazing bars with No. 18 gauge galvanized caps attached with clips.

Movable section at the ridge shall provide for ...... cubic feet of ventilation per minute. This section shall be operated with a hand chain from below, working through gears to open one or both sides.

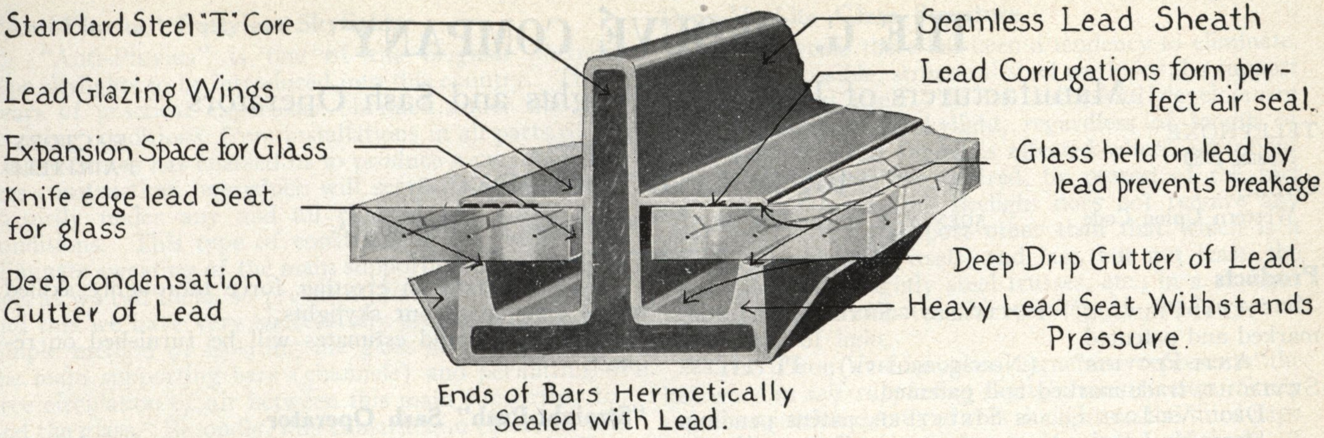
Skylights shall be made of No. 18 gauge galvanized steel and all metal parts shall have one shop coat of mineral paint.

Full Vent Type "J"—Skylights shown on plans shall be of the type known as Full Ventilating, as made by the American 3 Way-Luxfer Prism Co. They shall be composed of sections of each side that are hinged at the ridge and raised from the curb. These shall be operated by a hand chain mechanism, from below; each side separately. They shall be made of No. 18 gauge galvanized sheet steel painted one shop coat of mineral paint. Glazing shall be ¼-in. wired glass.


24 GAUGE GALV. IRON RIDGE CAP
BOTH SIDES OF VENTILATING SASH OPEN SIMULTANEOUSLY TO POSITION SHOWN. PROVIDING. 16" CLEAR OPENING.
¼" RIBBED WIRE GLASS
SPLICE ARM
SPLICE ARM
STEEL PIVOT PIN AND COTTER
SLOT PERMITS ONE SIDE TO OPEN AHEAD OF THE OTHER
SPILLWAY FROM CONDENSATION GUTTER ON GLAZING BAR TO MAIN CONDENSATION GUTTER ON BOTTOM RAIL OF SASH
WEEP HOLES
18 GA. GALV. IRON MEETING RAILS
OPERATING ARM
OPERATING ARM
18 GAUGE GALV. IRON GLAZING BAR & CAP
BRACKET ANGLE
¼" RIBBED WIRE GLASS
WEDGE AND CLEAT SECURES CAP IN PLACE
CONDENSATION GUTTERS
OPERATING GEAR
WORM GEAR REDUCTION UNIT COMPLETELY ENCASED IN DUST PROOF HOUSING
CHAIN GUIDE
CHAIN WHEEL
ENDLESS HAND CHAIN
SECTION THRU GLAZING BAR
ANGLE CLIP ON TRUSS BOTTOM RAIL OF SASH IS BOLTED
BRASS STOVE BOLTS
1½" × 2" × ⅛" ANGLE TRUSS
WEEP-HOLES
MAIN CONDENSATION GUTTER FORMED BY 18-GA. GALV. IRON CURB RAIL
WOOD CURB PROVIDED BY OTHERS SHOULD BE NOT LESS THAN 2" IN THICKNESS AND 8" IN DEPTH
STANDARD WIDTHS — 6 FT. 8 FT - 10 FT & 12 FT — OUT TO OUT OF WOOD CURB
LENGTHS IN MULTIPLES OF 2 FT.
ROOFING & COUNTER FLASHING BY OTHERS
SECTION THRU SKYLIGHT

Details of 3-Way Ventilating Skylight

Continued on next page

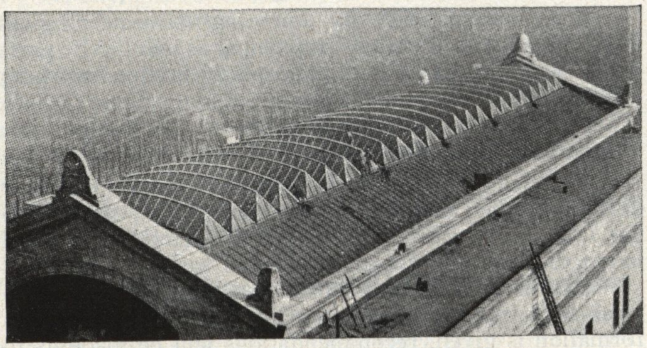

Standard Steel "T" Core
Lead Glazing Wings
Expansion Space for Glass
Knife edge lead Seat for glass
Deep Condensation Gutter of Lead
Seamless Lead Sheath
Lead Corrugations form perfect air seal.
Glass held on lead by lead prevents breakage
Deep Drip Gutter of Lead.
Heavy Lead Seat Withstands Pressure.
Ends of Bars Hermetically Sealed with Lead.

Steelead Construction

Steelead Skylight Construction

Steelead is the one everlasting puttyless skylight. In it are combined great strength, full light area, with a life that will outlast the building. No paint, no putty, no packing, no upkeep. Once installed it can be forgotten.

All exposed surfaces are lead or glass. Absolutely impervious to all assaults of weather, salt vapor, gases, smoke fumes and heat or cold.



Steelead Skylight Installed on New Union Station, Chicago, Ill.

On a steel "T" bar is extruded a seamless lead sheath of our patented design. This holds the glass, firmly on lead with lead; requiring no putty nor packing and reducing breakage through vibration to a minimum. Flashings are lead and all bolts and screws are from below so that all exposed metal is lead.

For any installation where maintenance and upkeep cost are an item, Steelead Skylights should be specified. Particularly fitted to railroad work, public buildings, etc.

Specifications—All skylights shown on the plans shall be constructed of Steelead, as manufactured by the AMERICAN 3 WAY-LUXFER PRISM CO., and in accordance with detailed drawings submitted by them and approved by the architects, engineers or purchasers.

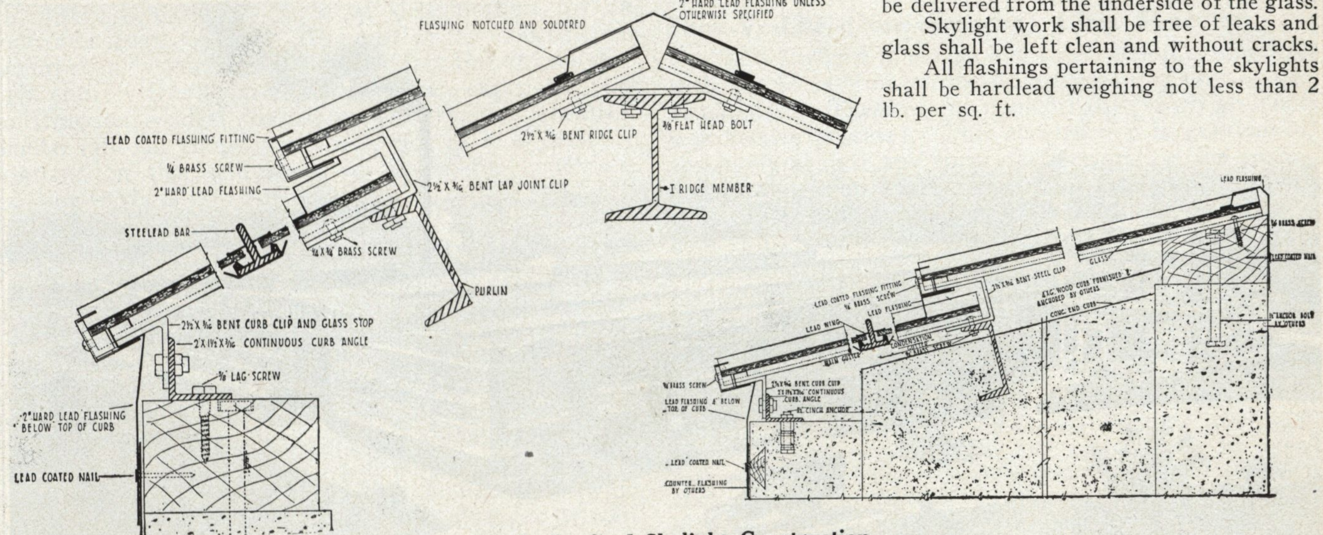
Glass supporting Steelead bars shall have a maximum deflection of not greater than 1/30 in. per lin. ft. of span, under normal loadings. The steel bar shall be hermetically sealed in a seamless lead sheath, fully capable of resisting attacks by fumes, gases, etc.

No bolts, nuts or metal, except lead, shall be exposed to the weather.

The glass shall be (state thickness, make and kind). This glass shall have a bearing on a lead cushion, and be left free to expand, without coming in contact with bolts or other rigid substances. The glass shall be securely held in place by the lead wings on the bar, making a weather-tight joint without the use of putty or packing. Ample provision shall be made for carrying away all condensation which may be delivered from the underside of the glass.

Skylight work shall be free of leaks and glass shall be left clean and without cracks.

All flashings pertaining to the skylights shall be hardlead weighing not less than 2 lb. per sq. ft.


2" HARD LEAD FLASHING UNLESS OTHERWISE SPECIFIED
FLASHING NOTCHED AND SOLDERED
LEAD COATED FLASHING FITTING
¼ BRASS SCREW
2" HARD LEAD FLASHING
2½" X 3/16 BENT RIDGE CLIP
3/8 FLAT HEAD BOLT
2½" X 3/16 BENT LAP JOINT CLIP
I RIDGE MEMBER
STEELEAD BAR
¼ X ¾ BRASS SCREW
PURLIN
2½ X 3/16 BENT CURB CLIP AND GLASS STOP
2 X 1½ X 3/16 CONTINUOUS CURB ANGLE
3/8 LAG SCREW
2" HARD LEAD FLASHING BELOW TOP OF CURB
LEAD COATED NAIL
LEAD FLASHING
BRASS SCREW
LEAD COATED NAIL
GLASS
BENT STEEL CLIP
LEAD COATED FLASHING FITTING
BRASS SCREW
LEAD FLASHING
WOOD CURB FURNISHED & ANCHORED BY OTHERS
CONC. END CURB
LEAD WING
CONDENSATION GUTTER
BRASS SCREW
MAIN GUTTER
ANCHOR BOLT BY OTHERS
BRASS SCREW
BENT CURB CLIP
CONTINUOUS CURB. ANGLE
LEAD FLASHING 4" BELOW TOP OF CURB
CINCH ANCHOR
LEAD COATED NAIL
COUNTER FLASHING BY OTHERS

Details Steelead Skylight Construction

THE G. DROUVÉ COMPANY

Manufacturers of Puttyless Skylights and Sash Operators

TELEPHONE
Noble 1950
CABLE
Western Union Code

(Post Office Address)
BRIDGEPORT, CONN.
AGENCY: E. K. Geyser & Co., 921 Fulton Building, PITTSBURGH, PA.

FACTORY
FAIRFIELD

Products

"Anti-Pluvius" Puttyless Skylight, trade-marked and patented.

"Anti-Pluvius" (Non-corrosive) Puttyless Skylight, trade-marked and patented.

Drou-Ve-Lite Glass Structure, patent pending.

Drou-Ve-Lite (Non-corrosive) Glass Structure, patent pending.

"Straight-Push" Sash Operator, tension type.

"Drouvé Lovell" Sash Operator, tension type.

Worm and Gear Sash Operator, torsion type.

Also manufacturers of the "Drouvé" Double Gutter Ventilators.

Facilities and Service

A modern one-story factory building containing 40,000 sq. ft. of floor space, equipped complete with the most modern sheet metal and skylight working machinery known to the trade.

This entire plant, one of the largest of its kind in the country, is devoted exclusively to the manufacture of our "Anti-Pluvius" puttyless skylights, ventilators and various types of sash operating devices.

A competent Engineering Department, invested with our twenty years of experience in the manufacture of puttyless skylights, is maintained for the purpose of furnishing you with practical information pertaining to all types of skylight construction.

Detailed drawings of different types of skylights embodying various conditions of installation will be forwarded on request, if you will advise us approximately regarding requirements.

We maintain an erecting force thoroughly skilled in the erection of our skylights.

Catalogues and estimates will be furnished on request.

"Straight-Push" Sash Operator

Designed to operate all types and makes of sash in monitors, skylights and sidewalls of buildings. Designed to withstand all manhandling and unexpected conditions.

Guide rolls mounted on brass pins to prevent rusting. All working parts have brass-to-iron connections. The sweep of levers is level.

Leverage force applied is uniform throughout length of line, insuring equal opening and closing of all sash.

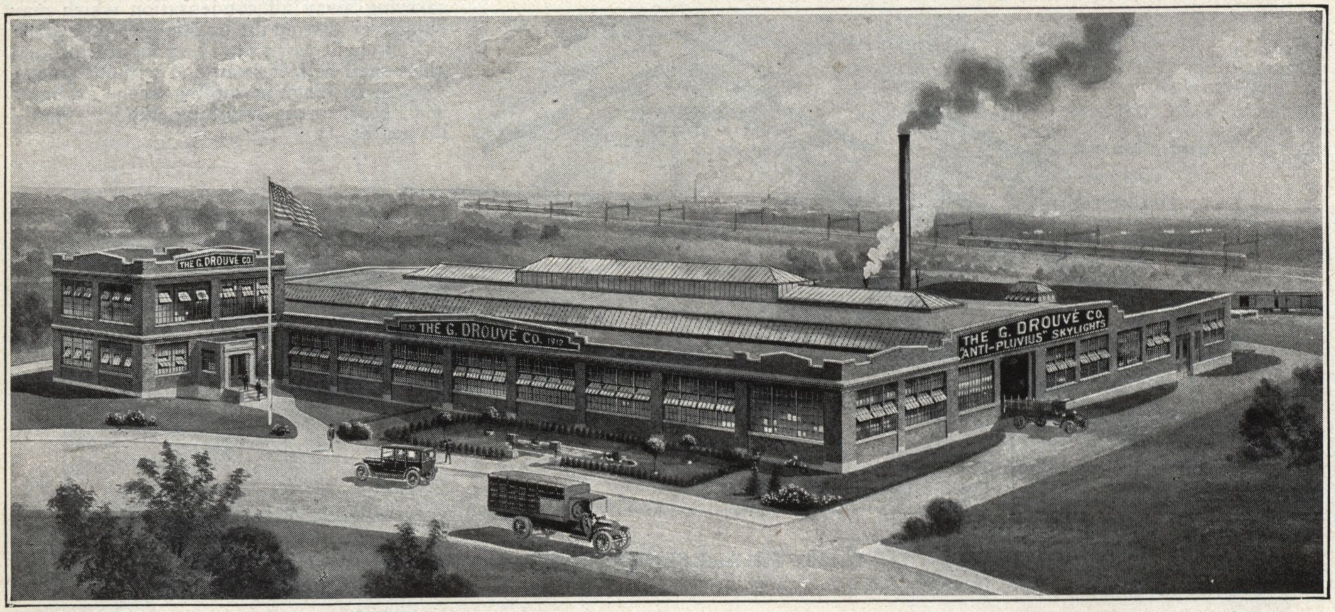
"Improved Lovell Dreadnought" Sash Operator

This design, with its sweeping movement, gives large openings to heavy top hung sash. All parts made extra heavy, with phosphor bronze working joints.

Worm and Gear Operators

Practically all types of standard worm and gear devices supplied as desired for operating lines of ventilating sash in sidewalls, pitched roofs, sawtooth roofs and monitors, and for pivoted or hinged sash.

Details of standard worm and gear operating devices forwarded on application and, when sufficient information is given, recommendations will be made as to efficient and economical procedure.


THE G. DROUVÉ CO.
1919 THE G. DROUVÉ CO. 1919
THE G. DROUVÉ CO.
"ANTI-PLUVIUS" SKYLIGHTS

Forty Thousand Square Feet of Floor Space Devoted Exclusively to the Manufacture of:

The "Anti-Pluvius" Puttyless Skylight
The Drouvé "Improved Lovell" Sash Operators
The Drou-Ve-Lite Glass Structure
The Drouvé "Straight Push" Sash Operators
The Drouvé Worm and Gear Sash Operators

Continued on next page

"Anti-Pluvius" Puttyless Skylights

"Anti-Pluvius" is one of the original puttyless type skylights to be introduced into this country. Thirty years of practical experience obtained under the most exacting conditions, from installations in all parts of the United States has enabled us to produce a perfect puttyless construction, one which will serve its owners satisfactorily under any and all climatic and atmospheric conditions. This type of construction was designed to eliminate sweating of the main supporting bars, or channels as we call them, so prevalent, naturally, in skylights and this we have very successfully accomplished by the simple method of isolating the glass and its rest from the main supporting bars (channels) and permitting of free circulation of air between this main supporting bar and the glass. Secondly, this construction combines into one its main supporting bars and condensation gutters by reason of the fact that the main supporting bars are U-shaped channels and in consequence, are utilized as condensation gutters as well as ample support for the skylight structure. This gives you an exceptionally large condensation gutter due to the depth of these channels without cutting down excessively on your glass area which, in skylights, is always desired in the maximum. The over-all width of the channels at their widest point is only 2¼ inches.

Other exceptional features, all necessary and proper to good skylight construction, to be found in the "Anti-Pluvius" construction are phosphor-bronze tension springs to allow for expansion, contraction and vibration and hence reducing glass crackage, so prevalent in skylights, to an absolute minimum; three-point contact caps; safety walk-bridges; overhang construction at curbs permitting the successful discharge of condensation to outside of building, and unusually high grade materials (see material specifications) well balanced and perfectly fitted in their respective places in the structure.

"Anti-Pluvius" (Non-corrosive) Puttyless Skylights

This skylight in design and construction is identical with our "Anti-Pluvius," the difference being only in the metals used. These are of non-corrosive materials (not a protective process). This construction is guaranteed absolutely against any form of deterioration for an indefinite length of time. The cost of this construction is surprisingly low considering the fact that it is a skylight entirely free from any maintenance expense. This construction is ideal for use on powerhouses, chemical plants, railroad shops, foundries, etc., as it is the only construction that will stand up under the conditions existing in these types of buildings.

Advantages of "Anti-Pluvius" Puttyless Skylights

The "Anti-Pluvius" puttyless skylight (either type) will satisfy the most exacting requirements for strength.

It is positively watertight. The strength of materials of the structure is ideal (see specifications following page). The glass may be readily cleaned by laying planks across the bridge sections, on which men can stand without injury to any part of the skylight structure.

The frames are flexible and ample allowances are made for expansion and contraction, vibration and wind pressures; the skylight is adaptable to all types of roof construction. It can be erected by anybody, anywhere.

Each light of glass as placed in the skylight is independent of every other light. The lights do not come in contact with each other nor do they come in contact with any metal.

The glass rests on pure non-rotting cattle hair felt.

Drou-Ve-Lite Glass Structure

In late years there has been a tendency to eliminate, as much as possible, structural steel work for the support of the skylight itself. In the successful development of a self-supporting skylight, regardless of length of span, a considerable saving is effected where exceptionally wide skylights are desired, by reason of the fact that the self-supporting skylight does not require any steel work for its support other than that which is a part of the skylight itself, and last, but not least, the elimination of unsightly steel trusses, etc., in a skylight well opening eliminates the casting of shadows and obstruction of light.

The Drou-Ve-Lite glass structure represents the last word in *self-supporting* skylight construction. Study our construction details of this skylight on the third page following. Take particular note of the methods of assembling this structure into one unit. Every part of the structure from ridge bar to curb functions in harmony. Its interlocking sections prevent, beyond any question of a doubt, sagging at the ridge and in consequence, spreading at the curbs. The rafter bars are $\frac{5}{16}$ inch thick by a depth suitable for span without any intermediate supports whatsoever. Intermediate rafter bar spacers are employed at certain points between ridge and eave, usually directly under glass laps, thereby holding the rafter bars absolutely parallel and in perfect alignment between the ridge and eave. The rigidness of this structure when assembled, is amazing. In the development of the Drou-Ve-Lite glass structure, we have, as in the now famous "Anti-Pluvius" construction, eliminated sweating of the main supporting bars and also we employ springs, although in a little different manner, to allow for expansion, contraction and vibration. While this structure does not give the exceptionally large condensation gutter to be found in "Anti-Pluvius," it does, however, give a condensation gutter decidedly in keeping with any number of competitive skylight constructions with the one advantage that this skylight obstructs less light than any other. The over-all width from out to out of condensation gutter (this being the widest point of light obstruction) is 1⅝ inches.

Drou-Ve-Lite (Non-corrosive) Glass Structures

This skylight in design and construction is identical with our Drou-Ve-Lite, the difference being only in the metals used. These are of non-corrosive materials (not a protective process). This construction is guaranteed absolutely against any form of deterioration for an indefinite length of time. The cost of this construction is surprisingly low considering the fact that it is a skylight entirely free from any maintenance expense. This construction is ideal for use on powerhouses, chemical plants, railroad shops, foundries, etc., as it is the only construction that will stand up indefinitely under the conditions existing in these types of buildings.

Advantages of Drou-Ve-Lite Glass Structures

Construction is entirely suitable for use over very small openings as well as exceptionally long spans, because its rafter bars are furnished proportionately to the size of the skylight; easily adaptable to all types of roof construction; each light of glass, as placed in the skylight, is independent of every other light and lights do not come in contact with each other.

Drou-Ve-Lite glass structures admit more daylight and in consequence, cast less shadow; they are positively watertight and, furthermore, the construction is such as to eliminate sweating of the rafter bars, thereby preventing condensation dripping into the room.

They can be erected by anybody.

Continued on next page

Specifications Covering the "Anti-Pluvius" Non-Corrosive Puttyless Skylight

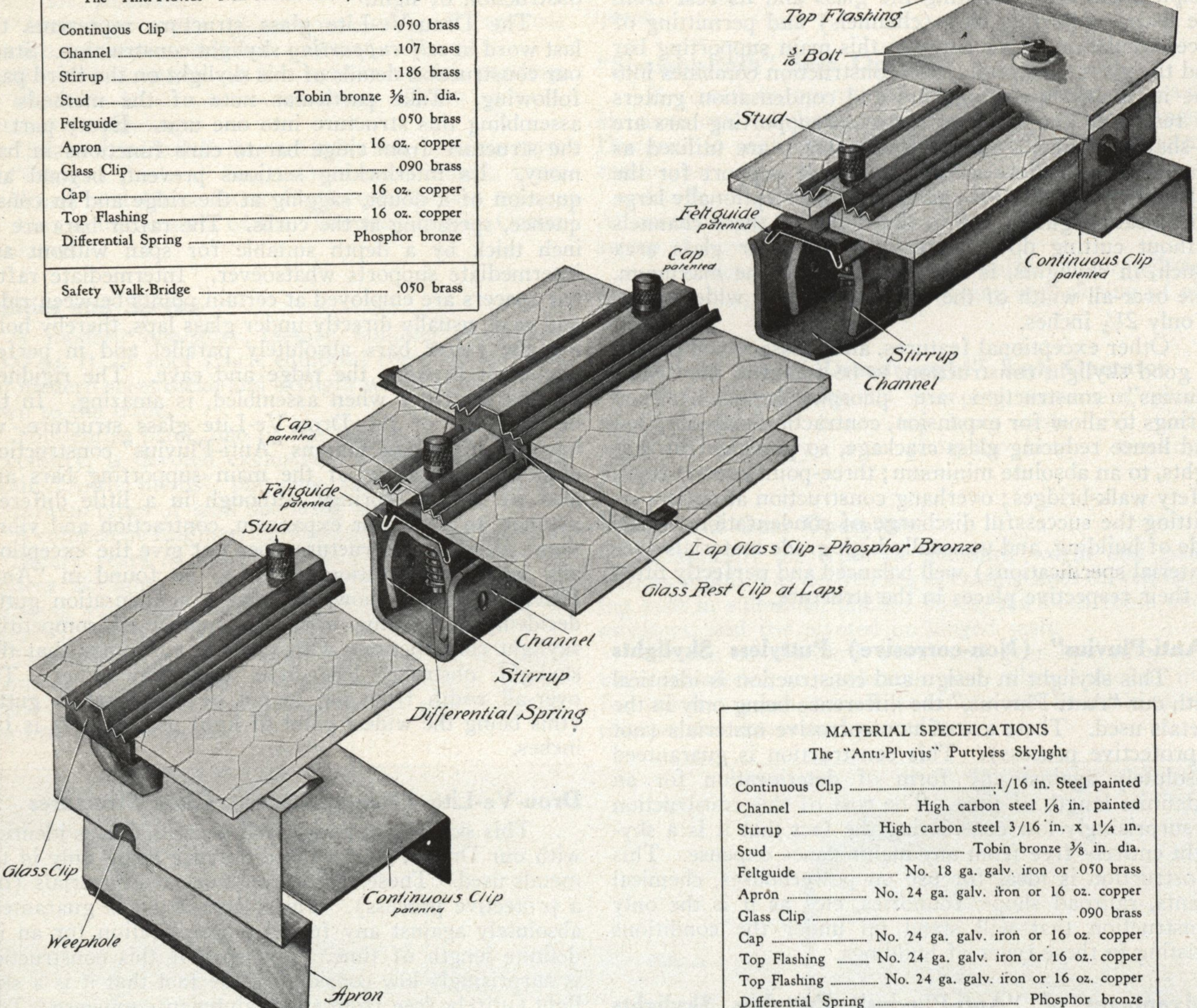
Skylights shall be of the "Anti-Pluvius" NON-CORROSIVE puttyless construction as manufactured by The G. Drouvé Company, Bridgeport, Conn., having all metal parts which are exposed to the interior of the building of brass and all metal parts whcih are exposed to the weather of copper. Glass to be ....., and to be laid on pure non-rotting cattle hair felt cushion. The cushions shall be confined and supported by continuous metal guides so constructed that the underside of the glass, when installed, will not come in contact with any materials other than the felt. The glass rest shall be raised above the channels sufficiently so that there will be a free circulation of air between the glass and the channels. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration, by the use of phosphor bronze springs.

(OPTIONAL)
SAFETY WALK-BRIDGES. Safety walk-bridges shall be supplied above each channel and supported from the channel for use in cleaning and maintaining skylights.

METAL SPECIFICATIONS

The "Anti-Pluvius" Non-Corrosive Puttyless Skylight

Continuous Clip	.050 brass
Channel	.107 brass
Stirrup	.186 brass
Stud	Tobin bronze 3/8 in. dia.
Feltguide	.050 brass
Apron	16 oz. copper
Glass Clip	.090 brass
Cap	16 oz. copper
Top Flashing	16 oz. copper
Differential Spring	Phosphor bronze
Safety Walk-Bridge	.050 brass



MATERIAL SPECIFICATIONS

The "Anti-Pluvius" Puttyless Skylight

Continuous Clip	1/16 in. Steel painted
Channel	High carbon steel 1/8 in. painted
Stirrup	High carbon steel 3/16 in. x 1¼ in.
Stud	Tobin bronze 3/8 in. dia.
Feltguide	No. 18 ga. galv. iron or .050 brass
Apron	No. 24 ga. galv. iron or 16 oz. copper
Glass Clip	.090 brass
Cap	No. 24 ga. galv. iron or 16 oz. copper
Top Flashing	No. 24 ga. galv. iron or 16 oz. copper
Top Flashing	No. 24 ga. galv. iron or 16 oz. copper
Differential Spring	Phosphor bronze
Safety Walk-Bridge	No. 18 gauge galv iron or .050 brass

Specifications Covering the "Anti-Pluvius" Puttyless Skylight

Skylight shall be of the "Anti-Pluvius" puttyless construction as manufactured by The G. Drouvé Company, Bridgeport, Conn., having all metal parts which are exposed to the weather of { copper. galvanized iron.

Skylight ribs or main supporting channels to be U-shaped and of high carbon steel painted one good shop coat of metallic paint. Glass to be ...... and to be laid on pure non-rotting cattle hair felt cushions. The cushions shall be confined and supported by continuous metal guides so constructed, that the underside of the glass, when installed, will not come in contact with any materials other than the felt. The glass rest shall be raised above channels sufficiently so that there will be a free circulation of air between the glass and the channels. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration, by the use of phosphor bronze springs.

(OPTIONAL)
SAFETY WALK-BRIDGES. Safety walk-bridges shall be supplied above each channel and supported from the channel for use in cleaning and maintaining skylights.

THE G. DROUVÉ
COMPANY
BRIDGEPORT, CONN.

CONSTRUCTION DETAIL
OF THE • ANTI-PLUVIUS • SKYLIGHT

Manufactured under
Drouve Pat. No. 892034
Hawes Pat. No. 1313809
Hawes Pat. No. 1313810

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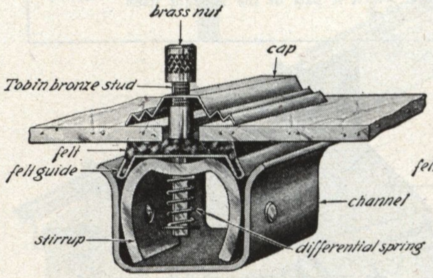
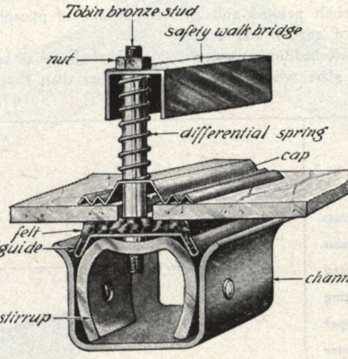

brass nut
cap
Tobin bronze stud
felt
felt guide
channel
stirrup
differential spring

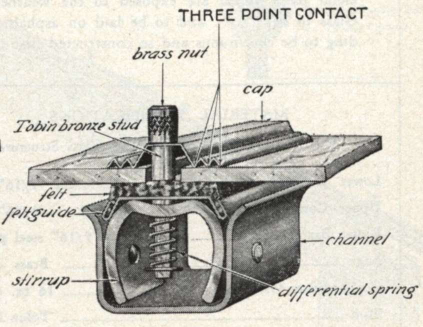
SHOWING POSITION OF THREE POINT CONTACT CAP BEFORE TIGHTENING STUD NUT


Tobin bronze stud
safety walk bridge
nut
differential spring
cap
felt
felt guide
channel
stirrup

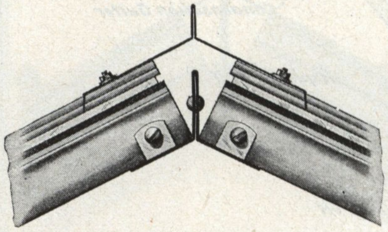
On skylights, the span of which exceeds six feet from ridge to eave, the Walk-Bridge permits one to stand or walk on the skylights to clean it without injury to the glass or other parts of the structure.

On skylights, the span of which does not exceed six feet from ridge to eave, the Walk-Bridge is unnecessary and therefore not recommended.

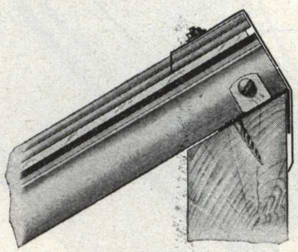
The difference in expansion between glass and metal is adjusted by the differential spring in both cases.


THREE POINT CONTACT
brass nut
cap
Tobin bronze stud
felt
felt guide
channel
stirrup
differential spring

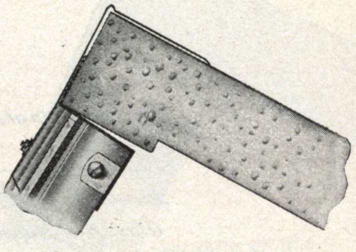
THREE POINT CONTACT AFTER TIGHTENING STUD NUT



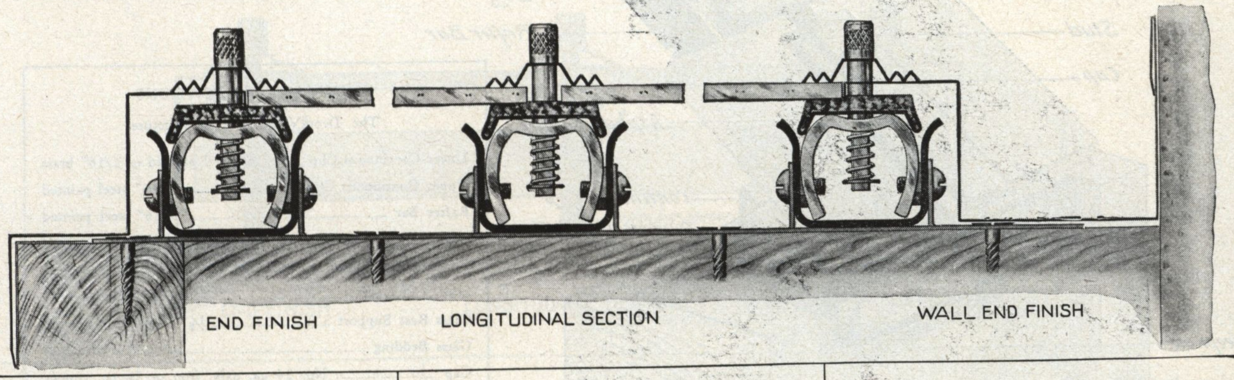
DOUBLE PITCH OR HIPPED AT RIDGE

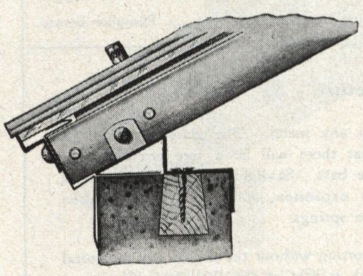


SINGLE PITCH AT TOP

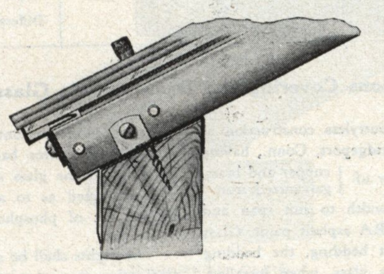


SAWTOOTH AT TOP

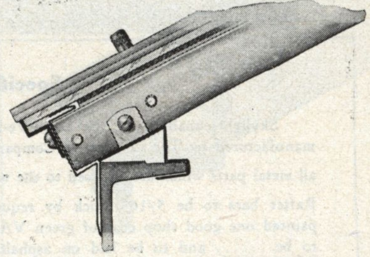

END FINISH
LONGITUDINAL SECTION
WALL END FINISH



FLAT TOP CURB



BEVELED TOP CURB



STRUCTURAL STEEL CURB

THE G. DROUVE COMPANY
BRIDGEPORT CONN.

CONSTRUCTION DETAILS
OF THE • **ANTI-PLUVIUS** • SKYLIGHT

Manufactured under
Drouve Pat. No. 892034
Hawes Pat. No. 1513809
Hawes Pat. No. 1513810

Continued on next page

Specifications Covering the Drou-Ve-Lite Non-Corrosive Glass Structure

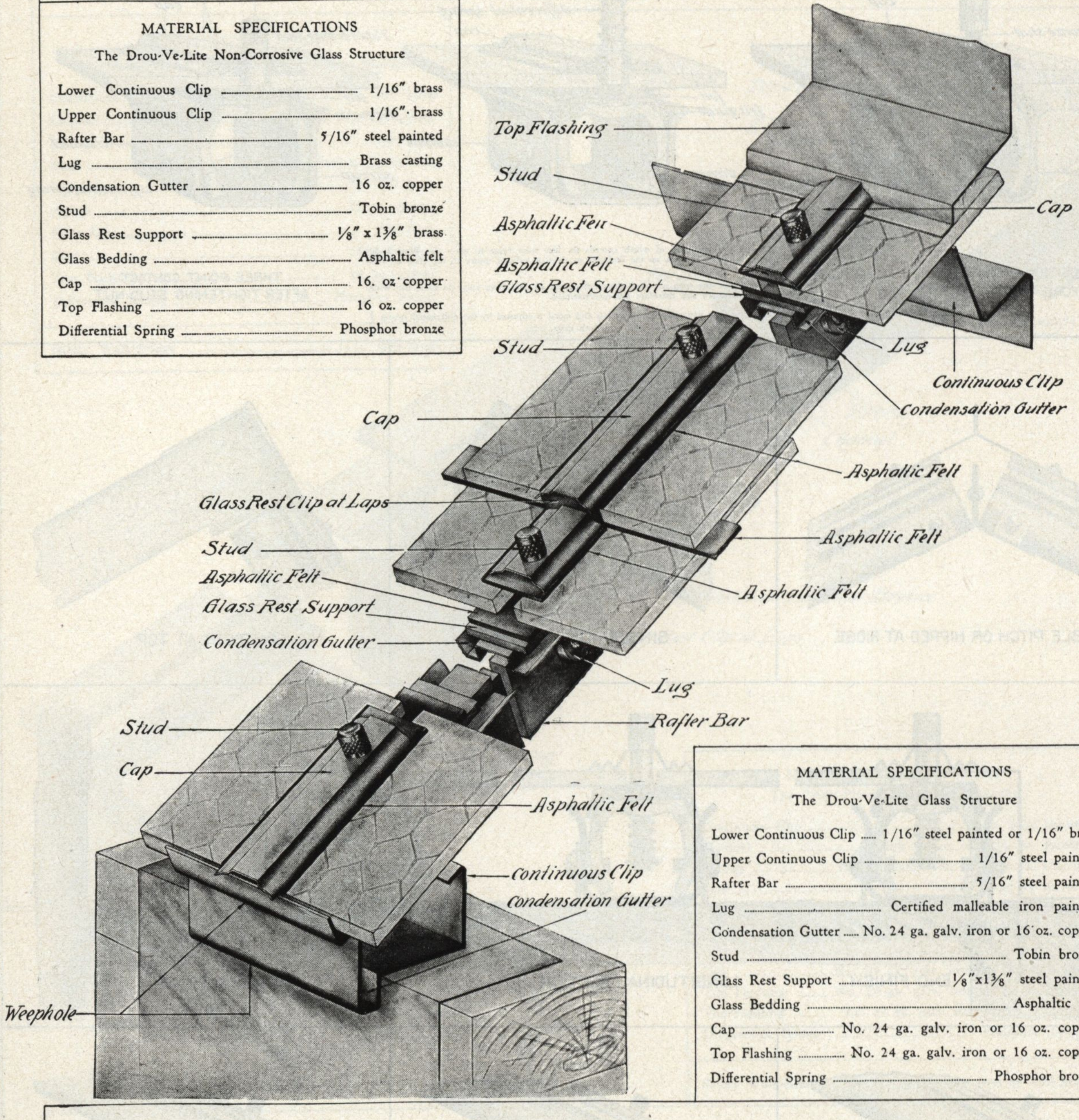
Skylights shall be of the Drou-Ve-Lite NON-CORROSIVE puttyless construction as manufactured by The G. Drouvé Company, Bridgeport, Conn., having all metal parts which are exposed to the interior of the building of brass with the exception of rafter bars which are to be of 5/16" steel VALDURA asphalt painted and all metal parts which are exposed to the weather of copper and brass. Glass to be ...... and to be laid on asphaltic felt bedding, the bedding to be continuous and so constructed that the glass, when installed, will not come in contact with any metal. The glass rest shall be raised above rafter bars so that there will be a free circulation of air between the glass and these bars. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration by the use of phosphor bronze springs.

Skylights shall be self supporting without the use of any structural steel other than that steel which is part of the skylight itself.

MATERIAL SPECIFICATIONS

The Drou-Ve-Lite Non-Corrosive Glass Structure

Lower Continuous Clip	1/16" brass
Upper Continuous Clip	1/16" brass
Rafter Bar	5/16" steel painted
Lug	Brass casting
Condensation Gutter	16 oz. copper
Stud	Tobin bronze
Glass Rest Support	1/8" x 1 3/8" brass
Glass Bedding	Asphaltic felt
Cap	16. oz. copper
Top Flashing	16 oz. copper
Differential Spring	Phosphor bronze


Top Flashing
Stud
Cap
Asphaltic Feu
Asphaltic Felt
Glass Rest Support
Stud
Lug
Continuous Clip
Condensation Gutter
Cap
Asphaltic Felt
Glass Rest Clip at Laps
Asphaltic Felt
Stud
Asphaltic Felt
Asphaltic Felt
Glass Rest Support
Condensation Gutter
Lug
Rafter Bar
Stud
Cap
Asphaltic Felt
Continuous Clip
Condensation Gutter
Weephole

MATERIAL SPECIFICATIONS

The Drou-Ve-Lite Glass Structure

Lower Continuous Clip	1/16" steel painted or 1/16" brass
Upper Continuous Clip	1/16" steel painted
Rafter Bar	5/16" steel painted
Lug	Certified malleable iron painted
Condensation Gutter	No. 24 ga. galv. iron or 16 oz. copper
Stud	Tobin bronze
Glass Rest Support	1/8"x1 3/8" steel painted
Glass Bedding	Asphaltic felt
Cap	No. 24 ga. galv. iron or 16 oz. copper
Top Flashing	No. 24 ga. galv. iron or 16 oz. copper
Differential Spring	Phosphor bronze

Specifications Covering the Drou-Ve-Lite Glass Structure

Skylights shall be of the Drou-Ve-Lite puttyless construction as manufactured by The G. Drouvé Company, Bridgeport, Conn., having all metal parts which are exposed to the weather of { copper and brass. / galvanized iron. } Rafter bars to be 5/16" thick by required width to suit span and painted one good shop coat of green VALDURA asphalt paint. Glass to be ...... and to be laid on asphaltic felt bedding, the bedding to be continuous and so constructed that the glass, when installed, will not come in contact with any metal. The glass rest shall be raised above rafter bars so that there will be a free circulation of air between the glass and these bars. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration by the use of phosphor bronze springs.

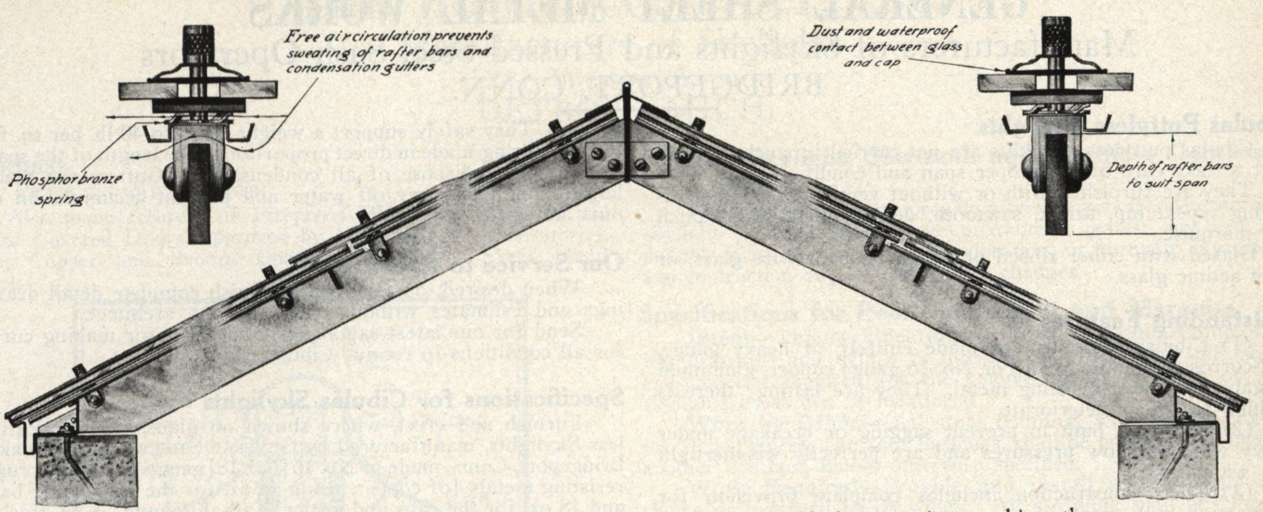
Skylights shall be self supporting without the use of any structural steel other than that steel which is part of the skylight itself.

THE G. DROUVÉ COMPANY
BRIDGEPORT, CONN.

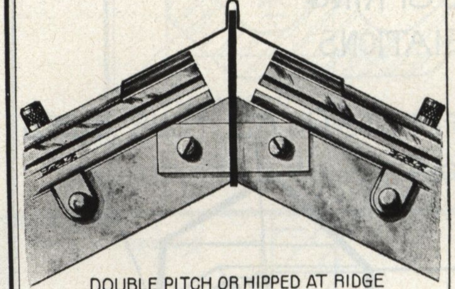
CONSTRUCTION DETAILS DROU-VE-LITE GLASS STRUCTURE
PUTTYLESS

PATENTS PENDING

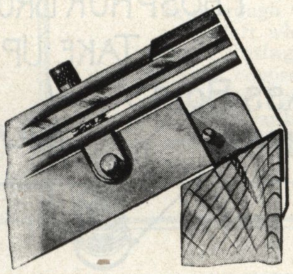
Continued on next page


Free air circulation prevents sweating of rafter bars and condensation gutters
Phosphor bronze spring
Dust and waterproof contact between glass and cap
Depth of rafter bars to suit span

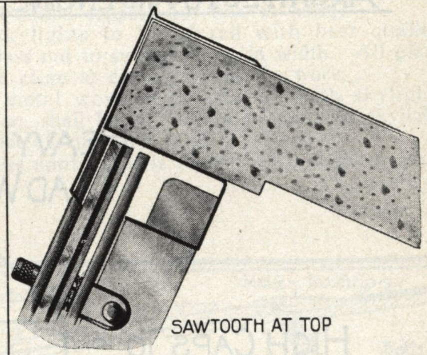
Section through Drou-Ve-Lite glass structure showing interlocking sections making the skylight entirely self supporting without the use of any structural steel whatsoever other than that which is a part of the skylight itself.



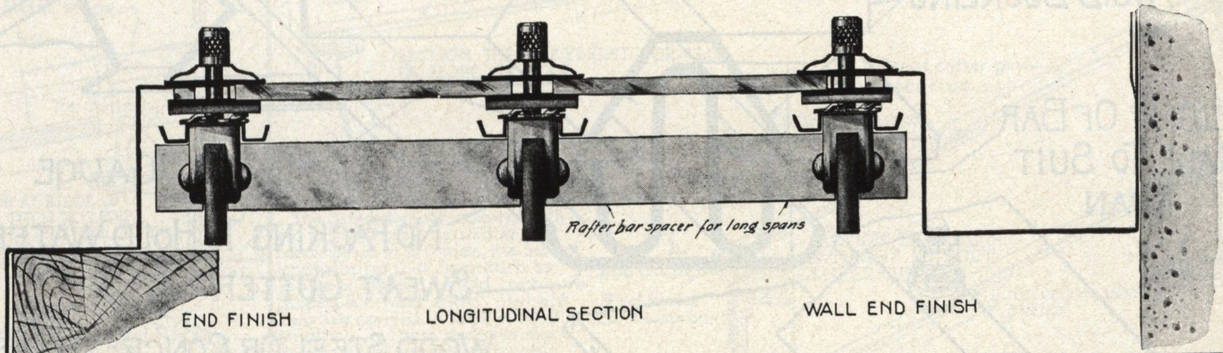
DOUBLE PITCH OR HIPPED AT RIDGE



SINGLE PITCH AT TOP



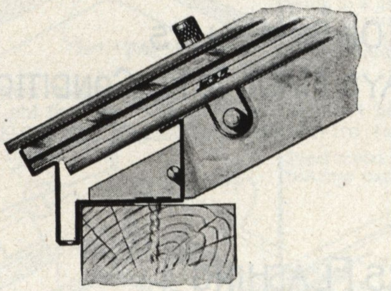
SAWTOOTH AT TOP


Rafter bar spacer for long spans

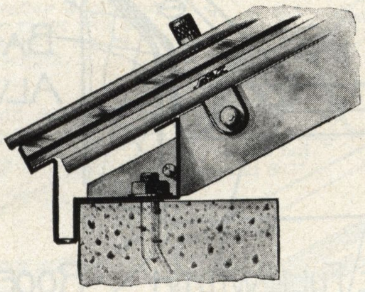
END FINISH

LONGITUDINAL SECTION

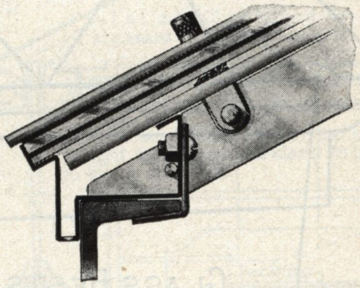
WALL END FINISH



FLAT TOP WOODEN CURB



CONCRETE CURB



STRUCTURAL STEEL CURB

THE G. DROUVÉ COMPANY
BRIDGEPORT, CONN.

CONSTRUCTION DETAILS DROU-VE-LITE GLASS STRUCTURE
PUTTYLESS

PATENTS PENDING

GENERAL SHEET METAL WORKS

Manufacturers of Skylights and Pressed Steel Sash Operators
BRIDGEPORT, CONN.

Cibulas Puttyless Skylights

Cibulas puttyless skylights are not carried in stock, but are built to take care of the proper span and conditions.

They are furnished with or without ventilators, in the following types: hip, turret, sawtooth, double pitch, single pitch and marquise.

Glazed with either ribbed or rough plain or wire glass, or plain actinic glass.

Outstanding Features

(1) Cibulas skylights are made entirely of heavy gauge, non-corrosive metals, No. 18 or No. 16 gauge copper, aluminum or galvanized rust-resisting metal. They are lasting; there is nothing to rot or deteriorate.

(2) They are built to prevent sagging or breakage under heavy wind or snow pressures and are perfectly weathertight and watertight.

(3) Their construction includes complete provision for contraction and expansion.

(4) They are suitable for all classes of buildings.

(5) They safely support a weight of 35 to 40 lb. per sq. ft., the bars being made in direct proportion to the length of the span.

(6) They dispose of all condensation. Gutters are made large enough to carry off water and prevent accumulation of dust and dirt.

Our Service to Architects

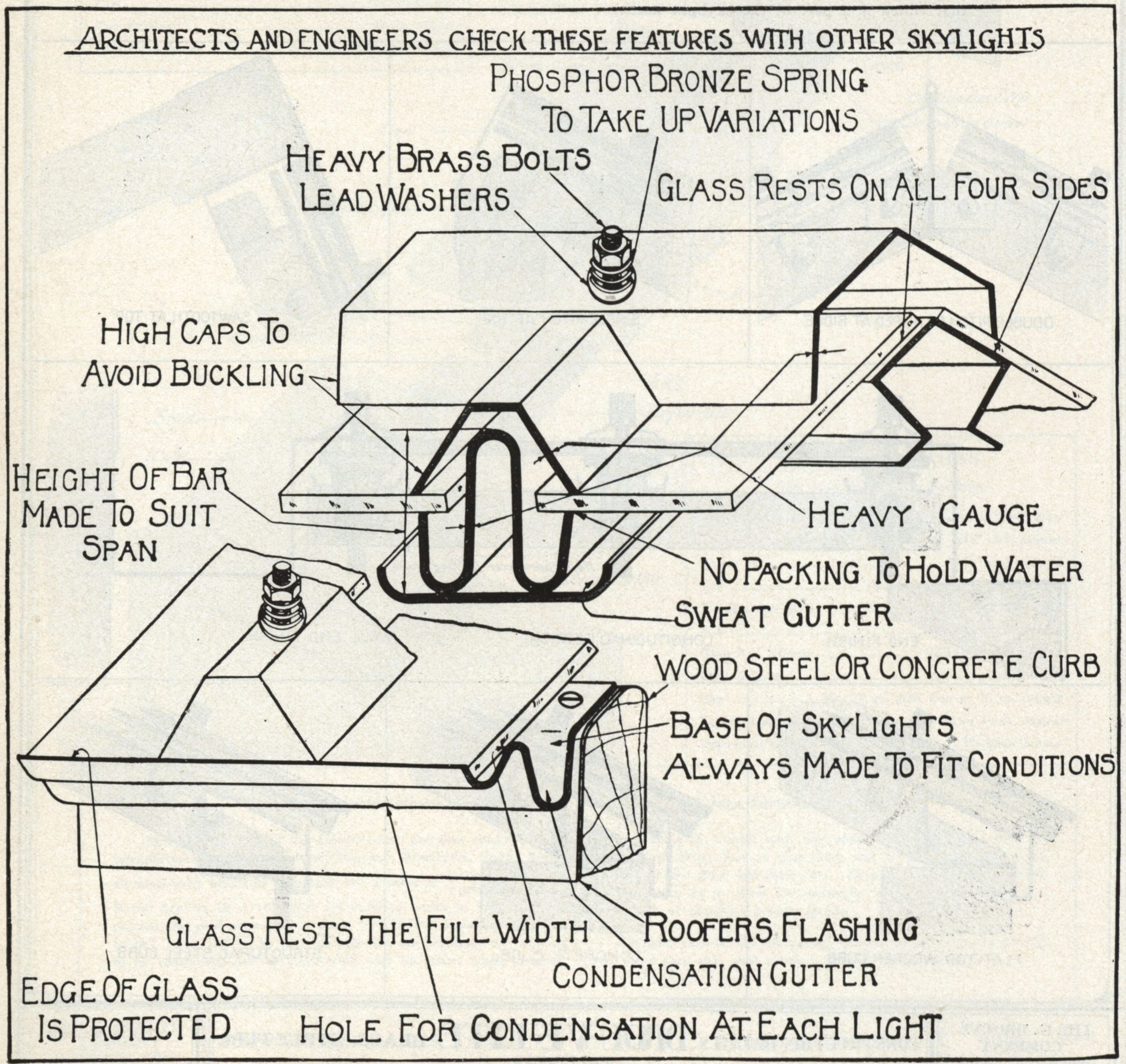
When desired, our engineers furnish complete detail drawings and estimates without obligating the architect.

Send for our latest catalogues, and chart for making curbs for all conditions to receive Cibulas skylights.

Specifications for Cibulas Skylights

Furnish and erect, where shown on plans, Cibulas Puttyless Skylights, manufactured by General Sheet Metal Works, Bridgeport, Conn., made of No. 16 [No. 18] gauge galvanized rust-resisting metals [of copper, using 48 oz. for the supporting bars and 18 oz. for the caps and gutter] [all-aluminum, $\frac{1}{16}$-in. thick].

Note: The glass commonly used in skylights is ribbed or rough plain glass, or ribbed or rough wired glass.


ARCHITECTS AND ENGINEERS CHECK THESE FEATURES WITH OTHER SKYLIGHTS
PHOSPHOR BRONZE SPRING TO TAKE UP VARIATIONS
HEAVY BRASS BOLTS LEAD WASHERS
GLASS RESTS ON ALL FOUR SIDES
HIGH CAPS TO AVOID BUCKLING
HEIGHT OF BAR MADE TO SUIT SPAN
HEAVY GAUGE
NO PACKING TO HOLD WATER
SWEAT GUTTER
WOOD STEEL OR CONCRETE CURB
BASE OF SKYLIGHTS ALWAYS MADE TO FIT CONDITIONS
GLASS RESTS THE FULL WIDTH
ROOFERS FLASHING
CONDENSATION GUTTER
EDGE OF GLASS IS PROTECTED
HOLE FOR CONDENSATION AT EACH LIGHT

Detail of the Cibulas Puttyless Skylight

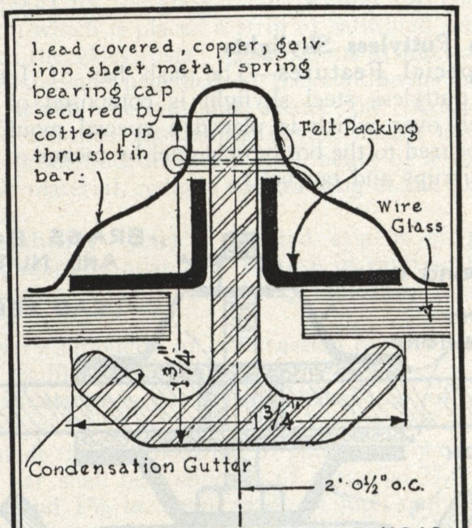
THE HOWIE COMPANY, INC.

Manufacturers of Skylights
5241 Wesson Avenue
DETROIT, MICH.

Products

Peerless Skylights.

Also manufacturers of Fireproof Windows, Tin Clad and Metal Covered Doors, approved by Underwriters' Laboratories, Inc.; Copper and Bronze Doors, Architectural Sheet Metal Work.


Lead covered, copper, galv. iron sheet metal spring bearing cap secured by cotter pin thru slot in bar.
Felt Packing
Wire Glass
1¾
1¾
Condensation Gutter
2'-0½" o.c.

FULL SIZE DETAIL OF SKYLIGHT BAR
1¾" x 1¾"

Peerless Skylight, Sawtooth and Marquise Constructions

These are designed to provide a weatherproof and dustproof skylight construction and one guaranteed against any and all possible glass breakage due to vibration, or through expansion and contraction due to temperature changes.

Specifications for Peerless Skylight and Marquise

Intent—This specification together with the accompanying drawings and details is intended to provide for all labor and material required for the completion and erection of all skylights as shown or mentioned.

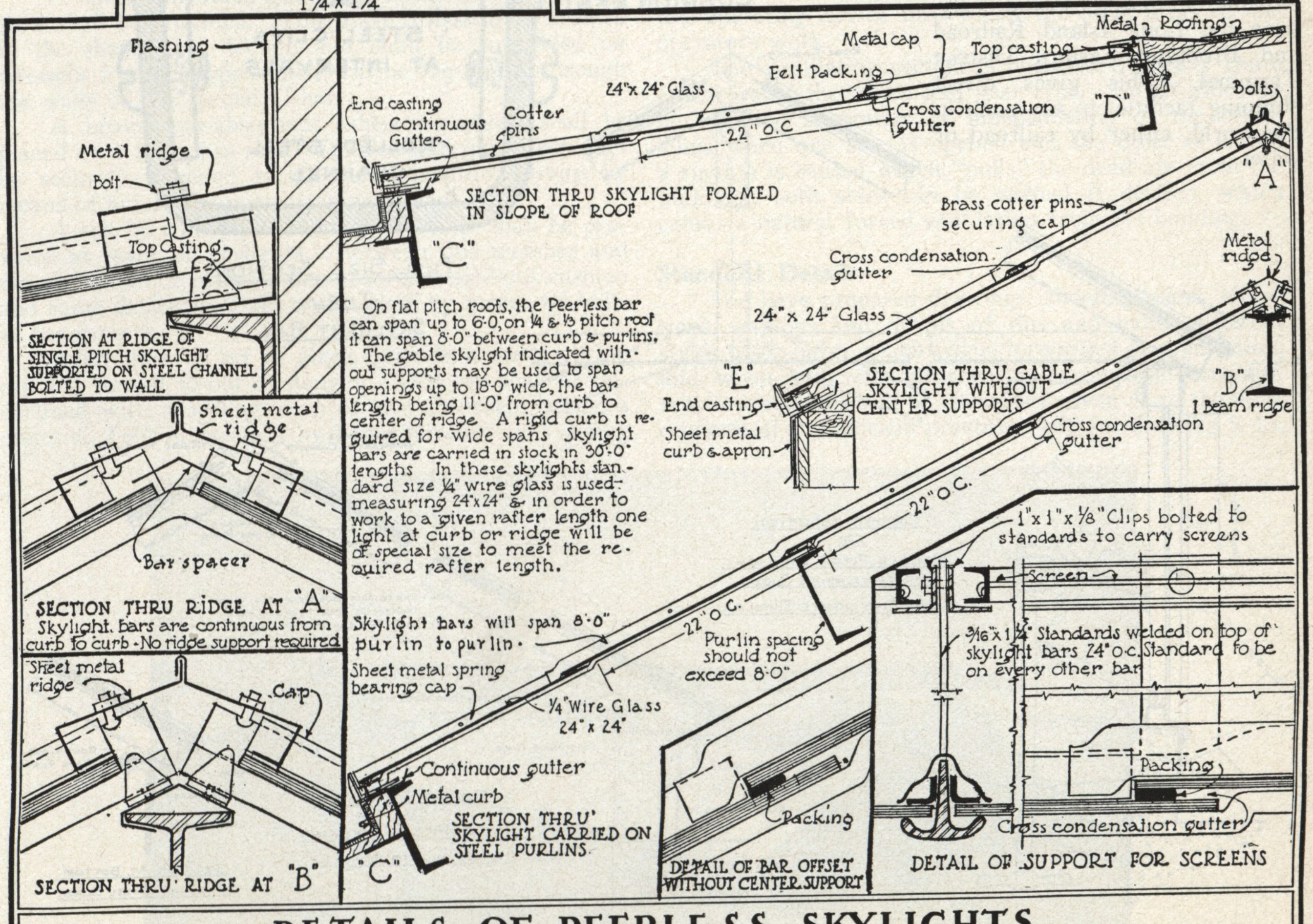
Work by Others—All steel framing, wood curbs, nailing strips, gutters and roof flashings, shall be provided for under another contract, unless otherwise specified.

Work Required—Provide and install all skylights as shown or indicated on drawings. All skylights shall be "Peerless" skylight construction as manufactured by The Howie Company, Inc., Detroit, Mich., complete as shown by their standard details, and adapted to the construction of the building. All sheet metal trimming shall be of No. 24 gauge galvanized iron [or 16 oz. cold rolled copper] [or No. 11 zinc].

Glazing—All skylights to be glazed with best quality ¼-in. rough wire glass not to exceed 24 in. in width. All glass to be left whole and clean at completion of the work.

Painting—All metal work in connection with skylight, except copper or zinc, shall be painted; also paint all skylight bars with 1 good coat of approved paint.

Guarantee—This contractor is to furnish a written guarantee for 5 years.


Flashing
Metal ridge
Bolt
Top Casting
SECTION AT RIDGE OF SINGLE PITCH SKYLIGHT SUPPORTED ON STEEL CHANNEL BOLTED TO WALL
End casting
Continuous Gutter
Cotter pins
24"x 24" Glass
Felt Packing
Metal cap
Top casting
Metal Roofing
Cross condensation gutter
22" O.C
"D"
Bolts
"A"
SECTION THRU SKYLIGHT FORMED IN SLOPE OF ROOF
"C"
On flat pitch roofs, the Peerless bar can span up to 6'-0", on ¼ & ⅓ pitch roof it can span 8'-0" between curb & purlins. The gable skylight indicated without supports may be used to span openings up to 18'-0" wide, the bar length being 11'-0" from curb to center of ridge. A rigid curb is required for wide spans. Skylight bars are carried in stock in 30'-0" lengths. In these skylights standard size ¼" wire glass is used measuring 24"x24" & in order to work to a given rafter length one light at curb or ridge will be of special size to meet the required rafter length.
Brass cotter pins securing cap
Cross condensation gutter
24" x 24" Glass
Metal ridge
"E"
End casting
Sheet metal curb & apron
SECTION THRU. GABLE SKYLIGHT WITHOUT CENTER SUPPORTS
Cross condensation gutter
"B"
I Beam ridge
Sheet metal ridge
Bar spacer
SECTION THRU RIDGE AT "A"
Skylight bars are continuous from curb to curb - No ridge support required
22" O.C.
1"x 1"x ⅛" Clips bolted to standards to carry screens
Screen
Skylight bars will span 8'-0" purlin to purlin.
22" O.C.
Purlin spacing should not exceed 8'-0"
3/16"x 1¼" Standards welded on top of skylight bars 24" o.c. Standard to be on every other bar
Sheet metal spring bearing cap
¼" Wire Glass 24" x 24"
Sheet metal ridge
Cap
Continuous gutter
Metal curb
SECTION THRU' SKYLIGHT CARRIED ON STEEL PURLINS
"C"
Packing
Packing
Cross condensation gutter
SECTION THRU' RIDGE AT "B"
DETAIL OF BAR OFFSET WITHOUT CENTER SUPPORT
DETAIL OF SUPPORT FOR SCREENS

DETAILS OF PEERLESS SKYLIGHTS

A. H. JETER & COMPANY, INC.

Manufacturers of Puttyless Steel Skylights

GENERAL OFFICE AND WORKS
496-498 Hancock Street
LONG ISLAND CITY, N. Y.

TELEPHONE
Astoria 4940

Products

Puttyless Steel Skylights.

Also Sheet Metal Skylights, Turrets and Louvers; Architectural Sheet Metal Work of every description; Metal, Tile and Slate Roofing.

Services and Estimates

This company's estimating and drafting department is at the disposal of architects, engineers and owners. Estimates, suggestions, specifications and plans for its products will be gladly given on request. A large force of experienced men is employed, who have been carefully trained to erect the company's products.

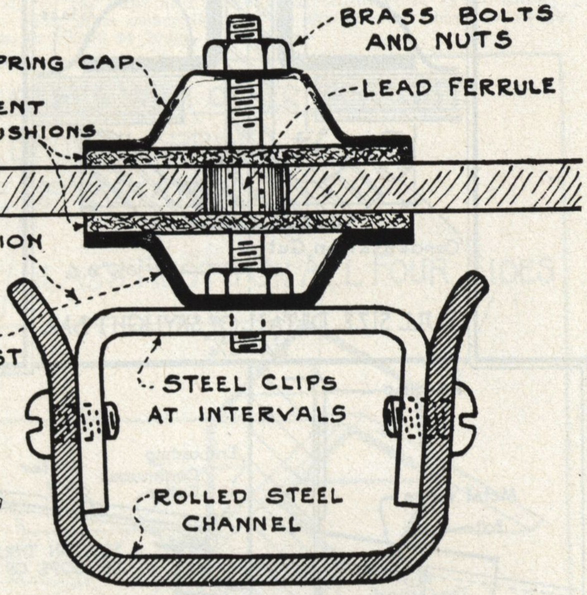
When material only is supplied, complete instructions and drawings are furnished.

Facilities

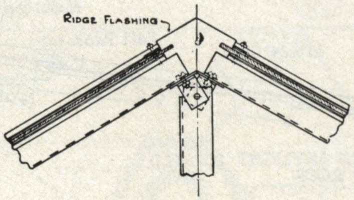
This company's factory is situated in Long Island City, near the Long Island Railroad and Brooklyn Eastern District Terminal. This gives direct shipping facilities to any point in the world, either by railroad or water.

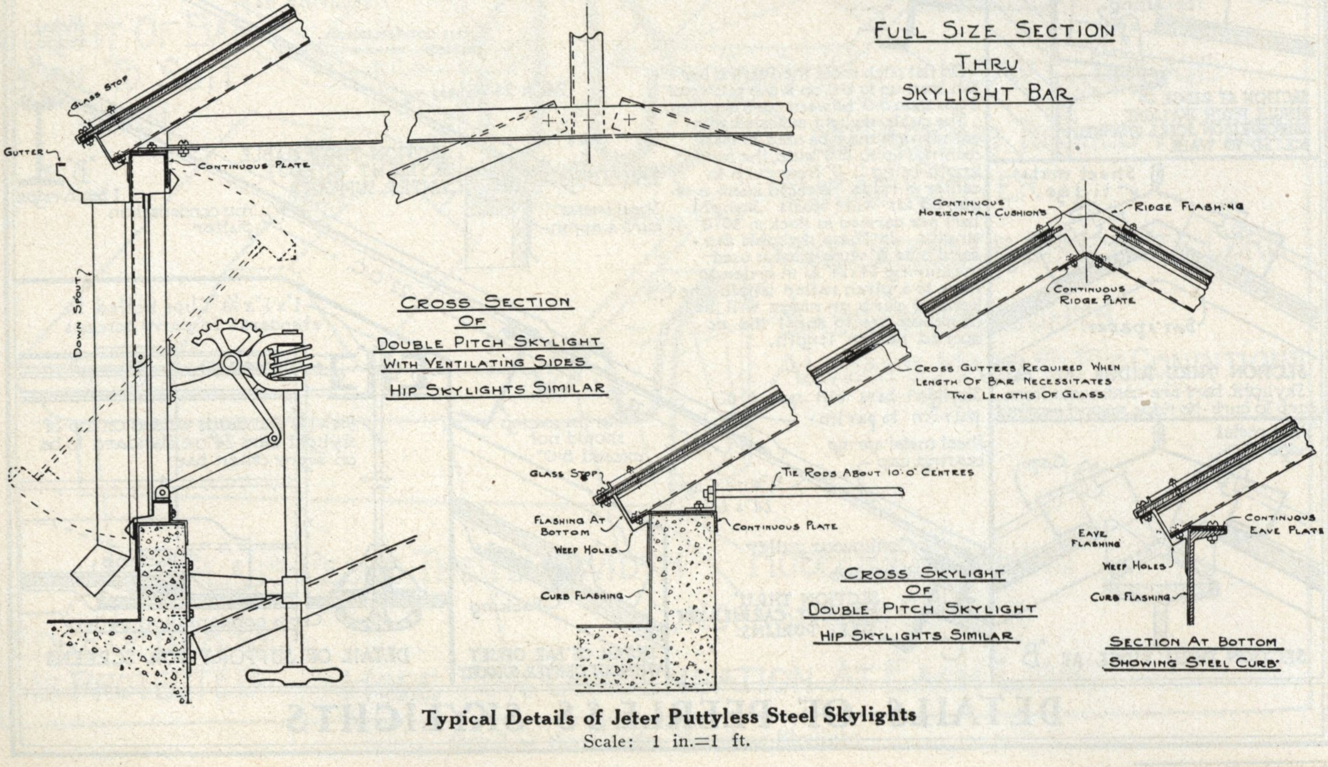
Jeter's Puttyless Skylights

Special Features—The sash bar of Jeter's patented puttyless steel skylight is composed of a lower channel, over which is placed a special moulded glass rest, secured to the bottom channel by means of wrought iron stirrups and tap bolts.


BRASS BOLTS AND NUTS
METAL SPRING CAP
LEAD FERRULE
NON-ABSORBENT ASBESTOS CUSHIONS
GLASS
CONDENSATION GUTTER
METAL CUSHION REST
STEEL CLIPS AT INTERVALS
ROLLED STEEL CHANNEL

Full Size Section Thru Skylight Bar


Ridge Flashing


Glass Stop
Gutter
Continuous Plate
Down Spout
Continuous Horizontal Cushions
Ridge Flashing
Continuous Ridge Plate
Cross Gutters Required When Length Of Bar Necessitates Two Lengths Of Glass
Glass Stop
Tie Rods About 10'0" Centres
Flashing At Bottom
Weep Holes
Continuous Plate
Curb Flashing
Eave Flashing
Continuous Eave Plate
Weep Holes
Curb Flashing

Cross Section Of Double Pitch Skylight With Ventilating Sides Hip Skylights Similar

Cross Skylight Of Double Pitch Skylight Hip Skylights Similar

Section At Bottom Showing Steel Curb

Typical Details of Jeter Puttyless Steel Skylights

Scale: 1 in.=1 ft.

Continued on next page

The glass rest is held in position by a brass bolt, which is of sufficient length to engage and secure the metal cap that covers the edges of the glass.

On the special moulded glass rest, a cushion of heavy saturated asbestos is provided, running entirely across the glass rest. After the glass is laid in place, a saturated asbestos sealing strip is provided, which is securely held in place by the metal cap. This feature insures against any dust or moisture getting under the glass and in to the sash bars or gutters.

A special moulded section is used as a continuous bottom support for the glass. This section also contains a pocket, on which is placed a strip of saturated asbestos upon which the glass rests. Connections at intervals of about 20½ in. are provided in the continuous bottom members, which receive and secure the bars. This method of asbestos cushioning device makes the skylight waterproof and dustproof and, being of a soft indestructible material, reduces the cracking of the glass to a minimum.

Adaptability—Jeter's patented system of puttyless steel glazing is adaptable for use in railroad terminals, museums, schools, hospitals, factories, machine-shops, etc.

The very simplicity of construction enables any mechanic to readily erect this system.

Specifications—All skylights shall be of rolled steel, of a type to allow for free expansion and contraction and made tight without use of paint, cement or putty.

Sash bar shall be composed of a special U-channel 2 in. wide and 1⅝ in. deep, made of high carbon steel ⅛ in. in thickness.

A special moulded glass rest made of No. 16 gage steel shall be provided. This glass rest shall be formed in the shape of a trough and shall be supported on wrought iron stirrups which will be tap-bolted through the walls of the special U-bar.

A heavy non-absorbent asbestos cushion shall be placed over the glass rest. Cushion and glass rest shall be securely fastened to the wrought iron stirrup by means of brass or copper machine screw.

A special continuous moulded member shall be provided at eaves of skylights. Between this member and the glass shall be placed a non-absorbent asbestos cushion and same drawn up tight under glass by means of bolts at bar centers.

After glass is set in place, provide a metal spring cap 1¾ in. out to out of flanges. This cap shall be underlined with a sealing strip of non-absorbent asbestos material, held in position by being punched and strung over the cap bolts. Edges of sealing strip shall not protrude beyond edges of cap. Securely fasten cap by means of a brass nut.

All skylights to be glazed with ¼-in. ribbed wire glass.

All caps, combing and trim shall be of (specify copper, zinc or galvanized iron).

After fabrication and before assembling the sash bars, all parts, shall be thoroughly coated with an application of bitumastic solution (or specify hot galvanizing).

Jeter's Top Ventilating Skylights

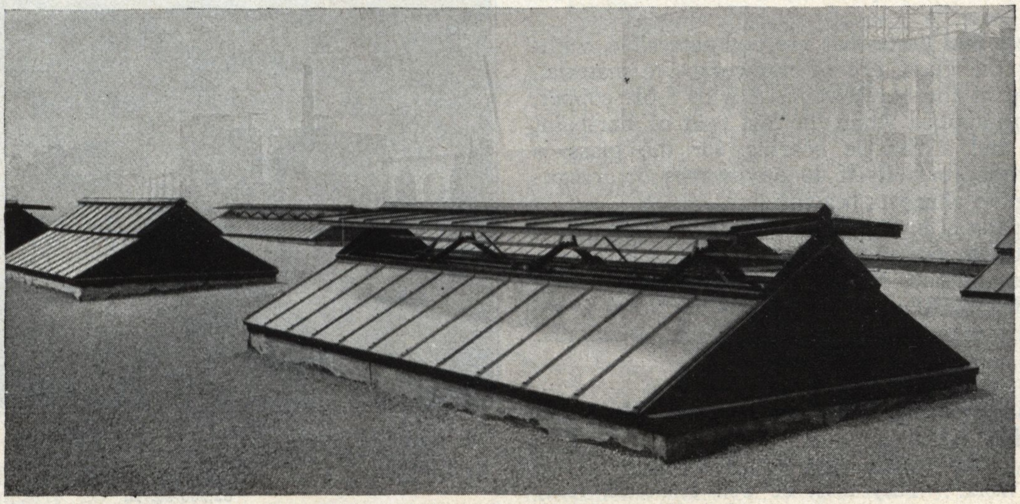
A puttyless steel skylight made from the same steel section as our regular skylights, previously described. The steel channel bars form the top cord of a truss and are securely bolted top and bottom to a steel curb and ridge plate, of the same gage metal as the bar. When the curbs are tied by either angles or rods a perfect truss is thus formed which obviates the necessity of building up an independent steel truss as is usually the case. This method is successful in skylights not exceeding 12 ft. in width, but any length.

The ventilating sections at the ridge are made from sheet metal, either galvanized iron or copper, and are top hung by means of heavy iron butts, securely bolted to continuous angles which run the entire length of the skylight. The sheet metal sash bars of this ventilator, *besides* being securely fastened to a stiffening member top and bottom, are again reinforced and tied with a 2½x½x⅛-in. channel which is fastened to the bars the entire length of the skylight with two ¼-in. bolts at each sash bar. This channel also receives the hinges of the operating device into which the push arms of the operators work.

The ventilating section is operated by heavy chain operators of the worm and gear type. Either side can be operated separately or independently of the other. Thus when one side is opened and the other is closed a suction is caused which "pulls" the dead air from the building; both sides can be opened if desired, which causes a natural forced ventilation from the building.

Standard Details

We have prepared drawings, showing plans, elevations, sections and details of this and many different styles of skylights, which will be forwarded on application, and when sufficient information accompanies request, recommendations will be cheerfully given as to the most economical and efficient practice. Send for drawing S-13.



Installation of Jeter Top Ventilating Skylights

NATIONAL VENTILATING COMPANY

Manufacturers of Puttyless Skylights

GENERAL OFFICE AND FACTORY
75 Tenth Street
LONG ISLAND CITY, N. Y.

TELEPHONE
STILLWELL 5733, 5734

Products

MULTI-UNIT PUTTYLESS SKYLIGHTS.

Also manufacturers of Side Lights, Operating Sash, and National Ventilating Devices; all kinds of Sheet Metal Products; Drawing and Stamping.

Adaptability

Skylights for railway terminals, power stations, machineshops, factories, foundries, libraries, museums, art galleries, and all other buildings whereon permanent watertight skylights of large area are required.

Advantages and Distinctive Features

Referring to Fig. 4 on following page, the bar and upper lights are supported in a fixed manner by the purlin thereunder; while the lower bar, supporting the lower lights, is secured by the same purlin in a loose manner, permitting it to expand freely.

This construction, being repeated at each purlin, permits movement, all in same direction, due to expansion, contraction, or vibration (along the slope of the skylight) of the cap, glass and bar of each unit or tier of glass, independently of every other unit or tier.

Along the longitudinal line of the skylight the steel frame of the building and the entire length of the glass are each taken as separate units, and the difference, nearly 100%, in the expansion and contraction of these materials (glass and steel) is likewise thoroughly taken care of by the copper spreader clips shown in transverse section at supporting bar (Fig. 2). These spreader clips are placed over each cap bolt, spaced about 10 in. along each skylight bar, and incidentally they serve also to better secure in place the brass bolts for holding the caps.

The cap is strong and yet resilient. Its upper half is of an inverted "U" shape, which provides strength and rigidity; while the lower half, especially at the lower extremities, is resilient, so as to conform thoroughly, when secured in position, to the surface of the the glass.

All gutters and parts that are non-accessible, without removing the glass, are of non-corrosive material. The entire top of the bar is covered with 8-oz. copper, the same being applied while the last coat of bar-paint is still wet; and a flexible bearing for the glass is formed, which adjusts itself to any warps or irregularity of the glass along its bearing line.

The company is equipped to cover the bottom of the bar also. Both the top and bottom bar covers are made by special dies and both fit the bar snugly.

No packing or filling substance of any kind is required, and no material is used other than glass and metal.

Standard Specification, Multi-unit System Puttyless Skylights

All curb and roof flashings shall be included under heading "Sheet Metal Work." They must be well connected, ready to receive the skylight work, and must include all necessary counter flashing, well secured to roof flashings and made watertight.

The skylights shall be of the puttyless type, of a design to allow for free expansion and contraction, or movement due to vibration, of the glass and supporting bars in line with the pitch of roof, *all in the same direction.*

Each light of glass shall be entirely independent of every other light, so that one light does not support another; and the glass shall be held laterally in a manner to prevent its coming in contact with any rigid part.

The bearing for the glass shall be flexible, so as to adjust itself to any warps or irregularities of the glass along its bearing line.

The caps shall be spring bearing, in order to thoroughly conform along the lines of contact, when secured in position, to the surface of the glass.

All bar gutters shall be of copper and all exposed parts other than sheet metal shall be of brass.

The supporting bars shall be of rolled steel, and shall be held in a loose manner at the upper end and in a fixed manner at the lower end.

Packing, filling substance of whatever kind, or material other than glass and metal shall not be used.

All skylight sheet metal work shall be [copper, zinc, or galvanized iron].

The glass shall be ⅜ in. thick [wire, plain or ribbed].

Adopted by Leading Railroads

The Pennsylvania Railroad Company, after carefully examining all other types of puttyless skylights in actual service, adopted the construction herein shown and described for its new New York & Long Island Railroad Passenger Station, 31st to 33d Streets and 7th and 8th Avenues, New York City, on which building this company completed, about 15 years ago, the erection of 83,000 sq. ft. of skylight, embracing nearly every known variety, such as hipped, ridge, flat, barrel-roof, sawtooth with bowed ridges, circular, elliptical, etc., all constructed with flat glass.

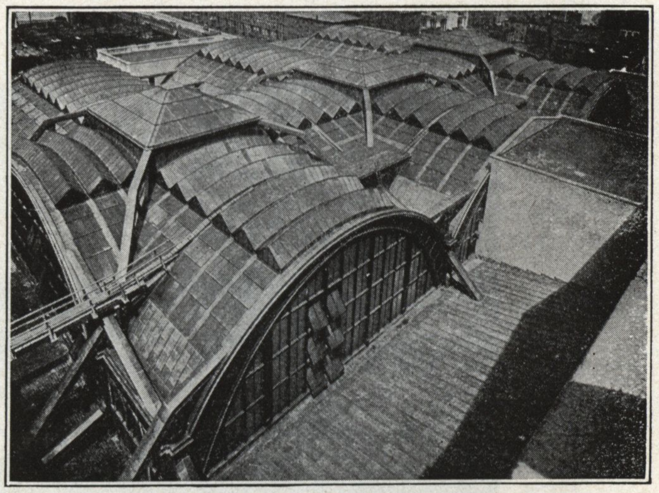


FIG. 1. GROUP OF MULTI-UNIT SKYLIGHTS OVER CONCOURSE OF PENNSYLVANIA TERMINAL, NEW YORK, N. Y.
Area of this group, about 50,000 sq. ft. Total area on the terminal, 83,000 sq. ft.

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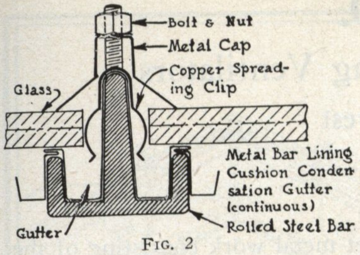

Bolt & Nut
Metal Cap
Copper Spreading Clip
Glass
Metal Bar Lining Cushion Condensation Gutter (continuous)
Rolled Steel Bar
Gutter

FIG. 2

HALF SIZED TRANSVERSE SECTION AT SKYLIGHT SUPPORTING BAR
(Patents applied for)

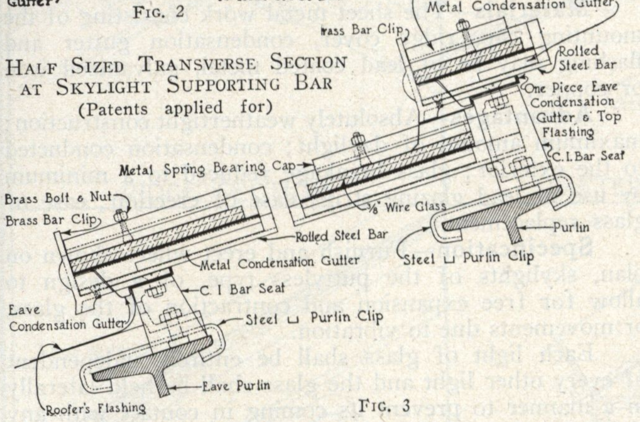

Metal Spring Bearing Cap
Metal Condensation Gutter
Brass Bar Clip
Rolled Steel Bar
One Piece Eave Condensation Gutter & Top Flashing
C.I. Bar Seat
Metal Spring Bearing Cap
Brass Bolt & Nut
Brass Bar Clip
1/4" Wire Glass
Purlin
Rolled Steel Bar
Metal Condensation Gutter
Steel ⊔ Purlin Clip
C. I Bar Seat
Eave Condensation Gutter
Steel ⊔ Purlin Clip
Eave Purlin
Roofer's Flashing

FIG. 3

REDUCED SCALE CROSS SECTION FROM EAVE TO NEXT PURLIN ABOVE
(Patents applied for)
Construction shown on the right side is repeated at each purlin between the eave and the ridge
Scale, 2 in. equals 1 ft.

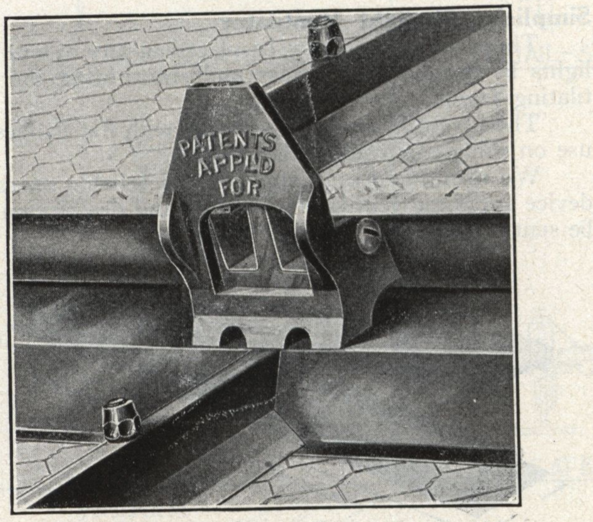

PATENTS APPL'D FOR

FIG. 4. HALF SIZED PERSPECTIVE
Showing exterior view over each purlin between the eave and the ridge

The Central Railroad of New Jersey adopted this system of skylights for its new terminal at Jersey City, N. J., where 116,000 sq. ft. of this construction has been installed.

The New York Central Railroad Co. also has this construction on its new Grand Central Terminal at 42nd Street, New York City; on its New York City Power House at 50th Street and Lexington Avenue; Power Stations at Yonkers and Port Morris, N. Y.; Boiler Shops at West Albany, N. Y., Reed & Stem, Architects, and for their new Passenger Station at Utica, N. Y., Stem & Fellheimer, Architects.

Result of Thorough Investigation

The system of skylight construction described here is the result of experience and investigations made by the NATIONAL VENTILATING COMPANY in this line over a period of nearly 20 years. All efforts during this time have been directed to producing, not the cheapest, but the best construction. As to skylights, true economy does not consist in buying the cheapest.

Public Buildings and Other Notable Installations

The following are a few, among many, installations made by this company during the past 19 years; in some cases replacing other work with the new and improved system above described:

BUILDING, LOCATION AND ARCHITECT

New Library Building, Bar Harbor, Me., Delano & Aldrich
Sun Parlor for E. Parmalee Prentice, New York, N. Y., Delano & Aldrich
International Paper Co. Mills at Niagara Falls, Palmer and Fort Edward, N. Y., and Rumford Falls and Chisholm, Me.
Maryland Institute, Baltimore, Md., Pell & Corbett
Auditorium Building, Springfield, Mass., Pell & Corbett
Municipal Building, Springfield, Mass., Pell & Corbett
New York Edison Co. Waterside Power Station, New York, N. Y.
U. S. Navy Yards at Norfolk, Va., Charlestown, Mass., Brooklyn, N. Y., Pensacola, Fla., and Washington, D. C.
Brooklyn Rapid Transit Co. Shops, Maspeth, N. Y.
American Steel & Wire Co. Mill, Worcester, Mass.
C. K. G. Billings Residences, New York and Locust Valley, N. Y.
Terminal Passenger Station, Norfolk, Va., Reed & Stem
New York Stock Exchange Building, New York, N. Y.
New U. S. Post office, New York, N. Y., McKim, Mead & White
New Municipal Building, New York, N. Y., McKim, Mead & White
Munsey Building, Washington, D. C., McKim, Mead & White
Brockton Library, Brockton, Mass.
New York, Westchester & Boston R. R., Quaker Ridge Station, New Rochelle, N. Y., and 180th Street Station, Bronx, N. Y., Stem & Fellheimer.
United Electric Light & Power Co. Powerhouse, 201st Street Station, New York, N. Y.
Julius Kayser & Co. Loom Building, Brooklyn, N. Y., Wm. Higginson
Institute of Arts and Sciences, Brooklyn, N. Y., McKim, Mead & White
The Beaver Companies' Mill, Thorold, Ont., Canada
Museum of Fine Arts, Minneapolis, Minn., McKim, Mead & White
Administration Building, Balboa, Canal Zone, Panama
Metropolitan Museum of Art Building, Sections "J" and "K," New York, N. Y., McKim, Mead & White
Standard Arcade Building, New York, N. Y., Severance & Van Alen
Robert Brewster's Enclosed Tennis Court at Mount Kisco, New York, Walter D. Blair
Enclosed Pastime Tennis Court, Long Island City, N. Y., Walter D. Blair
Ford Motor Co. Service Building, Long Island City, N. Y.
Union Passenger Station, Macon, Ga., Alfred Fellheimer
John J. Raskob's Residence, Claymont, Del., McClure & Harper
Buffalo General Electric Co., 1917 River Station Extension, Black Rock, N. Y., Stone & Webster, Engineers
American Tobacco Co. Building, Brooklyn, N. Y., Francisco & Jacobus
American Can Co. Building, Brooklyn, N. Y., N. M. Loney
U. S. Naval Operating Base, Hampton Roads, Va.
National City Bank, New York, N. Y.
Trenton Bank Building, Trenton, N. J., Dennison & Hirons
Commodore Hotel, New York, N. Y., Warren & Wetmore
Amherst College Library, Amherst, Mass., McKim, Mead & White
Standard Oil Company, Devoe Works, Long Island City, N. Y.
Kwang Tung Electric Supply Co. Building, Canton, China
U. S. Assay Building, New York, N. Y.
Westinghouse Electric Co. Warehouse, Essington, Pa.
S. W. Strauss Building, New York, N. Y., Warren & Wetmore
Continental Can Co., Jersey City, N. J., Francisco & Jacobus
Empire City Bank, New York, N. Y., Trowbridge & Livingston
New York Telephone Co., 6 Central Exchange Buildings, McKenzie, Voorhees & Gmelin
S. W. Straus & Co. Building, Chicago, Ill., Graham, Anderson, Probst & White
Paterson Paper Parchment Co., Edgerly, Pa., Abbott, Merkt & Co.
Federal Sugar Refining Co., Yonkers, N. Y., Dwight P. Robinson Co.
International Motor Co., Long Island City, N. Y.

GLENDON A. RICHARDS CO.

Manufacturers of Puttyless Skylights and Revolving Ventilators

Winter Avenue and Blumerich Street, Northwest
GRAND RAPIDS, MICH.

Products

The SIMPLICITY PUTTYLESS SKYLIGHT; the SIMPLICITY SKYLIGHT VENTILATOR; the VENTWELL REVOLVING VENTILATOR.

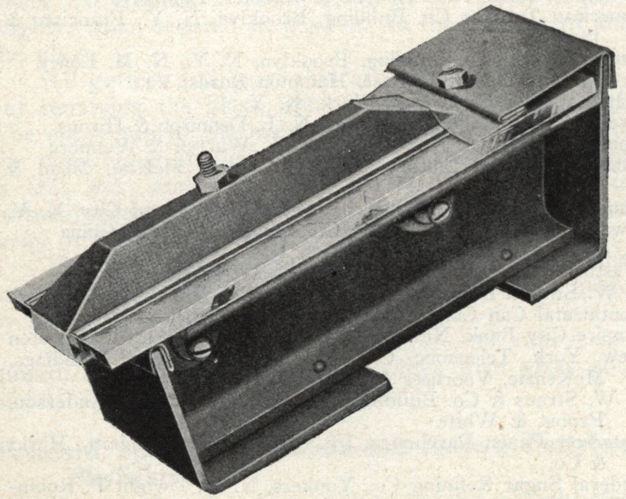
Simplicity Puttyless Skylight

Our aim in designing this skylight was to provide a product which would combine the maximum amount of daylight per square foot of area, with the lowest maintenance cost possible, and at the same time be of such construction as to lend itself to erection in the field with a minimum amount of time and labor.

The simplicity Puttyless Skylight consists of a steel supporting frame of tee iron rafters with angle curb and ridge members. The rafters are provided with sheet metal condensation gutters over which the glass (set in came lead glazing strips or channels) is laid. The mounting caps are set in place over the glass and secured, compressing the glazing channel firmly against both sides of the glass. The ridge cap and end flashing is then applied completing the assembly.

Steel Frame—The sizes of the steel members comprising the frame vary to suit conditions. Ridge and hip members are made in two sections (details on following page); this form of construction allows the frame for each slope, consisting of rafters, ridge and hip members, to be assembled complete at the factory. The erection work in the field is reduced to bolting the ridges and hips together and anchoring frame at curb.

Glazing Strips—These strips are small channels of came lead placed on the edges of the glass resting on the rafter members. When the mounting caps are set and secured they compress the lead firmly against both sides of the glass, making an absolutely windtight and weathertight joint. The soft lead takes up any unevenness in the surface of the glass and gives a continuous bearing surface; it also permits enough come and go in the glass to provide for contraction and expansion, thereby eliminating glass breakage from either of these sources.



SECTION OF SIMPLICITY PUTTYLESS SKYLIGHT BAR

Materials—The sheet metal work consisting of the mounting cap, ridge cover, condensation gutter and flashing may be of lead coated metal, galvanized iron or copper.

Advantages—Absolutely weathertight construction; maximum amount of daylight; condensation conducted to the exterior; glass breakage reduced to a minimum by use of lead glazing strip; ease of erection; ease of glass replacement.

Specification—Furnish and erect where shown on plan, skylights of the puttyless type, of a design to allow for free expansion and contraction of the glass, or movements due to vibration.

Each light of glass shall be entirely independent of every other light and the glass shall be held laterally in a manner to prevent its coming in contact with any rigid part.

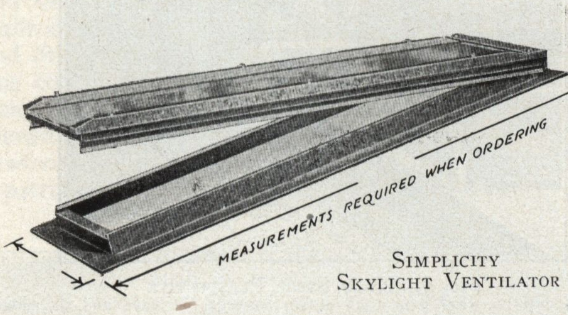
The bearing of the glass shall be flexible, so as to adjust itself to any warps or irregularities in the glass.

Simplicity Skylight Ventilator

These ventilators may be placed in any of our skylights by removing the glass and substituting the ventilating frame.

These ventilators are also made with flat flanges for use on shingle or composition roofs.

We manufacture an efficient and reliable operating device for these ventilators. Prices and description will be sent on request.



SIMPLICITY SKYLIGHT VENTILATOR

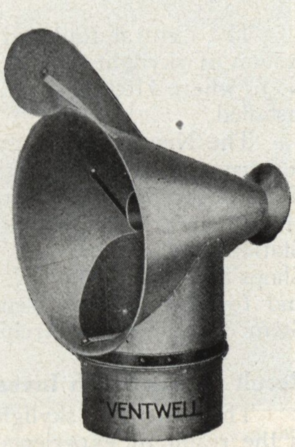
"Ventwell" Revolving Ventilator

This ventilator revolves with the wind and is so constructed that the action of the outside air creates a vacuum in the ventilator itself thereby drawing up the air to be expelled. It is efficient, and guaranteed to give satisfaction under all weather conditions.

It may be had in either galvanized iron or copper.

Bases and dampers extra.

Prices quoted on application.



VENTWELL REVOLVING VENTILATOR

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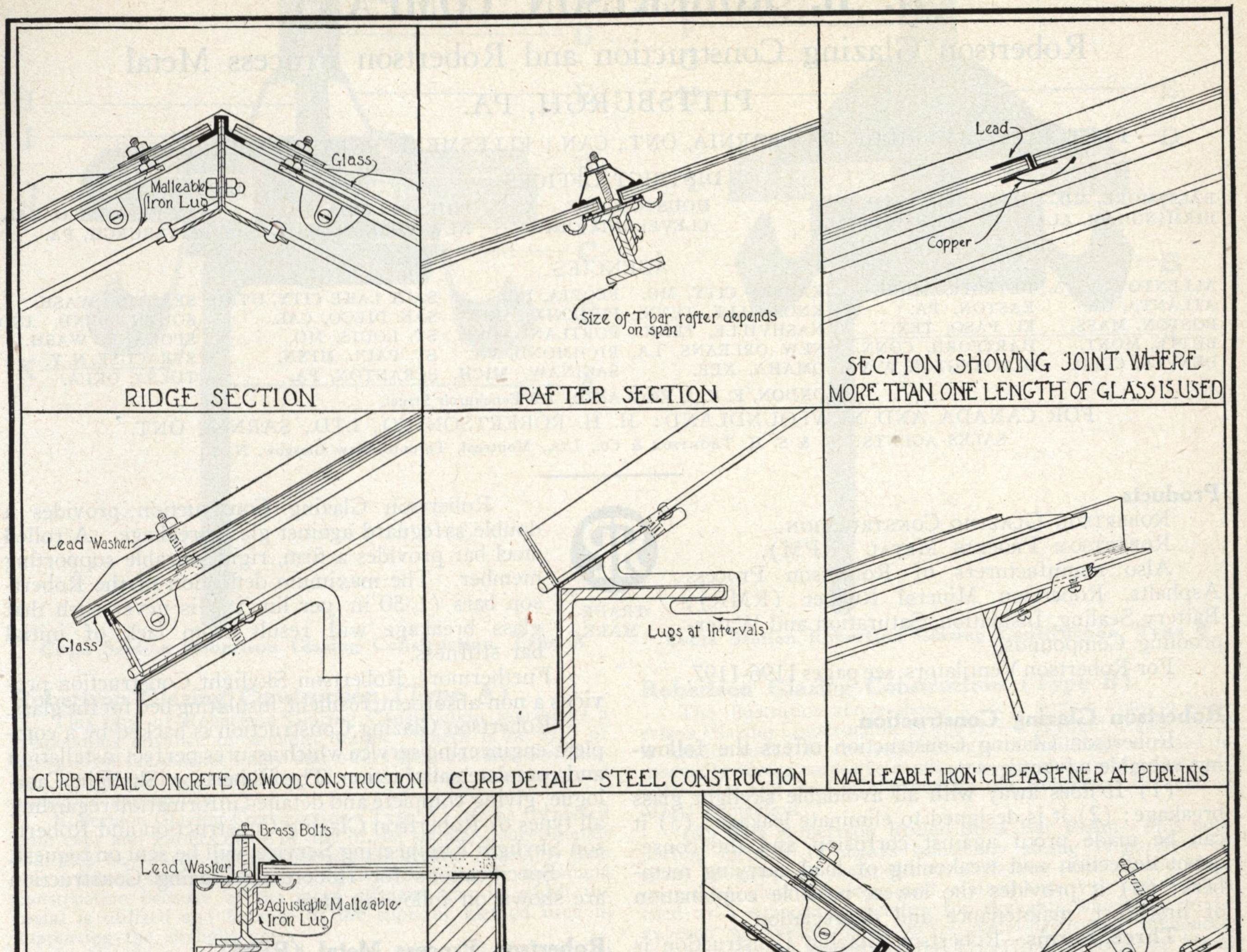

RIDGE SECTION

Glass
Malleable Iron Lug

RAFTER SECTION

Size of T bar rafter depends on span

SECTION SHOWING JOINT WHERE MORE THAN ONE LENGTH OF GLASS IS USED

Lead
Copper

CURB DETAIL-CONCRETE OR WOOD CONSTRUCTION

Lead Washer
Glass

CURB DETAIL- STEEL CONSTRUCTION

Lugs at Intervals

MALLEABLE IRON CLIP FASTENER AT PURLINS

FLASHING AT GABLE

Brass Bolts
Lead Washer
Adjustable Malleable Iron Lug

END FLASHING AT BRICK WALL

Cap
Base

VALLEY SECTION

Lead Cushion
Glass

HEAVY CONSTRUCTION WITH GUARD

CURB SECTION

Continuous Angle
Lead Cushion
Metal Flashing

RAFTER SECTION

¼ Ribbed Wire Glass
Patented Lead Glazing Strip

RIDGE SECTION

Continuous Angle
Screen Support
½ Round Screwed In Channel
Lead Washer

DRAWN BY SWEET'S CATALOGUE SERVICE INC.	STANDARD DETAILS OF SIMPLICITY PUTTYLESS SKYLIGHT CONSTRUCTION	SCALE 3" EQUALS 1-0' DATE·JULY'24	DRWG 1

H. H. ROBERTSON COMPANY

Robertson Glazing Construction and Robertson Process Metal

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

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NASHVILLE, TENN.
NEW ORLEANS, LA.
OMAHA, NEB.
PEORIA, ILL.
PHOENIX, ARIZ.
PORTLAND, ORE.
RICHMOND, VA.
SAGINAW, MICH.
SALT LAKE CITY, UTAH
SAN DIEGO, CAL.
ST. LOUIS, MO.
ST. PAUL, MINN.
SCRANTON, PA.
SEATTLE, WASH.
SOUTH BEND, IND
SPOKANE, WASH.
SYRACUSE, N. Y.
TULSA, OKLA.

LONDON, E. C. 3, ENGLAND: 110 Fenchurch Street

FOR CANADA AND NEWFOUNDLAND: H. H. ROBERTSON CO., LTD., SARNIA, ONT.

SALES AGENTS: B. & S. H. THOMPSON & Co., LTD., Montreal, Toronto, New Glasgow, N. S.

Products

ROBERTSON GLAZING CONSTRUCTION.

ROBERTSON PROCESS METAL (RPM).

Also manufacturers of Robertson Process Asphalts, Robertson Mineral Rubber (RMR); Battery Sealing, Insulation, Saturation and Waterproofing Compounds.

For Robertson Ventilators, see pages 1196-1197.

Robertson Glazing Construction

Robertson Glazing Construction offers the following valuable advantages:

(1) It does away with all avoidable skylight glass breakage; (2) it is designed to eliminate leakage; (3) it can be made proof against corrosion and the consequent deflection and weakening of load carrying members; (4) it provides the lowest possible combination of first cost, maintenance and depreciation.

Three Forms—Robertson Glazing Construction is available in three forms, all having the same basic advantages mentioned above, but each suitable for special uses:

1—Glass roofs for large building areas.
2—Self-supporting skylights.
3—Monitor, sawtooth and sidewall sash.

The Robertson Skylight Catalogue and other descriptive material giving complete data and information on these three forms of Robertson Glazing Construction will be sent on request.

Two Basic Types—Robertson Glazing Construction is manufactured in two basic types (see following page). Type B has been used for years by the most prominent corporations in almost every industrial field. It is especially adapted to the requirements of buildings exposed to severe corrosive influences, for its sheet metal parts are made rust and corrosion proof by the Robertson Process of Metal Protection.

Type A is a comparatively new Robertson skylight design. Its outstanding feature, as will be seen from the description on the following page, is the fact that it combines *all* of the essential characteristics of an ideal skylight in a design of remarkable simplicity and at a very moderate cost. Type A can be furnished with caps and gutters made of any of the standard sheet metals that may be desired.

Glass Breakage Minimized—The chief causes of broken glass in skylights are deflection of supporting members or improper cushioning and separating methods.

TRADE-MARK

Robertson Glazing Construction provides a double safeguard against glass breakage. A rolled steel bar provides a firm, rigid, durable supporting member. The maximum deflection of the Robertson bars (1/30 in. per lin. ft.) is never such that glass breakage will result from lack of initial bar stiffness.

Furthermore, Robertson Skylight Construction provides a non-absorbent, resilient, insulating bed for the glass.

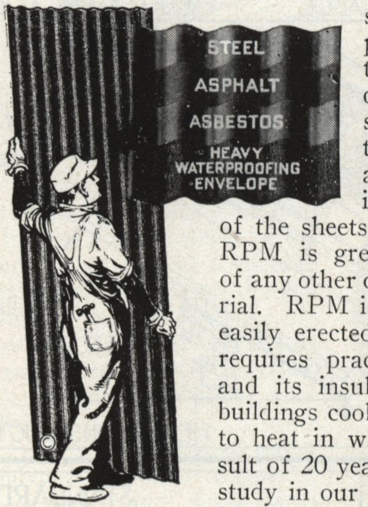
Robertson Glazing Construction is backed by a complete engineering service which assures perfect installation and complete satisfaction. The Robertson Skylight Catalogue, giving complete and detailed information regarding all types of Robertson Glazing Construction and Robertson Skylight Engineering Service, will be sent on request.

Specifications for Robertson Glazing Construction are shown on following page.

Robertson Process Metal (RPM)

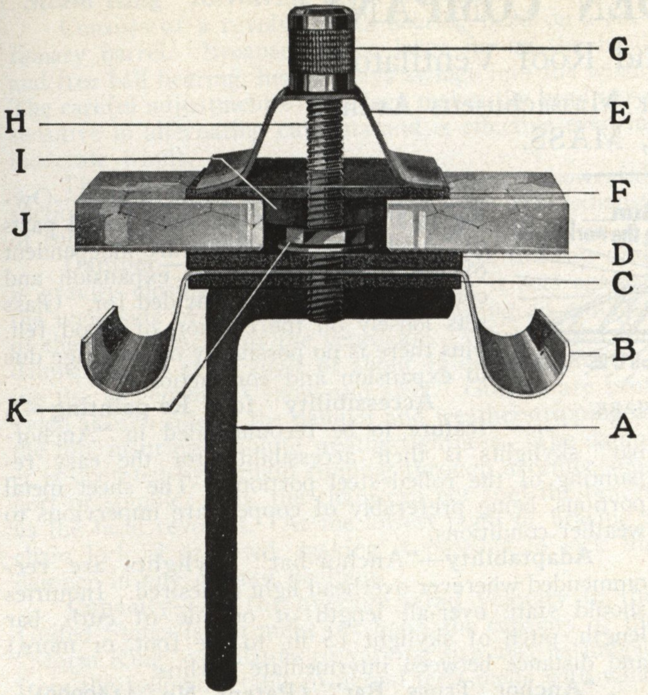
A permanent building material made by enveloping a steel sheet with three protective coatings: (1) asphalt, (2) asphalt impregnated asbestos felt applied under heat and heavy pressure, (3) waterproofing.

The finished sheets weigh from 138 to 224 lb. per 100 sq. ft., depending on gauge of the core sheet. Their strength and light weight allow the same savings in the cost of foundations, structural steel, transportation and erection that characterize the use of ordinary corrugated steel. To these are added the advantages of having a factory built-up roofing applied to both sides of the sheets. The covering area of RPM is greater per ton than that of any other durable corrugated material. RPM is moderate in first cost; easily erected, never needs painting, requires practically no maintenance and its insulating advantages make buildings cooler in summer and easier to heat in winter. RPM is the result of 20 years of experience and of study in our own and other research laboratories. A sample showing the processes by which the material is made will be sent on request.

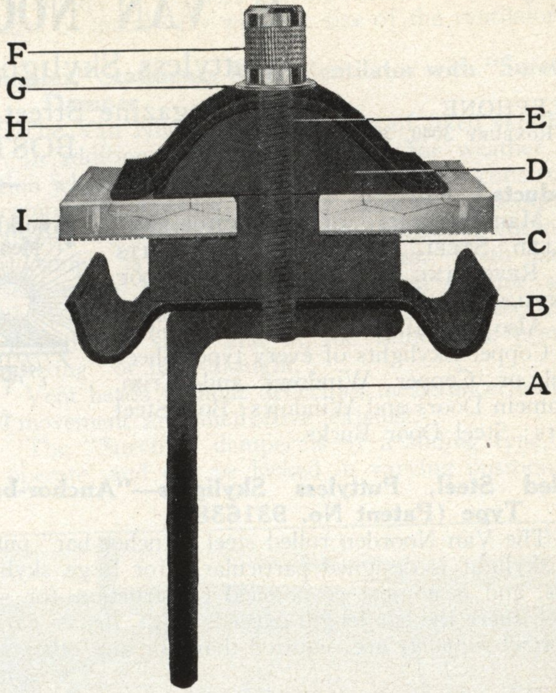


Robertson Process Metal (RPM)

Continued on next page



Cross Section Robertson Glazing Construction, Type A



Cross Section Robertson Glazing Construction, Type B

Robertson Glazing Construction (Type A)

This type of Robertson Glazing Construction represents a tremendous advance in skylight design. There is no type of skylight on the market today that offers such an ideal combination of durability, simplicity of construction, economy and attractive appearance.

Robertson Glazing Construction (Type A) can be furnished with caps and gutters made of any of the standard sheet metals that may be desired, but it possesses far greater durability than the ordinary skylight of copper, galvanized iron or aluminum construction because of the more efficient way in which the metal is utilized and because of the superior method used in supporting the skylight glass.

In the first place, it will be noted that all construction details are *above the supporting bar (A) and that the condensation gutter (B) is not a part of the supporting member.* This is a vast improvement over the usual type of glazing construction in which the bar and the gutter are formed as a single unit with the result that the bar is subjected to the corrosive action of the water of condensation which the gutter is designed to carry away. In Robertson Glazing Construction (Type A) there is absolutely no contact between the supporting member and the gutter. The two are completely separated by insulation (C).

In Robertson Glazing Construction (Type A) the glass (J) rests on a durable, watertight asphaltic cushion (D). This material is ideally adapted to the purpose it fulfills. Because of its flexibility and adhesive character, the Robertson asphaltic cushion adapts itself to all irregularities in the surface of the glass, forming a continuous, leakproof union. Thus it does away with one of the most common causes of glass breakage, for glass which lies on an irregular surface, touching in some places and not in others, is constantly subjected to destructive stresses and strains.

The Robertson skylight cap (E), scientifically designed and efficiently secured by the brass stud (H) and nut (G), contribute further strength, rigidity and durability to this type of Robertson Glazing Construction. The cap is extremely simple in construction, but it is perfectly suited to the job it has to do, for it is so designed that it is absolutely rigid between the studs. The pressure it exerts is continuous and equal at all points. Pressure is easily regulated by simply screwing the cap nut up or down. The brass lock nut and washer (K) do away with the possibility of leakage below the gutter.

You will see from the cross section view that the glass in this type of glazing construction does not touch metal at any point. The glass "spacer" (I) prevents the contacting of the glass with the lock nut (K).

Robertson Glazing Construction (Type B)

The illustration above shows a cross section view of Robertson Glazing Construction (Type B)—a skylight design which is ideally suited to the requirements of buildings exposed to unusually severe corrosive conditions. Its sheet metal parts are made rust and corrosion proof by the Robertson Process of Metal Protection.

(A) The Robertson Rolled Steel Bar Beam—This supporting member is always sufficiently strong (regardless of span) to carry its load without deflection—one of the chief causes of glass breakage and maintenance expense. When used as a supporting member for skylights which are to be exposed to exceptionally severe metal-destroying influences, the bar can be treated by the Robertson Process of Metal Protection. By this process the bar is completely and permanently protected from corrosion (and consequent deflection).

(B) Robertson Process Metal Condensation Gutter—In this type of Robertson Skylight, water of condensation is carried away by gutters that fit snugly over the tops of the bars. *The gutters are not integral parts of the steel bars.* They will deliver unusually long service because they are made of Robertson Process Metal.

(C) Robertson Glass Cushion and Separator—In Robertson Glazing Construction (Type B) the glass rests on a cushion of special high grade asphaltic compound that provides a broad, continuous, permanent bed. This cushion is pliable, non-absorbent, and durable. It positively keeps the glass from contact with all solid substances, even the studs, thus preventing destructive strains. It is protected from the action of light, heat and atmosphere. Being non-absorbent, it does not retain moisture which would cause the corrosion of the adjacent metal.

(D) Robertson Cap Filler—The edges of the lights of glass and the joints between them are covered and bridged with a half-oval section of the asphaltic compound used in the cushion. This filler, owing to its plastic character, enters all depressions and *adheres* to the glass, instead of merely touching the high points of its irregular surface. It provides a continuous, perfect seal.

(E) Brass Stud and (F) Cap Nut—These details clamp the glass between the flexible cushion and filler, insuring permanently waterproof joints.

(G) Brass Washer—

(H) Robertson Cap—The cap protects the cap filler and distributes pressure evenly and continuously. It is made of Robertson Process Metal.

(I) Glass—As specified.

ESTABLISHED 1873

E. VAN NOORDEN COMPANY

Puttyless Skylights and Roof Ventilators

TELEPHONE
Roxbury 3040, 3041, 3042

100 Magazine Street, near Massachusetts Avenue
BOSTON, MASS.

Products

Manufacturers of "Anchor-bar" Rolled Steel, Puttyless Skylights and Revolving and Stationary Roof Ventilators.

Also manufacturers of Sheet Steel and Copper Skylights of every type, Sheet Steel or Copper Windows and Trim, Kalamein Doors and Windows; Bois Steel Stairs; Steel Door Bucks.

To work by the Sun Means twice the work done.
"DAYLITE"
TRADE-MARK

Rolled Steel, Puttyless Skylights—"Anchor-bar" Type (Patent No. 931638)

The Van Noorden rolled steel "Anchor-bar" puttyless skylight is designed particularly for large skylight areas, and is a most economical construction for skylights where the bar length exceeds 8 ft. *Fewer purlins* and *steel supports* are required than for any other skylight.

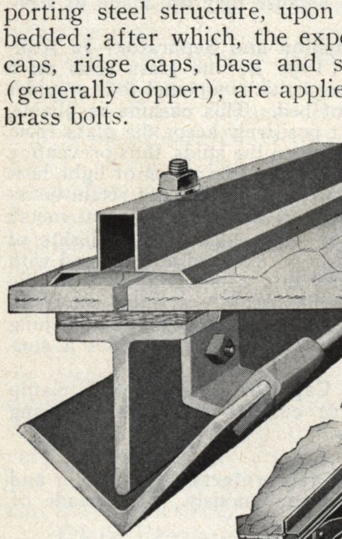
This company solicits from architects an opportunity of suggesting framework for any type of glazed roof structure, and a saving in the steel framework required is assured.

The structural parts of rolled steel, and the trim of sheet metal (generally copper), form a combination which can not be surpassed; namely—steel for strength and copper for weather protection.

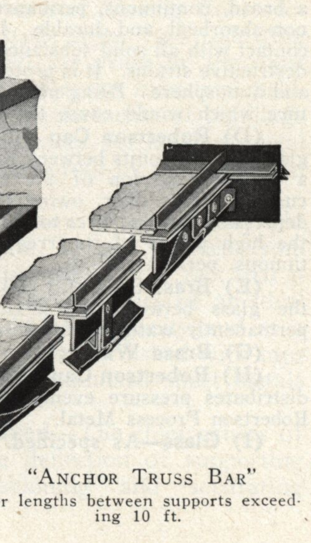
Bar—The bar consists of a tee and angle combination as shown. The angle member serves as a gutter for condensation. Glass rests loosely on cushion of pure wool felt.

Curb—The "Anchor-bar" skylight is the only skylight of prominence which has continuous steel reinforcement at the base. The thrust of skylight bars is directly against this member, which can not give way while the curb holds.

General Features—The distinctive feature of "Anchor-bar" skylight is the unit steel frame, consisting of bars, base and ridge—an independent self-supporting steel structure, upon which the glass is loosely bedded; after which, the exposed portions, such as bar caps, ridge caps, base and side apron of sheet metal (generally copper), are applied. Caps are secured with brass bolts.



Section of Bar
Van Noorden
"Anchor-bar"
Skylight



"Anchor Truss Bar"
For lengths between supports exceeding 10 ft.

Expansion and Contraction—Owing to the fact that the sheet metal parts of "Anchor-bar" skylights are independent of the rolled steel parts, expansion and contraction are amply provided for. Glass sets loosely on the cushion of wood felt, thus there is no possibility of breakage due to expansion and contraction.

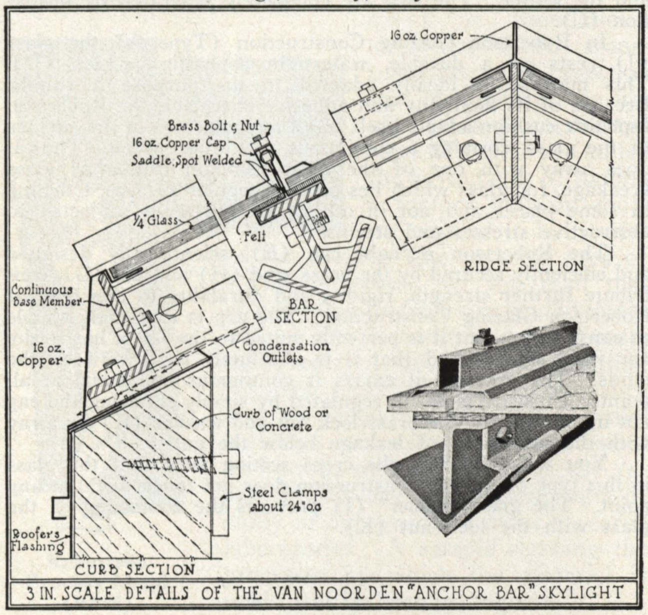
Accessibility for Re-painting—A feature to be recommended in "Anchor-bar" skylights is their accessibility for the easy re-painting of the rolled steel portions. The sheet metal portions, being preferably of copper, are impervious to weather conditions.

Adaptability—"Anchor-bar" skylights are recommended wherever overhead light is desired. Inquiries should state over-all length of outside of curb, bar length, pitch of skylight (5 in. to the foot, or more) and distance between intermediate purlins.

"Anchor Truss Bar" (Patent No. 1140909)—"Anchor Truss Bars" are used where bar length is more than 10 ft., unless intermediate purlins are provided. Truss bars are self-supporting for a bar length up to 15 ft. The saving effected in the steel frame support is far greater than the excess cost of truss bar construction. Details on application.

Notable Installations of "Anchor-bar" Skylights—

U. S. Treasury Annex, Washington, D. C.
U. S. Naval Hangar, Lakehurst, N. J.
General Electric Co., Lynn, Mass.
Gymnasium and Ball Cage, Middlesex School, Concord, Mass.
Republic Railway & Light Co., Lowellville, Ohio
Ford Service Stations, Cambridge, Mass.; Indianapolis, Ind.; Cincinnati, Ohio
El Paso Electric Co., El Paso, Tex.
New Departure Mfg. Co., Bristol and Meriden, Conn.
State Capitol, Augusta, Me.
Widener Library, Cambridge, Mass.
U.S. Post Offices: New Haven, Conn.; Ashtabula, Ohio; Brazil, Ind.
Colt Patent Fire Arms Co., Hartford, Conn.
Seamless Rubber Co., New Haven, Conn.
Western Electric Buildings, Kearny, N. J.



3 IN. SCALE DETAILS OF THE VAN NOORDEN "ANCHOR BAR" SKYLIGHT

Continued on next page

"Storm King" Revolving Roof Ventilator

Consists of a revolving ball bearing head on a stationary barrel. Because of the large fin on the head and free ball bearing, head always swings into the wind. The careful adjustment of bearings makes the head very sensitive to alternating currents and is effective even in moderate winds.

The flaring shape of the head causes a powerful suction at the mouth of the ventilator and a free exhaust of full capacity of shaft.

Damper—The damper is hinged at the top and is gravity closing. In an open position it sets against the underside of the head, thereby allowing an exhaust of the full capacity of the ventilator. When closed the damper slopes at an angle of about 45 degrees, preventing the lodgement of snow and sleet. Gutters are provided at each side of the damper and weatherstripping at the top, insuring absolute weathertightness. The damper is operated by a chain running through a center support or spindle; thus, the chain can not foul the braces as the head revolves. At the lowest point of bracing a chain lock is provided, making it possible to lock the damper in any desired position.

Capacity—As the average wind velocity in the United States is ten miles per hour, the capacity of the "Storm King" ventilators of varying size may be judged from the following table of actual tests made with wind velocity of five miles per hour.

SIZES AND CAPACITIES

Size, in.	Cu. ft. exhaust per min. wind 5 m.p.h.	Size, in.	Cu. ft. exhaust per min., wind 5 m.p.h.	Size, in.	Cu. ft. exhaust per min., wind 5 m.p.h.
12	300	18	715	36	2820
14	410	24	1225	48	4900
16	535	30	1875	60	7550

Bases—Bases are provided for ventilators only when so required and stated. In general, bases are square to fit over curbs of wood or concrete.

Material—"Storm King" ventilators are made of sheet copper or genuine galvanized rust-resisting iron. Gauges of metal vary with the size of the ventilator.

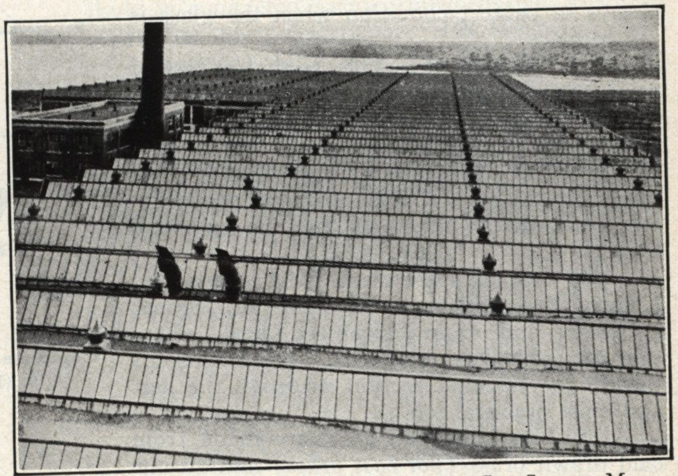
"Simplex" Stationary Roof Ventilator with "Suretite" Damper

The Van Noorden leading type of fixed ventilator. In addition to the band shield (for weather protection when ventilator is open), damper is constructed to completely close top of shaft, insuring an absolutely weatherproof ventilator when up-draught is cut off.

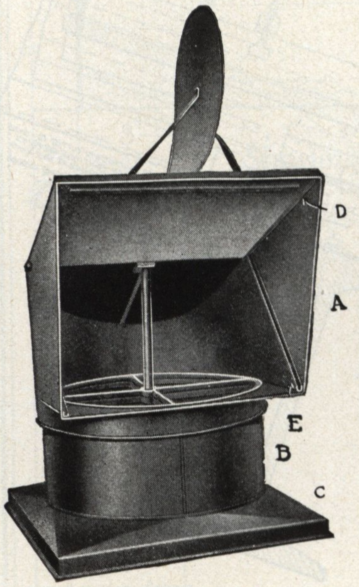
Damper is of a double cone form. With damper closed, upper cone will shed filtration of fine snow. With damper open, lower cone or deflector accelerates up-draught in shaft and at the same time prevents "pocketing" or back-draught.

Vent heads without deflectors mean uncertainty of air movement and ineffective exhaust.

The "Suretite" damper is of a sliding type, easy to operate, and can be locked in varying positions.

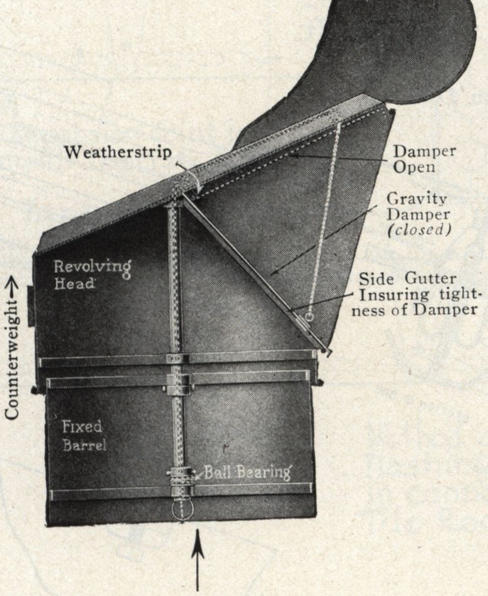


Weave Shed of Naumkeag Steam Cotton Co., Salem, Mass.
100,000 sq. ft. of Van Noorden skylights with 250 "Simplex" ventilators



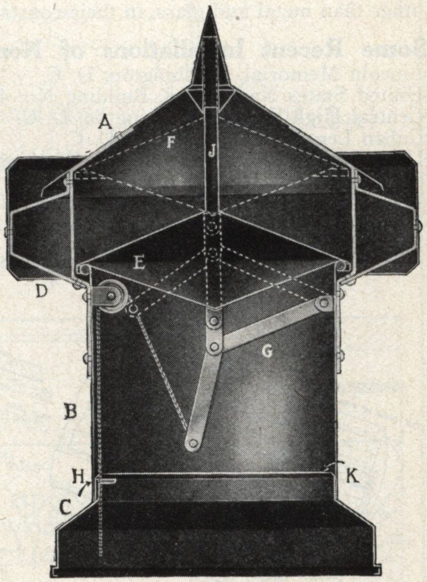
"Storm King" Rotary Ball Bearing Ventilator

A—Revolving head; B—Fixed barrel; C—Base; D—Gravity damper (open position); E—Side gutter insuring tightness of damper



Chainlock for locking damper in open position

"Storm King" Rotary Ball Bearing Ventilator



"Simplex" Ventilator with "Suretite" Sliding Damper

A—Head; B—Barrel; C—Base; D—Weather shield; E—"Suretite" gravity sliding damper (closed); F—Damper (open); G—Operating arm; H—Chain lock (locking damper in open position); J—Telescopic damper guide; K—Gutter (for condensation)

NONPAREIL SKYLIGHT CO.

Manufacturers of Nonpareil Puttyless Skylights

MAIN OFFICE
2609-2611 Pennsylvania Avenue, N. W., WASHINGTON, D. C.

Product

The Nonpareil Puttyless Skylight (patented November 1, 1910; October 3, 1911; October 14, 1913).

Some of Our Claims, for Our Construction

(1) It can not, and does not leak.

(2) Glass breakage with this construction is reduced to a minimum.

(3) A highly practical construction.

(4) Our lead glazing cushions are practical and lasting. Glass rests in use. Detail 5.

(5) These cushions are *not* attached until after all field work is done, therefore, they are always in perfect condition when the glass is put in place.

(6) They are reversible, so that in case of accident to the glass and they are injured, they can be reversed for installing new lights of glass—very advantageous feature.

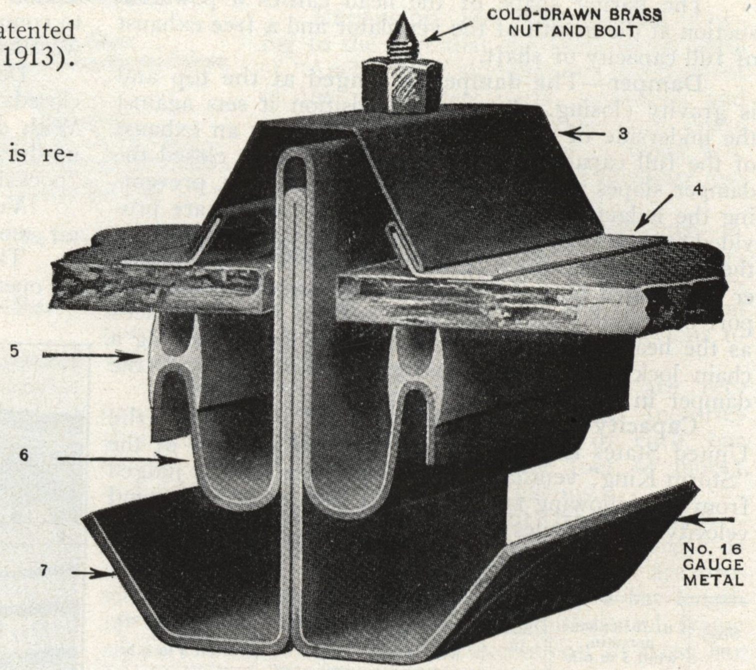
(7) Our condensation gutters are so made, and of such size, as to really and properly perform the functions they are supposed to perform.

(8) Our bars are made from lead coated Armco Iron, where the skylights are copper trimmed; and from galvanized steel, where they are galvanized trimmed. They are also of the proper size and section, to make the best and most practical job.

(9) Our bolts and nuts, are made from cold drawn brass (*not cast brass*) and all our castings are brass.

Specifications for Nonpareil Skylights

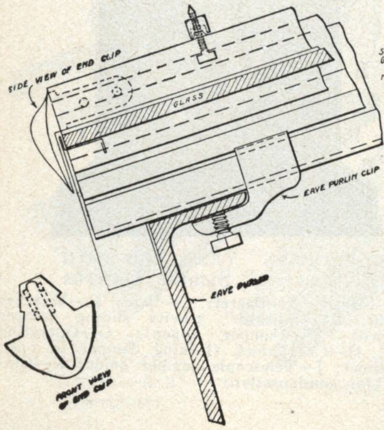
The skylights must be of a type that can be made watertight without the use of putty, and shall *not* contain any material other than metal and glass, in their construction.

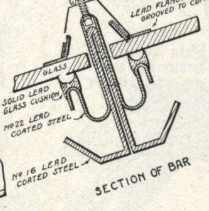

COLD-DRAWN BRASS NUT AND BOLT
3
4
5
6
7
No. 16 GAUGE METAL

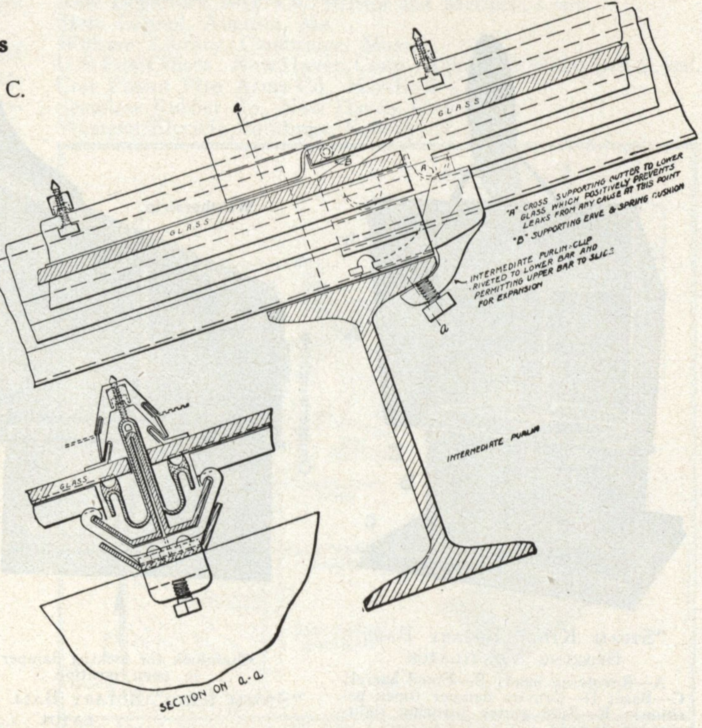
Complete Bar Assembled, Showing the Glass and Details of Construction
(Patented November 1, 1910; October 3, 1911; October 14, 1913)

Some Recent Installations of Nonpareil Skylights

Lincoln Memorial, Washington, D. C.
United States Navy Yard, Building No. 41, Washington, D. C.
Central High School, Washington, D. C.
Cuban Legation, Washington, D. C.
United States Treasury Building, Washington, D. C.
Canadian Pacific Railway, Montreal, Que.
Pratt Tennis Court, Glen Cove, L. I., N. Y.
Vitagraph Building, Brooklyn, N. Y.
Standard Oil Co., Baton Rouge, La.
United States Hospital for the Insane (Boiler House), Washington, D. C.
New York Central R. R. Station, Watertown, N. Y.
United States Post Office, Santa Barbara, Cal.
Biograph Building, New York, N. Y.
Capital Traction Co., Powerhouse and Car Barns, Washington, D. C.
Eastern High School, Washington, D. C.
Beloit State Bank, Beloit, Wis.


SIDE VIEW OF END CLIP
GLASS
EAVE PURLIN CLIP
EAVE PURLIN
FRONT VIEW OF END CLIP


POINTED T BOLT
CUPPED NUT COVERING BURR ON CAP
LEAD FLANGE GROOVED TO COPPER CAP
GLASS
SOLID LEAD GLASS CUSHION
No 22 LEAD COATED STEEL
No 16 LEAD COATED STEEL
SECTION OF BAR


a
GLASS
B
A
GLASS
"A" CROSS SUPPORTING GUTTER TO LOWER GLASS WHICH POSITIVELY PREVENTS LEAKS FROM ANY CAUSE AT THIS POINT
"B" SUPPORTING EAVE & SPRING CUSHION
INTERMEDIATE PURLIN-CLIP RIVETED TO LOWER BAR AND PERMITTING UPPER BAR TO SLIDE FOR EXPANSION
a
GLASS
INTERMEDIATE PURLIN
SECTION ON a-a

Section Details of Flexible or Shingle Type Construction

AMERICAN BAR-LOCK CO., INC.

Manufacturers of Skylight and Roof Light Construction

Hulst Street
LONG ISLAND CITY, N. Y.

BRANCH OFFICES OR REPRESENTATIVES IN ALL LARGE CITIES

Product

"AMERICAN BAR-LOCK" SKYLIGHT and ROOF CONSTRUCTION.

For Sidewalk Light Construction, see page 604.

"American Bar-Lock" Skylight, Roof Light and Floor Light Construction

Built strongly of reinforced concrete ribs 3½ in. deep, supporting the frames around the replaceable glass units, on four sides of each unit. Designed for permanency, protection of glass from breakage, leakage and maintenance expense. It is mechanically correct and is as strong and durable as the walls of the building. Can be walked on; is burglar, fire and waterproof. Requires no protecting screens. Will support the loads required, and withstand the action of the elements. Not affected by smoke or acid fumes.

Advantages of "American Bar-Lock" Construction

Their durability makes "Bar-Lock" skylights with wired glass more economical than other types.

The surface will harbor neither water nor dirt. Quick repairs are possible by unskilled labor.

Glass units are cushioned with a specially prepared waterproof composition. Metal frames entirely surround each unit of glass for its full depth, providing perfect protection against concrete expansion.

The ½-in. wired glass is of the replaceable type, and can be replaced by unskilled labor without any cutting of concrete, leaving of patch work or liability of leakage.

Expansion joints relieve pressure, and are caulked and made watertight with oakum and "Bar-Lock" caulking compound. Spans, up to 8 ft. in the clear without intermediate supports, for any type of building.

Construction of "American Bar-Lock" Skylights

Made in completed factory finished slabs ready to drop over the openings, or we will send our own mechanics, if preferred, to install in the field anywhere in the United States.

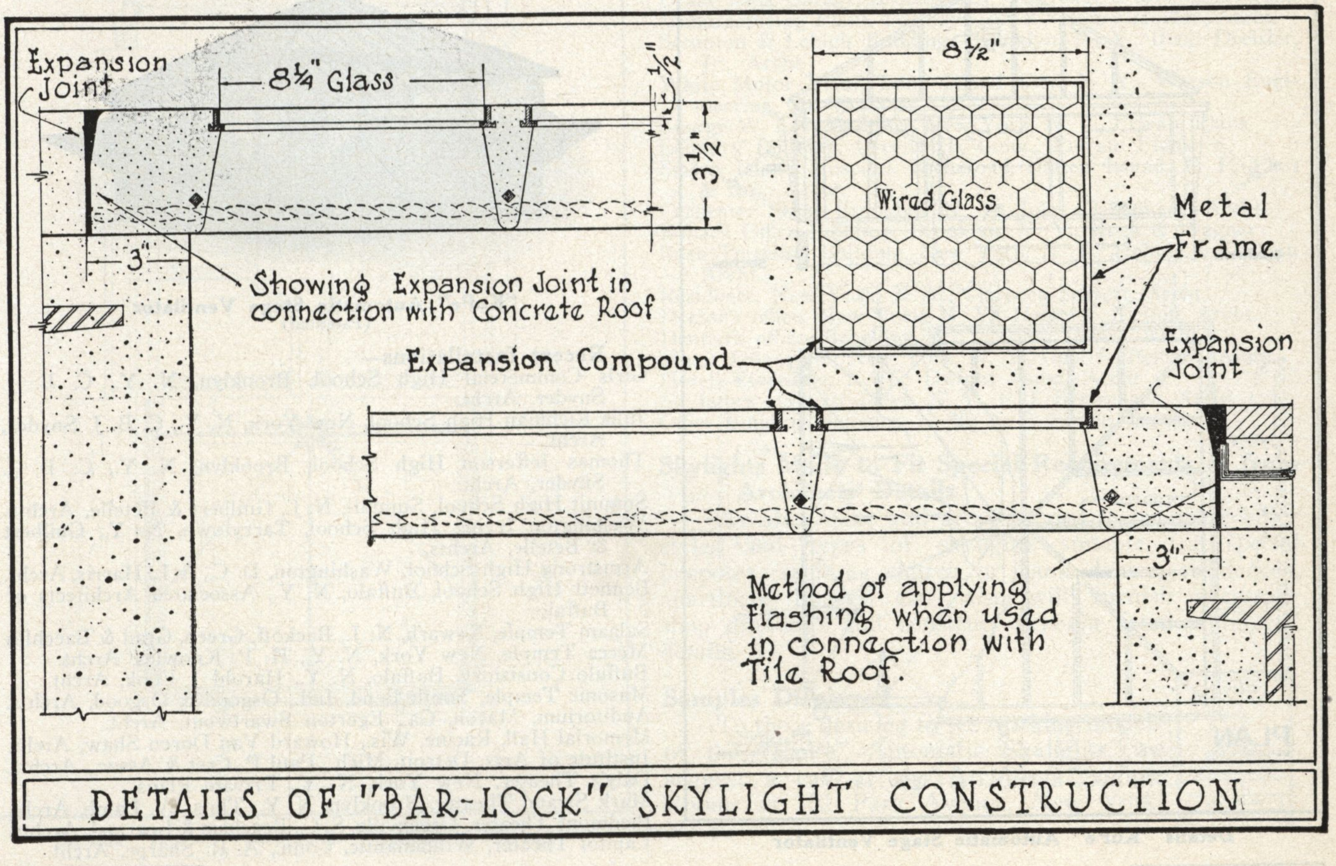
Specification

"Bar-Lock" Patented Double Reinforced Concrete Construction using 8¼-in. square, ½-in. thick, wired glass, protected by metal shields, with a signed guarantee to furnish glass for replacement free of charge (f.o.b. factory) for a period of 5 years.

Guarantees

We guarantee to maintain all work against defective workmanship and materials, and any leakage caused thereby, for a period of one year.

The AMERICAN BAR-LOCK CO., INC., further guarantees to furnish glass for replacement in the "Bar-Lock" wired glass skylight construction free of charge (f. o. b. factory) for a period of 5 years.


Expansion Joint
8¼" Glass
½"
3½"
3"
Showing Expansion Joint in connection with Concrete Roof
8½"
Wired Glass
Metal Frame.
Expansion Compound
Expansion Joint
3"
Method of applying Flashing when used in connection with Tile Roof.

DETAILS OF "BAR-LOCK" SKYLIGHT CONSTRUCTION

AUGUST KUHNLA, INC.

Manufacturers of Skylights

10 to 20 Lorimer Street
BROOKLYN, N. Y.

KuPe
T.M. Pending U.S. Pat. Office
TRADE-MARK

Products

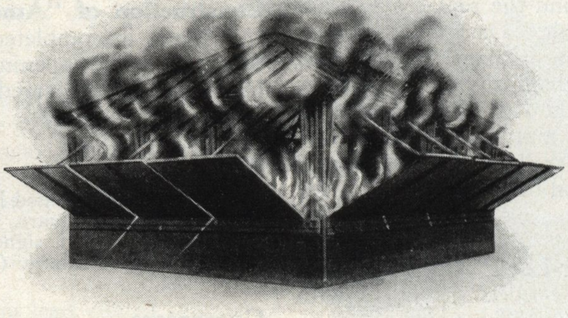
"KuPe" Automatic Stage Ventilator; "KuPe" Automatic Ventilating Skylight.

Patents

"KuPe" Automatic Ventilators and Skylights are protected under U. S. Letters Patent Nos. 1320568 and 1418732, and trade-mark "KuPe" is registered in U. S. Patent Office No. 149979. Other patents pending.

"KuPe" Automatic Stage Ventilator No. 67

A combined ventilator and weatherproof skylight. It consists of a metal frame with hipped glass roof, and sides provided with bottom hinged metal sash. Flexible cable equipped with fusible links passes over pulleys and connects the top of each sash to a main rope which extends down to the stage floor and within reach of the fly gallery. This main rope is also provided with fusible links. Under ordinary conditions the sash are hand operated, but in times of emergency the sash may be quickly opened by cutting the rope; in case of fire the operation of the sash is effected either individually or simultaneously by the melting of said fusible links.



"KuPe" Automatic Stage Ventilator
(Patented)

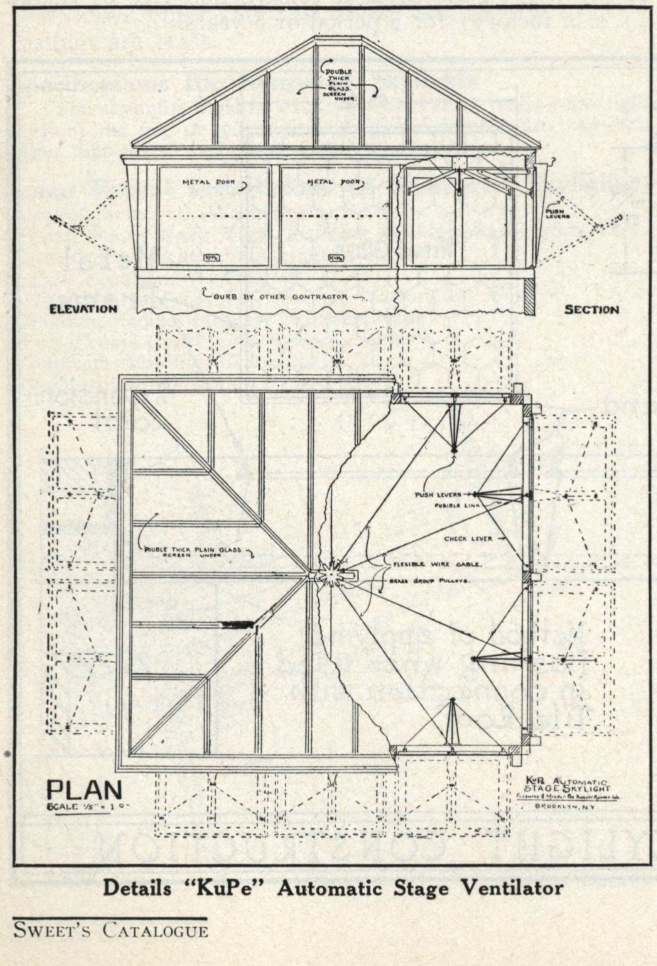
Connecting the top rail of the sash with the head jamb is a jackknife bracket which acts as a lever in thrusting the sash outward, overcoming any possible obstruction of ice, snow, or other encumbrances. This bracket also prevents the sash from opening beyond a certain point, and holds same rigid against wind when open.

Gutters under the roof supports conduct condensation to the exterior.

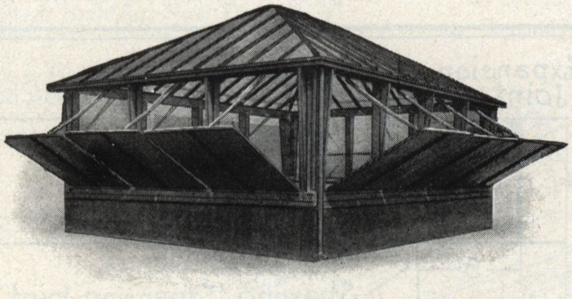
A scientifically constructed, efficient, self-opening ventilator, proof against obstruction by ice or snow, positive in action under all conditions.

Construction and Installation—We manufacture these ventilators to any dimension, complete, with sheet glass and with woven wire screen under the glass. We use standard gauges of galvanized iron or copper and the sash hinges are of heavy brass bolted to both sash and frame.

Indorsement—Approved by the Board of Fire Underwriters, city officials, architects and owners.



Details "KuPe" Automatic Stage Ventilator



"KuPe" Automatic Stage Ventilator
(Patented)

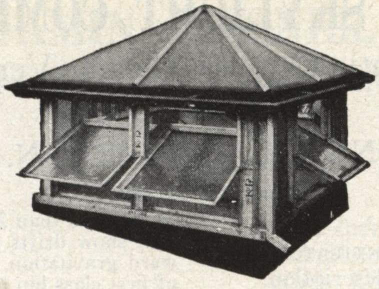
Recent Installations—

Girls Commercial High School, Brooklyn, N. Y., C. B. J. Snyder, Archt.
Julia Richman High School, New York, N. Y., C. B. J. Snyder, Archt.
Thomas Jefferson High School, Brooklyn, N. Y., C. B. J. Snyder, Archt.
Summit High School, Summit, N. J., Guilbert & Betelle, Archts.
Washington Irving High School, Tarrytown, N. Y., Guilbert & Betelle, Archts.
Armstrong High School, Washington, D. C., A. L. Harris, Archt.
Bennett High School, Buffalo, N. Y., Associated Architects of Buffalo
Salaam Temple, Newark, N. J., Backoff, Green, Grad & Baechlin
Mecca Temple, New York, N. Y., H. P. Knowles, Archt.
Buffalo Consistory, Buffalo, N. Y., Harold J. Cook, Archt.
Masonic Temple, South Bend, Ind., Osgood & Osgood, Archts.
Auditorium, Macon, Ga., Egerton Swartwout, Archt.
Memorial Hall, Racine, Wis., Howard Van Doren Shaw, Archt.
Institute of Arts, Detroit, Mich., Paul P. Cret & Assoc., Archts.
Daly's Theater, New York, N. Y., Private Plans
Mark Strand Theater, Brooklyn, N. Y., Thos. W. Lamb, Archt.
Piedmont Theater, Greenville, S. C., Beacham & Legrand, Archts.
Capitol Theater, Williamantic, Conn., A. R. Sharpe, Archt.

Continued on next page

"KuPe" Automatic Ventilating Skylight No. 66

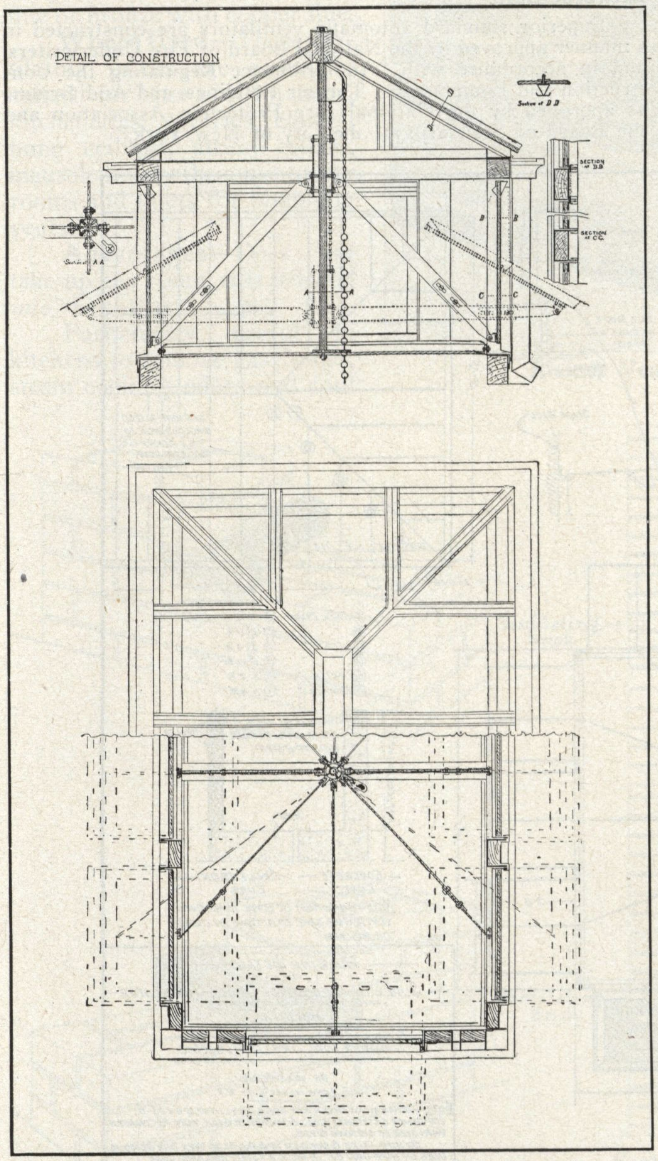
A combined ventilator and skylight. It consists of a rectangular metal frame having a hipped roof of glass. The sides of the structure consist of vertical sash openings, fitted with side pivoted sash. Struts from the bottom rail of these sash connect with a runner on a fixed vertical rod. A chain from this runner extends to a point suitable for manual operation, where it passes through a key slot arrangement permitting the sash to be opened simultaneously and locked in any desired position. Sash may also be opened thermally if so desired, by means of a fusible link.



"KuPe" Automatic Ventilating Skylight
(Patented)

The weight of the operating device effects a positive opening action on the sash when the chain is released. When closed, the head of the sash swings under the rain shed, the flanges on the side stiles fit into grooves on the panels, the apron on the bottom rail overlaps the sill, making the sash stormproof.

Gutters under the roof support conduct condensation to the exterior.



Details "KuPe" Automatic Ventilating Skylight

Construction and Installation—We manufacture these skylights of standard gauge galvanized iron or copper and install same complete with glass, gutters, leaders and operating device in the following sizes:

(Outside curb measurement, ft.)

2x3	5x5	6x10	8x12	10x12
3x4	5x7	7x9	8x16	10x14
4x4	6x6	8x8	8x20	10x16
4x6	6x8	8x10	10x10	10x20

Other sizes if required.

Indorsement—Approved by architects, engineers, contractors and owners after rigid tests and inspection.

Recent Installations—

Dairy, Greenville, Pa., McCormick Company, Archt.
Hampton Hall, Cranford, N. J., Hollingsworth & Bragdon
Larson Baking Plant, Brooklyn, N. Y., McCormick Co., Archt.
Goodmans Baking Plant, New York, N. Y., McCormick Co., Archt.
Dugan Bros. Baking Plant, Brooklyn, N. Y., Henry Holder, Archt.
Dugan Bros. Baking Plant, Newark, N. J., Marshall N. Shoemaker, Archt.
Horn & Hardart Baking Plant, New York, N. Y., F. P. Platt & Bro., Archt.
Baking Plant, Flushing, L. I., N. Y., Henry Holder, Archt.
Mill Building, Brooklyn, N. Y., Brutus Gundlach, Archt.
Ice Cream Plant, Oswego, N. Y., McCormick Co., Archt.
Candy Factory, New York, N. Y., Geo. Casazza, Archt.
Huber Storage Building, Bayonne, N. J., Brutus Gundlach, Archt.
Factory Building, Brooklyn, N. Y., Private Plans
Parochial School, Brooklyn, N. Y., Carrol, Murphy & Lehman, Archt.
Chemical Plant, Brooklyn, N. Y., Chas. Pfizer & Co., Owner
Meat Plant, Brooklyn, N. Y., Himmelback & Schlick, Archt.
Furniture House, Brooklyn, N. Y., Infanger & Son, Archt.
Garage Building, Brooklyn, N. Y., Private Plans
Garage Building, New York, N. Y., Hugh Getty, Inc.
Duguid Bros. Garage, Brooklyn, N. Y., Private Plans
Drake Bros. Garage, Brooklyn, N. Y., Dodge & Morrison, Archt.
Manufacturing Plant, Brooklyn, N. Y., Henry Holder, Archt.
Scranton & Lehigh Building, Brooklyn, N. Y., Benj. Dreisler, Jr., Archt.
White Motor Plant, Long Island City, N. Y., Watson Engineering Co., Builders
George W. Loft Building, New York, N. Y., Private Plans
Laundry Building, Greenwich, Conn., Private Plans
Staten Island Hospital, Richmond, Staten Island, F. P. Platt & Bro., Archt.
Carpenter Shop, Brooklyn, N. Y., John Clausnitzer, Archt.
Bohack Office Building, Brooklyn, N. Y., Kock & Wagner
Bush Terminal Building, New York, N. Y., Helmle & Corbett, Archt.
Residence, New York, N. Y., Clarence Seafert, Archt.
Doctor's office, New York, N. Y., Henry C. Pelton, Archt.
Dentist's office, Brooklyn, N. Y., Wm. Debus, Archt.
Music Emporium, New York, N. Y., Geo. F. Pelham, Archt.
Hotel, Riverdale, N. Y., Dwight Baum, Archt.
St. James Hall, Brooklyn, N. Y., F. J. Berlenbach, Archt.
Office Building, Jamaica, N. Y., A. P. Sorice, Jr., Archt.

Skylights Made to Fit Special Requirements or from Architects' Details

We also make and are equipped to originate other styles and types of skylights suitable for special purposes, such as church or bank domes, residences, apartment houses, etc.; also will furnish necessary shop drawings and construct skylight from architects' details.

Samples Displayed

To those desiring to see working models of the "KuPe" Automatic Skylights, we suggest a call at the Architects Sample Rooms at 101 Park Avenue, New York, N. Y.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

SUPERIOR SKYLIGHT COMPANY, INC.

Automatic Gravity Theater Ventilators

95 Webster Avenue
LONG ISLAND CITY, N. Y.

Products

Superior Automatic Gravity Ventilator.
Also Sheet Metal Work of every description.
For Superior Roof Leader Connection and Superior Yard, Floor and Roof Drains, see page 1856.

Superior Automatic Gravity Ventilator

For Theater Stages and Auditoriums—A combined ventilator and skylight. Universally approved for use over theater stages, elevator shafts, stair wells and fireproof roofs, etc. Efficient, reliable and automatic in action in case of fire.

Operation—The operation and automatic action depend on a series of hempen cords, each of which is attached to a sash or ventilator and which are immediately released, either independently or all at once, by the melting of fusible links, such as are in common use on fire doors, sprinkler systems, etc. They will melt and release the ventilators at a temperature of 160° F.—long before the flames reach them.

The ropes connecting with the sash are brought down to the stage and attached to a triangle plate which is connected with one main rope to the stage floor. Chains are also attached to the ropes permitting the manual opening and closing of the sash from the stage floor.

The automatic ventilator is to be mounted on an ordinary curb of concrete or angle iron frame made level with the wood plate set flush with the outside of the curb. The curb should be not less than 2 ft. 6 in. high from the finished roof in order that snow drifts and other encumbrances will not prevent outward gravitation. The roof of the ventilator skylight is to be of first class hip ridge construction with heavy bars and condensation gutters, glazed with a thin glass in accordance with the New York Building Code and made perfectly watertight. A No. 12 Galvanized 1-in. Underwriters wire mesh is placed underneath this roof to gather in the glass which invariably breaks from excessive heat in case of fire.

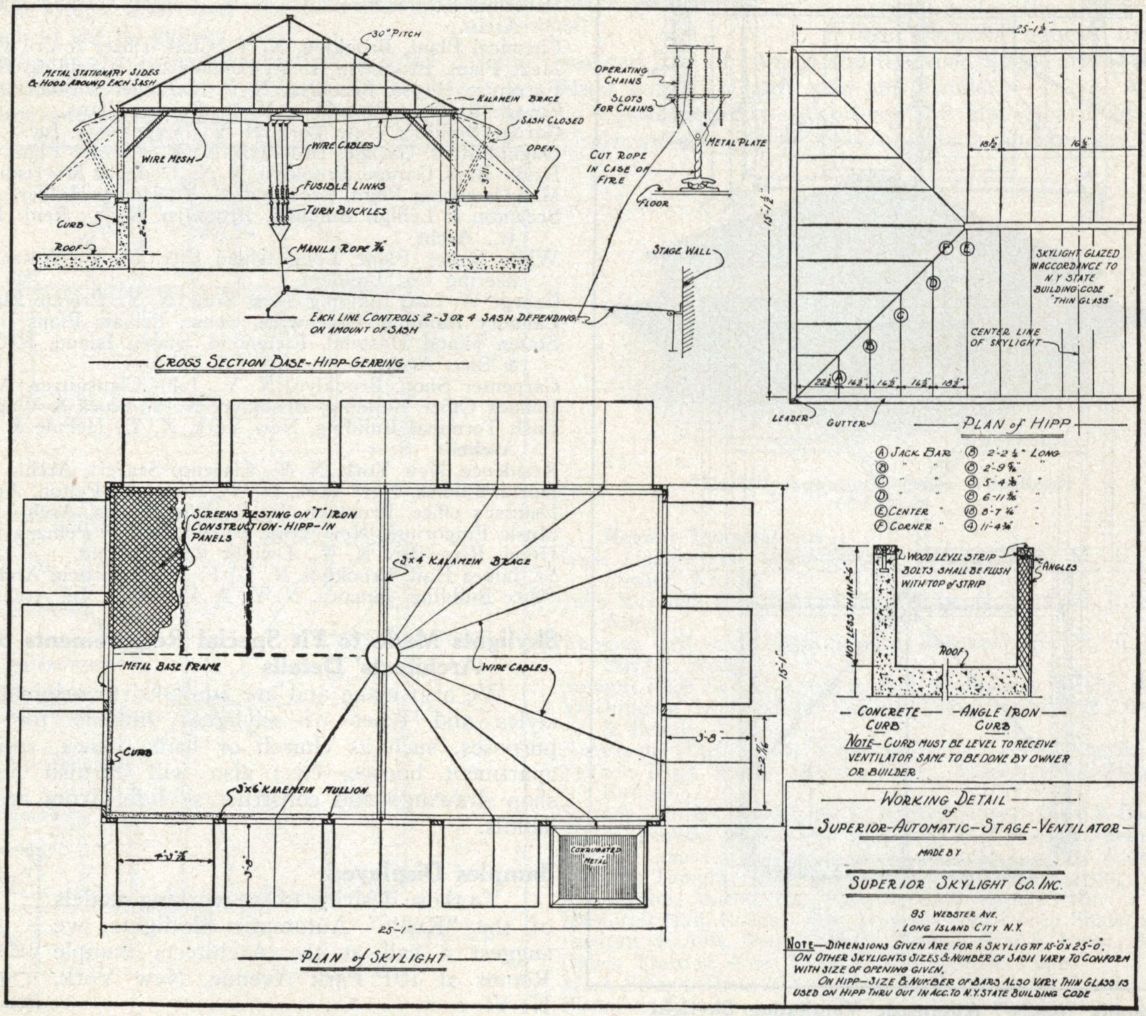
Construction and Installation

We manufacture these ventilators to any specified dimensions using standard gauges of galvanized iron or copper, and will deliver them, ready to assemble, to any part of the United States, Canada and Europe. We will supervise their installation and guarantee that they will meet with the approval of local fire marshals, inspection bureaus, fire insurance underwriters, etc.

The only gravity stage ventilator recognized by all municipal authorities throughout the United States.

Endorsement

Superior standard automatic ventilators are constructed in a manner approved by the National Board of Fire Underwriters, and in accordance with "An Ordinance Regulating the Construction and Equipment of Theater Buildings, and Auditoriums as approved by the National Fire Protection Association and the Board of Standards of the City of New York."


30° Pitch
Metal Stationary Sides & Hood Around Each Sash
Kalamein Brace
Sash Closed
Open
Wire Mesh
Wire Cables
Fusible Links
Turn Buckles
Curb
Roof
2'-6"
3'-11
Manila Rope 7/16
Each Line Controls 2-3 or 4 Sash Depending on Amount of Sash
Operating Chains
Slots for Chains
Metal Plate
Cut Rope in Case of Fire
Floor
Stage Wall
Cross Section Base-Hipp-Gearing
25'-1 1/2"
15'-1 1/2"
18 1/2
16 1/2
Skylight Glazed in Accordance to N.Y. State Building Code "Thin Glass"
Center Line of Skylight
22 1/2 16 1/2" 16 1/2" 16 1/2" 18 1/2"
Leader
Gutter
Plan of Hipp
Ⓐ Jack Bar ⑧ 2'-2 1/4" Long
Ⓑ " " ⑧ 2'-9 5/16" "
Ⓒ " " ⑧ 5-4 3/8" "
Ⓓ " " ⑧ 6-11 7/16 "
Ⓔ Center " ⑱ 8-7 1/4" "
Ⓕ Corner " ④ 11-4 3/4" "
Screens Resting on "T" Iron Construction-Hipp-in Panels
3x4 Kalamein Brace
Metal Base Frame
Wire Cables
Curb
3x6 Kalamein Mullion
Corrugated Metal
15'-1"
3'-8
4'-2 9/16
25'-1"
Plan of Skylight
Wood Level Strip
Bolts Shall Be Flush with Top of Strip
Angles
Not Less Than 2'-6"
Roof
Concrete Curb
Angle Iron Curb
Note—Curb Must Be Level to Receive Ventilator Same to Be Done by Owner or Builder
Working Detail of Superior-Automatic-Stage-Ventilator
Made by
Superior Skylight Co. Inc.
95 Webster Ave.
Long Island City N.Y.
Note—Dimensions Given Are for a Skylight 15-0" x 25-0". On Other Skylights Sizes & Number of Sash Vary to Conform with Size of Opening Given.
On Hipp—Size & Number of Bars Also Vary. Thin Glass Is Used on Hipp Thru Out in Acc. to N.Y. State Building Code

BENJAMIN RIESNER, INC.

Roofers and Sheet Metal Contractors

260 East 78th Street
NEW YORK, N. Y.

TELEPHONE
Butterfield 8580

Product
Riesner Ventilating Brick.

Riesner Ventilating Brick

Description—A ventilating brick, made of cast iron or bronze with galvanized iron flue, the size of a standard brick, having a louvered face with waterdrip, top and bottom.

Two Types—*"Type A"*—Transforms to a 3-in. diameter pipe and has a 3-in. brass collar at inside of wall.

"Type B"—Carries through wall with a 2x8-in. duct and has a register face at inside of wall.

Both types are 13 in. from louvered face to inside of wall. Ventilating bricks required longer or shorter than 13 in. can be made specially.

Construction—Made of cast iron with galvanized iron flue or bronze with copper flue.

Where Used—These ventilating bricks are especially suited for use in kitchens, kitchenettes, pantries, closets, hung ceilings, attics, cellars, mausoleums, bathrooms, utility rooms and inlets for plumbing vents.

Advantages—Does not take up any room, *it is bricked into the wall.*

Particularly useful in kitchens to remove gas fumes, steam cooking odors and foul air, where there is no room for vertical vent shafts and bulky ventilators.

When kitchens are properly ventilated and gas fumes, steam and cooking odors removed, the walls do not discolor and kitchens do not require painting as often.

Weatherproof, Durable, Economical—Riesner Ventilating Bricks are absolutely weatherproof by their design, durable because of the material used, and economical—for the first cost is the only cost.

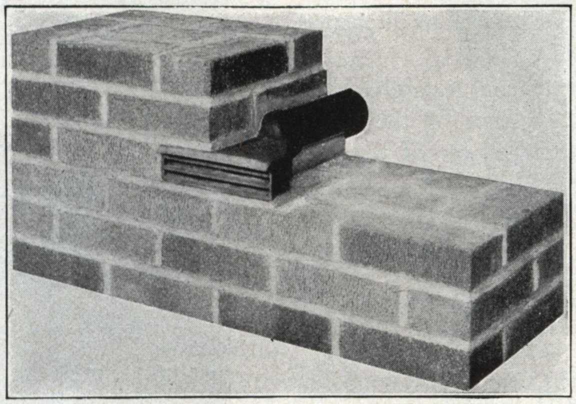
Installation—The ventilating brick is "bricked" into the wall by the mason as the wall goes up, 6 in. below the ceiling line with the louvered face to the outer air and flue or register face in the room.

Specifications—Specify under masonry heading: "Install Ventilating Bricks as manufactured by Benjamin Riesner, Inc., 260 East 78th Street, New York, N. Y., in the wall 6 inches below bottom of ceiling beam." (Specify type, where brick is to be installed, and whether cast iron or bronze.)

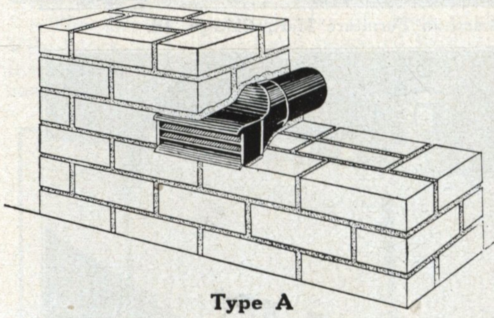
Prices—*"Type A"*—Cast iron 13 in. long with 3-in. diameter brass collar, $5.50 each, net f.o.b. New York, N. Y.

"Type B"—Cast iron 13 in. long with 2x8-in. register face, $6.50 each, net f.o.b. New York, N. Y.

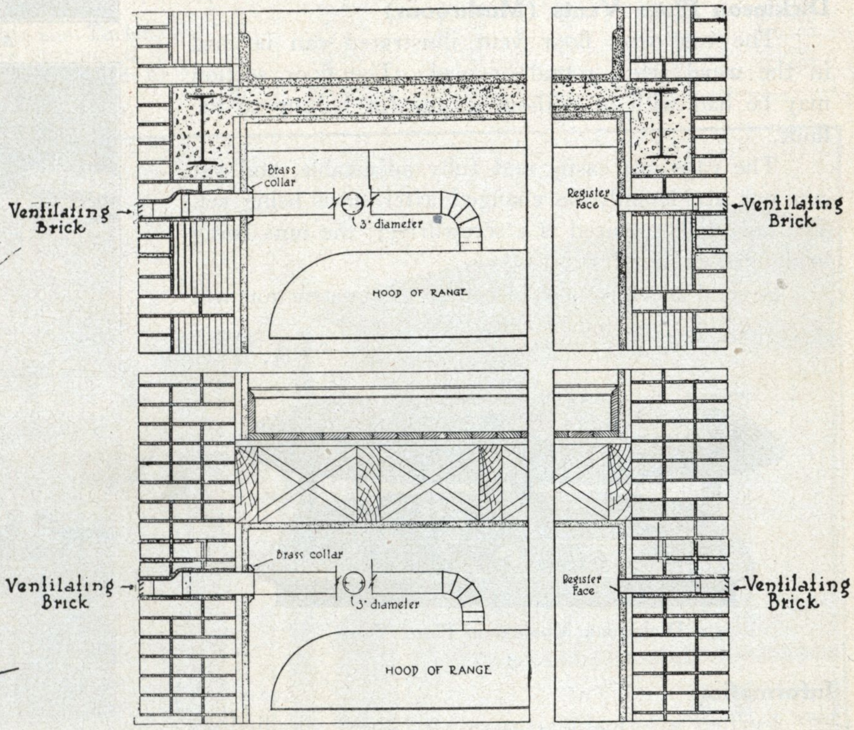
Cast bronze prices on application.



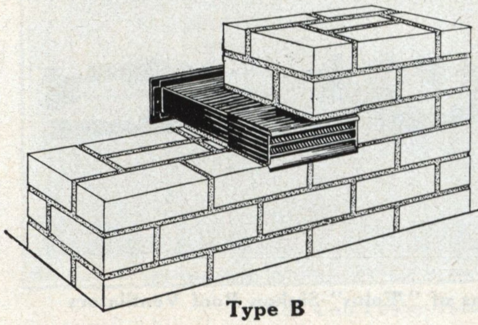
Riesner Ventilating Brick



Type A



Ventilating Brick in Walls of Fireproof and Non-fireproof Construction



Type B

ÆOLUS DICKINSON COMPANY

INDUSTRIAL DIVISION PAUL DICKINSON, INCORPORATED

Ventilators

TELEPHONE
Lafayette 1862, 1863

3324-3354 South Artesian Avenue
CHICAGO, ILL.

Products

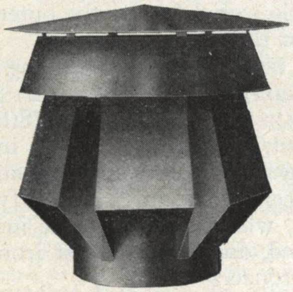
"Æolus" Roof Ventilators; Dickinson C. I. Floor Ventilators, Mushroom Type.

For Dickinson Cast Iron Exhaust Heads and Dickinson Cast Iron Scuppers, see page 624.

"Æolus" Dickinson Roof Ventilator

Used by big industries and railroads as well as on hotels, schools and office buildings. Made of any metal or cast iron. No mechanical parts to get out of order. Little, if any, maintenance expense.

Impartial tests give constant evidence of the merit and great power of this design.



"Æolus" Ventilator

Recent installations include:

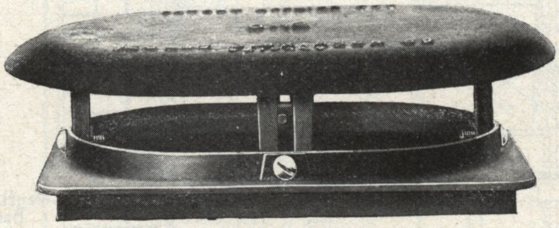
American Can Co.
Armour & Co.
Commonwealth Edison Co.
Corn Products Co.
Crane Co.
Grasselli Chemical Co.
International Harvester Co.
Jos. T. Ryerson & Son
Universal Portland Cement Co.
Western Electric Co.
Atchison, Topeka & Santa Fe Ry.
Illinois Central R. R.
Oxweld Acetylene Co.

Dickinson Floor Vents (Mushroom)

The cast iron floor vent illustrated can be had in the usual sizes, round or oval. The floor section may be had with or without means for bolting to the floor.

The caps are easily and fully adjustable, and yet can not accidentally be changed after once being set. The only tool required is a screwdriver, the nuts being held fixed in slots.

Several theaters now in course of construction will be served by these mushrooms.



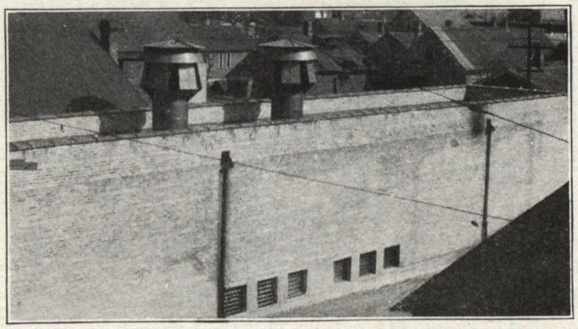
Dickinson Mushroom Floor Vent

Information

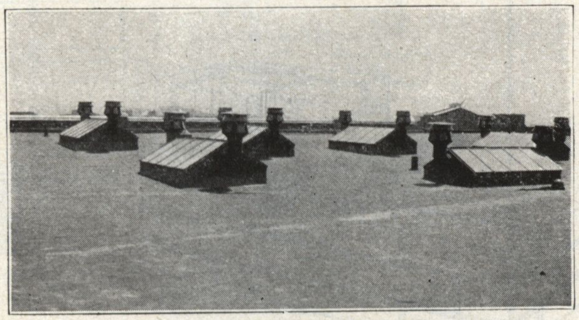
Further information, prices, etc., gladly supplied on request.

Edgewater Beach Hotel, Chicago, Ill.

American Furniture Mart, Chicago, Ill.



Over Transformer Vault



Westinghouse Electric Co., Chicago, Ill.

Installations of "Æolus" Siphon Roof Ventilators

ALLEN AIR-TURBINE VENTILATOR CO.

Manufacturers of Automatic Multi-Vane Air-Turbine Ventilators

GENERAL OFFICES AND FACTORY
Fourteenth and Howard Streets, DETROIT, MICH.
SALES ENGINEERS IN PRINCIPAL CITIES

Allen Automatic Multi-vane Turbine Ventilator

A true rotating air driven automatic suction multi-vane turbine, combining all the merits of the power driven systems without the heavy initial cost and continuous operating expense. The perfectly balanced multi-vane turbine actuated by the air not only pulls up and ejects smoke, fumes, foul air, gas, dust or moisture, but creates an air circulation. This ventilator is absolutely leakproof; its operation is not hampered by ice, sleet or rain. Constant operation under all conditions insures positive and uniform ventilation. The powerful upward suction force of the rotary multi-vane turbine makes down-drafts a mechanical impossibility. It is noiseless in operation and, once installed, requires no attention, care or adjusting.

This ventilator has embodied in its construction a complete Alemite lubricating and relubricating system and is constructed of standard gauge, rust resisting galvanized metal protected with a special compound rendering same practically immune to the deteriorating action of the weather or of acid fumes. It is also constructed of cold rolled copper.

Allen Multi-vane Turbine Ventilators, being produced in a variance of standard sizes, ranging from 8 to 48 inches, are adaptable to any ventilating condition.

Uses

The Allen Multi-vane Turbine Ventilator is especially adapted for removing excessive heat units and vitiated air from schools, churches, hotels, theaters, factories, residences and public buildings. It is particularly adapted and proved to be most satisfactory in actual installation in displacing vapor (steam), smoke, fumes, poisonous gases, dust, etc., from factories, mills, foundries, laundries and garages, and for displacing foul air, moisture, odors and dust from barns, stables, etc.

Specifications

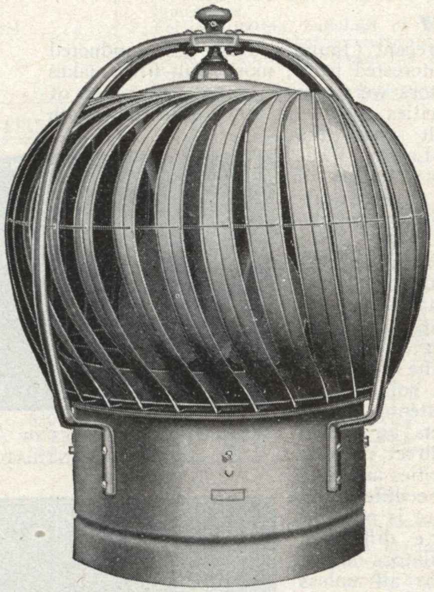
Furnish and erect Allen Multi-vane Turbine Ventilators (having inverted displacement cone) with a guaranteed displacement capacity as manufactured by the ALLEN AIR-TURBINE VENTILATOR CO., Detroit, Mich.

Guaranteed

The displacement capacities of Allen Multi-vane Turbine Ventilators, as published and tabulated here, are guaranteed if installed in accordance with the instruction tag attached to each ventilator.

Service

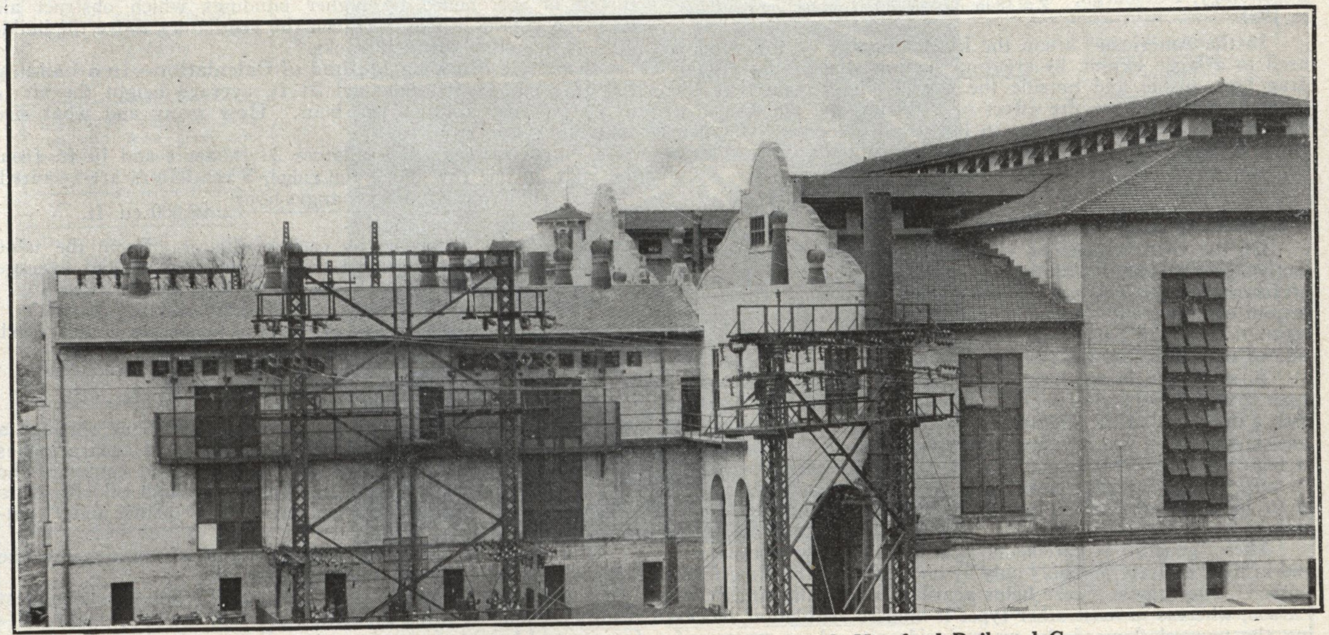
Problems of ventilation submitted to our Engineering Department will receive expert attention without cost or obligation.



PATENTED AND PATENTS PENDING

ALLEN AIR-TURBINE VENTILATOR DISPLACEMENTS

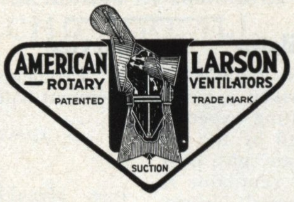
Diam. of throat, in.	Air displacement, cu. ft. per hr.		Diam. of throat, in.	Air displacement, cu. ft. per hr.	
	Wind velocity, 4 miles per hr.	Wind velocity, 8 miles per hr.		Wind velocity, 4 miles per hr.	Wind velocity, 8 miles per hr.
8	17,300	21,600	24	149,000	185,000
10	26,500	32,500	30	225,000	272,000
12	38,600	46,200	36	281,000	330,000
15	54,000	69,000	42	324,000	414,000
18	85,200	102,100	48	360,000	473,000
20	105,100	125,600			



Cos Cob Power House of the New York, New Haven & Hartford Railroad Co.

AMERICAN-LARSON VENTILATING COMPANY

MAIN OFFICE
Keystone Bank Building
PITTSBURGH, PA.



Product

American-Larson Suction Ventilators. (Patented.)

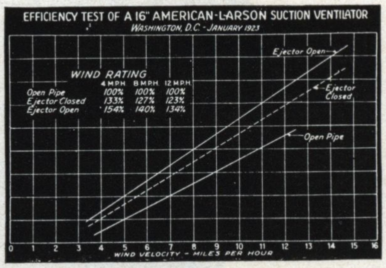
Efficiency

In a recent (January, 1923) test conducted by a disinterested party, more than fifty makes of ventilators were tested over a wide range of wind velocities and temperature differences with the result that the American-Larson Ventilator was shown to have the *highest* rating. Here are the reasons:

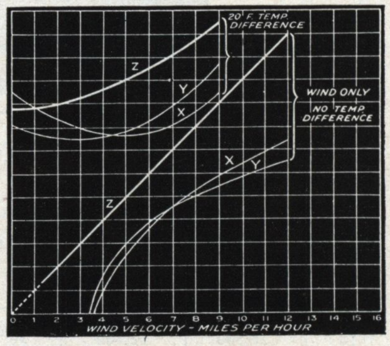
The American-Larson Ventilator offers less resistance to the passage of air than any other ventilator, be it of the stationary or of the rotary type.

The patented ejector tube effects air movement in direct ratio to wind velocities and temperature differences. When there is no temperature difference most ventilators do not function at all unless wind velocity is greater than 3½ miles per hour; furthermore, under temperature differences as great as 20° F., the efficiency of these ventilators actually decreases in gentle breeze up to 4 or 5 miles per hour velocity.

Further proof of efficiency is shown by this test conducted by Professor Trinks of the Carnegie Institute of Technology, Pittsburgh, in 1921.



Wind Rating Curves of American-Larson Ventilator



Graphic Record of Comparative Tests by Professor Trinks

X = 18-in. stationary siphon ventilator
Y = 18-in. rotary siphon ventilator
Z = 18-in. American-Larson suction ventilator

In the American-Larson the kinetic energy of the wind is used to a large extent, by creating suction, due to the viscous drag both inside and outside the cowl. The reason why the other two types have the effect of reducing the air discharge due to temperature difference in low wind velocities is, apparently, because the "laws" of fluid flow are not the same at high and low velocities, which is an established fact.

Ventilation and Ventilators

Of the two methods of ventilation: namely, ventilation by motive power, and ventilation by natural forces, the latter is preferred, because it is not dependent upon machinery which may get out of order, and because it requires no supervision. Natural ventilation utilizes temperature difference between inside and outside of buildings, and the effects of wind pressure.

A ventilator is an opening in the roof, properly protected against rain, snow and down drafts; and surrounded by a hood in such a manner that the slightest breeze, from any direction whatsoever, will assist and increase ventilation. Occasionally a damper is required to prevent over-ventilation in cold, stormy weather. In any event, openings near the floor of the building which is to be ventilated are necessary to allow the ventilators to act.

These general requirements are met by few ventilators, and in their entirety probably only by one; namely, the American-Larson. Any gentle breeze helps ventilation with the American-Larson, whereas in most other types it hinders ventilation, blocking the upward flow of the warm inside air. As a matter of fact, ventilation is most needed on days with very little wind, because the number of days with low wind is very large compared to the number of "high wind" days.

The reasons why the American-Larson Ventilator does the work which other ventilators can not do are plainly visible in the illustration on the opposite page. No obstructions are offered to the escape of foul air; flow takes place with a gentle curvature which is no greater than is needed to protect the ventilating opening from rain or snow. Outflow of foul air is greatly helped by the drag exerted by the wind passing over the cowl and by the entraining, inducing and syphoning action of the jet of air rushing through the cowl at the proper angle and with maximum obtainable velocity. The slightest variation of wind direction turns the hood, because of the large weather vane, and because of the method of support. The hood is carried on a hard pivot point which rests in a graphite grease cup. It is kept in a vertical position by a ball bearing. The whole hood is so perfectly balanced that it turns just as freely in a slightly inclined position as it does in the vertical position. This fact is of great importance, because brickwork and sheet metal work of the roofs on which the ventilators are mounted can not be made, commercially, to absolutely correct dimensions.

Copy of "Ventilators and Natural Ventilation" sent on request.

Number and Size of Ventilators Required

The air supply per person and per hour, or the number of reversals of air contents per hour, may be taken from the following table:

Type of room to be ventilated	Number of renewals of air contents per hour	Type of room to be ventilated	Number of renewals of air contents per hour
Workshops and barracks.....	2 to 3	Restaurants..................	5 to 6
Offices	4	Kitchens.....................	8 to 12
Schools......................	5 to 8	Toilets and bathrooms........	8 to 12
Hospitals....................	5 to 8	Foundries....................	10 to 12
Churches, theaters...........	5 to 8	Pickling rooms...............	15 to 20
Dining rooms.................	5 to 10	Tanneries, paint rooms.......	10 to 12

To obtain effective, uniform ventilation and avoid local drafts, the ventilators should not be placed more than 30 ft. apart; 20 ft. distance is a good average. It is best, although not absolutely necessary, to locate the ventilators at the ridge of the roof, unless the building exceeds 40 ft. in width, in which case two rows of smaller ventilators may be used. Where the building to be ventilated is surrounded by higher buildings which obstruct air currents, it is desirable to extend the ventilators above the buildings by mounting them on stacks.

Example Showing Method of Calculation—In a building 100 ft. long, 35 ft. wide and 28 ft. average height the air is to be renewed 5 times per hour. How many and what size ventilators are required?

With a spacing of ventilators 20 ft. apart and 10 ft. from the ends, in one row along the ridge, 5 ventilators are required.

$$\frac{(100\text{x}35\text{x}28\text{ ft.})\times 5\text{ changes hour}}{5\text{ ventilators}}=98{,}000\text{ cu. ft.}$$

per hour to be exhausted by each ventilator. From the table of capacities of American-Larson ventilators under average wind and temperature conditions, the nearest size is 24 in.

Requirements: Five 24-in. ventilators.

For specified conditions of height, temperature and wind, the capacity of the American-Larson ventilator is:

$$Q=A\left[\frac{36\sqrt{H\,(t^{1}-t^{o})}}{6+v}+20\times v\right],$$

where Q equals cubic feet of air exhausted per hour, through a ventilator having a free area at the throat of A square inches mounted on a roof at a height of H feet from the center of the ventilator outlet to the floor, and with a wind velocity of v miles per hour, and average temperatures t^1 inside, and t^o outside the building.

The above is based on sufficient area of openings in the sides of the building for inlet of fresh air.

A word about tests and rated capacities. When comparing test results or table of rated capacities, see that the temperature difference and height of ventilator as well as wind velocity are given.

Continued on next page

Most other ventilators depend upon temperature difference almost altogether, whereas the American-Larson Ventilator utilizes wind pressure. The table of capacities given below is based on actual test results which take both wind velocity and temperature difference into account.

Suggested Form of Specification

(1) All ventilators shall be American-Larson Suction Ventilators, as manufactured by the American-Larson Ventilating Company, of Pittsburgh, Pa., and shall [shall not] be equipped with dampers.

(2) The ventilators shall be made of (*see Note 1*) and shall be of the following gauges:

Below 18-in. diam., No. 24 gauge; 20 to 24-in. diam., No. 22 gauge; 30 to 48-in. diam., No. 20 gauge; 54-in. diam., No. 18 gauge.

(3) Where so indicated, the ventilators shall be mounted on extension piping of sufficient height to raise ventilators above surrounding obstruction.

(4) The ventilators shall be erected plumb and in a substantial manner. Where extension pipes are used they shall be anchored to four points with heavy gauge guy wires.

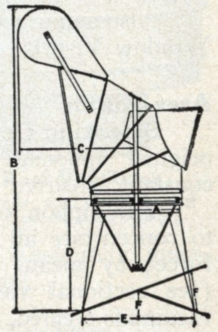
(5) Ventilators for ———— shall be equipped with fusible links to close dampers automatically in case of fire.

Note 1:

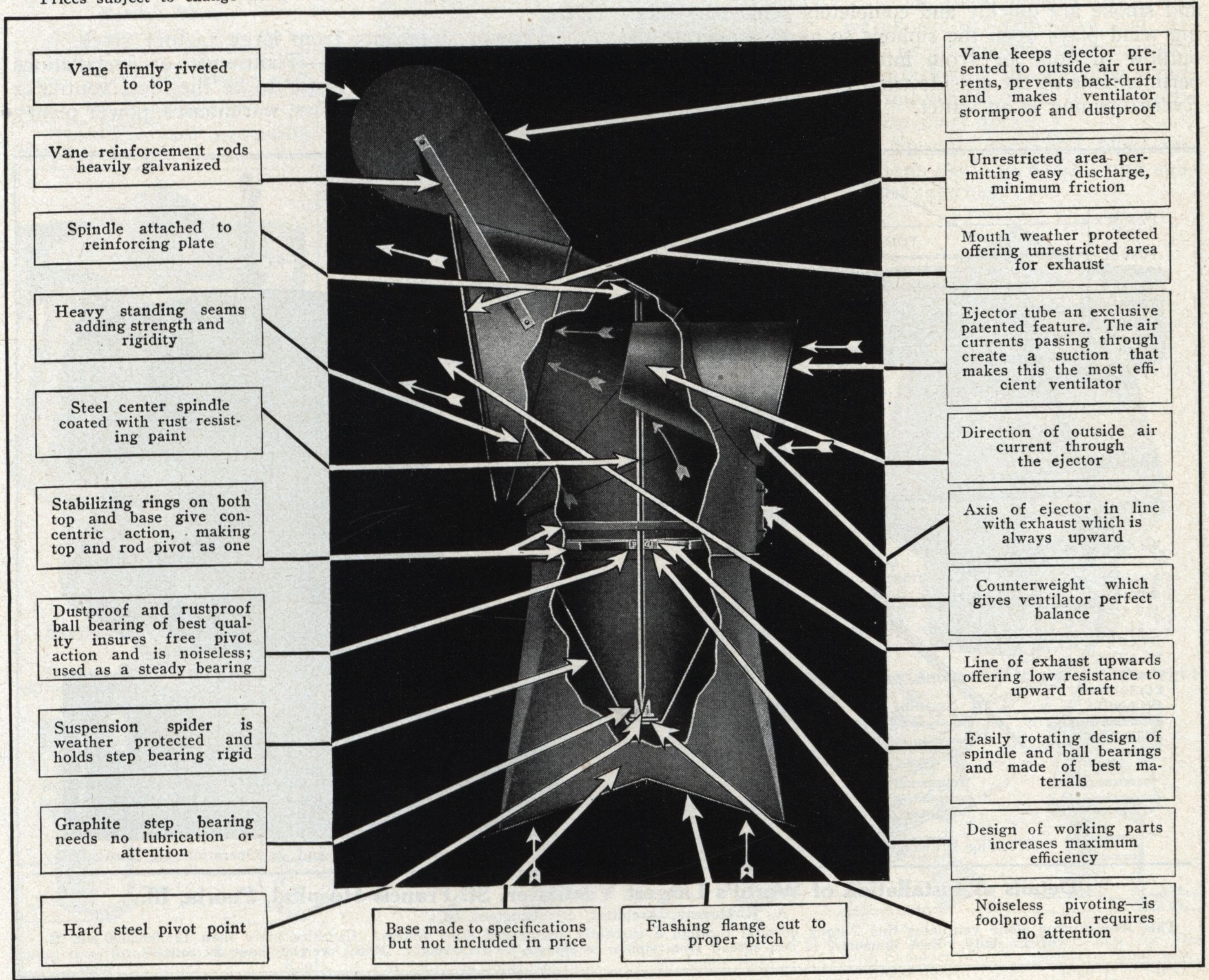
Material of ventilator	Uses of ventilator
Galvanized iron..........	1. All purposes for which no acid or corrosive fumes pass; standard practice.
Copper..................	2. All purposes for which long life is desired, provided that no strong acid or alkaline fumes pass.
Choice of metal..........	3. For ventilating buildings or rooms from which acid or other corrosive fumes rise.
Monel metal.............	4. Same as No. 3; has longer life, but is more expensive.
Zinc....................	5. Similar to copper, but a little cheaper.

DIMENSIONS, GAUGES, WEIGHTS, PRICES AND CAPACITIES

Size (throat diam.), A in.	B in.	C in.	D in.	E in.	Iron gauge No.	List price, damper	List price, ventilators only	Net weight, lb.	Crated weight, lb.	Conservative average discharge 5 miles velocity, cu. ft. per hour.
8	27	10	10	10	24	$ 1.50	$20.00	12	26	11,550
10	34	13	12	12	24	2.15	20.00	18	35	17,820
12	41	16	13	13	24	2.90	30.00	26	46	24,800
14	48	18	17	17	24	3.30	35.00	32	57	34,980
16	55	21	20	20	24	3.80	40.00	39	70	46,200
18	62	24	21	21	24	4.30	45.00	49	85	58,410
20	69	26	25	25	22	4.80	50.00	68	115	71,940
24	83	32	30	30	22	5.80	60.00	92	145	103,620
30	104	40	38	38	20	7.15	75.00	146	206	161,700
36	125	48	46	46	20	9.30	110.00	225	325	232,890
40	139	53	51	51	20	11.50	140.00	282	412	287,760
48	167	64	61	61	20	17.00	170.00	390	560	412,500
54	187	72	63	63	18	20.00	220.00	620	820	524,700
60	208	80	76	76	18	25.00	300.00	790	1025	646,800
66	229	88	84	84	18	35.00	375.00	930	1215	782,100



Prices subject to change without notice. Discounts furnished on request.


Vane firmly riveted to top
Vane reinforcement rods heavily galvanized
Spindle attached to reinforcing plate
Heavy standing seams adding strength and rigidity
Steel center spindle coated with rust resisting paint
Stabilizing rings on both top and base give concentric action, making top and rod pivot as one
Dustproof and rustproof ball bearing of best quality insures free pivot action and is noiseless; used as a steady bearing
Suspension spider is weather protected and holds step bearing rigid
Graphite step bearing needs no lubrication or attention
Hard steel pivot point
Base made to specifications but not included in price
Flashing flange cut to proper pitch
Vane keeps ejector presented to outside air currents, prevents back-draft and makes ventilator stormproof and dustproof
Unrestricted area permitting easy discharge, minimum friction
Mouth weather protected offering unrestricted area for exhaust
Ejector tube an exclusive patented feature. The air currents passing through create a suction that makes this the most efficient ventilator
Direction of outside air current through the ejector
Axis of ejector in line with exhaust which is always upward
Counterweight which gives ventilator perfect balance
Line of exhaust upwards offering low resistance to upward draft
Easily rotating design of spindle and ball bearings and made of best materials
Design of working parts increases maximum efficiency
Noiseless pivoting—is foolproof and requires no attention

American-Larson Suction Ventilator (patented)

AREX COMPANY

Industrial Ventilating Engineers

TELEPHONE
FRANKLIN 5453

1898 Conway Building, CHICAGO, ILL.

FACTORY
SOUTH GARY, IND.

EASTERN OFFICE, 132 Nassau Street, NEW YORK, N. Y.
BRANCH OFFICES IN PRINCIPAL CITIES

Products

AREX-AUSTOR (Air Exhauster), the Original Siphonage Roof Ventilator—*"The Power Fan's Only Rival."*

ECONOMY ROOF VENTILATOR (Plain Type).

Also manufacturers of "Arin" Anti-draft Window Ventilators. (Installed in Sash.)

Arex-Austor

Scientific Design—This ventilator, designed on the original siphonage principle, assures by natural means constant, positive and uniform ventilation.

The siphon or vacuo chambers are so placed as to concentrate all wind currents into a steady pulling force; by means of deflections opposite each siphon (see sectional view on following page) a powerful vacuum is created, drawing out air at a tremendous speed.

Foul air, warm air, fumes, gases, vapors, steam and smoke are quickly and completely removed. Passing wind plays upon the siphons so as to accelerate the outflow of foul air from interior of building, but it permits none of the outside wind to enter the ventilator. Every opening is an outlet.

Under ordinary conditions Arex-Austor will remove 300 cu. ft. of foul air per square inch per hour on a 9-mile wind velocity.

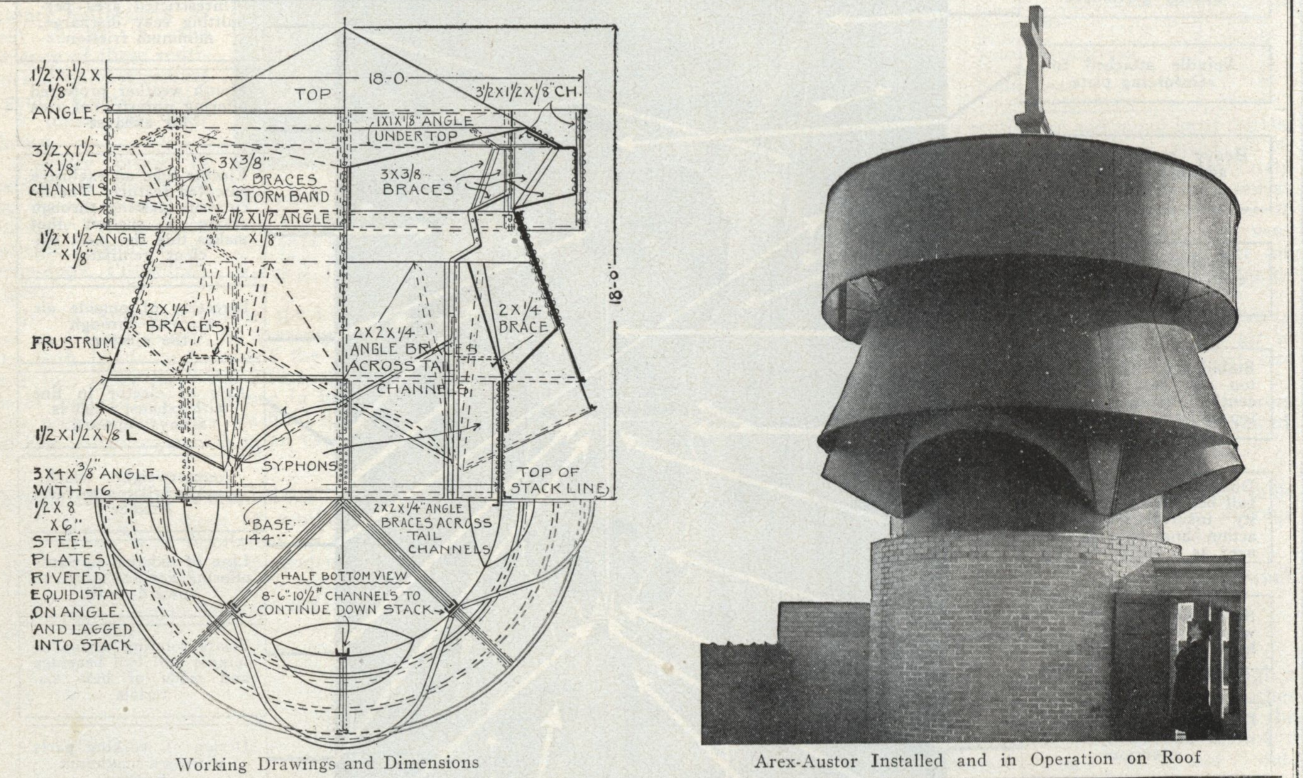
Upper part consists of a double conical deflector top surrounded by a scientifically adjusted broad storm-guard, making the Arex-Austor absolutely stormproof.

First Class Construction—Fabricated in one solid unit, no solder used, every joint rigidly riveted. Has no movable parts, no shutters or louvers to break off, no ball bearings to clog, no meaningless fancy trimmings to impede ventilating action, nothing to get out of order. In short, a ventilator, simple in principle, durable in construction and sure to give year-in and year-out service without attention or repair.

Made of galvanized iron, Ingot or Toncan metal, cold rolled copper; or in any special metal in size or gage.

Prompt shipments from large factory stock.

Wide Adaptability—Thousands of installations have proven the Arex-Austor to be the ideal ventilator for mills, factories, foundries, warehouses, power plants,


1½ x 1½ x ⅛" ANGLE
18-0
TOP
3½ x 1½ x ⅛" CH.
1 x 1 x ⅛" ANGLE UNDER TOP
3½ x 1½ x ⅛" CHANNELS
3 x ⅜" BRACES
STORM BAND
3 x ⅜ BRACES
1½ x 1½ ANGLE x ⅛"
1½ x 1½ ANGLE x ⅛"
2 x ¼ BRACES
2 x 2 x ¼ ANGLE BRACES ACROSS TAIL CHANNELS
2 x ¼ BRACE
18'-0"
FRUSTRUM
1½ x 1½ x ⅛ L
SYPHONS
3 x 4 x ⅜" ANGLE WITH -16 ½ x 8 x 6" STEEL PLATES RIVETED EQUIDISTANT ON ANGLE AND LAGGED INTO STACK
TOP OF STACK LINE
BASE 144"
2 x 2 x ¼" ANGLE BRACES ACROSS TAIL CHANNELS
HALF BOTTOM VIEW
8-6"-10½" CHANNELS TO CONTINUE DOWN STACK

Working Drawings and Dimensions

Arex-Austor Installed and in Operation on Roof

Details of Installation of World's Largest Ventilator, St. Francis Hospital, Peoria, Ill.

A. J. MORATZ, Architect, Bloomington, Ill.

This Arex-Austor alone ventilates this 7-story hospital through a carefully engineered duct system. Capacity more than 125,000,000 cu. ft. of air daily. Base diameter, 12 ft.; spread from siphon to siphon, 18 ft.; height, 18 ft.; weight about six tons

Continued on next page

train sheds, railway cars, ships, theaters, hospitals, schools, etc.

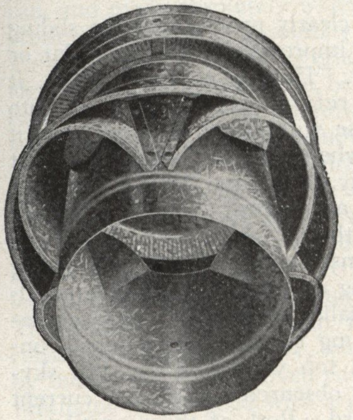
Can be installed on flat roofs, sawtooth roofs, slant roofs or on skylights and monitors.

Standard Specifications for Arex Ventilators

All roof ventilators to be Arex original siphonage ventilators as patented and manufactured by the Arex Company, 1598 Conway Building, Chicago, Ill

Caution: The phenomenal success of Arex ventilators has provoked petty imitations by name, design or principle. Beware of such infringements. Arex is the only trade-name under which our ventilator is sold.

How to Order Arex Ventilators



Bottom View

Actual photograph. Note the extraordinary outlet for escape of air—greater than in any other ventilator. Observe the immense ventilating area—the deep, penetrating siphons—the triangular channels between the siphons.

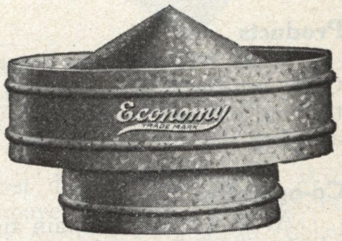
Well-balanced and mechanically perfect *throughout*

Simply multiply cubical contents of room by number of air changes required per hour. The exhaust capacity table below will indicate the exact size of Arex-Austor required.

Engineering Service

The first and foremost requirement is air exhaust capacity. Every factor that makes for or against results is of vital importance. The mere purchase of ventilating units does not in itself always solve a problem. That is why we, with 19 years' experience and the record of 150,000 successful installations, recognizing our position and responsibility as the world's largest exclusive manufacturers in this field, surround our product with an engineering service aimed to assure maximum Arex efficiency. This service consists of analyzing a problem, preparing sketch or blue print, making correct recommendation and giving valuable information and expert advice on this all important subject of ventilation.

Economy Roof Ventilator



Economy Roof Ventilator

Same high grade workmanship and materials as used in Arex-Austor

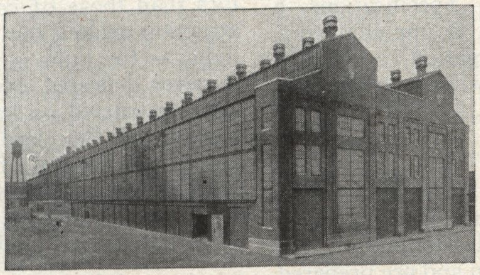
This ventilator is designed to meet the demand for a ventilator at lowest possible cost, yet capable of solving any ordinary ventilating problem.

Manufactured in attractive proportional design of solid sturdy construction. Absolutely guaranteed stormproof.

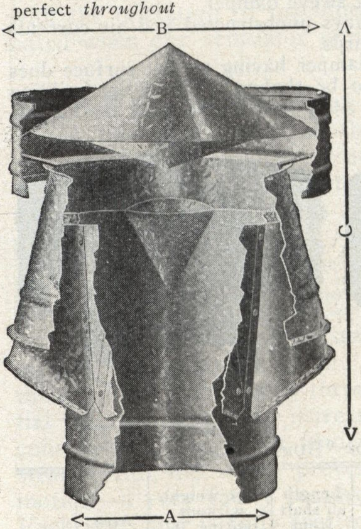
Manufacturing Facilities

Our own modern plant and warehouse at South Gary, Ind., afford us unequalled advantages for manufacturing and shipping standardized ventilators in large quantities on short notice.

Special bases and pipe connections made to order from submitted sketches.



121 Arex-Austors on This Forge Shop



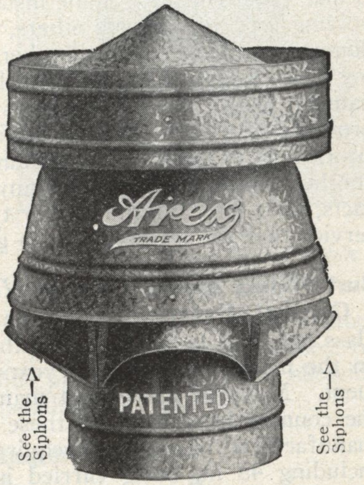
Sectional View of Arex-Austor

Showing siphonage system and extraordinary outlet for escape of air

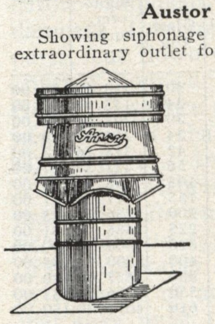
AREX-AUSTOR (ORIGINAL SIPHONAGE)
GALVANIZED

Principal dimensions, in.			Exhaust per hour, cu. ft.
A	B	C	
6	9	12	9425
7	10½	14	12828
8	12	16	16755
9	13½	18	21206
10	15	20	26180
12	18	24	37699
14	21	28	51313
16	24	32	67021
18	27	36	84823
20	30	40	104720
22	33	44	126711
24	36	48	140796
26	39	52	176976
28	42	56	205251
30	45	60	235619
36	54	72	339293
42	63	84	461813
48	72	96	603187
54	81	108	763407
60	90	120	942477

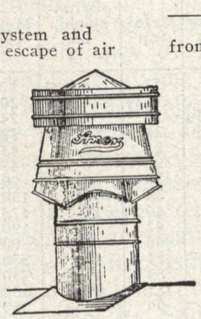
Immediate shipment from large stock always on hand from our factory at South Gary, Ind.



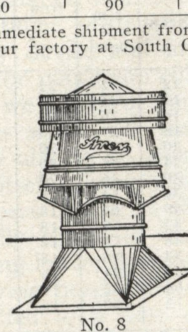
Arex-Austor (Original Siphonage)



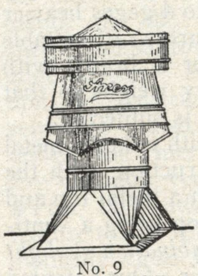
No. 3
Round Base for Slant Roof



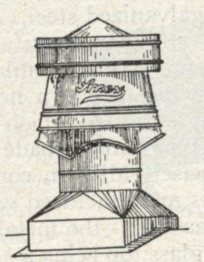
No. 5
Round Base for Gable Roof



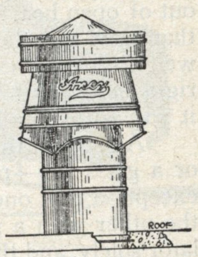
No. 8
Square to Round Base for Slant Roof



No. 9
Square to Round Base for Gable Roof



No. 12
Square to Round Base with Shoulder for Gable Roof



No. 13
Round Base for Flat Concrete Roof with Angle Iron Ring at Bottom

Typical Standard Installations of Arex-Austors (Original Siphonage)

ESTABLISHED 1890

BURT MANUFACTURING COMPANY

Manufacturers of Roof Ventilators

600 Main Street, AKRON, OHIO

BRANCH OFFICES

CHICAGO, ILL., 169 West Chicago Avenue
DENVER, COLO., George P. Heinz & Co., 1740 Champa Street
NEW YORK, N. Y., E. A. Fraser, Mgr., 7 West 42nd Street
KANSAS CITY, MO., Natkin Engineering Co.
LOUISVILLE, KY., Sheet Metal Supply Co.
WASHINGTON, D. C., Paul H. Brattain, Albee Building
PITTSBURGH, PA., Dravo-Doyle Co., Dravo Building
ATLANTA, GA., The Steel Specialties Co.
DETROIT, MICH., B. E. Englander, Hoffman Building
ST. LOUIS, MO., F. A. Cammann Builders Service Co.
NEW ORLEANS, LA., Woodward-Wight & Company
PHILADELPHIA, PA., Penn Building Specialties Company
CHARLOTTE, N. C., The Metal Window Products Company, P. O. Box 94
MONTREAL, QUE., George W. Reed & Co., 84-87 St. Antoine Street
ALL OTHER PRINCIPAL CITIES

Products

Burt Roof Ventilators: Sliding Sleeve Damper, Glass or Metal Top; Double Damper; Fan; Fire Retarding Sliding Cone Damper; Square and Rectangular; and Ball Bearing Revolving.

Co-operative Services

At Akron, we maintain an Engineering Department which will gladly and expeditiously co-operate with architects, engineers, contractors and others in selecting proper types and sizes of ventilators to suit particular conditions and requirements. Blue prints of our various types will be gladly furnished on application. Specifications, a rough pencil sketch or blue print sent to our engineers, will bring you, without cost or obligation, a detailed analysis of your situation together with recommendations.

Ventilators for all Installations

After 25 years in the ventilating business, we have proved beyond the question of a doubt that no single type ventilator will adequately meet all conditions. We have designed a type for every condition and are prepared to tell exactly what type and size will handle your particular requirements. Some installations will require revolving type ventilators; others, metal top sliding sleeve ventilators, and still others will need a fire retarding type; weave sheds will best be suited by our double damper weave shed ventilator. Conclusive tests have proved that under certain conditions one of these ventilators will exhause its maximum per cubic foot while another type will hardly pull anything. Knowing these facts, then selecting the proper type of ventilator is the service that we are prepared to give.

Burt Sliding Sleeve Damper Ventilator

General Description—Made with either metal or glass top, it is the standard of the world. Having been on the market for over 20 years it is no mere experiment. Many of the largest manufacturing concerns in the country have installed these ventilators. They are manufactured in any size required; all sizes up to and including 48 in. being carried in stock so that immediate shipment can be made. They are made throughout of open hearth galvanized steel (2 to 4 gages heavier than used by other ventilator manufacturers) of suitable weight for each size. Every ventilator is braced with rigid *galvanized* bracing of extra heavy weight so that it will withstand any strain to which it is subjected.

As stated, this type can be made with either a metal or a glass top—precisely alike in construction, with the exception that one is manufactured with a metal top and the other with a glass top—the metal top being a ventilator solely, and the glass top being a *combination skylight and ventilator,* admitting both light and air. Our patented sliding sleeve damper is furnished in both types, but ventilators can be furnished without dampers.

Thorough tests have clearly proved that the sliding sleeve damper is a great improvement over the flat or butterfly type of damper. Having no flat surface, it does not collect dust or refuse to be shaken off into the building, as is the case with other dampers; and it maintains its position wherever set, while the flat damper is kept constantly in motion by air currents and requires frequent adjustment. Sliding sleeve damper ventilators leave the air shaft open and unobstructed at all times, consequently greatly increasing their pulling power, making it possible to ventilate buildings adequately with a smaller number of Burt ventilators than those of competing types. This damper construction makes our glass top ventilator an ideal skylight, as the light is never obscured and the air current is never deflected downward. Both of these ventilators are constructed on scientific principles, and tests by the Bureau of Standards show that Burt ventilators are at or near the top of the list. Summing up the above, the following exclusive features not found in any other ventilator should be written into specifications:

(1) Telescopic or sliding sleeve damper.

(2) The air shaft is always unobstructed and air currents are never deflected downwards.

(3) The sliding sleeve damper having no flat surface does not collect dust or refuse to be shaken off into the building

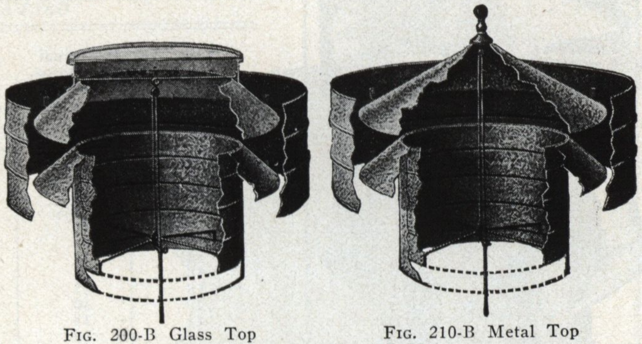


Fig. 200-B Glass Top

Fig. 210-B Metal Top

Sectional Views of "Burt" Ventilators

Diameters, in.		Gage of iron	Height without base, in.		Length air shaft from bottom of wind-shield, in.	Net weight without crating, lb.		Area of diameter, sq. in.	Price
Neck	Outer rim or band		Glass top	Metal top		Metal top	Glass top		
12	22	22	14	17	4¼	17	20	113.10	$8.00
14	24	22	15	17½	4¼	20	24	153.94	12.00
16	26	22	15½	19	5	24	30	201.06	15.00
18	29	20	16	21	5½	28	34	254.47	19.00
20	32	20	18	23	5½	33	42	314.16	23.00
24	38	20	22	26	6	45	56	452.39	27.00
30	46	20	24	30	6	90	105	706.85	38.00
36	54	18	27	36	8	130	155	1017.88	57.00
40	64	18	33	40	10	175	200	1256.00	75.00
42	68	18	34	42	10	190	225	1386.00	81.00
48	78	18	36	46	11	300	320	1809.00	90.00
54	86	18	40	51	14	350	400	2390.00	105.00
60	94	16	43	54	12½	430	480	2827.00	120.00
66	102	16	46	55	15½	500	550	3456.00	135.00
72	110	16	51	66	15½	560	610	4071.00	150.00

Prices f. o. b. Akron, Ohio, and include sliding sleeve damper.

Ventilator bases are charged for extra, for which prices will be quoted on receipt of specifications. Operating rope or chain not furnished.

Discounts on application.

Continued on next page

as is the case with most other dampers. Not being affected by wind currents, it requires no attention.

(4) The sliding sleeve damper after once being adjusted is held permanently in place by our patented clip, therefore making it unnecessary for one to fasten the cord to a nail, hook or post, as is the case where a common flat damper is used.

(5) Our patented trough or lip is placed below the glass to collect any condensation, making it impossible for water to find its way into the building.

(6) An especially designed patented notched rim is used to fasten the glass so that it can be shipped separately and then placed in position. If the glass is broken in any way it can easily be replaced without taking the ventilator from the roof.

Construction—The glass top is equipped with heavy ribbed wire glass held in place by patented notched rim, and made absolutely watertight by means of waterproof cement. It is absolutely guaranteed against leaks. This manner of fastening glass to the ventilator is an ideal one, as the glass can be replaced at any time by removing notched rim, therefore making it unnecessary for the ventilator to be removed from the roof.

The trough or lip feature (patented) is placed below the glass top into which runs any condensed water which may gather on the glass, making it impossible for condensation to get into the building. A similar trough is also placed on the lower part of the base to collect all condensation which may form on the air shafting. The patented damper with these types of ventilators consists of a sliding sleeve, which is operated from below by means of a cord, over rust resisting pulleys. Each ventilator is equipped with a patented clip so that whenever it is necessary to adjust the damper it can be set in any position and held there permanently, thereby doing away with the necessity of fastening to a cord, nail, hook, post, or counterbalance. In most cases, where the common flat damper is used, it is necessary to fasten the cord to some convenient place which often interferes with the operation of machinery. This defect is eliminated when our ventilator is used.

Burt Ball Bearing Revolving Ventilator

A late development in the "Burt" line of ventilators—neat, well constructed and highly effective. This ventilator is equipped with two sets of high grade case hardened steel ball bearings and is positively guaranteed not to stick or bind.

Note: In order to satisfy people who are not convinced as to our type of bearing, we are prepared to install at no additional charge bronze ball bearings in place of the hardened steel bearings. We do not recommend nor guarantee this type, but will furnish them if specified.

Its design and open back construction causes the air currents to pass not only over the top and sides of the ventilator but directly through it. This creates a partial vacuum and greatly increases its pulling power. This construction also has a tendency to hold the ventilator steady with the wind, preventing continuous whirling motion—a very faulty feature in most revolving types. Each ventilator is fully erected and tested in our factory before shipment, insuring perfect balance. Louver dampers (obstructing bracing) and other obstructive parts, cut down the efficiency of any device and are omitted from our ventilator, giving it the maximum efficiency. In place of louvered dampers we install or furnish free of charge dampers in bases which are furnished by us. In that manner we are able to do away with any obstructions in the ventilator itself, giving it the maximum efficiency. If desired, dampers can be of the fire retarding type which automatically closes in case of fire. Another reason for not installing louver dampers or dampers of any kind in the revolving head itself is that they must necessarily be connected to a rope or chain, offering another common cause for sticking and binding.

BURT BALL BEARING REVOLVING VENTILATORS

Diam. neck, in.	Price without damper	Gauge of iron	Wt. lb.	
			Net	Crated
8	$ 12	22	18	30
10	14	22	20	35
12	16	22	30	50
14	24	22	35	65
16	30	22	42	75
18	38	20	50	100
20	46	20	60	125
24	54	20	90	160
30	76	18	140	220
36	114	18	190	310
40	150	18	250	350
42	162	18	280	470
48	180	18	390	650
54	210	18	575	750
60	250	16	650	980

F.o.b. Akron, Ohio, U. S. A. Discounts on application.

Quotations on larger sizes on application. Bases extra.

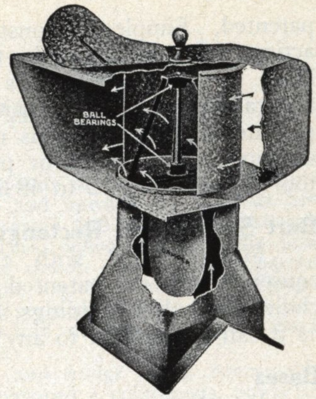


FIG. 800-Z
BALL BEARING REVOLVING VENTILATOR

Burt Fan Ventilator

Designed for the most difficult conditions. Will effectively and quickly remove excessive fumes, odors, etc., from blacksmith shops, dyehouses, foundries, rubber factories, theaters, schools, laundries and other similar buildings. Being power driven, it is positive in its action at all times and we can thereby guarantee that it will exhaust over a given period, approximately, 10 times more vitiated air than any stationary or revolving ventilator. The fan running at a speed of from 450 to 600 r.p.m. is operated from either a line shafting or by means of a motor. This motor can be installed in the housing on the side of the ventilator itself or can be operated from below by means of idlers. Power required to operate motor is from ¼ to ½ hp. This ventilator is equipped with our fire retarding damper so that in case of fire the fusible links melt, closing the damper and thereby shutting off all draft. It is manufactured in three stock sizes, 30, 36 and 48 in., but can be made in any size required above 24 in. Blue prints on application showing different methods of installing.

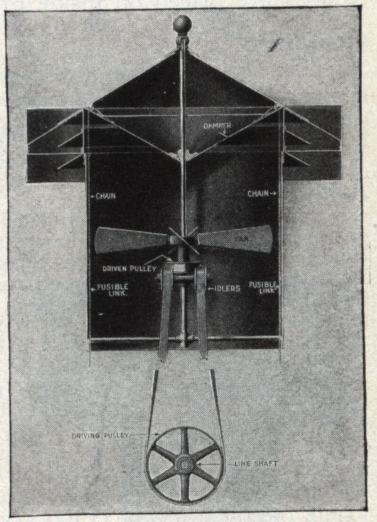


FIG. 650-Z
SECTIONAL VIEW, "BURT" FAN VENTILATOR

Burt Sliding Cone Damper Ventilator

Primarily designed to meet the requirements of the insurance companies and underwriters associations of America, this ventilator also possesses the merits of any common ventilator with the additional feature that it will automatically close in case of fire. Raising and lowering device—

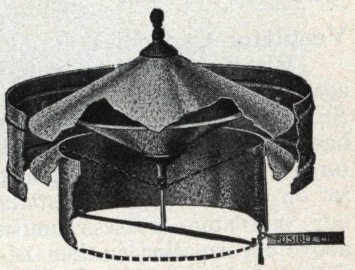


FIG. 500-X
SECTIONAL VIEW, "BURT" SLIDING CONE DAMPER VENTILATOR
With cone damper open

Continued on next page

patented. Simple in construction and positive in its action, it is guaranteed by this company not to stick or bind. Cone damper moves up and down on center rod and can be held in any position desired by means of our patented clip so that it is not necessary to fasten cord or rope to nail, hook, or post. Made only with metal top. Sizes from 12 to 48 in. carried in stock.

Burt Square and Rectangular Ventilator

Manufactured with either metal or glass top, equipped with our patented sliding sleeve damper. The choice for public buildings, foundries, schoolhouses, etc., as it can be adapted to any size or shape roof opening.

Bases

Burt bases are made separately for each job to conform to pitch of roof. Made either round or square, but square bases are recommended for maximum efficiency, capacity and rigidity. Bases are extra heavy, made from the same heavy gauge iron as the ventilator itself. Bases are always charged for as extra. Prices on application. Made from open hearth galvanized steel unless otherwise specified. Zinc, lead clad sheets, copper, Toncan metal, aluminum, Monel metal or ingot iron will be furnished when specified at slight additional cost. All bases, including smaller sizes, are made with at least a 4-in. flashing, making them absolutely stormproof; condensation troughs are placed on inside of base.

Guarantee

This company absolutely guarantees its ventilators against defects in workmanship and material and will replace free of charge f. o. b. our factory any ventilator which is proved to be so defective.

Additional Information

Ventilators and bases, as stated above, are constructed of open hearth galvanized steel braced throughout with galvanized band iron, all other accessories being of rust resisting material. However, we are prepared to make up ventilators or bases from zinc, copper, lead clad sheets, Toncan metal, aluminum, Monel metal or American ingot iron at slight additional cost.

Complete data and prices will be sent on request.

Bear in mind that pivoted sash, sawtooth or monitor roofs are not ventilators and are useful for light only.

Wind pressure, direction, humidity and angle govern window ventilation and produce contrary results—generally opposite effects. Louvre dampers of any kind generally cause downward drafts of currents, thereby defeating the purpose of the ventilator.

TABLE OF SPECIAL AIR CURRENTS FOR VARIOUS SERVICES

Kind of room or building to be ventilated	Number of air changes necessary per hour
Workshops and factories	2 to 3 times
Restaurants, schools, hotels, foundries	5 to 8 times
Rooms containing fumes, smoke or odors	15 to 20 times
Rooms containing paint or used for drying laundry	10 times
Rooms tightly closed where it is desired to prevent sweating	15 times
Rooms in which it is desired to remove light dust	20 times
Rooms heated up to and including 100° F.	10 to 20 times
Rooms heated from 100 to 120° F.	20 to 30 times

Ventilator Capacities

We desire to go on record as being very much against publishing ventilator capacities. The Bureau of Standards at Washington (which is the only fair test) has given us reports which indicate that our Burt ventilators of all types are the equal or superior of any ventilator on the market, which statement should convince that our ventilators possess unusual merit. We give the above information in lieu of capacities, owing to the fact that there are so many variables going into data of this kind that it is a very difficult proposition to arrive at accurate conclusions. As stated above, the temperature of the air, both inside and outside of the building, relative humidity of same, and the specific installation of each ventilator, all go to vary the exhaustive capacity of our ventilator or any ventilator on the market. We do have tests and capacities in our offices which we will furnish on request, but we feel that our guarantee and proposition to place one of our ventilators of any type side by side with any other ventilator, allowing your engineers to be the sole judge of the merits of the two, is the best proposition we can make.

Specifications

Metal Top Ventilator—(1) Furnish and install on roof, where shown on drawings, Burt Metal Top Ventilators, as manufactured by the Burt Manufacturing Company, Akron, Ohio.

(2) Ventilators shall be of diameters shown and shall be constructed of open hearth galvanized steel prime sheets of Burt Manufacturing Company's standard gauge, strongly braced with galvanized steel bands and properly riveted.

(3) Ventilators shall be provided with sliding sleeve dampers, operating by chains or cords over rust resisting pulleys and equipped with clips so that they can be set in any position and held permanently. When sleeve is at its highest point it shall completely close ventilator.

(4) Ventilators shall be guaranteed against defects in workmanship and material by the manufacturer, who shall agree to replace or repair without charge, f.o.b. factory, any ventilator proving so defective.

(5) Ventilators shall be thoroughly flashed to the roof and be made absolutely watertight.

Glass Top Ventilator—(6) Furnish and install on roof, where shown on drawings, Burt Glass Top Ventilators, as manufactured by the Burt Manufacturing Company, Akron, Ohio.

(Insert paragraph 2 here.)

(7) Ventilators shall be provided with notched rims as manufactured by the Burt Manufacturing Company, Akron, Ohio, for holding glass in place so that same can be replaced if necessary without removing ventilators from roof.

(8) Ventilators shall have troughs or lips placed below glass so as to conduct any condensation or moisture that may form to the roof.

(Insert paragraphs 3, 4 and 5 here.)

Double Damper Ventilator for Weaving Rooms—(9) Furnish ventilators for weaving rooms, as shown on drawings, to be provided with double dampers as manufactured by the Burt Manufacturing Company, Akron, Ohio.

(Insert paragraphs 2, 4 and 5 here.)

Fan Ventilators—(10) Ventilators in ......, as shown on drawings, shall be Burt Fan Ventilators, provided with 6-blade fan mechanism which can be operated by belt from line shafting or belt from motor.

Note: 24-in. fan to have ¼ hp. motor; 30 and 36-in., ⅓ hp. motor; above 36-in., ½ hp. motor; to be standard as furnished by the Burt Manufacturing Company, Akron, Ohio, unless otherwise specified.

(11) Fan ventilators shall be provided with cone dampers, operated by cord or chain and rust resisting pulleys with fusible links which will cause dampers to drop and completely close in case of fire.

(Insert paragraphs 2, 4 and 5 here.)

Sliding Cone Damper Ventilators—(12) Furnish and install on roof, where shown in drawings, Burt Sliding Cone Damper Ventilators as shown on drawings, and manufactured by the Burt Manufacturing Company, Akron, Ohio.

(13) These ventilators shall bear the approval of the Underwriters Association of America.

(Insert paragraph No. 11, but substitute "cone damper regulators" in place of fan. Follow with paragraphs 2, 4 and 5.)

Ball Bearing Revolving Ventilators—(14) Furnish and install on roof, where shown on drawings, Burt Ball Bearing Revolving Ventilators as manufactured by the Burt Manufacturing Company, Akron, Ohio.

(15) Ventilators shall be equipped with two sets of hardened steel ball bearings, and shall have open back construction so as to hold ventilators steady with the wind.

(Insert paragraphs 2, 4 and 5 here.)

Note: In order to satisfy people who are not convinced as to our type of bearing, we are prepared to install at no additional charge bronze ball bearings in place of the hardened steel bearings. We do not recommend nor guarantee this type, but will furnish them if specified.

Square and Rectangular Ventilators—(16) Furnish and install on roof where shown on drawings, Burt Square or Rectangular Ventilators as manufactured by the Burt Manufacturing Company, Akron, Ohio. These ventilators shall be equipped with sliding sleeve dampers or common flat dampers, and with glass or metal top.

(Insert paragraphs 2, 4 and 5 here.)

Note: If ventilators are to be constructed from copper, zinc, lead clad sheets or any other metal, insert these words in proper space above.

THE JOHN CALL COMPANY

Ventilating Specialists

TELEPHONE
Market 4969 (Bell)

122-128 No. Franklin Street, PHILADELPHIA, PA.
BRANCH OFFICES IN ALL PRINCIPAL CITIES

THE LIBERTY VENTILATOR
A GIANT IN POWER
THE JOHN CALL CO
VENTILATING SPECIALISTS
122 N. FRANKLIN ST.
PHILA. PA.

TRADE-MARK
Reg. 197990

Liberty Roof Ventilator

The most scientific roof ventilator made and the highest expression of modern ventilating engineering. So ingeniously does it harness and utilize outside air currents that their ventilating action is positive, constant and unfailing, regardless of their direction, angle or velocity.

Upward, downward, horizontal or swirling air currents are all brought under control and made to perform the task in hand—that of drawing heat, vitiated air, fumes, steam, smoke or floating dust up and out of the building.

Positive and Constant Ventilation—The Liberty ventilator is the result of many years of experimentation and tests. It has no moving parts—there is no rattle or wear, and no oiling or other attention is necessary. It requires no mechanical power and does not depend on certain wind direction or velocities—it is always "pointed" for action.

It functions in the slightest zephyr. The poor ventilator stops functioning in low wind velocities—the Liberty continues to function under such conditions long after ordinary ventilators cease.

Scientifically Designed—The Liberty ventilator utilizes four principles of physical science: (1) air impingement; (2) positive and negative air action, both pressure and vacuum; (3) siphonage; (4) stack action.

Eight vertical blades or fins are attached to the eduction pipe and covered by a frustrum-shaped skirt, forming eight narrowing chambers or tubes. Those on the positive side (facing the wind) act as air catchers; those on the opposite or negative side become siphons. Horizontal and upward air currents are mainly guided, compressed and accelerated through the funnellike chambers, deflected across the pipe opening, and further drawn along by the partial vacuum created in the negative chambers. Downward air currents, cleverly controlled, create a partial vacuum and suction no less effectual. *Back drafts are impossible.*

In this manner and under every conceivable wind condition is developed a continuous, powerful pulling force that assures positive and constant ventilation.

Does Not Depend on Stack Action—The Liberty ventilator is unique in that it utilizes stack action, yet is not in the slightest degree dependent upon it in order to function properly. When stack action (warm air rising) does occur, it simply accelerates this ventilator's pulling power.

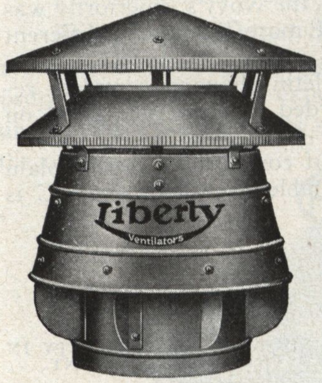
In tests made by the Carnegie Institute of Technology, the Liberty ventilator was shown to pull tremendously where the temperature inside the building was actually ten degrees lower than the temperature outside of the building.

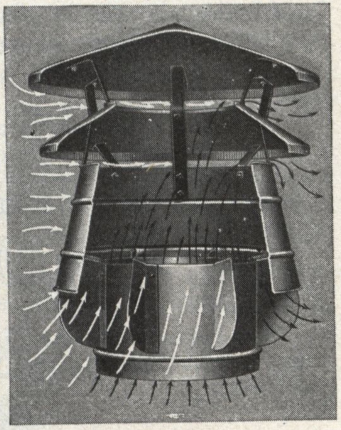
The Liberty ventilator has free areas for unobstructed stack action equal to more than 200% of the area of the pipe opening, thus a "no resistant constant" is guaranteed.

Built Right—The Liberty ventilator is staunchly built, weatherproof, and well designed. It is the most practical, efficient, dependable and in the end the most economical roof ventilator for factories, foundries, train sheds, etc. It is also an invaluable auxiliary for mechanical ventilating systems and for correcting faulty drafts in chimney flue stacks.

Sizes—Made in any size desired, of galvanized iron, copper or any special metal. Large stocks carried.

More Than 1000 Prominent Users—Write for list.





Liberty Ventilator

Black arrows indicate foul air coming from building. *White* arrows indicate trend of outside air, which causes impingement on ventilator, creating a vacuum, sucking air from main exhaust or eduction tube

Size	Area, sq. in.	Exhaust per hr., cu. ft. in 5-mi. wind*	Approx. shipping wt., lb.	Gauge of metal	Weight, copper, oz	
					Light	Medium
6	28	6,364	6	26	12	16
7	38	8,661	11	26	12	16
8	50	11,331	14	26	12	16
9	64	14,315	16	26	12	16
10	79	17,671	19	24	14	18
12	113	25,446	26	24	14	18
14	154	34,638	36	24	16	20
16	201	45,234	51	24	16	20
18	254	57,252	65	24	16	20
20	314	70,697	90	22	16	20
22	380	85,536	103	22	16	20
24	452	101,802	125	22	16	20
26	531	119,459	150	22	18	22
28	616	138,542	180	22	18	22
30	707	159,054	220	20	20	24
36	1,018	229,038	395	20	20	24
42	1,385	311,721	460	20	20	24
48	1,810	405,360	600	20	24	28
54	2,290	515,160	850	20	32	36
60	2,827	636,000	900	18–20	36	40
66	3,421	769,800	990	18–20	36	40
72	4,072	915,948	1,400	16–18	40	48
84	5,542	1,246,752	2,150	14–16	42	48
96	7,238	1,628,748	3,300	14	48	60
108	9,161	2,061,612	5,600	12–14	48	60
120	11,310	2,544,600	7,300	12–14	60	72
132	13,685	3,359,232	10,200	12	72	84
144	16,286	3.664.440	11.400	12	72	84

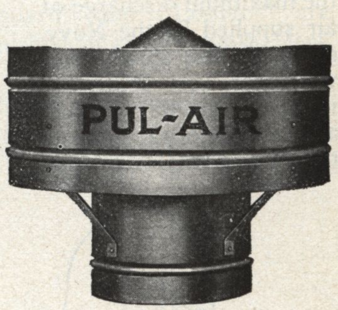
*Tests by Massachusetts Institute of Technology and Carnegie Institute of Technology.

Pul-Air Roof Ventilator

A mushroom type ventilator that is correctly and substantially built to serve conditions where the use of the Liberty ventilator is unwarranted. Tested by unbiased engineers in competitive tests and declared superior to the common type of ventilator.

Made of any metal desired.

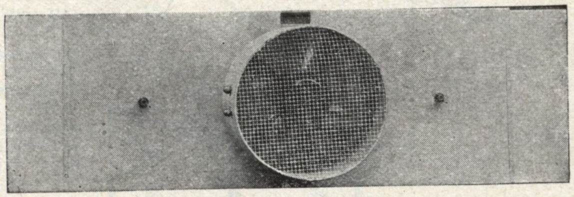
Large stocks for immediate shipment.



Pul-Air Ventilator

Call Window Ventilator

A pressed steel adjustable panel (highly finished in baked enamel) and an electric driven exhaust fan. Portable, light in weight and reasonable in cost. Exhaust capacity is, approximately, 1000 cu. ft. per min. Price, $30.00 to $37.50.



Call Window Ventilator

Yuga Varnish

Yuga is a high grade, high gloss finish. It dries dust free in 2½ hours and is "rubbing dry" and impervious to the weather in 8 hours. These remarkably quick drying qualities do not affect its durable, high luster. Yuga flows freely, levels perfectly, and forms an extremely tough surface film.

Its high gloss, which it retains indefinitely, is not marred by repeated washing, nor is it affected by caustic soda (a component of many soaps), salt air, ammonia, alcohol, and hot or cold water.

NOVY ROTARY VENTILATOR

MANUFACTURED BY

Decatur Cornice & Roofing Company, Inc.
ALBANY, ALA.

Novy Ventilator Manufacturing Co.
MUSKOGEE, OKLA.

Novy Rotary Ventilator

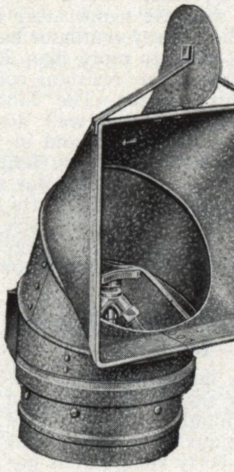
Scope of Use—The Novy Rotary Ventilator is particularly valuable in ventilating factories, foundries, powerhouses, schools, dairies, theaters, warehouses, office buildings, stores, hotels, private dwellings, etc.

Oilless—A rotary ventilator that requires no oiling. Can not stick from corrosion or freezing. Handles smoke, lint or dust, as effectually as it does air, a service we believe no other ventilator can supply. Has no ball bearing parts to constantly require attention.

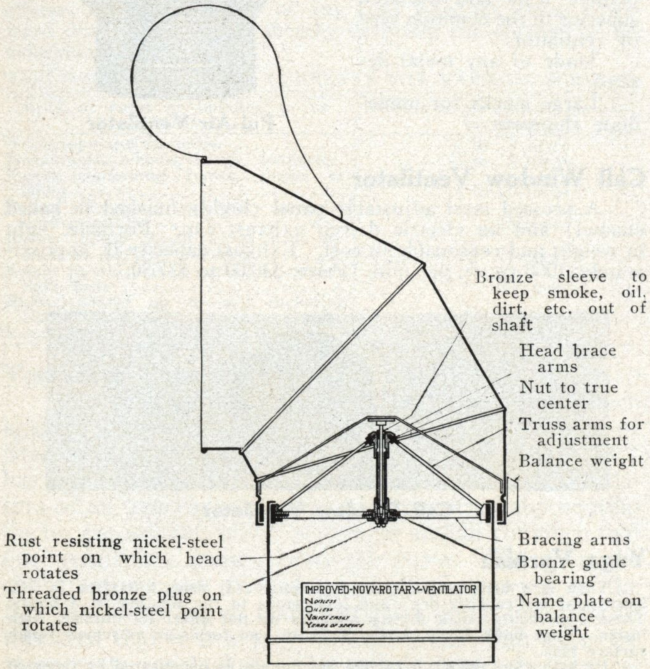
Bearing—The Novy is seated on a rust resisting nickel steel point which permits a noiseless operation at all times, and it never requires attention after the installation. The *pivot bearing* used exclusively in the Novy is the simplest and most efficient bearing known.

Area—The area of the mouth of the ventilator being 50% greater than that of the throat permits the Novy supplying a discharge of air that cannot be surpassed, if equalled, in any other rotary ventilator.

Efficiency—Due to the maximum discharge of air supplied by the Novy, a considerably smaller size ventilator, or fewer in number, can be specified and satisfactory results obtained at a minimum cost.



Side View



Bronze sleeve to keep smoke, oil, dirt, etc. out of shaft
Head brace arms
Nut to true center
Truss arms for adjustment
Balance weight
Bracing arms
Bronze guide bearing
Name plate on balance weight
Rust resisting nickel-steel point on which head rotates
Threaded bronze plug on which nickel-steel point rotates
IMPROVED-NOVY-ROTARY-VENTILATOR

Improved Novy Rotary Ventilator

LIST PRICES, SHIPPING WEIGHTS AND CAPACITY OF NOVY GALVANIZED ROTARY VENTILATORS

Throat diam., in.	Approx. crated weight, lb.	List price vent. only	List price damper	List price half-inch mesh wire for mouth of vent.	Discharge 10 miles wind velocity per hour, cu. ft.
10	39	$ 22.00	$ 2.25	$ 1.15	28,050
12	47	30.00	2.50	1.55	39,780
14	57	35.00	3.00	1.90	54,570
16	69	40.00	4.00	2.30	71,190
18	82	45.00	6.00	2.70	90,270
20	107	50.00	7.00	3.10	111,180
24	125	60.00	8.00	3.85	160,221
30	175	75.00	10.00	4.65	250,350
36	277	110.00	12.50	5.40	360,468
40	361	140.00	15.00	6.00	445,026
48	480	170.00	18.00	7.30	640,866
54	705	220.00	20.00	8.45	811,104
60	885	300.00	26.50	9.65	1,001,382
66	1050	375.00	35.00	10.80	1,211,658

Note: Prices on ventilators of copper and zinc, also on bases, will be quoted on application.

Correction of Faulty Drawing Furnace

The Novy Ventilator is extensively used to correct faulty drawing furnaces and chimneys. When specifying for this purpose, so state, as it is necessary to construct them of heavier gauge material.

Test

In an impartial comparative test of automatic ventilators conducted by the mechanical engineering department of a western university, the Novy's superiority was demonstrated over a field of more than forty different makes of ventilators.

Copy of university bulletin showing complete results of test will be forwarded to those interested on application.

List below is the table of comparative test of plain rotary ventilators. In this table Ventilator No. 4C is the Novy.

TABLE III—RESULTS OF TESTS SHOWING THE VELOCITY IN FEET PER MINUTE INDUCED THROUGH DIFFERENT PLAIN ROTARY VENTILATORS
VENTILATOR NO. 4C IS THE NOVY

Velocity of wind in miles per hour	Velocity induced through ventilator, feet per minute	Velocity of wind in miles per hour	Velocity induced through ventilator, feet per minute	Velocity of wind in miles per hour	Velocity induced through ventilator, feet per minute
No Ventilator		**Ventilator No. 1C**		**Ventilator No. 2C**	
3.42	132	3.32	150	3.51	158
4.73	193	4.60	213	4.88	224
4.97	206	6.92	308	7.06	310
6.58	273	7.93	359	7.39	338
8.08	327	9.19	405	7.93	352
9.40	376			9.42	434
				9.43	408
Ventilator No. 3C		*Ventilator No. 4C*		**Ventilator No. 5C**	
3.32	137	*3.37*	*166*	3.32	137
4.78	203	*4.91*	*251*	4.78	203
5.00	221	*6.32*	*333*	5.00	221
7.39	320	*7.40*	*387*	7.39	320
9.58	410	*7.96*	*412*	9.58	410
		9.80	*495*		
		Ventilator No. 6C			
		3.30	123		
		4.83	182		
		6.65	251		
		7.39	281		
		8.39	313		
		9.46	345		

WALTER B. GILBERT & CO.

Manufacturers of "Pullman Ventilators"

YORK, PA.

REPRESENTATIVES

NEW YORK, N. Y., 203 East 15th Street
HELENA, MONT., Raymond C. Glant
ST. PAUL, MINN., O'Connell Supply Co.
TORONTO, ONT., A. & F. Fisher

Products

Pullman Ventilating Roof Cowls; Pullman Sash Ventilators.

Also, Pullman Window Ventilators; Automatic Fire Retarding Dampers.

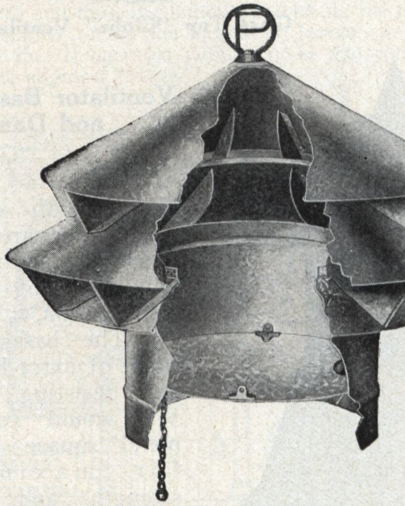
Pullman Ventilating Roof Cowls

Operation—These consist of three cones with spacing diaphragms between, and arranged in such a manner that the outside wind movement from any direction is conducted through constantly *narrowing* channels having an upward pitch of 30°.

These narrowing channels increase the velocity of the air passing over the flue opening. Spreading out through the constantly *widening* channels on the opposite side, this air draws with it the foul air or gases from the room below.

Pullman Cowls are always in position to work.

Specification Data—Standard Pullman Cowls are regularly made of prime galvanized steel sheets of the proper gauge, with all exposed edges wired or turned under, and with the rivets so set that the heads are on the outside.



(Patented)
Pullman Ventilating Roof Cowl Fitted with Automatic Fire Retarding Damper

Fitted with automatic fire retarding dampers and bases with condensation troughs to carry the water of condensation from the inside of the ventilator to the roof outside

Pullman Sash Ventilators

Description—These consist of two parts, i. e. an inside diffusion box and an outside hood.

The outside hoods are made in two styles which are called "Standard" and "Louvre." The inside box is the same in both cases.

The opening required is cut in the bottom sash rail at the mill where the sash are made, and the ventilators are screwed fast to the sash after the same are in place.

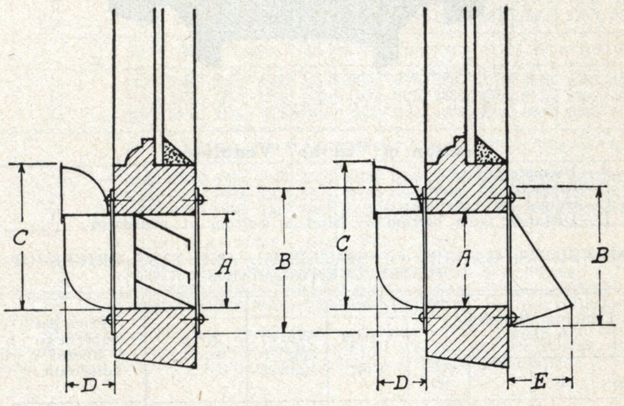
Ventilators are furnished complete with wood screws for mounting.

Specification Data—Standard Pullman Sash Ventilators are regularly made with inside diffusion boxes made of sheet brass with brushed brass finish and lacquered all over.

Fitted with hinged shutters to stay in any position from full open to closed.

Outside hoods, "Standard" and "Louvre," are made of sheet steel and finished in rubber finish black lacquer.

Fitted with 14-mesh copper screen cloth.



With Louvre Hood   With Standard Hood

Cross Sections of Bottom Sash Rail Fitted with Pullman Sash Ventilators

SIZES OF PULLMAN SASH VENTILATORS

Nominal sizes	A	B	C	D	E	Sash openings
Height and width, in.						Height and width, in.
2 x12	2	3⅛	3⅛	1	1⅜	2⅛x12⅛
2½x16	2½	3¾	4¼	1⅝	1⅞	2⅝x16⅛
3 x15	3	4⅛	5	1⅞	2¼	3⅛x15⅛
4 x18	4	5¼	6	2⅛	2⅝	4¼x18¼

GLOBE VENTILATOR COMPANY

Manufacturers of Roof Ventilators

TROY, N. Y.

Products

"Globe" Ventilating Devices:
Roof Ventilators.
Barn Ventilators.
Chimney Caps.
Car Ventilators.
Lamp Jacks.

Metal Top Ventilator

The "Globe" ventilator is made of heavy rust resisting galvanized material, cold rolled copper, Armco Iron, or Toncan Metal and it is strongly and rigidly braced with extra heavy steel bars.

In sizes 18 inches and above, the tops and bottoms are made in sections which overlap and are riveted, making them double at each of these points and exceptionally strong ventilators.

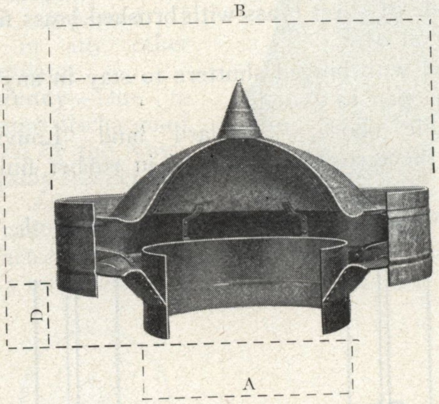
Uses—The "Globe" ventilator has been in operation for many years on practically every known type and class of building.

It is removing smoke, steam, fumes, gases, dust, etc., from factories, foundries, steel mills and other industrial buildings, and providing for fresh air in school buildings, churches, theaters, barns, etc. It has back of it years of *proved efficiency*.

Information and Estimates—Prices, blue prints, capacities, working model and complete information will be furnished on request.

Shipment—"Globe" ventilators are carried in stock in the leading cities, and immediate shipment can be made from our factory.

Metal Top "Globe" Ventilator



Section of "Globe" Ventilator

A—Diameter of pipe
B—Diameter of band
C—Height of ventilator
D—Distance from bottom of band to bottom of ventilator

DIMENSIONS, GAUGES OF MATERIAL, AND LIST PRICES OF "GLOBE" VENTILATORS

Principal dimensions in inches				Gauge of iron	Wt. of copper, ounces	Area sq. in.	*Price list subject to liberal discount
A	B	C	D				
6	11	9	1½	26	18	28.27	$ 3.40
8	14	11	1¾	26	18	50.26	4.65
10	17	13	2	24	18	78.54	5.75
12	19	14	2	24	18	113.10	6.75
14	25	18	3	20 & 24	18	153.94	13.00
16	28	20	3	20 & 24	18	201.06	20.00
18	32	23	4	20 & 24	18	254.47	27.00
20	36	25	4½	20 & 24	20 & 18	314.16	33.00
24	43	30	6	20 & 22	24 & 20	452.39	40.00
30	52	35	6	18 & 22	24	706.8	65.00
36	66	50	8	18 & 20	24	1017.9	120.00
40	74	57	9	18 & 20	24	1256.6	180.00
48	84	64	10	18 & 20	24 & 28	1809.6	240.00
54	92	67	10	18 & 20	28	2290.2	300.00
60	99	70	10	18 & 20	28	2827.4	360.00
72	111	80	12	18 & 20	28	4071.5	480.00

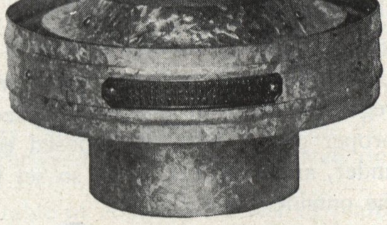
The heavier weights of material are placed in bands and collars of ventilators.

Fire-retardant dampers furnished when desired.

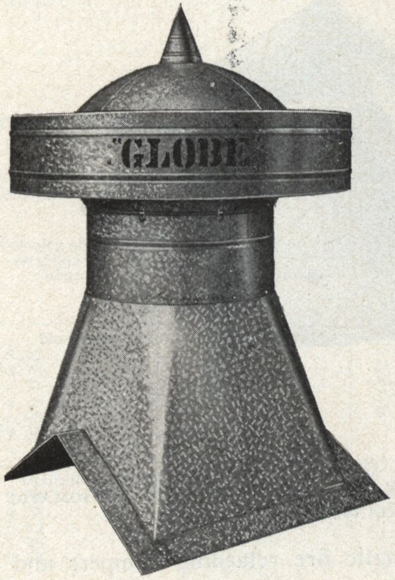
*Galvanized iron ventilators only. Prices of copper ventilators on request.

Glass Top Ventilator

The "Globe" glass top ventilator possesses all the qualities of the metal top ventilator and is designed to secure the greatest degree of ventilation and the largest area of light.



Glass Top "Globe" Ventilator



"Globe" Ventilator with Square Base

Ventilator Bases and Dampers

The "Globe" ventilator is furnished with either round or square base when desired, to fit any type of roof construction.

The bases are made of extra heavy rust resisting steel. We would recommend square bases for maximum strength and efficiency.

We furnish the regulation damper or fire retardant damper at a small additional cost.

Chimney Caps

"Globe" chimney caps prevent downward currents in chimneys and increase drafts in sluggish flues.

W. F. HIRSCHMAN CO., INC.

Manufacturers of Rotary Ball Bearing (Oil Flooded) Roof Ventilators

LE ROY, N. Y.

Product

Effico Fan Equipped Rotary Ball Bearing (Oil Flooded) Roof Ventilators (Patented).

Construction and Principle of Operation

The Effico rotating cowl exterior is covered by wind propelled blades; the interior by suction blades. There are no moving parts. The Effico shaft rotates on ball bearings, fitted with clock precision in solidly enclosed dust-tight and oil-tight housings, and is flooded in inches of non-freezing oil (furnished by us); no oiling required for years (proven), and the Effico is absolutely noiseless.

Great Air Volume Exhaust at Low Wind

All Efficos will draw considerable air at a 1-mile breeze (an apparent calm) without stack or heat assistance. The 30-in. size will rotate (standing start) at .7-oz. pressure, ½-mile breeze. Cowl outlet is over 50% larger than its stack area which is ample, as no wind enters ventilator to gain the so-called siphonage effect. Suction fan is same size as rotating cowl (note dimension chart). Thus each Effico is equipped with fan over 50% greater in diameter than its stack area. Fan pulls air up stack at even the slowest turning movement and wind blowing across the outlet adds to its efficiency.

Symmetry

The Effico has artistic lines and pleasing appearance. Lowest in height of rotary ventilators by over 50% average. Note dimension chart.

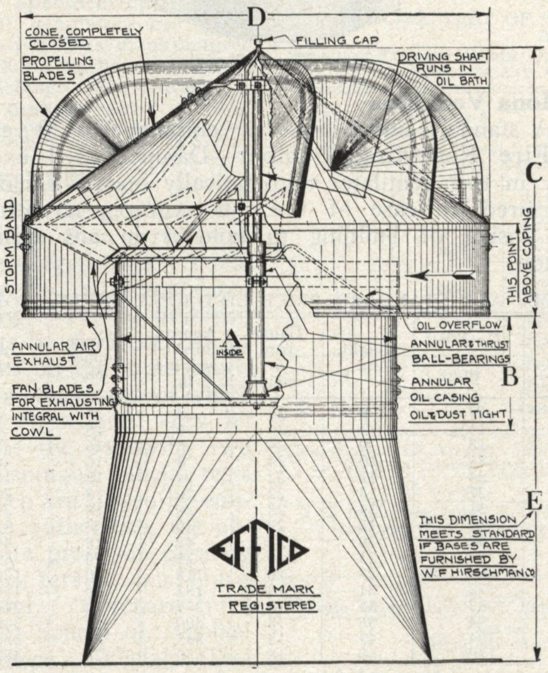
Weatherproofness

The Effico rotary ball bearing ventilator operates during all kinds of weather—rain, ice, snow or sleet does not affect or hamper its exhausting. No drip pans or bird screens are needed.

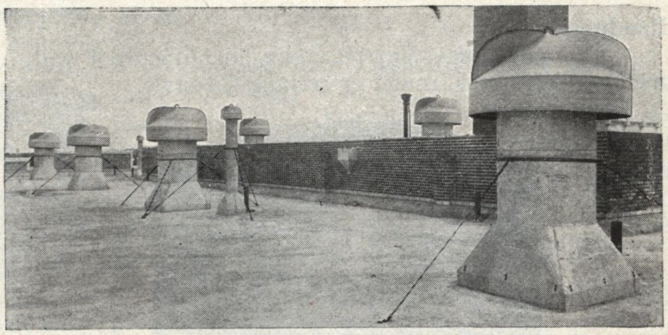
Commendation by an Expert

Samuel Edward Dibble, the head of Heating, Ventilating and Sanitation Department of Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pa., writes:

"The construction of the Effico Rotary Ball Bearing Ventilator is such that it is impossible for storms to beat into the ventilator and thus into buildings. During the time the ventilator was installed (from the month of January to June), no water was let in. It operated without noise and continued to operate with the slightest breeze."


D
CONE, COMPLETELY CLOSED
PROPELLING BLADES
FILLING CAP
DRIVING SHAFT RUNS IN OIL BATH
C
STORM BAND
THIS POINT ABOVE COPING
OIL OVERFLOW
ANNULAR AIR EXHAUST
A
INSIDE
ANNULAR & THRUST BALL-BEARINGS
B
FAN BLADES FOR EXHAUSTING INTEGRAL WITH COWL
ANNULAR OIL CASING OIL & DUST TIGHT
E
THIS DIMENSION MEETS STANDARD IF BASES ARE FURNISHED BY W. F. HIRSCHMAN CO.
EFFICO
TRADE MARK REGISTERED

Detail of Effico Rotary Ball Bearing Ventilator



Effico Rotary Ball Bearing Ventilator Installation

EFFICO STANDARDIZED VENTILATORS AND BASES

Dimensions in inches					Gauge of galvanized steel		Net weight lb.	Copper, oz.	Code
A	B	C	D	E	Cowl	Base			
6	4½	5½	13	....	26	26	10	14	sheck
10	4½	11	16	20½	26	26	18	14	sachem
12	5	14	21¾	21	24	24	25	14	scene
18	7	15½	27	23	24	24	38	16	saturn
24	10	25	42	30	24	22	95	18	shake
30	12	27	52	32	22	20	140	20	sank
36	12	31	62	32	22	18	180	24	sergeant
42	19	37	68	43	22	18	300	24	serpent
48	19	40	76	43	22	18	370	24	serve
54	19	44	86	43	22	18	525	24	sham
60	19	48	98	43	20	18	650	......	shawl
66	25	53	103½	49	20	18	700	......	sunk
72	30	57	114	54	20	18	750	......	shop
84	30	58	130	54	18	16	900	......	slave
96	30	63	153	60	18	16	1025	......	shekel

CAPACITIES OF EFFICO ROTARY BALL BEARING VENTILATORS

Cubic Feet of Air Exhausted Per Minute

Wind velocity, miles per hour	Temperature difference in degrees Fahrenheit in building and outside											
	0	10	20	30	0	10	20	30	0	10	20	30
	12-in. Ventilator				18-in. Ventilator				24-in. Ventilator			
5	295	365	430	465	500	740	850	925	900	1325	1500	1590
10	342	437	500	520	755	970	1070	1135	1325	1725	1900	2025
14	400	500	530	580	990	1080	1160	1270	1600	2000	2200	2300
	30-in. Ventilator				36-in. Ventilator				42-in. Ventilator			
5	1400	2080	2386	2600	2075	3000	3375	3650	2770	4090	4550	4950
10	2100	2925	3050	3250	2980	3880	4275	4550	3975	5175	5700	6000
14	2560	3200	3175	3525	3645	4365	4750	4935	4900	6000	6600	6900
	48-in. Ventilator				54-in. Ventilator				60-in. Ventilator			
5	3650	5300	6000	6500	4580	6600	7600	8200	5700	8300	9400	10200
10	5300	7100	7600	8100	6625	8625	9600	10000	8280	10900	12000	12700
14	6445	8050	8900	9200	8000	10000	11000	11600	10000	12600	13800	14500
	72-in. Ventilator				84-in. Ventilator							
5	8200	11800	13000	14800	11000	16300	18500	20000	"Effico" The Highest Developed Ventilator			
10	11900	15500	17000	18300	16300	21600	23600	25000				
14	14400	18000	19800	20800	19600	25000	27000	28500				

Above capacities are guaranteed and conservative. They are based on official test made at Carnegie Institute of Technology, Pittsburgh, Pa., and a great many by ourselves on special and regular installations.

Partial List of Effico Installations

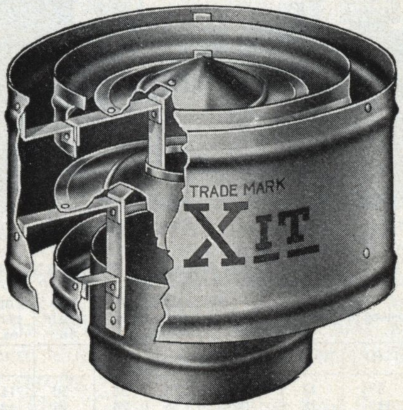
School, Northport, N. Y.
School, Mount Vernon, N. Y.
School, Portchester, N. Y.
Jefferson Avenue School, Detroit
Clinton Theater, Clinton, Mass.
Home Family Laundry, Buffalo
University of Rochester
St. Francis De Sales School
Roscoe Conkling School, Utica
University of Buffalo
Parker School, Clarence, N. Y.
Donner Steel Co., Buffalo
Worthington Pump Co., Buffalo
School, Port Jervis, N. Y.
General Motors Building, Detroit
Municipal Car Barns, Detroit
Municipal Paint Shop, Detroit
Utah Power & Light Co.
Military Park School, Wilmington
Ford Motor Co., Detroit
New Orleans Public Service, Inc.
Childrens' Hospital, Washington, D. C.
Arkansas Central Power Co.
Continental Can Co.
Eastman School of Music, Rochester
Adirondack Power & Light Co.
Roosevelt School, Roosevelt, N. Y.
Carolina Power & Light Co.
School, Mansfield, Mass.
School, Newmarket, N. H.

THE IONA VENTILATOR COMPANY, INC.

OFFICE AND WORKS
2821-29 West Dauphin Street
PHILADELPHIA, PA.

Products

XIT and Iona Ventilators, manufactured with metal or glass tops, round or rectangular style.



XIT Ventilator

XIT Ventilators

The super XIT is designed to meet perfectly those cases where the highest possible efficiency is demanded. Its unusually substantial construction is indicated in the above illustration. It is warranted storm proof, and its exceptional efficiency has been repeatedly demonstrated in actual comparative tests with the best ventilators previously available.

We believe the XIT to be the most efficient ventilator ever built because it has larger area of vertical exits and a greater total exit area.

Basic Principles of Design—(1) Head 80% greater in diameter than shaft of ventilator. (2) Width of storm band 80% of diameter of shaft and so placed as to exclude external air from ventilator head. (3) Area for air leaving ventilator head (not including bottom opening at head) 75% greater than cross-sectional area of shaft. (4) Principle of action or suction is that of chimney or stack, which is doubled by a second or internal band, thereby making two points of suction which are always to the lee side of ventilator, resulting in greater increased movement of air therefrom.

SIZES AND STANDARD PRICE LIST XIT VENTILATOR

Vent size, in.	Outside diam., in.	Height, in.	Gauge iron or metal	Approx. finished weights, lb.	Gauge copper, oz.	List price
6	10¾	8¾	26	5	16	$ 12.00
7	12½	10¼	26	6	16	14.00
8	14¼	11	26	8	16	16.00
9	16¾	12	26	10	16	18.00
10	18	13½	26	12	16	20.00
12	21½	15½	24	16	16	24.00
14	25	16¾	24	28	16	28.00
15	26½	17	24	31	18	30.00
16	28¾	18½	22	34	18	32.00
18	30	19½	22	43	18	36.00
20	34	22½	22	50	18	40.00
22	38½	24	22	55	18	44.00
24	43	26	22	61	18	48.00
26	46	28	22	84	20	52.00
28	50	30	22	105	20	56.00
30	54	32	22	131	20	65.00
32	57	34	22	146	20	80.00
34	60	36	22	160	20	100.00
36	64	38½	22	178	20	120.00
40	71¾	42	20	238	20	180.00
42	77	45	20	275	20	190.00
44	79	48	20	305	20	200.00
48	86	51	20	350	20	240.00
54	97	57	18	615	24	300.00
60	107	63	18	757	24	360.00
66	118	69	18	880	24	420.00
72	129	75	18	980	24	480.00

EXHAUST DATA CARD XIT VENTILATORS

Temp. inside and outside	Wind veloc., m.p.h.	Cubic feet of air through ventilator per hour									
		12	14	16	18	20	24	30	36	40	48
70°	3	20,546	27,783	36,352	45,960	50,804	81,811	127,008	193,287	225,792	326,044
70°	5	24,460	33,075	43,276	54,714	60,480	97,036	151,200	218,198	268,800	388,147
70°	10	34,244	46,305	60,536	79,599	84,672	125,850	211,680	305,477	376,320	543,405
70°	15	47,941	64,827	84,750	111,438	118,540	176,190	296,352	427,667	526,848	760,767
70°	20	67,117	90,757	118,650	156,013	165,956	246,666	414,892	598,733	737,587	1,065,073

Increase in velocity of wind over five miles, increases exhaust 8% per mile.

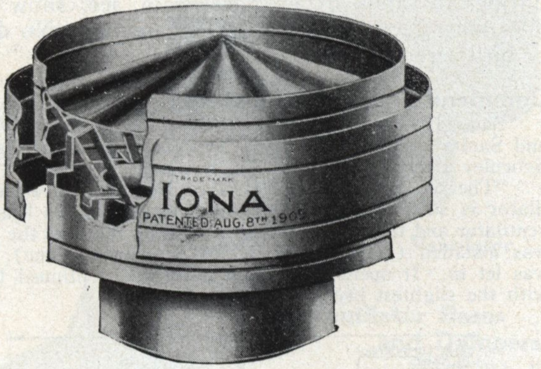
Higher inside temperature increases exhaust $1\frac{7}{10}$% per degree.

In elevation over 25 feet, exhaust increase varies as square root of height.

Dampers—XIT dampers used in this ventilator, when required, are of the butterfly type, felt-edged and guaranteed to be airtight.

Guarantee XIT Ventilators

Our guarantee is of the most substantial character, providing not only against defective materials, but backing our claims for this unusual ventilator to the extent of offering to take back within 60 days of date of purchase at our expense, refund any payments made and bear transportation costs both ways, any XIT ventilator that fails to fulfill what we specify for it at the time of sale. And we make only the simple provision that we have opportunity to be present at a comparative test.



Iona Ventilator

The Iona Ventilator

A standard and successful ventilator for 20 years.

Fire Retarding Damper—Damper used exclusively in this ventilator automatically opens or closes, as desired, in case of fire. It requires no attachment inside of building to hold it in any desired position.

SIZES AND STANDARD PRICE LIST IONA VENTILATOR

Vent size, in.	Outside diam., in.	Height, in.	Gauge iron or metal	Approx. finished weights, lb.	Gauge copper, oz.	List price
6	10	6	26	3	16	$ 3.40
8	14½	7	26	4	16	4.65
10	18	9	24	6	16	5.75
12	21	10	24	8	16	6.75
14	24	12	22	14	18	13.00
16	27	13	22	20	18	20.00
18	31	14	22	26	18	27.00
20	34	15	22	30	18	33.00
24	42	18	22	42	18	40.00
30	51	23	20	75	20	65.00
36	62	27	20	118	20	120.00
42	72	31	18	182	20	190.00
48	82	35	18	275	20	240.00
54	94	38	18	300	24	300.00
60	104	43	18	335	24	360.00
72	130	60	18	630	24	480.00

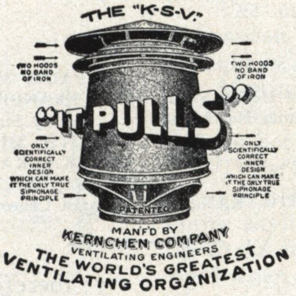
The prices of bases and dampers are always extra, regulated according to the number and size required.

KERNCHEN COMPANY

Ventilating Engineers

113 West Washington Street, CHICAGO, ILL.
EASTERN OFFICE—137 Nassau Street, NEW YORK, N. Y.
AGENCIES IN PRINCIPAL CITIES

FACTORY
SOUTH GARY, IND.


THE "K-S-V."
TWO HOODS NO BAND OF IRON
TWO HOODS NO BAND OF IRON
"IT PULLS"
ONLY SCIENTIFICALLY CORRECT INNER DESIGN WHICH CAN MAKE IT THE ONLY TRUE SIPHONAGE PRINCIPLE
ONLY SCIENTIFICALLY CORRECT INNER DESIGN WHICH CAN MAKE IT THE ONLY TRUE SIPHONAGE PRINCIPLE
PATENTED
MAN'F'D BY
KERNCHEN COMPANY
VENTILATING ENGINEERS
THE WORLD'S GREATEST VENTILATING ORGANIZATION

TRADE-MARK

Product

"K-S-V's" (Kernchen Siphonage Ventilators).

Where Used

For all buildings and all bad air conditions. A "K-S-V" does the work of three others. Save this cost!

"K-S-V's" Are Correct Siphons

The correct siphon is the most powerful pulling force known to this field of ventilation. It not only exhausts, but it pulls terrifically. The siphons harness the lightest air currents, compressing and compelling them to co-act in mightily increasing the suction of air out through the ventilator.

Construction—Simplicity of construction and complete absence of the friction inevitably involved in old-style rotary mechanisms make the "K-S-V" a troubleproof, lasting investment. Free area of outlet over 200% of pipe area. Nothing to choke or hinder. Friction at minimum, exhaust at maximum.

The eduction pipe is cylindrical with V-shaped notches or openings at the top, each covered by a siphon tapered inwardly toward the top, the total of four siphons being covered by a jacket of conical shape, whereby other siphons (four) are formed, greatly increasing the terrific pulling power. In addition, a top construction of two specially designed hoods is used, augmenting considerably the pulling force and making the unit stormproof.

The absence of friction, no revolving mechanism being present, means silent performance, nothing to wear out, nothing flopping around, no maintenance cost. A rotary requires a certain wind energy to swing it around *before it gets ready to ventilate*. The "K-S-V" *uses this wind energy to ventilate.*

Specifications — All roof ventilators are to be "K-S-V's" as manufactured by the Kernchen Co., 113 W. Washington St., Chicago, Ill.

Caution—Beware of imitations and infringements; protect yourself by specifying "K-S-V's."

Official Tests

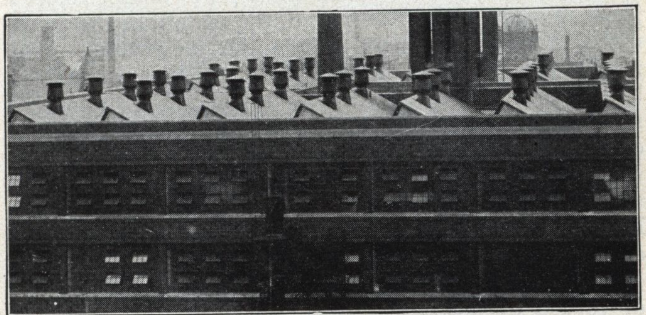
Nothing is more deceptive than irresponsible, alleged tests. A real test is a complicated thing. Try to find two tests by different institutions on the same ventilator, the results of which are consistent. Try it! Note the following two indisputable official tests which are signed by eminent authorities, the absolute proof of capacity and terrific pulling power. Compare the Case School of Applied Science Official Test (which was conducted on the roof of a building) with the Armour Institute Official Test (conducted in a laboratory) for scientific corroboration and verifications of each other and our statements regarding the actual powerful pull of "K-S-V's."

We challenge all to furnish such *signed* Institutes of Technology Official Tests.

Special Ventilation Service

The Kernchen Company specializes in ventilation and its engineers are always available, gratis.

Particular attention given to difficult or unusual problems involving great heat as well as temperatures below the freezing point; steam conditions; elimination of condensation, moisture, fumes, gases or smudge, foul or vitiated air, in every type of building or room.



52 "K-S-V's" Installed on This Sawtooth Roof with Pivoted Sash

Booklet—"It Pulls"

A postal will bring our latest illustrated booklet, "It Pulls," containing complete information concerning "K-S-V's" (Kernchen Siphonage Ventilators).

OFFICIAL TEST OF "K-S-V's" (KERNCHEN SIPHONAGE VENTILATORS) CONDUCTED BY ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

Showing Exhaust Under Different Wind Velocities, and Which Scientifically Proves the Terrific Pulling Power and 100% to 300% More Efficiency Than That of Other Ventilators

Wind velocity miles per hour	Air pulled through ventilator, lineal ft. per min.	Cubic feet air pulled through ventilator										
		Size of ventilator, in.	12	14	16	18	20	24	30	36	40	48
5	460	Per min.	364.0	492.2	644.0	814.2	1,003	1,444	2,250	3,247	4,000	5,776
		Per hr.	21,840	29,532	38,640	48,852	60,180	86,640	135,000	194,820	240,000	346,560
10	670	Per min.	525.0	717.0	938.0	1,186	1,460	2,103	3,280	4,730	5,830	8,412
		Per hr.	31,500	43,020	56,280	71,160	87,600	126,180	196,800	283,800	349,800	504,720
15	960	Per min.	754.0	1,027	1,344	1,699	2,100	3,014	4,700	6,777	8,350	12,056
		Per hr.	45,240	61,620	80,640	101,940	126,000	180,840	282,000	406,620	501,000	723,360
20	1,220	Per min.	957.0	1,305	1,708	2,159	2,660	3,830	5,980	8,613	10,640	15,320
		Per hr.	57,420	78,300	102,480	129,540	159,600	229,800	358,800	516,780	638,400	919,200
25	1,480	Per min.	1,161	1,584	2,072	2,619	3,230	4,647	7,250	10,448	12,870	18,588
		Per hr.	69,660	95,040	124,320	157,140	193 800	278,820	435,000	626,880	772,200	1,115,280

(Signed) G. F. Gebhardt, A. H. Anderson, Mechanical Engineers, Armour Institute of Technology

Case School of Applied Science—Test Nov. 6, 1913 on Roof of Leader Building, Cleveland, Ohio		Armour Institute of Technology—Test April 17, 1911, in Laboratory
15 inches	Diameter of ventilator	15 inches
5.32 miles per hour, or 6⅔% stronger than Armour's	Velocity of outside wind	5 miles per hour
497	Velocity of air pulled through ventilator per min., lineal ft.	460
610	Exhaust of ventilator per min., cubic ft.	564
Outside temperature, 67° Fahr.	Inside temperature, 85.8° Fahr.	

(Signed) F. H. Vose,
Head of Mech. Eng. Dept.,
Case School of Applied Science

(Signed) G. F. Gebhardt,
A. H. Anderson,
Mech. Engrs., Armour Institute of Technology

LICHTY METAL PRODUCTS CO.

Manufacturers of Monitor Ventilators and Skylights

WATERLOO, IOWA

AGENCIES

DUBUQUE, IOWA, Klauer Manufacturing Company
KANSAS CITY, MO., The Schafer Corporation, 2008-10 McGee Street
MINNEAPOLIS, MINN., W. S. Nott Co., Second Avenue North and Third Street
OMAHA, NEB., Bjornson Sheet Metal & Ventilating Co., 1411-13 Davenport Street
ST. PAUL, MINN., Ray Roofing Company
SAN FRANCISCO, CAL., C. J. Waterhouse & Sons Co., 55 New Montgomery Street
DULUTH, MINN., F. E. Christofferson Co., Inc.
TOPEKA, KAN., The Schafer Corporation
TULSA, OKLA., The Schafer Corporation
WICHITA, KAN., The Schafer Corporation

Products

Monitor Suction Ventilators.

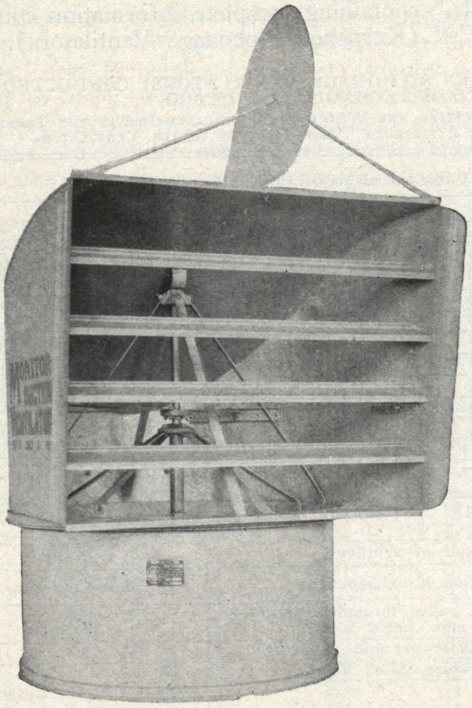
Monitor Ventilating Skylights.

Also manufacturers of Monitor Stationary Ventilators.

Monitor Suction Ventilators

Monitor Suction Ventilators are distinctively a *product of quality*. The design, the materials, the workmanship and the finish reflect our determination to produce a ventilator that will be more efficient, last longer, and look better than all others. The simple, yet strong and rigid construction with the best grades of copper bearing steel, and the exceptionally high grade workmanship, together with the permanent enamel finish, make these ventilators the outstanding high grade ventilators of the day. Continued specifying by architects is our best recommendation.

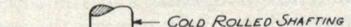
Suitable for either a low or high pressure, gravity or forced exhaust, permitting a free flow of air at all times and under all weather conditions, with a revolving device that is absolutely moistureproof and weatherproof and needs no attention. The storm louvers are stationary; therefore, positive and always in the proper position. The damper operates easily—fits tight when closed—and is not affected by weather elements.



Monitor Suction Ventilator

Materials—None but the best grades of materials are used throughout. The sheet metal parts are made of the very best grades of copper bearing galvanized steel (or of pure copper), or special brands of sheets when so specified. Gauges and thicknesses of metal are ample in all sizes, and as shown in table on following page. All braces and reinforcements are very heavy and much stronger than really required, and all are galvanized throughout—even the bolts and rivets used in assembling. The revolving shaft is the best cold rolled steel fitted within a large, heavy galvanized sleeve fitted with babbitt bearings top and bottom.

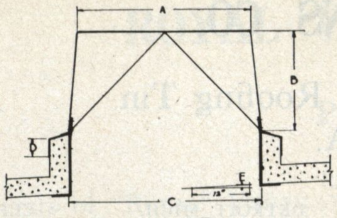
Bearings—Monitor thrust bearings are exclusive — found only in Monitor Suction Ventilators. It is simple, yet very strong and always reliable. The end of the shaft rests on one large steel ball which rotates as the shaft turns. The shaft is fitted into a long sleeve which holds it in a true, upright position guided within two babbitt bearings. The shaft is made of cold rolled steel and varies in size according to the size of the ventilator. Friction has been eliminated to a minimum, making it very easy for the top of the ventilator to rotate.



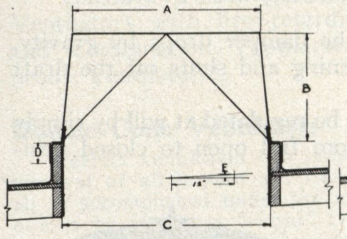
Revolving Device Monitor Suction Ventilator

Workmanship—Each and every ventilator is made up complete in our plant, and is tested and approved by our engineer, and labeled with a serial number. The exterior is treated with a special metal sizing which acts as a prime coat for the gray iron enamel finish. This makes, in reality, a two-coat job of paint, as this special sizing makes a good body coat. The enamel is then sprayed on completely and evenly, covering the entire surface and filling every crack and seam.

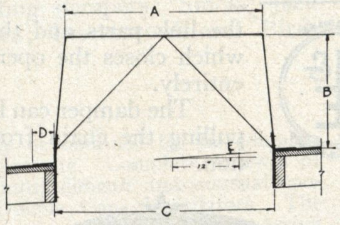
Continued on next page



Type A—Base



Type B—Base



Type C—Base

DIMENSIONS OF STANDARD BASES IN INCHES

A	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	66	72
B	7	8	9	10	11	13	15	17	19	21	21	21	21	21	21	21	21
C	10	12	14	16	18	20	22	24	28	34	40	46	52	58	64	70	76
D	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
E	Required dimensions, slope per foot specified.																

SIZES, WEIGHTS AND EXHAUST CAPACITIES MONITOR VENTILATORS

Size	Area, in.	*Exhaust capacity suction	Weight suction head, lb.	Weight base, lb.	Gauge steel	Ounce copper	Code word
8	50	155	10	9	26	18	Melicrat
10	78	243	11	13	26	18	Melificado
12	113	351	12	16	26	18	Melifiques
14	154	479	17	17	26	18	Melifiuos
16	201	625	33	24	24	18	Meligheid
18	254	790	41	30	24	18	Melilotus
20	314	976	50	33	24	18	Melimelum
24	452	1405	72	45	24	18	Melioramus
30	707	2198	125	72	22	20	Meliphagen
36	1018	3165	207	82	22	24	Melisseus
42	1385	4306	325	92	22	24	Melitense
48	1810	5628	418	106	20	32	Melitinos
54	2290	7120	502	116	20	32	Melivoro
60	2827	8790	635	145	20	32	Melkbaard
66	3421	10637	780	155	20	32	Melkbrug
72	4072	12661	940	180	20	32	Melkgevend

Add 15% to above weights for shipping weight.

*Exhaust as given is the number of cubic feet of air exhausted per minute based on a wind velocity of five miles per hour, with temperature difference of 20° F., ventilator located 35 ft. above floor:

WESTERN UNION TELEGRAPH CODE

Ship at once by freight	INCEPTOR
Ship at once by express	INCEPTIVAM
Price f.o.b. Waterloo	HALAGADO
Price f.o.b. destination	HALAGAR
How soon can you ship	INCIPIENT
Ship by rail and water	INCERABAS
Ship as soon as possible	INCEPPO

Suggested Form of Specification—(1) Furnish and install, where indicated on drawings, or as hereinafter specified, genuine Monitor Suction Ventilators (rotating type) as manufactured by the LICHTY METAL PRODUCTS CO., of Waterloo, Iowa. Same to be equipped [not equipped] with dampers.

(2) Ventilators shall be made of copper bearing steel (pure copper); 14 in. and smaller of No. 26 gauge; 16 to 24 in., inclusive of No. 24 gauge; 30 to 42 in., inclusive of No. 22 gauge; and 48 to 72 in., inclusive of No. 20 gauge, with all reinforcing bands and braces galvanized before assembly. The 36 in. and larger to have weight of head supported from channel reinforcing ring at lower edge of head by support bars to top of pivot spindle. Pivot device to be of the single ball thrust type, self-contained within waterproof and dustproof housing.

(3) Ventilators shall be erected plumb and in a substantial manner.

(4) Ventilator bases are to be of [galvanized copper steel] [pure copper] [as per details] the shape, size and gauges of the standard specifications of LICHTY METAL PRODUCTS CO. They are to be the square to round type with condensation gutter formed where ventilator collar attaches and well flashed over curb. Anchor bars supplied of heavy galvanized steel.

Monitor Ventilating Skylights (Patents Pending)

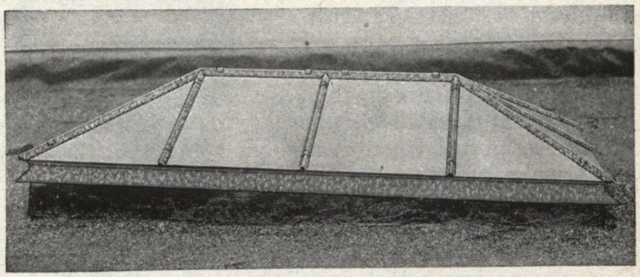
Monitor Ventilating Skylights are the last word in efficiency for use in packing plants, paper mills, foundries, garages or any building where maximum light and ventilation are necessarily paramount. The frames are constructed along the same mechanical lines as the regular Monitor Skylights. Galvanized copper steel is used throughout.

The curb or base moulding is equipped with a wide apron to prevent rain or snow from entering when skylight is raised.

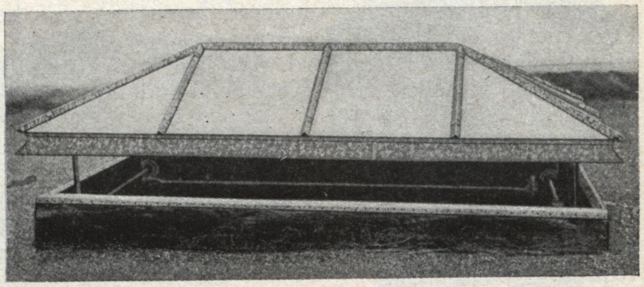
Monitor Ventilating Skylights have made top floors useful for workrooms where production had been impossible in hot weather.

These are manufactured with either hand or electrical operating device. The ventilating device raises the entire skylight and holds it open at any desired height up to 12 in. It is easily operated; is very strong and rigid when in operation and gives a large amount of ventilation.

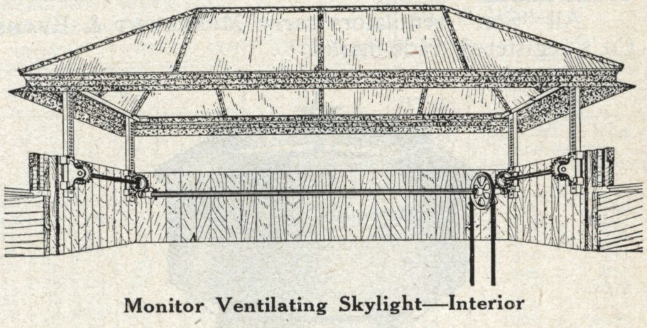
Regularly manufactured of galvanized copper steel; finished in gray iron enamel; in widths from 4 to 6 ft. and lengths from 4 to 12 ft.



Monitor Ventilating Skylight—Closed



Monitor Ventilating Skylight—Open



Monitor Ventilating Skylight—Interior

Operating Mechanism Can Be Purchased by Any Sheet Metal Worker—Sheet metal contractors who are equipped to manufacture skylights can purchase from us at reasonable prices the above raising device with patterns and instructions for building up the skylight frame, thus effecting a saving in freight. They are easy to build and erect—a child can operate them and they last a lifetime.

ESTABLISHED 1866

MERCHANT & EVANS CO.

POWELL EVANS, PRESIDENT

Manufacturers of Ventilators and Roofing Tin

PHILADELPHIA, PA.

OFFICES AND WAREHOUSES

PHILADELPHIA, PA. NEW YORK, N. Y. CHICAGO, ILL. DETROIT, MICH. CLEVELAND, OHIO
WHEELING, W. VA. KANSAS CITY, MO.

WORKS: PHILADELPHIA, PA.; LANCASTER, PA.; WHEELING (WARWOOD), WEST VA.

Products

STANDARD "STAR" VENTILATOR; FIRE RETARDING "STAR" VENTILATOR; made with metal or glass tops.

Also Roofing Tin: "Merchant's Old Method."

For M & E "Almetl" Fire Doors, see page 892.

What the "Star" Ventilator Is

A scientific combination of the injector and siphon principles applied to stationary roof ventilators, which in conjunction with extra large outlets, so protected as to defy the elements, gives a maximum of efficiency at a minimum of investment cost.

This Company's Claim

"Star" ventilators will give *more cubic feet* air exhaust capacity, *per dollar invested,* under like conditions of service and of equal construction strength, than any other make of ventilator.

U. S. Government Adoption

"Star" ventilators were placed in the *first* of the four classes into which ventilators were divided after efficiency tests had been made of various types.

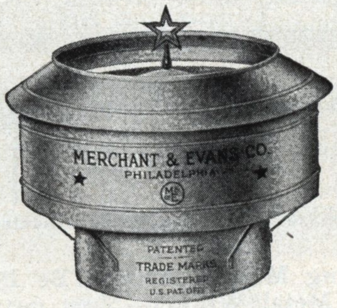
The result of these tests induced the engineers of the Construction Division of the Army to adopt the "Star" Ventilator as its war standard, resulting in many thousands being installed on Government buildings everywhere.

Industrial Installations

"Star" ventilators are today in successful use on thousands of the largest industrial plants throughout the country. Information will be gladly furnished on request.

Trade-marks

All "Star" ventilators carry MERCHANT & EVANS Co.'s registered trade-marks.

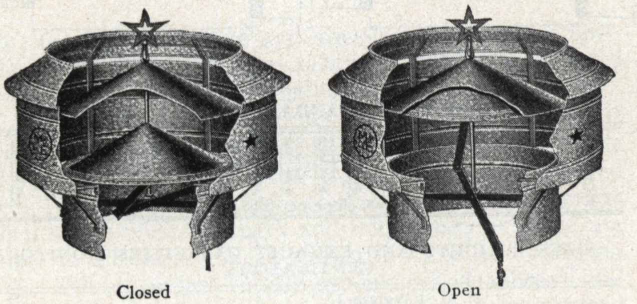


STANDARD "STAR" VENTILATOR
(Patented)

Fire Retarding "Star" Ventilator

The fire retarding gravity damper of this ventilator is operated by a lever movement, controlled by a chain with a fusible link. In the event of fire, the link parts and the damper drops by gravity, which closes the opening and shuts off the draft entirely.

The damper can be regulated at will by simply pulling the chain from full open to closed position.



Closed

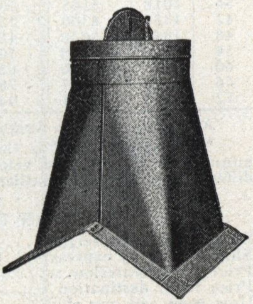
Open

FIRE RETARDING "STAR" VENTILATOR
With automatic gravity damper (patented)

Bases for "Star" Ventilators

Bases are regularly made of the same weight of material as the ventilator proper. Regulation bases are made square at the bottom, and gradually taper to cylindrical shape at the top. Straight pipe bases can also be furnished when requested. All bases have roof flanges of suitable width. All seams and joints are well riveted and thoroughly soldered to prevent leakage.

Flat disc counterbalanced dampers, strongly reinforced for rigidity and operated by either cord or chain, can also be furnished when required. These flat dampers are held on specially designed pivots, made of brass to prevent corrosion.



BASE WITHOUT VENTILATOR
Showing disc damper

Ventilating Data

The purpose of ventilation is to exhaust vitiated or foul air from an enclosed area and admit fresh, pure air to replace it.

"Star" ventilators exhaust foul air without possibility of down-draft.

The following schedule of air supply per hour per person is practical under ordinary conditions:

	Cu. ft. per hour
Hospitals	3600 per bed
Legislative assembly halls	3600 per seat
Barracks, bedrooms and workshops	3600 per person
Schools and churches	2400 per person
Theaters and ordinary halls	2400 per seat
Offices	1800 per person
Dining rooms	1800 per person

Above does not apply to all cases, but is a good, practical working basis.

Schedule of exhaust capacities and key to dimensions on request.

ROYAL VENTILATOR COMPANY

412 Locust Street
PHILADELPHIA, PA.

Products

Manufacturers of "ROYAL" VENTILATORS of Galvanized Steel, Copper, Toncan Metal, Armco Iron, etc.

Glass Top Ventilators; Rectangular and Square Ventilators with fire retarding dampers; Smoke Jack and Combination Ventilators; Insectproof and Birdproof Ventilators.

Double Cone Ventilators

Perfect ventilation can only be obtained by the complete removal of all impure air, fumes, etc. Complete renewal of air is accomplished under the most difficult and unusual conditions by installing "Royal" Double Cone Ventilators. The many unique and original principles embodied in the design of the "Royal" make it 100% effective and insure positive ventilation under any weather condition. Tapered frustrums deflect the outer air over and under the edges of the frustrums resulting in a powerful suction in the tube; this means maximum exhausting capacity. The inverted or bottom cone of the "Royal" avoids the creation of eddies, the outgoing air having a free outlet unimpeded by excess friction, by eddies or by being forced back upon itself. The upward moving foul air, etc. strikes the inverted cone and is drawn directly upward and outward.

Only an upward draft can be obtained.

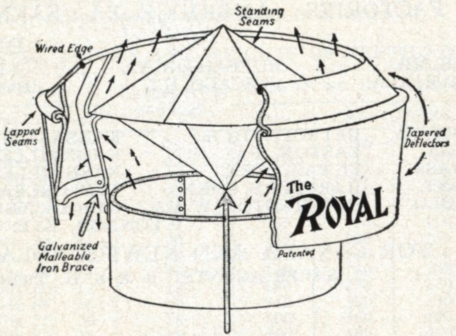
Construction

Superior and exclusive constructive features include lapped seams, giving three thicknesses of metal at joints, usually the weakest point. Wired edges and galvanized malleable iron stays arranged to not interfere with the passage of air currents. The double cone has standing seams and gives two thicknesses of metal instead of one.

Adapted for foundries, power houses, factories, as well as schools and other buildings.

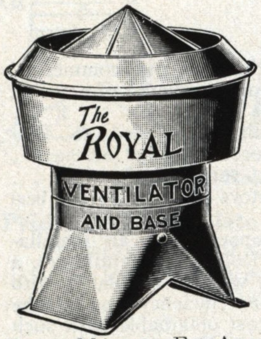
Specification

"Furnish and erect Royal Double Cone [or Glass Top] Ventilators, manufactured by ROYAL VENTILATOR COMPANY, Philadelphia, Pa."

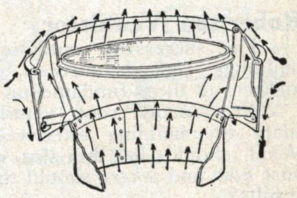


The Inverted Cone. The reason the Royal exhausts more air per minute - also why it offers least resistance to natural or forced draft.

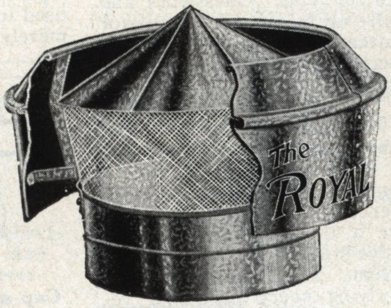
DOUBLE CONE VENTILATOR, ILLUSTRATING THE "ROYAL" PRINCIPLE—100% EFFICIENT



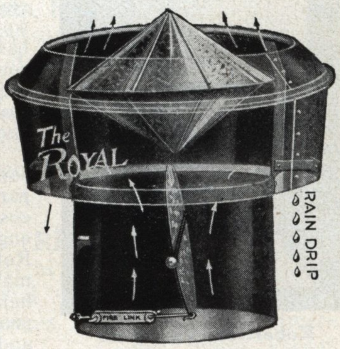
BASES MADE TO FIT ANY TYPE OF ROOF



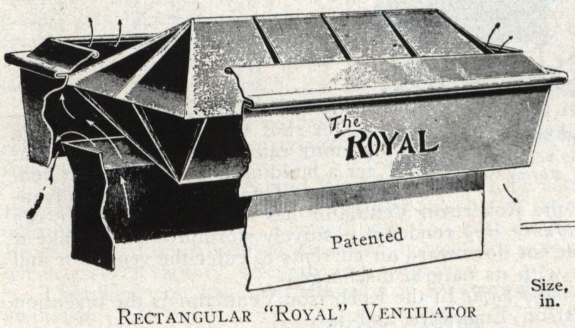
"ROYAL" GLASS TOP VENTILATOR
Gives more light and ventilation



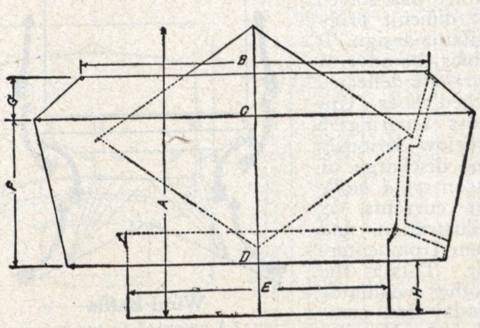
INSECTPROOF VENTILATOR
For hospitals, barns, powder mills, etc.



"ROYAL" VENTILATOR
With fire damper



RECTANGULAR "ROYAL" VENTILATOR
Metal or glass top. Made to any size



SECTIONAL DRAWING "ROYAL" DOUBLE CONE VENTILATOR

"ROYAL" DOUBLE CONE VENTILATOR DATA

Size, in.	Dimensions, in.								Area, sq. in.	Gage of iron	Weight of copper, oz.	Cu. ft. exhaust per min., wind 5 miles per hour Temp. dif. in bldg. and outside	
	A	B	C	D	E	F	G	H				0°	20°
10	12	13	16	14	10	5	2	3	78	24	16	141	186
12	13	15	19	16	12	6	2	3	113	24	16	159	417
16	17	20	26	23	16	8	3	3	201	24	16	388	512
18	18	23	29	26	18	8	3	3	255	24	16	490	832
20	21	25	31	28	20	10	4	5	314	24	16	606	911
22	24	26	34	32	22	11	4	5	380	24	16	709	1059
24	24	30	39	34	24	11	5	5	453	22	16	874	1373
26	24	33	42	36	26	13	4	3	527	22	16	1005	1631
28	26	35	45	40	28	13	5	3	615	20	16	1186	2080
30	26	35	45	41	30	14	5	4	707	20	18	1364	2390
32	25	37	47	44	32	14	5	4	804	20	18	1551	2700
34	28	40	50	48	34	15	5	4	908	20	18	1765	2987
36	28	44	56	51	36	15	6	4	1017	20	18	1961	3361
40	34	47	61	55	40	16	7	5	1257	18 and 20	18	2424	4124
42	32	52	68	63	42	17	7	3	1386	18 and 20	18	2673	4680
44	35	54	70	64	44	18	7	5	1620	18 and 20	18	3124	5310
48	39	59	75	70	48	19	8	4	1809	18 and 20	20	3489	5987
54	42	68	84	77	54	22	9	4	2390	18 and 20	20	5414	8304
60	47	76	94	82	60	23	8	8	2807	18	24	6665	9721
66	52	81	103	94	66	26	9	6	3504	18	24	7851	13346
72	50	86	108	98	72	26	10	6	4071	18	24	10682	16910

Send for catalogue and detail card.

H. H. ROBERTSON COMPANY

Manufacturers of Ventilators
PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

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SALES AGENTS: B. & S. H. Thompson & Co., Ltd., Montreal, Toronto, New Glasgow, N. S.

Products

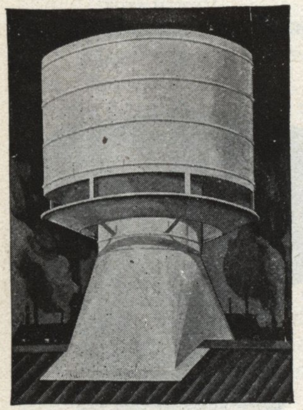
Robertson Ventilators.
Robertson Process Metal.
For Robertson Skylights, see pages 1166-1167.

TRADE-MARK

Robertson Ventilator

The successful ventilation of industrial and commercial buildings depends directly on the achievement of correct answers to these fundamental questions:

How many roof ventilators will be needed to ventilate the building effectively and economically? . . . . . . What should be the *size* of these ventilators? . . . . . . Just *how* and *where* should the ventilators be installed for best results?



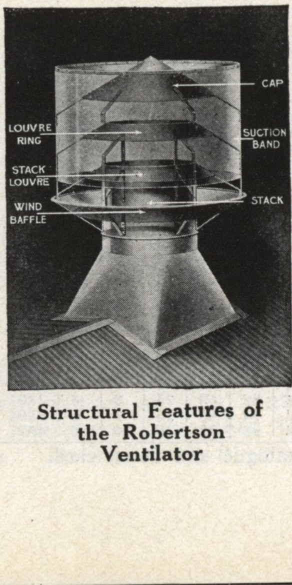
Robertson Ventilator

Equipped with an installation of Robertson Ventilators, a building will be ventilated with *maximum* efficiency and at the lowest cost obtainable with such efficiency. For every Robertson Ventilator installation is based on *facts.* Guesswork and rough estimates of ventilator requirements have no place in Robertson Ventilation Engineering.

The services of the Robertson Ventilation Engineering Department are available without cost or obligation to architects, engineers and plant officials. Robertson Ventilation Engineers make a thorough and comprehensive study of each ventilation problem. They get at the facts underlying every particular requirement. They bring to bear on each specific problem the *facts* which they have accumulated through years of experience in the ventilation of buildings of almost every type.

Then, after having determined the building's ventilation requirements with scientific accuracy, our engineers specify an installation of Robertson Ventilators that meets each specific need in every respect. A Robertson proposal will call for exactly the size and number of ventilators required for the efficient and economical ventilation of the building. Robertson Engineers specify no more ventilators than are needed and no less.

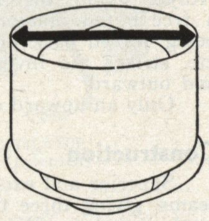
These are the reasons why a Robertson Ventilator installation—based on facts throughout—can be depended upon to maintain proper air conditions in industrial and commercial buildings at all times, and assures *most ventilation per dollar.*



Structural Features of the Robertson Ventilator

Robertson Ventilator Construction and Advantages

The Robertson Ventilator has an exceptionally powerful exhaust capacity—a superiority which is due primarily to the Robertson *suction band.* This band, scientifically designed as to size, proportions and position, multiplies the displacement or air pulling area of the ventilator more than six times. Passing winds blowing across the top and bottom of the *suction band* create a partial vacuum in the *ventilator pipe*—a strong, continuous suction which literally pulls foul air, fumes, smoke, steam, etc., out of the building.

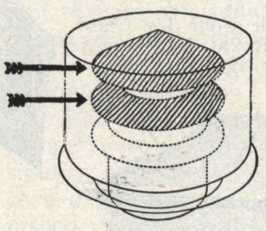


Enlarged Air Displacement Area
Gives powerful exhaust capacity

The condensed table of capacities below shows the exhaust capacity of Robertson Ventilators of various sizes under the following conditions: wind velocity—8 miles per hour; difference in temperatures of indoor and outdoor air —20° F.; height of ventilators above air intake—50 ft. These figures are dependable. They represent *actual* discharge capacities, not the so-called "rated" capacities which are widely used in connection with roof ventilators and which are, as a rule, merely a matter of estimate.

CAPACITIES OF ROBERTSON VENTILATORS

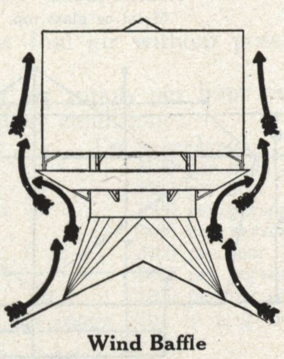
Size, in.	Discharge cap. per min., cu. ft.	Size, in.	Discharge cap. per min., cu. ft.
12	462	42	5658
16	898	48	7398
18	1041	54	9341
20	1499	60	11560
24	1848	66	13872
30	2882	72	16646
36	4160	84	22472



Cap and the Louvre Ring
Make the ventilator positively stormproof

A roof ventilator whose design permits rain, snow and wind to enter a building is not an efficient ventilator. One of the great advantages of the Robertson Ventilator lies in the fact that the *cap* and the *louvre ring* render it positively stormproof and make it impossible for downward air currents to enter the ventilator and interfere with its natural discharge.

The *wind baffle* of the Robertson Ventilator is the invention of Robertson Engineers and is to be found on no other ventilators. This feature has solved one of the most difficult problems in roof ventilator design. It positively overcomes the adverse effect of wind currents deflected upward from pitched roofs. Upward air currents entering a ventilator from below seriously interfere with the discharge of air. The Robertson *wind baffle* deflects such air currents, as shown in the illustration, and thus prevents them from entering the ventilator. This is the reason why no other ventilator on the market today can compare with the Robertson Ventilator in efficiency on pitched roofs.



Wind Baffle
(A patented feature)
Produces remarkable efficiency on pitched roofs

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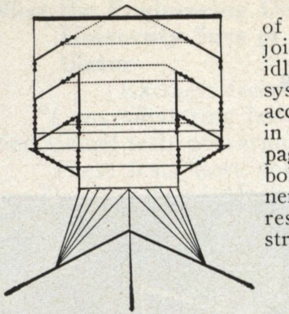
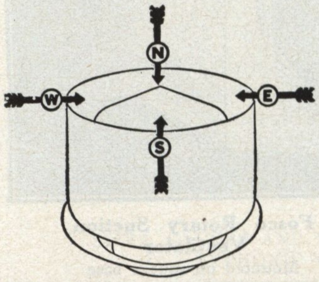


Braces Efficiently Designed Placed and Secured Provide Exceptional Rigidity and Strength

The modern tendency is distinctly towards ventilators of the *stationary* type—ventilators with no moving parts that require a perfectly level setting for efficient operation. The Robertson Ventilator is of the *stationary* type. Once erected, it requires no further attention, no adjustments of any kind, no repairs.

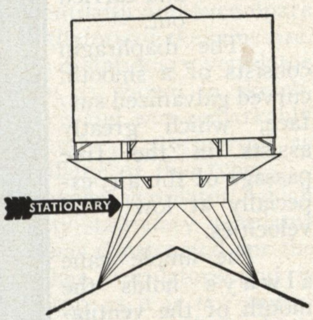


Robertson Ventilator Operates Efficiently Regardless of Wind Direction

Robertson Ventilators are made of Robertson Process Metal (RPM), copper, galvanized steel, or any other material that may be specified. In cases where ventilators will be exposed to severe corrosive conditions, Robertson Process Metal is the ideal material.

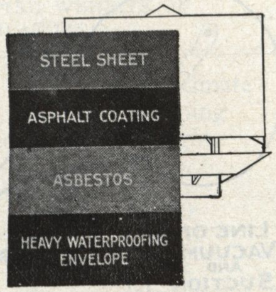
For ventilators made of Robertson Process Metal are rust and corrosion proof and never require painting.

The various component parts of the Robertson Ventilator are joined together into a strong, rigidly constructed unit by an efficient system of bracing (as shown in the accompanying illustration and also in the phantom view on opposite page). The ventilator parts are bolted to the braces and held permanently tight by lock washers. The result is a ventilator of exceptional structural strength and rigidity.



A Ventilator of the Stationary Type
No moving parts

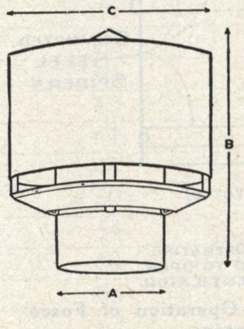
Because it is of the *stationary* type—with no moving apparatus to be caught and operated by the wind—and because it presents a uniform surface in all directions, the Robertson Ventilator operates efficiently at all times *regardless of the direction of the wind.*



Ventilators Made of Robertson Process Metal Are Rust Proof and Never Require Painting

Dimensions, Gauges and Weights—As can be seen from the table below, Robertson Ventilators are made in all sizes used in standard practice. You will note, too, that the Robertson Process Metal or galvanized iron used in each size is of a gauge which assures rigidity, strength and endurance.

Complete erection instructions are forwarded with each ventilator.



DIMENSIONS, GAUGES AND WEIGHTS OF VENTILATORS

Dimensions, in.			Gauges, galv. and RPM	Shipping weights, lb.	
A	B	C		Galv.	RPM
12	22⅝	22¾	24	75	90
14	27$\frac{1}{16}$	28	24	90	105
16	29¾	30⅛	24	105	120
18	32⅞	34	24	135	150
20	38⅞	37½	24	170	190
24	45	45⅜	24	220	250
30	55⅜	57	22	320	360
36	67¾	67½	22	410	480
*42	74⅞	79⅜	20	570	640
*48	89⅜	91	20	740	820
*54	101¾	102	20	900	1040
*60	108⅝	113	20	1080	1240
*66	126½	125	20	1280	1480
*72	129	136	20	1490	1740
*84	149¾	158¾	18	1800	2200

*Indicates that the ventilator is shipped knocked down.

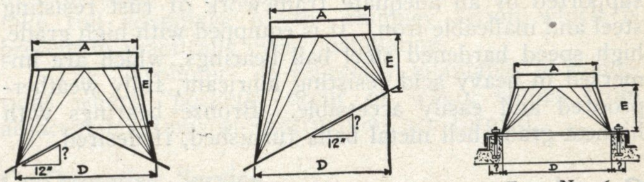
Robertson Ventilator Bases

Bases can be furnished with Robertson Ventilators to meet the requirements of any kind of roof. The three types diagramed below are most commonly used. Types 1 and 3 are made to fit roofs of any slope; in ordering specify roof pitch. Type 6 is made to fit over concrete curbs; in ordering give size of opening and curb. Round to square bases are strongest and are shipped unless special construction is ordered.

DIMENSIONS, GAUGES AND WEIGHTS OF VENTILATOR BASES

Dimensions, in.			Gauges, APM and galv.	App. net wt., lb.		Shipping wt., lb.	
Size A	Size D	Size E		Galv.	RPM	Galv.	RPM
12	16x 16	10	22	12	16	35	40
14	18x 18	10	22	18	23	43	48
16	21x 21	10	22	25	30	50	55
18	24x 24	10	22	35	40	70	75
20	28x 28	10	22	45	55	90	100
24	32x 32	10	22	55	75	110	130
30	38x 38	12	20	75	100	135	160
36	45x 45	14	20	110	140	170	200
*42	52x 52	14	18	140	180	200	250
*48	60x 60	15	18	190	230	270	310
*54	68x 68	16	18	240	300	330	390
*60	78x 78	20	18	300	380	400	480
*66	87x 87	22	18	360	480	480	620
*72	96x 96	24	18	460	580	600	750
*84	110x110	26	16	660	770	850	950

*Indicates that ventilator is shipped knocked down.



Type No. 1 Type No. 3 Type No. 6

Typical Robertson Ventilator Bases

Prices and Complete Descriptions

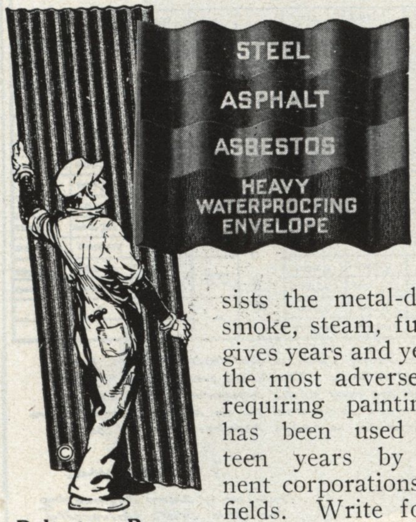
Prices, tables of capacities and complete descriptive data for Robertson Ventilators of all sizes will be sent on request.

Robertson Ventilation Data Book

This new 40-page Robertson book contains a wealth of interesting and valuable data on ventilation. So far as we know, it is the first book that has ever been published containing data on ventilation exhaust capacities under every probable combination of severe conditions. An invaluable book for architects, engineers and plant operators. A copy is yours for the asking.

Robertson Process Metal (RPM)

Robertson Process Metal (RPM) is the ideal roofing and siding material for buildings exposed to severe corrosive influences. It is a steel sheeting made rust, weather and corrosion proof by three impervious protective coatings (1) asphalt (2) asbestos felt and (3) waterproofing. It completely and permanently resists the metal-destroying action of smoke, steam, fumes, gases, etc. It gives years and years of service under the most adverse conditions without requiring painting or repairs. It has been used for the past fifteen years by the most prominent corporations in many industrial fields. Write for a sample of the material itself and complete descriptive literature.



Robertson Process Metal (RPM)

F. O. SCHOEDINGER

Manufacturer of Rotary Suction Ventilators

COLUMBUS, OHIO

FOSCO

TRADE-MARK

Products

Fosco Rotary Suction Ball Bearing Ventilators and Fosco Syphonic Ventilators.

Also "Columbus" Stationary Ventilators; Puttyless Skylights; Underwriters' Tin Clad Fire Doors; Underwriters' Fireproof Metal Windows.

For Fosco Quad Lock Joint Metal Ceilings, see page 1208.

Description

The Fosco rotary suction ventilator is rigidly constructed from galvanized steel, Armco iron or copper, supported by an adequate framework of rust resisting steel and malleable iron. It is equipped with high grade, high speed hardened steel ball bearings, which are immersed in heavy acid resisting lubricant, fully weatherproofed and easily accessible. Bronze bearings with highest grade bell metal balls furnished, if desired.

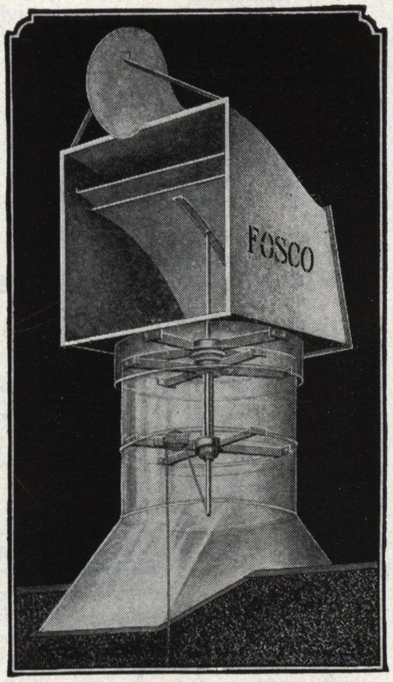
Operation

The Fosco rotary suction ventilator contains the inner Air Passage through which the passing winds and breezes blow with accelerated force, unhampered by conflicting cross currents, causing a pronounced vacuum in the head of the ventilator. The head of the ventilator is much larger than the stem, allowing the rising foul air to spread out along the horizontal line of the diaphragm, where it is caught by the suction of the swiftly moving air currents discharging from the passage above and carried out.

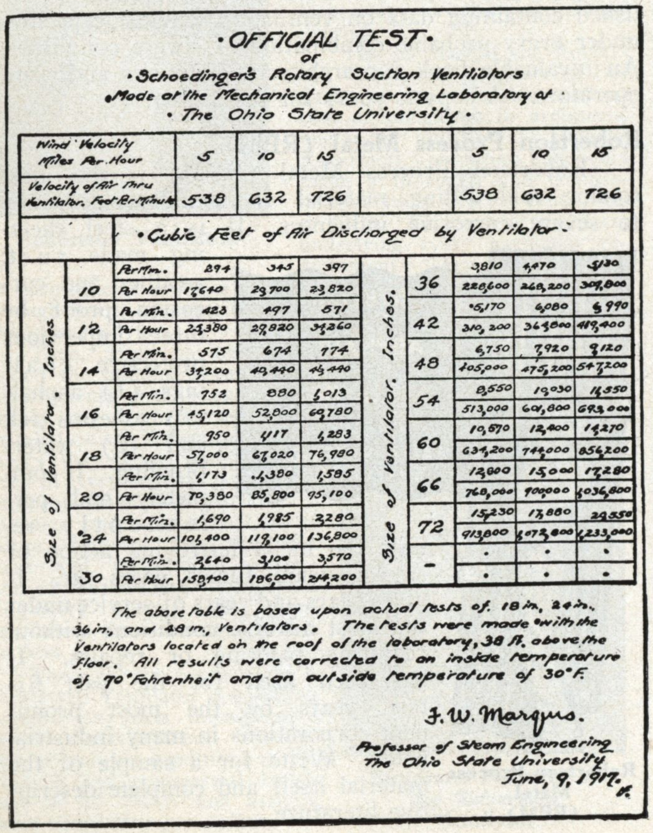
The diaphragm consists of a smooth, curved galvanized surface, which greatly assists in the free passage of the air, especially at low wind velocities.

The ample vane always holds the mouth of the ventilator away from the wind, making same proof against weather, rain, storm and downdrafts.

As no mechanical power is used, no operating expense results.



Fosco Rotary Suction Ventilator
Mounted on square base



·OFFICIAL TEST·
of
·Schoedinger's Rotary Suction Ventiliators
·Made at the Mechanical Engineering Laboratory at ·
· The Ohio State University ·

Wind Velocity Miles Per Hour		5	10	15		5	10	15
Velocity of Air Thru Ventilator. Feet Per Minute		538	632	726		538	632	726
Size of Ventilator. Inches	·Cubic Feet of Air Discharged by Ventilator:				Size of Ventilator. Inches			
10	Per Min.	294	345	397	36	3,810	4,470	5,130
	Per Hour	17,640	20,700	23,820		228,600	268,200	307,800
12	Per Min.	423	497	571	42	5,170	6,080	6,990
	Per Hour	25,380	29,820	34,260		310,200	364,800	419,400
14	Per Min.	575	674	774	48	6,750	7,920	9,120
	Per Hour	34,200	40,440	46,440		405,000	475,200	547,200
16	Per Min.	752	880	1,013	54	8,550	10,030	11,550
	Per Hour	45,120	52,800	60,780		513,000	601,800	693,000
18	Per Min.	950	1,117	1,283	60	10,570	12,400	14,270
	Per Hour	57,000	67,020	76,980		634,200	744,000	856,200
20	Per Min.	1,173	1,380	1,585	66	12,800	15,000	17,280
	Per Hour	70,380	85,800	95,100		768,000	900,000	1,036,800
24	Per Min.	1,690	1,985	2,280	72	15,230	17,880	20,550
	Per Hour	101,400	119,100	136,800		913,800	1,072,800	1,233,000
30	Per Min.	2,640	3,100	3,570	-	·	·	·
	Per Hour	158,400	186,000	214,200		·	·	·

The above table is based upon actual tests of. 18 in., 24 in., 36 in., and 48 in., Ventilators. The tests were made with the Ventilators located on the roof of the laboratory, 38 ft. above the floor. All results were corrected to an inside temperature of 70° Fahrenheit and an outside temperature of 30° F.

F. W. Marquis.
Professor of Steam Engineering
The Ohio State University
June, 9, 1917.

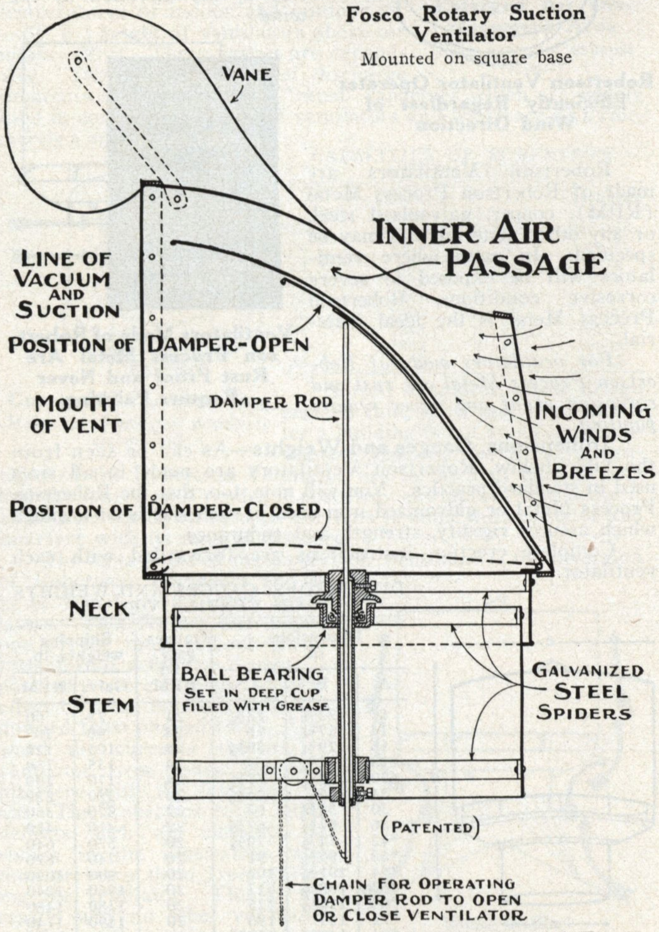

VANE
INNER AIR PASSAGE
LINE OF VACUUM AND SUCTION
POSITION OF DAMPER-OPEN
MOUTH OF VENT
DAMPER ROD
INCOMING WINDS AND BREEZES
POSITION OF DAMPER-CLOSED
NECK
BALL BEARING SET IN DEEP CUP FILLED WITH GREASE
STEM
GALVANIZED STEEL SPIDERS
(PATENTED)
CHAIN FOR OPERATING DAMPER ROD TO OPEN OR CLOSE VENTILATOR

Diagram Showing Construction and Operation of Fosco Rotary Suction Ventilators

Continued on next page

What the Engineering Department of the Ohio State University Says of the "Fosco" Syphonic Ventilator

(Extracts from Complete Report)

"I am submitting herewith the following report on wind tunnel tests of various ten-inch ventilators.

"These tests were conducted in Robinson Laboratory Department of Mechanical Engineering, The Ohio State University, on February 7, 14 and 21, 1925.

"Object of these tests was to determine the capacity of the Schoedinger "Syphonic" ventilator and to compare its capacity with that of other ventilators of the same size.

"The 'Syphonic' ventilator is a stationary ventilator of somewhat conventional design as shown in sketch. It has a rather pleasing appearance and was remarkably well constructed. It was apparently as stormproof as it is possible to construct a ventilator of this type.

"The 'Standard' is a stationary ventilator which shows the greatest capacity of any stationary ventilator yet tested in this laboratory. It was constructed for the purpose of comparison with other ventilators and is not a commercial type of ventilator, as it is not stormproof. In the tests of Professor Rowley of the University of Minnesota, which are published in the 1923 guide of the American Society of Heating & Ventilating Engineers, this type was known as ventilator Number Two.

"Considering first the curves of the 'Syphonic' in relation to the 'Standard' it is noticeable that they have about the same general shape. The capacity of the 'Syphonic' being about 83% of the 'Standard' for all conditions.

"Tests conducted by Professor Rowley of the University of Minnesota show that the capacities of three well known ventilators, a stationary, a syphonic and a rotary ventilator, all of national reputation, run between 60 and 82% of the Standard used in these tests (see 1923 Guide of the American Society of Heating and Ventilating Engineers). Comparing the results of these tests it will be seen that the capacity of the 'Syphonic' ventilator is much higher than that of the average ventilator and compares favorably with the capacity of the ventilators of the greatest efficiencies."

Respectfully submitted,

Approved: A. F. Brown, S. R. Beitler,
Assistant Professor of Heating Instructor M. E.
and Ventilating.

The official test shown herewith was made with wind velocities alone and without a difference in temperature.

The "Fosco" Syphonic is the result of over 35 years of experience in ventilator building, and is designed to take full advantage of the chimney action which is present in practically every installation.

The "Syphonic" is especially adaptable to conditions where "pockets" occur or where eddies from adjacent buildings or obstructions are formed.

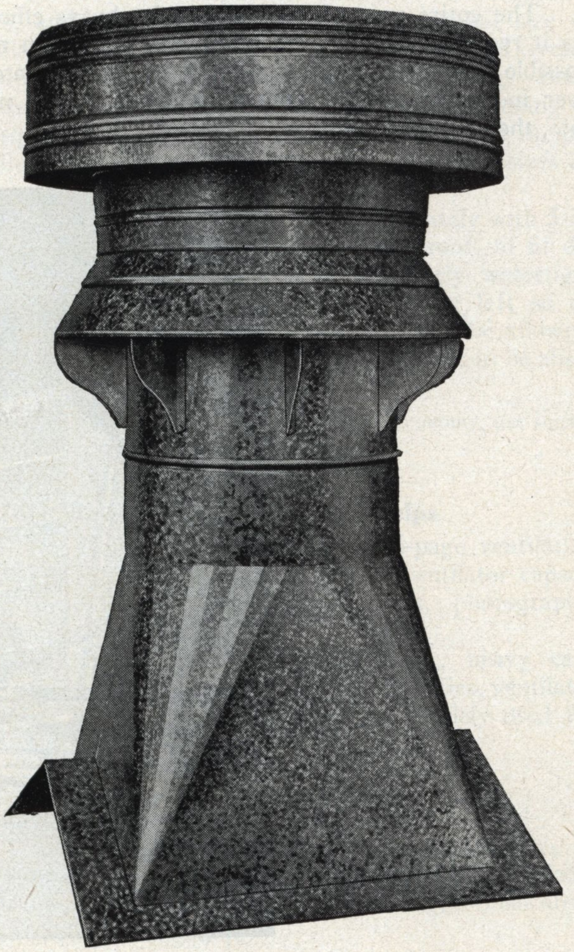
Co-Operative Service

Especial attention given to architect's correspondence concerning any particular installation.

Thirty-five years experience in ventilator building, insures a product of dependability.

SIZES, GAUGES AND SHIPPING WEIGHTS OF SYPHONIC VENTILATORS

Size, in.	Gauge of galvanized metal	Approximate shipping weight, lb.
10	26	20
12	26	24
14	26	35
16	26	42
18	26	55
20	24	65
22	24	80
24	24	95
26	22	110
28	22	130
30	22	150
32	22	180
34	22	210
36	22	240
38	20	280
40	20	320
42	20	370
44	20	415
48	20	465
50	20	
54	20	
60	20	
66	20	
72	20	



"Fosco" Syphonic Ventilator Mounted on Square Base

THE SWARTWOUT COMPANY

Rotary Ball Bearing Ventilators

MAIN OFFICE AND FACTORY
CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 103 Park Avenue
CHICAGO, ILL., 565 Washington Boulevard

ST. LOUIS, MO., 1887 Railway Exchange Building
PITTSBURGH, PA., 610 Maloney Building

Agents and Stocks in Most Principal Cities, Including Pacific Coast

Products

"SWARTWOUT" ROTARY BALL BEARING VENTILATORS.

Other products manufactured are Hydromatic Steam Traps, Low Pressure Traps, Cast Iron Exhaust Heads, Feed Water Heaters, Sediment Strainers, Industrial Ovens, Steam and Oil Separators, Air Separators.

Swartwout Principle and Operation

Swartwout principle is very simple. It actively compels the flow of air. Rotating on accurately machined ball bearings Swartwout always faces away from the wind; the passing breeze continually creates an active suction above the mouth of the ventilator, thus pulling out a steady flow of used air from the room it is connected to.

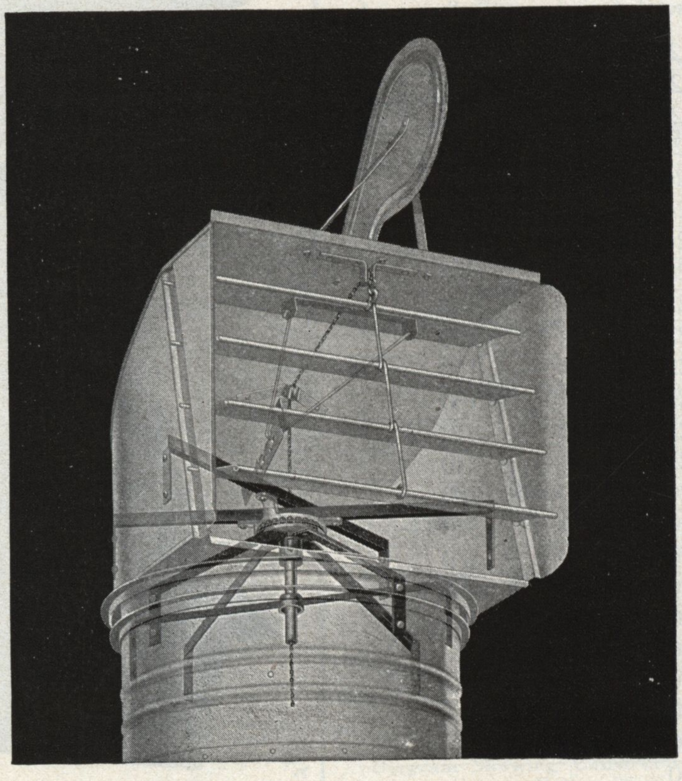
The entire area of the opening is always efficient. As it responds to every change in wind direction made possible by perfect bearing, no part of the ventilator is ever inoperative. The wind always blows past, never into, the ventilator.

Swartwout Rotary Ball Bearing Ventilator

Standard Type—Made of rust resisting galvanized copper bearing sheets of ample gauge covering a framework of sturdy angle iron, hot galvanized after accurately forming and punching. Built for lasting resistance, it is practically indestructible.

The ventilators are also constructed of copper, lead clad sheets, or zinc, on specification. Bearings on all ventilators are non-corrosive, all large size to insure correct balance, and practically frictionless. No grease or oil is necessary, which is a valuable feature.

Operates easily and effectively. Only one right angle turn is required for air flow, which is accurately controlled by stormproof louvers or dampers operated simultaneously from within from rustproof chains over brass pulleys. Louver-setting device permits setting of the louvers at open or closed positions. Distinctly efficient without sacrificing appearance and on account of its great capacity, fewer Swartwout ventilators are required.



Phantom View of "Swartwout" Ventilator

Continued on next page

Air-light Type—The standard construction, except for the substitution (on specification) of a full size, strong, wire glass top for the metal top, providing a combination skylight and ventilator. The top, steeply pitched, is self-cleaning.

No obstruction of the direct passage of light is possible.

An Analysis of Ventilator Requirements

For those in whose mind there is still some confusion as to the fundamental requirements in the choice of an efficient ventilator, we offer the following:

(1) Gauge of material in regard to relative overall dimensions and weight.

(2) Quality of material. Select a ventilator built to endure, one built of heavy rust resisting galvanized metal or copper sheets with heavily hot galvanized interior bracing, non-corrosive bronze bearings, bell-metal balls.

(3) Completeness. The selection of a ventilator complete with dampers, without additional cost.

(4) Capacity and general design. The years of service given under unusual conditions and the greatest possible capacity consistent with good substantial and practical design must be compared.

(5) Complete, ready for erection.

Fresh Air Requirements for Various Services

Figures in cubic feet per person per hour from table prepared by Prof. John R. Allen, Department of Mechanical Engineering, University of Michigan:

Workshops and barracks	3000
Office rooms	1800
Schools	2400
Hospitals	3600
Churches and theaters	2000
Dining rooms	1800
Toilets and bathrooms	2400

Testing Ventilators and the "Swartwout" Ventilator Testing Room for the Use of Architects and Engineers

So many laboratory ventilator tests have been made on identical ventilators in various parts of the country and with such varying results, that we now maintain a testing room, installed under natural conditions, for the testing of ventilators. This room is for the use of architects, engineers and prospective customers.

It is located where the wind has free access to it which avoids unfavorable eddies and uncertain results. It is equipped with the most accurate and reliable instruments obtainable, the measuring instruments being similar to those used in the United States Weather Bureau.

Comparative tests will be made or the reports of various tests of the "Swartwout" with other ventilators will be given upon application to this company. These tests extend over a considerable length of time and are as accurate as it is possible to make tests of this nature.

Capacities and Sizes of "Swartwout" Rotary Ventilators

For capacities, sizes and data on "Swartwout" ventilators, see detail drawing on following page.

Standard Specifications for "Swartwout" Ventilators

All ventilators to be of the rotary ball bearing type [metal top] [glass top] of [galvanized] [copper] copper bearing metal, all interior members of angle iron, hot galvanized *after* forming and punching or stamped from galvanized metal. The ventilators to turn sensitively on accurately machined special hard bronze bearings, employing bell-metal balls, and counterweighted on outside. The ventilators to be equipped with outside louver dampers to throw accumulated dirt outside of building, louver to be operated from within by chains over brass pulleys.

Gauge of metal to be The Swartwout Company, Cleveland, Ohio, standard, as furnished in Swartwout Rotary Ball Bearing Ventilators at regular prices. Top of collar and bottom of hood to be stiffened with galvanized angle iron rings.

(If desired, give standard gauge for each size, as shown.)

Note: Specifications and data for both ventilators and bases will be gladly furnished, on request, in convenient card form to fit your card index.

When specifying, inquiring or ordering, state character and pitch of roof, and whether ventilator will rest on peak or slope of roof.

Specifications for Bases

Build each base individually for its job.

Ventilator bases to be of galvanized rust-resisting metal, two gauges heavier than ventilator, according to The Swartwout Company standard for ventilator bases, and of sizes corresponding to nominal size of ventilators. Collars to be 5 in. high, grooved and riveted to body of base with 1-in. lap and 5-in. spacing. Body of base to be a square-to-round section with opening of the square 4 in. larger than the collar. Bases 18 in. and smaller to be 23 in. high over all, and larger sizes 27 in. high.

All bases to fit roof dimensions accurately with 5-in. flange, bent out, not sharp (if concrete roof, to fit detail shown), and must form an absolutely watertight juncture with the roofing material and be left so on completion. Seams at roofing line can not be allowed, except to fill in corners of base. Top of base to be absolutely level and round.

Note: For capacity, rigidity, tightness, economy, use square bases only.

Drafting Room and Specification Helps

"The Gospel of Fresh Air," a 36-page ventilation handbook with air-requirement tables, ventilator capacities, complete drawings, specifications, photographs, etc.

Ventilation Data Card, 8½x11 in., heavy card reference. Covers air requirements, capacities, ventilator and base specifications and drawings. Widely used for instant reference.

Co-operative Planning Service

Our engineering department, with many years of practical experience in mechanical ventilation, will gladly study ventilation problems and make suggestions absolutely without obligation.

Write us today.

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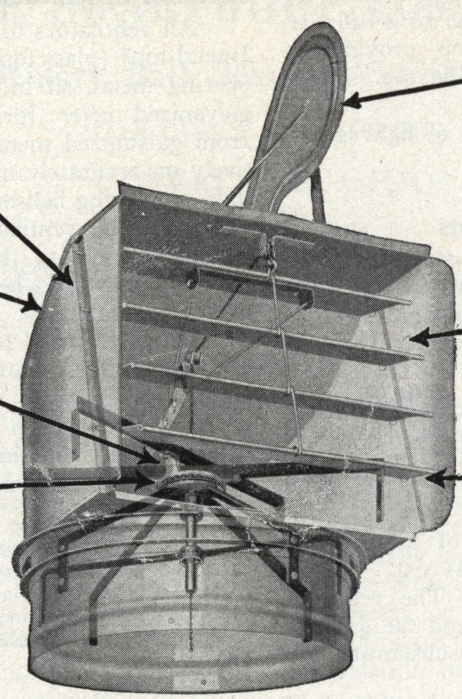


The Swartwout Standard Ventilator is constructed of heavy gauge copper bearing galvanized steel. Also copper, lead clad steel or special materials

All joints are double seamed. No bolts used

All interior members hot galvanized after forming and punching

Accurately machined bronze bearings revolving on non-corrosive hard composition balls. No oiling necessary

Vane keeps ventilator in proper direction to wind, preventing back draft and leakage of snow and rain

Full area opening; no restrictions

Adjustable louver dampers with ratchet attachment and chain

DETERMINING PROPER VENTILATOR SIZES

CONSERVATIVE AIR RATING OF SWARTWOUT ROTARY BALL BEARING VENTILATORS

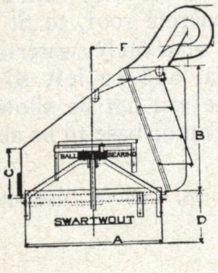
Size of vent, in.	Cu. ft. per min.	Size of vent, in.	Cu. ft. per min.	Size of vent, in.	Cu. ft. per min.
12	275	24	1100	54	5500
14	370	30	1700	60	6850
16	490	36	2550	66	8250
18	650	42	3400	72	9850
20	800	48	4450		

FACTORS OF IMPORTANCE

The volume of air handled by any roof ventilator is affected by many conditions. Among these conditions are wind velocity, direction of wind, location and sizes of surrounding buildings or other obstructions to free movement of air, inside and outside temperatures, location and size of open windows or doors, and methods of heating. In planning an installation, it is essential to use a sufficient factor of safety to be certain of complete ventilation at all times.

The cost of a few more or larger ventilators is insignificant when compared to the difference between satisfactory and unsatisfactory ventilation.

The conservative table at left is presented for your guidance in determining ventilator sizes. The actual capacity will, in most cases, be much greater than that shown.



DIMENSIONS, WEIGHTS AND GAUGES OF SWARTWOUT VENTILATORS

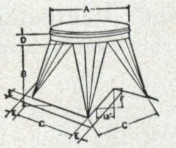
For dimensions, "A," "B," "C," "D," "F," in inches see table below.

In ordering, only dimension "A" is required.

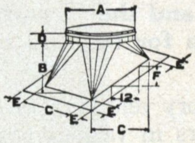
INSTALLATION

To insure proper installation and immediate satisfaction, complete directions for mounting are supplied on each ventilator.

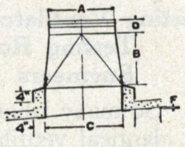
A	B	C	D	F	Gauge iron	Wt. copper, oz.	Net wt., lb.	Crated wt., lb.
10	9⅛	4	5	11½	24	18	15	25
12	11	4¾	5	14¼	24	18	20	30
14	12⅞	5¾	5½	15½	24	18	30	40
16	14¾	6	5½	17	24	18	35	50
18	16½	6⅝	6½	19	24	18	45	65
20	18½	7⁹⁄₁₆	6½	21	24	18	50	75
24	22	9	6¾	24½	24	20	60	90
30	27½	11⁵⁄₁₆	9⅛	30	22	24	120	190
36	33	13½	11	34½	22	24	160	265
42	38½	15¾	11¼	41¼	20	28	225	400
48	44	18⅞	11¼	46½	20	28	320	475
54	49½	20¼	13¾	47	20	28	485	650
60	55	22½	15½	61	20	28	560	740
66	60½	24¾	16¾	52½	20	28	650	825
72	66	27	16¾	67½	20	28	780	1000



Type A



Type B



Type C

DIMENSIONS, WEIGHTS AND GAUGES OF SWARTWOUT BASES

A	B	C	D	E	F	Gauge iron	Wt. copper, oz.	Aver. Net Wt., lb.	Aver. Crated Wt., lb.
10	18	14	5	5	Required dimension slope per ft.	22	24	13	15
12	18	16	5	5		22	24	18	20
14	18	18	5	5		22	24	26	28
16	18	20	5	5		22	24	35	37
18	18	22	5	5		22	24	38	40
20	22	24	5	5		22	24	45	50
24	22	28	5	5		22	24	55	65
30	22	34	5	5		20	28	80	95
36	22	40	5	5		20	28	95	110
42	22	46	5	5		18	32	105	125
48	22	52	5	5		18	32	115	135
54	22	58	5	5		18	32	125	150
60	22	64	5	5		18	32	140	165
66	22	70	5	5		18	32	155	185
72	22	76	5	5		18	32	170	200

DRAWN BY
THE SWARTWOUT
COMPANY

DATA AND DIMENSIONS OF VENTILATORS & BASES FOR SWARTWOUT ROTARY BALL BEARING VENTILATORS

NOT DRAWN
TO SCALE
DATE·AUG."25

DR'WG
1

THE V-W VENTILATOR COMPANY

Manufacturers of Roof, Window and Door Ventilators

428 Columbian Building, COLUMBUS, OHIO

Products

Stationary Roof Ventilators; Louvered Window and Door Ventilators; Ventilator Bases.

Type A, V-W Standard Roof Ventilator

An efficient ventilator of the stationary suction type, for use in schools, colleges, gymnasiums, libraries, hospitals, hotels and industrial buildings of every sort.

V-W roof ventilators exhaust the air continuously, regardless of the direction or velocity of the wind. There can never be any back-pressure or down-draft. Since V-W ventilators have no moving parts, there is nothing to wear, stick, rattle or get out of order—the first cost is the last cost.

V-W roof ventilators are symmetrical and pleasing in appearance, and contribute to the beauty of the building. They are lower in cost than other effective ventilators.

Bases—Type A ventilators are furnished separately from the bases. These will be supplied in accordance with dimensions furnished. When ordering bases, give pitch of roof (or sketch showing roof angle). State whether ventilators are to be placed on ridge or side, or on a flat roof. We also furnish neck or extension pieces, if required.

Type B, V-W Modified Roof Ventilator

Identical with Type A, except for the additional feature of insulated base, shields and hood, which prevent the cold outside air from chilling and condensing the moisture on the inside. Type B ventilators are recommended for paper, pulp and textile mills, laundries and other buildings where condensation of steam and consequent dripping is detrimental.

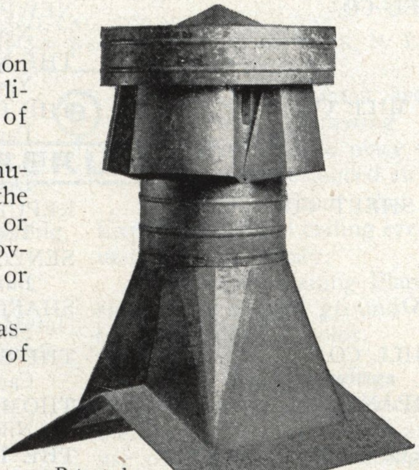
V-W Window and Door Ventilators

Consist of patented R-shaped metal louvers mounted vertically in a substantial frame. They admit air free of solid and liquid matter, draft and inconvenience.

Made in removable and built-in type. The built-in type is installed in sash or in door panels, and is especially recommended for apartments, hotels, hospitals, dormitories, store fronts and telephone booths.

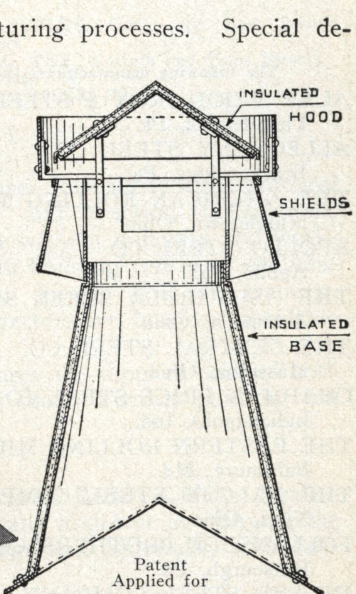
Ventilating Service

We specialize in the elimination of smoke, steam, heat, fumes and objectionable gases which arise in manufacturing processes. Special designs on request.



Patented 1924

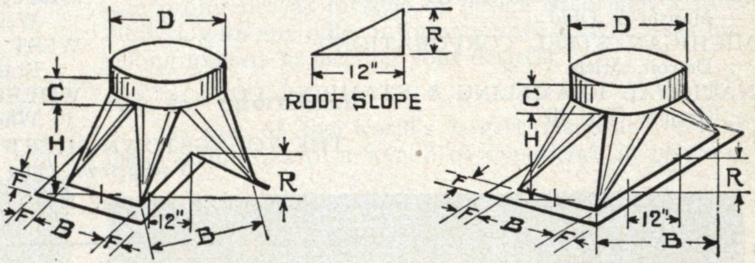
Type A Standard



Patent Applied for

Type B Modified

V-W Roof Ventilators



Ridge

Sloping

V-W ROOF VENTILATORS AND VENTILATOR BASES

Size, in.	*Capacities at wind velocity of 5 m.p.h.			Dimensions of base, in.				Gauge of gal. metal		Approximate weight, lb.		
	(1)	(2)	(3)	B	F	C	H	Vent.	Base	Vent.	Base	Total
10	80	175	290	14	5	5	18	24	22	15	16	31
12	110	255	425	16	5	5	18	24	22	20	20	40
14	150	355	595	18	5	5	18	24	22	20	20	40
16	190	450	770	20	5	5	18	24	20	35	30	65
18	240	575	975	22	5	5	18	24	20	45	38	83
20	300	715	1210	24	5	5	22	22	20	55	45	100
24	430	1025	1750	28	5	5	22	22	20	75	55	130
30	670	1600	2730	34	5	5	22	22	18	95	80	175
36	960	2300	3975	40	5	5	22	20	18	120	95	215
42	1310	3140	5355	46	5	5	22	20	18	150	105	255
48	1710	4085	6960	52	5	5	22	18	18	190	115	305
54	2160	5180	8840	58	5	5	22	18	18	250	125	375
60	2670	6400	10915	64	5	5	22	16	16	300	140	440
66	3230	7745	13205	70	5	5	22	16	16	375	155	520
72	3850	9220	15715	76	5	5	22	16	16	450	170	620

*Capacity: (1) is cu. ft. exhaust per min. without chimney action being considered. (2) is exhaust at 15° temperature change, ventilator 20 ft. above floor. (3) is exhaust at 30° temperature change, ventilator 50 ft. above floor.

Some Notable Installations and Users

New Administration, Journalism, Chemistry, and Medical Science Buildings at Ohio State University, Prof. J. N. Bradford, Architect

North High School, Columbus, Ohio, Frank L. Packard, Architect

Waverly High School, Waverly, Ohio, Floyd F. Glass, Architect

Mead Pulp & Paper Company, Chillicothe, Ohio

Ohio Archeological and Historical Museum

Columbus Transfer Co. Storage Plant, Richards, McCarthy & Bulford, Architects

Greenlawn Cemetery Receiving Vault, Bassett & Tressett, Architects

Dayton Engineering Laboratories Co. (Delco, Dayton, Ohio)

Garage for Winders Motor Sales Co., Carmichael & Millspaugh, Architects

New High School, Sheridan, Wyoming, Randall & Jordan, Architects

Neil House, Gustave W. Drach, Architect

Training School and Manual Training Buildings, Ohio University, Athens, Ohio, Herbert B. Briggs, Architect

Lima Woolen Mills, Lima, Ohio

Mt. Vernon High School and Elks Building, Mt. Vernon, Ohio, W. H. Tremaine, Architect

Diamond Match Company, Morristown, N. J.

International Derrick Company

SHEET STEEL TRADE EXTENSION COMMITTEE

Representing over 70% of the Sheet Steel Making Capacity of the United States

Oliver Building

PITTSBURGH, PA.

The following manufacturers subscribe to, support and co-operate in, the activities of the SHEET STEEL TRADE EXTENSION COMMITTEE

ALAN WOOD IRON & STEEL CO.
Philadelphia, Pa.
ALLEGHENY STEEL CO.
Brackenridge, Pa.
THE AMERICAN ROLLING MILL CO.
Middletown, Ohio
APOLLO STEEL CO.
Apollo, Pa.
THE ASHTABULA STEEL SHEET CO.
Ashtabula, Ohio
THE CENTRAL STEEL CO.
Massillon, Ohio
CHAPMAN PRICE STEEL CO.
Indianapolis, Ind.
THE EASTERN ROLLING MILL CO.
Baltimore, Md.
THE FALCON STEEL COMPANY
Niles, Ohio
FOLLANSBEE BROTHERS CO.
Pittsburgh, Pa.
INLAND STEEL COMPANY
Chicago, Ill.
MANSFIELD SHEET & TIN PLATE CO.
Mansfield, Ohio
MICHIGAN STEEL CORPORATION
Detroit, Mich.
NATIONAL ENAMELING & STAMPING CO.
Granite City, Ill.
NEWPORT ROLLING MILL CO.
Newport, Ky.
THE NEWTON STEEL COMPANY
Youngstown, Ohio
THE PARKERSBURG IRON & STEEL CO.
Parkersburg, W. Va.
THE REEVES MANUFACTURING CO.
Dover, Ohio
REPUBLIC IRON & STEEL CO.
Youngstown, Ohio
SENECA IRON & STEEL CO.
Buffalo, N. Y.
SHARON STEEL HOOP COMPANY
Sharon, Pa.
THE SUPERIOR SHEET STEEL CO.
Canton, Ohio
THOMAS SHEET STEEL COMPANY
Niles, Ohio
THE TRUMBULL STEEL COMPANY
Warren, Ohio
UNITED ALLOY STEEL CORPORATION
Canton, Ohio
WEIRTON STEEL COMPANY
Weirton, W. Va.
WEST PENN STEEL COMPANY
Brackenridge, Pa.
WHEELING STEEL CORPORATION
Wheeling, W. Va.
THE YOUNGSTOWN SHEET & TUBE CO.
Youngstown, Ohio

For Roofing, see pages 1132-33; for Cornices, see page 1134; for Sheet Steel for Interior Uses, see page 1148

STEEL CEILINGS

Design—Steel ceilings have, until recently, been generally characterized by the multitudinous repetition of single small square, often intricately beautiful units of design, each complete in itself but lacking sufficient connection or diversity to best hold and carry interest over the whole space covered.

New designs and new arrangements of some of the old ones now make available a great variety of suggested treatments. Others can in particular cases be executed to the architect's own design. Beamed ceilings and coffered effects, square, rectangular and polygonal for the high ceilings of public buildings, banks, society halls, moving picture theaters, hotel lobbies and department stores. Rich rubricated borders, large restful spaces interestingly textured or paneled and effective medallions for lower ceiled stores, theaters, libraries, assembly rooms and classrooms. If these are not shown in your current catalogues, write this Committee to be put into touch with those makers who are prepared to furnish superior quality effects.

Surface and Color—Not the gloss and glare formerly supposed to be indispensable to a sanitary surface, but all the desirable finishes, mattes, eggshell, stipples, translucent effects, Tiffanys and plain flats. In color, everything now available for decoration on any material.

Lasting Quality and Fire Resistance—Steel ceilings are waterproof. Leaks do not blister, disfigure or permanently stain their decorated surfaces. The beautiful finishes now available permit of repeated washings. Steel ceilings can not crack. Neither leaks, nor age, vibration nor shock, however heavy, can make them fall. In the many thousands of ordinary fires which have occurred under them, steel ceilings have practically without exception prevented the upward spread of the fire during the all important first twenty minutes and in most cases, longer. They are far superior to ordinary plastered ceilings.

Constructional Advantages—There being no successive coats to apply and dry, one day suffices for the erection of a ceiling which could not possibly be made ready for decoration in less than several days in any other permissible material. A steel ceiling, in conjunction with steel tile or other ready sidewall finish, permits of the immediate application of interior trim and the fitting of doors, cabinets, etc., without fear that joints will later shrink wide open. Finished floors may be safely laid at once and single floors can be expected to have clean unstained surfaces, free from plaster and grit.

Economy—The first cost of an eminently satisfactory treatment in this material will show a very substantial economy over any, approximately, equal effect in any other material, and its service will increase this advantage.

THE BERGER MANUFACTURING CO.

Steel Ceilings and Sidewalls

CANTON, OHIO

BRANCHES

BOSTON, MASS., 307-315 Dorchester Avenue
NEW YORK, N. Y., 514-524 West 25th Street
PHILADELPHIA, PA., 16th Street and Washington Avenue
CHICAGO, ILL., 123 West Madison Street
ST. LOUIS, MO., Third and Russell Avenues
NORTH KANSAS CITY, MO., 14th and Charlotte Streets
MINNEAPOLIS, MINN., 1701-1729 Broadway, N. E.
SAN FRANCISCO, CAL., 1120 Mission Street
LOS ANGELES, CAL., 405 East Second Street
DALLAS, TEX., Corinth and Pearl Streets
ROANOKE, VA.
JACKSONVILLE, FLA.

EXPORT DEPARTMENT: 514-524 West 25th Street, NEW YORK, N. Y.

BERLOY

Products

BERLOY METAL CEILINGS and SIDEWALLS in wide variety of attractive designs to harmonize with various styles of architecture and furnishings.

For Floor Cores, see page 45; for Metal Building Material, see pages 398-401.

Metal Ceiling Advantages

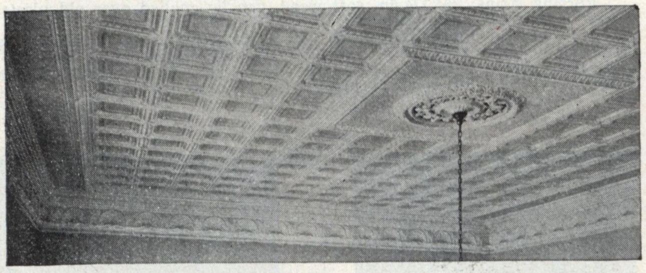
Briefly stated, the advantages of Berloy Metal Ceilings are beauty, safety, permanence, fire resistance, bacteriological cleanliness and ultimate economy.

Berloy Modern Steel Ceilings

Berloy Ceilings are formed on a draw press under a pressure of 900 tons. This brings out beauty, accuracy and sharpness of detail which can never be secured by the old drop hammer process which has been discontinued in the making of Berloy Ceilings and Sidewalls.

Berloy Designs

Berloy Steel Ceilings are made in beautiful and practical modern designs. These designs are made in wide variety to offer a range of choice for every service.



Berloy Metal Ceiling in Masonic Temple, Wilmington, Ohio

Various types of cornice border and field plates can be combined to form an endless variation of finished effects. Many of the best combinations are clearly illustrated in the big Berloy Catalogue S 23 which will be sent to any architect on request to the nearest Berger office.

Berloy Steel Sidewalls

For many uses steel sidewalls are also desirable and a variety of practical and attractive modern Berloy designs are available for the purpose.

Popular Priced Plates

For garages, lofts, basements, factory rooms and similar places where the more artistic designs are not required, Berloy popular priced ceiling and sidewall plates can be used with a considerable economy both in cost of ceiling material and in erection costs.

Details of Erection

Berloy Metal Ceilings can be erected on any supports to which nailing strips can be attached or they can be suspended, if desirable.

The plates are furnished with practical working drawing and erection instructions. They go into place without difficulty and workmen experienced in building can erect the ceilings without any special skill or training. Experienced steel ceiling erectors are, however, available in nearly every city.

All Berloy Ceiling Plates are supplied painted both sides with a good ground coat. Further painting can be in any desired color.

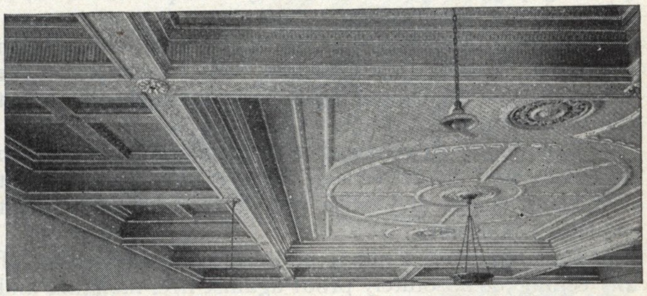
Estimates and Drawings

The corps of experienced Berloy Ceiling Draftsmen are at the service of any architect in planning the use of Berloy Steel Ceilings and Sidewalls, with estimates of cost.

This service is free to architects. Send sketch and exact dimensions of room, state height of ceiling, indicate preference as to style or design of ornamentation desired, with any other information which will assist our ceiling experts in meeting your desires.

Ask for Information

As one of the world's largest manufacturers of metal ceilings, with a wealth of experience in planning and erection, we are glad to answer questions, supply information about metal ceilings and send catalogues of designs, etc. Address nearest Berger office.



Berloy Ceiling in St. Clement's Church, Minneapolis, Minn.

Steel Ceiling Users

Modern designs and modern methods have combined to make Berloy Ceilings more practical and desirable than ever before, and their use is increasing rapidly. They may be used wherever finished ceilings are desirable.

Following is a list of representative buildings in which Berloy Steel Ceilings have been used:

Regent Hotel, St. Louis, Mo.
American Athletic Club, Chicago, Ill.
Knoxville Power & Light Co., Knoxville, Tenn.
Dance Hall, 308 West 52nd Street, New York, N. Y.
Manhattan State Hospital, Ward's Island, New York, N. Y.
Citizens National Bank, Covington, Ky.
High School, Athens, Ohio
General Motors Corporation, Muncie, Ind.
Plaza Theater, White Sulphur Springs, W. Va.
Kissam Hall, Vanderbilt University, Nashville, Tenn.

THE EDWARDS MANUFACTURING CO.

INCORPORATED 1901

Metal Ceilings and Roofing

CINCINNATI, OHIO

BRANCH OFFICES AND WAREHOUSES

DALLAS, TEX., Corner of Market and Collin Streets

NEW YORK, N. Y., 81-83 Fulton Street

Products

EDWARDS METAL CEILINGS and WALLS.

METAL SHINGLES.

METAL SPANISH TILE.

PATENTED PRESSED STANDING SEAM CORRUGATED STEEL ROOFING.

Also, "Reo" Cluster Shingles, Metal Culverts, Metal Garages, Portable Steel Buildings, Metal Wall Coverings, Metal Lath, Corrugated Iron Roofing and Siding, Steel Imitation Brick and Stone Siding, Galvanized Iron Cornice, Eaves Trough, Conductor Pipe, Cellular Metal Fireproofing and "Keyridge" Reinforcement and Lath, "Edmanco Tightcote" Fire Resisting Paint.

Edwards Metal Ceilings and Walls

Metal ceilings are no longer a luxury—they may almost be said to be a necessity. Where formerly they were used almost exclusively in churches, stores, halls and other buildings, they are now extensively used also in private residences.

There are a number of excellent reasons for this growing popularity. From every viewpoint the metal ceiling is the ideal ceiling.

In the first place, it is unusually attractive. With the wide variety of patterns which comprise the Edwards line to choose from, any architectural effect can be obtained.

Nor do the advantages of a metal ceiling end with its beauty and attractiveness. It is economical, the first cost being slight, and, with proper care, no subsequent expense for repairs.

It is the most sanitary and easiest to keep clean of any ceiling; is absolutely proof against fire, moisture and vermin.

Makes the room cool in summer and warm in winter; and eliminates danger from falling plaster.

Edwards Metal Shingles and Metal Spanish Roofing Tile

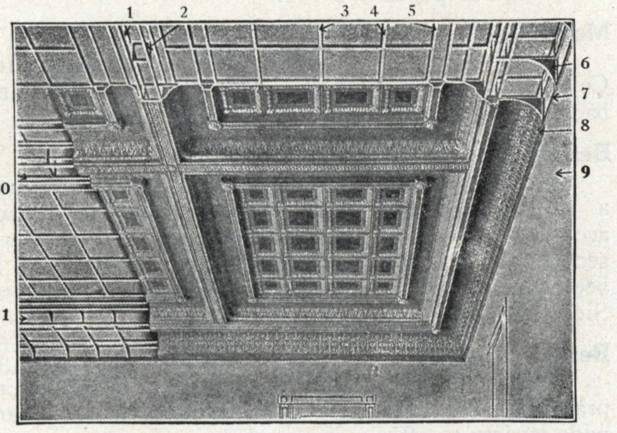
Are made from best quality terne plate, furnished painted or "Tightcote" galvanized, also in copper.

Their exceedingly attractive appearance is only one of the numerous advantages which commend them to builders and architects.

They are proof against fire, lightning, rain, snow and wind.

Do not warp or rot as wooden shingles do; and when laid according to the simple directions, will last a lifetime.

All Edwards metal shingles and metal Spanish tile are made with a patented side lock. Their interlocking device permits of a tight interlocking of each shingle or tile with the one lying next to it, so that, when the entire roof is laid, it is practically the same as one solid sheet of metal, without a crack or crevice anywhere through which a drop of water can seep. Although the seams are absolutely watertight, the lock is so devised as to allow for expansion and contraction



DETAILS OF APPLICATION, EDWARDS METAL CEILING

Furring strips, ⅞x1¼-in. soft wood, can be applied over old plaster direct to joist or wood ceiling.

(1) Construction of false beam. (2) Brace form. (3, 4, 5) Furring strips for ceiling. (6) Cornice bracket. (7) Furring strips at bottom of cornice or cove. (8) Cove. (9) Side wall. (10) Construction of false beam. (11) Showing small cornice at top of large cove

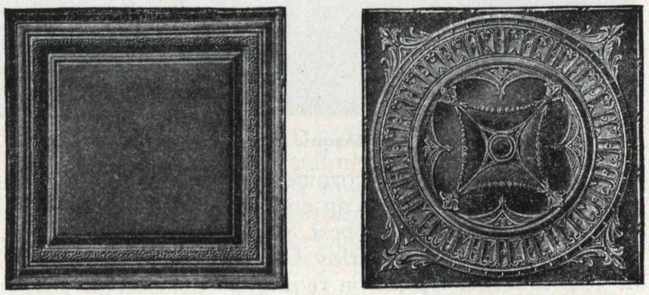


Plate No. 1735

Center, No. 2312

EDWARDS FRENCH RENAISSANCE METAL CEILINGS

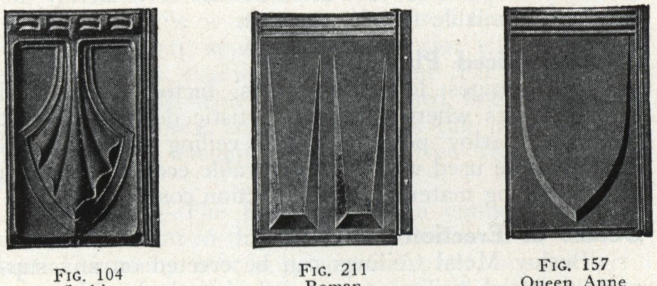


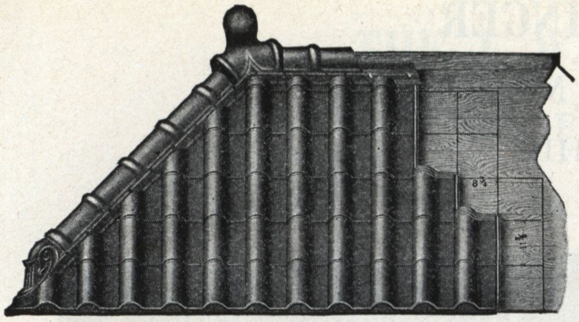
FIG. 104
Gothic
10x14 in.

FIG. 211
Roman
10x14 in.

FIG. 157
Queen Anne
10x14 in.

EDWARDS METAL SHINGLES

Continued on next page



Method of Applying Tile and Fixtures

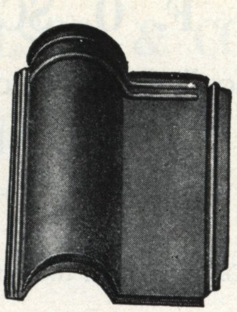


Fig. 367. Tile for Main Part of Roof

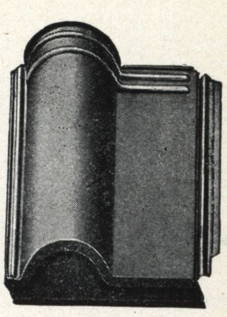


Fig. 369. Tile-Starter or Eave Tile, with Closed End for Edge of Roof at Gutter

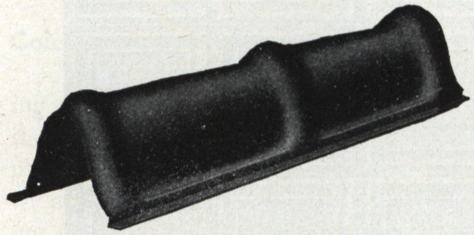


Fig. 414. Hip or Ridge Finish
Height, 6 in.; width, 7 in.; length, 28 in.

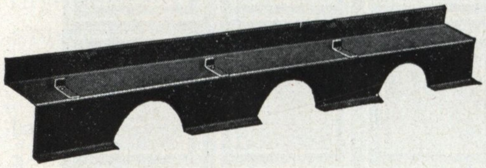
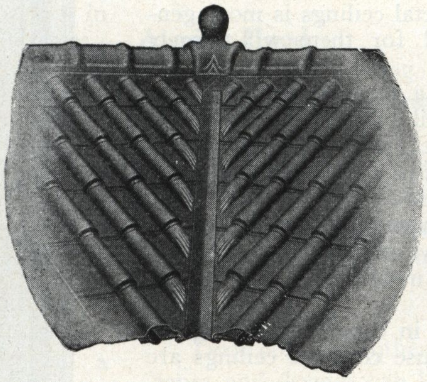


Fig. 409. Ridge Flashing Nailed to 2x4-in. Strip on Ridge. Ridge Finish Fastened to Flashings with Cleats, 10-ft. Lengths



Method of Locking Valley Tile into Valley

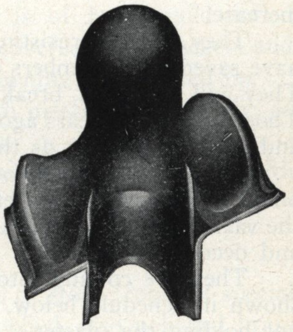


Fig. 397. 3-Way Finial, 2 Hips, 1 Ridge.
Height, 17 in.; width, 17 in.

Details Edwards Metal Spanish Roofing Tile

of the metal due to heat and cold, and thus there is never any danger of the roof buckling, warping and springing leaks.

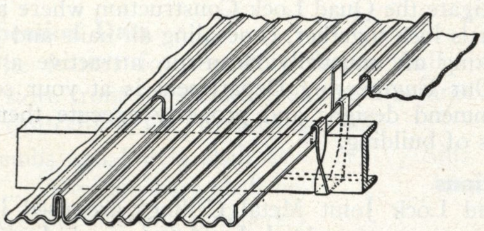
Patented Pressed Standing Seam Corrugated Steel Roofing

Edwards patented pressed standing seam corrugated steel roofing is especially adapted for use on structural steel buildings, as will be seen by the accompanying details. This roof has perfectly tight seams and can be applied directly to the purlins without rivets of any kind. Made in Nos. 16 to 28 gage, painted or galvanized.

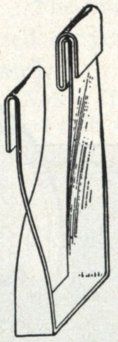
In the use of this new roofing, a saving of 11% can be effected on side seams alone, and a much tighter side lock is assured. The method of cleating makes the cleats absolutely tight and at the same time allows for vibration. It makes a 50% more watertight job. It has another advantage in that it can be placed on the roof and worked entirely from above, no scaffolding of any kind being necessary; and an entire roof can be put on without puncturing the sheets in the least, preserving the galvanized coating intact.

While the cost of this material is somewhat more than the regular corrugated sheets, the saving in side laps and application more than makes up for the difference.

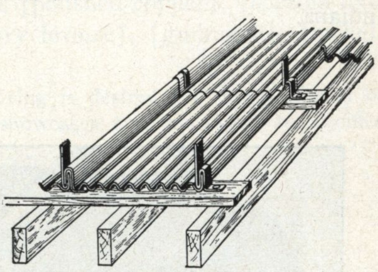
This roofing has been applied to a number of large buildings in various parts of the country and is giving absolute satisfaction. One roof, put on 6 years ago, covers a single building requiring over 1000 squares.



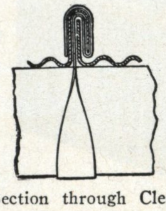
Applied to Steel Purlins



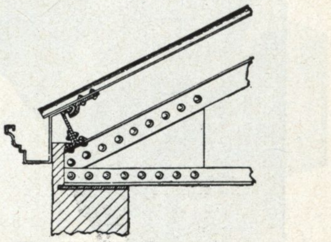
Cleat after Sheet is Applied



Applied to Wood Sheathing



Section through Cleat



Finishing out Eaves when Gutters are Used

Details Edwards Patented Pressed Standing Seam Corrugated Steel Roofing

F. O. SCHOEDINGER

"Fosco" Quad Lock Joint Metal Ceilings

COLUMBUS, OHIO

Products

Quad Lock Joint Metal Ceilings with the concealed nailing.

Also sole manufacturers of Kinnear and Gager's Quad Lock Metal Ceilings; also Metal Hospital Furniture.

For Ventilators, see pages 1198-1199.

"Fosco" Quad Lock Joint Metal Ceilings

When the true value of metal ceilings is more generally understood the demand for them will largely increase.

They are fire resisting to a very large degree and have saved large numbers of buildings from destruction. They will not crack, break loose, fall down or wear out. Those erected 35 years ago are just as good as new today and will last as long as the building.

Metal ceilings are now adaptable to every style of building because of the effective manner of combining the various types of panels with mouldings, beams, frieze and decorative cornices.

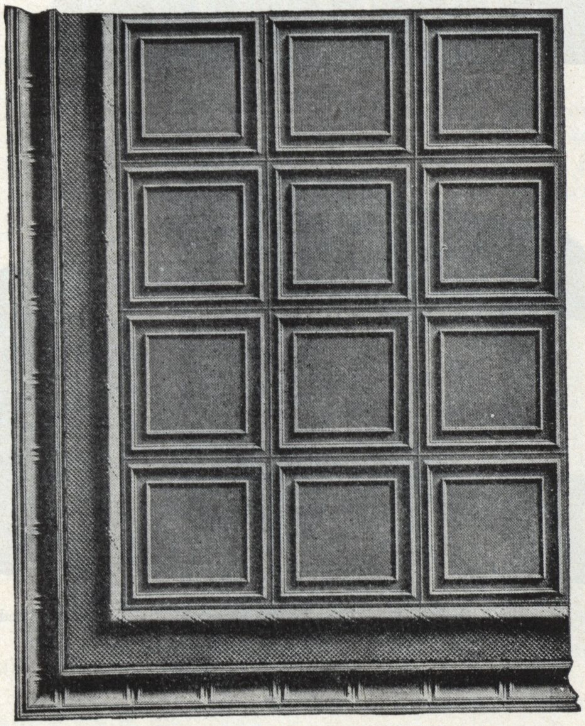
They are coming into use in concrete buildings as shown in schedule below, because concrete ceilings are not holding the plaster.

Construction

When considering metal ceilings, it is only natural to investigate the Quad Lock Construction where all the field panels lock together, concealing all nails and joints and making an unusually clean-cut, attractive appearance. Our Engineering Department is at your service to recommend designs and properly execute them for any class of building.

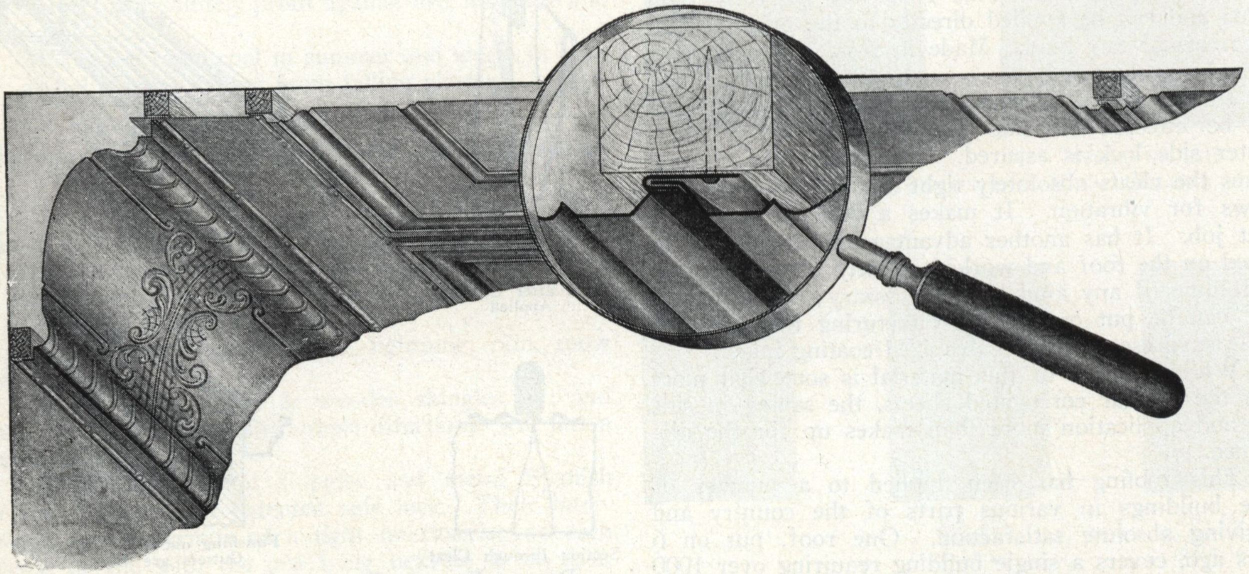
Installations

Quad Lock Joint Metal Ceilings are used in the following concrete school buildings in Indianapolis, Indiana.



Quad Lock Joint Design No. 4744-A

School No. 2—Washington and California Streets
School No. 22—Kansas and Illinois Streets
School No. 26—Martindale Avenue and Fifth
School No. 30—40 No. Miley Avenue
School No. 73—4101 E. 30th Street
School No. 75—14th Street and Belview Place
School No. 76—30th Street and College Avenue



"Fosco" Quad Lock Joint Metal Ceiling with the Concealed Nailing

THE J. W. COULSON & CO.

Store Front Construction

95-107 West Spring Street
COLUMBUS, OHIO

Colco Store Front Construction (Patent Applied For)

The J. W. Coulson & Co. have been manufacturing store fronts for the past 25 years and have been in the market with Colco store front construction for the past two years. In the designing of Colco construction, we have kept in mind the necessity of having a neat looking as well as a substantial store front construction.

Colco construction is adapted to any store front, large or small, simple or elaborate, and provides a good, strong, durable store front and a safe setting for glass.

The wood cushion in the corner posts and division bars allows for contraction and expansion and gives a firm grip on glass, reducing the breakage to a minimum.

The corner posts, division bars, ventilated stop and No. 215 sill are furnished with wood, all complete. All wood is treated with creosote to prevent decay. The remainder of the construction can be furnished with or without wood, as this metal covering can be placed on woodwork furnished by other contractors.

Finish

The finish is polished copper, spotted oxidized copper, statuary bronze, gunmetal or nickelplate.

Ventilating System

Proper and effective ventilation of show windows is provided by using Colco construction ventilated at transom bar and sill. We can provide ventilation up the sides if so desired, also ventilation and drainage for transom glass.

Awning Hood

The Colco awning hood is of heavy cold rolled copper supported with copper covered steel brackets and provides a protection for the awning when rolled up.

This can be furnished with metal covering only, or we can provide the transom bar in any width, which is creosoted wood with reinforced steel tees 2x2 in. with lugs at both ends to fasten to jambs.

Metal Coverings

Door posts and other parts of store fronts of special shapes and designs can be supplied, also polished brass kick plates and thresholds, and metal covered sash doors with door posts for showcases.

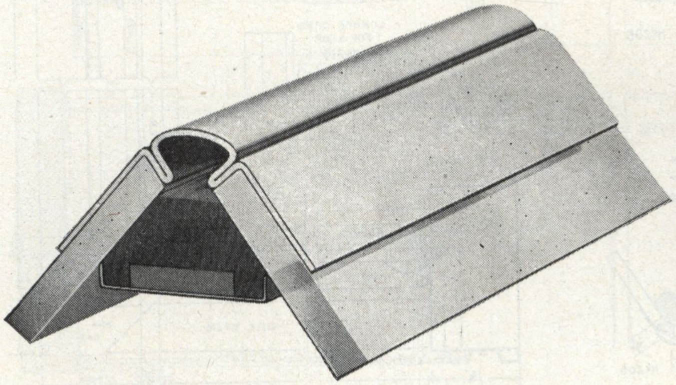
Specification Data

The frames for the store fronts shall consist of Colco store front construction, as manufactured by The J. W. Coulson & Co., Columbus, Ohio.

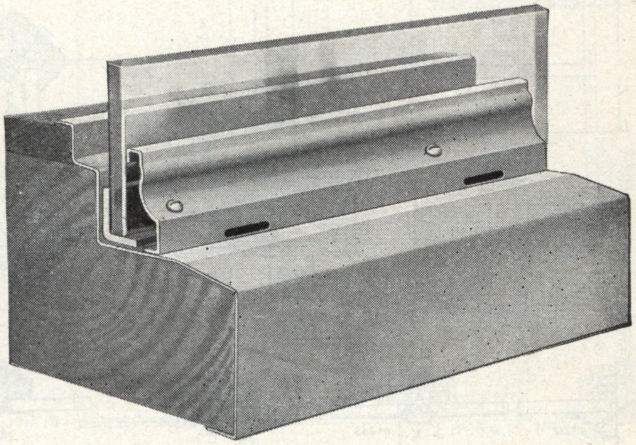
Jambs and lintels shall be .... Sills shall be .... Division bars shall be .... (See following page for size and numbers.)

The finish shall be [polished copper], [spotted oxidized copper], [statuary bronze], [gunmetal], [nickelplate].

Note: If metal covering is desired for doors, hinged or pivoted sash, door posts, showcases, etc., this should be specified in detail.

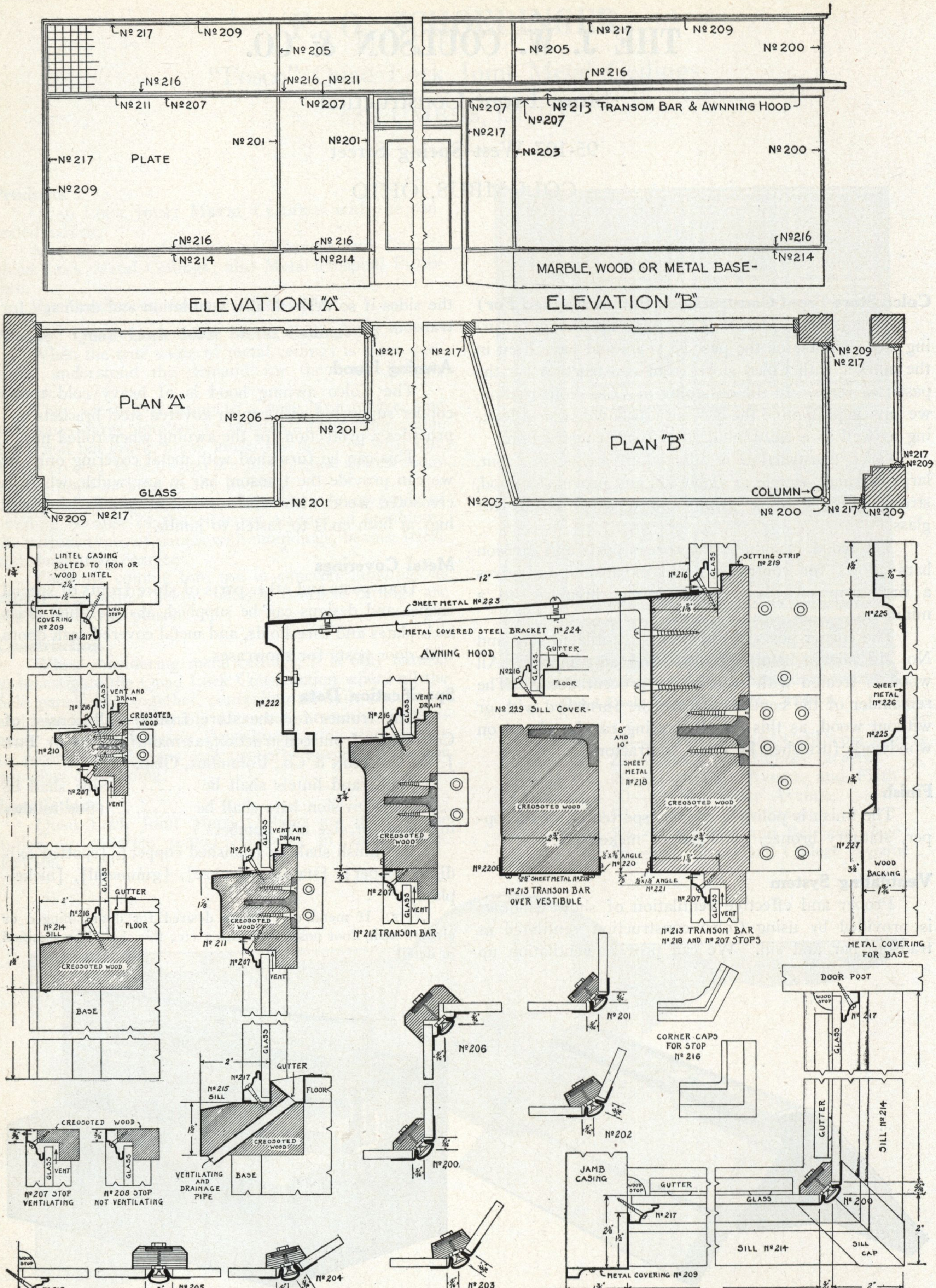


Colco Corner Post Construction



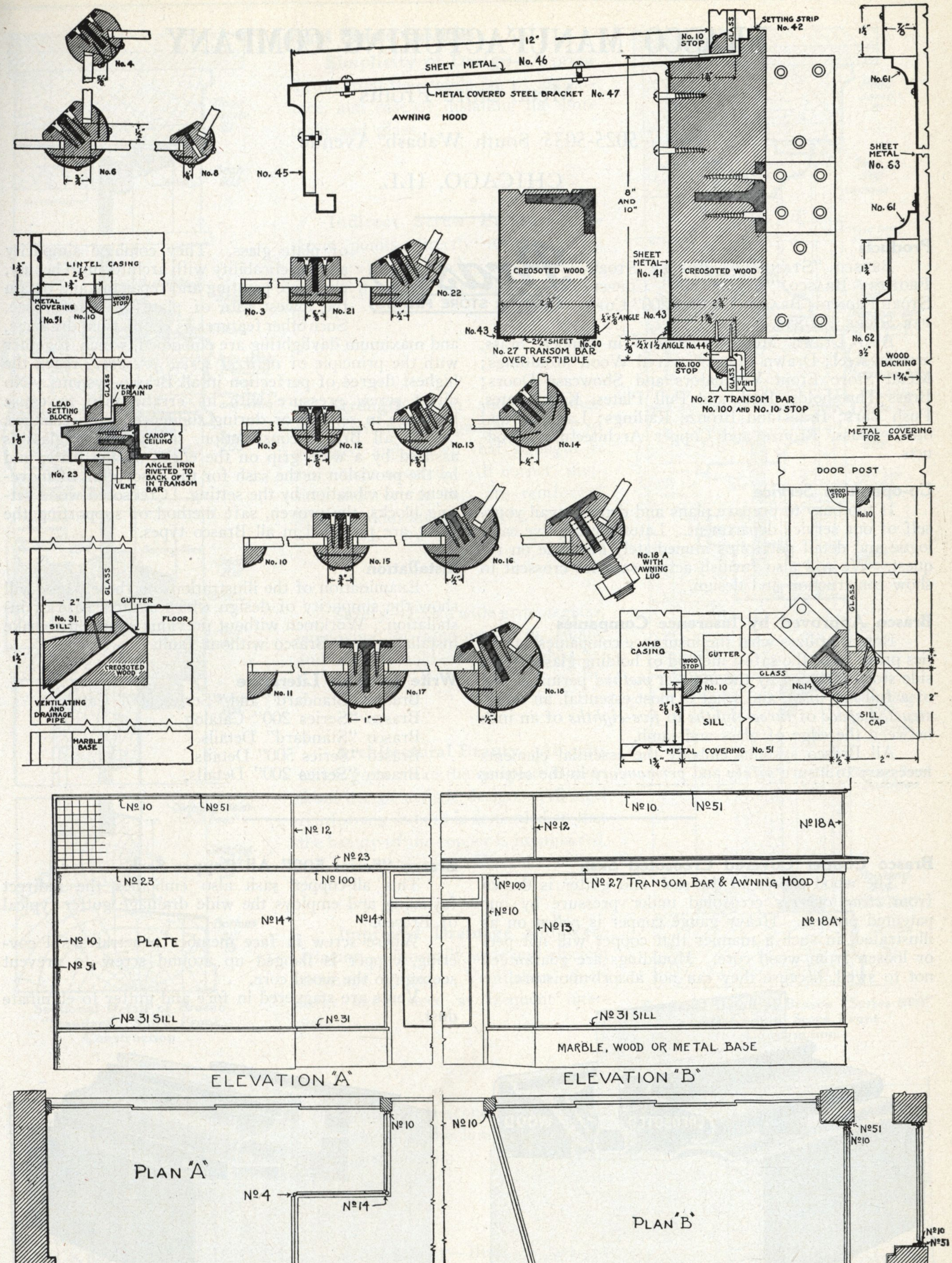
Colco Sill Construction

Continued on next page


No 217
No 209
No 205
No 216
No 211
No 207
No 200
No 213 TRANSOM BAR & AWNNING HOOD
No 201
No 203
PLATE
No 214
MARBLE, WOOD OR METAL BASE-
ELEVATION "A"
ELEVATION "B"
PLAN "A"
PLAN "B"
No 206
GLASS
COLUMN
LINTEL CASING BOLTED TO IRON OR WOOD LINTEL
METAL COVERING No 209
WOOD STOP
SHEET METAL No 223
METAL COVERED STEEL BRACKET No 224
AWNING HOOD
No 222
SETTING STRIP No 219
GUTTER
FLOOR
No 229 SILL COVER
VENT AND DRAIN
CREOSOTED WOOD
No 210
VENT
No 225
SHEET METAL No 226
SHEET METAL No 218
No 220 ANGLE
No 221 ANGLE
SHEET METAL No 228
No 213 TRANSOM BAR OVER VESTIBULE
No 213 TRANSOM BAR No 218 AND No 207 STOPS
No 212 TRANSOM BAR
No 214 SILL
BASE
No 215 SILL
No 227
WOOD BACKING
METAL COVERING FOR BASE
DOOR POST
CORNER CAPS FOR STOP No 216
No 202
No 207 STOP VENTILATING
No 208 STOP NOT VENTILATING
VENTILATING AND DRAINAGE PIPE
JAMB CASING
SILL No 214
SILL CAP
METAL COVERING No 209
No 204

Plan, Elevation and 3-inch Scale Details of "Colco" Store Front Construction

Continued on next page


No. 4
No. 6
No. 8
12"
SHEET METAL No. 46
METAL COVERED STEEL BRACKET No. 47
AWNING HOOD
No. 45
No. 10 STOP
GLASS
SETTING STRIP No. 42
8" AND 10"
SHEET METAL No. 41
CREOSOTED WOOD
CREOSOTED WOOD
No. 43
No. 40
2½" SHEET
No. 27 TRANSOM BAR OVER VESTIBULE
½"×½" ANGLE
1"×1½" ANGLE No. 44
No. 100 STOP
VENT
No. 27 TRANSOM BAR No. 100 AND No. 10 STOP
No. 61
SHEET METAL No. 63
No. 61
No. 62
WOOD BACKING
METAL COVERING FOR BASE
LINTEL CASING
METAL COVERING
No. 51
No. 10
WOOD STOP
No. 3
No. 21
No. 22
VENT AND DRAIN
GLASS
LEAD SETTING BLOCK
CANOPY CEILING
No. 23
ANGLE IRON RIVETED TO BACK OF T IN TRANSOM BAR
VENT
No. 9
No. 12
No. 13
No. 14
DOOR POST
WOOD STOP
No. 10
No. 15
No. 16
No. 18 A WITH AWNING LUG
GLASS
GUTTER
No. 31. SILL
FLOOR
CREOSOTED WOOD
VENTILATING AND DRAINAGE PIPE
MARBLE BASE
No. 11
No. 17
No. 18
JAMB CASING
WOOD STOP
GUTTER
GLASS
No. 10
No. 14
SILL
SILL CAP
METAL COVERING No. 51
No 10
No 51
No 12
No 23
No 23
No 100
No 14
No 14
No 10
No 51
PLATE
No 31 SILL
No 31
ELEVATION "A"
No 10
No 51
No 12
No 18A
No 27 TRANSOM BAR & AWNING HOOD
No 100
No 10
No 13
No 18A
No 31 SILL
MARBLE, WOOD OR METAL BASE
ELEVATION "B"
PLAN "A"
No 10
No 4
No 14
GLASS
No 51
No 10
No 14
No 10
PLAN "B"
No 51
No 10
No 10
No 51
COLUMN
No 13
No 18A
No 10
No 51

Plans, Elevations and 3-inch Scale Details of Coulson Patent Store Front Construction

BRASCO MANUFACTURING COMPANY

Metal Store Fronts

5025-5035 South Wabash Avenue

CHICAGO, ILL.

Brasco
COPPER STORE FRONTS

Products

Brasco "Standard" Copper Store Fronts; Brasco "Series 500" Copper Store Fronts; Brasco "Series 200" Copper Store Fronts.

Also Drawn Metal Mouldings in copper, brass, bronze, steel; Drawn Metal Covered Wood Mouldings; Metal Store Front Ventilators and Showcase Doors; Brass Thresholds, Push and Pull Plates, Kick Plates, Push Bars; Brass and Bronze Railings; Ladders, and other Brass, Bronze and Copper Architectural Products.

Co-operative Service

If too busy to prepare plans and details, avail yourself of our service department. Latest descriptive catalogue and detail portfolios immediately available on request. We will also furnish actual samples crosscut to show construction and design.

Brasco Approved by Insurance Companies

Brasco utilizes what the insurance companies' statistics prove to be the safest method of holding glass. Outside stops fastened by the *indirect method* permit a *grip* of a full *half-inch,* and what is most essential, an *unobstructed space* of *three-eighths* to *five-eighths* of an inch between the edge of glass and jamb.

All Brasco systems embody the essential elements necessary to insure *safety* and *permanence* in the setting of plate glass. They combine simplicity and practicability with architectural beauty, eliminate painting and repairing and obtain the lowest rate of plate glass insurance. Such other features as ventilation, drainage, and maximum daylighting are embodied, which, together with the principle of *indirect screw pressure,* reach the highest degree of perfection in all Brasco systems. No direct screw pressure with its erratic grip to cause breakage in settling or during sudden climatic changes.

In all Brasco construction, safety to the glass is assured by a wide grip on the edges of the plate, and by the provision in the sash for the absorption of movement and vibration by the setting. Creosoted wood setting blocks, the proven, safe method of supporting the glass, are provided in all Brasco types.

Installation

Examination of the illustrations on these pages will show the simplicity of design which assures ease of installation. Workmen without previous experience make installations of Brasco without fault.

Write for This Literature

Brasco "Standard" and "Series 500" Catalogs.
Brasco "Series 200" Catalog.
Brasco "Standard" Details.
Brasco "Series 500" Details.
Brasco "Series 200" Details.

Brasco Copper Covered Creosoted Sash

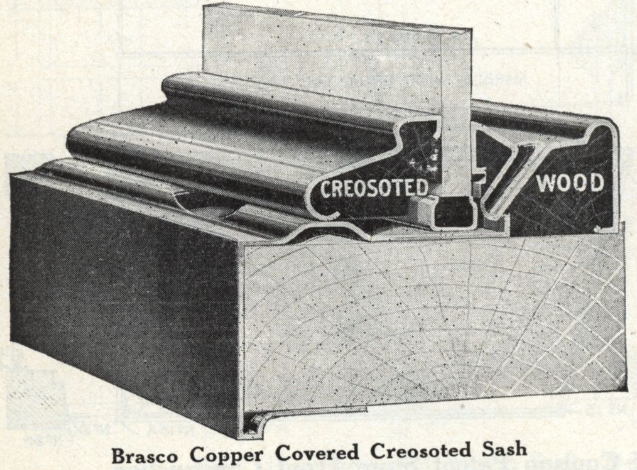
The wood shown in the sash and gutter is drawn from *clear cypress* creosoted under pressure by our patented process. Heavy gauge copper is *rolled* on as illustrated, in such a manner that copper will not peel or loosen from wood core. Mouldings are guaranteed not to swell, because they can not absorb moisture.

Brasco "Series 500" All Copper Sash

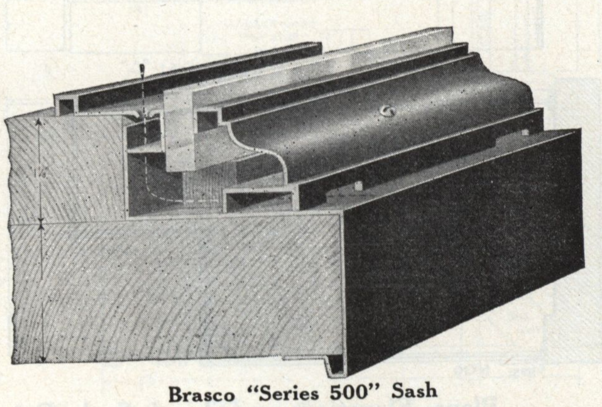
This all-copper sash also embodies the indirect fastening and employs the wide drainage gutter typical of Brasco.

Where screw in face member penetrates sill covering, copper is flanged up around screw to prevent seepage to the wood core.

Vents are staggered in face and gutter to eliminate dust.

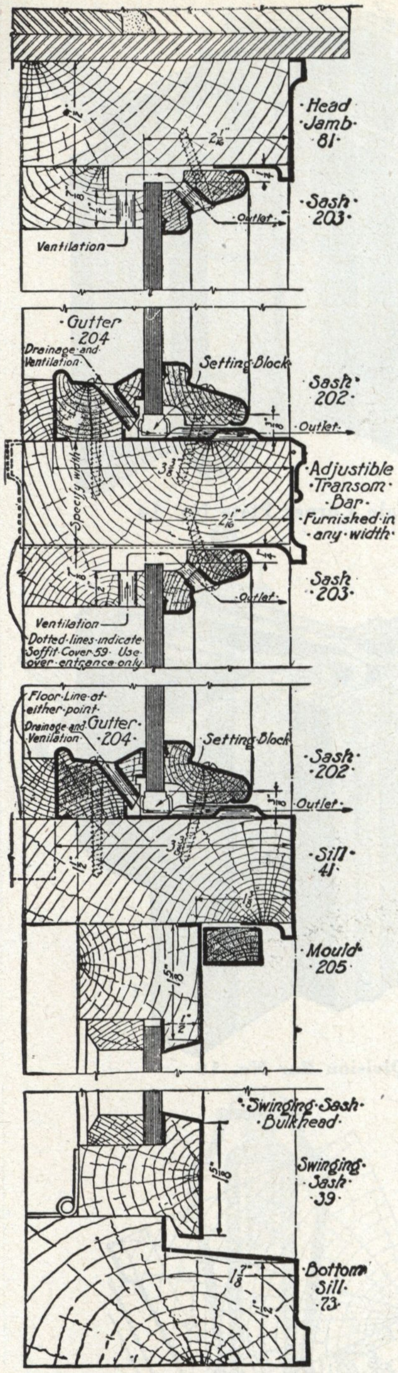


Brasco Copper Covered Creosoted Sash

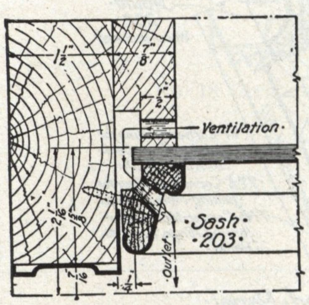


Brasco "Series 500" Sash

Continued on next page


Head Jamb 81
2½"
Sash 203
Outlet
Ventilation
Gutter 204
Drainage and Ventilation
Setting Block
Sash 202
Outlet
Specify width
3⅜"
Adjustible Transom Bar Furnished in any width
2½"
Sash 203
Outlet
Ventilation
Dotted lines indicate Soffit Cover 59 Use over entrance only
Floor Line at either point
Drainage and Venilation
Gutter 204
Setting Block
Sash 202
Outlet
3⅜"
Sill 41
1⅛"
Mould 205
Swinging Sash Bulkhead
Swinging Sash 39
1⅞"
Bottom Sill 73

Sectional Detail of Brasco "Standard" Store Front Construction


1½"
⅞"
½"
Ventilation
Sash 203
Outlet

Side Jamb Section Brasco "Standard" Construction

Eight Brasco Features

Simplicity of Design—A prime factor from the standpoint of appearance, and ease of installing the store front and glass.

Indirect Screw Pressure—No screw points directly toward glass, therefore the possibility of plate glass settling down on any screw is eliminated.

Strength—Sash and mouldings are drawn in heavy gauges, and are so designed and drawn that strength is more than assured. All corner, division and reverse bars are reinforced by continuous steel members.

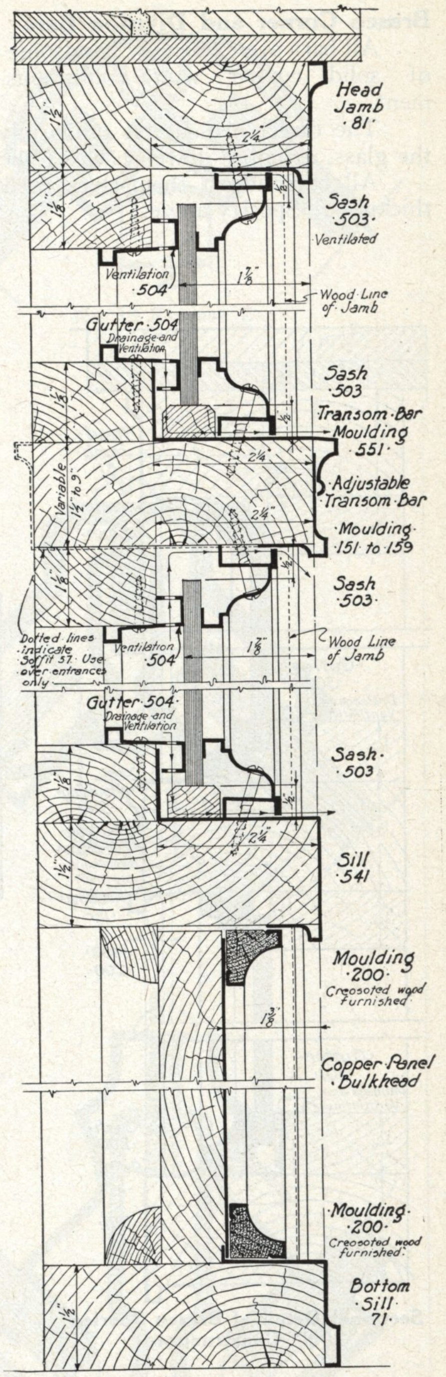
Safety—Extra wide grip on glass, employing the approved firm, supple and uniform hold—safest for glass.

Architectural Beauty—All units which go to make the complete Brasco front are of artistic design. All steel reinforcing in bars is concealed so that the beauty of the copper is unimpaired.

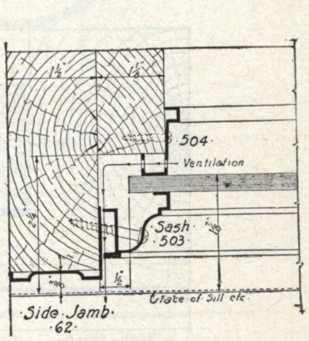
Improved Drainage and Ventilation—Unusually wide and efficient drainage gutter. Ventilation ducts large and spaced at frequent intervals.

Cost—Most economical to install, using standard size lumber and requiring less millwork.

Permanency—Built to last, insuring great saving in ultimate cost. As near everlasting as modern science makes possible.


Head Jamb 81
2¼"
Sash 503
Ventilated
Ventilation 504
1⅞"
Wood Line of Jamb
Gutter 504 Drainage and Ventilation
Sash 503
Transom Bar Moulding 551
Variable ½" to 9"
2¼"
Adjustable Transom Bar
Moulding 151 to 159
Sash 503
Dotted lines indicate Soffit 57 Use over entrance only
Ventilation 504
1⅞"
Wood Line of Jamb
Gutter 504 Drainage and Ventilation
Sash 503
2¼"
Sill 541
Moulding 200 Creosoted wood furnished
1⅞"
Copper Panel Bulkhead
Moulding 200 Creosoted wood furnished
Bottom Sill 71

Sectional Detail of Brasco "Series 500" All Copper Store Front Construction


1¼"
1½"
504
Ventilation
Sash 503
½"
Grade of Sill etc
Side Jamb 62

Side Jamb Section Brasco "Series 500" Construction

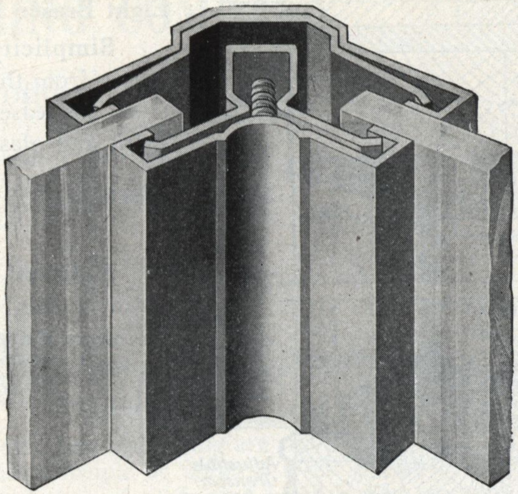
Continued on next page

Brasco Corner and Division Bars

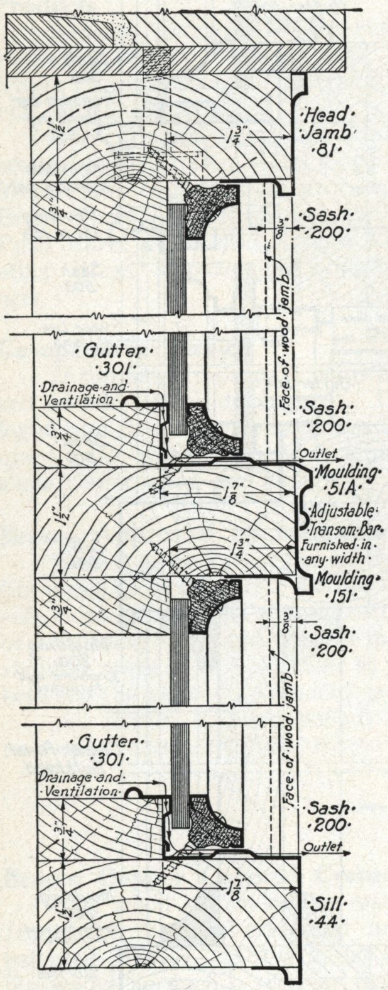
All bars are extremely handsome and strongly made of solid copper with continuous steel reinforcement.

The direct pressure is uniformly distributed along the glass, gripping it well back of the edge.

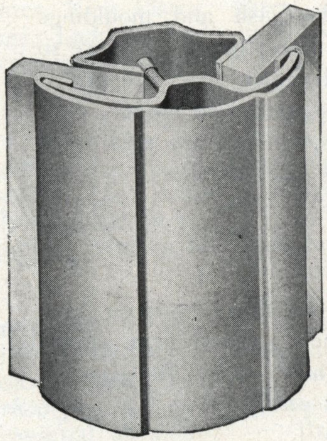
All bars adjust themselves easily to glass of any thickness. Specify angle.



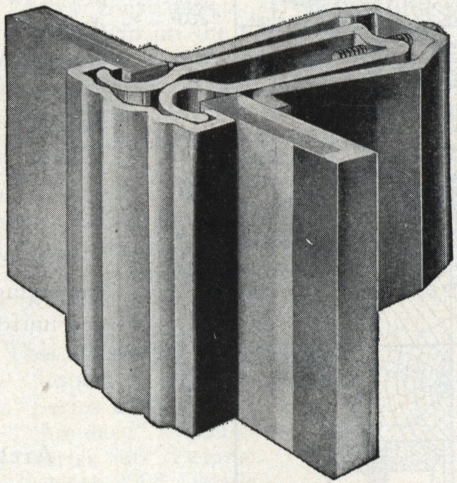
Reverse Angle Corner Plate No. 14


·Head·
·Jamb·
·81·
·Sash·
·200·
·Face·of·wood·jamb·
·Gutter·
·301·
·Drainage·and·
·Ventilation·
·Sash·
·200·
Outlet
·Moulding·
·51A·
·Adjustable·
·Transom·Bar·
·Furnished·in·
·any·width·
·Moulding·
·151·
·Sash·
·200·
·Face·of·wood·jamb·
·Gutter·
·301·
·Drainage·and·
·Ventilation·
·Sash·
·200·
Outlet
·Sill·
·44·

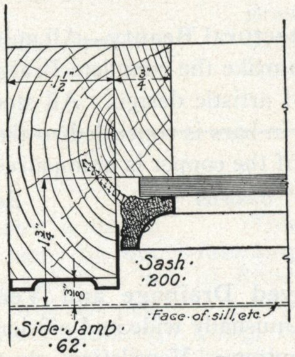
Sectional Detail of Brasco "Series 200" Construction



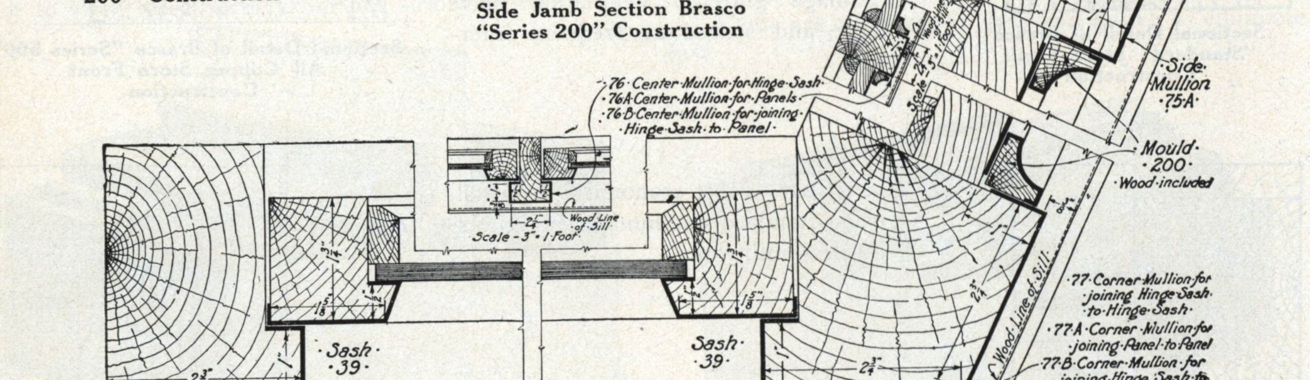
Corner Bar No. 10



Division Bar No. 18

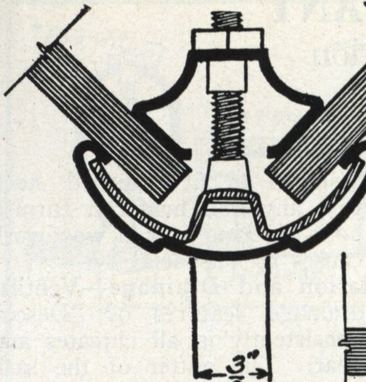

·Sash·
·200·
·Face·of·sill, etc·
·Side·Jamb·
·62·

Side Jamb Section Brasco "Series 200" Construction

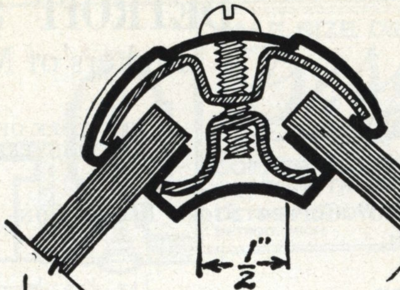

·76·Center·Mullion·for·Hinge·Sash·
·76A·Center·Mullion·for·Panels·
·76·B·Center·Mullion·for·joining·
·Hinge·Sash·to·Panel·
Wood·Line of·Sill·
Scale - 3" = 1·Foot·
Scale - 3" = 1·Foot·
Wood·Line of·Sill·
·Side·
·Mullion
·75·A·
·Mould·
·200·
·Wood·included
·77·Corner·Mullion·for
·joining Hinge·Sash·
·to·Hinge·Sash·
·77·A·Corner·Mullion·for
·joining·Panel·to·Panel
·77·B·Corner·Mullion·for
·joining·Hinge Sash·to·
·Panel·
·Sash·
·39·
·Sash·
·39·
Wood·Line of·Sill·
Wood·Line·of·Sill·
·Side·Jamb·
·75·
·Horizontal·Section·thru·Bulkhead·showing·both·Hinge·Sash·and·Panel·

Standard Brasco Bulkhead Construction for All Types

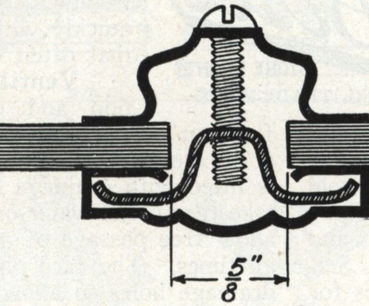
Continued on next page



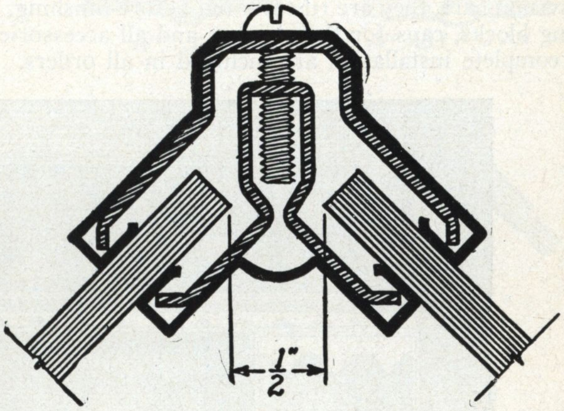
No. 10 Corner Bar



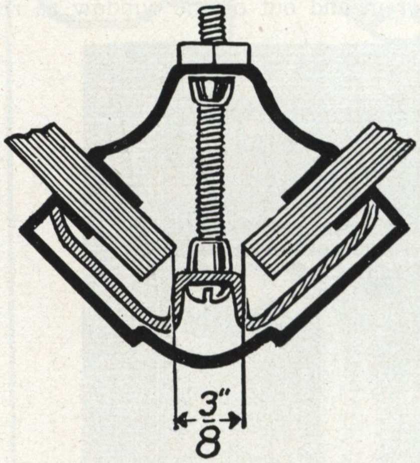
No. 13 Reverse Bar



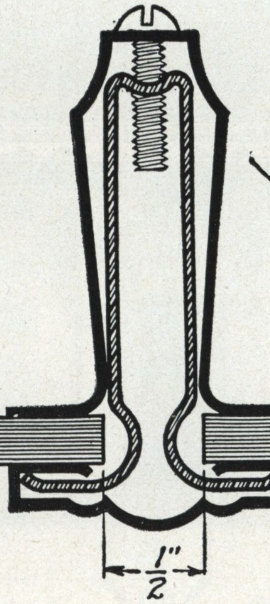
No. 15 Division Bar



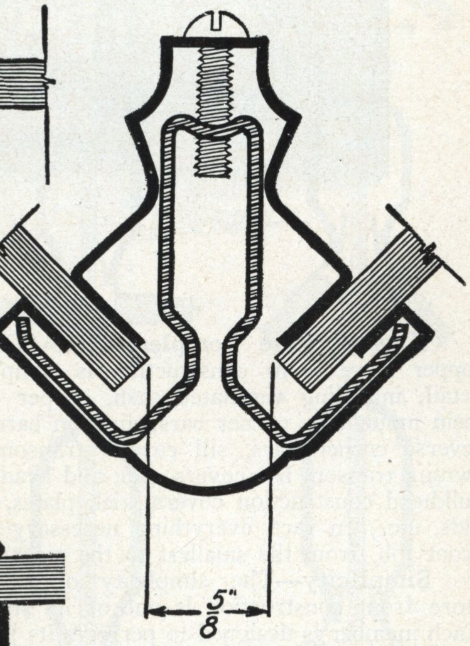
No. 14 Reverse Bar



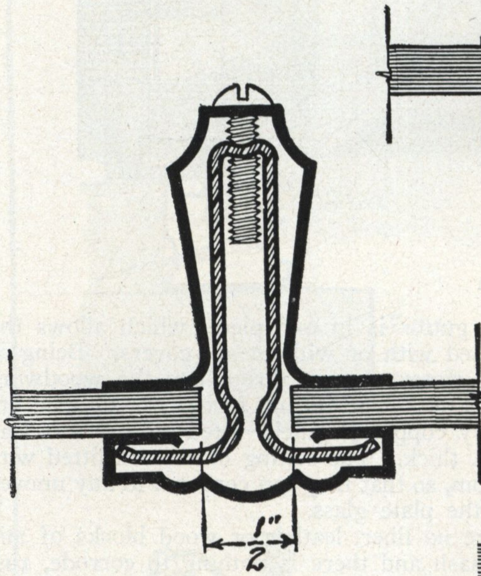
No. 7 Corner Bar



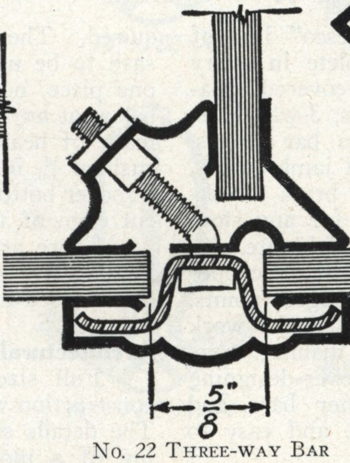
No. 19 Division Bar



No. 8 Corner Bar



No. 18 Division Bar



No. 22 Three-way Bar

Corner and Division Bars of Brasco Systems

Continuous steel reinforcing in all Brasco bars concealed between copper face and back

DETROIT SHOW CASE COMPANY

Makers of Metal Store Front Construction

DETROIT, MICH.

NEW YORK OFFICE AND WAREHOUSE, 562 West 52nd Street
DISTRIBUTERS AND DEALERS IN ALL PRINCIPAL CITIES

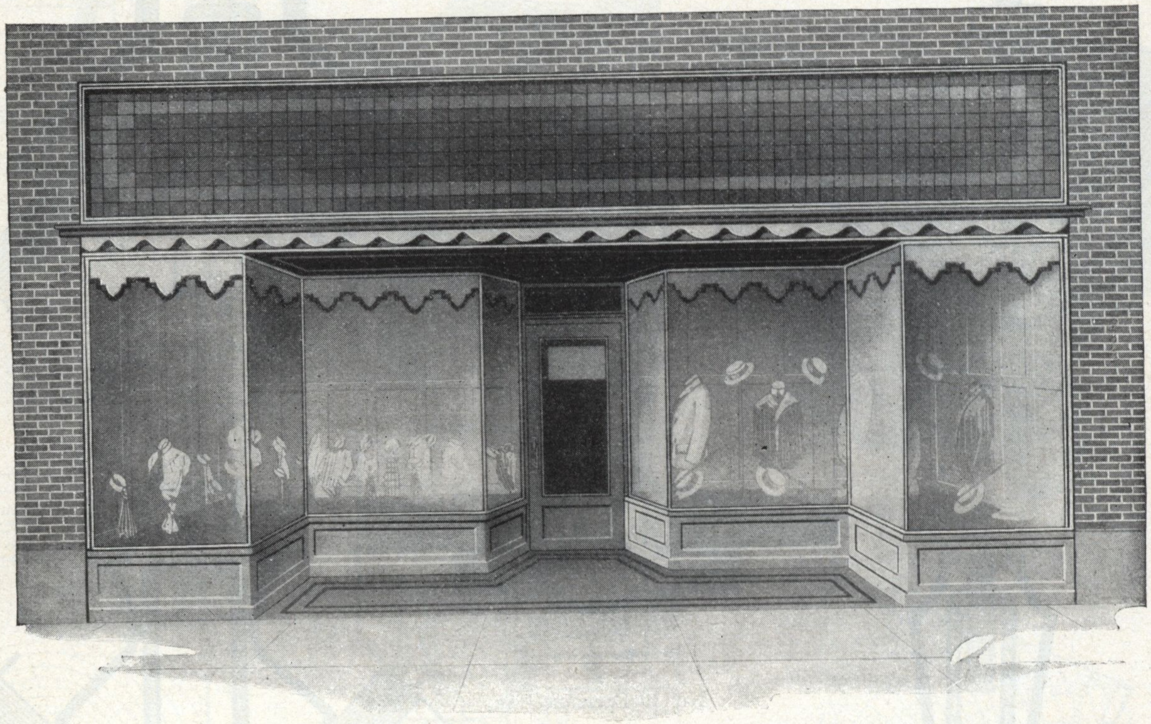
Desco
METAL
STORE FRONTS
REG. TRADE-MARK

Product

"Desco" Copper Store Front Construction.

Description

"Desco" copper store front construction is made and designed along the most approved architectural lines, the several shapes and members of the construction harmonizing perfectly. Heavy gauge, cold rolled copper only, is used in its making, and where steel reinforcing channels are used for corner bars and division bars, they are rustproofed before finishing. Setting blocks, caps for the corners, and all accessories for a complete installation are included in all orders.



A Typical "Desco" Store Front

"Desco" Line Complete—The "Desco" line of copper store front construction is complete in every detail, including ventilated sash, copper covered kalamein mouldings, corner bars, division bars, 3-way bars, reverse corner bars, sill covers, transom bar covers, awning transom bar covers, side and head jamb covers, bulkhead construction covers, kick plates, brass thresholds, etc. In fact, everything necessary for any store front job, from the smallest to the most elaborate.

Simplicity—The simplicity of "Desco" copper store front construction is one of its strongest points. Each member is designed to perform its particular work in the simplest, safest and most practical manner. No. freak ideas are found in "Desco" and over-designing has been systematically avoided. Corner bars and division bars are simple, easy to handle and easy to install.

In using "Desco" no special millwork or woodwork is required and any ordinary mechanic can install it correctly and quickly without trouble. The whole line has been designed to fit standard stock woodwork that any mill man can furnish quickly without ordering special woodwork that often causes serious delays.

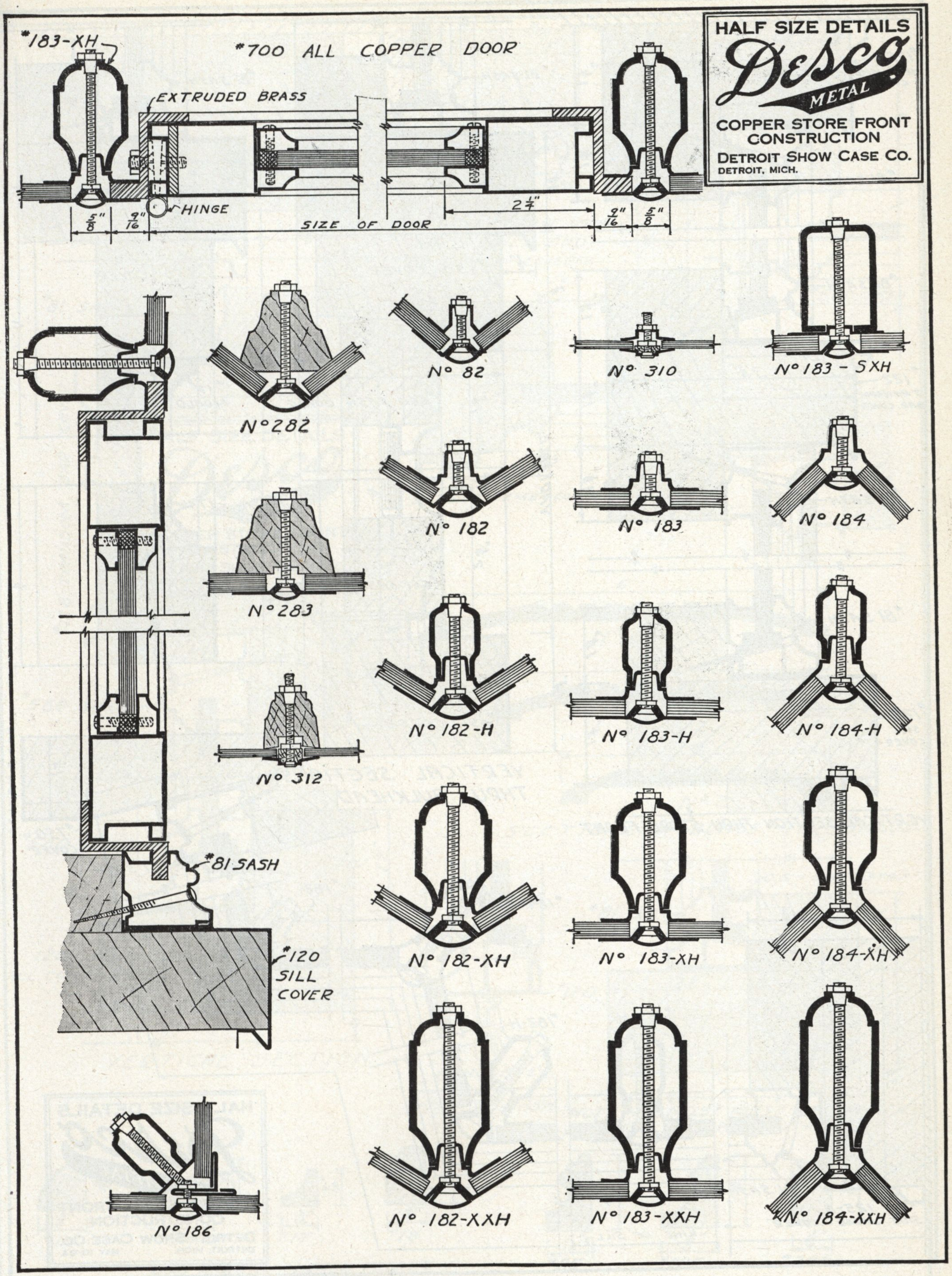
Ventilation and Drainage—Ventilation and drainage features of "Desco" function properly and consistently in all climates and at all seasons of the year. The gutter of the sash is fitted with drainage holes of ample proportions that take care of all water on the inside of the windows and allow free passage of air in and out of the window at all times. The face plates of the sash are fitted with drainage holes to allow water to escape to the outside and the air to enter in and out of the window as required. The gutter is in one piece, which allows the sash to be used with or without sill covers. Being in one piece, no water can get through to the woodwork below at any time. The setting blocks of "Desco" are made of heavy copper channels, fitted with a soft lead cushion $\frac{3}{16}$ in. thick. The setting blocks are fitted with a rocker bottom, so that they can conform to any uneven cut edge of the plate glass.

There are no fiber, leather or wood blocks of any kind in this sash and there is nothing to corrode, rust or rot used any place in the construction.

Architectural Service

Full size details of "Desco" copper store front construction will be mailed to any architect without cost. The details shown herewith are typical for the designing of a modern store front. "Desco" copper store front construction is distributed and sold through direct factory branches and dealers in practically all parts of the country.

Continued on next page


HALF SIZE DETAILS
Desco
METAL
COPPER STORE FRONT CONSTRUCTION
DETROIT SHOW CASE CO.
DETROIT, MICH.
*183-XH
*700 ALL COPPER DOOR
EXTRUDED BRASS
HINGE
5"/8
9"/16
SIZE OF DOOR
2 1/4"
9"/16
5"/8
N° 282
N° 82
N° 310
N° 183 - SXH
N° 182
N° 183
N° 184
N° 283
N° 182-H
N° 183-H
N° 184-H
N° 312
*81 SASH
*120 SILL COVER
N° 182-XH
N° 183-XH
N° 184-XH
N° 186
N° 182-XXH
N° 183-XXH
N° 184-XXH

Details of "Desco" Copper Store Front Construction

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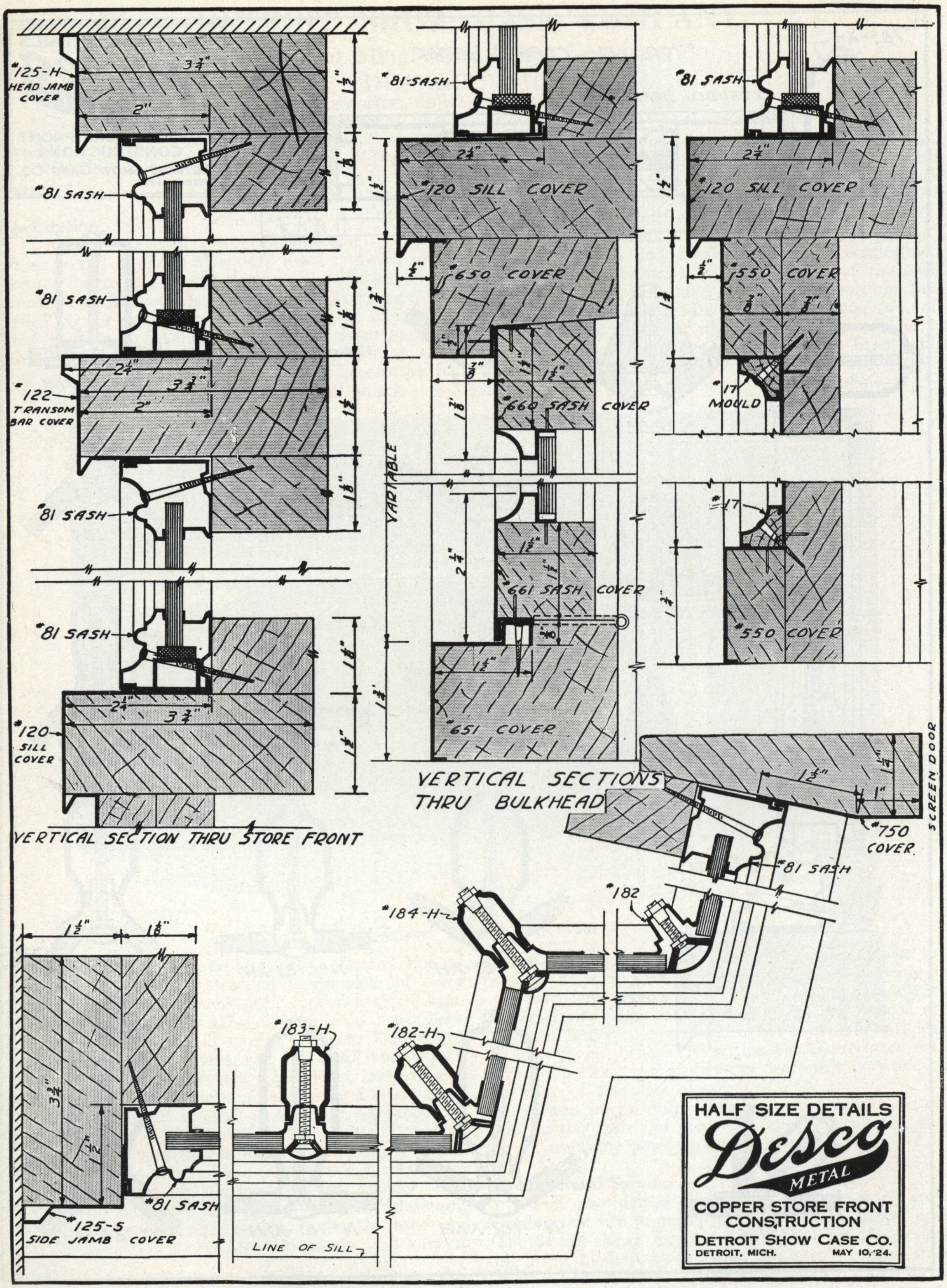
#125-H
HEAD JAMB
COVER
3¾"
2"
1½"
1⅛"
#81 SASH
#81 SASH
#122
TRANSOM
BAR COVER
2¼"
3¾"
2"
1½"
1⅛"
#81 SASH
#81 SASH
#120
SILL
COVER
2¼"
3¾"
1½"
VERTICAL SECTION THRU STORE FRONT
#81-SASH
2¼"
#120 SILL COVER
1¼"
½"
#650 COVER
⅞"
1½"
#660 SASH COVER
1⅛"
VARIABLE
2¼"
1½"
#661 SASH COVER
1⅛"
1½"
#651 COVER
VERTICAL SECTIONS
THRU BULKHEAD
#81 SASH
2¼"
#120 SILL COVER
1¼"
½"
#550 COVER
⅞"
⅞"
#17
MOULD
#17
#550 COVER
1¼"
1½"
1¼"
1"
#750
COVER
SCREEN DOOR
#81 SASH
#184-H
#182
1½"
1⅛"
3¾"
1½"
#183-H
#182-H
#81 SASH
#125-S
SIDE JAMB COVER
LINE OF SILL
HALF SIZE DETAILS
Desco
METAL
COPPER STORE FRONT
CONSTRUCTION
DETROIT SHOW CASE CO.
DETROIT, MICH.
MAY 10, '24.

Details of "Desco" Copper Store Front Construction

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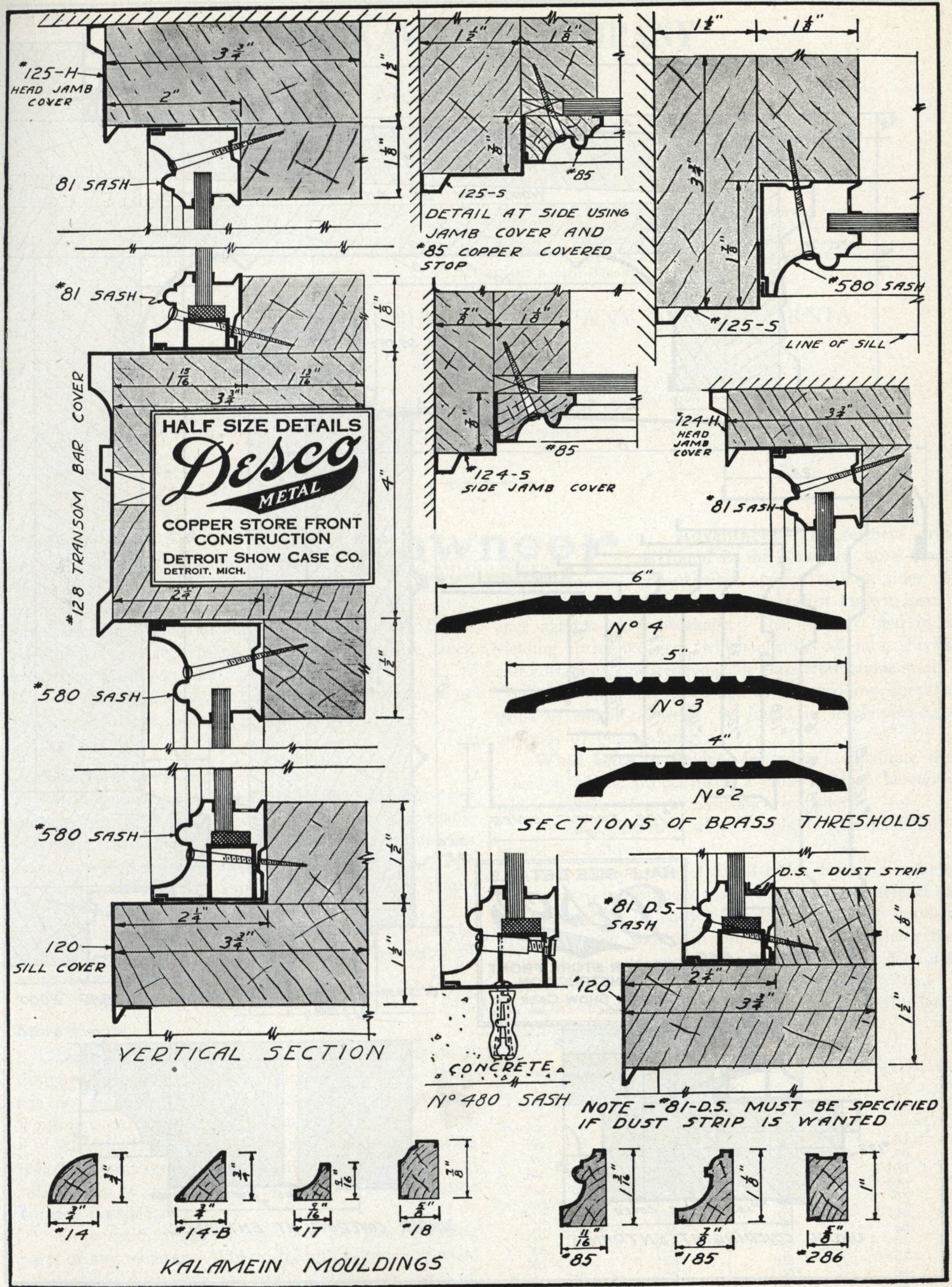
*125-H HEAD JAMB COVER
3¾"
2"
1½"
1⅛"
81 SASH
1½"
1⅛"
*85
125-S
DETAIL AT SIDE USING JAMB COVER AND *85 COPPER COVERED STOP
⅞"
1½"
1⅛"
3¾"
⅞"
*580 SASH
*125-S
LINE OF SILL
⅞"
1⅛"
⅞"
*85
*124-S SIDE JAMB COVER
*124-H HEAD JAMB COVER
3¾"
*81 SASH
*81 SASH
1⅛"
1 15/16"
1 13/16"
3¾"
4"
*128 TRANSOM BAR COVER
HALF SIZE DETAILS
Desco
METAL
COPPER STORE FRONT CONSTRUCTION
DETROIT SHOW CASE CO.
DETROIT, MICH.
2¼"
1½"
*580 SASH
6"
No 4
5"
No 3
4"
No 2
SECTIONS OF BRASS THRESHOLDS
*580 SASH
1½"
2¼"
3¾"
1½"
120 SILL COVER
VERTICAL SECTION
D.S. - DUST STRIP
*81 D.S. SASH
1⅛"
2¼"
*120
3¾"
1½"
CONCRETE
No 480 SASH
NOTE - *81-D.S. MUST BE SPECIFIED IF DUST STRIP IS WANTED
¾"
¾"
*14
¾"
¾"
*14-B
½"
9/16"
*17
⅞"
⅝"
*18
1⅛"
11/16"
*85
1⅛"
⅞"
*185
1"
⅝"
*286
KALAMEIN MOULDINGS

Details of "Desco" Copper Store Front Construction

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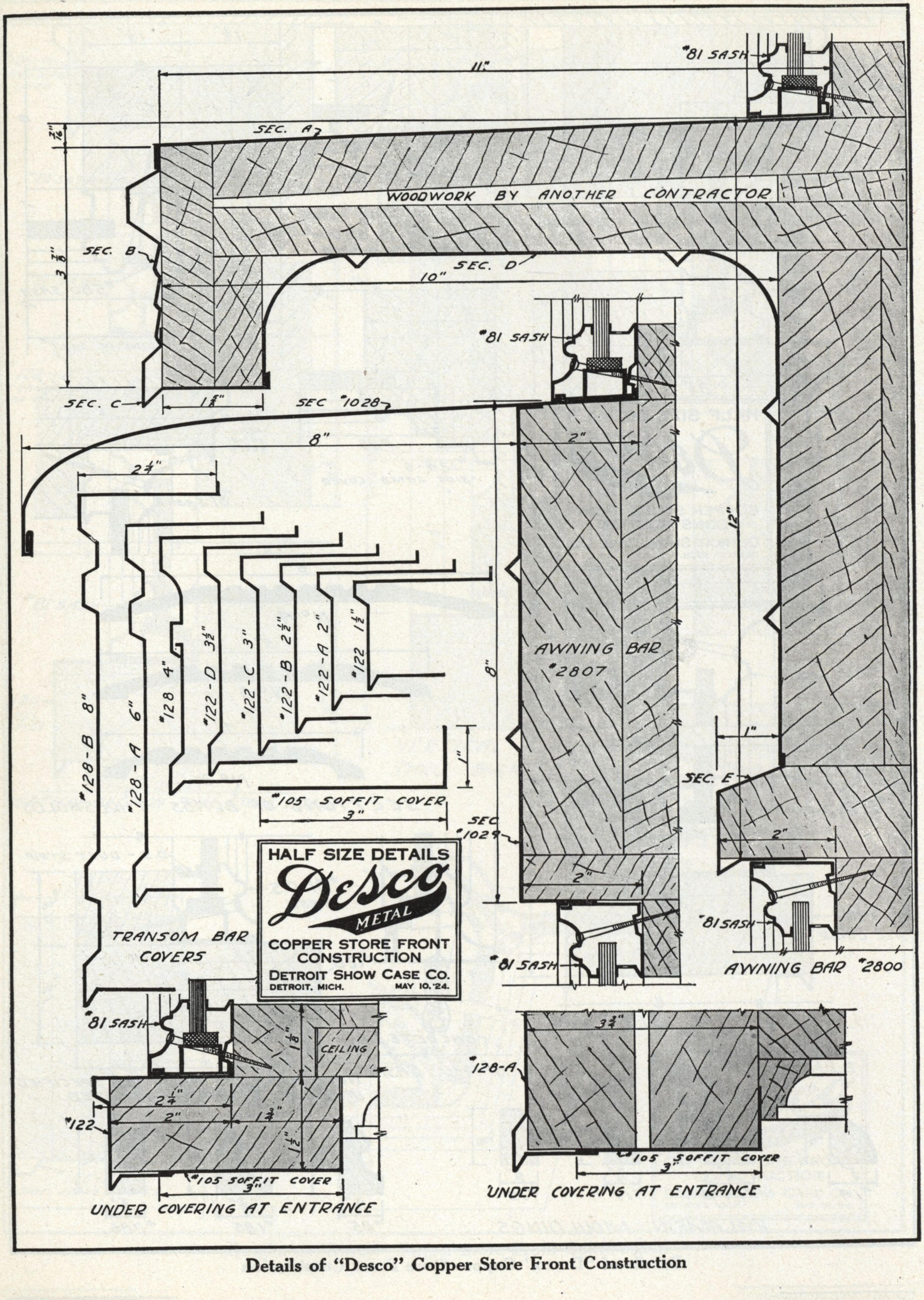
#81 SASH
11"
SEC. A
7/16"
WOODWORK BY ANOTHER CONTRACTOR
SEC. B
3 7/8"
SEC. D
10"
#81 SASH
SEC. C
1 1/8"
SEC #1028
8"
2"
2 1/4"
12"
#128-B 8"
#128-A 6"
#128 4"
#122-D 3 1/2"
#122-C 3"
#122-B 2 1/2"
#122-A 2"
#122 1 1/2"
AWNING BAR #2807
8"
1"
1"
#105 SOFFIT COVER
3"
SEC. E
SEC #1029
2"
2"
HALF SIZE DETAILS
Desco
METAL
COPPER STORE FRONT CONSTRUCTION
DETROIT SHOW CASE CO.
DETROIT, MICH.
MAY 10, '24.
TRANSOM BAR COVERS
#81 SASH
#81 SASH
AWNING BAR #2800
#81 SASH
1 1/8"
CEILING
2 1/4"
2"
1 3/4"
1 1/2"
#122
#105 SOFFIT COVER
3"
UNDER COVERING AT ENTRANCE
3 1/4"
#128-A
#105 SOFFIT COVER
3"
UNDER COVERING AT ENTRANCE

Details of "Desco" Copper Store Front Construction

THE KAWNEER COMPANY

Metal Store Fronts

NILES, MICH.

BRANCH OFFICES

ATLANTA, GA., 129 Peachtree Street
BOSTON, MASS., 6 Beacon Street
CHICAGO, ILL., 111 W. Washington Street
DETROIT, MICH., 615 Griswold Street
KANSAS CITY, MO., 903½ Grand Avenue
MILWAUKEE, WIS., 490 Broadway
NEW YORK, N. Y., 233 Tenth Avenue
PHILADELPHIA, PA., 10 N. Fourth Street
BUFFALO, N. Y., 951 Ellicott Square Building

KAWNEER MANUFACTURING COMPANY OF CALIFORNIA

BERKELEY, CAL.

More than 80 Distributers who carry stock are located in most of the principal cities in the United States and Canada. Stock is also carried at our New York and Philadelphia Branches.

All of our Branch Offices and most of the Distributers are equipped to install our Store Front Construction.

Kawneer SOLID COPPER **STORE FRONTS**

Products

Store Fronts made of Solid Copper.

Also Showcase Doors, hinged and pivoted; Thresholds of brass; Kickplates of brass, copper and bronze; Hollow Metal Mouldings in stock shapes or made to order.

For Double Hung and Casement Windows made of solid nickel-silver, see pages 983-985.

Architectural Service

Information concerning Store Fronts and accessories will be gladly furnished on request. A serviceable catalogue featuring our store front construction has been published for the convenience of architects. Copy of Catalogue "L," also a portfolio of full size details will gladly be mailed on request.

A large drafting department is maintained for the purpose of assisting architects in the preparation of store front details.

Store Fronts

Description—Kawneer store front construction is designed along the simplest principles possible. There are no unnecessary and intricate parts to confuse a workman and hamper installation.

All members of this construction are designed along pleasing architectural lines. Each member has a certain relationship to another, thus a harmonious installation is made possible.

Only solid copper is used for the glass gripping parts of any member. Where strength is required, rigid tubular reinforcements are used. These are made of steel and are finished in heavy copper plate.

Advantages—The resilient grip as found in the Kawneer store front construction, applied to both sides of the glass, is the safest known insurance against glass breakage. The glass is held in a yielding springlike grip, which absorbs all jars, shocks and vibrations, thus relieving the glass from undue strain. Compare this resilient feature with unyielding, vicelike grips of metal or wood, as found in less up-to-date methods of glass setting.

What Bars to Select—In order to facilitate the selection of the proper bars, a table is given herewith which will be of great assistance in ordering.

As an explanation of this table, a formula is submitted as follows:

It is recommended that all bars, shown in column "A" be used in instances where the combined surfaces of two plates held by such a bar is less than the number of square feet shown in column "B," and where the square footage of one plate, see column "C," does not exceed three-fifths of the combined glass area.

This rule applies to all bars up to the limited height, which is found in column "D."

BAR SIZES FOR VARIOUS GLASS AREAS

A	B sq. ft.	C sq. ft.	D in.
No. 3-B	50	30	84
No. 4-B	100	60	96
No. 6-B	150	90	108
No. 9-A	200	120	120
No. 7-B	128	77	96
No. 8-B	180	108	108
No. 11-B	50	30	60
No. 12-B	128	77	96
No. 13-B	180	108	108
No. 17-B	100	60	96
No. 18-B	150	90	108

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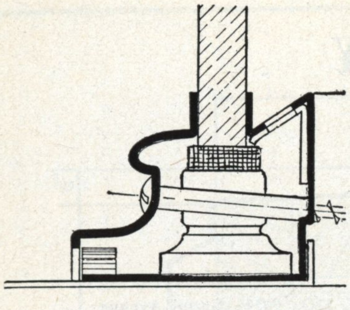
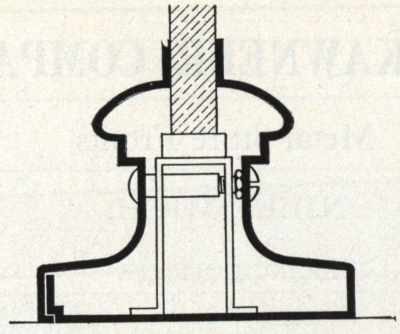


No. 30 SASH



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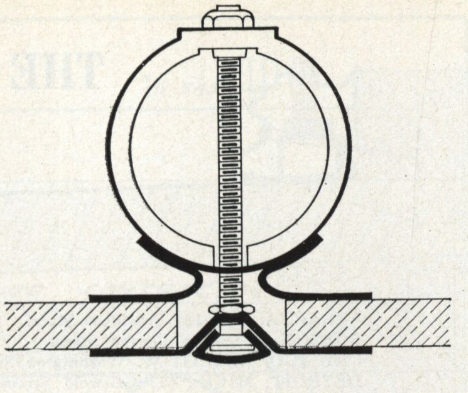
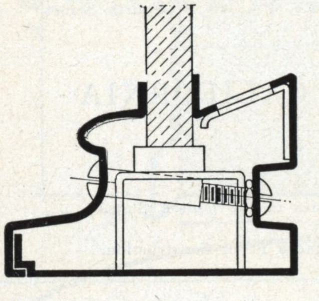
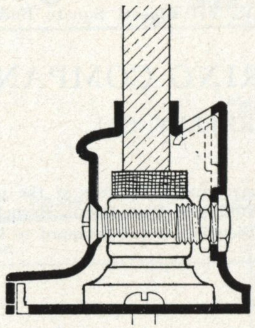


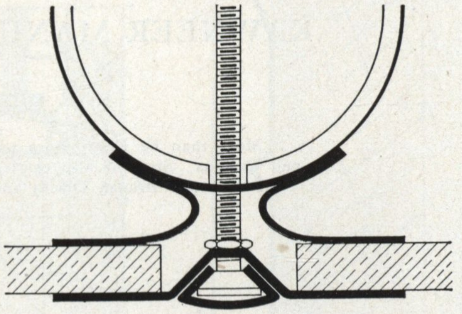
No. 12-B DIVISION BAR



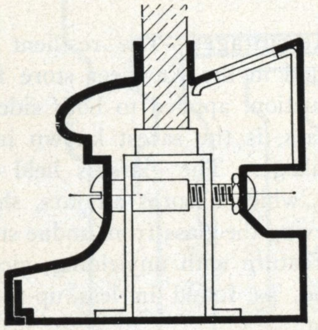
No. 36 SASH



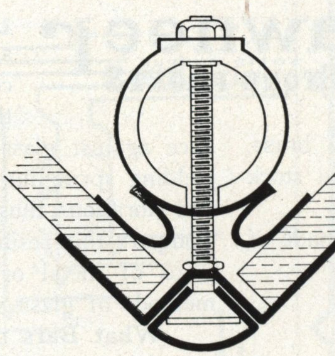
No. 40 SASH



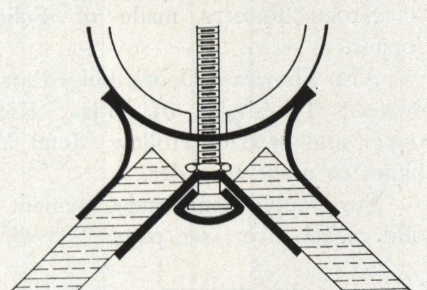
No. 13-B DIVISION BAR



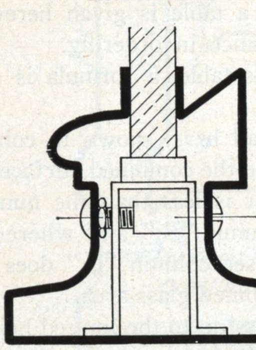
No. 31 SASH



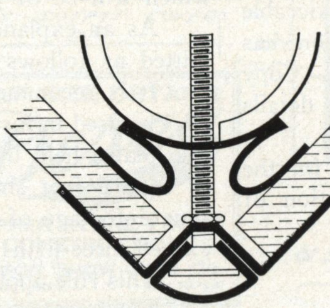
No. 6 B CORNER BAR



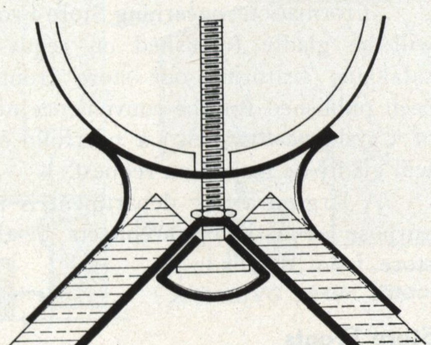
No. 17-B REVERSE BAR



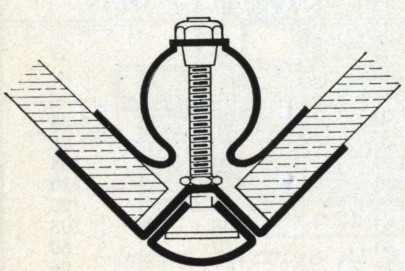
No. 34 SASH



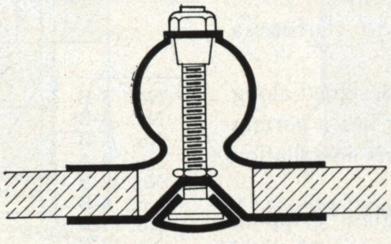
No. 9-A CORNER BAR



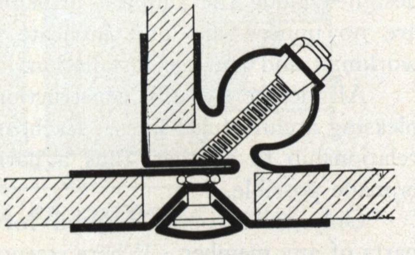
No. 18-B REVERSE BAR



No. 4-B CORNER BAR



No. 11-B DIVISION BAR

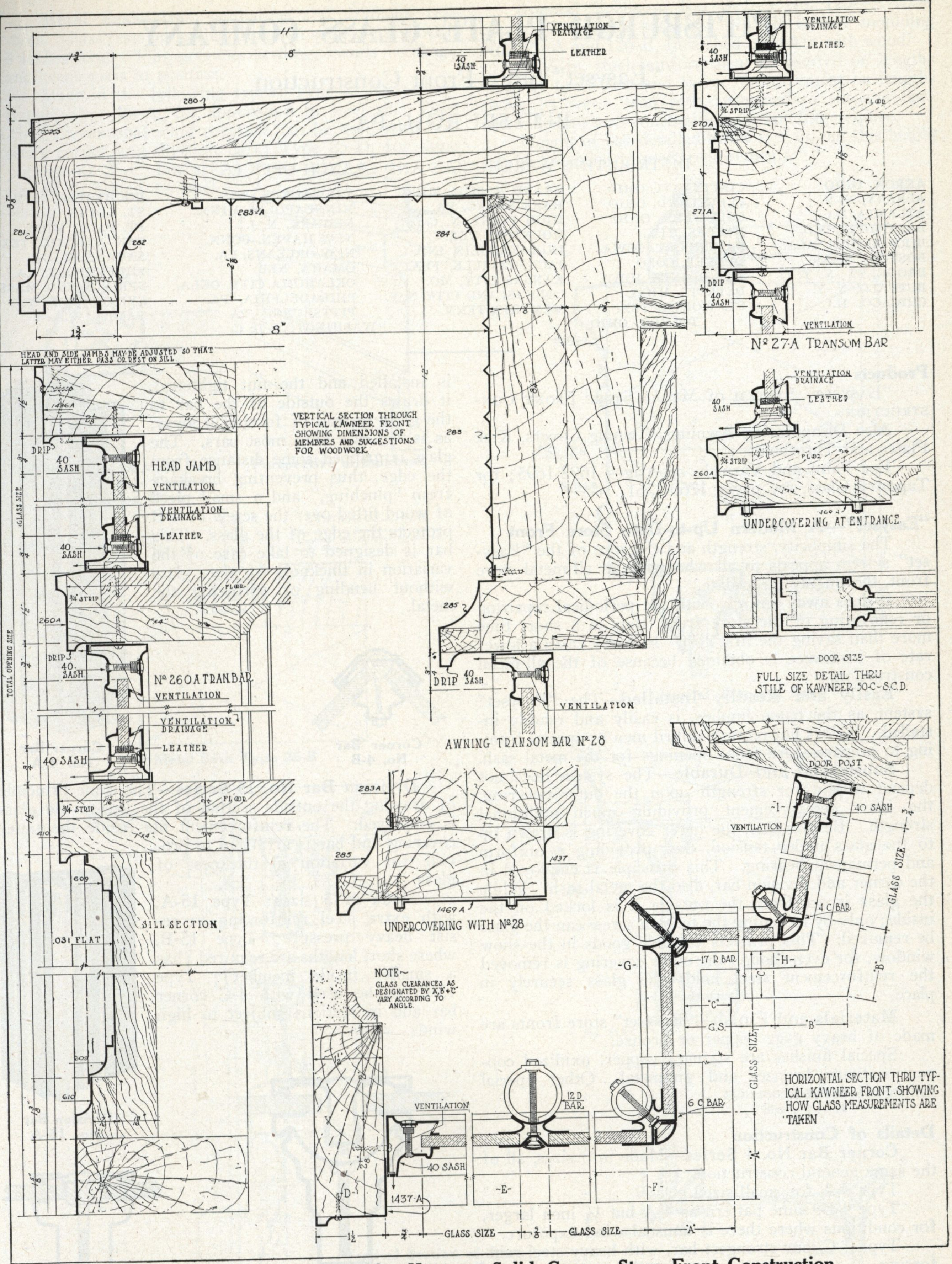


No. 19-A THREE WAY BAR

Kawneer Store Front Sash and Bars

Full size

Continued on next page


VENTILATION
DRAINAGE
LEATHER
40 SASH
11"
8"
1½"
280
283-A
284
281
282
1¾"
8"
FLOOR
¾ STRIP
270A
271A
DRIP
VENTILATION
Nº 27-A TRANSOM BAR
HEAD AND SIDE JAMBS MAY BE ADJUSTED SO THAT LATTER MAY EITHER PASS OR REST ON SILL
1436-A
VERTICAL SECTION THROUGH TYPICAL KAWNEER FRONT SHOWING DIMENSIONS OF MEMBERS AND SUGGESTIONS FOR WOODWORK
HEAD JAMB
260A
UNDERCOVERING AT ENTRANCE
1469 A
DOOR SIZE
FULL SIZE DETAIL THRU STILE OF KAWNEER 50-C-S.C.D.
Nº 260A TRAN BAR
AWNING TRANSOM BAR Nº 28
283A
285
1437
1469 A
UNDERCOVERING WITH Nº28
DOOR POST
4 C BAR
GLASS SIZE
17 R BAR
-G-
-H-
'C'
'B'
G.S.
SILL SECTION
.031 FLAT
609
608
610
410
TOTAL OPENING SIZE
NOTE~ GLASS CLEARANCES AS DESIGNATED BY 'A','B' & 'C' VARY ACCORDING TO ANGLE.
HORIZONTAL SECTION THRU TYPICAL KAWNEER FRONT SHOWING HOW GLASS MEASUREMENTS ARE TAKEN
12 D BAR
6 C BAR
1437-A
-D-
-E-
-F-
'A'
1½
¾
GLASS SIZE

Suitable Mouldings or Parts for Kawneer Solid Copper Store Front Construction

One-third size

PITTSBURGH PLATE GLASS COMPANY

"Easyset" Store Front Construction

PITTSBURGH, PA.

DISTRIBUTING WAREHOUSES AND BRANCH OFFICES

AKRON, OHIO
ALBANY, N. Y.
ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
BROOKLYN, N. Y.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
DAVENPORT, IOWA
DENVER, COLO.
DES MOINES, IOWA
DETROIT, MICH.
FT. WORTH, TEX.
TOLEDO, OHIO
GRAND RAPIDS, MICH.
HARRISBURG, PA.
HIGH POINT, N. C.
HOUSTON, TEX.
INDIANAPOLIS, IND.
JACKSONVILLE, FLA.
KANSAS CITY, MO.
LONG ISLAND CITY, N. Y.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEWARK, N. J.
NEW HAVEN, CONN.
NEW ORLEANS, LA.
OMAHA, NEB.
OKLAHOMA CITY, OKLA.
PHILADELPHIA, PA.
PITTSBURGH, PA.
WASHINGTON, D. C.
ROCHESTER, N. Y.
ST. LOUIS, MO.
ST. PAUL, MINN.
SAN ANTONIO, TEX.
SAVANNAH, GA.
SHREVEPORT, LA.
SPRINGFIELD, MASS.
SYRACUSE, N. Y.
TAMPA, FLA.

Products

"Easyset" System of Metal Store Front Construction.

Also Disappearing Awnings, Awning Covers, Kick Plates and Thresholds.

For Paint and Varnish, see pages 1692-1695; for Tapestry Glass, see pages 1760-1761.

"Easyset"—A Modern Up-to-Date Store Front

The simplicity, strength and elegance of the "Easyset" system appeals to all who wish an all-metal store front, thoroughly up-to-date.

It does away entirely with the periodical repairing or renovating of the store front, thus in a short time more than saving the first cost. In many cases a lower rate of insurance is obtained because of the all-metal construction.

Easily and Readily Installed—The "Easyset" system, as the name implies, is easily and readily installed. It does not require skilled men or special framing to prepare store front openings for the metal sash.

Substantial and Durable—The system does not depend wholly for strength upon the outer covering, the inner reinforcement providing much additional strength. Besides this, the outer covering is drawn up to the glass under tension, thus providing a uniform and permanent bearing. This principle is employed in the corner and division bar, also the metal sash. While the glass is set from the outside it is locked on the inside; only by loosening the tension screw can the glass be removed. This protects valuable goods in the show window, for even though the outer covering is removed the reinforcement steel holds the glass securely in place.

Materials and Finish—"Easyset" store fronts are made of heavy gage copper or bronze.

Special finishes are statuary copper, oxidized copper, statuary bronze, and gunmetal. Other special finishes if desired.

Details of Construction

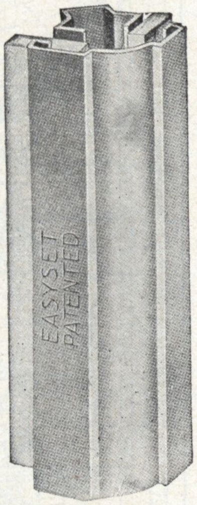
Corner Bar No. 4 Series—Made in 3 sizes, all of the same general construction.

Type 4-A for small sized glass.

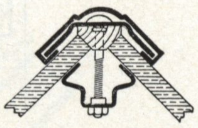
Type 4-B, same pattern as 4-A but ¼ inch larger, for conditions where there is unusual wind exposure.

Type 4-C, our strongest bar, with heavy steel reinforcing.

In corner bars Nos. 4-A, 4-B and 4-C the reinforcement fits inside the outer covering. When the bar is installed and the nut tightened, it draws the outside of the bar to the glass instead of forcing it away, as is the case with most bars. The glass is gripped some distance from the edge, thus preventing breakage from "pinching," and a small piece of wood fitted over the screw of 4-B protects the edge of the glass. This bar is designed to take care of the variation in thickness of plate glass without bending or springing the metal.



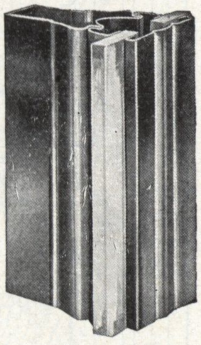
Corner Bar No. 4-A



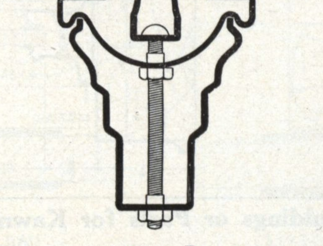
Corner Bar No. 4-B

Division Bar No. 15 Series—The same principle of drawing the outside section of the bar to the glass is employed. The reinforcement fits inside the outer covering and bar is arranged to provide for variation in thickness of glass.

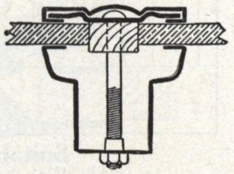
Made in 3 sizes: Type 15-A, with extra steel reinforcing to resist heavy pressure; Type 15-B, where short lengths are required (has a smaller inside member); Type 15-C, to be used with 4-C corner bar and in sections subject to high winds.



Division Bar No. 15-A



Division Bar No. 15-C



Division Bar No. 15-B

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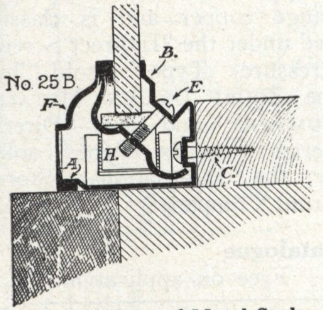
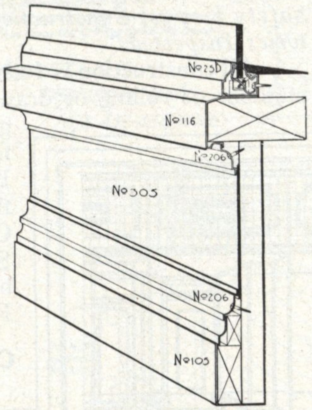
Metal Sash—Has ventilating and drainage features. Glass rests on leather mounted solid metal blocks, 4 inches long. This prevents settling, avoids breakage and keeps glass in position.

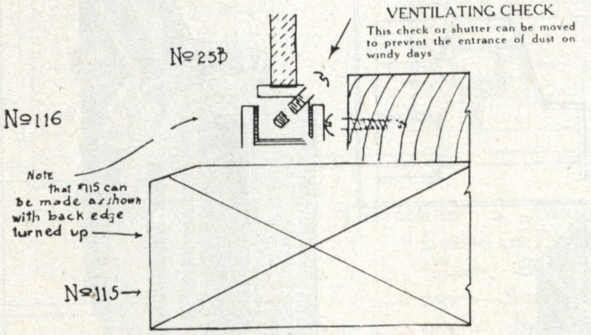
Made in the following types: Type 25-B, as illustrated; Type 26-A, for application to steel sill; Type 25-C, for unusual wind pressure (to be used with "C" series corner and division bars; Type 25-D, for same purpose as 25-C, but arranged to fasten to steel sill.


No. 25 B.
B.
E.
F.
H.
A.
C.

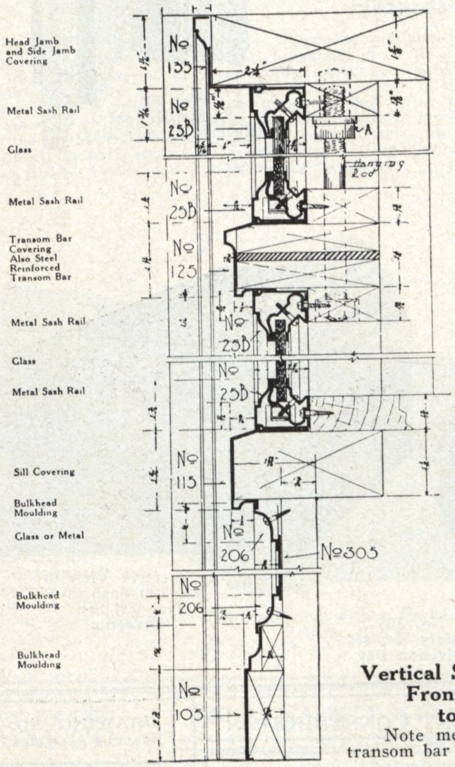
Sectional View of Metal Sash Showing Leather Capped Metal Setting Block


No 25B
No 116
No 206
No 305
No 206
No 105

Perspective of Bulkhead


VENTILATING CHECK
This check or shutter can be moved to prevent the entrance of dust on windy days
No 25B
No 116
Note that #115 can be made as shown with back edge turned up
No 115

Metal Sash Type 25-B


Head Jamb and Side Jamb Covering
No 135
Metal Sash Rail
No 25B
Glass
A
Hanging Rod
Metal Sash Rail
No 25B
Transom Bar Covering Also Steel Reinforced Transom Bar
No 125
Metal Sash Rail
No 25B
Glass
No 25B
Metal Sash Rail
Sill Covering
No 115
Bulkhead Moulding
Glass or Metal
No 206
No 305
Bulkhead Moulding
No 206
Bulkhead Moulding
No 105

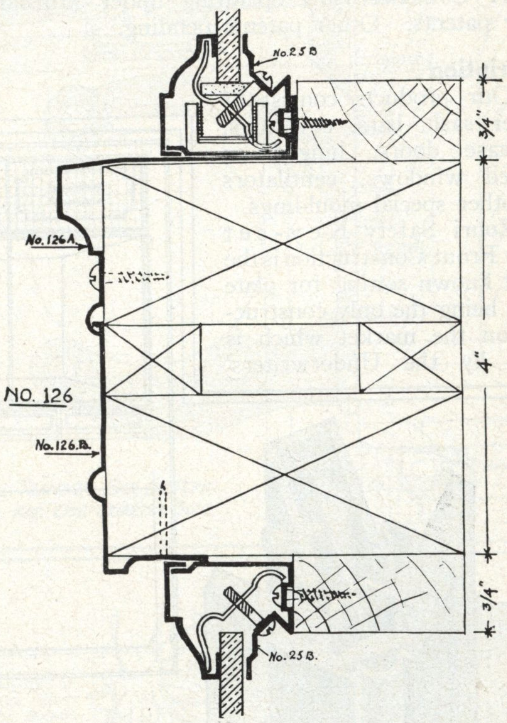
Vertical Section of Store Front, Sidewalk to I-beam

Note method of suspending transom bar

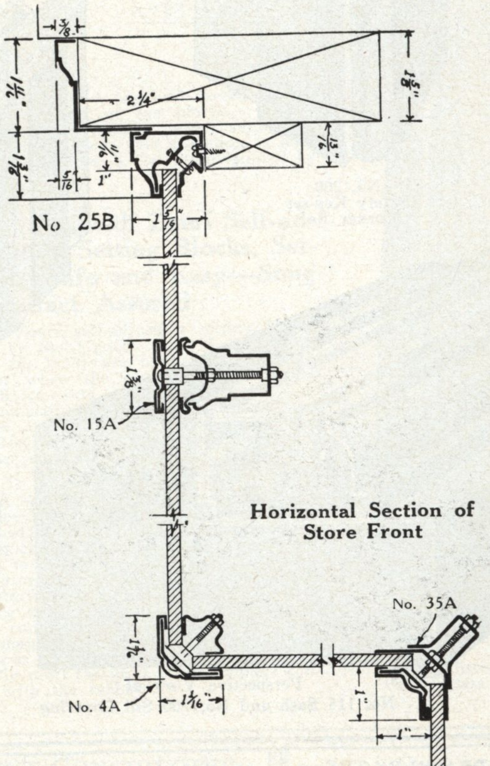
Special Transom Bar Series No. 126—A combination of metal sash bar No. 25-B and moulding No. 126-A and 126-B, furnished complete with wood.

A ⅛-in. steel reinforcement is inserted on lengths from 14 to 18 feet and ¼-in. reinforcement on lengths above 18 feet. Iron rods furnished to suspend bars where length and construction of building require.

Height of bar detailed below is 4 in. but this height can be extended to meet requirements.


No. 25 B
3/4"
No. 126 A
4"
NO. 126
No. 126 B
3/4"
No. 25 B.

Special Transom Bar


3/8"
1¼"
2¼"
1½"
No 25B
5/16"
1"
No. 15A
No. 35A
No. 4A
1⅙"
1"

Horizontal Section of Store Front

Sectional View

ZOURI DRAWN METALS COMPANY

Manufacturers of Zouri Safety Key-set Copper Store Front Construction

CHICAGO HEIGHTS, ILL.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

Product

Zouri Safety Key-set and International Store Front Construction operating under Murnane and Marr patents. Other patents pending.

Description

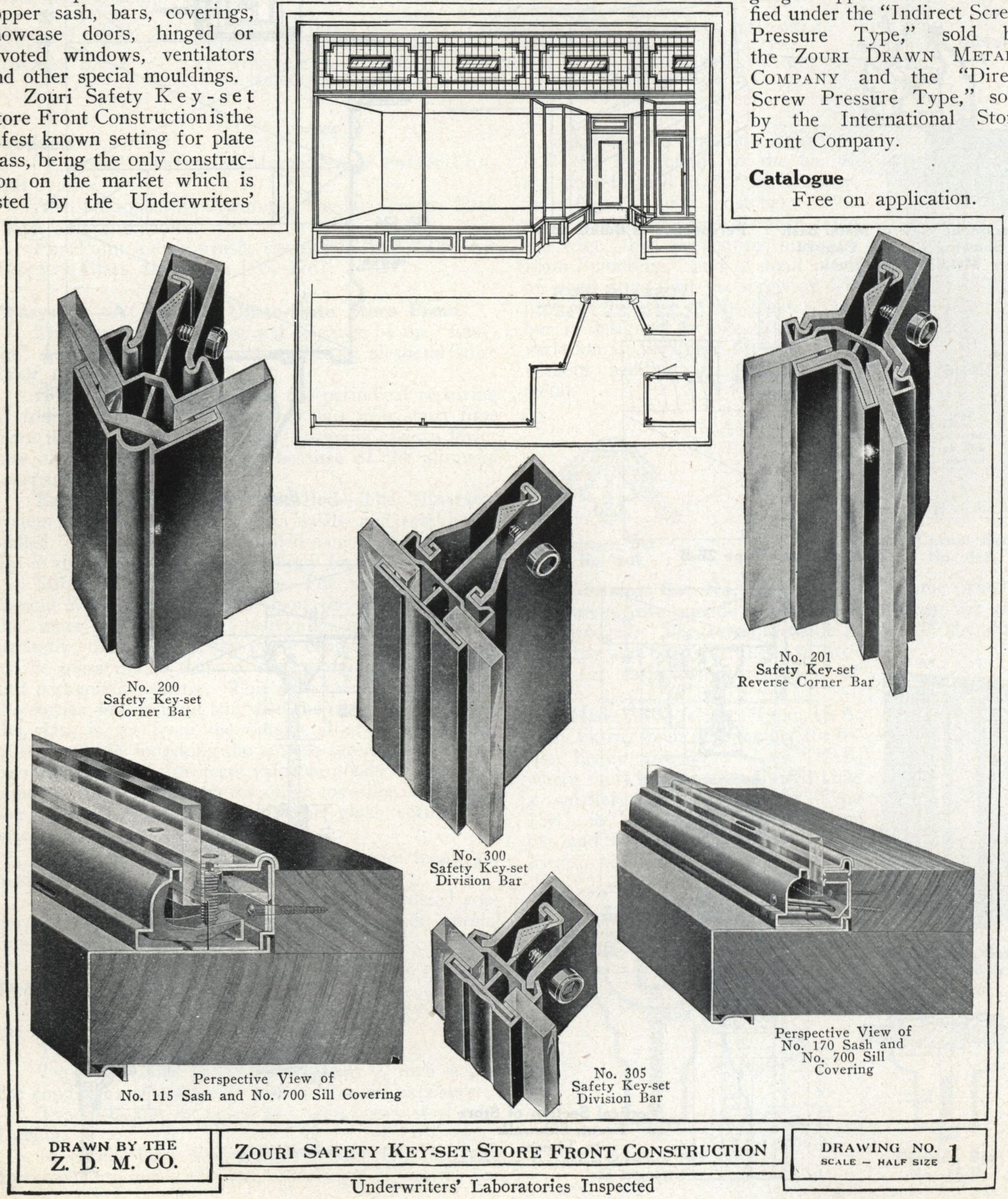
Our products consist of copper sash, bars, coverings, showcase doors, hinged or pivoted windows, ventilators and other special mouldings.

Zouri Safety Key-set Store Front Construction is the safest known setting for plate glass, being the only construction on the market which is listed by the Underwriters' Laboratories, Inc., under date of July 26, 1919, S. A. No. 135, and bears their stamp of inspection: *"Zouri Safety Key-set Construction Ptd. Underwriters' Laboratories Inspected."*

All construction is formed to shape by latest improved methods of rolling or drawing process from solid heavy gauge copper and is classified under the "Indirect Screw Pressure Type," sold by the Zouri Drawn Metals Company and the "Direct Screw Pressure Type," sold by the International Store Front Company.

Catalogue

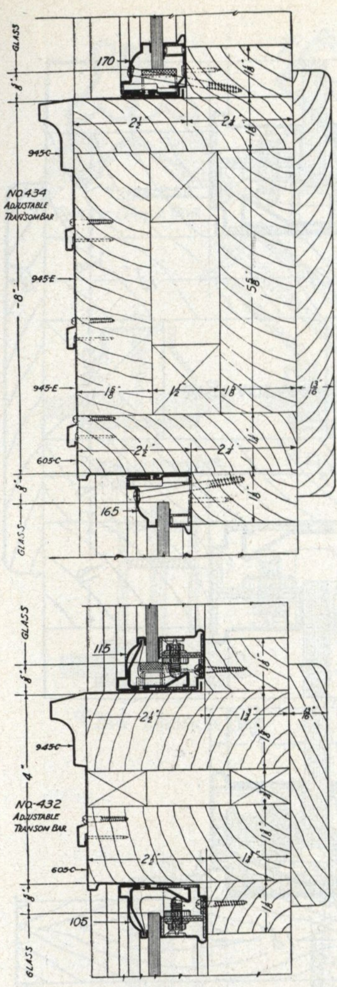
Free on application.

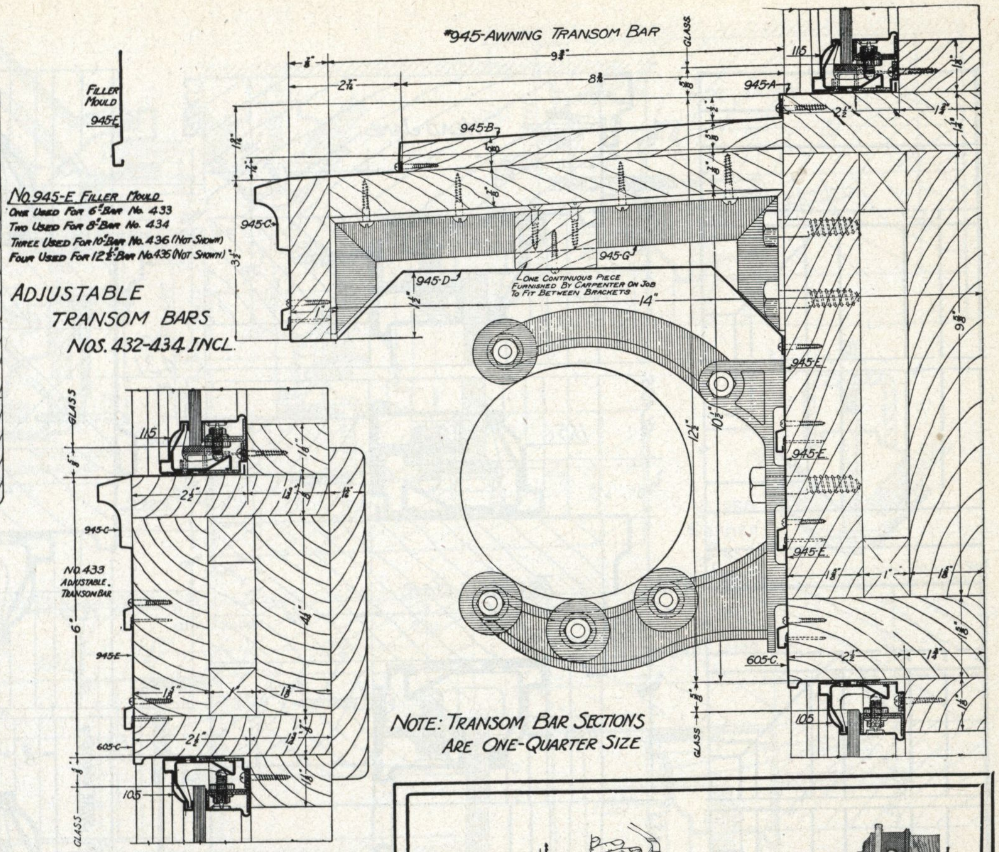

No. 200
Safety Key-set
Corner Bar
No. 201
Safety Key-set
Reverse Corner Bar
No. 300
Safety Key-set
Division Bar
Perspective View of
No. 115 Sash and No. 700 Sill Covering
No. 305
Safety Key-set
Division Bar
Perspective View of
No. 170 Sash and
No. 700 Sill
Covering
DRAWN BY THE
Z. D. M. CO.
DRAWING NO. 1
SCALE — HALF SIZE

ZOURI SAFETY KEY-SET STORE FRONT CONSTRUCTION

Underwriters' Laboratories Inspected

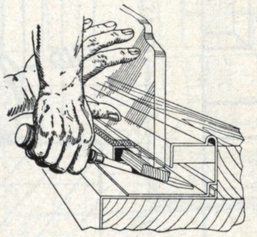
Continued on next page


GLASS
170
945-C
No. 434
ADJUSTABLE
TRANSOM BAR
945-E
605-C
165
GLASS
115
No. 432
ADJUSTABLE
TRANSOM BAR
105

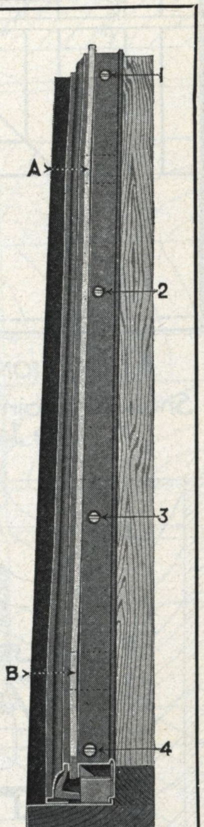

FILLER MOULD
945-E
No. 945-E FILLER MOULD
ONE USED FOR 6" BAR No. 433
TWO USED FOR 8" BAR No. 434
THREE USED FOR 10" BAR No. 436 (NOT SHOWN)
FOUR USED FOR 12" BAR No. 435 (NOT SHOWN)
ADJUSTABLE
TRANSOM BARS
NOS. 432-434 INCL.
#945-AWNING TRANSOM BAR
945-A
945-B
945-C
945-D
945-G
ONE CONTINUOUS PIECE FURNISHED BY CARPENTER ON JOB TO FIT BETWEEN BRACKETS
945-E
605-C
115
105
GLASS
No. 433
ADJUSTABLE
TRANSOM BAR
NOTE: TRANSOM BAR SECTIONS
ARE ONE-QUARTER SIZE

Distortion a Main Cause of Plate Glass Breakage—Stationary Setting Blocks Add to Hazards

Plate glass is heavy and unwieldy. Extreme vigilance is absolutely necessary to prevent cracks or breakage in setting. When the glass, in setting, is not in snug contact with the rabbet at the setting blocks, as shown at the right (A and B) there is distortion which often starts a crack or break under sudden wind pressures or heavy vibrations. Such distortion is clearly shown in the illustration at the right where the glass has been drawn into contact with the rabbet on both sides of the stationary setting blocks by the screws 1, 2, 3 and 4—but not at the blocks themselves.



Ordinarily, in setting, the glass is lifted by means of straps and set on two blocks about 14 in. from the ends of the glass and far enough from the rabbet to permit removal of the straps. It is then lifted off the blocks by means of a pry and forced against the rabbet in front of the blocks. Weight and friction do not readily permit sliding on stationary blocks, hence this operation is both difficult and hazardous, a fact often ignored by glaziers.

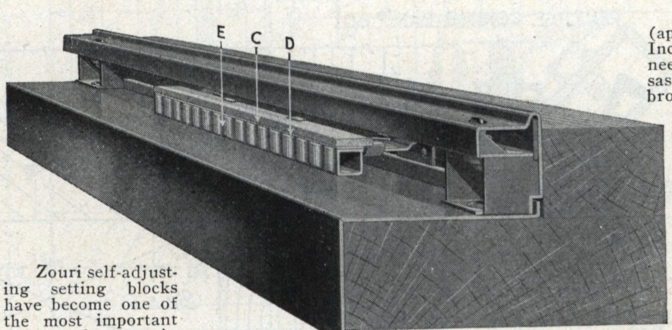


Showing Location of Stationary Setting Blocks
Notice the distortion of the glass

No Distortion with Zouri Self-adjusting Setting Blocks, Setting Safe and Easy—Snug Contact Assured

Where Zouri self-adjusting setting blocks (approved by the Underwriters' Laboratories, Inc., July 26, 1919) are used the pry is not needed, for when the outer member of the sash is drawn into position, the glass is brought automatically into contact with the rabbet at the points where it sets on the blocks, or it may be pushed into contact with the rabbet by a slight pressure of the hand.

A section of sill on the right shows a Zouri self-adjusting setting block. "C" indicates the sole leather cushion on which the glass sets, "D" the bronze plate to which the sole leather cushion is connected. This bronze plate forms an antifriction bearing with the copper setting block "E" to which it is adjustably connected, so that when the outside moulding is applied, the self-adjusting portions of the setting blocks slide inwardly until the glass is in complete contact with the rabbet.



Section of Sill Equipped with a Zouri Self-adjusting Setting Block

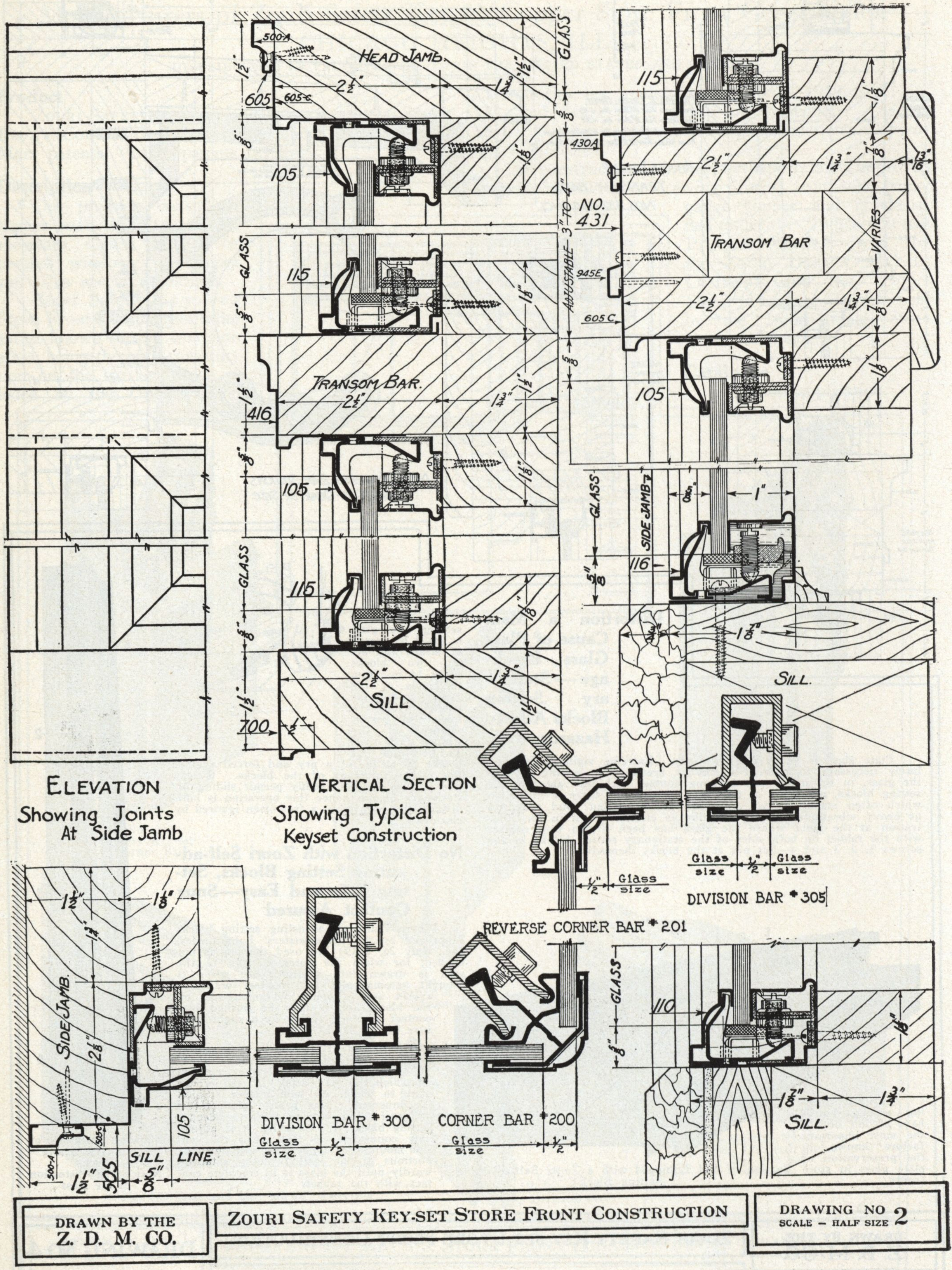
Zouri self-adjusting setting blocks have become one of the most important factors known in the preservation of plate glass in store fronts

DRAWN BY THE Z. D. M. CO.

ZOURI SAFETY KEY-SET STORE FRONT CONSTRUCTION

DRAWING No. 4

Continued on next page


500A
HEAD JAMB
GLASS
1½"
2½"
1¾"
605
605C
⅝"
105
1⅛"
115
NO. 431
ADJUSTABLE 3" TO 4"
430A
945E
605C
TRANSOM BAR
VARIES
13/16"
416
1⅞"
SIDE JAMB
116
1"
SILL
700
1⅜"
2⅛"
500-A
505
SILL LINE

ELEVATION
Showing Joints
At Side Jamb

VERTICAL SECTION
Showing Typical
Keyset Construction

REVERSE CORNER BAR # 201

½" Glass size

DIVISION BAR # 305

Glass size ½" Glass size

DIVISION BAR # 300

Glass size ½"

CORNER BAR # 200

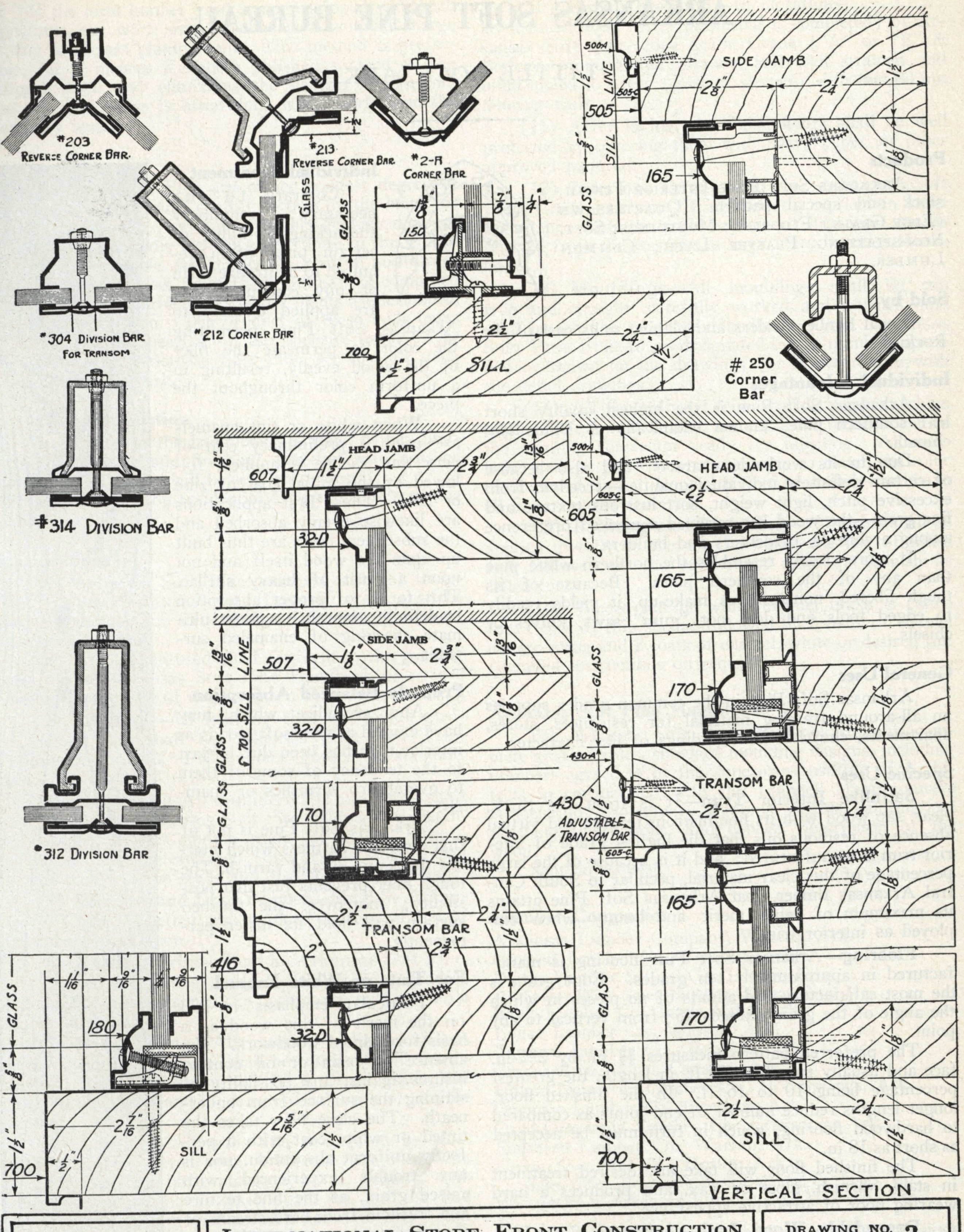
Glass size ½"

DRAWN BY THE
Z. D. M. CO.

ZOURI SAFETY KEY-SET STORE FRONT CONSTRUCTION

DRAWING NO 2
SCALE – HALF SIZE

Continued on next page


#203 Reverse Corner Bar
#213 Reverse Corner Bar
#2-A Corner Bar
#304 Division Bar For Transom
#212 Corner Bar
#314 Division Bar
#312 Division Bar
#250 Corner Bar
Side Jamb
500-A
505-C
505
Line
Sill
Glass
165
150
700
2 1/2"
2 1/4"
2 1/8"
Head Jamb
607
605
605-C
32-D
507
170
430-A
430
Transom Bar
Adjustable Transom Bar
416
180
2 7/16"
2 5/16"
Vertical Section

DRAWN BY THE
Z. D. M. CO.

INTERNATIONAL STORE FRONT CONSTRUCTION

DRAWING NO. 3
SCALE — HALF SIZE

ARKANSAS SOFT PINE BUREAU

LITTLE ROCK, ARK.

Products

Arkansas Soft Pine Interior Finish, stock and special patterns; Quartersawn (Edge Grain) Flooring; Mouldings; Soft, Non-splitting Plaster Lath; Common Lumber.

Sold by

Local lumber dealers and planing mills east of the Rockies.

Individual Advantages

Arkansas Soft Pine is the highest quality short leaf southern pine, known botanically as Pinus Enchinata.

Due to its workable character and also because of certain definitely individual qualities—freedom from excessive pitch, light weight, soft lustrous texture and fine grain—the wood has received a marked preference among architects, carpenters and builders.

It more closely resembles the northern white pine than any of the southern pines. Because of its tough fibered, non-resinous make-up, it yields readily to edged tools and does not "gum" saws, knives or chisels.

General Uses

Arkansas Soft Pine in the common grades supplies an all-around framing material for residences, stores, apartments, churches and buildings of like character.

Specific Uses

Satinlike Interior Trim—It is from the thick, clear, sap wood with its fine lustrous texture and virtual absence of resinous oils that the highest grade of interior trim is manufactured; and it is because of the large percentage of this clear material, peculiar to South Central Arkansas timber, that Arkansas Soft Pine attains its maximum of value, merit and beauty when employed as interior trim.

Flooring—Arkansas Soft Pine flooring is manufactured in approximately ten grades. Edge grain is the most satisfactory and admits of no pieces in which the angle of the grain exceeds 45° from vertical to any point.

The preferred pattern measures $\frac{25}{32}$ in. by $2\frac{3}{8}$-in. face and usually runs 8 to 20 ft. in length, the greatest percentage being 10 to 16 ft. In the finished floor, longer lengths reduce number of end joints as compared to hardwood flooring, which in turn must be accepted as short as 18 in.

The finished floor will take any desired treatment in stain, varnish, gloss or wax, and produces a hard wearing floor of attractive appearance.

Dependable Wood Lath—Arkansas Soft Pine lath are very light in weight and color; are strictly uniform in manufacture; may be had $\frac{3}{8}$x$1\frac{1}{2}$ in. x 32 or 48 in. long; and will not split, warp, buckle nor twist. They are skilfully dried and can be relied upon to supply a dependable wall backing.

Individual Treatment

Contrary to the necessary preliminary shellacking or filling of certain pine, often required to neutralize resin or oily content, stains are applied *directly* to Arkansas Soft Pine, permitting the color to permeate the fiber of the wood evenly, resulting in a uniform color throughout the piece.

When white or tint enamels are used, a preliminary coat of very thin shellac is applied, followed by the initial coat of zinc or lead. These first applications are likewise evenly absorbed and the subsequent coats are thus built up upon the wood itself and not upon a crust of heavy shellac. This factor of proper absorption is definite assurance against ultimate checking of enameled surfaces.

Properly Balanced Absorption

Any prejudice which may have existed against soft woods as interior trim has been due in part to the tendency of some of them to overabsorb varnishes or enamels.

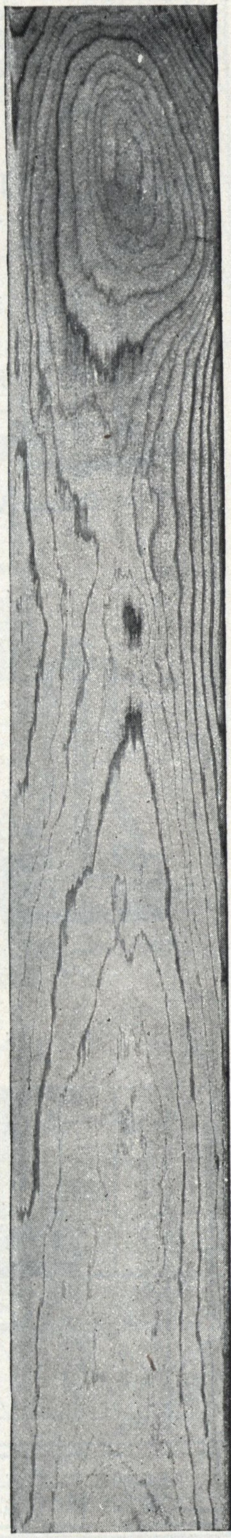
Arkansas Soft Pine is not of that cork-like softness which literally drinks up oil and varnish. The tough fiber prevents just that possibility; moreover, the finished surface will hold its luster permanently.

For Tints or White Enamel

Particular emphasis is laid on the merit of this wood as a basis for painted woodwork. The absence of resin or oil content insures against any possibility of staining the surface from underneath. The close fiber takes the tinted or white coat with a perfectly uniform absorption, nor is any trouble experienced with raised grain, as the fine texture and freedom from hard streaks of the wood prevent such tendency.

Proper Sanding

A prime prerequisite is that flat faced finish shall be machine sanded.



Typical Grain of Slash Sawn Arkansas Soft Pine Casing
From an actual photograph

Continued on next page

If the local lumber yard is not equipped with such apparatus, the work may be done at a nominal charge at any first class planing mill. This method is preferable, for it insures a smooth polished surface on the natural wood and eliminates the liability of scuffing the sap sections as is often done when worked on the bench by hand.

Source of Supply

Arkansas Soft Pine attains its greatest degree of perfection in the south central section of the state for which it is named. Certain favorable geological, topographical and climatic elements contribute to this condition; as for example, soil properties, rainfall and drainage. The ARKANSAS SOFT PINE BUREAU is composed exclusively of manufacturers whose plants are located in this identical region. The product of these mills bears the trade-mark appearing on the opposite page. To be sure of genuine Arkansas Soft Pine, see that all stock bears this trade-mark.

For Your Information

In addition to the handbook described below, literature on painting and finishing, together with finished and natural samples, will be sent on request.

Also brochure on residential design including twelve plans.

Specifications

(1) Arkansas Soft Pine, stamped with the trade-mark of the ARKANSAS SOFT PINE BUREAU, shall be used throughout for structural and finishing purposes, as specified below.

(2) All lumber used shall conform to the grading rules of the Arkansas Soft Pine Handbook on grades adapted from those of the Southern Pine Association.

(3) **Framing**—All framing timbers, joists, girders, studs, etc., shall be Arkansas Soft Pine (No. 1 Common or No. 2 Common) grade, of standard sizes.

(4) **Sheathing**—All outside walls and roofs shall be covered with Arkansas Soft Pine (shiplap or sheathing boards), No. 2 Common grade (or better). Sheathing boards shall be surfaced (one or two sides), shall be well nailed to the studs and shall be laid diagonally.

(5) **Window and Door Frames**—Shall be Arkansas Soft Pine rabbetted and moulded as detailed and of the dimensions shown.

(6) **Exterior Trim**—Shall be Arkansas Soft Pine, ("B" & Better finishing grade or "C" finishing grade), and shall be worked strictly in accordance with the scale and detail drawings.

(7) **Bevel Siding**—All exterior walls, as shown or noted on the drawings, shall be covered with Arkansas Soft Pine bevel siding of "B" & Better grade, laid (2½ in. in 4-in. and 4 in. in 6-in. widths) to the weather.

(8) **Lathing**—All walls and ceilings to be plastered shall be covered with Arkansas Soft Pine lath, No. 1 grade, laid horizontally, 2 in. on centers, with breaking joints. In no case shall the lath be laid vertically and all lath shall be well nailed to every stud or other bearing, using 4 nails to the lath.

(9) **Subflooring**—On all floors throughout, except as otherwise shown or noted, lay Arkansas Soft Pine subflooring, (No. 2 Common or No. 3 Common) grade shiplap, each board well nailed to every joist.

(10) **Finish Flooring**—In (locations) .... lay a finish floor (after plastering is completed) of Arkansas Soft Pine, edge grain, Grade ("A" or "B" & Better), tongued and grooved and well strained and blind nailed to every (joist or sleeper) with two 8d cut flooring nails.

(11) After laying, the finish floors shall be well protected by covering them with heavy paper, or other approved material.

(12) **Interior Trim**—Shall be Arkansas Soft Pine, Grade ("A" or "B" & Better), worked in strict accordance with the scale and detail drawings (or as selected from the ARKANSAS SOFT PINE BUREAU Handbook).

(13) **Mouldings**—All mouldings shall be run true and straight, carefully worked and finished, and shall be selected from the Handbook of the ARKANSAS SOFT PINE BUREAU, as designated by the numbers specified or shown on the drawings (or in accordance with the detail drawings).

(14) All flat-surfaced trim shall be triple machine sanded before installation, and shall be turned over to the painting contractor ready for finishing. All nail-holes shall be puttied up, using putty to match the color of the wood, and all wood that is to be stained shall have all finger marks removed.

(15) **Painting and Finishing**—All stains shall be applied directly to the wood without the use of filler, and followed by the subsequent coats of varnish as called for.

(16) Where tint or white enamel finish is called for, 1 coat of thin shellac followed by 2 coats of enamel undercoating and 2 coats of enamel, white or desired tint (detailed instructions on request).

Arkansas Soft Pine Handbook

The Arkansas Soft Pine Handbook contains complete grading rules, standard moulding designs, including numbers agreed to by the American Institute of Architects in conjunction with the Lumber Manufacturers Association; also actuary, shipping weights, painting and finishing instructions, and concise description of the wood.

Sent on request.

Member Companies

Arkansas Lumber Company, Warren, Ark.
Crossett Lumber Co., Crossett, Ark.
Dierks Lumber & Coal Co., Dierks, Ark.
Sales Office, Gates Building, Kansas City, Mo.
Eagle Lumber Co., Eagle Mills, Ark.
Edgar Lumber Co., Wesson, Ark.
Fordyce Lumber Co., Fordyce, Ark.
Graves Bros. Corp., Camden, Ark.
Halpin-Neimeyer Lumber Co., Hot Springs, Ark.
Ogemaw Lumber Co., Ogemaw, Ark.
Ozan-Graysonia Lumber Co., Graysonia, Ark.
Southern Lumber Co., Warren, Ark.
Union Saw Mill Co., Huttig, Ark.
Sales Office, Boatmen's Bank Building, St. Louis, Mo.
Wisconsin & Arkansas Lumber Co., Malvern, Ark.

Arkansas Soft Pine is grade marked. All stock bearing the Arkansas Soft Pine Trade-mark is manufactured and sold exclusively by the above companies composing the ARKANSAS SOFT PINE BUREAU, Little Rock, Ark.

CALIFORNIA WHITE AND SUGAR PINE MANUFACTURERS ASSOCIATION

675 Call Building
SAN FRANCISCO, CAL.

Products

California White Pine Lumber.
California Sugar Pine Lumber.
Also California White Fir, Douglas Fir, and Incense Cedar Lumber.

Association Membership and Organization

Our membership comprises 38 lumber mills located in California and the Klamath Falls district of Oregon.

This Association is not a sales organization. The mills have associated themselves together to promote efficiency in manufacturing, uniform grading, and the dissemination of information pertaining to the proper uses of their products.

Services

A trade extension department is maintained to assist architects, builders, manufacturers, dealers and consumers in all matters relating to the proper use of the woods listed above.

Architects and builders are requested to write us for information relative to the uses of these woods for lumber or its re-worked products. All inquiries addressed to the Association will be promptly answered by a competent wood technologist formerly with the Forest Products Laboratory conducted by the United States Government at Madison, Wis., and now affiliated with the Association. He will advise the kinds, grades and sizes of lumber we recommend for specific uses.

Mills in this Association employ as inspectors only expert graders of certified ability. The Association maintains an efficient corps of inspectors continually supervising and checking the work of the mill graders, thus insuring to purchasers of California pine, fir and incense cedar products, lumber of uniform manufacture and quality.

Forest Resources

The forests in which these mills operate contain approximately 250 billion board feet of standing timber, of the following species:

California white pine	105 billion feet
California sugar pine	32 billion feet
California white fir	33 billion feet
California Douglas fir	50 billion feet
California incense cedar	9 billion feet
Other species	24 billion feet

The annual lumber production of this region approximates 1½ billion board feet, divided about as follows:

California white pine	855 million feet
California sugar pine	270 million feet
California white fir	225 million feet
California Douglas fir	90 million feet
California incense cedar	30 million feet
Other species	30 million feet

At the present rate of cutting, the available supply should last for nearly two centuries. However, new growth is now adding a quarter-billion feet annually to the supply, thus insuring a continuous production of lumber.

Sold Throughout the United States

California white and sugar pines, white and Douglas firs and incense cedar are available in all sections of the United States in the forms of yard lumber, or as doors, sash, ready-cut frames, trim and millwork, and can be procured from retail lumbermen, jobbers, planing mills, and sash and door manufacturers.

This Association will gladly furnish the names of dealers in your district who will fill your specifications for these woods.

Seasoning and Dressing

California white and sugar pines, white and Douglas fir and incense cedar are carefully seasoned at all mills belonging to this Association, either naturally in the air or in dry kilns. In either case, a product fitted for immediate use is assured.

This lumber is uniformly graded according to the rules of this Association and furnished in sizes which are in close conformity to American Lumber Standards.

Furthermore, shrinkage having taken place during the seasoning process, the lumber is uniform in size and this uniformity is maintained.

California White Pine (Trade Name)

The botanical name for this wood is *Pinus Ponderosa.* The name of "California White Pine" was given to it because of its color and softness, long before

The Species "Pinus Ponderosa" (California White Pine) Attains Its Largest and Finest Growth in the California and Klamath Falls, Oregon, District

Continued on next page

it was shipped East and became a general commercial wood.

The physical properties of California white pine as demonstrated at the United States Government Forest Products Laboratory at Madison, Wis., and its uses, align it with eastern white pine.

In fact, in many of its important qualities and uses, California white pine is more typically a white pine than some species which botanically are classified as such.

By this name, buyers and users distinguish this wood from the harder and more pitchy pine growing in the southern part of the United States, which has entirely different values and uses.

Characteristics of California White Pine Growth—The species of soft pine from which California white pine lumber is obtained grows over the entire western mountain section of the Sierra Nevada mountains, from California south into Mexico, and north into British Columbia. However, a species of tree growing over so wide a range often attains its most perfect growth in one particular region.

This region, for California white pine, is California and the Klamath Falls district of Oregon, including both the eastern and western slopes of the Sierra Nevadas and the Siskiyou mountains. Here the winter snows deeply cover the tree's roots, and the summer sun bathes the trees in a flood of warmth, causing the trees to attain their largest size and finest quality.

California white pine reaches its most perfect growth at altitudes of 3500 to 6000 ft. On the western slopes of the mountains it grows mixed with other species, while on the eastern slopes it is found in nearly pure stands.

The California white pine tree grows tall and straight to a height of 125 to 175 ft., with an average diameter of from 3 to 4 ft., though individual trees reach a height of 200 ft. and a diameter of 8 ft.

A California Sugar Pine Monarch of the Forest

This tree was 9 ft. 2 in. in diameter above the swell of the butt. The first 16-ft. log scaled 6200 board feet; the second scaled 5280 board feet. The whole tree produced 32,340 board feet of lumber, enough to build two good sized houses

Cross Section of a California Sugar Pine Tree That Has Lain on the Ground for 40 Years

California Sugar Pine

A true White Pine.

Sugar pine is, botanically and physically, a true white pine. In fact, it is one of the most typical representatives of the white pine group. It differs from California white pine only in that its color is lighter.

It has five slender needles in each cluster, and the clusters occur in feathery tufts at the ends of graceful branches as do those of its eastern relative, the white pine of New England and the Lake States.

In cell structure sugar pine is also a white pine. The longitudinal cells are uniform in size and regularly spaced. The radial cells have smooth walls. There are no alternately hard and soft rings in the wood.

Tests on sugar pine made at the Forest Products Laboratory, operated by the United States Government at Madison, Wis., speak volubly of its excellence, and show it to be almost identical in many of its most important qualities with the white pine of the east. In specific gravity it comes within 3/1000; in volumetric shrinkage from green to oven dry it is within one-half of 1%; in softness, as determined by compounding properties, it is within 7%; in strength (as a beam or post) it is within 2%. Such variations are less than might be expected between different samples of either wood.

Further tests made by the Forest Products Laboratory proved that other woods (used for the same purposes as sugar pine) run from 1% to 53% heavier, that all but one have much greater shrinkage (running from 19% to 51% more than sugar pine) and that while several have about the same degree of softness, others are from 40% to nearly 100% harder, although they are classed as soft woods.

Characteristics of California Sugar Pine Growth—Sugar pine grows chiefly in the Sierra Nevadas of California, at elevations of from 3000 to 9000 ft., depending on the latitude. Occasional small stands are also found in southern Oregon.

The largest trees and heaviest stands are found in California on the western slope of the Sierra Nevada mountains.

Sugar pine is a monarch among trees, the largest of the numerous pine family. It has a tall, straight trunk with a rich purple-brown or cinnamon-red bark.

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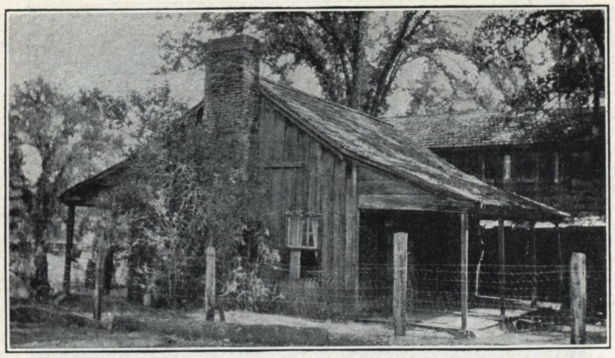


Cabin Built of California Sugar Pine at Fresno Flat, Cal., in 1854 and Occupied Continuously Since That Time

It grows, ordinarily, from 150 to 175 ft. high and from 4 to 5 ft. in diameter, though occasional specimens 230 ft. high and 12 ft. in diameter are seen.

The tree is exceptionally free from disease, and this, as well as its large size, makes possible the productions of large quantities of thick, wide lumber of high quality. Lumber produced from sugar pine trees can be seasoned without checking or warping, which gives evidence of the excellent characteristics of the wood.

Durability of Sugar Pine—The pioneers of 1849 found fallen sugar pine trees which gave evidence of having been on the ground for many years.

It was this mute testimony of its durability that prompted them to seek these trees with which to build their cabins. They were especially eager to obtain material from sugar pine for the roofs, knowing that this portion of their new homes would be subjected to the greatest exposure.

Sugar pine is new in use compared with eastern white pine, but there are many buildings still standing that attest its durability. Two of these are illustrated on this page.

Characteristics of California White Pine and California Sugar Pine

Both of these pines have the same general characteristics. They are light in weight and color, soft and uniform in texture, and possess ample strength beyond the requirements of use.

The grain is close, straight and uniform, and the surface is smooth and satiny. The structure consists of minute cells, regularly formed and evenly spaced.

Cabin of Gold Miner Built in 1868

Trees of other species have grown up around it and one has fallen over the roof and rotted. Still the original sugar pine shakes remain sound and serviceable and expel the rain

Properly seasoned, California pines will not warp, swell, shrink, check nor split.

California pines are easily worked. They cut easily and smoothly either with or against the grain, therefore the fitting of hardware is easily and quickly accomplished.

California pines have excellent nail and screw holding ability, and they will not split when nails are driven near the ends, neither at the time of installation nor after.

Being unusually free from resinous substances and raised grain, these pines take and hold paints, enamels and varnishes without discoloration, checking, chipping and peeling. Being light in color, they require fewer finishing coats, an economy of materials and labor.

Uses of California White Pine and California Sugar Pine

Because of their quality, texture, light color, availability and low cost, California pines are fast taking the place formerly held by eastern white pine and are used extensively for the following architectural purposes, in addition to many others:

- Framing
- Sheathing
- Exterior trim
- Siding
- Lath
- Porch columns
- Concrete forms
- Farm buildings
- Subflooring
- Doors and door frames
- Window sash
- Window frames
- Interior trim and finish
- Interior paneling
- Mouldings
- Partitions
- Ceilings
- Stair work

Built-in cabinets, bookcases, tables, seats, shelving, etc.

Cost

California pines sell at a price that is lower than that of eastern pines used for the same purposes.

California Pine Doors

California white and sugar pines are used more than any other woods for the manufacture of exterior and interior doors, including entrance, French, cupboard and garage doors.

The California pine door is the standard for quality among so-called "soft wood" doors, having earned its right to that distinction through unvaryingly excellent service of many years. The great majority of pine doors used today are made of California pine.

Light Weight and Great Strength—California pine doors are light in weight yet their great strength insures resistance to severe usage and assures the firm holding of nails and screws.

If a hardwood finish is desired, a hardwood veneer over a core of California pine will give satisfactory results.

Fine, Soft Texture—The soft and uniform texture of California pines and the fact that they machine easily to a smooth surface, permits low manufacturing costs and makes possible the production of doors of the finest design, with mouldings of sharp, clean profiles and evenly graduated curves. The art of architecture may be accurately expressed and preserved in California white and sugar pines.

The fine working qualities of California pines make possible the fine lines and delicate mouldings which characterize Colonial designs and also permit an absolutely accurate degree of joinery. In a well finished California pine door, the joints are practically invisible.

California pines are not of that degree of softness, however, that would permit them to scratch or mar easily. Furthermore, their texture is of a quality that

Continued on next page

takes glue easily—glued joints in California pine doors become as strong as is possible to be made.

Take Paint and Enamel Perfectly—California pine doors may be painted, enameled or varnished without fear of raised grain, discoloration, checking, cracking or peeling of the finish.

Slight Shrinkage—An important advantage of California pine doors is that they have relatively little degree of shinkage and do not warp or swell to an appreciable extent with changes in atmospheric conditions.

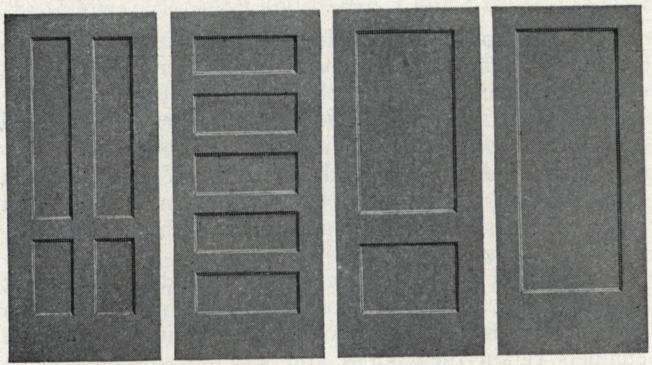
This freedom from expansion and contraction prevents sticking or rattling doors, failure of the lock to catch, and large cracks that admit cold air.

Economical—Not only has nature practically fitted California white and sugar pines for the economical production of doors, but, in addition, doors made of these woods may be installed at minimum cost because their soft texture permits the carpenter to cut them and fit hardware with little labor.

The first cost of painting California pine doors is less than with doors of other woods because fewer coats are required and repainting is not required as often.

Durable—Exterior doors, such as entrance and garage doors, must withstand severe conditions of temperatures and moisture—they may be wet and cold on one side and dry and warm on the other side. This tends to cause contraction on one side and expansion on the reverse, with resultant distortion of the door. Although this tendency might possibly be overcome by proper painting, the best protection is afforded by the use of doors made of California white or sugar pine.

Designs—There are available designs of California pine doors to suit all tastes, but the basic designs are grouped into four classes—four vertical panel, five horizontal panel, two panel and one panel. These patterns may be modified or combined to produce an infinite variety of patterns. Panels of wood may be supplanted by glass, mirrors or divided sash.



Four Panel Five Cross Panel Two Panel One Panel

Four Main Types of Door Construction

Thicknesses—California pine doors are available in finished thicknesses of $\frac{13}{16}$, 1⅛, 1⅜ and 1¾ in., which are known to the trade as 1, 1¼, 1½ and 2-in. doors respectively.

Sizes—Stock door sizes range from 2 ft. 6 in. by 6 ft. to 3 ft. 6 in. by 7 ft.

Grades—Four grades of doors are recognized in the trade—No. 1, No. 2, No. 3 and No. 4.

Most doors are No. 1 grade, which is practically without defect or blemish. No. 2 grade has minor defects easily covered with paint. No. 3 and No. 4 grades are suitable for cheap and temporary construction.

Door Frames—These should be thoroughly in keeping with the door itself.

Close fitting joints, often mitered, are required here, and the freedom from shrinkage of California pines recommends them for this purpose.

In addition, the finishing of the frame is as important as the finishing of the door. The use of a different frame material would upset the harmony of the finish.

California Pine Sash and Frames

The annual production of sash and frames made from California white and sugar pines is over 10,000,000 sash and 4,000,000 frames.

The popularity of these woods for this purpose is due to their easily working properties, light weight, great strength, soft and uniform texture, slight shrinkage, ability to take paint without discoloration, grain raising, checking or peeling, ability to take nails and screws without splitting, freedom from bowing and twisting and their great durability when properly constructed and painted.

Stock Sizes and Patterns—California white and sugar pine sash and frames are obtainable throughout the United States (either knocked down or assembled) in sizes to fit every opening and in patterns for any design.

Sash and frames may be made by hand on the job, using the Select grades obtainable from local dealers.

Thicknesses—The standard sash thickness is 1⅜ in., although 1⅛ and 1¾-in. thicknesses are obtainable.

Suggestions for Sash and Frame Installation—Sash should be well painted before or immediately after installation. Dipping in linseed oil is recommended before glazing is done.

Back-puttying is important; that is, a small amount of putty should be placed in the sash before the glass is installed, thereby forming an airtight and watertight cushion for the glass.

California Pine Siding

Bevel siding and drop or novelty siding made of California white and sugar pines are used extensively throughout the United States. The widespread use of California pine siding is due to the qualities which particularly fit that use. These qualities are characteristic of pine sidings which for centuries have been the standard of quality in exterior wall coverings.

Easy Cutting and Fitting—California pines have the fine, soft, uniform texture which assures smooth surface dressing and allows the carpenter to cut easily without splitting and fit sidings accurately.

Paint Perfectly—There is an appreciable saving in the original cost of painting and in the upkeep of California pine siding. It readily takes paint and holds it tenaciously and, because of the pale tones of these woods, requires fewer coats of paint and less repainting.

In addition, paints do not become discolored on California pine siding, because of the extremely low resin, oil and pitch content of the wood.

Absence of "grain raising" is another feature of importance.

Knots Will Paint Over—A particular feature of California white and sugar pine siding is, that although some grades may contain numerous knots, these knots are sound, the grain is not torn out around them, and they will paint over completely. Knots in California pine siding are not inclined to crack open or exude resin and ruin the paint.

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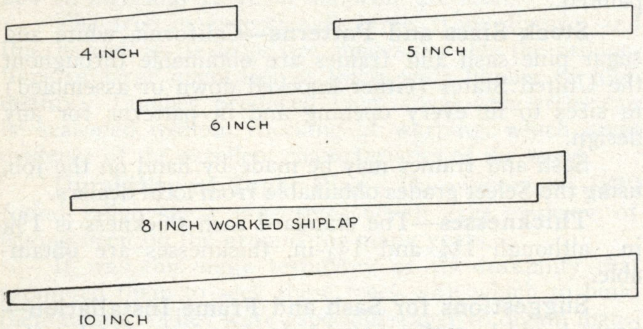
Slight Shrinkage—California pine siding is exceptionally free from objectionable endwise shrinkage. Unsightly, unpainted edges under the clapboards are absent wherever California pine siding is used and there are no openings between ends of strips.

Durable—When properly applied and protected, California pine siding greatly resists rot and decay. Many buildings with sides of California white and sugar pine erected in 1849 are still standing and in use. Some of these buildings have never been painted, but they shed water today as effectively as when they were built.

Good Insulators—California pine sidings are favored because they are efficient insulators against heat and cold.

Grades and Sizes—*Bevel Siding*—Available in 4, 5, 6-in. widths and greater, and in grades B and better, C, D and E.

This wide range of sizes and grades fits each individual taste and pocketbook.

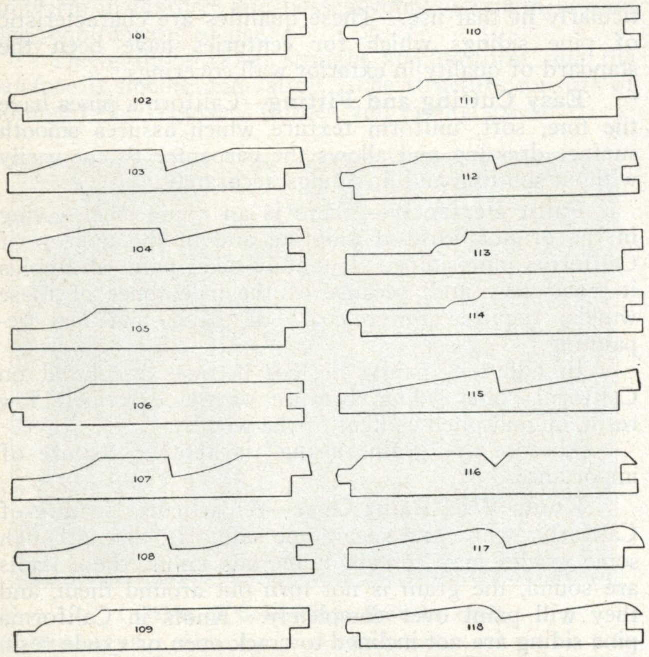


A Few Patterns of Bevel Siding

Drop or Novelty Siding—Made in numerous patterns from all grades of lumber, mostly from No. 2 Common and No. 3 Common. Both shiplapped and tongue-and-grooved patterns are available, though shiplap patterns are most extensively used.

Widths of 4, 6, 8, 10 and 12 in. are produced by mills in this Association.

Suggestions for Best Use—California pine siding should be thoroughly dry before installation. Siding should not be put up immediately after a rain storm; the sheathing should be allowed to thoroughly dry.



A Few Patterns of Drop Siding

The proper lap for bevel siding is ¾ in. on 4 in., 1 in. on 5 and 6 in., and 1½ in. on wider.

Siding should be cut with a miter saw at all corners. Wherever two pieces of siding join, a splice joint should be used (this is best accomplished with a miter saw).

Joints should be broken, with as wide a space as convenient between the joints of overlapping tiers. Where siding abuts window frames, a square tight joint should be made. A metal flashing underneath the siding will prevent any possibility of water seeping in.

For the finest finish, nails in sidings should be countersunk and the depression filled with putty.

All knots in siding should be covered with a thin coat of white shellac. The priming coat should be applied as soon as siding is put up, and for widths of siding over 8 in., it is advisable to paint the back before it is put on. Finishing coats should be applied several days after the application of the priming coat.

California Pine Interior Trim

California white and sugar pines are well suited for use in interior finish, including window and door casings, baseboards, chair rails, wainscoting, plate rails, picture moulding, crown moulding, corner moulding, staircases, mantels, built-in cabinets, etc.

Ease of Working—The soft, uniform texture of California pines permits the highest quality of workmanship both in the planing mill and by the carpenter. They come from the planing mill with a soft, velvety smoothness of surface, and, when the lumber is run to a moulded pattern, lines of corners are sharp (without splintering) and curves are uniformly true. The sharpest profiles and most finely graduated curves can be obtained from these woods.

The carpenter can cut California white and sugar pine trim easily along any line without splintering or tearing—the closest fit and tightest joint is assured. This easy and accurate workmanship can be performed with rapidity—much more rapidly than with most other woods.

Exceptional Nail-holding Qualities—California white and sugar pines are free from the tendency to split when nails are driven near the end of the piece, and they will not split after installation. The fibers of the wood tenaciously hold the nail with an everlasting grip.

Takes Any Desired Finish—When given a natural finish, the delicately beautiful grain of California pines presents a pleasing appearance without being obtrusive, and without muddy effects.

The light color of these woods is hidden by the first coat of paint, and fewer coats are required to obtain a satisfactory finish. Moreover, the whitest of white enamels retain their gloss and will not discolor when applied to California pines, nor will there be any grain raising to mar the finish.

Tight Joints Assured—Properly seasoned California white and sugar pines shrink very slightly, consequently all joints, whether side or inlays of narrow moulding, remain tight.

The individual lines and form of California pine woodwork are always preserved regardless of atmospheric conditions.

Thicknesses—California pine finish lumber is available in nominal thicknesses of $\frac{11}{16}$, 1, 1¼, 1½, 2, 2½, 3 and 4 in.

The dressed thicknesses are specified in the grading rules of the Association.

Widths—Standard widths are 2, 3, 4, 5, 6, 8, 10, 12 and 14 in. and up.

Continued on next page

Types of Interior Mouldings Available in Universal Patterns—

- Angle moulding
- Astragals
- Aprons
- Base shoe
- Patterns
- Beaded moulds
- Bed moulds
- Moulded casings
- Ceiling moulds
- Chair rails
- Door trim
- Corner beads
- Crown moulding
- Half rounds
- Quarter rounds
- Panel moulding
- Partition moulding
- Picture moulding
- Screen moulding
- Window stools
- Thresholds

Suggestions for Best Use—Interior trim should not be installed while plaster is wet; in fact, it should not be brought to the job until plaster has become thoroughly dry.

Wide pieces of trim and especially wide panels, should be painted on the back before installation so as to prevent bulging or buckling. Exposed end grain should be saturated with thick paint in order that absorption of moisture be prevented.

Knots should be coated with white shellac or wiped with a cloth saturated with benzol before the trim is painted.

California Pine Exterior Trim and Porch Flooring

The exceptional qualities of California white and sugar pines as explained under "California Pine Interior Trim and Moulding" also apply to exterior trim, which includes cornices, facia, soffits, outside casings, corner boards, porch floors, porch rails, porch columns, balusters, blinds, louvers, dormers, newels, etc.

Exterior Finishing Lumber—Produced from California pines in thicknesses varying from $\frac{11}{16}$ to 4 in. and in all widths.

It is graded under the rules of this Association, which conform closely to American Lumber Standards as follows: B Select and Better, 1 and 2 Clear, C Select, D Select and No. 1 Common.

Porch Flooring—Well matched porch flooring in 3, 4 and 6-in. widths is manufactured by mills in this Association and sold widely throughout the United States.

Exterior Mouldings—Mouldings that conform to "Universal Moulding Patterns" which were drawn up by architects to meet the ordinary needs of construction, are available in the following forms:

- Angle mouldings
- Cap mouldings
- Crown mouldings
- Drip caps
- Frieze mouldings
- Lattice
- Outside casings
- Gutters
- Thresholds
- Rails

Only one regular Association grade is generally recognized, although a grade of "seconds" consisting of "blue stain" stock is sometimes sold and found to be satisfactory when well painted.

Exterior Millwork—Many forms of California pine exterior millwork fabricated at the large millwork factories or made up in local planing mills include:

- Porch columns
- Newels
- Balusters
- Friezes
- Blinds and shutters
- Dormers
- Louvers
- Pilasters
- Brackets
- Rafter ends

California Pine Lath

California white and sugar pine lath are particularly desirable for the following reasons:

They are thoroughly seasoned at the mill and transported cheaply without deterioration.

They are light in weight, easy to handle, precisely sawed and uniformly graded.

They are clean and bright and will not discolor the plaster.

They cut easily and cleanly with one blow of the lather's hatchet without splitting or tearing. Nails are easily driven into them and hold tight.

They do not split when nailed or after installation. They do not buckle after installation, buckling being a frequent cause of cracking and ridging of the plaster.

They are practically free from shrinkage and swelling, thus preventing cracks in the plaster.

Sizes—California pine lath is 1½ in. wide (with a maximum variation of ⅛ in.) and ⅜ in. thick (with a maximum variation of $\frac{1}{16}$ in.). Wider and thinner lath are apt to buckle, while narrower and thicker lath are uneconomical to manufacture.

Lengths are 32 and 48 in.

Grades—California pine lath are made and sold under the specifications of this Association. Two grades are recognized—No. 1 and No. 2.

No. 1 lath is practically free from defects, uniform in sizes and suitable for the finest plaster jobs.

No. 2 lath contains occasional defects which eliminate them from the first grade. They may be used with satisfaction for work in which economy is a factor.

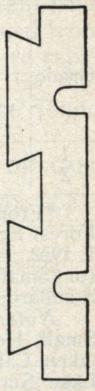
Covering Capacity—1000 lath 48 in. long will cover 640 sq. ft. of wall; 100 lath 32 in. long will cover 425 sq. ft. of wall.

Byrkit Patent Lath—These lath (see accompanying cross section) are made from the lower grade of lumber in widths of 4 and 6 in.

They make an excellent base for magnesite stucco because the wood is not affected by the magnesite. In many cases they have proved less expensive than expanded metal lath.

In mild climates, Byrkit lath may be applied directly over the studding with only building paper between. They thus serve as both sheathing and lathing.

Byrkit lath are rapidly and cheaply applied and will not cause plaster or stucco to crack. Because of the dovetail character of the groove, plaster keys itself tightly and will not pull away. The fact that there are no openings between the lath permits a large saving in plaster.



Byrkit Patent Lath

Suggestions for Plaster Use of California Pine Lath—Use well seasoned and clean lath. Lath should be thoroughly soaked in water before they are installed (so as to prevent cracking of the plaster) and the plaster applied as soon as possible after the lath are in place.

Space lath ⅜ in. apart and leave an opening of about ¼ in. between ends. Nail each lath over all studs with regular lathing nails. Break joints every 6 or 8 lath.

Do not permit lath to run behind partitions and leave no unsupported ends.

California White and Sugar Pine Common Boards and Dimension

Uses—*Common Boards*—Used principally for the following purposes:

- Sheathing
- Subflooring
- Roof boards
- Concrete forms
- Barn boards
- Shelving
- Partitions
- Boxes and crates

Continued on next page

Also for other uses where good, common lumber is wanted.

Dimension—Generally used in residential and small building construction for:

Joists	Plates
Studs	Girders
Rafters	Cribbing

Also used for heavy crating and all minor construction requiring light, strong lumber.

Pine Qualities for Boards and Dimension—The widespread use of California white and sugar pine boards and dimension is due to the fitting qualities and large available supply of all grades.

Light Weight and Strong—California white and sugar pine lumber is light in weight and amply strong for its weight.

Light weight keeps down transportation costs and reduces the expense of labor in handling, as well as increasing the amount of work performed during a given time.

The weight and strength of California white and sugar pine have been determined in many tests at the Forest Products Laboratory operated by the United States Government at Madison, Wis. These data are published in Department of Agriculture Bulletin No. 556, "Mechanical Properties of Woods Grown in the United States."

Allowable stresses for California pine structural lumber in small buildings are as given in the following table.

*ALLOWABLE STRESSES FOR CALIFORNIA PINE STRUCTURAL MATERIAL IN SMALL DWELLINGS

Grade	Allowable bending stress, lb. per sq. in.		Allowable stress in compression, lb. per sq. in.		Modulus of elasticity, lb. per sq. in.
	In extreme fiber	Horizontal shear	Parallel to grain	Perpendicular to grain	
1	900	85	750	250	1000
2	600	57	500	250	1000

*From data furnished by the Forest Products Laboratory, Forest Service, United States Department of Agriculture, Aug. 1, 1922, as published in "Recommended Minimum Requirements for Small House Construction," published by the Bureau of Standards, United States Department of Commerce.

Note: In the "Recommended Minimum Requirements for Small House Construction," from which these figures were taken, California white pine is classed with the white pine of the Lake States and New England. The latter species was for generations the main construction material of a great portion of the United States. Structures of all sizes and types, from small houses to large bridges, were built of it. Many of them still bear witness to the strength and durability of white pine. The grades designated as Grades 1 and 2 are those used in the original table. With a little care on the part of the builder in selecting and using joists according to the rule mentioned, lumber to fill this need may be selected from the Standard Association grades of dimension.

Sound, Tight Knots—The knots in California pines, particularly California white pine common lumber, are sound and tight. They hold their place and are not inclined to check. This advantage is particularly important in common boards when used where knotholes would be objectionable; as for instance, in sheathing, concrete forms, shelves or partitions.

Well Manufactured and Attractive—Because of their easy cutting qualities and careful manufacture, California pine common boards and dimension are smoothly and uniformly dressed and attractive to the user. Their bright, clean appearance pleases the builder and makes sales easy for the retailer.

Easy to Cut and Fit—Because of their soft, uniform texture, California pines can be sawed, cut and fitted with ease and accuracy by the carpenter. Experience has proven that carpenters, during a stated time, install more material and with better workmanship than when working with harder, heavier goods. There is satisfaction and pleasure in working with easy cutting, light, soft pines that readily respond to saws and tools. Pride of workmanship always means a better product.

May Be Painted If Desired—Another point of excellence in California pine common lumber is that it covers easily with paint without the knots showing through or discoloring.

Thoroughly Seasoned Before Dressing—California pine common boards and dimension are thoroughly seasoned at the sawmill before dressing. This means that the natural shrinkage of the wood will have taken place and that when the lumber is delivered it is uniform in thickness and width. A big saving in carpenters' time results, because all necessity of notching and "shimming" the framing material to prevent uneven floors is eliminated.

Dressing the lumber after it is seasoned also prevents warping, twisting or splitting, defects that are found in lumber that has been dressed while green.

Slight Shrinkage—California pines have very slight shrinkage. When dry California pine lumber is used in the framework there is very little settling, and consequently no cracking of the plaster. When used for sheathing or subfloorng, the boards stay in place and the structure remains stiff and weatherproof.

Boards 11/16-in. Thick Are Economical—A form of California pine common boards which proves especially economical is the 11/16-in. thickness. This is usually dressed on one side and may be shiplapped, tongued-and-grooved or square-edged. Where full weight sheathing is not required, or for interior sheathing such as is used in the Gulf States, or for light concrete forms, contractors and builders find this type particularly advantageous. It is inexpensive, available in wide widths which may be applied rapidly, easy to saw and fit, and lies flat against the studding.

Specific Information on Common Boards—The standard specifications of the CALIFORNIA WHITE AND SUGAR PINE MANUFACTURERS ASSOCIATION provide a number of different sizes and patterns of common boards to meet the varying requirements of lumber users.

Sizes—The nominal and dressed thicknesses and widths are given in the following tables:

COMMON BOARDS (S1S, S2S, S1S1E OR S4S)

Thickness, in.			Width, in.	
	Finished			
Nominal	Standard	Extra Standard	Nominal	Finished
11/16	11/16	...	3	2⅝
1	25/32	13/16	4	3⅝
1¼	1 1/16	1⅛	6	5⅝
1½	1 5/16	1⅜	8	7½
2	1⅝	1¾	10	9½
			12	11½

DRESSED AND MATCHED (D&M)

Thickness, in.			Width, in.		
	Finished				
Nominal	Standard	Extra standard	Nominal	Face width	Over-all width
11/16	11/16	...	3	2¼	2½
1	25/32	13/16	4	3¼	3½
1¼	1 1/16	1⅛	6	5¼	5½
1½	1 5/16	1⅜	8	7¼	7½
*2	1⅝	1¾	10	9¼	9½
			12	11¼	11½

*In the 2-in. thickness the tongue shall be ⅜ in. and face width ⅛ in. less than given above.

Continued on next page

SHIPLAP

Thickness, in.			Width, in.		
Nominal	Finished		Nominal	Face width	Over-all width
	Standard	Extra standard			
11/16	11/16	. . .	4	3⅛	3½
1	25/32	13/16	6	5⅛	5½
*2	1⅝	1¾	8	7⅛	7½
			10	9⅛	9½
			12	11⅛	11½

*In the 2-in. thickness the lap shall be ½ in. and face width ⅛ in. less than given above.

Standard Lengths—Standard lengths are from 8 ft. up, in multiples of 2 ft. Considerable quantities of lengths shorter than 8 ft. are also sold.

Grades and Uses—There are five Association grades of common boards: Nos. 1, 2, 3, 4 and 5 common. The characteristics of these grades are such as to fit them for the following uses in house construction:

No. 1 Common

- Cornice
- Facia
- Soffit
- Ridge boards
- Outside trim
- Porches, balconies, dormers
- Outside door and window frames
- Inside door casings
- Drop sidings
- Wide clapboards
- Flooring
- Interior trim
- Shelves
- Closets
- Attic and cellar stairs

No. 2 Common

- Form lumber
- Sheathing
- Subflooring
- Roof boards
- Barn boards
- Drop siding
- Wide clapboards
- Shelves
- Cellar and attic partition and closets

No. 3 Common

- Concrete forms
- Sheathing
- Shelving
- Subflooring
- Roof boards

No. 4 Common

- Sheathing
- Subflooring
- Roof boards

No. 5 Common

Has many commercial uses but is recommended for only the cheapest temporary construction.

Dressings—California pine boards may be purchased in the various thicknesses, rough, or they may be surfaced on one, two or four sides.

They are also dressed with a tongue-and-groove joint for use as tight floorings, partitions and for other purposes where smooth, tight joints are desired. This material may also be beaded on one or both sides when an ornamental effect is desired. When used for roofing, the beading or a groove which is often substituted for it, serves the purpose of carrying off the water.

Another very common dressing is a rabetted edge known as shiplap. Shiplap has many uses in building construction. It has the special merit of laying up rapidly and at the same time making tight lapped joints.

California White Pine Dimension—*Sizes*—For dimension, the grading rules of the California White and Sugar Pine Manufacturers' Association provide the following thicknesses and widths:

Thickness, in.		Width, in.	
Nominal	Dressed (S1S or S2S)	Nominal	Dressed (S1S1E or S4S)
2	1⅝	3	2⅝
3	2⅝	4	3⅝
4	3⅝	6	5⅝
		8	7½
		10	9½
		12	11½
		Over 12	½ off

Standard Lengths—Standard lengths for random shipments are 8 ft. and up. In addition, large quantities of shorter lengths, suitable for special uses, are produced and sold.

Grades and Uses—Three grades of dimension are provided: No. 1, No. 2 and No. 3 dimension.

No. 1 dimension is high quality structural lumber suitable for use in dwellings of the highest grade.

No. 2 dimension contains larger and coarser defects than No. 1, but has a high degree of strength and is suitable for use in many parts of the home.

No. 1 and No. 2 dimension are often sold under the combined grade of No. 2 Better Dimension. This combined grade will be found suitable for all ordinary dwelling construction. In using it, carpenters should be instructed to select the material for use for the different parts of the house according to the stresses it will be required to withstand.

No. 3 dimension is the lowest grade and is suitable only for cheap, temporary house construction, though, when cut, it has many commercial uses, particularly for boxing and crating. It is also used for crib work.

Permissible Stresses—Safe stresses for California white and sugar pine dimension may be determined from the table given on the preceding page. For more rapid use in determining the proper size joist to use for different length spans, the following table will be found useful:

*MAXIMUM PERMISSIBLE UNSUPPORTED SPANS OF CALIFORNIA WHITE PINE FLOOR JOISTS

Based on 40 lb. per sq. ft. live load and 10 lb. per sq. ft. weight of floor

Size of joists	Maximum length of span			
	16-in. spacing		24-in. spacing	
	Grade 1	Grade 2	Grade 1	Grade 2
2″x6″ (S1S1E) to 1⅝″x5⅝″	8′ 9″	7′2″	7′2″	5′10″
2″x8″ (S1S1E) to 1⅝″x7½″	11′ 8″	9′7″	9′7″	7′ 9″
2″x10″ (S1S1E) to 1⅝″x9½″	14′10″	12′1″	12′1″	9′10″
2″x12″ (S1S1E) to 1⅝″x11½″	17′11″	14′8″	14′8″	11′11″

*From data furnished by the Forest Products Laboratory, Forest Service, United States Department of Agriculture, Jan. 11, 1922, as published in "Recommended Minimum Requirements for Small House Construction," published by the Bureau of Standards, United States Department of Commerce.

Note: In the "Recommended Minimum Requirements for Small House Construction" from which these figures were taken, California white pine is classed with the white pine of the Lake States and New England. The latter species was for generations the main construction material of a great portion of the United States. Structures of all sizes and types, from small houses to large bridges, were built of it. Many of them still bear witness to the strength and durability of white pine.

The grades designated as Grades 1 and 2 are those used in the original table. With a little care on the part of the builder in selecting and using joists according to the rule mentioned, lumber to fill this need may be selected from the standard Association grades of dimension.

MAHOGANY

THE MAHOGANY ASSOCIATION, INC.

1133 Broadway, NEW YORK, N. Y.

Services

The Mahogany Association, Inc., was formed to assist architects, builders and cabinet makers in all matters relating to Mahogany. It offers its services without cost to those desiring information on the subject.

Advantages

No wood has been more generally and continuously used for cabinet making purposes and trim than Mahogany, and none possesses like advantages of soundness, large size, durability, beauty of color, richness and diversity of figure, freedom from defects, constancy and adaptability to any desired finish.

General Characteristics

Mahogany is generally sold under two heads: lumber and veneer, with surface markings classified as plain and figured.

Plain Mahogany—Has no other surface markings than those produced by the growth of the tree.

Figured Mahogany—Where the wood fibers are twisted and interlocked, an endless variety of figure is obtained and the wood is enhanced in value.

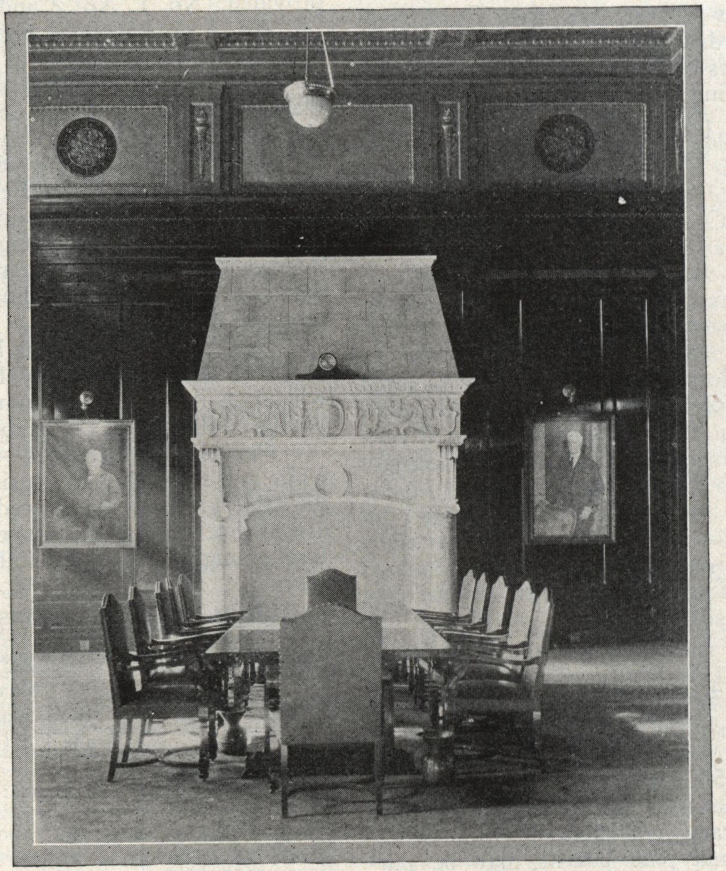
Considerable figured lumber is manufactured, but the best figured portions of all logs are usually selected for veneers, the figure of which runs into myriads of individual combinations, no two of which are alike.

Recognized Figure Types—Certain general characteristics of figure prevail and have been classified in various types, a few of which are: Stripy, Broken Stripe, Mottle, Ropy, Fiddleback and Crotch.

Color—Mahogany lends itself to many shades of color from rich golden hues to deep red browns. Time and light enhance its beauty, figure and transparency.

Comparative Cost

The original cost of Mahogany is slightly above that of some cabinet woods. It is, however, easier to dry, offers less resistance to woodworking tools, and sands and finishes more easily and satisfactorily than most cabinet woods. Its durability and freedom from defects make its use economical, and reduce repairs to a minimum during its long life.



Fireplace and Mantel of White Georgia Marble, Contrasting Sharply with Panels and Furniture of Genuine Mahogany

A bold architectural conception fully justified by the harmonious effect obtained

Uses

Solid Mahogany should be used for base, picture moulding, chair rails, door jambs, window frames, stools and aprons, stair rails, spindles, treads, risers, mantels, china closets, floors and all carved or relief work.

Veneered Mahogany should be used on all large flat surfaces, or surfaces curving one way only, and on all panels.

Mahogany has no superior among cabinet woods for carvings and intricate details. The latter are not necessary, however, for the production of beautiful woodwork because of the individuality of figured Mahogany. Simple designs and plain surfaces are recommended where the surrounding architectural details permit. If properly stained, so as not to obscure the figure, figured Mahogany is in itself a rich decoration which distinguishes any interior.

When large wood surfaces are contemplated, as in paneling a room, either a subdued figure or plain Mahogany is often used. Doors of moderately figured Mahogany, finished a soft brown-red, combined with painted trim, are suggested for light color schemes. Mahogany treads, spindles and handrail, with ivory or white risers and stringers, are suggested for hall combinations.

General Specifications

The following specifications are submitted to assist the architect in the use of descriptive terms in the sense in which they are used by the lumber manufacturers and dealers.

Exposed Surfaces—Except as elsewhere specifically noted herein or shown on the accompanying drawings, the exposed surfaces of all interior woodwork shall be hard, genuine, figured or plain Mahogany, as named and of the variety stated in Schedule A attached hereto.

Quality of Material—The finished trim, erected in place, shall be clear, sound, thoroughly dry and free from wormholes, splits, shakes, knots, rot, twist, warp or any other defect or blemish, true to, and in

Continued on next page

strict compliance with, the details both as to form and size.

Veneer—The outside veneer of all door and other panels shall be (....) in. thick, genuine Mahogany.

The outside veneer of all door stiles and rails shall be (....) in. thick, genuine Mahogany.

The surface or surfaces of all veneer exposed to view shall be well-figured and of the type named in Schedule A. The figured veneer for panels shall in every case be subject to the architect's approval.

All doors shall have plain genuine Mahogany edging strips (....) in. thick on all edges.

Cores—The cores for all door and other panels shall be of thoroughly dry, sound pine, poplar, chestnut or other suitable wood, cross-banded as shown, and glued under pressure.

For the Decorative Element of Contrast, As Well As for Warmth and Dignity, the Architects of This Colonial Church Have Relied Upon Genuine Mahogany

In addition to decorative value, Mahogany is a thoroughly practical wood, because it endures under service and, if properly finished, grows more beautiful with time

Cores for door and other stiles and rails, where required, shall be composed of thoroughly dry, sound pine, poplar, chestnut, or other suitable wood, built up of lumber and carefully glued as detailed.

All cores shall be carefully dried after manufacture and before the face veneer is applied.

Solid Stiles and Rails—Stiles and rails for panel work, where not required to be built up, shall be solid figured genuine Mahogany, as detailed.

Backing—Glued-on backing of thoroughly dry, sound, suitable wood will be permitted on certain mouldings and elsewhere, as detailed, but not otherwise.

Workmanship—The workmanship in manufacturing and erecting shall be first-class throughout. All surfaces shall be smooth, true to shape and free from knife marks, sand scratches, or other blemishes. All joints shall be tight.

Glue—Only the best quality glue shall be used in the operation. The contractor shall be responsible for the glue used and for all glued work.

Cleaning—The contractor shall furnish and erect the trim in place with shop finish applied, cleaned and in perfect condition for the finisher. He shall, furthermore, broom-clean all rooms after the erection of the trim and before the final cleaning of the woodwork, preparatory to finishing.

Nails—Where finishing nails are necessary in erecting trim, they shall be of ample length and gauge to securely fasten the trim in place, carefully countersunk on the exposed surface of the trim. Nailholes shall be filled with burnt-in shellac of the same color as the trim, even and true with the surface.

Guarantee—The contractor shall guarantee his work against any and all defects of material or workmanship, for a period of one year; and shall replace, free of cost, any work proving defective within that time.

Factory Finish—All exposed surfaces of the Mahogany woodwork shall be finished in the factory before shipment, as follows:

(1) Stain, with a diluted water solution of bichromate of potash, or other approved stain, to the color selected by the architect.

(2) After the stain coat is dry, apply and thoroughly rub into the pores an approved quartz filler of the required color.

(3) When dry, sand to a smooth hard surface.

(4) If the filler has not filled the pores of the wood completely, apply one or more coats of thin white shellac, to complete filling.

(5) Repeat No. 3, until the surface is free from shellac, except in the pores of the wood.

(6) Edges of built-up panels shall be given one good coat of spar varnish. Panels shall be stained and filled from edge to edge and end to end before assembling with stiles and rails.

Back Painting—All unexposed surfaces of the trim shall be thoroughly painted with one good coat of approved paint.

Samples—Samples of genuine Mahogany, finished by the woodworking contractor, as above specified, shall be submitted for the architect's approval. No work shall be finished and shipped from the factory contrary or prior to such approval.

Reservation—The owner reserves the right to modify the above paragraphs to include the application by this contractor of all finishing coats elsewhere specified. The compensation therefor and all other details covering the work shall be agreed on and approved by the architect all in writing, prior to contractor's doing the work.

SCHEDULE A
(Typical)

Space	Trim detail	Mahogany description
2nd to 6th floors, inclusive Rooms Nos. 1 to 15, inclusive	Base and picture moulding	Plain, solid, African Mahogany
	Window casing, door jambs, carved work and solid stiles and rails	Figured, solid, African Mahogany
	All panels	1/28-in. figured African Mahogany sliced veneers, broken stripe pattern
	Door stiles and rails	¼-in. figured African Mahogany sawed veneers, broken stripe pattern
2nd to 6th floors inclusive Rooms Nos. 16 to 32 inclusive	Same as above, substituting Mexican or Central American Mahogany where African is required in above schedule.	

THE NORTHERN HEMLOCK AND HARDWOOD MANUFACTURERS' ASSOCIATION

INCLUDING THE ROTARY BIRCH CLUB

226 F. R. A. Building
OSHKOSH, WIS.

Beautiful
birch

TRADE-MARK

Products

BIRCH LUMBER and BIRCH ROTARY CUT VENEER made from Yellow Birch (*Betula Lutea*), also known as gray birch; and from Sweet or Cherry Birch (*Betula Lenta*).

Description

No distinction is made between these closely similar species, as a rule. Both species produce lumber sold commercially as unselected or mixed color birch, selected red birch and selected white birch. Red and white birch are not different species as the red birch is the slightly reddish heartwood, and white birch the outer part of the same tree. Unselected or mixed color birch is the run of the lumber from the log containing both the white and red. The sapwood takes stains as readily as the heartwood—in this respect differing markedly from other important finishing woods.

It is not necessary to specify "selected" birch to obtain very satisfactory results in mahogany, walnut, or similar stains. The mixed colors in the unselected birch blend perfectly after the stain is applied, producing a uniform even color effect as required. Samples illustrating this feature will be furnished on request.

Unselected birch can be obtained for considerably less in price than the strictly selected red or white, as the quantity of the red or white birch obtained from the log is comparatively small. However, in rotary cut birch veneers, it is possible to obtain a much larger proportion of the red or white veneer than in sawn lumber.

A beautiful variation, especially in veneers, called Curly Birch comes from selected logs, and comes either in red or white or unselected. It commands a premium and should usually be specified "unselected."

Birch being an extremely close grained wood produces rotary cut veneer not subject to checking. It is not necessary to specify sawn veneers on doors or other cabinet work to assure against the objectionable checks which later develop in many other cabinet woods, or so-called cabinet woods.

Birch reaches its best development as a tree in the hardwood forests of Wisconsin and Michigan. Conditions there produce a very hard, smooth grained wood. Specify "Grown in Wisconsin or Michigan." The great bulk of birch lumber originates in these states.

Hardness

Birch is one of the hardest of the hardwoods. Under tests in the U. S. Forest Products Laboratory at Madison, Wisconsin, it required a pressure of 1320 pounds to embed an 0.444 inch steel ball one-fifth of an inch into the side grain of air-dried birch. This test is most important, as the forces of wear and indentation ordinarily come against the side grain of a wood used for interior trim, doors and furniture. The hardest of hardwoods is most economical in the long run, both in public buildings and private homes, because the fine finished appearance of the surface can be retained only by this quality of extreme hardness. Birch has it as shown above.

Strength

In all these tests for strength at the U. S. Forest Products Laboratory—static bending, impact bending, compression parallel to the grain and tension perpendicular to the grain—birch ranks first among the commercial hardwoods. In the tests for compression perpendicular to the grain and shearing strength parallel to the grain, birch compares favorably with other quality hardwoods.

Beauty

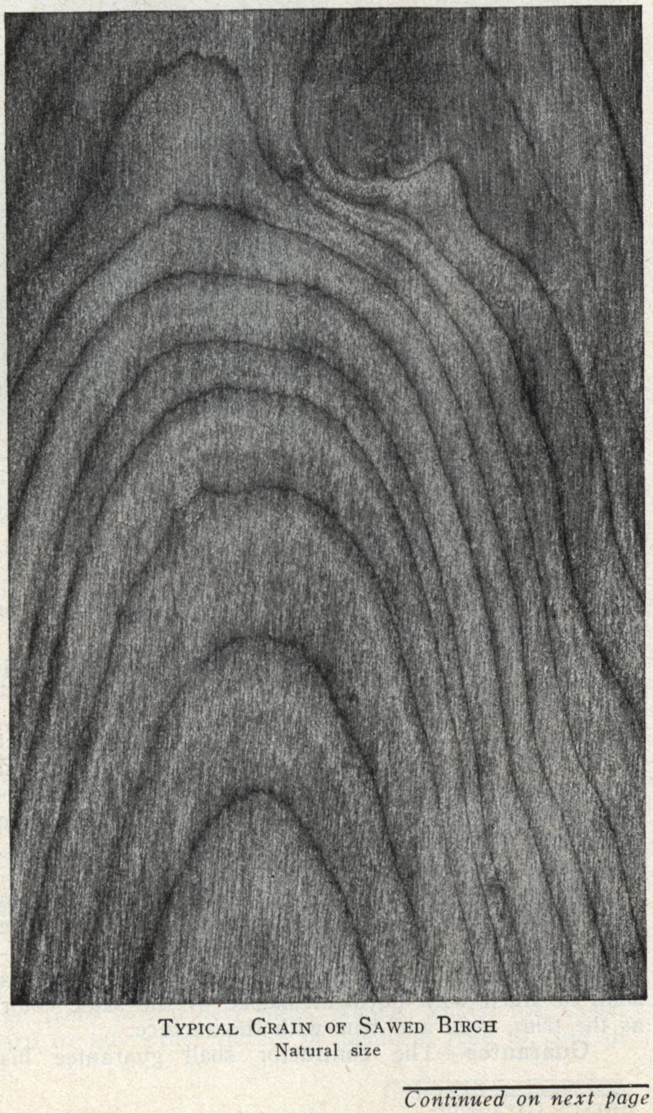
With the qualities of hardness and strength, birch combines that of beauty. It has a very handsome figured grain, is capable of taking a high finish and retaining it. Birch looks equally well, whether plain, or quarter sawed. Rotary cut birch veneer usually serves all purposes which demand highly figured wood in broad surfaces, such as panels, etc.

General Uses

Out of 134 representative uses for all commercial woods of the United States, birch finds place in half. Birch is fitted for so large a variety of purposes because of its beauty and its excellent mechanical and physical properties. It is used extensively for trim, doors, flooring, veneer and furniture.

Interior Trim

Birch has won recognition in trim as being a fine hardwood, of very handsome figured grain, and capable of high finish. It is in use not only in a multitude of residences and apartments, but also in very many hotels, office buildings, etc., of the highest class, for both trim and doors. Birch rotary cut veneer is especially adaptable to panel work of all kinds and is widely used, therefore, in wainscoting and for fixtures, store window backing, etc.



TYPICAL GRAIN OF SAWED BIRCH
Natural size

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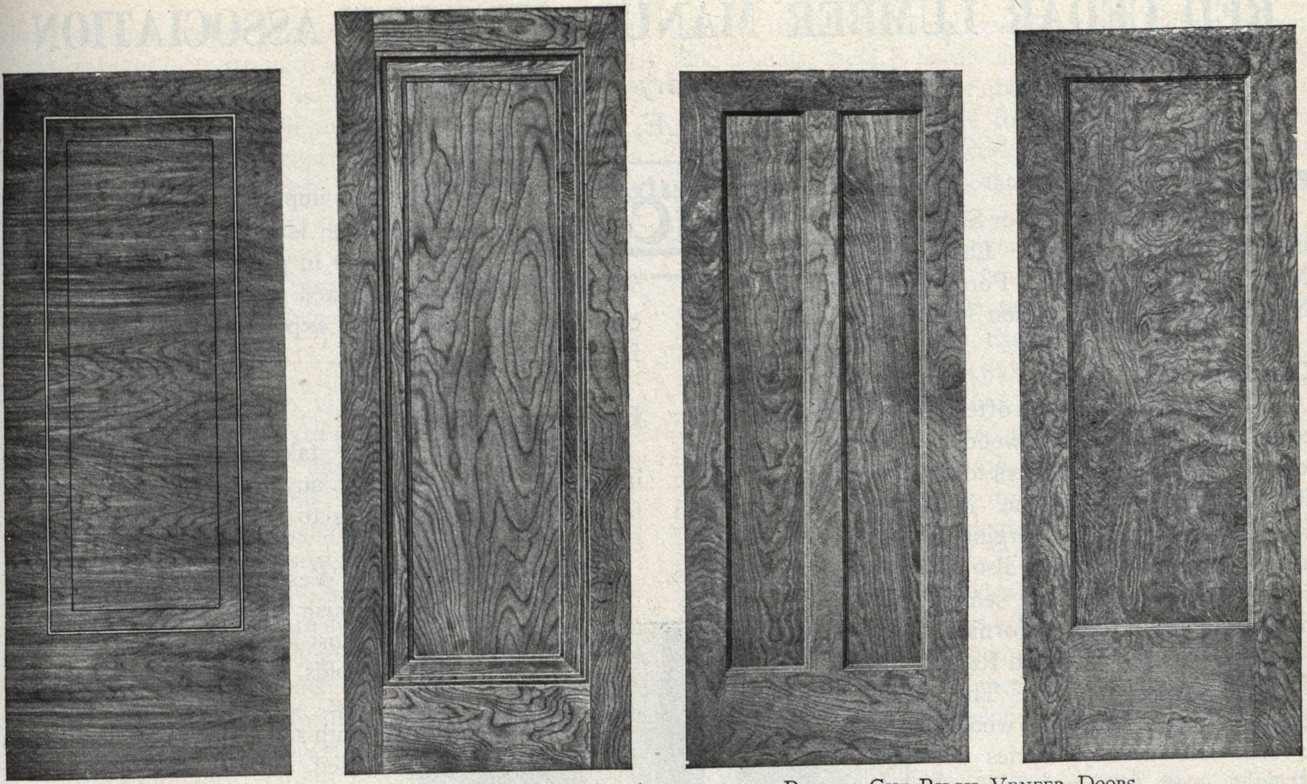


Four Out of Dozens of Designs Always Available in Rotary Cut Birch Veneer Doors

Doors

Birch veneered doors are usually specified with a standard ⅛-inch veneer on the frame of the door applied to a softwood core. Panels can be 3 or 5-ply in thickness. Names of the manufacturers who specialize on birch doors will be furnished on request.

Furniture

Birch has the qualities required of the best furniture woods, and for this use is second in the quantity used.

Birch Flooring

Birch flooring is comparable in service value with maple flooring, having nearly the same physical properties, including hardness. It comes either in red or unselected. Selected red birch floors are very desirable in most schemes of interior decoration, especially with trim of birch or mahogany. For grades, sizes and specifications, see listing in this Catalogue under the Maple Flooring Manufacturers' Association.

Finishing

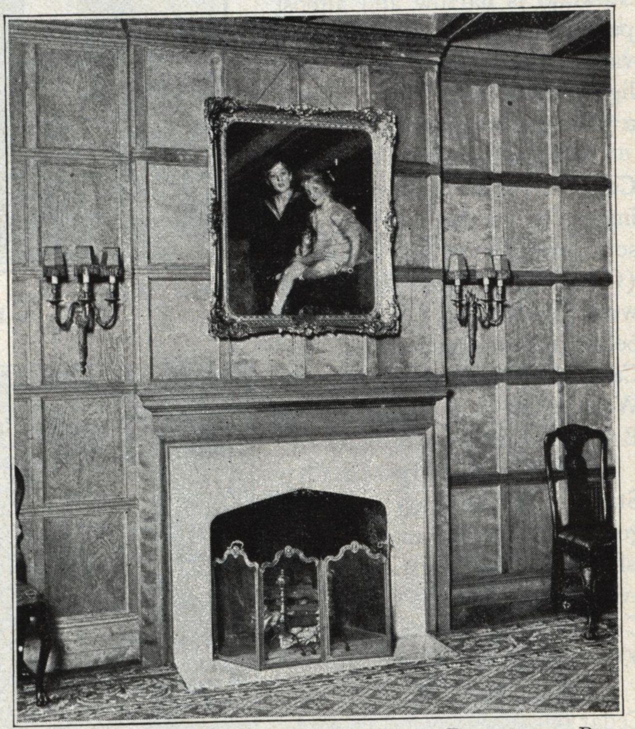
Birch lends itself perfectly to the production of any effect in finish which can be applied to a first class hardwood. To several beautiful finishes it is better adapted than any other wood—notably to gray and brown acid staining. It is also frequently and successfully used in place of red or brown stained mahogany. Birch in a natural finish is also much admired.

Because of the small size of the pores, a filler is usually not employed. If a dark filler is used, the pores can be made conspicuous, giving the wood additional figure. Rubbed, or rubbed and polished finishes, give fine results with birch. The user of birch should always remember that he is handling a high class hardwood, whose peculiar richness of tone and figure is worthy of painstaking treatment. It is of just the right density and texture to form a superior base for white enamel, for which the unselected grade is, of course, used.

Information

A handsome book on Birch and Its Uses, finished samples, and any specific information or assistance required will be gladly supplied on application.

The new 60-page "Where and Why" book is a reference work for every architect and engineer. Though primarily devoted to hard maple, it contains comparative statistics and tables of official strength and other tests of birch and other American hardwoods. Concise and authentic. Sent promptly on request.



Dining Room of a New York Residence Paneled in Birch

Co-operation

The Northern Hemlock and Hardwood Manufacturers' Association and The Rotary Birch Club will be glad to put inquirers in touch with our members, and with manufacturers of birch doors, trim, veneer, etc.

As hard maple, soft maple, birch, beech, hard and soft elm, basswood, ash, white cedar, white pine, Norway pine, balsam, hemlock and tamarack all grow in the great Northern forests of Wisconsin and Michigan, manufacturers of "Beautiful Birch" also produce many or all of these woods.

Complete data and detailed information about any of these species is gladly furnished on request.

RED CEDAR LUMBER MANUFACTURERS' ASSOCIATION

4449 White-Henry-Stuart Building
SEATTLE, WASH.

Western Red Cedar
"The Wood That Nature Armed Against Decay"

Products

Red Cedar Lumber for Siding, Flooring or Porch Decking, Lath, Lattice, Mouldings, Screen-stock, Porch Columns, Newels, Finish and Common Timbers.

Characteristics

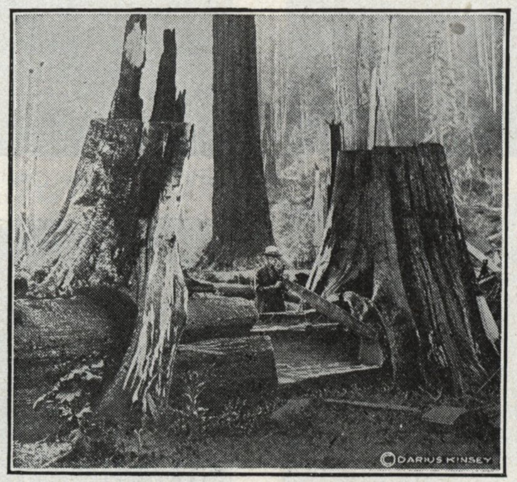
Western Red Cedar often is confused with other cedars and even with Redwood. Reference to its botanical classification is sufficient to set one straight. Western Red Cedar, "Thuja plicata," is absolutely distinct from Red Cedar, "Juniperus virginiana," indigenous to Tennessee and elsewhere, and also is quite a different species from Redwood, "Sequoia sempervirens," found in California.

The wood of Western Red Cedar is *not* red in color. The general effect is buff. The wood is soft and usually carries a straight, even, fine grain. The sapwood is narrow and almost pure white, while the heartwood varies from a dark brown to a light yellow tone. The wood has a pleasant, aromatic odor.

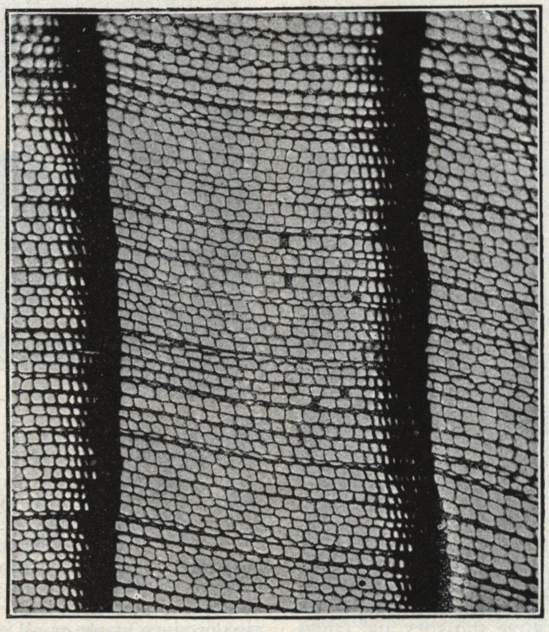
Habitat—Western Red Cedar is found in all of Washington, in northern Oregon, southern British Columbia (Canada), northern Idaho and western Montana. It grows to better advantage west of the Cascade Mountains, in western Washington and southwestern British Columbia.

Visible Supply—In the States of Washington and Oregon and in the province of British Columbia it is estimated the available stands of Western Red Cedar approximate 189,000,000,000 feet.

Qualities—Western Red Cedar possesses several valuable properties. Perhaps its marked resistance to decay and insect attack are the most noteworthy. The wood contains a natural preservative oil and is entirely free from resin or pitch. It is much used in parts of the Orient where proof against insect attack is a primary consideration.



Sound Western Red Cedar Log 2000 Years Prone on Damp Ground



Reproduction of a Magnified Cross Section of Western Red Cedar

Another important property of Western Red Cedar is its ability, when properly dried, to stay in place. In common use it has been tested under the most adverse conditions of climate and exposure and has never yet failed to hold its place.

For Paints or Stains

Western Red Cedar takes finish well. Where it is used with an oil or any other form of natural finish its warm tone helps to produce a very pleasing effect.

Paint spreads well on Western Red Cedar, the silky finish of which affords an almost ideal surface, yet the wood holds the paint without crawling. Paint should be mixed with somewhat more body when used on Western Red Cedar because of the porous nature of its substance. When this is done Western Red Cedar covers easily and economically with the same number of coats as white pine or other similar woods.

Because of its soft texture, Western Red Cedar is very easily worked. Compared with many other woods it admits of definite savings in the cost of handling. It admits of nailing without splitting, especially when square-cut or triangular pointed nails are used.

Lightness

Western Red Cedar is light in weight; per cubic foot the green wood weighs 27 pounds, the air dried, 22 pounds.

Western Red Cedar should not be regarded as structural wood. Under certain conditions, however, where the need for unusual durability is paramount, it may be specified for uses having strength as a requirement. Working stresses for this wood will be found in United States Department of Agriculture Circular Number 295. Using Douglas Fir as a

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basis of comparison, Western Red Cedar may be set down as regards its strength when used as a beam or post, as 68 per cent as strong as Douglas Fir, 61 per cent as hard, 64 per cent as tough and 60 per cent as stiff.

Where insulating properties are a factor Western Red Cedar ranks very high. An illustration of a magnified cross section appears on the preceding page. The cell structure of this wood is such that it lends itself very appreciably to the insulation of structures it encloses, thereby contributing to coolness in hot months and warmth in winter.

General Uses

Western Red Cedar is of paramount value for all uses where wood necessarily must come in contact with dampness or earth, or both; or where it is required to stay in place and resist deterioration over long periods when exposed to the elements.

Home Construction—As the exceptional properties of Western Red Cedar are becoming better known, its popularity is increasing rapidly. In many parts of the United States examples may be seen of the work of architects who, having informed themselves of Western Red Cedar's peculiar properties, have taken advantage of its great durability, stability and beauty of appearance.

Roofs and Siding—The great value of shingles of Western Red Cedar for roof coverings is generally well known. When properly laid, with hot dipped, zinc coated iron nails such a roof will give excellent service for half a century. Moreover, the beauty of the Western Red Cedar shingle roof, whether left natural, treated with monotone paint or stain or with vari-colored stains, is not open to serious dispute.

The use of Western Red Cedar siding is gradually penetrating a wider field as the outstanding desirability of this wood is becoming better appreciated.

The fact that Western Red Cedar *does not* end shrink makes it the most desirable of all woods for siding. It is particularly adaptable to the modern trend towards mitered corners because it *stays put.*

It compares favorably with old time white pine in lightness, ease of working, paint acceptance and stability. Its great durability and endurance in the face of rain, sun and wind, its freedom from resin or pitch of any description and its resistance to insect attack are other points in its favor.

Sizes of Siding—Western Red Cedar siding is made in the following sizes: ½x4, 5, 6, 8, and 10 inches and ¾x8, 10 and 12 inches. These are bevel sidings in which the ½-inch stock is ½ inch on thick edge and $\frac{5}{32}$ inch on thin edge. The ¾-inch material is ¾ inch on thick edge and $\frac{3}{16}$ inch on thin edge. Finished widths are 3½, 4½, 5½, 7½, 9½ and 11½ inches. Standard lengths are multiples of one foot.

The use of the 8, 10 and 12-inch widths is quite common and excellent effects are achieved.

The fine treatments that are being worked out with combinations of 4 and 6-inch widths with the other sizes is not so well known, however. There is room still for further treatments along these lines and, within reasonable bounds, there is hardly any limit to the possibilities.

Exterior Trim—The qualities which make Western Red Cedar highly suitable for siding also render it of value for other exterior work in building. For all outside trim Western Red Cedar has no superior and few, if any, equals.

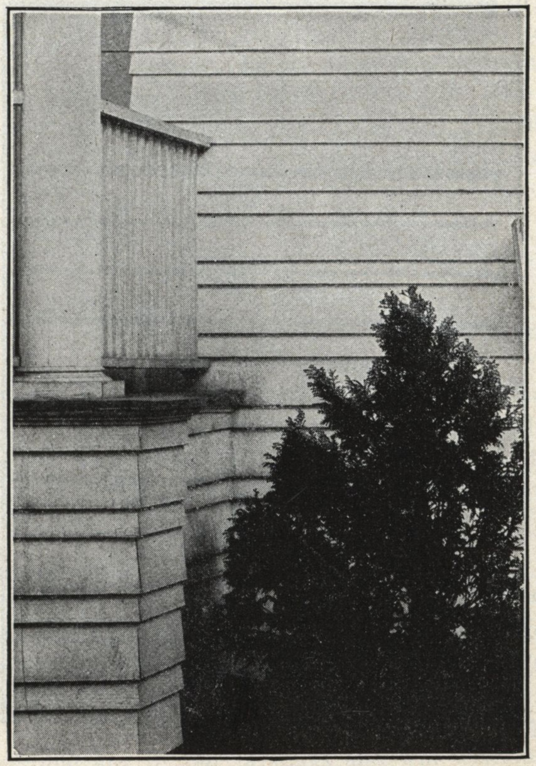
Western Red Cedar should be specified for all outside trim especially when it is used for roof and sidewalls. Otherwise the roof and sidewalls will be in good condition when the trim has deteriorated to a point requiring repairs and renewals.

Positions—There is no point about the outside of a house where Western Red Cedar will not give exceptional service and satisfaction, except for stepping. For porch ceiling, flooring, for railing and columns, for cornices, gutters, window casings, window frames (excepting sills) belt courses, fancy trim, moulding, frieze, skirting, etc., it may be specified with complete confidence.

Other Exterior Uses—For all outside work incidental to the building of a home, such as pergolas, arbors, summerhouses, garages, fences, lattice, window boxes, shutters, cold frames, greenhouses, etc., Western Red Cedar is second to none.

When it is desirable to erect a frame structure with sills resting on or close to the soil, or on posts or masonry piers or bolted to masonry walls, if durability is valued, Western Red Cedar sills would rank easily at the top of the list of untreated lumber.

Tight-knotted Western Red Cedar sheathing, either shiplap or D & M is excellent because of its minimum shrinkage and ability to stay in place.



An Example of the Use of 4-inch and 8-inch Siding in Combination

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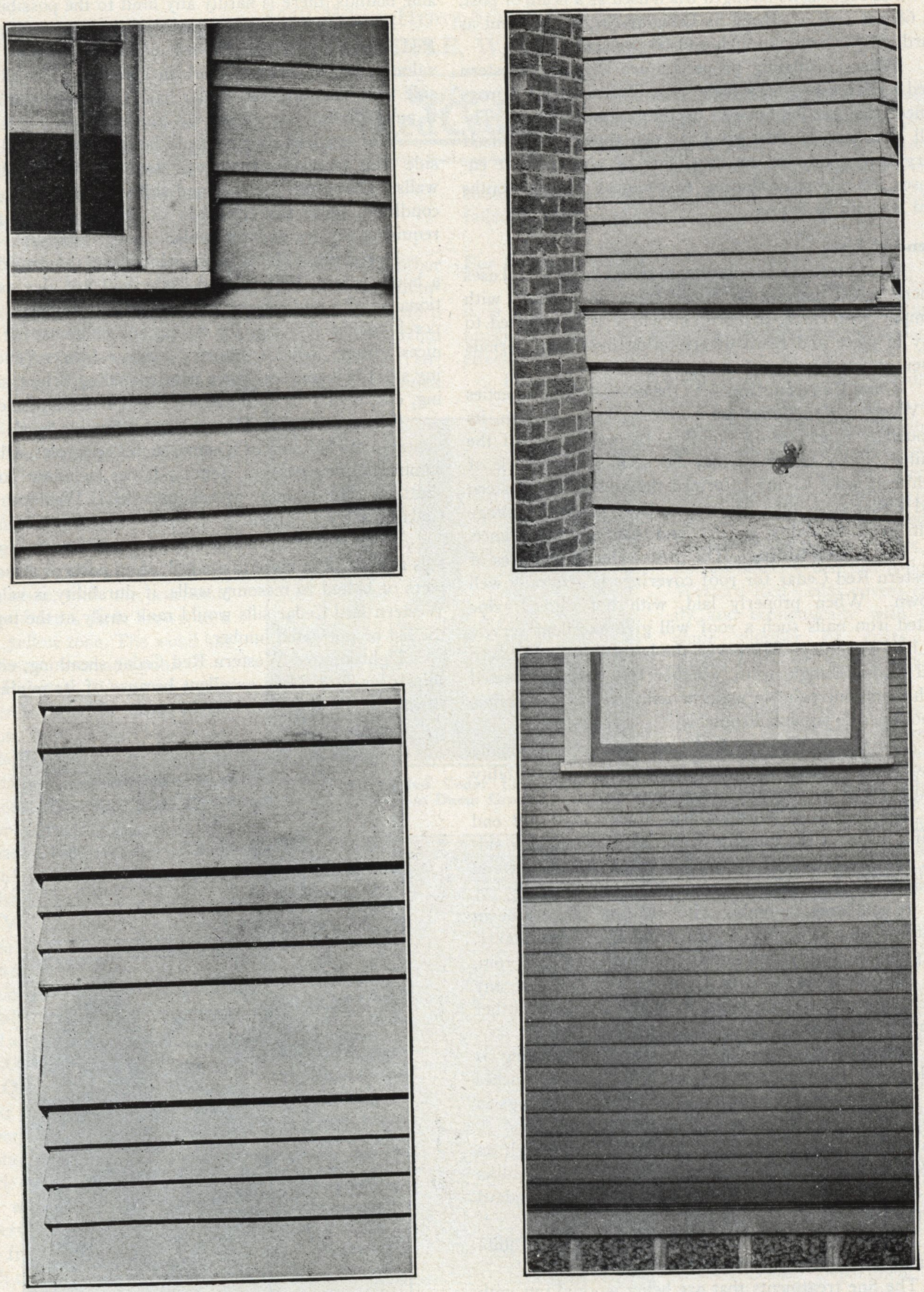

Varied Effects by Combining Different Widths of Siding

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Interior Uses—The use of Western Red Cedar inside the home is increasing materially and, when its excellent possibilities, and its limitations as well, are thoroughly understood, it proves of the utmost value and gives the architect a medium of remarkable usefulness, one, in fact, which fills a place that is filled by no other.

The use of clear lath of Western Red Cedar and its desirability for closet linings are obvious, of course, but Western Red Cedar is being used with great success and excellent results in a much wider interior field than those uses would indicate.

In considering Western Red Cedar for interior work, these characteristics should be kept in mind: first, its softness and comparative inability to withstand hard knocks or hard wear; second, its exceptional stability, devoid of shrinkage, warping, twisting, or buckling; third, its very easy workability and the accuracy with which it can be turned or framed; fourth, its lightness, a factor greatly in its favor for cornice work, mouldings, detail millwork, etc.

Western Red Cedar takes enamel beautifully, in fact, very few other woods take and hold fine enamel as well. Furthermore, multiple-coat enamel finish serves to render the wood hard enough to withstand usage that might mar it in its natural state. Hence, many architects are using it, well enameled, for casings, baseboards, etc., in addition to other commoner uses.

Western Red Cedar can be depended upon absolutely to keep tight joints and remain true and straight. Specify Western Red Cedar for all sashes and frames and you will eliminate the common complaint of "sticking" caused by swelling or warping.

Where a mahoganylike effect is wanted at nominal cost, Western Red Cedar will produce it faithfully.

When it is desired to use cottonwood panels, with stain finish, it has been shown that Western Red Cedar is the best wood to use in combination as it will take a stain that will give an effect uniform with the effect on the cottonwood.

For vaulted roof effects in churches, auditoriums, halls, etc., when hardwoods are prohibited by cost, no other wood can compare with Western Red Cedar as a substitute. It fills every requirement.

Comparative Strength

In noting the following data it is necessary to bear in mind the light weight of Western Red Cedar. While, in general strength tests, it is below the average of American softwoods, when its strength is considered in ratio to its specific gravity, it will be seen that it ranks well up.

Specify gravity: Western Red Cedar, .31; average of softwoods, .41.

Modulus of rupture: (test on pieces 2 inches square, 28 inches span, green clear wood) Western Red Cedar, 5200; average of softwoods, 6305.

Ratio of bending strength to weight: Western Red Cedar, 168; average of softwoods, 153.

Crushing strength: (resistance to weight placed on top of columns of clear green wood, expressed in terms of pounds per square inch) Western Red Cedar, 2840; average of softwoods, 3053.

Modulus of elasticity: (in terms of thousands of pounds per square inch) Western Red Cedar, 950; average of softwoods, 1158.

Toughness: (Test A, work to maximum load in inch pounds per cubic inch) Western Red Cedar, 5.0; average of softwoods, 6.8. (Test B, resistance to impact height in inches at which drop of 50-lb. hammer caused fracture of test piece) Western Red Cedar, 17; average of softwoods, 24.

Relative Durability

The following table of relative durability was prepared by a committee of the American Railway and Bridge Association and was first published in Vol. 14 of the Forestry Quarterly, page 14:

Species of Timber	Durability in Soil
Western Red Cedar	20 years
Chestnut	12 years
Cypress	20 years
White Oak	10-15 years
Longleaf Pine	10 years
Douglas Fir	8 years
Tamarack	8 years
White Pine	7 years
Spruce	7 years
Norway Pine	6 years

Availability

Owing to the fact that the outstanding merits of Western Red Cedar are only just now becoming generally recognized, this wood is not always as readily obtained from *every* yard as some of the other woods. Invariably, however, even in the smaller markets, it *can* be obtained if you refuse to be put off with a substitute.

In every market of important size Western Red Cedar is readily available at all times and, if difficulty is experienced in obtaining it, an inquiry addressed to this Association will bring you immediate advice as to where to obtain it.

Cost

Because of its very light weight, there is a considerable saving in the freight charges on Western Red Cedar, so that when its exceptional qualities are considered it is really an economical material to use. It sells at a price that compares very favorably with that of other woods over which it has many advantages in the way of adaptability for the particular uses for which it is recommended.

Literature

Booklets and folders describing our Red Cedar products and their uses, with much valuable information for architects and builders will be sent free on request.

We will be glad to answer any specific inquiries concerning any of our products and will welcome any suggestions regarding them.

THE SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

1214 Poydras Building
NEW ORLEANS, LA.

1214 Graham Building
JACKSONVILLE, FLA

Products

"Tidewater" Cypress Lumber.
"Tidewater" Cypress Shingles.
"Tidewater" Cypress Lath.
Tupelo Mouldings and Trim.
Tupelo Flooring.

TRADE-MARK
S C M A
Reg. U. S. Pat. Off.

"Tidewater" Cypress

Trade-mark Guarantee—As a guarantee of quality, accurate grading and responsible methods of manufacture, architects should specify "Tidewater" Cypress, the true "Wood Eternal," identified by the Arrow trade-mark above.

Where It Grows—The species of Cypress commercially known as "Tidewater" Cypress, or "Red Cypress," is the most valuable. It is distinctly a swamp tree and grows along the coasts and in the lowlands within 200 miles from the seaboard, of the Atlantic Ocean and the Gulf of Mexico, from Virginia to Texas. "Inland" or "Upland" Cypress does not possess the characteristic qualities of "Tidewater" Cypress in any desirable degree.

Durability—"Tidewater" Cypress, possessing a natural preservative, is one of the most durable of American woods. This statement applies specifically to the heart wood. "All-heart" grades should be specified where high resistance to decay-producing agencies is required—such as contact with the soil and when used in moist or humid conditions. It also "weathers well."

Color—The color of "Tidewater" Cypress varies from slightly reddish to a deeper red and from this all the way to almost black, giving rise to such names as Red and Black Cypress. The color of the sapwood is usually much lighter than the heartwood. Much "Tidewater" Cypress is varicolored—frequently marked by various color zones from slightly red to almost black. The safest specification is "Tidewater" Cypress, identified by the Arrow trade-mark.

Weight—"Tidewater" Cypress is one of the lighter woods. Green, it will weigh 50 to 60 pounds per cubic foot; when thoroughly air dry, about 28½ pounds per cubic foot. Specific gravity varies from 0.35 to 0.60, or an average of about 0.45 for air dry wood. These figures are broad averages, as trees will vary in weight according to rate of growth and region in which they are found.

Moisture Content—The moisture content of "Tidewater" Cypress varies considerably, depending upon location. In drying, Cypress shrinks with considerable uniformity. In rate, it stands midway between the heavy and light pines. The average shrinkage from absolutely green wood to absolutely air dry wood is about 8% in volume. Air dried "Tidewater" Cypress will contain 12 to 15 per cent of moisture, at or near point of manufacture. When kiln dried, the moisture content will go as low as 5%. From tests by the U. S. Forest Products Laboratories, the radial shrinkage from green to oven dried condition is about one-half of the tangential shrinkage.

Strength—In strength, like in weight, "Tidewater" Cypress is intermediate between heavy and light pines, indicating a good average strength.

Other Physical Properties—From the builder's standpoint, other characteristics of Cypress worthy of mention are, ease of working, freedom from splitting, checking and warping when properly dried, and good nail-holding power.

Defects—"Tidewater" Cypress, except "Pecky," has very few defects other than knots and occasional wormholes, and can be counted upon to have a very high percentage of flawless boards or lumber.

"Pecky" Cypress—It is the term applied to boards or timbers having the peculiar disease common to the heartwood of many Cypress trees. On the cross section, the board appears to be full of holes and on the surface, looks as if it had been gouged. This is a defect only in the sense of appearance and strength and its durability is practically as great as that of sound wood. The Pecky disease in no way detracts from the usefulness of "Tidewater" Cypress where exposure, and not strength, is the prime requirement, as in foundations and sills. At the present time, "Pecky" Cypress is in great demand for interior trim because of its antique appearance and the picturesque effects to be secured from such use.

Varied Utility—"Tidewater" Cypress having been used for many years, the evidence of its fitness for numerous purposes is overwhelmingly large. A few of the more general uses are given in the following paragraphs:

Interior Uses—For interior finish, its ease of working, straightness of grain, non-resinous nature and the fine, wide, clear sizes obtainable, make the higher grades of "Tidewater" Cypress one of the best woods for mouldings, doors, sills, panels, sash, casings, etc. As it shrinks or swells imperceptibly, when properly dried, "Tidewater" Cypress is especially desirable for doors where its fine-figured grain contributes to beautiful and artistic effects. The "Clear Heart" grade is recommended for best quality stain or natural finish and the "A" grade for ordinary stain finish or best enameled work.

Exterior Work—On account of its great durability and weather resisting qualities, "Tidewater" Cypress excels for all exterior work and for uses in contact with soil—such as foundation timbers, sills, girders, siding, doors, jambs, facings, window shutters, cornices; and for porch construction—flooring, columns, railings, steps and foundation supports.

For painting, the "B" grade of Cypress is suitable for the usual run of exterior mill work and finish, and the "A" or "Clear Heart" grade for best quality work.

Shingles—"Tidewater" Cypress is especially adapted to shingles. They have extraordinary durability and possess the added virtues of having more wood in them and of weighing more than any other shingle now on the market. They are sold as dimension shingles, as well as in random widths, and always full count, 4000 lineal inches to constitute 1000 shingles.

Continued on next page

Lath—In addition to the characteristic qualities of non-shrinking and non-warping when properly dried, and ease of working with good nail-holding power, "Tidewater" Cypress lath have the advantage of not showing through the plaster, a particularly valuable quality where light tints are to be employed.

Farm Uses—Because of its wearing and lasting qualities, "Tidewater" Cypress is the most economical lumber to be used, figured over the years, for fencings, posts, water troughs, well curbing, silos, incubators, barns, hog houses, poultry houses and sheds.

Imparting no odor, taste or color, and being almost non-porous, it is unexcelled for water tanks and for use in dairies.

Greenhouse Construction—In greenhouses, "Tidewater" Cypress is an invaluable wood because of its resistance to decay. The entire woodwork of some of the best greenhouses in the country—ridge poles, supports, sash, siding, benches (the latter of "Pecky")—is of "Tidewater" Cypress. It is equally adapted for all forms of cold frames and is much used for flats and flower boxes.

Miscellaneous Uses—Acid manufacturers, breweries, laundries, soap factories, canneries, dye plants, etc., use vast quantities of "Tidewater" Cypress for tanks and vats.

In refrigeration, "Tidewater" Cypress is recommended for water tanks, tank covers, cooling towers, inside sheathing for cold rooms, ice storage warehouses and like purposes.

"Tidewater" Cypress has also come much into use as a seating material for public and university stadiums, and for the construction of grandstands and bleachers for baseball parks and fair grounds and the like.

"Pecky" Cypress is suitable where rustic effects are desired, such as seating for parks; pergolas, etc. It is also adaptable for culverts, underground work or work in damp places, planking for small bridges, barn floors and foundation timbers.

Painting—For both exterior and interior work, "Tidewater" Cypress can be painted without special preparation and with complete satisfaction.

Natural Finish—But as the charm of modern architecture is in the use of the natural wood, "Tidewater" Cypress, on account of the beauty of its grain and variety of its rich shadings, should be varnished and finished in the natural.

"Sugi" Finish—One of the modern and interesting developments of "Tidewater" Cypress for interior finish is achieved by the Japanese treatment, known as "Sugi." It reproduces with remarkable accuracy the historic and highly artistic "driftwood effect."

It can be done at slight cost with an ordinary gasoline torch by any one who has the patience (and good taste) to brush out the charred portion of the wood. "Sugi" finish has been tried on other woods, but without success. The freedom of "Tidewater" Cypress from the resinous quality of most woods renders it adaptable to this extraordinary handling.

Staining—"Tidewater" Cypress can also be stained with great success. In imitation of mahogany—becoming even more beautiful than mahogany itself—of cherry, black walnut, the different oaks; or tinted any desired shade the most fastidious fancy may suggest.

Tupelo (Nyssa Aquatica)

Origin and Characteristics—Tupelo grows in proximity to and the trees are often interspersed with "Tidewater" Cypress.

Untreated Tupelo, however, does not have the same decay resisting qualities of "Tidewater" Cypress when exposed to moisture and the elements, but is well suited for interior uses. Tupelo has a closely interwoven, or involved grain, is uniformly white in color, does not sliver or splinter and is peculiarly adapted to uses where resistance to hard wear is the prime requirement. It is practically free from defects of any character.

Industrial Floors—Tupelo, because of its closely involved grain, which does not splinter or sliver, is much used for interior floors of industrial plants, warehouses, freight houses, for covered platforms, etc. Heavy trucking and traffic only tends to pack its fiber and to make it more solid and smoother as time goes on. It should not be used for exterior platforms and the like without being treated with a preservative.

Residential Floors—The same characteristics which recommend Tupelo for industrial flooring, plus its clear white uniform color, make it a very desirable flooring material for residences. Perfected methods of manufacture and kiln drying have made Tupelo a much superior product. For appearance and cost it is probably the best flooring for the moderate priced home on the market to-day.

Moulding and Trim—Tupelo is extensively manufactured into mouldings and other interior trim. Its uniform white color, close grain, freedom from defects and tendency to splitting, and ability to hold nails tenaciously, make it a most desirable wood for this purpose.

Tupelo does not raise its grain in the process of finishing and, therefore, provides an exceptionally smooth surface that takes and holds enamels nicely and can be stained effectively. It is especially adapted where a highly glossed finish is desired. And, its very moderate cost likewise recommends it where price must be taken into consideration.

Literature and Information

To meet the constantly growing demand from architects for detailed information, we have compiled a concise, authoritative, technical treatise on "Tidewater" Cypress, covering its qualities, grades, uses and relation of grades to uses, painting and finishing, together with suggested specifications for standard uses. Architects who have not received a copy of this data for their files, are invited to write for it.

Our booklet on Tupelo—its characteristics and uses, should also merit a place in your files for ready reference.

Architects are invited to write freely as to any special requirements, references to highly satisfied users for specific purposes, or for any other assistance that we can give on special problems.

WESTERN PINE MANUFACTURERS ASSOCIATION

510 Yeon Building

PORTLAND, OREGON

Pondosa Pine
The Pick o' the Pines

TRADE-MARK

Product

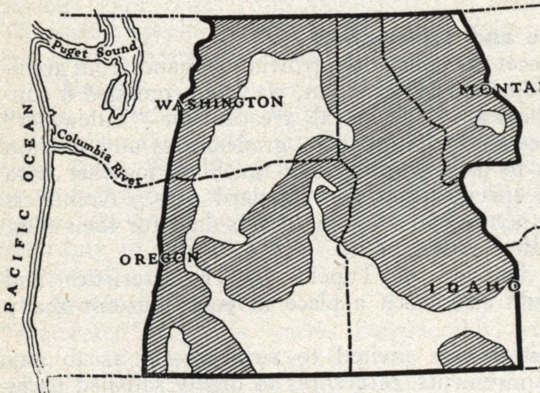
Pondosa Pine. Formerly marketed as "Western White Pine." Trade-mark on end grain.

Pondosa Pine

The finest lumber for all-round use. It is light, yet strong. It is easily worked. Takes nails without splitting. Pondosa Beveled Siding, with its very thin edge, illustrates just how unusual it is in this respect. Pondosa is beautiful lumber, yet most economical. Every trade-marked stick is rigidly *graded,* thoroughly *seasoned* and carefully *milled.* The fine grain and smooth surface are notable. Pondosa Pine takes a beautiful natural finish where desired. Paint penetrates its absorbent texture deeply and evenly, so that repainting is seldom necessary.

Source

Pondosa Pine, often called the "Sovereign of Softwoods," comes from the Inland Empire of the Great Northwest. In area the Inland Empire equals all New England, the Middle Atlantic States and Virginia—almost as much territory as the United States comprised at the end of the Revolutionary War.



The Inland Empire

Over fifty million acres of it are in forests—capable of producing from the present stand of timber over 300,000,000,000 board feet of lumber. This does not reckon with new growth added each year.

Resources

The Western Pine Manufacturers Association comprises fifty great modern mills. Its closely supervised lumber grades have been standard in the territory for fifteen years. A uniformity of quality and service is always noted in Pondosa Pine, no matter which mill has produced the lumber.

The Pondosa Pine country is served by five transcontinental railroads—the Great Northern, Northern Pacific, Chicago, Milwaukee & St. Paul, Canadian Pacific and the Union Pacific, providing ready, economical outlets for Pondosa Pine.

Grade Classification

Pondosa Pine, like all other woods, has its upper and lower grades. Some pieces are entirely clear and free from blemishes. Others contain knots and similar defects inherent in the tree itself.

Classified according to use, it is divided into Yard Lumber, the kind used for general building purposes—Structural Timbers—and Factory or Shop Lumber, which lumbermen call a "cutting type" and which is used for sash, doors, etc.

One of the chief aims of the Western Pine Manufacturers Association is to avert economic waste by effecting the use of the right grade of lumber in the right place.

Use

Doors, windows, frames, stairs, sash, moulding, interior and exterior trim, porch work, sheathing, siding, indeed *any place* where the specifications call for good, dependable lumber which is light, yet strong, is the place for Pondosa Pine. It is for sale at all good lumber yards.

Complete Information

Write for "Bingo of Flathead," a very interesting and instructive story of Pondosa Pine. Address Department 28, Western Pine Manufacturers Association of Portland, Ore.

THE PACIFIC LUMBER COMPANY

2060 McCormick Building
CHICAGO, ILL.

1527 Pershing Square Building
NEW YORK, N. Y.

311 California Street
SAN FRANCISCO, CAL.

Standard Oil Building
LOS ANGELES, CAL.

MILLS: SCOTIA, HUMBOLDT COUNTY, CAL.

The Pacific Lumber Co.
Redwood

Products

Redwood Lumber, a non-resinous soft wood permeated during growth with a *natural* odorless preservative.

Redwood Millwork.

Uses for Redwood

Exterior finish (siding, cornice, window, door and cellar frames, porch trim, columns, doors, sash, etc.), for shingles and shakes on roofs and sides of buildings; for sleeping porch trim, pergolas, summerhouses, window and flower boxes; for greenhouse construction.

For interior finish wherever beauty of grain, freedom from knots or defects and immunity from shrinkage or warping is desired, or wherever wide paneling from one piece is required.

For special farm uses—such as silo construction—and for hot-bed sash, beehives and incubators; for tanks, pipes, flumes, culverts, and cesspools.

Redwood block floors are discussed by the Rodd Company of Pittsburgh, Pa. (page 518).

Distinctive Characteristics of Redwood

Redwood is a soft wood and highly valuable for construction purposes because it is unusually resistant to decay, rot and fire, and because of its insulating qualities. Until recent years little was known in Eastern markets of the extraordinary value of Redwood as a specialty wood, but as Redwood is becoming better understood, its users are increasing continually.

Color—The heart wood ranges from light cherry color to mahogany, generally an old rose color. The sap wood (of which there is very little) is a cream color.

Resistance to Decay—A *natural* preservative which permeates Redwood fibre during growth makes Redwood lumber rot-resistant. And as nature always distributes this preservative evenly and thoroughly there are no chances for occasional failures as with artificial preservatives. A Redwood log buried in the ground for 600 years was found to be still sound and was cut into first class lumber.

The durability of Redwood is further indicated by the report of the U. S. Forest Products Laboratory at Madison, Wisconsin. Using white oak as the standard with a rating of 100%, this report places Redwood in the highest class with a rating of from 125% to 175%. The real meaning of this rating may be better appreciated when it is realized that some woods commonly used for exterior construction are rated as low as 35% to 50%.

It is unnecessary to treat Redwood with artificial preservatives.

Resistance to Fire—Being free of pitch or other resinous substances, Redwood is slow to ignite and its resistance to fire, as demonstrated in the San Francisco conflagration of 1906 and in many other fires, adapts it to many commercial purposes.

Non-conductivity—The large number of minute air cells, regularly spaced and of uniform shape, make Redwood highly non-conductive to heat or cold and, when properly dried, keep it from expanding or contracting in use.

The cells in properly dried Redwood are dead air spaces, unclogged by resinous deposits found in most woods.

Texture—Soft, yet firm, of close, even grain, and unusually free from knots or defects.

Weight—Light, compared with other "soft woods."

Growth

Redwood grows principally in the northern counties of California, on the Pacific slopes of the Coast Range. The Redwood used for commercial lumber is not the Sequoia Gigantea—the famous "Big Trees" in the National Parks of the Sierra Nevadas—but is a different species, the Sequoia Sempervirens (Ever Living). The trees are extremely large and attain heights varying from 150 to 350 ft., and diameters from 3 to 20 ft. They are known to have attained ages up to from 2000 to 3000 years.

Supply

The supply of California Redwood is ample for all the special uses for which it is best adapted. For although this timber grows only along a narrow strip of the coast of California, that limited area contains several thousand square miles of territory, and according to the best estimates supports approximately 70 billion feet of standing Redwood timber—sufficient for more than a century's use.

Reforestation

In order to perpetuate the supply of Redwood, The Pacific Lumber Company has recently put into effect an extensive program of scientific reforestation on all its cut-over lands. This work is being done under the direction of an experienced forest engineer and results already accomplished indicate a continued supply of Redwood timber for generations to come.

Painting and Staining

Redwood is especially well suited to all kinds of paint and enamel work, because of its fine grain, smooth surface and the absence of resin or pitch. High class jobs of enamel on Redwood, with hand rubbed finish, have lasted as long as 20 years, in recorded cases, without repainting. The freedom of Redwood from shrinking and swelling tends to insure against unsightly cracks in enamel work.

Redwood Millwork

The fine soft texture of Redwood makes it a splendid wood for millwork of all kinds.

For contact with the ground, as mud sills and underpinning, or for exposure to the weather, as exterior trim, porch columns and flooring, porch rails, etc., no wood is more durable than Redwood.

It is manufactured into all kinds of general millwork, such as frames for doors and windows, mouldings, columns for interior and exterior, newels, balusters, rails, spindles, pickets, battens, trim and specialty products. Many are built-up on special gluing machines.

Cost

Many people think that Redwood must necessarily be a high priced wood, on account of its being found only in California; but this is not the case. Because Redwood is lighter than other woods when dry, the item of freight is consequently reduced.

Redwood sells at a price that, in spite of the high production and shipping costs, compares favorably with the cost of other woods which have been used for similar purposes, for most of which uses Redwood's unusual adaptability and lengthened service tends to further reduce the actual costs of material.

Trade-mark

Wherever practicable, the registered trade-mark is placed upon Redwood from The Pacific Lumber Company, a mark to indicate to the trade and user that the product is the result of every refinement in the production of Redwood. In the cases where shipping tags are used, the trade-mark label is on the tags.

P T L Co
TRADE MARK
REGISTERED

All Redwood siding is plainly marked with trade-mark, surface measure, grade and size.

Door and window frames are stamped with trade-mark.

Moulding bundles are tagged with trade-mark, total number of pieces, lineal measurements and pattern.

Shingles in bundles are marked with trade-mark and grade.

Sales Offices

All sales in the territory east of the Rockies are made by The Pacific Lumber Company of Illinois. Its general offices are in Chicago, in the McCormick Building, 332 South Michigan Avenue.

The territory in the North Atlantic and New England States is handled through the New York Office, in the Pershing Square building, Park Avenue and Forty-second Street.

Sales in Pacific Coast territory are made from The Pacific Lumber Company's San Francisco office, 311 California Street. A branch sales office is located in the Standard Oil Building, Los Angeles.

Special Information and Service

All of our offices are prepared to consult with any lumber user concerning his needs, and to advise as to the suitability of Redwood and its economical use.

Inquiries from architects and engineers will receive special attention.

THE LONG-BELL LUMBER COMPANY

R. A. Long Building
KANSAS CITY, MO.

Long-Bell
THE MARK ON QUALITY LUMBER
TRADE-MARK

Products

Douglas Fir Lumber and Timbers; Longleaf and Shortleaf Southern Pine Lumber and Timbers.

Southern Hardwood Lumber and Timbers; Oak Flooring.

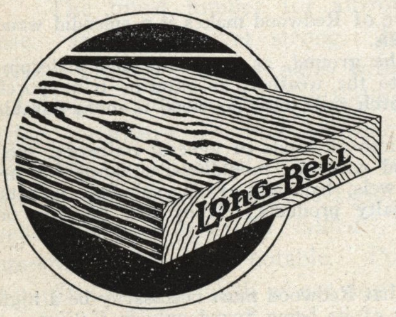
Creosoted Lumber and Timbers, including Ties, Poles, Piling, Fence Posts and Posts for Guard Rails.

California White Pine Lumber including Sash and Doors, Screen Doors, 3-ply Veneer and Box Shooks.

Long-Bell Lumber products are trade-marked "Long-Bell."

Source of Supply and Facilities

Fir—The Long-Bell Lumber Company has a large acreage of timber land in Washington. These holdings include what is said to be one of the finest stands of Douglas Fir timber in the Pacific Northwest. The company operates large Douglas Fir lumber manufacturing plants at Longview, Wash., located on three transcontinental railroads and on tide water, fifty miles from the Pacific Ocean on the Columbia River.

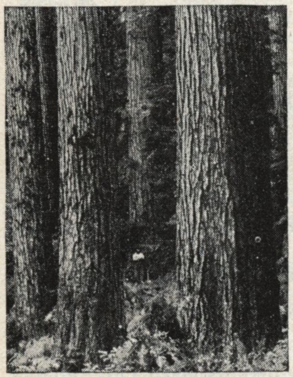


Long-Bell Trade-mark
This trade-mark is branded on the end of the piece as shown above

Other Lumber—In addition to the timber holdings and Douglas Fir manufacturing plants at Longview, The Long-Bell Lumber Company has large timber holdings in the South, and operates twelve other large, modern lumber manufacturing plants—eight of them manufacture Southern Pine, of which five are in Louisiana, two in Texas and one in Mississippi. There are three hardwood plants, two in Arkansas and one in Mississippi. Complete and modern oak flooring plants are operated at Pine Bluff, Ark. and Longville, La. The company's White Pine lumber and other White Pine products are manufactured at Weed, California.

Long-Bell creosoted Southern Pine products are creosoted at Shreveport, La., DeRidder, La., and Marion, Ill.

The Long-Bell Lumber Company is the largest lumber manufacturer in the world operating under a single name. All its lumber products are branded with the trade-mark "Long-Bell."



Long-Bell Douglas Fir Timber in Southwestern Washington
Douglas Fir is one of the strongest of soft woods. It is straight grained, resilient, tough and durable and is manufactured into every form of lumber known to the sawmill operator

Shipping Facilities—The company's exceptional railroad and water facilities permit shipments with dispatch, and immense reserve stocks are constantly on hand. At Longview, Washington, water and rail facilities permit direct shipments to any part of the world.

Advantages of Long-Bell Trade-marked Lumber

Long-Bell trade-marked lumber products afford the user many advantages. From the time the timber is cut until it leaves the Long-Bell manufacturing plants every precaution is taken to assure *maximum building and investment value.*

Among the safeguards established for this purpose are these:

Each log is cut and manufactured for the purposes to which it is best adapted.

Manufactured in our own plants, all operating with modern machinery under a uniform process and efficient supervision.

Unsurpassed accuracy and thoroughness at every step of manufacture.

Finished lumber is surfaced (planed smooth) four sides.

Unusual care in trimming.

Full length—uniform in width and thickness.

Uniformity of grading.

Uniform seasoning.

Lower grades receive the same care and attention as upper grades.

Correctly piled and stored—carefully shipped.

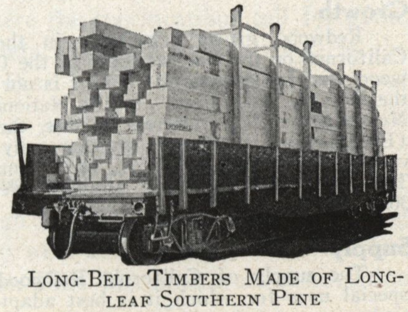
These precautions are to assure the minimum of carpenter labor (planing, sawing and sorting) necessary to put the lumber into construction; to assure the minimum of waste (due to the uniform quality); to assure full value for, and to safeguard, the investment.

These dependable products are those of a lumber company fifty years in the business. Long-Bell lumber can be identified by the Long-Bell trade-mark on the end of the piece. That trade-mark distinguishes the product, denotes its source and establishes its dependability.

Illustrating the Remarkable Strength of Longleaf Southern Pine
This pine was bent over in a storm by a falling tree. Though its top was pinned to the ground and its trunk twisted, the fibers remained intact

Grades of Douglas Fir and Southern Pine

The Long-Bell Lumber Company specializes on such grades of lumber and timbers as will meet all requirements for permanence, strength, safety and economy in



Long-Bell Timbers Made of Longleaf Southern Pine
Can be supplied creosoted, if desired

Continued on next page

mill construction work. At the company's Douglas Fir manufacturing plants at Longview, Washington, particular attention is given to large and long stock and timbers; and the latter can be furnished in the largest dimensions required in modern heavy construction. Douglas Fir lumber and timbers will be produced and graded in accordance with the rules and sizes of the West Coast Lumbermen's Association, and the American Standardization program.

As to Long-Bell Southern Pine, particular attention is given to structural timbers and this company is prepared to supply this material under the density specifications prescribed by the American Society of Testing Materials, from the largest sizes of posts and girders down to 3-in. thickness of factory flooring.

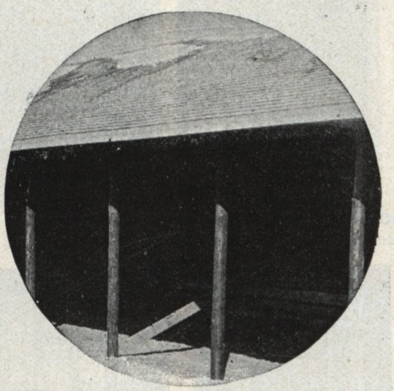
For residential and small building construction, THE LONG-BELL LUMBER COMPANY produces Douglas Fir and Southern Pine in all the various standard grades.

Creosoted Products

The exceptional qualities of Southern Pine make it especially adaptable to the Long-Bell cylinder pressure creosoting treatment. The three creosoting plants and unexcelled sources of supply and facilities for handling, enable the company to make large shipments without delay of heavy creosoted timbers as well as poles, posts, and lumber.

Creosoted Poles, Piling, Timbers, Lumber, Fence Posts, Posts for Guard Rails, etc.—Long-Bell poles cut from selected Southern Pine and treated under hydraulic pressure with creosote are not an experiment. Many years of service in the United States and abroad have proved conclusively that poles properly treated with creosote in airtight cylinders, under hydraulic pressure, give far longer life than ordinary poles. Railroads, public service companies and others maintaining transmission lines are using Long-Bell creosoted poles. Many miles of highways in the United States are paralleled with guardrails using Long-Bell creosoted posts. For dock and bridge piling, Long-Bell creosoted poles are unexcelled.

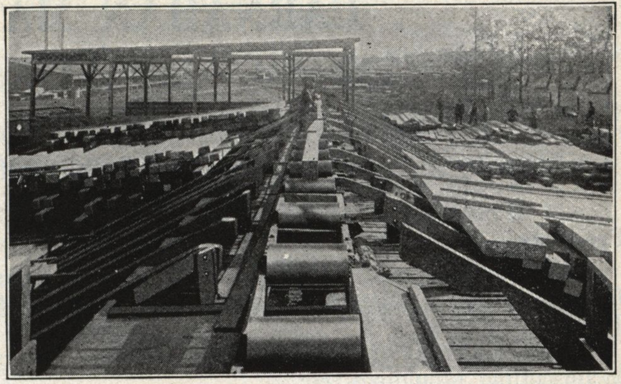
Thousands of large estates and farms are being fenced yearly with Long-Bell creosoted fence posts, known as "The Post Everlasting." These posts are unexcelled for strength, durability, attractiveness and economy.



LONG-BELL CREOSOTED BARN POLES AS USED IN GARAGE CONSTRUCTION

Hardwoods

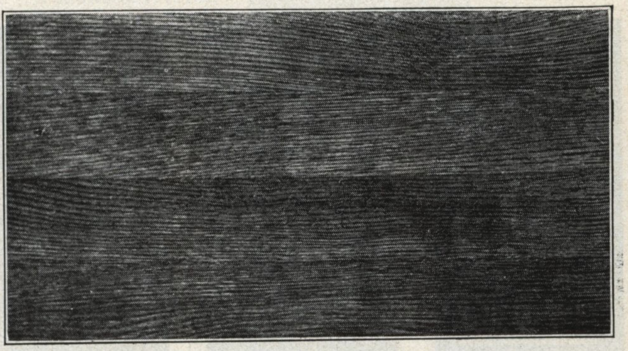
Long-Bell southern hardwoods come from the bottom lands of the Saline River region of Arkansas, the Bucatana Basin of Mississippi, the Calcasieu District of Louisiana and the Sabine and Attoyac Lowlands of East Texas. This fact, coupled with the most modern hardwood manufacturing equipment and capable plant management, insures products worthy of carrying the well-known trade-mark—*Long-Bell.*



OAK TIMBERS FOR RAILROAD AND OTHER HEAVY CONSTRUCTION

Oak Flooring

This company manufactures the widely known Long-Bell oak flooring which can not be surpassed for beauty, wear and ultimate economy in interior floors. Utmost care is taken in its manufacture; it is carefully graded, seasoned and stored. Floors laid with Long-Bell oak flooring give satisfaction from every standpoint of beauty, service and economy.



LONG-BELL OAK FLOORING

Flooring as it came from the factory. It has not been scraped, waxed or varnished. Note its beauty and remarkably smooth surface

California White Pine, Sash and Doors, etc.

THE LONG-BELL LUMBER COMPANY's plant at Weed, California, is known for the excellent quality of its California White Pine Lumber, sash and doors, screen doors and 3-ply veneers.

The Long-Bell Trade-mark

The products of THE LONG-BELL LUMBER COMPANY are branded at the plants during the process of manufacture with the trade-mark "Long-Bell," an assurance to the user that he is obtaining the best lumber products it is possible to make in modern plants and by a strict adherence to the most exacting grading rules.

Literature and Information

Complete information and descriptive literature concerning Long-Bell trade-marked lumber products will be sent to interested persons on request.

CARNAHAN MANUFACTURING CO.

Special Veneered Doors and Millwork to Detail

303 Mill Street
LOOGOOTEE, IND.

Products

Veneered Doors: Interior Doors, Front Doors, Evans Hollow Sanitary Doors; Evans Ring Joint.

Also, all kinds of Millwork, Interior Trim, Stairs, Wainscoting, Mouldings, etc.

Special Millwork and Facilities for Production

The Carnahan Manufacturing Co. makes a specialty of interior and exterior millwork made to architects' detailed plans. All the details of mouldings, etc., are carefully cut and follow profile of the drawings accurately.

The workmanship is of the highest grade, as our equipment consists of the most advanced type of machinery and the men are thoroughly trained.

Large quantities of materials are carried at all times in our yards and factories so as to have thoroughly seasoned stock from which to execute work at short notice.

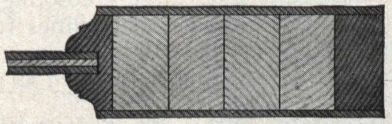
Guarantee for Veneered Doors

Veneered doors are guaranteed against defective workmanship and material, when properly handled, and we agree to replace "in the white" (unfinished) any veneered door of our manufacture that proves defective.

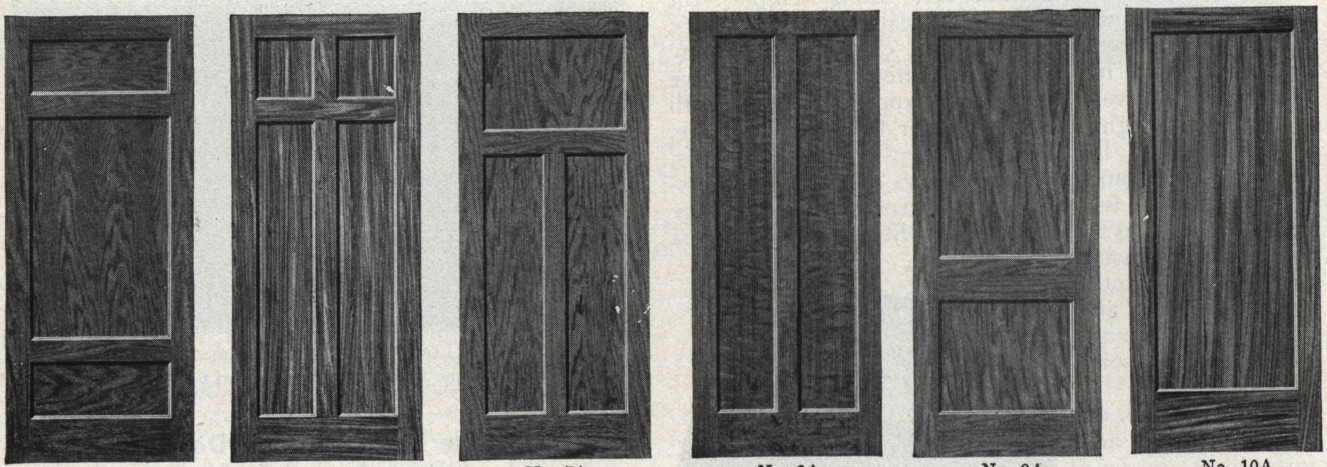
Carnahan Standard Veneered Doors

Interior Doors—The standard veneered doors are made with white pine cores, and can be furnished veneered in all woods, and in sizes and thicknesses and layouts shown in our price folder No. 10, a copy of which will be mailed on request.

Front Doors—Made in any kind of wood desired, glass paneling or divided lights in different designs.



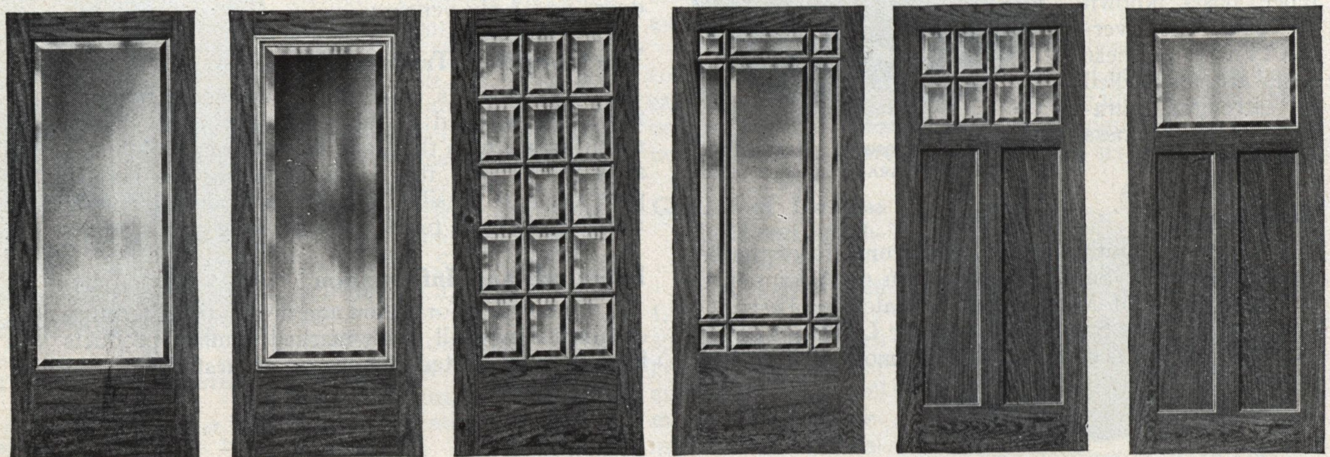
Construction of Standard Veneered Door



No. 1A No. 4A No. 7A No. 8A No. 9A No. 10A

Standard Veneered Interior Doors

Cove and bead sticking. Veneered in any kind of wood



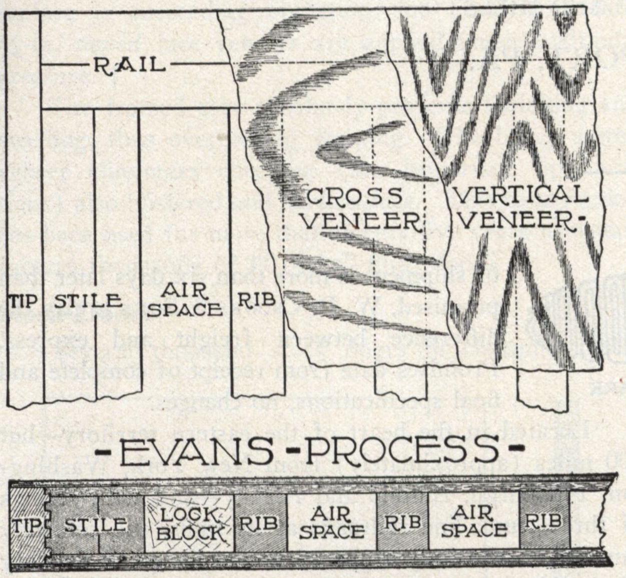
No. 19. Cove and Bead Sticking No. 20. Raised Mould No. 30 No. 31 No. 41. Paneled with Divided Lights No. 42

Standard Veneered Front Doors

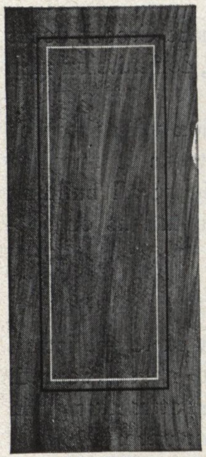
Continued on next page

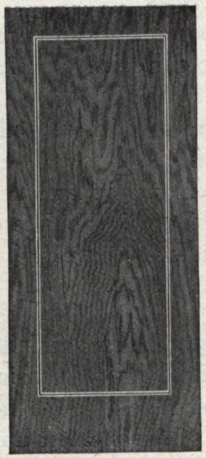
Evans Process Hollow Sanitary Flush Doors

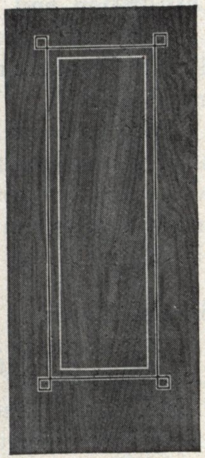
The Evans process flush door has a frame of core wood the size of the door, into which is placed a series of vertical ribs with air spaces between. Over this frame is glued a $\frac{3}{16}$-in. cross band, with a strip or tip of hardwood along the edges covering the glue joint between core and cross banding, thus avoiding the exposure of any end wood. The face veneer, consisting of a sheet of $\frac{1}{8}$-in. veneer, is then applied, completely covering the surface of the door. (See detail.)

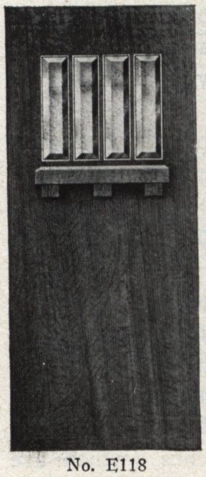


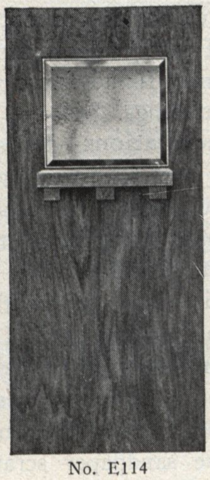
Detail of Construction, Evans Process Hollow Sanitary Door
Covered by United States and Canadian Patents


No. E51


No. E52
Inlaid ebony and holly


No. E53


No. E118


No. E114

No. E50

Evans Process Sanitary Flush Doors

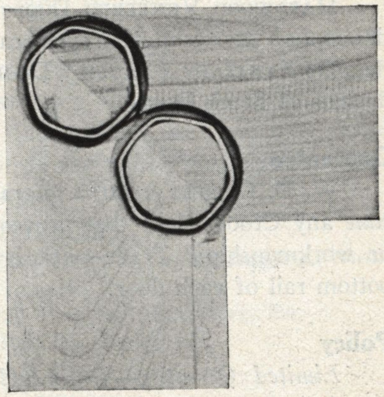
This sanitary door is as soundproof as a hollow partition, and is heat and cold resisting. It does not shrink in length or breadth; it stays straight, and does not distort. Light in weight (one-half that of a solid core door, or $3\frac{1}{2}$ lbs. per sq. ft.). Light on its hinges; easy to open and close.

Evans Ring Joint for Mitered Corners (Patented)

The Evans ring joint can not open from any cause whatsoever. Pressure takes up any variation caused by shrinkage; the more the wood swells, the tighter the joint becomes.

A corrugated tempered steel ring is expanded over a steel cone until it forms a true circle, and at the same time is put into place under heavy pressure. The expanded ring has a tendency to resume its corrugated form, thus exerting a strong holding force on the joint.

Furnished from 1 to 4 in. and in fractional parts. Should necessity arise, rings smaller than 1 in. or larger than 4 in. can be made.



Evans Ring Joint (Patented)
Showing back side of corner of mitered casing

Installations of Carnahan Doors

In the following partial list of installations, the name of the architect is also given:

Preble County Courthouse, Eaton, Ohio, Richards, Macarty & Bulford
Magnolia Building, Dallas, Tex., Alfred C. Bossom
Chemical Laboratory, Bozeman, Mont., Fred E. Wilson
Courthouse, Delphi, Ind., E. E. Dunlap Co.
Home for Aged Baptists, Ironton, Mo., L. Baylor Pendleton
Palace Theater, Cincinnati, Ohio, C. W. & G. L. Rapp
Deaconess' Hospital, Evansville, Ind., H. E. Boyle & Co.
St. Mary's Hospital, Evansville, Ind., C. Shoppell & Co.
Home Lawn Sanitarium, Martinsville, Ind., Wilson B. Parker
Dormitory, University of Cincinnati, Harry Hake
First National Bank, Richmond, Ind., C. C. & E. A. Weber
Sarah Scott School, Terre Haute, Ind., Johnson & Miller
Infirmary, St. Mary's of the Woods, Terre Haute, Ind., D. A. Bohlen & Son
Good Samaritan Hospital, Cincinnati, Ohio, Gustave W. Drach
Federal Reserve Bank, Houston, Tex., Sanquinet, Staats & Gottlieb
North Dallas High School, Dallas, Tex., Wm. B. Ittner
La Salle Hotel, South Bend, Ind., Nicol-Scholer-Hoffman
Harper Hospital Nurses' Home, Detroit, Mich., Albert Kahn
Herman Kiefer Hospital, Detroit, Mich., Albert Kahn
Jennie Edmunsen Memorial Hospital, Council Bluffs, Iowa, Jansen & Larsen
Metropole Hotel, Cincinnati, Ohio, J. G. Steinkamp & Bro.
School of Commerce and Finance, Indiana University, Bloomington, Ind., R. F. Daggett
McKinley School, Canton, Ohio, Geo. F. Hammond
John H. Lehman School, Canton, Ohio, Thayer & Johnson
Hotel Sontag & Victory Theater, Evansville, Ind., J. E. O. Pridemore
State School for Blind Girls, Romney, W. Va., R. A. Gillis
Medical Building and University Hospital, University of Michigan, Ann Arbor, Mich., Albert Kahn
Ford Hospital, Nurses Home, Detroit, Mich., Albert Kahn

ESTABLISHED 1886

W. D. CROOKS & SONS

For Forty Years Manufacturers of Hardwood Veneered Doors Exclusively

GENERAL OFFICE AND MILLS

WILLIAMSPORT, PA.

Products

Hardwood Veneered Doors of every description to architects' specifications and details; Sanitary (Flush) Doors and all designs of Stock Doors.

CROOKS 1886 DOORS

TRADE-MARK

Guarantee

W. D. Crooks & Sons guarantee to replace *at any time* any Crooks door that proves defective in material or workmanship. Trade-mark is stamped on top and bottom rail of each door.

Policy

Limited Quantity—Unlimited Quality.

A limited output—now 300 doors per day—has been the policy of this organization since its beginning forty years ago. The company's heads believe this the only possible means of maintaining its standard on special doors to architects' details, which constitute 75% of its sales.

W. D. Crooks & Sons regard its sanitary (flush) door as a special. The individual construction—later described—necessitates special work throughout, even for the flat faced, unembellished door.

The remainder of the Crooks output consists of stock designs. These are described below.

Construction

Crooks doors are veneered with any foreign or domestic wood specified. All veneer is shrunk in a re-drying machine. It is then mechanically tested to prove the absence of moisture. Core is "built-up" of narrow, soft wood, kiln dried strips, which are glued together and kept in retainers in hot rooms until perfect joints are assured. Core is then planed to even thickness and veneers applied under hydraulic pressure. Material is again held in retainers in hot rooms until all moisture is eliminated from the glue.

Succeeding operations are practically identical in all factories, the only difference being in the skill with which the work is performed.

On Time Shipments or Penalty

The policy outlined above permits quick shipments and definite guaranteed promises as follows:

When desired, all orders will be *expressed* if date of shipment is more than six days later than promised, W. D. Crooks & Sons to pay the difference between freight and express. Promises date from receipt of complete and final specifications, no changes.

Located in the heart of the eastern territory—but 200 miles (approximately) from New York, Washington, Pittsburgh, Buffalo and Albany—and with sidings of three trunk line railroads at its mills, the company can also assure its patrons of unusually quick delivery after orders are shipped.

Distribution and Prices

Any retail lumber dealer can purchase Crooks doors direct. There are no exclusive agencies, commission men or jobbers.

Crooks doors are sold in competition with those of other reputable manufacturers. The trade is supplied with price lists covering standard designs; all building supply dealers can obtain immediate quotations on specials by submitting lists and details.

Special Doors

Specifications and details are followed to the letter. Details are never "cut" and dimensions never reduced. "Matching up" veneers to obtain the most attractive grain effects is considered of the greatest importance.

Sample (Special) Doors

The company welcomes the opportunity to make and submit full size sample doors at actual cost. This suggestion has recently found favor with architects on a number of large buildings.

Important Specifications—For special doors architects are urged to specify sawed veneers and hand cleaning. Unless you definitely do so, manufacturers' estimators are tempted to figure on rotary cut veneers and ordinary machine sanding.

In rotary cutting of veneers the log, revolving against the knife, shatters the fiber of the wood. After a year's use these million little broken fibers can not resist the extremes of changing temperature. Small checks and larger splits result. Hand cleaning is the only way to remove sandpaper scratches (which are magnified by the finish) from the cross rails.

Continued on next page

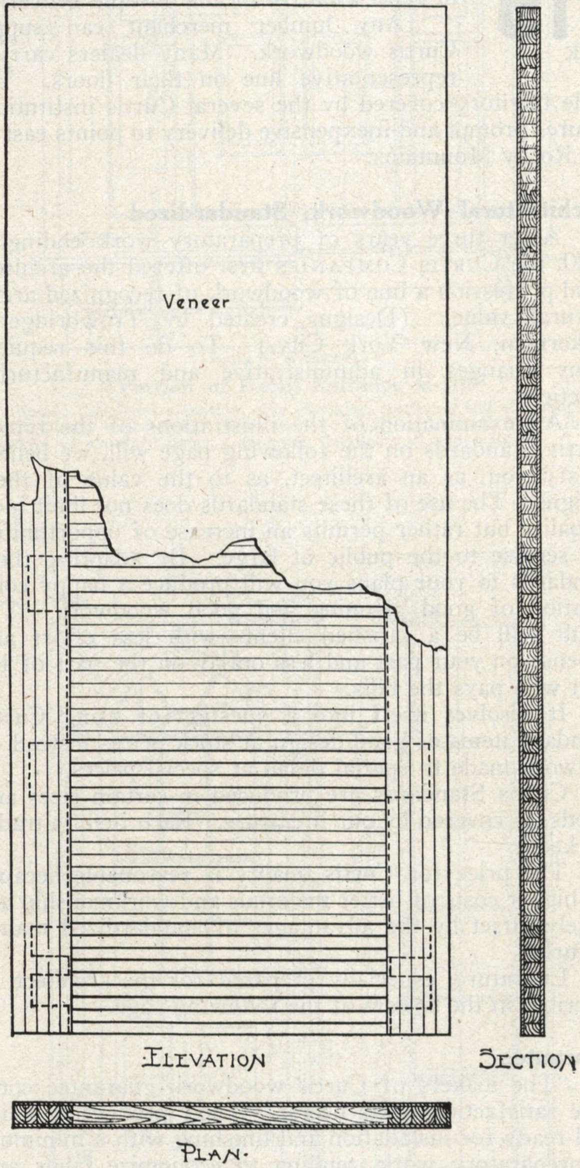
Sanitary (Flush) Doors

Core consists of narrow, soft wood strips. These are glued together to form stiles, cross rails and flush panels. After planing to even thickness, all parts are completely *framed* and assembled into a "core door," then re-dried in hot rooms. Sanding for perfectly even surface is succeeding operation and finally Standard ¼-in. *sawed* face veneers are applied under hydraulic pressure.

The framed core absolutely prevents shrinking and swelling, thus overcoming warping. The heavy sawed veneer eliminates checking (see Important Specifications) also blistered and sunken face. This construction has been used for more than twenty-five years to manufacture thousands of "Crooks" flush doors.

Stock Doors

Several thousand stock doors in chestnut, birch, plain red oak and red gum are always on hand for immediate shipment. Fifteen designs of red oak entrance doors are included. These are made with ¼-in. *sawed* veneers.



Construction of Crooks Non-warping Sanitary Door

An assortment of stiles, rails and panels for the quick assembling of odd size doors, or semistock designs, eliminates shipping delays, which so frequently result when a small amount of this class of work appears on an order.

Catalogue

A book of door designs, including tables of layouts and dimensions, full size moulding sections on blue print pages, inlay designs for flush doors, and embellished with etchings of many prominent Crooks equipped buildings, will be sent upon request.

References

The following users are listed to further indicate the quality of Crooks doors, which, in every case, were installed *throughout or in the major part of the buildings named:*

Union Medical College, Peking, China
House and Senate Chambers of U. S. Capitol Building, Washington, D. C.
Pennsylvania State Capitol Building, Harrisburg, Pa.
Delaware State Capitol Building, Dover, Del.
Sea View Hospitals, New York, N. Y.
Georgia State Hospitals, Augusta, Ga.
City Club, Boston, Mass.
Chalfonte Hotel, Atlantic City, N. J.
First Church of Christ, Scientist, Rochester, N. Y.
Office Building (Durant), General Motors Corp., Detroit, Mich.
Residence of John D. Rockefeller, Pontantico Hills, N. Y.
Residence of Eugene DuPont, Centreville, Del.
Residence of E. T. Stotesbury, White Marsh Valley, Philadelphia, Pa.
Residence of U. S. Senator Wolcott, Dover, Del.
Residence of Capt. Isaac E. Emmerson, Narragansett Pier, R. I.
Residence of Sir Reginald Gamble, Peking, China
Jefferson Hall Apartment Building, Detroit, Mich.
First Presbyterian Church, Pittsburgh, Pa.
Union Trust Company Building, Baltimore, Md.
Home Savings & Loan Building, Youngstown, Ohio
National State Bank Building, Newark, N. J.
National Bank of Commerce, Norfolk, Va.
Princeton College Buildings, Princeton, N. J.
Engineering Building, University of Pennsylvania, Philadelphia, Pa.
Charles M. Schwab Auditorium, Pennsylvania State College
Girard College High School, Philadelphia, Pa.
Waterbury High School, Waterbury, Conn.
Oglethorpe Club, Savannah, Ga.
Manufacturers Club, Philadelphia, Pa.
Times-Dispatch Building, Richmond, Va.
Chamber of Commerce Building, Pittsburgh, Pa.
Y. M. C. A. Building, Charleston, S. C.
Municipal Building, Springfield, Mass.
Union League Building, Philadelphia, Pa.

CURTIS COMPANIES SERVICE BUREAU

CLINTON, IOWA

Maintained and Operated in the Interest of the Following Curtis Companies:

CURTIS BROS. & CO., Clinton, Iowa
CURTIS & YALE CO., Wausau, Wis.
CURTIS SASH & DOOR CO., Sioux City, Iowa
CURTIS, TOWLE & PAINE CO., Lincoln, Neb.
CURTIS, TOWLE & PAINE CO., Topeka, Kan.
CURTIS-YALE-HOLLAND CO., Minneapolis, Minn.
CURTIS DOOR & SASH CO., Chicago, Ill.
CURTIS DETROIT CO., Detroit, Mich.

CURTIS COMPANIES, INC., CLINTON, IOWA
Maintaining Sales Offices At
PITTSBURGH, PA., 803 Commonwealth Building
NEW YORK, N. Y., 25 West 44th Street
BALTIMORE, MD., 907 Calvert Building

Manufacturers of Trade-marked Architectural Interior and Exterior Woodwork, Standardized

1866 CURTIS
TRADE-MARK

Products

Architectural Woodwork (Standardized):

- Complete Entrances
- Doors, Exterior and Interior, Solid, Veneered and Sanitary
- Frames
- Mantels
- Panel Work
- Dining Alcoves
- Stairways
- Stair Material
- Windows and Sash
- Louvres and Blinds
- Porch Work
- Built-in Woodwork:
  - Bookcases
  - Corner Cases
  - Sideboards
  - Buffets
  - Kitchen Dressers
  - Ironing Boards
  - Dressing Tables and Cases
  - Medicine Cabinets
- Exterior Moulding
- Interior Trim

Construction

A few typical details are presented on the following page to impress upon the architect in search of dependable woodwork the sincere effort made by the Curtis Organization to supply a product of quality.

It is impossible here to cover adequately the subject of the design and construction of the entire line of Curtis woodwork; hence typical details—entrances, doors, cabinet and stair work are presented on the following page. Details of similar character covering the products listed above are available. They make the use of Curtis Standards easy, practical and profitable.

In general our manufacturing practice may be summed up as follows:

(1) Extreme care in selection of woods used.

(2) Rigid inspection maintained to insure quality of material, workmanship and packing.

(3) Approved methods of door, sash and cabinet work construction employed.

(4) Standardized operations insure constant construction excellence, and unvarying quality.

Deliveries

Quantity production based on standardization has made available to the architect and his clients for the first time a complete line of woodwork of accepted architectural design. The Curtis Companies desire to be taken into the confidence of the architect.

With an exact knowledge of the architect's particular problems, his requirements being known, the acceptance of an order by any Curtis institution or representative means on-time deliveries.

Any lumber merchant can supply Curtis woodwork. Many dealers carry a representative line on their floors. The wide territory covered by the several Curtis institutions insures prompt and inexpensive delivery to points east of the Rocky Mountains.

Architectural Woodwork, Standardized

After three years of preparatory work ending in 1920, the Curtis Companies first offered the architectural profession a line of woodwork of recognized architectural value. (Designs created by Trowbridge & Ackerman, New York City.) To do this required many changes in administrative and manufacturing practice.

An examination of the illustrations of the typical Curtis Standards on the following page will, we believe satisfy you, as an architect, as to the value of these designs. The use of these standards does not limit individuality but rather permits an increase of opportunities for service to the public at large. By adapting these standards to your plans you will produce a happy combination of good planning and good woodwork. The result will be a satisfied client—with less effort and expense on your part and less outlay on the part of the man who pays the bills.

It resolves itself into a question of using Curtis Standard items of good design at stock prices instead of millwork made to special detail at special prices.

Curtis Standards are produced in certain sizes and woods, as covered by our literature. Each item is trademarked.

The price for Curtis quality is reasonable because the higher costs of better materials and workmanship are largely offset by the advantages of standardized manufacturing.

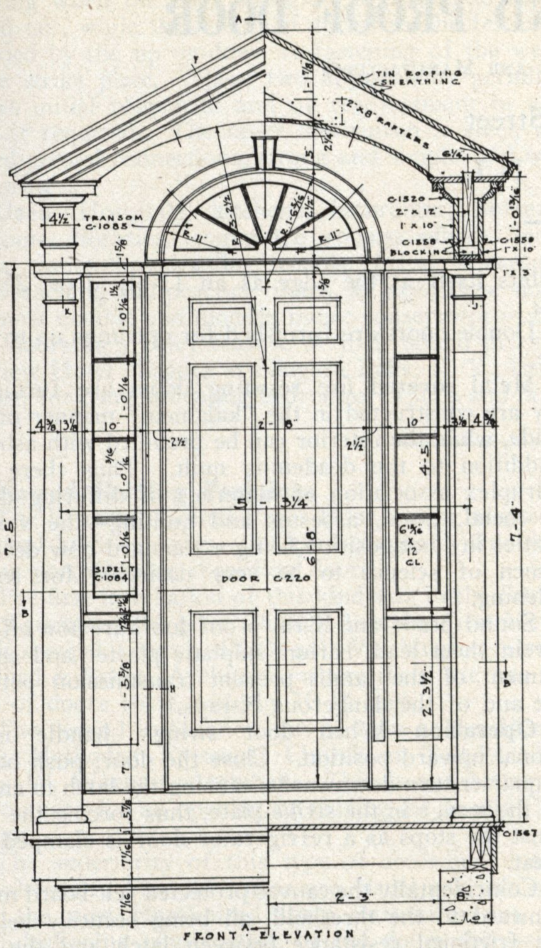
Literature, especially prepared for the architect, is described at the bottom of the following page.

Guarantee

"The makers of Curtis woodwork guarantee complete satisfaction to its users." Their product is delivered ready for installation and finishing with a minimum of preparatory work, tending to economize labor and minimize construction delays.

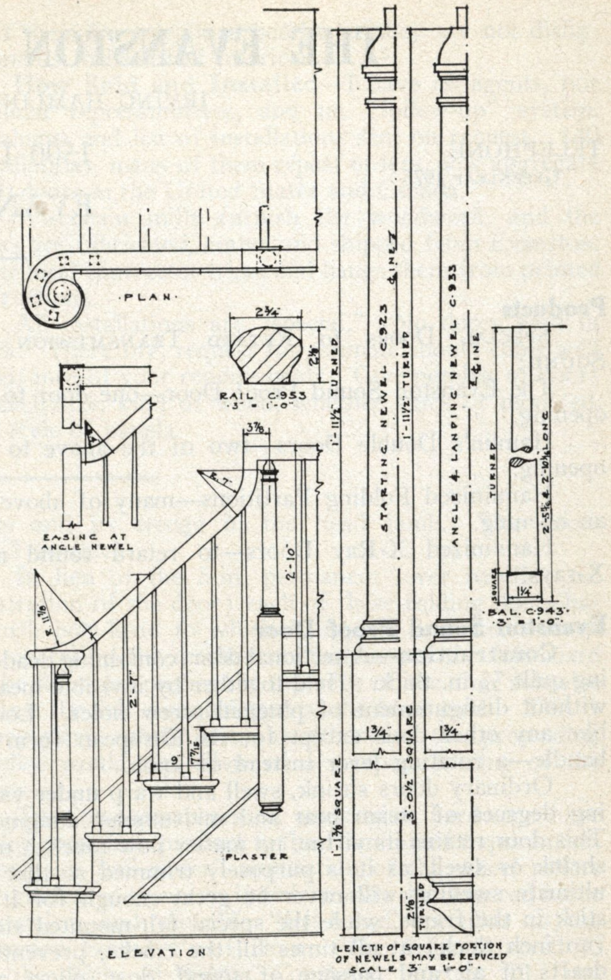
A letter to the Curtis Companies Service Bureau will bring complete information.

Continued on next page


TIN ROOFING
SHEATHING
2"x8" RAFTERS
TRANSOM C-1088
C-1320
2"x12"
1"x10"
C-1358
BLOCKING
SIDELT C-1084
DOOR C-220
FRONT ELEVATION
2'-3"
7'-5"
7'-4"
2'-8"
5'-3¼"
6'-8"
2'-3½"

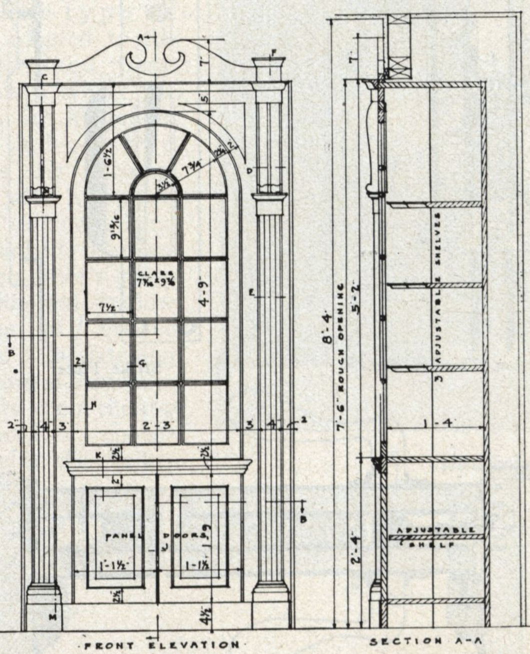
Portion of Detail Entrance C-100

Beside this front elevation, side elevation, sections, full size moulding details shown in original. Entrance and door sections of Curtis details illustrate 63 standard items, completely detailed and dimensioned


PLAN
RAIL C-953
3" = 1'-0"
EASING AT ANGLE NEWEL
PLASTER
ELEVATION
STARTING NEWEL C-923
ANGLE & LANDING NEWEL C-933
BAL. C-943
3" = 1'-0"
TURNED
SQUARE
LENGTH OF SQUARE PORTION OF NEWELS MAY BE REDUCED
SCALE 3" = 1'-0"

Detail Stair C-900

Standard stair parts, like all Curtis items are carried in stock. Newels, rail, balusters, volutes, etc., are adaptable to varying conditions imposed by rise and run. Detail Sheets show twelve complete stairways of varying type


GLASS
PANEL DOORS
7'-6" ROUGH OPENING
8'-4"
ADJUSTABLE SHELVES
ADJUSTABLE SHELF
FRONT ELEVATION
SECTION A-A

Portion of Detail Corner China Case C-700

Sectional plan shown at the right above. Curtis Detail Sheets cover 76 items of this character embracing that portion of the line listed under built-in woodwork on preceding page

Curtis Stair Construction

Complete factory-made stairs assure following construction features (parts are sold for assembly on job):

Stringers are housed. The housing is rounded on the ends to exactly fit the nosing on the treads. Face stringers are tenoned and notched at bottom to fit into a mortise in the corner or landing newel.

Balusters are dovetailed into the treads; the dovetailing being concealed by the nosing of the tread. No end grain shows. The balustrade is substantial.

Treads and risers are tongued and grooved together. They are wedged in place in the housing of the stringers.

Trade-marked Woodwork

The Curtis trade-mark is imprinted on the stiles of windows and sash, on the bottom rails of doors and is affixed to cabinet and stair work through a decalcomania process. Look for this trade-mark. It identifies every genuine piece of Curtis woodwork.

We cannot legally prevent other mills from copying our patterns and designs. The law, however, does prevent others from using our trade-mark. When you indicate the use of Curtis woodwork be sure that the sash, doors, mouldings or interior woodwork bear our trade-mark, illustrated on previous page.

Curtis Catalogue No. 400 and Detail Sheets

The catalogue of 240 pages, 9x12 in., and Curtis details, approximately 140 plates 8½x11 in. contained in a file pocket, A.I.A. indexed, will be sent gladly to architects maintaining offices in the territories served by the Curtis institutions. Address Curtis Companies Service Bureau, Clinton, Iowa.

THE EVANSTON SOUND PROOF DOOR

IRVING HAMLIN, Patentee and Manufacturer

TELEPHONE
Greenleaf 1975

1500 Lincoln Street
EVANSTON, ILL.

Products

Special Doors to Retard Transmission of Sound:

The Evanston Sound Proof Door—one door to an opening.

Hamlin's Double Doors—two of the above to an opening.

Hamlinized Folding Partitions—many of above to an opening.

Hamlinized X-Ray Doors—to retard sound and X-rays.

Evanston Sound Proof Door

Construction—A sectional door, containing deadening quilt ⅞ in. thick. Held together by invisible means, without disfigurement of plugged screw holes. Looks like any other door except for its European form of handle—a rotating lever instead of knob.

Ordinary doors shrink, swell and warp under varying degrees of steam heat and midsummer dampness. This door retains its virtue, no matter how much it may shrink or swell, as it is purposely trimmed so that its ultimate swelling will never be great enough for it to stick in the frame, while the special felt-mounted stops (an inch thick) at all times fill the cracks, preventing drafts of air and passage of sound, dust, odors and light.

The threshold opening is sealed by a movable member, the other three openings by mere compression of the door against the felted stops.

Made in any style of flush or sunken panels. Each section is a completely built-up ⅞-in. door in the core and cross-banded veneer manner of the best Wisconsin door mills, and the completely fabricated product thus exhibits itself at the edge as an 11-ply door, 2⅝ in. thick.

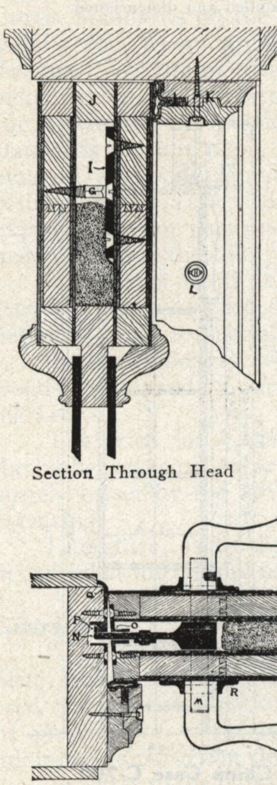
Double doors are furnished for openings up to 9 ft. wide.

Metal covered fire resisting doors are furnished. They are constructed in the "kalamein" manner on the outside, while the interior can be provided with asbestos in addition to the deadening quilt. Thus there is a quadruplex association of materials of differing densities—metal, wood, asbestos and quilting—the varying densities in juxtaposition being a standard now declared by men of science to be very desirable for sound-deadening.

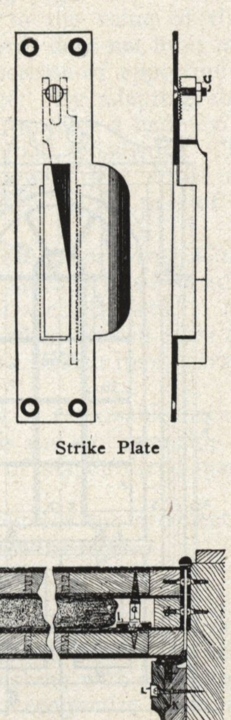
Sound proof and X-ray proof doors are now offered, wherein sheet lead, barium-sulphate plaster and special treatment of the jambs prevent transmission both of noise and of the dangerous X-rays.

Operation—When door swings, handle is in diagonal upward position. Close the door, push handle one-quarter turn downwards, causing the latch to engage with the wedge in the strike-plate, thus forcing the door against the stops as a refrigerator door is clamped into its seat.

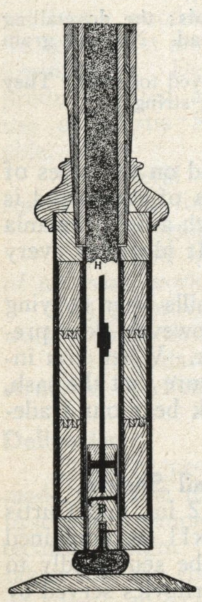
Coincidentally the canvas protected felt-board moves downward to the threshold, all being securely held by mere frictional resistance between latch and the long inclined surface of the wedge. Part of the inner mechanism is a counterweight to prevent felt-board from



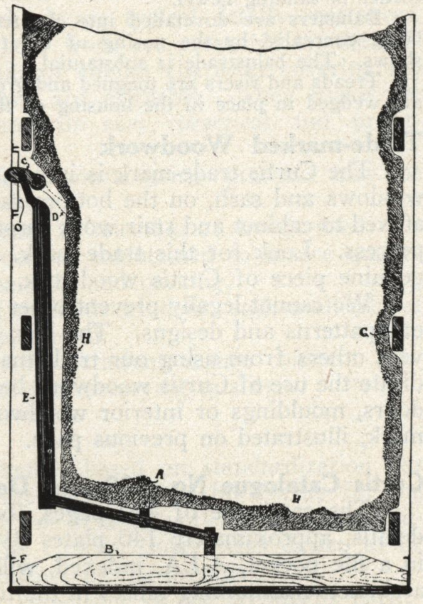
Section Through Head



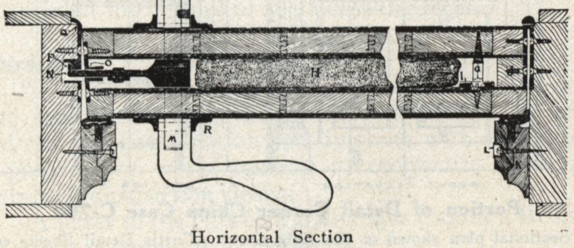
Strike Plate



Section Through Bottom Rail



Vertical Section Showing Operating Mechanism



Horizontal Section

Details of the Evanston Sound Proof Door

Continued on next page

dragging when the door swings. Stops are adjustable in and out, while the length of thrust in the felt-board is varied by the up or down re-fastening of the wedge in the strike plate. These two adjustments permit of correct initial placement and of readjustment in after years if required. The inner mechanism is steel, with riveted pivotal connections, strong and simple, and without springs.

Uses—Hospitals, kitchens, bathrooms, nurseries, bedrooms, libraries, committee rooms, offices, lodge-rooms, radio broadcasting rooms, piano salesrooms, music teaching and practice rooms, all need these doors. The most notable and modern music conservatories have these doors as a chief feature of their sound proofing. The new Hotel Niagara at Niagara Falls, N. Y., has 27 of them for communicating bedrooms. Clubs and hotels need them for telephone booths, as they are not disfigurements to beautiful interiors.

How Sold and Installed—I have no agents, nor regional representatives, and no "follow-up" system. Catalogue and list of installations sent on request. 140 installations, many of them repeat orders, now aggregate 1300 doors in the United States and Canada.

Wisconsin mills furnish the woodwork, and the doors are fabricated, crated and shipped from Evanston. Your local contractor trims and hangs them from printed instructions.

All installations are "special." No doors kept in stock. Therefore, request for estimate should come well in advance of your requirements. Give number of doors of each size, kind of wood, whether stuck or moulded, and style of panels.

Hamlinized Folding Partitions

The Evanston Sound Proof Door is now adapted to wide and high openings—the kind commonly known as folding partitions or accordion doors.

The first installation of this kind was in the Sunday School rooms of the great Chicago Temple, First Methodist Episcopal Church, Clark and Washington Streets, Holabird & Roche, Architects, where there are two batteries of doors 16 ft. wide by 10 ft. high.

The second installation can be seen at the Monroe Street Methodist Episcopal Church at Toledo, Ohio, Harry W. Wachter, Architect. This is one battery of twelve doors for an opening measuring 39 ft. wide by 8 ft. high.

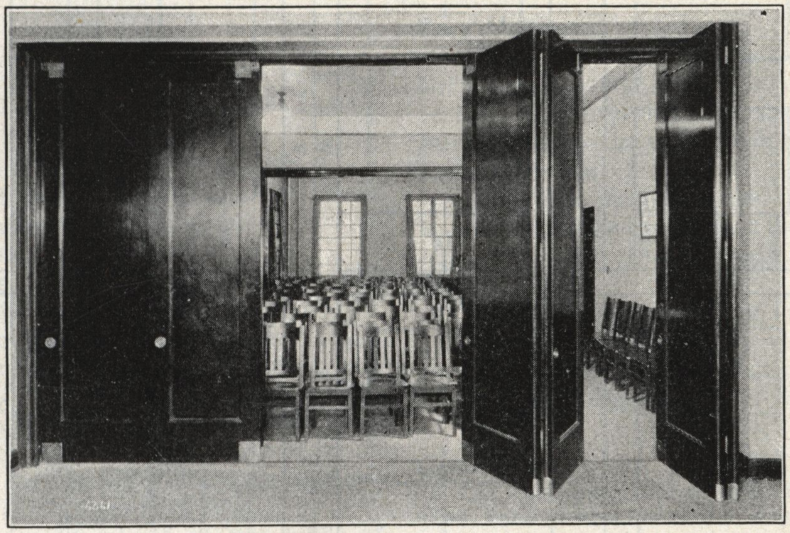
The superiority of this type of accordion door is very obvious. The old forms are visual barriers only, while the new Hamlinized form introduces not only sound-deadening construction of the doors themselves, but closes the openings above and below. It is well known that the open cracks about a door are the great offenders, and that distressingly large volumes of sound get through them.

The type of door adapted to the Hamlinized treatment is where the doors are hinged in pairs and pushed across the opening, each pair independently of the others, but linked together in each other's grasp by wide and shallow tongue and groove joints. The latching mechanism protrudes upward from the top of the door, engaging with the strike-plate and its wedge in the head jamb. The doors are 3 in. thick.

In lieu of the 5-in. permanent lever handle (see illustration of the door) each of these folding doors has a flush bolt head to which is applied a socket wrench for operating the mechanism that moves the felt-board to the floor and pushes the top edge of the door sidewise against the felt mounted stop at the head jamb. This is a necessary substitution, as otherwise the protruding handles would not allow of a compact folding of the doors.

Two manufacturers of suspension hardware have re-designed their product to the Hamlinized requirement, namely an "off-center" application of the wheel rollers and guides, so as not to interfere with the centered inner mechanism and movable "felt-board" peculiar to the Evanston Sound Proof Door. The firms referred to are the Richards-Wilcox Company, Aurora, Ill., and the Topping Manufacturing Company, Ashland, Ohio. They have prepared drawings for the purpose, showing the details of construction of the doors, the jambs and the hangers and their application in the new Hamlinized manner. The drawings are obtainable upon request from these companies.

The doors are manufactured and sold by me while the suspension hardware is obtained from the companies mentioned. Trimming the doors, erecting the jambs and applying the suspension hardware is done by the local contractor.



Hamlinized Folding Partitions

HARDWOOD PRODUCTS CORPORATION

Manufacturers of Doors

MAIN OFFICE AND FACTORY
NEENAH, WIS.

VENEER MILLS, CEDARS, MISS.

SALES OFFICES
NEW YORK, N. Y. CHICAGO, ILL. SAN FRANCISCO, CAL.

BLUE DIAMOND NEENAH

Product

Doors, Standard and Special, for hotels, apartments, office buildings, hospitals and public buildings.

Responsibility

Our rating in R. G. Dun's and Bradstreets is over $1,000,000, first grade of credit.

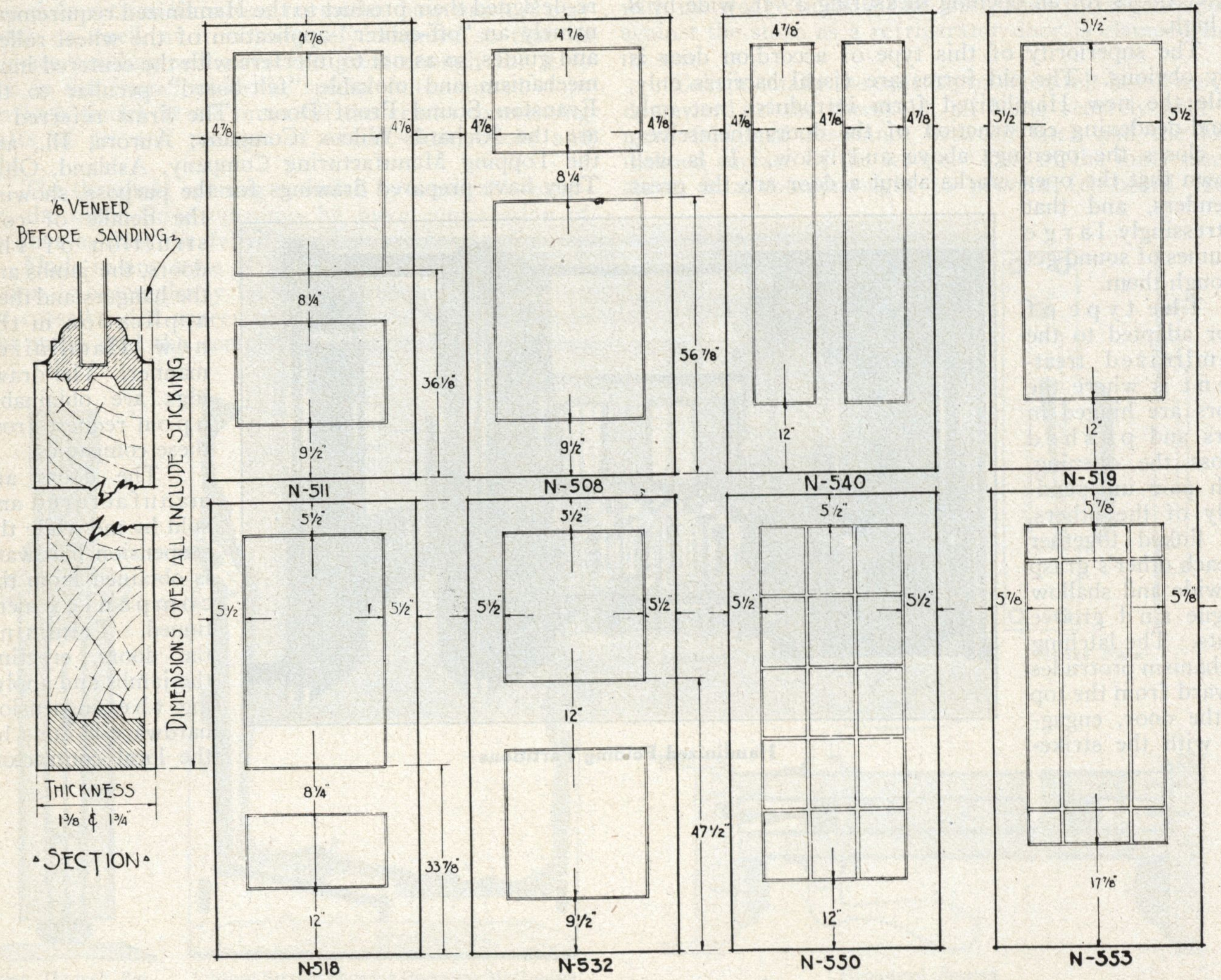
Facilities

We operate one of the largest plants devoted to the manufacture of hardwood veneered, and solid softwood doors. Our plant is equipped with the most modern and In the last ten years we have furnished over efficient door machinery.
2,500,000 doors for buildings in all sections of the United States and Canada.

A large part of the thin lumber and veneers used in our doors comes from our own timber lands, where we operate a modern veneer mill for producing center stock and veneers.

Advantages

We are thoroughly equipped to manufacture doors of special layout and design, to conform with architects' specifications and the general design of the building. By using our standard dimensions of stiles and rails, economies may be effected in the cost, and at the same time the distinctiveness of the architects' ideas may be secured. We suggest that wherever possible the architect specify our standard dimensions of stiles and rails as shown in the following drawings.


⅛ VENEER
BEFORE SANDING
DIMENSIONS OVER ALL INCLUDE STICKING
THICKNESS
1⅜ & 1¾
SECTION
4⅞
4⅞
4⅞
8¼
36⅛
9½
N-511
4⅞
4⅞
4⅞
8¼
56⅞
9½
N-508
4⅞
4⅞
4⅞
4⅞
12
N-540
5½
5½
5½
12
N-519
5½
5½
5½
8¼
12
33⅞
N-518
5½
5½
5½
12
47½
9½
N-532
5½
5½
5½
12
N-550
5⅞
5⅞
5⅞
17⅛
N-553

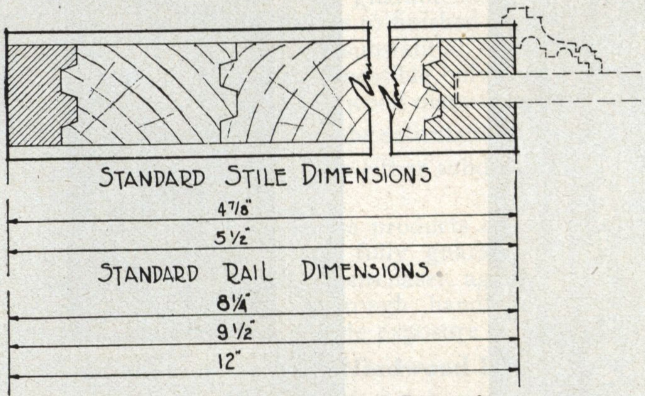
Standard Door Designs and Layouts

Continued on next page

The illustrations on the preceding page show standard layouts and detailed section indicating standard sticking with points of measurement.

Flexibility of Moulding Design

A "special" door may be secured at almost the price of the "standard" door with individual design and moulding. Note from the illustration, standard stile and rail dimensions and flexibility obtainable in moulding design. At a small additional cost, a moulding of the architect's own design can be incorporated on a stock model which, when completed, will give every appearance of a custom made door.



Standard Stile and Rail Dimensions

The dotted lines indicate only two of the many possibilities in moulding design obtainable through the use of stiles and rails of standard dimensions

We invite architects to write us, roughly outlining their needs in this connection, and we will gladly submit estimates and details of this distinctive feature of our work, that will make clear the definite saving in time and money to the owner that can be effected thereby.

Panels

Our standard is 5/16 inch thick 3-ply. Where a thicker panel is desired we recommend 7/16 inch 5-ply.

Practical Suggestions

The following information we believe will be of real aid to the specification writer and detailer:

Use white pine cores, kiln dried.

Veneers for exterior doors not less than ¼ inch thick before sanding, on stiles and rails.

Use water-resistant glue for exterior doors.

Bars for sash doors should not be less than ½ inch between glass.

Do not show a solid stuck mould over ½ inch wide.

For moulded doors do not use a moulding in excess of ¾ inch wide for 1⅜-inch thick doors, and not over 1⅛ inches wide for 1¾-inch thick doors.

Avoid, wherever possible, doors of two kinds of wood. Where this can not be avoided, do not use a rabbetted jamb or plowed-in stops.

Doors over 2 feet 8 inches wide should be made 1¾ inches thick.

Doors with one long panel should be made 1¾ inches thick.

Flush or sanitary doors should not be made less than 1¾ inches thick.

Do not design a door of the sanitary or flush type on one side and paneled on the other side.

All doors, unless otherwise specified, are machine sanded. If a high grade finish is desired, belt sanding or hand cleaning should be specified, belt sanding being less expensive.

All flush doors should be belt sanded.

Kiln Drying and Seasoning of Materials

All core material used in building up stiles and rails, also flush or sanitary doors, is composed of clear white pine blocks. Every piece of core is kiln dried to 2 to 3 per cent moisture in a specially designed core kiln. Core blocks are laid up with high grade glue, using tongue and groove joints, assuring perfect joints between core blocks.

All veneer, center stock and cross-banding is thoroughly re-dried in our veneer plate-driers, and all moisture removed before material enters our plant for manufacture. After glueing up, panels are re-dried before sanding to remove the excess moisture contained in the glue, thus avoiding checks in the face veneer.

Before stiles and rails are machined and clamped into the finished door, they are seasoned and moisture from the glue dried so that the finished door will contain, as nearly as possible, the same percentage of moisture (on the average about 6 per cent) as will obtain at the point where the finished door is delivered and installed.

These methods of kiln drying and seasoning insure perfect veneered surfaces after the doors are finished. On the usual "stock" veneered door, where insufficient drying processes are used, the joints in the core will often show through the face veneer after the door is finished. This is a frequent defect in a stock door which we have eliminated as a result of our careful seasoning methods.

Face Veneers

Unless otherwise specified, our standard doors in birch, gum, oak and ash will be veneered with rotary-cut veneers. Our experience has shown that *properly manufactured* rotary-cut veneer will give a very satisfactory surface.

All rotary-cut veneer used in our doors is carefully inspected to make certain that the veneer has been properly cut and that there has been no rupture of the wood fiber.

We are prepared, however, to furnish doors veneered with sawed or sliced veneer, where specified, at somewhat higher cost. All mahogany, quarter figured gum and walnut veneers are either sliced or sawed.

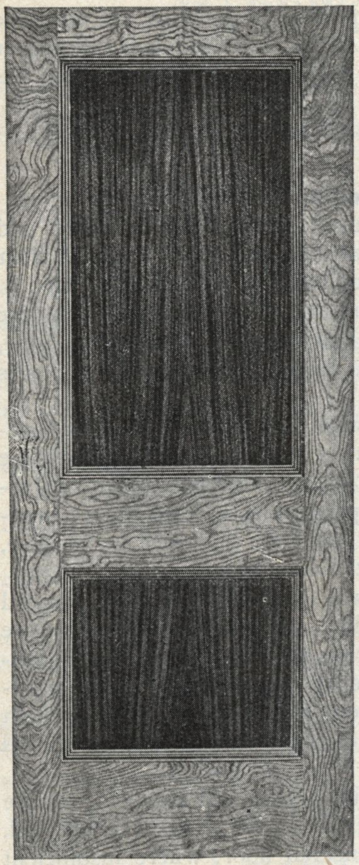
Catalogue

Our catalogue contains cuts of a large number of the more usual designs of doors which we manufacture; also information as to the proper care and treatment to be given hardwood veneered doors. This portion of our catalogue also contains our regular form of guarantee which we furnish with our doors.

Our file folder for architects entitled "Architects' Data on Doors," contains details and elevations as designed by various firms of architects for doors we have installed in numerous important buildings throughout the country. It also contains suggestions and cross section drawings showing standard and special mouldings, both solid and nailed in.

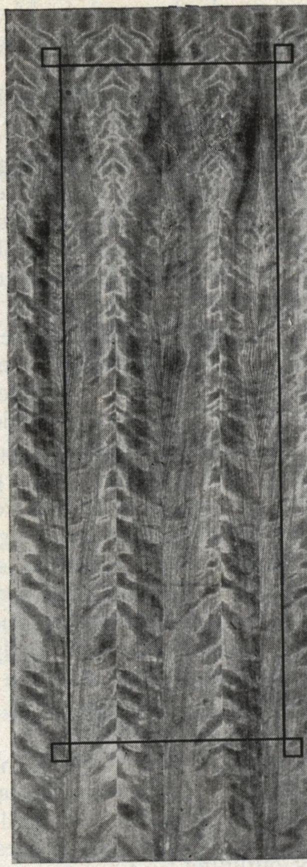
We shall be pleased to mail you one of our catalogues and architect's file folder containing door data without charge, on request.

Continued on next page

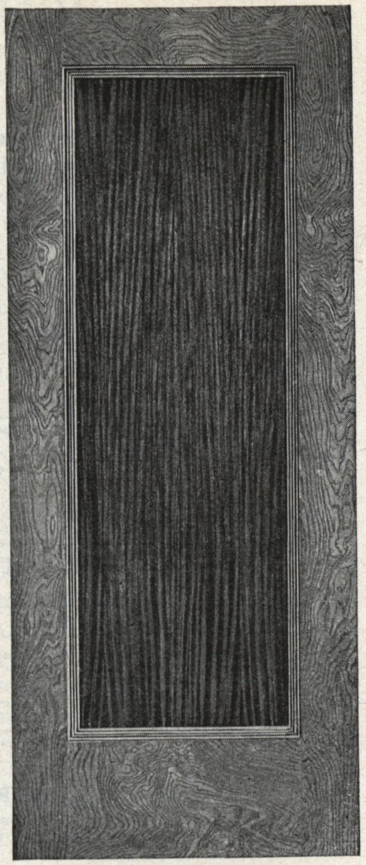


Design N-530. Unselected Birch Stiles and Rails, Mahogany Panels

4⅞-in. stiles and top rail.
8¼-in. lock rail.
9½-in. bottom rail.
Flush moulded two sides.
Similar design with glass opening in place of upper panel, N-531



Design N-590. Selected Curly Red Birch; Inlay, Type M, Single Line Ebony



Design N-525. Birch Stiles and Rails, Mahogany Panel

5½-in. stiles and top rail.
12-in. bottom rail.
Flush moulded two sides

References and Installations

The following recent HARDWOOD PRODUCTS CORPORATION installations will indicate the character of clientele we serve:

Biltmore Hotel, Los Angeles, Cal.
City Club, St. Louis, Mo.
Arlington Hotel, Hot Springs, Ark.
Youree Hotel, Shreveport, La.
Washington Hotel, Shreveport, La.
Claridge Hotel, Memphis, Tenn.
Sam Houston Hotel, Houston, Tex.
Masonic Temple, Birmingham, Ala.
Masonic Temple, Guthrie, Okla.
Cook Office Building, Omaha, Neb.
Travis Building, San Antonio, Tex.
San Jacinto Life Building, Beaumont, Tex.
Cotton Exchange Building, Houston, Tex.
First National Bank, Houston, Tex.
University High School, St. Louis, Mo.
Webster Hotel, Chicago, Ill.
Sheridan Plaza Hotel, Chicago, Ill.
Orrington Hotel, Evanston, Ill.
Jacksonview Hotel, Chicago, Ill.
Oak Park Arms Hotel, Oak Park, Ill.
Hayes Hotel, Chicago, Ill.
U. S. Public Health Hospital (Speedway), Chicago, Ill.
Columbian Life Building, Memphis, Tenn.
Piedmont High School, Piedmont, Cal.
Burlingame High School, Burlingame, Cal.
Cooper Arms Apartment, Long Beach, Cal.
Commonwealth Building, Seattle, Wash.
Bank of Italy Building, Los Angeles, Cal.
Spring Arcade Building, Los Angeles, Cal.
First National Bank Building, Fort Wayne, Ind.
Veterans' Hospital, Palo Alto, Cal.
Union Oil Building, Los Angeles, Cal.
State Building, Civic Center, San Francisco, Cal.
Belvedere Apartments, Brooklyn, N. Y.
Buckingham Hall, Brooklyn, N. Y.
Hotel Alms, Cincinnati, Ohio
Barry Apartment, Chicago, Ill.
Southmoor Hotel, Chicago, Ill.
Sheridan-Brompton Apartment Hotel, Chicago, Ill.
Elks Club, Newark, N. J.
Apartment, 141 East 72nd Street, New York, N. Y.
Westchester Biltmore Country Club, Rye, N. Y.
15-story Apartment, 1158 Fifth Avenue, New York, N. Y.
15-story Apartment, 1133 Park Avenue, New York, N. Y.
Spruce Hotel, Philadelphia, Pa.
18-story Apartment Building, 1900 Rittenhouse Square, Philadelphia, Pa.
14-story Apartment, 132 East 72nd Street, New York, N. Y.
Berkley Carteret Hotel, Asbury Park, N. J.
Clifton High School, Clifton, N. J.
Presbyterian Hospital, Denver, Colo.
Ft. Worth Club, Ft. Worth, Tex.
Ray Building, 19th Street and Broadway, Oakland, Cal.
Lemoore High School, Lemoore, Cal.
Santa Rosa High School, Santa Rosa, Cal.
Los Gatos High School, Los Gatos, Cal.
St. Peters Hospital, Olympia, Wash.
Hanford High School, Hanford, Cal.
New Knickerbocker Hotel, New York, N. Y.
14-story Apartment, 140 West 86th Street, New York, N. Y.
15-story Apartment, 675 West End Avenue, New York, N. Y.
14-story Apartment, N. E. corner Broadway and West 94th Street, New York, N. Y.
14-story Apartment, 529 Cathedral Parkway, New York, N. Y.
9-story Apartment, 138 West 93rd Street, New York, N. Y.
6-story Apartment, 38-48 Sickle Street, New York, N. Y.
6-story Apartment, East Waldo Avenue, South of West 242nd Street, New York, N. Y.
5-story Apartment, Far Rockaway, N. Y.
5-story and Basement Apartment, West side University Avenue, South of West 176th Street, New York, N. Y.
5-story and Basement Apartment, Andrews Avenue and West 176th Street, New York, N. Y.
Fresh Meadow Country Club, Flushing, L. I., N. Y.

ESTABLISHED 1853

PAINE LUMBER COMPANY, Ltd.

Manufacturers of Veneered Doors
OSHKOSH, WISC.

ORIGINAL
The PAINE Miracle Door
TRADE MARK REG. PAT. JULY 10, 1923

Products

Miracle Doors.
Klimax Doors.
Korelock Doors.

The "Miracle" Door

Genuine "Miracle" Doors are manufactured only by the "Paine Lumber Company, Ltd., Oshkosh, Wisc." These doors are produced and guaranteed by an organization that operates from tree to finished product with unsurpassed facilities. It is a substantial, attractive and distinctive door and is made possible only by patented new standards of precision in wood manufacturing.

These doors are endorsed by the entire building industry.

Miracle Doors are made in either solid softwood or hardwood veneer.

Guarantee—Like all of the products of our plants, Paine "Miracle" Doors are fully guaranteed. This guarantee does not protect purchaser against defects due to damage in transit, rough handling, inferior painters' finish, or unreasonable exposure to moisture.

Specifications for "Miracle" Hardwood Doors

All doors both exterior and interior, except metal and metal covered doors shall be "Miracle" veneered doors as manufactured by the Paine Lumber Company, Ltd., Oshkosh, Wisc. The veneers to be as follows (Give here a list of kinds of wood to be used at the different parts of the building).

Interior Doors shall be — inches thick with standard eighth inch veneer and of designs shown or noted.

Exterior Doors shall be — inches thick with —— inch veneer (not less than 3/16 inches—) and of designs as shown and noted. All exterior doors shall be painted with a good grade of oil paint, top and bottom, to prevent absorption of moisture.

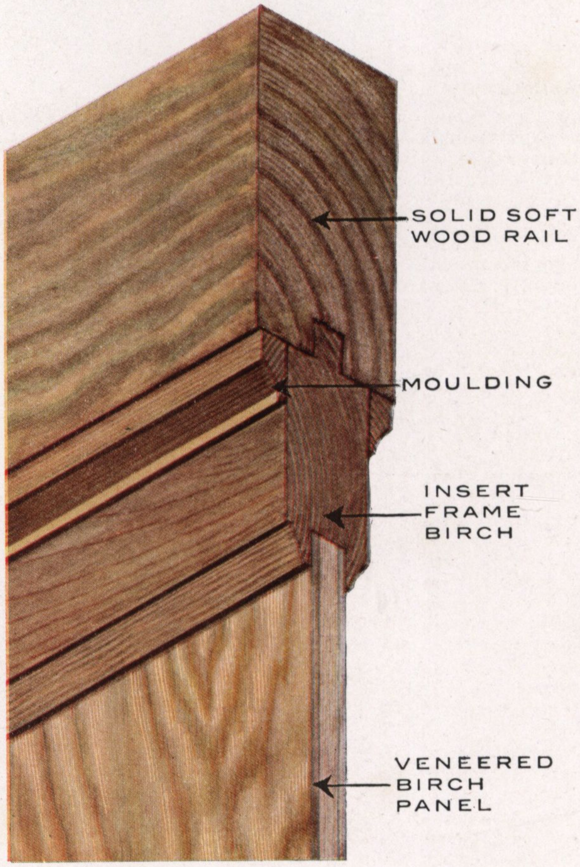
Guarantee—All doors furnished hereunder shall be guaranteed by the manufacturer, who shall replace F. O. B. user's railroad station, any door which proves defective in material or workmanship. The manufacturer's trade mark shall be stamped on edge of door.

Specifications for "Miracle" Softwood Doors

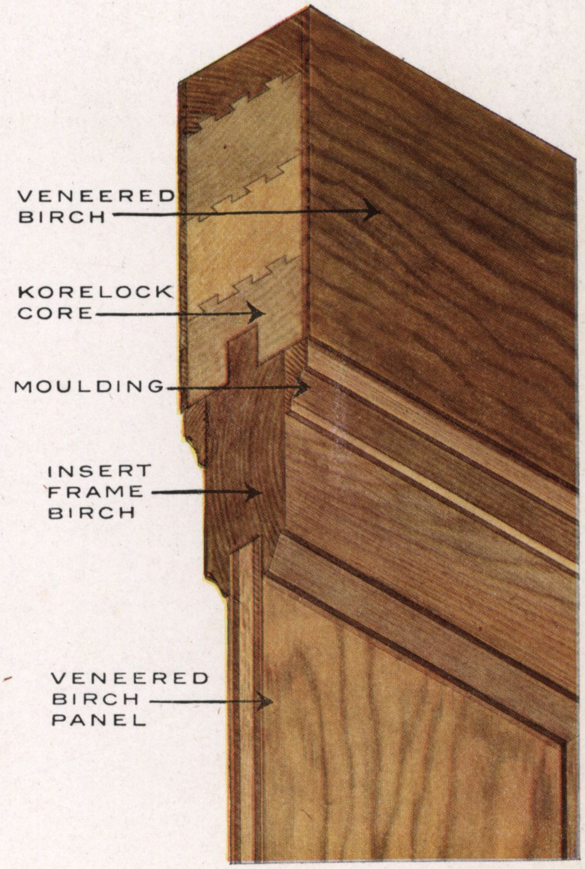
All doors both exterior and interior except metal and metal covered doors shall be "Miracle" softwood doors as manufactured by the Paine Lumber Company, Ltd., Oshkosh, Wisc. These doors shall be of (mention kind of wood desired). Exterior Doors —— inches thick. Interior Doors —— inches thick.

All doors shall be paneled as shown on the drawings. Sash Doors shall have lights as shown.

Guarantee—See Specifications for "Miracle" Hardwood Doors.



Miracle Solid Softwood Door



Miracle Hardwood Veneered Door

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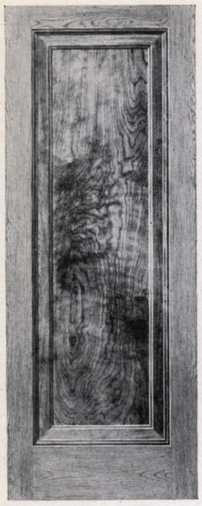
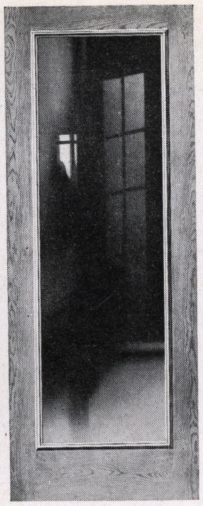

Design 700


Design 701

STANDARD SIZES OF MIRACLE BIRCH VENEERED DOORS NO. 700

2- 0x6-6, 1⅜
2- 4x6-6, 1⅜
2- 6x6-6, 1⅜
2- 0x6-8, 1⅜
2- 2x6-8, 1⅜
2- 4x6-8, 1⅜
2- 6x6-8, 1⅜
2- 8x6-8, 1⅜
2-10x6-8, 1⅜
2- 0x7-0, 1⅜
2- 2x7-0, 1⅜
2- 4x7-0, 1⅜
2- 6x7-0, 1⅜
2- 8x7-0, 1⅜
2-10x7-0 1⅜
3- 0x7-0, 1⅜
2- 6x6-6, 1¾
2- 0x6-8, 1¾
2- 2x6-8, 1¾
2- 4x6-8, 1¾
2- 6x6-8, 1¾
2- 8x6- 8, 1¾
2-10x6- 8, 1¾
3- 0x6- 8, 1¾
2- 6x6-10, 1¾
2- 0x7- 0, 1¾
2- 2x7- 0, 1¾
2- 4x7- 0, 1¾
2- 6x7- 0, 1¾
2- 8x7- 0, 1¾
2-10x7- 0, 1¾
3- 0x7- 0, 1¾

STANDARD SIZES OF MIRACLE SOFTWOOD DOORS NO. 700

2- 0x6-0, 1⅜
2- 0x6-6, 1⅜
2- 2x6-6, 1⅜
2- 4x6-6, 1⅜
2- 6x6-6 1⅜
2- 8x6-6, 1⅜
2- 0x6-8, 1⅜
2- 2x6-8, 1⅜
2- 4x6- 8, 1⅜
2- 6x6- 8, 1⅜
2- 8x6- 8, 1⅜
2-10x6- 8, 1⅜
3- 0x6- 8, 1⅜
2- 0x6-10, 1⅜
2- 6x6-10, 1⅜
2- 8x6-10, 1⅜
2-10x6-10, 1⅜
2- 0x7- 0, 1⅜
2- 2x7- 0, 1⅜
2- 4x7- 0, 1⅜
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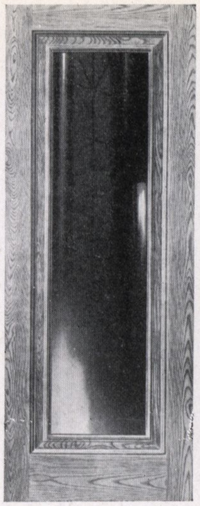
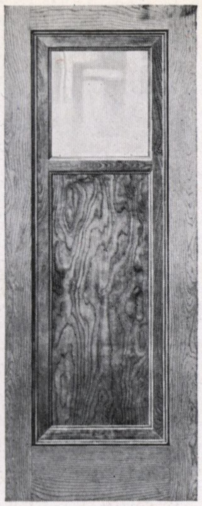
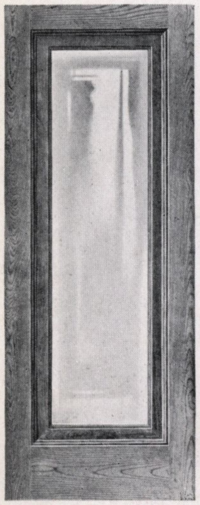
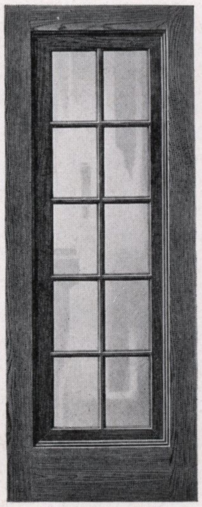
2-10x7- 0, 1⅜
3- 0x7- 0 1⅜


Design 702


Design 703


Design 704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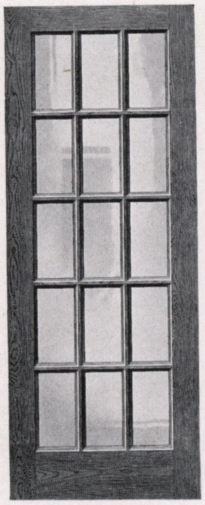
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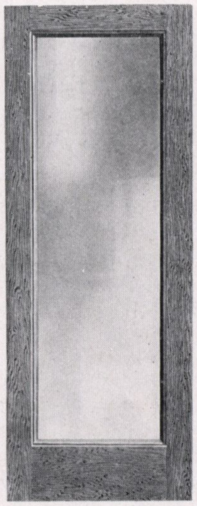
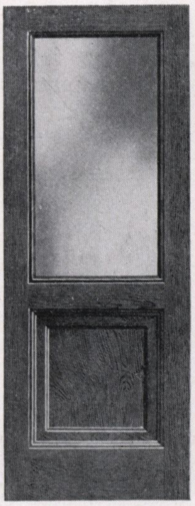
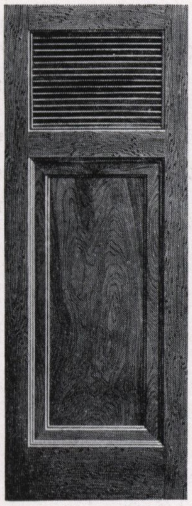

Design 707


Design 708


Design 709

GLASS SIZES OF MIRACLE SASH DOORS

Design	2-6x6-6	2-6x6-8	2-8x6-8	2-10x6-10	2-6x7-0	2-8x7-0	2-10x7-0	3-0x7-0	3-0x7-6	3-0x8-0
No. 701	20x62¾	20x64¾	22x64¾	24x66¾	20x68¾	22x68¾	24x68¾	26x68¾	26x74¾	26x80¾
No. 702	14¾x57½	14¾x59½	16¾x59½	18¾x61½	14¾x63½	16¾x63½	18¾x63½	20¾x63½	20¾x69½	20¾x75½
No. 703	16x16	16x18	18x18	20x20	16x22	18x22	20x22	22x22	22x28	22x34
No. 704	16x58⅞	16x60⅞	18x60⅞	20x62⅞	16x64⅞	18x64⅞	20x64⅞	22x64⅞	22x70⅞	22x76⅞
No. 705	7 9/16x11¼	7 9/16x11⅝	8 9/16x11⅝	9 9/16x12	7 9/16x12 7/16	8 9/16x12 7/16	9 9/16x12 7/16	10 9/16x12 7/16	10 9/16x13⅝	10 9/16x14 13/16
No. 706	6¾x12½	6¾x12⅞	7⅜x12⅞	8x13 5/16	6¾x13 11/16	7⅜x13 11/16	8x13 11/16	8¾x13 11/16	8¾x14⅞	8¾x16⅛
No. 707	20x62¾	20x64¾	22x64¾	24x66¾	20x68¾	22x68¾	24x68¾	26x68¾	26x74¾	26x80¾
No. 708	20x38	20x40	22x40	24x42	26x44	22x44	24x44	26x44	26x50	26x56
No. 709			Width of louvre opening 10″ less than width of door. Height to suit, average 16″							

NOTE:—To make a mirror door No. 701 remove flush moulding from a stock door one side and apply our stock mirror moulding to the insert frame.

NOTE:—To make a mirror door No. 702 apply our stock mirror moulding to the insert frame.

LAYOUTS OF DOORS

Design	Stiles Face Measure Inches	Stiles Including Moulding	Stiles Including Insert Frame	Top Rail Inches	Lock Rail Inches	Bottom Rail Inches	Width of Sticking of Insert Frame Inches	Bars Inches
No. 700	4¼	5¼	7½	4¼	---	9½	½	---
No. 701	4¼	5¼	---	4¼	---	9½	½	---
No. 702	4¼	5¼	7½	4¼	---	9½	½	---
No. 703	4¼	5¼	7½	4¼	2¾	9½	½	---
No. 704	4¼	5¼	7½	4¼	---	9½	½	---
No. 705	4¼	5¼	7½	4¼	---	9½	½	1
No. 706	4¼	4¾	---	4¾	---	9½	---	1½
No. 707	4¼	5¼	---	4¼	---	9½	---	---
No. 708	4¼	5¼	7½	4¼	4¼	9½	½	---
No. 709	4¼	5¼	7½	4¼	4¼	9½	½	--

NOTE:—Wider stiles, if required, will be furnished at a reasonable extra.

Continued on next page

Finishing of Woodwork

The process of finishing woodwork can be understood more clearly by considering the subject under the following heads: Woods, Temperature, Surfaces, Stains, Filling and Finishing Coats.

Woods—The woods used for Interior Woodwork are divided into two classes, viz., Close Grained Woods, which do not require Paste Filler, and Open Grained Woods, which do require Paste Filler. The following is a classified list:

Close Grained Woods			**Open Grained Woods**	
HARDWOODS	SOFTWOODS		HARDWOODS	SOFTWOODS
Birch	Gum	Fir	Oak	Butternut
Cherry	Yellow Pine	Redwood	Walnut	Chestnut
Maple	White Pine	Cedar	Calico Ash	
	Basswood	Hemlock	Brown Ash	
	Spruce	Whitewood	Mahogany	

Temperature—To apply varnish satisfactorily, the temperature of the room in which it is used should be about 70 degrees Fahrenheit, as cold interferes with the working qualities of varnish. It is very important that the wood be free from dampness or the varnish will not dry satisfactorily. Weather conditions also affect the drying. It requires a considerably longer period for varnish to dry in warm, sultry weather.

Surfaces—Varnish does not conceal but magnifies the natural beauty of the wood. A defect on the surface will also be magnified; hence, the importance of seeing that the surface is carefully smoothed and free from defects, dirt and dust before applying the finish.

Stains—Stains of reliable quality, of nearly any shade desired, may be purchased in proper shape for applying. Where stain is used, it is the first application on the wood, either open or close grained, after it is properly surfaced and cleaned.

Stains are designated according to the liquid vehicle in which the colors are mixed, as Spirit Stains, Pigment Oil Stains and Water Stains.

Spirit Stains usually have alcohol as a vehicle. This evaporates so quickly and the stain dries so rapidly that it is impossible to apply the stain evenly on a surface of any dimension. The wood becomes dark in some places and light in others, and the "laps" show plainly. Any attempts at equalizing usually make matters worse. Spirit Stains also have a tendency to "bleed," i.e., their color works through the varnish finish.

Oil Stains are intended principally for soft or close grained woods. They do not raise the grain and for this reason are economical in producing the smooth finishes. Splendid effects can be obtained with oil stains, but the colors are less clear and transparent than those produced by water stains.

Water Stains, often termed acid stains, produce the most satisfactory results. They have a tendency to raise the grain, but this is easily overcome by sponging wood with clear water and sanding smooth before applying the stain. This is only necessary where very smooth finishes are desired. Water Stains produce clear, transparent colors, are simple to use, can be applied evenly and quickly on woods of all kinds and will permit of any method of finishing over them. Water Stains, however, should not be used on exterior work from the fact that it is necessary to apply a coat of Shellac over these stains, and Shellac is not recommended for exterior use. If other than the natural wood color is desired for exterior work on close grained woods, one coat of Pigment Oil Stain (desired color) should be applied, then two or three coats of Exterior Varnish. Open grained woods should first be filled with a Paste Filler. Sometimes the desired effect can be obtained by using Paste Filler of the color desired. If, however, a different color is wanted than can be obtained by Paste Fillers, the open grained wood should first be stained with a Pigment Oil Stain of the color desired, then filled with a Paste Filler as nearly the same color as the stain. Then apply two or three coats of Exterior Varnish.

Filling—Close grained woods do not require Paste Filler, as they have no open cellular tissue to fill. Open grained woods, after being properly surfaced and stained, where a stain finish is desired, should be thoroughly filled with what is known as "Paste Filler." The filler should be allowed at least twenty-four hours to dry. If an examination shows that the surface is perfectly smooth, the wood may be considered ready for the first coat of varnish. When filling stained woods, the shade of filler is usually the same color as the stain, but frequently altered to produce varied effects.

Finishing Coats—At this point it is necessary to use a finishing varnish suitable for the purpose. On exterior woodwork a high grade of Exterior Varnish should be used to stand the exposure of the weather. Two good coats will prove satisfactory, but three will give the finish more fullness and a richer effect. On interior woodwork an Interior Finishing Varnish should be used, the exact kind and quality depending on whether the final finish is to be left in the gloss, rubbed dull or rubbed and polished.

Gloss Finish—On interior woodwork apply to the natural or stained surface a thin coat of shellac, let dry and then sand with 00 flint paper. Apply first coat of interior gloss varnish. Allow to dry thoroughly, then sand with 000 flint paper. Apply second coat of same varnish and let dry. On exterior woodwork *do not use shellac*. A good grade of exterior varnish should be used and applied directly to the surface. Sand first coat of varnish when dry with 000 flint paper, then apply second coat of exterior varnish and let dry. If third coat of varnish is applied, sand with 000 sand paper between second and third coats.

Rubbed Finish—On interior woodwork use an interior rubbing varnish. Proceed the same as for gloss finish, rubbing the last coat when dry with FFF pumice stone and paraffin rubbing oil to an egg-shell gloss. Wipe surface clean with cotton waste. On exterior woodwork use a good grade of exterior varnish, same as for gloss finish, proceed in the same way, rubbing the last coat when thoroughly dry with FFF pumice stone and paraffin rubbing oil to an egg-shell gloss. Wipe the surface clean with cotton waste.

Rubbed and Polished Finish—On interior woodwork use a rubbing and polishing varnish. Proceed with same as for a rubbed finish. After rubbing finish coat of varnish with pumice stone and oil, polish with rotten stone and furniture polish. Wipe surface clean with cotton waste. It is not customary to rub and polish exterior woodwork.

Flat Finishes—There are at the present time on the market various Flat Finishes of reliable quality for interior woodwork which will produce either a mission or rubbed finish without the labor of rubbing. While these materials do not entirely take the place of rubbing and polishing varnish, there are many cases where they may be used with the highest satisfaction, and by their use either of the above named effects will be secured at a greatly reduced cost. Where material of this nature is used, the finishing process is the same up to the application of the finishing coat.

Continued on next page

Prominent Installations

The manufacturers of the Miracle Door hold all the gold medals ever awarded the door industry by any national or international exposition in the United States.

The following is a list of a few of the users of "Miracle Doors":

Rockefeller Junior Dormitory,
Mt. Holyoke College, South Hadley, Mass.
Architects—Putnam & Cox, Boston, Mass.
Bon Air-Vanderbilt Hotel, Augusta, Ga.
Architect—Willis Irvin, Augusta, Ga.
McKim, Mead and White Associates, New York City.
Kansas City Athletic Club, Kansas City, Mo.
Architects—Hoit, Price & Barnes, Kansas City, Mo.
Eastern Junior High School, Lynn, Mass.
Architect—Geo. A. Cornet, Lynn, Mass.
Roosevelt High School, Wichita, Kansas.
Architects—Lorentz Schmidt & Co., Wichita, Kan.
The Granada, Miami, Fla.
Architect—M. L. Hampton, Miami, Fla.
Alden Park Manor, Detroit, Mich.
Architect—Kenneth M. DeVos, Detroit, Mich.
Buckingham & Belmont Apartments, Denver, Colo.
Architect—Wm. N. Bowman Co., Denver, Colo.
Presidential Apartments, Washington, D. C.
Architect—Appleton P. Clark, Jr., Washington, D. C.
Country Shore Apartments, Chicago, Ill.
Architect—Albert S. Hecht, Chicago, Ill.
Alden Park Manor, Brookline, Mass.
Architect—Harold Field Kellogg, Boston, Mass.
Bronzin Apartments, Minneapolis, Minn.
Architect—Alexander Fraser Rose, Minneapolis, Minn.
The Gatesworth Apartment Hotel, St. Louis, Mo.
Architects—Barnett, Haynes & Barnett, St. Louis, Mo.
The Rosemont, Cleveland, Ohio.
Architect—Max Weis, Cleveland, Ohio.
Oakwood Manor Apartments, Grand Rapids, Mich.
Architect—J. Will Wilson, Detroit, Mich.
Sylburn Court Apartments, Baltimore, Md.
Architect—Geo. R. Callis, Jr. Baltimore, Md.
Roosevelt Hotel, New Orleans, La.
Architects—Favrot and Livaudais, New Orleans, La.
Shorecrest Apartments, Milwaukee, Wis.
Architects—Martin Tulgren & Sons, Milwaukee, Wis.

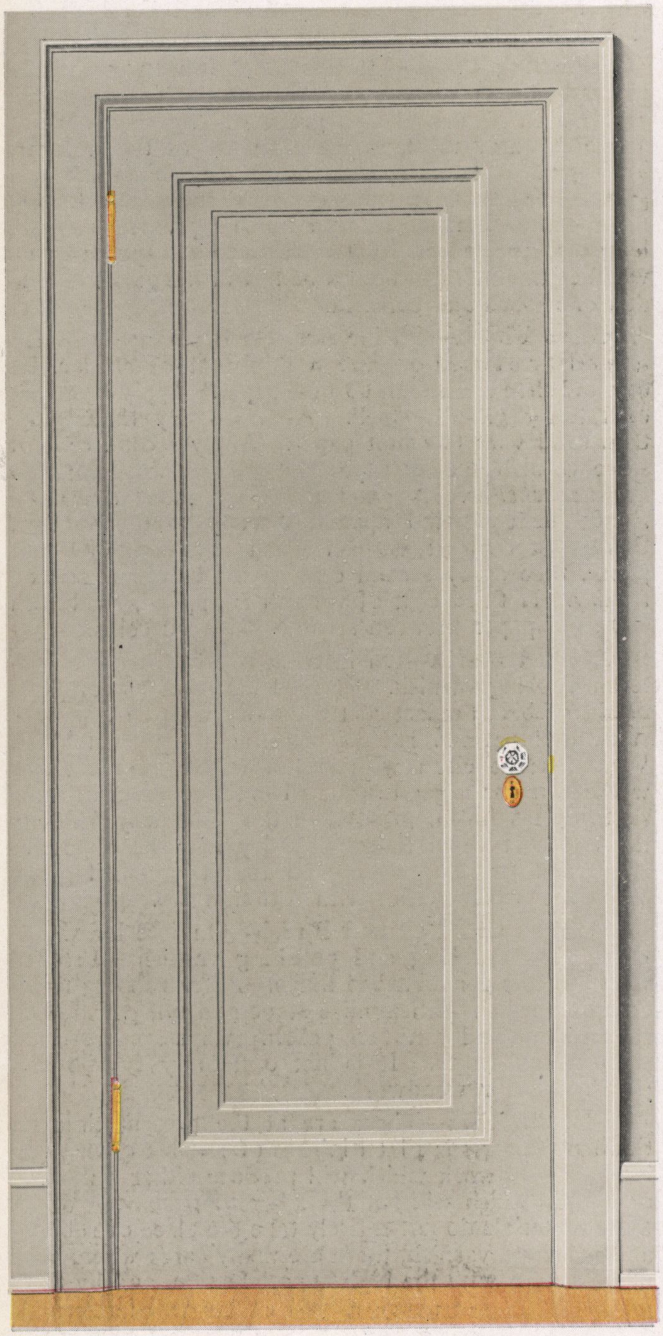


Illustration shows a Miracle Door with Spruce frame and unselected Birch insert with the trim Spruce. The door, trim and wall are finished French gray with two coats of flat French gray. The floor is Maple finished natural.

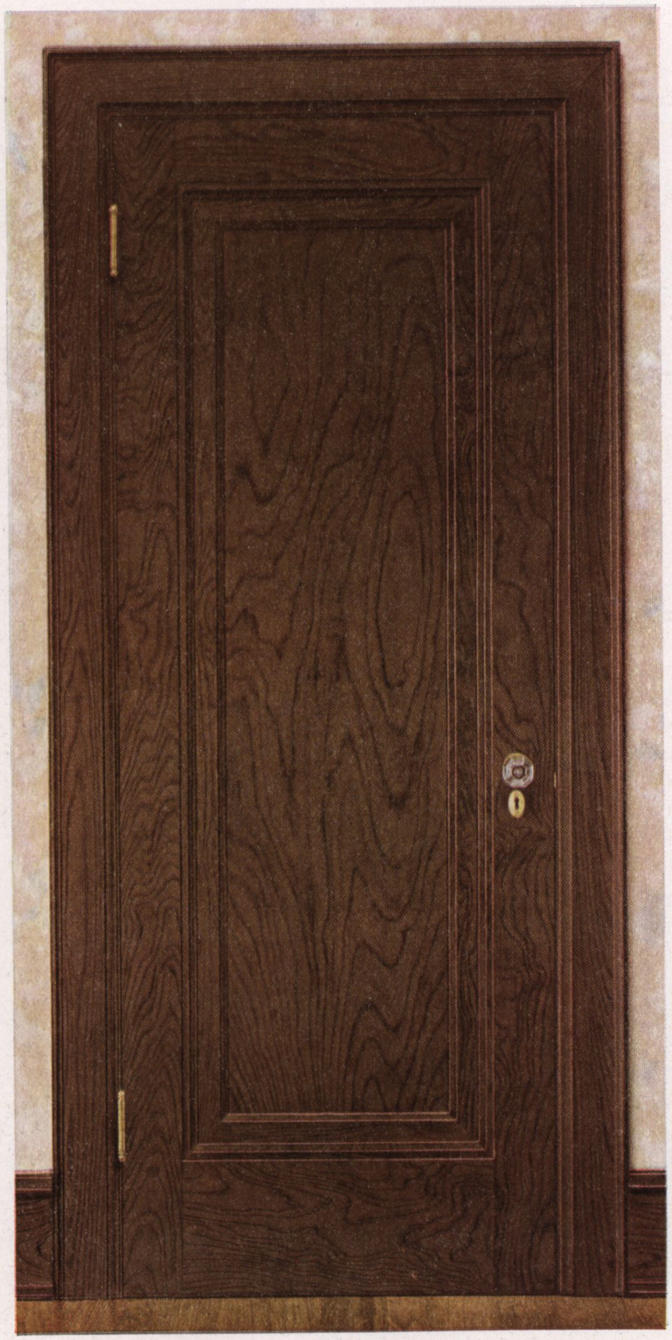


Illustration shows a veneered unselected Birch Miracle Door with unselected Birch trim. The door and trim are finished walnut with one coat of stain, one coat of white shellac and two coats of varnish.

ESTABLISHED 1885

HUTTIG SASH & DOOR CO.

Manufacturers of High Grade Millwork, Interior Trim and Cabinetwork

ST. LOUIS, MO.

SATIN BRAND
REG. U.S. PAT. OFF.
THE BUILDERS' PERFECT WOODWORK
SMOOTH AS A SMILE

Products

MILLWORK, INTERIOR TRIM and CABINETWORK:

- Doors:
  - Solid Softwood; Veneered Hardwood.
  - Sash Doors.
  - French Doors.
  - Mirror Doors.
  - Garage Doors.
- Interior Trim.
- Cabinetwork:
  - Sideboards; Buffets; Cupboards; Mantels; Bookcases; Window Seats; Breakfast Nooks, Kitchen Cabinets, Linen and Clothes Cabinets; Medicine Cabinets.
- Stairs:
  - Balusters; Newels; Handrails, etc.
- Colonnades.
- Porch Columns.
- Window and Door Frames.
- Window Sash.
- Built-in Ironing Board Cabinets.
- Office Railings and Partitions.
- Garden Furniture:
  - Pergolas; Arbors; Trellises.

Facilities and Experience

Our huge plant, consisting of 500,000 sq. ft. of floor space and 8 acres of ground, together with enormous stocks of raw materials, modern manufacturing equipment and thoroughly experienced woodworkers, gives us excellent quantity production facilities and low cost manufacturing advantages.

We have been continuously manufacturing high grade millwork, interior trim and cabinetwork for the past 40 years.

Satin Brand—The Woodwork of Quality

The Satin Brand label is a guarantee of high grade material and workmanship, and extraordinary durability, backed by 40 years' experience in this field.

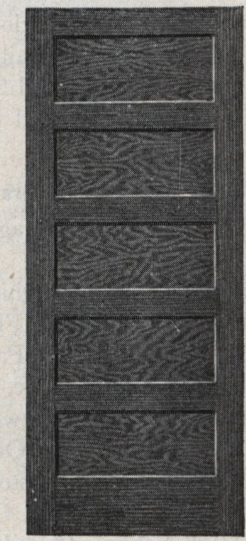
Our interest in Satin Brand woodwork does not end with delivery at the building, but it continues to final installation and finish. To insure correct finishing, we recommend that the work be filled and shellacked before shipment. In this way the work is protected against atmospheric changes and an absolutely perfect finish is assured. As an additional service, we will submit estimates on Satin Brand woodwork finished in accordance with architects' specifications.

Special Woodwork

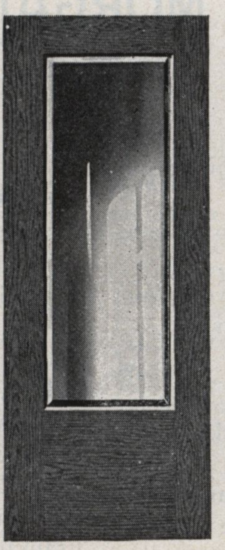
In addition to furnishing our standard stock designs, we make special, high grade woodwork in strict accordance with architects' details and specifications.

Huttig's "Handy Helper"

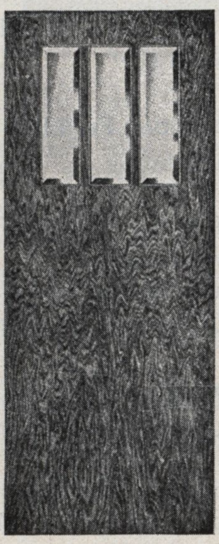
The complete line of Satin Brand millwork, interior trim and cabinetwork is described in our "Handy Helper," which will be sent on request.



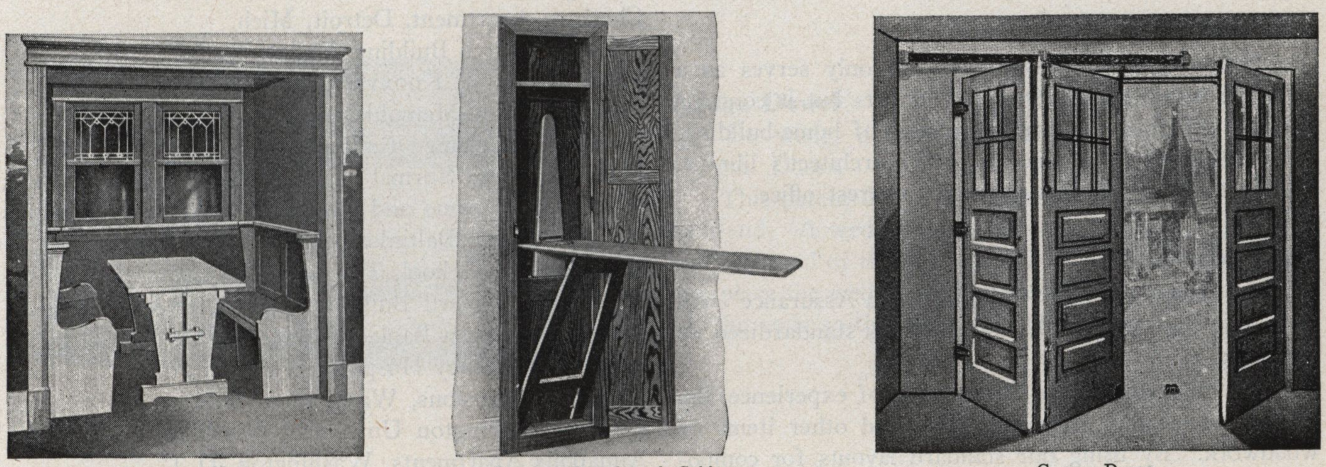
Solid Softwood Door



Veneered Hardwood Door



Flush Veneered Door



Breakfast Nook

Ironing Board and Cabinet

Garage Doors

A Few Examples from the Complete Line of Satin Brand Woodwork

MORGAN WOODWORK ORGANIZATION

Morgan Quality Standardized Doors and Woodwork

GENERAL OFFICES
OSHKOSH, WIS.

Comprising the Following Organizations that Manufacture and Distribute Morgan Woodwork Products

MORGAN COMPANY, OSHKOSH, WIS.

MORGAN SASH & DOOR CO.
CHICAGO, ILL.; DETROIT, MICH.; CLEVELAND, OHIO

MORGAN MILLWORK CO.
BALTIMORE, MD.; JERSEY CITY, N. J.; GREENSBORO, N. C.

SAWMILL OPERATIONS: ORIN, WASH. AND FORREST CITY, ARK.
SALES OFFICES: NEW YORK, N. Y.

Products

Morgan Doors and Standardized Woodwork, including Sash, Trim, Blinds, Cabinet Work, Stairwork.

MORGAN
TRADE-MARK
(Registered)

Manufacturing and Distributing Facilities

Two sawmills, manufacturing our own timber into lumber.

A modern factory for the manufacture of a complete line of doors and woodwork.

Distributing warehouses well located to give prompt service and carrying large stocks of standard sizes.

Trade-mark and Guarantee

Every genuine Morgan Product is stamped with the trade-mark shown above.

All woodwork bearing the Morgan stamp which with proper care fails to give satisfaction will be replaced, free of charge.

Catalogue

"Building With Assurance" not only serves as a complete catalogue of Morgan Products but it contains valuable information on many phases of home-building. It is deserving of a place in every architect's library. For further information write our nearest office.

Standardization

An examination of "Building With Assurance" will show that the Morgan Organization has standardized its products.

We have worked out, from years of experience, the most economical layouts for doors and other items of woodwork. By using our standard layouts for component parts, a great variety of combinations can be obtained without necessitating special setting up of machines.

For veneered doors, our standard widths for stile and top rail are 4⅞ in. and 5½ in. and for bottom rail 9 in. and 12 in. Special layouts mean greater cost and delay in manufacturing.

Installations of Morgan Doors and Woodwork

Edgewater Beach Hotel, Chicago, Ill.—Unit No. 1 and No. 2
Sovereign Hotel, Cleveland, Ohio
Mason Hotel, St. Petersburg, Fla.
San Maria Apartments, Oak Park, Ill.
Calgary Hotel, Montreal, Que.
The Cambria Apartments, New York, N. Y.
Whalen Block, Port Arthur, Ont.
New Mammoth Hotel, Yellowstone Park, Wyo.
Mt. Sinai Hospital, Cleveland, Ohio
Frankford High School, Philadelphia, Pa.
Metropolitan Bank, New Orleans, La.
Chatham Apartment, Detroit, Mich.
Adolphus Burch Building, Dallas, Tex.
Farragut Hotel, Knoxville, Tenn.
Peabody Hotel, Memphis, Tenn.
Insurance Exchange Building, Montreal, Que.
Maryland State Normal School Buildings, Towson, Md.
School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.
Towson High School, Towson, Md.
Montgomery Ward Building, Baltimore, Md.
Federal American Bank, Washington, D. C.
Annex Emergency Hospital, Washington, D. C.
Cathedral Mansions, Washington, D. C.
George Washington University, Washington, D. C.
Annapolis Apartments, Washington, D. C.
English Village, Washington, D. C.

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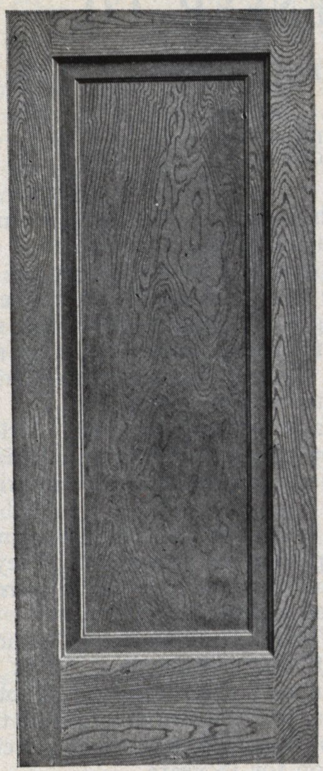
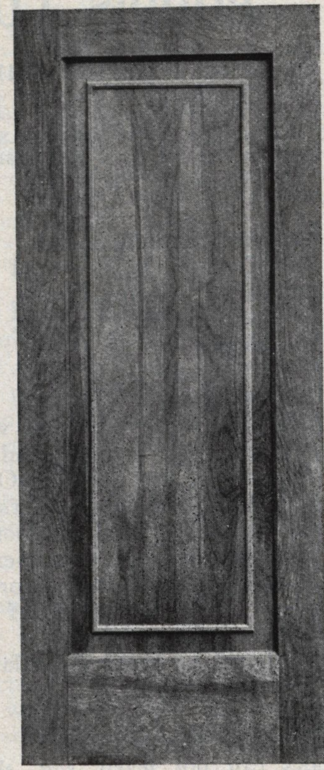


M-777
Framed Panels



M-721
Wedgewood

Morgan Doors

Two stock designs of Morgan Doors are shown above which are meeting with a great deal of favor at the present time. They have been specified for hotels, apartments, and private residences.

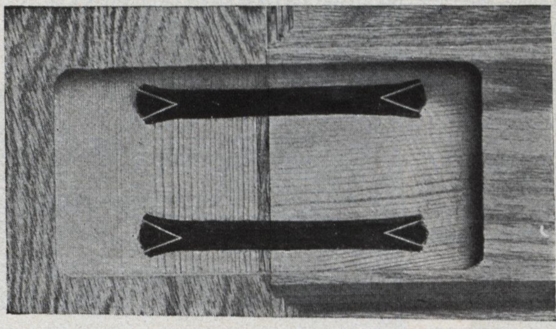
They are carried in stock in a wide range of sizes veneered with unselected gum, plain red gum, unselected birch and plain red oak. They are also carried in stock with white pine stiles and rails and laminated panels of unselected gum and unselected birch. They can be made to order in any desired wood.

Circulars which fully describe these doors, giving standard layouts and details of construction, will be mailed on request.

These are only two of many designs of Standardized Morgan Doors.

We specialize in the manufacture of flush doors, which are particularly suitable for hospitals and schools.

The price of all Morgan Products is always as low as is consistent with high quality of material and workmanship.



Wedge Dowel

The wedge dowel is a patented feature used in all Morgan Doors.

This patent dowel is of hardwood split obliquely at each end. A wedge-shaped piece of hardwood is fitted into each end of the dowel. When the dowel is clamped into place the wedges are drawn into the dowel, expanding the ends so that they hold like a vise.

RODDIS LUMBER AND VENEER CO.

Manufacturers of Flush and French Doors

MARSHFIELD, WIS.

SAWMILLS: PARK FALLS AND MARSHFIELD, WIS.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

Roddis Flush and French Doors.

Also Desk and Table Tops, Veneered Panels, Plain and Inlaid Wainscoting, Counter Fronts, Flat Waterproof Plywood, "Roddiswood," Lumber, Cedar Poles and Posts, Cedar Shingles.

Facilities and Resources

We own more than 40,000 acres of virgin timber, 25 miles of railroad, two sawmills and the largest veneer-cutting factory in the world. Our veneered panels are used by leading cabinet makers, and manufacturers of finest furniture. Roddis Doors are standard equipment in thousands of prominent buildings. They are made entirely by Roddis workmen, from timber to finished product. Thousands of doors in the white are stocked for instant delivery.

For more than a quarter-century, the largest makers of Flush and French Doors.

Merits of Roddis Flush Doors

Roddis Doors can not warp, sag, shrink, swell, separate nor check. They are sanitary, soundproof and fire resisting. Heat, cold, dampness, water, or steam does not affect them. They are furnished with surface veneer of any desired wood and inlaid as specified. The unbroken surface of natural wood provides a great natural beauty which is of important decorative value.

Highly endorsed by leading architects for hotels, hospitals, schools, clubs, apartments, public and office buildings, and better class homes.

Materials

We control every step in the production of Roddis Flush Doors. Material for the cores comes from our own timber tracts, through our sawmills, and its proper seasoning and drying is under our scientific direction. Only this specially prepared wood enters the cores; no waste nor odd scrap material is used. Veneers are cut from logs in our plant. Waterproof glue of our own manufacture is used exclusively.

Construction

All Roddis Doors are of the exclusive Roddis design of five-ply construction as illustrated.

The core is of softwood blocks uneven in length to absorb any tendency toward warpage. These are cemented with waterproof glue, providing a core of unchangeable shape and size with multiple the strength of a one-piece core.

Around the core—top, bottom and both sides—is an edge-strip of hardwood ¾ inch thick applied with waterproof glue. This contributes added strength and seals the core from moisture at the edges; also furnishing a smooth edge for hardware.

The cross band of strong veneer, $\frac{1}{16}$ inch thick, is glued over the two sides of the door, the grain of the veneer running across the door. This seals the two faces against moisture. With the edge-strip, it locks the core in an airtight compartment—the core can not change from its original dimension.

The surface veneer, $\frac{1}{16}$ inch thick, is applied with the grain running vertically. This may be of any wood desired to conform with interior decorative plans.

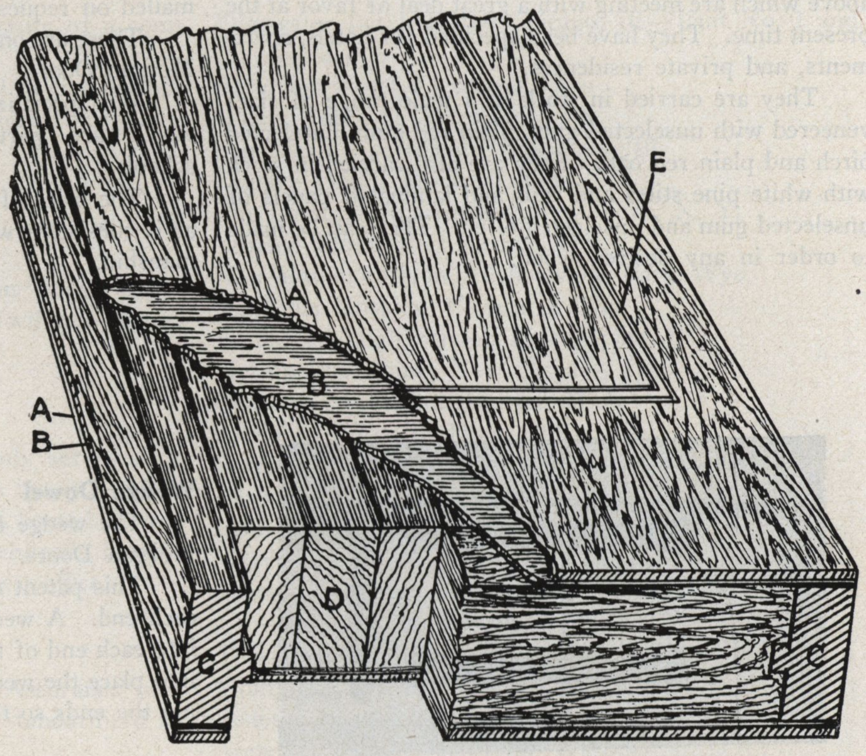
Under a hydraulic press, the assembled door is squeezed into permanent alignment. They are given a true, square and even surface which is retained under severest service conditions.

The flush door is unlike the stile-and-rail type in surface, weight and construction. It is five plies of wood and waterproof glue, from top to bottom.

We are practically the originators of the flush door in a commercial way and have made no change in this basic construction for 18 years.

Veneers

Unless otherwise specified, $\frac{1}{16}$-inch veneer is used on all doors. Long experience proves the correctness of this specification. Fine pianos and furniture use veneer 1/24 or 1/28 inch thick.



Detail of Roddis Door Construction

A—Surface veneer of desired wood for finishing

B—Cross banding veneer sealing faces of core

C—Hardwood edge-strip ¾ inch thick on all edges

D—Core of narrow soft wood strips glued to provide unchangeable foundation for veneers

E—Inlay of contrasting woods

Continued on next page

Waterproof Glue

All Roddis Doors are glued with waterproof glue, exclusively. This is of our own compounding in accordance with private formulæ perfected by our chemists during execution of strict aeroplane contracts for the U. S. Government. Moisture has no effect on it; heat does not blister it. The completed door can be likened to wood permanently set in cement.

Inlays

Inlays are furnished in any design, in plain or fancy woods. Crests, numbers, names and special designs can be supplied. Before inlaid, doors should be stained in order to protect the inlay. This is important and should be handled at our plant.

Guarantee

This Company unconditionally guarantees every Roddis Door and agrees to repair or replace without charge any doors that within two years should be found defective in workmanship or material.

Specifications

All interior doors throughout shall be laminated 5-ply flush veneered doors without panels as made by the Roddis Lumber and Veneer Company, of Marshfield, Wis.

All doors shall be glued exclusively with waterproof glue and guaranteed by the manufacturer for a period of at least two years from date of installation.

These doors shall be of thickness specified by the architect with cores built up of narrow strips of thoroughly dried soft woods, and glued together, and veneered with two $\frac{1}{16}$-inch veneers on each side; the lower veneer or cross banding running crosswise and the face veneer running lengthwise of the door. Top, bottom and both side edges shall be banded with a hardwood edge-strip $\frac{3}{4}$ inch thick glued to the core. The cross banding shall run to the edge of the door.

All inlaid doors shall be water stained before inlaying, with approved color, to prevent staining of inlay. Interior doors are to be given one coat of shellac after inlaying and before shipping, to protect them.

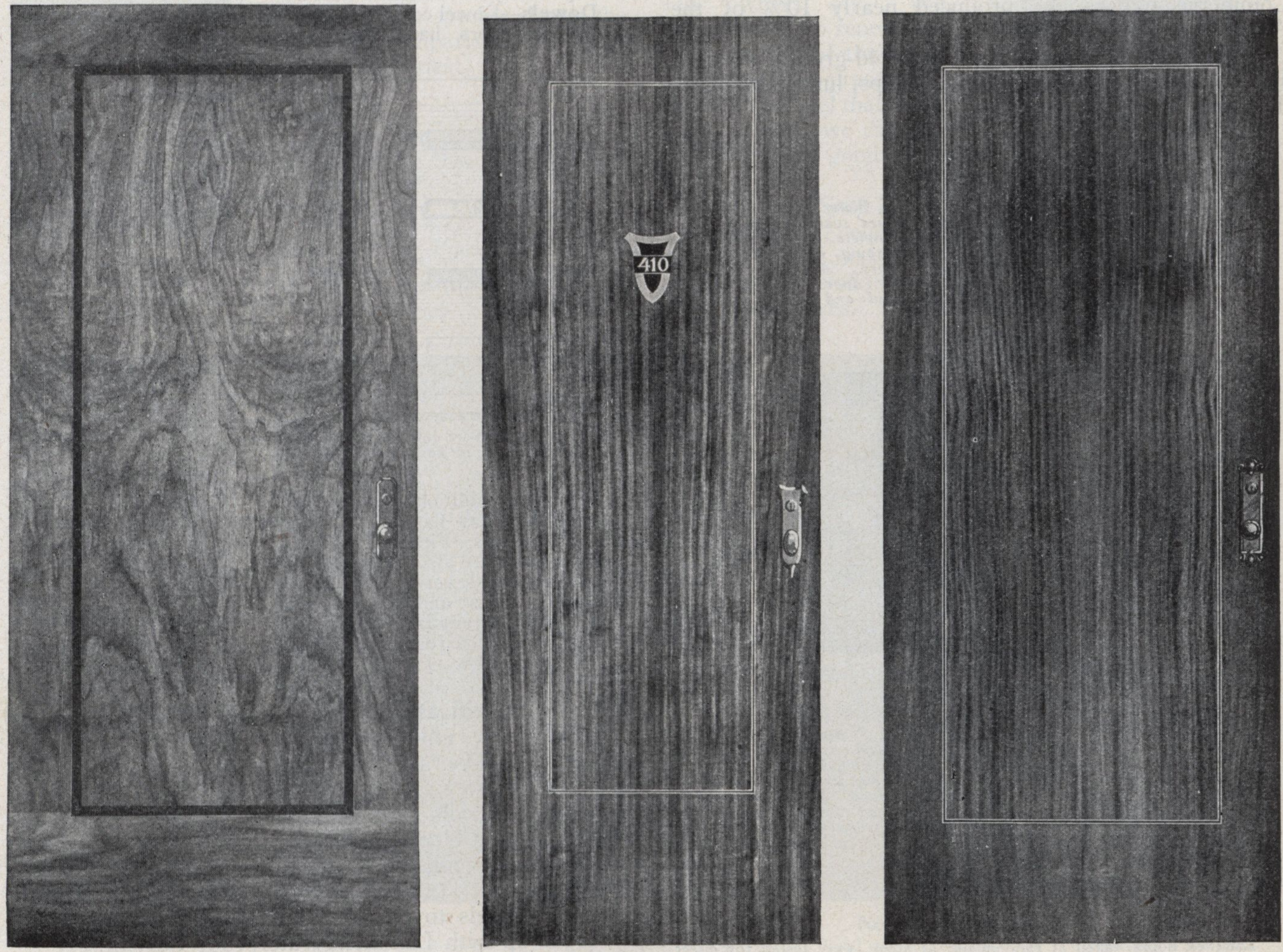
All doors to be hand sanded, carefully crated or packed in car, and subject to approval of architect.

Catalogues and Bulletins

A complete reference catalogue of 88 pages containing full data regarding the construction of Roddis Doors and the many door styles available for instant shipment, will be mailed upon letterhead request. Also, special bulletins are issued at intervals illustrating current typical installations of Roddis Doors in buildings of prominence—hotels, schools, hospitals, etc. These are of specific aid to architects planning buildings of similar nature.

Endorsements

Roddis Flush Doors are in service in thousands of prominent buildings in all sections of the country. Leading architects specify them regularly. To any architect unfamiliar with Roddis Doors, a comprehensive list of such endorsements will gladly be submitted.



Walnut, Wade Park Manor Type   Inlaid Mahogany, with Number Crest   Mahogany, Statler Type

Representative Styles of Roddis Doors

THE WHEELER, OSGOOD COMPANY

Manufacturers of Douglas Fir Doors and Fir Sash

TACOMA, WASH.

SALES OFFICES

NEW YORK, N. Y., 5622 Grand Central Terminal
MEMPHIS, TENN., 1870 Peabody Avenue
CHICAGO, ILL., 653 North Mayfield Avenue
LOS ANGELES, CAL., 1617 East 16th Street
SAN FRANCISCO, CAL., 112 Market Street
SPOKANE, WASH., 806 Old National Bank Building
LONDON, ENGLAND, Woco Door Company, Dashwood House

Stocks carried by Leading Jobbers in all distributing centers of United States and Canada

LAMINEX DOORS

"Will not Shrink, Swell or Warp"

A WOCO PRODUCT
TRADE-MARK

Products

Laminex, an improved Built-up Door made with special formula waterproof cement.

Woco Fir Sash.

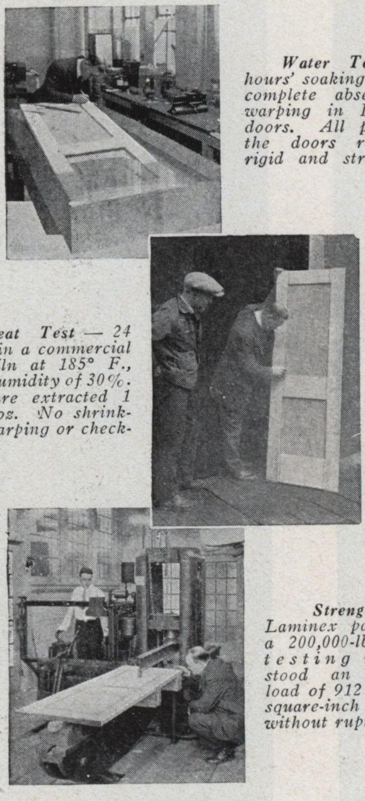
Also manufacturers of Woco Solid Stile and Rail Doors with Laminex waterproof cemented panels, and Woco Garage Doors.

Old-growth Douglas Fir is used exclusively in our products.

Resources and Experience

The Wheeler, Osgood Company, established in 1889, are pioneers in the manufacture of Douglas Fir doors and fir sash. Our production of doors is the largest in the world. According to U. S. Department of Commerce figures, we produced nearly 10% of the American output in 1924.

We own a large stand of fine, old-growth Douglas Fir and operate our own logging camps, lumber mill and door factories.



Water Test — 24 hours' soaking showed complete absence of warping in Laminex doors. All parts of the doors remained rigid and strong.

Heat Test — 24 hours in a commercial dry kiln at 185° F., with humidity of 30%. Moisture extracted 1 lb. 2 oz. No shrinkage, warping or checking.

Strength Test:— Laminex panels, in a 200,000-lb. Olsen testing machine, stood an average load of 912 lb. on a square-inch surface without rupturing.

Scientific Tests

Laminex doors, taken at random out of stock, were tested for effect of moisture and heat and for strength by Prof. Bror L. Grondal in the Forest Products Laboratory, University of Washington, Seattle, with the results shown above

What Laminex Is

We offer in Laminex a moderate-priced door with all the advantages of a built-up or veneer door—and none of the disadvantages. Laminex will not shrink, swell or warp, because the stiles, rails and panels are built-up and the grain of adjoining sections so crossed that all expansion and contraction are equalized.

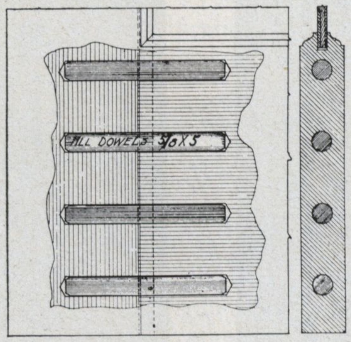
We have perfected a waterproof cement which has withstood scientific tests—has gone through floods and exposure where doors of all other types and woods failed.

Over a million Laminex doors are now in use, many of them in climates where excessive moisture or heat causes other veneered doors to separate, check, buckle and peel.

Construction of Laminex Doors

Several special features add to the remarkable strength and superiority of Laminex doors.

Dowels—Dowel construction as shown below. All Laminex and Woco doors have four wooden dowels in the bottom rail and two in the top rail. All dowels are ⅝ in. in diameter and 5 in. long. These give 50% more strength and 30% greater cementing surface than dowels ½ in. in diameter.

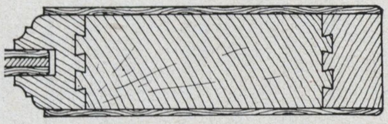


Dowel Construction

All Laminex and Woco doors have four ⅝-in. dowels in bottom rail

Wedge Joint—In building the stiles and rails, a strip is dovetailed and cemented the entire length with a tight-wedged joint (see diagram below). When the 200-lb. per square inch hydraulic pressure is exerted on each section and it is dried under this tremendous pressure, the construction of Laminex doors becomes virtually solid.

Grain—In addition to the rotary cut flat grain Douglas Fir, Laminex doors are also made with sliced vertical grain stiles and rails. Vertical grain is particularly desired for high class enamel work.



Cross Section of Sticking and Stile Showing Wedge Joint

Standard Specification for Laminex Doors

All doors, unless otherwise indicated, shall be Laminex Fir Doors manufactured by The Wheeler, Osgood Company, Tacoma, Washington.

Stiles and rails shall be built up. Edge strips dovetailed to center blocks. Face veneers shall be (flat or vertical grain) cemented to cores with Laminex Waterproof Cement.

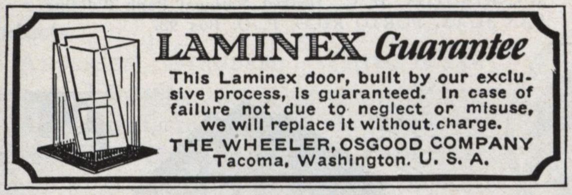
Door panels to be rotary cut, Douglas Fir, three-ply, made up with Laminex Waterproof Cement.

The doors, when delivered to the job, shall bear the Laminex guarantee label and trade-mark.

Continued on next page

Laminex Guarantee

The definite replacement guarantee shown below is affixed to every Laminex door. A similar guarantee will be found on No. 1 Woco Douglas Fir solid stile and rail doors with Laminex panels.

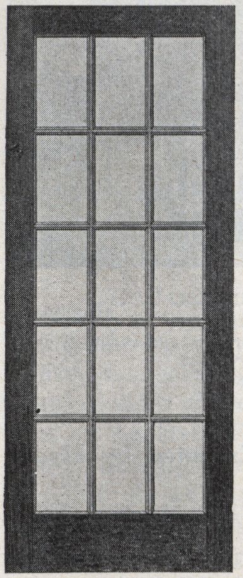


LAMINEX *Guarantee*

This Laminex door, built by our exclusive process, is guaranteed. In case of failure not due to neglect or misuse, we will replace it without charge.

THE WHEELER, OSGOOD COMPANY
Tacoma, Washington. U. S. A.

Strength and Durability of Old-growth Douglas Fir



No. 1535

Bead and Cove; stiles and top rail $4\frac{9}{16}$ in.; bottom rail $9\frac{3}{8}$ in.

U. S. Department of Agriculture tests show that:

Douglas Fir is equal in durability to Eastern White Pine.

Douglas Fir is over 10% higher in durability than Western White Pine.

Douglas Fir is over 88% higher in durability than Western Yellow Pine.

Douglas Fir is over 60% higher in durability than California Sugar Pine.

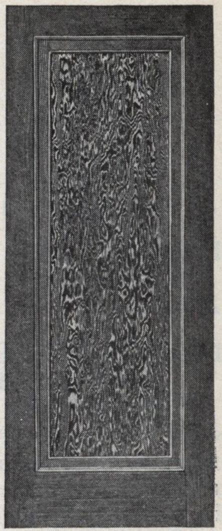
In comparison with commercial White Oak, the heartwood of these species shows the following comparison in decay resisting qualities:

White Oak	100%
Douglas Fir (average 80%)	75 to 85%
Northern White Pine (average 80%)	70 to 90%
Western White Pine (average $72\frac{1}{2}$%)	65 to 80%
Western Yellow Pine (average $42\frac{1}{2}$%)	35 to 50%
California Sugar Pine (average 50%)	45 to 55%

"Belle Porte"—a New Laminex Sub-frame Door

This design has the individuality desired for high class use, particularly for hotels, apartment houses, offices, etc.

Made with all square joints, and sub-frame fully doweled. Stiles, rails and panels are Laminex construction. Vertical or flat-grain stiles and rails, flat-grain panel.



"Belle Porte"

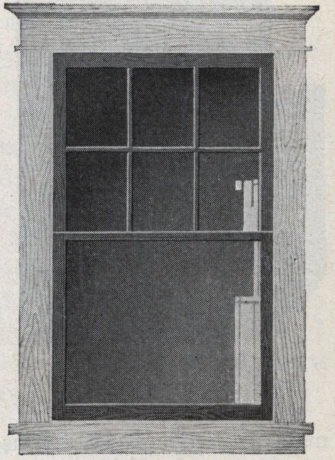
Stiles and top rail $4\frac{9}{16}$ in.; bottom rail $9\frac{3}{8}$ in.

Woco Fir Sash

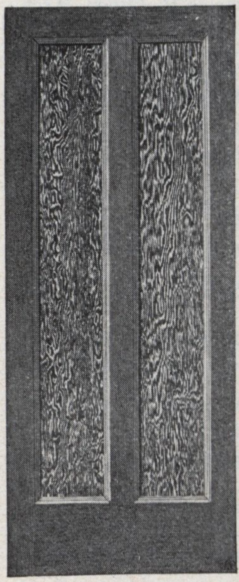
The remarkable durability of Douglas Fir makes it the ideal wood for sash.

The North American Building, State Street, Chicago, Ill., built in 1911, has fir sash throughout. The owners say, "We have not had to renew any from the fact of the wood rotting. From present indications we feel that, with ordinary care, we can expect continued good service."

Woco Fir Sash is free from sapwood, eliminating decay and making it permanent. Available in all standard sizes.

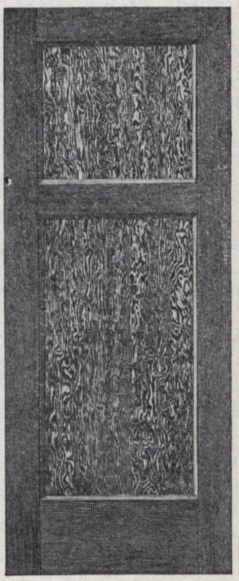


Woco Fir Sash



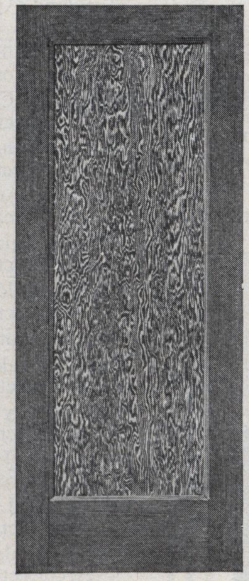
No. 80

Bead and Cove sticking; stiles $4\frac{9}{16}$ in.; top rail $4\frac{9}{16}$ in.; muntin $4\frac{1}{2}$ in.; bottom rail $9\frac{3}{8}$ in.



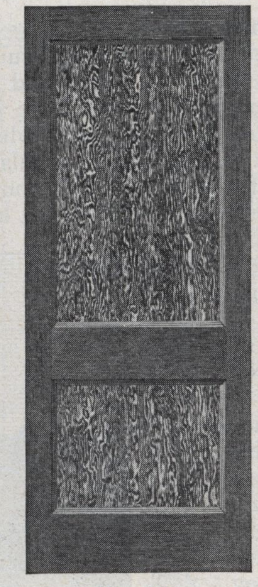
No. 29

Bead and Cove sticking; stiles and top rail $4\frac{9}{16}$ in.; lock rail $4\frac{1}{2}$ in.; bottom rail $9\frac{3}{8}$ in.



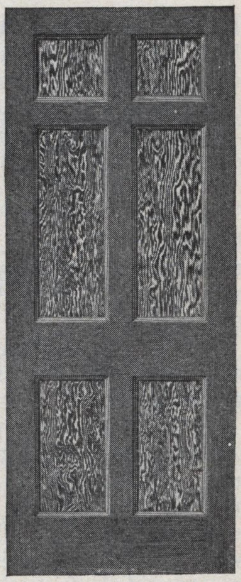
No. 21

Bead and Cove sticking; stiles and top rail $4\frac{9}{16}$ in.; bottom rail $9\frac{3}{8}$ in.



No. 82

Bead and Cove sticking; stiles $4\frac{9}{16}$ in.; top rail $4\frac{9}{16}$ in.; lock rail 8 in.; bottom rail $9\frac{3}{8}$ in.



No. 66

Bead and Cove sticking; stiles and top rail $4\frac{9}{16}$ in.; lock rail 8 in.; muntin and cross rail $4\frac{1}{2}$ in.; bottom rail $9\frac{3}{8}$ in.

Note: All Doors made in $1\frac{3}{8}$ and $1\frac{3}{4}$-in. thickness

HYDE-MURPHY COMPANY

Millwork, Cabinet Work and Trim

RIDGWAY, PA.

SALES OFFICES

NEW YORK, N. Y., 50 East 42nd Street
PITTSBURGH, PA., 6101 Penn Avenue
WASHINGTON, D. C., District National Bank Building
SAN JUAN, PORTO RICO, P. O. Box 927

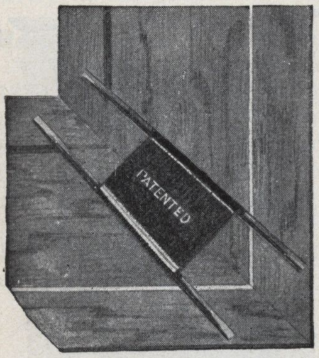
Products

High Grade INTERIOR TRIM, CABINET WORK and MILLWORK.

Producers of Highest Grade Interior Trim and Cabinet Work for the Past 50 Years

Our specialty is the manufacture of the highest grade of interior trim and cabinetwork, including fine interior finish, doors, mantels, stairs and special furniture for the better class of residences, public buildings, hotels, clubs, schools and churches.

Our output is confined exclusively to special high grade work executed in accordance with architects' details and specifications. Our exceptional facilities enable us to execute contracts of any size in any part of the United States.



MITER JOINT HELD BY KEYSTONE LOCK JOINT CLAMP

Our Trim is Held with "The Grip of Steel"

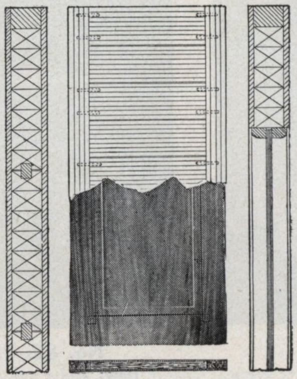
Permanently perfect straight and miter joints are made possible by the Keystone lock joint clamp, which is used in all our erected trim, cabinet work and paneling at no additional cost. This clamp, with its "grip of steel", absolutely prevents a joint from coming apart, whatever the conditions of climate or temperature. It is one of the factors which enable us to furnish maximum value in interior trim and cabinet work of the highest grade.

"No Warp" Flush Veneer Doors

These doors are strictly high grade and suitable for hospitals, schools, hotels, public buildings and churches where sanitary and soundproof features are essential. They are equally desirable for residences, where their beautifully figured veneer surfaces, plain or inlaid, blend with other architectural features of the various rooms. They have cores of thoroughly seasoned laminated chestnut stiles and rails, cross framed and doweled, and covered with ⅛-in. face veneer.

They will not warp or twist and are guaranteed against defects.

"No Warp" doors are specially made from architects' specifications. They may be had in any size, design, veneer or finish. Where desired, openings are provided for glazing or grille work, stops being furnished to secure glazing.



DETAILS OF "NO WARP" FLUSH VENEER DOORS

INVESTMENT BUILDING, WASHINGTON, D. C.
J. H. DE SIBOUR, Architect
Hyde-Murphy mill and cabinet work, interior trim and veneered doors were specified and installed throughout this building

Prominent Examples of Work Executed by Hyde-Murphy Company

First National Bank Building, Miami, Fla., Mowbrey & Uffinger, Architects

U. S. Fidelity and Guarantee Building, Baltimore, Md., Wyatt & Noelting, Architects

University Club, Pittsburgh, Pa., H. Hornbostel, Architect

Province Building, Boston, Mass., Densmore, LeClear & Robbins, Architects

Maryland Apartment, Boston, Mass., Charles R. Greco, Architect

Girls Commercial High School and Julia Richman High School, New York, N. Y., C. B. J. Snyder, Architect

All Souls Church, Washington, D. C., Coolidge & Shattuck, Architects

George Vanderbilt Hotel, Asheville, N. C., W. L. Stoddard, Architect

Francis Marion Hotel, Charleston, S. C., W. L. Stoddard, Architect

Argonne Apartments, Washington, D. C., Stern and Tomlinson, Architects

Realty Building, Youngstown, Ohio, Stanley and Sheibler, Architects

Poinsett Hotel, Greenville, S. C., W. L. Stoddard, Architect

United Bank Building, Cleveland, Ohio, Walker & Weeks, Architects

Erie County Home, Wende, N. Y., F. J. & W. A. Kidd, Architects

Dormitory, Johns Hopkins University, Baltimore, Md., Edward L. Palmer, Architect

Fox Chapel Golf Club, Pittsburgh, Pa., Alden & Harlow, Architects

United Bank Building, Cleveland, Ohio, Walker & Weeks, Architects

Dormitory, West Penn Hospital, Pittsburgh, Pa., J. Lewis Beatty, Architect

Y. M. C. A. Building, McKeesport, Pa., Jallade, Lindsay & Warren, Architects

ANDERSEN LUMBER COMPANY

Manufacturers of Standard White Pine Frames

BAYPORT, MINN.

TRADE-MARK
Registered
U. S. Pat. Off.

Products

Andersen Standard White Pine Window Frames.

Also manufacturers of White Pine Door Frames, Cellar Sash Frames and Barn Sash Frames.

Experience

For over 20 years this Company has specialized in the manufacture of Andersen Standard Window Frames.

Variety of Uses

Andersen Frames are adaptable to a variety of uses—for modern or period houses, mansions, modest dwellings, garages; city, suburban or country buildings of brick, frame or stucco construction. Box window frames are made especially for solid walled buildings.

Materials

White Pine, the best wood for out-of-door use, withstands shrinking, swelling, warping, rotting and creeping under all weather conditions. All exposed portions of Andersen Frames are made of White Pine as used in the Nation's oldest houses—not Western, Oregon, or California white pine, but the *genuine old-fashioned white pine*. The *white pine* construction gives long life and keeps the Andersen Frame accurate.

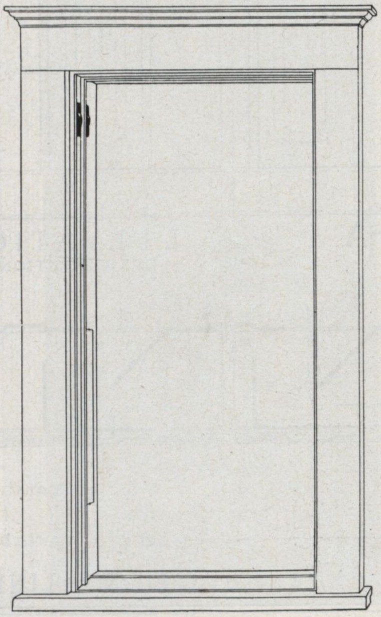
Andersen Window Frames are equipped with high grade cast iron sash pulleys. The face and wheel are ground, polished and lacquered; face is 1x4⅜ in., wheel is 2-in. diam. with ¼-in. steel axle. The grooved wheels carry standard size sash cord.

Distinctive Features

This frame is made up in seven units. Other knockdown frames average eighteen. These units are accurately cut. No trimming or fitting is required when assembling. Windows fit snugly, yet run easily, in Andersen Frames because of the painstaking, accurate construction.

The double shoulder on the sill makes the frame windproof and waterproof. The bottom sash fits against one shoulder and the storm sash or screen against the other shoulder.

On plain cap frames the water drip is rabbetted where it fits on to the casing. This prevents water running back. The groove under the front edge of the water drip also keeps water out.



Andersen White Pine Window Frame

Subsill frames are also furnished on which a shoulder on the sill fits into a groove in the subsill. This is another waterproof feature.

The seven frame units, with pockets, pulleys, blind and parting stops in place, are shipped in two small, compact bundles, each weighing less than 20 lb. The interchangeability of side and end pieces makes it possible to make 121 sizes of frames from a stock of only 11 sizes.

Andersen dealers can thus immediately supply a large variety of sizes.

Advantages

The accuracy of Andersen Standard White Pine Window Frames gives smooth running windows.

Specialization saves time and lumber in every stage of manufacture. This economy is passed on to the builder.

Handling is easier, trucks can haul larger loads, and less storage space is required.

One man with a hammer can assemble an Andersen Frame in ten minutes or less. That means a considerable saving in labor and lumber.

Andersen Standard White Pine Window Frames need not be ordered weeks in advance, as in the case of made-to-order frames. Delivery is made when the frames are needed without expensive delays.

Sizes of Andersen Window Frames

Dealers stock 11 standard sizes of Andersen Window Frames:

16x16 18x18 20x20 22x22
24x24 26x26 28x28 30x30
36x32 40x34 44x36

By interchanging heights and widths, it is possible to supply 121 different sizes of two-light windows from these 11 standard sizes.

Complete Information

Any Andersen dealer will supply the story in book form and explain fully the many advantages and economies in the use of Andersen Standard White Pine Frames.

The Andersen catalogue, containing much information for the architect, will be gladly sent on request.

Estimates and specifications may be obtained promptly from the nearest Andersen dealer, whose name will be furnished by addressing the Andersen Lumber Company.

VAN ZILE VENTILATING CORPORATION

Manufacturers of Adjustable Ventilators for Use in Doors

280 Madison Avenue
NEW YORK, N. Y.

Product

The VENTADOOR—A Ventilating Panel for Doors.

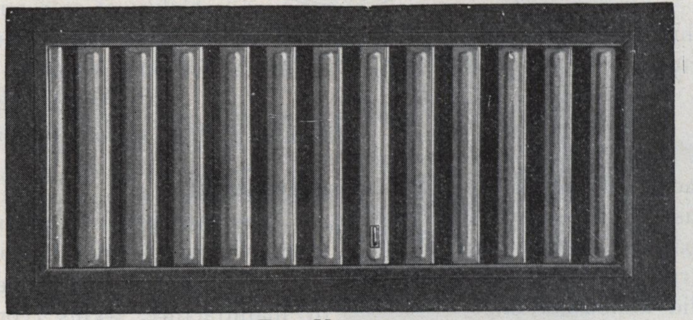
Purpose of the Ventadoor

The Ventadoor is designed for installation in a door and provides a means for the circulation of air out of or into a room without the transmission of light or vision.

The unique bending and placing of the steel front and back sheets provide air passages so formed that they present slight resistance to air currents but neither light nor vision can pass through them.

Construction of the Ventadoor

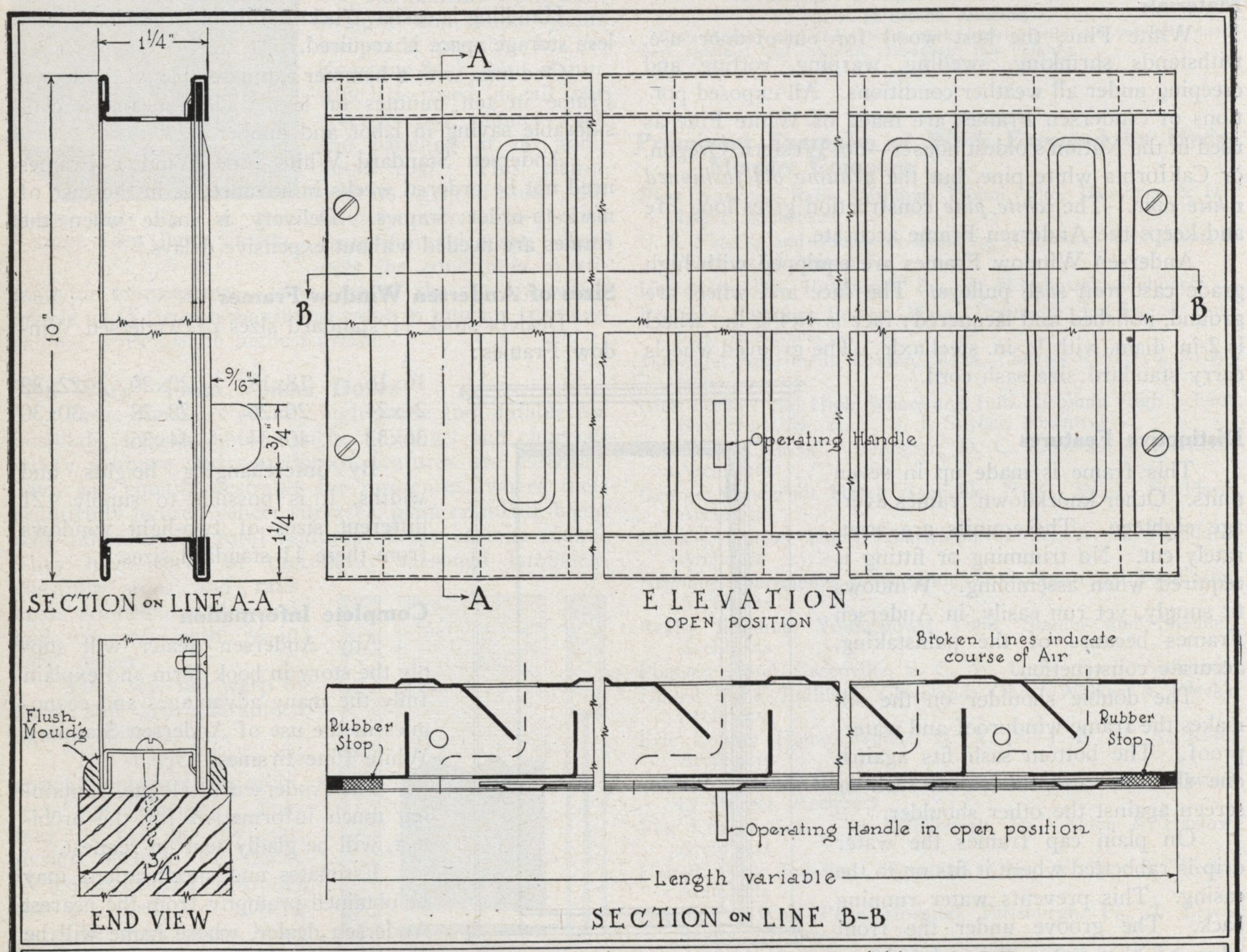
The Ventadoor is made of medium weight steel plate, finished with a baked-on coat of enamel to correspond with color sample furnished by the purchaser. With each Ventadoor there are furnished 4 screws of sufficient length to secure it in position.



THE VENTADOOR

Adjustment

The amount of air passing through is regulated by adjusting the shutter to obtain the required openings—a glance, only, is necessary to determine the proper adjustment. This shutter is the only movable part of the apparatus and it will never


1¼"
10"
9/16"
3/4"
1¼
SECTION ON LINE A-A
A
A
B
B
Operating Handle
ELEVATION
OPEN POSITION
Broken Lines indicate course of Air
Flush Mouldg
Rubber Stop
Rubber Stop
Operating Handle in open position
3/4"
1¼"
Length variable
END VIEW
SECTION ON LINE B-B

6 INCH SCALE DETAILS OF VENTADOOR

Continued on next page

develop a rattle. The opening or closing of the shutter is noiseless, as its limiting positions are determined by rubber stops. There are no metal parts to clang against each other. Owing to the double wall construction, the tendency to transmit noises from one side to the other is at a minimum.

Characteristics

The Ventadoor has no pockets where dust can accumulate and every surface can be reached with a dust cloth. It is so constructed that it will resist heavy blows or distorting pressure. There are no parts which can be broken or removed.

The Ventadoor is held in place by 4 screws which are inserted in the door rails from the inside of the room but which can not be reached by a person outside of the room, thus making it secure against the entrance of sneak thieves. Flames can not pass through the air openings, thus it is safer than a transom in case of fire.

Where Used

The many advantages of the Ventadoor should recommend its use in a door, rather than providing for a transom over the door. If desired, special applications can be made in walls or partitions.

There are many places where Ventadoors can be used to advantage, such as hotels, hospitals, apartment houses, institutional and office buildings, compartment and stateroom doors in sleeping cars and stateroom doors on ships.

The valuable features of the Ventadoor and its artistic appearance have met with the approval of many prominent architects, who have specified it for use in some of their most important buildings.

The Pullman Company has equipped the "Presidential" series of 10-compartment sleeping cars with Ventadoors, installing one in each compartment and stateroom door.

Approved for Tenements

The use of the Ventadoor for bedroom doors instead of transoms is approved by the New York City Tenement House Department.

Cost

The cost of the Ventadoor installed is less than a transom with its hardware and necessary extra height of door frame.

Patents

The Ventadoor is covered by patents in the United States and foreign countries.

Specifications

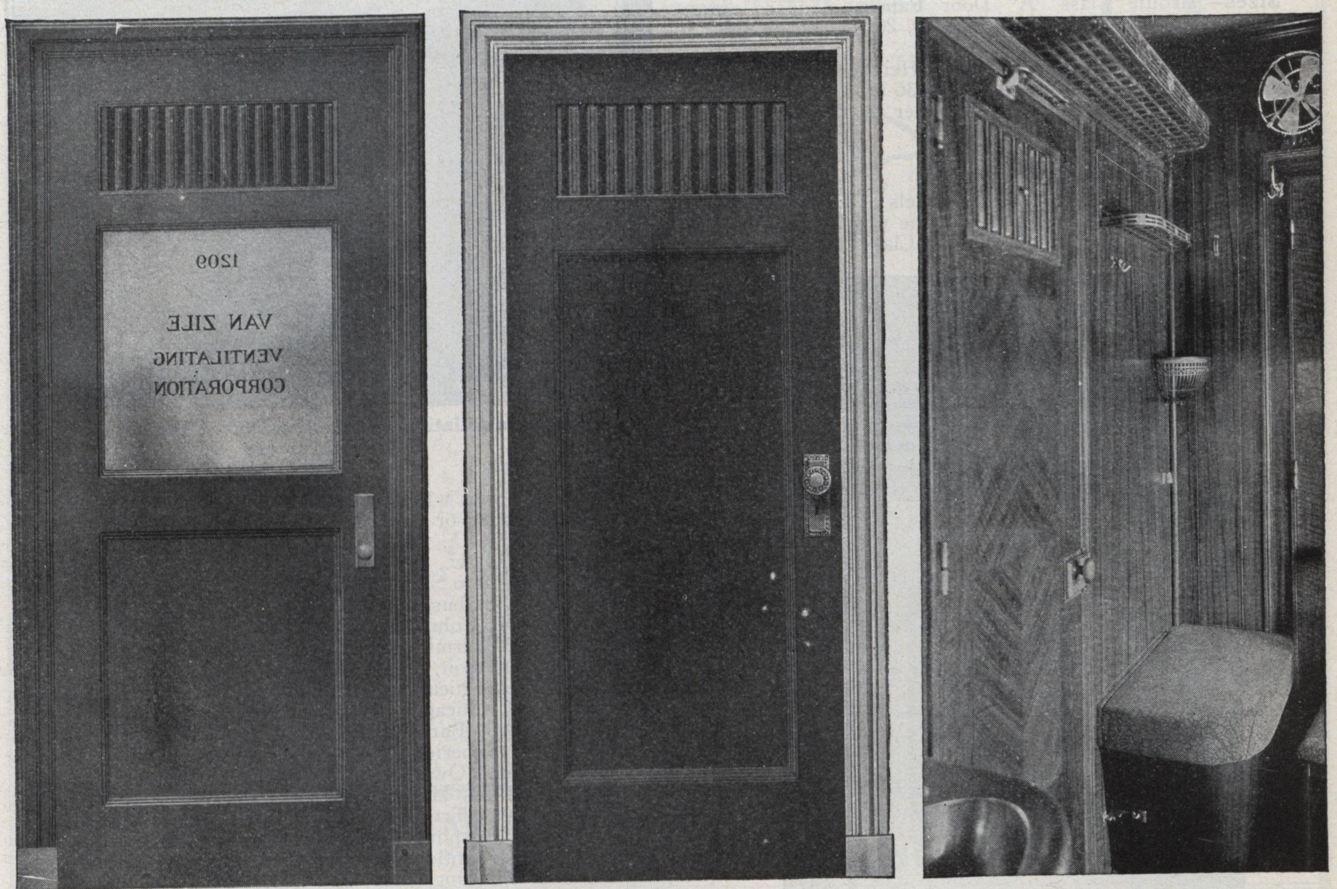
(1) The doors located and described as follows, shall be fitted with Ventadoors as manufactured by the Van Zile Ventilating Corporation, 280 Madison Avenue, New York.......
....

(2) These Ventadoors are to be made of steel plate and are to be 10 in. high, 1¼ in. thick and of sufficient length to fill the openings left between the stiles of the doors.

(3) The Ventadoors are to have an enamel finish to correspond with color sample to be furnished by the architect, and are to be delivered by [freight] [express] [truck] at..................................

(4) The door manufacturer, or the contractor erecting the doors, shall place the Ventadoors in the door openings and insert the screws, that are furnished by the Ventadoor manufacturer, and shall also furnish and place the mouldings required to make a finished and workmanlike installation.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1913



Office Door

Bedroom Door

Pullman Compartment Interior

Typical Installations of the Ventadoor

THE WINDOW-WALL COMPANY

Manufacturers of Airolite Ventilating Devices

MARIETTA, OHIO

AIROLITE
The Adjustable Metal Ventilator
For Windows-Transoms-Door Panels
TRADE-MARK

Products

AIROLITE, a patented Metal Ventilator for transoms, doors, windows, air shafts, etc., with adjustable and stationary horizontal louvers.

Also Window Wall for sleeping porches. Catalogue upon request.

Airolite Ventilators

Built with horizontal louvers and so constructed that they can be adjusted instantly to allow any degree of ventilation. The adjustment is controlled from the room side. A slight turn of the knob for Airolite Class "A" Panels and Airolite Transoms sets and holds the louvers at the desired angle quickly and silently. The cam throw on this adjustment locks the louvers in a wide open or tightly closed position. At all times the flange on the louvers insures absolute privacy, excludes the entrance of the corridor lights and prevents down-drafts.

An investigation of Airolite will prove that even in first cost it is more economical than the old style transom. Upkeep costs are unknown where Airolite is in operation.

Airolite Door Panels are shipped with operating hardware complete ready to be inserted in the openings left to receive them and are fastened in place by screws, wood mouldings, or both (we do not furnish screws or mould), and may be installed without the aid of skilled labor. Airolite Door Panels and Transoms are finished with high grade baked on enamel paint in standard and special solid colors, not grained. While we manufacture various styles of door panels we recommend our Class "A" Panel for new construction. Airolite Door Panels and Transoms are foolproof and should last as long as any building in which they are placed.

Caution: The openings left to receive Airolite Class "A" Door Panels and Transoms should be from $\frac{1}{16}$ to $\frac{1}{8}$ in. larger both in width and height than our panels.

Be careful of your sizes when ordering.

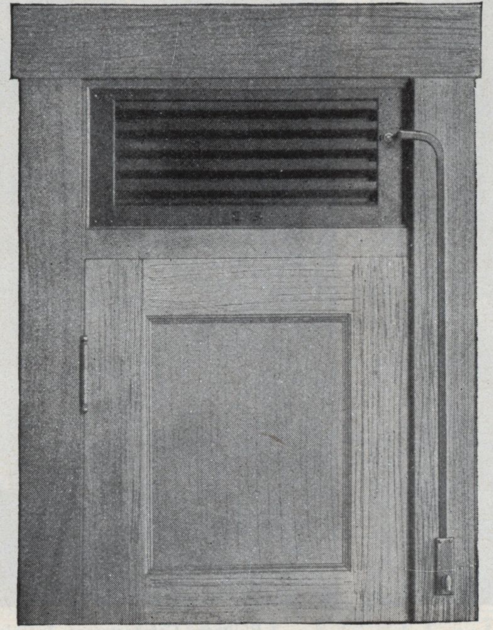
Sizes—Airolite Class "A" Door Panels, standard sizes: Height, 10, 11 and 12 in.; width, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27 in., and special sizes.

Airolite Transoms, standard sizes: Height, 8, 10, 12, 14, 16, 18, 20, 22 and 24 in.; width: 28, 30, 32 and 36 in., and special sizes.

Shipments—Made as directed, either to the place of installation or the door manufacturer.

Specifications for Door Panels

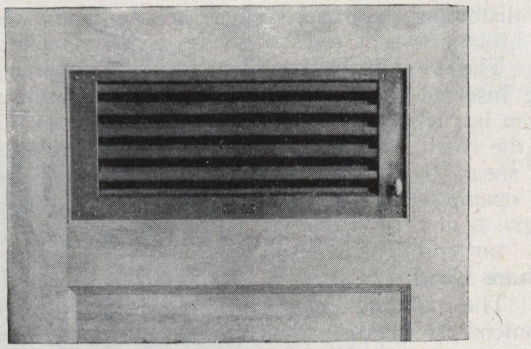
(1) Airolite Class "A" Door Panels: The (carpenter) contractor shall furnish and install in the upper panel of each corridor and partition door an Airolite Class "A" Door Panel as manufactured by THE WINDOW-WALL COMPANY, Marietta, Ohio.



Transom Airolite

(2) Airolite Class "A" Door Panels shall be finished in high grade baked enamel ...... color, not grained, and equipped with operating device finished in brass hardware.

(3) The contractor shall furnish all mouldings and other work required to install Airolite Class "A" Door Panels.



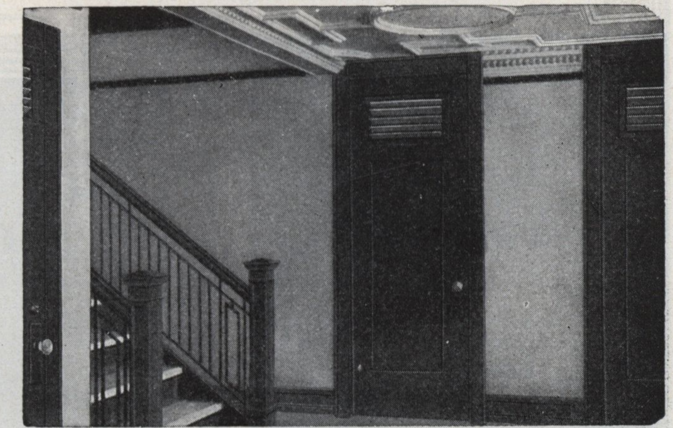
Class "A" Panel Airolite

Specifications for Transoms

(1) Airolite Transoms: The (carpenter) contractor shall furnish and install Airolite Transoms equipped with operating adjustment, complete as manufactured by THE WINDOW-WALL COMPANY, Marietta, Ohio, over all doors where indicated on the drawings, or herein specified as follows:

(2) Airolite Transoms shall be finished in high grade baked enamel ...... color, not grained.

(3) The contractor shall furnish all wood mouldings and other work required to install Airolite Transoms.



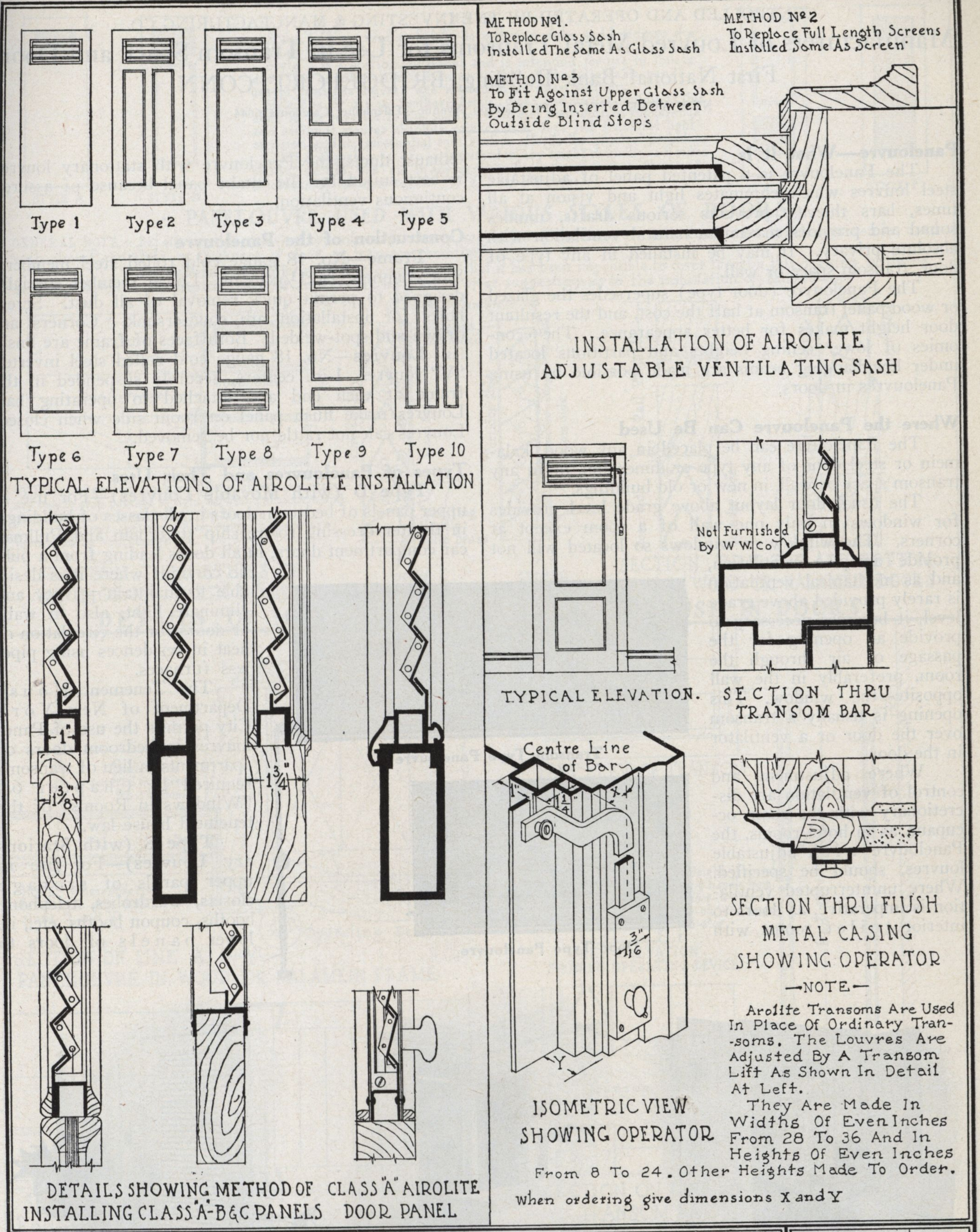
Typical Installation of Airolite Door Panel in Low Ceiling Structure

Installations

Prominent jobs where Airolite Door Panels and Transoms have been specified or used, and their architects:

Mack Hall, O. S. U., Columbus, Ohio, J. N. Bradford
Lindsley Hall, O. U., Athens, Ohio, Frank L. Packard
Bowling Green Ohio State Normal School, S. P. Stewart & Son
Neil House, Columbus, Ohio, Gustave W. Drach
Ft. Hayes Hotel, Columbus, Ohio, H. B. Beidler, Inc.
Redmont Hotel, Birmingham, Ala., G. Lloyd Preacher Co.
Webster Hall, Detroit, Mich., Halpin & Jewell
Morrison Hotel, Chicago, Ill., Holabird & Roche
Sherman Hotel, Chicago, Ill., Holabird & Roche
Chancellor Hotel, Parkersburg, W. Va., Pennington & Lewis
Androy Hotel, Superior, Wis., Roland C. Buck
Owensboro Hotel, Owensboro, Ky., C. W. Kimberlin
Mountaineer Hotel, Morgantown, W. Va., W. E. Russ
General Motors Office Building, Detroit, Mich., Albert Kahn
Johns Hopkins Hospital, Baltimore, Md., Jos. Evans Sperry
Morton Hotel, Atlantic City, N. J., Wm. Macy Stanton
High School Building, Marietta, Ohio, Garber & Woodward
Jacksonville Hotel, Jacksonville, Ill., Jarvis Hunt
Fairbairn Hotel, Detroit, Mich., P. R. Pereira

Continued on next page


Type 1
Type 2
Type 3
Type 4
Type 5
Type 6
Type 7
Type 8
Type 9
Type 10
METHOD Nº1.
To Replace Glass Sash
Installed The Same As Glass Sash
METHOD Nº2
To Replace Full Length Screens
Installed Same As Screen
METHOD Nº3
To Fit Against Upper Glass Sash
By Being Inserted Between
Outside Blind Stops
Not Furnished
By W.W. Co
1"
$1\frac{3}{8}$"
$1\frac{3}{4}$"
Centre Line
of Bar
1"
$\frac{1}{4}$"
X
$1\frac{3}{16}$"
Y

TYPICAL ELEVATIONS OF AIROLITE INSTALLATION

INSTALLATION OF AIROLITE ADJUSTABLE VENTILATING SASH

TYPICAL ELEVATION.

SECTION THRU TRANSOM BAR

SECTION THRU FLUSH METAL CASING SHOWING OPERATOR

DETAILS SHOWING METHOD OF INSTALLING CLASS "A"-B&C PANELS

CLASS "A" AIROLITE DOOR PANEL

ISOMETRIC VIEW SHOWING OPERATOR

—NOTE—

Arolite Transoms Are Used In Place Of Ordinary Transoms. The Louvres Are Adjusted By A Transom Lift As Shown In Detail At Left.

They Are Made In Widths Of Even Inches From 28 To 36 And In Heights Of Even Inches From 8 To 24. Other Heights Made To Order.

When ordering give dimensions X and Y

DRAWN BY SWEETS CATALOGUE SERVICE INC.	APPLICATION OF AIROLITE DOOR PANELS, TRANSOM & ADJUSTABLE VENTILATING SASH	SCALE 3 IN. EQUALS 1 FT. DATE AUG. 25	DRWG 1

THE VENTILOUVRE COMPANY

CONTROLLED AND OPERATED BY THE INVESTING & MANUFACTURING CO.

Manufacturers of Louvred Metal Transoms for Use in Transom Space and Doors

First National Bank Building, BRIDGEPORT, CONN.

NEW YORK OFFICE, 280 Madison Avenue—Telephone, Caledonia 6644

Panelouvre—What It Is

The Panelouvre is a patented panel of adjustable steel louvres which eliminates light and vision at all times, bars thieves, prevents serious drafts, muffles sound and provides maximum natural ventilation with absolute privacy. It may be installed in any type of door, transom space or wall.

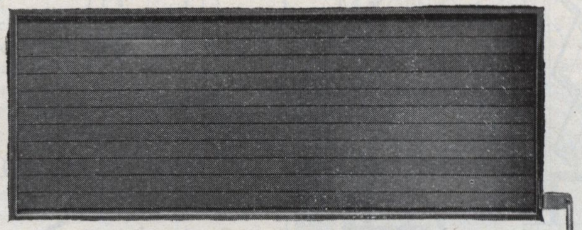
The Panelouvre (door type) supersedes the glazed or wood panel transom at half the cost, and the resultant door height makes for better appearance. The economies of lower ceiling heights and partitions located under low hanging beams are made possible by using Panelouvres in doors.

Where the Panelouvre Can Be Used

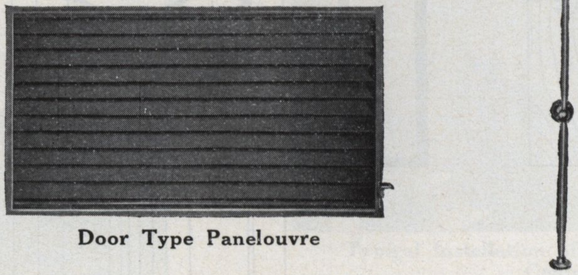
The Panelouvre can be placed in any wood, kalamein or steel door of any type or dimension, or in any transom space or wall, in new or old buildings.

The usual floor layout above grade level provides for windows in only one wall of a room except at corners. The window or windows so located will not provide ample ventilation, and as mechanical ventilation is rarely provided above grade level, it becomes necessary to provide an opening for the passage of air through the room, preferably in the wall opposite the window. This opening is usually a transom over the door or a ventilator in the door.

Where adjustment and control of ventilation are discretionary with the room occupant, as in hotel rooms, the Panelouvre with adjustable louvres, should be specified. Where uninterrupted ventilation is imperative, as doors to interior toilet rooms with exhaust ducts, the Panelouvre with stationary louvres is best suited for the intake panel because of assured continuous ventilation.



Transom Type Panelouvre



Door Type Panelouvre

Construction of the Panelouvre

Frame—No. 18 gauge cold rolled steel members. Side channels, $\frac{1}{2}$x$1\frac{1}{2}$x$\frac{1}{2}$ in. Lower member specially designed to permit quick removal of all dust. Screw holes for installation are countersunk. Corners are drawn and spot-welded. Both faces of frame are flush.

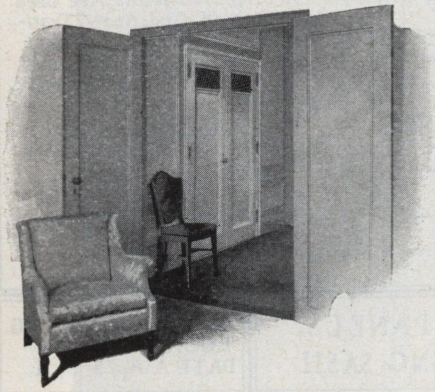
Louvres—No. 18 gauge cold rolled steel inverted "V" louvres, 1-in. centers, securely suspended in the frame at each end and attached to operating bar. Louvres make flush panel on room side when closed. Louvres can not rattle nor be removed.

Types of Panelouvres and Their Uses

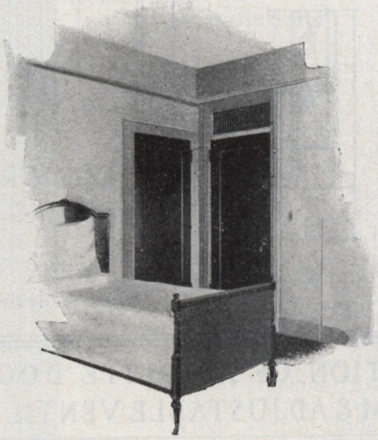
Type D (with Movable Louvres)—For use in upper panels of bedroom doors in all classes of buildings, in theater dressing room, ship stateroom and Pullman car compartment doors, in all doors leading from a public corridor where it is desirable to maintain privacy and eliminate light, also in walls or doors for the circulation of heat in residences using pipeless furnaces.

The Tenement House Department of New York City permits the use of Panelouvres in bedroom doors of apartments in lieu of transoms required by Chapter 63, "Windows in Rooms" of the tenement house law.

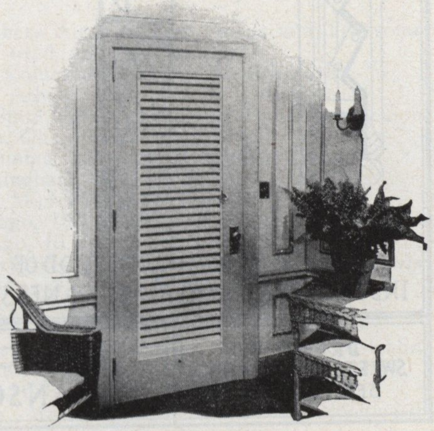
Type S (with Stationary Louvres)—For use in upper panels of storage closets, wardrobes, telephone booths, coupon booths, etc., in lower panels of doors to



Door Type Panelouvre

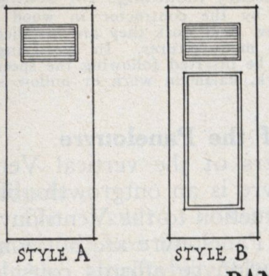


Transom Type Panelouvre



Full Length Panelouvre for Warm Climates

Continued on next page


STYLE A
STYLE B

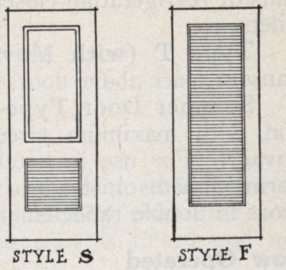
• NOTE •

Styles "A" & "B" are used in hotels, dormitories, clubs and buildings of a similar character.

Style "S" is a stationary panel and is intended for use in Toilets etc. The construction is similar to that of the adjustable panel except that the louvres are riveted in an open position.

Style "F" is for use in Southern hotels, clubs and similar buildings. This style is far superior to the solid and wood slat door both in appearance and utility; it assures absolute privacy as it does not transmit light or vision and its substantial construction affords the greatest protection

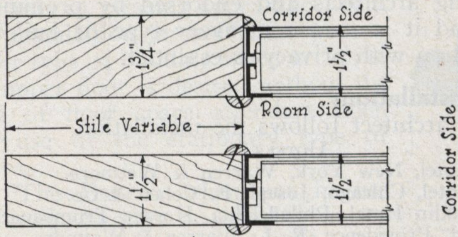
SIZES ~ Panelouvre can be furnished in any height in multiples of inches plus 3/8", i.e. 8 3/8", 9 3/8" etc. In any length in fractions of inches. Standard thickness of Panelouvres "D", "T" & "S" is 1 1/2 inches.


STYLE S
STYLE F

• PANELOUVRE USED WITH VARIOUS STYLES OF DOORS •

GENERAL NOTE ~ Details on this drawing are intended to cover only a few of the more common conditions. Panelouvre can be used with almost any style or thickness of door or transom condition.

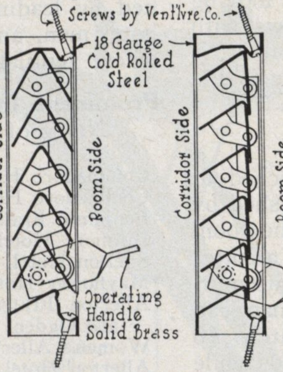
Hollow Metal Doors differ so much in construction that it has been impossible to cover them on this drawing. Write us sending sketch or description of door and we will be glad to offer suggestions as to the installation of Panelouvre.


Corridor Side
1 3/4"
1 1/2"
Room Side
Stile Variable
1 1/2"
1 1/2"

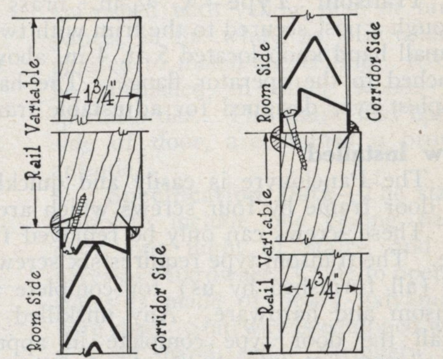
NOTE ~ Suggested stock mouldings shown are necessary only to stop passage of light between panelouvre and door, and are not furnished by Ventilouvre Co.

Screws securing Panelouvre in place are furnished by Ventilouvre Co.

SECTION THRU STILES OF WOOD OR KALAMEIN DOORS

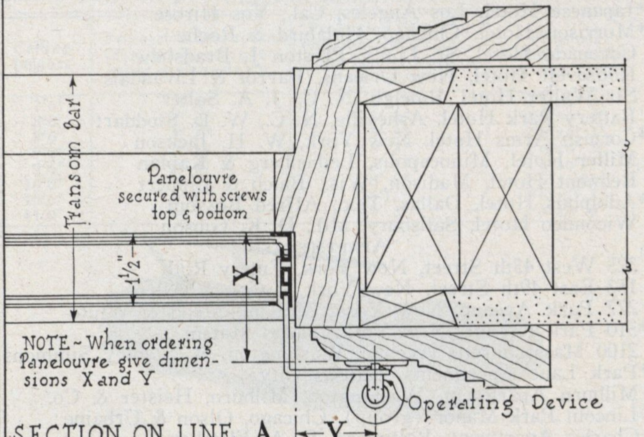

Screws by Vent'lvre. Co.
18 Gauge Cold Rolled Steel
Corridor Side
Room Side
Corridor Side
Room Side
Operating Handle Solid Brass

OPEN CLOSED
VERTICAL SECTIONS


Rail Variable
1 3/4"
Room Side
Corridor Side
Room Side
Corridor Side
Rail Variable
1 3/4"

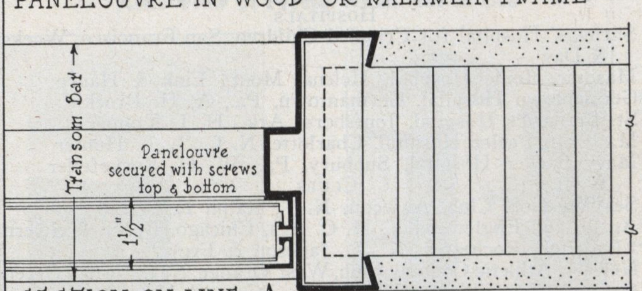
SECTION THRU TOP AND BOTTOM RAIL OF WOOD OR KALAMEIN DOORS

DETAILS OF MODEL "D" PANELOUVRE FOR USE IN DOORS

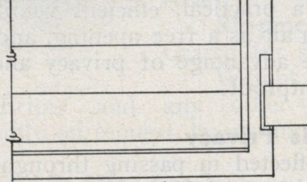

Transom Bar
Panelouvre secured with screws top & bottom
1 1/2
X
Y
Operating Device

NOTE ~ When ordering Panelouvre give dimensions X and Y

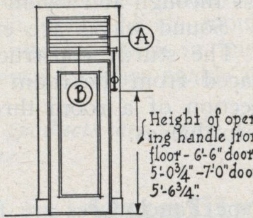
SECTION ON LINE A - Y
PANELOUVRE IN WOOD OR KALAMEIN FRAME


Transom Bar
Panelouvre secured with screws top & bottom
1 1/2

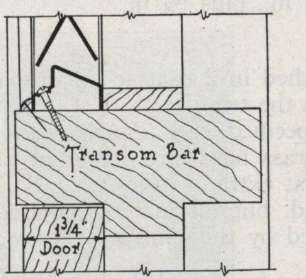
SECTION ON LINE A
PANELOUVRE IN COMBINATION STEEL BUCK



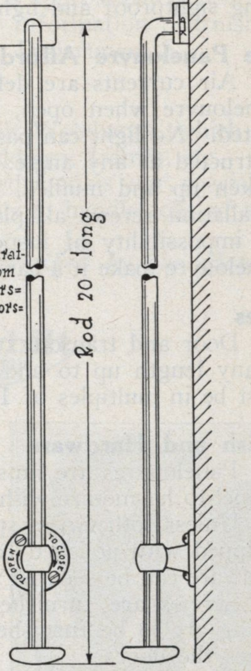
PART ELEV. OF TRANSOM


A
B
Height of operating handle from floor - 6'-6" doors = 5'-0 3/4" - 7'-0" doors = 5'-6 3/4".

KEY ELEVATION
SHOWING OPERATING DEVICE


Transom Bar
1 3/4"
Door

SECTION ON LINE B
TRANSOM BAR


Rod 20" long
TO OPEN
TO CLOSE

FRONT SIDE
OPERATING DEVICE

DETAILS OF MODEL "T" PANELOUVRE FOR USE IN TRANSOMS

SWEETS
CATALOGUE
SERVICE, INC.

DETAILS OF PANELOUVRE

VENTILOUVRE CO. 1st Nat'l. Bank Bld'g. Bridgeport, Conn.

SCALE 3 IN. EQUALS 1 FT.
MAY 1925

DR'WG.
1A

Continued on next page

toilet rooms having exhaust duct ventilation, also in walls of refrigerating closets and walls of airshafts from toilets, etc.

Type T (with Movable Louvres)—For use in transom space above doors in office buildings, schools, etc.

Summer Door Type—Affords full length ventilation with maximum circulation of air and absolute privacy. For use in hotels, apartments, clubs, etc., in warm climates instead of the usual paneled and slat doors in double rabbeted jambs.

How Operated

Door Type—The operating handle on the door type is a conveniently located brass thumb piece projecting through the frame. Adjustment is easy and positive and permits any degree of opening desired.

Transom Type—A ¼-in. brass rod moving through a post secured to the trim with two screws, with a small hand knob located 5 ft. 4 in. above the floor, is attached to the operator flange. The hardware is the simplest ever designed for adjustable transoms.

How Installed

The Panelouvre is easily and quickly attached to the door frame by four screws which are furnished by us. These screws can only be removed from the room side. The transom type requires six screws and a cotter pin (all furnished by us) for complete installation of transom and hardware. Any unskilled workman can install the door type complete in approximately 10 minutes after the opening in the door is provided, while the transom type requires about 15 minutes.

Air Moves Freely Through the Panelouvre

The Panelouvre is a practical, efficient ventilator admitting nearly as much air as a free opening, and yet possessing the invaluable advantage of privacy and of being sightproof and lightproof.

The Panelouvre Affords Privacy

Air currents are deflected in passing through the Panelouvre when open, hence serious drafts are prevented. No light can pass through and vision is totally obstructed at any angle. Sound waves are effectually broken up and muffled. The sturdy construction, the installation screws all placed from the room side and the impossibility of inspection of a room through the Panelouvre make it a bar to thieves.

Sizes

Door and transom type Panelouvres are furnished in any length up to and including 40 in. The height must be in multiples of 1 in., plus ⅜ in.

Finish and Hardware

Panelouvres are finished in 2 coats of plain baked enamel to harmonize with the trim.

Unless otherwise specified, all Panelouvres are equipped with polished brass hardware. Special finish hardware can be secured at extra cost.

Screws are furnished, but all mouldings used in setting are to be furnished by the contractor who furnishes the doors.

Specifications for Panelouvres

The contractor shall furnish and install where marked on plans or as specified herein, Panelouvres as manufactured by The Ventilouvre Company, Bridgeport, Conn., of the following types and sizes (insert schedule here).

All Panelouvres shall be factory finished with two coats of plain enamel baked on, of a color to harmonize with the trim, complete with hardware finished to match adjoining hardware. All samples of finish shall be approved by the architect.

This contractor shall do all cutting required to install the Panelouvres and shall furnish necessary mouldings for setting.

Note: Panelouvres are installed by the contractor in wood and kalamein work on the job, but in hollow steel work they are installed at the factory by the hollow steel door manufacturer. In specifying, a separate heading "Panelouvres" should be inserted following the specified interior doors, either in carpenter work, kalamein work or hollow steel work, according to the material used.

Ventilouvre—Predecessor of the Panelouvre

We are the manufacturers of the vertical Ventilouvre, of which the Panelouvre is an outgrowth. The Panelouvre is similar in construction to the Ventilouvre, except that the louvres in the Panelouvre are horizontal instead of vertical. The Panelouvre affords considerably greater ventilation than our former Ventilouvre, is more simple in construction and presents a more beautiful and harmonious appearance.

The vertical Ventilouvre, however, has been specified by leading architects and endorsed by prominent hotel men, and it is in use in every type of building where ventilation with privacy is essential.

Prominent Installations

Name of architect follows the installation.

HOTELS

Commodore Hotel, New York, Warren & Wetmore
Commodore Hotel, Chicago, Joseph E. Cohen & Co.
Benjamin Franklin Hotel, Philadelphia, Horace Trumbauer
Biltmore Hotel, Providence, R. I., Warren & Wetmore
Shelton Hotel, New York, Alfred Loomis Harmon
*Mayflower Hotel, Washington, D. C.
Allerton Fraternity Clubs Building, New York, Murgatroyd and Ogden
Women's Allerton, New York, Murgatroyd and Ogden
Allerton Hotel, Chicago, Ill., Murgatroyd and Ogden
Allerton Hotel, Cleveland, Murgatroyd and Ogden
St. George Hotel, Brooklyn, N. Y., Emery Roth
Hamilton Hotel, Washington, D. C., J. H. deSibour
Pancoast Hotel, Miami Beach, Fla., M. Hampton & E. Ehman
*Japanese Hotel, Los Angeles, Cal., Yos Hirose
*Morrison Hotel, Chicago, Holabird & Roche
Coronado Hotel, St. Louis, Preston J. Bradshaw
Roosevelt Hotel, New Orleans, Favrot & Livaudais
Sir Walter Hotel, Raleigh, N. C., J. A. Salter
Battery Park Hotel, Asheville, N. C., W. L. Stoddart
*Cornish Arms Hotel, New York, W. H. Jackson
Miller Hotel, Minneapolis, Leibenberg & Kaplan
Belmont Hotel, Madison, Wis., Balch & Lippert
*Adolphus Hotel, Dallas, Tex., Alfred Bossom
Wicomico Hotel, Salisbury, Md., D. K. Gibson

APARTMENTS

325 West 45th Street, New York, Emery Roth
153 East 49th Street, New York, Ewing & Allen
277 Park Avenue, New York, McKim, Mead & White
*510 Park Avenue, New York, Yasuo Matsui
2100 Massachusetts Avenue, Washington, B. Stanley Simmons
*Park Lane Apartments, Kansas City
Milburn Apartment, Washington, Milburn, Heister & Co.
Lincoln Park Manor (group), Chicago, Olson & Urbaine
Charles Apartment, Baltimore, F. A. Fletcher
Stoneleigh Court, Dallas, Tex., F. J. Woerner & Co.

HOSPITALS

Shriners' Hospital for Crippled Children, San Francisco, Weeks & Day
Masonic Home Hospital, Helena, Mont., Link & Haure
*Germantown Hospital, Germantown, Pa., A. H. Brockie
St. Bernard's Hospital, Jonesboro, Ark., H. J. Kramer
Matheson Peeler Hospital, Charlotte, N. C., L. L. Hunter
Mary Packer Hospital, Sunbury, Pa., W. H. Rockefeller

CLUBS

Seaview Golf Club, Absecon, N. J., Ralph E. White
*Austin and Englewood Y. M. C. A.'s, Chicago, Berlin & Swern
*Elks Club, Rochester, N. Y., Jackson & Frey
Newark Athletic Country Club, West Orange, N. J., Jordan Green
Racquet Club, Chicago, Wentworth, Dewey & McCormick
Northern Baptist Seminary, Chicago, S. M. Seator
Women's Residence, Columbia University, New York, McKim, Mead & White
*Elk's Club, Boston, McLaughlin & Burr
Bellevue Nurses' Home, New York, McKim, Mead & White
St. Raphael's Nurses' Home, New Haven, Conn., Louis A. Walsh
Y. M. C. A. Buildings in New York, New Jersey, Delaware, Indiana, Illinois, Wisconsin, Iowa and Texas

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*Panelouvre installations

FARLEY & LOETSCHER MFG. CO.

Ceiling Suspended Disappearing Stairway

DUBUQUE, IOWA

Presto
REGISTERED TRADE MARK
SLIDING STAIRS
"Works like Magic"

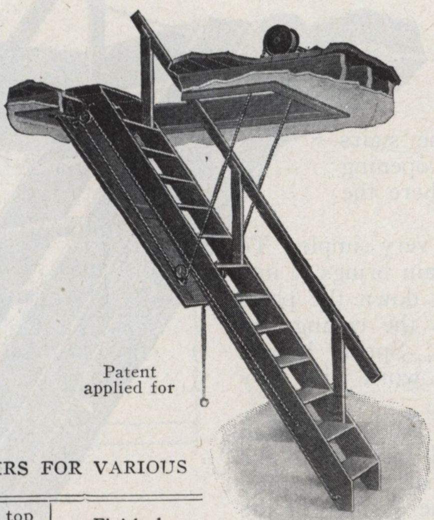
Products

The PRESTO DISAPPEARING STAIRS. (Patent applied for.)

Also Qualitybilt Woodwork.

Presto Disappearing Stairs

Description—The PRESTO Disappearing Stairway is a durable sliding stairway of pleasing appearance, built for installation in residences or any other type of building when access to an upper floor is desired without the loss of floor space attendant upon the use of the stationary type of stairs.

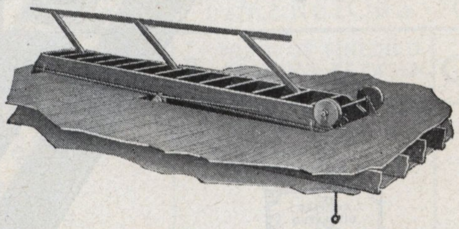


Patent applied for

The PRESTO when not in use slides up through an opening in the ceiling entirely out of view, leaving the space below clear for any desired use. The stair is equipped with heavy counterbalancing springs and a panel door; the springs take up the weight of the stair so that they may be raised or lowered with the minimum of effort. The panel attached to the underside of the stairs automatically closes the ceiling opening when stair is raised and not in use.

DIMENSIONS OF PRESTO SLIDING STAIRS FOR VARIOUS CEILING HEIGHTS

Ceiling heights	Projection into room from landing header when stair is down	Projection from top end of stairs to landing header when stair is up	Finished Ceiling Opening between jambs
7′6″	7′ 2″	4′11″	2′6″x6′ 3″
8′0″	7′ 6″	5′ 8″	2′6″x6′ 3″
8′6″	7′ 6″	5′ 8″	2′6″x6′ 3″
9′0″	7′ 6″	5′ 8″	2′6″x6′ 3″
9′6″	8′ 1″	6′ 3″	2′6″x6′11″
10′0″	8′ 1″	6′ 3″	2′6″x6′11″
10′6″	8′10″	6′11″	2′6″x7′ 3″
11′0″	9′ 1″	7′ 5″	2′6″x7′ 6″



Attic View of Presto When Not in Use

The PRESTO is inexpensive in cost and installation and can be installed by a carpenter in a single day.

Finish—The white pine door is furnished with yellow pine or birch panels, in the white, as it is usually painted to match the ceiling. It can be furnished in other woods on special order. The stairs, and upper side of door, are stained a brown antique.

Specification Data—The stairs complete include one ceiling panel door, one flight of stairs, and all necessary hardware. Cable to operate stairs is made of heavy galvanized wire rope. Stairway is equipped with a rigid hand rail. Stringers are housed to receive treads. No jambs or trim included—can be furnished as extras to match other trim in room.

Shipments and Weights—Crated for shipment.

Weight is approximately 230 lbs.

Prices and any other information furnished promptly on request, by writing Department S.

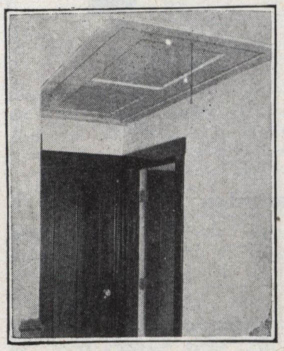
Qualitybilt Woodwork

We manufacture Qualitybilt Woodwork, which includes, sash, doors, blinds, mouldings, frames, etc.

Fine interior finish in hardwood is our specialty. Our immense facilities enable us to handle jobs of any size.

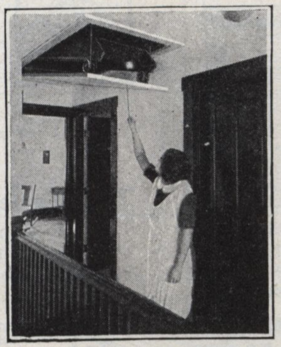
Our products are aptly identified by our adopted trade-name:

Qualitybilt
WOODWORK



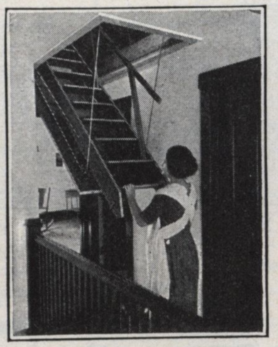
Neat Panel Only Is Visible from Room or Hallway Below

Stair is entirely out of the way when not in use



Short Chain Within Easy Reach, Though Out of the Way of Children

A light pull is sufficient to bring the stairway proper within reach for lowering



Operation

Holding stairway on bottom tread, pull forward as far as it will go and then lower lightly to the floor

Stairway with a Rigid Hand-rail Ready to Use Just Like Any Other Stairs

Any one can ascend quickly and without fear

THE BESSLER MOVABLE STAIRWAY CO.

AKRON, OHIO

Product

The BESSLER CEILING-SUSPENDED FOLDING STAIRWAY.

Description

The Bessler ceiling-suspended folding stairway is a substantial, sightly and practical flight of stairs for one or two-story residences and other types of buildings, providing proper stair access to an upper floor when desired, and leaving clear the floor space ordinarily occupied by stairs when that is wanted. While not in use, the stair folds into the ceiling out of the way.

The treads are properly secured to heavy string pieces with open risers. The hand rail is strong, practical and attractive. At the top the stairs are attached to the end trimmer of an opening in the ceiling of the room or hall where the stairs are to be located.

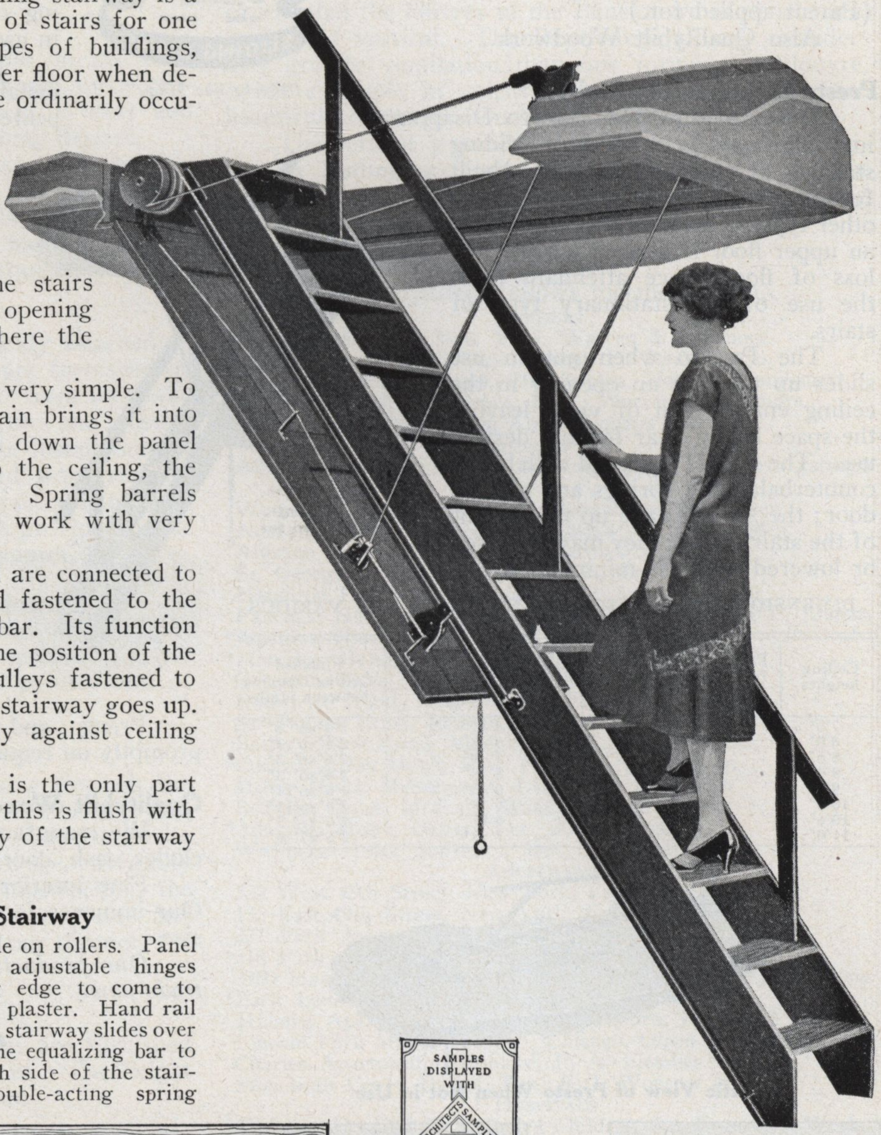
The mechanism and operation are very simple. To use the stairway a slight pull on a chain brings it into position; the stairhorse is then rolled down the panel on to the floor. To fold it back to the ceiling, the stairhorse is rolled up on the panel. Spring barrels on each side of the stairhorse do the work with very slight assistance from the operator.

The cables on either side of panel are connected to the balancing spring barrel. The rod fastened to the inside of the panel is the equalization-bar. Its function is to equalize the pull, regardless of the position of the stairway. This is accomplished by pulleys fastened to cables and which move forward as the stairway goes up. This causes the panel to close tightly against ceiling without slamming.

The panel attached to the stairs is the only part visible when the stairs are closed, and this is flush with the ceiling line. There is no possibility of the stairway coming down unassisted.

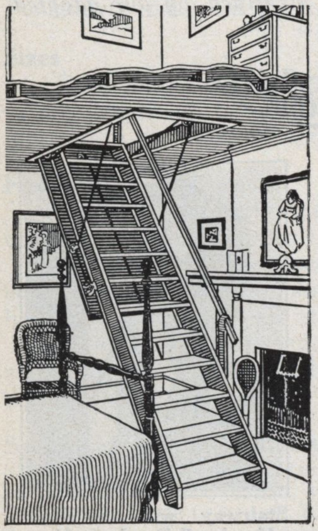
How to Specify a Bessler Movable Stairway

Stairway to be mounted on panel to slide on rollers. Panel to have adjustable hinges permitting edge to come to bottom of plaster. Hand rail to slide as stairway slides over panel. One equalizing bar to be on each side of the stairway. Double-acting spring barrel and spring drum on each side of the stair panel. The weight of the stair stringers to bear down on the shaft which is fastened to end trimmer. Adjustable cable clamps bearing against brackets to be fastened to jambs, as described on pages 1286-1287, Twentieth Edition of SWEET'S ARCHITECTURAL CATALOGUE.

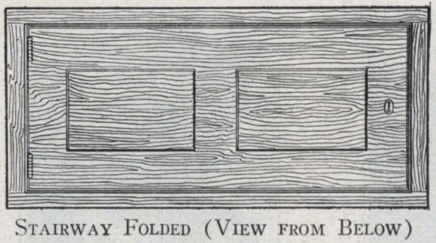


SAMPLES DISPLAYED WITH
ARCHITECT'S SAMPLES CORPORATION
NEW YORK, N.Y.

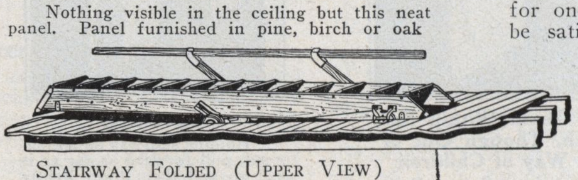
THE BESSLER MOVABLE STAIRWAY READY FOR USE
Is also being manufactured in all steel, as described on page 652



INTERIOR OF BUNGALOW SHOWING BESSLER STAIRWAY
A room, otherwise inaccessible, was thus virtually added to this bungalow



STAIRWAY FOLDED (VIEW FROM BELOW)
Nothing visible in the ceiling but this neat panel. Panel furnished in pine, birch or oak



STAIRWAY FOLDED (UPPER VIEW)
This view is gained in the room above. There is no possibility of the stairway coming down unassisted

The Bessler Guarantee

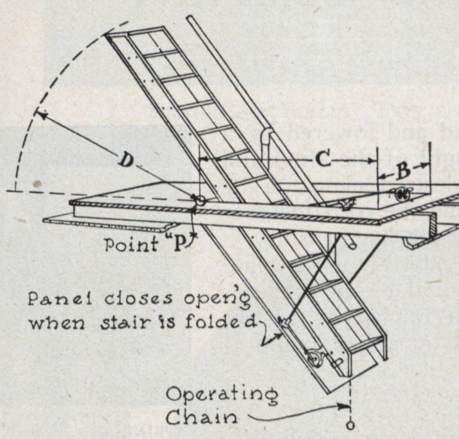
You can have the use of the Bessler for one month, and if it does not prove to be satisfactory, return it to us at our expense.

The Bessler disappearing stairway is guaranteed to last as long as the life of the building.

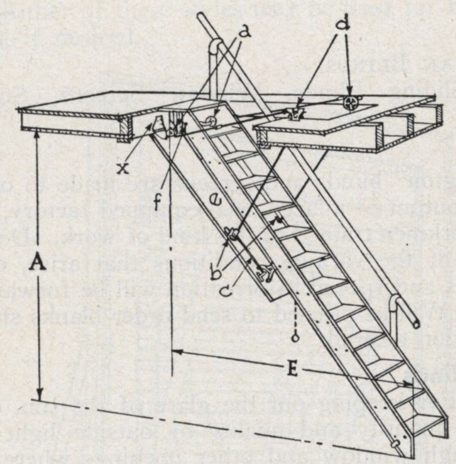
Estimates

Prices and literature furnished on request.

Continued on next page


D
C
B
Point "P"
Panel closes opening when stair is folded
Operating Chain

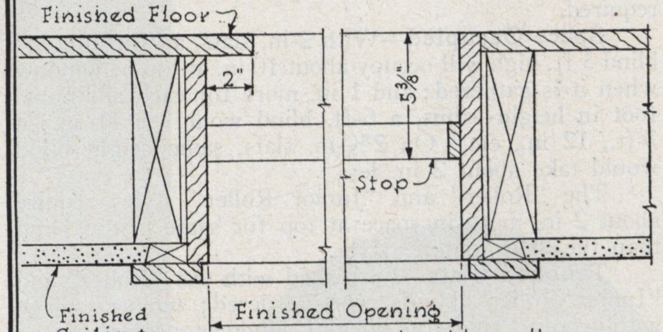
STAIRWAY PARTLY DOWN ON PANEL


a
d
d
x
f
e
b
c
A
E

KEY

a – Spring Barrels
b – Cable Holders
c – Equalizing Bars
d – Pulley Brackets
e – Stair Panel
f – Lugs
x – Trimmer

STAIRWAY IN POSITION FOR USE


Finished Floor
2"
5⅜"
Stop
Finished Ceiling
Finished Opening

Width of this opening should be exactly as given in table, 3/16 inch clearance for panel has been allowed.

NOTE– Jambs to extend full depth of opening as shown.

1½" SCALE SECTION THRU STAIR OPENING

TABLE OF DIMENSIONS FOR VARIOUS FLOOR TO FLOOR HEIGHTS

A HEIGHT FROM FLOOR TO FLOOR	B WIDTH OF FINISHED OPENING BETWEEN JAMBS.	C LENGTH OF FINISHED OPENING BETWEEN JAMBS.	D DIMENSION FROM UPPER END OF STAIR-HORSE TO POINT "P"	E DISTANCE FROM FRONT EDGE OF STAIR-HORSE TO FINISHED JAMB.
7'-7"	2'-6"	5'-10"	4'-2"	6'-5"
8'-1"	2'-6"	5'-10"	4'-10"	6'-9"
8'-7"	2'-6"	5'-10"	5'-5"	7'-2"
9'-1"	2'-6"	6'-0"	5'-11"	7'-7"
9'-7"	2'-6"	6'-4"	6'-3"	8'-0"
10'-1"	2'-6"	6'-8"	6'-6"	8'-5"
10'-7"	2'-6"	6'-11"	6'-11"	8'-9"
11'-1"	2'-6"	7'-3"	7'-3"	9'-2"
11'-7"	2'-6"	7'-6"	7'-7"	9'-6"
12'-1"	2'-6"	7'-9"	8'-0"	9'-11"
12'-7"	2'-6"	8'-1"	8'-3"	10'-4"
13'-1"	2'-6"	8'-4"	8'-7"	10'-5"
13'-7"	2'-6"	8'-8"	8'-11"	10'-8"
14'-1"	2'-6"	9'-0"	9'-2"	11'-0"
14'-7"	2'-6"	9'-3"	9'-6"	11'-2"
15'-1"	2'-6"	9'-6"	9'-9"	11'-6"
15'-7"	2'-6"	9'-9"	10'-1"	11'-9"
16'-1"	2'-6"	10'-1"	10'-5"	12'-0"
16'-7"	2'-6"	10'-5"	10'-9"	12'-4"

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	DIMENSIONS, AND DETAILS SHOWING OPERATION OF THE BESSLER MOVABLE STAIRWAY	SCALE - 1½" EQUALS 1'-0" DATE - SEPT. '25 DR'WG 1

ESTABLISHED 1882

BURLINGTON VENETIAN BLIND COMPANY

MAIN OFFICE AND FACTORY
BURLINGTON, VT.

Products

VENETIAN BLINDS.

Also Sliding Blinds, Window Screens, Screen Doors.

Service

"Burlington" blinds and screens are made to order and are the output of a large, well equipped factory, and of skilled workmen trained to this kind of work. Details to suit any of the varying conditions that arise, catalogues, prices and special information will be forwarded on request. Will be pleased to send order blanks showing information desired.

Venetian Blinds

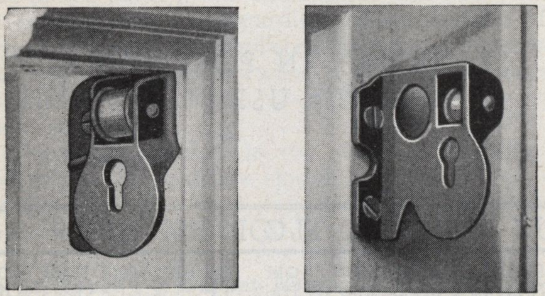
Uses—For keeping out the glare of the sun, controlling the quantity and quality of outside light admitted through window and other openings where desired, and for regulating the entrance and direction of outside air through such openings.

Adaptability—Can be successfully used in any place where the above conditions are desired.

Installation—This is simple, as will be seen by illustration shown.

Below are illustrations of right-hand hangers in various locations for "Burlington" style blinds.

Hangers for "Roller" blinds are attached in similar manner but are somewhat larger to support larger blinds.



Attached to Stop Beads or Subjambs — Attached to Face of Casings

RIGHT-HAND HANGERS FOR "BURLINGTON" VENETIAN BLINDS
Similar hangers may be had for attaching to head jambs

Types

"Burlington"—Generally used for openings not exceeding, say 50 sq. ft.

"Roller" and "Junior Roller"—Used for openings exceeding, say 50 sq. ft.

"E-Z Lift"—With cords arranged as shown on following page, passing over steel ball bearing rollers. Recommended for wide blinds and also those containing 75 to 125 sq. ft.

"Traverse Roller"—As shown on following page. Designed for use with exceedingly large blinds.

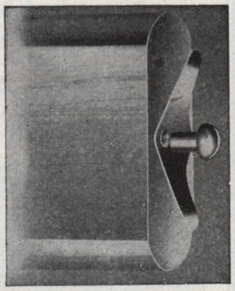
Rod Guides—Shown on opposite page in various locations. Prevent any swaying of the blind.

Operation

The tilting of slats in all types (slats are "raised" flat under each other) is accomplished by operating a cord at the left of the blind. They will remain in a fixed position until changed, owing to pressure of spring against circular face of right-hand hanger. The tension of spring may be adjusted by turning the screw.

In the "Burlington" and "Junior Roller" types the slats are raised and lowered by a cord on the right of the blind and held at any desired elevation by one turn around the cord fastener placed on the right-hand casing.

In the "Roller" type the blind is held at desired elevation automatically by a ratchet in the device, operated by a hand tape at side of blind.



SPRING ON TOP RAIL
Engaging with hangers and holding slats at desired angle

Slats

Slats about 1/8 in. thick, 2 3/8 in. wide are generally used; 2 in. wide, in the smaller windows; the wider the slat, the lower the price; fewer slats being required.

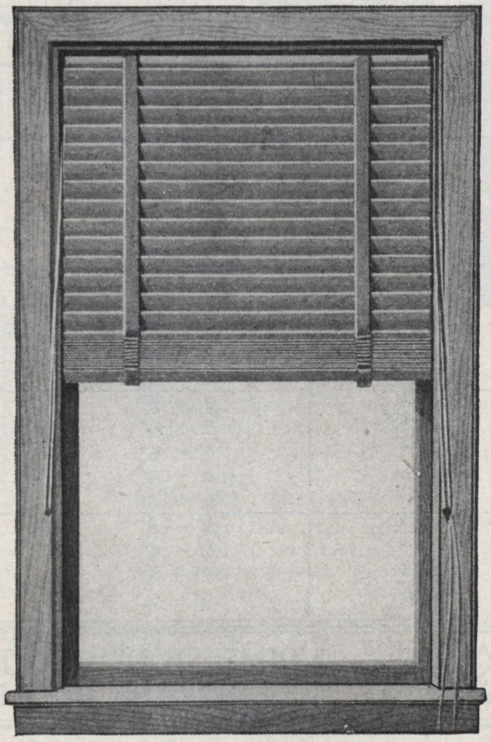
Space Occupied—With 2-in. slats, a "Burlington" blind 5 ft. high will occupy about 10 in. at top of window when it is gathered; and 1 in. more for each additional foot in height—thus, a 6-ft. blind would be 11 in.; a 7-ft., 12 in., etc. On 2 3/8-in. slats, same height blind would take about 2 in. less.

The "Roller" and "Junior Roller" styles require about 2 in. more in space at top for same height blind than the "Burlington" style.

Tenoned Slats—Furnished with the "Roller" and "Junior Roller" blinds when ordered; tenons engage with grooved guides at sides of windows, preventing the swaying of blind.

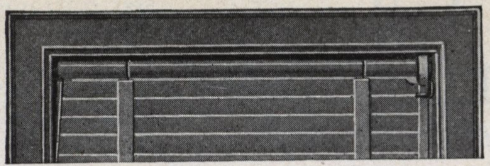
Materials and Finishes

All types are made of any kind of wood desired, from linden to mahogany, and finished in any style as ordered.



"BURLINGTON" TYPE VENETIAN BLIND

Continued on next page

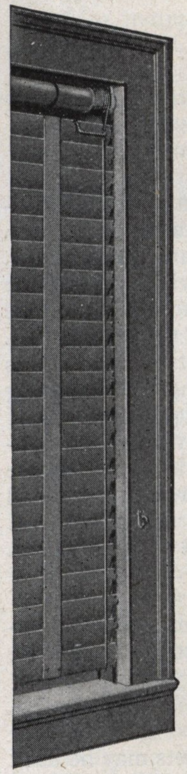


Section of "Roller" Type

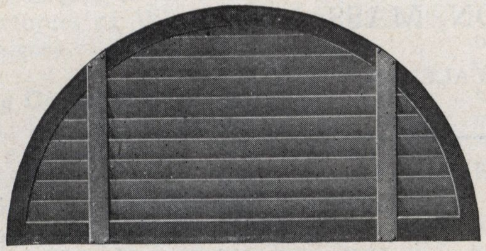
Venetian Blinds for Austral and Pivoted Sash

Below are shown Venetian blinds with rod guides used with austral sash or tilting transoms, each slat having a ring at each end engaging with the rod; and with pivoted sash, blinds having double thick slats at intervals, these having an eyelet engaging with the rods.

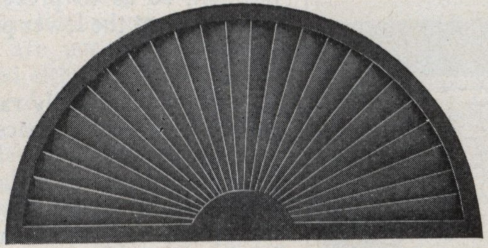
Either of these styles may be used for regular windows, if desired.



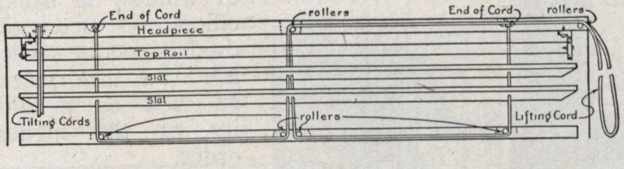
Section of "Junior Roller" Type with Tenoned Slats and Guides



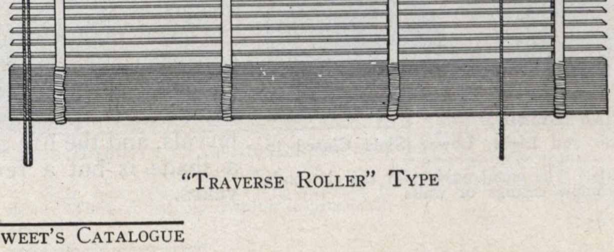
Treatment of Semicircular Top
Horizontal slats



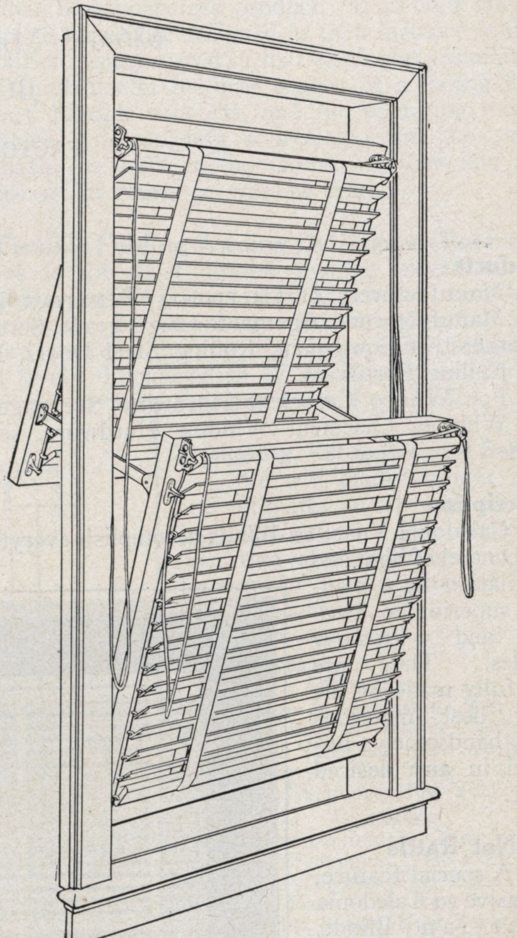
Treatment of Semicircular Top
Radial slats


End of Cord
Headpiece
rollers
End of Cord
rollers
Top Rail
Slat
Slat
Tilting Cords
rollers
Lifting Cord

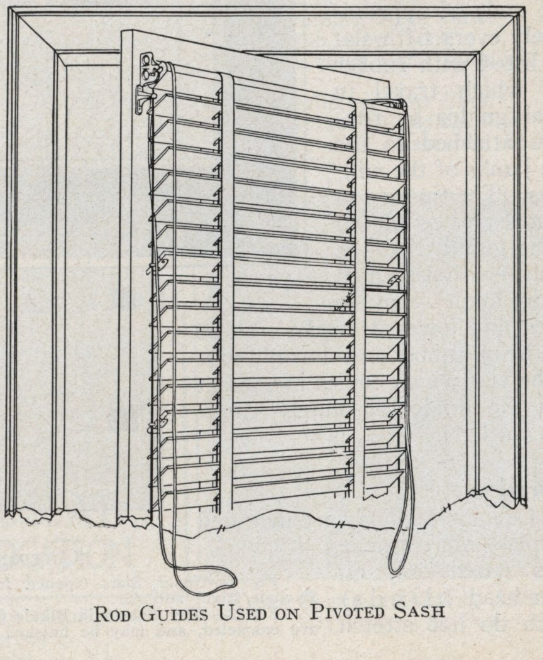
"E-Z Lift" Type
Fitted with ball bearing steel rollers insuring easy lifting



"Traverse Roller" Type



Rod Guides Used on Austral Sash or Transoms



Rod Guides Used on Pivoted Sash

CALEDONIA VENETIAN BLIND COMPANY

OPERATED BY

H. E. HOLBROOK COMPANY

636-645 Massachusetts Trust Building
BOSTON, MASS.

FACTORY: CALEDONIA, N. Y.

Products

Manufacturers of Caledonia Venetian Blinds.

Manufacturers' Agents for high grade Screen and Weatherstrip Equipment, Rolling Steel Doors, Folding and Rolling Partitions.

For Whitco Casement Hardware, see page 1657; for Whitney Casement Window Hardware, see page 1658.

Description

Caledonia Venetian Blinds accomplish everything in the control of light and ventilation in a manner superior to awnings and window shades. They are carefully made of the very best materials and handsomely finished in any desired color.

Do Not Rattle

A special feature, exclusive to Caledonia Venetian Blinds, makes it impossible for them to rattle. The ends of approximately every fifth slat are fitted with rubber tips which travel in metal guides or runways attached to the side jambs of the windows. The tips are so formed and so placed in the guides that the blinds—with slats tilted to any angle—may be raised and lowered freely. These tips, being rubber and the only part of the slat which comes in contact with the guide, absolutely eliminate rattle.

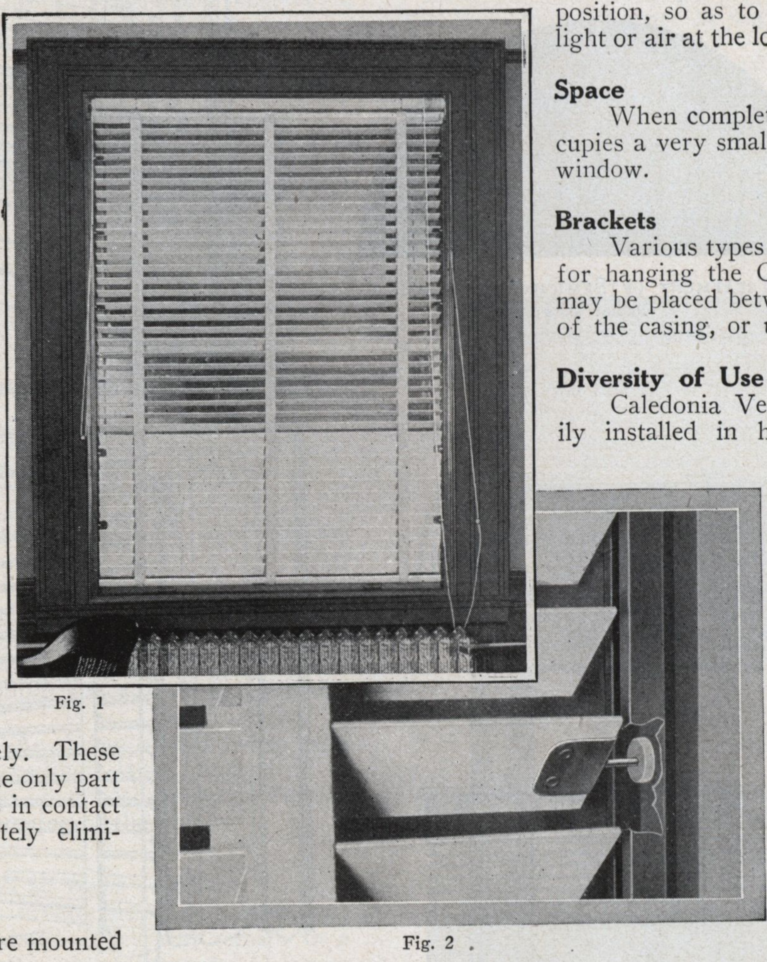


Fig. 1

Fig. 2

Caledonia Venetian Blind

Fig. 1—Upper Slats Opened for Ventilation and Light, Lower Slats Closed to Exclude Light and Air

Fig. 2—Why Caledonia Blinds Can Not Rattle. The metal guides for the slat ends are enameled, and may be finished to match window casings or walls

Operation

Caledonia Blinds are mounted on phosphor bronze tapes (used only on roller-head blinds) which do not stretch or shrink; which not only hold the slats in a horizontal position, but insure them raising and lowering evenly at all times.

Only one cord is required to operate these blinds. This is attached to a roller at the top which causes the blind to operate with unusual ease. On small openings the roller at the top of the blind may be dispensed with.

With use of our automatic head control, the blind is locked in any position simply by releasing the operating cord. The slats may be turned to any angle by means of the tilting cord, thus insuring instant control of the volume and diffusion of light. A part of the slats may be turned by a touch of the hand to a vertical position, so as to prevent the passage of light or air at the lower part of the window.

Space

When completely raised, the blind occupies a very small space at the top of the window.

Brackets

Various types of brackets may be used for hanging the Caledonia Blind. These may be placed between jambs, on the face of the casing, or under the header.

Diversity of Use

Caledonia Venetian Blinds are readily installed in homes, or in any type of window in banks, offices, or mercantile establishments. They are an adornment as well as a utility of the highest order.

Cost and Maintenance

The initial cost of Caledonia Venetian Blinds usually balances the expense of awnings and shades.

The maintenance expense is nil, whereas awnings must be renewed at frequent intervals, and the life of a shade is but a few years.

ESTABLISHED 1872

TELEPHONE
CANAL 4072, 6109

F. J. KLOES, INC.

Complete Awning Construction

269 Canal Street
NEW YORK, N. Y.

Products

AWNINGS; BUILT-IN GEAR ROLLER AWNING MECHANISMS, Hand or Power Driven; FLEXIBLE FOLDING AWNING OUTRIGGERS, for awnings on low store fronts, porches and large open terraces.

Also manufacturers of Window Shades, Curtains and Sidewalk Canopies.

Complete Awning Construction

F. J. KLOES, INC. plan, manufacture and install complete awning equipment for all types of buildings: stores, hotels, public buildings and residences.

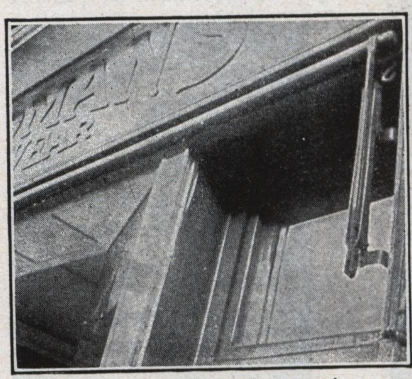
Long experience and extensive facilities enable this company to offer architects and contractors promptest co-operation and service. F. J. KLOES, INC., have also developed several special improvements in awning construction and manipulation which greatly simplify certain awning problems.

Kloes Built-in Gear Roller Awning Mechanism

This built-in mechanism obviates the unsightly exposed mechanical features of the old-fashioned type of awning and keeps awnings practically out of sight when they are not in use. It may be operated either by hand or power, as desired.

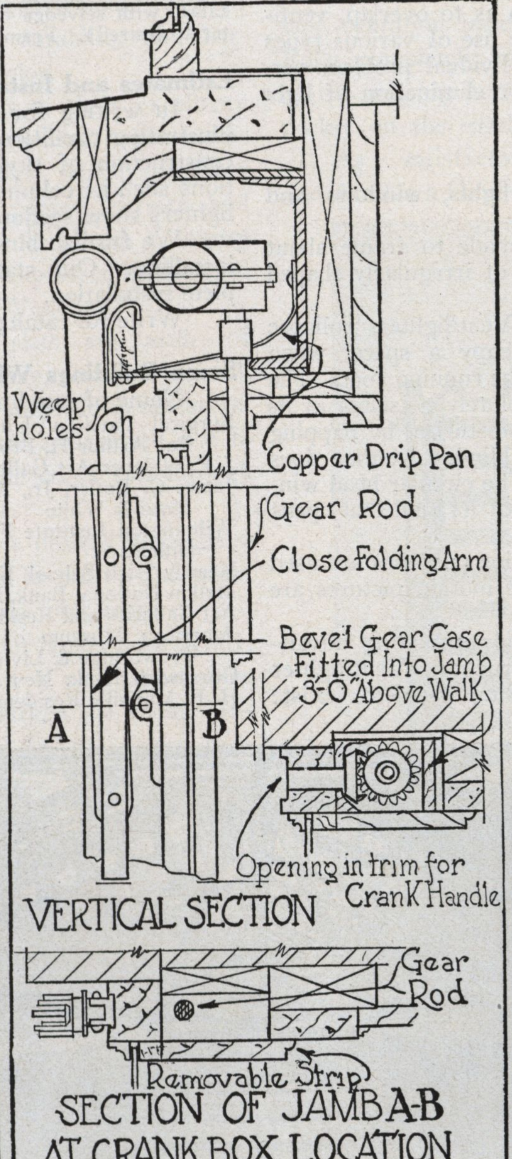
The Kloes Built-in Gear Roller Awning Mechanism is most economically installed during original building construction. It can, however, be installed in existing building fronts made of wood, stone, or iron, provided space available in jambs is at least 2½ in. in width.

Its use is especially desirable in the case of fine store fronts and wherever else it is important to preserve the best architectural harmony of the building. Further, it permits simultaneous and uniform control of a series of large awnings from a single controlling gear shaft.



KLOES BUILT-IN GEAR ROLLER AWNING INSTALLATION

Note how few features are exposed to view. When rolled up, awning is practically concealed


Weep holes
Copper Drip Pan
Gear Rod
Close Folding Arm
Bevel Gear Case Fitted Into Jamb 3-0" Above Walk
A
B
Opening in trim for Crank Handle
VERTICAL SECTION
Gear Rod
Removable Strip
SECTION OF JAMB A-B AT CRANK BOX LOCATION

DETAILS OF A KLOES BUILT-IN GEAR ROLLER AWNING MECHANISM
(Not drawn to scale)

Construction—The Kloes Built-in Gear Roller Awning Mechanism is a *system* of awning construction rather than a standardized product. It is built only on order and is especially designed in each instance to meet the conditions encountered in that particular installation.

Its fundamental features consist of a lifting front bar, arms, bracket supports, and the operating mechanism which is completely concealed from the street. Gear shafts are built in the jambs. Rollers and gear cases are set in recess in window trim.

Kloes Flexible Folding Awning Outriggers (Patented)

This is the most durable awning extension arm for awnings on low store fronts, porches, and large open terraces. It does away with uprights and slide rods and prevents awning from lowering below the desired level. Furnished in 17 standard sizes, for extensions from 4 to 20 ft.

Designing, Estimates and Service

We will gladly submit plans and estimates on all types of awning installations. We invite co-operation with architects and contractors in the solution of their awning problems.

References

ARCHITECTS

Trowbridge & Livingston, New York
McKim, Mead & White, New York
Starrett & VanVleck, New York
York & Sawyer, New York
Warren & Wetmore, New York

BUILDERS

Fuller Construction Co., New York
Mark C. Tredennick, New York
Cauldwell-Wingate, New York
Hegeman-Harris Co., New York
Marc Eidlitz & Son, New York

BUILDINGS

Hotel Plaza, New York
Copley Plaza, Boston
Hotel St. Regis, New York
Colony Club, New York
Bowery Savings Bank Building, New York
Barclay Building, New York
Royal Insurance Building, New York
New York Life Insurance Building, New York

KLOES FLEXIBLE FOLDING AWNING OUTRIGGERS IN USE

SIMON VENTILIGHTER CO., INC.

Ventilating Vane Shades for Windows, Sleeping Porches and Skylights

101 Park Avenue
NEW YORK, N. Y.

Ventilighter
TRADE-MARK
SCIENTIFIC SHADING
SLOGAN

Product

Ventilighter, a scientific shading device designed to control light in all its phases, decreasing solar heat, eliminating shadows and glare, without loss of light or ventilation.

Principles of Ventilighter

Ventilighter is not a screen, not an awning, not a blind and not a curtain, but has the advantages of all these devices with the disadvantages of none. It consists of a series of specially woven fabric vanes (although metal or other material may be substituted in special instances) mounted in a metal lattice frame. The vanes may be opened or closed so as to overlap, ventilation remaining unimpaired. The use of various types of vanes corresponding to the individual problem permits the concentration, diffusion or elimination of light rays.

Where Ventilighter Is Used

Ventilighter is used on skylights, windows and sleeping porches.

The skylight Ventilighter is made to frame about all obstructions and to fit all types of irregularly shaped openings.

Window and sleeping porch Ventilighters collapse horizontally to the jamb and occupy a space, when folded, of approximately ½ in. to the running foot. The sleeping porch Ventilighter is absolutely noiseless in its operation; hence, the sleeper is not disturbed by flapping or rattling, as with the old-time blind. Neither does the Ventilighter warp nor crack. The circular head window Ventilighter is the only device of its kind that opens and closes.

Metal Ventilighters for darkening purposes are used in schools, auditoriums, etc., where motion pictures are shown.

On account of its lighting and ventilating advantages and its flexibility of construction, Ventilighter should be adopted wherever shading problems exist: in art galleries, libraries, museums, banks, studios, drafting rooms, hospitals, solariums, public buildings, private offices, residences, etc. Wherever used, its simplicity of construction, skilled manufacture and tested high grade parts make it highly decorative and, at the same time, permanent and foolproof.

Specification

All skylights [windows] [sleeping porches] (specify location) shall be equipped with Ventilighter, a scientific shading device, as manufactured by Simon Ventilighter Co., Inc., 101 Park Avenue, New York, N. Y., consisting of a series of special vanes, adjustable as desired by the operation of a movable metal lattice frame, in which the vanes are mounted, thus permitting the control of light without impairing ventilation. Material of vanes to be a specially woven fabric with selvedge on both edges (or specify any other material desired). Frames to be finished to match surroundings.

Estimates and Installation

In writing for information please submit a sketch illustrating conditions. For skylight Ventilighters show construction of skylight opening and possible obstructions such as columns, piping, etc. For window Ventilighters show section of jamb, head and sill.

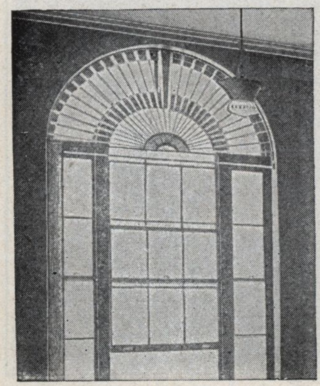
We furnish blue prints showing an easy method of installing. Our staff, if desired, will undertake complete installation.

Write for catalogue of construction, and installations.

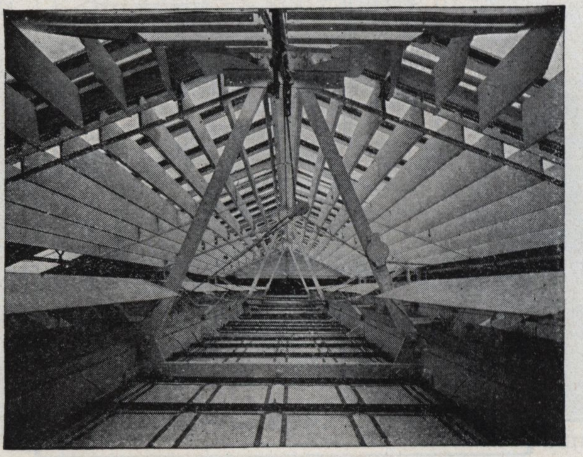
Some Buildings Where Ventilighter Is Installed

Name of building and architect:

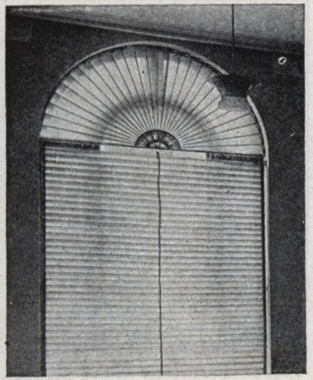
Surgical Pavilion, University of Pennsylvania, Philadelphia, Pa., Arthur H. Brockie
J. E. Widener Art Gallery, Philadelphia, Pa., Horace Trumbauer
James G. Butler, Jr., Art Gallery, Youngstown, Ohio, McKim, Mead & White
Wilmington Institute Free Library, Wilmington, Del., Tilton & Githens
Kearny High School, Kearny, N. J., Guilbert & Betelle
Mellon National Bank, Pittsburgh, Pa., Trowbridge & Livingston
Art Galleries and Residences, Charles A. Platt
American Museum of Natural History, New York, N. Y., Trowbridge & Livingston
Greenwich Bank, New York, N. Y., York & Sawyer
H. E. Manville Residence, Pleasantville, N. Y., Donn Barber
New York City Public Libraries, Carrère & Hastings
Hotel Shelburne, Atlantic City, N. J., Warren & Wetmore



Circular Head Open; Window Ventilighter Folded to Side



Breckenridge Long Art Gallery, St. Louis, Mo.
Guy Study, Architect



Circular Head and Window Ventilighter Closed

ESTABLISHED 1856

SWEDISH VENETIAN BLIND COMPANY

Importers and Sole Distributers on this Continent of Swedish Venetian Blinds

TELEPHONE
PENNSYLVANIA 1620

1265 Broadway
NEW YORK, N. Y.

CABLE ADDRESS
"VENETBLIND"

For Agencies, see page 1322

Product

SWEDISH VENETIAN BLINDS.

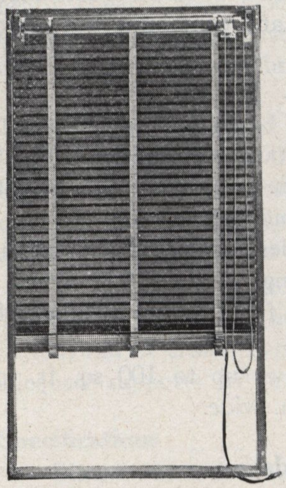
For Partitions, Rolling Doors and Shutters, see page 1322.

Swedish Venetian Blinds

These are the only imported blinds on the market and are radically different from all others, excelling in material, improved construction, ease of operation, durability and harmony of color.

Added to their excellence are conveniences, refinements and niceties which, together with the perfect service and easy control, afford a luxury only to be expressed by the term "Swedish Venetian."

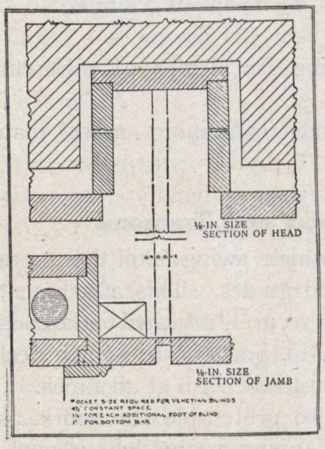
The slats are made of Norway pine, straight grained, very thin and, due to our secret process, are guaranteed not to warp. The cords run through glass rings, so as to prevent wear.



Sliding Venetian Blind in Grooves

The blinds are adjusted to any desired angle by a patent regulating device. They can be put up and taken down as easily as a roller shade; no tools required.

Our blinds close tightly, present a neat appearance and darken the room. Installed in the finest residences throughout the country.



Detail of Jamb and Pocket

When above is followed, it will result in a most satisfactory installation of Venetian blind, either outside, between screen and sash, or on the inside, giving a better service than any other blind of its kind

Sliding Venetian Blinds

For outside and inside purposes, with or without grooves.

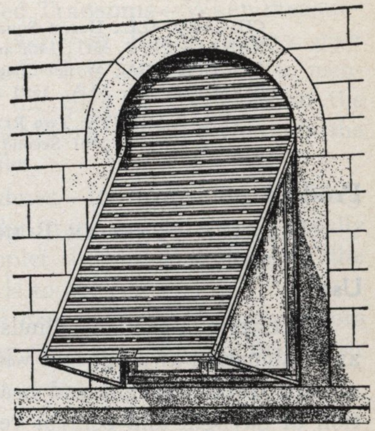
Also made with extensions, taking the place of awnings.

They answer the purpose of a shutter to a certain degree when let down.

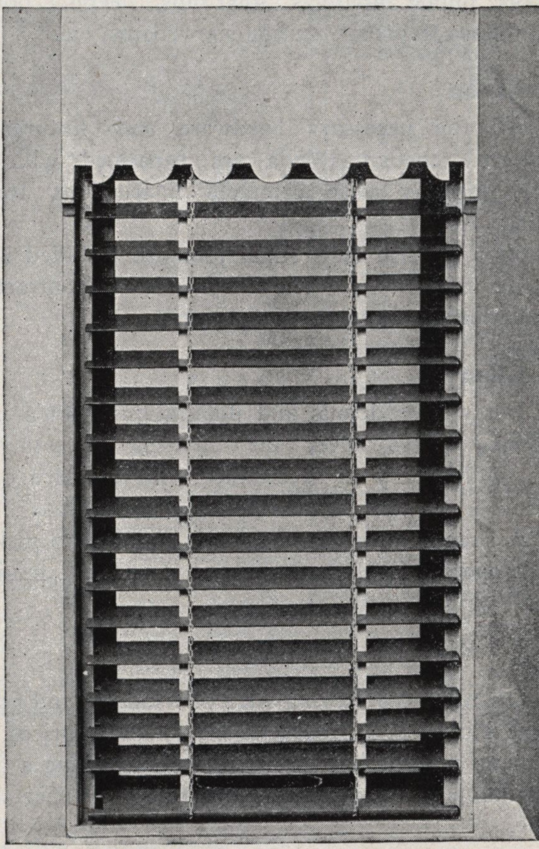
Outside Roller Blind

Made of heavy wood slats connected with non-rustable metal connectors. The slats slide in a neat metal groove. Slats can be adjusted so as to give ventilation and privacy, with only one tape operation inside. Rolls completely out of the way up into a pocket on the inside.

As satisfactory and durable a blind as there is on the market.



Roller Blind Open and Extended Out Like an Awning



Outside Venetian Blind, with Metal Tape

Illustration shown is an outside Venetian blind, a long-felt commodity. It is made of materials and so constructed that it will give long and satisfactory service; there is nothing that will wear out or go out of order. The slats are made with a center cut to operate on an L-shaped metal groove on the side. A metal hoisting tape and metal chain of non-rustable material are used; will not wear out and will withstand any atmospheric conditions, making this blind practically indestructible, and a very low cost blind installation

Catalogues, prices, details, at request.

WESTERN VENETIAN BLIND COMPANY

FORMERLY WESTERN BLIND & SCREEN COMPANY

Manufacturers of Venetian Blinds

2700 Long Beach Avenue
LOS ANGELES, CAL.

NEW YORK REPRESENTATIVE: Franklin S. Cobb, 310 Liggett Building

DISTRICT OFFICES

CHICAGO, ILL., Hearst Square Building
KANSAS CITY, MO., 14th and Montgall Streets
ATLANTA, GA., Wynne-Claughton Building
BIRMINGHAM, ALA., 1503 American Trust Building
SEATTLE, WASH., 911 Terminal Sales Building
SAN FRANCISCO, CAL., 921 Hearst Building
SAN DIEGO, CAL., 536 Spreckels Building
SALT LAKE CITY, UTAH, Boston Building

TEXAS AGENTS: Two Republics Sales Service, 523 Hicks Building, San Antonio; Southwestern Life Building, Dallas; 401 Second National Bank Building, Houston; 729 Hibernia Building, New Orleans, La.

WESTERN VENETIAN BLINDS
TRADE-MARK

Product

Western Venetian Blinds.

Use

Western Venetian Blinds are used as combination awnings and window shades. They keep out the direct sunlight and heat, afford better distribution of daylight and control ventilation.

Adaptability

They are suitable for banks, office buildings, schools, public buildings, solariums, sleeping porches, prism store transoms, garage showrooms, etc.

Installation

All the necessary hardware and fixtures for Western Venetian Blinds are furnished with each order, together with complete instructions for installing.

As a general rule, small jobs are installed by the contractor or owner. The factory usually contracts for installation of large or complicated jobs.

Operation

Descriptive details and illustrations shown in the following pages cover the different operating devices, which vary in accordance with the size of the blind.

A suitable operating device is supplied to make all blinds operate freely and easily, and with the minimum wear.

Prices

Owing to the varying sizes of windows and finishes of the blinds, it is impracticable to quote prices here. Estimates may be had, however, by furnishing a list of the windows, showing sizes, to the nearest office shown above.

Type C Blinds

This type of blind is designed for small windows—such as found in schools, office buildings, etc.

They are standard as to slats, ladder tape, cord and finish.

See details on second page following for different methods of hanging.

Recommended for windows less than 4 ft. 6 in. wide and containing not more than 30 sq. ft.

Type A Easy-lift Blinds

The double acting cord arrangement in this type of blind reduces the lifting strain to one-half the weight of the blind, and lifts the blind evenly.

Standard as to slats, ladder tape, cord and finish. All rollers steel ball bearing.

See second page following for different methods of hanging.

Recommended for windows up to 100 sq. ft. in area and those over 4 ft. 6 in. wide.

Oscillating Roller Type Blinds

This type of blind is designed for use in very large openings, such as found in banks, etc. Regardless of the size of the opening, these blinds are made to operate easily and freely.

See illustration of Federal Reserve Bank on third page following.

Standard as to slats, ladder tape, and finish. Lifted on $\frac{1}{16}$-in. flexible wire cables, by means of a single No. 6 sash cord.

See third page following for details of different methods of installation.

Recommended for blinds containing more than 100 sq. ft.

Rod Guide Blinds for Doors and Transoms

Blinds for transoms which swing into the room should be equipped with rod guides. This attachment consists of small swivel rings securely attached to the ends of slats which operate on $\frac{7}{32}$-in. brass or Bessemer steel rods, holding the blind firmly to the sash at all times.

This arrangement is also preferable for doors, as it prevents the blind from flapping as the door is operated, but in no way interferes with the operation of the blind or the door.

This attachment is also recommended for blinds which are exposed to strong winds.

Continued on next page

Skylight Blinds

This type of Western Venetian Blind overcomes the disadvantages presented by skylights which are often difficult to cope with.

Skylight blinds entirely eliminate glare and subdue bright sunlight that without them would flood through the skylight. Also heat from the sun, which is intensified by glass, is minimized and almost excluded by them.

They can be had in any size for all types of skylights. See third page following for details of installation, measurements, etc.

Type K Circular Head Blinds

This type of blind is made with stationary slats tilted to 45° angle. They are made with a horizontal bottom bar to which the uprights are securely fastened. After the slats are notched into these uprights, they are neatly covered with tapes. A strip 1/8x1 3/4 in. is bent around the circle to cover the ends of the slats, which are supported by small brads through this strip.

Type F Circular Head Blinds

This type is made the same as Type K above, with the exception that instead of bending a strip around the circle, a solid circular sawn frame 1 1/4x1 3/4 in. is used, and the ends of the slats are fastened to this.

Where there is no transom bar in the window, Type A blinds may be attached directly underneath the bottom rail of either Type F or Type K circular blinds; adequate supports are provided, regardless of width.

Specifications

Slats—Made from clear Port Orford white cedar (a wood of fine texture suitable for staining to match hardwoods, etc.) finished 1/8 in. thick. Standard width 2 3/8 in. Also made in 2-in. width. Guaranteed against warping, splitting or breaking for an indefinite period. Slats made from other wood are furnished, but not recommended or guaranteed; 2-in. slats recommended only for small windows.

Ladder Tape—Best quality cotton and linen fabric, interwoven ladders; imported or domestic.

Cord—Hollow, specially braided, glazed to prevent wear.

Finish—The blinds are finished to match or contrast woodwork. Natural white cedar finish constitutes three coats of high grade floor varnish. Stained finishes are covered with three coats of varnish. Painted or enameled finishes are regularly furnished in three coats.

Dark finishes are not recommended where daylight must be considered.

Hangers—Stamped from sheet metal, carrying cord rollers 7/8 in. in diameter, made of steel with double race ball bearings. Two styles for Type C blinds—one for installation between jambs or stops, and the other on face of casings. When installed between jambs, Type C hangers require a minimum of 3/4-in. space. When installed on face of casing, the slats should lap 1 1/2 in. on each side.

How to Measure for Western Venetian Blinds

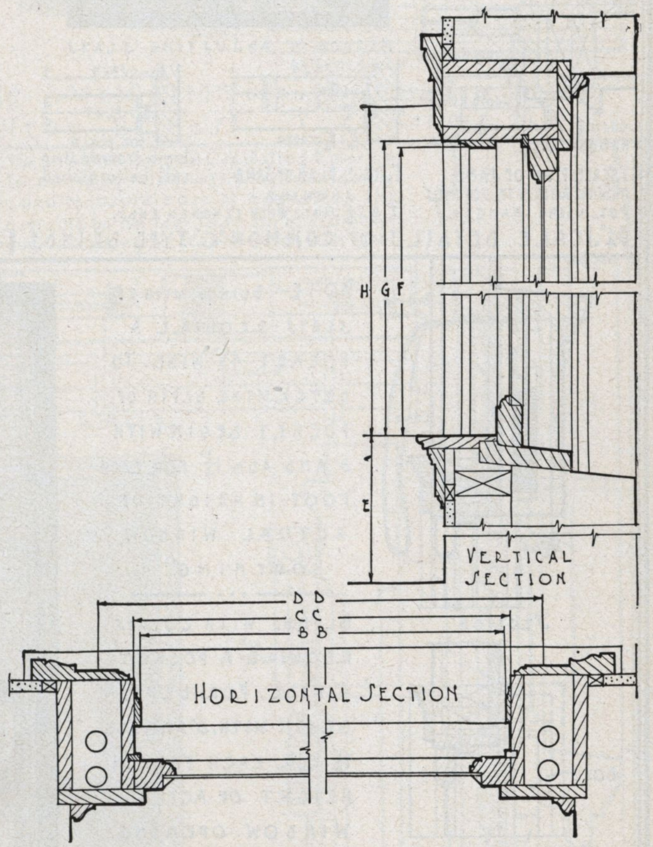
For Ordinary Windows—When blinds are to hang between stops or jambs (B-B or C-C) always give full net width and height of opening between such points and mention where measured.

When to be hung on face of casings (D-D) give the actual width and height of the blind wanted, mentioning where measured. For example—"Width D-D, 48 in., height of blind, 84 in."

For Doors or Hinged Transoms—When measuring these for Western Venetian Blinds, always give the actual size of the glass. It is also desirable to mention the distance from the edge of the glass to the nearest point of any hardware which occurs on the transom sash or door stiles.

For Circular Windows—In furnishing working measurements for circular transoms, etc., it is usually best to cut a paper templet the size and shape of the opening where the blind is to go.

Note: Always give distance from floor to bottom of blind, so that operating cords may be made the proper length.

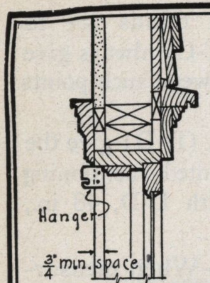


Measurement Diagram of Western Venetian Blind

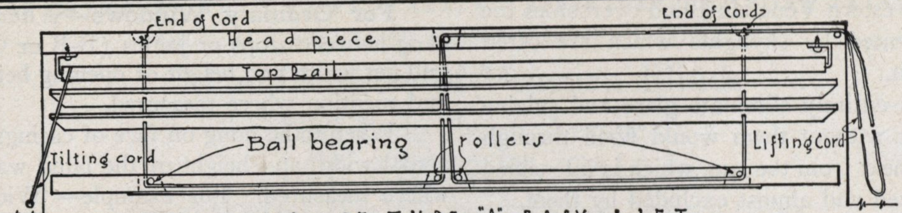
Attractive Appearance

Western Venetian Blinds not only outwear the ordinary fabric window covering, but distinguish the building by reason of the clean cut exterior. The architectural lines are maintained and both interior and exterior appearance is enhanced.

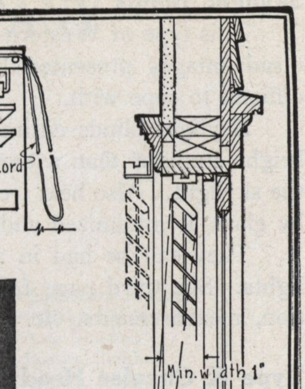
Continued on next page


Hanger
3/4" min. space

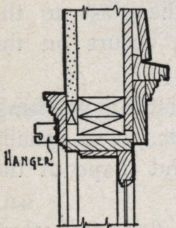
SECTION SHOWING HANGER ATTACHED TO SIDE JAMBS.


End of Cord
End of Cord
Head piece
Top Rail
Ball bearing rollers
Tilting cord
Lifting Cord

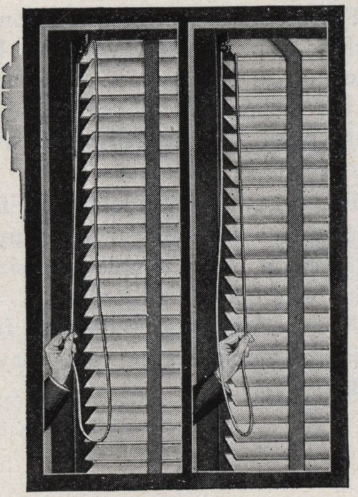
ELEVATION OF TYPE "A" EASY LIFT.



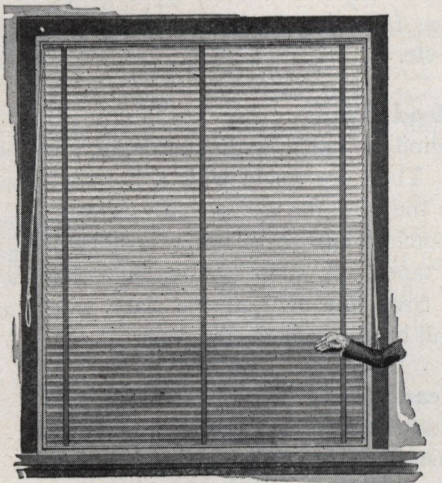
SECTION THRU HEAD SHOWING ALTERNATE HANGING POSITIONS.



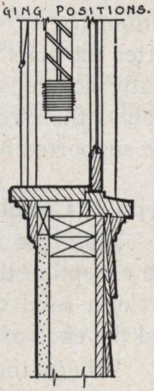
SECTION SHOWING HANGER ATTACHED TO CASING



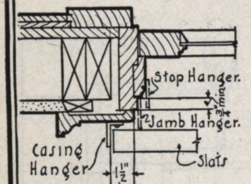
METHOD OF ADJUSTING SLATS.



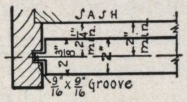
A VISION SCREEN IF DESIRED.



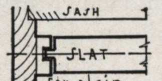
SECTION THRU SILL.


Stop Hanger.
3/4" min.
Jamb Hanger.
Casing Hanger
Slats
1 1/2"

1" SCALE PLAN OF JAMB SHOWING ALTERNATE SCHEMES FOR USING HANGER


SASH
1/4" min.
2" min.
3/16"
9/16" x 9/16" Groove

1" SCALE PLAN OF JAMB SHOWING 2" & 2 3/8" SLATS WITH TENONED ENDS.

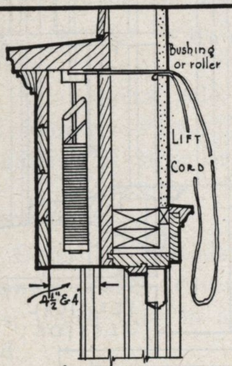


For plain Jamb Grooved Strip will be furnished.

NOTE:- THE BLINDS MAY BE CLOSED AT THE BOTTOM AS HIGH UP AS DESIRED, THEREBY SERVING THE PURPOSE OF A VISION SCREEN.

3/4" SCALE DETAILS OF COMMON "C" TYPE BLINDS.

3/4" SCALE DETAILS OF "A" TYPE BLINDS.

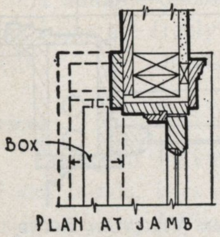

Bushing or roller
LIFT CORD
4 1/2" & 4"

SECTION

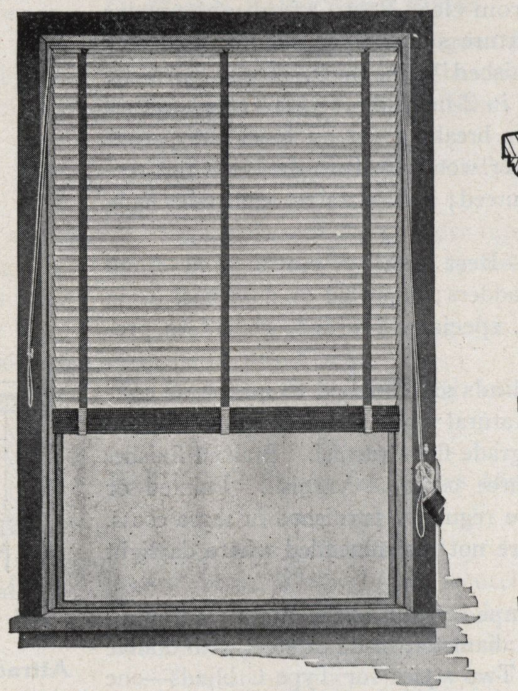
NOTE BLINDS WITH 2 3/8" SLATS REQUIRE A POCKET 4 1/2" WIDE. TO DETERMINE DEPTH OF POCKET BEGIN WITH 3" AND ADD 1 1/4" FOR EACH FOOT IN HEIGHT OF ACTUAL WINDOW OPENING.

...

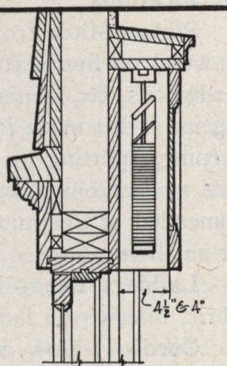
BLINDS WITH 2" SLATS REQUIRE A POCKET 4" WIDE. FOR DEPTH BEGIN WITH 3" AND ADD 1 1/2" FOR EACH FOOT IN HEIGHT OF ACTUAL WINDOW OPENING.



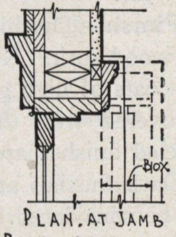
PLAN AT JAMB
BLIND CONCEALED OUTSIDE OPERATED FROM ROOM.



SHOWING BLIND PARTLY RAISED



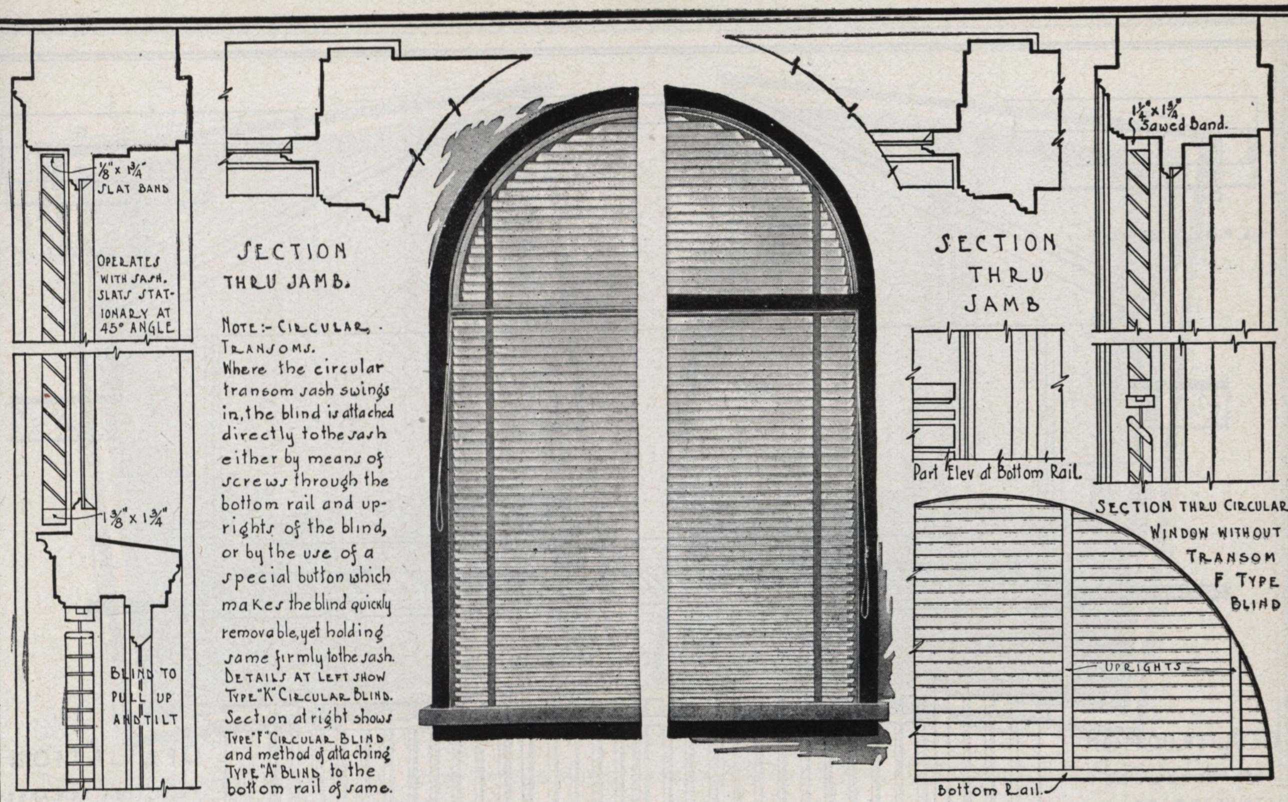
SECTION



PLAN. AT JAMB
BLIND CONCEALED IN ROOM.

DETAILS OF COMMON C TYPE & A TYPE WESTERN VENETIAN BLINDS

Continued on next page


1/8" x 1 3/4" SLAT BAND
OPERATES WITH SASH. SLATS STATIONARY AT 45° ANGLE
1 3/8" x 1 3/4"
BLIND TO PULL UP AND TILT
SECTION THRU JAMB.
SECTION THRU JAMB
Part Elev at Bottom Rail.
1 1/4" x 1 3/4" Sawed Band.
SECTION THRU CIRCULAR WINDOW WITHOUT TRANSOM F TYPE BLIND
UPRIGHTS
Bottom Rail.

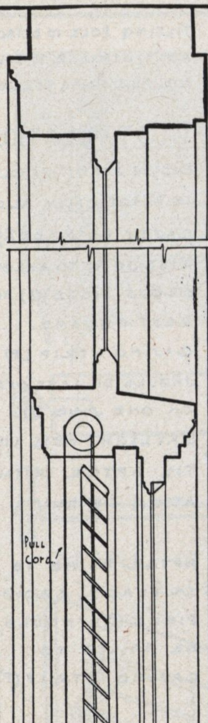
Note:- Circular Transoms. Where the circular transom sash swings in, the blind is attached directly to the sash either by means of screws through the bottom rail and uprights of the blind, or by the use of a special button which makes the blind quickly removable, yet holding same firmly to the sash. Details at left show Type "K" Circular Blind. Section at right shows Type "F" Circular Blind and method of attaching Type "A" Blind to the bottom rail of same.

SECTION THRU WINDOW WITH TRANSOM.

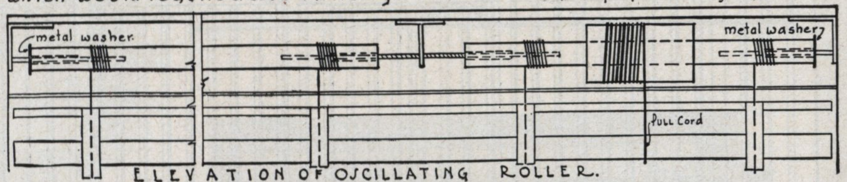
3/4" SCALE DETAILS SHOWING APPLICATION OF "F" & "K" TYPE CIRCULAR HEAD BLINDS.

PART ELEVATION OF "K" TYPE CIRCLE BLIND.

Note:- The size of the enclosing case for the mechanism on Oscillating Roller Type Blinds depends upon the weight of the blind. For example: A blind 10 ft. x 10 ft. would weigh approximately 75 lbs. in enamel finish, and to insure ease of operation the spool on which the operating cord winds should be not less than 3 1/2" in diameter which would require a case 4" x 4". Larger blinds would require proportionately large cases

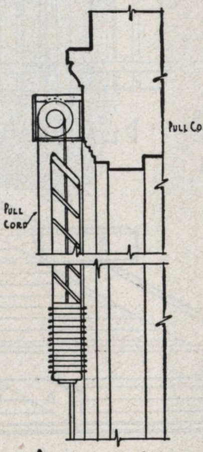


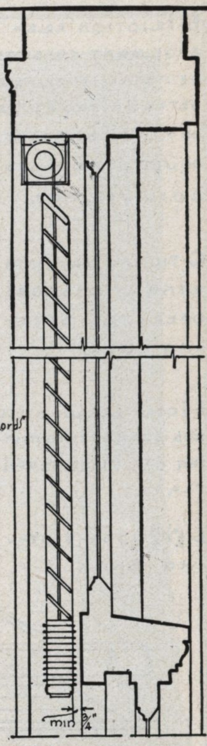
DETAIL OF BLIND OPERATOR CONCEALED IN TRANSOM.


metal washer
metal washer
Pull Cord

ELEVATION OF OSCILLATING ROLLER.

FEDERAL RESERVE BANK, KANSAS CITY, MO.
ARCHITECTS: GRAHAM-ANDERSON-PROBST & WHITE, CHICAGO & NEW YORK


Pull Cord
Pull Cord



3/4" SCALE DETAILS SHOWING APPLICATION OF OSCILLATING TYPE OF BLIND

DETAIL OF BLIND ON FACE OF CASING.

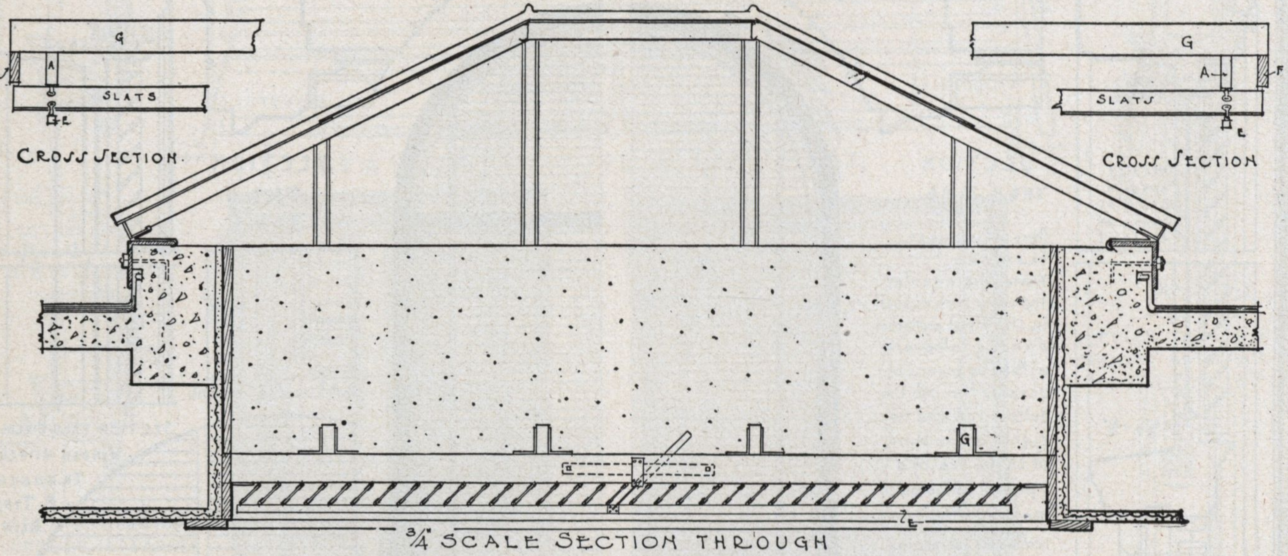
DETAIL OF BLIND OPERATOR CONCEALED AT HEAD.

WESTERN VENETIAN BLINDS

DETAILS OF CIRCULAR HEAD & OSCILLATING TYPES OF WESTERN VENETIAN BLINDS.

VENETIAN BLINDS WESTERN

Continued on next page



$\frac{3}{4}$ SCALE SECTION THROUGH SKYLIGHT WELL

CONSTRUCTION

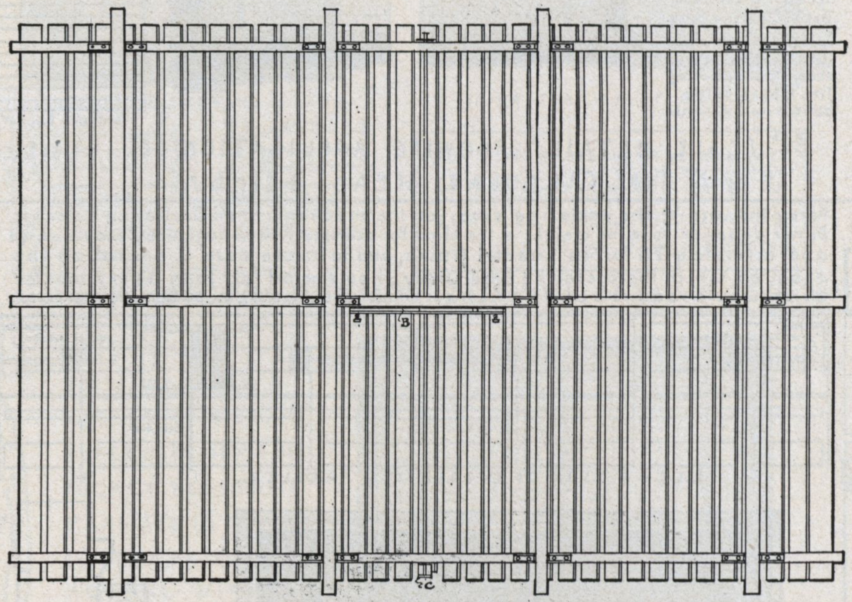
A.G FRAMEWORK CONSTRUCTED OF $\frac{7}{8}$" X 2 $\frac{7}{8}$" PIECES.

B-FRICTION ARRANGEMENT CONSISTS OF METAL LEVER HELD BETWEEN TWO STRIPS OF METAL BY MEANS OF SET SCREWS AND COIL SPRINGS.

C-TILTING ARM WITH RING AT END TO BE OPERATED BY TILTING POLE.

D-$\frac{1}{2}$" COLD ROLLED STEEL ROD CONNECTING TILTING BAR UNDERNEATH SLATS.

E-$\frac{1}{2}$"x$\frac{1}{2}$" WOOD TILTING BARS.



PLAN

OPERATION

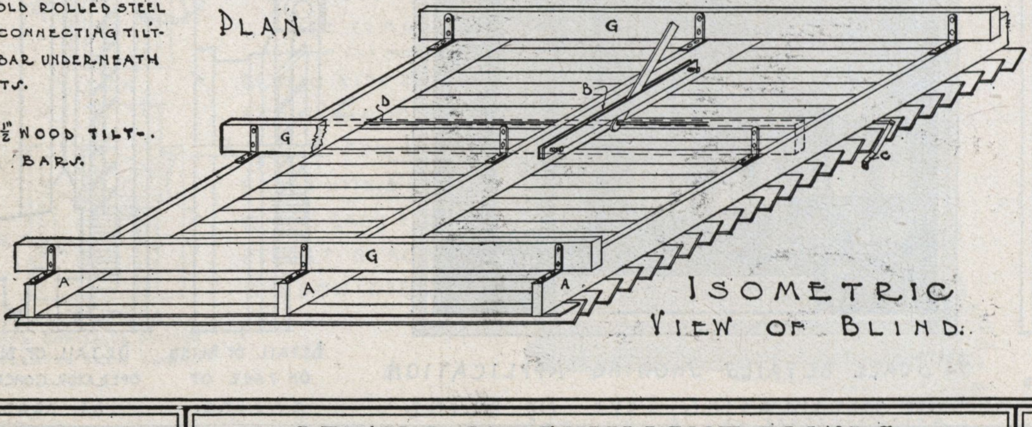
FRICTION ARRANGEMENT HOLDS SLATS IN ANY POSITION DESIRED.

TILTING POLE IS DETACHABLE, SIMILAR TO POLE FOR ADJUSTING TRANSOMS.

INSTALLATION

CASING STRIP (F) SHOULD IN PRACTICALLY ALL CASES BE MADE 2$\frac{3}{4}$" WIDE SO AS TO ALLOW CROSS PIECE (G) TO REST ON SAME. CASING STRIP (F) SHOULD BE LEFT OFF ON ONE SIDE OF SKYLIGHT WELL UNTIL AFTER INSTALLATION OF BLIND.

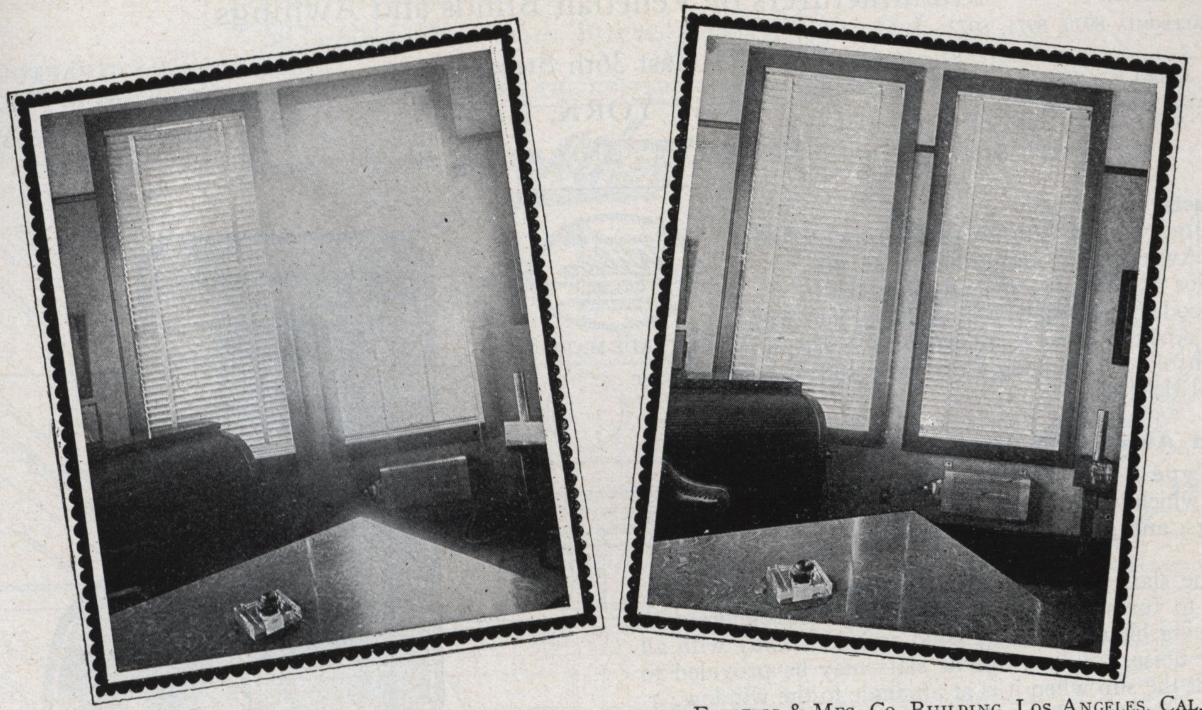
AFTER BLIND IS IN PLACE, CROSS PIECE (G) SHOULD BE NAILED TO CASING STRIP (F).



ISOMETRIC VIEW OF BLIND.

DETAILS OF SKYLIGHT BLINDS
WESTERN VENETIAN BLINDS

Continued on next page

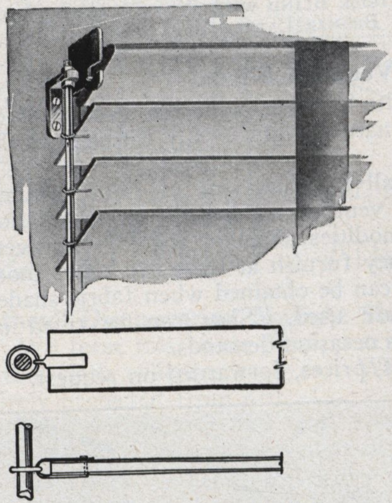


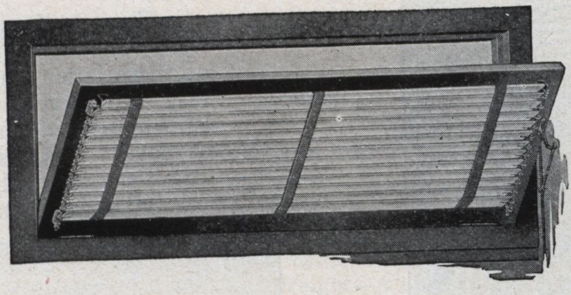
Reproductions from Photographs Made in the Westinghouse Electric & Mfg. Co. Building, Los Angeles, Cal.

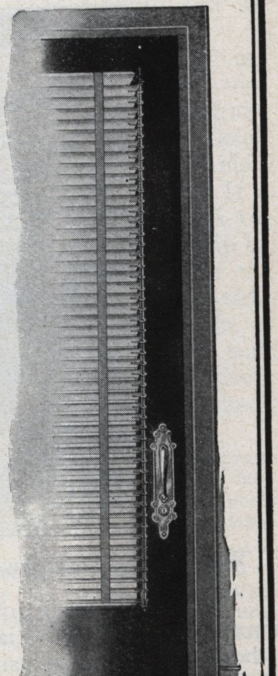
Not one minute elapsed between pictures.

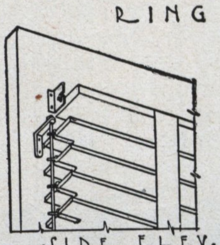
The camera has proved the intrinsic value of Western Venetian Blinds. It has demonstrated the perfect service performed by this window equipment in controlling the intensity of sunlight and in the proper distribution of daylight

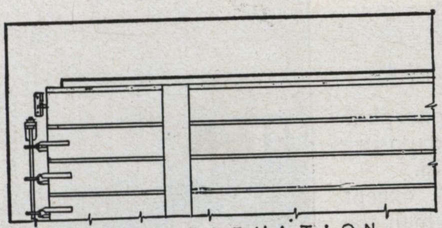
Western Venetian Blinds are particularly adaptable for use in windows unusually large in width and height. Oscillating Roller Type Blinds are recommended for such use; these can be had as wide as 25 ft. and as high as 30 ft.











DETAILS OF DOOR AND TRANSOM TYPES OF WESTERN VENETIAN BLINDS.

ESTABLISHED 1876

THE J. G. WILSON CORPORATION

Manufacturers of Venetian Blinds and Awnings

TELEPHONE
Caledonia 8970, 8971, 8972

CABLE
"Lydian, New York"

11 East 36th Street
NEW YORK, N. Y.

For Offices and Agencies, see page 924

FACTORY
NORFOLK, VA.

Established 1876
Wilson
DOORS - PARTITIONS - BLINDS
WARDROBES
THE J.G.WILSON CORPORATION
NEW YORK CITY

TRADE-MARK

Products

Diffuselite Venetian Blinds; Venetian Awning Blinds; Porch Blinds.

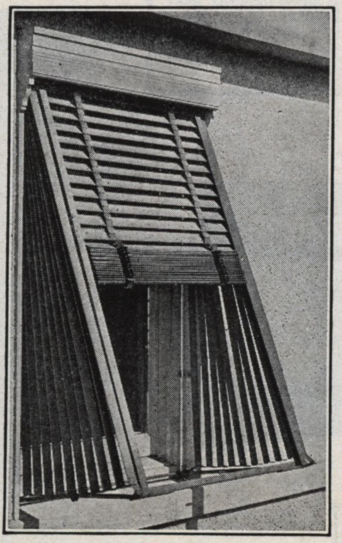
For Rolling Doors and Shutters in steel and wood, Horizontal Folding Doors and Fireproof Airkore Doors, see pages 924-927; for Sectionfold and Rolling Partitions and Wardrobes, see pages 1318-1321.

Wilson Awning Blinds

Type 1-4—Illustrated below. A Venetian awning blind which takes the place of shutters and fabric awnings, and gives perfect control of light and ventilation.

The slats slide in bronze grooves which can be extended to form an awning. This construction prevents their being blown about by wind and does away with all rattling noise. Side wings or slats may be provided to keep out the sun when it is at an angle to the window.

Installed on the outside of buildings, it may be raised or lowered while either in an extended or vertical position, with slats at all times capable of adjustment for the regulation of light and ventilation.



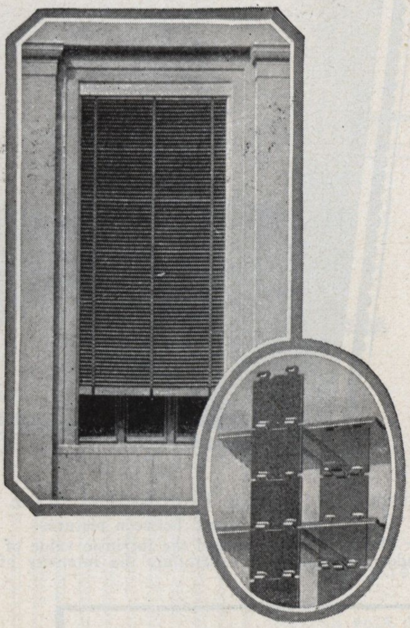
Wilson Venetian Awning Blind, Type 1-4

The slats are strung on non-corrosive phosphor bronze ladder tape which is not affected by exposure to the elements, an exclusive Wilson feature.

Type 3-5—Is similar to the No. 1-4, except that it has no side wings or grooves in which the slats slide.

It is usually used on porches.

Wilson awning blinds are built to fit exactly the openings for which they are made, so that they are readily installed. If desired, operation of the slats can take place from the inside of the room without opening the sash.



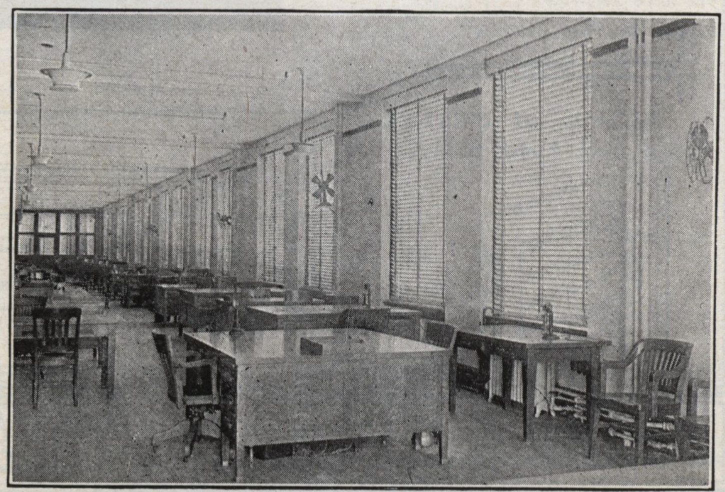
Wilson Venetian Outside Blind with Non-corrosive Phosphor Bronze Ladder Tape

Wilson Diffuselite Venetian Blinds

Wilson Diffuselite blinds exclude the direct rays of the sun and diffuse natural light evenly throughout the room.

They perform all the functions of fabric shades, fabric awnings and ventilators, making an installation of these latter commodities alone or together unnecessary. In addition they furnish at least five times more light to a room than can be obtained when fabric shades or fabric awnings are used. Slats can be tilted or raised and lowered as occasion demands.

Catalogue, details, prices, forwarded on request.



Typical Office Installation, Wilson Diffuselite Blinds

ATHEY COMPANY

Disappearing Skylight Shades and Partitions

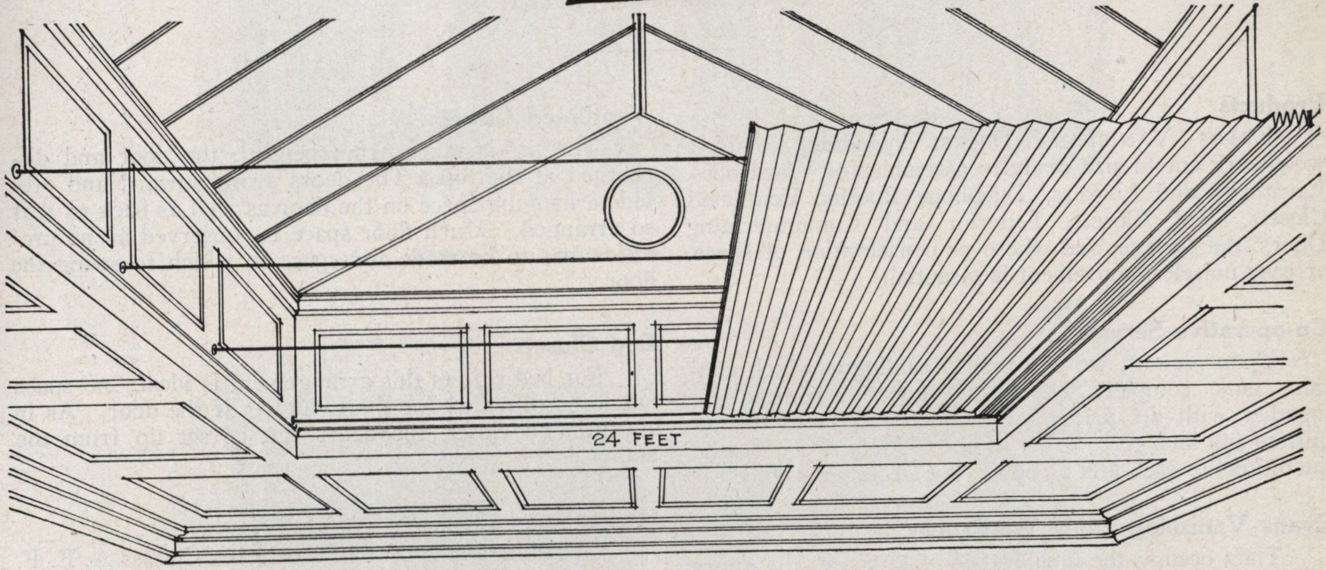
6035-6045 West 65th Street, CHICAGO, ILL.

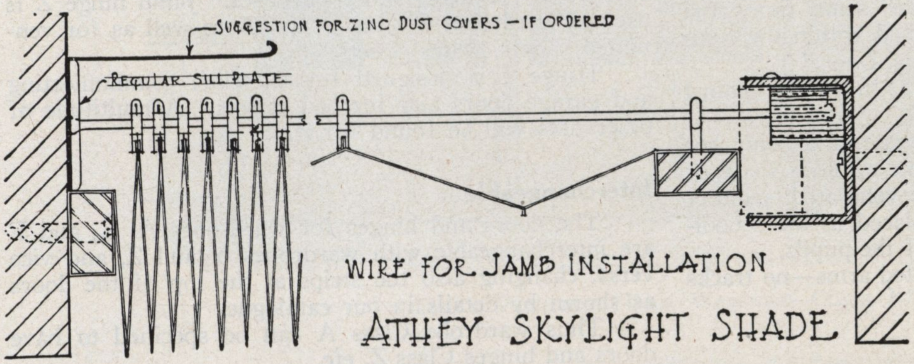
NEW YORK OFFICE, 7 East 42nd Street
MONTREAL, QUE., Creswell, McIntosh Co., 270 Seigneurs Street
BRANCHES AND AGENCIES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA—See Classified Telephone Directories

Products

"Athey" Skylight Shades; Disappearing Partitions.

For Weatherstrips, see pages 1412-1413; for Window Shades, see page 2750.




SUGGESTION FOR ZINC DUST COVERS — IF ORDERED
REGULAR SILL PLATE
WIRE FOR JAMB INSTALLATION
ATHEY SKYLIGHT SHADE

"Athey" Disappearing Skylight Shade

We term this shade "disappearing" because 16 ft. of this cloth collapses to 6 in. When collapsed, it is entirely protected from dirt.

It is the lightest and most effective shade in appearance and operation, as well as the least expensive on the market.

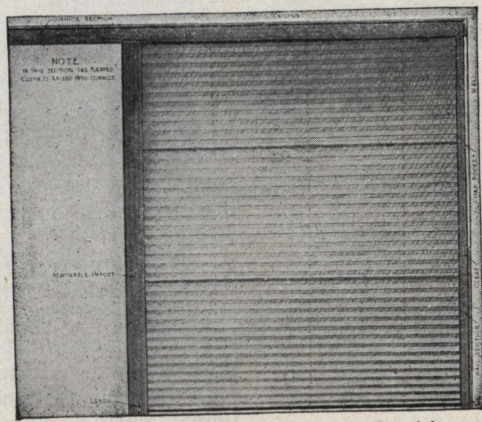
Cloth—Our standard shade cloth is a high grade coutil herringbone weave 112x76 threads to the square inch. We recommend the ecru color as being the most translucent and with the best reflective quality over electric lights. This shade is almost a perfect insulator for both heat and cold.

Operation—The perfect operation of the shade is accomplished by using small brass clips firmly clinched to the top of each pleat, which slide on strained brass wires.

The wires for shades over 8 ft. long are No. 12 gage and are on about 30-in. centers. There are no holes through cloth and almost no friction.

The operating devices are our regular steel channel cord case with brass rollers and the wire straining sleeves. Detail above illustrates the mechanism for well hole installations. If a greater width than 16 ft. is required, the shades can overlap by placing one an inch above the other where there are no subdividing beams. The braided operating cords, 1/8 in. in diameter, are gathered to a convenient point on the wall of the room by means of glass rings or pulleys. A shade 5 ft. wide will have only 3 wires and 2 cords; a shade 10 ft. wide, 5 wires and 2 cords.

Weight—A unit 12x16 ft. weighs complete 50 lb., averaging about 4 oz. per sq. ft. Units may be as large as 16x24 ft. Freight costs are low and installation is very simple.



Details of Athey Disappearing Partition

Athey Disappearing Partition

Entirely new; exceedingly attractive; thoroughly practical; very economical; simple and compact. *It really disappears.*

Description—The wood parts consist of two jamb sections, the cornice section and as many imposts as are necessary, or not to exceed 10-ft. centers; made of any wood and with rubbed finish, and all joints being fitted, the scribing mould takes care of unevenness of the plaster.

The cloth is coutil herringbone weave, taupe or other color, and is operated at the wall end with braided cords running over 7/8-in. brass rollers in the 1½x1½-in. steel channel cord case. Pleated cloth is raised into cornice and imposts removed in a few minutes, leaving room perfectly clear.

Shipping weight, including boxing, is 1¾ lb. per sq. ft., and the installation very simple.

W. L. EVANS

Vanishing Door Equipment

700 Block
WASHINGTON, IND.

CANADA: WINDSOR, ONTARIO

Products

Evans Vanishing Doors, including complete woodwork cut to size ready to assemble for Wardrobes, Lavatories and Lockers, Telephone Booths, Ventilated Closets, Bed Closets, Exterior and Communicating Doors, the Garage, and wherever conservation of space, or easy noiseless movement is essential.

Co-operative Service

Upon request, we will mail a catalogue which contains cuts, complete details and general information, together with net prices. When advised as to the requirements and given a list of the bidders, we will send quotations to each and a copy to the architect's office.

Evans Vanishing Door Wardrobes

They occupy the smallest possible space, the doors moving outward and inward at the same time, and when entirely open they have vanished within the compartment; thus the name, "Vanishing Door."

The doors can not stick or bind as they close against felt instead of between jambs.

They are noiseless, easy to operate, and being entirely out of the way they do not take up floor space or block the aisles. The wardrobes are ventilated, sanitary and unusually convenient. When placed in the schoolroom they contribute to the morals of the pupils.

The doors swing on double pivoted arms—no tracks or noisy rollers.

Lavatory and Locker Cabinets

They are especially adapted to offices, conserving at least 10 sq. ft. of space. When the doors are open they do not shade the interior of the cabinet. The ventilation is arranged the same as for the wardrobes.

Telephone Booths

They are ventilated and nearly soundproof. The walls, tops and doors are made of Evans Patent Process, which is a hollow, sanitary construction, flush without panels. The air is taken into the hollow wall near the floor and passing upward is discharged near the vertical center of the booth. The air is taken out through the hollow top, entering at the center and discharging at a point near the rear. The air spaces retard the vibration, and for all practical purposes the booths are soundproof.

Toilets

The Evans Vanishing Door for toilets conserves space of value equal to many times the cost of the equipment. The doors open inward and swing around the occupant in closing. There is no slamming of the door or noise.

Ventilated Closets

The air is taken from beneath the door and discharged at the top. The doors swing inward and provide a hanging space on the door as well as back of it if so arranged. Much floor space is conserved as no provision has to be made for space in which to swing the door.

Bed Closets

For bed closets this arrangement is ideal; no space has to be provided for the swinging of the door. As in a ventilated closet, the doors can be set up from the floor.

Hinges

Floor hinge A is used in wardrobes Classes A, E, F, as well as for many other purposes. Jamb hinge Z is used in wardrobes Classes Y and Z, as well as for ventilated closets, water closets, etc.

Hinge I is designed for exterior, communicating and garage doors and for bed closets. A multitude of other uses will be found for it.

Interchangeable

The doors and hinges for wardrobes A, E, and F are interchangeable with wardrobes Y and Z, and vice versa, changing also the strips at the top of the doors as shown by details in our catalogue.

Thus wardrobe Class A can be specified to have doors and hinges Class Z, etc.

Hinge Action

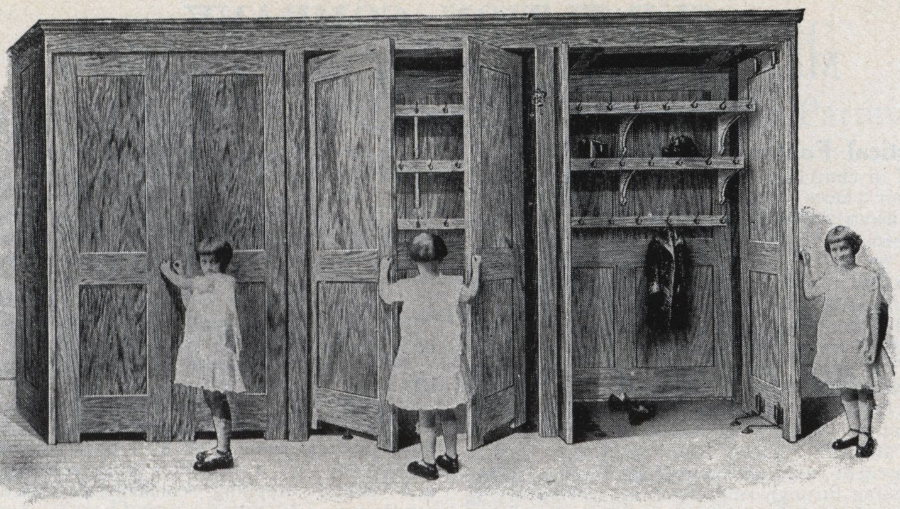
It is the combination of two movements producing a new mechanical motion. The hinge action of hinges A, I, and Z are all different from each other and fully illustrated by the square inch scale in the details shown in our catalogue.

It will be seen that floor hinge A uses less space inside and more space outside the compartment; the action of jamb hinge Z being just the reverse. Neither of these hinges will ever supersede the other; they are of different mechanism, different action, and often serve a different purpose. However, as in the case of wardrobes, either of these hinges can be successfully used, but for water closet doors it is evident a jamb hinge is required.

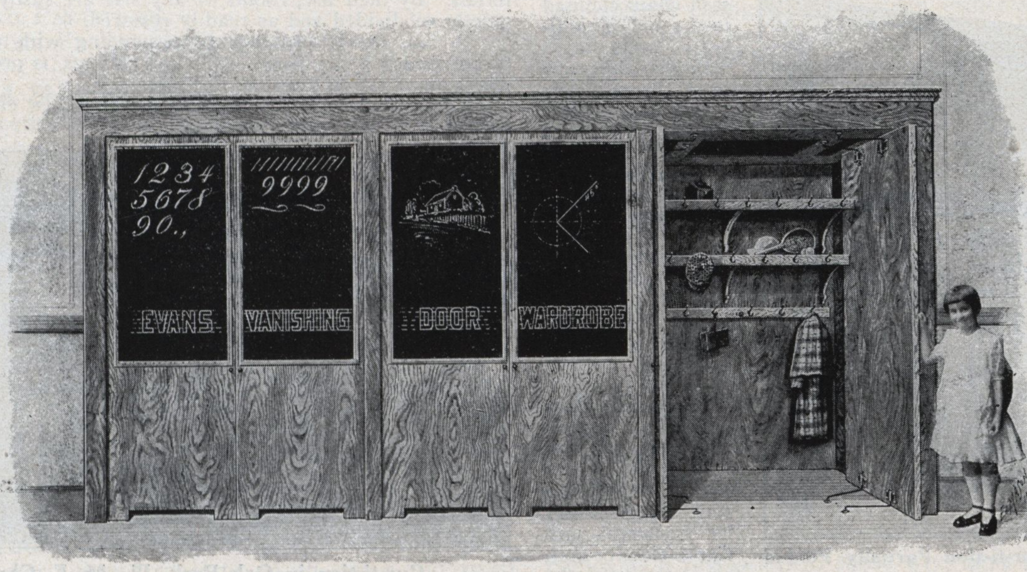
The jamb hinge moves the door inward according to the length of the arm, which also makes an automatic stop.

The floor hinge continues to carry the door inward until stopped. Either hinge is a successful creation; it only remains to choose the hinge adapted for its particular work.

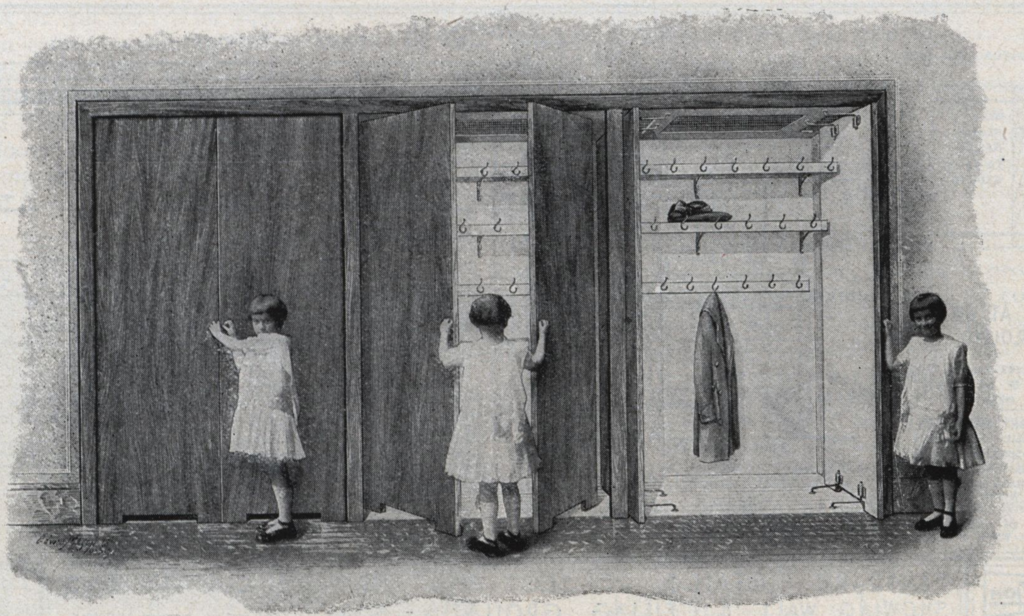
Continued on next page



Evans Vanishing Door Wardrobe—Class A-1


1234
5678
90.,
9999
EVANS
VANISHING
DOOR
WARDROBE

Evans Vanishing Door Wardrobe—Class E



Evans Vanishing Door Wardrobe—Class F

CUR-TI-TION COMPANY

Manufacturers of Acoustical Folding Partitions
1991 East 66th Street, CLEVELAND, OHIO

Cur-ti-tion Acoustical Folding Partition

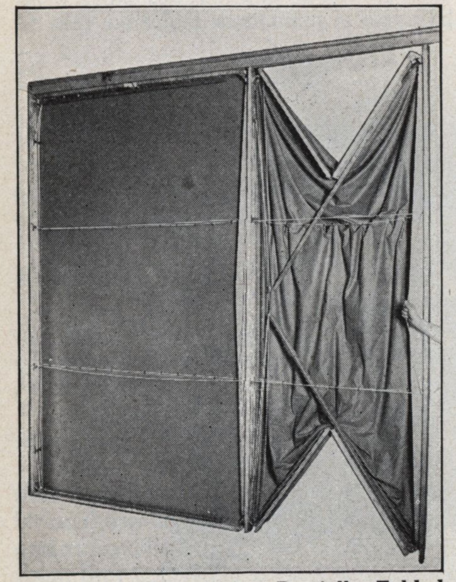
Extensively used in churches, schools, gymnasiums, lodges, offices and many other places where a folding partition is required, especially if acoustical perfection is imperative. Made for large or small openings.

It consists of a series of collapsible wood frames joined by malleable castings, each frame being suspended by a roller fiber wheel hanger running on a steel ceiling track which is neatly incased in wood moulding—see details below.

A standard heavy herringbone fabric of khaki color to match the wall—or any other fabric specified—is attached to both sides of the frame, thus when the Cur-ti-tion is in place as a partition, the fabric is tightly stretched and a 3½-in. sound absorbing dead air space is provided between the two walls formed by the fabric.

A system of sash cords running over self-lubricating pulleys on the frame and passing through rings fastened to reinforcing strips on the inside of the fabric, folds the fabric neatly when the frame is collapsed. A heavy sash chain clevised to the end of cantilever angle irons operates inversely over large self-lubricating pulley wheels located at top and bottom of the vertical members, resulting in simultaneous action of the upper and lower collapsing members and keeping the vertical members parallel with the wall at all positions.

Cur-ti-tions fold within their own width, preferably into shallow wall cabinets, entirely out of the way. Cabinets may be purchased with Cur-ti-tions or built as part of the building.



Two-section Cur-ti-tion Partially Folded

Showing fabric removed on one side and one section being folded

How Folded and Unfolded—Each section is collapsed by lifting the bar on the lower collapsing member and then by pulling the cord handle to end position. The fabric folds neatly with the collapsing frame. To restore the Cur-ti-tion as a partition, the handle on end vertical member is pulled and the Cur-ti-tion follows, section by section, until a complete closure is effected.

To pass through the Cur-ti-tion the end section is collapsed enough to pass through. It is then easily pushed back into position like a sliding door.

Three different models to meet varying conditions are manufactured.

Model "A" Cur-ti-tion used for classroom separation.

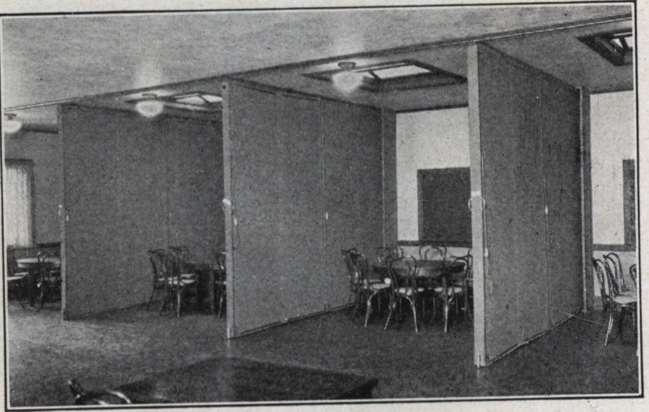
Model "B" Cur-ti-tion used when partition can not extend to the ceiling, running on fiber floor rollers.

Model "C" Cur-ti-tion with maximum sound absorbing and sound stopping construction used for departmental separation.

Advantages—Cur-ti-tions have a sound absorbing or acoustical value many times greater than partitions of other materials. By their use, rooms of any size are easily, quickly and quietly subdivided and as readily restored.

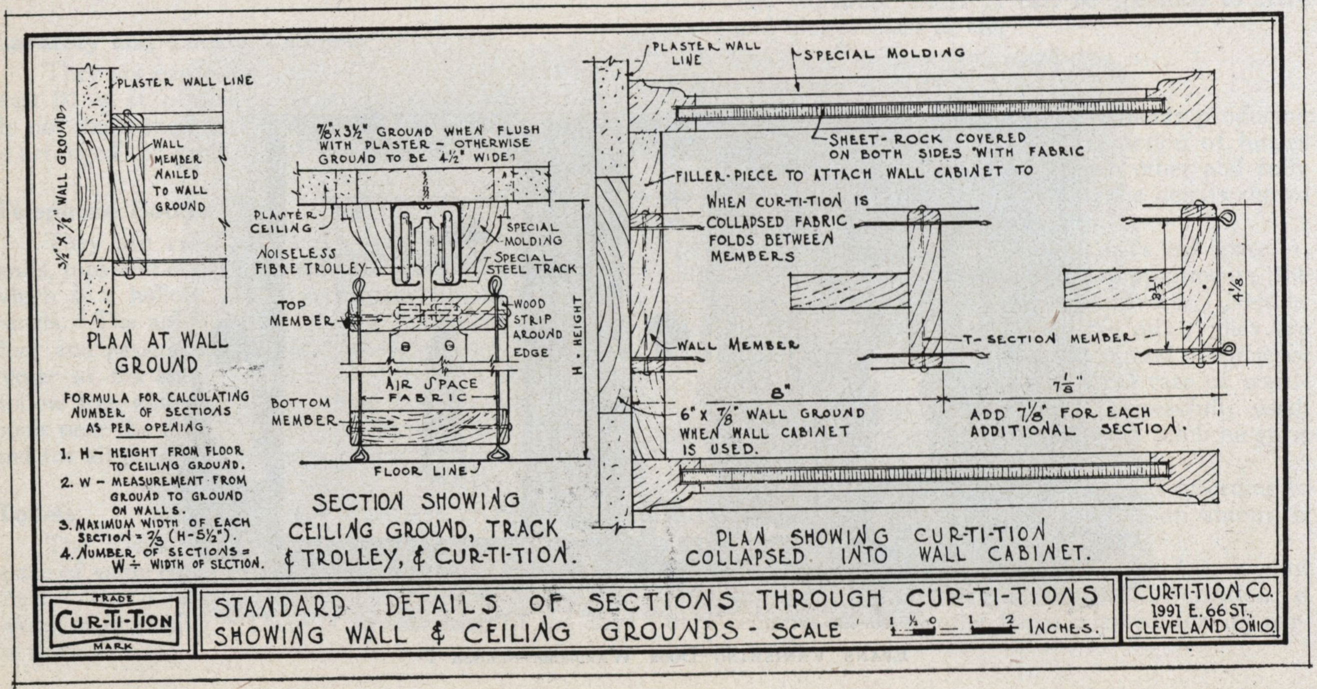
A flat, smooth surface corresponding with the wall and fitting snugly to the floor, walls and ceilings, is presented when Cur-ti-tions are in position.

Easily installed in new and old buildings either by contractor or Cur-ti-tion Company.



Cur-ti-tion in Oak Park, Ill., M. E. Church

Talmadge & Watson, Architects


PLASTER WALL LINE
3½" × 7⁄8" WALL GROUND
WALL MEMBER NAILED TO WALL GROUND
PLAN AT WALL GROUND
7⁄8"x3½" GROUND WHEN FLUSH WITH PLASTER – OTHERWISE GROUND TO BE 4½" WIDE
PLASTER CEILING
SPECIAL MOLDING
NOISELESS FIBRE TROLLEY
SPECIAL STEEL TRACK
TOP MEMBER
WOOD STRIP AROUND EDGE
H - HEIGHT
AIR SPACE
FABRIC
BOTTOM MEMBER
FLOOR LINE
SECTION SHOWING CEILING GROUND, TRACK & TROLLEY, & CUR-TI-TION.
PLASTER WALL LINE
SPECIAL MOLDING
SHEET-ROCK COVERED ON BOTH SIDES WITH FABRIC
FILLER-PIECE TO ATTACH WALL CABINET TO
WHEN CUR-TI-TION IS COLLAPSED FABRIC FOLDS BETWEEN MEMBERS
WALL MEMBER
T-SECTION MEMBER
3½"
4⅛"
8"
7⅛"
6" X 7⁄8" WALL GROUND WHEN WALL CABINET IS USED.
ADD 7⅛" FOR EACH ADDITIONAL SECTION.
PLAN SHOWING CUR-TI-TION COLLAPSED INTO WALL CABINET.
TRADE CUR-TI-TION MARK
STANDARD DETAILS OF SECTIONS THROUGH CUR-TI-TIONS SHOWING WALL & CEILING GROUNDS - SCALE 1 ½ 0 1 2 INCHES.
CUR-TI-TION CO. 1991 E. 66 ST., CLEVELAND OHIO.

FORMULA FOR CALCULATING NUMBER OF SECTIONS AS PER OPENING

1. H – HEIGHT FROM FLOOR TO CEILING GROUND.
2. W – MEASUREMENT FROM GROUND TO GROUND ON WALLS.
3. MAXIMUM WIDTH OF EACH SECTION = ⅔ (H-5½").
4. NUMBER OF SECTIONS = W ÷ WIDTH OF SECTION.

ESTABLISHED 1886

INCORPORATED 1905

ACME PARTITION COMPANY, INC.

FORMERLY UNION BLIND & LADDER COMPANY, INC.

Horizontal and Vertical Rolling and Folding Wood Partitions

OAKLAND, CALIFORNIA

REPRESENTATIVES

AMARILLO, TEX., Panhandle Builders Supply Co.
BILLINGS, MONT., Frank W. Richardson, Inc.
BIRMINGHAM, ALA., Union Mill Work Co.
BOSTON, MASS., H. E. Holbrook Co.
DALLAS, TEX., R. J. DeWees Co.
DENVER, COLO., George P. Heinz & Co.
DES MOINES, IOWA, Tower Materials Co.
HOUSTON, TEX., Louis G. Hester
JACKSON, MISS., Clark Building Material Co.
KANSAS CITY, MO., American Sash & Door Co.
LOS ANGELES, CAL., E. R. Kuns Co., Inc.
NEW ORLEANS, LA., Nachary Builders Supply Co.
OKLAHOMA CITY, OKLA., Hanson Building Specialty Co.
OMAHA, NEB., Sunderland Brothers Co.
PORTLAND, ORE., Cress and Co., Inc.
ST. LOUIS, MO., Harry C. Uhlenhaut
ST. PAUL, MINN., Concrete Steel Co.
SALT LAKE CITY, UTAH, S. A. Roberts & Co.
SAN ANTONIO, TEX., General Supply Co.
SAN FRANCISCO, CAL., Charles Christensen Co.
SEATTLE, WASH., D. E. Fryer & Co.
SIOUX CITY, IOWA, Henoch and Bridge
SPOKANE, WASH., D. E. Fryer & Co.
TACOMA, WASH., D. E. Fryer & Co.
WACO, TEX., Texas Building Material Co.
WATERLOO, IOWA, Iowa Building Material Co.
WICHITA, KAN., Grabendike Engineering Sales Co.

Products

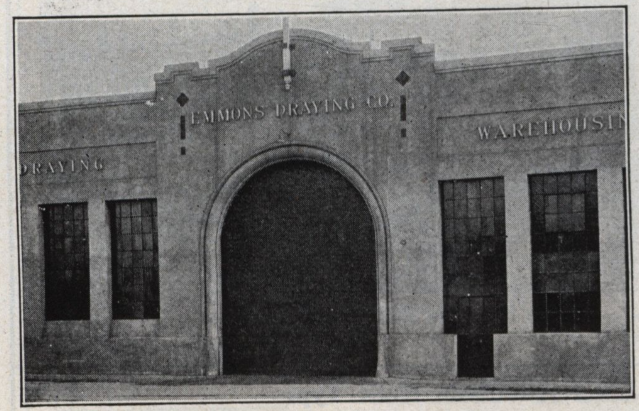
- Horizontal Wood Rolling Doors (Exterior).
- Vertical Wood Slat Doors (Exterior).
- Horizontal Wood Rolling Partitions.
- Vertical Wood Rolling Partitions.
- Folding Partitions.
- Wardrobe Fronts, Rolling or Folding.

Service and Shipping Facilities

The recent enlargement of our plant gives us added facilities insuring the prompt execution of all orders. The factory office maintains estimating and drafting departments for co-operation with the architectural and contracting profession. We invite correspondence relative to special or unusual requirements. Our plant is located in Oakland, on the mainland side of San Francisco Bay, which is favored as the terminus of three transcontinental railway systems and ten steamship lines engaged in Gulf and Atlantic seaboard trade. These unusual transportation facilities enable us to make direct shipment and prompt deliveries to all parts of the United States.

Acme Horizontal Wood Rolling Doors (Coiling Overhead) for Exterior Use

Construction—Slats of Oregon pine, white pine, or white cedar. Standard slats, ¾ in. thick and from 1½ to 2 in. wide on face, are threaded on bronze tapes which resist rust and corrosion due to chemical action of gases, acids, or salt air. The tapes are spaced from 30 to 40 in. on centers, each tape being capable of sustaining several times the weight of the entire door. Sufficient spring power is built into the shaft to properly counterbalance the door. The shaft is well trussed (except in small doors) and rotates upon $\frac{7}{16}$-in. ball bearings. Simple or compound gearing as may be necessary is used, the chain itself being standard lock-link galvanized chain. Only the best quality of gray iron castings are used, except in large, heavy work when cast steel or malleable iron is used. Our patented expansion joint (see illustration at bottom of following page) takes care of the swelling and shrinking of the slats incident to atmospheric changes. This is an important feature of all Acme doors and partitions.



Warehouse Opening 16x21 ft.

Types and Uses—Class A, exterior, is the regular chain hoist type with the operating mechanism on either side of the opening. The operating mechanism does not necessarily have to be on the same side of the wall as the coil.

Class B, exterior, is the same as Class A, except that the operation is through cut steel bevel and miter gears and hand crank. The operation may be from either the inside or outside of the wall, or both.

Class A or Class B doors may be of any width up to 24 ft. and any height up to 22 ft. provided the total area of the opening does not exceed 425 sq. ft.

Class C, exterior, is the same in construction as A and B, except that the doors are manually operated and should not be used in an opening having more than 85 sq. ft.

Acme horizontal wood rolling doors are used in public and private garages, warehouses, docks, and roundhouses. The quietness and ease of their operation comes as a revelation to those who have not previously used them. These doors may be used on a parity with steel doors as regards insurance where the opening under consideration has an area of more than 100 sq. ft. Many of our installations of this type of door are in what would otherwise be Class A or B buildings.

Details—For Class A doors a clearance of 11 in. must be available beyond the jamb line on the side where the chain hoist mechanism is located, and for Class B doors a minimum clearance of 16 in. is required beyond the jamb line for crank operation. A 5-in. clearance is ample on the other side of the opening. Class C doors require a clearance of 5 in. on each side of the opening. Coiling space should be provided above the lintel in accordance with the table of coil diameters on the following page. When planning openings for this type of door the cost will be somewhat lessened by keeping the jamb width 3 in. under even feet.

Specifications—Provide and install complete with cast iron hanger brackets, adjustable shaft supports (differential gear, hand chains) and wooden guides, horizontal wood rolling doors of the dimensions indicated in the drawings. These shall be of the Acme chain hoist [gear operated], [manually operated] type as manufactured by the Acme Partition Company, Inc., Oakland, Cal. The slats shall be of Oregon pine [white pine], [white cedar]. Each door shall be given a priming coat of oil and a coat of paint before shipment.

Note: Jambs, casings, and coil box trim are not included in the manufacturer's estimate and must be furnished by the builder who will also provide suitable anchorage for the supporting brackets and guide mouldings.

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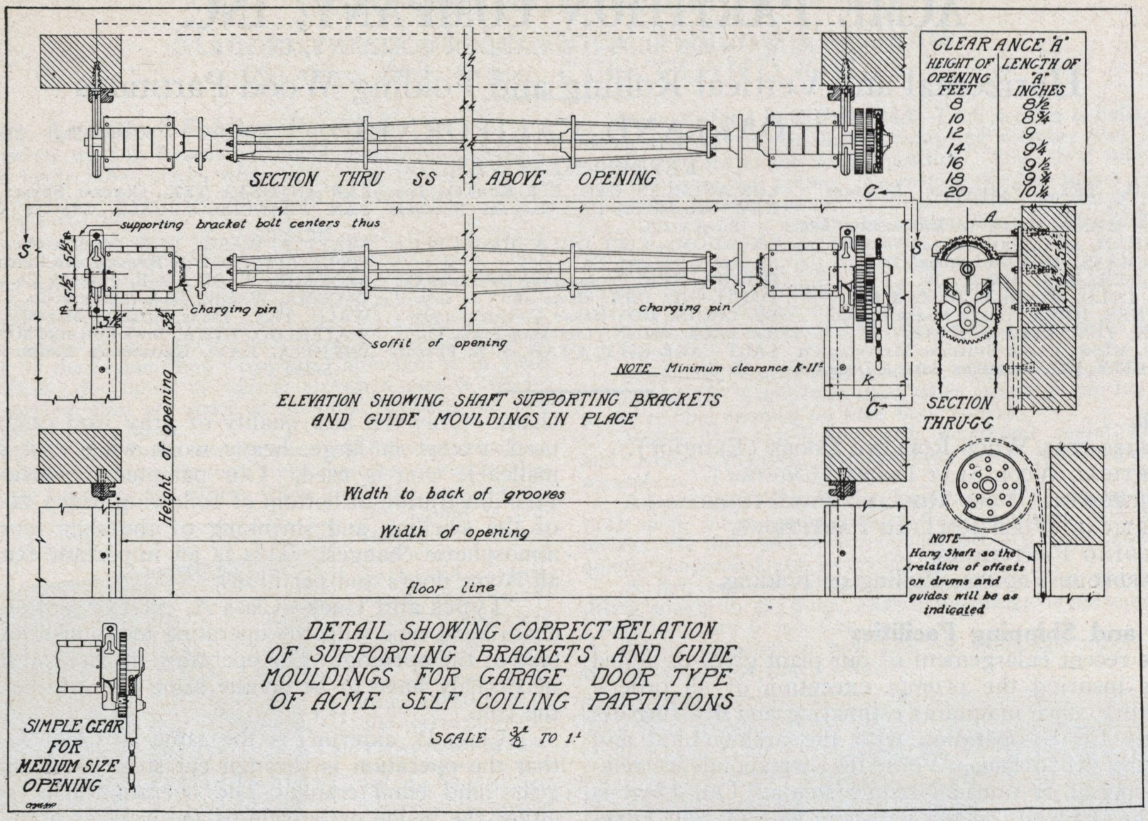
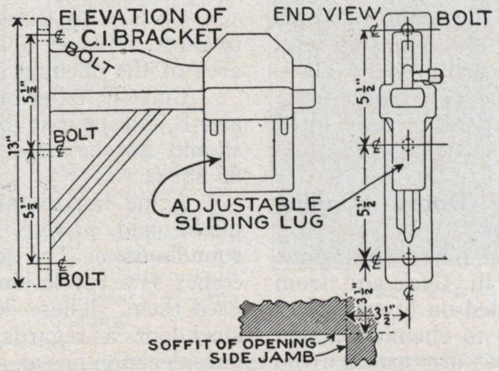

SECTION THRU SS ABOVE OPENING
supporting bracket bolt centers thus
S
charging pin
charging pin
soffit of opening
NOTE Minimum clearance R-11"
C
A
k
SECTION THRU-C-C
ELEVATION SHOWING SHAFT SUPPORTING BRACKETS AND GUIDE MOULDINGS IN PLACE
Height of opening
Width to back of grooves
Width of opening
floor line
NOTE Hang Shaft so the relation of offsets on drums and guides will be as indicated
DETAIL SHOWING CORRECT RELATION OF SUPPORTING BRACKETS AND GUIDE MOULDINGS FOR GARAGE DOOR TYPE OF ACME SELF COILING PARTITIONS
SCALE 3/4" TO 1'
SIMPLE GEAR FOR MEDIUM SIZE OPENING

CLEARANCE "A"

HEIGHT OF OPENING FEET	LENGTH OF "A" INCHES
8	8½
10	8¾
12	9
14	9¼
16	9½
18	9¾
20	10¼


ELEVATION OF C.I. BRACKET
BOLT
BOLT
BOLT
13"
5½"
5½"
END VIEW
BOLT
5½"
5½"
3½"
ADJUSTABLE SLIDING LUG
SOFFIT OF OPENING
SIDE JAMB

Information for Estimates

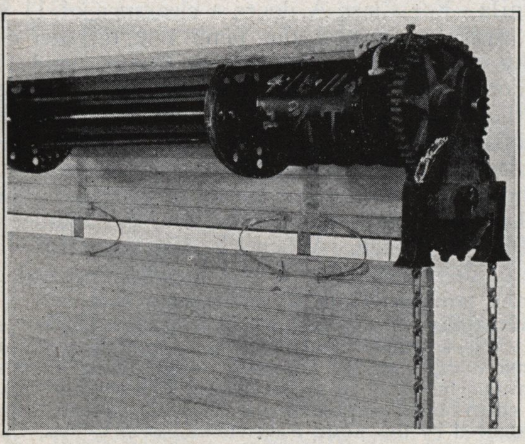
(1) Number of openings.
(2) Width of each.
(3) Height of each.
(4) Kind of wood (pine or cedar).
(5) If floor is not level show amount and direction of slope.

CLEAR SPACE REQUIRED FOR COIL CLASS "A" "B" AND "C"

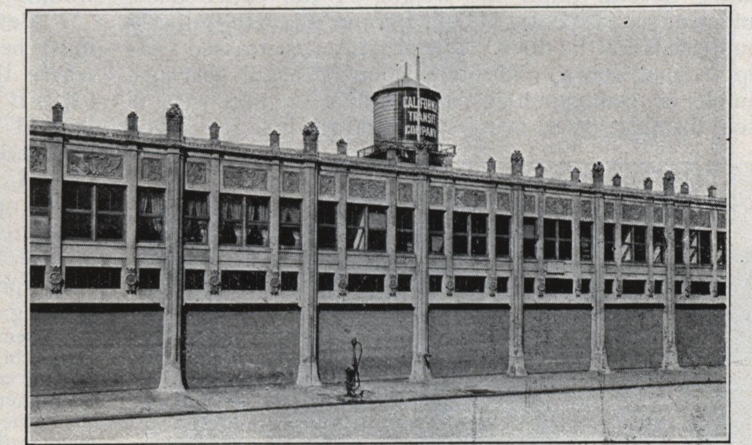
Clear height of opening, ft.	Coiling space, in. square
10	16
11	16½
12	16¾
13	17
14	17½
15	17¾
16	18¼
18	18¾
22	19½

Shipping weight, boxed, 6 lb. per ft.

Technical Data on Class A Doors, Chain Hoist Type



Typical Shaft Construction Showing Expansion Joint


CALIFORNIA TRANSIT COMPANY

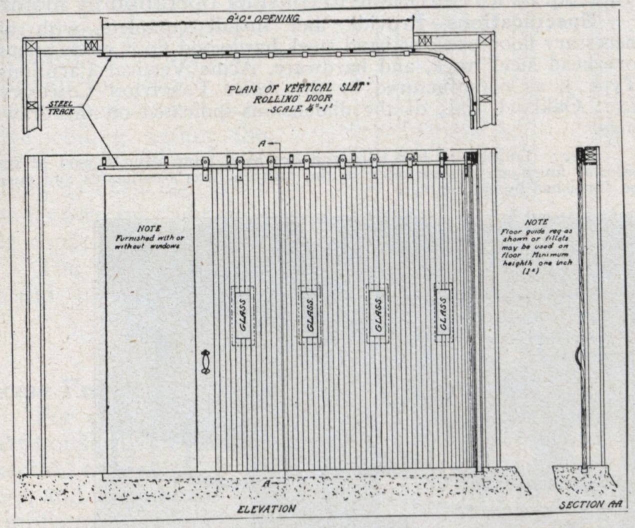
Acme Doors in Auto Transit Depot

Acme Horizontal Rolling Doors—Class A—Chain Hoist Type

Continued on next page

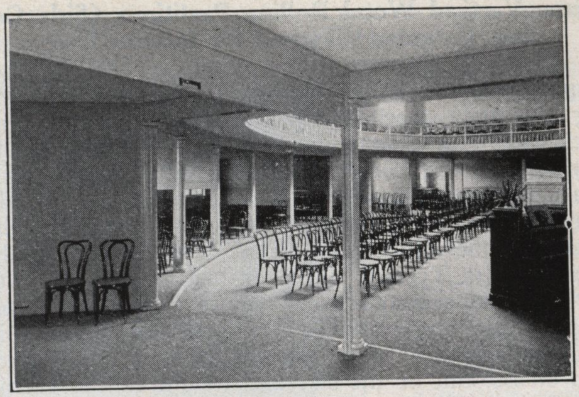
Acme Vertical Wood Slat Rolling Doors, Class E, for Small Garages, etc.

This door is fabricated of slats threaded on bronze tapes as in Class A doors. The slats hang, however, in a vertical position operating upon a steel track by means of ball bearing hangers. These are spaced approximately 12 in. on centers. Class E doors will operate around a curve having a 14-in. radius and along a wall at right angles to the opening. Lights of glass in metal frames 4½x12 in. are built into this type of door when desired. The very small space required for its operation permits this type of door to be used in those instances where space is limited, and it is especially adaptable to small residential garages.


8'-0" OPENING
STEEL TRACK
PLAN OF VERTICAL SLAT ROLLING DOOR SCALE ¼"-1'
A
NOTE Furnished with or without windows
GLASS
GLASS
GLASS
GLASS
NOTE Floor guide req as shown or fillets may be used on floor Minimum heighth one inch (1")
A
ELEVATION
SECTION AA

Acme Horizontal Wood Rolling Partitions (Coiling Overhead) for Interior Use

Construction—Slats of Oregon pine, white pine, white cedar, birch, or oak. The standard slat thickness is ½ in. but a slat thickness of ⅝ in. is available if desired as for use in wide openings. Our patented expansion joint (referred to under Class A doors) is a part of all Acme construction and is used on every Acme partition. Movable posts may be used between two or more sections when necessary. Partitions are carefully counterbalanced by springs operating in spring drums upon the shaft. These drums are mounted upon two sets of annular ball bearings. This construction provides the unusual ease of operation characteristic of Acme partitions. In openings over 12 ft. wide a trussed shaft is used, the springs being assembled in spring cages at the ends of the shaft. This type is also ball bearing.



Acme Horizontal Partitions Class D
Converging toward a common point forming classrooms

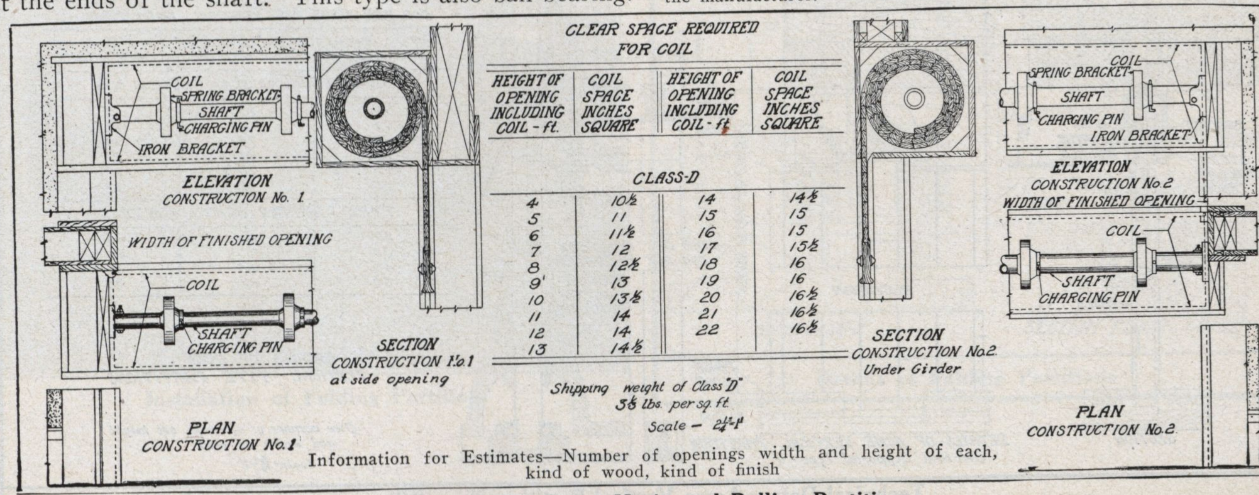
Malleable iron handles are furnished, the regular finishes being antique copper, old brass, and dull nickel. Other finishes may be had by special arrangement at a slightly increased cost. A mounted pull is furnished for operating partitions beyond reach. Finishes of oil, stain, shellac, wax, or varnish may be applied either at the factory or on the job. Enamel finish may be applied on the job but the factory should be advised as the weight of this finish requires added spring power. A very practical blackboard surface can be applied to any portion of the face of the partition (the side opposite the coil).

Uses and Types—Acme horizontal partitions are used in schools for separating classrooms, and across the proscenium arch, providing an added room on the stage; also wardrobe fronts. In churches they are used to separate the Sunday School room from the main auditorium, and for providing individual classrooms during the teaching period. Hospitals have used this type of partition with great success for covering the window openings of their X-ray laboratories, the partitions being lightproof.

Details—Partitions of this type should not have an area of more than 140 sq. ft. in a single section. A width of 20 ft. is available by the use of a trussed shaft. In planning for the use of this type of partition a considerable saving can be effected by making the finished jamb width 2 in. less than even feet wherever possible.

Specifications—Provide and install complete with all necessary guides and finish hardware Acme Horizontal Wood Rolling Partitions, Class D, as manufactured by Acme Partition Company, Inc., Oakland, Cal., of the dimensions indicated on the drawings.

Note: Jambs, casings, hanger blocks, and coil box trim being part of the interior finish are not furnished by the manufacturer and must be furnished by the builder. Exception: where two or more partitions are used in an opening a hanger block is furnished over each removable mullion by the manufacturer.


COIL
SPRING BRACKET
SHAFT
CHARGING PIN
IRON BRACKET
ELEVATION CONSTRUCTION No. 1
WIDTH OF FINISHED OPENING
COIL
SHAFT
CHARGING PIN
SECTION CONSTRUCTION No. 1 at side opening
PLAN CONSTRUCTION No. 1
SECTION CONSTRUCTION No. 2 Under Girder
COIL
SPRING BRACKET
SHAFT
CHARGING PIN
IRON BRACKET
ELEVATION CONSTRUCTION No. 2
WIDTH OF FINISHED OPENING
COIL
SHAFT
CHARGING PIN
PLAN CONSTRUCTION No. 2

CLEAR SPACE REQUIRED FOR COIL

HEIGHT OF OPENING INCLUDING COIL - ft.	COIL SPACE INCHES SQUARE	HEIGHT OF OPENING INCLUDING COIL - ft	COIL SPACE INCHES SQUARE
CLASS-D			
4	10½	14	14½
5	11	15	15
6	11½	16	15
7	12	17	15½
8	12½	18	16
9'	13	19	16
10	13½	20	16½
11	14	21	16½
12	14	22	16½
13	14½		

Shipping weight of Class "D" 3⅛ lbs. per sq. ft.

Scale – 2¼"=1'

Information for Estimates—Number of openings width and height of each, kind of wood, kind of finish

Technical Data Acme Horizontal Rolling Partitions

Continued on next page

Acme Vertical Wood Rolling Partitions (Side Coiling, Patented) Type J for Interior Use

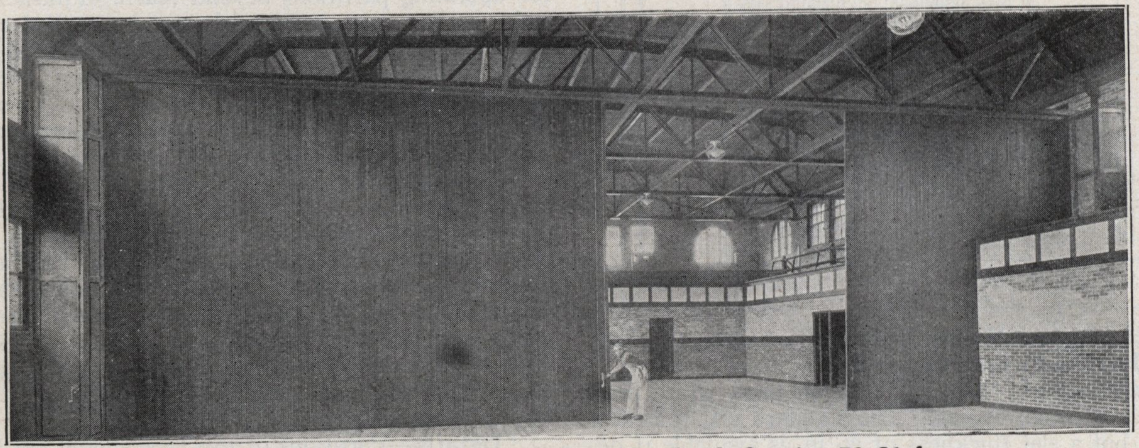
Type J Construction—Acme vertical partition, Type J, embraces the well-known "Drew" patent covering the only mechanism which has been designed exclusively for side coiling action. In applying the principles of the "Drew" patent to vertical partitions of constantly increasing sizes it became necessary to develop a method of carrying the weight of the partition (when outside of the coil box) on an overhead track. This has been done in Type J. The construction details of the partition proper are the same as in the other types except that the minimum slat thickness is $\frac{13}{16}$ in. Oregon pine is the only kind of wood suitable for this type of partition on account of the size and weight of the average installation. Upon entering the coil box the partition comes to rest and is carried upon the revolving disc which is mounted upon an upright shaft. The weight of the entire assembly is carried on an angular contact ball bearing. The operation of the Type J partition both into and out of the coil box is by hand crank through steel cut miter and spur gears. The crank may be located either upon the side or the front of the coil box, the latter when flush treatment is desired.

All Acme vertical partitions and their operating mechanism are completely assembled and installed in mill dressed coil boxes (spruce or pine) at the factory. The result is an installation on the job which works perfectly and which is accomplished with a minimum expenditure of time and money.

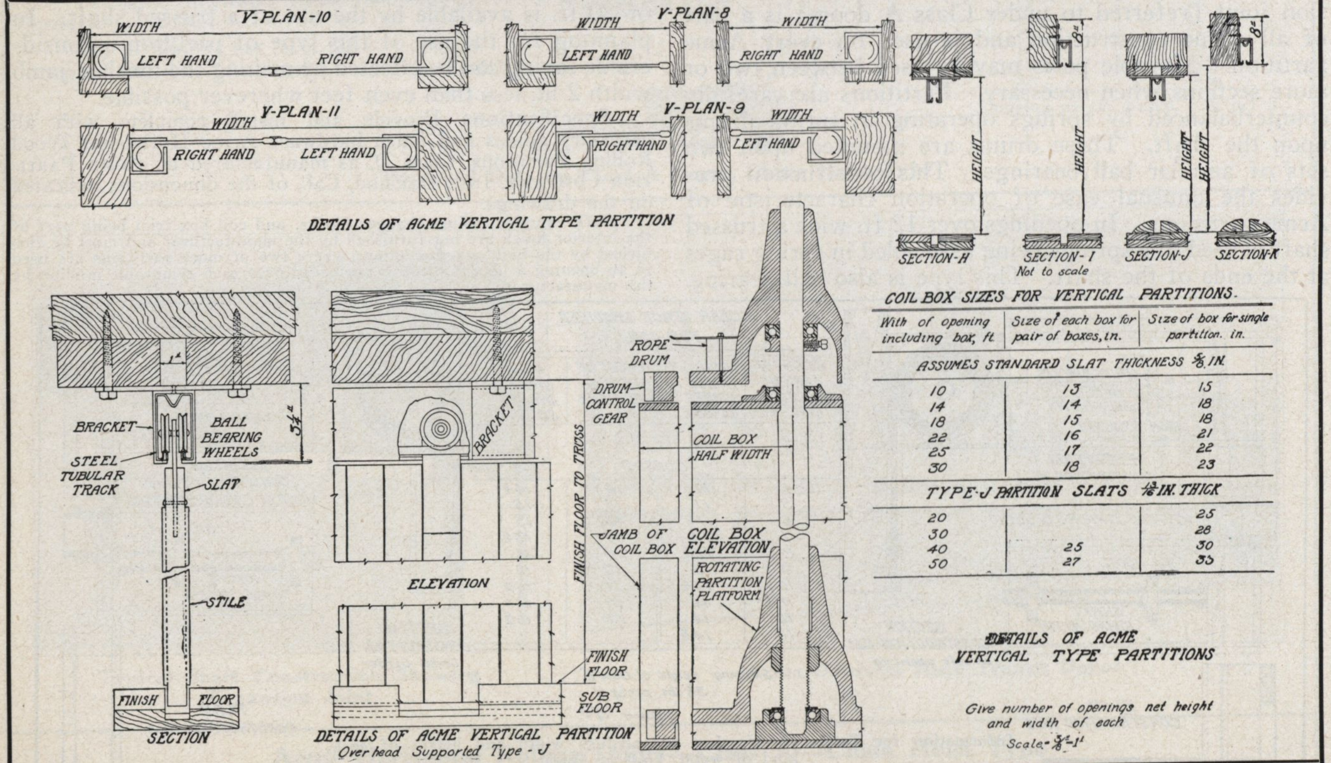
Acme vertical partitions, Type J, can be used to advantage in large openings: across a wide stage; dividing a gymnasium, banquet room, or lodge hall. Type J Acme vertical partitions are of such construction that we do not place any limitation on their size. Of course, where a single partition of this type contains more than 1200 sq. ft. it is advisable to consider operation by motor.

Specifications—Provide and install complete with all necessary floor track of band steel, hardwood floor guide strips, overhead steel track, and hardware, Acme Vertical Partitions, Type J, as manufactured by the Acme Partition Company, Inc., Oakland, Cal., of the dimensions indicated on the drawings.

Note: Jambs, coil box trim and overhead trim being a part of the interior finish are not included in the manufacturer's estimates and must be furnished by the builder.



Vertical Partitions (Type J) Supported Overhead, Opening 70x21 ft.


V-PLAN-10
WIDTH
LEFT HAND
RIGHT HAND
V-PLAN-11
WIDTH
RIGHT HAND
LEFT HAND
V-PLAN-8
WIDTH
WIDTH
LEFT HAND
RIGHT HAND
V-PLAN-9
WIDTH
WIDTH
RIGHT HAND
LEFT HAND
DETAILS OF ACME VERTICAL TYPE PARTITION
8"
8"
HEIGHT
HEIGHT
HEIGHT
HEIGHT
SECTION-H
SECTION-I
Not to scale
SECTION-J
SECTION-K
3½"
BRACKET
BALL BEARING WHEELS
STEEL TUBULAR TRACK
SLAT
STILE
FINISH FLOOR
SECTION
BRACKET
ELEVATION
FINISH FLOOR TO TRUSS
FINISH FLOOR
SUB FLOOR
DETAILS OF ACME VERTICAL PARTITION
Over head Supported Type - J
ROPE DRUM
DRUM-CONTROL GEAR
COIL BOX HALF WIDTH
JAMB OF COIL BOX
COIL BOX ELEVATION
ROTATING PARTITION PLATFORM
DETAILS OF ACME VERTICAL TYPE PARTITIONS
Give number of openings net height and width of each
Scale-⅜"-1'

COIL BOX SIZES FOR VERTICAL PARTITIONS.

With of opening including box, ft	Size of each box for pair of boxes, in.	Size of box for single partition. in.
ASSUMES STANDARD SLAT THICKNESS ⅝ IN.		
10	13	15
14	14	18
18	15	18
22	16	21
25	17	22
30	18	23
TYPE-J PARTITION SLATS $\frac{13}{16}$ IN. THICK		
20		25
30		28
40	25	30
50	27	33

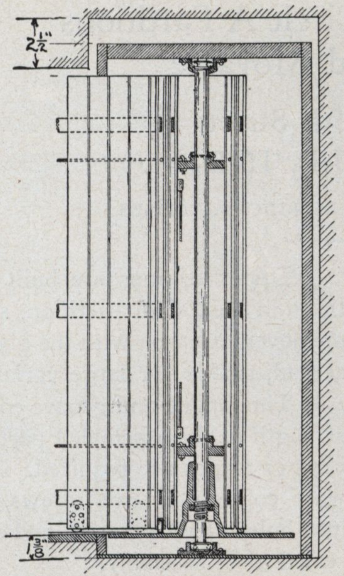
Technical Data—Acme Vertical Partition Type "J"

Continued on next page

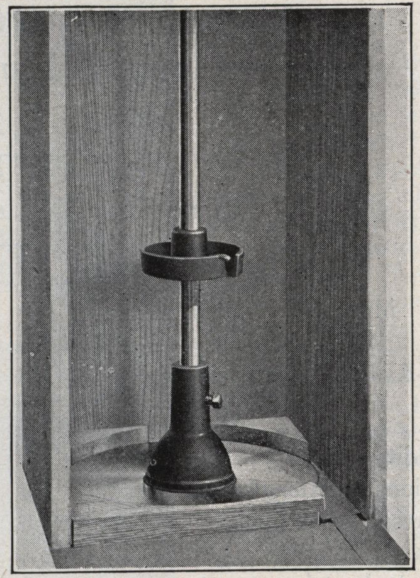
Acme Vertical Wood Rolling Partitions (Side Coiling, Patented) Type H for Interior Use

Construction—The construction of Type H vertical is the same as that of Type J, except that the weight is carried on the floor by roller bearing wheels spaced from 6 to 12 in. on centers, and the partition is manually operated. The partition is coiled in the box by the action of specially processed and treated springs which are threaded transversely through the slats. This construction insures positive coiling action the entire length of the partition, as each foot of it has its own inherent coiling capacity.

The mechanism referred to produces an ease of operation to be found only in Acme vertical partitions.



Elevation Section Showing Construction Details Type H



Interior Coil Box, Type H Vertical Partitions

A Type H partition should not exceed 16 ft. in height or 30 ft. in width. The normal slat thickness of this type is ⅝ in. and the maximum slat thickness $\frac{13}{16}$ in.

CLEAR SPACE REQUIRED FOR COIL BOX

(This table assumes standard slat thickness of ⅝ in.)

Width of openings including box, ft.	Size of each box for pair of doors, in.	Size of box for single door, in.
8	....	16
10	....	17
14	15	18
18	16	20
22	17	21
26	18	22
30	18	23

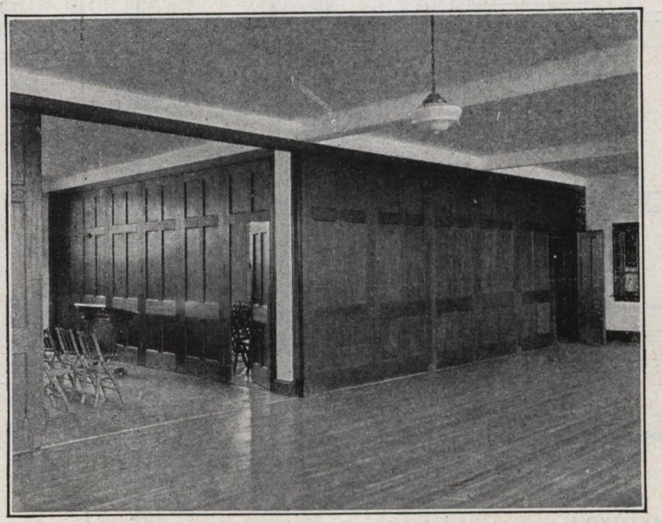
Acme Folding Partitions

For churches, auditoriums, and gymnasiums these partitions provide convenient subdivisions, meet the most exacting conditions, insure a high degree of soundproofness, and provide for the use of blackboard or glass and a uniformity of interior trim.

These doors are carefully manufactured from thoroughly kiln dried stock and furnished in pine, fir, or hardwoods, 1¾ to 3 in. thick. The weight of the doors is carried on an *overhead* track (not on the floor) by roller bearing wheels and thrust ball bearing swivel fixtures which provide vertical adjustment and insure the most easily operated folding partitions made.

There should be an even number of doors in each opening as they are hinged in pairs and move in units of two.

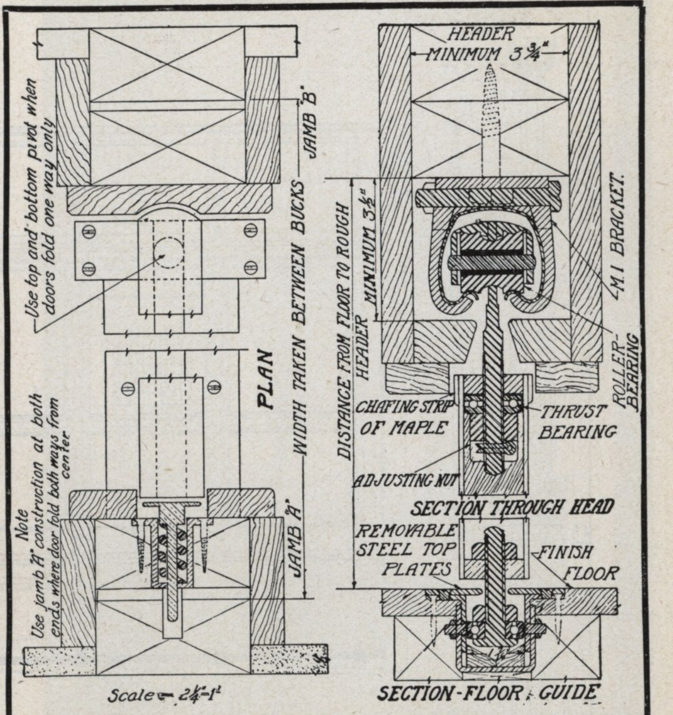
Partitions can be detailed so the doors will travel past the jambs and fold at the wall if desired, instead of within the opening as shown on accompanying detail.



Installation of Folding Partition

To Specify—Provide and install where shown in plans Acme Folding Partitions with "Easyfold" equipment. Doors as per detail. .... inches thick. Kind of wood .... Blackboards .... Glass .... Finish as per painting specifications or priming coat by manufacturer.

Partitions to be erected by Acme Partition Company, Inc., or representative, or in accordance with printed instructions.


Use top and bottom pivot when doors fold one way only
JAMB "B"
WIDTH TAKEN BETWEEN BUCKS
PLAN
Note
Use jamb "A" construction at both ends where door fold both ways from center
JAMB "A"
Scale = 2¼"-1'
HEADER
MINIMUM 3¾"
DISTANCE FROM FLOOR TO ROUGH HEADER MINIMUM 3½"
M.I BRACKET.
ROLLER-BEARING
CHAFING STRIP OF MAPLE
THRUST BEARING
ADJUSTING NUT
SECTION THROUGH HEAD
REMOVABLE STEEL TOP PLATES
FINISH FLOOR
SECTION-FLOOR GUIDE

Details of Folding Partitions

CIRCLE A PRODUCTS CORPORATION

Manufacturers of Circle A Partitions
Sectional and Movable

654 South 25th Street
NEWCASTLE, IND.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

Products

Sectional and Movable Office Partitions: two designs, Cabinet and Commercial; Ceiling Height, Cornice Height and Railing Height; in various woods and finishes.

Simplicity and Rigidity

Circle A partitions, sectional and movable, are distinguished by their simple and efficient design, which at the same time gives them great rigidity and solidity, and yet allows them to be taken apart and re-erected with the utmost speed and ease. The heavy design of the posts, cornice, and other main members—especially the built-up, continuous cornice—all of which are fitted together with tongue-and-groove joints, makes the Circle A partition as substantial as a permanently built-in wall.

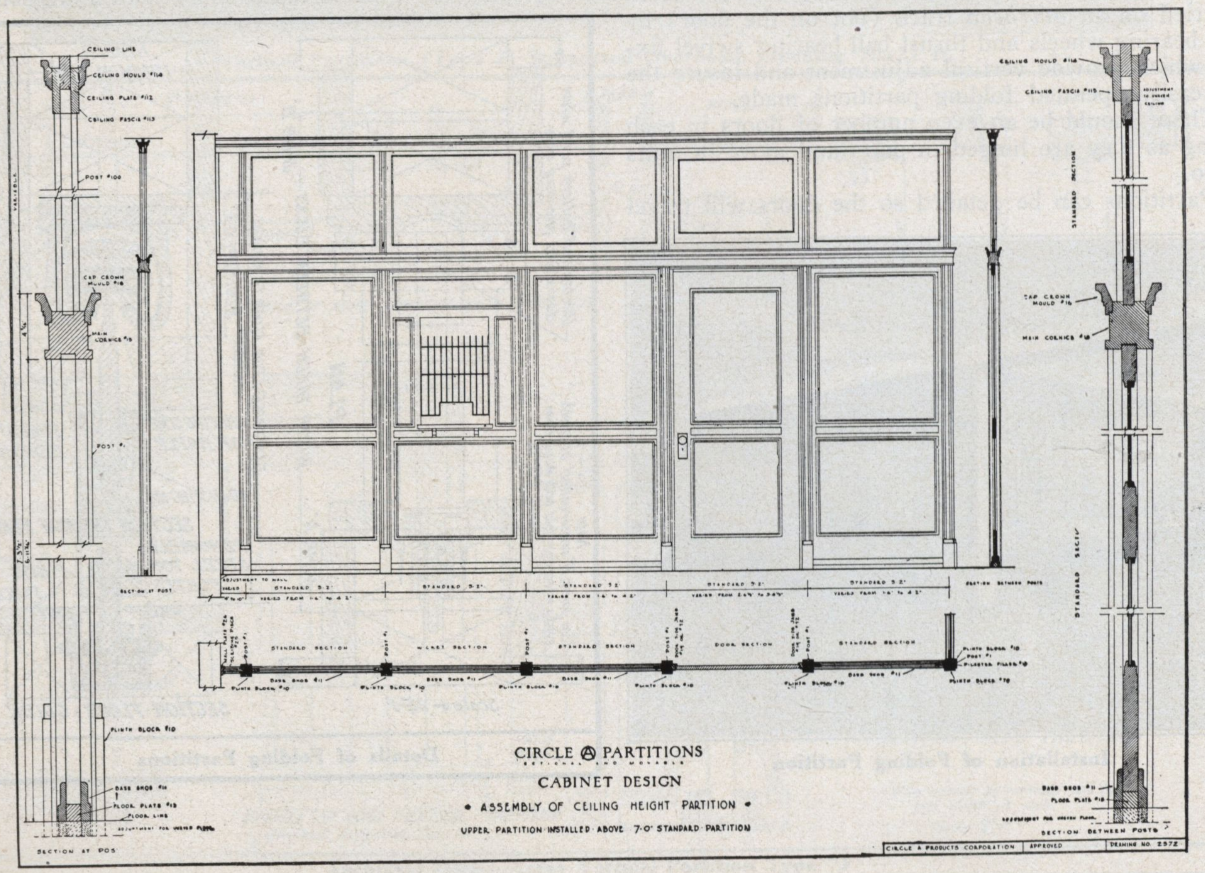
Only seven unit parts are required to make the standard 7-foot partition, and five for the addition for the ceiling height partition. Any ordinary mechanic can handle the assembling without difficulty.

Upper sections are built in unit frames similar to those in the 7-foot partition, so that they can be erected or moved as a unit with the glass in place. These frames are adjustable for large variation in ceiling height.

The tongue-and-groove construction gives maximum strength to the assembled partition. No auxiliary metal clips or angles are required. The only connecting hardware consists of two screws to each section which fit into holes already bored, and which are completely concealed after assembly.

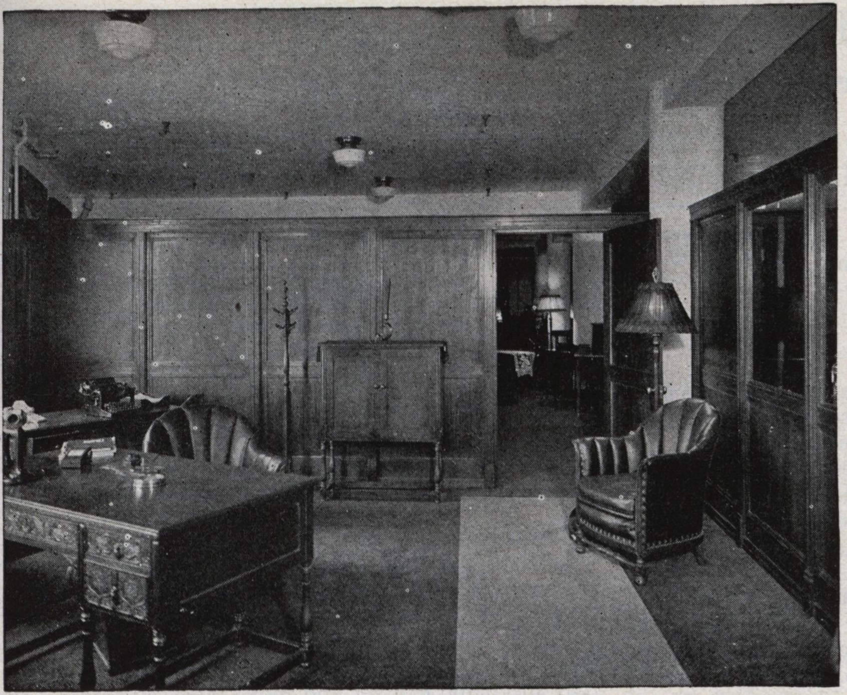
Adjustability

Circle A partitions will fit any space as neatly and perfectly as the finest built-in cabinet work. The adjustable base shoe and plinth block, and the ceiling moulds, allow for any unevenness of the floor or ceiling, and may be made to cover edges of linoleum if desired. The standard sections are carried in stock in varying widths, and with the use of standard scribing pieces any variation in the distance from wall to wall may be taken care of.


CEILING LINE
CEILING MOULD #114
CEILING PLATE #112
CEILING FASCIA #113
POST #100
VARIABLE
CAP CROWN MOULD #16
MAIN CORNICE #15
POST #1
PLINTH BLOCK #10
BASE SHOE #11
FLOOR PLATE #12
FLOOR LINE
ADJUSTMENT FOR UNEVEN FLOOR
SECTION AT POST
SECTION AT POST
STANDARD SECTION
WICKET SECTION
DOOR SECTION
POST #1
PLINTH BLOCK #10
PILASTER FILLER #18
SECTION BETWEEN POSTS
CEILING MOULD #114
CEILING FASCIA #113
ADJUSTMENT TO UNEVEN CEILING
STANDARD SECTION
CAP CROWN MOULD #16
MAIN CORNICE #15
STANDARD SECTION
BASE SHOE #11
FLOOR PLATE #12
ADJUSTMENT FOR UNEVEN FLOOR
SECTION BETWEEN POSTS
CIRCLE A PRODUCTS CORPORATION
APPROVED
DRAWING NO. 2572

CIRCLE Ⓐ PARTITIONS
CABINET DESIGN
• ASSEMBLY OF CEILING HEIGHT PARTITION •
UPPER PARTITION INSTALLED ABOVE 7'0" STANDARD PARTITION

Continued on next page



Office Interior with Circle A Partitions

Hinged transom sash over the doors can be furnished without changing the members of the partitions. Small windows, such as pay windows, can be built into regular sections at the mill at slight additional cost.

Adaptability to Re-arrangement

Circle A partitions are an asset of furniture, and not, like plaster partitions, an item of periodical expense. They can be moved any number of times to take care of expansion or change in the office layout.

The ease with which they are taken apart and re-assembled does away with the chance of injury to their structure or finish.

Material

Only thoroughly seasoned, kiln-dried lumber is used. All finished lumber exposed to view is first grade. Structural members hidden from view are yellow pine. Doors are $1\frac{3}{8}$-in. veneered doors, built-up core, with no veneering less than $\frac{1}{16}$ in. thick, modern mortise lock construction. Panels are 3-ply veneer, cross banded. Unless otherwise specified all doors and transoms are fitted with dull black bower barff finished hardware.

Appearance

Circle A partitions are made in two designs: cabinet and commercial.

Both designs have correct proportions, accurate workmanship and careful finish, resulting in dignified and pleasing appearance.

Cabinet Design—This is carried out in a perfection of architectural design and detail that will add to the appearance and impressiveness of the finest office. Wiring channels do away with all unsightly display of wires. Marble base and plinth blocks can be substituted for the standard carpet mould and plinth blocks.

Commercial Design—This has the same pleasing lines and proportions as the cabinet design, but is simplified for economy.

Delivery

Circle A partitions are shipped ready for final erection. They are complete with all doors and hardware fitted before shipment. Parts are numbered at the mill. Complete detailed erection instructions are furnished with each shipment—by the following which, any workman without special experience can erect the partitions easily and quickly. Partitions are shipped crated, knocked down. Large shipments making a carload are not crated.

We can make immediate shipment in the white. If partitions are desired stained and shellacked to match sample, an extra day or two is required; if varnished or rubbed before shipment, a few days more are needed. It is advisable to have partition completely finished before shipment, as it saves time and inconvenience on the job.

On receiving a correct sketch of the office layout, to scale, we will send sections that will fit the space exactly, with the addition of scribing pieces.

Catalogue

Complete illustrated catalogue, containing plans and elevations, specifications, etc., $8\frac{1}{2}$x11-in. size for filing, will be sent on application.

Circle A Railings Installed in Office

IMPROVED OFFICE PARTITION CO.

Manufacturers of the Telescoping, Sectional, Portable Partition

32 Grand Street
ELMHURST, NEW YORK, N. Y.

TELEPHONE
Newtown 3400-3401

Telesco Partition
REG. U.S. PAT. OFF.
IT TELESCOPES
TRADE-MARK

Product

"Telescopartition" (patented), a Telescoping Interchangeable Portable Office Partition for subdividing.

What Telescopartition Is

A telescoping portable office partition for subdividing. Telescopartition is a high quality sectional wood and glass office partition. All units are standardized and are easily assembled in place and easily dismantled without alteration. Sections are made in seven widths to meet all horizontal requirements. Telescoping posts make the partition adjustable to any height.

Telescopartition Is a Permanent Investment

It is especially designed to eliminate waste and reduce operating expense in office buildings. Any carpenter can make tenant changes without loss of time or rent. It is adjustable to all conditions without cutting or special fitting. Its salvage value is 100%. All units can be used numberless times without damage. Only screws are used in erecting it; no nails.

It is of cabinet quality, neat and pleasing in design.

Construction

Material—Seasoned, kiln dried plain oak, quartered oak, birch, mahogany and walnut.

Section Units—Made of 1¼-in. stock in 7 different widths: 1 ft. 6 in.; 2 ft.; 2 ft. 6 in.; 3 ft.; 3 ft. 6 in.; 4 ft.; 4 ft. 6 in. Height, 7 ft.

Panels—Panels in section units are built-up and veneered.

Doors—Built-up and veneered, 3 ft. wide, 6 ft. 8½ in. high, 1⅜ in. thick. One door is included in each 20 ft. of partition.

Posts—Built-up hollow, of four pieces, 7 ft. long and 3½x2⅝ in. Each post is grooved on two sides to receive section units. Hollow space of post encloses telescoping extension post 7 ft. long. Extension post can be fitted to any ceiling up to 13 ft. 6 in. Special extension members for higher ceilings are supplied.

Floor Strips—Grooved floor strips are secured to wood floor by screws, and to concrete floor by expansion bolts. Posts are screwed to floor strip.

Hardware—Lock sets are of the Yale Bit Key, Type "B" construction, made by The Yale & Towne Mfg. Co. Three tumblers, cast bronze front, triplex, three-piece, screwless spindle, bronze knobs on steel shell, with high shank and bronze escutcheons with high thimbles, round edges and corners. The strike of the lock is rounded at the edges. All coupling irons, knee braces, screws and transom pivots are included.

How Shipped

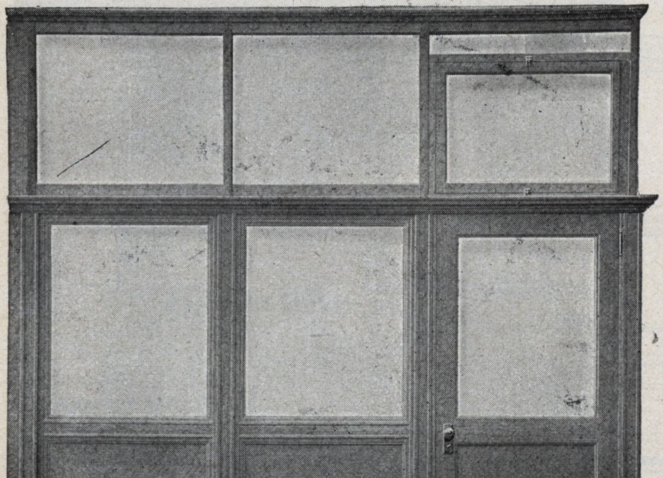
The partition is shipped crated, knocked down in the white or stained and shellacked, without glass, including all hardware, ready for immediate erection.

Erection

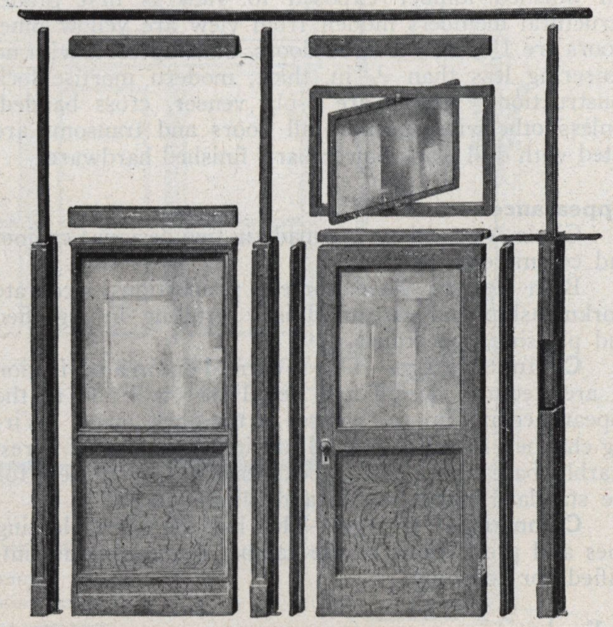
Any mechanic can set and move Telescopartition as all units are numbered to conform with numbers shown on detail on opposite page, are standardized and fit everywhere. Complete instructions for erection in booklet form are furnished.

Some Prominent Installations

Boston Chamber of Commerce Building, Boston, Mass., Parker, Thomas & Rice, Architects
Pershing Square Building, New York, N. Y., York & Sawyer, Architects
Westinghouse Building, New York, N. Y., Donn Barber, Architect
New York Stock Exchange Building, New York, N. Y., Trowbridge & Livingston, Architects
Cotton Exchange Building, Houston, Tex., Sanquinet, Staats and Hedrick, Architects
Genesee Building, Buffalo, N. Y., Edward Green & Sons, Architects
Packard Building, Philadelphia, Pa., Ritter & Shay, Architects
Schmidt Building, Cincinnati, Ohio, A. Lincoln Fechheimer, Architect
Lincoln Life Insurance Building, Fort Wayne, Ind., Benjamin W. Morris, Architect



Assembled Partition



Movable Units of Telescopartition

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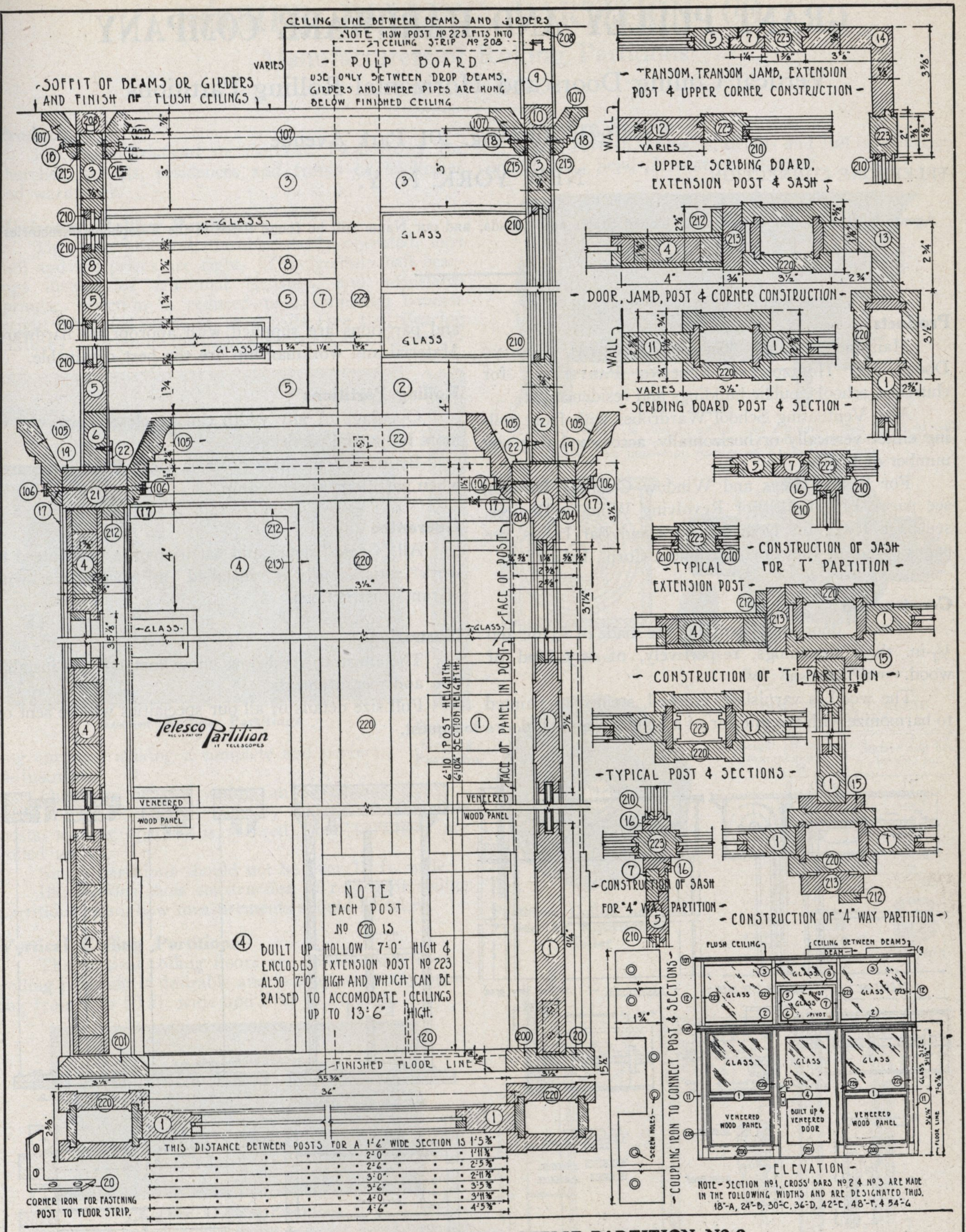

CEILING LINE BETWEEN BEAMS AND GIRDERS
NOTE HOW POST No 223 FITS INTO CEILING STRIP No 208
VARIES
PULP BOARD
USE ONLY BETWEEN DROP BEAMS, GIRDERS AND WHERE PIPES ARE HUNG BELOW FINISHED CEILING
SOFFIT OF BEAMS OR GIRDERS AND FINISH OF FLUSH CEILINGS
GLASS
FACE OF POST
FACE OF PANEL IN POST
6'10" POST HEIGHT
6'10½" SECTION HEIGHT
Telesco Partition
IT TELESCOPES
VENEERED WOOD PANEL
NOTE
EACH POST No 220 IS BUILT UP HOLLOW 7'0" HIGH & ENCLOSES EXTENSION POST No 223 ALSO 7'0" HIGH AND WHICH CAN BE RAISED TO ACCOMODATE CEILINGS UP TO 13'6" HIGH.
FINISHED FLOOR LINE
THIS DISTANCE BETWEEN POSTS FOR A 1'4" WIDE SECTION IS 1'5⅜"
2'0" 1'11⅜"
2'6" 2'5⅜"
3'0" 2'11⅜"
3'6" 3'5⅜"
4'0" 3'11⅜"
4'6" 4'5⅜"
CORNER IRON FOR FASTENING POST TO FLOOR STRIP.
TRANSOM, TRANSOM JAMB, EXTENSION POST & UPPER CORNER CONSTRUCTION
WALL
VARIES
UPPER SCRIBING BOARD, EXTENSION POST & SASH
DOOR, JAMB, POST & CORNER CONSTRUCTION
SCRIBING BOARD POST & SECTION
CONSTRUCTION OF SASH FOR "T" PARTITION
TYPICAL EXTENSION POST
CONSTRUCTION OF "T" PARTITION
TYPICAL POST & SECTIONS
CONSTRUCTION OF SASH FOR "4" WAY PARTITION
CONSTRUCTION OF "4" WAY PARTITION
COUPLING IRON TO CONNECT POST & SECTIONS
SCREW HOLES
FLUSH CEILING
CEILING BETWEEN DEAMS
BEAM
PIVOT
BUILT UP & VENEERED DOOR
FLOOR LINE
GLASS SIZE
ELEVATION

NOTE—SECTION No 1, CROSS' BARS No 2 & No 3 ARE MADE IN THE FOLLOWING WIDTHS AND ARE DESIGNATED THUS. 18"-A, 24"-B, 30"-C, 36"-D, 42"-E, 48"-F & 54"-G

DETAILS OF TELESCOPING OFFICE PARTITION No 2

MANUFACTURED BY

IMPROVED OFFICE PARTITION CO.

No 1011 ELMHURST., NEW YORK, N.Y.

GRANT PULLEY AND HARDWARE COMPANY

Vertical Coiling Doors and Horizontal Rolling Partitions

Architects Building, 101 Park Avenue

TELEPHONE CONNECTION NEW YORK, N. Y.

Agents in all principal cities of the United States and Canada, and our Name will be found listed in the Telephone Directories

---

Products

Manufacturers of "GRANT" VERTICAL COILING DOORS and HORIZONTAL ROLLING PARTITIONS for churches, schools, public buildings and residences.

Also Ventilating School Wardrobes with front rolling either vertically or horizontally, accommodating any number of pupils.

For Sash Pulleys and Window Cleaning Devices, see pages 1430-1431; for Revolving Window Devices, see page 1642; for Door Hangers and Bar Locks, see pages of Grant Elevator Equipment Corp., 1512-1515.

Construction

"Grant" doors and partitions are made of ¾-in. and ½-in. thick mouldings, respectively, of any kind of wood.

The wood is varnished, finished, stained or painted to harmonize with the interior of a building, and all doors and partitions are supplied with appropriate hardware. Material and workmanship are the best obtainable.

Rolling Partitions

Openings of any width can be closed with one or more horizontal partitions.

By use of movable posts, a clear floor is secured when partitions are rolled up.

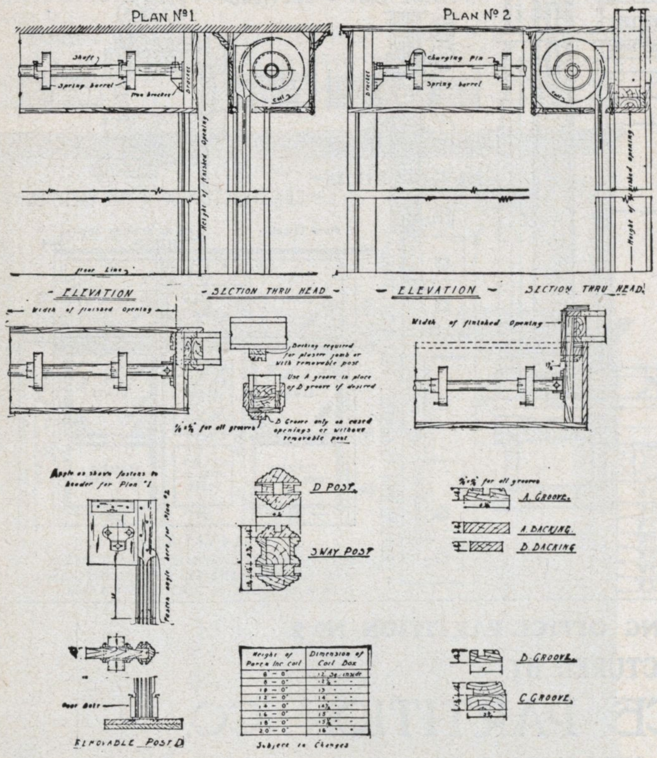
Guarantee

All "Grant" doors and partitions are guaranteed to work satisfactorily if installed in accordance with "Grant" instructions.

Illustrations

The illustrations below show methods of installation and measurements.

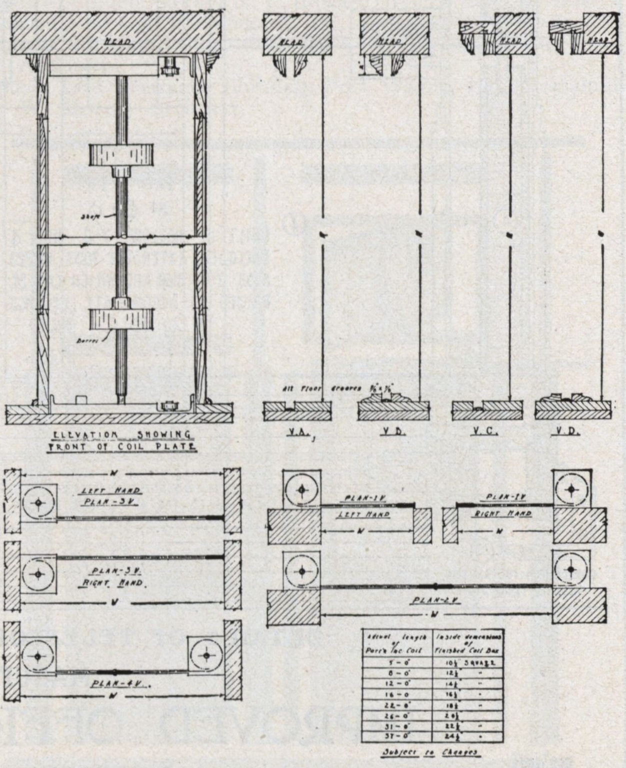
Full size details of all our specialties will be sent on request.


PLAN No1
PLAN No2
ELEVATION
SECTION THRU HEAD
ELEVATION
SECTION THRU HEAD
D POST
3WAY POST
A GROOVE
A BACKING
D BACKING
D GROOVE
C GROOVE
REMOVABLE POST D

Height of Part'n Inc Coil	Dimension of Coil Box
6' – 0"	12" Sq. inside
8 – 0"	12½ " "
10 – 0"	13 " "
12 – 0"	14 " "
14 – 0"	14½ " "
16 – 0"	15 " "
18 – 0"	15½ " "
20 – 0"	16 " "

Subject to Changes

"GRANT" HORIZONTAL ROLLING PARTITIONS


ELEVATION SHOWING FRONT OF COIL PLATE
V.A.
V.B.
V.C.
V.D.
LEFT HAND PLAN-3V
PLAN-3V RIGHT HAND
PLAN-4V
PLAN-2V LEFT HAND
PLAN-2V RIGHT HAND
PLAN-2V

Actual length of Part'n Inc Coil	Inside demensions of Finished Coil Box
5 – 0"	10½" SQUARE
8 – 0"	12½" "
12 – 0"	14½" "
16 – 0	16½" "
22 – 0"	18½" "
26 – 0"	20½
31 – 0"	22½" "
37 – 0"	24½" "

Subject to Changes

"GRANT" VERTICAL COILING DOORS

KÖCHER ROLLING PARTITION CO.

Manufacturers of Rolling Partitions

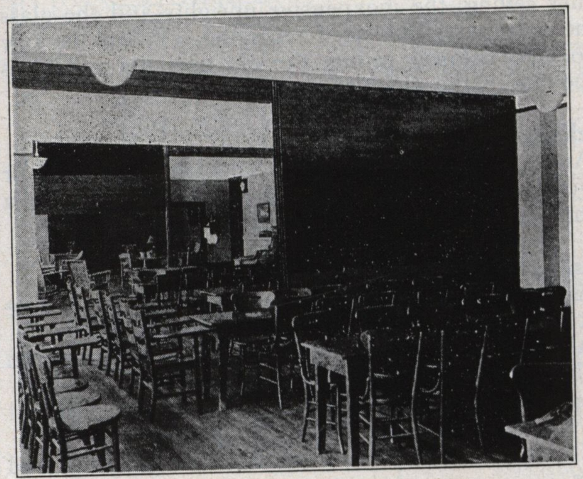
LIMA, OHIO

Products

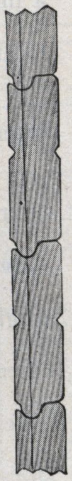
Kocher's Rolling or Coiling Partitions for churches, schools, residences and fronts of bookcases and wardrobes.

Horizontal Rolling Partitions

They are practical, durable, easily operated, look well and the prices are right. They contain ball bearings instead of frictional bearings, and adjustable springs. Friction is reduced to a minimum because weight is carried on 3/8-in. steel balls (see Ball Bearing Fixture). Also note the eight different points for attaching curtains, making a complete and perfect adjustment.



Kocher Rolling Partitions



Detail of Coiling Partition

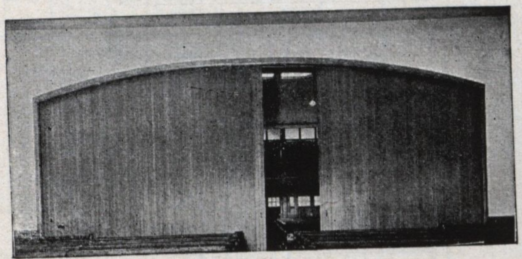
Openings of any width can be closed with one or more partitions. By the use of removable posts, a clear opening is secured when partitions are rolled up.

Single partitions should not be over 12 ft. wide.

Illustrations show construction of rolling or coiling partitions; also, how measurements should be taken.

Vertical Coiling Partitions

The vertical coiling doors are suitable wherever a rolling partition is desirable and is adapted to any opening from 6 to 50 ft. wide and 7 to 15 ft. high.



Kocher Vertical Partitions

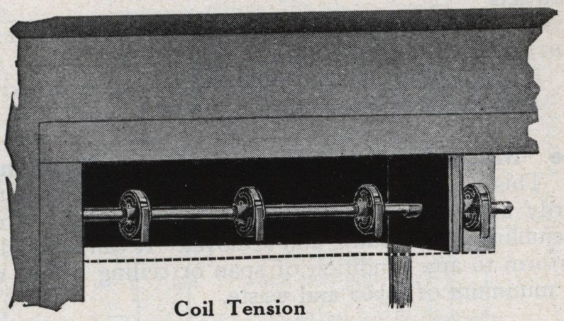
This Kocher vertical partition divides a Sunday School room from main auditorium; with it two smaller rooms are provided, yet a single large room is instantly available

Material Guarantee

Only the best materials enter into the construction of Kocher products, which are guaranteed to give perfect satisfaction if installed in accordance with instructions accompanying every shipment.

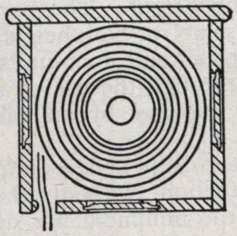
Co-operative Service

Will furnish estimates, details and full information on request. Send plans at our expense.

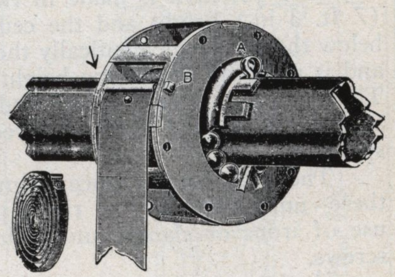


Coil Tension

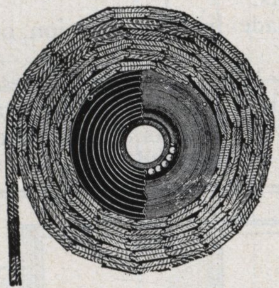
The coil tension is easy to adjust and regulate. Side panel of coil box can be removed and each coil adjusted individually, reducing friction to a minimum. An important feature of Kocher partitions



Coil Box



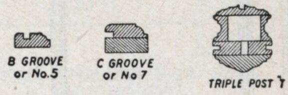
Ball Bearing Fixture

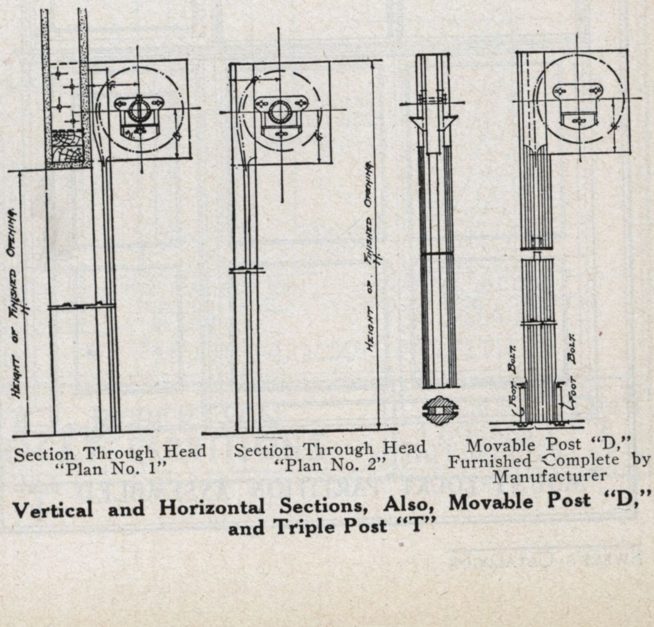


Partition Coiled on Ball Bearing Antifriction Roller

DIMENSIONS, COILING PARTITIONS

Height of partition including coil, ft.	Square coil box inside, in.
6	12
8	12½
10	13
12	14
14	14½
16	15
18	15½
20	16




Height of Finished Opening
Height of Finished Opening
Height of Finished Opening
Foot Bolt
Foot Bolt

Section Through Head "Plan No. 1"

Section Through Head "Plan No. 2"

Movable Post "D," Furnished Complete by Manufacturer

Vertical and Horizontal Sections, Also, Movable Post "D," and Triple Post "T"

MOUNT & ROBERTSON, INC.

Manufacturers of Adjustable Office Partitions

"Made by the Mile—Sold by the Foot"

Registered U. S. Patent Office

62 Broad Street
NEW YORK, N. Y.

Products

The "MOUNT-LOCKT" ADJUSTABLE WOOD OFFICE PARTITION.

High grade WOOD OFFICE PARTITIONS of all kinds. Also makers of fine Cabinet Work.

The "Mount-Lockt" Adjustable Office Partition

This is an interchangeable, sectional, office partition, sturdy and of dignified appearance, designed for easy assembling, dismantling and removal. It can be made to conform to any condition of span or ceiling height with the minimum of labor and waste.

Description

This partition is made in two heights, the cornice (7 ft. 3 in.) height and the ceiling height. The part below the cornice is identically the same for both heights and is made up of cornice height panel and door units. These units interlock at each end through the use of a special tongue and groove, keyed together by an oak spine.

The base and cornice members slip snugly into these units, making a rigid partition without the use of irons or clamps and with the minimum use of screws.

Horizontal adjustment is made by the removal or addition of panel and door units.

Vertical adjustment is made in the extension or part above the cornice.

Horizontal Adjustment—When it becomes necessary to re-locate the partition in a position requiring a longer or shorter span, door or panel units are removed or added. When an assembly of standard width units does not take up the full span, smaller units or fillers may be used at each or either end.

Vertical Adjustment—The extension or section above the cornice consists of a ceiling member, a cornice member and uprights. The ceiling and cornice members which are continuous are secured in place, and the uprights (shipped long) are cut to fit. The glass is then scribed in place.

When it becomes necessary to adapt the partition to a higher ceiling, the inexpensive uprights and the glass are the only parts that need replacing. When the new location has a lower ceiling the old uprights and glass may be readily cut down to size.

Interchangeability

Any panel unit may be replaced with a door unit or vice versa, and should occasion demand, the swing of a door may be changed by simply reversing the unit.

Advantages of Partition

Adjustability to any horizontal span or ceiling height with a maximum salvage of material.

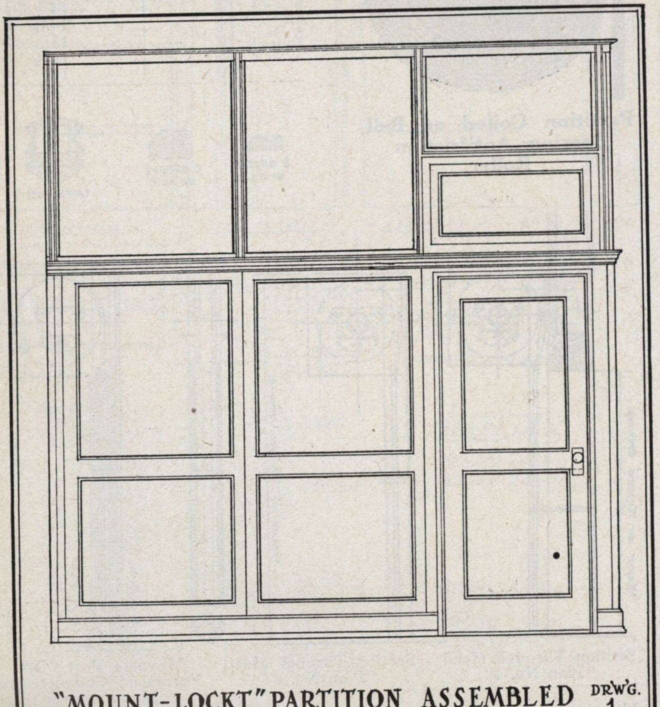
Absence of screws, clamps, etc., makes removal and assembly easy and prevents disfigurement.

Special tongue on edges of units protect exposed edges from bumps in handling.

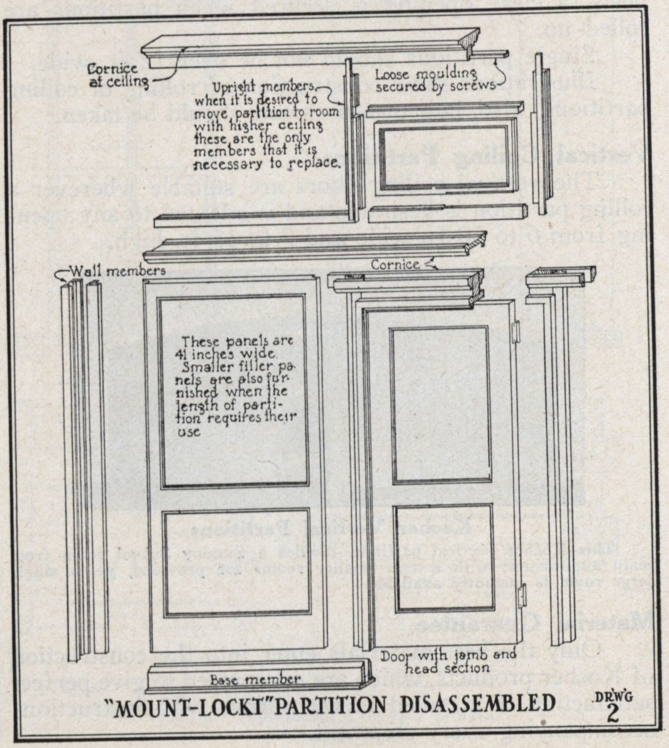
Requires minimum of space for shipping and storage.

Shipping and Finish

Partition is shipped crated knocked down, in the white or stained and shellacked, with glass and hardware ready for erection.

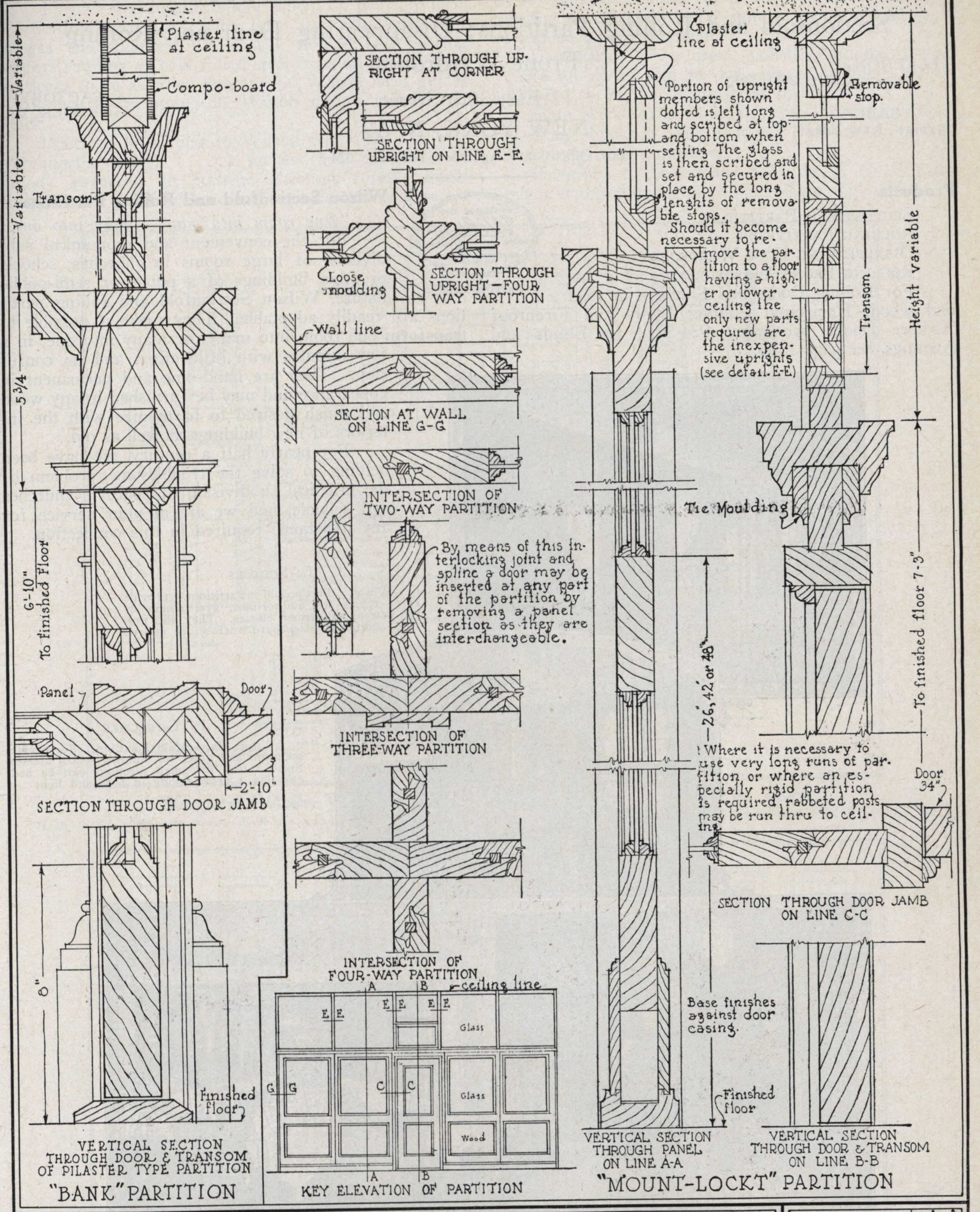


"MOUNT-LOCKT" PARTITION ASSEMBLED DRW'G. 1


Cornice at ceiling
Upright members, when it is desired to move partition to room with higher ceiling these are the only members that it is necessary to replace.
Loose moulding secured by screws
Wall members
Cornice
These panels are 41 inches wide. Smaller filler panels are also furnished when the length of partition requires their use
Door with jamb and head section
Base member

"MOUNT-LOCKT" PARTITION DISASSEMBLED DRW'G 2

Continued on next page


Plaster line at ceiling
Variable
Compo-board
Variable
Transom
5 3/4
6'-10" To finished Floor
Panel
Door
2'-10"
8"
Finished floor
Loose moulding
Wall line
A
B
ceiling line
E E
E E E E E E
Glass
G G
C C
Glass
Wood
A
B
Plaster line at ceiling
Removable stop.
Transom
Height variable
Tie Moulding
26, 42 or 48"
To finished floor 7-3"
Door 34"
Finished floor

SECTION THROUGH DOOR JAMB

VERTICAL SECTION THROUGH DOOR & TRANSOM OF PILASTER TYPE PARTITION

"BANK" PARTITION

SECTION THROUGH UPRIGHT AT CORNER

SECTION THROUGH UPRIGHT ON LINE E-E

SECTION THROUGH UPRIGHT—FOUR WAY PARTITION

SECTION AT WALL ON LINE G-G

INTERSECTION OF TWO-WAY PARTITION

By means of this interlocking joint and spline a door may be inserted at any part of the partition by removing a panel section as they are interchangeable.

INTERSECTION OF THREE-WAY PARTITION

INTERSECTION OF FOUR-WAY PARTITION

KEY ELEVATION OF PARTITION

Portion of upright members shown dotted is left long and scribed at top and bottom when setting. The glass is then scribed and set and secured in place by the long lenghts of removable stops.

Should it become necessary to remove the partition to a floor having a higher or lower ceiling the only new parts required are the inexpensive uprights (see detail E-E)

Where it is necessary to use very long runs of partition, or where an especially rigid partition is required, rabbeted posts may be run thru to ceiling.

Base finishes against door casing.

SECTION THROUGH DOOR JAMB ON LINE C-C

VERTICAL SECTION THROUGH PANEL ON LINE A-A

VERTICAL SECTION THROUGH DOOR & TRANSOM ON LINE B-B

"MOUNT-LOCKT" PARTITION

DRAWN BY SWEETS CATALOGUE SERVICE	DETAIL OF MOUNT & ROBERTSON "BANK" & "MOUNT-LOCKT" PARTITIONS	SCALE 3" EQUALS 1' DATE, SEPT. '25	DRWG 3

ESTABLISHED 1876

THE J. G. WILSON CORPORATION

Sectionfold and Rolling Partitions; Disappearing Door and Rolling Front Wardrobes

TELEPHONE
Caledonia 8970, 8971, 8972

CABLE
"Lydian, New York"

11 East 36th Street
NEW YORK, N. Y.

FACTORY
NORFOLK, VA.

For Offices and Agencies, see page 924

Products

- Sectionfold Partitions.
- Rolling Partitions.
- Disappearing Door Wardrobes.
- Rolling Front Wardrobes.

For Rolling Doors and Shutters in steel and wood, Horizontal Folding Doors and Fireproof Airkore Doors, see pages 924-927; for Blinds and Awnings, see page 1300.

Established 1876
Wilson
DOORS - PARTITIONS - BLINDS
WARDROBES
THE J.G.WILSON CORPORATION
NEW YORK CITY

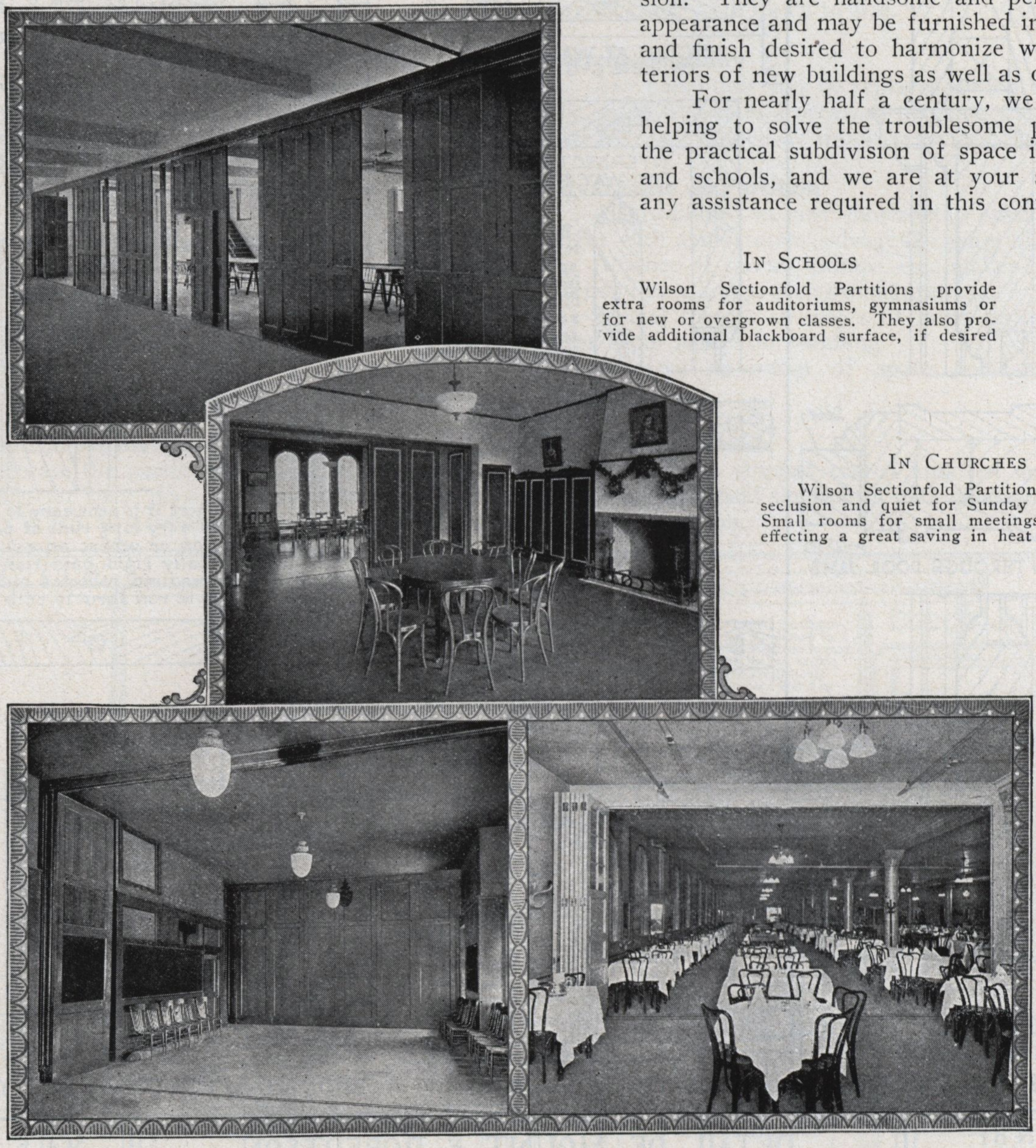
TRADE-MARK

Wilson Sectionfold and Rolling Partitions

"One room into many—many into one."

For the convenient and economical subdivision of large rooms in churches, schools or other buildings of a public or semi-public nature, Wilson Sectionfold and rolling partitions are readily adaptable. They make it possible to transform one room into many, or many into one, in a few minutes with little effort and no confusion. They are handsome and permanent in appearance and may be furnished in any wood and finish desired to harmonize with the interiors of new buildings as well as old.

For nearly half a century, we have been helping to solve the troublesome problem of the practical subdivision of space in churches and schools, and we are at your service for any assistance required in this connection.



In Schools

Wilson Sectionfold Partitions provide extra rooms for auditoriums, gymnasiums or for new or overgrown classes. They also provide additional blackboard surface, if desired

In Churches

Wilson Sectionfold Partitions offer perfect seclusion and quiet for Sunday school classes. Small rooms for small meetings can be had, effecting a great saving in heat and light

In Y. M. C. A.'s

Wilson Sectionfold Partitions make possible new rooms, for widened activities or for special occasions. They may be installed in present buildings with little difficulty

In Other Buildings

Extra rooms for private dinner parties, lodge or society meetings, dances or other occasions, can be quickly provided

Four Installations of Sectionfold Partitions

Continued on next page

Suggestion for Specifying Sectionfold Partitions

Furnish and install, where shown on plans, Wilson Sectionfold partitions with butt (or Soss invisible) hinges and mounted on Wilson double ball bearing castors running on cold rolled steel track on floor. Tops of doors to be steadied laterally by Wilson head guides (ball bearing) running in Wilson design metal head track.

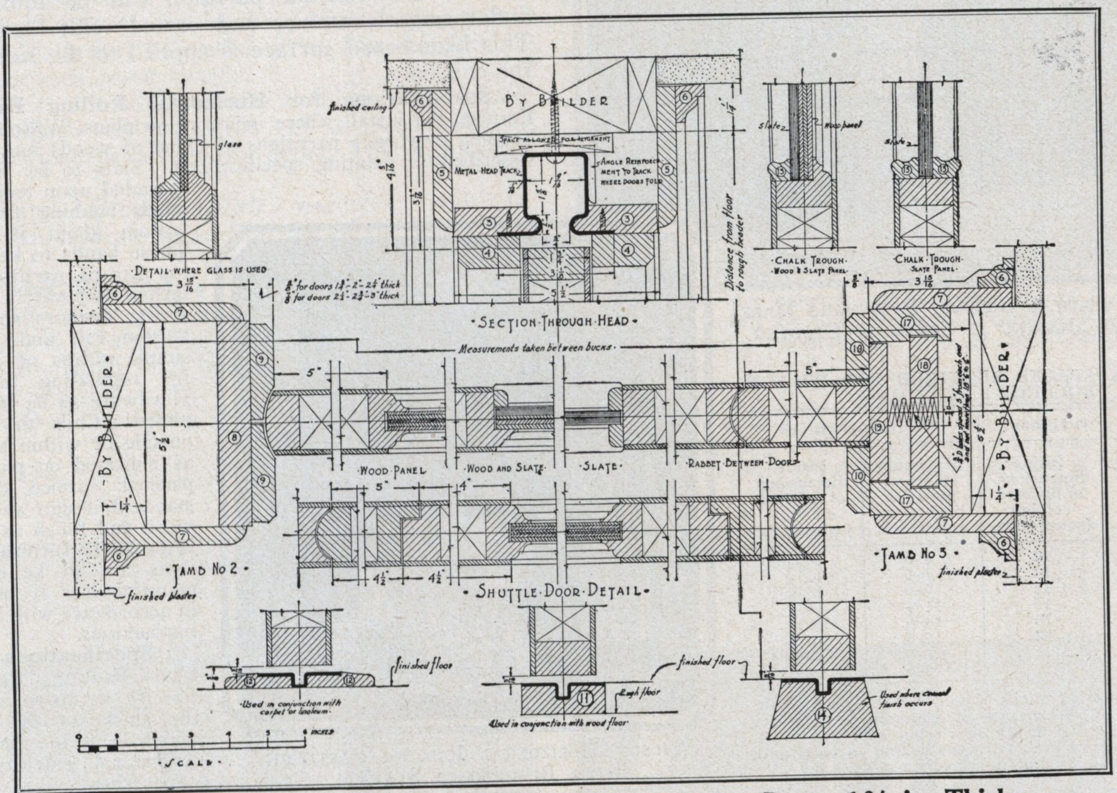
Doors to be similar to Wilson type (No.....) or (architect's detail) (....) inches thick of (kind of wood) veneered on built-up chestnut cores. Panel moulds to be standard bead and cove design. All necessary track, jambs, mouldings and Wilson standard trim to be included. Finish of doors to be as described in painting specification, or a suitable priming coat is to be applied before shipment.

Hardware to be iron, polished bronze plated. Where all doors fold to one side of opening Wilson automatic spring jambs are to be furnished.

Slate blackboards to be furnished where indicated.

Rough bucks at head, floor and jambs are to be furnished by general contractor.

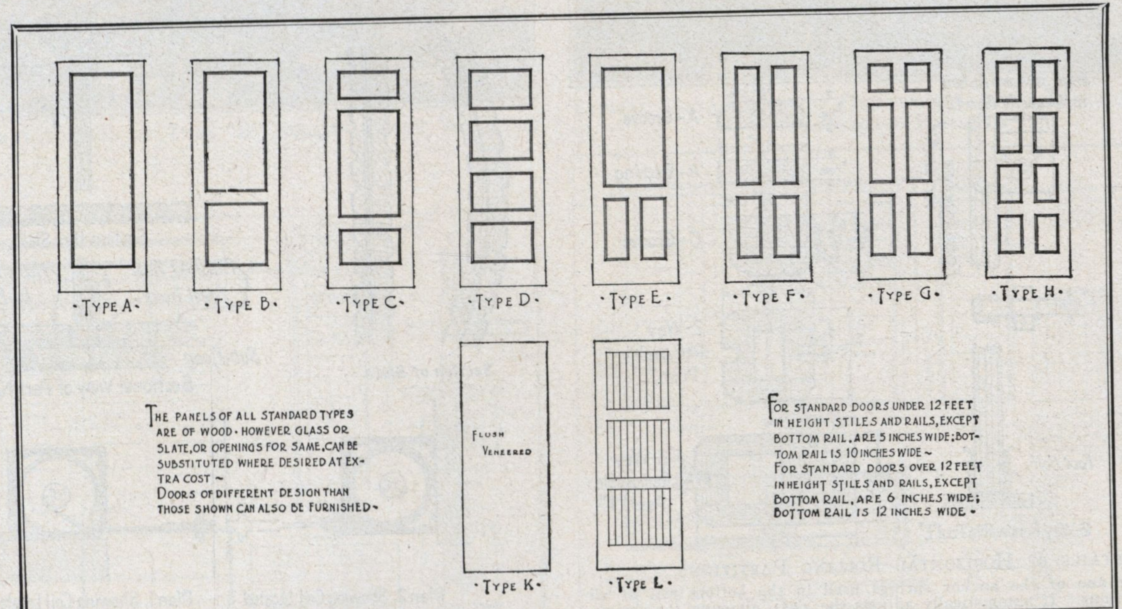
Partitions to be erected by The J. G. Wilson Corporation or under their supervision, if possible.



finished ceiling
BY BUILDER
SPACE ALLOWED FOR ADJUSTMENT
METAL HEAD TRACK
ANGLE REINFORCEMENT TO TRACK WHERE DOORS FOLD
glass
DETAIL WHERE GLASS IS USED
$\frac{5}{8}$" for doors $1\frac{3}{4}$"-2"-$2\frac{1}{4}$" thick
$\frac{7}{8}$" for doors $2\frac{1}{2}$"-$2\frac{3}{4}$"-3" thick
SECTION THROUGH HEAD
Measurements taken between bucks
Distance from floor to rough header
slate
wood panel
CHALK TROUGH WOOD & SLATE PANEL
CHALK TROUGH SLATE PANEL
BY BUILDER
WOOD PANEL
WOOD AND SLATE
SLATE
RABBET BETWEEN DOORS
JAMB No 2
JAMB No 3
finished plaster
SHUTTLE DOOR DETAIL
finished floor
Used in conjunction with carpet or linoleum
Used in conjunction with wood floor
Rough floor
Used where cement finish occurs
SCALE
inches

Standard Details, Wilson Sectionfold Partitions for Doors 1¾ in. Thick

Head, tracks and jambs shown above are standard for all doors 1¾ to 3 in. in thickness, except as noted for members No. 9 and No. 10



TYPE A
TYPE B
TYPE C
TYPE D
TYPE E
TYPE F
TYPE G
TYPE H
FLUSH VENEERED
TYPE K
TYPE L

THE PANELS OF ALL STANDARD TYPES ARE OF WOOD. HOWEVER GLASS OR SLATE, OR OPENINGS FOR SAME, CAN BE SUBSTITUTED WHERE DESIRED AT EXTRA COST ~ DOORS OF DIFFERENT DESIGN THAN THOSE SHOWN CAN ALSO BE FURNISHED ~

FOR STANDARD DOORS UNDER 12 FEET IN HEIGHT STILES AND RAILS, EXCEPT BOTTOM RAIL, ARE 5 INCHES WIDE; BOTTOM RAIL IS 10 INCHES WIDE ~ FOR STANDARD DOORS OVER 12 FEET IN HEIGHT STILES AND RAILS, EXCEPT BOTTOM RAIL, ARE 6 INCHES WIDE; BOTTOM RAIL IS 12 INCHES WIDE.

Standard Type Doors, Wilson Sectionfold Partitions

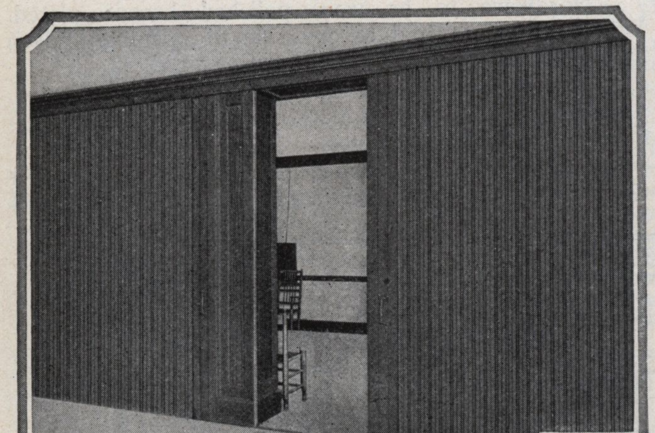
Continued on next page

Wilson Rolling Partitions

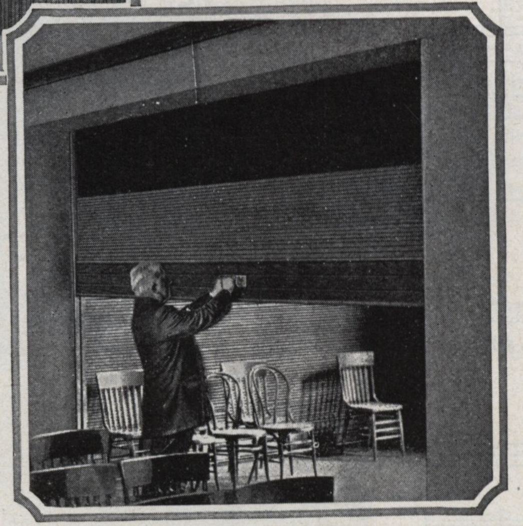
Made of wood slats, horizontal type ½ in. thick, vertical type ¾ in. thick (see specification below), threaded on tempered steel bands running from top to bottom. These bands are riveted to top bar of partition and attached separately to spiral spring anchors concealed in bottom rail (see below) and fitted with simple means of adjustment for regulating the tension. This tension holds slats in close contact, so that joints are absolutely airtight, as well as being automatically adjusted to all atmospheric changes.

With movable posts, any size room can be advantageously divided with these partitions. Swinging doors can be introduced when desired.

Blackboard Surface—A portion or whole of one side of a horizontal partition can be finished with a flat smooth surface and coated with black silicate. This blackboard surface is applied to the side opposite the coil only.



Wilson Vertical Rolling Partitions Made in a Pair Meeting at Center of Opening



Wilson Horizontal Rolling Partition with Blackboard Surface

COIL BOX SPACES REQUIRED FOR WILSON ROLLING PARTITIONS

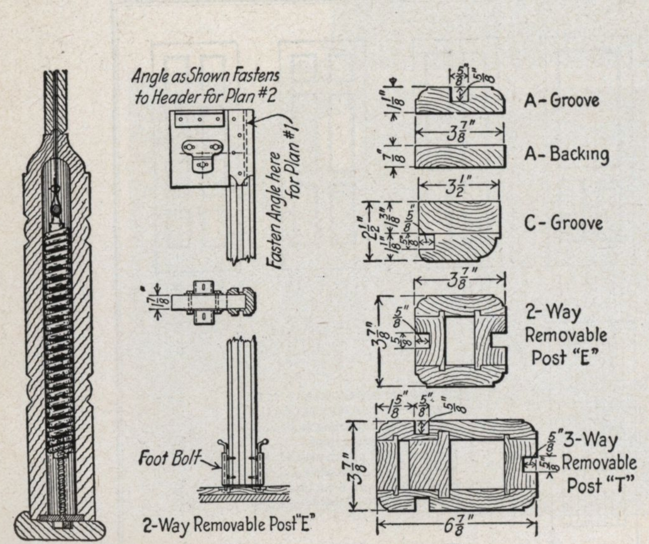
Horizontal partitions		Vertical partitions	
Maximum height of opening, ft.-in.	Inside dimensions of finished coil box (square), in.	Maximum length of partition including coil, ft.-in.	Inside dimensions of finished coil box (square), in.
4-0	11	4-6	10½
6-6	12	7-6	12½
10-0	13	9-6	13½
11-0	15	11-6	14½
15-0	16	13-6	15½
18-0	18	15-6	16½
....	....	17-6	17½
....	....	20-6	18½

Horizontal partitions should not be over 12 ft. wide. This will insure ease of operation.

We find no difficulty in closing openings 40 ft. wide by using vertical partitions coiling to both sides of opening and without intermediate posts.

Specifications for Horizontal Rolling Partitions—Furnish and install where indicated on plans, Wilson horizontal (rolling overhead) partitions of (kind of wood) and finished as described in painting specifications. Slats to be ½ in. thick, threaded upon tempered steel bands running from top to bottom about 16 in. apart. These bands to be riveted to top bar of partition and attached separately to spiral spring anchors concealed in bottom rail and fitted with simple means of adjustment for regulating the tension. Hardware to be iron, bronze plated. Coils to be located outside or within the opening as indicated on plans. Plain paneled cornice of Wilson standard design and of same wood and finish as partitions, is also to be furnished. Partitions are to be erected by manufacturer if possible, or in accordance with his printed instructions.

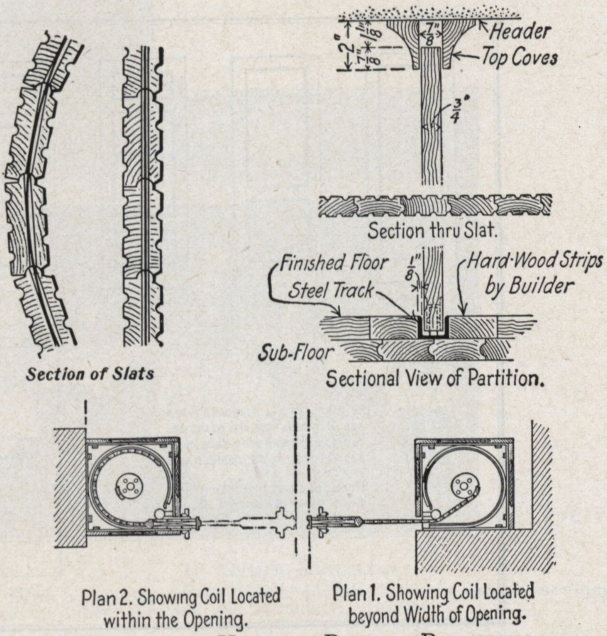
Specifications for Vertical Rolling Partitions—Specify as above, except for the thickness of the slats, which is ¾ in., and the partitions roll sideways instead of overhead.


Angle as Shown Fastens to Header for Plan #2
Fasten Angle here for Plan #1
Foot Bolt
2-Way Removable Post "E"
A-Groove
A-Backing
C-Groove
2-Way Removable Post "E"
3-Way Removable Post "T"
3⅞"
3½"
6⅞"
2½"
⅞"
⅝"
1⅛"

Details of Horizontal Rolling Partitions

Showing one of the anchor springs used in the bottom rail of all Wilson partitions. It automatically adjusts the slats, allowing for shrinking and swelling due to atmospheric changes.

An exclusive Wilson feature


Header
Top Coves
¾"
Section thru Slat.
Finished Floor
Steel Track
Hard-Wood Strips by Builder
Sub-Floor
Section of Slats
Sectional View of Partition.
Plan 2. Showing Coil Located within the Opening.
Plan 1. Showing Coil Located beyond Width of Opening.

Details of Vertical Rolling Partitions

Continued on next page

Wilson Hygienic Wardrobes

Have been used as standard for many years by a great many architects, who, after careful investigation and tests, have found them added features to school hygiene. These wardrobes economize space to such an extent that they more than pay for themselves in total reduction of the size or cost of building.

In the Modern School—Where economy of space and hygienic conditions are so important, the advantages of Wilson wardrobes are widely recognized. Connecting with the ventilating system of the school, a constant current of fresh, dry air is assured, while space usually occupied by coatrooms is conserved. Installed in the schoolroom, the wardrobe is always under the eye of the teacher, or it may be placed in the corridor without interference with passageways.

Each 4-ft. unit accommodates clothing for 17 pupils.

Blackboards—Blackboards of composition or slate are provided, as desired, for doors. This is an added economy.

Teachers' Closets—Each wardrobe may be equipped with separate section for use of the teacher.

Rolling Front Wardrobes

Generally made in units about 4 ft. wide and in three types—B, C and D.

Type B—Illustrated below, seems to have given the most satisfaction.

Type C—Has a wire mesh back instead of wood panels.

Type D—Has fronts which roll sideways instead of overhead.

Specifications—Furnish and install where shown on plans, Wilson Hygienic Wardrobes equipped with Wilson rolling fronts of (........wood) and finished as per painting specifications. Rolling fronts to be made up of slats ½ in. thick, threaded upon tempered steel bands running from top to bottom about 16 in. apart. These bands to be riveted to top bar of curtain and attached separately to spiral spring anchors concealed in bottom rail and fitted with simple means of adjustment for regulating the tension. Wardrobes to be equipped with 17 coat hooks for every 4-ft. section, umbrella rack and drip pan. Hardware to be iron, polished bronze plated.

Tops of wardrobes to be of sheet metal.

Teachers' closets equipped with drawers, shelves and coat hooks to be furnished where indicated in connection with wardrobes.

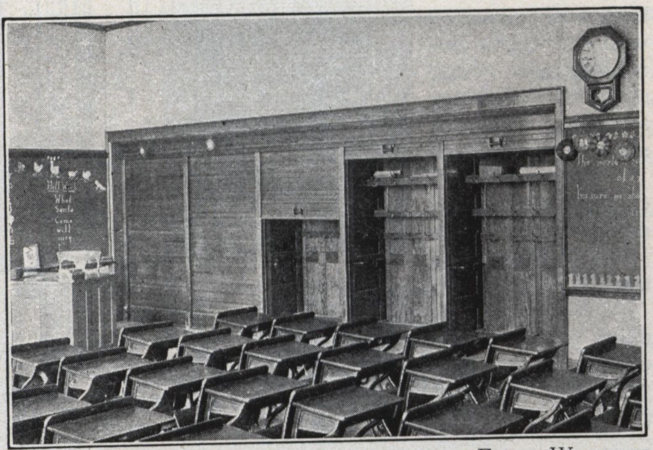
Disappearing Door Wardrobes

The latest development of the Wilson hygienic wardrobe, for so many years the standard for modern school buildings. With its disappearing doors, this wardrobe combines the very necessary feature of economy in space. Doors, as they open, move in a quarter circle, disappearing into side of wardrobe out of the way. Movement is smooth and free from noise. Built in units 4 ft. wide, accommodating 17 pupils—extension to any length is possible.

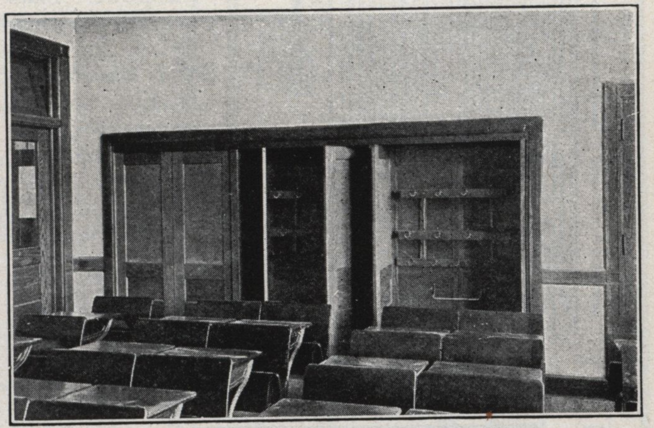
Specifications—Furnish and install where shown on plans, Wilson Disappearing Door Wardrobes of (......wood) and finished as per painting specifications. Doors to be made with mortise joints or flush veneered, equipped with Wilson standard operating mechanism. Top of wardrobe to be of sheet metal.

Doors to be equipped with iron, bronze plated bar handles for operating. Wardrobes to be equipped with 17 coat hooks for every 4-ft. section, umbrella rack and drip pan.

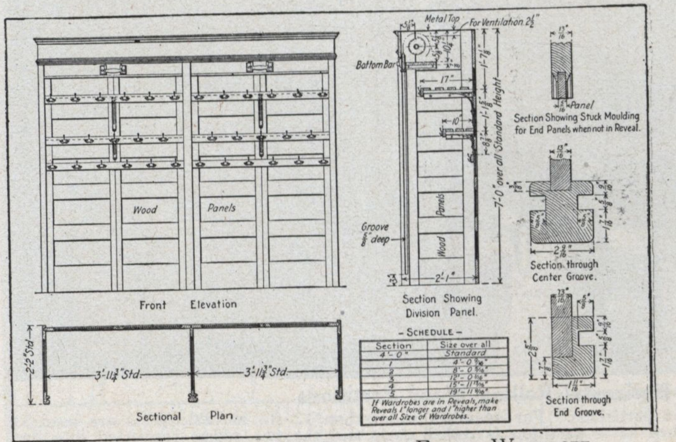
Teachers' closets equipped with drawers, shelves and coat hooks to be furnished where indicated in connection with wardrobes.



TYPICAL INSTALLATION OF TYPE "B" ROLLING FRONT WARDROBE



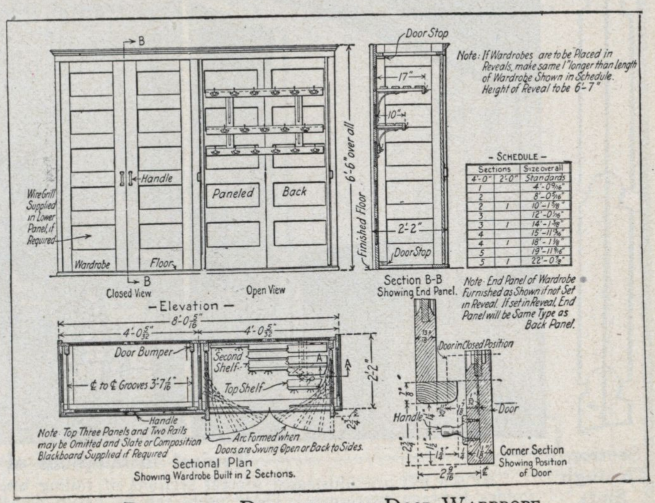
TYPICAL INSTALLATION OF DISAPPEARING DOOR WARDROBE WITH BLACKBOARD PANELS


Metal Top
For Ventilation 2½"
Bottom Bar
17"
10"
1'-7⅞"
1'-1⅝"
8⅞"
7'-0" over all Standard Height
Groove ⅝" deep
Wood
Panels
2'-1"
Front Elevation
Section Showing Division Panel.
Panel
Section Showing Stuck Moulding for End Panels when not in Reveal.
Section through Center Groove.
Section through End Groove.
2'-2" Std.
3'-11¾" Std.
3'-11¾" Std.
Sectional Plan.
- SCHEDULE -

Section 4'-0"	Size over all Standard
1	4'-0 9/16"
2	8'-0 5/16"
3	12'-0 1/16"
4	15'-11 13/16"
5	19'-11 9/16"

If Wardrobes are in Reveals, make Reveals 1" longer and 1" higher than over all Size of Wardrobes.

DETAILS OF TYPE "B" ROLLING FRONT WARDROBE


B
Door Stop
17"
10"
6'-6" over all
Finished Floor
2'-2"
Door Stop
Handle
Paneled
Back
Wire Grill Supplied in Lower Panel, if Required
Wardrobe
Floor
Closed View
Open View
- Elevation -
Section B-B Showing End Panel.
Note: If Wardrobes are to be Placed in Reveals, make same 1" longer than length of Wardrobe Shown in Schedule. Height of Reveal to be 6'-7"
- SCHEDULE -
Note: End Panel of Wardrobe Furnished as Shown if not Set in Reveal. If set in Reveal, End Panel will be Same Type as Back Panel.
8'-0 5/16"
4'-0 5/32"
4'-0 5/32"
Door Bumper
Second Shelf
Top Shelf
℄ to ℄ Grooves 3'-7 1/16"
2'-2"
Handle
Note: Top Three Panels and Two Rails may be Omitted and Slate or Composition Blackboard Supplied if Required
Arc Formed when Doors are Swung Open or Back to Sides.
Sectional Plan Showing Wardrobe Built in 2 Sections.
Door in Closed Position
Door
Handle
Corner Section Showing Position of Door

Sections 4'-0"	Sections 2'-0"	Size over all Standards
1		4'-0 9/16"
2		8'-0 5/16"
2	1	10'-1 5/8"
3		12'-0 1/16"
3	1	14'-1 3/8"
4		15'-11 13/16"
4	1	18'-1 1/8"
5		19'-11 9/16"
5	1	22'-0 7/8"

DETAILS OF DISAPPEARING DOOR WARDROBE

ESTABLISHED
1856

SWEDISH VENETIAN BLIND COMPANY

Rolling Wood Partitions and Steel Rolling Doors and Shutters

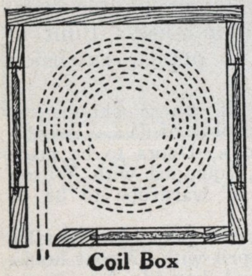
1265 Broadway, NEW YORK, N. Y.

AGENCIES

BIRMINGHAM, ALA., Beecroft & Mallory Sales Co., 420 No. 21st Street
COLORADO SPRINGS, COLO., Fred A. Sperry, 18 E. Kiowa Street
BOULDER, COLO., Ideal Metal Weather Strip Co., Geo. Jump, Mgr., 1015 Walnut Street
MIAMI, FLA., O. D. Brinson, Bedford Building
ATLANTA, GA., Steel Specialties Co., 608 Walton Building
NEW ORLEANS, LA., J. T. Mann & Co., Inc., 319 Dryades Street
BALTIMORE, MD., Philip H. Lenderking, 415 St. Paul Place
MINNEAPOLIS, MINN., John E. Sodergren, 2906 Dorman Avenue, and L. D. Starks, 1700 W. Lake Street
JACKSON, MISS., General Builders Supply Co., P. O. Box 533
WILSON, N. C., J. O. Hearne
CLEVELAND, OHIO, Geo. E. McNeal & Co., Builders Exchange, Rose Building
OKLAHOMA CITY, OKLA., Hanson Building Specialty Co., 200¼ W. Reno Avenue
PITTSBURGH, PA., Hartzell & Williams, 410 Bessemer Building
SCRANTON, PA., William B. Bennett, Union National Bank Building
NEWPORT, R. I., W. F. Spingler, 7 Travers Block, Bellevue Avenue
ROCK HILL, S. C., Hambright & Company
DALLAS, TEX., Conibear-Jackson Co., 428 W. Center Street
ROANOKE, VA., F. Simmons, American National Bank Building
SEATTLE, WASH., Tourtellotte-Bradley, Inc., L. C. Smith Building

Products

Rolling Wood Partitions.
Rolling Steel Doors and Shutters.
For Swedish Venetian Blinds, see page 1293.

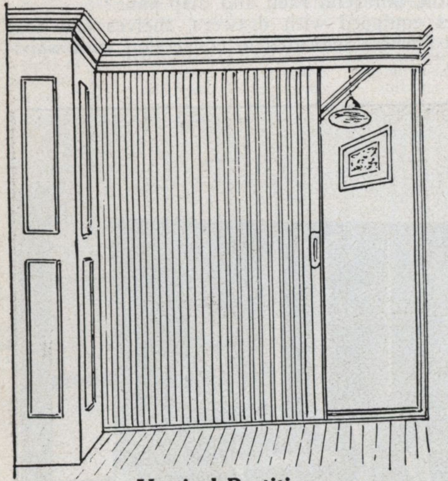


Coil Box

Horizontal and Vertical Rolling Wood Partitions

For all purposes where room division is necessary: schools, churches, clubrooms, factories, residences, etc.

By their use, convenient, economical floor arrangement can be obtained. They dispense with folding and accordion doors.



Vertical Partition

Made of the best wood obtainable for the purpose. Slats are 1¾ in. wide by ½ in. thick and have non-friction joints connected by metal straps.

DIMENSIONS OF ROLLING WOOD PARTITIONS

Height, including coil, ft.	Inside of coil box, in. square
6	12
8	12½
10	13
12	14
14	14½
16	15
18	15½
20	16

Improved ball bearing coiling device insures ease of operation and noiselessness. Furnished in any finish desired, with attractive hardware, adjusted coiling apparatus and hangers to carry ends of shafts.

Openings of any width can be closed with one or more partitions. Single partitions should not be over 12 ft. wide.

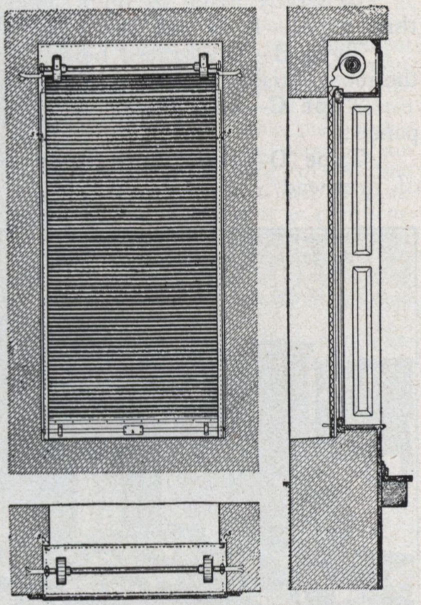
Detail drawings furnished on request.

Steel Rolling Doors and Shutters

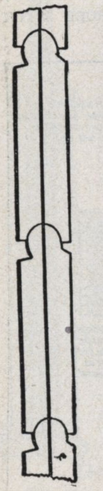
Made of the best grade of English continuous corrugated steel sheets. Different operating mechanisms furnished to suit varying conditions. Used for all kinds of openings where strength, durability, ease of operation, efficiency and economy of space are required.

Any good mechanic can easily erect our products from details furnished by us.

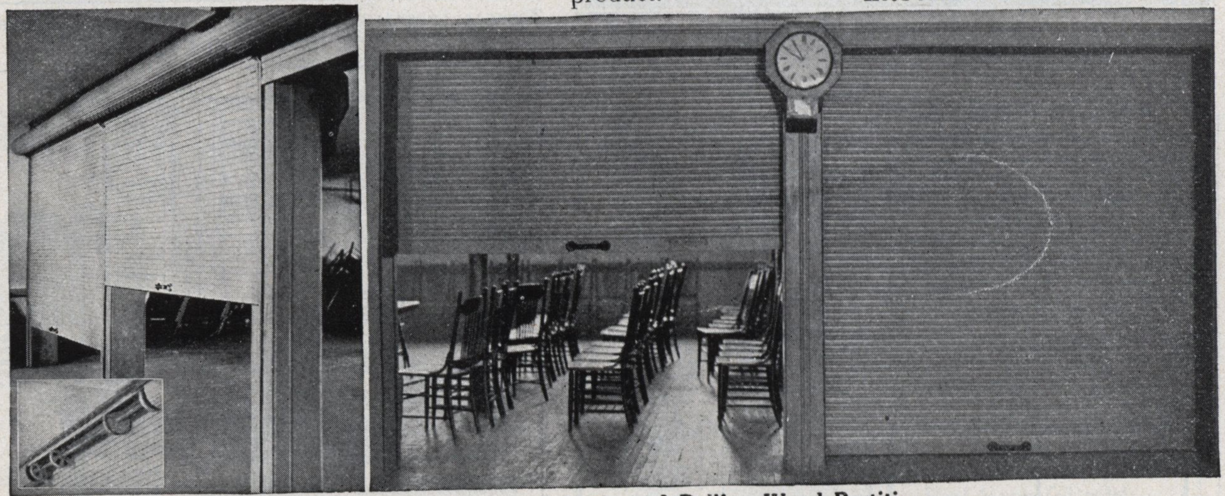
We have had many years' experience in this line and guarantee a perfect product.



Corrugated Steel Shutter
Hood removed to show operation



Section Through Slats



Typical Installations of Horizontal Rolling Wood Partitions

At the left are illustrated several sections of rolling wood partitions. For openings wider than 12 ft., movable posts are used as guides between partitions. These posts can be easily detached after partition is coiled away and the two rooms converted into one large space. The spring roller which operates the partitions is also shown. At the right is illustrated the rolling wood partition installed in an assembly room

EMPIRE STEEL PARTITION CO., INC.

Third Avenue and Eleventh Street, COLLEGE POINT, N. Y.

Products

Empire Extensible Steel Partitions for offices, factories, hospitals, etc.; Steel Office Railings.

Also Toilet Partitions, Hollow Steel Doors and Trim, Steel Coupon Booths, Drawn Metal Mouldings.

Empire Extensible Steel Partitions

The Empire Extensible Steel Partitions are ideal for office and factory and are also used extensively for hospitals, toilets and coupon booths.

Adjustable — This partition is "adjustable" to any height up to 13 ft. 6 in.; over that height special extension members can be supplied. The height adjustment is taken care of above the main cornice line, all material below that point being of standard height and size. The adjustment of the partition to the floor plan is taken up by a filler piece as shown. The standard height of the low partition is 7 ft. 3¾ in. The partition is constructed of cold rolled strip and sheet steel, Nos. 18 and 20 gauge. The slip joint method of construction is employed and all welds are made by the electrical or the acetylene process. The fastenings are concealed.

The standard unit widths are:

Door unit 2 ft. 8 in. and 3 ft. by 7 ft.; 1¾ in. thick.

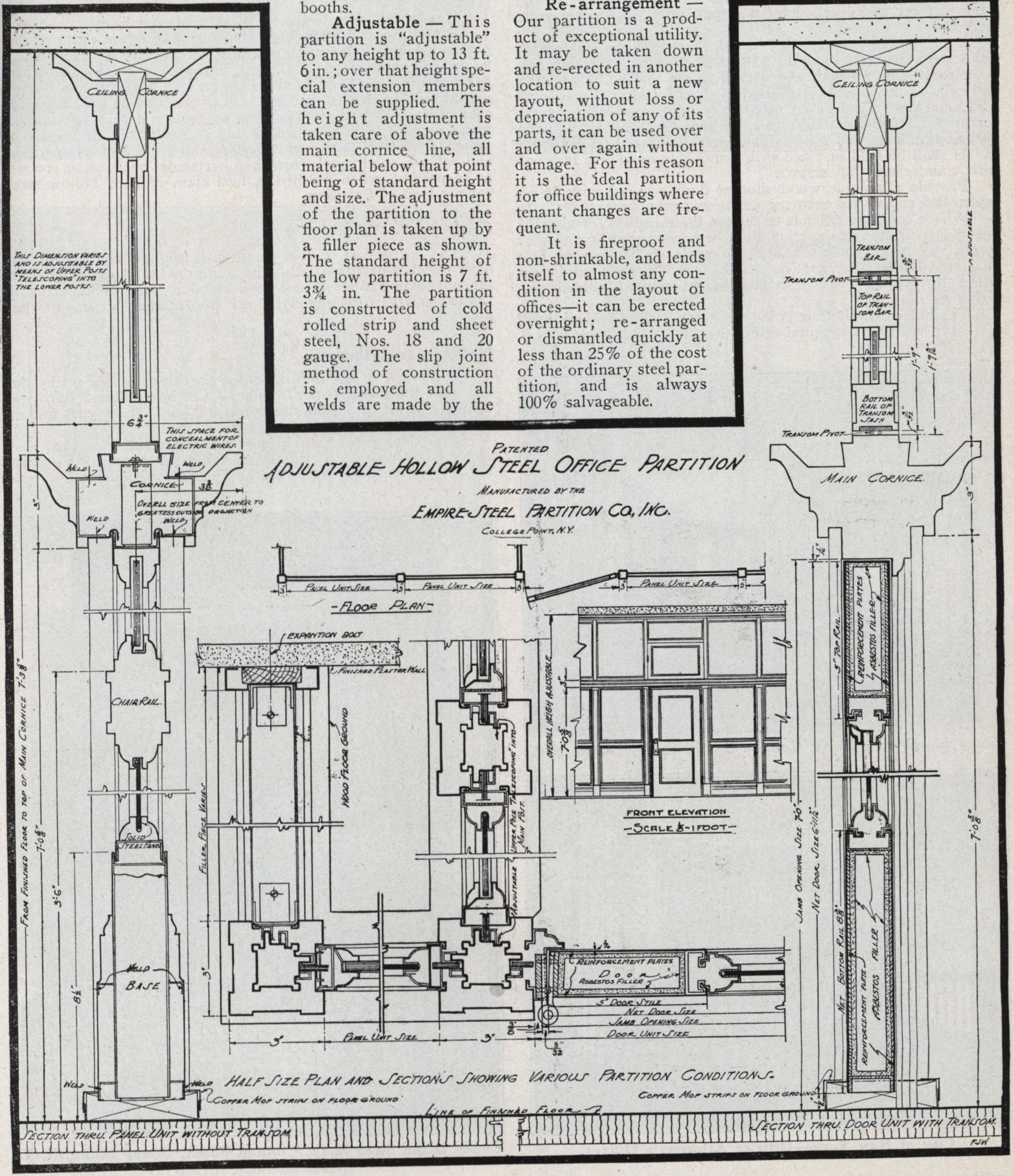
Panel unit: 1 ft. 6 in., 2 ft., 2 ft. 6 in., 3 ft., 3 ft. 6 in. and 4 ft., by 7 ft. high.

Transoms, wickets and pass window are furnished in units when required. Glass above the main cornice can not be more than ⅛ in. thick.

Glass below the main cornice can not be more than $\frac{3}{16}$ in. thick.

Re-arrangement — Our partition is a product of exceptional utility. It may be taken down and re-erected in another location to suit a new layout, without loss or depreciation of any of its parts, it can be used over and over again without damage. For this reason it is the ideal partition for office buildings where tenant changes are frequent.

It is fireproof and non-shrinkable, and lends itself to almost any condition in the layout of offices—it can be erected overnight; re-arranged or dismantled quickly at less than 25% of the cost of the ordinary steel partition, and is always 100% salvageable.


PATENTED
ADJUSTABLE HOLLOW STEEL OFFICE PARTITION
MANUFACTURED BY THE
EMPIRE STEEL PARTITION CO, INC.
COLLEGE POINT, N.Y.
CEILING CORNICE
THIS DIMENSION VARIES AND IS ADJUSTABLE BY MEANS OF UPPER POSTS "TELESCOPING" INTO THE LOWER POSTS.
6¾"
THIS SPACE FOR CONCEALMENT OF ELECTRIC WIRES.
WELD
CORNICE
3⅜"
OVERALL SIZE FROM CENTER TO GREATEST OUTSIDE PROJECTION
CHAIR RAIL
FROM FINISHED FLOOR TO TOP OF MAIN CORNICE 7'-3⅝"
7'-0⅝"
3'-6"
SOLID STEEL BAND
BASE
8½"
COPPER MOP STRIPS ON FLOOR GROUND
LINE OF FINISHED FLOOR
SECTION THRU. PANEL UNIT WITHOUT TRANSOM
PANEL UNIT SIZE
FLOOR PLAN
EXPANSION BOLT
FINISHED PLASTER WALL
WOOD FLOOR GROUND
FILLER PIECE VARIES
UPPER POLE TELESCOPING INTO MAIN POST
ADJUSTABLE
REINFORCEMENT PLATES
DOOR
ASBESTOS FILLER
5" DOOR STILE
NET DOOR SIZE
JAMB OPENING SIZE
DOOR UNIT SIZE
3"
3/32"
HALF SIZE PLAN AND SECTIONS SHOWING VARIOUS PARTITION CONDITIONS
OVERALL HEIGHT ADJUSTABLE
7'-0⅝"
FRONT ELEVATION
SCALE ⅛"=1 FOOT
TRANSOM BAR
TRANSOM PIVOT
TOP RAIL OF TRANSOM BAR
1'-9"
1'-9⅞"
BOTTOM RAIL OF TRANSOM SASH
MAIN CORNICE
5" TOP RAIL
REINFORCEMENT PLATES
ASBESTOS FILLER
JAMB OPENING SIZE 7'0"
NET DOOR SIZE 6'11½"
NET BOTTOM RAIL 8⅛"
REINFORCEMENT PLATE
ASBESTOS FILLER
SECTION THRU. DOOR UNIT WITH TRANSOM.
F.J.W.

Continued on next page

Specification for Steel and Glass Partitions

Materials and Workmanship—The contractor shall furnish and erect hollow extensible steel partition, doors and transoms, as indicated on the drawings. Partitions shall be 2¾ in. thick by height shown, formed up with pilasters, stiles and rails, base and cornice, and with solid panels and glazed upper panels.

Stiles and rails of the doors shall be constructed of No. 18 U. S. gauge, panels No. 12 gauge. Main cornice, posts, ceiling cornice, glass mouldings shall be constructed of Nos. 18 and 20 gauge cold rolled strip steel stock. All miters shall be sharp and true and shall be welded.

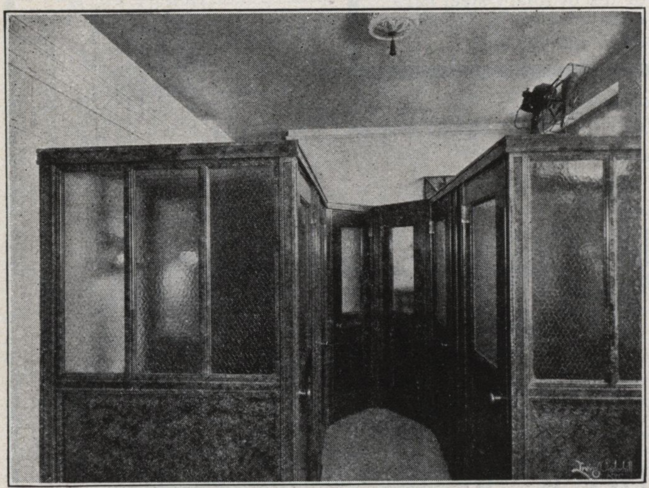
All metal shall be best quality, cold rolled, open hearth, double annealed, steel plates free from scale, buckle, pits and other defects and levelled by the "patent" or other approved methods.

Partitions and doors shall be reinforced on the inside with small steel channels securely welded to the plates. Reinforcement for the doors shall extend full height and width of stiles and rails to provide support for hinges and locks. Provide all additional steel channels or heavy plate reinforcement necessary for proper attaching and supporting hardware and maintaining perfect alignment and rigidity of doors. The glass in the upper panels shall be held in place with removable moulding fastened with countersunk tap screws.

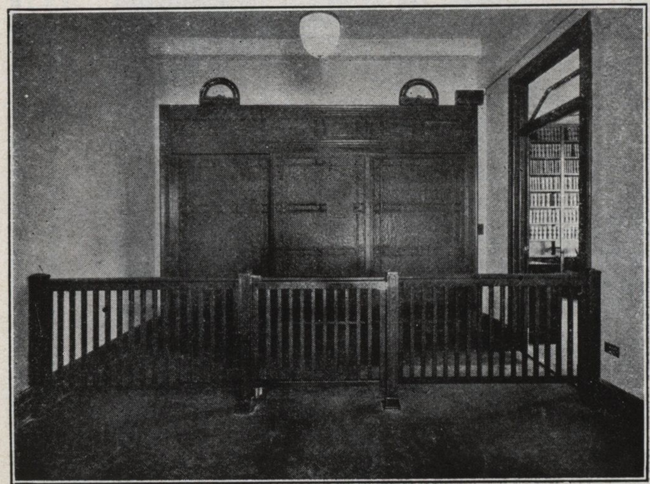
Provide a suitable wood shoe at floor covered with 16-oz. cold rolled copper for securing partition to the floor.

Where partition extends to ceiling, the members forming the upper part or transom portion shall be constructed in a similar manner as herein specified, and the posts shall telescope into pilasters so that they can be adjusted to the required height either to greater or less ceiling height without added material.

The inner or adjusting pole to have several additional lineal feet over and above original ceiling height.



Coney Island State Bank, Coupon Booth, Coney Island, N. Y.



City of New York—District Attorney's Offices

Do all tapping, drilling and cutting and apply all hardware herein specified.

Partitions and doors shall be equal to those manufactured by the Empire Steel Partition Co., Inc., College Point, N. Y., or approved equivalent.

Glazing—All glass shall be of the best quality, and free from waves, bubbles and other defects as much as possible.

All glass for interior openings shall be carefully bedded in putty composed of white lead stiffened by the addition of dry whiting only, and shall be secured in place with stop beads supplied with the doors, sash or frames. Glass to be as selected.

Hardware—Hardware to be as approved by us.

Finishing and Painting—Before the different parts of the partitions and doors are assembled all interior surfaces shall be thoroughly cleaned of all rust, oil, grease, etc., by sandblast, gasoline dip or otherwise and then receive a filling coat covering up welding marks, etc., and also to receive one final finishing coat of varnish and rubbed, then to receive a priming coat of metallic paint, which is baked and rubbed, then to receive a finishing coat of paint and varnish properly baked as specified and rubbed, so all work furnished hereunder shall be so erected as to present, when finished, a first class finished hollow steel cabinet type of Partition.

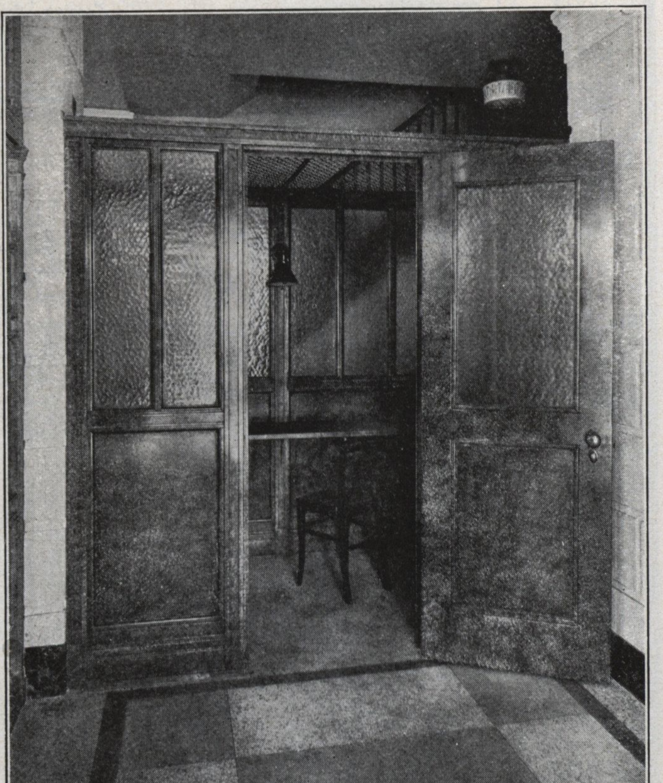
Cost

The initial cost of this partition is slightly more than that of a wooden partition. But the additional cost, together with the advantages offered over the wooden type which make it vastly superior to any type on the market, represents an asset.

Notable Installations

The proof of the merits of our partitions is evident by the fact that the New York Telephone Co. has adopted our type throughout all of its buildings for the past three years and is still continuing same.

The Chesapeake and Potomac Telephone Co. has also adopted our type of partitions, covering the states of Virginia, West Virginia, Maryland and the District of Columbia.



Coney Island State Bank, Coupon Booth, Coney Island, N. Y.

Herbert Mainzer, Architect

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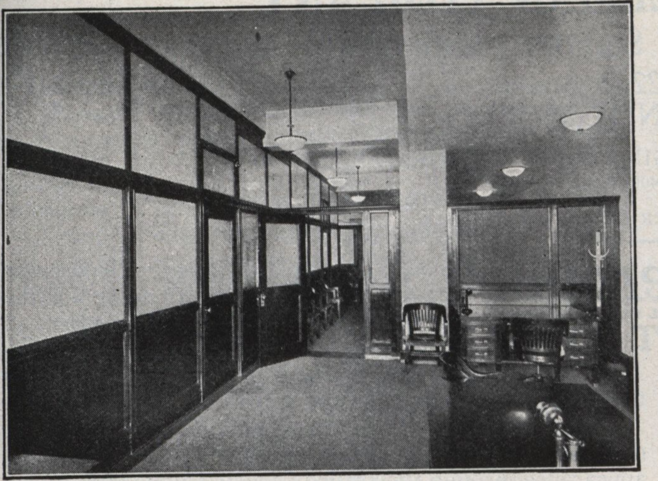
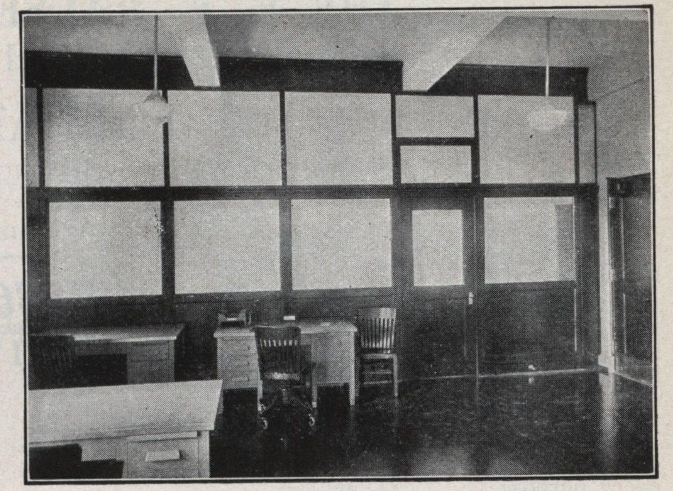
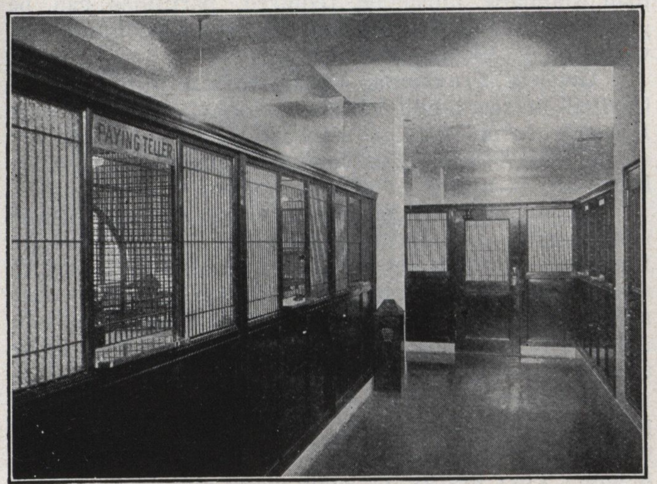


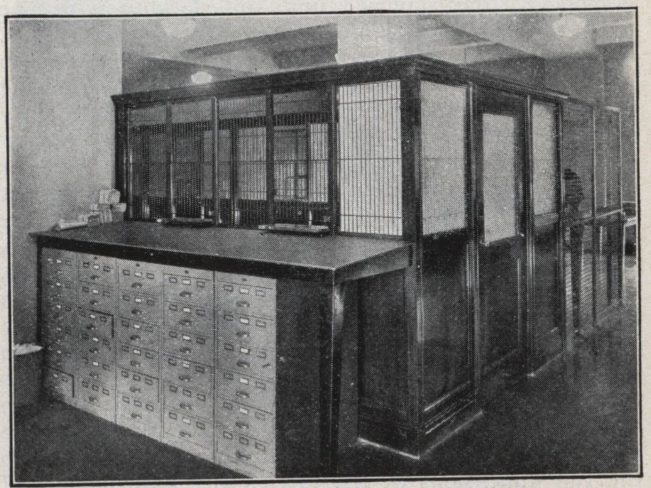
Ante-room, Brooklyn Edison Co., Brooklyn, N. Y.



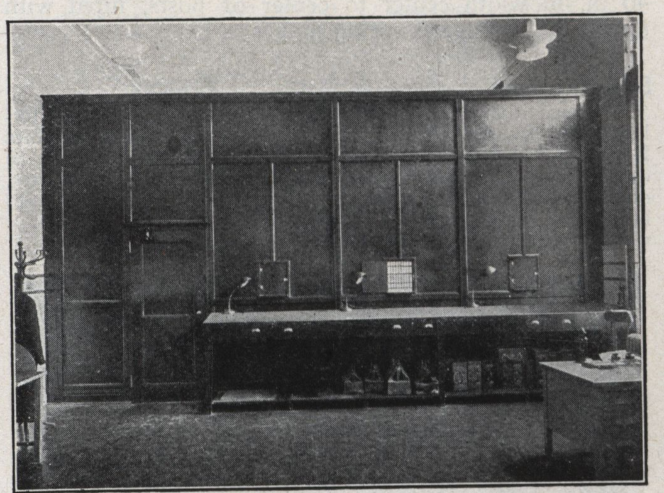
Private Office, Brooklyn Edison Co., Brooklyn, N. Y.



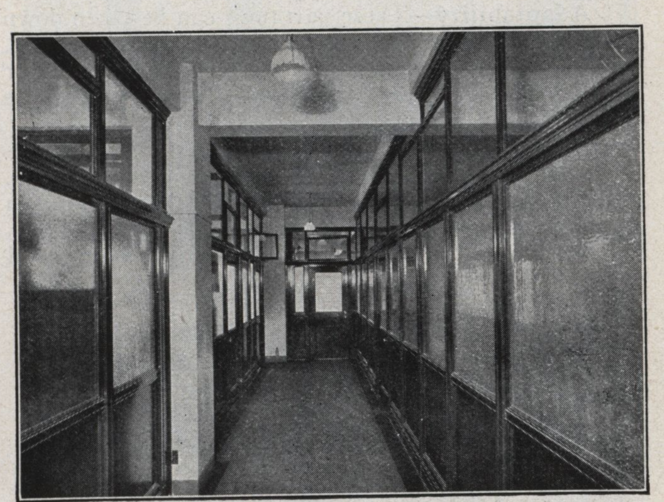
Cashier's Office, Brooklyn Edison Co., Brooklyn, N. Y.



Accounting Department, Brooklyn Edison Co., Brooklyn, N. Y.



Office in Payroll Department, Brooklyn Edison Co., Brooklyn, N. Y.



International Paper Corridor, Pershing Square Building, New York, N. Y.

Recent Installations of Empire Steel Partitions

Endorsed and Specified By

McKenzie, Voorhees & Gmelin
McKim, Mead & White
Walker & Weeks
Geo. B. Post & Sons
Raldiris & La Velle
New York Edison Co.
New York Telephone Co.
American Telephone & Telegraph Co.
Western Electric Co.
Brooklyn Edison Co.
National Biscuit Co.
Wm. Whitehill
W. B. Gardiner

And many others of like character.

Partial List of Installations

Building and Location	Architect or Contractor
New Federal Reserve Bank, Cleveland, Ohio	Walker & Weeks
N. Y. Telephone Co., Bridge St., Brooklyn, N. Y.	McKenzie, Voorhees & Gmelin
Anne Arundel County Court, Annapolis, Md.	W. B. Gardiner
Western Union Telegraph Co., 195 Broadway, N. Y.	
Hotel Statler, Buffalo, N. Y.	Geo. B. Post & Sons
Royal Baking Powder Co., Pershing Sq., New York, N. Y.	
Attleboro Steam & Electric Co., Attleboro, Mass.	

THE E. F. HAUSERMAN COMPANY

Hauserman Hollow Steel Standard Unit Partitions

1721 East 22nd Street
CLEVELAND, OHIO

FACTORY BRANCHES WITH ENGINEERING AND FIELD SERVICE
NEW YORK, N. Y., 41 East 42nd Street
DETROIT, MICH., 400 Penobscot Building
PITTSBURGH, PA., 938 Oliver Building
CHICAGO, ILL., 140 So. Dearborn Street
BOSTON, MASS., 10 High Street
AGENTS IN OTHER LARGE CITIES

Hauserman
HOLLOW STEEL STANDARD UNIT
PARTITIONS

Products

Hauserman Hollow Steel Standard Unit Partitions and Railing.

Hauserman Hollow Steel Standard Unit Partitions

For use in banks, offices, factories, office buildings, schools, hospitals and garages. A type and grade for every purpose.

General Description—Hauserman partitions are assembled from standard units interlocking with one another and securely bolted to posts by concealed bolts. All posts are securely anchored to floor and ceiling (in case of ceiling height partition) with one concealed lag screw and rawl plug or expansion bolt, depending entirely upon the type of structure.

Standard Units—Units are made of steel, glass or wire mesh in various heights and widths in order that any layout or condition can be met by assembling these units together with posts and doors. The units are 1, 2, 3, 4 or 5 panels or lights in width, corresponding to 20, 40, 60, 80 and 100 in. center to center of posts and in heights of 30, 36, 42 and 48 in.

Top and End Conditions—Any variation in heights between the uppermost unit and the ceiling is taken care of by the use of an adjustable top filler, through which overhead pipes may be carried. At the ends where the standard width units do not take up the full dimensions of the given space adjustable steel end fillers are provided.

Adaptability—These partitions can be taken down and re-arranged as often as changing conditions require. This can be done quickly and easily without waste or damage—100% salvage. Additional stock units can be shipped on short notice.

Advantages—Being constructed of steel these partitions are fire retarding. All units, doors, wickets, grilles, ventilators and transoms are interchangeable with others of corresponding dimensions. All posts, units, base and chair rails are designed to carry and conceal electric and telephone wires. All posts are recessed on four sides, providing for the extending of partitions from any one or all sides. One side of the post has a removable cap, so that panels may be bolted from the inside, concealing bolts and providing for easy wiring.

Appearance—Hauserman partitions are clean-cut, dignified and well-designed, presenting a dominating appearance through their sturdy construction; attractively finished in olive green baked-on enamel. Should other than standard finish be required, partitions can be grained or painted in the field, our standard finish providing an excellent prime coat.

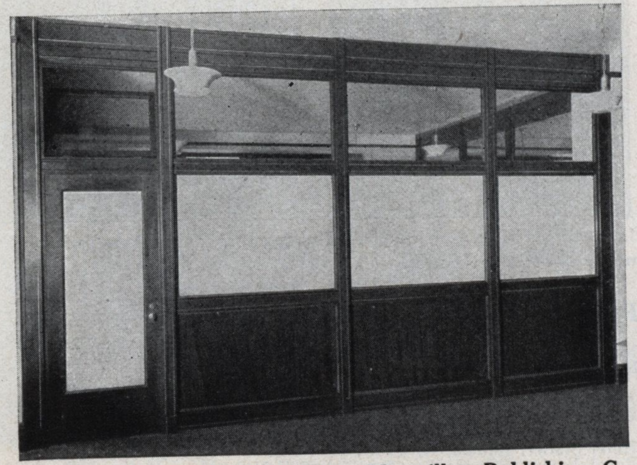
Grilles, Transoms, Ventilators and Wickets—Carried in stock and can be mounted into the space formerly occupied by a standard light. Wickets are single hinged, sliding or counterweighted, while ventilators are furnished in vertical pivoted types.

Hardware—All hardware for doors, wickets and ventilators is the best of its respective kind. Doors are furnished with Stanley butts and Yale & Towne lock sets. Communicating lock sets and latches can be furnished and are interchangeable with cylinder lock sets. All hardware is finished in polished bronze. Door checks are either Norton or Rixon.

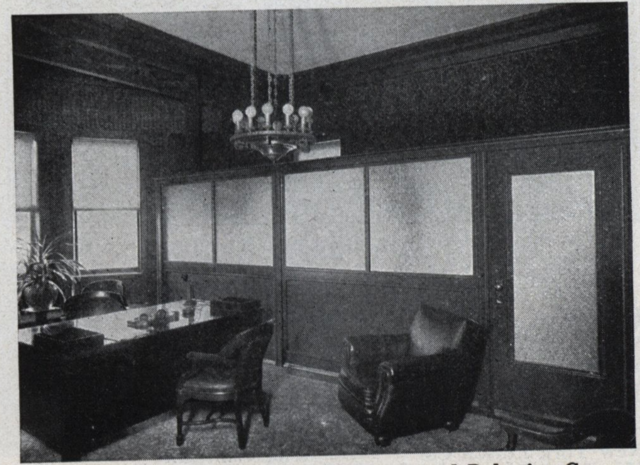
Railings—Railings are assembled from standard partition units 30 in. high, using standard posts (with post caps) either with or without a 6-in. base and base mould. They are of the same detail and design as the partitions and are equipped with gates approximately 40 in. in width center to center of posts, fitted with double acting sagless spring hinges.

Specifications

All partitions shown on drawings shall be Hauserman Hollow Steel Standard Unit Partitions as manufactured by The E. F. Hauserman Company, Cleveland, Ohio. They shall be constructed of standard units with doors, standard hardware, door checks, ventilators, wickets and glass. Partitions are to be finished in standard olive green baked-on enamel. They are to be glazed and erected complete in place.



Type M Ceiling Height Partition, Macmillan Publishing Co., New York, N. Y.



Type L Cornice Height Partition, United Bakeries Corp., Chicago, Ill.

Continued on next page

Delivery

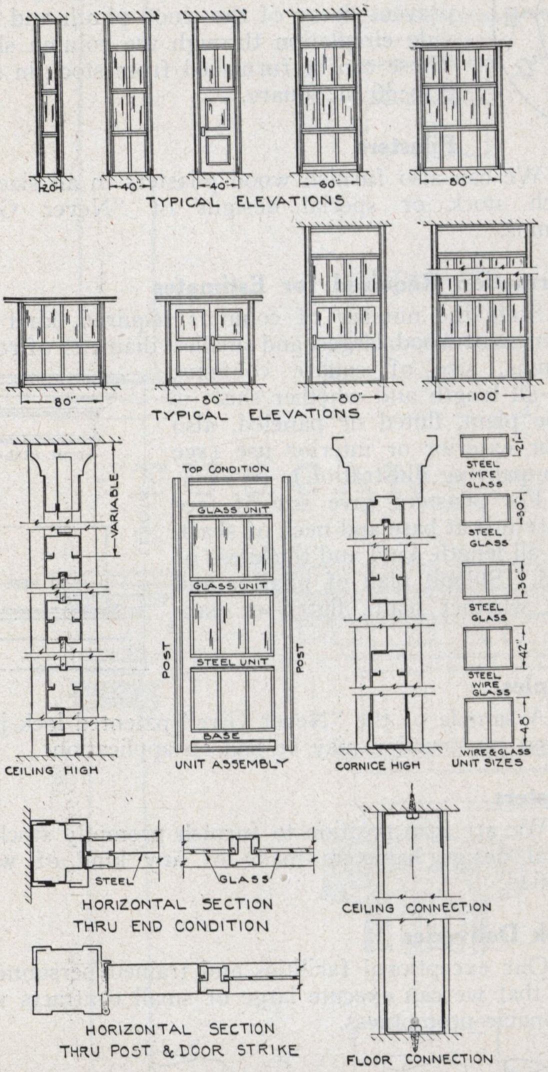
Average shipment of standard partition units in two to four weeks after receipt of approved drawings.

Estimating Service

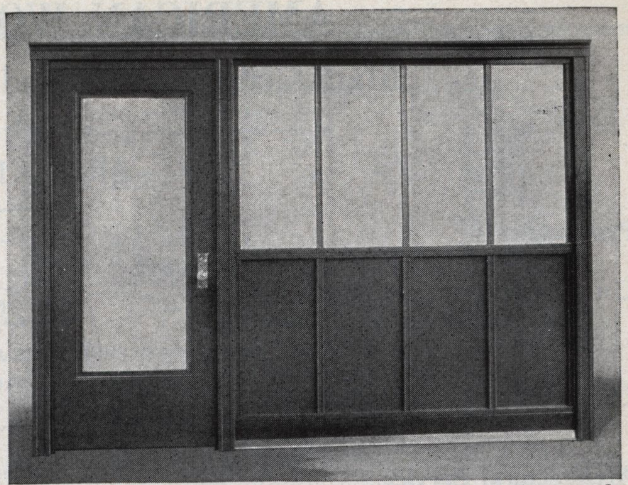
Forward blue print or plans to us and we will gladly prepare estimate and return promptly, without obligation.

Catalogue

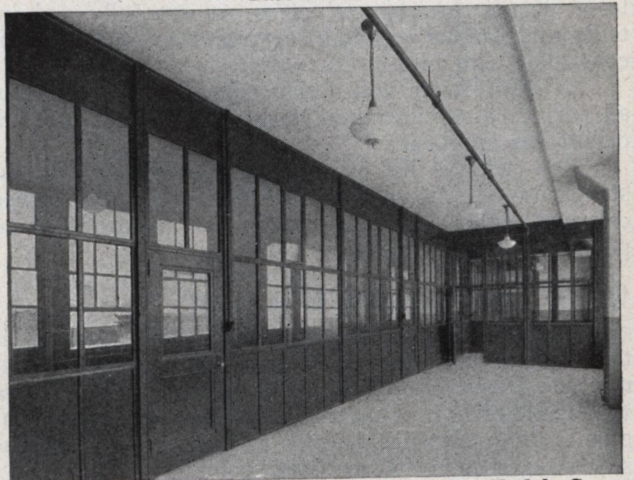
Complete illustrated catalogue and descriptive literature, containing plans, elevations and specifications of different type partitions, will be mailed on request.


20"
40"
40"
80"
80"
TYPICAL ELEVATIONS
80"
80"
80"
100"
TYPICAL ELEVATIONS
VARIABLE
CEILING HIGH
TOP CONDITION
GLASS UNIT
GLASS UNIT
STEEL UNIT
BASE
POST
POST
UNIT ASSEMBLY
CORNICE HIGH
21"
STEEL WIRE GLASS
30"
STEEL GLASS
36"
STEEL GLASS
42"
STEEL WIRE GLASS
48"
WIRE & GLASS UNIT SIZES
STEEL
GLASS
HORIZONTAL SECTION THRU END CONDITION
CEILING CONNECTION
HORIZONTAL SECTION THRU POST & DOOR STRIKE
FLOOR CONNECTION

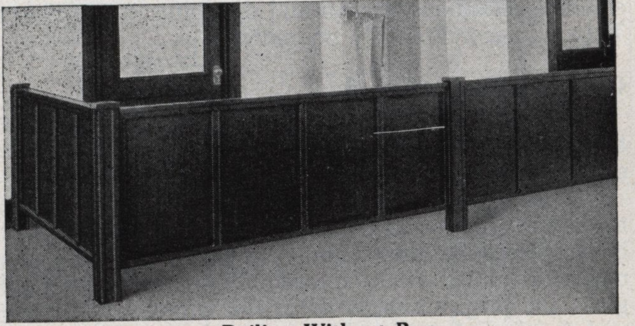
Typical Details



Type J Cornice Height Partition, Single Panel Door and Base Mould

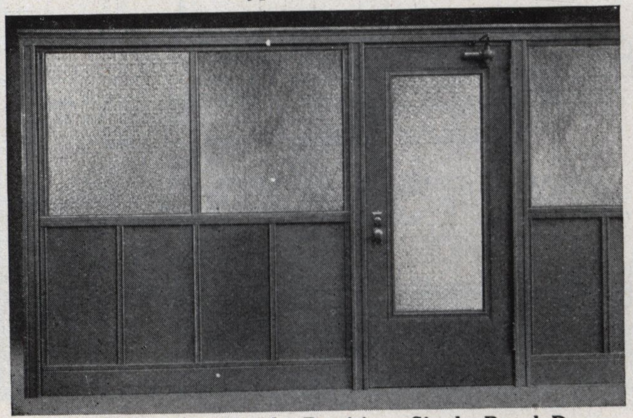


Type H Ceiling Height Partition, Eastman Kodak Co., Rochester, N. Y.

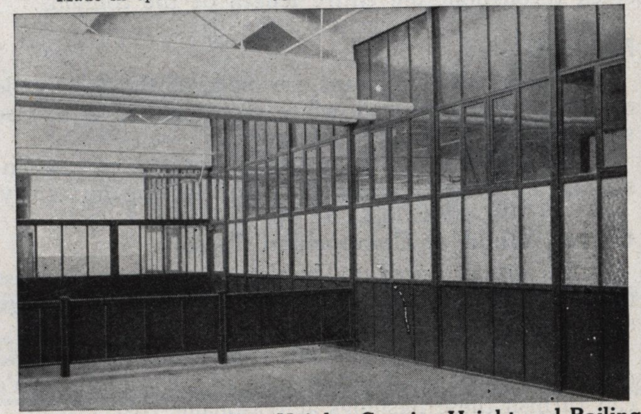


Railing Without Base

Made in open or closed types to match each type of partition



Type K Cornice Height Partition, Single Panel Door



Type G Partition, Ceiling Height, Cornice Height and Railing in the Philadelphia Inquirer, Elverson Building, Philadelphia

AMERICAN WOOD COLUMN CO.

Manufacturers of Wood Stave Lock-joint Columns

910 Grand Street
BROOKLYN, N. Y.

Products

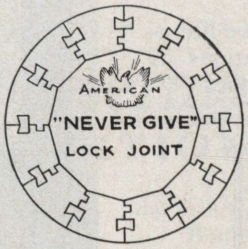
Patented Lock-joint Wood Stave Columns for exterior and interior use.

Iron Plinths for columns.

Pilasters.

Carved Wood and Composition Capitals.

Balusters.



Architectural Service

We specialize in building wood columns to architects' details. Architects' ideas are carefully and intelligently carried out and our prices are as low as is consistent with high grade work.

If desired, we will design columns conforming to all periods of architectural design and submit full size details for approval.

Our selected list of stock designs conform to the standards of Vignola and include lock-joint turned columns, either plain or fluted, also plain, fluted or paneled square columns.

"Never Give" Patented Lock-joint

The principal feature of "Never Give" columns is the wedge-shaped dowel made of hardwood, which is machine driven through the entire length of the column (see trade-mark). Only the best quality of waterproof glue is used. No metal bands are required to hold the staves together in "Never Give" columns.

This hardwood wedge holds the staves together so tightly and securely that the column is capable of withstanding enormous tension and the joints can not open. This we unconditionally guarantee.

Correctly Proportioned

"Never Give" columns are architecturally correct, having entasis, stopped flutes and other characteristics of the columns of ancient classical orders.

Unless otherwise specified, the staves are worked to the correct entasis (convex curve) in the rough before being placed in the columns (one-third straight and upper two-thirds swell-tapered). This method not only gives the proper entasis when the columns are turned and finished, but also insures maximum thickness of stock throughout the entire length of the columns.

Materials

"Never Give" columns are made of the best grade of thoroughly seasoned white pine (unless otherwise specified) of any desired thickness.

Our columns are primed with one coat of raw linseed oil and Atlantic white lead before leaving the factory.

Carved Wood or Composition Capitals

We are prepared to furnish promptly high class carved wood and composition capitals of standard design or made from architects' details.

We strongly recommend that architects specify lead or copper flashings for the tops of all capitals. We can furnish these flashings at reasonable cost.

Iron Plinths for Columns

We recommend the use of cast iron ventilated plinths for exterior columns that rest on stone, cement or brick floors. They prevent decay of the wood plinth and provide circulation through the column shaft. These can be furnished from stock in sizes 8 to 36 in. square.

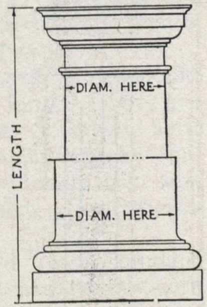
Pilasters

We can also furnish wood pilasters in all sizes to match stock or special designs of "Never Give" columns.

Information Required for Estimates

State the number of columns required, kind and thickness of wood, largest and smallest diameter of round columns, size of square columns, over-all length and whether shaft is to be plain, fluted or paneled, also if for exterior or interior use (see accompanying illustration).

For pilasters, give size of face and return at base and neck of shaft, over-all length, kind and thickness of wood. Submit plan of pilaster and state whether plain, fluted or paneled.



Samples

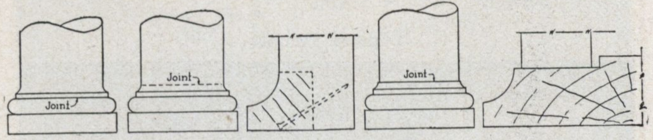
A sample of the "Never Give" patented lock-joint column construction may be had on application.

Balusters

We are in a position to furnish promptly stock or special design balusters made of any kind of wood specified.

Quick Deliveries

Our exceptional facilities and trained personnel is such that we can execute large or small contracts with reasonable promptness.



Style 50 Style 51 Turnout on 51 Style 52 Turnout on 52

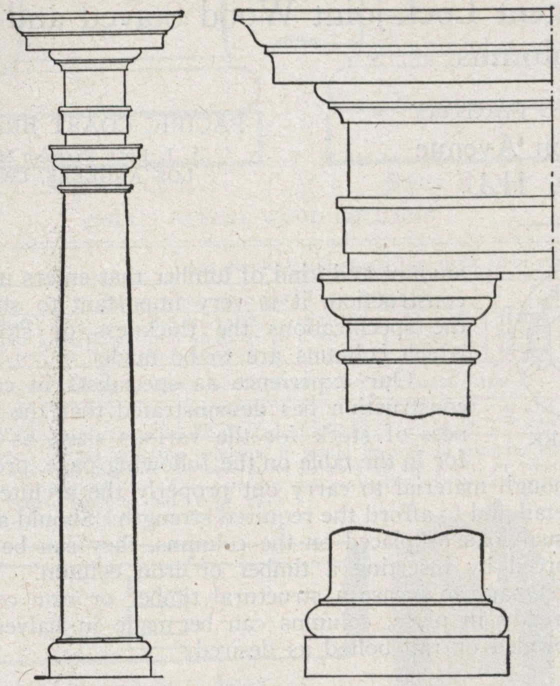
Methods of Finishing Columns at Base

DIAMETER (IN INCHES) OF "NEVER GIVE" COLUMNS

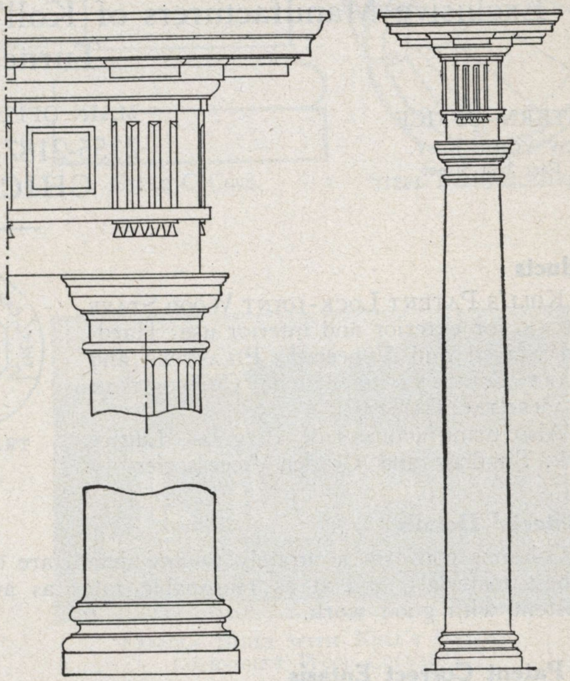
Thickness of shaft	2 in.	2½ in.	3 in.	4 in.
With Cove on Shaft Similar to Style 50				
Plain shaft	Up to 18	19 to 22	23 to 30	31 and up
Doric or Ionic fluted shaft	Up to 16	17 to 19	20 to 27	28 and up
Doric fluted shaft	Up to 22	21 to 28	29 to 39	40 and up
With Cove Planted on (Style 51) or Made a Base Member (Style 52)				
Plain shaft	Up to 22	23 to 30	31 to 40	41 and up
Ionic fluted shaft	Up to 22	23 to 28	29 to 38	39 and up

When ordering or specifying columns, state whether cove is to be a part of the shaft or whether it can be planted on.

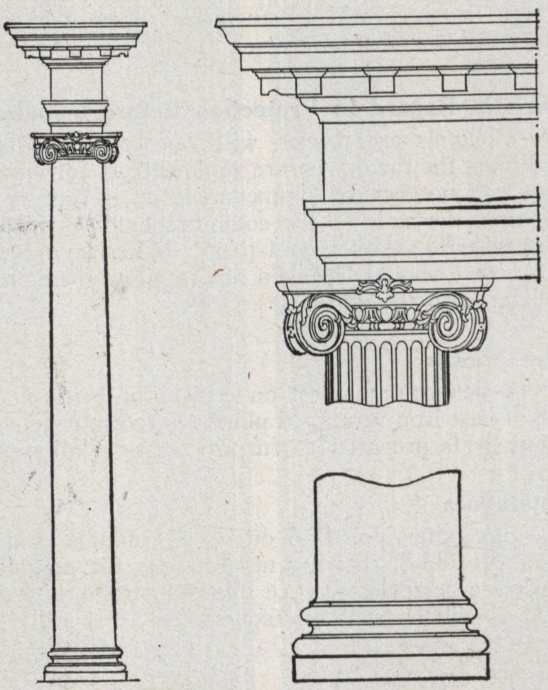
Continued on next page



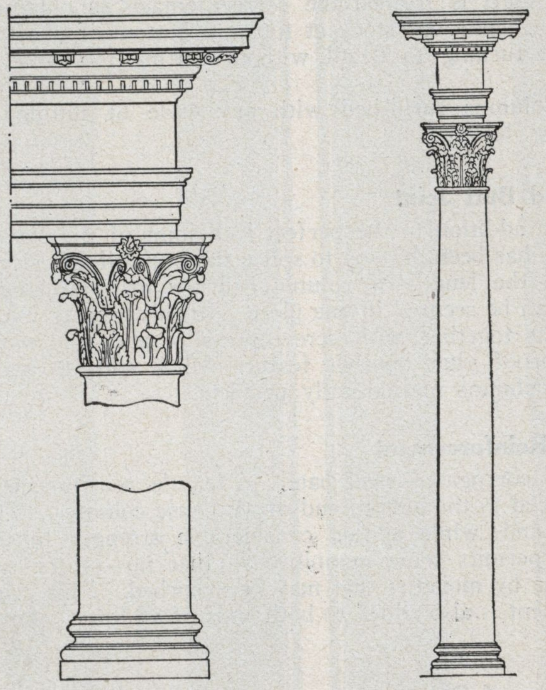
TUSCAN



DORIC



IONIC



CORINTHIAN

DRAWN BY
J.F.C. — L.J.P.
AMER.WD.COL.CO.

AMERICAN WOOD COLUMN CO.

NOT DRAWN
TO SCALE
8–10–'25

1

HARTMANN-SANDERS CO.

Exclusive Manufacturers of Koll's Patent Lock-joint Wood Staved and Turned Columns

EASTERN OFFICE
NEW YORK, N. Y.
6 East 39th Street

MAIN OFFICE AND FACTORY
2155-2187 Elston Avenue
CHICAGO, ILL.

PACIFIC COAST BRANCH
A. J. Koll Planing Mill
LOS ANGELES, CAL.

Products

Koll's Patent Lock-joint Wood Stave Column for exterior and interior use: Hardwood Staved and Veneered; Pilasters and Square Columns to match; Composition Ornamental Capitals.

Also manufacturers of Pergolas, Lattice Work, Sundials and Garden Accessories.

THEY CAN NOT COME APART
KOLL'S PATENT
TRADE-MARK

Architects' Details

Columns conform accurately to any detail, are of the best materials, and at as reasonable rates as are consistent with good work.

Our Patent Correct Entasis

Correct Entasis Secured in Forming Stave Itself—The staves in all columns manufactured *under Koll's patent* are, in order to secure the proper entasis, *straight one-third and swell-tapered upper two-thirds,* so that when shaft is formed the correct entasis is obtained, securing sufficient stock at top and bottom of shaft to permit turning to detail without cutting too close to joint.

Columns furnished with any style of fluting or reeding desired.

Spliced Butt Joint

In addition to the perfect lock joint of the staves, a joint has been devised to splice the butts of the staves should the length of column call for material longer than can be secured in one piece. In this process joints are put together with screw pressure and cold-water waterproof glue, another feature which adds to make these columns mechanically perfect.

Steel Reinforcement

A corrugated steel band or ferrule reinforcement is applied to the bottom end of all Doric columns. The steel band, while adding considerable strength to the shaft, permits some flexibility so that no injury can be done by moisture that may be absorbed. This reinforcement is also added to both ends of all large column shafts.

Waterproof Glue

All columns are glued with cold-water, waterproof, vegetable glue.

The staves of all columns and all exterior work produced by us are put together with waterproof glue. The inside of all columns and pilasters above 14 in. is waterproofed with a special waterproof compound.

Thickness of Stock

As the price of the column is regulated by the amount and kind of lumber that enters into its construction, it is very important to state in the specifications the thickness of stock of which columns are to be made.

Our experience as specialists in column construction has demonstrated that the thickness of stock for the various sizes, as called for in the table on the following page, provides enough material to carry out properly the architectural detail and to afford the required strength. Should an unusual load be placed on the columns, they can be reinforced by inserting a timber or iron column. When necessary to incase a structural timber or iron column already in place, columns can be made in halves and doweled or rail bolted as desired.

Flashings

The entire top of all wood and ornamental caps should be flashed with either galvanized iron, copper or sheet lead to protect the same from the weather. These flashings will be furnished when the specifications call for them.

Facts in Regard to Protection Before Installation

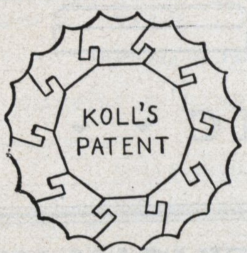
Columns are primed with one coat of white lead and oil at the factory before shipment. If for any reason they can not be used immediately or if roof is not in position, the ends of the column should be temporarily covered with weatherproof paper. When laying columns down care should be taken not to allow them to get in contact with the soil.

Iron Plinths

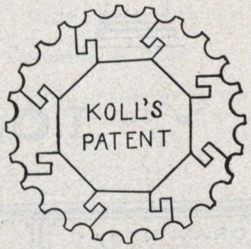
When columns rest on cement or brick floor, the use of cast iron ventilated plinths is recommended. The company is prepared to furnish these in all sizes.

Catalogues

Catalogue No. 47-8 on wood columns, and Catalogue No. 33-8, showing new designs for pergolas and garden accessories—lattice fences, garden houses and arbors—will be sent on request.



Doric Fluting Columns, 195, 195⅔, 215 and 215⅔



Ionic Fluting Used on All Other Fluted Columns Shown in Catalogue

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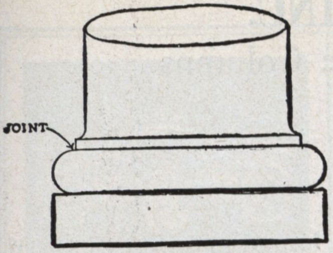
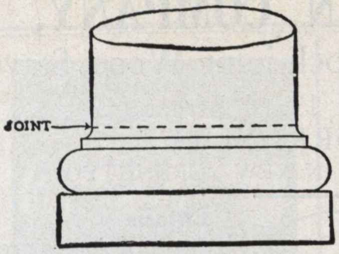
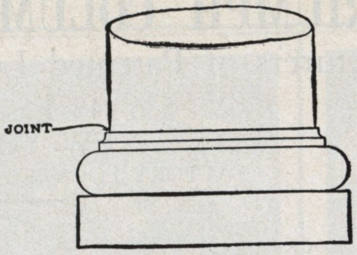


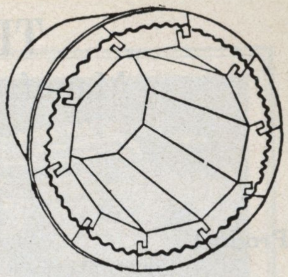
Style A Cove



Style B Cove



Style C Cove

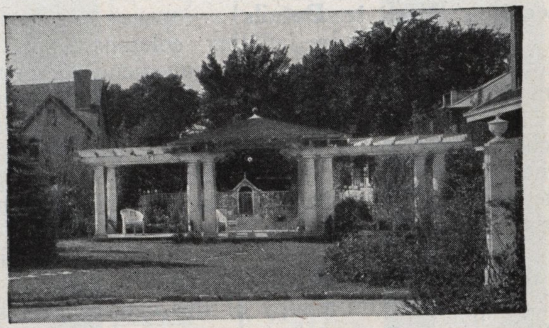


Steel Reinforcement

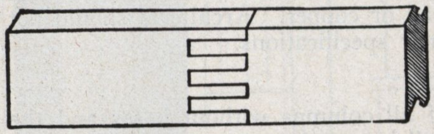
KOLL'S PATENT WOOD COLUMNS

	2-in. stock	2½-in. stock	3-in. stock	4-in. stock
With Cove on Shaft Like Style A				
Plain shaft . . . . in.	up to 18	19 to 22	23 to 30	31 and up
Doric and Ionic fluted . in.	up to 16	17 to 19	20 to 27	28 and up
Doric fluted, No. 195 . . . in.	up to 22	21 to 28	29 to 39	40 and up
Cove Planted on Like B, or Made a Base Member Like C				
Plain shaft . . . . in.	up to 22	23 to 30	31 to 40	41 and up
Ionic fluted . . . . in.	up to 22	23 to 28	29 to 38	39 and up

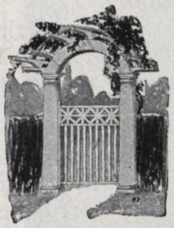
Note: Before ordering columns, it would be well to examine detail closely and note whether the cove is to be part of the shaft, or whether this can be planted on. This company can make the column either way, but of course must be guided by what specifications and details call for.



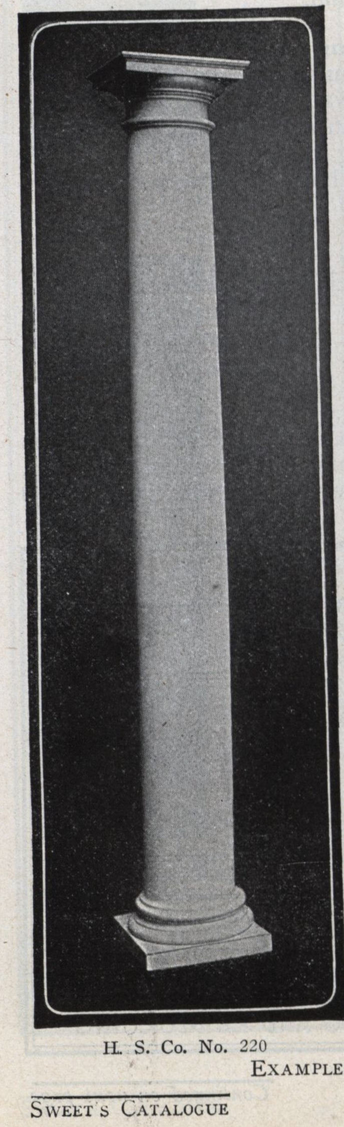
Pergola Built with Koll's Patent Lock-joint Wood Columns



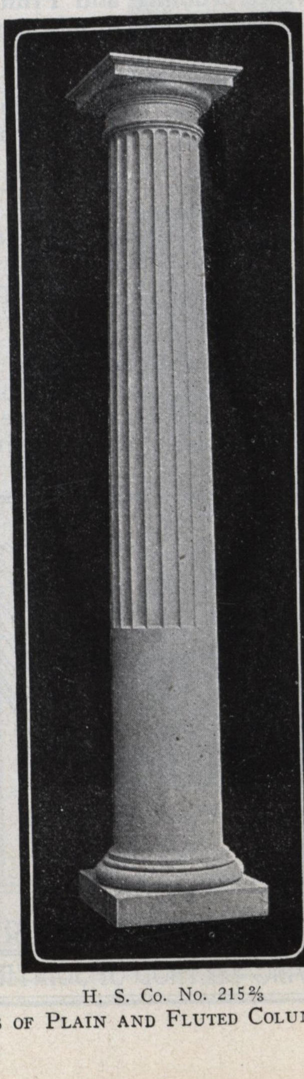
Spliced Butt Joint



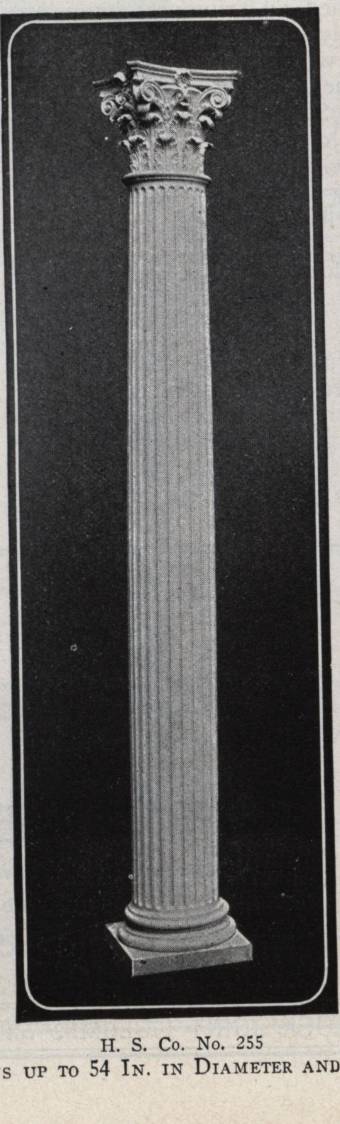
Gate Entrance



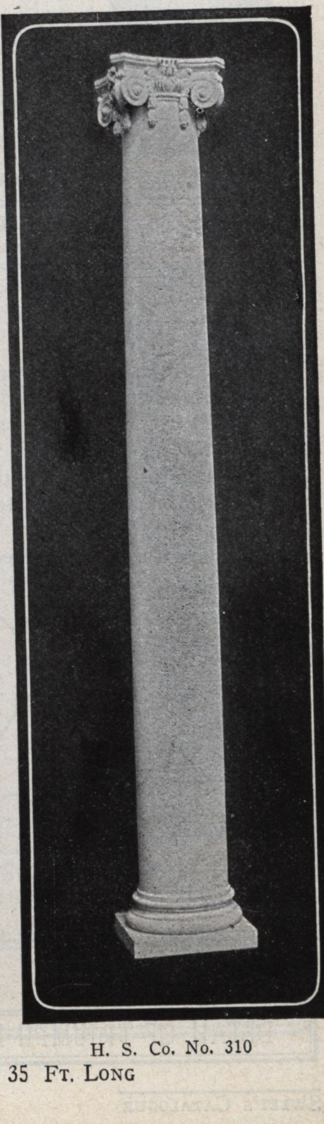
H. S. Co. No. 220



H. S. Co. No. 215⅔



H. S. Co. No. 255



H. S. Co. No. 310

Examples of Plain and Fluted Columns up to 54 In. in Diameter and 35 Ft. Long

TRIUMPH COLUMN COMPANY, INC.

Manufacturers of Patented Lock-joint Wood Stave Columns

536-548 East 133rd Street
NEW YORK, N. Y.
FACTORY LOCATED IN NEW YORK CITY

TRADE-MARK

Product

Triumph Patent Lock-joint Wood Stave Columns for exterior and interior use.

Also, Square Columns and Pilasters; Balusters; Composition Capitals; Wood Carving.

Executing Work to Details

We specialize in building columns to architects' details, but, for the convenience of our customers, we offer a list of selected standard designs.

Standard designs are made to conform to the Architectural Standards of Vignola. Columns are made turned, either plain or fluted; and square, either plain, fluted or paneled. Pilasters can be supplied to match any column.

In our catalogue will be found a complete list of all dimensions and details of standard designs. We will gladly send you a copy of this catalogue upon request.

Stock and Thickness

Unless otherwise specified, all Triumph columns are made of white pine expressly selected for our use. We can, however, furnish any wood desired. It is important that the desired thickness of stock be specified, as this determines the price. Stock 1½ to 4 in. thick is used, depending on size of column and load to be carried. In general, the following proportions are used:

Diameter of column	Up to 20 in.	20 to 26 in.	26 in. up
Thickness of stock	2 in.	2½ in.	3 in.

For unusual heights or loading, please consult us for specifications.

Lock-joint

Triumph columns are guaranteed not to open at the joints. The staves are joined with a patented lock-joint that has an unusually large area of contact between glued surfaces. Only the best grade of waterproof, cold water glue is used in putting together all columns, pilasters, caps and bases to prevent destructive effects of moisture on joints.

Entasis

All staves are formed to correct entasis in the rough, thus securing maximum amount of stock. Staves are made one-third straight, upper two-thirds tapered, unless otherwise specified.

Caps and Bases

Columns can be furnished with wood caps and bases, or with composition caps of any style desired. Special detail capitals of either composition or carved wood can also be furnished.

When desired, we are prepared to furnish cast iron plinths in all sizes.

Flashing

When erecting, cap must be entirely covered with flashing of sheet lead or copper. Architects should not overlook this in their specifications.

Reinforcing

The bottom of all columns without bases and the bottom and top of all large columns are reinforced with a heavy corrugated steel band.

Waterproofing and Priming

The insides of all columns 16-in. diameter and over are painted with a special waterproofing paint.

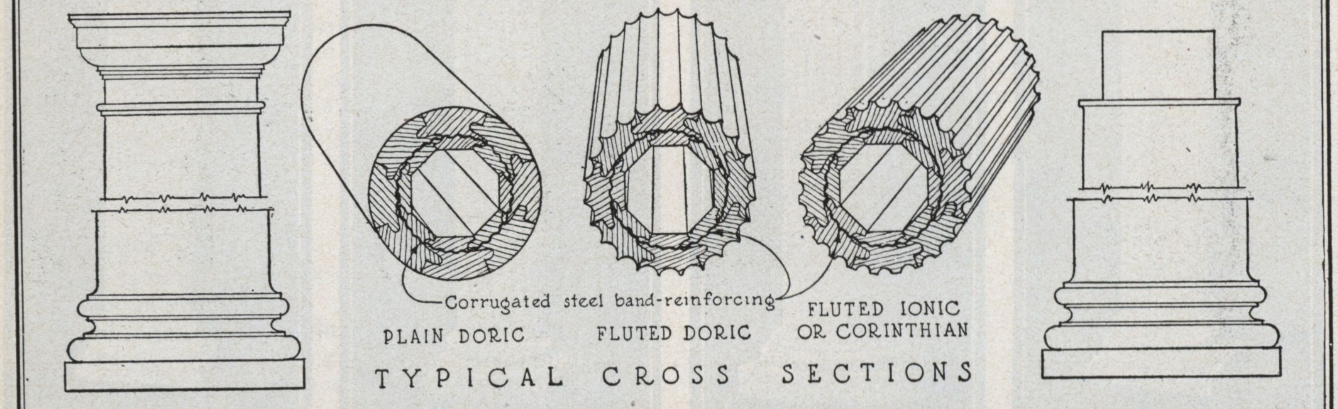
Unless otherwise specified, all columns and pilasters are given two priming coats of a paint specially designed to give protection but easily covered by a finish coat.

Guarantee

All columns are absolutely guaranteed as to material, workmanship and durability. Any defects due to inferior materials or workmanship will be rectified without question.

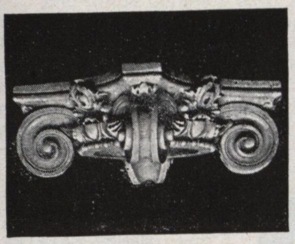
Shipping and Deliveries

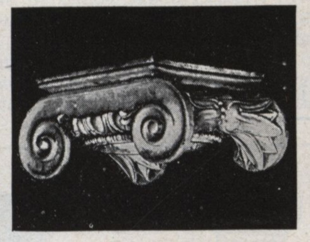
Our convenient location in New York City enables us to make prompt shipments by railroad or boat and, when required, we can deliver by auto truck within 100 miles of New York City.

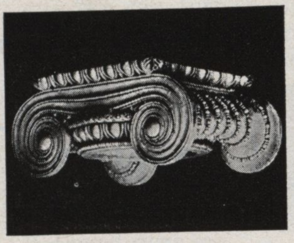


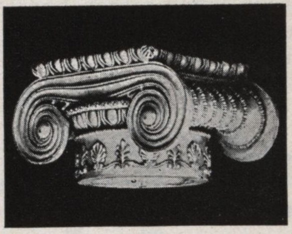
DETAIL OF TRIUMPH LOCK-JOINT COLUMNS SHOWING METHOD OF JOINTING AND REINFORCING

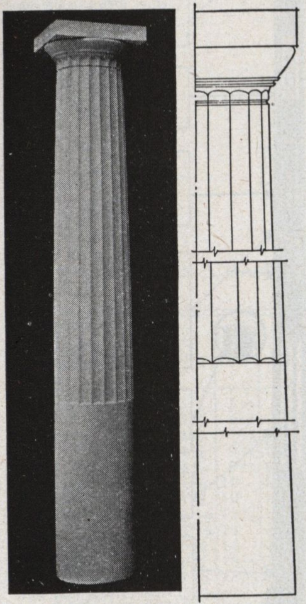
Continued on next page

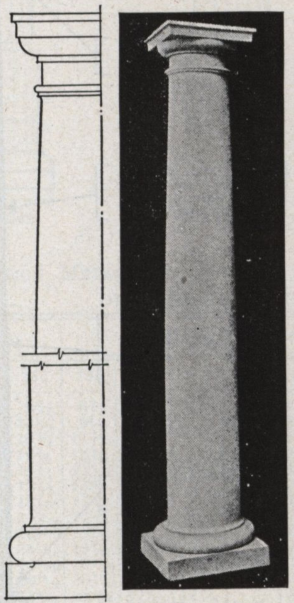

A-SCAMOZZI CAPITAL

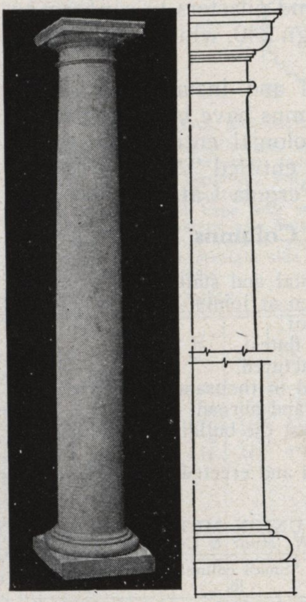

B-ROMAN IONIC CAPITAL

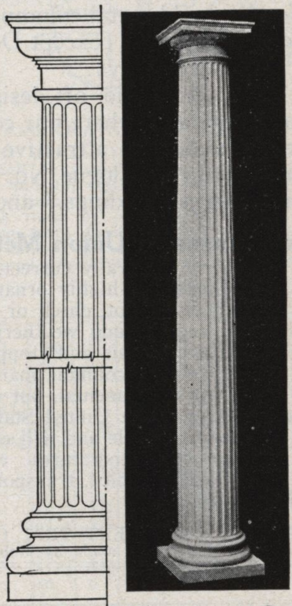

C-GREEK IONIC CAPITAL

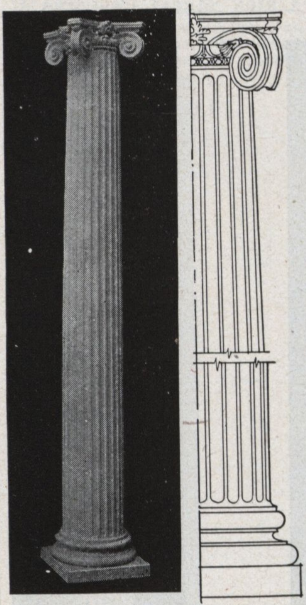

G-GREEK ERECHTHEUM CAPITAL WITH NECKING

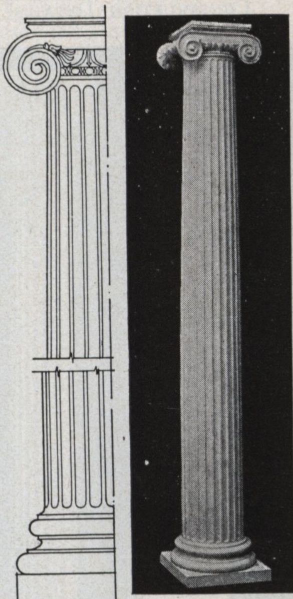

Nº 65⅔-GREEK DORIC
Fluted ⅔
Nº 60 Similar but without flutes.

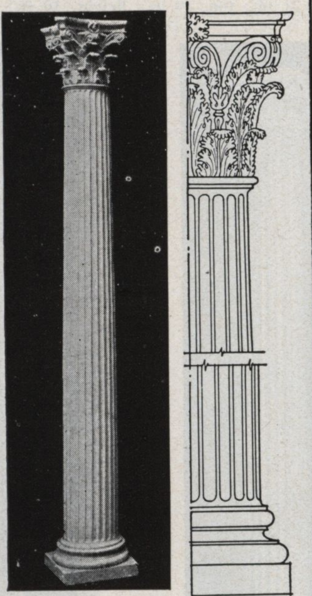

Nº 70-TUSCAN
Plain
Nº 75 Similar but with flutes.

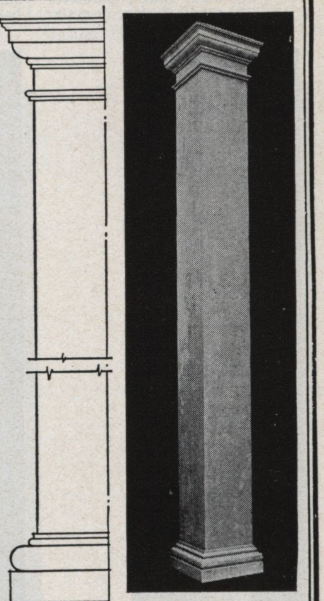

Nº 80-ROMAN DORIC
Plain
Nº 85 Similar but with flutes.


Nº 95-DORIC CAP
ATTIC BASE Fluted
Nº 90 Similar but without flutes


Nº 105-SCAMOZZI CAP
ATTIC BASE Fluted
Nº 100 Similar but without flutes


Nº 115-ROMAN IONIC
Fluted
Nº 110 Similar but without flutes


Nº 135-ROMAN CORINTHIAN
Fluted
Nº 130 Similar but without flutes.


SQUARE COLUMN
Fluted, Plain or Paneled

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

TRIUMPH LOCK-JOINT COLUMNS

NOT DRAWN
TO SCALE
DATE: FEB.-21

DRWG
1

THE UNION METAL MANUFACTURING CO.

Manufacturers of Metal Columns
CANTON, OHIO

UNION
TRADE-MARK
Reg. U. S. Pat. Off.

Products

Union Metal Columns and Pilasters.

Stock and Special Designs

We offer the ten classical designs shown herewith. We also build metal columns and pilasters to conform to architects' details (except Design 240, which is furnished in stock sizes only).

Our portfolio of designs and installations shows many buildings where our columns have been used and a large number of attractive Colonial entrances. Write for Column Catalogue No. 50 entitled "Ancient Beauty for Modern Buildings," and Pergola Catalogue No. 51.

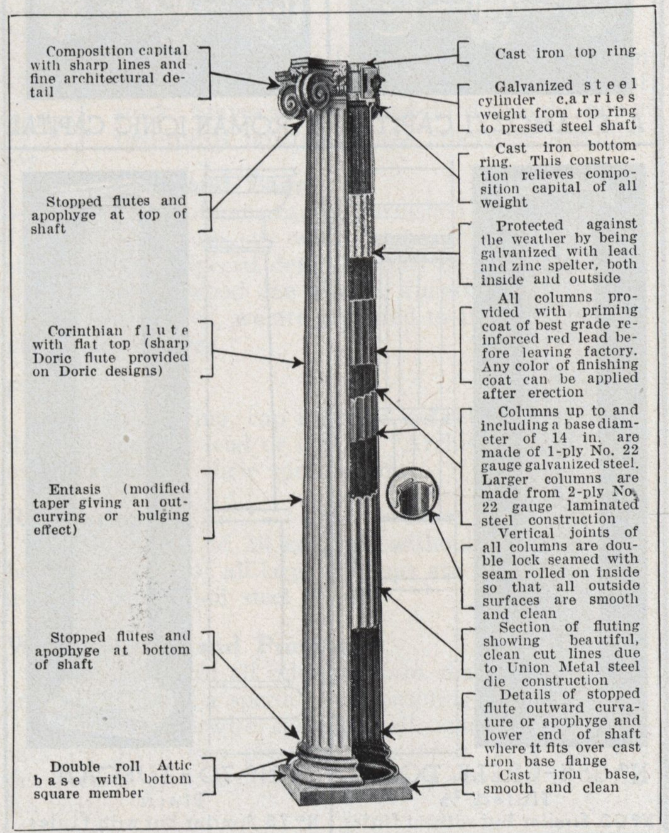
Advantages of Union Metal Columns

(1) Architecturally correct.
(2) Clean cut, highly ornamental and stately.
(3) Will not rot, check or open at joints.
(4) Fireproof and weatherproof.
(5) Have entasis and stopped flutes.
(6) Strongest columns manufactured.
(7) Not experimental, but used in thousands of representative buildings in the United States and abroad.
(8) Indestructible and will outlast the buildings; suitable for all climates and temperatures.
(9) Easily handled, transported and erected because of their light weight.

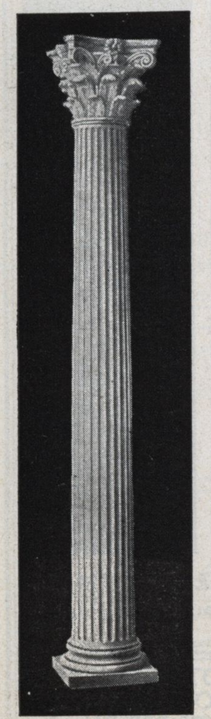
RESULT OF RECENT TEST ON UNION METAL COLUMNS
Test made by Robt. W. Hunt & Co.

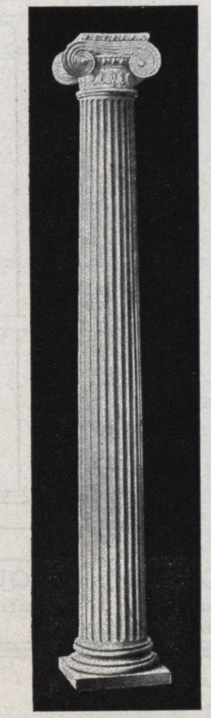
	*Small column, lb.	†Large column, lb.
Bottom fillet (apophyge) bent at......	5840	16,240
Top fillet (apophyge) bent at..........	6580	16,700
Column buckled near top at (maximum load)	27.220	29,960

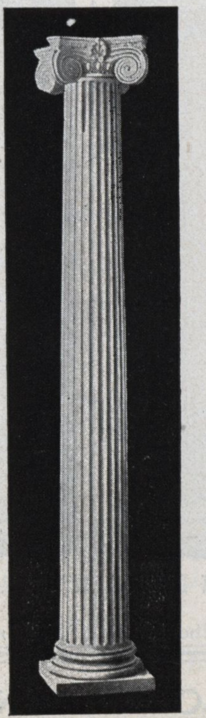
*1-ply steel shaft; diameter: base, 8 in.; top, 6½ in.; height, 6 ft.
†2-ply steel shaft; diameter: base, 21 in.; top, 19 in.; height, 10 ft.

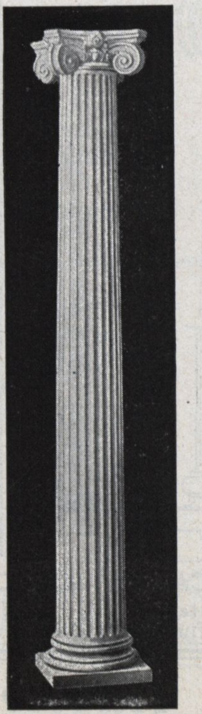

Composition capital with sharp lines and fine architectural detail
Stopped flutes and apophyge at top of shaft
Corinthian flute with flat top (sharp Doric flute provided on Doric designs)
Entasis (modified taper giving an outcurving or bulging effect)
Stopped flutes and apophyge at bottom of shaft
Double roll Attic base with bottom square member
Cast iron top ring
Galvanized steel cylinder carries weight from top ring to pressed steel shaft
Cast iron bottom ring. This construction relieves composition capital of all weight
Protected against the weather by being galvanized with lead and zinc spelter, both inside and outside
All columns provided with priming coat of best grade reinforced red lead before leaving factory. Any color of finishing coat can be applied after erection
Columns up to and including a base diameter of 14 in. are made of 1-ply No. 22 gauge galvanized steel. Larger columns are made from 2-ply No. 22 gauge laminated steel construction
Vertical joints of all columns are double lock seamed with seam rolled on inside so that all outside surfaces are smooth and clean
Section of fluting showing beautiful, clean cut lines due to Union Metal steel die construction
Details of stopped flute outward curvature or apophyge and lower end of shaft where it fits over cast iron base flange
Cast iron base, smooth and clean

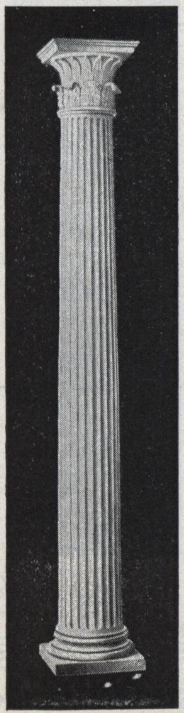
Construction Details of Union Metal Columns


Design 212
Roman
Corinthian


Design 230
Greek
Ionic


Design 237
Modern
Ionic

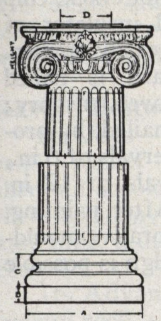

Design 222
Italian
Ionic
(Scamozzi)


Design 213
Temple of the
Winds

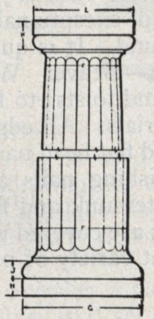
Continued on next page

Architects' Specification

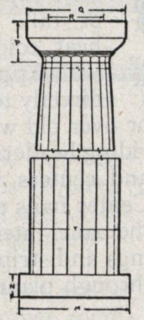
The fluted columns used shall be Union Metal Pressed Steel Columns with entasis and stopped flutes, manufactured by The Union Metal Manufacturing Co., Canton, Ohio. The design number, style and size of columns to be used is indicated on drawings. The manufacturer shall apply a priming coat of high grade metallastic paint to all columns before shipment from his plant.



Designs 212, 230, 237, 222, 213, 219, 224 and 200



Design 240



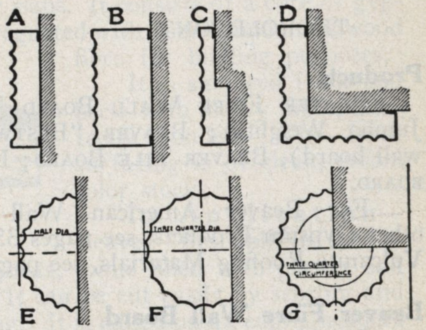
Design 700

Dimension Chart of Union Metal Columns

Pilasters and Odd Shaped Columns

We can furnish square and corner metal pilasters and half-round and three-quarter round metal columns in all sizes to match stock or special designs of Union Metal Columns.

- A—Quarter return pilaster
- B—Half return pilaster
- C—Unequal return pilaster
- D—Quarter return corner pilaster
- E—Half column
- F—Three-quarter column
- G—Three-quarter corner column



Union Metal Pilasters and Odd Shaped Columns

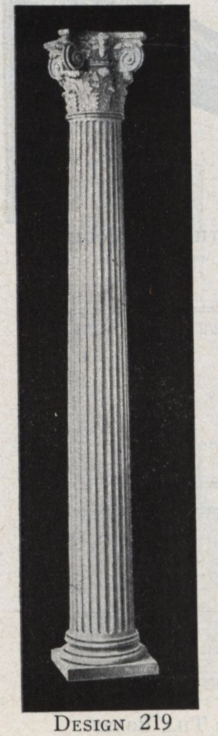
When ordering pilasters, specify whether face shall be tapered to match columns or whether face shall be straight from top to bottom. Unless otherwise ordered, bottom and top faces of pilasters will be furnished same as bottom and top diameters of columns, in which case pilaster bases and caps will match those of columns in height. All Union Metal pilasters are fluted on front face to match columns but are not fluted on return faces unless specially ordered. Pilasters are furnished with straight side face or straight tapered face and are not provided with entasis

DIMENSIONS OF UNION METAL COLUMNS

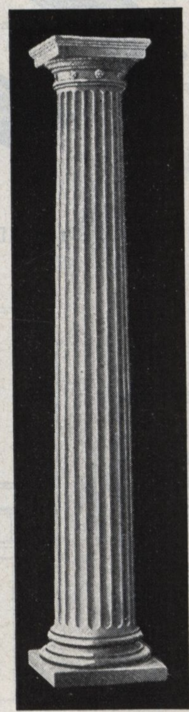
Bot. diam. shaft, in.	A in.	B in.	C in.	*D in.	E in.	F in.	Height of capital, ft.								G in.	H in.	J in.	K in.	L in.	M in.	N in.	P in.	Q in.	*R in.	S in.	T in.
							212	230	237	222	213	219	224	200												
8	10⅝	1 5/16	3	5⅛	8	6½	9⅞	6⅛	4⅛	4⅛	8⅞	11⅛	4⅛	4 15/16	11	1 9/16	1½	2½	8⅝	....	....	....	....	....	....	....
10	13 15/16	1 11/16	3⅜	6¼	9¾	8	13 1/16	9 1/16	6 7/16	5 5/16	12 13/16	13 1/16	6 1/16	5 15/16	13¼	1 15/16	1⅞	3 3/16	11	12¼	2½	4⅝	10⅞	5¼	7½	10
12	16	1 15/16	4 5/16	7⅞	12	10	15⅛	11⅛	6⅞	5⅝	15⅝	15⅜	7⅝	7½	16	2 5/16	2¼	3 13/16	13¼	14⅜	3	5 5/16	13	6½	9	12
14	18⅝	2 5/16	4¾	9⅜	14	12	16¾	13¼	7¾	6¾	16¼	19¼	8¾	8 5/16	18⅝	2¾	2¾	4 9/16	16	16⅝	3⅜	6½	15½	7¼	11	14
16	20¾	3	4⅛	9⅜	15¾	12	16¾	13¼	7¾	6¾	16¼	19¼	8¾	8 5/16	....	....	....	....	....	18⅞	3⅞	7 1/16	16¾	7⅞	12	16
16	20¾	3	4⅛	10	15¾	14	18½	15¾	10	8	21¼	22½	11¾	9¾	....	....	....	....	....	....	....	....	....	....	....	....
18	23	3¼	4¾	10	17⅜	14	18½	15¾	10	8	21¼	22½	11¾	9¾	....	....	....	....	....	20⅛	4¼	8 1/16	19¼	8¾	14	18
20	26	3⅜	4 11/16	12½	19½	15¾	24 15/16	17 7/16	11 3/16	8 15/16	....	24 3/16	11 15/16	11¼	....	....	....	....	....	23⅜	4¾	8 9/16	20½	9¼	15	20
20	26	3⅜	4 11/16	14	19½	17⅜	26 11/16	17 7/16	12 3/16	9 15/16	23 7/16	27 7/16	13 7/16	13 1/16	....	....	....	....	....	....	....	....	....	....	....	....
22	28¾	3¾	5⅞	14	22	17⅜	26 11/16	17 7/16	12 3/16	9 15/16	23 7/16	27 7/16	13 7/16	13 1/16	....	....	....	....	....	25 7/16	5	9¼	24	9¾	17	22
24	32	4	6¾	15½	23½	19½	29 11/16	20 11/16	12 7/16	10 15/16	26 3/16	29 11/16	15 3/16	14 11/16	....	....	....	....	....	27½	5½	10 3/16	24⅜	10	18	24
26	34½	4⅝	7 7/16	15½	25	19½	29 11/16	20 11/16	12 7/16	10 15/16	26 3/16	29 11/16	15 3/16	14 11/16	....	....	....	....	....	30	6	12	28⅝	13½	20	26
26	34½	4⅝	7 7/16	17	25	22	32 9/16	21 13/16	12 9/16	12 1/16	....	32 9/16	16 13/16	16 5/16	....	....	....	....	....	....	....	....	....	....	....	....
28	37	5⅛	8 7/16	17	26⅞	22	32 9/16	21 13/16	12 9/16	12 1/16	....	32 9/16	16 13/16	16 5/16	....	....	....	....	....	32	6⅜	13¼	31¾	15	22	28
30	39	5½	9 7/16	18¾	29¼	23½	35 7/16	23 7/16	12 11/16	13 3/16	....	35 7/16	17 15/16	18 5/16	....	....	....	....	....	34½	6⅞	14½	34¾	16	24	30
32	41½	6	10⅞	20¼	31⅞	25	39 11/16	24 15/16	13 3/16	14 3/16	....	36 15/16	18 7/16	19 7/16	....	....	....	....	....	36¾	7⅜	14½	34¾	16	24	32
34	43	6⅛	10¼	22	34	26⅞	42	26	16	15	....	40	....	20¾	....	....	....	....	....	39	7¾	16½	43	18	28	34
36	45½	6½	11¼	23¼	36	29¼	42⅛	28⅛	18⅛	16⅛	....	42⅛	....	19⅜	....	....	....	....	....	41½	8¼	16½	43	18	28	36
42	56	7	14	27	42	34	....	....	19¼	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

All stock designs (except Design 240) are made in all sizes from 8 to 42-in. diam., and from 5 to 35 ft. high. Design 240 is made in 8 to 14-in. diam. only. Columns with diameter greater than 42 in. and higher than 35 ft. are specially constructed.

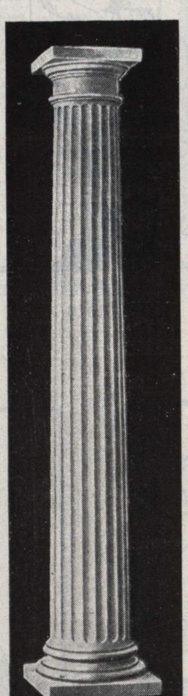
* D and R dimensions represent opening through capital.



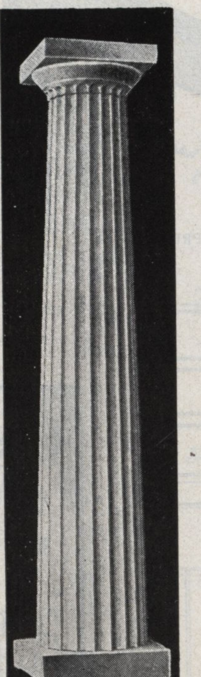
Design 219
Italian
Composite



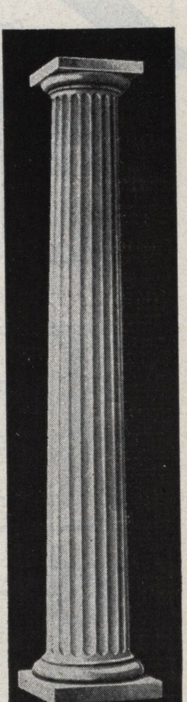
Design 224
Roman
Doric



Design 200
Plain
Doric



Design 700
Greek
Doric



Design 240
All-steel
Doric

THE BEAVER PRODUCTS COMPANY, INC.

Wall Boards—Fibre and Plaster

THOROLD, ONT. BUFFALO, N. Y. LONDON, ENG.

TRADE MARK

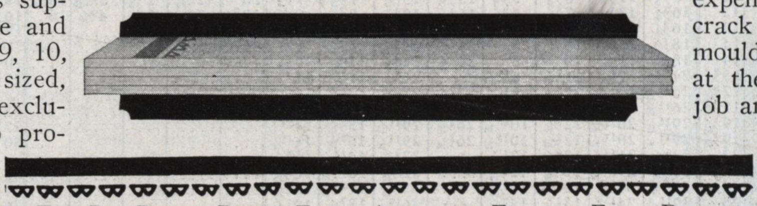
Products

Beaver Fibre Wall Board (Standard and Jumbo Weights); Beaver "Bestwall" (plaster wall board), Beaver Tile Board; Beaver Blackboard.

For Beaver American Wall Plasters and other Gypsum Products, see pages 356-359; for Beaver Vulcanite Roofing Materials, see pages 1096-1097.

Beaver Fibre Wall Board

Its Uses—For walls and ceilings in new frame construction; for remodeling over the old wall materials; the quick, economical way to build in partitions or finish off waste space; ideal for store ceilings, window backgrounds, offices and booths; a fuel saver as sheathing in small homes and garages; just the thing for finishing the summer home; an efficient sound deadener in floors; and a handy form of lumber for the manufacture of hundreds of articles.


The Red Beaver Border Found Along the Edges of Every Panel

Its Advantages—Only Genuine Beaver Wall Board is built of new spruce fibre. It comes in light, strong, panels, the Standard 3/8 in. thick, and the Jumbo, a full 1/4 in. thick. It is supplied 32 or 48 in. wide and in lengths of 6, 7, 8, 9, 10, 12, 14 and 16 ft. It is sized, front and back, by the exclusive *Sealtite* process to protect it against moisture and as a part of the preparation of its splendid Art Mat surface, a surface that makes possible superior painted effects. It will not crack, chip or fall. It is an exceptionally good insulator of heat, cold and sound. It is quick and easily applied.

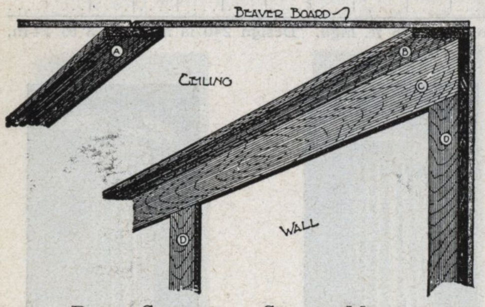
Application—Beaver Wall Board is nailed directly to studs and joists; to furring over masonry; or over old wall materials. All edges are nailed, by providing headers, with 3d flat head nails at intervals of 6 in., and centers with finishing nails at intervals of 12 in. Center nails are countersunk and filled. After painting, the panel intersections are covered with decorative mouldings and strips. Great variety of panel design is possible through planning.

Beaver Tile Board

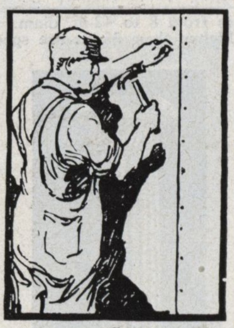
A durable, inexpensive tiling for bathrooms, kitchens, restaurants, restrooms, and other places where a glistening sanitary wainscot or wall is desired. It comes in panels 48 in. wide and in regular wall board lengths. It is deeply indented into tiles. Nailed horizontally across the studs, or over old wall materials, painted and enameled, the result is equal in appearance to the most expensive tile, and it will never crack or fall. The finish mouldings, along the top and at the corners, complete the job and it is quickly done.

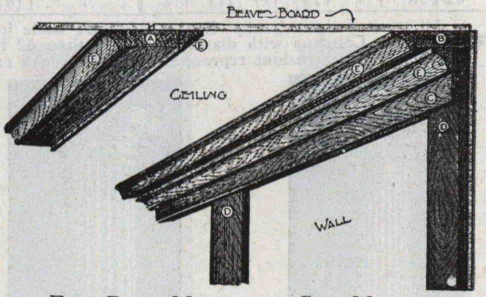
Beaver Blackboard

Comes in two colors, black or green, in

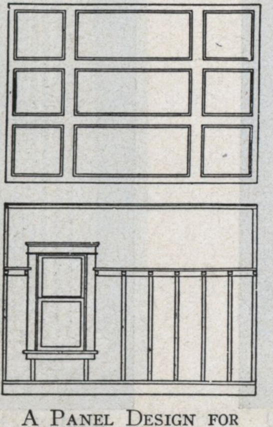


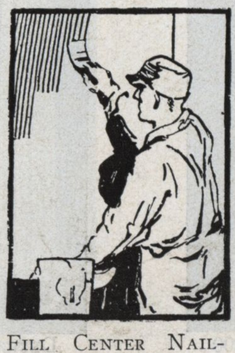
Plain Strip with Sprung Mould

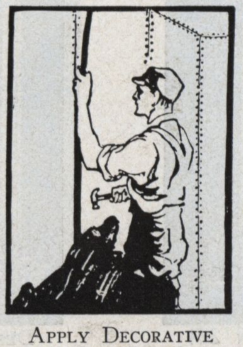

Nail to Studs and Joists

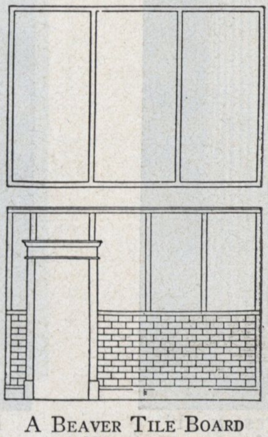


Flat Beam Made with Cove Mould


A Panel Design for Dining Rooms


Fill Center Nail-holes and Paint


Apply Decorative Panel Strips


A Beaver Tile Board Wainscot

Continued on next page

slabs of standard blackboard widths, 3, 3½ and 4 ft., and in lengths of 6, 7, 8, 9, 10, 12, 14 and 16 ft. It is built up on a base of ¼-in., five-ply Beaver Wall Board with a hand rubbed and hand plated surface. Carborundum and silex are used to develop a durable writing surface and one that retains a fine "bite" for the chalk, for years. The back is thoroughly waterproofed with asphaltum. It is easily sawed to fit and nailed in place to the studs or over old walls.

Beaver "Bestwall"

Beaver "Bestwall"

Its Uses—Beaver "Bestwall" (plaster wall board) is used in frame buildings where an absolutely rigid, fireproof material is required; where economy of time and labor is essential and at the same time, a durable, perfectly decorated result must be secured.

Its Advantages—Supplies a plaster wall of pre-set gypsum rock, always mixed and set under proper conditions and supervision; saves time in application; requires no drying-out delay before rooms can be occupied; will not crack or fall; has an exclusive cream colored surface finer for decoration; can be redecorated with ease because of the character of this fibre surfacing found on no other plaster wall board; and provides excellent fire protection.

Beaver "Bestwall" comes in slabs 4 ft. wide and in lengths of 6, 7, 8, 8½, 9, and 10 ft. It is ⅜ in. thick. It is supplied in square or beveled edge. The beveled edge board allows a wide strong plaster key at the joint and of easy alignment of the slabs. It consists of a core of gypsum rock plaster impregnated with a small amount of wood fibre for binding purposes.

It is surfaced front and back with heavy fibre, perfectly bonded. The front surfacing is of clean, cream color stock.

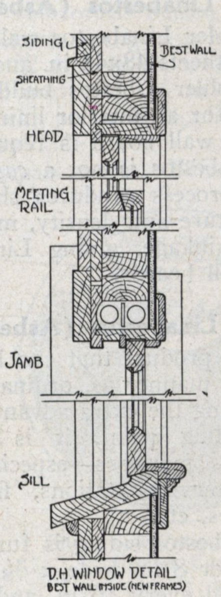
Its Application—Beaver "Bestwall" is merely nailed to studs and joists, joints filled with plaster and painted or papered. It can be cut easily by scoring and breakage, or by sawing. It is nailed on all edges, headers being provided in the framing for the ends, with 3d flat head nails placed at intervals of about 6 in. It is nailed to the center supports with finishing nails placed about every 12 in. Plaster for filling is furnished and this is quickly used to fill joints and holes over counter sunk center nails. Painting or papering is next, then the job is done.

Additional Information

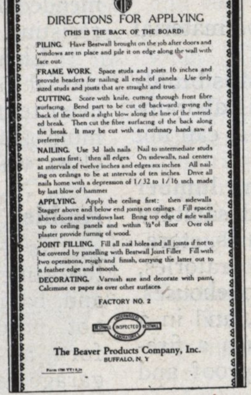
Write The Beaver Products Company, Inc., Buffalo, N. Y., or to our nearest office, for complete specifications and evidence of results secured.

Identification: On the back of every panel is a label bearing brief instructions for application, the name "Bestwall," the Underwriters' stamp of approval, and the Red Beaver Border. This label identifies the genuine Beaver "Bestwall." Look for the Red Beaver Border.

Distribution: "Bestwall" is carried by leading lumber dealers and dealers in building supplies. Beaver Mills, located at strategic points, supply Beaver Dealers with a minimum of freight cost and a service that makes possible prompt delivery in all sizes, and in any quantity.



D.H. WINDOW DETAIL
BEST WALL INSIDE (NEW FRAMES)



BESTWALL

A Better System of Wall and Ceiling Construction

DIRECTIONS FOR APPLYING

(THIS IS THE BACK OF THE BOARD)

PILING. Have Bestwall brought on the job after doors and windows are in place and pile it on edge along the wall with face out.

FRAME WORK. Space studs and joists 16 inches and provide headers for nailing all ends of panels. Use only sized studs and joists that are straight and true.

CUTTING. Score with knife, cutting through front fibre surfacing. Bend part to be cut off backward, giving the back of the board a slight blow along the line of the intended break. Then cut the fibre surfacing of the back along the break. It may be cut with an ordinary hand saw if preferred.

NAILING. Use 3d lath nails. Nail to intermediate studs and joists first; then all edges. On sidewalls, nail centers at intervals of twelve inches and edges six inches. All nailing on ceilings to be at intervals of ten inches. Drive all nails home with a depression of 1/32 to 1/16 inch made by last blow of hammer.

APPLYING. Apply the ceiling first: then sidewalls. Stagger above and below end joints on ceilings. Fill spaces above doors and windows last. Bring top edge of side walls up to ceiling panels and within ½" of floor. Over old plaster provide furring of wood.

JOINT FILLING. Fill all nail holes and all joints if not to be covered by panelling with Bestwall Joint Filler. Fill with two operations, rough and finish, carrying the latter out to a feather edge and smooth.

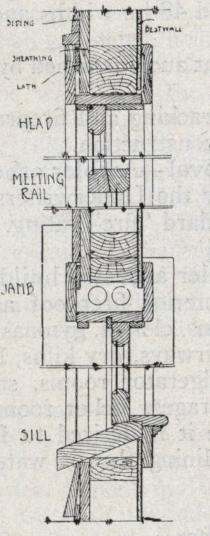
DECORATING. Varnish size and decorate with paint, Calcimine or paper as over other surfaces.

FACTORY NO. 2

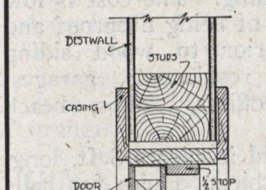
BESTWALL INSPECTED BESTWALL

The Beaver Products Company, Inc.
BUFFALO, N. Y.

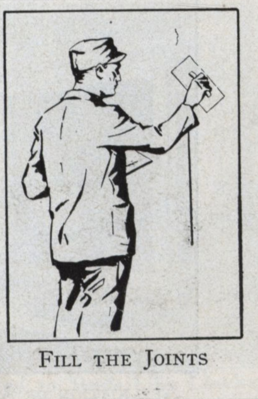
THE RED BEAVER BORDER LABEL ON THE BACK IDENTIFIES EVERY PANEL



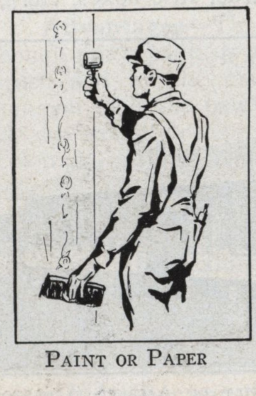
D.H. WINDOW DETAIL
USING STANDARD FRAME



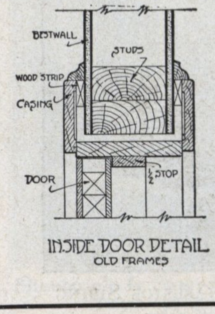
INSIDE DOOR DETAIL
NEW FRAMES



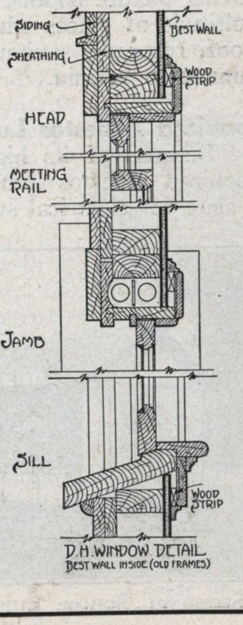
FILL THE JOINTS



PAINT OR PAPER



INSIDE DOOR DETAIL
OLD FRAMES



D.H. WINDOW DETAIL
BEST WALL INSIDE (OLD FRAMES)

ASBESTOS SHINGLE, SLATE & SHEATHING CO.

Asbestos Building Lumber and Wall Board

MAIN OFFICE AND FACTORY
AMBLER, PA.

BRANCH OFFICES

BALTIMORE, MD.
BOSTON, MASS.
CLEVELAND, OHIO
CINCINNATI, OHIO
BUFFALO, N. Y.
CHICAGO, ILL.
MINNEAPOLIS, MINN.
OMAHA, NEB.
PHILADELPHIA, PA.
WILKES-BARRE, PA.
MILWAUKEE, WIS.
NEW YORK, N. Y.
WASHINGTON, D. C.
PITTSBURGH, PA.
DETROIT, MICH.
TORONTO, ONT.
HAVANA, CUBA

SOUTHWESTERN DISTRIBUTER: R. V. Aycock, Kansas City, Kan.; St. Louis, Mo.; Tulsa, Okla.; Houston, Tex.
SOUTHERN DISTRIBUTERS: Dixie Asbestos Co., Birmingham, Ala.; Berry Asbestos Co., Atlanta, Ga.
WESTERN DISTRIBUTER: J. A. Drummond, San Francisco, Los Angeles, Fresno, Cal.
PACIFIC COAST DISTRIBUTER: H. G. Sperry Co., Seattle, Wash.; Salt Lake City, Utah

Products

Ambler Asbestos Building Lumber, for general exterior and interior fireproof construction; Asbestos Fireproof Sectional School Buildings; Ambler Linabestos (Asbestos) Wall Board for interior fireproof sheathing, ceilings and sidewalls; Ambler Linabestos (Asbestos) Siding.

For Asbestos Shingles and Corrugated Sheathing, see page 1095.

Ambler Asbestos Building Lumber

Ambler asbestos building lumber is an absolutely fireproof material made of selected asbestos fiber and portland cement in sheets ⅛ to 1 in., and greater thicknesses if desired, in 42 and 48-in. widths and lengths of 48 and 96 in.

Special sizes will be cut and furnished by the factory at a nominal charge.

The permanent non-cracking and fireproof material for exterior half timber construction.

Underwriters' Approval—Ambler asbestos building lumber is approved by the Underwriters' Laboratories, Inc. and bears a standard "fire" rating. It can not burn.

Interior Uses—Ambler asbestos building lumber is used extensively for interior fireproof and sanitary lining in bathrooms, kitchens, closets, gymnasiums, storerooms, elevator shafts, stairways, dry kilns, laboratories, paint and oil rooms, refrigerator rooms, smokehouses, moving picture booths, garages, locker rooms, and in a multitude of places where it is desired to form a fireproof, rotproof, sanitary lining that is waterproof and immune to vermin.

Ebonized Asbestos Lumber

Because of its high dielectric properties, Ambler Ebonized asbestos lumber is used in place of marble or slate for electrical switchboards, fuse boxes, etc.

Asbestos Fireproof Sectional School Buildings

Simplicity of Construction—These buildings are regular "sectional" type buildings using Ambler asbestos building lumber, and can be erected in extremely short time by local carpenters.

Taking into consideration the present high cost of skilled labor necessary to erect a frame, brick, stone, plaster or hollow tile building that would even approximately compare in appearance and durability, the cost would be substantially more, especially for frame or like type of construction that has to be painted.

Ambler Linabestos (Asbestos) Wall Board

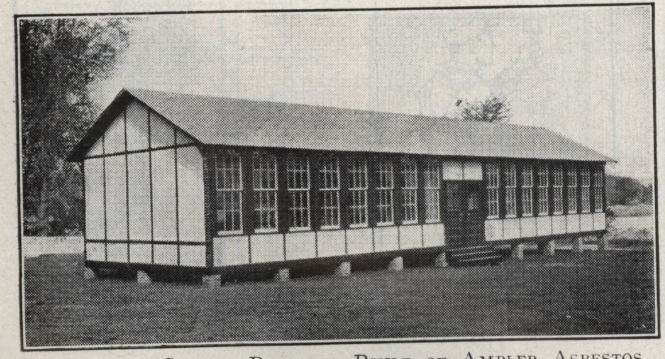
Ambler Linabestos wall board made $\frac{3}{16}$ and ¼ in. thick in sheets 48x48 in. and 48x96 in. is less expensive than Ambler asbestos building lumber, and is recommended for all interior linings where a flameproof, fire resisting wall board is required.

Linabestos is not a *cast* or *moulded* material. A special process produces sheets of uniform thickness, even texture and density, maximum strength and minimum shrinkage, giving Linabestos a superiority over other wall boards.

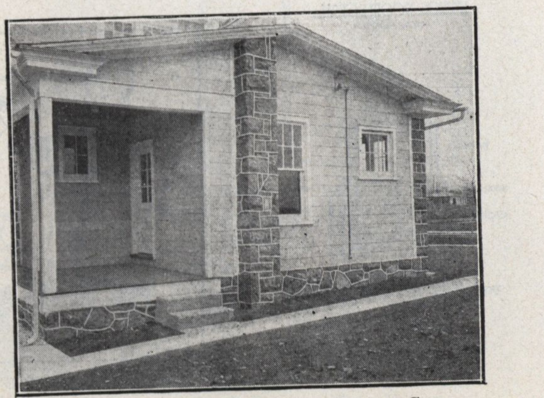
Ambler Linabestos (Asbestos) Siding

Is a product that can be used in place of, and in the same manner as, ordinary siding. The cost is low and, having the extra advantages of being fireproof and not needing paint, it is superior to wood siding for all purposes—especially residences, garages, garage service stations, field offices, camps, beach bungalows, etc.

Linabestos siding is furnished in pieces 8 ft. long, either 6 or 8 in. wide x ⅜ in. thick. Holes for nails are drilled every 16 in. and countersunk.



Sectional School Building Built of Ambler Asbestos Building Products



Application of Ambler Linabestos Siding
An attractive light buff color

UNITED STATES GYPSUM COMPANY

Sheetrock Wallboard

205 West Monroe Street
CHICAGO, ILL.

For Sales Offices, see page 374

Products

SHEETROCK, Interior Wall, Ceiling and Partition Finish.

SHEETROCK TILE BOARD.

SHEETROCK FINISHER, for concealing joints and nailheads.

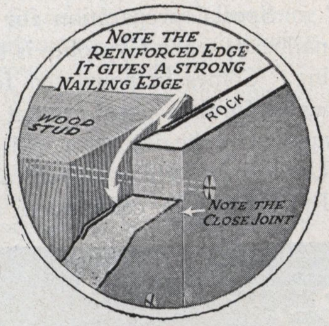
TEXTONE.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Sheathing, see page 1361.

Sheetrock

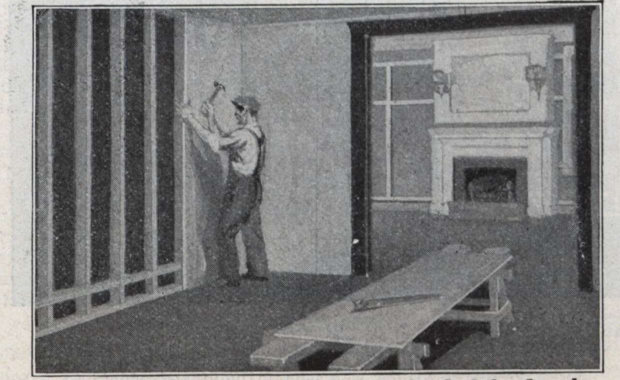
Description—Sheetrock is a gypsum wall and ceiling material in unit form. It consists of a core of set gypsum protected by a specially treated fibre covering which folds over to form reinforced nailing edges—a patented feature insuring extra strength in nailing and handling. Made in sheets 32 and 48 in. wide, 6, 7, 8, 8½, 9 and 10 ft. long, and uniformly ⅜ in. thick.

Advantages—Sheetrock, properly applied, makes a strong, permanent wall suitable for new construction and for remodeling and repair work. Because of its gypsum rock construction, Sheetrock is fireproof and structurally strong—yet it can be sawed like lumber, and nailed directly to studs and joists or over old construction. Each board bears the label of the Underwriters' Laboratories, Inc.—they have tested Sheetrock for fire resistance and inherent strength.



Sheetrock Patented Reinforced Edges
These provide extra nailing strength and tight, flush joints

Decorative Possibilities—Sheetrock can not warp or buckle and, when joints and nailheads are filled with Sheetrock Finisher, the wall presents a permanently smooth surface suitable for any type of decoration without the use of panels.



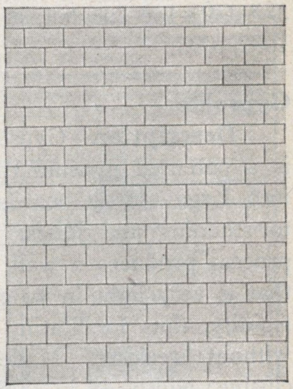
Sheetrock Is Sawed and Nailed to Studs Like Lumber
Takes any decoration—with or without panels

Sheetrock Finisher

A specially prepared material for concealing joints and nailheads in Sheetrock walls and ceilings. Comes as a powder packed in 5-lb. cartons and when mixed with water forms a cement which is easily applied with a semi-flexible scraping knife. May also be used to repair surface mars and as a patching plaster for cracks in plastered walls.

Sheetrock Tile Board

Description—Sheetrock Tile Board has a specially prepared surface bearing impressions to represent tiling. When enameled, it is an excellent imitation of tile and may be washed in the same way as genuine tile. Made in panels 48 in. wide, and 6, 7, 8, 9 and 10 ft. long. The tiles are 3x6 in. with the long dimension parallel to that of the board.



Sheetrock Tile Board

Uses—Sheetrock Tile Board is suitable for wainscoting in bathrooms, kitchens, lavatories, hospitals, laundries, restaurants, barber shops, and in other places requiring a durable tiled interior.

Decoration—Although the usual finish is white enamel, any color may be used.

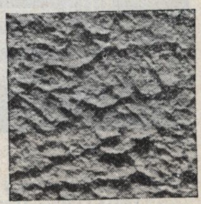
Textone

Description—Textone is a heavy bodied decorating material with which durable, rough textured wall effects can be produced at moderate cost. It comes as a dry powder, packed in 10 and 25-lb. cartons, and is ready for use with the addition of water. Textone adheres perfectly to plaster, Sheetrock, wood, glass, metal, wallpaper, and similar surfaces.

Advantages—This material, although not a paint, is applied with a brush and by the manipulation of common tools the painter or decorator can accurately reproduce English, Colonial, Spanish, and other period styles or any preferred wall texture.

Decorative Possibilities—As tinting is done with pigment colors mixed with the Textone before application, the color possibilities are practically unlimited. Beautiful blended and shaded effects can be produced with Textone Glaze. (Supplied in quart and gallon cans.)

Fine Brush Texture



Coarse Brush Texture

UNIVERSAL GYPSUM COMPANY

Manufacturers of Wall Board

Conway Building
CHICAGO, ILL.

For Sales Offices, see page 377

GYPSOLITE WALLBOARD

Products

Gypsolite, a Gypsum Wall Board, for interior walls, ceilings and partitions.

Gypsolite Finisher, for filling joints and covering nailheads.

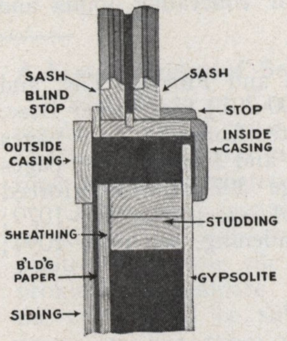
For Gypsum Plaster and Plaster Board, see pages 377-379; for Insulex, a Gypsum Insulation, see pages 1092-1093.

Gypsolite

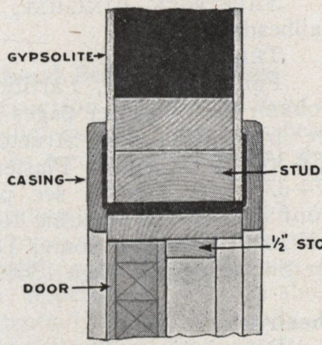
Description—Gypsolite, a finished wall material, is a patented gypsum rock wall board, machine built into large sturdy boards, predried and ready to nail to studding and joists. The special Gypsolite patent process produces a wall board with uniform thickness that is very light in weight and has great strength and rigidity, thus facilitating ease of handling and nailing without breaking. Made in lengths of 6 to 10 ft, inclusive; width, 48 in.; thickness, 3/8 in.

Advantages—Being of pure rock formation without sawdust or other substitutes, Gypsolite forms a solid and continuous wall of rock that can not warp, crack or bulge. It provides better insulation and is fireproof because of the millions of dead air cells contained in this patented processed gypsum core. Great strength, unusual light weight and minimum breakage are combined, assuring a rigid wall surface for all types of interior construction. Adaptable to new construction as well as repair and remodeling.

Decoration—As Gypsolite is lined with a tough, smooth surfaced material, it forms a perfect surface for wall paper, canvas, paint, calcimine or any other type of wall covering. The fiber covering lends itself to painted effects, in a durable and washable result. Every type of enameled or mottled and tinted finish can be obtained. When panels are used, it is unnecessary to fill the section joints.



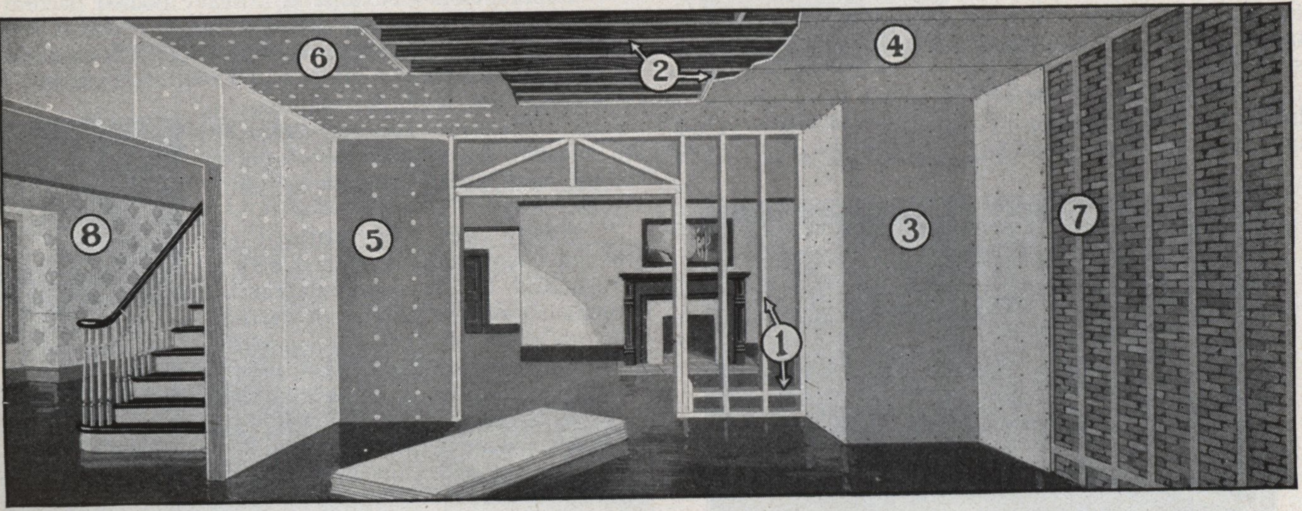
Window Frame Made for Gypsolite Ground



Door Frame Made for Gypsolite Ground

Gypsolite Finisher

Special preparation for filling joints and covering nailheads when Gypsolite is to be finished without paneling. Comes in powdered form and when mixed with water forms a putty cement which is easily and quickly applied by the decorator with a semielastic scraping knife. Used for patching plaster and repairing surface mars. Put up in 5-lb. containers.



Gypsolite Application and Treatment

(1) Walls ready for applying Gypsolite on studding and headers.
(2) Ceilings ready for application of Gypsolite on joists and headers.
(3) Gypsolite applied to wall.
(4) Gypsolite applied to ceiling.
(5) Gypsolite on wall with filler in joints and nailheads.
(6) Gypsolite on ceiling with filler in joints and nailheads.
(7) Brick wall ready for Gypsolite with furring in place.
(8) Gypsolite result with wallpaper decoration

C. S. GARRETT & SON CORP.

"Garrettite" Building, Sheathing and Insulating Papers

PHILADELPHIA, PA.

TELEPHONES
Bell, Lombard 6895
Keystone, Main 8567

Products
Rawhide Waterproof Building, Sheathing and Insulating Papers; Liberty Black Insulating Papers; Asphalt Shingles; Deadening Felt.

RAW-HIDE
WATER PROOF
PAPER

TRADE-MARK

Rawhide Waterproof Building Paper

The C. S. Garrett Rawhide is a high grade rope paper made of old manila rope stock, drawn out with a long fiber to give the best strength to the paper. The paper is treated with the Rawhide secret process to procure its waterproof qualities. It is odorless.

Rawhide is put up in 36-in. rolls.

Made in two standard colors: No. 200 Buff, weighing 50 lbs. per roll, and No. 215 Red, weighing 60 lbs. per roll of 500 sq. ft. The No. 200 is the grade generally used for ordinary insulation. It has sufficient body to produce satisfactory results under ordinary conditions; but if the test is exceptionally severe the No. 215 is recommended.

Roll of Rawhide

For Use on Frame and Stucco Houses—When used under slate, clapboards, shingles and stucco, Rawhide waterproof building paper is equal to a course of sheathing boards in protecting from cold and dampness.

In the accompanying illustration two types of stucco construction are shown. Type A has been given the only perfect permanency rating in the progress report of the United States Bureau of Standards. No sheathing boards are used in this construction, the windproofing and weatherproofing being provided by waterproof building paper tacked in between the studs. For this purpose there is no better paper made than No. 215 Rawhide waterproof building paper.

Type B has furring and lath applied over sheathing, covered with waterproof paper. Either No. 200 or No. 215 Rawhide waterproof paper will give satisfactory results for this purpose.

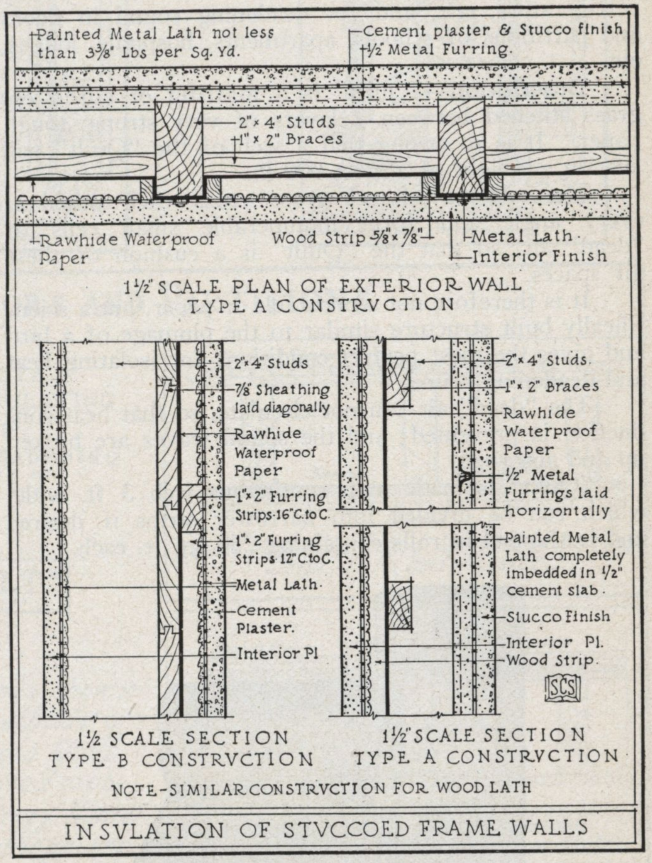
Specifications—*Building or Insulating Paper*—All material for insulating exterior walls and roofs shall be C. S. Garrett & Son Corp. Rawhide Waterproof Building Paper. All sloping roof and deck surfaces and all sheathing on exterior walls shall be covered with No. 200 Rawhide Waterproof Paper. (Note:—where shingle strips are specified, building or insulating paper should be omitted.) All surfaces shall be completely covered in such manner as to make the building windproof and weatherproof subject to the approval of the architect. All joints of the paper shall be lapped not less than 2 in. and nailed with tin capped nails set not over 6 in., center to center. Carry paper into all window and door openings and under all window sills and exterior trim.

Type A Construction—The interior of all exterior studs shall have No. 215 Rawhide Waterproof Paper applied as follows: The paper shall be nailed with tin capped nails, spaced not over 6 in. center to center, to the inside face of the studs and secured to sides of the studs with vertical strips securely nailed to the studs after paper is applied. The paper shall be applied to the interior of all exterior wall surfaces in such manner as to make the building windproof and weatherproof subject to the approval of the architect.

For Cold Storage Insulation—Rawhide waterproof papers, on account of being odorless and impervious to dampness and moisture, are especially adapted for the insulation of cold storage houses, refrigerators, refrigerator cars and for all other purposes where a dependable waterproof paper is required. Samples will be sent on request.

Liberty Black Insulating Papers

Fiber stock, thoroughly waterproofed, evenly surface coated on both sides of the sheet. The heavy weighs 35 lbs., and extra heavy 50 lbs. per roll of 500 sq. ft. Recommended for good service where cheaper material than Rawhide is desired.


Painted Metal Lath not less than 3⅜" Lbs per Sq. Yd.
Cement plaster & Stucco finish
½" Metal Furring.
2" × 4" Studs
1" × 2" Braces
Rawhide Waterproof Paper
Wood Strip ⅝" × ⅞"
Metal Lath
Interior Finish
1½" SCALE PLAN OF EXTERIOR WALL TYPE A CONSTRVCTION
2" × 4" Studs
⅞" Sheathing laid diagonally
Rawhide Waterproof Paper
1" × 2" Furring Strips 16" C. to C.
1" × 2" Furring Strips 12" C. to C.
Metal Lath.
Cement Plaster.
Interior Pl
2" × 4" Studs.
1" × 2" Braces
Rawhide Waterproof Paper
½" Metal Furrings laid horizontally
Painted Metal Lath completely imbedded in ½" cement slab.
Stucco Finish
Interior Pl.
Wood Strip.
SCS
1½ SCALE SECTION TYPE B CONSTRVCTION
1½" SCALE SECTION TYPE A CONSTRVCTION
NOTE-SIMILAR CONSTRVCTION FOR WOOD LATH

INSVLATION OF STVCCOED FRAME WALLS

Garrettite Slate Surface Strip Shingles

The body of the Garrettite is wool fiber, made under our own formula and special supervision. We guarantee its uniformity. The felt is thoroughly asphalt saturated. It is then coated with a heavy layer of pure Gilsonite Asphalt; into which at high temperature is embedded a heavy coat of red, green and blue-black non-fading crushed slate.

Made in 3 styles: hexagonal, 3 shingles to a strip; octagonal and square butts, 4 shingles to a strip.

Deadening Felt

A high grade wool felt for deadening sound. Used between walls and under floors, it not only eliminates sound but acts as an insulator against heat and cold. Made in three weights: No. 18, 1 lb. per sq. yd.; No. 19, 1½ lb. per sq. yd.; No. 20, 2 lb. per sq. yd. We especially recommend the No. 20 for use in schools, churches and lodge rooms.

SAMUEL CABOT, INC.

Building Insulation

141 Milk Street
BOSTON, MASS.

For Branch Offices and Agencies, see page 1726

Products

HEAT-INSULATING and SOUND-DEADENING "QUILT."

For Stained Shingles see page 1107; for Paints, Stains and Wood Preservatives see pages 1726-1727.

Cabot's Heat-insulating and Sound-deadening "Quilt"

Purposes—For lining houses, stables, factories, etc., to make them warm in winter and cool in summer; for insulating cold storage and icehouses, breweries, refrigerators, etc., and for deadening sound in floors and partitions of schools, apartments, hospitals, lodges, etc.

Description—"Quilt" is a matting of cured eel grass stitched between 2 layers of very strong, tough paper. It is so strong that a web of the "Quilt" will sustain a weight of almost 900 lb.

The ribbons of eel grass cross each other at every angle and form innumerable small cells of "dead" air, so that the "Quilt" is a cushion of these air spaces.

It is therefore not a mere felt or paper, but a scientifically built structure similar to the plumage of a bird and gives the most perfect conditions for isolating heat and deadening sound.

The "dead" air can not circulate, so that heat conduction is prevented; and the sound waves are broken up and absorbed.

"Quilt" is made in a continuous web 3 ft. wide, which can be divided into narrower strips if desired and is shipped in rolls containing 250 sq. ft. each.

CABOT'S
"QUILT"
CABOT'S
"QUILT"

Rolls of "Quilt"

Grades—"Quilt" is regularly made in 5 grades, as follows:

Grade	Thickness, in.	Weight (per roll of 250 sq. ft.)
Single-ply	⅓	About 40 lb.
Double-ply	½	About 60 lb.
Triple-ply	¾	About 85 lb.
Asbestos (fireproof)	½	About 90 lb.
Waterproof	½	About 70 lb.

Efficiency—Actual scientific tests show that 1 layer of single-ply "Quilt" is equal to 28 layers of common, cheap building paper.

The double-ply is better than 40 layers. It is warmer and more permanent and much cheaper than backplastering.

As a sound deadener, the most exhaustive tests ever made (by Professor Norton for the New England Conservatory of Music) proved it to be far superior to all other methods tested, and also much cheaper, lighter, and more adaptable.

Why Eel Grass?—"Quilt" is made of eel grass because of the really wonderful qualities of this salt water plant, which no other fiber possesses, to wit:

It has a long, flat fiber, which, when matted in "Quilt," makes the "dead" air spaces (a round fiber like straw would make air circulation easy).

It is indestructible by decay.*

Old Pierce House, Dorchester, Mass. Built About 1635

It repels moths and other insects and vermin.

It is almost non-inflammable, because it contains silicon in place of the carbon that is present in plants that grow in the air, and it is therefore an effective fire retardant.

It is very tough, and never loses its elasticity.

Application—"Quilt" can be applied in any way that any common felt or paper can be, and with vastly better results.

The drawings shown on the following page are merely suggestions of a few methods of heat insulation in dwellings, etc., and of sound deadening in floors and partitions.

Adaptability—Single-ply is sufficient for lining houses and for all other ordinary heat insulation.

Double-ply is for sound deadening, cold storage and similar insulation where the conditions are more severe.

Triple-ply is for cold storage and other work where unusual conditions prevail.

Asbestos "Quilt" is for work where fireproofing as well as insulation and deadening are required. It is the only deadener that is fireproof, and the only fireproofing that is an efficient deadener.

Waterproof "Quilt" is double-ply with waterproof paper.

Specification—Specify Cabot's "Quilt," and state what grade shall be used.

Samples

Samples of all materials, with full information, promptly furnished on request.

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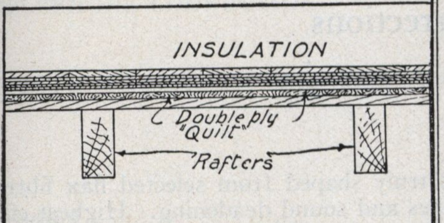
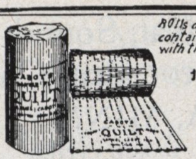
* The walls of the old Pierce House, Dorchester, Mass., were stuffed with eel grass when the house was built, about 1635, and the grass is still in a perfect state of preservation. We have a sample of this 290-year-old eel grass in our office.

Continued on next page

HEAT INSULATION


INSULATION
Double ply "Quilt"
Rafters

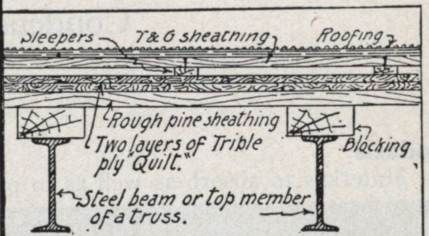
SHINGLE or SLATE ROOF


CABOT'S QUILT
QUILT

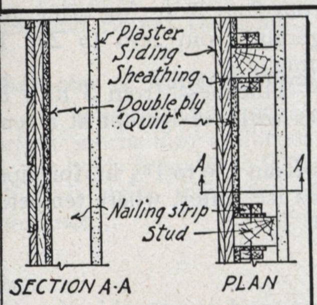
ROlls of "QUILT" as shipped. Each roll contains 250 sq.ft "QUILT" is 3'-0" wide with thin edges for lapping

GRADES OF "QUILT"

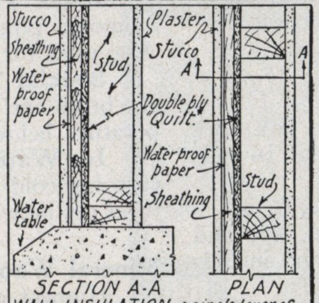
1. Standard Single-Ply is the grade commonly used for lining house and similar work. One layer is equal to 28 of common papers. It is about 1/3" thick, compressing to 1/4".
2. Double-ply is used for sound deadening cold storage, etc. About 1/2" thick.
3. Triple-ply is also for deadening and cold storage work, but is more effective than the double-ply. About 3/4" thick.
4. Asbestos "QUILT" is double-ply with Asbestos paper on both sides.
5. Waterproof "QUILT" is double-ply with waterproof paper on both sides and with needle holes sealed securely.


Sleepers
T&G sheathing
Roofing
Rough pine sheathing
Two layers of Trible ply "Quilt."
Blocking
Steel beam or top member of a truss.

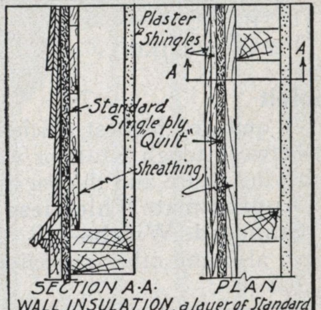
SLAG ROOF INSULATION.


Plaster
Siding
Sheathing
Double ply "Quilt"
A
A
Nailing strip
Stud
SECTION A-A
PLAN

WALL INSULATION, usual method of insulating with one layer of two ply "Quilt".

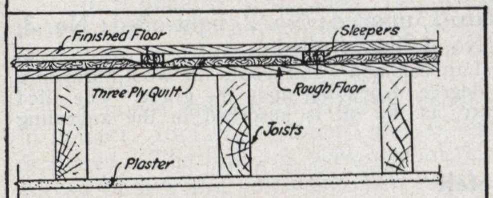

Stucco
Sheathing
Water proof paper
Stud
Water table
Plaster
Stucco
A
A
Double ply "Quilt."
Water proof paper
Stud
Sheathing
SECTION A-A
PLAN

WALL INSULATION, a single layer of double ply "Quilt" laid on studs under sheathing for outside plaster finish


Plaster
Shingles
A
A
Standard Single ply "Quilt"
Sheathing
SECTION A-A
PLAN

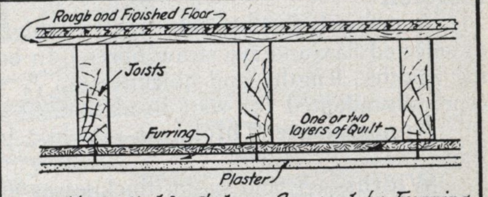
WALL INSULATION, a layer of Standard single ply "Quilt" is laid on the sheathing under shingles or siding

SOUND DEADENING-FLOORS AND PARTITIONS


Finished Floor
Sleepers
Three Ply Quilt
Rough Floor
Joists
Plaster

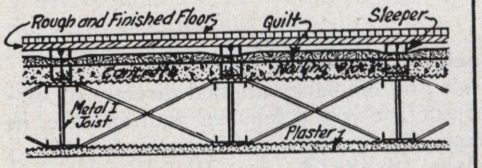
Quilt Laid on Rough Flooring with Strips on which Finish Floor is Laid

CABOTS
HEAT INSULATING
AND
SOUND DEADENING
QUILT


Rough and Finished Floor
Joists
Furring
One or two layers of Quilt
Plaster

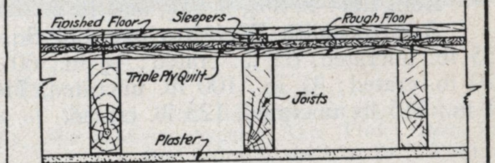
Quilt Applied in Ceiling Covered by Furring Strips, Lath and Plaster

"QUILT"
TRADE MARK

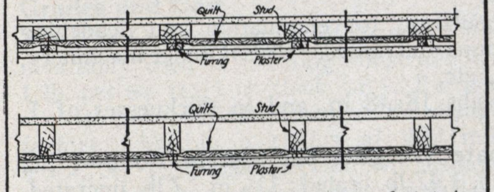

Rough and Finished Floor
Quilt
Sleeper
Concrete
Nailing Strip
Metal I Joist
Plaster

Quilt Laid on Concrete and Metal Lumber Floor with Furring Strips to receive Floor

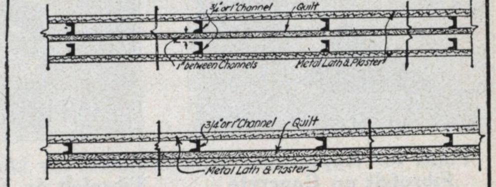
These drawings show a few of the methods of applying Cabots Quilt that have proved especially satisfactory. Numerous other methods are used. Quilt is flexible and it fits any surface whether rounding or with jogs and angles, or broken up by pipes and wires


Finished Floor
Sleepers
Rough Floor
Triple Ply Quilt
Joists
Plaster

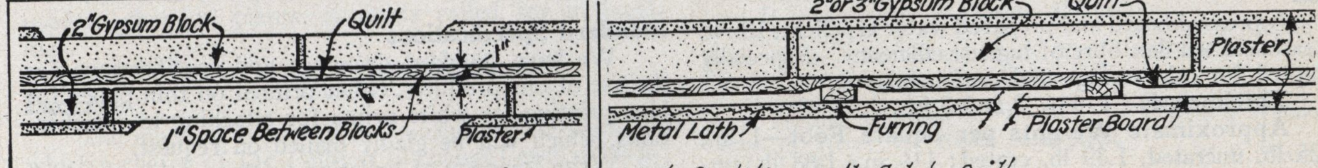
Section Showing Floating Method. Furring not nailed, floor floats on Quilt


Quilt
Stud
Furring
Plaster
Quilt
Stud
Furring
Plaster

Two Sectional Views Showing Use of Cabots Quilt in Wood-stud Partition


3/4" or 1" Channel
Quilt
1" between Channels
Metal Lath & Plaster
3/4" or 1" Channel
Quilt
Metal Lath & Plaster

Sections of Metal Lath Partition with Cabots Quilt


2" Gypsum Block
Quilt
1"
1" Space Between Blocks
Plaster
2" or 3" Gypsum Block
Quilt
Plaster
Metal Lath
Furring
Plaster Board

Sections of Gypsum Block Partitions with Cabots Quilt

Details Showing Application of Cabot's "Quilt" for Heat Insulation and Sound Deadening

UNION FIBRE CO. INC.

All Forms of Insulation for Cold, Heat, Sound, Mechanical Vibrations, Condensation and Acoustical Corrections

WINONA, MINN.

AGENTS IN ALL LARGE CITIES

Products

Materials to absorb as well as to prevent transmission of heat and sound:

LINOFELT.
FIBROFELT.
LITH.
PIPE COVERING.
MINERAL WOOL.
ACOUSTICAL LINOFELT
ACOUSTIFIBROBLOCK.
ANTI-VIBRO-BLOC.

Linofelt

A quilt, of highest efficiency, of selected flax fibre batt between tough Kraft or waterproof paper. In rolls of varying width and thickness.

Approximate Thickness—5/16 in.; ½ in.; ¾ in.

Standard Widths—18, 24, 26, 32, 36, 48, and 54 in.; also any other special widths up to, and including, 108 in.

Approximate Weights per 100 Sq. Ft.—5/16-in. Kraft, 17 lb.; ½-in. Kraft, 28 lb.; ¾-in. Kraft, 39 lb.; 5/16-in. waterproof, 23 lb.; ½-in. waterproof, 32 lb.; ¾-in. waterproof, 43 lb.

Fibrofelt

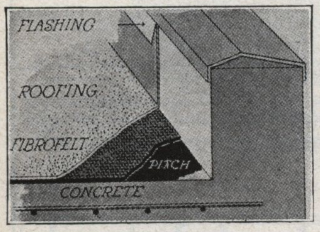
A pressed, flexible felt board of highest efficiency, of selected flax and rye straw fibres. In boards of varying widths, lengths and thicknesses, 5/16 to 1 in., and especially adapted for roof insulation.

Approximate Thickness—5/16 in.; ½ in.; ¾ in.; 1 in.

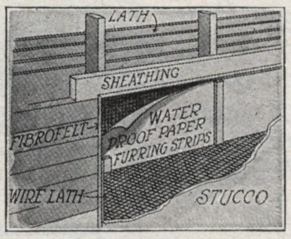
Widths—5/16 and ½-in. thicknesses are flanged for 16 and 24 in. on center. Also furnished flat in 32 and 36-in. widths; ¾ and 1-in. thicknesses furnished only in 32 and 36-in. widths.

Lengths—8, 8½, 9, 9½, and 10 ft.

Approximate Weights per 100 Sq. Ft.—5/16 in., 55 lb. uncrated, 65 lb. crated; ½ in., 60 lb. uncrated, 70 lb. crated; ¾ in., 100 lb. uncrated, 110 lb. crated; 1 in., 115 lb. uncrated, 125 lb. crated.



Plans for Application of Fibrofelt on Concrete Roof



Plans for Application of Fibrofelt on Exterior Walls of Building to be Finished in Stucco

Lith

A pressed board and prepared water repellent, 18x48 in., of selected flax fibre of highest efficiency. Especially adapted for cold storage and roof insulation.

Thicknesses—1, 1½, 2 and 3 in.

Approximate Weights per Square Foot—1 in., 1.25 lb. uncrated, 1.39 lb. crated; 1½ in., 1.88 lb. uncrated, 2.09 lb. crated; 2 in., 2.50 lb. uncrated, 2.79 lb. crated; 3 in., 3.75 lb. uncrated, 4.18 lb. crated.

Pipe Covering

Pressed and truly shaped from selected flax fibres. Used for cold pipes and sound deadening. Highest efficiency. Three thicknesses.

Brine Thickness—From 2 to 3 in. for brine and ammonia pipes with refrigerant from zero to 25° F. Also used for sound deadening.

Special Thick Brine—Thickness from 3 to 4 in. for brine and ammonia pipes with refrigerant at a temperature below zero.

Ice Water—Thickness from 1½ to 1¾ in. for pipes carrying cold liquids, such as ice water, where temperatures are between 25 and 50° F.

Mineral Wool

Highest quality, no dust, and is not objectionable to handle when prepared by our patented process, which anneals and makes the fibres more pliable and tough and prevents the fibres from breaking up again into dust form. Packed in burlap bags of approximately 50 lb. each.

Grades—No. 1, unoiled; No. 2, light oiled; No. 3, medium oiled; No. 4, heavy oiled.

Note: The oil anneals and waterproofs the wool fibres to a greater or lesser degree, depending upon the grade. The oiled wool is not greasy, as the oil is absorbed in the annealing process.

Acoustical Linofelt

Gives highest tests for sound absorption. Made from our best grade flax batt, burlap covered.

Made in standard rolls, 36 in. wide, 33⅓ ft. long, and 1 in. thick. Weighs, approximately, 60 lb. per square.

Acoustifibroblock

Highest grade and efficiency applied directly to surfaces. Its outer surface is the finished wall surface, in plain or tile effect. No surface membrane needed.

Made in slabs 18x48x1⅜ in. Weighs, approximately, 1.80 lb. uncrated, 2 lb. crated.

Anti-vibro-bloc

A super-insulation for elimination and deadening of severe vibrations and noises. Placed under machinery, in floors, walls, etc.

Made in slabs 18x48 in. and in thicknesses of 1, 1½, 2 and 3 in.

Approximate Weights per Square Foot—1 in., 1.33 lb. uncrated, 1.47 lb. crated; 1½ in., 2 lb. uncrated, 2.21 lb. crated; 2 in., 2⅔ lb. uncrated, 2.96 lb. crated; 3 in., 4 lb. uncrated, 4.43 lb. crated.

Standard Specifications

We have standard drawings and specifications for the use of our products, either printed on thin paper for blue printing, or white prints for attaching to specifications, which will be gladly mailed on request.

Write for copy of bulletins on those subjects which may concern you. We cheerfully furnish without charge engineering advice concerning the use of our products.

UNITED STATES MINERAL WOOL COMPANY

TELEPHONE CONNECTION

280 Madison Avenue
NEW YORK, N. Y.

FACTORY: STANHOPE, N. J. (Railroad Station, Netcong, N. J.)

Product

Mineral Wool, a Non-combustible Insulator and Sound Deadener.

Character of Mineral Wool

A mineral substance, made by converting melted scoria into a fibrous state.

It holds from 92 to 96% of air in suspension, which is more than any other non-combustible substance.

Uses

Mineral Wool is extensively used for insulating ovens and heat treating furnaces; and by leading manufacturers of refrigerators, ice and refrigerating machinery, as well as for filtering acids and the packing of carboys.

In residences it is used for lining walls, floors, roofs and ceilings, as partly shown in the accompanying illustration. It is cheap and easily applied.

A house lined with Mineral Wool is warm in winter, cool in summer, and is thoroughly deafened. The lining is verminproof, checks the spread of fire and keeps out dampness.

How to Estimate

To find the quantity of Ordinary Mineral Wool required to fill the outside walls the full thickness of studding:

Rule—1 lb. per sq. ft. for each inch in thickness.

Take the entire distance around the building on a horizontal line and multiply by the height of the studding, which will give the square feet of outside surface. Deduct, ordinarily, one-third to one-half for space occupied by doors, windows, chimneys, studding, bracing, etc. Multiply the remainder by the thickness of the studding; the result will be the number of pounds of Mineral Wool required to fill the space.

Grades and Cost

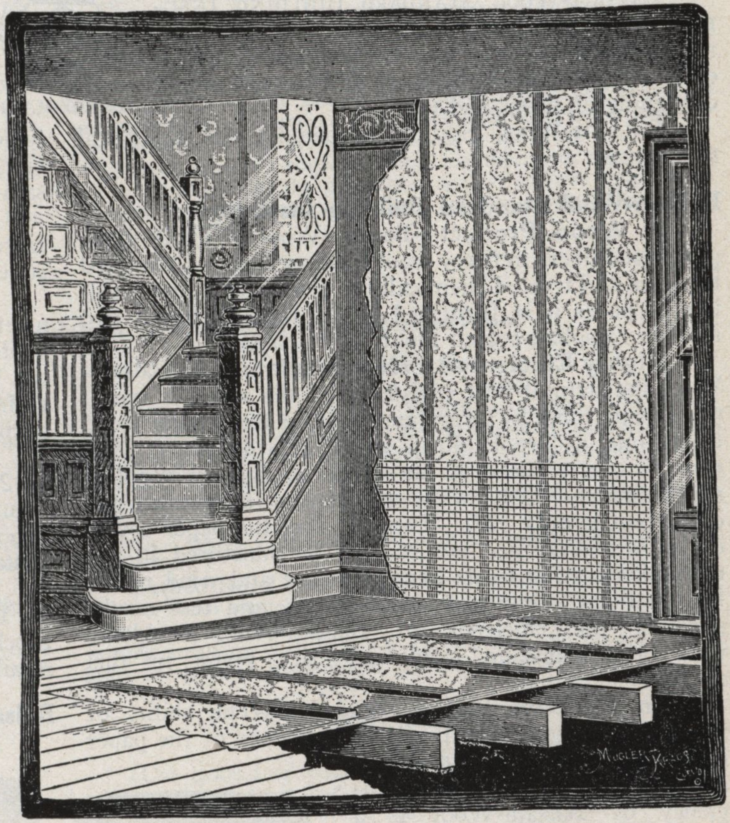
The Ordinary grade of Mineral Wool (the quality invariably used in building construction) weighs about 1 lb. per sq. ft., 1 in. thick, or 12 lbs. per cu. ft.

It costs $28.00 (subject to change) per ton at factory. Within a radius of 200 miles from New York, N. Y., $10.00 per ton will usually cover freight charges. A laborer can apply from ½ to ¾ of a ton a day.

The Selected grade of Mineral Wool, which is used in chemical plants, is rarely called for in buildings.

Package

The material is packed in 3-bushel burlap bags, for which a charge of 15¢ (subject to change) each is made; if returned in good condition within 30 days, and free of all freight charges, they are credited at 10¢.



A Few Applications of Mineral Wool

How to Specify

"Insulation of Mineral Wool (United States Mineral Wool Company, 280 Madison Avenue, New York) shall be provided for .... For floors, it shall be [4 in.] thick and set upon boards placed between beams on cleats. For walls it shall fill the spaces between studs and be placed in position as the lathing is being proceeded with. For roofs, it shall fill the space between rafters from eaves to [collar beams]. The Wool shall be pressed compactly but lightly."

Samples

Samples and descriptive pamphlets will be gladly supplied, on application.

A Partial List of Installations

Building and Location	Architects
Schults Bread Co., Mount Vernon, N. Y.	C. B. Comstock
Ward Baking Company's Plants, New York and Brooklyn, N. Y.	C. B. Comstock
John D. Rockefeller, Jr., Estate, Pocantico Hills, N. Y.	Delano & Aldrich
Baker House, Glen Cove, L. I., N. Y.	Walker & Gillette
The Hebrew Sheltering Guardian Society, Hawthorne, N. Y.	H. A. Jacobs
Veryl Preston, Hohokus, N. J.	Warren & Wetmore
Estate of Henry H. Wood, Mill Neck, L. I., N. Y.	A. & F. B. Ware
E. C. Potter, Jr., Hewlett, L. I., N. Y.	H. O. Chapman
E. T. Holmes, Greenwich, Conn.	Carrère & Hastings

WOOD CONVERSION COMPANY

Balsam-Wool for Building Insulation and Sound Deadening

GENERAL OFFICE AND FACTORY
CLOQUET, MINN.

DISTRICT OFFICES
ST. PAUL, MINN., 808 Merchants National Bank Building
CHICAGO, ILL., 310 South Michigan Avenue
RETAIL DISTRIBUTION BY LUMBER DEALERS EVERYWHERE

TRADE-MARK

Products

Balsam-Wool Standard Building Insulation for preventing heat losses through walls, roofs, floors and ceilings; for insulating refrigerator rooms, cars and boxes; and for the sound deadening of floors and walls.

Balsam-Wool Sound Absorbent for acoustical treatments.

Balsam-Wool Standard Building Insulation

A Wood Product—Balsam-Wool is made from pure wood fibers in fleecy wool form, permanently matted together and treated chemically to resist fire. For building purposes it is furnished ½ in. thick, between two sheets of asphalt-coated tough kraft paper.

Highly Efficient as a Heat Insulator—In Balsam-Wool the natural heat resistance of the wood is multiplied many times by a rearrangement of the cellular wood fibers into a "wool" form which retards the circulation of air. The still air space in Balsam-Wool is approximately 95%, while its density in pounds per cubic foot is only 3.80. The fact that the paper covers of Balsam-Wool are *not stitched* or punctured in any way adds further to its heat, moisture and wind resisting qualities. Standard specifications, and test results showing the efficiency of Balsam-Wool compared with other building insulations, are given in this article.

An Effective Sound Deadener—The ability of the wool to absorb sound, and the tendency of the paper covering to reflect sound waves, account for the remarkable efficiency of Balsam-Wool as a sound deadener. Standard specifications and comparative tests are given in this article.

Waterproof—The film of asphalt which lines the paper coverings protects the wool from moisture, and at the same time keeps dampness out of the building.

Fire Resistant—The wool is chemically treated against fire. It will char while exposed to flame, but will not smolder or burn after the flame is removed. Balsam-Wool in itself will not support combustion.

THERMAL CONDUCTIVITIES OF HEAT INSULATORS

Tests made by C. F. Burgess Laboratories, using standard hot plate method

Insulating material	Thickness, in.	§Thermal Conductivity in B.t.u.		Density in lb. per cu. ft.
		1 hour	24 hours	
Balsam-Wool	.60	.249	5.976	3.80
*A	.35	.255	6.120	5.45
*B	.38	.270	6.480	14.00
*C	.50	.279	6.696	15.90
*D	.40	.309	7.416	5.07
*E	.43	.317	7.608	15.80
*F	.67	.318	7.632	15.90

*Insulating materials in competition with Balsam-Wool.

§Per square foot per 1°F. drop per 1-in. thickness.

Balsam-Wool
USE NO HOOKS

Standard Package

Contains 250 sq. ft.
Weight, 50 lb.

17-in. Balsam-Wool Applied Between Studs

Verminproof and Sanitary—Balsam-Wool contains no animal matter. It does not attract or harbor rats, mice or vermin. It is clean, odorless and sanitary.

Permanent—The wool can not shift or settle because each fiber is coated with an adhesive which cements it to adjoining fibers. The asphalt coating provides a permanent bond between wool and paper. Balsam-Wool is as permanent as the walls which hold it.

Uniform in Quality—During the process of manufacture, Balsam-Wool is under constant laboratory supervision for uniformity and thermal conductivity.

Low Cost of Installation—Three standard widths meet all average construction requirements. Thus, the carpenter cuts only to length. Being flexible, Balsam-Wool can be fitted easily into corners and around projections without waste of material. Being light and easily installed, it speeds up the work and keeps down installation costs.

Widths and Thickness—The standard widths are 17, 25 and 32 in. The standard thickness is ½ in., although 1-in. thickness can be furnished on special order. Balsam-Wool is rolled, wrapped, and sealed in standard packages containing 250 sq. ft. and weighing 50 lb.

How Distributed—Balsam-Wool Standard Building Insulation is distributed through retail lumber dealers. Stocks are carried by dealers in all sections, and any retail lumber dealer can promptly obtain a supply.

Balsam-Wool Sound Absorbent

For use in acoustical treatments, where sound *absorption* rather than sound insulation is the important factor, Balsam-Wool is furnished in a special form. Complete information on Balsam-Wool Sound Absorbent will be furnished on request.

A Weyerhaeuser Product

Balsam-Wool bears the name of an organization which for more than 65 years has been known for the high standard of quality maintained in all its products. On every roll of genuine Balsam-Wool will be found the Weyerhaeuser Forest Products trade-mark, the maker's pledge of personal responsibility.

EFFICIENCY OF VARIOUS SOUND INSULATORS

Tests made on actual floor sections by C. F. Burgess Laboratories

Insulation used	Thickness, in.	Sound stopped by insulation	Sound transmitted
Balsam-Wool	½	38 %	62 %
*G	½	36.5%	63.5%
*F	½	34.4%	65.6%
*B	½	26.0%	74.0%
*C	½	24.7%	75.3%
*A	2 ply	20.4%	79.6%
*D	½	18.1%	81.9%
*E	½	4.4%	95.6%

*Insulating materials in competition with Balsam-Wool.

Continued on next page

Heat Insulation for Buildings

Practical Insulation Tests—In the effort to obtain practical insulating data for architects, a series of tests was recently conducted for Wood Conversion Company by the C. F. Burgess Laboratories of Madison, Wis.

Made on Actual Wall and Roof Sections—The roof and wall sections tested were of standard construction, and included types most commonly encountered in residential work.

First, each section was tested for its thermal conductivity without insulation. Commercial insulating materials, purchased from dealers' stocks, were then applied in turn, so that the series of tests would show (1) the absolute heat loss through each type of wall or roof, insulated and uninsulated, and (2) the relative efficiency of the different insulators *under actual service conditions.*

Standard heat transmission test methods were employed. Details of these will be furnished on request.

Balsam-Wool the Most Efficient—Results of these tests show a wide difference in the efficiency of the eight insulators under trial. As might be expected, their relative standing varies somewhat in the case of the different wall and roof constructions to which they were applied, but in every case the heat loss through Balsam-Wool was shown to be the lowest.

General Conclusions—Test results show that the heat loss through the roof is relatively greater than through the walls. They also show that the amount of heat loss in either case is largely dependent on the building materials employed.

The percentage of saving due to insulation is highest in the case of those walls and roofs which showed the greatest amount of heat loss when uninsulated. However, the results show that there is a large preventable waste of heat through uninsulated walls and roofs of *every* type.

The Economies of Insulation—In the light of these tests and the actual results obtained in insulated buildings, insulation must be recognized as an important measure of fuel conservation.

Thousands of insulated houses throughout the country are burning from one-fourth to one-third less coal than uninsulated houses of the same size. Moreover, heating engineers are suggesting a reduction of as much as 20% in boiler capacity and radiation when proper insulation is specified.

These economic considerations, together with summer and winter comfort and the protection against sudden temperature changes, explain the popularity and greater resale value of the insulated house.

Standard Specifications for Heat Insulation of Buildings with Balsam-Wool

Materials

Heat insulation shall be standard ½-in. thick Balsam-Wool, manufactured by the Wood Conversion Company, Cloquet, Minnesota. Widths shall be as specified hereinafter. (Stock widths are 17, 25, and 32 in.)

General

Continuity of insulation shall be maintained. Where floors, ceilings or roofs are insulated, as well as outside walls, insulate walls thoroughly between joist and rafter ends.

Throughout, all joints shall be made airtight, especially at door and window openings.

Use full length strips of insulation. End joints, where necessary, shall be butted and covered with lath, nailed through insulation to boarding or header.

Insulation strips shall in all cases run in the same direction as studding, joists and rafters.

Frame Outside Wall Insulation

(Wood siding, stucco or brick veneer finish. Studs set on 16-in. centers.)

Method No. 1 (17-in. Width)—Insulate with 17-in. width Balsam-Wool applied vertically between studding with back of insulation against face of sheathing. The flanges or turnouts shall be continuously fastened by means of laths or strips nailed securely through insulation to the studding on the sides and to soles, plates or headers at the top and bottom.

Note: Where studding is set on 24-in. centers use 25-in. width Balsam-Wool.

Method No. 2 (32-in. Width)—Insulate with 32-in. width Balsam-Wool applied vertically on inside face of studding, edges butted together on every other stud. Fur over insulation with 1x2-in. furring strips on each stud to receive lath and plaster.

Note: This method requires special width door and window frames.

Where heating or plumbing pipes are installed in space between studs of outside walls, insulate between studs as in Method No. 1, in addition to insulation as above.

Masonry Outside Wall Insulation

(Stone, brick, hollow tile or concrete block)

Method No. 1 (32-in. Width)—Fur the wall with 1x2-in. furring strips on 16-in. centers, shimmed plumb and true. Insulate with 32-in. width Balsam-Wool applied vertically on inside of furring, edges butted together on every other strip. Fur over insulation with 1x2-in. furring strips on each wall-furring strip to receive lath and plaster.

Method No. 2 (17-in. Width)—Fur the wall with 2x2-in. furring strips, on 16-in. centers, shimmed plumb and true. Insulate with 17-in. width Balsam-Wool applied vertically between furring strips with back of insulation against inside face of wall. The flanges or turnouts shall be continuously fastened by means of laths or strips nailed securely to the furring on the sides and to soles, plates or headers at the top and bottom.

Roof Insulation

(Rafters set on 16-in. centers)

Method No. 1 (17-in. Width)—Insulate with 17-in. Balsam-Wool applied between the rafters with back of insulation against inside face of roof boarding. The flanges or turnouts shall be continuously fastened by means of laths or strips nailed securely through insulation to the sides of rafters, plates, ridges, etc.

Note: Where rafters are set on 24-in. centers use 25-in. width Balsam-Wool.

Method No. 2 (32-in. Width)—Insulate with 32-in. width Balsam-Wool applied on the inside face of rafters, edges butted together on every other rafter. Fur over insulation with 1x2-in. furring strips on each rafter to receive lath and plaster. (Use laths or strips if space under rafters is unplastered.)

Ceiling Insulation

(Joists set on 16-in. centers)

(Use instead of roof insulation for second floor ceilings where attic above is not to be used for living quarters; also for basement ceilings where space is unheated; and for porch ceilings where space above is used for living quarters, as in second floor extensions, etc. Insulation is also recommended for first floor ceilings under bedrooms that will be cold at night, and for ceilings of first floor bedrooms where space above is heated at night.)

Method No. 1 (17-in. Width)—Insulate with 17-in. width Balsam-Wool applied between joists with back of insulation against underside of rough flooring. The flanges or turnouts shall be continuously fastened by means of laths or strips nailed securely through insulation to the sides of joists, plates, headers, etc.

Note: Where joists are set on 24-in. centers use 25-in. width Balsam-Wool.

Method No. 2 (32-in. Width)—Insulate with 32-in. width Balsam-Wool applied on the bottom of joists, edges butted together on every other joist. Fur over insulation with 1x2-in. furring strips on each joist to receive lath and plaster or ceiling.

Floor Insulation

(Over partially excavated or cold basement areas. Joists set on 16-in. centers.)

Method No. 1 (32-in. Width)—Insulate with 32-in. width Balsam-Wool applied over subfloor, edges butted together over every other joist. Fur over insulation with 1x2-in. furring strips secured over each joist to receive finish floor.

Note: Where entire building floor area is not insulated as above, set floor joists of insulated area sufficiently below normal joist level to compensate for thickness of insulation and stripping.

Method No. 2 (17-in. Width)—(Use where headroom below joists is sufficient for working space and is accessible.)

Insulate with 17-in. width Balsam-Wool applied between joists as specified in Method No. 1 for Ceiling Insulation.

Continued on next page

Sound Insulation for Buildings

Sound Transmission Tests—In order to furnish architects with authoritative and workable data on the problems of sound insulation, as encountered in the design of apartments, hotels, hospitals and schools, Wood Conversion Company several years ago began a series of exhaustive researches through the C. F. Burgess Laboratories.

The problem of sound *insulation* may be defined as "finding effective methods of arresting the transmission of sounds." In other words, it must be distinguished from sound *absorption* problems, as encountered in auditoriums and banking rooms. Information on this latter subject has long been available, but before the Burgess tests there was no practical method of measuring the sound transmission through different materials and structural units.

Made on Actual Floor and Wall Sections—The Burgess tests were made on actual floor and wall sections. The amount of sound transmitted through an uninsulated floor (or wall) was taken as 100%. Conversely, the sound stopped was 0%. Various insulated floor and wall constructions were rated by this standard. Full details of the test methods, which were developed specially, will be furnished on request.

Three Series of Tests—In the first series, the aim was to find the relative soundproofing value of various commercial insulating materials. The results, which are listed in table in second column on the first page of this article, give Balsam-Wool the highest rating—38%, as against 4.4% for the least efficient material.

In the second series, the aim was to find the relative sound insulating efficiency of various floor constructions insulated with Balsam-Wool. (Figs. 1 to 8 on the following page.)

The third series was similar to the second, except that the tests were made on walls. (Figs. 9 to 15.)

General Conclusions—These sound tests developed important general conclusions, as follows:

(1) Joist pads do not reduce the sound transmission if the floor is nailed through the joist pads into the joists.

(2) The greater the amount of pressure on an insulator, the greater the amount of sound which it transmits.

(3) Little of practical value is gained by offsetting the furring strips from directly over the floor joists.

(4) Of all types of floor construction, the suspended ceiling construction showed the greatest sound resistance. (Figs. 5 to 8.)

(5) Of the wall types studied, double studding staggered construction showed the greatest sound resistance. (Figs. 12 to 15.)

(6) The manner of applying the insulation, and the number of layers, have a marked effect on sound resistance.

Standard Specifications for Sound Deadening Floors and Walls with Balsam-Wool

Material

Sound deadening material (insulation) shall be standard ½-in. thick Balsam-Wool, 32 in. wide, manufactured by the Wood Conversion Company, Cloquet, Minn.

Floor Sound Insulation—General

Continuity of the sound deadening material shall be maintained—all joints shall be sealed.

Where false ceiling construction is used (ceiling joists independent of floor joists) and sound deadening material is woven between the two sets of joists, insulating strips shall run at right angles to joists, with edge laps of at least 1½ in. Tension on all strips shall be as nearly equal as possible to guard against open joints at edge laps.

Insulation strips applied over subfloor or on bottom of joists, shall run in the same direction as joists.

Use full length strips of insulation. End joints where necessary shall be lapped 1½ in. and covered with lath nailed through insulation to subfloor, joist or header.

Where specified, there shall be constructed a false ceiling; the joists to support the floor and those carrying the ceiling being independent. The ceiling joists shall be set midway between the floor joists with bottoms at least 1½ in. below the bottom line of the floor joists where woven insulation is used.

Floor Sound Insulation—Methods

(Methods herein specified are arranged from low to high, in order of their effectiveness.)

Method No. 1 (One Layer, 15% of Sound Stopped)—Insulate with Balsam-Wool applied on the bottom of joists, edges butted together on every other joist. Fur over insulation with 1x2-in. furring strips on each joist to receive lath and plaster. (Fig. 2.)

Method No. 2 (One Layer, 43% of Sound Stopped)—Insulate with Balsam-Wool applied over subfloor with edges butted together over every other joist. Fur over insulation with 1x2-in. furring strips over each joist to receive finish floor. (Fig. 3.)

Method No. 3 (Two Layers, 52% of Sound Stopped)—Insulate with two layers of Balsam-Wool. The first layer shall be applied on the bottom of joists, as specified in method No. 1, and the second layer shall be applied over the subfloor as specified in Method No. 2. (Fig. 4.)

Note: Methods 4, 5, 6 and 7 are used with false ceiling construction, as specified in the last paragraph under "Floor Sound Insulation—General."

Method No. 4 (One Layer, 75% of Sound Stopped)—Insulate with Balsam-Wool woven between the two sets of joists and secured to the bottom of each floor joist with laths or strips (or tin discs) nailed through the insulation. (Fig. 5.)

Method No. 5 (One Layer, 84% of Sound Stopped)—Insulate with Balsam-Wool applied on subfloor, as specified in Method No. 2. (Fig. 6.)

Method No. 6 (Two Layers, 86% of Sound Stopped)—Insulate with two layers of Balsam-Wool. The first layer shall be applied over subfloor, as specified in Method No. 2, and the second layer shall be woven between the two sets of joists as specified in Method No. 4. (Fig. 7.)

Note: Insulation applied on bottom of ceiling joists as in Method No. 1, in lieu of woven insulation, rates the same.

Method No. 7 (Three Layers, 88% of Sound Stopped)—Insulate with three layers of Balsam-Wool. The first layer shall be woven between the two sets of joists as specified in Method No. 4; second layer shall be applied under joists as specified in Method No. 1; third layer shall be applied over subfloor as specified in Method No. 2. (Fig. 8.)

Wall Sound Insulation—General

Continuity of the sound deadening material shall be maintained—all joints shall be sealed.

Where floors and ceilings are insulated, as well as partition walls, insulate thoroughly between joist ends.

Where double partition (staggered stud) construction is used and sound deadening material or insulation is woven between the two sets of studding, insulating strips shall run horizontally at right angles to studs, with edge laps of at least 1½ in. Tension on all strips shall be as nearly equal as possible to guard against open joints at edge laps.

Insulation strips applied on the face of studding shall run vertically in the same direction as the studs.

Use full length strips of insulation. End joints, where necessary, shall be butted and covered with lath nailed through insulation to stud or header.

Where specified, there shall be built double partition walls of staggered stud construction, each set of studs set on 16-in. centers, the one set of studs centering between the others. On the same side of the partition there shall be at least 1½ in. from the face of one set of studs to the face of the other where woven insulation is used.

Wall Sound Insulation—Methods

(Methods herein specified are from low to high, in the order of their effectiveness.)

Method No. 1 (One Layer, 28% of Sound Stopped)—Insulate with Balsam-Wool applied on one face of studding only, edges butted together on every other stud. Fur over insulation with 1x2-in. furring strips on each stud to receive lath and plaster. (Fig. 10.)

Method No. 2 (Two Layers, 48% of Sound Stopped)—Insulate with two layers of Balsam-Wool applied on the two faces of studding, as specified in Method No. 1. (Fig. 11.)

Note: Methods 3, 4, 5 and 6 are used with double studding staggered construction, as specified in the last paragraph under "Wall Sound Insulation—General."

Method No. 3 (One Layer, 57% of Sound Stopped)—Insulate with Balsam-Wool woven between the two sets of studding and secured on the face of every stud of one set with laths or strips (or tin discs) nailed through insulation. (Fig. 12.)

Method No. 4 (One Layer, 66% of Sound Stopped)—Insulate with Balsam-Wool applied on the face of one set of studding, as specified in Method No. 1. (Fig. 13.)

Method No. 5 (Two Layers, 73% of Sound Stopped)—Insulate with two layers of Balsam-Wool applied on the face of each of the two sets of studding, as specified in Method No. 1. (Fig. 14.)

Method No. 6 (Three Layers, 77% of Sound Stopped)—Insulate with three layers of Balsam-Wool. One layer shall be woven between the two sets of studding as specified in Method No. 3, and one layer shall be applied on the faces of each of the two sets of studding, as specified in Method No. 1. (Fig. 15.)

Continued on next page

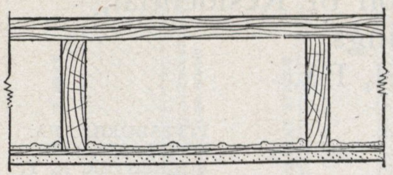


Fig. 1
Per cent of sound stopped, **0**

Note: The amount of sound transmitted through a floor section constructed in the usual manner, as illustrated, and without any insulation was taken as 100% sound transmission (or 0% sound stopped). The various types of floors insulated with Balsam-Wool were rated against this figure.

Solid black in Figs. 2 to 8 indicates Balsam-Wool.

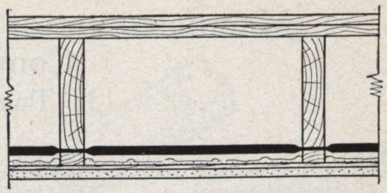


Fig. 2
Per cent of sound stopped, **15**

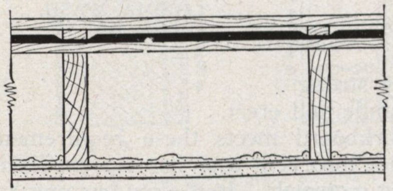


Fig. 3
Per cent of sound stopped, **43**

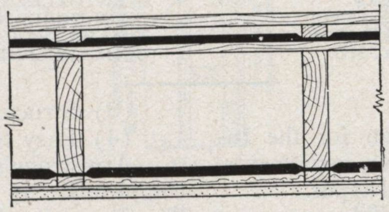


Fig. 4
Per cent of sound stopped, **52**

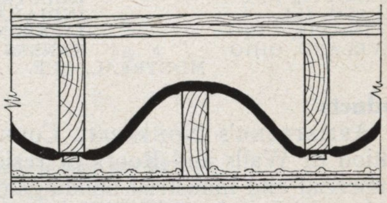


Fig. 5
Per cent of sound stopped, **75**

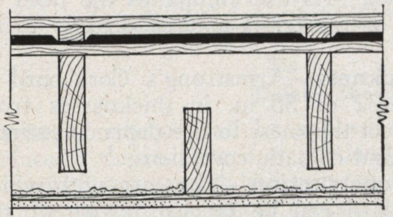


Fig. 6
Per cent of sound stopped, **84**

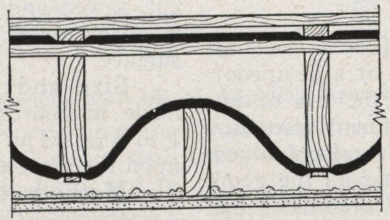


Fig. 7
Per cent of sound stopped, **86**

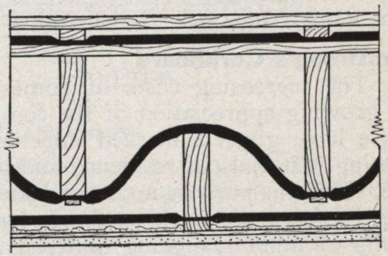


Fig. 8
Per cent of sound stopped, **88**

TEST RESULTS SHOWING RELATIVE SOUND DEADENING EFFICIENCY OF VARIOUS TYPES OF FLOORS INSULATED WITH BALSAM-WOOL

Note: The amount of sound transmitted through a wall section without any insulation, as illustrated, was taken as 100% sound transmission (or 0% sound stopped).

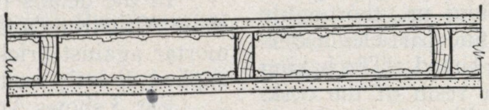


Fig. 9
Per cent of sound stopped, **0**

Note: Solid black in Figs. 10 to 15 indicates Balsam-Wool Insulation.

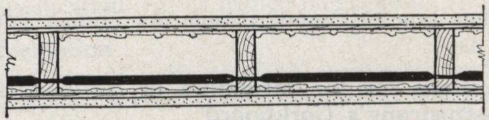


Fig. 10
Per cent of sound stopped, **28**

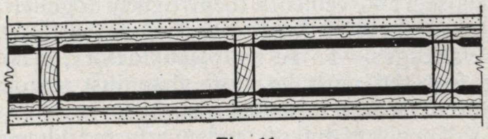


Fig. 11
Per cent of sound stopped, **48**

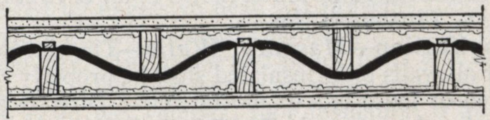


Fig. 12
Per cent of sound stopped, **57**

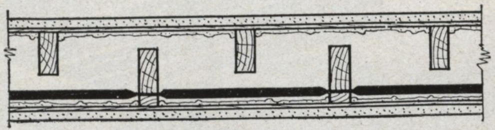


Fig. 13
Per cent of sound stopped, **66**

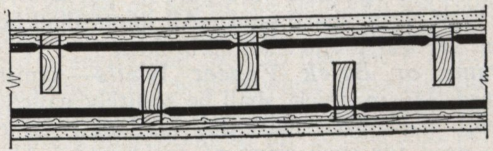


Fig. 14
Per cent of sound stopped, **73**

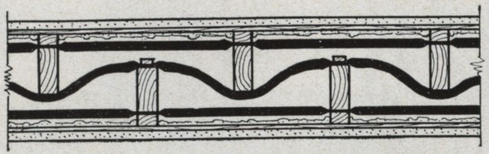


Fig. 15
Per cent of sound stopped, **77**

TEST RESULTS SHOWING RELATIVE SOUND DEADENING EFFICIENCY OF VARIOUS TYPES OF WALLS INSULATED WITH BALSAM-WOOL

SOUND INSULATION OF FLOORS AND WALLS

ARMSTRONG CORK & INSULATION COMPANY

Manufacturers of and Contractors for Insulation of Residential, Commercial and Industrial Buildings

135 Twenty-fourth Street, PITTSBURGH, PA.

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CINCINNATI, OHIO
CLEVELAND, OHIO
DALLAS, TEX.
DENVER, COLO.
DETROIT, MICH.
GRAND RAPIDS, MICH.
HARTFORD, CONN.
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LOUISVILLE, KY.
MEMPHIS, TENN.
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SAN FRANCISCO, CAL.
SEATTLE, WASH.
SPOKANE, WASH.
TACOMA, WASH.
TULSA, OKLA.
TORONTO, ONT.

Products

Armstrong's Nonpareil Corkboard for the Insulation of Walls and Roofs of residences, apartments, commercial and industrial buildings of all types.

For Linotile and Armstrong's Cork Tile, see pages 560-561; for Cold Storage Insulating Materials, see pages 2354-2355; for Cork Bulletin Boards, see page 2828.

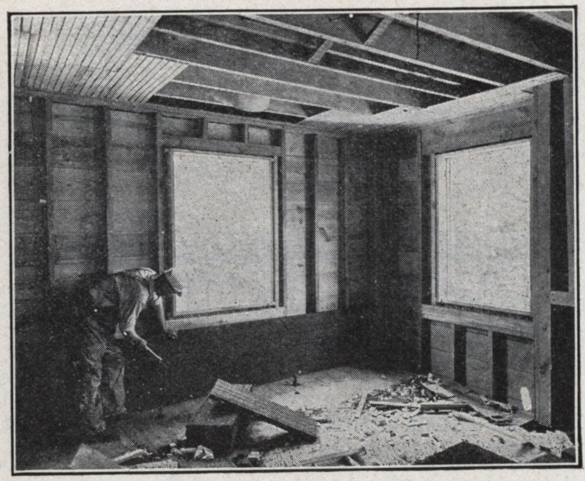
Armstrong's Corkboard

The increasing costs of domestic fuel as well as the growing appreciation of the comfort of a heatproof house have given a marked impetus to the use of insulating materials in residence and apartment construction. For this purpose no better material can be obtained than Armstrong's Corkboard. It combines all the good points of other insulating materials and eliminates the faults common to most of them. It is the most efficient practical insulation known and has been the accepted standard insulating material in cold storage construction for the past twenty years or more. There is nothing new or experimental about its use.

Description—Armstrong's Corkboard is composed entirely of cork. The cork is ground up, thoroughly sifted to remove all dust, dirt and fine particles and is then compressed in metal moulds and baked. The baking process liquefies the natural gum or resin of the cork. While in a liquid state this gum permeates the whole mass, coats each of the granules with a natural moistureproof coating and cements them tightly together into a light, strong sheet of Armstrong's Corkboard.

Advantages—To be truly satisfactory, a house insulating material must be more than just a good nonconductor of heat. It should also be:

(1) Nonabsorbent of, and unaffected by moisture.
(2) A fire retardant.
(3) Structurally strong.
(4) Easy to handle and erect.



Nailing Armstrong's Corkboard Against Studs as in Frame or Brick Veneer Construction

Plaster is applied directly to the corkboard without the use of lath

Armstrong's Corkboard meets these requirements completely. It is nonabsorbent and has no capillarity like fibrous insulating materials. It is slow burning and does not smolder or carry fire. It has structural strength and stability. It is light and clean to handle and is easily cut, sawed and nailed. Its use eliminates the need of wood or metal lath as plaster is applied directly to its surface.

Size and Thickness—Armstrong's Corkboard is made in boards 12x32 or 36 in. in thicknesses from 1 to 6 in. The correct thickness to use depends entirely upon the structural and climatic conditions.

Methods of Construction—The ease with which Armstrong's Corkboard can be erected is one of the chief points in its favor. It can be put up just as readily as lumber in buildings of frame construction, or erected in portland cement mortar against brick, concrete, stone or hollow tile. It provides continuous insulation that is fire-safe, verminproof and moistureproof.

In the details on the following page Figs. 1 and 2 show Armstrong's Corkboard erected in portland cement mortar against brick and hollow tile walls, with plaster applied directly on the cork.

Fig. 3 shows Armstrong's Corkboard nailed to studs, 16 in. on centers, and plastered.

Fig. 4 shows a similar construction for the roof insulation.

Other types of construction not shown here can also be used.

Specifications for the Insulation of Residences with Armstrong's Corkboard

Material—All insulation shall be Armstrong's Corkboard, 12 in. wide, 32 (or 36) in. long and 1½ or 2 in. thick, manufactured by Armstrong Cork & Insulation Company, Pittsburgh, Pa.

Application—***Masonry Walls***—The inside surfaces of all walls to be insulated shall be properly cleaned and freed of loose bits of mortar, etc. Directly against these walls, Armstrong's Corkboard, 1½ in. thick, shall be erected in a ½-in. backing of portland cement mortar, mixed in the proportion of 1 part of portland cement to 2 parts of clean, sharp sand. All joints shall be made tight and vertical joints shall be broken.

Frame or Brick Veneer Walls—Armstrong's Corkboard, 1½ in. thick, shall be securely nailed to the studs with galvanized nails 2½ in. long. Nine nails shall be used for each sheet of corkboard. All joints shall be made tight and vertical joints shall be broken.

Stucco Finished Frame Walls—Armstrong's Corkboard, 1½ in. thick, shall be securely nailed to the sheathing with galvanized nails 2½ in. long. Nine nails shall be used for each sheet of corkboard. All joints shall be made tight and vertical joints shall be broken.

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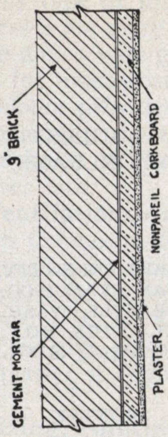

9" BRICK
NONPAREIL CORKBOARD
CEMENT MORTAR
PLASTER

Fig. 1

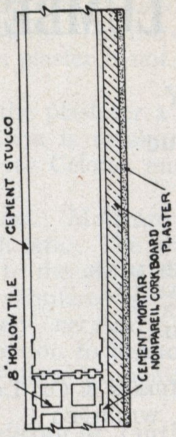

CEMENT STUCCO
8" HOLLOW TILE
CEMENT MORTAR
NONPAREIL CORKBOARD
PLASTER

Fig. 2

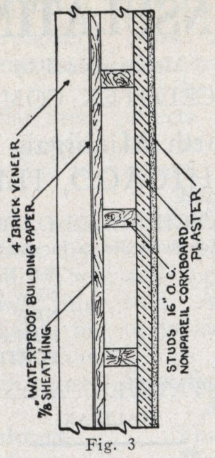

4" BRICK VENEER
WATERPROOF BUILDING PAPER
7/8 SHEATHING
STUDS 16" O.C.
NONPAREIL CORKBOARD
PLASTER

Fig. 3

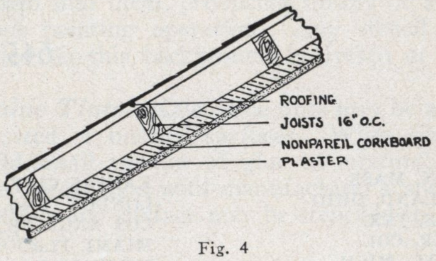

ROOFING
JOISTS 16" O.C.
NONPAREIL CORKBOARD
PLASTER

Fig. 4

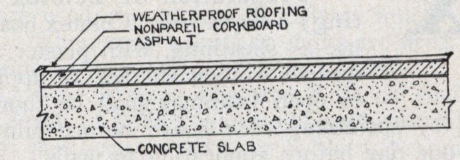

WEATHERPROOF ROOFING
NONPAREIL CORKBOARD
ASPHALT
CONCRETE SLAB

Fig. 5

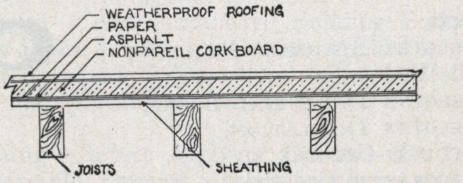

WEATHERPROOF ROOFING
PAPER
ASPHALT
NONPAREIL CORKBOARD
JOISTS
SHEATHING

Fig. 6

Details Showing Various Methods of Applying Armstrong's Corkboard

Magnesite stucco shall be applied directly against the surface of the corkboard or portland cement stucco shall be applied over metal lath secured to the corkboard in accordance with the stucco manufacturer's directions.

Ceilings and Roofs—Armstrong's Corkboard, 2 in. thick, shall be securely nailed to the joints (or rafters) with galvanized nails 3 in. long. Nine nails shall be used for each sheet of corkboard. All joints shall be made tight and short joints shall be broken.

Interior Finish—The exposed surface of the corkboard shall be plastered in accordance with the plastering specification.

Samples and Literature

Samples of Armstrong's Corkboard and a 40-page book, "The Insulation of Dwellings with Armstrong's Corkboard," containing detailed information and complete specification will be mailed on request.

Roof Insulation

Insulation of roofs of office, commercial and industrial buildings serves several important purposes. It conserves fuel in winter heating; keeps the upper floors cooler in summer and makes them more comfortable for employees and safer for the storage of goods that might be affected by excessive heat. It prevents condensation of moisture on underside of ceilings when there is excessive humidity. In textile and paper mills and other industrial plants where goods or machines might be harmed by drip from wet ceilings, roof insulation is absolutely essential.

Advantages—On most buildings, roof insulation should be placed on top of the slab with the roofing laid directly over it. (Figs. 5 and 6.) It must be firm enough to afford a substantial base so that there is no danger of the roofing being broken when walked upon. However, since there is always a chance that from some other cause a break may occur in the roofing and permit the entrance of water, a roof insulating material must be nonabsorbent of moisture.

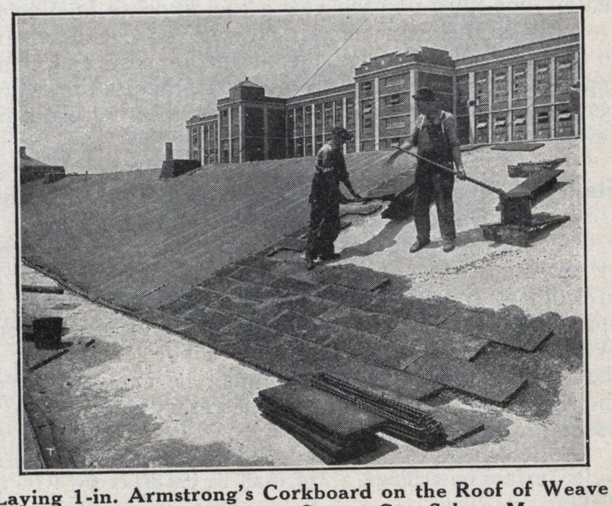
In structural strength, moisture resistance, and in heat retarding value, Armstrong's Corkboard is a most efficient insulation for building roofs, as it is for cold storage work. When laid, as shown (Figs. 5 and 6), in hot asphalt and with the surface mopped with the same material, it is so completely moistureproof that it will not be permanently affected by any chance leaks in the roofing. Armstrong's Corkboard is nonabsorbent and it has no capillarity. Unlike some insulating materials which are often ruined by moisture in a few months, Armstrong's Corkboard is a permanent insulation and by far the most economical.

Sizes and Thicknesses—Armstrong's Corkboard comes in sheets, 12x36 in. 1 to 6 in. thick, and is easily and quickly laid. The proper thickness for insulating against heat or cold, or to prevent condensation can be determined only by an analysis of conditions in each case, such as outside and inside temperatures, humidity, etc.

Short Specification—The roof shall be insulated with Armstrong's Corkboard of the proper thickness applied in accordance with the standard specification of Armstrong Cork & Insulation Company.

Further Information—The Engineering Department of this Company has collected considerable data on the subject of roof insulation and is prepared to furnish architects and engineers with specific and reliable information.

Inquiries will receive prompt attention.



Laying 1-in. Armstrong's Corkboard on the Roof of Weave Shed, Naumkeag Steam Cotton Co., Salem, Mass.

CELOTEX—INSULATING LUMBER

Manufactured by
THE CELOTEX COMPANY
645 North Michigan Avenue
CHICAGO, ILL.

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NEW ORLEANS, LA.

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CANADIAN REPRESENTATIVES: Alexander Murray & Co., Ltd.

TORONTO VANCOUVER HALIFAX WINNIPEG MONTRE

Products

- Celotex Standard Building Board.
- Celotex Industrial Board.
- Celotex Insulation.
- Acousti-Celotex.
- Decorative Celotex.
- Celotex Box Board.

CELOTEX
INSULATING LUMBER
TRADE-MARK

Celotex Insulating Lumber

A felted and waterproofed cane fibre board with heat insulating value of 0.33 B.t.u. per hour and strength in wall sections greater than horizontal pine sheathing. It has a higher sound insulation value than standard deadening felts.

Celotex Standard Building Board

Thickness, approximately, $\frac{7}{16}$ in.; average weight, 60 lb. per 100 sq. ft.; width, 4 ft.; lengths, 8 to 12 ft.

Principal Uses—

(A) Sheathing (and insulation) for frame and brick veneer buildings, replacing wood sheathing.

(B) With plaster applied directly to its surface (and insulation) replacing lath or plaster board.

(C) Roof insulation.

(D) Floor and wall sound deadener.

(E) Interior and exterior wall finish. (Can be painted or stained or left natural.)

Advantages—When properly insulated by the use of Celotex Standard Building Board as a part of the structure, a home or any other building becomes stronger, warmer, more quiet and more healthful. The house is free from drafts and dampness and a saving of approximately one-third of each year's fuel expense is effected.

All of this is accomplished with no extra expense to the builder in his original construction costs as Celotex replaces other materials. In addition, the use of Celotex permits of the installation of a smaller heating plant and fewer radiators.

Standard Specifications for the Application of Standard Building Board to Open Framing

Framing—The sills, studs, plates, joists and rafters or furring strips on masonry walls, shall be framed as in ordinary construction, taking precaution, however, to space the studs, joists and rafters 16 in. on centers. Wherever it is necessary to have a horizontal joint in the Celotex, a 2x4-in. header shall be cut in between the framing. No bracing is necessary other than is usual in frame construction.

Note: Where Celotex is used with plaster applied directly to its surface on ceilings, a 2x4 shall be cut in every 4 ft. for nailing.

Preparation of Celotex (Wetting)—*Important.* Celotex boards for use as sheathing, with plaster applied directly to their surface, or application to open framing, shall be thoroughly moistened by sprinkling each board before piling, not less than one day before application to walls.

Application—The Celotex boards shall be applied lengthwise of studs, joists and rafters, directly to the wood framework, and set in place so as to have a bearing for nailing along all edges.

Leave $\frac{3}{16}$-in. space between adjoining boards, also at top and bottom of boards. The board is cut a scant 4 ft. to allow for this space. Around window and door frames, or where a snug joint is desired, the Celotex shall be brought to moderate contact, but *do not* force into place.

Where rafters project beyond face of studding, Celotex shall be cut to fit snugly around rafters, and to form close joint with the roof insulation.

Nailing—Nail the Celotex to intermediate studs, beginning at top, then entirely around all edges of each board. Nail in like manner to joists, rafters, sills, plates and headers. Use standard 1½-in. galvanized roofing nails with ⅜-in. heads. Space nails 3 in. apart along edges for sheathing, and 2 in. apart for plaster and wall paper base, and 6 in. apart along intermediate rows, driving nails until the heads are $\frac{1}{16}$ to ⅛ in. below the surface of the Celotex. Nails shall be placed approximately ⅜ in. from the edge of the boards.

Note: Where Celotex is to be used as an interior finish, all exposed surfaces shall be nailed with 1¾-in. finishing nails spaced 3 in. on centers. They shall be driven at an angle of 30°, staggering the angles, and set in with a nail-set so that the heads will lie slightly below the surface of the Celotex.

Where Celotex is applied to wood strips on masonry walls use 1¼-in. nails with ⅜-in. heads.

Application of Plaster—Do not moisten Celotex after application before applying plaster. Prepared wood fibre or gypsum plaster containing not more than 10% of lime content shall be used. If neat gypsum plaster is used, mix 1 part with not more than 2 parts of clean, coarse, sharp sand, free from loam or other foreign matter.

If sanded gypsum plaster or gypsum wood fibre plaster is used, mix according to manufacturer's directions. Plaster that will "set" in 1½ to 2 hours should be used. Apply plaster directly to Celotex, in the same manner as applied to lath, pressing the plaster thoroughly into the joints between sheets of Celotex, completely filling joint to the lumber base. This forms a full key reinforcing the joint. The first coat must have a thickness of not less than ⅜ in. In all plaster work the finished plaster thickness shall be not less than ½ in.

Continued on next page

Any type of finish coat may be used, provided its thickness is not more than 1/8 in. The use of lime plaster, or lime mixed with gypsum plaster is not recommended, except for finish coat.

Celotex provides for the plasterer a wide flat area and sometimes the temptation is to skimp the plaster. The thickness of plaster over Celotex must be equal to that over lath.

Ventilation—*Important.* Moisture will not pass through Celotex as through lath. The plaster must dry by giving up its moisture to the air in the room. The room must be thoroughly ventilated to carry away this moisture. It is absolutely necessary, especially in winter, to give proper attention to heat and ventilation while plaster is drying. Failure to ventilate will cause trouble.

Sizing, Painting, Staining or Tinting Celotex—

Sizing—To secure maximum coverage, when oil paints are used, the surface of Celotex must be sized or primed. When water paints or stains are used, no sizing or priming is necessary.

(A) Glue Sizing—Dissolve [illegible] lb. of shell or chip glue in 3 gal. of boiling water and apply warm. Use no size that has been mixed over 8 hours. Apply swiftly and evenly. Coverage, approximately, 250 sq. ft. to the gallon of this mixture. When glue size is dry any oil paint or stain may be applied, or the board may first be tinted with a water stain (see specification below), then sized and oil paint applied with stencils.

(B) Oil and Silax Size—Dissolve 8 lb. of silax in 1 gal. of boiled linseed oil (cheaper oils may be used but results are not as good). Mix thoroughly and apply; coverage, approximately, 225 sq. ft. to the gallon of this mixture. This size is more expensive, but produces a very satisfactory surface and takes the place of one coat of oil paint.

(C) Casein Size—All casein sizes are produced with manufacturer's specifications for mixing and applying. The average coverage is, approximately, 275 sq. ft. per gallon of mixture. They are mixed with water. No casein size should be used that contains free lime. In markets where these sizes are not available The Celotex Company will recommend an appropriate brand.

Oil Paints—*Priming*—Instead of sizing, a priming coat containing one-third turpentine, one-third boiled linseed oil and one-third paint may be used. This should be brushed on swiftly and evenly.

Painting—Over a sized or primed surface, any paint may be used or painting effect produced.

Note: The above specifications apply equally to interior or exterior painting so far as the preparation of the walls is concerned.

Oil Stains—Oil, benzol, alcohol, acid or any other penetrating stain may be applied over glue or casein sizes in the usual manner. Oil and silax size produce a built-up white surface similar to one coat of white oil primer.

Water Paints and Stains—*Wood Stains*—All commercial stains used for dyeing wood may be used over Celotex without sizing. These are mixed in hot water and applied cold in accordance with manufacturer's specifications. The coverage is large, approximately 500 sq. ft. to the gallon, but the quantity of dye used depends upon the strength of tint desired. These tints should be applied swiftly and evenly with a large brush.

Paste Water Stains—Paste water stains are dry colors which are mixed with paste specially prepared by manufacturers and may be applied without the use of sizes, as the paste contains the necessary glue. They are mixed in accordance with manufacturer's specifications. Any color or tint may be produced. Due to the slow drying qualities of this material other color tints may be mottled into them, producing tiffany or antique effects in one painting operation. Any stencil effect can be applied on this background in fresco or japan colors.

Kalsomine Tints—Kalsomine tints may be applied over either sized or unsized surfaces. When sizing is not used, add small amount of glue to mixture. Mix and apply in accordance with manufacturer's specification. Any kalsomine surface may be stenciled in fresco or japan colors.

Specifications for Celotex as Interior Wall Finish for Application of Wall Paper, Sanitas or Canvas

For use in structures of moderate cost.

Material—Celotex Standard Building Board shall be used as a base for this application, applied in accordance with Standard Specifications with the following additions and precautions which govern this application:.

Framing—Before applying Celotex, the framing must be carefully checked. If studs require straightening, saw the concave side of the bowed studs about 2 in. and drive in a wood wedge until stud straightens.

Nailing—Nail all surfaces of the board except the edges, in accordance with Standard Specifications. On all outside edges space nails 2 in. on centers, and drive in until the heads are 1/16 to 1/8 in. below the surface of the board.

Sandpapering—Because of the close nailing and the fact that nails are driven in so far, there is a depression and roughness at joint. Wrap a piece of coarse sandpaper around a piece of 2x4 in. about 12 in. long, and sand with a circular motion, across the joint. Do not sand the depression out or to the nailheads, but just enough to smooth off rough or raised surface caused by nailing. Bring the surface of the two Celotex boards, except for depression at nails, to an even plane. Check surface of Celotex board at intermediate nailing; if raised, sand slightly in same way. Also sand well in joints between nails to keep edges from rising.

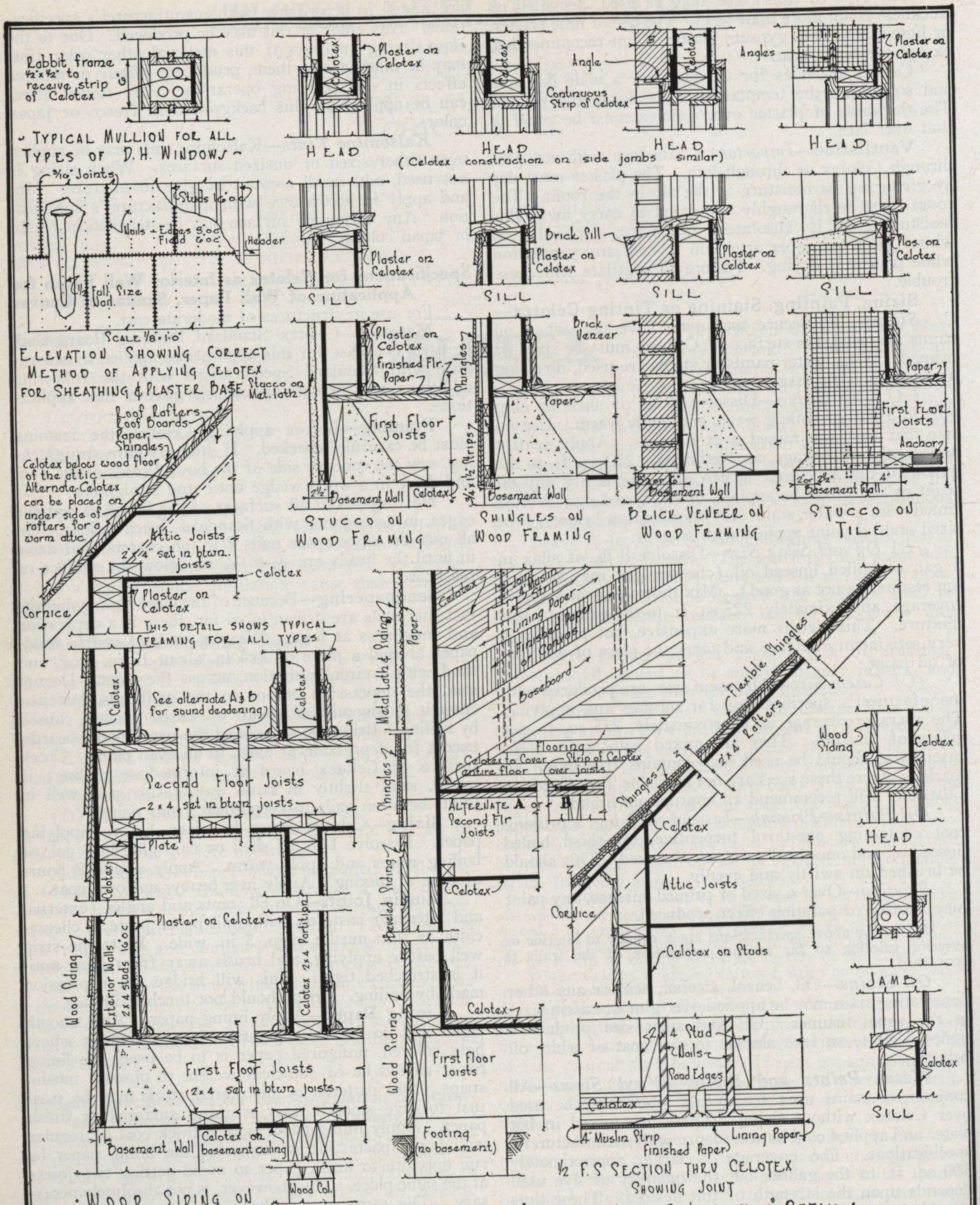
Sizing—Celotex must be sized before applying paper. Dissolve 1 lb. of shell or chip glue in 3 gal. of boiling water and apply warm. Apply within 8 hours of time of mixing. Apply in a heavy, uniform coat.

Muslin Joints—On all joints and angles (external and internal) paste on with wall paper paste, a cheesecloth or thin muslin strip, 5 in. wide. Paste the strip well before applying, and brush away from joint until it is stretched tight. This will bridge the depression made by nailing. Strip should not touch nailheads.

Lining Paper—Apply lining paper. Any smooth paper will do for this operation, but on ceilings where light colored, unfigured paper is to be used, the lining paper should be of sufficient weight to obscure muslin strips. Old patterns or discolored stock may be used just to give smooth, easy working surface for finish paper. Apply lining paper with a thick coat of regular wall paper paste. It is suggested the lining paper be run opposite to finish paper to avoid getting two joints at the same place. This, however, is not absolutely necessary. The same care in hanging is not needed as in finish paper, the important thing being not to use lap joints. This lining paper when dry bridges over depression made by nailheads, not touching them. It also strengthens muslin joints.

Finish Paper—Any desired paper, Sanitas or canvas, is then applied the same as over any wall surface.

Continued on next page

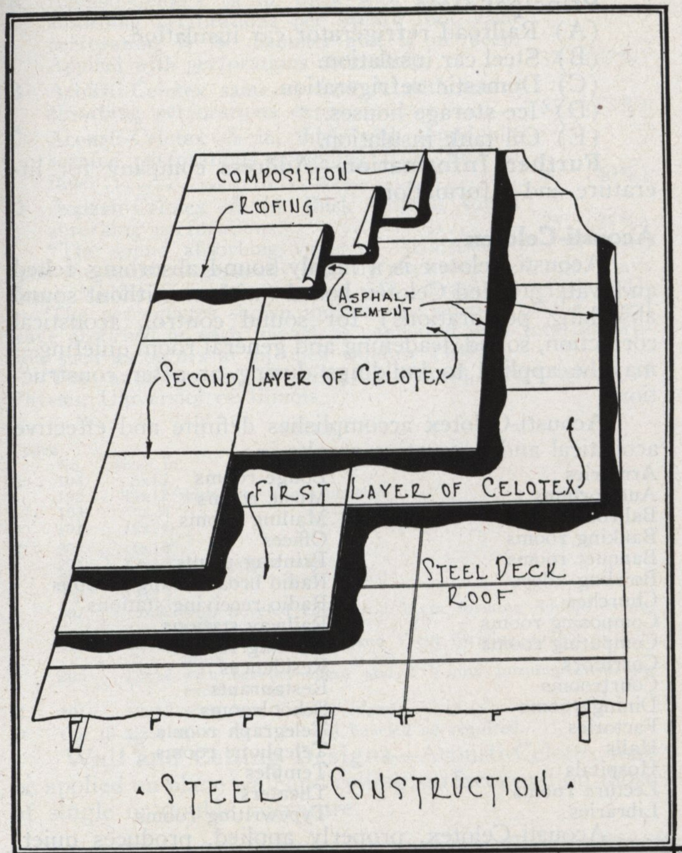

Rabbit frame ½"x½" to receive strip of Celotex
- TYPICAL MULLION FOR ALL TYPES OF D.H. WINDOWS -
Celotex
Plaster on Celotex
HEAD
Continuous Strip of Celotex
HEAD
(Celotex construction on side jambs similar)
Angle
Angles
Tile
Plaster on Celotex
HEAD
HEAD
3/16" Joints
Studs 16" o.c.
Nails - Edges 3" o.c. Field 6" o.c.
Header
1½" Full Size Nail
SCALE 1/8"-1'-0"
ELEVATION SHOWING CORRECT METHOD OF APPLYING CELOTEX FOR SHEATHING & PLASTER BASE
SILL
Plaster on Celotex
SILL
Brick Sill
Plaster on Celotex
SILL
Plaster on Celotex
Plas. on Celotex
SILL
Plaster on Celotex
Finished Flr.
Paper
Stucco on Met. lath
First Floor Joists
2½"
Basement Wall
Celotex
STUCCO ON WOOD FRAMING
Shingles
¾"x1½" Strips
Paper
Basement Wall
SHINGLES ON WOOD FRAMING
Brick Veneer
5½" or 2"
Basement Wall
BRICK VENEER ON WOOD FRAMING
Paper
First Floor Joists
Anchor
2" or 2½"
4"
Basement Wall
STUCCO ON TILE
Roof Rafters
Roof Boards
Paper
Shingles
Celotex below wood floor of the attic
Alternate-Celotex can be placed on under side of rafters for a warm attic.
Attic Joists
2"x4" set in btwn. joists
Celotex
Plaster on Celotex
Cornice
THIS DETAIL SHOWS TYPICAL FRAMING FOR ALL TYPES
Celotex
See alternate A & B for sound deadening
Celotex
Second Floor Joists
2x4 set in btwn joists
Plate
Celotex
Plaster on Celotex
Wood Siding
Exterior Walls 2x4 studs 16"o.c.
Celotex 2x4 Partition
First Floor Joists
2x4 set in btwn joists
Basement Wall
Celotex on basement ceiling
Wood Col.
· WOOD SIDING ON WOOD FRAMING
Metal lath & Siding
Paper
Shingles
Beveled Siding
Wood Siding
Celotex to Cover entire floor
ALTERNATE A or B
Second Flr. Joists
Celotex
Celotex
First Floor Joists
Footing (no basement)
Celotex
Joint
Muslin Strip
Lining Paper
Finished Paper or Canvas
Baseboard
Flooring
Strip of Celotex over joists
Flexible Shingles
2x4 Rafters
Shingles
Celotex
Attic Joists
Cornice
Celotex on Studs
Wood Siding
Celotex
HEAD
JAMB
Celotex
SILL
4 Stud
Nails
Pound Edges
Celotex
Muslin Strip
Lining Paper
Finished Paper
½ F.S. SECTION THRU CELOTEX SHOWING JOINT
· CELOTEX · COTTAGE HOME CONSTRUCTION DETAILS ·
R.L.N.

THE CELOTEX COMPANY

DETAILS SHOWING APPLICATION OF CELOTEX TO SEVERAL TYPES OF CONSTRUCTION

SHEET NO. 1
SCALE 3/4" EQUALS 1'-0"

Continued on next page


COMPOSITION
ROOFING
ASPHALT CEMENT
SECOND LAYER OF CELOTEX
FIRST LAYER OF CELOTEX
STEEL DECK ROOF
·STEEL CONSTRUCTION·

Celotex Industrial Board

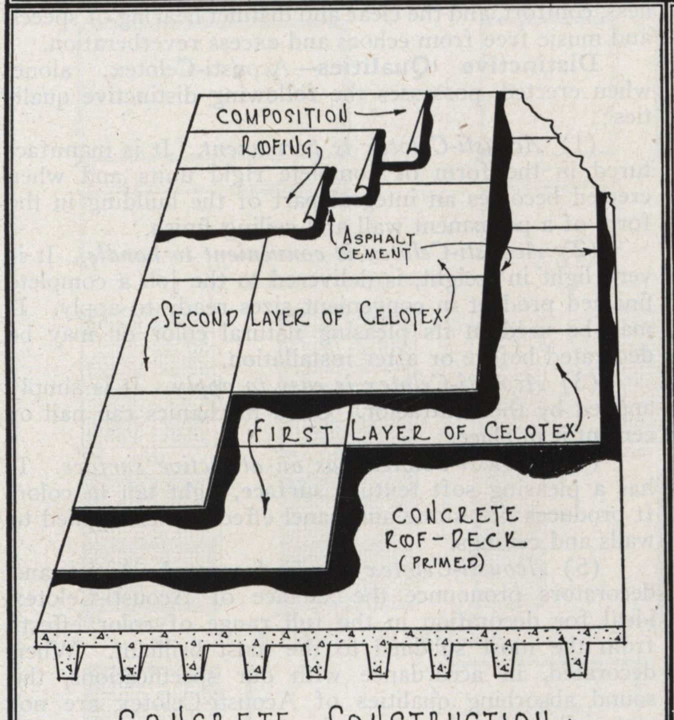
Thickness, approximately, ½ in.; average weight, 58 lb. per 100 sq. ft.; width, 3 ft.; length, 6 ft.

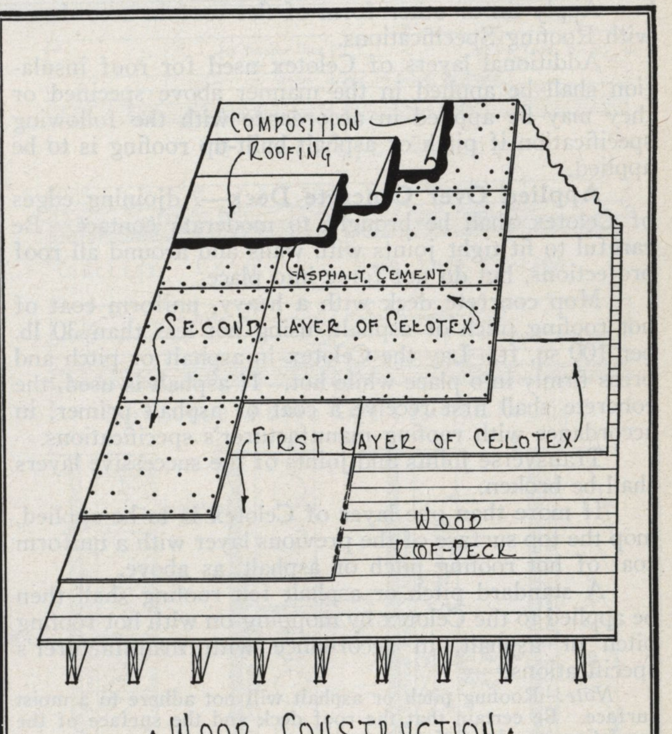
Celotex Industrial Board has greater insulating value than Standard Building Board but less tensile strength, hence should not be used as replacement of wood sheathing, with plaster applied, interior or exterior finish, for which purposes Standard Building Board is especially adapted.

Celotex Industrial Board is designed especially to meet important requirements for a firm, secure base for roof covering in the work of roof insulation. It is, also, ideally adapted for general insulation work and sound insulation in floors and partitions.

Fuel Saving—The great economic advantage of roof insulation is to conserve heat, thus saving fuel and money. The saving which will result from insulating the roof of a building can readily be computed. Such computation will indicate conclusively that an actual saving from 20% to 30% can be effected through proper insulation at the roof line.

Prevention of Condensation—Condensation or sweating on the underside of a roof is a source of damage and annoyance. It occurs at times under all types of non-insulated roofs. This condition of condensation or sweating develops when warm or heated air carrying a high percentage of humidity contacts with the cool surface of the underside of a roof deck causing the temperature of the air to drop to the dew point. The use of the proper amount of insulation will entirely eliminate the development of condensation except in extreme cases where insulation should be combined with some form of forced ventilation.


COMPOSITION
ROOFING
ASPHALT CEMENT
SECOND LAYER OF CELOTEX
FIRST LAYER OF CELOTEX
CONCRETE ROOF-DECK (PRIMED)
·CONCRETE CONSTRUCTION·


COMPOSITION
ROOFING
ASPHALT CEMENT
SECOND LAYER OF CELOTEX
FIRST LAYER OF CELOTEX
WOOD ROOF-DECK
·WOOD CONSTRUCTION·

THE CELOTEX COMPANY	CELOTEX INDUSTRIAL BOARD ROOF INSULATION DETAILS	SHEET NO. 3 NOT TO SCALE

Continued on next page

Protection from Outside Heat—It is an accepted fact that during the heat of summer the upper rooms of a building are a number of degrees hotter than the lower rooms. An accumulation of summer heat on the underside of the roof is the source of this trouble. This frequently develops an unbearable condition, making upper floors of houses and apartments untenantable. Insulation is as effective in keeping out sun heat in summer as it is in retaining the artificial heat in winter.

The sun temperature is frequently 30° and commonly 20° higher than shade temperature. With the sun shining on a non-insulated roof, the still air immediately under it is warmed by the heat that penetrates the roof to a temperature approximating the sun temperature. It is this blanket of warm air that makes the upper part of the building unbearable long into the night.

This can be prevented by insulating the roof so that heat can not readily pass through. It has been demonstrated that where upper floors of buildings have been properly insulated with Celotex, temperatures have been maintained within 2° of the outside shade temperature.

Specification for Application of Celotex Industrial Board

Applied Over Wood Deck—The Celotex shall be nailed to the wood deck, using 1½-in. standard roofing nails with ⅜-in. head, and spacing nails 1 ft. on centers. Nails in the body of the board shall be staggered. Nails shall be driven until the nailheads are $\frac{1}{16}$ to ⅛ in. below the surface of the Celotex.

Transverse joints and joints of successive layers shall be broken.

Be careful to fit tight joints with walls and around all roof projections, but *do not* force into place.

Apply tin or other form of flat roof in accordance with Roofing Specifications.

Additional layers of Celotex used for roof insulation shall be applied in the manner above specified or they may be applied in accordance with the following specification if pitch or asphalt built-up roofing is to be applied.

Applied Over Concrete Deck—Adjoining edges of Celotex shall be brought to moderate contact. Be careful to fit tight joints with walls and around all roof projections, but do not force into place.

Mop concrete deck with a heavy, uniform coat of hot roofing pitch or asphalt, using not less than 30 lb. per 100 sq. ft. Lay the Celotex in asphalt or pitch and press firmly into place while hot. If asphalt is used, the concrete shall first receive a coat of asphalt primer, in accordance with roofing manufacturer's specifications.

Transverse joints and joints of the successive layers shall be broken.

If more than one layer of Celotex is to be applied, mop the top surface of the previous layer with a uniform coat of hot roofing pitch or asphalt, as above.

A standard pitch or asphalt felt roofing shall then be applied to the Celotex by mopping on with hot roofing pitch or asphalt, in accordance with manufacturer's specifications.

Note: Roofing pitch or asphalt will not adhere to a moist surface. Be certain that the roof deck and the surface of the insulation are dry before mopping.

Where extreme humidity is to be dealt with, write company for recommendation.

Other Roof Decks—For steel and other roof decks apply in manner similar to above.

Celotex Insulation

Thickness ½ in.; average weight, 56 lb. per 100 sq. ft. Manufactured in special sizes to comply with the requirements of railroad car builders and other manufacturers.

Principal Uses—

(A) Railroad refrigerator car insulation.
(B) Steel car insulation.
(C) Domestic refrigeration.
(D) Ice storage houses.
(E) Oil tank insulation.

Further Information—Address company for literature and information.

Acousti-Celotex

Acousti-Celotex is a highly sound absorbing felted and waterproofed Celotex board (with or without sound absorbing perforations) for sound control, acoustical correction, sound deadening and general room quieting—may be applied to buildings during or after construction.

Acousti-Celotex accomplishes definite and effective acoustical and decorative results in:

Armories
Auditoriums
Ballrooms
Banking rooms
Banquet rooms
Bowling alleys
Churches
Composing rooms
Computing rooms
Corridors
Courtrooms
Dining rooms
Factories
Halls
Hospitals
Lecture rooms
Libraries
Lodge rooms
Music rooms
Mailing rooms
Offices
Printing plants
Radio broadcasting stations
Radio receiving stations
Railway stations
Reading rooms
Residences
Restaurants
Schoolrooms
Telegraph rooms
Telephone rooms
Temples
Theaters
Typewriting rooms

Acousti-Celotex, properly applied, produces quietness, comfort, and the clear and distinct hearing of speech and music free from echoes and excess reverberation.

Distinctive Qualities—Acousti-Celotex, alone, when erected, possesses the following distinctive qualities:

(1) *Acousti-Celotex is permanent.* It is manufactured in the form of complete rigid units and when erected becomes an integral part of the building in the form of a permanent wall and ceiling finish.

(2) *Acousti-Celotex is convenient to handle.* It is very light in weight, is delivered to the job a complete finished product in convenient sizes ready to apply. It may be used in its pleasing natural color or may be decorated before or after installation.

(3) *Acousti-Celotex is easy to apply.* It is simply applied by the contractor. Good mechanics can nail or cement it in place.

(4) *Acousti-Celotex has an attractive surface.* It has a pleasing soft texture surface, light tan in color. It produces tile, stone and panel effects when applied to walls and ceilings.

(5) *Acousti-Celotex may be decorated.* Artists and decorators pronounce the surface of Acousti-Celotex ideal for decoration in the full range of color effects from the most subdued to the most brilliant. When decorated, in accordance with our specifications, the sound absorbing qualities of Acousti-Celotex are not materially reduced.

(6) *Acousti-Celotex requires no membrane.* It requires no cotton cloth or other covering which must be renewed from time to time.

(7) *Acousti-Celotex is susceptible of plastic ornamentation.* It forms a bond with gypsum plaster of more than 700 lb. per sq. ft. and becomes an ideal surface for the application of any form of plastic ornamentation such as mouldings, borders, rosettes, etc.

Continued on next page

TYPES AND QUALITIES

Types	Description	Sound Absorbing Value	
A	Acousti-Celotex ⅞ in. thick with 400 sound absorbing perforations per square foot, each perforation ¼ in. diameter and ¾ in. deep. Applied with perforations concealed..........	*37	(37%)
B	Acousti-Celotex same as type A, with sound absorbing perforations exposed..............	55	(55%)
C	Acousti-Celotex $\frac{7}{16}$ in. thick with sound absorbing perforations extending from face to face	40	(40%)
D	Acousti-Celotex $\frac{7}{16}$ in. thick without sound absorbing perforations.........................	25	(25%)

*The sound absorbing value of Acousti-Celotex is based upon the standard generally used by physicists (C4, one octave above Middle C, a frequency of 512 vibrations per second).

The percentages shown indicate the portion of the sound wave absorbed at each impact as compared with total absorption such as occurs at an open window (100%).

The authority is Dr. F. R. Watson, Department of Physics, University of Illinois.

SIZES

Types	No.	Sizes, in.	
A	104	6x12	
	102	12x12	with four edges beveled
	103	6x24	
	101	12x24	
B	203	6x12	
	201	12x12	with square edges
	204	6x12	with four edges beveled
	202	12x12	
	207	6x12	with beveled edges and V-cut forming double 6x6-in. units
	205	12x12	with beveled edges and V-cut forming double 6x12-in. units
	206	12x12	with beveled edges and 2 V-cuts forming quadruple 6x6-in. unit
C	301	12x12	with four beveled edges
D		Cut to sizes up to 4x12 ft. and beveled as required.	

Wall and Ceiling Designs—Acousti-Celotex may be applied on plane wall and ceiling surfaces and on those of single or double curvature.

Acousti-Celotex types, sizes and beveling permit of a wide range of designs and patterns, such as square tile and rectangular tile patterns, regular, varying coursed and random ashlar patterns, basket weave and herringbone patterns.

Type D being cut to order, admits of panels of any size up to 4x12 ft.

Application of Acousti-Celotex—Acousti-Celotex units or tiles of all types are generally applied to wood furring strips by nailing. Cement coated nails are recommended. Finishing nails may be used if driven at varying angles and with nailheads countersunk. The furring strips are usually 1x2 or 1x3 in. and spaced 6 or 12 in. on centers, in accordance with the requirements of the design and size of units, the method of attaching the furring strips depending on the type of wall and ceiling construction.

Specifications—Address company for specifications and details for erection of Acousti-Celotex.

Decorative Celotex

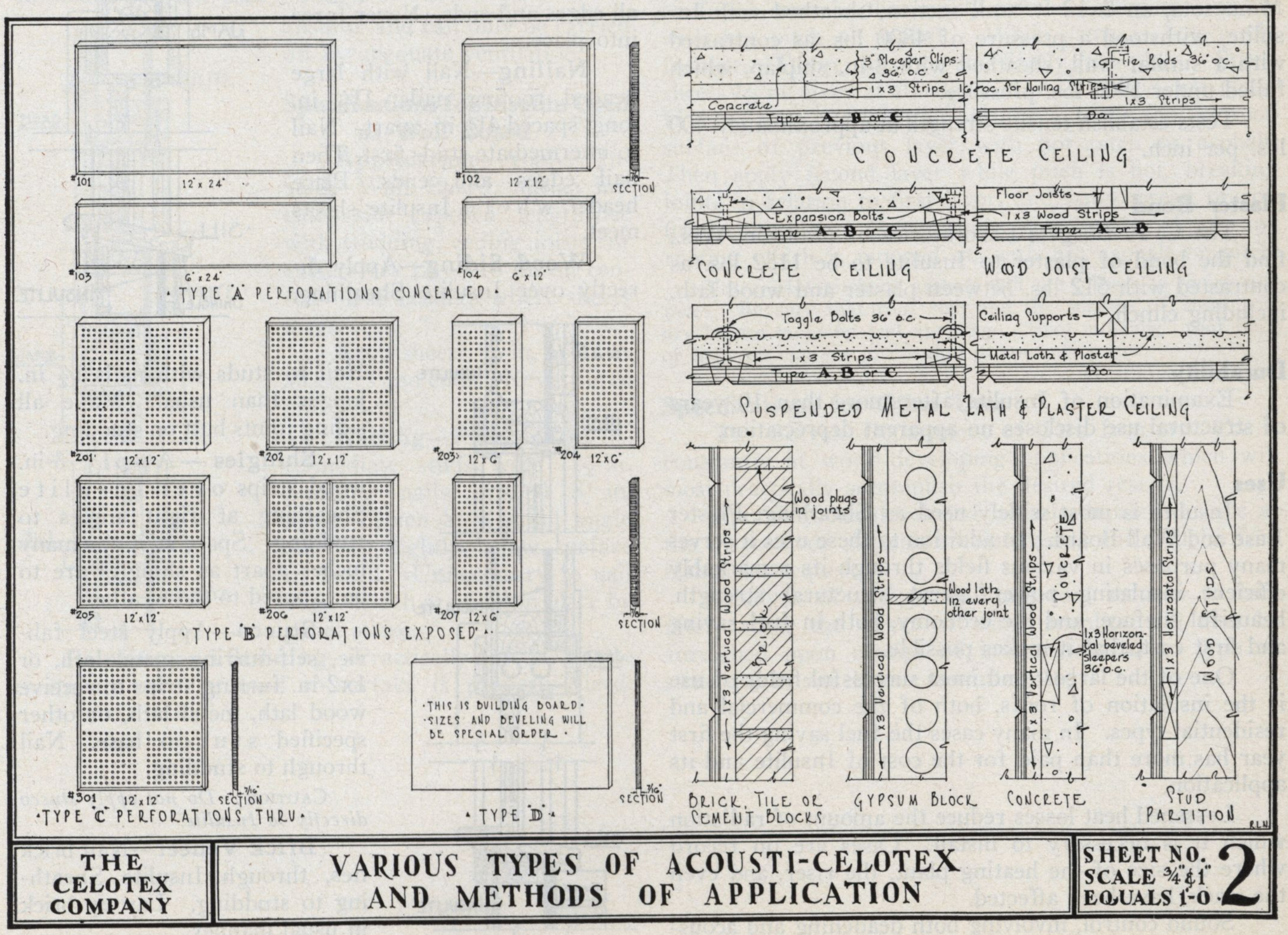
Selected Standard Building Board and Acousti-Celotex used for interior wall finish and decorated with stains, paints and other forms of interior wall treatment.

Address company for literature and information. See Specifications and Details for Celotex Standard Building Board and Acousti-Celotex for methods of erecting decorative Celotex.

Celotex Box Board

A special board produced for box and shipping case manufacturers.

Address company for literature and information.


#101
12"x 24"
#102
12"x 12"
SECTION
#103
6"x 24"
#104
6"x 12"
·TYPE 'A' PERFORATIONS CONCEALED·
#201
12"x12"
#202
12"x12"
#203
12"x6"
#204
12"x6"
#205
#206
12"x12"
#207
12"x6"
SECTION
·TYPE 'B' PERFORATIONS EXPOSED·
#301
12"x12"
SECTION
·TYPE 'C' PERFORATIONS THRU·
·THIS IS BUILDING BOARD·
·SIZES AND BEVELING WILL
BE SPECIAL ORDER·
SECTION
·TYPE 'D'·
3" Sleeper Clips 36" O.C.
1x3 Strips 12" o.c. for Nailing Strips
Concrete
Type A, B or C
Tie Rods 36" o.c.
1x3 Strips
Do.
CONCRETE CEILING
Expansion Bolts
Type A, B or C
CONCRETE CEILING
Floor Joists
1x3 Wood Strips
Type A or B
WOOD JOIST CEILING
Toggle Bolts 36" o.c.
1x3 Strips
Type A, B or C
Ceiling Supports
Metal Lath & Plaster
Do.
SUSPENDED METAL LATH & PLASTER CEILING
Wood plugs in joints
1x3 Vertical Wood Strips
Wood lath in every other joint
1x3 Vertical Wood Strips
CONCRETE
1x3 Vertical Wood Strips
1x3 Horizontal beveled sleepers 36" o.c.
1x3 Horizontal Strips
WOOD STUDS
BRICK, TILE OR CEMENT BLOCKS
GYPSUM BLOCK
CONCRETE
STUD PARTITION
R.L.H.

THE CELOTEX COMPANY

VARIOUS TYPES OF ACOUSTI-CELOTEX AND METHODS OF APPLICATION

SHEET NO. 2
SCALE ¾"=1'
EQUALS 1-0

THE INSULITE CO.

SUBSIDIARY OF MINNESOTA & ONTARIO PAPER COMPANY

GENERAL OFFICES
Builders' Exchange Building
MINNEAPOLIS, MINN.

MILLS: INTERNATIONAL FALLS, MINN., AND FORT FRANCES, ONTARIO, CAN.

Insulite

Products

INSULITE, a strong, efficient, board-form insulation that is practical and desirable for use as Sheathing, Plaster Base or Wall Board or for any uses where fuel economy, all-year comfort, sound control or strong, economical construction is desired.

Nature

Insulite is made by felting together long, tough, wood fibers into sheets of 4 ft. wide, ½ in. thick and from 8 to 12 ft. in length.

Insulation

Tests by the United States Bureau of Standards place conductivity of Insulite at 7.1 B.t.u. per inch thickness per square foot, per degree Fahrenheit difference, per 24 hours.

Strength

In tests made by Prof. F. R. Rowley, University of Minnesota, an 8x12-ft. wall section, sheathed with Insulite, withstood a pressure of 4800 lbs. as contrasted with a similar wall, sheathed with 8-in. shiplap, which failed under 1900 lbs. pressure.

Tests establish tensile strength at approximately 400 lbs. per inch.

Plaster Bond

The C. F. Burgess Laboratories of Madison, Wis., find the bond of plaster to Insulite to be 1152 lbs. as contrasted with 512 lbs. between plaster and wood lath, including clinch.

Durability

Examination of Insulite after more than 10 years of structural use discloses no apparent depreciation.

Uses

Insulite is most widely used as Sheathing, Plaster Base and Wall Board. In addition to these uses it serves many purposes in various fields through its remarkably efficient insulating power, great structural strength, beautiful surface, and the economy, both in fuel saving and first cost, that it makes possible.

One of the largest and most successful fields of use is the insulation of roofs, both of the commercial and residential types. In many cases the fuel saving the first year has more than paid for the cost of Insulite and its application.

Lessened heat losses reduce the amount of radiation which it is necessary to install. Cases are on record where the size of the heating plant, the riser, and even the stack, have been affected.

Sound control, involving both deadening and acoustical correction, has been an especially successful field.

Many laundries and industrial buildings have eliminated condensation through the use of Insulite.

Other places of use include refrigerators of all types, from the largest to the smallest domestic box, dairy barns, poultry houses, fruit and vegetable warehouses, laboratories, auditoriums, etc.

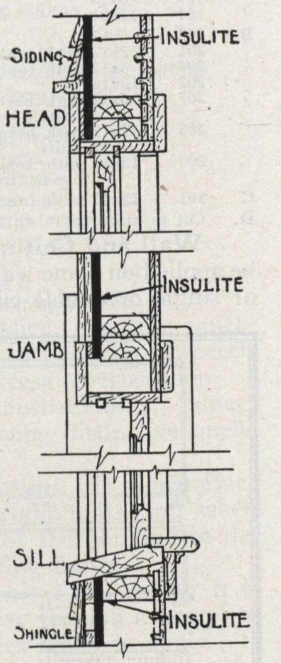
Specifications for Insulite Used as Sheathing

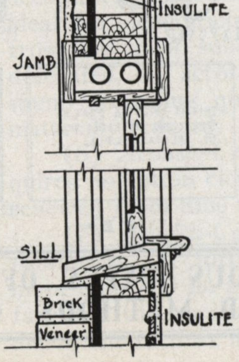
Application—Apply Insulite vertically, directly to studding set on 18-in. centers. If studs are crooked, straighten by sawing half way through concave edge and driving wedge into saw cut until stud is straight.

Keep sheets ¼ in. apart at all edges and ends. Never force into place.

Nailing—Nail with large headed roofing nails, 1½ in. long, spaced 4½ in. apart. Nail to intermediate studs first. Then nail edges and ends. Place header where Insulite sheets meet.

Wood Siding—Apply directly over Insulite Sheathing. Nail to studs with nails ½ in. longer than usual. Make all siding joints butt on studding.





Shingles—Apply 3-in. wood strips over Insulite Sheathing at right angles to studding. Space strips as many inches apart as shingles are to be exposed to the weather.

Stucco—Apply steel fabric, self-furring metal lath, or 1x2-in. furring strips to receive wood lath, metal lath, or other specified stucco base. Nail through to studding.

CAUTION: *Do not apply stucco directly to Insulite.*

Brick Veneer—Nail brick ties, through Insulite Sheathing to studding. Lay up brick in usual manner.

Continued on next page

Specifications for Insulite Used as Plaster Base

Before applying Insulite in cold or damp weather, thoroughly dry building by providing heat and ventilation. If this is impossible, sprinkle sheets with water about four hours before applying and ventilate as much as possible.

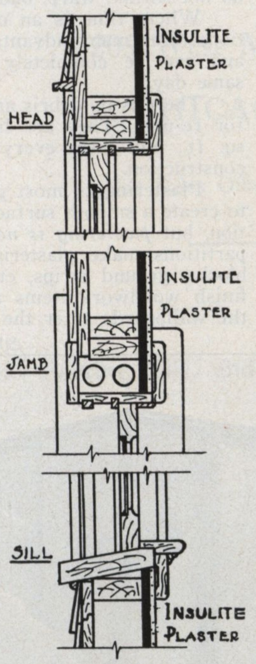
Application—Apply Insulite Plaster Base, burlap finished side exposed, lengthwise with studding, ceiling joints, or rafters, set 12 or 16 in. on center.

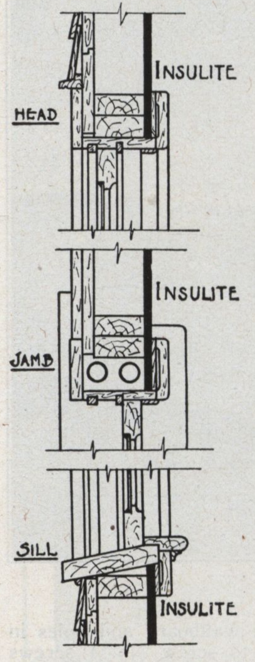
Keep sheets ¼ in. apart at all edges and ends. Never force into place.

Nailing—First nail intermediate studs with 4d box nails, 4½ in. on center. Then nail edges. At sills and plate, nail ends of sheets with only three nails; one 8 in. from each end and one in center of sheet.

It is good practice to apply a 4-in. strip of expanded metal lath in all corners to reinforce plaster and reduce possibility of corner cracks.

Plastering — Apply hard wall plaster, not less than ⅜ in. thick, according to plaster manufacturer's specifications. While plaster is drying in cold weather, it is absolutely necessary that the rooms be well ventilated. Moisture can not pass through Insulite and can only be carried off by adequate ventilation.





Specifications for Insulite Used as Wall Board

Application—Apply Insulite Wall Board, burlap finished side exposed, lengthwise with studding, ceiling joists, or rafters set 12 or 16 in. on center. Use headers where sheets meet.

Keep sheets ¼ in. apart at all edges and ends. Never force into place.

Nailing—First nail to intermediate studs with 1½-in. finishing nails, spaced 8 in. apart, driven at a slight angle and set slightly below surface of board. Unnecessary to nail edges which are held in place by panel strips.

Painting and Staining—Practically any decorative treatment may be used if surface is properly sized. Insulite Self-Sizing Paint is recommended as a size or finish. Chip glue size may be used.

Insulite Self-Sizing Paint—Especially designed for sizing and finishing the surface of Insulite Wall Board. It seals the surface without penetrating the board. Does not lessen the insulating efficiency. Information on request.

Exterior Finish

Insulite may be exposed to the weather after being painted with two coats of Insulite Self-Sizing Paint and two coats of oil paint.

Battens—After finishing surface as desired, cover all joints with batten strips and apply such other strips as are needed to obtain the desired panel effect.

Specifications for Insulite Used as Roof Insulation

Wood Decks—Apply Insulite directly to the roof boards, spacing sheets ⅛ in. apart. First nail center of sheets at random, about 14 in. on center. Then nail edges and ends 12 in. on center. Use 3d galvanized shingle nails. Apply any satisfactory roofing in proper manner. If more than one layer of Insulite is to be applied, use only sufficient 3d shingle nails to hold first layer in place. Apply second layer directly on first, breaking all joints. Space sheets ⅛ in. apart all around. Nail as before, but use 4d galvanized shingle nails.

Note: If it is desired to provide against dripping of tar or asphalt through wood deck, apply layer of dry felt over roof boards before applying Insulite.

Concrete or Tile Roof Slabs—If asphalt is used, roof slab must be thoroughly primed. Mop thoroughly with hot pitch or asphalt. While same is hot, apply Insulite. Tamp, press or roll firmly into place. Space sheets ⅛ in. apart at all edges. *Do not crowd into place.* If more than one layer of Insulite is to be applied, mop surface of previous layer with hot pitch or asphalt. Then apply second layer while pitch is hot, breaking joints in relation to first layer, and tamp, press, or roll firmly into place. Space sheets ⅛ in. apart. Apply any roofing which is mopped on with hot asphalt or pitch.

Note: Hot pitch or asphalt will not adhere to moist surfaces. Be sure that roof slab and the surface of Insulite is dry before mopping and applying. "Spot mopping" roof deck or between courses of Insulite is not sufficient.

Specifications for Other Uses

The Service Department of THE INSULITE CO. is constantly at work developing applications which will most practically accomplish the desired results.

Specifications developed by this department are at the disposal of all who are interested and will be furnished on request.

Analysis of various wall and roof sections to definitely show the effect of using Insulite will also be furnished upon receipt of information as to type of structure in which you are interested.

RYBER MANUFACTURING COMPANY

414 Board of Trade Building, INDIANAPOLIS, IND.

Pronto Partitions (Fireproof without Plaster)

Pronto partitions have been created and designed to meet the increasing demand for a construction that will give satisfactory and permanent results for building interiors, partitions, wall furring and ceilings, *without the use of plaster.*

Steel studs properly covered with protective paint, made for straight walls, corners, wall furrings, etc., together with special screws, make possible the application of gypsum wallboard direct to the surface of the studs, and leave no protruding elements to mar the smooth finished surface of the wallboard. By exercising a reasonable amount of care in the erection and application of the filler, the finished result will satisfy the most critical.

After the wallboard has been applied, the joints between the boards and the countersunk screw heads are filled with wallboard joint filler or finisher, and the resulting surface is smooth and ready for decoration.

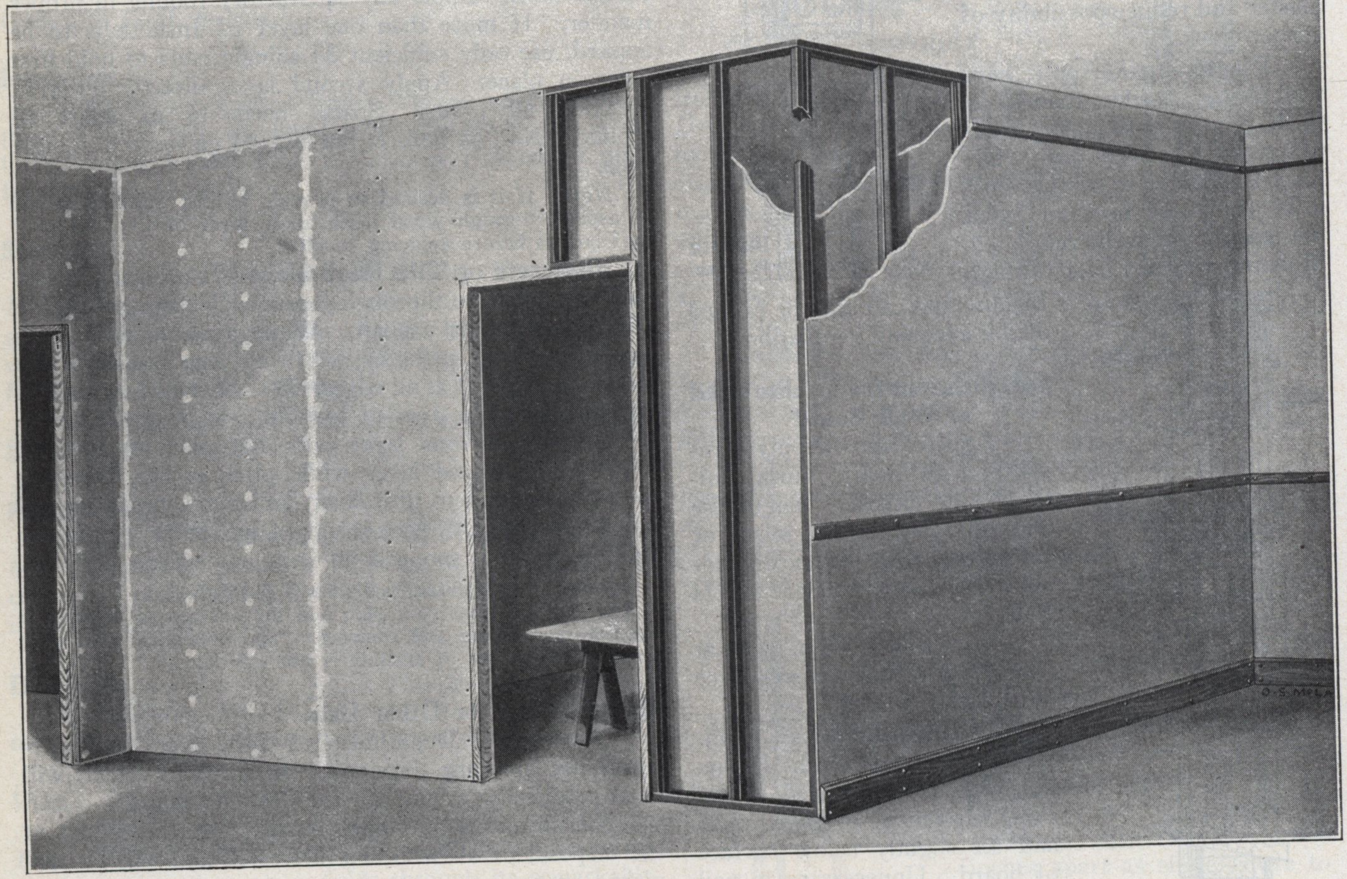
Pronto partitions make possible the installation of a non-plastered construction under the heading of *incombustible* or *fireproof.* They are ideally adapted for office buildings, hotels, schools, store buildings, etc., where rapid construction is desired and where the walls are to be decorated with calcimine, paint, Kraftex, Textone, linen fabrics, wall paper, etc.

Steel studs and gypsum wallboard are both materials that do not shrink, warp, buckle or burn.

Where time is an element for consideration, Pronto partitions offer many advantages. They require no drying out time and can be completely erected and the walls decorated the same day.

There is no debris and the *materials can be entirely salvaged* for re-use. They are light in weight, weighing only 5 lb. per sq. ft., and meet every requirement for non-bearing partition construction.

Plastering is most generally used on fireproof construction to create a smooth surface for finished appearance or for decoration, but *plastering is not essential to good decoration.* Pronto partitions make plastering unnecessary and require no ground blocks, ground strips, etc., as baseboards, chair rail and other finish woodwork items are attached directly to the surface of the wallboards after the installation has been completed.



Specifications for Pronto Partitions

After rough door or window bucks or frames of 2x4-in. stock have been erected or placed, set Pronto floor and ceiling plates properly plumbed, anchored to the floor and ceiling, using nails, toggle bolts or whatever the rough construction requires for permanent attachment.

Set Pronto whole and half studs vertically in the floor and ceiling plates.

Half studs to be set where walls intersect. Whole studs to be used for all other locations except corners. Studs to be set on 16 in. centers.

Gypsum wallboards 4 ft. wide, cut to size if necessary, are to be placed against the Pronto studs on each side.

Factory folded edges of board to be butted tight. Cut edges to be filed down to leave an open joint for filler.

Wallboards to be attached to studs, using Pronto punch for making holes and countersinking in wallboard and holes in stud, and using a spiral screw driver to screw No. 1 screws through board and into stud.

Wallboard should be screwed to intermediate studs first and edges last, spacing the screws on 12-in. centers on intermediate supports and 9-in. centers on all edges.

After wallboards have been completely attached, properly countersinking the screws, sandpaper the rough particles of paper to create a smooth surface and fill all joints and screw heads with wallboard joint filler or finisher.

After joint filler has been applied, properly sanded down to create a smooth surface, attach the baseboard, chair rail or other woodwork items as specified elsewhere. These wood accessories to be attached by the use of No. 1½ Pronto round head screws. Decoration to be as desired.

UNITED STATES GYPSUM COMPANY

Gyp-Lap, Fireproof Sheathing

205 West Monroe Street

CHICAGO, ILL.

For Sales Offices, see page 374

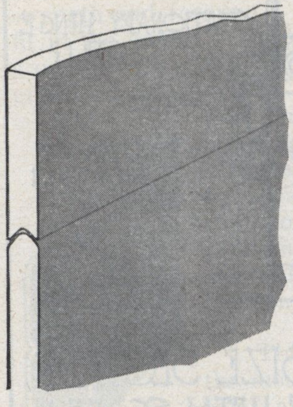
Product

Gyp-Lap, Fireproof Sheathing.

For Filler Tile, Partition and Furring Tile, and Column Covering, see pages 200-201; for Plaster Base, see page 449; for Structolite Concrete, see pages 352-355; for Gypsum Plasters and Finishes, see pages 374-376; for Stucco, see page 397; for Reinforced Roof Tile and Monolithic Roof, see pages 1076-1079; for Insulation and Sound Deadening, see page 1094; for Wall Board, see page 1339.

Gyp-Lap

Description—Gyp-Lap is a gypsum sheathing and insulating material for frame, brick veneer, or stucco construction. It consists of a ½-in. gypsum core protected by a tough, waterproofed, fibre paper covering. It is manufactured in wide sheets 8 ft. long with patented interlocking edges which insure tight joints and make the use of building paper unnecessary.

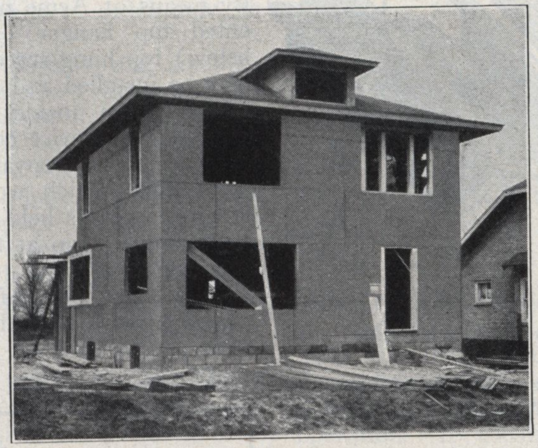


Interlocking Edges

The patented interlocking edges of Gyp-Lap permanently seal joints against wind seepage. The ⅜-in. thickness of gypsum assures maximum heat, cold, and sound resistance

When used as sheathing, Gyp-Lap is nailed directly to the studding with 6d cement coated common nails. The material is also an effective insulator, sound deadener, and fire stop when nailed to the joists between floors.

Advantages—Gyp-Lap is easily handled and a building can be sheathed with the large sheets in a surprisingly short time. A snug fit around openings can always be obtained as Gyp-Lap saws as readily as lumber. The sections are extremely strong and, when nailed in place, brace the entire structure against racking wind stresses. The patented interlocking edges fit together perfectly and, as Gyp-Lap can not warp or buckle, the wall is thus permanently sealed.



Residence Sheathed with Gyp-Lap

Residence sheathed with Gyp-Lap and ready for application of stucco, brick veneer, or siding. Building paper is not required as the patented Gyp-Lap joints interlock perfectly. Notice that joints are reduced to a minimum because of the large size of the Gyp-Lap sections

Gyp-Lap can not burn and it acts as a barrier to the spread of flames. This feature is particularly valuable when Gyp-Lap is used between floors and under roofs. The gypsum core of Gyp-Lap is an effective insulator and, as this gypsum contains myriads of confined air cells, the insulating and sound deadening value of the material is increased.

The fibre paper covering of the board is specially treated to resist moisture and Gyp-Lap offers an ideal backing for stucco because it forms a perfect bond, will not absorb water from the stucco, and provides a rigid base.

Directions for Applying Gyp-Lap

Apply Gyp-Lap to the framework with length crosswise of the studs.

Always place grooved side down. Place trademark in.

Fasten securely with 6d cement coated or galvanized common nails, 4 in. apart on each stud and ⅜ in. from the edge of the boards.

Butt the ends tightly and interlock the side edges.

Stagger vertical joints.

Fit tightly around all door and window frames.

When Gyp-Lap is used as a base for Oriental Stucco exteriors, a No. 14 gauge galvanized wire reinforcement should be applied over the entire wall. Mesh should be not over 2 in. square and crimped so that it will be self-furring.

ACME METAL MFG. CO.

Not Incorporated

1211 Clybourn Avenue
CHICAGO, ILL.

DEALERS EVERYWHERE

Product

Acme Steel Window Screens.

Construction of Acme Steel Window Screens

Acme steel window screens are rewireable and made of No. 16 gauge steel. They are better than wood screens, are more lasting and attractive in appearance and the cost is low.

Frame—The frame consists of but two interlocking steel members, between which the wire is held taut and firm. There are no splines, rods, rivets, screws or other wire cloth holding devices used.

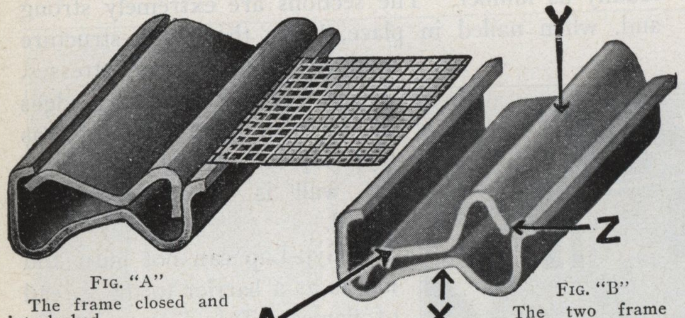


Fig. "A"
The frame closed and interlocked

Frame Details

Fig. "B"
The two frame members closing on the wire cloth

Lay a block of wood at point "Y" and hit the wood with hammer and the frame closes on wire cloth and stretches it taut.

To open frame to rewire, lay a wedge of wood at point "A" and hit with hammer. You are then ready to rewire frame.

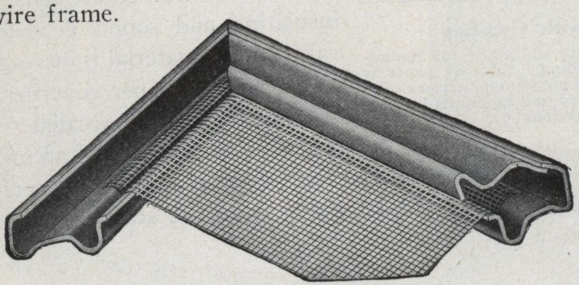


Fig. "C" Corner Detail

A corner part with top member in position ready to lock on wire cloth. Top member is mitered at the four corners and when closed and locked the opening is scarcely noticeable

Rustproofing—Every part of Acme steel frame screens is thoroughly rustproofed by the Meaker process of cold electro-galvanizing; this is done after all parts have been cut.

Enameling—The enamels used are the highest grade obtainable and are baked on.

Types of Acme Steel Window Screens

Acme screens are made to properly screen any type of window. We have lately patented different kinds of hardware to properly install any type of screen in a way that is not complicated, and is unbreakable.

Half Sliding—For covering the lower half of double hung windows (Fig. D). Screen slides in steel guide strips placed on blind stops. Two hand lifts are attached to bottom rail of screen.

Side Hung—For hinged sash openings. Screen is equipped with pivot bolts or loose pin hinges to swing out and in. When closed it is held with latch bolt.

Top Hung—For covering entire window opening, on double hung or casement windows. By means of Acme patented top hanger (see below) top hung screens may be installed and removed from inside of room. This device consists of two removable pivot bolts which work in hinge sockets held by a stationary strip at top of window, permitting screen to swing in and out.

On each side of screen near bottom is a brass fastener which securely locks the screen and is invisible from the outside.

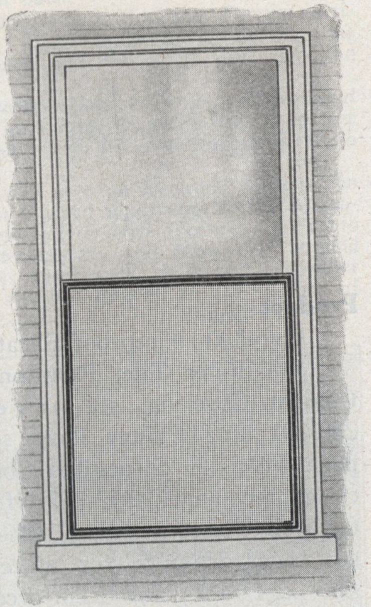
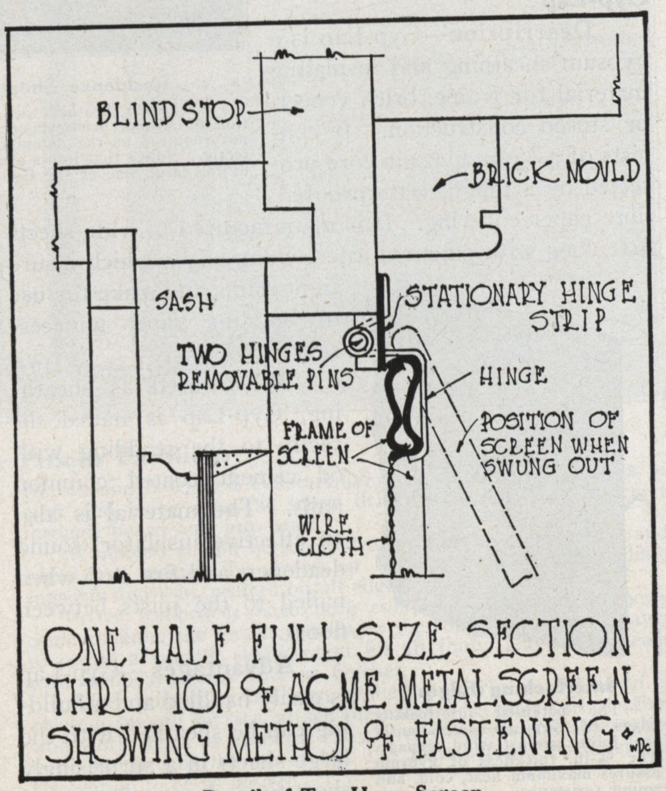


Fig. "D" Half Sliding Screen


BLIND STOP
BRICK MOULD
SASH
STATIONARY HINGE STRIP
TWO HINGES REMOVABLE PINS
HINGE
FRAME OF SCREEN
POSITION OF SCREEN WHEN SWUNG OUT
WIRE CLOTH
ONE HALF FULL SIZE SECTION THRU TOP OF ACME METAL SCREEN SHOWING METHOD OF FASTENING
wpc

Detail of Top Hung Screen

THE W. J. BAKER COMPANY

All-metal Window Screens and Metal Weather Strips

NEWPORT, KY.

Products

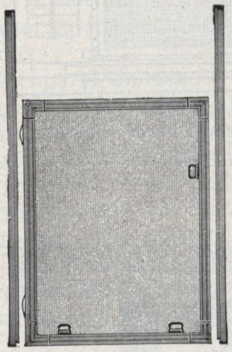
Baker's Improved All-metal Window Screens and Metal Weather Strips.

Also manufacturers of high grade Door Screens.

Services and Facilities

Twenty-nine years of experience in the manufacture of screens together with the facilities of a modern, fully equipped screen factory and choice stocks of material are at the service of the architect, builder and home owner.

Baker's All-metal Window Screens


Sliding Screen
Showing guides

Baker's improved all-metal window screens are designed to replace the old style, inconvenient and unsightly wood frame screens. They are made to order only, to fit openings.

These screens are so constructed that the greatest possible strength is secured without excessive weight. The frames are made of heavy cold rolled steel well galvanized with pure zinc, or of hand drawn copper. Metal runs or guides are secured to the window frames to hold screens in place and allow them to slide up and down easily. Wire cloth is of highest grade copper wire.

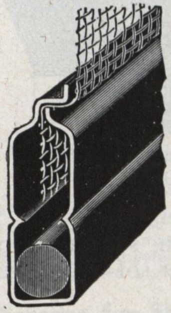
Their neat narrow frames, practically invisible in the window, admit a free passage of light and air. No shrinkage, swelling or warping; slide easily; are quickly removed; always fit the window perfectly.

They are made in the two types (with lapping edge and with rewireable feature), described and illustrated below.

Lapping Edge Screen

This is an exclusive, patented type of screen in which the moulding is formed in angles, supplying great strength and forming a square end that insures perfect fit in the guides. The moulding is then clamped about a one-piece frame made of ¼-in. galvanized rod, which gives a solid support. In clamping, the shape of the moulding causes one edge to overlap the other and the wire cloth which passes between the edges is stretched perfectly tight and held as in a vice, allowing the cloth no chance to sag. The edges of the moulding, which come in contact with the cloth, are rounded perfectly to prevent any possibility of the cloth being cut.

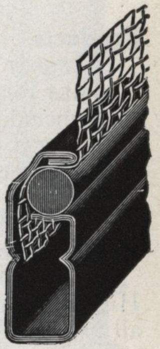
This type of construction makes the moulding more rigid, gives an "inside" and "outside" appearance to the screen, forms a perfect watershed and effectively seals the moulding from water and dirt.


Lapping Edge Screen
Actual size

Rewireable Screen

In the rewireable type of screen, the ¼-in. galvanized rod is placed on the outer surface of the screen and can be easily taken out when new cloth is needed. The rod which encircles the entire frame holds the cloth secure and greatly strengthens the corners.

In all other details the construction of this screen is similar to that of the lapping edge type described above.

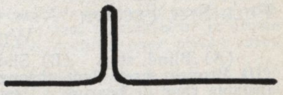

Rewireable Screen
Actual size

Wire Cloth

The standard size of wire cloth furnished with Baker's all-metal screens is 16 mesh, or 16 openings to the inch. For special work or in the South, 18 mesh is furnished. For places from which it is necessary to exclude fine particles of dust, 24 to 40 mesh, as the case may demand, is furnished.

This cloth is made of unalloyed copper. It is tough and durable, will not rust or corrode, requires no paint or lacquer, affords clear passage of light and air, is uniform in color and so delicately shaded as to be almost invisible. This wire has resiliency and strength equal to that of steel wire.

Baker's Metal Weather Strip

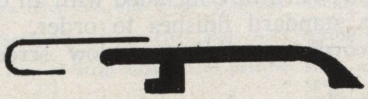

Baker's Metal Weather Strip
For double hung windows

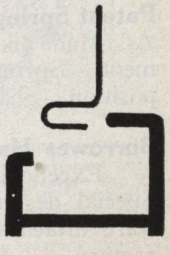
Baker's metal weather strip for double hung windows is extremely simple in construction and efficient in operation. It consists of a strip of zinc folded lengthwise into a T shape so that the upright portion fits into a groove made in the wood of the sash. The sashes run on this zinc track, which holds them true and steady in place and completely eliminates rattling, entrance of dust or cold air, and frictional resistance of the surrounding woodwork. Being made of zinc, it can not rust, and is permanent and will last as long as the house stands.

Baker's Extruded Brass Channel Bars

Positively rainproof equipment for casement windows. The heavy hook strip is placed on the bottom of the sash and engages the brass channel, making it impossible for rain to beat in. The only satisfactory weather strip for use on casements opening in.

The brass threshold and hook for doors operates on the same principle as the channel bar.


Brass Threshold and Hook


Channel Bar
For casement windows

THE E. T. BURROWES CO.

Manufacturers of Wood or Metal Frame Rustless Screens for All Purposes

GENERAL OFFICES AND FACTORIES
PORTLAND, ME.

REPRESENTATIVES EVERYWHERE; NEAREST ADDRESS AND TELEPHONE ON REQUEST

Products

Insect Screens with Wood or Metal Rewirable Frames for windows, doors, ventilators and other openings, including porches, outdoor sleeping rooms, loggias; All-metal Weatherstrips.

Also Screen Netting, Grilles and Guards for screen doors, Wire Safety Guards for basement windows.

Co-operative Service

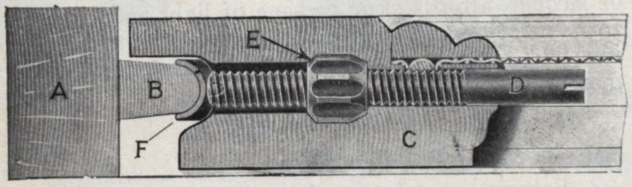
Direct with architects through local salesmen. Highly trained organization and modern equipment solve all problems in wood or metal frame screening.

Burrowes Nettings

Unless otherwise specified, 16-mesh. Finer or coarser meshes if ordered.

Burrowes "Copbronze" netting is 93% pure copper, practically indestructible.

Burrowes "Enameled Galvanite" netting is high grade, far superior to the average; wire is galvanized before weaving, heavily enameled and japanned.



Full Size Section "New Century" Adjustable Wood Frame Window Screen

(A) Blind stop. (B) Slide moulding. (C) Left-hand screen stile. (D) Bronze screw bolt through (E) stationary nut operating (F) adjustable shoe or bearing. Deep groove right-hand stile has elliptical tension for perfect balance

"New Century" Spring Sliding Screens, Wood Frames

For double hung windows. Stiles grooved to slide on full length moulded runs. Left groove has two adjustable shoes or bearings opposite two arched steel balance springs in right groove, to hold screen in any position for top or bottom ventilation.

These bearings and springs form the only points of contact between screen and screen runs. They assure ease of operation without friction, and overcome any inequalities in window frames, such as unequal widths at top and bottom or sagged sills.

Once adjusted, these screens require no attention whatever. No interference with window sash, draperies or blinds.

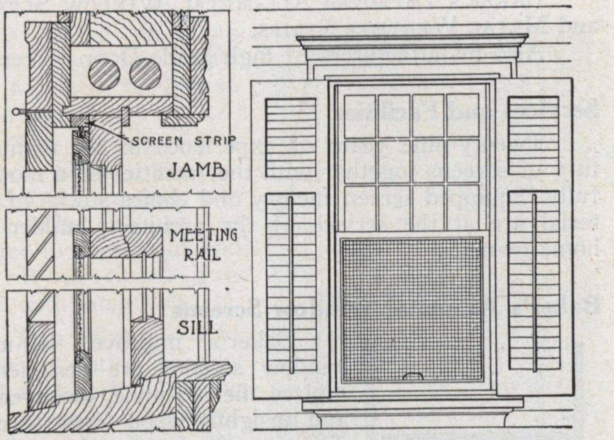
Patent Spring Sliding Screens, Wood Frames

Made like the "New Century" without the adjustment. Springs in groove hold screen in any desired position. Shallow groove in left-hand stile.

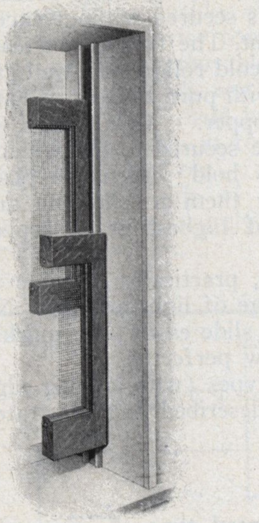
Burrowes Hardware

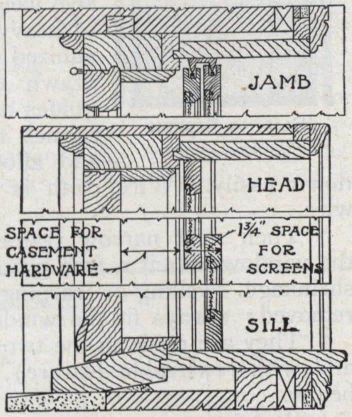
Excellent quality hardware included with all orders. Special designs in standard finishes to order. Hardware attached to ordinary sliding window screens at factory.

Hardware for doors and special screens carefully packed with full directions.



Detail of Window Frame Construction showing how extra space may be provided by the architect for screens and blinds or shutters, by inserting a screen strip (width determined by conditions) inside of blind stop





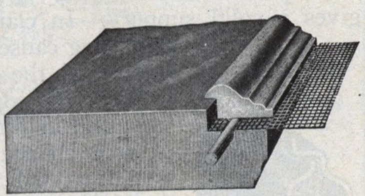
Detail of Casement Window Construction, with Burrowes Wood Frame Twin Sliding Screens (at the left) Applied Inside of Sash

Application Details of Burrowes Wood Frame Screens

Burrowes Screen Doors, Wood Frames

Made to order from Burrowes or architect's designs; finished to harmonize with house door.

Burrowes doors are very strong; made with greatest care from best selected kiln dried lumber and may be finished to match submitted samples. Note lock-strip method of wiring; every strand held taut and even.



Section of Screen Door Stock
Reduced size

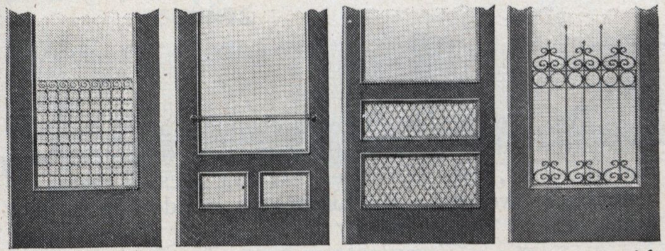
Beautiful, substantial hardware, in standard finishes, adds to the distinctive character of Burrowes doors.

Lower panels may be reinforced with heavy 3-mesh guard, 1¼-in. diamond mesh guards or plain or ornamental grilles of bronze or iron.

Continued on next page

Note: Burrowes screen doors are unusually thick and strong. Readily adapted to architect's plan if the screen door rabbet is at least 1⅛ in. deep, with proper distance between doors to clear house door hardware.

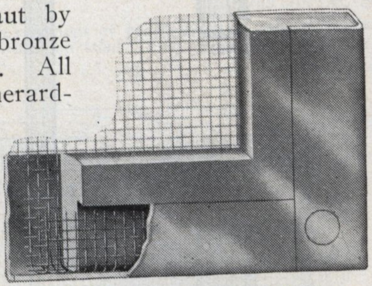
We solicit difficult work—screening problems entirely out of the ordinary—involving odd shapes or requiring expert handling for satisfactory screening.


No. 24-C 5 No. 26-D No. 39-D. G. No. 24-C Special

A Few Suggestions for Screen Door Treatment

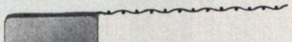
"Regis" Metal Screen

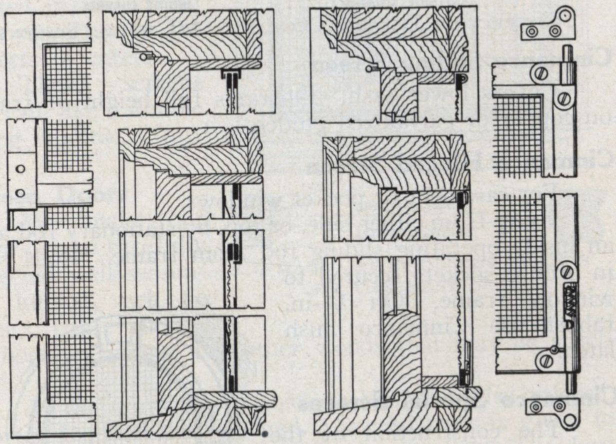
Strong, rigid inner frame, electro-welded at corners, netting drawn taut by outer casing secured by bronze rivets; easily re-wired. All steel parts thoroughly sherardized (best process of protecting steel from rust). Enameled any color; baked at high temperature. Solid bronze if desired. U-guides of metal equipped with springs for sliding screens.


Corner Section of "Regis" Screen Assembled
Full size

"Primus" Metal Screen

One-piece continuous solid metal frame, electro-welded corners, sherardized, painted and enameled. Solid bronze if desired. Netting firmly and smoothly soldered to face of frame. Adapted for every shape of window—circles, ovals, Gothic arches, etc.


Section
"Primus" Metal Screen


Details Showing Application of Burrowes Metal Screens to Casement Windows

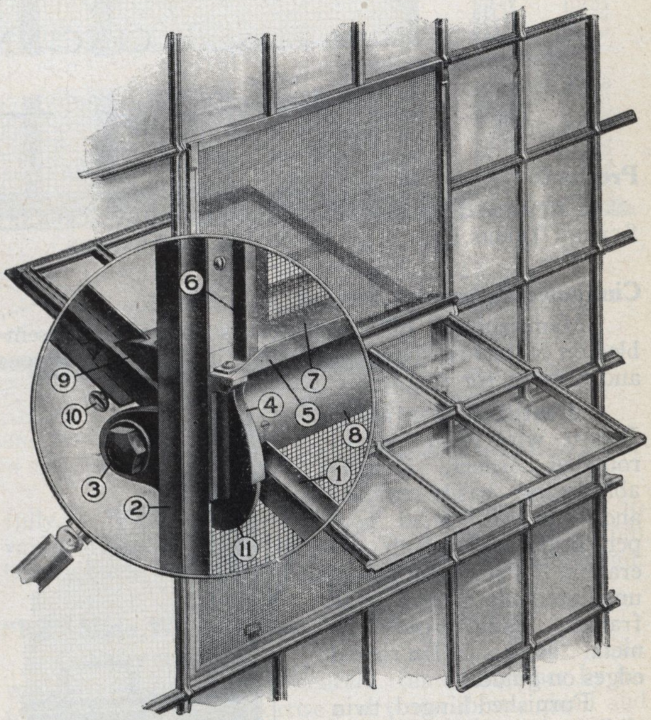
Left-hand diagram shows Burrowes twin sliding metal frame screen applied to casement inside the sash. Similar construction, with U-guides reversed, is applied outside on blind stop.

Right-hand diagram shows Burrowes full length side-pivoted metal frame screen applied to casement. Metal keepers for pivot at top and spring-actuated pivot at bottom for easy insertion or removal

Screens for Steel Sash Ventilators

The Burrowes patents applied to all types of steel sash ventilators guarantee insectproof screening without cages. Note numbered parts (from outside looking in) showing one style of ventilator screened with "Burrowes."

Various methods employed for screening all types steel sash ventilators.



Screen for Steel Sash Ventilators
Note magnified parts

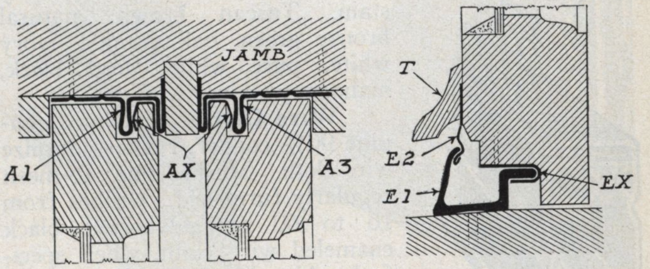
Ventilator (1) is pivoted at (3) in sash (2). Bronze casting (4) supports bottom guide (5) and side guides (6). These guides support and hold upper screen (7) in contact with sash. Sheet metal roll (8) screwed to ventilator through casting (9) centered on pivot (3) and rotates in contact with lower edge of guide (5). Roll (8) fitted around muntins and butts against glass, completely closing opening below upper screen.

Opening over lower screen is closed by T-shaped cap (not visible) held by thumbscrews (10) to rotate with ventilator in closing contact with upper edge of lower screen. Pivot cover (11) fast to ventilator is drawn up through hollow casting (4) to close small opening over pivot—every opening absolutely insectproof.

Upper screen is narrower than ventilator opening, and removed from inside by raising to clear guide (5). Lower screen (on inside) removed by detaching cap held by thumbscrews (10)

Metal Weatherstrips

Complete line for every type of window or door opening, finest materials in simple and novel designs, expert installations provide airtight metal-to-metal contact with perfect ease of operation. Diagrams below indicate practical character of the entire line—many forms not shown—every problem considered and solved individually. Materials are zinc, copper and bronze. Detail sheets on request.



For Double Hung Sash

Note contact between spring bronze liner AX and loop on double rib

Springtite strip (A1 and A3), holds sash in close sliding contact with face of strip adjacent to parting bead

When Casement Swings In

A difficult problem solved simply and effectively. The drip from moulding T checked by spring bronze double contact E2 and by metal hook EX. For sides and top various types of spring bronze and interlocking strips suited to all conditions

Details Metal Weatherstrip Installations

THE CINCINNATI FLY SCREEN CO.

Gest and Evans Streets

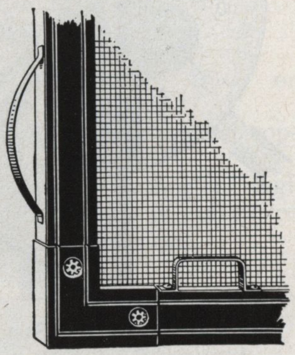
CINCINNATI, OHIO

Products

Cinmanco All-metal Re-wireable Fly Screens; Screen Doors and "EZ" Wood Frame Screens.

Cinmanco All-metal Screens

Manufactured of best materials obtainable; assembled on correct mechanical principle, in a variety of types and finishes for required conditions.



Corner Section Cinmanco All-metal Re-wireable Fly Screen

Note detachable spring, open rivets, and location of stationary bronze direct lift

Features—Rewirable. Bronze wire cloth held by rounded corners. Detachable springs, easily removed and renewed. Solid copper bearings, smooth operation. Free ventilation, unpainted cloth, and small frame. Reinforced by metal angles. Turned edges on guide.

Furnished hinged, twin sliding, basket, circle, segment top, bow, bullseye, or any shape desired, of any mesh from 14 to 60, to fit all or part space. Made and stay true. Easily raised by bronze direct lifts. Steel frames specially galvanized, not sherardized.

Types—*Window Screens*—Finish A: Solid copper frame, statuary bronze finish, bronze wire cloth.

Finish B G: Galvanized black enameled steel frame, with galvanized corners and galvanized guides, bronze wire cloth.

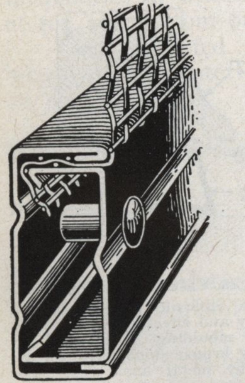
Finish B C: Galvanized black enamel steel frame, with copper corners and copper guides, bronze wire cloth.

Steel frames have copper content.

Frames can be made in any finish desired.

Screen Doors—Finish quartered oak in golden, natural, antique, or English.

Finish pine in light slate, Colonial white, cherry stain, Tuscan brown, natural bronze green, oak grained, ivory white, pure white, dead black, mahogany stain.

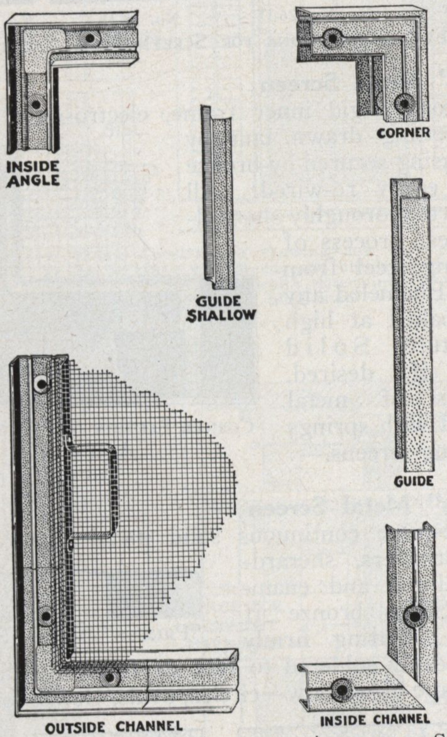


Sectional Detail Showing Assembly All-metal Screen

Wire Cloth—Cinmanco genuine 90% copper, rustless, bronze wire cloth. Meshes true; 16-mesh regularly furnished. Meshes from 16 to 60 or galvanized black enameled wire cloth, when specified. Also Monel metal cloth can be had, if desired.

Construction—The accompanying illustrations show construction details, method of securing wire cloth and the absence of cutting edges.

Two rectangular grooved channels are fitted one inside the other. The cloth is secured firmly without use of solder, rods or splines. Heavy pressed metal inside angle swedged and countersunk in addition to outside corner.



Construction Details Cinmanco All-metal Screens

Cinmanco Sliding Screen

Covers lower sash. Operates full height of frame on copper or galvanized guides.

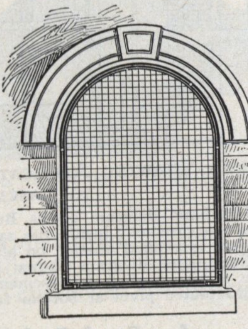
Cinmanco Hinged Screen

For casement or pocket windows.

Hung from either side, or top, by stationary rod and an inside operating sliding rod from frame. Rods rest in bronze sockets secured to window frame. On ½-in. rabbet use Cinmanco flush latch.

Cinmanco Special Screens

The construction of the frame of the Cinmanco Screen is such that we are able to make a perfect screen without marring the frame in either basket, circle or segment top, bow, bullseye, or any shape which may be necessary to thoroughly screen a building with all-metal screens.



Cinmanco Screen Adapted to Special Window

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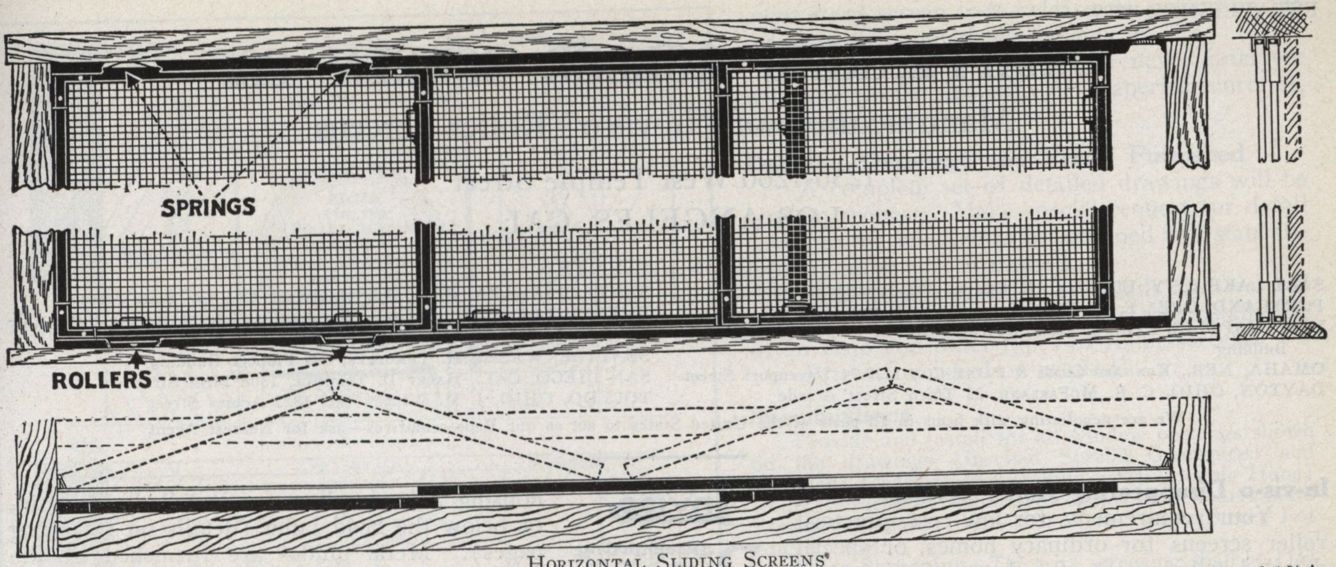


Horizontal Sliding Screens

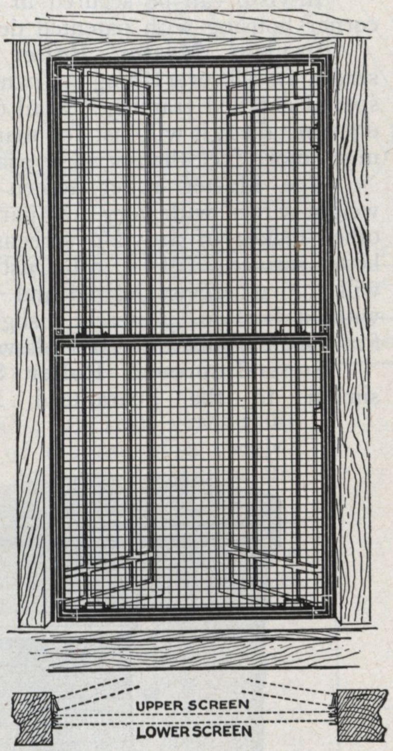
Cinmanco treatment for wide casement or porch openings, resting on sill or rail. Roller bearing allows 1¼-in. for metal frame screens and 1¾-in. for wood frame screens in total width on stool

Cinmanco Twin Sliding Screens for Casement Sash

We recommend twin sliding screens in preference to hinged screens, as they do not interfere with the curtains or draperies, and it is not necessary to open the whole screen to operate the sash or awnings.

The lower screen can be raised part way and the sash hardware adjusted easily, giving less opportunity for insects to enter.

These screens operate like a double hung window.



Cinmanco Twin Sliding Screens for Casement Sash

Screen Doors

We make our doors from carefully selected well seasoned lumber, white pine, oak, cherry, mahogany, walnut and other woods that may be specified.

All doors are 1⅛ in. thick, unless otherwise ordered, mortised, glued and wedged. Special care is given to produce a superior door in every respect. The best paint, stains and varnishes are used, all carefully rubbed down.

Screen Door Grilles

Our catalogue shows for selection a large variety of screen door grilles.

Screen Door Hardware

The best hardware to be had has been selected carefully. Mortise door latch is all bronze and comes in various finishes. Five knuckle, steel bushed, loose pin bronze butts, or sherardized steel plated butts can be had.

"EZ" Slide Wood Frame Screens

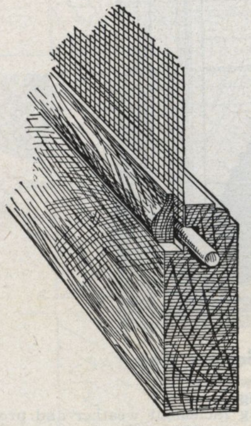
Construction—The corners of the "EZ" slide wood frame screens are securely framed together by interlocking concealed mortise and tenon joints, glued and securely wedged. This construction gives the greatest possible strength and makes the joints impervious to the weather.

The springs used in the wood frame screens are elliptic in shape; made of steel clock spring, they will last as long as the screen itself.

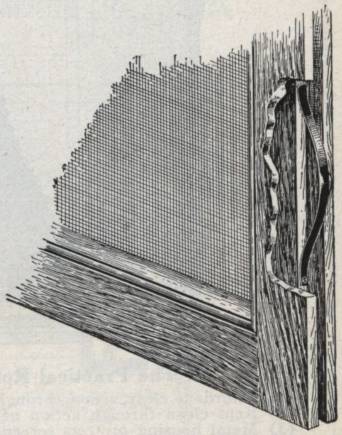
The wire cloth is attached to the screen frame by means of a groove and lock strip that keeps it perfectly tight and smooth. Its holding powers are equal to the strength of the wire itself. By this method the screens are easily rewired.

Duplicate numbers are furnished to be put on window sills, thus making it a simple matter to return the screens to their proper places.

Zinc metal or wooden guides are furnished with this equipment.



Cross Section Wood Frame Screen, Showing Groove and Lock Strip



Corner Section "EZ" Slide Wood Frame Screen

Sleeping Porch or Solarium Screens

Made to harmonize with the surroundings.

ESTABLISHED 1909

DISAPPEARING ROLLER SCREEN CO.

Manufacturers of "In-vis-o" Roller Screens

1256-1260 West Temple Street
LOS ANGELES, CAL.

SELLING AGENTS

SALT LAKE CITY, UTAH, C. E. Curtis, 503 Templeton Building
PORTLAND, ORE., F. W. Farrington & Co., Henry Building
INDIANAPOLIS, IND., General Builders Supply Co., Merchants Bank Building
OMAHA, NEB., Kennard Glass & Paint Co., 1420-24 Davenport Street
DAYTON, OHIO, C. B. McFarland, 22 Third Street Arcade
SANTA BARBARA, CAL., Ott Hardware Co., 727 State Street
EMERYVILLE, CAL., Simpson Screen Co. (Agent for Northern California), 4246 Holden Street
SEATTLE, WASH., H. TeRoller, 608 Pioneer Building
SAN DIEGO, CAL., Harry D. Trounce, 1308 Fifth Street
TOLEDO, OHIO, J. M. Wilson Co., 1822 Adams Street

We are negotiating with firms in all parts of the United States to act as our Representatives—ask for Nearest Agent

In-vis-o Disappearing Roller Screens

Your requirements for low cost, practical roller screens for ordinary homes, or special detailed roller screens for the most ornate and expensive homes, will be fully met by one of our types of disappearing roller screens, which are made and guaranteed by one of the oldest and largest roller screen manufacturers.

We claim that the In-vis-o roller screen outsells any three other roller screens on the market. It has stood the test of public opinion for over 15 years and carries a working guarantee of 10 years.

For Fireplaces—In-vis-o roller screens are now used in large quantities to screen fireplaces and are found very practical. Full information regarding screening fireplaces will be sent upon request.

Types and Description

The In-vis-o roller screen is made in 4 types:

In-vis-o Master
In-vis-o Double Hung
In-vis-o Special
Super-Improved

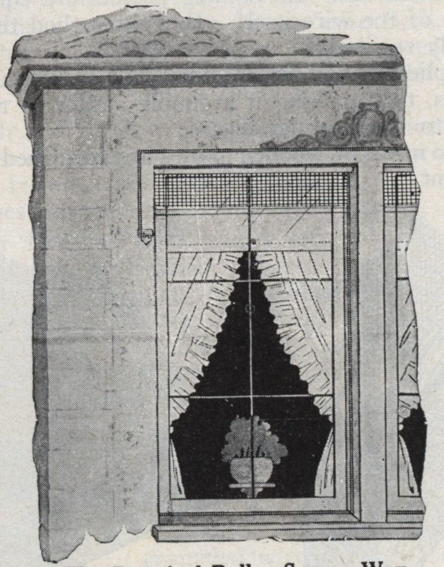
The In-vis-o roller screen rolls up into a metal housing 2 in. in diameter installed above, in, or below the head jamb (details on following pages). Metal guides are furnished by the manufacturer, if desired, but wooden stops worked out with artistic taste provide a more ornate window (details on following pages).

In-vis-o can be secured in a cylindrical or square corner housing with patented deflected lip.

In-vis-o Master Roller Screen—This roller screen fulfills everything its name implies. It requires special detailed framing (detail on following page) but once installed, it will last for many years with an action much more free than a roller shade.

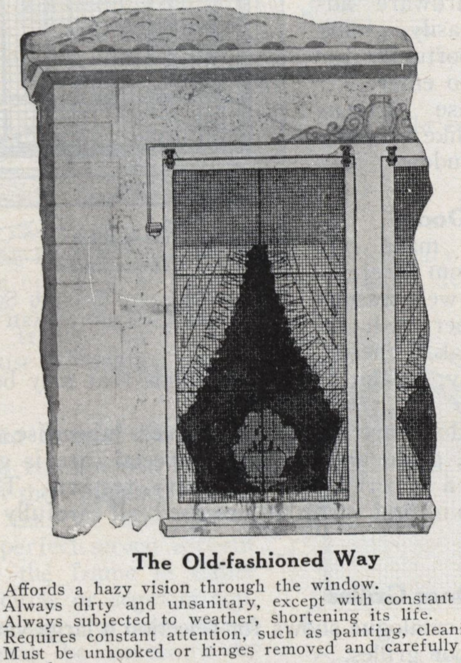
The Master roller screen is a counterbalanced weight screen with very few parts. It costs more than other makes of In-vis-o screens but renders a much better service. It is so constructed and balanced that it will stop wherever desired and will move up or down without friction by merely a slight push or pull (specifications and guarantee on following page).

Super-Improved Roller Screen—This type is similar to the guaranteed In-vis-o Special and



The Practical Roller Screen Way

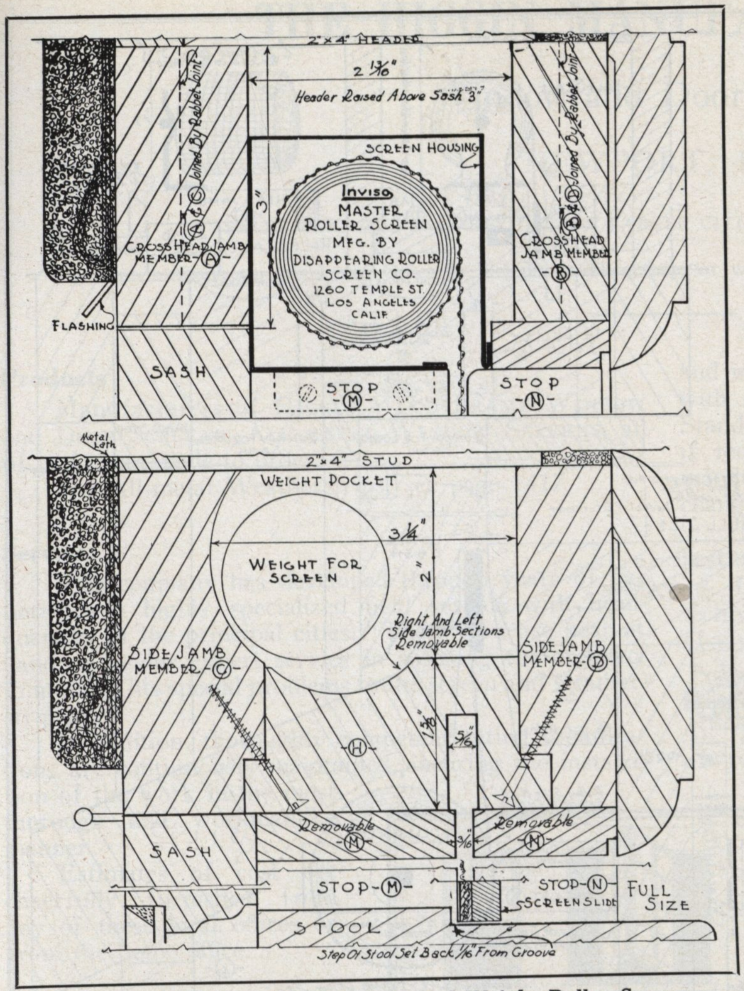
(1) Affords a clear vision through the window.
(2) Kept clean through action of rolling.
(3) Metal housing protects screen during inclement weather and prolongs its life.
(4) No maintenance cost, such as painting, etc.
(5) Easy to operate and dispose of.
(6) Always ready for instant use.
(7) Offers no interference with the hanging and use of curtains, draperies and shades and affords practical access to operate casement sash (swinging out) adjusters.
(8) On screen following sash in double hung windows, the screen merely covers that opening made by raising or lowering the sash



The Old-fashioned Way

(1) Affords a hazy vision through the window.
(2) Always dirty and unsanitary, except with constant care.
(3) Always subjected to weather, shortening its life.
(4) Requires constant attention, such as painting, cleaning, etc.
(5) Must be unhooked or hinges removed and carefully stored away to eliminate damage.
(6) Trouble involved in unpacking and rehanging.
(7) Prevents the proper hanging and use of curtains, draperies and shades on casement windows swinging out and affords a very impractical access to operate casement sash adjuster

Continued on next page


2"×4" HEADER
2 13/16"
Header Raised Above Sash 3"
3"
SCREEN HOUSING
Inviso
MASTER
ROLLER SCREEN
MFG. BY
DISAPPEARING ROLLER
SCREEN CO.
1260 TEMPLE ST.
LOS ANGELES
CALIF.
A & C Joined By Rabbet Joint
B & D Joined By Rabbet Joint
CROSSHEAD JAMB MEMBER-Ⓐ-
CROSSHEAD JAMB MEMBER -Ⓑ-
FLASHING
SASH
STOP -Ⓜ-
STOP -Ⓝ-
Metal Lath
2"×4" STUD
WEIGHT POCKET
3 1/4"
WEIGHT FOR SCREEN
2"
Right And Left Side Jamb Sections Removable
SIDE JAMB MEMBER-Ⓒ-
SIDE JAMB MEMBER-Ⓓ-
1 5/16"
5/16"
-Ⓗ-
Removable -Ⓜ-
Removable -Ⓝ-
3/16"
SASH
STOP-Ⓜ-
STOP-Ⓝ-
SCREEN SLIDE
FULL SIZE
STOOL
Step Of Stool Set Back 1/16" From Groove

Details of "Master" Counterbalanced Weight Roller Screen
Copyright 1925 by Disappearing Roller Screen Co.

is used in the same details. Its cost is materially less however, because of the use of a cheaper wire cloth, the use of different mechanism and the elimination of a metal housing.

The bronze wire cloth used in the Super-Improved roller screen, although not reinforced nor annealed, is woven with special selvage edges and is considered one of the best bronze wire cloths sold.

In-vis-o Double Hung Roller Screen—This type automatically follows either top or bottom sash and is concealed in pockets provided below the sill and above the head jamb (detail Fig. 30 on following page).

Another detail quite as satisfactory and with less special construction is shown in Fig. 6 on the following page, with still others obtainable from the manufacturer.

Various Types of Windows Can Be Equipped with In-vis-o Roller Screens

The most artistic homes have the casement sash swinging out, because this method provides more room space, a better weather window, and presents no interference for the proper and practical installation of curtains and draperies which is impossible with casement sash swinging in.

Roller screens will be found exceptionally practical for casement windows swinging out. All that is necessary in operating the In-vis-o *guaranteed* screen is to release the catch and the screen will automatically disappear.

In-vis-o roller screens will never interfere with the proper hanging of draperies, curtains, shades, etc.

Detailed Drawings and Prices Furnished

A complete set of detailed drawings will be sent on request. Make special request for detail covering the window to be screened and state the type of roller screen desired.

Send copies of full size details and we will submit our recommendations for the installation of In-vis-o and other types of roller screens.

Prices furnished on request.

Specifications

Provide and install for all window openings shown on the drawings [In-vis-o Special Guaranteed and Patented] [Master] [Super-Improved] [Double Hung] Roller Screens as manufactured by the Disappearing Roller Screen Co., 1256-1260 West Temple Street, Los Angeles, Cal.

Wire Screening—The wire screening shall be [14] [16] mesh [silver finish] [*rolling bronze] [special reinforced bronze fully guaranteed by the manufacturer] [special reinforced monel metal fully guaranteed by the manufacturer].

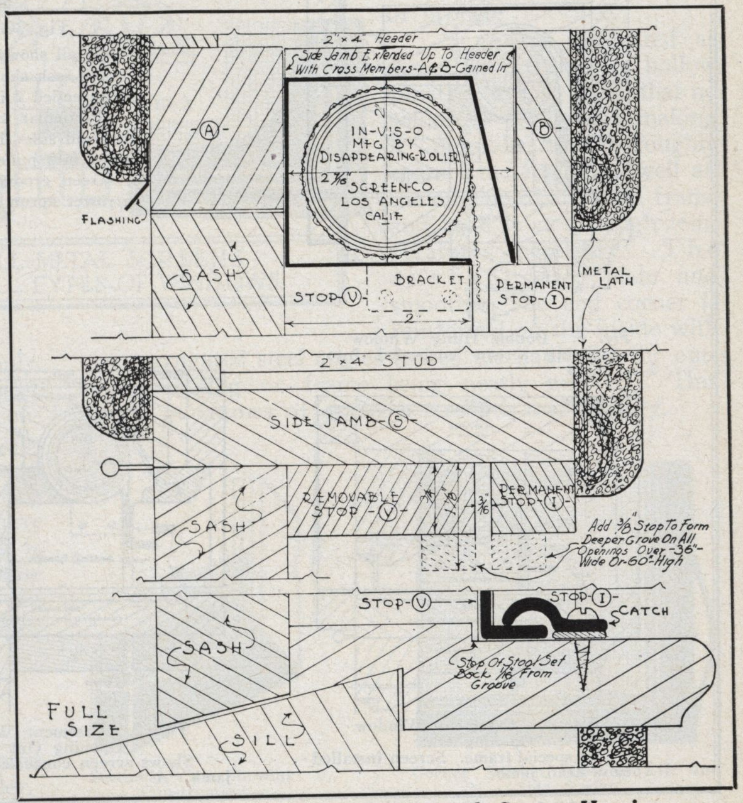
(*Rolling bronze is not guaranteed against breakage in the action of rolling, but should last some years.)

Stops for Screen Guides—All stops to form guides shall be of the same material and finish as adjoining trim. Stops used shall be ¾ in. thick on all openings up to 36 in. wide or 60 in. high, and 1⅛ in. on all larger openings.

Guarantee

The mechanism of In-vis-o and Master roller screens is fully guaranteed for 10 years.

The wire cloth used in In-vis-o and Master screens is specially made for us in accordance with our formula and it will not break in the action of rolling.


2"×4" Header
Side Jamb Extended Up To Header With Cross Members-A & B-Gained In
-Ⓐ-
-Ⓑ-
2"
IN-VIS-O
MFG BY
DISAPPEARING-ROLLER
SCREEN-CO.
LOS ANGELES
CALIF.
2 7/16"
FLASHING
SASH
BRACKET
STOP-Ⓥ
2"
PERMANENT STOP-Ⓘ-
METAL LATH
2"×4" STUD
SIDE JAMB-Ⓢ-
REMOVABLE STOP-Ⓥ-
1 1/8"
3/16"
PERMANENT STOP-Ⓘ-
SASH
Add 3/8" Stop To Form Deeper Grove On All Openings Over-36"-Wide Or-60"-High
STOP-Ⓥ
STOP-Ⓘ-
CATCH
SASH
Step Of Stool Set Back 1/16" From Groove
FULL SIZE
SILL

Details of In-vis-o Roller Screen with Square Housing
Copyright 1925 by Disappearing Roller Screen Co.

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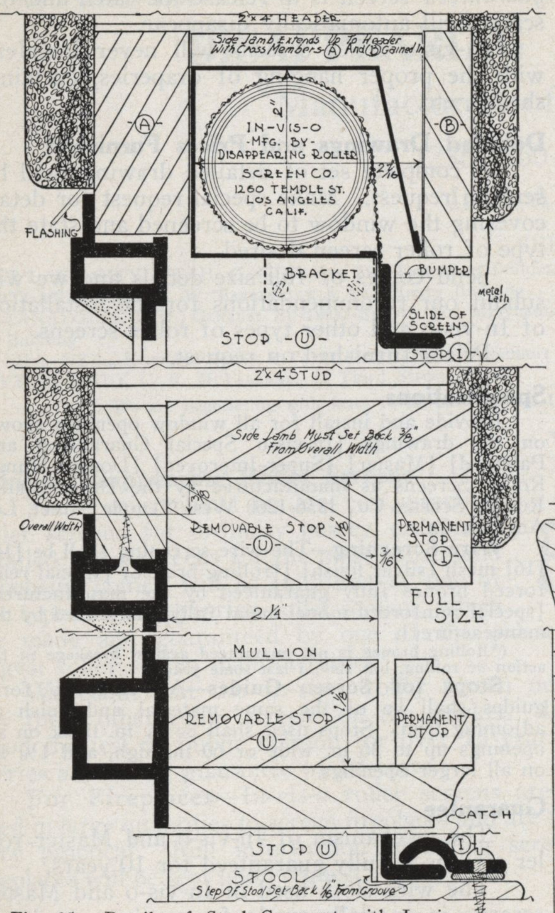

2"x4" HEADER
Side Jamb Extends Up To Header With Cross Members (A) And (B) Gained In
-(A)-
-(B)-
IN-VIS-O -MFG. BY- DISAPPEARING ROLLER SCREEN CO. 1260 TEMPLE ST. LOS ANGELES CALIF.
FLASHING
BRACKET
BUMPER
Metal Lath
SLIDE OF SCREEN
STOP -(U)-
STOP (I)
2"x4" STUD
Side Jamb Must Set Back 3/8" From Overall Width
Overall Width
REMOVABLE STOP -(U)-
PERMANENT STOP -(I)-
FULL SIZE
2 1/4"
MULLION
REMOVABLE STOP -(U)-
PERMANENT STOP
CATCH
STOP (U)
STOOL
Step Of Stool Set Back 1/16 From Groove

Fig. 35. Details of Steel Casement with In-vis-o Roller Screen

Copyright 1925 by DISAPPEARING ROLLER SCREEN CO.

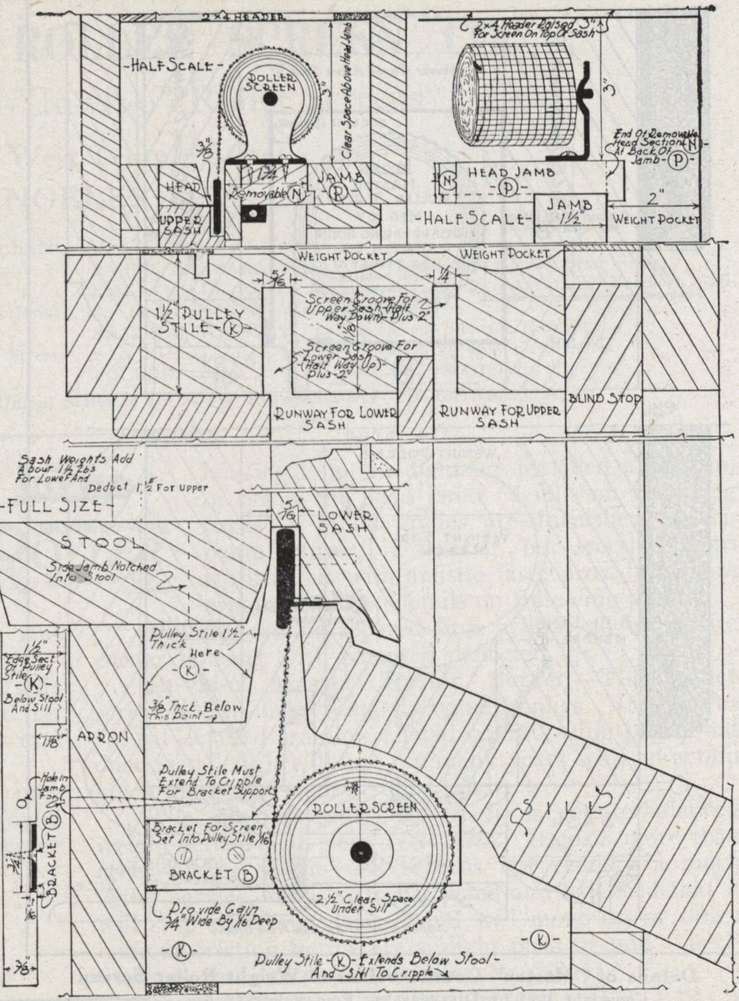

2"x4" HEADER
-HALF SCALE-
ROLLER SCREEN
Clear Space Above Head Jamb
HEAD
UPPER SASH
Removable (N)
JAMB -(P)-
2"x4" Header Raised 3" For Screen On Top Of Sash
End Of Removable Head Section At Back Of Jamb -(P)-
HEAD JAMB -(P)-
-HALF SCALE-
JAMB 1 1/2"
WEIGHT POCKET
WEIGHT POCKET
WEIGHT POCKET
1 1/2" PULLEY STILE -(K)-
Screen Groove For Upper Sash (Half Way Down) Plus 2"
Screen Groove For Lower Sash (Half Way Up) Plus 2"
RUNWAY FOR LOWER SASH
RUNWAY FOR UPPER SASH
BLIND STOP
Sash Weights Add About 1 1/2 lbs For Lower And
Deduct 1 1/2 For Upper
-FULL SIZE-
STOOL
LOWER SASH
Side Jamb Notched Into Stool
Pulley Stile 1 1/2" Thick Here
-(K)-
Edge Sect. Of Pulley Stile -(K)- Below Stool And Sill
3/8 Thick Below This Point
APRON
Pulley Stile Must Extend To Cripple For Bracket Support
SILL
Hole In Jamb For
BRACKET (B)
Bracket For Screen Set Into Pulley Stile 1/16
BRACKET (B)
ROLLER SCREEN
2 1/2" Clear Space Under Sill
Provide Gain 3/4" Wide By 1/16 Deep
-(K)-
Pulley Stile -(K)- Extends Below Stool And Sill To Cripple
-(K)-

Fig. 30. Details of In-vis-o Special Double Hung Roller Screen

Detail shows the In-vis-o special double hung roller screen following both sash. All sash should be rabbetted out for rail piece to fasten into. Screen runways are extended 2 in. more than the half-way mark.

Particular stress is laid upon the rabbeted pulley stile (3/8 in. thick) below stool and sill. This provides for proper installation of the screen bracket which is gained into pulley stile K 3/4 x 1/16 in. and enables edge of screen to extend to back of screen groove. The lower side of sill is shaped as shown so as to enable a narrower apron to be used. Apron is screwed to the pulley stile

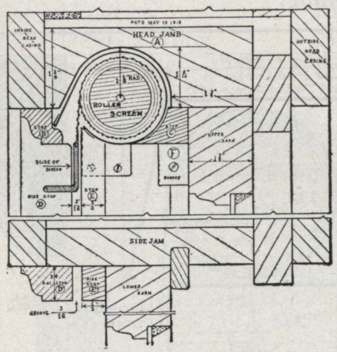

HEAD JAMB
ROLLER SCREEN
SIDE JAMB

Fig. 6. Double Hung Window Showing screen concealed into head jamb

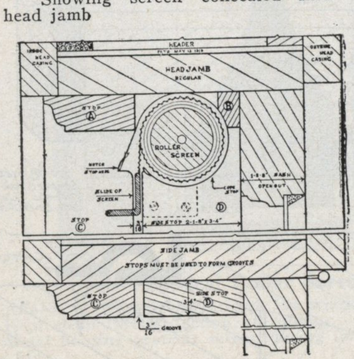

HEADER
HEAD JAMB
ROLLER SCREEN
SLIDE OF SCREEN
STOP
SIDE JAMB
STOPS MUST BE USED TO FORM GROOVE
GROOVE

Fig. 1. Casement Window Opening Out No special frame. Screen installed below head jamb

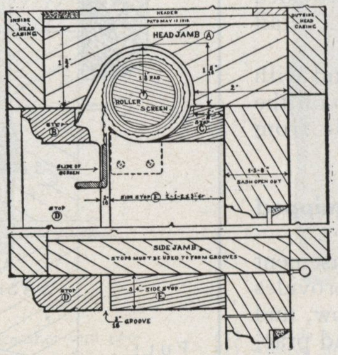
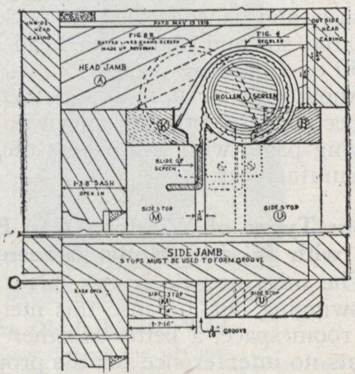

HEADER
HEAD JAMB (A)
ROLLER SCREEN
SLIDE OF SCREEN
SIDE JAMB
STOPS MUST BE USED TO FORM GROOVES
GROOVE

Fig. 2. Casement Window Opening Out Shows screen concealed into head jamb "A"


HEAD JAMB (A)
ROLLER SCREEN
SLIDE OF SCREEN
SIDE JAMB
STOPS MUST BE USED TO FORM GROOVE
GROOVE

Figs. 4 and 8R. Casement Window Opening In

Fig. 8R. Dotted lines show screen made up reversed

Various Details Showing Installation of Roller Screens for Various Kinds of Windows

Figs. 1, 2, 6, 4 and 8R are not drawn to scale

THE HIGGIN MANUFACTURING CO.

Window and Door Screens

NEWPORT, KY.

SALES AGENCIES IN FIFTY OF THE LARGER CITIES THROUGHOUT THE COUNTRY

Look up our Local Office in Telephone Directory, or write to Newport, Ky., for information

Products

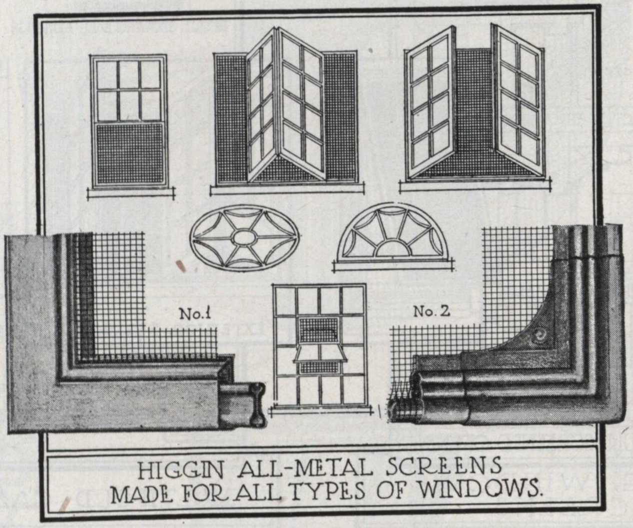
Manufacturers of Higgin Wood Frame Window and Door Screens, All-metal Window Screens, all of which are made to order.

For All-metal Weatherstrips, see page 1417.

Service

This company has developed through years of experience a highly specialized field service with headquarters in the principal cities. These men are near at hand to render expert service in assisting the architect in meeting his special problems in the screen and weatherstrip lines.

In addition, thoroughly competent fitting organizations are continuously maintained, insuring the installation of the work in the most thorough and workmanlike manner.



HIGGIN ALL-METAL SCREENS MADE FOR ALL TYPES OF WINDOWS.

Estimates of cost are cheerfully furnished from any of these local offices or from the home office.

Facilities

The extensive plant of The Higgin Manufacturing Co. is centrally located, and prompt deliveries can, therefore, be made to all parts of the United States. Facilities are constantly being increased to meet the growing demand for their products.

Wood Frame Screens

This company manufactures high grade wood frame screens of standard construction, to measurements only.

Wood frame screens are made of selected straight white pine or of hardwood, if desired. Standard construction, 7/8 in. thick, 17/8-in. side, top and bottom rails. Screens 11/8 in. thick have 2-in. side and top rails and 21/2-in. bottom rail. Screens of other dimensions furnished if specifically called for. Wood screens have double lock joint corner construction and wire cloth is forced into a groove and held with a rattan spline covered with a flush moulding. All screens are finished with an oil and lead paint finish of any color desired.

Screen Doors

A full line of high grade screen doors of pine, quartered oak, cherry, mahogany, etc., is made to order.

All doors have mortised, glued and tenoned joints and wire cloth is forced into a groove and held in place with a rattan spline, covered with a flush moulding. Standard thickness is 11/8 in., but heavier doors are made, if required. Rails and stiles are ordinarily made to match those of corresponding house doors so that no change in architectural effect is apparent.

The finish is any color or specification desired, the best of paints, stains, and varnishes being employed.

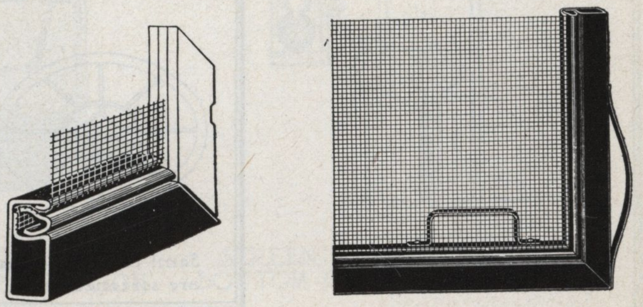
Doors are fitted, as required, with guard wire protection, or with copper grille; these are made in a variety of styles.

Higgin All-metal Window Screens

The Higgin metal frame window screens are of two types as illustrated below and numbered 1 and 2.

All Higgin metal frame screens are made of galvanized steel, enameled both inside and outside so that all unsupported and exposed surfaces of the metal are protected. Frames are also made of solid rolled copper or bronze.

Screens illustrated as No. 1 have frames of hollow construction, so made that no solder is used, thus making it possible to thoroughly enamel the inside as well as the outside of the steel frame and bake it at the high temperatures necessary. The surfaces are plain and smooth. The end corner is reinforced on the inside with two corrugated steel angles locked mechanically, the outside moulding or frame being neatly mitered. This results in frames of extreme strength and rigidity.



Sectional View Showing Construction

Corner Section Showing Lift and Side Spring

Construction Details of Re-wirable Screen

Continued on next page

The netting is held in the groove by means of a cam shaped non-resilient spline so formed as to roll into place and lock. This spline can be removed for the purpose of rewiring the screen without damage to either spline or frame. There are no sharp edges to cut the netting, which comes in contact with rounded surfaces only.

Screens illustrated as No. 2 are made with an inside frame of ¼-in. galvanized steel or copper clad rod. Around this rod the wire netting is drawn, stretched perfectly tight, and held securely there by the outside mouldings. The netting can not pull out or get loose, and there are no sharp edges bearing against it with a tendency to cut it, as it expands or contracts with changes in the atmosphere.

In the "Higgin" screen, only round surfaces bear against the netting. The mouldings are made from open hearth copper content steel thoroughly galvanized and finished in baked enamel, which may be black or in color; or from copper or bronze in various finishes.

Wire Netting

The netting used in both screens and doors is made of Anaconda bronze wire and is usually 14, 16 or 18-mesh.

For special work, such as office or bank windows, laundry dry rooms, varnish rooms, etc., 20, 24, 40, or even finer mesh netting will be furnished, if desired.

Monel wire is furnished when specifically called for.

Double Hung Window Screens

Screens for double hung windows may be half sliding or full height hinged.

Half sliding screens are set in metal channels placed on outside stop beads and extending full height of window.

Full height screens may be hinged at top or side. They are hung on concealed pivots and locked with spring bolts. Extension arms provided for top hinged screens. Hinged screens set in outside rabbet which should be ½ in. deep and not less than ½ in. wide.

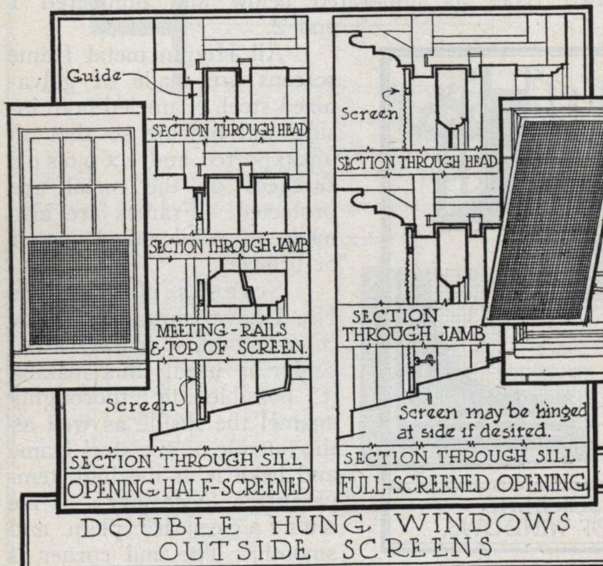
Casement Window Screens

Screens for casements opening in may be full height stationary set in guides, double sliding or hinged. If double sliding, 1⅛-in. space is required for double guides. Casements opening out may be screened with hinged screens opening in, or with vertical or horizontal double sliding screens. Hinged screens single or in pairs as conditions demand. With hinged screens, a rabbet ½ in. deep and not less than ½ in. wide should be provided.

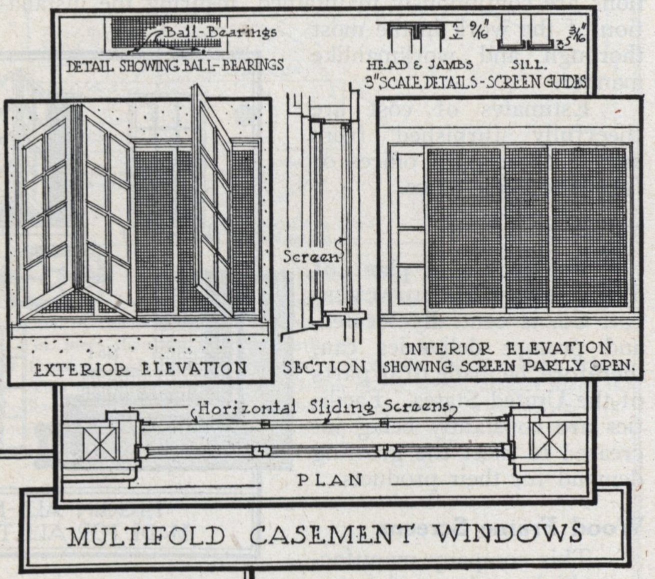
With double sliding screens, 1⅛-in. space is required for double guides.

For horizontal sliding screens, a special double grooved extruded brass bar is provided for the bottom.

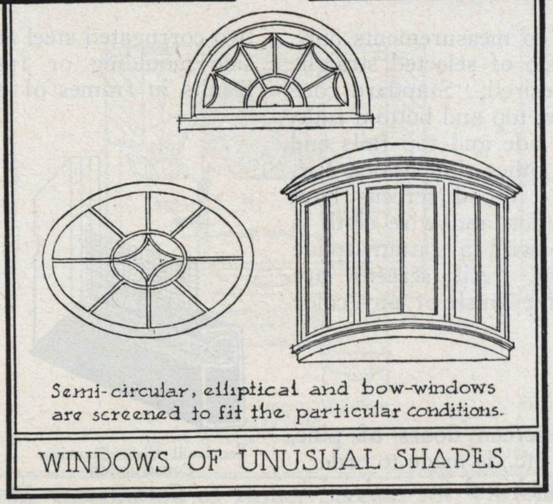
Windows of Whitney, Hoffman, and similar types are screened with horizontal sliding screens with double


Guide
SECTION THROUGH HEAD
SECTION THROUGH JAMB
MEETING-RAILS & TOP OF SCREEN.
Screen
SECTION THROUGH SILL
OPENING HALF-SCREENED
Screen
SECTION THROUGH HEAD
SECTION THROUGH JAMB
Screen may be hinged at side if desired.
SECTION THROUGH SILL
FULL-SCREENED OPENING

DOUBLE HUNG WINDOWS OUTSIDE SCREENS


Ball-Bearings
DETAIL SHOWING BALL-BEARINGS
9/16"
3/16"
1 3/16"
HEAD & JAMBS
SILL.
3" SCALE DETAILS - SCREEN GUIDES
Screen
EXTERIOR ELEVATION
SECTION
INTERIOR ELEVATION SHOWING SCREEN PARTLY OPEN.
Horizontal Sliding Screens
PLAN

MULTIFOLD CASEMENT WINDOWS


Semi-circular, elliptical and bow-windows are screened to fit the particular conditions.

WINDOWS OF UNUSUAL SHAPES

Continued on next page

grooved extruded brass bar on the bottom. Screens may be divided into as many sections as necessary and run in one set of double guides. Space required for double guides is 1⅛ in.

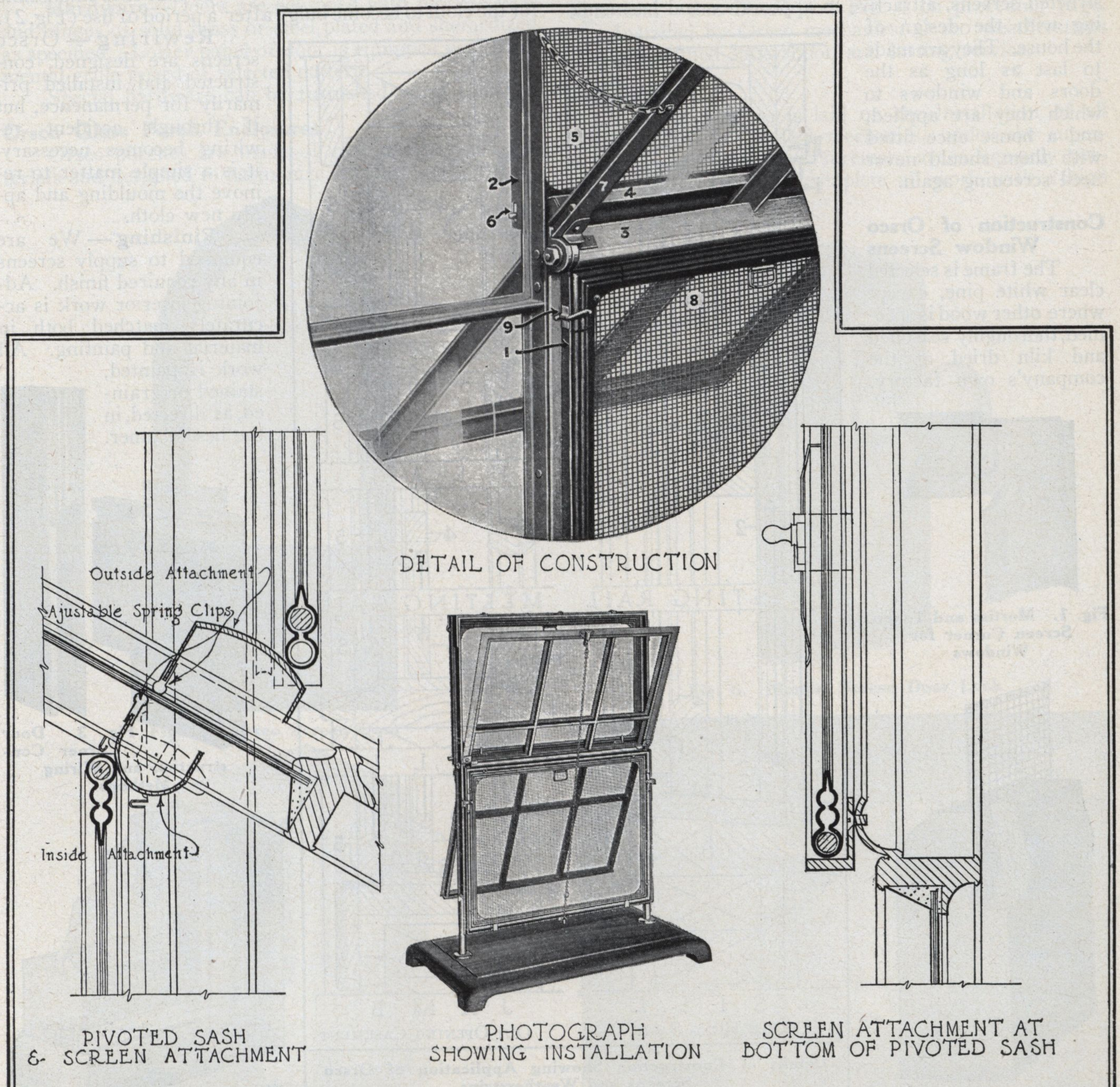
Higgin All-metal Screen Equipment for Pivoted Sash

Consists of straight metal frame screen, placed at top of opening on outside and a like screen at bottom on inside (see illustration). These screens set in angle frames permanently attached to window frame with machine screws. Metal contact rolls attached to ventilator at center close up spaces between ventilator and screens.

Patented features of Higgin equipment insure positive contact between rolls and screens at all times, no matter at what angle ventilator is set. Rolls and angles become a permanent part of window but screens may be easily removed and replaced. Higgin equipment is adaptable to any type or make of either metal or wood pivoted sash. We study each individual problem and make installations right on job, giving personal, expert supervision. Screens, rolls and angles are made to measure for each individual opening.

Strong Points of Higgin All-metal Equipment—The circular illustration shows in detail the following mechanical features:

(1) Angle frame for holding lower inside screen.
(2) Angle frame for holding outside screen.
(3) Contact roll between sash and lower screen.
(4) Contact roll between sash and upper screen.
(5) Upper outside screen.
(6) Spring pivot securing upper screen.
(7) Steel sash ventilator.
(8) Lower inside screen.
(9) Movable latch holding lower inside screen in place.



DETAIL OF CONSTRUCTION

PIVOTED SASH & SCREEN ATTACHMENT

PHOTOGRAPH SHOWING INSTALLATION

SCREEN ATTACHMENT AT BOTTOM OF PIVOTED SASH

DETAILS OF CONSTRUCTION FOR HIGGIN ALL-METAL EQUIPMENT FOR PIVOTED SASH

ORANGE SCREEN CO.

Manufacturers of Rustless Screens for Windows, Doors and Porches;
Glass Enclosures of All Types

515 Valley Street, MAPLEWOOD, N. J.

Products

INSECT SCREENS for all types of door, window and porch openings, designed, constructed and installed to specifications.

COMBINATION GLASS and SCREEN PORCHES complete.

GLASS VESTIBULES for entrance protection.

METAL WEATHERSTRIPS for all types of door and window openings.

Orsco Screens

Orsco Screens are made to individual measurements and fill the demand for perfect fitting, durably constructed screens, attractive in appearance and harmonizing with the design of the house. They are made to last as long as the doors and windows to which they are applied, and a house once fitted with them should never need screening again.

Construction of Orsco Window Screens

The frame is selected clear white pine, except where other wood is specified, thoroughly seasoned and kiln dried at the company's own factory.

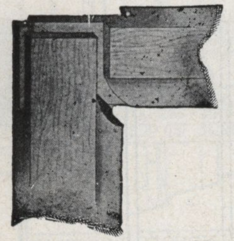


Fig. 1. Mortise and Tenon Screen Corner for Windows

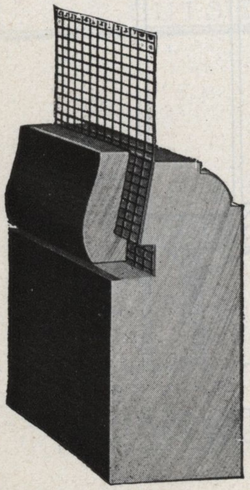


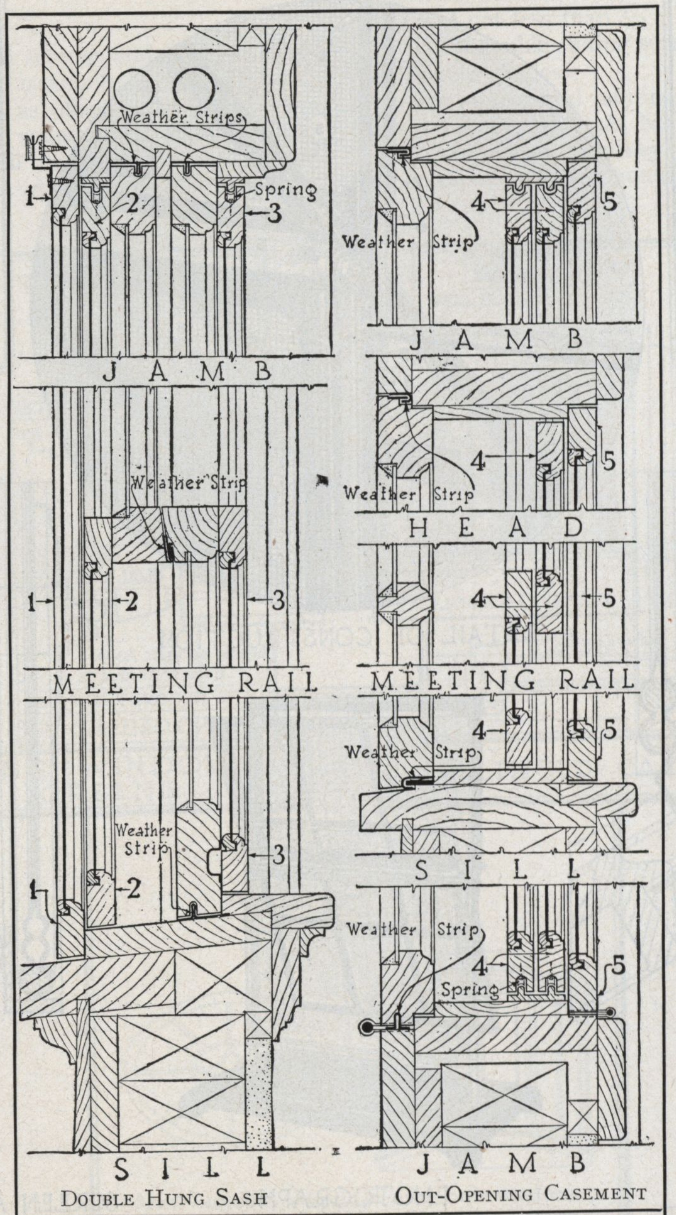
Fig. 2. Method of Attaching Wire to Frame

Corner Construction—Considerable study has been given to securing a corner joint that is both rigid and permanent. The result is a corner mortised and tenoned with extreme accuracy, firmly glued and finally pinned with barbed steel dowels. Experience has shown that this construction gives the maximum of strength at this important point (Fig. 1).

Securing Wire Cloth—The wire cloth is held securely in place by a neat moulding, mitered at the corners. This moulding is rabbeted on the back and engages in a groove in the frame; the wire is clinched into place and snubbed by means of this rabbet so that it is impossible for the cloth to become bulgy after a period of use (Fig. 2).

Rewiring—Orsco screens are designed, constructed and installed primarily for permanence, but if through accident rewiring becomes necessary, it is a simple matter to remove the moulding and apply new cloth.

Finishing—We are equipped to supply screens in any required finish. Adjoining interior work is accurately matched both in material and painting. All work is painted, stained or grained, as directed, in the best manner.



DOUBLE HUNG SASH — OUT-OPENING CASEMENT

Details of Construction Showing Application of Orsco Screens and Weatherstrips

(1) Outside full screen. (2) Outside sliding screen. (3) Inside sliding screen. (4) Twin sliding screens. (5) Casement screen

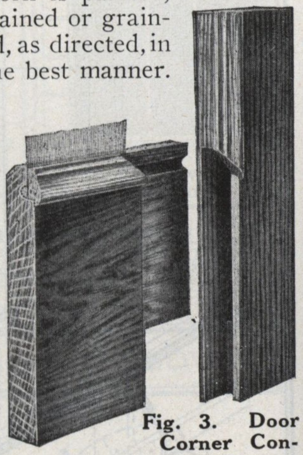


Fig. 3. Door Corner Construction and Wiring Methods

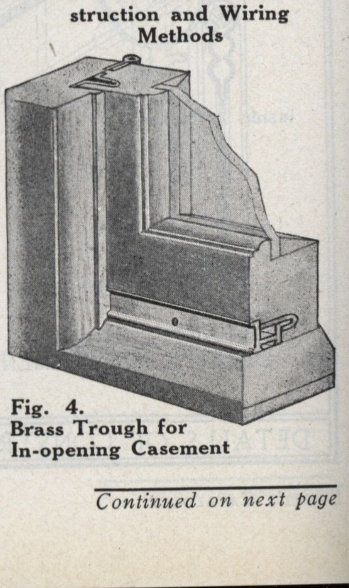


Fig. 4. Brass Trough for In-opening Casement

Continued on next page

Hardware—Orsco screens are fitted with high grade hardware in standard finishes and designs. Solid brass or steel plated and sherardized is supplied according to the requirements or specifications.

We can also furnish hardware for special hanging requirements when necessary.

Orsco Screen Doors

Orsco screen doors are made of selected white pine painted in any selected color. Doors may also be made in any desired wood and finished to harmonize with surrounding wood work.

Construction—A mortise and tenon construction is used so successfully with Orsco screen doors, that the corner is as strong as any other part of the door and absolutely can not sag (Fig. 3).

The cloth is applied in a manner similar to that used with Orsco screens.

Hardware—Doors are equipped with mortise locks and hinges of solid brass or steel plated and sherardized, as specified. Lower panel of door is equipped with ornamental grille guard of selected pattern.

Special hardware can be furnished when specified.

Orsco Glass Porch Enclosures

Orsco porches are made of carefully selected materials and designed to harmonize with the design of the house. Fig. 8 shows one of the many ways in which Orsco enclosed porches are utilized. Porches of similar construction are also built for sleeping apartments.

Orsco Vestibules

Made in a great variety of styles to conform in design and finish to residence on which they are installed (Fig. 7).

These enclosures are adapted for residences where vestibules are not built into the house. They extend out from the front door, making a most desirable entrance from the standpoint of architectural effect and service.

Weatherstrips

Made from high grade zinc rendered impervious to moisture by special treatment. The metal is stamped to form a rigid tongue which engages perfectly with corresponding grooves in wood of double hung or casement windows and doors, making a positive acting, weather-tight seal. See Detail and Fig. 4 on preceding page.

Installed by Orsco mechanics, Orsco weatherstrips give unqualified satisfaction and lasting service.

Installation

Particular stress is laid on the installation of all Orsco products. Skilled mechanics, under the supervision of an installation foreman, are adequately prepared and equipped to complete all work with a high degree of satisfaction.

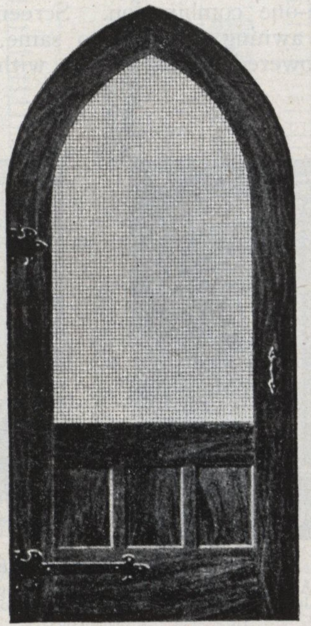


Fig. 5. Orsco Screen Door

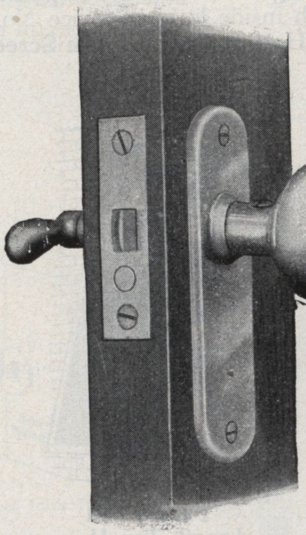


Fig. 6. Mortise Screen Door Lock

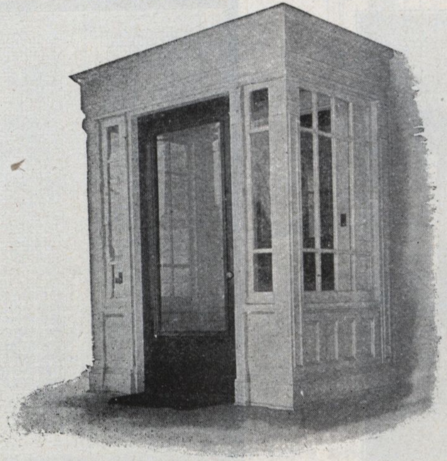


Fig. 7. One Style of Orsco Vestibules Made to Specifications

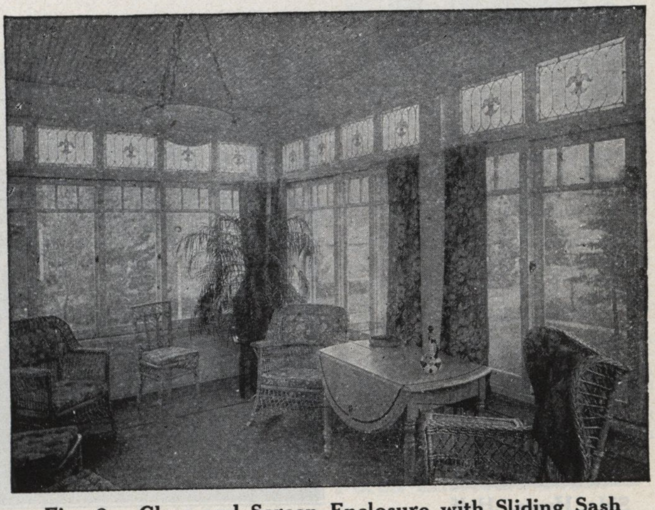


Fig. 8. Glass and Screen Enclosure with Sliding Sash
Indoor restfulness plus outdoor breezes

PHENIX MANUFACTURING COMPANY

Screens and Awnings, Storm Sash, Screen Hardware

022 to 044 Center Street
MILWAUKEE, WIS.

Products

Phenix Window and Door Screens, and Screen Enclosures; Phenix Combined Window Screens and Awnings; Phenix Hangers and Fasteners (Patented) for screens, storm windows and doors.

Also Phenix Storm Sash and Enclosures.

For Garage and Heavy Door Bolts and Holders, see page 1497.

Phenix Window and Door Screens and Enclosures

Made to order to fit any opening.

Material—Window and door screens and storm sash made from thoroughly seasoned white pine, wired with either rustproof or copper bronze wire cloth. Hardware finishes in steel, galvanized finish and solid brass.

Full Length Top Hung Screen—Fastening and locking device No. 102 for cleaning of windows and for ventilation.

Top Hung, Swinging Half Screen—Fits in between outside casings, with shut-off stop at meeting rail, and provided with inside locking device No. 30.

Side Hung, Half or Full Length Screen—Swings out like a door; hung by "Phenix" loose joint, self-locking hinges No. 130 and locked with No. 30 fastener, permitting hanging or removal from inside and the ready cleaning of windows.

Corner Joints—Joined by special dovetail hardwood dowel set in glue—superior to any mortise and tenon in carrying strength. Dowel pins form perfect wedge lock.

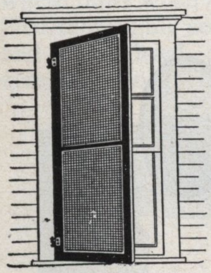
Method of Wiring—No tacks used. Note wedge-grip manner of wiring; every strand of wire held perfectly taut and secure.

Screen Doors—Furnished complete with all necessary hardware, ornamental grilles and guards for special wire protection.

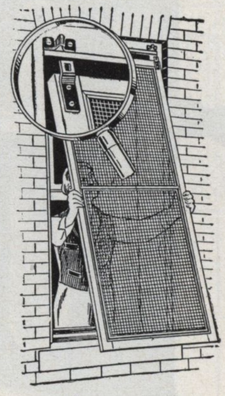
Veranda Enclosures—Made in convenient sized sections and held together with Phenix Nos. 60, 70 and 75 flush and corner locking devices.

Phenix Combined Screens and Awnings

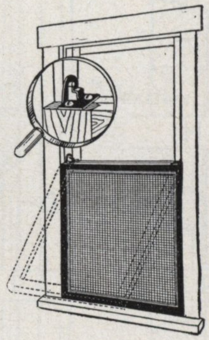
A two-in-one combination. Screen covers entire window with awning attached to same, awning being raised and lowered from inside without disturbing screen.



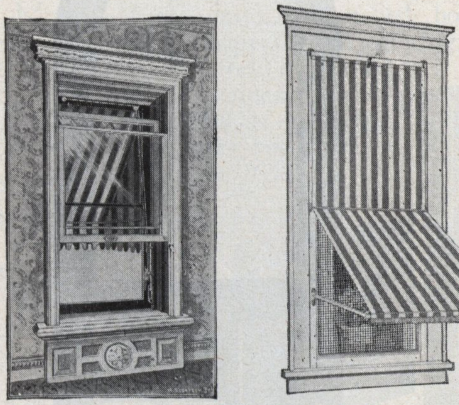
Side Hung, Full Length Screen



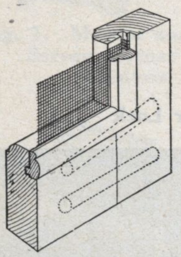
Phenix Full Length Top Hung Screen



Top Hung, Half Length Screen

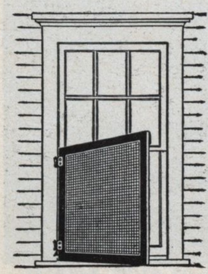


Phenix Combined Screen and Awning
Awning raised and lowered without opening screens. Full length screen makes ventilation possible

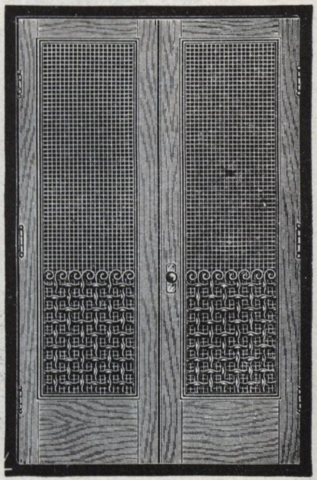


Phenix Wedge-grip and Corner Joint
Method of wiring without tacks holds every wire taut

Phenix Veranda Screen Enclosure



Side Hung, Half Length Screen



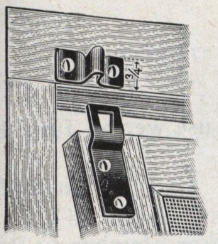
Phenix Screen Door

Continued on next page

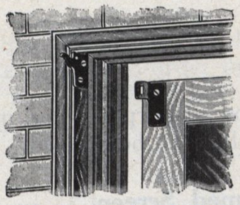
Hangers and Fasteners

Complete line of hangers, hinges and fasteners adaptable for all requirements to hang and fasten storm sash, full and half length window screens. So designed as to be easily hung or removed from inside, and fastened at bottom with lock that draws sash firmly to building. Screens or storm sash may, for cleaning of window or ventilation, be extended outward. Made of wrought steel, galvanized finish or wrought brass.

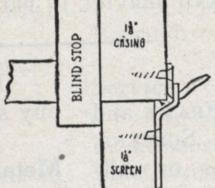
See illustrations of various styles of hangers and fasteners and their applications.



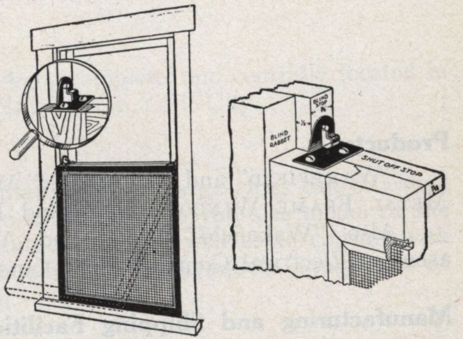
No. 114
For Flush Casings
Strong, simple, unbreakable; retain form for years



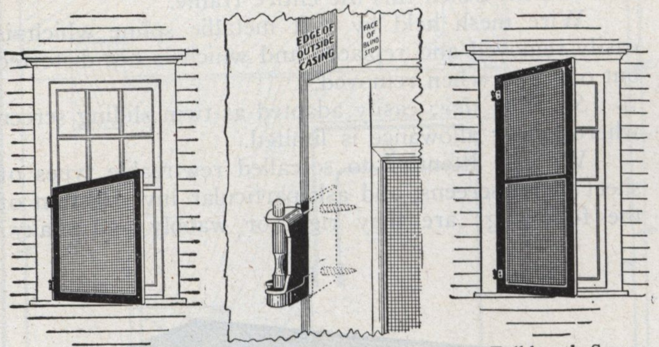
No. 20
For Brick Frame Construction
One part screwed on edge of casing, other part on face of sash. First part can be sunk in, or its equivalent taken off edge of sash



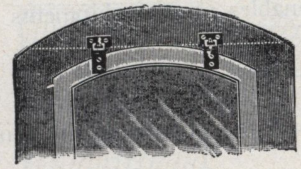
No. 3
Shows sash 1⅛-in., casing 1⅜-in., difference in thickness, ¼ in. B part required in this case offset ¼ in.



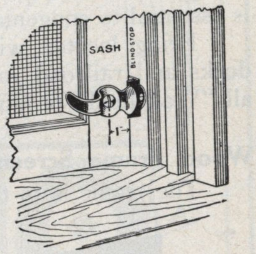
No. 112. Top Swinging Half Length Screen Hanger
Adjustable to any thickness of sash or stop. So constructed that half screen can not be raised, blown or pushed from its pivots



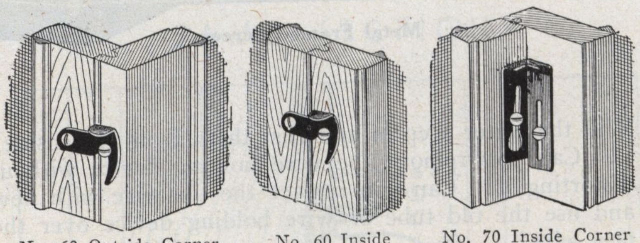
For Half-length Screens
Close-up View
For Full-length Screens
No. 130 Phenix Side Swinging Loose Joint Self-locking Hinge



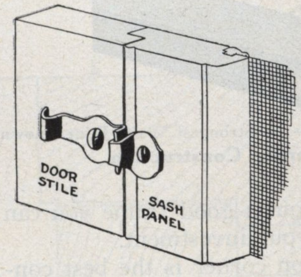
Method of Hanging Segment Head Screens



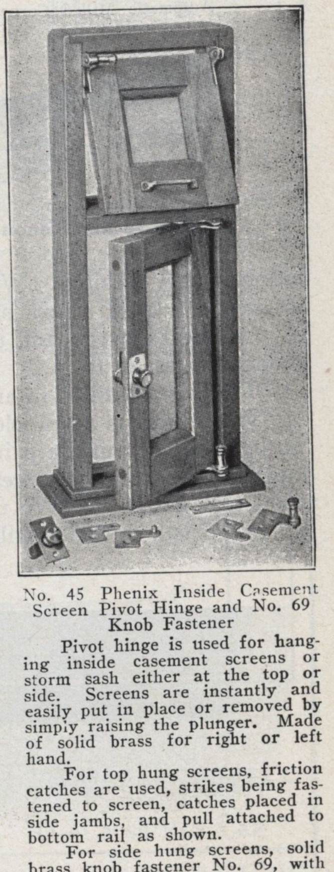
No. 30 Fastener
For all full and half length screens, storm, sash, basement screens and storm sash, porch enclosures



No. 60 Outside Corner Joint Fastener
No. 60 Inside Flush Joint Fastener
No. 70 Inside Corner Joint Fastener
For clamping veranda screen and storm enclosure sections (either flush or corners) into solid joints. Joints are rigid, sections are easily separated



No. 75 Rabbet Joint Fastener

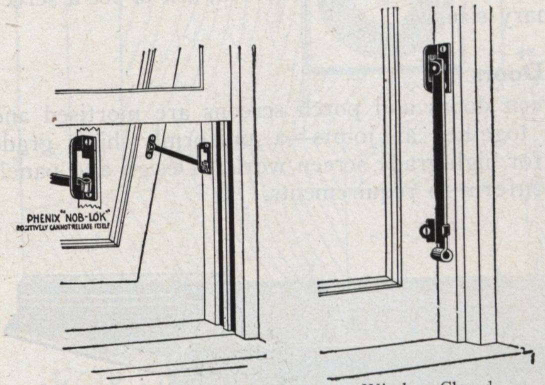


No. 45 Phenix Inside Casement Screen Pivot Hinge and No. 69 Knob Fastener

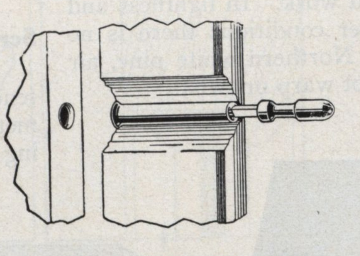
Pivot hinge is used for hanging inside casement screens or storm sash either at the top or side. Screens are instantly and easily put in place or removed by simply raising the plunger. Made of solid brass for right or left hand.

For top hung screens, friction catches are used, strikes being fastened to screen, catches placed in side jambs, and pull attached to bottom rail as shown.

For side hung screens, solid brass knob fastener No. 69, with strike plate, is used



Extended for Ventilation or Cleaning of Window
Window Closed
Phenix "Nob-Lok" Fastener No. 102
Draws sash up tight and secure to building at all points. When sash is extended for ventilation, automatically locks and can not accidentally become unfastened



No. 35 Phenix Window Spring Bolt (Ventilating Sash Lock)
One-third actual size. When withdrawn from the socket and given a half-turn, the bolt is set in its housing in an unlocked position, allowing sash to operate freely. Made of solid brass only

Phenix Hangers, Fasteners and Locks for Storm Sash, Window Screens and Porch Enclosure Joints

MORRISON-SKINNER COMPANY

Manufacturers of Wood and Metal Frame Insect Screens

WAKEFIELD, MASS.

(10 Miles North of Boston)

SALES AND SERVICE IN PRINCIPAL CITIES

Products

"Wakefield" and "American" Wood Frame and Metal Frame Window, Door and Porch Screens.

Also "Wakefield" Wood and Asbestos or All-asbestos Electrical Compartment Doors.

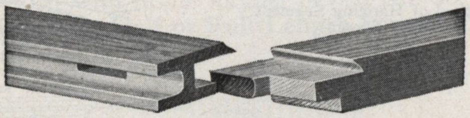
Manufacturing and Shipping Facilities

Thirty-five years of continuous experience and a thoroughly modern plant assure production of the highest quality, and a promptness in manufacturing which is essential to congenial and profitable connections.

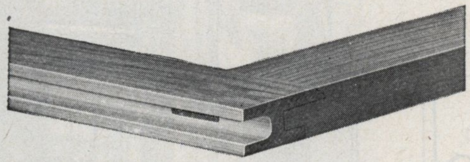
Being located within a few miles of the Boston docks and railroad yards enables prompt shipments of all "Wakefield" products.

Wood Frame Screen

The frame is to the window screen what the foundation is to a building. Without a good frame you can not expect a good return on your investment.



Automatic Milled Corners Before Being Assembled



Corners as Put Together After Milling—the Strongest Wood Joint Known

Mortise and Tenon Corner Construction

Our full mortise and tenon corner is the best construction possible to get.

The wire is rolled in and held by flexible spline.

White pine is acknowledged to be as good stock as can be used for outside painted work. In lightness and durability under severe weather conditions there is no wood that excels it. We use Northern white pine, air and kiln dried, so that it will not warp or twist.

For special purposes and inside use we can furnish any stock that can be desired.

Metal Framed Screen

Made of rustproof steel, bronze or aluminum. In a metal frame window screen we offer a product of proven advantages—a few of which are:

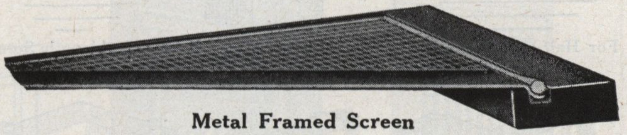
Strength derived from solid bar material electrically welded at corners—milled groove for wire mesh.

Rustproofed through acid dip and bath in molten lead and tin which tins the entire frame.

Wire mesh held by soft metallic spline which is easily removed and replaced and which is not distorted out of shape when removed.

Small in size; easily adapted as twin sliding screen where casing allowance is limited.

We call attention to so-called rewireable types of sheet metal screens, and ask particular investigation of the following: are they rigid or wabbly and shaky? Will the water seep in and rust them from the inside?



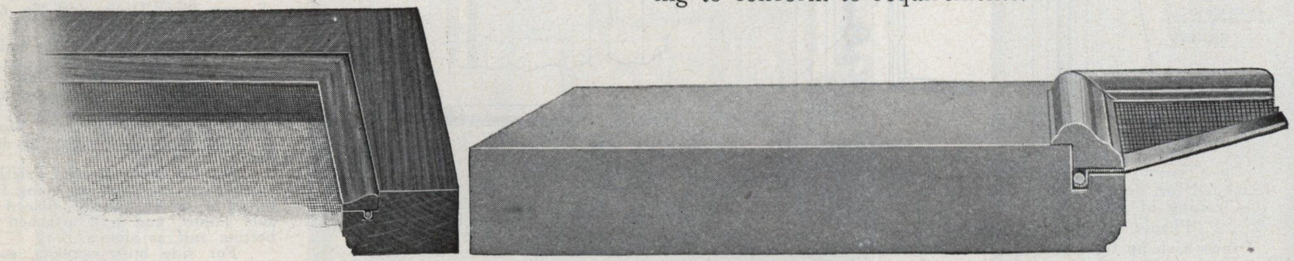
Metal Framed Screen

Can *you* remove the wire holding device without distorting it? Can you replace the old wire with new and use the old tube or wire holding device over the new wire?

Can you drop the frame 30 ft. to a concrete sidewalk without distorting and breaking it? Do not judge by the small corner or sample screen, ask to see a screen of ordinary size.

Screen Doors

Screen doors and porch screens are mortised and tenoned together at joints—a uniformly high grade method for high grade screen work. Design and paneling to conform to requirements.



Wood Frame

Frame

The Wire Is Rolled in and Held by Flexible Spline

ROLLING SCREENS, INC.

Manufacturers of the MacCormack Rolling Window Screen

13 Bergen Street, BROOKLYN, N. Y.

Product

Manufacturers of the MacCormack All-metal Rolling Window Screen, made-to-order only.

Also Wood Frame and Metal Frame, Stationary, Porch and Door Screens.

Material

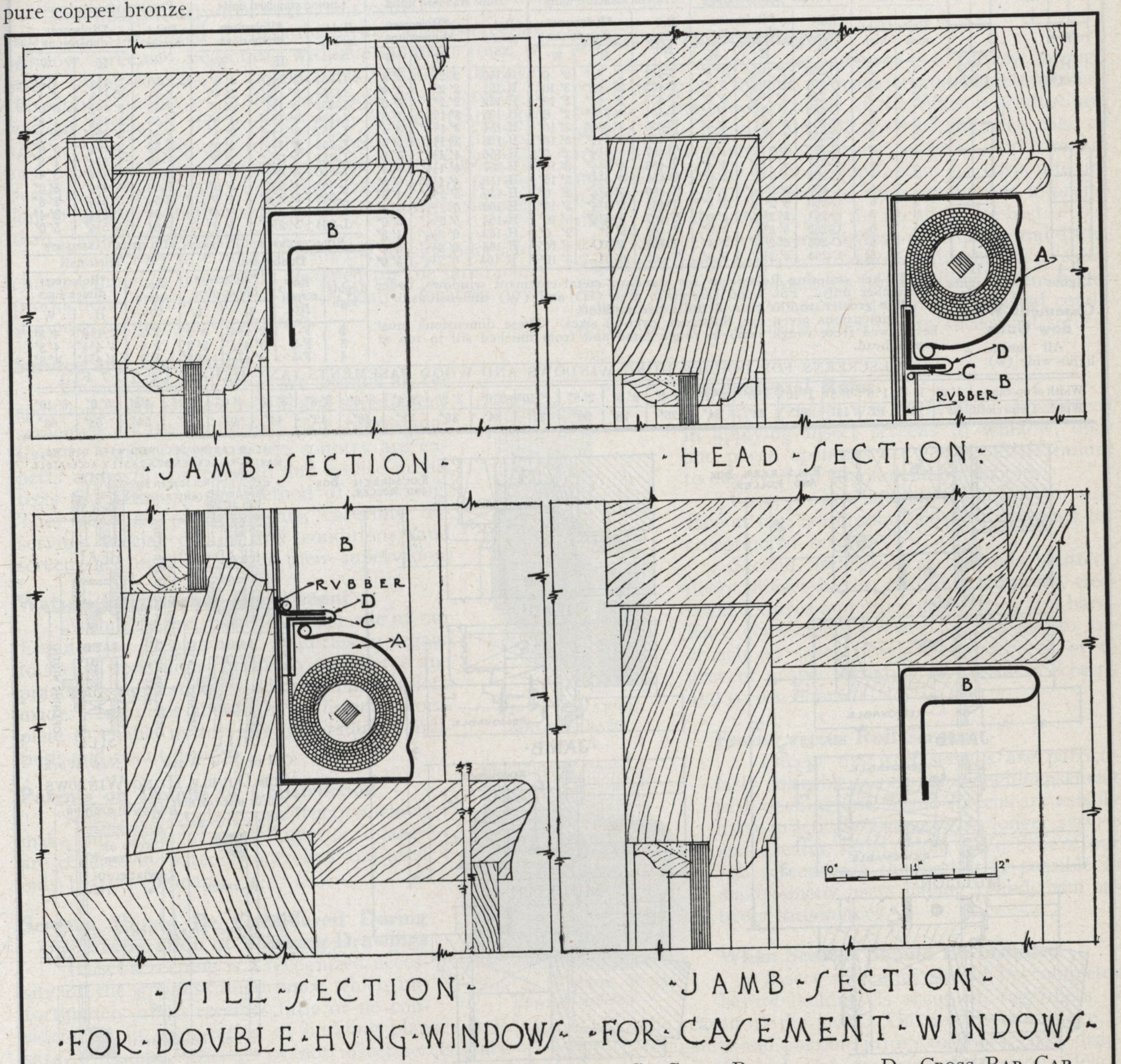
The screen frames are of heavy terne plate metal, baked enamel finish to match the window trim and the wire cloth is specially drawn and closely woven 16-mesh pure copper bronze.

Location

Our plant is very complete, and centrally located in Borough of Brooklyn, New York City.

Service

Our representatives in all large cities can be called in on short notice to show you a full size model of the MacCormack rolling screen, as well as to consult with you regarding details for the complete equipment of our rolling screen.


B
A
D
C
B
RUBBER
·JAMB·SECTION·
·HEAD·SECTION·
B
RUBBER
D
C
A
B
0"
1"
2"
·SILL·SECTION·
·JAMB·SECTION·
·FOR·DOUBLE·HUNG·WINDOWS·
·FOR·CASEMENT·WINDOWS·

A—Roller Case B—Screen Guide C—Cross Bar D—Cross Bar Cap

DETAILS SHOWING APPLICATION OF MacCORMACK ROLLING SCREENS TO DOUBLE HUNG AND CASEMENT WINDOWS

ROLSCREEN COMPANY

DES MOINES, IOWA

Rolscreens—A Convenient, Permanent and Economical Method of Screening

Easily installed on any type of window and in either new or old construction. On new construction, if desired, they can be practically concealed. On double hung windows, already in place, they can be installed in same position as wood screens. On casements, already in place, any good carpenter can build them in.

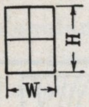
Automatically Locks on Inside—A Rolscreen, when pulled down, can not be raised or opened from outside.

Permanent Construction of Rolscreens—Made throughout of lead coated terne plate metal—fire and rustproof. Wire is 16-mesh aluminum alloy of great tensile strength—will not sag or become baggy with use. Spring is of No. 15 gauge, oil tempered steel, encased in heavy steel roller and runs entire width of the window. The wire cloth is locked in the guides on either side by lugs fastened in a selvage on the wire, and is gripped by the jaws of the guides. In case of accident, wire is easily replaced.

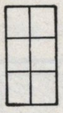
Cost Compares Favorably with That of Wood Screens—The cost of Rolscreen, for all types of casement windows, is frequently less than for good wood screens., For double hung windows, the first cost is somewhat higher than for very ordinary wood frame screens.

Catalogue of details furnished on request.

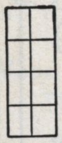
‡DIRECTIONS FOR ORDERING ROLSCREEN FOR STEEL CASEMENT WINDOWS



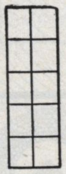
H-2 Lights



H-3 Lights



H-4 Lights



H-5 Lights

Casement Window Units

All units 2 lights wide (w)

Stock sizes		Critta'l standard units			Truscon standard units			Hope standard units			Lupton standard units			Fenestra standard units		
Units wide	Lights high	Rol-screen No.	*Rolscreen dimensions		Rol-screen No.	*Rolscreen dimensions		Rol-screen No.	*Rolscreen dimensions		Rol-screen No.	*Rolscreen dimensions		Rol-screen No.	*Rolscreen dimensions	
			H	W		H	W		H	W		H	W		H	W
1	2	C-250	2′ 1 15/16″	1′ 8″	T-451	2′ 3/4″	2′ 0″	H-150	2′ 2″	1′ 8″	L-353	2′ 1 3/4″	1′ 8″	F-50	2′ 4 3/8″	1′ 8″
2	2	C-251	2′ 1 15/16″	3′ 4″	T-452	2′ 3/4″	3′ 10″	H-151	2′ 2″	3′ 4″	L-354	2′ 1 3/4″	3′ 4″	F-51	2′ 4 3/8″	3′ 4″
3	2	C-252	2′ 1 15/16″	5′ 0″	T-453	2′ 3/4″	5′ 10″	H-152	2′ 2″	5′ 0″	L-355	2′ 1 3/4″	5′ 0″	F-52	2′ 4 3/8″	5′ 0″
1	3	C-253	3′ 1 5/8″	1′ 8″	T-454	3′ 5 1/8″	2′ 0″	H-153	3′ 1 5/8″	1′ 8″	L-356	3′ 1 3/8″	1′ 8″	F-53	3′ 4 5/8″	1′ 8″
2	3	C-254	3′ 1 5/8″	3′ 4″	T-455	3′ 5 1/8″	3′ 10″	H-154	3′ 1 5/8″	3′ 4″	L-357	3′ 1 3/8″	3′ 4″	F-54	3′ 4 5/8″	3′ 4″
3	3	C-255	3′ 1 5/8″	5′ 0″	T-456	3′ 5 1/8″	5′ 10″	H-155	3′ 1 5/8″	5′ 0″	L-358	3′ 1 3/8″	5′ 0″	F-55	3′ 4 5/8″	5′ 0″
1	4	C-256	4′ 1 1/8″	1′ 8″	T-457	4′ 5 1/2″	2′ 0″	H-156	4′ 1 1/8″	1′ 8″	L-359	4′ 0 3/4″	1′ 8″	F-56	4′ 4 7/8″	1′ 8″
2	4	C-257	4′ 1 1/8″	3′ 4″	T-458	4′ 5 1/2″	3′ 10″	H-157	4′ 1 1/8″	3′ 4″	L-360	4′ 0 3/4″	3′ 4″	F-57	4′ 4 7/8″	3′ 4″
3	4	C-258	4′ 1 1/8″	5′ 0″	T-459	4′ 5 1/2″	5′ 10″	H-158	4′ 1 1/8″	5′ 0″	L-361	4′ 0 3/4″	5′ 0″	F-58	4′ 4 7/8″	5′ 0″
1	5	C-259	5′ 2 11/16″	1′ 8″	T-460	5′ 5 7/8″	2′ 0″	H-159	5′ 2 5/8″	1′ 8″	L-362	5′ 2 7/16″	1′ 8″	F-59	5′ 5 1/8″	1′ 8″
2	5	C-260	5′ 2 11/16″	3′ 4″	T-461	5′ 5 7/8″	3′ 10″	H-160	5′ 2 5/8″	3′ 4″	L-363	5′ 2 7/16″	3′ 4″	F-60	5′ 5 1/8″	3′ 4″
3	5	C-261	5′ 2 11/16″	5′ 0″	T-462	5′ 5 7/8″	5′ 10″	H-161	5′ 2 5/8″	5′ 0″	L-364	5′ 2 7/16″	5′ 0″	F-61	5′ 5 1/8″	5′ 0″
1	6	C-262	6′ 2 3/16″	1′ 8″	T-463	6′ 5″	2′ 0″	H-162	6′ 2 1/8″	1′ 8″						
2	6	C-263	6′ 2 3/16″	3′ 4″	T-464	6′ 5″	3′ 10″	H-163	6′ 2 1/8″	3′ 4″						
3	6	C-264	6′ 2 3/16″	5′ 0″	T-465	6′ 5″	5′ 10″	H-164	6′ 2 1/8″	5′ 0″						

ROLSCREENS FOR FENESTRA MULTIPLE CASEMENTS

	Double unit			Triple unit		
Lights high	Rol-screen No.	*Rolscreen dimensions		Rol-screen No.	*Rolscreen dimensions	
		H	W		H	W
2	F-1	2′ 4 3/8″	3′ 2″	F-2	2′ 4 3/8″	4′ 8″
3	F-3	3′ 4 5/8″	3′ 2″	F-4	3′ 4 5/8″	4′ 8″
4	F-5	4′ 4 7/8″	3′ 2″	F-6	4′ 4 7/8″	4′ 8″

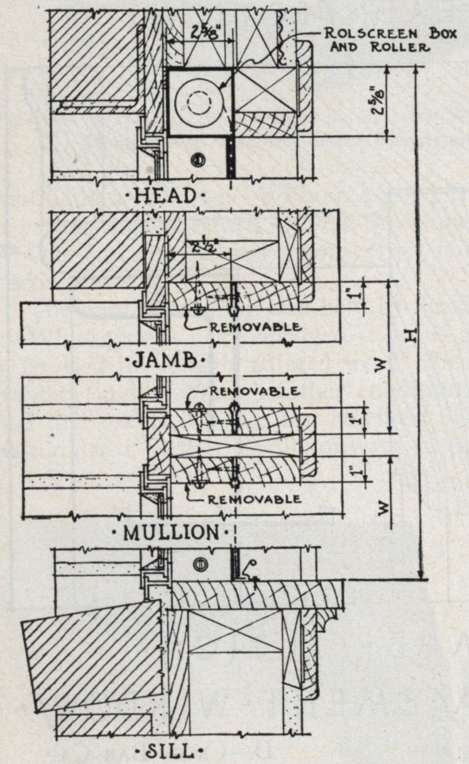
§When ordering Rolscreens for standard metal casement windows, order by number only. For wood casements give (H) and (W) dimensions.

For greater widths than 3 units use mullion.

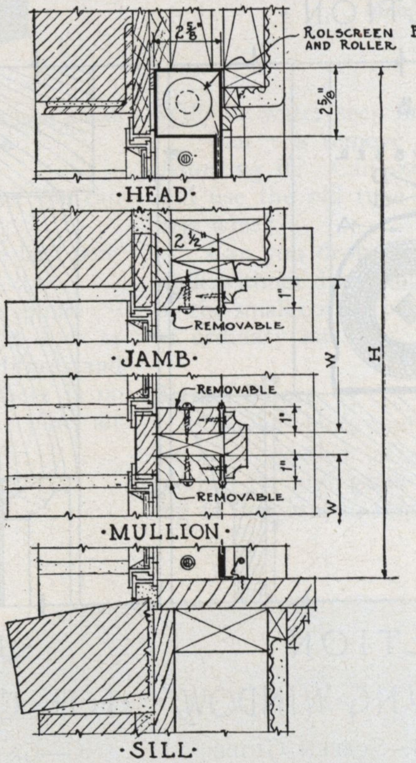
*Dimensions given are Rolscreen over-all sizes. These dimensions must be allowed from rough jamb to rough jamb and from finished sill to top of rough head.

ROLSCREENS FOR DOUBLE HUNG WINDOWS AND WOOD CASEMENTS (ANY HEIGHT UP TO 7 FT.)

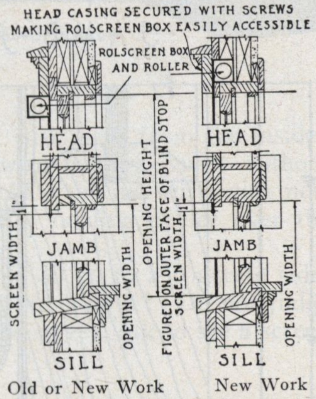
Width of opening..	1′ 2″	1′ 4″	1′ 6″	1′ 8″	1′ 10″	2′ 0″	2′ 2″	2′ 4″	2′ 6″	2′ 8″	2′ 10″	3′ 0″	3′ 2″	3′ 4″	3′ 6″	3′ 8″	3′ 10″	4′ 0″	4′ 2″	4′8″	5′ 0″	5′ 10″
Width of wire cloth	12″	14″	16″	18″	20″	22″	24″	26″	28″	30″	32″	34″	36″	38″	40″	42″	44″	46″	48″	54″	58″	68″


2⅝"
ROLSCREEN BOX AND ROLLER
2⅝"
·HEAD·
2½"
1"
REMOVABLE
·JAMB·
H
W
REMOVABLE
1"
1"
REMOVABLE
W
·MULLION·
·SILL·

For Casement Windows with Wood Trim


2⅝"
ROLSCREEN BOX AND ROLLER
2⅝"
·HEAD·
2½
1"
REMOVABLE
·JAMB·
W
H
REMOVABLE
1"
REMOVABLE
W
·MULLION·
·SILL·

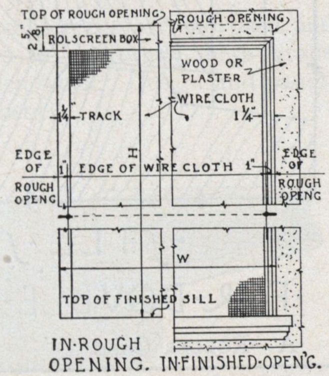
For Casement Windows with Plaster Jambs


HEAD CASING SECURED WITH SCREWS MAKING ROLSCREEN BOX EASILY ACCESSIBLE
ROLSCREEN BOX AND ROLLER
HEAD
HEAD
JAMB
JAMB
SCREEN WIDTH
OPENING HEIGHT
OPENING WIDTH
FIGURED ON OUTER FACE OF BLIND STOP SCREEN WIDTH
OPENING WIDTH
SILL
SILL

Old or New Work

New Work

For Double Hung Windows


TOP OF ROUGH OPENING
ROUGH OPENING
2⅝"
ROLSCREEN BOX
WOOD OR PLASTER
WIRE CLOTH
1¼
¼ TRACK
H
EDGE OF ROUGH OPENG
EDGE OF WIRE CLOTH
1"
EDGE OF ROUGH OPENG
W
TOP OF FINISHED SILL
IN-ROUGH OPENING.
IN-FINISHED-OPEN'G.

Interior Elevation in Casement Windows

Details of Typical Rolscreen Installations

WATSON MANUFACTURING COMPANY

Manufacturers of Metal and Wood Frame Window, Door and Porch Screens

EXECUTIVE OFFICE AND FACTORY
JAMESTOWN, N. Y.

The Fly Outside
TRADE MARK

TRADE-MARK

Products

INSECT SCREENS (made-to-order) of Bronze, Steel and Wood, for windows, doors, porches, hospital terraces, railroad cars, steel factory sash, etc.

For Metal Office Furniture, see pages 2664-2665.

The Watson Manufacturing Company, Facilities and Watson Quality

For nearly thirty-five years, this company has specialized in manufacturing and perfecting window screens. Beginning with the simplest form of wood frame screens, its product has extended to cover the highest quality of bronze, steel and wood screens in various forms of flat and irregular shaped frame and roll screens. Although of the highest quality they are not necessarily more expensive than other high grade screens. The quality, however, causes them to wear longer and give better service and be more economical than cheaply made screens.

The factory is equipped with the most modern machinery, much of it specially designed for the satisfactory production of our work. Due to central location, good shipping facilities are provided.

A Separate Screen Contract Advisable

Because of the highly specialized nature of screen work and installation, it is advised that screens be made the subject of a separate contract and not included in general contract. General contractors frequently see only price and lose sight of the quality, adaptability, efficiency, appearance, etc., contemplated by the architect, which results in ultimate dissatisfaction.

Object of This Catalogue

In this catalogue our endeavor is to convey, through constructive and reliable information and suggestion, confidence in the superior merit of the Watson product and service. We manufacture all types of roll, flat, cage or irregular metal and wood frame screens, therefore are not influenced by factory limitations or corporate interests, and in all particulars, this catalogue is unprejudiced. Our desire is to give the architect the best of our experience. With this end in view, description and drawings have been prepared to show only the most satisfactory and practical methods for installing screens under usual conditions. Occasional special and unusual conditions present no serious difficulties to successful screening.

Service and Installation

On accepting an order we assume all responsibility for the successful and satisfactory screening of the building. Our representatives in various parts of the country are experts and will confer with and advise architects as to the proper method of screening. They take all measurements, carefully observing special details and conditions, and screens are installed under their supervision.

Watson Engineering Department

Architects are invited to make use of our Engineering Department. Inquiries in regard to special conditions cheerfully considered and practical suggestions and recommendations made. Inquiries should be sufficiently complete to enable us to fully understand conditions and result desired.

Patents on Details of Construction

Nearly all details of construction which make our work of such superior quality are covered by patents controlled and used only by this company.

Screens Should Be Considered During Preparation of Working Drawings

Insect screening is a recognized necessity of the greatest importance which unfortunately often receives little or no consideration in preparation of building plans. It is safe to assume, whether or not insect screens are included in the architect's plans or in general contract, that they will eventually be required; therefore, design and construction should be arranged to allow for future use of screens in an economical and satisfactory way.

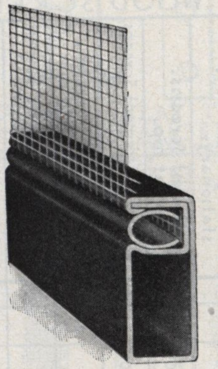


FIG. 1. WATSON METAL FRAME SCREEN

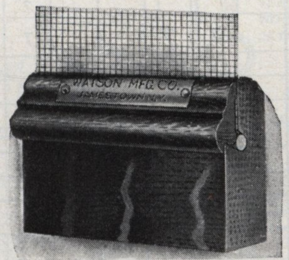


FIG. 2. WATSON WOOD FRAME SCREEN

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

Fundamental Rules

In a general way, difficulties experienced in applying insect screens to window, door and porch openings are the result of failure to observe two fundamental principles.

First, provide suitable framework or surface at top, bottom and sides of openings for reception of screens.

Second, arrange all sash, blinds, shutters, doors, flower boxes, curtains, draperies, electrical fixtures and other accessories and hardware connected therewith so as not to encroach on space provided for screens or to prevent proper swinging of casement screens and screen doors.

Frame versus Roll Screens

Except that roll screens are particularly desirable for inside use with casement sash opening out, frame screens are usually more practical, cheaper, give longer service and greater satisfaction. We believe our roll screens are the best it is possible to make—many users having found them entirely satisfactory.

When Screens Should Be Installed

Insect screening should be completed before building is occupied, regardless of the season of the year. This avoids annoyance to occupants and possible injury to floors, rugs, draperies, etc., and also frequent and serious delays because of congested condition of screen factories in the spring. Early installation may also provide protection during interior finishing, wall decorating and furnishing.

Continued on next page

Wire Cloth

We have adopted as standard 16-mesh commercial bronze wire cloth (Specification of the American Society for Testing Materials—containing not less than 90% copper). Upon special order we can furnish other mesh and weights of bronze cloth, as well as nickel and various compositions of nickel and copper. While not recommended, we can also furnish plain and painted galvanized steel cloth upon special order.

Specialists in Hospital Screening

Hospital screening demands frequently extend to more or less structural work around partly enclosed or open pavilion terraces, sun rooms, etc. We are particularly well equipped through our engineering department and complete machinery equipment for sheet metal construction work, to handle work of this character with exceptional success; in fact, to furnish any special framework of metal or wood needed for proper installation of window frames and doors under any circumstances.

Hardware

Practically all the hardware referred to in this catalogue is manufactured in our own plant. We can furnish hardware other than is shown in this catalogue to meet special conditions when necessary.

Screen Specifications

Except as generally described and shown in drawings, we are making no attempt to suggest specifications, which vary greatly according to circumstances of each job. We shall be glad at any time to assist architects to prepare specifications if requested.

Cost and Quality to be Considered

There is such a wide difference in quality of material, workmanship, adaptability, utility, efficiency, manner of application, etc., as well as standing and experience of the manufacturer and the sales representatives, that all details of proposals should be carefully considered before awarding contracts. In absence of uniformity, price is not the only consideration.

Classification of Window Screens

Screens naturally divide themselves into two classes:

Frame Screens—May be full height, covering entire opening; or part height, covering part of opening. Full height screens are made stationary, top hung (top hinged or pivoted), side hung (hinged or pivoted), two- or three-part sliding screens (vertical or horizontal) cage screens, screens for pivot sash, screen doors and porch screens. Part height screens may be sliding, stationary, top hung (top or side pivoted, or side hinged).

Roll Screens—May be full size, covering entire opening; or half size, covering part of opening.

Schedule and Detail Drawings

The following schedule indicates type of screen recommended for various types of windows, doors, porches, etc. Reference numbers refer to drawing numbers on pages following. Drawings illustrate the most usual conditions; but no attempt has been made to cover innumerable special conditions, in the working out of which we will gladly assist.

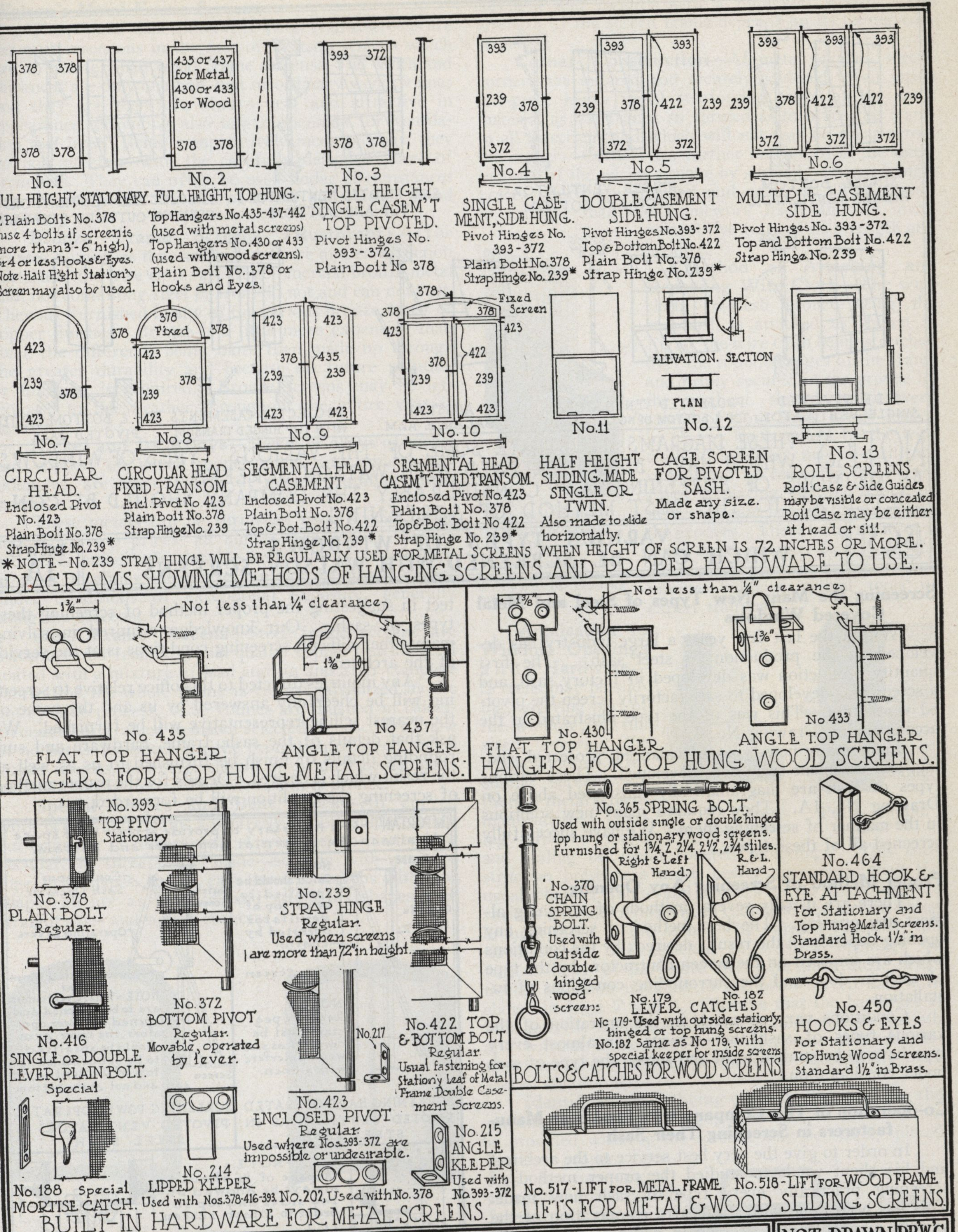
Relationship of screens to doors, sash, shutters, curtains, draperies and hardware, is shown. While a certain construction is suggested, details may be varied, providing proper relationship of window details is preserved.

TYPES OF WINDOWS / TYPES OF SCREENS	SPECIAL SCREENS Wood or Metal.	WOOD SCREENS							METAL SCREENS									
		Full Height Screens, stationary.	Full Height Screens, hung at top.	Full Height Casement Screens, hinged or pivoted.	Vertical Sliding Screens, twin or multiple.	Horizontal Sliding Screens, twin or multiple.	Half Height Screens, exterior.	Half Height Screens, interior.	Cage Screens.	Full Height Screens, stationary.	Full Height Screens, hung at top.	Full Height Casement Screens, hinged or pivoted	Vertical Sliding Screens, twin or multiple.	Horizontal Sliding Screens, twin or multiple	Half Height Screens, exterior.	Half Height Screens, interior.	Exterior Rolling Screens.	Interior Rolling Screens.
Basement.		6	6	6						6	6	6						
Wood Casements, opening in, with Shutters or with Outside Awnings.					6								6				6	
Wood Casements, opening in, without Shutters and without Awnings.		6	6	6						6	6	6						
Transoms.		6-13	6	10						6-8-13	6-8	8-10						
Wood Casements, opening out.			9	9	9						9	9	9					11
Double Hung Sash, with Shutters.							7	7							7	7		12
Double Hung Sash, without Shutters and without Awnings.			7	7			7	7			7	7			7	7		12
Multifold Wood Casements, opening in.			10	10	10	10					10	10	10	10				
Multifold Wood Casements, opening out.					10	10							10	10				
Metal Casements, opening in, with Shutters.																		
Metal Casements, opening in, without Shutters.										8	8	8						
Metal Casements, opening out												8	8					8
Pivoted Ventilators in Steel Sash or Pivoted Windows.	4								1									
PORCH OPENINGS		14-15	14-15	14-15	15					14-15	14-15	14-15	15					
DOORS AND FRENCH WINDOWS																		
Wood or Metal Screens, Wood Doors, opening in.				13								13						
Wood French Windows, opening in with Shutters.				13								13						
Wood French Windows, opening in without Shutters.				6								6						
Wood French Windows, opening out.				6-13								6-13						
SPECIAL OPENINGS	1-1 A	Practically all types of openings may be screened																

NOTE. The Numbers refer to the Drawing Numbers on pages following in which are detailed the recommended methods of screening the above described openings When conditions warrant, any of the various methods of screening may be used.

INDEX FOR VARIOUS CONDITIONS OF WINDOWS WITH SCREENS

Continued on next page


378 378 378 378
No.1
FULL HEIGHT, STATIONARY.
2 Plain Bolts No. 378 (use 4 bolts if screen is more than 3'-6" high), or 4 or less Hooks & Eyes. Note: Half H'ght Station'y Screen may also be used.
435 or 437 for Metal, 430 or 433 for Wood
378 378
No.2
FULL HEIGHT, TOP HUNG.
Top Hangers No. 435-437-442 (used with metal screens) Top Hangers No. 430 or 433 (used with wood screens). Plain Bolt No. 378 or Hooks and Eyes.
393 372 378 378
No.3
FULL HEIGHT SINGLE CASEM'T TOP PIVOTED.
Pivot Hinges No. 393-372.
Plain Bolt No 378
393 239 378 372
No.4
SINGLE CASEMENT, SIDE HUNG.
Pivot Hinges No. 393-372
Plain Bolt No. 378
Strap Hinge No. 239*
393 393 239 378 422 239 372 372
No.5
DOUBLE CASEMENT SIDE HUNG.
Pivot Hinges No. 393-372
Top & Bottom Bolt No. 422
Plain Bolt No. 378
Strap Hinge No. 239*
393 393 393 239 378 422 422 239 372 372 372
No.6
MULTIPLE CASEMENT SIDE HUNG.
Pivot Hinges No. 393-372
Top and Bottom Bolt No. 422
Strap Hinge No. 239*
423 239 378 423
No.7
CIRCULAR HEAD.
Enclosed Pivot No. 423
Plain Bolt No. 378
Strap Hinge No. 239*
378 Fixed 378 378 423 239 378 423
No.8
CIRCULAR HEAD FIXED TRANSOM
Encl. Pivot No 423
Plain Bolt No. 378
Strap Hinge No. 239
423 423 378 435 239 239 423 423
No.9
SEGMENTAL HEAD CASEMENT
Enclosed Pivot No. 423
Plain Bolt No. 378
Top & Bot. Bolt No. 422
Strap Hinge No. 239*
378 Fixed Screen 378 378 423 423 378 422 239 239 423 423
No.10
SEGMENTAL HEAD CASEM'T-FIXED TRANSOM.
Enclosed Pivot No. 423
Plain Bolt No. 378
Top & Bot. Bolt No 422
Strap Hinge No. 239*
No.11
HALF HEIGHT SLIDING. MADE SINGLE OR TWIN.
Also made to slide horizontally.
ELEVATION. SECTION
PLAN
No.12
CAGE SCREEN FOR PIVOTED SASH.
Made any size or shape.
No.13
ROLL SCREENS.
Roll Case & Side Guides may be visible or concealed. Roll Case may be either at head or sill.
*NOTE - No. 239 STRAP HINGE WILL BE REGULARLY USED FOR METAL SCREENS WHEN HEIGHT OF SCREEN IS 72 INCHES OR MORE.
DIAGRAMS SHOWING METHODS OF HANGING SCREENS AND PROPER HARDWARE TO USE.
1 3/8"
Not less than 1/4" clearance
No. 435
FLAT TOP HANGER
1 3/8"
No 437
ANGLE TOP HANGER
HANGERS FOR TOP HUNG METAL SCREENS.
1 3/8"
Not less than 1/4" clearance
No. 430
FLAT TOP HANGER
1 3/8"
No 433
ANGLE TOP HANGER
HANGERS FOR TOP HUNG WOOD SCREENS.
No. 393
TOP PIVOT
Stationary
No. 378
PLAIN BOLT
Regular.
No. 416
SINGLE OR DOUBLE LEVER, PLAIN BOLT.
Special
No. 188 Special
MORTISE CATCH.
No. 372
BOTTOM PIVOT
Regular.
Movable, operated by lever.
No. 214
LIPPED KEEPER
Used with Nos. 378-416-393.
No. 239
STRAP HINGE
Regular.
Used when screens are more than 72" in height.
No. 217
No. 423
ENCLOSED PIVOT
Regular.
Used where Nos. 393-372 are impossible or undesirable.
No. 202, Used with No. 378
No. 422 TOP & BOTTOM BOLT
Regular.
Usual fastening for Station'y Leaf of Metal Frame Double Casement Screens.
No. 215
ANGLE KEEPER
Used with No. 393-372
BUILT-IN HARDWARE FOR METAL SCREENS.
No. 365 SPRING BOLT.
Used with outside single or double hinged top hung or stationary wood screens. Furnished for 1 3/4", 2", 2 1/4", 2 1/2", 2 3/4" stiles.
No. 370
CHAIN SPRING BOLT.
Used with outside double hinged wood screens.
Right & Left Hand
R. & L. Hand
No. 179
No. 182
LEVER CATCHES
No. 179 - Used with outside station'y, hinged or top hung screens.
No. 182 Same as No 179, with special keeper for inside screens.
BOLTS & CATCHES FOR WOOD SCREENS.
No. 464
STANDARD HOOK & EYE ATTACHMENT
For Stationary and Top Hung Metal Screens. Standard Hook 1 1/2" in Brass.
No. 450
HOOKS & EYES
For Stationary and Top Hung Wood Screens. Standard 1 1/2" in Brass.
No. 517 - LIFT FOR METAL FRAME
No. 518 - LIFT FOR WOOD FRAME
LIFTS FOR METAL & WOOD SLIDING SCREENS.

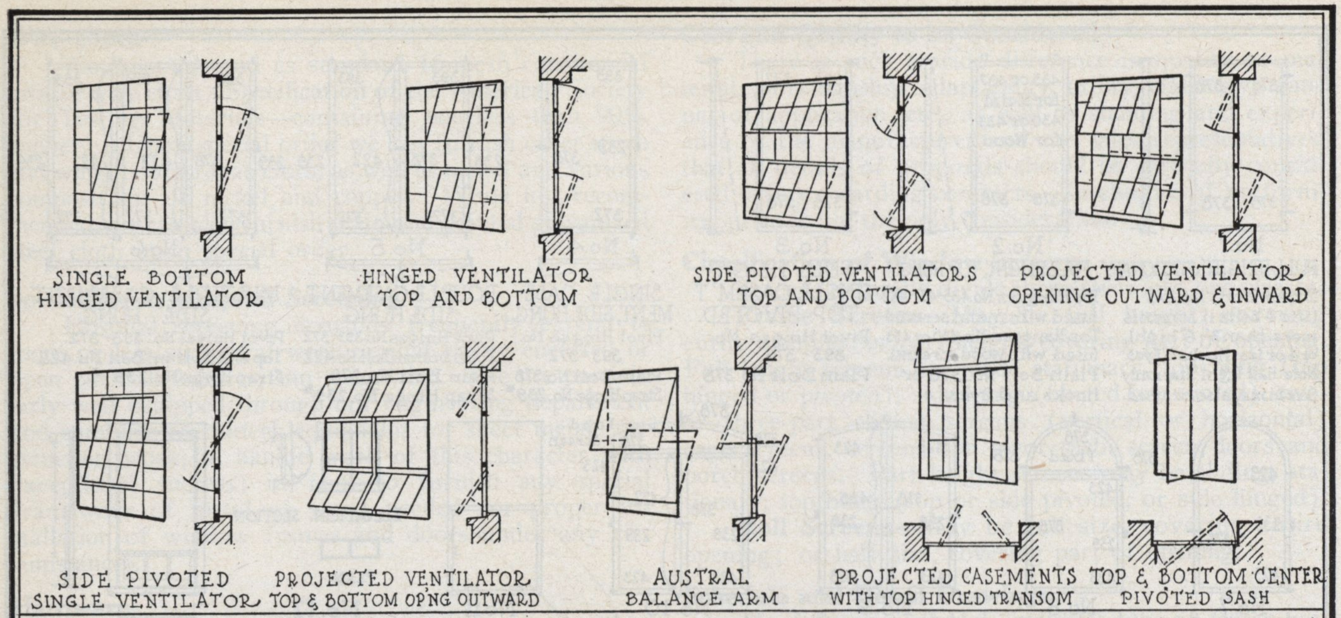
DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

DIAGRAMS SHOWING METHODS OF HANGING AND HARDWARE USED WITH WATSON SCREENS

NOT DRAWN TO SCALE.
DATE, AUG. '21

DRW'G
1

Continued on next page


SINGLE BOTTOM HINGED VENTILATOR
HINGED VENTILATOR TOP AND BOTTOM
SIDE PIVOTED VENTILATORS TOP AND BOTTOM
PROJECTED VENTILATOR OPENING OUTWARD & INWARD
SIDE PIVOTED SINGLE VENTILATOR
PROJECTED VENTILATOR TOP & BOTTOM OP'NG OUTWARD
AUSTRAL BALANCE ARM
PROJECTED CASEMENTS WITH TOP HINGED TRANSOM
TOP & BOTTOM CENTER PIVOTED SASH

NOTES THESE DIAGRAMS ILLUSTRATE SOME OF THE VARIOUS TYPES OF WINDOWS WHICH HAVE BEEN SCREENED WITH WATSON SCREENS.
AS METHODS OF SCREENING VARY CONSIDERABLY THE COMPANY SHOULD BE CONSULTED AS TO THE BEST METHOD OF SCREENING

SCS VARIOUS TYPES OF WINDOWS WHICH CAN BE SCREENED WITH WATSON SCREENS DRWG 1A

Screening the Many New Types of Steel and Metal Covered Windows

Within the last few years a large industry has developed in the production of steel sash. The first quantity production was developed in factory sash, and a screen was developed to satisfactorily screen the pivoted ventilators. This was of the type illustrated in the accompanying Drawing No. 4.

Later many new types of balanced, projected, sliding, and casement sash were developed. These various types of sash are diagramatically illustrated above on Drawing No. 1A. They required many new solutions in the manner of screening them. We have successfully screened all of these types.

Proper Method of Screening Any Opening

There are usually several methods of screening almost any opening. The best method of screening any opening depends on the results desired; by the conditions which are imposed on the screen contractor; by the type of sash or door and the surrounding conditions of installation.

Conditions vary so much in the operation of the various types of sash that screens for almost every type have to be studied to fit and screen the type of sash under consideration.

Co-operation of This Company with Steel Sash Manufacturers in Screening Their Sash

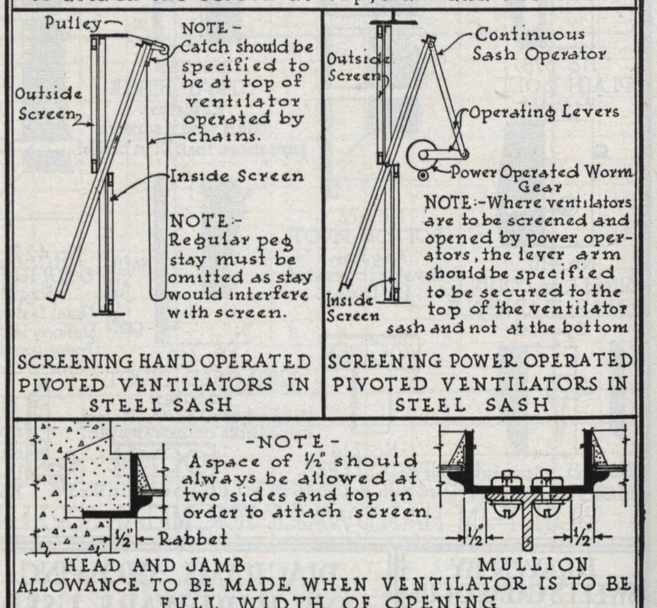
In order to give the very best service to the architect and his client we have studied the proper method of screening practically every type of sash now made. This has been done with the hearty co-operation of the various manufacturers of sash in order to develop the proper screen for their particular sash.

Co-operation with the Architect

We are always willing to co-operate with the architect in suggesting the proper method of screening these types of sash. Our knowledge acquired in solving many other difficult screening conditions is at the service of the architect.

Any inquiries directed to this office relative to screening will be cheerfully answered by us and the name of the nearest selling representative will be furnished. We ask that details of the sash, frame, hardware and surrounding details of finish be furnished to us as well as the result which is desired. Details for the proper method of screening the condition will be forwarded.

IMPORTANT:- It is necessary to provide at least ½" of space to attach the screen at top, sides and bottom.


Pulley
Outside Screen
NOTE - Catch should be specified to be at top of ventilator operated by chains.
Inside Screen
NOTE - Regular peg stay must be omitted as stay would interfere with screen.
Outside Screen
Continuous Sash Operator
Operating Levers
Power Operated Worm Gear
NOTE:- Where ventilators are to be screened and opened by power operators, the lever arm should be specified to be secured to the top of the ventilator sash and not at the bottom
Inside Screen
-NOTE- A space of ½" should always be allowed at two sides and top in order to attach screen.
½"
Rabbet
½"
½"

SCREENING HAND OPERATED PIVOTED VENTILATORS IN STEEL SASH

SCREENING POWER OPERATED PIVOTED VENTILATORS IN STEEL SASH

HEAD AND JAMB

MULLION

ALLOWANCE TO BE MADE WHEN VENTILATOR IS TO BE FULL WIDTH OF OPENING

SCS REQUIREMENTS FOR SUCCESSFUL SCREENING OF VENTILATORS IN STEEL SASH DRWG. 4

Continued on next page

Watson's Metal Frame Screens

The popular conception that metal frame screens are heavy is erroneous in the case of Watson screens which are no heavier than wood frame screens. The width and thickness are only one-half that of ordinary wood frames and they are therefore always neat and attractive in appearance, providing also larger openings for ventilation and light. Being comparatively inconspicuous, they do not interfere with the carefully designed plans of architects. They can often be used under circumstances that do not permit the use of wider and thicker wood frames.

Bronze Frame Screens (Rustproof)—The frames, as well as the various hardware and construction parts, and the wire cloth, are of commercial bronze metal and, not containing steel or iron, do not and can not rust. They are furnished in any of the various bronze, brass or copper finishes. Bronze is a little more expensive than steel, the difference being more than made up through the greater durability and because no future painting or finishing is required. Bronze screens may be left exposed to the weather throughout the entire year if desired.

Nickel and Its Alloys—Nickel or alloys of nickel and copper, of which monel metal and ambrac are examples, are advocated as of greater durability than bronze.

These metals can be furnished upon special order and at varying prices, all higher than bronze, but as bronze is sufficiently durable and entirely satisfactory in most localities, their use can not be urged except under conditions of exceptional exposure, generally along the seacoast.

Steel Frame Screens—Steel frame screens are manufactured from a special quality copper bearing steel coated with a mixture of lead and tin and after complete fabrication the whole frame is electro-galvanized by the hot cyanide process. The frames are finished in baked-on enamel or grained to match selected woods. We know of no better measures for the protection of steel. Steel frame screens, however, should be painted occasionally as conditions require. The wire cloth is bronze.

Special Shapes and Bent Work—All curved work is bent and retains a perfectly smooth surface without crimping or distortions. Any shape, no matter how peculiar, is successfully made—screens with rounded tops, oval shapes, circles, cage screens, screens with bow shape—all are as practical and strong as shapes with straight sides and square corners.

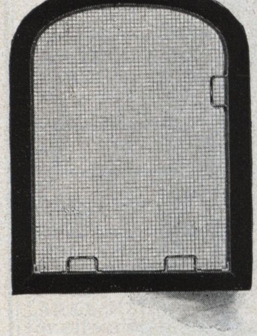


Fig. 3

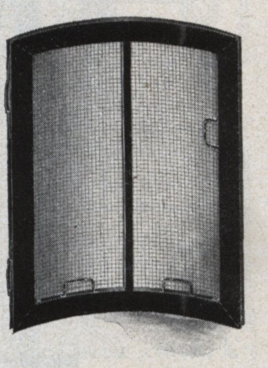


Fig. 4

Types of Irregular Shaped Metal Screens

Construction—Great strength and rigidity is provided through the well established principle of solid tubular construction, recognized as providing greatest strength and rigidity with a minimum weight. The strength of the screen frame depends on its corner construction.

Corner Construction—All-metal frame screen corners are mitered and securely soldered to an inside one-piece heavy metal reinforcing angle of the same material as the frame, so formed as to brace the frame in all directions and which will not tear or shear across the corner. Corners are further reinforced at the intersections of the wiring groove by specially designed angle braces which are clinched and soldered. This corner is stronger than the framework itself and we invite competitive tests of its strength and rigidity.

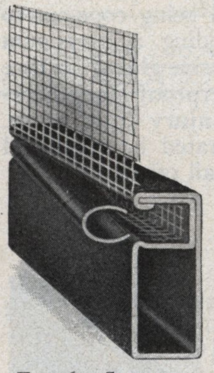


Fig. 6. Section Through Metal Frame

Shows patented tubular construction and method of *rewiring* screen

Method of Attaching and Renewing Wire Cloth—The wire cloth, 16-mesh bronze being the standard, is attached as shown in Fig. 6, the wire cloth being stretched over the rounded edges of the frame and firmly secured in the groove by the resilient slotted tube, every strand of cloth being firmly locked in place. Replacement of the wire cloth, if necessary, may be easily accomplished by removing the slotted tubes, replacing the old cloth by new and again forcing the tubes into the grooves. There being no screws, bolts, rivets or other fastenings, the work is easily accomplished in a few minutes without special tools or expert training.

Application to Window Openings and Hardware—Screens may be sliding, covering part of the window; or full sized, covering the whole window. Our sliding screens are the only metal screens manufactured having grooved edges and sliding on metal covered mouldings. This construction presents a much neater appearance than the usual channel slides and enables us to overcome the various difficulties incident to channels, our screens being brought close to the sash. The various types of full sized screens are attached to window openings by various items of hardware elsewhere illustrated. Particular attention is called to the pivot screen hardware shown in Figs. 7 and 8. Observe that the hardware is built into the frames, leaving the frame perfectly smooth and without defacement or projections. We are prepared to furnish special hardware to successfully meet special conditions.

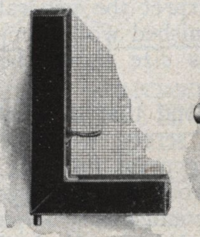


Fig. 7. Operating Pivot Hinge

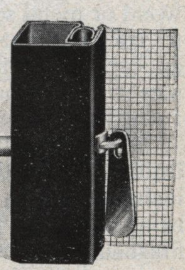


Fig. 8. Spring Bolt

Identification—It being customary to remove the screens for winter storage, a means of identification is provided whereby the screens may be readily placed in the proper openings by permanently stamped numbers in the framework, the corresponding numbering tack being applied to the window frame, all as indicated by Figs. 9 and 10.

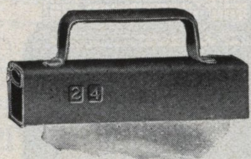


Fig. 9. Lift

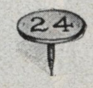


Fig. 10. Tack

Identification Numbers

Continued on next page

Watson's Wood Frame Screens

We manufacture a complete line of wood frame insect screens of all styles, sizes and shapes. The material is invariably the best and is thoroughly seasoned and kiln dried. All framework is properly proportioned in thickness and width to insure the best appearance and necessary strength for service. Wood frame screens are usually soft pine, painted with the best quality of exterior enamel paint in any color required. We also make wood frame screens of any fine wood finished in natural or stained colors to match adjoining woodwork.

Corner Construction—In our corner construction we employ hardwood dowels, the rail being cope-cut to fit the moulding of the stile, providing a maximum gluing surface, in addition to the extensive gluing surface provided by the dowels. We use waterproof glue, therefore our corners are not subject to injury from water. This construction has been demonstrated by tests and practical experience to be superior to all others.

Fastening Wire Cloth—The wire cloth is fastened by a groove and spline method shown in Fig. 11. The groove is placed to insure maximum strength of material. The wire cloth is held firmly in place by a rattan spline and is further held by a neat moulding, mitered at the corners and held in place by brass brads.

Finishing—We are prepared to make any finish required on wood or metal screens, but in order to correctly interpret the general appearance of finished work samples of generous size should be furnished.

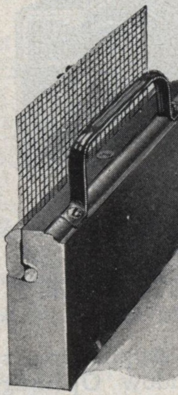


Fig. 11. Section Through Wood Frame

Shows patented method of attaching wire cloth

We recommend that the finishing of wood screen work be included in the general finishing contract, the screens being shipped from the factory unfinished or partly finished. This would insure screen finishing identically the same as the balance of the building. While this suggestion is a radical departure from generally accepted practice, in many cases it is worthy of consideration.

Identification—Identification of each screen with its proper opening is provided by duplicate numbering tacks, one being placed on the screen frame and the other on the window frame.

Hardware—We furnish with every screen brass or bronze hardware suitable for its installation. A considerable variety of special hardware applicable to usual and special conditions of hanging is provided.

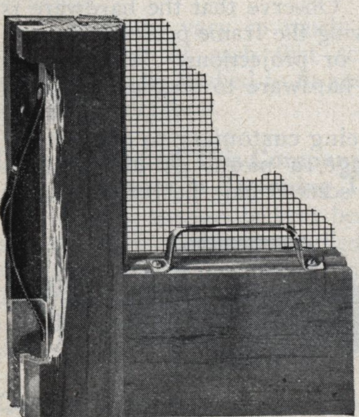


Fig. 12. Wood Screen Corner

Corner Reinforcement—Fig. 12, in addition to showing the usual construction lifts, grooves and springs employed in regular sliding screens, shows a metal corner reinforcement which is furnished on special order and is a desirable addition to wood screens. It strengthens the corners and provides a metal wearing surface on the screen slides.

Watson's Roll Screens

While roll screens are not intended to replace the usual frame screen, they can sometimes be advantageously used. Fig. 13 illustrates the application to casement sash opening out, the roll screen being operated from the top and covering the entire window, giving accessibility to the sash and without interference with window curtains or draperies. The screen cloth rolls into a metal case, the edges of the cloth being contained in side guides or grooves and is held flat by spring tension. The screen will stay in any position without fastening. The screens are made in two sizes, the regular or small size being applicable for most window openings, and the larger size being provided for especially large openings.

Construction—Our construction is the result of exhaustive investigation and experience and no expense has been spared to make it as perfect as its inherent characteristics will admit. The Watson screen is adjustable to provide for unequal or unsymmetrical openings. The adjustment of the screen can not be destroyed by inadvertence or carelessness. The cross rails are narrow and inconspicuous. The construction is such as to provide maximum wear and utility with a minimum amount of difficulty experienced because of the peculiar characteristics of roll screens.

Material and Finish—The framework of roll screens is usually of alloy coated steel electro-galvanized after fabrication by the hot cyanide process, but in special cases may be made of bronze in any of the different finishes. Steel frames may be finished in any color of enamel or grained to imitate fine cabinet woods and finishes.

Wire Cloth—The wire cloth used is 16-mesh bronze, special weight, which rolls easily and smoothly.

Inspection—All roll screens are completely assembled, inspected and tested by actual operation to insure the screens being in perfect condition before shipment. After inspection, each screen is carefully braced and packed separately in tight boxes for shipment.

Details and Installation—Details of window frame construction for the proper reception and installation of roll screens will be found on pages 1394, 1397 and 1398.

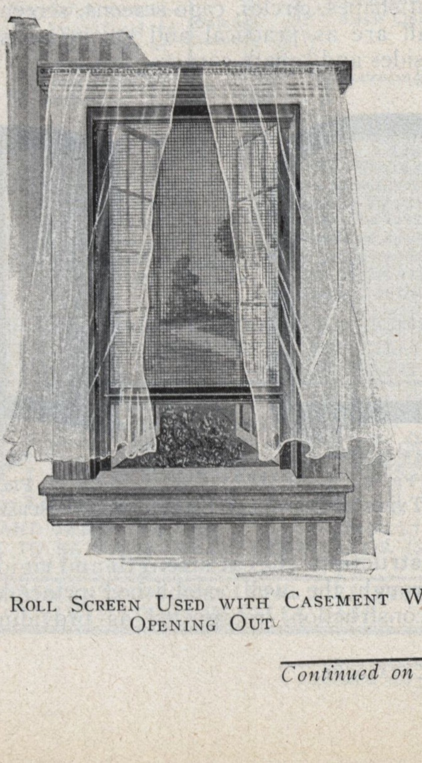
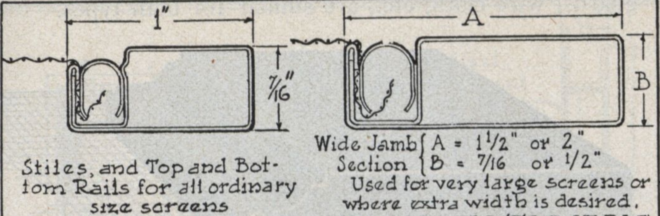


Fig. 13. Roll Screen Used with Casement Window Opening Out

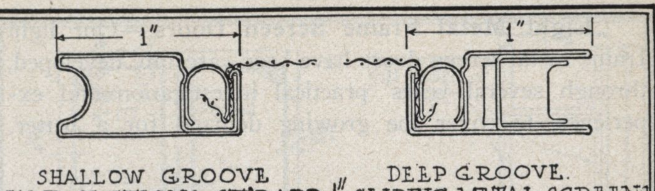
Continued on next page



Stiles, and Top and Bottom Rails for all ordinary size screens

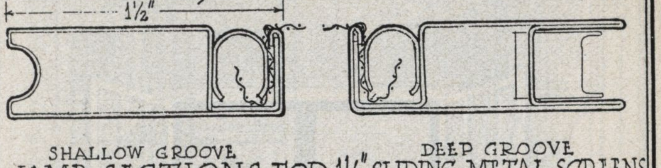
Wide Jamb Section A = 1½" or 2"; B = 7/16 or ½"
Used for very large screens or where extra width is desired.

F.S. SECTIONS FOR STATIONARY, TOP HUNG TOP PIVOTED & SIDE HUNG METAL SCREENS.



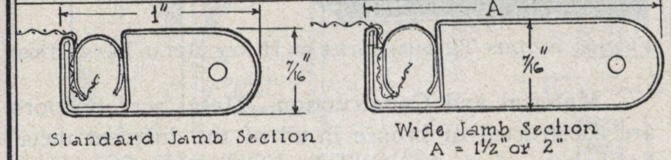
SHALLOW GROOVE DEEP GROOVE.

JAMB SECTIONS, ST'DARD 1" SLIDING METAL SCREENS



SHALLOW GROOVE DEEP GROOVE

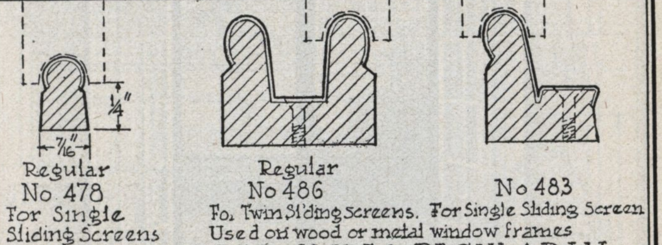
JAMB SECTIONS FOR 1½" SLIDING METAL SCREENS



Standard Jamb Section

Wide Jamb Section
A = 1½" or 2"

F.S. SECTION, HINGE SIDE FOR METAL PIVOT HINGED SCREENS.

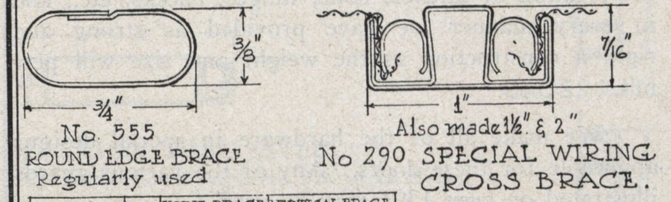


Regular No 478 For Single Sliding Screens

Regular No 486 For Twin Sliding Screens. Used on wood or metal window frames

No 483 For Single Sliding Screen

METAL CAPPED SLIDES REGULARLY USED FOR SLIDING METAL SCREENS



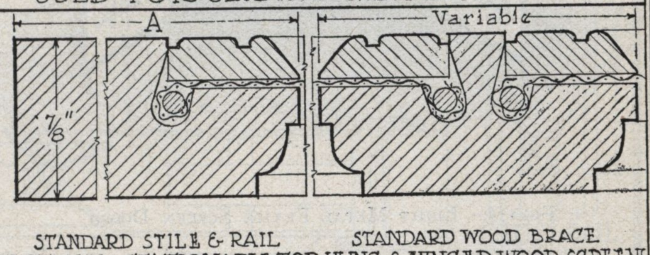
Also made 1½" & 2"

No. 555 ROUND EDGE BRACE Regularly used

No 290 SPECIAL WIRING CROSS BRACE.

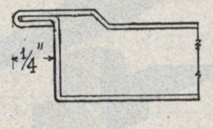
BRACING RULES FOR METAL FRAMES		HORIZ. BRACE	VERTICAL BRACE
	1"	60" high	50" wide
	1½"	72" "	60" "
	2"	90 "	72" "

F.S. DETAILS, BRACES USED WITH METAL SCREENS.



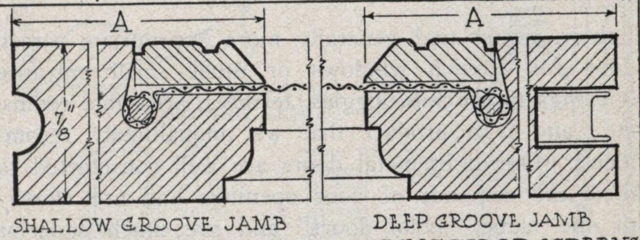
STANDARD STILE & RAIL STANDARD WOOD BRACE

SECTIONS,-STATIONARY, TOP HUNG & HINGED WOOD SCREENS



This Astragal is used with Double Casement Screens.

F.S. ASTRAGAL USED WITH METAL FRAME SCREENS

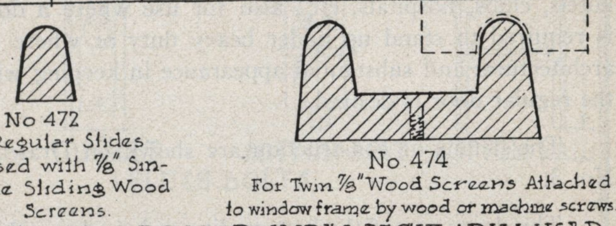


SHALLOW GROOVE JAMB DEEP GROOVE JAMB

HORIZONTAL SECTIONS OF SLIDING WOOD SCREENS

TABLE OF DIMENSIONS FOR ALL WOOD SCREENS

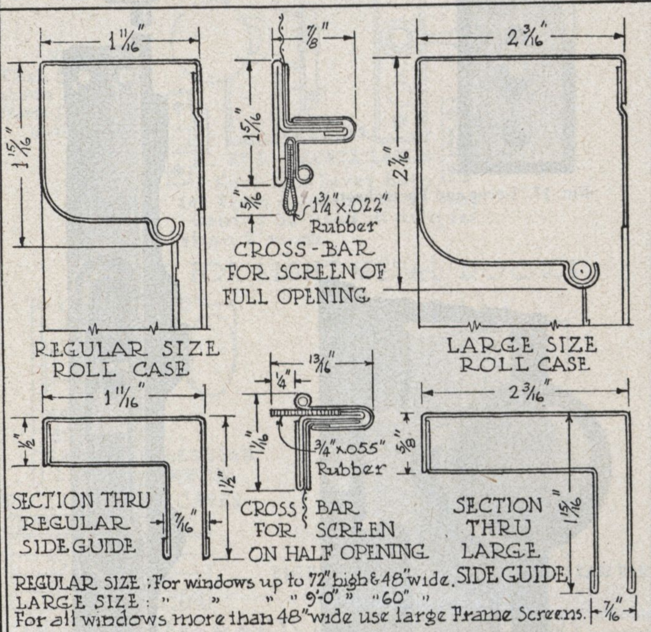
SIZE OF SCREEN		STILES	TOP RAIL	BOTTOM RAIL	WOOD BRACE
WIDTH	HEIGHT	Dim. "A"	Dim "A"	Dim. "A"	
To 48"	To 48"	1¾"	1¾"	2¼"	Required for Screens more than 60" wide or high
48" to 72"	48" to 72"	2"	2"	2½"	
72" or more	72" or more	2¼"	2¼"	2¾"	



No 472 Regular Slides used with 7/8" Single Sliding Wood Screens.

No 474 For Twin 7/8" Wood Screens Attached to window frame by wood or machine screws

STANDARD WOOD SLIDES REGULARLY USED FOR SINGLE AND TWIN SLIDING WOOD SCREENS.



CROSS-BAR FOR SCREEN OF FULL OPENING

REGULAR SIZE ROLL CASE

LARGE SIZE ROLL CASE

SECTION THRU REGULAR SIDE GUIDE

CROSS BAR FOR SCREEN ON HALF OPENING

SECTION THRU LARGE SIDE GUIDE

REGULAR SIZE: For windows up to 72" high & 48" wide.
LARGE SIZE: " " " " 9'-0" " "60" "
For all windows more than 48" wide use large Frame Screens.

HALF FULL SIZE DETAILS OF ROLLING SCREENS.

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

DETAILS FOR STATIONARY, TOP HUNG, TOP PIVOTED, SIDE HUNG & SLIDING SCREENS OF METAL OR WOOD

SCALE-F.S.-6" EQUALS 1'-0"
DATE-SEPT.'21

DR'WG 2

Continued on next page

Watson's Metal Screen Doors

Light Metal Frame Screen Doors—Our light frame metal screen doors have been carefully developed, through several years' practical investigation and experience, to cover the growing demand for a better, lighter, neater and generally more appropriate screen door for French windows or other small entrance openings to porches, loggias, terraces, breakfast rooms, etc., and is a product that we unqualifiedly recommend. Our light metal doors are well constructed to meet the demands of door openings and are worthy of the name "metal doors" and are much superior in all details to the ordinary large window screen frequently furnished under the mistaken name of "metal doors."

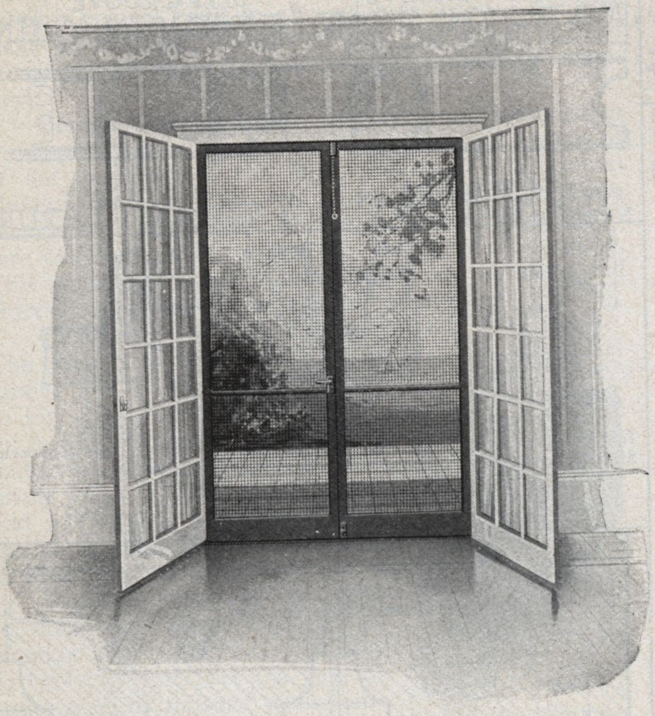


Fig. 14. Light Metal Frame Screen Doors

Heavy Metal Frame Screen Doors—These doors are made especially for use in fine residence work, hotels, clubs, hospitals, etc., also for use where a door is required to stand up under heavy duty or where an architectural and substantial appearance in keeping with the regular door is desired.

The details of construction are shown on Drawing No. 3.

The doors are of the best quality and workmanship. They are very much heavier in construction and material than the light metal screen door. The stiles and rails are heavily reinforced and the moulded panel edges also add to their stiffness.

The hardware is special and made heavier than that for the light metal doors, but the material, finish, guards, wire cloth, etc., are similar for both types.

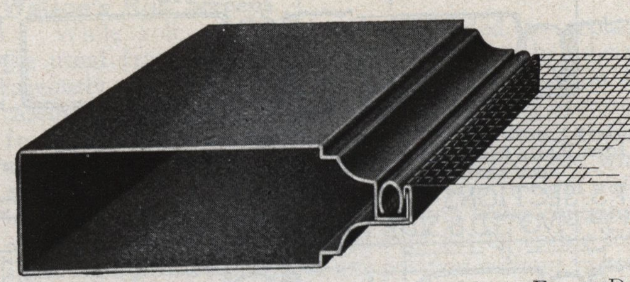


Fig. 16. Section Through Stile of Heavy Metal Frame Door

Material and Construction—Metal screen doors are constructed of bronze in all of the different metal finishes or of steel enameled or grained.

The frames are reinforced at all corners and at the location of latches, bolts, hinges, checks, etc., and in every manner we have provided as strong and rigid a construction as the weight and size will permit.

We make all of the hardware in special designs applicable for these doors. Any of the various guards illustrated on page 1391 may be used.

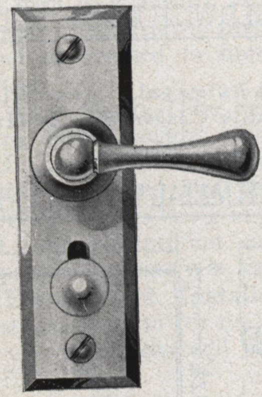


Fig. 17. Lever and Escutcheon

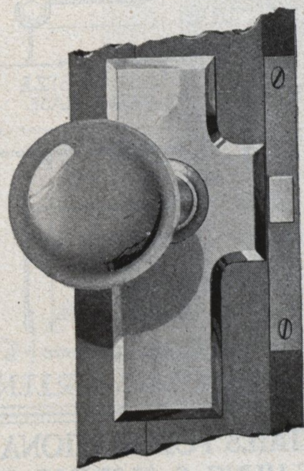


Fig. 18. Knob and Escutcheon

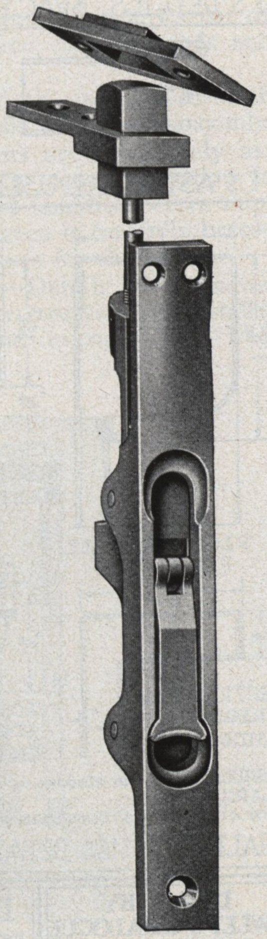


Fig. 19. Flush Bolt

Light Metal Frame Screen Door Hardware

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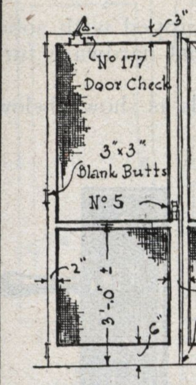
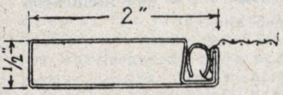

3"
No 177
Door Check
Top-Bolt
3"x3"
Blank Butts
No 5
2"
3'-0" ±
4"
2"
6"
Bottom Bolt

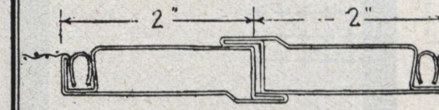
EXTERIOR ELEVATION SHOWING PAIR OF LIGHT METAL SCREEN DOORS OPENING OUT

NOTE:- It is desirable that lower panel be protected by a heavy wire guard

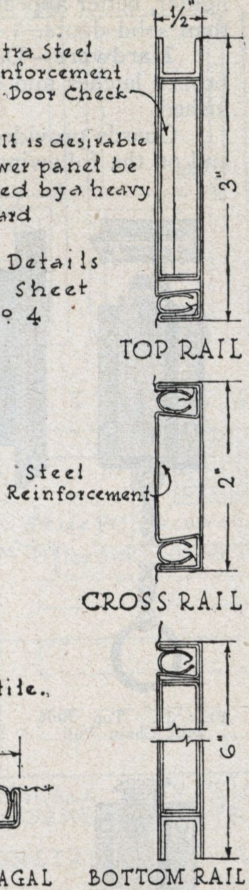
For Details see Sheet No 4



SECTION THRU STILE
Cylinder lock requires 2 1/4" wide stile.



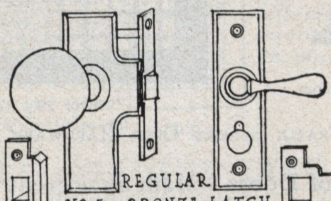
MEETING STILES WITH DOUBLE ASTRAGAL


1/2"
Extra Steel Reinforcement for Door Check
3"
TOP RAIL
Steel Reinforcement
2"
CROSS RAIL
6"

BOTTOM RAIL

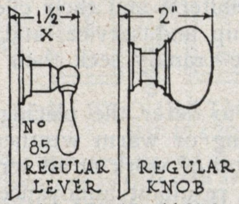
LIGHT METAL DOORS FOR USE WITH FRENCH CASEMENTS OR SMALL ENTRANCE DOORS

~NOTE~
Flush Bolts are shown with Heavy Frame Door Details on this drwg.



REGULAR No 5 BRONZE LATCH
Knob and Lever both set from inside by slide stop
Cannot be used in stiles les than 2" wide.

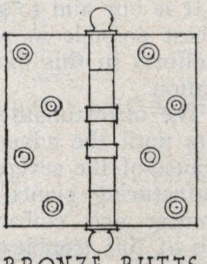
LATCH FOR LIGHT METAL DOORS



No 85 REGULAR LEVER
REGULAR KNOB

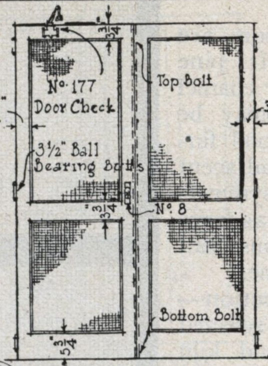
SPECIAL LEVER CASES

NUMBER	PROJ. X
76	5/8"
79	7/8"
82	1 1/8"
85	1 1/2" Std.



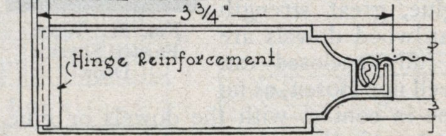
BRONZE BUTTS
LIGHT DOORS 3-3"x 3" LOOSE BRASS PIN

KNOBS & LEVERS & BUTTS USED WITH LIGHT DOORS

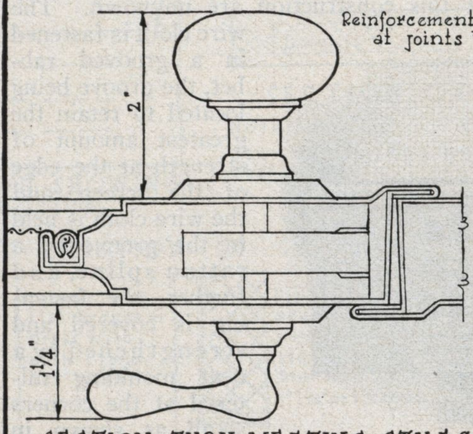

No 177
Door Check
3 3/4"
Top Bolt
3 3/4"
3 1/2" Ball Bearing Butts
3 3/4"
No 8
5 3/4"
Bottom Bolt

NOTE
Single doors same as active leaf with astragal omitted

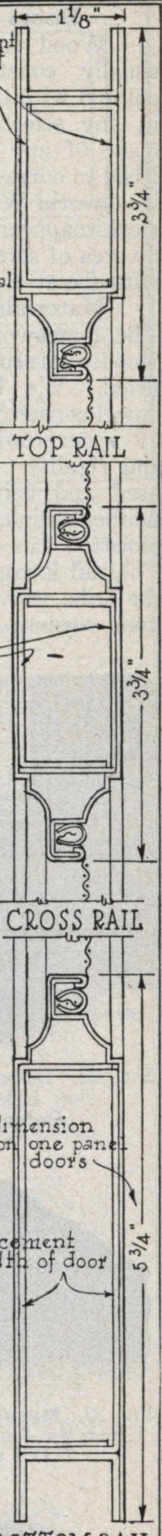
EXTERIOR ELEVATION OF HEAVY FRAME METAL DOOR ~ OPENING OUT


3 3/4"
Hinge Reinforcement

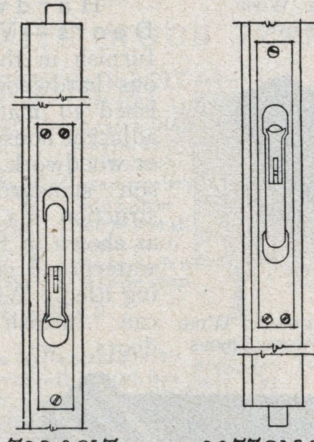
SECTION THRU STILE SHOWING HINGE



SECTION THRU MEETING STILES
SHOWING LATCH


1 1/8"
Reinforcement full width of door
3 3/4"
TOP RAIL
Reinforcement at joints
3 3/4"
CROSS RAIL
This dimension 11 3/4" on one panel doors
Reinforcement full width of door
5 3/4"

BOTTOM RAIL



TOP·BOLT BOTTOM·BOLT

FLUSH BOLTS

LATCH & BOLTS FOR HEAVY FRAME DOORS

IMPORTANT NOTE:-A RABBET AT LEAST EQUAL TO THICKNESS OF DOOR SHOULD ALWAYS BE PROVIDED AT HEAD, JAMB & SILL

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

STANDARD CONSTRUCTION AND HARDWARE FOR WATSON LIGHT & HEAVY METAL SCREEN DOORS

NOT DRAWN TO SCALE
DATE-JULY '25

DRWG 3

Continued on next page

Watson's Wood Frame Screen Doors

Wood frame screen doors are usually constructed of soft pine painted with the best exterior enamel in any selected color, but may be made of any fine cabinet wood finished to correspond with the adjacent woodwork. Watson doors are symmetrical in appearance, and have as large an area of screen cloth as is consistent with the strength of the frame.

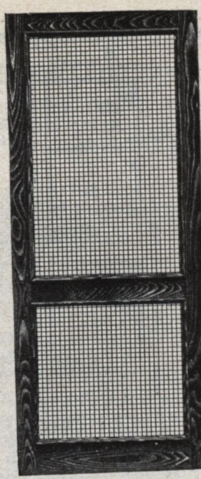


Fig. 21. Wood Frame Screen Door

Materials and Construction—The framework is made of selected woods carefully seasoned and kiln dried. We have secured by our dowel corner construction and the use of waterproof glue, great strength and rigidity. Hardwood dowels are used and being fully enclosed can neither shrink, swell nor loosen, as no moisture can come in contact with the dowels or glue. The rail is cope-cut to fit the mouldings of the edge of the stile, providing additional gluing surface. Broken door corners of this construction are unknown. The wire cloth is fastened in a grooved rabbet, the groove being located to retain the greatest amount of strength at the edge of the screen, and the wire cloth is held in the groove by a rattan spline, and further, the fastening is covered and strengthened by a neat moulding mitered at the corners—all as shown in Figs. 22 and 23.

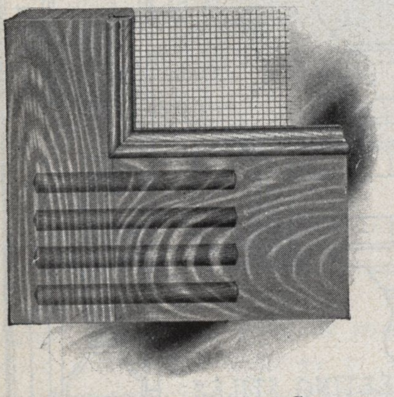


Fig. 22. Dowel Corner Construction Used in All Wood Doors and Screens

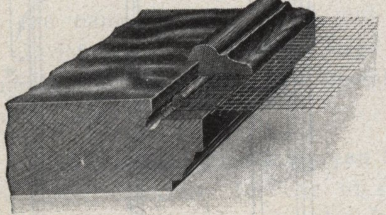


Fig. 23. Method of Securing Wire Cloth in Solid Hardwood Doors

Hardwood Doors—We can furnish in the various hardwoods, finished to match the adjacent house doors or woodwork. Watson standard construction is a veneer as shown in Fig. 24, waterproof glue being used. While we can furnish solid doors, we recommend veneered doors as being better in construction, lighter, better appearance and less liable to warp or twist than solid doors.

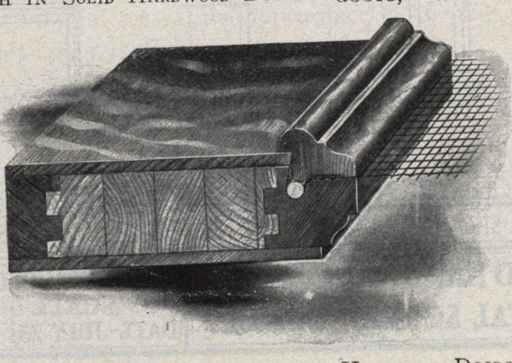


Fig. 24. Method of Veneering Hardwood Doors

Hardware—Doors regularly equipped with solid bronze latches and hinges; other special hardware furnished.

Guards provided for bottom panels as shown below and on the following page.

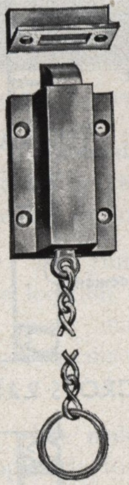


Fig. 25. Top Bolt with Chain Pull

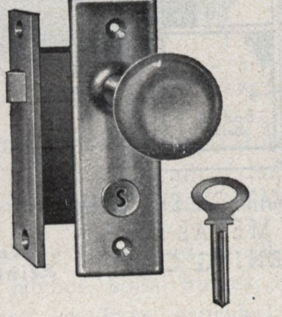


Fig. 26. Outside Knob and Escutcheon

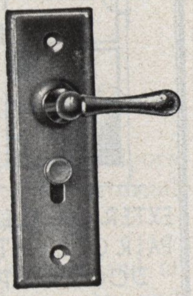


Fig. 27. Inside Lever and Escutcheon

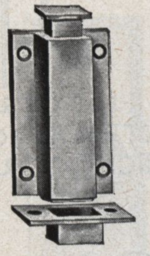


Fig. 28. Bottom Bolt

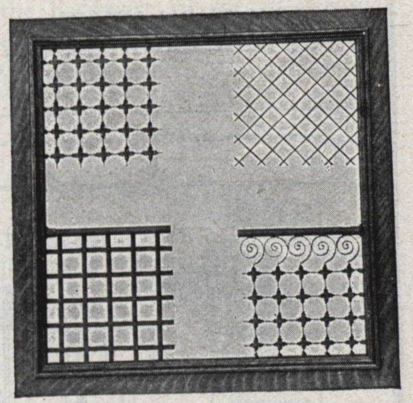


Fig. 29. Guards

Wood Frame Screen Door Hardware and Guards

Styles of Doors—Made in a great many different styles of panel, usually to correspond to house door. Solid panels instead of guards sometimes used at bottom, but these are not recommended.

Very Important—Order Early

It is our aim to give to architects and their clients the best possible in workmanship and service, and, in our efforts in this direction, we frankly seek their co-operation.

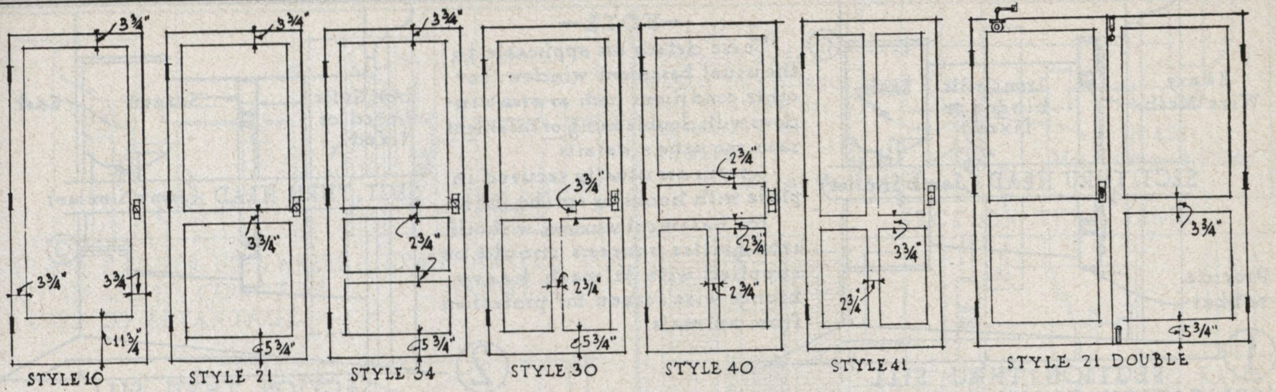
The unfortunate tendency to defer the placing of orders until the advent of spring or warm weather is the cause of the severe congestion of work at all screen manufacturing plants, with the resultant annoyance to customers and embarrassment to the manufacturers. Much of this trouble is entirely avoidable.

We, therefore, earnestly recommend that action on screen equipment for such operations as mature in the summer and fall be taken at the time, to permit of fall and winter fabrication.

Payment of orders which we are permitted to build in the fall, but which can not be installed until spring, or orders fabricated in the winter for spring shipment, may be deferred until completely installed.

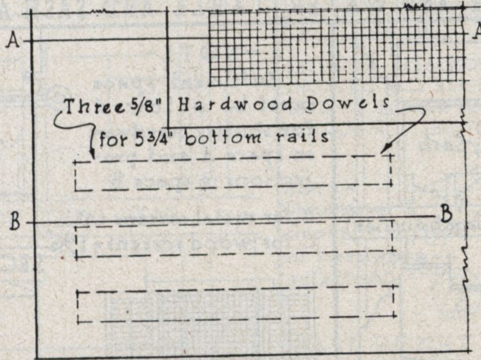
Your co-operation will enable us to give the utmost in service and reflect to the best interests of your clients.

Continued on next page

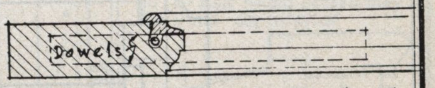


ELEVATIONS SHOWING TYPICAL STYLE OF WOOD FRAME DOORS

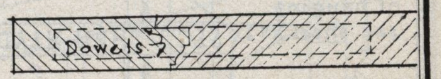
NOTES
It is desirable that rabbet be provided to receive the top, sides and bottom of all screen doors. Rabbet must always be as deep as the thickness of door. Sufficient space must be allowed for hardware of both screen and house doors. An unobstructed swinging space must be provided, this especially refers to location of lighting fixtures. Stiles and top rails for French Doors may be 2¾" in width if standard latch is used. Special panel designs of any type may be made. Dimensions on stiles are standard for doors as shown can be varied but should never be made smaller.



3" SCALE ELEVATION SHOWING CORNER CONSTRUCTION



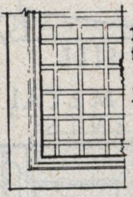
SECTION ON LINE "A-A"



SECTION ON LINE "B-B"

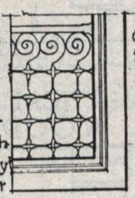
Note:- Standard thickness of doors 1⅛"

DETAILS SHOWING CONSTRUCTION AT JUNCTION OF STILES AND RAILS



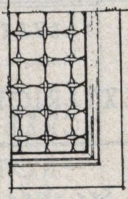
Nº 2

Double crimped flat bronze or brass wire. Made in light weight either ¼" or ½" mesh. Made in heavy weight either 1¼" or 1½" mesh.



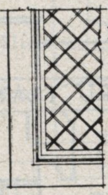
Nº 8A

Quarter twist flat bronze or brass wire, with rod and scrolls, 1" and 1½" mesh.



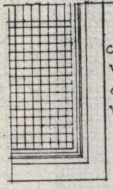
Nº 8

Quarter twist flat bronze or brass wire with 1" and 1½" mesh.



Nº 23

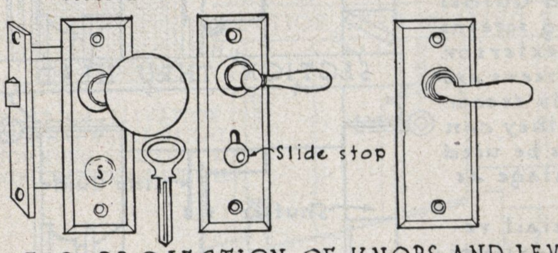
Diamond mesh double crimped wire, galvanized steel, brass or bronze in ¾", 1", 1¼" or 1½" mesh.



Nº 12

Double crimped woven bronze or brass wire with ½" mesh.

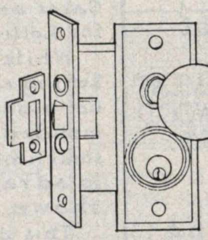
VARIOUS DESIGNS OF GUARDS USED WITH WOOD FRAME DOORS



FOR PROJECTION OF KNOBS AND LEVERS SEE SHEET NO.3

Nº 10 & 20

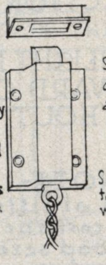
This latch regularly used on all doors and set from inside by slide stop and locked from outside with key. No 10 for stiles 3¾" and wider, No. 20 for stiles 2¾" wide

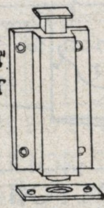


Nº 8

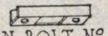
This cylinder lock may be masterkeyed with other cylinder locks. Doors must be not less than 1⅛" thick and stiles not less than 3¾"

CHAIN BOLT Nº102 (Reversible) Chain Bolt (2½" case) used regularly with bottom bolt Nº 9 for all double doors. Strike plate is used on stop.



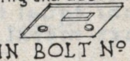


BOTTOM BOLT Nº 96

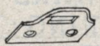


CHAIN BOLT Nº 113
Same as Nº 111 Strike Plate designed to be used on T astragal transom bar

CHAIN BOLT Nº 115
Same as Nº 111 except designed to be placed on face of casing when casing and door are flush



CHAIN BOLT Nº 119
See note for Nº 115



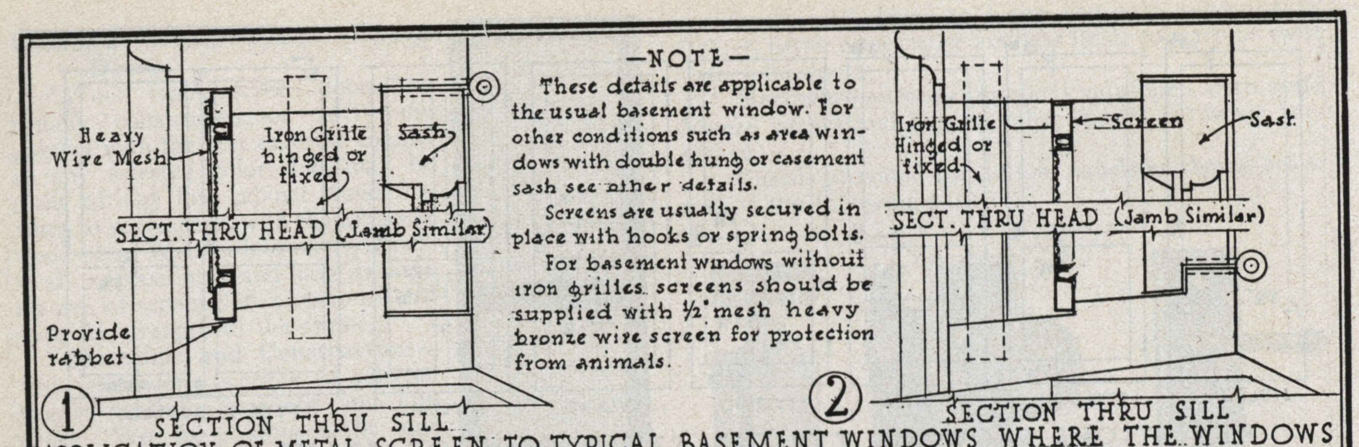
CHAIN BOLT Nº 117
Same as Nº 119 except the shape of keeper

Nº 205 COILED SPRINGS REGULARLY FURNISHED
Furnished in steel (never in brass or bronze) Door checks are special but their use is recommended.

HARDWARE USED WITH WITH WOOD FRAME DOORS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	STANDARD CONSTRUCTION AND HARDWARE FOR WATSON WOOD FRAME SCREEN DOORS	SCALE ¼", 3" EQUALS 1'-0" DATE-SEPT.'25	DRWG 5

Continued on next page


Heavy Wire Mesh
Iron Grille hinged or fixed
Sash
SECT. THRU HEAD (Jamb Similar)
Provide rabbet
①
SECTION THRU SILL
Iron Grille Hinged or fixed
Screen
Sash
SECT. THRU HEAD (Jamb Similar)
②
SECTION THRU SILL

-NOTE-

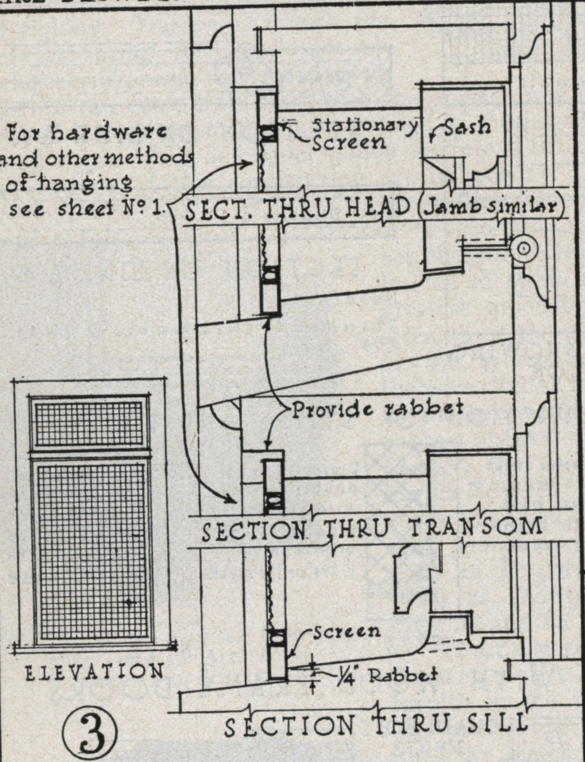
These details are applicable to the usual basement window. For other conditions such as area windows with double hung or casement sash see other details.

Screens are usually secured in place with hooks or spring bolts.

For basement windows without iron grilles screens should be supplied with 1/2" mesh heavy bronze wire screen for protection from animals.

APPLICATION OF METAL SCREEN TO TYPICAL BASEMENT WINDOWS WHERE THE WINDOWS ARE BETWEEN FINISHED GRADE AND WATER TABLE AND SASH ARE HINGED TO SWING IN

For hardware and other methods of hanging see sheet Nº 1.


Stationary Screen
Sash
SECT. THRU HEAD (Jamb similar)
Provide rabbet
ELEVATION
SECTION THRU TRANSOM
Screen
1/4" Rabbet
SECTION THRU SILL
③

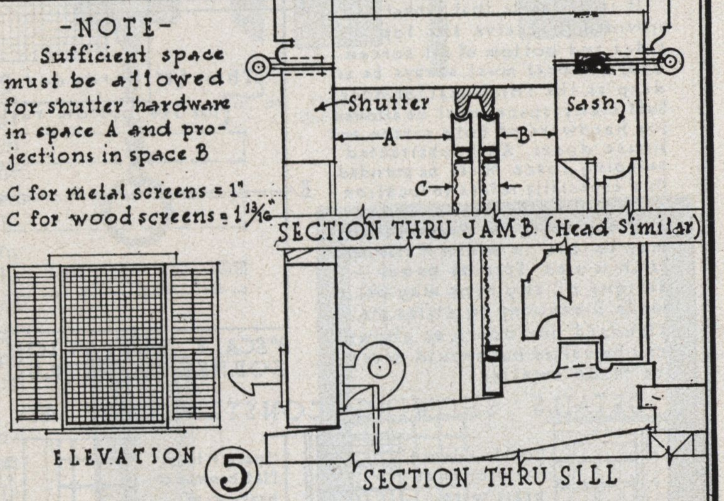
DETAILS OF FULL HEIGHT METAL CASEMENT SCREENS FOR INWARD OPENING WOOD CASEMENT WITHOUT SHUTTERS.

-NOTE-

Sufficient space must be allowed for shutter hardware in space A and projections in space B

C for metal screens = 1"

C for wood screens = 1 13/16"

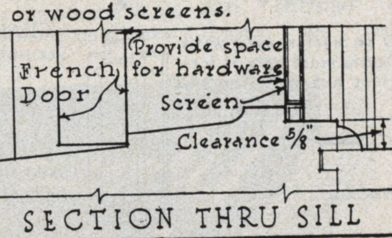

Shutter
Sash
A
B
C
SECTION THRU JAMB (Head Similar)
ELEVATION
⑤
SECTION THRU SILL

EXTERIOR TWIN VERTICAL SLIDING METAL SCREENS FOR WOOD CASEMENTS

-NOTE-

Provide rabbets at sills, heads and jambs equal to at least the thickness of either metal or wood screens.

DETAIL FOR OUTWARD OPENING FRENCH WINDOW

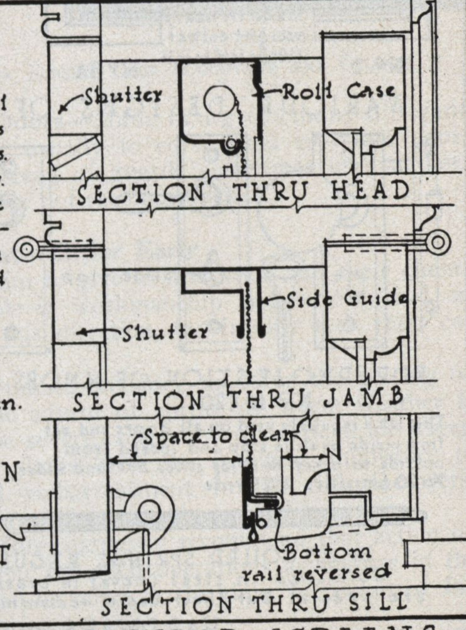

French Door
Provide space for hardware
Screen
Clearance 5/8"
④
SECTION THRU SILL

-NOTE-

See sheet Nº 2. for dimensions of large and small Roll Cases and Guides for Rolling screens.

While exterior Rolling screens are not usually recommended they can sometimes be used to advantage as shown.

This detail requires reversing bottom rail of screen.


Shutter
Roll Case
SECTION THRU HEAD
Side Guide
Shutter
SECTION THRU JAMB
Space to clear
Bottom rail reversed
SECTION THRU SILL

⑥ ROLLING SCREEN USED WITH INWARD OPENING WOOD CASEMENT WITH SHUTTERS

THESE DETAILS (EXCEPT FIG. 6), ALSO APPLY FOR WOOD SCREENS

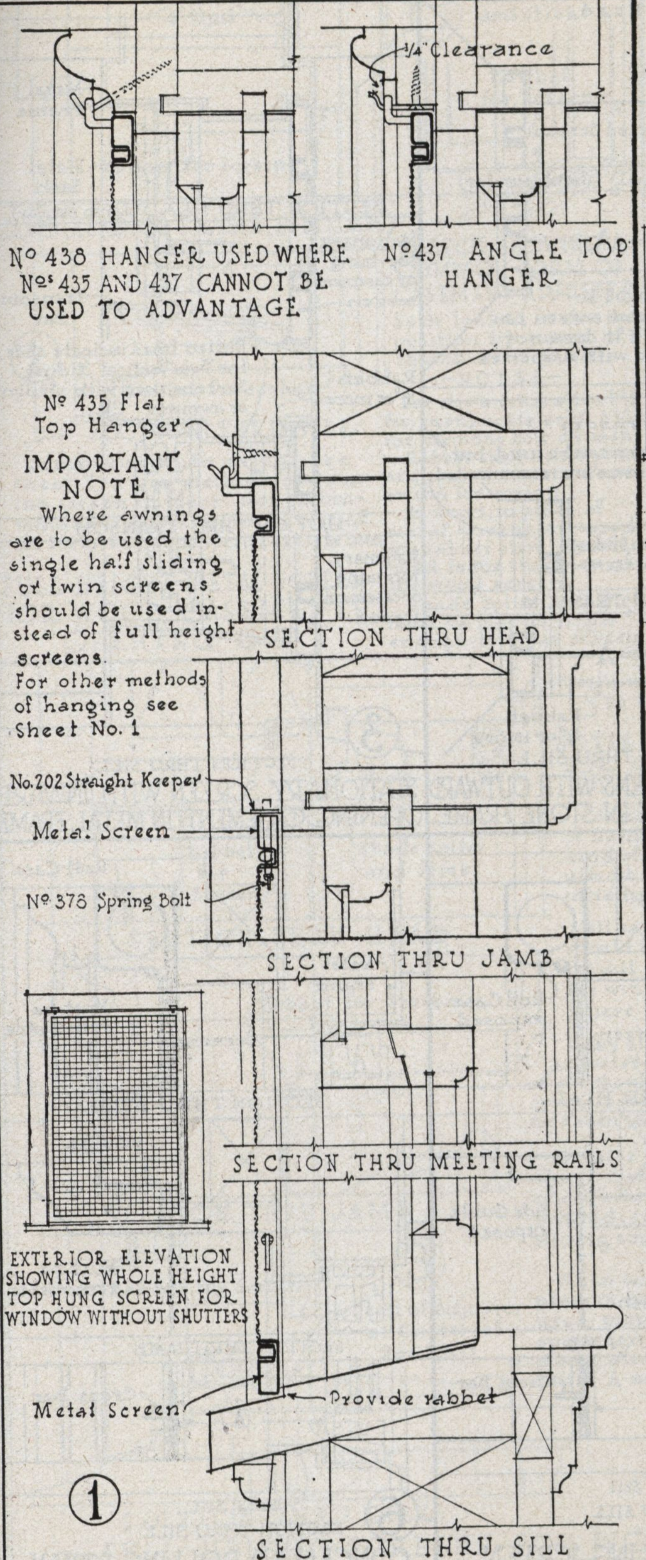
DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

SCREENS FOR BASEMENT WINDOWS AND WOOD CASEMENTS OPENING IN

SCALE 3" EQUALS 1'-0
DATE-JUNE:21

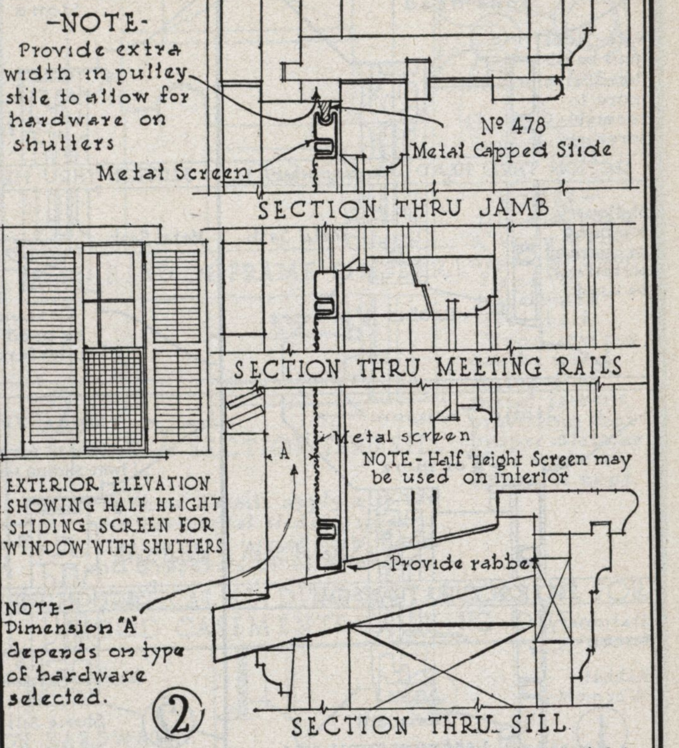
DRWG 6

Continued on next page


1/4" Clearance
No 438 HANGER USED WHERE Nos 435 AND 437 CANNOT BE USED TO ADVANTAGE
No 437 ANGLE TOP HANGER
No 435 Flat Top Hanger
SECTION THRU HEAD
No. 202 Straight Keeper
Metal Screen
No 378 Spring Bolt
SECTION THRU JAMB
SECTION THRU MEETING RAILS
EXTERIOR ELEVATION SHOWING WHOLE HEIGHT TOP HUNG SCREEN FOR WINDOW WITHOUT SHUTTERS
Metal Screen
Provide rabbet
SECTION THRU SILL

IMPORTANT NOTE
Where awnings are to be used the single half sliding or twin screens should be used instead of full height screens.
For other methods of hanging see Sheet No. 1

① FULL HEIGHT EXTERIOR TOP HUNG SCREEN FOR DOUBLE HUNG WINDOW WITHOUT SHUTTERS

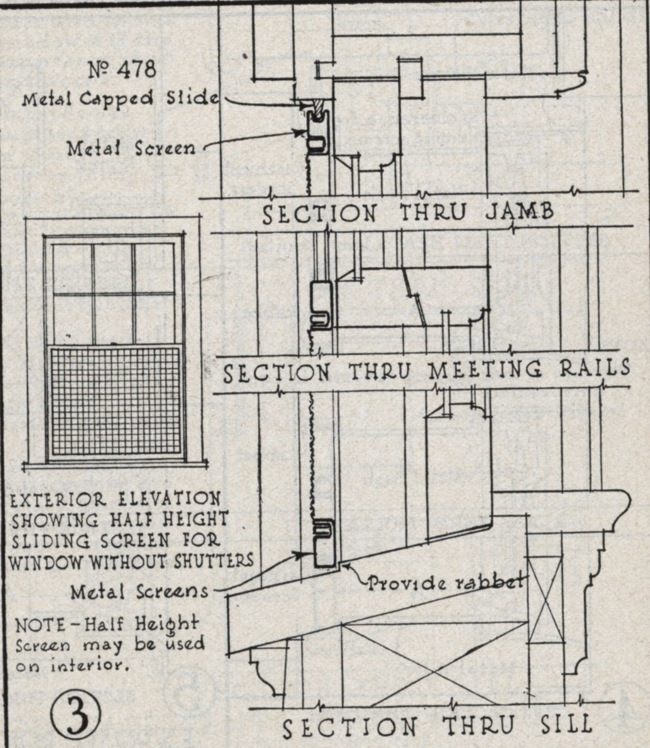

No 478 Metal Capped Slide
Metal Screen
SECTION THRU JAMB
SECTION THRU MEETING RAILS
EXTERIOR ELEVATION SHOWING HALF HEIGHT SLIDING SCREEN FOR WINDOW WITH SHUTTERS
A
Metal screen
Provide rabbet
SECTION THRU SILL

-NOTE-
Provide extra width in pulley stile to allow for hardware on shutters

NOTE-Half Height Screen may be used on interior

NOTE-
Dimension "A" depends on type of hardware selected.

② HALF HEIGHT EXTERIOR SLIDING SCREEN FOR DOUBLE HUNG WINDOW WITH SHUTTERS


No 478 Metal Capped Slide
Metal Screen
SECTION THRU JAMB
SECTION THRU MEETING RAILS
EXTERIOR ELEVATION SHOWING HALF HEIGHT SLIDING SCREEN FOR WINDOW WITHOUT SHUTTERS
Metal Screens
Provide rabbet
SECTION THRU SILL

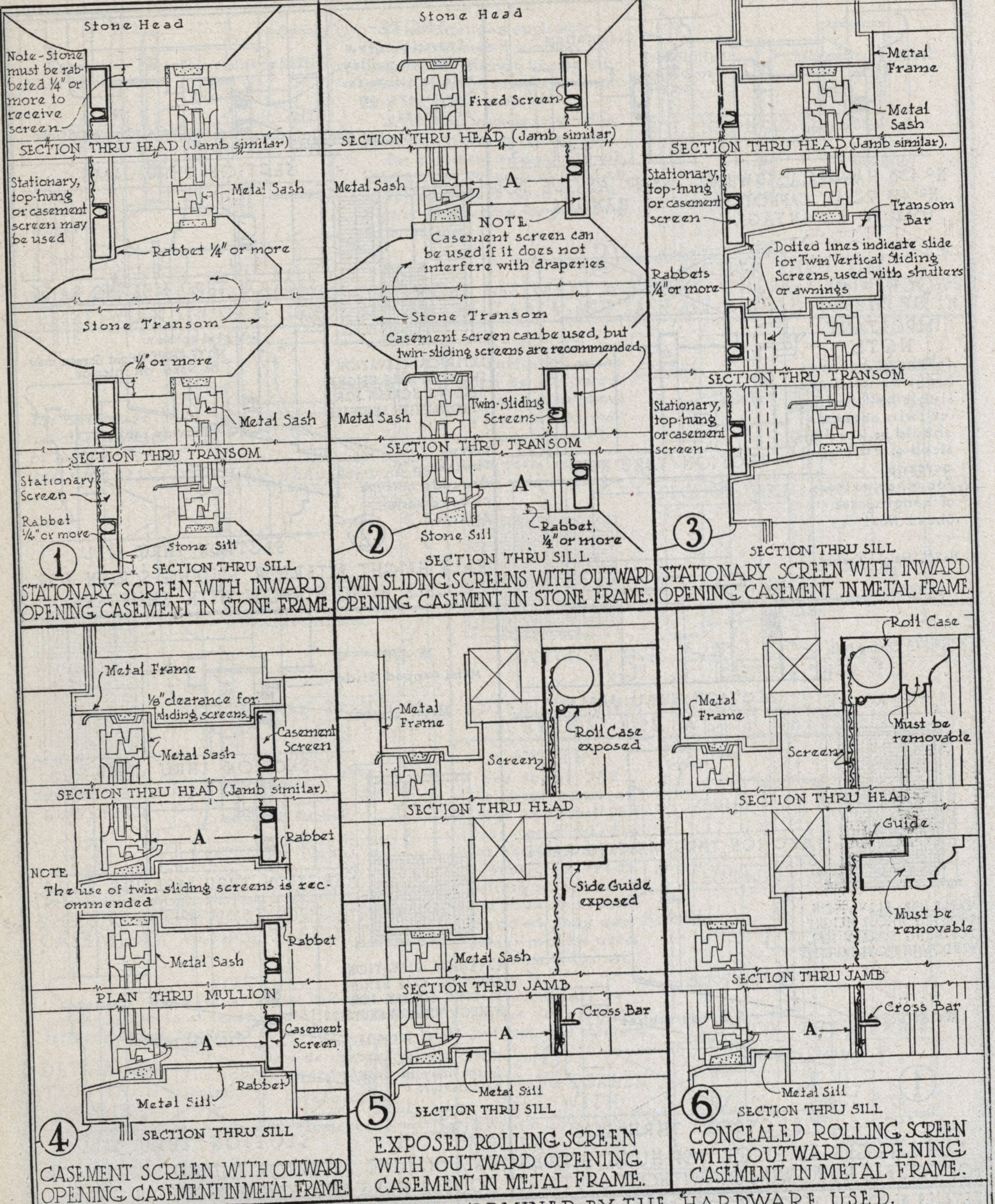
NOTE-Half Height Screen may be used on interior.

③ HALF HEIGHT EXTERIOR SLIDING SCREEN FOR DOUBLE HUNG WINDOW WITHOUT SHUTTERS

DETAILS ALSO APPLY FOR WOOD SCREENS. FOR DETAILS OF SCREENS & HARDWARE SEE SHEETS Nos 1&2

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	EXTERIOR FULL HEIGHT AND VERTICAL SLIDING SCREENS FOR DOUBLE HUNG WINDOWS	SCALE 3" EQUALS 1'-0" DATE-JUNE: 21	DRWG 7

Continued on next page


Stone Head
Note-Stone must be rabbeted 1/4" or more to receive screen.
SECTION THRU HEAD (Jamb similar)
Stationary, top-hung or casement screen may be used
Metal Sash
Rabbet 1/4" or more
Stone Transom
1/4" or more
Metal Sash
SECTION THRU TRANSOM
Stationary Screen
Rabbet 1/4" or more
Stone Sill
SECTION THRU SILL
Stone Head
Fixed Screen
SECTION THRU HEAD (Jamb similar)
Metal Sash
A
NOTE Casement screen can be used if it does not interfere with draperies
Stone Transom
Casement screen can be used, but twin-sliding screens are recommended
Metal Sash
Twin-Sliding Screens
SECTION THRU TRANSOM
A
Stone Sill
Rabbet, 1/4" or more
SECTION THRU SILL
Metal Frame
Metal Sash
SECTION THRU HEAD (Jamb similar).
Stationary, top-hung or casement screen
Transom Bar
Dotted lines indicate slide for Twin Vertical Sliding Screens, used with shutters or awnings
Rabbets 1/4" or more
SECTION THRU TRANSOM
Stationary, top-hung or casement screen
SECTION THRU SILL
Metal Frame
1/8" clearance for sliding screens
Casement Screen
Metal Sash
SECTION THRU HEAD (Jamb similar)
A
Rabbet
NOTE The use of twin sliding screens is recommended
Rabbet
Metal Sash
PLAN THRU MULLION
Casement Screen
A
Rabbet
Metal Sill
SECTION THRU SILL
Metal Frame
Roll Case exposed
Screen
SECTION THRU HEAD
Side Guide exposed
Metal Sash
SECTION THRU JAMB
Cross Bar
A
Metal Sill
SECTION THRU SILL
Roll Case
Metal Frame
Must be removable
Screen
SECTION THRU HEAD
Guide
Must be removable
SECTION THRU JAMB
Cross Bar
A
Metal Sill
SECTION THRU SILL

① STATIONARY SCREEN WITH INWARD OPENING CASEMENT IN STONE FRAME.

② TWIN SLIDING SCREENS WITH OUTWARD OPENING CASEMENT IN STONE FRAME.

③ STATIONARY SCREEN WITH INWARD OPENING CASEMENT IN METAL FRAME.

④ CASEMENT SCREEN WITH OUTWARD OPENING CASEMENT IN METAL FRAME.

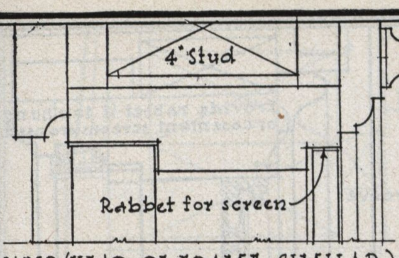
⑤ EXPOSED ROLLING SCREEN WITH OUTWARD OPENING CASEMENT IN METAL FRAME.

⑥ CONCEALED ROLLING SCREEN WITH OUTWARD OPENING CASEMENT IN METAL FRAME.

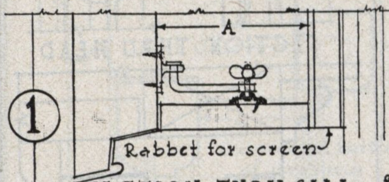
NOTE-DIMENSION "A" WILL BE DETERMINED BY THE HARDWARE USED.

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	METAL SCREENS WITH METAL CASEMENTS	SCALE 3" EQUALS 1'-0" DATE-SEPT. '21	DR'WG 8

Continued on next page


4" Stud
Rabbet for screen

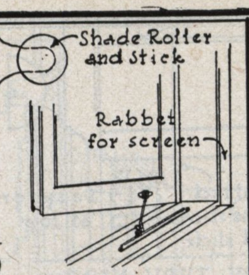
JAMB (HEAD OF FRAME SIMILAR)


A
①
Rabbet for screen

SECTION THRU SILL

Screen pivoted to swing. See Sheet Nº 1 for methods of securing screen in place. Not recommended if draperies are to be used. See Drwgs. 8 & 9 if draperies are to be used.

FULL HEIGHT METAL SCREEN FOR WOOD CASEMENTS OPENING OUT


Shade Roller and Stick
Rabbet for screen

SKETCH SHOWING A COMMON FORM OF CASEMENT ADJUSTER

Sash locked in desired position by means of thumb screw on sill.

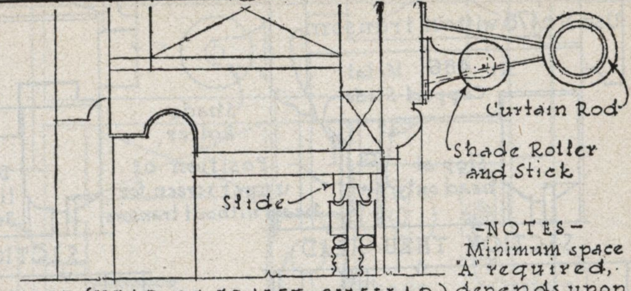
—NOTES—

For distance A allow 1¾" for turnbuckle and 3½" for cremone bolt on sash.

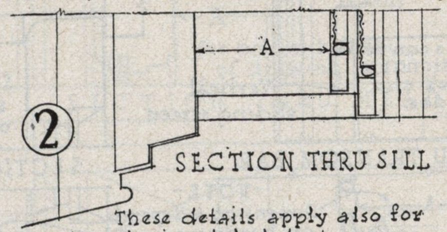
Rabbet stool below screen as shown to insure free swing for screen.

If wood, in place of metal screens, are used the rabbet should correspond to the thickness of the wood screen.

Shade roller and stick must be placed high enough to clear screen.


Curtain Rod
Shade Roller and Stick
Slide

JAMB (HEAD OF FRAME SIMILAR)



SECTION THRU SILL

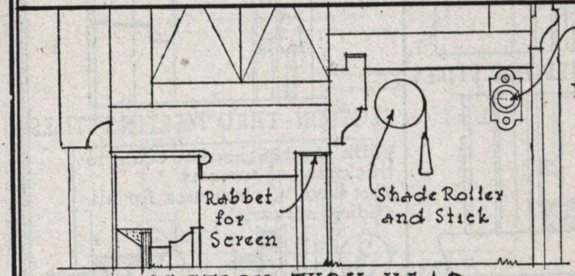
These details apply also for twin horizontal sliding screens This permits use of both shades and draperies on interior trim.

-NOTES-

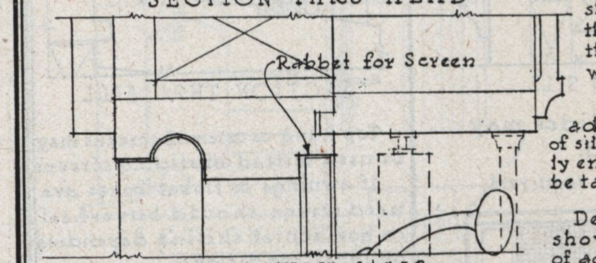
Minimum space "A" required, depends upon type of hardware selected.

Wood screens can be used instead of metal screens, providing that proper distance "A" as noted above, is kept.

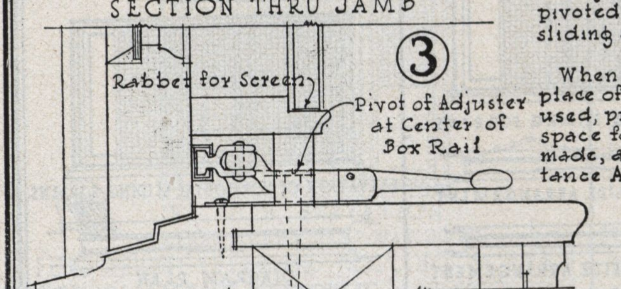
TWIN VERTICAL SLIDING METAL SCREENS FOR WOOD CASEMENTS OPENING OUT


Curtain Rod attached to trim
Rabbet for Screen
Shade Roller and Stick

SECTION THRU HEAD


Rabbet for Screen

SECTION THRU JAMB


③
Rabbet for Screen
Pivot of Adjuster at Center of Box Rail

SECTION THRU SILL

NOTES ON HARDWARE FOR CASEMENTS OPENING OUT

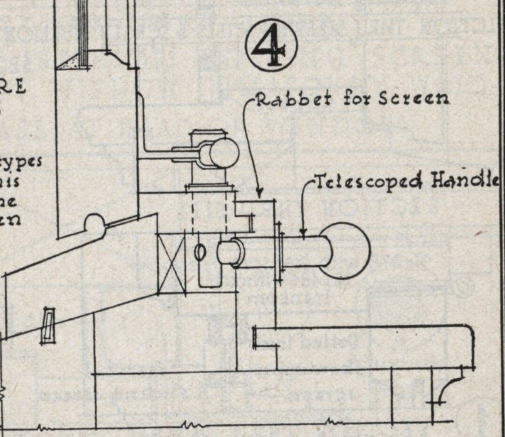
Consideration of the types of hardware used for this kind of window is of the utmost importance when installing screens.

All sash hardware should be placed below the sill or outside of the window opening where possible.

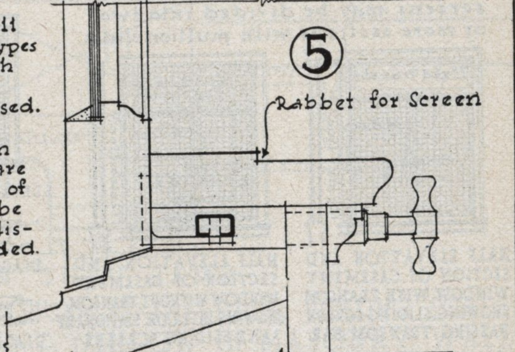
Any kind of casement adjuster placed on top of sill should be permanently enclosed and care must be taken to make it fly tight.

Details Nº 9, 10 and 11 show three different types of adjusters with which pivoted, side hung, or sliding screens may be used.

When wood screens in place of metal screens are used, proper allowance of space for rabbet must be made, also minimum distance A must be provided.


④
Rabbet for Screen
Telescoped Handle

SECTION THRU SILL


⑤
Rabbet for Screen

SECTION THRU SILL

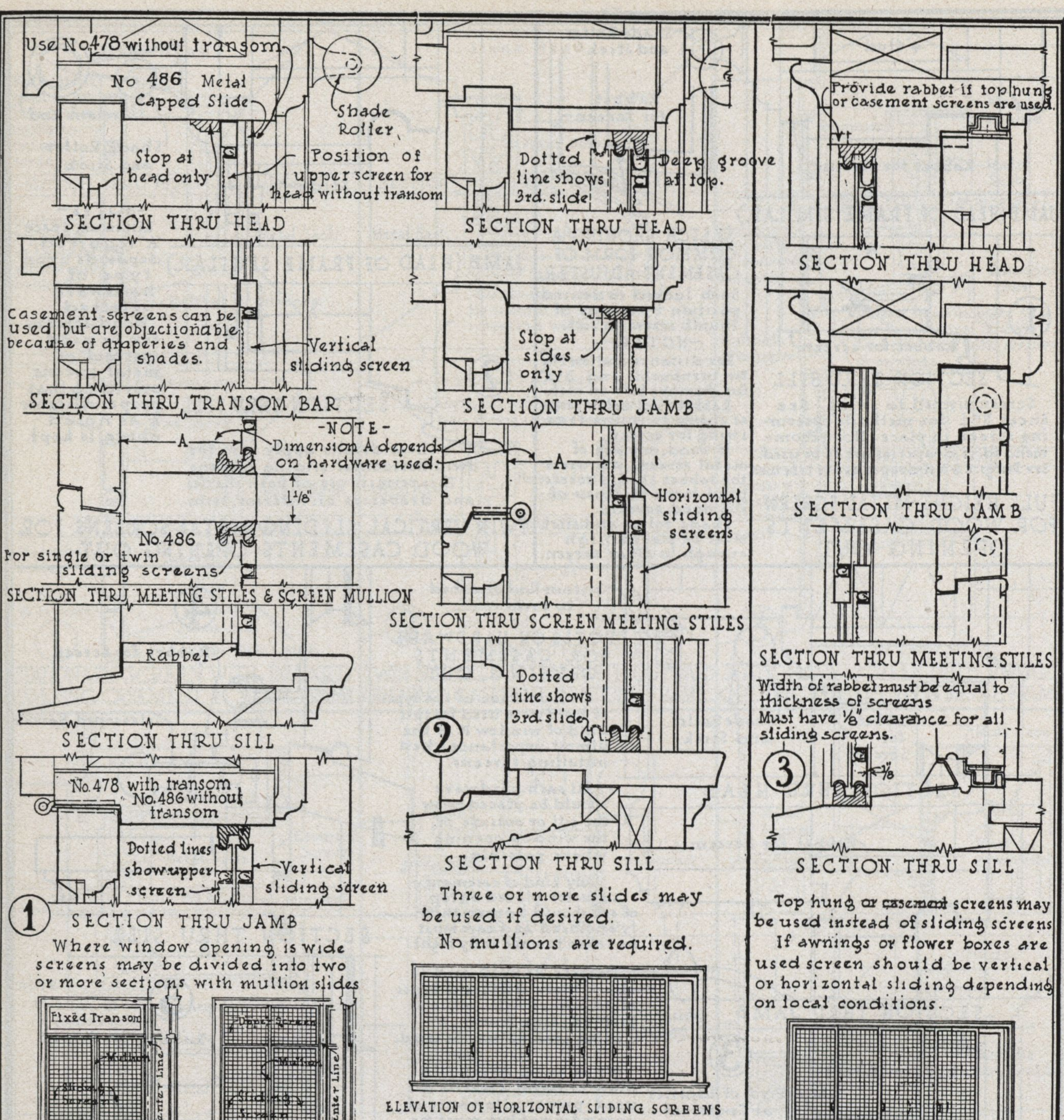
FULL HEIGHT SCREENS FOR WOOD CASEMENTS OPENING OUT WHICH ARE EQUIPPED WITH PATENT ADJUSTERS

FOR METHOD OF HANGING SCREENS AND HARDWARE FOR SAME SEE SHEET Nº 1

NOTE:-SEE SHEET Nº 2 FOR DETAIL SECTIONS OF WOOD SCREENS AND HARDWARE

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	PIVOTED AND SLIDING SCREENS FOR WOOD CASEMENT WINDOWS OPENING OUT	SCALE 3" EQUALS 1'-0" DATE-SEPT-21	DRWG 9

Continued on next page


Use No.478 without transom
No 486 Metal Capped Slide
Shade Roller
Stop at head only
Position of upper screen for head without transom
SECTION THRU HEAD
Casement screens can be used but are objectionable because of draperies and shades.
Vertical sliding screen
SECTION THRU TRANSOM BAR
-NOTE- Dimension A depends on hardware used.
A
1 1/8"
No.486
For single or twin sliding screens
SECTION THRU MEETING STILES & SCREEN MULLION
Rabbet
SECTION THRU SILL
No.478 with transom No.486 without transom
Dotted lines show upper screen
Vertical sliding screen
①
SECTION THRU JAMB
Where window opening is wide screens may be divided into two or more sections with mullion slides
Fixed Transom
Upper Screen
Mullion
Sliding Screen
Center Line
HALF ELEVATION AND SECTION OF CASEMENT WINDOW WITH TRANSOM SHOWING SLIDING SCREEN PASSING TRANSOM BAR
HALF ELEVATION AND SECTION OF CASEMENT WINDOW WITHOUT TRANSOM SHOWING INTERIOR STATIONARY AND SLIDING SCREENS
Dotted line shows 3rd. slide
Deep groove at top.
SECTION THRU HEAD
Stop at sides only
SECTION THRU JAMB
A
Horizontal sliding screens
SECTION THRU SCREEN MEETING STILES
Dotted line shows 3rd. slide
②
SECTION THRU SILL
Three or more slides may be used if desired.
No mullions are required.
ELEVATION OF HORIZONTAL SLIDING SCREENS
DIAGRAM PLAN OF TWO SLIDE ARRANGEMENT
DIAGRAM PLAN OF THREE SLIDE ARRANGEMENT
Provide rabbet if top hung or casement screens are used.
SECTION THRU HEAD
SECTION THRU JAMB
SECTION THRU MEETING STILES
Width of rabbet must be equal to thickness of screens
Must have 1/8" clearance for all sliding screens.
③
1/8
SECTION THRU SILL
Top hung or casement screens may be used instead of sliding screens
If awnings or flower boxes are used screen should be vertical or horizontal sliding depending on local conditions.
ELEVATION OF HORIZONTAL SLIDING SCREENS
DIAGRAM PLAN

INTERIOR VERTICAL SLIDING SCREENS FOR MULTIFOLD CASEMENTS OPENING OUT

INTERIOR HORIZONTAL SLIDING SCREENS FOR MULTIFOLD CASEMENTS OPENING OUT

EXTERIOR HORIZONTAL SLIDING SCREENS FOR MULTIFOLD CASEMENTS OPENING IN

NOTE WOOD SCREENS MAY BE USED IN PLACE OF METAL SCREENS IF DESIRED
SEE SHEET Nº 2 FOR DETAIL SECTIONS OF METAL AND WOOD SCREENS

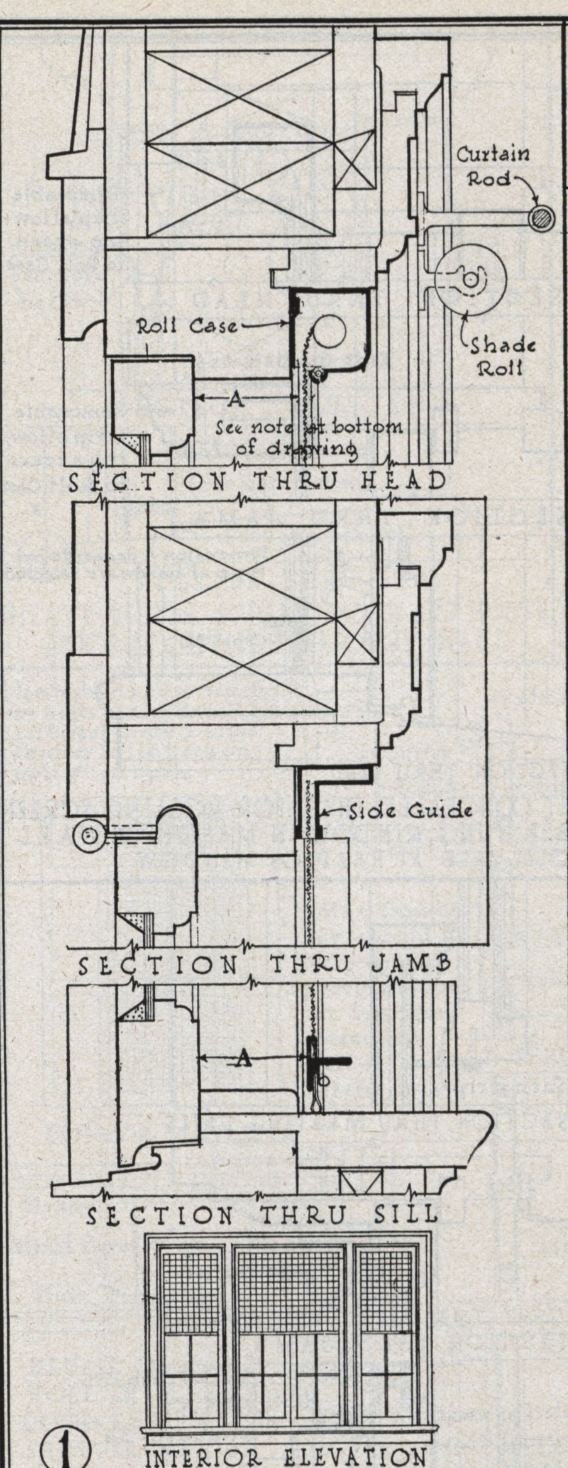
DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

VERTICAL AND HORIZONTAL SLIDING SCREENS
FOR MULTIFOLD CASEMENT WINDOWS

SCALE 3" EQUALS 1'-0"
DATE-JUNE-21

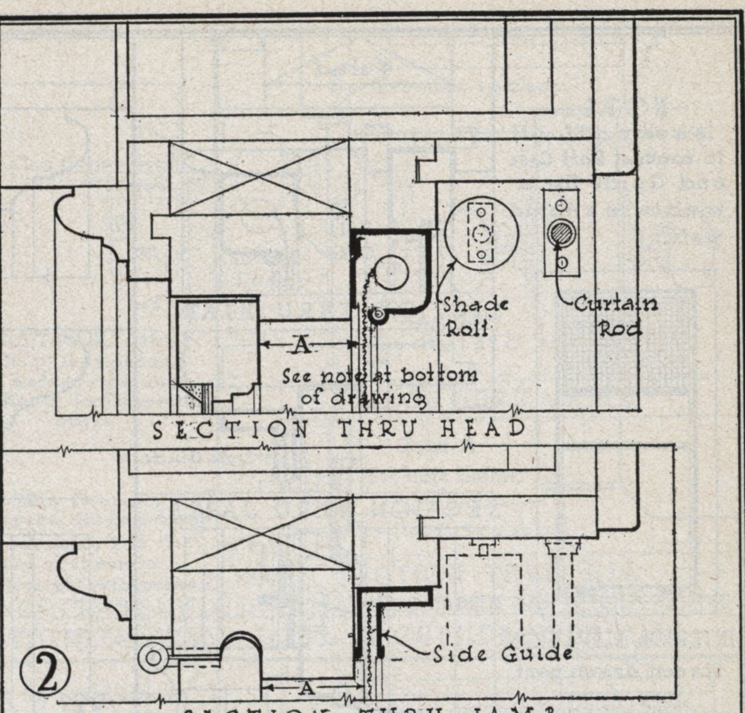
DRWG
10

Continued on next page

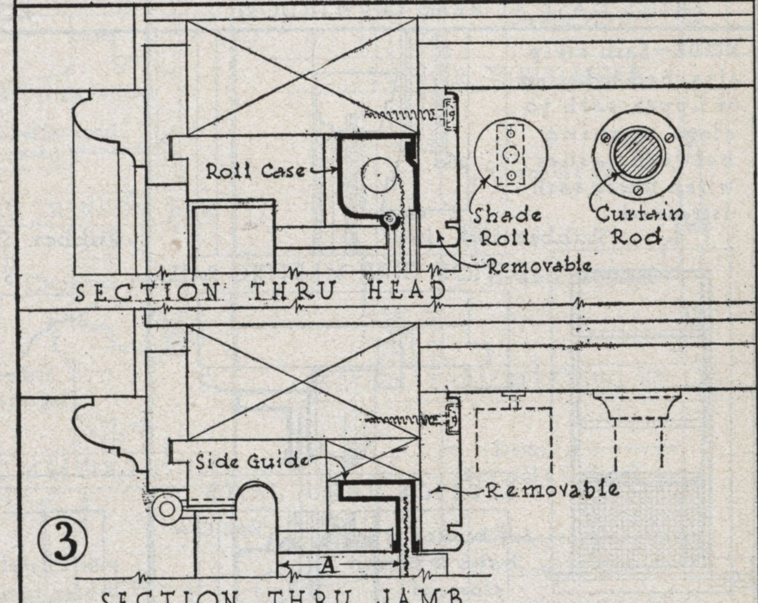

Curtain Rod
Roll Case
Shade Roll
A
See note at bottom of drawing
SECTION THRU HEAD
Side Guide
SECTION THRU JAMB
A
SECTION THRU SILL
①

INTERIOR ELEVATION
SCREENS DRAWN PART WAY DOWN

FULL HEIGHT INTERIOR ROLLING SCREEN
FOR CASEMENT WINDOW IN 4 IN. STUD WALL
ROLL CASE AT HEAD OF WINDOW


Shade Roll
Curtain Rod
A
See note at bottom of drawing
SECTION THRU HEAD
Side Guide
②
A
SECTION THRU JAMB

FULL HEIGHT INTERIOR ROLLING SCREEN
FOR CASEMENT WINDOW IN MASONRY WALL
ROLL CASE AT HEAD OF WINDOW

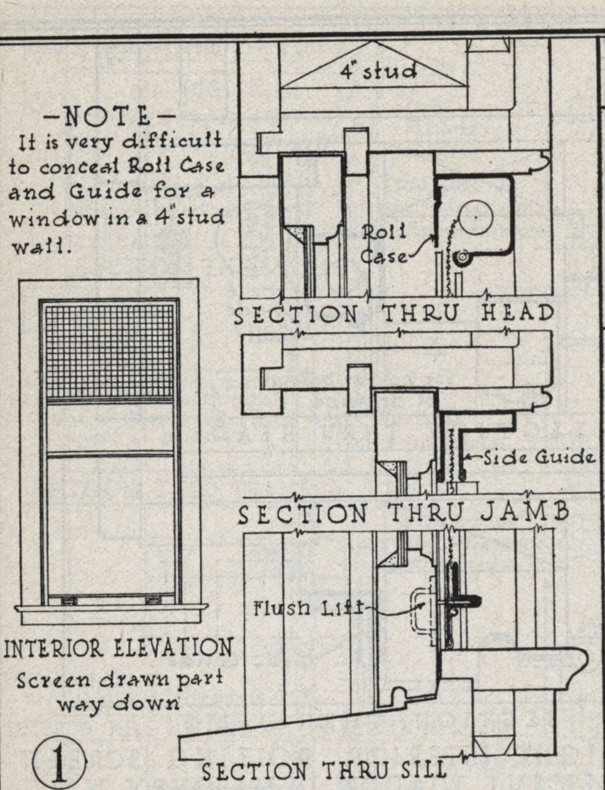

Roll Case
Shade Roll
Curtain Rod
Removable
SECTION THRU HEAD
Side Guide
Removable
③
A
SECTION THRU JAMB

FULL HEIGHT CONCEALED INTERIOR ROLLING SCREEN
FOR CASEMENT WINDOW IN MASONRY WALL
ROLL CASE AT HEAD OF WINDOW

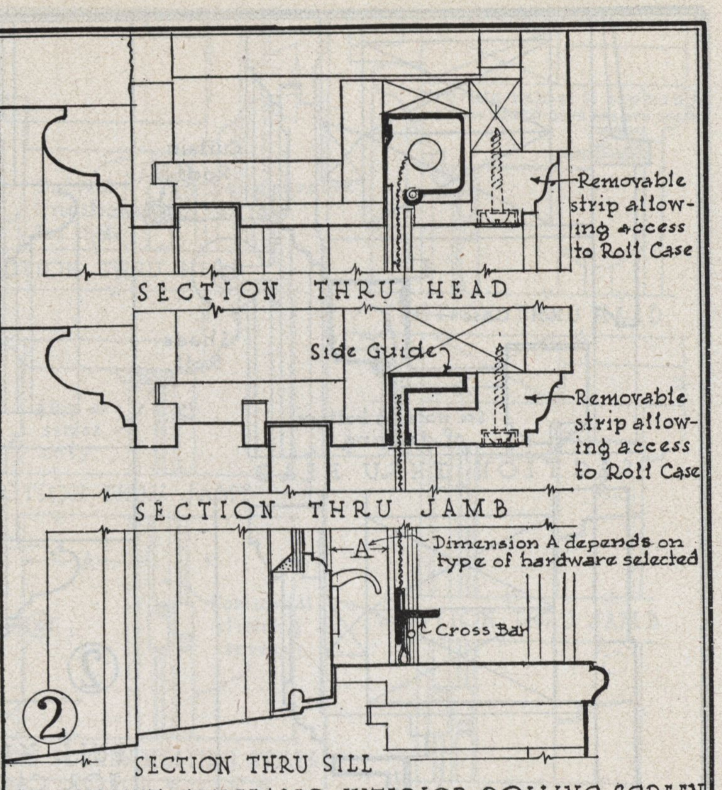
GENERAL NOTES EXCEPTING TWIN SLIDING SCREENS, THE ROLLING SCREEN IS THE MOST DESIRABLE METHOD OF SCREENING CASEMENTS OPENING OUT AS IT DOES NOT INTERFERE WITH DRAPERIES.
DIMENSION **A** WILL IN ALL CASES BE DETERMINED BY THE TYPE OF HARDWARE USED.
FOR SIZE OF CASE IN RELATION TO SIZE OF OPENING SEE DATA ON SHEET NO. 2.

DRAWN BY SWEETS CATALOGUE SERVICE, INC.	EXPOSED AND CONCEALED ROLLING SCREENS FOR WOOD CASEMENTS OPENING OUT	SCALE 3" EQUALS 1'-0" DATE-JUNE-21	DRWG 11

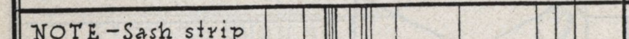
Continued on next page


-NOTE-
It is very difficult to conceal Roll Case and Guide for a window in a 4" stud wall.
4" stud
Roll Case
SECTION THRU HEAD
Side Guide
SECTION THRU JAMB
Flush Lift
INTERIOR ELEVATION
Screen drawn part way down
SECTION THRU SILL
①

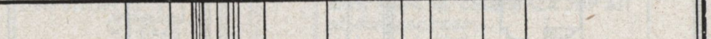
FULL HEIGHT INTERIOR ROLLING SCREEN FOR DOUBLE HUNG WINDOW IN 4" STUD WALL
ROLL CASE AT HEAD OF WINDOW


Removable strip allowing access to Roll Case
SECTION THRU HEAD
Side Guide
Removable strip allowing access to Roll Case
SECTION THRU JAMB
A
Dimension A depends on type of hardware selected
Cross Bar
②
SECTION THRU SILL

FULL HEIGHT CONCEALED INTERIOR ROLLING SCREEN FOR DOUBLE HUNG WINDOW IN MASONRY WALL
ROLL CASE AT HEAD OF WINDOW


NOTE-Sash strip attached to bottom of upper sash to close opening between sashes when lower sash is raised.
Rubber
Sash strip
SECTION THRU MEETING RAILS
SECTION THRU JAMB
Sill beveled at weep holes to permit escape of water from Roll Case
Roll Case
INTERIOR ELEVATION
Screen drawn part way up with sash
③
SECTION THRU SILL

HALF HEIGHT INTERIOR ROLLING SCREEN FOR DOUBLE HUNG WINDOW IN 4" STUD WALL
ROLL CASE AT STOOL OF WINDOW


Rubber
Sash strip
SECTION THRU MEETING RAILS
Side Guide
SECTION THRU JAMB
No. 718 Special Sash Lift.
Roll Case
Minimum 2¼"
Sill beveled at weep holes to permit escape of water from Roll Case
④
SECTION THRU SILL

HALF HEIGHT PARTLY CONCEALED INTERIOR ROLLING SCREEN FOR DOUBLE HUNG WINDOW IN 4" STUD WALL
ROLL CASE AT STOOL OF WINDOW

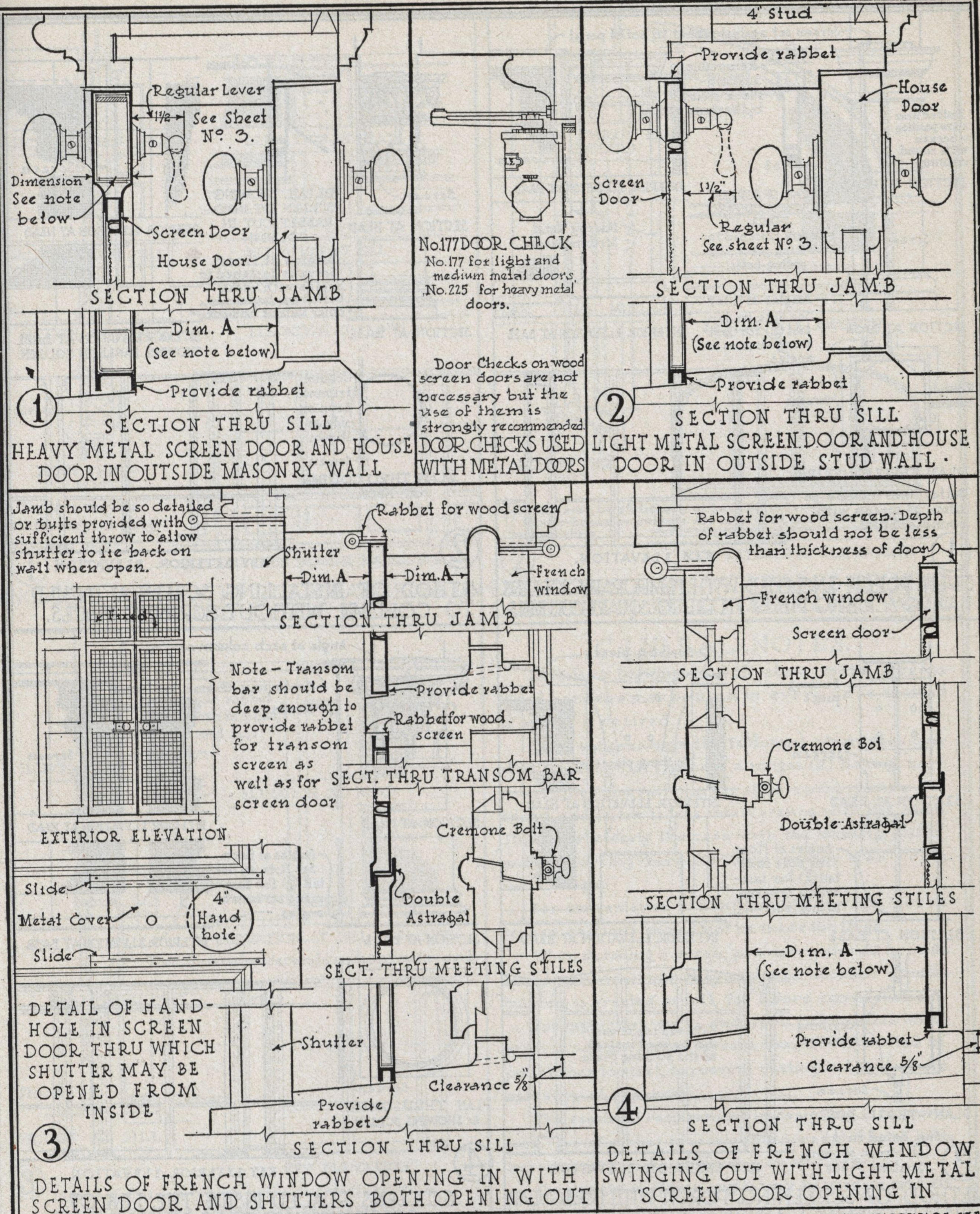
FOR SIZE OF CASE IN RELATION TO SIZE OF OPENING SEE DATA ON SHEET NO. 2

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

EXPOSED AND CONCEALED ROLLING SCREENS FOR DOUBLE HUNG WINDOWS

SCALE 3" EQUALS 1'-0"
DATE-JUNE: 21
DRWG. 12

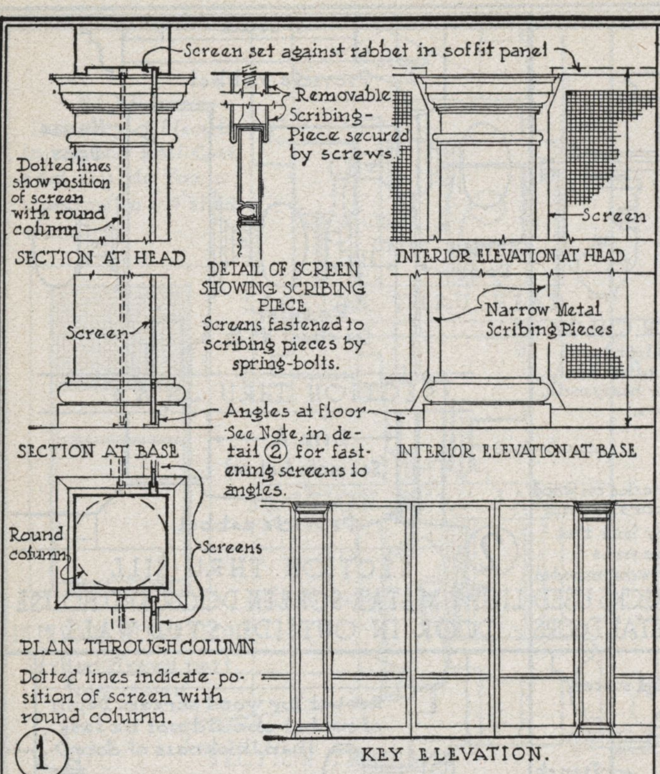
Continued on next page


Regular Lever
1½
See Sheet Nº 3.
Dimension See note below
Screen Door
House Door
SECTION THRU JAMB
Dim. A
(See note below)
Provide rabbet
①
SECTION THRU SILL
HEAVY METAL SCREEN DOOR AND HOUSE DOOR IN OUTSIDE MASONRY WALL
No.177 DOOR CHECK
No.177 for light and medium metal doors
No.225 for heavy metal doors.
Door Checks on wood screen doors are not necessary but the use of them is strongly recommended.
DOOR CHECKS USED WITH METAL DOORS
4" Stud
Provide rabbet
House Door
Screen Door
1½"
Regular See sheet Nº 3.
SECTION THRU JAMB
Dim. A
(See note below)
Provide rabbet
②
SECTION THRU SILL
LIGHT METAL SCREEN DOOR AND HOUSE DOOR IN OUTSIDE STUD WALL.
Jamb should be so detailed or butts provided with sufficient throw to allow shutter to lie back on wall when open.
Fixed
EXTERIOR ELEVATION
Rabbet for wood screen
Shutter
Dim. A
Dim. A
French window
SECTION THRU JAMB
Note - Transom bar should be deep enough to provide rabbet for transom screen as well as for screen door
Provide rabbet
Rabbet for wood screen
SECT. THRU TRANSOM BAR
Cremone Bolt
Double Astragal
SECT. THRU MEETING STILES
Slide
Metal Cover
4" Hand hole
Slide
DETAIL OF HAND-HOLE IN SCREEN DOOR THRU WHICH SHUTTER MAY BE OPENED FROM INSIDE
Shutter
Clearance 5/8"
Provide rabbet
③
SECTION THRU SILL
DETAILS OF FRENCH WINDOW OPENING IN WITH SCREEN DOOR AND SHUTTERS BOTH OPENING OUT
Rabbet for wood screen. Depth of rabbet should not be less than thickness of door
French window
Screen door
SECTION THRU JAMB
Cremone Bol
Double Astragal
SECTION THRU MEETING STILES
Dim. A
(See note below)
Provide rabbet
Clearance 5/8"
④
SECTION THRU SILL
DETAILS OF FRENCH WINDOW SWINGING OUT WITH LIGHT METAL SCREEN DOOR OPENING IN

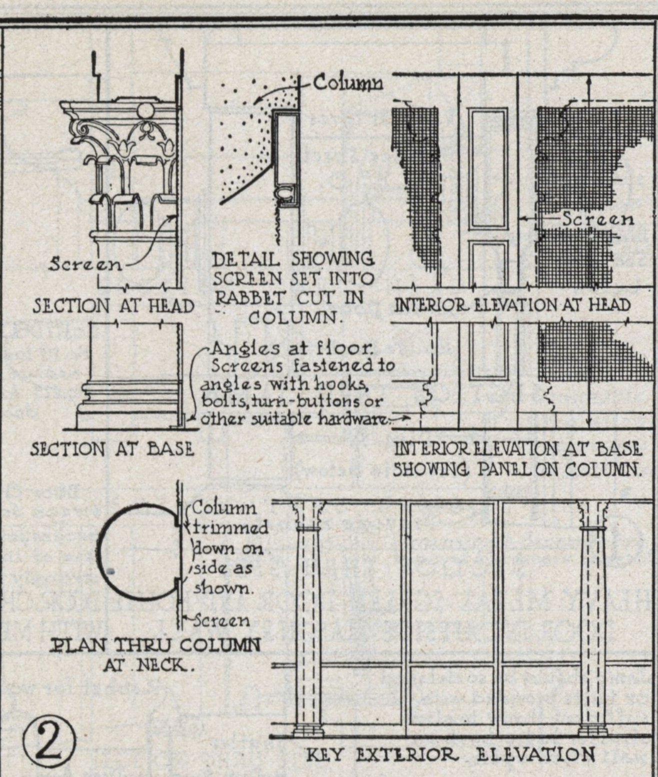
DIMENSION **A** IS GOVERNED BY KIND OF HARDWARE AND DOOR CHECK USED. FOR THICKNESS OF SCREEN DOORS AND HARDWARE SEE SHEETS NO. 3. IF WOOD SCREEN DOORS ARE USED INSTEAD OF METAL DOORS, PROPER ALLOWANCE MUST BE MADE FOR RABBETS

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	HEAVY AND LIGHT METAL SCREEN DOORS WITH WOOD DOORS AND FRENCH WINDOWS	SCALE 3" EQUALS 1'-0" DATE-JUNE: 21	DRWG 13

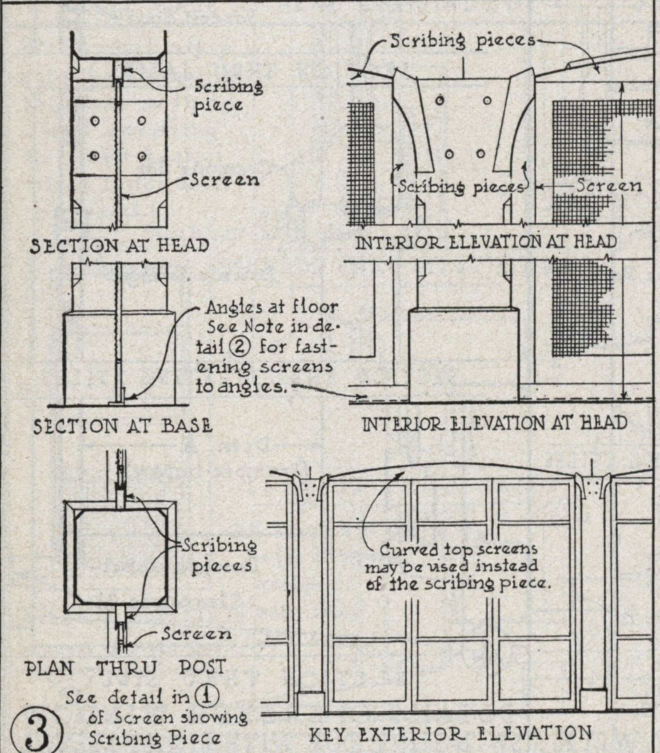
Continued on next page


Screen set against rabbet in soffit panel
Removable Scribing-Piece secured by screws
Dotted lines show position of screen with round column
SECTION AT HEAD
DETAIL OF SCREEN SHOWING SCRIBING PIECE
Screens fastened to scribing pieces by spring-bolts.
INTERIOR ELEVATION AT HEAD
Screen
Narrow Metal Scribing Pieces
Screen
Angles at floor
See Note, in detail ② for fastening screens to angles.
SECTION AT BASE
INTERIOR ELEVATION AT BASE
Round column
Screens
PLAN THROUGH COLUMN
Dotted lines indicate position of screen with round column.
KEY ELEVATION.

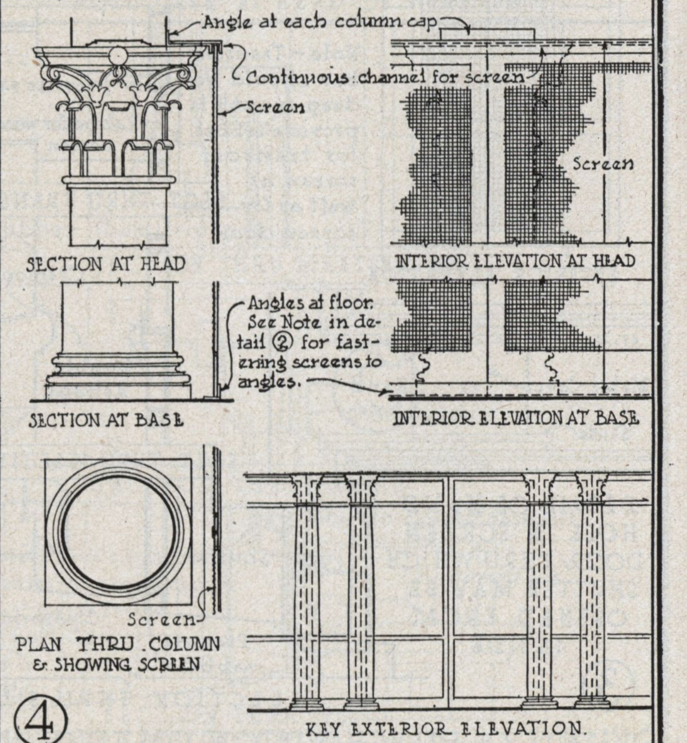
① OPEN PORCH ENCLOSED WITH TEMPORARY SCREENS HAVING SCRIBING PIECES FITTED TO SQUARE COLUMNS.


Column
Screen
SECTION AT HEAD
DETAIL SHOWING SCREEN SET INTO RABBET CUT IN COLUMN.
Screen
INTERIOR ELEVATION AT HEAD
Angles at floor.
Screens fastened to angles with hooks, bolts, turn-buttons or other suitable hardware.
SECTION AT BASE
INTERIOR ELEVATION AT BASE SHOWING PANEL ON COLUMN.
Column trimmed down on side as shown.
Screen
PLAN THRU COLUMN AT NECK.
KEY EXTERIOR ELEVATION

② METHOD OF INSTALLING SCREEN ATTACHED TO COLUMN WITHOUT SCRIBING PIECES.


Scribing piece
Screen
SECTION AT HEAD
Scribing pieces
Scribing pieces
Screen
INTERIOR ELEVATION AT HEAD
Angles at floor
See Note in detail ② for fastening screens to angles.
SECTION AT BASE
INTERIOR ELEVATION AT HEAD
Scribing pieces
Screen
PLAN THRU POST
See detail in ① of Screen showing Scribing Piece
Curved top screens may be used instead of the scribing piece.
KEY EXTERIOR ELEVATION

③ METHOD OF SCREENING PORCH WITH IRREGULAR SHAPED OPENINGS, USING SCRIBING PIECES.


Angle at each column cap
Continuous channel for screen
Screen
SECTION AT HEAD
Screen
INTERIOR ELEVATION AT HEAD
Angles at floor.
See Note in detail ② for fastening screens to angles.
SECTION AT BASE
INTERIOR ELEVATION AT BASE
Screen
PLAN THRU COLUMN & SHOWING SCREEN
KEY EXTERIOR ELEVATION.

④ SCREENS PLACED INSIDE THE LINE OF COLUMNS, AND FREE OF SAME.

NOTE - SEE GENERAL NOTES, DRAWING 15.

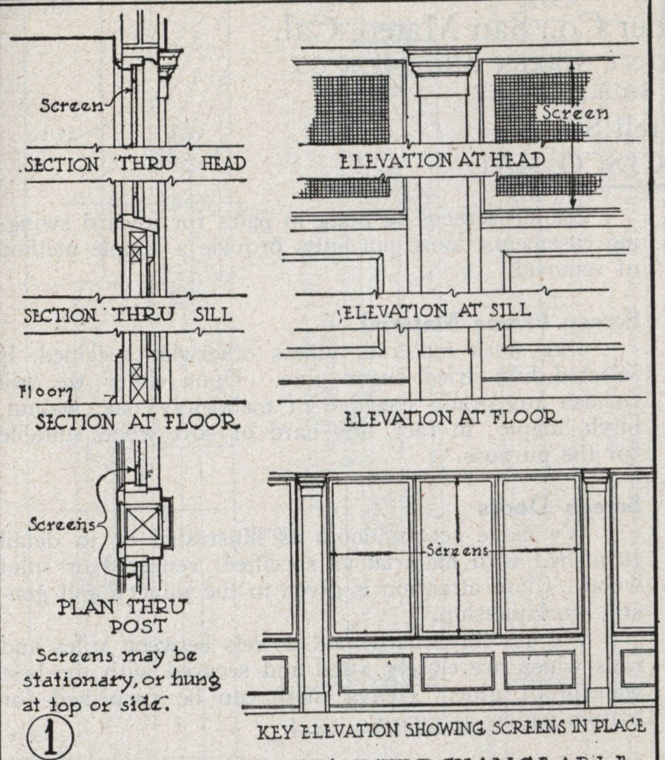
DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

METHODS OF SCREENING OPEN PORCHES FOR SUMMER USE

NOT DRAWN TO SCALE.
DATE, AUG. '21

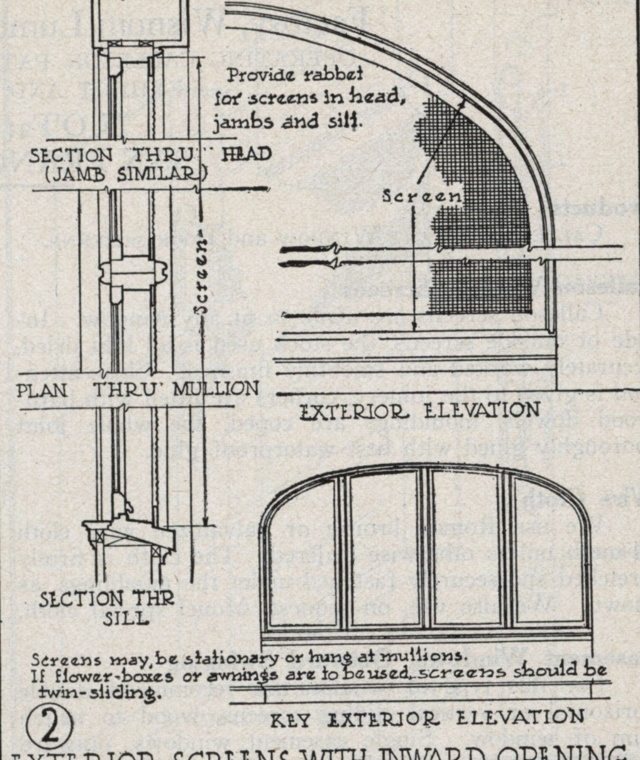
DR'WG 14

Continued on next page


Screen
SECTION THRU HEAD
SECTION THRU SILL
Floor
SECTION AT FLOOR
Screens
PLAN THRU POST
Screen
ELEVATION AT HEAD
ELEVATION AT SILL
ELEVATION AT FLOOR
Screens
KEY ELEVATION SHOWING SCREENS IN PLACE
1

Screens may be stationary, or hung at top or side.

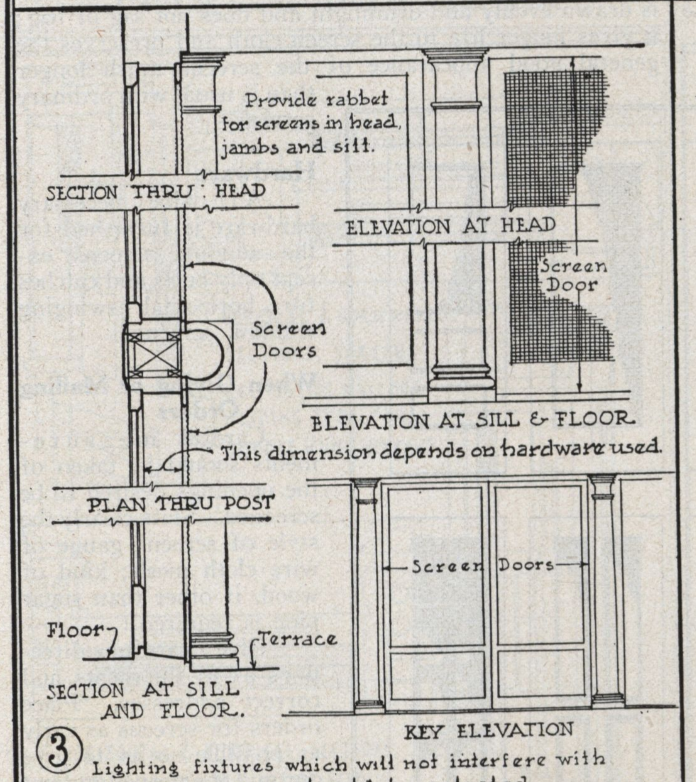
ENCLOSED PORCH WITH INTERCHANGEABLE SCREENS AND STORM SASH.


SECTION THRU HEAD (JAMB SIMILAR)
Screen
PLAN THRU MULLION
SECTION THR SILL
Screen
EXTERIOR ELEVATION
KEY EXTERIOR ELEVATION
2

Provide rabbet for screens in head, jambs and sill.

Screens may be stationary or hung at mullions. If flower-boxes or awnings are to be used, screens should be twin-sliding.

EXTERIOR SCREENS WITH INWARD OPENING CASEMENTS IN STUCCO OR MASONRY WALL.


SECTION THRU HEAD
Screen Doors
PLAN THRU POST
Floor
Terrace
SECTION AT SILL AND FLOOR.
ELEVATION AT HEAD
Screen Door
ELEVATION AT SILL & FLOOR.
Screen Doors
KEY ELEVATION
3

Provide rabbet for screens in head, jambs and sill.

This dimension depends on hardware used.

Lighting fixtures which will not interfere with the door-swings should be selected.

ENCLOSED PORCH WITH FRENCH GLAZED DOORS & SCREEN DOORS.

GENERAL NOTES.

Details on Drawings 14 & 15 show metal screens. Wood screens may be used in every case, instead of metal if desired.

Metal screens have the following advantages over wood screens — (1) They are stronger. (2) Having narrower stiles and rails, larger sight-openings are obtained, and there is less interference with the vision. This is particularly the case with the meeting-stiles and reinforcing-bars. (3) They require less room for storage.

For convenience in handling and storage, porch screen sections should not be made too large.

When detailing a porch, provision should be made for screens, whether they are to be installed when the building is erected, or left for future consideration.

For high-class work, and work in localities within reach of salt air, bronze screens should be specified in preference to steel, to prevent rusting and to eliminate necessity of repainting.

The essential requirement in designing is to provide some type of rabbet to receive the screen at head, jambs and sill, and to make a light-stop on all sides.

On straight surfaces angles may be used as rabbets instead of scribing-pieces.

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	METHODS OF SCREENING ENCLOSED PORCHES FOR SUMMER USE	NOT DRAWN TO SCALE DATE, SEPT. '21.	DR'W'G 15

CALLESON PATENT SCREENS AND DOORS

Factory, Wisnom Lumber Co., San Mateo, Cal.
OPERATING CALLESON PATENT SCREEN AND DOOR CO.
EXHIBIT AND SALES OFFICE
77 O'Farrell Street
SAN FRANCISCO, CAL.

Products

Calleson Patent Window and Door Screens.

Calleson Window Screens

Calleson screens are made to fit any window. Inside or outside screens, the stock used is all kiln dried, accurately worked and smoothly finished. Close attention is given to the joinery, corners are fitted with hardwood dowels, mouldings are coped, the whole joint thoroughly glued with best waterproof glue.

Wire Cloth

We use Roman bronze or galvanized wire cloth 14-mesh unless otherwise ordered. The cloth is firmly stretched and securely fastened under the mouldings, as shown. We also use, on request, Monel special cloth.

Casement Windows, Outward Swinging

For this type of window we recommend double horizontal or vertical sliding screens, wood to match trim of window. Single casement windows, outward swinging, can have single screen hung with butts, or fastened with groove and springs. The latter method of fitting makes the screen easily removable.

Casement Windows, Inward Swinging

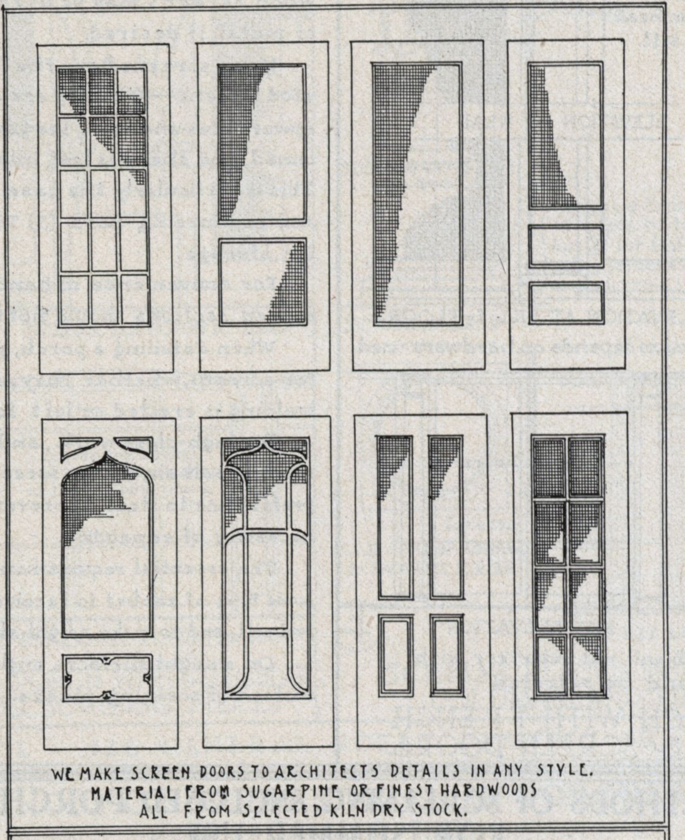
These windows can be screened either with a single screen, a double swinging screen to match the casements or a double vertical sliding screen.

Double Hung Windows

Double hung windows are usually fitted with vertical sliding screens, either both inside or one-half inside and one-half outside. These are always supplied with full length guides. Where economy is essential, half-screens can be installed either upper or lower half inside or out.

Installations

Our screens are made accurately to the dimension given and if the measurements are taken as shown on adjoining details, no further fitting will be required. The screens may be removed at any time by compressing the side springs, when the screen can easily be removed from the guides.



WE MAKE SCREEN DOORS TO ARCHITECTS DETAILS IN ANY STYLE.
MATERIAL FROM SUGAR PINE OR FINEST HARDWOODS
ALL FROM SELECTED KILN DRY STOCK.

TYPES OF CALLESON SCREEN DOORS

Should screens be hung in pairs for inward swinging casements, loose pin butts provide a simple method of removal.

Screen Frame Material

Our stock material, unless otherwise specified, is selected kiln dried sugar pine. Upon order we will furnish any grade specified of mahogany, oak, walnut, birch, maple; in fact, any hard or soft wood suitable for the purpose.

Screen Doors

We make screen doors as illustrated or to detail furnished with material as specified, veneered or solid wood. Close attention is given to the joinery and general workmanship.

We use three hardwood dowels between stiles and rails which are closely fitted and secured with the best waterproof glue. Heavy mesh can be furnished for bottom panels as guard.

Screen Cloth Fastening

Owing to our patent lock mould the screen cloth is drawn evenly and drumtight and does not sag or bag; it gives longer life to the screen cloth and preserves the general good appearance of the screens much longer than is usual with ordinary screens.

Hardware

All the necessary hardware is furnished for the window screens except only butts and catches for horizontal swinging window screens.

When Giving or Mailing Orders

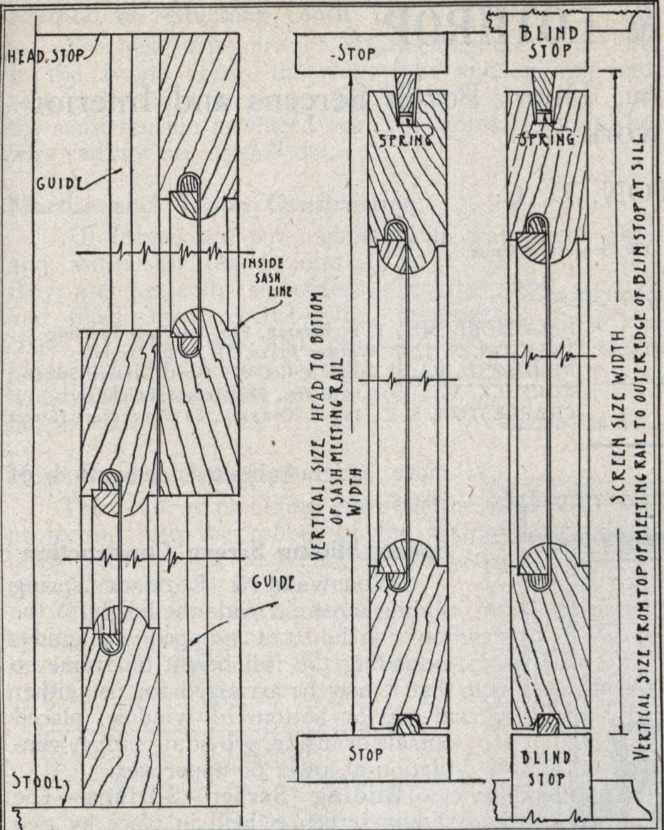
Careful measurements should be taken of the openings desired to be screened. State clearly the style of screen; gauge of wire cloth mesh; kind of wood, if other than sugar pine is required.

Give careful directions as to shipments and correct addresses. Place orders for screens as early as possible so as to give our mill the proper amount of time the order merits.

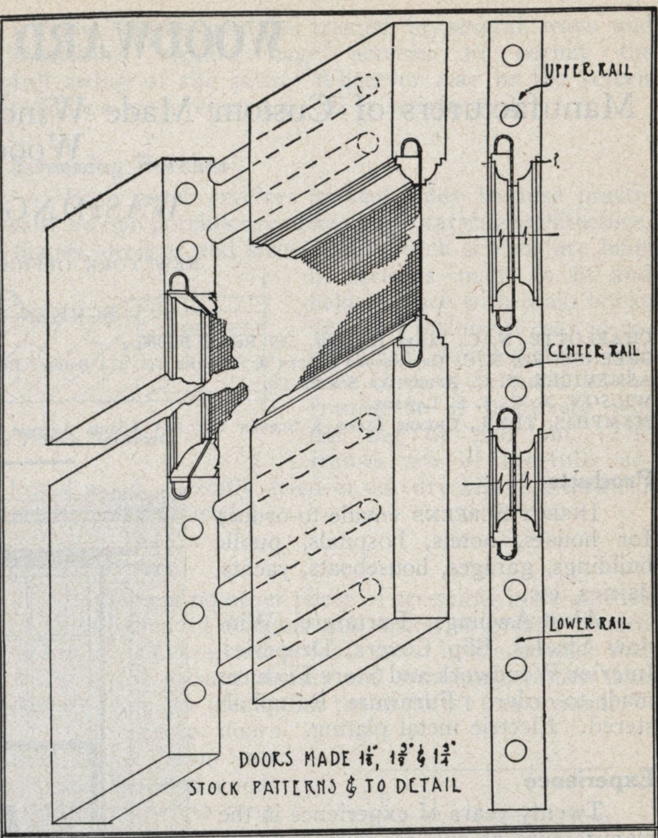
Detailed Door and Window Screens

Architects' details are followed in all particulars, and this form of business is particularly solicited.

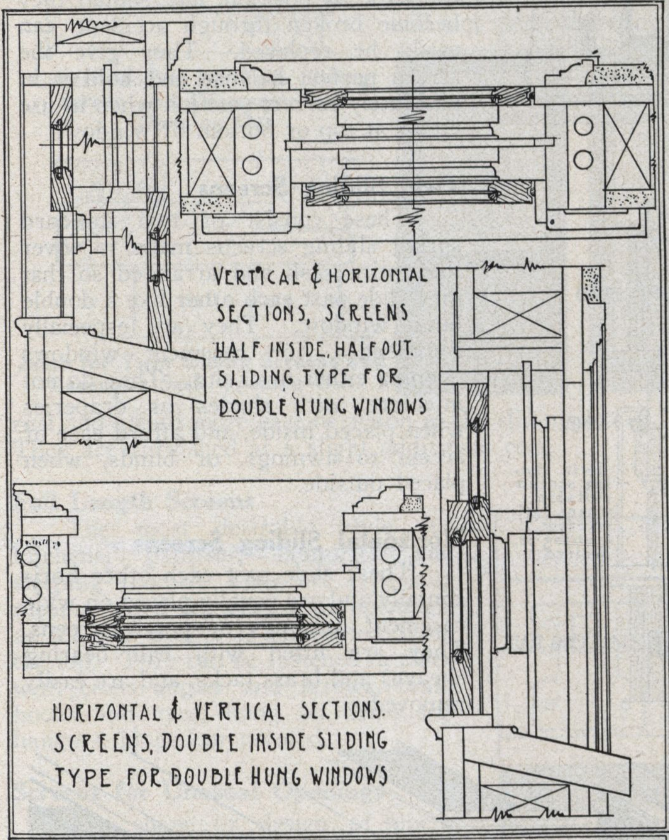
Continued on next page


HEAD STOP
GUIDE
INSIDE SASH LINE
GUIDE
STOOL
STOP
SPRING
STOP
BLIND STOP
SPRING
BLIND STOP
VERTICAL SIZE HEAD TO BOTTOM OF SASH MEETING RAIL WIDTH
SCREEN SIZE WIDTH
VERTICAL SIZE FROM TOP OF MEETING RAIL TO OUTER EDGE OF BLIN STOP AT SILL

EXTETIOR & INTERIOR SLIDING. INTERIOR DOUBLE SLIDING TYPE


UPPER RAIL
CENTER RAIL
LOWER RAIL
DOORS MADE 1⅛", 1⅜" & 1¾"
STOCK PATTERNS & TO DETAIL

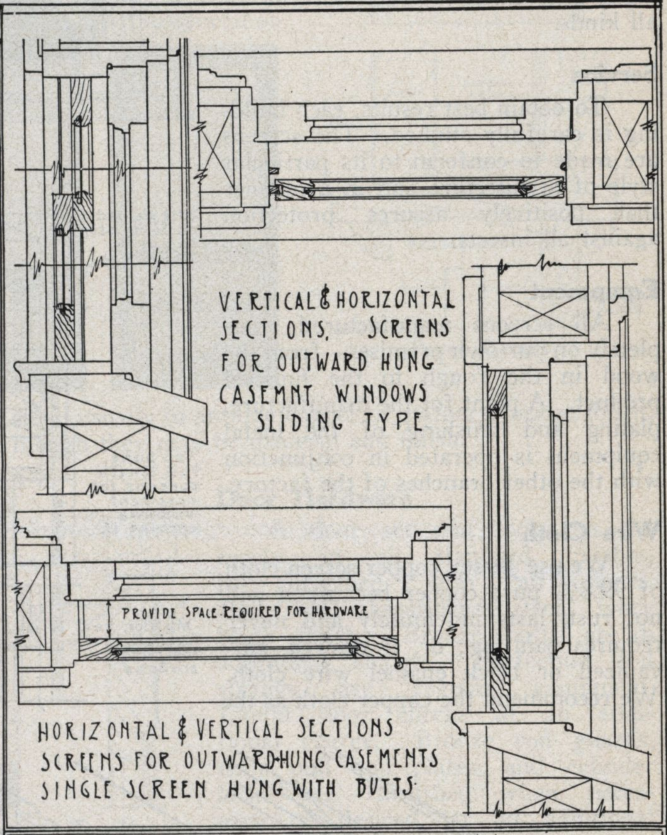
DETAILS OF CALLESON PATENT SCREEN DOORS



VERTICAL & HORIZONTAL SECTIONS, SCREENS HALF INSIDE, HALF OUT. SLIDING TYPE FOR DOUBLE HUNG WINDOWS

HORIZONTAL & VERTICAL SECTIONS. SCREENS, DOUBLE INSIDE SLIDING TYPE FOR DOUBLE HUNG WINDOWS

DETAILS OF CALLESON PATENT SCREENS


PROVIDE SPACE REQUIRED FOR HARDWARE

VERTICAL & HORIZONTAL SECTIONS, SCREENS FOR OUTWARD HUNG CASEMNT WINDOWS SLIDING TYPE

HORIZONTAL & VERTICAL SECTIONS SCREENS FOR OUTWARD-HUNG CASEMENTS SINGLE SCREEN HUNG WITH BUTTS

DETAILS CALLESON PATENT • SCREENS

WOODWARD & LOTHROP

Manufacturers of Custom Made Window, Door, Porch Screens and Interior Woodwork

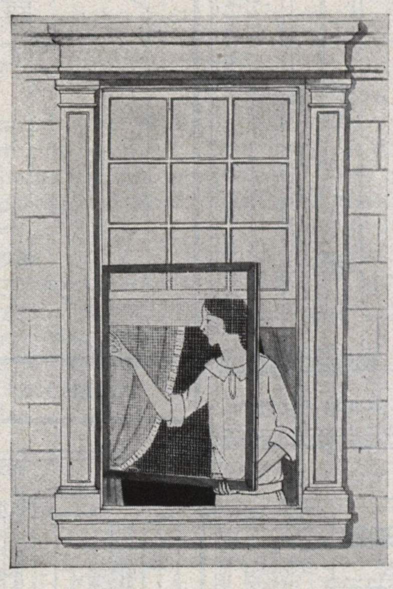
WASHINGTON, D. C.

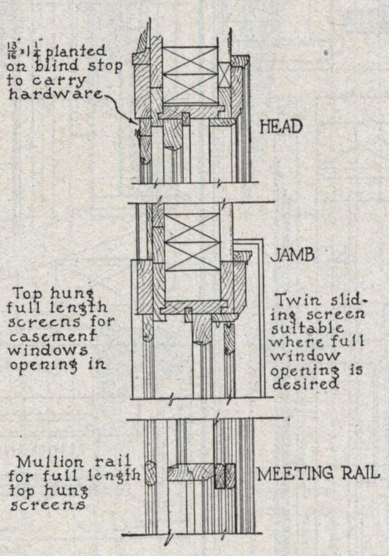
NEW YORK OFFICE, 370 Seventh Avenue

SCREEN AGENCIES

CHARLOTTE, N. C., James H. Bost, 519 Realty Building
GREENSBORO, N. C., Greensboro Screen & Heating Co., 313 Banner Building
ASHEVILLE, N. C., Asheville Screen Co.
WILSON, N. C., J. L. Lawshe
MEMPHIS, TENN., Chears Floor & Screen Co., 884 Adams Avenue

BALTIMORE, MD., J. B. Embick, 813 American Building
TRENTON, N. J., J. Watson Jones, 51 Model Avenue
RICHMOND, VA., Lamkin & Co., 209 North Adams Street
NORFOLK, VA., Lamkin & Co., 335 Arcade Building
CHARLESTON, S. C., Ira T. Conklin, 70 Vanderhorst Street




$\frac{13}{16}$"×1$\frac{1}{4}$" planted on blind stop to carry hardware
HEAD
JAMB
Top hung full length screens for casement windows opening in
Twin sliding screen suitable where full window opening is desired
Mullion rail for full length top hung screens
MEETING RAIL

Products

Insect Screens (made-to-order) for houses, hotels, hospitals, public buildings, garages, houseboats, yachts, dairies, etc.

Also Awnings, Furniture, Window Shades, Slip Covers, Draperies, Interior Woodwork and Store Fixtures made-to-order. Furniture Re-upholstered. Electric metal plating.

Experience

Twenty years of experience in the manufacture of rustless wire window, door and porch screens, has placed us in a foremost position in production of highgrade, made-to-order screens of all kinds.

Service

To obtain best results, each building is carefully studied. The screens are made to conform to its particular style of architecture and in a manner that positively assures protection against all insects.

Equipment

All screens manufactured completely on our own premises—from the wood in the rough to the finished product. A plant for the manufacture, plating and finishing of the metal equipment is operated in conjunction with the other branches of the factory.

Wire Cloth

We use Jersey copper screen cloth of 99.8% pure copper because it will not rust, lasts indefinitely and never requires painting; or, if desired, galvanized or black enamel wire cloth. We recommend the copper cloth as the more satisfactory over a period of years.

Spring Sliding Screen Construction

Woodward & Lothrop spring sliding screen is made the height of the lower sash. It is equipped with guides extending the full height of frame so that it may be arranged for use either at top or bottom of window, placed outside or inside, providing proper ventilation at lower or upper sash

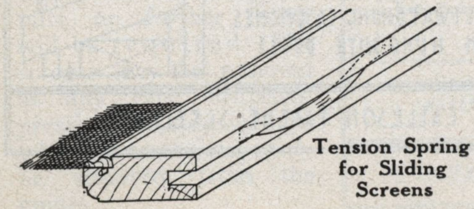
Sliding Screen Springs—The sliding screen is held in place by two balance springs that will last as long as the screen itself. They can not get out of shape or position, and should they become broken through accident, can easily be replaced. They give the screen perfect balance and hold it in absolutely correct position when in use either at top or bottom of window.

Twin Sliding Screens

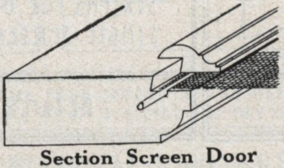
These consist of two standard spring sliding screens made to cover the entire sash and arranged so that they slide past each other like a double hung window. They are especially commended for casement windows opening either in or out. They do not interfere with shades or draperies when placed inside, and afford ease of access to awnings, or blinds, when placed outside.

Horizontal Sliding Screens

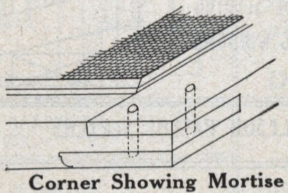
These slide past each other horizontally and are usually placed on wide casement openings or porch screens. They are fitted with ball bearing sheaves and brass tacks, and are easily removed.



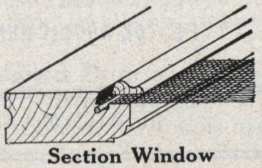
Tension Spring for Sliding Screens



Section Screen Door Stock



Corner Showing Mortise and Tenon



Section Window Screen
Method of attaching wire cloth

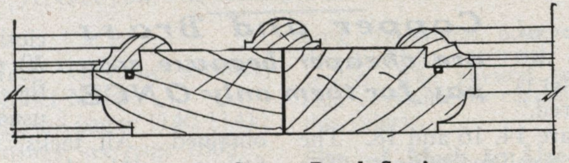
Continued on next page

Method of Attaching Cloth

The lock strip method of attaching the wire cloth to the frame draws the cloth taut and smooth and securely holds it in place. Each strand is secured and the same tension produced over the entire frame. The wire can not sag or pull out.

Mortise and Tenon Construction

All frames are put together with waterproof glue and with slip tenon joint; they are perfectly smoothed and filled, then receive two coats of best lead and oil paint colored to match the woodwork where they are to be placed.

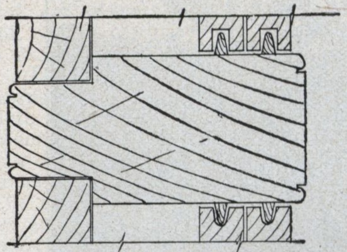


Batten for Screen Porch Sections

How Bead Is Attached

The bead or moulding covering the wire has a lip projecting into the rabbet of the frame which absolutely prevents the moulding from raising or opening upon exposure to weather.

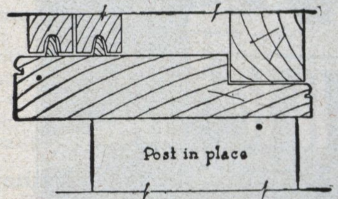
This feature, so far as we know, was originated by us, and is possessed only by Woodward & Lothrop screens, and employed by no other screen manufacturer; it positively overcomes the moulding drawing away from the frame.



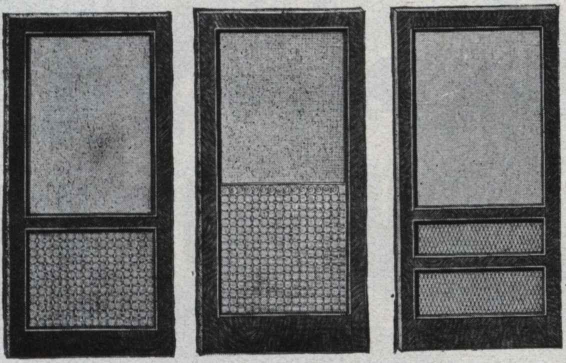
Center Mullion for Twin Sliding Screen and Casement Sash Opening Out

Wood or Zinc Guides

Wood guides, extending the full height of the window are standard. Zinc guides will not deteriorate or rust and afford more ease of action in the sliding screen. They are furnished at a slight additional cost.

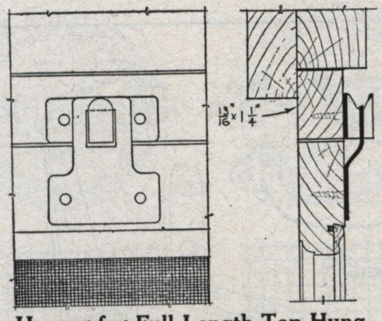


Jamb for Twin Sliding Screens and Casement Sash Opening Out



Full Length Screens

The most desirable style for kitchens, pantries, laundries and sleeping rooms. They are especially recommended for very wide openings, as all the weight is supported from the top. They can be fastened in place with brass angles and screws, brass hooks and eyes, hung on brass top hangers, hinged or pivoted.



Hanger for Full Length Top Hung Screen

Screens for Unusual Openings

Any shape or design of opening screened satisfactorily. Pivoted window sashes may be treated in several ways and sometimes require cage screens to permit the full swing of the sash. Whatever may be the screen need, we are prepared to fill it satisfactorily.

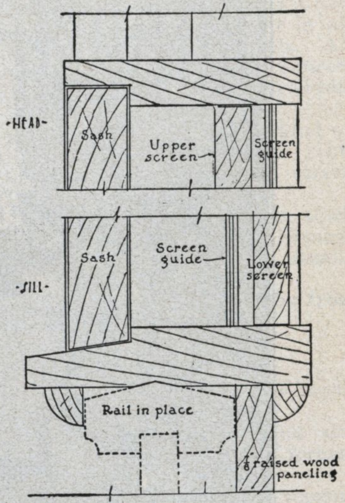
Screening Porches

Each porch receives careful study because practically no two porches are alike, due to varying architecture, shapes, designs and sizes. Our porch screens are built in sections, made to fit and held in place with brass hooks and eyes making it easy to remove each screen section. The wire cloth is fastened in the frames so it positively will not sag or pull out. The frames are of carefully selected wood, specially dried in our dry kiln and finished in any color desired.

Screen Doors

Perhaps in no other phase of screening is the service of an experienced designer and maker so greatly needed to study each case, and provide for it in the manner that will give the greatest beauty and symmetry, rather than detract from the ideals that the architect has created.

Our screen doors are made from air seasoned selected woods—northern white pine, quartered oak and mahogany. The grille work is made in our own shops. Grilles are of solid bronze metal or steel, usually in antique copper or statuary bronze finish, though they may be made in any finish.



Porch Details

Door Hardware

A door set that locks on the inside, in all standard finishes, is furnished with all doors. Butts of sherardized steel, ivory black finish. Bronze butts at an additional charge. Perfection coil springs are regular equipment. Liquid door checks at an additional charge. Bronze rod guards, door pull and plates, and cylinder locks are furnished when necessary or desired, at an additional charge.

BRONZE AND COPPER INSECT SCREEN CLOTH

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

Screens

Insect screen cloth made of bronze or copper is available in two finishes, bright and dark. The latter is also called "antique" or "weathered."

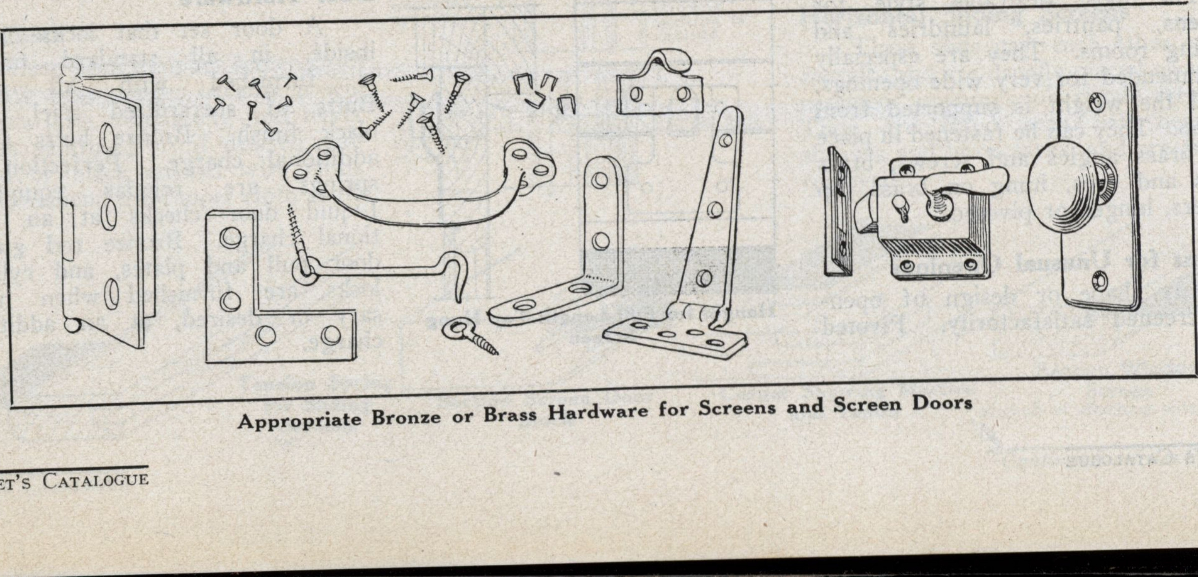
The meshes generally used are 14, 16 and 18. The 14-mesh will exclude flies but not small mosquitoes. The 16-mesh, the most widely used, will keep out all insects except midges and gnats. Where these small insects are prevalent, as in some southern localities, 18-mesh is recommended.

Copper and Brass are cheaper because you pay for them only ONCE

Bronze or copper insect screen cloth is made in widths ranging from 30 to 38 inches, 100 lineal feet to the roll. These are the widths usually stocked but others can be obtained. All tacks, screws, handles or other metal fittings and hardware used on either wood or metal framed screens, should be of copper, brass or bronze in order to obtain the best service. Bronze or copper insect screens equipped with brass or bronze hardware, are rustproof at all vital parts.

The White House, Washington, D. C., Screened with Copper

The Government specifies bronze or copper insect screens for official buildings



Appropriate Bronze or Brass Hardware for Screens and Screen Doors

U. T. HUNGERFORD BRASS & COPPER CO.

Screen Cloth

Hungerford Building, Lafayette, White and Franklin Streets
NEW YORK, N. Y.

BRANCH OFFICES AND WAREHOUSES

BOSTON, MASS., 411-429 D Street
PHILADELPHIA, PA., 510 Arch Street
CLEVELAND, OHIO, 3035 St. Clair Avenue
ST. LOUIS, MO., Boatmen's Bank Building
PITTSBURGH, PA., Chamber of Commerce Building
BALTIMORE, MD., Lombard and South Streets
SAN FRANCISCO, CAL., 22 Battery Street

Products

SCREEN CLOTH: Hungerford Genuine Bronze, Hungerford Pure Copper, and Monel Metal.

For Copper Roofing Materials, see pages 1140-1141; for Brass Plumbing Pipe and Fittings, see page 1803.

Hungerford Genuine Bronze Screen Cloth

Is the most economical, non-rusting material for screening windows, doors and porches where quality, ultimate cost and permanence are controlling factors.

It is woven from wire containing not less than 90%, nor more than 92%, pure copper; the remaining 8% to 10% being an absolutely non-rusting alloy introduced solely as a *hardening* agent and not for the purpose of in any way *cheapening* the product. As a matter of fact bronze cloth costs slightly more than copper and this unfortunately has tempted some unscrupulous dealers to furnish copper and call it "bronze" or "copper-bronze" or some similar qualifying term. In specifying bronze screen cloth, therefore, always make certain that bronze and *not* copper is furnished. The Hungerford label on a full roll of cloth is positive assurance that the material inside is exactly what the label says it is.

Hungerford Genuine Bronze Screen Cloth is harder, stronger and more resilient and durable than pure copper cloth. Bronze cloth when released after having been bent under pressure of the thumbs will spring back into its original flat, straight surface, whereas pure copper cloth when bent under even a moderate pressure, remains permanently distorted. The tempering of copper is frankly acknowledged to be a *lost art* and screen cloth woven from pure copper wire can not be made as hard and resilient as bronze, regardless of any extravagant *claims* that may be made for it.

Antique Finish

In places where *bright* finish is undesirable Antique Finish, Hungerford Genuine Bronze Screen Cloth is an ideal substitute for the regulation bright bronze. The finish on this type of cloth gives it a very dark bronze color. *Antique* finish is produced by a special process which adds a permanent dark coating to the wire *before* it is woven into cloth, thus insuring uniform color. This process in no way detracts from the rust resisting qualities of the screen.

Hungerford Pure Copper Screen Cloth

This cloth is exactly what its name implies: screen cloth woven from 99.9% pure copper wire that is drawn as hard in temper as it is possible to make. Copper of course is non-rusting and needs no painting. It does not give as good results as bronze where large surfaces are to be covered, owing to its softness and liability to damage and being stretched out of shape after it is installed. Hungerford Copper Screen Cloth is clearly and unmistakably labelled *"copper,"* or if the wrapping has been removed it can be readily identified by testing with the fingers for resiliency and strength.

Hungerford Monel Metal Screen Cloth

This is a non-rusting, high grade screen cloth. Monel is more expensive than either bronze or copper and, therefore, not so extensively used. It is ideal, however, for use in the tropics and along the Southern seacoast where atmospheric conditions are severe. The physical properties of Monel Metal and its high resistance to corrosion are fully set forth elsewhere in this volume.

Size of Mesh to Use

The term *mesh* is generally understood to mean the number of openings in a linear inch and that is the standard by which our screen cloth is manufactured. 16-mesh is used more than any other size because it gives better service in guarding against both mosquitos and house flies.

12-mesh is only suitable for use where nothing but house flies and larger insects have to be reckoned with.

14-mesh will protect against flies but will not bar out mosquitos.

18-mesh is required in some tropical climates and close to the Southern seashores in order to protect against the extremely small mosquitos and gnats that infest those localities.

Standard Widths

Hungerford Genuine Bronze Bright Finish Screen Cloth is always available for immediate warehouse shipment in all *even widths* from 18 to 48 in., i. e., 18, 20, 22, 24, 26, etc. All of these widths are available in either 14, 16 or 18-mesh. Antique finish bronze cloth is also carried in all even inch widths from 18 to 48 in. but in 14 and 16-mesh only.

It is possible to furnish widths up to 72 in. in any kind of cloth, though wide widths are not practical unless reinforced and supported by frequent cross bars in the screen frames.

Hungerford Pure Copper Screen Cloth is carried in stock in all *even inch* widths from 18 to 48 in., in 14 and 16-mesh only. Where 18-mesh is required, *bronze* cloth is usually specified.

Monel Metal cloth is carried in all *even inch* widths from 24 to 48 in. and in 16 and 18-mesh only.

Specification

The following form of specification with necessary modifications will be found satisfactory for most work:

Insect Screens—All movable windows, doors and also front (or side) porches shall be equipped with insect screens covering the entire opening.

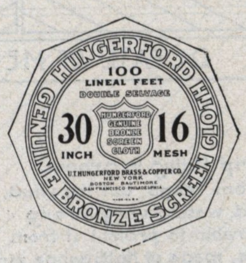
Double hung windows to have full length, top hung screens. Hinged windows opening into the building to have outside stationary screens. Hinged windows opening out to have top hung screens to swing in. Screen doors to swing in opposite direction to house doors.

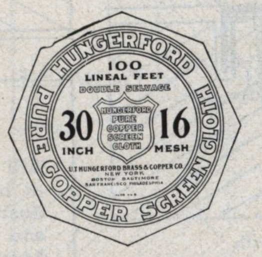
Frames of all screens to be made of well seasoned, clear white pine with mortise tenon corners securely wedged and glued and to be painted with 3 coats of best lead and linseed oil in colors to harmonize with surrounding trim.

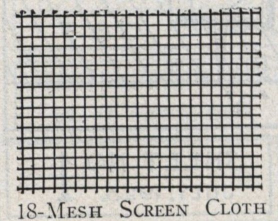
Insect screen wire to be 16-mesh, genuine bronze as manufactured by the U. T. HUNGERFORD BRASS & COPPER CO.

All hardware to be solid brass or bronze.

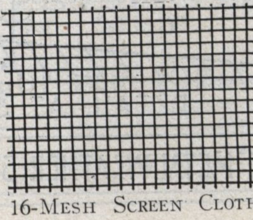
Installation of screens to be made under direction of architect.


HUNGERFORD CLOTH
GENUINE BRONZE SCREEN CLOTH
100
LINEAL FEET
DOUBLE SELVAGE
30
INCH
16
MESH
HUNGERFORD GENUINE BRONZE SCREEN CLOTH
U.T. HUNGERFORD BRASS & COPPER CO.
NEW YORK

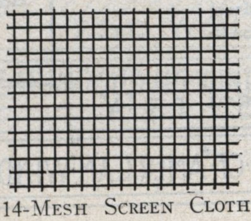




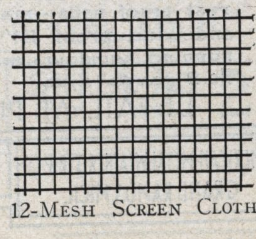
18-MESH SCREEN CLOTH



16-MESH SCREEN CLOTH



14-MESH SCREEN CLOTH



12-MESH SCREEN CLOTH

AMERICAN METAL WEATHER STRIP CO.

HOME OFFICE AND FACTORY
GRAND RAPIDS, MICH.

Sales and Service Offices from Coast to Coast with All Sales and Installations Made Under Our Direct Supervision

Products

This company manufactures and installs "American Windustite" Metal Weatherstrips for windows and doors of all types.

Guarantee

The guarantee clause which we include in our suggested specification (see below), is backed by a concern of strong financial standing and 13 years of experience. This written guarantee of material and workmanship for our weatherstrip is the surest insurance against inconvenience and disappointment. It is the answer to any question that may be asked regarding the durability and efficiency of our product.

REGISTERED TRADE-MARKS

Specifications

(1) All double-hung windows shall have American type jamb, sill, head and meeting rail strips manufactured by American Metal Weather Strip Co., Grand Rapids, Michigan.

(2) All strips on sill to be of zinc not lighter than No. 16 gauge and to be applied with special rustproof screws.

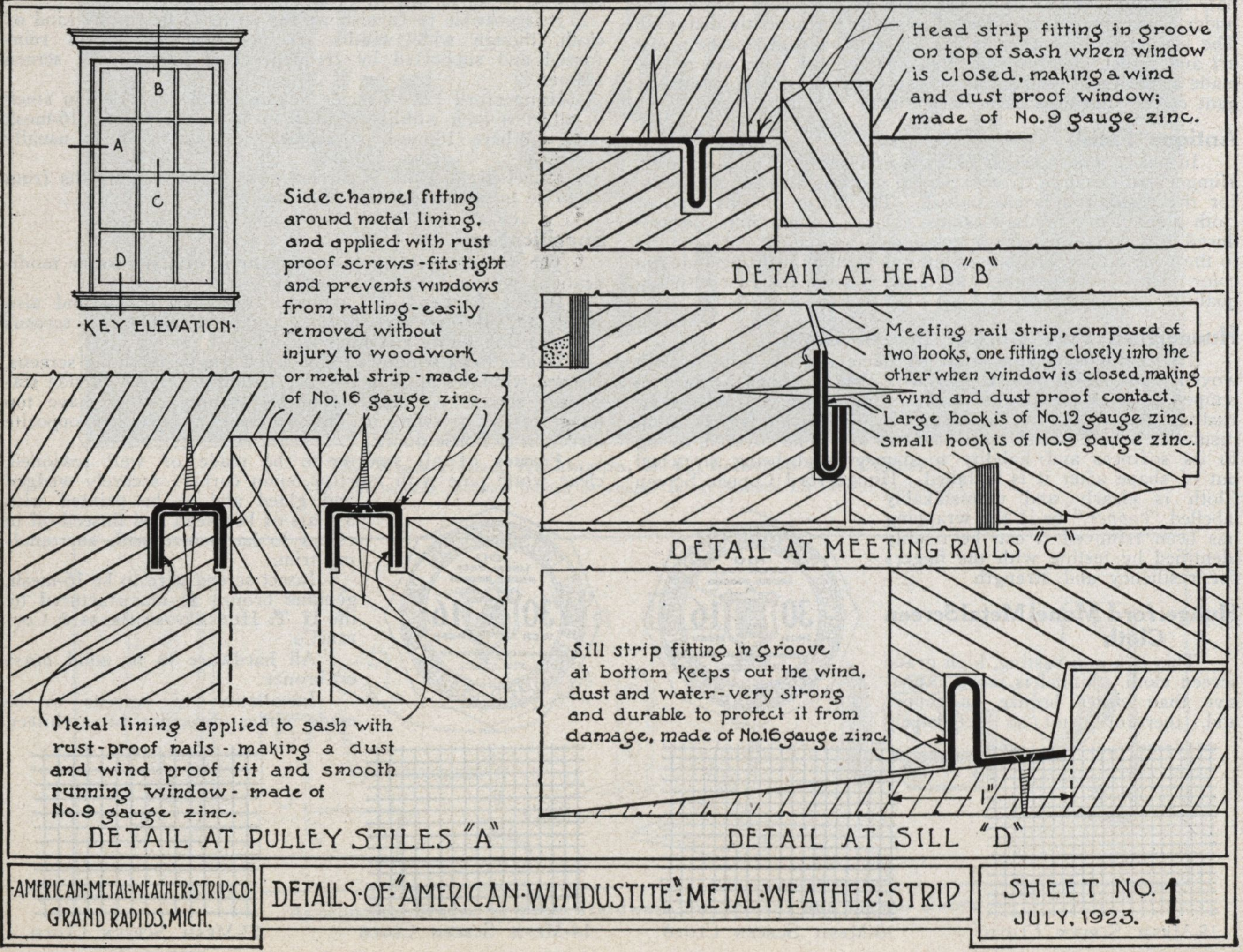
(3) All side strips to be of zinc channel metal to metal type of strip. Channel on jamb to be of No. 16 gauge zinc and to be applied with special rustproof screws. Lining on sash to be of No. 9 gauge zinc and applied with special rustproof nails.

(4) Meeting rail strips on upper sash to be of No. 12 gauge zinc; meeting rail strip on lower sash to be of No. 9 gauge zinc and head strip to be of No. 9 gauge zinc, all to be applied with special rustproof nails.

(5) Weatherstrips to be guaranteed by the manufacturer for a period of ten years as to material and workmanship and to render satisfaction in preventing passage of air and dust where an American type of metal weatherstrip is applied.

Co-operative Services

We maintain a highly efficient staff of experienced experts who are at the service of architects, contractors and others in the solution of weatherstrip problems. Full information, quotations and detailed blue prints will be mailed on request.



Side channel fitting around metal lining, and applied with rust proof screws - fits tight and prevents windows from rattling - easily removed without injury to woodwork or metal strip - made of No. 16 gauge zinc.

Metal lining applied to sash with rust-proof nails - making a dust and wind proof fit and smooth running window - made of No. 9 gauge zinc.

DETAIL AT PULLEY STILES "A"

Head strip fitting in groove on top of sash when window is closed, making a wind and dust proof window; made of No. 9 gauge zinc.

DETAIL AT HEAD "B"

Meeting rail strip, composed of two hooks, one fitting closely into the other when window is closed, making a wind and dust proof contact. Large hook is of No. 12 gauge zinc, small hook is of No. 9 gauge zinc.

DETAIL AT MEETING RAILS "C"

Sill strip fitting in groove at bottom keeps out the wind, dust and water - very strong and durable to protect it from damage, made of No. 16 gauge zinc.

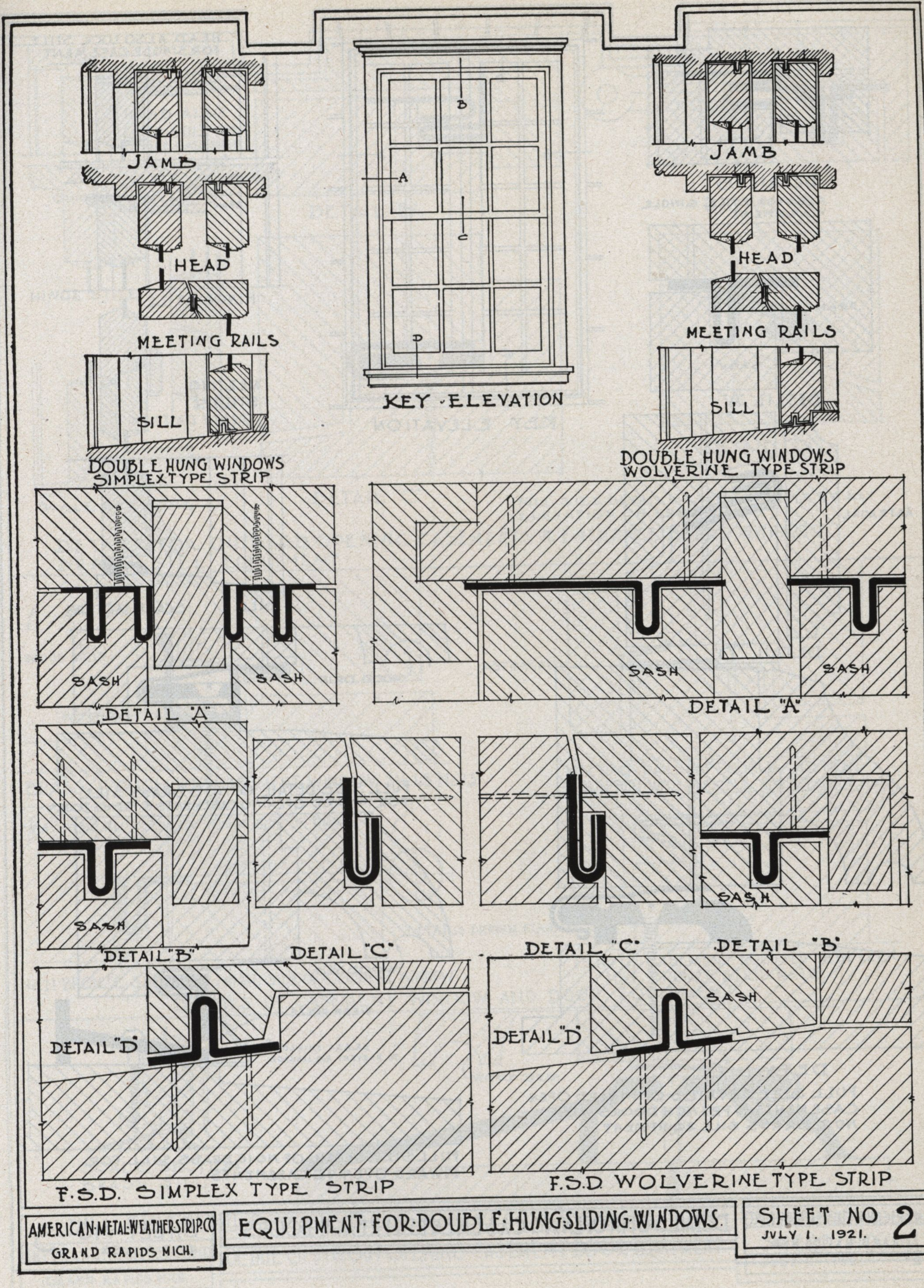
DETAIL AT SILL "D"

AMERICAN·METAL·WEATHER·STRIP·CO·
GRAND RAPIDS, MICH.

DETAILS·OF·"AMERICAN·WINDUSTITE"·METAL·WEATHER·STRIP

SHEET NO. 1
JULY, 1923.

Continued on next page

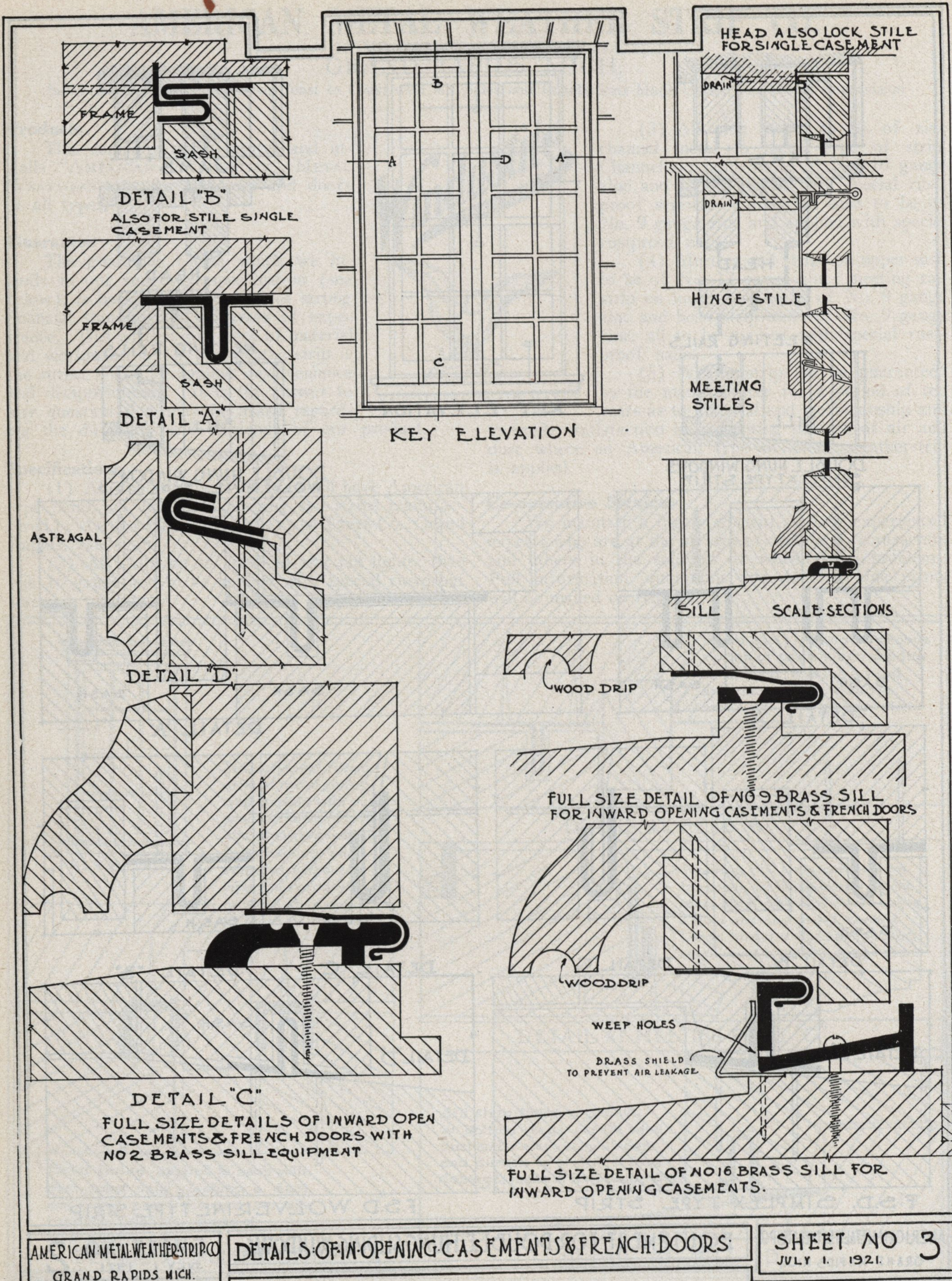

JAMB
HEAD
MEETING RAILS
SILL
DOUBLE HUNG WINDOWS
SIMPLEX TYPE STRIP
B
A
C
D
KEY - ELEVATION
JAMB
HEAD
MEETING RAILS
SILL
DOUBLE HUNG WINDOWS
WOLVERINE TYPE STRIP
SASH
SASH
DETAIL "A"
SASH
SASH
DETAIL "A"
SASH
"DETAIL "B"
DETAIL "C"
SASH
DETAIL "C"
DETAIL "B"
DETAIL "D"
SASH
DETAIL "D"
F.S.D. SIMPLEX TYPE STRIP
F.S.D. WOLVERINE TYPE STRIP

AMERICAN·METAL·WEATHERSTRIP·CO
GRAND RAPIDS MICH.

EQUIPMENT· FOR·DOUBLE·HUNG·SLIDING·WINDOWS.

SHEET NO 2
JULY 1. 1921.

Continued on next page

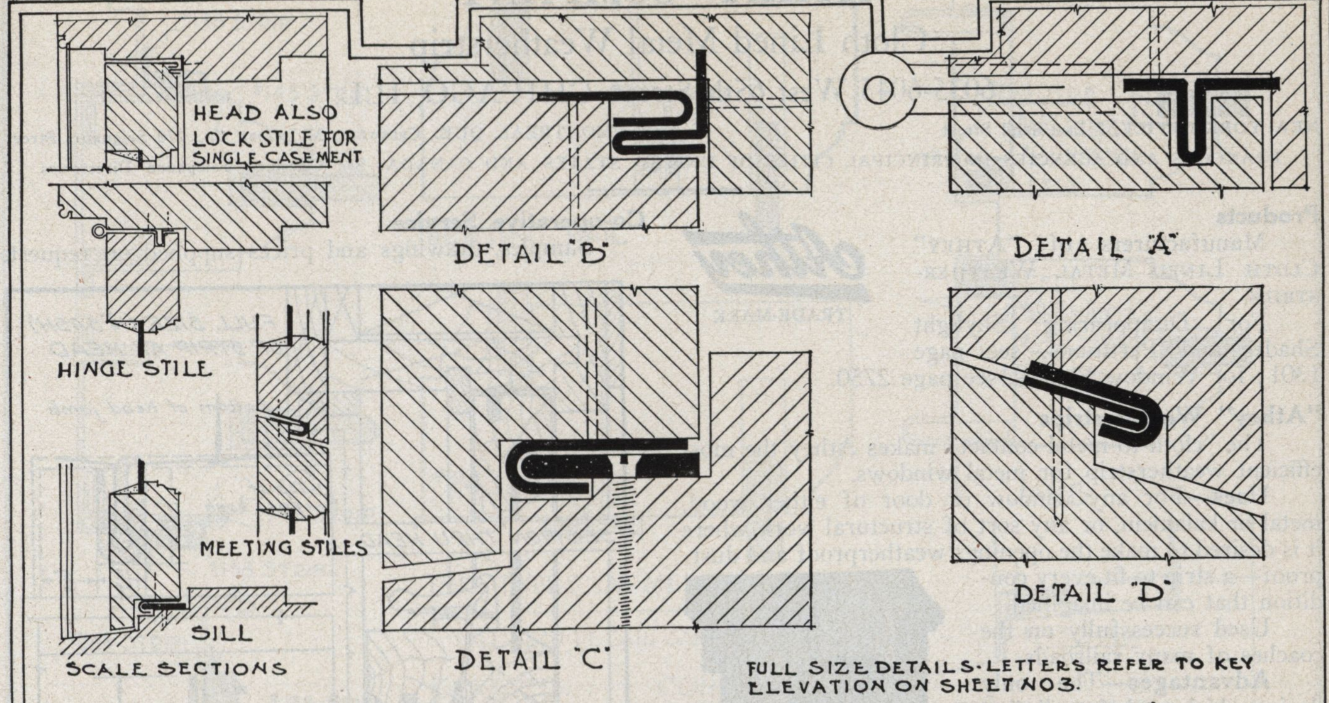

HEAD ALSO LOCK STILE FOR SINGLE CASEMENT
DRAIN
DRAIN
HINGE STILE
FRAME
SASH
DETAIL "B"
ALSO FOR STILE SINGLE CASEMENT
FRAME
SASH
DETAIL "A"
B
A
D
A
C
KEY ELEVATION
MEETING STILES
ASTRAGAL
DETAIL "D"
SILL
SCALE·SECTIONS
WOOD DRIP
FULL SIZE DETAIL OF NO 9 BRASS SILL FOR INWARD OPENING CASEMENTS & FRENCH DOORS
WOOD DRIP
WEEP HOLES
BRASS SHIELD TO PREVENT AIR LEAKAGE
DETAIL "C"
FULL SIZE DETAILS OF INWARD OPEN CASEMENTS & FRENCH DOORS WITH NO 2 BRASS SILL EQUIPMENT
FULL SIZE DETAIL OF NO 16 BRASS SILL FOR INWARD OPENING CASEMENTS.

AMERICAN·METAL·WEATHER·STRIP·CO
GRAND RAPIDS MICH.

DETAILS·OF·IN·OPENING·CASEMENTS & FRENCH·DOORS

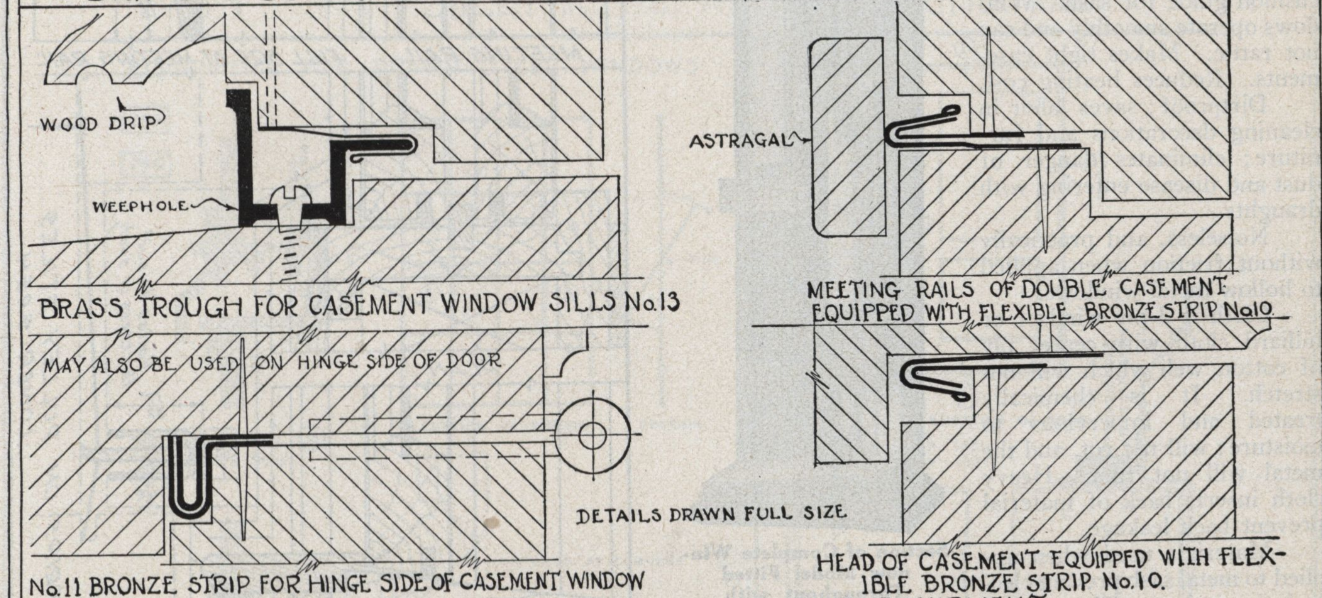
SHEET NO 3
JULY 1. 1921.

Continued on next page


HEAD ALSO LOCK STILE FOR SINGLE CASEMENT
HINGE STILE
MEETING STILES
SILL
SCALE SECTIONS
DETAIL "B"
DETAIL "A"
DETAIL "C"
DETAIL "D"

FULL SIZE DETAILS - LETTERS REFER TO KEY ELEVATION ON SHEET NO 3.

DETAILS FOR OUTWARD OPENING CASEMENTS & ENTRANCE DOORS WITH NO 9 BRASS SILL EQUIPMENT.


WOOD DRIP
WEEPHOLE
ASTRAGAL
DETAILS DRAWN FULL SIZE

BRASS TROUGH FOR CASEMENT WINDOW SILLS No.13

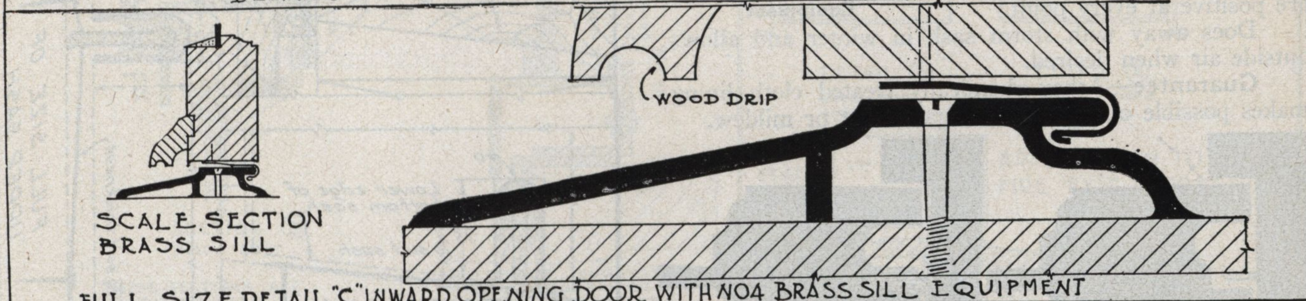
MEETING RAILS OF DOUBLE CASEMENT EQUIPPED WITH FLEXIBLE BRONZE STRIP No10.

MAY ALSO BE USED ON HINGE SIDE OF DOOR

No.11 BRONZE STRIP FOR HINGE SIDE OF CASEMENT WINDOW

HEAD OF CASEMENT EQUIPPED WITH FLEXIBLE BRONZE STRIP No.10.

DETAILS OF CASEMENT WINDOW AND DOOR EQUIPMENT



SCALE SECTION BRASS SILL

FULL SIZE DETAIL "C" INWARD OPENING DOOR WITH NO4 BRASS SILL EQUIPMENT

AMERICAN METAL WEATHER STRIP CO
GRAND RAPIDS MICH.

DETAIL OF IN & OUT OPENING CASEMENT DOOR EQUIPMENT

SHEET NO 4
JULY 1. 1921.

ATHEY COMPANY

Cloth Lined Metal Weatherstrip

6035-6045 West 65th Street, CHICAGO, ILL.

NEW YORK OFFICE, 7 East 42nd Street

MONTREAL, QUE., Creswell, McIntosh Co., 270 Seigneurs Street

BRANCHES AND AGENCIES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA—See Classified Telephone Directories

Products

Athey

TRADE-MARK

Manufacturers of "Athey" Cloth Lined Metal Weather-strips.

For Disappearing Skylight Shades and Partitions, see page 1301; for Window Shades, see page 2750.

"Athey" Weatherstrips

The "cloth to metal contact" makes Athey the most efficient weatherstrip for metal windows.

Uses—For any window or door of either wood, metal or kalamein, or any sort of structural work where it is desired to make the openings weatherproof and dust-proof—a strip to fit every condition that can be imagined.

Used successfully on the coaches of many railroads.

Advantages—The only device which excludes *all* dirt. The cloth lined channel acts as cushion guide for sash. Windows operate smoothly and can not rattle. Makes tight casements. Reduces heating cost.

Dirtproof; saves labor in cleaning decorations and furniture; eliminates danger of dust and disease entering with draughts.

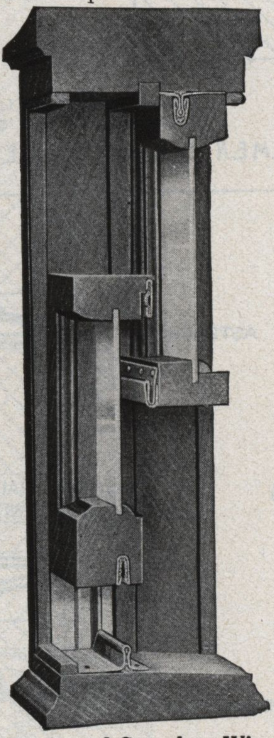
Noiseless, and practically without friction when applied to hollow metal windows.

Cloth is 3-ply windsor or billiard cloth with center ply of cotton web which will not stretch. It is chemically treated and impervious to moisture; will not rot, and the metal will not rust. Heavy cloth inserts back of material prevent back leakage.

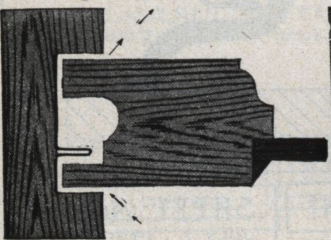
Materials used when applied to metal sash prevent electrolytic action. The results are positive at every point.

Does away with storm sash in winter and allows outside air when desired.

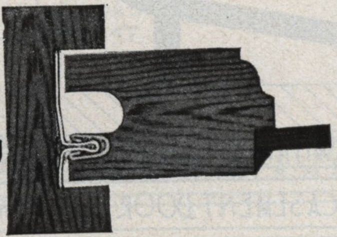
Guarantee—Athey chemically treated cloth lining makes possible our guarantee against rot or mildew.



Section of Complete Window Model Fitted Throughout with Cloth Lined Equipment



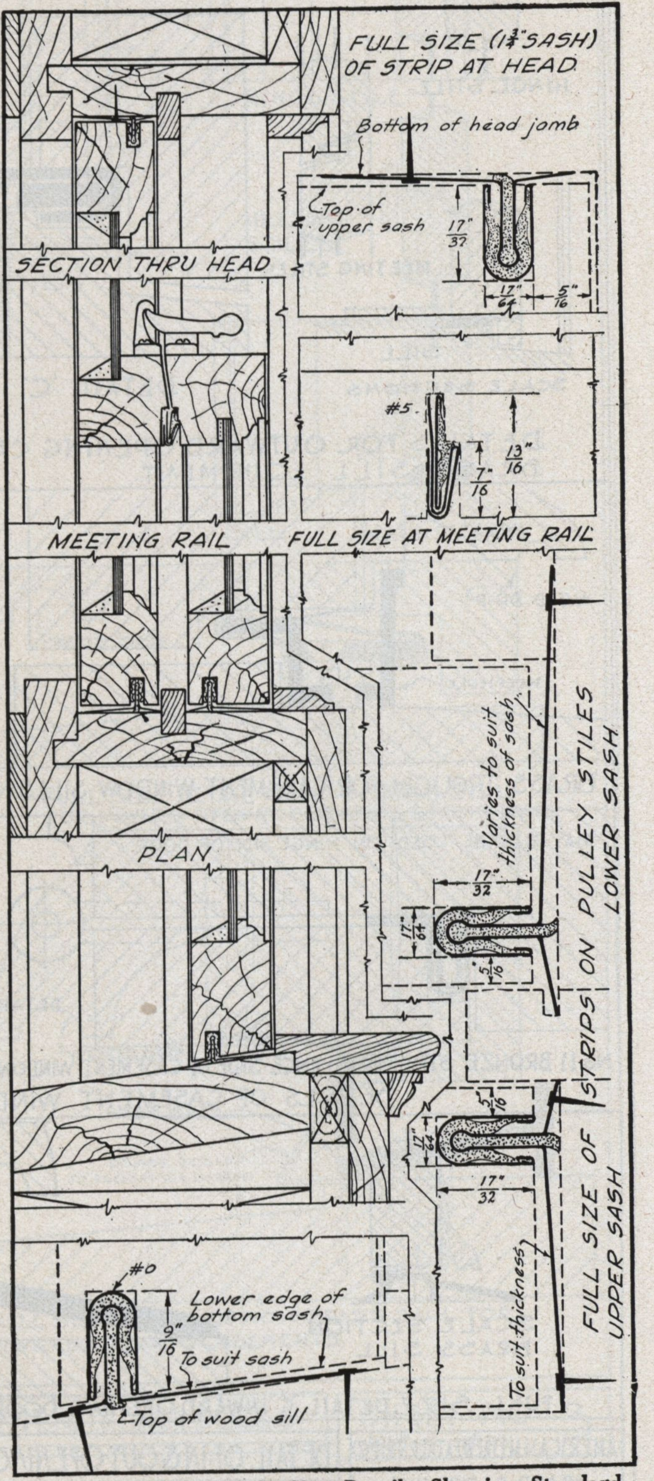
Ordinary Weatherstrip
Showing leakage without channel at sash cord groove



Cloth Lined Channel
No leakage possible even at sash cord groove

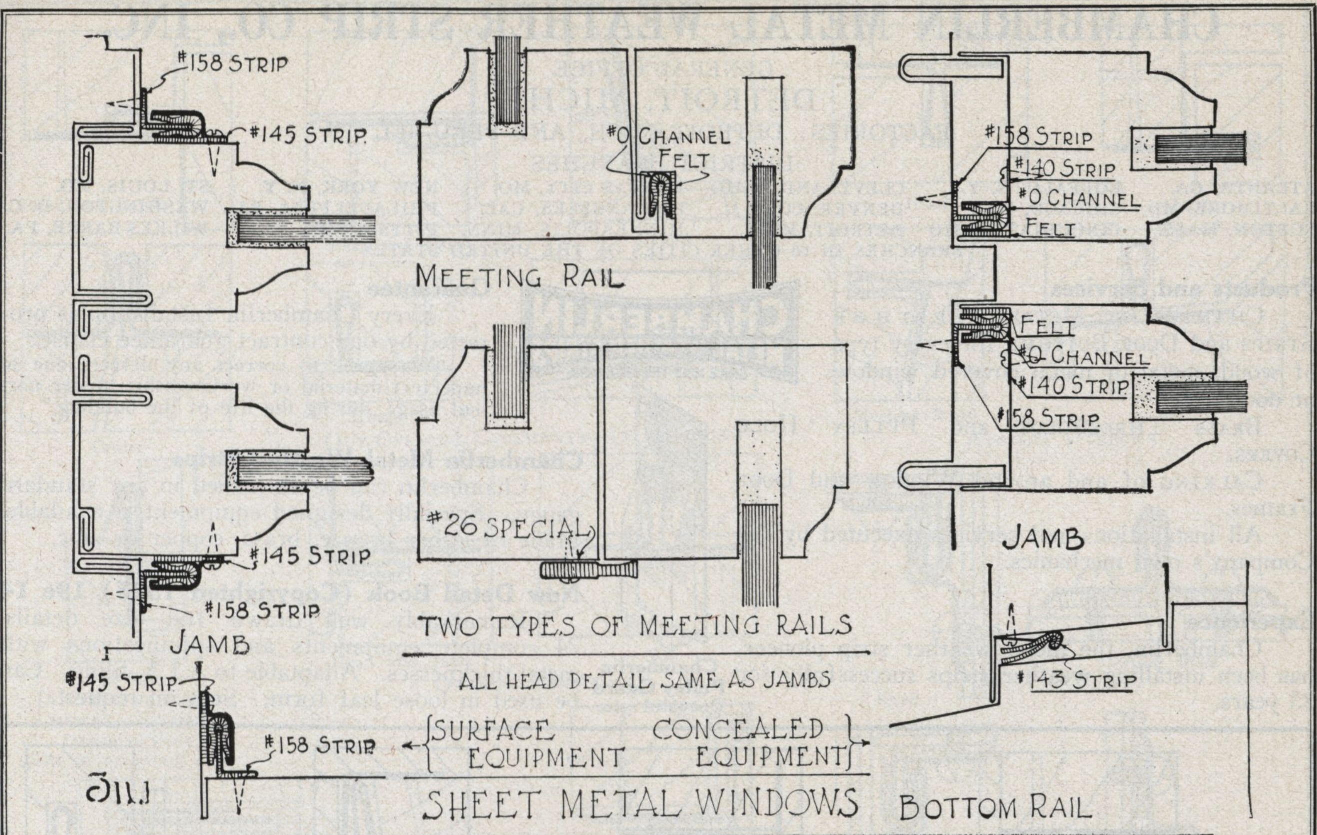
Co-operative Service

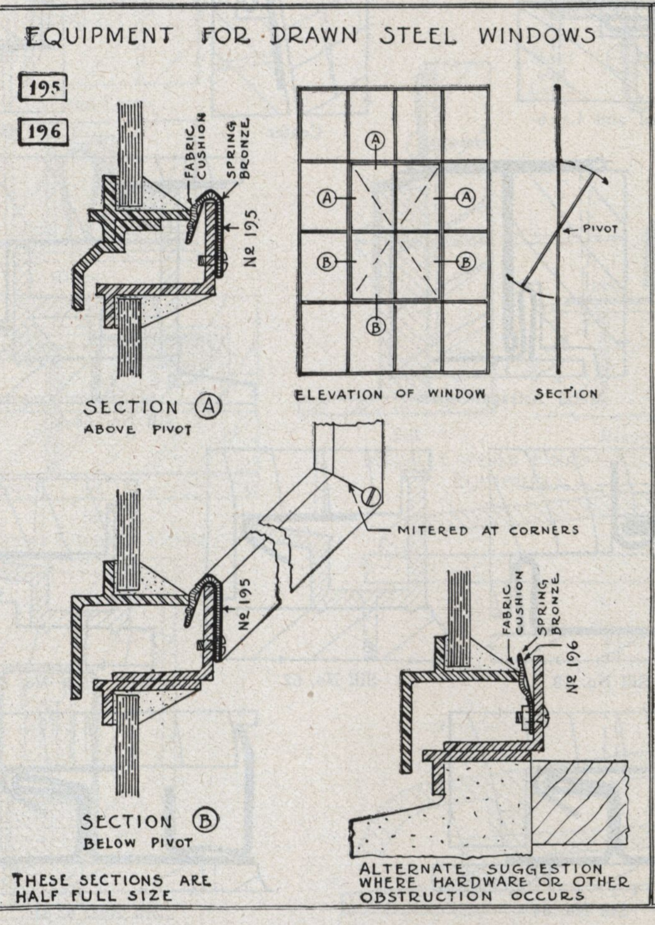
Samples, drawings and prices supplied on request.

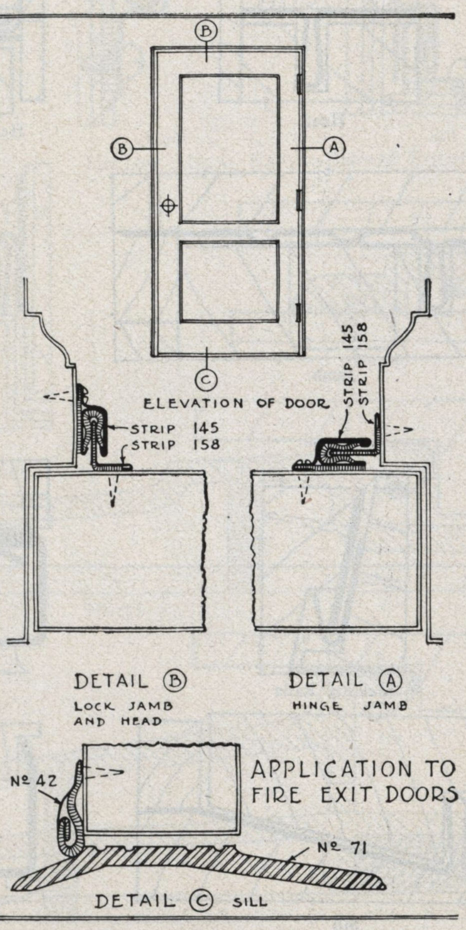

FULL SIZE (1¾" SASH) OF STRIP AT HEAD
Bottom of head jamb
Top of upper sash
17"/32
17"/64
5"/16
SECTION THRU HEAD
#5
13"/16
7"/16
MEETING RAIL
FULL SIZE AT MEETING RAIL
Varies to suit thickness of sash
17"/32
17"/64
5"/16
FULL SIZE OF STRIPS ON PULLEY STILES LOWER SASH
PLAN
FULL SIZE OF STRIPS ON PULLEY STILES UPPER SASH
5"/16
17"/64
17"/32
To suit thickness
#0
Lower edge of bottom sash
9"/16
To suit sash
Top of wood sill

3-inch Scale and Full Size Details Showing Standard Equipment for Double Hung Sash—Athey Cloth Lined Metal Weatherstrip, 1¾-inch Sash

Continued on next page


#158 STRIP
#145 STRIP
#145 STRIP
#158 STRIP
JAMB
#145 STRIP
#158 STRIP
SILL
#0 CHANNEL
FELT
MEETING RAIL
#26 SPECIAL
TWO TYPES OF MEETING RAILS
ALL HEAD DETAIL SAME AS JAMBS
SURFACE EQUIPMENT
CONCEALED EQUIPMENT
SHEET METAL WINDOWS
#158 STRIP
#140 STRIP
#0 CHANNEL
FELT
FELT
#0 CHANNEL
#140 STRIP
#158 STRIP
JAMB
#143 STRIP
BOTTOM RAIL


EQUIPMENT FOR DRAWN STEEL WINDOWS
195
196
FABRIC CUSHION
SPRING BRONZE
Nº 195
SECTION (A)
ABOVE PIVOT
A
A
A
B
B
B
ELEVATION OF WINDOW
PIVOT
SECTION
MITERED AT CORNERS
Nº 195
SECTION (B)
BELOW PIVOT
THESE SECTIONS ARE HALF FULL SIZE
FABRIC CUSHION
SPRING BRONZE
Nº 196
ALTERNATE SUGGESTION WHERE HARDWARE OR OTHER OBSTRUCTION OCCURS


B
B
A
C
ELEVATION OF DOOR
STRIP 145
STRIP 158
STRIP 145
STRIP 158
DETAIL (B)
LOCK JAMB AND HEAD
DETAIL (A)
HINGE JAMB
Nº 42
APPLICATION TO FIRE EXIT DOORS
Nº 71
DETAIL (C) SILL

Athey Products

Cloth Lined Metal Weatherstrip as Applied to Metal Windows and Doors

All Details One-half Size

CHAMBERLIN METAL WEATHER STRIP CO., INC.

GENERAL OFFICE
DETROIT, MICH.
FACTORIES: DETROIT, MICH., AND PERU, ILL.

DISTRICT BRANCHES
ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DENVER, COLO.
DETROIT, MICH.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ST. LOUIS, MO.
WASHINGTON, D. C.
WILKES-BARRE, PA.
BRANCHES IN 60 OTHER CITIES OF THE UNITED STATES

CHAMBERLIN
METAL WEATHER STRIPS
"SINCE 1893-THE STANDARD"

Products and Services

CHAMBERLIN METAL WEATHER STRIPS and DOOR BOTTOMS for every type of wood, metal or metal covered window or door.

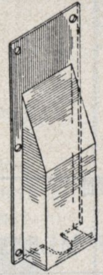
BRASS THRESHOLDS and PULLEY HOLE COVERS.

CALKING of and around Window and Door Frames.

All installations and services executed by the Company's own mechanics.

Experience

Chamberlin, the metal weather strip pioneer, has been installing weather strips successfully for 33 years.



Chamberlin Pulley Guard
One-third size

Guarantee

Every Chamberlin Installation is protected by our contract guarantee clause:

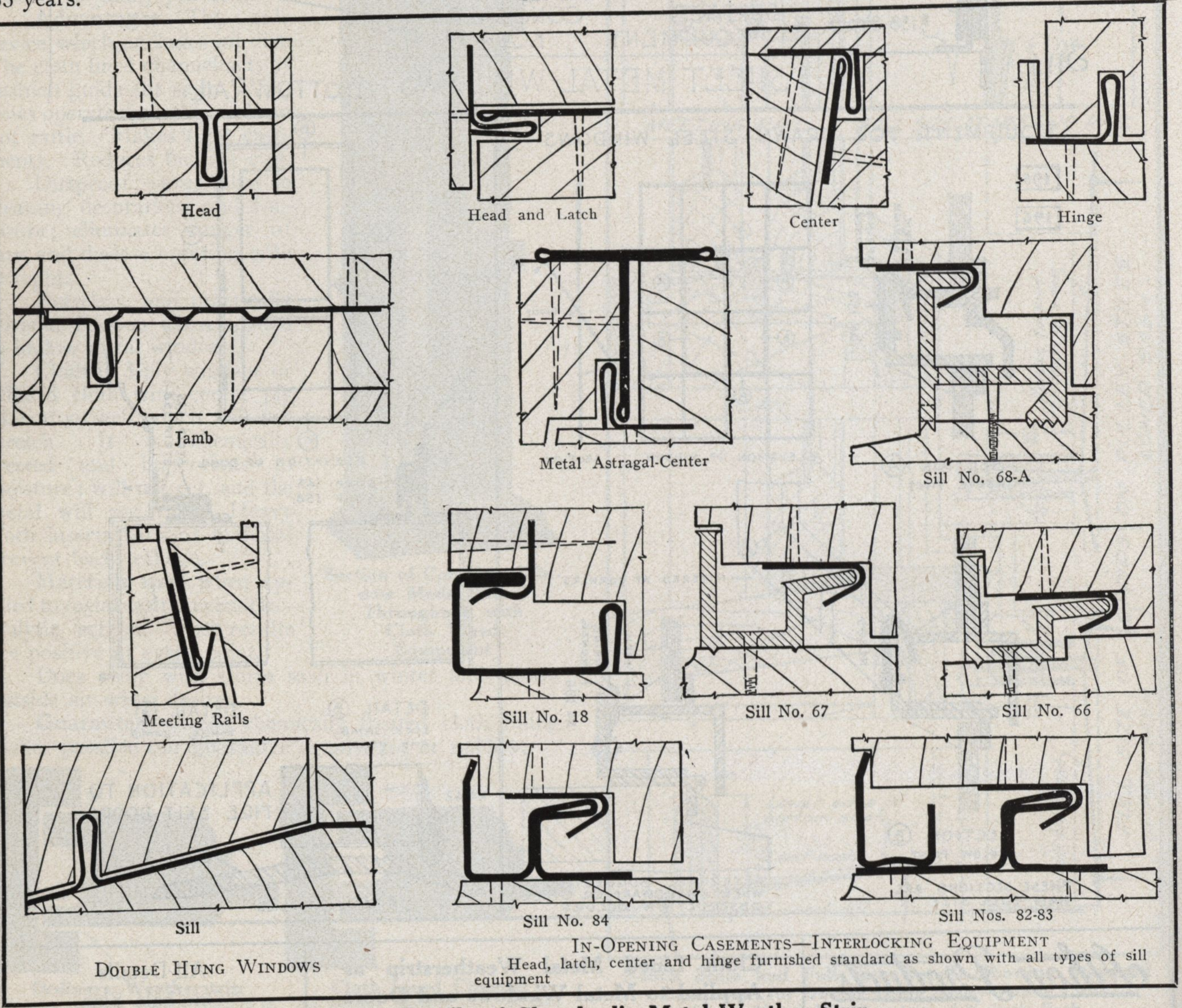
"We agree to correct any defects due to imperfect material or workmanship, under normal usage, during the life of the building."

Chamberlin Metal Weather Strips

Chamberlin can be furnished in any standard gauge. Specially designed equipment is available. Made of either bronze, brass, copper or zinc.

New Detail Book (Copyrighted 1925) 19e 14

Remarkably well drawn full size details. 24 complete equipments and specifications with metal thicknesses. Adaptable to A.I.A. filing. Can be used in loose leaf form. Sent on request.

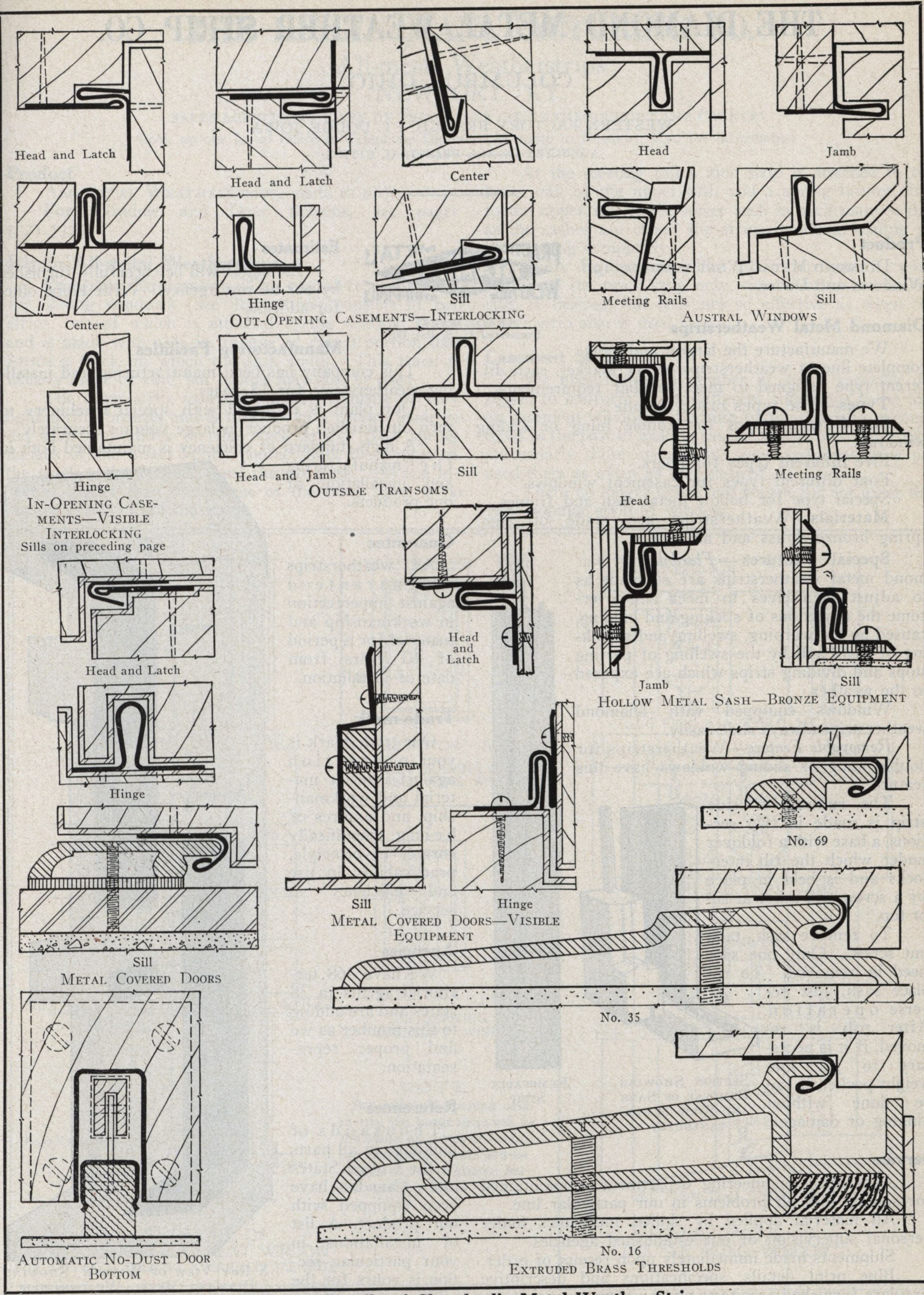


DOUBLE HUNG WINDOWS

IN-OPENING CASEMENTS—INTERLOCKING EQUIPMENT
Head, latch, center and hinge furnished standard as shown with all types of sill equipment

Full Size Details of Chamberlin Metal Weather Strip

Continued on next page


Head and Latch
Head and Latch
Center
Head
Jamb
Center
Hinge
Sill
Meeting Rails
Sill
OUT-OPENING CASEMENTS—INTERLOCKING
AUSTRAL WINDOWS
Hinge
IN-OPENING CASEMENTS—VISIBLE INTERLOCKING
Sills on preceding page
Head and Jamb
Sill
OUTSIDE TRANSOMS
Head
Meeting Rails
Head and Latch
Jamb
Sill
HOLLOW METAL SASH—BRONZE EQUIPMENT
Head and Latch
Hinge
No. 69
Sill
METAL COVERED DOORS
Sill
Hinge
METAL COVERED DOORS—VISIBLE EQUIPMENT
No. 35
AUTOMATIC NO-DUST DOOR BOTTOM
No. 16
EXTRUDED BRASS THRESHOLDS

Full Size Details of Chamberlin Metal Weather Strip

THE DIAMOND METAL WEATHER STRIP CO.

COLUMBUS, OHIO

WESTERN FACTORY BRANCH, FT. DODGE, IOWA

AGENCIES IN ALL PRINCIPAL CITIES

PRACTICAL METAL
THE DIAMOND WAY
WEATHER STRIPPING

TRADE-MARK
Registered U. S. Pat. Off.

Product

Diamond Metal Weatherstrips for Windows and Doors.

Diamond Metal Weatherstrips

We manufacture the largest and most complete line of weatherstrips on the market, each different type designed to meet peculiar requirements.

Types—The types made include:

Six different types for double hung or sliding windows.

Five different types for doors.

Four different types for casement windows.

Special type for hollow metal sash and frames.

Materials—Weatherstrips are made of zinc, spring bronze, brass and aluminum.

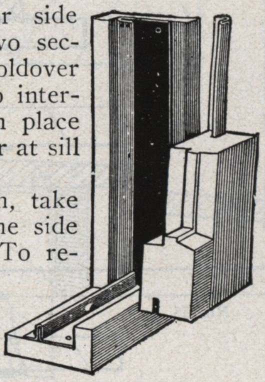
Special Features — *Flexibility* — Diamond metal weatherstrips are so made as to adjust themselves to meet and overcome the objections of sticking and binding, caused by the warping, swelling and shrinking of sash, and by the swelling of parting stops and dividing strips which are exposed to the weather.

Windows equipped with Diamond weatherstrips always slide easily.

Removable Feature—Weatherstrips for double hung or sliding windows have this feature.

The runway or side strip is made in two sections, a base with a foldover under which the rib interlocks and is held in place by a screw and miter at sill or top.

To remove sash, take out screw. Only one side need be removed. To replace sash, just reverse operation. After rib is removed, if it is necessary to get into weight pocket, it can be done without kinking or damage.



Section Showing Removal of Sash and Strip Simultaneously

Removable Strip

Service

A practical engineering department is maintained for solving difficult problems in our particular line.

All material applied by skilled mechanics under personal supervision of our established agencies.

Shipments made immediately upon receipt of order.

Blue print details, specifications and descriptive circulars furnished architects and builders on request

Estimates

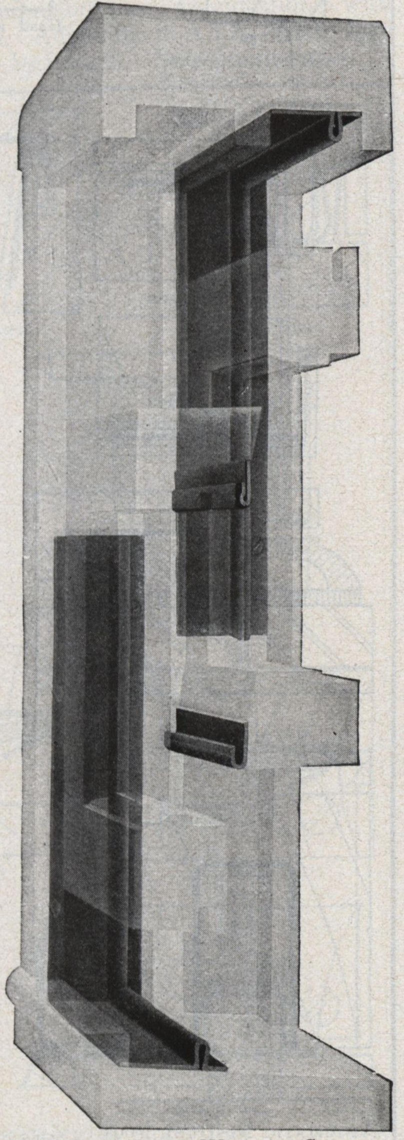
Estimates will be cheerfully furnished by our nearest agency. Write home office for address.

Manufacturing Facilities

This company has been manufacturing and installing weatherstrips for 15 years.

Our plant is equipped with special machinery to turn out finished product in large volume accurately.

A high standard of efficiency is maintained both in the manufacturing and installation of our products.



X-Ray View of Window, Showing Diamond Metal Weatherstrip Installed

Guarantee

All weatherstrips are guaranteed against imperfection in workmanship and material for a period of 10 years from date of installation.

Trade-mark

Our trade-mark is your protection against inferior material and workmanship, and assures of being scientifically correct in principle, practicability in use and efficiency in service.

Agencies

We have 468 territorial agents in 38 states and are adding to this number as we find proper representation.

References

Thousands of buildings in all parts of the United States and Canada have been equipped with our product. A list of installations in your particular section is yours for the asking.

THE HIGGIN MANUFACTURING CO.

All-metal Weatherstrips

NEWPORT, KY.

SALES AGENCIES IN FIFTY OF THE LARGER CITIES THROUGHOUT THE COUNTRY

Look up our Local Office in Telephone Directory, or write to Newport, Ky., for information

Product

ALL-METAL WEATHERSTRIPS, made to order.

For Window and Door Screens, see pages 1371-1373.

Higgin All-metal Weatherstrips

Complete Equipment—The complete equipment for sliding windows (see illustration) consists of two strips, one of which is attached to the window frame and is made with a 3/8-in. tongue or raised portion that forms a track on which the sash slides. This track is usually made of zinc, but bronze may also be used.

The other strip, called the insert, is made of very light spring bronze, and is inserted in a groove made in the sash and slides on the track strip. The spring flanges of the insert lightly contact with the tongue of the track and effectually seal the aperture. As the insert is higher than the tongue of the track there is no chance for it to cut the insert.

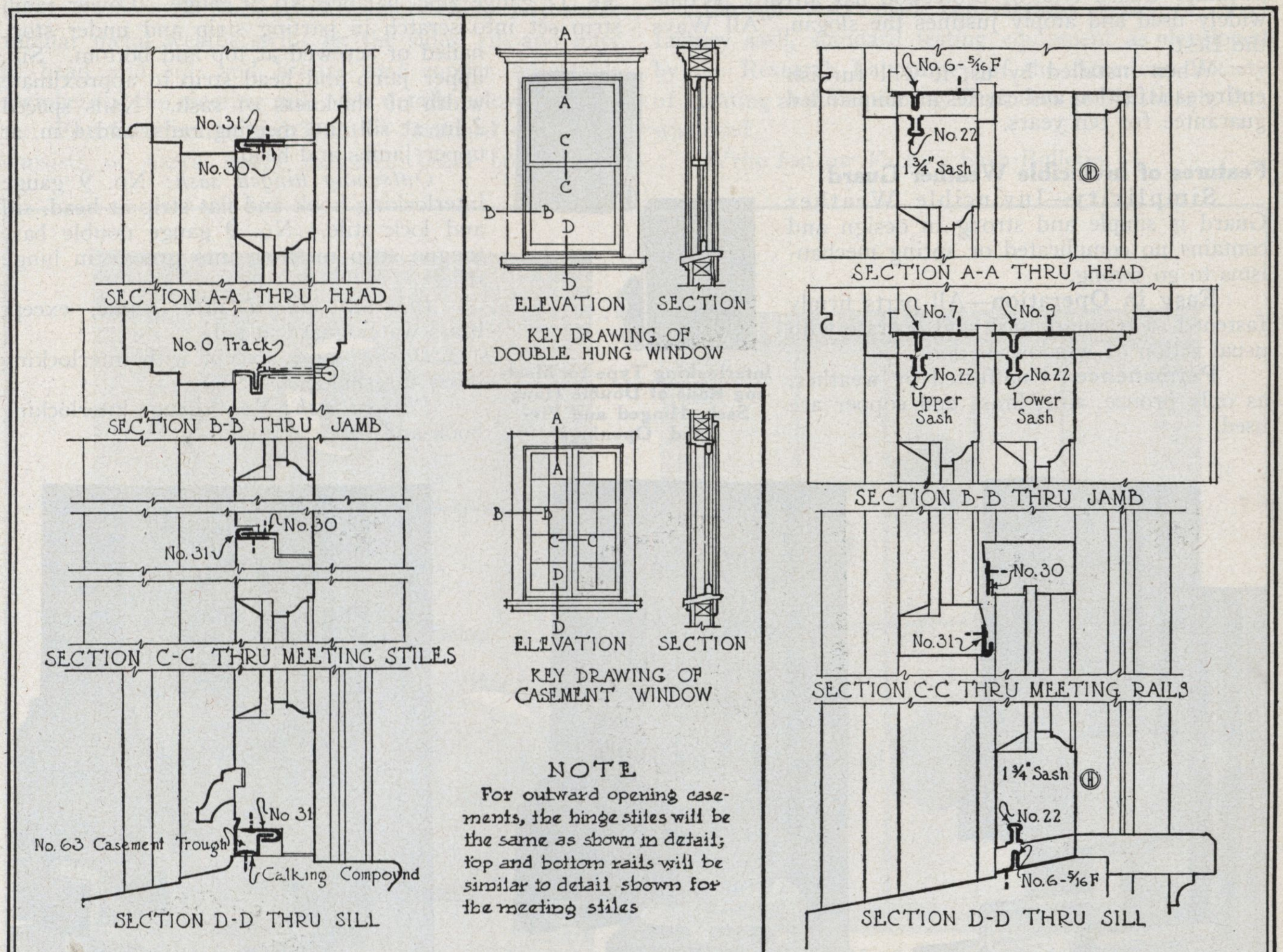
At the meeting rail a zinc strip is attached to the lower rail of the upper sash and a spring bronze strip to the upper rail of the lower sash in such manner that as the sashes are closed the strips interlock, sealing up the opening completely.

Plain Equipment—The plain equipment, consisting of the track strip only, can be furnished at less cost, if desired, but it is not so effective as when the insert strip also is used.

Casement Strip

We manufacture a number of strips specially designed to conform to the different conditions to be met on casement windows. Because of the difficulty encountered in the past in making casement windows watertight, particularly those opening in, some architects have not used them as often as they desired.

There no longer exists any reason for not using this very popular style of window.


No. 31
No. 30
SECTION A-A THRU HEAD
No. 0 Track
SECTION B-B THRU JAMB
No. 30
No. 31
SECTION C-C THRU MEETING STILES
No. 31
No. 63 Casement Trough
Calking Compound
SECTION D-D THRU SILL
3" SCALE DETAIL OF
INWARD OPENING CASEMENT WINDOW
FOR OUTWARD OPENING CASEMENTS SEE NOTE
A
C
B
D
ELEVATION
SECTION
KEY DRAWING OF
DOUBLE HUNG WINDOW
A
B
C
D
ELEVATION
SECTION
KEY DRAWING OF
CASEMENT WINDOW
NOTE
For outward opening casements, the hinge stiles will be the same as shown in detail; top and bottom rails will be similar to detail shown for the meeting stiles
No. 6-5/16 F
No. 22
1 3/4" Sash
SECTION A-A THRU HEAD
No. 7
No. 9
No. 22
No. 22
Upper Sash
Lower Sash
SECTION B-B THRU JAMB
No. 30
No. 31
SECTION C-C THRU MEETING RAILS
1 3/4" Sash
No. 22
No. 6-5/16 F
SECTION D-D THRU SILL
3" SCALE DETAIL OF
DOUBLE HUNG WINDOW

DETAILS SHOWING APPLICATION OF HIGGIN ALL-METAL WEATHER STRIPS

INVINCIBLE WEATHER GUARD CO., INC.

Nostrand Avenue and Midwood Street
BROOKLYN, N. Y.

The Importance of Proper Installation in Weatherstrip

The success of probably no other branch of building construction depends to so large an extent upon careful and expert installation methods, as in the weatherstripping of windows and doors.

Experience has shown that often too much weight is placed on this or that particular design, but little upon its proper application.

The protective qualities sought in weatherstrip can be obtained only by proper design and materials, properly fitted and set. *There can be no substitute for careful work.*

Invincible Weather Guard is the result of years of experience in the design, manufacture, and *installation* of weatherstrip. When properly installed on windows and doors, it provides a simple, permanent and effective protection against drafts, dust and rain.

Guaranteed "All Ways the Best"

Although comparatively new, the Invincible Weather Guard type of protection has already become widely used and amply justifies the slogan, "All Ways the Best."

When installed by us, it will furnish entire satisfaction and carries an unqualified guarantee for ten years.

Features of Invincible Weather Guard

Simplicity—Invincible Weather Guard is simple and strong in design and contains no complicated or spring mechanisms to go wrong.

Easy in Operation—All parts firmly fastened to frame or sash and operate with usual action of window or door.

Permanence—Unaffected by weather, as only bronze, zinc, brass and copper are used.

Concealed Work—In almost every case it is possible to install Invincible Weather Guard, so that, when the window is closed, no part of the work is visible.

Types

There is a type of Invincible Weather Guard to take care of every condition. Some of the more common of these are illustrated below.

Note: Special equipment drawn up on request.

Specification

All exterior wood sash and doors shall be equipped with metal weatherstrip as manufactured and installed by the INVINCIBLE WEATHER GUARD CO., INC.

Material to be 9 and 12 gauge pure sheet zinc, sheared across grain, and installed with ⅞-in. No. 16 galvanized and barbed steel wire nails.

When copper, specify 12 and 16-oz. cold rolled sheet copper, with copper nailing.

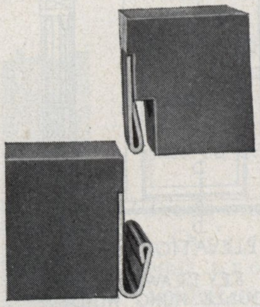
Sliding sash: sill and meeting-rail hook member of No. 12 gauge zinc, balance No. 9 gauge. Lower jamb strip set into scratch in parting strip and under stop, nailed or screwed at top and bottom. Sill, upper jamb and head strip to approximate width of thickness of sash. Nails spaced 2 in. at sill and meeting rails, and 4 in. at upper jambs and head.

Outswung hinged sash: No. 9 gauge interlocking hook and flat strip at head, sill and lock stile. No. 9 gauge double base tongue strip meshing into groove in hinge stile.

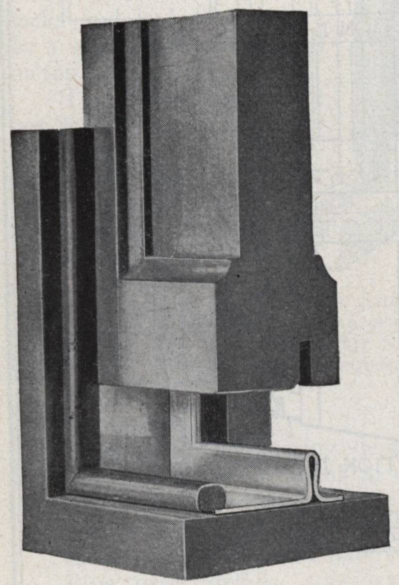
Inswung hinged sash: same, except brass water guard at sill.

Doors: same, except with interlocking brass threshold.

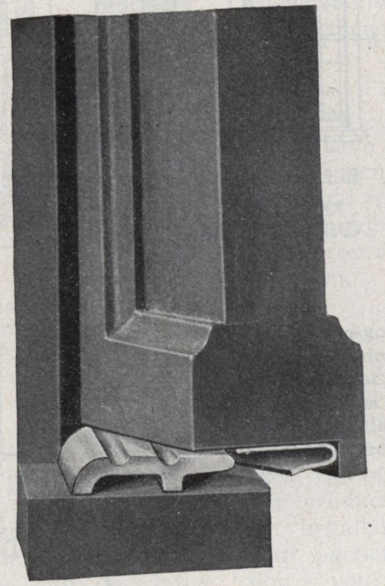
Pivoted sash: No. 9 gauge interlocking hook and flat.



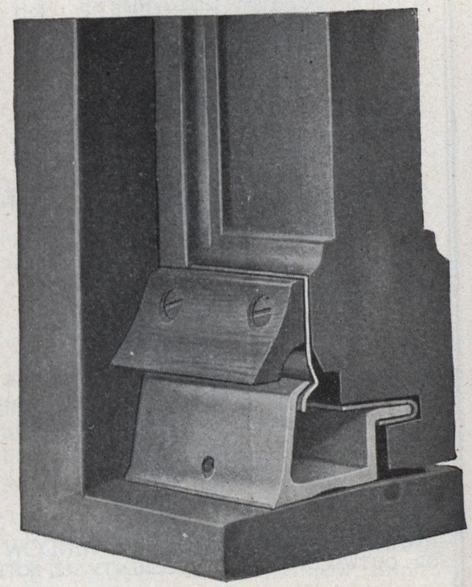
Interlocking Type for Meeting Rails of Double Hung Sash, Hinged and Pivoted Openings



Weather Guard Installed at Head, Sills and Jambs of Sliding Sash



Interlocking Brass Threshold



Interlocking Brass Water Guard for Inswinging Hinged Windows

MONARCH METAL PRODUCTS CO.

Monarch Metal Weather Strips—"Standard Control of Infiltration"

5020 Penrose Street
ST. LOUIS, MO.

Direct Representatives in All Principal Cities of the United States and Canada
(See classified telephone directory)

Products

METAL WEATHERSTRIPS.

For Casement Hardware, see page 1662.

Architects' and Engineers' Service

A complete testing laboratory is maintained to investigate leakage through windows and doors, and an engineering department analyzes and prepares reports on these tests for architects and engineers.

Monarch Metal Weatherstrips

For Double Hung Windows—Standard equipment consists of two-member interlocking adjustable tubular metal weatherstrips on the sides, rib and liner at head and sill, and bronze and copper adjustable members at the meeting rail. See details below.

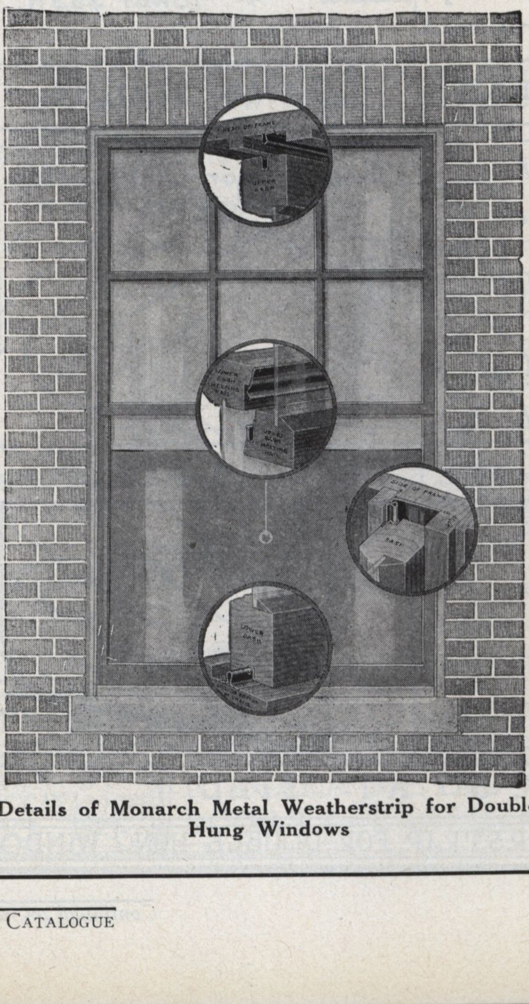
For Casements and Doors—Standard equipment consists of extra heavy extruded brass bottom and heavy gauge hardened spring bronze members at the top, hinge and lock sides.

For Factory Steel Side Pivoted Sash—Monarch metal weatherstrips for this type of sash is a new development which greatly reduces leakage of air into factory buildings. In a well installed ventilator, the leakage is reduced *72.2%* by the installation of this weatherstrip.

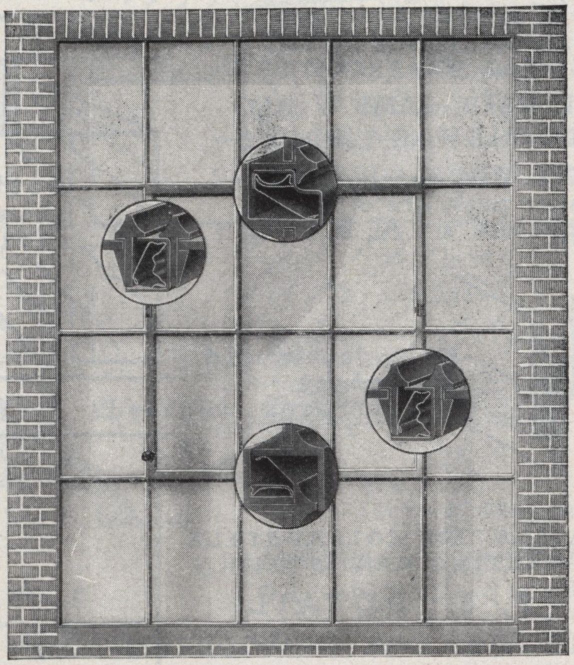
Standard equipment consists of a heavy hardened spring bronze strip securely installed in the sash and frame of the ventilator. See details below.

On all tests made on various types of steel factory sash, standard testing equipment as developed by the Research Laboratory of the American Society of Heating and Ventilating Engineers at Pittsburgh, Pa., was used.

Write for our Factory Sash Bulletin.



Details of Monarch Metal Weatherstrip for Double Hung Windows



Details of Monarch Metal Weatherstrip for Factory Steel Side Pivoted Sash

NIAGARA METAL WEATHER STRIP CO.

GENERAL OFFICES AND FACTORY
37 West Tupper Street
BUFFALO, N. Y.

Products

Manufacturers of Niagara Metal Weatherstrip for windows and doors; Craig Channel Bar and Niagara Aluminum Channel Bar for sills of inward opening casements; Niagara Brass Threshold Protection Strip and Brass Saddles for doors.

Niagara Metal Weatherstrip, the Only Reinforced Metal Weatherstrip Made for Double Hung Windows

Niagara metal weatherstrip, of which a full size section is shown below, is made of No. 26 U.S. standard gage zinc, reinforced with hardwood. On account of this wood reinforcing it will bear the weight of a heavy man without buckling. This is especially desirable on the sills of windows, as it is on the window sill that most weatherstrips collapse. It is however also used on the heads and jambs of double hung windows.

Niagara Equipment for Weatherproofing Double Hung Windows

For the head, sill and the length of each sash on each jamb, specify Niagara Reinforced Metal Weatherstrip.

For the meeting rails, specify Niagara Non-collapsible Meeting Rail Strip. Note the double thickness of zinc at the contact surface of the meeting rail strip.

Niagara Equipment for Weatherproofing Inward-opening Casements

For the head, lock side of jamb for single casements, and for meeting stiles of double casements, specify Niagara Interlocking Bronze Hook and Flat. A cheaper zinc hook is also made but the flexible bronze hook is recommended.

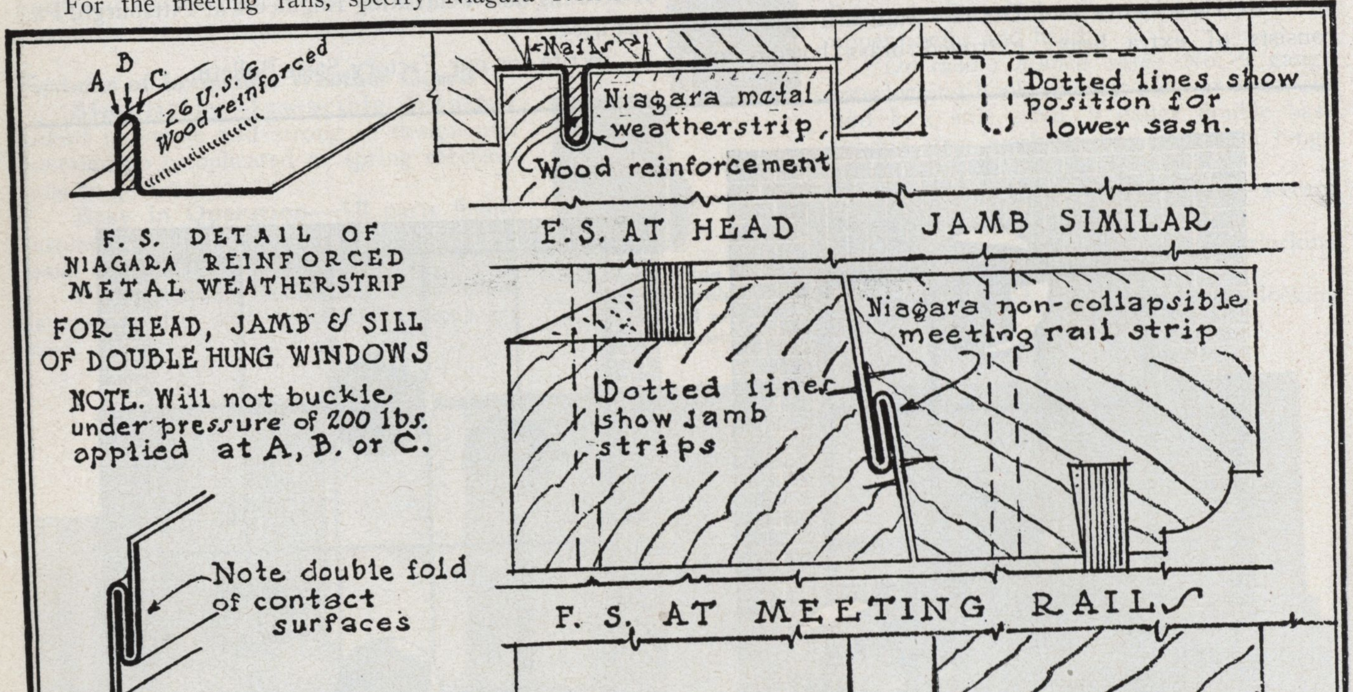
For the hinge side of jambs specify Niagara Metal Weatherstrip.

For the sill, specify the Craig Zinc Channel Bar and Zinc Drip, or the Niagara Aluminum Channel Bar and Bronze Hook. The Craig Channel Bar is slightly less expensive than the Niagara Aluminum Bar.

Niagara Equipment for Weatherproofing Doors

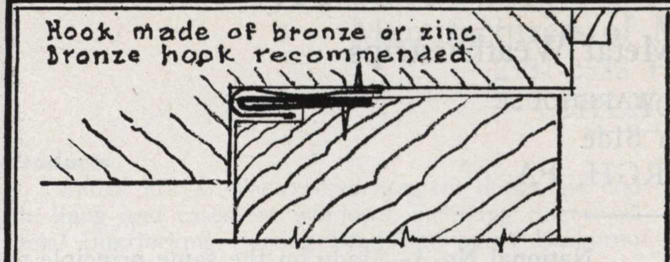
For the jambs and head specify Niagara Spring Bronze Weathering, or if an interlocking equipment is desired specify same as for inward opening casements.

For the sill specify either the Niagara Brass Threshold Strip or the Brass Saddle and the Brass Ell Weatherstrip, set according to details. The threshold strip is generally used with wood sills and the brass saddle with stone on concrete sills.


A
B
C
26 U.S.G
Wood reinforced
F. S. DETAIL OF NIAGARA REINFORCED METAL WEATHERSTRIP
FOR HEAD, JAMB & SILL OF DOUBLE HUNG WINDOWS
NOTE. Will not buckle under pressure of 200 lbs. applied at A, B, or C.
Nails
Niagara metal weatherstrip
Wood reinforcement
Dotted lines show position for lower sash.
F.S. AT HEAD
JAMB SIMILAR
Niagara non-collapsible meeting rail strip
Dotted lines show jamb strips
F. S. AT MEETING RAIL
Note double fold of contact surfaces
NIAGARA NON-COLLAPSIBLE MEETING RAIL STRIP
F. S. DETAIL
F. S. AT SILL

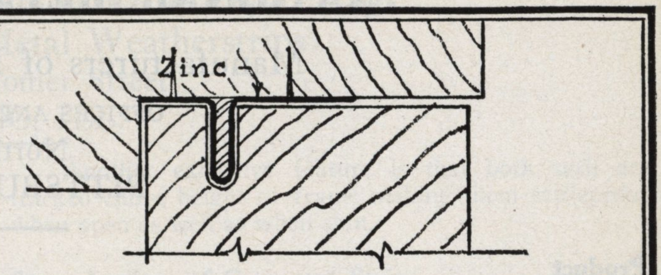
F. S. DETAILS OF NIAGARA METAL WEATHERSTRIP FOR DOUBLE HUNG WINDOWS

Continued on next page


Hook made of bronze or zinc
Bronze hook recommended

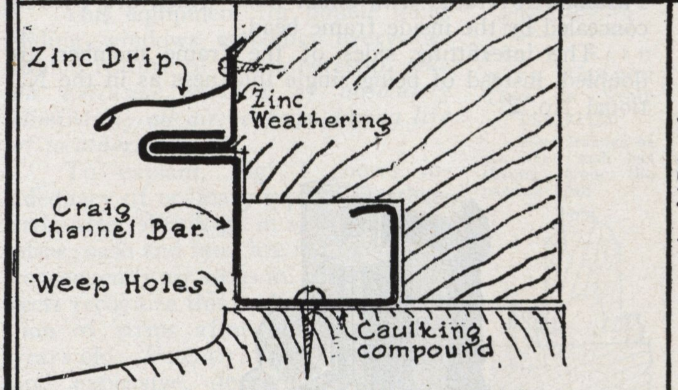
NIAGARA INTERLOCKING HOOK & FLAT

DETAIL FOR HEAD, LOCK SIDE OF JAMB & MEETING RAILS OF DOUBLE CASEMENT



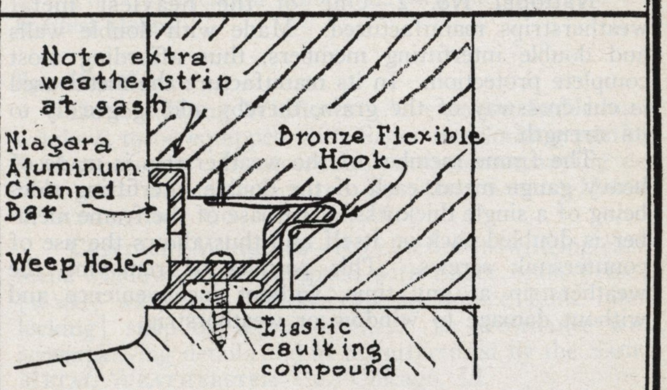
NIAGARA REINFORCED ZINC WEATHERSTRIP.

DETAIL FOR HINGE SIDE OF JAMB


Zinc Drip
Zinc Weathering
Craig Channel Bar
Weep Holes
Caulking compound

CRAIG CHANNEL BAR

SECTION THRU WOOD SILL

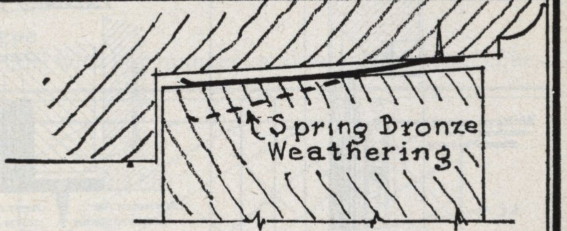

Note extra weatherstrip at sash
Niagara Aluminum Channel Bar
Bronze Flexible Hook
Weep Holes
Elastic caulking compound

NIAGARA ALUMINUM CHANNEL BAR

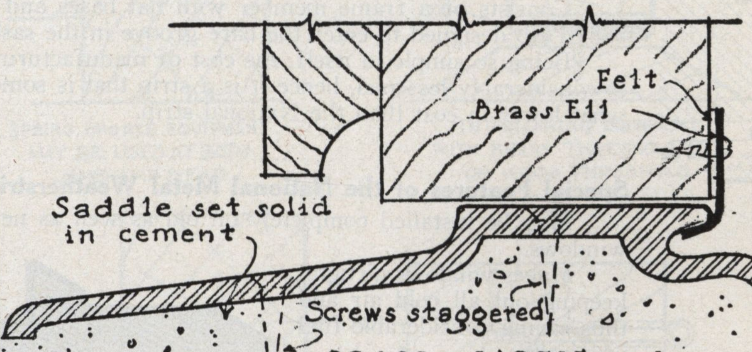
SECTION THRU WOOD SILL

F. S. DETAILS OF WEATHERPROOFING FOR WOOD CASEMENTS OPENING IN

NOTE. Interlocking equipment for doors can also be supplied. Details similar to that used for casement above.

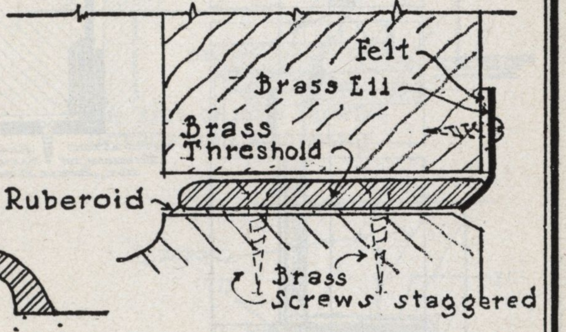

Spring Bronze Weathering

DETAIL FOR JAMB & HEAD


Felt
Brass Ell
Saddle set solid in cement
Screws staggered

BRASS SADDLE

FOR STONE & CONCRETE SILLS


Felt
Brass Ell
Brass Threshold
Ruberoid
Brass Screws staggered

BRASS THRESHOLD STRIP

FOR WOOD SILLS

F. S. DETAILS OF BRASS SADDLES AND WEATHERPROOFING FOR DOORS

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

NIAGARA METAL WEATHERPROOFING FOR DOORS & CASEMENT WINDOWS OPENING IN

SCALE
FULL SIZE
DATE-JUNE '22

DR'WG
2

NATIONAL METAL PRODUCTS CO.

Manufacturers of Metal Weatherstrips

OFFICES AND WAREHOUSE
North Side
PITTSBURGH, PA.

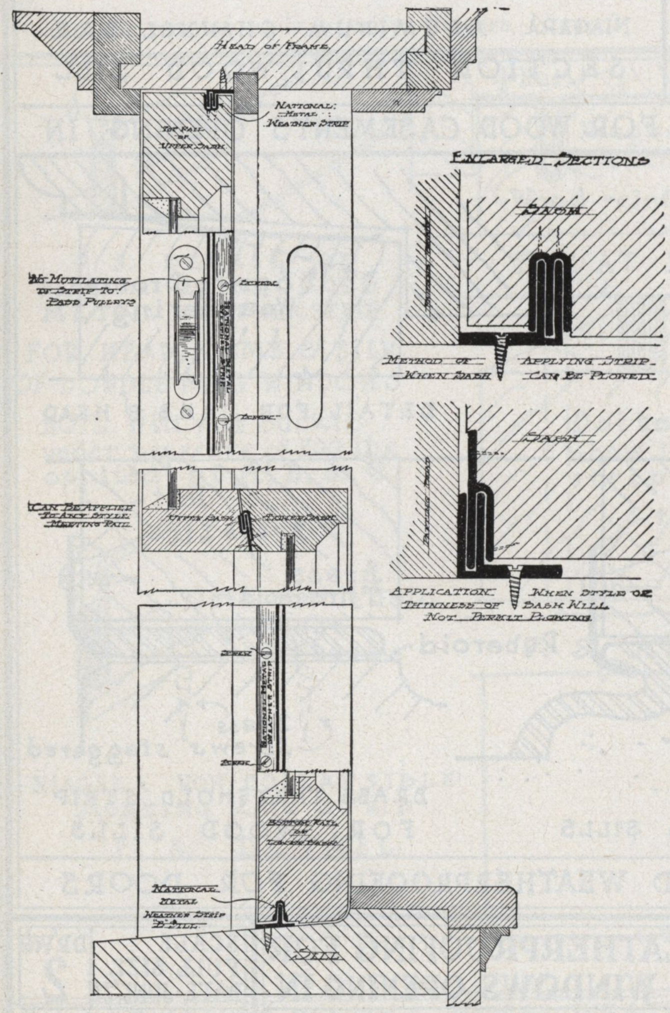
Product

METAL WEATHERSTRIPS.

Description

National No. 2—One of the heaviest metal weatherstrips manufactured. Made with double walls and double interfitting members, thus affording most complete protection. In its manufacture the metal used is cut crossway of the grain, thereby adding greatly to its strength.

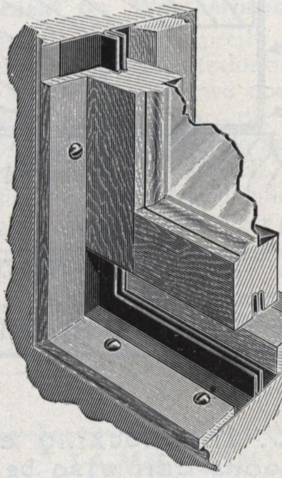
The frame member of the weatherstrip is made of heavy gauge metal, each of the double interfitting sides being of a single thickness. The base of the frame member is doubled back on itself and thus allows the use of countersunk screws. This permits of removing the weatherstrip at any time, without inconvenience and without damage to window or weatherstrip.


HEAD OF FRAME
NATIONAL METAL WEATHER STRIP
TOP RAIL OF UPPER SASH
NO MUTILATING OF STRIP TO PASS PULLEYS
SCREW
NATIONAL METAL WEATHER STRIP
SCREW
CAN BE APPLIED TO ANY STYLE MEETING RAIL
UPPER SASH
LOWER SASH
SCREW
NATIONAL METAL WEATHER STRIP
SCREW
BOTTOM RAIL OF LOWER SASH
NATIONAL METAL WEATHER STRIP "B" SILL
SILL
ENLARGED SECTIONS
SASH
METHOD OF APPLYING STRIP WHEN SASH CAN BE PLOWED
SASH
PARTING BEAD
APPLICATION WHEN STYLE OR THINNESS OF SASH WILL NOT PERMIT PLOWING

NATIONAL NO. 2 WEATHERSTRIP APPLIED TO DOUBLE HUNG WINDOW

National No. 1—Made on the same principle as the National No. 2 but is of a lighter metal and covers the entire run of the window frame. One edge of the frame member enters the parting bead and the other, or inner, edge extends under the inside bead of the frame. Fastened to frame with small nails which are entirely concealed by the inside frame bead.

The interfitting sides of the frame member are doubled, instead of being single thickness as in the National No. 2.



SECTION SHOWING NATIONAL NO. 1 WEATHERSTRIP APPLIED TO WINDOW

Columbia No. 1—A strip more simple in construction than the National strips described.

Consists of a frame member with flat bases and a raised rib designed to enter the bare groove in the sash.

Being so simple in itself, the cost of manufacturing is considerably lessened, hence it is a strip that is somewhat lower in cost than the National strip.

Special Features of the National Metal Weatherstrip

May be installed completely on old as well as new windows.

Makes windows airtight, keeping out all cold air and thus saving considerable fuel in winter.

Prevents dust entering through windows.

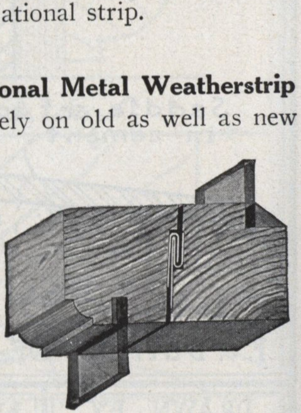
Quiets all rattling.

Enables the window to slide with ease.

Does not disfigure the sash, nor mar the window.

Will never wear out.

The first, and only, cost is moderate.



SECTION THROUGH MEETING RAILS SHOWING WEATHER-STRIP

Section is same for National Nos. 1 and 2 and Columbia No. 1 weather strips

SAGER METAL WEATHERSTRIP CO.

Manufacturers of Metal Weatherstrips
2531-2533 Homer Street
CHICAGO, ILL.

Products

Sager Metal Weatherstrips for doors and double hung and casement windows, including Sager All-metal Interlocking Parting Bead, and Sager Leakproof Casement Strip.

Solid Brass Door Thresholds.

Sager All-metal Interlocking Parting Bead

This equipment for double hung sliding windows embodies every desirable feature of a weatherstrip, *plus an exclusive method of absolutely eliminating all air seepage during life of weatherstrip.*

To explain, Fig. 1 shows inadequacy of ordinary type of weatherstrip after shrinkage in sash has taken place; sash and bead are not in contact, consequently air seeps in. Many architects recognize this and advise installation of strips after building is two years old. Patently, this is impractical and expensive, depriving owner of building of two years benefit of weatherstrip installation.

Fig. 2 shows how Sager parting bead stops the air at the source before it gets in back of the sash. Despite shrinkage, contact is still perfect; sash can not spread from parting bead because of their interlocking.

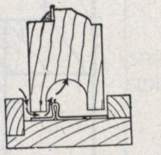


Fig. 1. Sash with Common Type of Strip Installed

Note leakage of air when sash has shrunk from the parting bead

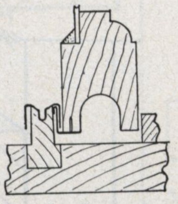


Fig. 2. Sash After Shrinkage with Sager All-metal Interlocking Parting Bead Installed

Contact is still perfect and has not been affected by this shrinkage

Another exclusive feature is that both sash are tracked entire height of frame making them rattleproof when open as well as when shut.

Sager Leakproof Casement Strip

Consists of a metal tongue attached to the bottom of the sash in such manner as to contact with the metal trough.

This fortification will hold back the water in the hardest storm.

Specifications

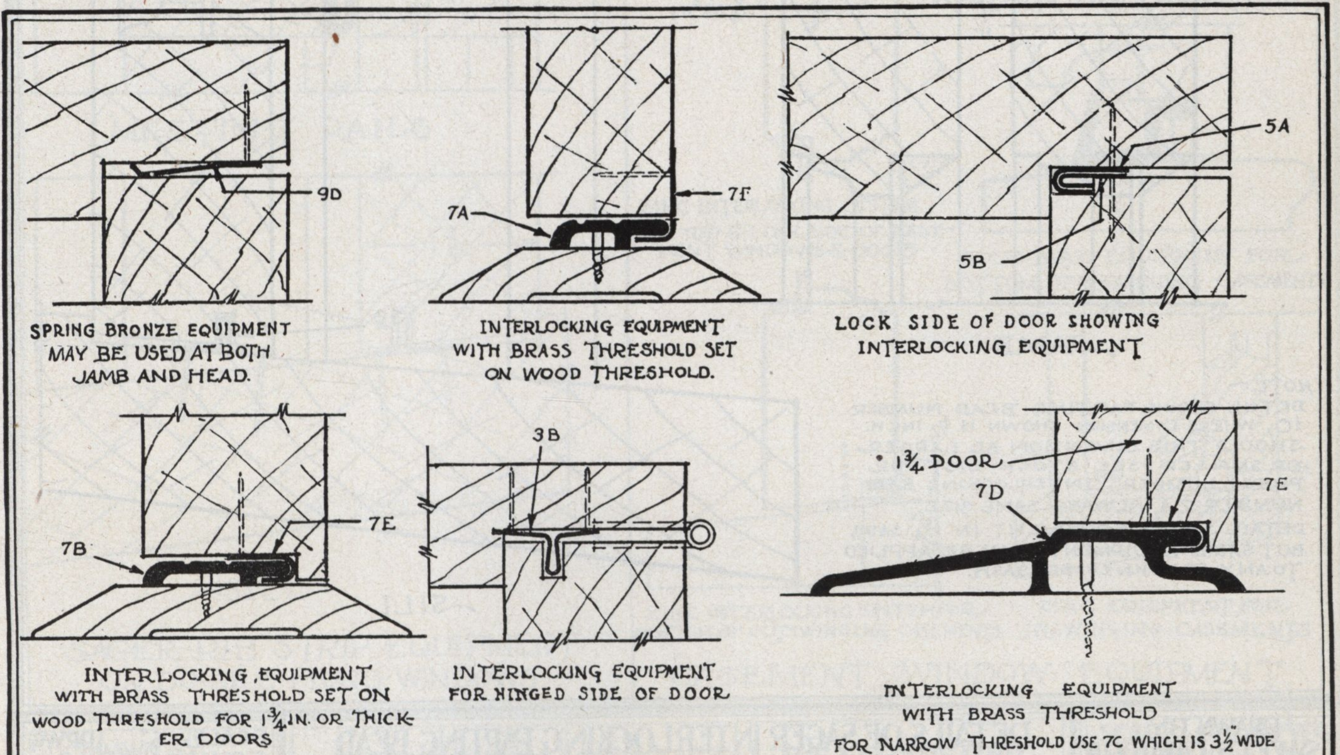
Double Hung Windows—All exterior double hung windows to be equipped with Sager interlocking parting bead zinc strip. In accordance with accompanying details and as manufactured by the Sager Metal Weatherstrip Co., Chicago, Ill.

Casement Windows—All exterior inswinging casement windows to be equipped with Sager brass [zinc], [wood] watertight bottoms, spring bronze [zinc interlocking] strip on top and sides. In accordance with accompanying details and as manufactured by the Sager Metal Weatherstrip Co., Chicago, Ill.

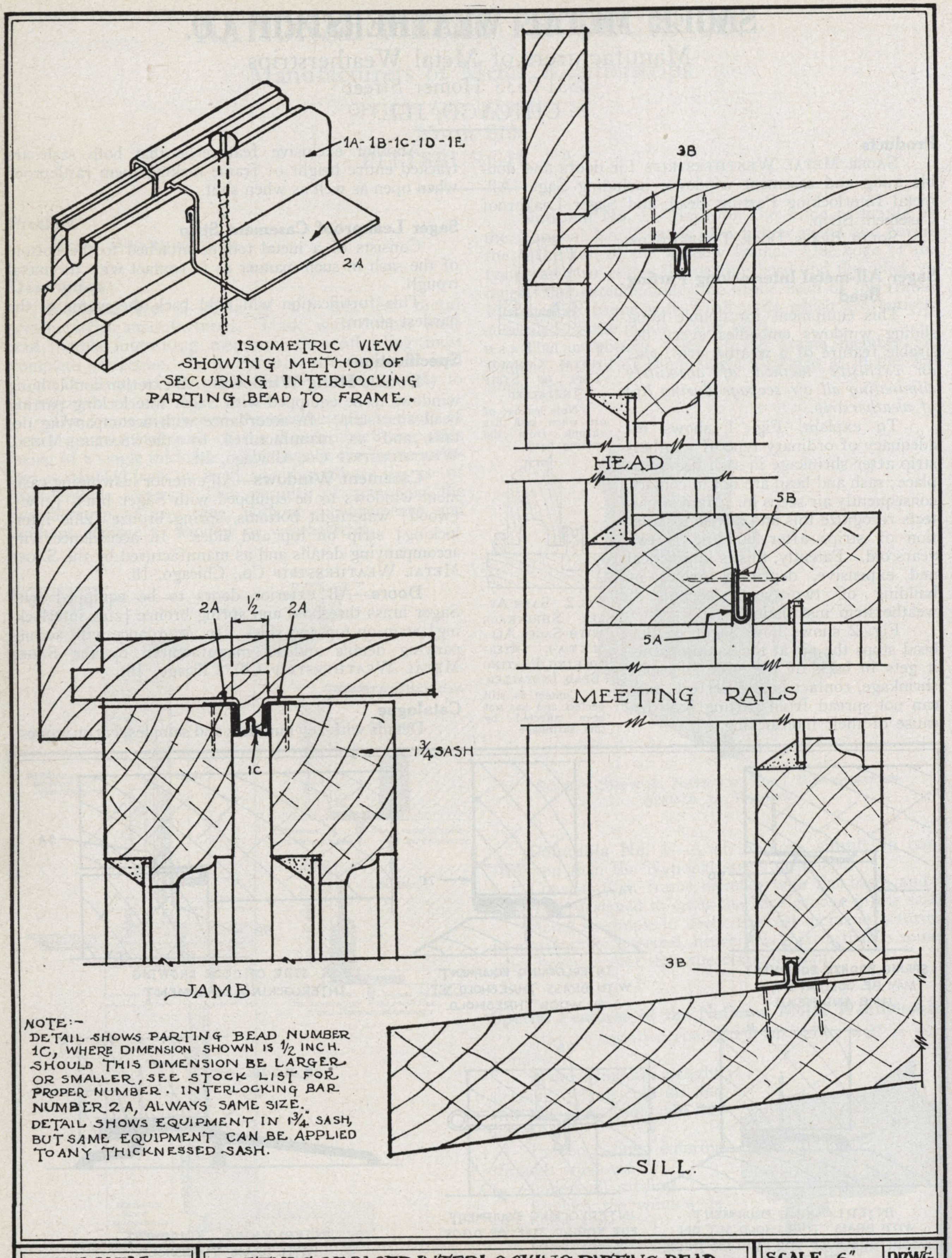
Doors—All exterior doors to be equipped with Sager brass threshold and spring bronze [zinc interlocking] strip on top and sides. In accordance with accompanying details and as manufactured by the Sager Metal Weatherstrip Co., Chicago, Ill.

Catalogue

Details with key numbers and samples sent on request.


9D
SPRING BRONZE EQUIPMENT MAY BE USED AT BOTH JAMB AND HEAD.
7A
7F
INTERLOCKING EQUIPMENT WITH BRASS THRESHOLD SET ON WOOD THRESHOLD.
5A
5B
LOCK SIDE OF DOOR SHOWING INTERLOCKING EQUIPMENT
7B
7E
INTERLOCKING EQUIPMENT WITH BRASS THRESHOLD SET ON WOOD THRESHOLD FOR 1¾ IN. OR THICKER DOORS
3B
INTERLOCKING EQUIPMENT FOR HINGED SIDE OF DOOR
1¾ DOOR
7D
7E
INTERLOCKING EQUIPMENT WITH BRASS THRESHOLD
FOR NARROW THRESHOLD USE 7C WHICH IS 3½" WIDE
3IN. SCALE DETAILS OF SAGER METAL DOOR EQUIPMENT
DRWG 1.

Continued on next page


1A-1B-1C-1D-1E
2A
ISOMETRIC VIEW
SHOWING METHOD OF
SECURING INTERLOCKING
PARTING BEAD TO FRAME.
3B
HEAD
5B
5A
MEETING RAILS
2A
1/2"
2A
1 3/4 SASH
1C
JAMB
3B
SILL.

NOTE:-
DETAIL SHOWS PARTING BEAD NUMBER 1C, WHERE DIMENSION SHOWN IS 1/2 INCH. SHOULD THIS DIMENSION BE LARGER OR SMALLER, SEE STOCK LIST FOR PROPER NUMBER. INTERLOCKING BAR NUMBER 2A, ALWAYS SAME SIZE. DETAIL SHOWS EQUIPMENT IN 1 3/4" SASH, BUT SAME EQUIPMENT CAN BE APPLIED TO ANY THICKNESSED SASH.

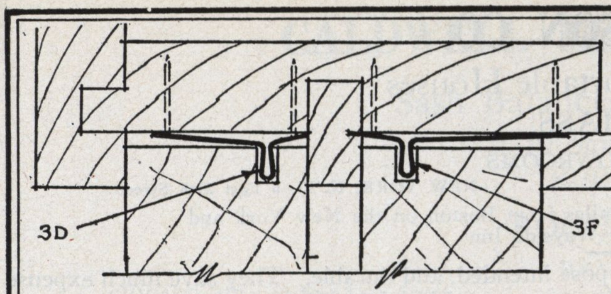
DRAWN BY
SWEET'S CATALOGUE
SERVICE INC.

DETAILS OF SAGER INTERLOCKING PARTING BEAD
EQUIPMENT FOR DOUBLE HUNG WINDOWS WITH 1¾" SASH

SCALE 6"
EQUALS 1'-0"
DATE-JULY,'24

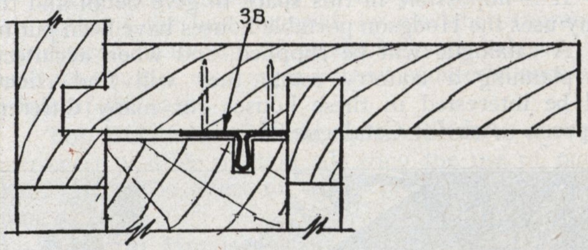
DRWG
2.

Continued on next page

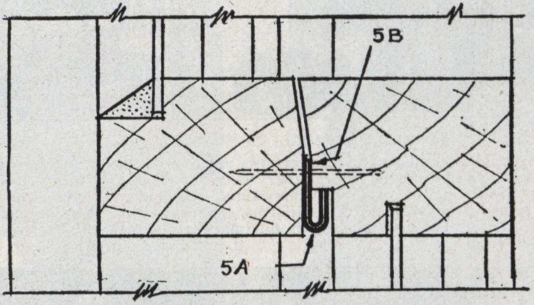


JAMB.

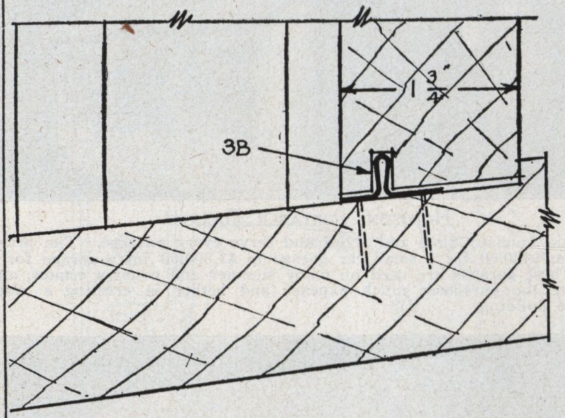
NOTE:
ABOVE DETAIL IS FOR 1¾" SASH. FOR 1⅜" USE #3C FOR SIDES OF UPPER SASH AND USE #3E FOR SIDES OF LOWER SASH. BOTTOM, TOP AND MEETING RAIL STRIPS THE SAME AS FOR 1¾" SASH.
FOR 2¼" SASH SPECIAL WIDE STRIPS CAN BE FURNISHED.



HEAD

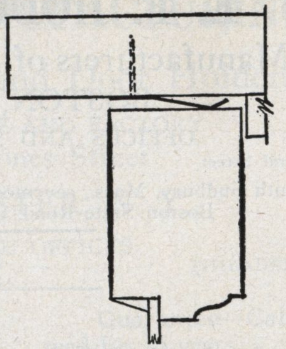


MEETING RAILS

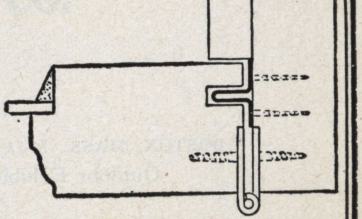


SILL

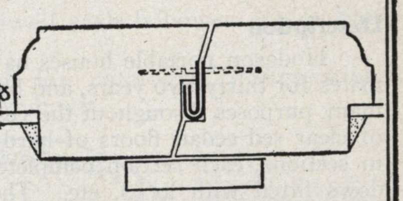
SAGER RIB STRIP EQUIPMENT ON DOUBLE HUNG WINDOWS



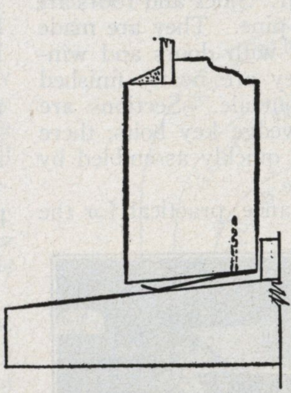
SPRING BRONZE STRIP FOR TOP & SIDES OF CASEMENT WINDOWS & DOORS



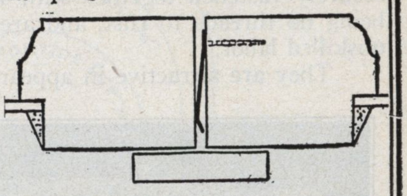
RIB STRIP FOR HINGED SIDE OF CASEMENTS & DOORS



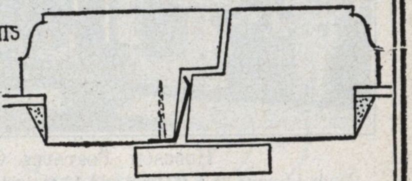
ZINC INTERLOCKING SYSTEM FOR CENTER OF DOUBLE CASEMENTS & DOORS



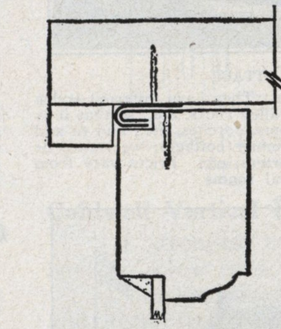
SPRING BRONZE STRIP FOR BOTTOM OF OUTSWINGING CASEMENTS



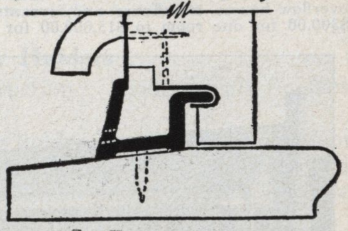
SPRING BRONZE STRIP FOR CENTER OF DOUBLE CASEMENTS & DOORS



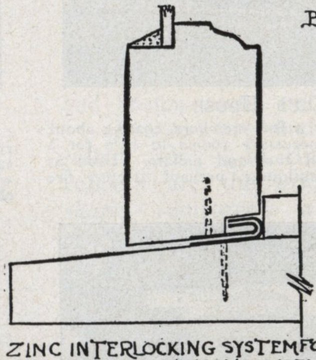
SPRING BRONZE STRIP FOR CENTER OF DOUBLE CASEMENTS & DOORS



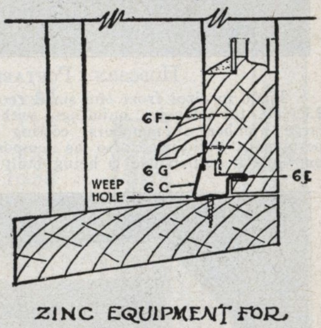
ZINC INTERLOCKING SYSTEM FOR TOP & LOCK SIDE OF CASEMENT WINDOWS & DOORS



SOLID BRASS EQUIPMENT FOR BOTTOM OF INSWINGING CASEMENTS



ZINC INTERLOCKING SYSTEM FOR BOTTOM OF OUTSWINGING CASEMENTS



ZINC EQUIPMENT FOR INSWINGING CASEMENTS

CASEMENT WINDOW EQUIPMENT

DRAWN BY
SWEET'S CATALOGUE
SERVICE INC.

DETAILS OF SAGER METAL WEATHERSTRIP

SCALE 6"
EQUALS 1'-0"
DATE-JULY '24

DRWG
3

E. F. HODGSON CO.

Manufacturers of Portable Houses

BOSTON, MASS.

OFFICES AND SHOWROOMS

BOSTON, MASS., 71-73 Federal Street
NEW YORK, N. Y., 6 East 39th Street

Outdoor Exhibit, South Sudbury, Mass., seventeen miles from Boston on the New York and Boston State Road, near Wayside Inn

Product

Hodgson Portable Houses.

Description

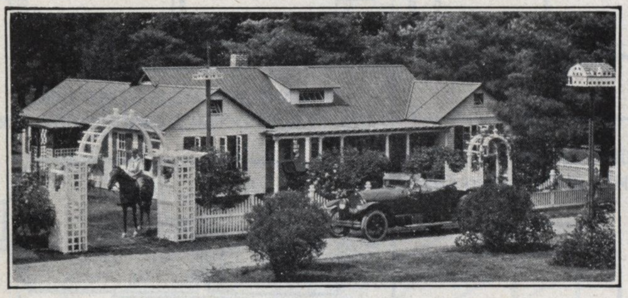
Hodgson portable houses have been used in all climates for thirty-two years, and have proved practical for many purposes throughout the year. Sides and roofs are of clear red cedar, floors of hard pine. They are made in sections, each section complete with doors and windows fitted with locks, etc. They are neatly finished inside and painted three coats outside. Sections are securely fastened together with wedge key bolts, there being no threads to rust, and are quickly assembled by unskilled labor.

They are attractive in appearance, practical for the purpose intended, and durable. They save much expense and annoyance of building.

Hodgson houses are used on the estates of the Ameses, Hunnewells, Fricks, Rockefellers, McAlpins, Carnegies, Astors, Fennos, Lowells, Vanderbilts, Bancrofts, Gardners, Belmonts, Goulds, Cranes, Iselins, Forbeses, etc., being used for overflow houses, play houses, garden houses, chauffeurs' houses, servants' houses, garages, poultry houses, kennels, etc.

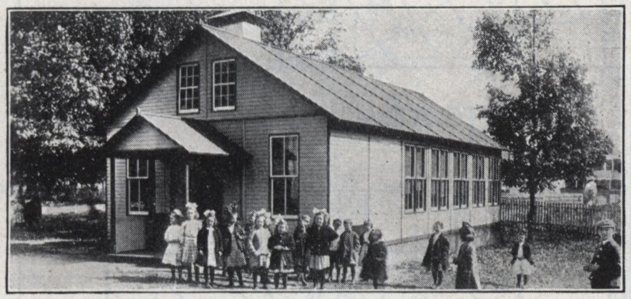
It is impossible in this space to give detail and the many uses the Hodgson portable houses have been put to.

A catalogue will be supplied, and when architects are planning a country estate they will find clients will be interested in these houses for many different purposes. Ask for Catalogue 25.



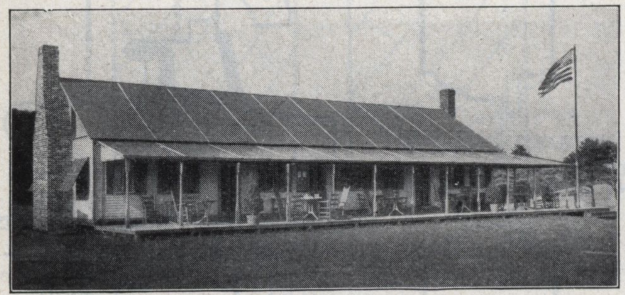
Hodgson Portable Cottage

Made in units of 6 ft. long and 12 ft. wide. They have different styles of porches, screened rooms, sun parlors, ells, valley roofs, etc., so that it is possible to make up many arrangements of rooms, porches, etc., and to add to them at any time. They are used as summer cottages, week-end, or overflow houses, chauffeurs' and servants' quarters, etc. Prices vary from $300.00 for one room to $15,000.00 for several rooms



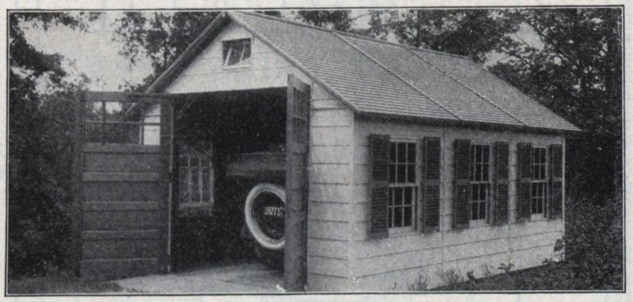
Hodgson Portable Schoolhouse

Very valuable to take care of overflows until permanent quarters are arranged for. Easily moved to another district. Used by many towns and cities. Made in one and two classrooms. Heated and ventilated to pass state laws. Our system of ventilating insures warm floors in classroom in winter, and a cool classroom during warm weather. Prices are from $2,000.00 up



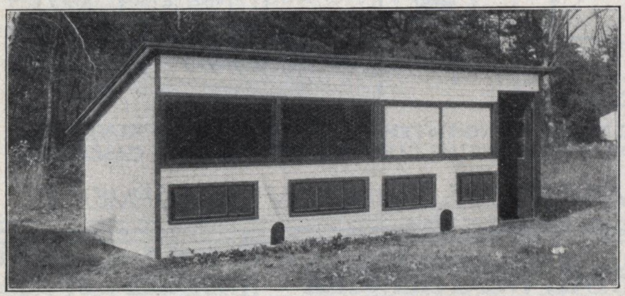
Hodgson Portable Club House

Made in sizes from one small room for a few members, costing about $300.00, to extensive buildings, with all necessary rooms to care for a large number of members, costing several thousand dollars. Used as permanent buildings; also as temporary buildings, perhaps after a fire or while a club house is being built



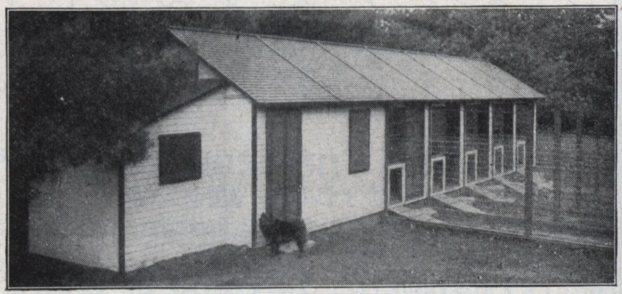
Hodgson Portable Garage

Made in many sizes and styles and serve every purpose. The prices run from $400.00 for a small car garage to $1,000.00 for a garage for 4 cars. These garages are used on many summer and country estates, and will save the purchaser much expense and bother in erecting a more elaborate building



Hodgson Poultry House

Poultry houses for 12 to 1000 hens



Hodgson Dog Kennel

Kennels for one or many dogs

CALDWELL MANUFACTURING CO.

Sash Balances and Door Holders

MAIN OFFICE AND FACTORY
8-10 Jones Street
ROCHESTER, N. Y.

BRANCH OFFICES
CHICAGO, ILL., 62 East Lake Street
PHILADELPHIA, PA., 525 Commerce Street

Products

Manufacturers of Caldwell Sash Balances; Vertical, Junior and Empire Door Holders. Also other Hardware Specialties.

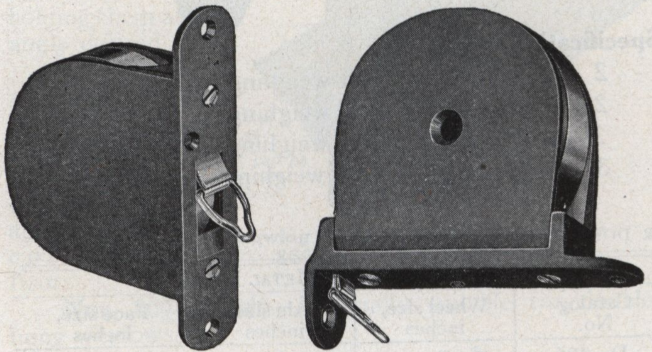
Caldwell Sash Balances

Have been made by us for the past 37 years. They are made of the best material, by workmen thoroughly experienced in the art of producing sash balances with uniform tension, insuring a perfect counterbalance at all points of the sash.

Top Balances—Enable the architect to make the narrowest possible mullion, allowing the use of narrow trim, giving the effect of casements in rows of double hung sash.

Uniform Mortises—Cut at the mill, reduce cost of installing.

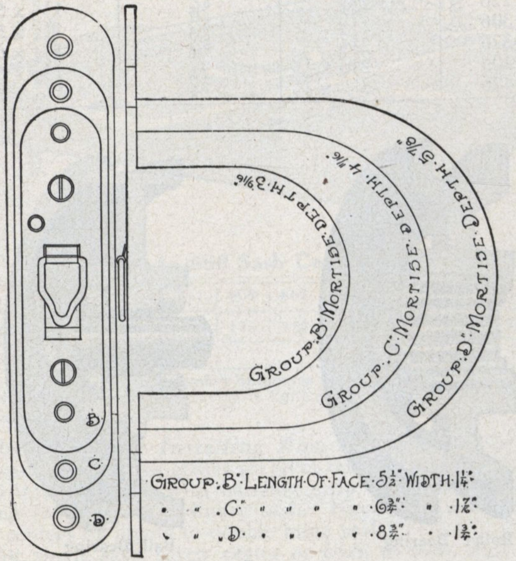
Quality and Durability—Proved by years of satisfactory service.



Side

Angle Top

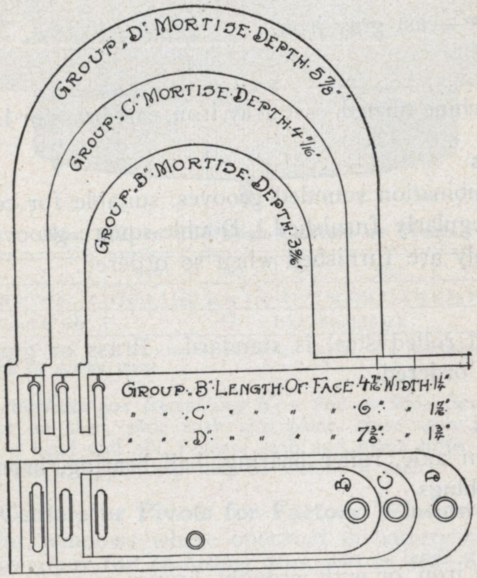
Caldwell Sash Balance


Group "B" Mortise Depth 3 9/16"
Group "C" Mortise Depth 4 11/16"
Group "D" Mortise Depth 5 7/8"
B
C
D
Group "B" Length of Face 5½" Width 1¼"
" " "C" " " " " 6¾" " 1 7/16"
" " "D" " " " " 8¾" " 1¾"

Side Balance
Measurements on outline are full size

Guarantee—Caldwell sash balances are guaranteed for 15 years.

Literature—Send for catalogue, "Suggestions for the Present Day Architect."


Group "D" Mortise Depth 5 7/8"
Group "C" Mortise Depth 4 11/16"
Group "B" Mortise Depth 3 9/16"
Group "B" Length of Face 4 7/16" Width 1¼"
" " "C" " " " " 6" " 1 7/16"
" " "D" " " " " 7⅜" " 1¾"
B
C
D

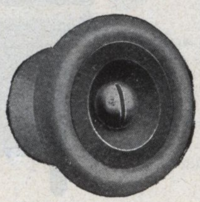
Top Balance for Mullion Windows
Measurements on outline are full size

Caldwell Vertical Door Holders

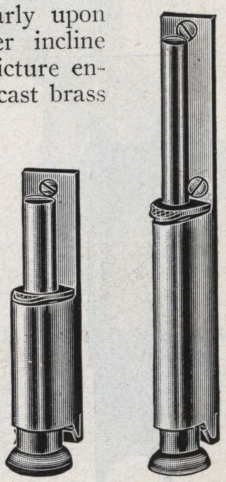
Of strongest construction; made in all finishes; have no screw ears.

A bracket affixes the holder immovably to the door, and gives strength at the base of holder where it is most required. Our *special large vertical door holder* with 4¼-in. drop is recommended for use on heavy outside doors, particularly upon vestibule doors, which open over incline floors, such as theaters, moving picture entrances, etc. Large size made in cast brass and bronze metal only.

Pressers are made of cold rolled rods, ⅝-in. diam. The rubbers are the *original cup shape,* reinforced with hard leather gaskets, which prevent the rubbers from being cut and torn.



Rubber for Caldwell Vertical Door Holders
(Full size)



Regular Size 1¼-in. Drop

Special size 4¼-in. Drop

Caldwell Vertical Door Holders

COLUMBIAN LOCK DIVISION

Manufacturers of Sash Pulleys

1290 East 53rd Street
CLEVELAND, OHIO

Product

Columbian Sash Pulleys for double hung windows.

Material

Case—cast gray iron.

Wheels

Machine turned, cast gray iron, cast brass or bronze.

Grooves

Combination rounded grooves, suitable for cord or chain, regularly furnished. Double-square grooves for chain only are furnished when so ordered.

Axles

Cold rolled steel is standard. Brass or gunmetal when so ordered.

Bearings

Plain axle, roller bearing, ball bearing, bronze or steel bushings.

Faces

Cast iron, or with wrought bronze metal faces.

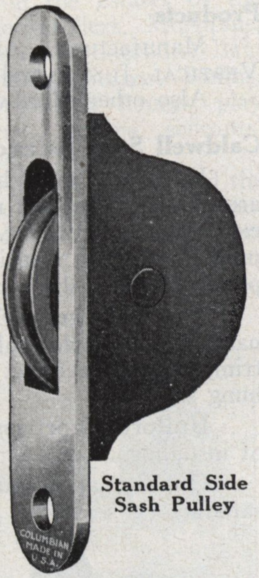
Standard Finishes

0—No finish—plain.
02—Polished and lacquered.
12—Bright brass.
13—Dull brass.
1—Bright bronze.

Overhead Pulleys

For complete specification and data on overhead pulleys, write for our catalogue.

To insure perfect pulleys, specify "Columbian."



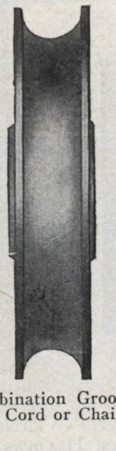
Standard Side Sash Pulley

Specification Data

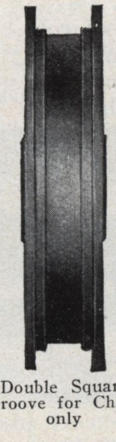
2 -in. wheels for sash weighing up to 40 lb.
2¼-in. wheels for sash weighing up to 100 lb.
2½-in. wheels for sash weighing up to 150 lb.
3 -in. wheels for sash weighing over 150 lb.

COLUMBIAN SASH PULLEYS FOR DOUBLE HUNG WINDOWS

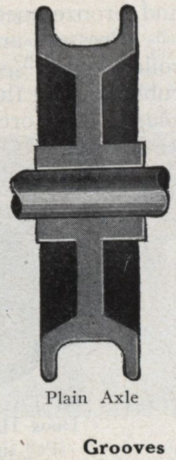
Cast Iron Faces				Wrought Bronze Metal Faces			
Catalog No.	Wheel size, inches	Axle size, inches	Face size, inches	Catalog No.	Wheel size, inches	Axle size, inches	Face size, inches
100	2	5/16	1⅛ x 5	D—106	2	5/16	1⅛ x 5
200	2¼	5/16	1⅛ x 5	D—206	2¼	5/16	1⅛ x 5
220	2¼	5/16	1⅛ x 5½	D—226	2¼	5/16	1⅛ x 5½
300	2½	5/16	1¼ x 5¾	D—306	2½	5/16	1¼ x 5¾
320	2½	5/16	1¼ x 6	D—326	2½	5/16	1¼ x 6
400	2½ x ½	⅜	1¼ x 6	D—406	2½ x ½	⅜	1¼ x 6
420	3 x ½	⅜	1¼ x 6½.	D—426	3 x ½	⅜	1¼ x 6½



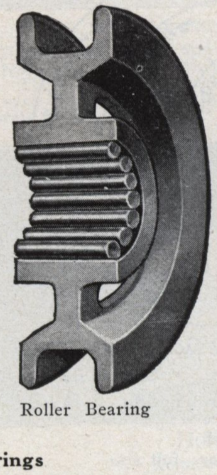
Combination Groove for Cord or Chain



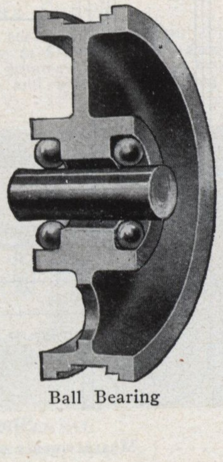
Double Square Groove for Chain only



Plain Axle



Roller Bearing



Ball Bearing

Grooves and Bearings

THE DETROIT WORKS

Manufacturers of Sash Centers or Pivots, Iron Kick Plates and Hardware Specialties

3156 East Larned Street
DETROIT, MICH.

Products

Sole manufacturers of PATENT ROLLER FRICTION SASH CENTERS OR PIVOTS.

Also Iron Kick Plates, rustproof finish, Casement Hangers and Adjusters, Push and Pull Plates.

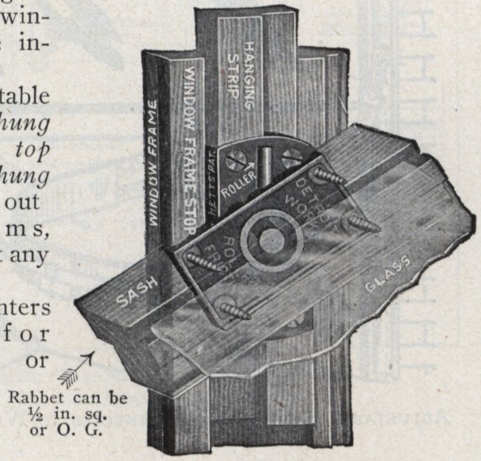
Sash Centers or Pivots for General Use

These patent roller friction sash centers or pivots are automatic and hold the window at any angle. Absolutely weatherproof.

For use on *double hung windows* with hanging strip (or stile) allowing the window to slide up and down for ventilation, or reverse inside out for ventilating and permitting cleaning of both sides of window from the inside.

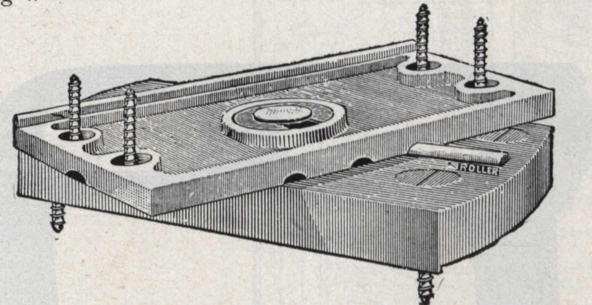
Also suitable for *single side hung sash* or *single top and bottom hung sash,* inside or out side transoms, holding them at any angle desired.

These centers are suitable for monitor sash or factory windows and can be operated by a cord from floor.



Showing Application of Nos. 860 to 866 on Double Hung Sash

Nos. 860 to 866—Especially suitable for double hung windows.



Nos. 860 to 866 Sash Centers or Pivots

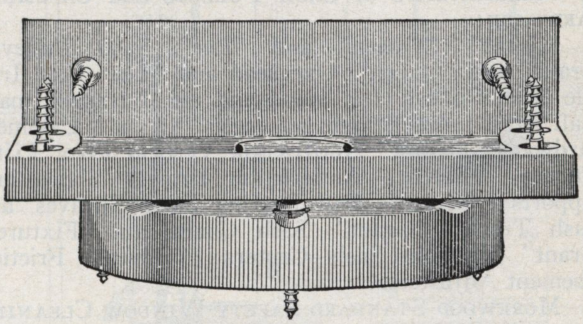
No.	860	861	862	863	864	865	866
Thickness of sash . . . in.	1⅜	1¾	2	2¼	2½	2¾	3
Material and finish	Iron, dead black						

Note: Prefix "C" to number indicates brass. No mortising necessary for spring or spring post. Specify if light spring is desired for small transom sash.

Directions for Installing Nos. 860 to 866—For double hung sash, screw sash center or pivot on sash and hanging strip (or stile). Fit sash with hanging strip (or stile) attached to opening same as the ordinary sash. Have sash manufacturers apply centers or pivots to double hung sash.

For single sash, screw center or pivot to sash, slide sash in place and screw center to frame, reverse sash and plant stops on frame.

Nos. 960 to 965—Patent roller friction sash centers or pivots are especially suitable for heavy outside or inside windows, top and bottom hung.



Nos. 960 to 965 Sash Centers or Pivots

No.	960	961	962	963	964	965
Thickness of sash . . . in.	1⅜ to 1½	1¾ to 1⅞	2 to 2⅛	2¼ to 2⅜	2½ to 2⅝	.3
Material and finish	Iron, dead black					

Note: Prefix "C" to number indicates brass. No mortising necessary for spring or spring post.

Directions for Installing Nos. 960 to 965—Screw center or pivot on sash, slide sash into place, close sash and screw center to head and sill, reverse sash and plant stops on frame. Do not fail to apply drip strip to bottom of sash.

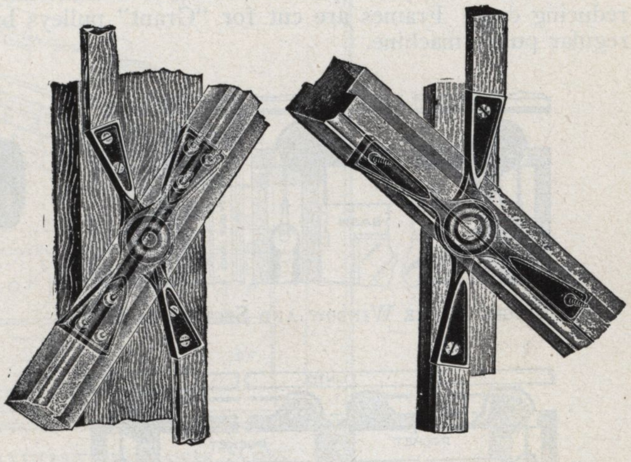
Sash Centers or Pivots for Factory Windows

For windows where operated in battery or single.

Directions for Installing Nos. 460 to 462—Screw sash center or pivot on sash and stand sash in frame, screw center to frame, swing sash open and put on stops ½x⅞ in.

Sash does not need rabbeting as with No. 560 type.

Directions for Installing Nos. 560 to 562—Screw center or pivot to stile and sash, then screw stile to window jamb and nail stops on each side of stile.



Nos. 460 to 462 and Nos. 560 to 562 Sash Centers or Pivots

No.	460	461	462	560	561	562
Thickness of sash . . . . in.	1⅜	1¾	2¼	1⅜ to 1½	1¾ to 2	2¼ to 2½
Material and finish	Iron, dead black					

Note: Prefix "C" to number indicates brass.

Catalogue

Write for catalogue or details. Pivots for every kind of sash.

GRANT PULLEY AND HARDWARE COMPANY

Sash Pulleys and Casement Window Hardware

TELEPHONE CONNECTION

Architects Building, 101 Park Avenue
NEW YORK, N. Y.

Agents in all the principal cities of the United States and Canada, and our Name will be found listed in the Telephone Directories

Products

Manufacturers of SASH PULLEYS and CASEMENT HARDWARE:

"Grant," "Queen" and "Lee" Sash Pulleys; "Grant" and "Queen" Overhead and "Lee" Cast Iron Side Sash Pulleys for wood and metal frames, made in all sizes, finishes and bearings; "Grant" Casement Hardware; "Grant" Antifriction Vertical Pivot Lifts; "Turner" (Patent) Antifriction Drawer Slides and Supports; "Grant" Ball Bearing Door Sheaves and Flush Track; "Grant" Sash Chain and Fixtures; "Grant" Friction Sash Centers; "Queen" Friction Casement Adjusters.

MOREWOOD STANDARD SAFETY WINDOW CLEANING DEVICES.

For "Grant" Wood Rolling Partitions, see page 1314; for Revolving Window Devices, see page 1642; for Door Hangers and Bar Locks, see pages of Grant Elevator Equipment Corp., 1512-1515.

Selling Agents for:

"American" steel sash pulleys; "Von Duprin" safety exit devices; "Howarth" reversible sash centers; "Grant" tubular ball bearing door hangers.

Details

Full size details of all our specialties will be sent on request.

"Grant" Overhead Pulleys

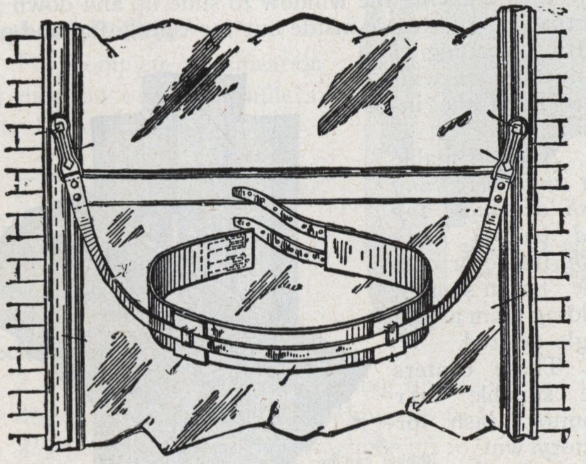
On account of additional pocket room gained by use of "Grant" pulleys, iron instead of lead weights can be used for heaviest plate glass windows, thus materially reducing cost. Frames are cut for "Grant" pulleys by regular pulley machine.

"Grant" overhead pulleys are also made for triple, quadruple and quintuple windows.

Morewood Standard Safety Window Cleaning Device

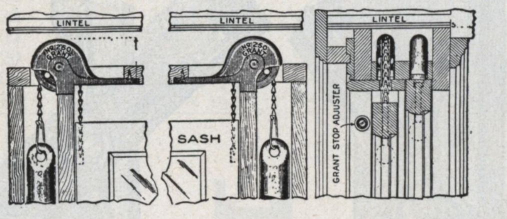
This device efficiently insures safety for outside window cleaners.

Consists of adjustable safety belt connected to the window frame and fastened on to either an anchor or bolt embedded in the framework.

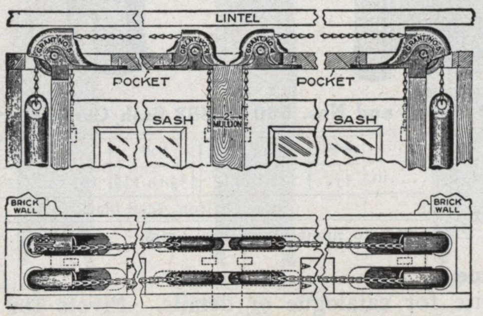


ADJUSTABLE SAFETY BELT CONNECTED TO WINDOW FRAME

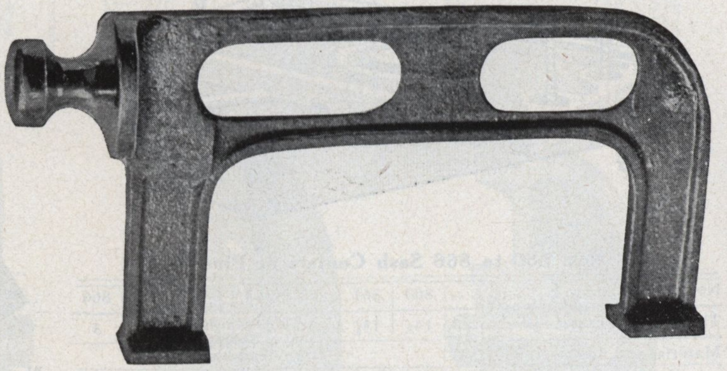
The anchor is best inserted in the masonry while the building is under construction, as the cement will bind through the cut out parts. This anchor does away with all cutting by the mason. The heads are machined, thus insuring uniform size.



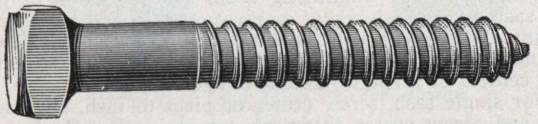
SINGLE FRAME WINDOW AND SECTION OF FRAME



"GRANT" PULLEYS FOR TWIN WINDOWS



LATEST PATTERN UNIVERSAL BRONZE ANCHOR
The cement binds through cut-out parts

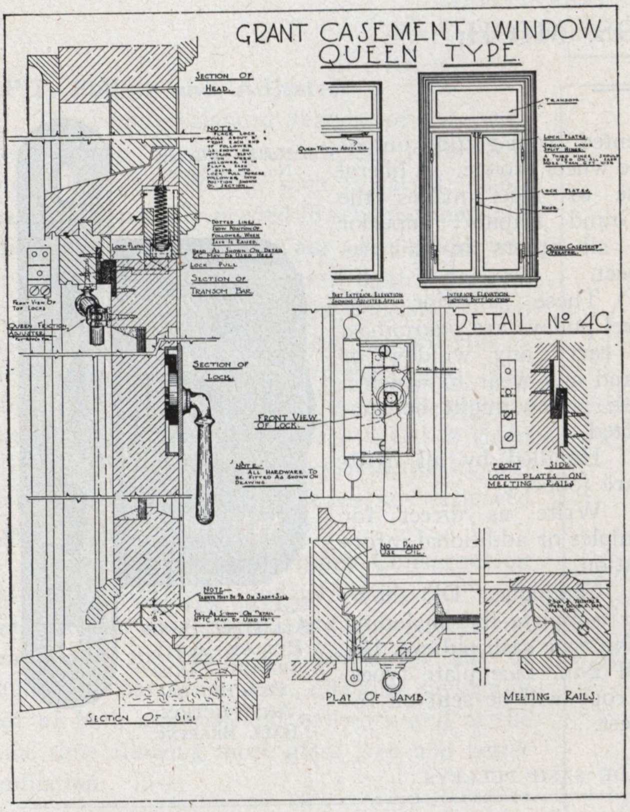


TOBIN BRONZE BOLT FOR WOOD OR METAL COVERED FRAMES

Continued on next page

"Grant" Casement Hardware

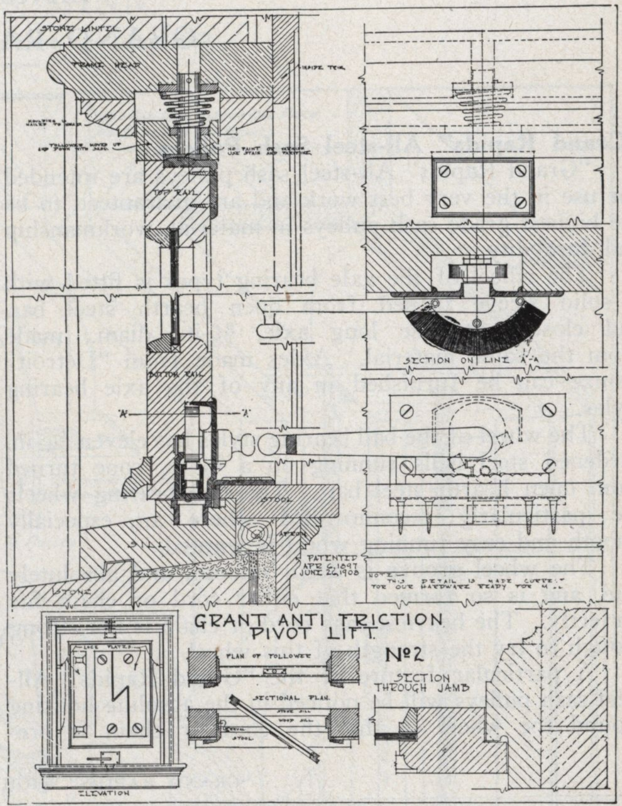
A casement window, opening into room fitted with this hardware, gives, without changing the natural appearance, an inexpensive and weatherproof casement window.


GRANT CASEMENT WINDOW
QUEEN TYPE
SECTION OF HEAD.
NOTE—
DOTTED LINES SHOW POSITION OF FOLLOWER WHEN SASH IS RAISED.
LOCK PLATE
HEAD AS SHOWN ON DETAIL Nº C MAY BE USED HERE
LOCK PULL
SECTION OF TRANSOM BAR.
FRONT VIEW OF TOP LOCKS
QUEEN FRICTION ADJUSTER
SECTION OF LOCK.
NOTE— ALL HARDWARE TO BE FITTED AS SHOWN ON DRAWING
NOTE—
SILL AS SHOWN ON DETAIL Nº C MAY BE USED HERE
SECTION OF SILL
QUEEN FRICTION ADJUSTER
PART EXTERIOR ELEVATION SHOWING ADJUSTER APPLIED
INTERIOR ELEVATION SHOWING BUTT LOCATION
TRANSOM
LOCK PLATES
SPECIAL LOOSE SPLIT HINGE.
LOCK PLATES
KNOB
QUEEN CASEMENT OPERATOR
DETAIL Nº 4C.
STEEL BUSHING
FRONT VIEW OF LOCK.
FRONT SIDE
LOCK PLATES ON MEETING RAILS
NO PAINT USE OIL.
PLAN OF JAMB.
MEETING RAILS.

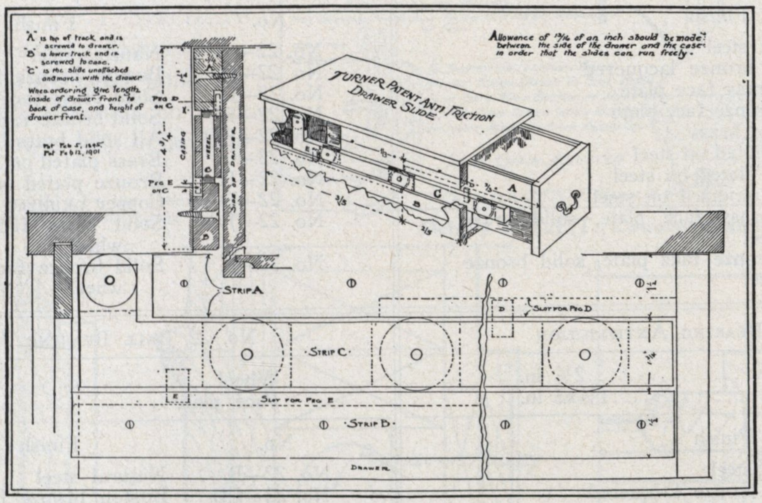
Details, "Grant" Casement Window
Showing application of hardware

"Grant" Antifriction Vertical Pivot Lifts

The "Grant" antifriction pivot lift, when applied to sash pivoted top and bottom, can be quickly and easily opened for ventilation.


STONE LINTEL
FRAME HEAD
INSIDE TRIM
FOLLOWER MOVED UP AND DOWN WITH SASH.
TOP RAIL
BOTTOM RAIL
"A" "A"
STOOL
APRON
SILL
STONE
PATENTED APR 6, 1897 JUNE 26, 1906
SECTION ON LINE A-A
GRANT ANTI FRICTION PIVOT LIFT.
Nº2
PLAN OF FOLLOWER
SECTIONAL PLAN.
STONE SILL
WOOD SILL
STOOL
SECTION THROUGH JAMB
LOCK PLATES
ELEVATION

Details, Pivot Windows
Equipped with "Grant" antifriction lifts


"A" is top of track and is screwed to drawer.
"B" is lower track and is screwed to case.
"C" is the slide unattached and moves with the drawer
When ordering give length inside of drawer front to back of case, and height of drawer front.
Pat Feb 5, 1895.
Pat Feb 12, 1901
Allowance of 13/16 of an inch should be made between the side of the drawer and the case in order that the slides can run freely.
TURNER PATENT ANTI FRICTION DRAWER SLIDE
PEG D ON C
PEG E ON C
CASING
WHEEL
SIDE OF DRAWER
A
B
C
D
E
STRIP A
STRIP C
STRIP B
SLOT FOR PEG D
SLOT FOR PEG E
DRAWER

Details "Turner" (Patent) Antifriction Drawer Slides

"Turner" (Patent) Antifriction Drawer Slide

The "Turner" antifriction drawer slide and support are noiseless. When fitted with the "Turner" attachment a drawer can not fall from the case when pulled out suddenly; nor can it sag, if heavily loaded, when opened to its limit.

References

This company will furnish as references, on request, the names and locations of buildings in all large cities in the United States and Canada where its products are in use. These products are giving such satisfaction that the company can refer to all the users.

GRAND RAPIDS HARDWARE CO.

Manufacturers of All-steel Sash Pulleys

Eleventh Street
GRAND RAPIDS, MICH.

"Grand Rapids" All-steel Sash Pulleys

"Grand Rapids" All-steel sash pulleys are intended for use in the very best work and are guaranteed to be the highest grade sash pulleys in material, workmanship and durability.

The wheel of the axle bearing types is fitted with a solid sleeve turned from open hearth steel bar, and closely fits the long axle, ⅜-in. diam., made from the same material. Axles made from "Detroit" bronze can be furnished in any of the axle bearing styles.

The wheel of the ball bearing styles has eleven ¼-in. hardened steel balls running on a ⅝-in. cone turned from open hearth steel bar. The ball bearing wheels are particularly recommended where an especially smooth and easy running wheel is wanted.

The wheel groove is deep, smooth, and absolutely true, and is so formed that either cord or chain fits perfectly. The heaviest sash cord or chain is not strong enough to try the strength of this wheel.

A particular feature of the "Grand Rapids" All-steel sash pulleys will be noticed in the absolute housing around the wheel so that the cord or chain is prevented from getting out of the wheel groove. A liberal use of steel makes the "Grand Rapids" superior to all others in this respect.

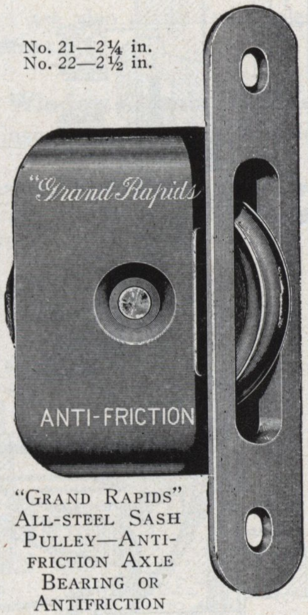
These superior All-steel pulleys are *guaranteed* to carry any window or stand any wear to which a sash pulley might be subjected.

Handled by all hardware jobbers.

Write us direct for samples or additional information.

Catalogue "D" shows our complete line including drive type sash pulleys, 1¾ and 2-in. face plate types. A copy will be sent on request.

No. 21—2¼ in.
No. 22—2½ in.



"GRAND RAPIDS" ALL-STEEL SASH PULLEY—ANTI-FRICTION AXLE BEARING OR ANTIFRICTION BALL BEARING

"GRAND RAPIDS" HIGH GRADE SASH PULLEYS

No. 21 Axle Bearing Antifriction

Wheel ....2¼ in.
Face plate.......................1⅛x5 in.

No.	Finish
No. 21—	Natural steel
No. 21—C	Boston bronze lacquered
No. 21—D	Solid brass face plate
No. 21—E	Solid bronze face plate
No. 21—F	All solid brass
No. 21—G	Brass plated on steel
No. 21—H	Bronze plated on steel
No. 21—I	Copper oxidized on steel
No. 21—J	Solid brass face plate, solid brass wheel
No. 21—K	Solid bronze face plate, solid bronze wheel

No. 21 Ball Bearing Antifriction

Wheel ....2¼ in.
Face plate.......................1⅛x5 in.

No.	Finish
No. 21—B	Natural steel
No. 21—CB	Boston bronze lacquered
No. 21—DB	Solid brass face plate
No. 21—EB	Solid bronze face plate
No. 21—FB	All solid brass
No. 21—GB	Brass plated on steel
No. 21—HB	Bronze plated on steel
No. 21—IB	Copper oxidized on steel
No. 21—JB	Solid brass face plate, solid brass wheel
No. 21—KB	Solid bronze face plate, solid bronze wheel

No. 22 Axle Bearing Antifriction

Wheel ....2½ in.
Face plate.....................1⅛x5¼ in.

No.	Finish
No. 22—	Natural steel
No. 22—C	Boston bronze lacquered
No. 22—D	Solid brass face plate
No. 22—E	Solid bronze face plate
No. 22—F	All solid brass
No. 22—G	Brass plated on steel
No. 22—H	Bronze plated on steel
No. 22—I	Copper oxidized on steel
No. 22—J	Solid brass face plate, solid brass wheel
No. 22—K	Solid bronze face plate, solid bronze wheel

No. 22 Ball Bearing Antifriction

Wheel ....2½ in.
Face plate.....................1⅛x5¼ in.

No.	Finish
No. 22—B	Natural steel
No. 22—CB	Boston bronze lacquered
No. 22—DB	Solid brass face plate
No. 22—EB	Solid bronze face plate
No. 22—FB	All solid brass
No. 22—GB	Brass plated on steel
No. 22—HB	Bronze plated on steel
No. 22—IB	Copper oxidized on steel
No. 22—JB	Solid brass face plate, solid brass wheel
No. 22—KB	Solid bronze face plate, solid bronze wheel

Handled by all hardware jobbers. Write us direct for samples or additional information.

L.P.T. SPECIALTY CO.

Manufacturers of Counterbalanced Window Hardware

120 South Ninth Street
MINNEAPOLIS, MINN.

For Casement Window Hardware, see page 1652

L.P.T. Pulleys and Adjusters

The counterbalanced feature of this window opening device automatically lowers the top sash as the bottom sash is raised. This feature is especially needed in schools, hospitals, office buildings, porches or any place where better ventilation and maximum of light is desired.

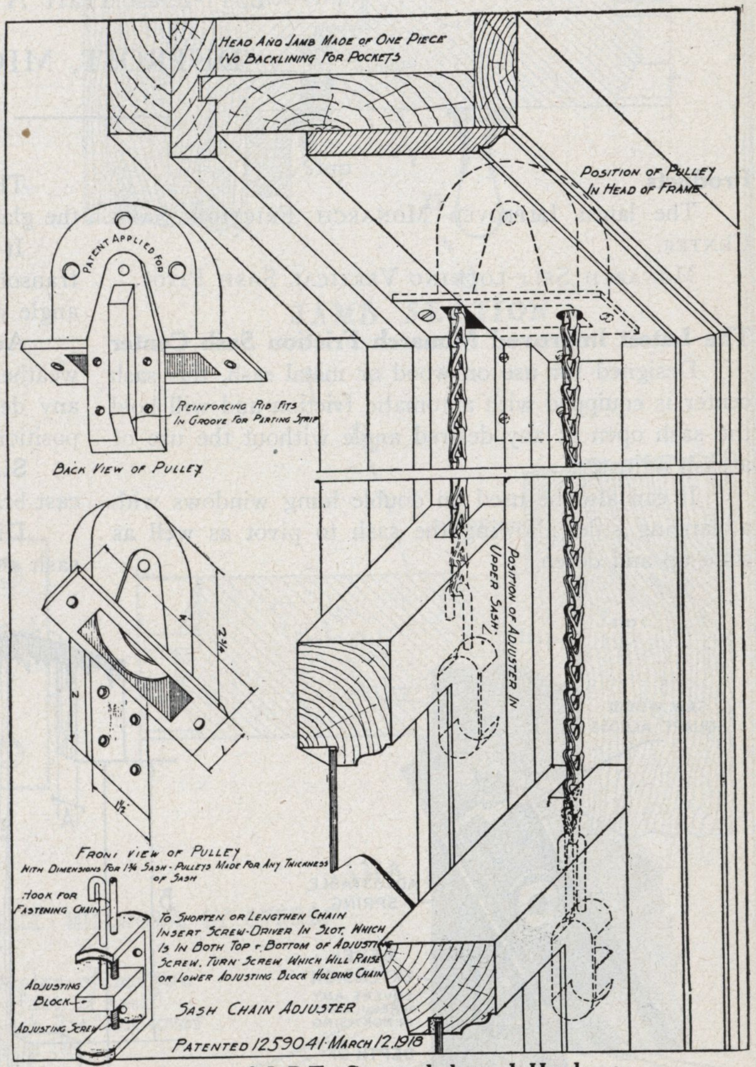
Description—The device consists of two cast iron housed pulleys placed at each end of the head jamb and braced into the frame. The windows are counterbalanced by chains running through these pulleys and are attached to chain adjusters. The adjusters are placed two in each sash, one on each side, adjusting screws placed flush with meeting rail.

Cost Less Than Ordinary Construction—L.P.T. overhead pulleys eliminate sash weights, sash weight boxes, ordinary pulleys and nearly half the chain, and permit the use of mullions as narrow as 3-in., effecting savings in cost of both material and millwork and at the same time allowing more glass area and better ventilation.

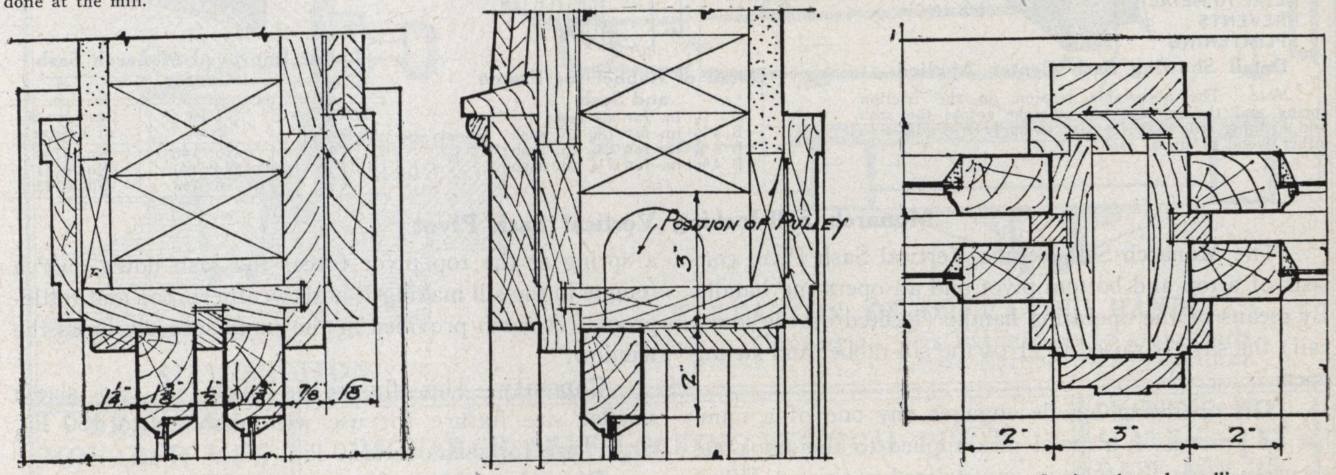
Specifications

All counterbalanced sash where shown or noted shall be equipped with pulleys and chain adjusters, as manufactured by L.P.T. Specialty Co., 120 South Ninth Street, Minneapolis, Minn., using 2 pulleys in each head jamb for each opening, and 2 chain adjusters in each sash; adjusting screws on lower sash to be flush with meeting rail.

Note: This equipment to be furnished by the general contractor, who will supply samples so that all mortising can be done at the mill.


HEAD AND JAMB MADE OF ONE PIECE
NO BACKLINING FOR POCKETS
POSITION OF PULLEY IN HEAD OF FRAME
PATENT APPLIED FOR
REINFORCING RIB FITS IN GROOVE FOR PARTING STRIP
BACK VIEW OF PULLEY
2¼
2
1½
FRONT VIEW OF PULLEY
WITH DIMENSIONS FOR 1¾ SASH - PULLEYS MADE FOR ANY THICKNESS OF SASH
POSITION OF ADJUSTER IN UPPER SASH
HOOK FOR FASTENING CHAIN
TO SHORTEN OR LENGTHEN CHAIN INSERT SCREW-DRIVER IN SLOT, WHICH IS IN BOTH TOP & BOTTOM OF ADJUSTING SCREW. TURN SCREW WHICH WILL RAISE OR LOWER ADJUSTING BLOCK HOLDING CHAIN
ADJUSTING BLOCK
ADJUSTING SCREW
SASH CHAIN ADJUSTER
PATENTED 1259041 · MARCH 12, 1918

Details of L.P.T. Counterbalanced Hardware


1¼"
1⅜"
½"
1⅜"
7/8
1/8
POSITION OF PULLEY
3"
2"
2"
3"
2"

Section through jamb

Section through head

Section through mullion

Details for Frame Construction

MONARCH MANUFACTURING CO.

Builders Hardware

2511-2525 Hart Avenue

DETROIT, MICH.

Products

The latest Improved Monarch Friction Sash Center.

Monarch Self-locking Vertical Sash Pivot.

The Latest Improved Monarch Friction Sash Center

Designed for use on wood or metal sash, this sash center is equipped with automatic friction and will hold the sash open at any desired angle without the use of a sash adjuster.

It can also be used on double hung windows with a hanging stile, allowing the sash to pivot as well as slide up and down.

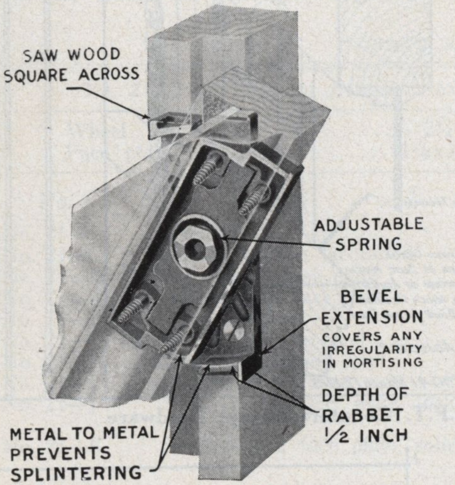
This feature permits the cleaning of both sides of the glass from the room side.

It is well adapted for use with inside or outside transoms and will hold the transom open at any desired angle without the use of a transom lift.

Advantages—It is easily applied and absolutely weathertight. The beveled extensions on the ends cover any defect in mortising and hold the pivot in correct position.

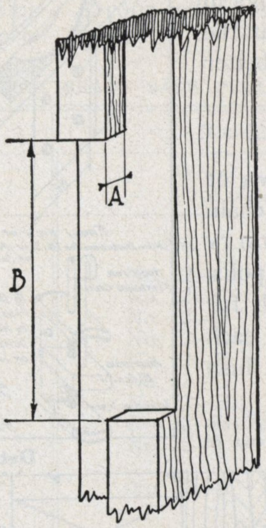
Sizes and Finishes—Made in 3 sizes: in cast iron, cast brass or cast bronze, any finish.

Directions for Applying—Directions for applying sash center packed with every set.


SAW WOOD SQUARE ACROSS
ADJUSTABLE SPRING
BEVEL EXTENSION COVERS ANY IRREGULARITY IN MORTISING
DEPTH OF RABBET ½ INCH
METAL TO METAL PREVENTS SPLINTERING

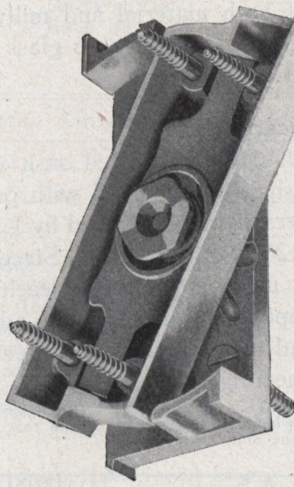
Detail Showing Sash Center Applied

Note: The adjustable tension on the friction spring and the mortise cut straight across the sash and hanging stile make it easy to apply and adjust to either wood or metal sash



Detail of Rabbet for Frame and Sash

A ½ in. for all sash
B 4½ in. for 1⅜ in. sash
B 4⅝ in. for 1¾ in. sash
B 4⅝ in. for 2¼ in. sash



Latest Improved Monarch Sash Center

Thickness of sash, in.	Cast iron	Cast brass or bronze
1⅜	No. 140	No. 0140
1¾	No. 141	No. 0141
2¼	No. 143	No. 0143

Monarch Self-locking Vertical Sash Pivot

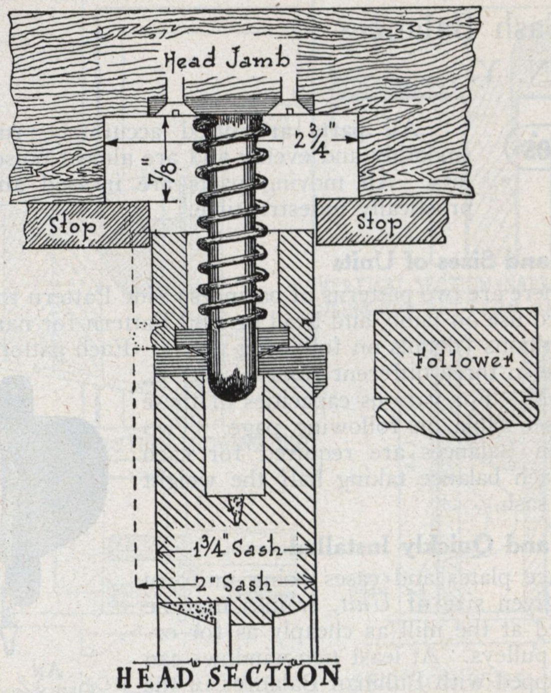
The Monarch Self-locking Vertical Sash Pivot consists of a top and bottom pivot and an operating handle. By means of the operating handle (located on the lower rail) the sash is raised clear of the sill rabbet and swung open.

The operating handle engages any one of a number of grooves in a metal disc applied to the stool and securely holds the sash in any desired position. When it is desired to close the sash the action is reversed and a spring at the top pivot forces the sash down over a tongue in the sill making it both weatherproof and rattleproof. A catch provided at the jamb securely locks the window.

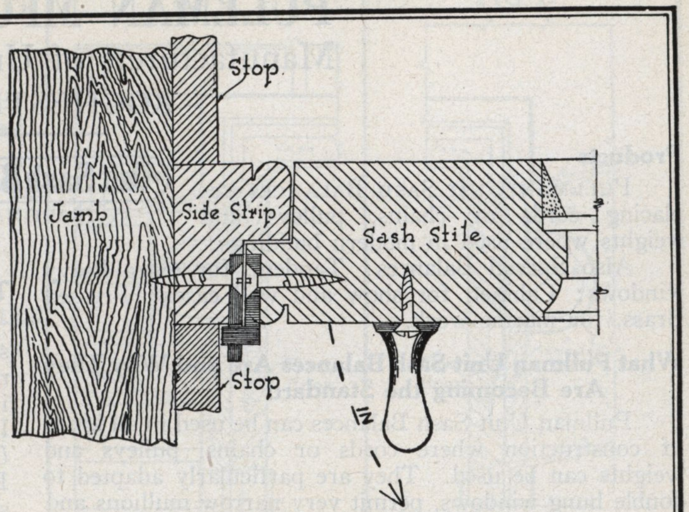
Capacity—This fixture is made in two sizes: smaller size fixture for use with sash up to 150 lb., larger size for sash over 150 lb.

Directions for Applying—Full directions for applying the fixtures are enclosed with each set.

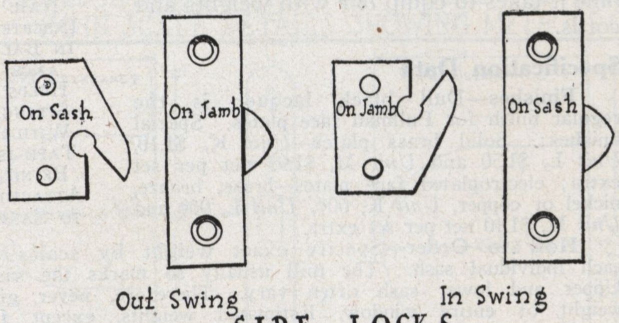
Continued on next page


Head Jamb
2 3/4"
7/8"
Stop
Stop
Follower
1 3/4" Sash
2" Sash

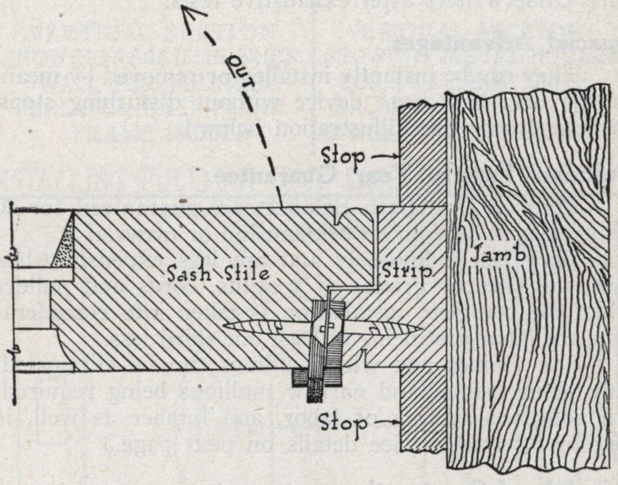
HEAD SECTION


Stop
Jamb
Side Strip
Sash Stile
Stop
In

JAMB SECTION

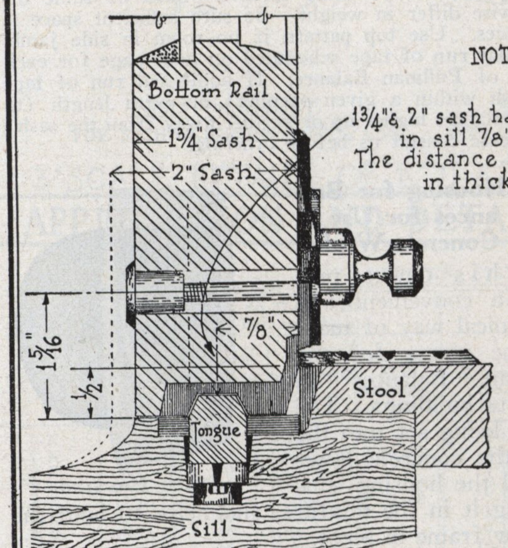

On Sash
On Jamb
On Jamb
On Sash
Out Swing
In Swing

SIDE LOCKS


Out
Stop
Sash Stile
Strip
Jamb
Stop

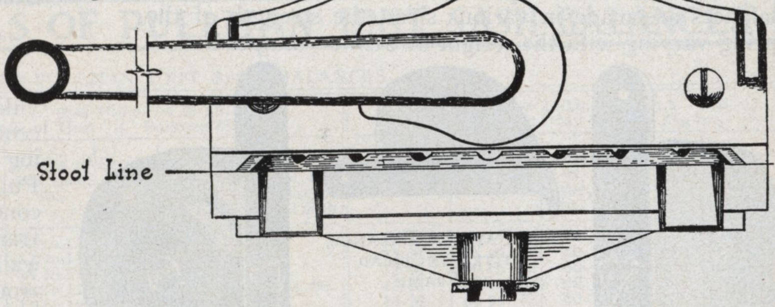
JAMB SECTION

NOTE~ ALL MILLWORK BY OTHERS-


Bottom Rail
1 3/4" Sash
2" Sash
7/8"
1 5/16"
1/2"
Stool
Tongue
Sill

1 3/4" & 2" sash have center of tongue in sill 7/8" from face of sash. The distance for sash 2 1/4" and over in thickness is 1 1/8"

SILL SECTION



ELEVATION OF OPERATING HANDLE

CAPACITY~ This Fixture up to 150 pounds.
Large Fixture over 150 pounds.

DRAWN BY MONARCH MFG COMPANY	MONARCH SELF-LOCKING VERTICAL PIVOT	DRAWING NO. 1 SCALE 6"=1 FT. DATE APR.'25

PULLMAN MFG. COMPANY

Manufacturers of Unit Sash Balances

ROCHESTER, N. Y.

Unit Sash Balances
TRADE-MARK

Products

PULLMAN UNIT SASH BALANCES, replacing cords or chains, pulleys and weights where used in modern buildings.

Also Special Balances: Tandem, for extra heavy windows; Cabinet, for show and wall cases; Pressed Brass, for marine work.

What Pullman Unit Sash Balances Are and Why They Are Becoming the Standard

Pullman Unit Sash Balances can be used in all kinds of construction where cords or chains, pulleys and weights can be used. They are particularly adapted to double hung windows, permit very narrow mullions and do away with box frames.

They have been approved by the National Board of Fire Underwriters after exhaustive tests.

Special Advantages

They can be instantly installed or removed by means of the new *tape hook* device without disturbing stops, sash or frame (see illustration below).

Pullman Twenty Year Guarantee

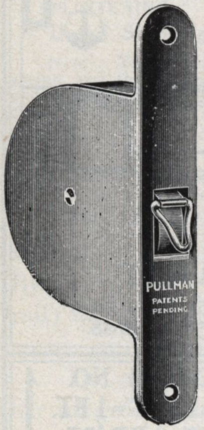
Pullman Unit Sash Balances are guaranteed for 20 years against defective workmanship or material.

They last indefinitely and are less expensive than even the cheaper grades of weights, cords and pulleys when the complete installation is taken into consideration, the labor cost being at least one-third less.

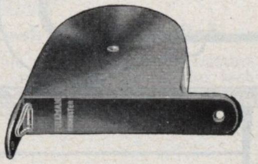
Box frames and wide mullions can be eliminated, only plain frames and narrow mullions being required. An additional saving of labor, and lumber as well, is thereby effected. (See details on next page.)

Principle of Construction

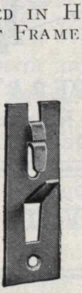
The Pullman Balance consists of a pressed steel casing enclosing a rustproof steel tape, wound on a revolving drum. It is operated by the *New Pullsteel Spring* of the finest clock steel obtainable, uniform in tension and temper, subjected to rigid tests, coiled and assembled by a new process. The loop in the end of the tape is hooked on to the tape hook on the sash. Pullman Balances are made in various sizes, the strength of the spring varying with the weight of sash to be operated.



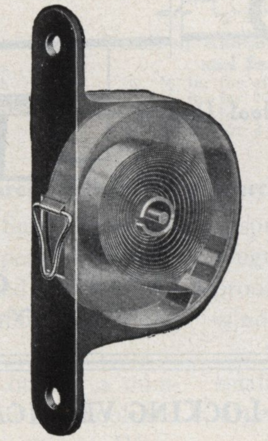
UNIT SASH BALANCE, SIDE PATTERN



TOP PATTERN BALANCE, FITTED IN HEAD OF FRAME



TAPE HOOK

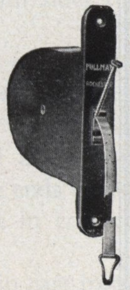


INTERIOR CONSTRUCTION, UNIT SASH BALANCE

All parts are fitted accurately, run smoothly and evenly and are almost noiseless. All moving parts are incased and practically indestructible.

Types and Sizes of Units

There are two patterns of balances; Side Pattern for standard use on jamb, and head or Top Pattern for narrow mullions (details on following page). Each pattern is made in three different sizes—*Units* K, L and M. For various capacities of these *Units* see table on following page. Two Pullman Balances are required for each sash, each balance taking half the weight of the sash.



AN ORDINARY NAIL INSERTED IN BALANCE HOLDS SPRING WHILE TAPE IS BEING ATTACHED TO SASH

Easily and Quickly Installed

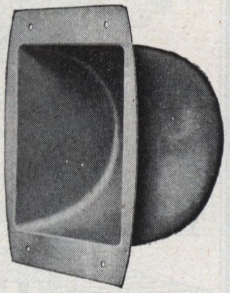
Face plates and cases being uniform for a given size of *Unit,* frames may be mortised at the mill as cheaply as for ordinary pulleys. At least *two* windows can be equipped with Pullman Balances in the time it takes to equip *one* with weights and cords.

Specification Data

Finishes—Dull black lacquer is the regular finish for Pullman face plates. Special finishes: Solid brass plates—*Unit* K, $1.10, *Unit* L, $1.50 and *Unit* M, $1.95 net per set extra; electroplated face plates—brass, bronze, nickel or copper, *Unit* K, 60¢, *Unit* L, 90¢ and *Unit* M, $1.10 net per set extra.

How to Order—Specify exact weight by scales of each individual sash. The mill usually so marks the sash. Upper and lower sash often vary. Therefore, never give weight of entire window. Estimated weights, except for mortising purposes, always cause trouble. Sash of same dimensions likewise differ in weight. Be sure sufficient space is left for balances. Use top pattern if no room in side jamb. Note the regular run of tape scheduled on next page for each serial number of Pullman Balance. If additional run of tape (travel of sash within a given opening) or extra length (to simply locate balances higher up or farther away from the sash) is required, please consult us before ordering.

Steel Housing for Balances for Use in Concrete Work



STEEL HOUSING

This device provides a convenient and economical way of making the recess for the Pullman Balances in concrete buildings. The frame being set into the wall, the concrete flows around the housing, embedding it in the mixture, and helps to hold the window frame in place.

Illustrated Catalogue and Blue Prints

For further details, illustrations and references write for illustrated catalogue with accompanying blue prints. The operation and advantages of the new *tape hook* are fully described therein. This remarkable invention is revolutionary in scope.

Continued on next page

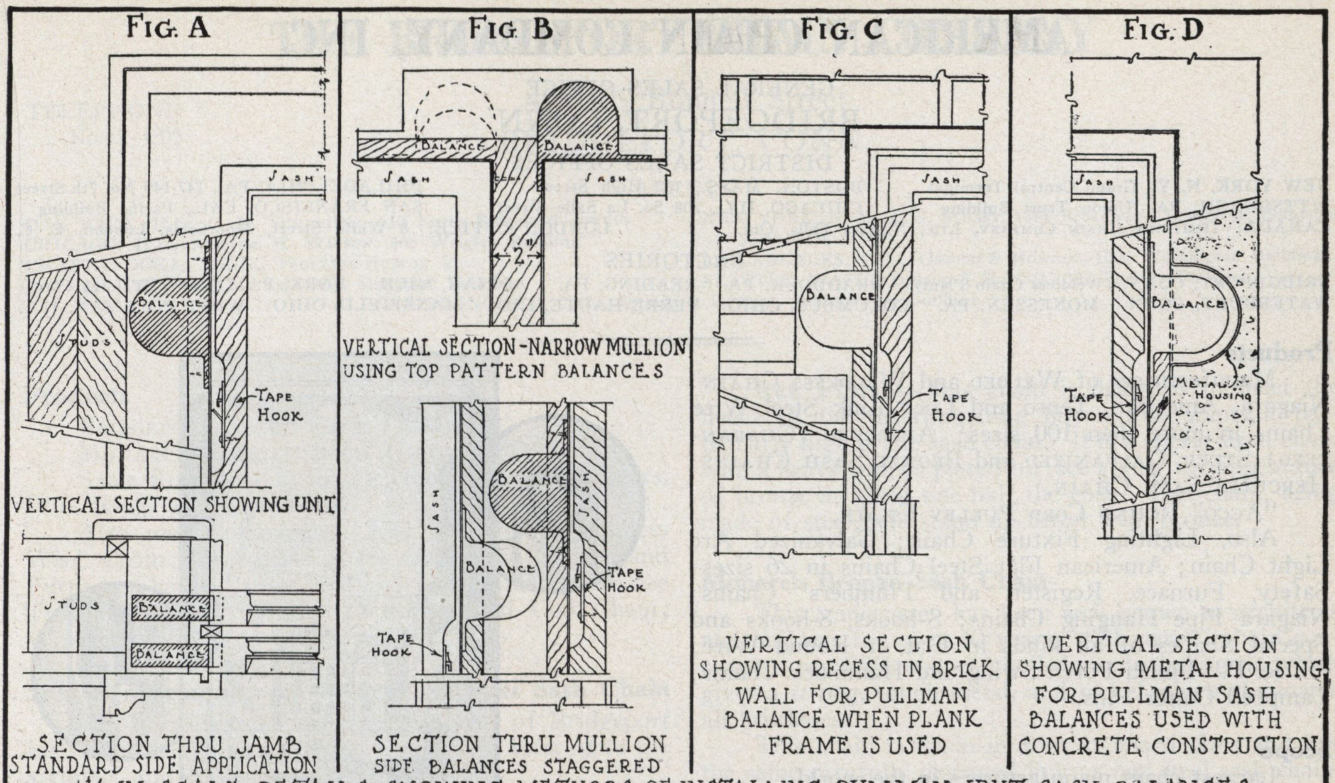
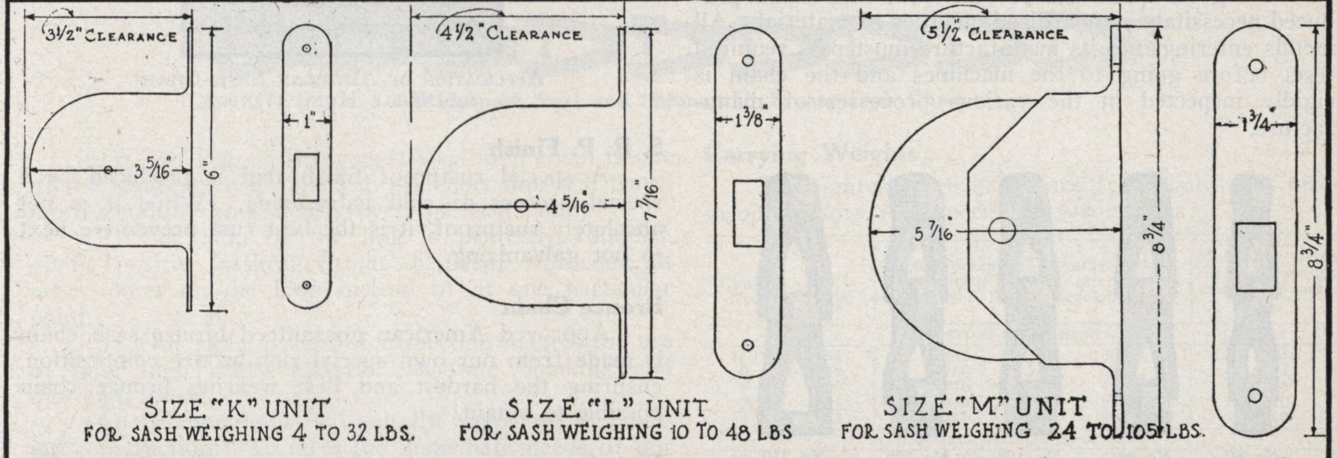


FIG. A
SASH
BALANCE
STUDS
TAPE HOOK
VERTICAL SECTION SHOWING UNIT
STUDS
BALANCE
BALANCE
SECTION THRU JAMB STANDARD SIDE APPLICATION
FIG. B
BALANCE
BALANCE
SASH
SASH
2"
VERTICAL SECTION-NARROW MULLION USING TOP PATTERN BALANCES
BALANCE
SASH
SASH
BALANCE
TAPE HOOK
TAPE HOOK
SECTION THRU MULLION SIDE BALANCES STAGGERED
FIG. C
SASH
BALANCE
TAPE HOOK
VERTICAL SECTION SHOWING RECESS IN BRICK WALL FOR PULLMAN BALANCE WHEN PLANK FRAME IS USED
FIG. D
SASH
BALANCE
METAL HOUSING
TAPE HOOK
VERTICAL SECTION SHOWING METAL HOUSING FOR PULLMAN SASH BALANCES USED WITH CONCRETE CONSTRUCTION

1½ IN SCALE DETAILS SHOWING METHODS OF INSTALLING PULLMAN UNIT SASH BALANCES


3½" CLEARANCE
3 5/16"
6"
1"
SIZE "K" UNIT
FOR SASH WEIGHING 4 TO 32 LBS.
4½" CLEARANCE
4 5/16"
7 7/16"
1 3/8"
SIZE "L" UNIT
FOR SASH WEIGHING 10 TO 48 LBS
5½" CLEARANCE
5 7/16"
8 3/4"
1 3/4"
8 3/4"
SIZE "M" UNIT
FOR SASH WEIGHING 24 TO 105 LBS.

3" SCALE DETAILS OF "K" "L" & "M" SIZES OF PULLMAN UNIT SASH BALANCES

APPLICATION AND DETAILS OF PULLMAN UNIT SASH BALANCES

PRICES, ETC., OF PULLMAN UNIT SASH BALANCES

Unit "K," for 4-lb. to 32-lb. Sash
Depth of Unit "K" Balance 3$\frac{5}{16}$ in.

Balance No.	Weight of each sash, lb.	Length of tape, in.	Code word	Per set of 4 balances for 2 sash
0-K	4 to 5	30	Kale	$2.25
1-K	6 to 7	30	Kalif	
2-K	8 to 9	30	Kaolin	
3-K	10 to 11	46	Keck	2.60
4-K	12 to 13	46	Kedge	
5-K	14 to 15	46	Keel	
6-K	16 to 17	46	Keg	2.85
7-K	18 to 19	46	Keep	
8-K	20 to 21	46	Kern	
9-K	22 to 23	46	Ketch	
10-K	24 to 26	46	Key	3.25
11-K	27 to 29	46	Kick	
12-K	30 to 32	46	Kidnap	

Side and Top Pattern Balances are the same price.
Side Pattern is always sent unless Top Pattern is specified.
For details of special finishes, see "Specification Data" paragraph on preceding page.

Unit "L," for 10-lb. to 48-lb. Sash
Depth of Unit "L" Balance 4$\frac{5}{16}$ in.

Balance No.	Weight of each sash, lb.	Length of tape, in.	Code word	Per set of 4 balances for 2 sash
3-L	10 to 11	54	Label	$4.00
4-L	12 to 13	54	Labor	
5-L	14 to 15	54	Lace	
6-L	16 to 17	54	Lack	
7-L	18 to 19	54	Lactic	
8-L	20 to 21	54	Lacona	
9-L	22 to 23	54	Lacteal	
10-L	24 to 26	54	Laddie	
11-L	27 to 29	54	Lade	4.25
12-L	30 to 32	54	Lading	
13-L	33 to 35	54	Ladle	
14-L	36 to 38	54	Lady	
15-L	39 to 41	54	Lag	
16-L	42 to 44	54	Laggard	
17-L	45 to 48	54	Lagging	

Unit "M," for 24-lb. to 105-lb. Sash
Depth of Unit "M" Balance 5$\frac{7}{16}$ in.

Balance No.	Weight of each sash, lb.	Length of tape, in.	Code word	Per set of 4 balances for 2 sash
10-M	24 to 26	60	Mace	$7.50
11-M	27 to 29	60	Machine	
12-M	30 to 32	60	Mackerel	
13-M	33 to 35	60	Madam	
14-M	36 to 38	60	Madly	
15-M	39 to 41	60	Madonna	
16-M	42 to 44	60	Magic	
17-M	45 to 48	60	Magnate	
19-M	49 to 52	60	Magnet	8.50
21-M	53 to 56	60	Magnify	
23-M	57 to 60	60	Magnolia	
25-M	61 to 64	60	Magpie	
27-M	65 to 68	60	Mahogany	
29-M	69 to 72	60	Maiden	9.75
31-M	73 to 76	60	Mail	
33-M	77 to 80	60	Maintain	
35-M	81 to 84	60	Majestic	
37-M	85 to 88	60	Major	11.00
39-M	89 to 92	60	Maker	
41-M	93 to 96	60	Malady	
43-M	97 to 100	60	Malice	
45-M	101 to 105	60	Malign	

AMERICAN CHAIN COMPANY, INC.

GENERAL SALES OFFICE
BRIDGEPORT, CONN.

DISTRICT SALES OFFICES

NEW YORK, N. Y., Grand Central Terminal
PITTSBURGH, PA., Union Trust Building
CANADA: Dominion Chain Company, Ltd., Niagara Falls, Ont.
BOSTON, MASS., 132 High Street
CHICAGO, ILL., 208 So. La Salle Street
PHILADELPHIA, PA., 147-149 No. 7th Street
SAN FRANCISCO, CAL., Pacific Building
LONDON OFFICE: 8 White Street, Moorfields, London, E. C.

FACTORIES

BRIDGEPORT, CONN. (Weldless Chain Plant) BRADDOCK, PA. READING, PA. ADRIAN, MICH. YORK, PA. (Electric Welding Plant)
WATERBURY, CONN. MONESSEN, PA. COLUMBUS, OHIO TERRE HAUTE, IND. MANSFIELD, OHIO WEST PULLMAN, ILL.

Products

Manufacturers of Welded and Weldless Chain: Niagara, American, Tenso and Lock Link Steel Wire Chains in more than 100 sizes: Approved (Guaranteed) Steel, Galvanized and Bronze Sash Chains; Hercules Sash Chain.

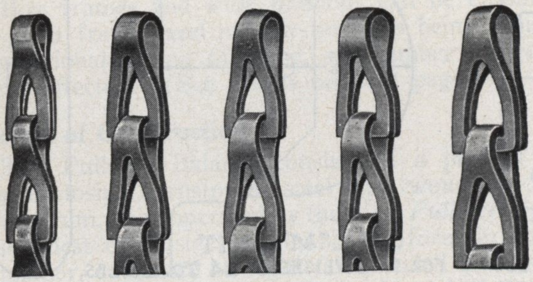
"Acco" Round Cord Pulley Chain.

Also, Lighting Fixture Chain; Galvanized Arc Light Chain; American Flat Steel Chains in 26 sizes; Safety, Furnace, Register, and Plumbers' Chains; Niagara Pipe Hanging Chains; S-hooks, 8-hooks and Special Shapes of all kinds in Flat or Round Wire; "S. R. P." Finish Porch Swing and Hammock Chains; Campbell Cotter Pins.

Scope

Largest chain manufacturers in the world.

The great quantities of American sash chain produced necessitate standardized qualities of material. All metals entering into its manufacture must pass required tests before going to the machines and the chain is rigidly inspected in the various processes of manufacture.



American Sash Chain

Each size of American sash chain is numbered to correspond with the weight of the double hung sash for which it is intended

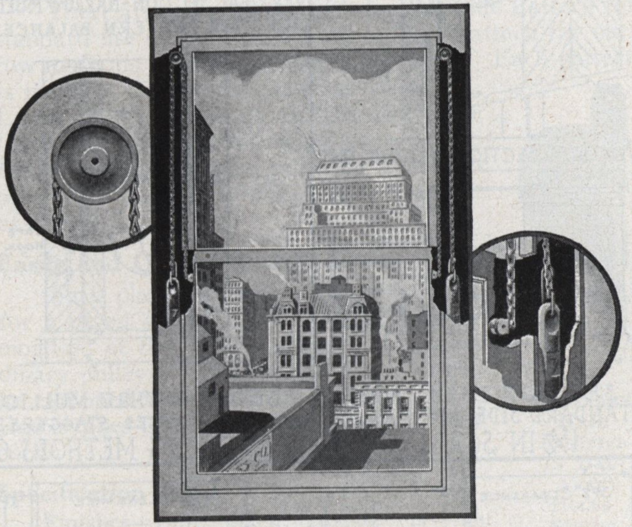
Steel, Hot Galvanized Chain

Approved American guaranteed hot galvanized steel sash chain is manufactured from high grade steel, galvanized by our own special hot process, ensuring a uniform, heavy rustproof coating—with links perfectly free—running smoothly and noiselessly over the smallest pulleys. Unquestionably the strongest sash chain made.

Also furnished in any finish desired.

Hercules Sash Chain

Wherever a chain is required to harmonize with interior finish, guaranteed Hercules sash chain is recommended. It is made of high grade steel, hot galvanized, with a heavy electro-copper plate over the galvanizing, which makes a rich bronze color. The price is less than one-half that of bronze chain. Being made of steel, it is stronger than any alloy chain, and in case of fire will maintain its load at a temperature 50% greater than bronze chain of any mixture.



Application of American Sash Chain to Double Hung Window

S. R. P. Finish

A special rustproof finish that is produced by a special process of cold galvanizing. While it is not absolutely rustproof, it is the best rust preventive next to hot galvanizing.

Bronze Chain

Approved American guaranteed bronze sash chain is made from our own special rich bronze composition, ensuring the hardest and best wearing bronze chain possible to obtain.

Fixtures

Made in copper finish only, consist of weight hook, sash ring and U-piece, made for ⅞ and 1-in. bores.

No. 60 is recommended for sash weighing up to 60 pounds. No. 80 is recommended for sash weighing up to 250 pounds.

Packing

American sash chain is furnished on substantial steel reels of 500 ft. each, and packed 2 reels to a case.

"Acco" Round Cord Pulley Chain

Made of the best steel obtainable, blanked and assembled on specially designed automatic machines. Strength is uniform throughout, will not kink, knot, stretch, rot, or burn. Guaranteed to operate freely and smoothly over any common cord pulley, and is stronger and more economical than sash cord. "Acco" round cord pulley chain is easily handled. Packed in strong cloth bags containing 100 ft. of chain with 40 weight fixtures, enough for five double hung sash.

Three finishes: coppered steel, "S. R. P." (special rustproof), and hot galvanized.

THE BRIDGEPORT CHAIN COMPANY

TELEPHONE
Noble 4500

495-505 Bunnell Street
BRIDGEPORT, CONN.

AGENTS

OAK PARK, ILL., C. M. Schneider, 630 North Ridgeland Avenue
CHICAGO, ILL., Arthur M. Watson, 406 Wrigley Building
CHATTANOOGA, TENN., Faucette-Huston Co.
DALLAS, TEX., Dan M. Bell, 222 Slaughter Building
NEW YORK, N. Y., J. G. Stuart, 1834 Broadway– Telephone, Columbus 5758; 2756
LOS ANGELES, CAL., Osgood & Howell, 1006 Washington Building
SEATTLE, WASH., Osgood & Howell, 302 Pioneer Building
SAN FRANCISCO, CAL., Osgood & Howell, Wells Fargo Building

Products

Bridgeport Steel Sash Chain.

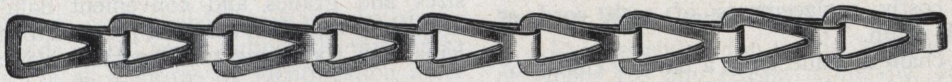
Monarch Bronze Sash Chain.

Sash Fixtures, including Hooks, Chain Fasteners, Wire Rings and Sash Cups.

Also manufacturers of Flat Metal and Weldless Wire Chain; Brass and Steel Plumbers', Safety and Furnace Chain; Brown Pattern and Monarch Bronze Transom Chain; Triumph Sprocket and Coil Chain; Wire Specialties; Metal Stampings.

Special Advantages of Bridgeport Steel Sash Chain

There are several special advantages of Bridgeport sash chain which are of distinct value and interest to the architect and contractor:



Bridgeport Steel and "Monarch" Bronze Sash Chain

(1) The link of Bridgeport steel sash chain is one of the shortest on the market. A short link will travel more smoothly and silently over the sash pulley.

(2) The loop of the link is perfectly rounded, giving positive assurance that the wear will come at every point on the loop instead of at one particular point.

(3) Our rigid system of inspection insures the use of only high grade material, accurate blanking and thorough finish.

(4) Prompt delivery is vitally important in building construction. To meet the immediate needs of our customers, we carry a well assorted stock on hand at all times.

Finishes

The matter of finishes is one of vital importance to the buyer of sash chain. In practically every case the demand is for a rustproof finish which will protect the chain and give it long life.

Sherardizing—For a thorough rustproof finish we strongly recommend sherardizing.

From actual tests and from years of experience, we have found that there is no better protection from corrosion.

It is a thoroughly reliable process consisting of alloying zinc with steel so that it completely fills all the pores and becomes an integral part of the metal. It can not chip or flake, there are no pinholes and it will stand the wear on a pulley.

In addition, tests have shown that sherardizing increases the tensile strength of the metal from 5% to 10%.

The National Board of Fire Underwriters has given its approval of this finish.

Rex Finish—This chain is designed to meet the needs of the discriminating buyer who wants a particularly high grade sash chain. It is a sherardized chain with a heavy copper plated surface giving the appearance of bronze at about one-half the cost. This chain, being made of steel, will stand up better than bronze.

Monarch Bronze Sash Chain

This trade name has been well known to architects and builders for over 40 years. "Monarch" chain consists of over 88% copper, the balance including tin which gives a strong, tough metal, and nickel which eliminates all brittleness.

This chain is made in four standard sizes and has the same carefully designed link as our steel sash chain.

Carrying Weights

The figures given below are from daily tests made in our factory for a period of six months:

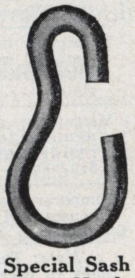
Chain No.	BCCO gauge	Maximum tensile strength developed, lb	Average tensile strength developed, lb.	Maximum weight of window that chain will carry, lb.
Bridgeport Steel Sash Chain				
2/0	032	344	309	123
0	028	460	381	152
1	036	510	440	176
2	045	640	552	220
4	065	850	800	320
Monarch Bronze Sash Chain				
0	028	335	310	124
1	032	420	386	154
2	042	500	475	190
4	055	680	625	250

Approved by Fire Underwriters

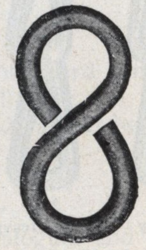
Bridgeport steel sash chain is approved by the National Board of Fire Underwriters.

Samples and Further Information

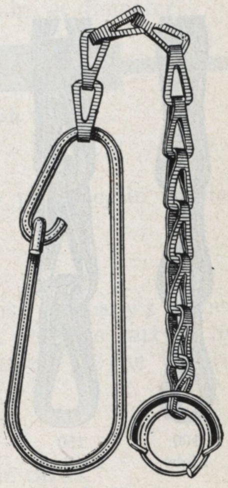
Let us send you samples and prices.



Special Sash Chain Hook



Eight Hook



Sash Fixture

THE CHAIN PRODUCTS COMPANY

CLEVELAND, OHIO

DISTRICT SALES OFFICES

ATLANTA, GA., J. C. Grinnan, 304 Bona-Allen Building
BALTIMORE, MD., Henry Kediel & Co., Inc., 405-407 West Redwood Street
BOSTON, MASS., Wm. C. Pickersgill, 18 Tremont Street
BUFFALO, N. Y., Ellmaker & Mann, 501 Jackson Building
CHICAGO, ILL., C. A. Pipenhagen, 169 West Chicago Avenue
DETROIT, MICH., Geo. E. Quigley, Inc., 1908 Washington Boulevard Building
LOS ANGELES, CAL., O. W. Sands, 923 East Third Street
NEW YORK, N. Y., E. A. Neylon, 150-52 Chambers Street
PITTSBURGH, PA., Ft. Pitt Hardware Co., 807 Liberty Avenue
PHILADELPHIA, PA., T. B. Hendrickson & Co., 525 Commerce Street
SAN FRANCISCO, CAL., Edward L. Camp, 34 Natoma Street
SALT LAKE CITY, UTAH, Alex S. Sims, B-100 Bransford
ST. LOUIS, MO., J. J. Horan & Son, 606 Oriel Building
ST. PAUL, MINN., P. R. Stowers, 201-5 Endicott Building
WINNIPEG, CAN., D. A. McDonald, 126 Lombard Street

Product

Hodell Sash Chain.

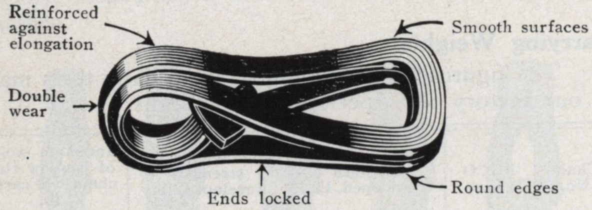
Also manufacturers of a complete line of Weldless Chain, including Bulldog, Samson, Cleveland, Noweld and Cepeco; Steel and Brass Wire Chains in more than 114 sizes and 8 finishes; also a full line of General Purpose Chains, S Hooks, Screw Hooks and special shapes in all varieties of flat and round wire.

Hodell Sash Chain

Description—A revolutionary improvement in sash chain manufacture has produced a unique, patented type. Elimination of 60% waste in its construction brings cost to a level where it can be economically specified for every type of building.

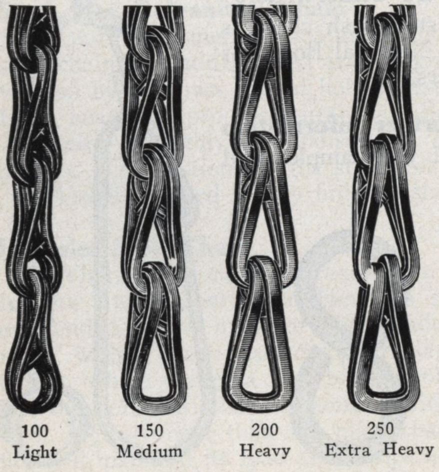
Hodell sash chain was developed after an insistent demand by architects for a sash suspension that would eliminate those costly replacements of sash cord or ordinary flat link chain.

Hodell sash chain is made from a narrow ribbon of cold rolled polished metal, woven by automatic machinery to the type of link illustrated above. The saving in material over the old method of blanking out links is utilized to purchase a higher grade stock.



Enlarged Link, Hodell Sash Chain

Hodell sash chain is identical in length and outside diameter to ordinary sash chain. Fits standard pulleys and runs more smoothly than any other type. Wears twice as long because of double metal at eye.



Types of Hodell Sash Chain

In tensile strength tests, *Hodell* sash chain will be found to be from 10% to 15% stronger than the ordinary flat pattern. It also possesses absolute uniformity of every link, freedom from improperly formed blanks common to stamped chain, smooth polished surfaces with all rounded edges.

Approval—*Hodell* sash chain is approved by the Underwriters' Laboratories, Inc.

Fittings—Standard type of fittings are supplied. Furnished regularly in two sizes, one for light and medium, the other for heavy and extra heavy sash.

Further Information and Co-operative Service

Send for specially designed folder adapted to standard construction classification of American Institute of Architects. Attractive sample display cards showing all sizes and grades and convenient data gladly sent to architects and builders. If you have any chain problems, our Experimental Department is at your service.

GRADES, WEIGHTS AND STRENGTHS OF HODELL SASH CHAIN

Grade	No.	For double hung sash weighing, lbs.	Tensile strength, lbs.
Phosphor bronze	125-B	Up to 75	475
	175-B	Up to 125	575
	275-B	Up to 175	650
	400-B	Over 250	800
Red bronze	100-R	Up to 60	400
	150-R	Up to 100	450
	225-R	Up to 150	500
	300-R	Over 200	700
Hot galvanized	100-HG	Up to 60	425
	150-HG	Up to 100	500
	200-HG	Up to 150	560
	250-HG	Over 200	650
Luminized steel	100-L	Up to 60	425
	150-L	Up to 100	500
	200-L	Up to 150	560
	250-L	Over 200	650
Coppered steel	100-C	Up to 60	425
	150-C	Up to 100	500
	200-C	Up to 150	560
	250-C	Over 200	650

PROPER SIZES, GRADES AND WEIGHTS OF HODELL SASH CHAIN FOR VARIOUS TYPES OF BUILDING CONSTRUCTION

	Light	Medium	Heavy	Extra Heavy
For double hung sash having plate glass area............ *For sash weighing............*	*Up to 6 sq. ft.* *Up to 60 lbs.*	*Up to 10 sq. ft.* *Up to 100 lbs.*	*Up to 15 sq. ft.* *Up to 150 lbs.*	*15 sq. ft. and upward* *Over 200 lbs.*
Federal, state, county, municipal buildings, banks, hotels, offices, libraries, residences ($10,000 and up)...........	125-B	175-B	275-B	400-B
Theaters, hospitals, railroad stations, schools, churches, high grade apartments, clubs....................	125-B or 100-R	175-B or 150-R	275-B or 225-R	400-B or 300-R
Mercantile buildings, apartments (4 to 6 suites), stores, residences ($5,000 to $10,000).................	100-R 100-HG or 100-L	150-R 150-HG or 150-L	225-R 200-HG or 200-L	250-R 250-HG or 250-L
Temporary construction, frame houses and stores, factories, mills....................	100-L or 100-C	150-L or 150-C	200-L or 200-C	250-L or 250-C

Note: The sizes of chain above recommended are intended to provide strength many times in excess of that required to handle the respective sizes of sash and will insure permanent satisfaction.

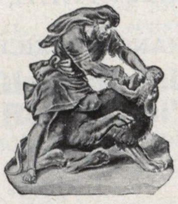
SAMSON CORDAGE WORKS

88 Broad Street
BOSTON, MASS.

Products

Manufacturers of Braided Cotton Cord in all sizes and colors for all purposes, including Samson Spot Cord, Samson Wire Center Cord and other Sash Cords.

Also manufacturers of Clothes Line, Ventilator Cord, Curtain and Shade Cord, Awning Line, Masons' Line, Dumbwaiter Rope, Arc Lamp and Trolley Cord, Signal Cord, Cotton Twine, etc.



TRADE-MARK

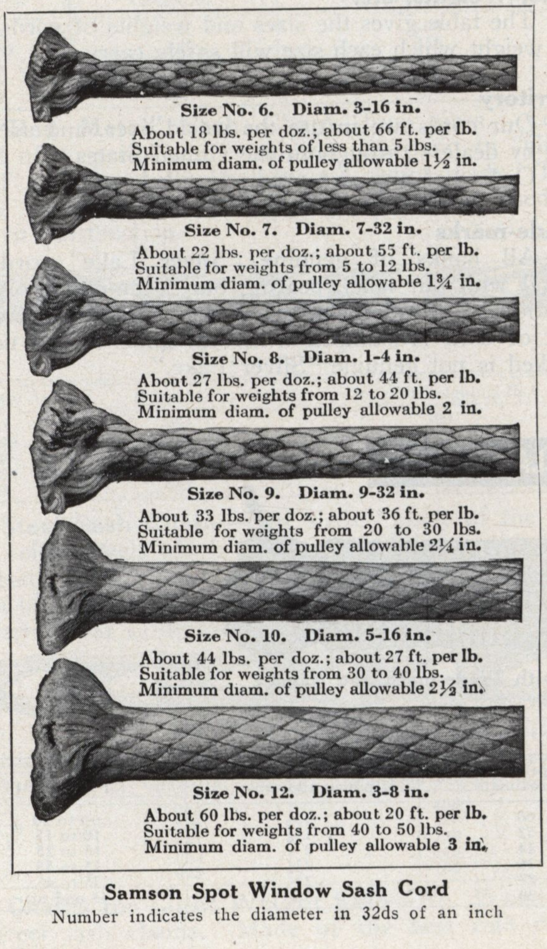
Samson Cord

All goods bearing the trade-mark of Samson and the Lion are made of extra quality stock; are carefully inspected, and guaranteed free from the rough braiding and finishing which destroy common cords so quickly.

The Samson Cordage Works manufactures several grades of sash cord, but the lower grades made for competing trade in cheap work, do not bear the Samson trade-mark. They do not fill specifications for Samson cord, which is much more economical in the end.

Samson Spot Cord

The colored spots on the cord, which may be of any color, are our trade-mark, used only with this extra quality. They serve as a means of identification after the label is removed.



Size No. 6. Diam. 3-16 in.
About 18 lbs. per doz.; about 66 ft. per lb.
Suitable for weights of less than 5 lbs.
Minimum diam. of pulley allowable 1½ in.

Size No. 7. Diam. 7-32 in.
About 22 lbs. per doz.; about 55 ft. per lb.
Suitable for weights from 5 to 12 lbs.
Minimum diam. of pulley allowable 1¾ in.

Size No. 8. Diam. 1-4 in.
About 27 lbs. per doz.; about 44 ft. per lb.
Suitable for weights from 12 to 20 lbs.
Minimum diam. of pulley allowable 2 in.

Size No. 9. Diam. 9-32 in.
About 33 lbs. per doz.; about 36 ft. per lb.
Suitable for weights from 20 to 30 lbs.
Minimum diam. of pulley allowable 2¼ in.

Size No. 10. Diam. 5-16 in.
About 44 lbs. per doz.; about 27 ft. per lb.
Suitable for weights from 30 to 40 lbs.
Minimum diam. of pulley allowable 2½ in.

Size No. 12. Diam. 3-8 in.
About 60 lbs. per doz.; about 20 ft. per lb.
Suitable for weights from 40 to 50 lbs.
Minimum diam. of pulley allowable 3 in.

Samson Spot Window Sash Cord
Number indicates the diameter in 32ds of an inch

Spot Cord will wear many times longer than chain or than the common cord, so often found on the market, made of inferior yarn roughly braided and poorly finished, causing early destruction by abrasion on the pulley.

A good deal of the low priced cord now offered contains a large loaded center, which is put in to increase the weight of the cord, but which stiffens it and makes it wear out very quickly in running over pulleys. The possibility of such cord being used can be avoided by specifying Samson Spot Cord, which can be so easily distinguished by the trade-mark.

Specifications—Architects' specifications should read:

"Windows to be hung with Samson Spot Cord; size of cord and size of pulleys to agree with manufacturer's list."

Sample Cards—Sample cards, showing proper sizes for use with different weights and pulleys, will be gladly sent to architects and builders.

Samson Wire Center Cord

Recommended for use in hanging heavy windows or where for any reason a metallic device is desired.

The cover is made of the same extra quality cotton yarn as used in Samson Spot Cord, with an enameled steel wire center, manufactured under specifications for running over pulleys and of entirely different quality from ordinary wire.

The weight of the window is borne chiefly by the wire center, the cotton cover merely acting as a cushion, thus avoiding contact of metal with metal which causes noise and wear.

It is carried in mahogany color in two sizes: Nos. 8 and 10.

No. 8 is suitable for weights up to 30 lbs. if used with pulleys not less than 2 in. in diameter, or for weights up to 50 lbs. with pulleys not less than 2½ in. in diameter.

No. 10 for weights up to 75 lbs. if used with pulleys not less than 2½ in. in diameter, or for weights up to 100 lbs. with pulleys not less than 3 in. in diameter.

Samson Wire Center Sash Cord

Special Cords

Cords made to order for any purpose, in special braid, finish or color.

Territory

Samson Spot Cord and this company's other goods are sold all over the world, and are carried by most of the builders' hardware dealers in the United States.

Catalogues —

Send for catalogues and sample cards.

SILVER LAKE CO.

Manufacturers of Sash, Bell and Signal Cord

HEAD OFFICE AND FACTORIES
NEWTONVILLE, MASS.

BRANCH OFFICES

NEW YORK, N. Y., 76 Reade Street
PHILADELPHIA, PA., 508 Market Street
BALTIMORE, MD., 405 West Redwood Street

CHICAGO, ILL., 20 West Kinzie Street
SAN FRANCISCO, CAL., 604 Mission Street
SEATTLE, WASH., 169 Jackson Street

Products

Manufacturers of "Silver Lake" Solid Braided Window Sash Cord.

Also Railroad Bell, Trolley, Signal, Curtain and Shade Cord; Arc Lamp, Dumbwaiter and Transmission Rope; Mason's Lines and Clothes Lines, and all kinds of Solid Braided Cordage.

Description of Solid Braided Cordage

We are the pioneer manufacturers of solid braided cordage. "Silver Lake" cords have been used for the best work since 1868 and have become known as the standard. "Silver Lake" solid braided sash cord is made of the best quality of selected cotton yarn; twice doubled and twisted, and then braided on solid braiding machines of our own design.

Advantages—"Silver Lake" cord costs less per pound than linen and other fine fibers, and its weight is so much less that it costs less per foot than cords that are cheaper per pound. Cotton is the only fiber that will stand constant bending over a pulley; consequently a cotton cord is more durable than one made of linen or hemp. It varies in diameter by thirty-seconds of an inch, and is adapted to all styles and sizes of weights and pulleys. Our process of finishing takes up all the stretch, so that "Silver Lake" cords do not lengthen as they wear, but maintain the weight at its original height.

Ordinary twisted cords kink badly in unwinding from the hank, and a great deal of time is required to straighten them out. "Silver Lake" braided cord comes out smoothly and makes it possible to hang more sash in a given time than when ordinary cords are used. "Silver Lake" cord is smooth in finish and can not work in between pulley wheel and case, a fact that precludes all possibility of broken sash cords. Our shade cords are extremely handsome in appearance and do not fray and break.

Guarantee—Furthermore, we issue a certificate of guarantee protecting every architect who specifies "Silver Lake A" sash cord against the breakage of same for a period of 20 years after installation.

Tests—Tests as made by the United States Government, Bureau of Standards, show that "Silver Lake" outwears many times chains and cheap cords. The hard braid and smooth finish also make it more fire resisting than chains.

Special Cords

All colors of wire center cord and a great variety of other braided cords for special purposes manufactured to order. Estimates promptly furnished on any sample sent to us. Anything in the way of a solid braided cord, in any color or design, may be had.

Sizes, Weights, etc.

The table gives the sizes and weights of cords, and the weight which each size will safely carry.

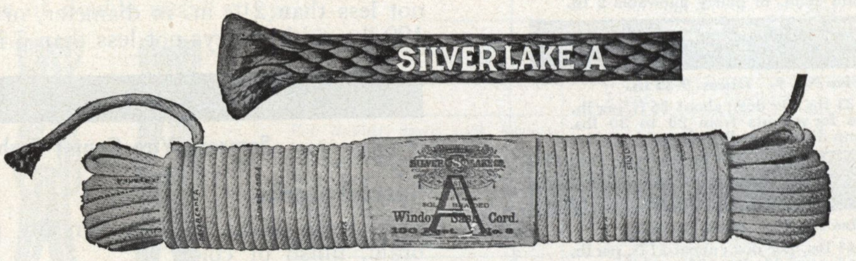
Territory

Our cords are in use the world over, and are carried by dealers throughout the United States.

Orders of any size promptly filled.

Trade-marks

All hanks of genuine "Silver Lake" cord are bound with our label, bearing our trade-mark. As an additional protection and means of identification, every foot of cord is stamped with our name. Cord not so marked is not genuine "Silver Lake."



Reproduction of "Silver Lake" Cord with Trade-mark and Name
Registered in U. S. Patent Office

SIZES, WEIGHTS, LENGTHS, ETC., OF "SILVER LAKE" CORD

Size No.	Diameter, in.	Weight per dozen hanks, lb.	Feet per pound, approximate	Minimum diameter, of pulley allowable, in.	Suitable for weights, lb.
6	3/16	18	66	1½	up to 10
7	7/32	23	52	1¾	10 to 15
8	1/4	27	44	2	15 to 25
9	9/32	33	36	2¼	25 to 35
10	5/16	44	27	2½	35 to 45
12	3/8	60	20	3	45 and up

Prices on application.

THE SMITH & EGGE MFG. CO.

Manufacturers of Chain
BRIDGEPORT, CONN.

BRANCH OFFICES

NEW YORK, N. Y., H. W. Kelley, 258 Broadway
CHICAGO, ILL., H. H. Munger, 112 West Lake Street
SEATTLE, WASH., C. J. Schilling, 619 Second Avenue
PHILADELPHIA, PA., H. A. Terry, 527 Commerce Street
ST. LOUIS, MO., Seidel Mfg. Co., 2006 Locust Street
LOS ANGELES, CAL., Smith Sales Co., 506 American Bank Building
SAN FRANCISCO, CAL., J. S. Rawlins, 604 Mission Street

"Giant Metal"
"Red Metal"
REGISTERED TRADE-MARKS

Products

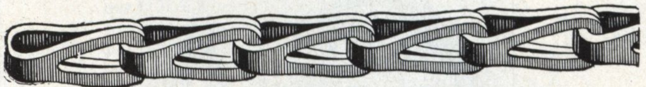
Sash Chain; Cable Chain.

Experience and Quality of Products

This company originated sash chain as a substitute for cord for hanging windows more than 45 years ago, and has maintained an unbroken record for quality which is equalled by none. In all this time, The Smith & Egge Mfg. Co.'s sash chains have been recognized by the leading architects throughout the country as the standard of quality and excellence.

Sash Chain and Fixtures

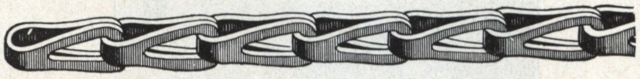
"Giant Metal" Sash Chain—Five sizes. Composed of a special phosphor bronze mixture and is entirely free from zinc or any impurities. It has greater tensile strength and durability than any other sash chain produced and retains its strength under continuous use and exposure to the elements.



"Giant Metal" Sash Chain
No. A, actual size

Size	Gauge, in.	For sash weighing, lb.
A	.054	400
A30	.049	350
1	.042	275
2	.032	175
0	.028	125

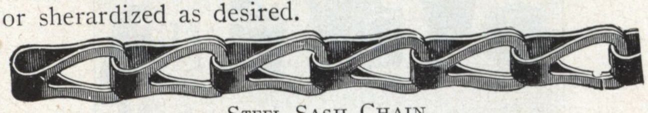
"Red Metal" Sash Chain—Five sizes. Composed of a special copper mixture and next to "Giant Metal" is superior to all other sash chains made. This is the universally accepted bronze sash chain used in modern construction.



"Red Metal" Sash Chain
No. 1, actual size

Size	Gauge, in	For sash weighing, lb.
A	.054	300
A30	.049	250
1	.042	225
2	.032	150
0	.028	100

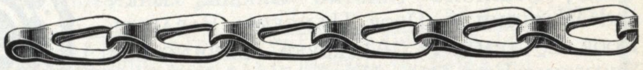
Steel Sash Chain—Five sizes. Made of the best cold rolled steel, which gives it the finest appearance, greatest strength and wearing qualities of any steel chain on the market. This chain can be copper plated or sherardized as desired.



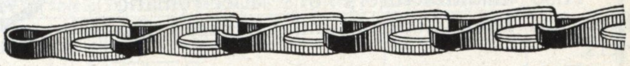
Steel Sash Chain
No. 0, actual size

Size	Gauge, in.	For sash weighing, lb.
A	.054	400
A30	.049	300
1	.042	250
2	.032	150
0	.028	100

Chains for Light Weight Sash—No. 35 and No. 00 steel sash chains. Made of the best cold rolled steel and furnished in plain steel, copper plated and sherardized finishes. Very popular with architects and contractors for apartment house construction. Tensile strength, 250 lb.



No. 35 Steel Sash Chain

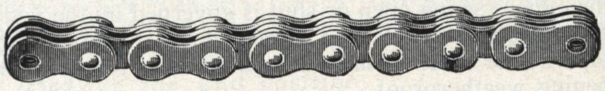


No. 00 Steel Sash Chain
Actual size. For sash weighing up to 100 lb.
Over 200,000 ft. of our No. 00 steel sash chain was used in the Metropolitan Life Insurance Co. development at Astoria, L. I.

Fixtures—Standard types, easily attached. All our chains use the same fixtures with the exception of the No. 00 and No. 35 chains, for which we have designed a special light fixture.

Cable Chain

Eight sizes. Made in both copper and steel, these chains are especially recommended for use where a heavy weight is required, and are especially adapted for use on elevator or fire doors, safety gates, etc. Tensile strengths vary according to size of chain, from 290 lb. for the smallest chain, to 3150 lb. for the largest chain.



Cable Chain

Prominent and Recent Installations

Illinois Merchants Bank Bldg., Chicago, Ill.	64,000 ft.
Marinouchi Bldg., Tokio, Japan	51,000 ft.
Woolworth Bldg., New York, N. Y.	50,300 ft.
Physicians Hospital, Plattsburg, N. Y.	50,000 ft.
Edgewater Beach Hotel, Chicago, Ill.	40,500 ft.
Grant Telephone Bldg., Pittsburgh, Pa.	35,000 ft.
Liberty Bank Bldg., Buffalo, N. Y.	32,000 ft.
Atlantic Refining Co. Bldg., Philadelphia, Pa.	30,000 ft.
North Section Wrigley Bldg., Chicago, Ill.	30,000 ft.
Nicollet Hotel, Minneapolis, Minn.	29,500 ft.
Pacific Mutual Life Insurance Bldg., Los Angeles, Cal.	28,000 ft.
Adolphus Hotel, Dallas, Tex.	25,000 ft.
Tuberculosis Soldiers' Hospital, Milwaukee, Wis.	25,000 ft.
Technical High School, Omaha, Neb.	24,000 ft.
Jonathan Club, Los Angeles, Cal.	20,000 ft.
London Guarantee & Accident Bldg., Chicago, Ill.	20,000 ft.
Commonwealth Atlantic National Bank, Boston, Mass.	20,000 ft.
Olympic Hotel, Seattle, Wash.	20,000 ft.
Housing Group, Bywood, Pa.	20,000 ft.
U. S. Naval Base Hospital, San Diego, Cal.	20,000 ft.
Francesca Apartments, Los Angeles, Cal.	20,000 ft.
Western Reserve University, Cleveland, Ohio	19,446 ft.
North High School, Omaha, Neb.	19,000 ft.
Forest Park School, Baltimore, Md.	18,100 ft.
Matson Bldg., San Francisco, Cal.	18,000 ft.
Plankington Arcade Addition, Milwaukee, Wis.	18,000 ft.
Washington Bldg., Tacoma, Wash.	18,000 ft.
Medical Arts Bldg., Dallas, Tex.	16,000 ft.
Lake Shore Drive Bldg., Chicago, Ill.	16,000 ft.
Temple Bldg., Chicago, Ill.	16,000 ft.
Los Angeles Biltmore Hotel, Los Angeles, Cal.	16,000 ft.

Catalogues

Our latest catalogue on sash chain, or samples of chains will be mailed on request.

ALLITH-PROUTY COMPANY

SUCCESSOR TO ALLITH MFG. CO., CHICAGO, ILL., AND T. C. PROUTY CO., LTD., ALBION, MICH

Manufacturers of Garage, Warehouse and Fire Door Hardware

DANVILLE, ILL.

Products

Folding Sliding Garage Door Hardware; Straight Sliding Garage, Barn and Warehouse Door Hangers; Parallel Door Equipment; "Approved" Sliding and Swinging Fire Door Hardware.

Also manufacturers of "Electromatic" Electrical Door Control, and Overhead Carriers.

For Accordion Door Hangers, see pages 1510-1511.

TRADE-MARK

Folding Sliding Garage Door Hardware, No. 1080

This hardware is designed for folding sliding doors, allowing the doors to fold back at any angle up to 180°, and for use on openings from 6 to 18 ft. wide, depending upon the number of doors used. Single tracks are required for 3, 4, 5 or 6 doors.

With these outfits doors are hinged together and hung to the jambs and are supported at the upper outer corner by a ball bearing swivel hanger, sliding in a trolley track. This arrangement prevents sagging of doors, and permits the use of all or part of the opening at one time.

Space required between the inside wall and car when doors swing open or shut is governed by the width of one door only. When closed, doors fit against the stops in the same manner as a house door, making the opening weatherproof.

This equipment may be applied to the outside of an opening, though protection for the doors when open should be arranged for.

No. 60-X track with adjustable brackets is regularly furnished with No. 1080 equipment. The hangers are of malleable iron construction with vertical and horizontal adjustment, roller bearing metal wheels and ball bearing swivel.

See page following for details.

No. 1081 similar to above but of heavier construction.

No. 71-X track with heavy adjustable brackets and hangers is furnished for medium weight doors. Specify No. 1081 equipment.

See page following for details.

Same as above but of the heaviest construction.

No. 67-X track with heavy adjustable brackets and hangers is furnished for extra heavy doors. Specify No. 1082 equipment.

See the two pages following for details.

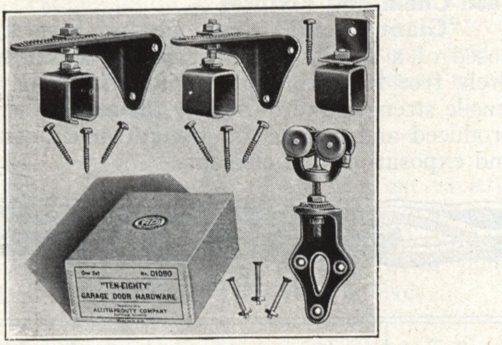
Three-door Outfit Type "3D"—For openings 6 to 9 ft. wide. Two doors hinged together and attached to one jamb, while the third or passage door is hinged to the opposite jamb. Type 3D1 slides and folds all three doors to one jamb.

Four-door Outfit—For openings 8 to 12 ft. wide. Made in two combinations as follows:

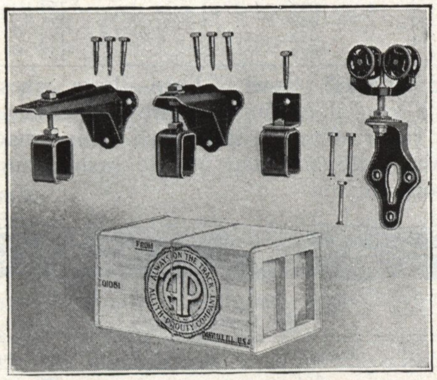
Two doors hinged to each jamb, or three doors hinged to one jamb and one door hinged to opposite jamb.

Five-door Outfit—For openings 10 to 15 ft. wide. Two doors hinged together and hinged to one jamb and three doors hinged together and hinged to opposite jamb.

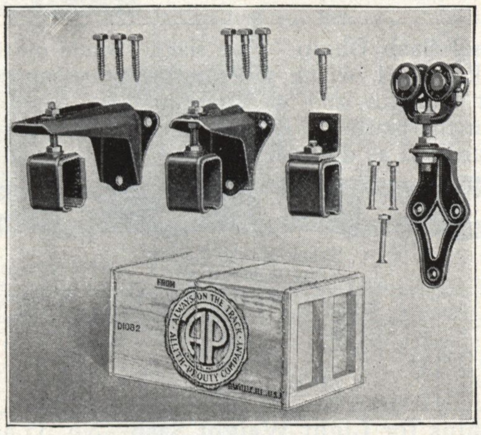
Six-door Outfit—For openings 12 to 18 ft. wide. Three doors hinged to one jamb and three doors hinged to opposite jamb.



No. 1080 Folding Sliding Garage Door Hardware Set

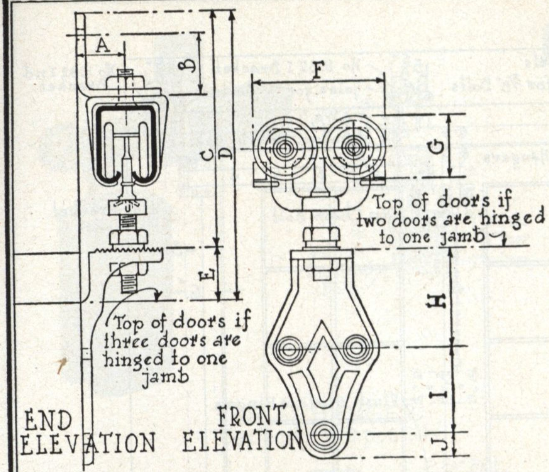


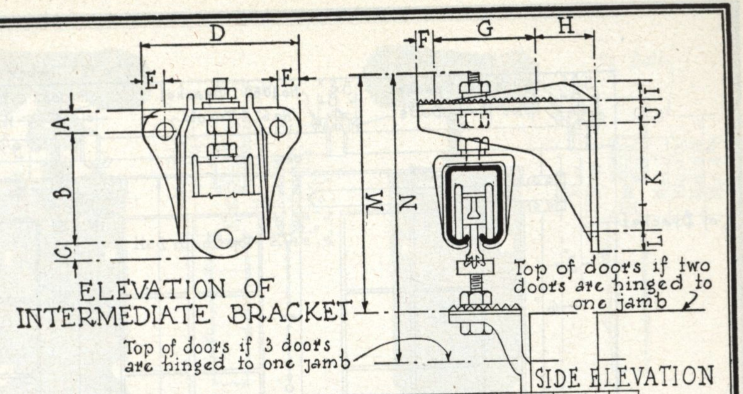
No. 1081 Folding Sliding Garage Door Hardware Set



No. 1082 Folding Sliding Garage Door Hardware Set

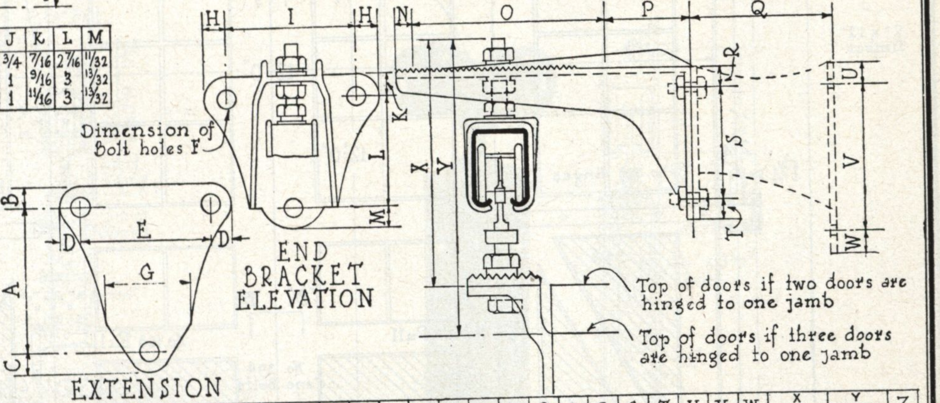
Continued on next page


A
B
C
D
E
F
G
H
I
J
Top of doors if two doors are hinged to one jamb
Top of doors if three doors are hinged to one jamb
END ELEVATION
FRONT ELEVATION


D
E
E
A
B
C
ELEVATION OF INTERMEDIATE BRACKET
Top of doors if 3 doors are hinged to one jamb
F
G
H
I
J
K
L
M
N
Top of doors if two doors are hinged to one jamb
SIDE ELEVATION

TYPE	A	B	C	D	E	F	G	H	I	J	K	L	M		N		O
													MAX.	MIN.	MAX.	MIN.	
1080	13/16	2 15/16	3/4	4 1/2	9/16	13/16	4	3	—	13/16	2 15/16	3/4	7 3/4	6 7/8	9 7/8	9	7/16
1081	7/8	3 5/8	7/8	6 11/16	7/8	11/16	4 1/4	2 3/4	5/8	7/8	3 5/8	7/8	10 3/4	9 1/4	12 13/16	11 5/16	9/16
1082	7/8	4 7/8	7/8	7 3/8	7/8	11/16	4 1/4	2 3/4	5/8	7/8	4 7/8	7/8	11 7/16	9 13/16	13 1/2	11 7/8	11/16

TYPE	A	B	C		D		E	F	G	H	I	J	K	L	M
			MAX.	MIN.	MAX.	MIN.									
1080	1 1/4	1 1/2	7 1/2	6 5/8	9 5/8	8 3/4	2 1/8	4	1 27/32	3 9/16	2 3/4	3/4	7/16	2 7/16	11/32
1081	1 5/8	1 3/4	9 5/8	8 1/8	11 11/16	10 3/16	2 1/16	6 1/8	2 3/4	4 1/4	3 1/4	1	9/16	3	13/32
1082	2	2 5/8	11 5/8	10	13 11/16	2 1/16	2 1/16	5 13/16	2 3/4	4 1/4	4 1/2	1	11/16	3	13/32


H
I
H
N
O
P
Q
R
S
T
U
V
W
K
L
M
X
Y
Dimension of Bolt holes F
B
D
E
D
G
A
C
END BRACKET ELEVATION
EXTENSION
Top of doors if two doors are hinged to one jamb
Top of doors if three doors are hinged to one jamb

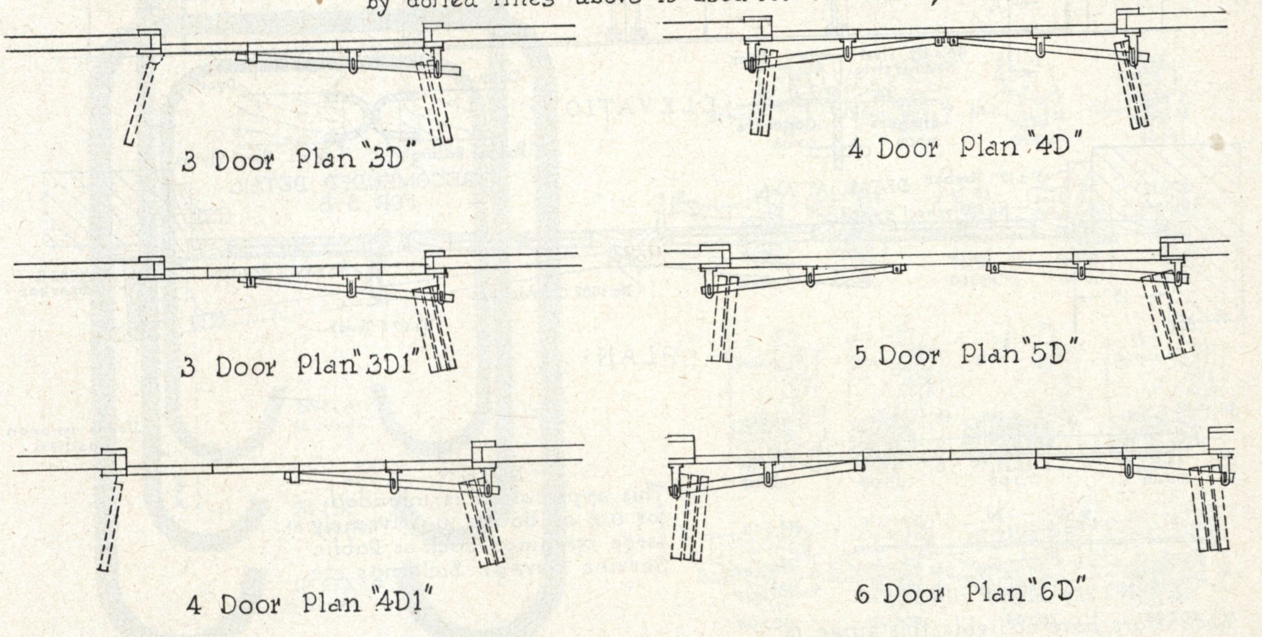
No.1080 Size suitable for doors not over 2 inches thick, 3 feet wide or 150 pounds in weight

No.1081 Size suitable for doors not over 2½ inches thick, 3½ feet wide or 250 pounds in weight.

No 1082 Size suitable for doors not over 3½ inches thick, 4 feet wide or 350 pounds in weight

TYPE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X		Y		Z
																								MAX.	MIN.	MAX.	MIN.	
1080	—	—	—	—	—	7/16	—	3/4	3 3/8		13/16	2 15/16	3/4	27/32	6	3	—	13/16	2 15/16	3/4	—	—	—	7 3/4	6 7/8	9 7/8	9	—
1081	7/8	6 1/4	7/8	7/8	5 5/8	9/16	3 7/8	7/8	4 15/16	5/8	7/8	3 5/8	7/8	11/16	8 3/4	3 1/4	6	7/8	3 5/8	7/8	7/8	6 1/4	7/8	10 3/4	9 1/4	12 13/16	11 5/16	11/16
1082	7/8	6 1/4	7/8	7/8	5 5/8	11/16	3 7/8	7/8	5 5/8	5/8	7/8	4 7/8	7/8	11/16	9	3	6	7/8	4 7/8	7/8	7/8	6 1/4	7/8	11 7/16	9 13/16	13 1/2	11 7/8	11/16

Where doors are to fold back 180° the regular end bracket is used as intermediate and another end bracket plus extension block as shown by dotted lines above is used for the end position.


3 Door Plan "3D"

4 Door Plan "4D"

3 Door Plan "3D1"

5 Door Plan "5D"

4 Door Plan "4D1"

6 Door Plan "6D"

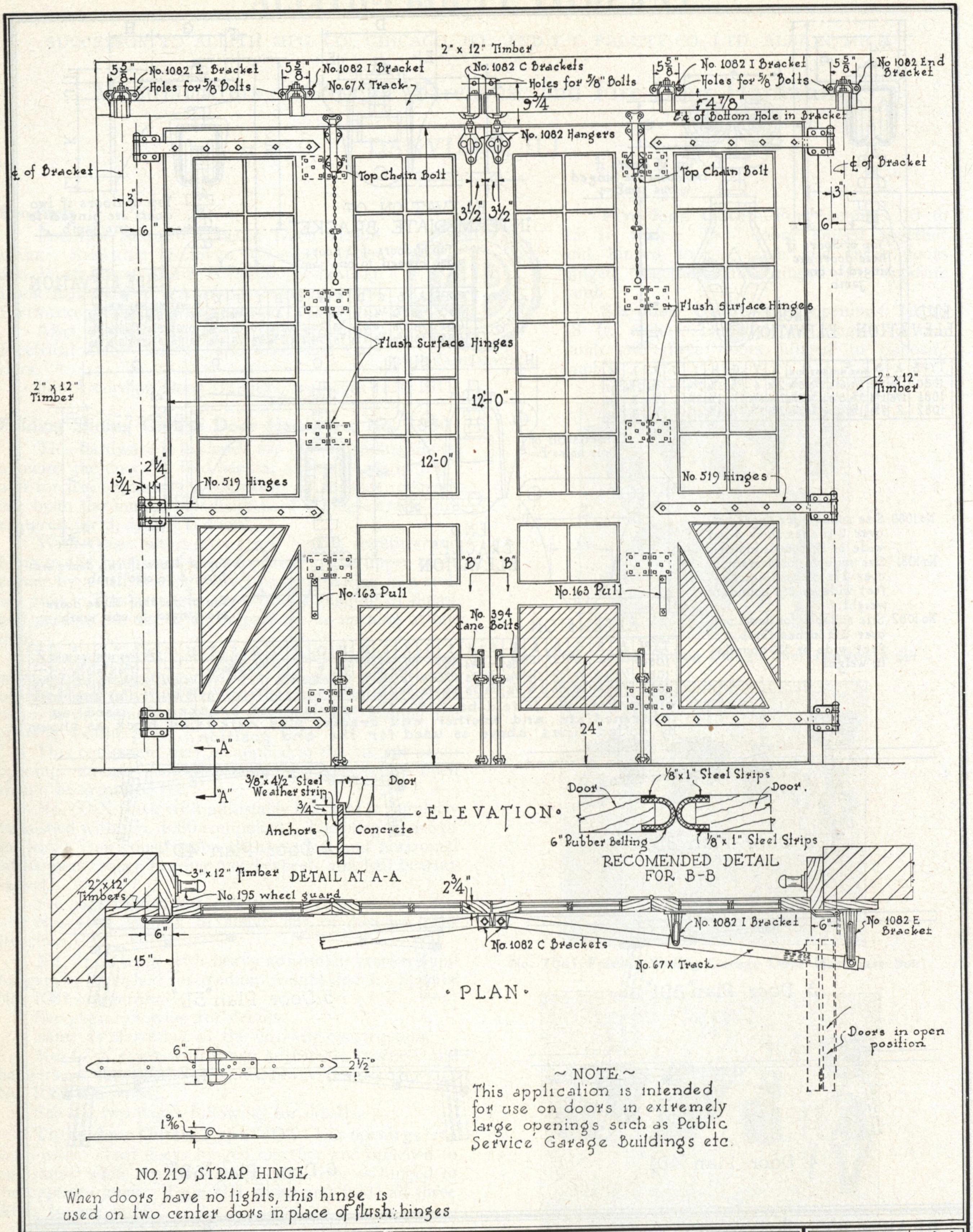
DRAWN BY SWEET'S CATALOGUE SERVICE INC.

DETAILS OF TYPE 1080, 1081 AND 1082 GARAGE DOOR HANGERS ...

NOT DRAWN TO SCALE
DATE AUG '25

DRWG 1

Continued on next page


2" x 12" Timber
5 5/8"
No. 1082 E Bracket
Holes for 5/8" Bolts
5 5/8"
No. 1082 I Bracket
No. 67 X Track
No. 1082 C Brackets
Holes for 5/8" Bolts
9 3/4"
5 5/8"
No. 1082 I Bracket
Holes for 5/8" Bolts
4 7/8"
℄ of Bottom Hole in Bracket
5 5/8"
No 1082 End Bracket
No. 1082 Hangers
℄ of Bracket
Top Chain Bolt
Top Chain Bolt
℄ of Bracket
3"
6"
3 1/2"
3 1/2"
3"
6"
Flush Surface Hinges
Flush Surface Hinges
2" x 12" Timber
12'-0"
2" x 12" Timber
12'-0"
1 3/4"
2 1/4"
No. 519 Hinges
No. 519 Hinges
"B"
"B"
No. 163 Pull
No. 163 Pull
No. 394 Cane Bolts
24"
"A"
"A"
3/8" x 4 1/2" Steel Weather strip
Door
3/4"
Anchors
Concrete
ELEVATION
DETAIL AT A-A
Door
1/8" x 1" Steel Strips
Door
6" Rubber Belting
1/8" x 1" Steel Strips
RECOMENDED DETAIL FOR B-B
3" x 12" Timber
2" x 12" Timbers
No. 195 wheel guard
2 3/4"
6"
15"
No. 1082 I Bracket
No. 1082 C Brackets
6"
No 1082 E Bracket
No. 67 X Track
Doors in open position
PLAN
6"
2 1/2"
1 9/16"
NO. 219 STRAP HINGE
When doors have no lights, this hinge is used on two center doors in place of flush hinges
~ NOTE ~
This application is intended for use on doors in extremely large openings such as Public Service Garage Buildings etc.

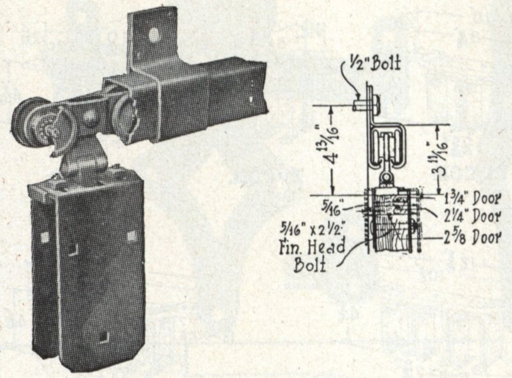
DRAWN BY
SWEET'S CATALOGUE
SERVICE INC.

TYPICAL NO. 1082 APPLICATION FOR HUGE DOOR OPENINGS

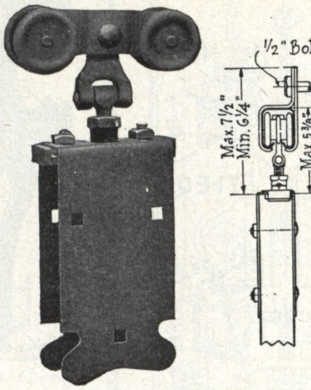
NOT DRAWN TO SCALE
DATE AUG '25

DR'WG 2

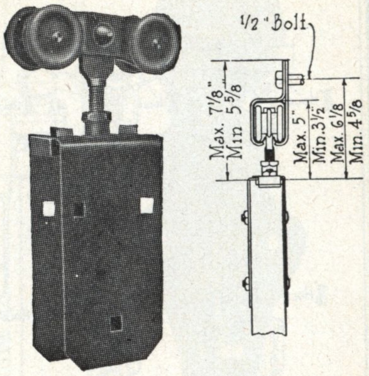
Continued on next page


1/2" Bolt
4 13/16"
3 11/16"
5/16"
1 3/4" Door
2 1/4" Door
2 5/8 Door
5/16" x 2 1/2" Fin. Head Bolt

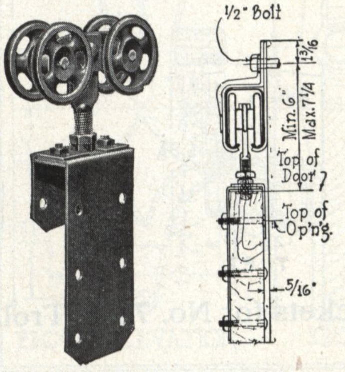
Nº 61 HANGER
Capacity 500 pounds


1/2" Bolt
Max. 7 1/2"
Min. 6 1/4"
Max. 5 3/4"
Min. 4 7/8"
Max. 6 1/2"
Min. 5 1/4"

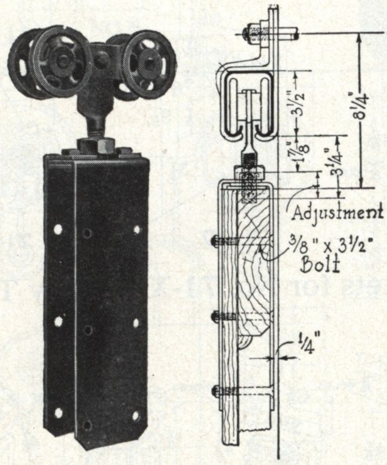
Nº 63 HANGER
Capacity 400 pounds


1/2" Bolt
Max. 7 1/8"
Min. 5 5/8
Max. 5"
Min. 3 1/2
Max. 6 1/8
Min. 4 5/8

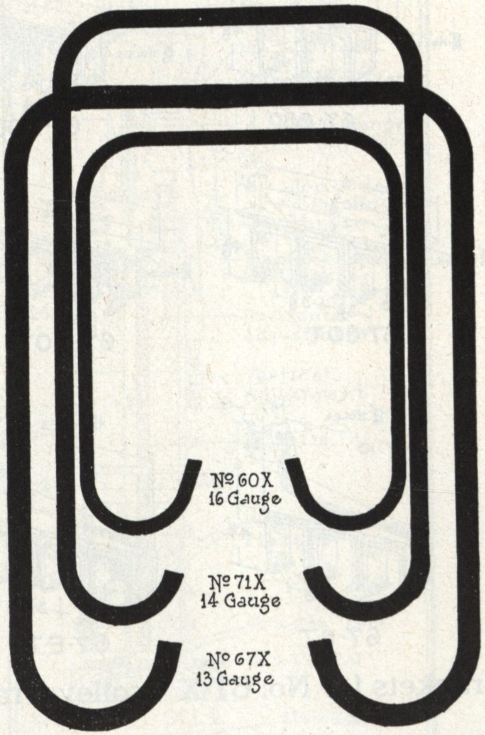
Nº 66 HANGER
Capacity 400 pounds


1/2" Bolt
1 3/16"
Min. 6"
Max. 7 1/4
Top of Door
Top of Op'n'g.
5/16"

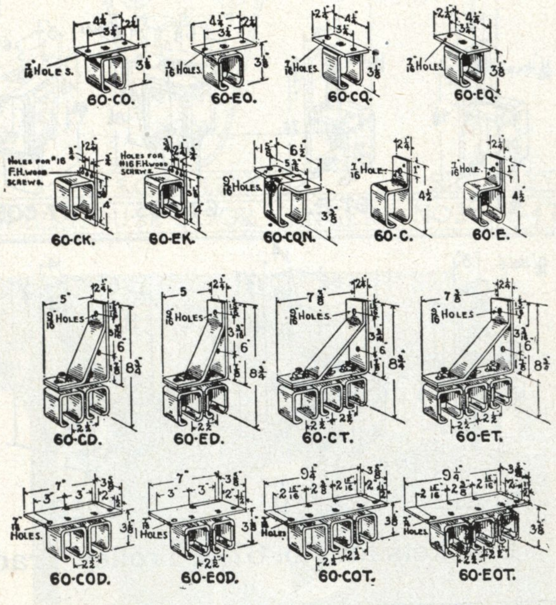
Nº 72 HANGER
Capacity 700 pounds


3 1/2"
8 1/4"
1 7/8"
3 1/4
Adjustment
3/8" x 3 1/2" Bolt
1/4"

Nº 68 HANGER
Capacity 1000 pounds


Nº 60X
16 Gauge
Nº 71X
14 Gauge
Nº 67X
13 Gauge

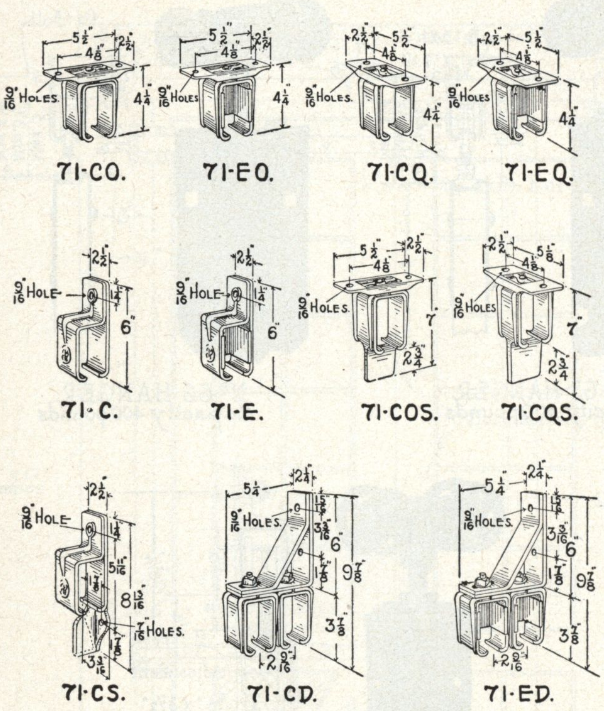
FULL SIZE DETAILS OF TROLLEY TRACKS


60-CO.
60-EO.
60-CQ.
60-EQ.
60-CK.
60-EK.
60-CQN.
60-C.
60-E.
60-CD.
60-ED.
60-CT.
60-ET.
60-COD.
60-EOD.
60-COT.
60-EOT.

BRACKETS FOR Nº 60 X TROLLEY TRACK

DRAWN BY SWEETS CATALOGUE SERVICE, INC.	DETAILS OF HANGERS TRACKS & BRACKETS	NOT DRAWN TO SCALE DATE AUG'25	DRWG 3

Continued on next page

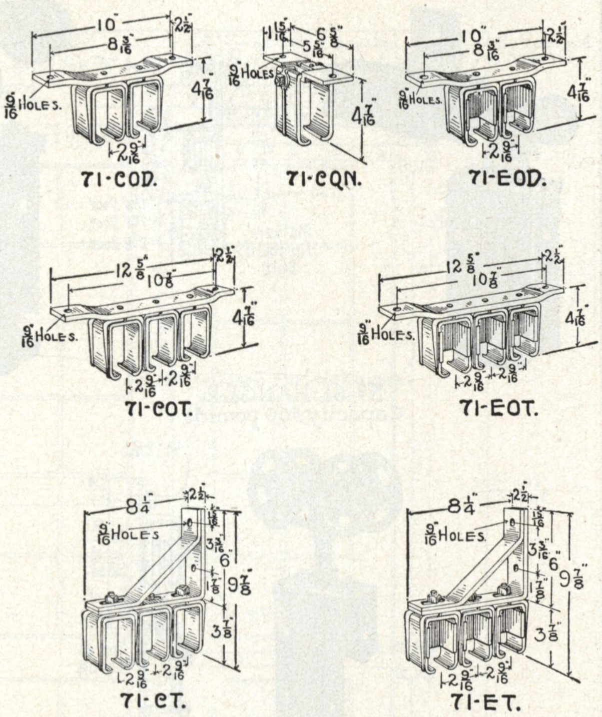

5½"
4⅝"
2½"
9/16" HOLES
4¼"
2½"
9/16" HOLE
1¼"
6"
7"
2¾"
5 1/16"
1⅞"
8 13/16"
7/16" HOLES
3 3/16"
5¼"
2¼"
9/16" HOLES
3 3/16"
9⅞"
3⅞"
2 9/16"

71-CO. 71-EO. 71-CQ. 71-EQ.

71-C. 71-E. 71-COS. 71-CQS.

71-CS. 71-CD. 71-ED.

Brackets for No. 71-X Trolley Track

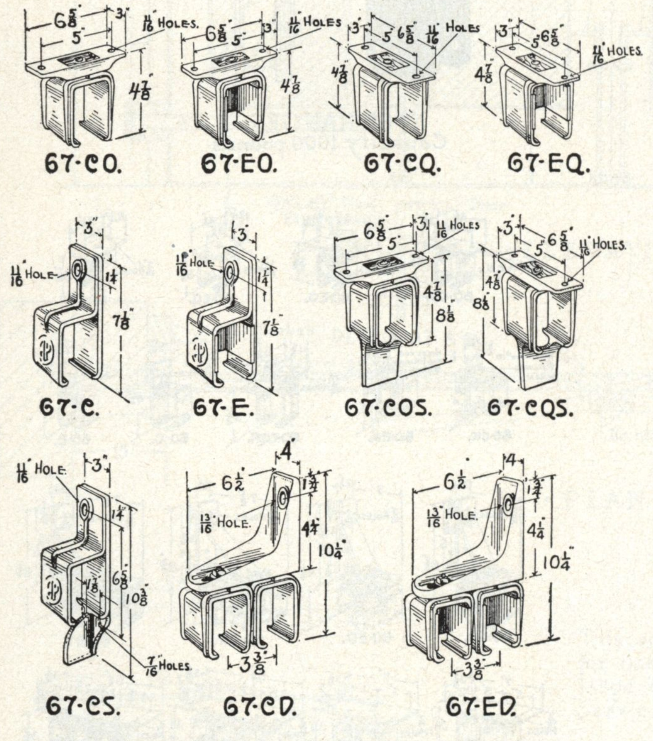

10"
2½"
8 3/16"
9/16" HOLES
4 7/16"
2 9/16"
1 15/16"
6⅝"
5⅝"
12⅝"
10⅞"
8¼"
6"
1⅞"
9⅞"
3⅞"

71-COD. 71-CQN. 71-EOD.

71-COT. 71-EOT.

71-CT. 71-ET.

Brackets for No. 71-X Trolley Track

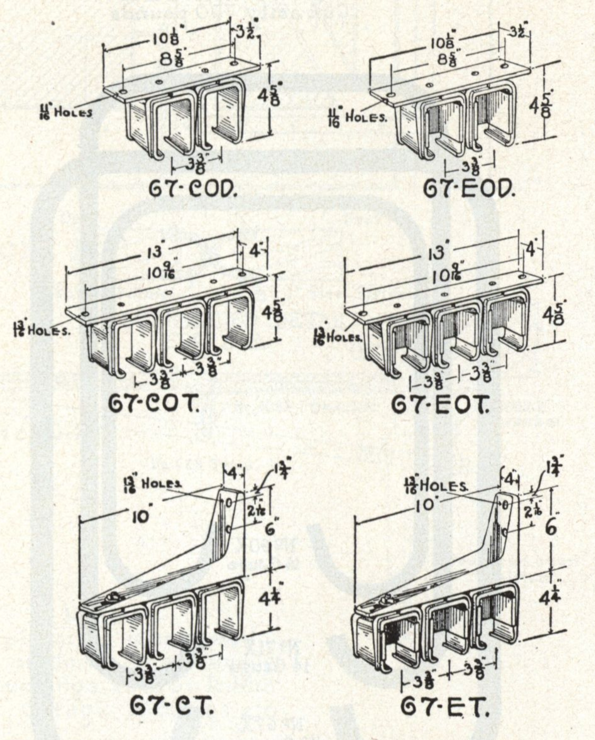

6⅝"
5"
3"
11/16" HOLES
4⅞"
11/16" HOLE
1¼"
7⅝"
8⅝"
1⅞"
10⅝"
7/16" HOLES
4"
6½"
13/16" HOLE
4¼"
10¼"
3⅜"

67-CO. 67-EO. 67-CQ. 67-EQ.

67-C. 67-E. 67-COS. 67-CQS.

67-CS. 67-CD. 67-ED.

Brackets for No. 67-X Trolley Track


10⅝"
3½"
8⅝"
11/16" HOLES
4⅝"
3⅜"
13"
4"
10 9/16"
13/16" HOLES
10"
6"
4¼"

67-COD. 67-EOD.

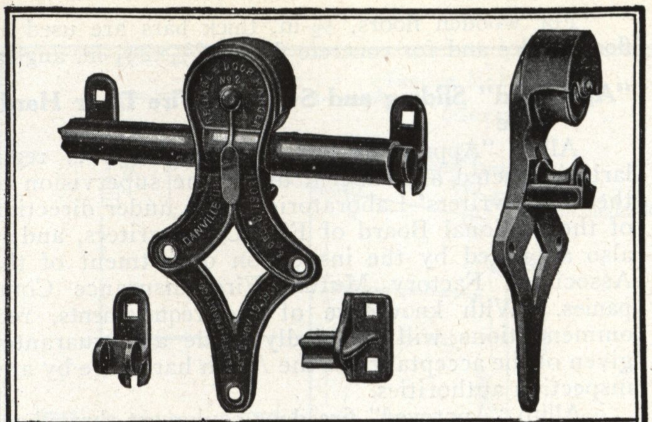
67-COT. 67-EOT.

67-CT. 67-ET.

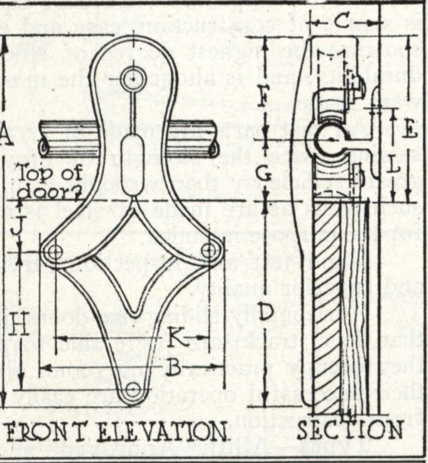
Brackets for No: 67-X Trolley Track

DRAWN BY ALLITH-PROUTY COMPANY	DETAILS OF TRACK BRACKETS	NOT DRAWN TO SCALE DATE AUG.'25	DRWG 4

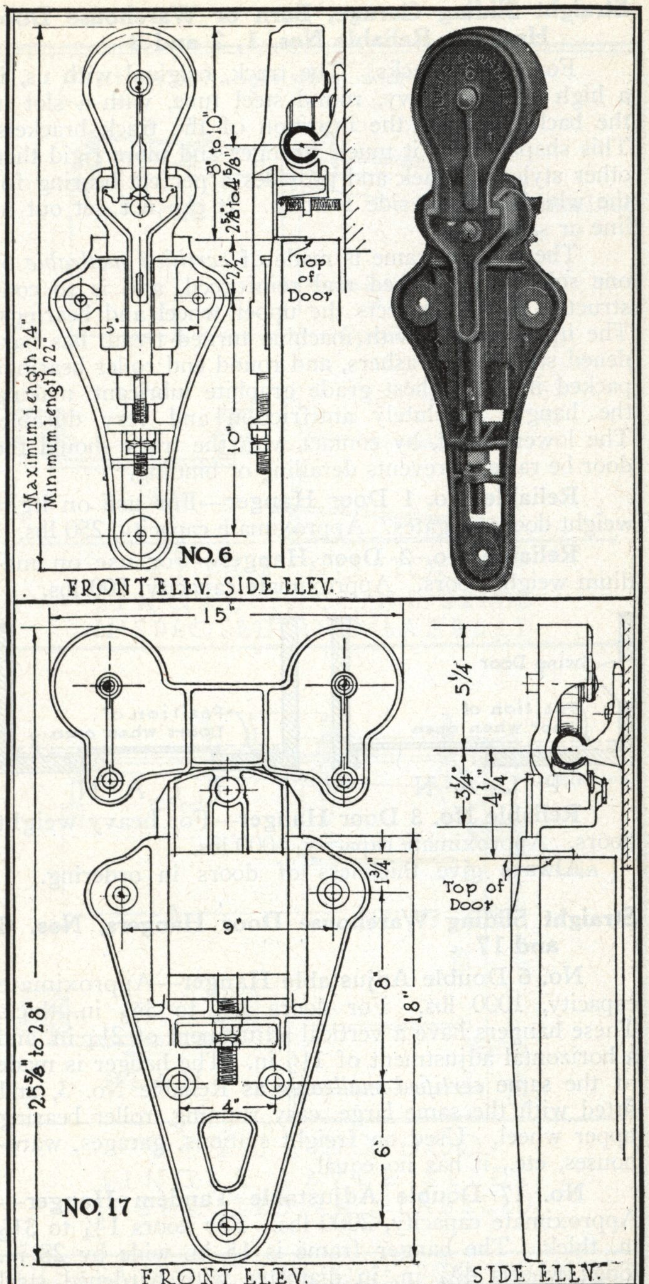
Continued on next page



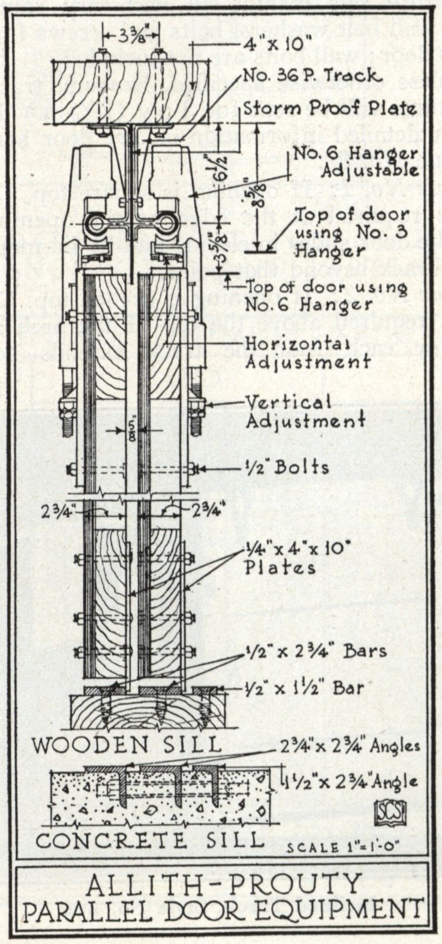
	NO.1	NO.2	NO.3
A	9½"	12"	21⅜"
B	4"	6"	7¾"
C	2⅛"	2¼"	3¼"
D	5¼"	6½"	14"
E	4⅛"	5¼"	7⅜"
F	2¾"	3⅜"	5¼"
G	1⅜"	1⅞"	2⅛"
H	3½"	4⅜"	10"
J	1³⁄₁₆"	1⅜"	2½"
K	3"	4⅜"	5"
L	2¼"	3"	3⅝"


A
Top of door
J
H
K
B
D
C
F
G
E
L
FRONT ELEVATION.
SECTION

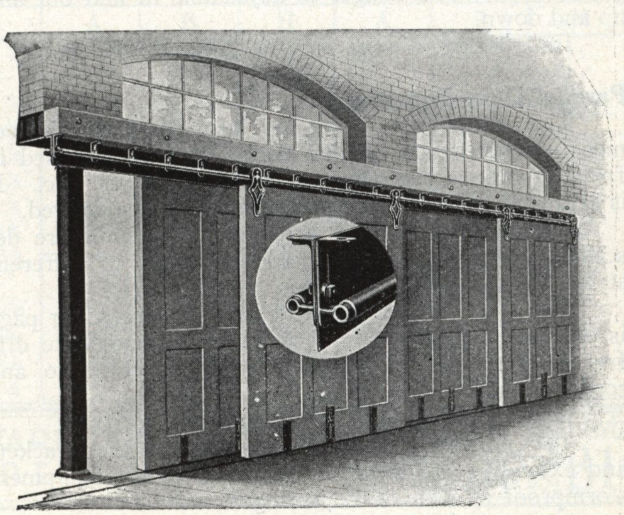
RELIABLE DOOR HANGERS NO.1, NO.2 & NO.3


Maximum Length 24"
Minimum Length 22"
8" to 10"
2⅜" to 4⅝"
2½"
5"
10"
Top of Door
NO.6
FRONT ELEV.
SIDE ELEV.
15"
5¼"
3¼"
4¼"
3¼"
Top of Door
9"
25⅝" to 28"
18"
4"
6"
NO.17
FRONT ELEV.
SIDE ELEV.

WAREHOUSE DOOR HANGERS NOS. 6 & 17


3⅜"
4" x 10"
No. 36 P. Track
Storm Proof Plate
No. 6 Hanger Adjustable
6½"
8⅝"
3⅝"
Top of door using No. 3 Hanger
Top of door using No. 6 Hanger
Horizontal Adjustment
Vertical Adjustment
½" Bolts
2¾"
2¾"
¼" x 4" x 10" Plates
½" x 2¾" Bars
½" x 1½" Bar
WOODEN SILL
2¾" x 2¾" Angles
1½" x 2¾" Angle
CONCRETE SILL
SCALE 1"=1'-0"

ALLITH-PROUTY
PARALLEL DOOR EQUIPMENT



Showing Application of Parallel Door Equipment

Continued on next page

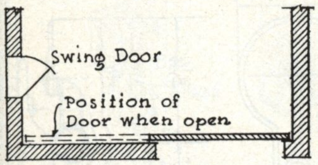
Straight Sliding Garage, Barn or Warehouse Door Hangers, Reliable Nos. 1, 2 and 3

For round tracks. The track, original with us, is a high carbon, heavy, round steel tube, with a slot in the back, allowing the insertion of the track brackets. This shape makes it much stronger and more rigid than other styles of track and provides a perfect bearing for the wheel with no side friction. It can not get out of line or sag.

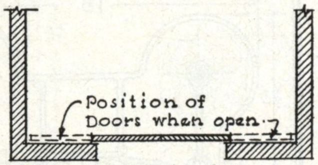
The hanger frame is made of *certified malleable* of one solid piece, ribbed and reinforced, and is so constructed that it protects the upper wheel and bearings. The upper wheel, with machine turned tread, has hardened steel axle, washers, and round end roller bearings packed in the highest grade graphite lubricant, making the hanger absolutely antifriction and very durable. The lower wheel, by contact with the track should the door be raised, prevents derailing or binding.

Reliable No. 1 Door Hanger—For use on light weight doors or gates. Approximate capacity, 250 lbs.

Reliable No. 2 Door Hanger—For use on medium weight doors. Approximate capacity, 500 lbs.



PLAN



PLAN

Reliable No. 3 Door Hanger—For heavy weight doors. Approximate capacity, 1000 lbs.

Always give thickness of doors in ordering.

Straight Sliding Warehouse Door Hangers, Nos. 6 and 17

No. 6 Double Adjustable Hanger—Approximate capacity, 1000 lbs. For doors $1\frac{3}{4}$ to $3\frac{3}{8}$ in. thick. These hangers have a vertical adjustment of $2\frac{1}{4}$ in. and a horizontal adjustment of $1\frac{1}{2}$ in. The hanger is made of the same *certified malleable* as Reliable No. 3, and fitted with the same large, easy running, roller bearing upper wheel. Used on freight stations, garages, warehouses, etc., it has no equal.

No. 17 Double Adjustable Tandem Hanger—Approximate capacity, 2000 lbs. For doors $1\frac{3}{4}$ to $3\frac{1}{2}$ in. thick. The hanger frame is 15 in. wide by 28 in. long; wheels $4\frac{3}{4}$ in. in diameter with hardened steel bushings and roller bearings. The axles are fitted with grease cups. The hanger is adjustable in and out and up and down.

In ordering, always specify thickness of doors.

Parallel Door Equipment

This outfit is designed for insuring perfect movement of continuous parallel doors such as are used in freight stations, warehouses, public garages, etc. It is arranged to permit an opening at any place desired.

Nos. 2, 3, 6 and 17 hangers, as hereinbefore described, are used to accommodate doors of different styles, weights and thicknesses.

The track shown in illustration on preceding page is assembled complete in sections to accommodate different openings. It is suitable for attaching to any construction.

Installation is simple and alignment perfect.

The parting strip fastened between the brackets and extending below top of door makes the equipment stormproof as well as the strongest.

For wooden floors, $\frac{1}{2}$-in. thick bars are used as floor guides and for concrete floors, $2\frac{3}{4}$x$2\frac{3}{4}$-in. angles.

"Approved" Sliding and Swinging Fire Door Hardware

Allith "Approved" fire door hardware is regularly inspected and labeled under the supervision of the Underwriters' Laboratories, Inc., under direction of the National Board of Fire Underwriters, and is also approved by the inspection department of the Associated Factory Mutual Fire Insurance Companies. With knowledge of the requirements, recommendations will be gladly made and guarantee given of the acceptance of the Allith hardware by any inspection authorities.

Allith "Approved" fire door equipment throughout is simple of construction, easy and economical to apply, showing the highest degree of efficiency, strength and durability, and is altogether the most satisfactory hardware made.

All cast parts are made of *certified malleable,* possessing twice the strength of gray iron castings and greater efficiency than wrought iron. The steel used in such parts as are made of steel is all carefully selected for the purpose intended.

Rigid test and inspection service insures uniform and superior quality.

Horizontally sliding fire doors, inclined track rather than level track, are preferable to swinging doors, for they occupy practically no room, and the openings for their successful operation are easily kept clear and free from obstruction.

Types—Allith "Approved" sliding and swinging fire door hardware is furnished to meet practically every requirement.

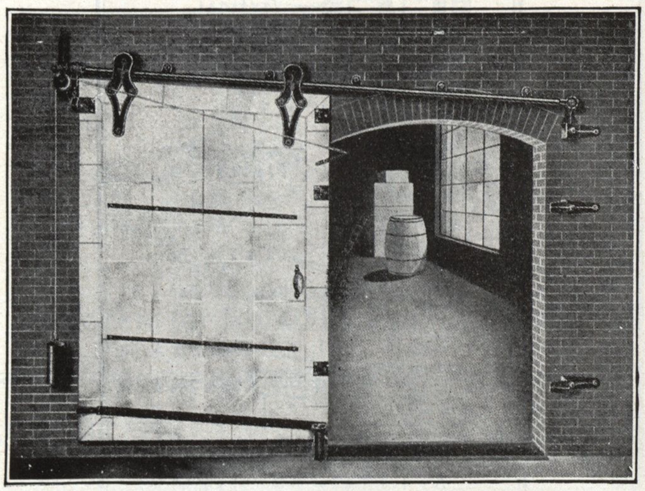
Fixture sets include all necessary counterbalance weight, wall bolt washers, bolts and screws for attaching parts to door; wall bolts are not included.

Unless otherwise specified, hangers, track brackets and fixtures will be sent for 3-ply ($2\frac{5}{8}$-in.) doors.

For detailed information on fire door hardware see Catalogue No. 87.

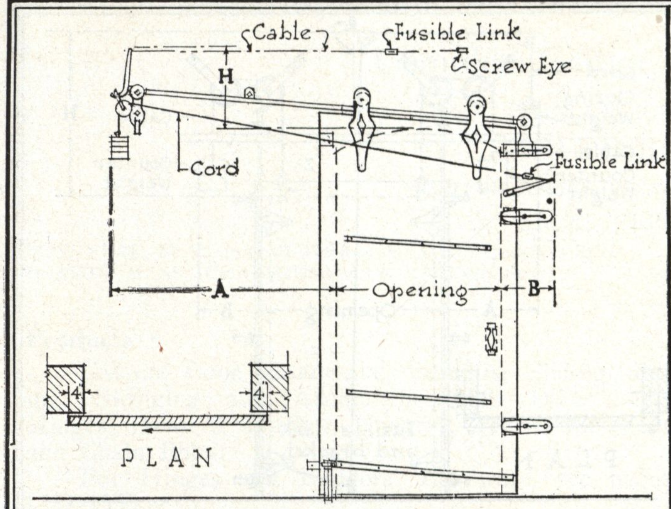
Note No. 1: If opening is square top, 12-in. headroom is required at the edge of the opening towards which the door slides in closing and $\frac{3}{4}$ in. more for each foot of track beyond that point.

Note No. 2: If opening is arched top, 12-in. headroom is required above the top of the arch and $\frac{3}{4}$ in. more for each foot the track extends beyond the center.

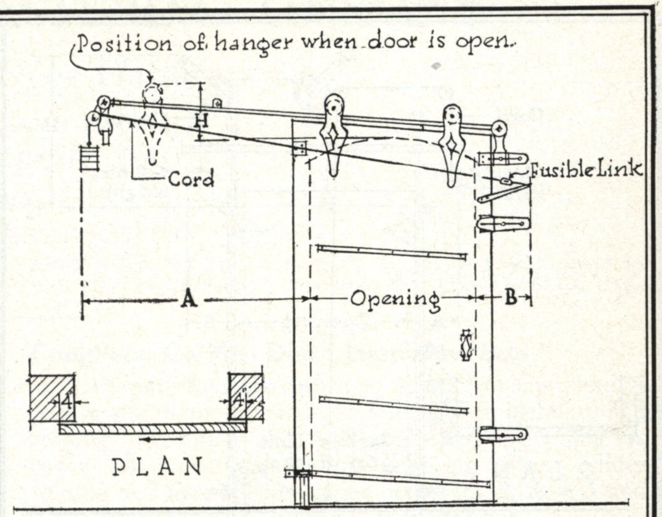


Inclined Track, Style No. 500

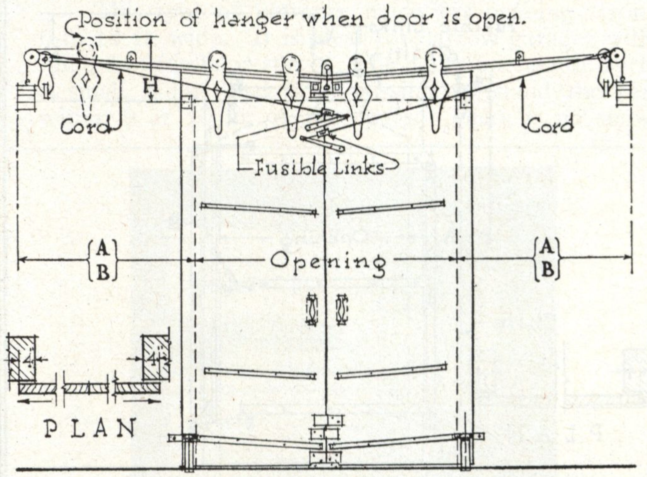
Continued on next page


Cable
Fusible Link
Screw Eye
H
Cord
Fusible Link
A
Opening
B
4
4
PLAN

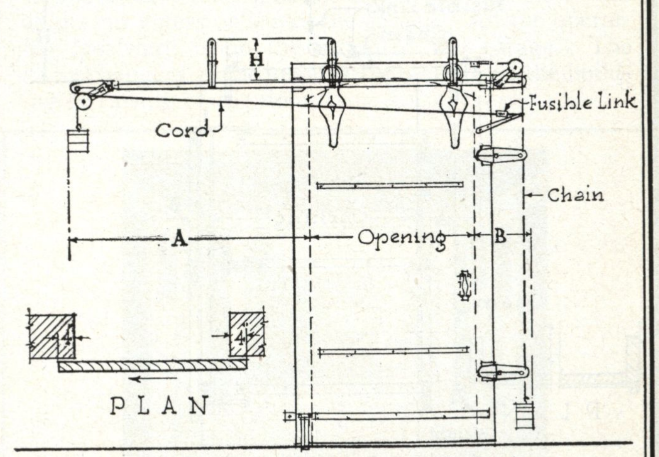
STYLE NO. 500
SINGLE INCLINE SLIDE
INSPECTED AND LABELED


Position of hanger when door is open.
H
Cord
Fusible Link
A
Opening
B
4
4
PLAN

STYLE NO. 700
SINGLE INCLINE SLIDE
INSPECTED AND LABELED


Position of hanger when door is open.
H
Cord
Cord
Fusible Links
A
B
Opening
A
B
4
4
Cord
PLAN

STYLE NO. 1700
DOUBLE INCLINE SLIDE
INSPECTED AND LABELED


H
Fusible Link
Cord
Chain
A
Opening
B
4
4
PLAN

STYLE NO. 900
SINGLE LEVEL SLIDE
INSPECTED AND LABELED

TABLE GIVING MINIMUM HEADROOM AND CLEARANCE AT SIDE OF DOOR OPENING

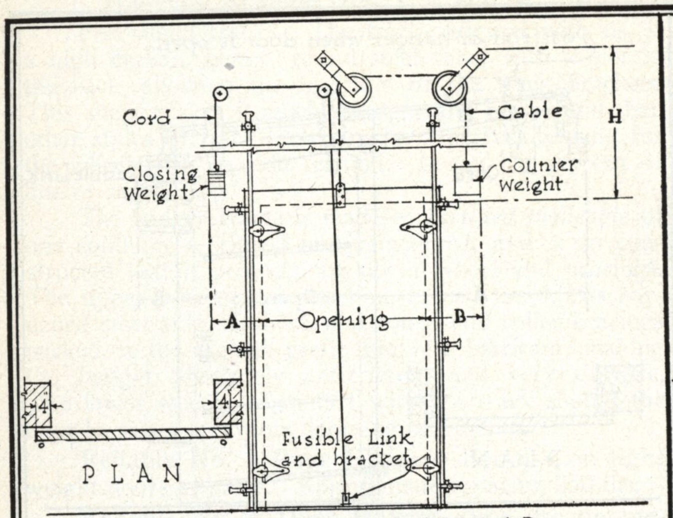
WIDTH OF DOOR OPENING	500			700			1700			900		
	A	B	H	A	B	H	A	B	H	A	B	H
2' — 6"	3'-10"	1'-2"	1'-8⅜"	3'-10"	1'-2"	1'-3⅜"	2'-3"	2'-3"	1'-2"	4'-1"	1'-3"	11"
3' — 0"	4'-4"	1'-2"	1'-9"	4'-4"	1'-2"	1'-4"	2'-6"	2'-6"	1'-2⅜"	4'-7"	1'-3"	11"
3' — 6"	4'-10"	1'-2"	1'-9⅝"	4'-10"	1'-2"	1'-4⅝"	2'-9"	2'-9"	1'-2¾"	5'-1"	1'-3"	11"
4' — 0"	5'-4"	1'-2"	1'-10¼"	5'-4"	1'-2"	1'-5¼"	3'-0"	3'-0"	1'-3⅛"	5'-7"	1'-3"	11"
4' — 6"	5'-10"	1'-2"	1'-10⅞"	5'-10"	1'-2"	1'-5⅞"	3'-3"	3'-3"	1'-3½"	6'-1"	1'-3"	11"
5' — 0"	6'-4"	1'-2"	1'-11½"	6'-4"	1'-2"	1'-6½"	3'-6"	3'-6"	1'-3⅞"	6'-7"	1'-3"	11"
5' — 6"	6'-10"	1'-2"	2'-0⅛"	6'-10"	1'-2"	1'-7⅛"	3'-9"	3'-9"	1'-4¼"	7'-1"	1'-3"	11"
6' — 0"	7'-4"	1'-2"	2'-0¾"	7'-4"	1'-2"	1'-7¾"	4'-0"	4'-0"	1'-4⅝"	7'-7"	1'-3"	11"
6' — 6"	7'-10"	1'-2"	2'-1⅜"	7'-10"	1'-2"	1'-8⅜"	4'-3"	4'-3"	1'-5"	8'-1"	1'-3"	11"
7' — 0"	8'-4"	1'-2"	2'-2"	8'-4"	1'-2"	1'-9"	4'-6"	4'-6"	1'-5⅜"	8'-7"	1'-3"	11"
7' — 6"	8'-10"	1'-2"	2'-2⅝"	8'-10"	1'-2"	1'-9⅝"	4'-9"	4'-9"	1'-5¾"	9'-1"	1'-3"	11"
8' — 0"	9'-4"	1'-2"	2'-3¼"	9'-4"	1'-2"	1'-10¼"	5'-0"	5'-0"	1'-6⅛"	9'-7"	1'-3"	11"
8' — 6"	9'-10"	1'-2"	2'-3⅞"	9'-10"	1'-2"	1'-10⅞"	5'-3"	5'-3"	1'-6½"	10'-1"	1'-3"	11"
9' — 0"	10'-4"	1'-2"	2'-4½"	10'-4"	1'-2"	1'-11½"	5'-6"	5'-6"	1'-6⅞"	10'-7"	1'-3"	11"

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

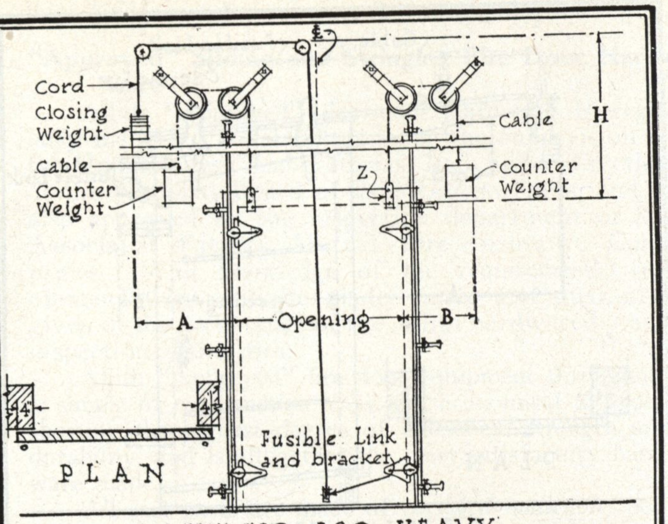
ALLITH PROUTY HARDWARE FOR AUTOMATIC
SLIDING FIRE DOOR

SCALE ¼" EQUALS 1'-0"
DATE·AUG. 25
DRWG B1

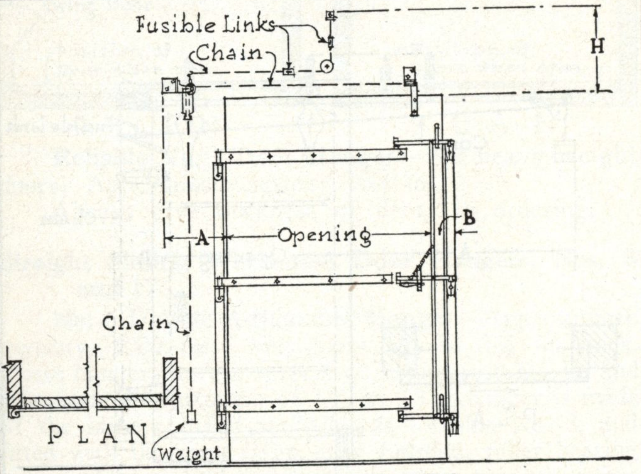
Continued on next page


Cord
Cable
H
Closing Weight
Counter Weight
A
Opening
B
4
4
Fusible Link and bracket
PLAN

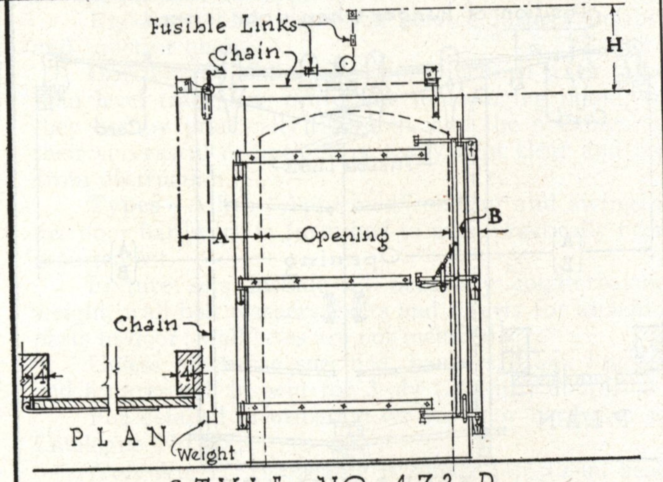
STYLE NO. 380 REGULAR
VERTICAL SLIDE—DOORS UNDER 300 POUNDS
NOT LABELED


Cord
Closing Weight
Cable
Counter Weight
Z
Cable
H
Counter Weight
A
Opening
B
4
4
Fusible Link and bracket
PLAN

STYLE NO. 380 HEAVY
VERTICAL SLIDE—DOORS 300 LBS. AND OVER
NOT LABELED


Fusible Links
Chain
H
A
Opening
B
Chain
PLAN
Weight

STYLE NO. 473
SINGLE SWING FLUSH
INSPECTED AND LABELED


Fusible Links
Chain
H
A
Opening
B
Chain
4
4
PLAN
Weight

STYLE NO. 473-R
SINGLE SWING OVERLAP
INSPECTED AND LABELED

TABLE GIVING MINIMUM HEADROOM AND CLEARANCE AT SIDE OF DOOR OPENING

WIDTH OF DOOR OPENING	380 REGULAR			380 HEAVY			473			473-R		
	A	B	H	A	B	H	A	B	H	A	B	H
2'—6"	1'-1"	1'-8"	Height of Door plus 1'-7"	2'-3"	1'-9"	Height of Door plus 2'-0"	1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
3'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
3'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
4'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
4'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
5'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
5'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
6'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
6'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
7'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
7'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
8'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
8'—6"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"
9'—0"	1'-1"	1'-8"		2'-3"	1'-9"		1'-4"	2½"	1'-9"	1'-9"	6½"	1'-9"

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SWEET'S CATALOGUE
SERVICE, INC.

ALLITH PROUTY HARDWARE FOR AUTOMATIC
SLIDING AND SWINGING FIRE DOORS

SCALE ¼" EQUALS 1'-0"
DATE-AUG.'25

DR'WG
B2

McKINNEY MANUFACTURING COMPANY

Complete Garage Door Hardware Sets

MAIN OFFICE AND FACTORY
PITTSBURGH, PA.

WESTERN OFFICE, 938 Wrigley Building, CHICAGO, ILL.

SALES REPRESENTATIVES
NEW YORK, N. Y., John H. Graham & Co., 113 Chambers Street
BOSTON, MASS., Crowe-McGarvey Co., 132 Pearl Street
BALTIMORE, MD., Henry Keidel & Co., 405-407 West Redwood Street
PACIFIC COAST, John T. Rowntree, Inc., LOS ANGELES, CAL.

Products

Garage Door Hardware, including Sliding-folding, Swinging and Around-the-corner Door Sets; Hinges, Holders, Latches, Hangers, Track, and Foot and Chain Bolts.

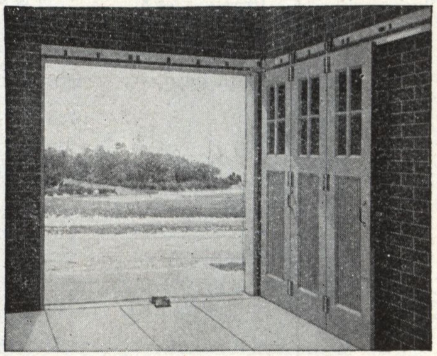
For Hinges and Builders' Hardware, see pages 1537-1555.

Complete Garage Door Hardware Sets

All our door hardware is packed in complete sets with every item except locks needed for installation including directions and working drawings. The sets cover all requirements for swinging doors, sliding-folding and around-the-corner doors for 2, 3, 4, 5 and 6 door entrances and different combinations.

AROUND-THE-CORNER GARAGE DOOR HARDWARE SETS (COMPLETE)

This type of entrance made for openings from 6 to 12 ft. wide. It is ideal for narrow garages with limited inside floor space. The doors operate on such a small radius that it is possible to stand the car within 9 or 10 in. of the doors. There is no snow to shovel in winter and the doors can not blow shut as the car enters or leaves the garage. All the operating hardware is on the inside of the garage. The swivel hangers are adjustable for settling of the building or raising of the floor.



No. 9023

No. 9023 Three-door Around-the-corner Garage Door Hardware Set—For Openings 6 to 10 Feet Wide

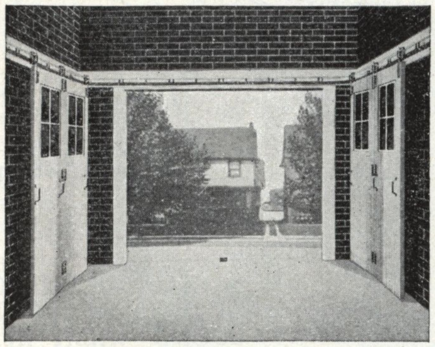
The three doors are hinged together as a unit and equipped with swivel hangers to roll on a continuous track around one corner and along the side wall, resting flat against the side wall on the inside when open.

Three doors should be the same width not to exceed 3 ft. 4 in. and a minimum headroom of 8 in. must be allowed.

The end door serves as a passage door. It is necessary to have a minimum jamb space each side of opening of not less than 2½ in.

HARDWARE IN BOX FOR SET NO. 9023

1 curved section of track
8 straight sections of track (each 28 in. long)
2 swivel hangers with special hinge door plates
1 swivel hanger with regular door bracket
2 pairs hinges, tight pin (5x5 in.)
4 door handles or pulls
1 floor guide (2 pieces)
No lock is included



No. 9026

Double Two-door Around-the-corner Garage Door Hardware Set No. 9026—For Openings 8 to 12 Feet Wide

Four doors are hinged together in pairs, equipped with swivel hangers to roll two doors around one corner and two doors around the other corner and to lie flat against the wall on both sides of the opening. Four doors should be of equal width not to exceed 3 ft. each. A separate passage door is not required. A specially constructed floor guide acts as a bumper and prevents the doors being moved when locked with padlock and safety hasp on the outside.

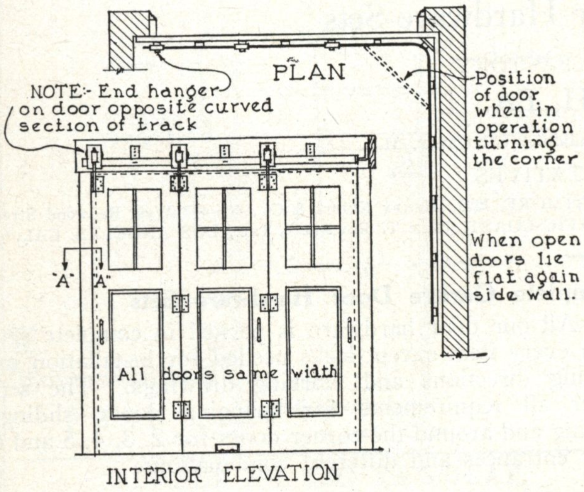
It is necessary to have 18 in. at side of jamb on each side of entrance to allow doors to lie flat against the wall.

HARDWARE IN BOX FOR SET NO. 9026

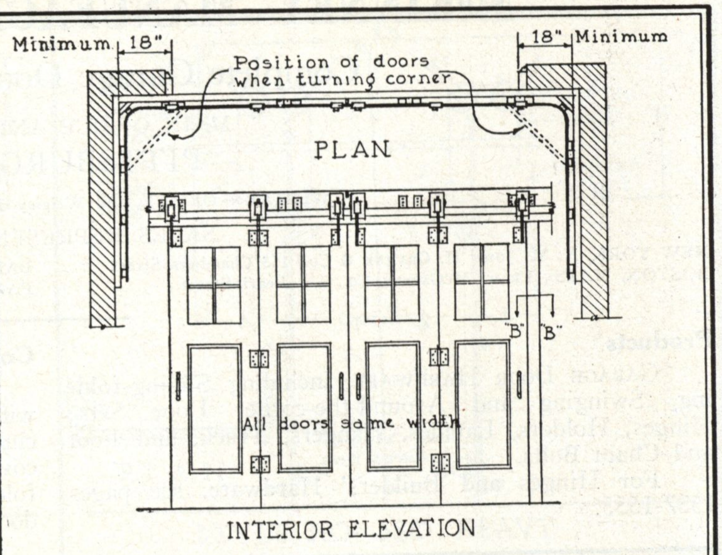
2 curved sections of track
11 straight sections of track (each 28 in. long)
2 swivel hangers with special hinge door plates
4 swivel hangers with regular door plates
2 pairs hinges, tight pin (5x5 in.)
6 door handles or pulls
1 adjustable floor guide

Complete installation drawings and directions and all screws and bolts in each box. All items finished black Japan

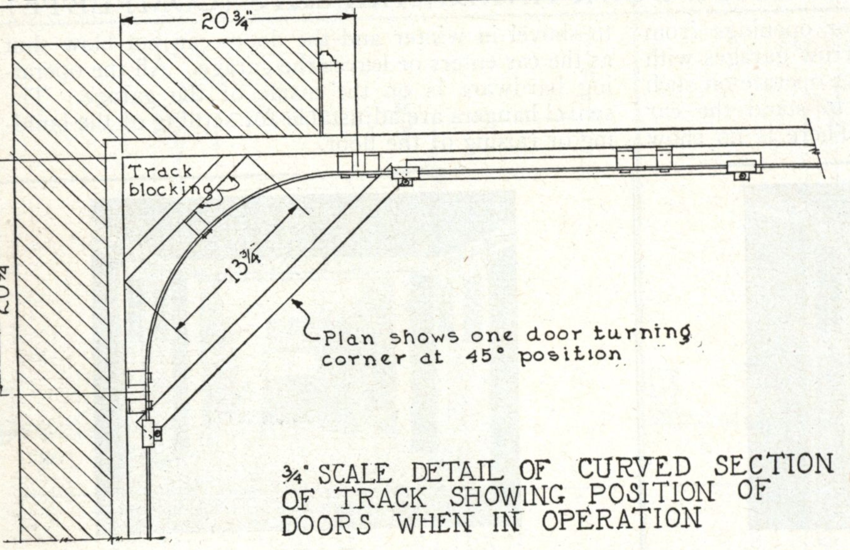
Continued on next page


PLAN
NOTE:- End hanger on door opposite curved section of track
Position of door when in operation turning the corner
When open doors lie flat again side wall.
"A" "A"
All doors same width
INTERIOR ELEVATION

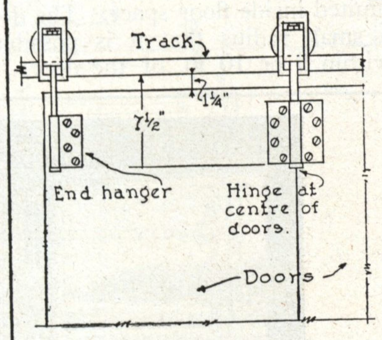
DETAILS OF THREE DOOR SET NO. 9023.


Minimum 18"
18" Minimum
Position of doors when turning corner
PLAN
"B" "B"
All doors same width
INTERIOR ELEVATION

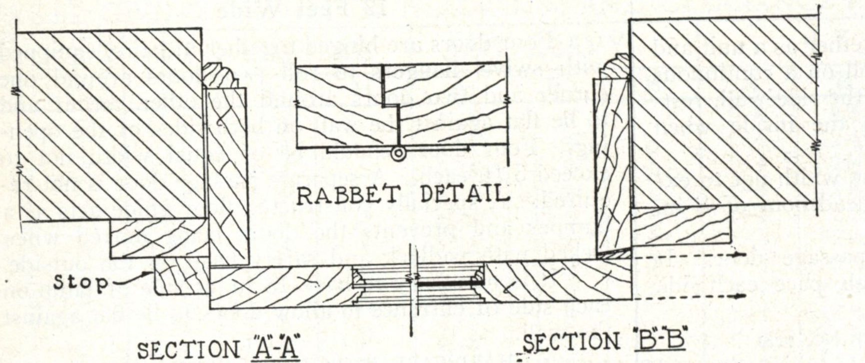
DETAILS OF FOUR DOOR SET NO. 9026.


20¾"
Track blocking
13¾"
20¾"
Plan shows one door turning corner at 45° position

¾" SCALE DETAIL OF CURVED SECTION OF TRACK SHOWING POSITION OF DOORS WHEN IN OPERATION


Track
1¼"
7½"
End hanger
Hinge at centre of doors.
Doors

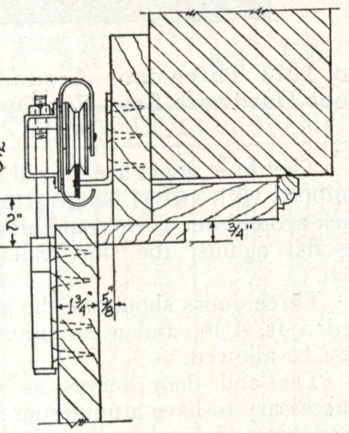
ELEVATION SHOWING END AND CENTRE HANGER


RABBET DETAIL
Stop

SECTION "A-A" FOR THREE DOOR SET

SECTION "B-B" FOR FOUR DOOR SET

JAMB SECTIONS



SECTION THROUGH HEAD OF DOOR SHOWING HANGER

DETAILS OF HANGER

McKINNEY MANUFACTURING COMPANY	DETAILS OF AROUND THE CORNER COMPLETE GARAGE DOOR SETS.	SCALE 3/16 & 1½ EQUAL 1-0" DATE AUG '24	DRWG 1

Continued on next page

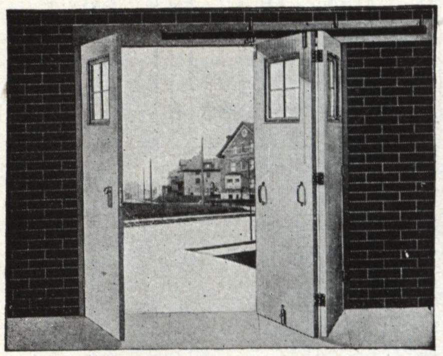
SLIDING-FOLDING GARAGE DOOR SETS (COMPLETE)

These types close absolutely weathertight into door frames. Doors can be hung inside or outside, but the in-swinging installation is recommended, as no shoveling of snow is necessary in winter and little inside floor space is required—the maximum being width of one door; also there is no danger of doors being blown against car by the wind. Practically all hardware is on inside, out of the weather.

No. 9010 Three-door and No. 9015 Four-door Sliding-folding Garage Door Hardware Sets—Openings 6 to 9 Feet Wide and 8 to 12 Feet Wide

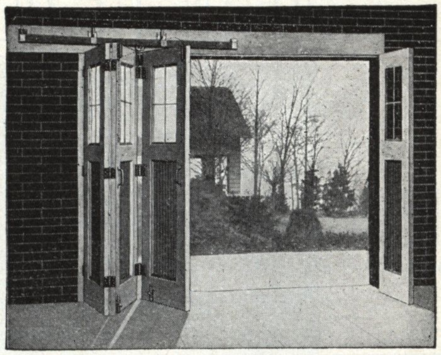
These two types are very similar as to equipment. No. 9010 has two doors hinged together and to one of the jambs to slide, swing and fold, by an overhead trolley inside the garage. The third door is hinged to the opposite jamb and acts as a passage door. The two sliding-folding doors must be of equal width.

No. 9015 has three doors hinged together and to one side jamb to slide, swing and fold inside the garage. The fourth door is hinged to the other jamb, serving as a passage door.



HARDWARE IN BOX FOR SET NO. 9010

1	swivel trolley hanger
1	adjustable long bracket for track
1	adjustable medium bracket for track
1	adjustable short bracket for track
1	stationary end bracket for track
3	sections trolley track (7 ft. in all)
4½	pairs tight pin butts (4x4 in.)
1	foot bolt, 6 in.
1	chain bolt, 6 in.
3	door handles or pulls



HARDWARE IN BOX FOR SET NO. 9015

1	swivel trolley hanger
1	adjustable long bracket for track
1	adjustable medium bracket for track
1	adjustable short bracket for track
1	stationary end bracket for track
3	sections trolley track (7 ft. in all)
4½	pairs tight pin butts (4x4 in.)
1½	pairs tight pin offset butt-hinges
2	foot bolts, 6 in.
2	chain bolts, 6 in.
4	door handles or pulls

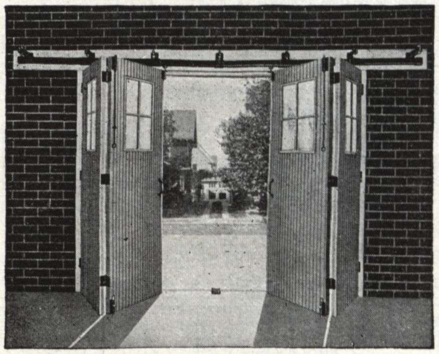
No. 9016 Double Two-door and No. 9018 Five-door Sliding-folding Garage Door Hardware Sets—Openings 8 to 12 Feet Wide and 10 to 15 Feet Wide

These two types are very similar in equipment but No. 9016 requires a separate entrance door while No. 9018 does not.

No. 9016 has 4 doors hinged in pairs, one pair hinged to each jamb to slide, swing and fold by means of overhead hangers. All doors must be of equal width not to exceed 3 ft. each.

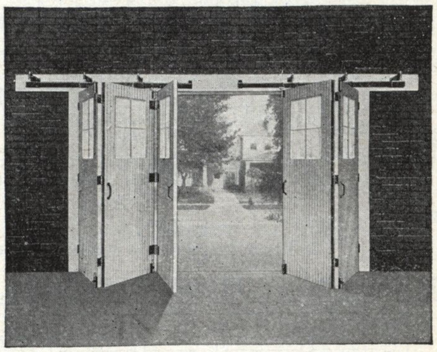
No. 9018 has 3 doors hinged together and to one jamb to slide, swing and fold inside the garage while the other two doors are hinged together and to the opposite jamb and slide, swing and fold together. All doors must be of equal width not to exceed 3 ft. each.

It is advisable to allow 8 to 12 in. each side of jamb.



HARDWARE IN BOX FOR SET NO. 9016

2	swivel trolley door hangers
2	adjustable long wall brackets (10 in.)
2	adjustable medium wall brackets (7½ in.)
3	adjustable short wall brackets (4½ in.)
6	sections trolley track (each 28 in. long)
6	pairs tight pin butts (4x4 in.)
2	foot bolts
2	chain bolts
4	door handles or pulls



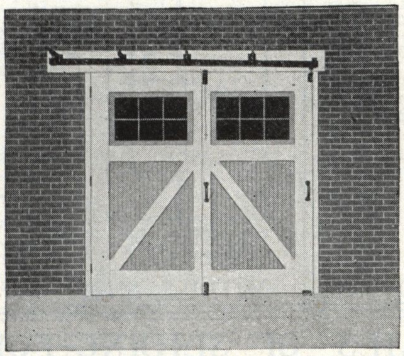
HARDWARE IN BOX FOR SET NO. 9018

2	swivel trolley door hangers
2	adjustable long wall brackets (10 in.)
2	adjustable medium wall brackets (7½ in.)
2	adjustable short wall brackets (4½ in.)
2	stationary wall brackets
6	sections trolley track (each 28 in. long)
6	pairs tight pin butts (4x4 in.)
1½	pairs tight pin offset butts
2	foot bolts
2	chain bolts
4	door handles or pulls

No. 9011 Two-door Exterior Sliding-folding Garage Door Hardware Set—Openings up to 9 Feet

Designed principally for outswinging installation but can be used inside if desired. They close weathertight, and the heavy overhead track and hanger carries the weight of the door and prevents sagging.

The two doors are hinged together and to one jamb. The set can be used very well on pairs of old swinging doors. Both doors must be of equal width not to exceed 4½ ft. each. Minimum headroom required is 8 in. For entrances up to 18 ft. use two No. 9011 sets and four doors hinged in pairs.



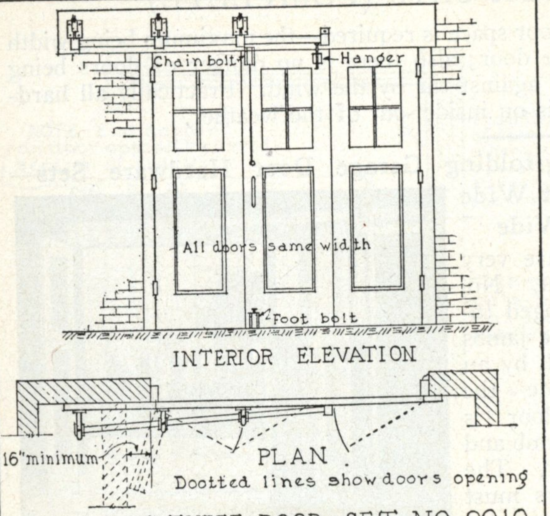
HARDWARE IN BOX FOR SET NO. 9011

1	swivel trolley door hanger (single truck)
1	wall extension arm, long
2	wall extension arms, medium
1	wall extension arm, short
3	combination sleeve-brackets with bolt (use with Nos. 1996 and 1997)
1	track bracket with stop (use with No. 1995)
1	wall stationary track bracket (end)
4	sections trolley track (29 in. long each)
3	pairs tight pin mortise butts (4x4 in.)
1	foot bolt (6 in.)
1	chain bolt (6 in.)
2	door handles or pulls (No. 4)
1	floor guide (1 piece)

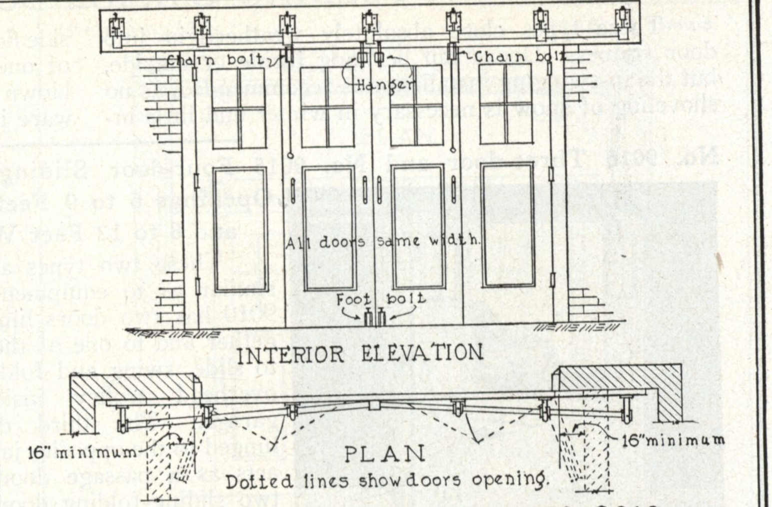
Complete installation drawings and all screws and bolts in each box. All items finished black Japan

McKINNEY MANUFACTURING COMPANY	McKINNEY COMPLETE GARAGE DOOR HARDWARE SETS	PLATE 2

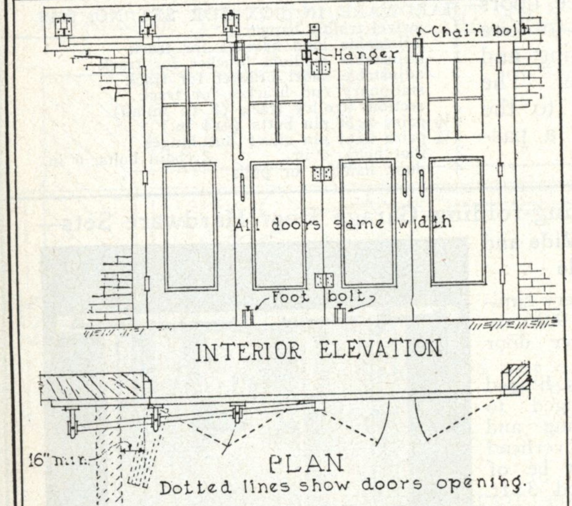
Continued on next page


Chain bolt
Hanger
All doors same width
Foot bolt
INTERIOR ELEVATION
16" minimum
PLAN
Dotted lines show doors opening

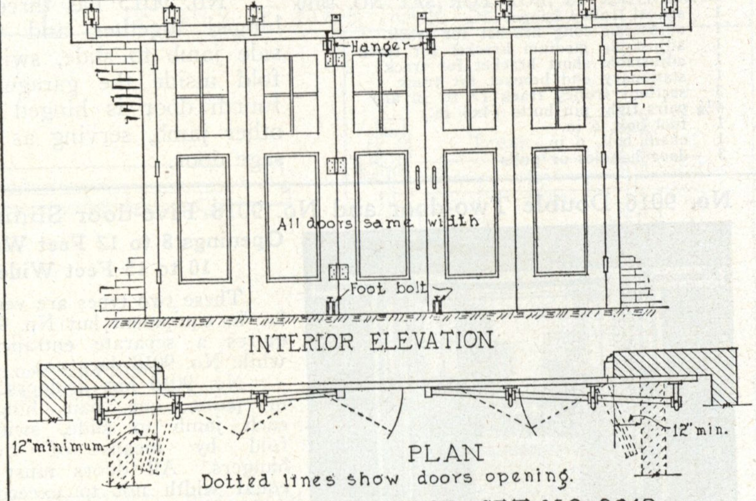
DETAILS OF THREE DOOR SET NO. 9010.


Chain bolt
Chain bolt
Hanger
All doors same width.
Foot bolt
INTERIOR ELEVATION
16" minimum
16" minimum
PLAN
Dotted lines show doors opening.

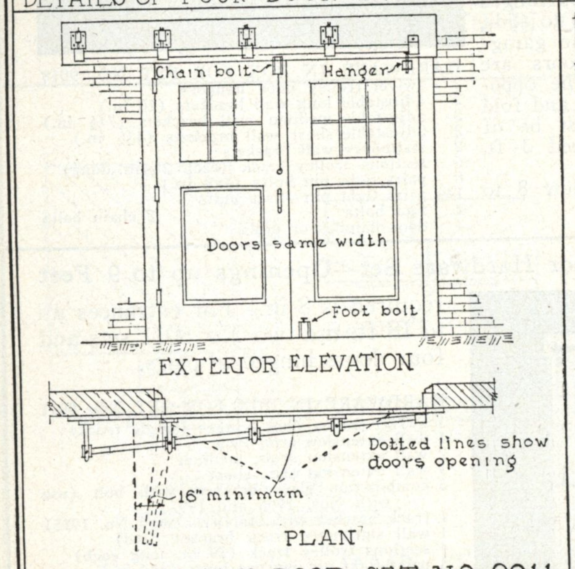
DETAILS OF FOUR DOOR SET NO. 9016.


Chain bolt
Hanger
All doors same width
Foot bolt
INTERIOR ELEVATION
16" min.
PLAN
Dotted lines show doors opening.

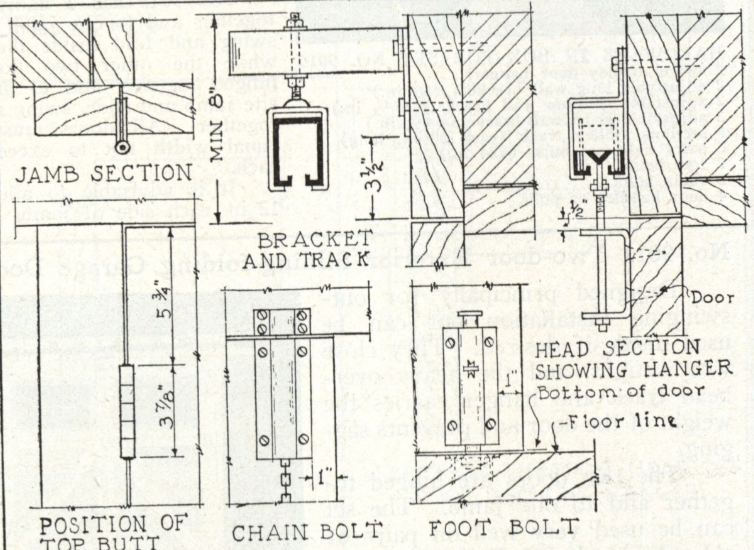
DETAILS OF FOUR DOOR SET NO. 9015


Hanger
All doors same width
Foot bolt
INTERIOR ELEVATION
12" minimum
12" min.
PLAN
Dotted lines show doors opening.

DETAILS OF FIVE DOOR SET NO. 9018.


Chain bolt
Hanger
Doors same width
Foot bolt
EXTERIOR ELEVATION
Dotted lines show doors opening
16" minimum
PLAN

DETAILS OF TWO DOOR SET NO 9011


JAMB SECTION
MIN 8"
3½"
BRACKET AND TRACK
5¾"
3⅞"
1"
1"
½"
1"
Door
HEAD SECTION SHOWING HANGER
Bottom of door
Floor line
POSITION OF TOP BUTT
CHAIN BOLT
FOOT BOLT

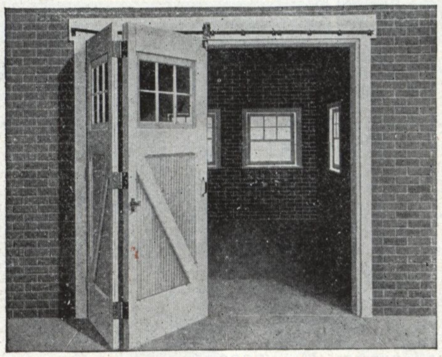
DETAILS SHOWING APPLICATION OF HARDWARE

McKINNEY MANUFACTURING COMPANY	DETAILS OF SLIDING-FOLDING COMPLETE GARAGE DOOR SETS.	SCALE 3/16 & 1½ EQUAL 1'-0" DATE AUG'24	DRWG 2

Continued on next page

INEXPENSIVE SLIDING-FOLDING GARAGE DOOR HARDWARE SETS (COMPLETE)

These types of doors close absolutely weathertight into the door frames. They are designed principally for out-swinging installations but can be used inside if desired. They have a sturdy flat track instead of the hollow steel track. Both types are less expensive than the types on Plate 2. All parts are of sturdy construction and meet the demands of heavy service. The outward opening doors require the removal of snow in the winter time to allow them to open.


No. 9017

View from Exterior—Doors Partly Opened Out

No. 9017 Two-door Exterior Sliding-folding Garage Door Hardware Set with Flat Track—Openings 7 to 10 Feet

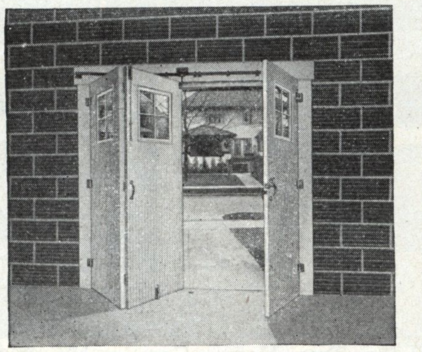
Designed principally for out-swinging installations, but can be used inside if desired. They close weathertight and the sturdy overhead track and hanger carry the weight of the door and prevent sagging.

Can be used very well on pairs of old swinging doors. Both doors must be of equal width, not to exceed 5 ft. each.

The cremone bolt is on the inside of the doors, and is operated and locked from the outside.

HARDWARE IN BOX FOR SET NO. 9017

1	door hanger complete
1	angle section of track
4	straight sections of track (28 in. each)
1½	pairs tight pin butts (5x5 in.)
1	pair reversed pad T-hinges (10 in.)
1	cremone bolt complete
1	door handle or pull


No. 9012

View from Interior—Doors Partly Opened In

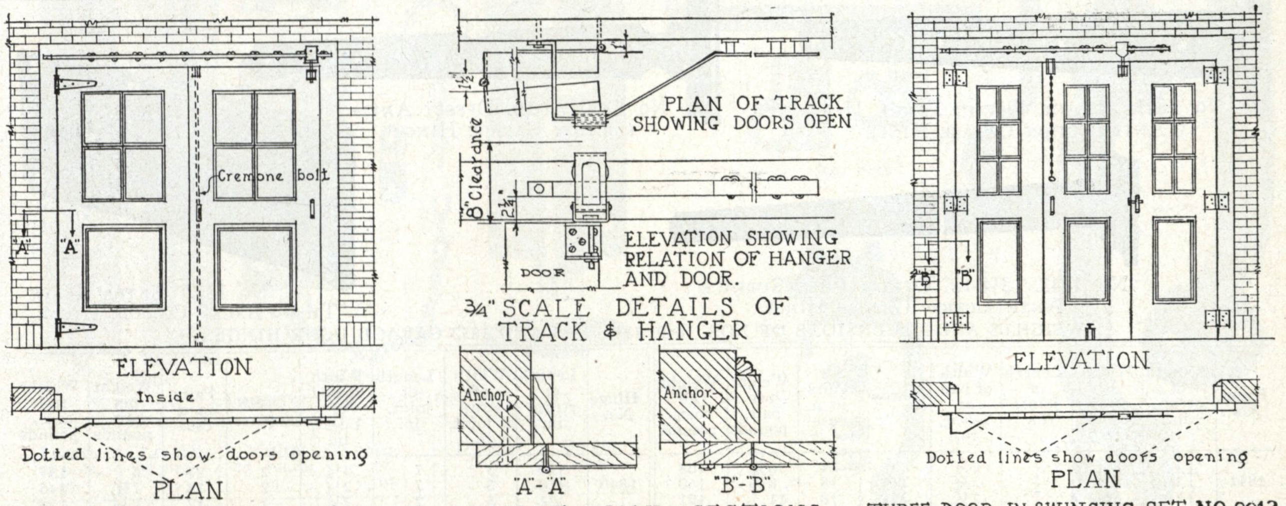
No. 9012 Three-door Sliding-folding Garage Door Hardware Set with Flat Track—Openings from 6 to 9 Feet

Two equal sized doors are hinged together and the pair hinged to one jamb to swing, fold and slide by means of an overhead hanger inside the garage. The third door is hinged to the opposite jamb. All three doors can be hinged in a group to operate from one side if desired. The set can be installed to operate outside, but the in-swinging installation is preferable. Hangers can be used on doors of any thickness and have both horizontal and lateral adjustment. Hardware finished in black Japan.

HARDWARE IN BOX FOR SET NO. 9012

1	swivel door hanger (double wheel)
1	angle section of track
4	straight sections of track (2 ft. long each)
4½	pairs tight pin butts (4x4 in.)
1	foot bolt (6 in.)
1	chain bolt (6 in.)
1	door handle or pull (No. 3)
1	Duogrip thumb latch

Complete installation drawings and directions and all screws and bolts in each box. All items finished black Japan


Cremone bolt
"A"
"A"
ELEVATION
Inside
Dotted lines show doors opening
PLAN
1½"
PLAN OF TRACK SHOWING DOORS OPEN
8" Clearance
2¼"
DOOR
ELEVATION SHOWING RELATION OF HANGER AND DOOR.
¾" SCALE DETAILS OF TRACK & HANGER
Anchor
"A"-"A"
Anchor
"B"-"B"
"B"
"B"
ELEVATION
Dotted lines show doors opening
PLAN

TWO DOOR OUT-SWINGING SET NO.9017 ¾" SCALE JAMB SECTIONS. THREE DOOR IN-SWINGING SET NO 9012

DETAILS OF SLIDING-FOLDING GARAGE DOOR SETS USING FLAT TRACKS

McKINNEY MANUFACTURING COMPANY

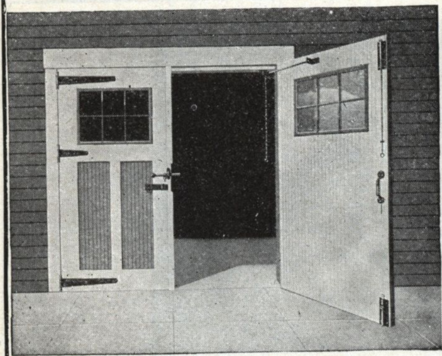
McKINNEY COMPLETE GARAGE DOOR HARDWARE SETS

PLATE 3

Continued on next page

STANDARD SWINGING GARAGE DOOR HARDWARE SETS (COMPLETE)

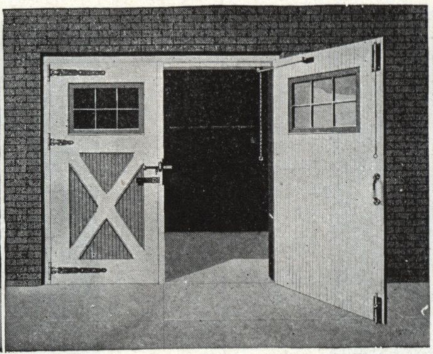
These sets of hardware listed below are for the standard type of swinging garage doors. This is the simplest type of arrangement for doors. It has, however, the disadvantage of requiring the removal of snow in winter in order to open the doors. Where the space allowed for the depth of the garage is limited, this type of entrance can often be used to advantage. These hardware sets are also the least expensive type of equipment for garage doors and always satisfactory. The door holders prevent the doors from being closed by the wind. Can be had without holders if desired.



No. 9035 for Two Heavy Garage Doors—Highest Grade

Hardware of the best quality extra heavy metal is used in this set for swinging doors of large size. Hinges are made with a 1-in. offset. The best methods for holding the doors securely fastened when closed, and in rigid position when opened, have been carefully studied.

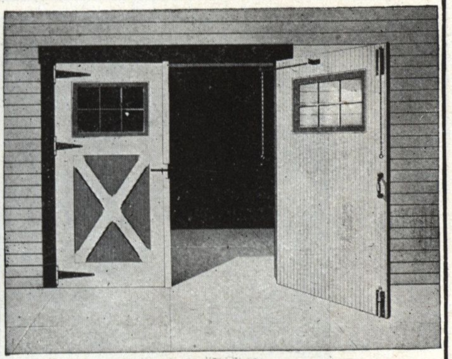
HARDWARE IN BOX FOR SET NO. 9035
2 pairs anti-friction garage hinges No. 1841 (24 in.)
1 pair anti-friction garage hinges No. 1841 (12 in.)
1 foot bolt No. 1960 (6 in.)
1 chain bolt No. 1965 (6 in.)
1 pair door holders No. 1934
1 heavy Duogrip thumb latch No. 1948



No. 9037 for Two Heavy Garage Doors—Medium Priced

This set is for the same service as No. 9035, but provides a more ornamental hinge. Made like No. 9035 with 1-in. offset. Of strong wrought steel, these hinges have escalloped edges and are embossed. The solid metal anti-friction washers are at all joints.

HARDWARE IN BOX FOR SET NO. 9037
2 pairs anti-friction garage hinges No. 1840 (24 in.)
1 pair anti-friction garage hinges No. 1840 (10 in.)
1 foot bolt No. 1960 (6 in.)
1 chain bolt No. 1965 (6 in.)
1 pair door holders No. 1934
1 heavy Duogrip thumb latch No. 1948



No. 9039 for Two Garage Doors—Ordinary Size

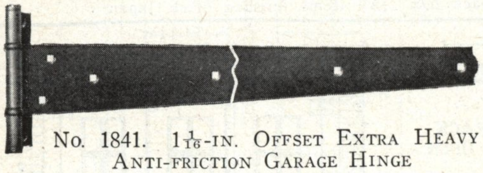
Contains all hardware necessary to properly equip two garage doors of ordinary size. The door holders prevent the doors from blowing against the car as it is entering or leaving the garage. Chain and foot bolt hold closed door rigidly.

HARDWARE IN BOX FOR SET NO. 9039
2 pairs extra heavy reversed pad T-hinges No. 1809½ (16 in.)
1 pair extra heavy reversed pad T-hinges No. 1809½ (10 in.)
1 foot bolt No. 1960 (6 in.)
1 chain bolt No. 1965 (6 in.)
1 Duogrip thumb latch No. 1945

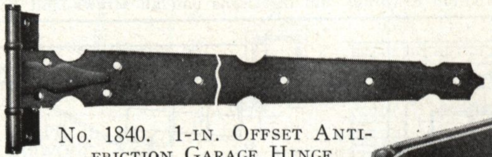
SUGGESTED DIMENSIONS FOR GARAGE AND DRIVE

One-car garage interior, ft.—in.	Two-car garage interior, ft.—in.	Width of door, ft.—in.	Height of door, ft.—in.	Min. width of drive, ft.—in.	Std. width wheel tread c. to c., ft.—in.	Turn-around min. rad., ft.—in.		Min. depth Y-turn, ft.—in.	Overall length of car, ft.—in.	Tread of car, ft.—in.
10–0 x 18–0	20–0 x 22–6	8–0	8–6	8–0	4–8	Ford	14–0	15–0	11–6	4–8
						Pierce Arrow	30–6	15–0	18–3	5–9

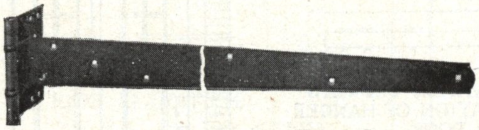
McKINNEY WROUGHT STEEL GARAGE DOOR HINGES



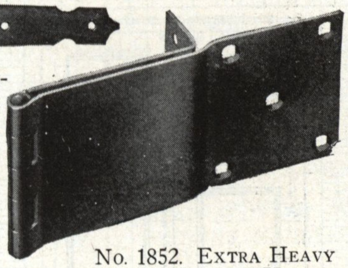
No. 1841. 1$\frac{1}{16}$-in. Offset Extra Heavy Anti-friction Garage Hinge



No. 1840. 1-in. Offset Anti-friction Garage Hinge



No. 1842. 2¼-in. Offset Full Surface Anti-friction Garage Hinge



No. 1852. Extra Heavy "Throw Back" Garage Hinge

WEIGHTS AND DIMENSIONS OF NOS. 1840, 1841, 1842 AND 1852 GARAGE DOOR HINGES

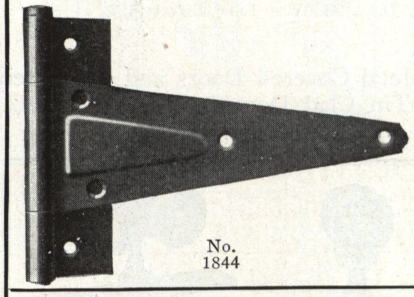
Hinge No.	Length of strap, in.	Width of strap at joint, in.	Length of joint, in.	Width of pad or T-leaf, in.	Throw, in.	Pairs in a case	Weight per pair, pounds	Weight full case, pounds	Hinge No.	Length of strap, in.	Width of strap at joint, in.	Length of joint, in.	Width of pad or T-leaf, in.	Throw, in.	Pairs in a case	Weight per pair, pounds	Weight full case, pounds
1841	12	3¼	7	2¼	2⅛	24	6¾	168	1840	10	3	7	2¼	2	24	6	151
	18	3¼	7	2¼	2⅛	18	8½	160		18	3	7	2¼	2	18	7¾	146
	24	3¼	7	2¼	2⅛	18	11	191		24	3	7	2¼	2	12	9½	124
	36	4	8	4	2⅛	6	20	127	1852	4¾	4½	4½	4½		1	3	
1842	36	4	8	4	4½	6	23	136		8½	4½	4½	4½		1	5	

All sizes (except bright steel) packed with 2x20 in. wood screws. Lag screws or carriage bolts when desired.

Continued on next page

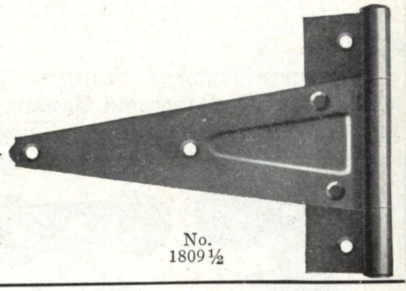
EXTRA HEAVY REVERSED PAD WROUGHT STEEL GARAGE DOOR HINGES

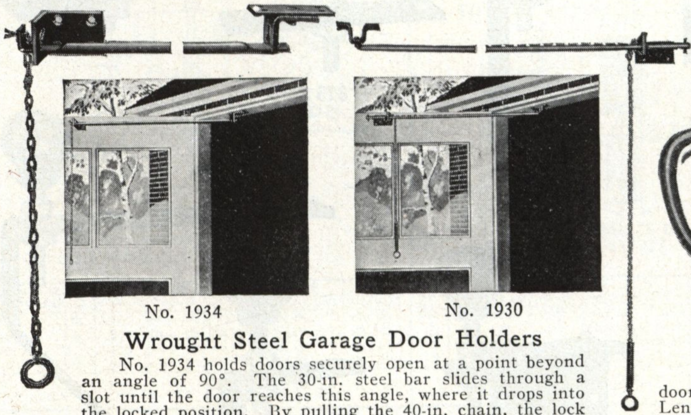
The use of these reversed pad T-hinges saves time and labor in hanging doors, as the jamb only is mortised; the strap leaf (embossed) being applied to the surface of the door. They are especially recommended for garage work. No. 1809½ is fitted with tight or riveted pins, while No. 1844 has loose pins and is made regularly in only the 8, 10 and 12-inch sizes. The loose pins in No. 1844 make it possible to reverse the pads or T-leaves either for mortising into the jamb or for applying to the surface of the door frame.


No. 1844

DATA ON NOS. 1844 AND 1809½

Length of strap in.	Width of pad or T-leaf, in.	Length of joint, in.	Screw holes in each hinge	Size of screws	Weight per pair pounds
8	2	5½	9	1½x13	3½
10	2⅜	7	9	1¾x14	5
12	2¹³⁄₁₆	7¾	10	1¾x16	7½
14	2¹³⁄₁₆	7¾	10	1¾x17	7⅔
16	2¹³⁄₁₆	7¾	10	1¾x17	8⅖

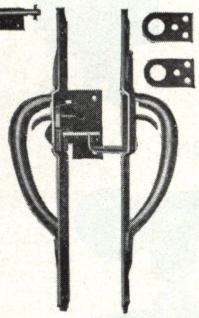

No. 1809½

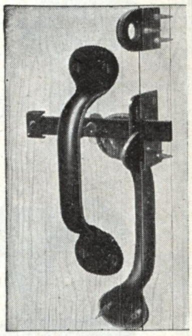

No. 1934

No. 1930

Wrought Steel Garage Door Holders

No. 1934 holds doors securely open at a point beyond an angle of 90°. The 30-in. steel bar slides through a slot until the door reaches this angle, where it drops into the locked position. By pulling the 40-in. chain, the lock is released. No. 1930, similar to No. 1934, has a notched holding bar that will hold door open at many different angles.


No. 1948


No. 1945

Duogrip Door Latches

No. 1945 Duogrip thumb latch of wrought steel affords a roomy handle on either side of the door. It can be used on right or left hand doors swinging either in or out. The latch bar and the larger of the two handles are always placed on that side towards which the door swings. No. 1948 extra heavy wrought steel duogrip door latch is a sturdy and attractive latch. Can be used as the above, interchangeably. The latch bar is only 4⅞ in. long, making possible its use with very narrow meeting stiles. It is adjustable for doors of 1¾ to 3 in. in thickness. Both are made in one size only. Length of handle 10⅝ in., escutcheon plates 14½ in. long and 2¾ in. wide; latch bar 4⅞ in. long. Combination holes permit use of either screws or bolts.

WROUGHT STEEL BOLTS, HASPS AND HANDLES

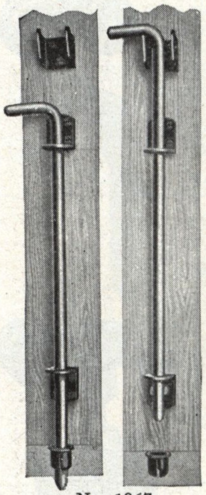
No. 1967 wrought steel cane bolt with extra long drop. Maximum drop is six inches. Drops by gravity.

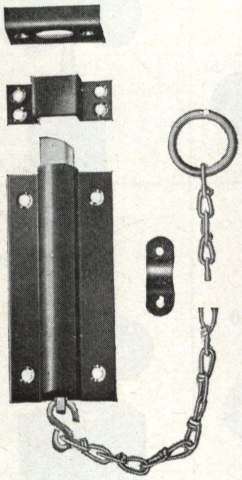
No. 1965 wrought steel chain bolt. Strong steel wire spring automatically throw bolt into place when door closes or chain is released. No. 1960 wrought steel foot bolt is a strong wrought steel bolt with no springs to wear out. Pressure on upper caps locks bolt; on lower one releases it.

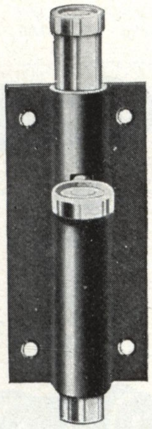
No. 1944 thumb latch with padlock keepers. Wrought steel.

No. 1947 extra heavy thumb latch (wrought steel).

No. 1953 and 1954 (extra heavy) wrought steel handles.

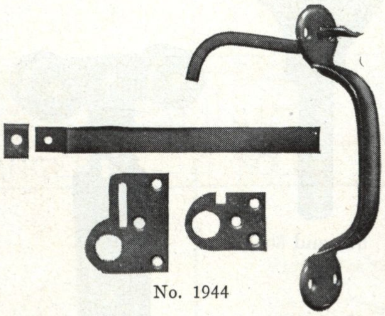

No. 1967

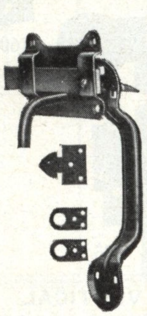

No. 1965

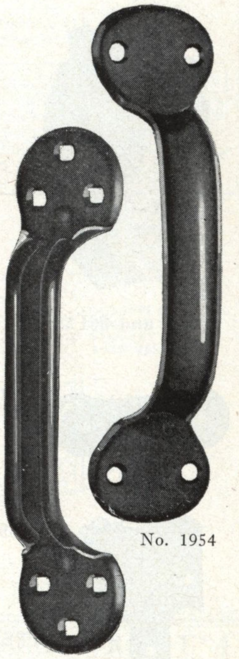

No. 1960

WROUGHT STEEL BOLTS NOS. 1960 AND 1965

Length of bolt, in.	Length of plate, in.	Width of plate, in.	Size of screws	Dozens in a box	Dozens in a case
6	5	2⁵⁄₁₆	1 x 8	½	10
8	7	2½	1 x10	¼	10
10	9	3¹⁄₁₆	1¼x11	1/12	5


No. 1944


No. 1947


No. 1954

No. 1953

McKINNEY MANUFACTURING COMPANY | McKINNEY GARAGE DOOR HARDWARE | PLATE 5

COBURN TROLLEY TRACK MFG. CO.

Sliding Door Hardware

HOLYOKE, MASS.

BRANCHES

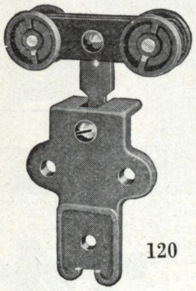
NEW YORK, N. Y., 10 East 43rd Street
PHILADELPHIA, PA., 422 Commerce Street

BOSTON, MASS., 108 Broad Street
CHICAGO, ILL., 74 West Lake Street

Products

COBURN FOLDING SLIDING GARAGE DOOR HARDWARE; COBURN BARN and GARAGE DOOR HANGERS and TRACK; HANGERS for heavy sliding doors.

For Standard Metal Covered Doors and Trim, see pages 862-865; for Tin Clad Doors and Shutters, see pages 886-887.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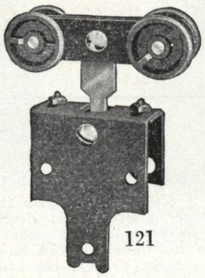
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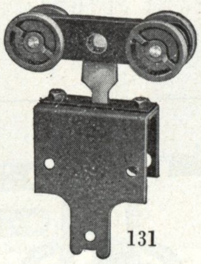
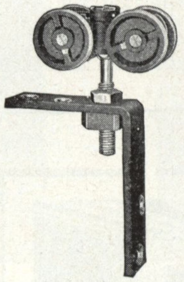

131

LATERAL ADJUSTMENT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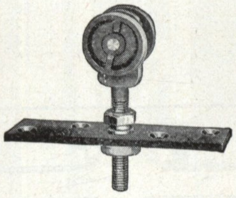
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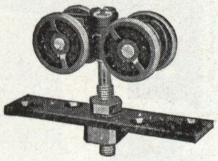
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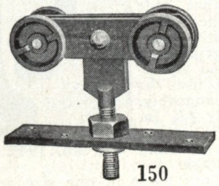
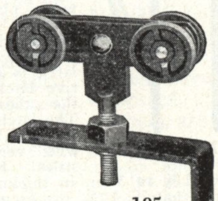
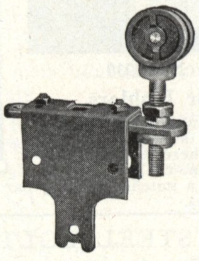
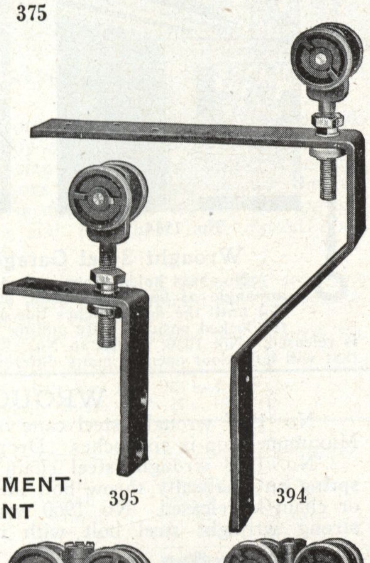

150


185

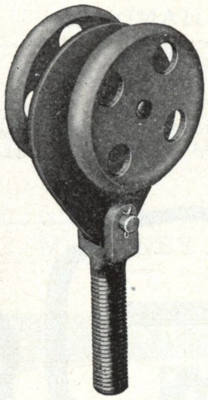
VERTICAL ADJUSTMENT

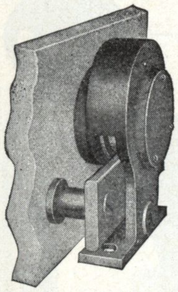

388

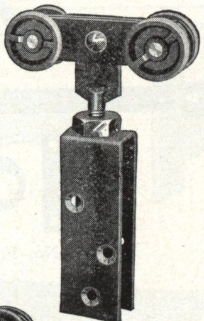

395

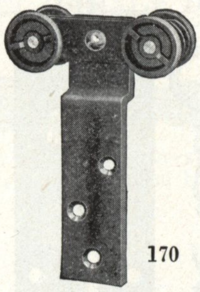
394

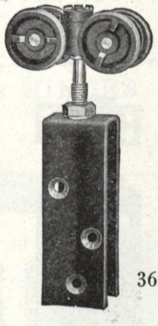
VERTICAL ADJUSTMENT
SWIVEL PENDANT

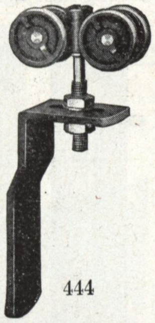

841 and 861

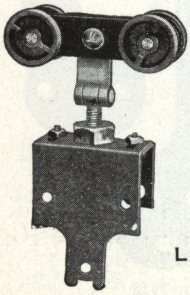

800 and 801


160


170


360


444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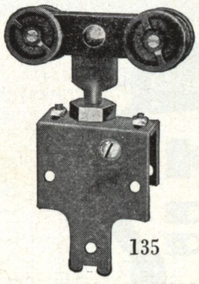
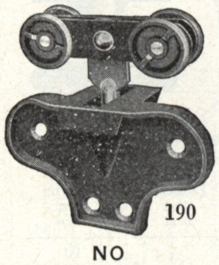
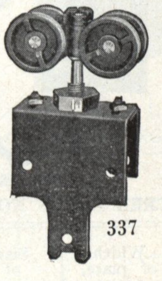
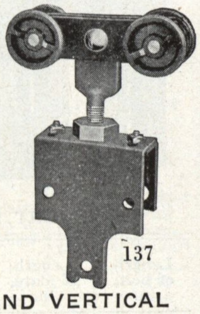

135

LATERAL AND VERTICAL
ADJUSTMENT


190

NO
ADJUSTMENT


337

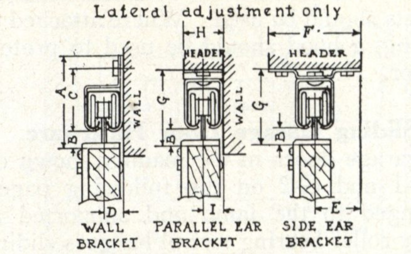

137

LATERAL AND VERTICAL
ADJUSTMENT—SWIVEL
PENDANT

ROLL OR BALL BEARING, IRON WHEEL DOOR HANGERS

Continued on next page

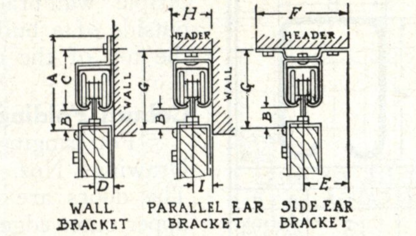
Lateral adjustment only


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS.	TH'KN'SS OF DOOR IN.	A	B	C	D	E	F	G	H	I
a	1	400	1 1/4 - 1 3/4	5 1/2	1	3 13/16	1 1/16	2 5/8	5 1/4	4 1/4	2 1/4	1 1/16
b	2	600	1 3/4 - 2 1/2	6 7/8	1	5 3/16	1 1/16	2 5/8	5 1/4	5 9/16	2 1/4	1 1/16
c	4	1200	2 1/4 - 3 1/2	8	1 1/8	6 1/8	1 11/16	3 3/16	6 3/8	6 3/8	3 1/4	1 1/16
d	6	800	2 1/4 - 3 1/2	7 3/4	1 7/16	5 5/8	1 15/32	3	6	6 1/8	3	1 1/2

NO. 120 HANGER

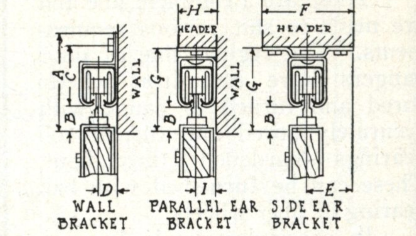
Vertical and lateral adjustments.


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO	WEIGHT OF DOOR LBS.	TH'KN'SS OF DOOR IN	A		B		C	D	E	F	G		H	I
				MIN.	MAX.	MIN.	MAX.					MIN	MAX		
a	1	400	1 1/4 - 1 3/4	5 5/8	7 3/16	1 3/16	2 3/4	3 13/16	1 1/16	2 5/8	5 1/4	4 3/8	5 15/16	2 1/4	1 1/16
b	2	600	1 3/4 - 2 3/4	6 7/8	8 3/16	1 1/16	2 3/8	5 3/16	1 1/16	2 5/8	5 1/4	5 5/8	6 15/16	2 1/4	1 1/16
c	4	1200	2 1/4 - 3 1/2	8 1/8	9 9/16	1 1/4	2 5/8	6 1/8	1 11/16	3 3/16	6 3/8	6 1/2	7 15/16	3 1/4	1 11/16
d	6	800	2 1/4 - 3 1/2	7 15/16	9 3/8	1 9/16	2 15/16	5 5/8	1 15/32	3	6	6 1/4	6 11/16	3	1 1/2

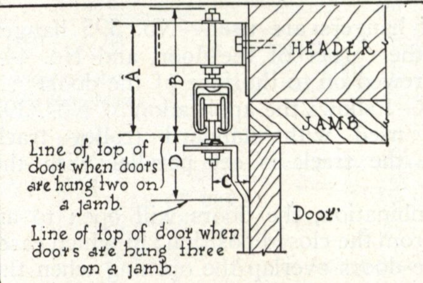
NO. 135 HANGER

Vertical and lateral adjustment.


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS	TH'KN'SS OF DOOR IN	A		B		C	D	E	F	G		H	I
				MIN	MAX	MIN.	MAX.					MIN	MAX		
a	1	400	1 1/4 - 1 3/4	5 5/8	7 3/16	1 3/16	2 3/4	3 15/16	1 1/16	2 5/8	5 1/4	4 3/8	5 15/16	2 1/4	1 1/16
b	2	600	1 3/4 - 2 3/4	6 7/8	8 3/16	1 1/16	2 3/8	5 3/16	1 1/16	2 5/8	5 1/4	5 5/8	6 15/16	2 1/4	1 1/16
c	4	1200	2 1/4 - 3 1/2	8 1/8	9 9/16	1 1/4	2 5/8	6 1/8	1 11/16	3 3/16	6 3/8	6 1/2	7 15/16	3 1/4	1 11/16
d	6	800	2 1/4 - 3 1/2	7 15/16	9 3/8	1 9/16	2 15/16	5 5/8	1 15/32	3	6	6 1/4	7 11/16	3	1 1/2

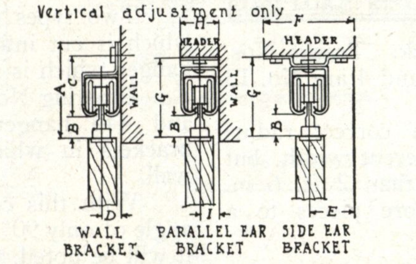
NO. 137 HANGER


HEADER
A
B
JAMB
D
C
Line of top of door when doors are hung two on a jamb.
Line of top of door when doors are hung three on a jamb.
Door

SIZE	TRACK NO.	WEIGHT EACH LBS.	MAX WGHT OF DOOR LBS.	THKNSS OF DOOR IN	A		B	C		D	
					MIN.	MAX.		MIN.	MAX.	MIN.	MAX.
444A	1	2 3/4	125	1 1/4 - 1 3/4	5 7/16	6 1/16	6 5/8	1 3/16	2 15/16	3 3/8	4 1/2
444B	2	3 1/4	200	1 3/4 - 2 1/2	6 3/4	7 5/16	7 7/8	1 3/16	2 15/16	3 3/8	4 1/2
444C	4	6	400	2 1/4 - 3 1/2	7 1/4	7 13/16	8 3/8	1 5/8	3 1/8	4 1/8	4 7/8
444D	6	5 1/2	300	2 1/4 - 3 1/2	6 7/8	7 3/8	7 15/16	1 5/8	3 1/8	4 5/16	4 7/8

NO. 444 HANGER

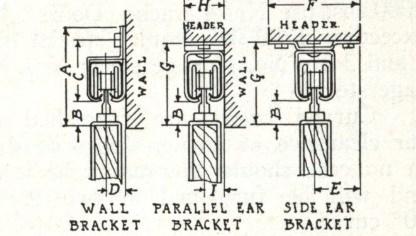
Vertical adjustment only


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS.	MINIMUM THICKNESS INCHES	A		B		C	D	E	F	G		H	I
				MIN.	MAX.	MIN.	MAX.					MIN	MAX		
a	1	300	1 1/2	5 7/16	7 1/4	1	2 13/16	3 13/16	1 1/16	2 5/8	5 1/4	4 3/16	6	2 1/4	1 1/16
b	2	500	1 1/2	6 5/8	8 3/16	3/4	2 3/8	5 3/16	1 1/16	2 5/8	5 1/4	5 5/16	6 15/16	2 1/4	1 1/16
c	4	900	2	7 3/4	9 7/16	7/8	2 9/16	6 1/8	1 11/16	3 3/16	6 3/8	6 1/8	7 13/16	3 1/4	1 11/16
d	6	700	2	7 9/16	9 1/4	1 3/16	2 7/8	5 5/8	1 15/32	3	6	5 7/8	7 9/16	3	1 1/2

NO 150 & 350 HANGER

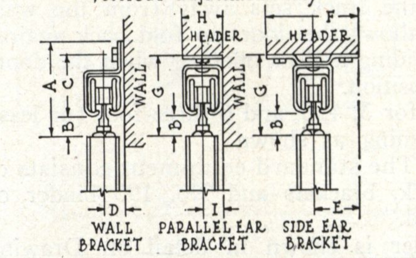
Vertical and lateral adjustments.


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO	WEIGHT OF DOOR LBS	TH'KN'SS OF DOOR IN	A		B		C	D	E	F	G		H	I
				MIN	MAX	MIN	MAX					MIN	MAX		
a	1	400	1 1/4 - 1 3/4	5 9/16	7 1/2	1 1/8	3 1/16	3 13/16	1 1/16	2 5/8	5 1/4	4 5/16	6 1/4	2 1/4	1 1/16
b	2	600	1 3/4 - 2 3/4	6 3/4	8 1/2	7/8	2 11/16	5 3/16	1 1/16	2 5/8	5 1/4	5 7/16	7 1/4	2 1/4	1 1/16
c	4	1200	2 1/4 - 3 1/2	7 15/16	9 13/16	1 1/16	2 15/16	6 1/8	1 11/16	3 3/16	6 3/8	6 5/16	8 3/16	3 1/4	1 11/16
d	6	900	2 1/4 - 3 1/2	7 3/4	9 5/8	1 3/8	3 1/4	5 5/8	1 15/32	3	6	6 1/16	7 15/16	3	1 1/2

NO. 160 HANGER

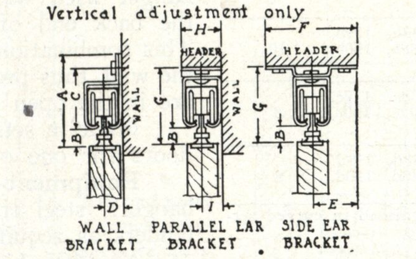
Vertical adjustment only


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS.	MINIMUM THICKNESS INCHES	A		B		C	D	E	F	G		H	I
				MIN.	MAX.	MIN.	MAX.					MIN.	MAX.		
a	1	300	1 1/2	5 5/16	7 1/4	1 1/16	3	3 1/2	1 1/16	2 5/8	5 1/4	4 5/16	6 1/4	2 1/4	1 1/16
b	2	500	1 3/4	6 3/4	8 1/2	1 3/16	2 15/16	4 3/4	1 1/16	2 5/8	5 1/4	5 3/4	7 1/2	2 1/4	1 1/16
c	4	900	2 1/4	7 3/4	10 9/16	1 3/8	4 3/16	5 1/2	1 11/16	3 3/16	6 3/8	6 5/8	9 7/16	3 1/4	1 11/16
d	6	700	2 1/4	7 5/8	10 1/2	1 11/16	4 1/2	5 1/16	1 15/32	3	6	6 3/8	9 3/16	3	1 1/2

NO. 395 HANGER

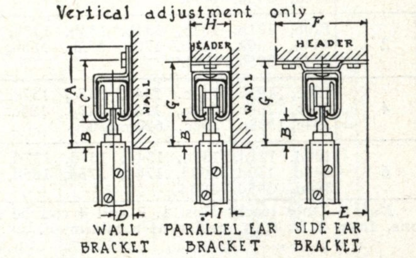
Vertical adjustment only


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO	WEIGHT OF DOOR LBS.	MINIMUM THICKNESS INCHES	A		B		C	D	E	F	G		H	I
				MIN.	MAX.	MIN.	MAX.					MIN.	MAX.		
a	1	200	1 1/2	5 5/16	7 3/16	7/8	2 3/4	3 13/16	1 1/16	2 5/8	5 1/4	4 1/16	5 15/16	2 1/4	1 1/16
b	2	400	1 1/2	6 13/16	8 5/8	15/16	2 13/16	5 3/16	1 1/16	2 5/8	5 1/4	5 1/2	7 3/8	2 1/4	1 1/16
c	4	800	2	8	10 3/4	1 1/8	3 7/8	6 1/8	1 11/16	3 3/16	6 3/8	6 3/8	9 1/8	3 1/4	1 11/16
d	6	600	2	7 3/4	10 1/2	1 3/8	4 1/8	6 5/8	1 15/32	3	6	6 1/16	8 13/16	3	1 1/2

NO. 375 HANGER

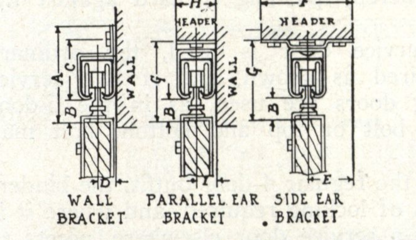
Vertical adjustment only


H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS.	MINIMUM THICKNESS INCHES	A		B		C	D	E	F	G		H	I
				MIN	MAX.	MIN.	MAX.					MIN	MAX		
a	1	400	1 1/2	5 11/16	7 1/2	1 1/4	3 1/16	3 13/16	1 1/16	2 5/8	5 1/4	4 7/16	6 1/4	2 1/4	1 1/16
b	2	600	1 1/2	6 15/16	8 1/2	1 1/16	2 11/16	5 3/16	1 1/16	2 5/8	5 1/4	5 5/8	7 1/4	2 1/4	1 1/16
c	4	1000	2	8 1/8	9 13/16	1 1/4	2 15/16	6 1/8	1 11/16	3 3/16	6 3/8	6 1/2	8 3/16	3 1/4	1 11/16
d	6	800	2	7 15/16	9 5/8	1 9/16	3 1/4	5 5/8	1 15/32	3	6	6 1/4	7 15/16	3	1 1/2

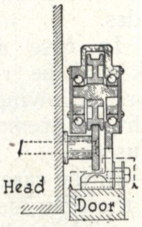
NO. 185 & 385 HANGER

Vertical adjustment only

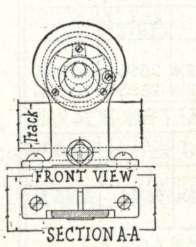

H
F
HEADER
A
C
B
G
WALL
D
I
E
WALL BRACKET
PARALLEL EAR BRACKET
SIDE EAR BRACKET

SIZE	TRACK NO.	WEIGHT OF DOOR LBS	MINIMUM THICKNESS INCHES	A		B		C	D	E	F	G		H	I
				MIN.	MAX.	MIN.	MAX.					MIN	MAX		
a	1	200	1 1/2	5 5/16	7 3/16	7/8	2 3/4	3 13/16	1 1/16	2 5/8	5 1/4	4 1/16	5 15/16	2 1/4	1 1/16
b	2	400	1 1/2	6 13/16	8 5/8	15/16	2 13/16	5 3/16	1 1/16	2 5/8	5 1/4	5 1/2	7 3/8	2 1/4	1 1/16
c	4	800	2	8	10 3/4	1 1/8	3 7/8	6 1/8	1 11/16	3 3/16	6 3/8	6 3/8	9 1/8	3 1/4	1 11/16
d	6	600	2	7 3/4	10 1/2	1 3/8	4 1/8	6 5/8	1 15/32	3	6	6 1/16	8 13/16	3	1 1/2

NO. 388 HANGER



COMBINED SECTION AND END VIEW

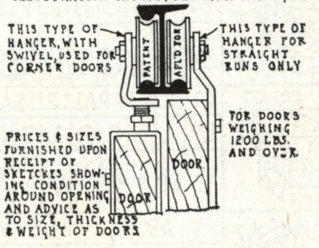


FRONT VIEW.

SECTION A-A

NO. 800 HANGER

ILLUSTRATION SHOWING TWO TYPES OF HANGERS


THIS TYPE OF HANGER, WITH SWIVEL, USED FOR CORNER DOORS
THIS TYPE OF HANGER FOR STRAIGHT RUNS ONLY
PATENT
APL'D FOR
FOR DOORS WEIGHING 1200 LBS. AND OVER.
PRICES & SIZES FURNISHED UPON RECEIPT OF SKETCHES SHOWING CONDITION AROUND OPENING AND ADVICE AS TO SIZE, THICKNESS & WEIGHT OF DOORS
DOOR
DOOR

NO. 750 HANGER

COBURN
TROLLEY TRACK
MANUFACTURING CO.

COBURN HANGERS FOR SLIDING DOORS

SHEET NO. E1
NOT DRAWN TO SCALE

Continued on next page

Coburn Sliding Door Hangers for Garage and Warehouse Doors

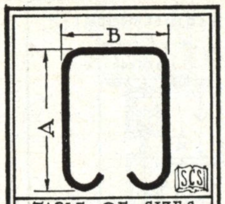


TABLE OF SIZES

Nº	GAUGE	A	B
1	16	2 1/8	1 3/4
2	16	3 3/8	1 3/4
4	13	3 3/4	2 13/16
6	13	3 7/16	2 7/16

DIMENSIONS OF COBURN TROLLEY TRACK

These are a complete line and are made to suit various requirements. The regular line of door hangers have cast iron wheels bored and turned to gauge with accurately bored and turned roll bearings hardened throughout. These can be furnished with ball bearing or fiber wheels.

In specifying track, hangers and brackets, always give the thickness of doors.

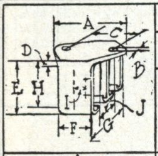
Track—For doors 300 lbs. or less use No. 1 track; 500 lbs. or less use No. 2 track; 800 lbs. or less use No. 6 track; over 1000 lbs. use No. 4 track. Doors exceeding 1200 lbs. require special track. Tracks Nos. 1 and 2 are No. 16 gage steel; Nos. 6 and 4 are No. 13 gage steel.

Curved tracks are furnished on correct radius for clearance of corner doors of different width, but in no case should the radius be less than 2 ft. 6 in. and will be furnished in two or more pieces to a 90° curve.

COBURN "ROUND TROUGH" TROLLEY TRACKS

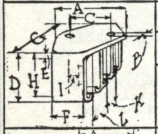
No. of track	Used with hanger No.	Longest length made, ft.
1	120a, 121a, 131a, 134a, 135a, 137a, 138a, 139a, 444a, 150a, 160a, 170a, 375a, 185a, 388a, 190a, 394a, 395a, 396a	10
2	120b, 121b, 131b, 134b, 135b, 137b, 138b, 139b, 444b, 150b, 160b, 170b, 375b, 185b, 388b, 190b, 394b, 395b, 396b	10
4	120c, 121c, 131c, 134c, 135c, 137c, 138c, 139c, 444c, 150c, 160c, 170c, 375c, 185c, 388c, 190c, 394c, 395c, 396c, 620, 750	8
6	120d, 121d, 131d, 134d, 135d, 137d, 138d, 139d, 444d, 150d, 160d, 170d, 375d, 185d, 388d, 190d, 394d, 395d, 396d	8

Note: Only tracks Nos. 1, 2 and 4 can be furnished in curved sections, from 2 ft. 6 in. radius as a minimum.



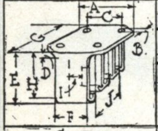
DOUBLE PARALLEL EAR BRACKET

Nº	A	B	C	D	E	F	G	H	I	J	PATTERN Nº CENTER	PATTERN Nº END
1	4 5/8	9/16	3 1/4	3/8	3 7/16	2 1/16	4 1/2	3 3/16	13/16	2 1/8	2691	2691 E
2	5	9/16	3 1/2	3/8	4 1/2	2 3/16	4 3/4	4 1/4	13/16	2 1/4	2692	2692 E
4	6 3/16	9/16	4 3/4	5/8	5 11/16	3	7 1/4	5 1/4	1 3/16	3 3/8	2693	2693 E



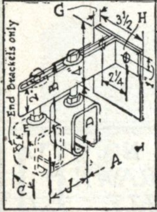
TRIPLE PARALLEL EAR BRACKET

Nº	A	B	C	D	E	F	G	H	I	J	PATTERN Nº CENTER	PATTERN Nº END
1	4 5/8	9/16	3 1/4	3/8	3 7/16	2 1/16	6 5/8	3 3/16	13/16	2 1/8	2694	2694 E
2	5	9/16	3 1/2	3/8	4 1/2	2 3/16	6 7/8	4 1/4	13/16	2 1/8	2695	2695 E



TRIPLE PARALLEL EAR BRACKET FOR NO. 4 RAIL

Nº	A	B	C	D	E	F	G	H	I	J	PATTERN Nº CENTER	PATTERN Nº END
4	6 3/16	9/16	4 3/4	5/8	5 11/16	3	10 1/4	5 1/4	1 3/16	3 1/4	2696	2696 E



ADJUSTABLE WALL BRACKET

Nº	A MAX. SHORT LOOP	A MAX. LONG LOOP	A MIN.	B	C	D MAX.	D MIN.	E	G	H LAG	J
1	4 7/8	7 3/16	1 1/4	6 1/2	2 1/4	1 7/8	1 7/16	9/16	9/32	3/8	2
2	4 7/8	7 3/16	1 1/4	7 3/4	2 1/4	3 1/8	2 3/4	9/16	5/16	3/8	2
4	7 3/16	11 1/8	1 13/16	8 1/8	3 3/8	3 1/2	3 3/16	1 1/8	5/16	1/2	3 3/8
6	7 3/16	11 1/8	1 5/8	7 3/4	3	3 1/8	2 3/4	15/16	5/16	1/2	2 15/16

COBURN TRACK BRACKETS

Brackets—Should be placed 4 to 5 ft. on centers. For parallel runs of track, "double" wall brackets or "triple" wall brackets should be used. Where attached to outside of a building, a hood should be used to protect the top of the door.

Coburn Folding Sliding Garage Door Hardware

For hanging garage doors in the manner shown on Drawings Nos. G-1 and G-2 on the following pages. The doors are hinged to the jamb and supported at upper outer edge by roller bearing swivel hangers sliding in a trolley track. For openings from 6 to 18 ft. wide.

With this outfit, the doors fold and slide inside the building, fit perfectly tight and will not warp or sag. A novel and practical outfit easily applied and operated.

Two types of hangers are used—No. 395 hanger which is cut into the corner of the door, and No. 444 hanger which is screwed on to the face of the door.

Drawing No. G-1 shows the application of Nos. 395 and 444 hangers used with standard trolley track brackets in which the track is set parallel with the wall.

With this combination, the doors will open to an angle of only 90° from the closed position; in which case, it will be noted, the doors overlap the opening when the doors stand in the open position.

This combination is used only where conditions prevent folding the doors further back than 90° to the opening.

Drawing No. G-2 shows the application of No. 444 hanger used with adjustable track brackets in which the back end of the track sets away from the wall. This combination allows the doors to fold back against the wall, thus providing a clear opening when the doors are in the open position.

Made in sets for 3, 4, 5, and 6 three-foot (or less) doors for one opening as shown.

Equipment—The standard equipment consists of hangers, steel track, brackets and No. 195 binder or binders as required.

No. 195 binder is shown in detail on Drawing No. G-2. The advantage of this binder is its ability to hold the door tight against the opening or against stops under all conditions. Also it does not connect in any way with the floor, ceiling or header but is entirely on the doors. The binding action is secured by cams acting on iron pieces in such a way as to tend to turn the door inside out, thereby pushing it hard against the guides.

In case a service door is used, the ordinary lock will be required as shown, and if two service doors or swinging doors are used, as in the 6-door outfit, a cremone bolt or top and bottom bolt may be used.

In the case of the regular 4-door outfit, the binders are the only means of locking required, and where it is impossible to have a service door elsewhere, access to the binder may be had through a hinged panel in the door as shown on detail of 4-door outfit. The Coburn Trolley Track Mfg. Co. can furnish butts, locks and all hardware required to make a complete equipment or, if desired, these items can be purchased elsewhere, the Coburn Trolley Track Mfg. Co. furnishing only the track, supports and hangers.

The No. 195 door binder is a product exclusively of Coburn manufacture and has patent applied for.

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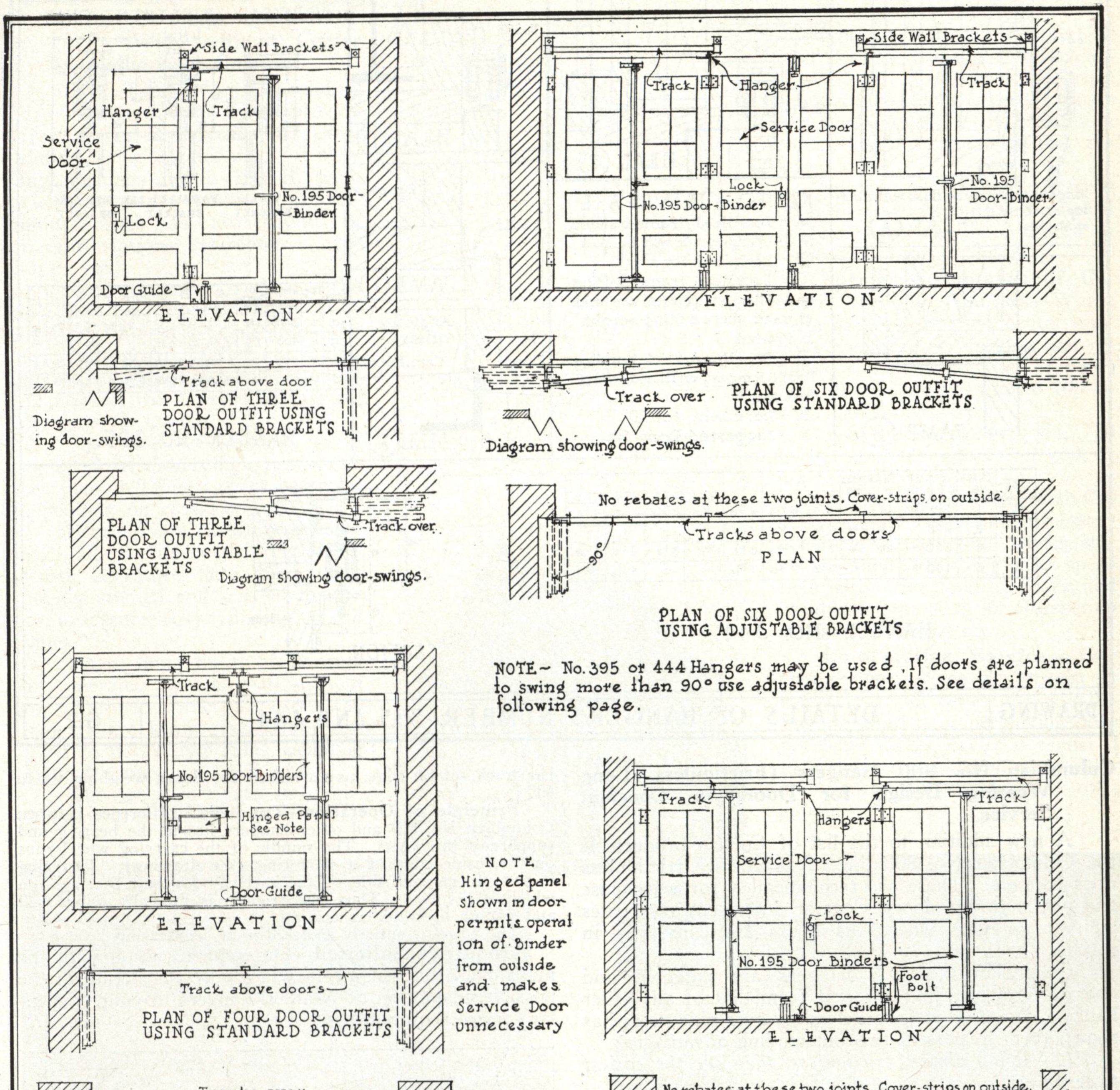

Side Wall Brackets
Hanger
Track
Service Door
Lock
No. 195 Door-Binder
Door Guide
ELEVATION
Track above door
Diagram showing door-swings.
Track over
Diagram showing door-swings.
Side Wall Brackets
Track
Hanger
Service Door
Lock
No. 195 Door-Binder
No. 195 Door-Binder
Track
ELEVATION
Track over
Diagram showing door-swings.
No rebates at these two joints. Cover-strips on outside.
Tracks above doors
90°
PLAN
Track
Hangers
No. 195 Door-Binders
Hinged Panel See Note
Door-Guide
ELEVATION
Track above doors
Tracks over
Diagram showing door-swings.
Track over
Diagram showing door-swings.
Track
Hangers
Track
Service Door
Lock
No. 195 Door Binders
Foot Bolt
Door Guide
ELEVATION
No rebates at these two joints. Cover-strips on outside.
Tracks above doors
90°
Track over
Track over
Diagram showing door-swings.

PLAN OF THREE DOOR OUTFIT USING STANDARD BRACKETS

PLAN OF THREE DOOR OUTFIT USING ADJUSTABLE BRACKETS

PLAN OF SIX DOOR OUTFIT USING STANDARD BRACKETS

PLAN OF SIX DOOR OUTFIT USING ADJUSTABLE BRACKETS

NOTE— No. 395 or 444 Hangers may be used. If doors are planned to swing more than 90° use adjustable brackets. See details on following page.

NOTE
Hinged panel shown in door permits operation of Binder from outside and makes Service Door unnecessary

PLAN OF FOUR DOOR OUTFIT USING STANDARD BRACKETS

PLAN OF FOUR DOOR OUTFIT USING ADJUSTABLE BRACKETS

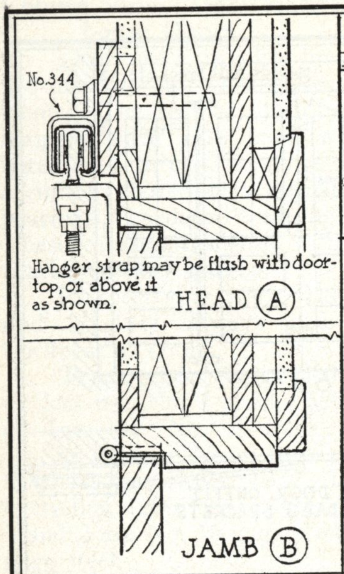
ALTERNATE FOUR DOOR OUTFIT USING ADJUSTABLE BRACKETS

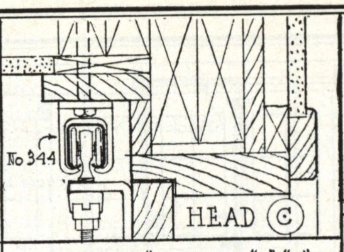
PLAN OF FIVE DOOR OUTFIT USING STANDARD BRACKETS

PLAN OF FIVE DOOR OUTFIT USING ADJUSTABLE BRACKETS

DRAWN BY SWEET'S CATALOGUE SERVICE INC.	FOLDING SLIDING GARAGE DOORS USING STANDARD & ADJUSTABLE BRACKETS WITH NO 395 & 444 HANGERS	SCALE 3/16" & 1½" EQUAL 1'-0" DATE, AUG. 25	DRWG G1

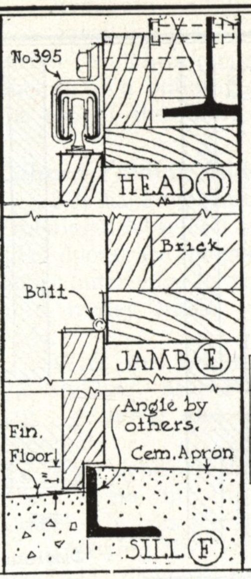
Continued on next page

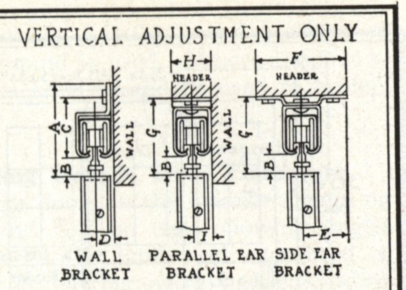

No.344
Hanger strap may be flush with door-top, or above it as shown.
HEAD (A)
JAMB (B)



KEY TO 1½" DETAILS "A"-"E"

A - Door Head, frame building, No.344 Hanger, side wall bracket
B - Door Jamb for "A" & "C"
C. - Door Head, frame building No.344 Hanger, parallel ear bracket, used where ceiling height is limited
D - Door Head, brick building No.395 Hanger, with side wall bracket.
E - Door Jamb for "D".
F - Suggested Door-Sill.



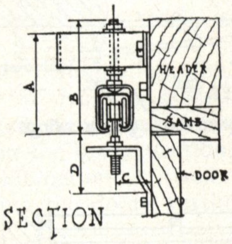


SIZE	TR'K. NO.	WEIGHT OF DOOR	MIN. THICKNESS	A		B		C	D	E	F	G		H	I
				MIN	MAX	MIN	MAX					MIN	MAX		
a	1	200 lbs	1½	5 5/16	7 3/16	7/8	2¾	3 13/16	1 1/16	2 5/8	5¼	4 1/16	5 15/16	2¼	1 1/16
b	2	400 "	1½	6 13/16	8 5/8	15/16	2 13/16	5 3/16	"	"	"	5½	7 3/8	"	"
c	4	800 "	2	8	10¾	1 1/8	3 7/8	6 1/8	1 11/16	3 3/16	6 3/8	6 3/8	9 1/8	3¼	1 11/16
d	6	600 "	2	7¾	10½	1 3/8	4 1/8	6 5/8	1 15/32	3	6	6 1/16	8 13/16	3	1½

HANGER NO. 395.

SIZE	TRACK NO.	WEIGHT OF DOOR	THICKNESS OF DOOR	A		B	C		D	
				MIN	MAX		MIN	MAX	MIN.	MAX.
a	1	125 lbs	1¼"-1¾"	5 7/16	6 1/16	6 5/8	1 3/16	2 15/16	3 3/8	4½
b	2	200 "	1¾"-2½"	6¾	7 5/16	7 7/8	"	"	"	"
c	4	600 "	2¼"-3½"	7¼	7 13/16	8 3/8	1 5/8	3 1/8	4 1/8	4 7/8
d	6	400 "	" "	6 7/8	7 3/8	7 15/16	"	"	4 5/16	"

HANGER NO. 344.



DRAWING | DETAILS OF HANGERS NUMBER 395 AND 444 | G2

Columbian No. 800 Hangers (Frictionless, Long Wearing Design for Doors in Constant Service)

A new addition to the list of Coburn products is the Columbian No. 800 line of practically frictionless door hangers. These are recommended for warehouse and public garage doors, elevator doors, entrance gates and similar uses where the doors are constantly in service.

Columbian No. 800 hangers are patented and operate on a principle different from that of any other hanger. A series of tests extending over nine years has shown them to possess two outstanding advantages:

(1) Being almost frictionless, they are the easiest to set in motion.

Tests—A heavy boiler plate garage door weighing 1200 lb. and hung on Columbian No. 800 hangers was set in motion by a push measured at 8 lb. on a spring balance.

(2) The bearing points are so arranged that even under the most severe service the wear on the hanger is practically negligible.

Tests—The U. S. Bureau of Standards has made exhaustive tests of the Columbian No. 800 hanger, subjecting it to several million oscillations under conditions similar to elevator door operation. Periodically during the test the hanger was taken down and calibrated. The wear at the end of the test was negligible, and the Columbian No. 800 was almost as good as a new hanger.

A pair of these hangers have been in service on one of the elevator doors at the Bureau of Printing in Washington, D. C., for several years. They show little sign of wear, although other types of hangers in the same service had to be replaced after four or five months.

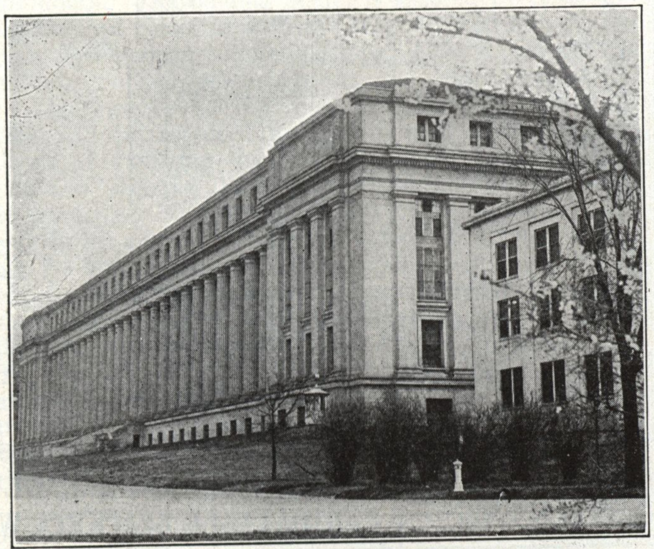
One, Two and Four-wheel Models—Columbian No. 800 hanger is made in one, two and four-wheel models depending on the weight of door. It can be furnished in sizes to carry almost any load, and special models are designed to meet conditions of service.

The detail drawing shows a one-wheel model running on bar track set on edge, as furnished for doors weighing up to 600 lb.

Principle of Operation—The radical difference between Columbian No. 800 and other hangers lies in the bearing and support of the wheel. The spindle of the carrying wheel runs on the inside edge of a steel ring (see drawing). This ring in turn forms one side of the raceway for ball bearings, on which it revolves. Thus, the friction is radically diminished and smooth operation is assured.

The wheel is entirely enclosed in an iron casing.

Inquiries Solicited—On communication with the main office, our engineers will gladly co-operate in the possible adaptation of No. 800 hangers to your particular service requirements.



Bureau of Printing and Engraving, Washington, D. C.
Columbian No. 800 Hangers used throughout

Continued on next page

Coburn Sliding Door Hangers for Openings up to 100 Ft. Wide without Center Mullions or Columns

Our Type No. 750 sliding door hangers and track provide free and perfect movement of heavy sliding doors or gates used for closing openings up to 100 ft. wide (without center mullions or columns) such as are found in freight stations, warehouses, garages, etc.

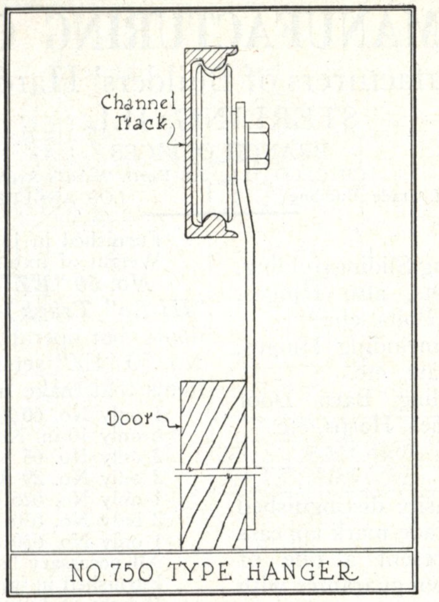
Special attention is given to the design of the hangers. The minutest details with regard to materials and workmanship are carried out so that perfect operation and easy running qualities of this type of hanger are permanently assured.

The wheels of the hangers are mounted on either high grade ball bearings or Timken roller bearings, depending on conditions.

Bearings are carefully selected and all details with regard to wheel curvature have been thoroughly studied and carried out so as to assure easy running at all times.

Doors hung on these hangers are operated by one man without undue effort; in fact, Type No. 750 hangers are being successfully applied to doors and gates weighing up to 6 tons.

The track is made in single, double and triple sections (the first being shown in the accompanying detail).



NO.750 TYPE HANGER

The single track consists of an iron channel, the double track consists of an I-beam and the triple track is a combination of the single and double track. In all cases, a rounded rail is mounted on the lower flange.

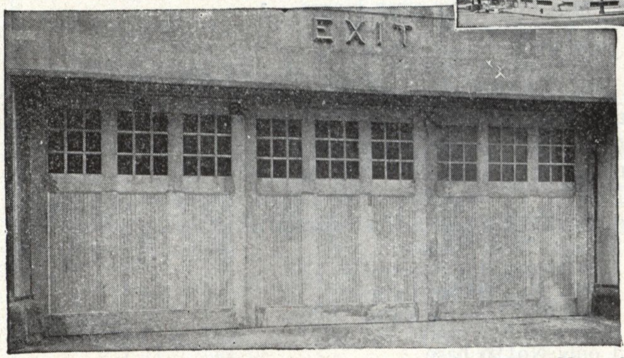
Suitable gearing and electrical operating devices can be furnished so that doors can be operated in 2-speed or 3-speed control.

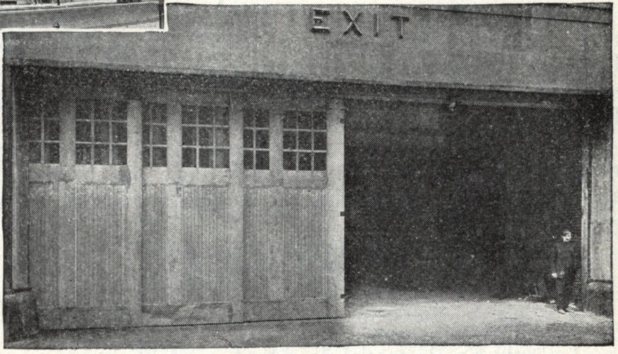
Special Advantages of Coburn No. 750 Hangers—Where these hangers are used, center mullions and columns such as are required for all other types of doors (installed in openings up to 100 ft. wide) are unnecessary.

The use of Coburn No. 750 hangers greatly reduces the cost of door maintenance.

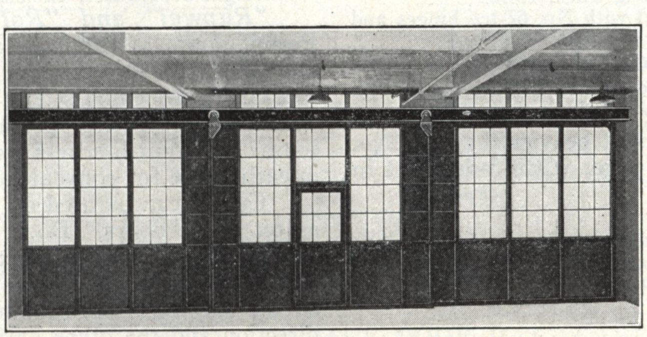
Where doors are hung with Coburn No. 750 hangers, the necessary openings for passage of trucks, etc., are obtained with far greater speed than with other types of doors, and in addition, *there are no obstructing mullions, columns, etc.*

Co-operative Service—Our engineering service department is available at all times for a satisfactory solution of perplexing door problems. This service is rendered to architects, engineers, contractors and owners without charge or obligation.





American News Building, New York, N. Y.
Russell G. Cory, Architect and Engineer — Turner Construction Co., Contractors
Coburn 3-speed hangers No. 750 installed in openings 38x14 ft.



Power House of Wm. Skinner & Sons Co.
Equipped with No. 750 Track and Hangers

FRANTZ MANUFACTURING COMPANY

Manufacturers of Builders' Hardware

STERLING, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 220 East 41st Street
CHICAGO, ILL., 208 North Wabash Avenue
DETROIT, MICH., Webster Hall
INDIANAPOLIS, IND., 412 Board of Trade Building
LOS ANGELES, CAL., 443 South San Pedro Street

Products

Garage Door Hardware, including Sliding-folding, Around-the-corner and Swinging Sets, also Hinges, Butts, Door Holders, Foot and Chain Bolts, etc.

Residence Finish Hardware, including Hinges, Butts, Screen Door Sets, Sash Hardware, etc.

Barn Door Hardware, including Barn Door Hangers and Track, also Hinges, Latches, Hasps, etc.

A Guarantee with Every Item

Frantz products, which can be easily distinguished by the bright red label (on which the trade-mark appears prominently) on every carton, represent a line of builders' hardware that includes a written guarantee with every item.

Frantz hangers and track described herein are so standardized that four designs and three weights will amply take care of any barn or garage builder's needs. For quick translation, "Glide" and "Hi-Lo" mean heavy duty; "Runwel" will take care of any ordinary door, and "Rollaway" is intended for light work.

Garage Door Hardware

Sliding-folding Sets—

No. 40 "EZ" Garage Fixtures (to Be Used with "Rollaway" Track)—For light weight doors. The last word in garage hardware construction. Easy to erect and easy to operate. With these fixtures, a perfect installation is assured. They make a job as weatherproof as any swinging door job, and doors can be hung in any combination desired.

Doors can be used inside or outside of the building and opened at any angle as conditions require. No brackets for track are necessary; track is fastened flat against header of door opening. For details, see following page.

This equipment is as satisfactory for barns as the regular sliding door. It actually keeps out more cold and requires less track. Packed one 3-door set in a fiber container as follows:

1 only No. 40 "EZ" hanger
4½ pairs 4x4-in. No. 908 japanned tight pin butts
1 only No. 625 chain bolt
1 only No. 650 foot bolt
1 No. 31½ japanned door pull
1 only No. 25 special door latch
All necessary bolts, lag screws, directions, etc.
Furnished in japan finish
Weight of fixtures, not including track, 17 lb.
These fixtures can also be had with No. 67 tee hinges and No. 65 offset butts.

No. 50 "EZ" Garage Fixtures (to Be Used with "Runwel" Track)—This set operates in identically the same manner as the preceding one, but is intended for average garage doors, and is built heavier than the No. 40. See details on following page. One 3-door set in a fiber carton contains:

1 only No. 50 "EZ" hanger
6 only 8-in. No. 67 garage hinges
3 only No. 65 butts
1 only No. 22 "Positive" latch
1 only No. 31½ door pull
1 only No. 626 chain bolt
1 only No. 650 foot bolt
1 only No. 630 chain pull
All necessary bolts, lag screws, directions, etc.
Furnished in japan finish
Weight of fixtures, not including track, 24 lb.

No. 60 "EZ" Garage Fixtures (to Be Used with "Hi-Lo" Track)—This set is intended for the heaviest doors, but operates the same as both the No. 40 and the No. 50 "EZ" sets. See details on following page. The items that make up a 3-door set are as follows:

1 only No. 60 "EZ" hanger
6 only 10-in. No. 67 garage hinges
3 only No. 65 butts
2 only No. 29 door pulls
1 only No. 626 chain bolt
2 only No. 650 foot bolts
1 only No. 630 chain pull
All necessary bolts, lag screws, directions, etc.
Furnished in japan finish
Weight of fixtures, not including track, 29¼ lb.

Around-the-corner Sets—

No. 5 "Y" Garage Fixtures (to Be Used with "Rollaway" Track)—Details on the following page show how this set is applied and what an ideal job is obtained through its use. Intended for light weight doors.

The separate passage door is especially desirable as the rolling doors need only be moved for taking car in or out. Doors can be hung to fit smoothly in the jamb, assuring a weatherproof job. Very little space is required in operating the doors.

The following items make up this set, exclusive of "Rollaway" track and corner curve:

3 only No. 5 hangers
2 only No. 31 door pulls
2 only No. 205 floor guides
3 only 8-in. No. 67 garage hinges
3 only 5-in. heavy strap hinges
All necessary bolts, lag screws, directions, etc.
Furnished in japan finish
Weight of fixtures, exclusive of track and curve, 13¼ lb.

No. 15 "Y" Garage Fixtures (to Be Used with "Runwel" Track)—These fixtures were designed to be used on the average stock door, and are built stronger than the preceding set. Operates in the same manner as No. 5 "Y" fixtures. See details on following page. One complete set in a fiber carton contains:

3 only No. 15 hangers
2 only No. 31½ door pulls
2 only No. 206 floor guides
3 only 8-in. No. 67 garage hinges
3 only No. 63 butts
1 only No. 96 hasp
All necessary bolts, lag screws, directions, etc.
Furnished in japan finish.
Weight of fixtures, exclusive of track and curve, 19½ lb.

"Runwel" and "Rollaway" Corner Curves—Permit doors to run back and away from the opening any distance desired. See details on following page. The curves are embossed on one end the same as straight track and they telescope, making a neat and complete joint. No joint brackets required. There is an oil hole in each curve for convenience in oiling hangers.

Curves can be used on double doors equally as well as on single doors. Doors can be made solid or may be divided and hinged together. Any number of doors can be hinged together and run in one direction, or two curves may be used, running one-half the doors in one direction and the other half in the other direction. In other words, by using corner curve, one may have as simple or elaborate a job as desired.

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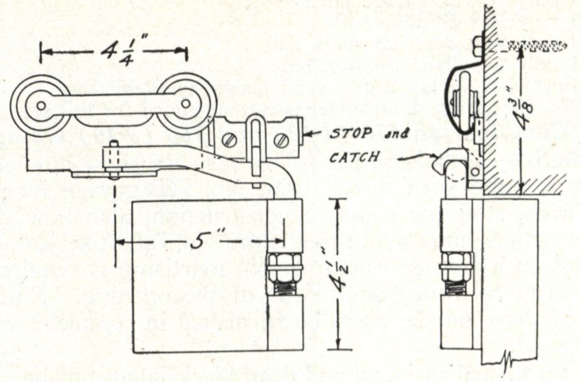
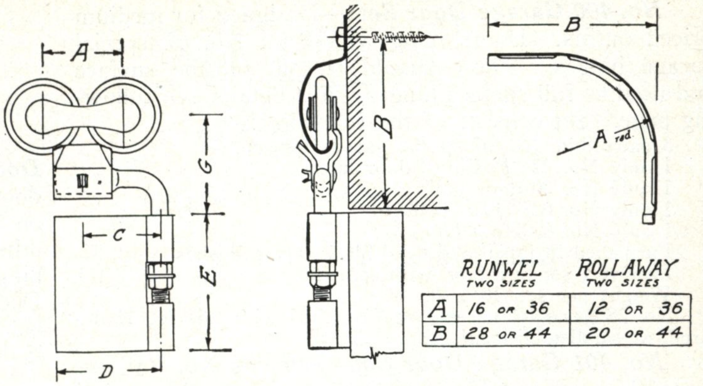
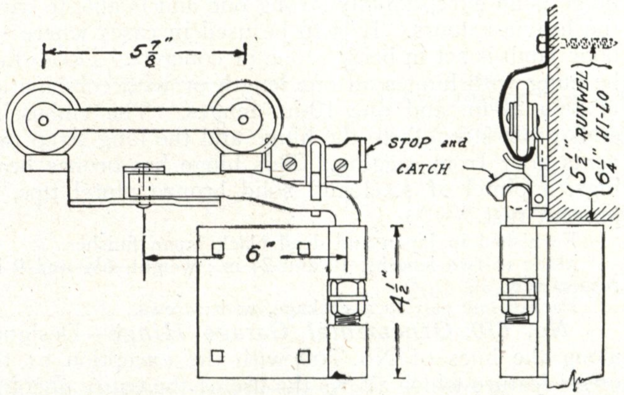

4 1/4"
STOP and CATCH
5"
4 3/8"
4 1/2"

No. 40 E-Z Hanger and Track

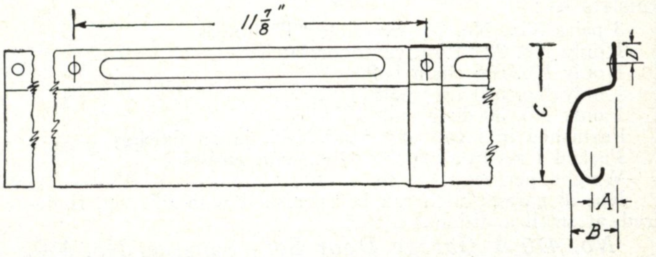

A
G
C
E
D
B
B
A rad

	RUNWEL TWO SIZES	ROLLAWAY TWO SIZES
A	16 OR 36	12 OR 36
B	28 OR 44	20 OR 44

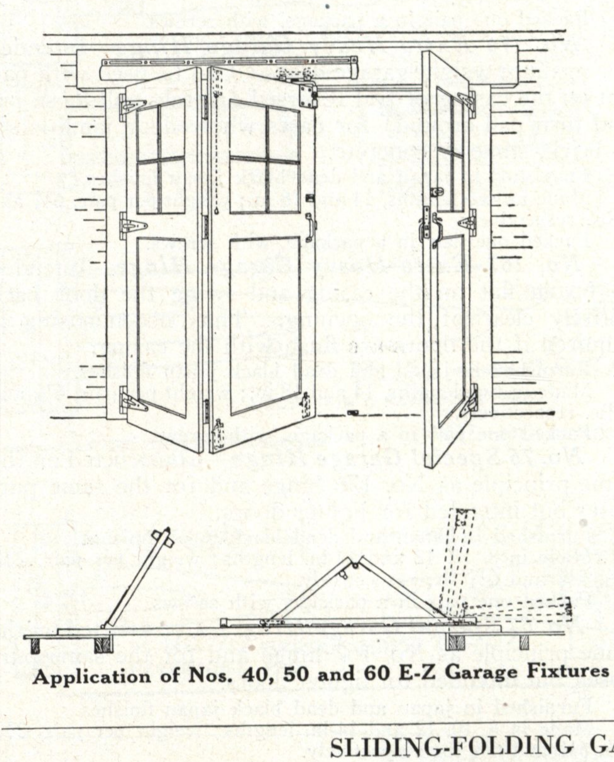
	A	B	C	D	E	G
Nº 5 ROLLAWAY	$1\frac{7}{8}$	$4\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{3}{8}$	4	$2\frac{1}{4}$
Nº 15 RUNWEL	$2\frac{3}{8}$	$5\frac{1}{4}$	$2\frac{1}{4}$	$3\frac{1}{4}$	4	3


5 7/8"
STOP and CATCH
6"
4 1/2"
5 1/2" RUNWEL
6 1/4" HI-LO

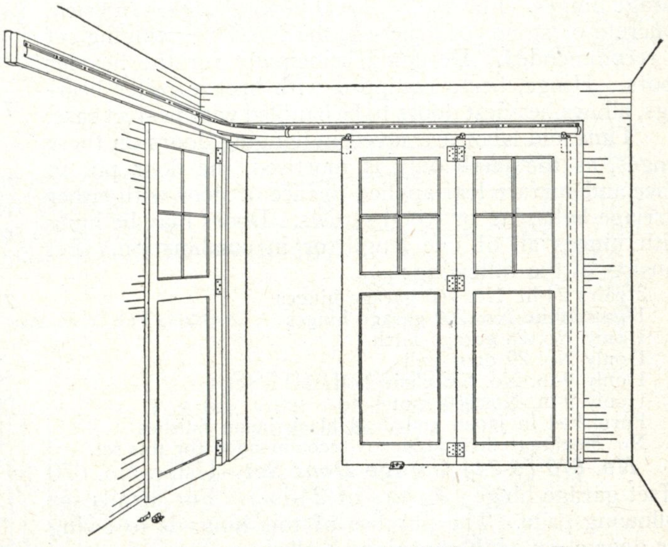
No. 50 and No. 60 E-Z Hangers and Track



TRACK	LENGTHS	A	B	C	D
HILO	4', 6', 8', & 10 FT.	$\frac{7}{8}$	$1\frac{5}{8}$	$4\frac{7}{8}$	$\frac{3}{4}$
RUNWEL	4.5.6.7.8.9.&10 FT.	$\frac{3}{4}$	$1\frac{3}{8}$	4	$\frac{5}{8}$
ROLLAWAY	4.5.6.7.8.9 & 10 FT.	$\frac{9}{16}$	$1\frac{1}{32}$	3	$\frac{1}{2}$



Application of Nos. 40, 50 and 60 E-Z Garage Fixtures



Application of Nos. 5 and 15 "Y" Garage Fixtures

SLIDING-FOLDING GARAGE DOOR HARDWARE

Continued on next page

Swinging Sets—

No. 400 Garage Door Sets—Designed for medium priced outfits. Doors hung with 8-in. No. 67 special garage hinges. These should be put on the surface and used as full surface hinges. For details, see following page. Set consists of the following:

3 pairs 8-in. No. 67 special garage hinges
1 only No. 22 "Positive" door latch
1 only No. 30 door pull
1 only No. 625 chain bolt
1 only No. 650 foot bolt
Furnished in japan and dead black japan finishes
Packed 1 set in a box, with screws
Weight per set, 10½ lb.

No. 28 garage latch can be furnished with this set, if desired, at small additional cost.

No. 401 Garage Door Set—Same as No. 400, except 10-in. No. 67 special garage hinges are packed instead of the 8-in. hinges. Weight per set, 13½ lb.

No. 28 garage latch can be furnished with this set, if desired, at small additional cost.

No. 410 Garage Door Set—Using our 8-in. No. 76 reversible "T" hinge. Can be used as full surface hinge or can be reversed and mortised in jamb when used on brick buildings. For details, see following page. Set consists of:

3 pairs 8-in. No. 76 reversible "T" hinges
1 only No. 22 "Positive" door latch
1 only No. 625 chain bolt
1 only No. 650 foot bolt
1 only No. 30 door pull
Furnished in japan and dead black japan finishes
Packed 1 set in a paper carton, with screws
Weight, per set, 11½ lb.

No. 28 garage latch can be furnished with this set, if desired, at small additional cost.

No. 410-A Garage Door Set—Same as No. 410, except pad is reversed on No. 76 hinge. Packed right and left pairs. Weight per set, 11½ lb.

No. 411 Garage Door Set—Same as No. 410, except that 10-in. hinges are used instead of 8-in. hinges. Weight per set, 16¼ lb.

No. 411-A Garage Door Set—Same as No. 410, except pad is reversed on No. 76 hinge and 10-in. hinges are used in place of 8-in. hinges. Packed right and left pairs. Weight per set, 16¼ lb.

No. 760 (2-24-10) Garage Door Set—In this set are used 2 pairs of 24-in. and 1 pair of 10-in. No. 760 garage hinges. For details, see following page. In brick, concrete or stone construction, the No. 760 swinging set is recommended. Designed principally for the heavier doors. Hinge, being equipped with bronze roller bearings, allows heaviest doors to be handled with perfect ease.

Time and labor are saved in hanging doors on these hinges, as the jamb only is mortised, the door put in place and surface leaf applied to face of door with either carriage bolts, lag or wood screws. Doors may be hung with hinges all of one length or in combination. Set consists of the following:

2 pairs 24-in. No. 760 garage hinges
1 pair 10-in. No. 760 garage hinges
1 only No. 28 garage latch
1 only No. 29 door pull
1 only 9-in. No. 625 chain bolt
1 only 9-in. No. 650 foot bolt
Furnished in japan and dead black japan finishes
No. 50 garage door holder is recommended for this set.

No. 670 (3-24) Garage Door Set—Using No. 670 offset garage hinge (3 pairs of 24-in.). For details see following page. The purpose of this hinge is to swing the door clear of the opening; it allows room for getting car in and out. It is easily applied, as mortising is unnecessary. A combination of 2 pairs of 24-in. and 1 pair of 12-in. hinges can be used if desired. Set consists of the following:

3 pairs 24-in. No. 670 offset garage hinges
1 only No. 28 garage latch
1 only No. 29 door pull
1 only 9-in. No. 625 chain bolt
1 only 9-in. No. 650 foot bolt
Furnished in japan and dead black japan finishes
No. 500 garage door holder is recommended for this set.

Combination 670 (3-12) and 760 (3-10) Garage Door Set—Details on the following page show how one door is hung with three 10-in. No. 760 garage hinges on brick, stone or concrete construction, also how the other door is hung with three 12-in. No. 760 offset garage hinges on a frame structure. No mortising is required. Door can be swung back clear of the opening. Either one of these numbers can be furnished in complete sets, if desired.

Furnished in japan and dead black japan finishes.

Ornamental Garage Door Sets Nos. 760 and 670—For details, see following page. Door holder folds back against top of door, out of the way, when door is closed. We recommend the use of No. 500 door holder on every swinging door job.

No. 760 Ornamental Garage Hinge—The No. 760 hinge is an exceptionally strong one and is able to carry the heaviest doors. It is to be used in cases where the door jamb is set in brick, stone or concrete. Doors may be hung with hinges all one length or with combination of two 24-in. and one 10-in. hinges. The embossing adds great strength to the hinge and the long strap prevents door from sagging. This hinge has bronze bearings, a pintel of steel and solid bronze pintel tips, to prevent rust.

Furnished in japan and dead black japan finishes.
Made in two lengths, 10 and 24 in.; weight, 6½ and 9 lb., respectively.
Packed one pair in a package, with screws.

No. 670 Ornamental Garage Hinge—Designed along the lines of No. 760 with the exception of the offset feature which allows the use of the entire opening. They are easily applied as no mortising is necessary.

Furnished in japan and dead black japan finishes.
Made in two lengths, 12 and 24 in.; weight per pair, 6½ and 9 lb., respectively.
Packed one pair in a package, with screws.

No. 176 Extra Heavy Garage Hinge—Intended for medium weight garage doors. Can be used with pad flat on the casing or pad reversed (merely pull loose pin and turn pad around) for cases where door jamb is set in brick, stone or concrete.

Furnished in japan and dead black japan finishes.
Made in two lengths, 14 and 18 in.; weight per pair, 6¼ and 7 lb., respectively.
Packed one pair in a package, with screws.

No. 167 Extra Heavy Garage Hinge—Intended to fasten flat on the casing and swing the door back entirely clear of the opening. Thus no mortising is required if the doors are flush with the casing.

Furnished in japan and dead black japan finishes.
Made in two lengths, 14 and 18 in.; weight per pair, 6¼ and 7 lb., respectively.
Packed one pair in a package, with screws.

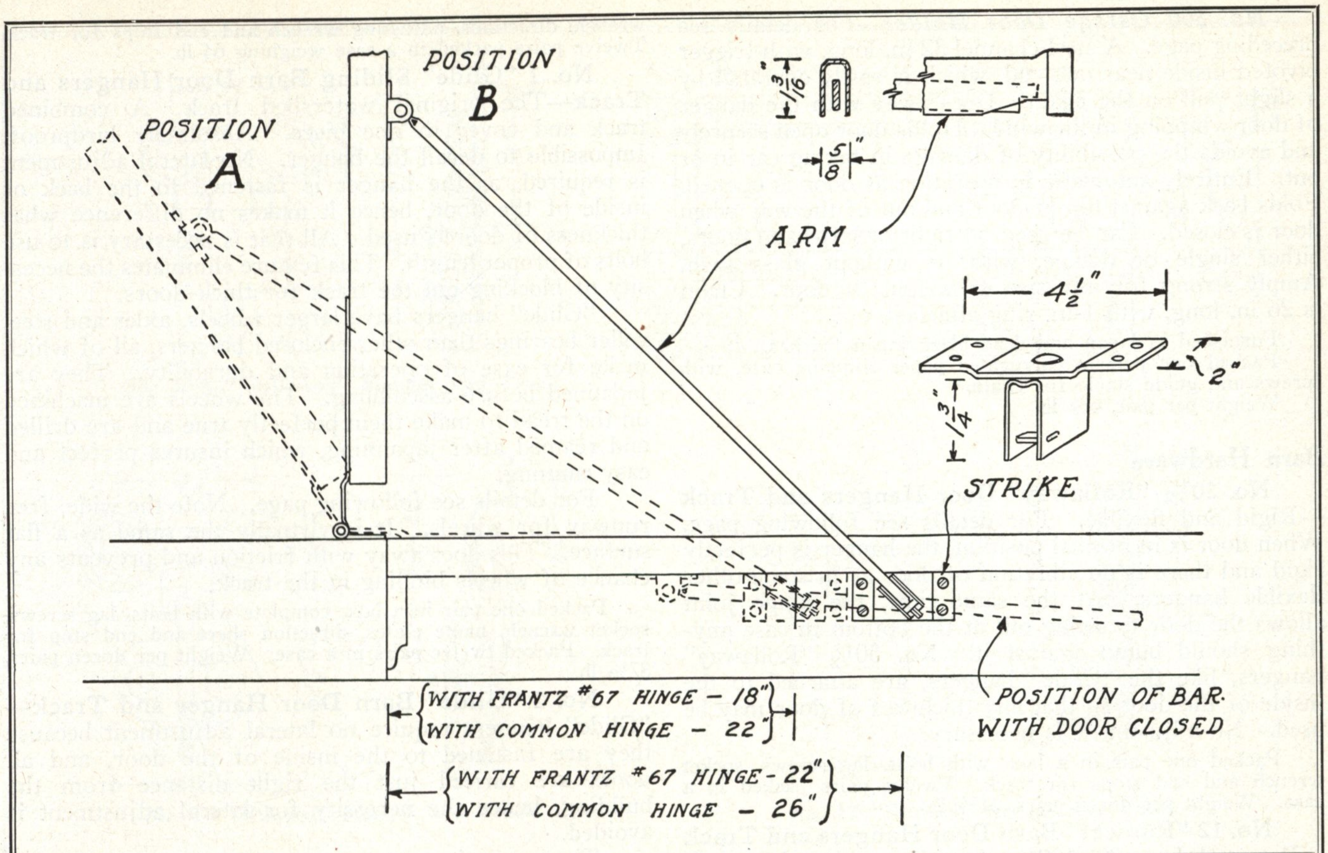
No. 76 Special Garage Hinge—Constructed on the same principle as No. 176 hinge and for the same purposes but intended for lighter doors.

Furnished in japan and dead black japan finishes.
Made in 8, 10, 12 and 14-in. lengths; weight per pair, 2¾, 4½, 5¼ and 6¼ lb., respectively.
Packed one pair in a package, with screws.

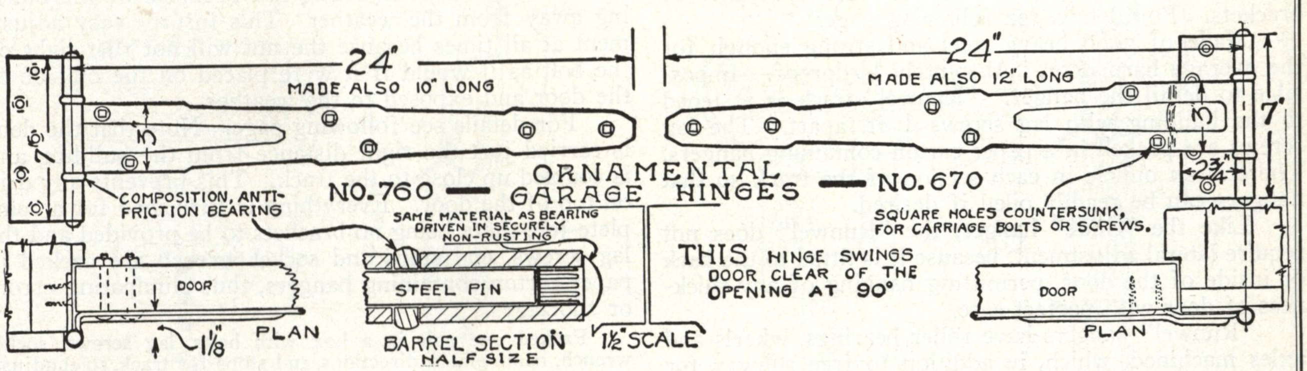
No. 67 Special Garage Hinge—Constructed on the same principle as No. 167 hinge and for the same purposes, but intended for lighter doors.

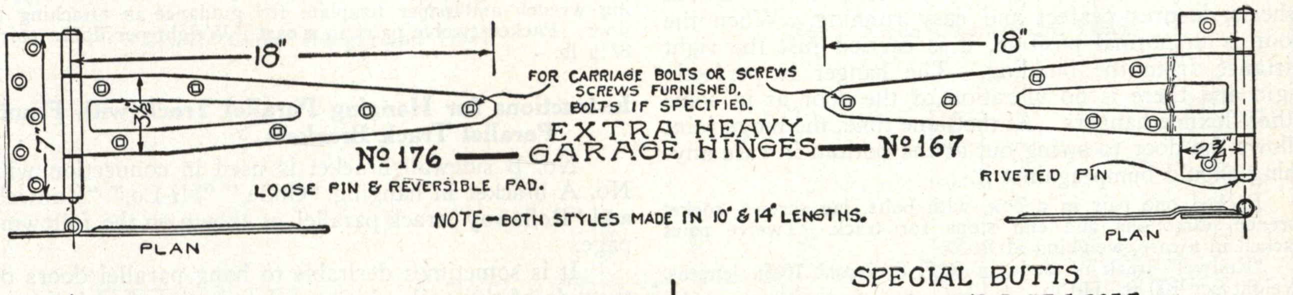
Furnished in japan and dead black japan finishes.
Made in 8, 10, 12 and 14-in. lengths; weight per pair, 2¾, 4½, 5¼ and 6¼ lb., respectively.
Packed one pair in a package, with screws.

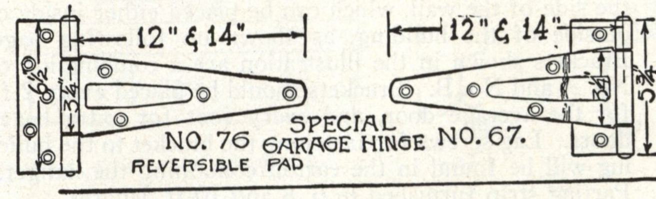
Continued on next page

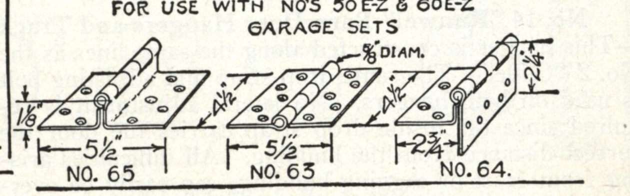

POSITION B
POSITION A
3 1/16"
5/8"
ARM
4 1/2"
2"
1 3/4"
STRIKE
POSITION OF BAR WITH DOOR CLOSED
WITH FRANTZ #67 HINGE – 18"
WITH COMMON HINGE – 22"
WITH FRANTZ #67 HINGE – 22"
WITH COMMON HINGE – 26"

No. 500 GARAGE DOOR HOLDER


24"
MADE ALSO 10" LONG
7"
3"
COMPOSITION, ANTI-FRICTION BEARING
NO. 760 — ORNAMENTAL GARAGE HINGES — NO. 670
SAME MATERIAL AS BEARING DRIVEN IN SECURELY NON-RUSTING
STEEL PIN
BARREL SECTION HALF SIZE
1 1/2" SCALE
DOOR
PLAN
1 1/8"
24"
MADE ALSO 12" LONG
7"
3"
2 3/4"
SQUARE HOLES COUNTERSUNK, FOR CARRIAGE BOLTS OR SCREWS.
THIS HINGE SWINGS DOOR CLEAR OF THE OPENING AT 90°
DOOR
PLAN


18"
7"
3 1/2"
FOR CARRIAGE BOLTS OR SCREWS SCREWS FURNISHED, BOLTS IF SPECIFIED.
EXTRA HEAVY GARAGE HINGES
№ 176
№ 167
LOOSE PIN & REVERSIBLE PAD.
NOTE—BOTH STYLES MADE IN 10" & 14" LENGTHS.
PLAN
18"
2 3/4"
RIVETED PIN
PLAN


12" & 14"
6 1/2"
3 1/4"
NO. 76
REVERSIBLE PAD
SPECIAL GARAGE HINGE
12" & 14"
5 3/4"
NO. 67.


SPECIAL BUTTS
FOR USE WITH NO'S 50 E-Z & 60 E-Z GARAGE SETS
5/8 DIAM.
1/8"
4 1/2"
4 1/2"
2 1/4"
2 3/4"
5 1/2"
5 1/2"
NO. 65
NO. 63
NO. 64.

SWINGING DOOR GARAGE HARDWARE

Continued on next page

No. 500 Garage Door Holder—For details see preceding page. A steel channel 32 in. long, with trigger pivoted inside near one end, which is easily operated by a slight pull on the chain. Does away with the danger of door whipping in the wind. Holds door open securely and avoids the possibility of damage in taking car in or out. Entirely automatic in operation as door is opened. Folds back against top of door and out of the way when door is closed. Can be used on right or left-hand doors, either single or double, with or without glass sash. Amply strong for any size or weight of door. Chain is 26 in. long, with 1-in. ring attached.

Furnished in japan and dead black japan finishes.

Packed one pair in corrugated paper shipping case, with screws and guide staple for chain.

Weight per pair, 6⅜ lb.

Barn Hardware

No. 30½ "Rollaway" Door Hangers and Track—Rigid and flexible. For details see following page. When door is in normal position, the hanger is perfectly rigid and there is no vibration of door as in some other flexible hangers. At the same time, the hinge joint allows the door to swing out at the bottom in case anything should bump against it. No. 30½ "Rollaway" hangers, like the "Glide" hangers, are attached to the inside of the door so that any thickness of door may be used. No adjustment is necessary.

Packed one pair in a box, with bolts, lag screws, socket wrench and end stops for track. Twelve pairs packed in a case. Weight per dozen pairs, 31½ lb.

No. 12 "Runwel" Barn Door Hangers and Track—Patented June 20, 1921. A trolley track with semi-watershed, made of one piece of steel, telescoping at the joints, doing away with the expense and annoyance of brackets. For details see following page.

Made of good heavy steel and strong enough for the average barn door. Absolutely birdproof. Impossible to derail the hanger. "Runwel" track is fastened to the building with lag screws 1 ft. apart. The lag screws are packed in a paper carton containing hangers. There is an oilhole in each section of the track so that hangers can be readily oiled if desired.

Like the "Glide" hanger, the "Runwel" does not require lateral adjustment, because it is fitted to the back or inside of the door, permitting hanging of any thickness of door with perfect ease.

"Runwel" hangers have roller bearings, wheels and axles machined, which, in addition to free runway for wheels, insures perfect and easy running. When the door is in normal position, it is carried just the right distance from the building. The hanger is perfectly rigid and there is no vibration of the door as in some other flexible hangers. At the same time, the hinge joint allows the door to swing out at the bottom in case anything should bump against it.

Packed one pair in a box, with bolts, lag screws, socket wrench, directions and end stops for track. Twelve pairs packed in a case, weighing 51 lb.

"Runwel" track is made in 6, 7, 8, 9 and 10-ft. lengths. Weight per 100 ft., 140 lb.

No. 14 "Runwel" Barn Door Hangers and Track—This hanger is constructed along the same lines as the No. 2 "Glide." The same drop strap and adjusting bolt is used on both hangers. No lateral adjustment is required since the inside drop strap carries the door the correct distance from the building. All difficulties arising from frost or sagging buildings can easily be overcome by the adjustable feature. For details see following page.

Packed one pair in a box, with bolts, lag screws, socket wrench, directions, adjusting wrench and end stops for track. Twelve pairs packed in a case weighing 64 lb.

No. 1 "Glide" Sliding Barn Door Hangers and Track—The original watershed track. A combined track and cover in one piece. Absolutely birdproof. Impossible to derail the hanger. No lateral adjustment is required, as the hanger is fastened to the back or inside of the door, hence it makes no difference what thickness of door is used. All that is necessary is to use bolts of proper length. This feature eliminates the necessity of blocking out the track for thick doors.

"Glide" hangers have larger wheels, axles and steel roller bearings than other enclosed hangers, all of which make for ease of operation and durability. They are japanned before assembling. The wheels are machined on the tread to make them perfectly true and are drilled and reamed after japanning, which insures perfect and easy running.

For details see following page. Note the wide, free runway for wheels. It is virtually the same as a flat surface. This does away with friction and prevents any chance of wheels binding in the track.

Packed one pair in a box, complete with bolts, lag screws, socket wrench, name plates, direction sheet and end stop for track. Packed twelve pairs in a case. Weight per dozen pairs, 87½ lb.

No. 2 "Glide" Barn Door Hanger and Track—"Glide" hangers require no lateral adjustment because they are fastened to the inside of the door, and all doors are carried just the right distance from the building, hence the necessity for lateral adjustment is avoided.

There are times, however, when a vertical adjustment is desirable, which is our reason for building this construction. The adjusting nut is inside of the building away from the weather This insures easy adjustment at all times because the nut will not rust tight on the bolt as it would if it were placed on the outside of the door and exposed to the weather.

For details see following page. Note that the door is carried just the right distance from the building and is coupled up close to the track. This prevents any drip on top of the door. Everything is furnished for a complete job, there being no brackets to be provided and the lag screws, end stops and socket wrench are packed in paper carton containing hangers, thus eliminating errors or shortages.

Packed one pair in a box with bolts, lag screws, socket wrench, name plates, directions, end stops for track, steel adjusting wrench and paper template for guidance in attaching to door. Packed twelve pairs in a case. Weight per dozen pairs, 87½ lb.

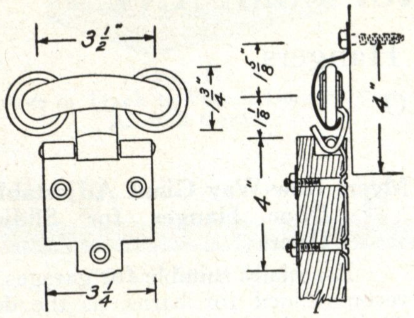
Instructions for Hanging Parallel Track with Frantz Parallel Track Brackets

No. B sidewall bracket is used in connection with No. A bracket in hanging "Glide," "Hi-Lo," "Runwel" and "Rollaway" track parallel, as shown on the following page.

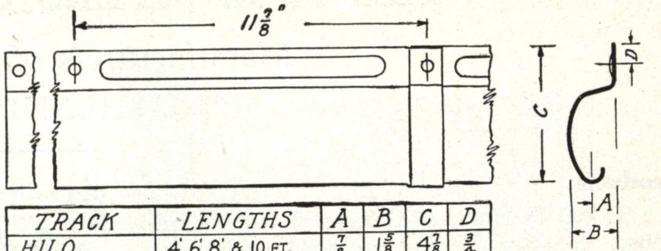
It is sometimes desirable to hang parallel doors on the side of the wall, which can be placed either inside or outside of the building, as shown on following page. Brackets shown in the illustration are a combination of No. A and No. B. Brackets should be placed every 2 ft. for the average door, and every foot for extra heavy doors. Lag screws for fastening the bracket to the building will be found in the carton containing the hangers. Parting strip furnished in 6, 8 and 10-ft. lengths.

Floor guide furnished, if desired. Prices and full description on request. In writing, mention width of opening, etc.

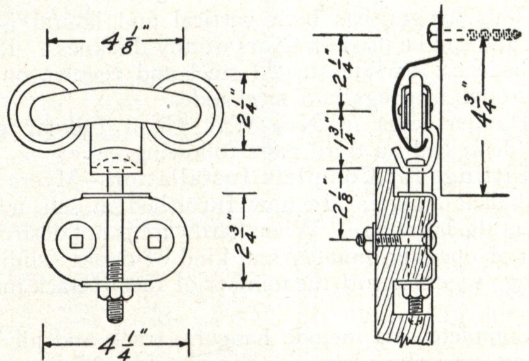
Continued on next page


3 1/2"
1 3/4"
5/8"
1/8"
4"
4"
3 1/4"

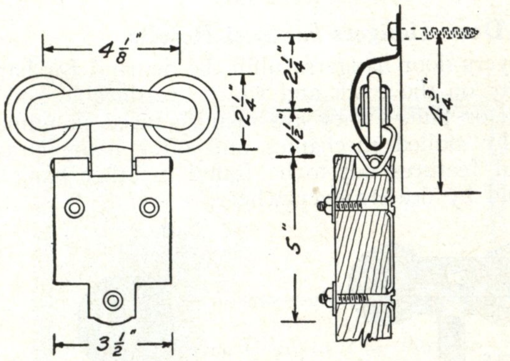
No. 30½ "Rollaway" Hanger and Track



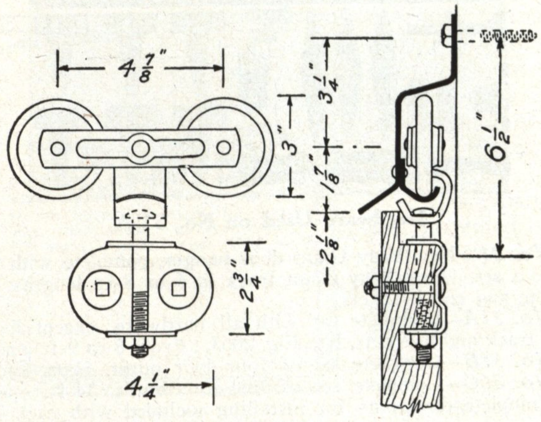
TRACK	LENGTHS	A	B	C	D
HILO	4', 6', 8', & 10 FT.	7/8	1 5/8	4 7/8	3/4
RUNWEL	4.5.6.7.8.9. & 10 FT.	3/4	1 3/8	4	5/8
ROLLAWAY	4.5.6.7.8.9 & 10 FT.	9/16	1 1/32	3	1/2


4 1/8"
2 1/4"
2 1/4"
1 3/4"
4 3/4"
2 1/8"
2 3/4"
4 1/4"

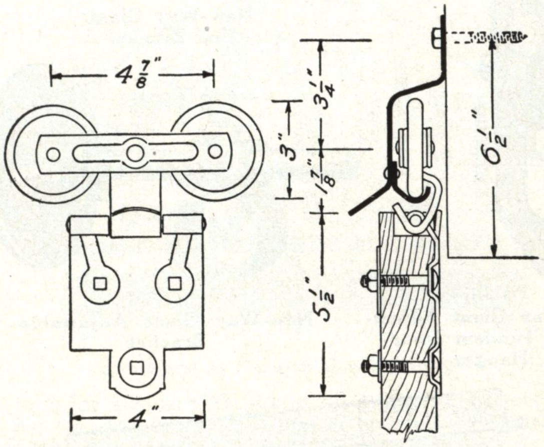
No. 14 "Runwel" Hanger and Track


4 1/8"
2 1/4"
2 1/4"
1/2"
4 3/4"
5"
3 1/2"

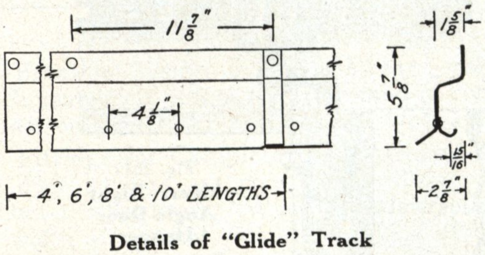
No. 12 "Runwel" Hanger and Track


4 7/8"
3"
3 1/4"
1 7/8"
6 1/2"
2 1/8"
2 3/4"
4 1/4"

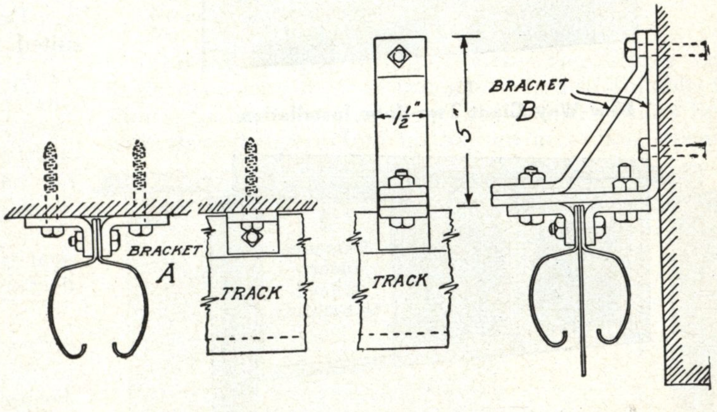
No. 2 "Glide" Hanger and Track


4 7/8"
3"
3 1/4"
1 7/8"
6 1/2"
5 1/2"
4"

No. 1 "Glide" Hanger and Track


11 7/8"
4 1/8"
4', 6', 8' & 10' LENGTHS
1 5/8"
5 7/8"
15/16
2 7/8"

Details of "Glide" Track


BRACKET A
TRACK
TRACK
1 1/2"
5"
BRACKET B

Parallel Track Brackets

BARN DOOR HARDWARE

THE F. E. MYERS & BRO. COMPANY

Manufacturers of Door Hangers

ASHLAND, OHIO

Products

Door Hangers: Garage, Barn, Warehouse, etc. for Sliding and Sliding-Folding Doors; Store Ladders; Lift and Force Pumps.

For Hay Tools, see page 1669; for Power Pumps, see pages 1921-1923.

Myers Door Hangers for Best Results

Myers door hangers fulfill the demand for hangers that stay on the track and which are durable and easy to push or pull. They are manufactured in numerous styles by skilled mechanics and offer many practical patented features not to be found in other hangers.

Sold by dealers everywhere.

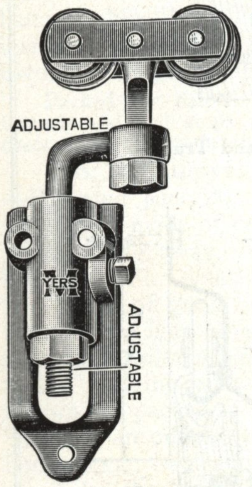


Fig. 2172
New-Way Giant Adjustable Tandem Door Hanger

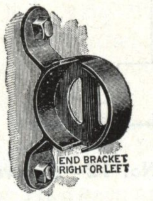


Fig. 2160
New-Way Giant End Bracket

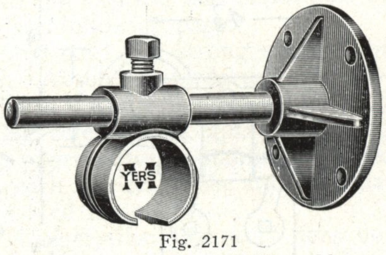


Fig. 2171
New-Way Giant Adjustable Bracket

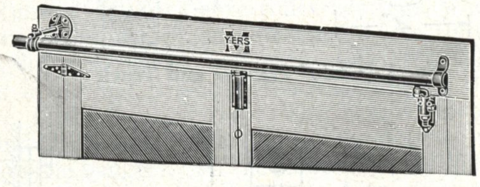


Fig. 2064
New-Way Giant Two-door Installation

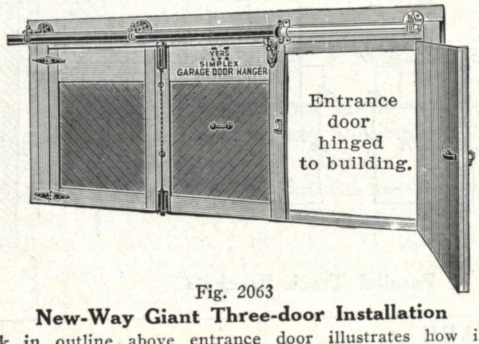


Fig. 2063
New-Way Giant Three-door Installation
Track in outline above entrance door illustrates how it can be extended for use on double doors

TAKE OFF YOUR HAT TO THE
MYERS
PUMPS FOR EVERY PURPOSE
HAY TOOLS & DOOR HANGERS
TRADE-MARK

Myers New-Way Giant Adjustable Tandem Door Hanger for Sliding-Folding Doors

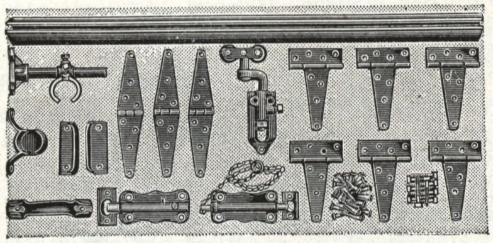
Especially suitable for garages, but is also recommended for barns, as the door can be fitted under a header, thus fitting the door flush at the top, affording complete protection from the weather.

This hanger has both vertical and lateral adjustment and can be used on doors of any thickness. Rollers are made of machine-turned steel and revolve on hard steel roller bearings and steel axle.

Hanger runs in New-Way Giant tubular girder track described on third page following.

Fittings for Complete Installation—Myers New-Way Giant hangers are now furnished in sets with or without the hardware. When hardware is not desired, the width of opening, number and kind of doors (sliding or folding) together with the number of feet of track must be given.

Complete sets include hangers, track and all hardware except lock or latch for three or four-door openings of different widths as given in the specifications below:



Hardware Used on No. 31-A

No. 31—New-Way Giant door hanger, complete with bolts, one to a set. New-Way Giant track in 6 or 8-ft. lengths. Adjustable and end brackets.

No. 31A—Complete set with all hardware, except lock or latch, track and brackets, like Fig. 2063. From 8 to 9-ft. opening.

No. 31B—Complete set of four-door outfit, 11-ft. opening.

No. 31C—Complete set of five-door outfit, 14-ft. opening.

Complete directions for installing included with each set.

Myers Right Angle Garage Door Hangers

Designed especially for garages, but are equally suited for barns, warehouses, etc. Suitable for either

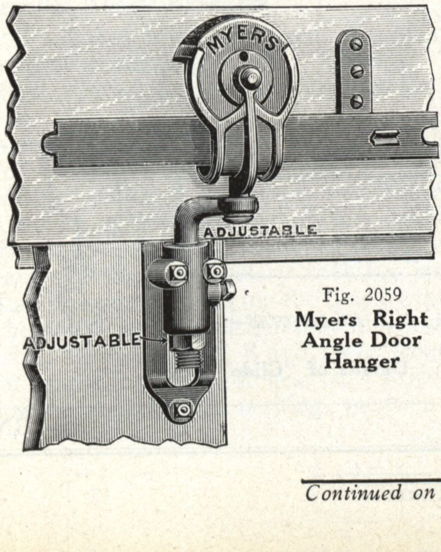


Fig. 2059
Myers Right Angle Door Hanger

Continued on next page

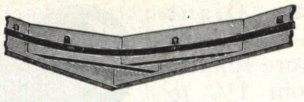
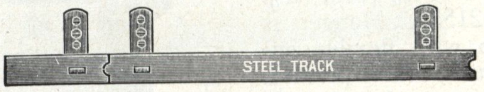


Fig. 1793

Curve in Track to Permit Door to Pass Around Corner



"O.K." Steel Track

right angle sliding or sliding-folding doors as shown.

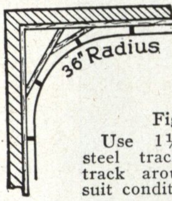


Fig. 1800

Use 1¼x⅜ in. flat steel track. Bend the track around corner to suit conditions

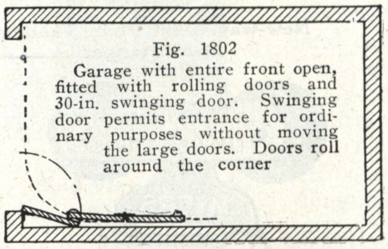


Fig. 1802

Garage with entire front open, fitted with rolling doors and 30-in. swinging door. Swinging door permits entrance for ordinary purposes without moving the large doors. Doors roll around the corner

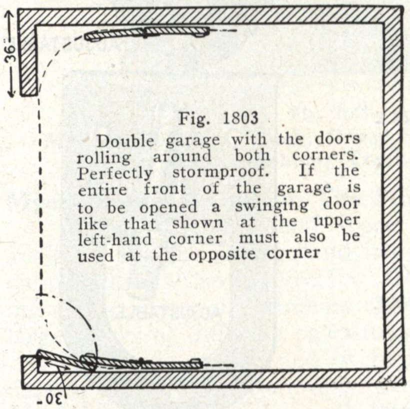


Fig. 1803

Double garage with the doors rolling around both corners. Perfectly stormproof. If the entire front of the garage is to be opened a swinging door like that shown at the upper left-hand corner must also be used at the opposite corner

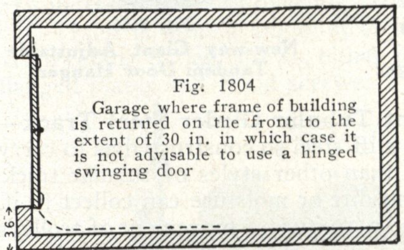


Fig. 1804

Garage where frame of building is returned on the front to the extent of 30 in. in which case it is not advisable to use a hinged swinging door

Garage Details

For Sliding Doors—When used for right angle sliding doors, these hangers operate on track hung on the inside of the building with a curved section in one corner so that the doors slide entirely out of the way. In this manner the entire door opening can be utilized as 2, 3, 4 or more doors can be hinged together and operated satisfactorily. If desired, a swinging entrance door can be used independent of the sliding doors as shown.

These hangers are provided with vertical and lateral adjustments, and may be used on doors of any thickness. The "Stay-on" feature prevents doors from jumping the track. They operate on any 1¼x$\frac{3}{16}$-in. flat steel track and can be easily and quickly installed by any mechanic. Myers "O. K." steel track is furnished in lengths of 4, 6, 8, and 10 ft.

Frame of hanger is made of heavy malleable iron which completely covers the large tandem rollers, which operate on steel roller bearings and steel axles.

Fittings for Complete Installations—Myers garage door hangers are now furnished in sets with or without the hardware. When hardware is not desired, the width of opening, number and kind of doors (sliding or folding) together with the number of feet of track must be given. Complete sets include hangers, track and all hardware except lock or latch for three or four-door openings of different widths as given in the specifications below.

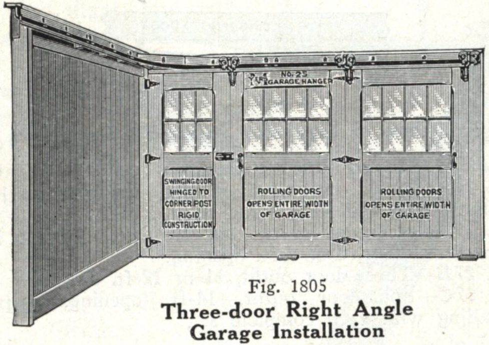

No. 25 GARAGE HANGER
SWINGING DOOR HINGED TO CORNER POST RIGID CONSTRUCTION
ROLLING DOORS OPENS ENTIRE WIDTH OF GARAGE
ROLLING DOORS OPENS ENTIRE WIDTH OF GARAGE

Fig. 1805

Three-door Right Angle Garage Installation

Entrance door hinged to jamb. Two sliding doors roll around corner on curved track

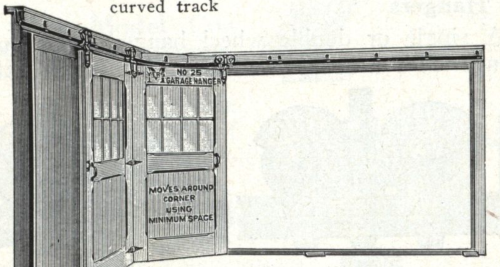
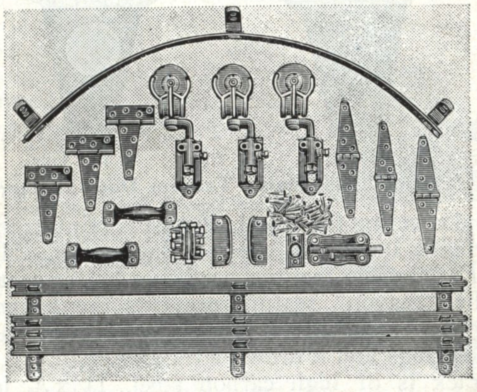

No 25 GARAGE HANGER
MOVES AROUND CORNER USING MINIMUM SPACE

Fig. 1806

Sliding Doors as They Appear When Open



Hardware as Furnished with No. 26A

Sets for Inside Sliding and Swinging Foot Door—

No. 26—Hangers only, in sets of three complete with bolts, "O.K." flat steel track, 4, 6, 8 and 10-ft. lengths.

No. 26A—Hangers, track and hardware complete, except lock or latch for three-door outfit, 8-ft. opening.

No. 26B—Three-door outfit, 11-ft. opening.

No. 26C—Four-door outfit, 16-ft. opening.

For Sliding-Folding Doors—The Myers right angle door hanger described above is also suitable for sliding-folding doors as illustrated below. Doors hung with these hangers fold up like an accordion, opening

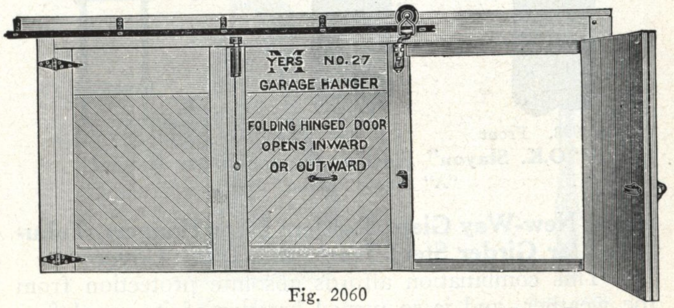

MYERS NO. 27 GARAGE HANGER
FOLDING HINGED DOOR OPENS INWARD OR OUTWARD

Fig. 2060

Right Angle Hangers Applied to Sliding-Folding Doors

Continued on next page

either inward or outward, and can be folded back against the sidewall or parallel to the front of the building. Any 1¼x$\frac{3}{16}$-in. flat track may be used.

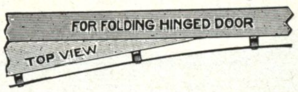

FOR FOLDING HINGED DOOR
TOP VIEW

Fig. 1810
Top View of Track for Sliding-Folding Doors

Sets for Hinged Folding Doors—

No. 27—Hanger only, set of one, complete with bolts. "O.K." flat steel track, 4, 6, 8 and 10-ft. lengths.

No. 27A—Hangers, track and hardware, except lock or latch, for three-door, 8 or 9-ft. opening.

No. 27B—Three-door outfit, 11 or 12-ft. opening.

No. 27C—Four-door outfit, 14-ft. opening. Instructions for installing with each complete set.

Myers "O. K. Stayon" Flexible Covered Door Hangers

A single or double wheel hanger, light and easy running. Has a heavy malleable iron frame extending over and covering the wheel. Frame is reinforced by two ribs, greatly increasing the carrying power. Has plain hasp or adjustable features as shown by illustrations.

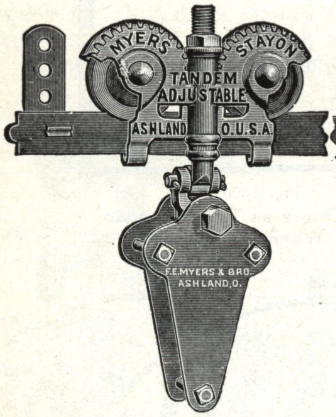

MYERS
STAYON
TANDEM ADJUSTABLE
ASHLAND
O.U.S.A.
F.E.MYERS & BRO. ASHLAND, O.

Fig. 1154

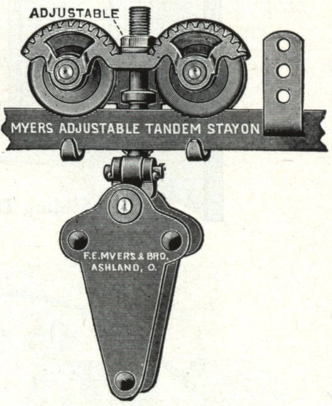

ADJUSTABLE
MYERS ADJUSTABLE TANDEM STAYON
F.E.MYERS & BRO. ASHLAND, O.

Fig. 1155

"Stayon" Adjustable Tandem Door Hanger

The "Stayon" feature prevents the hanger from leaving the track. Steel wheels revolve on hard steel roller bearings and a drawn steel axle.

Track is of high carbon steel, 1¼x$\frac{3}{16}$ in., supported by steel brackets and is furnished in lengths of 4, 6, 8 and 10 ft.

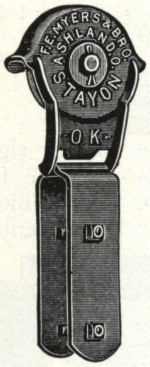

F.E.MYERS & BRO. ASHLAND, O.
STAYON
O K

Fig. 998. Front

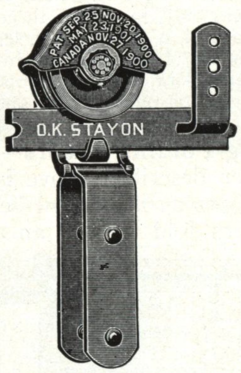

PAT. SEP 25 NOV 20 1900 MAY 23 1901 CANADA NOV 21 1900
O.K. STAYON

Fig. 999. Back

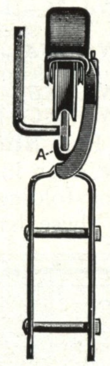


Fig. 997. Side

"O.K. Stayon" Flexible Covered Door Hanger

"A" shows "Stayon" device

Myers New-Way Giant Tandem Door Hangers, Tubular Girder Steel Track and Track Cover

This combination affords absolute protection from the weather, and is so named because of its novel features, its size and strength, and carrying power.

New-Way Giant Hangers—New-Way Giant hangers are suitable for doors from 1½ to 3 in. thick or more. They are provided with both vertical and lateral adjustments, or with plain hasp (Fig. 2155). Hanger is tandem with flexible engine truck, center pivoted. Rollers are large, machined from solid steel and fitted with hard steel roller bearings surrounding heavy steel axle.

Construction lessens vibration, allows doors to be raised or lowered and moved in and out, provides ample carrying power and insures easy and fast operation.

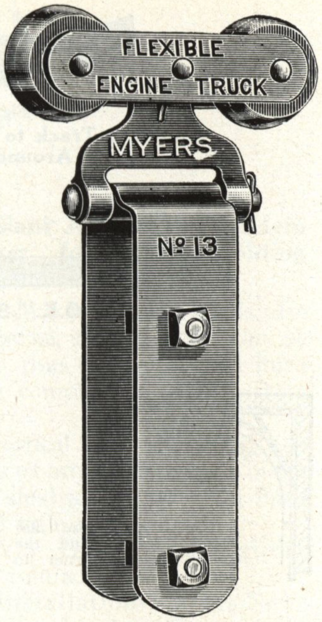

FLEXIBLE
ENGINE TRUCK
MYERS
No 13

Fig. 2155
New-way Giant Plain Tandem Door Hanger

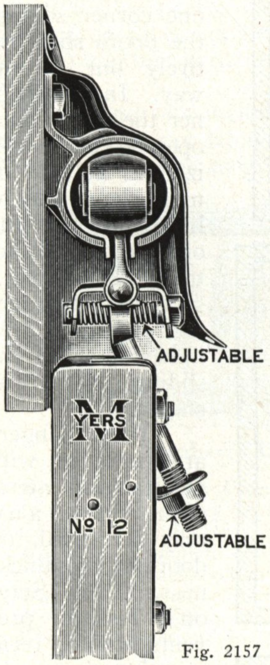

ADJUSTABLE
MYERS
No 12
ADJUSTABLE

Fig. 2157
Vertical and Lateral Adjustments New-way Giant Hanger

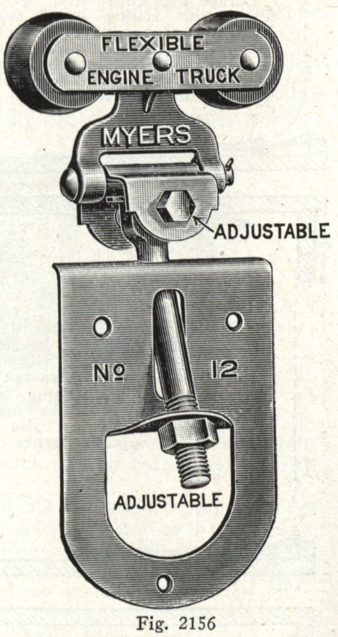

FLEXIBLE
ENGINE TRUCK
MYERS
ADJUSTABLE
No 12
ADJUSTABLE

Fig. 2156
New-way Giant Adjustable Tandem Door Hanger

New-Way Giant Tubular Girder Steel Track—Made of high carbon stiff steel so constructed as to carry a much heavier load than other styles of tubular track. It is so shaped that no dirt or moisture can collect in it. This prevents rust and permits free movement of trolleys at all times. Track is supported every 4 ft. by heavy malleable iron bracket held in position by a lag screw. Joint is made by ends of track meeting half way in bracket, producing a rigid splice which equals the strength of any other part of the track. Reversible end brackets of heavy malleable iron hold track in position and not only prevent its slipping endways but make it birdproof.

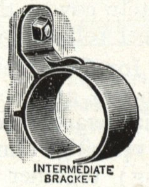

INTERMEDIATE BRACKET

Fig. 2160

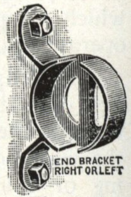

END BRACKET RIGHT OR LEFT

Fig. 2161

Track Brackets

Continued on next page

New-Way Giant track has oil holes to lubricate the roller bearings, is made in 4, 6 and 8-ft. lengths, and is furnished with or without track cover as described in following paragraph.

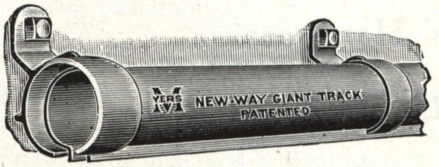


Fig. 2159

Section of New-Way Giant Track 4, 6 and 8-ft. Lengths

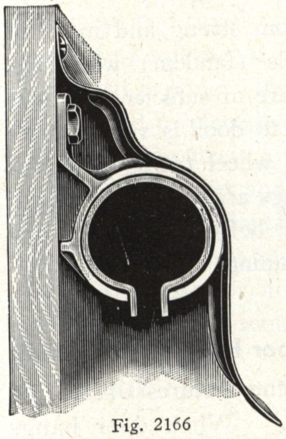


Fig. 2166

End View of Track and Cover

Myers Track Cover for New-Way Giant Track—Constructed of heavy sheet metal with corrugations to stiffen it. Attached to building above and resting on the track, it forms a complete watershed, shielding both track and tops of doors from rain, ice, sleet and snow. It is dirt, dust and vermin proof and can be installed over entire length of track, above door opening only, or left off entirely.

Comes in 100-ft. bundles of assorted 4, 6 and 8-ft. lengths.

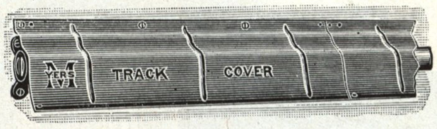


Fig. 2163

Myers Galvanized Track, Cover for New-Way Giant Tubular Track

Myers Noiseless Cushion Tire Store Ladder

Makes wall and shelf space to the ceiling safely available for the storage and handling of all kinds of merchandise. Also adapted for factory stockrooms, casting sheds, repair departments and similar places where large stocks of different parts must be stored.

Ladder is constructed of best clear Georgia pine, natural finish. Has 5-in. open panel sides. Steps have 5½-in. tread. Width over all, 12 in.

Track is double angle, steel rail and is suspended from ceiling by lag screws, either jointed or rigid, or by flanged plates and wood screws.

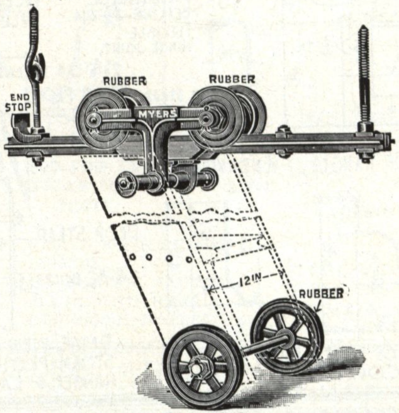


Fig. 1260

Upper and Lower Trolleys of Myers Cushion Tire Store Ladder

Trolley is self-adjusting, and is fitted with turned steel bearings and 3-in. anti-rattler, rubber tired wheels.

Floor travelers are 5 in. in diameter with rubber tires. Axle is steel.

Desirable Features—Easy and safe to ascend or descend. No vibration. Permits use of both hands when placing or removing stock. Ample strength to carry heavy loads with safety. Noiseless, safe, light running. Easy to install. Occupies small space.

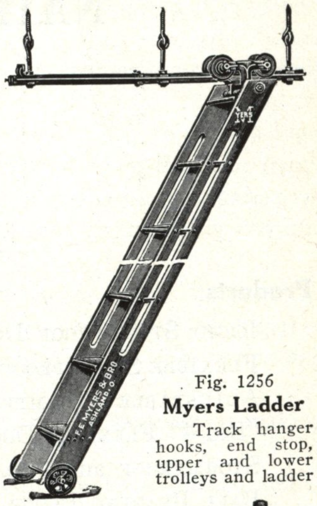

F.E. MYERS & BRO.
ASHLAND, O.

Fig. 1256

Myers Ladder

Track hanger hooks, end stop, upper and lower trolleys and ladder

Myers New Model Cog Gear Force Pump

A compact, neatly designed, well built, double acting, force pump of the low down type that will elevate water into overhead tanks, pump it any reasonable distance, or when equipped with an air valve will force air and water into a pressure tank.

It is built in two sizes, 3 and 4-in. cylinders, and will stand hard service.

Operates 33⅓% easier than similar pumps because it is fitted with Myers patented *easy operating cog gear head.*

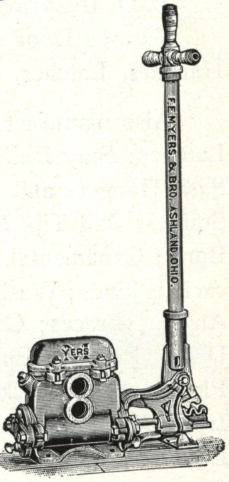

F.E. MYERS & BRO. ASHLAND, OHIO
MYERS

Fig. 1908

Double Acting Force Pump

Myers Shallow and Deep Well Force and Lift Pumps, House Pumps, Tank Pumps and Cylinders.

Different communities require different styles of pumps for their wells and cisterns.

We have accordingly given this class of pumps special attention and the Myers Line today is most complete in every respect.

Fig. 2229 illustrates one of our most successful deep well pumps fitted with easy operating cog gear head, while Fig. 1895 shows the Myers cog gear double acting house force pump.

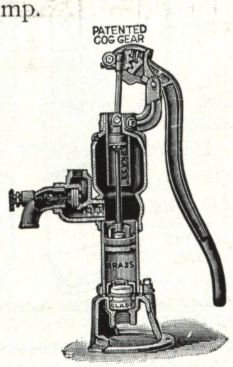


Fig. 1895

Myers Cog Gear House Pump

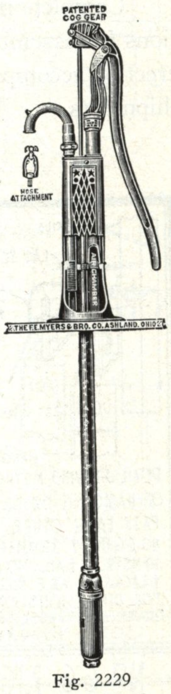


Fig. 2229

Deep Well Pump

NATIONAL MANUFACTURING COMPANY

Manufacturers of Builders' Hardware

STERLING, ILL.

Products

Rigid Stormproof Door Hangers (Patented).

Flexible Stormproof Door Hangers (Patented).

Adjustable Stormproof Door Hangers.

"Big 4" Flexible Door Hangers (Patented).

Stormproof and "Braced" Rails.

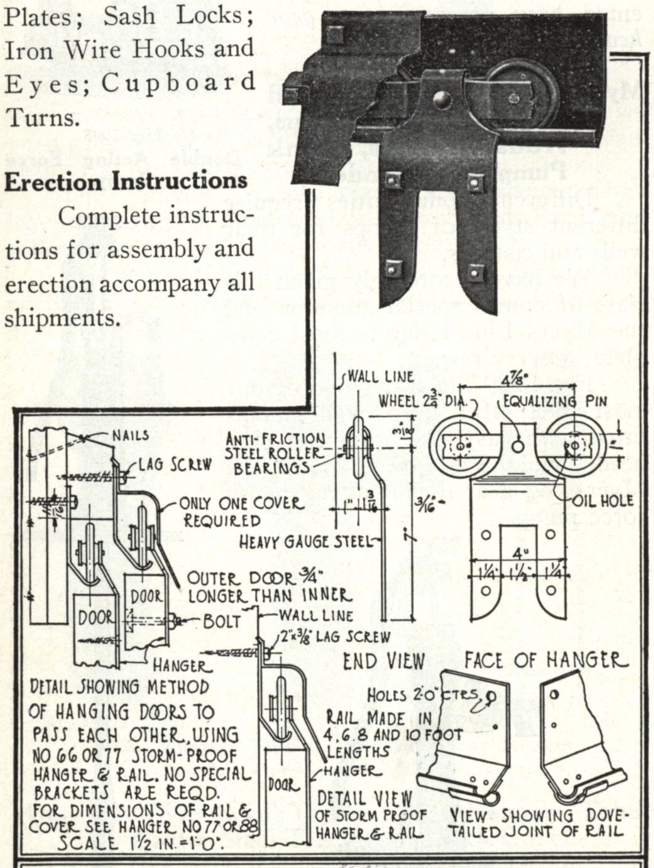
Ball Bearing Floor Hinges.

Garage Door Hardware including Complete Sets, Hangers, Latches, Holders, etc.

Also manufacturers of Barn Door Bumpers; Door Latches; Stay Rollers; Door Pulls; Screen and Storm Sash Hangers and Adjusters; Hasps of various kinds; Staples; Ball Tip, Light, Light Narrow and Parliament Butts; Ornamental Butts and Hinges; Plain Hinges of various kinds; Washers; Corner Irons; Mending Plates; Angles; Braces; Cellar Window Sets; Foot Scrapers; Door Plates; Push Plates; Sash Locks; Iron Wire Hooks and Eyes; Cupboard Turns.

Erection Instructions

Complete instructions for assembly and erection accompany all shipments.


WALL LINE
WHEEL 2¾" DIA.
4⅞"
EQUALIZING PIN
NAILS
LAG SCREW
ANTI-FRICTION STEEL ROLLER BEARINGS
ONLY ONE COVER REQUIRED
1"
3/16
3/16"
7"
OIL HOLE
HEAVY GAUGE STEEL
4"
1¼"
1½"
1¼"
OUTER DOOR ¾" LONGER THAN INNER
DOOR
DOOR
BOLT
WALL LINE
2"×⅜" LAG SCREW
HANGER
END VIEW
FACE OF HANGER
DETAIL SHOWING METHOD OF HANGING DOORS TO PASS EACH OTHER, USING NO 66 OR 77 STORM-PROOF HANGER & RAIL. NO SPECIAL BRACKETS ARE REQD.
FOR DIMENSIONS OF RAIL & COVER SEE HANGER NO 77 OR 88
SCALE 1½ IN.=1'-0".
HOLES 2'-0" CTRS.
RAIL MADE IN 4, 6, 8 AND 10 FOOT LENGTHS
HANGER
DOOR
DETAIL VIEW OF STORM PROOF HANGER & RAIL
VIEW SHOWING DOVE-TAILED JOINT OF RAIL

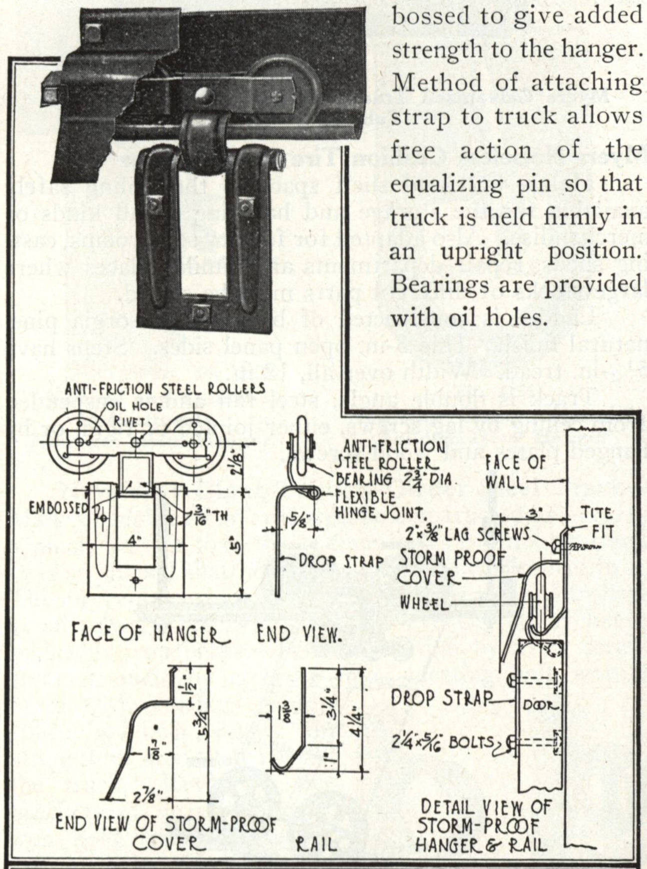
Nº 66 RIGID STORM-PROOF DOOR HANGER

No. 66 Rigid Stormproof Door Hanger (Patented)

Of very simple construction, strong and made of heavy gage steel. Two wheels (tandem) with steel roller bearings. Wheel treads are of sufficient width to insure easy rolling. Attaching to door is very simple; the equalizing pin in center of wheel trucks puts half the load on each wheel. Bearings are free from japan; wheels and frames are japanned before assembling and wheel is reamed out after japanning.

No. 77 Flexible Stormproof Door Hanger (Patented)

Incorporates all the excellent features of No. 66 and has flexible hinged joint. When door hangs straight down there is no vibration, but when anything bumps against the door the hinge joint allows the door to swing out. Connecting strap and drop strap are heavily embossed to give added strength to the hanger. Method of attaching strap to truck allows free action of the equalizing pin so that truck is held firmly in an upright position. Bearings are provided with oil holes.


ANTI-FRICTION STEEL ROLLERS
OIL HOLE
RIVET
2⅛"
EMBOSSED
3/16" TH
4"
5"
FACE OF HANGER
ANTI-FRICTION STEEL ROLLER BEARING 2¾" DIA.
FLEXIBLE HINGE JOINT.
1⅝"
DROP STRAP
END VIEW.
FACE OF WALL
3"
TITE FIT
2"×⅜" LAG SCREWS
STORM PROOF COVER
WHEEL
½"
5¾"
1⅞"
2⅞"
END VIEW OF STORM-PROOF COVER
13/16"
3¼"
4¼"
1"
RAIL
DROP STRAP
DOOR
2¼"×5/16" BOLTS
DETAIL VIEW OF STORM-PROOF HANGER & RAIL

Nº 77 FLEXIBLE STORM-PROOF DOOR HANGER

Continued on next page

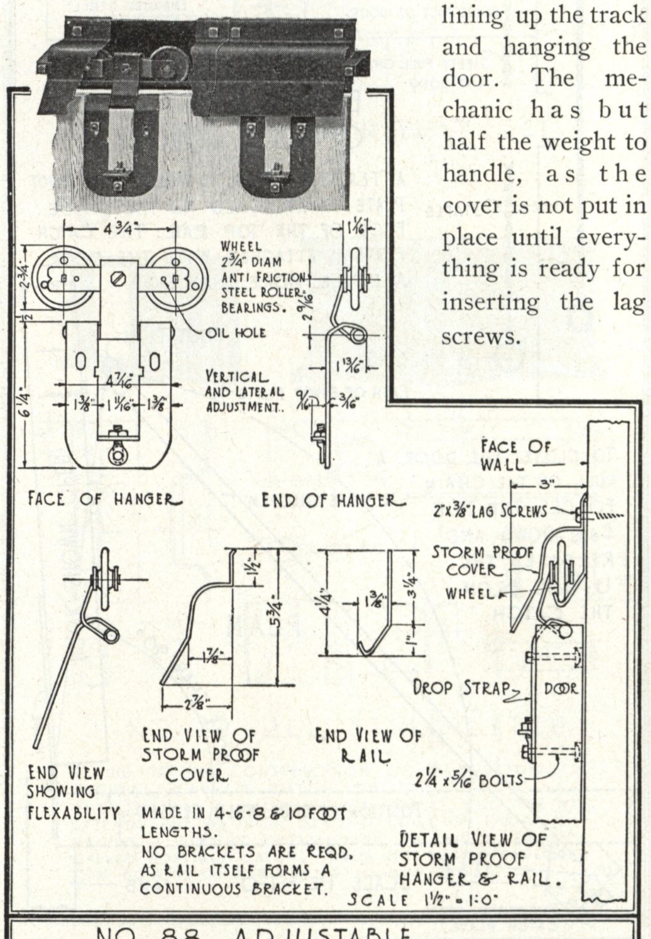
No. 88 Adjustable Stormproof Door Hanger

Constructed same as No. 77 except that it has both vertical and lateral adjustment. It allows the door to be carried close to the rail.

Stormproof Rail

The cover is long enough to protect the opening between the top of door and bottom of rail. No cover splice is needed as the ends of cover sections dovetail together and make a strong and weatherproof construction. An end cap is provided which closes the openings in ends of rail and it is unusually wide at the base for additional bracing. Rail fits closely against the building and is held in place by a lag screw 2 in. long by 3/8 in. thick. No brackets are needed, the rail itself being a continuous bracket and it is sufficiently strong to carry all the weight imposed. Nails hold the rail in position until lag screws are inserted. Holes for lag screws are 2 ft. apart. Rail is in two pieces, track and cover and the cover can be removed when desired for painting the inside.

The two-piece rail is particularly convenient in the important operation of properly lining up the track and hanging the door. The mechanic has but half the weight to handle, as the cover is not put in place until everything is ready for inserting the lag screws.


4 3/4"
1 1/16"
2 3/4"
1/2
WHEEL 2 3/4" DIAM ANTI FRICTION STEEL ROLLER BEARINGS.
OIL HOLE
2 9/16"
1 13/16"
6 1/4"
4 7/16"
1 3/8"
1 11/16"
1 3/8"
VERTICAL AND LATERAL ADJUSTMENT.
9/16"
3/16"
FACE OF HANGER
END OF HANGER
FACE OF WALL
3"
2"x3/8" LAG SCREWS
STORM PROOF COVER
WHEEL
1 1/2"
5 3/4"
1 7/8"
2 7/8"
4 1/4"
1 3/8"
3 1/4"
1"
DROP STRAP
DOOR
2 1/4"x5/16" BOLTS
END VIEW SHOWING FLEXABILITY
END VIEW OF STORM PROOF COVER
END VIEW OF RAIL
DETAIL VIEW OF STORM PROOF HANGER & RAIL.

MADE IN 4-6-8 & 10 FOOT LENGTHS.
NO BRACKETS ARE REQD. AS RAIL ITSELF FORMS A CONTINUOUS BRACKET.

SCALE 1 1/2" = 1'-0"

NO. 88 ADJUSTABLE
STORM-PROOF DOOR HANGER

"Big 4" Flexible Door Hanger (Patented)

Built on heavy lines with the simplest of construction. Hood is embossed to insure great strength. There are no complicated parts and the hanger is made entirely of steel.

It is both flexible and rigid; has roller bearings, and is rigid and without vibration when the door hangs in normal position, but when anything bumps against the door, a flexible device permits of its swinging out and rising.

The door is held close to the track. A shoulder keeps the wheel housing from being pressed together and binding on the hub of the wheel. *The axles and rivets are sherardized.*

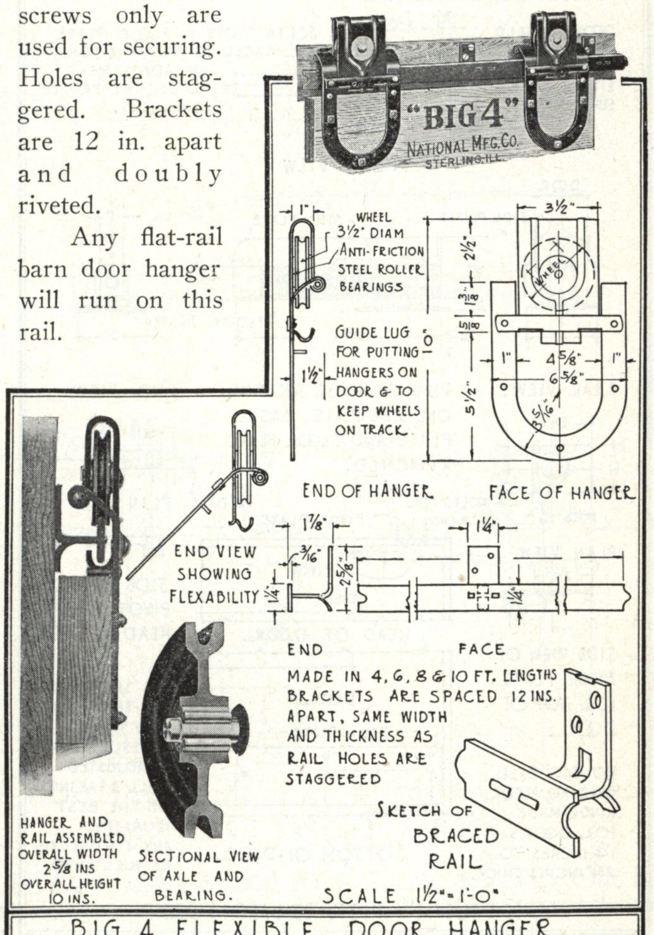
Japanning and reaming are the same as in making the No. 66 hanger.

Two studs, together with the hook turned under the rail, prevent the hanger from jumping the track; they also serve as guides when the hanger is being adjusted to the door.

"Braced" Rail

Used with "Big 4" hangers. Brackets are same thickness and width as rail. Bracing provides three times as much strength as when screws only are used for securing. Holes are staggered. Brackets are 12 in. apart and doubly riveted.

Any flat-rail barn door hanger will run on this rail.


"BIG 4"
NATIONAL MFG. CO.
STERLING, ILL.
1"
WHEEL 3 1/2" DIAM ANTI-FRICTION STEEL ROLLER BEARINGS
GUIDE LUG FOR PUTTING HANGERS ON DOOR & TO KEEP WHEELS ON TRACK
1 1/2"
3 1/2"
2 1/2"
1 3/8"
5/8
10"
5 1/2"
WHEEL
1"
4 5/8"
1"
6 5/8"
3 5/16"
END OF HANGER
FACE OF HANGER
END VIEW SHOWING FLEXABILITY
1 7/8"
3/16"
2 5/8"
1/4"
1 1/4"
1/4"
END
FACE
SKETCH OF BRACED RAIL

HANGER AND RAIL ASSEMBLED OVERALL WIDTH 2 5/8 INS OVERALL HEIGHT 10 INS.

SECTIONAL VIEW OF AXLE AND BEARING.

MADE IN 4, 6, 8 & 10 FT. LENGTHS BRACKETS ARE SPACED 12 INS. APART, SAME WIDTH AND THICKNESS AS RAIL HOLES ARE STAGGERED

SCALE 1 1/2" = 1'-0"

BIG 4 FLEXIBLE DOOR HANGER
AND BRACED RAIL

Continued on next page

No. 240 Ball Bearing Floor Hinge

Construction is radically different from others. The spring-closing features and part that bears the weight of door are independent of each other. In No. 240 hinge, the pressure of the spring is not against the hinge bearing which carries the door, but it is against a 1-in. casehardened roller; this prevents wear on the hinge bearing, and when the door is at rest, the hinge keeps it firmly in the center of the opening. The door when swung to either side is held open 95°. The pressure on this bearing is but 10 lbs. and the saving in wear in favor of this hinge over other types is in the ratio of 30 lbs. to 1.

Spring is oil tempered and pressure is adjustable. Ball bearings are of the best. No chiseling is necessary to attach pivot to top of door.

The construction of pivot plate for head jamb is unique. To place bearing portion in right position, it is necessary simply to place end of plate against head jamb and insert three screws. No mortising or measuring is required.

Finish—This hinge is furnished in any finish desired.

No. 810 Garage Door Holder for Swinging Doors

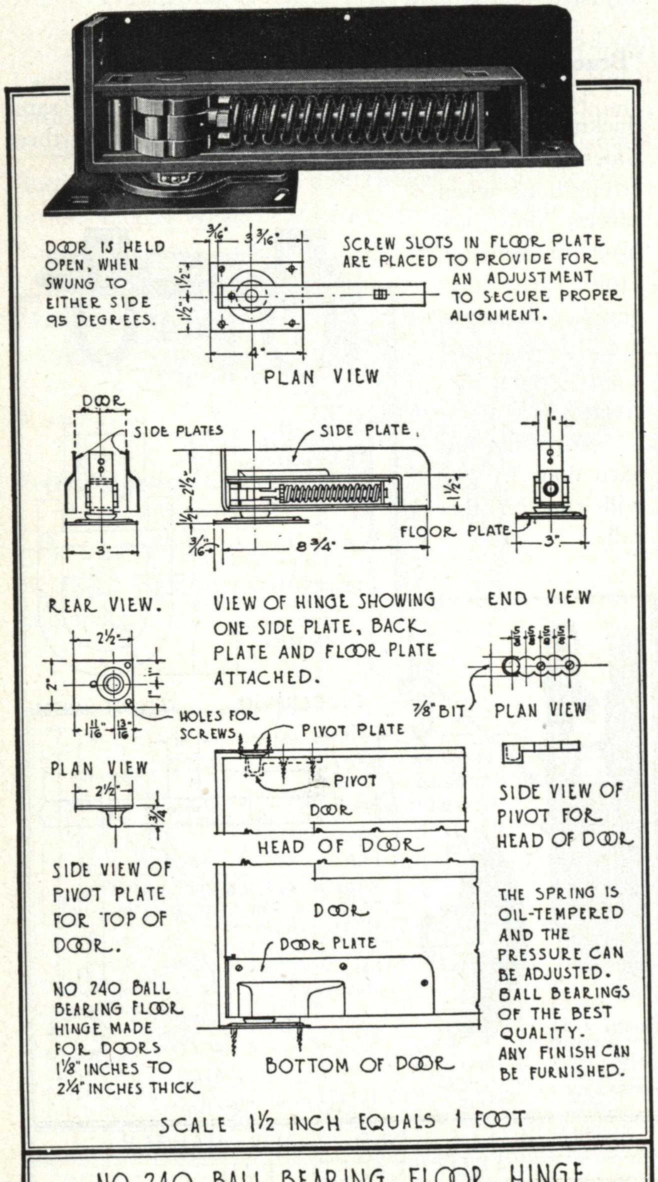
This device holds the doors securely open and keeps them from damaging a car when it enters or leaves the garage. It has a rigid U-shaped steel arm 32 in. long which, when door is opened, slides through an embossed steel catch plate until two notches at its inner end catch in the plate and hold the door open. To close the door it is necessary only to pull lightly on a safety chain that lifts the arm so that the notches can no longer hold it. Then the arm slides back through the plate. A swivel joint allows the arm to fold back along the head jamb when the door is closed. Made throughout of heavy gage steel, and strong enough for any door.

Regular stock finishes are japan, dead black japan, sherardized, sherardized and dead black japan.

No. 27 Garage Door Latch for Swinging Doors

Handles have long graceful lines, equal to door locks of the higher grade. The mechanism is simple. Latch is reversible.

Regular finishes are japan, dead black japan, sherardized and plated any finish.



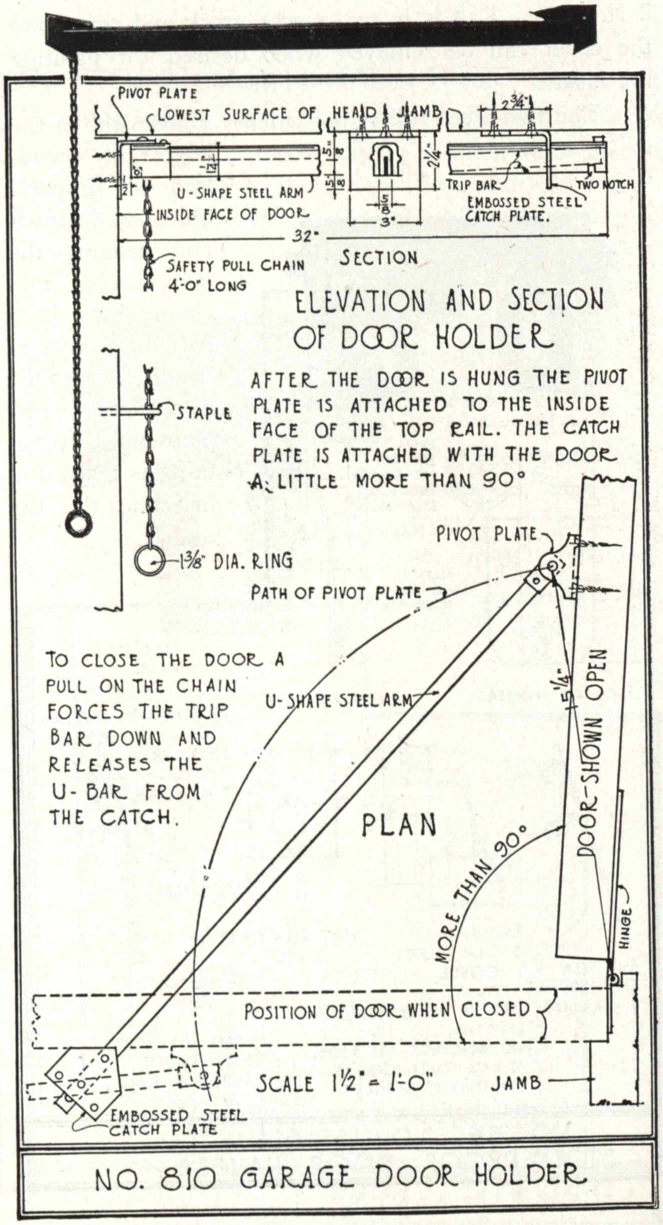
DOOR IS HELD OPEN, WHEN SWUNG TO EITHER SIDE 95 DEGREES.
3/16"
3 3/16"
1 1/2"
4"
SCREW SLOTS IN FLOOR PLATE ARE PLACED TO PROVIDE FOR AN ADJUSTMENT TO SECURE PROPER ALIGNMENT.
PLAN VIEW
DOOR
SIDE PLATES
SIDE PLATE
2 1/2"
1 1/2"
3"
3/16"
8 3/4"
FLOOR PLATE
3"
REAR VIEW.
VIEW OF HINGE SHOWING ONE SIDE PLATE, BACK PLATE AND FLOOR PLATE ATTACHED.
END VIEW
2 1/2"
2"
1"
1 11/16"
13/16"
HOLES FOR SCREWS
7/8" BIT
PLAN VIEW
PIVOT PLATE
PIVOT
DOOR
HEAD OF DOOR
PLAN VIEW
2 1/2"
3/4"
SIDE VIEW OF PIVOT FOR HEAD OF DOOR
SIDE VIEW OF PIVOT PLATE FOR TOP OF DOOR.
DOOR
DOOR PLATE
BOTTOM OF DOOR

THE SPRING IS OIL-TEMPERED AND THE PRESSURE CAN BE ADJUSTED. BALL BEARINGS OF THE BEST QUALITY. ANY FINISH CAN BE FURNISHED.

NO 240 BALL BEARING FLOOR HINGE MADE FOR DOORS 1 1/8" INCHES TO 2 1/4" INCHES THICK.

SCALE 1 1/2 INCH EQUALS 1 FOOT

NO 240 BALL BEARING FLOOR HINGE



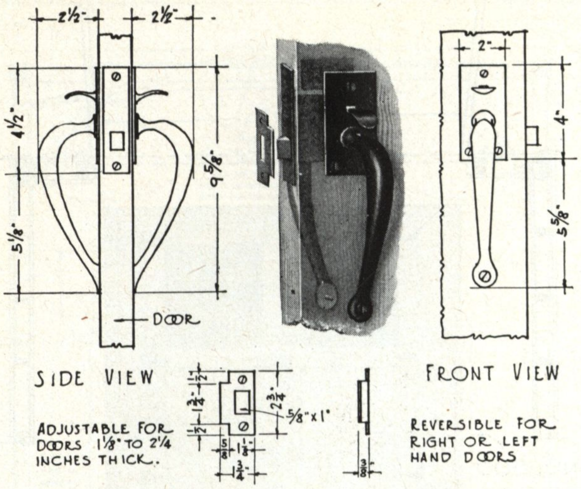
PIVOT PLATE
LOWEST SURFACE OF HEAD JAMB
2 3/4"
5/8"
1/2"
1 1/4"
2 1/4"
U-SHAPE STEEL ARM
INSIDE FACE OF DOOR
5/8"
3"
TRIP BAR
TWO NOTCH
EMBOSSED STEEL CATCH PLATE.
32"
SAFETY PULL CHAIN 4'-0" LONG
SECTION
ELEVATION AND SECTION OF DOOR HOLDER
STAPLE
1 3/8" DIA. RING
PIVOT PLATE
PATH OF PIVOT PLATE
U-SHAPE STEEL ARM
5 1/4"
DOOR-SHOWN OPEN
PLAN
MORE THAN 90°
HINGE
POSITION OF DOOR WHEN CLOSED
SCALE 1 1/2" = 1'-0"
JAMB
EMBOSSED STEEL CATCH PLATE

AFTER THE DOOR IS HUNG THE PIVOT PLATE IS ATTACHED TO THE INSIDE FACE OF THE TOP RAIL. THE CATCH PLATE IS ATTACHED WITH THE DOOR A LITTLE MORE THAN 90°

TO CLOSE THE DOOR A PULL ON THE CHAIN FORCES THE TRIP BAR DOWN AND RELEASES THE U-BAR FROM THE CATCH.

NO. 810 GARAGE DOOR HOLDER

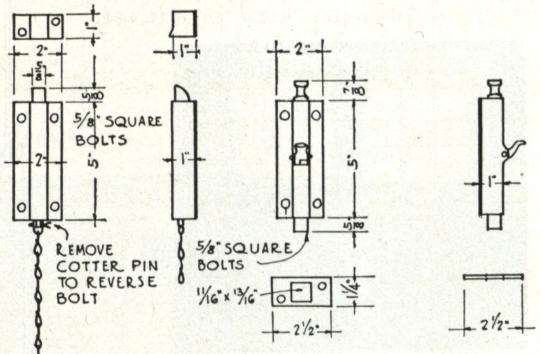
Continued on next page


2½"
2½"
4½"
9⅝"
5⅛"
DOOR
2"
4"
5⅞"
⅝" x 1"
SIDE VIEW
FRONT VIEW

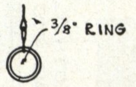
ADJUSTABLE FOR DOORS 1⅛" TO 2¼ INCHES THICK.

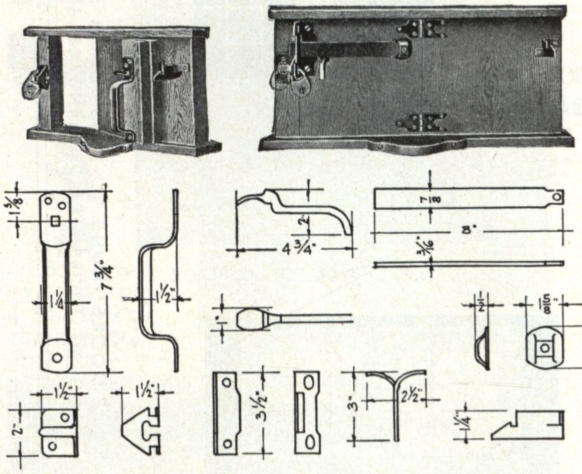
REVERSIBLE FOR RIGHT OR LEFT HAND DOORS

NO-27 SWINGING DOOR LATCH


2"
5⅝" SQUARE BOLTS
5"
1"
REMOVE COTTER PIN TO REVERSE BOLT
5⅝" SQUARE BOLTS
11/16" x 13/16"
2½"
2½"
1¼"

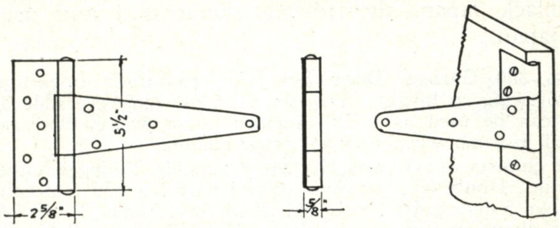
FOOT AND CHAIN BOLT SET




1⅜"
7¾"
1¼"
1½"
4¾"
8"
3½"
3"
2½"
1½"
1½"
2"

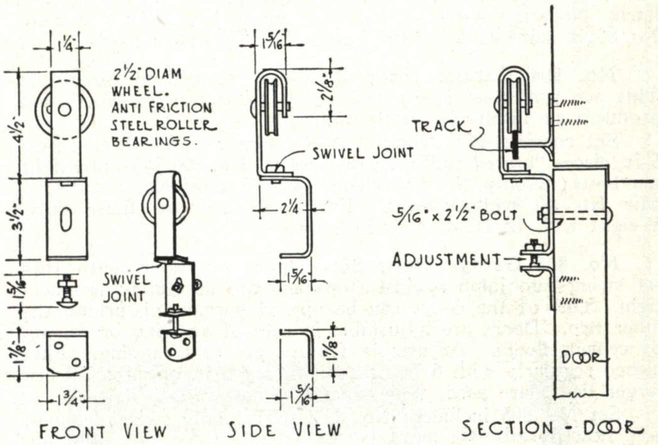
NO-29 ALL STEEL LATCH

OWING TO THE CONSTRUCTION OF THIS LATCH, HARNESS CANNOT CATCH ON IT. THE STRIKE IS MADE WITH A GUARD, AND THE BAR EXTENDS BUT ⅜ INCH BEYOND EDGE OF DOOR, MAKING A SLIGHT PROJECTION ON WHICH HARNESS CANNOT POSSIBLY CATCH. WHEN NOT IN USE PADLOCK CAN BE HUNG ON STRIKE, AS ILLUSTRATED.

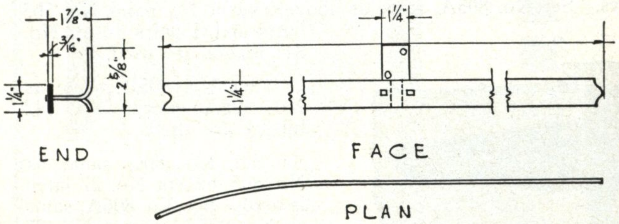


NO. 840 REVERSIBLE 'T' HINGE

MADE IN 6-8-10 INCH SIZES

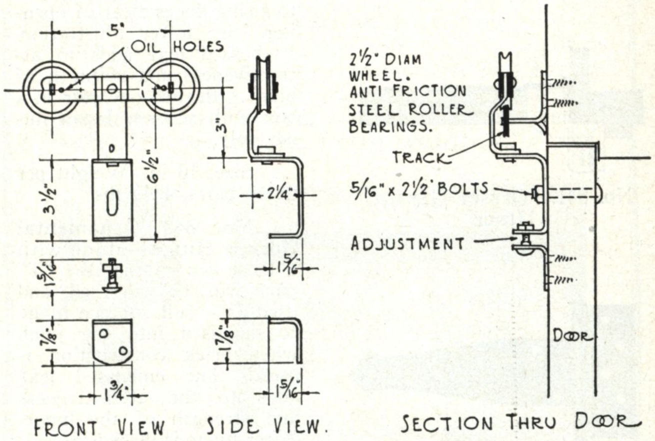

1¼"
4½"
3½"
2½" DIAM WHEEL. ANTI FRICTION STEEL ROLLER BEARINGS.
SWIVEL JOINT
1⅞"
1¾"
15/16"
2⅛"
SWIVEL JOINT
2¼
TRACK
5/16" x 2½" BOLT
ADJUSTMENT
DOOR
FRONT VIEW
SIDE VIEW
SECTION - DOOR

NO. 851 SWIVEL HANGER


1⅞"
3/16"
2⅝"
1¼"
1¼"
1¼"
END
FACE
PLAN

MADE IN 4, 6, 8 & 10 FOOT LENGTHS. BRACKETS ARE SPACED 12 INCHES APART; SAME WIDTH AND THICKNESS AS RAIL. HOLES ARE STAGGERED.

BRACED RAIL.


5"
OIL HOLES
3"
6½"
3½"
2¼"
1⅞"
1¾"
15/16"
2½" DIAM WHEEL. ANTI FRICTION STEEL ROLLER BEARINGS.
TRACK
5/16" x 2½" BOLTS
ADJUSTMENT
DOOR
FRONT VIEW
SIDE VIEW.
SECTION THRU DOOR

NO. 850 SWIVEL HANGER

SCALE - ONE & ONE HALF INCH EQUALS ONE FT.

GARAGE DOOR HARDWARE

Continued on next page

Garage Door Sets

Packed in strong cartons. Stock finishes are japan, dead black japan, sherardized, sherardized and dead black japan.

No. 800 Garage Door Set—For two-door openings, doors to swing on hinges. This set has loose pin, reversible T-hinge; can be used as a full surface hinge or reversed and mortised in jamb when used on brick building.

Set consists of: 3 pairs No. 840 reversible T-hinges, either 8 or 10 in.; 1 only No. 820 chain bolt; 1 only No. 830 foot bolt; 1 only No. 5 door pull; 1 only No. 29 all-steel latch. No. 800A, same as above, except 3 pairs 10-in. No. 841 hinges are used. No. 800B, same as No. 800A, except No. 842 hinges are used. Set No. 801, same as No. 800, except that No. 27 latch and one pair No. 40 padlock eyes are used instead of No. 29 all-steel latch. No. 801A, same as No. 800A, except No. 27 latch is used. No. 801B, same as No. 800B, except No. 27 latch is used.

No. 804 Garage Door Set—For four-door openings. This set works as freely and easily as any house door, and produces an absolutely weathertight job.

Set consists of: 2 only swivel hangers (one-wheel); two 6-ft. pieces "braced rail"; 6 pairs 4x4-in. No. 505 japanned tight pin butts; 2 only No. 820 chain bolts; 2 only No. 5 pulls; 1 pair No. 40 padlock eyes. Furnished in japan finish only. Weight with 12 ft. of rail, 29½ lbs.

No. 805 Garage Door Set—Doors equipped with this set swing into jamb against stops and are absolutely weathertight. One of the doors can be opened without disturbing the other two. Doors are adjustable in case of swelling or raising of cement floors. Adjustable feature prevents sagging. Furnished regularly with 6 ft. braced rail for 8-ft. opening. When larger doors are used, same should be specified.

Set No. 805 includes: No. 29 latch; 1 only swivel hanger; 6-ft. braced rail; 4½ pairs 4x4-in. japanned No. 505 tight pin butts; 1 only No. 820 chain bolt; 1 only No. 830 foot bolt; 1 only No. 5 pull; 1 pair No. 40 padlock eyes. All necessary bolts and screws. Set No. 805A, same as above, except 1½ pairs No. 505 butts and 3 pairs 10-in. No. 841 hinges are used.

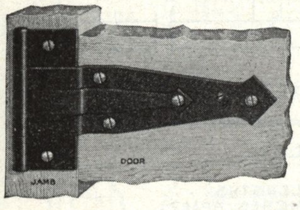
Set No. 805B, same as No. 805A except No. 842 hinges are used.

Set No. 806, same as No. 805, except No. 27 latch is used. Set No. 806A, same as No. 805A, except No. 27 latch is used. Set No. 806B, same as No. 805B, except No. 27 latch is used.

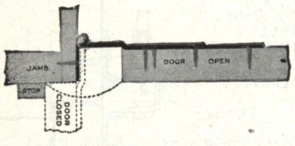
No. 841 Offset Garage Hinge—Made with offset to swing doors clear of opening. See lower illustration. Embossed leaf adds to attractiveness and strength of hinge. Packed one pair in a box with screws, Japan finish only.

Size, 10 in. Weight per dozen pairs, 43½ lbs.

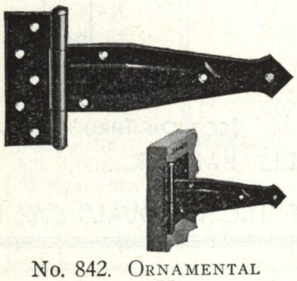
No. 842 Ornamental Garage Hinge—Made with a loose pin so that the "T" part can be reversed and used as a full surface hinge or mortised into the jamb when brick construction is used. The embossed leaf adds to the attractiveness and strength of the hinge. After hinge is placed in position, the end of pin can be slightly riveted to prevent its removal. Packed one pair in a box with screws. Japan finish only. Size, 10 in. Weight per dozen pairs, 43¾ lbs.



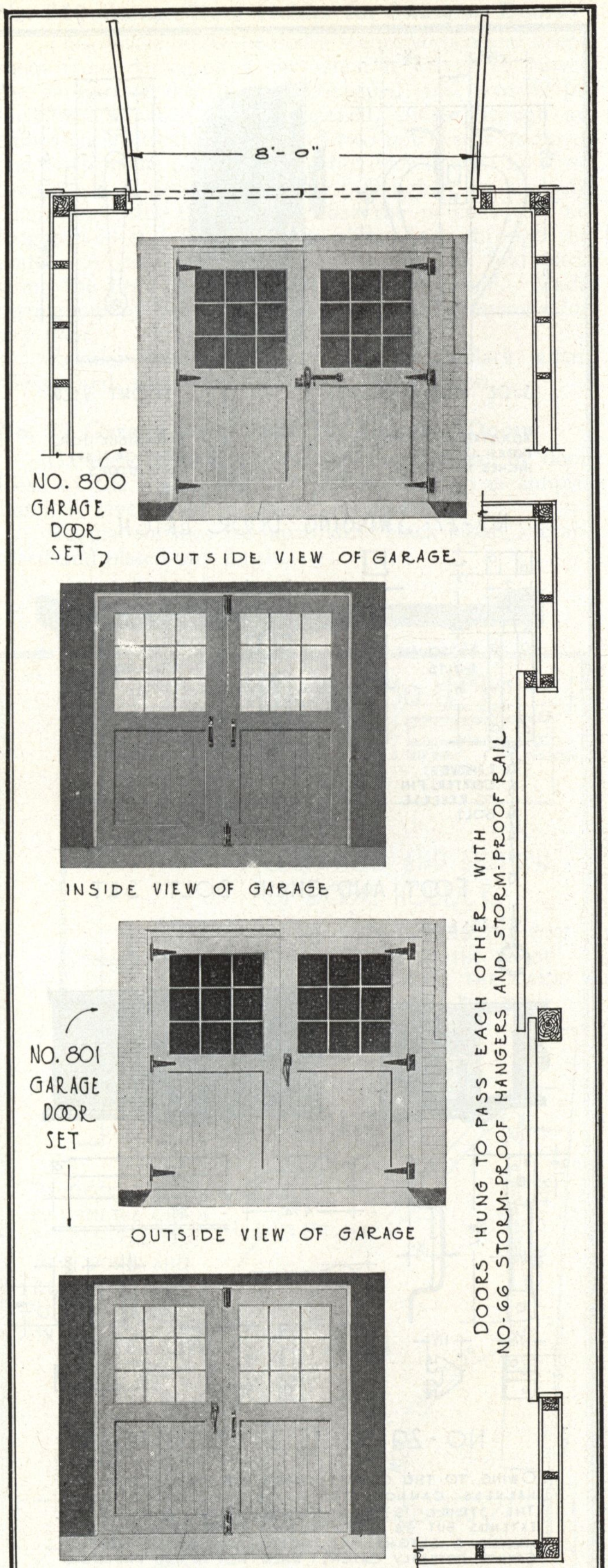
No. 841. Offset Garage Hinge



No. 841. Offset Garage Hinge

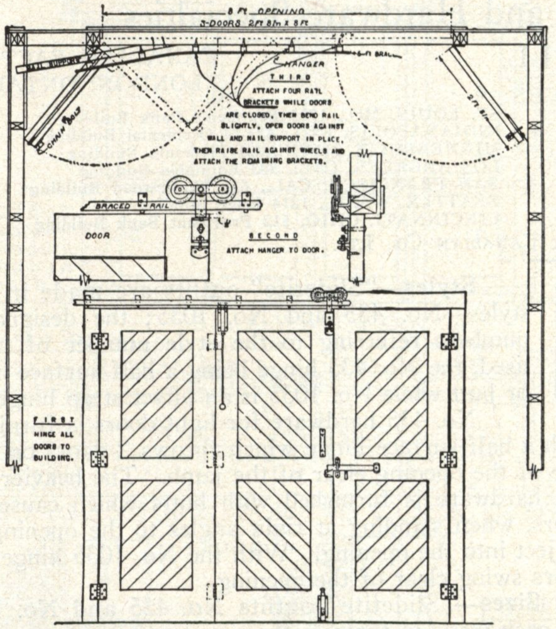


No. 842. Ornamental Garage Hinge



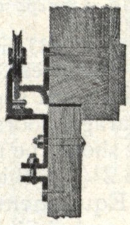
TWO DOOR SETS

Continued on next page

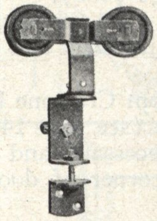

8 FT OPENING
3-DOORS 2FT 8IN X 8FT
RAIL SUPPORT
HANGER
THIRD
ATTACH FOUR RAIL BRACKETS WHILE DOORS ARE CLOSED, THEN BEND RAIL SLIGHTLY, OPEN DOORS AGAINST WALL AND NAIL SUPPORT IN PLACE, THEN RAISE RAIL AGAINST WHEELS AND ATTACH THE REMAINING BRACKETS.
CHAIN BOLT
2FT 8IN
BRACED RAIL
DOOR
SECOND
ATTACH HANGER TO DOOR.
FIRST
HINGE ALL DOORS TO BUILDING.

METHOD OF HANGING DOORS WITH NO 805 & NO 806 GARAGE DOOR SETS

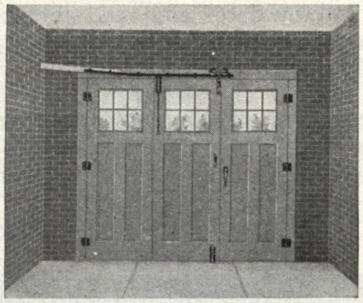
OUTSIDE



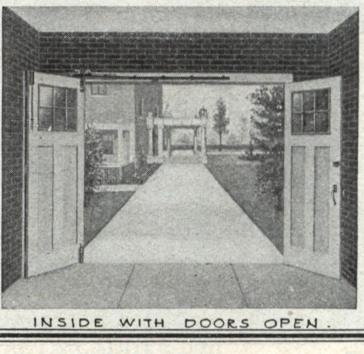
SECTIONAL VIEW OF NO 850 SWIVEL HANGER



NO. 850 HANGER OPERATES ON A SWIVEL AND TURNS BACK EASILY



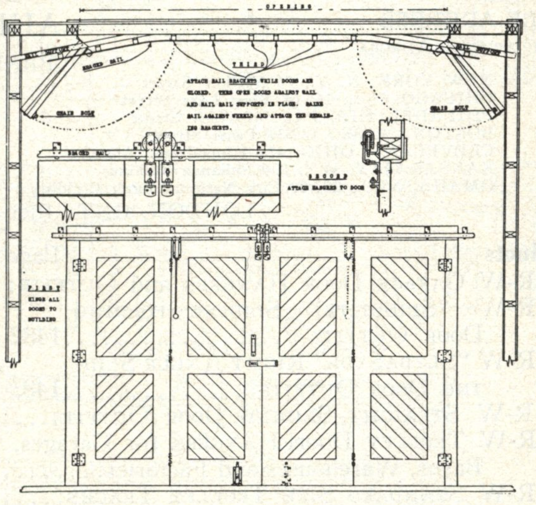
INSIDE WITH DOORS CLOSED



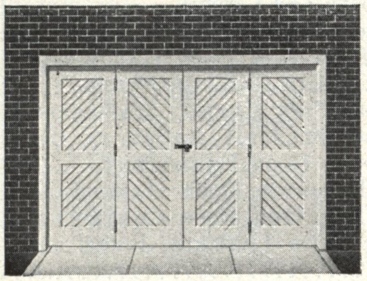
INSIDE WITH DOORS OPEN.

NOS 805 AND 806. SLIDING AND SWINGING GARAGE DOOR SETS WORK EASILY AND WITHOUT BINDING OR FRICTION

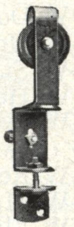
THREE DOOR SETS


OPENING
RAIL SUPPORT
BRACED RAIL
THIRD
ATTACH RAIL BRACKETS WHILE DOORS ARE CLOSED. THEN OPEN DOORS AGAINST WALL AND NAIL RAIL SUPPORTS IN PLACE. RAISE RAIL AGAINST WHEELS AND ATTACH THE REMAINING BRACKETS.
CHAIN BOLT
CHAIN BOLT
BRACED RAIL
SECOND
ATTACH HANGERS TO DOOR
FIRST
HINGE ALL DOORS TO BUILDING

METHOD OF HANGING WITH NO 804 GARAGE DOOR SET.



OUTSIDE VIEW



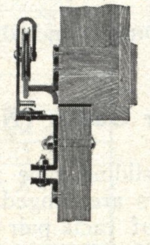
NO. 851 SWIVEL HANGER

THE HANGER IS SO CONSTRUCTED THAT THE DOORS SWING INTO THE JAMB AGAINST STOPS. THE DOORS ARE HUNG ON THE INSIDE AND FOLD AGAINST THE INNER WALL, REQUIRING ONLY MINIMUM SPACE IN OPENING.

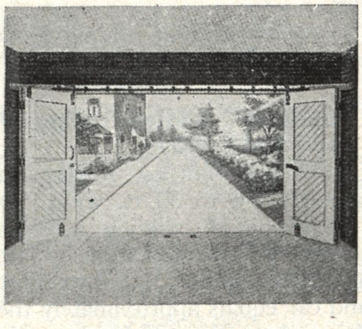
THE EQUIPMENT IS PROTECTED FROM THE WEATHER

FOUR DOORS ARE REQUIRED IN THIS COMBINATION

DOORS ARE SECURELY HUNG WITH 4"x4" BUTTS WITH A STRONG, ADJUSTABLE, ROLLER BEARING HANGER ON THE OUTER END, WHICH ABSOLUTELY PREVENTS THE DOORS FROM SAGGING.



SECTIONAL VIEW OF NO-851 SWIVEL HANGER



INSIDE VIEW

FOUR DOOR SETS

RICHARDS-WILCOX MANUFACTURING CO.

INCORPORATED

Manufacturers of Door Hangers and Hardware Specialties

CABLE ADDRESS
"Richwilco, Aurora"

AURORA, ILL.

CANADIAN FACTORY
LONDON, ONTARIO

BRANCH OFFICES

NEW YORK, N. Y., 85 Walker Street
CHICAGO, ILL., 166-68 West Lake Street
PHILADELPHIA, PA., 507 Arch Street
BOSTON, MASS., 132-34 Pearl Street
CLEVELAND, OHIO, 459 Hippodrome Annex
KANSAS CITY, MO., 206 Reliance Building
OMAHA, NEB., 202-03 City National Bank Building

ST. LOUIS, MO., 1735 Boatmen's Bank Building
INDIANAPOLIS, IND., 423-24 Occidental Building
MINNEAPOLIS, MINN., 321 Plymouth Building
LOS ANGELES, CAL., 503 Equitable Building
SAN FRANCISCO, CAL., 626 Underwood Building
SEATTLE, WASH., 1214 Hoge Building
CINCINNATI, OHIO, 512 Provident Bank Building

LONDON, ONT., Richards-Wilcox Canadian Co., Ltd.

Products Page

R-W Garage Door Hangers and Outfits:
R-W "Slidetite" Sliding-folding Door Outfits....................1482
R-W "SlydaSyde" Right Angle Sliding Door Outfits...............1485
R-W Straight Sliding Door Outfits... 1485
R-W Trolley Door Hangers for Garages, Barns, Warehouses and Factories.........1486
R-W Standard Size Trolley Tracks.....1486
R-W Standard Trolley Track Brackets..1487
R-W Bolts, Locks, Floor Guides, etc., for Sliding Doors 1487
R-W Door Closer and Check.............1488
R-W House Door Hangers...............1488
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R-W "Ideal" Elevator Door Controller.1494
R-W Elevator Door Latches, Bolts and Locks 1494
R-W Ideal Electric and Mechanical Interlocks for Elevator Doors...........1496

Also manufacturers of "OveR-Way" Monorail Conveying Equipment.

For Multifold Window Hardware, see pages 1654-1656.

R-W Garage Door Hangers and Outfits

The R-W line of garage door hangers and outfits consists of three general types, as follows:

(1) R-W "Slidetite" Sliding-folding Door Outfits, No. 435 and No. 1035.

(2) R-W "SlydaSyde" Right Angle Sliding Door Outfits, No. 235, to open door against sidewall, inside building.

(3) R-W Straight Sliding Door Outfits, including single and parallel track types.

R-W "Slidetite" Sliding-folding Door Outfits (Nos. 435 and 1035)

Combination hinged, folding and sliding type for openings from 8 to 30 ft. wide. Doors are hinged at jamb on inside of building with one of each pair of doors supported at outer edge by No. 435 roller bearing sliding door hangers. Space requirement between doorway and car equals approximately the width of one door plus 4 in. where No. 435 hardware is used, or the width of one door plus offset of hinge where No. 1035 hardware is used. "Slidetite" doors fit perfectly tight, are weatherproof, can not sag, and will not warp. All of the openings may be used at one time.

Styles—"Slidetite" outfits are made in two styles—No. 435 and No. 1035; the designating numbers referring to the style number of hinge used, the No. 435 hinge being a half surface hinge or butt while No. 1035 is an offset strap hinge.

No. 435 hardware for light doors is furnished with a half-surface hinge which throws 2 doors on each side of the opening clear of the jamb. The heavier No. 435 hardware is furnished with butts which cause the doors, when standing at right angles to the opening, to project into the opening. With the No. 1035 hinge, the doors swing clear of the opening.

Sizes—"Slidetite" outfits No. 435 and No. 1035 are each made in three sizes:

No. 435x31 or No. 1035x31 for light doors up to 125 lbs.

No. 435x232 or No. 1035x232 for medium doors from 125 to 200 lbs.

No. 435x33 or No. 1035x33 for heavy doors over 200 lbs.

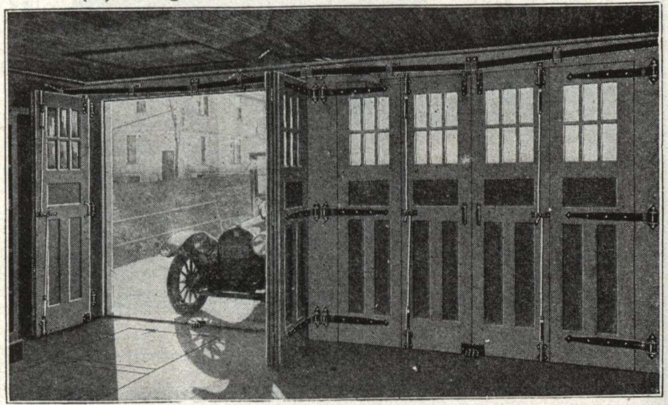
Thickness of Doors—For private garages, doors 1¾ in. thick should give satisfactory service. For public garage doors, subject to hard usage, doors 2¼ in. thick should be used. Hardware is made to handle doors up to 2½ in. thick.

Equipment—All necessary hardware is furnished with each "Slidetite" outfit, including: track, hangers, brackets, hinges, bow handles, top and bottom bolts and all screws and bolts necessary to erect. Lock for entrance door not furnished with sets, but should be specified separately (see illustration on page 1488).

Intermediate and end brackets are adjustable. Hangers have metal wheels, vertical adjustment and ball-bearing swivel pendants.

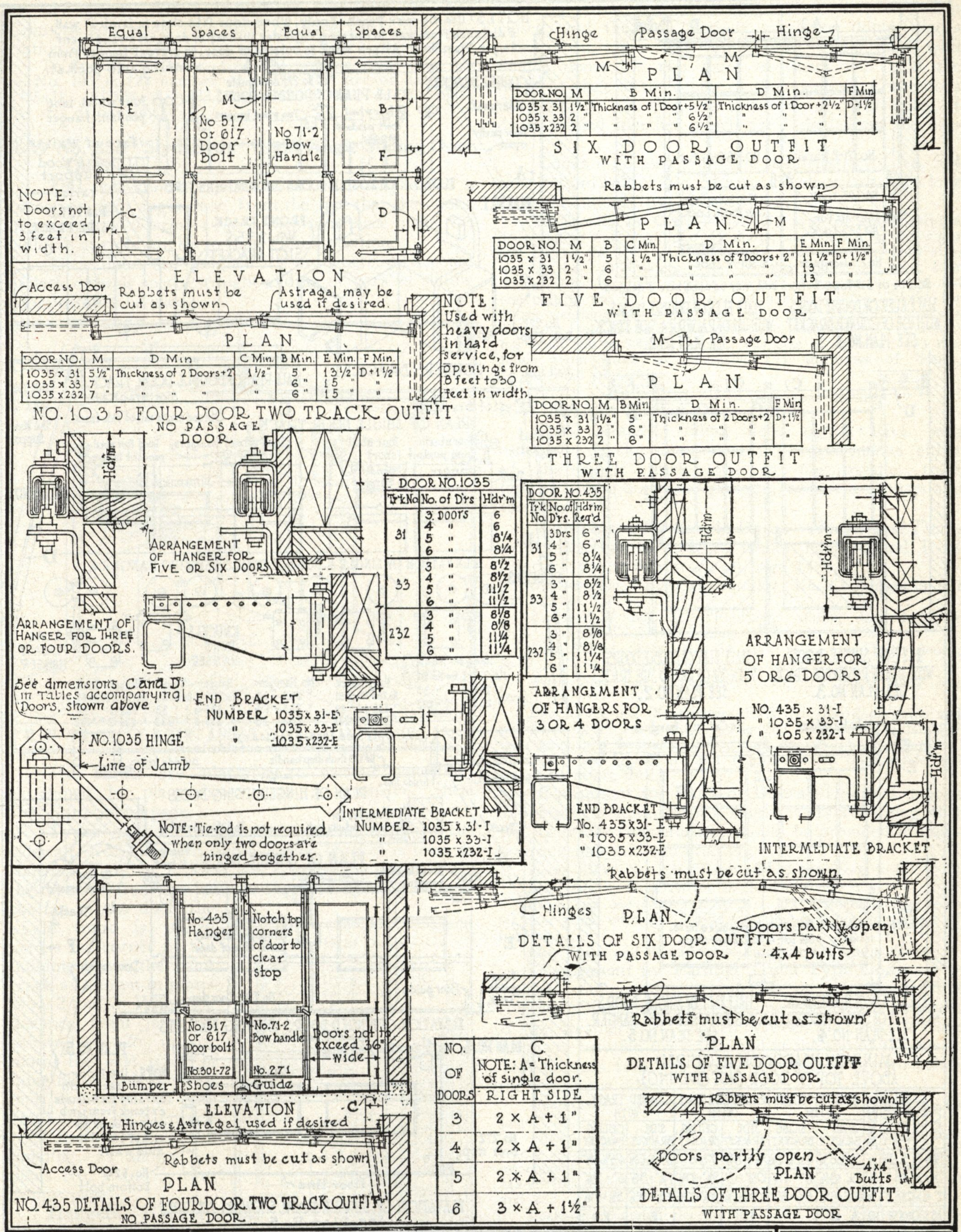
No. 517 or No. 617 top and bottom Cremone bolts are required to lock the doors in place (see page 1487). Floor guides are furnished where necessary and two bumper shoes are attached to lower corner of door to prevent chafing by guide.

Locking—If no separate entrance door is available (1) hang the doors so one door near the center of



Interior of Garage Equipped with Two 4-Door R-W "Slidetite" Outfits
No. 1035 offset hinges used

Continued on next page


Equal
Spaces
Equal
Spaces
M
E
B
F
C
D
No 517 or 617 Door Bolt
No 71-2 Bow Handle
NOTE: Doors not to exceed 3 feet in width.
Hinge
Passage Door
Hinge
M
M
Rabbets must be cut as shown
M
Access Door
Rabbets must be cut as shown
Astragal may be used if desired.
NOTE: Used with heavy doors in hard service, for openings from 8 feet to 30 feet in width.
M
Passage Door
Hdr'm
Hdr'm
Hdr'm
Hdr'm
See dimensions C and D in Tables accompanying Doors, shown above
NO. 1035 HINGE
Line of Jamb
NOTE: Tie-rod is not required when only two doors are hinged together.
No. 435 Hanger
Notch top corners of door to clear stop
No. 517 or 617 Door bolt
No. 71-2 Bow handle
Doors not to exceed 36" wide
No. 301-72 Bumper
Shoes
No. 271 Guide
C
Hinges & Astragal used if desired
Access Door
Rabbets must be cut as shown
Rabbets must be cut as shown
Hinges
Doors partly open
4x4 Butts
Rabbets must be cut as shown
Rabbets must be cut as shown
Doors partly open
4"x4" Butts

ELEVATION

PLAN

DOOR NO.	M	B Min.	D Min.	F Min
1035 x 31	1½"	Thickness of 1 Door + 5½"	Thickness of 1 Door + 2½"	D + 1½"
1035 x 33	2 "	" " " 6½"	" " "	"
1035 x 232	2 "	" " " 6½"	" " "	"

SIX DOOR OUTFIT
WITH PASSAGE DOOR

PLAN

DOOR NO.	M	B	C Min.	D Min.	E Min.	F Min.
1035 x 31	1½"	5	1½"	Thickness of 2 Doors + 2"	11½"	D + 1½"
1035 x 33	2 "	6	"	" " "	13 "	"
1035 x 232	2 "	6	"	" " "	13 "	"

FIVE DOOR OUTFIT
WITH PASSAGE DOOR

PLAN

DOOR NO.	M	D Min	C Min.	B Min.	E Min.	F Min.
1035 x 31	5½"	Thickness of 2 Doors + 2"	1½"	5 "	13½"	D + 1½"
1035 x 33	7 "	" " "	"	6 "	15 "	"
1035 x 232	7 "	" " "	"	6 "	15 "	"

NO. 1035 FOUR DOOR TWO TRACK OUTFIT
NO PASSAGE DOOR

PLAN

DOOR NO.	M	B Min	D Min.	F Min
1035 x 31	1½"	5 "	Thickness of 2 Doors + 2"	D + 1½"
1035 x 33	2 "	6 "	" " "	"
1035 x 232	2 "	6 "	" " "	"

THREE DOOR OUTFIT
WITH PASSAGE DOOR

ARRANGEMENT OF HANGER FOR FIVE OR SIX DOORS

ARRANGEMENT OF HANGER FOR THREE OR FOUR DOORS

DOOR NO. 1035		
Tr'k No.	No. of D'rs	Hdr'm
31	3 DOORS 4 " 5 " 6 "	6 6 8¼ 8¼
33	3 " 4 " 5 " 6 "	8½ 8½ 11½ 11½
232	3 " 4 " 5 " 6 "	8⅛ 8⅛ 11¼ 11¼

DOOR NO. 435		
Tr'k No.	No. of D'rs.	Hdr'm Req'd
31	3 Drs. 4 " 5 " 6 "	6 " 6 " 8¼ 8¼
33	3 " 4 " 5 " 6 "	8½ 8½ 11½ 11½
232	3 " 4 " 5 " 6 "	8⅛ 8⅛ 11¼ 11¼

ARRANGEMENT OF HANGERS FOR 3 OR 4 DOORS

ARRANGEMENT OF HANGER FOR 5 OR 6 DOORS

END BRACKET
NUMBER 1035 x 31-E
" 1035 x 33-E
" 1035 x 232-E

INTERMEDIATE BRACKET
NUMBER 1035 x 31-I
" 1035 x 33-I
" 1035 x 232-I

NO. 435 x 31-I
" 1035 x 33-I
" 105 x 232-I

INTERMEDIATE BRACKET

END BRACKET
No. 435 x 31-E
" 1035 x 33-E
" 1035 x 232-E

ELEVATION

PLAN

NO. 435 DETAILS OF FOUR DOOR TWO TRACK OUTFIT
NO PASSAGE DOOR

NO. OF DOORS	C NOTE: A = Thickness of single door. RIGHT SIDE
3	2 × A + 1"
4	2 × A + 1"
5	2 × A + 1"
6	3 × A + 1½"

PLAN

DETAILS OF SIX DOOR OUTFIT
WITH PASSAGE DOOR

PLAN

DETAILS OF FIVE DOOR OUTFIT
WITH PASSAGE DOOR

PLAN

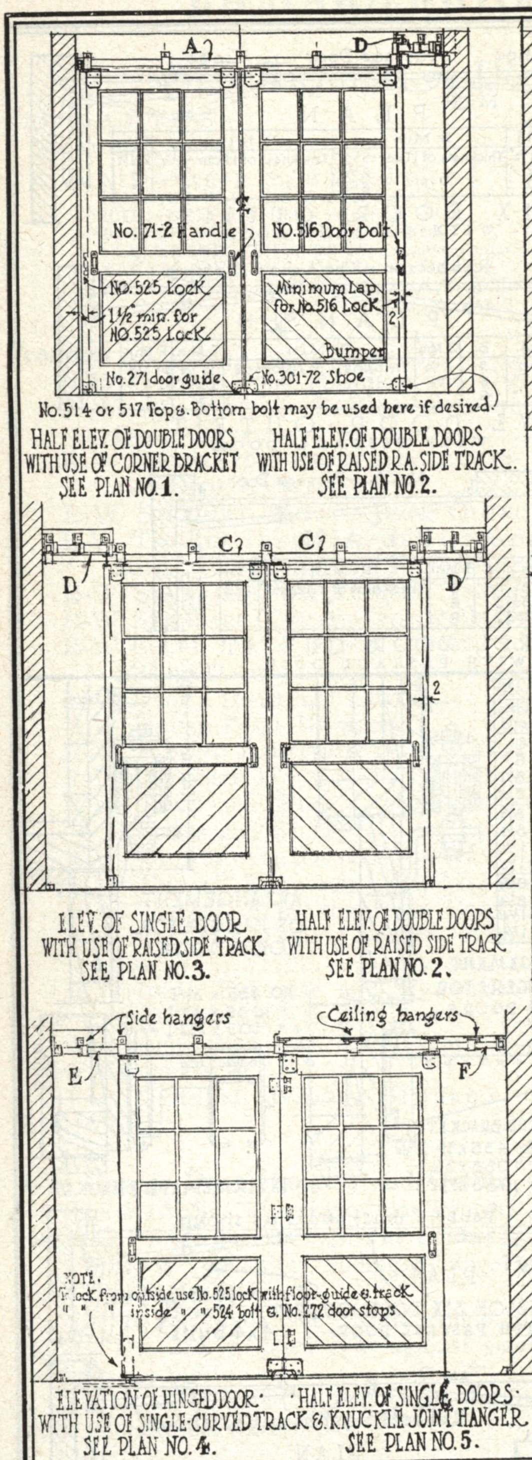
DETAILS OF THREE DOOR OUTFIT
WITH PASSAGE DOOR

DRAWN BY
SWEETS CATALOGUE
SERVICE, INC.

R.W. "SLIDETITE" GARAGE DOOR
OUTFITS NO. 1035 AND 435.

SHEET NO. 1
SCALE 3/16" & 1½"
EQUALS 1'-0"

Continued on next page


A
D
No. 71-2 Handle
NO.516 Door Bolt
NO.525 Lock
1½ min. for NO.525 Lock
Minimum Lap for No.516 Lock
2
Bumper
No.271 door guide
No.301-72 Shoe
No.514 or 517 Top & Bottom bolt may be used here if desired.
C
C
D
D
2
Side hangers
Ceiling hangers
E
F
NOTE.
If lock from outside use No.525 lock with floor-guide & track
" " inside " " 524 bolt & No.272 door stops

HALF ELEV. OF DOUBLE DOORS WITH USE OF CORNER BRACKET SEE PLAN NO.1.

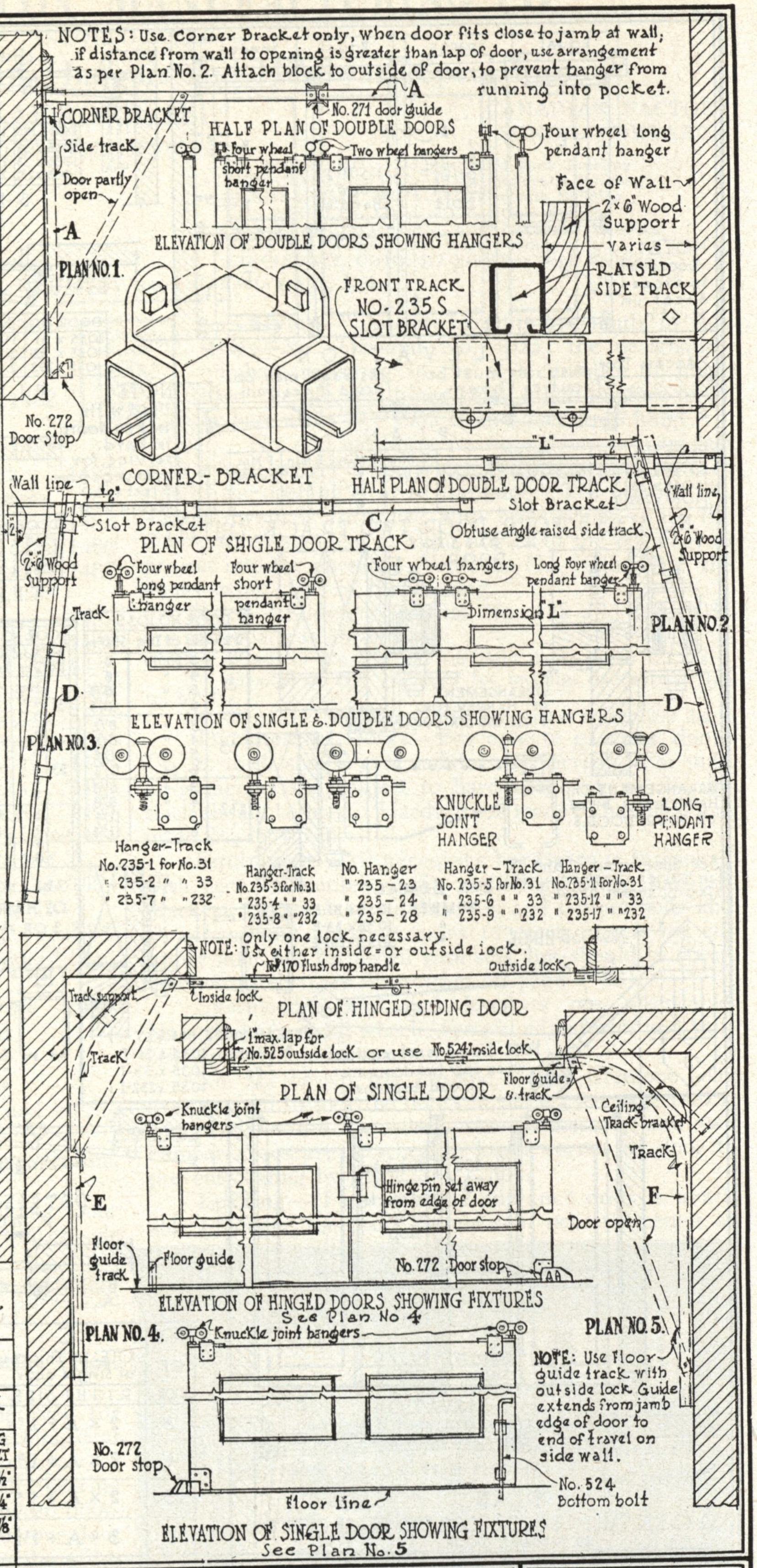
HALF ELEV. OF DOUBLE DOORS WITH USE OF RAISED R.A. SIDE TRACK. SEE PLAN NO.2.

ELEV. OF SINGLE DOOR WITH USE OF RAISED SIDE TRACK SEE PLAN NO.3.

HALF ELEV. OF DOUBLE DOORS WITH USE OF RAISED SIDE TRACK SEE PLAN NO.2.

ELEVATION OF HINGED DOOR. WITH USE OF SINGLE-CURVED TRACK & KNUCKLE JOINT HANGER. SEE PLAN NO.4.

HALF ELEV. OF SINGLE DOORS. SEE PLAN NO.5.


A
No. 271 door guide
CORNER BRACKET
Side track
Door partly open
A
PLAN NO.1.
No. 272 Door Stop
HALF PLAN OF DOUBLE DOORS
Four wheel short pendant hanger
Two wheel hangers
Four wheel long pendant hanger
ELEVATION OF DOUBLE DOORS SHOWING HANGERS
Face of Wall
2"×6" Wood Support
varies
RAISED SIDE TRACK
FRONT TRACK
NO. 235 S SLOT BRACKET
CORNER-BRACKET
"L"
2
HALF PLAN OF DOUBLE DOOR TRACK
Slot Bracket
Wall line
Wall line
2"
2
Slot Bracket
C
PLAN OF SINGLE DOOR TRACK
Obtuse angle raised side track
2"×6" Wood Support
2"×6" Wood Support
Four wheel long pendant hanger
Four wheel short pendant hanger
Four wheel hangers
Long Four wheel pendant hanger
Track
Dimension "L"
PLAN NO.2.
D
D
ELEVATION OF SINGLE & DOUBLE DOORS SHOWING HANGERS
PLAN NO.3.
KNUCKLE JOINT HANGER
LONG PENDANT HANGER
Hanger-Track No.235-1 for No.31
" 235-2 " " 33
" 235-7 " " 232
Hanger-Track No.235-3 for No.31
" 235-4 " " 33
" 235-8 " "232
No. Hanger
" 235-23
" 235-24
" 235-28
Hanger-Track No.235-5 for No.31
" 235-6 " " 33
" 235-9 " "232
Hanger-Track No.235-11 for No.31
" 235-12 " " 33
" 235-17 " "232
NOTE: Only one lock necessary. Use either inside or outside lock.
No.170 Flush drop handle
Outside lock
Track support
Inside lock
PLAN OF HINGED SLIDING DOOR
1" max. lap for No.525 outside lock or use No.524 inside lock.
Track
PLAN OF SINGLE DOOR
Floor guide & track
Knuckle joint hangers
Ceiling Track-bracket
Track
Hinge pin set away from edge of door
E
F
Door open
Floor guide track
Floor guide
No.272 Door stop
ELEVATION OF HINGED DOORS SHOWING FIXTURES
See Plan No 4
PLAN NO.4.
Knuckle joint hangers
PLAN NO.5.
NOTE: Use Floor guide track with outside lock. Guide extends from jamb edge of door to end of travel on side wall.
No. 272 Door stop
Floor line
No. 524 Bottom bolt
ELEVATION OF SINGLE DOOR SHOWING FIXTURES
See Plan No. 5

NOTES: Use Corner Bracket only, when door fits close to jamb at wall; if distance from wall to opening is greater than lap of door, use arrangement as per Plan No. 2. Attach block to outside of door, to prevent hanger from running into pocket.

MINIMUM HEADROOM REQUIRED ABOVE TOP OF DOOR (NOT OPENING).

DOOR THICKNESS	TRACK NO.	DIA. WHEELS	BRACK BOLT	FRONT TRACK WITH		RAISED SIDE TRACK WITH		CURVED TRACK WITH	
				SIDE BRACKET	CEILING BRACKET	SIDE BRACKET	CEILING BRACKET	SIDE BRACKET	CEILING BRACKET
1¾" to 2"	31	2⅛	½"	5¾" to 6¾"	4½" to 5½"	7¾" to 8¾"	7" to 8"	5⅜" to 6⅜"	4½" to 5½"
2½" " 3	33	3"	¾"	7¼" " 8½"	6" " 7¼"	10¾" " 12"	9½" " 10¾"	7¼" " 8½"	6" " 7¼"
2" " 2½	232	3"	⅝"	6⅞" " 8⅛"	5⅝" " 6⅞"	10⅜" " 11⅝"	9⅛" " 10⅜"	6⅞" " 8⅛"	5⅝" " 6⅞"
AS SHOWN IN FIG.				A C		D		E	F

DRAWN BY
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SERVICE, INC.

"R-W." RIGHT ANGLE SLIDING DOOR OUTFITS NO.235 WITH AND WITHOUT CORNER BRACKET

SHEET NO. 2
SCALE 3/16", 3/8" & 1½" EQUALS 1'-0.

Continued on next page

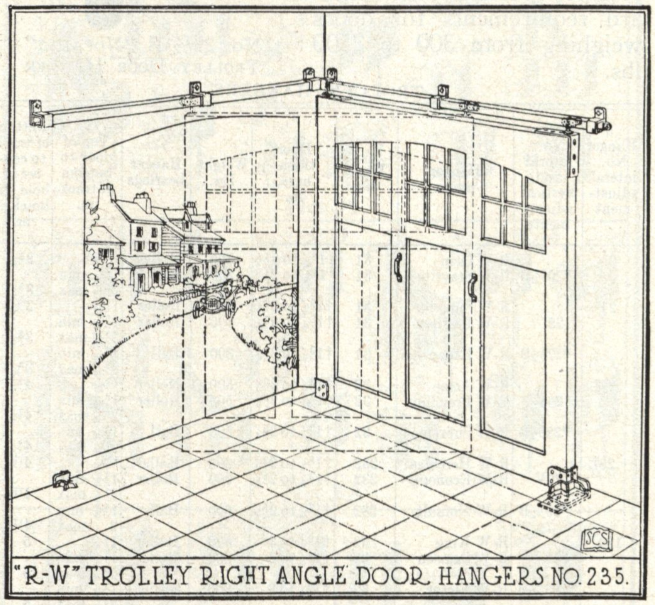
the opening will be hinged free to serve as passage door, or (2) specify No. 1125 outside lock with No. 617 Cremone bolt inside (see plans on page 1483; and illustration on page 1487.

To Specify or Order—Give (1) type of outfit (No. 435 or No. 1035); (2) number of doors; (3) size of hardware (435x31, 1035x31, 435x232, 1035x232, 435x33, or 1035x33); (4) size of opening.

R-W No. 235 "SlydaSyde" Right Angle Sliding Door Outfit

This well-known type of door is usually called a corner or right angle door, from the fact that the doors, in opening, *slide around the corner* to a place inside the building at right angles to their closed position.

These doors are designed for use where, on account of lack of wall space, straight sliding or parallel sliding doors can not be used.



"R-W" TROLLEY RIGHT ANGLE DOOR HANGERS NO. 235.

The outfits are adaptable to various conditions as shown by plans Nos. 1 to 5, inclusive, Sheet No. 2, preceding page.

Types—Where door opening is adjacent to the sidewall, No. 235 right angle corner bracket is used as shown at Plan No. 1, Sheet No. 2, preceding page. When the distance from the jamb to the door opening exceeds the lap of the door, the side track is placed across the corner of the building above the front track as shown in plans Nos. 2 and 3. When the distance from jamb to sidewall is 26 in. or more, the side track is hung flat against the wall and connected to the front track by a curved track in the corner of the building, as shown in plans No. 4 and 5, preceding page.

Hangers—Hangers for straight track are built with rigid frames, and hangers for curved track are built with knuckle-jointed frames.

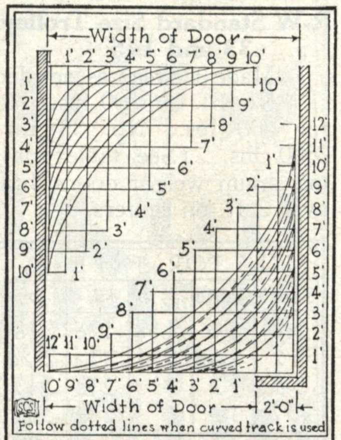


DIAGRAM SHOWING CLEARANCE REQUIRED FOR RIGHT ANGLE GARAGE DOORS EQUIPPED WITH R-W NO. 235 FIXTURES

Floor Guides and Stop—No. 272 end stop will hold the front end of a single door in place when closed, and the back end of single or double doors when open. No. 271 center floor guide used with double doors, or two pairs of doors will hold the doors in place at the center of the opening. Continuous floor guides, No. 635, are required only with pairs of doors hinged together which are locked from the outside.

Locks—To lock from the inside, specify No. 524 cane bottom bolt or No. 516 parallel door bolt. To lock from the outside, use No. 525 lock.

To Specify or Order—Give (1) type of outfit (single door sliding one way; pair of doors, one sliding to the right and one to the left; pair of doors hinged together, both sliding one way; three doors hinged together sliding one way; four doors hinged together in pairs, one pair sliding to the right and one pair to the left); (2) size of hardware (No. 235x31 for doors weighing up to 300 lbs. each; No. 235x232 for doors weighing from 300 to 500 lbs. each; No. 235x33 for doors weighing from 500 to 800 lbs. each); (3) size of opening; (4) distance from jamb to sidewall; (5) thickness of doors; (6) method of locking.

R-W Straight Sliding Door Outfits

R-W straight sliding door outfits have been especially developed to meet any requirements either of the single track type or the parallel track type of sliding doors for garages, barns, warehouses and factories.

Equipment for Single Doors—*Hangers and Tracks*—See description of R-W trolley hangers and R-W standard size trolley track on page 1486,

Brackets—No. 1 side center bracket; No. 2 side right or left end bracket.

Locks—R-W No. 525 "Faultless" sliding door lock, or R-W No. 510 "Nobreak" sliding door lock.

Stay Rollers—R-W No. 54 stay roller for light doors; R-W No. 154 stay roller for heavy doors.

Floor Stop and Guide—R-W No. 272 floor guide and stop.

Door Guide and Weatherstrip—R-W No. 736 door guide and weatherstrip for heavy doors (over 500 lbs.), or R-W No. 737 door guide and weatherstrip for light doors. (Stay rollers and floor stop and guide are not required when door guide and weatherstrip are used.)

Equipment for Pairs of Doors—Hangers, tracks and brackets same as for single doors excepting that No. 12 center stop brackets should be provided in addition to center and end brackets.

Locks—R-W No. 525 "Faultless" sliding door lock.

Stay Rollers—Same as for single doors.

Floor Stop and Guide—R-W No. 271 Adjustable floor center door guide with No. 301-72 steel bumper shoe for center of opening.

Door Guide and Weatherstrip—Same as for single doors.

Equipment for Parallel Track Type Doors—For various combinations, see details on page 1486. first column. Double or triple tracks may be used as required. A steel weatherstrip is placed between the tracks to close the space between the tracks and at the top of the doors. This extends from the header to an inch or two below the top of the doors.

Hangers—See description of R-W trolley hangers on page 1486.

Tracks—Nos. 256, 257, 258 and 259—R-W parallel door tracks assembled with weatherstrips and brackets for *sidewall* attachment. Nos. 356, 357, 358 and 359 for overhead attachment. Made respectively for the following size tracks—Nos. 31, 32, 33 and 232.

Locks—For jamb locks use R-W No. 525 "Faultless" sliding door lock, or R-W No. 510 "Nobreak" sliding door lock.

For locking doors together when they overlap, use R-W No. 516 parallel door bolt and lock, or, R-W No. 518 parallel door bolt for heavy warehouse doors 2½ in. thick.

Bottom Bolts—No. 524 R-W cane bottom bolt, or R-W No. 519 parallel door gravity bolt.

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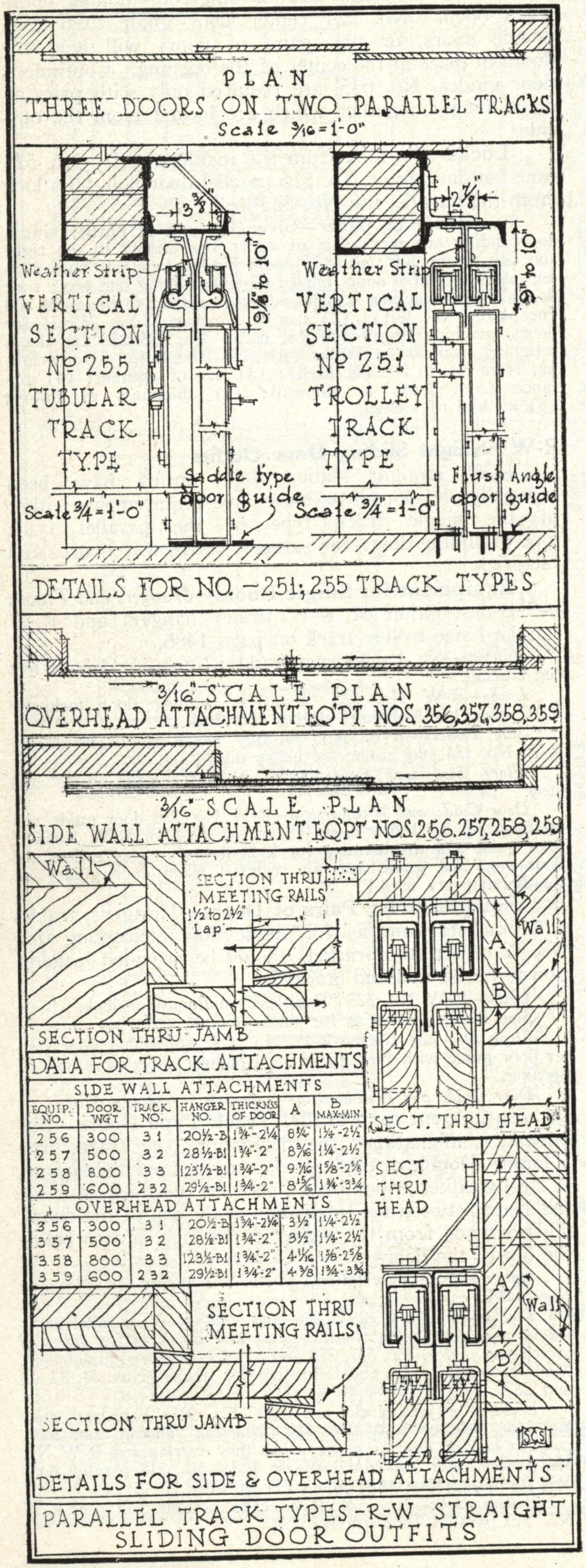

PLAN
THREE DOORS ON TWO PARALLEL TRACKS
Scale 3/16=1'-0"
3⅜
2⅞
9⅛ to 10"
10 to 11"
Weather Strip
Weather Strip
VERTICAL SECTION Nº 255 TUBULAR TRACK TYPE
VERTICAL SECTION Nº 251 TROLLEY TRACK TYPE
Saddle type door guide
Flush Angle door guide
Scale ¾=1'-0"
Scale ¾=1'-0"
DETAILS FOR NO. -251; 255 TRACK TYPES
3/16 SCALE PLAN
OVERHEAD ATTACHMENT EQ'PT NOS. 356,357,358,359
3/16 SCALE PLAN
SIDE WALL ATTACHMENT EQ'PT NOS. 256.257,258,259
Wall
SECTION THRU MEETING RAILS
1½" to 2½" Lap
Wall
A
B
SECTION THRU JAMB
SECT. THRU HEAD
SECT THRU HEAD
A
B
Wall
SECTION THRU MEETING RAILS
SECTION THRU JAMB
SCS
DETAILS FOR SIDE & OVERHEAD ATTACHMENTS

DATA FOR TRACK ATTACHMENTS

EQUIP. NO.	DOOR WG'T	TRACK NO.	HANGER NO.	THICKN'SS OF DOOR	A	B MAX-MIN.
SIDE WALL ATTACHMENTS						
256	300	31	20½-B	1¾-2¼	8¼"	1¼"-2½"
257	500	32	28½-B1	1¾"-2"	8 3/16"	1¼"-2½"
258	800	33	123½-B1	1¾"-2"	9 7/16"	1⅝"-2⅝"
259	600	232	29½-B1	1¾-2"	8 15/16"	1¾"-3¾
OVERHEAD ATTACHMENTS						
356	300	31	20½-B	1¾"-2¼	3½"	1¼"-2½"
357	500	32	28½-B1	1¾"-2"	3½"	1¼"-2½"
358	800	33	123½-B1	1¾"-2"	4 11/16	1⅝-2⅝
359	600	232	29½-B1	1¾"-2"	4⅜"	1¾"-3¾

PARALLEL TRACK TYPES-R-W STRAIGHT SLIDING DOOR OUTFITS

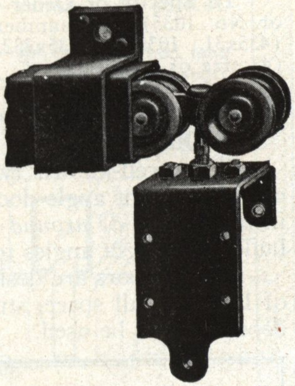
Flush Pulls—No. 70 steel flush pulls.

Door Guide and Weatherstrip—R-W No. 736 door guide and weatherstrip for heavy doors (over 500 lbs.) or R-W No. 737 door guide and weatherstrip for light doors.

If floor guide weatherstrips are not desired, use No. 172 adjustable floor center door guide.

R-W Trolley Hangers for Garages, Barns, Warehouses and Factories

The RICHARDS-WILCOX MANUFACTURING Co. makes hangers as listed below with ball bearings or roller bearings having lateral and vertical adjustment and of sizes to meet practically all standard requirements for doors weighing from 300 to 2500 lbs.



No. 29½-B "NOFAULT" TROLLEY DOOR HANGER

TROLLEY HANGERS

Hanger No., lateral adjustment	Hanger No., lateral and vertical adjustments	Hanger name	Track No.	Door thickness, in.	Weight, lbs.	Hanger bearings	Top of door to bottom of track, in.	Bottom of track to center of hole in bracket, in.
20		R-W Gem	31	1¾ to 2½	300	Roller	⅞	3¾
	*20½B	R-W Stayrite	31	1¾ to 2½	300	Ball	1 3/16 min. 2 5/16 max.	3¾
24		R-W Superior	31	†1¾ to 2¾	300	Roller	1 1/16	3¾
	25	R-W Peerless	31	†1¾ to 2¾	300	Roller	1 3/16 min. 2 5/16 max.	3¾
	*27½B	R-W Expansion	31	†1¾ to 2¾	300	Ball	1 3/16 min. 2 5/16 max.	3¾
28L		R-W Acme	32	†1¾ to 2¾	500	Roller	13/16	4¼
	28V	R-W Premium	32	†1¾ to 2¾	500	Roller	1 3/16 min. 2 5/16 max.	4¼
	*28½B	R-W Supreme	32	†1¾ to 2¾	500	Ball	1 3/16 min. 2 5/16 max.	4¼
29L		R-W Hercules	232	†1¾ to 2¾	600	Roller	15/16	4 11/16
	29V	R-W Economy	232	†1¾ to 2¾	600	Roller	1⅛ min. 2½ max.	4 11/16
	*29½B	R-W Nofault	232	†1¾ to 2¾	600	Ball	1⅛ min. 2 max.	4 11/16
120		R-W King	33	†1¾ to 3	800	Roller	1⅛	5
	121	R-W Samson	33	†1¾ to 3	800	Roller	1¼ min. 2⅜ max.	5
	*123½B	R-W Victor	33	†1¾ to 3	800	Ball	1½ min. 2⅝ max.	5
	150	R-W Jumbo	33	†1¾ to 3½	1000	Roller	1¼ min. 2⅜ max.	5
	*150½B	R-W Overall	33	†1¾ to 3½	1000	Ball	1½ min. 2⅝ max.	5
	149-1		145	1¾ to 2¼	2500	Ball	1¾ min. 3¼ max.	6
	149-2		145	2½ to 3¾	2500	Ball	1¾ min. 3¼ max.	6

*Can be furnished with knuckle joint for curved track. When so specifying, add the words "knuckle joint."

†For doors 1¾ to 2 in. thick, specify No. 1 size hanger. For thicker doors, specify No. 2 size hangers.

R-W Standard Size Trolley Track, Nos. 31, 32, 232, 33 and 145

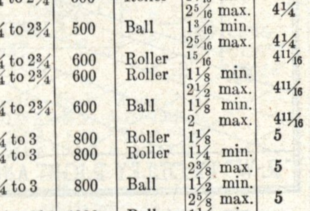
Made in five sizes, for doors of the following weights: No. 31 for 300 lbs.; No. 32 for 500 lbs.; No. 232 for 600 lbs.; No. 33 for 1000 lbs.; No. 145 for 2500 lbs. (See table for weight and gauge.) For maximum weight doors, brackets should be spaced not over 2 ft. on centers.

SIZES FOR TYPE "A"

TRACK	GAUGE	WGT LBS PER FT	A	B
31	16	1⅔	1⅞"	2⅜"
32	14	2	2 1/16"	2 15/16"
33	13	4	2⅞"	3½"
232	14	3	2 7/16	3 7/16"

SIZES FOR TYPE "C"

TRACK	GAUGE	WGT LBS. PER FT.	A	B
145	11	10	3¼"	4⅝"


A
A
B
B
1" x.2"x¼" Angles
TYPE "A"
TYPE "C"

NOTE: Tracks furnished in lengths up to 10'-0" Brackets furnished to suit requirements.

SCS

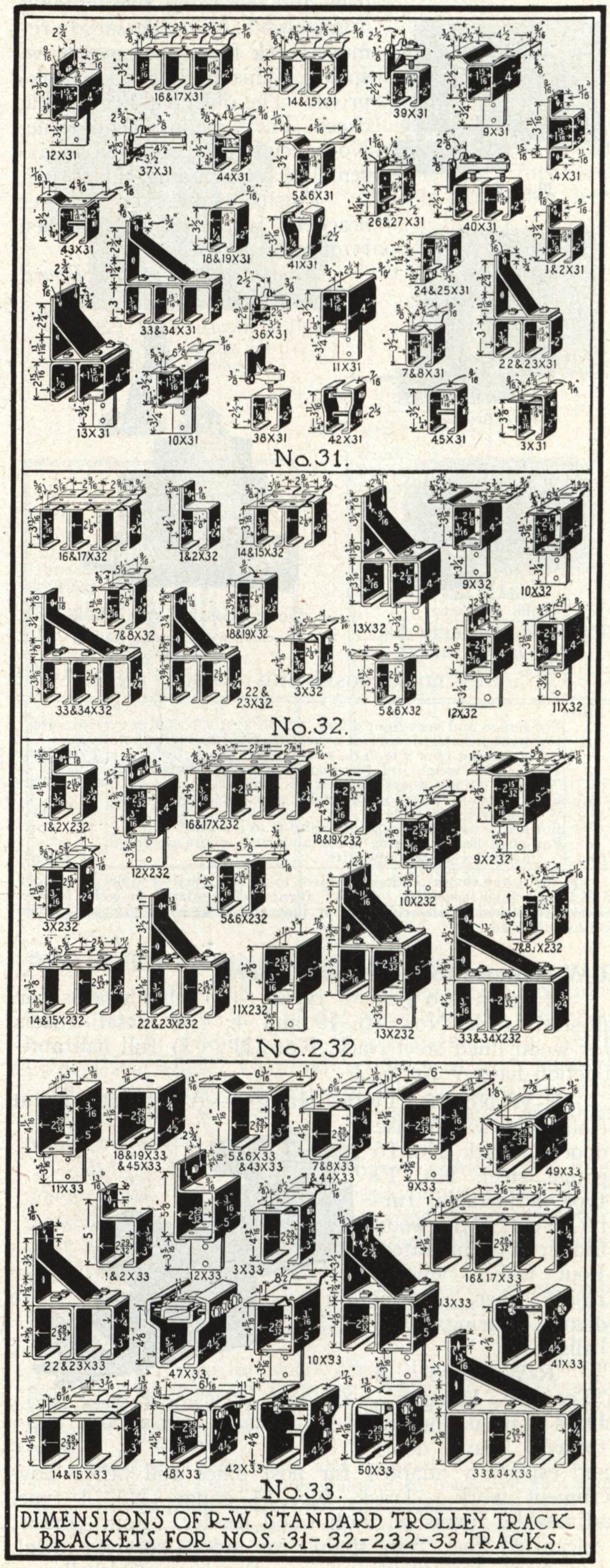
R.W. STANDARD SIZE TROLLEY TRACKS

Continued on next page

R-W Standard Trolley Track Brackets

In ordering, always specify number of track for which brackets are desired.

Brackets are made to fit practically any condition (see plate below).


12X31
16&17X31
14&15X31
39X31
9X31
37X31
44X31
4X31
5&6X31
26&27X31
40X31
43X31
18&19X31
41X31
1&2X31
24&25X31
33&34X31
36X31
11X31
7&8X31
22&23X31
13X31
10X31
38X31
42X31
45X31
3X31
No.31.
16&17X32
1&2X32
14&15X32
9X32
10X32
7&8X32
18&19X32
13X32
33&34X32
22&23X32
3X32
5&6X32
12X32
11X32
No.32.
1&2X232
16&17X232
18&19X232
12X232
9X232
10X232
3X232
5&6X232
7&8.X232
14&15X232
22&23X232
11X232
13X232
33&34X232
No.232
11X33
18&19X33 &45X33
5&6X33 &43X33
7&8X33 &44X33
9X33
49X33
1&2X33
12X33
3X33
16&17X33
22&23X33
47X33
10X33
13X33
41X33
14&15X33
48X33
42X33
50X33
33&34X33
No.33.

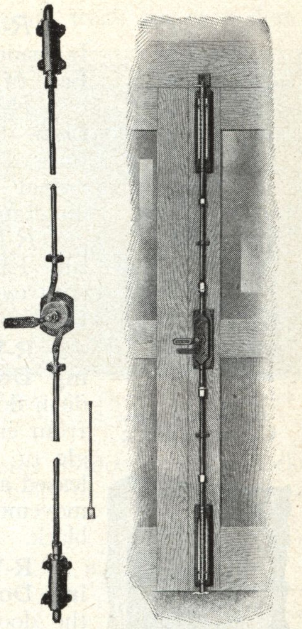
DIMENSIONS OF R-W. STANDARD TROLLEY TRACK BRACKETS FOR NOS. 31-32-232-33 TRACKS.

Sliding Door Bolts, Locks, Floor Guides, etc.

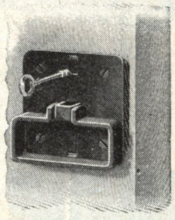
R-W No. 517 Garage Cremone Bolt—Locks doors at both top and bottom with one movement of the lever handle. Maintains its position by gravity and can not be changed except by moving the lever handle.

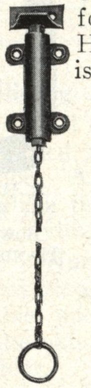
R-W No. 617 Garage Cremone Bolt—Especially designed for doors equipped with "Slidetite" folding-sliding garage door hardware. It is made of steel finished in black enamel. Base plate of the center section is 12¾x3⅜ in.; top and bottom sections 17½x2⅞ in.

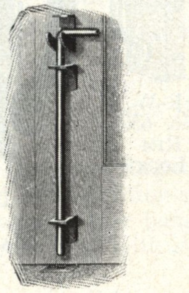
R-W No. 1125 Lock—For use in locking the No. 617 door bolt from the outside. Size of plate 4x4½ in. Made of steel, finished in black enamel.

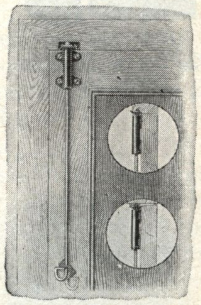

R-W No. 517 R-W No. 617
CREMONE BOLTS

Locks and Latch with Two Handles—The handles illustrated may be applied to No. 550 cylinder lock, No. 450 three-tumbler lock or No. 350 latch. Each lock or latch is furnished with one handle for each side of the door. Handles furnished in polished brass or japan.


R-W No. 1125
LOCK


R-W. No. 514

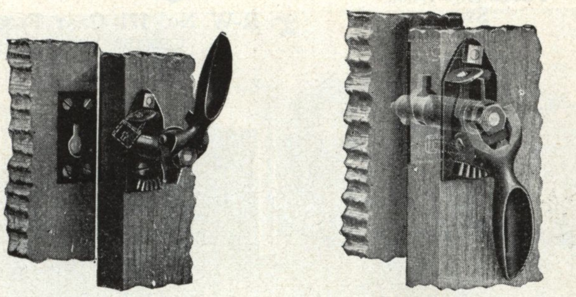

R-W No. 524


R-W No. 414

R-W No. 514—Top or Bottom Spring Bolt. No. 1 size: housing, 4⅝ in. long; chain, 24 in. long. No. 2 size: housing, 9 in. long; chain, 36 in. long

R-W No. 524—Cane Bottom Bolt. No. 1 size: ⅝x18 in. No. 2 size, ¾x24 in.

R-W No. 414—Self-aligning Top or Bottom Door Bolt. No. 1 size: housing, 4⅝ in. long; length over all, 26 in. No. 2 size: housing, 9 in. long; length over all, 36 in.


Unlocked Locked

R-W No. 516 PARALLEL DOOR BOLT AND LOCK

For doors 1¾ to 3 in. thick. Made of malleable iron and steel. When used on outside of building, a padlock can be attached. Doors should lap each other or jamb at least 2 in.

Continued on next page

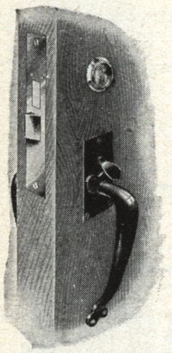
R-W No. 550 Cylinder Lock—Is made with one or two cylinders. Face of the lock is 7¾x1¼ in.

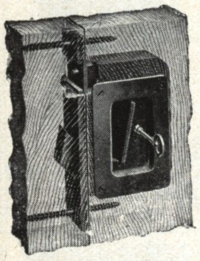
R-W No. 450 Three-tumbler Lock—Locks door from both sides. Face of the lock is 6½x1⅛ in. Furnished with two handles same as illustrated for No. 550.

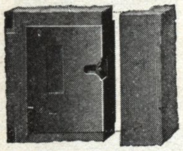
R-W No. 350 Latch—Japan finish. Face plate 4½x1 in. Furnished with two handles same as illustrated for No. 550.

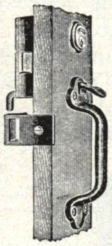
R-W No. 525 "Faultless" Sliding Door Lock—Lock, latch and flush door pull combined. Operated from either side of door. For single or double doors. Latch is released and door pulled open by same movement. Finish is rustless dead black.

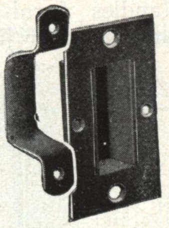
R-W No. 510 "Nobreak" Sliding Door Lock—Made flush with the door on both sides and can be operated from both inside and outside. Closing the door latches it. Serves as lock, latch, and door pull combined. No. 1 size adjustable for doors 1¾ to 2¼ in.; No. 2, 2½ to 3 in. thick. Width of lock, 5⅛ in.


R-W No. 550 Cylinder Lock

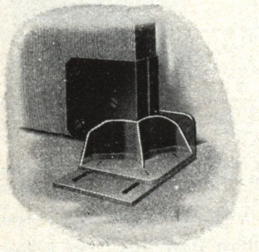

R-W No. 525 "Faultless" Sliding Door Lock

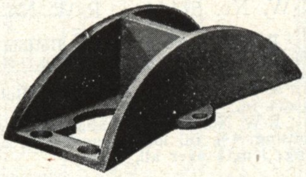

R-W No. 510 "Nobreak" Sliding Door Lock

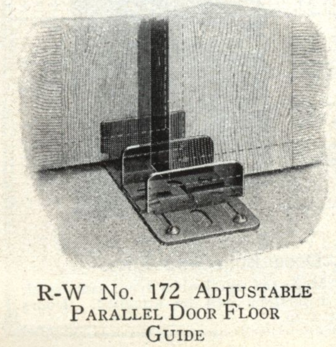

R-W No. 650 Rim Lock

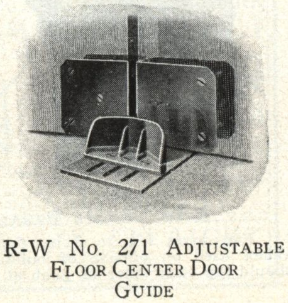

R-W No. 70 Flush Door Pull and No. 71 Bow Handle

R-W No. 81 Bow Handle


R-W No. 272 Adjustable Floor End Door Stop


R-W No. 171 Cast Floor Center Stop


R-W No. 172 Adjustable Parallel Door Floor Guide

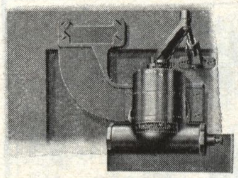

R-W No. 271 Adjustable Floor Center Door Guide

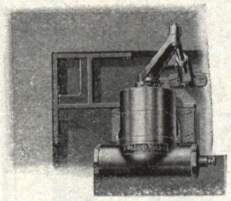
R-W Door Closer and Check No. 643

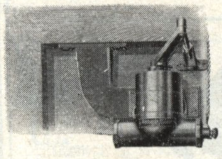
In this device, the crank and pitman principle is improved and simplified. All working parts in checking cylinder made of steel drop forgings. While tension of spring can be adjusted to suit conditions by pawl and tooth dog, overwinding is impossible. Not necessary to remove check from door to remove spring. This liquid check is leak-proof. The only truly reversible check. Parts are interchangeable. No special tools required in assembling or winding up spring.

Flush, soffit or corner brackets furnished extra when required.

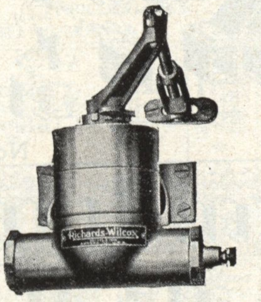
Approved by National Board of Underwriters.


Flush Bracket


Corner Bracket


Soffit Bracket

Types of Brackets for R-W Door Check


Door Closer and Check

Attached with regular casing bracket

DOOR CLOSER AND CHECK

Size		
1	For screen and very light doors	6 lbs.
2	For light interior doors not over 3 ft. wide and vestibule doors not over 2 ft. 6 in. wide	7½ lbs.
3	For medium weight interior doors not over 3 ft. wide, or light outside doors not over 2 ft. 6 in. wide	10 lbs.
4	For heavy interior doors or medium weight outside doors not over 3 ft. wide	12 lbs.
5	For heavy outside doors not over 3 ft. 6 in. wide	15 lbs.
6	For extra heavy outside doors and large doors operated against very strong drafts	18 lbs.

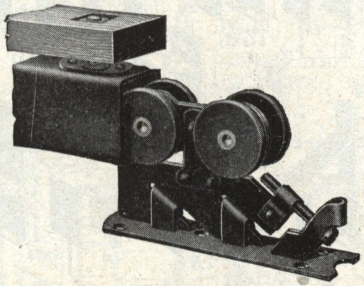
Extra heavy doors or doors subject to strong drafts require check one size larger than specified. Checks furnished regularly in gold bronze. Checks furnished in silver bronze or ivory black at same prices. Special finishes to order.

R-W Hangers for Vanishing Doors

Made in two general types: (1) fiber wheels for all-steel track, Nos. 16, 19 and 4; (2) metal wheels for wood lined steel track, No. 221; (3) full ball anti-friction hanger No. 722.

R-W No. 16 "Twin" Hanger—A popular tandem trolley for wide house doors. Track, No. 16 gauge steel, No. 19 type, adjustable, furnished with wood header as illustrated. Four wheels vulcanized fiber, 2⅛-in. diam. Bearings, steel balls.

R-W No. 4 "Trojan" Hanger—Designed for extremely heavy doors and especially adapted for post office and other Government work. Track, No. 14 gauge, No. 4 type, adjustable, furnished with wood header. Four wheels, vulcanized fiber, 3-in. diam., for indoor service; metal, 3-in. diam., for outside service. Bearings, steel balls.

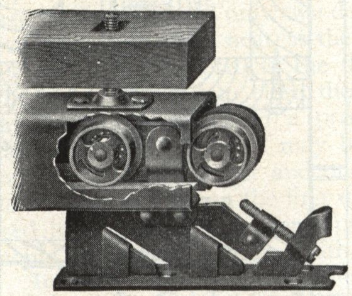

No. 16 R-W Twin Trolley Ball Bearing House Door Hanger

Continued on next page

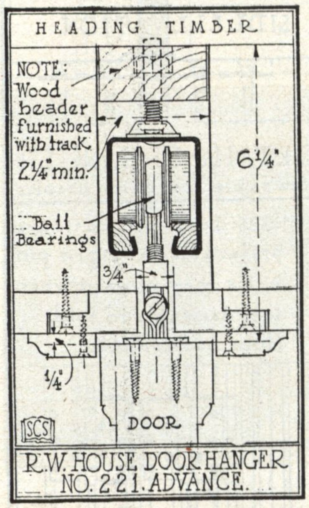
R-W No. 722 Ideal Hanger—The easiest and smoothest sliding door hanger made. Should be specified for the best class of residences.

R-W No. 19 "Hero" Hanger—A popular trolley hanger for homes of moderate cost. Not recommended for doors over 5 ft. in width. Similar to No. 16 shown on preceding page, but has only two wheels.

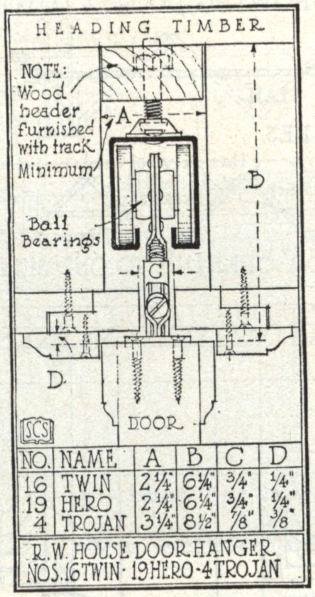
R-W No. 221 "Advance" Hanger—A noiseless 4-wheel hanger. Track, No. 16 gauge steel, hard maple lined, No. 221 clincher type, furnished with wood header, adjustable as illustrated. Wheels, malleable iron, lathe turned, 1⅞-in. diam. Steel frames. Ball bearing.



No. 221 R-W Advance Ball Bearing Trolley House Door Hanger



R.W. HOUSE DOOR HANGER NO. 221. ADVANCE.



NO.	NAME	A	B	C	D
16	TWIN	2¼"	6¼"	¾"	¼"
19	HERO	2¼"	6¼"	¾"	¼"
4	TROJAN	3¼"	8½"	⅞"	⅜"

R. W. HOUSE DOOR HANGER NOS. 16 TWIN · 19 HERO - 4 TROJAN

R-W Sliding Partition Door Hardware

Designed for 5 types of sliding door partitions: (1) sliding flush; (2) sliding parallel; (3) sliding accordion; (4) folding doors in pairs supporting weight in overhead track; (5) folding doors in pairs supporting weight in lower track. For schools, churches, auditoriums, clubs, Y. M. C. A. rooms, libraries and other public buildings.

Sliding Flush Door Hangers—Doors are flush when closed. When doors are open, they are concealed in pockets, or partition may be composed of one stationary door and a number of sliding doors, all when opened occupying position along side of stationary door.

Specification Data—Width of doors not limited by equipment, but all doors should be same width except first and last doors. Outer stiles of these doors should be slightly wider to allow for lap over jamb.

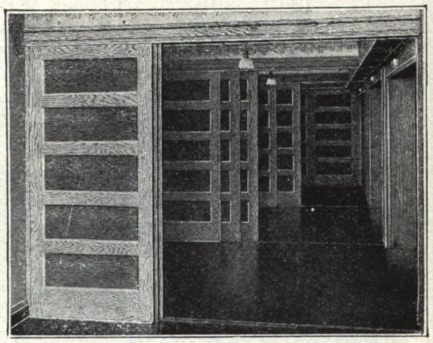
Hangers regular for doors 2½ in. thick, but can be furnished for doors of any thickness. Hangers No. 443 for No. 164 track, or No. 444-1 for No. 75 track, will accommodate doors up to 500 lbs. For heavier doors No. 444-2 hanger and No. 164 track.

State if steel soffit plates and casings are required.

Always send sketch showing layout of track and dimensions so we can determine whether curves are right or left hand.

Note: Soffits are trimmed to approximate shape, but screwholes in soffits and casings must be punched by contractor on the job.

Sliding Parallel Door Hangers—Doors slide parallel to each other, with separate track for each door. Number of doors is not limited, but a better appearance is obtained by using not more than two or three doors sliding in same direction. Pockets may be provided for doors, or, instead, a stationary panel or door used. Floor guides may be used to steady bottoms of doors. Door locks may be employed, and flush bolts to secure bottoms of doors to floor.



Sliding Parallel Door Installation in Sunday School Room

SLIDING PARALLEL DOOR HANGERS

Thickness of door, in.	Max. weight of door, lbs.	Hanger No.	Bearings	Wheels	Track No.	Bracket No.	Min. track centers, in.	Top of soffits to bottom of header, in.	Top of door to top of soffit, in.	
									⅞-in. soffit	1⅛-in. soffit
1⅜	200	126	Ball	Metal	30½	7x30½	1⅞	2⅞	1⅛	1⅜
1¾ to 2¼	300	226	Ball	Metal	31	7x31	2 5/16*	3¾	1⅛	1⅜
1¾ to 2¼	300	626	Ball	Metal	526†	7x31	2 5/16*	3¾	1⅛	1⅜
1¾ to 2¼	300	140-1	Roller	Metal or fiber	31	7x31	2 5/16*	3¾	1⅛	1⅜
2½	500	140-2	Roller	Metal or fiber	33	7x33	3⅜	5⅛	1⅛	1⅜

†Wood lined track *2½ in. for 2¼-in. doors.
Brackets should be spaced 2 to 3-ft. centers. Space brackets 2-ft. centers for maximum weight doors on each size track.

Sliding Accordion Door Hangers

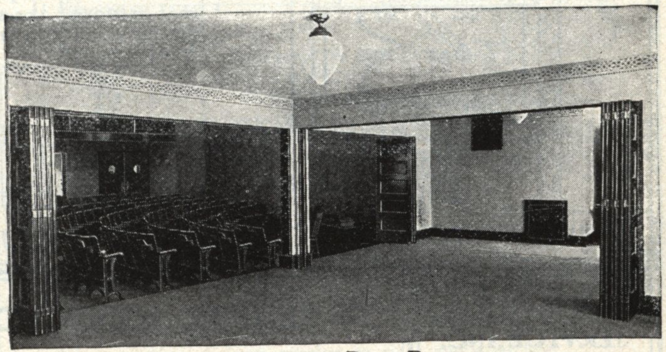
All doors can be folded to one side or they may be divided at center and half the doors folded to each side. A half door is required adjoining jamb toward which the doors fold. Doors should not exceed 3 ft. in width.

Number of Hangers Required—Four-wheel hangers, Nos. 135 and 335 accordion door hangers are preferable, and, when used, one hanger is applied to each alternate door, beginning with door farthest from half door.

If desirable to install hanger on each door, No. 137 accordion door hanger, a two-wheel hanger can be used.

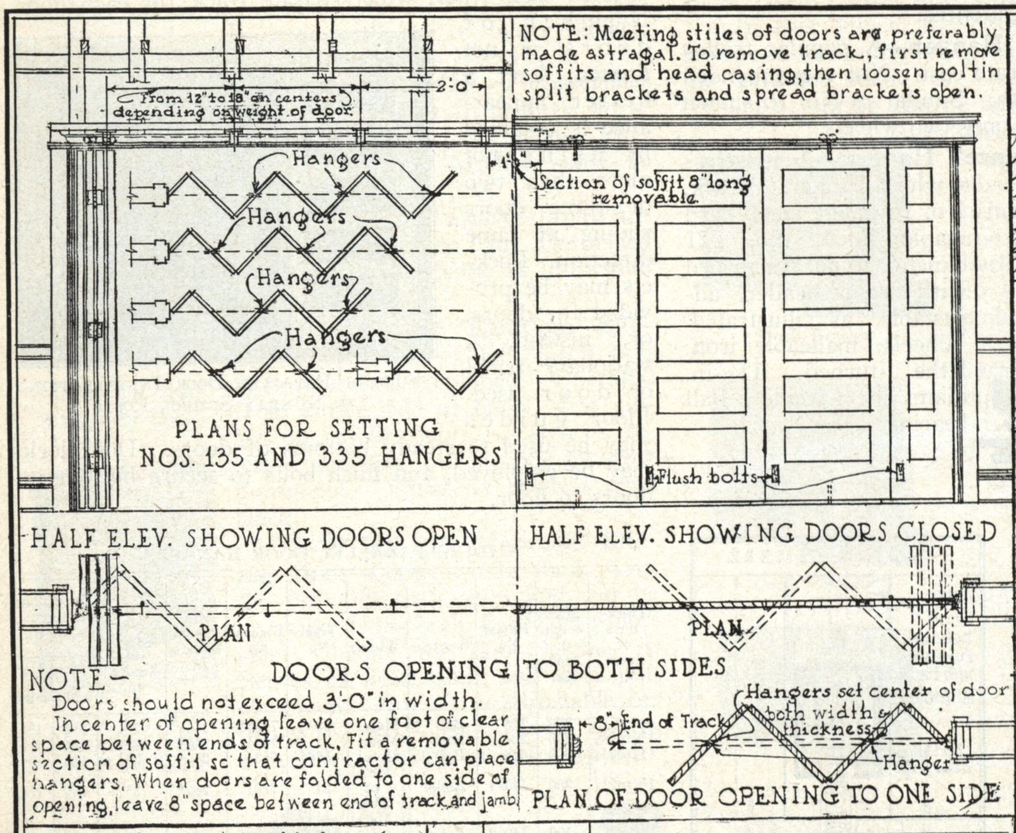
Hangers have ball bearing swivel and vertical screw adjustments.

See detail drawings on following page.



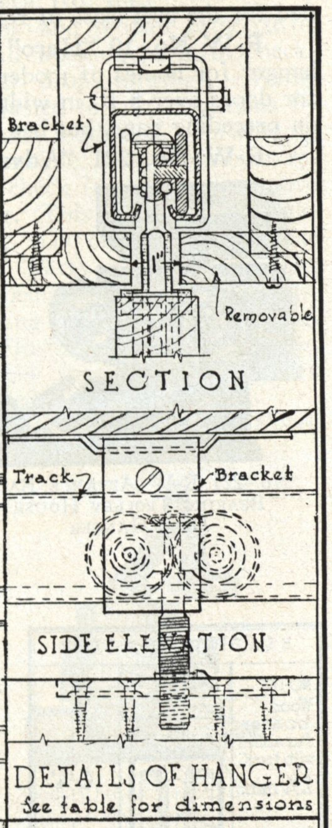
Sliding Accordion Door Partitions

Continued on next page


From 12" to 18" on centers depending on weight of door
2'-0"
Hangers
Hangers
Hangers
Hangers
1"
Section of soffit 8" long removable
Flush bolts
PLANS FOR SETTING NOS. 135 AND 335 HANGERS
HALF ELEV. SHOWING DOORS OPEN
HALF ELEV. SHOWING DOORS CLOSED
PLAN
PLAN
DOORS OPENING TO BOTH SIDES
8" End of Track
Hangers set center of door both width & thickness
Hanger
PLAN OF DOOR OPENING TO ONE SIDE

NOTE: Meeting stiles of doors are preferably made astragal. To remove track, first remove soffits and head casing, then loosen bolt in split brackets and spread brackets open.

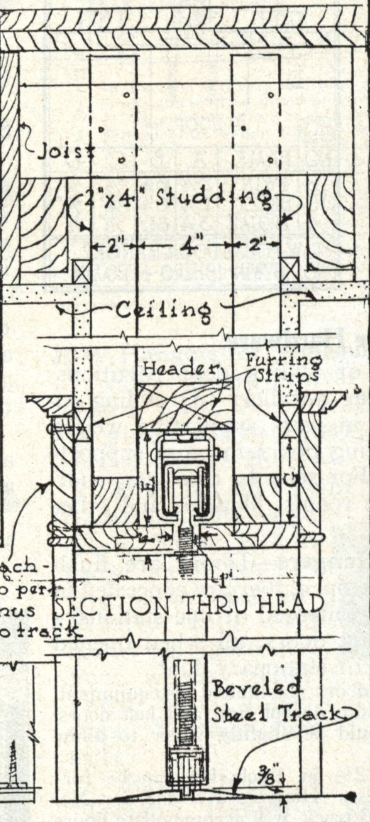
NOTE—
Doors should not exceed 3'-0" in width. In center of opening leave one foot of clear space between ends of track. Fit a removable section of soffit so that contractor can place hangers. When doors are folded to one side of opening, leave 8" space between end of track and jamb.

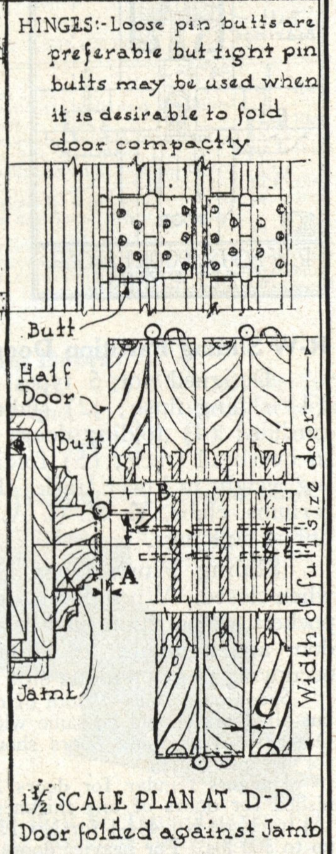

Bracket
1"
Removable
SECTION
Track
Bracket
SIDE ELEVATION
DETAILS OF HANGER
See table for dimensions

Note—* Fibre wheels furnished on order.

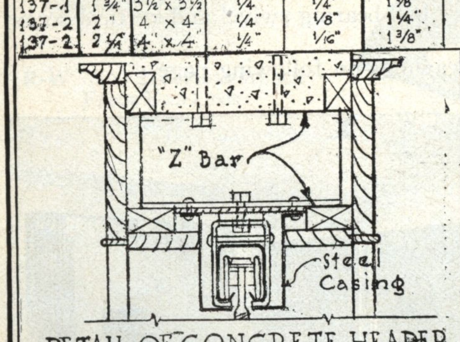
HANGER NUMBER	WHEELS	BEARINGS	TRACK NUMBER	THICKNESS OF DOORS	E	F 7/8" SOF.	F 1 1/8" SOF.	G
135-0	STEEL	BALL	30 1/2	1 3/8"	3 1/8"	1 1/8"	1 3/8"	3 1/4"
135-1	STEEL *	ROLLER	31	1 3/4"	3 7/8"	"	"	"
135-1	STEEL *	ROLLER	31	2" & 2 1/4"	3 7/8"	"	"	"
135-2	METAL *	ROLLER	33	2 1/2"	5 1/4"	"	"	4 3/4"
335	MALL.IRON	BALL	526	1 3/8" & 1 3/4"	3 7/8"	"	"	3 1/4"
137-0	STEEL	BALL	30 1/2	1 3/8"	3 1/8"	"	"	"
137-1	FIBRE	BALL	31	1 3/4	3 7/8"	"	"	"
137-2	STEEL	BALL	31	2" & 2 1/4"	3 7/8"	"	"	"

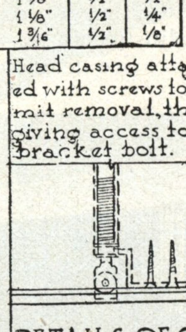
HANGER NO.	THICKNESS OF DOOR	SIZE OF BUTTS	"A"=DISTANCE FROM CENTER OF HINGE PIN TO EDGE OF DOOR–SEE PLAN D-D		B=DISTANCE FROM EDGE OF HALF DOOR TO CENTER LINE OF HANGER TRACK SEE PLAN		C=SPACE BETWEEN DOORS WHEN FOLDED SEE PLAN D-D	
			LOOSE PIN BUTTS	TIGHT PIN BUTTS	LOOSE PIN BUTTS	TIGHT PIN BUTTS	LOOSE PIN BUTTS	TIGHT PIN BUTTS
135-0	1 3/8"	3" x 3"	1/4"	1/4"	15/16"	15/16"	1/2"	1/2"
135-1	1 3/4"	3 1/2" x 3 1/2"	1/4"	1/4"	1 1/8"	1 1/8"	1/2"	1/2"
135-1	2"	4" x 4"	1/4"	1/4"	1 1/4"	1 1/4"	1/2"	1/2"
135-1	2 1/4"	4" x 4"	1/4"	1/8"	1 3/8"	1 1/4"	1/2"	1/4"
135-2	2 1/2"	5" x 5"	3/8"	3/8"	1 5/8"	1 5/8"	3/4"	3/4"
335	1 3/8"	3" x 3"	1/4"	1/4"	15/16"	15/16"	1/2"	1/2"
335	1 3/4"	3 1/2" x 3 1/2"	1/4"	1/16"	1 1/8"	15/16"	1/2"	1/8"
137-0	1 3/8"	3" x 3"	1/4"	1/4"	15/16"	15/16"	1/2"	1/2"
137-1	1 3/4"	3 1/2" x 3 1/2"	1/4"	1/4"	1 1/8"	1 1/8"	1/2"	1/2"
137-2	2"	4" x 4"	1/4"	1/8"	1 1/4"	1 1/8"	1/2"	1/4"
137-2	2 1/4"	4" x 4"	1/4"	1/16"	1 3/8"	1 3/16"	1/2"	1/8"


Joist
2"x4" Studding
2"
4"
2"
Ceiling
Header
Furring Strips
1"
SECTION THRU HEAD
Beveled Steel Track
3/8"


Butt
Half Door
Butt
B
A
Jamb
C
Width of full size door
1 1/2 SCALE PLAN AT D-D
Door folded against Jamb

HINGES:—Loose pin butts are preferable but tight pin butts may be used when it is desirable to fold door compactly.


"Z" Bar
Steel Casing
DETAIL OF CONCRETE HEADER


DETAILS OF GUIDE AND TRACK NO. 739.

Head casing attached with screws to permit removal, thus giving access to track bracket bolt.

DRAWN BY
SWEETS CATALOGUE
SERVICE, INC.

R-W. SLIDING ACCORDION FOLDING DOOR FIXTURES

SHEET NO. A1
SCALE 1/4 & 1 1/2" EQUALS 1'-0"

Continued on next page

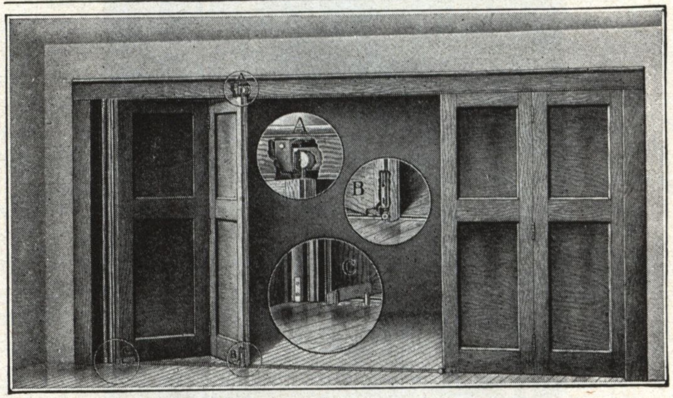
No. 237 Folding Partition Door Hardware

Developed for use where it is desired to have all of the doors in a partition of equal width. It is also especially adapted for use where the doors must be drawn past columns before they are folded or where it would be objectionable to have part of the doors extend beyond the wall line on one side, as is necessary, when using the regular accordion folding doors. The doors are hinged together in pairs and only two doors are moved at a time. Generally, the doors nearest the jamb toward which the doors fold, are pivoted to the floor and head jamb, but where it is desired to close the doors into a pocket or have them stand behind a projection of the partition wall, each pair of doors may be fitted with hangers at both ends. One hanger and one floor guide is required for each door. When the first door is pivoted, pivots are used instead of the hangers for that door. The doors should not exceed 3 ft. in width.

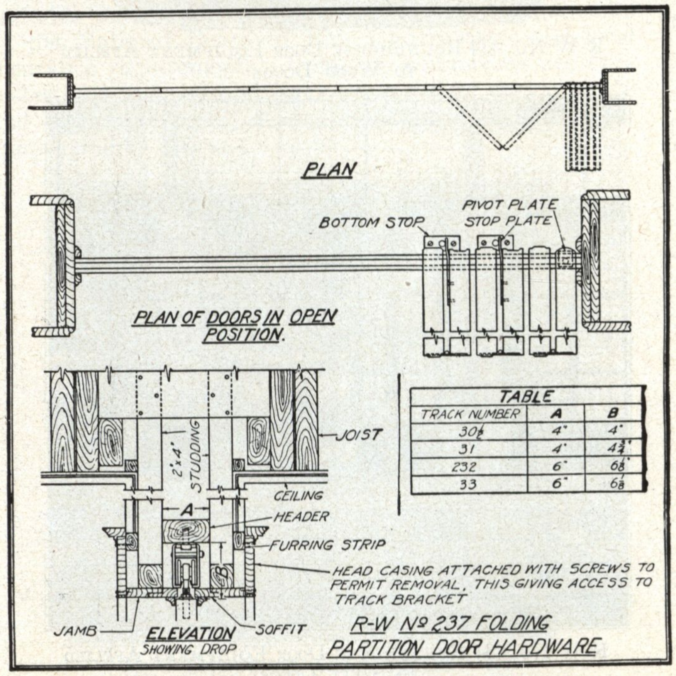
In Specifying—Give: (1) width of opening; (2) number of doors; (3) thickness of doors; (4) are all doors to fold toward one side or to divide at center, half folding each way; (5) on small size doors using either Nos. 237-0 or 237-2 hangers, state type of floor guide track, No. 739-2 or 739-3.

FOLDING PARTITION DOOR HARDWARE

Hanger No.	Thickness of doors, in.	Track No.
237-0	1⅜	30½
237-2	1¾ to 2¼	31
237-3	2 to 2¾	33
237-4	1¾ to 2½	232



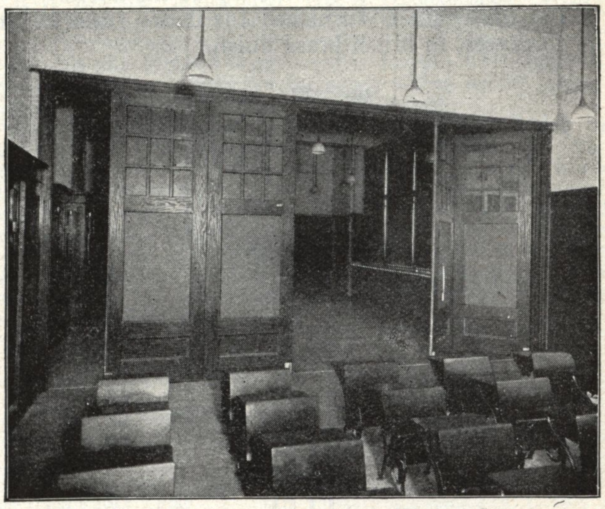
Detail of Installation


PLAN
BOTTOM STOP
PIVOT PLATE
STOP PLATE
PLAN OF DOORS IN OPEN POSITION.
TABLE
TRACK NUMBER
A
B
30½
4"
4"
31
4"
4¾"
232
6"
6⅛"
33
6"
6⅛
JOIST
2"x4" STUDDING
A
CEILING
HEADER
FURRING STRIP
HEAD CASING ATTACHED WITH SCREWS TO PERMIT REMOVAL, THIS GIVING ACCESS TO TRACK BRACKET
JAMB
ELEVATION SHOWING DROP
SOFFIT
R-W Nº 237 FOLDING PARTITION DOOR HARDWARE

R-W No. 237 Folding Partition Door Hardware

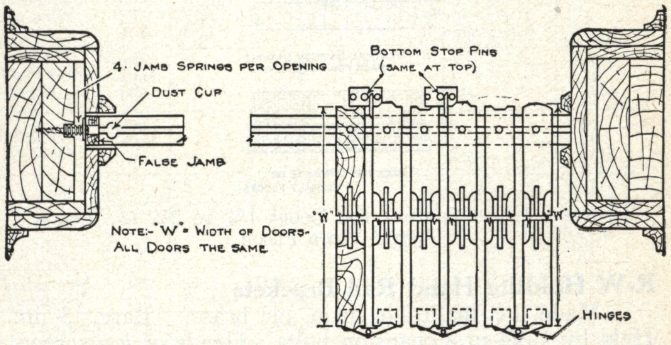
No. 535 Folding Partition Door Hardware

This hardware is especially adapted for partition doors, such as are used for dividing Sunday School rooms from the main church auditorium, divisions in gymnasiums or between public school rooms.

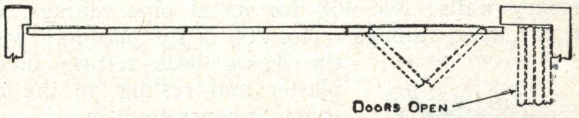


No. 535 Hardware Used in a Public School

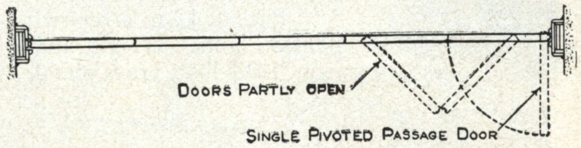
The doors are hinged together in pairs and each pair is operated as an independent unit. All doors may be made to open in one direction, or the doors may


4· Jamb Springs per Opening
Dust Cup
False Jamb
Bottom Stop Pins (same at top)
"W"
"W"
Note:-"W"= Width of Doors-All Doors the same
Hinges

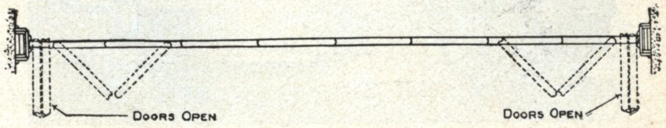
Plan of 6-door opening; doors folding to the right. Note astragal edges on doors. Exact shape and size of astragal edges must be made in accordance with R-W blue prints so they match up with astragals in bottom roller housings



6-door opening arranged so doors will stand behind a projection of wall when doors are open. In such cases, pivots are omitted, and rollers are used on all doors; spring jambs are also unnecessary


Doors Partly Open
Single Pivoted Passage Door

5-door opening showing pivot door mounted independently of other doors, to be used as passage door. When passage doors are required and wicket doors are not desirable, the former should always be at side of opening as shown, and not in center of opening


Doors Open
Doors Open

8-door opening, 4 doors opening to right and 4 to left

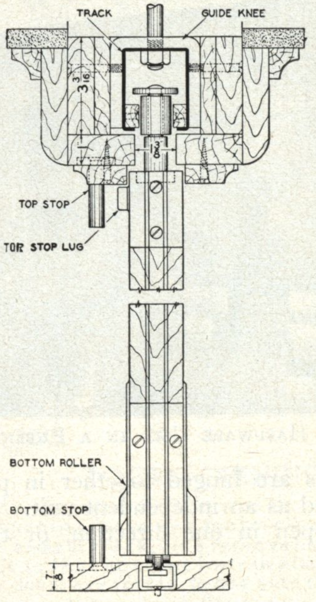
R-W No. 535 Folding Partition Door Hardware

Continued on next page

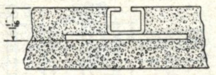
be divided in the center and half of the doors folded to the right and half to the left.

The entire load is carried on the floor track. The upper track, which is made of wood furnished by the builder, only serves to guide the top of the doors.

The hardware is furnished for doors from 1¾ to 3-in. thickness, in brush brass finish.



VERTICAL SECTION SHOWING TRACK FOR WOOD FLOOR



TRACK FOR CONCRETE OR ASPHALT FLOORS

VERTICAL CROSS SECTION FOR DOORS 1¾ TO 2¼ IN. THICK WITH WOOD FLOOR

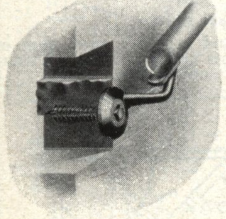
R-W Holdtite Hand Rail Brackets

Made of malleable iron or brass. Base, 3 in. Held by ½x4-in. expansion bolts. Heads of lag screws finished to match brackets. Projection from wall line, 3 in.

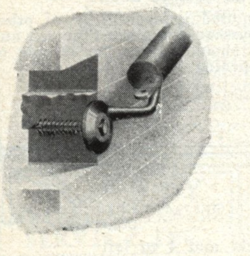
Nos. 466 and 666 are for attachment to wood or masonry walls; No. 466 for metal pipe railings, No. 666 for wood railings. No. 766 is for plastered walls, the ¾-in. boss setting in the plaster and resting on the masonry or concrete walls.

Finishes, black enamel or plated in bronze, antique copper, lemon or antique brass.

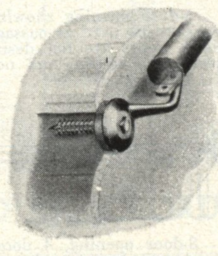
Packed 12 in a box with expansion bolts. Weight, malleable iron, 14¼ lbs.; brass metal, 15¾ lbs.



R-W No. 466



R-W No. 666



R-W No. 766

R-W HOLDTITE HAND RAIL BRACKETS

R-W No. 434 Roundhouse Door Equipment

Designed primarily to meet the severe service and operating conditions required on roundhouse doors.

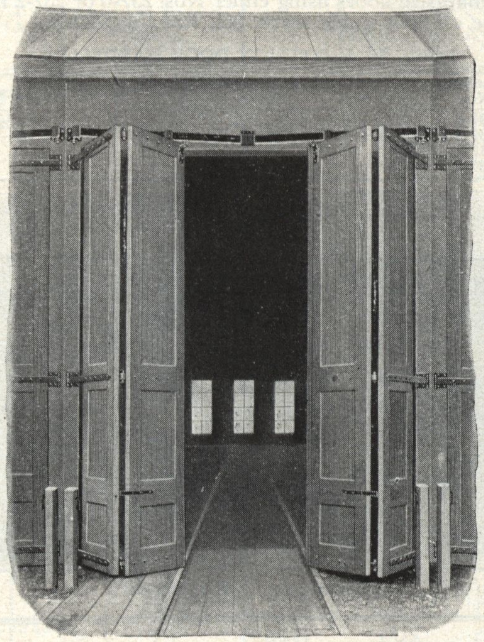
Doors are narrow, presenting only half as much area to the wind as the ordinary pairs of doors.

The upper corners of the center doors are supported and guided by hangers which run in No. 13 gauge steel trolley track, thus preventing the doors from being easily blown about by the wind.

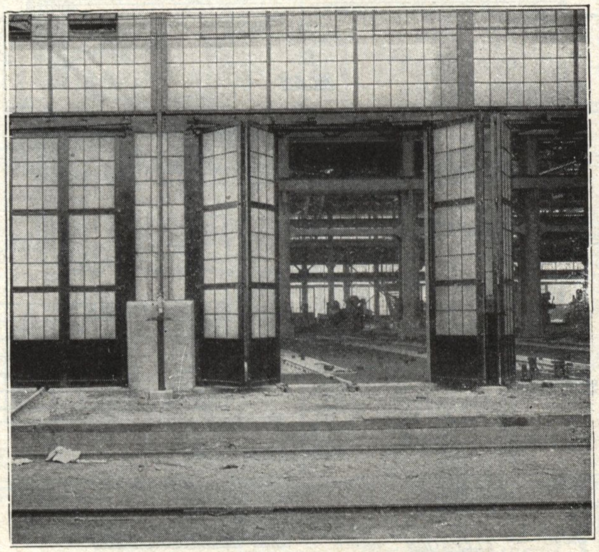
It is only necessary to use 12-in. columns with 1-in. stops on each side between the openings.

A hold-open latch bar is attached to a post or section of rail set in the ground to hold the doors in open position.

The jamb hinges extend entirely across the doors. The two doors of each pair are connected by heavy double strap hinges, bolt holes of which correspond to bolt holes in the strap of jamb hinge. These are bolted together through the door, thus forming a continuous hinge from the jamb to the center of the opening.



R-W No. 434 ROUNDHOUSE DOOR EQUIPMENT APPLIED TO WOOD DOORS



R-W No. 434 ROUNDHOUSE DOOR EQUIPMENT APPLIED TO STEEL DOORS
Also used on industrial doorways

Continued on next page

R-W Standard Fire Doors and Shutters

R-W standard fire doors and shutters are constructed in accordance with the rules and requirements of the National Board of Fire Underwriters and are inspected and labeled under the supervision of the Underwriters' Laboratories, Inc.

Two thicknesses of tin clad fire doors meet practically all requirements for openings in fire walls as follows:

3-Ply or Standard Door—This has a 3-ply wooden core and double lock joints in the tin covering. Thickness of door, 2⅝ in.

For openings in first class fire walls between two buildings or large sections of the same building, one 3-ply door is required on each side of wall.

For openings in second class fire walls between important rooms or enclosing some special hazard, one 3-ply door is required on one side of wall.

2-Ply Door—This has a 2-ply wooden core and double lock joints in the tin covering. Thickness of door, 1¾ in.

For openings in third class fire walls (minor division walls and partitions, stair and elevator walls, belt towers, etc.) one 2-ply door is required on one side of wall.

Standard fire shutters for use on the outside of buildings to protect window openings are made in the same manner as 2-ply doors.

"FyeR-Wall"—Corrugated sheet metal fire doors. Are lighter in weight and less easily damaged than tin clad doors; also show lower maintenance costs. Made in one thickness only (2½ in.) and are suitable for protecting all kinds of fire hazard openings.

Lap of Doors—Sliding doors when shut must overlap the sides and top of opening 4 in., and should have the top built on a pitch of ¾ in. per ft., when designed to close by gravity.

Swinging doors should preferably shut into angle iron door frames, but may be made to overlap the opening 4 in. on two sides and top.

Shutters may either overlap or fit close inside the window opening. Single swinging shutters furnish the best protection, although those made in pairs may be used on large openings.

Sliding shutters are not recommended because accumulation of snow and ice on the track and sill prevent closing in spite of shields arranged as a protection.

R-W Fire Door and Shutter Equipment

The R-W line of fire door and shutter equipment includes outfits and combinations for all requirements of the National Board of Fire Underwriters and local insurance requirements. Complete equipments are furnished for inclined and level track sliding doors, single and double swinging doors, vertical sliding and horizontal sliding doors. Also fire shutter and trap fire door fixtures.

Type of Equipment to Select—The selection of the proper type of equipment to meet a particular requirement depends principally upon the space requirements at side of opening and the height of ceiling.

When headroom over opening is 3 ft. or more, the two-link R-W No. 102 "Monarch-A" type is recommended. Where headroom is less than 3 ft., one-link, R-W No. 201 "Monarch-A" type is recommended.

No. 204 for double sliding doors is for use when space at side of opening is not sufficient for single sliding doors. Either flat track or round track types can be furnished.

Directions for Ordering or Specifying—In ordering or specifying state (1) number of openings and number of doors; whether doors are on one side or both sides of wall; (2) width and height of opening (mention width first); (3) thickness of doors, whether 2-ply (1¾ in.) or 3-ply (2⅝ in.) or corrugated sheet metal; (4) thickness of wall; (5) distance from edge of opening to wall at right angles, if any, to provide sufficient space for wall binders; state distances from highest points of openings to nearest obstructions overhead; (6) whether opening is square or arched top.

FIRE DOOR FIXTURES

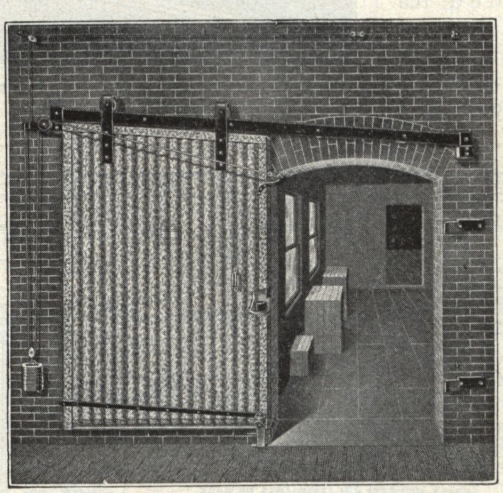
Type of door	Fixture No.	Round or flat track	Clearance above top of opening, in.	Clearance required at side of opening, in.	
				Where doors slide or swing	Opposite side
Incline track sliding door	102*	Flat	14†	Width of opening +21	13½
	201*	Flat	14†	Width of opening +19	13½
	645*	Round	12†	Width of opening +17	13½
	646*	Round	12†	Width of opening +15½	13½
Level track sliding door	303	Flat	14†	Width of opening +19	20
	304	Flat	9†	Width of opening +19	19
	641	Flat	12†	Width of opening +15½	19
Sliding doors in pairs	204	Flat	14†	½ wd. of open'g +15	
	604	Round	12†	½ wd. of open'g +11½	
	302	Flat	17	½ wd. of open'g +20	
	305	Flat	9	½ wd. of open'g +20	
Single swing doors	206		9	10	3½
	406*		9	11	4
	606		none	3½	3½
Swing doors in pairs	306		10	10	10
	506*		10	11	11
	706		3½	3½	3½
				Sidewall required	
				Doors under 300 lbs.	Doors over 300 lbs.
Vertical sliding doors	203*	Flat	Height of opening +19	15 and 21	21 and 28
	603	Round		16 and 22	22 and 29

*Adjustable hanger can be furnished with Nos. 102, 201, 204, 302, 303, 641, 645, 646 and 604 fixtures, and requires 3 in. more headroom above the top of opening than rigid hangers.

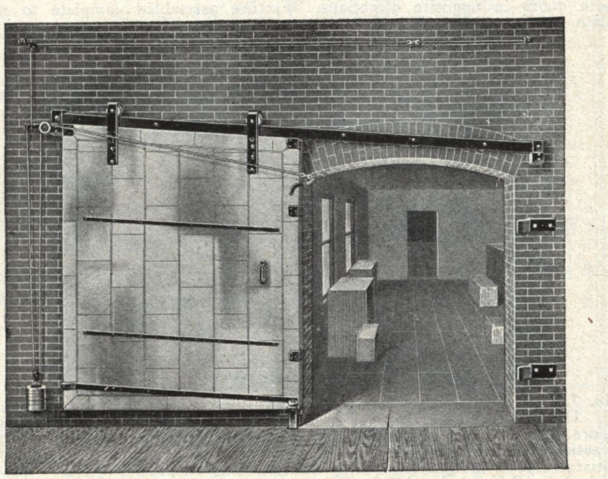
*Approved and labeled under directions of National Board of Fire Underwriters.

†For arched top openings add ¾ in. for each foot of track back of the center of the opening, to the dimension given. For square top openings add ¾ in. for each foot of track back of edge of opening towards which the door slides in closing, to the dimension given.

When hardware is wanted for "FyeR-Wall" corrugated sheet metal fire doors, prefix 1 to catalogue numbers above. Example: No. 201 hardware for sheet metal doors becomes No. 1201.



R-W Corrugated Sheet Metal Door



No. 102 Monarch Fire Door Fixtures

Recommended where headroom exceeds 3 ft. Two fusible links, one in opening and one near ceiling. Door closes by gravity

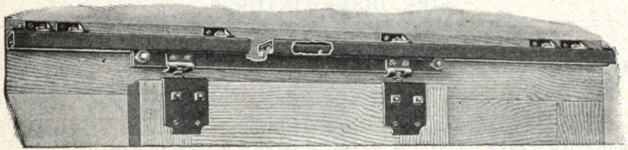
Continued on next page

R-W "Ideal" Elevator Door Hangers

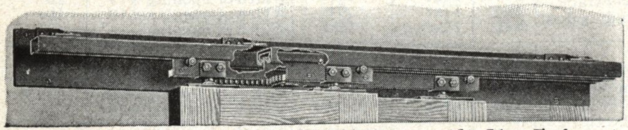
For passenger and freight elevator service. Length of hanger is equal to the width of door, providing a long bearing, evenly distributing weight of door over a long section of track, insuring smooth, steady motion, and easy running. The weight of the door is carried on two rows of ½-in. high duty steel balls, kept equal distance apart by a retainer. Limit rollers provided to prevent doors from jumping or raising.

Track is rectangular shaped tube made of very heavy gauge steel, and is drawn to form two parallel runways for steel balls upon which hanger rolls. The track is dustproof and dirtproof.

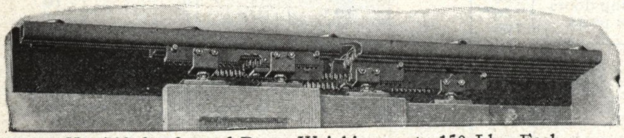
Styles—Made in 6 styles: (1) for single doors; (2) for two-speed doors; (3) for 3-speed doors; (4) for doors in pairs; (5) for single combination swing and slide doors; (6) for 2-speed combination swing and slide doors.



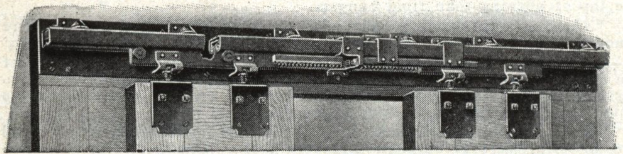
No. 727 for Single Doors Weighing up to 200 Lbs.
Track furnished with brackets for sidewall attachment. Track has lateral and hanger has vertical adjustment



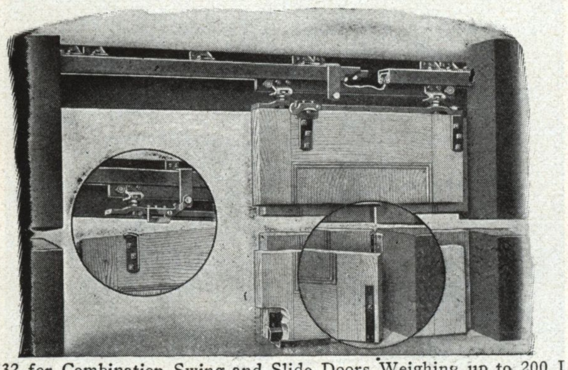
No. 728 for 2-speed Doors Weighing up to 150 Lbs. Each
Made with rack and pinion attachment for operating two doors in same direction, one door moving at twice the speed of the other. Has a 4⅝-in. width wall plate to which complete fixture is assembled



No. 729 for 3-speed Doors Weighing up to 150 Lbs. Each
Made with rack and pinion attachment for operating three doors in same direction, fast door at three times the speed, intermediate door at twice the speed of slow door. Fixture assembled complete to wall plate 5 in. wide



No. 730 for Doors in Pairs Weighing Up to 200 Lbs.
Made with rack and pinion attachment for simultaneously operating both doors in opposite directions. Fixture assembled complete to wall plate 4¼ in. wide



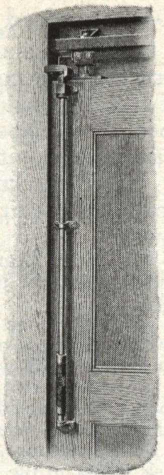
No. 732 for Combination Swing and Slide Doors Weighing up to 200 Lbs.
Used when stationary door is hinged and it is desirable to swing both doors open so as to use full width of elevator opening, and yet it is not practicable to swing transom bar to which track is attached. Usually more satisfactory to arrange to swing transom bar, if possible. Can be furnished for 2-speed doors when required

STYLES OF R-W "IDEAL" ELEVATOR DOOR FIXTURES

R-W Straight Bar Elevator Door Bolt No. 625

A reliable lock, strongly made, attractive in appearance. Locking spring enclosed in knurled handle, protecting it from dust and possible damage. Length, 3 ft. 6 in. Maximum projection from door, 1⅜ in. Cushion washers between all contacting parts make the bolt noiseless in operation. Can be arranged to unlock from corridor side. Keeper, as shown, regular. Special keeper furnished as required. Regular finish, dead black. Special finish, dead black with solid brass handle and door brackets. Packed, wrapped, with screws. Weight, 3¼ lbs.

Can also be furnished for use with R-W electric interlocks for elevator doors.



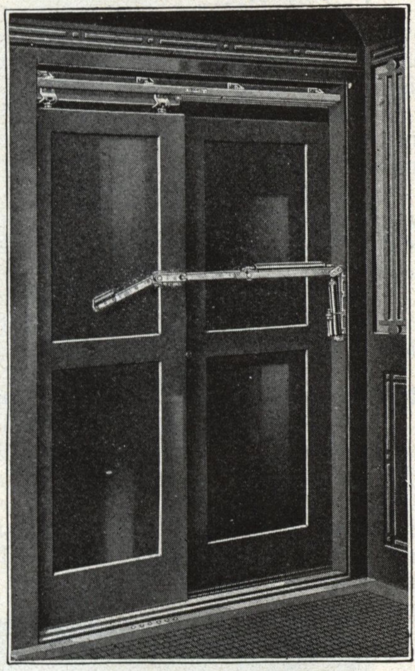
No. 625-A
STRAIGHT BAR ELEVATOR DOOR BOLT

"Ideal" Elevator Door Controller and Check No. 743

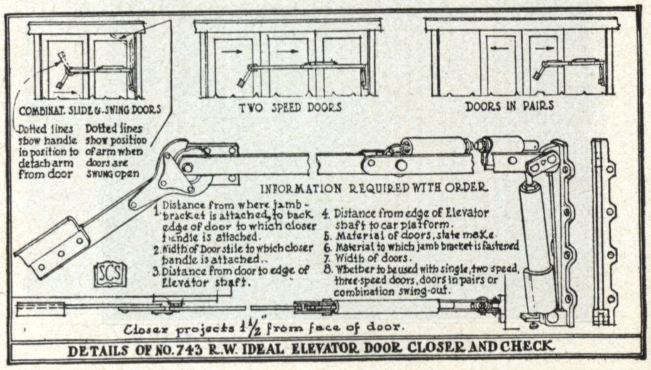
Automatically closes doors positively and easily; eliminates accidents, noise and slamming of doors. Can be used with any standard hanger; single, 2-speed, 3-speed, doors in pairs, or combination swing out.

The long lever handle starts the doors easily. The spring can not be overwound. The spring and checking mechanisms are separate and can be readily regulated independently of each other to suit the varying conditions. Made right or left hand.

When so ordered, the "Ideal" elevator door controller and check No. 743 can be equipped with electric interlocking attachment giving the added feature of preventing the operation of the car until the door is closed.



"IDEAL" ELEVATOR DOOR CONTROLLER AND CHECK
Approved by National Board of Underwriters


COMBINAT. SLIDE & SWING DOORS
TWO SPEED DOORS
DOORS IN PAIRS
Dotted lines show handle in position to detach arm from door
Dotted lines show position of arm when doors are swung open
SCS
Closer projects 1½" from face of door.

INFORMATION REQUIRED WITH ORDER.

1. Distance from where jamb-bracket is attached, to back edge of door to which closer handle is attached.
2. Width of Door stile to which closer handle is attached.
3. Distance from door to edge of Elevator shaft.
4. Distance from edge of Elevator shaft to car platform.
5. Material of doors, state make.
6. Material to which jamb bracket is fastened
7. Width of doors.
8. Whether to be used with single, two speed, three-speed doors, doors in pairs or combination swing-out.

DETAILS OF NO. 743 R.W. IDEAL ELEVATOR DOOR CLOSER AND CHECK

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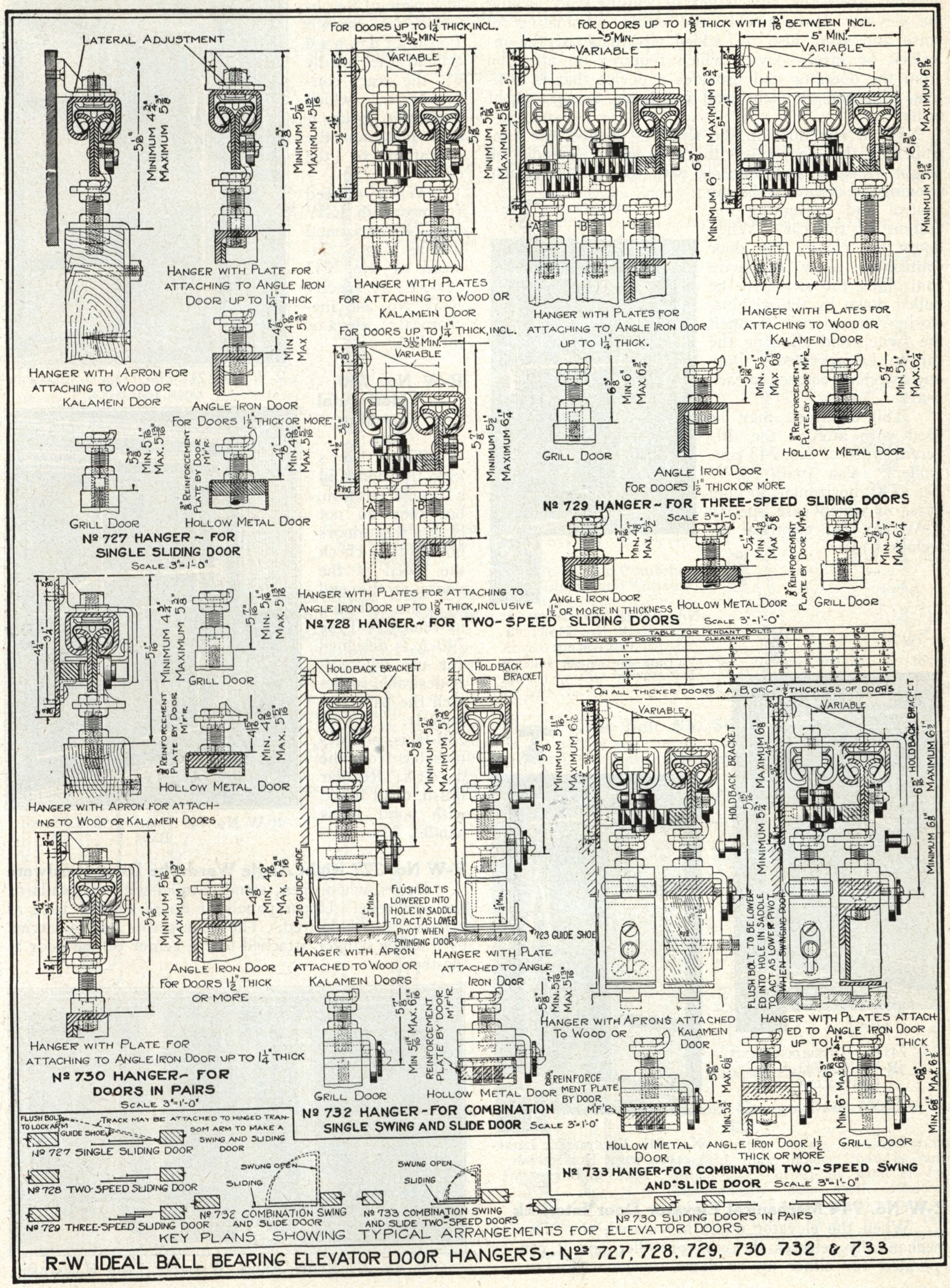

LATERAL ADJUSTMENT
MINIMUM 4 3/4"
MAXIMUM 5 3/8"
HANGER WITH APRON FOR ATTACHING TO WOOD OR KALAMEIN DOOR
HANGER WITH PLATE FOR ATTACHING TO ANGLE IRON DOOR UP TO 1 1/4" THICK
ANGLE IRON DOOR FOR DOORS 1 1/2" THICK OR MORE
GRILL DOOR
HOLLOW METAL DOOR
3/8" REINFORCEMENT PLATE BY DOOR M'F'R.
FOR DOORS UP TO 1 1/4" THICK, INCL.
3 11/32" MIN.
VARIABLE
MINIMUM 5 1/16"
MAXIMUM 5 13/16"
HANGER WITH PLATES FOR ATTACHING TO WOOD OR KALAMEIN DOOR
HANGER WITH PLATES FOR ATTACHING TO ANGLE IRON DOOR UP TO 1 3/8" THICK, INCLUSIVE
MINIMUM 5 1/2"
MAXIMUM 6 1/4"
FOR DOORS UP TO 1 3/8" THICK WITH 3/16" BETWEEN INCL.
5" MIN.
MAXIMUM 6 3/4"
MINIMUM 6"
MAXIMUM 6 9/16"
MINIMUM 5 13/16"
HANGER WITH PLATES FOR ATTACHING TO ANGLE IRON DOOR UP TO 1 1/4" THICK.
HANGER WITH PLATES FOR ATTACHING TO WOOD OR KALAMEIN DOOR
ANGLE IRON DOOR FOR DOORS 1 1/2" THICK OR MORE
ANGLE IRON DOOR 1 1/2" OR MORE IN THICKNESS
A
B
C
HANGER WITH APRON FOR ATTACHING TO WOOD OR KALAMEIN DOORS
HANGER WITH PLATE FOR ATTACHING TO ANGLE IRON DOOR UP TO 1 1/4" THICK
ANGLE IRON DOOR FOR DOORS 1 1/2" THICK OR MORE
HOLDBACK BRACKET
#720 GUIDE SHOE
FLUSH BOLT IS LOWERED INTO HOLE IN SADDLE TO ACT AS LOWER PIVOT WHEN SWINGING DOOR
#723 GUIDE SHOE
HANGER WITH APRON ATTACHED TO WOOD OR KALAMEIN DOORS
HANGER WITH PLATE ATTACHED TO ANGLE IRON DOOR
REINFORCEMENT PLATE BY DOOR M'F'R.
FLUSH BOLT TO BE LOWERED INTO HOLE IN SADDLE TO ACT AS LOWER PIVOT WHEN SWINGING DOOR
HANGER WITH APRONS ATTACHED TO WOOD OR KALAMEIN DOOR
HANGER WITH PLATES ATTACHED TO ANGLE IRON DOOR UP TO 1 1/4" THICK
HOLLOW METAL DOOR
ANGLE IRON DOOR 1 1/2" THICK OR MORE
GRILL DOOR
FLUSH BOLT TO LOCK ARM
GUIDE SHOE
TRACK MAY BE ATTACHED TO HINGED TRANSOM ARM TO MAKE A SWING AND SLIDING DOOR
No 727 SINGLE SLIDING DOOR
No 728 TWO-SPEED SLIDING DOOR
No 729 THREE-SPEED SLIDING DOOR
SWUNG OPEN
SLIDING
No 732 COMBINATION SWING AND SLIDE DOOR
No 733 COMBINATION SWING AND SLIDE TWO-SPEED DOORS
No 730 SLIDING DOORS IN PAIRS
KEY PLANS SHOWING TYPICAL ARRANGEMENTS FOR ELEVATOR DOORS

No 727 HANGER ~ FOR SINGLE SLIDING DOOR
SCALE 3"=1'-0"

No 728 HANGER ~ FOR TWO-SPEED SLIDING DOORS SCALE 3"-1'-0"

No 729 HANGER ~ FOR THREE-SPEED SLIDING DOORS
SCALE 3"=1'-0"

TABLE FOR PENDANT BOLTS

THICKNESS OF DOORS	CLEARANCE	*728 A	*728 B	729 A	729 B	729 C
1"	1/8"	3/16"	11/16"	3/16"	1/16"	3/8"
1"	3/16"	1/2"	11/16"	1/2"	1/2"	1 1/4"
1"	1/4"	1/2"	11/16"	1/2"	1/2"	1 1/4"
1 1/8"	1/8"	9/16"	11/16"	9/16"	9/16"	1 1/4"
1 1/8"	3/16"			9/16"	9/16"	11/16"

ON ALL THICKER DOORS A, B, OR C = 1/2 THICKNESS OF DOORS

No 730 HANGER ~ FOR DOORS IN PAIRS
SCALE 3"=1'-0"

No 732 HANGER ~ FOR COMBINATION SINGLE SWING AND SLIDE DOOR SCALE 3"=1'-0"

No 733 HANGER ~ FOR COMBINATION TWO-SPEED SWING AND SLIDE DOOR SCALE 3"=1'-0"

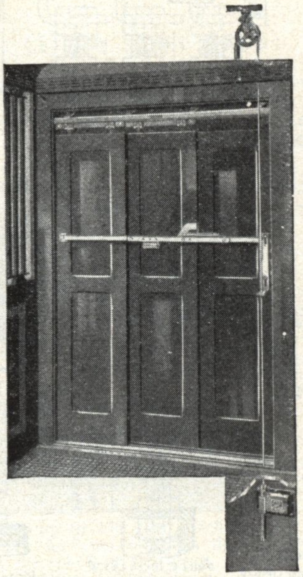
R-W IDEAL BALL BEARING ELEVATOR DOOR HANGERS ~ Nos 727, 728, 729, 730 732 & 733

R-W No. 743-IL Electrical Elevator Door Interlock

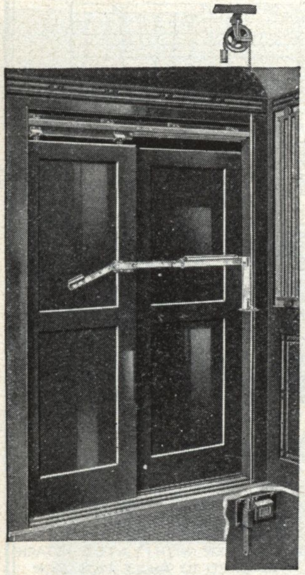
When used with R-W Ideal controllers, this combination gives the advantages of closing and locking the elevator doors quickly and easily, eliminating all noise and slam, also the added advantage of the interlock or safety device which requires no attention from the operator and provides a device that is positive, of great simplicity and not liable to get out of order.

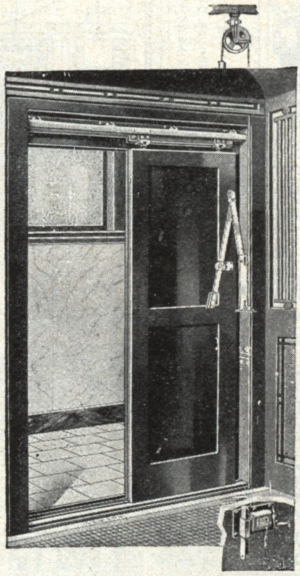
When any door in the shaft is opened, the controller on that door raises the wire which extends full height of shaft and connects with the cut-out switch, opening the circuit to the car control and preventing operation of the car. When doors are closed, the door controllers allow the wire controlling the switch to be pulled down by the weights, closing the circuit through the switch and allowing the car to be operated. Only one switch is required in each shaft.

This interlock may be used with any of the different types of No. 743 controllers, also with R-W No. 740 horizontal locking bars, in which case specify R-W No. 741 electrical interlock.


No. 743-IL Interlock and R-W No. 743-C Controller

Only one cut-out switch per shaft required


No. 743-IL Interlock and R-W No. 743-A Controller

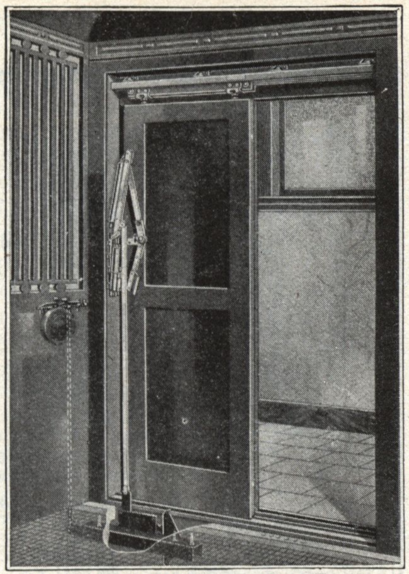

No. 741 Electrical Interlock with Horizontal Locking Bars

R-W No. 744 Mechanical Elevator Door Interlock

When the elevator doors are closed, the No. 744 mechanically releases the car controller and it can be operated for either up or down movement.

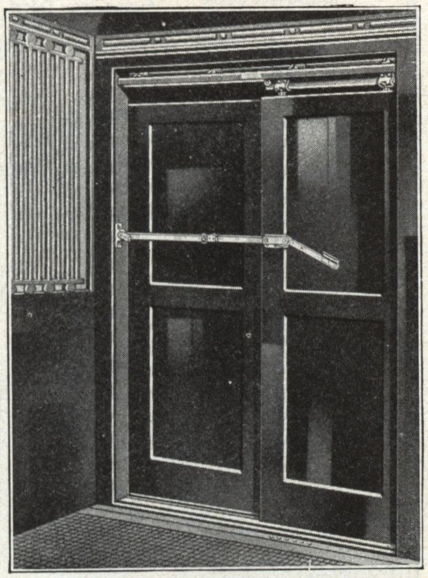
When the doors are open, the lock plate of the interlock is thrown forward and around the handle of the car controller, which positively locks it and prevents the operation of the car.

When desired for use with R-W No. 740 horizontal locking bars instead of No. 743 closers, specify R-W No. 745 mechanical elevator interlock.


R-W No. 744 Mechanical Elevator Door Interlock

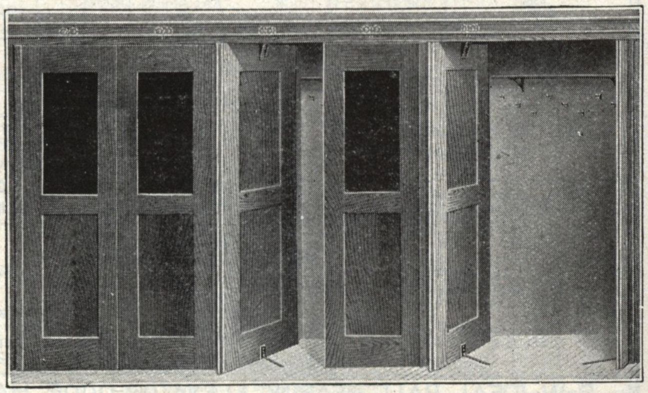
R-W No. 740 Horizontal Locking Bars

These bars lock the doors in closed position, but they do not close the doors nor do they check the speed of the doors at the end of the closing movement. Type 740-A is designed for use where it is desirable to detach the bars frequently. Type 740-B is not detachable from the doors. Regular finish, dead black, with solid brass handle.


R-W No. 740 Horizontal Locking Bars

R-W No. 377 Right Angle Wardrobe Door Hardware

Doors, when open, stand parallel with sidewalls of the wardrobe. Upper panels of doors may be used as blackboards, if desired. The door pivots and is carried by a single hanger attached to the center of the door at the top.


R-W No. 377 Right Angle Wardrobe Door Hardware

PHENIX MANUFACTURING COMPANY

Garage Door Bolts and Holders

022 to 044 Center Street, MILWAUKEE, WIS.

Products

Bolts and Holders for garage and other heavy doors.

For Window and Door Screens, Screen Hangers and Fasteners, see pages 1376-1377.

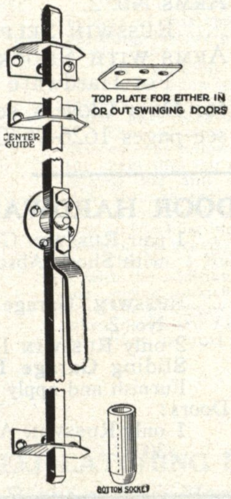
Phenix Cremone Door Bolt No. 50 for Inside Locking Only

For right or left hand, single or double garage, factory, warehouse, fire and other heavy doors, swinging either in or out.

Durable, reliable, strong and simple in action. One turn of the handle either locks or unlocks both top and bottom bolts. The handle always retains its position because of the counterweight of the upper bar, consequently the bottom bolt is prevented from dragging on the floor. Steel construction throughout. Bolt made of ½x½-in. steel rod.

Stock lengths, 6 to 13 ft., inclusive, increasing by 6-in. steps. Intermediate lengths will be supplied at slight additional cost.

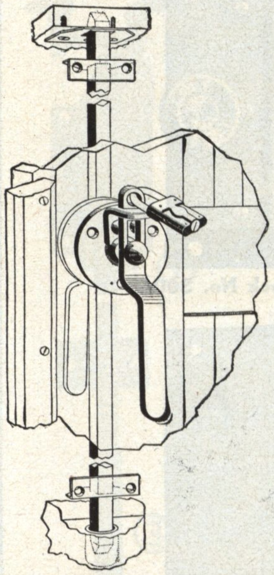
If bolts are desired cut to exact length, give exact height from floor to top plate.



Cremone Door Bolt No. 50 for Inside Locking

Phenix Cremone Door Bolt No. 51 for Outside Locking Only

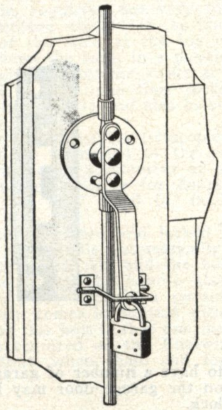
Same construction and sizes as bolt No. 50, but is furnished with an extra outside lever handle and strong malleable iron disc casting provided with loop arrangement for padlock. Used especially on garages without service doors. Made of steel, heavily galvanized. Specify whether for use on doors 1¾ or 2¼ in. thick.



Cremone Door Bolt No. 51 for Outside Locking

Phenix Cremone Door Bolt No. 53 for Combination Inside and Outside Locking

Same construction and sizes as No. 50, but has a locking attachment (screwed to inside face of door) which slips over the end of the bolt handle.



Inside Handle Loop Bracket for Cremone Door Bolts Nos. 53 and 59

Phenix Adjustable Cremone Door Bolts

Suitable for single or double, right or left-hand doors of any size and weight, swinging either in or out.

Length, 7 ft. 6 in. Adjustable from ⅛ in. to 3 ft., that is, it may be extended to 10 ft. 6 in. For higher doors, extra lengths of ½-in. rods can be obtained for top section of bolt so that it can be extended to 12 ft. 6 in. Adjustment is positive and secure.

One turn of the handle locks or unlocks both doors, also top and bottom bolt. Keeps doors in position and prevents them from warping. Handle retains its position and never allows bottom bolt to drag on the floor because of the counterweight of upper bar and the binding spring contact at center guide bracket used on upper bar.

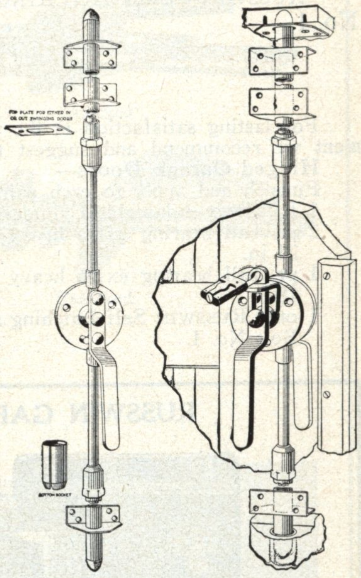
High grade, extra heavy and exceptionally strong. Should lintel sag or sill raise or lower, these bolts can be adjusted in a moment with plyers and wrench.

Made of steel throughout, heavily galvanized.

No. 57 for Inside Locking Only—Suitable for garages with service doors.

No. 58 for Outside Locking Only—Same as No. 57 but is furnished with an outside lever handle and strong malleable iron disc casting with loop arrangement for padlock. Used especially on garages without service doors. Specify whether for use on doors 1¾ or 2¼ in. thick.

No. 59 for Combination Inside and Outside Locking—Same as No. 57 but has a locking attachment (screwed to inside of door) which slips over the end of the bolt handle as shown in the illustration of bolt No. 53.



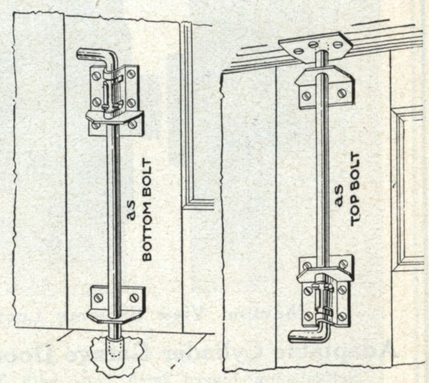
No. 57. For Inside Locking

No. 58. For Outside Locking

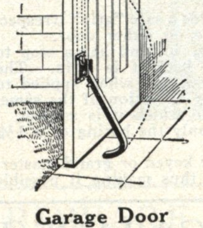
Adjustable Cremone Door Bolts

Phenix Cane Bolt No. 54

As a door bolt, it can be used at top or bottom by simply reversing. As a door holder, it holds the door rigidly in either open or closed position and offers no obstruction to passage of cars, etc. Equally applicable to level or sloping floors. Automatically locks itself by its own weight when released from the keeper. No springs or chains used. All-steel construction, heavily galvanized. Rod is ⅝-in. diameter by 24 in. high.



Phenix Cane Bolt No. 54



Garage Door Holder No. 52

Phenix Garage Door Holder No. 52

A simple, strong, inexpensive and practical door holder that is easily turned down or up by hand or foot. Automatically locks itself. Positively holds doors of any size and weight, and is equally effective on any kind of floor. All-steel construction, heavily galvanized. Made of ½x½-in. steel rod, 12 in. long.

RUSSELL & ERWIN MFG. CO.

THE AMERICAN HARDWARE CORPORATION, SUCCESSOR

Manufacturers of Garage Hardware

NEW BRITAIN, CONN.

For Warehouses and Factories, see page 1586

Products

Russwin Adaptable Cylinder Garage Door Lock No. 200.

Russwin Adaptable Cylinder Sliding Garage Door Lock No. 300.

Russwin Self-latching Garage Door Bolt No. 1.

Russwin Self-adjusting Holders or Hold-open Arms No. 2.

Russwin Self-adjusting Holders or Hold-open Arms with Shock Absorbers No. 3.

For Hardware Trim and Locks, see pages 1586-1625; for Door Closers, see page 1581; for Fire Exit Devices, see pages 1626-1630.

RUSSWIN GARAGE DOOR HARDWARE

For lasting satisfaction in the way of Garage Door equipment we recommend and suggest the following specifications:

Hinged Garage Doors—

Furnish and apply to each pair of Hinged Garage Doors:

1 Russwin Adaptable Cylinder Lock No. 200.

2 pr. ball bearing extra heavy wrought steel strap hinges, 24 in.

1 pr. ball bearing extra heavy wrought steel strap hinges, 18 in.

1 only Russwin Self-Latching and Adaptable Garage Door Bolt No. 1.

1 pair Russwin Garage Door Holders or Hold-Open Arms with Shock Absorbers No. 3.

OR

Russwin Garage Door Holders or Hold-Open Arms No. 2.

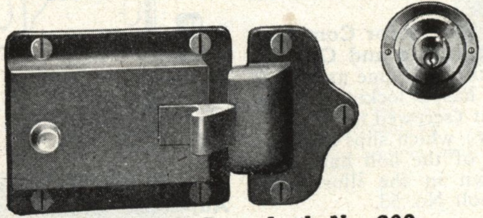
2 only Russwin Door Pull No. 2900.

Sliding Garage Doors—

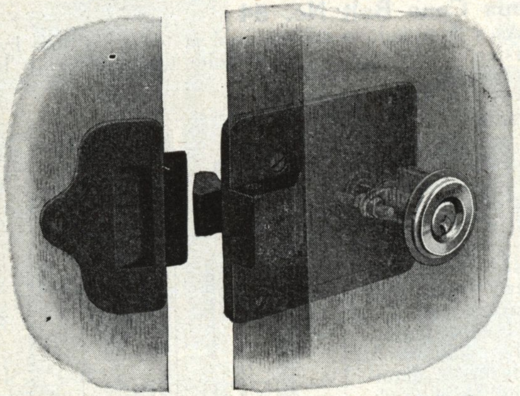
Furnish and apply to each Single or Pair of Sliding Garage Doors:

1 only Russwin Adaptable Cylinder Sliding Door Lock No. 300.

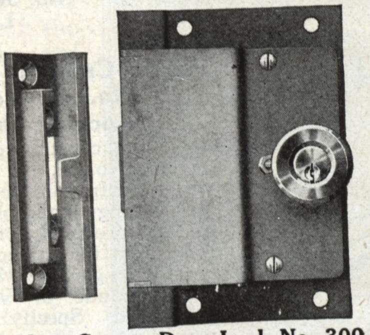
RUSSWIN GARAGE HARDWARE FOR HINGED AND SLIDING DOORS



Hinged Garage Door Lock No. 200

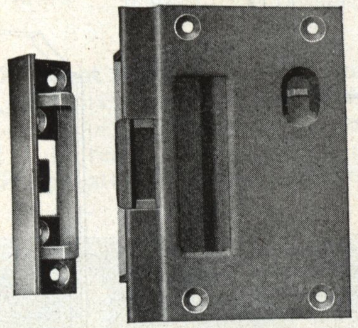


Phantom View Showing Lock and Strike



Sliding Garage Door Lock No. 300

Outside View



Inside View

Adaptable Cylinder Garage Door Lock No. 200

Self-latching hinged latch bolts with Russwin adjustable unit cylinders for use on either right or left hand reverse bevel doors.

The feature of this lock is its adaptability to any position the door may assume, as a result of the natural tendency of wide heavy doors to sag.

The broad latching face on the strike affords a safe "grip" irrespective of the amount of sag that may take place on either door.

The case is of cast iron, size 4½ in. x 4⅝ in. and has a stop to hold the latch retracted when desired. The backset is 3 in. The cylinder and cylinder collar are of bronze metal, and when applied to the door are flush with the stile, preventing any operation of the same, except by the regular change or master key to which it is subject.

The application is very simple—requiring only the boring of a 1½ in. hole through the door.

The cylinders of these locks may be master keyed or grand master-keyed with any other Russwin cylinder locks, thus making it possible to have a number of garages under the control of one key, or the lock on the garage door may be made subject to the key of the residence lock.

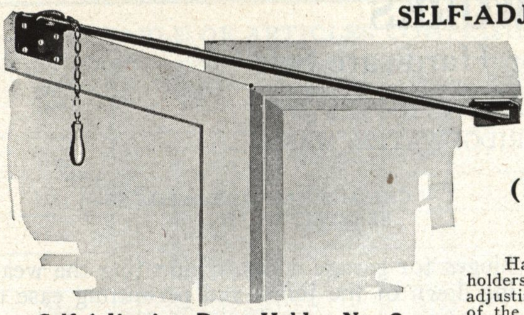
Adaptable Cylinder Sliding Door Lock No. 300

Self-latching, broad-faced, hinged malleable iron latch bolts, which engage with the strike irrespective of any sag of the door.

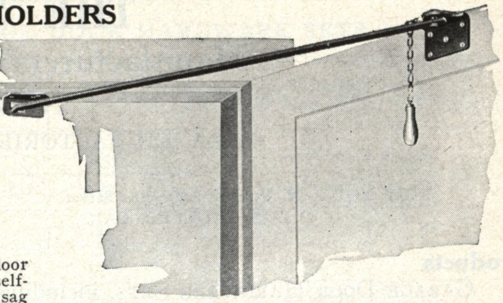
The case is of cast iron size 5⅝ in. x 4 in., and has a stop to hold the latch retracted when desired. A feature of this lock, which is exclusively Russwin, is that the latch bolt when withdrawn by the key from the outside remains in a retracted position as long as the key remains in the lock, thus allowing the use of both hands for the operation of the door. The application and master keyable features are the same as the No. 200 lock.

Continued on next page

SELF-ADJUSTING DOOR HOLDERS



Self-Adjusting Door Holder No. 2



Self-Adjusting Door Holder No. 3

(Hold-Open Arms)

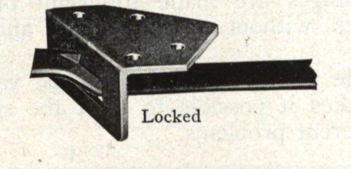
No. 2 and No. 3

Have the advantage of other door holders of this type, in that the self-adjusting feature provides for any sag of the door.

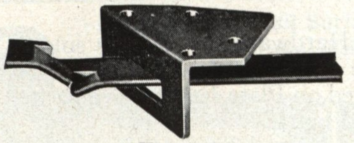
All working parts have been planned to allow perfect freedom and positive locking action, even on doors which have sagged.

The operation of either of these devices is as follows: A slight pull on the chain tilts the arm, disengages the locking lug and allows the arm to slide through the strike. When pressure is removed from the chain, the arm and locking lug drop into a locked position by gravity (see cut).

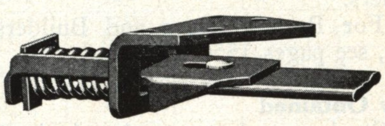
The No. 3 Holder is like the No. 2 with the addition of a shock absorbing spring, which takes the strain from the hinges as well as the holders, when doors are forcibly thrown open by either manual or wind pressure.



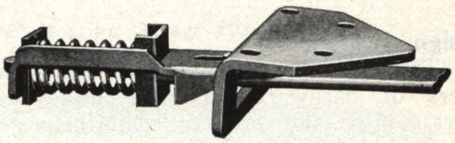
Locked



Unlocked



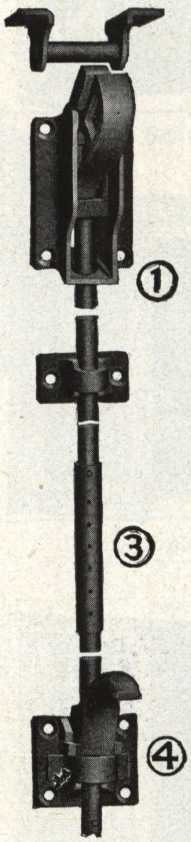
Locked



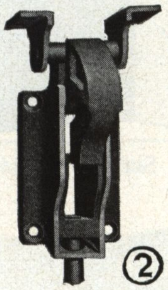
Unlocked

SELF-LATCHING DOOR BOLT NO. 1

For Right or Left Hand Reverse Bevel Doors



Self Latching Door Bolt No. 1



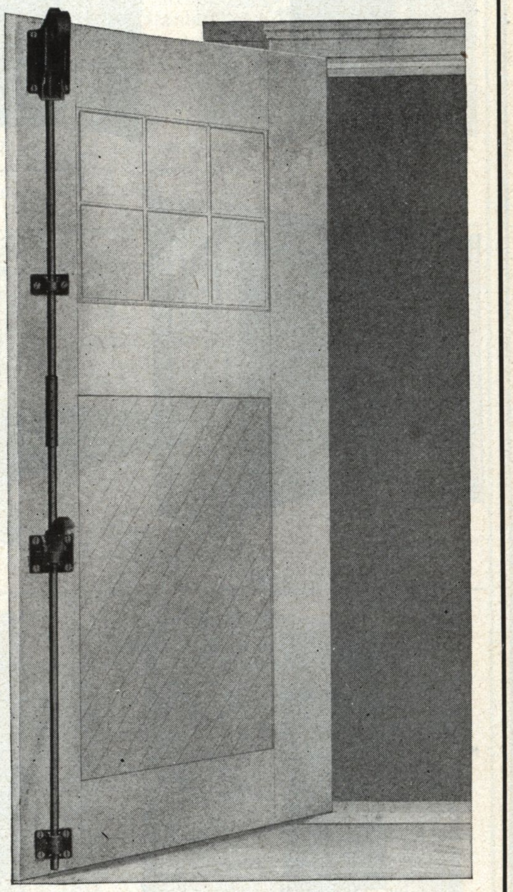
All and more than the name implies. The application is very simple, requiring but very little time to apply, and no mortising except for the bottom strike.

The contact of the latch at the top of the door with the strike throws the latch in a position whereby the bolt falls by gravity into the strike at the bottom of the door, and at the same time locks the latch at the top (see cuts 1 and 2) and also locks the lifting handle (see cut 4).

Each bolt has an adjustable telescopic rod which can be lengthened or shortened to the exact height of the door permitting an adjustment of 6½ in. and are regularly furnished suitable for doors measuring from 7 ft. 11½ in. to 7 ft. 0 in. in height (see cut 3).

When the door is closed and locked in position, the act of lifting the handle automatically disengages the latch from the top strike, and the bolt from the bottom strike, and lifting the handle also holds the bottom bolt and the top latch in a retracted position until the latch again comes in contact with the strike.

The feature of this bolt is that one manual operation is all that is required on the Russwin self-latching bolt against four, when chain and foot bolts are used.



Self Latching Bolt on Door

THE STANLEY WORKS

Manufacturers of Garage Door Hardware Sets

NEW BRITAIN, CONN.
BRANCH FACTORIES: NILES, OHIO; BRIDGEWATER, MASS.

BRANCH OFFICES
NEW YORK, N. Y., 100 Lafayette Street
LOS ANGELES, CAL.
SAN FRANCISCO, CAL.
CHICAGO, ILL., 73 East Lake Street
SEATTLE, WASH.

STANLEY
S.W.
TRADE-MARK

Products

Garage Door Hardware Sets, including Hinges, Bolts, Latches, Handles and Door Holders.

For Butts, Hinges and Builders Hardware, see pages 1556-1568.

How Obtained

Stanley products can be obtained from any hardware dealer.

Design

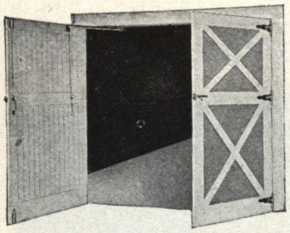
The Stanley Works were the original manufacturers of hardware especially designed for garage doors. Also the first to manufacture ball bearing hinges for garage doors, eliminating the wearing down of the joints and permitting ease of operation.

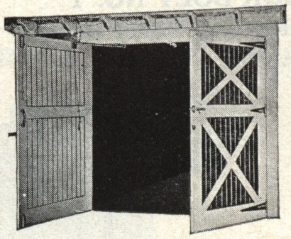
The hinges are made for right or left hand doors without taking apart and reversing.

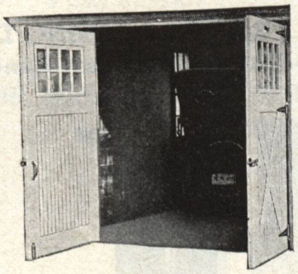
A wide variety in design of the various articles makes it possible to meet the special requirements of different problems.

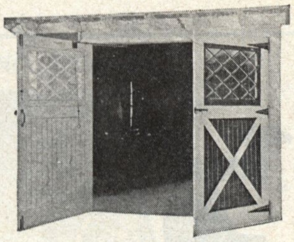
Garage Sets

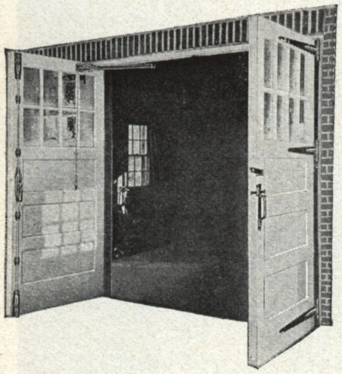
Stanley Garage Hardware is regularly sold in complete sets to meet the requirements of all types of swinging doors, as illustrated on Plate 1. Sets are packed complete with screws and bolts.

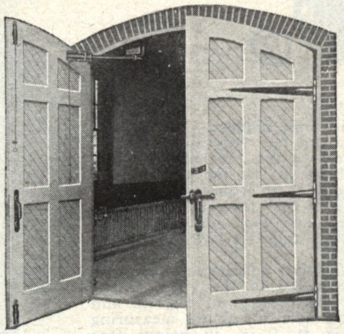

Set No. 1786

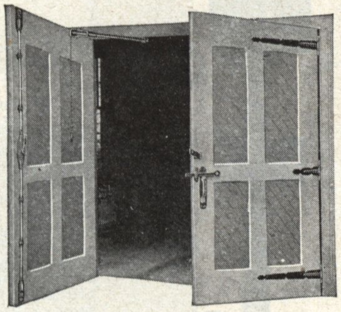

Set No. 1787

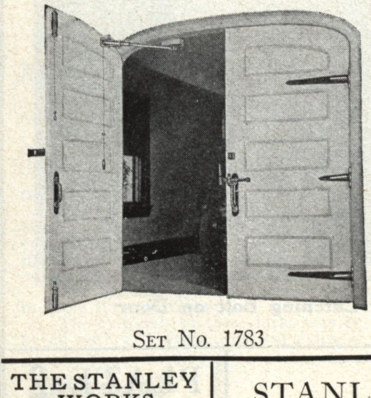

Set No. 1776


Set No. 1777


Set No. 1780


Set No. 1781


Set No. 1782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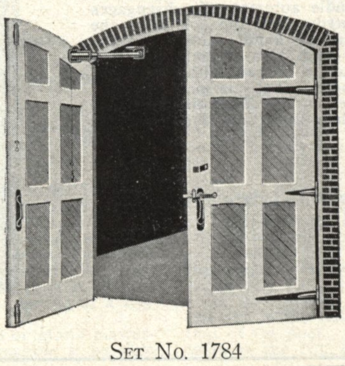
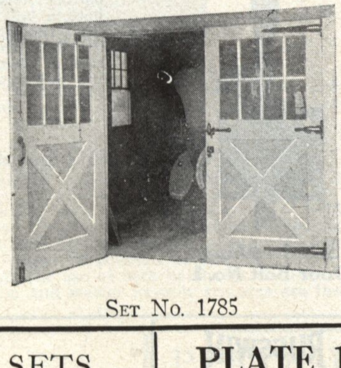

Set No. 1784


Set No. 1785

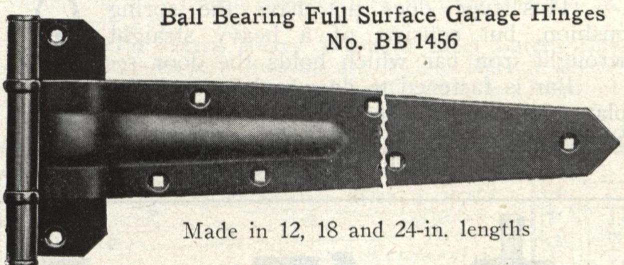
THE STANLEY WORKS | STANLEY GARAGE DOOR HARDWARE SETS | PLATE 1

Continued on next page

TABLE OF ARTICLES COMPRISING STANLEY GARAGE DOOR HARDWARE SETS

Set No.	Hinges No.	Butt No. for curved top doors	Door holder No. (1 pair)	Garage cremone bolt No.	Chain bolt No.	Foot bolt No.	Latch No.	Handle No.	Padlock hasp No.	Wt. packed, lb.
1780	1 pr. BB 1458-24″ 2 pr. BB 1458-36″	BB 250	1773	1052			1264		Sc 915½	111
1781	1 pr. BB 1458-24″ 2 pr. BB 1458-36″	BB 250	1773		1055-10″	1056-10″	1264	1266	Sc 915½	106
1782	1 pr. BB 1457-10″ 2 pr. BB 1457-24″	BB 250	1773	1052			1264		Sc 915½	86
1783	1 pr. BB 1457-10″ 2 pr. BB 1457-24″		1773		1055-10″	1057-10″	1264	1266	Sc 915½	68
1784	1 pr. BB 1458-12″ 2 pr. BB 1458-24″		1773		1055-10″	1057-10″	1264	1266	Sc 915½	68
1785	1 pr. BB 1457-10″ 2 pr. BB 1457-24″		1774		1055- 6″	1057-10″	1252	1265	Sc 915½	58
1786	3 pr. BB 1457-10″		1774		1055- 6″	1057- 6″	1260 No. 4	1257 No. 4		47
1787	1 pr. BB 1458-12″ 2 pr. BB 1458-18″		1774		1055- 8″	1057- 8″	1252	1265	Sc 915½	58
1777	1 pr. 963½-12″ 2 pr. 963½-16″		1774		1055- 6″	1057- 6″	1260 No. 4	1257 No. 4		48
1776	3 pr. 963½-10″				1055- 6″	1057- 6″	1260 No. 4	1257 No. 4		19

Ball Bearing Full Surface Garage Hinges
No. BB 1456



Made in 12, 18 and 24-in. lengths

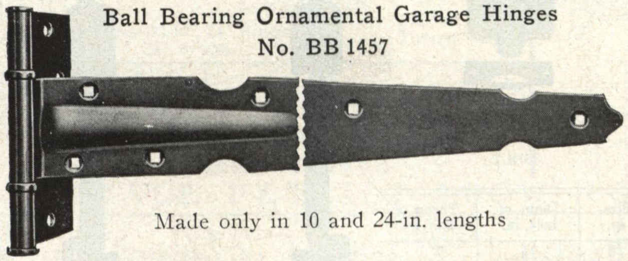
This hinge, while not listed in the sets, can be obtained when desired.

No mortising is necessary. Pad is set on door casing and strap to the surface of the door. Door must be flush with casing (see detail).

Top rail should not be less than 7 in. wide.

Packed with wood screws or carriage bolts.

Ball Bearing Ornamental Garage Hinges
No. BB 1457



Made only in 10 and 24-in. lengths

Corrugated near joint. Equipped with Stanley Ball Bearing Washers. Throw, 2⅛ in.

In applying, casing only is mortised; strap is fastened to the surface of the door.

Top rail should not be less than 7 in. wide.

Packed with wood screws or carriage bolts.

HINGE DIMENSIONS IN INCHES

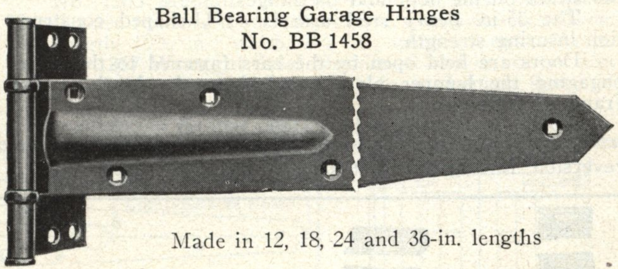
	No. BB 1458		No. BB 1459	No. BB 1457	No. BB 1456	
Length	12-18-24	36	36	10-24	12-18	24
Length of joint	7	8	8	7	7	8
Width of pad..	2 13/16	3 5/16	4	2 13/16	3	2 9/16
Width of strap.	3	4	4	3	3	4
Offset	1 1/16	1 1/16	2¼	1 1/16		
Throw	2⅛	2⅛	4½	2⅛		

SIZE OF HINGES FOR GARAGE DOORS

Door thickness, in.	Hinge size in inches for		
	8x4-ft. door	9x4½-ft. door	10x5-ft. door
⅞ batten	10	16	24
1⅜	12	16 or 18	24
1¾ Std.	24 or 18	24	36
2–2¼	36	36	36
2½ and up	36	36	36

These sizes represent upper and lower hinges.

Ball Bearing Garage Hinges
No. BB 1458



Made in 12, 18, 24 and 36-in. lengths

Exceptionally heavy and strong. All sizes corrugated near joint. Equipped with Stanley Ball Bearing Washers. Throw, 2⅛ in.

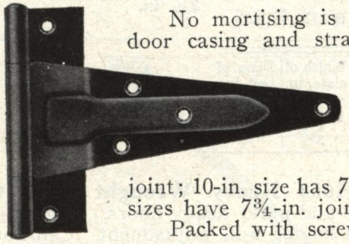
In applying, casing only is mortised and the strap fastened to surface of door.

No. BB 1459—Similar to No. BB 1458, but made only in 36-in. length and has 4½-in. throw.

Top rail should not be less than 8 in. wide for 36-in. hinges and 7 in. wide for smaller sizes.

Packed with wood screws and carriage bolts.

Wrought Steel Extra Heavy Full Surface Embossed T-Hinges
No. Sc 965

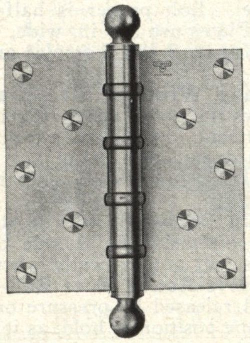


No mortising is necessary; pad is set on door casing and strap to the surface of the door. The casing must be flush with the surface of the door.

Made in lengths of 8, 10, 12, 14 and 16 in. 8-in. size has 5½-in. joint; 10-in. size has 7-in. joint; 12, 14 and 16-in. sizes have 7¾-in. joint.

Packed with screws.

Extra Heavy Wrought Steel Ball Bearing Butts
No. BB 250



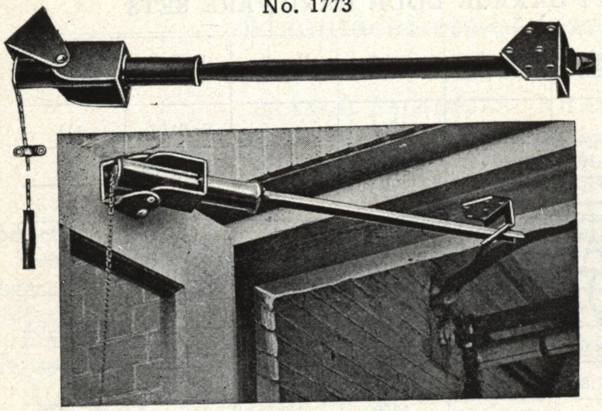
Used on segment head doors or where the rails have not width enough to accommodate the regular garage hinges.

All hinges have four ball bearing washers. When used on top in connection with 36-in. hinges on the lower rails, specify 8x6-in. size. When used with smaller hinges, specify 6x6-in. size.

THE STANLEY WORKS | STANLEY GARAGE DOOR HARDWARE | PLATE 2

Continued on next page

Wrought Steel Garage Door Holder
No. 1773



No. 1773 Garage Door Holder Applied to a Door in the Open Position

Provided with a heavy spring cushion which relieves the strain on the door and the hinges.

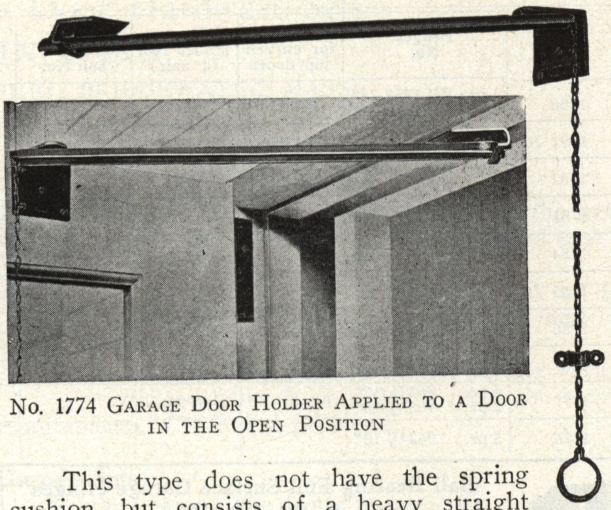
The 35-in. heavy steel arm is of U-shaped construction insuring strength.

Doors are held open by the bars fastened to the door, engaging the bumper plate attached to the head of the frame or door casing.

Holder is disengaged by a slight pull on the chain.

Can be used on doors with a square or curved head and reversible for right or left hand doors.

Wrought Steel Garage Door Holder
No. 1774



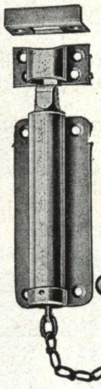
No. 1774 Garage Door Holder Applied to a Door in the Open Position

This type does not have the spring cushion, but consists of a heavy straight wrought iron bar which holds the door securely.

Bar is fastened to door and engages the bumper plate, attached to head of frame or door casing. Slight pull on chain disengages holder.

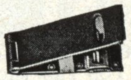
Arm, of wrought steel, is 30 in. long.

No 1052 Heavy Garage Bolt



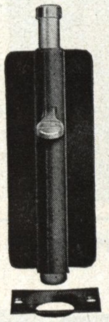
No. 1055 Chain Bolt

Size, in.	Lgth. of plate, in.	Width of plate, in.	Diam. of bolt, in.
6	5	2	¾
8	7	2¾	¾
10	9	3⅜	⅞



No. Sc 915½

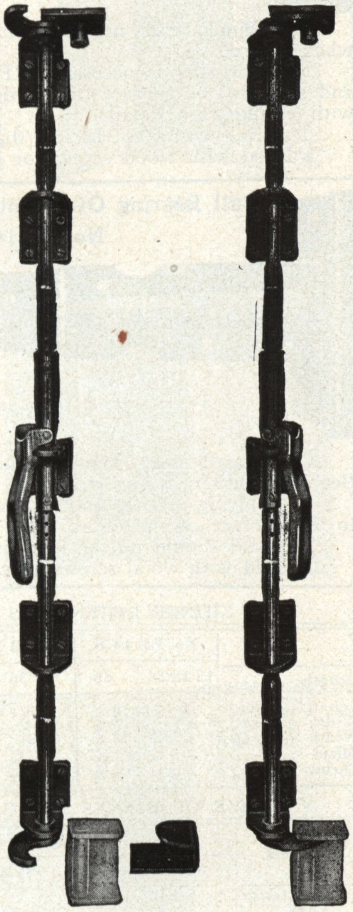
No. Sc 915½ Wrought Steel Safety Hasp—Hasp when closed covers all screws. Staple allows for shrinking of door. Length of strap, 7 in.; length of joint, 2½ in.



No. 1057 Positive Action Foot Bolt

Size, in.	Diam. of bolt, in.	Throw of bolt, in.
6	⅝	1
8	11/16	1⅝
10	21/32	1¼

Concrete floor strike included when ordered.



Open

Closed

No. 1053 Heavy Garage Bolt

No. 1052 Heavy Wrought Steel Garage Bolt—For use on garage and other heavy doors. Made in sizes, 7, 7½, 8, 8½ and 9 ft., each having 6-in. adjustment. Can not be tampered with after bolt is in position.

Lever handle is of brass and rods of sherardized steel. Plates of cold rolled steel. Bolt proper is half-oval steel, 1½ in. wide and ⅜ in. thick. Plates are 3¼ in. wide, bolt has 1½-in. throw.

Packed with Nos. 1, 2 and 3 staples and No. 1140-No. 2 strike for concrete work.

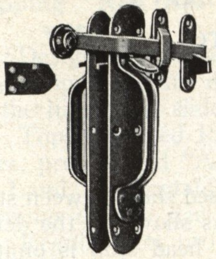
No. 1053 Heavy Wrought Steel Garage Bolt—Has special feature which draws the doors tightly together. Made in 8 ft. only, but has 6 in. adjustment. Special rods can be furnished to fit larger doors. For use on doors opening out.

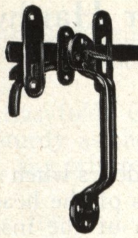
Lever handle is made of steel, sherardized and brass plated; bolts are sherardized.

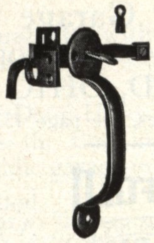
No. 1055 Chain Bolt—For top of standing leaf. Bolts are reversible for use on inside or outside of doors. Strong music wire spring throws bolt automatically when chain is released.

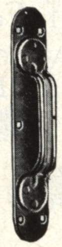
No. 1057 Positive Action Foot Bolt—Operated by pressure of foot on cap and released by pressure on trigger. Bolt need not be thrown to extreme position to hold, as it will hold in any position.

Continued on next page


No. 1264


No. 1252


No. 1260


No. 1266

No. 1265

No. 1257

No. 1264 Wrought Steel Extra Heavy Duplex Latch—Two handles with thumb pieces provide a comfortable grip in handling a heavy door from either side.

Adjustable for doors from 1¾ to 2¼ in. thick, although it can be supplied on special orders for doors of any thickness. Escutcheon plates may be bolted together through the door, using ¼-in. carriage or stove bolts. Packed with screws.

Length of bar, 12 in.; length of escutcheon plate, 14½ in.; width, 2¾ in. Handle proper, 10½ in. long and 1¼ in. wide; ends, 2½ in. wide.

No. 1252 Extra Heavy Wrought Steel Latch—Has combination holes permitting the use of either bolts or screws. Packed with screws. Length of handle, 10½ in.; length of bar, 12 in.

No. 1260 Wrought Steel Thumb Latch—Latches furnished with pad locking attachment.

Length of handle, 6¾, 7½ and 8⅞ in.

No. 1266 Heavy Wrought Steel Handle—Large size handle conforms to shape of the hand.

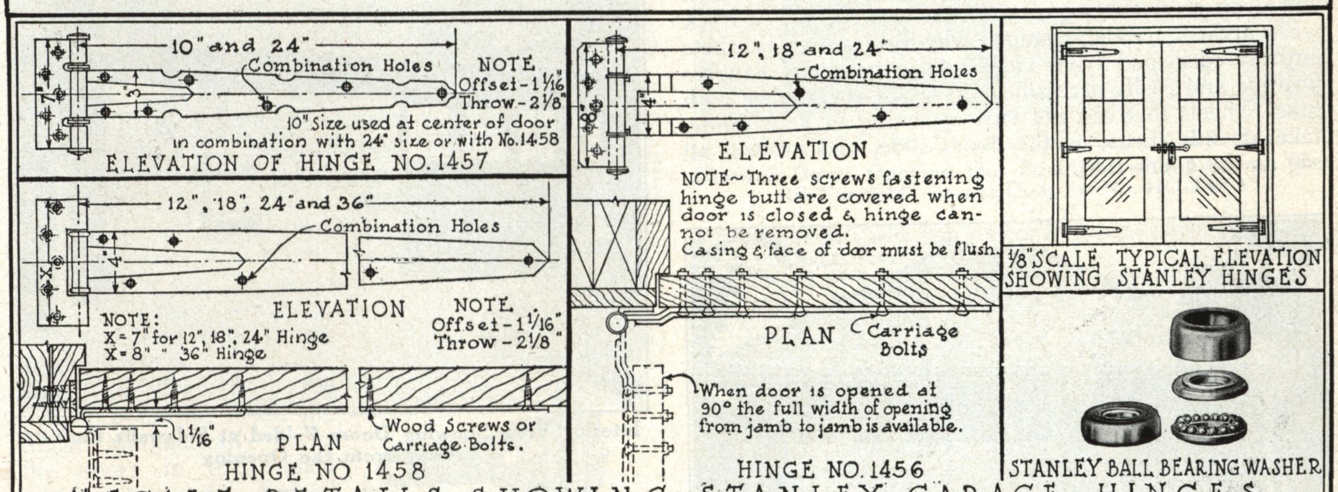
Has combination holes for bolts or screws. Packed with screws.

Plate, 14½ in. long, 2¾ in. wide; handle, 10½ in. long, 1¼ in. wide; ends, 2½ in. wide.

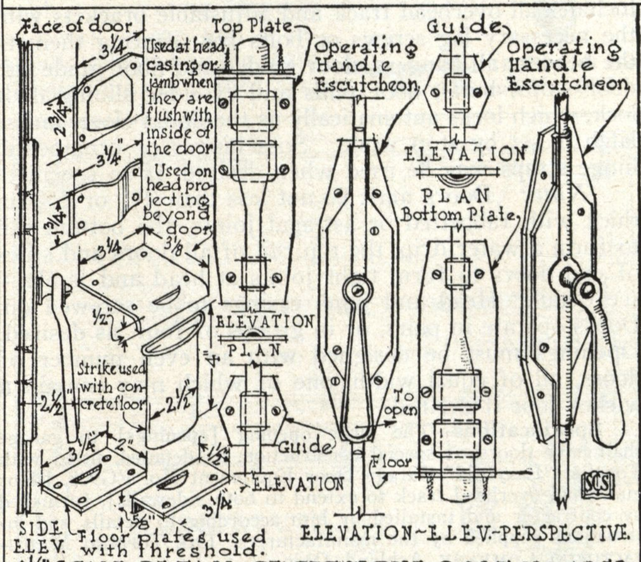
No. 1265 Medium Weight Wrought Steel Handle—Handles are reinforced but do not have steel plate escutcheon.

Length, 10½ in.; width, 1¼ in.; width of ends, 2½ in.

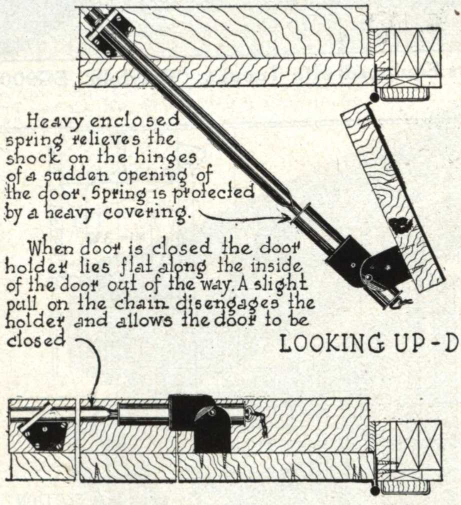
No. 1257 Wrought Steel Handle—Used in connection with No. 1260 on inside of opposite door. Length, 9 in.


10" and 24"
Combination Holes
NOTE
Offset-1 1/16
Throw-2 1/8
10" Size used at center of door in combination with 24" size or with No. 1458
ELEVATION OF HINGE NO. 1457
12", 18" and 24"
Combination Holes
ELEVATION
NOTE~Three screws fastening hinge butt are covered when door is closed & hinge cannot be removed.
Casing & face of door must be flush.
1/8" SCALE TYPICAL ELEVATION SHOWING STANLEY HINGES
12", 18", 24" and 36"
Combination Holes
ELEVATION
NOTE:
X=7" for 12", 18", 24" Hinge
X=8" " 36" Hinge
NOTE
Offset-1 1/16"
Throw-2 1/8"
PLAN
Carriage Bolts
1/16"
PLAN
Wood Screws or Carriage Bolts.
HINGE NO 1458
When door is opened at 90° the full width of opening from jamb to jamb is available.
HINGE NO. 1456
STANLEY BALL BEARING WASHER

1" SCALE DETAILS SHOWING STANLEY GARAGE HINGES


Face of door
Top Plate
Guide
Operating Handle Escutcheon
Operating Handle Escutcheon
3/4"
Used at head casing or jamb when they are flush with inside of the door
Used on head projecting beyond door
2 3/4"
3 1/4"
3 1/4"
3 1/4"
3/8
1/2"
ELEVATION
PLAN
ELEVATION
PLAN
Bottom Plate
Strike used with concrete floor
2 1/2
2 1/2"
3/4"
2"
3/8
3 1/4"
Guide
ELEVATION
To open
Floor
SIDE ELEV.
Floor plates used with threshold.
ELEVATION~ELEV.-PERSPECTIVE.
SCS

1½" SCALE DETAIL OF CREMONE BOLT NO. 1052


Heavy enclosed spring relieves the shock on the hinges of a sudden opening of the door. Spring is protected by a heavy covering.
When door is closed the door holder lies flat along the inside of the door out of the way. A slight pull on the chain disengages the holder and allows the door to be closed
LOOKING UP-DOOR OPEN
LOOKING UP-DOOR CLOSED

NO. 1773 GARAGE DOOR HOLDER

THE STANLEY WORKS

STANLEY GARAGE DOOR HARDWARE

PLATE 4

THE TOPPING MANUFACTURING COMPANY

Manufacturers of Folding Garage Door Hardware

TELEPHONE
Ashland 339 Main

MAIN OFFICE AND FACTORY
ASHLAND, OHIO
For District Offices, see page 1522

Products

Topping "Easyfold" Hardware Equipment for Garage Doors.

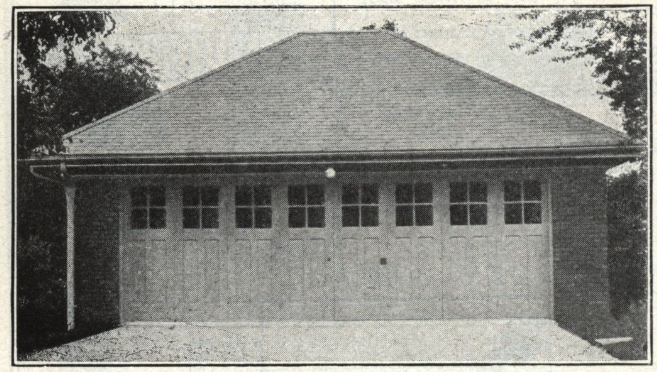
For "Easyfold" Equipment for Folding Partitions, Accordion Doors and Wardrobes, see pages 1522-1525.

EASYFOLD
THE TOPPING MFG CO
RED-RIB
PATENTED
ASHLAND, O. U.S.A.
TRADE-MARKS

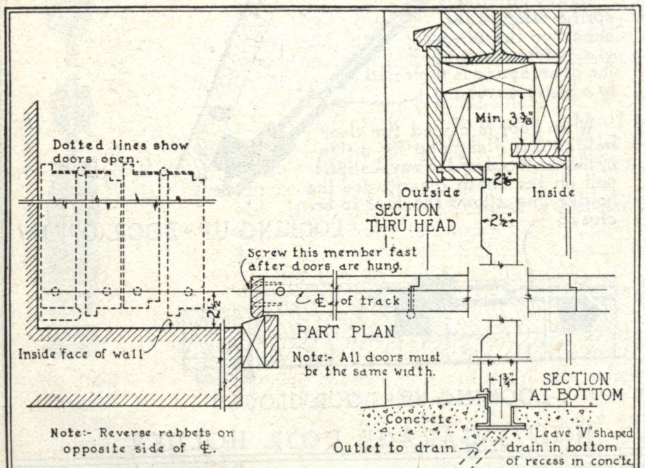
Topping "Easyfold" Hardware Equipment for Doors, Opening In

Topping "Easyfold" Garage Door Equipment No. EG900 was designed especially for use in private garages of high grade construction with wide openings, having 6, 8, 10 or 12 doors opening in, all doors to fold parallel with and against the sidewalls, away from jambs. Not adaptable to doors opening out.

Operation—The doors, suspended from above on hangers of extra heavy construction of malleable iron and drop steel forgings, move easily on a heavy track with arched treads, clamped rigidly by the brackets entirely concealed from view. Adjustment of hangers positive and easily accessible. Heavy door guides, with brass wheels that can not rust operating in floor guide, take all side thrust as the doors slide, and prevent all sag as the doors fold.



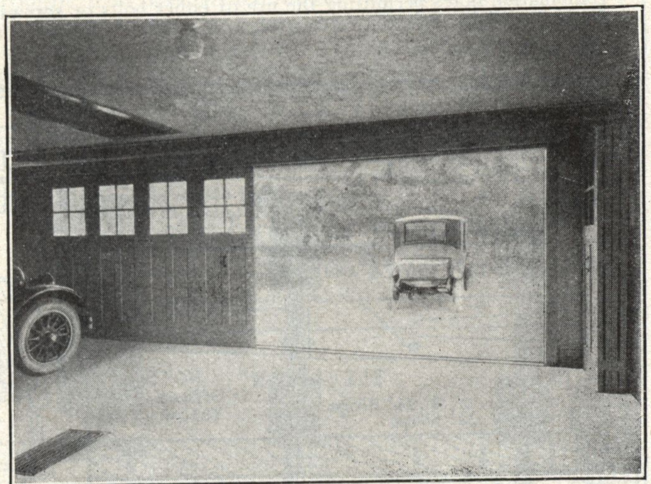
Garage Doors Equipped with Topping "Easyfold" EG900


Dotted lines show doors open.
2½"
Inside face of wall
Note:- Reverse rabbets on opposite side of ℄.
Screw this member fast after doors are hung.
℄ of track
PART PLAN
Note:- All doors must be the same width.
Min. 3⅜"
2⅛"
Outside
Inside
SECTION THRU HEAD
2½"
1¾"
SECTION AT BOTTOM
Concrete
Outlet to drain.
Leave "V" shaped drain in bottom of recess in conc'te.

DETAILS FOR TOPPING "EASY-FOLD" GARAGE EQUIPMENT E.G. 900.

The doors when closed slide between stops both sides of the head as shown in the detail. A section of the inside head stop is omitted at the end (or ends) where the doors fold. They can not fold in opening until they have reached their proper position at the sidewalls.

Note: The track is concealed. The fact that most of the hardware is invisible adds materially to the attractiveness of the doors. The doors folding only at the sidewalls cause no obstruction in the opening, and eliminate all danger of damage to doors or fenders. The doors moving in units of two make it possible to open as much, or as little, of the opening as may be desired.



Interior View Showing Doors Folded at Sidewalls Entirely Away from the Opening

Equipment Supplied—"Easyfold" No. EG900 includes all overhead track and adjustable brackets with the necessary lag screws or bolts for securing them to the header; all hangers, door guides and floor guide; all door stops, butts, door pulls and cylinder sliding door lock, which locks automatically as the doors close, unless latch is set by stop work. Soss hinges or ornamental hinge straps may be used when desired, if so specified.

Note: Doors must be not less than 2¼ or 2½ in. thick with rabbetted or astragal joints, the bottom rail to form a water drip, the top rail of all doors and stiles of end doors to form tight joints at head and jambs—see detail. Head and jamb casings to be screwed on. Doors operate in pairs, or in groups of four, as desired. Openings must be designed with an even number of doors, all of equal width, one of which may contain a wicket door if desired.

Specifications—The large opening [openings] to garage shall have doors of special construction, as detailed, fitted with Topping "Easyfold" Garage Door Equipment No. EG900, [floor guide and overhead track to extend to both sidewalls], furnished by contractor and installed by him according to details and instructions supplied by the manufacturers, The Topping Manufacturing Company, Ashland, Ohio.

Note: If detailed with wicket door through one door, the cylinder latch desired (master-keyed if necessary) and door handles No. 677 should be included in the specification.

Details furnished on request.

Continued on next page

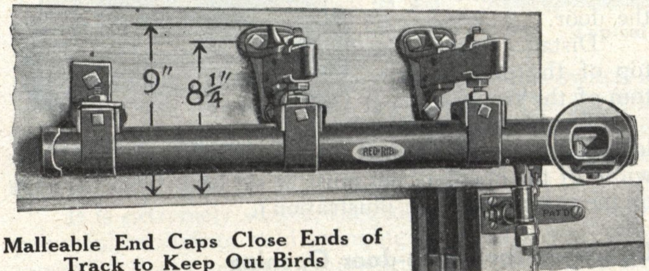
Topping "Red Rib Easyfold" Garage Door Hardware

Designed for strength, service and durability, with a hold-open feature not found in any other garage set of the hinge and slide type.

Topping "Red Rib Easyfold" Garage Door Hardware, pronounced "As Sturdy as the Ash—the Best in the Land," is adaptable to any private or public garage in openings of any size.

Regular sets provide for 2, 3, 4, 5 or 6 doors in an opening, doors opening in or out. "Red Rib" can be supplied to order for openings having 7, 8, 9 or 10 doors. Doors bolt automatically when closed without manual operation of any bolts.

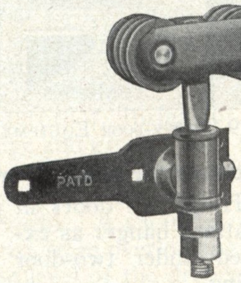
Description—Brackets of great strength clamp the track rigidly and prevent all end play. A rigid track facilitates easy operation of doors.


9"
8¼"
RED RIB
PAT'D

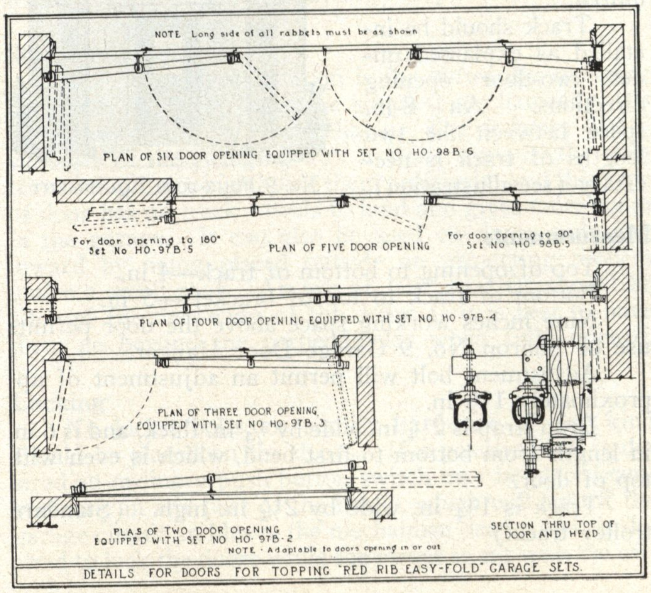
Malleable End Caps Close Ends of Track to Keep Out Birds

The horizontal apron of the hangers, overlapping the joint between stile and top rail, bolting to both members, greatly strengthens the door at its weakest point and prevents sag. The long sleeve bearing for pendant retains hanger in its proper position. The vertical and lateral adjustments are positive. Double grooved, roller bearing wheels run on the arched treads of the track and span the slot.

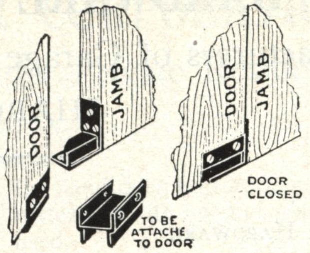
The hangers are made both with hold-open feature and without it. The heavy hold-open hook of the hanger, operating inside the track, automatically locks the doors in their open position, at any desired angle, preventing damage to doors or car, and is instantly released by the chain through the slot in the track.



Hanger No. 107B with Sets No. 97B and No. 98B

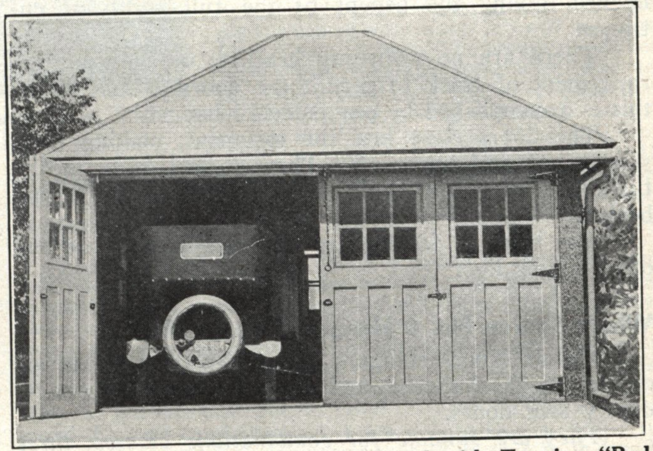

NOTE Long side of all rabbets must be as shown
PLAN OF SIX DOOR OPENING EQUIPPED WITH SET NO HO-98B-6
For door opening to 180° Set No HO-97B-5
PLAN OF FIVE DOOR OPENING
For door opening to 90° Set No HO-98B-5
PLAN OF FOUR DOOR OPENING EQUIPPED WITH SET NO HO-97B-4
PLAN OF THREE DOOR OPENING EQUIPPED WITH SET NO HO-97B-3
PLAS OF TWO DOOR OPENING EQUIPPED WITH SET NO HO-97B-2
NOTE · Adaptable to doors opening in or out
SECTION THRU TOP OF DOOR AND HEAD

DETAILS FOR DOORS FOR TOPPING "RED RIB EASY-FOLD" GARAGE SETS.


DOOR
JAMB
TO BE ATTACHED TO DOOR
DOOR
JAMB
DOOR CLOSED

The telescopic action of door and floor guides holds doors securely at the bottom and wedges them tightly against jamb or sill. They prevent the warping of doors and make them weatherproof.

The latch pull and binder controlling the bolts latch the doors together horizontally and bolt them securely at top (or top and bottom as specified). Doors are unbolted by lifting the latch, and bolt automatically when closed.



Showing Doors Opening Out Equipped with Topping "Red Rib Easyfold" Garage Door Set No. HO-98B-4

Regular sets with butt hinges for use at jambs and surface butts for joints between doors:

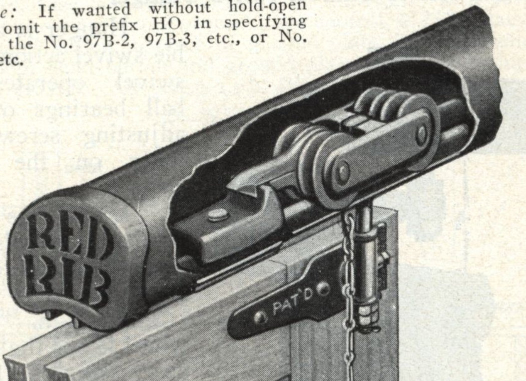
Set No. HO-97B-2 for 2-door openings—specify width
Set No. HO-97B-3 for 3-door openings—specify width
Set No. HO-97B-4 for 4-door openings—specify width
Set No. HO-97B-5 for 5-door openings—specify width
Set No. HO-97B-6 for 6-door openings—specify width

Special sets with offset "T" hinges to hinge doors back of jamb line surface butts for joints between doors:

Set No. HO-98B-2 for 2-door openings—specify width
Set No. HO-98B-3 for 3-door openings—specify width
Set No. HO-98B-4 for 4-door openings—specify width
Set No. HO-98B-5 for 5-door openings—specify width
Set No. HO-98B-6 for 6 door openings—specify width

Specification—Furnish and install Topping "Red Rib Easyfold" Garage Door Sets with Hold-open Hangers (Set No. ..) for the large doors to garage.

Note: If wanted without hold-open feature omit the prefix HO in specifying and use the No. 97B-2, 97B-3, etc., or No. 98B-2, etc.


RED RIB
PAT'D

Hanger No. HO-107B with Hold Open Hook with Sets HO-97B and No. HO-98B

SHARON HARDWARE MANUFACTURING CO.

Manufacturers of Garage and Barn Door Hardware

SHARON, PA.

Product

GARAGE and BARN DOOR HARDWARE.

Sharon Garage and Barn Door Hangers No. 9

The doors slide in accordion fashion, folding back parallel with the front of the building when opened, giving the benefit of the full width of entrance.

There are no adjusting brackets or built-out arrangement of track to permit the doors to fold back; this is accomplished by our patented hanger.

The doors close into the casement, making them stormproof and sagproof. They do not slide in the threshold, but swing clear of the sill before the sliding begins.

The track is fastened in the same manner as any other sliding door track.

Where Sharon No. 9 Hangers Can Be Used

Sharon No. 9 Hangers can be placed either inside or outside the building, and will operate freely on ordinary size doors.

They are suitable for combinations of two, three or four doors in an opening and can be used with doors that swing to either the right or left.

Why Sharon No. 9 Hangers Should Be Used

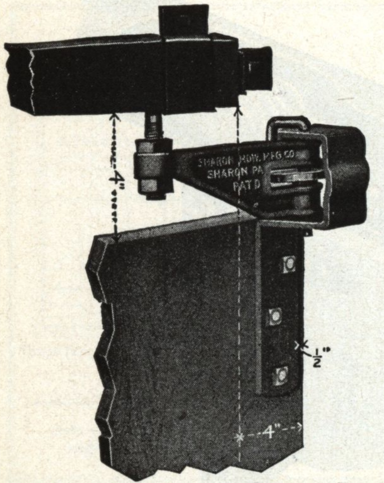
They prevent sagging which is of special advantage in high or wide doors where sagging is most likely to occur.

They allow the doors to be folded back parallel with the opening, giving the benefit of the full width of the opening.

They eliminate the center post ordinarily necessary in a four-door opening.

They use only a length of track equal to the exact width of the sliding doors.

Construction of Sharon No. 9 Hanger



RELATIVE POSITIONS OF NO. 9 PATENTED HANGER, TRACK AND DOOR

Hanger is a double swivel action—one swivel operates on ball bearings on the adjusting screw, the other on the drop strap.

Truck has four solid steel wheels running on case hardened roller bearings.

A 3-in. guide wheel keeps the doors away from the building while in operation.

Relative position of hanger, door and track remains stationary regardless of the number of doors in the opening.

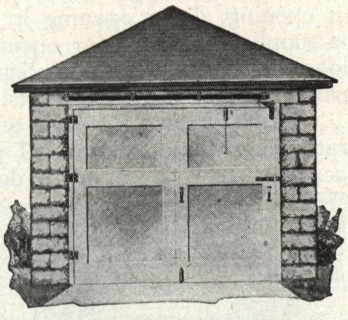
Directions for Two-door Opening

Hinge the door together and the pair of doors to one jamb.

Bolt the hanger strap to the door—$1\frac{1}{2}$ in. from the edge—farthest from the door hinged to the jamb. The first bend of the strap to be even with the top of the door.

Distance from the top of the door to bottom of the track, 4 in.

Track need not be longer than the exact width of the opening, but must be set back from the edge of the door 4 in. (see illustration).



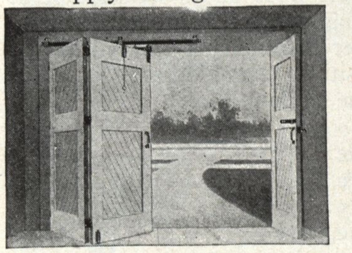
NO. 9 TWO-DOOR EQUIPMENT

Directions for Three-door Opening

Hinge two doors together and then to a jamb. Hinge the third door to the opposite jamb.

Apply hanger as described under two-door direction.

Track should be set in 4 in. from the edge of the middle door—see illustration. Track required does not exceed the width of the pair of doors, that is, a 9-ft. three-door opening requires 6 ft. of track.



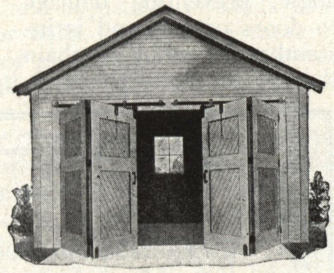
NO. 9 THREE-DOOR EQUIPMENT

Directions for Four-door Opening

Hinge the doors in pairs—two pair to each jamb and attach hanger as explained under two-door opening.

No center post required.

Track should be installed as explained under two-door opening directions. An 8-in. space between the two lengths of track is necessary (see illustration).



NO. 9 FOUR-DOOR EQUIPMENT

Measurements

Top of opening to bottom of track—4 in.

Bottom of track to top of brackets—5 in.

Nine inches working space above the door permits use of Sharon No. 9 Garage Door Hanger.

Adjustment bolt will permit an adjustment of approximately $1\frac{1}{2}$ in.

Drop strap is $2\frac{1}{4}$ in. wide by $\frac{1}{4}$ in. thick, and is 6 in. in length from bottom to first bend, which is even with top of door.

Track is $1\frac{3}{4}$ in. wide by $2\frac{1}{4}$ in. high. (Standard trolley track.)

ELECTRIC DOOR CORPORATION

Automatic Electric Doors for the Private Residence Garage

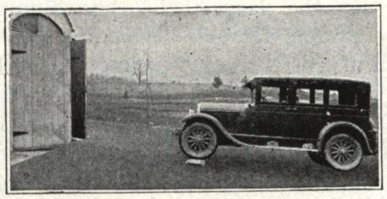
ITHACA, N. Y.

Product

Electric Mechanism for Opening and Closing Garage Doors without getting out of the car.

What It Is and Does

The Electric Door opens or closes by the pressure of a car wheel on a ground plate switch in the driveway, or by a hand push button, if desired, mounted on a post at the side of the drive. A push button switch is also located in the garage to open or close the doors when the car is inside. If there is no side door for entrance and exit this switch is located outside on the wall of the garage. The Electric Door is particularly designed for the residence garage, but can be applied to the public garage or to industrial doors.



Typical Installation

It is extremely simple, rugged, and foolproof, and is powerful enough to hold swinging doors in any wind or sweep back any ordinary snowfall. It operates in any weather, permits adequate heating of the garage, and allows full enjoyment of a closed car. It never requires any lubrication, in fact it *must not* be oiled. Since it stops on friction any oiling or greasing of the gearing will make it run so easily that the doors will be difficult to control and stop in their proper positions. It costs about a cent a month to operate in the average residential installation.

The ground plate consists of a cast iron frame with two hinged plates which when loaded depress a spring and operate a switch. It is not affected by rain, mud, ice, or snow; is self-draining and self-cleaning. The switch mechanism is rustproof and waterproof. Instead of being bolted, the plates hinge on a ridge and groove joint forming a loose construction which can not be jammed by ice forming in the joints or any foreign object like pebbles or bits of wood getting into the cracks. A shoulder on the bottom casting protects the button from overloading. The ground plate is raised above the level of the driveway so that there is a slight bump when the car wheel goes upon it indicating to the driver when to stop.

Standard Type

The standard installation is for outwardly swinging doors, as this type, being the simplest mechanically, has been found to be the most reliable. The ordinary disadvantages of the swinging door are overcome by the electric mechanism which holds them positively, and this type of door has no track wheels to bind and gives more room in the garage. It can also be used on doors swinging inward by being placed outside on projecting timbers under a small roof. An arc of 105° to 110° should be allowed for the swing of the doors as it is best to have them go beyond the perpendicular when fully opened.

Locking

No locks, bolts, or similar hardware of any kind should be placed on the doors. If a positive lock is desired an ordinary push button switch may be placed conveniently in any part of the house, which will cut off the garage circuit and leave the mechanism dead. If it is desired to lock the doors while the owner is out with the car, the hand push button on a post or wall should be installed instead of the ground plate type, and a key lock switch used.

Installation

Installation is simple and the average should not cost more than $15.00 to $25.00. Where a concrete driveway is to be laid a hole should be left for the ground plate, the dimensions of which are 18¾x16 in. The long dimension should be across the driveway. It is generally more convenient to place the ground plate on the left-hand side of the driveway looking toward the garage so that the driver can see it as he drives in. It should be at least 20 ft., preferably 30 ft., from the doors. If the length of the driveway will not permit this, the hand button control should be used. The ground plate or push button switches should be located so that the driver can see the doors while operating them.

The weight of the doors does not matter as the mechanism will operate anything that can be swung by hand, but they should be properly hung so that they will swing and close easily. Doors should be cut off 1 in. clear at bottom to allow for our special copper weatherstrip. This takes care of any sagging of the doors and jamming because of ice, frozen mud, or stones. Door jamb strips back of the doors should be omitted as they serve no purpose and tend to chew the doors when the doors warp. On new construction it is desirable to have a short concrete ramp from sill to driveway about 18 in. to 2 ft. in length with a slope of 2 in. to 1 ft.

The mechanism itself, including a ⅛ hp. motor, is all assembled before being shipped and should be placed and supported as shown in diagram, between two 2x4's 20 in. apart. Weight of mechanism inside garage is about 70 lb.

Hinges used as sockets for the arms permit attaching the arms at various levels and should be bolted through the doors, not just put on with screws. The mechanism can be disconnected from the doors by merely lifting the arms from the sockets.

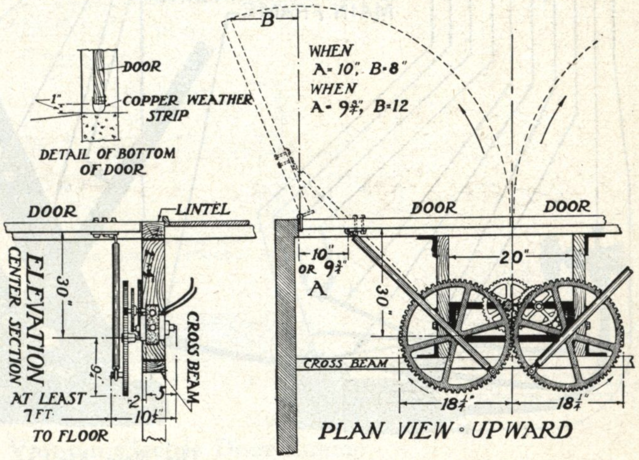
All switches used are self-restoring momentary contact, and those furnished for outside installation are waterproof.

No special power circuit required; operates from any lighting circuit, 110 volts a-c. or d-c., any cycle. Other voltages $10.00 extra.

Full directions for installing sent with each shipment.

Prices

Electric Door operating mechanism complete, including switches, fuse box, weatherstrips, all hardware, with 40 ft. of lead armored cable and ground plate control, $125.00; same, but with hand button in place of ground plate, $120.00; same, but with both hand button and ground plate control and duplicate cables, $135.00. All prices f.o.b. Ithaca, N. Y.



Details of Mechanism

SCHOELKOPF MANUFACTURING COMPANY

Manufacturers of Pneumatic Door Openers and Closers

MADISON, WIS.

New Air-Lec (Wind Resisting Model)

The powerful Air-Lec will operate the largest swinging, sliding or folding door. Any garage, factory or warehouse having large doors which are used many times a day should install the Air-Lec.

Installed up over the door it is out of the way but still accessible for oiling. *Requires only 5 inches headroom.*

The Air-Lec does not interfere with the operation of the door by hand. There is only the resistance of the spring to overcome.

The remote push button control makes the Air-Lec especially practical and efficient. The switches can be placed wherever desired and as many as needed.

Description and Operation

The Air-Lec machine comes complete for either double or single doors.

The single door outfits come as shown in the illustration below. Each outfit contains with its engine assembly, control valve, three operating switches, 100 feet double wire, and 1 warning sign.

Compressed air is used for power. The touch of a switch releases the air through the control valve assembly, the door moving, due to the quick shot of air in the air cylinders, the air being shut off by the striker arm when the door travels half its travel, and the heavy spring in the check carrying the door the rest of the way.

Each engine assembly is furnished with an oil check which permits the door to be opened and closed without a slam, the check being adjustable to each individual door.

Only a 6-volt battery is needed to trip the air or, if desired, may be wired into the light circuit using a 75-watt a-c. transformer.

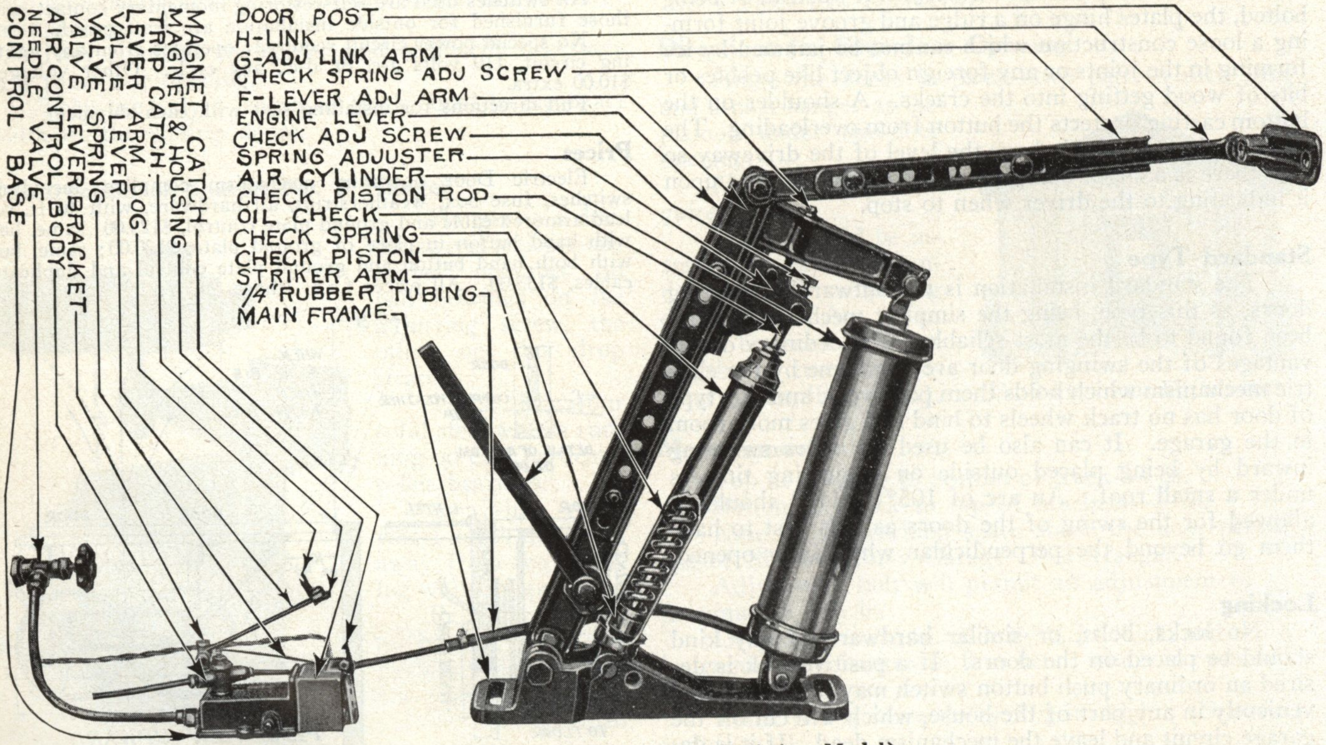
The strong spring enclosed in the check holds the door in the open or closed position. This spring action is especially strong when the door (swinging and folding) is in the closed position, holding the door snug and tight against the wind (wind resisting in a true sense of the word). No need of any hooks, catches, etc., to hold the doors open or shut.

Guarantee

Guaranteed to operate and with a liberal guarantee for one year against defective workmanship and materials.

Sizes

Comes in four regular sizes. The 2-inch outfit for small doors up to about 10x10 feet; the 2½-inch outfit for larger doors or low air pressure; the 3-inch outfit for extremely large doors and the 4-inch outfit for doors difficult to operate, such as large folding and sliding doors.


CONTROL BASE
NEEDLE VALVE
AIR CONTROL BODY
VALVE LEVER BRACKET
VALVE SPRING
VALVE LEVER
LEVER ARM DOG
TRIP CATCH
MAGNET & HOUSING
MAGNET CATCH
DOOR POST
H-LINK
G-ADJ LINK ARM
CHECK SPRING ADJ SCREW
F-LEVER ADJ ARM
ENGINE LEVER
CHECK ADJ SCREW
SPRING ADJUSTER
AIR CYLINDER
CHECK PISTON ROD
OIL CHECK
CHECK SPRING
CHECK PISTON
STRIKER ARM
1/4" RUBBER TUBING
MAIN FRAME

The New Air-Lec (Wind Resisting Model)

VARNUM DOOR ENGINE COMPANY

949 West 16th Street

LOS ANGELES, CAL.

Products

Varnum Electric Door Engines for electrically operating various types and kinds of doors and gates (swing and sliding, exterior and interior) by remote control.

Description of the Varnum Electric Door Engine

The Varnum electric door engine comprises an electric motor and gearing together with controls applicable to different types of doors and gates.

Motors range from one-sixth to three-quarter horsepower according to the size or weight of doors.

Varnum door engines are worked out on scientific principles after years of experience and are so designed that the motor which serves to operate the door, at the same time functions as a governor for the door. Therefore, it is impossible for a door equipped with this device to slam, because the door starts slowly and gradually accelerates its speed to the middle of the opening, when it starts to retard its speed and gradually comes to rest at the open or closed position, as the case may be. Thus the motor is relieved of any undue strain, because it starts with no load, which is gradually picked up as the door advances.

References

Nearly all the banks in Los Angeles, Cal., besides many more on the Pacific coast and in the middle West are using Varnum door engines on their grille doors.

Write to any prominent Los Angeles bank.

A catalogue further describing our product will be sent on request.

Prices

Prices are from $250.00 up, according to the size of engine required.

Our engineering department is ready at all times to work out plans for special conditions. Installations can be made from blue prints furnished with each engine by any competent mechanic.

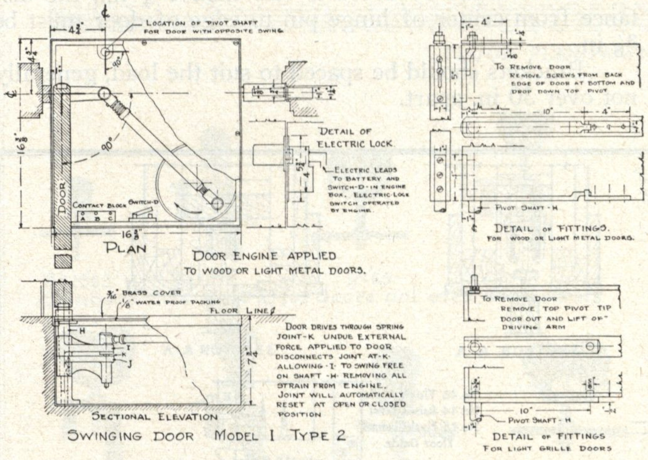
Model K, Type 4

This is an engine suitable for operating a driveway gate. In the accompanying illustration, the engine is shown installed in one of the pillars where it is protected from the weather. A door for access to the engine can be provided either at the side or at the back of the pillar. Motion is transmitted from one gate to the other by a connecting rod working through a large pipe (beneath the driveway) which connects the two iron boxes containing the lower bearings for the hinge pivots of the gates.

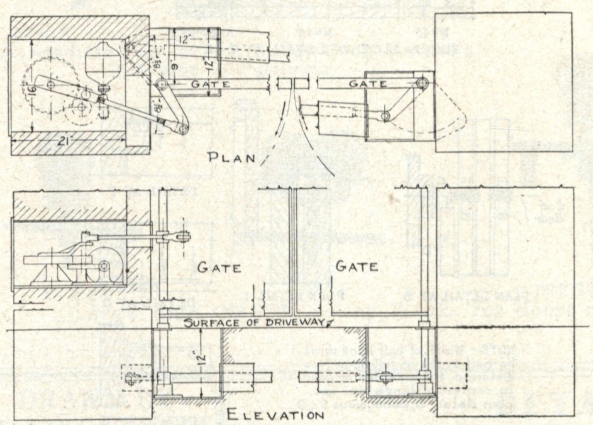
Model J, Type 2

The illustration below shows our stock model which is used in the majority of installations. It can be applied to bank gates whether mounted on top of floor as shown or sunk in an iron box where it is desired that it shall be concealed.

By the addition of special attachments which we furnish, this model can be used to operate garage sliding or swinging doors. It also lends itself very nicely to secret panels or other doors in residences.


Location of pivot shaft for door with opposite swing
4¾"
4¾"
16⅝"
90°
90°
Door
Contact block
A B C
Switch-D
16⅝"
Plan
Detail of electric lock.
Electric leads to battery and switch-D-in engine box. Electric lock switch operated by engine.
5¾"
4
Door engine applied to wood or light metal doors.
To remove door remove screws from back edge of door at bottom and drop down top pivot
4"
1"
5"
10"
4"
Pivot shaft - H
Detail of fittings. For wood or light metal doors.
3/16" brass cover
⅛" water proof packing
Floor line
H
I
K
J
7¾"
Door drives through spring joint-K undue external force applied to door disconnects joint at-K-allowing -I- to swing free on shaft -H- removing all strain from engine. Joint will automatically reset at open or closed position
Sectional elevation
Swinging door Model I Type 2
To remove door remove top pivot tip door out and lift off driving arm
10"
Pivot shaft - H
Detail of fittings for light grille doors

Model I, Type 2


12"
9"
12"
16"
21
Gate
Gate
Plan
Gate
Gate
Surface of driveway
12"
Elevation
Detail of driveway gate installation
Model K Type 4

Model K, Type 4

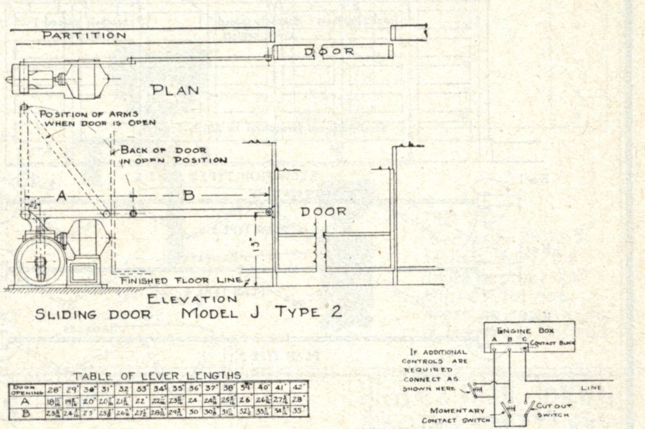

Partition
Door
Plan
Position of arms when door is open
Back of door in open position
A
B
Door
15"
Finished floor line
Elevation
Sliding door Model J Type 2
Engine box
A B C
Contact block
If additional controls are required connect as shown here
Line
Momentary contact switch
Cut out switch
Engine fitted with ¼ H.P motor 110 volts single phase 50 or 60 cycles
Wiring diagram

TABLE OF LEVER LENGTHS

Door opening	28"	29"	30"	31"	32	33"	34"	35"	36"	37"	38"	39"	40"	41"	42"
A	18 11/16"	19 5/16"	20"	20 11/16"	21 5/16"	22"	22 11/16"	23 5/16"	24"	24 5/8"	25 5/16"	26"	26 11/16"	27 3/8"	28"
B	23 5/16"	24 1/16"	25"	25 7/8"	26 11/16"	27 1/2"	28 3/16"	29 3/16"	30	30 7/8"	31 11/16"	32 1/2"	33 5/16"	34 3/16"	35"

Model J, Type 2

Details of Several Models of the Varnum Electric Door Engine

ALLITH-PROUTY COMPANY

SUCCESSOR TO ALLITH MFG. CO., CHICAGO, ILL., AND T. C. PROUTY CO., LTD., ALBION, MICH.

Manufacturers of Accordion Door Hardware

DANVILLE, ILL.

TRADE-MARK

Products

ACCORDION DOOR HANGERS.

Also manufacturers of House Door Hangers, Spring Hinges, and Rolling Store Ladders.

For Folding Sliding Garage Door Hardware, Straight Sliding Garage, Barn and Warehouse Door Hangers, Parallel Door Equipment, "Approved" Sliding and Swinging Fire Door Hardware, see pages 1444-1452.

Accordion Door Hangers

The hangers have *certified malleable* frame, roller bearing wheels, ball bearing swivel, antifriction guide rollers and vertical adjustment.

Made with four wheels, No. 69; and two wheels, No. 1069; for doors 2 in. thick and under. For heavier doors, use Nos. 64 and 1064. The four-wheel hangers are over twice as strong as the two-wheel and should be used in preference to two-wheel hangers where conditions permit.

General Directions—All of the doors can be folded to one side, or they can be divided at the center, and half the doors folded to each side of the opening. A half door is required adjoining the jamb toward which the doors fold; when divided at the center two half doors are required for Plans types 1 and 2. All doors are full doors or of full width in Plans types 3, 4, 5, 6, 7 and 8.

The half doors must be exactly one-half the width of the full size doors, less the distance from the center of jamb strip to center of butt pins. The full size doors must all be of the same width, top and bottom with edges parallel.

When all doors fold to one side, length of the track is 8 in. less than the width of the opening.

If divided at center to fold to each side, leave a space of 1 ft. at center.

These spaces in the track are used for inserting or removing the hangers from track.

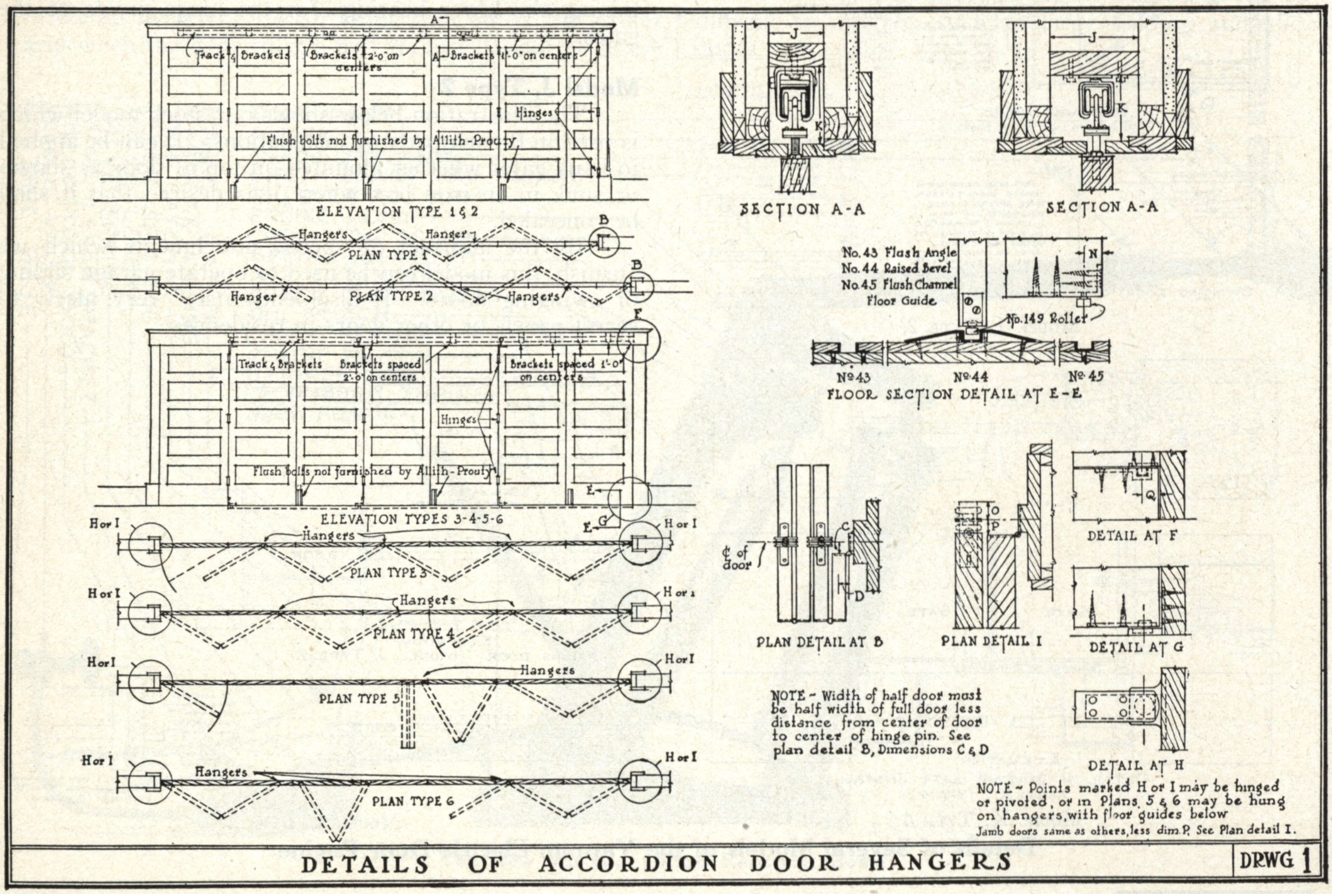
Four-wheel hangers should be applied to each alternate door.

If desirable to apply a hanger to each door the two-wheel hanger is required. Half doors require no hanger.

Locate all the butts so the hinge pins will be the same distance from the edge of the door.

If thickness of doors is less than 1¾ in., the distance from center of hinge pin to edge of door must be ⅜ in.

Brackets should be spaced to suit the load, generally not over 30 in. apart.


A
Track & Brackets
Brackets 2'-0" on centers
A
Brackets 1'-0" on centers
Hinges
Flush bolts not furnished by Allith-Prouty
ELEVATION TYPE 1 & 2
Hangers
Hanger
PLAN TYPE 1
B
Hanger
PLAN TYPE 2
Hangers
B
F
Track & Brackets
Brackets spaced 2'-0" on centers
Brackets spaced 1'-0" on centers
Hinges
Flush bolts not furnished by Allith-Prouty
E
G
E
ELEVATION TYPES 3-4-5-6
H or I
Hangers
H or I
PLAN TYPE 3
H or I
Hangers
H or I
PLAN TYPE 4
H or I
Hangers
H or I
PLAN TYPE 5
H or I
Hangers
H or I
PLAN TYPE 6
J
K
SECTION A-A
J
K
SECTION A-A
No. 43 Flush Angle
No. 44 Raised Bevel
No. 45 Flush Channel
Floor Guide
N
No. 149 Roller
No 43
No 44
No 45
FLOOR SECTION DETAIL AT E-E
¢ of door
C
D
PLAN DETAIL AT B
O
P
PLAN DETAIL I
Q
DETAIL AT F
DETAIL AT G
DETAIL AT H

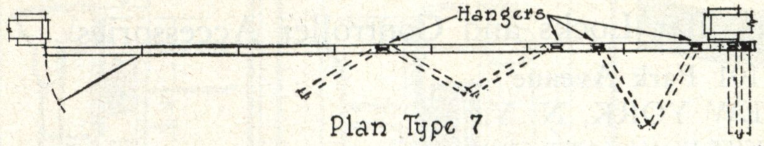
NOTE – Width of half door must be half width of full door less distance from center of door to center of hinge pin. See plan detail B, Dimensions C & D

NOTE – Points marked H or I may be hinged or pivoted, or in Plans 5 & 6 may be hung on hangers, with floor guides below
Jamb doors same as others, less dim. P. See Plan detail I.

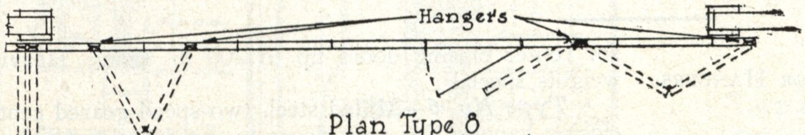
DETAILS OF ACCORDION DOOR HANGERS

DRWG 1

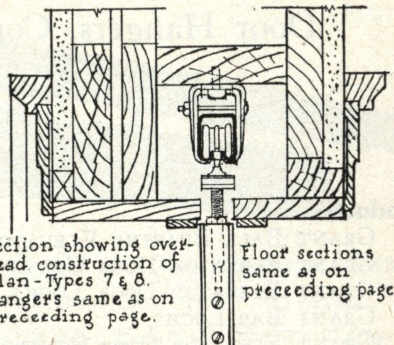
Continued on next page



Plan Type 7

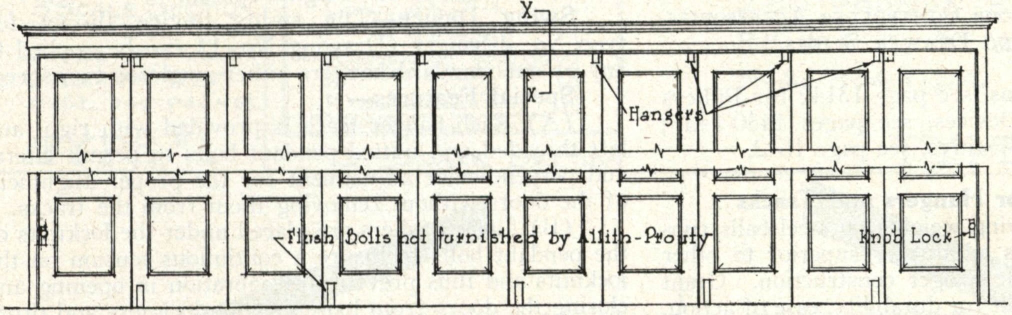


Plan Type 8
Doors hung in independent pairs

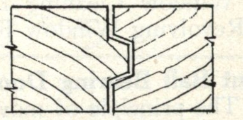


Section showing overhead construction of Plan-Types 7 & 8. Hangers same as on preceeding page.

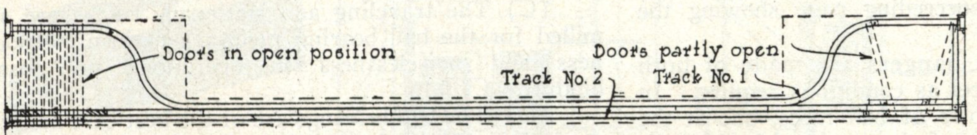
Floor sections same as on preceeding pages


X
X
Hangers
B
Flush bolts not furnished by Allith-Prouty
Knob Lock

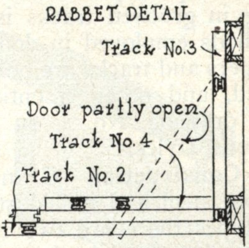
ELEVATION PARTITION DOORS



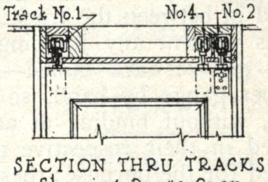
RABBET DETAIL


Doors in open position
Doors partly open
Track No. 2
Track No. 1

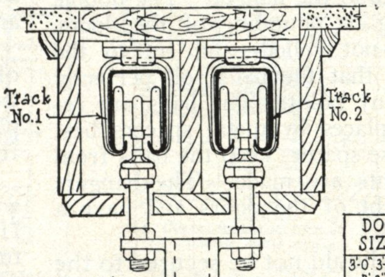
FLOOR PLAN-PARTITION DOORS


Track No. 3
Door partly open
Track No. 4
Track No. 2

ENLARGED DETAIL AT JAMB


Track No. 1
No. 4
No. 2

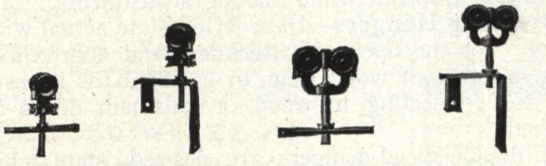
SECTION THRU TRACKS
Showing Doors Open


Track No. 1
Track No. 2

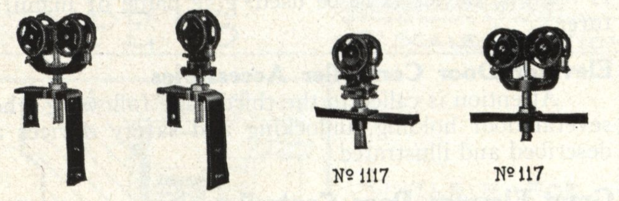
№ 1074 HANGER WITH SPECIAL APRON

SECTION X-X

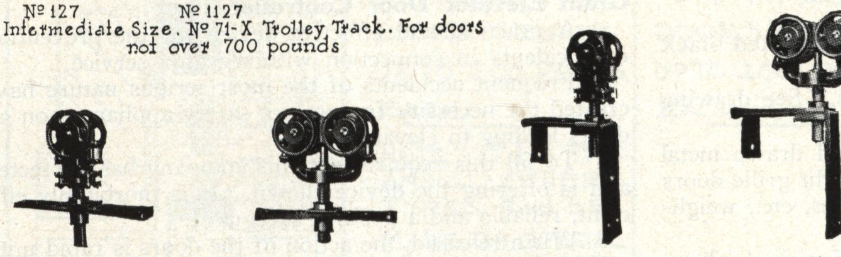
DOOR SIZES	MAXIMUM NO. DOORS TO EITHER SIDE	LENGTH CURVE
3'-0" 3'-1" 3'-2"	5	4'-0"
3'-3" 3'-4"	6	"
3'-5" 3'-6"	7	"
3'-7" 3'-8"	8	"
3'-9" 3'-10"	9	"
3'-11" 4'-0"	10	"
4'-1" 4'-2" 4'-3" 4'-4"	11	Varies
4'-5" 4'-6" 4'-7" 4'-8"	12	"
4'-9" 4'-10" 4'-11" 5'-0" 5'-1"	13	"
5'-2" 5'-3" 5'-4" 5'-5"	14	"
5'-6" 5'-7" 5'-8" 5'-9"	15	"
5'-10" 5'-11" 6'-0"	16	"



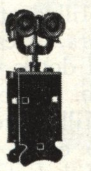
№ 1069 № 1079 № 69 № 79
Standard Size № 60-X. For doors not over 400 pounds



№ 127 № 1127 № 1117 № 117
Intermediate Size. № 71-X Trolley Track. For doors not over 700 pounds



№ 1064 № 64 №1074 № 74
Large Size. № 67-X Trolley Track. For doors not over 1000 pounds



№ 70
Used with № 60-X Trolley Track. For doors not over 400 pounds. For use where an apron type of hanger is desired

DRAWN BY SWEETS CATALOGUE SERVICE, INC.	DETAILS OF ACCORDION DOOR HANGERS	3 IN. & 1/8 IN. EQUALS 1 FT. DATE AUG 25	DRWG 2

GRANT ELEVATOR EQUIPMENT CORP.

Door Hangers, Controllers, Bar Locks and Controller Accessories

101 Park Avenue
NEW YORK, N. Y.
AGENCIES IN ALL LARGE CITIES

Products

Grant Ball Bearing Elevator Door Hangers.
Grant Elevator Door Controllers.
Grant Elevator Door Locks.
Grant Bar Locks.
Grant Elevator Door Controller Accessories.
Grant Ball Bearing Drawer Slides.
Also Car Signals.

For Rolling Partitions, see page 1314; for Pulleys and Window Cleaning Devices, see pages 1430-1431; for Revolving Window Fixtures, see page 1642.

Grant Ball Bearing Door Hangers and Tracks

The principle of moving weights on steel balls running in grooved tracks is admittedly superior to other methods employed in door hanger construction. Grant hangers and tracks are built for durability, ease of action, speed, and other essential door hanger requirements. See drawing No. 1 on succeeding page showing the various styles.

Construction—Grant hangers are made of both drawn steel and milled steel as conditions require. In all types there are two rows of ball races, one at the top and one at the bottom of the track with the balls fitted in between the track and the hanger. The double races prevent any jumping or pounding of the doors. The grooves are milled—not rolled—and set to the proper gauge by hand, so that the balls roll perfectly free, without binding at any point. The balls are retained in their respective places by metal spacers best suited for the purpose; these spacers keep the balls from being lost when adjustments are made. The hangers are made to suit the weight of the doors and have a very large factor of safety.

Installation—Tracks should not be secured to the brick, terra cotta or concrete with expansion bolts, but should have steel or wood backing. The details on the following pages show a few suggestions as to the best application for securing a good installation job.

All doors should be stopped with rubber bumpers. The hanger should not act in this capacity as it is not made for this purpose.

Finish—All hangers and tracks are painted black unless otherwise ordered.

Types—Made in six general types. See drawing No. 1.

Type No. 1—Milled steel track and drawn metal hanger for single doors. Designed for light grille doors for bank work, wood doors for wardrobes, etc., weighing up to 100 lb. each.

Type No. 2—Milled steel hanger for single doors weighing up to 400 lb. each. Heavier weights special.

Type No. 3—Milled steel two-speed, geared hangers for doors weighing not over 200 lb. each. Heavier weights special. *Note:* If door controllers are used, gears are omitted.

Type No. 4—Milled steel, geared hangers for center closing doors up to 200 lb. each. Heavier weights special.

Type No. 5—Milled steel, chain traction hangers for center closing doors up to 200 lb. each. Heavier weights special.

Type No. 6—Milled steel, two-speed geared center closing hangers for four doors to the opening weighing 200 lb. each. Heavier weights special.

Swing Device—The swing device shown for type No. 2 hanger (Drawing No. 1) can be applied to any of our standard hangers either single or two-speed.

Special Features—

(A) Each hanger track is provided with right and left threaded and nutted pendant bolts to permit lateral and perpendicular adjustment for the proper alignment of the doors without removing them from the tracks.

(B) Lock washers are placed under the locknuts of the pendant bolts to insure a continuous tension on the locknuts and thus prevent any vibration in opening and closing the doors from loosening the locknuts and dropping the doors.

(C) The traveling and stationary tracks are shop milled for the ball bearing raceways to insure smoothness and noiselessness in operation; no possible binding.

(D) The ball bearings are of the best case hardened steel obtainable and set in spacers of heavy sheet steel so stamped that the balls have a perfectly free motion and can not drop out while making adjustments.

Ordering Hangers—In ordering state actual width of door (not the opening), thickness and approximate weight, whether of wood, iron, or kalamein, as knees or plates for connecting to wood or kalamein doors are furnished.

If double-speed hangers are desired, state which way doors close, looking from inside of elevator car. If opening device is to be used, give name of manufacturer.

Elevator Door Controller Accessories

Attention is called to the third page following where several door holding, unlocking and safety devices are described and illustrated.

Grant Elevator Door Controller

A practical and effective device for the prevention of accidents in connection with elevator service.

Frequent accidents of the most serious nature have created the necessity for perfect safety appliances on all doors leading to elevators.

To fill this requirement this company has perfected and is offering the device shown. It is thoroughly efficient, reliable and a positive safeguard.

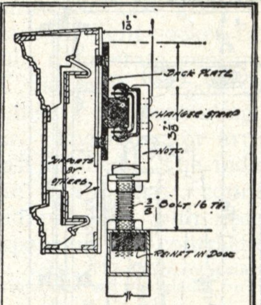
When released, the action of the doors is rapid until within a few inches of the closing point. The liquid checking device then takes control, checks the rapid movement, and brings the doors to a noiseless, slamless stop.

These elevator door controllers can be manufactured to meet almost any conditions.

They are made for single, center closing, two-speed, and combination slide and swing doors.

For holding, unlocking and safety devices, see second page following.

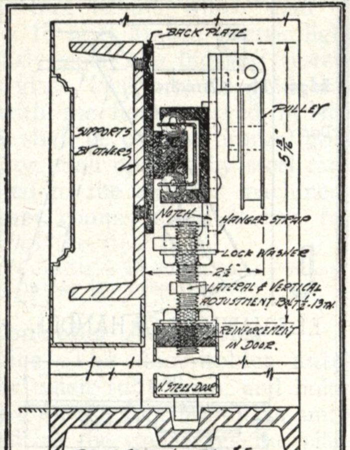
Continued on next page


1 1/8"
BACK PLATE
HANGER STRAP
3 7/8"
NOTCH
SUPPORTS BY OTHERS
3/8" BOLT 16 TH.
REINF'T IN DOOR

CROSS SECTION OF TYPE #1
FOR BANK SCREEN & WARDROBE DOORS

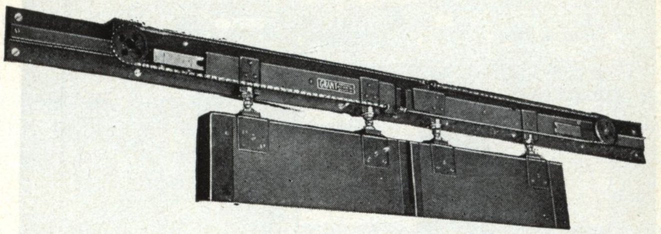
3" SCALE SECTION
SUITABLE FOR
DOORS & GRILLES
WEIGHING NOT
OVER 100 POUNDS.

TYPE #1


BACK PLATE
PULLEY
SUPPORTS BY OTHERS
5 13/16"
NOTCH
HANGER STRAP
LOCK WASHER
2 1/2"
LATERAL & VERTICAL ADJUSTMENT BOLT 1/2-13 TH.
REINFORCEMENT IN DOOR.
H. STEEL DOOR

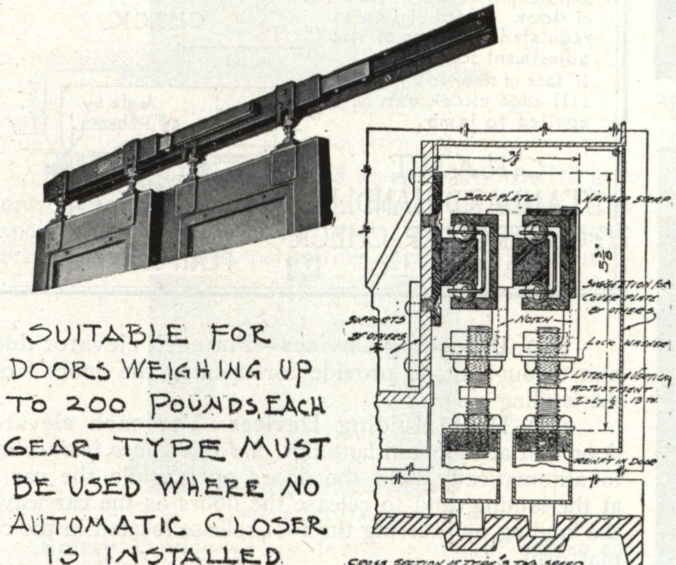
CROSS SECTION OF TYPE #5
CENTER CLOS'G. CHAIN TRACTION HANGER
FOR HOLLOW STEEL DOORS.

3" SCALE SECTION



THIS HANGER IS SUITABLE FOR
DOORS WEIGHING NOT OVER
200 POUNDS, EACH, BUT CAN
BE MADE ON SPECIAL ORDER
FOR HEAVIER DOOR UNITS.

TYPE #5

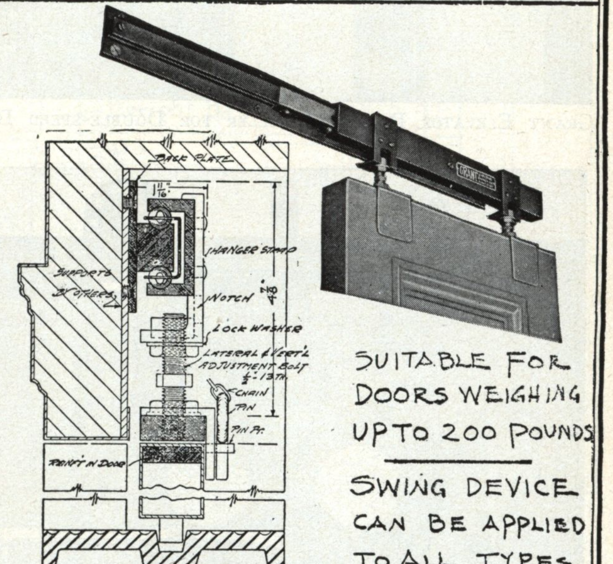

3 1/8"
BACK PLATE
HANGER STRAP
5 3/8"
SUGGESTION FOR COVER PLATE BY OTHERS
SUPPORTS BY OTHERS
NOTCH
LOCK WASHER
LATERAL & VERTICAL ADJUSTMENT BOLT 1/2 : 13 TH.
REINF'T IN DOOR

CROSS SECTION OF TYPE #3 TWO SPEED
NON GEARED HANGER FOR USE WITH
AUTOMATIC CLOSERS FOR HOL. STEEL DOORS.

3" SCALE SECTION

SUITABLE FOR
DOORS WEIGHING UP
TO 200 POUNDS EACH
GEAR TYPE MUST
BE USED WHERE NO
AUTOMATIC CLOSER
IS INSTALLED.

TYPE #3


BACK PLATE
1 11/16"
HANGER STRAP
SUPPORTS BY OTHERS
NOTCH
4 7/8"
LOCK WASHER
LATERAL & VERT'L ADJUSTMENT BOLT 1/2 : 13 TH.
CHAIN
PIN
PIN PL.
REINF'T IN DOOR

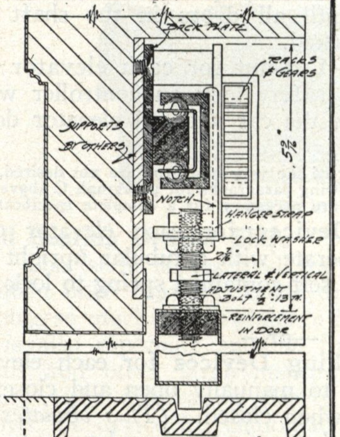
CROSS SECTION OF TYPE #2
SHOWING SWING DEVICE

3" SCALE SECTION

SUITABLE FOR
DOORS WEIGHING
UP TO 200 POUNDS

SWING DEVICE
CAN BE APPLIED
TO ALL TYPES.

TYPE #2


BACK PLATE
RACKS & GEARS
SUPPORTS BY OTHERS
5 9/16"
NOTCH
HANGER STRAP
LOCK WASHER
2 7/16"
LATERAL & VERTICAL ADJUSTMENT BOLT 1/2 : 13 TH.
REINFORCEMENT IN DOOR

CROSS SECTION OF TYPE #4.
CENTER CLOS'G. GEARED TRACTION HGR.
FOR HOLLOW STEEL DOORS.

3" SCALE SECTION

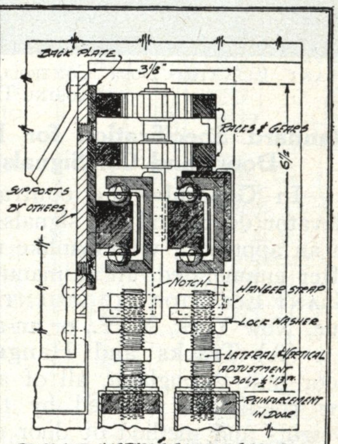
SUITABLE FOR
DOORS WEIGHING
UP TO 200 POUNDS,
EACH.

NOTE: THIS TYPE
AND ALL OTHER
TYPES CAN BE
MADE ON SPECIAL
ORDER FOR ANY
HEAVIER DOOR UNITS.

TYPE #4

SUITABLE FOR
DOORS WEIGHING.
UP TO 200 POUNDS
EACH.

TYPE #6

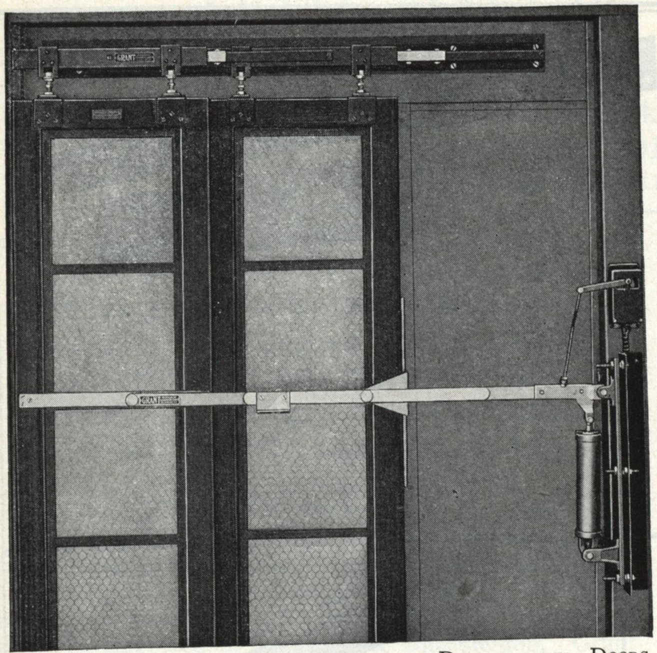

BACK PLATE
3 1/8"
RACKS & GEARS
6 1/2"
SUPPORTS BY OTHERS
NOTCH
HANGER STRAP
LOCK WASHER
LATERAL & VERTICAL ADJUSTMENT BOLT 1/2 : 13 TH.
REINFORCEMENT IN DOOR

CROSS SECTION OF TYPE #6 GEARED TWO SPEED
CETER CLOSING HANGER FOR FOUR DOORS TO THE
OPENING & FOR HOLLOW STEEL DOORS.

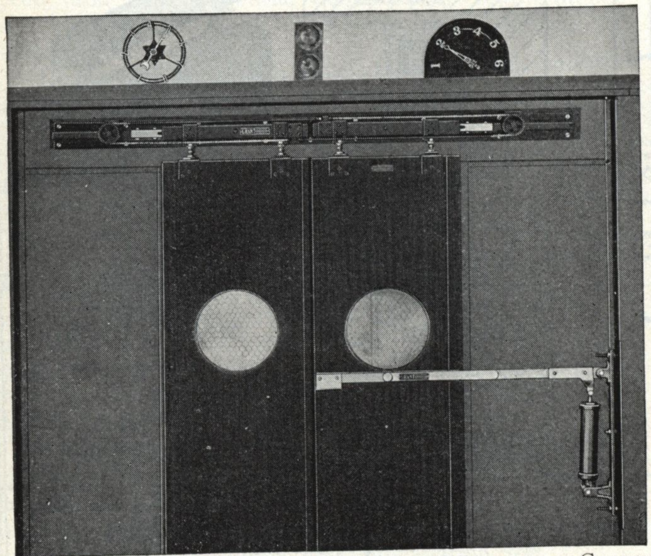
3" SCALE SECTION

SERVICE SHEET	GRANT BALL BEARING HANGERS.	SCALE: 3" EQUALS 1'-0" DATE, AUG. 1ST	DRWG 1

Continued on next page



Grant Elevator Door Controller for Double-speed Doors



Grant Elevator Door Controller for Single or Center Closing Door

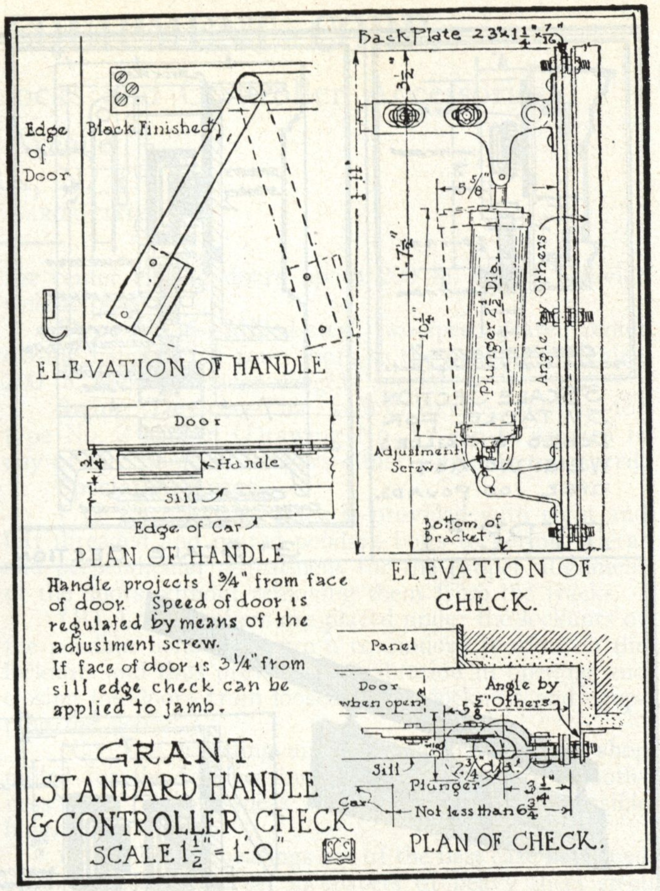
Standard Specification for Equipment of Elevator Doors and Car Signals

In General—The contractor for equipment of elevator doors and car signals shall furnish and install in an approved, workmanlike manner the items hereinafter enumerated, all as manufactured and sold by the Grant Elevator Equipment Corp. of 101 Park Avenue, New York, N. Y., or an approved equal.

(A) Tracks and Hangers—For each elevator door unit throughout, all of approved type suitable to the conditions required by the door materials, door weights and method of door operation.

(B) Rack and Pawl Safety—For each elevator door unit throughout, with steel ratchet and fibre pawl placed at the top of the doors, to prevent the re-opening of the doors after they are closed to within 6 in. of the jamb.

(C) Controllers—For each elevator door unit throughout, for manual opening and automatic closing and locking of same.



Back Plate 23"×1¼"×7/16"
Edge of Door
Black Finished
3½"
1'-11"
5/8"
1'-7½"
10¼"
Plunger 2½" Dia.
Angle by Others
Adjustment Screw
Bottom of Bracket
ELEVATION OF HANDLE
Door
¾
Handle
Sill
Edge of Car
PLAN OF HANDLE
Handle projects 1¾" from face of door. Speed of door is regulated by means of the adjustment screw.
If face of door is 3¼" from sill edge check can be applied to jamb.
ELEVATION OF CHECK.
Panel
Door when open
Angle by Others
5⅝"
Sill
2¾ dia.
Plunger
Car
3¼"
Not less than 6¾
PLAN OF CHECK.
GRANT STANDARD HANDLE & CONTROLLER CHECK
SCALE 1½" = 1'-0"
SCS

(D) Unlocking Devices—For each elevator door unit throughout, to provide for opening the doors from the landing side.

(E) Door Holding Devices—For each elevator door unit at the main landing (*and elsewhere if desired*) to automatically hold the doors open while the car is at the landing and to release the doors as the car leaves the landing by pressing the foot release located in the car platform.

(F) Electric Safety Locks—Attached to each elevator door controller (*bar lock, horizontal lock or gravity lock*) to automatically prevent the car from leaving the landing until all doors in the shaft are closed and securely locked.

(G)—Emergency Cut-out for each elevator cab to cut out the electric safety lock on controller when it is desired to operate the car with all elevator doors unlocked.

Note: If door controllers of the very best type are not desired, substitute either of the three following paragraphs for paragraph C above. All other paragraphs enumerated are necessary for a complete specification.

(G) Bar Locking Devices for each elevator door unit throughout, to operate with a tubular upright bar with latch at top and a self-contained spring to lock and unlock the door.

—or—

(G) Horizontal Locking Devices for each elevator door unit throughout, to manually open and close the doors and lock same when closed. *(This obviates the necessity for a rack and gear in the door hanger to regulate the speed in a two-speed door.)*

—or—

(G) Gravity Locking Devices for each elevator door unit throughout, to operate by a gravity drop-bar latch.

(H) Dial Indicators located over each elevator door unit throughout, and each consisting of an ornamental cast iron frame with No. 10 gauge sheet steel

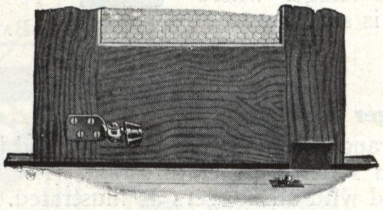
Continued on next page

box all painted to match sample selected, with opalescent removable cast glass dial face behind which shall be placed a light socket for a 10 watt Mazda electric light bulb to operate continuously upon the lighting system of the halls. Upon the glass face provide gold leaf numbers corresponding with the floors served by the car. The indicator arrow shall be of cast bronze, gold leaf finished. The indicator shall operate by steel tape run in the shaft, connected to the elevator machinery and provided with necessary compensating devices for expansion and contraction of the steel tape.

Note: The above indicators are capable of an infinite variety of applications and we will gladly furnish further data upon request.

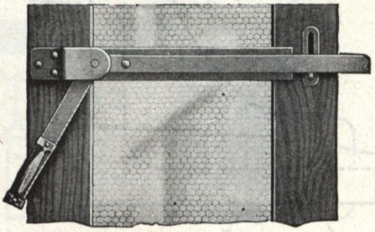
Grant Elevator Door Controller Accessories

Door Holding Device—The door-holder automatically engages the door when fully open, and holds it until released by pressure on the foot button, or until it is automatically released, as the car leaves the platform.



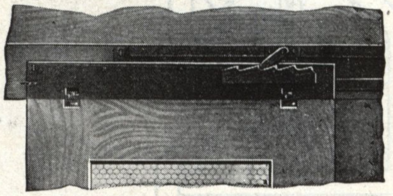
Door Holding Device

Unlocking Device—Used in connection with any controller for unlocking door from hall side. The tapered key is inserted underneath the arm raising same from dead center thus permitting opening of the door.



Unlocking Device

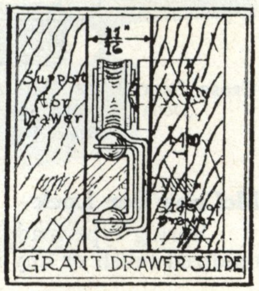
Safety Device—This device is useful where no electric switch is installed and is designed to prevent reopening of door while the door is in the act of closing, and after car has left the landing.



Safety Device

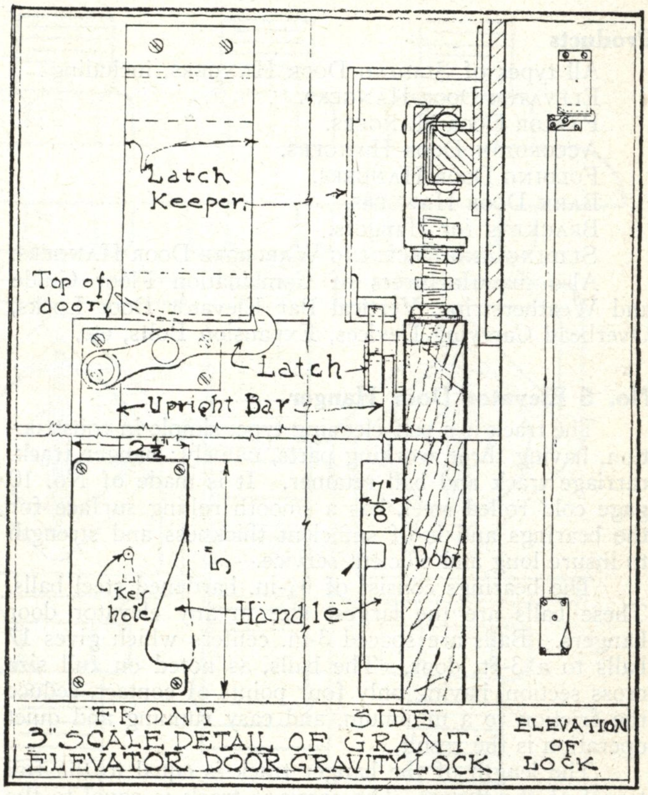
Ball Bearing Drawer Slide

This slide is designed for use in connection with built-in linen drawers, cedar drawers, etc., which contribute so much to convenience in the modern residence. It is also especially suitable for banks, libraries, hospitals and other large institutions. The illustration clearly shows the device in relation to the drawer. It is very easily installed. The slide will not only operate with ease (at the slightest pull of the finger) irrespective of the weight of the drawer or its contents, but will also permit the drawer to pull out all the way—its entire depth.



Grant Gravity Lock

Does not require a spring of any kind. A slight pressure on the handle causes the upright bar to lift and unlock, and the same motion naturally opens the door. When the pressure is removed the bar drops of its own weight. Can be placed on the front or rear stile of the door. Requires only 1 in. from face of door. Finish of statuary bronze or black oxidized. Can be unlocked from hall side with key.



Grant Bar Lock

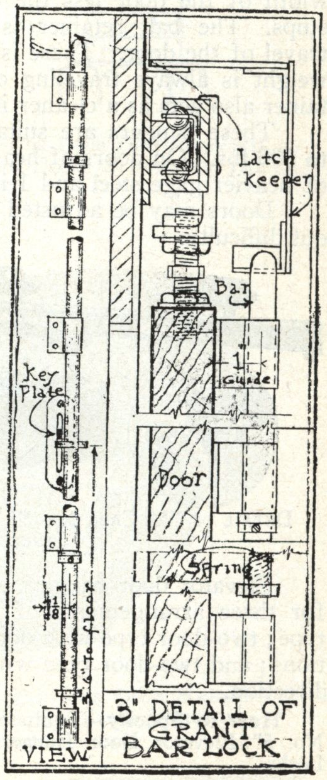
Made of steel tubing with a spring concealed therein.

The lock is made of the proper length to bring the center of the handle 3 ft. 6 in. from the floor.

Can be furnished with brackets to bring the center of the lock 3/4 or 1 in. from the face of the door and will require either 1 3/8 or 1 5/8 in. from the door edge.

Finished black oxidized unless ordered in statuary bronze.

One key device is furnished to each shaft for unlocking from the hall side.



THE McCABE HANGER MFG. CO.

Sliding Door Hangers

425-427 West 25th Street
NEW YORK, N. Y.

Products

All types of Sliding Door Hangers, including:
Elevator Door Hangers.
Parlor Door Hangers.
Accordion Door Hangers.
Folding Door Hangers.
Barn Door Hangers.
Brackets for Hangers.
Sliding and Receding Wardrobe Door Hangers.

Also manufacturers of Combination Floor Guide and Weatherstrips, Vertical Bar Elevator Door Locks, Overhead Carrying Devices, Expansion Bolts, etc.

No. 5 Elevator Door Hanger

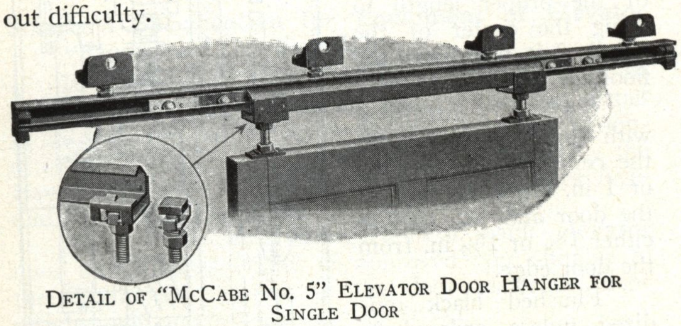
The track is a self-cleaning type, simple in construction, having three working parts, namely: hanger track, carriage track and ball retainer. It is made of No. 10 gage cold rolled steel, has a smooth rolling surface for the bearings and is of sufficient thickness and strength to insure long and efficient service.

The bearings consist of ¾-in. hardened steel balls. These balls are the largest size in any elevator door hangers. Balls are spaced 3-in. centers which gives 17 balls to a 3-ft. door. The balls, as noted on full size cross section, having only four points of contact, reduce the friction to a minimum, and easy running and quiet operation is the result.

The length of the hanger track is equal to the full travel of the doors. The carriage track is equal to the width of the door less the distance required for track stops. The ball retainer is three-fourths of the full travel of the door. There is no cantilever action, as the weight is always traveling on the balls. This ball retainer also acts as a cleaner in the track.

These hangers are suitable for doors weighing up to 300 lbs. On doors of heavier weight we supply track of heavier gage steel and 1-in. balls.

Doors may be adjusted laterally or vertically without difficulty.



Detail of "McCabe No. 5" Elevator Door Hanger for Single Door

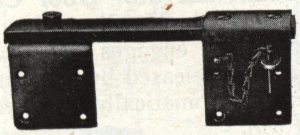
Elevator door hangers and tracks can be furnished for three arrangements of doors, namely: single door type; two-door type with doors sliding in opposite directions; and two-door type with doors sliding in the same direction.

How to Specify—Equip elevator doors with "McCabe No. 5" Elevator Door Hangers and "McCabe" Vertical Bar Locks.

McCabe **"Blue Book"**—This book on elevator door hangers sent on request.

Single Bar Swing Device

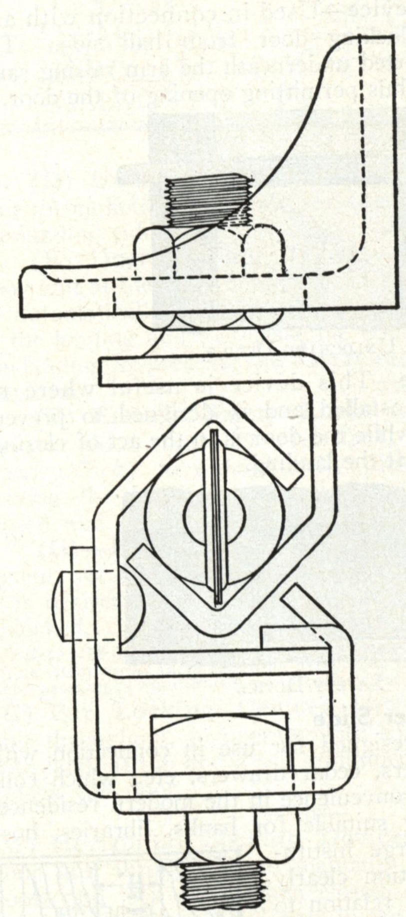
Used for sliding swinging doors in connection with No. 5 single hanger where transom bar is stationary.



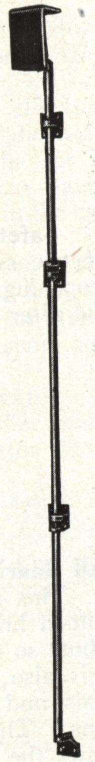
Single Bar Swing

No. 5 Hanger for Single Door

This arrangement is the most simple and is such that the door can slide in either direction. Angle brackets are furnished with all hangers as illustrated.



Cross Section of "McCabe No. 5" Elevator Door Hanger for Single Door
Scale, full size



Bar Lock

McCabe Bar Lock

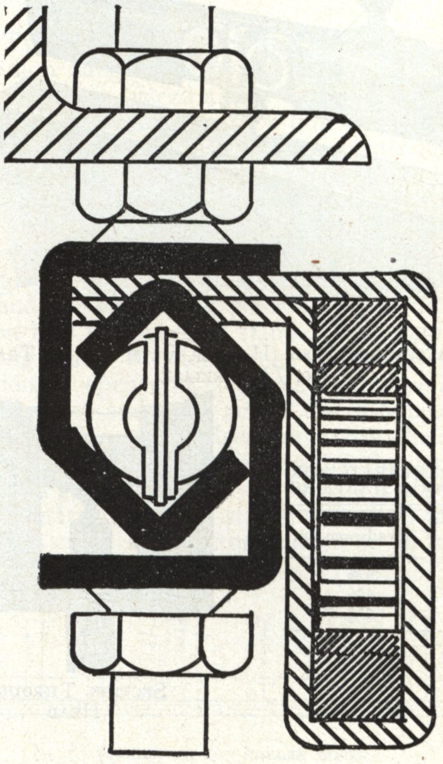
Spring type made from seamless steel tubing, black oxidized finish or any other specified.

Continued on next page

No. 5 Hanger with Two Doors Sliding in Opposite Directions

Both doors slide on a single track. A pinion and two racks are so arranged that when either door is opened or closed the other door automatically opens or closes.

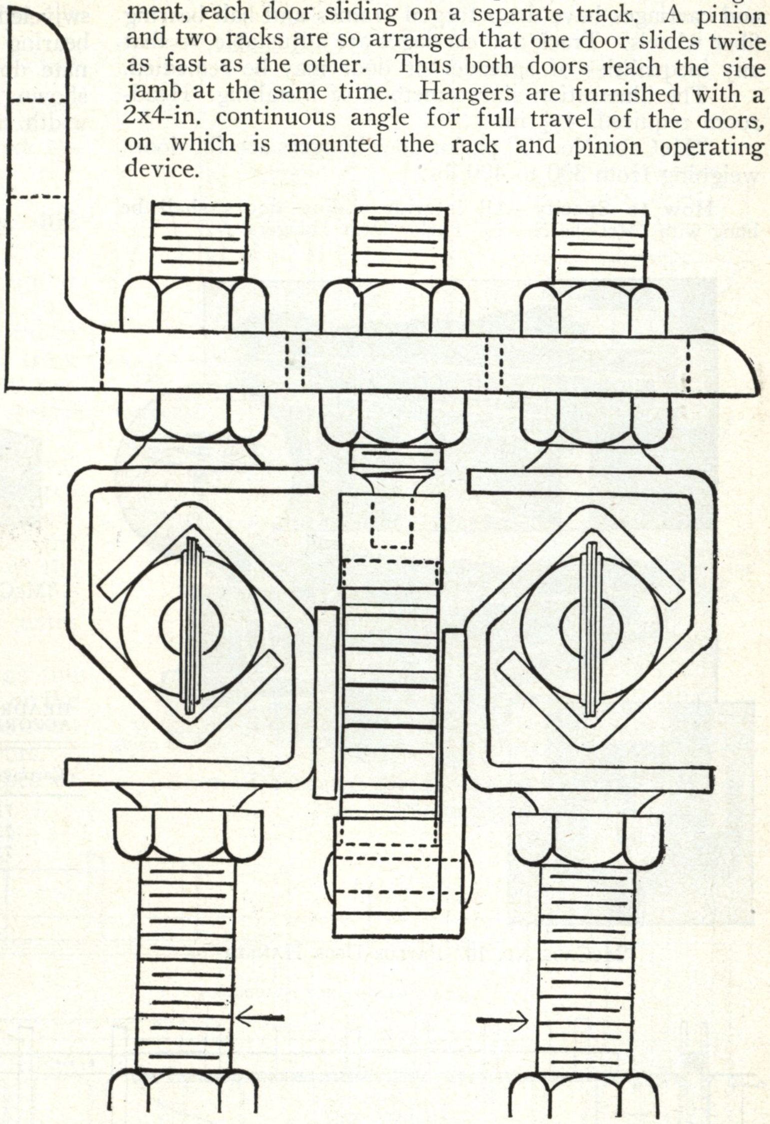
All the hangers are furnished with angle brackets as shown.



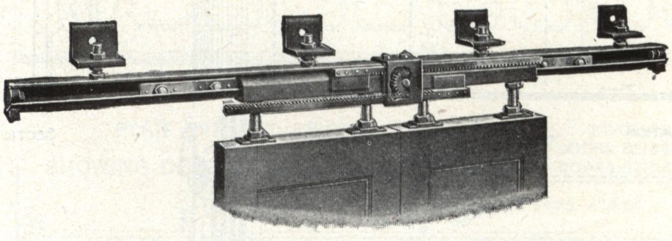
Cross Section of "McCabe No. 5" Elevator Door Hanger With Pinion and Rack Adjustment for Two Doors Sliding in Opposite Directions
Scale, full size

No. 5 Hanger with Two Doors Sliding in the Same Direction (Two-speed Type)

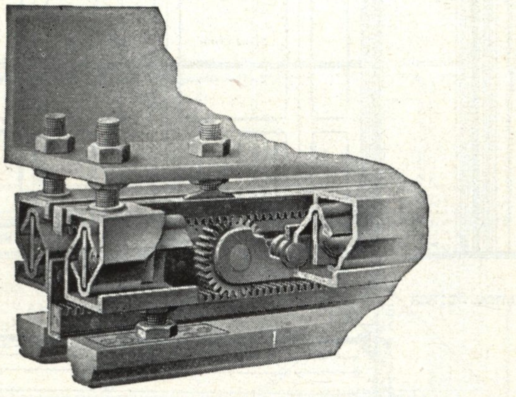
Two sets of tracks are required for this arrangement, each door sliding on a separate track. A pinion and two racks are so arranged that one door slides twice as fast as the other. Thus both doors reach the side jamb at the same time. Hangers are furnished with a 2x4-in. continuous angle for full travel of the doors, on which is mounted the rack and pinion operating device.



Cross Section of "McCabe No. 5" Elevator Door Hanger With Pinion and Rack Adjustment for Two Doors Sliding in the Same Direction
Scale, full size



Detail of "McCabe No. 5" Elevator Door Hanger With Two Doors Sliding in Opposite Directions
Showing pinion and rack adjustment



Detail of "McCabe No. 5" Elevator Door Hanger With Two Doors Sliding in the Same Direction
Showing pinion and rack adjustment

Continued on next page

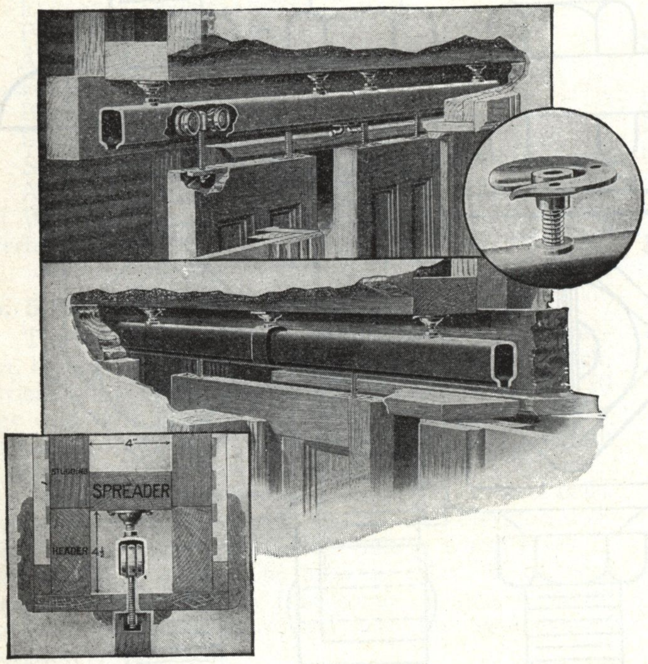
Parlor Door Hangers

"McCabe No. 10" is a simple, durable and noiseless device. Track is made of No. 13 gage cold drawn steel, and carriages have drop forged frames and ball bearing fiber wheels. Track and carriages are adjustable, so that any inequalities of spreader or door may be remedied.

The illustration shows method of installing. Headroom required, 4½ in.

"McCabe No. 10" parlor door hangers are for doors weighing from 300 to 400 lbs.

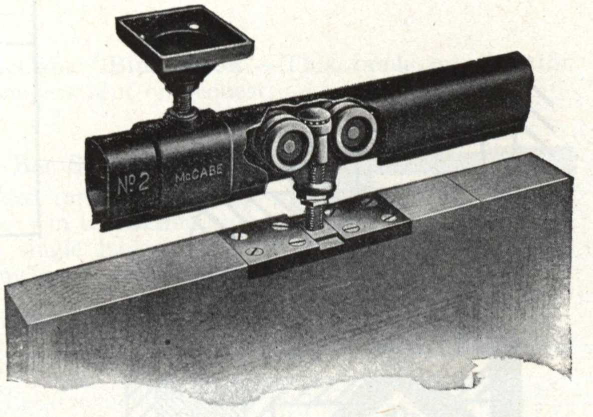
How to Specify—All interior sliding doors shall be hung with "McCabe No. 10" Parlor Door Hangers.


4"
STUDDING
SPREADER
HEADER
4½

"McCabe No. 10" Parlor Door Hanger

Accordion and Folding Door Hangers for Accordion or Folding Partitions

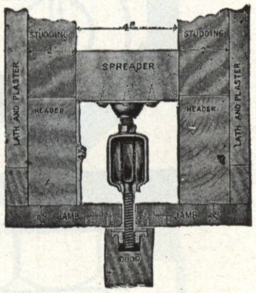
Track is made of No. 13 gage cold drawn steel, and swiveled carriages have drop forged frames and ball bearing wheels. One carriage only is used on each alternate door, placed in the exact center of the door as shown. If possible, doors should not exceed 3 ft. in width, or 100 lbs. in weight.



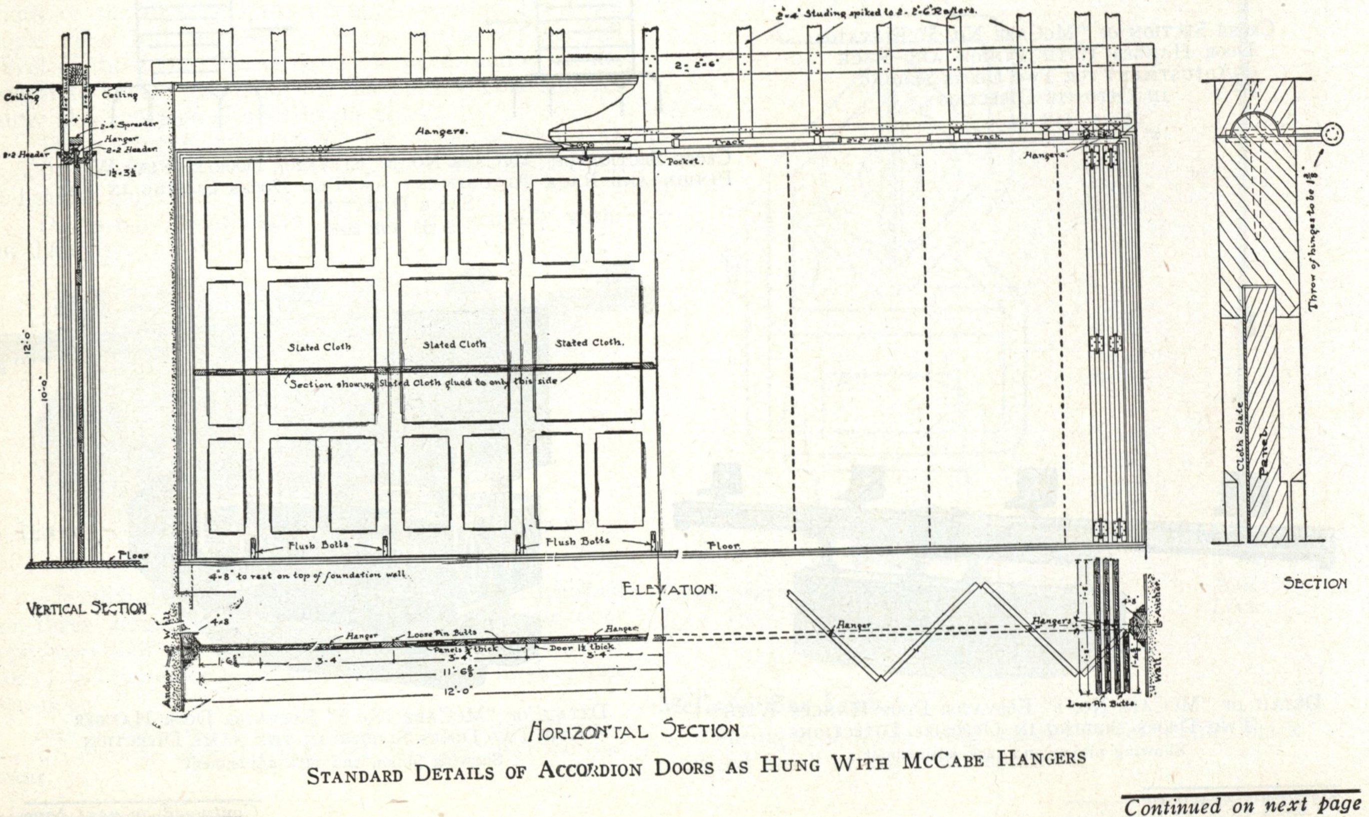
"McCabe" Accordion Door Hanger with No. 2 Track and No. 72 Carriage

HEADROOM REQUIRED FOR ACCORDION DOOR HANGERS

Carriage No.	Headroom, in.
71	4½
72	4½
73	6½


STUDDING
STUDDING
SPREADER
LATH AND PLASTER
LATH AND PLASTER
HEADER
HEADER
JAMB
JAMB
DOOR

Section Through Head


2"-4" Studing spiked to 2 - 2"-6" Rafters.
2 - 2"-6"
Ceiling
Ceiling
2-4 Studing
2-4 Studing
2-4 Spreader
Hanger
2-2 Header
2-2 Header
1½-3½
12'-0"
10'-0"
Floor
Hangers.
Pocket.
Track
2-2 Header
Track
Hangers.
Slated Cloth
Slated Cloth
Slated Cloth.
Section showing Slated Cloth glued to only this side
Flush Bolts
Flush Bolts
Floor
4"-8" to rest on top of foundation wall.
Vertical Section
Elevation.
4-8
Wall
Anchor
Hanger
Loose Pin Butts
Panels ⅜ thick
Door 1½ thick
Hanger
1'-6⅝"
3'-4"
3'-4"
3'-4"
11'-6⅝"
12'-0"
Hanger
Hangers
1'-8
1'-8
1'-6⅝
4-8
Anchor
Wall
Loose Pin Butts.
Horizontal Section
Throw of hinges to be 1⅛"
Cloth Slate
Panel
Section

Standard Details of Accordion Doors as Hung With McCabe Hangers

Continued on next page

Any number of doors may be placed in an opening, commencing with a half door hinged to the jamb at either side, as per illustration. This half door must be exactly one-half the width of the full doors, less the throw of the hinge.

How to Specify—Folding doors and partitions shall be equipped with "McCabe" Accordion Door Hangers.

Note: For 1½-in. or 1⅜-in. doors, specify Track No. 1 and Carriage No. 71. For 1¾-in. doors, specify Track No. 2 and Carriage No. 72. For 2-in. to 2½-in. doors, specify Track No. 3 and Carriage No. 73.

McCabe Special Folding Door Hangers Nos. 402 and 405

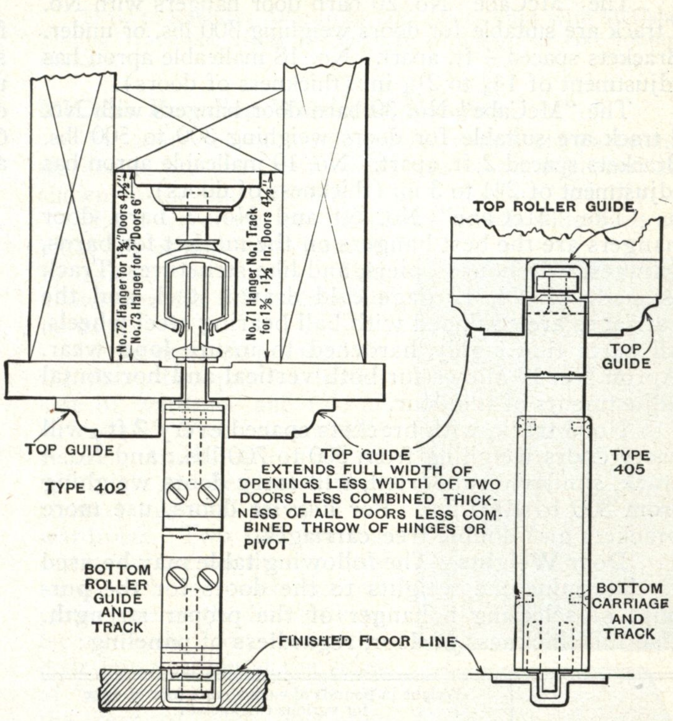
Type No. 402—Used on doors where the regular accordion hanger can not be used. On this type door the carriage is placed at the end of the door, instead of the center as in the accordion type. The accordion track is used at the top with the accordion carriage; the bottom of the door has a ball bearing guide which runs in special pressed steel channel in the floor.

The doors will fold back as noted on plan and elevation sketch at the bottom of the page. It will be noted that all the doors are hinged together, making the opening and closing of the partition much quicker for the reason that the operator stands at the jamb side of the opening where the doors fold up and is able from this position to open and close the doors, saving the extra walking back and forth across the opening.

Type No. 405—Used on doors the same as the No. 402 type with the exception that the doors roll on the floor and guide overhead. This type is used where overhead construction is not strong enough to carry doors.

See cross section for headroom on both types of hanger.

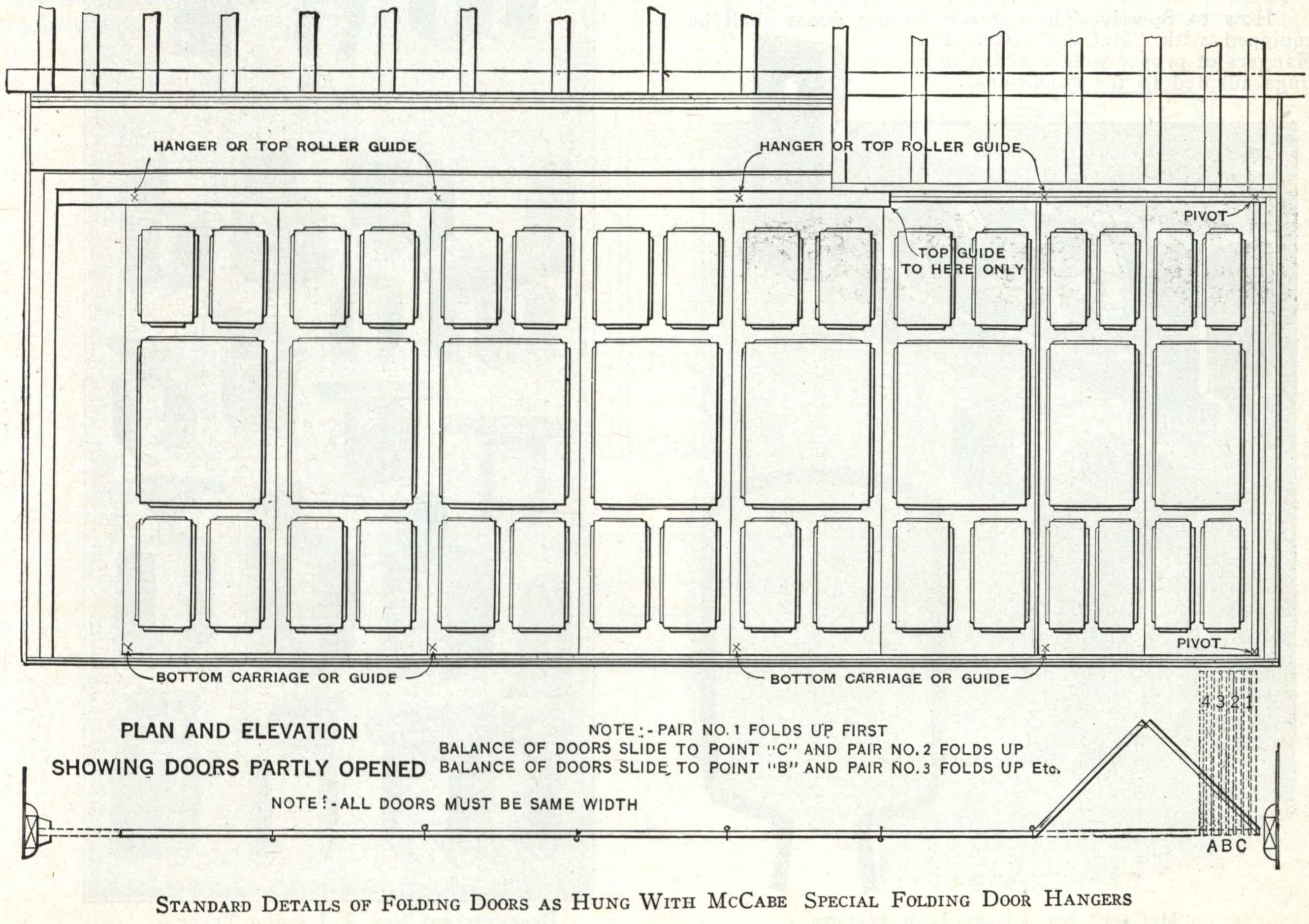
How to Specify—Folding partitions to be hung with McCabe No. 402 or McCabe No. 405 Special Folding Hangers.


No. 72 Hanger for 1¾" Doors 4½"
No. 73 Hanger for 2" Doors 6"
No. 71 Hanger No. 1 Track for 1⅜ - 1½ In. Doors 4½"
TOP GUIDE
TOP GUIDE EXTENDS FULL WIDTH OF OPENINGS LESS WIDTH OF TWO DOORS LESS COMBINED THICKNESS OF ALL DOORS LESS COMBINED THROW OF HINGES OR PIVOT
TYPE 402
BOTTOM ROLLER GUIDE AND TRACK
FINISHED FLOOR LINE
TOP ROLLER GUIDE
TOP GUIDE
TYPE 405
BOTTOM CARRIAGE AND TRACK

Type No. 402
Weight of door carried at top. Doors guide at floor

Type No. 405
Weight of door carried on floor. Doors guide overhead

Sections Through McCabe Special Folding Door Hangers and Guides


HANGER OR TOP ROLLER GUIDE
HANGER OR TOP ROLLER GUIDE
TOP GUIDE TO HERE ONLY
PIVOT
PIVOT
BOTTOM CARRIAGE OR GUIDE
BOTTOM CARRIAGE OR GUIDE
4 3 2 1
A B C

PLAN AND ELEVATION
SHOWING DOORS PARTLY OPENED

NOTE:- PAIR NO. 1 FOLDS UP FIRST
BALANCE OF DOORS SLIDE TO POINT "C" AND PAIR NO. 2 FOLDS UP
BALANCE OF DOORS SLIDE TO POINT "B" AND PAIR NO. 3 FOLDS UP Etc.

NOTE:- ALL DOORS MUST BE SAME WIDTH

Standard Details of Folding Doors as Hung With McCabe Special Folding Door Hangers

Continued on next page

Barn Door Hangers

The "McCabe" No. 20 barn door hangers with No. 2 track are suitable for doors weighing 300 lbs. or under. Brackets spaced 4 ft. apart. No. 18 malleable apron has adjustment of 1¾ to 2¼ in. (thickness of doors).

The "McCabe" No. 30 barn door hangers with No. 2 track are suitable for doors weighing 300 to 500 lbs. Brackets spaced 2 ft. apart. No. 19 malleable apron has adjustment of 2⅜ to 3 in. (thickness of doors).

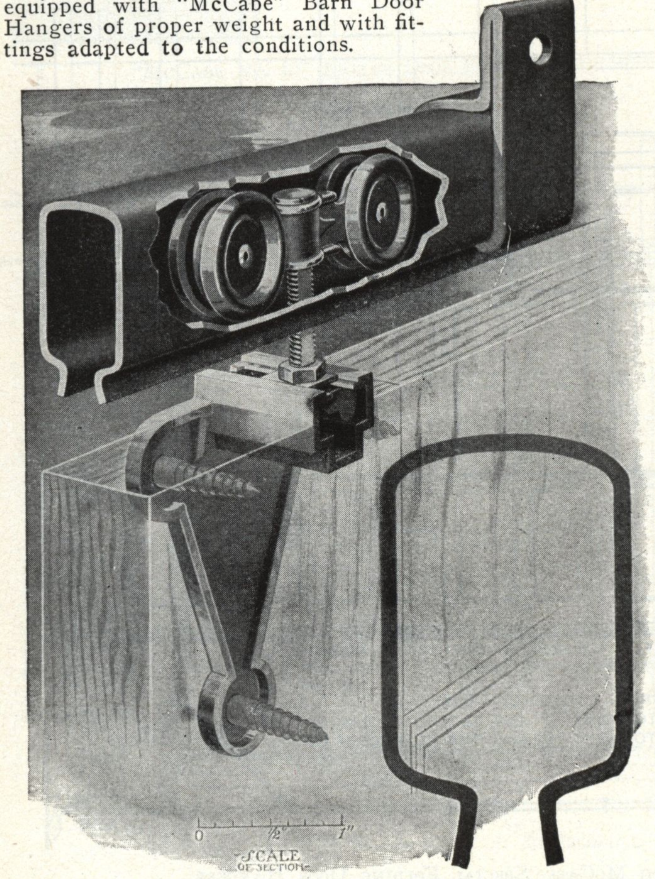
The "McCabe" No. 60 and No. 3 barn door hangers are the best hangers on the market for barns, garages, warehouses, piers, and like structures. Track is made of No. 12 gage cold drawn steel, and the carriages are equipped with ball bearing steel wheels, all parts thoroughly hardened to insure long wear. Apron No. 19 allows for both vertical and horizontal adjustments of the door.

No. 3 track, with brackets spaced every 2 ft., will carry doors weighing from 500 to 700 lbs.; and No. 4 track, similarly supported, will carry doors weighing from 800 to 1000 lbs. For heavier doors, use more brackets and double-tree carriages.

Door Weights—The following table may be used to determine the weights to the doors for the purpose of selecting a hanger of the proper strength. Use full thickness of door, regardless of paneling:

Material	Weight in pounds of each square foot of door for various thicknesses								
	1 in.	1½ in.	1¾ in.	2 in.	2¼ in.	2⅜ in.	2⅝ in.	3 in.	3½ in.
Pine	2.08	3.12	3.64	4.16	4.68	4.95	5.46	6.24	7.28
Oak or ash	4.00	6.00	7.00	8.00	9.00	9.50	10.50	12.00	14.00
Cypress	2.50	3.75	4.36	5.00	5.62	5.93	6.55	7.50	8.75
Whitewood	2.42	3.63	4.22	4.84	5.45	5.74	6.34	7.26	8.47
Chestnut	3.42	5.13	5.98	6.84	7.69	8.12	8.97	10.26	11.97

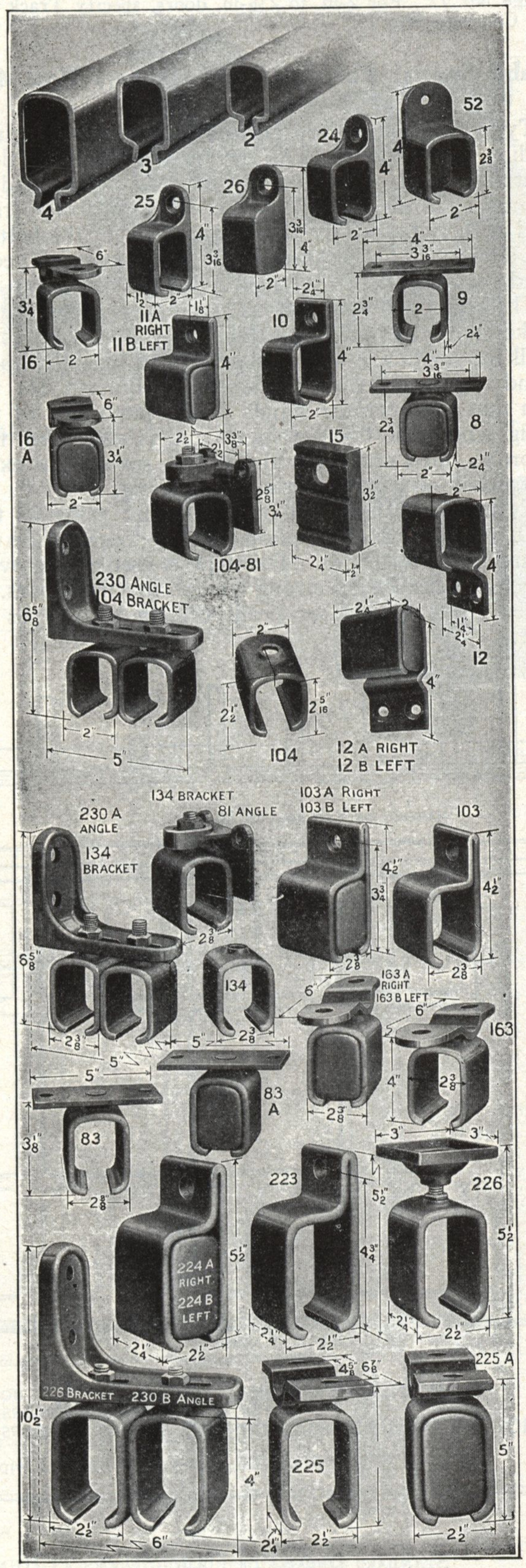
How to Specify—The exterior sliding doors shall be equipped with "McCabe" Barn Door Hangers of proper weight and with fittings adapted to the conditions.


0
½"
1"
SCALE OF SECTION

"McCabe" No. 3 Barn Door Hanger

Brackets

The following illustration shows the various forms of brackets used for hanging track to the structural member of door opening. Fittings in upper half of illustration are for Nos. 20 and 30 hangers, No. 2 track; the 6 fittings at bottom are for No. 60 hangers, No. 4 track; and the remaining fittings are for No. 3 track.


4
3
2
24
52
25
26
9
16
11 A RIGHT
11 B LEFT
10
16 A
8
15
104-81
230 ANGLE
104 BRACKET
104
12 A RIGHT
12 B LEFT
12
230 A ANGLE
134 BRACKET
134 BRACKET
81 ANGLE
103 A RIGHT
103 B LEFT
103
134
163 A RIGHT
163 B LEFT
163
83 A
83
223
226
224 A RIGHT
224 B LEFT
226 BRACKET
230 B ANGLE
225
225 A

Brackets for Nos. 2, 3 and 4 Track

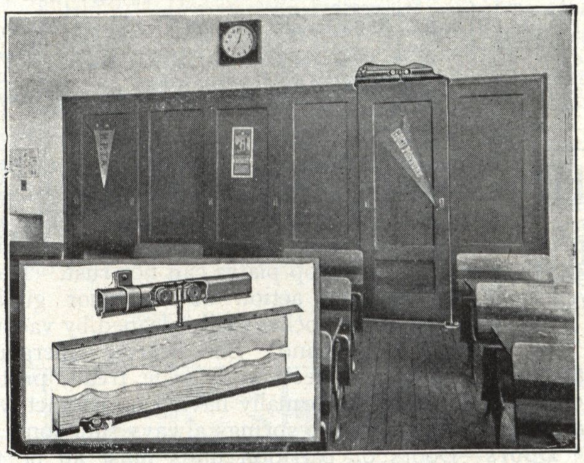
Continued on next page

McCabe Sliding Wardrobe Hangers

The illustration below is a typical installation of McCabe wardrobe door hangers used in school buildings.

One long wardrobe is built, the front of which is closed by alternate stationary and sliding doors. The detail at the bottom of this page shows the sliding door mounted on hangers overhead.

It is advisable to have the outside line of doors the sliding group, and the inside line the stationary group.



Typical Installation of Sliding Wardrobe Door Hanger
For use in school buildings

All sliding doors are connected on the top with a steel bar, and on the bottom with a steel channel.

One carriage is used on the top center of each sliding door. A small ball bearing roller guide is screwed to the floor, just inside of the edge of the doors. This arrangement leaves the floor of the wardrobe clear.

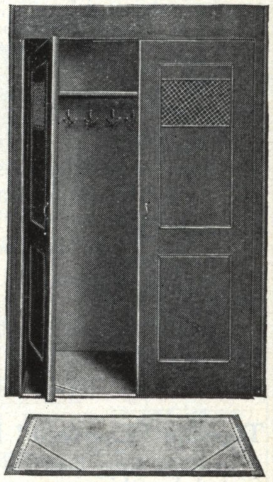
All the wardrobe doors are opened or closed by the sliding of any one of the doors.

How to Specify—Wardrobe doors to be hung with McCabe Sliding Wardrobe Hangers complete with top bar and bottom channel.

McCabe Receding Wardrobe Hangers

In some school buildings, individual compartment wardrobes are preferred. This can be accomplished as shown in the illustration.

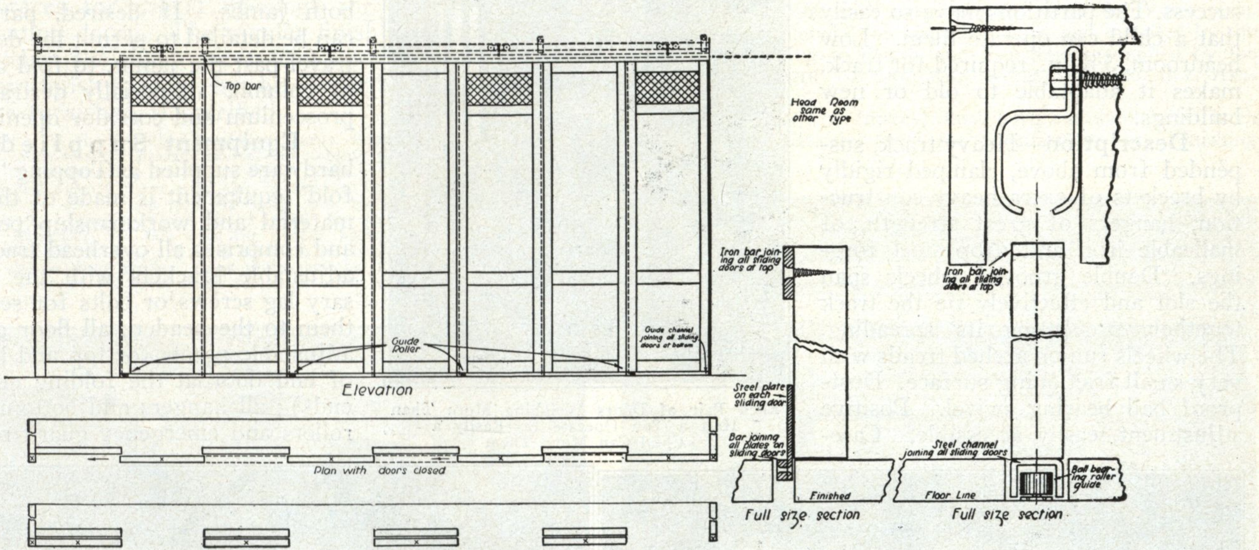
Each wardrobe has two doors, which slide back at right angles and stand parallel to side of wardrobe. This allows for the full interior to be used.



Typical Installation Individual Compartment Wardrobe, Receding Type
For use in school buildings

Four channels are used on the floor, two parallel to the side of wardrobe and two at 45° angle. Two tubular self-cleaning tracks are used at 45° angle overhead, with two channels parallel to side of wardrobe. Two ball bearing carriages, one on the top center of each door with two pin plates, one at the bottom center of each door, carry the door into position at the sides of wardrobe. Two pins on the rear of each door top and bottom, guide the doors in the side channel. This leaves the floor of the wardrobe clear from any special hinged arrangement.

How to Specify—Receding wardrobe doors to be equipped with McCabe Receding Wardrobe Hangers.


Top bar
Guide Roller
Guide channel joining all sliding doors at bottom
Elevation
Plan with doors closed
Plan with doors open
Head Room same as other type
Iron bar joining all sliding doors at top
Steel plate on each sliding door
Bar joining all plates on sliding doors
Finished
Full size section
Iron bar joining all sliding doors at top
Steel channel joining all sliding doors
Ball bearing roller guide
Floor Line
Full size section

Detail for Sliding Wardrobe Hangers

THE TOPPING MANUFACTURING COMPANY

Manufacturers of Folding Partition Hardware and Door Hangers

TELEPHONE
Ashland 339 Main

MAIN OFFICE AND FACTORY
ASHLAND, OHIO

DISTRICT OFFICES:

BIRMINGHAM, ALA., C. S. Caldwell, 2011 Third Avenue—Telephone, Main 3000
CHICAGO, ILL., I. D. Cotterman, 62 East Lake Street—Telephone, Randolph 6760
CLEVELAND, OHIO, The Gesing Bros. Co., 816 Finance Building—Telephone, Cherry 77
MARYLAND, Kemp & Jackson, So. East Cor. Maryland Avenue and 22nd Street, Baltimore—Telephone, Homewood 9400
NEW ENGLAND, Geo. F. Tracy Co., 101 Tremont Street, Boston, Mass.—Telephone, Main 2132
NEW YORK AND NEW JERSEY, L. R. Leeds, 66 Luddington Avenue, Clifton, N. J.—Telephone, Passaic 3609
ROCHESTER, N. Y., Henry Lester Hardware Co., 150 West Main Street—Telephone, Main 5355
PHILADELPHIA, PA., A. Soeffing & Co., 833 Arch Street—Telephone, Filbert 2574
PACIFIC COAST, W. R. Voorhees & Co., 417 Market Street, San Francisco, Cal.—Telephone, Sutter 6574
SEATTLE AND NORTHWEST, Earl H. Jones, 645 Randolph Avenue, Seattle, Wash.—Telephone, Beacon 3589
DALLAS, TEX., Don Stanbery, 4810½ Reiger Avenue

Product

Topping "Easyfold" Equipment for Folding Partitions for schools, churches, hotels, etc., and for Disappearing Door Wardrobes.

Accordion Door Equipment.

For Garage Hardware, see pages 1504-1505.

EASYFOLD
THE TOPPING MFG. CO.
RED-RIB
ASHLAND, O. U.S.A.
TRADE-MARKS

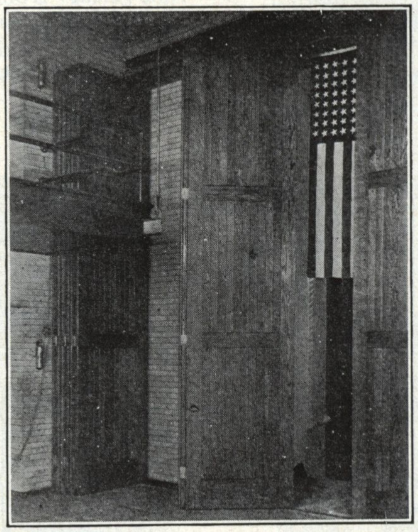
Services

Our service department will gladly supply information and expert advice regarding special conditions and extend at all times the benefit of our years of experience.

Topping "Easyfold" Equipment

Topping "Easyfold" partition hardware was perfected by this company after a thorough and searching investigation of the requirements necessary to produce an equipment of tested strength and sound construction, of simple and indestructible type, which would insure the easiest possible operation of folding partitions. Many installations of folding partitions hung with Topping "Easyfold" equipment prove its complete success. The partitions move so easily that a child can operate them. Low headroom, 3⅜ in., required for track, makes it adaptable to old or new buildings.

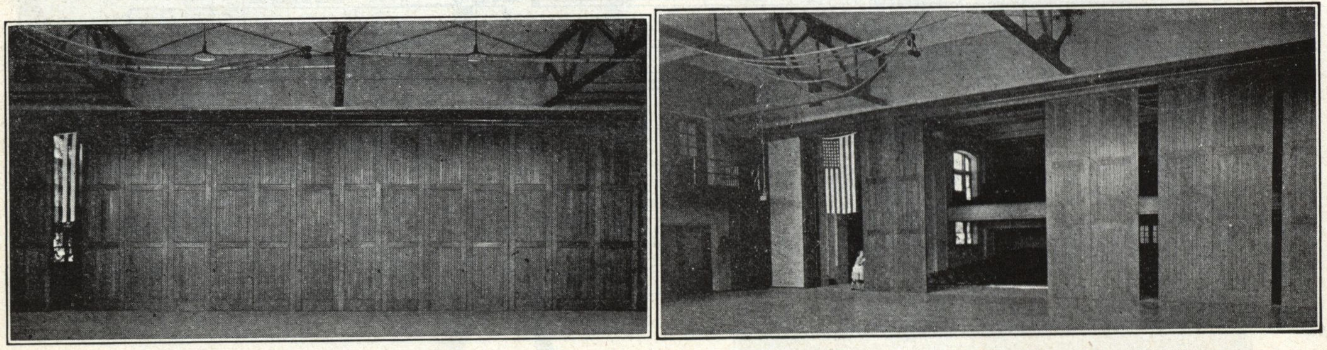
Description—Heavy track, suspended from above, clamped rigidly by brackets of extra heavy construction, hangers of great strength, of malleable iron and drop steel forgings. Double grooved wheels span the slot and effectively tie the track together, preventing its spreading. The wheels run on arched treads with very small frictioning surface. Dustproof ball bearing swivel. Positive adjustment, easily accessible. Casehardened ball bearing wheels in horizontal position operating in floor guide of improved design take all side thrust as doors fold. The extruded brass floor guide with its interlocking and removable top plates can not rust. There is no shearing action of the door guides. V-shaped dust pocket easily cleaned by vacuum cleaner or by hand. Ball bearing emergency guard rollers, having wheels with wide tread, protect uneven floors, although normally having no contact with floor. Compensating jamb springs always function.


Each Pair of Doors Weighing More Than Half a Ton Operate So Easily a Child Can Move Them

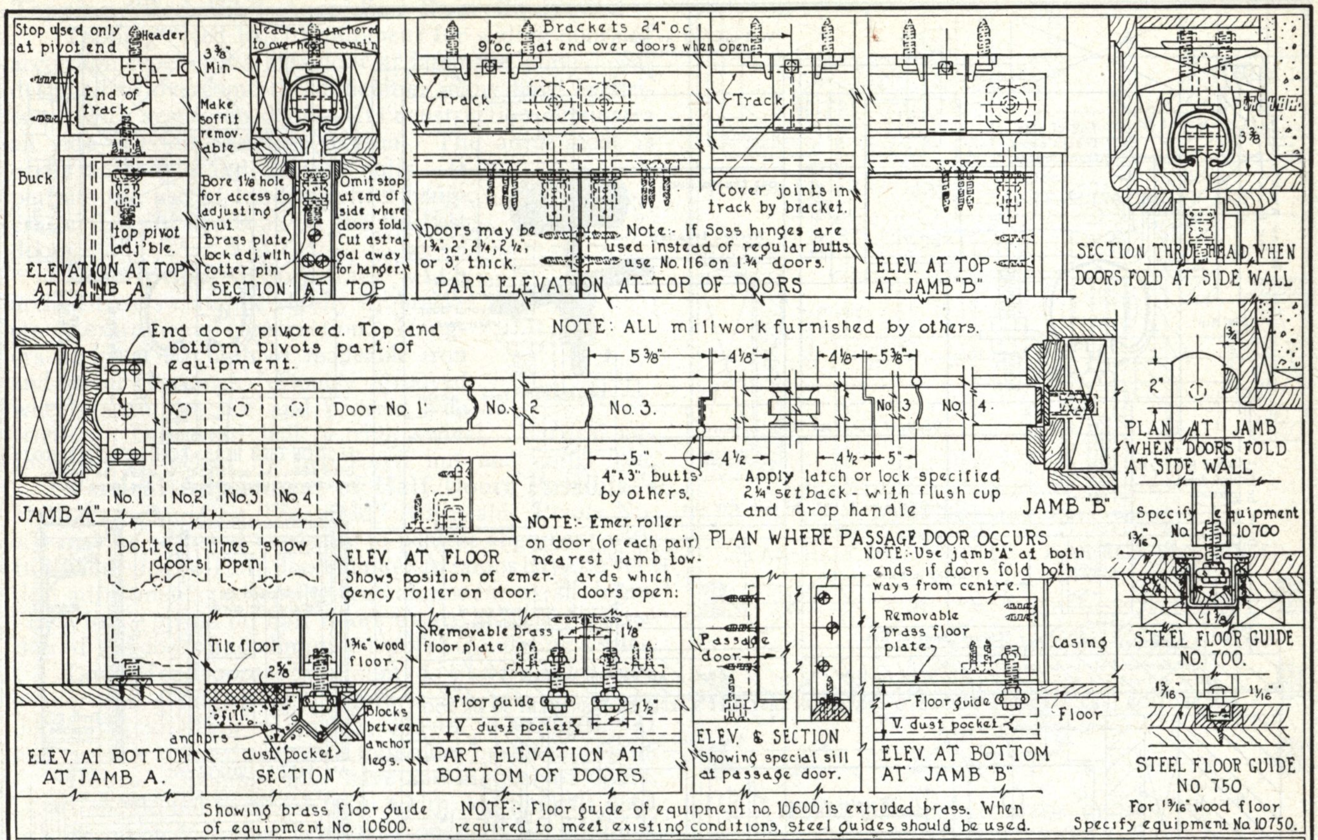
Doors—Doors or partition units must all be the same width, any size, and 1¾ to 3 in. thick. They may be glazed, paneled or flush as desired; if required, the panels may be of slate for blackboards. Doors may be of regular type, of soundproof construction or fireproofed. A hinged door may be made in any section for passage through partition when closed.

Partitions may be of any length. Designed if possible with an even number of doors. The doors moving in units of two may fold at one or both jambs. If desired, partitions can be detailed to permit the doors to travel past the jambs, to fold at wall or column. Especially desirable at proscenium and corridor openings.

Equipment Supplied—The hardware supplied as Topping "Easyfold" equipment is made of the best material and workmanship possible, and comprises all overhead track and adjustable brackets with the necessary lag screws or bolts for securing them to the header; all floor guides, adjustable pivots for top and bottom of end door at the folding end (or ends); all hangers and bottom guide rollers and emergency guard rollers;


Three Views of Partition in Bucyrus High School, Bucyrus, Ohio, Operating on Topping "Easyfold"
Thomas D. McLaughlin and Associates, Architects

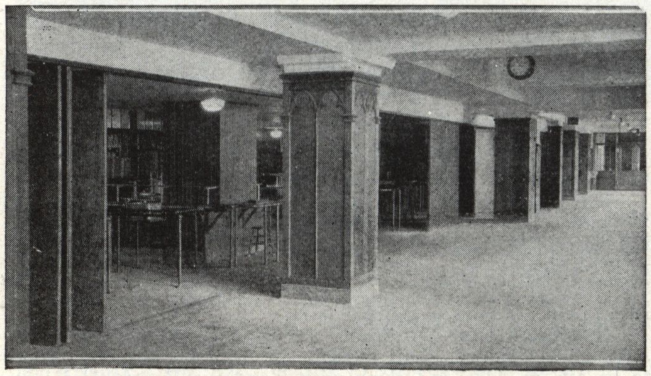
Continued on next page


Stop used only at pivot end
Header
End of track
Buck
top pivot adj'ble.
ELEVATION AT TOP AT JAMB "A"
3⅜" Min
Make soffit removable
Header anchored to overhead const'n
Bore 1⅛ hole for access to adjusting nut.
Brass plate lock adj. with cotter pin
Omit stop at end of side where doors fold. Cut astragal away for hanger.
SECTION AT TOP
Brackets 24" o.c.
9" o.c. at end over doors when open
Track
Track
Cover joints in track by bracket.
Doors may be 1¾", 2", 2¼", 2½", or 3" thick.
Note:- If Soss hinges are used instead of regular butts use No. 116 on 1¾" doors.
PART ELEVATION AT TOP OF DOORS
ELEV. AT TOP AT JAMB "B"
3⅜
SECTION THRU HEAD WHEN DOORS FOLD AT SIDE WALL
End door pivoted. Top and bottom pivots part of equipment.
NOTE: ALL millwork furnished by others.
Door No. 1
No. 2
No. 3.
No. 3
No. 4.
5⅜"
4⅛"
4⅛
5⅜"
5"
4½
4½
5"
4"x3" butts by others.
Apply latch or lock specified 2¼" set back - with flush cup and drop handle
PLAN WHERE PASSAGE DOOR OCCURS
NOTE:-Use jamb "A" at both ends if doors fold both ways from centre.
JAMB "A"
JAMB "B"
No. 1
No. 2
No. 3
No. 4
Dotted doors lines open show
ELEV. AT FLOOR Shows position of emergency roller on door.
NOTE:- Emer. roller on door (of each pair) nearest jamb towards which doors open:
2"
¾
PLAN AT JAMB WHEN DOORS FOLD AT SIDE WALL
Specify equipment No. 10700
13/16"
1⅞
STEEL FLOOR GUIDE NO. 700.
13/16"
11/16"
STEEL FLOOR GUIDE NO. 750
For 13/16" wood floor Specify equipment No. 10750.
ELEV. AT BOTTOM AT JAMB A.
Tile floor
2⅝
13/16" wood floor.
fill
anchors
dust pocket
Blocks between anchor legs.
SECTION
Showing brass floor guide of equipment No. 10600.
Removable brass floor plate
1⅛"
Floor guide
V. dust pocket
1½"
PART ELEVATION AT BOTTOM OF DOORS.
NOTE:- Floor guide of equipment no. 10600 is extruded brass. When required to meet existing conditions, steel guides should be used.
Passage door.
ELEV. & SECTION Showing special sill at passage door.
Removable brass floor plate
Floor guide
V. dust pocket
Casing
Floor
ELEV. AT BOTTOM AT JAMB "B"

DETAILS OF TOPPING "EASYFOLD" EQUIPMENT. SCALE 1½"

jamb springs to insure tight joints and compensate for any expansion or contraction of the doors; special sills and braces for use at openings for passage or communicating doors. The regular finish of parts exposed only when the doors are folded open is a dead black, or plain finish to stain, but bronze or brass plated finish will be furnished, if specified.

Note: As the finishing hardware (butts, flush bolts, door pulls and lock or latch sets for passage doors) for folding partitions should always match the surrounding hardware, these items are not included. Architects should specify them with the "Finishing Hardware" for the building, specify either fast pin or loose pin butts, or invisible hinges as desired. Specify—Flush Bolts shall be The Topping Manufacturing Company No. 609 with the proper backset to center the doors (made with ⅞, 1, 1⅛, 1¼, 1½ and 1¾-in. backsets) and bolt head to fit the slot in floor guide. Door pulls shall be The Topping Manufacturing Company No. 608, finish to match other hardware in parts where these occur.



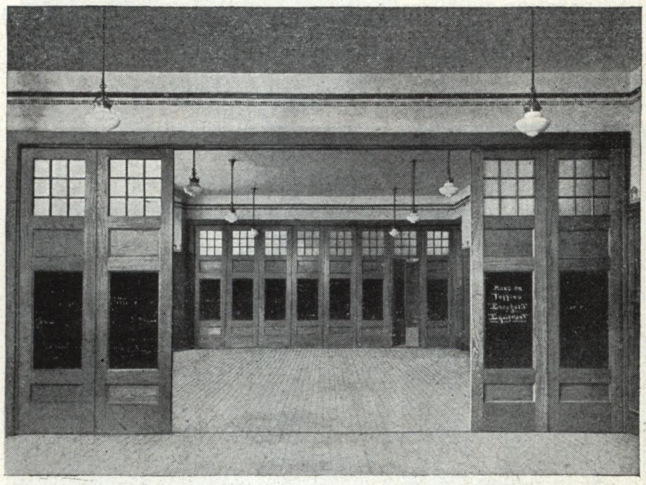
Weaver High School, Hartford, Conn.

Frank Irving Cooper Corp., Architects

A folding partition, 63 ft. in length, operating on Topping "Easyfold" Equipment, between the lunch room and cafeteria, provides easy means of throwing both rooms into one

Specification—The doors, jambs, head trim and other woodwork of folding partitions, where shown on the drawings, shall be made according to the details by a mill satisfactory to the architect, and furnished with Topping "Easyfold" equipment No. 10600 (or No. 10600 with parts exposed when doors are open, bronze or brass plated) for operating same and installed by the contractor according to details and instructions supplied by the manufacturers, The Topping Manufacturing Company, Ashland, Ohio.

For butts [invisible hinges], flush bolts and door pulls (latch or lock set for passage door) see Specification for "Finishing Hardware."



Milford School, Newark, N. J.

Guilbert & Betelle, Architects

The doors in these partitions slide to one end and fold in pockets having hinged doors. The partition doors are entirely out of sight when open. The passage or wicket doors in each partition permit communication between the rooms when the partitions are closed.

Partitions hung on Topping "Easyfold" are the easiest to operate of all folding partitions

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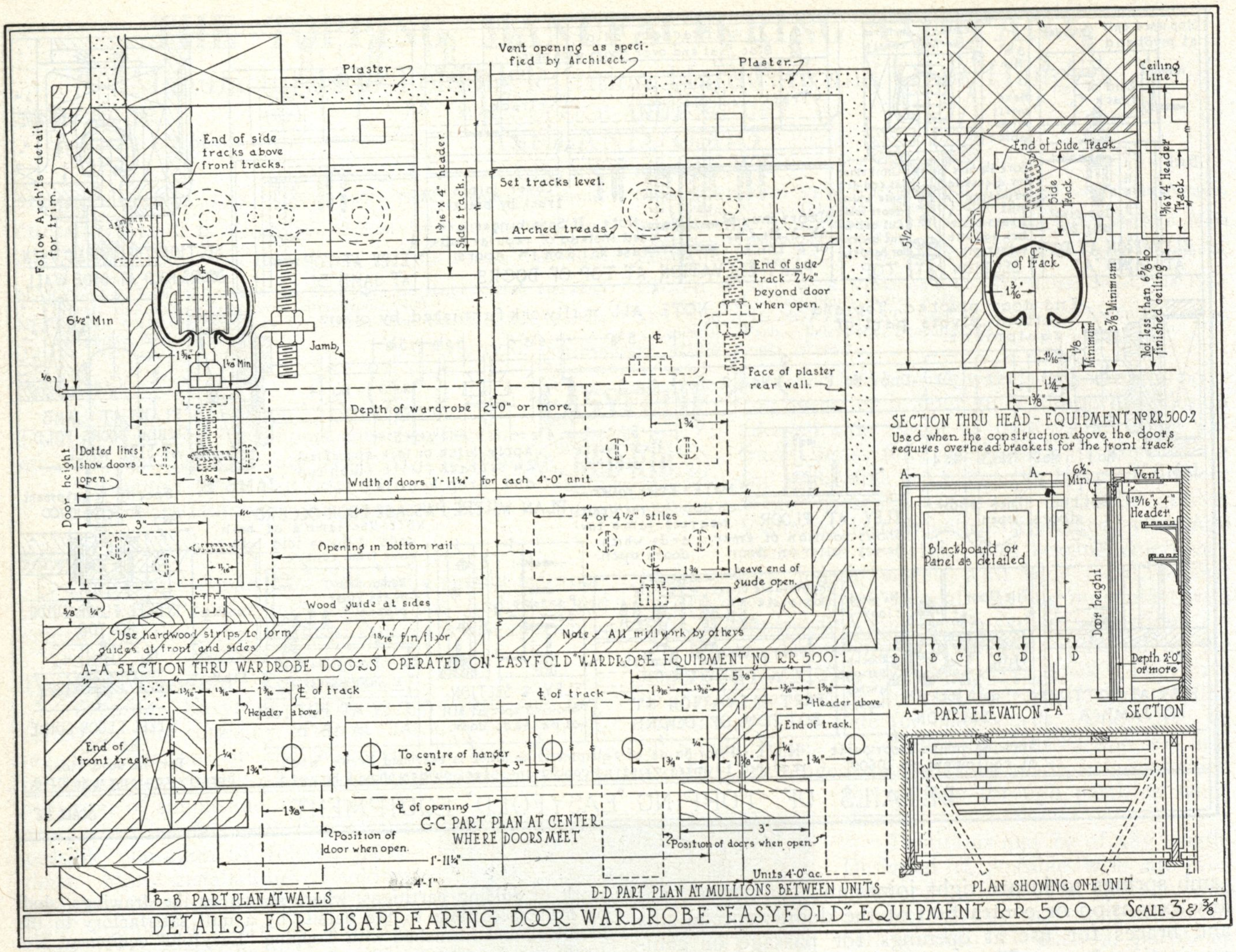
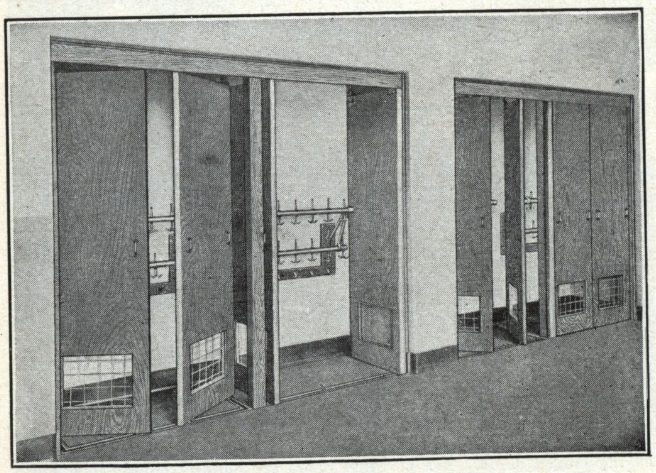

Vent opening as specified by Architect.
Plaster.
Plaster.
Follow Arch'ts detail for trim.
End of side tracks above front tracks.
13/16" x 4" header
Side track.
Set tracks level.
Arched treads
End of side track 2½" beyond door when open.
Face of plaster rear wall.
6½" Min
1/8
1 3/16"
1⅛" Min
Jamb
Depth of wardrobe 2'-0" or more.
1¾"
Dotted lines show doors open.
Door height
1¾"
Width of doors 1'-11¼" for each 4'-0" unit.
4" or 4½" stiles
3"
Opening in bottom rail
11/16"
1¾
Leave end of guide open.
Wood guide at sides
5/8"
1/4"
Use hardwood strips to form guides at front and sides
13/16" fin. floor
Note – All millwork by others
A-A SECTION THRU WARDROBE DOORS OPERATED ON "EASYFOLD" WARDROBE EQUIPMENT NO RR 500-1
Ceiling Line
End of Side Track
Side Track
13/16 x 4" Header Track
5½"
℄ of track
1 3/16"
11/16"
1⅛ Minimum
3⅜" Minimum
Not less than 6⅝ to finished ceiling
1¼"
1⅜"
SECTION THRU HEAD – EQUIPMENT Nº RR 500-2
Used when the construction above the doors requires overhead brackets for the front track
13/16" 13/16 1 3/16 ℄ of track
Header above
End of front track
1/4"
1¾"
To centre of hanger
3"
3"
℄ of track
℄ of opening
1⅜"
Position of door when open.
C-C PART PLAN AT CENTER WHERE DOORS MEET
1'-11¼"
4'-1"
B-B PART PLAN AT WALLS
5⅛"
1 3/16" 13/16"
13/16" 1 3/16"
Header above.
End of track.
1/4"
1¾"
1⅛"
1/4"
1¾"
3"
Position of doors when open.
Units 4'-0" ac.
D-D PART PLAN AT MULLIONS BETWEEN UNITS
A A A A
Blackboard or Panel as detailed
B B C C D D
PART ELEVATION
6½" Min.
Vent
13/16" x 4" Header
Door height
Depth 2'-0" or more
SECTION
PLAN SHOWING ONE UNIT
SCALE 3" & ⅜"

DETAILS FOR DISAPPEARING DOOR WARDROBE "EASYFOLD" EQUIPMENT RR 500

Topping "Easyfold" Wardrobe Equipment for Disappearing Doors

Designed to prevent open doors protruding into the room, to provide accurate and positive adjustment, ease of operation and simplicity of installation. Door plates require no mortising.

Safety, Compactness, Accessibility—Wardrobes and teachers' closets in classrooms equipped with Topping "Easyfold" No. RR500 offer no obstruction in aisles, doors disappear into wardrobe when opened, and do not project into room beyond extreme projection of casings or wall line of recess, thus removing a dangerous obstruction in case of fire or panic. With doors open, all parts of wardrobe are easily accessible.



Underwood School, Newton, Mass.
Herbert W. Colby, Architect
Equipped with "Easyfold" wardrobe equipment

Equipment Supplied—"Easyfold" consists of: heavy overhead track with arched treads for front and sides of each unit; brackets constructed to permit accurate alignment and clamp rigidly; lag screws and bolts for securing them to headers. Hangers with dustproof ball bearing swivel, insure perfect alignment as doors disappear, and positive vertical adjustment. Door guides with wide rim ball bearing wheels for bottom of doors. Felt strip to be glued to each jamb to deaden the sound of doors striking against the jambs when closing.

Note: Construct the floor guide of hard maple strips, beveled one edge, laid ¾ in. apart, at front and sides or provide slot in floor, as desired. Angle guides can be furnished when specified. Equipment No. RR500-1 requires 6½-in. headroom above door. Equipment No. RR500-2 requires 5½-in. headroom above the door, and the distance top of door to finished ceiling is 6⅝ in. for the side tracks. Doors must be 1⅜ or 1¼ in. thick. 4-ft. wardrobe units with doors 1 ft. 11¼ in. wide must be 2 ft., or more, in the clear in depth.

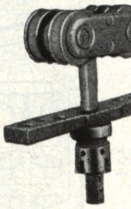
Specifications—Wardrobes (and Teachers' Closets), constructed as detailed, shall be built in by the contractor, doors to be 1⅜ in. [1¼ in.] thick with Topping "Easyfold" Equipment No. RR500-1 [No. RR500-2] furnished and installed by the contractor, according to details and instructions supplied by the manufacturers, The Topping Manufacturing Company, Ashland, Ohio.

Note: Specify blackboards on doors, ventilator grilles, shelves and umbrella racks, if desired. Specify door pulls (friction catches if wanted) and coat hooks with "Finishing Hardware."

Continued on next page

Topping "Red Rib" Accordion Door Equipment

Topping "Red Rib" Equipment for sliding doors of accordion type with a half door at jamb (or jambs) was designed to overcome the difficulties many have experienced with accordion doors. Its construction eliminates all side friction and lost motion. The adjustment is easily accessible and can not shift. It permits the use of tandem wheel hangers on 1⅜-in. doors as on the thickest doors.



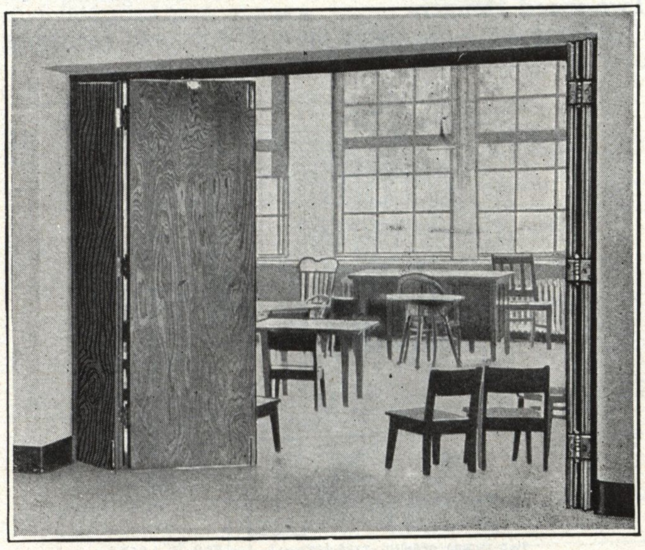
Hanger

Description—Heavy track with arched treads clamped rigidly by brackets of extra heavy construction. Hangers of great strength of malleable iron and steel forgings. Double grooved wheels span the slot and prevent side friction. Dustproof ball bearing swivel. Vertical adjustment is locked by castellated nut and cotter pin.

Vertical Adjustment of Half Doors Possible—Half doors hung on "Easyfold" Adjustable Pivots No. 604 may be adjusted vertically to perfect alignment with full width doors. Half doors hinged to jambs have no vertical adjustment, preventing true alignment of all doors. "Easyfold" pivots on half doors insure an easier operation of the doors and eliminate trouble if building settles.

Low Headroom—Minimum distance between header and soffit for light doors is 2⅞ in.; for heavy doors, 1¾ in. thick or thicker, 3⅜ in. is required. If half door is pivoted, *increase* minimum headroom ½ in.

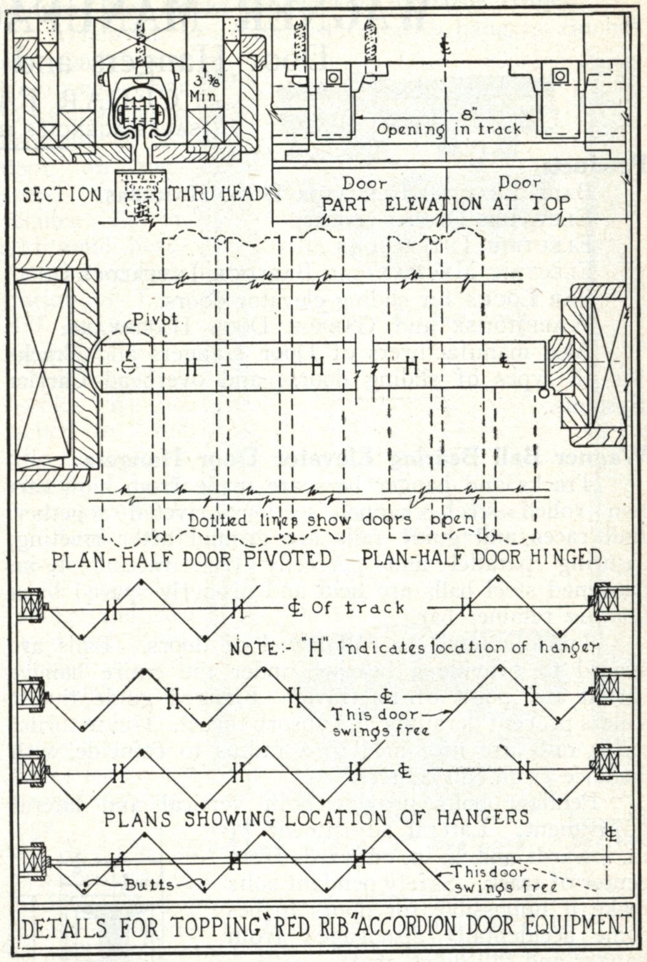
Doors—Openings may have any number of doors. Doors should not exceed 3 ft. in width. If the half door is to be pivoted, it must be exactly one-half the width of full doors *plus* 1⅛ in. If the half door is to be hinged to jamb, it must be exactly one-half the width of full doors *less* the distance from center of track to center of butt pin. Hangers are required for every other door beginning with the door farthest from the half door.



Underwood School, Newton, Mass.
HERBERT W. COLBY, Architect
Accordion doors operate on Topping "Red Rib" hangers.
Half doors pivoted

Specifications—Furnish and install for all accordion doors "Red Rib" Accordion Door Hangers No. 105B, Track No. 92 and Brackets No. 092C spaced as recommended by the manufacturers.

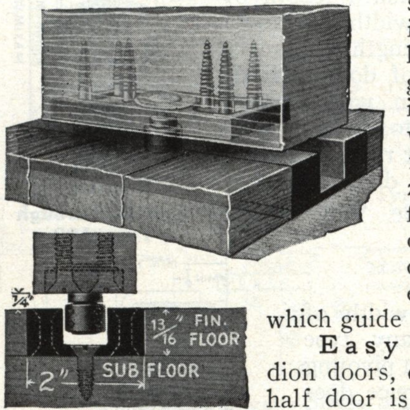
Note: For doors 1⅜ in. thick, or for light 1¾-in. doors, specify "Red Rib" Hangers No. 105A, Track No. 91 and Brackets No. 091C. Specify "Easyfold" Pivots No. 604, butts, flush bolts and lock trim for these doors under "Finishing Hardware."



DETAILS FOR TOPPING "RED RIB" ACCORDION DOOR EQUIPMENT

Accordion Door and Floor Guides

Heavy cold rolled steel floor guides $\frac{13}{16}$ in. thick by 2 in. wide, ¾-in. slot with parallel sides, top and sides square and true, finished smooth and lacquered. Door guides of malleable iron with ball bearing wheels with wide face run in a horizontal position in the floor guide make the operation of accordion doors 50% easier than doors on which guide pins are used.



Accordion Door and Floor Guides

Easy Operation—Accordion doors, of the type where a half door is used, have a tendency to cramp at the bottom, due to the manner in which they are hinged together. The use of the Topping Floor Guide No. 750 and Topping Door Guides No. 753½ overcomes this difficulty. They should be specified in all cases, together with the Topping "Red Rib" Accordion Door Equipment, where the ease of operation is the principal factor, being omitted only when the "lowest possible cost" is the most essential point to be considered.

Specifications—Furnish and install for all accordion doors Topping Floor Guide No. 750 the full width of openings and Topping Door Guide No. 753½ for every other full width door.

WAGNER MANUFACTURING COMPANY

Door Hangers and Hardware Specialties

CEDAR FALLS, IOWA

SALES AGENCIES IN ALL LARGE CITIES

Products

Ball Bearing Elevator Door Hangers.
Elevator Door Closers.
Electric Interlocks.
Electric Mechanical Barlock Interlocks.
Bar Locks for sliding elevator doors.
Warehouse and Garage Door Hardware.

Also manufacturers of Door Hangers and Tracks for all types of sliding doors; and overhead Carrier Systems.

Wagner Ball Bearing Elevator Door Hangers

Tracks and hanger bars are made from high carbon rolled steel channel sections riveted together. Ball races and guide rails are ground after riveting, insuring parallel and perfectly true races. ⅝-in. hardened steel balls are held and properly spaced by a floating retainer bar.

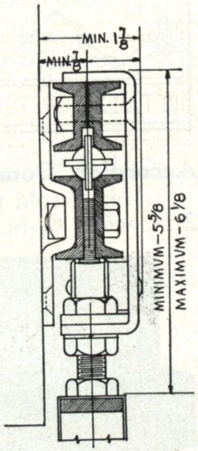
Track extends to full travel of doors. Balls are spaced to provide a bearing under the entire hanger bar at any point of its travel. Flanged guide thrust rollers prevent derailing and absorb thrust. Guide thrust roller rails are machined to a radius to coincide with distance from ball centers.

Pendant bolts provide both vertical and lateral adjustment. Lateral adjustment ¼ in. inwards and ⅜ in. outwards from center of track. Safety pendant bolts make it impossible for doors to become accidentally disengaged from hanger and fall down shaft.

Single Sliding Hangers

Type 100—For doors weighing up to 200 lb. Standard length of hanger twice the width of doors minus back lap. Length of hanger bar same as width of door. Headroom required 5⅝ in. with pendant bolt adjusting up to 6 in. Wall brackets vary to meet requirements.

Type 103—For doors weighing from 200 to 400 lb. Construction similar to Type 100.


MIN. 1 7/8
MIN. 7/8
MINIMUM-5 5/8
MAXIMUM-6 1/8

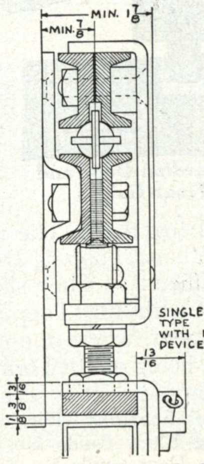
Section Through Type 100

Pivoting Devices

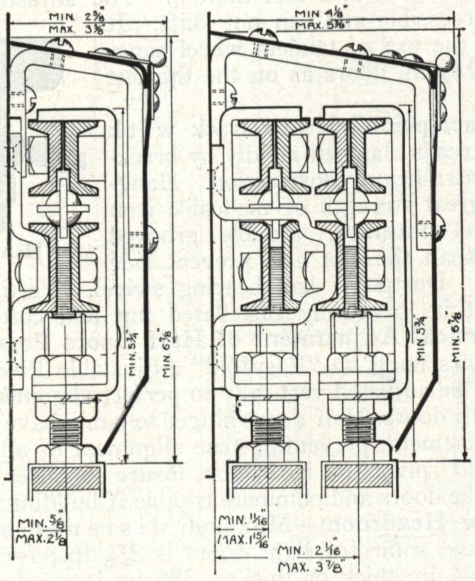
To make full width of opening available, any type may be provided with pivoting device. Pivoting device does not include hinges for panel or flush bolts for bottom of doors. Plain pivot pin for inserting in reinforcement built into hollow metal or tube doors, or pivot pin riveted in an angle to be attached to kalamein or wood doors, furnished as requested.

Specify type of hanger required, and order pivoting device extra.

When swinging transom bar is used to which the hanger is attached and transom bar, sliding doors, and panel swing out as one unit, pivoting devices are not required.


MIN. 1 7/8
MIN. 7/8
SINGLE SLIDING. TYPE 100 WITH PIVOTING DEVICE
13/16
1/8
3/8
3/16

Section Through Type 100 with Pivoting Device


MIN. 2 3/8"
MAX. 3 3/8"
MIN. 5 3/4"
MIN. 6 7/8
MIN. 5/8"
MAX. 2 1/8
MIN. 4 1/8"
MAX. 5 3/8"
MIN. 5 3/4
MIN. 6 7/8
MIN. 11/16"
MAX. 1 15/16
MIN. 2 1/16"
MAX. 3 7/8"

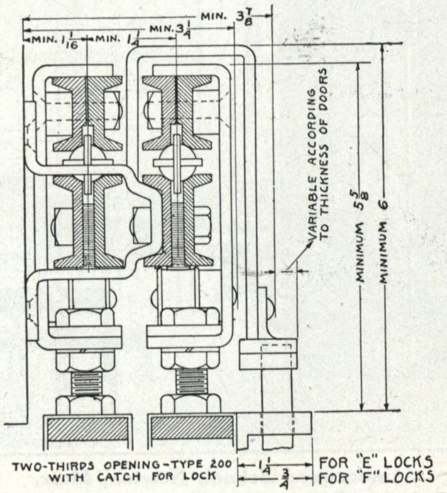
Single-speed with Hood   Two-speed with Hood

Hinged Hoods for Protecting Hangers

Furnished extra, not as part of hangers

Two-speed Hangers

Type 200—For doors up to 150 lb., and for doors over 150 lb. to 300 lb.


MIN. 3 7/8
MIN. 3 1/4
MIN. 1 1/16
MIN. 1 1/4
VARIABLE ACCORDING TO THICKNESS OF DOORS
MINIMUM 5 5/8
MINIMUM 6
TWO-THIRDS OPENING-TYPE 200 WITH CATCH FOR LOCK
1 1/4 FOR "E" LOCKS
3/4 FOR "F" LOCKS

Section Through Type 200 with Bar Lock Catch Bracket

Standard length of hanger, full width of opening plus width of widest sliding door and front lap.

Tracks extend to full travel of doors. No overhang.

Wall brackets and spacers between tracks provide for various thicknesses of doors. Equipped with the Wagner patented gearless two-speed operating device which provides a two-speed movement without the use of racks and pinion, levers or chains.

This device is absolutely noiseless, extremely simple and very durable.

Type 202—Same as Type 200 except that two-speed operating device is omitted. For use with Wagner door closers.

Continued on next page

Center Parting Hangers

Type 500—For doors up to 200 lb. each equipped with Wagner sliding chain drive operating device.

This operating device is noiseless, simple and very durable.

Type 503—For doors weighing from 200 to 300 lb. each.

Construction similar to Type 500.

Type 400—For doors weighing up to 200 lb. each, equipped with rack and pinion operating device.

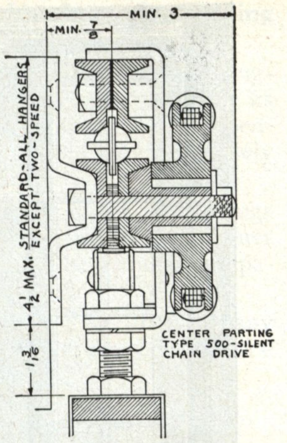
Type 403—For doors weighing from 200 to 400 lb. each.

Construction similar to Type 400.

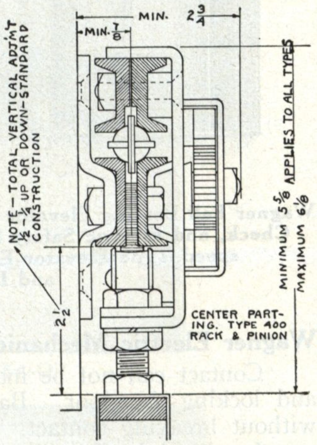
Type 404—For bi-parting doors weighing 400 lb. or more each, not equipped with operating device.

Each door operates independently. Largely used for main entrances and heavy grilles.

Standard length of center parting hangers, width of opening plus width of both doors plus center gap, if any.


MIN. 3
MIN. 7/8
4 1/2 MAX. STANDARD-ALL HANGERS EXCEPT TWO-SPEED
1 3/16
CENTER PARTING TYPE 500-SILENT CHAIN DRIVE

Section Through Type 500


MIN. 2 3/4
MIN. 7/8
NOTE - TOTAL VERTICAL ADJ'M'T 1/2 - 1/4 UP OR DOWN-STANDARD CONSTRUCTION
2 1/2
MINIMUM 5 5/8 APPLIES TO ALL TYPES
MAXIMUM 6 1/8
CENTER PARTING. TYPE 400 RACK & PINION

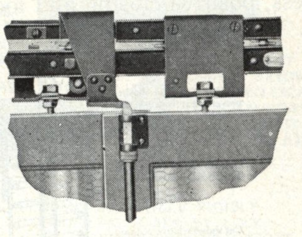
Section Through Type 400

Wagner Bar Locks for Sliding Elevator Doors

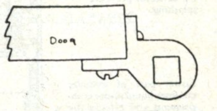
When bar locks are ordered with hangers, catches are built into hanger. Bar locks attached to back stile of fast door on two-speed openings require 3/8 in. additional headroom. See illustration of Type 200 on preceding page.

When bar locks are attached to front stile of door no additional headroom is required.

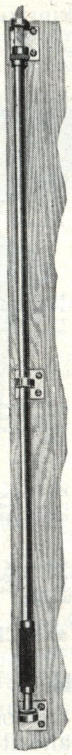
Lock rods are made from 5/8-in. seamless tubing and are fitted with 7/8-in. knurled handhole which also serves as a spring retainer. Brackets are heavy brass castings.



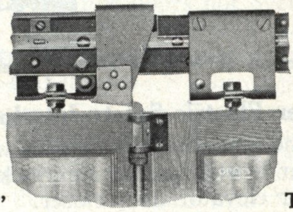
Type "E" Bar Lock



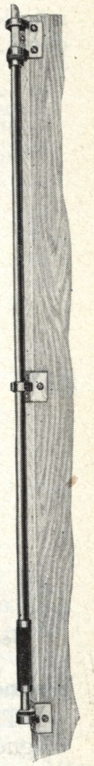
Bracket for Type "F" Bar Lock



Type"E" Bar Lock



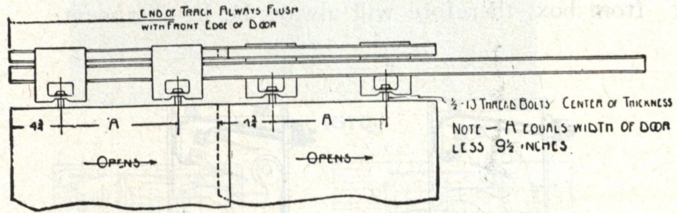
Type "F" Bar Lock



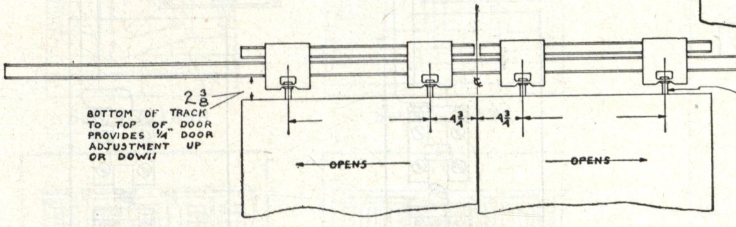
Type "F" Bar Lock

Type E locks project 1¼ in. and Type F project ¾ in. from face of door. Type E may be located on either stile, but Type F lock can be used only on back stile. Furnished in black oxidized and polished brass finishes.

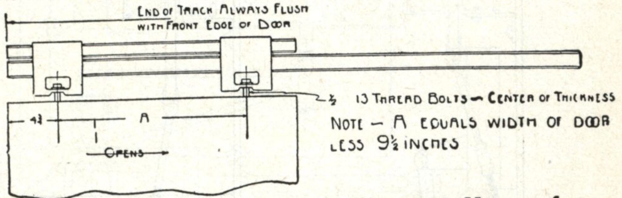
Information Required—Specify style, finish, type of door: wood, kalamein, hollow metal or iron; hand of slide and which stile lock is to be mounted on.


END OF TRACK ALWAYS FLUSH WITH FRONT EDGE OF DOOR
½-13 THREAD BOLTS CENTER OF THICKNESS
4 3/4
A
4 3/4
A
NOTE - A EQUALS WIDTH OF DOOR LESS 9½ INCHES
OPENS
OPENS

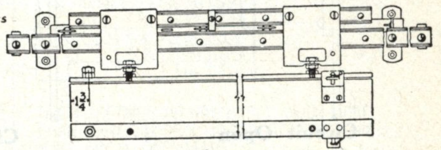
Type 200 or 202 Hanger for Two-speed Doors


2 3/8
BOTTOM OF TRACK TO TOP OF DOOR PROVIDES 1/4 DOOR ADJUSTMENT UP OR DOWN
4 3/4
4 3/4
½-13-U.S.S. THREAD BOLTS
OPENS
OPENS

Type 400 or 500 Center Parting Hangers


END OF TRACK ALWAYS FLUSH WITH FRONT EDGE OF DOOR
½ 13 THREAD BOLTS - CENTER OF THICKNESS
4 3/4
A
NOTE - A EQUALS WIDTH OF DOOR LESS 9½ INCHES
OPENS

Type 100 Hanger for Single Sliding Door



Type 100 Hanger—Single Sliding Door with Pivoting Device

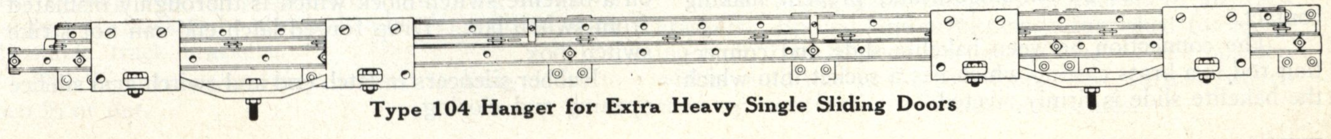
Type 104 Hanger for Extra Heavy Single Sliding Doors

For doors weighing from 400 to 600 lb.

Doors supported by 4 hanger brackets which are made from heavier material than the standard brackets and coupled in pairs with a heavy bridge bar to which the pendant bolts are attached, distributing the load over the entire length of the hanger bar.

Wall brackets are also made from heavier material than the standard wall bracket and are spaced according to weight of door carried.

This type can be furnished to carry doors weighing up to 3000 lb.

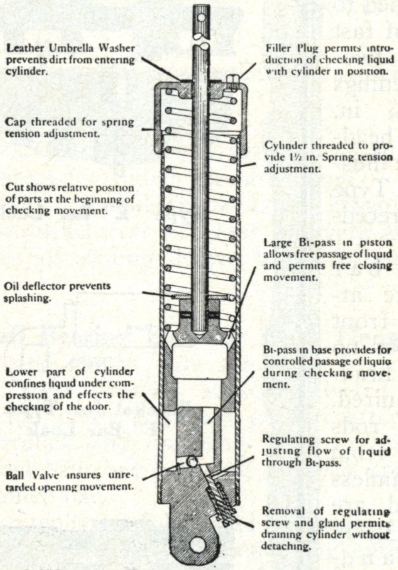


Type 104 Hanger for Extra Heavy Single Sliding Doors

Continued on next page

Wagner Elevator Door Closer and Check

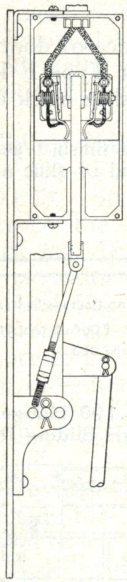
Wagner door closer and check insures automatic, noiseless, positive closing and locking of sliding elevator doors.


Leather Umbrella Washer prevents dirt from entering cylinder.
Cap threaded for spring tension adjustment.
Cut shows relative position of parts at the beginning of checking movement.
Oil deflector prevents splashing.
Lower part of cylinder confines liquid under compression and effects the checking of the door.
Ball Valve insures unretarded opening movement.
Filler Plug permits introduction of checking liquid with cylinder in position.
Cylinder threaded to provide 1½ in. Spring tension adjustment.
Large Bi-pass in piston allows free passage of liquid and permits free closing movement.
Bi-pass in base provides for controlled passage of liquid during checking movement.
Regulating screw for adjusting flow of liquid through Bi-pass.
Removal of regulating screw and gland permits draining cylinder without detaching.

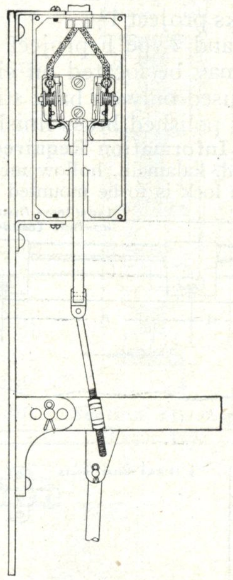
Section of Wagner Door Closer and Check Cylinder

Wagner Electric Safety Interlocks

The illustrations below show the construction of the Wagner electric safety interlock and its relation to the Wagner elevator door closer.



Circuit Open

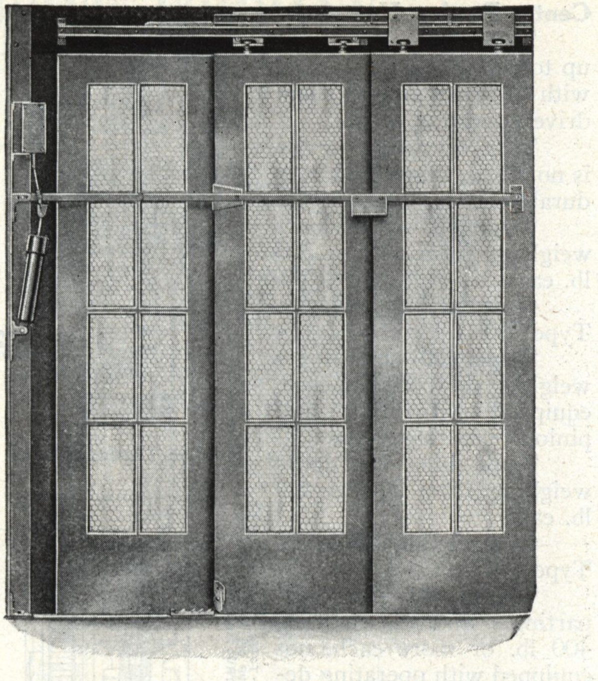


Circuit Closed

The copper contact block is made especially heavy. The bronze fingers do not touch the bakelite slide. The springs do not function as conductors. The current is shorted from the fingers to the binding posts by means of stranded jumpers which are firmly soldered to the contact fingers.

A piece of fiber rod is inserted in the bakelite slide directly below the copper contact. Should the bakelite slide become disconnected and drop down, the fiber rod would rest on the switch fingers and prevent making contact.

The connection between bakelite slide and connection rod is a brass casting which has a socket into which the bakelite slide is firmly riveted.

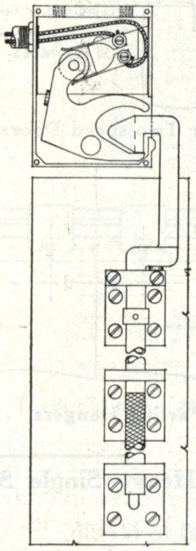


Wagner Ball Bearing Elevator Door Hanger, Door Closer and Check, and Electric Safety Interlock as Applied to Two-speed Type Elevator Enclosure—Doors Closed and Locked

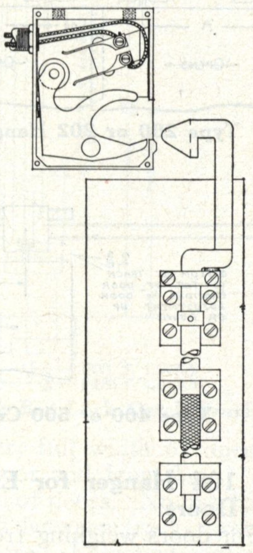
Wagner Electric Mechanical Barlock Interlock

Contact can not be made without latching barlock and locking the door. Barlock can not be unlatched without breaking contact.

Insulated rotary contact is mounted on arm which is pivoted to switch box. Contact is not withdrawn from box, therefore will always be in alignment.



Closed



Open

The phosphor bronze switch fingers are mounted on a bakelite switch block which is thoroughly insulated from switch box. Drop forged latch end can not strike switch box.

Rubber silencers in latch end and switch arm silence opening and closing.

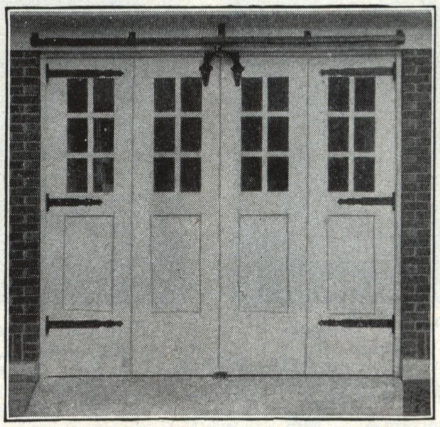
Continued on next page

Wagner Cloztite Garage Door Hardware for Folding Sliding Doors

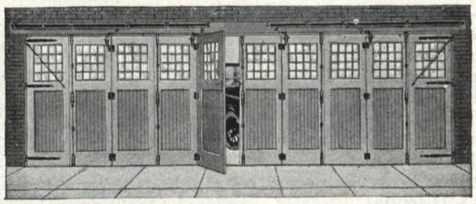
Doors hung with Wagner Cloztite garage door hangers will fit between jambs and against stops the same as an ordinary hinged door, insuring a weathertight opening. Pivoted arm permits doors to fold together closely at both 90° and 180°.

Complete hardware for hanging doors in openings with from two to ten doors, packed in sets. Wagner Cloztite hangers and tracks will also be furnished separately if complete sets are not desired.

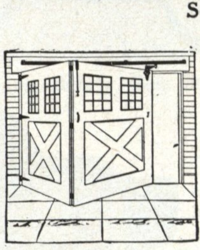
The illustrations below show a few of the many combinations that can be made with Wagner Cloztite garage door hardware.



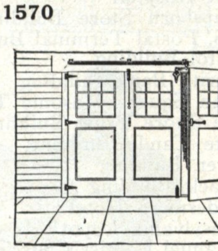
Set No. 1554-O



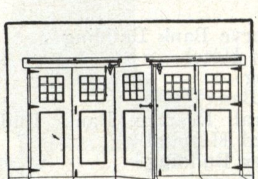
Set No. 1570



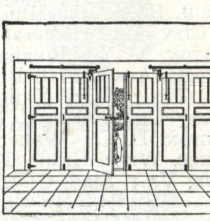
Set No. 1552



Set No. 1558



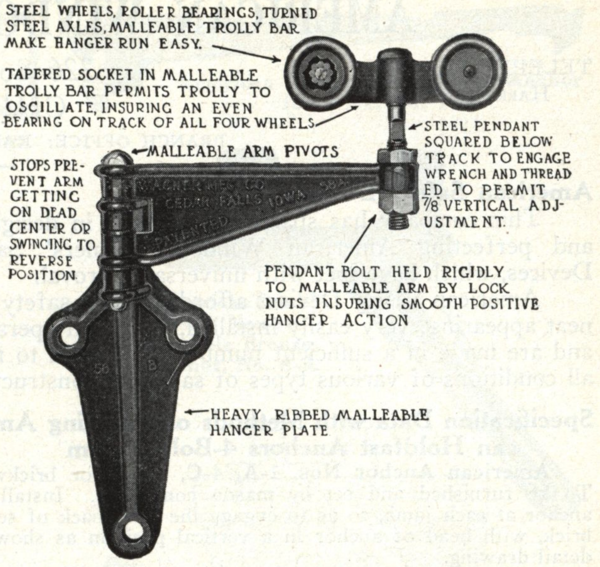
Set No. 1555



Set No. 1556

When three or more doors are hinged together each door should not be over 36 in. wide. When only two doors are hinged together each door may be 48 in. wide. The pivoting arm compensates for the swing of doors, and permits track to be attached to header without using adjustable track brackets.

The same hardware may be used to hang doors to open in or out.


STEEL WHEELS, ROLLER BEARINGS, TURNED STEEL AXLES, MALLEABLE TROLLY BAR MAKE HANGER RUN EASY.
TAPERED SOCKET IN MALLEABLE TROLLY BAR PERMITS TROLLY TO OSCILLATE, INSURING AN EVEN BEARING ON TRACK OF ALL FOUR WHEELS
STEEL PENDANT SQUARED BELOW TRACK TO ENGAGE WRENCH AND THREADED TO PERMIT 7/8 VERTICAL ADJUSTMENT.
MALLEABLE ARM PIVOTS
STOPS PREVENT ARM GETTING ON DEAD CENTER OR SWINGING TO REVERSE POSITION.
PENDANT BOLT HELD RIGIDLY TO MALLEABLE ARM BY LOCK NUTS INSURING SMOOTH POSITIVE HANGER ACTION
HEAVY RIBBED MALLEABLE HANGER PLATE

Wagner Cloztite—The Universal Hanger

No. 58 Cloztite Hanger—For doors not over 1¾ in. thick. Wheels 1⅞-in. diameter. Used with No. 15 track. Combined weights of doors carried by each hanger should not exceed 600 lb.

No. 59 Cloztite Hanger—Same as No. 58 except that it has longer arm for doors not over 2½ in. thick.

No. 78 Cloztite Hanger—For doors not over 2½ in. thick. Wheels 2¾-in. diameter. Used with No. 20 track. Combined weights of doors carried by each hanger should not exceed 1000 lbs.

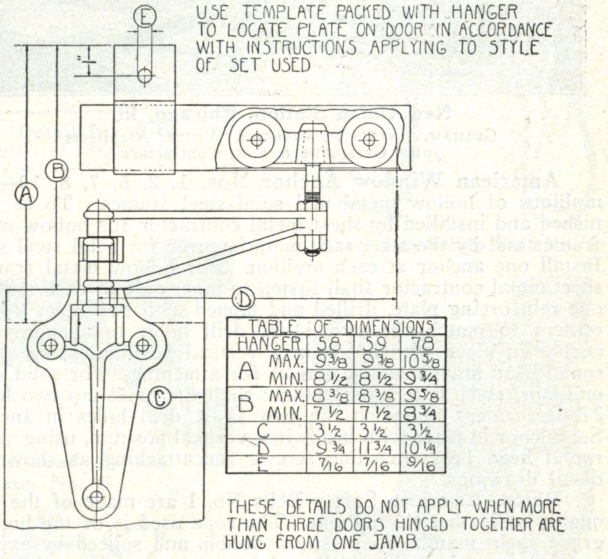

USE TEMPLATE PACKED WITH HANGER TO LOCATE PLATE ON DOOR IN ACCORDANCE WITH INSTRUCTIONS APPLYING TO STYLE OF SET USED
E
1
B
A
D
C
THESE DETAILS DO NOT APPLY WHEN MORE THAN THREE DOORS HINGED TOGETHER ARE HUNG FROM ONE JAMB

TABLE OF DIMENSIONS

HANGER		58	59	78
A	MAX.	9⅜	9⅜	10⅝
	MIN.	8½	8½	9¾
B	MAX.	8⅜	8⅜	9⅝
	MIN.	7½	7½	8¾
C		3½	3½	3½
D		9¾	11¾	10¼
E		7/16	7/16	9/16

Installation Details

Note: For No. 1554 and No. 1554-O sets for hanging four doors—two to fold each way—add 2¼ in. to dimension "B" when hangers No. 58 and No. 59 are used, and $1\frac{5}{16}$ in. when hanger No. 78 is used, and disregard dimension of 1 in. between center of hole and top of bracket, to provide additional head room required for Style No. 6 bracket.

See Catalogue for complete dimensions of all track brackets. Special blue print details furnished for hanging from 7 to 10 doors in one opening. State number, widths and thicknesses of doors, and furnish sketch showing construction of header and jambs.

AMERICAN WINDOW SAFETY DEVICE CO.

TELEPHONE
Harrison 6421-6411

326 South State Street
CHICAGO, ILL.

WAREROOM
673 W. Madison Street
Telephone, Monroe 4380

BRANCH OFFICE: KANSAS CITY, MO., 1912 Walnut Street

American Safety Devices

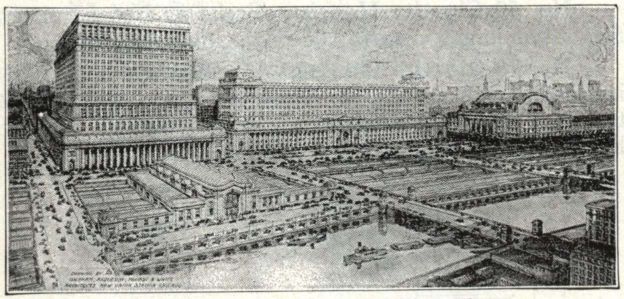
This company has spared no expense in designing and perfecting American Window Cleaners' Safety Devices, which have met with universal approval.

American Safety Devices afford absolute safety, are neat appearing, very easily installed, simple in operation and are made in a sufficient number of designs to meet all conditions of various types of sash and construction.

Specification Data with Methods of Installing American Holdfast Anchors 4-Bolt System

American Anchor Nos. 1-A, 4-C, 9-A—For brickwork. To be furnished and set by mason contractor. Install one anchor at each jamb, so as to engage the joint back of second brick, with head of anchor in a vertical position as shown in detail drawing.

American Anchor Nos. 6-F, 6-S, 3-C, 8-A—For wood. To be furnished and installed by carpenter contractor. Install one anchor at each jamb with head inclined toward window opening, in a vertical position. Bore one $\frac{7}{16}$-in. hole through staff bead and pulley stile. Set anchor with bolt in place, attach plain and lock washers, then nut and tighten up as shown in detail drawings.



New Union Station, Chicago, Ill.
Graham, Anderson, Probst & White, Architects
John Griffiths & Son, Contractors

American Window Anchor Nos. 1, 2, 6, 7, 8, 10—For mullions of hollow metal and solid steel frames. To be furnished and installed by sheet metal contractor for hollow metal frames and by the steel sash manufacturer for solid steel sash. Install one anchor at each mullion. For hollow metal frames, sheet metal contractor shall fasten to inner side of each mullion one reinforcing plate, drilled and tapped with two holes $2\frac{3}{16}$-in. centers to match the two $\frac{11}{32}$-in. drill holes in anchor. Set anchor in place with heads in a vertical position, using $\frac{5}{16}$-in. round head brass machine screws for attaching. For solid steel mullions, steel sash manufacturer shall drill and tap two holes $2\frac{3}{16}$-in. centers to match the two $\frac{11}{32}$-in. drill holes in anchor. Set anchor in place with heads in a vertical position, using $\frac{5}{16}$-in. round head brass machine screws for attaching as shown in detail drawings.

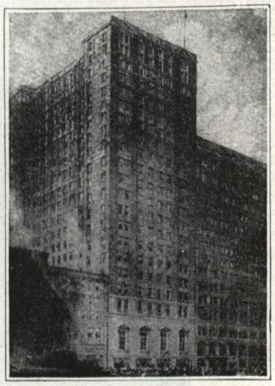
Belts—American Safety Belts No. 1 are made of the best quality of leather throughout. The rope used is of the highest grade yacht manila, four stands, double and spliced by experienced help only. Shoulder and breast straps are adjustable, assuring comfort and safety to the window washer.

American Safety Belt No. 2 is made of solid leather rope. (See assembly details.)

American Anchors No. 11 for Concrete—To be furnished and installed by mason contractor. Install one anchor at each jamb. First bore 1¼-in. hole in wood form, wedge anchor in place, with head in a vertical position. After concrete has set, pull board over head.

Directions for Installing—All American Safety Devices must be installed 42 to 45 in. above sill.

Palmer House, Chicago, Ill.
Holabird & Roche, Architects
Thompson-Starret Co., Contractors

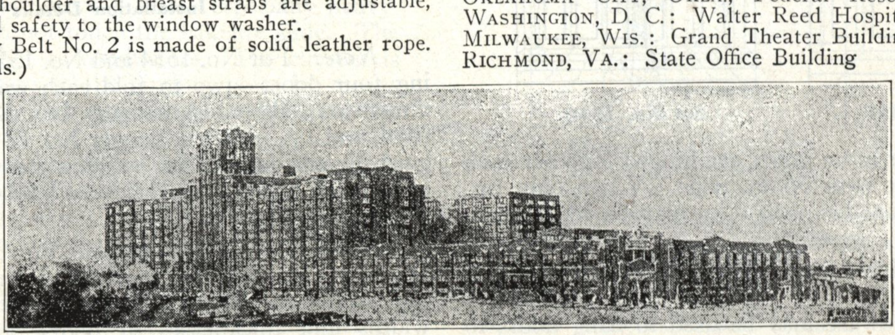


Sherman House, Chicago, Ill.
Holabird & Roche, Architects
G. A. Fuller & Co., Contractors

Installations

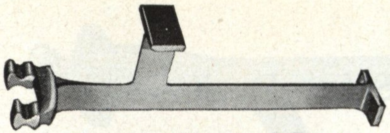
Chicago, Ill.:
- Bell Telephone Building
- Sovereign Hotel
- Embassy Hotel
- Crane Technical College
- Tilden High School
- Harborview Apartments
- Pullman High School
- Belden Hotel
- Chicago Trust Building
- Hirst Hospital
- Philipsborn Store Building
- U. S. Postal Terminal Building
- Capitol Building
- Security Bank Building
- Logan Square Masonic Temple
- Lake Shore Trust Building
- Bunte Candy Building
- Tower Building
- Schlack Building
- Windermere Hotel
- Pennsylvania Depot
- Immanuel Baptist Church
- Y. M. C. A. Building

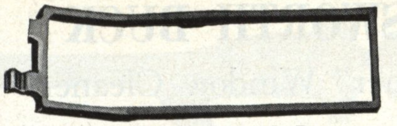
Pittsburgh, Pa.: Crane Building
Kansas City, Mo.: Federal Reserve Bank Building
Binghamton, N. Y.: Binghamton Hotel
Little Rock, Ark.: Hall Building
Houston, Tex.: State National Bank
Oklahoma City, Okla., Federal Reserve Bank Building
Washington, D. C.: Walter Reed Hospital
Milwaukee, Wis.: Grand Theater Building
Richmond, Va.: State Office Building

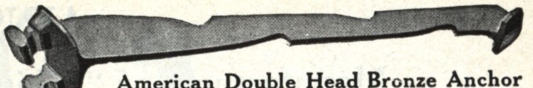


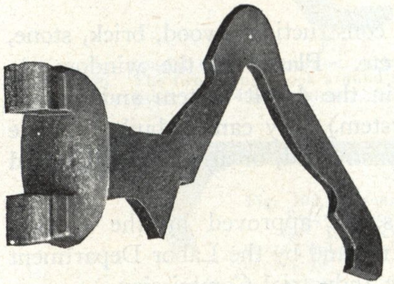
Sears, Roebuck & Co. Plant, Kansas City, Mo.—Truscon Windows
Geo. C. Nimmons & Co., Architects
B. & W. Construction Co., Contractors

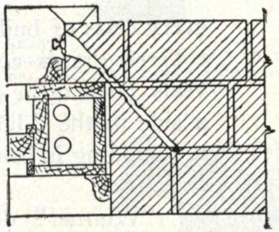
Continued on next page

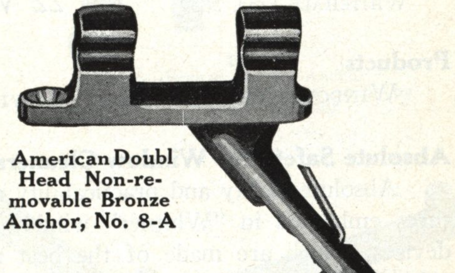

American Double Head Bronze Anchor, No. 4-C

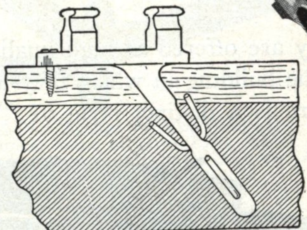

American Double Head Bronze Anchor, No. 9-A

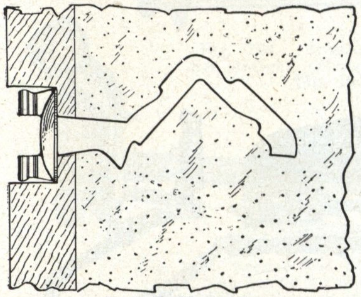

American Double Head Bronze Anchor for Brick, No. 1-A

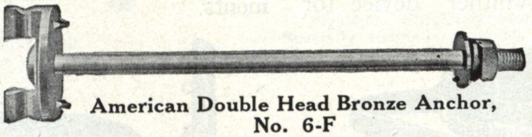

American Double Head Bronze Anchor for Concrete, No. 11

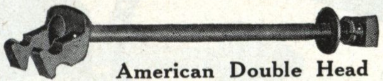

Detail No. 1-A
Manner of placing in reveal of wall. This anchor secures a bond of 8 in. into the masonry and can be used in face as well as reveal of wall

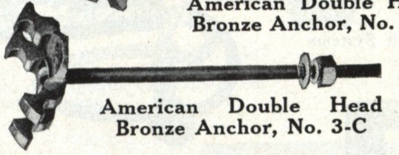

American Doubl Head Non-removable Bronze Anchor, No. 8-A

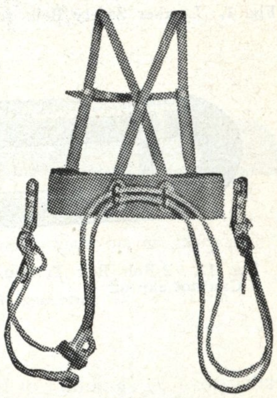

Detail No. 8-A
Side view of American non-removable anchor. No. 8-A can be installed in buildings already erected without damage to reveal. This device is approved by leading authorities

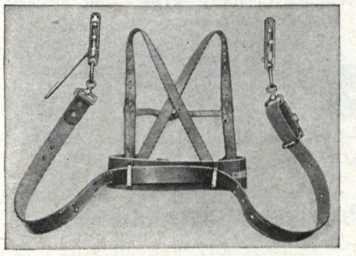

Detail No. 11
Manner of placing in reveal of wall. Anchor No. 14 can be used in face as well as reveal of wall

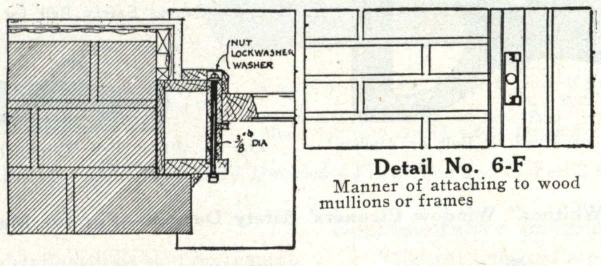

American Double Head Bronze Anchor, No. 6-F


American Double Head Bronze Anchor, No. 6-S

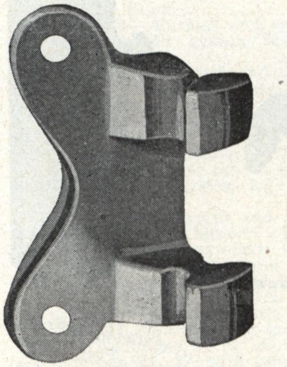

American Double Head Bronze Anchor, No. 3-C

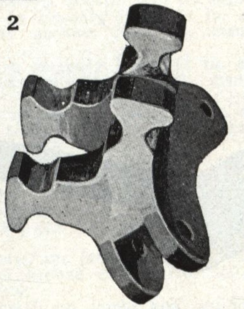

American Safety Belt No. 1

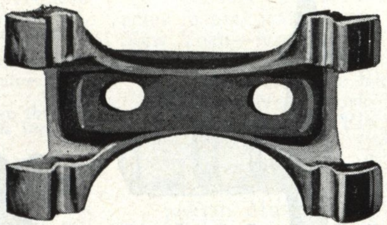

American Safety Belt No. 2

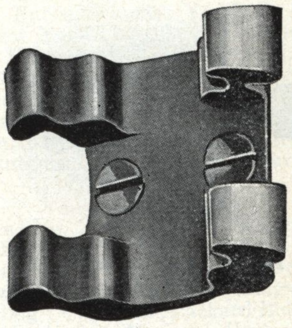


Detail No. 6-F
Manner of attaching to wood mullions or frames

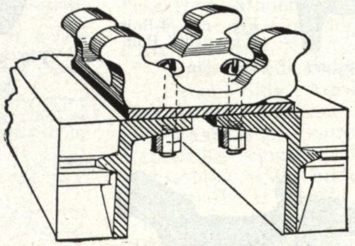

American Double Head Bronze Drill Plate, No. 8

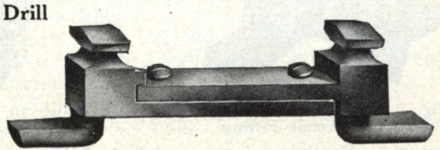

American Four-head Bronze Drill Plate, No. 7

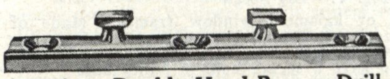

American Four-head Bronze Drill Plate, No. 6

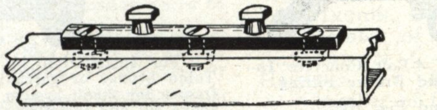

American Double Head Bronze Drill Plate, No. 2

BUILDING DEPARTMENT, CITY OF CHICAGO
APPROVED
MAR 2-1923
Plan Examiner


Detail American Four-head Drill Plate, No. 6


American Double Head for Campbell Metal Windows, No. 11-N


American Double Head Bronze Drill Plate No. 1


Detail American Double Head Bronze Drill Plate, No. 1

AINSWORTH BUCK

Manufacturer of "Whitner" Window Cleaners' Safety Devices

TELEPHONE
WHITEHALL 5755, 5859

22 Vesey Street, NEW YORK, N. Y.

Products

WINDOW CLEANERS' SAFETY DEVICES.

Absolute Safety for Window Cleaners

Absolute safety and practicability are essential features embodied in "Whitner" window cleaners' safety devices, which are made of the best materials obtainable.

They are offered as high quality products that will outlast the building in which they are installed.

There is a distinct style of "Whitner" device for every class of building construction—wood, brick, stone, concrete, terra cotta, etc. Placed in the window reveals (two on a side in the 4-bolt system and one on a side in the 2-bolt system) they can be built in while the building is being constructed, or attached to finished structures.

"Whitner" devices are approved by the Underwriters' Laboratories, Inc. and by the Labor Department of the New York State Industrial Commission.

Special devices made to meet architects' requirements.

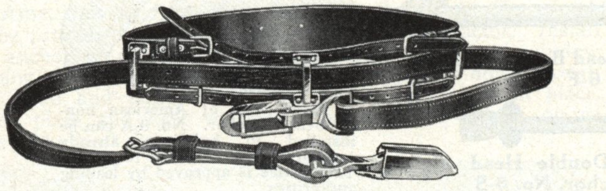


Fig. 1. Leather Safety Belts for Window Cleaners—2 or 4-Bolt Systems

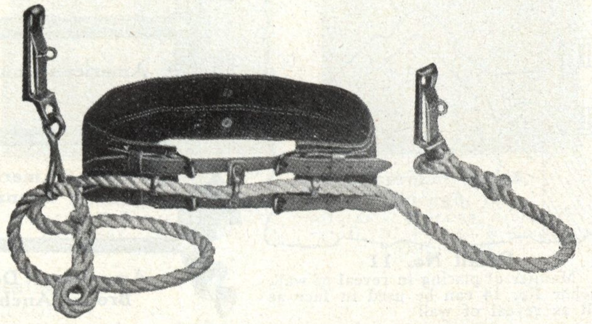


Fig. 8. Canvas Safety Belt for Window Cleaners—2 or 4-Bolt Systems

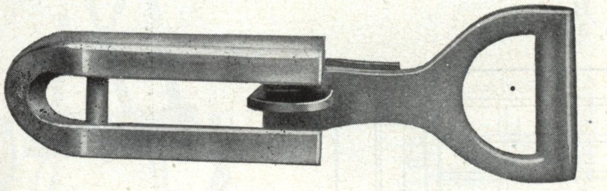


Fig. 12. 2-Bolt Belt Terminal—Locks on Head of Bolt or Anchor
Can not slip off

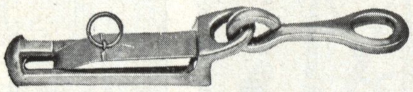


Fig. 3. 4-Bolt Belt Terminal—Locks on Head of Bolt or Anchor
Can not come off

"Whitner" Window Cleaners' Safety Devices—For the Man

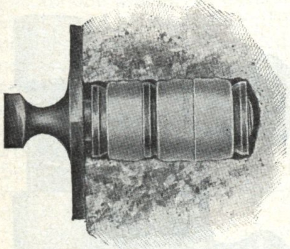


Fig. 5. 2-Bolt Expansion Bolt

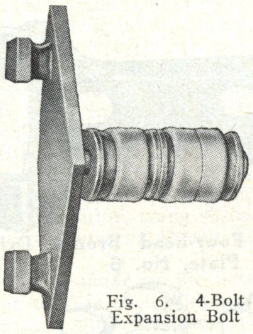


Fig. 6. 4-Bolt Expansion Bolt

Both Fig. 5 and Fig. 6 use Cinch system of expansion

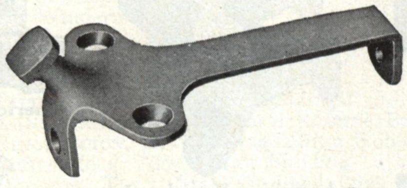


Fig. 300. Bronze Clamp with Four Screws for Wood or Kalamein Jambs
Made to fit jamb box

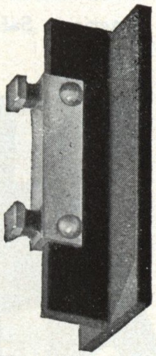


Fig. 204. Bronze Straddle Mullion Fitting
For use on T-bar mullion, either 2 or 4-bolt system

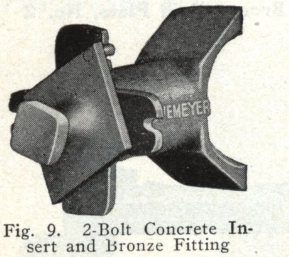


Fig. 9. 2-Bolt Concrete Insert and Bronze Fitting

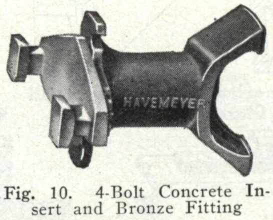


Fig. 10. 4-Bolt Concrete Insert and Bronze Fitting

Havemeyer insert used in both Fig. 9 and Fig. 10

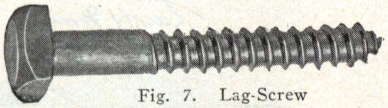


Fig. 7. Lag-Screw

For installation in wood or kalamein window frames. Made of Tobin bronze or galvanized steel. One placed on each side of window frames for 2-bolt system (2 on each side for 4-bolt system) 48 to 51 in. above sill and installed so as to have a secure hold in pulley stile

"Whitner" Window Cleaners' Safety Devices—Furnished for Either 2 or 4-Bolt System

Continued on next page

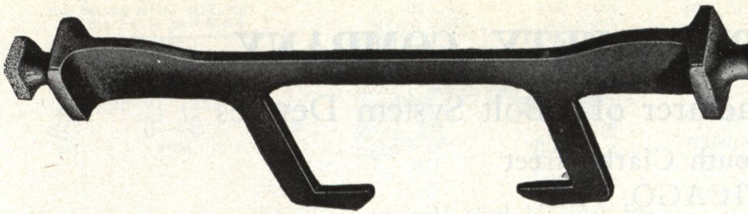


Fig. 8. Twin Anchor

Special masonry mullion anchor for masonry mullions from 8 to 13 in. The two prongs hook around iron T-bar. Set by masonry contractor. For either 2 or 4-bolt system

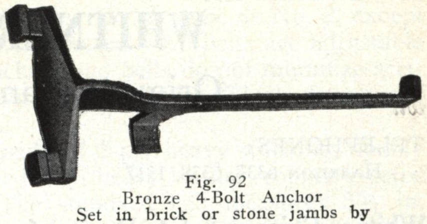


Fig. 92

Bronze 4-Bolt Anchor

Set in brick or stone jambs by mason contractor

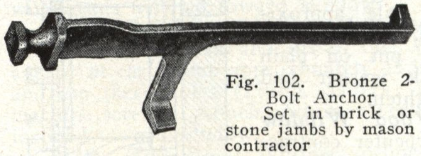


Fig. 102. Bronze 2-Bolt Anchor

Set in brick or stone jambs by mason contractor

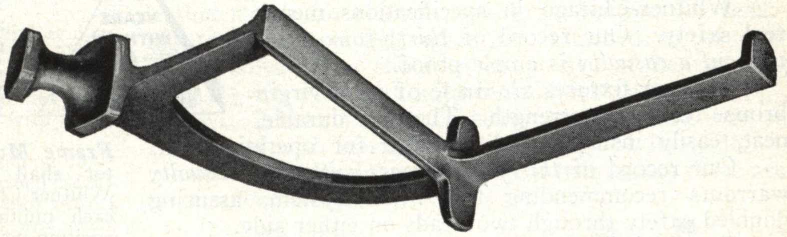


Fig. 400. Special Bronze 2-Bolt Anchor (Patent Pending)

Specially adapted to veneer brick, stone or terra cotta jambs. Leg extends into tile backing. Set by masonry contractor. Also for 4-bolt system

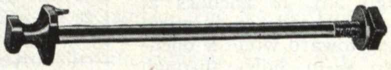


Fig. 700. Bronze Rod Bolt

Set straight, otherwise same as Fig. 100

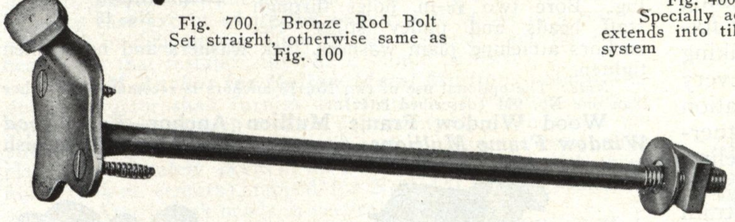


Fig. 100. Bronze Rod Bolt, Offset with Nut and Washer on Inside for Wood or Kalemein Jambs

To go entirely through jamb, countersunk on inside. For 2 or 4-bolt systems

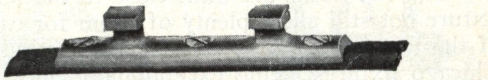


Fig. 27. Bronze 4-Bolt

Made to conform to contour of all window frames

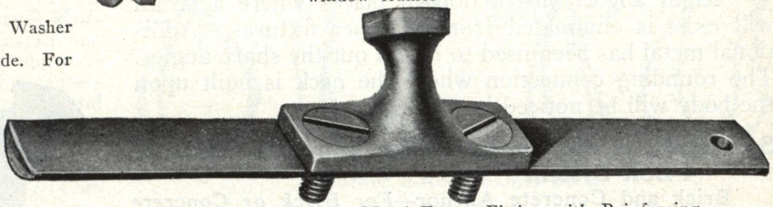


Fig. 37A. Bronze 2-Bolt Hollow Metal Frame Fitting with Reinforcing Plate and Screws

Concave, convex or flat types. Heads either straight set or offset. Made for both 2 and 4-bolt systems

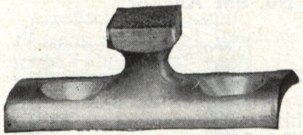


Fig. 34A. Bronze 2-Bolt

Made to conform to contour of all window frames

"Whitner" Window Cleaners' Safety Devices—Furnished for Either 2 or 4-Bolt System

Specifications for Architects

Blue prints giving installation details will be sent on request.

Fig. 102.—Furnish and set in masonry jambs 51 in. above the sill, "Whitner" 2-bolt system bronze anchors No. 102, manufactured by Ainsworth Buck.

Fig. 92.—Furnish and set in masonry jambs 51 in. above the sill, "Whitner" 4-bolt system bronze anchors No. 92, manufactured by Ainsworth Buck.

Fig. 400.—Furnish and set in masonry jambs 51 in. above the sill, "Whitner" 2-bolt system special anchor No. 400 (which extends into the backing), manufactured by Ainsworth Buck.

Fig. 7.—Furnish and install on jambs and mullions of wood or kalamein windows 51 in. above the sill, "Whitner" 2-bolt system bronze lag bolts No. 7, manufactured by Ainsworth Buck.

Note: The above can be specified for the 4-bolt system as well. Both the 2 and 4-bolt system lag bolts can be furnished in bronze or galvanized steel.

Fig. 300.—Furnish and install on jambs of wood windows 51 in. above the sill, "Whitner" 2-bolt bronze clamps No. 300 with screws, manufactured by Ainsworth Buck.

Fig. 37A.—Furnish and install on jambs and mullions of hollow metal (or steel) windows 51 in. above the sill, "Whitner" 2-bolt system hollow metal fitting No. 37A, with reinforcing plate and screws, manufactured by Ainsworth Buck.

Fig. 27.—Furnish and install on jams and mullions of hollow metal (or steel) windows 51 in. above the sill, "Whitner" 4-bolt system hollow metal fitting No. 27, with reinforcing plate and screws, manufactured by Ainsworth Buck.

Fig. 34A.—Furnish and install on jambs and mullions of cast iron windows 51 in. above the sill, "Whitner" 2-bolt system device No. 34A, with screws, manufactured by Ainsworth Buck.

Fig. 26.—Furnish and install on jambs and mullions of cast iron windows 51 in. above the sill, "Whitner" 4-bolt system device No. 26, with screws, manufactured by Ainsworth Buck.

Fig. 100.—Furnish and install on jambs of wood windows 51 in. above the sill, "Whitner" 2-bolt system rod bolt No. 100, to go entirely through pulley stile with nut and washer on the inside, manufactured by Ainsworth Buck.

Fig. 700.—Furnish and install on mullions of wood windows 51 in. above the sill, "Whitner" 2-bolt system rod bolt No. 700, to go entirely through pulley stile with nut and washer on the inside, manufactured by Ainsworth Buck.

Fig. 204.—Furnish and install on "T" bar mullions, "Whitner" 4-bolt system "T" bar straddle fittings, manufactured by Ainsworth Buck.

Note: The above can be furnished for the 2-bolt system as well; specify Fig. 201 "T" bar straddle fittings in this case.

Representative Installations

"Whitner" devices are installed in buildings of every character in practically every city, a few of which follow:

New York—Equitable Bldg.; Hotel Pennsylvania; Yale Club; Vanderbilt Concourse Bldg.; Public Schools; Y. M. C. A. Bldgs.; Telephone Bldgs.; New York Central Mail Service Bldgs.; New York Stock Exchange; Canadian Pacific Bldg.; Western Electric Bldgs.; Lord & Taylor Bldg.; Arnold Constable Bldg.; General Electric Bldgs.; Capitol Theater; Loew's State Theater; Textile Bldg.; Bush Terminal Bldg.; Metropolitan Club; Shelton Hotel; Metropolitan Museum of Art; American Museum of Natural History

Brooklyn—Edison Bldg.

Hartford—Phoenix Mutual Life Ins. Co. Bldg.; Travelers Insurance Co. Bldg.; Hartford, Conn., Trust Co. Bldg.

Philadelphia—Ritz-Carlton Hotel; Stock Exchange; Pennsylvania R. R. Bldgs.; University of Pennsylvania Bldgs.; Drexel Bldg.; Ford Service Bldg.; City Hall; Packard Bldg.

Pittsburgh—William Penn Hotel; Mellon National Bank

San Francisco—Southern Pacific Bldg.

Baltimore—Southern Hotel; American Can Co. Bldg.

Harrisburg, Pa.—State Capitol

Detroit—First & Old National Bank; General Motors Bldg.

Cleveland—Fisher-Body Ohio Bldg.

Boston—Elks Club; University Club; Boston City Hospital

Seattle—Sears Roebuck Bldg.

Wilmington—Delaware Trust Co. Bldg.; Du Pont Hotel

Washington, D. C.—Interstate Commerce Commission Bldg.; Chamber of Commerce Bldg.; Grace Dodge Hotel

Biltmore, N. C.—Vanderbilt Mansion

Houston, Tex.—Keystone Office Bldg.; Cotton Exchange Bldg.; Chamber of Commerce

Asheville, N. C.—Battery Park Hotel; George Vanderbilt Hotel

ESTABLISHED 1891

WHITNER 2-ROPE SAFETY COMPANY

Originator and Manufacturer of 4-Bolt System Devices

TELEPHONES:
Harrison 6337, 6338, 1517

638 South Clark Street
CHICAGO, ILL.

Whitner-Chicago Safety Devices for Window Washers

Whitner-Chicago in specifications means real safety. Our record of *thirty-four years without a casualty* is ample proof.

34
YEARS
WITHOUT
A
CASUALTY
WHITNER
CHICAGO

Whitner fixtures are made of solid virgin bronze tested for strength. They are durable, neat, easily installed and practical for operation.

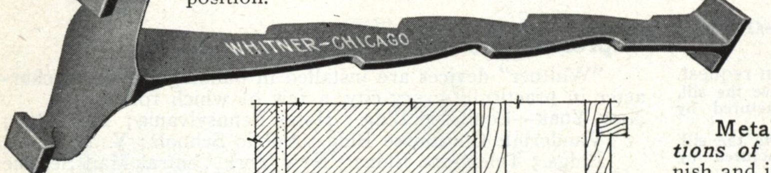
Our record of *thirty-four years without a casualty* warrants recommending the 4-bolt system, assuring doubled safety through two heads on either side.

Description of Fixtures—In addition to using only the highest quality virgin bronze in Whitner fixtures, the fixtures are designed to eliminate breaking points. The heads are built close to the body on every fixture but still allow plenty of room for easy operation of the terminal. A "wrestler's" neck is used on Whitner-Chicago fixtures, being exceptionally thick. This eliminates snapping of heads.

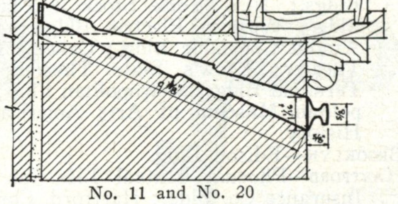
Right angle construction in places where a strain will exist is eliminated from Whitner fixtures. Additional metal has been used to round out the sharp angles. The rounding connection where the neck is built upon the body will be noticed in particular.

Specifications and Methods of Installing the Whitner 4-Bolt System

Brick and Concrete Anchor—*For Brick or Concrete Walls*—Mason contractor shall furnish and install one Whitner-Chicago No. 11 (No. 20) anchor at each jamb, approximately 45 in. above the sill, engaging the joint back of second brick, heads of anchor in vertical position.

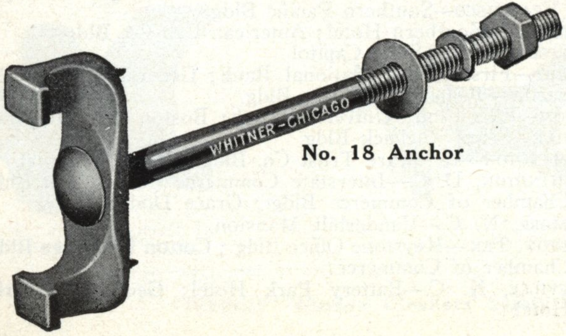


No. 11 and No. 20 Anchor

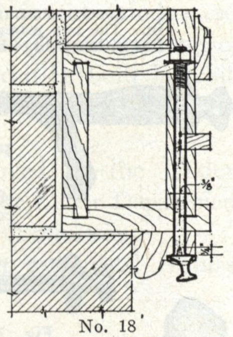


No. 11 and No. 20

Wood Window Frame Anchor—*For Wood Window Frames*—Carpenter contractor shall furnish and install one Whitner-Chicago No. 18 anchor at each jamb with heads inclined toward window, in a vertical position. Bore one $\frac{7}{16}$-in. hole through staff bead and pulley stile approximately 45 in. above the sill. Set anchor, put on plain washer, lock washer and nut; then tighten.



No. 18 Anchor

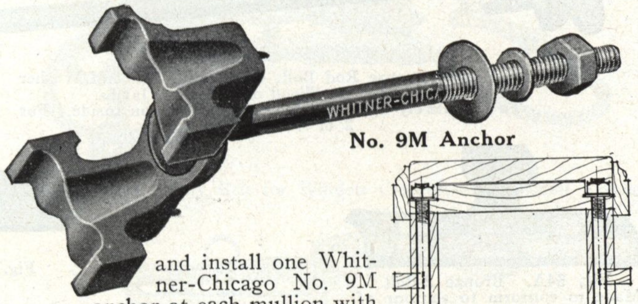


No. 18

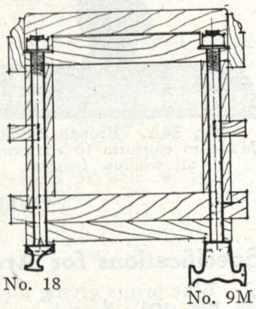
For Wood Window Frame Mullions—Carpenter contractor shall furnish and install two Whitner-Chicago No. 18 anchors at each mullion with heads in vertical position inclining toward window opening. Bore two $\frac{7}{16}$-in. holes through staff beads and pulley stiles. Set anchors attaching plain washers, lock washers and nuts; then tighten.

Note: The optional use of two No. 18 anchors is recommended rather than one No. 9M (described later).

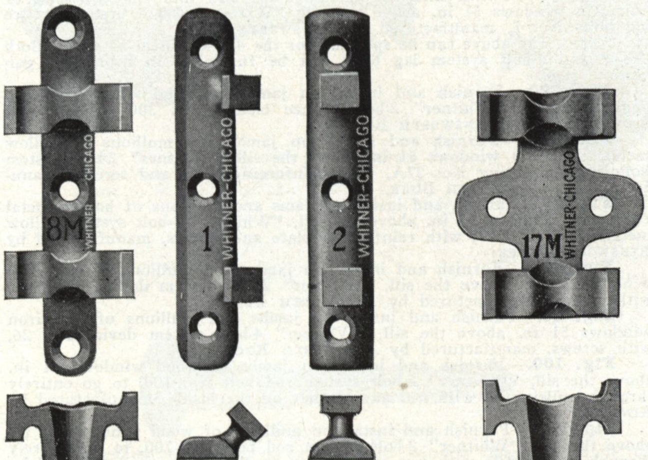
Wood Window Frame Mullion Anchor—*For Wood Window Frame Mullions*—Carpenter contractor shall furnish and install one Whitner-Chicago No. 9M anchor at each mullion with heads in a vertical position. Bore one $\frac{7}{16}$-in. hole through staff bead and pulley stile approximately 45 in. above the sill. Set anchor with bolt in place, put on plain washer, lock washer and nut, then tighten.



No. 9M Anchor



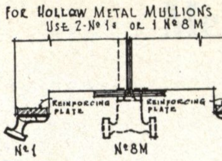
Metal Window Anchors—*No. 1 Anchor for Jamb Sections of Metal Frames*—Metal window contractor shall furnish and install one Whitner-Chicago No. 1 anchor at each jamb approximately 45 in. above the sill. When hollow metal frames are used, contractor shall fasten to inner side of frame at

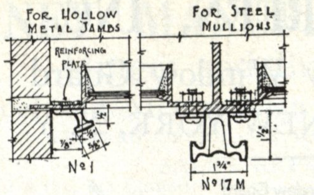


No. 8M No. 1 No. 2 No. 17M

Whitner-Chicago Anchors for Metal Windows

Continued on next page





each jamb one reinforcing plate of mild steel bar approximately 3/16x1x10 in., drilled and tapped with three holes (2⅛-in. centers) for No. 1420 flat head machine screws, at approximately 45 in. above the sill. Attach anchor in vertical position with heads inclined toward window.

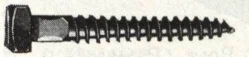
When Solid Steel Frames Are Used—Metal window contractor shall furnish and install one Whitner-Chicago No. 1 anchor at each jamb approximately 45 in. above the sill. Drill and tap three holes (2⅛-in. centers) for No. 1420 flat head machine screws. Attach anchor in vertical position with heads inclined toward window.

Note: Two No. 1 Whitner anchors may be used at mullions instead of one No. 8M Whitner anchor (described later) attached same as at jambs. The No. 2 Whitner anchor differs from the No. 1 only in that the heads are not offset, and when desired, are installed the same as No. 1. No. 1 is recommended in every case except where the anchor is to be set in a retreat, resulting in difficult operation of the terminal over the offset heads. In that instance, the No. 2 should be used.

No. 8M Anchor for Hollow Metal Mullions—Metal window contractor shall furnish and install one Whitner-Chicago No. 8M anchor at each mullion approximately 45 in. above the sill, fastening to the inner side of each mullion one reinforcing plate approximately 3/16x1x10 in. mild soft bar steel with three holes (2⅛-in. centers), tapped for No. 1420 flat head machine screws. Attach with heads in vertical position.

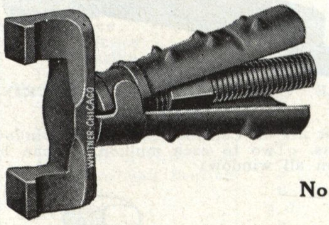
No. 17M Whitner-Chicago Anchor for Solid Steel Mullions—Metal window contractor shall furnish and install one No. 17M Whitner-Chicago anchor at each mullion approximately 45 in. above the sill. Drill two holes (1⅜-in. centers horizontally for Lupton; or 1⅝-in. centers for Fenestra and Truscon sash) and attach with 5/16-in. round head brass machine screws and square nuts.

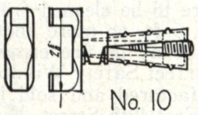
Lag Screw Anchor—***No. 12 Whitner-Chicago Anchor for Jambs and Mullions of Wood Window Frames***—Carpenter contractor shall furnish and install two Whitner-Chicago No. 12 anchors in vertical position (2½-in. centers) approximately 45 in. above the sill at each jamb, and, where mullions occur, install four Whitner-Chicago No. 12 anchors, two on each side of mullion. Use ¼-in. bit, boring holes 2½ in. deep through staff bead into pulley stile. Use brace and socket wrench for turning anchors into frame.



No. 12 Anchor

Expansion Shell Anchor—***No. 10 Whitner-Chicago Anchor for Masonry of Buildings Already Erected***—Mason contractor shall furnish and install one Whitner-Chicago No. 10 anchor at each jamb with the heads in a vertical position.





No. 10 Anchor

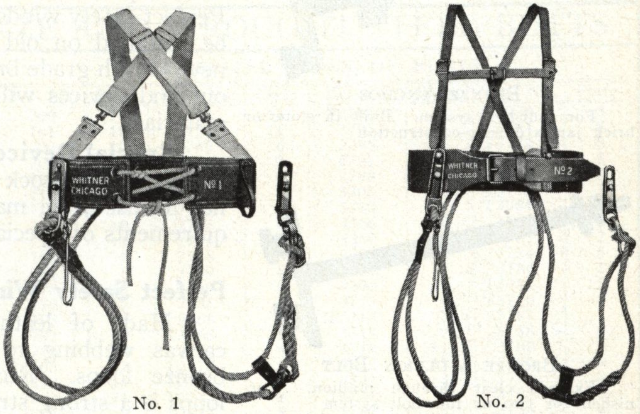
Whitner 2-Rope Safety Belts

Like the anchors, the belts are practical, durable, and of sufficient strength to carry over a ton. Made in 3 styles: No. 1, double-ply webbing reinforced with leather and equipped with lacing cord; No. 2, all-leather belt equipped with buckle; No. 3, same as No. 2, except shoulder straps are eliminated. All belts are adjustable to wearer. Our anchors and belts do not minimize accidents but do actually prevent them. *Thirty-four years without a casualty.*

No. 1 belt is made of 2-ply heavy webbing, doubly sewed and reinforced with heavy leather, copper riveted to the webbing. The standard belt measures 3¾ in. wide by 32 in. long. The lacing cord allows the belt to be adjusted to different sizes. It is equipped with leather straps for chamois, and brass buttons for hooking terminals on belt when not attached to window safety bolts. The shoulder straps are of heavy webbing 1½ in. wide with adjustable slides and clasps.

No. 2 belt is made of heavy leather, same size as No. 1 and with leather shoulder straps 11/16 in. wide.

No. 3 belt is the same as No. 2 belt except there are no shoulder straps.



No. 1 No. 2

Whitner 2-Rope Safety Belts

The terminals which hook over the safety anchors and the rope eyes through which the ropes slide are made of virgin bronze. The rope eyes are securely fastened to the back of each belt by eight No. 8 solid copper rivets. The right terminal has a strong hook for the water pail. The standard length of rope is 8 ft. from terminal to terminal. Longer rope will be furnished if desired. Shorter rope may be had through adjustment for which a drop forged hitch hook is provided at the left terminal. The best yacht silk manila rope, with a minimum average breaking point of 2695 lb. is always used.

The Whitner 2-rope belt provides a double safety feature inasmuch as the top or service rope is always taut and the bottom or safety rope is always slack, not being subject to any wear, and will hold the window washer if the service rope is worn through.

Prices, half scale blue prints, and further descriptive matter will be furnished on request. If any difficulty is experienced in selecting the fixture for a particular job, submit full sized detail and a fixture will be suggested to exactly fit the need. Single-head fixtures will be furnished if desired.

SUMMARIZED TABLE OF WHITNER-CHICAGO ANCHORS

No.	Type	Material	Length, in.	Height, in.	Width, in.	Weight, oz.	Use
11	Brick and concrete anchor	Virgin bronze	10	2⅞	1⅛	7¼	Masonry jambs; brick reveal
20	Brick and concrete anchor	Virgin bronze	10	2⅞	1⅛	9	Masonry jambs; brick reveal where building code requires a heavier anchor than the No. 11
18	Wood anchor, 10½-in. shaft	Virgin bronze	11⅛	2⅞	⅞	9	Wood window frame jambs
18	Wood anchor, 8-in. shaft	Virgin bronze	8⅝	2⅞	⅞	7½	Wood window frame jambs
9M	Wood mullion anchor, 10½-in. bolt	Virgin bronze	11⅝	2 15/16	1¾	16	Wood window frame mullions
1	Metal jamb anchor	Virgin bronze	13/16	5 1/16	1⅜	4¾	Metal window frame jambs
2	Metal jamb anchor	Virgin bronze	13/16	5⅜	15/16	4¾	Metal window jambs where anchor must be placed in a recess, and No. 2 is not usable
8M	Hollow metal mullion anchor	Virgin bronze	1⅜	5 1/16	1¾	9½	Hollow metal window mullions
17M	Steel mullion anchor	Virgin bronze	1½	2 15/16	2 7/16	11	Steel window mullions
12	Lag screw anchor	Brass	3⅜	9/16	9/16	1½	Wood window jambs and mullions where building code permits use of this rather than No. 9 and 9M
13	Expansion shell anchor	Virgin bronze	4½	2⅝	⅞	13	Brick wall already constructed

ESTABLISHED 1900

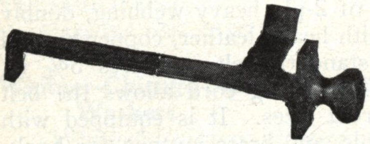
JOHN K. GREEN, INC.

The Perfect Safety Window Guard

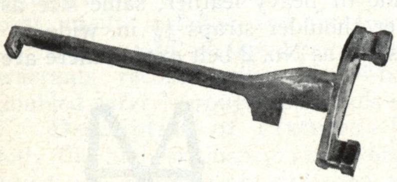
15 East 40th Street, NEW YORK, N. Y.

Perfect Safety Window Guard
For
Protection Against Accident in Outside Window Cleaning

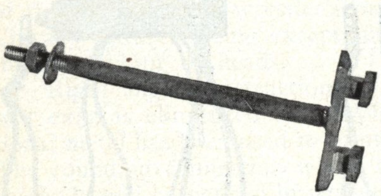
TRADE-MARK



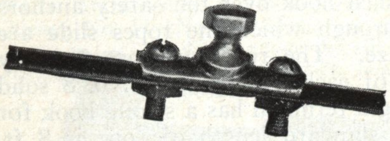
Bronze Anchor Bolt
For 4 or 8-in. reveal. Anchors are built in the stone or brick jambs during the construction of the building



Bronze Anchor
For four-bolt system. Built in stone or brick jambs during construction



Bronze Mullion Bolt
Extends clear through mullion. Furnished for two or four-bolt system



Bronze Plate with Steel Reinforcement
Used on hollow metal or steel frames. Applied by frame maker during fabrication. Furnished for two or four-bolt system

The Perfect Safety Window Cleaner's Device

Whether built of steel, hollow metal, metal covered, wood, stone, brick, terra cotta or other material, there is a Perfect safety window cleaner's device designed for the particular construction employed. Perfect safety window cleaner's bolts may be installed on old buildings as well as new. High grade bronze is used throughout and devices will outlast the building materials.

Special Devices for Special Needs—Where our stock bolts or anchors can not be used, we make bolts to meet requirements of special frames or mullions.

Perfect Safety Window Cleaner's Belt

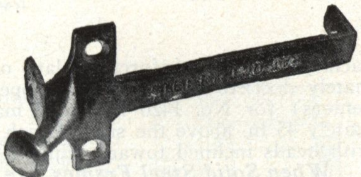
Made of leather, or special heavy canvas webbing to which are attached bronze loops. Running through these loops is a strong strap fitted at both ends with bronze terminals. These terminals lock automatically on the semi-globular heads of the anchors or screw bolts secured to windows. They give direct bearing in any position and can not become disengaged until removed by the operator, insuring absolute safety against accident.

The Perfect safety belt is also a labor saver, for the window cleaner is held securely in place outside of the window, and can use both hands while working.

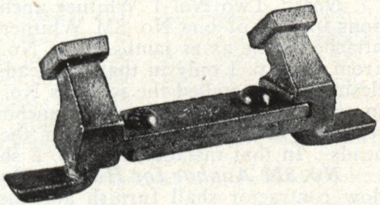
Architect's Specifications

All windows which are to be cleaned from the outside and which are 6 ft. or more above grade or above a roof, balcony or fire escape, shall be equipped with Perfect Safety Window Cleaner's Bolts, as manufactured and sold by John K. Green, Inc., 15 East 40th Street, New York, N. Y.

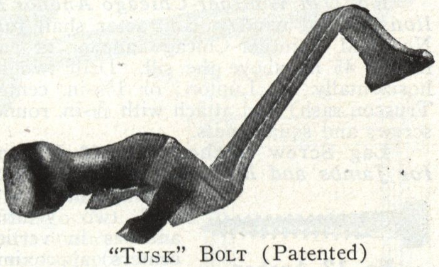
Install bolts 49 to 51 in. above sill, or at a height to conform with local laws and regulations.



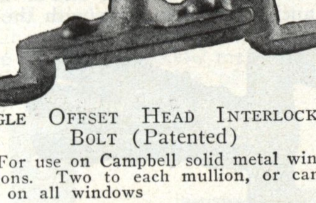
Wing Bolt (Patented)
For use on wood and kalamein frame. Made to fit frame and held in place by four bronze screws. Applied by the frame maker at mill. Popular with architects all over the U. S.



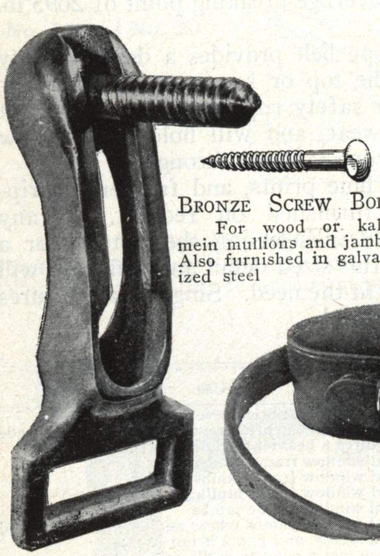
Double Offset Head Interlocking Bolt (Patented)
Designed for use on Campbell solid metal windows where four-bolt system is required



"Tusk" Bolt (Patented)
For use on Campbell solid metal windows. Can not pull out. Especially adapted where terra cotta, limestone or stone jambs occur

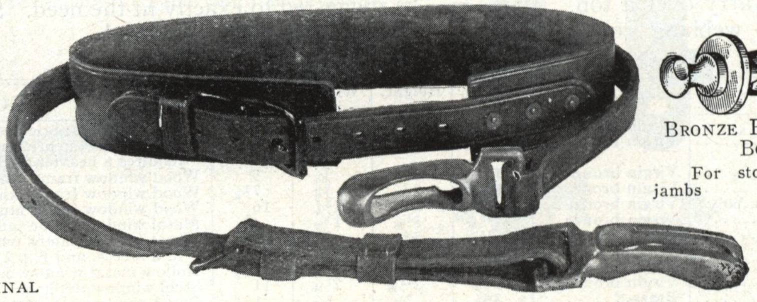


Single Offset Head Interlocking Bolt (Patented)
For use on Campbell solid metal window mullions. Two to each mullion, or can be used on all windows

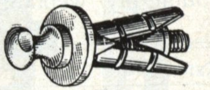


Bronze Screw Bolt
For wood or kalamein mullions and jambs. Also furnished in galvanized steel

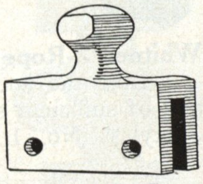
Bronze Belt Terminal
Application to bolt. All bolts have same style head



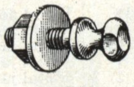
The Perfect Safety Window Cleaner's Belt



Bronze Expansion Bolt
For stone or brick jambs



Bronze Book Plate
For use on steel windows of Fenestra type



Bronze Mullion Bolt
For cast iron mullions and jambs

McKINNEY MANUFACTURING COMPANY

Hinges and Builders' Hardware

Liverpool and Metropolitan Streets, PITTSBURGH, PA.
WESTERN OFFICE, 938 Wrigley Building, CHICAGO, ILL.

SALES REPRESENTATIVES

NEW YORK, N. Y., John H. Graham & Co., 113 Chambers Street
BOSTON, MASS., Crowe-McGarvey Co., 132 Pearl Street
BALTIMORE, MD., Henry Keidel & Co., 405-407 West Redwood Street
PACIFIC COAST, John T. Rowntree, Inc., LOS ANGELES, CAL.

Products

Butts: Wrought steel and bronze butts for wood and metal doors, transoms, metal sash, casement windows, shutters, cabinet work.

Also a complete line of hinges, including strap and tee, screw and strap, garage, etc. Miscellaneous Builders' Hardware.

For Garage Hardware see pages 1453-1459.

The McKinney Manufacturing Company

This Company has been manufacturing hardware for more than sixty years and makes a specialty of fine butts for all classes of service. McKinney butts are recognized throughout the country as of the very finest quality in both workmanship and finish.

Identification of McKinney Butts

All McKinney butts are plainly stamped with the name McKinney. The catalogue numbers and special symbols are also stamped on the backs of the butts for proper identification.

Purpose and Arrangement of this Catalogue

This catalogue has been prepared by a Committee of Architects in consultation with this Company for the purpose of giving the architects a catalogue of information on butts which will be of real value to them. With this end in view, complete information has been given in a condensed form eliminating as much as possible the repetition of the usual hardware catalogue.

WROUGHT BRASS, WROUGHT BRONZE AND WROUGHT STEEL BUTTS

ALPHABETICAL INDEX OF BUTTS

Wrought Brass and Bronze

Type of Butt	Plate No.
Wrought Brass	2, 11
Light Loose Pin	1
Light Narrow Loose Pin	1
Wrought Bronze	2
Anti-Friction	2
Asylum	2
Wrought Bronze:	
Ball Bearing	2
Ball Bearing Asylum	2
Standard	2
Template	2
Transom	2
Paumelles	1

Wrought Steel

Type of Butt	Plate No.
Accordion	3, 4, 9
Anti-Friction	3
Ball Bearing	4
Standard	9
Anti-Friction	3,5,6,7,8
Accordion	3
Asylum	1
Full Surface Template	8
Half Mortise	6
Half Mortise Template	7, 8
Heavy, extra	5
Heavy, extra, Template	5
Standard	3
Standard Template	7
Ball Bearing	4,5,6,7,8,9
Accordion	4
Asylum	1
Full Surface	8
Half Mortise	6
Half Mortise Template	8
Heavy	4, 7
Heavy, extra	5
Heavy, extra, Template	5
Template	7
Broad, Tight Pin	10
Full Surface	8
Anti-Friction	8
Ball Bearing	8
Template	8
Half Mortise	6, 7, 8
Anti-Friction	6
Ball Bearing	7, 8
Embossed	5
Template Anti-Friction	7, 8
Template Ball Bearing	8
Tight Pin	8
Heavy	4, 7
Heavy Tight Pin	8
Kalamein Door	8
Light	11
Loose Pin	11
Loose Pin, Painted	12
Narrow Fixed Pin	11
Narrow Loose Pin	11
Light:	
Narrow Loose Pin, Ptd.	12
Narrow Reversible	11
Reversible	11
Loose Joint	10
Loose Pin, Light Ball Tip	10
Narrow	10
Narrow	10
Loose Joint	10
Loose Pin	10
Loose Pin, Painted	12
Tight Pin	10
Metal Door	2, 7, 8
Anti-Friction Template	5, 8
Anti-Friction, Extra Heavy Template	5
Ball Bearing Template	2, 7, 8
Ball Bearing Extra Heavy Template	5
Extra Heavy Tight Pin	8
Standard Template	7
Painted:	
Loose Pin, Standard	12
Loose Pin, Light	12
Loose Pin, Lt. Narrow	12
Parliament	10
Loose Joint	10
Loose Joint Ball Tip	10
Loose Pin	10
Loose Pin, Light	10
Paumelles	1
Anti-Friction	1
Ball Bearing	1
Solid Steel Washers	1
Standard	8, 9
Accordion	9
Tight Pin	8
Template	2, 5, 7, 8
Anti-Friction	5, 7, 8
Ball Bearing	2, 5, 7, 8
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Half Mortise	7, 8
Transom Tight Pin	2, 8, 10
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Template	2, 8

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Screen	2
Screens Hinged	2, 3
Shutters	2
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Hollow Metal	4
Metal	5
Metal Covered	4
Wood	2

NUMERICAL INDEX OF BUTTS

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700	10
701	10
702	10
705	10
706	8
715	10
715½	10
716	10
719	11
763	8
764	8
778	12
779	12
793	12
1702	10
1716	10
2305	2
2318	11
2322	11
2714	9
T2714	7
2715	10
2715½	10
2716	10
2716½	10
2717	11
2718	11
2719	11
2721	11
2722	11
2735	6
2742	3
T2742	7
2743	3
T2743	7
2745	6
2755	6
2758	6
2759	6
2760	9
2765	3
2768	4
T2768	7
2769	4
T2770	8
T2771	8
T2772	8
T2773	8
2774	6
2775	6
T2781	8
2785	6
2792	3
2794	4
T2794	7
2795	4
2796	3
2797	4
2798	9
3305	2
3313	2
3366	2
3367	2
3383	1
3388	2
3390	2
3713	9
T3713	7
3714	9
3718	11
3722	11
3741	3
T3741	7
3742	3
3743	3
3760	9
3765	3
3766	4
T3766	7
3767	4
3768	4
3769	4
T3770	8
T3771	8
T3772	8
T3773	8
T3776	7
T3777	7
T3781	8
3782	1
3783	2
3784	5
3786	5
T3784	5
T3786	5
3787	1
3788	1
3789	1
3790	9
3791	3
3792	3
3794	4
3795	4
3799	1
4702	10
4715½	10
4778	12
4779	12
4793	12

PROPER BUTTS TO USE ON WOOD AND STEEL DOORS

Width of Door	Height of Door	No. of Butts	Size of Butts	Wght. of Butts
1⅛″ Doors (Wood)				
To 36″	To 60″	2	3½″	Std.
To 36″	Over 60″ to 90″	3	3½″	Std.
1⅛″ Doors (Steel)				
To 36″	To 60″	2	4½″	Std.
To 36″	Over 60″ to 90″	3	4½″	Std.
1¼″ and 1⅜″ Doors (Wood)				
To 32″	To 60″	2	3½″	Std.
To 32″	Over 60″ to 90″	3	3½″	Std.
Over 32″ to 37″	To 60″	2	4″	Std.
Over 32″ to 37″	Over 60″ to 90″	3	4″	Std.
1¼″ and 1⅜″ Doors (Steel)				
To 32″	To 60″	2	4½″	Std.
To 32″	Over 60″ to 90″	3	4½″	Std.
Over 32″ to 37″	To 60″	2	5″	Std.
Over 32″ to 37″	Over 60″ to 90″	3	5″	Std.
1 9/16″, 1¾″ and 1⅞″ Doors (Steel or Wood)				
To 32″	To 60″	2	4½″	Std.
To 32″	Over 60″ to 90″	3	4½″	Std.
To 32″	Over 90″ to 120″	4	4½″	Std.
Over 32″ to 37″	To 60″	2	5″	Std.
Over 32″ to 37″	Over 60″ to 90″	3	5″	Std.
Over 32″ to 37″	Over 90″ to 120″	4	5″	Std.
Over 37″ to 43″	To 60″	2	5″	Ex. H.
1 9/16″, 1¾″ and 1⅞″ Doors (Steel or Wood) Continued				
Over 37″ to 43″	Over 60″ to 90″	3	5″	Ex. H.
Over 43″ to 50″	Over 60″ to 90″	3	6″	Ex. H.
Over 37″ to 50″	Over 90″ to 120″	4	6″	Ex. H.
2″, 2¼″ and 2½″ Doors (Steel or Wood).				
To 37″	To 60″	2	5″	Std.
To 37″	Over 60″ to 90″	3	5″	Std.
To 37″	Over 90″ to 120″	4	5″	Std.
Over 37″ to 43″	To 60″	2	5″	Ex. H.
Over 37″ to 43″	Over 60″ to 90″	3	5″	Ex. H.
Over 43″ to 50″	To 60″	2	6″	Ex. H.
Over 43″ to 50″	Over 60″ to 90″	3	6″	Ex. H.
Over 37″ to 50″	Over 90″ to 120″	4	6″	Ex. H.
1¼″ and 1⅜″ Transoms (Steel or Wood)				
To 48″	To 20″	2	2½″	Std.
Over 48″ to 72″	To 20″	3	2½″	Std.
To 48″	Over 20″ to 36″	2	3″	Std.
Over 48″ to 72″	Over 20″ to 36″	3	3″	Std.
1½″, 1 9/16″, 1¾″ and 1⅞″ Transoms (Steel or Wood)				
To 48″	To 20″	2	3″	Std.
Over 48″ to 72″	To 20″	3	3″	Std.
To 48″	Over 20″ to 36″	2	3½″	Std.
Over 48″ to 72″	Over 20″ to 36″	3	3½″	Std.

CLEARANCES OF REGULAR STOCK SIZE BUTTS FOR WOOD DOORS

Thickness of Door	Size of Butt	Maximum Clearance
1⅜″	3 x3″	⅝″
	3½x3½″	1⅛″
	4 x4″	1⅝″
1¾″	4 x4″	⅞″
	4½x4½″	1⅜″
	5 x5″	1⅞″
2″	4½x4½″	⅞″
	5 x5″	1⅝″
	6 x6″	2⅝″
2¼″	5x5″	1⅛″
	6x6″	2⅛″
	6x7″	3⅛″
	6x8″	4⅛″
2½″	5x5″	⅝″
	6x6″	1⅝″
	6x7″	2⅝″
	6x8″	3⅝″

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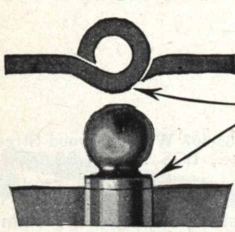
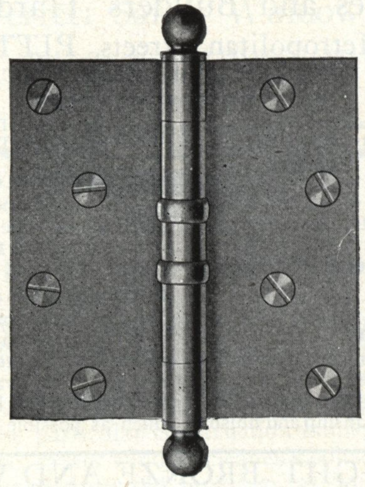
FACTORS IN DETERMINING QUALITY AND FINISHES IN BUTTS



1. The inner edges of the leaves are beveled to form a perfect joint.

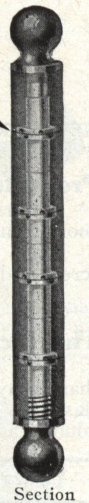
2. Outer edges and corners ground clean and true.

3. Squared collars of ball tips fit flush with knuckles.



Wrought bronze butt with ball bearing washers

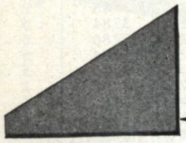
4. Ball Bearing Washers to minimize wear.
5. Butts without ball bearing washers are equipped with steel bushings on inside of each knuckle extending the entire length of the barrel to prevent pin from coming in contact with the bronze metal.
6. Steel bushings shaped to retain the lubricant where needed.
7. Non-rising pins.
8. Joints in perfect alignment.
9. The bronze metal is highly polished and finished in either the natural color or other finishes as desired.



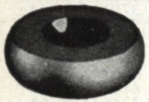
Section showing steel bushings

McKinney Wrought Bronze Butts for Wood and Metal Doors

1. The inner edges of the leaves are beveled to form a perfect joint (in extra fine steel butts).
2. Highly polished butts are first copper plated to serve as a base for the final plating in the desired finish (in extra fine steel butts).



4. The outer edges and corners ground clean and true. (In extra fine steel butts).

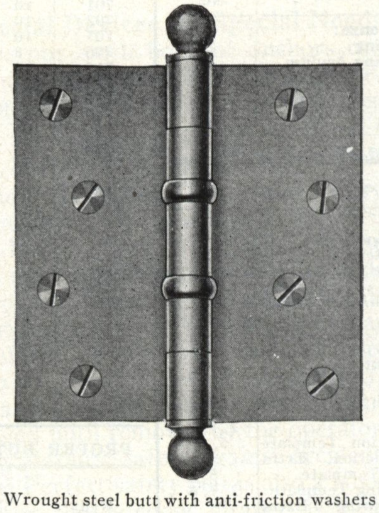


Anti-friction washer

10. Anti-friction washers are made of a special bronze alloy metal to minimize the excessive wear and strain at the joints.
11. The bearings and runways in the ball bearing washers are snugly enclosed in copper cups or jackets to prevent dust and moisture from working in.

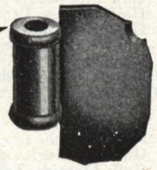
Ball bearing washer

12. The runways are case hardened to minimize constant wear and strain.



Wrought steel butt with anti-friction washers

3. Joints are in perfect alignment.
5. Squared collars of the tips fit flush with the knuckles.
6. A little lip or wing on the pin fits into a corresponding groove in the knuckle, thus counteracting the tendency of the pin to work up under the action of the door.
7. Annular or ring shaped grooves in the pins retain the lubricant where needed insuring smooth silent action.
8. The steel pins are case hardened to minimize wear on the inside of the barrel.
9. Washers cannot fall out or become loose when the butts are dissembled.



McKinney Wrought Steel Butts for Wood and Metal Doors

Finishes and Grades of McKinney Butts

1. Extra Fine Butts in Bronze Metal and Wrought Steel—Designed for use in the finest work. Wrought steel butts of this class are always made of highly polished steel and then given a heavy coating of copper plating to serve as a base for the final heavy plating in the desired finish. Another refinement which adds slightly to the cost of these butts is the fact that the inner edges of the leaves are always beveled to form perfect joints.

2. Standard Butts in Wrought Steel—

Polished Steel Butts (Plated)—These butts are made of wrought steel and then polished before being plated in the desired finish. They do not have beveled joints or a copper base before plating. They are therefore lower in price than the Extra Fine Butts.

Planished Steel Butts (Plated)—Wrought steel butts used on ordinary work, where price very often is the deciding factor, are of this class. In the process of cold rolling the steel is given a certain smoothness and brightness and is designated as "planished." They do not present quite the same high lustre and beauty of finish as do the "polished" butts, and consequently cost less.

FINISHES AND SYMBOLS OF MC KINNEY BUTTS

McKinney Symbols	Description of Finish	Russell & Erwin Mfg. Co.	Sargent & Co.	Yale & Towne Mfg. Co.	P. & F. Corbin	Norwalk Lock Co.
BB	Bower Barff	46	BB	FX80	F	RI
BP	Brass Plate	10	B	AZ10	A	IB
OB	Brass, Dull	9	OB	AY22	DA	K
XB	Brass, Dull, Slightly Oxdzd	9C	OE	AY21	KA	M2
XBS	Brass, Dull, Slightly Oxidized, Sand Finish	09C	RD	AX24	SKA	HM2
LB	Brass, Oxidized, Light Center	9¾		AY57		K3
LBS	Brass, Oxidized, Light Center, Sand Finish	09¾		AX57		HK3
MB	Brass, Oxidized, Mottled	9½	EB	AZ17	HA	M
MBS	Brass, Oxdzd, Mtld, Sand Fin.	09½	RK	AX17	SHA	HM
B	Bronze	11	P	BZ10	B	1
DX	Bronze, Dull, Slightly Oxdzd.	11C		BY21	HB	
DE	Bronze, Dull		OP	BY22	DB	
DA	Bronze, Antique, Light		03P			
YL	Bronze, Statuary Light	2				
YLS	Bronze, Staty, Lt, Sand Fin.					DB3
YD	Bronze, Statuary, Dark	2D		CY24		D2
YDS	Bronze, Staty, Dk, Sand Fin.					H2
YM	Bronze, Statuary, Stand			BY65	LB	
YMS	Bronze, Statuary, Stand., Sand Finish					
AC	Copper, Oxidized, Mottled	7½	AB	CZ17	R	O
ACS	Copper, Oxdzd, Mtld, Sand Fin.	07½		CX17	SR	HO
EDB	Dead Black, Electroplate	06		BX16	KF	HW
DB	Dead Black, Japanned	47			D	
G	Galvanized, Hot					
J	Japanned					
N	Nickel	4	N	NZ10	E	NP
ND	Nickel, Dull		LN	NY10	DE	
NS	Nickel, Sand Finish		RN	NX10		
*SH	Sherardized					
V	Verde Antique	36		BX67	V	

*The prefix "SH" denotes a sherardized base, as SH 2714 B for planished and plated bronze finish over sherardizing.

Continued on next page

WROUGHT BRONZE AND WROUGHT STEEL PAUMELLES FOR WOOD DOORS

McKinney wrought bronze and wrought steel paumelles (or butts) are designed for doors where it is desired to keep the butts as inconspicuous as possible. These butts are of the olive knuckle type, the larger ones designed for use on French doors, smaller ones for cabinets, bookcases, etc.

No. 3383 Wrought Bronze Paumelles with Ball Bearing Washer

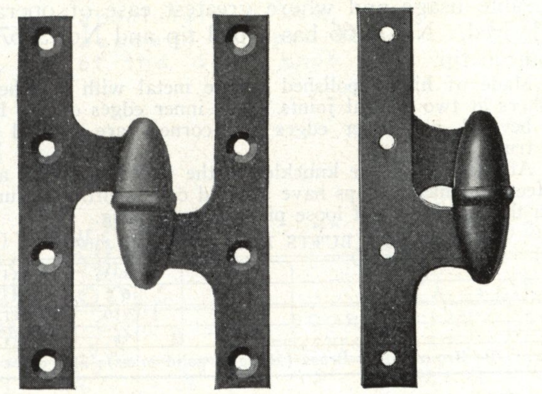
Especially for use with French doors or other doors where an olive knuckle type butt is desired. The four screws in each leaf give ample support and solidity. Only the olive shape knuckle shows where door is closed. This wrought bronze hinge is not made with anti-friction washer.

Plain steel finishes, except sherardized, first receive a priming coat, which serves as a base for painting.

Wrought Steel Paumelles—No. 3782 with Anti-friction Washers; No. 3783 with Ball Bearing Washers

These paumelles or butts are designed especially for use with French doors and other doors where it is desired to keep the metal trim as inconspicuous as possible. Olive knuckle type.

No. 3782 is equipped with a solid metal, non-detachable, anti-friction washer. No. 3783 has a non-detachable ball bearing washer. In all other points the two butts are the same.



WROUGHT BRONZE AND WROUGHT STEEL PAUMELLES

Butts are made both right and left hand. When ordering specify which is desired.

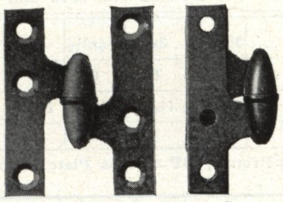
DATA ON PAUMELLES NOS. 3383, 3782 AND 3783

Length each leaf, in.	Width of leaves, in.	Width open, in.	Width betw. leaves full open, in.	Screw holes in each	Size of screws	Finishes
5	¾	3¼	1¾	8	1¼x10	B—Bronze BP—Brass Plate AC—Ant. Copper MB—Ant. Brass Mottled XB—Ant. Brass Oxid.
6	13/16	3⅞	2¼	8	1¼x12	

Wrought Steel Paumelles with Non-detachable Solid Steel Washers—No. 3799

Designed for use on bookcases, cupboards, casement sash and other cabinet work. Harmonize with larger size paumelles shown on this page. Olive knuckle type. Plain steel finishes, except when sherardized, receive a priming coat which serves as a base for painting. Equipped with a solid steel non-detachable washer to minimize friction.

All these paumelles or butts are made both right hand and left hand and it is necessary when ordering to specify which hand is desired.



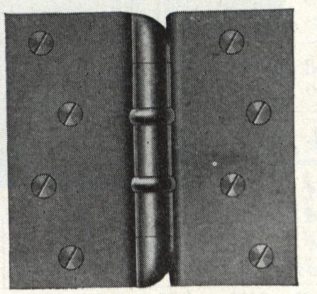
No. 3799 WROUGHT STEEL PAUMELLES

DATA ON PAUMELLES NO. 3799

Length each leaf, in.	Width of leaves, in.	Width open, in.	Width betw. leaves full open, in.	Screw holes in each	Size of screws	Finishes
3	⅝	2 5/16	1 1/16	6	0	B—Bronze BP—Brass Plate AC—Ant. Copper MB—Ant. Brass Mottled XB—Ant. Brass Oxid.

WROUGHT STEEL TIGHT PIN ASYLUM BUTTS

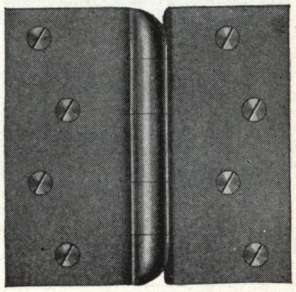
No. 3787 with Anti-friction Washers; No. 3788 with Ball Bearing Washers; No. 3789 without Washers



Nos 3787-3788

Polished and plated. Designed for use in asylums, hospitals, sanitariums and other buildings of this type. No projecting tips. The inner edges of the leaves are beveled and the corners and outer edges are ground clean and true. All sizes have five knuckles in the joint.

No. 3787 is equipped with solid metal non-detachable anti-friction washers, No. 3788 with ball bearing washers, and No. 3789 is without washers. In all other respects the three butts are similar.



No. 3789

DATA ON BUTTS NOS. 3787, 3788, 3789

							Finishes
Size open, in.	3 x 3	3½ x 3½	4 x 4	4½ x 4½	5 x 5	6 x 6	B—Bronze AC—Ant. Copper DB—Dull Brass
Screw holes	6	6	8	8	10	10	
Size screws	⅞ x 8	1 x 8	1 x 10	1¼ x 10	1¼ x 12	1½ x 14	

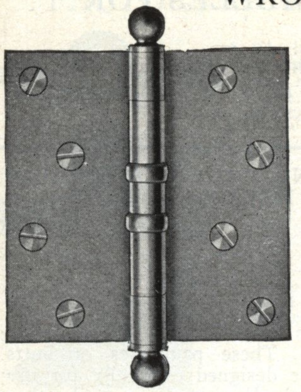
Note: For metal doors using template butts, simply prefix letter "T" to any of above numbers (as—T3366, etc.) and butts will be supplied with holes accurately drilled to template to match holes in metal door.

McKINNEY MANUFACTURING COMPANY | McKINNEY PAUMELLES & ASYLUM BUTTS | PLATE 1

Continued on next page

WROUGHT BRONZE BUTTS FOR WOOD DOORS

(For Metal Door Butts, see table below)



No. 3366
BALL BEARING, BALL TIP
WROUGHT BRONZE BUTT

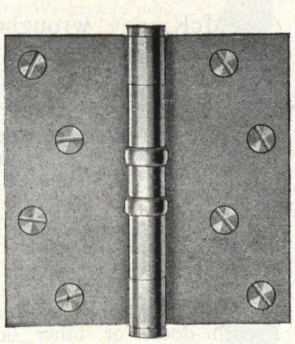
Bronze butts are recommended especially for exterior use or for interior use where the very finest butts are desired.

Nos. 3366 and 3367. Highest Grade Ball Bearing, Ball or Button Tip, Loose Pin Wrought Bronze Butts

For the very finest exterior doors subject to considerable usage and where greatest ease of operation is desired. No. 3366 has a ball tip and No. 3367 has a button tip.

Made of highly polished bronze metal with ball bearing washers at two central joints. The inner edges of the leaves are beveled, and outer edges and corners are ground clean and true.

All sizes have five knuckles in the joint and joints are in perfect alignment. Tips have squared collars fitting accurately with the knuckles, and loose pins are non-rising.



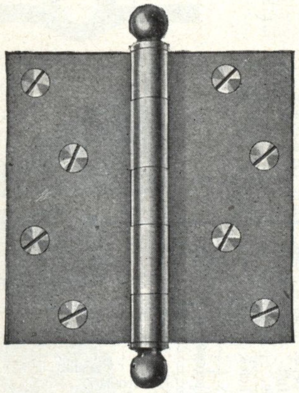
No. 3367
BALL BEARING, BUTTON TIP
WROUGHT BRONZE BUTT

DATA ON BUTTS NOS. 3366 AND 3367

Size of butts open, in	3x3	3½x3½	4x4	4½x4½	5x5	6x6
Screw holes in each	6	6	8	8	10	10
Size of screws	1¼x10	1¼x10	1¼x12	1¼x12	1¼x12	1½x12
Weight per pair, lb	1	1⅜	1⅞	2⅜	3⅛	5

Finishes: B=Bronze; BP=Brass (Made of solid brass); also other finishes

Nos. 3313 and 3390. Regular Ball or Button Tip, Loose Pin Wrought Bronze Butts



No. 3313
REGULAR BALL TIP
WROUGHT BRONZE BUTT

Recommended for exterior doors when a fine butt is desired at a slightly lower cost than the ball bearing butts.

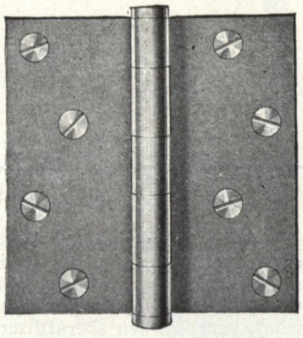
These butts are made of highly polished bronze metal with steel pins. The inside of the barrel is lined with steel bushings to take the wear instead of the bronze metal. Bushings are shaped to retain lubricant where needed.

The finish of inner edges, collars of ball and button tips and number of joints is the same as for the ball bearing butts. These butts all have 5 knuckles but no ball bearing washers.

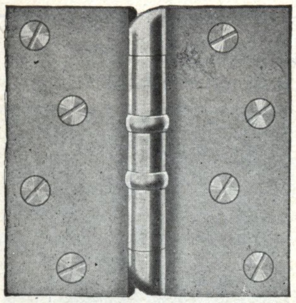
DATA ON BUTTS No. 3313 and 3390

Size of Butt Open, in	2½x2½	3x3	3½x3½	4x4	4½x4½	5x5	6x6
Screw Holes in each	6	6	6	8	8	10	10
Size of Screws	1x8	1¼x10	1¼x10	1¼x12	1¼x12	1¼x12	1½x12
Weight per Pair, lb	⅝	1	1⅜	1⅞	2⅜	3⅛	5

Finishes: B=Bronze; BP=Brass Plate; also other finishes



No. 3390
REGULAR BUTTON TIP
WROUGHT BRONZE BUTT



No. 3388
BALL BEARING ASYLUM BUTT,
WROUGHT BRONZE

No. 3388. Ball Bearing Asylum Butt, Tight Pin, Wrought Bronze

For use in asylums, hospitals, sanitariums and public buildings. Have no projecting tips over which sheets, ropes, etc. can be hung by persons contemplating suicide by hanging.

Have five knuckles with two ball bearing washers at two central joints. Inner edges of leaves are beveled and corners and outer edges are ground clean and true.

DATA ON BUTT No. 3388

Size of Butt Open, in	3x3	3½x3½	4x4	4½x4½	5x5	6x6	Finishes B—Bronze
Screw Holes in each	6	6	8	8	10	10	
Size of Screws	1x10	1x10	1¼x12	1¼x12	1¼x12	1½x12	
Weight per Pair, lb	½	1⅓	1⅞	2⅜	2⅞	4½	

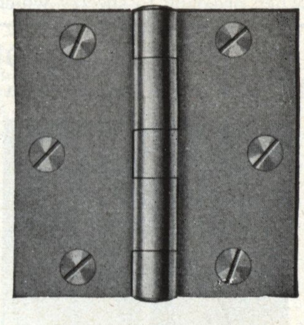
Nos. 3305 and 2305. Transom Butt, Tight Pin, Wrought Bronze

Recommended for use on transoms and other places where tight pin butts are required.

The brass pins are riveted and can not be removed to disassemble the butt.

No. 3305 is made of polished wrought bronze.

No. 2305 is made of wrought brass metal planished and plated.



NOS. 3305 AND 2305
TRANSOM BUTTS
WROUGHT BRONZE

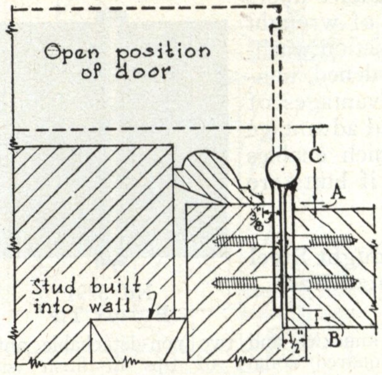
DATA ON BUTTS No. 3305 and No. 2305

			Finishes	
Size of Butt Open, in	3x3	3½x3½	No. 3305	No. 2305
Screw Holes in each	6	6	B—Bronze	BP—Planished Brass, natural fin.
Size of Screws	1¼x10	1¼x10	BP—Brass, natural finish	Other finishes
Weight per Pair, lb	1	1¼		

Note: For metal doors using template butts, simply prefix letter "T" to any of above numbers (as—T3366, etc.) and butts will be supplied with holes accurately drilled to template to match holes in metal door.

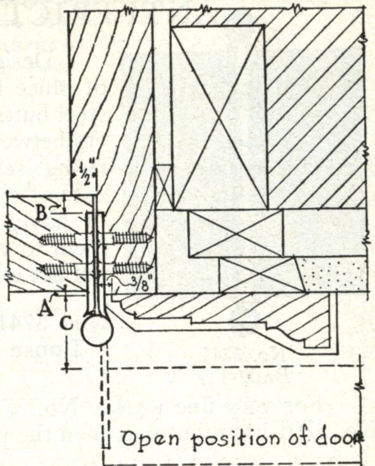
McKINNEY MANUFACTURING COMPANY | WROUGHT BRONZE BUTTS FOR WOOD DOORS | PLATE 2

Continued on next page


Open position of door
C
A
⅜"
Stud built into wall
½"
B

NOTE: Bronze butts are recommended for exterior doors where exposed to the elements.

A butt with an extremely wide throw is required if door is to lay back absolutely flush, on account of projection of the door knob.


½"
B
⅜"
A
C
Open position of door

2½" & 2¼" EXTERIOR WOOD DOOR OPENING OUT

DATA FOR 2½" & 2¼" DOORS

DOOR THICKNESS	SIZE BUTT	MAX. CLEARANCE C		B
		A = ⅛"	DOOR FLUSH	
2½"	6" × 6"	1⅝"	1¾"	⅜"
2¼"	5" × 5"	1"	1⅛"	⅜"
2¼"	6" × 6"	2"	2⅛"	⅜"
2¼"	5" × 7" *	3"	3⅛"	⅜"

* Denotes Accordion Door Butts.

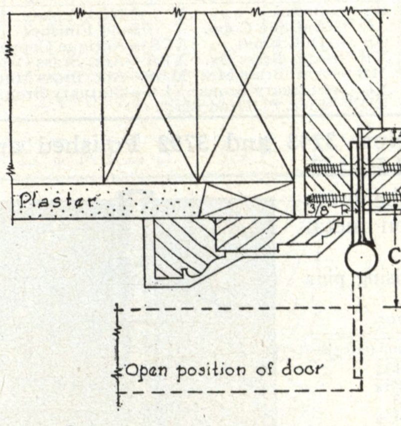
2" EXTERIOR WOOD DOOR OPENING IN OR OUT

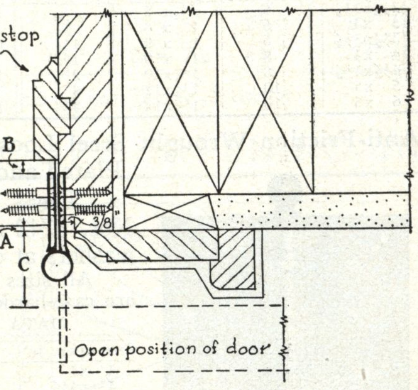
DATA FOR 2" DOOR

DOOR THICKNESS	SIZE BUTT	MAX. CLEARANCE C		B
		A = ⅛"	DOOR FLUSH	
2"	4½" × 4½"	1⅛"	1¼"	⅜"
2"	5" × 5"	1⅝"	1¾"	⅜"
2"	6" × 6"	2⅝"	2¾"	⅜"
2"	5" × 7" *	3⅝"	3¾"	⅜"

* Denotes Accordion Door Butts.

DETAILS OF EXTERIOR WOOD DOORS OPENING IN OR OUT


B
Plaster
⅜"
A
C
Open position of door


Applied stop
B
⅜"
A
C
Open position of door

1¾" INTERIOR WOOD DOOR

DATA FOR 1¾" DOOR

DOOR THICKNESS	SIZE BUTT	MAX. CLEARANCE C		B
		A = ⅛"	DOOR FLUSH	
1¾"	4" × 4"	⅞"	1"	¼"
1¾"	4½" × 4½"	1⅜"	1½"	¼"
1¾"	5" × 5"	1⅞"	2"	¼"
1¾"	4" × 6" *	2⅞"	3"	¼"

* Denotes Accordion Door Butts.

1⅜" INTERIOR WOOD DOOR

DATA FOR 1⅜" DOOR

DOOR THICKNESS	SIZE BUTT	MAX. CLEARANCE C		B
		A = ⅛"	DOOR FLUSH	
1⅜"	3" × 3"	⅝"	¾"	¼"
1⅜"	3½" × 3½"	1⅛"	1¼"	¼"
1⅜"	4" × 4"	1⅝"	1¾"	¼"
1⅜"	4" × 6" *	3⅝"	3¾"	¼"

* Denotes Accordion Door Butts.

DETAILS OF INTERIOR WOOD DOORS

McKINNEY
MANUFACTURING
COMPANY

DETAILS OF EXTERIOR & INTERIOR WOOD DOORS

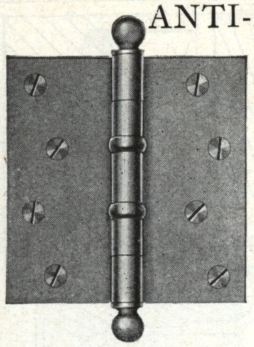
SCALE: 3"
EQUALS 1'-0"
DATE: AUG. '23

DRWG.
1

Note: When any steel butts are required to be rustproof (sherardized), simply prefix letters "SH" to the class number.

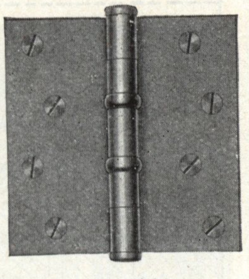
Continued on next page

ANTI-FRICTION WROUGHT STEEL BUTTS FOR WOOD DOORS



No. 3741
Ball Tip

Designed for especially severe service as in entrance doors of office buildings, etc. They are the highest type of wrought steel butts made. They have five joints with anti-friction washers between the two middle joints and have case hardened, non-rising, self-lubricating pins. They have all the advantages of ease of operation of ball bearing butts with the added advantage of having solid washers of anti-friction metal which enables them to withstand constant usage and strains even if butts are not set exactly true.



No. 3791
Button Tip

Nos. 3741 and 3791 Extra Fine Anti-Friction Wrought Steel Loose Pin Butts—Highly Polished Copper Plated Base and Heavily Plated, Beveled Joints

For very fine work. No. 3741 has a ball tip and No. 3791 has a button tip on the pin.

Made of highly polished cold rolled steel, copper plated then heavily plated. Inner edges of the leaves beveled.

Butts have five knuckles and two non-detachable anti-friction washers. Squared collars of tips fit flush with knuckles and joints are in perfect alignment. Corners are clean cut and the outer edges of the leaves are ground clean and true.

Note: For data and finishes, see tables below

Anti-Friction, Wrought Steel Loose Pin Butts—Nos. 3742 and 3765 Polished and Plated, Nos. 2742 and 2765 Planished and Plated—Joints Not Beveled

For medium priced work where the extra fine butt is not required but where ease of operation and good wearing quality is important.

Nos. 3742 and 2742 have ball tips and 3765 and 2765 have button tips. Nos. 3742 and 3765 are made of wrought steel polished and plated. Nos. 2742 and 2765 are the same except that they are planished and plated. Butts 3x3 ins. and larger have 5 knuckles and 2 solid anti-friction non-detachable metal washers.

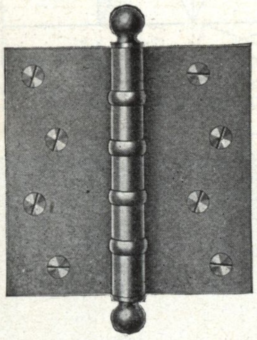
The squared collars of the tips fit flush with knuckles and joints are in perfect alignment.

Note: For data and finishes, see table below

DATA AND FINISHES FOR BUTTS NOS. 3741 AND 3791, 3742 AND 3765, 2742 AND 2765

Size open, in.	Holes in Butts	Size of screws	Weight per pair, lb.	Finishes: Polished and Plated Nos. 3741, 3791, 3742 and 3765 Planished and Plated Nos. 2742 and 2765	Finishes: Polished Sherardized and Plated SH3741, SH3791, SH3742 and SH3765 Planished Sherardized and Plated SH2742 and SH2765
2½x2½	6	⅞x 8	½	B —Bronze AC —Antique Copp. OB —Dull Brass XB —Ant. Brass Ox. MB —Ant. Brass Mot. YL —Statuary Bronze EDB—Elec. Pl. Dead Black N —Nickel Sand Finishes ACS—Antique Copper XBS—Ant. Brass Oxid. MBS—Ant. Brass Mott. YLS—Statuary Bronze	B —Bronze AC —Antique Copp. OB —Dull Brass XB —Ant. Brass Ox. MB —Ant. Brass Mot. YL —Statuary Bronze EDB—Elec. Pl. Dead Black N —Nickel plate Sand Finishes ACS—Antique Copper XBS—Ant. Brass Oxid. MBS—Ant. Brass Mott. YLS—Statuary Bronze
3 x3	6	1 x 8	⅘		
3½x3½	6	1 x 9	1⅓		
4 x4	8	1 x10	1¾		
4½x4½	8	1¼x10	2⅜		
5 x5	10	1¼x12	3		
6 x6	10	1½x14	4½		

Anti-Friction Wrought Steel Loose Pin Butts for Heavy Doors—Nos. 3743 and 3792 Polished and Plated and Nos. 2743 and 2792 Planished and Plated



Nos. 3743 and 2743
Ball Tip

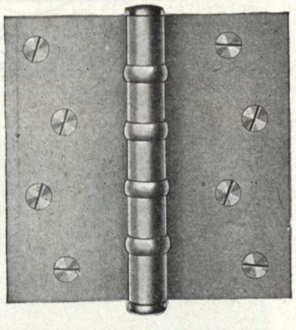
These butts are of the same quality as the butts Nos. 3742 and 3765 but have solid anti-friction metal washers at each joint.

All sizes have 5 knuckles in the joint. The non-rising pins are case-hardened and self-lubricating.

DATA AND FINISHES NOS. 3743, 2743, 3792, 2792

Size open, in.	Holes each butt	Size of screws	Weight per pair, lb.
4 x4	8	1 x10	1¾
4½x4½	8	1¼x10	2⅜
5 x5	10	1¼x12	3
6 x4	10	1½x14	3½
6 x5	10	1½x14	4
6 x6	10	1½x14	4½

Finishes for No. 3743 and No. 3792 Polished and Plated	Finishes for No. 2743 and No. 2792 Planished and Plated	
B —Bronze AC—Ant. Copp. OB—Dull Brass N —Nickel	B —Bronze AC—Ant. Copper OB—Dull Brass N —Nickel	Sand Finishes ACS—Ant. Copp XBS—Ant. Brass Oxid.



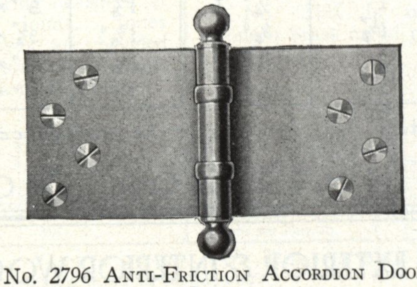
Nos. 3792 and 2792
Button Tip

No. 2796 Accordion Door, Anti-Friction, Wrought Steel, Loose Pin Butts, Planished and Plated

These butts give sufficient clearance to permit two doors to be hung together such as accordion or folding doors. On account of the throw a pair of doors will stand parallel when open.

They have solid metal washers and case-hardened, non-rising loose pins.

These butts are made with the ball tip only.



No. 2796 Anti-Friction Accordion Door Butt

DATA ON NO. 2796

Size open, in.	Holes each butt	Size of screws	Weight per pair, lb.
3x6	8	1x10	2
4x6	8	1x10	2½
4x7	8	1x10	2⅔
5x7	8	1x10	3⅓

Finishes	
B —Bronze AC —Ant. Copper OB —Dull Brass EDB—Elec. Pl. Dead Black N —Nickel	SH —Sherardized Sand Finishes ACS—Ant. Copper MBS—Ant. Bronze

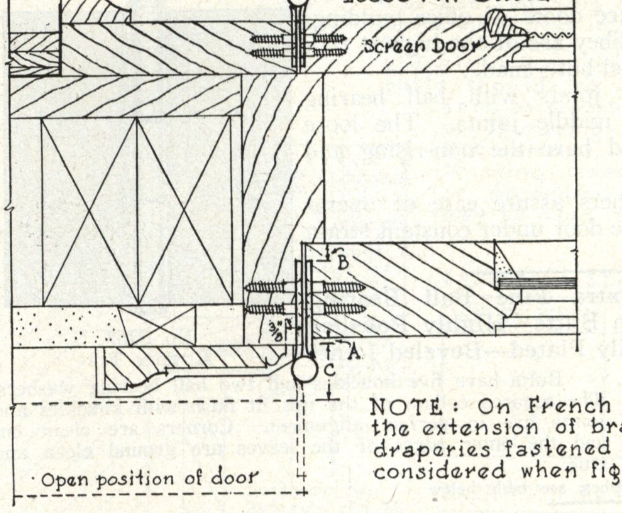
McKINNEY MANUFACTURING COMPANY

ANTI-FRICTION WROUGHT STEEL BUTTS FOR WOOD DOORS

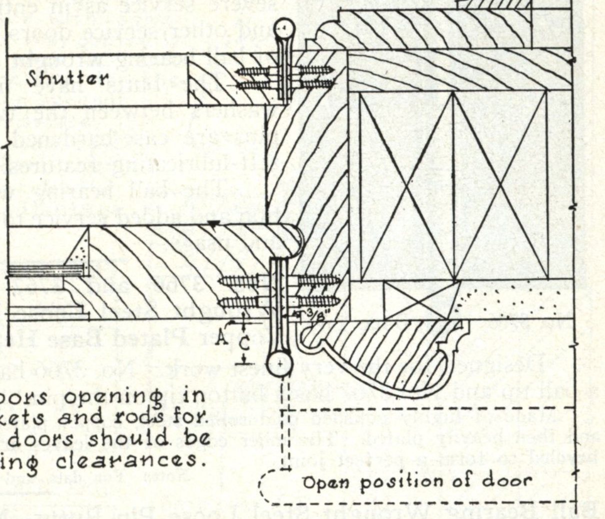
PLATE 3

Continued on next page

For screen doors use Light Loose Pin Butts or Light Parliament Loose Pin Butts.



For extremely wide throws for shutters Loose Joint Parliament Butts can often be used to advantage.



NOTE: On French doors opening in the extension of brackets and rods for draperies fastened to doors should be considered when figuring clearances.

2" & 1¾" EXTERIOR FRENCH DOOR OPENING IN WITH STRAIGHT JAMBS AND WITH SCREEN DOOR

DATA FOR 2" DOOR

SIZE BUTT	MAX. CLEARANCE C		B
	A = 1/8"	DOOR FLUSH	
4½" × 4½"	1⅛"	1¼"	⅜"
5" × 5"	1⅝"	1¾"	⅜"
6" × 6"	2⅝"	2¾"	⅜"
5" × 7" *	3⅝"	3¾"	⅜"

DATA FOR 1¾" DOOR

SIZE BUTT	MAX. CLEARANCE C		B
	A = 1/8"	DOOR FLUSH	
4" × 4"	⅞"	1"	¼"
4½" × 4½"	1⅜"	1½"	¼"
5" × 5"	1⅞"	2"	¼"
5" × 7" *	3⅞"	4"	¼"

* Denotes Accordion Door Butts.

2" & 1¾" EXTERIOR FRENCH DOOR OPENING IN WITH FRENCH DETAIL IN RABBET OF JAMB AND WITH SHUTTER

DATA FOR 2" DOOR

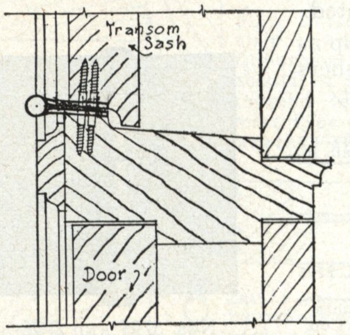
SIZE BUTT	MAX. CLEARANCE C	
	A = 1/8"	DOOR FLUSH
4½" × 4½"	1⅞"	2"
5" × 5"	2⅜"	2½"
6" × 6"	3⅜"	3½"
5" × 7" *	4⅜"	4½"

DATA FOR 1¾" DOOR

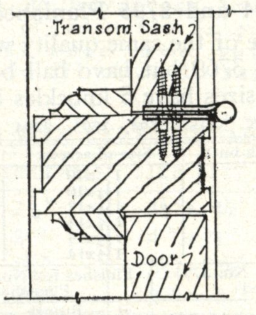
SIZE BUTT	MAX. CLEARANCE C	
	A = 1/8"	DOOR FLUSH
4" × 4"	1⅞"	2"
4½" × 4½"	2⅜"	2½"
5" × 5"	2⅞"	3"
5" × 7" *	4⅞"	5"

* Denotes Accordion Door Butts.

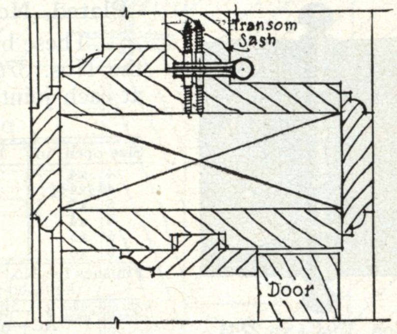
DETAILS OF EXTERIOR FRENCH DOORS OPENING IN



TRANSOM BAR AND HINGED TRANSOM FOR EXTERIOR DOOR



NARROW SOLID TRANSOM FOR VESTIBULE TYPE TRANSOM FLUSH WITH DOOR



TRANSOM BAR WITH TRANSOM CENTERED IN PARTITION

NOTES: For transoms 1¾" thick use 3"×3" butts. Butts also made 3½"×3½" in bronze or steel. Transoms should be hinged with tight pin butts. Where subject to exposure they should be of bronze, or steel butts should be sherardized and plated. Door transoms are hinged at bottom to swing into the room and butts should fit as close to sash as possible. Window transoms may be hinged at bottom to swing in, or hinged at top to swing out. They may also be hinged at side to swing out.

DETAILS OF TRANSOMS FOR EXTERIOR & INTERIOR DOORS

McKINNEY
MANUFACTURING
COMPANY

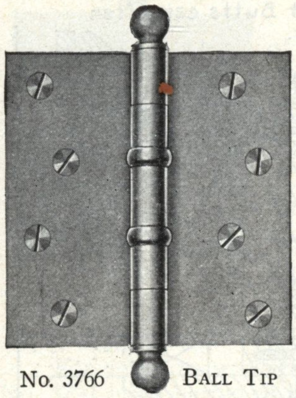
DETAILS OF EXTERIOR WOOD FRENCH DOORS ALSO WOOD TRANSOMS

SCALE: 3" EQUALS 1'-0"
DATE: AUG. '23
DRWG. 2

Note: When any steel butts are required to be rustproof (sherardized), simply prefix letters "SH" to the class number.

Continued on next page

BALL BEARING WROUGHT STEEL BUTTS FOR WOOD DOORS

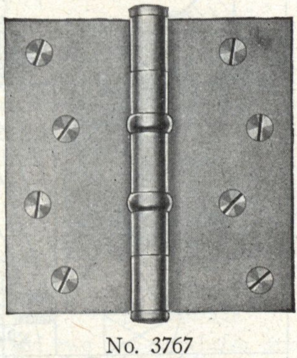


No. 3766 Ball Tip

Designed for ease of operation and especially severe service as in entrance doors of office buildings and other service doors. They are of the highest type of ball bearing wrought steel butts made.

The butts have five joints with ball bearing washers between the two middle joints. The loose pins are case-hardened and have the non-rising and self-lubricating features.

The ball bearing washers assure ease of operation and added service to the door under constant strain and usage.



No. 3767 Button Tip

Nos. 3766 and 3767 Extra Fine Ball Bearing Wrought Steel Loose Pin Butts—Highly Polished Copper Plated Base Heavily Plated—Beveled Joints

Designed for the very finest work. No. 3766 has a ball tip and No. 3767 has a button tip on the pin.

Made of highly polished cold rolled steel, copper plated and then heavily plated. The inner edges of the leaves are beveled to form a perfect joint.

Butts have five knuckles and two ball bearing washers. The squared collars of the tips fit flush with knuckles and joints are in perfect alignment. Corners are clean cut and the outer edges of the leaves are ground clean and true.

Note: For data and finishes, see table below

Ball Bearing Wrought Steel Loose Pin Butts—Nos. 3768 and 3769 Polished and Plated. Nos. 2768 and 2769 Planished and Plated—Joints Not Beveled.

For medium priced work where the finest finish is not required but ease of operation and wearing quality is important.

Nos. 3768 and 2768 have ball tip and Nos. 3769 and 2769 have button tip. Nos. 3768 and 3769 are made of wrought steel polished and plated. Nos. 2768 and 2769 are the same except that they are planished and plated. Butts 3x3 in. and larger sizes have 5 knuckles and two non-detachable ball bearing washers. The squared collars of the ball and button tips fit flush with the knuckles and the joints are in perfect alignment.

Note: For data and finishes, see table below

DATA AND FINISHES FOR BUTTS NOS. 3766, 3767, 3768, 3769, 2768 AND 2769

Size open, in.	Holes in. butts	Size of screws, in.	Weight per pair, lb.
2½x2½	6	⅞x 8	½
3 x3	6	1 x 8	⅘
3½x3½	6	1 x 9	1⅓
4 x4	8	1 x10	1¾
4½x4½	8	1¼x10	2⅜
5 x5	10	1¼x12	3
6 x6	10	1½x14	4½

FINISHES

Polished and Plated Nos. 3766, 3767, 3768 and 3769
Planished and Plated Nos. 2768 and 2769

B --Bronze
AC —Antique Copper
OB —Dull Brass
XB —Ant. Brass Oxid.
MB —Ant. Brass Mottled
YL —Statuary Bronze
EDB—Elec. Plat. D. Black
BB —Bower Barff
N —Nickel

Sand Finishes

ACS —Antique Copper
XBS —Ant. Brass Oxid.
MBS —Ant. Brass Mot.
YLS —Statuary Bronze

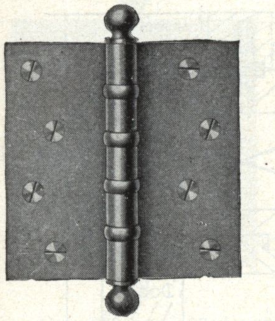
Polished Sherardized and Plated SH-3766, SH-3767, SH-3768 and SH-3769
Planished Sherardized and Plated SH-2768 and SH-2769

B —Bronze
AC —Antique Brass
OB —Dull Brass
XB —Ant. Brass Oxid.
MB —Ant. Brass Mottled
YL —Statuary Bronze
EDB—Elec. Pl. D. Black
N —Nickel Plate

Sand Finishes

ACS —Antique Copper
XBS —Ant. Brass Oxid.
MBS—Ant. Brass Mot.
YLS —Statuary Bronze

Ball Bearing Wrought Steel Loose Pin Butts for Heavy Doors—Nos. 3794 and 3795 Polished and Plated, Nos. 2794 and 2795 Planished and Plated



Nos. 3794 and 2794 Ball Tip

These butts are of the same quality workmanship as the Nos. 3768 and 3769 but have ball bearing washers at each joint. All sizes have 5 knuckles in the joint.

DATA ON NOS. 3794, 3795, 2794, 2795

Size open, in.	Holes each butt	Size of screws	Weight per pair, lb.
4 x4	8	1 x10	1¾
4½x4½	8	1¼x10	2⅜
5 x5	10	1¼x12	3
6 x4	10	1½x14	3½
6 x5	10	1½x14	4
6 x6	10	1½x14	4½

Finishes for No. 3794 and No. 3795 Polished and Plated

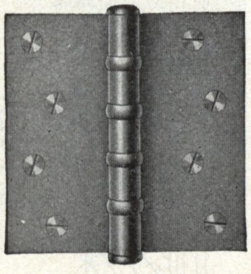
B —Bronze
AC—Ant. Copp.
OB—Dull Brass
N —Nickel

Finishes for No. 2794 and No. 2795 Planished and Plated

B —Bronze
AC—Ant. Copp.
OB—Dull Brass
N—Nickel

Sand Finishes

ACS—Ant. Cop.
XBS—Ant. Brass Oxid.



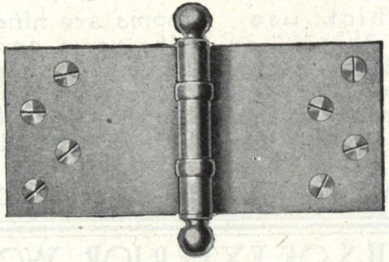
Nos. 3795 and 2795 Button Tip

No. 2797 Accordion Door Ball Bearing Wrought Steel Loose Pin Butts—Planished and Plated

These butts give sufficient clearance to permit two doors to be hung together such as accordion or folding doors. On account of the throw a pair of doors will stand parallel when open.

They have ball bearing washers and case hardened, non-rising loose pins.

These butts are made with the ball tip only.



No. 2797 Ball Bearing Accordion Door Butt

DATA ON NO. 2797

Size open, in.	Holes each butt	Size of screws	Weight per pair, lb.
3x6	8	1x10	2
4x6	8	1x10	2½
4x7	8	1x10	2⅔
5x7	8	1x10	3⅓

FINISHES

B —Bronze
AC —Ant. Copper
OB —Dull Brass
EDB—Elec. Pl. Dead Black
N —Nickel
SH —Sherardized

Sand Finishes

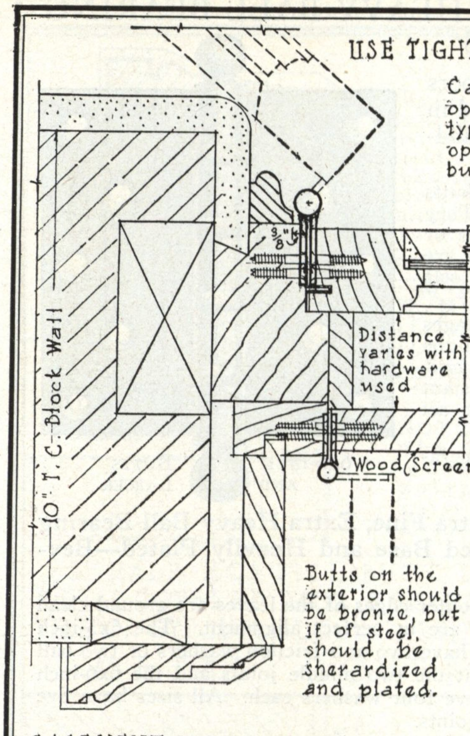
ACS —Ant. Copper
MBS—Ant. Bronze

McKINNEY MANUFACTURING COMPANY | BALL BEARING WROUGHT STEEL BUTTS FOR WOOD DOORS | PLATE 4

Continued on next page

USE TIGHT PIN BUTTS FOR CASEMENTS OPENING OUT

Casements opening out are generally operated or held in place with some type of adjuster. If so, they generally operate only slightly past 90° and butts should be as close to the sash as possible on account of operating hardware. If casements are required to swing clear Parliament or Accordion Door Butts may be used to advantage.



Butts on the exterior should be bronze, but if of steel, should be sherardized and plated.

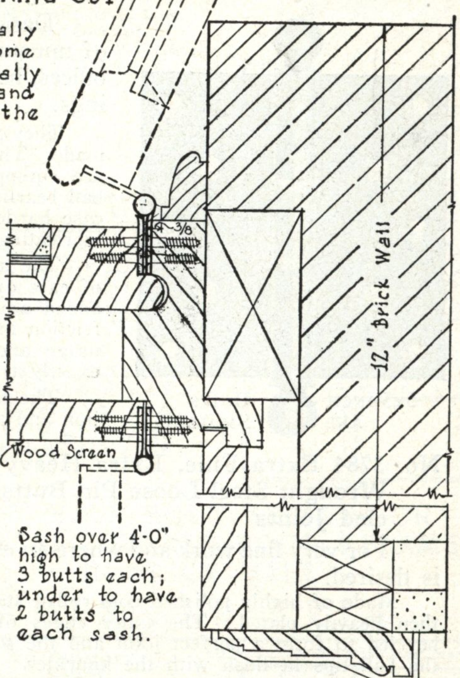
CASEMENT WINDOWS OPENING OUT WITH STRAIGHT JAMB & WOOD SCREEN HINGED TO OPEN IN

SASH WITH STRAIGHT JAMB

SASH THICKNESS	SIZE BUTT
2¼"	4" × 4"
2"	4" × 4"
1¾"	3½" × 3½"
1⅜"	3" × 3"

SASH WITH FRENCH DETAIL

SASH THICKNESS	SIZE BUTT
2¼"	4" × 4"
2"	3½" × 3½"
1¾"	3" × 3"



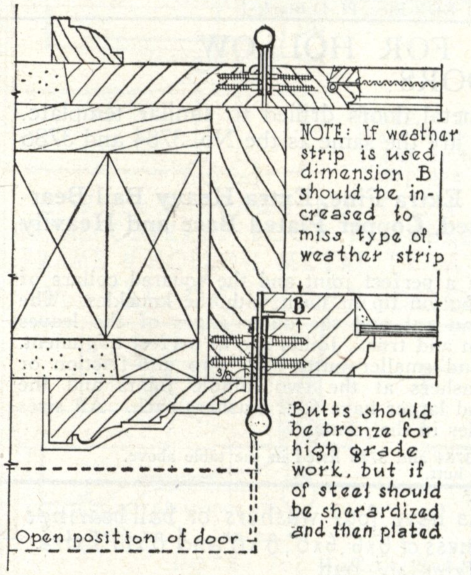
Sash over 4'-0" high to have 3 butts each; under to have 2 butts to each sash.

CASEMENT WINDOWS OPENING OUT WITH FRENCH DETAIL JAMB & SASH & METAL SCREEN HINGED TO OPEN IN

DETAILS OF WOOD CASEMENT SASH OPENING OUT IN MASONRY WALLS

USE LOOSE PIN BUTTS FOR CASEMENTS OPENING IN

Casements opening in are rarely required to clear the trim. If such condition occurs Parliament Butts or Accordion Door Butts may be used to advantage. Some type of adjuster is generally used and butt should fit close to sash.



NOTE: If weather strip is used dimension B should be increased to miss type of weather strip

Butts should be bronze for high grade work, but if of steel should be sherardized and then plated

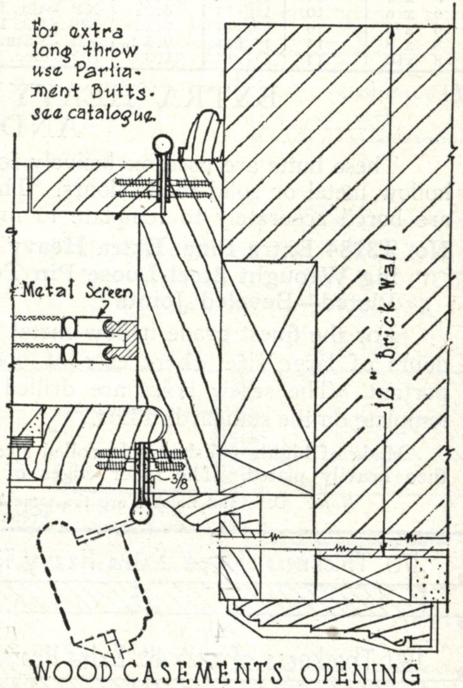
WOOD CASEMENTS OPENING IN WITH STRAIGHT JAMBS & WITH SHUTTERS

SASH WITH STRAIGHT JAMB

SASH THICKNESS	SIZE BUTT
2¼"	4½" × 4½"
2"	4" × 4"
1¾"	3½" × 3½"
1⅜"	3" × 3"

SASH WITH FRENCH DETAIL

SASH THICKNESS	SIZE BUTT
2¼"	4" × 4"
2"	4" × 4"
1¾"	3½" × 3½"
1⅜"	3" × 3"



For extra long throw use Parliament Butts- see catalogue.

WOOD CASEMENTS OPENING IN WITH FRENCH DETAIL JAMBS & SASH

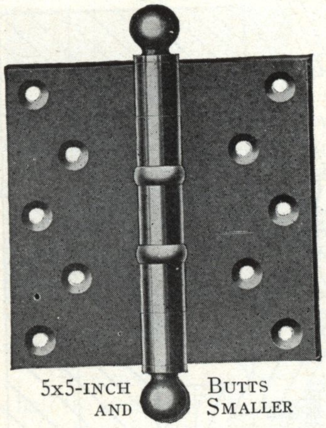
DETAILS OF INWARD OPENING WOOD CASEMENTS IN FRAME & MASONRY WALLS

McKINNEY MANUFACTURING COMPANY	DETAILS OF WOOD CASEMENT WINDOWS	SCALE: 3" EQUALS 1'-0" DATE: AUG. '23	DRWG. 3

Note: When any steel butts are required to be rustproof (sherardized), simply prefix letters "SH" to the class number.

Continued on next page

EXTRA HEAVY ANTI-FRICTION AND EXTRA HEAVY BALL BEARING WROUGHT STEEL BUTTS



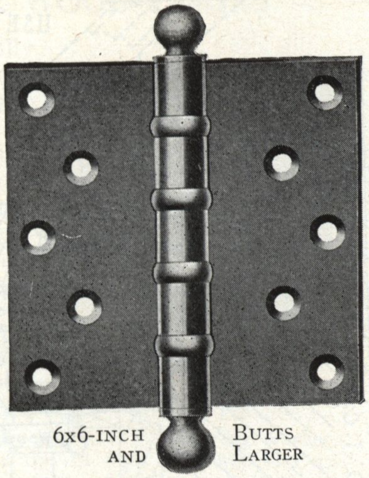
5x5-INCH AND SMALLER BUTTS

Designed for use in hanging heavy doors of unusual dimensions and weight, as found in offices, hospitals, hotels and other public buildings.

They are the highest type of wrought steel butts made. They have five knuckles in the joints. They are equipped with non detachable anti-friction or ball bearing washers. The non-rising steel pins are case hardened to minimize wear and have the self lubricating feature.

The anti-friction butts have all the advantages of ease of operation of ball bearing butts with the added advantage of having solid washers of anti-friction metal, enabling them to withstand constant usage and strains even if the butts are not set exactly true.

The ball bearing washers assure ease of operation and added service to the door.



6x6-INCH AND LARGER BUTTS

No. 3784 Extra Fine, Extra Heavy Anti-Friction and No. 3786 Extra Fine, Extra Heavy Ball Bearing Wrought Steel Loose Pin Butts, Highly Polished, Copper Plated Base and Heavily Plated—Beveled Joints

For very fine work and where an extra heavy butt is desired.

Made of highly polished cold rolled steel, copper plated then heavily plated. The inner edges of the leaves are beveled to form a perfect joint and the squared collars of the ball tips fit flush with the knuckles. The corners are clean cut and the outer edges of the leaves are ground clean and true. Joints are in perfect alignment. The 5x5-inch and smaller butts have two anti-friction washers or two ball bearing washers at the two middle joints and the 6x6-inch size and larger have four washers each. All sizes have five knuckles in the joints.

DATA AND FINISHES FOR BUTTS NOS. 3784 AND 3786

Size open, in.	No. of screw holes	Size of screws	Net weight per pair, lb.	Finishes			
				Polished and Plated, Nos. 3784 and 3786		Polished, Sherardized and Plated, Nos. SH-3784 and SH-3786	
4 x 4	8	1¼x11	2.44	B -Bronze AC -Antique Copper OB -Dull Brass XB -Ant. Brass Oxid. MB -Ant. Brass Mottled YL -Statuary Bronze EDB-Elec. Pl. D. Black	N -Nickel Sand Finishes ACS-Antique Copper XBS-Ant. Brass Oxid. MBS-Ant. Brass Mottled YLS-Statuary Bronze	B -Bronze AC -Antique Copper OB -Dull Brass XB -Ant. Brass Oxid. MB -Ant. Brass Mottl'd YL -Statuary Bronze EDB-Elec. Pl. D.Black	N -Nickel Sand Finishes ACS-Antique Copper XBS-Ant. Brass Oxid. MBS-Ant. Brass Mottl'd YLS-Statuary Bronze
4½x 4½	8	1½x12	3.04				
5 x 5	10	1½x14	3.88				
6 x 6	10	1¾x14	6.25				
6 x 8	10	1¾x14	7.33				
8 x 8	14	1¾x14	9.5				
8 x10	14	1¾x14	11.3				

EXTRA HEAVY TEMPLATE BUTTS FOR HOLLOW AND SOLID METAL DOORS

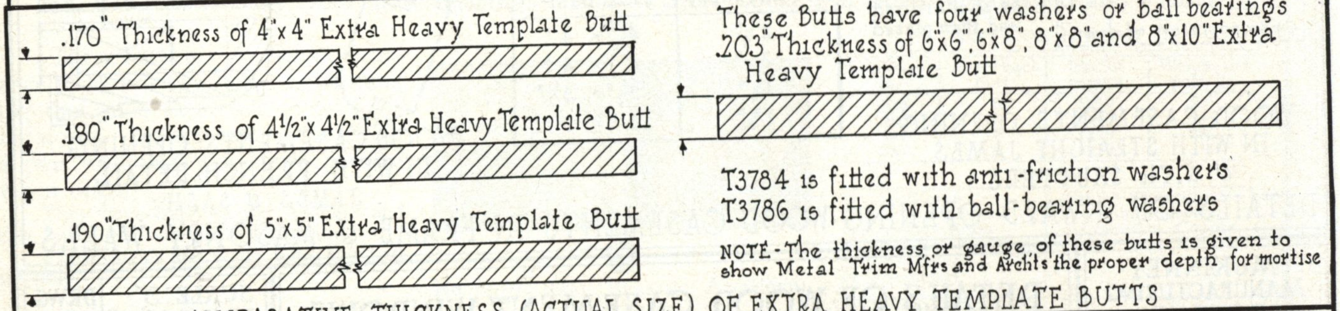
These butts are used exclusively for extra heavy hollow metal or solid metal doors. The screw holes are bored accurately to template to match perfectly the holes in metal doors drilled to similar template, otherwise they are the same as the No. 3784 and 3786 listed above.

No. T3784 Extra Fine, Extra Heavy Anti-Friction and No. T3786 Extra Fine, Extra Heavy Ball Bearing Wrought Steel Loose Pin Template Butts, Highly Polished, Copper Plated Base and Heavily Plated—Beveled Joints

For the finest grade hollow metal or solid metal doors of large size where ease of operation is important. The screw holes are drilled accurately to template on the standard radius.

Made of highly polished cold rolled steel, copper plated then heavily plated. The inner edges of the leaves are beveled to form a perfect joint and the squared collars of the ball tip or button tip fit flush with the knuckles. The corners are clean cut and the outer edges of the leaves are ground clean and true. Joints are in perfect alignment. The 5x5-inch and smaller butts have two anti-friction or ball bearing washers at the two middle joints and the 6x6-inch size and larger have four washers each. All sizes have five knuckles in the joints.

Note: Data and finishes are the same for Nos. T3784 and T3786 as for Nos. 3784 and 3786 listed in the table above. Prefixing the letter "T" indicates a template butt.


.170" Thickness of 4"x 4" Extra Heavy Template Butt
.180" Thickness of 4½"x 4½" Extra Heavy Template Butt
.190" Thickness of 5"x 5" Extra Heavy Template Butt
These Butts have four washers or ball bearings
.203" Thickness of 6"x6", 6"x 8", 8"x 8" and 8"x10" Extra Heavy Template Butt

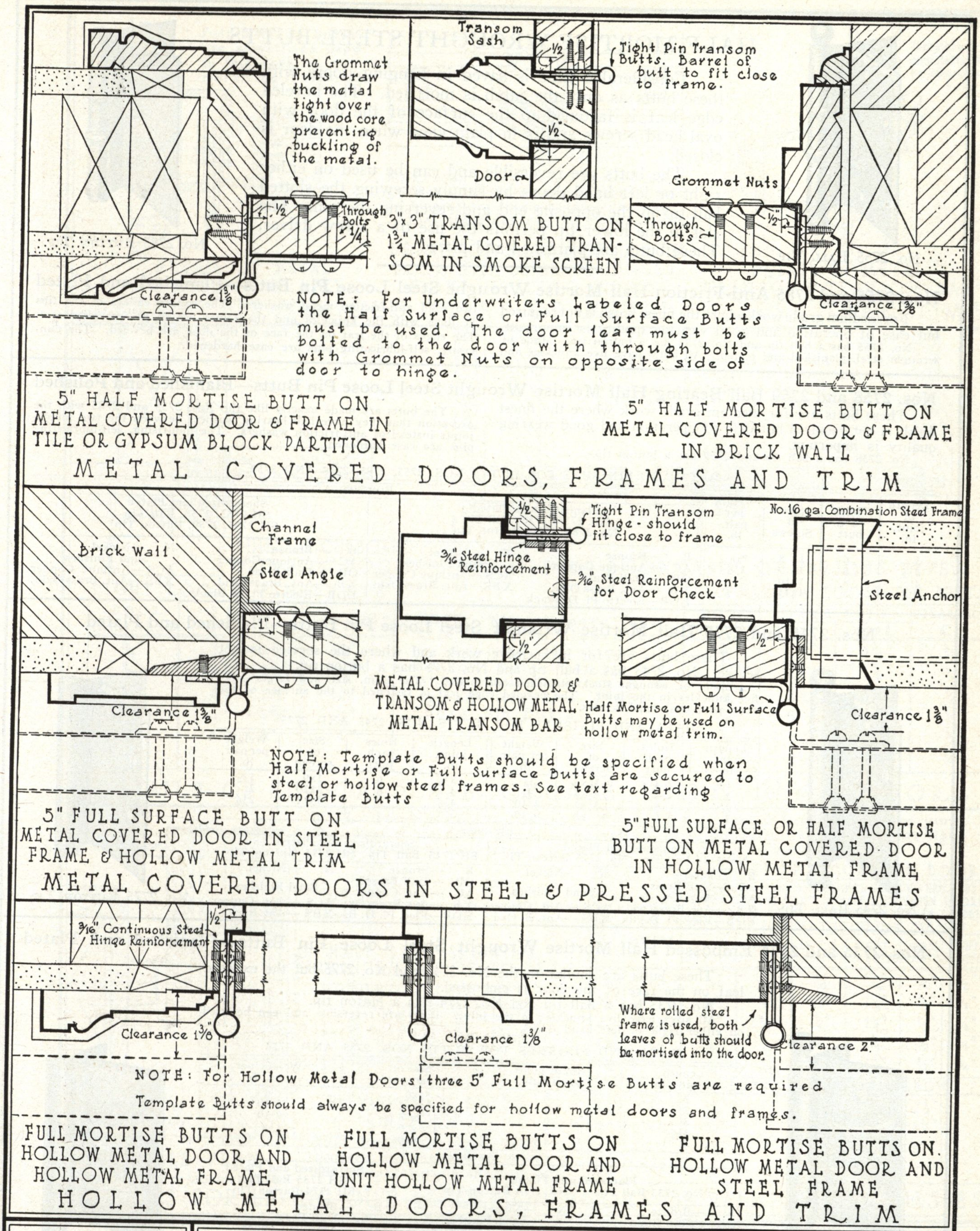
T3784 is fitted with anti-friction washers
T3786 is fitted with ball-bearing washers

NOTE - The thickness or gauge of these butts is given to show Metal Trim Mfrs and Archts the proper depth for mortise

COMPARATIVE THICKNESS (ACTUAL SIZE) OF EXTRA HEAVY TEMPLATE BUTTS

McKINNEY MANUFACTURING COMPANY	EXTRA HEAVY ANTI-FRICTION & EXTRA HEAVY BALL BEARING STANDARD & TEMPLATE WROUGHT STEEL LOOSE PIN BUTTS	PLATE 5

Continued on next page


The Grommet Nuts draw the metal tight over the wood core preventing buckling of the metal.
1/2"
Through Bolts
1/4"
Clearance 1 3/8"
Transom Sash
1/2"
Tight Pin Transom Butts. Barrel of butt to fit close to frame.
1/2"
Door
Grommet Nuts
Through Bolts
1/2"
Clearance 1 3/8"
Channel Frame
Brick Wall
Steel Angle
1"
Clearance 1 3/8"
1/2"
Tight Pin Transom Hinge - should fit close to frame
3/16" Steel Hinge Reinforcement
3/16" Steel Reinforcement for Door Check
1/2"
No.16 ga. Combination Steel Frame
Steel Anchor
1/2"
Half Mortise or Full Surface Butts may be used on hollow metal trim.
Clearance 1 3/8"
1/2"
3/16" Continuous Steel Hinge Reinforcement
Clearance 1 3/8"
Clearance 1 3/8"
Where rolled steel frame is used, both leaves of butts should be mortised into the door.
Clearance 2"

3"x3" TRANSOM BUTT ON 1 3/4" METAL COVERED TRANSOM IN SMOKE SCREEN

NOTE: For Underwriters Labeled Doors the Half Surface or Full Surface Butts must be used. The door leaf must be bolted to the door with through bolts with Grommet Nuts on opposite side of door to hinge.

5" HALF MORTISE BUTT ON METAL COVERED DOOR & FRAME IN TILE OR GYPSUM BLOCK PARTITION

5" HALF MORTISE BUTT ON METAL COVERED DOOR & FRAME IN BRICK WALL

METAL COVERED DOORS, FRAMES AND TRIM

METAL COVERED DOOR & TRANSOM & HOLLOW METAL METAL TRANSOM BAR

NOTE: Template Butts should be specified when Half Mortise or Full Surface Butts are secured to steel or hollow steel frames. See text regarding Template Butts

5" FULL SURFACE BUTT ON METAL COVERED DOOR IN STEEL FRAME & HOLLOW METAL TRIM

5" FULL SURFACE OR HALF MORTISE BUTT ON METAL COVERED DOOR IN HOLLOW METAL FRAME

METAL COVERED DOORS IN STEEL & PRESSED STEEL FRAMES

NOTE: For Hollow Metal Doors three 5" Full Mortise Butts are required

Template Butts should always be specified for hollow metal doors and frames.

FULL MORTISE BUTTS ON HOLLOW METAL DOOR AND HOLLOW METAL FRAME

FULL MORTISE BUTTS ON HOLLOW METAL DOOR AND UNIT HOLLOW METAL FRAME

FULL MORTISE BUTTS ON HOLLOW METAL DOOR AND STEEL FRAME

HOLLOW METAL DOORS, FRAMES AND TRIM

McKINNEY MANUFACTURING COMPANY	METAL COVERED & HOLLOW METAL DOORS IN METAL COVERED, STEEL AND HOLLOW METAL FRAMES	SCALE: 3" EQUALS 1'-0" DATE. AUG. '23	DRWG. 4

Note: When any steel butts are required to be rustproof (sherardized), simply prefix letters "SH" to the class number.

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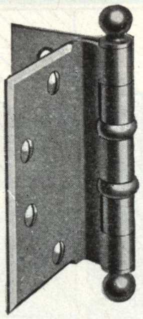
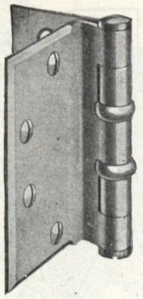


No. 2755 Ball Tip

HALF MORTISE WROUGHT STEEL BUTTS

Considerable time is saved in hanging doors with these butts as only the jamb is mortised. The beveled edge leaf is fastened to the surface of the door with oval head screws and is in plain view when the door is closed.

The butts are reversible and can be used on either right or left hand doors by simply screwing the slotted ball tip in the opposite end and reversing the pin. The slot in the lower tip permits the use of a screw driver. These butts are planished and plated.



No. 2785 Button Tip

Nos. 2755 and 2785 Anti-Friction Half Mortise Wrought Steel Loose Pin Butts—Planished and Plated

For medium grade work where the finest finish is not required but ease of operation and good wearing quality is important.

No. 2755 has a ball tip and No. 2785 has a button tip. Made of wrought steel, planished and plated. All butts have five knuckles and two solid anti-friction metal washers. The square collars of the tips fit flush with the knuckles and the joints are in perfect alignment. The edges of the leaf on the face of the door are beveled. The non-rising, self-lubricating pins are case hardened.

Nos. 2758 and 2759 Ball Bearing Half Mortise Wrought Steel Loose Pin Butts—Planished and Polished

These butts are for medium grade work where the finest finish is not required but ease of operation and good wearing quality is important.

No. 2758 has a ball tip and 2759 has a button tip.

The butts are made exactly like the Nos. 2755 and 2785 with the exception that they have ball bearing washers between the two middle joints instead of anti-friction washers. The non-rising, self-lubricating pins are case hardened.

DATA AND FINISHES FOR BUTTS NOS. 2755, 2785, 2758 AND 2759

Length of joint, in.	Holes each butt	Size of Screws	Weight per pair, lb.
3	6	1x 8	9/10
3½	6	1x 9	1½
4	8	1x10	2
4½	8	1x11	2½

Finishes

Planished and Plated
No. 2755, 2758, Ball Tip
No. 2785, 2759, Button Tip

B —Bronze
AC —Antique Copper
OB —Dull Brass
XB —Ant. Brass Oxid.
EDB—Electro Pl. D. Black
N —Nickel

Sand Finishes
ACS—Antique Copper
XBS—Ant. Brass Oxid.

Sherardized and Plated
SH 2755, 2758, Ball Tip
SH 2785, 2759, Button Tip

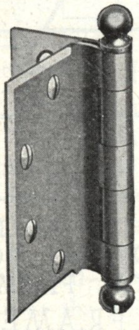
B —Bronze
AC —Antique Copper
OB —Dull Brass
XB —Ant. Brass Oxid.
EDB—Electro Pl. D. Black
N —Nickel

Sand Finishes
ACS—Antique Copper
XBS—Ant. Brass Oxid.

Nos. 2745 and 2775 Half Mortise Wrought Steel Loose Pin Butts—Planished and Plated

These butts are for inexpensive work and where the service is not severe. No. 2745 has a ball tip and No. 2775 has a button tip.

Made of wrought steel, planished and plated. The 2 in. size and larger have five knuckles in the joint. The beveled edge leaf is fastened to the surface of the door with oval head screws.



No. 2745 Ball Tip

DATA AND FINISHES FOR BUTTS NOS. 2745 AND 2775

Length joint, in.	Holes each butt	Size of screws	Weight per pair, lb.	Length joint, in.	Holes each butt	Size of screws	Weight per pair, lb.
1½	4	¾x6	1/6	3½	6	1x9	1½
2	4	¾x6	1/4	4	8	1x10	2
2½	6	¾x7	4/10	4½	8	1x11	2½
3	6	1 x8	9/10	5	.....	.....	.....

Finishes

Planished and Plated
No. 2745 Ball Tip No. 2775 Button Tip

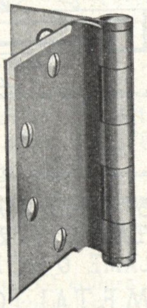
B —Bronze
OB —Dull Brass
AC —Ant. Copper
XB —Ant. BrassOxid.
EDB—Elec. Pl. D. Blk
N —Nickel

Sand Finishes
ACS —Ant. Copper
XBS —Ant. B. Oxd

Sherardized and Plated
SH 2745 Ball Tip SH 2775 Button Tip

B —Bronze
OB —Dull Brass
AC —Ant. Copper
XB —Ant. Brass Ox.
EDB—Elec. Pl. D. B.
N —Nickel

Sand Finishes
ACS —Ant. Copper
XBS —Ant. Br. Ox.



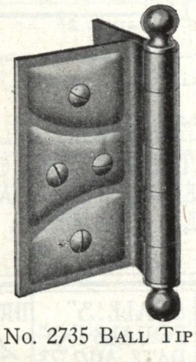
No. 2775 Button Tip

Nos. 2735 and 2774 Embossed Half Mortise Wrought Steel Loose Pin Butts—Planished and Plated

These butts are similar to the No. 2745 and No. 2775 but the exposed leaf on the face of the door is embossed.

No. 2735 has a ball tip and No. 2774 has a button tip.

All sizes have five knuckles in the joint. Butts are reversible and can be used on either right or left hand doors.



No. 2735 Ball Tip

DATA AND FINISHES FOR BUTTS NOS. 2735 AND 2774

Length of joint, in.	No. of holes each butt	Size of screws	Weight per pair, lb.
2	5	¾x6	1/4
2½	6	¾x 7	4/10
3	6	1 x 8	9/10
3½	6	1 x 9	1½
4	8	1 x10	2

Finishes

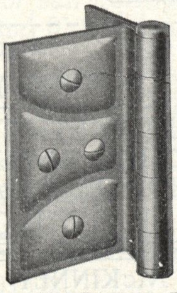
Planished and Plated
No. 2735 Ball Tip No. 2774 Button Tip

B —Bronze
OB —Dull Brass
AC —Antique Copper
XB —Antique Brass Oxid.
MB —Ant. Brass Mottled
EDB—Electro Pl. Dead Black
N —Nickel

Sand Finishes
ACS—Ant. Copper
XBS—Ant. Brass Oxid.
MBS—Ant. Brass Mott.

Sherardized and Plated
SH 2735 Ball Tip
SH 2774 Button Tip

B —Bronze
OB —Dull Brass
AC —Antique Copper
XB —Ant. Brass Oxid.
MB —Ant. Brass Mottled
EDB—Elec. Pl. Dead Black



No. 2774 Button Tip

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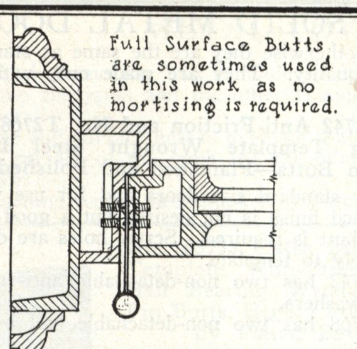
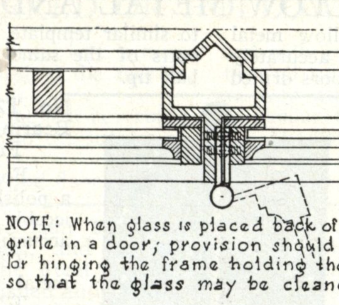
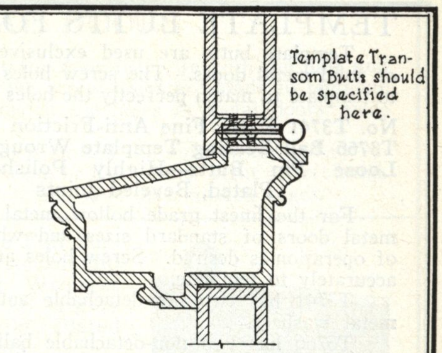

Full Surface Butts are sometimes used in this work as no mortising is required.

DETAIL OF METAL DOOR AND FRAME



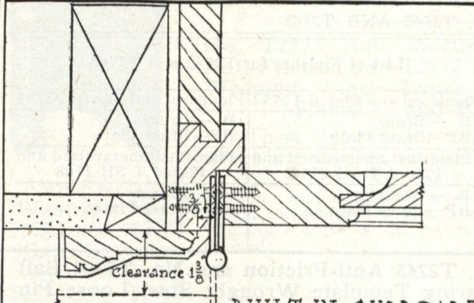
NOTE: When glass is placed back of a metal grille in a door, provision should be made for hinging the frame holding the glass so that the glass may be cleaned easily

DETAIL OF METAL GRILLE IN DOOR WITH SEPARATE HINGED FRAME HOLDING GLASS

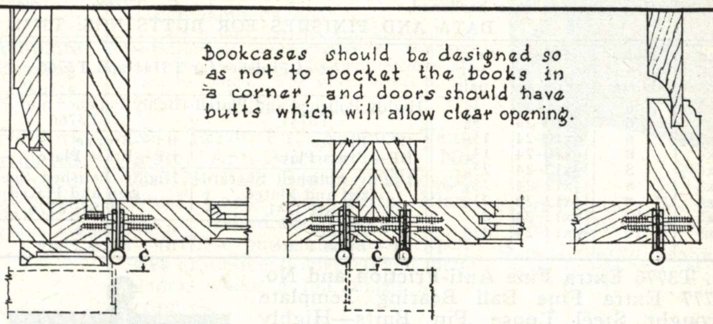


DETAIL OF METAL TRANSOM & TRANSOM BAR

DETAILS OF VARIOUS TYPES OF METAL DOORS & TRANSOMS



BUILT-IN CUPBOARD USING 1 1/8" DOORS



Bookcases should be designed so as not to pocket the books in a corner, and doors should have butts which will allow clear opening.

DETAILS OF BOOKCASES OF VARIOUS TYPES

LIGHT LOOSE PIN BUTTS

DOOR THICKNESS	SIZE BUTT	CLEARANCE C
3/4"	2" × 2"	3/4"
7/8"	2 1/2" × 2 1/2"	1/2"
7/8"	2 1/2" × 2 1/2"	1"
1 1/8"	3" × 2 1/2"	1/2"
1 1/8"	3" × 3"	1"

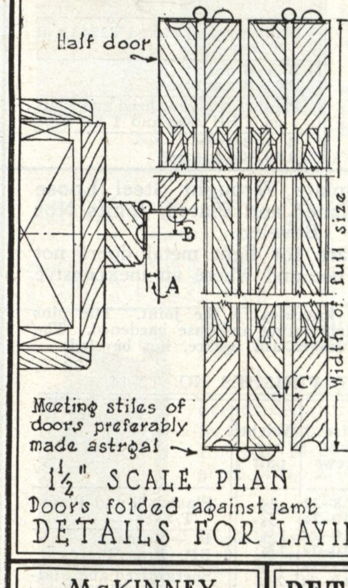
NOTE: Where doors are thin or little clearance is required the Light Narrow Butts may be used. Where more clearance is required use the Light Loose Pin Butts.

LIGHT NARROW LOOSE PIN BUTTS

DOOR THICKNESS	SIZE BUTT		CLEARANCE C
	HIGH	WIDE	
3/4"	1 1/2"	1 3/8"	3/16"
3/4"	2"	1 5/8"	3/8"
7/8"	2 1/2"	1 3/4"	1/4"
7/8"	3"	1 15/16"	1/2"
7/8"	3 1/2"	2 1/4"	3/4"
1 1/8"	3 1/2"	2 1/4"	1/4"

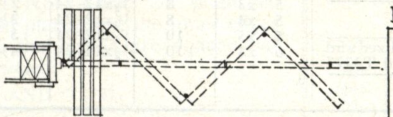
DETAILS OF CUPBOARD & BOOKCASE USING 1 1/8" & 7/8" DOORS

NOTE: Doors should not exceed 3'-0" wide. A half door is used next to the jamb. The edges of the doors should be rabbetted. Loose Pin Butts are preferable but Tight Pin Butts may be used when it is desirable to fold doors compactly.

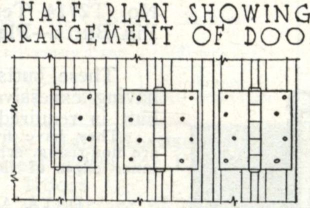


Meeting stiles of doors preferably made astragal

1 1/2" SCALE PLAN
Doors folded against jamb



HALF PLAN SHOWING ARRANGEMENT OF DOORS



ELEVATION OF BUTTS ON DOORS

NOTE: For details of overhead hangers and method of installing see manufacturers catalogues.

DATA & CLEARANCES OF ACCORDION DOORS

THICKNESS OF DOOR	SIZE OF BUTTS	"A" = DISTANCE FROM CENTER OF HINGE PIN TO EDGE OF DOOR · SEE PLAN		"B" = DISTANCE FROM EDGE OF HALF DOOR TO CENTER LINE OF HANGER TRACK · SEE PLAN		"C" = SPACE BETWEEN DOORS WHEN FOLDED SEE PLAN	
		LOOSE PIN BUTTS	TIGHT PIN BUTTS	LOOSE PIN BUTTS	TIGHT PIN BUTTS	LOOSE PIN BUTTS	TIGHT PIN BUTTS
1 3/8"	3" × 3"	1/4"	1/4	15/16"	15/16"	1/2"	1/2"
1 3/4"	3 1/2" × 3 1/2"	1/4"	1/4	1 1/8"	1 1/8"	1/2"	1/2"
2"	4" × 4"	1/4"	1/4	1 1/4"	1 1/4"	1/2"	1/2"
2 1/4"	4" × 4"	1/4"	1/8	1 3/8"	1 1/4"	1/2"	1/4"
2 1/2"	5" × 5"	3/8"	3/8	1 5/8"	1 5/8"	3/4"	3/4"
ACCORDION BUTTS FOR WIDE THROW							
1 3/4"	3" × 6"	1 3/8"		2 3/8"		2 3/4"	
2"	4" × 6"	1 1/4"		2 1/4"		2 1/4"	
2 1/4"	4" × 7"	1 1/2"		2 5/8"		3"	
2 1/2"	5" × 7"	1 1/4"		2 1/2"		2 1/2"	

DETAILS FOR LAYING OUT ACCORDION DOORS OF VARIOUS THICKNESSES

McKINNEY MANUFACTURING COMPANY

DETAILS OF SOLID METAL DOORS & TRANSOMS WOOD CABINET & ACCORDION DOORS

SCALE: 3" EQUALS 1'-0"
DATE: AUG. '23

DRWG. 5

Note: When any steel butts are required to be rustproof (sherardized), simply prefix letters "SH" to the class number.

Continued on next page

TEMPLATE BUTTS FOR HOLLOW METAL AND SOLID METAL DOORS

Template butts are used exclusively for hollow metal or solid metal doors. The screw holes are bored accurately to template to match perfectly the holes in metal doors drilled to similar template, otherwise they are the same as standard butts of the same quality. They are made only with the ball tip.

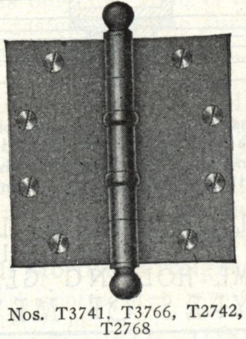
No. T3741 Extra Fine Anti-Friction and No. T3766 Ball Bearing Template Wrought Steel Loose Pin Butts—Highly Polished and Plated, Beveled Joints

For the finest grade hollow metal or solid metal doors of standard sizes and where ease of operation is desired. Screw holes are drilled accurately to template.

T3741 has two non-detachable anti-friction metal washers.

T3766 has two non-detachable ball bearing washers.

All butts have five knuckles in the joint. Made of highly polished wrought steel, copper plated then heavily plated. Inner edges of leaves are beveled, outer edges and corners ground square and true. The non-rising, self-lubricating pins are case hardened.



Nos. T3741, T3766, T2742, T2768

No. T2742 Anti-Friction and No. T2768 Ball Bearing Template Wrought Steel Loose Pin Butts—Planished and Polished

For standard size doors and for use where a polished finish is not desired but a good serviceable butt is required. Screw holes are drilled accurately to template.

T2742 has two non-detachable anti-friction metal washers.

T2768 has two non-detachable ball bearing washers.

All sizes of butts have five knuckles in the joint. They are made of planished wrought steel heavily plated. The inner edges of the leaves are square and not beveled. The non-rising, self-lubricating pins are case hardened.

DATA AND FINISHES FOR BUTTS NOS. T3741, T3766, T2742 AND T2768

Size open, in.	Holes in butts	Size of screws	Weight per pair
2½x2½	6	½x 8–32	½
3 x3	6	½x10–24	⅘
3½x3½	6	½x10–24	1⅓
4 x4	8	½x10–24	1¾
4½x4½	8	½x12–24	2⅜
5 x3	8	½x12–24	2⅛
5 x4	8	½x12–24	2½
5 x5	10	½x12–24	3
6 x5	10	½x14–24	4½

List of Finishes for T3741 and T3766		List of Finishes for T2742 and T2768	
Highly Polished and Plated T3741	Highly Polished and Plated T3766	Planished and Plated T2742	Planished and Plated T2768
B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate
Highly Polished Sherardized and Plated T SH 3741	Highly Polished Sherardized and Plated T SH 3776	Planished Sherardized and Plated T SH 2742	Planished Sherardized and Plated T SH 2768
B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate	B —Bronze BP—Brass Plate

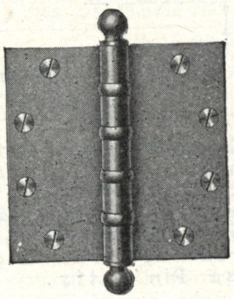
No. T3776 Extra Fine Anti-Friction and No. T3777 Extra Fine Ball Bearing Template Wrought Steel Loose Pin Butts—Highly Polished and Plated, Beveled Joints

For the finest grade extra heavy hollow metal or solid metal doors where ease of operation is important. Screw holes are drilled accurately to template.

T3776 has four non-detachable anti-friction metal washers.

T3777 has four non-detachable ball bearing washers.

All butts have five knuckles in the joint. Made of highly polished wrought steel, copper plated then heavily plated. Inner edges of leaves are beveled, outer edges and corners are ground square and true. The non-rising, self-lubricating pins are case hardened.



Nos. T3776, T3777, T2743, T2794

No. T2743 Anti-Friction and No. T2794 Ball Bearing Template Wrought Steel Loose Pin Butts—Planished and Plated

For heavy doors or where the service is severe and where the finest finish is not necessary, but a good serviceable butt is required. Screw holes are drilled accurately to template.

T2743 has four non-detachable anti-friction metal washers.

T2794 has four non-detachable ball bearing washers.

All butts have five knuckles in the joint. They are planished and plated. Inner edges of leaves are square, not beveled. The non-rising, self-lubricating pins are case hardened.

DATA AND FINISHES NOS. T3776 AND T3777

Size open, in.	Holes in butts	Size of screws	Weight per pair	Finishes
2½x2½	6	½x 8–32	½	Highly Polished and Plated T3776 and T3777
3 x3	6	½x10–24	⅘	B —Bronze BP—Brass Plate
3½x3½	6	½x10–24	1⅓	Highly Polished, Sherardized and Plated T SH 3776 and T3777
4 x4	8	½x10–24	1¾	B —Bronze BP—Brass Plated
4½x4½	8	½x12–24	2⅜	
5 x3	8	½x12–24	2⅛	
5 x4	8	½x12–24	2½	
5 x5	10	½x12–24	3	
6 x5	10	½x14–24	4½	

DATA AND FINISHES NOS. T2743 AND T2794

Size open, in.	No. of holes in butts	Size of screws	Weight per pair	Finishes
4 x4	8	½x10–24	1¾	Planished and Plated T2743 and T2794
4½x4½	8	½x12–24	2⅜	B —Bronze BP—Brass Plate
5 x3	8	½x12–24	2⅛	Planished Sherardized and Plated T SH 2743 and T SH 2794
5 x4	8	½x12–24	2½	B —Bronze BP—Brass Plate
5 x5	10	½x12–24	3	
6 x5	10	½x14–24	4½	

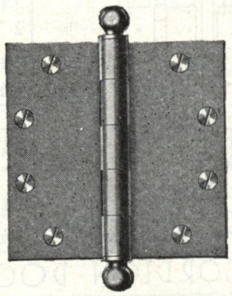
No. T3713 Extra Fine Template Wrought Steel Loose Pin Butts—Highly Polished and Plated, Beveled Joints

These butts are for metal doors not having excessive use but where an extra fine butt is required.

They have five knuckles in the joint. The pins are non-rising, self-lubricating and case hardened. The inner edges of the leaves are beveled.

DATA AND FINISHES NO. T3713

Size open, in.	No. of holes in. butts	Size of screws	Weight per pair	Finishes
2½x2½	6	½x 8–32	½	Highly Polished and Plated T 3713
3 x3	6	½x10–24	⅘	B —Bronze BP—Brass Plate
3½x3½	6	½x10–24	1⅓	Highly Polished Sherardized and Plated T SH 3713
4 x4	8	½x10–24	1¾	B —Bronze BP—Brass Plate
4½x4½	8	½x12–24	2⅜	
5 x3	8	½x12–24	2⅛	
5 x4	8	½x12–24	2½	
5 x5	10	½x12–24	3	
6 x5	10	½x14–24	4½	



Nos. T3713 AND T2714

No. T2714 Template Wrought Steel Loose Pin Butts—Planished and Plated, Joints Not Beveled

These butts are for light metal doors not having excessive use and where an inexpensive butt is required.

They have five knuckles in the joint. The pins are non-rising, self-lubricating and case hardened. The inner edges of the leaves are square, not beveled.

DATA AND FINISHES NO. T2714

Size open, in.	No. of holes in butts	Size of screws	Weight per pair	Finishes
2½x2½	6	½x 8–32	½	Planished and Plated T 2714
3 x3	6	½x10–24	⅘	B —Bronze BP—Brass Plate
3½x3½	6	½x10–24	1⅓	Sherardized and Plated T SH 2714
4 x4	8	½x10–24	1¾	B —Bronze BP—Brass Plate
4½x4½	8	½x12–24	2⅜	
5 x3	8	½x12–24	2⅛	
5 x4	8	½x12–24	2½	
5 x5	10	½x12–24	3	
6 x5	10	½x14–24	4½	

McKINNEY
MANUFACTURING
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TEMPLATE WROUGHT STEEL BUTTS
FOR HOLLOW AND SOLID METAL DOORS

PLATE 7

Continued on next page

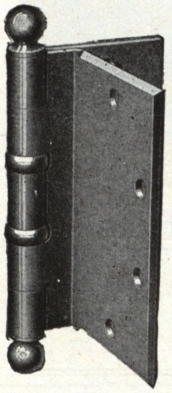
HALF MORTISE AND FULL SURFACE TEMPLATE BUTTS FOR METAL COVERED OR HOLLOW METAL DOORS

The half mortise butt is made so that one leaf is mortised into the jamb and the other is applied to the face of the door.

The full surface butt is made so that one leaf is secured on the surface of the jamb and the other to the surface of the door.

Machine screws are supplied for securing door to jamb and with grommet nut for door leaf. In both the half and the full surface butts the screw holes are made to template so they will exactly match the holes in metal doors made to similar template.

The bottom ball tip is slotted for unscrewing and by reversing the pin the butts can be used, either right or left hand. The leaf attached to the door has beveled edges.



Anti-Friction Washers Nos. T3773 and T2773
Ball Bearing Washers Nos. T3772 and T2772

No. T3773 Extra Fine Half Mortise Template, Anti-Friction, and T3772 Ball Bearing Wrought Steel Loose Pin Butts, Highly Polished and Heavily Plated Beveled Joint

These butts are for the finest grade work on standard size doors.

Each butt has five knuckles and two anti-friction, non-detachable washers. The non-rising, self-lubricating pins are case hardened. The inner edges of the leaves are beveled.

No T2773 Half Mortise, Template Anti-Friction and T2772 Ball Bearing, Wrought Steel Loose Pin Butts, Planished and Plated

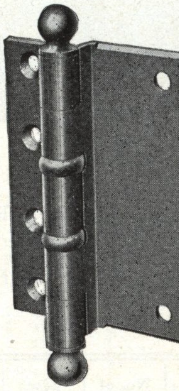
These butts are for inexpensive work where the polished finish is not required.

Each butt has five knuckles and two anti-friction, non-detachable washers. The non-rising, self-lubricating pins are case hardened. The inner edges of the leaves are square, not beveled.

DATA AND FINISHES FOR NOS. T3772, T3773, T2772 AND T2773

Size open, in.	Door thick, in.	Holes each butt	Size of Jamb leaf	Screws door leaf	Weight per pair	Finishes Polished and Plated T3772–T3773 / Planished and Plated T2772-T2773
4½	1¾	8	½x12–24	5/16x2¼	3	B —Bronze
5	1¾	8	½x12–24	5/16x2¼	4	AC —Ant. Copper
						OB —Dull Brass
						EDB—Elec. Pl. D. Blk.

Note: Machine screws are supplied for these butts.



Anti-Friction Washers Nos. T3770 and T2770
Ball Bearing Washers Nos. T3771 and T2771

No. T3770 Extra Fine Full Surface Template Anti-Friction and T3771 Ball Bearing Wrought Steel Loose Pin Butts, Highly Polished and Heavily Plated Beveled Joints

These butts are for the finest grade metal covered and all metal doors and are the most satisfactory as no mortising is required on either jamb or door.

Each butt has five knuckles and two anti-friction, non-detachable washers. The non-rising, self-lubricating pins are case hardened. The inner edges of the leaves are beveled.

No. T2770 Full Surface Template Anti-Friction and No. T-2771 Ball Bearing Wrought Steel Loose Pin Butts, Planished and Plated

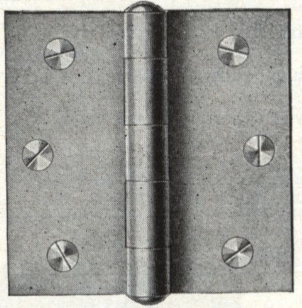
These butts are for inexpensive grade metal covered and metal doors, where a fine finish is not required.

Each butt has five knuckles in the joint and two anti-friction, non-detachable washers. The non-rising, self-lubricating pins are case hardened. The inner edges of the leaves are square, not beveled.

DATA ON NOS. T3770, T3771, T2770 AND T2771

Size open, in.	Door thick, in.	Holes each butt	Size of screws		Wght. per pair	Finishes Polished and Plated T3771–T3770 / Planished and Plated T2771—T2770
			Jamb leaf	Door leaf		
4½	1¾	8	½x12–24	5/16x2¼	3	B —Bronze OB—Dull Brass
5	1¾	8	½x12–24	5/16x2¼	4	AC—Ant. Copper
						EDB—Electro Pl. Dead Black

Note: Machine Screws are supplied for these butts.



No. T3781

No. T3781 Extra Fine and T2781 Template Wrought Steel Tight Pin Butts

For metal covered or metal transoms or sash. Highly polished heavily copper plated.

The screw holes are drilled accurately to template. Inner edges of leaves are beveled and outer edges ground clean and true.

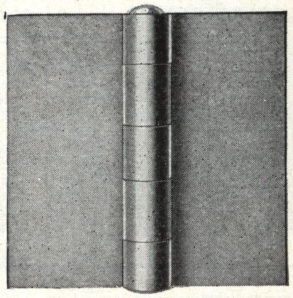
No. T2781 is planished and plated and the inner edges of the leaves are square not beveled.

DATA ON T3781 AND T2781

Size open, in.	Holes each butt	Size of screws	Wght. doz. pair	Size open, in.	Holes each butt	Size of screws	Wght. doz. pair	Finishes for T3781 and T2781
2½x2½	6	½x8–32	5⅞	3½x3½	6	½x10–24	15	B —Bronze
3 x2½	6	½x8–32	7	4 x4	8	½x10–24	19½	BP—Brass Plate
3 x3	6	½x8–32	8⅝					

No. 706 Extra Heavy Wrought Steel Tight Pin Butts, Without Holes for Iron Gates, Shutters and Cell Doors

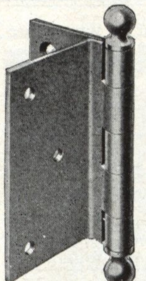
Made of extra heavy cold rolled steel, in bright steel finish only without screw holes and are fitted at the job or in the shop.



No. 706

DATA ON NO. 706

Size open, in.	Screw holes	Wt. doz. pr.	Size open, in.	Screw holes	Wt. doz. pr.
2 x2	None but drilled to template on order	4	4 x3	None but drilled to template on order	18
2½x2½		7	4 x4		23
3 x3		10½	4½x4½		29
3 x3½		12	5 x5		36
3½x3		13½	6 x6		55
3½x3½		16			



No. 763

No. 763 Ball Tip Half Mortise Loose Pin Wrought Steel Butts for Kalamein Doors

The holes in the surface of door leaf are drilled for ¼ in. bolts while the holes in the mortise or jamb leaf are countersunk for No. 14-24 machine screws. Made with steel pins; also with brass pins.

DATA ON NO. 763

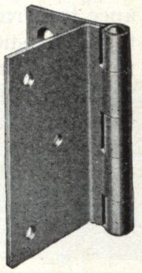
Length of joint	Screw Holes	Bolt Holes	Finishes			
			763	1763	4763	4763BR
5 in.	3	3	Bright steel	Jap.	Gal. with Steel Pins	Gal. with Brass Pins

No. 764 Tight Pin Half Mortise Wrought Steel Butts

Designed especially for hanging kalamein doors. The holes in the surface of the door leaf are drilled for ¼ in. bolts while the holes in the mortise leaf are countersunk for machine screws.

DATA ON NO. 764

Length of joint, in.	Screw Holes	Bolt Holes	Finishes			
			764	1764	4764	4764BR
5	3	3	Bright Steel	Jap.	Gal. with Steel Pins	Gal. with Brass Pins



No. 764

McKINNEY MANUFACTURING COMPANY

HALF MORTISE & FULL SURFACE TEMPLATE WROUGHT STEEL BUTTS FOR METAL COVERED & HOLLOW METAL DOORS

PLATE 8

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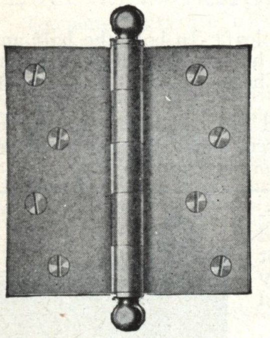
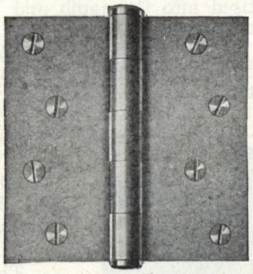
STANDARD LOOSE PIN WROUGHT STEEL BUTTS



No. 3713
Ball Tip

These butts are designed for doors where they will not have severe service and where the question of cost is important.

They are made in ball tip and button tip. The qualities are the same in both types in each grade and are made for the very finest work as well as for moderate-priced work.



No. 3790
Button Tip

Nos. 3713 and 3790 Extra Fine Wrought Steel Loose Pin Butts—Highly Polished and Heavily Plated Beveled Joints

Designed for highest grade work where a highly finished butt is desired.

No. 3713 has a ball tip pin.

No. 3790 has a button tip pin.

Made of highly polished cold rolled steel, copper plated and then heavily plated. The inner edges of the leaves are beveled. Butts 2½x2½ in. and larger have five knuckles in the joint and the squared collars of the tips fit flush with the knuckles.

The joints are in perfect alignment. The corners are clean cut and outer edges of the leaves are ground clean and true.

The non-rising pins are self-lubricating and case hardened.

DATA AND FINISHES NOS. 3713 AND 3790

Size open, in.	No. of holes each butt	Size of screws	Weight per pair butts	Finishes			
				Polished and Plated No. 3713 Ball Tip No. 3790 Button Tip		Polished Sherardized and Plated SH 3713 Ball Tip SH 3790 Button Tip	
2 x2	4	¾x 7	⅓	B —Bronze	EDB —Electro. P. D. Blk.	B —Bronze	EDB —Electro Pl. D. Blk.
2½x2½	6	⅞x 8	½	AC —Ant. Copper	N —Nickel	AC —Ant. Copper	N —Nickel
3 x3	6	1 x 8	⅘	OB —Dull Brass	Sand Finishes	OB —Dull Brass	Sand Finishes
3½x3½	6	1 x 9	1⅓	XB —Ant. Brass Oxid.	ACS —Antique Copper	XB —Ant. Brass Oxid.	ACS —Antique Copper
4 x4	8	1 x10	1¾	MB —Ant. Brass Mott.	XBS —Ant. Brass Oxid.	MB —Ant. Brass Mott.	XBS —Antique Brass Ox.
4½x4½	8	1¼x10	2⅜	YL —Statuary Bronze	MBS —Ant. Brass Mott.	YL —Statuary Bronze	MBS —Ant. Brass Mott.
5 x5	10	1¼x12	3	BB —Bower Barff			
6 x6	10	1½x14	4½				

Medium Grade Regular Wrought Steel Loose Pin Butts—Nos. 3714 and 3760 Polished and Plated, Nos. 2714 and 2760 Planished and Plated—Joints Not Beveled

For medium priced work where beveled joints and other refinements are not required.

Nos. 3714 and 2714 have a ball tip pin.

Nos. 3760 and 2760 have a button tip pin.

Nos. 3714 and 3760 are made of wrought steel polished and plated.

Nos. 2714 and 2760 are the same except that they are planished and plated.

The 3x3 size and larger have five knuckles in the joint. Smaller sizes have three.

The pins have the non-rising feature but are not self-lubricating or case hardened.

The inner edges of the leaves are square, not beveled.

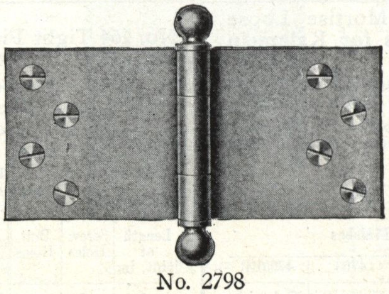
DATA AND FINISHES NOS. 3714, 3760, 2714 AND 2760

Size open, in.	No. of holes each butt	Size of screws	Weight per pair butts	Finishes			
				Polished and Plated Nos. 3714 and 3760 Planished and Plated Nos. 2714 and 2760		Polished Sherardized and Plated SH 3714 Ball Tip SH 3760 Button Tip	SH 2714 Ball Tip SH 2760 Button Tip
2 x2	4	¾x 7	⅓	B —Bronze	EDB —Electro Pl. D. Blk.	B —Bronze	EDB —Electro Pl. D. Blk.
2½x2½	6	⅞x 8	½	AC —Ant. Copper	N —Nickel	AC —Ant. Copper	N —Nickel
3 x3	6	1 x 8	⅘	OB —Dull Brass	Sand Finishes	OB —Dull Brass	Sand Finishes
3½x3½	6	1 x 9	1⅓	XB —Ant. Brass Oxid.	ACS —Antique Copper	XB —Ant. Brass Oxid.	ACS —Antique Copper
4 x4	8	1 x10	1¾	MB —Ant. Brass Mott.	XBS —Ant. Brass Oxid.	MB —Ant. Brass Mott.	XBS —Ant. Brass Oxid.
4½x4½	8	1¼x10	2⅜	YL —Statuary Bronze	MBS —Ant. Brass Mott.	YL —Statuary Bronze	MBS —Ant. Brass Mott.
5 x5	10	1¼x12	3		YLS —Statuary Bronze		YLS —Statuary Bronze
6 x6	10	1½x14	4½				

No. 2798 Medium Grade Loose Pin Wrought Steel Butts for Accordion Doors—Planished and Plated

These butts give sufficient clearance to permit two doors to be hung together, such as accordion doors or folding doors. On account of their throw a pair of folding doors will stand parallel when open. The non-rising loose pins are case hardened.

These butts are made with ball tips. Special sizes can be furnished on request.



No. 2798

DATA ON NO. 2798

Size open, in.	Holes each butt	Size of screws	Weight per pair, lb.
3x6	8	1x10	2
4x6	8	1x10	2½
4x7	8	1x10	2⅔
5x7	8	1x10	3⅓

Finishes

B —Bronze	No. 1798 Japanned
AC —Ant. Brass	No. 1798DB Jap., Dead Black
OB —Dull Brass	Sand Finishes
EDB—Elec. Pl. D. Blk.	ACS —Ant. Copper
N —Nickel	MBS—Ant. Brass
SH —Sherardized	

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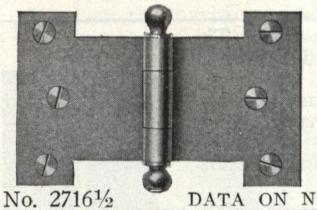
PARLIAMENT BUTTS, WROUGHT STEEL, FOR SHUTTERS AND WOOD CASEMENTS

These butts are used for shutters and wood casements as they have a much greater throw than the ordinary butt. They are smaller in the joint than the regular butts giving a much neater appearance when the projection is great. The surface screwed to the jamb and the shutter or casement is the same length as the regular butts. The loose pin butts are generally used on the interior and tight joint on the exterior.

No. 2716½ Loose Pin Ball Tip Wrought Steel Parliament Butts Planished and Polished

No. 1716½ Japanned
No. 716½ Bright Steel
No. 4716½ Galvanized

Used for inward opening casements. Have three knuckles and ball tip loose pins.



No. 2716½

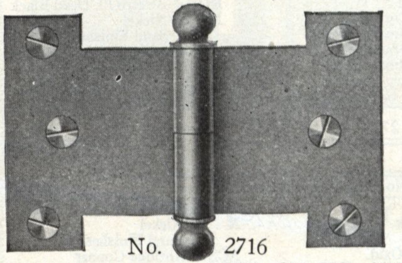
DATA ON NO. 2716½

Width open, in.	Length of joint, in.	Width be-tween flanges	Length of sides, in.	Holes each butt	Size of screws	Wght. doz. pair, lb.	Finishes
3	1½	1 11/16	2 3/16	6	⅞x 8	4¼	B —Bronze
3½	1¾	2	2 7/16	6	1x9	5½	AC —Antique Copper
4	1¾	2 7/16	2 7/16	6	1x9	6¼	OB —Dull Brass
4½	1¾	2 13/16	2 7/16	6	1x9	7⅜	EDB—Electro Pl. Dead Black
5	1¾	3¼	2 7/16	6	1x9	9⅛	N —Nickel
6	2	4⅛	2⅞	6	1¼x10	12¾	Sand Finishes
8	2½	5¾	3⅝	6	1¼x11	23	BS —Bronze
10	3	7½	4¼	8	1¼x12	34	ACS—Antique Copper
							OBS—Dull Brass

No. 2716 Loose Joint Ball Tip Wrought Steel Parliament Butts, Planished and Plated

No. 1716 Japanned
No. 1716 DB Japanned Dead Black
No. 716 Bright Steel

For shutters and outward opening casements. Have loose joint with ball tips



No. 2716

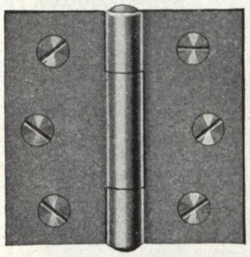
DATA ON NO. 2716

Width open, in.	Length joint, in.	Width between flanges	Length side, in.	Holes each butt	Size of screws	Wght. doz. pairs	Finishes
2½*	......	......	......	6	......	4½	
3	1½	1 11/16	2 3/16	6	1 x 8	5	
3½	1¾	2	2 7/16	6	1 x 9	6¼	B —Bronze
4	1¾	2 7/16	2 7/16	6	1 x 9	7¼	AC —Antique Copper
4½	1¾	2 13/16	2 7/16	6	1 x 9	8⅓	OB —Dull Brass
5	1¾	3¼	2 7/16	6	1 x 9	10¾	
6	2	4⅛	2⅞	6	1¼x10	14½	
8	2¼	5¾	3 7/16	6	1¼x11	24	

*The 2½ inch size is not made in 716 bright steel.

No. 705 Tight Pin Wrought Steel Broad Butt, Bright Steel

Used for transoms, etc. The 3x2½ size and larger have five knuckles in the joint; other sizes three knuckles.



No. 705

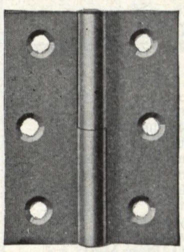
DATA ON 705

Size open, in.	Holes in butts	Size screws, in.	Wt. doz. pairs, lb.	Size open, in.	Holes in butts	Size screws, in.	Wt. doz. pairs, lb.
2 x2	4	¾x7	3	3½x3	6	1 x 9	10
2½x2½	6	⅞x8	4½	3½x3½	6	1 x 9	11
2½x3	6	1x8	5⅜	4 x4	8	1 x10	14½
3 x2½	6	1x8	6⅜	4½x4½	8	1¼x10	20
3 x3	6	1x9	7½	5 x5	8	1¼x12	24
3 x3½	6	1x9	8⅛	6 x6	8	1½x14	36

Note: First dimension denotes length of joint; second, width of butt when open.

No. 701 Narrow Loose Joint Wrought Steel Butts

Good for hanging screens. Made regularly in bright steel.



No. 701

DATA ON NO. 701

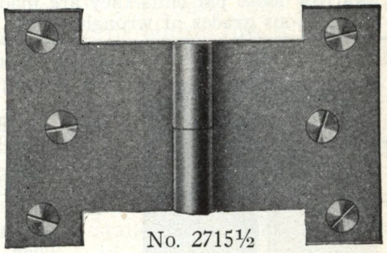
Length joint, in.	Width open in.	Holes in butts	Size of screws	Weight doz. pairs, lb.
2	1 11/16	4	¾x7	2
2¼	1¾	6	⅞x7	2½
2½	1⅞	6	⅞x7	3¼
2¾	2	6	1x8	3¾
3	2⅛	6	1x8	4½
3½	2½	6	1x9	7
4	2⅞	8	1x9	9

No. 2715½ Loose Joint Wrought Steel Parliament Butts Planished and Plated

Used for shutters and outward opening casements. Have a loose joint without ball tips.

No. 715½ is bright steel.

No. 4715½ is galvanized and has brass pins.



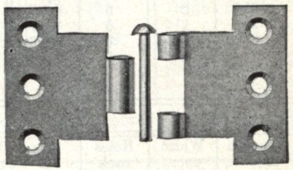
No. 2715½

DATA ON NO. 2715½

Width Open, in.	Holes Each Butt	Size of Screws	Weight Doz. Pairs, lb.
2½	6	⅞x8	3½
3	6	⅞x8	3¾
3½	6	1 x9	4¾
4	6	1 x9	6
4½	6	1 x9	7
5	6	1 x9	8
5½	6	1¼x10	9
6	6	1¼x10	12
8	6	1¼x11	20

No. 715 Light Loose Pin Wrought Steel Parliament Butts, in Bright Steel Finish. 2715B Is Planished and Bronzed

Used for casements opening in, screens, screen doors, etc., where a butt with a wide throw is required. Not as heavy as the standard Parliament butts and have the loose pin and three knuckles.



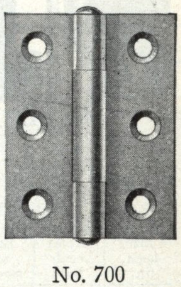
No. 715

DATA ON NO. 715

Width Open, in.	Length of Joint, in.	Width Between Flanges	Length of Side, in.	Holes Each Butt	Size of Screw
2½	1⅛	1 7/16	1 11/16	6	¾x6
3	1⅛	1 15/16	1 11/16	6	¾x6
3½	1¼	2 7/16	1⅞	6	¾x6
4	1¼	3	1⅞	6	¾x7

No. 700 Tight Pin Wrought Steel Narrow Butts, Bright Steel

These butts are used for transoms, etc., where tight pin butts are required.



No. 700

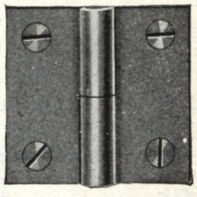
DATA ON NO. 700

Length joint, in.	Width open, in.	Holes in butts	Size of screws	Length joint, in.	Width open, in.	Holes in butts	Size of screws
1	1 3/16	4	⅝x5	3	2⅛	6	1 x 8
1¼	1 5/16	4	¾x 6	3¼	2¼	6	1 x 8
1½	1½	4	¾x 6	3½	2⅜	6	1 x 9
1¾	1 9/16	4	¾x 7	3¾	2⅝	6	1 x 9
2	1¾	4	¾x 7	4	2⅞	8	1 x 9
2¼	1 13/16	6	¾x 7	4½	2 15/16	8	1¼x10
2½	1⅞	6	¾x 7	5	3⅜	8	1¼x11
2¾	2 1/16	6	1 x 8	6	4	8	1½x12

No. 702 Loose Joint Wrought Steel Butts, Bright Steel

Used for hanging screens and other places where a loose joint butt is required. Made in the following finishes:

No. 702 Bright Steel.
No. 1702 Japanned.
No. 4702BR Galvanized with brass pins.



No. 702

DATA ON NO. 702

Size open, in.	Holes in butts	Size of screws	Wt. doz. pairs, lb.	Size open, in.	Holes in butts	Size of crews	Wt. doz. prs., lb.
2 x2	4	¾x7	3	3½x3½	6	1 x9	11
2½x2	6	⅞x8	3⅘	4 x3½	8	1 x10	13
2½x2½	6	⅞x8	4½	4 x4	8	1 x10	14
2½x3	6	⅞x8	5½	4½x4	8	1¼x10	17
3 x2½	6	1x9	6	4½x4½	8	1¼x10	18
3 x3	6	1x9	7	5 x5	8	1¼x12	23
3 x3½	6	1x9	8	6 x6	8	1½x14	34
3½x3	6	1x9	9¼				

McKINNEY
MANUFACTURING
COMPANY

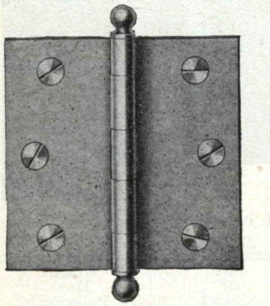
PARLIAMENT & NARROW BUTTS & TIGHT PIN BROAD & NARROW BUTTS FOR SHUTTERS, TRANSOMS, CUPBOARDS, ETC.

PLATE 10

Continued on next page

WROUGHT BRASS AND WROUGHT STEEL BUTTS FOR CUPBOARD DOORS AND OTHER CABINET WORK

The following butts are made expressly for cupboard doors and other cabinet work, china closets, bookcases and other articles of furniture. In the Light Standard and Light Narrow loose pin butts they are made in wrought brass and the various grades of wrought steel. In the Light Reversible and Light Narrow Reversible loose pin butts the pin has a button at one end. The Fixed Pin butts are for use where it is not desirable to remove the doors and for places where they will be used horizontally.



Nos. 2318, 3718 AND 2718

Light Loose Pin Ball Tip Butts in Wrought Brass and Wrought Steel

No. 2318BP Wrought Brass Butts

No. 3718 Wrought Steel Butts Polished and Plated

No. 2718 Wrought Steel Butts Planished and Plated

They are used principally for light cabinet work such as cupboards, china closets, bookcases and other articles of furniture.

The butts are swaged for mortising. The 2½x2 in. size and larger have five knuckles in the joint.

Light Narrow Loose Pin Ball Tip Butts in Wrought Brass and Wrought Steel

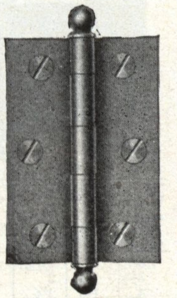
No. 2322BP Wrought Brass Butts

No 3722 Wrought Steel Butts, Polished and Plated

No. 2722 Wrought Steel Butts, Planished and Plated

These butts are similar to the Light Loose Pin Butts but are narrower when open. They are used for light cabinet work such as cupboards, china closets, bookcases and other articles of furniture.

Butts are swaged for mortising. The 2½ in. size and larger have five knuckles in the joint.



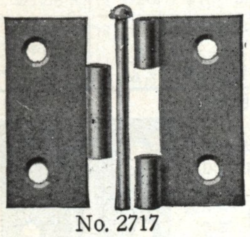
Nos. 2322BP, 3722 AND 2722

DATA AND FINISHES FOR NOS. 2318, 3718 AND 2718

Length of joint, in.	Width open, in.	Holes each butt	Size of screws	Finishes			
				No. 2318	No. 3718 Pol. and Pl.	No. SH 3718 Pol., Sher. and Pl.	Nos. 2718 Plan. and Pl. and SH 2718 Plan., Sher. and Pl.
2	2	4	¾x7	No. 2318 BP Wrought Brass No. 2318 B. Wrought Brass Bronze Plated	B —Bronze AC —Antique Copper. OB —Dull Brass XB —Ant. Brass Oxid. MB —Ant. Brass Mott. YL —Statuary Bronze N —Pol. and Nickld.	B —Bronze AC —Ant. Copper OB —Dull Brass MB —Ant. Brass Mott. XB —Ant. Brass Oxid. N —Pol. and Nick.	B —Bronze AC —Ant. Copper OB —Dull Brass XB —Ant. Brass Oxid. MB —Ant. Brass Mottled YL —Statuary Bronze BB— Bower Barff (not Sherardized) EDB —Electro Pl. Dead Black N —Nickel Sand Finishes ACS —Ant. Copper XBS —Ant. Brass Oxid. MBS —Ant. Brass Mottled YLS —Statuary Bronze
2½	2	6	¾x7				
2½	2½	6	¾x7				
3	2½	6	¾x8				
3	3	6	¾x8				

DATA AND FINISHES FOR NOS. 2322, 3722 AND 2722

Length of joint, in.	Width open, in.	Holes each butt	Size of screws	Weight per doz. pairs, lb.	Finishes		
					No. 2322 Wrought Brass	No. 3722 Pol. and Pl.	No. 2722 Wrought Steel Plan. and Pl.
1½	1⅜	4	⅝x5	1¼	B —Bronze Plated BP—Wrought Brass	B —Bronze AC —Antique Copper OB —Dull Brass XB —Ant. Brass Oxid. MB —Ant. Brass YL —Statuary Bronze N —Nickeled	B —Bronze AC —Ant. Copper OB —Dull Brass XB —Ant. Brass Oxid. MB —Ant. Brass Mottled YL —Statuary Bronze BB —Bower Barff EDB —Electro Pl. Dead Black N —Nickel Sand Finishes ACS —Antique Copper XBS —Ant. Brass Oxid. MBS —Ant. Brass Mottled YLS —Statuary Bronze
2	1⅝	4	¾x6	2⅛			
2½	1¾	6	¾x6	3			
3	1$^{15}/_{16}$	6	¾x7	4½			
3½	2¼	6	¾x8	7¼			



No. 2717

No. 2717 Light Reversible Loose Pin Wrought Steel Butts—Planished and Plated

They are used for the same purpose as the Nos. 2722, 3722, etc. Are the cheapest grade of the light reversible loose pin butts.

The pin has a rounded head. The 2½x2 in. size and larger have five knuckles in the joint; other sizes three knuckles.

DATA AND FINISHES FOR NO. 2717

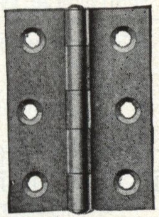
Size open, in.	Holes each butt	Size of screws	Weight per doz pairs, lb.	Finishes	
2 x2	4	¾x7	2	B —Bronze AC—Ant. Copper OB—Dull Brass XB—Ant. Brass Ox.	Sand Finishes ACS—Ant. Copper OBS—Dull Brass XBS—Ant. Brass Ox.
2½x2	6	¾x7	2¾		
2½x2½	6	¾x7	3½		
3 x2½	6	¾x8	4½		
3 x3	6	¾x8	5⅜		

Nos. 2719 and 719 Light Narrow Fixed Pin Wrought Steel Butts

No. 2719 Planished and Plated

No. 719 Bright Steel

These butts are for use on cabinet work of an inexpensive grade. The 2½ in. size and larger have 5 knuckles to the joint.



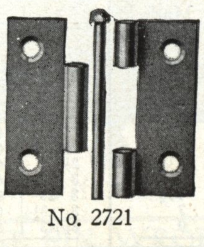
Nos. 2719 AND 719

DATA AND FINISHES FOR NOS. 2719 AND 719

Length joint, in.	Width open, in.	Holes each, butt	Size of screws	Weight per doz. pairs	Finishes
¾	....	....	....	....	AC —Antique Copper; B—Bronze OB —Dull Brass MB —Ant. Brass Mottled XB —Ant. Brass Oxid. EDB—Electro. Pl. Dead Black N —Nickel Sand Finishes ACS—Antique Copper MBS—Ant. Brass Mottled XBS—Ant. Brass Oxid.
1	1	4	⅝x3	⅝	
1¼	1$^{1}/_{16}$	4	⅝x3	¾	
1½	1$^{7}/_{16}$	4	⅝x5	1¼	
2	1$^{9}/_{16}$	4	¾x6	2	
2¼	1$^{11}/_{16}$	6	¾x6	2½	
2½	1$^{11}/_{16}$	6	¾x6	2⅞	
3	2	6	¾x7	4¼	
3½	2¼	6	¾x8	6½	
4	2⅞	8	1 x9	10	

No. 2721 Light Narrow Wrought Steel Butts—Planished and Plated

These butts are similar to the No. 2717 except that the butt when open is narrow. The butts are reversible. The 2½ in. size and larger have five knuckles in the joint. Other sizes have three knuckles.



No. 2721

DATA AND FINISHES ON NO. 2721

Length joint, in.	Width open, in.	Holes each butt	Size of screws	Wt. per dz. prs., lb.	Finishes
1	1	4	⅝x3	½	B —Bronze AC —Antique Copper OB —Dull Brass MB —Ant. Brass Mott. XB —Ant. Brass Oxid. EDB—Electro. Pl. Dead Black N —Nickel Sand Finishes ACS —Antique Copper MBS—Ant. Brass Mott. XBS—Ant. Brass Oxid.
1½	1$^{7}/_{16}$	4	⅝x5	1	
2	1$^{9}/_{16}$	4	¾x6	1¾	
2¼	1$^{11}/_{16}$	6	¾x6	2	
2½	1$^{11}/_{16}$	6	¾x6	2½	
3	2	6	¾x7	3¾	

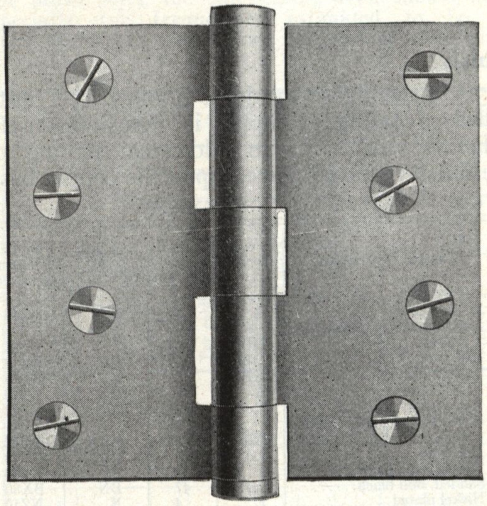
Continued on next page

LOOSE PIN BUTTON TIP WROUGHT STEEL BUTTS FOR PAINTING

Owing to the general increased demand for painted interiors and the painting of the butts to match the surrounding trim, a new line of butts has been designed to answer this need.

These new wrought steel loose pin butts are especially made with a $\frac{1}{16}$-inch cut-out or clearance space between the barrel and the inner edges of the leaves so that they can be painted over easily and quickly. This unusually large cut-out prevents the possibility of the paint being scraped off when doors are set in motion.

For best results, the sanded and sherardized finishes are recommended, as the special treatment acts as a priming coat, imparting just the proper tooth to take the pigment freely. The butts can be furnished with ball tips instead of button tips if desired, although ball tips are not recommended for painted work.


No. 4779

Nos. 779 and 4779 Loose Pin Button Tip Wrought Steel Butts for Painting, with 1/16-inch Clearance at Joint

These butts are used when a painted finish is desired for butts on doors which would ordinarily use a standard size butt. Made with $\frac{1}{16}$-inch clearance at the joint.

Made of cold rolled steel in bright steel, sanded or sherardized finishes. Sherardized is especially recommended for painted finish. Made with button tip. Can be obtained with ball tip if desired, but this is not recommended for painting. Also in sand finish, No. 779S.

DATA ON NOS. 779 AND 4779

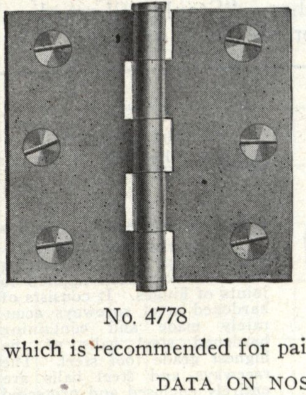
*Size open, in.	Holes in each butt	Size of screws	Pairs in a box	Pairs in a case	Weight per pair, lb.	Finishes	
3 x3	6	1 x 8	1	100	¾	No. 779	Bright Steel
3½x3½	6	1 x 9	1	100	1¼		
4 x4	8	1 x10	1	100	1⅝	No. 779 S	Sand Finish
4½x4½	8	1¼x10	1	50	2¼		
5 x5	10	1¼x12	1	50	2⅞	No. 4779 SH	Sherardized
6 x6	10	1½x14	1	25	4⅜		

*First dimension denotes length of joint; second dimension is width of butt when open.

LIGHT LOOSE PIN BUTTON TIP WROUGHT STEEL BUTTS FOR PAINTING

These butts are made especially for painting. They are used on various pieces of light cabinet work such as book cases, cupboards and for light doors. They are designed to harmonize with the larger painted butts for doors, and thus carry the same scheme of finish throughout the interior. The $\frac{1}{16}$-in. clearance at the joint prevents the rubbing of the paint when the hinge is opened. They are made with the button tip, but can be obtained with a ball tip if desired, although this is not recommended for painting. The sherardized and the sand finish are recommended as forming a better base for the pigment.

Nos. 778 and 4778 Light Loose Pin Button Tip Wrought Steel Butts for Painting — Used for Cabinet Work


No. 4778

These butts for cupboard doors and other cabinet work harmonize in style and design with No. 779.

Made especially for painting, with $\frac{1}{16}$-inch clearance at the joint. Made with button tip. Can be obtained with ball tip if desired, but this is not recommended for painting. No. 778 is in bright steel and No. 4778SH is sherardized, which is recommended for painting. Also in sand finish, 778S.

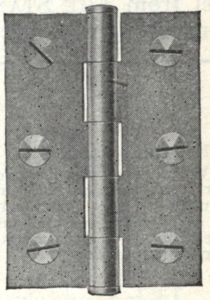
DATA ON NOS. 778 AND 4778

Size open, in.	Holes in each butt	Size of screws	Weight per doz. pairs, lb.	Finishes	
2 x2	4	¾x7	2½	No. 778	Bright Steel
2½x2	6	¾x7	3½	No. 778 S	Sand Finish
2½x2½	6	¾x7	4⅛	No. 4778 SH	Sherardized

Nos. 793 and 4793 Light Narrow Loose Pin Button Tip Wrought Steel Butts for Painting—Used for Light Cabinet Work

These butts for light thin doors on cabinet work harmonize in style and design with No. 779.

Made especially for painting, with $\frac{1}{16}$-inch clearance at the joint. Made with button tip. Can be obtained with ball tip if desired, but this is not recommended for painting. No. 793 is in bright steel and No. 4793SH is sherardized, which is recommended for painting. Also in sand finish, No. 793S.


No. 4793

DATA ON NOS. 793 AND 4793

Size open, in.	Holes in each butt	Size of screws	Weight per doz. pairs, lb.	Finishes	
2 x1⅝	4	¾x6	2⅛	No. 793	Bright Steel
2½x1¾	6	¾x6	3	No. 793 S	Sand Finish
3 x1$\frac{15}{16}$	6	¾x7	4½	No. 4793 SH	Sherardized

McKINNEY
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COMPANY

WROUGHT STEEL LOOSE PIN BUTTS
FOR PAINTING

PLATE 12

THE STANLEY WORKS

Builders' Hardware

MAIN OFFICE AND FACTORY
NEW BRITAIN, CONN.
BRANCH FACTORIES: NILES, OHIO; BRIDGEWATER, MASS.

BRANCH OFFICES
NEW YORK, N. Y., 100 Lafayette Street
SAN FRANCISCO, CAL.
CHICAGO, ILL., 73 East Lake Street
LOS ANGELES, CAL.
SEATTLE, WASH.

STANLEY
S.W.
TRADE-MARK

Products

Wrought Steel and Bronze Builders Hardware, including: Ball Bearing Butts and Hinges, Latches, Handles, Bolts, Storm Sash and Screen Hardware, Blind Hardware, and Heavy Hardware for mills and factories.

For Garage Hardware, see pages 1500-1503.

Obtainable

Stanley products can be obtained from any builders' hardware dealer.

Builders' hardware manufacturers will furnish Stanley products whenever they are specified.

Identification

All Stanley products are stamped with Stanley trade-mark.

Numbers, designating certain types of butts, and symbols, also certain finishes, are stamped on the back of the butt.

How to Specify

Use the name, Stanley, together with the size, catalogue number, and proper symbol for the finish desired, thus: "All butts to be wrought bronze, ball bearing Stanley No. BB 180A, 5x5".

For additional specification data, see succeeding pages.

Material

Stanley products are manufactured from cold rolled steel from The Stanley Works' own steel mills, also from wrought bronze.

Finish

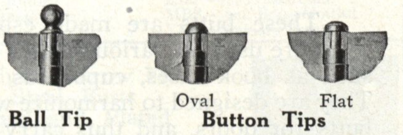
On the higher grade of Stanley steel butts, a heavy coating of copper is deposited on the polished steel with an additional plating of the finish required placed upon the copper base.

COMPARATIVE LIST OF FINISHES

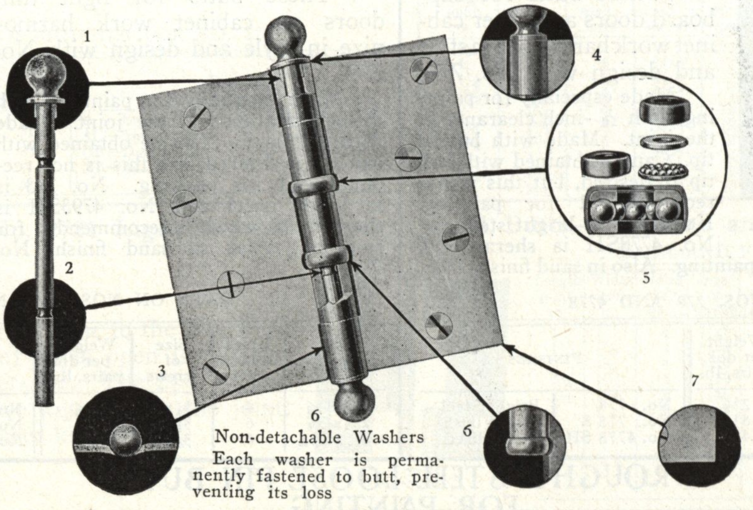
The Stanley Works	United States Standard	General Description	P. & F. Corbin	Russell & Erwin Mfg. Co.	Sargent & Co.	The Yale & Towne Mfg. Co.
A	US9	Bright bronze	B	11	P	BZ10
A4	US11	Dull bronze, oxidized and relieved	HB	11C	06P	BY21
A5	US10	Dull bronze	DB	11D	OP	BY22
B	US20	Statuary bronze	KB	2	A	BY65
C	US3	Bright brass	A	10	B	AZ10
D2	US8	Antique copper	R	7½	AB	CZ27
E4	US23	Silver plated, dull, oxidized and relieved	KS	8C	LS	SY52
F	US4	Dull brass	EA	9	OB	AY22
G	US18	"Rustproof" black	F	46	BB	FX80
H	US19	Sanded, dull black	KF	47	BN	BX80
N	US14	Nickel plated	E	4	N	NZ10
N5	US15	Nickel plated, dull	DE	14	LN	NY10
NM	US25	White bronze	NK	44	EM	NZ40
SB	US21	Statuary bronze, sanded	SKB	02	RA	BX12
SF4	US6	Sanded brass, oxidized and relieved	SKA	09C	RD	AX28
Z	US25	Sherardized				

Tips

All Stanley Butts are regularly furnished with ball tips, but can be supplied with oval button or flat button tips when specified.



Sherardizing—"Stanley Sherardized" finish is recommended for all steel articles exposed to the weather. Sherardizing is done before assembling, and may be electroplated in various finishes. "Stanley Sherardized" products are stamped "Z" on the back of butt.



1
Non-rising Loose Pins
Wings on pins fit into corresponding grooves in knuckle of butt. Pin can be easily taken out and put back, but is non-rising under action of door.

2
Self-lubricating Pins
Grooves hold lubricant which prevents wear on inside of knuckle and insures silent action of butt

3
Beveled Edges
Inner edges of leaves conform to curve of barrel, making a closely fitting joint

4
Square Shoulders
Square shoulders of the tips fit flush with knuckle.

5
Stanley Ball Bearing Washers
This is the most highly developed type of ball bearing that has ever been applied to joints of hinges. It consists of hardened steel raceways accurately made and containing hardened steel balls of the highest grade tool steel. The raceways and steel balls are entirely enclosed and protected by a copper jacket, which serves to exclude dust and moisture and to keep in place the lubricant which is applied to the bearings in assembling

6
Non-detachable Washers
Each washer is permanently fastened to butt, preventing its loss

7
Square Corners
Square corners add to the general uniformity

Seven Outstanding Features of a Stanley Ball Bearing Butt

Continued on next page

The Relative Wearing Value of Ball-Bearing and Steel-Bushed Bronze Butts

The Bureau of Standards of the Department of Commerce, Washington, D. C., reports a series of tests undertaken for the Builders' Hardware Committee of the Federal Specifications Board for the purpose of determining the relative wearing value of various types of butts.

The following is a quotation from a recent test:

"(a) Steel-bushed or steel-washered bronze or brass butts as now produced are relatively poor from the standpoint of wear and are not recommended for use except on doors used moderately where extreme climatic or corrosive conditions require bronze or brass butts.

"(b) In general, where conditions warrant the use of bronze or brass butts, the ball-bearing type should be specified, especially for frequencies estimated to be greater than 15,000 cycles per year, since the service they give outweighs the differential in cost over the other types tested.

"(c) Ball-bearing washers of the visible type are preferable to the concealed type of ball bearings as now made.

"(d) Extra heavy ball-bearing butts should be specified for all doors where exceptional frequency of operation may be expected.

"(e) Ball-bearing butts should be specified where silent operation of doors is required, as in hospitals.

"(f) There is little difference between the wearing qualities of steel butts with visible bronze washers and steel-bushed bronze butts, but both types are decidedly inferior to ball-bearing butts.

"(g) While compared to the other types tested, ball-bearing butts will give greater service, regardless of lubrication; nevertheless, lubrication is an important feature in all types of butts and should be provided not only as an essential part of the manufacturing process, but also throughout the life of the butt by systematic inspection."

SCHEDULE OF STANLEY BUTTS FOR WOOD AND METAL DOORS

No.	Uses and Types									Material		Inner Edges			Styles of Tips		Size, inches	Pins		Treatment of Metal Finishes						Plate No. in Sweet's
	For wood doors	Template butts (metal doors)	For hospital doors	For accordion doors	For gates and grilles	For cabinet doors	For sash, transoms, etc.	Parliament butts	Paumelles	Wt. bronze	Wt. steel	Beveled	Square	Ball bearing	Ball	Spun		Non-rising self-lubricating	Tight	Polished with copper base	Polished and plated	Sherardized and plated	Planished and plated	Plain steel	For painting	
BB100	x								x	x				x			5—6				x					1
100						x			x	x							3									1
144		x									x	x			x		3 x 3 —4 x 4								x	7
BB145		x									x		x	x	x		3½ x 3½—5 x 5	x							x	7
145		x									x		x		x		2½ x 2½—6 x 5	x							x	7
BB168		x									x	x		x	x		4 x 4 —6 x 6	x		x						6
BB170		x									x	x		x	x		4½—5	x		x		x				6
BB171		x									x		x	x	x		4½—5	x					x			6
BB172		x									x	x		x	x		4½—5	x		x		x				6
BB173		x									x		x	x	x		4½—5	x					x			6
BB174		x									x	x		x	x		2½ x 2½—6 x 6	x		x		x				6
174		x									x	x			x		2½ x 2½—6 x 6	x		x		x				6
175	x									x		x			x		2½ x 2½—6 x 6				x					1
176		x					x				x	x				x	2½ x 2½—4 x 4			x						7
178		x					x				x		x			x	2½ x 2½—4 x 4					x	x			7
BB179		x									x		x	x	x		2½ x 2½—6 x 5						x			6
179		x									x		x		x		2½ x 2½—6 x 5						x			6
BB180	x									x		x		x	x		3 x 3 —6 x 6	x			x					1
BB181	x									x		x		x	x		4½ x 4½—8 x 8	x			x					1
BB183	x		x							x		x		x			3 x 3 —6 x 6		x							1
189						x				(Wt. Brass)			x		x		2 x 2 —3 x 3						x			3
192							x			x		x				x	3 x 3 —4 x 4		x				x			1
192½							x			x		x				x	3 x 3 —4 x 4		x		x					1
BB193		x								x		x		x	x		4½ x 4½—6 x 6	x			x					5
194		x								x		x			x		3 x 3 —6 x 6				x					5
195						x				(Wt. Brass)			x		x		2—3						x			3
196		x					x			x		x				x	3 x 3 —3½ x 3½		x				x			5
196½		x					x			x		x				x	3 x 3 —3½ x 3½		x		x					5
BB197		x	x								x	x		x			3 x 3 —6 x 6		x		x					6
BB198		x	x							x		x		x			3 x 3 —6 x 6		x		x					5
BB199		x								x		x		x	x		5 x 5 —8 x 8	x			x					5
BB200	x								x		x			x			5—6								x	2
200						x			x		x						3								x	2
BB201	x								x		x			x			5—6				x					2
201						x			x		x						3				x					2
214	x										x	x			x		3 x 3 —4½ x 4½	x							x	3
BB235	x										x	x		x	x		3½ x 3½—6 x 6	x							x	3
235	x										x	x			x		3½ x 3½—6 x 6	x							x	3
BB237	x		x								x	x		x			3 x 3 —6 x 6		x		x					2
237	x		x								x	x					3 x 3 —6 x 6		x		x					2
BB239	x										x	x		x	x		3 x 3 —6 x 6	x		x						2
239	x										x	x			x		2 x 2 —6 x 6	x		x						2
BB241½	x										x		x	x	x		3 x 3 —6 x 6	x			x	x				2
241½	x										x		x		x		2 x 2 —6 x 6				x	x				2
BB243	x			x							x		x	x	x		2¾ x 6 —4 x 7	x				x	x			2
243	x			x							x		x		x		2¾ x 6 —4 x 7	x					x			2
BB250	x										x	x		x	x		4 x 4 —8 x 10	x		x						2
285						x					x	x			x		2 x 2 —2½ x 2½								x	3
289						x					x		x		x		2 x 2 —3 x 3				x	x				3
295						x					x		x		x		1½—4					x	x			3
828	x							x			x		x		x		3—10							x		3
829	x							x			x		x		x		3—10							x		3
840	x					x					x		x				1—6							x		3
850		x			x						x		x			x	2 x 2 —6 x 6		x					x		7
BB851					x						x	x		x	x		5 x 5 —8 x 10	x						x		5

Note: Stanley butts are furnished in all finishes to match other hardware.

Continued on next page

Extra Heavy Wrought Bronze Ball Bearing Butts for Wood Doors

No. BB 181

Highly polished Heavily plated

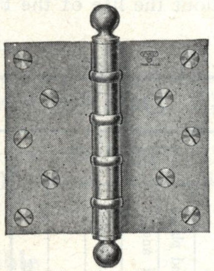
Designed for doors where exceptional frequency of operation may be expected such as exterior doors of office buildings, theaters, schools, hospitals, etc.

Equipped with Stanley non-detachable ball bearing washers.

Sizes 5x5 and under, have two ball bearing washers; larger sizes four.

For metal doors or wood doors with metal jambs use No. BB 199 which is template of No. BB 181.

Furnished in all standard finishes.



No. BB 181

DATA ON NO. BB 181

Size open, in.	Number cf screw holes	Size screws, in.	Wt. per pair, lb.
4½ x 4½	8	1½ x 12	3½
5 x 5	10	1½ x 14	4
6 x 6	10	1¾ x 14	6½
8 x 8	14	1¾ x 14	9½

Wrought Bronze Ball Bearing Butts for Wood Doors

No. BB 180

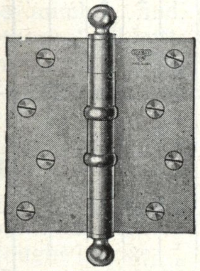
Designed for use where a medium weight wrought bronze butt is required, such as exterior doors which are used moderately, or for interior doors in office buildings, etc.

Equipped with Stanley non-detachable ball bearing washers. Loose pin; ball tips.

All sizes are furnished with two ball bearing washers.

For metal doors or wood doors with metal jambs use No. BB 193 which is template of No. BB 180.

Furnished in all standard finishes.



No. BB 180

DATA ON NO. BB 180

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	1 x 8	⅘
3½ x 3½	8	1 x 9	1⅓
4 x 4	8	1 x 10	1⅘
4½ x 4½	8	1¼ x 10	2¼
5 x 5	10	1¼ x 12	3
6 x 6	10	1½ x 14	5⅕

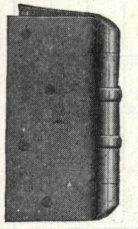
Wrought Bronze Tight Pin Ball Bearing Hospital Butts for Wood Doors

No. BB 183

Originated by THE STANLEY WORKS for use in asylums and hospitals. Ropes or wearing apparel can not be hung on the joint. The outer edges and joints are ground true and the inner edges are beveled.

For metal doors or wood doors with metal jambs use No. BB 198 which is template of No. BB 183.

Furnished in all standard finishes.



No. BB 183

DATA ON NO. BB 183

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
4½ x 4½	8	1¼ x 10	2.48
5 x 5	10	1¼ x 12	3.26
6 x 6	10	1½ x 14	5.20

Wrought Bronze Loose Pin Butts for Wood Doors

No. 175

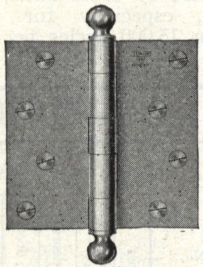
Highly polished Steel bushed

For use on medium weight interior doors where a bronze butt is desired.

The bronze metal is toughened and hardened by cold rolling. Steel bushings of special design to retain lubricant extend through all the knuckles.

Furnished in all standard finishes.

For metal doors or wood doors with metal jambs use No. 194 which is template of No. 175.



No. 175

DATA ON NO. 175

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
2½ x 2½	6	⅞ x 8	½
3 x 3	6	1 x 8	⅘
3½ x 3½	6	1 x 9	1⅓
4 x 4	8	1 x 10	1⅘
4½ x 4½	8	1¼ x 10	2¼
5 x 5	10	1¼ x 12	3¼
6 x 6	10	1½ x 14	5⅕

Wrought Bronze Ball Bearing Paumelles for Wood Doors

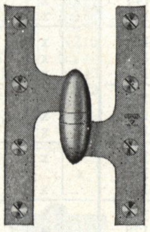
No. BB 100

Designed for use on medium weight doors where it is desired that the hardware be inconspicuous.

Equipped with Stanley non-detachable ball bearing washers.

No. 100 Wrought Bronze Paumelles—Designed for use on bookcases, medicine cabinets, etc. Equipped with solid washers.

For metal doors or wood doors with metal jambs use No. BB 95 which is template of No. BB 100. Made both right and left hand. Specify hand desired.



No. BB 100

DATA ON NOS. BB 100 AND 100

No.	Length of leaf, in.	Width of leaf in.	Width open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
100	3	⅝	2 5/16	6	1 x10	.6
BB 100	5 6	¾ 13/16	3¼ 3⅞	8 8	1¼x10 1¼x12	1.4 2.3

Wrought Bronze Tight Pin Butts for Wood Transoms

Nos. 192 and 192½

No. 192, planished; No. 192½, polished.

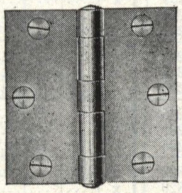
For use on transoms, casement sash opening out and other similar places requiring tight pin butts.

Inner edges of the leaves are beveled making a closely fitting joint.

For metal transoms or wood transoms with metal jambs use Nos. 196 and 196½ which are templates of Nos. 192 and 192½ respectively.

DATA ON NOS. 192 AND 192½

Size open, in.	Number of screw holes	Size screws, in.	Wt. per doz. pairs, lb.
3 x 3	6	1 x 8	11
3½ x 3½	6	1 x 9	16⅓



Nos. 192 AND 192½

Continued on next page

Extra Heavy Wrought Steel Ball Bearing Butts for Wood Doors

No. BB 250

Designed for use on heavy weight doors where high frequency of operation may be expected such as office and public buildings.

A heavy plating of copper, deposited on the cold rolled steel, serves as an excellent base for plating and insures a lasting high finish.

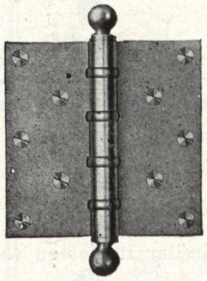
Size 5x5 and smaller have two Stanley non-detachable ball bearing washers attached to one leaf, larger sizes have four.

Loose pin; ball tips.

Inner edges of the leaves are beveled. The pin has the Stanley non-rising self-lubricating features.

Furnished in all standard finishes.

For metal doors or wood doors with metal jambs use No. BB 168 which is template of No. BB 250.



No. BB 250

DATA ON NO. BB 250

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
4 x 4	8	1¼ x 11	2.44
4½ x 4½	8	1½ x 12	3.04
5 x 5	10	1½ x 14	3.88
6 x 6	10	1¾ x 14	6.25
6 x 8	10	1¾ x 14	7.33
8 x 8	14	1¾ x 14	9.5
8 x 10	14	1¾ x 14	11.3

Wrought Steel Ball Bearing Butts for Wood Doors

No. BB 239

Designed for the finest work. A heavy plating of copper deposited on the cold rolled steel serves as an excellent base for plating and insures a lasting high finish.

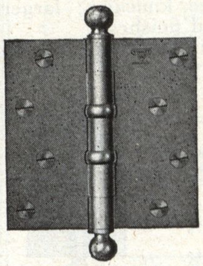
The loose pin is non-rising and self-lubricating. The inner edges are beveled and outer edges are square and true.

Equipped with Stanley non-detachable ball bearing washers.

No. 239—Is a plain joint butt similar to BB 239.

Furnished in all standard finishes.

For metal doors or wood doors with metal jambs use No. BB 174 which is template of No. BB 239. No. 174 is template of No. 239.



No. BB 239

DATA ON NOS. BB 239 AND 239

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	1 x 8	0.9
3½ x 3½	6	1 x 9	1⅓
4 x 4	8	1 x 10	1¾
4½ x 4½	8	1¼ x 10	2¼
5 x 5	10	1¼ x 12	3
6 x 6	10	1½ x 14	4½

Wrought Steel Ball Bearing Butts for Wood Doors

No. BB 241½

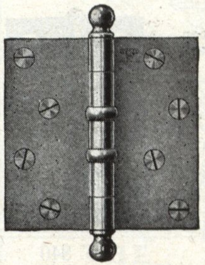
Made of cold rolled steel, polished and plated.

Equipped with Stanley non-detachable ball bearing washers.

Loose pin is non-rising and self-lubricating.

No. 241½—Is plain joint butt similar to BB 241½.

Furnished in all standard finishes.



No. BB 241½

DATA ON NOS. BB 241½ AND 241½

Butt No.	Size open, in.	Number of screw holes	Size screws, in.	Wt. per pr., lb
241½	2 x 2	4	¾ x 7	⅓
BB241½ and 241½	2½ x 2½	6	⅞ x 8	½
	3 x 3	6	1 x 8	0.9
	3½ x 3½	6	1 x 9	1⅓
	4 x 4	8	1 x 10	1¾
	4½ x 4½	8	1¼ x 10	2¼
	5 x 5	10	1¼ x 12	3
	6 x 6	10	1½ x 14	4½

Wrought Steel Tight Pin Ball Bearing Hospital Butts for Wood Doors

No. BB 237

Highly polished and heavily plated.

Originated by The Stanley Works for use in hospitals and asylums.

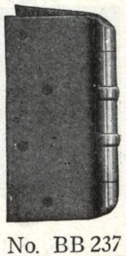
Equipped with two Stanley ball bearing washers.

Inner edges are beveled; outer edges are square and true.

No. 237—Is plain joint butt similar to BB 237.

Furnished in all standard finishes.

For metal doors or wood doors with metal jambs use BB 197 which is template of BB 237. No. 197 is template of No. 237.



No. BB 237

DATA ON NOS. BB 237 AND 237

Size open, in.	Number cf screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	1 x 8	1
3½ x 3½	6	1 x 9	1⅓
4 x 4	8	1 x 10	1¾
4½ x 4½	8	1¼ x 10	1⅞
5 x 5	10	1¼ x 12	3
6 x 6	10	1¼ x 14	4½

Wrought Steel Ball Bearing Paumelles for Wood Doors

No. BB 200

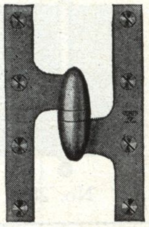
Especially designed for painting.

Priming coat applied as a base for painting. Equipped with Stanley non-detachable ball bearing washers.

No. 200—A 3-in. paumelle similar to No. BB 200 but equipped with a non-detachable solid steel washer.

Nos. BB 201 and 201—Are similar to BB 200 and 200, respectively, but are furnished in plated finishes.

For metal doors or wood doors with metal jambs use No. BB 140 which is template of No. BB 200. No. BB 141 is template of BB 201.



No. BB 200

DATA ON NOS. BB 200 AND 200

No.	Length of leaf, in.	Width of leaf, in.	Width open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
200	3	⅝	2 5/16	6	1 x10	.6
BB 200	5	¾	3¼	8	1¼x10	1.3
	6	1 3/16	3⅞	8	1¼x12	2

Wrought Steel Ball Bearing Butts for Accordion Wood Doors

No. BB 243

Made of cold rolled steel planished and plated. For use on folding doors where an unusual throw is desired.

The center of the inside screw hole is 1 in. from the outer edge of the leaf.

Equipped with Stanley non-detachable ball bearing washers.

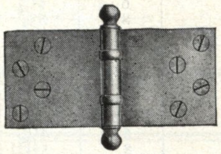
Pin is non-rising and self-lubricating.

No. 243—Is plain joint butt similar to No. BB 243.

Furnished in all standard finishes.

DATA ON NOS. BB 243 AND 243

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
2¾ x 6	8	1 x 10	2
4 x 7	8	1 x 10	2.7



No. BB 243

THE STANLEY WORKS

STANLEY BUTTS FOR WOOD DOORS

PLATE 2

Continued on next page

Wrought Steel Ball Bearing Butts for Wood Doors No. BB 235

Designed especially for painting.

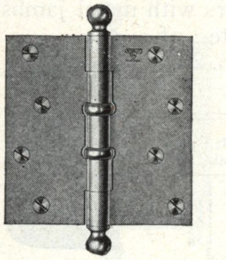
Extra clearance is provided between the knuckles and edges of the leaves to prevent marring the paint when the door is operated. Provided with a priming coat which serves as an excellent base for painting.

Equipped with Stanley non-detachable ball bearing washers. Loose pin is non-rising and self-lubricating.

Furnished with flat button or oval button tips when desired.

No. 235—Is plain joint butt similar to BB 235.

For metal doors or wood doors with metal jambs use No. BB 145 which is template of BB 235. Template of No. 235 is No. 145.



No. BB 235

Furnished in plain steel, sanded and sherardized finishes, each with priming coat.

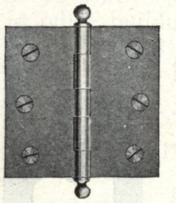
DATA ON NOS. BB 235 AND 235

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3½ x 3½	6	1 x 9	1⅓
4 x 4	8	1 x 10	1¾
4½ x 4½	8	1¼ x 10	2¼
5 x 5	10	1¼ x 12	3
6 x 6	10	1¼ x 14	4¾

Wrought Steel Loose Pin Butts for Cabinet Doors No. 285

Designed especially for painting. Extra clearance between the knuckles and edges of the leaves prevent marring the paint when the door is operated. Provided with a priming coat as a base for painting. Ball tip and pin are made in one piece. Flat button or oval button tips can be substituted when desired.

Furnished in plain steel, sanded and sherardized finishes, each with priming coat.



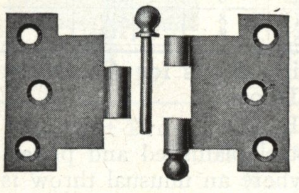
No. 285

DATA ON NO. 285

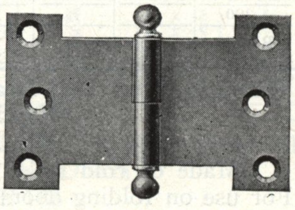
Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
2 x 2	4	6	2.7
2½ x 2	6	6	3.3
2½ x 2½	6	6	3.8

Wrought Steel Parliament Butts Nos. 828 and 829

No. 828 Loose Pin Butts. No. 829 Loose Joint Butts. Furnished in bright steel. For use on blinds and shutters. No. 828 butts in plated finishes is No. 260. No. 829 butts in plated finishes is No. 257.



No. 828



No. 829

DATA ON NOS. 828 AND 829

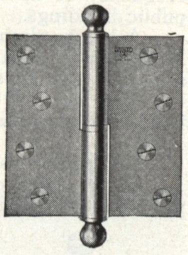
Butt No.	Width open, in.	Width between flanges, in.	Length joint, in.	Length sides, in.	Number of screw holes	Size screws, in.	Wt. per dz. prs., lb.
828	3	1⅝	1½	2³⁄₁₆	6	⅞ x 8	4
	3½	1¹⁵⁄₁₆	1¾	2⁷⁄₁₆	6	⅞ x 9	5½
	4	2⁷⁄₁₆	1¾	2⁷⁄₁₆	6	1 x 9	6½
	4½	2⅞	1¾	2⁷⁄₁₆	6	1 x 9	7⅗
	5	3⅜	1¾	2⁷⁄₁₆	6	1 x 9	9
	6	4¹⁄₃₂	2	2⅞	6	1¼ x 10	13
	8	5¾	2½	3⅝	6	1¼ x 11	28
	10	7½	3	4¼	8	1¼ x 12	43
829	3	1⅝	1½	2³⁄₁₆	6	⅞ x 8	4
	3½	1¹⁵⁄₁₆	1¾	2⁷⁄₁₆	6	⅞ x 9	5½
	4	2⁷⁄₁₆	1¾	2⁷⁄₁₆	6	1 x 9	6½
	4½	2⅞	1¾	2⁷⁄₁₆	6	1 x 9	7⅔
	5	3⅜	1¾	2⁷⁄₁₆	6	1 x 9	9
	6	4¹⁄₃₂	2	2⅞	6	1¼ x 10	13
	8	5¾	2¼	3⁷⁄₁₆	6	1¼ x 11	23
	10	7½	2½	3⅝	8	1¼ x 12	34½

Wrought Steel Loose Joint Butt for Wood Doors No. 214

Extra clearance. Solid steel washers. Designed especially for painting. A priming coat serves as an excellent base for painting. Flat button or oval button tips can be furnished when desired.

For metal doors or wood doors with metal jambs use No. 144 which is template of No. 214.

Furnished in plain steel, sanded and sherardized finishes, each with priming coat.



No. 214

DATA ON NO. 214

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	1 x 8	.8
3½ x 3½	6	1 x 9	1.4
4 x 4	8	1 x 10	1.8
4½ x 4½	8	1¼ x 10	....

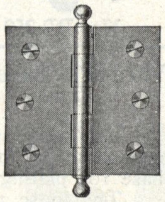
Wrought Steel Loose Pin Light Butts for Wood Doors No. 289

Planished and plated.

For use on light weight doors, such as china closets, medicine cabinets and bookcases.

2½-in. size and smaller have three knuckles; larger sizes have five. Furnished in all standard finishes.

No. 189 Wrought Brass Butt—Similar in design to No. 289.



No. 289

DATA ON NO. 289

Size open, in.	Number of screw holes	Size screws, in.	Wt. per dz. prs., lb.
2 x 2	4	¾ x 6	2⅗
2½ x 2	6	¾ x 6	3⅓
2½ x 2½	6	¾ x 6	3⅘
3 x 2½	6	¾ x 7	5⅗
3 x 3	6	¾ x 7	6⅖

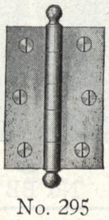
Wrought Steel Narrow Loose Pin Butt No. 295

Planished and plated.

For use on cabinets, bookcases, etc.

2½-in. size and smaller have three knuckles; larger sizes have five. Furnished in all standard finishes.

No. 195 Wrought Brass Butts—Similar in design to No. 295.



No. 295

DATA ON NO. 295

Size open, in.	Number of screw holes	Size screws, in.	Wt. per dz. prs., lb.
1½	4	⅝ x 5	1¼
1¾	4	⅝ x 5	2
2	4	¾ x 6	2⅖
2¼	6	¾ x 6	2⅘
2½	6	¾ x 6	3
3	6	¾ x 7	4⅘
3½	8	¾ x 8	7⅕

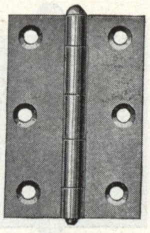
Wrought Steel Loose Pin Light Narrow Butts for Wood Doors No. 840

Furnished in bright steel only. The 2½-in. size and larger have five knuckles; smaller sizes have three.

No. 286 is plated butt similar to No. 840.

DATA ON NO. 840

Length, in.	Width open, in.	Number of screw holes	Size screws, in.	Wt. per doz. pair, lb.
1	1	4	3	½
1¼	1 ¹⁄₁₆	4	4	⅗
1½	1 ⁷⁄₁₆	4	5	.9
1¾	1 ⁷⁄₁₆	4	5	1¼
2	1 ⁹⁄₁₆	4	6	1⅘
2½	1¹¹⁄₁₆	6	6	2⅓
3	2	6	7	3¾
3½	2¼	6	8	5¾
4	2¾	8	9	8⅗
4½	3	8	10	10.9
5	3 ³⁄₁₆	8	10	13¾
6	3¹⁵⁄₁₆	8	11	21¾



No. 840

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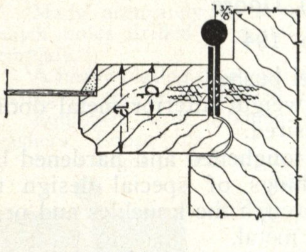
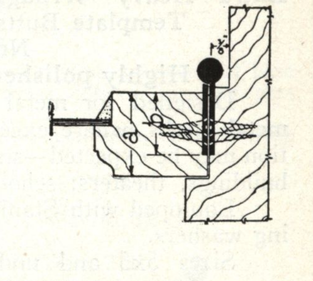


TABLE OF CLEARANCES

Sash Thickness	Size of Butt	TYPE A		TYPE B	
		b-in.	Clearance	b-in.	Clearance
1 3/8	3 x 3	3/4	1 3/8	1	7/8
1 3/4	3 1/2 x 3 1/2	1	1 3/8	1 1/4	7/8
2 1/4	4 x 4	1 1/2	7/8	1 1/2	7/8



DETAILS SHOWING CLEARANCES FOR CASEMENTS OPENING OUT

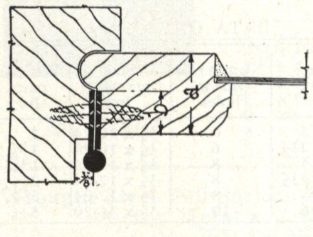
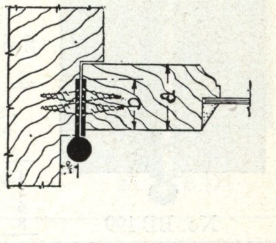


TABLE OF CLEARANCES

Sash Thickness	Size of Butt	TYPE A		TYPE B	
		b-in.	Clearance	b-in.	Clearance
1 3/8	3 x 3	3/4	1 3/8	1/4	7/8
1 3/4	3 1/2 x 3 1/2	1	1 3/8	1 1/4	7/8
2 1/4	4 x 4	1 1/2	7/8	1 1/2	7/8



DETAILS SHOWING CLEARANCES FOR CASEMENTS OPENING IN

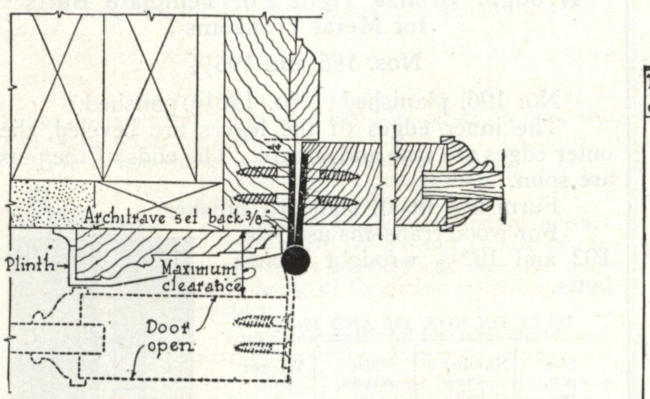
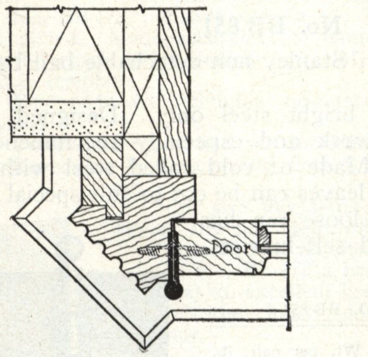


TABLE OF CLEARANCES

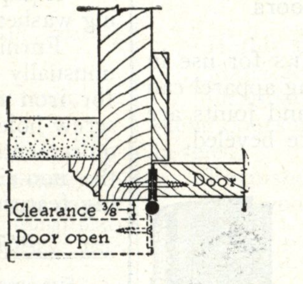
Thickness of Door	Size of Butt	Maximum Clearance	Thickness of Door	Size of Butt	Maximum Clearance
1 3/8	3 x 3	5/8	2 1/2	5 x 5	5/8
	3 1/2 x 3 1/2	1 1/8		6 x 6	1 5/8
	4 x 4	1 5/8		6 x 7	2 5/8
				6 x 8	3 5/8
1 3/4	4 x 4	7/8			
	4 1/2 x 4 1/2	1 3/8	3	7 x 6	5/8
	5 x 5	1 7/8		8 x 6	5/8
				7 x 7	1 5/8
2	4 1/2 x 4 1/2	7/8		7 x 8	2 5/8
	5 x 5	1 5/8		8 x 8	2 5/8
	6 x 6	2 5/8		7 x 10	4 5/8
				8 x 10	4 5/8

NOTE- When door is set flush with face of jamb, add 1/8 inch to the figure given in the clearance column of above table

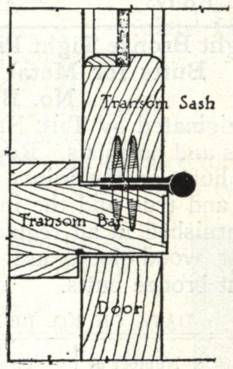
DETAILS SHOWING CLEARANCES FOR REGULAR BUTTS FOR WOOD DOORS



DETAIL OF 2 1/2 IN X 2 1/2 IN. BUTT ON 1 3/8 IN. LIGHT CABINET DOOR



DETAIL OF 2 1/2 IN. LIGHT NARROW BUTT NO. 195 ON 3/4 IN. CABINET DOOR



DETAIL OF 3 IN. X 3 IN BUTT ON 1 3/4 IN. TRANSOM

THE STANLEY WORKS

DETAILS SHOWING APPLICATION WITH CLEARANCES OF STANLEY REGULAR BUTTS FOR WOOD DOORS

DRAWING NO. 1

Continued on next page

Extra Heavy Wrought Bronze Ball Bearing Template Butts for Metal Doors

No. 199

Highly polished Heavily plated

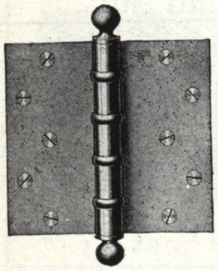
Designed for metal doors or wood doors with metal jambs, where exceptional frequency of operation may be expected—such as exterior doors of office buildings, theaters, schools, hospitals, etc.

Equipped with Stanley non-detachable ball bearing washers.

Sizes 5x5 and under, have two ball bearing washers; larger sizes with four.

For wood doors use No. BB 181.

Furnished in all standard finishes.



No. BB 199

DATA ON NO. BB 199

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
4½ x 4½	8	½ x ¼-20	3⅓
5 x 5	8	½ x ¼-20	4
6 x 6	10	½ x ¼-20	6½
8 x 8	16	½ x ¼-20	9½

Wrought Bronze Ball Bearing Template Butts for Metal Doors

No. BB 193

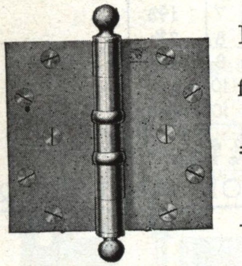
Designed for use on metal doors or wood doors with metal jambs, where a medium weight bronze butt is required—such as exterior doors which are used moderately or for interior doors in office buildings, etc.

Equipped with Stanley non-detachable ball bearing washers.

All sizes are furnished with two ball bearing washers.

For wood doors use No. BB 180.

Furnished in all standard finishes.



No. BB 193

DATA ON NO. BB 193

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
4½ x 4½	8	½ x 12-24	2½
5 x 5	8	½ x 12-24	3⅓
6 x 6	10	½ x ¼-20	5

Wrought Bronze Tight Pin Ball Bearing Template Butts for Metal Hospital Doors

No. BB 198

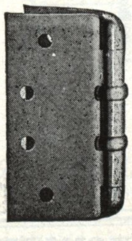
Originated by The Stanley Works for use in asylums and hospitals. Ropes or wearing apparel can not be hung on the joint. The edges and joints are square and true and the inner edges are beveled.

Furnished in all regular finishes.

For wood doors use No. BB 183 wrought bronze butts.

DATA ON NO. BB 198

Size open, in.	Number of screw holes	Size screws, in.	Wt. per doz. pr., lb.
3 x 3	6	*½ x 10-24	⅗
3½ x 3½	6	½ x 10-24	1⅕
4 x 4	8	½ x 12-24	1⅗
4½ x 4½	8	½ x 12-24	2
5 x 5	8	½ x 12-24	2⅗
6 x 6	10	½ x ¼-20	4¼



No. BB 198

Wrought Bronze Loose Pin Template Butts for Metal Doors

No. 194

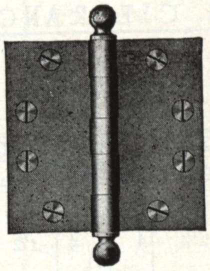
Highly polished; steel bushed.

For use on medium weight interior metal doors where a bronze butt is desired.

The bronze metal is toughened and hardened by cold rolling. Steel bushings of special design to retain lubricant extend through the knuckles and prevent wear on the bronze metal.

Furnished in all standard finishes.

For wood doors use No. 175.



No. 194

DATA ON NO. 194

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	½ x 10-24	1
3½ x 3½	6	½ x 10-24	1⅖
4 x 4	8	½ x 12-24	1⅘
4½ x 4½	8	½ x 12-24	2½
5 x 5	8	½ x 12-24	3⅓
6 x 6	10	½ x ¼-20	5⅕

Wrought Bronze Tight Pin Template Butts for Metal Transoms

Nos. 196 and 196½

No. 196, planished. No. 196½ polished.

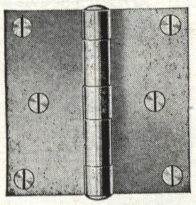
The inner edges of the leaves are beveled, the outer edges are true and square. The ends of the pins are spun.

Furnished in all standard finishes.

For wood transoms use Nos. 192 and 192½ wrought bronze butts.

DATA ON NOS. 196 AND 196½

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	½ x 10-24	¾
3½ x 3½	6	½ x 10-24	1⅓



Nos. 196 and 196½

Extra Heavy Wrought Steel Ball Bearing Butts for Metal Doors

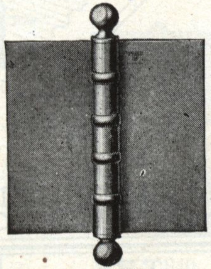
No. BB 851

Equipped with Stanley non-detachable ball bearing washers.

Furnished in bright steel only. Designed for unusually heavy work and especially recommended for iron doors. Made of cold rolled steel without screw holes. The leaves can be cut to suit special requirements. The loose pin has the non-rising and self-lubricating features.

DATA ON NO. BB 851

Size open, in.	Wt. per pair, lb.
5 x 5	3⅘
6 x 4	4⅗
6 x 5	5½
6 x 6	6
6 x 7	6⅔
6 x 8	7¼
8 x 6	7⅗
8 x 8	9½
8 x 10	11⅓



No. BB 851

THE STANLEY WORKS

STANLEY TEMPLATE BUTTS FOR METAL DOORS

PLATE 5

Continued on next page

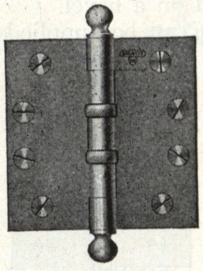
Extra Heavy Wrought Steel Ball Bearing Template Butts for Metal Doors
No. BB 168

Made accurately to template, screwholes will exactly match holes drilled in metal doors and jambs to similar template.

A heavy plating of copper serves as a base for additional plating of the finish desired and insures permanency.

Equipped with Stanley non-detachable ball bearing washers. Loose pins.

Inner edges of leaves are beveled.


No. BB 168

Furnished in all standard finishes.

For wood doors use No. BB 250.

DATA ON NO. BB 168

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
4 x 4	8	½ x 12-24	2⅖
4½ x 4½	8	½ x 12-24	3
5 x 4	8	½ x 12-24	3¼
5 x 5	8	½ x ¼-20	3⅘
6 x 5	10	½ x ¼-20	5½
6 x 6	10	½ x ¼-20	6¼
8 x 6	16	½ x ¼-20	7⅗
8 x 8	16	½ x ¼-20	9½

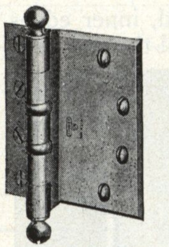
Wrought Steel Full Surface Ball Bearing Template Butts for Metal and Kalamein Doors
No. BB 170 and No. BB 171

BB 170, polished and plated; BB 171, planished and plated. Made accurately to template, screwholes will exactly match holes drilled in metal doors and jambs to similar template.

Equipped with Stanley non-detachable ball bearing washers.

4½-in. size has 1⅛-in. offset on door leaf and 1⅛-in. offset on jamb leaf. 5-in. size has 1-in. offset on door leaf and ⅞-in. offset on jamb leaf.

Pin is non-rising and self-lubricating.


Nos. BB 170 AND BB 171

Reversible by unscrewing the slotted tip and reversing the pin.

Furnished in all the standard finishes.

On No. BB 170 a heavy plating of copper serves as an excellent base for additional plating of the finish desired, insuring permanency.

DATA ON NOS. BB 170 AND BB 171

Size open, in.	Number of screw holes	Size bolts, door leaf, in.	Size screws, jamb leaf, in.	Wt. per pair, lb.
4½	8	¼ x 2 x 20	½ x 12-24	2⅘
5	8	¼ x 2 x 20	½ x 12-24	3¾

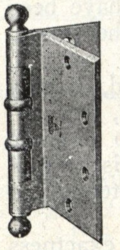
Wrought Steel Half Surface Ball Bearing Template Butts for Metal and Kalamein Doors
No. BB 172 and No. BB 173

No. BB 172, polished and plated; No. BB 173, planished and plated. Made accurately to template, screwholes will exactly match holes drilled in metal doors and jambs to similar template.

Equipped with Stanley non-detachable ball bearing washers.

Pin is non-rising and self-lubricating.

Reversible by unscrewing slotted tip and reversing the pin.


Nos. BB 172 AND BB 173

5-in. size has 1-in. offset on door leaf; 4½-in. size has ¾-in. offset.

Furnished in all the standard finishes.

On No. BB 172 a heavy plating of copper serves as an excellent base for additional plating of the finish desired, insuring permanency.

DATA ON NOS. BB 172 AND BB 173

Size open, in.	Number of screw holes	Size screws, door leaf, in.	Size screws, jamb leaf, in.	Wt. per pair, lb.
4½	8	¼ x 2 x 20	½ x 12-24	2.9
5	8	¼ x 2 x 20	½ x 12-24	3⅘

Wrought Steel Ball Bearing Template Butts for Metal Doors
No. BB 174

Highly polished and heavily plated.

Made accurately to template.

A heavy plating of copper serves as an excellent base for additional plating of the finish desired, insuring permanency.

Equipped with Stanley non-detachable ball bearing washers.

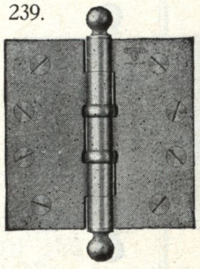
Pins are non-rising and self-lubricating.

Inner edges of leaves are beveled.

No. 174—Is plain joint butt similar to BB 174.

Furnished in all standard finishes.

For wood doors use No. BB 239 or 239.


No. BB 174

DATA ON NO. BB 174

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
2½ x 2½	6	½ x 8-32	.54
3 x 3	6	½ x 10-24	.88
3½ x 3½	6	½ x 10-24	1.35
4 x 4	8	½ x 12-24	1.7
4½ x 4½	8	½ x 12-24	2.2
5 x 3	8	½ x 12-24	2.0
5 x 4	8	½ x 12-24	2.4
5 x 5	8	½ x 12-24	3.0
6 x 5	10	½ x ¼-20	4.0
6 x 6	10	½ x ¼-20	4.5

Wrought Steel Ball Bearing Template Butts for Metal Doors
No. BB 179

Planished and plated.

Made accurately to template.

Equipped with Stanley non-detachable ball bearing washers.

Loose pin is non-rising and self-lubricating.

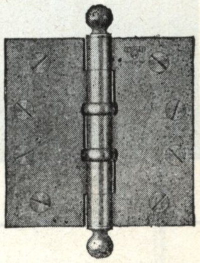
No. 179—Is plain joint butt similar to No. BB 179.

Furnished in all standard finishes.

For wood doors use No. BB 241½ or 241½.

DATA ON NO. BB 179

Size, open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
2½ x 2½	6	½ x 8–32	.54
3 x 3	6	½ x 10–24	.88
3½ x 3½	6	½ x 10–24	1.35
4 x 4	8	½ x 12–24	1.7
4½ x 4½	8	½ x 12–24	2.2
5 x 3	8	½ x 12–24	2.0
5 x 4	8	½ x 12–24	2.4
5 x 5	8	½ x 12–24	3.0
6 x 5	10	½ x ¼–20	4.0
6 x 6	10	½ x ¼–20	4.5


No. BB 179

Wrought Steel Ball Bearing Template Hospital Butts for Metal Doors
No. BB 197

Highly polished and heavily plated.

Made accurately to template.

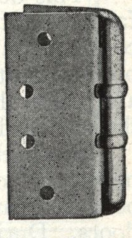
Originated by The Stanley Works for use on metal doors in hospitals and asylums. Inner edges are beveled.

Furnished in all standard finishes.

For wood doors use No. BB 237.

DATA ON NO. BB 197

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	*½ x 10-24	½
3½ x 3½	6	½ x 10-24	1
4 x 4	8	½ x 12-24	1½
4½ x 4½	8	½ x 12-24	1.9
5 x 5	8	½ x 12-24	2½
6 x 6	10	½ x ¼-20	3⅘


No. BB 197

Continued on next page

Wrought Steel Ball Bearing Template Butts for Metal Doors

No. BB 145

Made accurately to template.

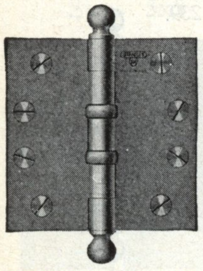
Designed especially for painting. Extra clearance is provided between the knuckle and the edges of the leaves, which are milled back on a bevel.

Furnished with priming coat as a base for painting. Equipped with Stanley non-detachable ball bearing washers. Pin is non-rising and self-lubricating.

Furnished regularly with ball tips but flat button or oval button tips can be supplied when specified. Furnished in plain steel, sanded and sherardized finish, each with priming coat.

No. 145—Is plain joint butt similar to No. BB 145.

For wood doors use No. BB 235, or No. 235.



Nos. BB 145 and 145

DATA ON NOS. BB 145 AND 145

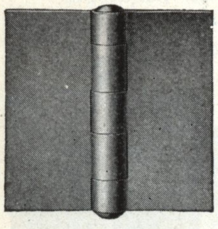
Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3½ x 3½	6	½ x 10-24	1.35
4 x 4	8	½ x 12-24	1.8
4½ x 4½	8	½ x 12-24	2.2
5 x 5	8	½ x 12-24	3.0

Extra Heavy Wrought Steel Tight Pin Butts Without Holes, for Metal Doors

No. 850

Designed especially for iron shutters, gates and jail work. The holes may be drilled to meet special requirements.

Finished in bright steel only.



No. 850

DATA ON NO. 850

Size open, in.	Wt. per doz. pairs, lb.
2 x 2	4.51
2½ x 2½	7.8
3 x 3	10.8
3 x 3½	12.1
3½ x 3	13.4
3½ x 3½	17.8
4 x 3	22.3
4 x 4	26.6
4½ x 4½	35.4
5 x 5	42.4
6 x 6	59.5

Wrought Steel Template Loose Joint Butts for Metal Doors

No. 144

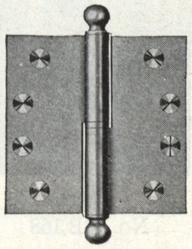
Made accurately to template.

Designed especially for painting. Equipped with solid steel washers unless otherwise specified. Provided with a priming coat as a base for painting. Extra clearance is provided between the knuckles and the edges of the leaves which are milled on a bevel.

Flat button or oval button tips can be supplied when specified.

Furnished in plain steel, sanded and sherardized finish, each with priming coat.

For wood doors use No. 214.



No. 144

DATA ON NO. 144

Size open, in.	Number of screw holes	Size screws, in.	Wt. per pair, lb.
3 x 3	6	½ x 10-24	.8
3½ x 3½	6	½ x 10-24	1.4
4 x 4	8	½ x 12-24	1.8

Wrought Steel Tight Pin Template Butts for Metal Transoms

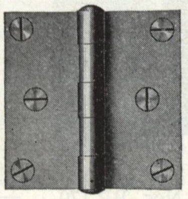
No. 176 and No. 178

No. 176, polished and plated; No. 178, planished and plated.

Made accurately to template. The ends of the pins are spun making a close fitting joint.

On No. 176 a plating of copper serves as an excellent base for additional plating of the finish desired, insuring permanency.

Inner edges of No. 176 are beveled, inner edges of No. 178 are square. Furnished in all the standard finishes.



Nos. 176 and 178

DATA ON NOS. 176 AND 178

Size open, in.	Number of screw holes	Size screws, in.	Wt. per doz. pairs, lb.
2½ x 2½	6	½ x 8-32	6
3 x 2½	6	½ x 10-24	7
3 x 3	6	½ x 10-24	8½
3½ x 3½	6	½ x 10-24	14⅘
4 x 4	8	½ x 12-24	19⅗

Stanley Template Butts

In the year 1911 The Stanley Works designed and produced, particularly for the manufacturers of fireproof doors and casings, several lines of full mortise and half surface butt hinges called "template butts." The screwholes were punched exactly to a template. By referring to this template as a standard, holes could be located in the metal doors and jambs so that they would register perfectly with the holes in the butts.

This degree of accuracy in screwhole location is far beyond that required for butts to be used on wood construction. The skill and precision necessary to produce butts of a uniform quality of this high standard makes the cost of production greater than that of the standard line of butts for wood doors.

Some easily recognized distinguishing feature is necessary to eliminate all possibility of confusion between template butts and standard butts for wood doors. During the manufacture, or later in the hands of the trade, an unfortunate substitution would be possible which might cause great inconvenience to the builder. To prevent any such substitution an entirely different arrangement of screwholes is used. There is no possibility of confusing the two butts.

Class numbers for each Stanley template butt is stamped on the back of the leaf, making it easy to identify the butts.

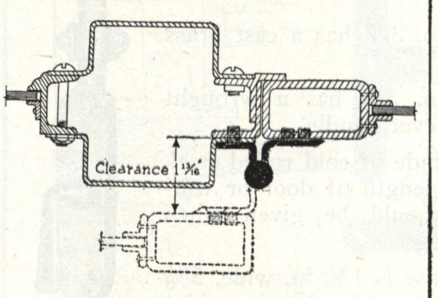
All Stanley template butts are packed with machine screws. The sizes of these screws have been established by experimentation to insure the proper size screw for each butt.

Having been in use for so long a period, Stanley template butts are familiar to the architects, the contractors and metal door manufacturers. To all these people the reliability of this line of butts is so well established that they have become accustomed to using this template as a standard.

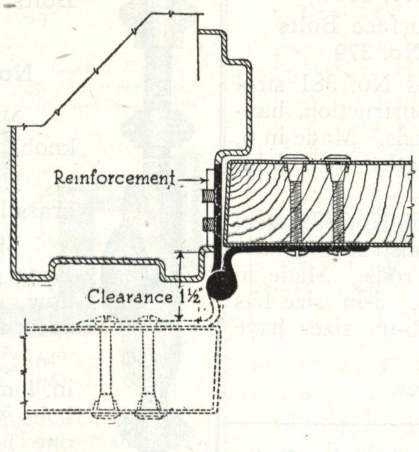
This assurance of uniform quality and exactness causes Stanley butts to be specified as a guarantee against delays and confusion.

THE STANLEY WORKS	STANLEY TEMPLATE BUTTS FOR METAL DOORS	PLATE 7

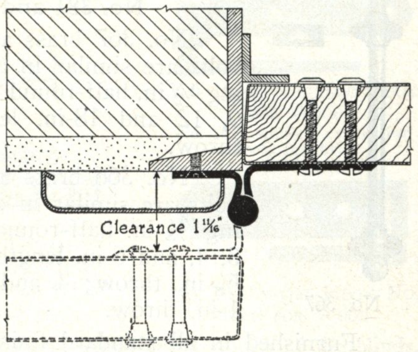
Continued on next page


Clearance 1 13/16"

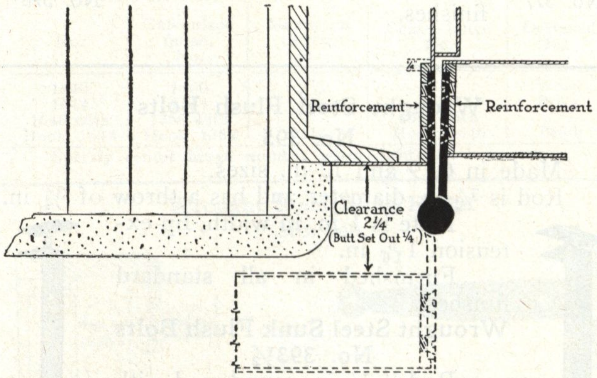
DETAIL SHOWING 5 IN. FULL SURFACE BUTT ON 1⅜ IN. HEAVY IRON DOOR


Reinforcement
Clearance 1½

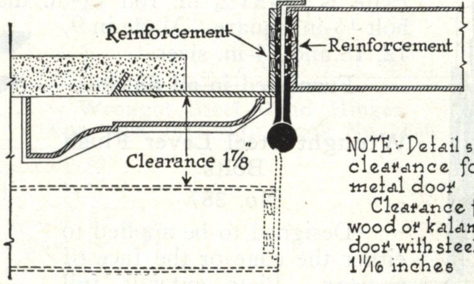
DETAIL SHOWING 5 IN. HALF SURFACE BUTT ON 1¾ IN. KALAMEIN DOOR


Clearance 1 11/16"

DETAIL SHOWING 5 IN. FULL SURFACE BUTT ON 1¾ IN. KALAMEIN DOOR

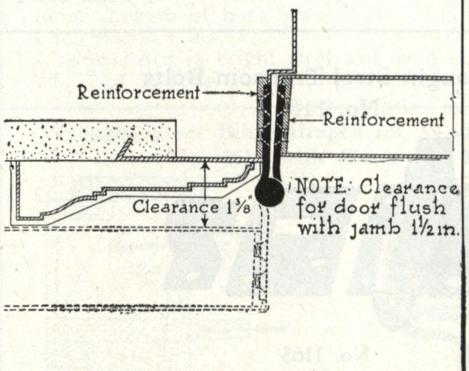

Reinforcement
Reinforcement
Clearance 2¼"
(Butt Set Out ¼")

DETAIL SHOWING CLEARANCE FOR 6 IN. X 6 IN. BUTT AND 2 IN. DOOR


Reinforcement
Reinforcement
Clearance 1⅞"

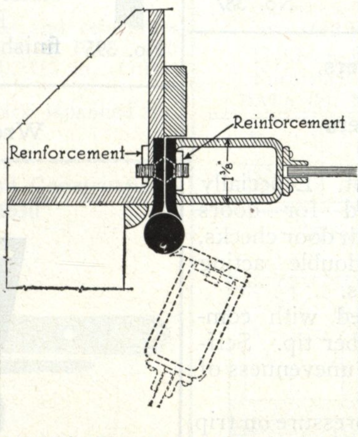
NOTE-Detail shows clearance for metal door Clearance for wood or kalamein door with steel jamb, 1 11/16 inches

DETAIL SHOWING CLEARANCE FOR 5 IN. X 5 IN. BUTT AND 1¾ IN. DOOR

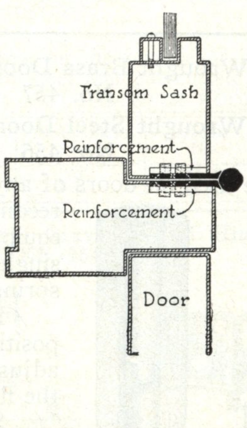

Reinforcement
Reinforcement
Clearance 1⅞"

NOTE: Clearance for door flush with jamb 1½ in.

DETAIL SHOWING CLEARANCE FOR 4½ IN. X 4½ IN. BUTT AND 1¾ IN. DOOR


Reinforcement
Reinforcement
⅜

DETAIL SHOWING CLEARANCE FOR 6 IN. X 4 IN. BUTT ON 1⅜ IN. IRON & GLASS DOOR


Transom Sash
Reinforcement
Reinforcement
Door

DETAIL OF 3 IN. X 3 IN. BUTT ON 1¾ IN. TRANSOM

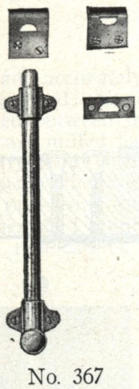
THE STANLEY WORKS

DETAILS SHOWING APPLICATION WITH CLEARANCES OF STANLEY TEMPLATE BUTTS FOR METAL DOORS

DRAWING NO. 2

Continued on next page

Wrought Brass Surface Bolts
No. 367 and No. 366
Wrought Steel Surface Bolts
No. 381 and No. 379

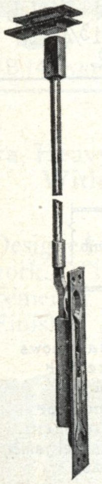

No. 367

No. 367 brass and No. 381 steel bolts are similar in construction, having ½ in. half-round rods. Made in 6, 9, 12 and 18-in. lengths with 1-in. throw.

No. 366 brass and No. 379 steel bolts are similar in construction, having ⅜-in. half-round rods. Made in 3, 4, and 6-in. lengths. 3-in. size has ⅝-in. throw; 4 and 6-in. sizes have 1-in. throw.

Furnished in all standard finishes.

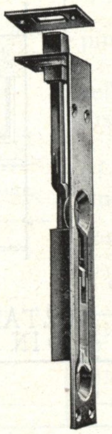
Wrought Bronze Lever Mortise Bolt
No. 386
Wrought Steel Lever Mortise Bolt
No. 385


No. 386

No. 386 bronze and No. 385 steel bolts are similar in construction, having 11/16-in. throw. Self-centering strike plates. Plate is 6¼x1¼-in. rod ¼-in. diameter, bolt ½-in. square. Made in 9, 12, 18 and 24-in. sizes.

Furnished in all finishes.

Wrought Steel Lever Flush Bolts
No. 387


No. 387

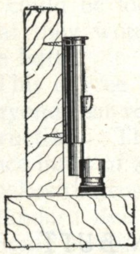
Designed to be applied to either the edge or the face of a door. Plate extends full length of bolt.

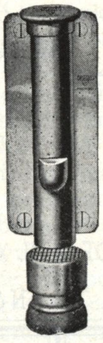
Throw is ⅝ in. Strike plate is self-centering. Rod is ¼-in. square, bolt ½-in. square, plate 1¼ in. wide. Made in 9, 12, 18 and 24-in. sizes.

Furnished in all finishes.

Wrought Brass Door Holders
No. 457
Wrought Steel Door Holders
No. 456

Can be used on doors of any weight. Especially recommended for doors equipped with door checks, single or double acting spring hinges.


No. 457


No. 457

Equipped with composition rubber tip. Self-adjusting to unevenness of the floor.

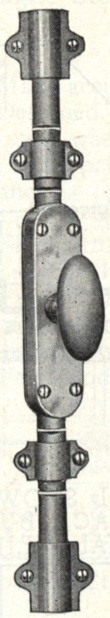
Slight pressure on trip lever releases the holder.

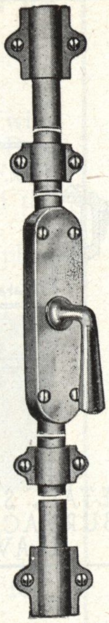
Plates are 5x2 in. Diameter of bolt ¾ in. Throw ¾ in.

Furnished in all standard finishes.

Wrought Steel Cremone Bolts for Casement Sash or French Doors

No. 377 and No. 378


No. 377


No. 378

No. 377 has a cast brass knob.

No. 378 has a wrought brass lever handle.

Made of cold rolled steel. Exact length of door or window should be given when ordering.

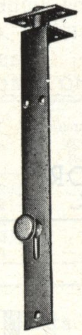
Case is 1⅜ in. wide, 5⅜ in. long; guides 1⅞ in. wide; bolts ⅝ in. wide. Packed with one handle, two center and two end guides, two No. 2 staples, one No. 1 staple and a sufficient quantity of 1¼-in. x No. 8 screws in a box.

Furnished in all standard finishes.

Wrought Steel Flush Bolts
No. 395

Made in 6, 9 and 12-in. sizes.

Rod is ½-in. diameter and has a throw of ¾ in.


No. 395

No. 393½

Plate is 1 in. in width, lip extension 1 5/16 in.

Furnished in all standard finishes.

Wrought Steel Sunk Flush Bolts
No. 393½

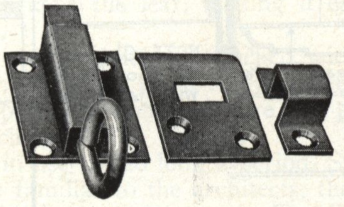
Rod is ¼ in. round, rod with throw of ¾ in.

Plate is ¾ in. in width, lip extension is 1 5/16 in.

Made in 6, 9, 12 and 18-in. sizes.

Furnished in all standard finishes.

Wrought Steel Transom Bolts
No. 1165

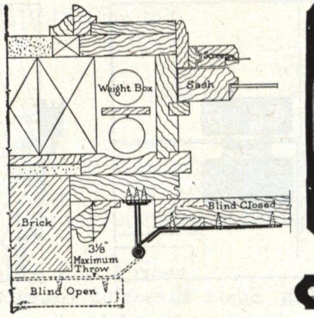

No. 1165

For use on transoms. Bolts and large ring handle of one-piece cold wrought steel; can not be broken. Springs of music wire. Made in 1 and 2-in. sizes.

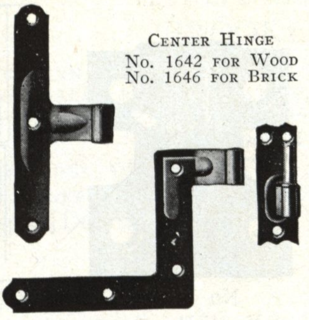
Furnished in all standard finishes.

Continued on next page

Wrought Steel Blind Hinges for Wood and Brick
Nos. 1640, 1644, 1642, 1646


Screen
Sash
Weight Box
Brick
Blind Closed
3⅛" Maximum Throw
Blind Open

Detail Showing Application



Center Hinge
No. 1642 for Wood
No. 1646 for Brick

No. 1640 for Wood
No. 1644 for Brick

The strap of Nos. 1640 and 1644 hinges extends across and reinforces the joints of the blind. Horizontal part of hinge is 5 in. long. Vertical part is 4 in. Width of hook plates, 1⅛ in.

No. 1642 or No. 1646 center hinge should be used for high shutters.

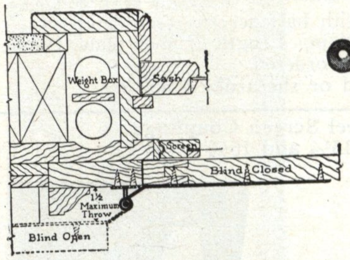
Furnished in bright steel and galvanized finish.

DATA ON NOS. 1640, 1644 AND 1640 WITH HOOK NO. 1644

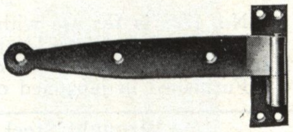
No.	Galvanized finish, No.	Maximum throw, in.	Center hinge No.	Designed for
1640	1360	2⅛	1642	Wood
1644	1364	4¼	1646	Brick
1640 with Hook 1644	1360 with Hook 1364	3⅛	1642 with Hook 1646	Brick

Specify center hinge number when desired.

Wrought Steel Blind Hinge
No. 940


Weight Box
Sash
Screen
Blind Closed
1½ Maximum Throw
Blind Open

Detail Showing Application

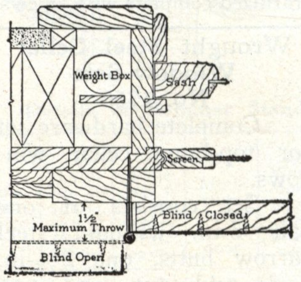


No. 940

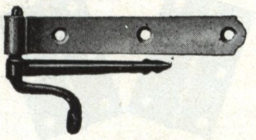
The strap of the hinge extends across and reinforces the joints of the blind. Length of strap, 6, 8, 10, 12 and 16-in. Length of hook plate, 4 in. Width, 1¼ in. Offset 1 in., throw 2 in.

Furnished in bright steel and dead black japanned finish. Can be furnished with special offsets.

Wrought Steel Blind Hinges for Wood Construction
No. 1616 with Hook No. 1650


Weight Box
Sash
Screen
Blind Closed
1½" Maximum Throw
Blind Open

Detail Showing Application

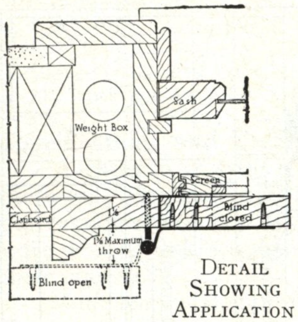


No. 1616

The strap of the hinge extends across the joints of the blind, reinforcing them. Hinge is 5 in. long and ¾ in. wide.

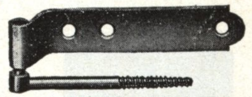
Furnished in bright steel and galvanized finish.

Wrought Steel Blind Hinges for Frame Construction
Nos. 1620, 1624 and 1628 with Hook No. 1666

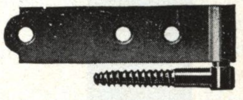

Sash
Weight Box
Screen
Clapboard
Blind closed
1¾ Maximum throw
Blind open

Detail Showing Application

No. 1624 with No. 1666 Hook



No. 1624. No. 1666 Hook for Wood
No. 1628 similar, except for offset, for brick



No. 1620 with Hook No. 1666 for Wood

Straps of the hinges extend across joints of the blinds, reinforcing them.

No. 1624 has offsets of ½, ¾, or 1 in.

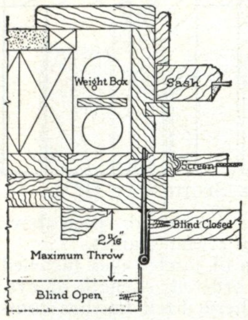
No. 1628 has offsets of 1¼, 1½, 1¾ or 2 in.

Furnished in bright steel and galvanized finish.

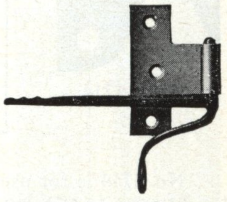
DATA ON NOS. 1620, 1624, AND 1628 WITH HOOK NO. 1666

No.	Length, in.	Width, in.	Hook No.	Offset, in.	Throw, in.
1620	4	1	1666-2 "	....	....
	5	1	1666-2½"	....	....
	7	1⅛	1658-4½"	....	⅜
1624	5	1	1666-2 "	½	⅞
	5	1	1666-2½"	¾	1⅜
	5	1	1666-3 "	1	1⅞
1628	5	1	1666-3 "	1¼	2⅜
	5	1	1666-3½"	1½	2⅞
	5	1	1666-3½"	1¾	3⅜
	5	1	1666-3½"	2	3⅞

Wrought Steel Blind Hinges
Nos. 1608, 1612 with Hook No. 1650


Weight Box
Sash
Screen
Blind Closed
2³⁄₁₆ Maximum Throw
Blind Open

Detail Showing Application for 1612 Hinge



No. 1608
No. 1612 similar, except for offset

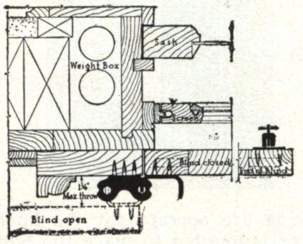
Used on blinds hung on the outside of casing.

Furnished in bright steel and galvanized finish.

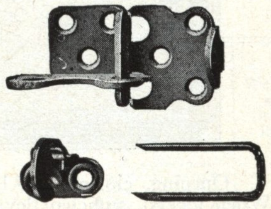
DATA ON NOS. 1608 AND 1612 WITH HOOK NO. 1650

No.	Throw, in.	Width plate, in.	Hook No.	Size of hook, in.
1608	2¹¹⁄₁₆	3	1650	4½
1612	5	3	1650	5½

Wrought Steel Gravity Blind Hinges
No. 1647½


Sash
Weight Box
Screen
Blind closed
1¼" Max throw
Blind open

Detail Showing Application



No. 1647½ Gravity Hinge

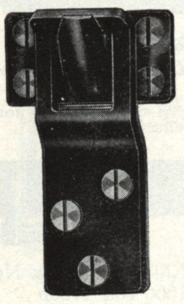
Blind can not be removed except when wide open. Hinge is reversible, holding the blind either open or closed.

Furnished in bright steel or sherardized finish.

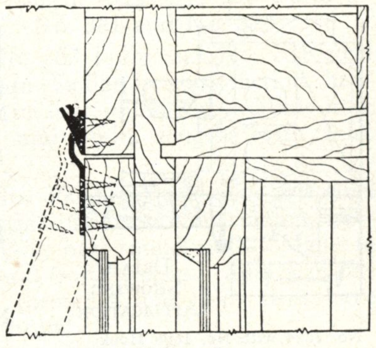
THE STANLEY WORKS | STANLEY WROUGHT STEEL BLIND HINGES | PLATE 8

Continued on next page

Wrought Steel Full Length Storm Sash Hanger No. 1715



No. 1715

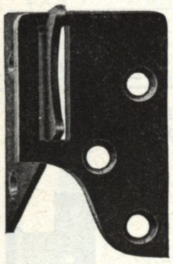


3-in. Scale Section

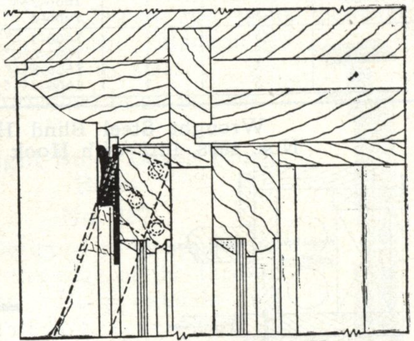
For use where there is at least 1¼ in. clearance above top of sash (see detail).

The angle on the hook guides the eye up and over the hook, so that sash can be easily hung from inside the building. Extra eyes furnished when ordered. Length of hanger, 2⅞ in. Furnished in japanned or sherardized finishes complete with screws.

Wrought Steel Full Length Storm Sash Hanger No. 1714



No. 1714

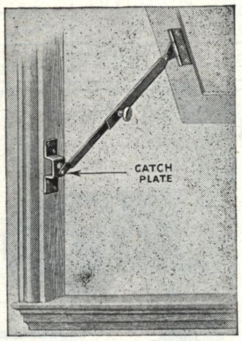


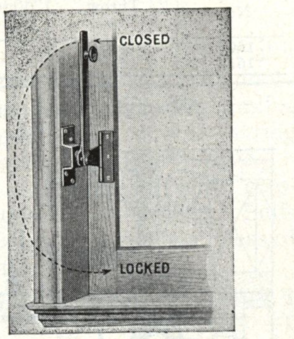
3-in. Scale Section at Head

No. 1714 is for use where there is not enough space above top of sash to use No. 1715, and for reveal frames.

Hooks of hangers fastened to top of jambs, eyes fastened to sash. Extra eyes furnished when ordered. Length of eye, $2\frac{7}{16}$ in. Furnished in japanned or sherardized finishes complete with screws.

Wrought Steel Folding and Locking Storm Sash Holders and Fasteners No. 1723

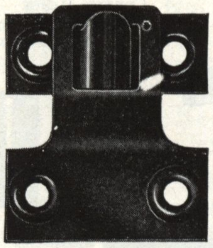




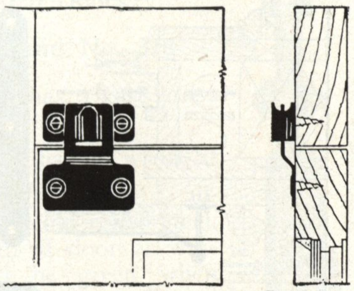
Opening, closing and locking are operated by the knob. When locked, sufficient leverage is exerted to make the window weathertight. Take down feature allows storm sash to be removed without the use of tools.

Length open, 12 in. Closed, 6½ in. Eye piece extends ⅞ in. from casing. Furnished japanned or sherardized finish.

Wrought Steel Full Length Screen Hanger No. 1724



No. 1724

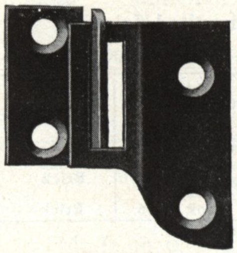


3-in. Scale Elevation Section

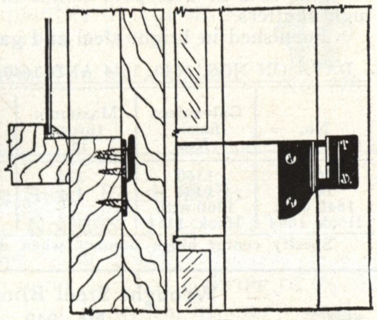
No. 1724 is for use where there is at least 1 in. clearance above top of screen (see detail).

The hook plate is 2⅝ in. wide and ¾ in. high. Length of eye plate, $2\frac{1}{16}$ in. Extra eyes furnished when ordered. Furnished in japanned or sherardized finishes.

Wrought Steel Half Screen Hanger No. 1725



No. 1725



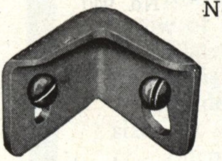
Section Elevation

No. 1725 is for use with half screens (see detail).

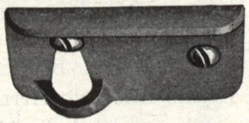
Length of eye plate, 1½ in. Length of hook plate, $1\frac{1}{16}$ in. Extra eyes furnished when ordered.

Furnished in japanned or sherardized finishes.

Wrought Steel Screen Couplings Nos. 15½ and 16½



No. 15½
Corner Coupling



No. 16½
Flat Coupling

Used for erecting sections of screen or storm sash used for enclosing porches.

Screens or sash may be taken down and easily re-erected without loss of fittings, which remain in their proper position.

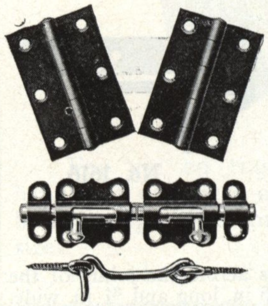
Right and left-hand fittings meet any condition.

No. 15½ is $1\frac{5}{32}$ in. wide, $1\frac{5}{32}$ in. high.

No. 16½ is 2 in. long, $1\frac{7}{32}$ in. high.

Furnished japanned or sherardized complete with screws.

Wrought Steel Cellar Window Sets No. 1760



Complete hardware set for top-hung cellar windows.

Set consists of one pair 3-in. wrought steel narrow butts, one 2½-in. hook and eye, and two 2½-in. cellar window bolts.

Furnished japanned or sherardized finish.

BOMMER SPRING HINGE COMPANY

GENERAL OFFICE AND FACTORY
251-271 Classon Avenue
BROOKLYN, N. Y.

ESTABLISHED 1876

WESTERN SALES OFFICE, 180 North Market Street, CHICAGO, ILL.
PACIFIC COAST SALES REPRESENTATIVE, JOHN T. ROWNTREE, INC., LOS ANGELES, CAL.

TRADE MARK
BOMMER
Reg. U. S. Pat. Office

Products

SPRING HINGES for all kinds of doors, also PIVOTS; STRIKES, BOLTS and LATCHES for Lavatory and Hospital Doors.

Quality and Prices

Standard for 48 years, and kept up-to-date, retaining superiority over all others.

Prices are guaranteed to be no higher than those for goods of corresponding type.

Specifications and Catalogues

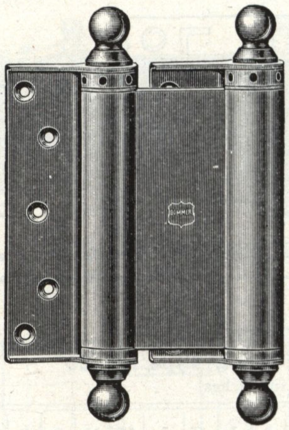
Architects, in specifying these products, should use the word "Bommer" and in addition thereto, if possible, the catalogue number of the article and finish. Hardware dealers and lock manufacturers can include them in their contracts.

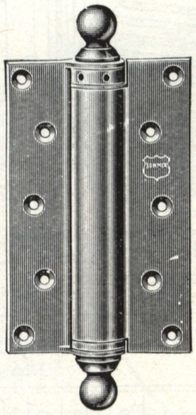
Complete catalogue of the BOMMER SPRING HINGE COMPANY's line forwarded on application. For projects requiring special spring hinges, details of construction are solicited.

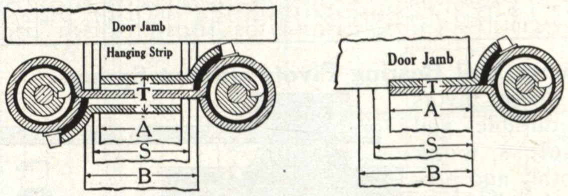
Bommer Standard Spring Butt Hinges

Bommer standard spring butt hinges require a hanging strip for fastening them to the door casing. One flange is mortised into the hanging strip and the other into the door, which gives a uniform appearance and secure fastening.

They are made of wrought steel, bronze and brass, in all finishes. The bearing surfaces are of different hardness in order to reduce friction. The spring barrels and their connecting plate are integral and exceptionally strong and of uniform thickness. The springs are of large diameter and unusual length, made of the best oil tempered steel wire, have great resilience and power and never go lame. The pintle and flange are interlocked, preventing the ball tips from working loose.


Double Action Type No. 29


Single Action Type No. 0



Details of Bommer Standard Spring Butt Hinges

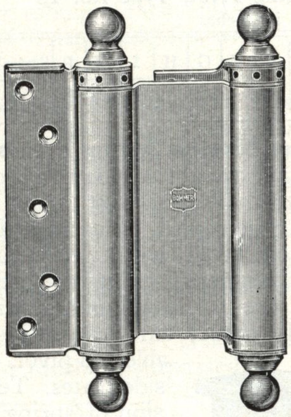
Size of hinge	T Type No. 29 thickness of the 3 leaves	T Type No. 0 thickness of the 2 leaves	A Minimum thickness of door	B Wood door maximum thickness	S Metal door maximum thickness	Width of door	Weight of door, lbs.	Hanging strip depth
3″	7/16″	11/64″	¾″	1″	⅞″	2′ 2″	30	½″
4″	7/16″	11/64″	⅞″	1¼″	1⅛″	2′ 4″	42	⅝″
5″	7/16″	3/16″	1⅛″	1½″	1⅜″	2′ 6″	56	⅝″
6″	9/16″	7/32″	1¼″	1¾″	1½″	2′ 8″	72	¾″
7″	9/16″	15/64″	1⅜″	2″	1¾″	2′ 9″	90	⅞″
8″	¾″	17/64″	1½″	2¼″	2″	2′10″	110	1″
10″	¾″	½″	1¾″	2½″	2⅛″	3′ 0″	150	1⅛″
12″	¾″	17/32″	2¼″	3″	2⅝″	3′ 2″	190	1¼″

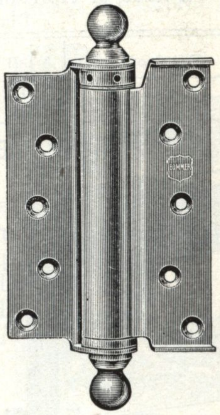
Always use the largest size hinge the thickness of door will permit.

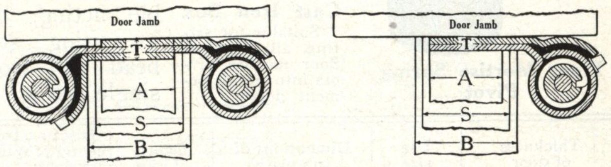
Bommer Ever Ready Spring Hinges

Ever Ready double action spring hinges do not require a hanging strip. They are fastened to the surface of the door casing, the entire thickness of hinge being mortised into the door.

They are made of wrought steel, bronze and brass, in all finishes. The bearing surfaces are of different hardness in order to reduce friction. The spring barrels and their connecting plate are integral and exceptionally strong and of uniform thickness. The springs are of large diameter and unusual length, made of the best oil tempered steel wire, have great resilience and power and never go lame. The pintle and flange are interlocked, which prevents the ball tips from working loose.


Double Action Type No. 3029


Single Action Type No. 3000



Details of Ever Ready Spring Hinges

Size of hinge	T Type 3029 thickness of the 3 leaves	T Type 3000 thickness of the 2 leaves	A Minimum thickness of door	B Wood door maximum thickness	S Metal door maximum thickness	Width of door	Weight of door, lbs.
3″	15/16″	11/64″	¾″	1″	⅞″	2′ 2″	30
4″	¼″	11/64″	⅞″	1¼″	1⅛″	2′ 4″	42
5″	9/32″	3/16″	1⅛″	1½″	1⅜″	2′ 6″	56
6″	5/16″	7/32″	1¼″	1¾″	1½″	2′ 8″	72
7″	⅜″	15/64″	1⅜″	2″	1¾″	2′ 9″	90
8″	13/32″	17/64″	1½″	2¼″	2″	2′10″	110

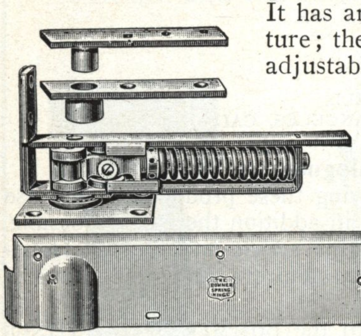
When hinges larger than the above are required, use Bommer standard spring butt hinges with a hanging strip.

Always use the largest size hinge the thickness of door will permit.

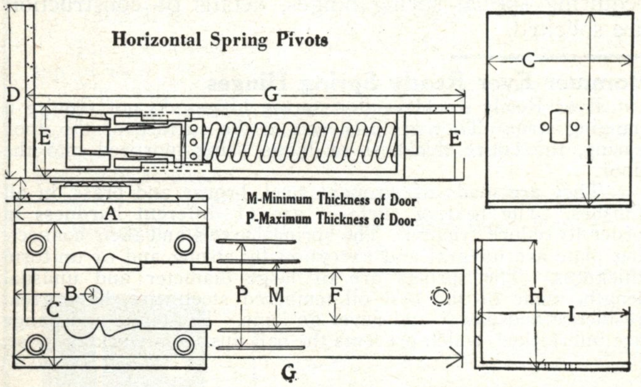
Continued on next page

Bommer Horizontal Spring Pivot with Holdback Feature

Will hold the door open when swung back beyond 90°. It has an efficient alignment feature; the tension of the spring is adjustable. The floor plate is screwed to the floor surface, obviating the need of cutting holes in the floor. The weight of the door is carried on ball bearings. All moving parts can be lubricated through a hole in the side plate.



Horizontal Spring Pivot

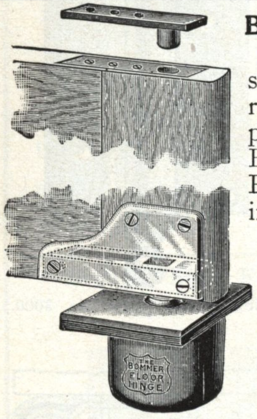


Details of Horizontal Spring Pivot, Type No. 18
Dimensions in inches

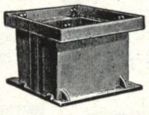
For doors	A	B	C	D	E	F	G	H	I	M	P	Series No.
1⅛ to 1¾	3½	1½	2¾	3¾	1 7/16	1	8¾	2⅛	3⅝	1⅛	1¾	18
2 to 2½	5 1/16	2¼	4	4⅞	2 9/16	1¼	12	2 9/16	5⅛	2	2½	19

Bommer Mortise Spring Pivots

Support weight of door on tool-steel ball bearings set upon a raised center post. Bearings are protected from water and dirt. Best oil tempered springs are used. Pivots are furnished either with invisible socket bar with adjustable top pivot, or side plates. Tension of spring is adjustable. Pivots are double acting, but by using stop bead will work single acting.



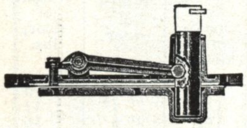
Floor Mortise Spring Pivot



Cast Iron Box

Suitable for setting all sizes. of floor mortise pivots into tile or cement floors

Thickness of door	Use size	Dimensions of top plate	Depth of cup	Distance from center of spindle to door casing
⅞″ to 1½″	2	3¾″ x 5⅛″	3 ″	1⅝″
1⅜″ to 2 ″	4	3⅞″ x 5⅝″	3½″	1¾″
2 ″ to 2½″	6	4½″ x 6½″	3¾″	2 ″
2½″ to 3½″	8	4½″ x 6½″	3¾″	2 ″



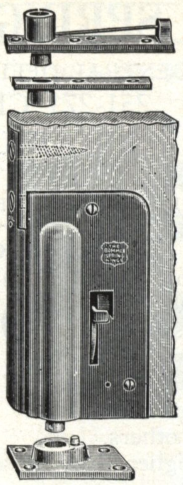
Type No. P 26, Screw Top Pivot with Sockets

Can be used with any floor pivot, which permits the door to be taken down quickly without removing the screws

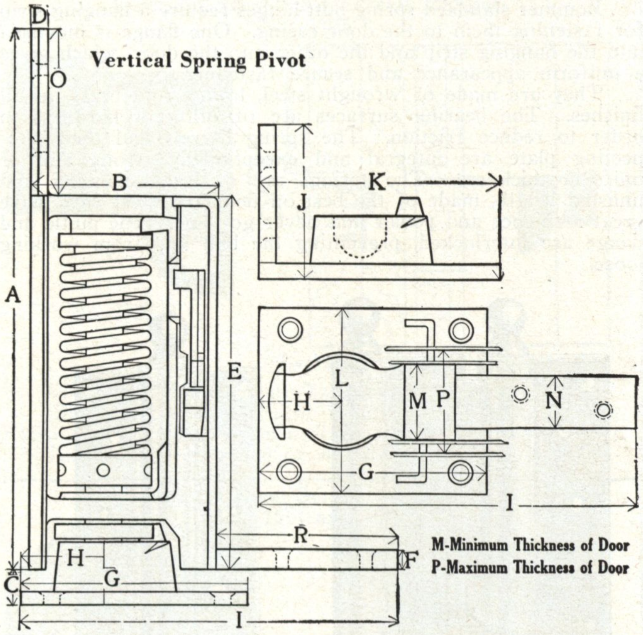
Thickness of door	Use size	Length and width of top pivot plate	Total height of pivot	Center of pivot to back edge of plate
¾″ to 1¼″	P26	3⅞″x ¾″	1½″	½″
1¼″ to 2¼″	P27	5¾″x1¼″	2 ″	1⅜″
2 ″ to 4 ″	P28	8 ″x2½″	3⅝″	2 ″

Bommer Vertical Spring Pivot with Release Feature

Permits door to stand open at any angle by pressing down either side pedal with the foot. The spring tension automatically re-engages itself when door is closed. The floor plate is fastened to the floor surface, obviating the need of cutting holes in the floor. The weight of the door is carried on ball bearings located in the upper part of the pivot frame away from water and dust. The top pivot has a spring actuated plunger which permits the door to be taken down quickly without removing the screws. For tile or concrete floors a special right angle floor plate can be furnished instead of the floor plate shown in the illustration.



Vertical Spring Pivot, Type 20

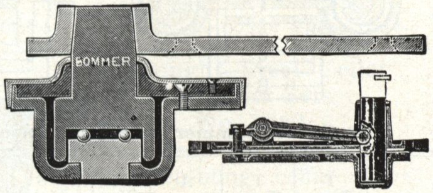


Details Vertical Spring Pivot, Type No. 20
Dimensions in inches

For doors	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
1⅛ to 1½	7⅞	2¾	½	5/16	5½	5/16	3¼	1¼	5 3/16	2¼	3½	2 11/16	1⅛	¾	2½	1½	2⅝
1½ to 2	8	3	½	7/16	5½	⅜	3⅝	1½	6¼	2½	4	3 1/16	1½	1	2 9/16	2	3⅛
1¾ to 2¾	10⅛	4⅛	½	⅝	7⅛	7/16	4⅝	2 3/16	7⅞	3	4¾	3¾	1¾	1⅜	3	2¾	3¾

Bommer Ball Bearing Pivots without Springs

These pivots are durable and noiseless, work smoothly and permit the heaviest doors to be used with slight exertion.



Type No. 27

Weight of door	Thickness of door	Use size	Dimensions of top plate	Length and width of socket bar	Depth of cup	Center of pivot to casing	Length and width of top pivot plate	Length and width of top pivot socket
Light	⅞ to 1¼	26	1 ″x4 ″	3⅝″x ⅝″	1⅛″	⅝″	4¾″x1⅛″	4 ″x ⅞″
Medium	1¼ to 2¼	27	4 ″x3¼″	6⅞″x1⅛″	1½″	1⅝″	5¾″x1 3/16″	4⅝″x1 ″
Heavy	2 to 4	28	5½″x5¼″	8¾″x1¾″	3¼″	2¼″	8 ″x2½″	6¼″x2 ″

No. 28 Pivot has two races of ball bearings to take care of both the weight and the side thrust.

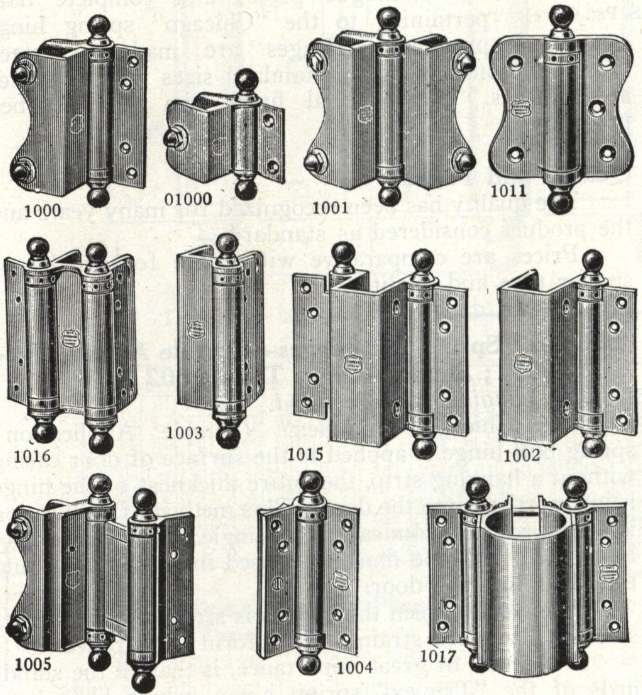
Continued on next page

Bommer Lavatory Spring Hinges

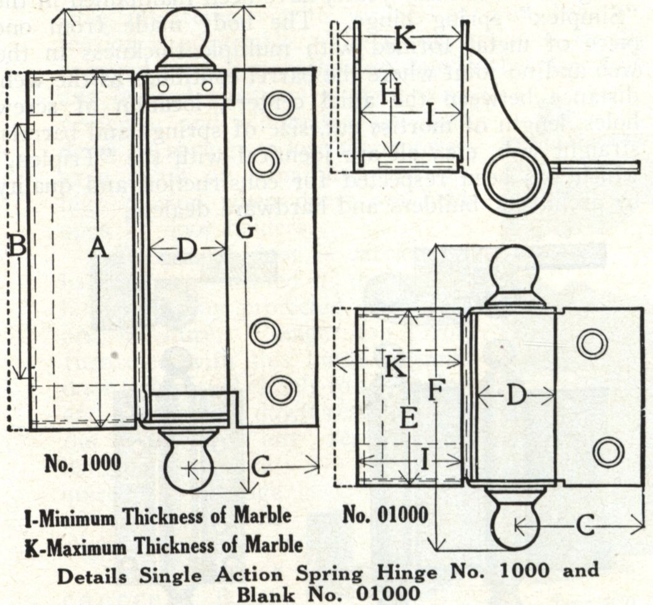
For clamping lavatory doors on to marble, slate or Carrara glass partitions. Made in bronze, brass, nickelplated or nickeline metal.

Flanges are 4 in. long. Clamp-flanges of No. 1000 and 01000 hinges and 1032 pivots are adjustable ⅛ in. over and under the following sizes: 1, 1¼, 1½, 1¾ and 2 in. The thickness of both partition and door must be stated when specifying.

For extra light and narrow lavatory doors, combination of blank and single action lavatory spring hinge can be used. When doors swing in, hinges to hold door open can be furnished.


1000
01000
1001
1011
1016
1003
1015
1002
1005
1004
1017

Lavatory Spring Hinges


K
H
I
B
A
D
G
C
No. 1000
I-Minimum Thickness of Marble
K-Maximum Thickness of Marble
K
F
E
I
D
C
No. 01000

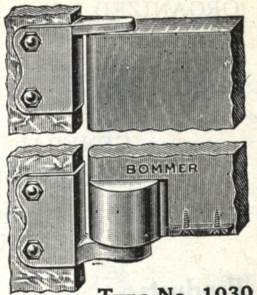
Details Single Action Spring Hinge No. 1000 and Blank No. 01000

Dimensions in inches

Thickness of marble	A	B	C	D	E	F	G	H	I	K
1	4	2⅞	1½	⅞	2	3½	5½	1	⅞	1⅛
1¼	4	2⅞	1½	⅞	2	3½	5½	1	1⅛	1⅜
1½	4	2⅞	1½	⅞	2	3½	5½	1	1⅜	1⅝
1¾	4	2⅞	1½	⅞	2	3½	5½	1	1⅝	1⅞
2	4	2⅞	1½	⅞	2	3½	5½	1	1⅞	2⅛

Bommer Spring Pivots for Lavatory Doors

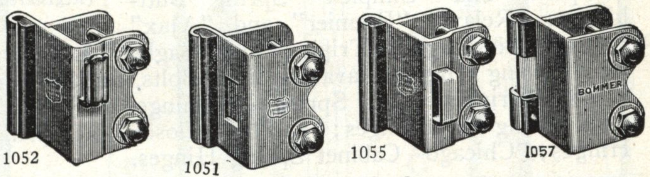
Can be applied to either single or double acting doors, opening in or out, and swing from either the right or the left side. The clamp-flanges are adjustable ⅛ in. over and under the following sizes: 1, 1¼, 1½ and 1¾ in.



Type No. 1030
Lavatory Spring Pivots

Strikes for Lavatory Doors

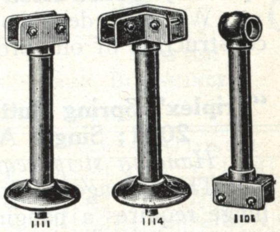
Adjustable strikes, having rubber bumper, to clamp to the marble, for use with lavatory spring hinges in connection with any style of bolt or latch, can be furnished.


1052
1051
1055
BOMMER
1057

Lavatory Door Strikes

Fittings for Lavatory Stalls

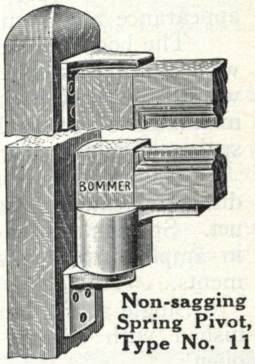
For setting marble or slate stalls, urinals and showers. Thickness of marble backs, partitions and stiles must be specified. Top and bottom standards are 12 in. high, unless otherwise specified. Ball fittings for 1⅛-in. outside diameter tubing. Posts 1⅛-in. tubing. Also made for wood partitions.


1111
1114
1101

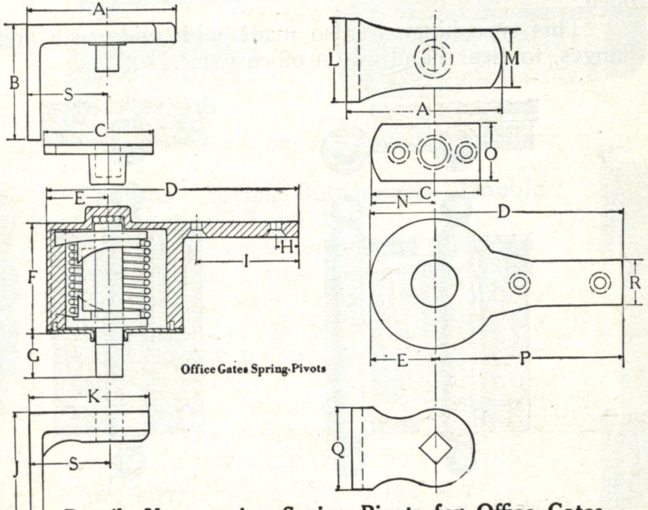
Fittings for Lavatory Stalls

Bommer Non-sagging Spring Pivots for Office Gates

Suitable for either double action or single action gates. No need to mortise brackets into gate or door post, although they can be mortised if so preferred. Adapted to either wood or metal gates and railings. Easy to apply. Workmanship and finish unsurpassed.



Non-sagging Spring Pivot, Type No. 11


A
B
S
C
D
E
F
H
I
G
Office Gates Spring-Pivots
K
J
S
L
M
A
O
N
C
D
R
E
P
Q

Details Non-sagging Spring Pivots for Office Gates

Dimensions in inches

For gates 1⅛ to 2½ thick	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	2⅝	2¼	2$\frac{1}{16}$	4⅞	1¼	2⅛	$\frac{15}{16}$	$\frac{7}{16}$	1$\frac{15}{16}$	2¼	2$\frac{5}{16}$	1⅝	1⅛	1¼	1⅛	3⅝	1⅝

ORGANIZED 1871 INCORPORATED 1885

CHICAGO SPRING HINGE COMPANY

Spring Hinges and Pivots

GENERAL OFFICES AND WORKS
1500-1502 Carroll Avenue
CHICAGO, ILL.
TELEPHONE, Monroe 6868, 6869

EASTERN OFFICE AND WAREHOUSE
23 Warren Street
NEW YORK, N. Y.
TELEPHONE, Barclay 8236

TRADE CHICAGO MARK
SPRING HINGES
(Registered U. S. Pat. Office)

Products

Manufacturers of a complete line of Patent Spring Hinges, including "Chicago" Spring and Springless Butt-hinges; "Triplex" and "Simplex" Spring Butt-hinges; "Relax," "Premier" and "Ajax" Spring Pivot-hinges; "Triplex" and "Sagless" Lavatory Door Spring Hinges; Lavatory Door Bolts, Latches and Stops; "Triplex" Gate Spring Butt-hinges; "Sagless" Gate Spring Pivot-hinges; "Sanitex" Closet Seat Spring Hinges; "Chicago" Cabinet Spring Hinges.

Specially Constructed Products

We solicit details of conditions which require special construction of our products.

Specifications

In specifying, designate article by number, size and finish. Hardware dealers have our catalogue prices and complete data pertaining to the "Chicago" spring hinge products. Hinges are made of steel, brass or bronze metal, in standard sizes and all standard finishes. Any special finish can be furnished promptly.

Quality and Prices

The quality has been recognized for many years and the product considered as standard.

Prices are comparative with those for articles of similar type and quality.

"Triplex" Spring Butt-hinges—Double Acting, Type 2001; Single Acting, Type 2002

Hanging strip required.

The Chicago "Triplex" (Three Leaf) spring butt-hinge requires a hanging strip for applying it to door casing. One flange is mortised into the hanging strip and the other into the door, which gives a uniform appearance and secure application.

The body is made from one piece of metal, formed with multiple thickness in the web and there is no joint where the barrel continues as the web. This gives maximum of strength and rigidity and avoids exposing springs to moisture which would cause rust and breakage.

The broad steel bearings, hardened lug bushings and disassemblement features are characteristics of this product. Springs are made of the best tempered steel wire, in ample proportions for the most excessive requirements.

Single acting hinges, when so specified, can be furnished with reverse-action springs to hold the door open.

This type hinge is also made with wide web and flanges, to clear handrail on office gates.

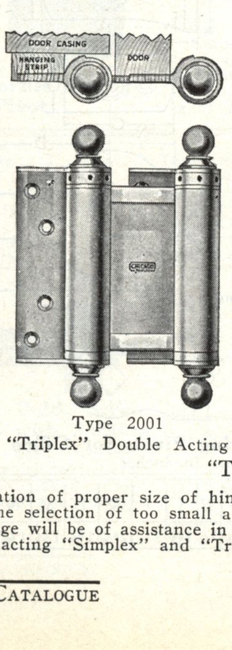
"Simplex" Spring Butt-hinges—Double Acting, Type 9001; Single Acting, Type 9002

No hanging strip required.

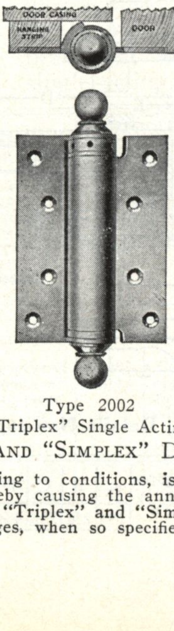
The Chicago "Simplex" (Simple Application) spring butt-hinge is applied to the surface of door casing without a hanging strip, the entire thickness of the hinge being mortised into the door. This method of application is simple and economical. The single acting hinge may be applied with one flange mortised into the casing and the other into the door.

The web between the barrels is straight, which gives strength, balanced strain and uniform appearance.

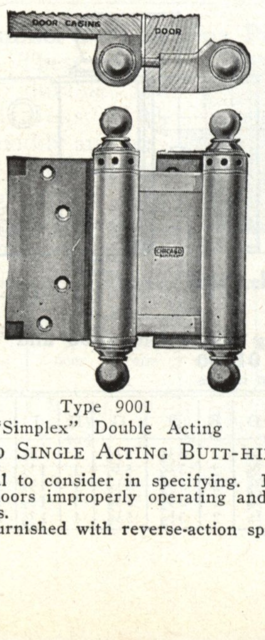
A feature, of great importance, is that all the standards of the "Triplex" spring hinge, which have been recognized for many years, have been maintained in the "Simplex" spring hinge. The body made from one piece of metal formed with multiple thickness in the web and no joint where the barrel continues as the web, distance between the axial centers, location of screw holes, length of mortise cut, size of springs and barrels, straight web, etc., all are identical with the "Triplex," which has been respected for construction and quality by architects, builders and hardware dealers.



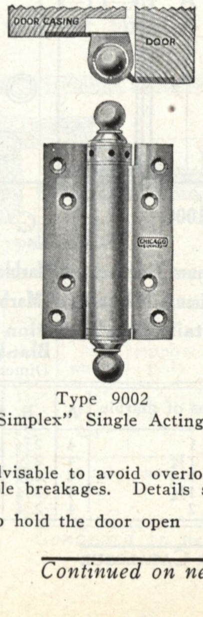
Type 2001
"Triplex" Double Acting



Type 2002
"Triplex" Single Acting



Type 9001
"Simplex" Double Acting



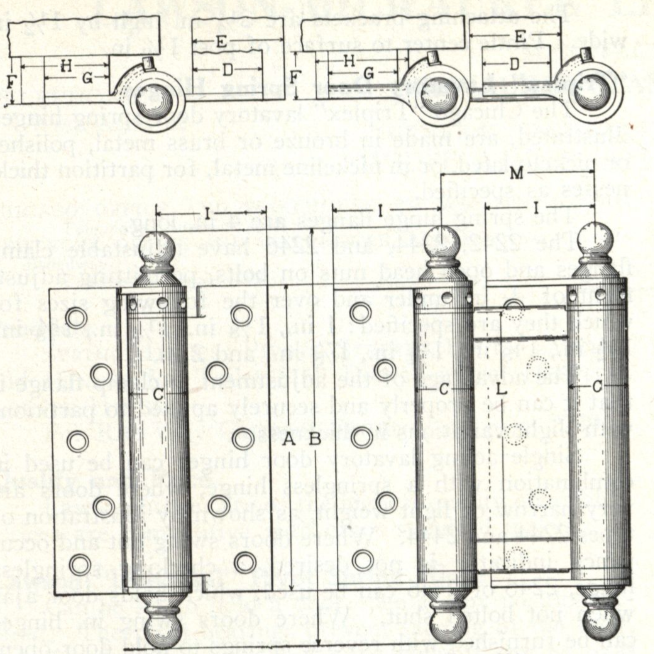
Type 9002
"Simplex" Single Acting

"Triplex" and "Simplex" Double and Single Acting Butt-hinges

Application of proper size of hinge, according to conditions, is an essential to consider in specifying. It is advisable to avoid overloading the hinge by the selection of too small a size, thereby causing the annoyance of doors improperly operating and possible breakages. Details shown on the next page will be of assistance in specifying "Triplex" and "Simplex" hinges.

Single acting "Simplex" and "Triplex" hinges, when so specified, can be furnished with reverse-action springs to hold the door open

Continued on next page



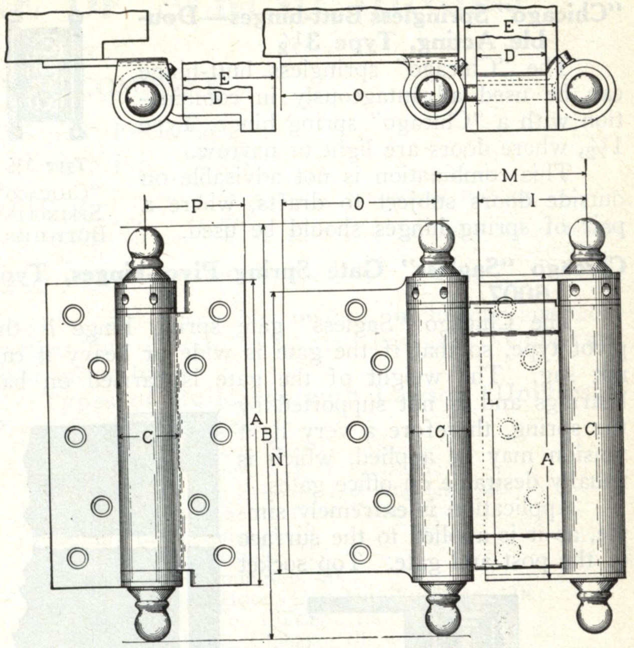
Type 2002 Type 2001

Detail of "Triplex" Spring Butt-hinge

DIMENSIONS IN INCHES

Single Acting Type 2002								
A	B	C	D	E	F	G	H	I
3	4 1/2	55/64	3/4	1	5/8	3/4	1	1 9/32
4	5 1/2	57/64	7/8	1 1/4	5/8	7/8	1 1/4	1 3/8
5	6 3/4	63/64	1 1/8	1 1/2	3/4	1 1/8	1 1/2	1 25/32
6	8 1/8	1 3/32	1 1/4	1 3/4	7/8	1 1/4	1 3/4	1 7/8
7	9 1/4	1 7/32	1 3/8	2	1	1 3/8	2	2 3/16
8	10 5/8	1 3/8	1 1/2	2 1/4	1 1/8	1 1/2	2 1/4	2 9/16
10	13 1/8	1 37/64	1 3/4	2 3/4	1 1/4	1 3/4	2 3/4	2 25/32
12	15 1/4	1 3/4	2 1/4	3	1 3/8	2 1/4	3	3 3/8

Double Acting Type 2001										
A	B	C	D	E	F	G	H	I	L	M
3	4 1/2	55/64	3/4	1	5/8	7/8	1	1 9/32	2 5/16	1 7/8
4	5 1/2	57/64	7/8	1 1/4	5/8	3/4	1 1/4	1 3/8	3 21/64	2 1/8
5	6 3/4	63/64	1 1/8	1 1/2	3/4	1 1/8	1 1/2	1 25/32	4 13/64	2 1/2
6	8 1/8	1 3/32	1 1/4	1 3/4	7/8	1 1/4	1 3/4	1 7/8	5 9/64	2 13/16
7	9 1/4	1 7/32	1 3/8	2	1	1 3/8	2	2 3/16	5 61/64	3
8	10 5/8	1 3/8	1 1/2	2 1/4	1 1/8	1 1/2	2 1/4	2 9/16	6 23/32	3 15/32
10N	13 1/8	1 37/64	1 3/4	2 1/2	1 1/4	1 3/4	2 1/2	2 25/32	8 5/8	3 15/16
10W	13 3/8	1 1/2	2 1/4	2 3/4	1 1/8	2 1/4	2 3/4	2 3/16	9 3/32	4 7/16
12	15 1/4	1 3/4	2 1/4	3	1 3/8	2 1/4	3	3 3/8	10 15/16	4 13/16



Type 9002 Type 9001

Detail of "Simplex" Spring Butt-hinge

DIMENSIONS IN INCHES

*Single Acting Type 9002					
A	B	C	D	E	P
3	4 9/16	55/64	3/4	1	1 13/64
4	5 5/8	57/64	7/8	1 1/4	1 9/32
5	6 3/4	63/64	1 1/8	1 1/2	1 5/8
6	8 3/16	1 3/32	1 1/4	1 3/4	1 23/32
7	9 9/32	1 7/32	1 3/8	1 7/8	2
8	10 11/16	1 3/8	1 1/2	2	2 25/64
10	13 1/8	1 37/64	1 3/4	2 1/4	2 9/16

Double Acting Type 9001									
A	B	C	D	E	I	L	M	N	O
3	4 17/32	55/64	3/4	1	1 9/32	2 5/16	1 7/8	2 5/8	1 29/32
4	5 1/2	57/64	7/8	1 1/4	1 3/8	3 21/64	2 1/8	3 19/32	2 9/32
5	6 3/4	63/64	1 1/8	1 1/2	1 25/32	4 13/64	2 1/2	4 17/32	2 17/32
6	8 1/8	1 3/32	1 1/4	1 3/4	1 7/8	5 9/64	2 13/16	5 1/2	2 15/16
7	9 1/4	1 7/32	1 3/8	1 7/8	2 3/16	5 61/64	3	6 1/2	3 1/8
8	10 5/8	1 3/8	1 1/2	2	2 9/16	6 23/32	3 15/32	7 7/16	3 5/8
10	13 1/8	1 37/64	1 3/4	2 1/4	2 25/32	8 5/8	3 13/16	9 1/4	4 1/8

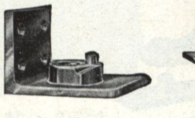
*Single Acting, Type 9002, may be applied with one flange mortised into casing and the other into the door.

Chicago "Relax" Spring Pivot-hinges—Double Acting, Type 6001

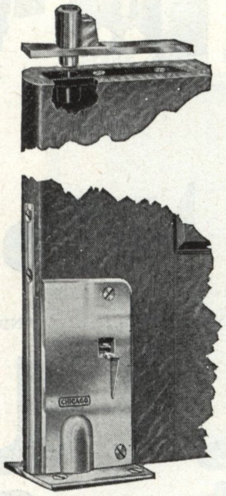
The Chicago "Relax" Spring pivot-hinge is suitable for highest class requirements. It is applied to surface of floor, thereby avoiding cutting and possible interference with girders or iron beams. The tension is adjustable. The spring action is readily disengaged by a lever, allowing door to be placed open at any desired position; a great convenience, and eliminates the tendency of springs to lose their power as a result of remaining fixed at high tension when doors are held open by door holders.

Weight of door is carried on ball bearings located in the top of hinge, thereby protected from dirt and moisture. Plunger top pivot, furnished with this hinge, permits door to be fitted closely to top casing and to be taken down readily without removing any screws. No hanging strip required. Jamb edge of door must be slightly rounded.

For tile or concrete floors specify jamb attaching plates.



Jamb Attaching Plate

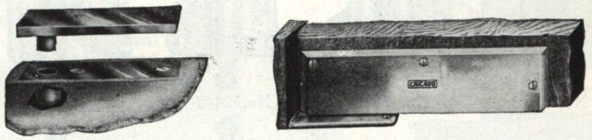


Type 6001

Chicago "Relax" Spring Pivot-hinge

Chicago "Premier" Spring Pivot-hinges—Double Acting, Type 4001

The Chicago "Premier" spring pivot-hinge is applied to surface of floor. Mechanical construction eliminates the tendency of wear in bearings. Action of spring is compression and it is made of best tempered steel flat wire; tension is readily adjusted and a device is provided for aligning door. With this hinge, door will remain open if swung beyond 90°. No hanging strip is required. Jamb edge of door is slightly rounded. For tile or concrete floors specify jamb attaching plates.



Type 4001

Chicago "Premier" Spring Pivot-hinge

"Chicago" Spring Butt-hinges—Double Acting, Type 1½

The "Chicago" spring butt hinge is constructed in a most substantial manner. The spring power, effected by both a torsion and leverage principle, produces a positive action as well as an easy movement of the door.

General construction and mechanical action of this hinge give best results obtainable in operating doors subject to excessive and violent use.

For doors of the following thicknesses:

7/8 to 1 in.
1 1/8 to 1 1/4 in.
1 3/8 to 1 1/2 in.
1 3/4 to 2 in.
2 1/4 to 2 1/2 in.
2 3/4 to 3 in.

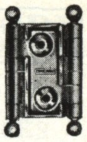
Type 1½ "Chicago" Spring Butt-hing

Continued on next pag

"Chicago" Springless Butt-hinges—Double Acting, Type 3½

The "Chicago" springless butt-hinge can be used advantageously in combination with a "Chicago" spring hinge, Type 1½, where doors are light or narrow.

This combination is not advisable on outside doors subject to drafts, where a pair of spring hinges should be used.

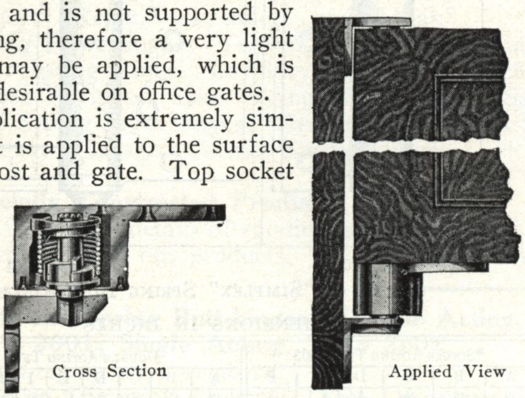


Type 3½ "Chicago" Springless Butt-hinge

Chicago "Sagless" Gate Spring Pivot-hinges, Type 6007

The Chicago "Sagless" gate spring hinge is the pivot type, so that if the gate is wide or heavy it can not sag. The weight of the gate is carried on ball bearings and is not supported by the spring, therefore a very light tension may be applied, which is usually desirable on office gates.

Application is extremely simple, as it is applied to the surface of the post and gate. Top socket may be applied to the surface of the gate, avoiding mortising, which is particularly desirable on metal gates.



Cross Section

Applied View

Type 6007, Chicago "Sagless" Gate Spring Pivot-hinge

Although not usually required, the brackets may be mortised into the post, reducing the space between the edge of gate and post.

These hinges are supplied in iron, brass or bronze metal.

This hinge is suitable for gates ⅞ to 2½ in. thick and with a handrail as wide as 2½ in.

The attaching brackets are 2¼ in. high by 1½ in. wide. Pintle center to surface of post 1½ in.

"Triplex" Lavatory Door Spring Hinges

The Chicago "Triplex" lavatory door spring hinges, illustrated, are made in bronze or brass metal, polished or nickel-plated, or in nickeline metal, for partition thicknesses as specified.

The spring hinge flanges are 4 in. long.

The 2242, 2244, and 2246 have adjustable clamp flanges and open head nuts on bolts, permitting adjustment of $\frac{1}{16}$ in. under and over the following sizes for which they are specified: 1 in., 1⅛ in., 1¼ in., 1⅜ in., 1½ in., 1⅝ in., 1¾ in., 1⅞ in., and 2 in.

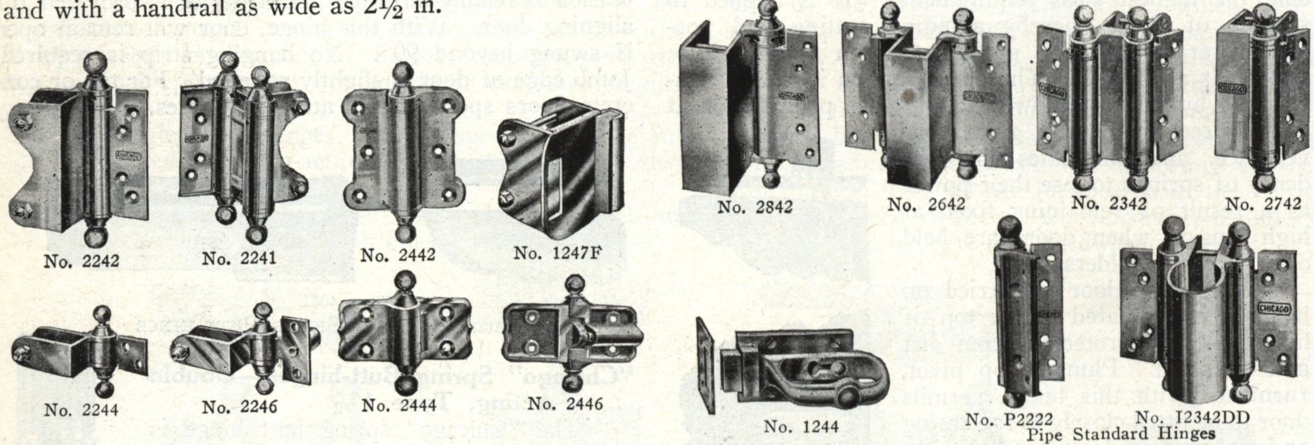
The advantage of the adjustment in clamp flange is that it can be properly and securely applied to partitions with slight variations in thickness.

Single-acting lavatory door hinges can be used in combination with a springless hinge, where doors are very narrow or light weight, as shown by illustration of types 2244 and 2444. Where doors swing out and occupancy indicator is not desired, a checking springless hinge, 2246 or 2446 can be used, which holds door ajar when not bolted shut. Where doors swing in, hinges can be furnished with reverse springs to hold door open.

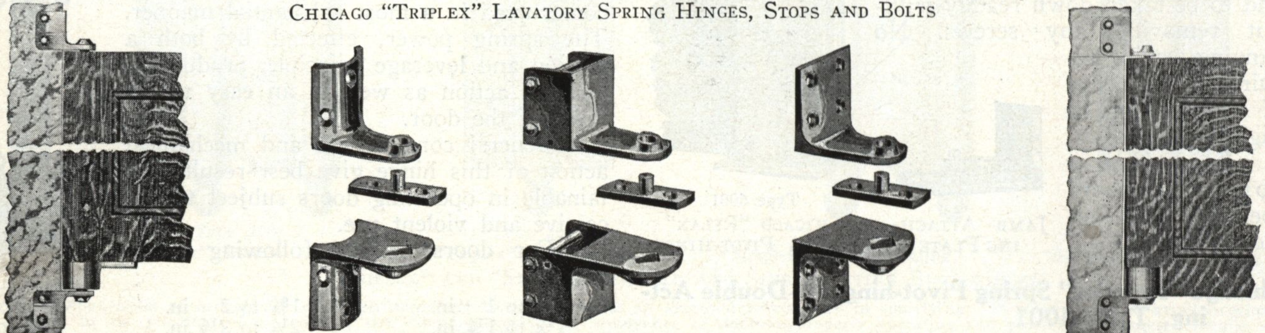
Lavatory door stops similar to No. 1247F, with keeper for door bolt similar to No. 1244, can be supplied in various types to meet conditions.

Chicago "Sagless" Lavatory Door Spring Pivot-hinge, Type C6227

The "Sagless" lavatory door spring pivot-hinge is made with attachments for application to marble partitions or pipe standards. It can be used on both double and single acting doors. This hinge is constructed so that the pintle may be set in the bottom bracket and positively held in any one of five positions: holding the door in closed position; 90° open, right or left; or 45° open, right or left. Refer to Type 6007 "Sagless" gate spring pivot-hinge for details of construction.



Chicago "Triplex" Lavatory Spring Hinges, Stops and Bolts



Chicago "Sagless" Lavatory Spring Hinges

LAWSON-MILWAUKEE LINE OF SPRING HINGES

MANUFACTURED BY

MILWAUKEE STAMPING COMPANY

TELEPHONE
West Allis 62

GENERAL SALES OFFICES AND FACTORY
WEST ALLIS, MILWAUKEE, WIS.

CHICAGO OFFICE AND WAREHOUSE, 230 West Superior Street
Telephone, Superior 6588
NEW YORK OFFICE AND WAREHOUSE, Lanbush-Fisher Co., 416 Broadway
Telephone, Canal 4089

ST. LOUIS OFFICE, F. J. Smalley, 905 Carlton Building
Telephone, Olive 3561
NEW ENGLAND OFFICE, C. E. Harris, 120 Pearl Street, Boston, Mass.
Telephone, Congress 4384

Products

Spring Hinges; Pivots, Strikes, Bolts, Latches and Hinges for Toilet Stall Doors; special Hospital Louvre Hinges.

For Rite-Way Garment Fixtures, see page 2749.

Quality and Price

Lawson hinges are of the highest quality obtainable. Prices are competitive with other standard makes.

Lawson "Universal" Pivot Spring Hinge

Can be set to hold a door open at any position desired. The pivot bearings prevent sagging of the door.

The hinge support and pivot support can be used either right or left hand, opening in or out by using the pivot support as a hinge support or vice versa.

The pintle is tapered at the bottom and fits into a tapered socket. When the nut is tightened, the pintle is drawn down into the socket, and this taper fit holds the pintle firmly in place.

The hinge is double acting but can be used single acting by the application of a door stop or strike. Best results are obtained by using double acting hinges (see specifications on next page), as this eliminates the pounding of the door against the strike, which causes loosening of the joints or breaking of the marble.

Because of its simplicity, strength, adaptability to any construction and reversible feature, architects and contractors find it wise to specify Lawson's "Universal" pivot spring hinge.

Types of Buildings with Lawson "Universal" Pivot Spring Hinges—

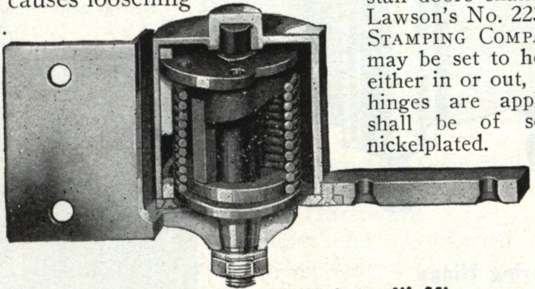
St. Paul Union Depot, St. Paul, Minn.
Loew's State Theater, New York, N. Y.
Los Angeles Public Schools, Los Angeles, Cal.
New York City Schools, New York, N. Y.
Furniture Mart, Chicago, Ill.
Elks Building, Louisville, Ky.
Bent School, Bloomington, Ill.
Edgewater Beach Hotel, Unit No. 2, Chicago, Ill.
Western Electric Co., Chicago, Ill.
New Palmer House, Chicago, Ill.

Some of the Partition Manufacturers Who Have Adopted Lawson "Universal" Pivot Spring Hinges as Standard Equipment—

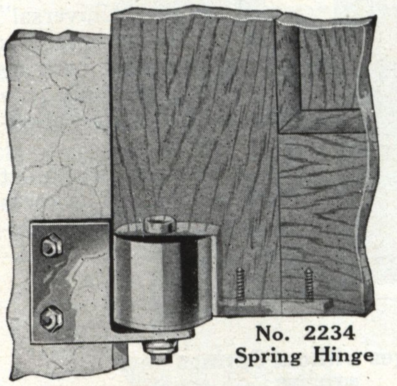
The Vitrolite Company
Henry Weis Manufacturing Co.
Hart & Hutchinson Co.
Litterer Bros., Mfg. Co.
Elkay Manufacturing Co.
Theo. S. Gassner

Hardware Specifications for Toilet Stalls

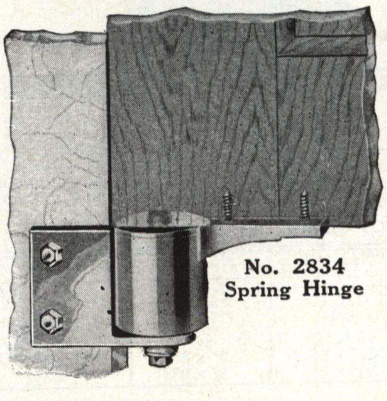
Marble, Slate or Glass Partitions—All hinges for toilet stall doors shall be of the pivot type, similar to Lawson's No. 2234 or 2834, made by Milwaukee Stamping Company, and so arranged that they may be set to hold the door open, 3, 5 or 7 in., either in or out, as the owner may elect, after the hinges are applied. They shall be of solid brass, nickelplated.



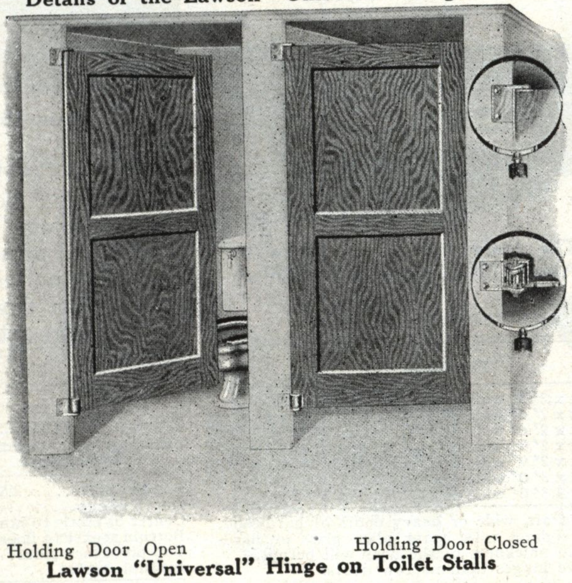
Details of the Lawson "Universal" Hinge



No. 2234
Spring Hinge



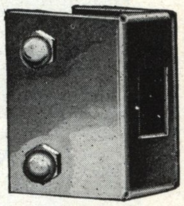
No. 2834
Spring Hinge



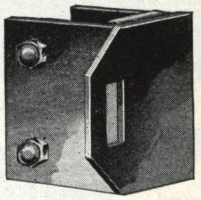
Holding Door Open

Holding Door Closed

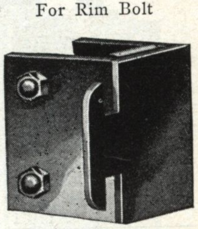
Lawson "Universal" Hinge on Toilet Stalls



1850
For Mortise Bolt



1852
For Rim Bolt



1854
For Throw Latch

Double Acting Keepers

Continued on next page

All keepers for these doors shall be of the double acting type, similar to Lawson's No. 1850, 1852 or 1854.

Metal Partitions—All doors shall be equipped with pivot spring hinges, similar to Lawson's "Universal" hinge for metal doors, made by Milwaukee Stamping Co., and so arranged that they may be set to hold the door open in or out 3, 5 or 7 in., as the owner may elect, after the hinges are applied.

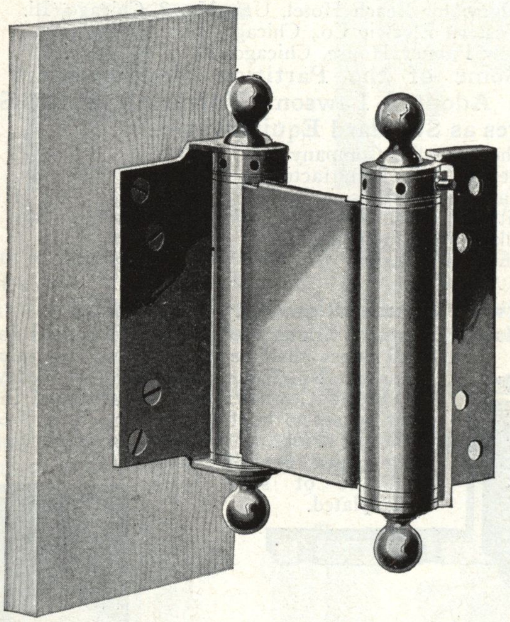
Where Coin Locks Are to Be Used—Add the following to above specifications: All doors shall be set, before the strike is attached, to hold the door open in 3, 6 or 9 in. Open door out and attach strike, thus giving the spring additional power necessary to insure locking of the door, no matter how gently the door is closed.

Lawson "Nu" Jamb Spring Hinge

The Lawson "Nu" Jamb spring hinge *does not* require the use of a hanging strip. It fastens directly to the jamb and thus gives a far more solid support for the door than if a hanging strip were used.

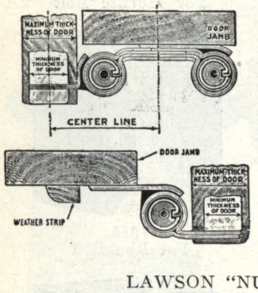
Where a hanging strip is already installed, this hinge can also be used. Only one mortise to make, therefore more easily and quickly applied.

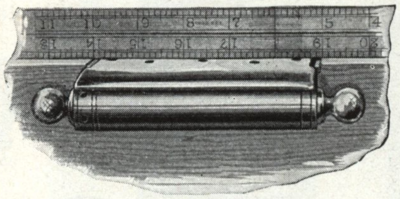
Made of the best materials obtainable, this hinge is exceptionally strong and durable. It is fully guaranteed as to workmanship and material.



"Nu" Jamb Spring Hinge

Notice that the hinge fastens directly to the door jamb


MAXIMUM THICKNESS OF DOOR
MINIMUM THICKNESS OF DOOR
DOOR JAMB
CENTER LINE
DOOR JAMB
MAXIMUM THICKNESS OF DOOR
MINIMUM THICKNESS OF DOOR
WEATHER STRIP



The Only Mortise to Make to Attach "Nu" Jamb Spring Hinge

LAWSON "NU" JAMB SPRING HINGES

Size of hinge	For doors
3″	¾″ thick x 2′ 3″ wide or 1″ thick x 2′ 0″ wide
4″	1″ thick x 2′ 6″ wide or 1¼″ thick x 2′ 0″ wide
5″	1⅛″ thick x 2′ 6″ wide or 1½″ thick x 2′ 3″ wide
6″	1¼″ thick x 2′ 9″ wide or 1¾″ thick x 2′ 3″ wide
7″	1⅜″ thick x 2′ 9″ wide or 2″ thick x 2′ 6″ wide
8″	1½″ thick x 3′ 0″ wide or 2¼″ thick x 2′ 6″ wide
10″	1¾″ thick x 3′ 0″ wide or 2½″ thick x 2′ 9″ wide

For outside doors subject to draft, wide or heavy doors of hardwood, metal covered doors, or doors weighted with heavy plate glass or hardware, use the largest size hinge the thickness of the door will permit.

Wide doors require larger size hinges than narrow doors.

Racine & Milwaukee Spring Hinges

Material—The best grade of cold drawn steel, bronze or brass and spring steel of the finest oiltempered quality.

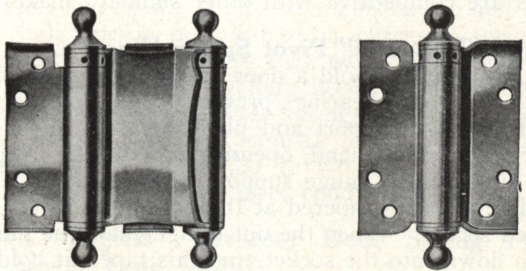
Construction—Springs are large diameter, unusual in length and retain their great resiliency and power indefinitely. Hinges are designed so as to protect the spring from moisture and grit.

Bearings are entirely enclosed in the barrel and are formed by the spring bottom and the tension adjustment working on the ball tips. This results in a large bearing surface. Outside surface is plain and smooth and can be easily kept clean.

Brass and bronze hinges are equipped with steel bearings. This makes them equally as strong and durable as steel hinges.

Finish—Great care is exercised to maintain a high standard in the finish. Each and every part is given an extra heavy coat of plating.

Finished in planished steel, solid brass or bronze.



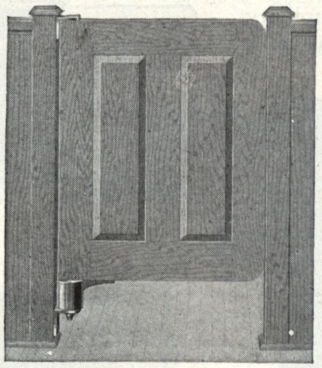
Double Acting Hinge   Single Acting Hinge

Racine & Milwaukee Spring Hinges

SIZES FOR SINGLE OR DOUBLE ACTING BUTTS

Length of flange	3″	4″	5″	6″	7″	8″
Thickness of door	¾″ to 1″	⅞″ to 1¼″	1″ to 1½″	1⅛″ to 1¾″	1¼″ to 2″	1½″ to 2¼″

Always select the largest hinge which the thickness of the door permits.



Gate Hinge

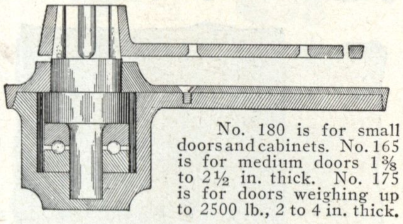
"Universal" Pivot Gate Hinges

Lawson "Universal" pivot gate hinge is sagless and requires no hanging strip. It is the only gate hinge with a positive alignment feature.

Maximum width at hand rail, 2 in. Thickness of gate, 1 to 2 in. Diameter of cup, 2 in. Brackets, 2x1⅛ in. wide.

Matchless Pivot Hinges without Springs

The ball bearings distribute the weight and provide easy and noiseless action. For double and single acting doors.



No. 180 is for small doors and cabinets. No. 165 is for medium doors 1⅜ to 2½ in. thick. No. 175 is for doors weighing up to 2500 lb., 2 to 4 in. thick.

MATCHLESS PIVOT HINGE WITHOUT SPRING

Dimensions	No. 165	No. 175	No. 180
Top plate	2 1/16″ x 4½″	4¾″ x 5¼″	1″ x 4″
Depth of cup	1¾″	3⅛″	1⅛″
Center of pintle to jamb	1″	1⅞″	11/16″
Bottom socket to floor	⅜″	⅝″	⅜″
Top pivot face plate	1⅜″ x 5⅞″	2″ x 8″	1″ x 4¾″
Invisible socket	1 3/16″ x 7⅞″	2″ x 9¾″	⅝″ x 3¾″

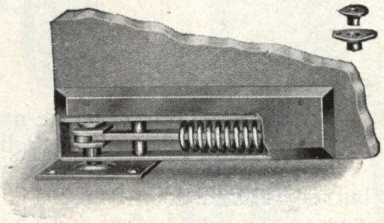
Continued on next page

Floor Hinges

Series No. 800—This surface floor hinge is made for doors from 1⅛ to 1¾ in. thick and of standard size, weighing under 55 lb.

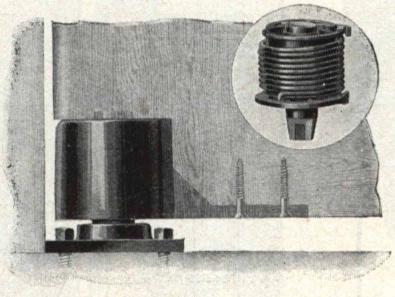
Furnished with square beveled edge side plates which are reversible.

The ball bearing is at the top of the hinge where it should be to carry the weight. This arrangement also keeps it up out of the dirt. The hinge has a smooth, snappy action at all times. Wear is reduced to a minimum by having all moving parts hardened by a special process. Easily and quickly applied.

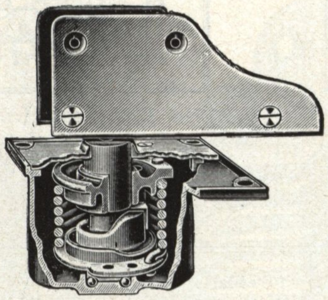

No. 800 Surface Floor Spring Hinge

Series No. 600—This surface floor hinge is of heavier construction and has the working parts enclosed in a grease chamber which keeps out the dirt and prevents wear. For 1⅛ to 1¾-in. doors.

Series No. 900—This surface floor hinge is for heavier doors from 1¾ to 2½ in. thick.


Matchless Mortise Floor Hinge

Series No. 1700—For doors 2¼ in. thick and over, weighing approximately 500 lb. Especially adapted for factories. Has surface floor plate.


Details of Matchless Mortise Floor Hinge

Do not use stronger than No. 1300 for residences. Width of door is the main point to consider

MATCHLESS MORTISE FLOOR HINGE

Series No.	1200	1300	1400	1500	1600
Thickness of doors	1⅛" to 1½"	2½" to 2"	2" to 2½"	2½" to 3¼"	3" to 4"
Size of cover	4¼"x4¼"	4¾"x4¾"	5"x5"	5½"x5½"	6⅛"x6⅛"
Center of pintle to door casing	1⅞"	2¹⁄₁₆"	2⅜"	2½"	2¹¹⁄₁₆"
Depth of hinge	3⅛	3¼"	3½"	4"	4"

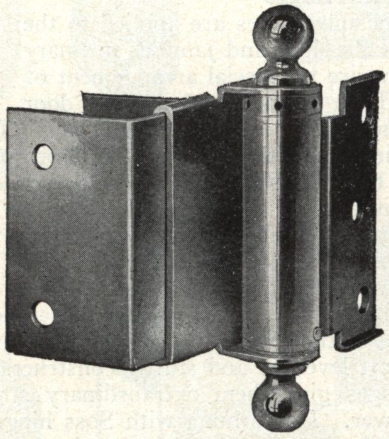
No. 1800 Lavatory Spring Hinge

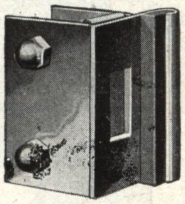
Made of wrought metal for doors not exceeding 30 lb. in weight and 1¼ in. thick.

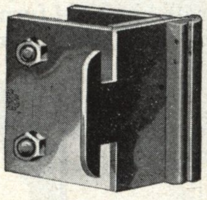
We recommend the use of a pair of these 3-in. spring hinges, No. 1800, in place of the old style 4-in. hinge and blank.

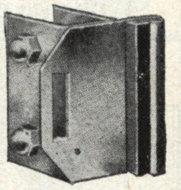
They give a wider range of spring action, wear longer and make a better looking job as the same size bracket is used top and bottom. Four bolts are used in place of three, holding the door more solidly.

The box flange has an adjusted range from 1⅛ to 1½ in., covering all standard size partitions.


Standard 3-in. Jamb Spring Hinge with Adjustable Bracket


No. 1842
For Mortise Bolt for Doors Opening in or Out

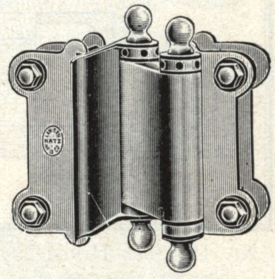

No. 1844
For Throw Latch for Doors Opening in

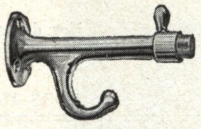

No. 1848
For Rim Bolt for Doors Opening in

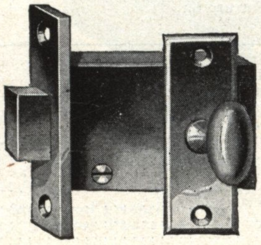
Lavatory Door Strikes and Keepers

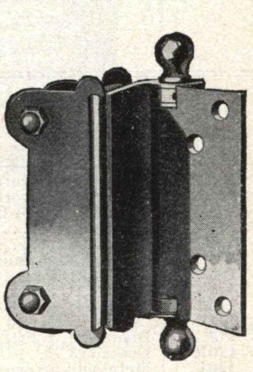
Lavatory Hardware

Besides the "Universal" pivot spring hinges illustrated on previous page and the No. 1800 spring hinge illustrated above, we also make a complete line of all types of lavatory hinges, strikes, bolts, bumpers, etc., and can furnish anything desired.


No. 1904 Hinge


No. 1982 Bumper


No. 1988 Mortise Bolt


No. 1900 Lavatory Hinge

SOSS MANUFACTURING COMPANY, INC.

Manufacturers of Invisible Hinges

777 Bergen Street
BROOKLYN, N. Y.

Soss Invisible Hinges

Soss invisible hinges are applied to the same part of the door and jamb as ordinary butts and require no special arrangement of the work. They are mortised into the door and jamb and can not be seen when closed. There is no projecting metal at either side of the door, and because they fit into the mortise, there is no wide crack when the door is open. In no way can Soss invisible hinges be reached when the door is closed—a safety feature of particular value.

The invisibility of Soss hinges makes them particularly suitable for secret panels and wherever the obtrusiveness of the ordinary visible butt is objectionable.

The short leverage and sturdy construction of Soss invisible hinges give them extraordinary strength and carrying power. Doors hung with Soss hinges will not sag nor will the hinges wear down under heavy loads—facts that have been demonstrated by many years of use.

With each pair of hinges is furnished a templet, the use of which insures an accurate mortise.

SOSS

TRADE-MARK

Styles of Finish

Soss invisible hinges are made in three styles: Rufkast, Blunt and Polished.

Rufkast is the assembled hinge, plated but not buffed or polished.

Blunt hinges, assembled, buffed and plated.

Polished hinges have the arm sections highly ground, buffed and plated.

Hinges can be furnished in brass, nickel, bronze, or any special finish.

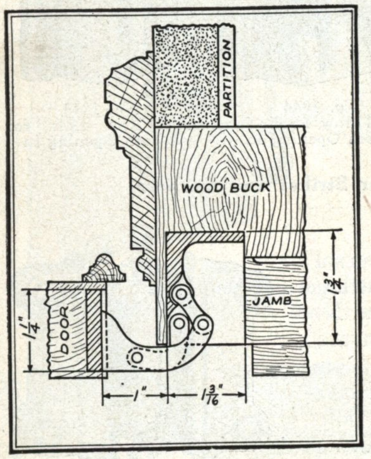
Specified Everywhere in the Best Work

Soss invisible hinges are extensively used in the finest residences, office and public buildings, hotels, store fixtures, cabinet work and furniture.

They have been adopted by many of the foremost architects and furniture manufacturers in the country.

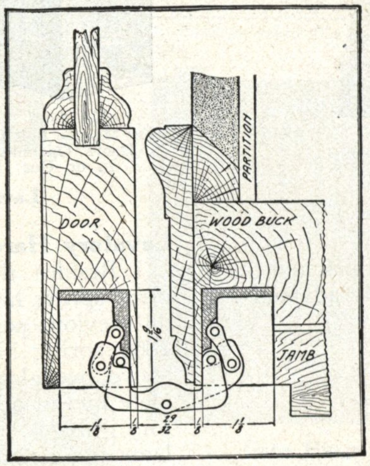
Catalogue

Catalogue "I" gladly sent on request.



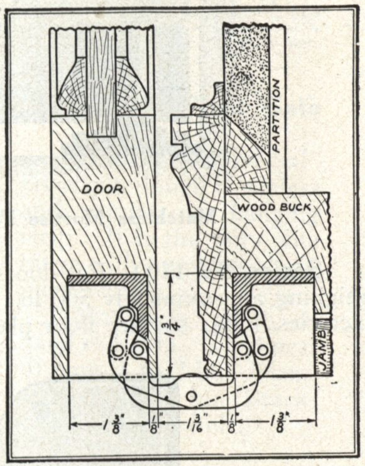
No. 117 Soss Hinge Installed

Showing clearance when door is fully opened. Used on house doors and secret panels with projecting moulding



No. 118 Soss Invisible Hinge Installed

For doors where extra clearance is required for deep moulding



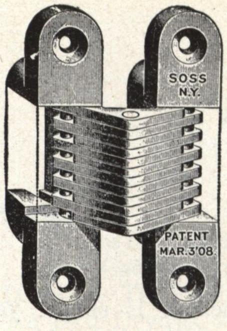
No. 120R Soss Hinge Installed

For heavy wood doors—wide clearance for projecting trim. One of the strongest hinges made

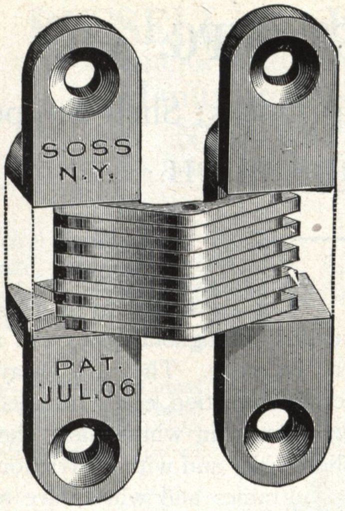
SOSS INVISIBLE HINGES

Hinge No.	For use on	Thickness of wood required, in.		Plates		Depth of mortise, in.	Clearance between plates, in.	Movement of hinge
		Minimum	Maximum	Length, in.	Width, in.			
100	Light cabinet work and furniture	9/16	....	1	⅜	15/32	¼	180°
101	Light cabinet work and furniture	9/16	....	1 11/16	⅜	15/32	¼	180°
102A	Same as No. 101 but plates have square corners	9/16	....	1 11/16	⅜	½	¼	180°
103	Light work	¾	....	1½	½	⅝	⅜	180°
104	Doors 5x2 ft	¾	⅞	2⅜	½	⅝	⅜	180°
105	Metal cabinets and medicine closets	1/16 metal	....	2⅜	½	⅝	⅜	180°
108	Doors 5x2 ft	1	1⅛	2¾	⅝	¾	½	180°
112	Doors 6 ft. x 2 ft. 6 in	1⅛	1⅜	3½	¾	15/16	9/16	180°
116	Doors 6 ft. x 2 ft. 6 in	1⅜	1½	4⅜	1	1 3/16	11/16	180°
117	Doors 7x3 ft. and secret panels	1½	1¾	4	1 3/16	1 3/16	1	90°
118	Doors 6 ft. x 2 ft. 6 in	1½	1⅝	4¼	1⅛	1 9/16	1 5/32	180°
120R	Doors 7x3 ft	1¾	2½	5	1⅜	1¾	1 7/16	180°
120J	Metal and fireproof doors	1½	....	4⅞	1⅜	1¾	1 7/16	180°

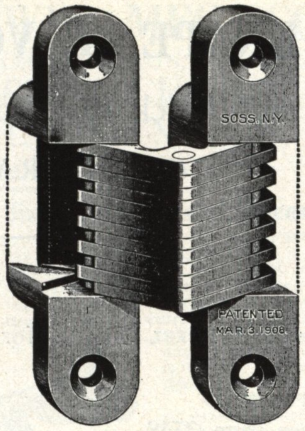
Continued on next page


SOSS
N.Y.
PATENT
MAR.3'08

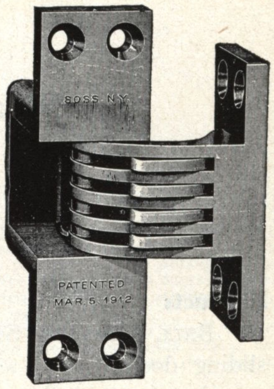
No. 101 (Actual Size)
For Light Cabinet Work


SOSS
N.Y.
PAT.
JUL.06

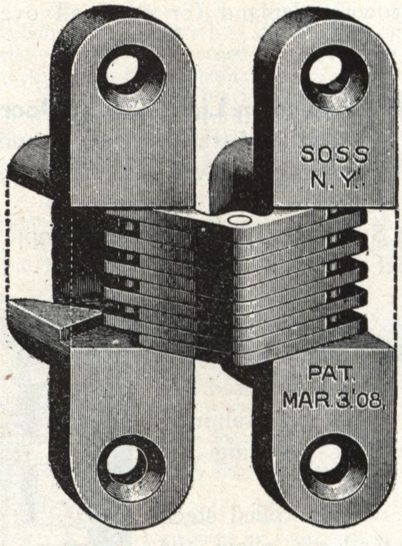
No. 104 (Actual Size)
For Light Doors


SOSS.N.Y.
PATENTED
MAR.3.1908

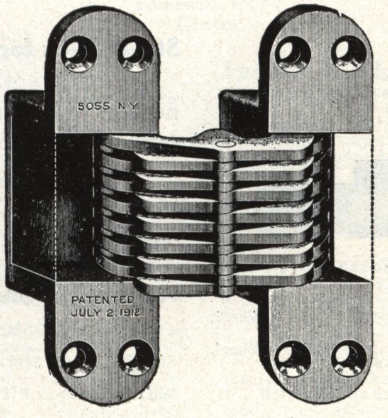
No. 116 (One-half Size)
For Standard House Doors
Normal Clearance.
Roller Bearings


SOSS N.Y.
PATENTED
MAR.5.1912

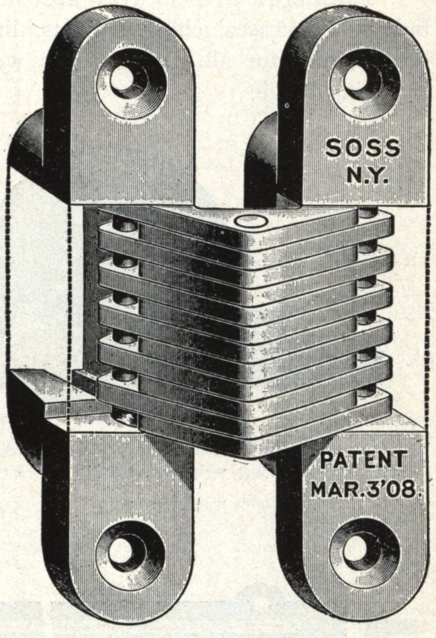
No. 117 (One-half Size)
For House Doors and Secret
Panels with Projecting
Mouldings


SOSS
N.Y.
PAT.
MAR.3.'08.

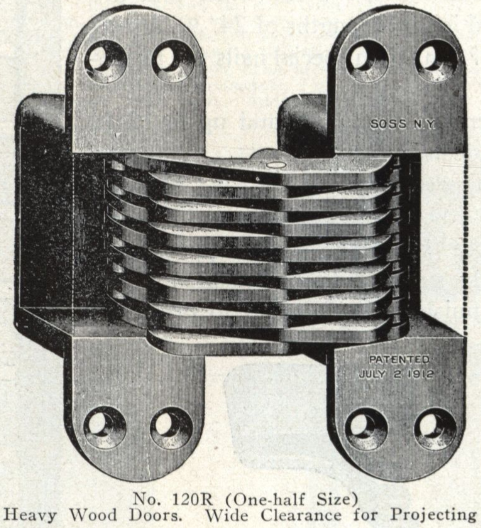
No. 108 (Actual Size)
For Same Purposes as No. 104 but Where
Greater Strength Is Required


SOSS N.Y.
PATENTED
JULY 2.1912

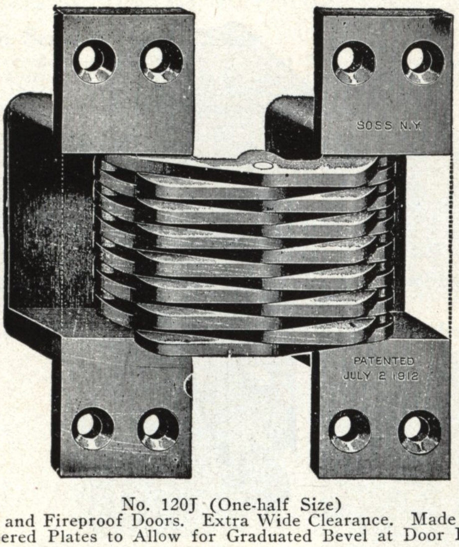
No. 118 (One-half Size)
For Standard House Doors Where Extra
Clearance Is Required for Deep
Mouldings


SOSS
N.Y.
PATENT
MAR.3.'08.

No. 112 (Actual Size)
For Standard House Doors. Normal Clearance.
Roller Bearings


SOSS N.Y.
PATENTED
JULY 2.1912

No. 120R (One-half Size)
For Heavy Wood Doors. Wide Clearance for Projecting Trim


SOSS N.Y.
PATENTED
JULY 2.1912

No. 120J (One-half Size)
For Metal and Fireproof Doors. Extra Wide Clearance. Made with $\frac{1}{16}$-in.
Tapered Plates to Allow for Graduated Bevel at Door Edge

Soss Invisible Hinges

KNAPE & VOGT MFG. CO.

Sheaves and Track for Sliding Doors; Shelf Supports

GRAND RAPIDS, MICH.

Products

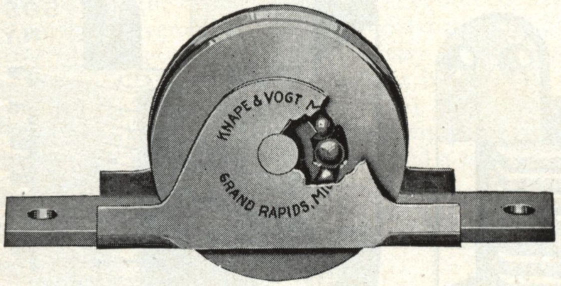
Ball Bearing Sheaves and Steel Track for sliding doors.

Adjustable Shelf Supports.

For Garment Carriers, see page 2748.

Ball Bearing Sheaves for Sliding Doors

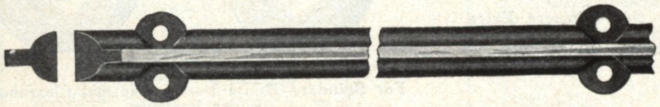
These patented sheaves are suitable for use in built-in bookcases, china cabinets, linen cabinets, cupboards, and for all sliding doors weighing up to and including 75 lb.



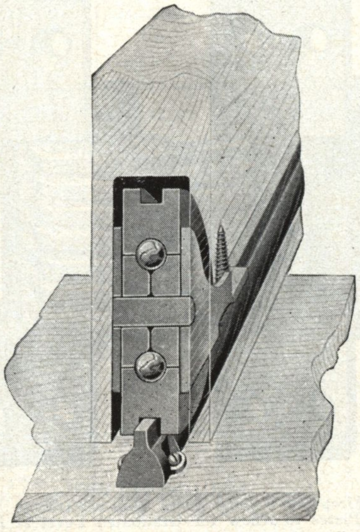
Ball Bearing Sheave

No. 429 for doors weighing up to 25 lb. Frame, 2¼x⅜ in. Wheel, 1 in. in diameter.

No. 430 for doors weighing up to 75 lb. Frame, 2¾x½ in. Wheel, 1⅜ in. in diameter



No. 458 Steel Track for Sheaves and Sliding Doors



Section Through Bottom Rail of Door Showing How Sheave Is Installed

The construction of these sheaves is simple yet rugged throughout—they are as strong and durable as can be made. They are always smooth-running, noiseless in operation, easily installed and stay rigidly in place.

Doors in which these sheaves are installed always slide easily and without friction.

Frames and wheels are made of cold rolled steel, and the hardened steel 2-point ball bearings run on machined steel axles.

The recognized superiority of these sheaves has created a rapidly growing demand for them all over the United States.

Steel Track for Door Sheaves on Light Sliding Doors

Our No. 458 cold rolled steel track is used in connection with our ball bearing sheaves previously described.

It is supplied in 8, 10 and 12-ft. lengths, in copper plated finish. Special nails are supplied for fastening.

Adjustable Shelf Supports

These patented devices are used for supporting shelving in closets, cabinets, wall cases, etc., without grooving the wood.

They are made of cold rolled steel.

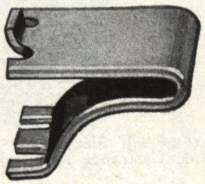
Slots in the standards allow the shelving to be adjusted every ½ in. and insure perfect shelf alignment.

Standards are 1 in. wide, and are supplied in stock lengths of 24, 30, 36, 48, 60 and 72 in., with special nails for fastening.

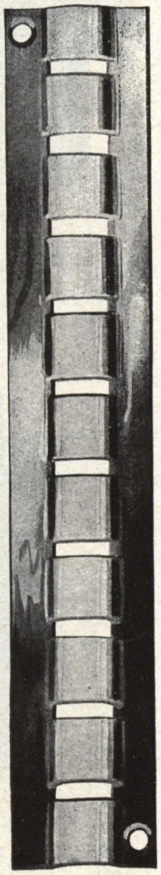
Lengths over 6 ft. and up to 12 ft. are made to order.

Supports are 1¼x¾ in. and are packed 500 to the carton.

Both standards and supports are regularly supplied in nickelplated finish. Other finishes are supplied to order.



No. 235 Shelf Support
1x¾ inch



No. 226
Standard

RUSSELL & ERWIN MFG. CO.

THE AMERICAN HARDWARE CORPORATION, SUCCESSOR

Manufacturers of Door Closers

NEW BRITAIN, CONN.

For Branch Offices and Warehouses, see page 1586

Product

Russwin Liquid Door Closer.

For Garage Hardware, see pages 1498-1499; for Hardware Trim and Locks, see pages 1586-1625; for Fire Exit Devices, see pages 1626-1630.

Features

Ease of Application—Russwin Liquid Door Closer can be applied to either a right-hand or left-hand door without reversing either the arm or spring, thus avoiding possibility of mistake in re-assembling.

Method of Attachment—Can be applied so that it will operate satisfactorily under almost every possible condition of construction.

The Spring—A flat wire-coil spring replaces old type round spring, thereby nearly doubling spring area.

The Valve—This gives a checking action which takes effect when the door is open at an angle of 90°. The speed of the door is constant from 90° to closing point.

The Liquid—This is a non-freezing liquid in which the main working parts are immersed. *Leakage* is impossible.

Working Parts—All are malleable iron and drop forge steel.

The Piston—Piston is operated by crank and link construction which gives a perfectly smooth and even action.

Guaranty—It is guaranteed against faults in workmanship and imperfections in material.

Special Equipment

Russwin door closers may be equipped with regulating valve, operated by key, extra charge for key. Recommended for schools, etc.

Also with positive stop hold open arms, for stopping and holding door at any predetermined point. Additional charge.

With fusible washered arm for fire doors. Closers so equipped when subjected to heat are automatically released, door closes at once. Additional charge.

With parallel arms for use where there is only a narrow space between doors. Closers so equipped are *not reversible* and the *hand* must be specified. Minimum space required is as follows. Additional charge. (Fig. 34.)

Size.	A	B	C	D	E	F
Space, in.	4¼	4⅝	5	5½	6⅜	6⅜

With extra length arms for doors opening up to 180° additional charge.

With Slow Closing Action, the door being gradually checked to the point of contact between latch bolt of lock and strike and then released, permitting the door to close. (Regular style.)

With Quick Closing Action, the door being rapidly closed to a point within 6 or 8 in. of the stop and then gradually checked to point of contact.

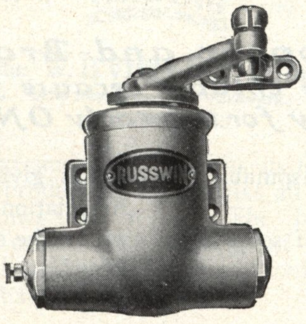
With Quick Closing Action, the door being rapidly closed to a point within 3 or 4 in. of the stop and then very slowly until closed. For doors with push plates and pulls (no locks) or with dead locks only.

With Special Arms so arranged that door will be held open about 2 in. except when closed by slight hand pressure. When released, door regains normal distance of, approximately, 2 in. from closed position. For coupon and telephone booth doors. Additional charge.

Sizes, Finishes and Prices

Sizes—For best results on screen and light inside doors, use size A; for inside doors not exceeding 3 ft. in width, use size B; for outside doors not exceeding 2 ft. 6 in. in width use size C; for outside doors not exceeding 3 ft. in width, use size D; for heavy outside doors exceeding 3 ft. in width and large doors operated against very strong drafts, use size E; for extra heavy outside doors, use size F.

Note: These specifications apply to doors under normal conditions. If the door is unusually heavy, or is subject to very strong drafts, use one size larger than is specified.



Russwin Door Closer

Finishes—Russwin door closers may be obtained in brass, bronze or iron, polished or unpolished, and finishes to match the other trim hardware on building. Also cast iron, unpolished, gold bronze (regular finish).

*PRICES OF RUSSWIN LIQUID DOOR CLOSERS

Cast Iron Unpolished		Cast Bronze and Brass Unpolished	
Closer No.	**G. B. finish	Closer No.	Natural finish
A	$ 5.20	AB	$16.00
B	6.60	BB	19.20
C	8.00	CB	22.40
D	9.60	DB	27.20
E	12.80	EB	32.00
F	16.00	FB	38.40
RC	8.00		

*These prices are included for purposes of comparison as prices fluctuate.

**Gold Bronze Finish.

Special Brackets

Blocking Bracket No. 33—Should be used where the door is recessed ⅞ in or more beyond the surface of the casing. This bracket is furnished regular for doors recessed from ⅞ to 1⅞ in. If recess is greater, same must be so specified. Where required and used the closer occupies its normal position and insures its satisfactory operation. (Same application as Fig. 1.)

Soffit Bracket No. 27—Used where the door opens outward or where conditions are such that the closer can not be applied to the hinge side of door. Minimum space required for attaching is as follows (Fig. 2):

Size.	A	B	C	D	E	F
Space, in.	1⅜	1½	1⅝	1⅝	1⅝	1⅝

Corner Bracket No. 28—Used under same conditions as described for No. 27. Does not require as much space as No. 27, is fastened at both the top and side, each angle securely braced gives a greater solidity to the closer. Minimum space required for attaching is as follows (Fig. 3):

Size.	A	B	C	D	E	F
Space, in.	⅞	⅞	1⅛	1⅛	1⅛	1⅛

Flush Bracket No. 29—Used where soffit is not wide enough to furnish suitable footing for brackets No. 27 or 28 (Fig. 4).

Straight Jamb Bracket No. 30—Used on segment, circle or gothic head doors where intermediate rails will permit, or if panel is thick enough to withstand strain. Similar to No. 27 closer, must be applied below point of radius. If insufficient headroom use No. 32.

Half Circle Bracket No. 31—Suitable for use only on half circle or segment head doors when door is flush with or not recessed more than 1¼ in. beyond casing, and when top of door does not have an irregular radius. Not reversible, specify hand. Detail required where recess is greater than noted (Fig. 5).

Curved Jamb Bracket No. 32—For circle and gothic head doors, opening outward or where the conditions will not permit the closer to be applied to hinge side of door. Not reversible, specify hand. Detail required showing exact radius and location of closer indicated (Fig. 7).

Russwin Screen Door Closer

For screen doors use Russwin Closer No. 7. Reversible for right or left-hand doors, and installation on either the inside or outside of door. *Note:* Always have the closer indoors where possible. Fig. 1 shows standard application and is recommended wherever conditions permit.

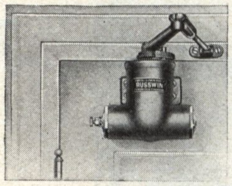


Fig. 1. Regular Bracket

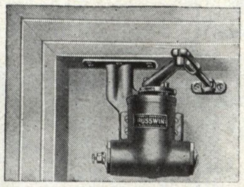


Fig. 2. Bracket No. 27

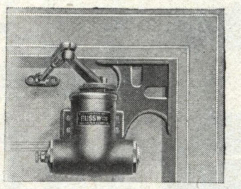


Fig. 3. Bracket No. 28

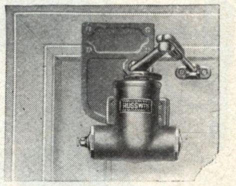


Fig. 4. Bracket No. 29

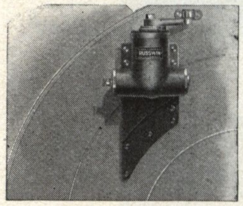
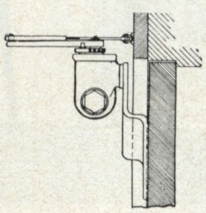


Fig. 5. Bracket No. 31



Bracket No. 31 on Door

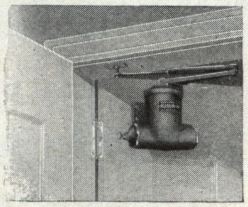


Fig. 6 Bracket No. 34

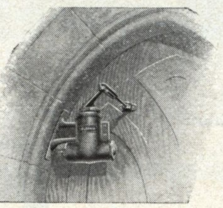


Fig. 7 Bracket No. 32

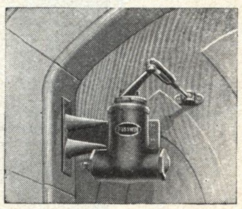


Fig. 8 Bracket No. 30

HARDWARE

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

---

Hardware

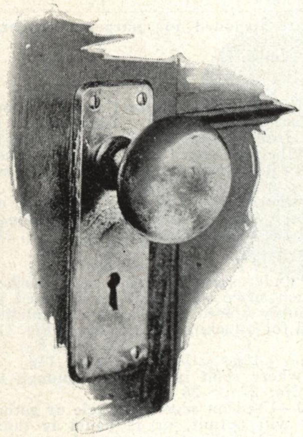
Hardware is made in a great variety of designs and of different kinds of material to suit all pocketbooks.

Solid brass or bronze hardware is indisputably the best.

All good outside door sets are made of solid brass or bronze because these metals do not rust.

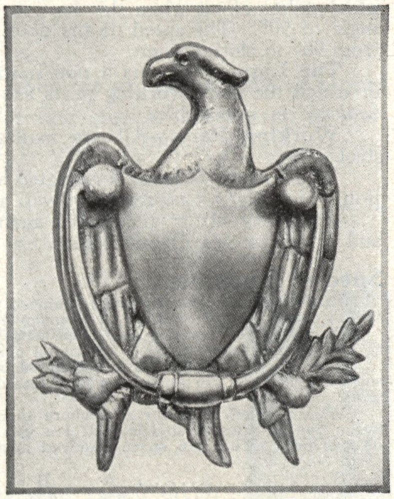
Leading manufacturers of hardware publish fully illustrated catalogues giving complete lists of their products. This Association will gladly furnish names of manufacturers who make solid brass or bronze hardware.

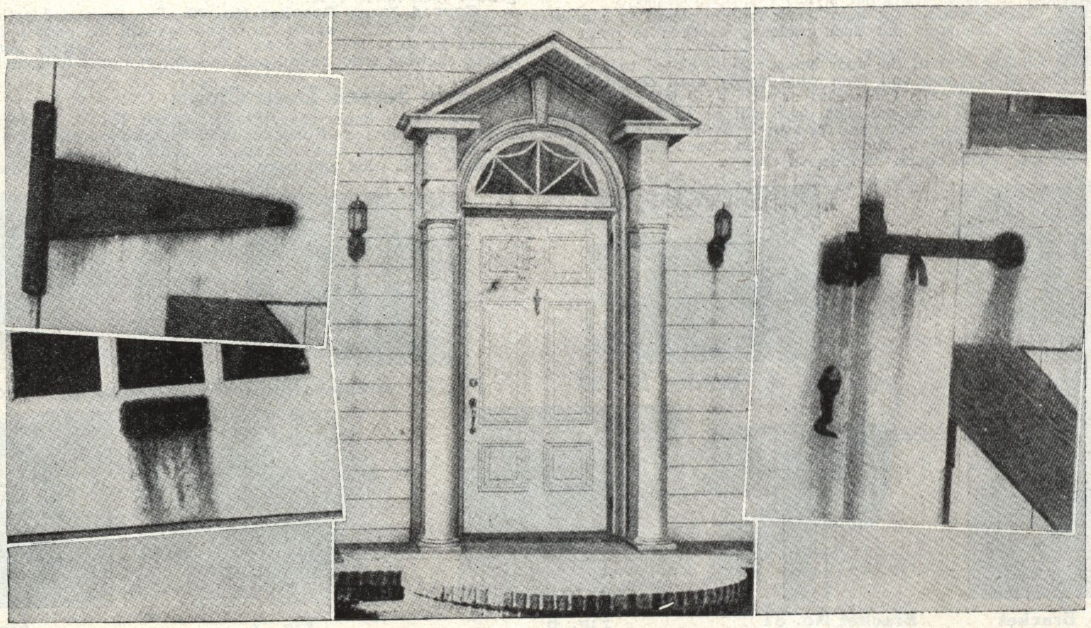
Copper and Brass are cheaper because you pay for them only ONCE



The Unsightliness of Corroded Hardware

Two of these photographs show the marring effects of corrosion, which has not only spoiled the appearance of the plated hardware used but has also streaked and stained the surrounding woodwork. The photograph on the right is a solid brass door-knocker which has been in use for more than 50 years.





THE W. IRVING FORGE, INC.

Hand Forged Colonial Hardware

326-328 East 38th Street
NEW YORK, N. Y.

TELEPHONE
Caledonia 2485

Products

Colonial Hardware of Hand Forged Wrought Iron: Door and Shutter Fixtures, Lighting Fixtures, Fireplace Fittings, reproduced from authentic hand forged specimens in the W. Irving Collection and from original designs in the Colonial spirit.

Description

Two things must be present in a true piece of Colonial hardware—design and craftsmanship. Only when Colonial designs are faithfully reproduced by the same methods the smiths of Colonial times used in creating them, can the product be honestly called *hand forged Colonial hardware*. When the design alone is copied the result is merely imitative and not real.

W.IRVING

the W. Irving Forge. inc.
hand forged colonial hardware.

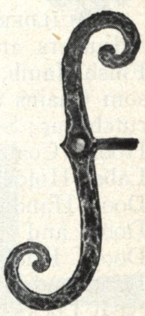
TRADE-MARKS

Preserving the True Colonial Character

Here at the W. Irving Forge, Inc., something is done which we do not believe is being done elsewhere today.

Hand forged Colonial hardware is made just as it was made a century and a half ago by unhurried smiths in the Irving way, and the result justifies all the extra trouble it may take.

The holly leaf trade-mark is the pledge of this painstaking execution—"free from the hall-mark of a rolling mill."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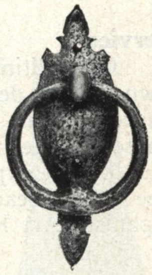
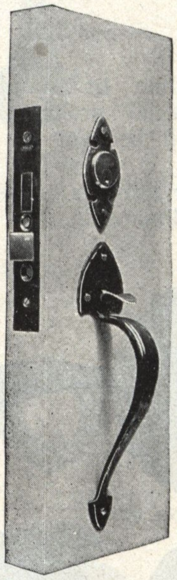
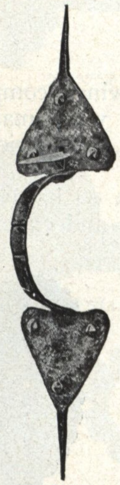

W. Irving Knocker No. 613


W. Irving Thumb Latch Set No. 145 Equipped with Yale Lock No. 482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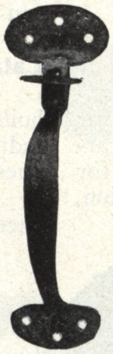
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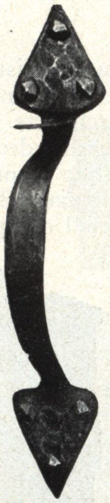
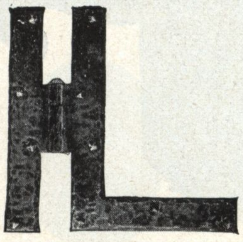
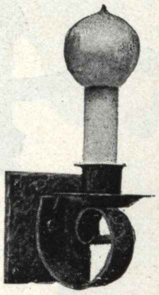
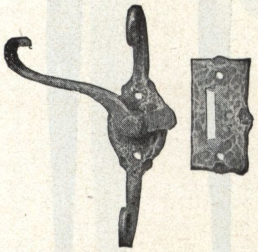
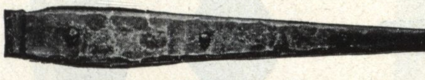
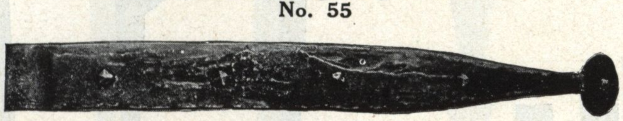

W. Irving Thumb Latch Set No. 147


W. Irving "HL" Hinge No. 94


W. Irving Sconce No. 1102


W. Irving Casement Fastener No. 1601


W. Irving Hinge No. 55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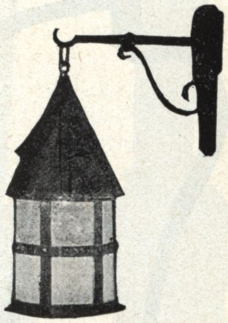
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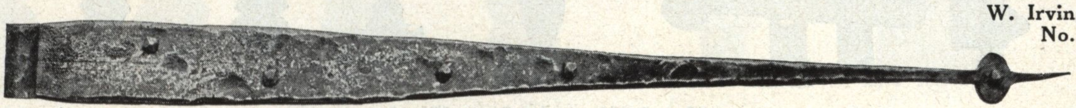

W. Irving Hinge No. 41

EARLE HARDWARE MANUFACTURING COMPANY

Manufacturers of Builders' Hardware
2369 East 51st Street, LOS ANGELES, CAL.

REPRESENTATIVE: A. C. ECK Co., 209 Main Street, SEATTLE, WASH.
PRODUCTS DISTRIBUTED BY LEADING WHOLESALERS OF THE PACIFIC COAST

Products

BUILDERS' HARDWARE: including Casement Adjusters and Fasteners; Bolts: Rim, Surface, Flush, Jamb, Door; Extension Flushbolts; Transom Chains and Catches; Keyhole and Cup Escutcheons; Screen Guards; Front Door Handles; Hooks: Coat, Hat, Towel; Door Holders; Card and Label Holders; Door Latches; Door Knockers; Lever Door Handles; Sash and Screen Lifts; Letter Slots; Door and Drawer Pulls; Kick and Push Plates; Door Knobs; Cremone Bolts; Cupboard Turns; Blind and Shutter Holders; Shelf and Rail Brackets; Sash Locks; Cast Brass Butt Hinges; French Hinges; Sash Catches or Fasteners; Sash Centers; Hasps; Bell Buttons; Door Stops or Bumpers; Mud Scrapers; Door and Drawer Knobs; Brass and Bronze Headed Nails; Lavatory Trim and Brass Rim Locks.

Service

Originating of individual, artistic designs of our own, or the development of ideas and suggestions submitted to us by artists, architects and builders; for those who desire harmonizing and decorative effects carried out in expert workmanlike manner. Fitments for the home beautiful; in Colonial, Bungalow, Mission, Spanish, Art Kraft and Period designs.

TRADE-MARK
Reg. U. S. Pat. Off.

We are glad to co-operate at all times by submitting sketches or assisting to originate new ideas or designs in hardware or fitments in cast or wrought metals, hand chased or etched. Correspondence and sketches on which to base estimates are invited.

Finishes On Products

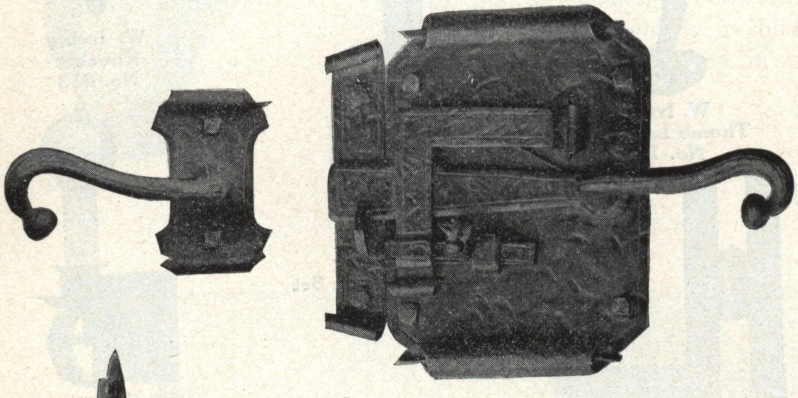
We use all standard finishes employed by the better class manufacturers of builders' hardware including bronze, sanded bronze, brass, sanded brass, copper, sanded copper, dead black, nickel, silver, gold and verde antique.

Earle products can be used with those of any other manufacturer with perfect assurance of being in harmony with any decorative color scheme. Any required coloring to meet individual color schemes also can be furnished.

Catalogue

Catalogue showing complete line of standard builders hardware, with many special products of individual character, and prices, will be sent on request.

The Earle mark on hardware or fitments is assurance of high quality and expert workmanship.



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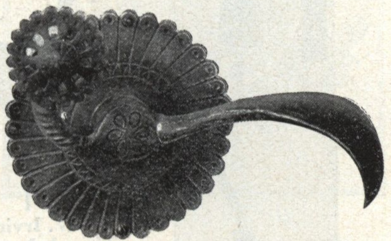

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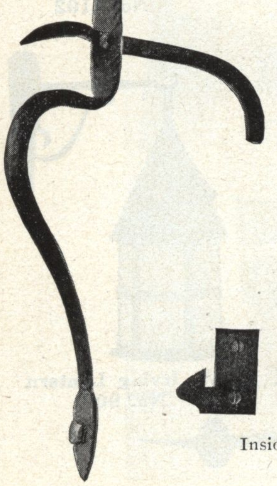

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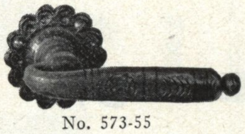

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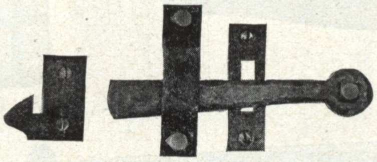
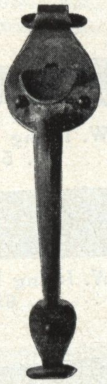


Inside Trim for Latches



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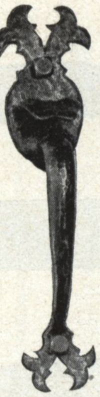

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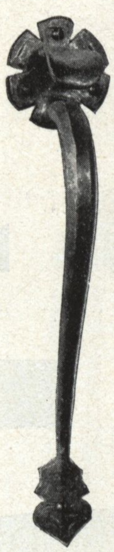

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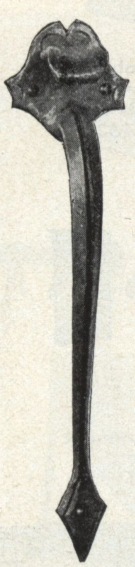

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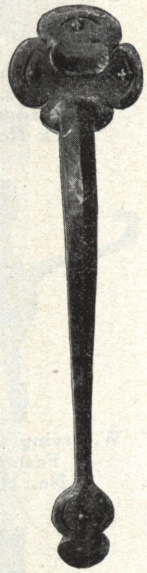
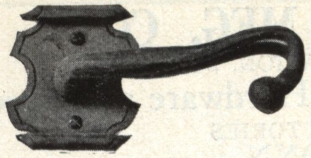


No. 775-44

Hand Wrought Iron Work

A few specimen designs originated for period homes

Continued on next page



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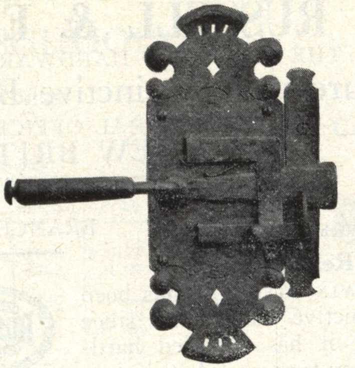
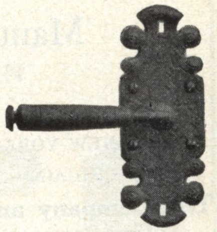

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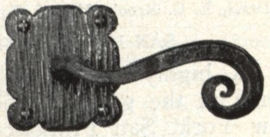

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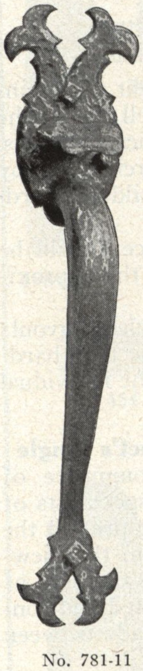

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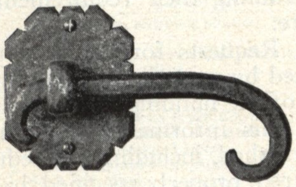

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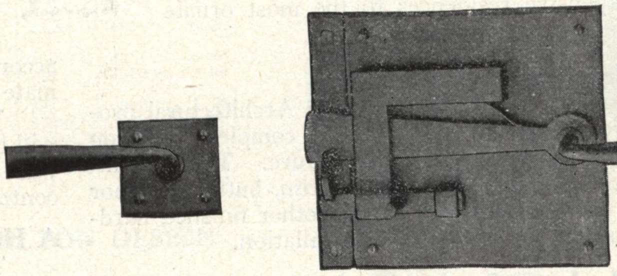

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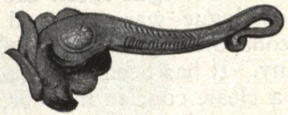

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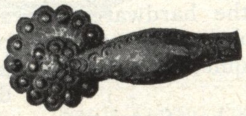

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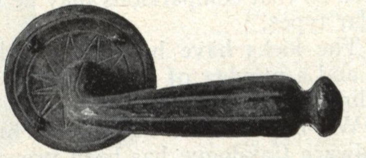

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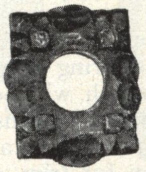

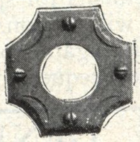

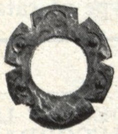

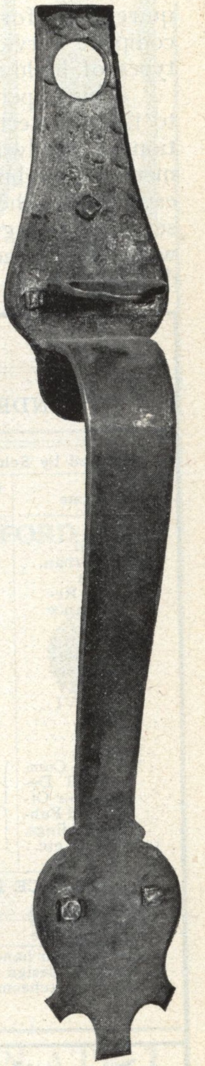

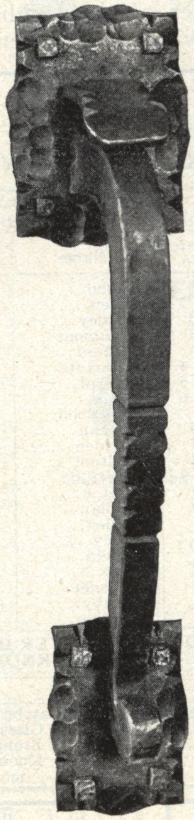

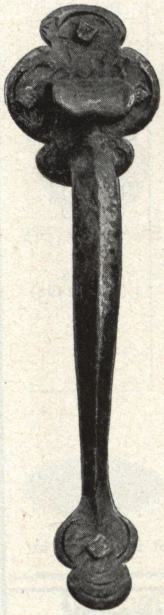

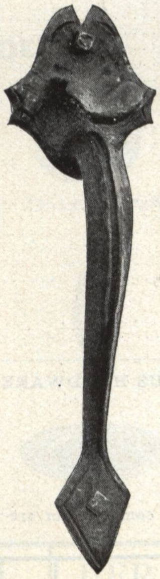

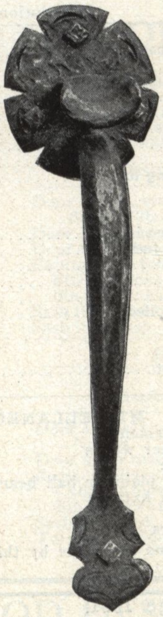

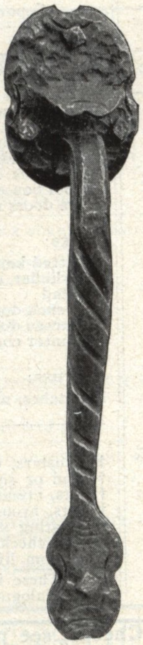

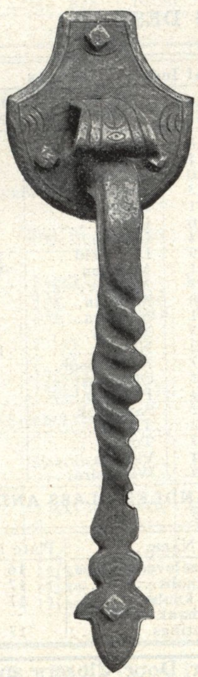

No. 775-11 No. 776-11 No. 777-11 No. 780-11 No. 718-11 No. 772-11 No. 568-11

Other Examples of Earle Hand Wrought Iron

RUSSELL & ERWIN MFG. CO.

THE AMERICAN HARDWARE CORPORATION, SUCCESSOR

Manufacturers of Distinctive Builders' Hardware and Specialties

GENERAL OFFICES AND FACTORIES
NEW BRITAIN, CONN.

BRANCH OFFICES AND WAREHOUSES
NEW YORK—94-98 Lafayette Street
LONDON, E. C. Brooks Wharf, Upper Thames Street

BRANCH OFFICES
CHICAGO—168 No. Michigan Avenue
SAN FRANCISCO—327 Call Building

The Company and Its Reliability

The RUSSELL & ERWIN MFG. CO. has been making RUSSWIN Distinctive Hardware since 1839. During this time it has supplied hardware for buildings of every type and description, from inexpensive residences to the most ornate and monumental buildings.

A Complete Hardware Line

In offering our hardware to the Architectural profession, we can assure a varied and complete selection of hardware of RUSSWIN manufacture. The line includes, locks of every description, trim, butts, fire door hardware, garage hardware and all other finished hardware necessary for a complete installation.

Special Hardware Service for the Profession

The experience gained in designing and supplying hardware which would best fulfill the hardware requirements for various services, enables us to offer a complete service in supplying the requirements of all types of buildings.

This experience also enables us to be of assistance to the architect in offering suggestions as to the selection of hardware which will best answer the requirements of the building under consideration. This applies especially to the proper locking arrangements for specific services. Suggestion for trim, which will be consistent with the character of the building in regard to cost, design and use will also be given when requested.

A highly specialized department is maintained at the general offices, as well as in the New York, San Francisco and Chicago offices, for the purpose of assisting architects by scheduling their requirements in builders' hardware.

Requests for this type of service should be accompanied by preliminary drawings, and the approximate cost of the building.

With this information at hand, complete layouts will be furnished, including a schedule of the trim hardware required, properly specified, based on the individual contract.

A Hardware Catalogue from the Architect's Angle

This catalogue was prepared by a committee of architects collaborating with the hardware specialists of this company. It has been their endeavor to present the subject in a clear, concise manner, not from the viewpoint of the manufacturer but from that of the user of hardware. The information has been tabulated and condensed so that comparisons may be easily made between similar types.

The locks have been classified in regard to their uses and a number of lists of locks for various types of buildings have been included.

We believe that this is the first time a Builders' Hardware Catalogue has been prepared in this manner. We hope that it will be of greater use to the profession than the old type of catalogue.

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†Blind or shutter works
†Bolts, cremone
†Butts, bronze, plain or ball bearing
†Elevating sash fixtures
†Floor checks
†Transom lifters

†These items are made by this company but are not illustrated in this catalogue.

RUSSWIN

For Door Closers and Checks, see page 1581.
For Fire Exit Devices, see pages 1626-1630.
For Garage Door Hardware, see pages 1498-1499.

RUSSWIN

Continued on next page

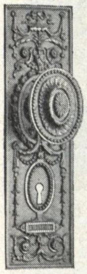
Illustrations

ADAMS SCHOOL

One-fifth size

Cast Bronze

CAENWOOD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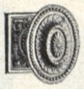
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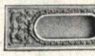

454

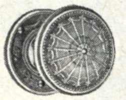
CAENWOOD DESIGN (Symbol Caen.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shanks, 5/16-in. spindle No. 30	2 1/2x1 7/8	3981	$ 6.75
Door knob roses, square	2	3962	2.00
Escutcheons for:			
Mortise locks, 4, 4 1/4 and 4 1/2-in.	8 3/4x2 3/8	940	6.00
Mortise locks, 3 1/2-in.	8 3/4x2 3/8	935	6.00
Bit-key locks (key-plate)	2 5/8x1 1/8	925	1.50
Sash lift, flush	1 1/2x4 3/8	454	3.00

CALMAN DESIGN (Symbol Cal.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shanks, 5/16-in. spindle No. 20	2 1/4x2 1/4	2951	6.25
Door knobs, screwless shanks, 5/16-in. spindle No. 30	2 1/4x2 1/4	3951	6.75
Door knob roses, round	2 1/4	3952 1/2	2.00
Escutcheons for:			
Cylinder locks (cylinder collar)	2 1/4	910	1.50
Mortise locks, 4, 4 1/4 and 4 1/2-in.	8 1/2x2 1/2	940	6.00
Mortise locks, 3 1/2-in.	8 1/2x2 1/2	935	6.00
Bit-key locks (key-plate)	2 3/4x1 3/16	925	1.50
Sash lift, flush	1 3/8x3 3/4	454	3.00
Turn piece 3/16-in. spindle	2 3/4x1 3/16	920	2.00

CALMAN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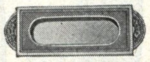
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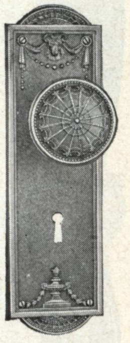
925

910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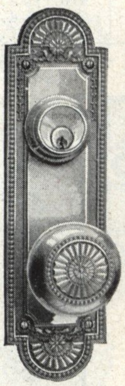
CARLTON DESIGN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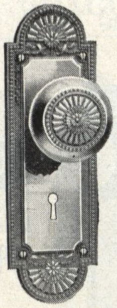
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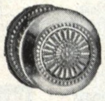
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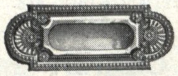
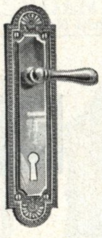
925

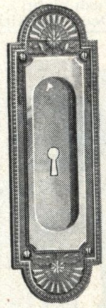

454

CARLTON DESIGN (Symbol Carl.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2 1/4x2 1/4	2951	$ 4.50
Door knob roses, round	2 1/4	3952 1/4	1.50
Escutcheons for:			
Cylinder locks (cyl. collar)	2 1/4	910	1.20
Cylinder locks, outside, 5 1/2-in. and larger	10 x2 3/4	900	7.80
Cylinder locks, outside, 5 1/2-in. and larger	8 x2 1/2	901	4.80
Mortise locks, 4, 4 1/4 & 4 1/2-in.	8 x2 1/2	940	4.80
Mortise locks, 3 1/2-in.	8 x2 1/2	935	4.80
Mortise locks, sliding door	8 x2 1/2	970	6.00
Mortise locks, lever handle No. 728	6 1/4x1 1/2	938 1/4	3.50
Bit-key locks (key-plate)	2 1/2x1 1/8	925	.90
Sash lift, flush	1 3/4x4 5/8	454	2.25
Push button	4 x1 3/4	600	6.75
Door pull with grip No. 073	10 x2 3/4	625	10.20


938 1/4

600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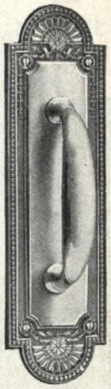
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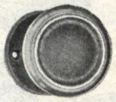
COLONIAL SCHOOL

ARDEN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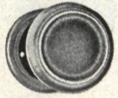
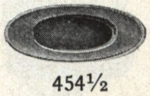

2951x3952 1/8A

926

925


454 1/2

454

ARDEN DESIGN (Symbol Ard.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2 1/4x2 1/4	2951	$4.50
Door knob roses, round	2 1/8	3952 1/8A	1.25
Door knob roses, round	2 1/8	3952 1/8B	1.25
Escutcheons for:			
Bit-key locks (key-plate)	2 x1	925	.50
Bit-key locks (key-plate)	2 x1	926	.50
Sash lift, flush	1 1/4x3 1/4	454	1.25
Sash lift, flush	1 1/4x3 1/4	454 1/2	1.25

BEDFORD DESIGN (Symbol Bed.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2 1/2x1 1/2	2981A	$7.00
Door knob roses, round	2	F952	2.00
Escutcheons for:			
Cylinder locks (cylinder collar)	2 1/2	910	1.50
Bit-key locks (key-plate)	1 3/4x 7/8	925	1.00
Sash lift, flush	1 3/4x4	454	1.60
Turn piece, 3/16-in. spindle	1 3/4x 7/8	920	1.50

BEDFORD

2981AxF952

910

925

454

RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE 1

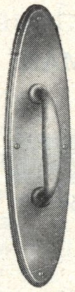
Continued on next page

COLONIAL SCHOOL

Cast Bronze

CLINTON

3390x901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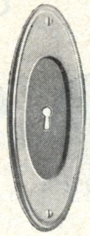
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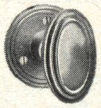
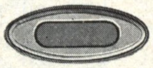

2981A
2952¼A

T932

925

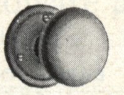

454

3390x935

CLINTON DESIGN (Symbol Clin.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2½x1½	3390	$ 4.50
Door knobs, simplex shank 5/16-in. spindle No. 20	2½x1½	2981A	7.00
Door knob roses, round	2¼	3952¼	2.00
Mortise bolt knob, rose No. 951¾, spindle No. 5	1¾x1	980	2.25
Escutcheons for:			
Cylinder locks, 5½-in. and larger	9 x2⅞	901	4.00
Mortise locks, 4, 4¼ and 4½-in.	7 x2½	940	3.00
Mortise locks, 3½-in.	7 x2½	935	3.00
Mortise locks, sliding door	7 x2½	970	3.75
Bit-key locks, turn No. 059	3⅜x1⅜	T932	1.75
Bit-key locks (key-plate)	1⅞x ⅞	925	.75
Bit-key locks (key-plate) with drop	1⅞x ⅞	930	1.25
Sash lift, flush	1½x4	454	.80
Push plate	15 x3¾	616	9.00
Door pull with grip No. 076	15 x3¾	626	12.10

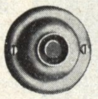
ESSEX


3376x3122¼
Type of 175

910

925

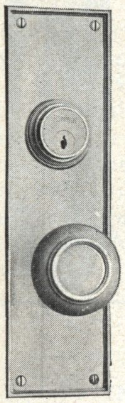
970


600

ESSEX DESIGN (Symbol Sx.)

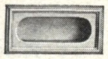
Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3376	$ 3.50
Door knob roses, round	2¼	3122¼	.70
Mortise bolt knob, rose No. 121¾, spindle No. 5	1½	175	1.40
Escutcheons for:			
Cylinder locks (cyl. collar)	2¼	910	1.20
Bit-key locks (key-plate)	1¼	925	.75
Sliding door locks	2⅞	970	3.25
Push button	2¼	600	4.50
Turn piece, 3/16-in. spindle	1¼	920	1.25

GRANBY

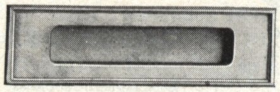

2951x900

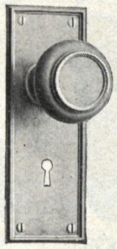
2951x3952¼
Type of 950x951½

925


454

1420½


1420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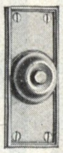
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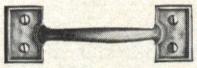
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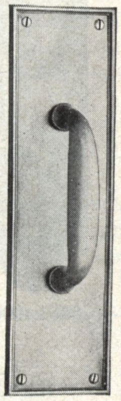

625

GRANBY DESIGN (Symbol Gby.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$ 4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30.	2¼x2¼	3951	4.50
Door knob roses, round	2¼	3952¼	1.50
Mortise bolt knob, rose No. 951½, spindle No. 5	1½	950	3.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	10½x3	900	5.50
Cylinder locks, outside, 5½-in. and larger	8 x2¼	902	4.50
Mortise locks, 4, 4¼ and 4½-in.	6⅜x2¼	940	3.25
Mortise locks, 3½-in.	6⅜x2¼	935	3.25
Bit-key locks (key-plate)	2¼x1	925	.75
Sash lift, flush	1⅜x3	454	1.50
Sash lift bar	1⅝x5⅛	525	2.50
Push button	4 x1¾	600	4.00
Door pull with grip No. 073	10½x3	625	7.90
Letter box plate, outside	2¼x7¾	1420	5.50
Letter box hood, inside	2¼x7¾	1420½	5.50

Note: For Unit Locks in this Design, see plate 27.

PROCKTER

2376x
3112¼
Type of 175

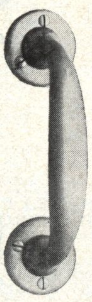
971

970

926

910

600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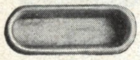

454

PROCKTER DESIGN (Symbol Proc.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2376	$ 3.00
Door knob roses, round	2¼	3112¼	.70
Mortise bolt knob, rose No.011½, spindle No. 5	1½	175	1.40
Escutcheons for:			
Cylinder locks (cylinder collar)	2⅜	910	1.20
Bit-key locks (key-plate)	1⅜	926	.40
Mortise locks, sliding door	2⅞	970	3.20
Mortise locks, sliding door	5½x1¾	971	4.80
Sash lift, flush	1⅜x3⅝	454	1.50
Push button	2½	600	2.50
Door pull, with grip No. 076	7½x2	635	4.50
Turn piece, 3/16-in. spindle	1¾	920	.90

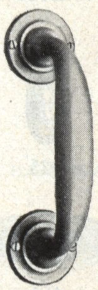
SAYBROOK

970

3951x3172¼

925

600


635

910

454

SAYBROOK DESIGN (Symbol Say.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 5.00
Door knob roses, round	2¼	3172¼	1.50
Escutcheon for:			
Cylinder locks (cylinder collar)	2¾	910	1.50
Bit-key locks (key-plate)	1¼	925	.50
Mortise locks, sliding door	3	970	3.90
Sash lift, flush	1¼x3¼	454	1.80
Push button	2¾	600	3.00
Door pull with grip No. 076	7½x2	635	4.80
Turn piece, 3/16-in. spindle	1¼	920	1.00

RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE **2**

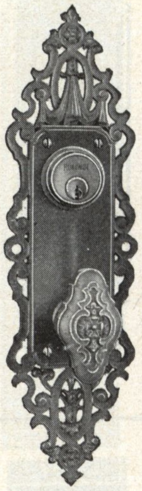
Continued on next page

ELIZABETHAN SCHOOL

Cast Bronze

HARDWICK

LANCASTER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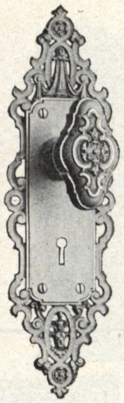
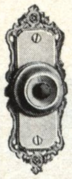

3981x935

3981x3981¾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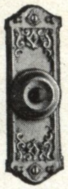
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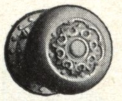
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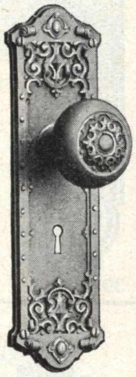
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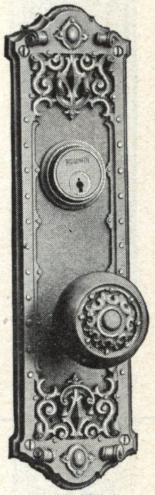
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HARDWICK DESIGN (Symbol Hard.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2⅞x1¾	3981	$ 6.75
Door knob roses, oval	3 x1¾	3981¾	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12¾x3½	901	10.20
Mortise locks, 4, 4¼ and 4½-in.	10¼x3	940	8.00
Mortise locks, 3½-in.	10¼x3	935	8.00
Push button	4⅜x1¾	600	9.60

LANCASTER DESIGN (Symbol Lan.)

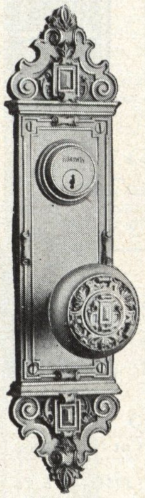
Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 6.75
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12¼x3⅜	900	8.00
Mortise locks, 4, 4¼ and 4½-in.	9¼x2⅝	940	6.00
Mortise locks, 3½-in.	9¼x2⅝	935	6.00
Push button	4¾x1½	600	8.00

FLEMISH SCHOOL

Cast Bronze

HAGUE

LEYDEN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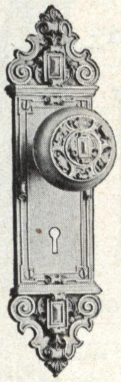
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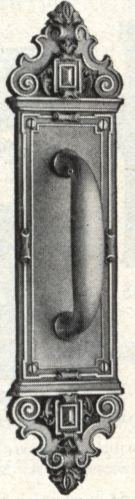
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Type of
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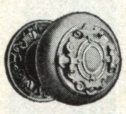
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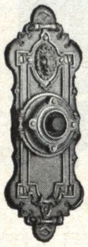
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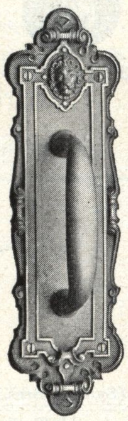
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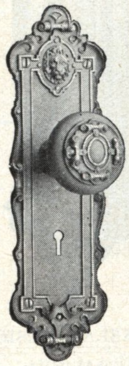
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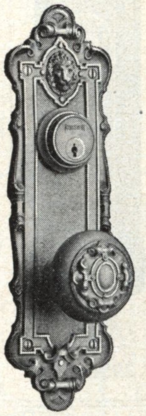

3951x900

HAGUE DESIGN (Symbol Hag.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 6.75
Door knob roses, round	2¼	3952¼	2.00
Mortise bolt knob, rose No. 951½, spindle No. 5	1½	950	4.15
Escutcheon for:			
Cylinder locks, 5½-in. and larger	13¼x3¼	900	10.00
Mortise locks, 4, 4¼ and 4½-in.	10¼x2⅝	940	8.00
Mortise locks, 3½-in.	10¼x2⅝	935	8.00
Push button	5½x2	600	9.00
Door pull, with grip No. 073	13¼x3¼	625	12.40

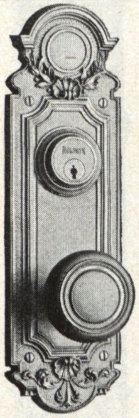
LEYDEN DESIGN (Symbol Ley.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 6.75
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	11 x3¼	900	9.00
Mortise locks, 4, 4¼ and 4½-in.	10 x2¾	940	8.00
Mortise locks, 3½-in.	10 x2¾	935	8.00
Push button	6½x2½	600	9.00
Door pull, with grip No. 073	11 x3¼	625	11.40

FRENCH RENAISSANCE SCHOOL

Cast Bronze

BEAUMONT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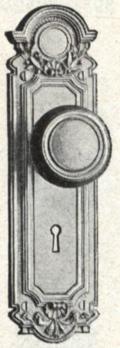
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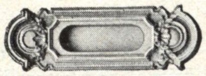
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Type of
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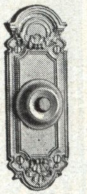
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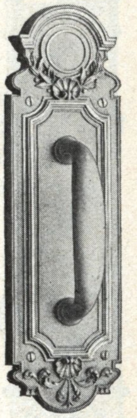
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BEAUMONT DESIGN (Symbol Beau.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 4.50
Door knob roses, round (Madison)	2¼	3952¼	1.50
Mortise bolt knob, rose No. 951½ (Madison), spindle No. 5	1½	950	3.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	11 x3¼	900	8.00
Mortise locks, 4, 4¼ and 4½-in.	9 x2½	940	6.00
Mortise locks, 3½-in.	9 x2½	935	6.00
Sash lift, flush	1¾x5⅜	454	3.00
Sash lift bar	1⅝x6¾	525	3.25
Push button	5 x1¾	600	8.00
Door pull, with grip No. 073	11 x3¼	625	10.40

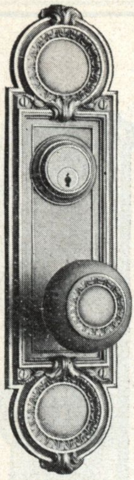
RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE **3**

Continued on next page

FRENCH RENAISSANCE SCHOOL

Cast Bronze

DARCY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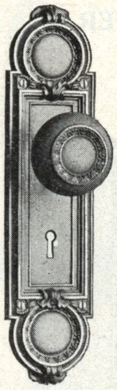
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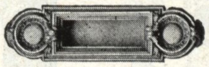
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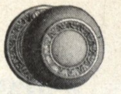
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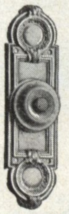
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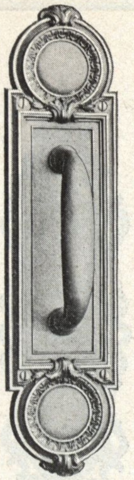
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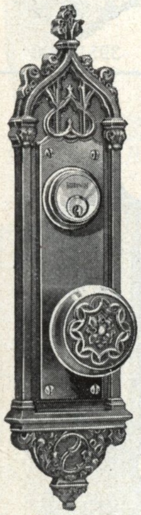
DARCY DESIGN (Symbol Dcy.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$4.50
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12⅝x3	900	6.25
Mortise locks, 4, 4¼ and 4½-in.	10¼x2½	940	4.00
Mortise locks, 3½-in.	10¼x2½	935	4.00
Sash lift, flush	1½x5½	454	1.75
Push button	5½x1½	600	5.50
Door pull, with grip No. 073	12⅝x3	625	8.65

GOTHIC SCHOOL

Cast Bronze

BRESLAU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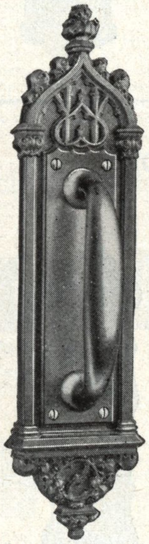
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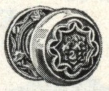
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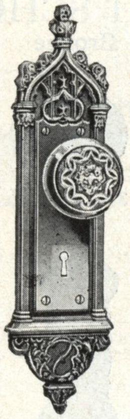
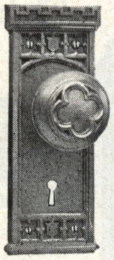

3951x935

BRESLAU DESIGN (Symbol Bres.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 5.75
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	14 x3⅝	900	10.00
Cylinder locks, inside, 5½-in. and larger	11¼x3⅛	B901	8.00
Cylinder locks, inside, turn No. 067	11¼x3⅛	T901	8.50
Mortise locks, 5-in. and larger	11¼x3⅛	950	8.00
Mortise locks, 4, 4¼ and 4½ in.	11¼x3⅛	940	8.00
Mortise locks, 3½-in.	11¼x3⅛	935	8.00
Door pull, with grip No. 076	14 x3⅝	625	13.10

NORTHMOOR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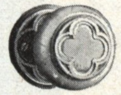
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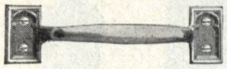
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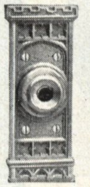
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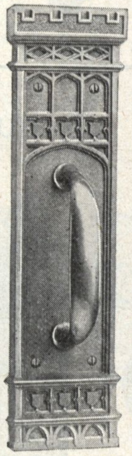
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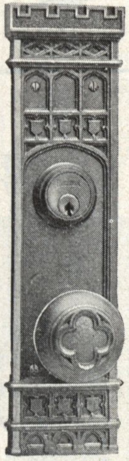
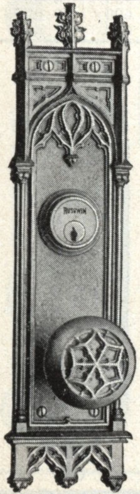

3953x900

NORTHMOOR DESIGN (Symbol Nmr.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 5.75
Door knobs, screwless shank, 5/16-in. spindle No. 30	2½x2¼	3952	6.50
Door knobs, screwless shank, 5/16-in. spindle No. 30	2½x2½	3953	7.25
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12¼x3⅜	900	9.00
Mortise locks, 4, 4¼ and 4½-in.	8 x2¾	940	5.00
Mortise locks, 3½-in.	8 x2¾	935	5.00
Sash lift, bar	1⅝x6	525	3.00
Push button	4¾x2	600	8.00
Door pull, with grip No. 073	12¼x3⅜	625	11.40

TOULON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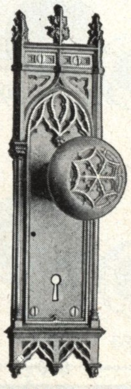
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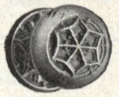
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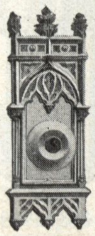
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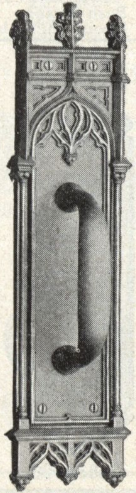
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TOULON DESIGN (Symbol Tou.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$ 5.75
Door knobs, screwless shank, 5/16-in. spindle No. 30	2½x2¼	3952	6.50
Door knobs, screwless shank, 5/16-in. spindle No. 30	2½x2½	3953	7.25
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	13¼x3⅝	900	8.00
Cylinder locks, outside, 5½-in. and larger	11¼x2⅞	901	6.70
Mortise locks, 4, 4¼ and 4½-in.	10 x2⅞	940	6.00
Mortise locks, 3½-in.	10 x2⅞	935	6.00
Push button	5¾x2⅛	600	8.00
Door pull, with grip No. 073	13¼x3⅝	625	10.40

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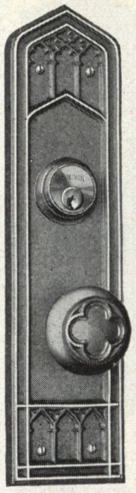
GOTHIC SCHOOL

Cast Bronze

WHITSHIRE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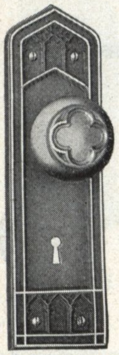
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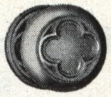
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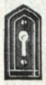
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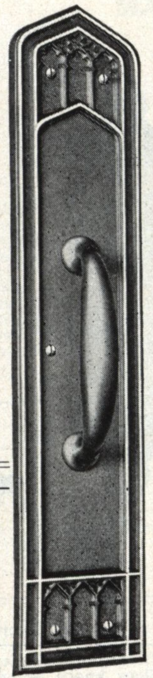

626

Type of 625

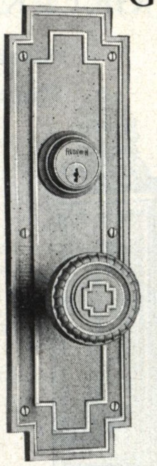
WHITSHIRE DESIGN (Symbol Whi.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20....	2 ¼x2 ¼	2951	$ 5.25
Door knob roses, round.....	2 ¼	3952 ¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5 ½-in. and larger..........	12 ½x3 ¼	900	6.25
Cylinder locks, inside, blank	9 ¼x2 ¾	B902	5.25
Cylinder locks, inside, turn No. 067..............	9 ¼x2 ¾	T902	5.75
Mortise locks, 4, 4 ¼ & 4 ½-in.	9 ¼x2 ¾	940	5.25
Mortise locks, 3 ½-in......	9 ¼x2 ¾	935	5.25
Bit-key locks (key-plate)..	2 ⅛x1 ⅛	925	1.00
Door pull, with grip No. 073	12 ¼x3 ¼	625	8.50
Door pull, with grip No. 076	18 x3 ¾	626	15.25

GREEK SCHOOL

Cast Bronze

THETIS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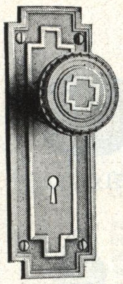
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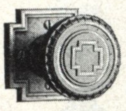
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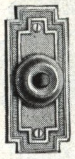
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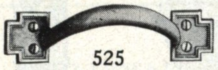
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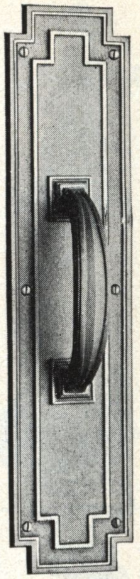
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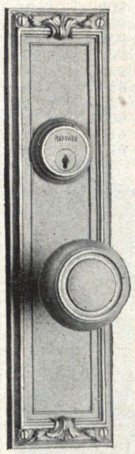
THETIS DESIGN (Symbol The.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30..........................	2 ¼x2 ¼	3951	$ 5.00
Door knob roses, square....................	2 ¼	3962 ¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5 ½-in. and larger...	12 x3 ½	900	6.50
Cylinder locks, outside, 5 ½-in. and larger...	9 x3	901	5.25
Mortise locks, 4, 4 ¼ and 4 ½-in...........	7 ¼x2 ½	940	4.00
Mortise locks, 3 ½-in....................	7 ¼x2 ½	935	4.00
Sash lift, bar..........................	1 ⅜x5 ¾	525	2.60
Push button..........................	4 x1 ¾	600	4.25
Door pull, with grip No. 780...............	15 x3 ½	625	12.80

GREEK SCHOOL

Cast Bronze

CERES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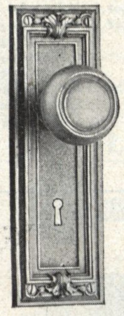
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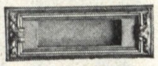
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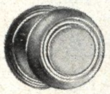
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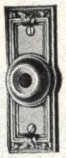
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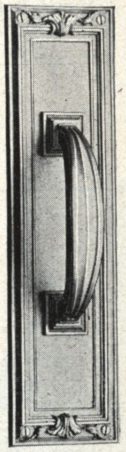
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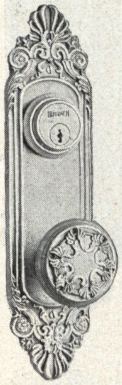
CERES DESIGN (Symbol Cer.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30..	2 ¼x2 ¼	3951	$ 4.50
Door knob roses, round (Madison)................	2 ¼	3952 ¼	1.50
Escutcheon for:			
Cylinder locks, outside, 5 ½-in. and larger........	12 x3	900	9.00
Cylinder locks, outside, 5 ½-in. and larger.......	9 x3	901	7.00
Cylinder locks, inside, blank..................	8 ¼x2 ⅝	B902	5.00
Cylinder locks, inside, turn No. 067...........	8 ¼x2 ⅝	T902	5.50
Mortise locks, 4, 4 ¼ and 4 ½-in..............	8 ¼x2 ⅝	940	5.00
Mortise locks, 3 ½-in......................	8 ¼x2 ⅝	935	5.00
Sash lift, flush..........................	1 ½x4	454	2.50
Push button..........................	4 x1 ½	600	6.00
Door pull, with grip No. 780................	12 x3	625	14.30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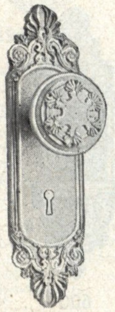
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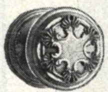
OLYMPUS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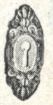
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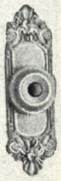
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OLYMPUS DESIGN (Symbol Olmp.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20...	2 ¼x2 ¼	2951	$3.25
Door knob roses, round (No. 952 ¼ Madison)......	2 ¼	3952 ¼	1.50
Escutcheon for:			
Cylinder locks, outside, 5 ½-in. and larger.......	10 ¼x2 ½	900	5.00
Mortise locks, 4, 4 ¼ and 4 ½-in...............	8 ¼x2 ¼	940	3.25
Mortise locks, 3 ½-in.....................	8 ¼x2 ¼	935	3.25
Bit-key locks (key-plate).................	2 ⅝x1 ⅛	925	.75
Push button..........................	4 ¾x1 ⅜	600	5.00

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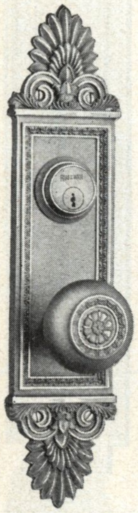
GREEK SCHOOL

Cast Bronze

MINERVA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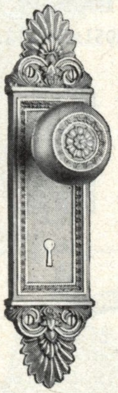
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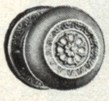
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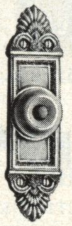
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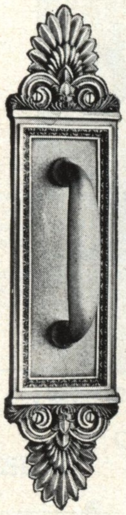
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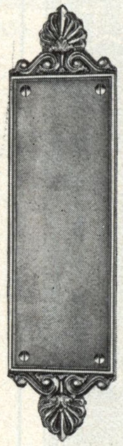
MALOS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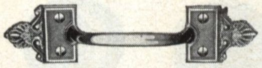
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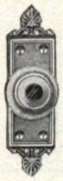
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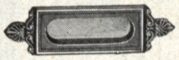
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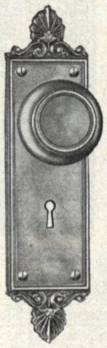
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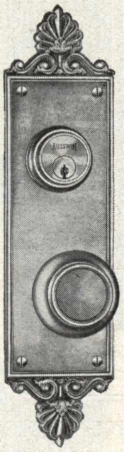

2951x900

MINERVA DESIGN (Symbol Mva.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	$5.00
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	13¼x3¼	900	7.00
Mortise locks, 4, 4¼ and 4½-in.	10¼x2½	940	5.00
Mortise locks, 3½-in.	10¼x2½	935	5.00
Push button	5¾x1⅝	600	6.00
Push plate	13¼x3¼	615	7.00
Door pull, with grip No. 073	13¼x3¼	625	9.40

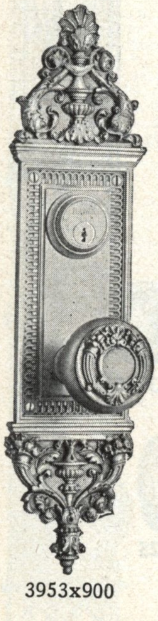
MALOS DESIGN (Symbol Mal.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No.20	2¼x2¼	2951	$ 4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, round	2¼	3952¼	1.50
Mortise bolt knob, rose No. 951½, spindle No.5	1½	950	3.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12 x3	900	5.75
Cylinder locks, outside, 5½-in. and larger	10 x2½	901	4.75
Mortise locks, 4, 4¼ and 4½-in.	9⅜x2¼	940	3.50
Mortise locks, 3½-in.	9⅜x2¼	935	3.50
Bit-key locks (key-plate)	3¾x1⅛	925	.90
Sash lift, flush	1⅜x4¾	454	1.60
Sash lift bar	1⅝x6⅞	525	2.25
Push button	4¾x1⅜	600	5.25
Push plate	12 x3	615	5.75
Push plate	18¾x3	617	12.00

ITALIAN RENAISSANCE SCHOOL

Cast Bronze

BRAMANTE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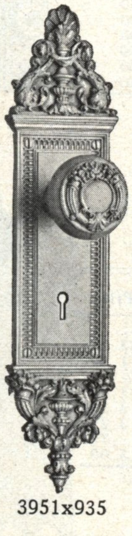
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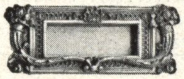
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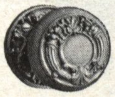
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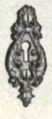
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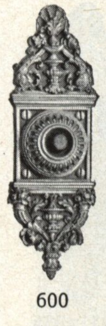
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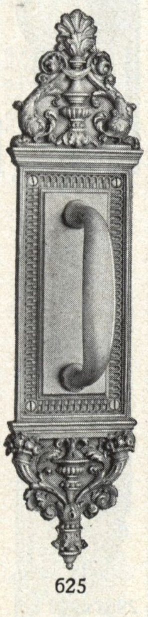

625

BRAMANTE DESIGN (Symbol Bram.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No.30	2¼x2¼	3951	$ 6.75
Door knobs, screwless shank, 5/16-in. spindle No.30	2½x2¼	3952	7.50
Door knobs, screwless shank, 5/16-in. spindle No.30	2½x2½	3953	8.25
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	15 x3¾	900	13.50
Cylinder locks, inside, blank	13 x3¼	B901	10.00
Cylinder locks, inside, turn No. 067	13 x3¼	T901	10.50
Mortise locks, 5-in. and larger	13 x3¼	950	10.00
Mortise locks, 4, 4¼ and 4½-in.	13 x3¼	940	10.00
Mortise locks, 3½-in.	13 x3¼	935	10.00
Bit-key locks (key-plate)	2¾x1⅛	925	1.35
Sash lift, flush	1⅞x4¾	454	3.40
Push button	7¼x2½	600	9.00
Push plate	15 x3¾	615	13.50
Push plate	18½x3¾	616	18.00
Door pull, with grip No. 073	15 x3¾	625	15.90

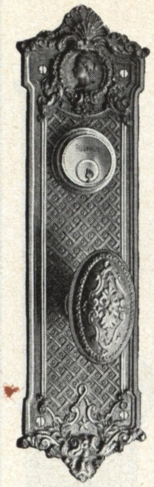
RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE **6**

Continued on next page

LOUIS XIV SCHOOL

Cast Bronze

MAZARIN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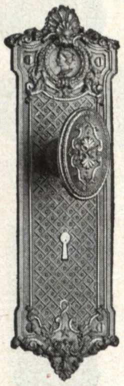
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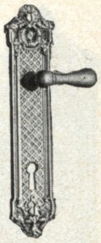
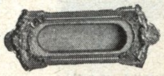
3983x3981½


938¼

925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MAZARIN DESIGN (Symbol Maz.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30	2⅞x1¾	3983	$8.25
Door knob roses, oval	2½x1½	3981½	2.00
Escutcheon for:			
Cylinder locks, outside, 5½ in. and larger	12¼x3½	901	10.00
Mortise locks, 4, 4¼ and 4½-in.	10 x3¼	940	8.00
Mortise locks, 3½-in.	10 x3¼	935	8.00
Mortise locks, with lever No. 728	6⅛x1⅜	938¼	5.50
Bit-key locks (key-plate)	3⅛x1⅜	925	1.50
Sash lift, flush	1⅝x4¼	454	3.75

LOUIS XVI SCHOOL

Cast Bronze

FALCONET

3981AxF3952

910

925

FALCONET DESIGN (Symbol Fal.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No.30	2½x1⅛	3981A	$24.00
Door knob roses	2	F3952	3.00
Door knob roses, with auxiliary spring	1¾	3931¾	2.00
Escutcheon for:			
Cylinder locks (cylinder collar)	2½	910	2.50
Bit-key locks (key-plate)	2½x1⅜	925	3.00

CLODIAN

3981AxF3952¼
Type of
980x951½

925

454

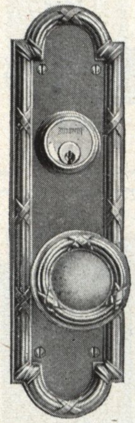
910

970

CLODIAN DESIGN (Symbol Clo.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No.30	2⅝x1⅝	3981A	$7.00
Door knob roses, round	2¼	F3952¼	2.00
Door knob roses, with auxiliary spring	2½x1½	3931½	2.00
Escutcheon for:			
Cylinder locks (cylinder collar)	2¼	910	1.50
Mortise locks, sliding door	4½x2¼	970	9.00
Bit-key locks (key-plate)	2⅛x1⅛	925	1.50
Sash lift, flush	1⅝x3¼	454	3.50

LA LONDE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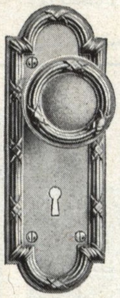
3779

910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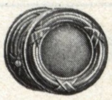
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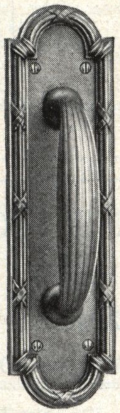
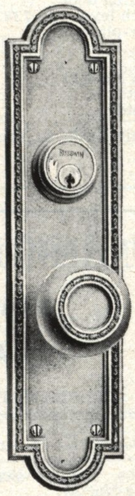

625

LA LONDE DESIGN (Symbol La L.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No.30	2¼x2¼	3951	$ 5.00
Door knob roses, round	2¼	3952¼	2.00
Door knob roses, round, with auxiliary spring	1¾	3931¾	2.00
Lever handle, screwless shank, 5/16-in. spindle No. 30	4	3779	18.00
Escutcheon for:			
Cylinder locks (cylinder collar)	2½	910	1.50
Cylinder locks, outside, 5½-in. and larger	11 x3	900	6.25
Mortise locks, 4, 4¼ and 4½-in.	7½x2⅝	940	4.00
Mortise locks, 3½-in.	7½x2⅝	935	4.00
Bit-key locks (key-plate)	2¼x1¼	925	1.20
Push button	4 x1⅝	600	5.50
Door pull, with grip No. 776	11 x3	625	10.25

LEDOUX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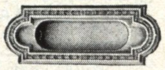
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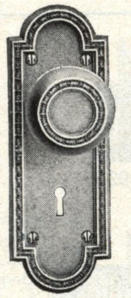
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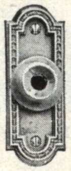
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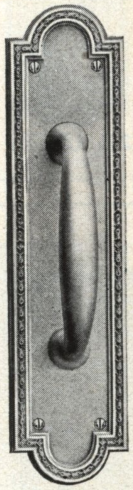
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LEDOUX DESIGN (Symbol Ldx.)

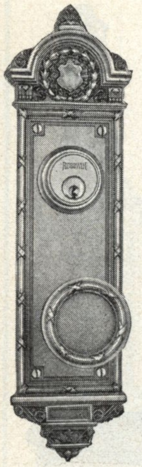
Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No.30	2¼x2¼	3951	$ 6.75
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12 x3	900	7.00
Mortise locks, 4, 4¼ and 4½-in.	7¼x2⅝	940	5.00
Mortise locks, 3½-in.	7¼x2⅝	935	5.00
Sash lift, flush	1½x4¼	454	1.75
Push button	4¼x1½	600	6.00
Door pull, with grip No. 076	12 x3	625	10.10

RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE 7

Continued on next page

LOUIS XVI SCHOOL

VIGNOLA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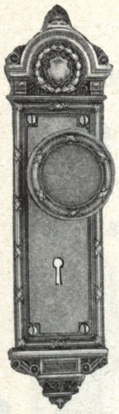
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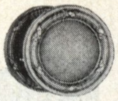
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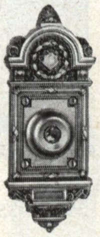
VIGNOLA DESIGN (Symbol Vig.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30..	2¼x2¼	3951	$ 8.00
Door knob roses, round	2¼	3952¼	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	10½x2⅞	901	10.00
Mortise locks, 4, 4¼ and 4½-in.	10½x2⅞	940	8.00
Mortise locks, 3½-in.	10½x2⅞	935	8.00
Push button	6 x2½	600	9.00
Door pull, with grip No. 073	12x3⅜	625	12.40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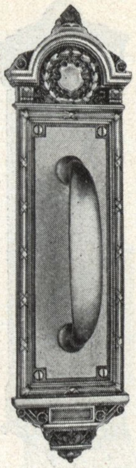
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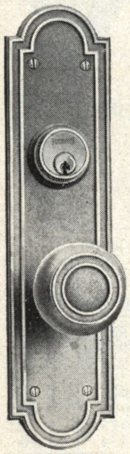
CAMDEN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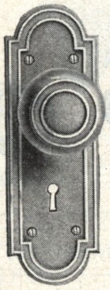
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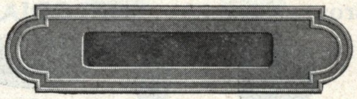
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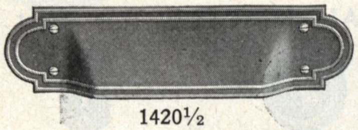
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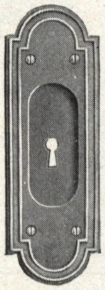
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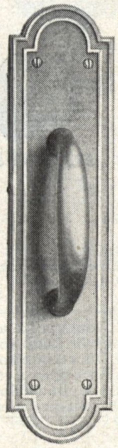
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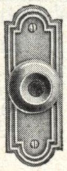
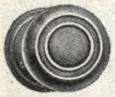

600

CAMDEN DESIGN (Symbol Cam.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20...	2¼x2¼	2951	$4.00
Door knobs, simplex shank, 5/16-in. spindle No. 20...	2¼x2¼	2957	2.45
Door knobs, screwless shank, 5/16-in. spindle No. 30..	2¼x2¼	3951	4.50
Door knob roses, round (Madison)	2¼	3952¼	1.50
Mortise bolt knob, rose 951½ Mad., spindle No. 5..	1½	950	3.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	10½x3	901	5.50
Cylinder locks, inside, blank	9½x2¾	B903	4.50
Cylinder locks, inside, turn No. 067	9½x2¾	T903	5.00
Mortise locks, 5-in. and larger	9 x2½	950	4.50
Mortise locks, 4, 4¼ and 4½-in.	7¼x2½	940	3.25
Mortise locks, 3½-in.	7¼x2½	935	3.25
Mortise locks, sliding door	7¼x2½	970	4.00
Mortise locks, with lever No. 728	5½x1½	938¼	3.50
Bit-key locks (key-plate)	2¼x1¼	925	.75
Sash lift, flush	1½x4¼	454	1.50
Push button	4¼x1½	600	4.00
Door pull, with grip No. 073	12 x3	625	7.90
Letter box plate, outside	2½x9½	1420	5.50
Letter box hood, inside	2½x9½	1420½	5.50

Note: For Unit Locks in this design, see plate 27.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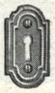
Type of
950x951½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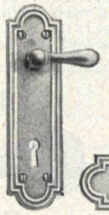
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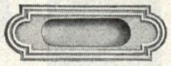
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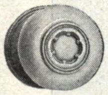
MISSION SCHOOL

Cast Bronze

ALAMO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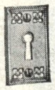
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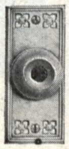
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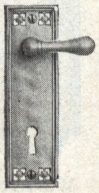
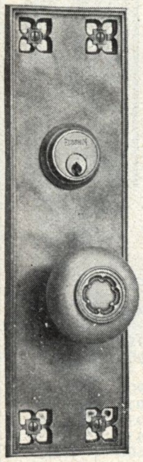

938¼

ALAMO DESIGN (Symbol Amo.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$ 4.50
Door knob roses, round	2¼	3952¼	1.50
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	12 x3½	900	6.00
Cylinder locks, inside, blank	7 x2¼	B902	4.00
Cylinder locks, inside, turn No. 067	7 x2¼	T902	4.50
Mortise locks, 4, 4¼ and 4½-in....	7 x2¼	940	4.00
Mortise locks, 3½-in.	7 x2¼	935	4.00
Mortise locks, sliding door	7 x2¼	970	4.75
Mortise locks, w'th lever No. 728..	5½x1¼	938¼	4.00
Bit-key locks (key-plate)	2 x1¼	925	.90
Sash lift, flush	1½x3⅝	454	1.60
Sash lift bar	1½x4¾	525	2.60
Push button	3⅝x1½	600	5.25
Door pull, with grip No. 780	12 x3½	625	11.30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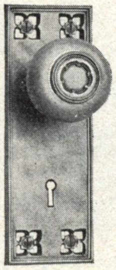
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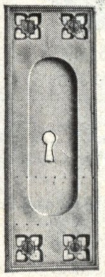
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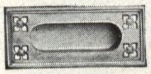
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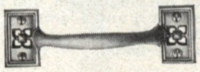
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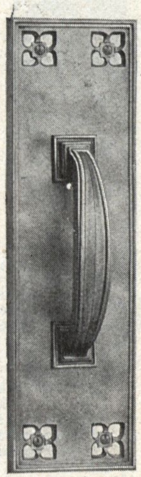
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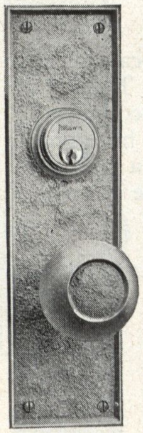
RUSSWIN | PERIOD DESIGNS OF HARDWARE TRIM | PLATE **8**

Continued on next page

MISSION SCHOOL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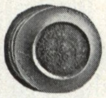
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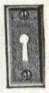
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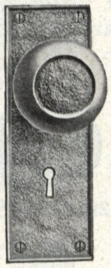
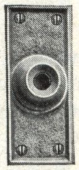

2951x935

MONICA

MONICA DESIGN (Symbol Mca.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20...	2¼x2¼	2951	$ 4.00
Door knob roses, round..........	2¼	3952¼	1.50
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger.......	10⅜x2⅞	900	6.00
Cylinder locks, inside, blank..........	7¾x2⅛	B902	4.50
Cylinder locks, inside, turn No. 067..........	7¾x2⅛	T902	5.00
Mortise locks, 4, 4¼ and 4½-in..........	6¼x2⅛	940	3.75
Mortise locks, 3½-in..........	6¼x2⅛	935	3.75
Mortise locks, with lever No. 728..........	4½x1	938¼	4.00
Bit-key locks (key-plate)..........	2⅛x1	925	.90
Push button..........	3⅞x1⅝	600	5.25
Push plate..........	10⅜x2⅞	615	6.00
Door pull, with grip No. 073..........	10⅜x2⅞	625	8.40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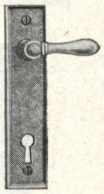
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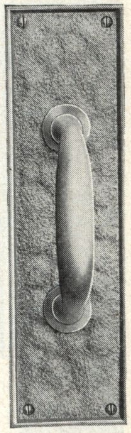
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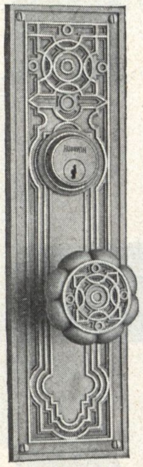
MOORISH SCHOOL

Cast Bronze

CADIZ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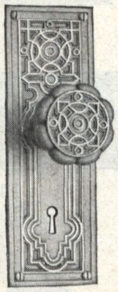
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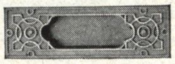
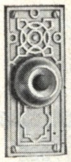

454

CADIZ DESIGN (Symbol Cdz.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30..	2¼x2¼	3951	$ 8.00
Door knob roses, square..........	2 x2	3962	2.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger.......	12 x3¼	900	9.00
Mortise locks, 4, 4¼ and 4½-in..........	7⅜x2⅜	940	5.00
Mortise locks, 3½-in..........	7⅜x2⅜	935	5.00
Sash lift, flush..........	1⅜x4½	454	2.75
Push button..........	4 x1⅝	600	8.00
Push plate..........	12 x3¼	615	9.00
Door pull, with grip No. 774..........	12 x3¼	625	12.00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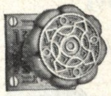
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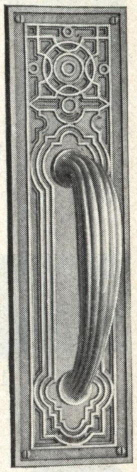
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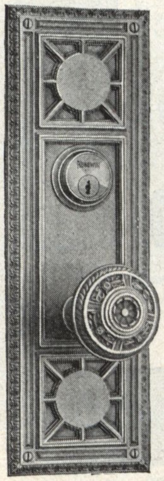
ROMAN SCHOOL

Cast Bronze

HADRIAN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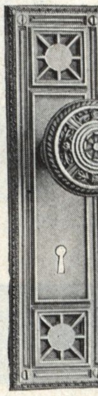
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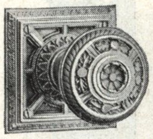
HADRIAN DESIGN (Symbol Had.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, screwless shank, 5/16-in. spindle No. 30..........	2¼x2¼	3951	$ 6.75
Door knobs, screwless shank, 5/16-in. spindle No. 30..........	2½x2¼	3952	7.50
Door knobs, screwless shank, 5/16-in. spindle No. 30..........	2½x2½	3953	8.25
Door knob roses, square..........	2½x2½	3962½	3.00
Escutcheon for:			
Cylinder locks (cylinder collar)..........	3¼x3¼	910	2.25
Cylinder locks, outside, 5½-in. and larger	13¼x4	900	10.00
Cylinder locks, inside, blank..........	10¼x2⅞	B901	7.00
Mortise locks, 4, 4¼ and 4½-in..........	10¼x2⅞	940	7.00
Push button..........	3 x3	600	6.00
Push plate..........	12½x4	615	10.00
Push plate..........	18 x4	616	15.00
Door pull, with grip No. 783..........	12½x4	625	18.00
Door pull, with grip No. 783..........	18 x4	626	23.00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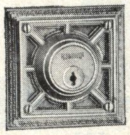
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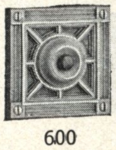
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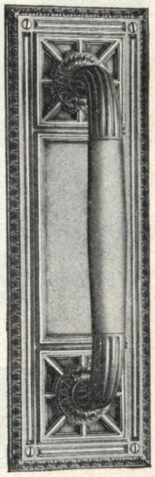
625

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DESIGNS FOR COMMERCIAL BUILDINGS

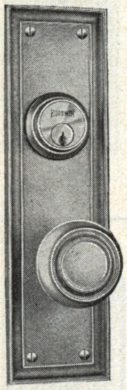
For Unit Locks, see plates 24 to 27, inclusive

Cast Bronze

The following designs were developed especially for use in commercial and public buildings and offer a complete line from which to select high grade trim for such buildings.

They are listed under this heading on account of answering the special requirements demanded for buildings of this character.

The hardware is of the highest grade cast bronze and the designs are simple and dignified. They have a character which recommends them for commercial and public buildings of all classes where a high grade product is desired. They are made extra heavy to withstand the years of constant hard use to which such hardware is subjected.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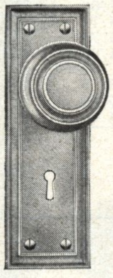
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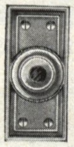
2951x3952¼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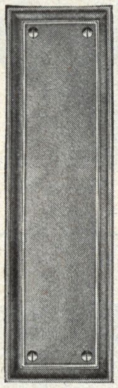
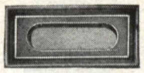

615

ARDSLEY

ARDSLEY DESIGN (Symbol Ards.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, round	2¼	3952¼	1.50
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	10 x2¾	900	5.50
Cylinder locks, outside, 5½-in. and larger	8½x2⅝	901	4.50
Mortise locks, 5-in. and larger	8½x2⅝	950	4.50
Mortise locks, 4, 4¼ and 4½-in.	7 x2¼	940	3.25
Mortise locks, 3½-in.	7 x2¼	935	3.25
Sash lift, flush	1⅝x3½	454	1.50
Sash lift bar	1⅜x5¾	525	2.50
Push button	3½x1⅝	600	4.00
Push plate (type of Pull Plate 625)	10 x2¾	615	5.50
Push plate (type of Pull Plate 626)	15 x3½	616	9.00
Letter box plate, outside	2⅝x8½	1420	5.50
Letter box hood, inside	2⅝x8½	1420½	5.50

525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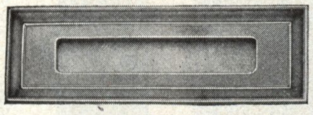
1420½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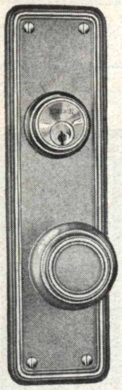
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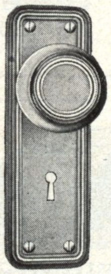
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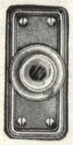
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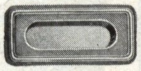
LITCHFIELD

LITCHFIELD DESIGN (Symbol Lit.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, round	2¼	3952¼	1.50
Escutcheon for:			
Cylinder locks, 5½-in. and larger	10 x2¾	900	5.50
Cylinder locks, 5½-in. and larger	8½x2⅝	901	4.50
Mortise locks, 4, 4¼ and 4½-in.	7 x2¼	940	3.25
Mortise locks, 3½-in.	7 x2¼	935	3.25
Sash lift, flush	1⅝x3½	454	1.50
Sash lift bar	1⅜x5¾	525	2.50
Push button	3½x1⅝	600	4.00
Push plate	10 x2¾	615	5.50
Push plate	15 x3½	616	9.00
Letter box plate, outside	2½x8½	1420	5.50
Letter box hood, inside	2½x8½	1420½	5.50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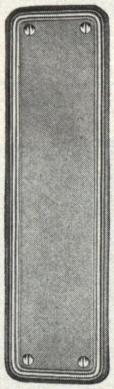
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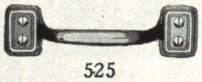
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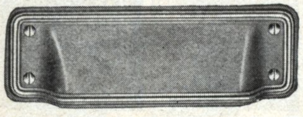
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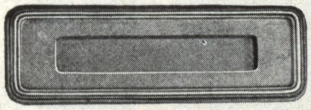
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RUSSWIN | MODERN DESIGNS OF HARDWARE TRIM | PLATE **10**

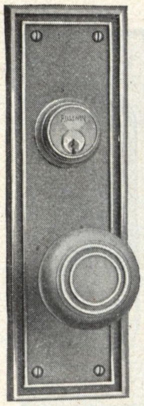
Continued on next page

DESIGNS FOR COMMERCIAL BUILDINGS

For Unit Locks in these designs, see plates 24 to 27, inclusive

Cast Bronze

COPLEY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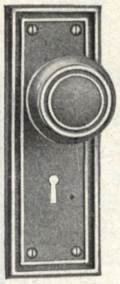
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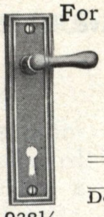
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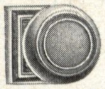
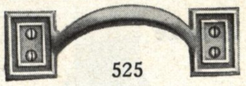

2951x3962¼
Type of
950x961½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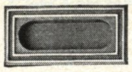
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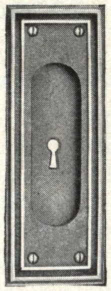
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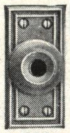
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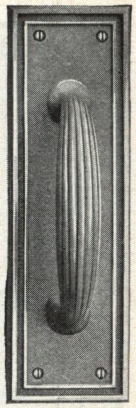
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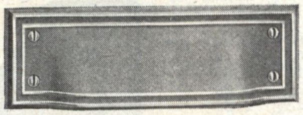
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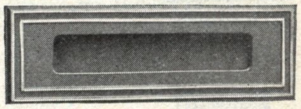
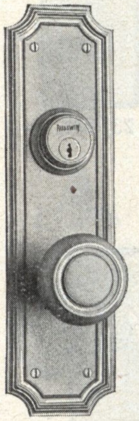

1420

COPLEY DESIGN (Symbol Cop.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, with 5/16-in. spindle No. 20	2¼x2¼	2951	$4.00
Door knobs, screwless shank, with 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, square	2¼x2¼	3962¼	2.00
Mortise bolt knob, rose No. 961½, spindle No. 5	1½x1½	950	3.00
Escutcheon for:			
Cylinder locks (cylinder collar)	2¼x2¼	910¼	1.20
Cylinder locks, outside, 5½-in. and larger	10¼x2¾	901	5.50
Cylinder locks, outside, 5½-in. and larger	9 x2¾	902	4.50
Cylinder locks, inside, blank	7 x2½	B903	3.25
Cylinder locks, inside, turn No. 067	7 x2½	T903	3.75
Mortise locks, 4, 4¼ and 4½-in.	7 x2½	940	3.25
Mortise locks, 3½-in.	7 x2½	935	3.25
Mortise locks, sliding door	7 x2½	970	4.00
Mortise locks, lever handle No. 728	5 x1¼	938¼	3.50
Bit-key locks (key-plate)	2 x1¼	925	.75
Sash lift, flush	1½x3	454	1.50
Sash lift, bar	1¾x6	525	2.50
Push button	3 x1½	600	4.00
Push plate	10¼x3¼	615	5.50
Push plate	16 x3¼	616	9.00
Push plate	20 x4	617	11.00
Door pull, with grip No. 776	10¼x3¼	625	9.50
Door pull, with grip No. 776	16 x3¼	626	13.00
Letter box plate, outside	2½x7⅝	1420	5.50
Letter box hood, inside	2½x7⅝	1420½	5.50

MADISON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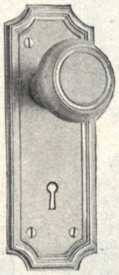
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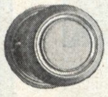
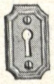

2951x3952¼
Type of
950x951½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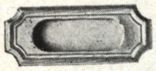
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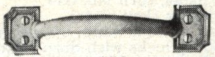
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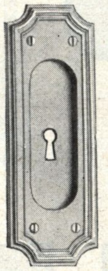
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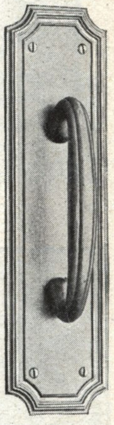
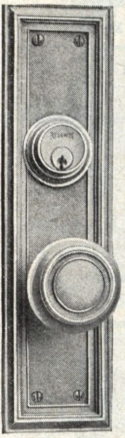

625

MADISON DESIGN (Symbol Mad.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, round	2¼	3952¼	1.50
Door knob roses, square	2¼x2¼	3962¼	2.00
Mortise bolt knob, rose No. 951½, spindle No. 5	1½x1½	950	3.00
Escutcheon for:			
Cylinder locks, outside, 5½-in. and larger	11 x3	900	5.50
Cylinder locks, outside, 5½-in. and larger	9 x2⅝	901	4.50
Mortise locks, 4, 4¼ and 4½-in.	7 x2½	940	3.25
Mortise locks, 3½-in.	7 x2½	935	3.25
Mortise locks, sliding door	7 x2½	970	4.00
Bit-key locks (key-plate)	2 x1¼	925	.75
Sash lift, flush	1⅝x4	454	1.50
Sash lift bar	1⅜x5¾	526	2.50
Push button	4 x1⅝	600	4.00
Door pull, with grip No. 784	11 x3	625	9.40
Letter box plate, outside	2½x9	1420	5.50
Letter box hood, inside	2½x9	1420½	5.50

NIANTIC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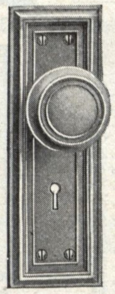
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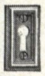
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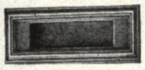
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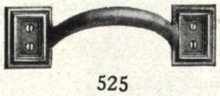
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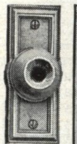
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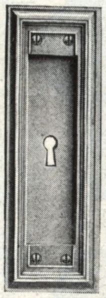
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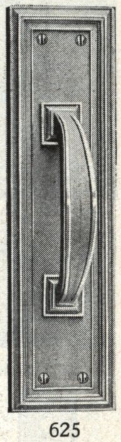

625

NIANTIC DESIGN (Symbol Ntic.)

Description of parts	Size, in.	Cat.No.	Price
Door knobs, simplex shank, 5/16-in. spindle No. 20	2¼x2¼	2951	$4.00
Door knobs, screwless shank, 5/16-in. spindle No. 30	2¼x2¼	3951	4.50
Door knob roses, square	2¼x2¼	3962¼	2.00
Mortise bolt knob, rose No. 961½ Copley, spindle No. 5	1½x1½	950	3.00
Escutcheon for:			
Cylinder locks (cylinder collar)	2½x2½	910	1.20
Cylinder locks, outside, 5½-in. and larger	11½x3	900	6.50
Cylinder locks, outside, 5½-in. and larger	8 x3	901	5.50
Cylinder locks, inside, blank	7½x2½	B902	3.25
Cylinder locks, inside, turn No. 067	7½x2½	T902	3.75
Mortise locks, 4, 4¼ and 4½-in.	7½x2½	940	3.25
Mortise locks, 3½-in.	7½x2½	935	3.25
Mortise locks, sliding door	7½x2½	970	4.00
Bit-key locks (key-plate)	1⅞x1	925	.75
Sash lift, flush	1½x3¾	454	1.50
Sash lift bar	1¾x6	525	2.50
Push button	3¾x1½	600	4.00
Push button	2½x2½	602	4.00
Door pull, grip No. 780	11½x3	625	14.30
Letter box plate, outside	2⅝x7	1420	5.00
Letter box hood, inside	2⅝x8	1420½	5.50

RUSSWIN | MODERN DESIGNS OF HARDWARE TRIM | PLATE **11**

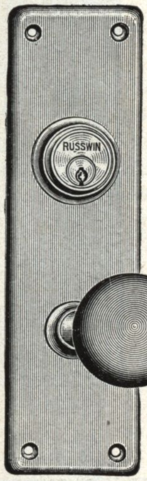
Continued on next page

COMPLETE HARDWARE SETS FOR COMMERCIAL BUILDINGS

For Unit Lock Sets, see plates 24 to 27, inclusive

Cast Bronze

ENFIELD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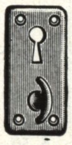
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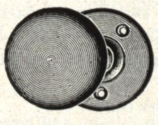
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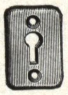
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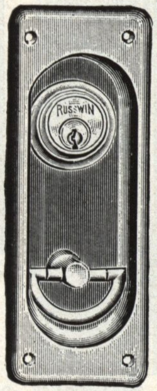
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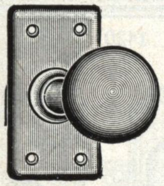
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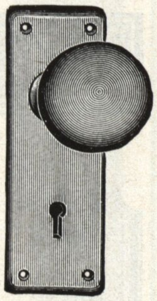
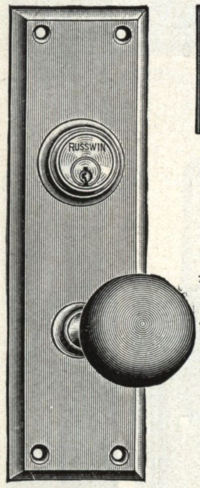

2376x935

ENFIELD DESIGN (Symbol En.)

Description of parts	Size, in.	Cat. No.	Price
Escutcheon for:			
Latches	3¾x2	990	$0.90
Cylinder locks (cylinder collar)	2½x2½	910	1.20
Cylinder locks, outside, 5½-in. and larger	10 x2¾	901	4.00
Cylinder locks, outside, 5½-in. and larger	9 x2½	902	3.00
Cylinder locks, outside, 5½-in. and larger	8 x2½	902½	2.25
Cylinder locks, outside, 5½-in. and larger	7½x2¼	903	1.75
Bit-key locks, No. 0122, etc	7½x2¼	906½	1.75
Mortise locks, 5-in. and larger	7½x2¼	952	1.75
Mortise locks, 4, 4¼ and 4½-in	7½x2¼	941	1.75
Mortise locks, 3½-in	7½x2¼	936	1.75
Mortise locks, 4, 4¼ and 4½-in	6 x2	940	1.35
Mortise locks, 3½-in	6 x2	935	1.35
Bit-key locks, turn No. 059	2¾x1¼	T927	1.00
Bit-key locks (key-plate)	1¾x1⅛	925	.40
Sliding door locks (cup, 6⅛x2¼)	8 x3	972	4.10
Sliding door locks with drop handle (cup, 6⅛x2¼)	8 x3	972½	6.10

Can also be had in Unit Lock Design.

LENOX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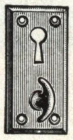
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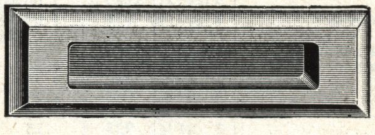
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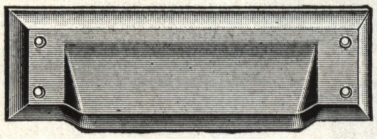
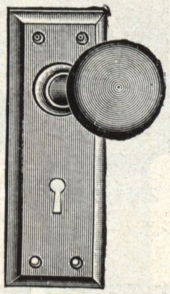

1420½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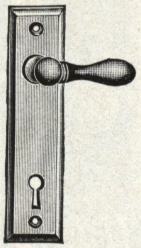
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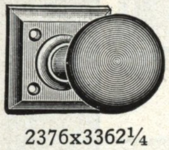
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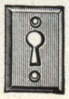
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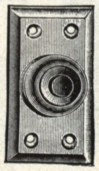

600

LENOX DESIGN (Symbol Lnx.)

Description of parts	Size, in.	Cat. No.	Price
Door knob rose, square	2¼x2¼	3362¼	$2.00
Escutcheon for:			
Latches	4 x2¼	990	.90
Cylinder locks (cylinder collar)	2¼x2¼	910	1.20
Cylinder locks, outside, 5½-in. and larger	10 x2¾	901	4.00
Cylinder locks, outside, 5½-in. and larger	9 x2½	902	3.00
Cylinder locks, outside, 5½-in. and larger	8 x2½	902½	2.25
Cylinder locks	7¼x2½	902¾	1.75
Cylinder locks, inside, 5½-in. and larger	7½x2¼	B903	1.75
Cylinder locks, inside, turn No. 067	7½x2¼	T903	2.25
Bit-key locks, No. 0122, etc	7½x2¼	906½	1.75
Mortise locks, 5-in. and larger	7½x2¼	952	1.75
Mortise locks, 4, 4¼ and 4½-in	7½x2¼	941	1.75
Mortise locks, 3½-in	7½x2¼	936	1.75
Mortise locks, 4, 4¼ and 4½-in	6 x2	940	1.35
Mortise locks, 3½-in	6 x2	935	1.35
Mortise locks with lever No. 728	5 x1	938¼	2.10
Mortise locks (key-plate)	2 x1½	926	.40
Mortise locks (key-plate)	1¾x1⅛	925	.40
Sliding door locks	6 x2	970	2.00
Push button	3⅛x1⅝	600	3.00
Letter box plate, outside	2¼x7¼	1420	3.60
Letter box hood, inside	2¼x8¼	1420½	3.60

Can also be had in Unit Lock Design.

RUSSWIN | DESIGNS FOR COMMERCIAL BUILDINGS | PLATE 12

Continued on next page

ENTRANCE DOOR HANDLES—SECTIONAL DESIGNS

FOR STORE AND RESIDENCE FRONT AND VESTIBULE DOORS

Store Door Sets

Fig. 1—Illustrates an installation especially adapted for entrance doors where a handle is desired on both sides.

Entrance Handle Lock Set No. 3098 Proc. consists of lock 9098 (type of Nos. 9098½, 9118, 9119, 9132 and 9152½M) with two handles No. 420 Proc. (type of these handles are shown below and on Plates 14 and 15).

For full description of this lock, packed regular, also the other locks noted above in parentheses, see Plates 30 and 31.

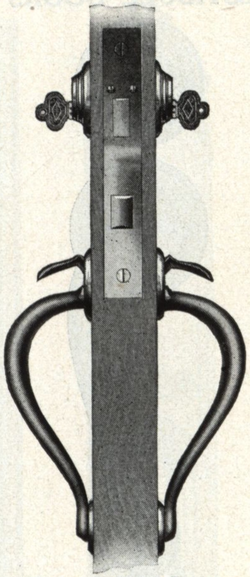


Fig. 1. 3098 Proc.

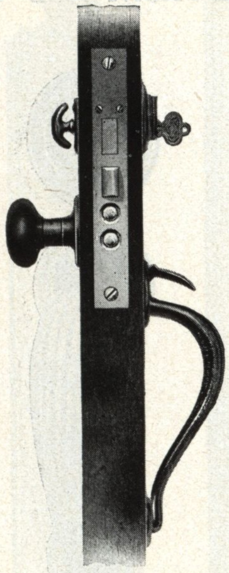
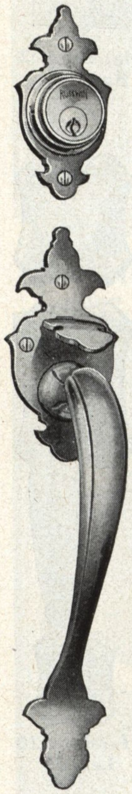


Fig. 2. 3013 Proc.

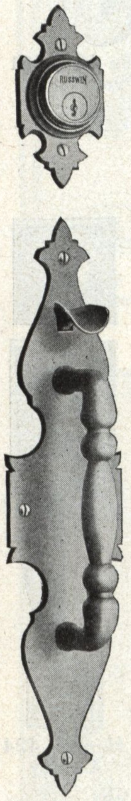
Residence Door Sets

Fig. 2—Entrance Handle Lock Set No. 3013 Proc. consists of lock No. 1213 (type of 1213½ and 1223 as shown on Plates 29 and 36) with one handle No. 420 Proc. (type of others shown herein) for outside of door, and knob 2383xRose 3012xturn 066½ for inside.

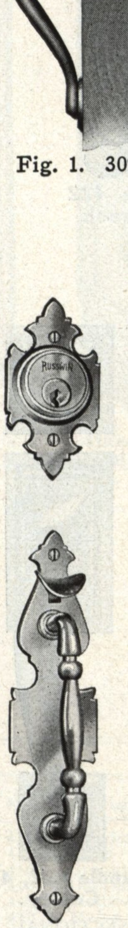
Any cast or wrought brass or bronze (either ornamental or plain) escutcheon as T940, T901, T902 or T903 and any knob (either metal or glass) or knobs with roses and separate turns may be substituted for inside.



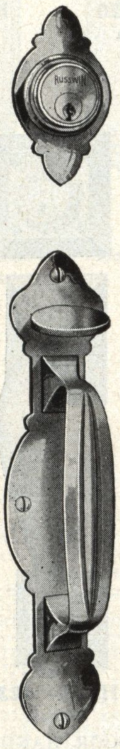
Handle 420
Brewster



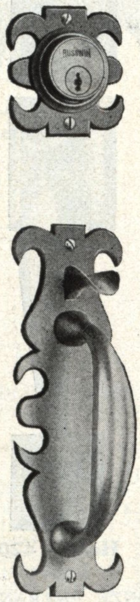
Handle 420
Ellington



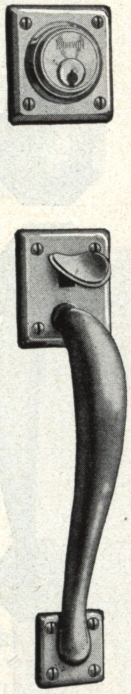
Handle 421
Ellington



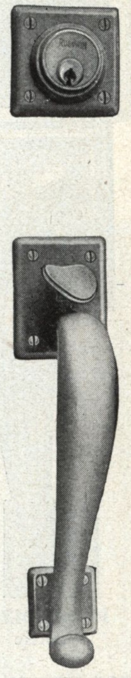
Handle 420, 421
Newton



Handle 420
Somerset



Handle 420
Enfield



Handle 422
Enfield

CAST BRONZE ENTRANCE DOOR HANDLES—SECTIONAL DESIGN

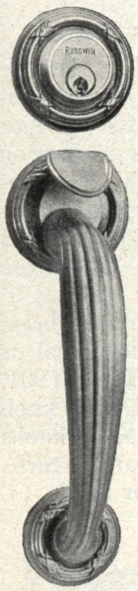
	Two handles, complete with cylinder collars, one for each side of door								One handle, cylinder collar, ½ pr. knobs 2383, rose 3012, turn 066½				
Design	Size overall, in	Cylinder collar, in.	Plates, in.	Set No.	Lock No.	Handle No.	Grip No.	Price, set	Set No.	Lock No.	Handle No.	Grip No.	Price set
Brewster	16½x2½	4⅛x2⅛	5x2½	3098 Brew.	9098	420	Brew.	$22.00	3013 Brew.	1213	420	Brew.	$15.00
Ellington	16½x2⅝	3⅞x2	12¼x2⅝	3098 Ell.	9098	420	0745	21.50	3013 Ell.	1213	420	0745	15.00
Ellington	13½x2	3⅞x2	8⅜x1¾	3198 Ell.	9098	421	0746	20.00	3113 Ell.	1213	421	0746	14.25
Enfield	14½x2½	2½x2½	2½x2¼x1½x1½	3098 En.	9098	420	0778	20.00	3013 En.	1213	420	0778	14.25
Enfield	14 x2½	2½x2½	2½x2¼x1½x1½	3298 En.	9098	422	0790	21.50	3213 En.	1213	422	0790	15.00
Newton	15¼x2⅜	3¾x2⅛	10½x2⅜	3098 Ntn.	9098	420	071	21.50	3013 Ntn.	1213	420	071	15.00
Newton	14 x2⅛	3¾x2⅛	9¼x1⅞	3198 Ntn.	9098	421	072	20.00	3113 Ntn.	1213	421	072	14.25
Somerset	12¼x2⅝	2¾x2⅝	7¾x2⅝	3098 Som.	9098	420	027	21.50	3013 Som.	1213	420	027	15.00

Continued on next page

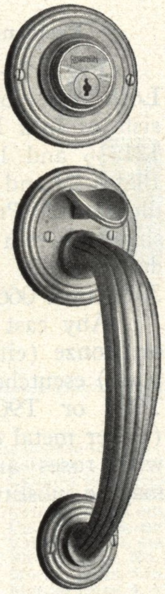
ENTRANCE DOOR HANDLES

Sectional Designs

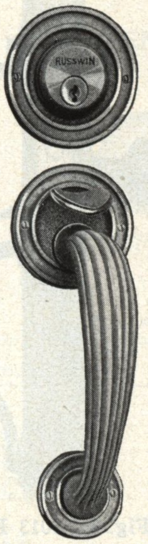
FOR FRONT AND VESTIBULE DOORS



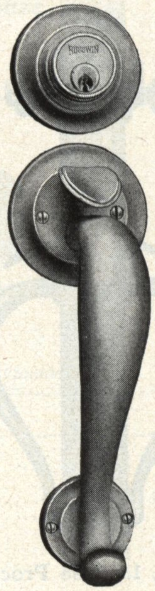
Handle 420
LaLonde



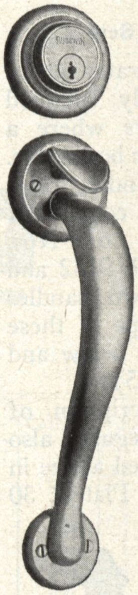
Handle 420
Westbrook



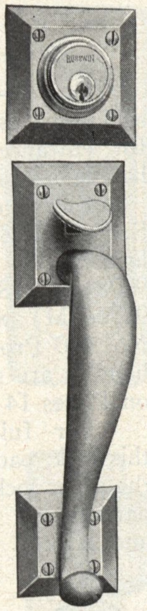
Handle 420
Camden



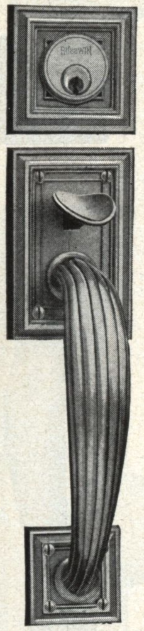
Handle 422
Saybrook



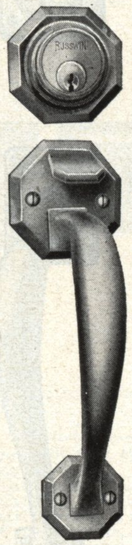
Handle 420, 421
Prockter



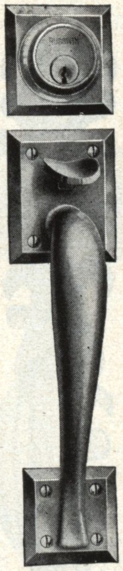
Handle 422
Randolph



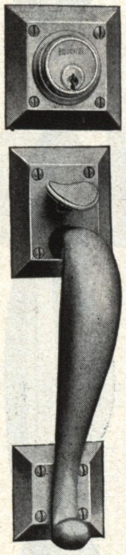
Handle 420
Niantic



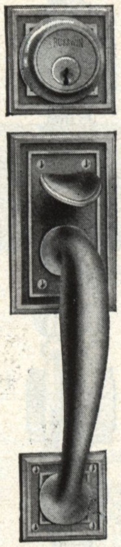
Handle 422
Hanover



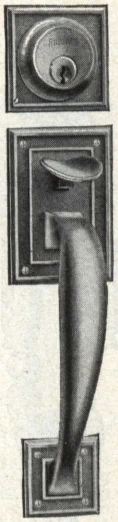
Handle 420
Lenox



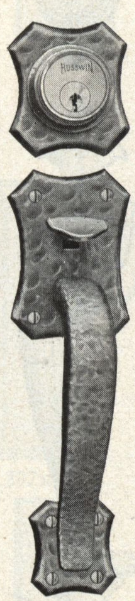
Handle 423
Lenox



Handle 422, 423
Copley



Handle 424
Copley



Handle 420
Laredo

CAST BRONZE ENTRANCE DOOR HANDLES—SECTIONAL DESIGN

	Two handles, complete with cylinder collars, one for each side of door								One handle cylinder collar, ½ pr. knobs, 2383, rose 3012, turn 066½				
Design	Size overall in.	Cylinder collar, in.	Plates in.	Set No.	Lock No.	Handle No.	Grip No.	Price set	Set No.	Lock No.	Handle No.	Grip No.	Price set
Camden	13⅛x2¾	2⅜	2⅝x1¾	3098 Cam.	9098	420	773	$21.50	3013 Cam.	1213	420	773	$15.00
Copley	12½x2¼	2¼x2¼	3¼x2¼x1⅝x1⅝	3298 Cop.	9098	422	0777¼	20.00	3213 Cop.	1213	420	0777¼	14.25
Copley	13 x2¼	2¼x2¼	3¼x2¼x1⅝x1⅝	3498 Cop.	9098	424	0798	20.00	3413 Cop.	1213	424	0798	15.00
Hanover	13 x2⅜	2⅜x2⅜	2⅜x2⅜x1⅝x1⅝	3298 Han.	9098	422	0798	20.00	3213 Han.	1213	422	0798	14.25
LaLonde	14½x2½	2½	2½x1⅞	3098 LaL.	9098	420	774	27.00	3013 LaL.	1213	420	774	17.75
Laredo	12⅞x2½	2½x2⅝	2¾x2½x2 x1⅝	3098 Lar.	9098	420	0793	20.00	3013 Lar.	1213	420	0793	14.25
Lenox	13¾x2¼	2¼x2¼	2¾x2¼x2 x2	3098 Lnx.	9098	420	0799	20.00	3213 Lnx.	1213	420	0799	14.25
Lenox	13¾x2¼	2¼x2¼	2¾x2¼x2 x2	3398 Lnx.	9098	423	0790	21.50	3313 Lnx.	1213	423	0790	15.00
Niantic	14¼x2½	2½x2½	3⅞x2½x1⅞x1⅞	3098 Ntic.	9098	420	774	21.50	3013 Ntic.	1213	420	774	15.00
Prockter	14 x2¼	2¼	2¼x1¾	3098 Proc.	9098	420	0778	20.00	3013 Proc,	1213	420	0778	14.25
Prockter	12½x2¼	2¼	2¼x1¾	3198 Proc.	9098	421	0777	20.00	3113 Proc.	1213	421	0777	14.25
Randolph	14¼x3	3 x3	3⅛x2½x2¼x2¼	3298 Ran.	9098	422	0790	21.50	3213 Ran.	1213	422	0790	15.00
Saybrook	14⅛x3	2¾	3x1⅞	3298 Say.	9098	422	0790	21.50	3213 Say.	1213	422	0790	15.00
Westbrook	14 x3	2¾	3x2	3098 Wstb.	9098	420	774	29.50	3013 Wstb.	1213	420	774	19.00

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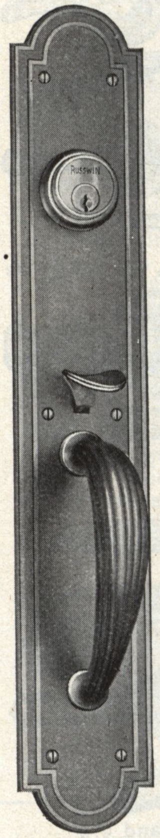
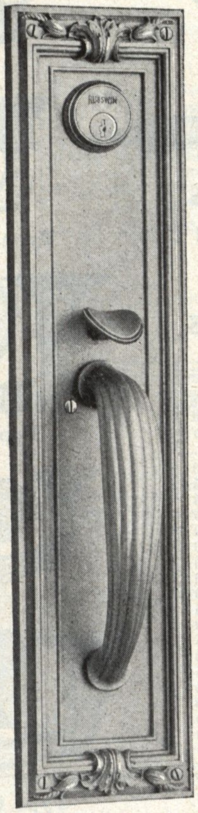
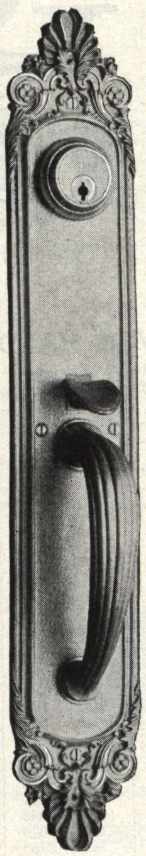
ENTRANCE DOOR HANDLES WITH ESCUTCHEONS


Handle 410
Camden


Handle 410
Ceres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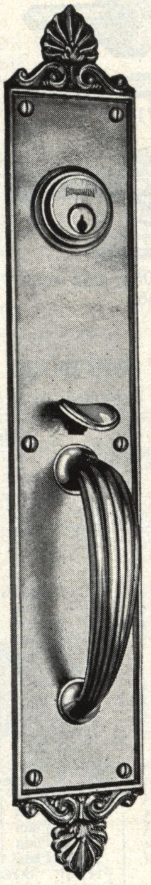
Olympus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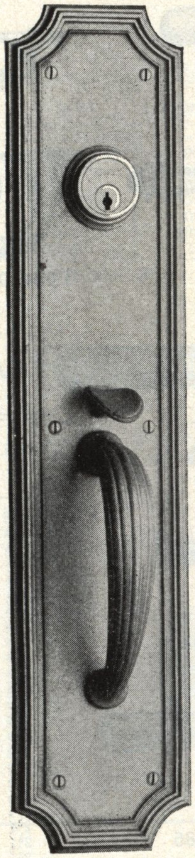
Malos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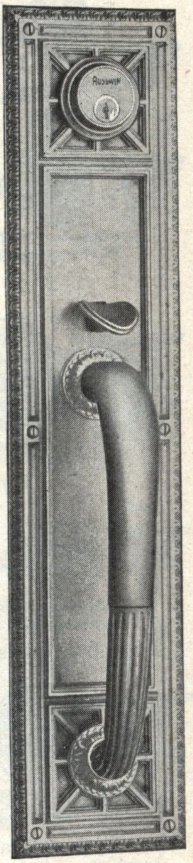
Madison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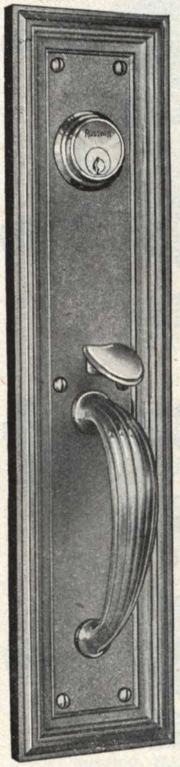
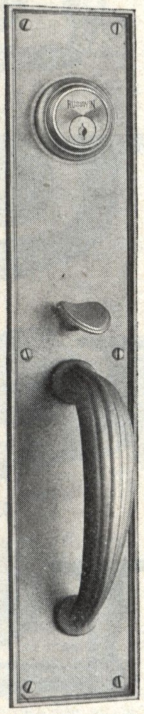
Hadrian


Handle 410
Niantic


Handle 410
Granby

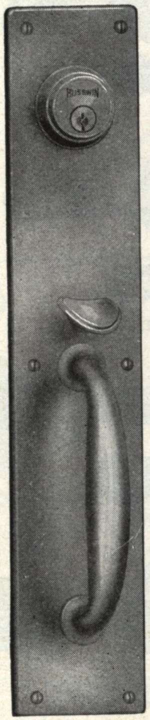
ENTRANCE DOOR HANDLES

Cast Bronze

No.	Design	Grip	Size, in.	Set No.	Price
410	Camden	773	17¾x3	1098 Cam.	$26.00
410	Ceres	774	17 x4	1098 Cer.	31.25
410	Granby	773	15 x3	1098 Gby.	26.00
410	Hadrian	0796	18 x4	1098 Had.	38.50
410	Madison	773	18 x4	1098 Mad.	29.00
410	Malos	773	18¾x3	1098 Mal.	30.00
410	Niantic	773	16¼x3½	1098 Ntic.	28.00
410	Olympus	0777	16 x3	1098 Olmp.	28.00
410	Thetis	780	15 x3½	1098 The.	29.00
414	Enfield	076	15 x3	1498 En.	20.00

Lock No. 9098 furnished regularly with the above sets.

Nos. 9098½, 9118, 9119, 9132 and 9152½M may be substituted.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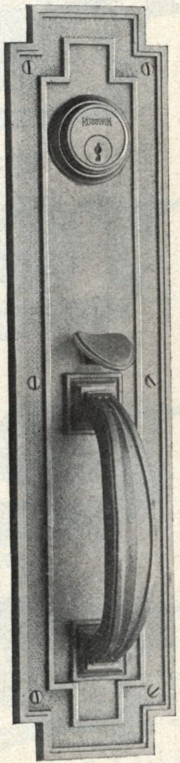
Enfield


Handle 410
Thetis

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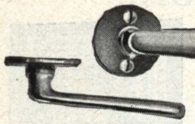
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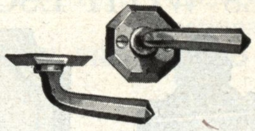
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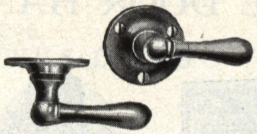
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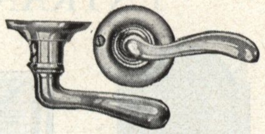
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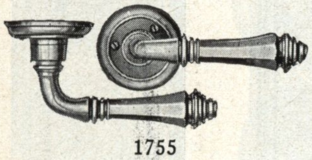
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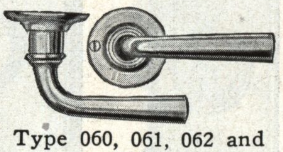
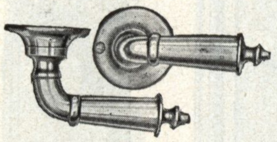
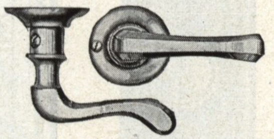
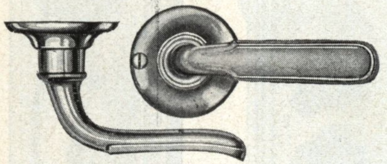

Type 060, 061, 062 and 063


Type 756 and 1756


Type 075, 076 and 076½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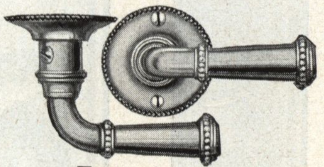
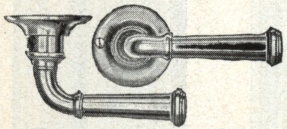
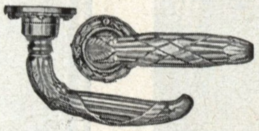

Type 079, 080


Type 081, 082 and 083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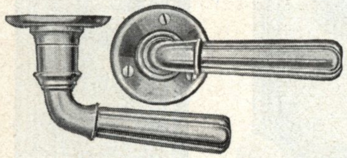
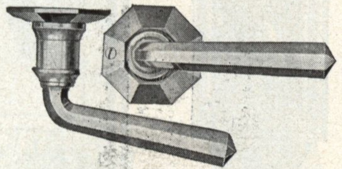

Type 085 and 086


Type 077 and 078

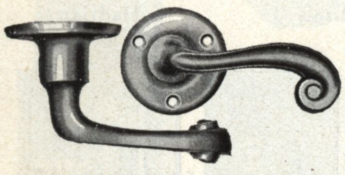
CAST BRONZE LEVER HANDLES

Arranged According to Projections

Proj., in.	†Length, in.	Rose No.	Shank		Spin. No.	Cat. No.	Price with rose
			Type	Diam., in.			
5/8	2½	069	Plain	Spec.	10	†† 069	$ 1.60
1¼	1¾	041⅜	Plain	Spec.	10	†† 717	2.25
1¼	1¾	011⅜	Plain	9/16	10	†† 728	1.25
2⅛	2½	111¾	Plain	¾	10	‡ 043	2.25
2¼	3	011¾	Plain	9/16	10	747	4.50
2¼	3¼	3112¼	Simplex	Spec.	20	2772	6.00
2¼	3½	F755	Plain	Spec.	20	1755	6.00
2⅜	2¼	111½	Plain	¾	10	060	1.60
2⅜	2½	111¾	Plain	¾	10	* 061	2.00
2⅜	3	111¾	Plain	¾	10	* 062	2.25
2⅜	3	111¾	Plain	¾	10	756	3.50
2⅜	3	111¾	Plain	¾	20	1756	3.75
2½	2¼	111¾	Plain	¾	10	075	2.25
2½	2½	151¾	Plain	¾	10	* 079	3.75
2½	2½	111¾	Plain	¾	10	* 081	2.75
2½	3	111¾	Plain	¾	10	* 082	3.00
2½	3¼	F951½	Plain	Spec.	20	1777	9.00
2½	3½	3912	Screwless		30	3749	7.50
2⅝	2¾	111¾	Plain	¾	10	* 076	2.50
2⅝	2¾	111¾	Plain	¾	10	085	4.25
2¾	2¾	141¾	Plain	¾	10	* 077	4.25
2¾	3¾	112¼	Plain	¾	10	* 083	3.50
2¾	3¾	142½	Plain	¾	10	* 078	5.00
2¾	3	3141¾	Screwless		30	3750	5.00
2¾	4	F3952	Screwless		30	3779	18.00
2¾	4¼	3912	Screwless		30	3758	12.00
2⅞	3¾	112¼	Plain	¾	10	086	5.25
2⅞	3¾	152⅜	Plain	¾	10	* 080	4.25
2⅞	3¾	112¼	Plain	¾	10	* 063	2.75
3	3½	3112¼	Screwless		30	3073	4.25
3	4	112¼	Plain	¾	10	* 076½	4.00
3	4	3142½	Screwless		30	3751	6.00
3⅛	4	3952¼	Screwless		30	3754	2.00
3⅛	4¾	3142¼	Screwless		30	3766	12.00
3¼	4½	3152⅜	Screwless		30	3757	10.50
3⅜	3½	3112¼	Screwless		30	‡3088	4.25

†Measured from end of handle to center of spindle.
‡Specify hand.
††These levers can not be spindled in pairs.
*Furnished with simplex shanks, add $0.25 each and prefex 2 to Catalogue No.

Note: Thickness of door should be given on all lever handles.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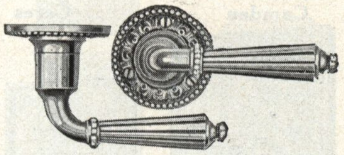
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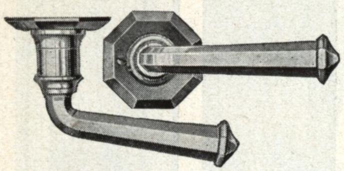
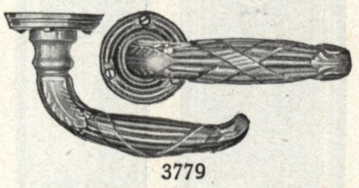

Type 3750 and 3751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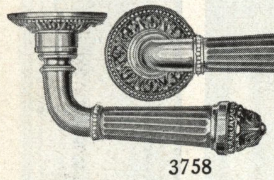
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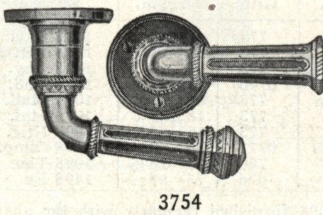
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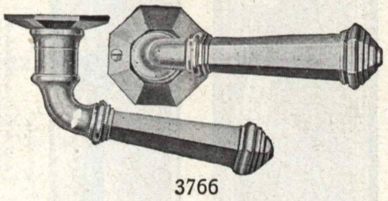
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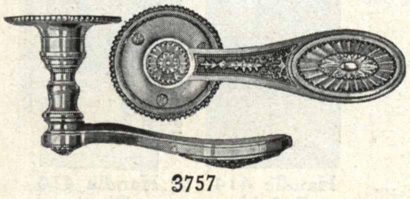
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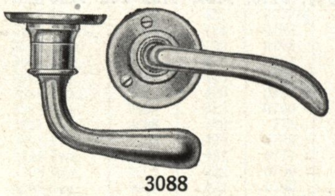
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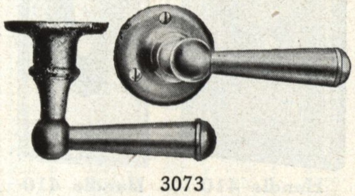
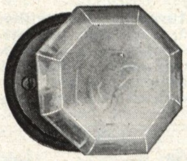
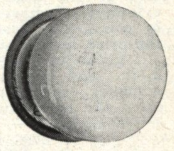

3073

RUSSWIN CAST BRONZE LEVER HANDLES PLATE **16**

Continued on next page

GLASS AND CAST KNOBS


C2136½, 2136½ Knob
3022¼ Rose

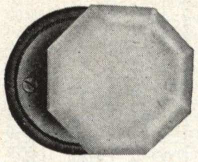

C2115½ Knob
3022¼ Rose

CAST DOOR KNOBS

Priced with roses

Diameter, in.		Description	Knob No.	Rose No.	List price, pr.
2¼	Cast bronze	Simplex shank, 5/16-in. spindle No. 20	2376	3112¼	$3.00
2¼	Cast bronze	Screwless shank, 5/16-in. spindle No. 20	3376	3112¼	3.50
2⅝x1⅝	Cast bronze	Simplex shank, 5/16-in. spindle No. 10	2390	3112¼	4.00
2⅝x1⅝	Cast bronze	Screwless shank, 5/16-in. spindle No. 10	3390	3112¼	4.50
1¾	Cast bronze	Simplex shank, 5/16-in. spindle No. 20	21378	1378	3.00
1¾	Cast bronze	Simplex shank, 5/16-in. spindle No. 20	21371	F371-1¾-in.	3.00
2	Cast bronze	Simplex shank, 5/16-in. spindle No. 20	21372	F371-2 -in.	3.25

Note: The 2000 Series have the simplex shank and the 3000 Series the Screwless shank.


C2142½ Knob
3022¼ Rose

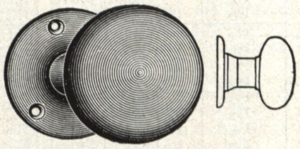
C2174 Knob
3022¼ Rose

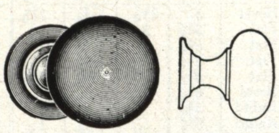
GLASS DOOR KNOBS, BRASS SHANKS

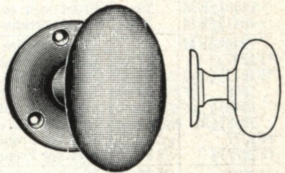
Pressed Glass, priced with wrought brass roses

Diameter, in.	Description	Knob No.	Rose No.	List price, pr.
2¼	Simplex shank, 5/16-in. spindle No. 20	C2136½	3022¼	$3.00
2¼	Simplex shank, 5/16-in. spindle No. 20	*C2115½	3022¼	3.50
2¼	Simplex shank, 5/16-in .spindle No. 20	*C2142½	3022¼	3.50
Cut Glass, priced with wrought brass roses				
2¼	Simplex shank, 5/16-in. spindle No. 20	C2174	3022¼	11.75

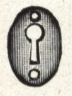
*Milk white glass.


2376 to 2376¾ Knobs
3112¼ Rose


1378 Knob, 1378 Rose
Type of 21378 Knob, 1378 Rose


2390 Knob
3112¼ Rose

ESCUTCHEONS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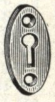
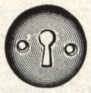
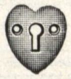
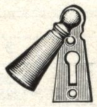

68

ESCUTCHEONS (KEY PLATES)

Size, in.	Description	Catalogue No.	List price, doz.
2 x ⅞	Cast bronze with drop	030	$12.00
2⅛x1⅛	Cast bronze with drop	032	12.00
1⅝x1⅛	Cast bronze	66	3.00
1⅞x ⅞	Cast bronze	68	3.60
1⅝x1¼	Cast bronze	925 Fenwick	4.80
1⅜	Cast bronze	926 Prockter	4.80


926 Prockter


925 Fenwick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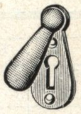
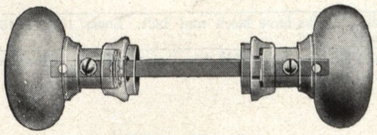
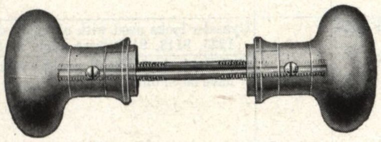
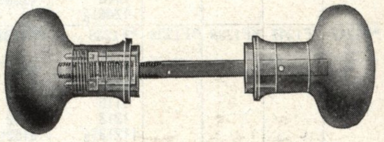

032

TYPES OF DOOR MOUNTINGS (SHANKS)


Plain Shank


Simplex Shank 2000 Series


Screwless Shank 3000 Series
(Patented)

Plain Shank Knobs—Fastened to a plain spindle by side knob screws in the side of the shank, by which with the aid of knob washers the proper adjustment is obtained.

The shank fits into the cup or thimble of the rose or escutcheon, which permits a little loose play.

Simplex Shank Knobs—Designed to overcome the looseness described above, which is common of all plain shank knobs, and to give a closer adjustment without the use of washers. These knobs are fastened to a threaded and grooved spindle by the means of side knob screws at each end. When the knobs are screwed up to the proper position, the screws are set in the groove of the spindle. This type of mounting permits a close fit with entire freedom of action, the shank resting on a turned thimble rather than fitting loosely in it as on the plain shank type.

Screwless Shank Knobs—Have all the advantages of the simplex type, with the following additional features which make them the ideal knobs to use.

The outside knob is fastened to the spindle by the means of a pin which is held in place and concealed by the thimble when in use; the inside knob has an adjustable shank which is set up on the spindle by the means of wrench, thus affording the most accurate and closest possible adjustment.

These knobs also rest on a turned thimble, and are so made that there isn't any lost play or possibility of the knobs working loose or coming apart from the spindle.

Continued on next page

GENERAL INDEX FOR CYLINDER MORTISE LOCKS

FOR USE ON HINGED DOORS

These locks have japanned iron cases, cast bronze fronts and bolts, cast and wrought bronze strikes, brass hubs, and include cylinders with Number 852 key-way, which permits the same to be either master keyed in sets or keyed alike with locks in this chart, as well as any other Russwin Cylinder Lock with the same kind of cylinder. Numbers with either "M" or "EM" suffixed indicate master or emergency master keyed feature, the cost of which is included in the price of the lock.

Locks with beveled fronts have the standard bevel of ⅛ in. on 2 in. and are not reversible. Locks with flat fronts are reversible, except where indicated by an "*" and when thus indicated the hand must be specified. This is also necessary in ordering rabbeted and beveled front locks. For hands of doors see plate 22.

Flat front locks can be furnished with beveled fronts ⅛ in. on 2 in. without additional charge. Any other bevel is special on all locks, and an extra charge will be made, depending upon the quantity ordered. Prices on application.

Special backsets as indicated below can be furnished, and without additional charge, except where indicated by "†"; when thus indicated, add for special backsets $1.50 per lock. Most locks are 1 in. wider than the backset. There are exceptions, however, and this should be carefully checked with the text covering each particular lock.

Locks requiring turn knobs are packed with No. 066½ when sold separately.

	Illustrated on plate	Name or type of lock and purpose for which best suited	Front		Size case, in.			Backsets		Spacings	Strikes,		Cylinders	Latch hub		Latch type
			Size, in.	Type	Hgt., in.	Width, in.	Thick., in.	Reg.	Special		Kind	Lip to center. in.		Size, in.	Kind	
0371	38	Cupboard or cabinet lock.....	.....	.....	2¼	1⅞	.....	¾	⅞-1-1¼-1½	.....	.....	.....	1	.....	.....	.....
0685	38	Drawer lock.....	.....	.....	2¼	1⅞	.....	¾	1¾-2-2¼-2½	.....	.....	.....	1	.....	.....	.....
†1203	39	Mortise dead lock.....	4⅛x1⅛	Flat	2½	3¾	⅝	2¾	1½-2	.....	Wrt.	No lip	1	.....	.....	.....
†1203½	39	Mortise dead lock.....	4⅛x1⅛	Flat	2½	3¾	⅝	2¾	1½-2	.....	Cast	No lip	2	.....	.....	.....
†1205	39	Mortise dead lock.....	5½x1¼	Flat	3¼	3¾	¾	2¾	1½-2-3	.....	Wrt.	No lip	1	.....	.....	.....
†1205½	39	Mortise dead lock.....	5½x1¼	Flat	3¼	3¾	¾	2¾	1½-2-3	.....	Cast	No lip	2	.....	.....	.....
†1207	39	Mortise dead lock.....	6⅞x1¼	Flat	4½	3¾	⅞	2¾	1½-2-2½-3-3¼	.....	Cast	No lip	1	.....	.....	.....
†1207½	39	Mortise dead lock.....	6⅞x1¼	Flat	4½	3¾	⅞	2¾	1½-2-2½-3-3¼	.....	Cast	No lip	2	.....	.....	.....
†1213	36	Lock for entrance door.....	7⅜x1	Flat	5	3⅝	¾	2½	2-2⅞	3⅝	Wrt.	1½	1	5/16	Solid	C.S.L.
†1223	29	Lock for entrance door.....	7⅜x1	Flat	5	3⅝	¾	2½	2-2⅞	3⅝	Wrt.	1½	1	5/16	Solid	C.S.L.
1225	28	Lock for entrance door.....	8 x1¼	Bevel	5½	3¾	¾	2¾	2-2½	3⅝	Cast	1½	1	5/16	Solid	E.C.
1225½	28	Lock for entrance door.....	8 x1¼	Bevel	5½	3¾	¾	2¾	2-2½	3⅝	Cast	1½	2	5/16	Solid	E.C.
1228	28	Heavy entrance door lock....	8 x1 5/16	Bevel	6	4	1	3	.....	3⅝	Cast	1½	1	5/16	Solid	E.C.
1228½	28	Heavy entrance door lock....	8¼x1 5/16	Bevel	6	4	1	3	.....	3⅝	Cast	1½	2	5/16	Solid	E.C.
1230EM	33	Hotel corridor lock.....	7⅝x1¼	Bevel	5½	3¾	⅞	2¾	.....	3⅝	Cast	1½	1	5/16	Rigid	D.C.
1232EM	33	Hotel corridor lock.....	7⅝x1¼	Bevel	5½	3¾	⅞	2¾	.....	3⅝	Cast	1½	1	5/16	Solid	D.C.
†*F1238	38	Lock for French door.....	8 x1¼	Flat	5½	3¾	¾	2¾	1¾-2-2½-3	3⅝	Wrt.	1½	1	5/16x⅜	Swivel	F.
1239	36	Front, vest. or office corr. dr...	8 x1¼	Bevel	5½	3¾	¾	2¾	2-2½	3⅝	Wrt.	1½	1	5/16x⅜	Swivel	E.C.
1239½	29	Front, vest. or office corr. dr...	8 x1¼	Bevel	5½	3¾	¾	2¾	2-2½	3⅝	Wrt.	1½	1	5/16x⅜	Swivel	E.C.
1239¾EM	29	Front, vest. or office corr. dr...	8 x1¼	Bevel	5½	3¾	¾	2¾	.....	2⅜-3⅝	Wrt.	1½	1	5/16x⅜	Swivel	E.C.
1241¾EM	33	Hotel corridor lock.....	8½x1¼	Bevel	6¼	3½	⅞	2½	.....	3¼	Wrt.	1½	1	5/16x⅜	Swivel	D.C.
1246¾EM	33	Hotel corridor lock.....	7 5/16x1¼	Bevel	5	3½	¾	2½	.....	3¼	Wrt.	1½	1	5/16	Rigid	D.C.
*F1247	37	Lock for French door.....	8 x1¼	Flat	5¾	2	¾	1	1¼-1½	3⅝	Cast	1 7/16	1	5/16x⅜	Swivel	F.
†*F1247½	37	Lock for French door.....	8 x1¼	Flat	5¾	.....	¾	1	1¼-1½	3⅝	Cast	1 7/16	1	5/16x⅜	Swivel	F.
1248	36	Front, vest. or office.....	7¾x1	Flat	5½	3⅞	11/16	2½	.....	3⅝	Wrt.	1½	1	5/16x⅜	Swivel	C.L.
1248½	29	Vestibule or office dr.....	7¾x1	Flat	5½	3⅞	11/16	2½	.....	3⅝	Wrt.	1½	1	5/16x⅜	Swivel	C.L.
1258½M	31	Lock for ent. dr., apt., schools	8 x1¼	Bevel	5½	3¾	¾	2¾	.....	3⅝	Cast	1½	2	5/16x⅜	Swivel	E.C.
†F1277	37	Lock for French door.....	8x1¼x½	Rabtd.	5¾	.....	¾	1	1¼-1½	3⅝	Cast	1 7/16	1	5/16x⅜	Swivel	F.
†F1277½	37	Lock for French door.....	8x1¼x½	Rabtd.	5¾	.....	¾	1	1¼-1½	3⅝	Cast	1 7/16	1	5/16x⅜	Swivel	F.
†1294	39	Mortise night latch.....	5⅛x1⅛	Flat	3¼	3½	¾	2¾	2½-3	.....	Wrt.	1¼	1	5/16	Solid	E.C.
†1294½	39	Mortise night latch.....	5⅛x1⅛	Flat	3¼	3½	¾	2¾	2½-3	.....	Wrt.	1¼	2	.....	.....	E.C.
1446EM	33	Hotel corridor lock.....	8 x1¼	Bevel	5½	3⅜	⅞	2½	.....	3⅝	Cast	1½	2	5/16x⅜	Swivel	D.C.
1456	29	Front, vest. office corr. dr....	8 x1¼	Bevel	5½	3¾	¾	2¾	2½	3⅝	Cast	1½	1	5/16x⅜	Swivel	E.C.
1456¾	29	Front, vest. office corr. dr....	8 x1¼	Bevel	5½	3¾	¾	2¾	2½	3⅝	Cast	1½	1	5/16x⅜	Swivel	E.C.
1457	29	Front, vest. office corr. dr....	8⅜x1¼	Bevel	6	4¾	13/16	2¾	3¼	3⅝	Cast	1½	1	5/16x⅜	Swivel	C.L.
1457½M	31	Lock for ent. dr., apt., schools	8⅜x1¼	Bevel	6	4¾	13/16	2¾	3¼	3⅝	Cast	1½	2	.....	Swivel	C.L.
1458½M	31	Lock for ent. dr., apt., schools	8 x1¼	Bevel	5½	3¾	¾	2¾	2½	3⅝	Cast	1½	2	.....	Swivel	E.C.
9098	30	Lock for store door ent. hdle.	7 x1 3/16	Flat	5	3¾	¾	2¾	2½	4¼	Wrt.	1½	2	.....	.....	S.C.
9098½	30	Lock for store door ent. hdle.	7x1⅜x½	Rabtd.	5	3¾	¾	2¾	2½	4¼	Wrt.	1½	2	.....	.....	S.C.
†9118	30	Lock for store door ent. hdle.	7½x1¼	Flat	5	3¾	¾	2¾	2½	4¼	Wrt.	1½	2	.....	.....	S.C.
†9119	30	Lock for store door ent. hdle.	7½x1¼	Flat	5	3¾	¾	2¾	2½	4¼	Wrt.	1½	1	.....	.....	S.C.
9132	30	Lock for store door ent. hdle.	7¾x1⅜	Bevel	5	3¾	1	2¾	.....	4¼	Cast	1½	2	.....	.....	S.C.
9152½	31	Lock for store door ent. hdle.	7⅞x1¼	Bevel	5	3¾	¾	2¾	.....	4¼	Cast	1½	2	.....	.....	C.L.

Note: For Unit Locks see Plate Nos. 24, 25, 26 and 27.

CYLINDER LOCKS GROUPED ACCORDING TO BACKSET

CYLINDER LOCKS GROUPED ACCORDING TO BACKSET

Numbers Marked "" Have Beveled Fronts and Are Not Reversible and Hand Must Be Specified. "†" Indicates Rabbeted Front—Short Side Measurement. Bold Face Numbers Indicate Regular Backset for the Lock*

Backsets, in.								Name and type of lock and purpose for which it is best adapted.
1	1½	1¾	2	2½	2¾	3	3¼	
			*1225 *1225½	*1225 *1225½	***1225** ***1225½**	***1228** ***1228½**		Cylinder locks with latch and bolt for heavy entrance doors.
				*1458½M	***1457½M** ***1458½M** ***1258½M**		*1457½M	Cylinder locks with latch and automatic means for dead locking latch when door is closed. Used for entrance to apartment houses, schools, and public buildings. Locks are under control of master key.
				*1456 *1456¾	***1456** ***1456¾** ***1457**		*1457	Cylinder locks with latch and automatic means for deadlocking latch when door is closed, and with stops in face of lock. Used for front, vestibule and office doors.
			*1239 *1239½	*1239 *1239½ **1248** **1248½**	***1239** ***1239½** ***1239¾**			Front, vestibule and office doors. Cylinder locks with latch and with latch and bolt. Suffix "½" indicates latch only. Locks have stops in face.
***F1247**	***F1247**	*F1238	*F1238	*F1238	***F1238**	*F1238		Cylinder locks with French spring for lever handles. For front, vestibule and office doors. Stops in face.
				9098 9118 9119 **1213** **†1213½** **1223**	**9098** **9118** **9119** ***9132** ***9152½**			Cylinder locks used with entrance door handles. Locks have latch and bolt. Locks 1213, 1213½, 1223, 9118, 9119 have stops in face of lock.
				***1241¾EM** ***1246¾EM** ***1446EM**	***1230EM** ***1232EM**			Cylinder locks for hotel corridor locks. Locks 1230EM and 1232EM have latch and bolt. Other locks have latch only.
					***9452** ***9458**			Cylinder locks used with fire exit bolts.
				1294 1294½	**1294** **1294½**	1294 1294½		Cylinder mortise night latches.
	1203 1203½ 1205 1205½ 1207 1207½		1203 1203½ 1205 1205½ 1207 1207½	1205 1205½ 1207 1207½	**1203** **1203½** **1205** **1205½** **1207** **1207½**	1205 1205½ 1207 1207½	1207 1207½	Cylinder mortise dead locks. Suffix "½" indicates two cylinders.

GENERAL INDEX FOR MORTISE BITTED KEY LOCKS

LOCKS, LATCHES AND DEAD LOCKS ARRANGED NUMERICALLY

These locks have japanned iron cases, cast bronze fronts and bolts, cast and wrought bronze strikes, but can be furnished with brass fronts and cast and wrought brass strikes. They are furnished with solid steel nickelplated keys, and locks operated by keys of the same class can be master keyed together. Locks with either "M" or "EM" suffixed indicate master or emergency key feature; the cost of which is included in the price of the lock.

Locks with beveled front have the standard bevel of ⅛ in. on 2 in., and are not reversible. Locks with flat fronts are reversible, except where indicated by an "*" and when thus indicated, the hand must be specified. This is also necessary when ordering rabbeted and beveled front locks. For hand of doors, see plate 22.

Flat front locks, grade of No. 380¾ and better can be furnished with beveled fronts ⅛ in. on 2 in. without additional charge. Any other bevel is special on all locks, and an extra charge will be made, depending upon the quantity orders. Prices on application.

Special backsets as indicated in this chart can be furnished, and without additional charge, except where indicated by a "†"—when thus indicated. add for special backsets as noted on the page illustrating the lock. Most locks are 1 in. wider than the backset. There are exceptions, however, and this should be carefully checked with the text covering each particular lock.

Lock Number	Illustrated on plate	Name or type of lock and purpose for which best suited	Front		Case			Backset, in.		Spacing, in.	Strikes		Tumblers	Changes	Latch hub		Key	Bolt hub, in.	Latch construction
			Size, in.	Type	H'ght, in.	Width, in.	Thickness, in.	Reg.	Spec.		Kind	Lip to center, in.			Size, in.	Kind			
*0015¾EM	34	Hotel corridor	6½x1¹⁄₁₆	Flat	4⅝	3⅜	⅝	2⅝	......	2³⁄₁₆x3⁹⁄₁₆	Cast	1¼	3	300	⁵⁄₁₆	Solid	877	³⁄₁₆	D.C.
021	39	Knob latch	3½x ¾	Flat	1¾	3⅜	⁹⁄₁₆	2⅝	......	......	Wrt.	1	....	....	⁵⁄₁₆	Solid	......	....	S.C.
0022¾	34	Lock for bath or bedroom	6¾x1¹⁄₁₆	Flat	4⅝	3½	⅝	2¾	......	1⅞x3³⁄₁₆	Cast	1⅜	3	48	⁵⁄₁₆	Solid	871	³⁄₁₆	D.C.
025	39	Knob latch	4 x1⅛	Flat	2¼	3½	¾	2¾	2¼-3	......	Wrt.	1½	....	....	⁵⁄₁₆	Solid	......	....	D.C.
026	39	Knob latch	3¼x ⅞	Flat	1⅝	3½	⅝	2¾	2-2½	......	Wrt.	1⅛	....	....	⁵⁄₁₆	Solid	......	....	S.C.
028	39	Knob latch	4 x1¼	Flat	2½	3⅝	¾	2¾	2½-3¼	......	Cast	1½	....	....	⁵⁄₁₆	Solid	......	....	D.C.
042	39	Knob latch	3¼x ⅞	Flat	1½	3¼	⅝	2½	2¾	......	Wrt.	1	....	....	⁵⁄₁₆	Solid	......	....	S.C.
043	39	Knob latch	3 x ⅞	Flat	1¼	3	½	2½	......	......	Wrt.	1	....	....	⁵⁄₁₆	Solid	......	....	S.C.
076¾	39	Dead lock	3¾x1	Flat	2½	3¼	⅝	2½		......	Wrt.	No lip	3	36	....	......	563	....	......
078¾	39	Dead lock	4 x1	Flat	2¼	3½	⅝	2¾	1⅝-2¼	......	Wrt.	No lip	3	48	....	......	871	....	......
0125	30	School house lock	6½x1	Flat	4½	3⅝	⅝	2¾	......	2⅝	Cast	1¼	3	48	⁵⁄₁₆	Swiv.	871	....	C.L.
00125	30	School house lock	6½x1	Recessed	4½	3⅝	⅝	2⅞	......	2⅝	Cast	1¼	....	....	⁵⁄₁₆	Swiv.	871	....	C.L.
223	37	Comm. and bathroom door lock	5¼x ⅞	Flat	3½	3⅛	½	2⅜	......	2³⁄₁₆	Wrt.	1	....	....	⁵⁄₁₆	Swiv.	......	³⁄₁₆	S.E.
223½	37	Comm. and bathroom door lock	5¼x ⅞	Flat	3½	3⅛	½	2⅜	......	2³⁄₁₆	Wrt.	1	....	....	⁵⁄₁₆	Swiv.	......	³⁄₁₆	S.E.
G231	38	French door lock	6 x1	Flat	4	2⅜	⅝	1½	1¾	2⅝	Cast	1¼	....	....	⁵⁄₁₆	Solid	......	³⁄₁₆	G.
233	37	Comm. and bathroom door lock	5½x ⅞	Flat	3½	3¼	⅝	2½	......	2³⁄₁₆	Wrt.	1	....	....	⁵⁄₁₆	Solid	......	³⁄₁₆	E.
233½	37	Comm. and bathroom door lock	5½x ⅞	Flat	3½	3¼	⅞	2½	......	2³⁄₁₆	Wrt.	1	....	....	⁵⁄₁₆	Swiv.	......	³⁄₁₆	E.
236	37	Comm. and bathroom door lock	5⅞x1	Flat	4	3½	⅝	2¾	2-2½	2⅝	Wrt.	1¼	....	....	⁵⁄₁₆	Comp.	......	³⁄₁₆	D.C.
236½	37	Comm. and bathroom door lock	5⅞x1	Flat	4	3½	⅝	2¾	2-2½	2⅝	Wrt.	1¼	....	....	⁵⁄₁₆	Swiv.	......	³⁄₁₆	D.C.
238	37	Comm. and bathroom door lock	6¾x1⅛	Flat	5	3½	¾	2¾	......	3¾	Cast	1½	....	....	⁵⁄₁₆	Solid	......	³⁄₁₆	D.C.
238½	37	Comm. and bathroom door lock	6¾x1⅛	Flat	5	3½	¾	2¾	......	3¾	Wrt.	1½	....	....	⁵⁄₁₆	Swiv.	......	³⁄₁₆	D.C.
355	38	French door lock	5¼x ⅞	Flat	3⅝	2¼	⅝	1½	1¼-1¾	2³⁄₁₆	Wrt.	1½	1	12	⁵⁄₁₆	Swiv.	558¾	....	F.
358	38	French door lock	5¼x1x½	Rabtd.	3⅝	2¼	⅝	1½	¾-1¼	2³⁄₁₆	Wrt.	1½	1	12	⁵⁄₁₆	Swiv.	558¾	....	F.
0370	36	Mortise knob lock	5½x ⅞	Flat	3½	3¼	⅝	2½	......	2³⁄₁₆	Wrt.	1	1	12	⁵⁄₁₆	Solid	558¾	....	E.
0370¾	36	Mortise knob lock	5½x ⅞	Flat	3½	3¼	⅝	2½	......	2³⁄₁₆	Wrt.	1	3	36	⁵⁄₁₆	Solid	559	....	E.
380¾	36	Mortise knob lock	5½x1	Flat	3½	3⅜	⅝	2⅝	......	2³⁄₁₆	Wrt.	1¼	3	48	⁵⁄₁₆	Solid	871	....	D.C.
*G381¾	38	French door lock	6 x1	Flat	4	2¼	⅝	1½	1¼-1¾-2	2⅝	Wrt.	1¼	3	48	⁵⁄₁₆	Solid	871	....	G.
382¾	36	Mortise knob lock	6¼x1¹⁄₁₆	Flat	4	3½	⅝	2¾	......	2⅝	Wrt.	1¼	3	48	⁵⁄₁₆	Comp.	871	....	D.C.
384¾	36	Mortise knob lock	6 x1	Flat	4	3½	⅝	2¾	2½	2⅝	Wrt.	1¼	3	48	⁵⁄₁₆	Comp.	871	....	D.C.
387¾	35	Mortise knob lock	6 x1¹⁄₁₆	Flat	4	3½	⅝	2¾	......	2⅝	Wrt.	1½	4	1000	⁵⁄₁₆	Comp.	557	....	D.C.
G391¾	38	French door lock	6x1⅛x½	Rabtd.	4	2¼	⅝	1½	1-1¼-1¾-2	2⅝	Wrt.	1½	3	48	⁵⁄₁₆	Swiv.	871	....	G.
*444¾	30	School house classroom	7⅜x1¹⁄₁₆	Flat	5½	3¾	⅝	2¾	......	2⅝	Cast	1¼	3	48	⁵⁄₁₆x⅜	Swiv.	871	....	D.C.
608¼EM	34	Lock for hotel corridor	8½x1⅛	Bevel	6¼	3½	¾	2¾	......	2⅜x4	Cast	1½	4	4000	⁵⁄₁₆	Comp.	557	....	D.C.
609¼EM	34	Lock for hotel corridor	7⅝x1¹⁄₁₆	Bevel	5¾	3½	⅝	2⅝	......	2x3½	Cast	1½	3	2160	⁵⁄₁₆	Comp.	547	....	DC..
610¼EM	34	Lock for hotel corridor	7⅝x1¹⁄₁₆	Bevel	5¾	3½	⅝	2⅝	......	2x3½	Cast	1½	3	2160	⁵⁄₁₆	Comp.	547	....	D.C.
0786	39	Dead lock	5⅛x1⅛	Flat	3	3½	¾	2⅝	1½	......	Cast	No lip	4	1000	....	......	557	....	......
1121¾M	35	Hotel comm. door lock	7½x1⅛	Flat	5⅛	3½	¾	2¾	......	2⅛x3⁹⁄₁₆	Cast	1½	4	1000	⁵⁄₁₆	Comp.	557	³⁄₁₆	D.C.
1122¾M	35	Hotel comm. door lock	7½x1⅛	Flat	5⅛	3½	¾	2¾	......	2⅛x3⁹⁄₁₆	Cast	1½	4	1000	⁵⁄₁₆	Comp.	557	³⁄₁₆	D.C.
1133¾M	35	Hotel comm. door lock	7⅝x1	Flat	5¾	3½	⅝	2¾	......	1¾x4⅛	Cast	1½	3	300	⁵⁄₁₆	Comp.	877	³⁄₁₆	D.C.
1134¾M	35	Hotel comm. door lock	7⅝x1	Flat	5¾	3½	⅝	2¾	......	1¾x4⅛	Cast	1½	3	300	⁵⁄₁₆	Comp.	877	³⁄₁₆	D.C.
1384¾	35	Mortise knob lock	6½x1	Flat	4¾	3½	⅝	2¾	......	2⅝	Cast	1¼	3	48	⁵⁄₁₆	Comp.	871	....	D.C.
1387¾	35	Mortise knob lock	6½x1¹⁄₁₆	Flat	4¾	3½	¾	2¾	......	2⅝	......	1½	4	1000	⁵⁄₁₆	Comp.	557	....	D C.

BITTED KEY LOCKS GROUPED ACCORDING TO BACKSET

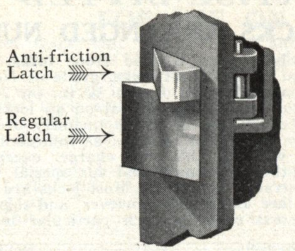
Lock Numbers Marked "" Have Beveled Fronts and Are Not Reversible. Bold Face Numbers Indicate Regular Backset*

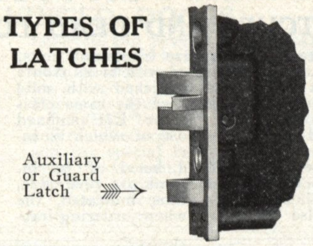
Backset, in.													Name and type of lock and purpose for which it is best adapted
1¼	1½	1⅝	1¾	2	2¼	2⅜	2½	2⅝	2¾	2⅞	3	3¼	
				026	025		026 028 **042** **043**		**025** **026** **028** 042		025	028	Mortise knob latches.
				236 236½		**223** **223½**	**233** **233½** 236 236½		**236** **236½** **238** **238½**				Mortise knob locks for communicating and bath room doors. These locks have latch and deadbolts, the deadbolts being thrown by turn knobs. The suffix "½" indicates a lock with two turn knobs.
G381¾	**G231** **G381¾** **G391¾** **355** **358**		G231	G381¾									Mortise knob locks for French or narrow doors. Prefix "G" denotes a gun metal spring. These locks are not reversible.
							0370 **0370¾** 384¾	**380¾**	**382¾** **384¾** **387¾** **1384¾** **1387¾**				Mortise knob locks.
								***609¼EM** ***610¼EM** **0015¾EM**	***608¼EM**				Hotel corridor locks. These locks have latch and two dead bolts. Throwing bolt from inside deadlocks against all keys except emergency key.
									1121¾ **1122¾** **1133¾** **1134¾** **0022¾**				Bath room and communicating room locks. These locks have latch bolt and two dead bolts. These locks can be master keyed.
									0125 **444¾**	**00125**			School house locks—knob is always operative from inside.
		078¾			078¾		**076¾**	**0786**	**078¾**				Mortise dead locks.

Continued on next page

DEFINITIONS AND TERMS APPLIED TO RUSSWIN LOCKS

TYPES OF LATCHES





Anti-friction Latch—A small additional latch connected with the regular latch bolt in high grade cylinder locks, which engages the strike and retracts the regular latch.

It prevents friction between latch and strike, strain on the lock, and permits the door to close more easily.

Recommended for doors on which Door Closers are used.

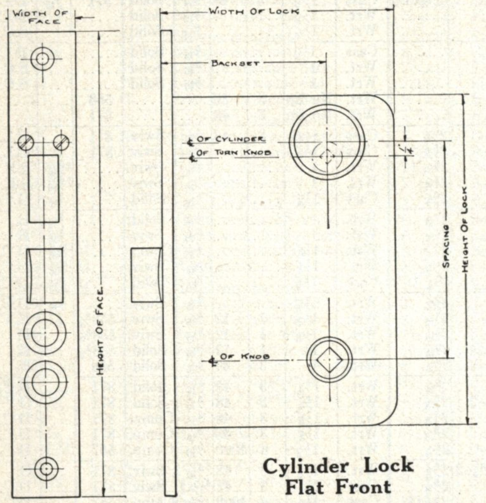
Auxiliary or (Guard) Latch—A supplemental latch used for dead-locking locks which do not have dead bolts.

An Auxiliary Latch does not engage in, but rides on the surface of the strike. This holds the Auxiliary Latch depressed, and when the outside knob has been set, the regular latch bolt cannot be retracted by any means other than the key from outside and knob inside. It also prevents any manipulation of stops in face of lock when door is closed.

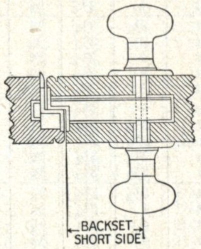
Russwin Auxiliary Latches are of the improved swinging type, permitting the easy closing of door.

Swinging or Hinged Latch—In this type of construction the latch is hinged at the inner face of the lock front and swings into the lock case on contact with the strike. Affords the easiest action with the least friction.

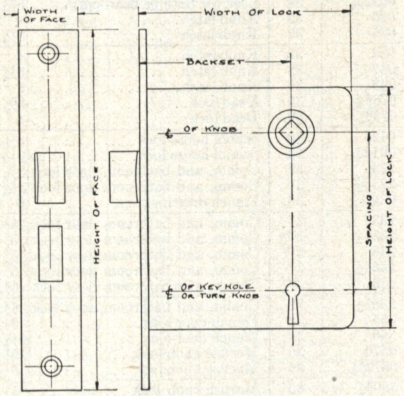
BACKSET SPACING AND FRONTS OF LOCKS



Cylinder Lock Flat Front



Rabbeted Front Locks



Bitted Key Lock Flat Front

Spacing—This is the vertical distance between the center of the knob hub and the center of the cylinder, keypost or turnpiece hub.

Backset—This is the horizontal distance from the face of a lock to the center line of its keyhole or hub.

Method of measuring backset of locks is as follows—

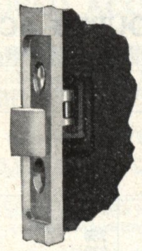
Flat Front Locks—Outside face of the front to the center of the keyhole or hub.

Beveled Front Locks—Center of the outside face of the front to the center of the keyhole or hub.

Rabbeted Front Locks—In this catalogue the short side measurement is given (see cut). When ordering special backsets, the number of the lock and the backset wanted should be specified. When backset is mentioned it will be interpreted as meaning the distance on the short side and that the regular depth of rabbet furnished with the lock specified is required. Locks having depth of rabbet other than regularly listed will be furnished to order at additional cost. When ordering special depths of rabbet send full-size detail of door stiles at the point where the lock and strike meet.

Rabbeted Front Locks are not reversible and hand of door should be specified.

Beveled Front Locks—The regular bevel is ⅛-inch on 2 inches. All other bevels are special and an extra charge will be made for them. Locks 380, and all higher grade, will be furnished with fronts beveled ⅛ on 2-inches without extra charge. Any special bevels will be charged extra. Beveled front locks are not reversible and orders should specify the hand of lock wanted. See plate No. 22 for Bevel and Hand of Doors. Reversible locks are beveled only to order.



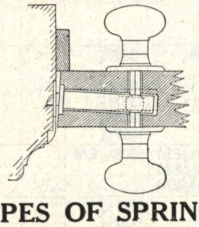
Recessed Front

Recessed Front Lock—One having an especially constructed front and strike which, when interlocked, guards or protects the latch bolt against attack through the crevice of the door. Especially adapted for use upon doors of Insane Asylums, and other doors opening outward (see cut).

Rounded Front Locks—Cylinder Mortise Dead Locks can be furnished with rounded fronts of standard radius to conform to the edge of double-acting doors, without extra charge. Standard radius, 2¼ inches.

HUBS AND LATCH BOLT

Hubs—Brass Compensating—Our compensating hub is of the brass ball construction, which will allow compensation in any direction. The use of this type of compensating hub is a simple and effective means of relieving any cramping or binding of the knobs when the lock case is not applied in a line exactly parallel with the face of the door stile. It also permits the use of a flat front lock to a door having its edge slightly beveled (see cut).



Latch Bolt—Easy Spring—Used in all good locks. The term Easy Spring when applied to a lock designates that the latch is operated by a separate spring from the knob. Formerly the knob and latch were actuated by one spring. This necessitated a heavy spring and made the closing of the door hard as the latch was stiff. With the introduction of two springs a lighter spring could be used on the latch and the latch operated easily, thus the term Easy Spring.

TYPES OF SPRINGS

French Spring—(see Plate 21 for illustration)—This is a heavy type of spring which is usually applied to the hub of a lock, intended to offset the overbalancing effect of the lever handle, thereby relieving the strain which would otherwise be thrown on the sensitive spring of the latch bolt. Locks equipped with this type of spring are indicated by prefix "F."

Gun Spring—(see Plate 21 for illustration)—A heavy flat spring of special construction specially adapted for use with lever handles. It is designed to give the full resiliency of the spring and will not break from crystallization. Locks equipped with this type of spring are indicated by prefix "G."

Continued on next page

THE DETERMINING FACTORS IN QUALITY OF RUSSWIN LOCKS

The lock constructions herewith shown cover practically the entire Russwin line, and are for purpose of comparison only.

The three essential qualities of a lock are:

1st. That its bolt should be guarded against operation by keys other than those to which it has been fitted.

Security is obtained by—

(a) The number of tumblers.
(b) Different sections of keyway.
(c) Wheel wards which are small lugs on the inside of the lock, in the path of the key, obstructing any key except the one to which it has been fitted.

Note: Security is imparted directly as any one of the above are eliminated.

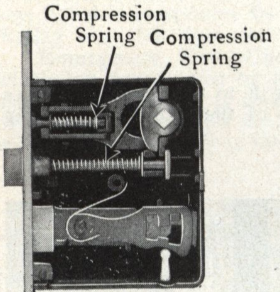
2nd. That the latch should be controlled by an independent spring, of a resilience and ease of action, that the door may be closed easily against its resistance, when it comes in contact with the strike.

3rd. That the knob or lever handle mechanism should be controlled by springs of sufficient power to insure the return of same to their normal position.

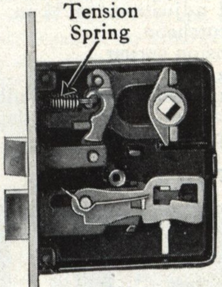
Springs:

The types of springs used in a lock are arranged in a sequence of quality as follows:

French	Springs	For use with lever Handles only.
Gun	Springs	
Compression	Springs	Used with Knobs.
Tension	Springs	
Coil	Springs	
Lever	Springs	


Compression Spring
Compression Spring

384
Type DC


Tension Spring

0370
Type E

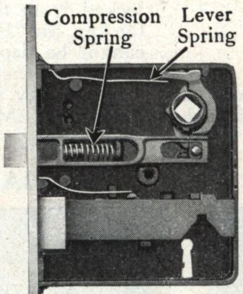
BITTED KEY LOCKS

Lock 384 has double compression springs.

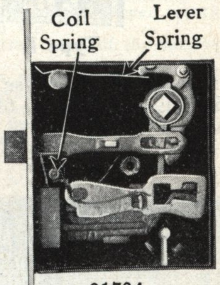
Lock 0370 has the extension easy spring.

Lock 0389 has compression and lever springs.

Lock 01734 has semi-easy spring.

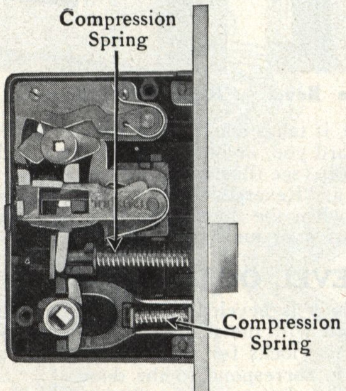

Compression Spring
Lever Spring

0389
Type K

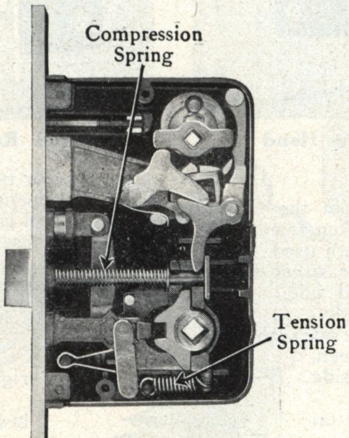

Coil Spring
Lever Spring

01734
Type SE

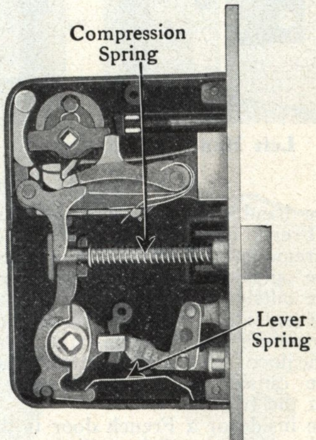
CYLINDER LOCKS USED WITH KNOBS


Compression Spring
Compression Spring

1246¾EM
Type DC
Double Compression Spring


Compression Spring
Tension Spring

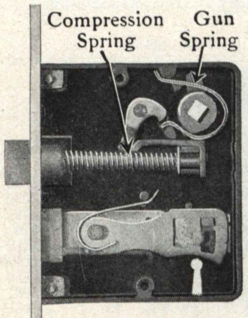
1238
Type EC
Easy Compression Spring


Compression Spring
Lever Spring

1248
Type CL
Compression and Lever Springs

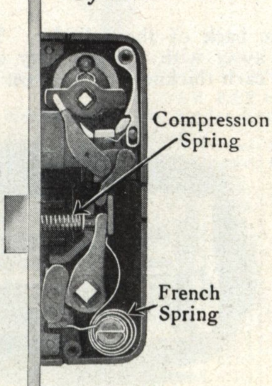
LOCKS USED WITH LEVER HANDLES

Bitted Key Lock


Compression Spring
Gun Spring

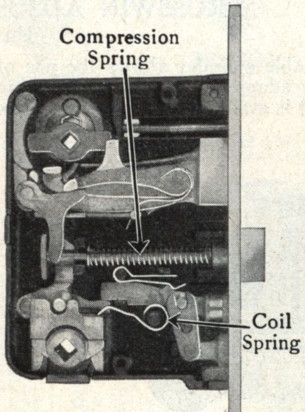
G384
Type G
Gun Spring

Cylinder Lock

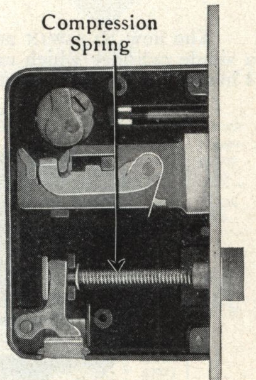

Compression Spring
French Spring

F1247
Type F
French Spring for Narrow Stiles

CYLINDER LOCKS STORE DOOR HANDLES


Compression Spring
Coil Spring

1213
Type CSL
Compression and Slide Lever


Compression Spring

9098
Type SC
Single Compression Springs

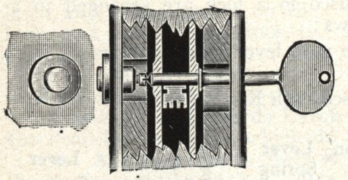
RUSSWIN | TYPES OF RUSSWIN LOCK CONSTRUCTION | PLATE 21

Continued on next page

DEFINITIONS AND TERMS CONTINUED

INDICATOR

To indicate if room is occupied. This indicator is not included in the price of locks.

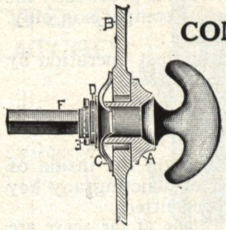


Type B

Type B (Patented)—When locks are supplied with this indicating device, the outside escutcheon has a "Push Button" attachment.

When the door is locked from the inside by the key, the "Push Button" cannot be depressed, thus indicating that the room is occupied. For use with locks operated by key as Nos. 608¼EM, 609¼EM, 610¼EM, 1230EM, 1232EM, 1241¾EM and 1246¾EM.

COMPENSATING TURN PIECE



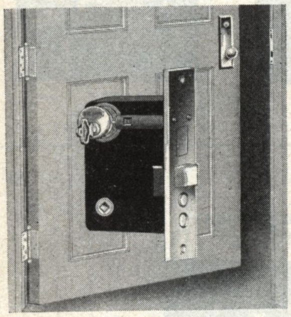
067 (Patented)

This Turn Piece is furnished with Cylinder Locks only when ordered with a combined rose and escutcheon requiring a Turn Piece.

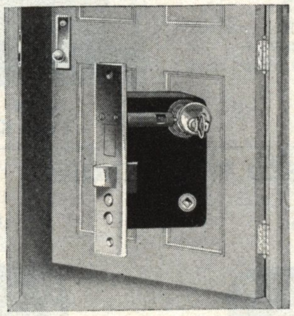
The advantages are that it allows perfect alignment in application, thus insuring free action and reducing friction to a minimum.

A: Collar on escutcheon having a vertical adjustmentof ⅛ in.
B: Escutcheon.
C: Tension spring.
D: Washer.
E: Pin which fastens spindle F to the turn and allows both vertical and horizontal play of the spindle eliminating any tendency to bind.

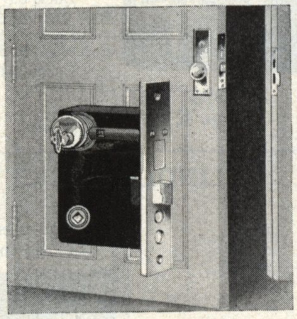
THE HAND AND BEVEL OF DOORS



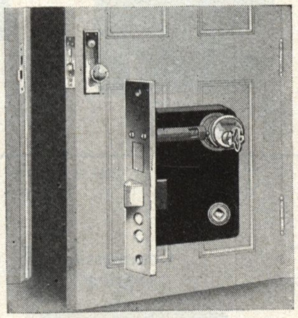
Left Hand



Right Hand



Left Hand Reverse Bevel



Right Hand Reverse Bevel

HAND OF DOOR

The hand of a door is determined from the Outside, except French doors on which the hand is taken from Inside, when cremone bolts or casement fasteners are used.

The outside of an Entrance door is the street side.

The outside of a Room door is the hall side.

The outside of a Closet is the room side.

The outside of a Communicating door is the side from which, when the door is closed, the butts can not be seen.

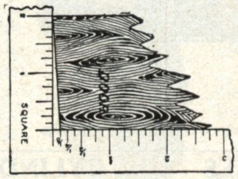
The outside of Twin doors is the side between the two doors.

The inside of a French door is the side on which the cremone bolt is applied.

Standing outside the door if the butts are on the right it is a right hand door; if on the left it is a left hand door.

If, when standing outside, the door opens from you, or inward, it takes a lock with regular bevel latch bolt; if it opens toward you, or outward, it takes a lock with reverse bevel latch bolt (see illustration above.

Locks described as "Reversible" can be used on doors of either hand, except when the door is beveled. In this case the hand and bevel of door must be given.



BEVEL OF DOOR

A door is beveled when its edge is not at right angle with the surface.

Mortise locks for such doors require fronts beveled to correspond to the door.

Bevel is determined by placing square on the door.

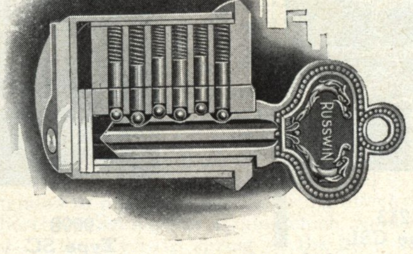
State thickness of door and the distance that one edge is back of the other.

The standard bevel is ⅛ inch on 2 inches.

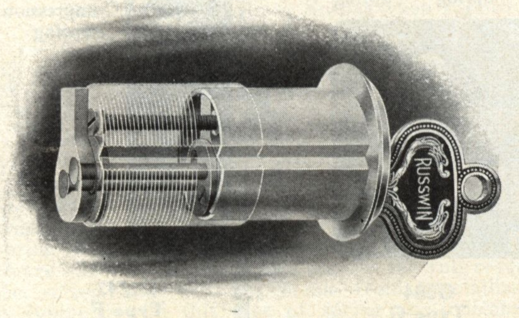
RUSSWIN ADJUSTABLE CYLINDERS

Patented

The new Russwin adjustable cylinder allows the use of a single cylinder which can be adapted to doors from 1¾ to 4 inches thick. The adjustment is made by an adjusting screw at the back of the cylinder. The new adjustable cylinder does away with the necessity of ordering special cylinders to fit each thickness of door on the job.



Cylinder Not Extended



Cylinder Extended

Continued on next page

DESCRIPTIONS OF MASTER KEYS AND THEIR OPERATIONS

Applying to both Russwin cylinder and bitted key locks, but only to such locks as are described as adapted to the various key systems

Guest or Change Key—Operates only the lock to which it is fitted.

Closet door locks in rooms can be constructed, when desired, so that they are controlled by the guests, or change key only. In this case they are not subject to any of the various master keys, except the emergency key.

Maids' Master Key—Operates one group of locks.

Grand Master Key—Operates a number of groups of locks, each group being under control of a maids' master key.

Master Guard Key—Operates any locks subject to the maids' master, grand master or display keys. It is so constructed that when used on locks ordered subject to a guard key, it makes inoperative the maids' master, grand master and display keys, but does not act against an emergency key.

Emergency Key—Operates any lock in the system which has been locked by the guests', maids' master, grand master, master guard or display keys. It controls the functions of the lock the same as the master guard key and in addition will operate when bolt is thrown from the inside even though the guests' key remains in the lock. This key can also be used to make inoperative all keys except the master guard key. It can also be used as a master guard or shut out key.

The Display or Individual Guard Key—This is a guests' key so constructed that it makes inoperative the maids' master and grand master keys. Only the emergency key will then operate. It is designed for rooms requiring special protection and assures the holder absolute security against any key except the emergency key.

Note: Attention is called to the fact that the guests' key or the turn piece will always operate to unlock the door from the inside even when it has been locked from the outside by any one of the various types of master keys.

When ordering master keyed locks the name of the building on which they are to be used should be given so that a proper record of the key system furnished may be kept on file.

Orders should specify the quantity of master keys, of the various types, required.

Duplicate master keys are furnished to sample, and then only upon receipt of proper requisition from the owner or authorized agent.

Russwin Cylinder locks are master keyed and grand master keyed without the use of a supplemental cylinder. Both regular and master keyed cylinders are interchangeable in the same lock.

MAISON SYSTEM

The Maison and Maison Master systems are applicable only to Russwin Cylinder locks.

Under the Maison system one or more locks are subject to all the keys of other locks in the building. As used in Apartment House work the locks to the various apartments are all different but each one acts as a master key upon the entrance door locks.

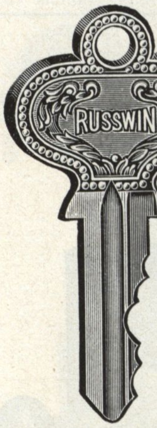
No extra charge is made for locks except for those subject to the master key.

The Maison Master system is identical with the Maison system except that all locks in the building are subject to a master key.

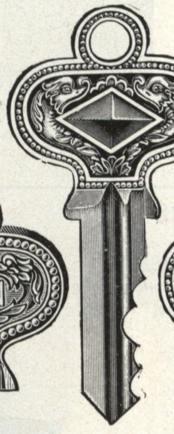
Locks ordered for entrance doors under the Maison system should be ordered master keyed.

CYLINDER MASTER KEYS

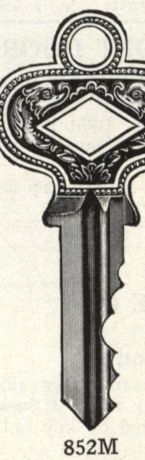
For Residential Work



852

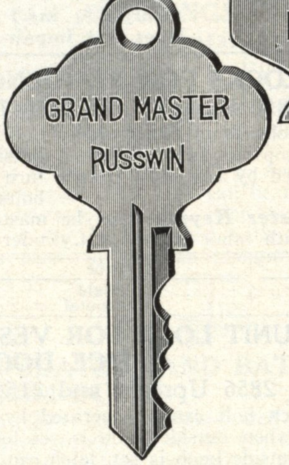


852GM

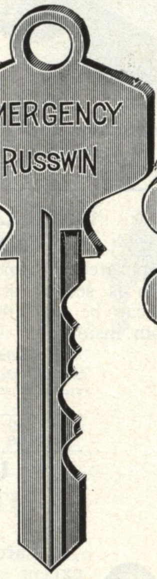


852M

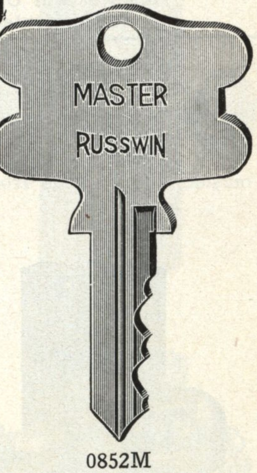
For Hotels and Office Buildings



0852GM



0852EM



0852M

MASTER KEYABLE BITTED KEY LOCKS

Locks Having Same Master Key can be Master Keyed Together in Sets. Master Keys 647 and 677 will interchange.

Lock		Change key	Master keyed change key			Master key			Grand master key	Emergency key
No.	Plate No.	Class No.	Class No.	Tumblers	Changes	Class No.	Sets	Different	Class No.	Class No.
0015¾EM	34	877	877	3	300	677	6 of 50	300	677G	....
0022¾	34	871	877	3	300	677	6 of 50	300	677G	....
076¾	39	563	563	3	300	663	3 of 100	300	663G	....
078¾	39	871	877	3	300	677	6 of 50	300	677G	....
0125	30	871	877	3	300	677	6 of 50	300	677G	....
00125	30	871	877	3	300	677	3 of 100	300	677G	....
0370¾	36	559	563	3	300	663	3 of 100	300	663G	....
380¾	36	871	877	3	300	677	6 of 50	300	677G	....
G381¾	38	871	877	3	300	677	3 of 100	300	677G	....
382¾	36	871	877	3	300	677	6 of 50	300	677G	....
384¾	36	871	877	3	300	677	6 of 50	300	677G	....
387¾	35	557	557	4	1000	688	20 of 50	1000	688G	....
G391¾	38	871	877	3	300	677	3 of 100	300	677G	....
444¾	30	871	877	3	300	677	3 of 100	300	677G	....
608¼EM	34	557	557	4	4000	688	1 to 20	4000	688G	688E
609¼EM	34	547	547	3	2160	647	24 of 90	2160	647G	647E
610¼EM	34	547	547	3	2160	647	24 of 90	2160	647G	647E
0786	39	557	557	4	1000	688	20 of 50	1000	688G	....
1121¾M	35	557	557	4	1000	688	20 of 50	1000	688G	....
1122¾M	35	557	557	4	1000	688	20 of 50	1000	688G	....
1133¾M	35	877	877	3	300	677	6 of 50	300	677G	....
1134¾M	35	877	877	3	300	677	6 of 50	300	677G	....
1384¾	35	871	877	3	300	677	6 of 50	300	677G	....
1387¾	35	557	557	4	1000	688	20 of 50	1000	688G	....

THE RUSSWIN UNIT LOCK SETS

(Patented)

The Unit Lock offers everything to be desired in a lock. It represents the height of the art of lock making. It is easily applied, requiring no mortising. A rectangular hole only 1¾-in. deep is cut into the stile of the door with a saw and one hole is bored to receive the knob.

The inside and outside escutcheons are mechanically doweled together assuring perfect alignment, eliminating the binding of the knob which so frequently occurs with the ordinary lock set.

The long swinging latch is actuated by a phosphor bronze spring and the knobs by a separate phosphor bronze spring. This allows the use of a light spring for the latch, insuring easy action, and a heavy spring in the knobs, bringing them firmly back to a normal position and preventing rattling.

The knobs are seamless solid bronze castings. The shanks are self-lubricating and absolutely screwless, each being fitted to long bracket bearing thimbles of the supporting type. The self-lubricating shanks reduce friction to a minmum.

The lock is controlled by a cylinder located in the concave of the knob, thereby giving security and the assurance of finding the key hole easily.

All parts of the "Unit Lock"—knobs, escutcheons and lock frame, are solid bronze metal castings, with the exception of the locking mechanism, which is of heavy hard rolled brass formed in dies, insuring uniformity and imparting the greatest possible strength.

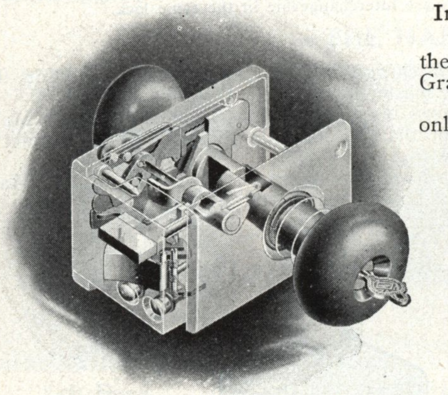
Attention is called to the two types of safety devices. The auxiliary latch safeguards against outside manipulation and the deadlocking plunger safeguards the latch and prevents operation of the stops when the door is closed.

Master Keying—The cylinders used in Unit Locks are identical with the Russwin Ball Bearing Cylinders, and are also subject to the same master keying systems.

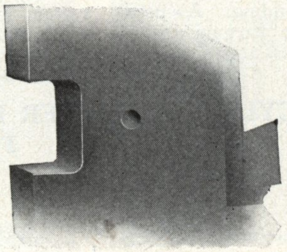
Important Note Regarding Designs

Unit Lock Trim can be obtained in the following designs: Camden, Copley, Granby, Madison, Niantic; see plate 27.

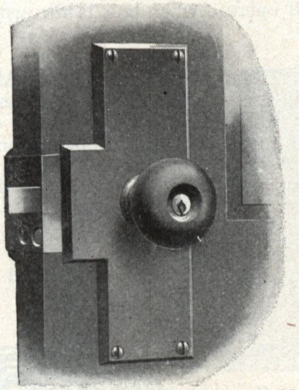
The illustrations show general type only.



Phantom View of Construction and Parts of the Russwin Unit Lock Set; Horizontal Type



To Install the Lock, the Small Amount of Cutting Required (Only 1¾ ins.) of the Stile, Does Not Impair Its Strength



A Vertical Type or 2800 Line Unit Lock Installed

Note difference between this lock and the horizontal type as illustrated in phantom view

UNIT LOCKS FOR RESIDENCE FRONT DOORS

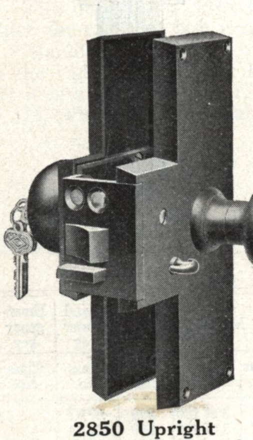
2850 Upright and 2150 Horizontal Type

Latch bolt can be operated by knobs from either side except when outside knob is set by stops in face of lock. When knob is set, latch can be operated by key only from outside, and by knob from inside.

In addition it has a dead bolt operated by key from outside and by turn knob from the inside. A continuous turn of key on outside will operate both dead and latch bolts.

Master Keying—Can be master keyed in sets as desired with other Russwin Cylinder Locks.

No.	Type	Cylinder
2850	Upright	One
2150	Horizontal	One



2850 Upright
2150 Horizontal

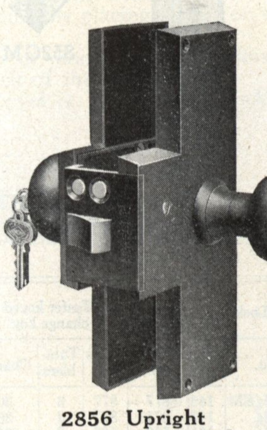
UNIT LOCK FOR VESTIBULE OR OFFICE DOORS

2856 Upright and 2156 Horizontal

Latch bolt can be operated by knobs from either side except when outside knob is set by stops in faec of lock. When outside knob is set, latch can be operated by key only from outside and by knob from inside.

2866 Upright and 2166 Horizontal—In addition to the above they have Dead Locking Plunger, automatically deadlocking and safeguarding the latch bolt, preventing it from being retracted by any instrument inserted between face of lock and strike. It also prevents manipulation of stops when door is closed, thus making lock absolutely secure against entrance except by key.

Master Keying—Can be master keyed in sets as desired with other Russwin Cylinder Locks.



2856 Upright
2156 Horizontal

No.	Type	Cylinder	Dead locking plunger
2856	Upright	One	Without
2866	Upright	One	With
2156	Horizontal	One	Without
2166	Horizontal	One	With

GENERAL CONSTRUCTION

Works: Brass. *Case and Escutcheon:* Cast bronze.
Cylinder: Ball bearing. *Changes:* Unlimited.
Keys: 3 Liberty silver. *Knobs:* Seamless cast bronze.
Shanks: Self-lubricating. *Strike:* Protected.
Latch Bolt: ½-in. throw, heavy cast bronze, swinging type.

Front: Beveled ⅛ on 2-in.

Backset: 3-in. *Door Thickness:* For doors 1½ to 3½-in., as specified.

Reversible: Yes, except when design of escutcheons prevents it being inverted.

RUSSWIN | RUSSWIN UNIT LOCKS | PLATE 24

Continued on next page

UNIT LOCKS FOR FRONT VESTIBULE AND OFFICE DOORS

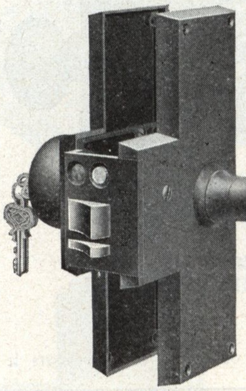
2800 Series Upright Type; 2100 Series Horizontal Type

Latch bolt can be operated by knob from either side, except when outside knob is set by stops in face of lock. When outside knob is set, latch can be operated by key only from outside and by knob from inside.

Auxiliary latch automatically deadlocks and safeguards latch bolt, preventing it from being retracted by any instrument inserted between face of lock and strike.

It also prevents manipulation of stops, thus making the lock absolutely secure against entrance except by key.

No.	Type	Cylinder	No.	Type	Cylinder
2857	Upright	One	2157	Horizontal	One


2857

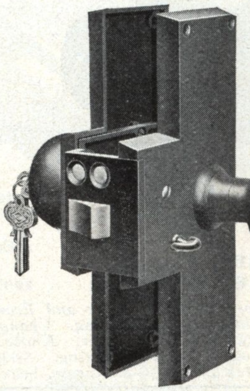
UNIT LOCKS FOR OFFICE DOORS

2866¾ Upright and 2166¾ Horizontal Types

Latch bolt can be operated from either side except when outside knob is set by stops in face of lock. When knob is set, latch can be operated by key only from outside, and by knob inside. When door is closed, turn piece on inside will deadlock against keys, and set both knob and latch bolt.

Deadlocking plunger automatically deadlocks and safeguards latch bolt, preventing it from being retracted by any instrument inserted between lock face and strike. It also prevents manipulation of stops when door is closed.

No.	Type	Gylinder	No.	Type	Cylinder
2866¾	Upright	One	2166¾	Horizontal	One


2866¾

FOR ENTRANCE DOORS TO APARTMENT HOUSES, SCHOOLS AND PUBLIC BUILDINGS

2859½ Upright and 2159½ Horizontal Types

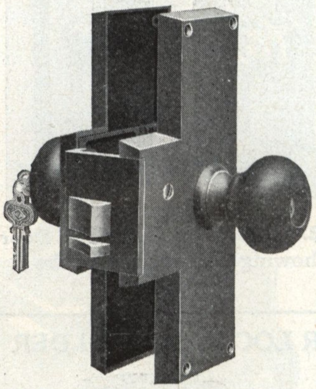
Latch bolt can be operated by knobs from either side except when outside knob is set by master (or janitor's) key through the inside cylinder. When knob is set, latch can be operated by change or master key only from outside, and by knob from inside. The auxiliary latch automatically deadlocks and safeguards latch bolt, preventing retraction by any instrument inserted between lock face and strike.

The janitor or custodian has absolute control over the outside knob, as the change or master key in retracting the latch bolt does not disturb the deadlocking mechanism of the outside knob.

Especially adapted for use on double doors.

No.	Type	Cylinder	No.	Type	Cylinder
2859½	Upright	Two	2159½	Horizontal	Two

Can be furnished reverse bevel for doors opening out.


2859½

FOR PUBLIC BUILDINGS

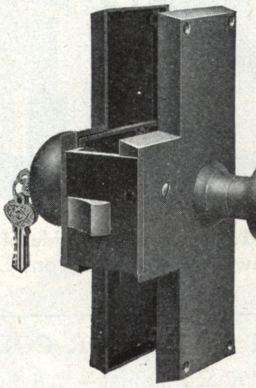
2816 Upright and 2116 Horizontal Types

Latch bolt can be operated by key only from outside, by knob from inside. The outside knob is always rigid.

This lock can be equipped with a dead locking plunger which will deadlock and safeguard latch bolt, preventing retraction by any instrument inserted between lock face and strike. When plunger is desired, prefix "P" to number.

When equipped with plunger, this lock can be furnished reverse bevel for single doors opening out. For use on double doors opening out, it can be furnished with auxiliary latch which serves the same purpose as plunger. When auxiliary latch is desired, prefix "A" to number.

No.	Type	Cylinder	No.	Type	Cylinder
2816	Upright	One	2116	Horizontal	one


2816

FOR COMMUNICATING AND BATH ROOM DOORS

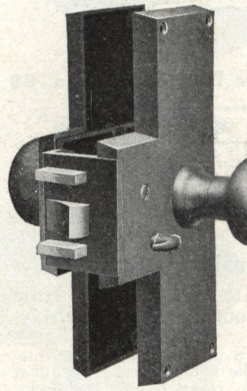
2834 Upright and 2134 Horizontal—Latch bolt can be operated by knobs from either side at all times.

In addition there is a dead bolt operated by turn knob from inside only.

2835 Upright and 2135 Horizontal—Latch bolt can be operated by knobs from either side at all times.

In addition there are two dead bolts operated by turn knobs from opposite sides.

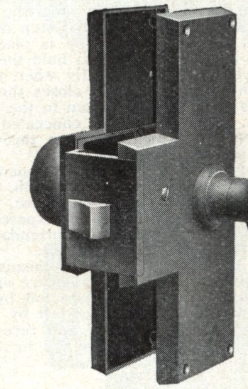
No.	Type	Turnpieces	No.	Type	Turnpieces
2834	Upright	One	2835	Upright	Two
2134	Horizontal	One	2135	Horizontal	Two


2835

KNOB LATCHES FOR CLOSET DOORS

2845 Upright and 2145 Horizontal—Latch bolt can be operated by knobs from either side at all times.

No.	Type	No.	Type
2845	Upright	2145	Horizontal


2845

GENERAL DESCRIPTION

Works: Brass. *Case and Escutcheons:* Cast bronze.
Cylinder: Ball bearing. *Changes:* Unlimited.
Keys: 3 liberty silver. *Knobs:* Seamless cast bronze.
Shanks: Self-lubricating. *Strike:* Protected on strike.
Latch Bolt: ½-in. throw, heavy cast bronze, swinging type.

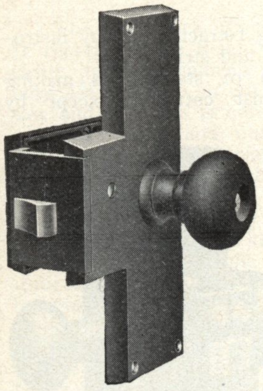
Front: Beveled ⅛ on 2-in.; reverse bevel furnished when so ordered for doors opening out.
Backset: 3-in. *Door Thickness:* For doors 1½ to 3½-in., as specified.
Reversible: Yes, except when design of escutcheons prevents it being inverted.

RUSSWIN | RUSSWIN UNIT LOCKS | PLATE **25**

Continued on next page

RUSSWIN UNIT LOCKS FOR DOORS TO PIPE AND WIRE SHAFTS

2816¼ Upright and 2116¼ Horizontal Types



2816¼ Upright
2116¼ Horizontal

Latch bolt can be operated by key *only from outside.*

This lock can be equipped with a deadlocking plunger which automatically deadlocks and safeguards latch bolt, preventing it from being retracted by any instrument inserted between lock face and strike. When plunger is desired, prefix "P" to number.

When equipped with plunger this lock can be furnished reverse bevel for single doors opening out. For use on double doors opening out, it can be furnished with auxiliary latch which serves the same purpose as the plunger. When auxiliary latch is desired, prefix "A."

SAFETY UNIT FIRE DOOR LOCKS

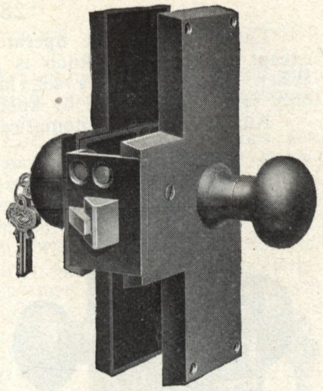
These locks have been approved by the New York Fire Underwriters, and their use secures the lowest rate of insurance.

2886 Upright and 2186 Horizontal

Latch bolt can be operated by knobs from either side except when outside knob is set by stops in face of lock. When knob is set, latch bolt can be operated by key only from outside, and by knob from inside.

The latch bolt is of the anti-friction type, thus insuring easy action.

Design—Furnished only in Enfield design, both vertical and horizontal types.



2886 Upright
2186 Horizontal

Works: Brass. *Case and Escutcheons:* Cast bronze.
Cylinder: Ball bearing. *Changes:* Unlimited.
Keys: 3 liberty silver. *Knobs:* Seamless cast bronze.
Shanks: Self-lubricating. *Strike:* Protected.
Latch Bolt: ½-in. throw, heavy cast bronze, swinging type.

Front: Beveled ⅛ on 2-in.
Backset: 3-in.
Door Thickness: For doors 1½ to 3½-in. as specified.
Reversible: Yes, except when design of escutcheons prevents it being inverted.

UNIT LOCKS FOR DOUBLE DOORS

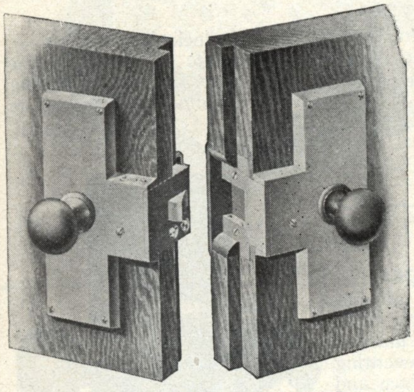


Fig. 1. View from Inside of Door
Showing Rabbeted Front Locks

For Rabbeted Doors—Fig. 1 shows the Russwin Unit Lock applied to rabbeted doors with Double Trim. It may be applied in the same manner without the double trim. These locks are for doors with ½-in. rabbet. All numbers and designs of Unit Locks will be furnished when so ordered, at additional cost, equipped with strike for use with rabbeted door.

Specify Lock Set Number, Name of Design and suffix "Rabbeted."

For Dummy Trim—Fig. 2 shows Unit Lock with Dummy Trim applied. All Unit Locks can be furnished, when so ordered at additional cost, fitted with Dummy Trim. Locks so ordered will be fitted with full pair of dummy knobs and escutcheons; knobs rigid, for both sides of Inactive Door.

Specify Lock Set Number, Name of Design and suffix "Dummy Trim."

Half Double Trim—Same as for Dummy Trim except with only one dummy knob and escutcheon for use upon one side of Inactive Door. Knob made rigid.

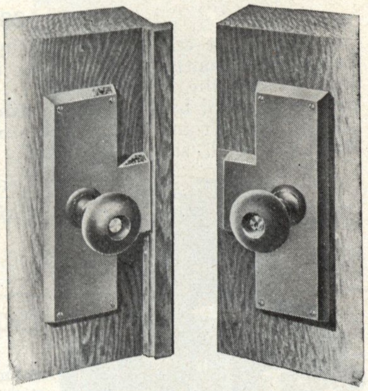


Fig. 2. View from Outside of Door
Showing Flat Front Locks

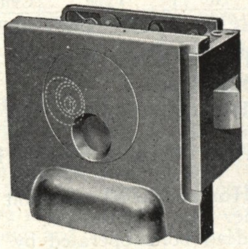
UNIT LOCKS FOR COUPON BOOTH DOORS

2196 Horizontal — Latch bolt can be operated by key only from outside, by knob from inside.

The door is held open when the booth is not occupied, by a special stop or stay attached to the door. Stop is placed in position by the attendant to hold the door open, releasing automatically when patron opens the door. A check closes the door which is always locked when in the closed position. The keyhole is concealed by a revolving disc which has been thrown in position by the attendant.

The occupant on leaving opens the door by turning the inside knob. This operation releases the circular disc, which revolves automatically and exposes the keyhole, indicating to the attendant in charge that the booth is vacant.

As the door is closed by means of the check, after the departure of the patron, the booth is secure against other patrons of the institution until it has been inspected by the attendant who can examine the booth for any valuables left by the last occupant. He then places the door stop in position and throws the disc over the keyhole; the booth now being ready for the next patron.

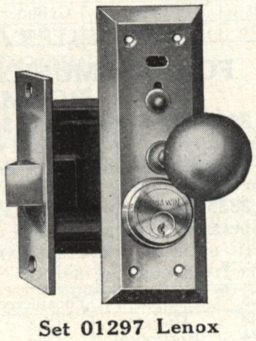


Left-hand Reverse Bevel

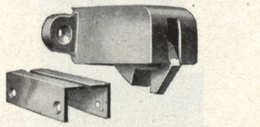
No.	Type	Knob	Escutcheons, in.	Cylinder
2196	Horizontal	One	Inside, 3⅛x4⅞ Outside, 4¾x4	One special (under disc)

Keys: 3 special for each gang of locks.

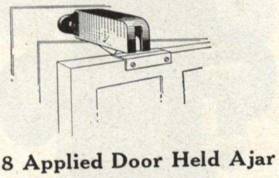
COUPON BOOTH DOOR LOCK AND HOLDER



Set 01297 Lenox



Automatic Door Holder No. 68



No. 68 Applied Door Held Ajar

01297—Latch bolt can be operated by key only from outside, by knob from inside. The outside knob is always rigid and acts as a pull.

The door of the booth is held open when unoccupied by the Automatic Door Holder. The client entering the booth releases the door holder and the door, controlled by a check, closes quietly and locks. The occupant merely turns the knob to leave. The turning of the knob operates a red indicator on the outside escutcheon, indicating to the attendant that the booth is now vacant. As the door has been closed, after the departure of the client by means of the check, the booth is secure against other patrons until it has been inspected by the attendant. After inspecting, he then throws the indicator back and sets the door holder, leaving the door ajar for the next occupant.

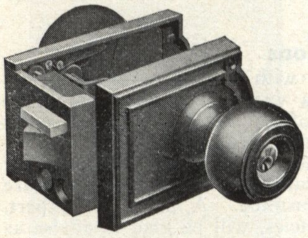
RUSSWIN | RUSSWIN UNIT LOCKS | PLATE 26

Continued on next page

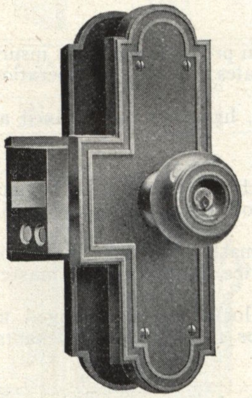
SPECIAL DESIGNS IN UNIT LOCKS

In Ordering Specify Set Number (Cat. No.) and Name of Design by Symbol and Finish

CAMDEN DESIGN

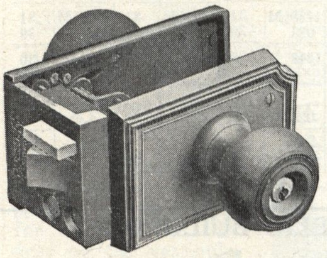


2150
Horizontal

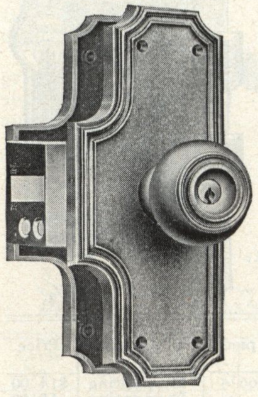


2856
Upright

MADISON DESIGN



2150
Horizontal



2856
Upright

INDEX TO UNIT LOCK DESIGNS

All Knobs 2¼x2¼-in.

Horizontal Type—For Door Stiles Not Less Than 5-in. Wide

	CAMDEN DESIGN Escutcheons, 3⅛x4⅞-in.		COPLEY DESIGN Escutcheons, 3⅜x4¾-in.	
FOR DOORS	CAT. No.	*PRICE	CAT. No.	*PRICE
Front	2150	$28.00	2150	$28.00
Vestibule	2156M	25.00	2156M	25.00
Office	2166M	25.00	2166M	25.00
Office	2157M	25.00	2157M	25.00
Office	2166¾M	27.00	2166¾M	27.00
Entrance	2159½M	32.00	2159½M	32.00
Entrance	2116M	25.00	2116M	25.00
Communicating	2134	15.00	2134	15.00
Communicating	2135	15.00	2135	15.00
Latch	2145	13.00	2145	13.00

Upright Type—For Door Stiles Not Less Than 4¾-in. Wide

	Escutcheons, 10¼x3-in.		Escutcheons, 9x3-in.	
Front	2850	$30.00	2850	$30.00
Vestibule	2856M	27.00	2856M	27.00
Office	2866M	27.00	2866M	27.00
Office	2857M	27.00	2857M	27.00
Office	2866¾M	29.00	2866¾M	29.00
Entrance	2859½M	34.00	2859½M	34.00
Entrance	2816M	27.00	2816M	27.00
Communicating	2834	17.00	2834	17.00
Communicating	2835	17.00	2835	17.00
Latch	2845	15.00	2845	15.00

Horizontal Type—For Door Stiles Not Less Than 5-in. Wide

	MADISON DESIGN Escutcheons 3⅛x4⅞-in.		NIANTIC DESIGN Escutcheons, 3⅜x4⅞-in.	
Front	2150	$28.00	2150	$28.00
Vestibule	2156M	25.00	2156M	25.00
Office	2166M	25.00	2166M	25.00
Office	2157M	25.00	2157M	25.00
Office	2166¾M	27.00	2166¾M	27.00
Entrance	2159½M	32.00	2159½M	32.00
Entrance	2116M	25.00	2116M	25.00
Communicating	2134	15.00	2134	15.00
Communicating	2135	15.00	2135	15.00
Latch	2145	13.00	2145	13.00

Upright Type—For Door Stiles Not Less Than 4¾-in. Wide

	Escutcheons, 9x3-in.		Escutcheons, 8¼x3-in.	
Front	2850	$30.00	2850	$30.00
Vestibule	2856M	27.00	2856M	27.00
Office	2866M	27.00	2866M	27.00
Office	2857M	27.00	2857M	27.00
Office	2866¾M	29.00	2866¾M	29.00
Entrance	2859½M	34.00	2859½M	34.00
Entrance	2816M	27.00	2816M	27.00
Communicating	2834	17.00	2834	17.00
Communicating	2835	17.00	2835	17.00
Latch	2845	15.00	2845	15.00

GRANBY DESIGN

	Horizontal Type—For Door Stiles Not Less Than 5⅜-in. Wide Escutcheons, 3½x5¼ in.		**Upright Type—For Door Stiles Not Less Than 4¾-in. Wide** Escutcheons, 9x3-in.	
FOR DOORS	CAT. No.	*PRICE	CAT. No.	*PRICE
Front	2150	$28.00	2850	$30.00
Vestibule	2156M	25.00	2856M	27.00
Office	2166M	25.00	2866M	27.00
Office	2157M	25.00	2857M	27.00
Office	2166¾M	27.00	2866¾M	29.00
Entrance	2159½M	32.00	2859½M	34.00
Entrance	2116M	25.00	2816M	27.00
Communicating	2134	15.00	2834	17.00
Communicating	2135	15.00	2835	17.00
Latch	2145	13.00	2845	15.00

***Note: Prices shown above are list prices and are included for comparison only**

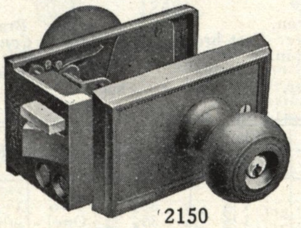
Unit locks with rabbeted strike, add $3.50 set.

Unit locks with dummy trim, add two-thirds the price of the full set.

Note: If the exact thickness of the doors is given the locks will be machined and especially fitted for the thickness of door specified. Unit locks will be furnished, if so ordered, adjustable for doors of the following thicknesses: 1½ to 2, 2 to 2½, 2½ to 3 in. Minimum and maximum thicknesses should be specified as 1 set locks No. 2850 Lenox, 1½ to 2 in.

GRANBY DESIGN

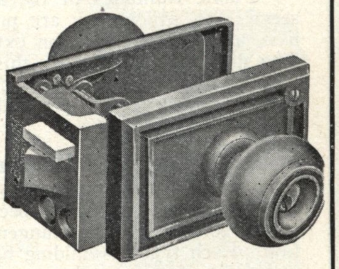
For full description of the operation and functions of these locks, see plate Nos. 24, 25 and 26.



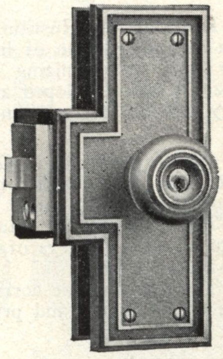
2150
Horizontal

Can also be furnished in the upright type, as other designs shown herewith.

COPLEY DESIGN

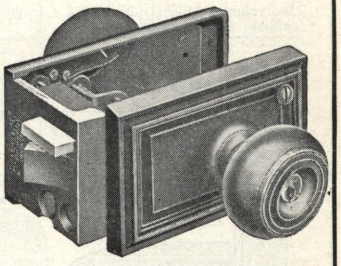


2150
Horizontal

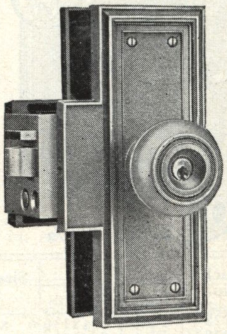


2856
Upright

NIANTIC DESIGN



2150
Horizontal



2850
Upright

RUSSWIN | RUSSWIN UNIT LOCK DESIGNS | PLATE **27**

Continued on next page

LOCKS FOR PUBLIC BUILDINGS

BANKS LIBRARIES GOVERNMENTAL CLUBS STORES INSTITUTIONS
FRATERNAL CHURCHES MUSEUMS HOSPITALS FACTORIES WAREHOUSES

See special classification for Office Buildings, Hotels, Apartment Houses, Schools and Residences

Public Buildings of the above types, on account of the services to which they are put demand hardware that must have as first consideration extreme durability and reliability. The design and finish of this hardware must be attractive and durable, as it is subject to the use and scrutiny of great numbers of people and in most cases receives hard usage.

Special Hardware Requirements

Almost every building of a public character such as those noted above have special requirements, especially in regard to the locking arrangements, which need special attention. Each type of building has its own requirements. Even in buildings of a similar type the locking arrangements may be very different. For this reason separate lists of hardware are not given in this catalogue for some of these buildings.

Before Writing Specifications

Supplying public buildings with hardware for years has furnished the Company with a wealth of experience. This experience is all at the service of the architect, and will assist him greatly in the problems confronted by him.

We therefore suggest, whether our hardware is finally selected or not, that before starting to write the hardware specification, we should be consulted. A hardware expert, from one of our offices or agencies, will be glad to advise as to the hardware which will best meet the requirements of the building under consideration. This will be done without obligating the architect in any way.

HOSPITALS AND INSTITUTIONS

Hospitals and Institutions have necessitated the creation of a specialized line of hardware, especially in reference to door trim. Recognizing this need, the Russell & Erwin Mfg. Co. has developed an excellent line of hardware especially adapted for use on hospitals and institutions. Every possible need that may arise has been provided for, thus insuring a maximum of comfort to inmates and ease of operation for attendants.

Such special features, however, have not been gained at any sacrifice of Russwin quality.

LOCKS FOR OFFICE BUILDINGS

All of the locks in Group One, listed below, are of the Unit Type and embody the best features obtainable in the art of lock-making today. See Plates Nos. 25, 26 and 27.

The lock on the Main Entrance Doors should be so arranged that the keys of each individual office entrance door will act on same.

The locks on the corridor doors should be subject to the keys of individual and private offices.

Locks on the lavatories of each floor should be subject to the keys of all the individual office door locks of their respective floors only.

All office door locks may be master keyed by floors or in sets as desired for janitor service, with a grand master key for the entire building.

Keying systems for cylinder locks can be changed at any time to fit special conditions or requirement of tenants.

OFFICE BUILDING LOCKS
Locks arranged in groups according to choice and quality

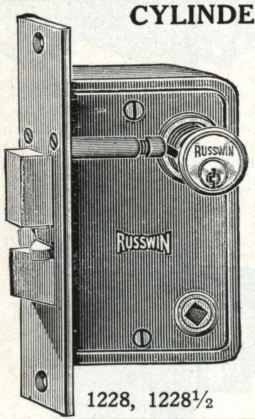
Use	Unit locks		Standard locks							
	Group 1		Group 2		Group 3		Group 4		Group 5	
	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate
Entrance	2159½ 2859½	25 25	9152½M 9132	31 30	9152½M 9132 9098	31 30 30	9152½M 9132 9098	31 30 30	9152½M 9132 9098	31 30 30
Vestibule and corridor	2166 2866 2156 2856	24 24 24 24	*1457	29	1456	29	1239½	29	1248½	29
Individual offices	2166¾ 2866¾	25 25	1456	29	1456	29	1239½	29	1248½	29
Private offices	2166¾ 2866¾ 2134 2834	25 25 25 25	1456 236	29 37	1456 236	29 37	1239½ 236 233	29 37 37	1248½ 233	29 37
Communicating	2135 2835	25 25	236½	37	236½	37	236½ 233½	37 37	233½	37

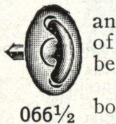
Use	Unit locks		Standard locks							
	Group 1		Group 2		Group 3		Group 4		Group 5	
	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate
Closets	2145 2845	25 25	1248 028 025	36 39 39	1248 025	36 39	1248 025 042	36 39 39	1248 042	36 39
Lavatories	P2116 P2816	25 25	*1457½M	31	1458½M	31	1458½M 1258½M	31 31	12 1258½M	31
Stair wells	2159½ 2859½	25 25	*1457½ 028	31 39	1458½M 025	31 39	1458½M 1258½M	31 31	1258½M 042	31 39
Janitor's closet	P2116 P2816	25 25	1248	36	1248	36	1248	36	1248	36
Slop sinks	2145 2845	25 25	*028 025	39 39	025	39	025	39	025	39
Pipechases, wire shafts, etc.	P2116¼ P2816¼	26 26	1203	39	1203	39	1203	39	1203	39

*Latch bolts have ¾-in. throw to meet Underwriters' requirements.

CYLINDER KNOB LOCKS FOR ENTRANCE DOORS TO PUBLIC BUILDINGS

1228, 1228½, 1225, 1225½ Cylinder Locks for Heavy Entrance Doors

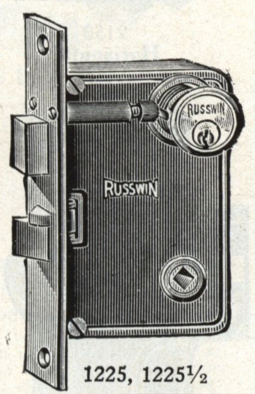

1228, 1228½


066½

These locks are for similar services. The 1228 and 1228½ are the heavier. The latch bolt which is of the anti-friction type, insuring easy action, can be operated from either side at all times.

The locks in addition have a dead bolt. The bolt in 1228 and 1225 is operated by a key from the outside and by turn piece from the inside. In 1228½ and 1225½ it is operated by key from either side. A continuous turn of the key withdraws both dead and latch bolts.

066½


1225, 1225½

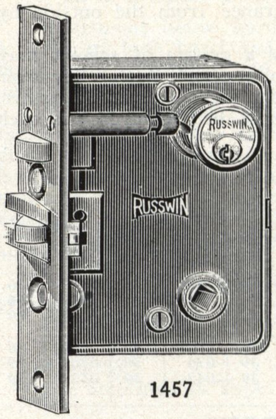
Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze.
Keys: Liberty silver.
Hub: Brass. *Spindles:* 5/16-in.
Latch Construction: E. C.
Reversible: No, specify hand.
Lock Width: 1 in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
1228	Flat	8¼x1⁵⁄₁₆	6 x4 x1	3	....	1½	3⅝	One	3	Unlimited	No. 066½	Easy spring	$14.00
1228½	Flat	8¼x1⁵⁄₁₆	6 x4 x1	3	....	1½	3⅝	Two	3	Unlimited	....	Easy spring	15.00
1225	Flat	8 x1¼	5½x3¼x¾	2¾	2, 2½	1½	3⅝	One	3	Unlimited	No. 066½	Easy spring	13.00
1225½	Flat	8 x1¼	5½x3¾x¾	2¾	2, 2½	1½	3⅝	Two	3	Unlimited	,...........	Easy spring	14.00

Continued on next page

CYLINDER LOCKS FOR ENTRANCE AND CORRIDOR OFFICE DOORS

Especially Adapted for Doors Opening Out



1457

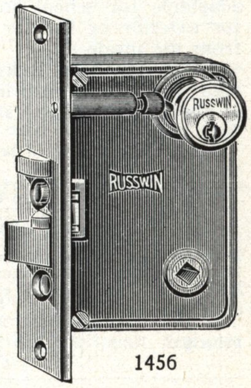
No. 1457 (Latch bolt has ¾ in. throw) for Kalamein and other Fire Doors; No. 1456 has Standard Latch Throw

These are heavy locks for services noted above in high class buildings. Anti-friction Type Latch Bolt can be operated by knobs from either side except when outside knob is set by stop in face of lock. When knob is set, latch bolt can be operated only by key from outside and by knob from inside.

An Auxiliary Latch automatically dead locks and safeguards the latch bolt, preventing retraction by instruments inserted between the face of lock and strike. It also prevents manipulation of stops when door is closed, making the lock secure against entrance except by key.

GENERAL CONSTRUCTION

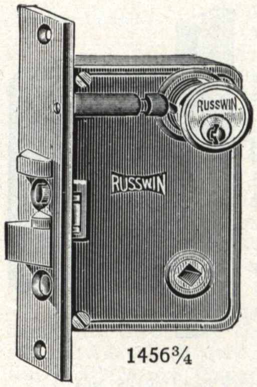
Case: Japanned iron. *Fronts, Bolts, Strikes:* Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass. For $\frac{5}{16}$x⅜-in. swivel spindle.
Latch Construction: 1457, CL; 1456, EC.
Reversible: No. Specify hand.
Lock Width: 1457, 1½ in. more than backset; 1456, 1 in. more than backset.



1456

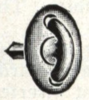
Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
1457	Flat	8⅜x1¼	6 x4¾x$\frac{13}{16}$	2¾	3¼	1½	3⅝	One	3	Unlimited	None	Anti-friction	$18.00
1456	Flat	8 x1¼	5½x3¾x¾	2¾	2½	1½	3⅝	One	3	Unlimited	None	Easy spring	12.00

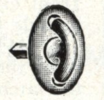
SPECIAL LOCKS FOR OFFICE DOORS GIVING ABSOLUTE PRIVACY



1456¾

1456¾ and 1239¾ Cannot Be Opened from the Outside When Dead Locked



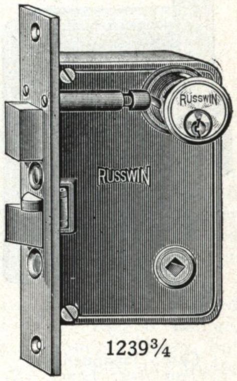


No. 1456¾ has the same safety features as No. 1456 described above with the auxiliary latch. In addition the latch bolt can be dead locked by Turn Knob inside, making keys inoperative from outside. The lock then offers absolute security against intrusions.

No. 1239¾ has the same features, offers the same security as 1456¾ except that it does not have the auxiliary latch, but has dead bolt.

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass. For $\frac{5}{16}$x⅜ in. swivel spindle.
Latch Construction: EC.
Reversible: No. Specify hand.
Lock Width: 1 in. more than backset.



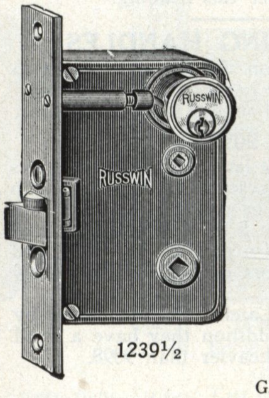
1239¾

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
1456¾	Flat	8x1¼	5½x3¾x¾	2¾	2½	1½	3⅝	One	3	Unlimited	No. 066½	Easy spring	$14.00
1239¾	Flat	8x1¼	5½x3¾x¾	2¾	....	1½	3⅝	One	3	Unlimited	No. 066½	Anti-friction	12.50

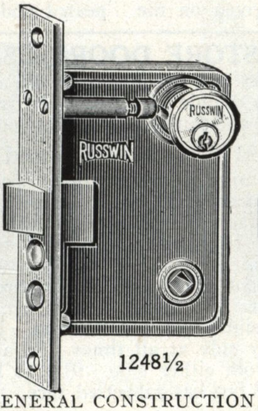
INEXPENSIVE OFFICE DOOR AND VESTIBULE ENTRANCE LOCKS WITH DEAD LOCKED LATCH BOLT FOR USE WITH KNOBS AND HANDLE

These locks can be used when an inexpensive lock is desired for the doors of offices or the vestibule entrance of apartment houses. They afford only the protection from the outside of a dead locked latch.

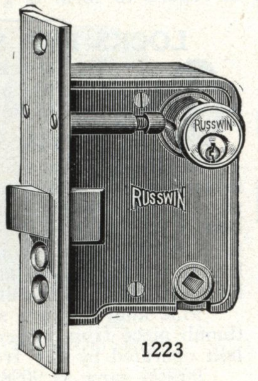
For locks offering greater protection for vestibule entrance to apartment houses see 1458½, 1258½ and 9152½.



1239½



1248½



1223

1239½ and 1248½ For Knobs Both Sides—Which operate the latch bolt except when outside knob is dead locked by stops in face of lock, then by key only from outside. Latch bolt can always be operated by knob from inside.

1223 For Handle With Thumb Piece Outside and Knob Inside—The control is the same as for 1239½ and 1248½.

GENERAL CONSTRUCTION

Case: Japanned iron. *Fronts, Bolts, Strikes:* Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass. For $\frac{5}{16}$x⅜-in. swivel spindle.
Latch Construction: 1239½, EC; 1248½, CL; 1223, CSL.
Reversible: 1239½, No; 1248½, Yes; 1223, Yes.
Lock Width: 1239½ and 1248½, 1 in. more than backset; 1233, 1⅛ in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
1239½	Flat	8 x1¼	5½x3¾x¾	2¾	2-2½	1½	3⅝	One	3	Unlimited	None	Anti-friction	$10.50
1248½	Flat	7¾x1⅛	5½x3⅞x$\frac{11}{16}$	2⅞	2½	1½	3⅝	One	3	Unlimited	None	Easy spring	9.00
1223	Flat	7⅜x1⅛	5 x4 x¾	2⅞	2-2¼-2½	1½	3⅝	One	3	Unlimited	None	Easy spring	10.00

Continued on next page

LOCKS ESPECIALLY USEFUL FOR SCHOOL HOUSES

The locks illustrated or listed below are especially adaptable for school house work. All these locks whether for exterior or interior doors can be operated at all times from the inside.

Exterior door locks are used in connection with Fire Exit Bolts, thus insuring absolute safety to the occupants of the building. Doors so equipped can always be operated from the inside, but prevent entrance from the outside by unauthorized persons.

All locks in a building or in a system of schools may be master keyed in one set with a grand master key over all. Where bitted key and cylinder locks are used together, a separate master key system must be employed for each type of lock.

INDEX TO LOCKS FOR SCHOOLS

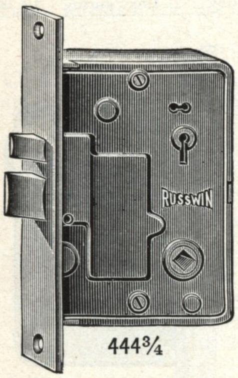
Index and suggested layout of locks arranged in groups, horizontally according to choice and vertically according to quality and use. Group 1 is the highest grade.

Use	Group 1		Group 2		Group 3		Group 4	
	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate
Main entrance...	See fire exit bolts.							
Side entrances...	See fire exit bolts.							
Exits..........	See fire exit bolts.							
Class rooms.....	1458½	31	444¾	30	00125	30	0125	30
	1258½	31	......	.....	......	.....	......	.....
Principal.......	1458½	31	1248	36	1248	36	1248	36
	1258½	31	......	.....	380¾	36	380¾	36
Teachers' rooms..	1458½	31	1248	36	1248	36	1248	36
	1258½	31	......	.....	380¾	36	380¾	36
Teachers' lavatories.........	1458½	31	1248½	29	1248½	29	1248½	29
	1258½	31	......	.....	......	.....	......	.....
Closets..........	1248	36	380¾	36	380¾	36	380¾	36
	025	39	025	39	026	39	026	39
	026	39	026	39	042	39	042	39
Auditorium.......	Same as entrance.							

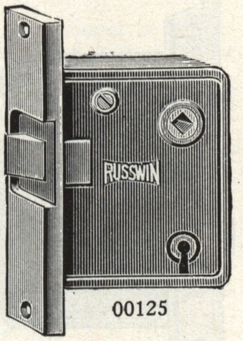
CYLINDER LOCKS FOR ENTRANCE OR CORRIDOR DOORS

When high grade Cylinder Locks are desired for Entrance or Corridor **Doors** see table above for Lock and Plate Number. As the locks noted are used for other services they are not repeated here.

BITTED KEY LOCKS FOR CORRIDOR DOORS



444¾



00125

These locks are especially designed for corridor or classroom doors as they allow free operation at all times from the classroom side without having to unlock the lock but afford required protection from entrance from the corridor side.

444¾M, 00125 and 0125—All have the latch bolt operated by knobs from either side. The inside knob is free to operate at all times. The outside knob can be locked rigid by the key from either side.

444¾M also has an auxiliary latch which is automatically released, when the outside knob is locked, and automatically deadlocks and safe guards the latch bolt, preventing it from being retracted by any instrument inserted between the face of lock and strike. When the outside knob is unlocked the auxiliary latch is held in a retracted position. The lock is regularly furnished master keyed; if this feature is not desired it must be so specified.

00125—Gives the same protection from entrance as 444¾ by means of a recessed lock front instead of the auxiliary latch. The recessed front prevents the retraction of the latch bolt by any instrument inserted between the face of lock and strike.

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Tumblers: Lever. *Keys:* Nickelplated steel.
Hub: Brass. For $\frac{5}{16}$x⅜-in. swivel spindle.

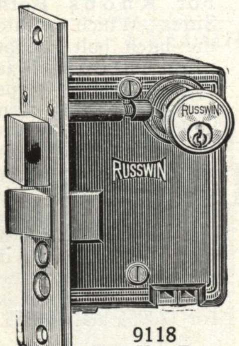
Latch Construction: CL.
Reversible: 444¾ and 00125, no; specify hand; 0125, yes.
Master Keying: 3 sets 100 each or 300 all different.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
444¾	Flat	7⅜x1$\frac{1}{16}$	5½x3¾x⅝	2¾	....	1¼	2⅝	Lever	One	48	None	Easy spring	$7.50
00125	Recessed	6½x1	4½x3⅞x⅝	2⅞	....	1¼	2⅝	Lever	One	48	None	Easy spring	5.00
0125	Flat	6½x1	4½x3⅝x⅝	2¾	....	1¼	2⅝	Lever	One	48	None	Easy spring	3.75

BITTED KEY LOCK FOR CLOSET DOORS

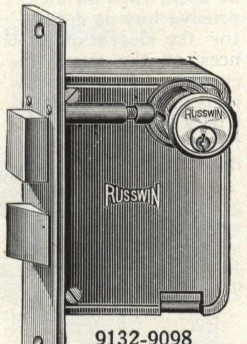
Suitable locks for closet doors are noted in the index and as full information in regard to them is given on the Plate number. As the locks noted are used for other services peated under this heading.

LOCKS FOR STORE DOORS USING HANDLES



9118
9119 Has Turn Piece

These locks are designed for use on the entrance doors to stores where a double swinging door is not used. They are used when a handle and thumb piece is desired on both sides of the door.



9132-9098
Type of 9098½

9118, 9119, 9132, 9098 and 9098½

9118 and 9119 are similar in construction. The latch bolt for both locks is operated by thumb piece from either side, except when outside thumb piece is set by stops in face of lock, when it can be operated by key from outside and thumb piece from inside. In addition a dead bolt is operated in 9118 by key from both sides and in 9119 by turn piece from inside, and key from outside. A continuous turn of key from outside will withdraw both dead and latch bolt.

9132 and 9098 are similar in construction. Latch bolt is operated by thumb piece from either side at all times. In addition they have a dead bolt operated by key from either side. 9132 is heavier than 9098.

9098½ same as 9098 but has rabbetted face.

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Cylinder: Bronze. *Keys:* Liberty silver.
Latch Construction: SC.

Reversible: 9118, 9119 and 9098, yes; 9132 and 9098½, no; specify hand.
Lock Width: 1 in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
9118	Flat	7½x1¼	5x3¾x¾	2¾	2¼, 2½	1½	4¼	Two	3	Unlimited	None	Easy spring	$12.00
9119	Flat	7½x1¼	5x3¾x¾	2¾	2¼, 2½	1½	4¼	One	3	Unlimited	No. 066½	Easy spring	12.00
9132	Bevel	7¾x1⅜	5x3¾x1	2¾	....	1¾	4¼	Two	3	Unlimited	None	Easy spring	13.00
9098	Flat	7 x1$\frac{3}{16}$	5x3¾x¾	2¾	2½	1½	4¼	Two	3	Unlimited	None	Easy spring	12.00
9098½	Rabetted	7x1⅜x½	5x3¾x¾	2¾	2½	1½	4¼	Two	3	Unlimited	None	Easy spring	15.00

RUSSWIN | SCHOOL HOUSE & STORE DOOR LOCKS | PLATE **30**

Continued on next page

LOCKS FOR APARTMENT HOUSES AND DORMITORIES

Apartment house hardware has many of the characteristics of both hotel and residential hardware. It draws much from both types, and yet has distinctive features of its own.

Apartment houses equipped with Russwin hardware and master keyed in that system, afford to the occupants the privacy of the residential house, and the conveniences of the hotel. The same specialized service that is furnished on other types of buildings is supplied to the architect planning the new apartment house.

Apartment houses are of three general types:

1. The apartment hotel.
2. Two or more residences under one roof or otherwise grouped.
3. A combination of two first named.

For buildings referred to as Type One, see Hotel Locks, Plate No. 32.

For buildings as Type Two see Residential Locks, Plate Nos. 36, 37 and 38. In the case of Type Two the lock on the main entrance of the building can be arranged so the keys of the lock to the entrance of each apartment will operate same.

The table below applies more to Type Three where a building is taken care of by a resident manager who furnishes maid, valet, janitor and dining room service.

Various keying systems may be used in connection with buildings of this type.

The lock on the main entrance door should be so arranged that the keys to the locks of each individual apartment entrance door will act on same.

The apartment entrance doors may be master keyed in sets subject to a maid's master key, and all sets subject to a grand master key controlled by the resident manager.

The locks on the rear entrance door of each apartment, the garage, and storage room, may be keyed alike or all different, yet subject to the key of the apartment entrance lock in connection with which they are let.

INDEX TO APARTMENT HOUSE LOCKS

The index and suggested layout of locks suitable for Apartment House Work are arranged according to choice and quality

Where used	Lock No.	Plate	Where used	Lock No.	Plate	Where used	Lock No.	Plate
Main entrance.....	9152½M 1458½M 1456M	31 31 29	Interior doors.....	384¾ 380¾ 0370¾ 0370	36 36 36 36	Baths............	236 233	37 37
Entrance to apts...	1456M 1239-1456¾M 1248M	29 36-29 36	Closets...........	384¾ 380¾ 0370¾ 0370 042 043	36, 36 36, 36 39 39	French doors......	F1247½ G381¾ 355	37 38 38
Rear entrance......	1248M	36				Storage doors.....	1248M	36
Garage............	200M 300M	See pages 1498-1499						

JANITOR CONTROLLED LOCKS FOR ENTRANCE DOORS TO APARTMENT HOUSES, SCHOOLS AND PUBLIC BUILDINGS

These locks offer greater protection for vestibule doors than those with stops on the face of the lock controlling the setting of the outside knob. Stops can be operated by anyone, while the door is open, making the outside knob operative or inoperative.

With the locks illustrated below the outside knob can be made operative or inoperative, only by means of a master or janitor's key. This makes it impossible for unauthorized persons to manipulate the dead locking of the latch when the door is open.

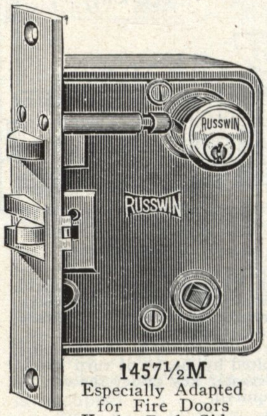
1457½M for Kalamein and Fire Doors (latch bolt has ¾-in. throw for Underwriter Doors), 1458½M (with standard latch throw) Have Knobs Both Sides—1457½M and 1458½M are similar except for throw of the latch bolt. Latch bolt can be operated by knobs from either side, except when outside knob is set by master (or janitor's) key through the inside cylinder. When outside knob is set, latch bolt can be operated by key only from the outside and by knob from inside.

They also have the protection of an auxiliary latch, which automatically dead locks and safeguards latch bolt, preventing it being retracted by any instrument inserted between the face of the lock and strike. The regular change, master (or janitor's) keys will operate outside cylinder, but only the master (or janitor's) key will operate the inside cylinder, unless otherwise specified.

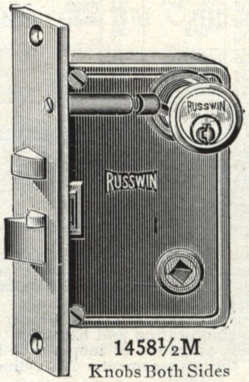
Latch bolts are of the anti-friction type insuring easy action.

1258½M, Knobs Both Sides—Similar to 1458½M except does not have the auxiliary latch.

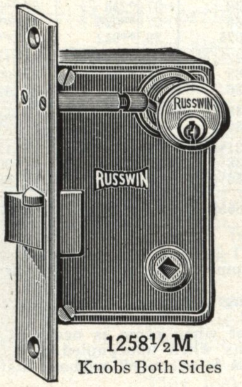
9152½M, Handle With Thumb Piece Both Sides—Similar to 1458½M except that it is used with handles and thumb pieces both sides.



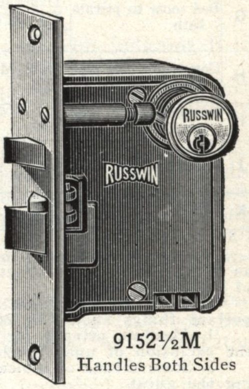
1457½M
Especially Adapted for Fire Doors
Knobs Both Sides



1458½M
Knobs Both Sides



1258½M
Knobs Both Sides



9152½M
Handles Both Sides

GENERAL CONSTRUCTION

Case: Japanned iron. *Fronts, Bolts, Strikes:* Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass, for $\frac{5}{16}$x⅜-in. swivel spindle.

Latch Construction: 1457½M, CL; 1458½M, EC; 1258½M, EC; 9152½M, CL.
Reversible: No, specify hand.
Lock Width: 1457½M, 1½-in. more than backset; 1458½M, 1258½M and 9152½M, 1-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
1457½M	Flat	8⅜x1¼	6 x4¾x1$\frac{13}{16}$	2¾	3¼	1½	3⅝	Two	3	Unlimited	None	Anti-friction	$24.00
1458½M	Flat	8 x1¼	5½x3¾x ¾	2¾	2½	1½	3⅝	Two	3	Unlimited	None	Anti-friction	17.50
1258½M	Flat	8 x1¼	5½x3¾x ¾	2¾	2½	1½	3⅝	Two	3	Unlimited	None	Anti-friction	15.50
9152½M	Flat	7⅞x1¼	5 x3¾x ¾	2¾	....	1½	....	Two	3	Unlimited	None	Anti-friction	17.50

Continued on next page

RUSSWIN HOTEL LOCKS

The Importance of the Hardware in the Satisfactory Operation of a Hotel

It is a well known fact that the character of the hotel depends to a very large extent on the locking system and the amount of control the hotel management has over the locking system.

This is especially true of the locking system on communicating doors between rooms. Unless the management has absolute control of this type of room, the hotel cannot be kept up to standards of the highest character.

A good lock for the guest room doors to corridor and closets is a good investment. It will save the management many dollars for the adjustment of claims from theft. It will give the guest a feeling of privacy and security from intrusion which is highly desirable.

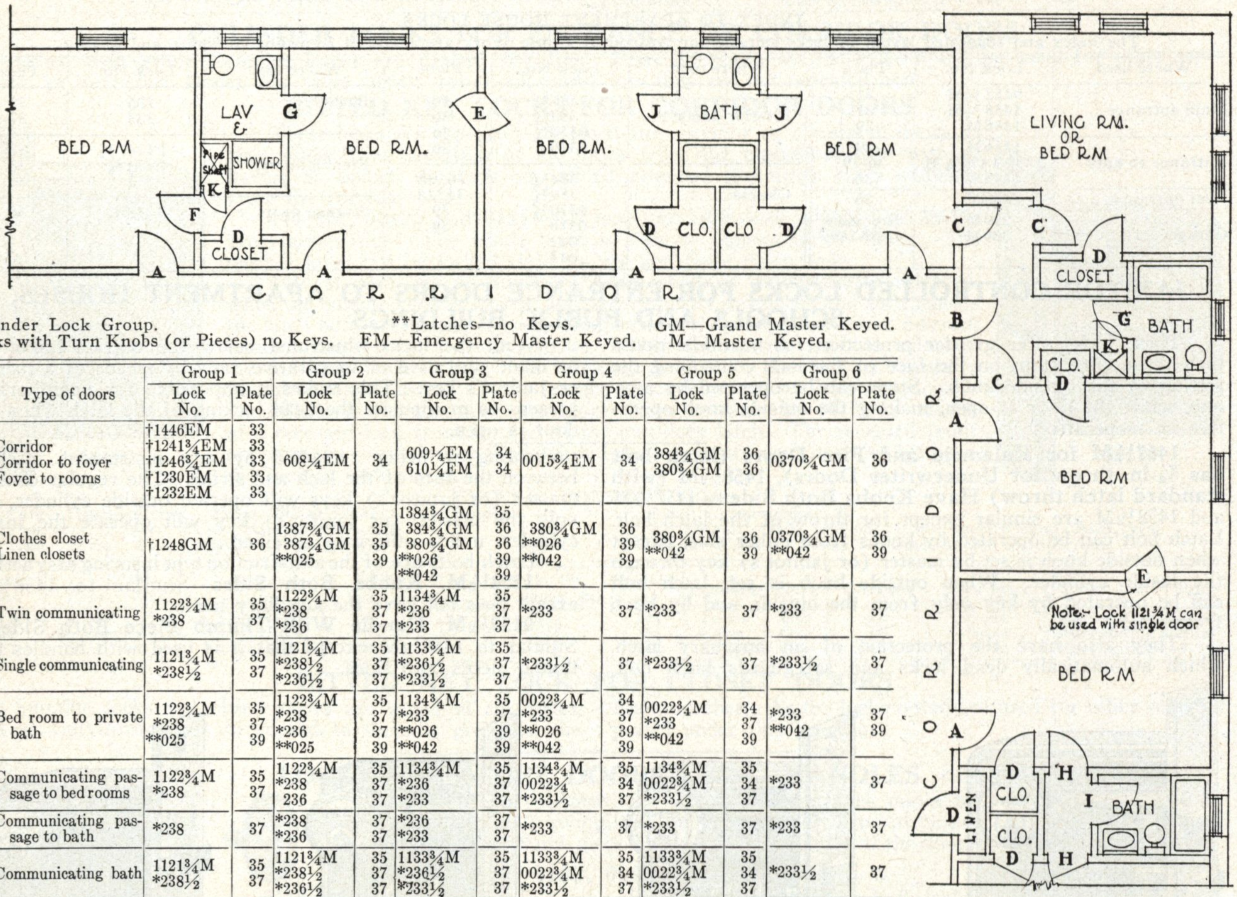
The Advice of Hotel Hardware Specialists

It is hoped that the diagram and index to locks will be of assistance in the selection of the proper locks, for various services. We also urge that the expert services of the hotel specialists of the company be called upon. A highly specialized department has been created at the general offices, for the purpose of giving architects the benefit of years of experience in solving problems that arise in connection with the hardware equipment of hotels.

Russwin Hardware for hotel use conforms to all the codes formulated for the protection of patrons.

INDEX AND SUGGESTED LAYOUT OF HOTEL LOCKS

Locks arranged in groups according to quality and systems in which they may be Master Keyed together.



†Cylinder Lock Group.
*Locks with Turn Knobs (or Pieces) no Keys.
**Latches—no Keys.
EM—Emergency Master Keyed.
GM—Grand Master Keyed.
M—Master Keyed.

Symbol	Type of doors	Group 1		Group 2		Group 3		Group 4		Group 5		Group 6	
		Lock No.	Plate No.	Lock No.	Plate No.	Lock No.	Plate No.	Lock No.	Plate No.	Lock No.	Plate No.	Lock No.	Plate No.
A B C	Corridor Corridor to foyer Foyer to rooms	†1446EM †1241¾EM †1246¾EM †1230EM †1232EM	33 33 33 33 33	608¼EM	34	609¼EM 610¼EM	34 34	0015¾EM	34	384¾GM 380¾GM	36 36	0370¾GM	36
D	Clothes closet Linen closets	†1248GM	36	1387¾GM 387¾GM **025	35 35 39	1384¾GM 384¾GM 380¾GM **026 **042	35 36 36 39 39	380¾GM **026 **042	36 39 39	380¾GM **042	36 39	0370¾GM **042	36 39
E	Twin communicating	1122¾M *238	35 37	1122¾M *238 *236	35 37 37	1134¾M *236 *233	35 37 37	*233	37	*233	37	*233	37
F	Single communicating	1121¾M *238½	35 37	1121¾M *238½ *236½	35 37 37	1133¾M *236½ *233½	35 37 37	*233½	37	*233½	37	*233½	37
G	Bed room to private bath	1122¾M *238 **025	35 37 39	1122¾M *238 *236 **025	35 37 37 39	1134¾M *233 **026 **042	35 37 39 39	0022¾M *233 **026 **042	34 37 39 39	0022¾M *233 **042	34 37 39	*233 **042	37 39
H	Communicating passage to bed rooms	1122¾M *238	35 37	1122¾M *238 236	35 37 37	1134¾M *236 *233	35 37 37	1134¾M 0022¾ *233½	35 34 37	1134¾M 0022¾M *233½	35 34 37	*233	37
I	Communicating passage to bath	*238	37	*238 *236	37 37	*236 *233	37 37	*233	37	*233	37	*233	37
J	Communicating bath	1121¾M *238½	35 37	1121¾M *238½ *236½	35 37 37	1133¾M *236½ *233½	35 37 37	1133¾M 0022¾M *233½	35 34 37	1133¾M 0022¾M *233½	35 34 37	*233½	37
K	Wire shafts, closets, pipe chases, etc.	†1203M 0786M	39 39	0786M	39	078¾M	39	078¾M	39	078¾M	39	076¾	39

We recommend locks in Groups 1-2-3 and 4 in the order shown as being the most satisfactory equipment yet devised in the way of hotel room locks.

In selecting equipment for locking hotel room doors, three important things should be considered.

1. Absolute privacy for the guest when room is occupied, and the exclusion of unauthorized persons when unoccupied.

2. Some means of indicating room is occupied, without disturbing the guest.

3. Means of entering room by maid when room is unoccupied, and the ability of the Management to enter room at all times in case of emergency.

Russwin Hotel Locks as listed in Groups 1-2-3 and 4 combine all these features.

Note: Corridor Locks automatically locked when door is closed. 1446EM, 1241¾EM, 1246¾EM, 1230EM.

Corridor Locks which must be locked by key after closing door. 1232EM, 609¼EM, 608¼EM, 610¼EM, 0015¾EM.

Lock Group 1

Cylinder Locks (indicated by daggers) in Group 1 cannot be master keyed with the bitted key locks under this heading. The corridor and closet doors are usually arranged under one system and the communicating and bath room locks under another control, the master key in such cases being retained by the room clerk. Under this arrangement rooms may be rented ensuite or separately, with or without bathrooms.

We recommend Cylinder Locks for corridor and closet doors. Communicating and bathroom locks are bolted by means of turn knobs, made operative or inoperative by a bitted master key under the control of the management. No cylinders are required.

Lock Group 2-3-4-5 and 6

All locks listed in Groups 2-3-4-5 and 6, with the exception of those which do not have or require keys, may be master keyed in the same manner, i.e. in two systems, or can be master keyed in one system.

When two systems are used locks shown for corridor and closet doors in one group may be used in connection with locks for the other types of doors in another group. This should be avoided if possible, and is not necessary, as in some instances a choice of four locks is given.

Corridor locks shown in Groups 5 and 6 are not strictly Hotel Locks, and do not have all the functions which a corridor lock should have. They are suitable for use, however, in small Inns and Hotels with a limited number of rooms.

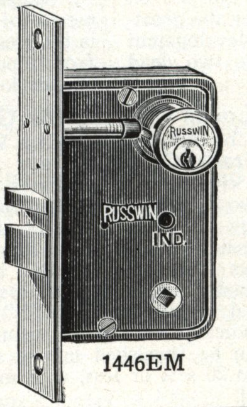
Continued on next page

MORTISE BALL BEARING CYLINDER LOCKS

1446EM Highest Grade Cylinder Lock for Hotel Corridor Doors

When door is closed the latch bolt is automatically deadlocked, and lock can be operated by key only from outside and by knob from inside. Outside knob is rigid at all times. Auxiliary latch automatically deadlocks and safeguards the latch bolt, preventing it from being retracted by any instrument inserted between the face of the lock and strike. It can also be locked by key from inside, then all keys are made inoperative from the outside except the Emergency.

When thus locked, the outside cylinder is disengaged from the locking mechanism and any key, except the emergency on the outside, revolves freely without engaging any part of the locking mechanism, indicating that the room is occupied. This feature eliminates strain of any kind on the lock and prevents the twisting and breaking of keys by maids.



1446EM

Can also be furnished with Indicator B if desired (see plate No. 22).

The latch cannot be deadlocked when door is open, thus preventing any damage to the lock when latch bolt comes in contact with strike.

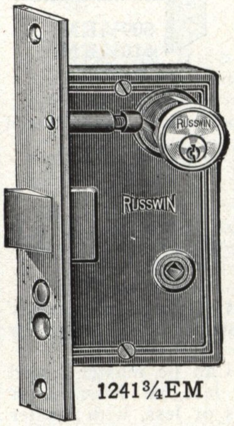
When not locked by key on inside, the lock is subject to guests', maids' master, grand master, display and emergency keys.

GENERAL CONSTRUCTION

Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass.
Reversible: No, specify hand.
Latch Construction: Type D. C.
Lock Width: ⅞-in. more than backset.
Master Keyed: Can be with other Russwin Cylinder Locks.
Indicator: Type B, $1.85 additional.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
1446EM	Bevel	8x1¼	5½x3⅜x⅞	2½	....	1½	3⅝	Two	3	Unlimited	......	Easy spring	$21.60

1241¾EM and 1246¾EM Cylinder Locks for Hotel Corridor Doors



1241¾EM

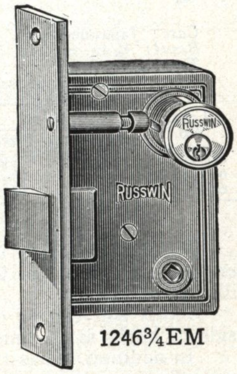
1241¾EM—Latch bolt can be operated by knob from either side except when outside knob is set by stops in face of lock, then by key only from outside and by knob from inside.

In addition the latch bolt can be deadlocked by turn knob on inside, making all keys inoperative except the emergency. If Indicator is desired, specify Indicator B (see plate No. 22). When latch bolt is deadlocked, indicator shows room is occupied.

1246¾EM—When door is closed it is automatically locked, and lock can be operated by key only from outside and by knob from inside. Outside knob is rigid at all times. In addition the latch bolt can be deadlocked by turn knob inside, making all keys inoperative except the emergency. If indicator is desired, specify Indicator B (see plate No. 22). When latch bolt is deadlocked, indicator shows that room is occupied.

Can be furnished with guests', maids' master, grand master, display and emergency keys.

Case: Japanned iron.
Fronts, Bolts, Strikes: Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze.
Keys: Liberty silver.
Hub: Brass. For 5/16-in. spindle.
Reversible: No, specify hand.
Latch Construction: Type D.C.
Lock Width: 1-in. more than backset.
Master Keyed: Can be with other Russwin Cylinder Locks.
Indicator: Type B, $1.85 additional.



1246¾EM

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
1241¾EM	Bevel	8½x1¼	6¼x3½x⅞	2½	....	1½	3¼	One	3	Unlimited	066½	Easy spring	$18.00
1246¾EM	Bevel	7 5/16x1¼	5 x3½x¾	2½	....	1½	3¼	One	3	Unlimited	066½	Easy spring	18.00

1230EM and 1232EM Cylinder Locks for Hotel Corridor Doors

1230EM—This lock is somewhat similar to 1446EM except that it does not have the auxiliary latch and the dead bolt is operated by a turn piece instead of by key.

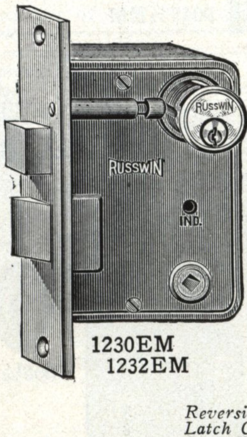
When door is closed it is automatically locked, and lock can be operated by key only from outside and by knob from inside. Outside knob is rigid at all times.

In addition it has a dead bolt operated by turn knob or piece on the inside.

When deadlocked the outside cylinder is disengaged from the locking mechanism and any key, except the emergency, on the outside, revolves freely without engaging any part of the locking mechanism indicating that the room is occupied.

This feature eliminates strain of any kind on the lock and prevents the twisting and breaking of keys.

Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass. For 5/16x⅜-in. swivel spindle.



1230EM
1232EM

Can also be furnished with Indicator B if desired.

When not deadlocked, the lock is subject to guests', maids' master, grand master, display and emergency keys.

1232EM—Latch bolt can be operated by knobs from either side at all times. In addition it has a dead bolt operated by turn knob from inside, and key from outside. When deadlocked by turn knob from inside all keys except the emergency are made inoperative.

If Indicator is desired, specify Indicator B (see plate No. 22). When dead bolt has been thrown by turn knob on inside, indicator shows room is occupied.

This lock can be furnished with guests', maids' master, grand master, display and emergency keys.

Reversible: No, specify hand.
Latch Construction: Type D. C.
Lock Width: 1-in. more than backset.
Master Keyed: Can be with other Russwin Cylinder Locks.
Indicator: Type B, $1.85 additional.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
1230EM	Bevel	7⅝x1¼	5½x3¾x⅞	2¾	....	1½	3⅝	One	3	Unlimited	066½	Easy spring	$21.00
1232EM	Bevel	7⅝x1¼	5½x3¾x⅞	2¾	....	1½	3⅝	One	3	Unlimited	066½	Easy spring	20.75

Continued on next page

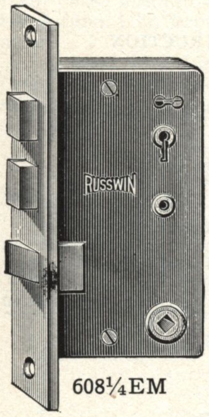
MORTISE BITTED KEY LOCKS

HOTEL CORRIDOR DOORS

The locks illustrated are designed especially for use on the door from corridor to guest room. They offer the greatest security to the guest and are the highest development in the bitted key type of lock. The locks have two dead bolts operated from opposite sides.

When the inside bolt is thrown by the guest by means of a key the only key which can operate the lock is the emergency key. This gives the guest absolute privacy from operation of the lock by maids or other regular master keys.

Bitted Key Corridor Door Locks Offering the Greatest Security to the Guest Can Be Opened Only by Emergency Key When Locked on Inside



608¼EM

608¼EM High Grade Corridor Door Lock—Latch bolt can be operated by knobs from either side at all times.

In addition it has two dead bolts, operated thru separate keyholes. The lower bolt is operated by key from inside at all times, and when thrown all keys except the emergency are made inoperative from outside. The upper bolt is operated by keys from outside. Can be furnished with guests', maids' master, grand master, master grand, display and emergency keys.

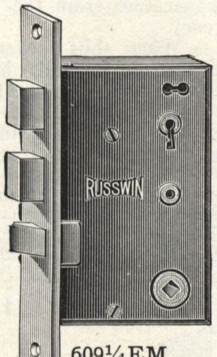
If indicator is desired, specify Indicator "B" (see plate No. 22). When lower bolt is thrown indicator shows that room is occupied.

Master Keying—Can be furnished in one set of 4000 locks, all different, or subdivided into 20 sets or less, with master key for each set and grand master key for all.

609¼EM—This lock is similar to 608¼ except that it is a lighter and less expensive lock and has less master keying facilities.

Master Keying—Can be furnished in one set of 2160 all different, or subdivided into 24 sets or less, with master key for each set and grand master for all.

610¼EM—This lock is similar to 609¼EM including master keying except that it does not require an indicator. When the lower bolt is thrown from the inside, the outside knob is made inoperative, indicating that the room is occupied.



609¼EM
610¼EM

Case: Japanned iron. *Front, Bolts, Strikes:* Cast Bronze.
Bevel: ⅛-in. on 2-in. *Keys:* Nickelplated steel.
Tumblers: Steel.
Hub: Brass, compensating. For 5/16-in. spindle.
Latch Construction: Type D.C.
Reversible: No. specify hand.
Lock Width: 608¼EM, ¾-in. more than backset; 609¼EM and 619¼EM, ⅞-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
608¼EM	Flat	8½x1⅛	6¼x3½x¾	2¾	....	1½	2⅜–4	4 levers	1	4000	......	Easy spring	$15.25
609¼EM	Flat	7⅝x1 1/16	5¾x3½x⅝	2⅝	....	1½	2 –3½	3 levers	1	2160	......	Easy spring	9.50
610¼EM	Flat	7⅝x1 1/16	5¾x3½x⅝	2⅝	....	1½	2 –3½	3 levers	1	2160	066½	Easy spring	10.00

Inexpensive Bitted Key Corridor Door Lock

0015¾EM—This is a lighter and less expensive lock for corridor doors than those illustrated above.

Latch bolt can be operated from either side by knobs at all times.

In addition it has two dead bolts. The upper bolt can be operated by key only from outside. The lower bolt by turn knob from inside. Turn knob will also withdraw upper bolt when thrown from outside by key. When locked from inside all keys except the emergency are made inoperative. The upper bolt can be operated by any of the keys to which it is subject, except when locked by emergency key.

0015¾EM

066½

Can be furnished with guests', maids' master, grand master and emergency keys.

Master Keying—Can be master keyed in one set of 300 or less, all different, or subdivided into 6 sets or less, with master key for each set, and grand master key for all.

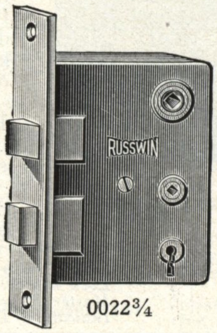
Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Tumblers: Steel.
Keys: Nickelplated steel.
Hub: Brass, compensating. For 5/16-in. spindle.
Latch Construction: Type D.C.
Reversible: No, specify hand.
Lock Width: ¾-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt
	Type	Size, in.		Std.	Spec.							
0015¾EM	Flat	6½x1 1/16	4⅝x3⅜x⅝	2⅝	....	1¼	2 3/16x3 9/16	3 lever	1	300	065	Easy spring

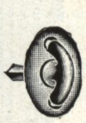
MORTISE KNOB LOCKS FOR HOTEL BATH ROOM DOORS

0022¾—Latch bolt can be operated by knobs from either side at all times.

In addition it has a dead bolt operated from the inside by turn knob and by key from outside, in case of emergency. Key will also dead lock bolt when required, permitting room to be rented separately or ensuite.



0022¾



066½

GENERAL CONSTRUCTION

Case: Japanned iron.
Front, Bolt, Strikes: Cast bronze.
Keys: Nickelplated steel.
Turn Piece: Cast bronze.
Tumblers: Lever, cast iron.
Hub: Brass, compensating. For 5/16-in. spindle.
Latch Construction: 0022¾, D.C.; 233, E.
Reversible: Yes.
Lock Width: ¾-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt
	Type	Size, in.		Std.	Spec.							
0022¾	Flat	6¾x1 1/16	4⅝x3½x⅝	2¾	2½	1 7/16	1⅞–3 3/16	3 lever	1	48	066½	Easy spring

Continued on next page

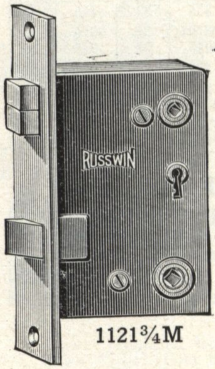
MORTISE BITTED KEY LOCKS

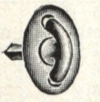
HOTEL COMMUNICATING DOORS

Two different sets of locks are shown for different services. 1121¾M and 1133¾M are for single doors between communicating bed rooms or rooms in suites which can be rented separately, see diagram and table Plate 32. The split dead bolt, which can be made inoperative in either the locked or unlocked position by the management by means of a master key, is the special feature of these locks.

1122¾M and 1134¾M are for single doors as between bed rooms and living or for bath room door or for use on double or twin communicating doors between bed rooms which can be rented separately. They have a single bolt operated from one side only. This bolt can also be made inoperative in either a locked or unlocked position by master key of the management.

Locks with Split Dead Bolt


1121¾M

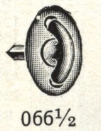

066½

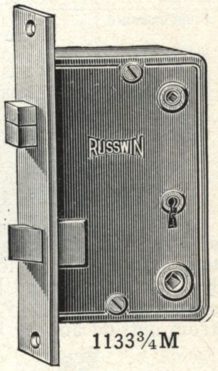
1121¾M High Grade—Latch bolt can be operated by knobs from either side at all times. In addition it has split dead bolts operated by turn pieces from opposite sides. When either half bolt is thrown from one side it can not be retracted from the opposite side. Master or grand master key will deadlock turn piece when dead bolts are either thrown or withdrawn.

Change keys are not required and not furnished unless specified.

Master Keying—One set of 1000 or less, all different, or subdivided into 20 sets or less with master key for each set, and grand master for all.

1133¾M Medium Grade—This lock has the same functions as 1121¾ but is less expensive. Can only be master keyed in one set of 300 or less or 6 sets of 50 with master key for each and grand master for all.


066½


1133¾M

Locks with Single Dead Bolt

1122¾M High Grade—Latch bolt can be operated by knobs from either side at all times. In addition it has a single dead bolt operated by turn piece from one side only. Master and grand master will deadlock turn piece when dead bolt is either thrown or withdrawn.

Change keys are not required, and not furnished unless specified.

Master Keying—One set of 1000 or less, all different, or subdivided into 20 sets or less, with master key for each set, and grand master key for all.

1134¾M Medium Grade—This lock has the same functions as 1122¾M but is less expensive. It can only be master keyed in one set of 300 or less or 6 sets of 50 with master key for each and grand master for all.

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Tumblers: Lever, steel. *Key:* Nickelplated steel.
Hub: Brass, compensating, for $\frac{5}{16}$-in. spindle.
Turn Piece: Cast bronze.
Latch Construction: Type D.C.
Reversible: Yes.
Lock Width: ¾-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
1121¾M	Flat	7½x1⅛	5½x3½x¾	2¾	....	1½	2⅛	4 lever	1	1000	2- 066½	Easy spring	$9.00
1122¾M	Flat	7½x1⅛	5½x3½x¾	2¾	....	1½	2⅛	4 lever	1	1000	1- 066½	Easy spring	8.00
1133¾M	Flat	7⅝x1	5¾x3½x⅝	2¾	....	1½	1¾	3 lever	1	300	2- 066½	Easy spring	7.50
1134¾M	Flat	7⅝x1	5¾x3½x⅝	2¾	....	1½	1¾	3 lever	1	300	1- 066½	Easy spring	6.50

Also see 238, 238½, 236, 236½, 233, 233½, Plate 37

HOTEL CLOSET DOORS

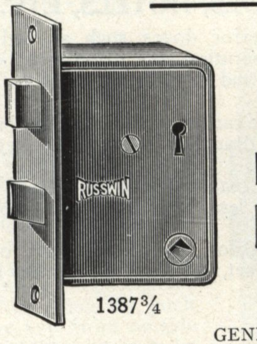
These locks can be and are usually made to be controlled by the guests individual corridor (or rooms) door key.

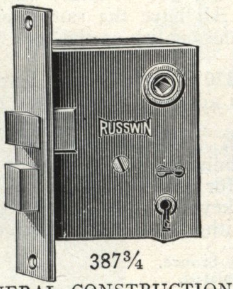
When so controlled they are not subject to any of the various master keys except the emergency, thus affording the guest protection from petty theft.

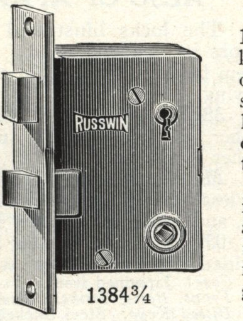
This control can also be used for 384¾GM, 380¾GM, 0370¾ when used with Hotel Corridor Bitted Key Locks.

1387¾, 387¾, 1384¾—These locks are similar in function, differing in quality and weight of lock.

Latch Bolt can be operated by knobs from either side at all times. In addition have dead bolt operated by key from either side. 1387¾ and 1384¾ have the key for the dead bolt above the knobs.


1387¾


387¾


1384¾

Master Keying — 1387¾, 387¾, master keyed in one set of 1000 or less, all different, or subdivided into 20 sets, or less, with master key for each set, and grand master key for all.

1384¾, master keyed in one set of 300 or less, all different or subdivided into 6 sets or less, with master key for each set, grand master key for all.

GENERAL CONSTRUCTION

Case: Japanned iron. *Fronts, Bolts, Strikes:* Cast bronze.
Tumbler: Lever, steel. *Keys:* Nickelplated steel.
Hub: Brass, compensating, for $\frac{5}{16}$-in. spindle.
Latch Construction: Type D.C.
Reversible: Yes.
Lock Width: ¾-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.							
1387¾	Flat	6½x1$\frac{1}{16}$	4¾x3½x¾	2¾	....	1½	2⅝	4 levers	1	1000	Easy spring	$5.50
387¾	Flat	6 x1$\frac{1}{16}$	4 x3½x⅝	2¾	1¾–2¼	1½	2⅝	4 levers	1	1000	Easy spring	5.50
1384¾	Flat	6½x1	4¾x3½x⅝	2¾	....	1¼	2⅝	3 levers	1	300	Easy spring	4.00

Note—Also see 384¾, 380¾, 0370¾ Residential Locks, Plate 36

Continued on next page

LOCKS FOR RESIDENCES

Exterior cylinder locks for the front, rear and side entrances, and garage, may be keyed alike or all different, yet subject to the key of the front entrance door. This permits the use of various doors by different individuals as maid or chauffeur, without the necessity of intruding on the privacy of the owner.

Bitted key locks cost less than cylinder locks and afford the requisite security on interior doors. If desired they may all be keyed alike or all different, subject to a master key.

Note: Particular attention is called to the very reasonable cost of master keying the cylinder locks of even small residences, amounting to not more than $0.75 per cylinder to master key. This is worth many times the slight cost in the convenience to the owner of having one key which will open all the doors master keyed on the system.

LOCKS ARRANGED IN GROUPS ACCORDING TO CHOICE AND QUALITY

Use	Group 1		Group 2		Group 3		Group 4	
	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate	Lock No.	Plate
Front entrance	1213 1248	36 36	1213 1248	36 36	1213 1248	36 36	1213 1248	36 36
Side entrance	1213 1248	36 36	1213 1248	36 36	1213 1248	36 36	1213 1248	36 36
Rear entrance	1248	36	1248	36	1248	36	1248	36
Interior doors	384¾	36	380¾	36	0370¾	36	0370	36
Ex. French doors	F1247	37	F1247	37	G381¾	38	G231	38
In. French doors	G381¾	38	355	38	355	38	355	38
Closets	384¾ 042	36 39	380¾ 042	36 39	0370¾ 043	36 39	0370 043	36 39
Bath	236	37	236	37	233	37	233	37
Communicating	236½ 384¾	37 36	236½ 380¾	37 36	233½ 0370¾	37 36	233½ 0370	37 36
Garage	*200 *300	....	*200 *300	....	*200 *300	....	*200 *300	....

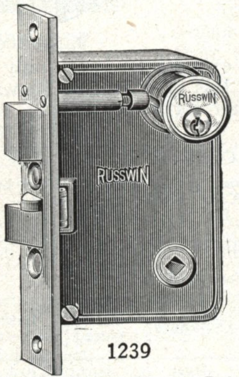
*For Garage Locks, see Garage Hardware Section, pages 1498-1499.

CYLINDER LOCKS FOR ENTRANCE DOORS TO RESIDENCES, APARTMENTS, ETC.

1239 and 1248—Knobs Both Sides—These locks are similar in operation except that 1239 has the additional feature of the anti-friction latch insuring easy operation. Latch bolt can be operated by knobs from either side except when outside knob is set by stops in face of lock, then by key only from outside and by knob from inside.

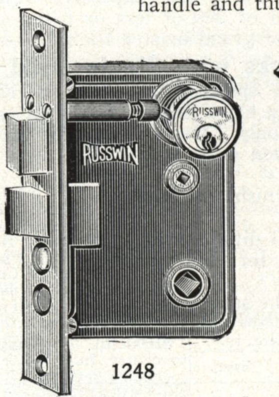
In addition they have dead bolts operated by key from outside and by turn knob from inside. Both dead and latch bolt can be operated from outside by a continuous turn of key.

1213—Handle and Thumb Piece Outside, Knob Inside—This lock is similar to 1248 except for the use of handle and thumb piece for the outside.



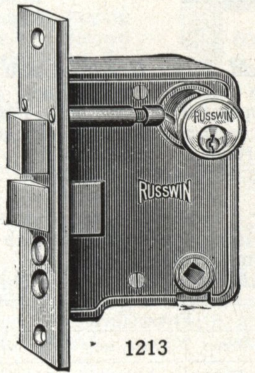
1239

066½



1248

066½

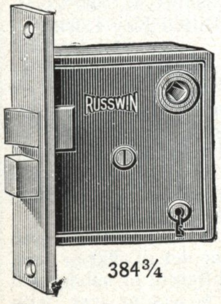


1213

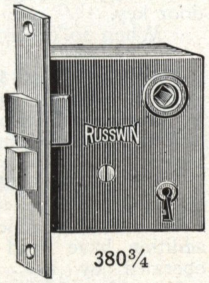
Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Bevel: ⅛-in. on 2-in.
Cylinder: Bronze. *Keys:* Liberty silver.
Hub: Brass. 1239 and 1248 for 5/16x⅜-in. swivel spindle; 1213, Spindle No. 40, 5/16-in.
Latch Construction: 1239-EC, 1248-CL, 1213-CSS.
Reversible: 1239, no; 1248, yes; 1213, yes.
Lock Width: More than backset, 1-in. for 1238 and 1248; 1⅛-in. for 1213.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price
	Type	Size, in.		Std.	Spec.								
1239	Flat	8 x1¼	5½x3¾x¾	2¾	2-2½	1½	3⅝	1	3	Unlimited	No. 066½	Anti-friction	$11.50
1248	Flat	7¾x1⅛	5½x3⅞x1/16	2½	......	1½	3⅝	1	3	Unlimited	No. 066½	Easy spring	10.00
1213	Flat	7⅜x1⅛	5 x4 x¾	2½	2-2⅞	1½	4¼	1	3	Unlimited	....	Easy spring	11.00

BITTED KEY LOCKS FOR INTERIOR DOORS OF RESIDENCES, ALSO OF APARTMENTS, SCHOOLS, HOTELS, ETC.



384¾



380¾

The locks illustrated are for ordinary interior doors such as bed room doors in residences, etc. All have the same operation, the difference between them being in the weight and quality of the lock and the limitations as to master keying.

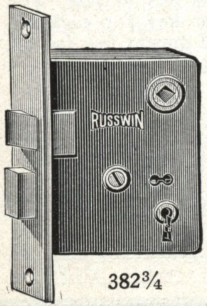
382¾, 384¾, 380¾, 0370¾, 0370—Latch bolt can be operated by knobs from either side at all times. In addition they have a dead bolt operated by key from either side.

Master Keying—382¾, 384¾, 380¾ can be master keyed in one set of 300 or less, all different, or subdivided into 6 sets, or less, with master key for each set, and grand master key for all.

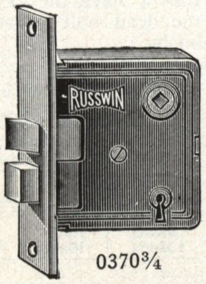
0370¾ can be master keyed in one set of 180, or less, all different, or subdivided into 3 sets, or less, with master key for each set, and grand master key for all.

Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Bitted Keys: Steel, nickelplated.
Tumblers: Steel.
Hub: 382¾ and 384¾, brass compensating; 380¾, brass; 0370¾, iron for 5/16-in. spindle.
Latch Construction: 382¾, 384¾ and 380¾, DC; 0370¾, E.
Reversible: Yes.
Lock Width: ¾-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, tocenter.in.	Spacing, in.	Tumblers	Keys	Changes	Latch bolt	Price
	Type	Size, in.		Std.	Spec.							
382¾	Flat	6¼x1x1/16	4¼x3½x⅝	2¾	......	1⅜	2⅝	3 lever	1	48	Easy spring	$4.00
384¾	Flat	6 x1	4 x3½x⅝	2¾	2½	1¼	2⅝	3 lever	1	48	Easy spring	3.60
380¾	Flat	5½x1	3½x3⅜x⅝	2⅝	......	1¼	2 3/16	3 rack lever	1	48	Easy spring	3.00
0370¾	Flat	5½x⅞	3½x3¼x⅝	2½	2 3/16	1	2 3/16	3 rack lever	1	36	Easy spring	1.85
0370	Flat	5½x⅞	3½x3¼x⅝	2½	2 3/16	1	2 3/16	1 rack lever	1	12	Easy spring	1.50



382¾



0370¾

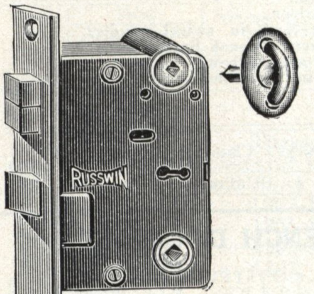
Continued on next page

MORTISE KNOB LOCKS FOR BATH AND COMMUNICATING ROOM DOORS FOR RESIDENCES, ALSO APARTMENT HOUSES AND HOTEL BATH ROOMS

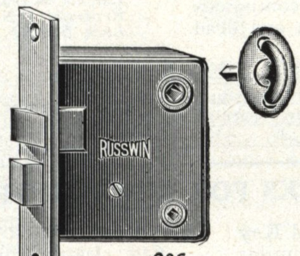
These locks have latch and dead bolts. The dead bolt being operated from the bathroom side by a turn knob. For communicating doors use locks with suffix ½ as this indicates a lock with two turn knobs operating a split dead bolt, half of which can be operated from each side.

238, 236, 233, 223 Locks With Single Dead Bolt for Bathrooms—Latch bolt can be operated by knobs from either side at all times. In addition they have a single dead bolt operated by turn knob from one side only. In case of necessity dead bolt can be operated from opposite side of door by square stem key.

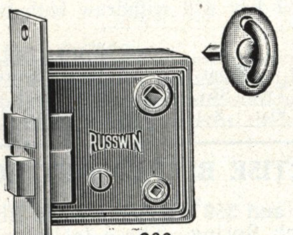
238½, 236½, 233½, Locks with Split Dead Bolt for Communicating Doors—Latch bolt operated by knobs from either side at all times. In addition they have split dead bolts operated by turn knobs from opposite sides. When bolt is thrown from one side it can not be retracted from the other.



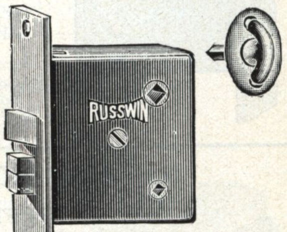
238½
238 has one bolt



236
236½ has split bolt



233
233½ has split bolt



223½
223 has one bolt

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolt, Strikes:* Cast bronze.
Turn Piece: Cast bronze.
Hub: Brass. For $\frac{5}{16}$-in. spindle.
Latch Construction: 238, 238½, 236, 236½-DC, 233, 233½-E, 223, 223½, SE.
Reversible: Yes.
Lock Width: ¾-in. more than backset for 238, 238½, 236, 236½; ⅞-in. more than backset for 233, 233½, 223, 223½.

Lock No.	Flat		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.					
238	Flat	6¾x1⅛	5 x3½x¾	2¾	....	1½	3¾	066½	Easy spring	$6.00
238½	Flat	6¾x1⅛	5 x3½x¾	2¾	....	1½	3¾	Two 066½	Easy spring	7.00
236	Flat	5⅞x1	4 x3½x⅝	2¾	2, 2½	1¼	....	066½	Easy spring	4.00
236½	Flat	5⅞x1	4 x3½x⅝	2¾	2, 2½	1¼	....	Two 066½	Easy spring	5.00
233	Flat	5½x ⅞	3½x3¼x⅝	2½	....	1	....	066½	Easy spring	2.00
233½	Flat	5½x ⅞	3½x3¼x⅝	2½	....	1	....	Two 066½	Easy spring	3.00
223	Flat	5¼x ⅞	3½x3⅛x½	2⅜	....	1	2$\frac{3}{16}$	066½	Easy spring	1.90
223½	Flat	5¼x ⅞	3½x3⅛x½	2⅜	....	1	2$\frac{3}{16}$	Two 066½	Easy spring	2.90

GENERAL INFORMATION REGARDING PROPER LOCKS TO USE ON FRENCH DOORS

When French doors are used they generally have narrow stiles. This necessitates a different kind of lock and trim treatment from that on door having standard width stiles. If the stile is less than 4-in., lever handles should be used, as knobs would leave too little room to operate the latch without knocking the fingers on the door jamb.

Lever handles should never be used on a lock designed for use with knobs as the constant weight of the lever handle would spoil the regular spring. The locks as listed for French doors are designed especially for use with lever handles. They are made with two types of springs, French Spring and Gun Spring. These springs are designed to offset the weight of the lever handle.

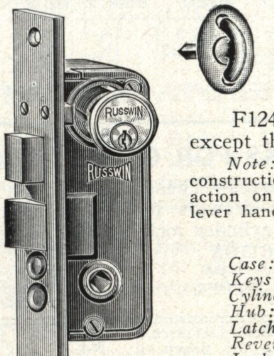
Backsets of varying dimensions are listed to take care of almost any width of stile. The bracket plus 1 in. will give the full width or depth of lock case.

On the illustration of various handles, on Plate 16, the projection of the handles are given. This should be taken into consideration especially if two doors come together as on exterior and screen doors. If there is not sufficient room between the doors for the handles to clear, the screen door hardware should be raised to stagger the hardware.

NARROW MORTISE CYLINDER LOCKS FOR EXTERIOR FRENCH DOORS

Designed especially for use on exterior French doors and can be master keyed on the same system as the regular cylinder locks in other parts of the building.

F1247 Flat and F1277 Rabbeted Face with Cylinder Lock and Dead Bolt—F1247½ Flat and F1277½ Rabbeted Face with Cylinder but without Dead Bolt— F1247 and F1277 are alike except for face of lock. Latch bolt can be operated by lever handle from either side, except when outside handle is set by stops in face of lock, then the latch bolt can only be operated by key from outside and lever handle inside. In addition these locks have a dead bolt operated by key from outside and by turn knob from inside. A continuous turn of key will withdraw both dead and latch bolt.



F1247

F1247½ and F1277½ are similar to F1247 and F1277 except they do not have the dead bolt feature.

Note: All these locks have the French Spring Type of latch construction, which gives a strong action on the hub and an easy action on the latch, making it especially adapted for use with lever handles.

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolt, Strikes:* Cast bronze.
Keys: Liberty silver.
Cylinder: Bronze.
Hub: Brass. For $\frac{5}{16}$x⅜-in. swivel spindle.
Latch Construction: French Spring Type F.
Reversible: No, specify hand.
Lock Width: 1-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.								
F1247	Flat	8 x1¼	5¾x¾	1	1¼,1½	1$\frac{7}{16}$	3⅝	1	3	Unlimited	066½	Easy spring	$15.00
F1247½	Flat	8 x1¼	5¾x¾	1	1¼,1½	1$\frac{7}{16}$	3⅝	1	3	Unlimited	....	Easy spring	14.00
F1277	Rabbet	8x1¼x½	5¾x¾	1	1¼,1½	1$\frac{7}{16}$	3⅝	1	3	Unlimited	066½	Easy spring	18.00
F1277½	Rabbet	8x1¼x½	5¾x¾	1	1¼,1½	1$\frac{7}{16}$	3⅝	1	3	Unlimited	....	Easy spring	17.00

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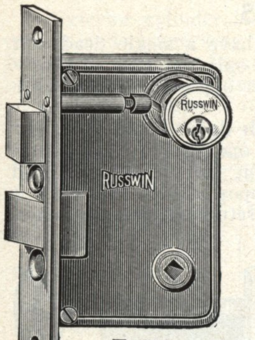
MORTISE CYLINDER LOCK FOR EXTERIOR FRENCH DOORS



F1238

F1238 Flat Face With Cylinder Lock and Dead Lock—This lock is somewhat similar to Lock F1247 except that the case is wider and cannot be used on doors with narrow stiles. Latch bolt can be operated with knobs or lever handles both sides, except when outside knob or handle is set by stop in face of lock, then the latch bolt can be operated only by key from outside and knob or lever handle inside. In addition it has a dead bolt operated by key from outside and turn piece inside. A continuous turn of key will withdraw both latch and dead bolt.

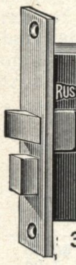
This is a high grade cylinder lock for use on exterior French doors which do not have a stile less than 4-in. It can be used with knobs or lever handles.

GENERAL CONSTRUCTION

Case: Japanned iron.
Front, Bolts, Strikes: Cast bronze.
Cylinder: Bronze.
Keys: Liberty silver.
Hub: Brass for 5/16x⅜-in. swivel spindle.
Latch Construction: French Spring Type F.
Reversible: No, specify hand.
Lock Width: 1-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Cylinder	Keys	Changes	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.							
F1238	Flat	8x1¼	5½x3¾x¾	2¾	2½, 3	1½	3⅝	1	3	Unlimited	Easy spring	$13.25

NARROW MORTISE BITTED KEY LOCKS FOR INTERIOR FRENCH DOORS



355

355 Flat and 358 Rabbeted Face Bitted Key Locks French Spring—These locks are similar except for difference in face. Latch bolt can be operated by knobs from either side at all times. In addition it has a dead bolt operated by keys from either side.

Note: The 358 lock has reversible rabbeted front.

GENERAL CONSTRUCTION

Case: Japanned iron.
Front and Strikes: Wrought brass.
Bolts: Cast brass.
Tumblers: Steel. *Keys:* Nickelplated steel.
Hub: Iron for 5/16-in. spindle.
Reversible: 355, yes; 358, no; specify hand.
Latch Construction: French Spring Type F.
Lock Width: 355, ⅞-in. more than backset; 358, 13/16-in. more than short side backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip, to center, in.	Spacing, in.	Tumblers	Keys	Changes	Latch bolt	Price group
	Type	Size, in.		Std.	Spec.							
355	Flat wrt. brass	5¼x⅞	3⅝x2¼x⅝	1½	1¼, 1¾	1	2 3/16	1	1	12	French spring	$1.30
358	Rab. wrt. brass	5¼x1x½	3⅝x2¼x⅝	1½	¾, 1¼	1	2 3/16	1	1	12	French spring	2.30

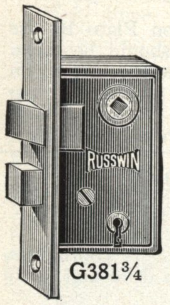
G381¾ Flat Face and G391¾ Rabbeted Face Bitted Key Locks With Latch and Dead Bolt, Gun Spring for Knobs or Lever Handle—For use with knobs or lever handles to operate latch bolt at all times. Lever handles should be used on outside.

In addition there is a dead bolt operated by key from either side at all times. The gun spring type of latch construction is especially adapted for use with lever handles.

Master Keying—Can be furnished in one set of 300, all different, or subdivided into 3 sets or less, with master key for each set and grand master for all.

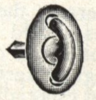
G231 Flat Face and G291 Rabbeted Face Bitted Key Locks With Latch and Dead Bolt, Gun Spring, Lever Handle or Knob Inside—These locks have narrower backset than G381¾ and G391¾, requiring lever handle on outside and a lever handle or knob on inside to operate the latch at all times.

In addition there is a dead bolt operated by turn knob from one side only. The gun spring latch bolt construction makes it especially suited for use with lever handles.

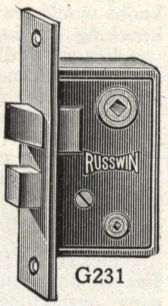


G381¾

Case: Japanned iron.
Front and Bolts: Cast brass. *Strikes:* Wrought brass.
Tumblers: G381¾ and G391¾, steel.
Keys: Nickelplated steel.
Hub: Brass. For 5/16-in. spindle.
Reversible: No, specify hand.
Latch Construction: Type G.
Lock Width: G381¾, G391¾ and G291, ¾-in.; G231, ⅞-in. more than backset.
Lever handle should be used on outside.



065



G231

Lock No.	Front		Size case, in.	Backset, in.		Strike lip to center, in.	Spacing, in.	Tumblers	Keys	Changes	Turn piece	Latch bolt	Price group
	Type	Size, in.		Std.	Special								
G381¾	Flat	6x1	4x⅝	1½	1¼, 1¾, 2	1¼	2⅝	3	1	48	......	Easy spr.	$4.50
G391¾	Rabbet	6x1⅛x½	4x⅝	1½	1, 1¼, 1¾, 2	1¼	2⅝	3	1	48	......	Easy spr.	6.50
G231	Flat	6x1	4x⅝	1½	1¾	1¼	2⅝	....	....	....	065	Easy spr.	4.00
G291	Rabbet	6x1⅛x½	4x⅝	1½	1¾	1¼	2⅝	....	....	....	065	Easy spr.	6.00

CYLINDER LOCKS FOR CUPBOARDS AND DRAWERS

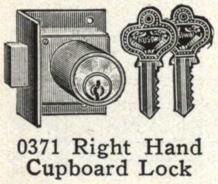
0371 for Cupboard Doors—0685 for Drawers—These cylinder locks are for use on cupboards and drawers in pantries, kitchens and cabinet work requiring a cylinder lock which can be keyed in the Russwin cylinder lock system.

They can also be used on Pipe Chases, Wire Shafts and light closet doors.

GENERAL CONSTRUCTION

All Brass: Bolt heavy cast brass.
Cylinder: Russwin Ball Bearing.
Keys: Two liberty silver.

Changes: Unlimited.
Cylinder: 1⅛-in. diam. for ⅞-in. wood.
Furnished for ¾-in. wood at same price.
Reversible: No, specify hand.

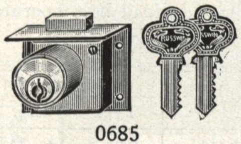


0371 Right Hand Cupboard Lock

Lock No.	Case, in.	Backset, in.	List price, dozen
0371A	2¼x1⅞	¾	$47.00
0371B	2¼x1⅞	⅞	48.00
0371C	2¼x2	1	48.00
0371D	2¼x2¼	1¼	49.00
0371E	2¼x2½	1½	50.00
0371F	2¼x2⅞	1¾	51.25
0371G	2¼x3	2	52.60
0371H	2¼x3¼	2¼	56.00
0371I	2¼x3½	2½	58.00

Lock No.	Case, in.	Backset, in.	List price, dozen
0685¼	2¼x1⅞	¾	$47.00
0685	2¼x1⅞	⅞	48.00
0686	2¼x2	1	48.00
0688	2¼x2¼	1¼	49.00
0689	2½x2½	1½	50.00
0690	2¼x2⅞	1¾	51.25
0691	2¼x3	2	52.60

All locks listed in table can be Master Keyed at $24.20 additional.



0685 Drawer Lock

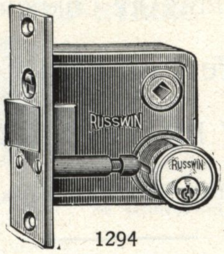
RUSSWIN RESIDENCE LOCKS PLATE 38

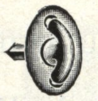
Continued on next page

MORTISE CYLINDER NIGHT LATCHES

These night latches are used generally as a supplemental latch or lock, in order to give extra protection to doors having inadequate locking devices.

1294 Latch Bolt Operated by Key from Outside and Turn Knob from Inside—Stops in face of lock can be set to hold latch bolt retracted. 1294½ same as 1294 except bolt is operated by key from both sides. Can be master keyed in any Russwin cylinder lock system.


1294



GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Cylinder: Bronze.
Keys: Liberty silver.
Hub: Brass. For $\frac{5}{16}$-in. spindle.
Latch Construction: Type EC.
Reversible: Yes.
Lock Width: ¾-in. more than backset.

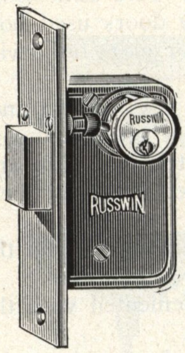
Lock No.	Front		Size case, in.	Backset, in.		Strike lip to center, in.
	Type	Size, in.		Std.	Special	
1294	Flat	5⅛x1⅛	3¼x3½x¾	2¾	2¼, 2½, 3	1¼
1294½	Flat	5⅛x1⅛	3¼x3½x¾	2¾	2¼, 2½, 3	1¼

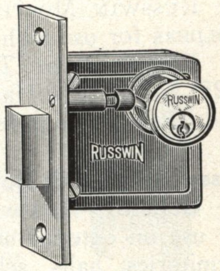
Lock No.	Cylinder	Keys	Changes	Turn knob	Latch bolt	Price group
1294	One	3	Unlimited	1294	Easy spring	$7.50
1294½	Two	3	Unlimited	....	Easy spring	9.50

CYLINDER DEAD LOCKS

These locks are especially adapted for use on doors equipped with push plates or pulls, or both, as on banks, department stores, railroad stations, etc., and those under janitor control; also doors leading to safe deposit vaults.

1207-1207½—Extra heavy cylinder dead locks.
1205-1205½—Medium weight cylinder dead locks.
1203-1203½—Light weight cylinder dead locks.
1207, 1205, 1203—Dead bolt can be operated only by key from outside and turn knob inside.
1207½, 1205½, 1203½—Dead bolt operated by key only from either side. Can be master keyed in any Russwin Cylinder Lock System.


1207


1205

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Front: Can be rounded or beveled on special order.
Cylinder: Bronze. *Keys:* Liberty silver.
Reversible: Yes. *Lock Width:* 1-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Cylinder	Keys	Changes	Turn piece	Price group
	Type	Size, in.		Std.	Special					
1207	Flat	6⅞x1¼	4½x3¾x⅞	2¾	1½,2,2½,3,3¼	One	3	Unlimited	066½	$10.00
1207½	Flat	6⅞x1¼	4½x3¾x⅞	2¾	1½,2,2½,3,3¼	Two	3	Unlimited	066½	11.00
1205	Flat	5½x1¼	¾x3¾x¾	2¾	1¼,1½,2,2½,3	One	3	Unlimited	066½	8.50
1205½	Flat	5½x1¼	¾x3¾x¾	2¾	1¼,1½,2,2½,3	Two	3	Unlimited	066½	9.50
1203	Flat	4⅛x1⅛	2½x3¾x⅝	2¾	1½,2	One	3	Unlimited	066½	7.00
1203½	Flat	4⅛x1⅛	2½x3¾x⅝	2¾	1½,2	Two	3	Unlimited	066½	8.00

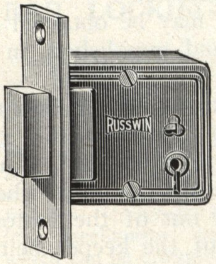
BITTED KEY DEAD LOCKS

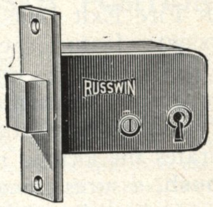
0786 Flat Face and 0786⅞ Rabbeted Face Heavy Bitted Key Dead Locks—Dead bolt can be operated by key only from either side.

Master Keying—In one set of 1000 or less all different, or subdivided into 20 sets, or less, with master key for each set, and a grand master key for all.

078¾ and 076¾ Flat Face Medium Weight Bitted Key Dead Locks—Dead bolt can be operated by keys from either side.

Master Keying—In one set of 300, or less, all different or 3 sets or less, with master key for each set and grand master key for all.


0786


078¾

GENERAL CONSTRUCTION

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Keys: Bitted, nickelplated steel.
Reversible: Yes.
Lock Width: 1-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Tumblers	Keys	Changes	Price group
	Type	Size, in.		Std.	Spec.				
0786	Flat	5⅛x1⅛	3 x3½x¾	2⅝	1½, 1¾, 2¼	4 lever	1	1000	$5.15
078¾	Flat	4 x1	2¼x3½x⅝	2¾	1⅝, 2¼	3 lever	1	48	2.00
076¾	Flat	3¾x1	2½x3¼x⅝	2½	....	3 lever	1	36	2.00

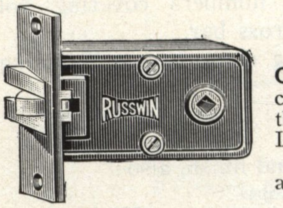
MORTISE LATCHES

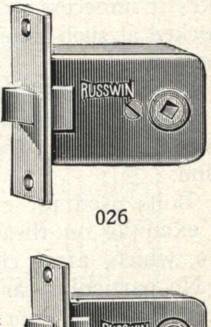
These latches are used mostly on closets. They vary in size and weight.

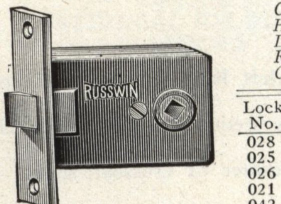
028 Latch for Fire Underwriters Door to Closets and to Stairs of Office and Loft Buildings, Latch has ¾-in. Throw—This latch is especially adapted for kalamein and other fire doors on account of the ¾-in. throw of latch. Can be operated by knobs from either side at all times. Latch is of the anti-friction type.

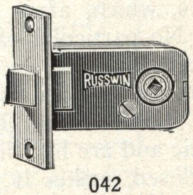
025, 026, 042, 043, Mortise Knob Latches—These locks vary in size and weight. Operation is the same for all.

Latch bolt can be operated from either side at all times.


028


026


025


042
Type of 043

Case: Japanned iron. *Front, Bolts, Strikes:* Cast bronze.
Hub: Iron. *Spindle:* $\frac{5}{16}$-in.
Latch Construction: 028 and 025, DC; 026, 021 and 042, SC.
Reversible: Yes.
Case Width: ¾-in., 028, 1½-in. more than backset.

Lock No.	Front		Size case, in.	Backset, in.		Strike lip to center, in.	Latch bolt	Price group
	Type	Size, in.		Std.	Special			
028	Flat	4 x1$\frac{1}{16}$	2¼x4¼x¾	2¾	1¾, 2½, 3¼	1½	Easy spring	$4.00
025	Flat	4 x1⅛	2¼x3½x¾	2¾	2¼, 3	1½	Easy spring	3.00
026	Flat	3¼x ⅞	1⅝x3½x⅝	2¾	2, 2½	1½	Easy spring	1.75
021	Flat	3½x ¾	1¾x3⅝x$\frac{9}{16}$	2⅝	....	1	Easy spring	.85
042	Flat	3¼x ⅞	1½x3¼x⅝	2½	2¾	1	Easy spring	.75
043	Flat	3 x ⅞	1¼x3 x½	2½	....	1	Easy spring	.60

RUSSELL & ERWIN MFG. CO.

THE AMERICAN HARDWARE CORPORATION, SUCCESSOR

Manufacturers of Fire Exit Devices

NEW BRITAIN, CONN.

For Branch Offices and Warehouses, see page 1586

Products

Russwin Fire Exit Bolts.

Russwin Mortise Locks and Automatic Door Holders for use with Fire Exit Bolts.

For Hardware Trim and Locks, see pages 1586-1625; for Garage Hardware, see pages 1498-1499; for Door Closers, see page 1581.

Russwin Fire Exit Bolts

General—Russwin Fire Exit Bolts are designed for use on exterior and interior doors in auditoriums, dormitories, halls, schools, theaters and any building where a **safe** and **sure exit** is desired at any time.

They are automatic in action, the slightest pressure, a light touch, on the bar or lever on the inside of the door, automatically and instantly releases the lock and the bolts, at all times.

Outstanding Features and Advantages—Russwin Fire Exit Bolts have the rotary action, a strictly Russwin feature, permitting the positive operation of the locking devices under either a **very slight pressure** or a **great** or **unusual pressure.**

This feature, together with the fact that the bar operates the locking mechanism, **either from a pull or a push,** assures immediate opening of the door under the worst panic conditions.

Being automatic and sure in action they furnish the same protection afforded by the employment of two or more watchmen or doormen, with the added assurance that their services are constant and uninterrupted.

They are on duty twenty-four hours a day, never tire, and are always ready when the occasion demands.

The use of these bolts which are automatic in action, makes it unnecessary for exit doors to be left open or unlocked at such times as is required by many city ordinances

On school buildings the janitor can lock the latching bolts or locking devices in a retracted position, thus preventing children from playing with same during recess period.

Bolts used for exit only, that are in daily use, as for example on theater exit doors, have self-latching bolts, which, after closing a door, automatically locks it. No particular care and inspection is required to be certain that the doors are properly locked after being used, as the bolts function automatically.

The fact that Russwin Fire Exit Bolts are automatic and are held in a retracted position, until the door is closed, makes it possible to use standard strikes on all types. This eliminates the necessity of detailing sills and head jambs and the furnishing of special strikes.

Types and Finishes—Russwin Fire Exit Bolts may be obtained for single or double doors used both for entrances as well as exits, and for exits only with the following equipment:

Those which are described for use on entrance doors are equipped with either handles or knobs, controlled by keys on the outside to match in design and keyed alike or master keyed with other Russwin locksets.

For exit doors only, furnished without trim on the outside. See plates 3 and 4.

Any of these bolts may be supplemented with the following:

Bar locking devices for holding the bar in a depressed position; recommended for school buildings. See plate 1.

Dustproof, self-closing bottom strikes. See plate 1.

Automatic door holders. See plate 2.

All Russwin Fire Exit Bolts may be obtained in both brass and bronze, polished and unpolished, in a variety of finishes.

General Notes on Construction—All Russwin Fire Exit Bolts have compensating bottom latches on the bottom rods, working independent of the rod. This feature prevents intrusion from the outside even when the bottom latch has been worked out of the bottom strike or keeper, or in the event of the keeper being plugged or filled and preventing the latch from engaging in it.

Bolts with which locks Nos. 9452, 9458, 0444¾ or 0440 are used should have stiles at least 4½ in. wide.

We recommend split astragals, as per sketch on plate No. 1, on all pairs of doors equipped with Russwin Fire Exit Bolts, except on the numbers covering bolts equipped with a connecting cross bar.

On bolts with connecting cross bars a T astragal should be used.

Information for Specifying

Specify number of bolt and finish, also:

(1) Width of door between stops.

(2) Height of door between threshold and stop.

(3) Width of stile.

(4) Thickness of door.

(5) Give detail of astragal.

(6) Specify if for right or left hand reverse bevel door taken from *outside.**

(7) When sill is not flat show section through it with relation to door.

(8) Distance from floor to center of crossbar should be 38 in.

(9) If pairs of doors are used specify hand of door on which lock is applied.

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*For information to determine hand of door, see hardware trim and lock section, page 1586.

Continued on next page

DETAILS OF TOP AND BOTTOM STRIKES AND LOCKS

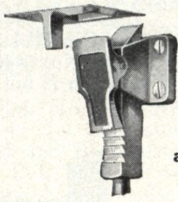
TOP STRIKE

Top strike No. 1T is so designed as to eliminate the necessity for any special detailing of head jambs, and is standard for all RUSSWIN fire-exit bolts.

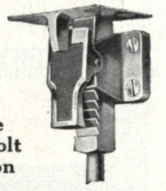
When the bar of any RUSSWIN top and bottom latching fire exit bolt is depressed and the door opened, the bolt is automatically held retracted; thus no special lip strikes are required.

When the bar is released and the door closes, the trips on the top case contacts with the strike and throws the bolts into the locked position again. These operations are clearly shown in the accompanying illustrations.

Top Strike 1T for Bolt 60



Unlocked

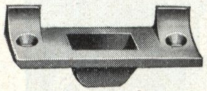


Locked

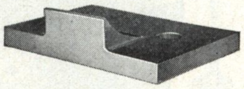
Top Strike and Top Bolt in Operation

BOTTOM STRIKES, STOPS AND SIDE LATCH STRIKE

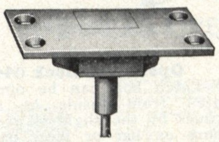
Bottom Strike 1B for Bolt 60



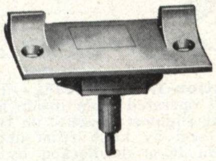
Flanged Bottom Strike for Double Doors No. 5B



Stop for Bottom of an Active Door No. 2B



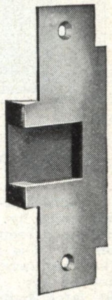
Dustproof Bottom Strike for Single Doors No. 4B



Dustproof Bottom Strike for Double Doors No. 3B

The bottom strikes, illustrated here, operate on the same principle as that of the top strike, described above. They also require no special arrangement for their installation on the threshold, except where a bronze threshold is used.

Strike No. 2B is furnished with bolts 66, 67, etc., and strike No. 5B with 60, etc., only when orders specify for double doors; otherwise strikes as illustrated with the bolts will be furnished.

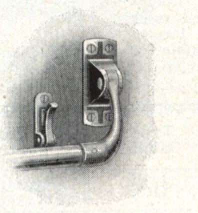


Open Back Lock Strike

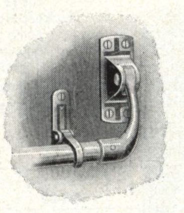
BAR LOCKING DEVICES WITH KEY FOR LOCKING BAR IN DEPRESSED POSITION USED PRINCIPALLY FOR SCHOOLS

The bar locking device No. 81 is especially designed for use in schools.

It is made of bronze in natural and lacquered brass and bronze finishes; also nickel, brass and bronze plated finishes. It consists of a locking mechanism and lever which can be dropped down to hold the bar in a depressed position until released by unlocking.

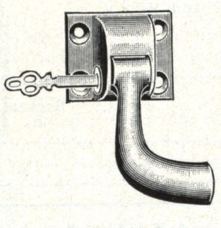


Bar Unlocked



Bar Depressed and Locked

Bar Lock No. 81



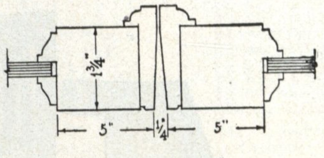
End Lock

When ordering specify number of bolt for which required.

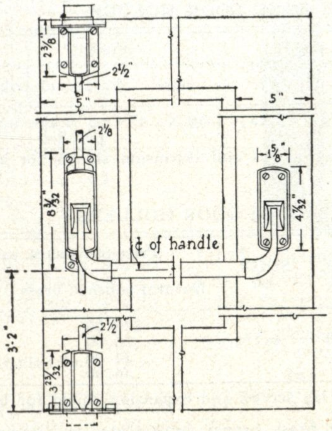
End Case Locking Device—All RUSSWIN fire exit bolts, with horizontal bar, can be equipped with an end case locking device, without extra charge.

Specify, "With locking device," when required.

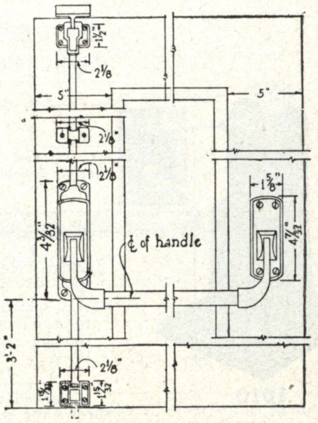
DETAILS OF DOORS USING EXIT DEVICES



DETAIL OF ASTRAGAL FOR DOUBLE DOORS



No. 40 PANIC BOLT APPLIED



No. 60 PANIC BOLT APPLIED

Continued on next page

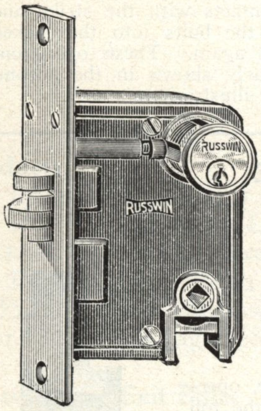
MORTISE LOCKS FOR USE WITH FIRE EXIT BOLTS

These mortise locks are especially designed for use on RUSSWIN fire exit bolts, described on the following pages. The fire exit bolts operate the latch bolts with a rotary motion, insuring instant and certain action.

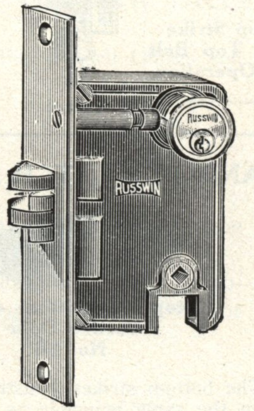
Cylinder Lock No. 9452 and 9458 are for exterior doors and can be master keyed in any RUSSWIN cylinder lock system. The latch bolts on these locks can be held retracted.

Lock No. 0444¾ is for exterior doors and can be master keyed in RUSSWIN bitted key system.

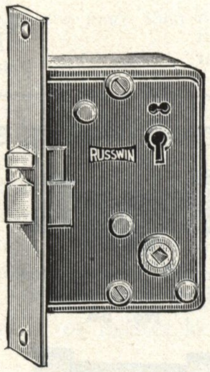
Lock No. 0440 is for interior doors, where deadlocking of the latch is not required.



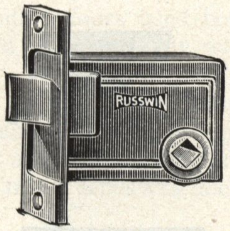
Lock No. 9452



Lock No. 9458



Lock No. 0444¾



Lock No. 0440

Operation-Lock 9452—Latch bolt can be operated from inside at all times by the slightest pressure on bar or lever pad, and by the thumbpiece from outside, except when it is deadlocked by key. The thumb piece is automatically deadlocked when latch bolt is withdrawn by key and when thus locked remains so until unlocked by a reverse throw of key. To hold latch bolt in a retracted position, first withdraw latch bolt by thumb piece, and lock it by turning key toward face of lock. Auxiliary latch automatically deadlocks and safeguards latch bolt, preventing it from being retracted by any instrument inserted between face of lock and strike.

Operation-Lock 9458—Similar in every detail to lock 9452, except operated by knob on outside.

Operation-Lock 0444¾—Latch bolt can be operated from inside at all times by the slightest pressure on bar or lever pad, and by knob from outside, except when it is deadlocked by key. When knob is unlocked the auxiliary latch is held in a retracted position. When knob is locked the auxiliary latch is released, and it automatically deadlocks and safeguards the latch bolt, preventing it from being retracted by any instrument inserted between face of lock and strike.

Operation-Lock 0440—Latch bolt can be operated from inside at all times by the slightest pressure on bar or lever pad. If outside trim is used, latch bolt can be operated from outside at all times by knob.

GENERAL CONSTRUCTION

Case: Japanned iron.
Fronts, Bolts, Strikes: Cast bronze.
Cylinder: (Bronze, Locks 9452 and 9458.)
Keys: Locks 9452 and 9458, Liberty Silver; Lock 0444¾, Bitted, Nickelplated steel.
Hub: Brass.
Reversible: No, specify hand.

MORTISE LOCKS

Lock No.	Type latch	Case, in.	Front, in.	Backset, in.	Spacing, in.	Lock No.	Type latch	Case, in.	Front, in.	Backset, in.	Spacing, in.
9452	Anti-friction	5¼x3¾x⅞	8x1¼	2¾	3⅝	0444¾	DC	5½x3¾x⅝	7⅜x1 1/16	2¾	2⅝
9458						0440		2⅝x3⅜x15/16	4½x1¼	2 13/16	

AUTOMATIC DOOR HOLDERS

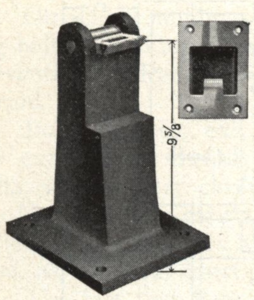
Designed for use on doors equipped with fire exit bolts and door checks, and for installation on the floor.

They are of heavy construction, nicely finished and operate in such a way as to engage and hold the door firmly and disengage it without requiring either foot or hand pressure.

IRON BASE DOOR HOLDER

Holder, No.	Height, in.	Base, in.	Strike, in.	Finish		Price, each
				Base	Latch and strike	
1010	9⅝	7x6⅛	4⅜x3⅛	Iron No. 47	Cast brass, unpolished	$12.00

Packed with steel lag screws and expansion shields for base, and screws for strike



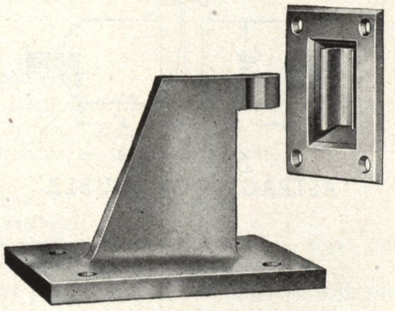
1010

CAST BRONZE DOOR HOLDERS

Holder No.	Height, in.	Base, in.	Strike, in.	Price of finishes, each	
				Natural polished brass	1-2-3-*
104⅜	4⅜	6x5	4x2⅜	$20.00	$23.00
106½	6½			25.00	28.00
109¼	9¼			34.00	38.00
110¼	10¼			36.00	40.00

Packed with bronze lag screws and expansion shield for base, and screws for strike.

*Buffed and oxidized brass, bronze, brass plated and bronze plated finishes.



104⅜ to 110¼

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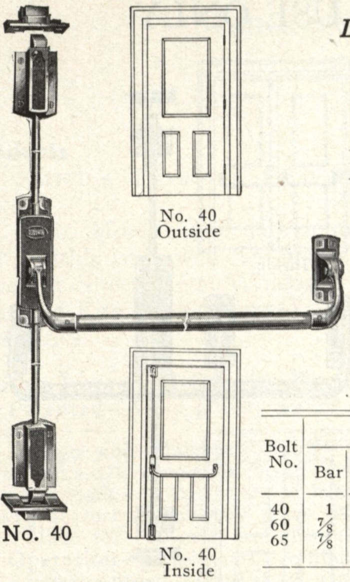
SINGLE EXIT DOORS FOR EXIT AND ENTRANCE

Doors for exit only have no outside focus

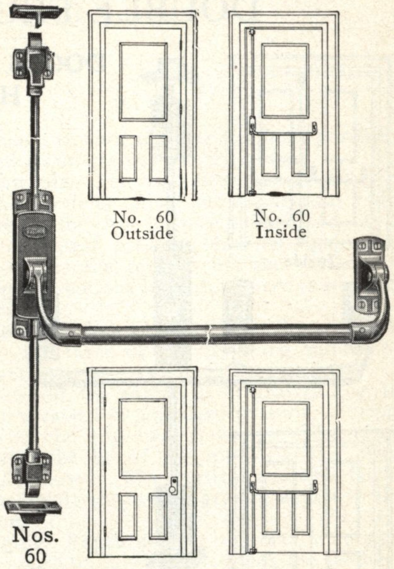
DOORS OPERATE FROM INSIDE OR OUTSIDE AS SHOWN—HAVE TOP AND BOTTOM BOLT

Bolt No. 40 differs from Nos. 60 and 65 in that the top and bottom bolts are completely enclosed and the construction is heavier throughout. Bolts Nos. 40 and 60 have top and bottom latching feature only, require no lock, are operated from the inside only and do not have any outside trim. Bolt No. 65 can be operated from the outside by the use of a knob, except when knob is deadlocked by key on the outside.


No. 40

No. 40 Outside

No. 40 Inside


Nos. 60 65

No. 60 Outside

No. 60 Inside

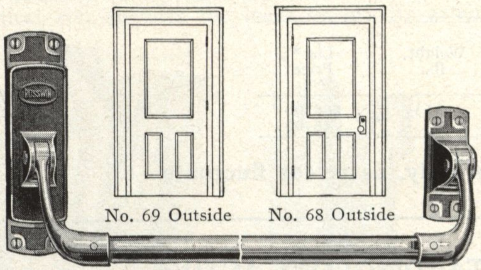
No. 65 Outside

No. 65 Inside

Bolt No.	Dimensions, in.				Wt., lb.	Lock type	Outside trim	List* price
	Bar	Rods	End cases	Center case				
40	1	½	3¾x2½	8 x2	17½	None	None	$52.00
60	⅞	⅜	1½x2⅛	8 x2	14	None	None	36.00
65	⅞	⅜	1½x2⅛	8½x2	15	Cylinder	Cast bronze knob and escutcheon	52.00

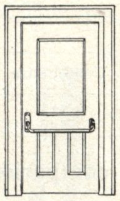
DOORS OPERATE FROM INSIDE OR OUTSIDE AS SHOWN—HAVE CENTER CATCH

Bar Type


No. 69 Outside

No. 68 Outside

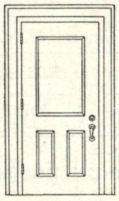
Nos. 68 and 69

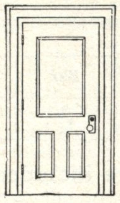

Nos. 68 and 69 Inside

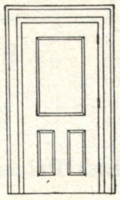
Bolt No. 68 can be operated from the outside by the use of a knob, except when the knob is deadlocked by key on the outside. Bolt No. 69 requires no lock, is operated from inside only and has no outside trim.

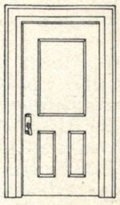
Bolt No.	Dimensions, in.		Weight, lb.	Lock No.	Outside trim	List* price
	Box	Case				
68	⅞	8x2	12½	0444¾	Wrt. bronze knob and escutcheon	$31.50
69	⅞	8x2	11	0440	None	25.00

Push Lever Type


No. 96 Outside


Nos. 97 and 98 Outside


No. 99 Outside


Nos. 96, 97, 98 and 99 Inside

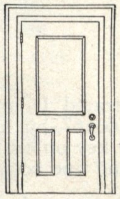
No. 99

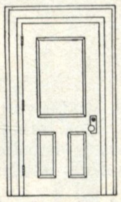
Bolts Nos. 96, 97 and 98 can be operated from the outside, by knob or handle, except when it is deadlocked by key on outside. Bolt No. 99 requires no lock, is operated from inside only and has no outside trim.

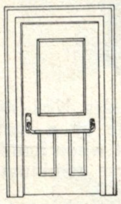
Bolt No.	Case, in.	Lock No.	Outside trim	List price*
96	8x2	9452	Cast bronze handle	$37.50
97	8x2	9458	Cast bronze knob and escutcheon	37.50
98	8x2	0444¾	Wrt. bronze knob and escutcheon	28.50
99	8x2	0440	None	19.00

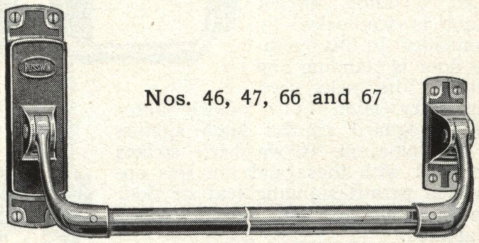
SINGLE ENTRANCE DOORS

DOORS OPERATE BY BAR FROM INSIDE AND BY KNOB OR HANDLE FROM OUTSIDE


Nos. 46 and 66 Outside


Nos. 47 and 67 Outside


Nos. 46, 47, 66 and 67 Inside


Nos. 46, 47, 66 and 67

Bolts Nos. 46 and 66 can be operated from the outside by the use of a handle and bolts Nos. 47 and 67 by a knob except, when handle or knob is deadlocked by key on the outside.

Latch bolt can be held retracted and also released by use of key. Locks used have auxiliary latch bolts, which automatically safeguard regular latch against outside manipulation.

Bolt No.	Dimensions, in.		Weight, lb.	Lock No.	Outside trim	List* price	Bolt No.	Dimensions, in.		Weight, lb.	Lock No.	Outside trim	List* price
	Bar	Case						Bar	Case				
46	1	8x2	14½	9452	Cast bronze handle	$55.00	47	1	8x2	14½	9458	Cast bronze knob and escutcheon	$55.00
66	⅞	8x2	14	9452		40.50	67	⅞	8x2	14	9458		40.50

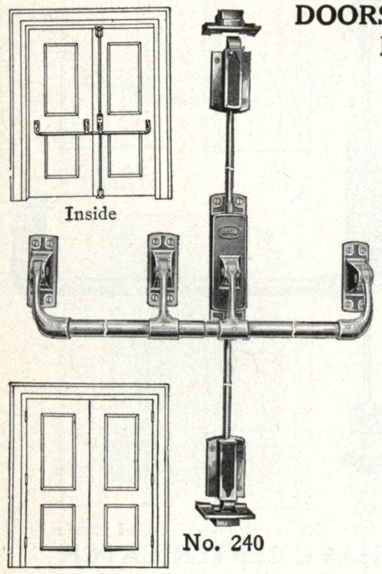
*List Prices are included for purposes of comparison only, as prices fluctuate

RUSSWIN FIRE EXIT BOLTS FOR SINGLE DOORS PLATE 3

Continued on next page

DOUBLE FIRE EXIT DOORS FOR EXIT USE ONLY

DOORS OPERATE FROM INSIDE ONLY—HAVE NO TRIM ON OUTSIDE

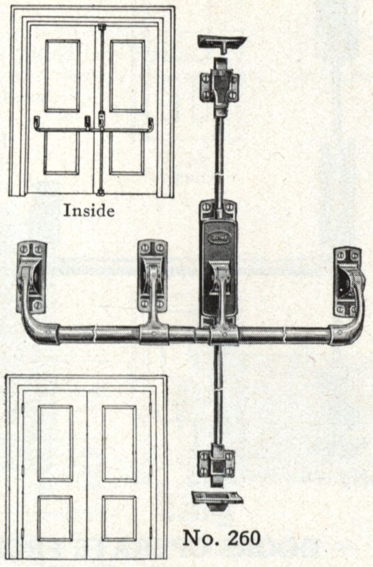

Inside

No. 240

Outside

Bolt No. 240 differs from No. 260 in that the top and bottom bolts are completely enclosed and the construction is heavier throughout. These bolts have top and bottom latching feature only, require no lock, are operated from inside only and do not have any outside trim. The bolts are operated by the crossbar on both doors.

For these types of bolts, use "T" astragals.


Inside

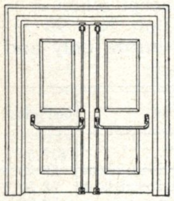
No. 260

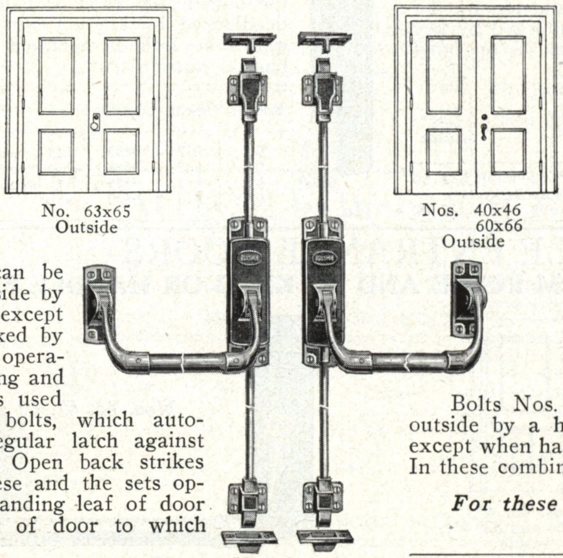
Outside

Bolt No.	Dimensions, in.				Weight, lb.	List* Price
	Bar	Rods	End cases	Center case		
240	1	½	3¾x2½	8x2	25½	$66.00
260	⅞	⅜	1½x2⅛	8x2	22	48.00

*List Prices are included for purposes of comparison only, as prices fluctuate

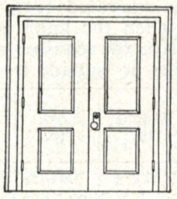
LOCKS FOR ENTRANCE AND EXIT—ONE STANDING, ONE ACTIVE

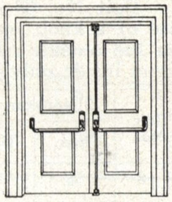

No. 63x65
Inside


No. 63x65
Outside

Nos. 40x46
60x66
Outside

No. 63x65


Nos. 40x47
60x67
Outside


Nos. 40x46
40x47
60x66
60x67
Inside

Bolt No. 63x65 can be operated from the outside by means of a knob, except when knob is deadlocked by key on outside. In this operation one door is standing and one active. The locks used have auxiliary latch bolts, which automatically safeguard regular latch against outside manipulation. Open back strikes are furnished with these and the sets opposite which permit standing leaf of door to open independently of door to which lock is applied.

Bolts Nos. 40x60 and 60x66 can be operated from the outside by a handle and Nos. 40x47 and 60x67 by knob, except when handle or knob is deadlocked by key on outside. In these combinations one door is standing and one active.

For these types of bolts, use "Split" astragals.

Bolt No.	Dimensions, in.				Wt., lb.	Lock type	Outside trim	List* price
	Bar	Rods	End cases	Center case				
63x65	⅞	⅜	1½x2⅛	8½x2	29	Cylinder	Cast bronze knob and escutcheon	$88.00

Bolt No.	Dimensions, in.				Wt., lb.	Lock No.	Outside trim	List* price
	Bar	Rods	End cases	Center case				
40x46	1	½	3¾x2½	8x2	32	9452	Bronze handle	$107.00
60x66	⅞	⅜	1½x2⅛	8x2	28	9452		76.50
40x47	1	½	3¾x2½	8x2	32	9458	Bronze knob and escutcheon	107.00
60x67	⅞	⅜	1½x2⅛	8x2	28	9458		76.50

*List Prices are included for purposes of comparison only, as prices fluctuate

RUSSWIN | FIRE EXIT BOLTS FOR DOUBLE DOORS | PLATE 4

THE STEFFENS-AMBERG CO.

Manufacturers of Smith's Improved Panic Exit Locks

260-270 Morris Avenue
NEWARK, N. J.

Products

Smith's Improved Gravity Panic Exit Locks.

Also, Mortise and Horizontal Rim Devices and Smith's Improved Automatic Door Holders; Hardware for Sheet Metal Windows (approved by National Board of Fire Underwriters); Fusible Links, and Metal Specialties.

Smith's Improved Gravity Panic Exit Locks

Patented—As to gravity action in the United States and Canada.

Design and Material—Smith's Improved Gravity Panic Exit Locks are simple in design and of heavy construction. They are made of cast bronze or brass, therefore no corrosion. Gravity feature is embodied in all style exit locks with vertical rod. Made for both exit and entrance doors.

Operation—Simple, positive and durable in operation and use. Easily opened. Consist of a crossbar, a vertical rod in two sections, and two locks of the hinged or swinging latch type (these are not draw bolts).

The crossbar operates the vertical rod by lever action. The vertical rod operates the locks by gravity action. This mechanical principle and natural force are both positive in their action and *eliminate the use of springs.*

Lever Principle—The fork extension of the crossbar engages the shoulder offset of the vertical rod at all times. Due to the fine balance maintained at this point of contact, the slightest pressure exerted against any point of the crossbar causes the fork to lift the vertical rod, which retracts both top and bottom latches. *There is no spring action at this vital point.*

Gravity Principle—The doors lock without the application of any external force—the force of gravity being sufficient to complete the closing action.

When the door is closed, the automatic or gravity dog, that held the vertical rod in a raised or unlocked position, is tripped by a trigger located on the top lock housing. The trigger operates by contact with the lip of the top strike an instant before the door is fully closed. The vertical rod and latches, thus released, are immediately thrown by gravity action to their normal locking position.

Automatic Dogging Feature—The automatic dogging feature performs an important function—it holds the latches in a retracted position when doors are open, preventing the bottom latch from dragging on flush sills.

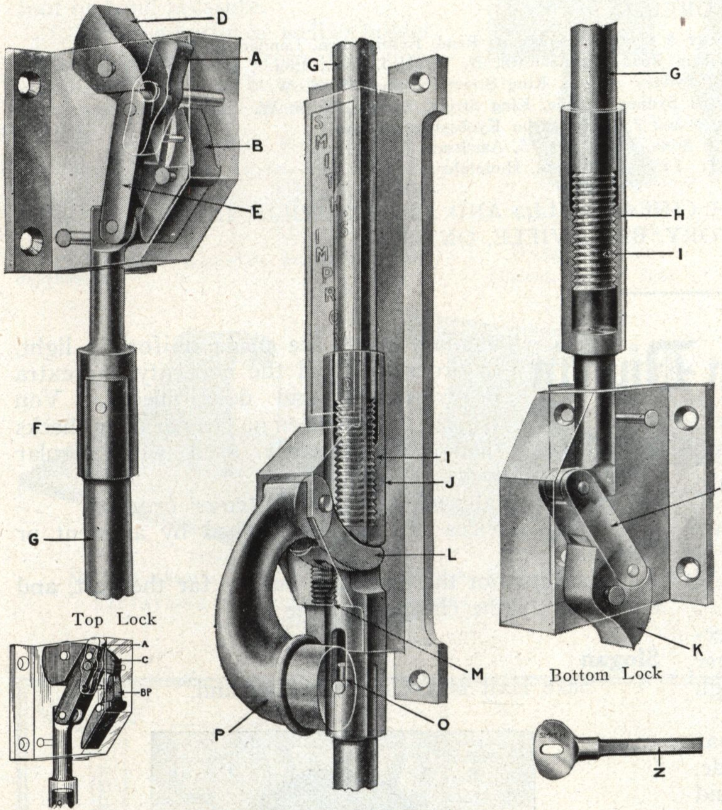
Permanent Dogging Feature—The permanent dogging feature retracts all locking parts, eliminating wear and tear on the entire device, and locking crossbar in a stationary position to be used as a push bar.

Slip Rod Feature—This feature insures independent operation of top and bottom locks. The lock has been made foolproof by making the vertical rod in two sections, which are slotted together. If bottom latch is flush with sill and latch should be forced up into housing, the top rod and latch are not affected, as the slot in the vertical rod coupling provides for the necessary take up. The door, even in this condition, will always be securely locked at the top.

Installations

Large installations have been made in: Newark, Albany, Boston, Cleveland, Toledo, Dayton, Washington, Baltimore, Richmond, Atlanta and many other cities.

Send for Catalogue No. 20.



Top Lock

Top Lock Retracted

Center Lock Style Housing

Bottom Lock

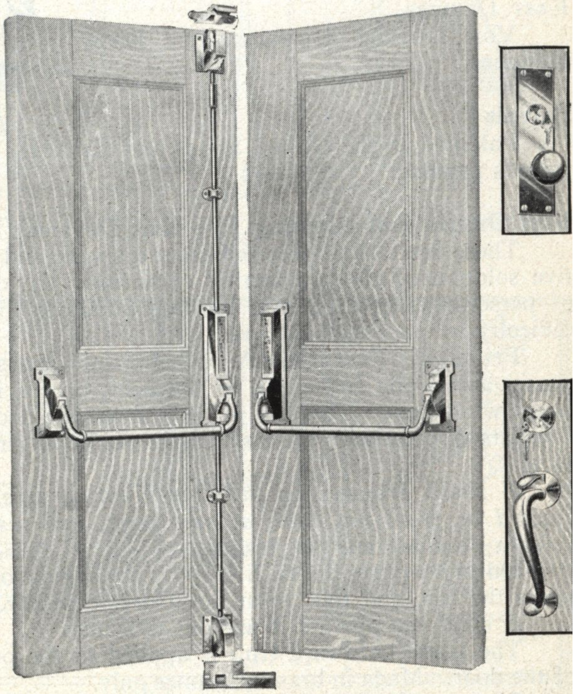
Phantom Views of the Gravity Exit Lock

(A) Automatic Gravity Dog Trigger. (B) Gravity Dog Latch—undogged position. (BB) Gravity Dog Latch—dogged position. (C) Tail of Gravity Dog—holding latch in retracted position. (D) Top Latch—has a $\frac{5}{8}$-in. throw. (E) Connecting Links—lever action. No springs. (F) Top Coupling—to which top rod is riveted. (G) $\frac{7}{16}$-in. solid brass or bronze rod.

(H) Adjustable Bottom Coupling. (I) Sufficient thread for necessary adjustments. (J) Center Coupling—to which top rod is screwed. Adjustment in either direction.

(K) Bottom Latch—has a $\frac{5}{8}$-in. throw. (L) Lever—lifts rod and retracts the latches. No springs. (M) Permanent Dog—operated by dogging key, holds latches retracted and makes crossbar stationary. (N) Dogging Key—for permanent dogging feature. (O) Slip Rod Feature—insures independent operation of top and bottom locks.

(P) Crossbar Arm—accommodates 1-in. outside diameter with $\frac{1}{16}$-in. wall, seamless brass or bronze tubing



Style 70 Panic Exit Lock on Double Entrance Doors

With mortise locks Nos. 37, 36, 35, 34

VONNEGUT HARDWARE CO.

Manufacturers of Von Duprin Self-releasing Fire Exit Devices

INDIANAPOLIS, IND.

DISTRIBUTERS

UNITED STATES OF AMERICA

BALTIMORE, MD., Sponsler & Baird, 714 N. Howard Street—Telephone, Vernon 4786

CHICAGO, ILL., John C. Bold & Co., Machinery Hall, 549 W. Washington Boulevard—Telephone, Franklin 4888

CLEVELAND, OHIO, Harrie E. Weed, 1279 Ethel Avenue, West—Telephone, Lakewood 6920

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EL PASO, TEX., C. C. Gaines, 359 First National Bank Building—Telephone, Main 436

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WATERLOO, IOWA, Iowa Building Material Co., 300½ West Fourth Street—Telephone 1387

KANSAS: Fred O. Routh, 136 North Twelfth Street, Minneapolis, Minn.

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DOMINION OF CANADA: BELLEVILLE, ONT., Springer Lock Mfg. Co.

FOREIGN

ENGLAND and the UNITED KINGDOM: H. Wright & Co., 59 Caversham Road, Kentishtown, London, N. W. 5
FRANCE: H. Wright & Co., 59 Caversham Road, Kentishtown, N. W. 5, London, Eng.
AUSTRALIA: F. Lindsay Thompson, 52 Sydney Arcade, King Street, Sydney, N. S. W.
NEW ZEALAND: F. Lindsay Thompson, 52 Sydney Arcade, King Street, Sydney, N. S. W.
JAPAN: F. W. Horne Company, 6 and 7 Takiyamacho Kyobashiku, Tokyo
INDIA: Habib Ullah & Sons, P. O. Box 75, Amritsar
HAWAIIAN ISLANDS: Lewers & Cooke, Honolulu

UNITED STATES FACTORIES, NORTH CHICAGO, ILL., AND INDIANAPOLIS, IND.
CANADIAN FACTORY, BELLEVILLE, ONT.

Von Duprin

TRADE-MARK
(Registered U. S. Pat. Off., No. 85021)

Products

Von Duprin Self-releasing Fire Exit Devices.

Von Duprin Automatic Door Holders.

Patents

Patented in the United States and Canada. Other patents pending.

Von Duprin Self-releasing Fire Exit Devices

These fire exit devices represent a simple and effective solution of the problem of eliminating the danger of persons being trapped in burning buildings through difficulty in opening the doors.

Principal Features—A substantial brass bar passes across the full width of the door, on the inside, about waist high. This bar projects from the door and connects directly with the mechanism of the locking devices.

A slight pressure on the double acting cross bar, toward or from the door, at any point, will instantly release deadlock and latches.

During a panic the rush of people will unavoidably press the bar, and thus open the doors to safety.

A child can operate it without difficulty.

The usual hardware trim is applied to the outside of the door. Made in brass or bronze only.

Simple, Strong, Symmetrical, Durable—Parts subject to hard service are made *very extra heavy.* Elementary parts are made uniformly light, in order to avoid the necessity for extra heavy hinges and door checks. Von Duprin devices need no heavier door checks than are ordinarily used with regular locks.

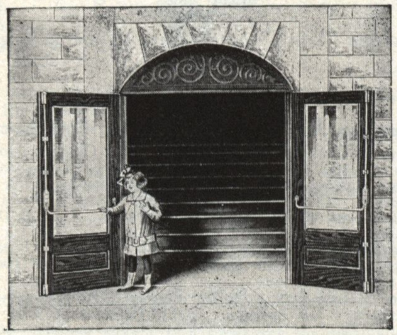
All vertical rods are *solid brass or bronze.*

These devices can not be blocked by accident or design.

Perhaps not the cheapest, but by far the best, and consequently the cheapest in the end.

Slogan

"Safe Exit is a Universal Demand."



Self-releasing Fire Exit Latch

For standing door of double entrance doors, or both doors of double exit doors

Continued on next page

Prices

For sale by all hardware dealers (*insuring legitimate competition*) with whom a *special contract* is made, *with prices alike to all.*

Competitive Devices

We make a complete line of cheaper devices *only for competitive work.* Nothing can be said for them except that they are lower in price than the Von Duprin line and *are better than any other devices at the same price.*

They are not illustrated, for it would only confuse the architect, as it is assumed that architects using SWEET'S ARCHITECTURAL CATALOGUE want nothing but highest grade, commendable goods.

Approvals

U. S. Government (War Department) Ordnance Department, for armament of Fortifications "C," hospitals, etc.

U. S. Government (Municipal Department)

U. S. Government (Treasury Department), Bureau of Engraving and Printing Building

Australian Government, Geo. McRae, Government Architect, N. S. W.

New York Board of Standards (N. Y. City Fire Dept.), Deputy Fire Commissioner

New York Board of Fire Underwriters, New York, N. Y.

New York Bureau of Buildings (Borough of the Bronx)

National Board of Fire Underwriters, Chicago, Ill.

Members of International Association of Building and Factory Inspectors

London, England, Canadian Red Cross Society, especially approved and used for hospitals

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Standard Von Duprin Devices

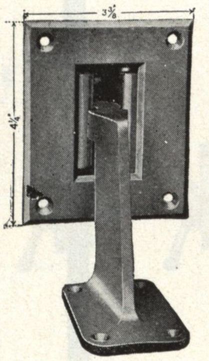
Very brief descriptions of the principal standard Von Duprin fire exit devices and accessories will be found on this page and on the page following. Our Catalogue No. 24, which shows many, will be sent to architects on request.

Von Duprin Automatic Door Holder—A high class device, very extra heavy, designed to engage the door at the farthest terminal from the closing point without the necessity of engaging and disengaging same by foot or hand pressure.

Acts as a buffer as well as holder. Nothing projecting from door upon which clothing can be caught.

No.	Height, in.	No.	Height, in.
238	4⅜	239	4⅜
238A	6½	239A	6½
238A	9½	239A	9½
238A	10¾	239A	10¾

Packed with ⅜x3½-in. bronze bolts with expansions.

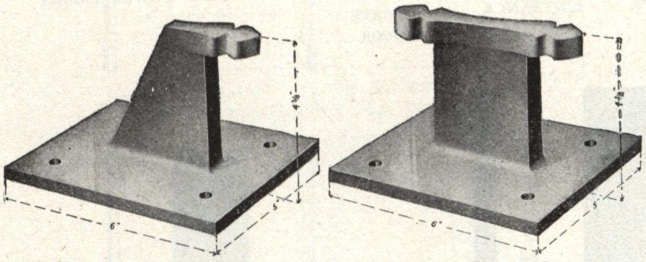


ELEVATION SHOWING PLATE AND BASE ENGAGED
(Patent applied for)

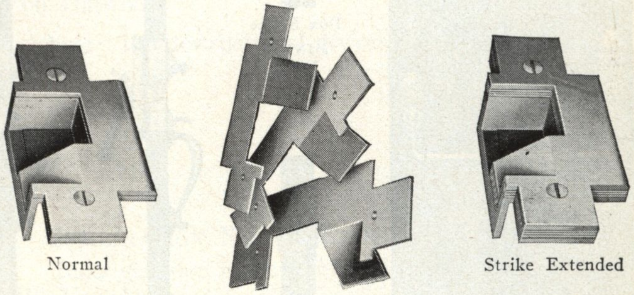
Automatic door holders are made for floor or wall and for concrete or stone. Bronze or brass metal only.

No. 247 Adjustable Strike for Double Doors—Eliminates shrunken door troubles, since the doors can be kept adjusted as the seasons (wet or dry) change. A full ½-in. extension can be made. Shims can be made of cardboard and are not furnished by the manufacturer.

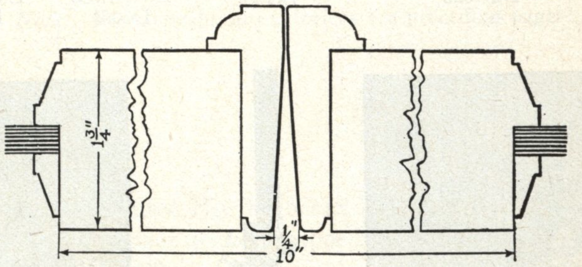
No. 247 adjustable strike is furnished as regular equipment with Type "B" Von Duprin devices.



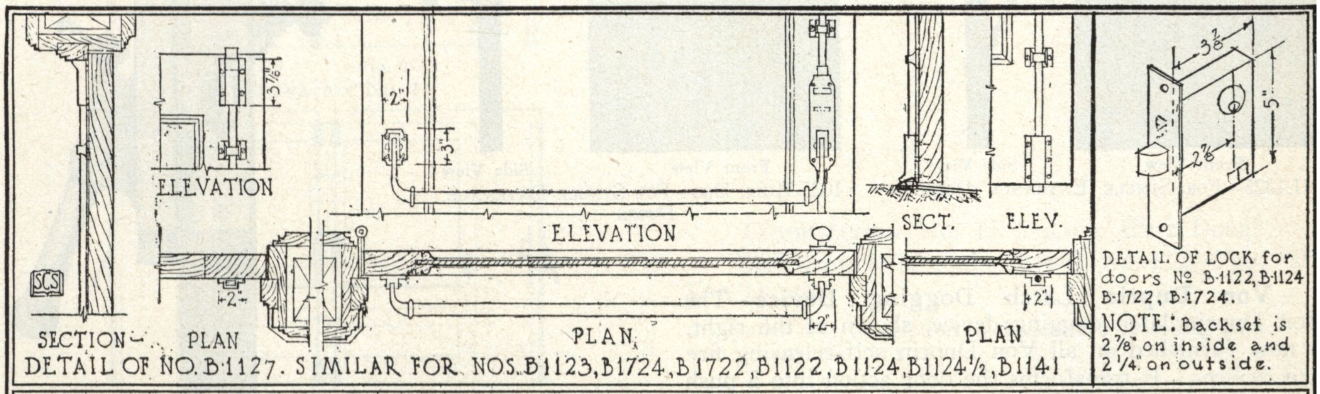
No. 238 (Single Door) No. 239 (Double Door)
ELEVATIONS SHOWING DOOR HOLDERS FOR FLOOR
(Patent applied for)



NO. 247 ADJUSTABLE STRIKE FOR DOUBLE DOORS
(Patented)

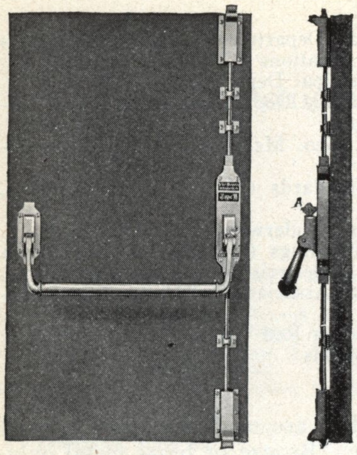


DETAILS OF VON DUPRIN ASTRAGAL FOR INDEPENDENT ACTING DOORS

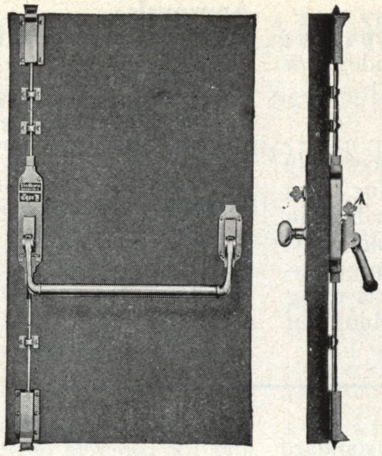

ELEVATION
3 7/16"
SCS
SECTION
PLAN
2"
2"
3"
ELEVATION
PLAN
2"
SECT.
ELEV.
PLAN
2"
3⅞
5"
2⅞
DETAIL OF NO. B·1127. SIMILAR FOR NOS. B1123, B1724, B1722, B1122, B1124, B1124½, B1141
DETAIL OF LOCK for doors № B·1122, B·1124 B·1722, B·1724.
NOTE: Backset is 2⅞" on inside and 2¼" on outside.

DETAILS OF VON DUPRIN SELF-RELEASING FIRE EXIT DEVICES.

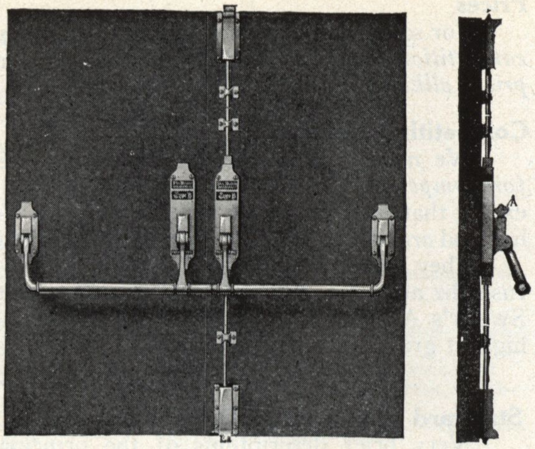
Continued on next pag


Front View Side View

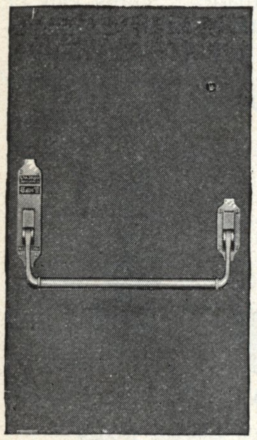
1127—FOR STANDING LEAF OF DOUBLE DOORS

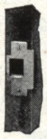

Front View Side View

1123—FOR ACTIVE LEAF OF DOUBLE DOORS

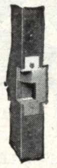

Front View Side View

1172—FOR DOUBLE EXIT DOORS

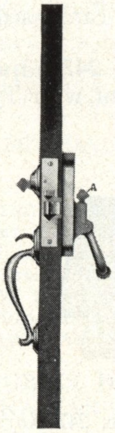

INSIDE ELEVATION FOR ALL MORTISE LOCK DEVICES


Box Strike

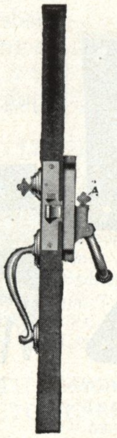
SINGLE DOOR


Open Strike

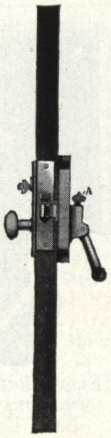
DOUBLE DOORS


1724 Double
1124 Single

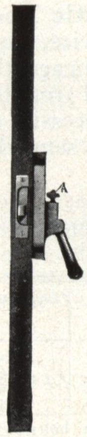
ENTRANCE DOORS


NL1724 Double
NL1124 Single

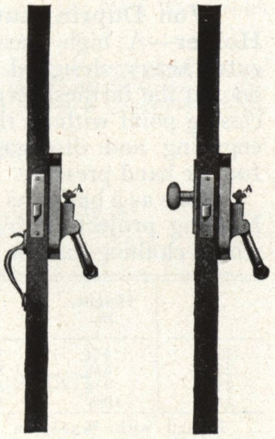
ENTRANCE DOORS


1722 Double
1122 Single

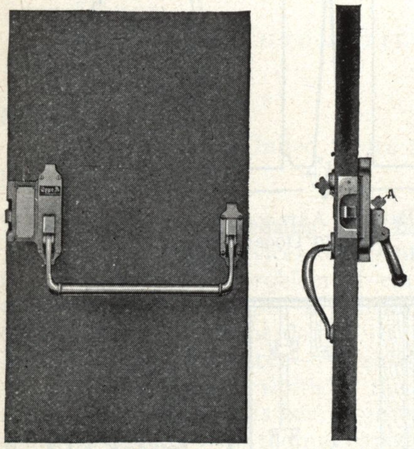
ENTRANCE DOORS


1129R Latch

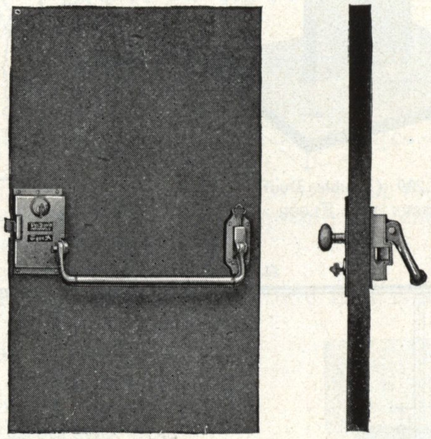
FIRE ESCAPE DOOR


1126 Latch 1126K Latch

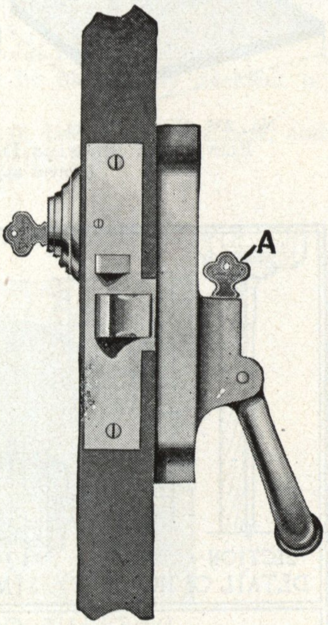
FIRE TOWER DOORS


Front View Side View

NL1325—FOR SINGLE ENTRANCE DOORS


Front View Side View

1025 BULL DOG—FOR SINGLE ENTRANCE DOORS



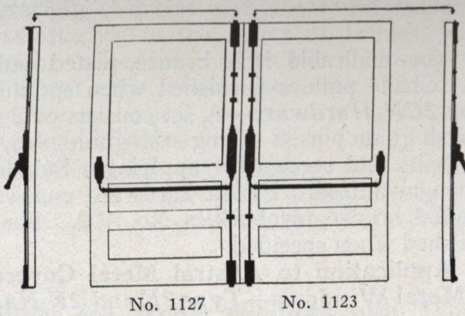
LATCH DOGGING DEVICE

Von Duprin Latch Dogging Device—The Von Duprin latch dogging device, shown at the right, is now furnished on all Von Duprin self-releasing fire exit devices. It transforms the door action into a push and pull type. By locking the latches in a retracted position, it eliminates spring wear.

Continued on next page

Specification Data—Practical Combinations for Double Doors

Note to Architects—To secure *"Von Duprin Service,"* we strongly suggest adopting the following specifications, which give the advantage of our newest type cross bar action, which is "to-or-from" the door; likewise, the new symmetrical vertical type of lock case, which eliminates many elementary parts heretofore used, simplifying the working parts, *thereby insuring the highest possible efficiency.*



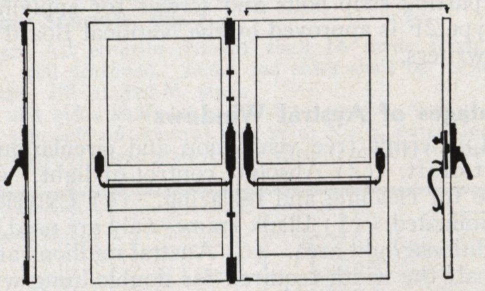
COMBINATION No. 11

COMBINATION No. 11 MAIN ENTRANCE DOORS

Inactive door to be equipped with No. 1127 Type "B" Von Duprin.

Active door to be equipped with No. 1123 Type "B" Von Duprin.

Note: For description of devices see preceding page.



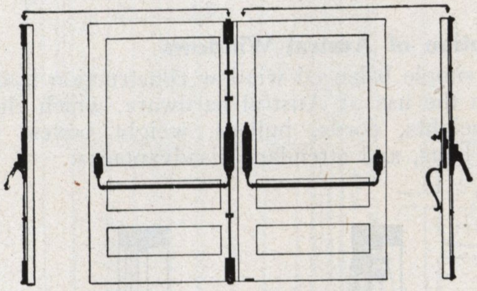
COMBINATION No. 12

COMBINATION No. 12 MAIN ENTRANCE DOORS

Inactive door to be equipped with No. 1127 Type "B" Von Duprin.

Active door to be equipped with No. 1724 Type "B" Von Duprin.

Note: For description of devices see preceding page.



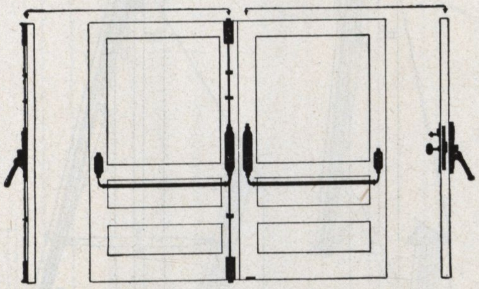
COMBINATION No. 13

COMBINATION No. 13 MAIN ENTRANCE DOORS

Inactive door to be equipped with No. 1127 Type "B" Von Duprin.

Active door to be equipped with No. NL1724 Type "B" Von Duprin.

Note: For description of devices see preceding page.



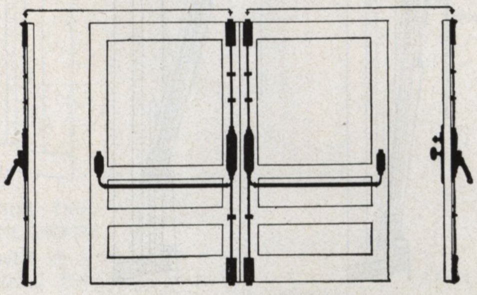
COMBINATION No. 14

COMBINATION No. 14 MAIN ENTRANCE DOORS

Inactive door to be equipped with No. 1127 Type "B" Von Duprin.

Active door to be equipped with No. 1722 Type "B" Von Duprin.

Note: For description of devices see preceding page.



COMBINATION No. 15

COMBINATION No. 15 DOUBLE EXIT DOORS

Both doors to be equipped with No. 1127 Type "B" Von Duprin.

Note: For description of devices see preceding page.

Authors Note: Every architect has his own individuality in specifying hardware. For this reason we only brief the combinations.

AUSTRAL WINDOW CO.

Architects Building, 101 Park Avenue
NEW YORK, N. Y.

Products

Manufacturers of AUSTRAL WINDOW HARDWARE for Austral Balanced Windows.

Applicability of Austral Window Hardware

Austral hardware is applicable to Austral wood, kalamein, rolled steel and hollow metal windows for public buildings, offices, schools, hospitals, libraries, etc.

The one-plane solid steel window equipped with Austral balance is designed for use in high grade buildings. See pages of International Casement Co., Inc.

Types of Austral Window Hardware

The types of Austral hardware supplied by this company and applied to Austral wood or metal windows are as follows:

For Application to Austral Wood Windows—***Type 2BN Hardware***—A set consists of 2 balance arms, 4 sash guide pins, 2 parting strip bolts and screws for attaching. Standard finish, electrogalvanized. Finish hardware consists of automatic solid bronze sash fast No. 200 (or malleable iron bronze plated sash fast No. 7200½) and 1 pair of solid bronze offset pulls No. 300 (or malleable iron bronze plated pulls No. 7300½). Shade pulleys furnished when specified.

Type 2CN Hardware—A set consists of 2 balance arms, 2 sash guide pins, 2 spring sash guide pins, 2 parting strip bolts and screws for applying. Standard finish, electrogalvanized. Finish hardware consists of 1 pair of solid bronze turnbuckles No. 400. Shade pulleys furnished when specified.

For Application to Austral Metal Covered and Hollow Metal Windows—***Type 2E and 2F Hardware***—Each set consists of 2 balance arms, 4 sash guide rollers, 2 parting strip bolts and screws for applying.

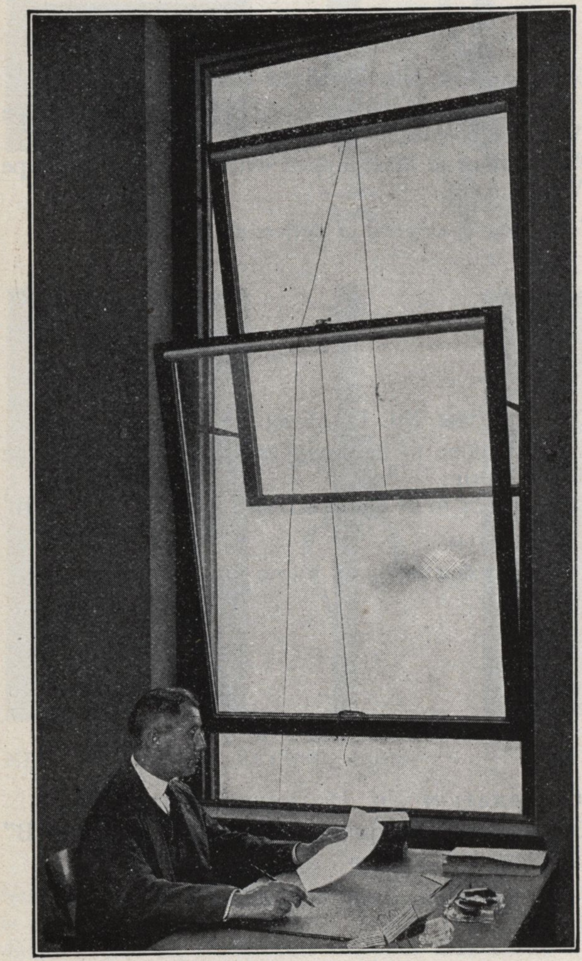
Type 2F is approved by the National Board of Fire Underwriters.

Advantages of Austral Windows

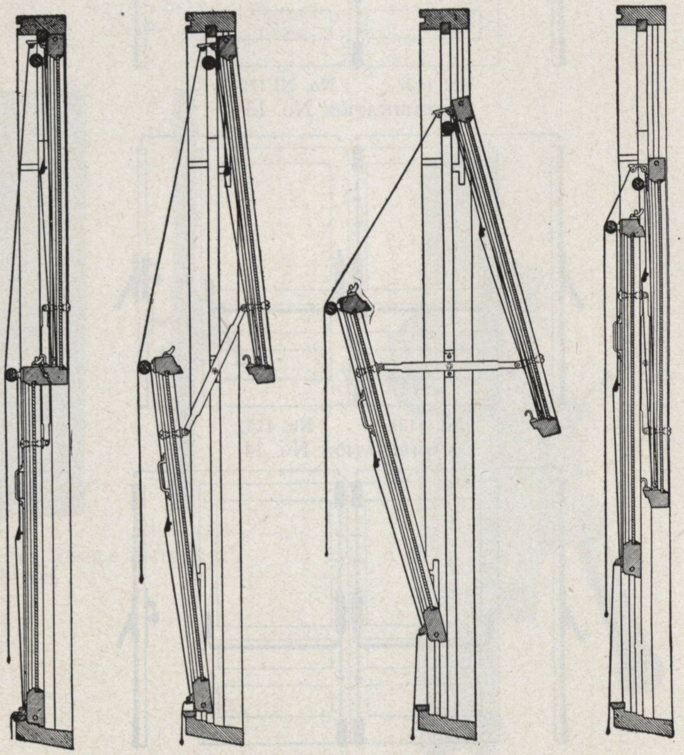
(1) Permit free ventilation and circulation of air without draft. (2) Absolute control of light. (3) Reversible for cleaning and reglazing. (4) Exterior awnings eliminated. (5) Plank frames only are used, affording additional light area. (6) Austral mullions are made about half the width required for double hung windows. (7) Windows adjusted by slight pull on lower sash. (8) *Extreme simplicity in construction and operation.*

Description of Austral Windows

A simple balanced window construction is obtained through the use of Austral hardware, which eliminates sash weights, cords, pulleys, weight boxes, window cleaner bolts, and attendant disadvantages.



Austral Window Equipped with Austral Fixtures



Vertical Sections Through Austral Windows, Showing Sash in Various Positions

Continued on next page

Austral kalamein, rolled steel and hollow metal windows are built by licensed manufacturers under the supervision of this company. Weatherstripping is integral with frame and sash. Wood frames and sash built by any mill according to Austral details.

Operation—Austral sash are counterbalanced on pivot bars attached to the center of frames, with sash guide pins or rollers attached to lower corners of lower sash and upper corners of upper sash. Guide pins or rollers operate in vertical grooves or along parting strip, permitting free adjustment of sash (see illustrations).

When Ordering or Writing for Estimates—Furnish width and height of masonry openings, thickness of sash and type of window and finish hardware desired.

Specifications for Wood Windows with Type 2BN Austral Hardware (Suitable for Office Buildings, Schools, etc.)

Frames—All exterior frames shall be made from clear white pine, well seasoned. Head and sides shall be formed of 2x5-in. plank; sill of 3x6-in. plank.

Head and sides shall be grooved to receive Austral hardware (see schedule on Austral blue print No. 1, dated January, 1925, for length of these grooves for various masonry openings). Parting strips shall be made of straight grained white pine 1x1-in. in cross section.

Bracing—Frames are to be braced with two diagonal braces at head and one brace placed horizontally in center of frame, all to be left in position until sash are to be hung.

Anchoring—Frames are to be anchored to metal or wood anchors placed at intervals of 24 in. on sides and to an anchor in center of head of frame.

Sash—Sash shall be 1¾ in. thick, made of clear, straight grained white pine, well seasoned. They shall be made true to required size and moulded as per detail.

Glazing—Care must be used in glazing to keep sash of equal weight, as all sash must be in perfect balance.

Hardware—Above frames and sash shall be fitted with type 2BN Austral hardware as made by the Austral Window Co., 101 Park Avenue, New York, N. Y., whose working drawings and instructions shall be considered part of this specification.

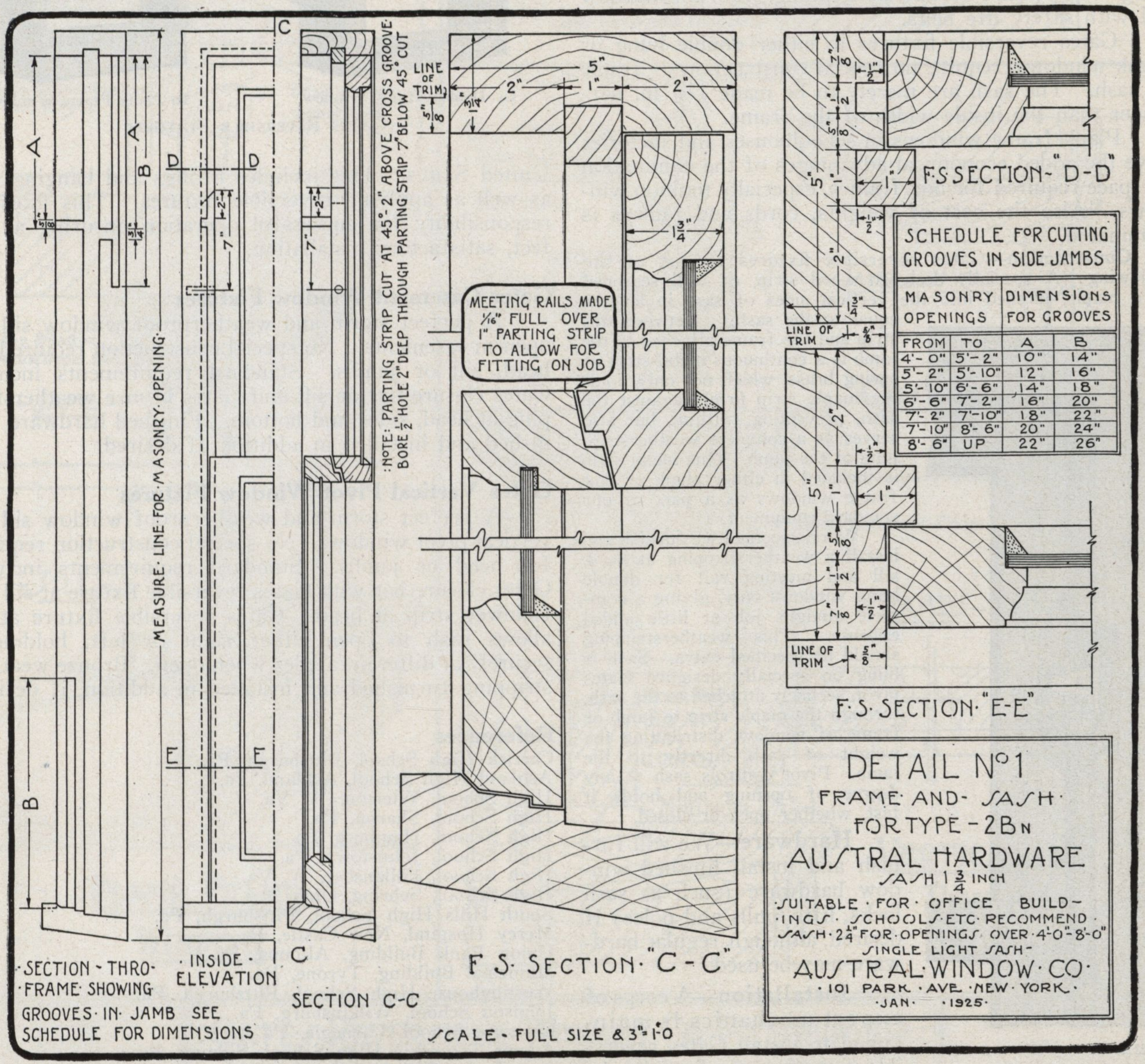
Finish Hardware—Each pair of sash shall be fitted with one Austral automatic solid bronze sash fast No. 200, to be placed at the center of the meeting rails, also one pair of solid bronze Austral offset pulls No. 300, placed on side rails of lower sash.

Note: For single light sash openings exceeding 4 ft. 6 in. x 8 ft., dimensions of frame and sash should be as follows:

Head and sides of frames	1¾x6-in. plank
Sill	3x7-in. plank
Sash	2⅜ in. thick

Demonstration Card Model

Our new demonstration card model will be mailed on request.



C
LINE OF TRIM
5"
2"
1"
2"
1¾"
⅝"
NOTE: PARTING STRIP CUT AT 45° 2" ABOVE CROSS GROOVE. BORE ½" HOLE 2" DEEP THROUGH PARTING STRIP 7" BELOW 45° CUT
MEETING RAILS MADE 1/16" FULL OVER 1" PARTING STRIP TO ALLOW FOR FITTING ON JOB
A
B
D
E
7"
MEASURE LINE FOR MASONRY OPENING
F.S SECTION "D-D"
F.S. SECTION "E-E"
F.S. SECTION "C-C"
SECTION THRO FRAME SHOWING GROOVES IN JAMB SEE SCHEDULE FOR DIMENSIONS
INSIDE ELEVATION
SECTION C-C
SCALE FULL SIZE & 3"=1'0
DETAIL No 1
FRAME AND SASH
FOR TYPE-2BN
AUSTRAL HARDWARE
SASH 1¾ INCH
SUITABLE FOR OFFICE BUILDINGS SCHOOLS ETC RECOMMEND SASH 2¼" FOR OPENINGS OVER 4'-0"-8'-0" SINGLE LIGHT SASH
AUSTRAL WINDOW CO
101 PARK AVE NEW YORK
JAN. 1925

SCHEDULE FOR CUTTING GROOVES IN SIDE JAMBS

MASONRY OPENINGS		DIMENSIONS FOR GROOVES	
FROM	TO	A	B
4'-0"	5'-2"	10"	14"
5'-2"	5'-10"	12"	16"
5'-10"	6'-6"	14"	18"
6'-6"	7'-2"	16"	20"
7'-2"	7'-10"	18"	22"
7'-10"	8'-6"	20"	24"
8'-6"	UP	22"	26"

Details of Austral Wood Window Not Requiring Screens

INCORPORATED 1914

GATES REVERSIBLE WINDOW CO.

Manufacturers of Patent Window Devices

PITTSBURGH, PA.

SALES AGENCIES IN PRINCIPAL CITIES

Products

GATES REVERSIBLE WINDOW FIXTURES for plank frame and double hung windows; GATES CASEMENT WINDOW FIXTURES; GATES VERTICAL PIVOT WINDOW FIXTURES.

Gates Reversible Window Fixtures

Where Used—*For Plank Frame Windows*—Suitable for use in schoolhouses, public buildings and factories and where 100% venitlation is desired.

For Double Hung Windows—Suitable for use in schoolhouses, office buildings, hotels, hospitals and residences.

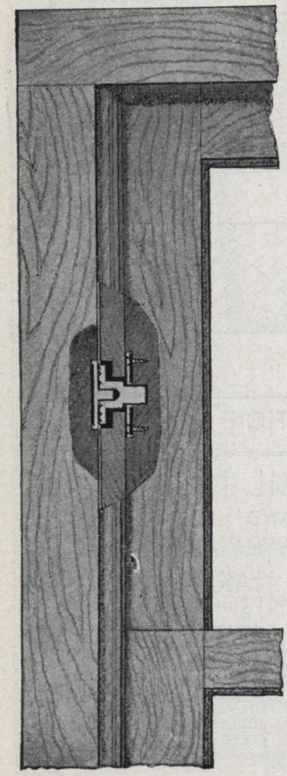
Advantages—Windows equipped with Gates reversible fixtures, either double hung or plank frame, offer an enormous saving in cleaning, as both sides can be cleaned from inside the building. This not only saves time and expense, but eliminates the undesirable and dangerous feature of outside cleaning from the window sill with safety life belts.

Gates reversible fixtures in either double hung or plank windows, require no special construction of frame or sash. The sash are merely to be made 1½ in. narrower than the inside width of the frame.

Plank frame windows in schoolhouses and factories have the added economical advantages of the elimination of space required for box frames, especially mullion windows. Also the cost of weights, cords and pulleys is eliminated.

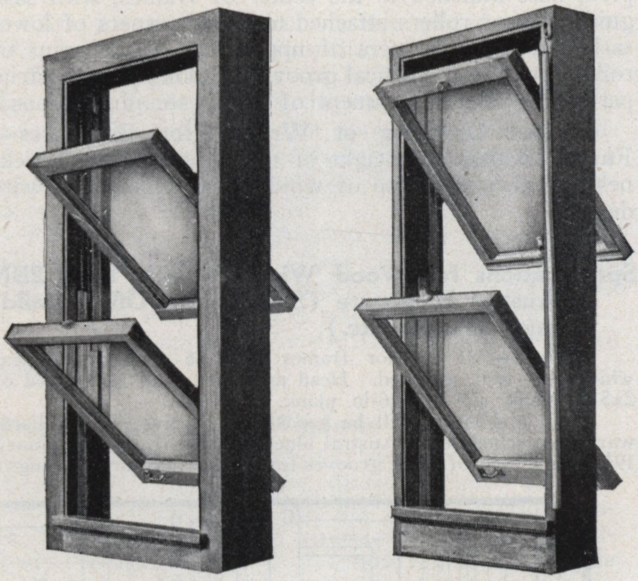
Construction—Gates reversible fixtures consist of the following: A specially designed wood strip, of well seasoned hard maple, meshed into the vertical sides of sash in lengths equal to the sash. Between this strip and the frame attached to the jamb is a continuous metal strip of spring brass, which not only holds the maple strip firmly against the sash, preventing rattling, but also serves as a complete weatherstripping at the jamb. This metal strip is included in either plank or box frame windows as a part of our standard equipment.

When specified we furnish and install a weatherstripping at head, sill and meeting rail for double hung windows only, giving a complete airtight job at little added expense. This weatherstripping should be specified extra. Sash is hung on specially designed Gates pivot, securely attached to the sash, through the maple strip to jamb or frame of window, distributing the weight of sash directly to the jamb. Pivot controls sash at any degree of opening and holds it fast, whether open or closed.



PHANTOM VIEW OF THE GATES PIVOT

Hardware—We will furnish and install finished window hardware (such as sash locks, lifts, pulls and poles) if desired, although regular hardware may be used.



In Double Hung Window

In Plank Frame Window

GATES REVERSIBLE FIXTURES

Installation—A corps of expert mechanics is maintained to install Gates reversible fixtures anywhere in the United States. This includes fittings and hanging sash as well as applying reversible fixtures. This fixes the responsibility for successful operation, insuring a perfect, satisfactory installation.

Gates Casement Window Fixtures

A perfect storm and weatherproof window sill for open-in casements. No special construction required for head, sill or jambs. Standard requirements include: Gates closure bar or sill and Gates bronze weatherstripping at head, sides and bottom. Finished hardware furnished and installed in addition, if desired.

Gates Vertical Pivot Window Fixtures

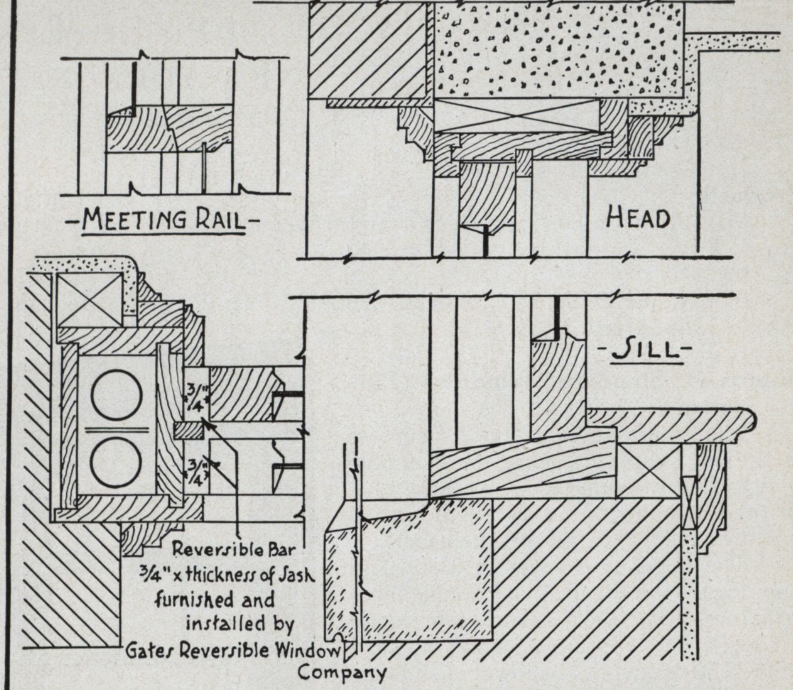
A perfect storm and weatherproof window sill for vertical pivot windows. No special construction required for head or jambs. Standard requirements include: Gates closure bar with Gates reversible fixture at sill and follower strip at head. Gates reversible fixture at sill allows sash to open either right or left, holding it securely at different angles when open. Bronze weatherstripping furnished and installed in addition, if desired.

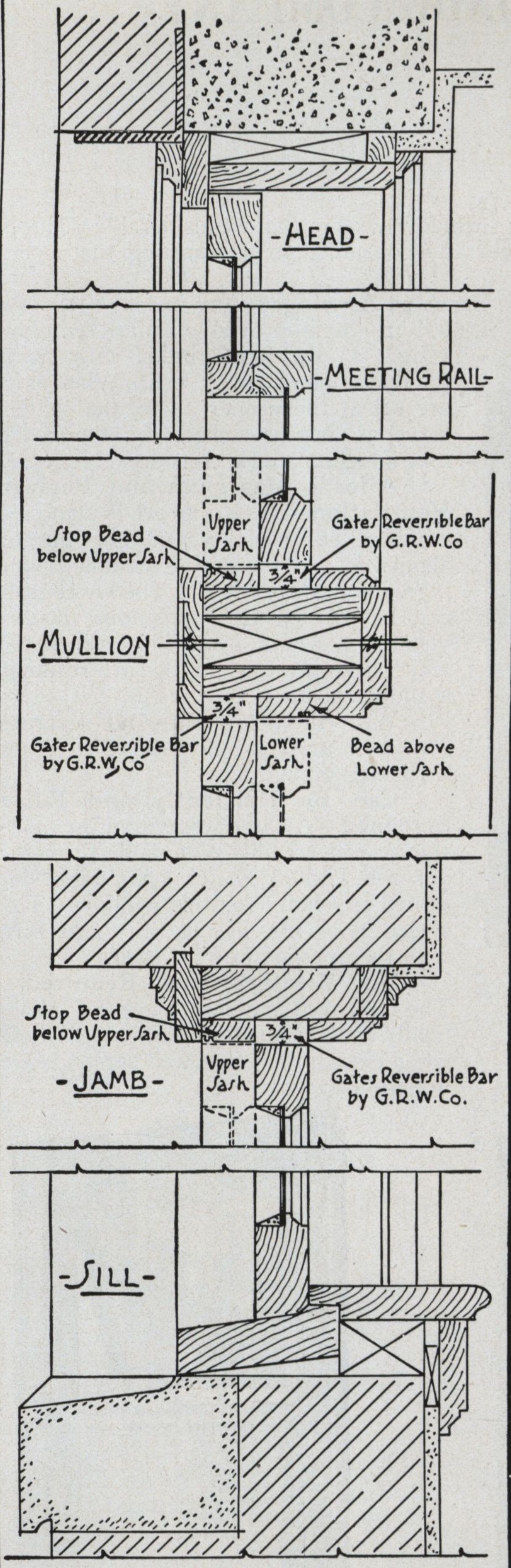
References

Carrick High School, Pittsburgh, Pa.
Ashland High School, Ashland, Pa.
High School, Wierton, W. Va.
High School, Sharon, Pa.
High School, Hamburg, Pa.
High School, Johnstown, Pa.
High School, Follansbee, W. Va.
High School, Sebring, Ohio
South Hills High School, Pittsburgh, Pa.
Mercy Hospital, New Castle, Pa.
Union Bank Building, Altoona, Pa.
Municipal Building, Tyrone, Pa.
Westinghouse High School, Pittsburgh, Pa.
Johnson School, Wilkinsburg, Pa.
Carnegie School, Carnegie, Pa.
Adams Township High School, Sidman, Pa.
And numbers of others.

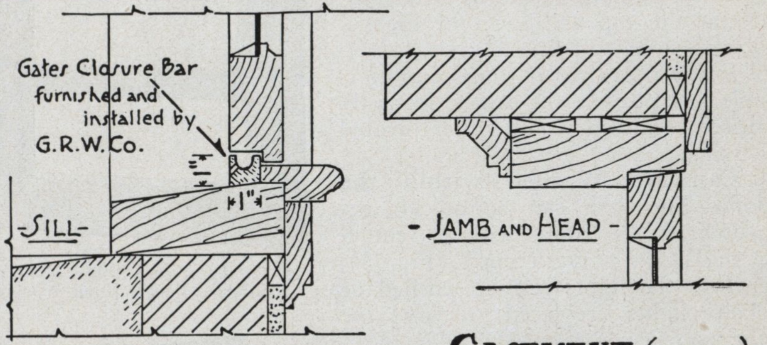
Continued on next page

–DOUBLE HUNG WINDOW–

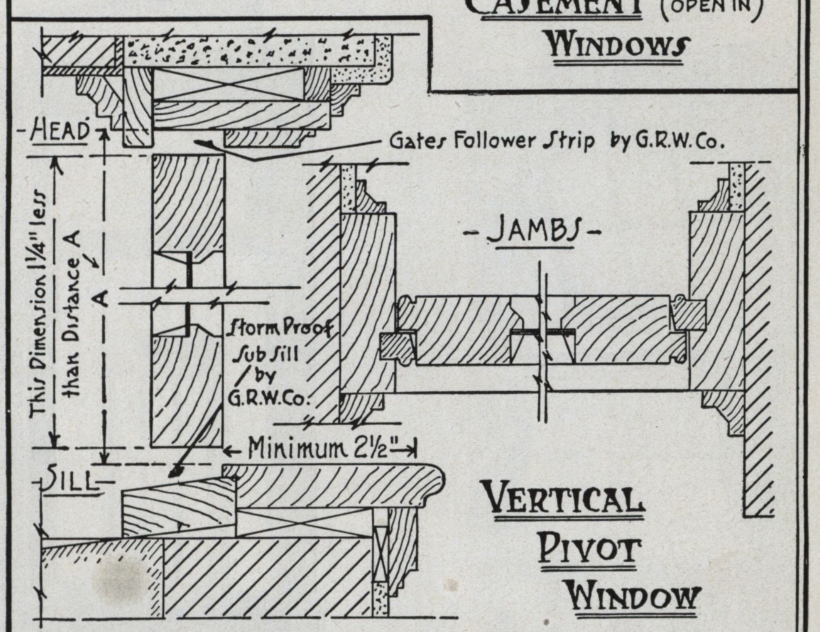

-MEETING RAIL-
HEAD
-SILL-
3/4"
3/4"
Reversible Bar
3/4" x thickness of Sash
furnished and
installed by
Gates Reversible Window
Company


-HEAD-
-MEETING RAIL-
Stop Bead
below Upper Sash
Upper
Sash
Gates Reversible Bar
by G.R.W.Co
3/4"
-MULLION-
3/4"
Gates Reversible Bar
by G.R.W. Co
Lower
Sash
Bead above
Lower Sash
Stop Bead
below Upper Sash
3/4"
-JAMB-
Upper
Sash
Gates Reversible Bar
by G.R.W.Co.
-SILL-

PLANK FRAME WINDOW


Gates Closure Bar
furnished and
installed by
G.R.W.Co.
1"
1"
-SILL-
-JAMB AND HEAD-

CASEMENT (OPEN IN) WINDOWS


-HEAD-
Gates Follower Strip by G.R.W.Co.
-JAMBS-
This Dimension 1¼" less than Distance A
A
Storm Proof
Sub Sill
by
G.R.W.Co.
Minimum 2½"
-SILL-

VERTICAL PIVOT WINDOW

GATES WINDOW
DEVICES
WEATHER STRIPPING
HARDWARE

:GATES REVERSIBLE WINDOW CO:PITTSBURGH PA:
FURTHER INFORMATION–F.S. & MILL DETAILS SENT UPON REQUEST

"ORGANIZED
FOR
SERVICE"

IMPROVED STANDARD WINDOW COMPANY

101 Park Avenue
NEW YORK, N. Y.
AGENTS IN EVERY STATE

Products

Combination Double Hung and Pivoted Windows.

Overhead Sash Pulleys.

Samples exhibited at Architects' Samples Corp., 101 Park Avenue, New York.

Improved Standard Window (Patented)

The improved standard window is the old standard sliding sash double hung window which also operates as a pivoted window, in which either sash operates independently of the other.

The upper and lower sash slide up and down as in the ordinary double hung window, and, the upper sash being pivoted at the top, can be swung outward at the bottom, while the lower sash being pivoted at the bottom, can be swung inward at the top as shown in Figs. 2 and 4.

Every operation of this window is simple and positive—it can be instantly adjusted to any position, either pivoted or sliding.

Can Be Washed within the Room—The sash can be quickly removed from the frame without removing the stops or sash cord (Fig. 3), therefore the lights can be washed or broken lights replaced *within the room.*

This feature eliminates the hazard incidental to window washing and considerably reduces the time generally consumed in performing that operation.

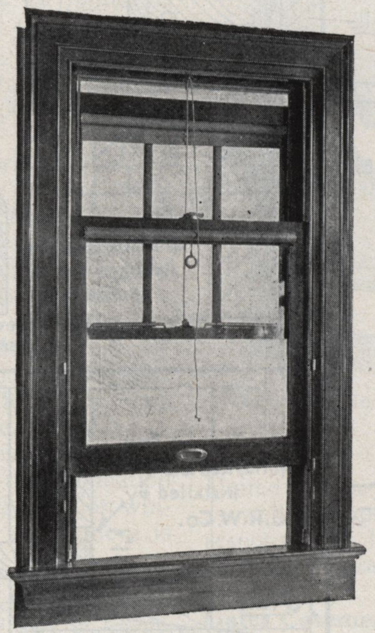


Fig. 1. Appearance When Used as an Ordinary Double Hung Window

Shades Serve as Awnings—Any make of window shade can be used in the improved standard window (Fig. 4) without interfering with the operation of either sash. When sash are set at the proper angle, the shades serve as awnings, therefore the latter may be eliminated at considerable saving.

Affords Maximum and Perfect Ventilation—The improved standard window furnishes ventilation up to about 75% of the entire window opening without direct draft. The lower sash can be pivoted in 3 positions, consequently it serves as an ideal ventilator which disappears when the sash resumes a sliding position.

With these windows, no separate ventilator units are necessary, effecting a further saving.

Can Be Efficiently and Fully Screened—A satisfactory and inexpensive screen (readily obtainable throughout the United States) has been designed especially for this window. The screen does not in any way interfere with the operation of the sash.

No Weatherstrips Required—The improved standard window is practically airtight, dusttight and stormproof when closed, therefore weatherstrips are unnecessary.

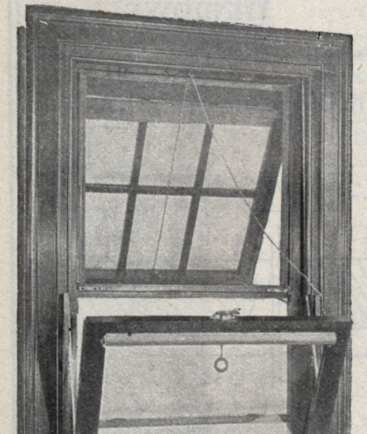


Fig. 2. Appearance When Used as a Pivoted Window
Screen Does Not Interfere with Operation of Either Sash

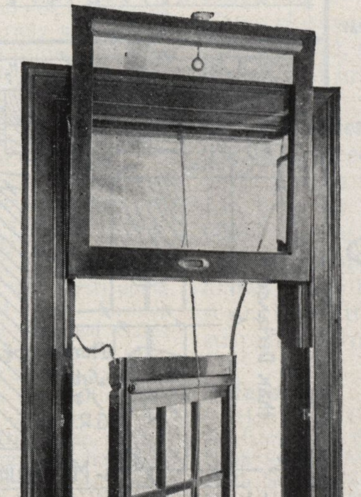


Fig. 3. Both Sash Are Easily Removed from Frame for Washing, etc., from Inside of Room

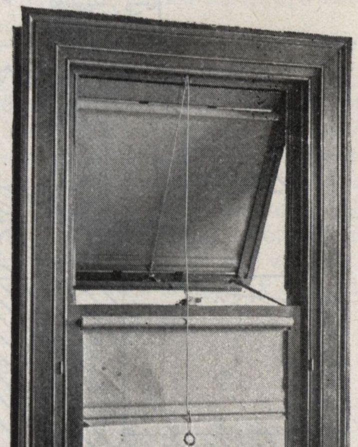


Fig. 4. Shades Can Be Installed without Interfering with Operation of Either Sash

Improved Standard Window

Continued on next page

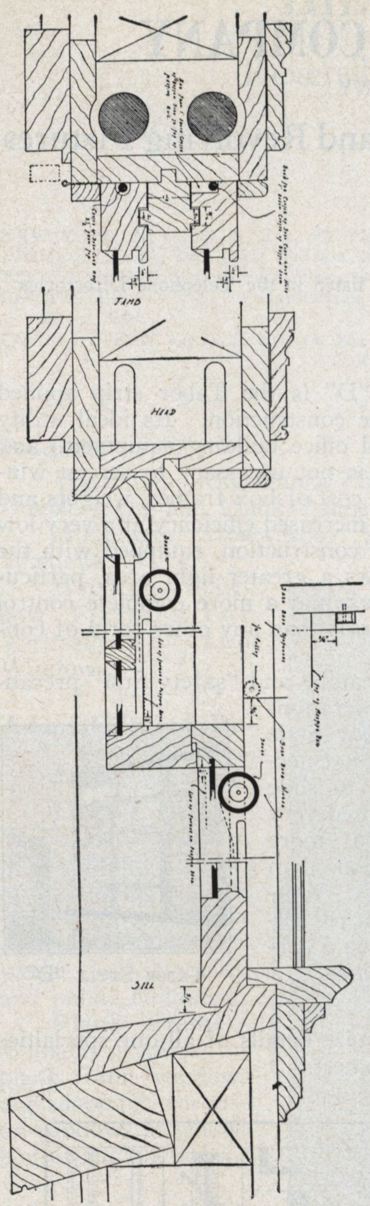

JAMB
HEAD
SILL

Fig. 5. Details of Improved Standard Window

Not Affected by Weather Conditions—Because of its unique design (Fig. 5), this window automatically adjusts itself to shrinkage and wear; it will not rattle, stick or bind, and is not affected by weather conditions.

Other Advantages—It provides fresh air without draft and excludes dust, cold air and dampness.

It ventilates in rainy as well as in fair weather and no water can get into the room.

Substantially made in every respect. Practical, durable, economical and easily installed. Provides perfect control of ventilation, light and temperature.

Hardware is not exposed to the weather and there are no springs.

Where these windows are used, no ventilators, no weatherstrips and no awnings are required, and there is no direct draft.

How Furnished—Improved standard windows are made to order in any size—no windows are carried in stock.

We will furnish improved standard windows made of any kind of wood, either with or without screens and shades of any make specified; or, we will furnish blue prints, specifications and necessary hardware so that these windows can be made by any sash manufacturer.

At present these windows are being made in wood, but when certain developments will have been perfected in the very near future, they may also be had in hollow metal or kalamein.

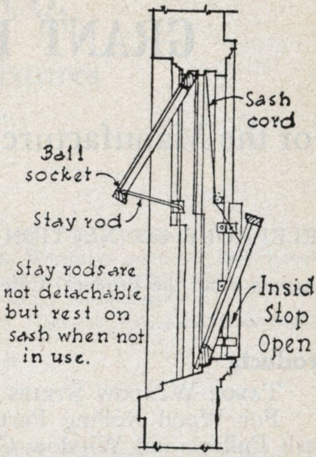

Sash cord
Ball socket
Stay rod
Stay rods are not detachable but rest on sash when not in use.
Inside Stop Open

Fig. 6. Section Through Improved Standard Double Hung Window Illustrating Pivoting Feature

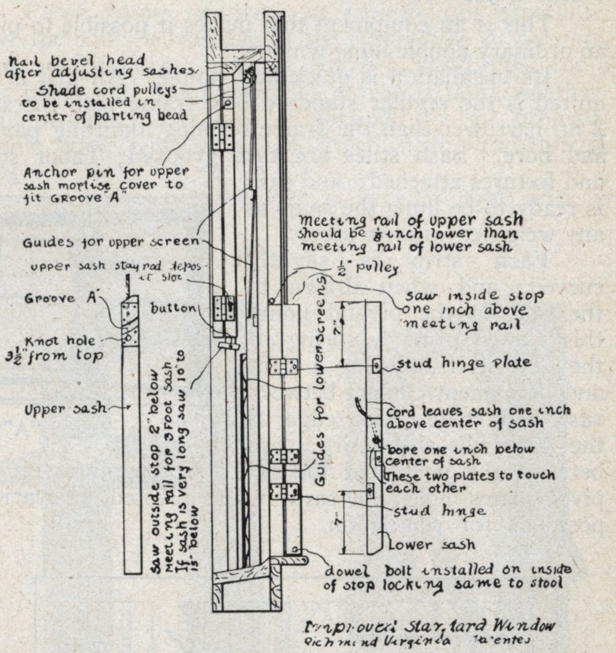

Nail bevel head after adjusting sashes
Shade cord pulleys to be installed in center of parting bead
Anchor pin for upper sash mortise cover to fit Groove "A"
Guides for upper screen
upper sash stay rod depos-it slot
Groove A
button
Knot hole 3½" from top
Upper sash
Saw outside stop 2" below meeting rail for 3 foot sash If sash is very long saw 10" to 15" below
meeting rail of upper sash should be ⅛ inch lower than meeting rail of lower sash
½" pulley
Guides for lower screens
saw inside stop one inch above meeting rail
7"
stud hinge plate
cord leaves sash one inch above center of sash
bore one inch below center of sash
These two plates to touch each other
stud hinge
7"
Lower sash
dowel bolt installed on inside of stop locking same to stool
Improved Standard Window Richmond Virginia Patented

Fig. 7. Rough Sketch Details of Improved Standard Window Designating Hardware and Other Special Features

Improved Overhead Sash Pulley (Patented)

This sash pulley is easily and quickly put in place without mortising or countersinking. It saves time, labor and expense.

It is installed behind the stile of the window frame and above the head as shown in Fig. 9.

This pulley can not work loose or get out of place, it is quick and positive in action, and readily responds to the movement of the sash.

It is suitable for all sash using weights, and sash cord or chain. The position of the two wheels in the housing insures long life for the cords or chains; however, the latter are quickly replaced if necessary.

Sturdily built for long service. Housing is made of either cast iron or pressed steel as specified, pulley shafts are made of bronze and pulley wheels are made of rust-proof steel.

This pulley has been approved and specified by many prominent architects and contractors. Thousands have been installed and are giving satisfaction.

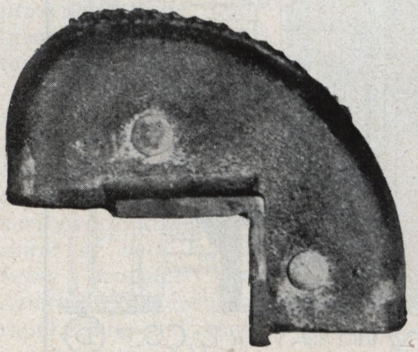


Fig. 8. Improved Overhead Sash Pulley

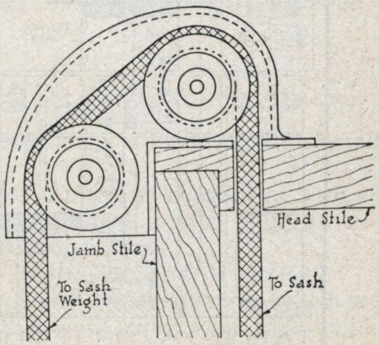

Head Stile
Jamb Stile
To Sash Weight
To Sash

Fig. 9. Details of Improved Overhead Sash Pulley

GRANT PULLEY AND HARDWARE COMPANY

SUCCESSORS TO TABOR SASH FIXTURE COMPANY

For the Manufacture and Sale of the Tabor Window Strips and Revolving Fixtures

Architects Building, 101 Park Avenue
TELEPHONE CONNECTION NEW YORK, N. Y.

Agents in all the Principal Cities of United States and Canada, and our Name will be found listed in the Telephone Directories

Products

Tabor Window Strips and Revolving Fixtures.

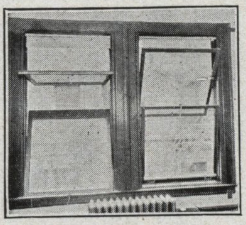
For Wood Rolling Partitions, see page 1314; for Sash Pulleys and Window Cleaning Devices, see pages 1430-1431; for Door Hangers and Bar Locks, see pages of Grant Elevator Equipment Corp., 1512-1515.

Tabor Style "A"

This is an equipment that makes it possible to pivot an ordinary double hung window.

Its installation is quick and simple. All that is required is the regular standard box frame with the sash 2 in. narrower than the frame opening, omitting plough and bore. Sash stiles are then grooved; Tabor strip and fixtures attached; and sash is ready to be hung the same as any weighted window sash.

Each strip is slightly curved; and when drawn to the sash at the pivotal point, this curve forms a spring of the strip itself, making a tight and permanent contact between sash and strip. One edge of the strip fills the entire space between the jamb and the sash. Corrugations on the pivot plates hold the sash, when pivoted, at various positions for ventilation.



Tabor Style "A"

Tabor Style "D"

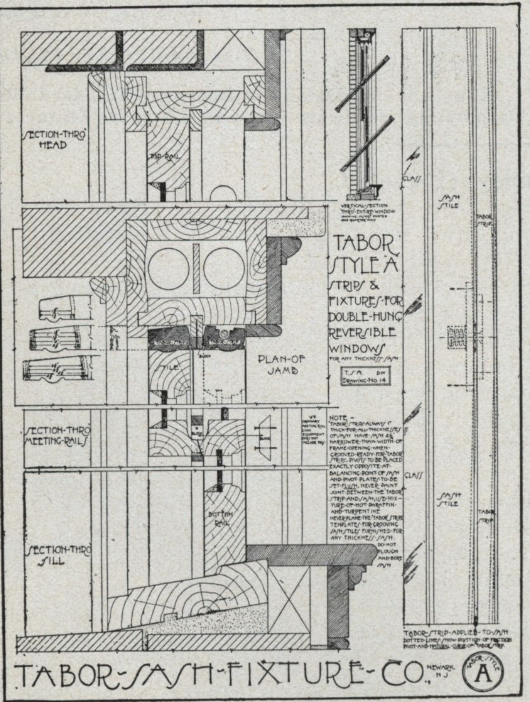
The Tabor Style "D" is the Tabor strip applied on plank or solid frame construction. Its ideal utility is for schoolhouses, and office building equipment, and for buildings where it is not necessary to screen windows. It eliminates the cost of box frames, weights and chains, thereby offering increased efficiency at a very low cost. The plank frame construction, equipped with the Style "D" fixture, allows a greater light area, particularly in mullion windows, and a more complete control of ventilation without draft than any other form of construction.

Accessibility for cleaning and "safety first" precautions are the same considerations as in the selection of our Style "A" fixture. Since it is not necessary with Style "D" to slide the sash, same can be fitted very tightly, and assures a more weatherproof construction than the regular double hung. Window shades, being attached directly on the sash, provide a perfect substitute for awnings.

Tabor Style "D"

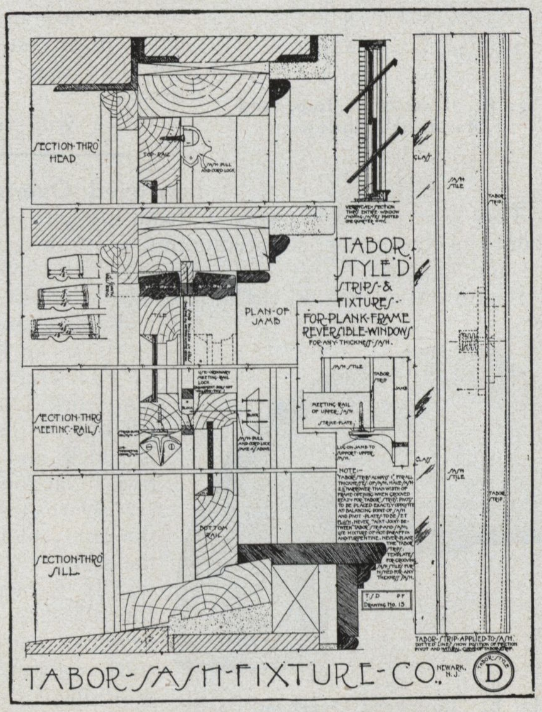
Catalogue, etc.

Catalogue and full size details of all our specialties will be furnished on request.



SECTION-THRO' HEAD
TOP-RAIL
VERTICAL-SECTION THRO'-ENTIRE-WINDOW
CLASS
SASH STILE
TABOR STRIP
TABOR STYLE "A" STRIPS & FIXTURES-FOR DOUBLE-HUNG REVERSIBLE WINDOWS FOR ANY THICKNESS SASH
PLAN-OF JAMB
STILE
T.S.A. DH Drawing No. 14
SECTION-THRO MEETING-RAILS
NOTE
SECTION-THRO SILL
BOTTOM RAIL
TABOR-STRIP-APPLIED-TO-SASH
TABOR-SASH-FIXTURE-CO. NEWARK, N.J.
TABOR STYLE A

Detail of Tabor Style "A"



SECTION-THRO' HEAD
TOP-RAIL
SASH PULL AND CORD LOCK
CLASS
SASH STILE
TABOR STRIP
TABOR STYLE "D" STRIPS-& FIXTURES-FOR-PLANK-FRAME REVERSIBLE-WINDOWS FOR-ANY-THICKNESS-SASH.
PLAN-OF JAMB
STILE
SASH STILE
JAMB
MEETING RAIL OF UPPER SASH
STRIKE PLATE
SECTION-THRO MEETING-RAILS
NOTE
SECTION-THRO' SILL
BOTTOM RAIL
T.S.D. PF Drawing No. 13
TABOR-STRIP-APPLIED-TO-SASH
TABOR-SASH-FIXTURE-CO. NEWARK, N.J.
TABOR STYLE D

Detail of Tabor Style "D"

THE WILLIAMS PIVOT SASH CO.

Reversible, Pivoted and Casement Window Fixtures

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., W. S. Ely, 601 West 130th Street
PHILADELPHIA, PA., J. H. Windell, 1505 Race Street
PITTSBURGH, PA., J. R. Colclough, 1425 Dagmar Avenue (Beechview)
ROCHESTER, N. Y., Construction Specialties Co., 25 Main Street, East
CHARLOTTE, N. C., D. F. Hoover, Box 224
CHICAGO, ILL., M. R. Duffy, 1528 Tribune Tower
DETROIT, MICH., T. B. Rayl Co., Woodward and Grand River Avenues
CINCINNATI, OHIO, Geo. C. Ramsey, 206 W. Court Street
INDIANAPOLIS, IND., The Vonnegut Hardware Co.
ST. LOUIS, MO., Schroeter Bros. Hardware Co., 810-814 Washington Avenue
TORONTO, CANADA, Aikenhead Hardware Limited, Temperance Street

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Products

Williams Reversible Window Fixtures for Double Hung and Plank Frame Windows.

Williams Stormproof Subsill for Casement Windows.

Williams Window Fixtures for Vertically Pivoted Windows.

Adaptability of Reversible Window Fixtures

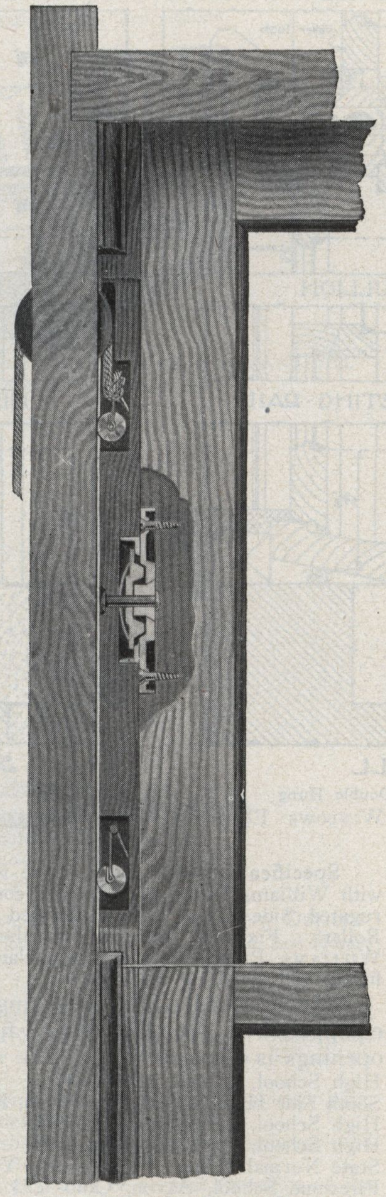
Double Hung—Williams fixtures for double hung windows are adaptable for use on windows in office buildings, hotels, hospitals, schoolhouses, and public buildings.

Plank Frame—Williams fixtures for plank frame windows are adaptable for use on windows in schoolhouses and factories.

Advantages of Reversible Window Fixtures

Windows equipped with Williams reversible fixtures afford overhead ventilation without draft. Roller springs prevent rattling and insure ease of operation.

Outside of both sash can be cleaned from the floor, with the opening closed, in one-half the time ordinarily occupied, on account of both hands being available for cleaning. This insures rapid, safe and economic cleaning. Many managers of hotels and office buildings recognize this device as a factor in the economic management of the building.

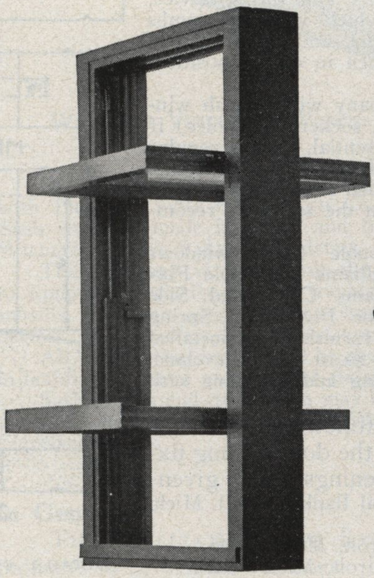


Section of Sash and Frame
Showing strip, roller spring and pivot

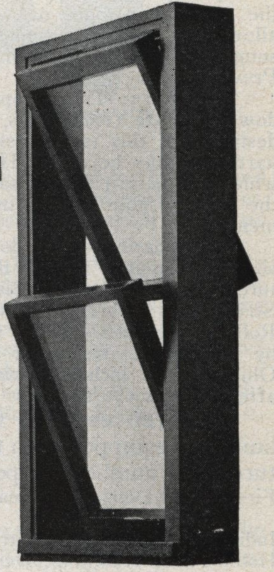
Weatherstrips may be used if desired.

Plank frame windows, in schoolhouses especially, have the added advantage of the *elimination of weights, cords and pulleys.* A plank frame is substituted for a box frame and it is possible to provide a more weathertight window than can be obtained by an ordinary double hung window not provided with weatherstripping.

On mullioned windows a greater light area is obtained.



Double Hung
Showing 100% opening



Plank Frame
Showing overhead ventilation

Installation

A staff of expert mechanics is maintained to install Williams fixtures.

This service includes fitting and hanging of sash as well as the application of fixtures. This fixes the responsibility for successful operation.

Small orders sold f.o.b. Cleveland, if desired.

During the period of over twenty years in which we have been engaged in this work more than 1500 buildings have been equipped.

Continued on next page

Williams Double Hung Reversible Window Fixtures

The Williams double hung reversible window fixtures require no special construction of frames or sash. The sash are merely to be made 1¾ in. narrower than inside width of frame.

The sash are operated the same as an ordinary double hung window with the additional advantage that each sash can be completely reversed at any position, or raised and lowered at will.

The Williams fixtures to be applied to double hung windows are the Williams Corrugated Side Strip with Truncated Cone Pivot and Spring Rollers.

Williams Corrugated Side Strip—A wood strip of well seasoned hard maple, ⅞ in. thick, of width equal to thickness of sash, corrugated on the sash side. Furnished in length required for sash. Affixed to this strip are:

Truncated Cone Pivot—A reliable and effective sash pivot is assured by application of the truncated cone as a pivot. Weight of sash is automatically used to draw reversible strip and sash together tightly, thereby firmly nesting corrugations in strip and sash. The pivot holds sash in any position when open, without the aid of transom lift or chain. Made of cast iron with parts carefully fitted.

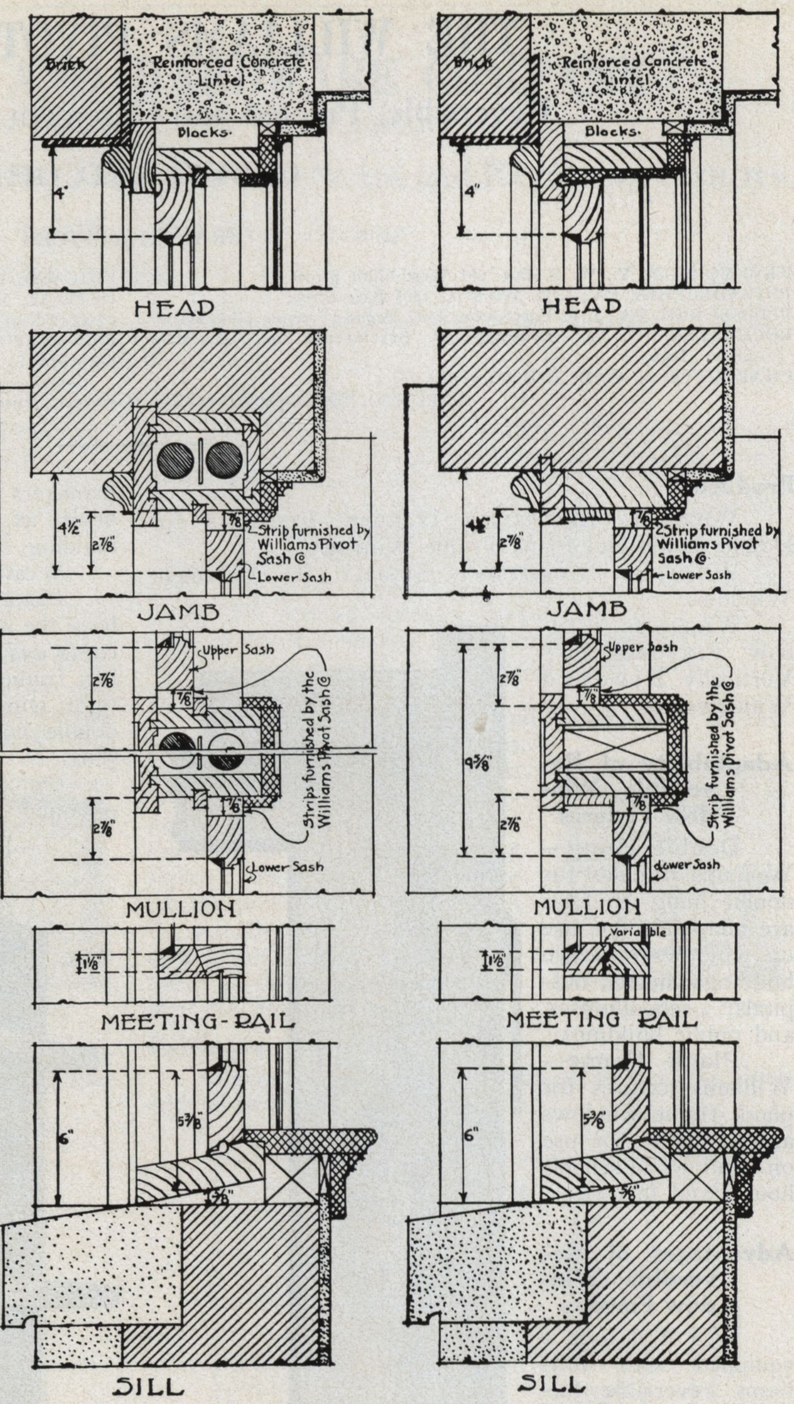
Spring Roller—A roller and spring device, the constant contact of which with the jambs allows free sliding movement, and keeps strip in snug contact with sash when in closed position. Prevents sash rattling.

Hardware—This company will furnish window hardware (locks, lifts, sockets and poles) if desired, but this is not essential, as the regular hardware may be used. However, a ring socket which will permit the top sash to be tilted without the window pole binding in the socket is recommended.

Specification—All double hung windows shall be equipped with Williams Reversible Fixtures consisting of Williams Corrugated Side Strips with Truncated Cone Pivots and Spring Rollers. Fixtures shall be furnished and installed by The Williams Pivot Sash Co., Cleveland, Ohio. (This includes fitting and installing sash after weights are strung.)

References—The following are a few buildings equipped with the double hung fixtures; the number of openings is also given:

First & Old Detroit National Bank, Detroit, Mich.—1589
Indian Village Manor, Detroit, Mich.—1746
Hotel Tuller Additions, Detroit, Mich.—1024
Hotel Cleveland, Cleveland, Ohio—1229
Hotel Winton, Cleveland, Ohio—589
Hotel Statler, St. Louis, Mo.—788
Hotel Ten Eyck Addition, Albany, N. Y.—529
St. Mary's Hospital, St. Louis, Mo.—646
Canadian Westinghouse Co., Hamilton, Ont.—361
Niagara Life Building, Buffalo, N. Y.—199
Sacred Heart Seminary, Detroit, Mich.—1916


Brick
Reinforced Concrete Lintel
Blocks
4"
HEAD
Brick
Reinforced Concrete Lintel
Blocks
4"
HEAD
4½"
2⅞"
⅞
Strip furnished by Williams Pivot Sash Co
Lower Sash
JAMB
4½"
2⅞"
⅞
Strip furnished by Williams Pivot Sash Co
Lower Sash
JAMB
Upper Sash
2⅞"
⅞
2⅞"
⅞
Strips furnished by the Williams Pivot Sash Co
Lower Sash
MULLION
Upper Sash
2⅞"
4⅝"
⅞
2⅞"
⅞
Strip furnished by the Williams Pivot Sash Co
Lower Sash
MULLION
1⅛"
MEETING-RAIL
Variable
1⅛"
MEETING RAIL
6"
5⅜"
1⅞"
SILL
6"
5⅜"
1⅞"
SILL

Double Hung

Plank Frame

Details of Windows Equipped With Williams Reversible Window Fixtures

Williams Plank Frame Reversible Window Fixtures

No special construction of frame required.

Sash to be made 1¾ in. narrower than jamb opening.

The Williams fixtures to be applied to this type of window are:

Williams Corrugated Side Strip—Same as described under double hung windows.

Specification—All plank frame windows shall be equipped with Williams Reversible Fixtures consisting of Williams Corrugated Side Strips with Truncated Cone Pivots and Spring Rollers. Fixtures shall be furnished and installed by The Williams Pivot Sash Co., Cleveland, Ohio. (This includes fitting and installing the sash.)

References—The following are a few schools equipped with the plank frame fixtures; the number of openings is also given:

High School, Canton, Ohio—849
South Side High School, Pittsburgh, Pa.—321
High School, Bethlehem, Pa.—524
High School, Harrisburg, Pa.—488
State Normal School, Potsdam, N. Y.—265
Firestone School, Akron, Ohio—273
Moorehead School, Durham, N. C.—174
Jackson School, York, Pa.—64

Continued on next page

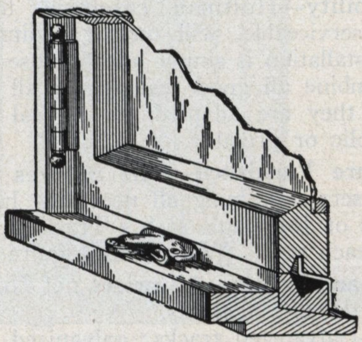
Williams Stormproof Casement Fixture

A perfect weatherproof casement window sill.

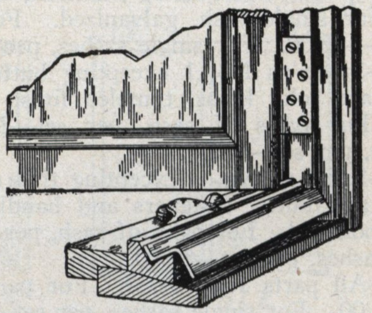
No special construction of header, sill or side jambs required.

Double casement fixture made with divided closure bar providing for independent operation of each sash if desired. Subsill and closure bar furnished with operating devices attached.

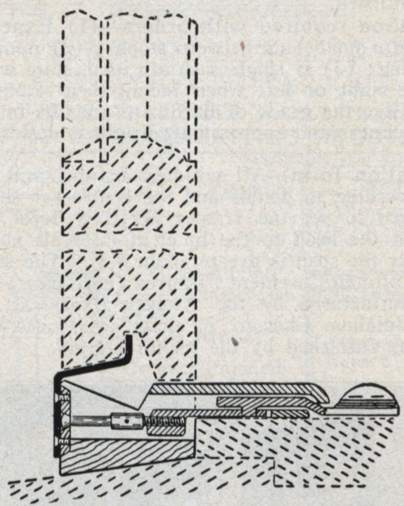
Use the ordinary butt hinge.



Section Through Bottom Rail, Subsill, Stool and Sill
Sash and closure bar in closed position



Section Through Bottom Rail, Subsill, Stool and Sill
Sash and closure bar in open position



Section Through Bottom Rail and Operating Device
Showing stool plate, eccentric lever, threaded adjusting rod, and closure bar engaged in groove in sash when closed

Specifications—All casement or hinged sash to be equipped with The Williams Pivot Sash Co.'s Stormproof Subsill and Closure Bar. Sash shall be made to conform to The Williams Pivot Sash Co.'s detail.

This company is to furnish the wood subsills, closure bars, stool plates and operating devices.

All finished hardware shall be equal to other hardware used in building in metal and style of finish.

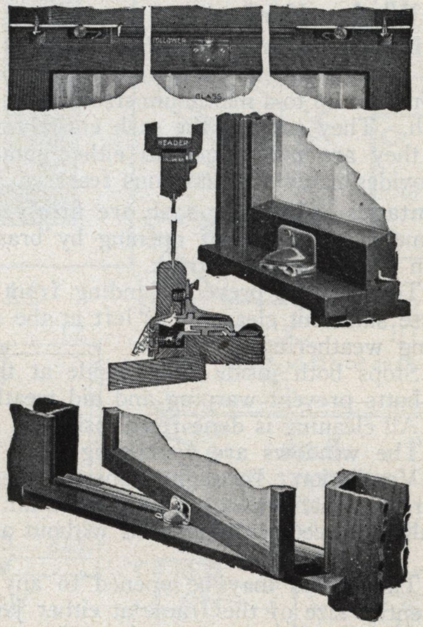
Sash details and description may be seen at the office of the architects, or, by applying to The Williams Pivot Sash Co., Cleveland, Ohio.

Williams Vertically Pivoted Window Fixtures

By raising and lowering the closure bar, sash is locked and unlocked; the necessity of lifting the sash to reverse for cleaning is eliminated.

With the closure bar and follower strip a perfectly tight sill and header are guaranteed. An effective stop is provided to hold the sash at different angles.

The follower and wood subsill are furnished with closure bar; all parts fitted and equipped with hardware in any material or finish desired. Subsill and closure bar furnished to conform to thickness of sash.



Williams Vertically Pivoted Window Fixtures

Specifications—All vertically pivoted sash to be equipped with The Williams Pivot Sash Co.'s Vertical Sash Fixtures. Sash shall be made in width and height to conform to The Williams Pivot Sash Co.'s detail.

This company is to furnish the hardware, etc., necessary to equip all vertically pivoted windows specified, such as wood subsills, follower strips, closure bars, pivot plates, operating devices, spring rollers, guide screws and sash handles.

All finished hardware shall be equal to other hardware used in building in metal and style of finish.

Sash details and description may be seen at the office of the architect, or by applying to The Williams Pivot Sash Co., Cleveland, Ohio.

In General

The Williams Pivot Sash Co. is one of the pioneers in reversible windows. The original basic principle of this device—the use of a truncated cone pivot utilizing the weight of the sash to hold the strip and sash tightly together—has been retained.

The practice of including the erection has also been a strong factor in keeping this equipment on the market over twenty years. Trained workmen are sent to the building to fit and hang the sash and apply the reversible equipment. These men are responsible directly to the main office and are not working under any of our agencies. This definitely fixes the responsibility for the proper operation of the equipment.

References

References can be furnished to almost any number desired—extending over many years.

ANDREW HOFFMAN MFG. CO.

Casement Window Hardware

905 Steger Building
CHICAGO, ILL.

DISTRIBUTERS IN ALL LARGE CITIES

Products

Casement Window Hardware.
Ceiling Light Sash Hardware.

Casement Window Hardware

Description—Hoffman casement fixtures (United States and foreign patents) are for outward or inward opening windows up to a maximum size of 2 ft. 6 in. x 7 ft. per sash. They support the sash entirely from the head and they are not hinged to either jamb, which method provides many advantageous features.

Advantages—(1) The sash are firmly attached to the frame at all points of opening by brass rollers engaging in a metal channel track.

(2) Top support prevents binding from swelling sash because sufficient clearance is left at the sill without affecting weathering.

(3) Stops both inside and outside at the jambs and three butts prevent warping and aid weathering.

(4) All cleaning is done from inside.

(5) The windows are weathertight.

(6) Ventilation. By slightly opening the window, a flue is created that draws out all impure air which is automatically replaced with fresh air without any direct draft.

(7) The sashes may be opened to any position up to the entire size of the frame at either jamb or at any point between the jambs and need no adjusters because one sash acts as a stay or brace to the other.

(8) The windows are designed by the architect and specified under carpentry or millwork the same as any other window. This company furnishes hardware only.

(9) Sash in series may be used in frames of any width omitting all mullions, providing head is securely bolted to lintel to prevent sagging. (We have a special detail sheet suggesting several methods of head support.)

(10) Sash in even numbers may be 1⅜, 1¾, or 2¼ in. thick. Single sash or sash in odd numbers must be 1¾ or 2¼ in. thick. Hardware for inward opening sashes is made for sash in pairs only.

Adaptability—Hoffman casement fixtures are strong and serviceable, will outlast ordinary window hardware, installation is simple and because windows so equipped combine all good features of all other types of windows they are adapted for typical use in any building, public or private.

Hardware Furnished—The fixtures are packed in complete sets containing all necessary hardware for sash in pairs or for single sash. Track is included up to 2 ft. for each sash. Wider sash require extra track.

Grades and Prices—All prices net f.o.b. Chicago. Distribution through agencies.

No. 1—Galvanized tracks; galvanized top hangers with brass wheels; galvanized bottom guides with brass swivel pins; *plated iron* butts, fasteners and handle. Stay arms for single sash, galvanized. For pairs of sash, per set—$5.00. For single sashes, per set—$4.50.

No. 2—Same as No. 1 excepting butts, fasteners and handle are solid brass, tumbled finish (not hand polished). For pairs of sash, per set—$7.00. For single sashes, per set—$6.00.

No. 3—Same as No. 2 excepting that sill track is *solid brass,* and butts, fasteners and handle are *solid brass,* hand polished. For pairs of sash, per set—$9.00. For single sashes, per set—$8.00.

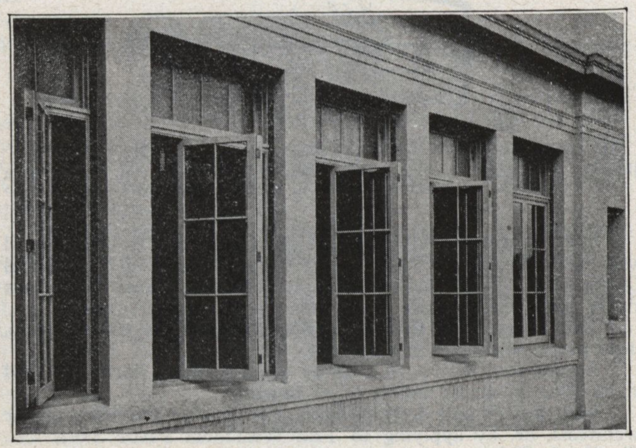
No. 4—All parts *solid brass.* For pairs of sash, per set—$12.00. For single sashes, per set—$10.50.

Also additional grades for both outward and inward opening windows.

Information required with orders—(1) Exact width of opening *jamb to jamb* (not between stops); (2) number of sash in each opening; (3) if single sash are used, state whether they swing to the right or left when facing them from inside the room. (4) Give the grade of hardware and the finish desired. (5) Sash thickness and approximate height is desirable, but not necessary.

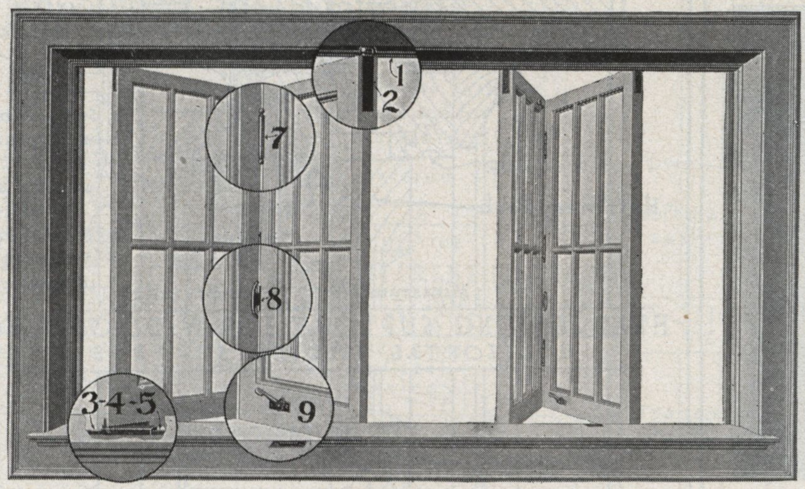
Specification form—All window frames and sash shall be milled according to details and the contractor shall exercise particular care to set the frames perfectly level and square and shall bolt the head to the lintel at intervals not exceeding 4 ft. wherever the span is greater than 4 ft. The sash shall be hung with Hoffman Casement Fixtures (here insert grade number) as manufactured by the Andrew Hoffman Mfg. Co., 905 Steger Building, Chicago, in exact accordance with details and directions furnished by the manufacturers.

Presbyterian Home, Evanston, Ill.

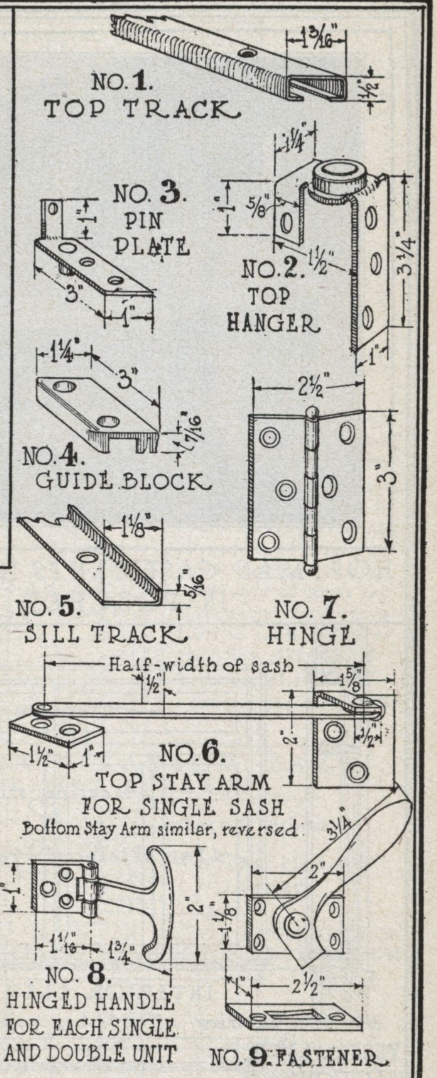


Hoffman Casements as Used in Schools

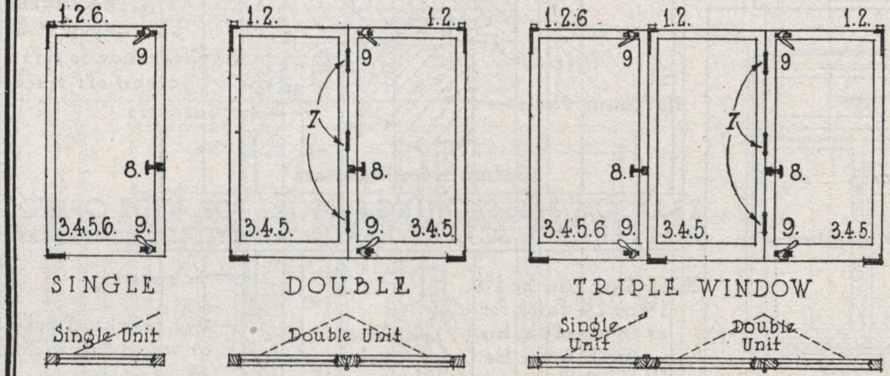
Continued on next page



PERSPECTIVE SHOWING HARDWARE APPLIED

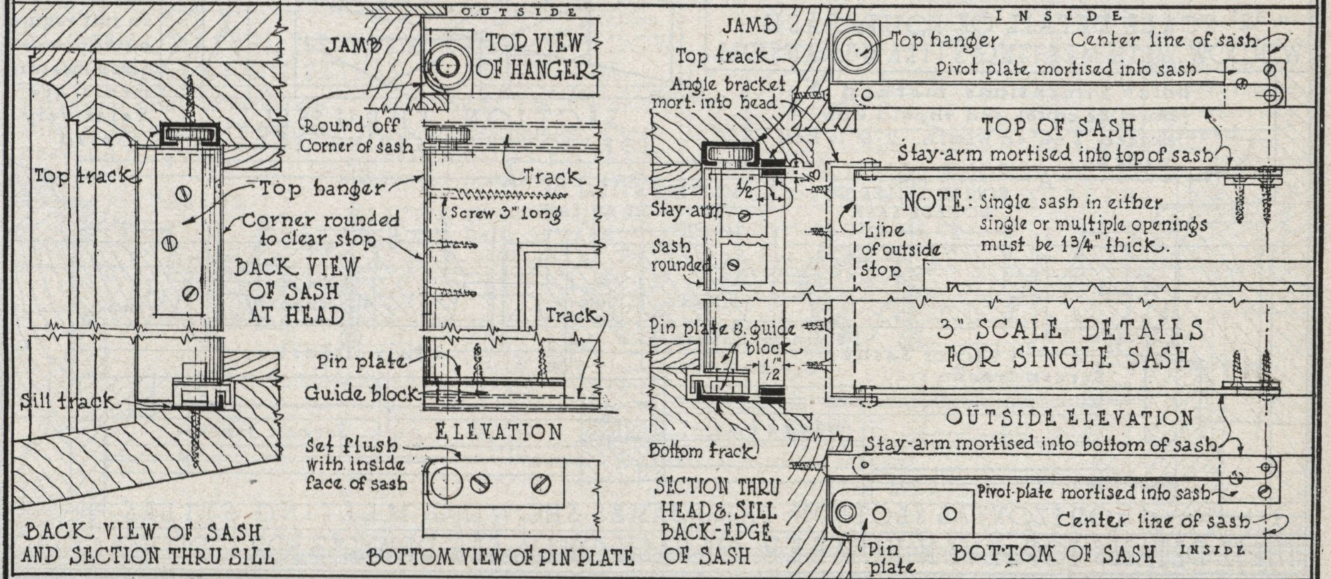

NO. 1.
TOP TRACK
1 3/16"
1/2"
NO. 3.
PIN PLATE
1"
3"
1"
1 1/4"
5/8"
1"
1 1/2"
1/2"
NO. 2.
TOP HANGER
3 1/4"
1"
1 1/4"
3"
7/16"
NO. 4.
GUIDE BLOCK
2 1/2"
3"
1 1/8"
5/16"
NO. 5.
SILL TRACK
NO. 7.
HINGE
Half-width of sash
1/2"
1 5/8"
2"
1 1/2"
1"
1/2"
NO. 6.
TOP STAY ARM
FOR SINGLE SASH
Bottom Stay Arm similar, reversed
3/4"
1"
2"
2"
1 1/8"
1 1/16"
1 3/4"
NO. 8.
HINGED HANDLE
FOR EACH SINGLE
AND DOUBLE UNIT
1"
2 1/2"
NO. 9. FASTENER

DETAILS OF HARDWARE


1.2.6.
9
8.
3.4.5.6.
9.
1.2.
1.2.
9
7
8.
3.4.5.
9.
3.4.5.
1.2.6
1.2.
1.2.
9
9
7
8.
8.
3.4.5.6
9.
3.4.5.
9.
3.4.5.
SINGLE
DOUBLE
TRIPLE WINDOW
Single Unit
Double Unit
Single Unit
Double Unit

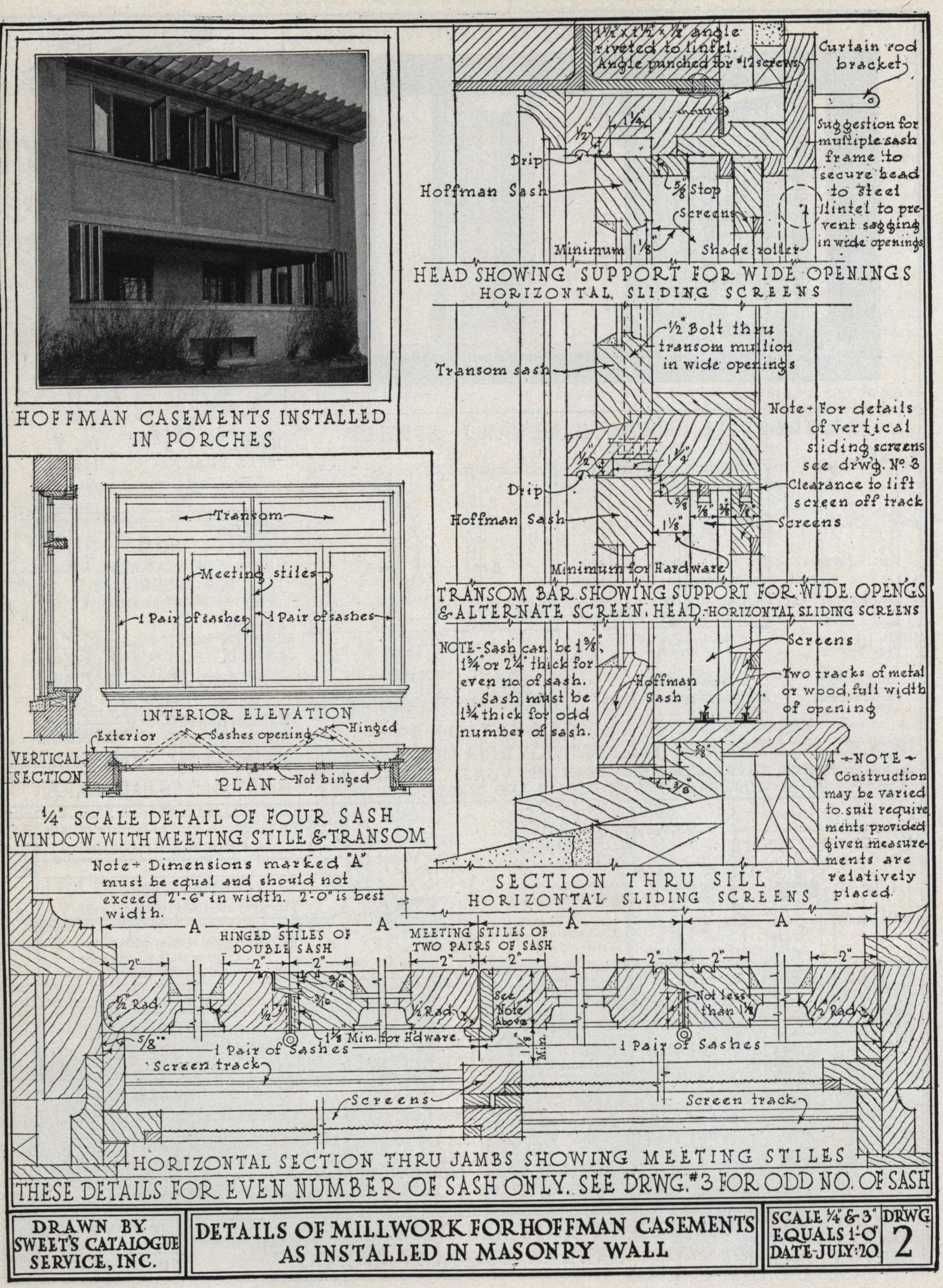
KEY PLANS AND ELEVATIONS
SHOWING OPERATION OF VARIOUS COMBINATIONS OF SASH

NOTE: WHEN THERE ARE MORE THAN THREE SASH, THEY ARE MADE UP OF COMBINATIONS OF DOUBLE AND SINGLE SASH UNITS.


OUTSIDE
JAMB
TOP VIEW OF HANGER
Round off Corner of sash
Top track
Top hanger
Corner rounded to clear stop
BACK VIEW OF SASH AT HEAD
Track
Screw 3" long
Track
Pin plate
Guide block
ELEVATION
Sill track
Set flush with inside face of sash
BACK VIEW OF SASH AND SECTION THRU SILL
BOTTOM VIEW OF PIN PLATE
JAMB
Top track
Angle bracket mort. into head
Stay-arm
Sash rounded
1/2
Line of outside stop
Pin plate & guide block
1/2
Bottom track
SECTION THRU HEAD & SILL BACK-EDGE OF SASH
INSIDE
Top hanger
Center line of sash
Pivot plate mortised into sash
TOP OF SASH
Stay-arm mortised into top of sash
NOTE: Single sash in either single or multiple openings must be 1 3/4" thick.
3" SCALE DETAILS FOR SINGLE SASH
OUTSIDE ELEVATION
Stay-arm mortised into bottom of sash
Pivot plate mortised into sash
Center line of sash
Pin plate
BOTTOM OF SASH
INSIDE

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	DETAILS OF HOFFMAN CASEMENT HARDWARE ANDREW HOFFMAN MFG. CO.	SCALE 3" & 1/4" EQUALS 1'-0". DATE-APR. 22	DRWG 1

Continued on next page


HOFFMAN CASEMENTS INSTALLED IN PORCHES
1½"x1½"x⅛" angle riveted to lintel. Angle punched for #12 screws
Curtain rod bracket
Suggestion for multiple sash frame to secure head to steel lintel to prevent sagging in wide openings
1¼"
½"
Drip
Hoffman Sash
⅝" Stop
Screens
Minimum 1⅛"
Shade roller
HEAD SHOWING SUPPORT FOR WIDE OPENINGS
HORIZONTAL SLIDING SCREENS
½" Bolt thru transom mullion in wide openings
Transom sash
Note: For details of vertical sliding screens see drwg. No 3
1¼"
½"
Drip
Clearance to lift screen off track
⅜"
⅞"
⅜"
⅞"
Hoffman Sash
1⅛"
Screens
Minimum for Hardware
TRANSOM BAR SHOWING SUPPORT FOR WIDE OPENGS & ALTERNATE SCREEN HEAD - HORIZONTAL SLIDING SCREENS
Transom
Meeting stiles
1 Pair of sashes
1 Pair of sashes
INTERIOR ELEVATION
Exterior
Sashes opening
Hinged
VERTICAL SECTION
PLAN
Not hinged
¼" SCALE DETAIL OF FOUR SASH WINDOW WITH MEETING STILE & TRANSOM
NOTE - Sash can be 1⅜", 1¾" or 2¼" thick for even no. of sash. Sash must be 1¾" thick for odd number of sash.
Screens
Hoffman Sash
Two tracks of metal or wood, full width of opening
⅝"
⅜"
NOTE: Construction may be varied to suit requirements provided given measurements are relatively placed.
SECTION THRU SILL
HORIZONTAL SLIDING SCREENS
Note: Dimensions marked "A" must be equal and should not exceed 2'-6" in width. 2'-0" is best width.
A
A
A
A
HINGED STILES OF DOUBLE SASH
MEETING STILES OF TWO PAIRS OF SASH
2"
2"
2"
2"
2"
2"
2"
2"
2"
9/16
3/16
½" Rad.
½" Rad.
½" Rad.
½"
1"
1⅛ Min. for Hdware.
See Note Above
⅛" Min.
Not less than 1⅛
⅝"
1 Pair of Sashes
1 Pair of Sashes
Screen track
Screens
Screen track
HORIZONTAL SECTION THRU JAMBS SHOWING MEETING STILES
THESE DETAILS FOR EVEN NUMBER OF SASH ONLY. SEE DRWG. #3 FOR ODD NO. OF SASH

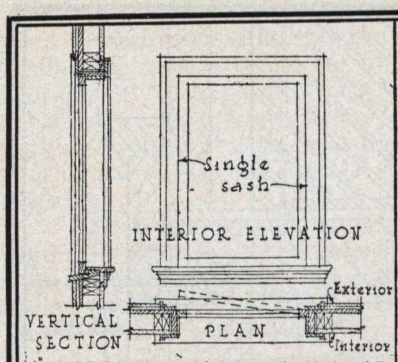
DRAWN BY SWEET'S CATALOGUE SERVICE, INC.

DETAILS OF MILLWORK FOR HOFFMAN CASEMENTS AS INSTALLED IN MASONRY WALL

SCALE ¼" & 3" EQUALS 1'-0"
DATE - JULY '20

DRWG. 2

Continued on next page

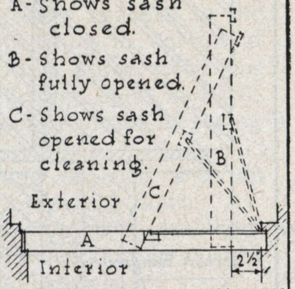

Single sash
INTERIOR ELEVATION
Exterior
VERTICAL SECTION
PLAN
Interior

¼ SCALE DETAIL OF SINGLE SASH WINDOW

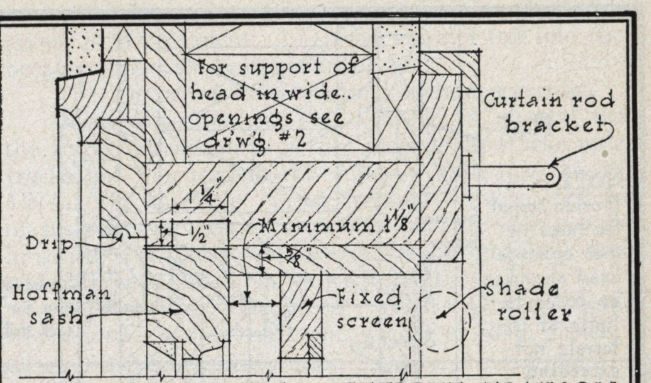
A- Shows sash closed.

B- Shows sash fully opened.

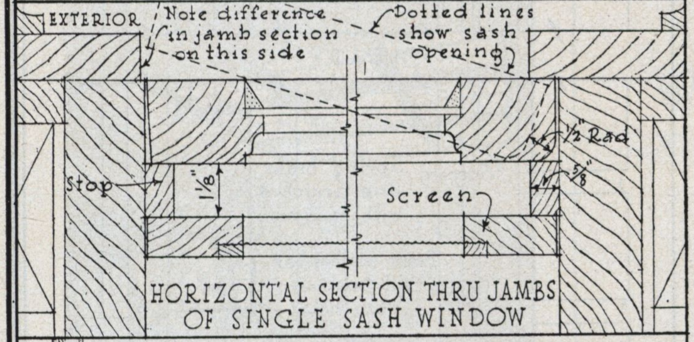
C- Shows sash opened for cleaning.


Exterior
A
B
C
Interior
2½"

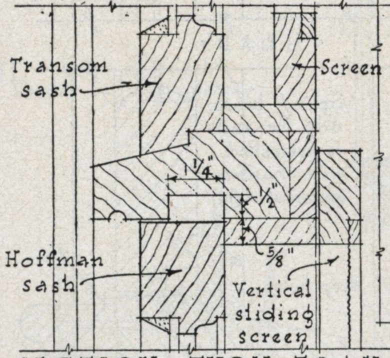
DIFFERENT POSITIONS OF SINGLE SASH OPEN AND CLOSED


For support of head in wide openings see drwg. #2
Curtain rod bracket
1¼"
½"
Minimum 1⅛"
⅝"
Drip
Hoffman sash
Fixed screen
Shade roller

SECTION THRU HEAD WITHOUT TRANSOM
VERTICAL SLIDING SCREENS

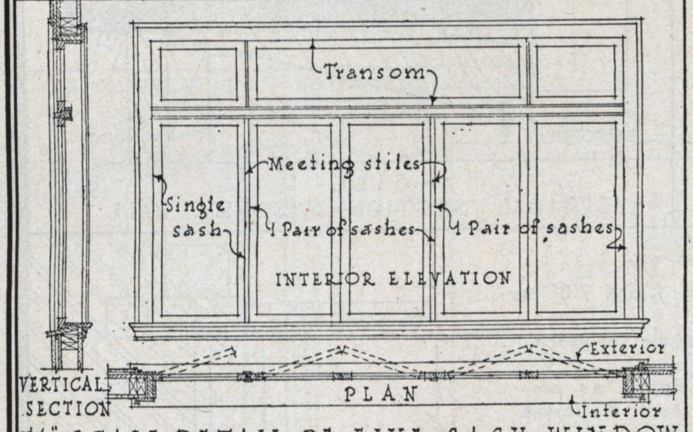

EXTERIOR
Note difference in jamb section on this side
Dotted lines show sash opening
½" Rad
Stop
1⅛"
⅝"
Screen

HORIZONTAL SECTION THRU JAMBS OF SINGLE SASH WINDOW


Transom sash
Screen
1¼"
½"
⅝"
Hoffman sash
Vertical sliding screen

For windows without transom, vertical sliding screens are made in two sections. Upper section is only 10" or 12" high to avoid having cross rail at middle of window. Lower section slides up height of upper section, permitting operation of sash at lower rail. For details of horizontal sliding screens see drwg. #2

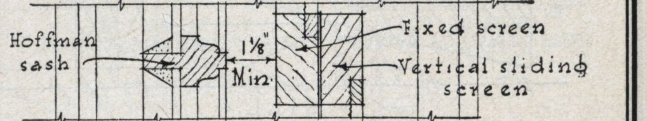
SECTION THRU TRANSOM BAR
VERTICAL SLIDING SCREENS


Transom
Meeting stiles
Single sash
1 Pair of sashes
1 Pair of sashes
INTERIOR ELEVATION
Exterior
VERTICAL SECTION
PLAN
Interior

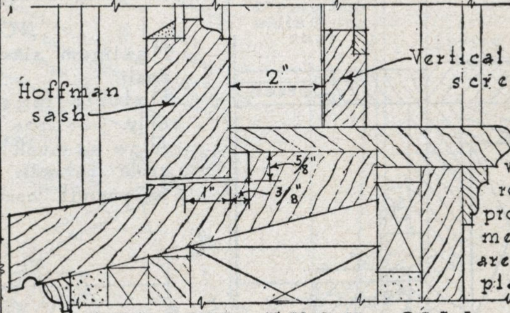
¼" SCALE DETAIL OF FIVE SASH WINDOW WITH MEETING STILES & TRANSOM

NOTE- For detail of meeting stiles of two pairs of sash see drawing #2.

Sash can be 1⅜", 1¾" or 2¼" thick for even number of sash. Sash must be 1¾" thick for odd number of sash

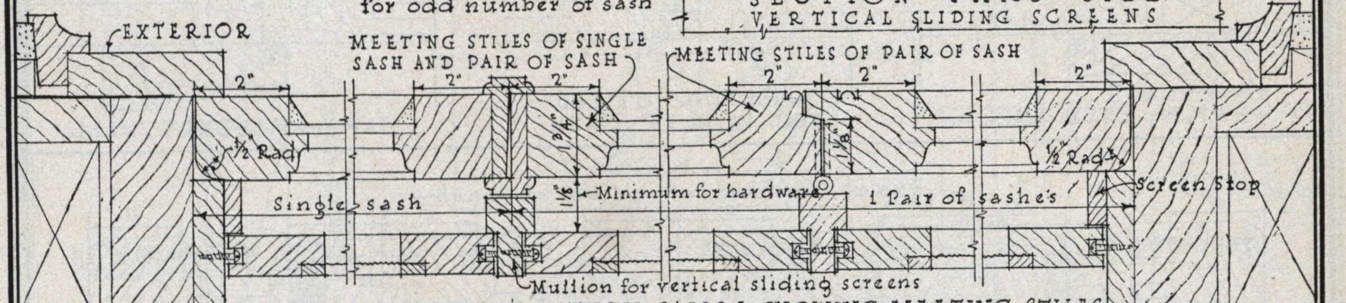

Hoffman sash
1⅛" Min.
Fixed screen
Vertical sliding screen

SECTION THRU MUNTIN SHOWING APPLICATION OF VERTICAL SLIDING SCREENS TO WINDOW WITHOUT TRANSOM


Hoffman sash
2"
Vertical sliding screen
⅝"
1"
⅜"

+NOTE+ Construction may be varied to suit requirements provided given measurements are relatively placed.

SECTION THRU SILL
VERTICAL SLIDING SCREENS

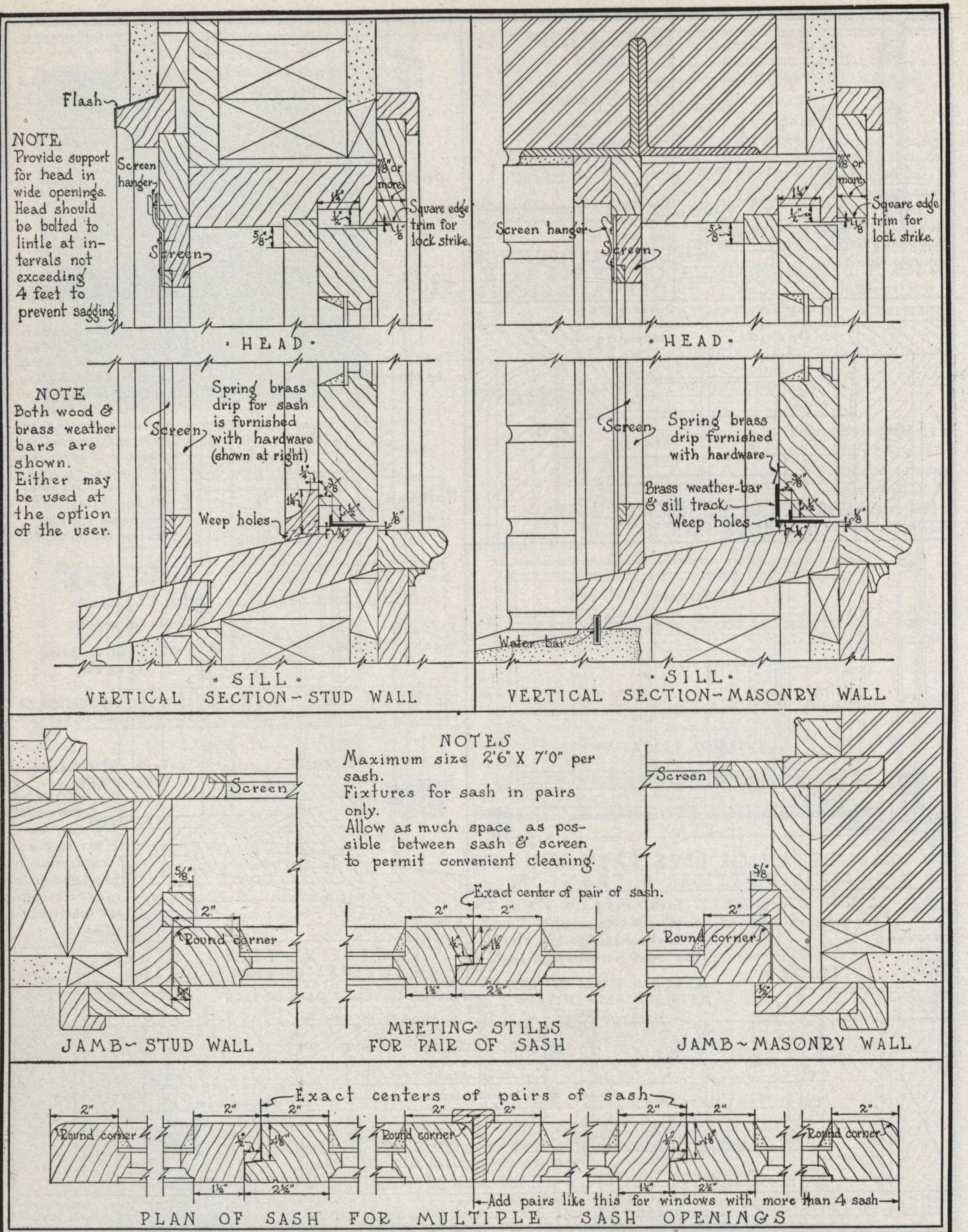

EXTERIOR
MEETING STILES OF SINGLE SASH AND PAIR OF SASH
MEETING STILES OF PAIR OF SASH
2"
2"
2"
2"
2"
2"
1¾"
1⅛"
1⅛"
½" Rad
½" Rad
Single sash
Minimum for hardware
1 Pair of sashes
Screen Stop
Mullion for vertical sliding screens

HORIZONTAL SECTION THRU JAMBS SHOWING MEETING STILES

THESE DETAILS FOR ODD NUMBER OF SASH ONLY. SEE DRWG. #2 FOR EVEN NO. OF SASH

DRAWN BY SWEET'S CATALOGUE SERVICE, INC.	DETAILS OF MILLWORK FOR HOFFMAN CASEMENTS AS INSTALLED IN FRAME WALL	SCALE ¼" & 3" EQUALS 1'-0" DATE-JULY-20	DRWG 3

Continued on next page



NOTE
Provide support for head in wide openings. Head should be bolted to lintle at intervals not exceeding 4 feet to prevent sagging.

NOTE
Both wood & brass weather bars are shown. Either may be used at the option of the user.

NOTES
Maximum size 2'6" X 7'0" per sash.
Fixtures for sash in pairs only.
Allow as much space as possible between sash & screen to permit convenient cleaning.

Flash
Screen hanger
Screen
7/8" or more
1¼"
½"
5/8"
1/8"
Square edge trim for lock strike.
HEAD
Screen
Spring brass drip for sash is furnished with hardware (shown at right)
¼"
3/8"
1¼"
½"
1/8"
1¼"
Weep holes
SILL
VERTICAL SECTION – STUD WALL
Screen hanger
Screen
7/8" or more
1¼"
½"
5/8"
1/8"
Square edge trim for lock strike.
HEAD
Screen
Spring brass drip furnished with hardware
Brass weather-bar & sill track
Weep holes
3/8"
½"
1/8"
¼"
Water bar
SILL
VERTICAL SECTION – MASONRY WALL
Screen
5/8"
2"
Round corner
1/8"
JAMB – STUD WALL
Exact center of pair of sash.
2"
2"
½"
1/8"
1½"
2½"
MEETING STILES FOR PAIR OF SASH
Screen
5/8"
2"
Round corner
1/8"
JAMB – MASONRY WALL
Exact centers of pairs of sash
2"
Round corner
2"
2"
½"
1/8"
1½"
2½"
2"
2"
Round corner
2"
2"
½"
1/8"
1½"
2½"
2"
Round corner
Add pairs like this for windows with more than 4 sash
PLAN OF SASH FOR MULTIPLE SASH OPENINGS

MILLWORK DETAILS FOR HOFFMAN CASEMENTS INWARD OPENING
SCALE 3" EQUALS 1'0"

JUNE-30-1923

Continued on next page

Hoffman Ceiling Lights

Description—Fixtures for hanging and operating ceiling light sash, consisting of rollers attached to the corners of each pair of sash operating in horizontal channel tracks in conjunction with a guide roller engaging in a vertical track at the hinged point and balancing the sash in any open position by means of spring balances.

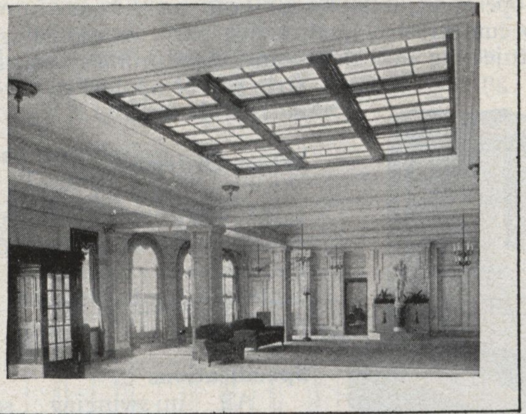
Sashes are opened by pushing upwards with an ordinary window pole and closed by pulling down.

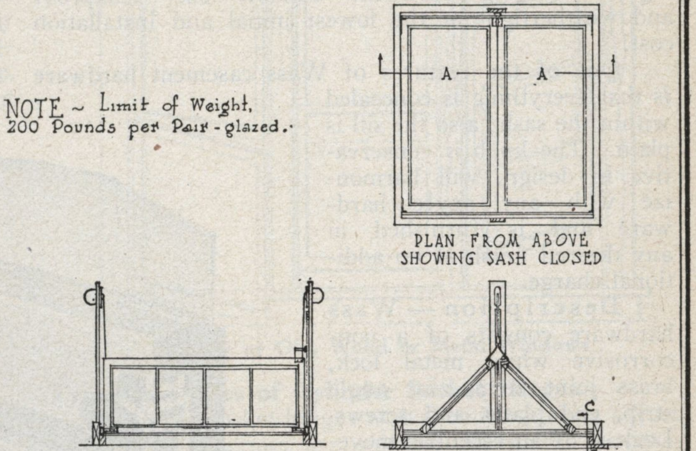
Advantages—(1) No hardware in sight from below except butt knuckles. (2) Sashes may be opened for ventilation without exposing skylight above. (3) Cleaning may be done from beneath if other access is inconvenient. (4) Sash can not fall into room because supported by stops on all sides.

(5) Operation is simple and without exertion.

Millwork—Sashes should be 1¼ in. shorter than the frame dimension to permit placing the tracks unless tracks are mortised in the frame. Sash may be 1⅜, 1¾ or 2¼ in. thick. Cross framing between each pair of sash may be omitted if desired and the sash installed in series. Provide a vertical stile for upright guide track and balances at each end of each pair of sash.

Information Required With Orders—Exact width across ends of sash and weight of sash, glazed.

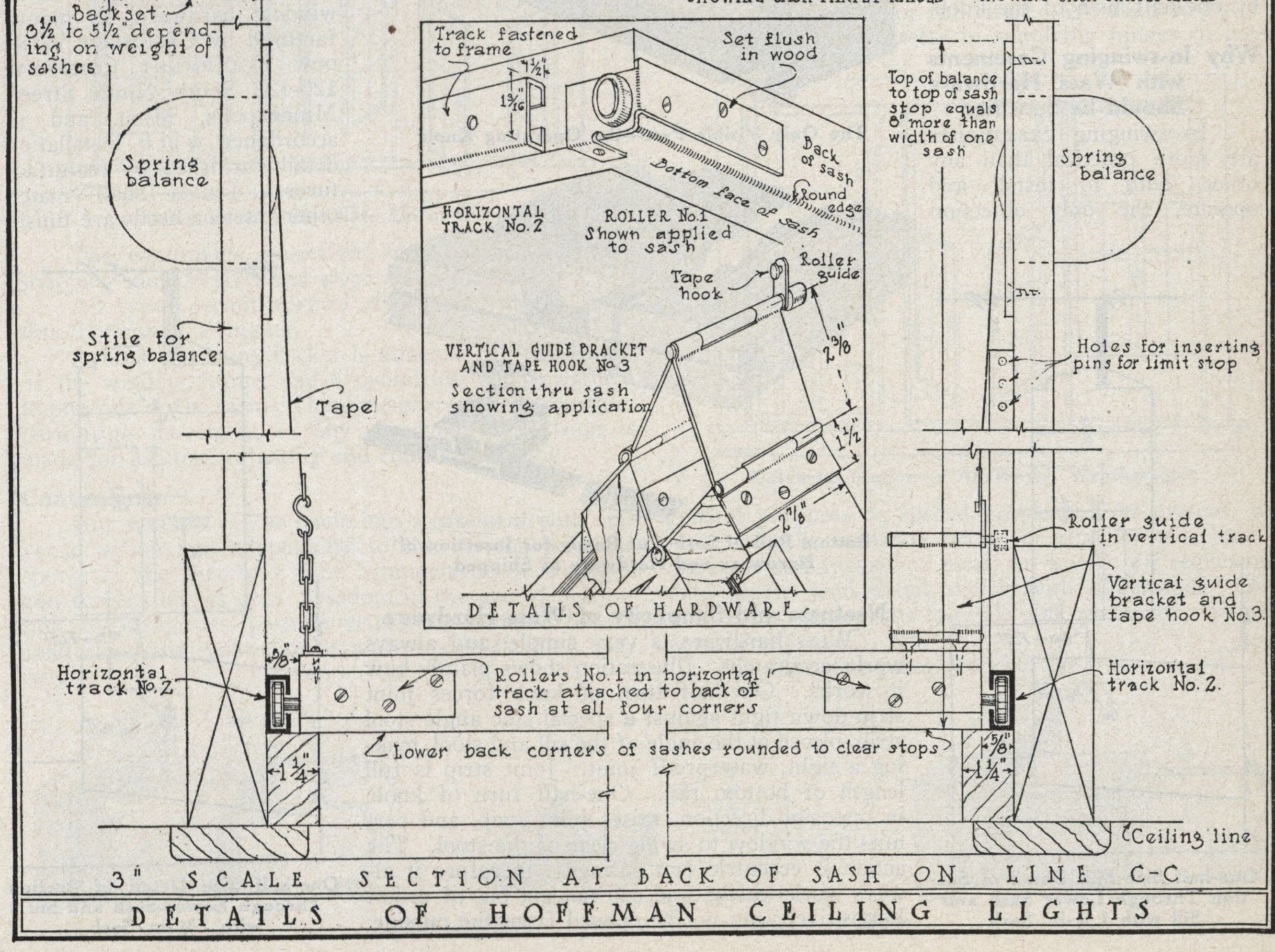

AN INSTALLATION OF HOFFMAN CEILING LIGHTS


NOTE ~ Limit of Weight, 200 Pounds per Pair-glazed.
A
A
C
C

PLAN FROM ABOVE SHOWING SASH CLOSED

SECTION AT C-C SHOWING SASH PARTLY RAISED

SECTION AT A-A SHOWING SASH PARTLY RAISED


Backset 3½" to 5½" depending on weight of sashes
Spring balance
Stile for spring balance
Tape
Horizontal track No. 2
⅝"
1¼"
Track fastened to frame
1½"
1 3/16"
Set flush in wood
Back of sash
Round edge
Bottom face of sash
HORIZONTAL TRACK No. 2
ROLLER No. 1 Shown applied to sash
Tape hook
Roller guide
2⅝"
1½"
2⅞"
VERTICAL GUIDE BRACKET AND TAPE HOOK No 3
Section thru sash showing application
DETAILS OF HARDWARE
Rollers No. 1 in horizontal track attached to back of sash at all four corners
Lower back corners of sashes rounded to clear stops
Top of balance to top of sash stop equals 8" more than width of one sash
Spring balance
Holes for inserting pins for limit stop
Roller guide in vertical track
Vertical guide bracket and tape hook No. 3
Horizontal track No. 2
⅝"
1¼"
Ceiling line

3" SCALE SECTION AT BACK OF SASH ON LINE C-C

DETAILS OF HOFFMAN CEILING LIGHTS

CASEMENT WINDOW EQUIPMENT COMPANY

120 South Ninth Street
MINNEAPOLIS, MINN.

For Counterbalanced Window Hardware, see page 1433

Wass In-swinging Casement Window Hardware

Wass hardware for in-swinging casement windows has been developed through seven years of actual practice and experience in the manufacture of window hardware specialties for the special purpose of making in-swinging casement window sills leakproof and weathertight at the lowest initial and installation cost.

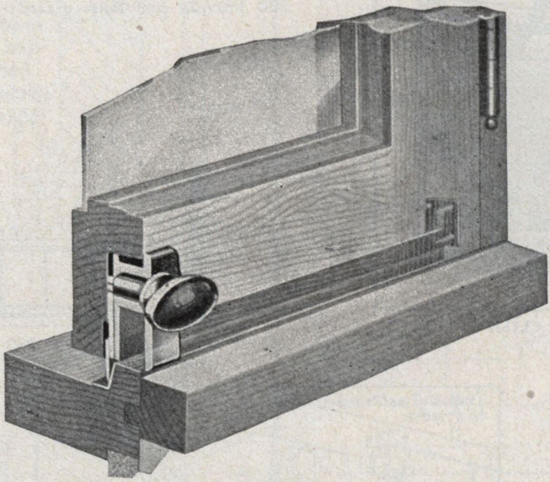
One of the features of Wass casement hardware is that everything is concealed within the sash; also the sill is plain. The knob is conservative in design, will harmonize with any style hardware and is furnished in any desired finish at no additional charge.

Description — Wass hardware consists of a non-corrosive white metal lock, brass joint strip, zinc angle strip, end plates and screws. Lock is of an eccentric movement (no springs) governed by one-half turn of the knob.

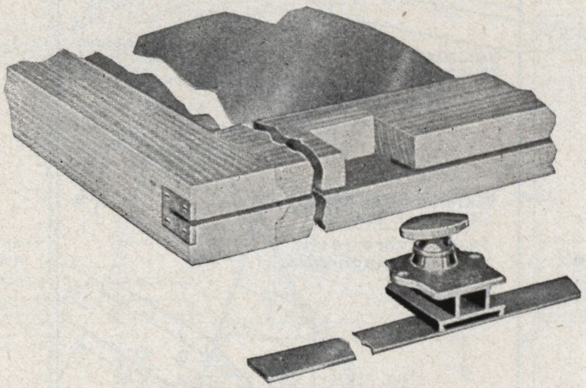
Why In-swinging Casements with Wass Hardware Should be Specified

In-swinging casements are more practical than any other, both to install and operate, the only objection heretofore being the danger of a leaky sill. They are the safest and easiest to clean and permit the hanging of storm sash and screens on the outside in their proper place.

Wass hardware positively prevents rain, snow and dust entering at the sill; locks and seals the window in one operation; is foolproof—can not get out of order; has no cumbersome unattractive parts or moulding on sash projecting into the room. Any ordinary weather-strip can be applied to top and sides if desired.



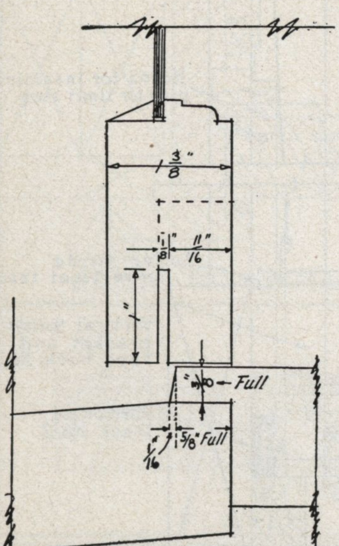
The Only Visible Part—the Operating Knob



Bottom Rail of Sash Cut Ready for Insertion of Hardware and Hardware as Shipped

Neatness and Simplicity of Wass Hardware

Wass hardware is very simple, and always works accurately. Illustration shows plainly how it works. One-half turn of knob forces joint strip down tight against a special zinc angle stool strip, placed at the angle of the sill and stool, making a tight, waterproof joint. Joint strip is full length of bottom rail. One-half turn of knob, in opposite direction, raises joint strip, and permits the window to swing clear of the stool. The action is eccentric (no springs), therefore it always works easily, and can not get out of order. It positively can not be opened from the outside.



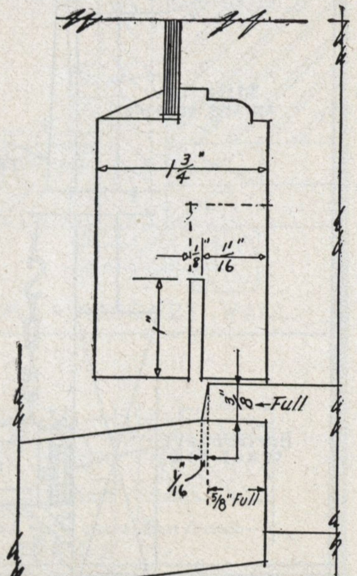
One-half Size Mill Detail of Section Through Lower Sash and Sill with 1⅜-in. Sash

When Ordering

Give over-all width of sash, whether for single or double windows and, if double, whether rabbeted or not. State finish of hardware desired.

Specifications

All in-swinging sash, where shown or noted, shall be equipped with casement window hardware, as manufactured by Casement Window Equipment Company, 120-122 South Ninth Street, Minneapolis, Minn. and in accordance with installation detail furnished by manufacturer. Finish shall match other interior hardware finish.



One-half Size Detail of Section Through Lower Sash and Sill with 1¾-in. Sash

L. H. LEHMAN

Manufacturer of Slide-Swing Hinges and Casement Hardware

1210 North 8th Street
PHILADELPHIA, PA.

Products

Cylinder Socket Hinges.

Casement Fittings.

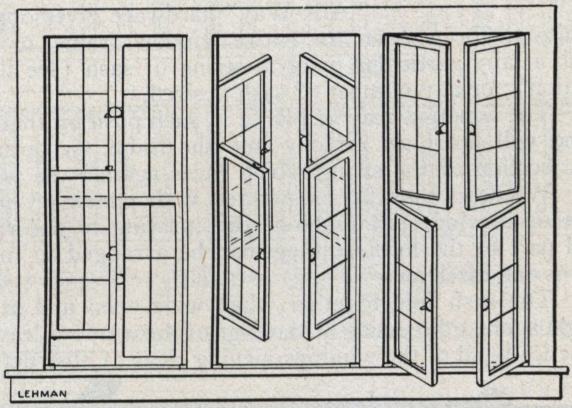
For Glass Shower Stall Doors and Bathtub Shower Shields, see page 1985.

Lehman All-Ways Windows

Work all ways on our patent hinges, sliding up and down, and at the same time swinging in or out. They can be raised, lowered or swung to any position—adjusters and counterbalances holding them in place. They swing in (lifting over the sill beading) or out through a quarter or half circle.

Easy Installation

Lehman Patent Hardware can be applied quickly and easily to almost any old or new window sash and frame.



Swing In or Out—Slide Up or Down

The continuous watertight hinge makes weatherstripping unnecessary, and stops all rattling.

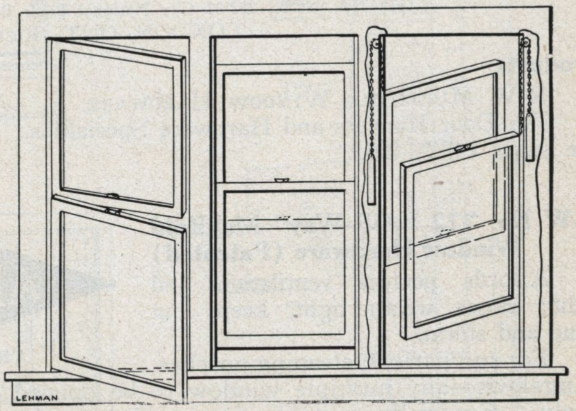
All types permit vertical sliding and at the same time horizontal swinging.

A brass retaining socket is attached the full length of the window frame, and a cylindrical rod is applied to one side of the sash. These members slidefit together, permitting movement in any direction. Provision is made for locking, adjusting and counterbalancing.

Convenience

Any window can be made into a casement with universal action and adaptability to the various positions shown in the sketches. The arrangement of windows and screens allows great freedom in the use of decoration and draperies, permits ventilation suitable for all conditions, and makes inside and outside cleaning very easy.

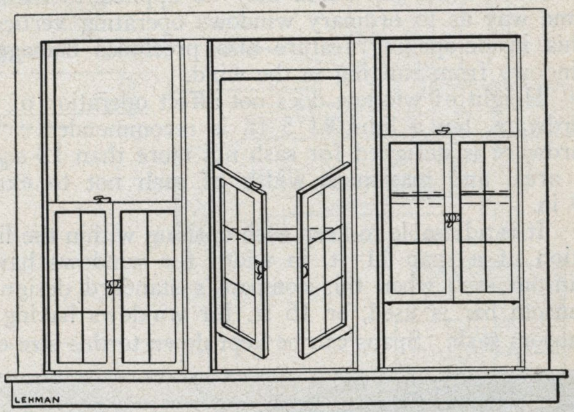
Lehman Wonder Windows do anything you want them to do, and stay anywhere you place them. They are weatherproof and rustproof, sturdy, moderate in cost, and simple to install.



Fit New or Old, Wood or Metal Windows

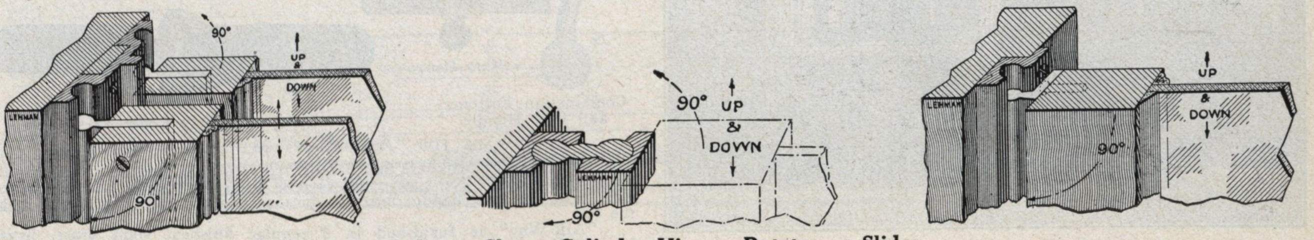
Types and Uses of Cylinder Socket Hinges

Cylinder socket hinges with their lengthwise adjustment after hanging, are suitable for many purposes. Compound hinges are made to permit rotation through a half, three-quarter or full circle. We shall be glad to co-operate with architects in supplying hinges to meet general purposes or special problems. At present, we make only the hardware ready for attachment to standard sash and frames of metal or wood. In requesting data please send detail sketch with dimensions. We will furnish blue prints to guide sash contractor. Priced surprisingly low.



Universal Motion—"All-Ways" Weathertight

Discounts for quantity and to the trade.



Lehman Sleeve Cylinder Hinge—Rotates or Slides

RICHARDS-WILCOX MANUFACTURING CO.

INCORPORATED

Manufacturers of AiR-Way Multifold Window Hardware

CABLE ADDRESS
"RICHWILCO, AURORA"

AURORA, ILL.

CANADIAN FACTORY
LONDON, ONTARIO

BRANCH OFFICES

NEW YORK, N. Y., 85 Walker Street
CHICAGO, ILL., 166-68 West Lake Street
PHILADELPHIA, PA., 507 Arch Street
BOSTON, MASS., 132-34 Pearl Street
CLEVELAND, OHIO, 459 Hippodrome Annex
KANSAS CITY, MO., 206 Reliance Building
OMAHA, NEB., 202-03 City National Bank Building

ST. LOUIS, MO., 1735 Boatmen's Bank Building
INDIANAPOLIS, IND., 423-24 Occidental Building
MINNEAPOLIS, MINN., 321 Plymouth Building
LOS ANGELES, CAL., 503 Equitable Building
SAN FRANCISCO, CAL., 626 Underwood Building
SEATTLE, WASH., 1214 Hoge Building
CINCINNATI, OHIO, 512 Provident Bank Building

LONDON, ONT., RICHARDS-WILCOX CANADIAN CO., LTD.

Products

R-W MULTIFOLD WINDOW HARDWARE.

For Door Hangers and Hardware Specialties, see pages 1482-1496.

TRADE-MARKS

R-W No. 312 "AiR-Way" Multifold Window Hardware (Patented)

Affords perfect ventilation and light; closes weathertight, keeps out wind and storm.

For sun parlors, sleeping porches, bungalows—any multiple window to be opened entirely. Especially suitable for residences, hotels, hospitals, sanitariums, schools, libraries, clubs, apartments and flats.

"AiR-Way" equipped windows open inside, permitting their being washed readily and removing the danger and inconvenience connected with washing windows from outside.

"AiR-Way" windows do not interfere with screens or storm windows, which may be applied to them in same way as to ordinary windows operating vertically. This inside-opening feature also precludes damage to windows from banging in the wind.

Height of window does not affect operation of this hardware, but a limit of 5 ft. is recommended. The hardware is designed for sash not more than 12 sq. ft. in area, and maximum width of sash not to exceed 24 in.

It is advisable to keep each opening within the limitation of a span 11 ft. in width for windows having transom sash when this company's standard design of transom bar is used, or 16 ft. for windows having no transom sash. Spans can be kept down to this size conveniently by the use of solid mullions. Two, three or four sash may be linked together to fold in one direction. Total width of sash folding one way is 8 ft.

Sash must be constructed according to special details shown on next page.

Directions furnished with hardware enable any competent carpenter to install these windows.

"AIR-WAY LETS THE OUTDOORS IN

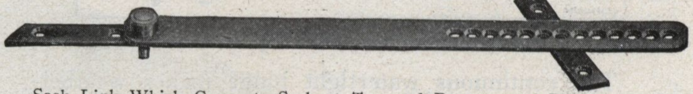
Ventilation

"AiR-Way" hardware gives opportunity to throw open the entire window frame, or one sash at any particular point in string of sash (see illustration); or any number of sash desired.

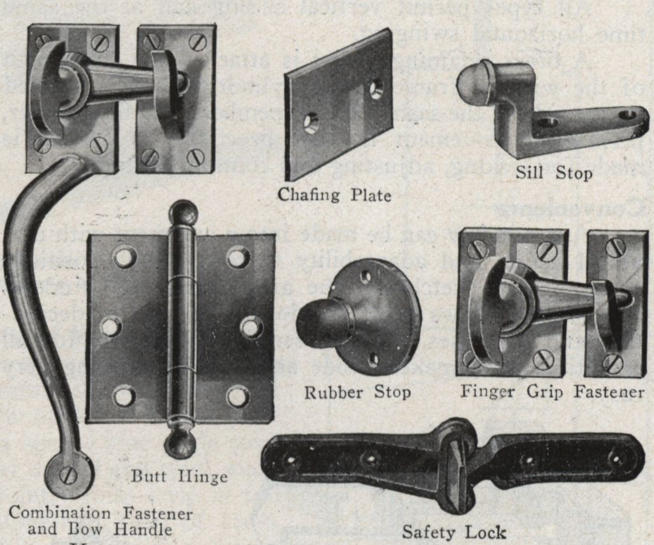
The windows may be placed in such position that the wind will not blow directly into the room, by opening that section of the string which faces against the wind.

Windows may be constructed with stationary mullion or moving split mullion, part moving to the right and part to the left; or they may be arranged to move all in one direction.

The sash fold together when wide open and at an angle against the casing at the edge of the window, leaving practically all of the window opening clear of obstruction.



Sash Link Which Connects Sash at Top and Bottom, and Runs in Metal Tracks Used as Top and Bottom Guides

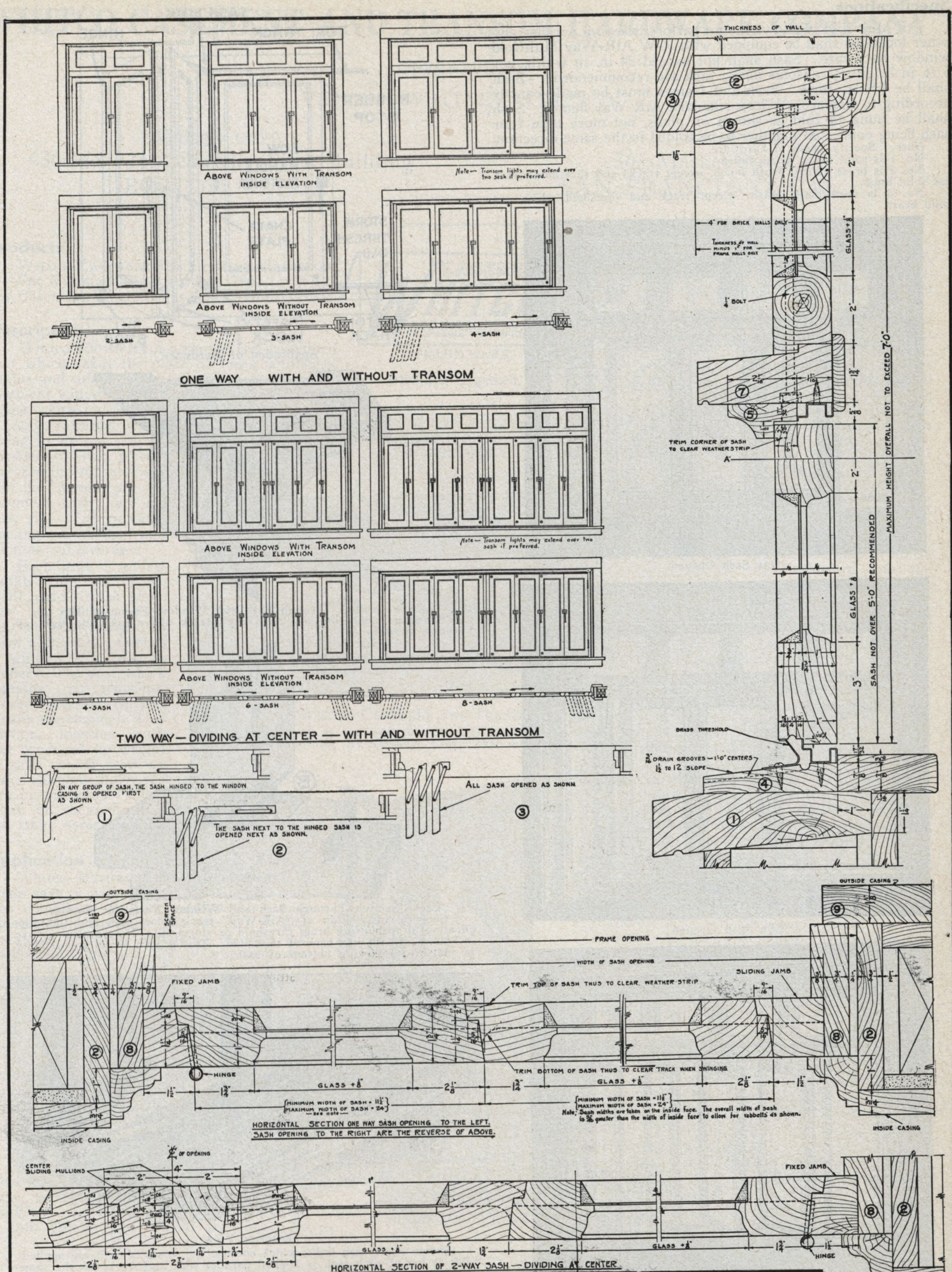


HARDWARE FOR "AIR-WAY" MULTIFOLD WINDOWS

Two types of fasteners and handle are employed, one with bow handle and one without. For high windows it is advisable to use 2 fasteners for each sash, the bow handle near the bottom and the finger grip type near the top.

"AiR-Way" is furnished in 3 regular finishes; solid brass, brush brass finish; brass plated, brush brass finish; and dull black, imitation bower-barff

Continued on next page


Above Windows With Transom
Inside Elevation
Note—Transom lights may extend over two sash if preferred.
Above Windows Without Transom
Inside Elevation
2-Sash
3-Sash
4-Sash
ONE WAY WITH AND WITHOUT TRANSOM
Above Windows With Transom
Inside Elevation
Note—Transom lights may extend over two sash if preferred.
Above Windows Without Transom
Inside Elevation
4-Sash
6-Sash
8-Sash
TWO WAY—DIVIDING AT CENTER—WITH AND WITHOUT TRANSOM
In any group of sash, the sash hinged to the window casing is opened first as shown
①
The sash next to the hinged sash is opened next as shown.
②
All sash opened as shown
③
Thickness of wall
③
②
⑧
4" for brick walls only
Thickness of wall minus 1" for frame walls only
1/4" Bolt
Glass + 1/8"
⑦
⑤
Trim corner of sash to clear weatherstrip
A
Glass + 1/8
Sash not over 5'0" recommended
Maximum height overall not to exceed 7'0"
Brass threshold
3/8" Drain grooves—1'0" centers
1 1/2 to 12 slope
④
①
Outside casing
Screen space
⑨
Frame opening
Width of sash opening
Fixed jamb
Sliding jamb
Trim top of sash thus to clear weather strip
Trim bottom of sash thus to clear track when swinging
Hinge
Glass + 1/8"
Minimum width of sash = 11 1/2"
Maximum width of sash = 24"
see note
Note; Sash widths are taken on the inside face. The overall width of sash is 9/16" greater than the width of inside face to allow for rabbetts as shown.
Horizontal section one way sash opening to the left.
Sash opening to the right are the reverse of above.
Inside casing
Outside casing
⑨
⑧
②
Inside casing
℄ of opening
Center sliding mullions
Fixed jamb
Hinge
Glass + 1/8"
Horizontal section of 2-way sash—dividing at center

RICHARDS-WILCOX No 312 AIR-WAY MULTIFOLD WINDOW HARDWARE SCALE FOR SECTIONS 3"=1FT.

Continued on next page

Specifications

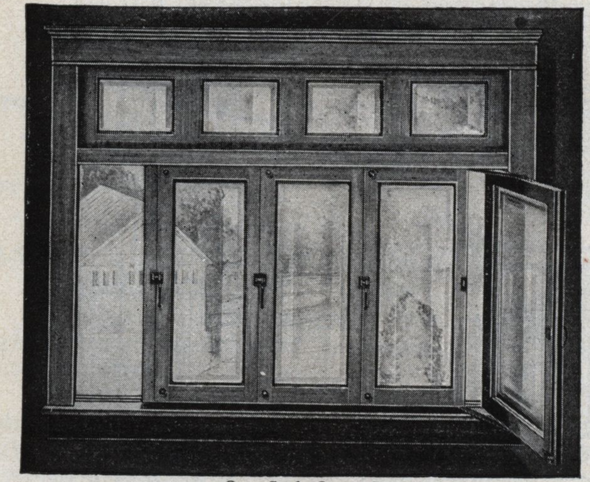
All Multifold windows in sun parlors, sleeping porches and other locations shall be equipped with R-W AiR-Way Multifold window hardware. Sash shall not exceed 24 in. in width, nor 5 ft. in height, (transoms above sash are recommended). Sash shall be 1¾ in. thick. Sash and frames must be made exactly according to Richards-Wilcox standard AiR-Way details. Sash shall be hung to fold as shown on plans, not more than four sash being connected together to be folded in the same direction.

Note: Specify finish of hardware.

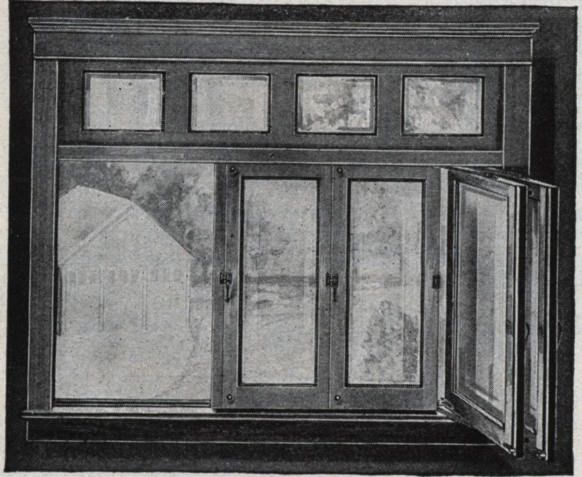
No. 1 is solid brass, brush finish

No. 2 is brass plated, brush finish, except tracks and threshold which are solid brass.

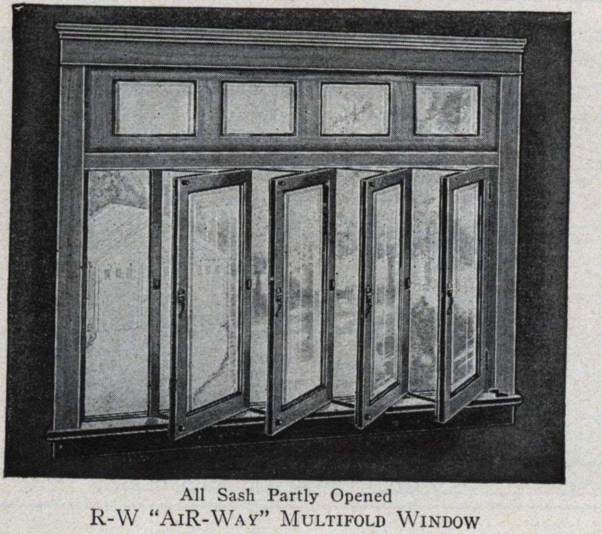
No. 3 is dead black finish, except track and threshold which are solid brass.



One Sash Opened

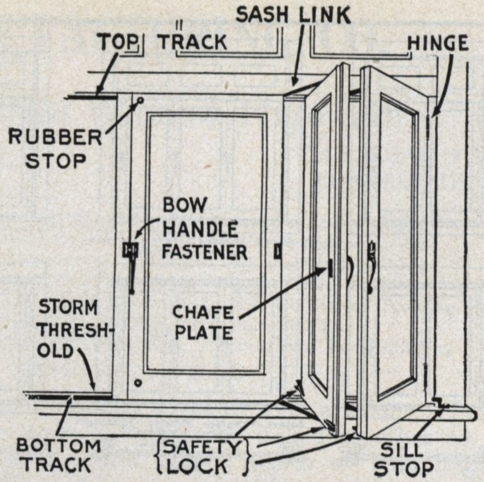


Two Sash Opened

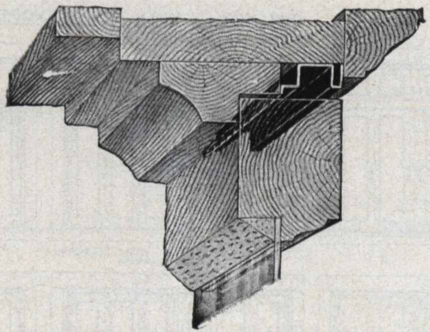


All Sash Partly Opened

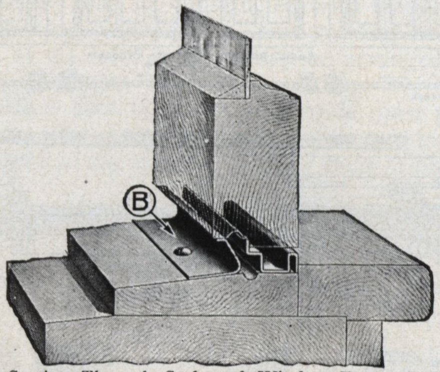
R-W "AiR-Way" Multifold Window



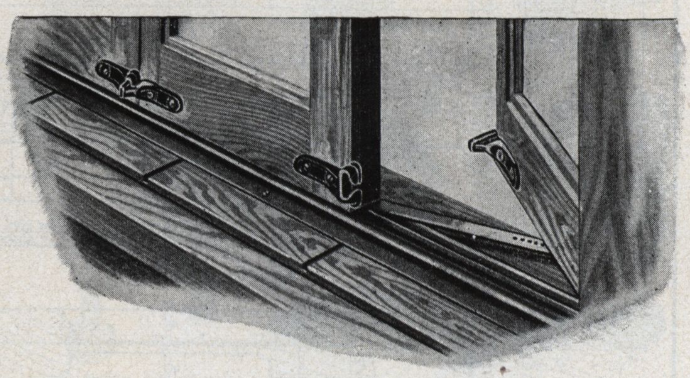
Application of Hardware



Cross Section Through Sash and Window Frame at Top
Showing installation of "AiR-Way" track above sash and tight application of sash



Cross Section Through Sash and Window Frame at Bottom
Showing installation of "AiR-Way" track below sash and tight application of sash using brass threshold or storm sill. Note arched groove in bottom of sash just back of threshold. This groove obviates possibility of moisture following bottom of sash



Exterior View
Shows where sash links, which connect the series of sash are applied. Link at top of each sash is applied parallel with and works on the same principle as link at bottom of each sash. Also note metal track and safety locks

R-W "AiR-Way" Multifold Window Hardware

Note: All tracks and threshold are solid brass

WHITCO CASEMENT AND TRANSOM HARDWARE COMPANY

OPERATED BY
VINCENT WHITNEY COMPANY

EASTERN OFFICE
636-645 Massachusetts Trust Building
BOSTON, MASS.

WESTERN OFFICE
365 Market Street
SAN FRANCISCO, CAL.

CASEMENT
WHITCO
HARDWARE
TRADE-MARK

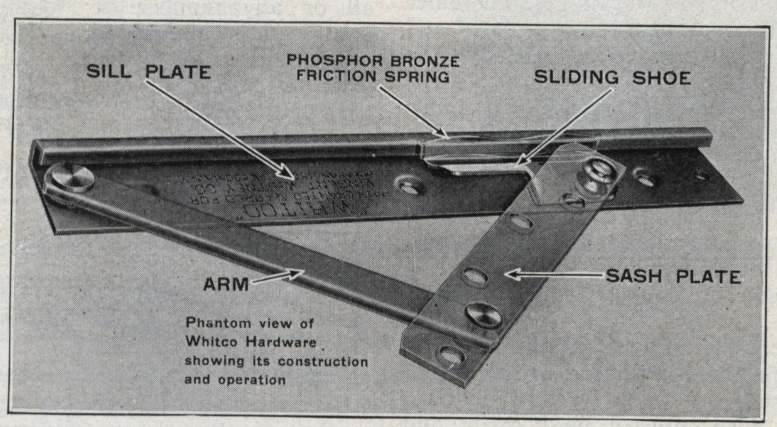
Products

Whitco Casement and Transom Hardware. For Venetian Blinds, see page 1290; for Whitney Casement Window Hardware, see page 1658.

Description

Whitco Hardware is a simple, self-contained unit which takes the place of butts, adjusters, chains and other operating devices for hinging and controlling casement windows which swing either out or in and transoms which swing in or out. A set consists of two pieces: one for the top and one for the bottom of the casement sash; one for each side of a transom. Factors of control are friction and leverage.

Each unit is an assembly of four parts, a sill plate, a sash plate, arm and sliding shoe. The sill plate, shaped to form a channel, attaches to window sill (also to header). The shoe, which contains a phosphor bronze friction spring, runs in the channel. This friction, together with that produced by weight of sash, which rests on lower sill plate, holds sash in any desired position in any wind. All parts are heavy solid brass, or sherardized steel, brass trimmed, and come assembled and properly adjusted.



Phantom view of Whitco Hardware showing its construction and operation

Whitco Casement and Transom Hardware

The hardware used at top and that used at bottom of casement sash (or at two sides of a transom) are identical, except that one is the reverse of the other

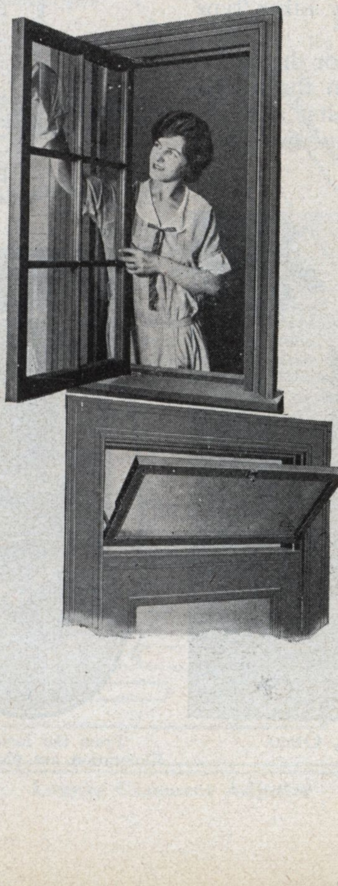
Application

Whitco Hardware may be applied to a single sash, a pair of sash, or to wide openings containing multiple sash without mullions; also to transoms. It operates in such a way as to afford maximum of light and ventilation. One size fits all size sash, and any set may be installed to swing either to the right or left. We do not recommend the use of Whitco Hardware on casement sash more than 26 to 28 in. in width, or 30 in. as a maximum or on transom sash more than 20 in. in height.

When applied to casements, Whitco Hardware makes the sash self-adjusting, doing away with the need for hinges and adjusters. Not only does it hold the sash in any desired position without rattle, but makes it easy and safe to clean the outside of the window from the inside of the room.

When applied to a transom, Whitco Hardware balances the sash perfectly at any angle, permits it to be opened and closed easily and noiselessly, and affords ventilation at both bottom and top of transom. No transom rods, chains or butts are required. A stop is provided with each piece of hardware, which restricts a transom which opens in from the top to open to a maximum angle of 45°.

With wooden sash or transoms, no special sash or frame detail is required except that where it is desired to have inswinging casements weathertight, a special detail is suggested, which will be furnished on request. Hollow metal or kalameined sash can be readily and easily detailed to accommodate Whitco Hardware.



Installation

The installation, whether for casement sash or transoms, is simplicity itself. The carpenter has only to house the hardware into the top and bottom of the sash, or into the side stiles of transom. If sill is beveled, level sill the length and width of sill plate. No other fitting is required. The sash plate is first attached to top and bottom of sash. The sash is then placed in window opening, and the sill plates screwed to sill and header. The complete installation is made with 14 screws, which are furnished with the hardware.

Any type of sash fastener may be used in connection with Whitco Hardware, for holding sash in position when closed, but neither hinges nor adjusters are required.

Features

No special sash or frame detail required. Makes sash self-adjusting. Sash can not rattle. All hardware entirely concealed. No special finish required. One size fits all sash. Easily applied to old or new sash. May be installed to swing to right or left. Makes it easy and safe to clean outside of window from inside of room.

Obtainable Everywhere

Whitco Hardware is sold only through hardware trade. Each set, with complete and simple installing instructions, is packed in a neat carton 1 in. square by 8 in. long.

Prices

The retail price of Whitco Hardware complete for each casement sash or transom, is as follows:

Solid brass	$2.25
Sherardized steel, brass trimmed	1.75

WHITNEY CASEMENT WINDOW HARDWARE CO.

OPERATED BY
H. E. HOLBROOK COMPANY
636-645 Massachusetts Trust Building
BOSTON, MASS.

Product

Whitney Casement Window Hardware; made for single, double, triple, and multiple windows.

Only the patented hardware is made or sold by the manufacturers, and any style of sash or frames may be adapted to the use of Whitney Casement Window Hardware.

For Venetian Blinds, see page 1290; for Whitco Casement Hardware, see page 1657.

Description and Features

Description—Whitney casement window hardware consists of a heavy interlocking sill track, with sliding bronze shoes, connected to the lower inner corners of the sash with substantial pivot hinges. The inner top corners of the sash are held by pivot plates and rollers working in a $1\frac{1}{16}$x¾-in. groove in the head of the window frame.

Hinges are used to connect the two sash of a double casement window. The lower hinge is equipped with a handle for pulling the window shut. Single windows have an arm connected to one side jamb and center of the sash top and bottom. In openings containing an odd number of sash, the odd sash operates as a single window. Fasteners are provided for all windows.

Each window, single or double, works independently of the others.

Features—Casement windows, when properly fitted with this unique patented hardware, are tight and weatherproof when closed.

Are self-adjusting, open outward, work easily, and stay placed in any part of the opening.

Do not rattle in either open or closed position.

Give greater control of ventilation and protection from drafts than is possible with any other type of window.

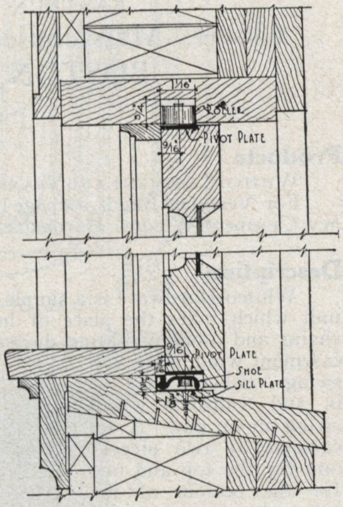
Do not interfere with curtains, shades or draperies.

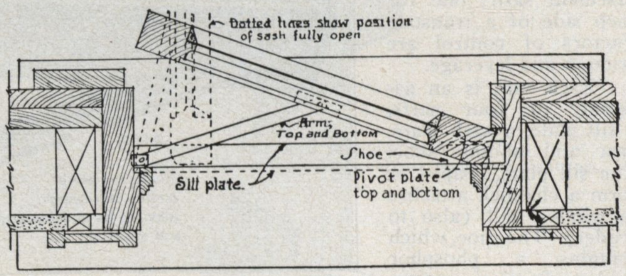
Are easily washed on both sides from the inside, eliminating the use of ladders or life belts, and the dangers and inconvenience of washing windows from the outside.

Operation

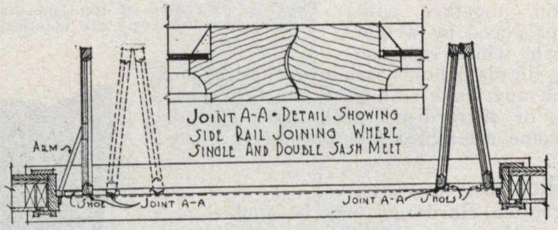
To open a single Whitney casement window, it is only necessary to unfasten and push window to any desired position.

Double windows operate the same way except that they can be pushed to either side of the opening when there is more than one double window in an opening; all or any number of pairs can be moved to either side, or all to one side, or placed in any part of the opening.



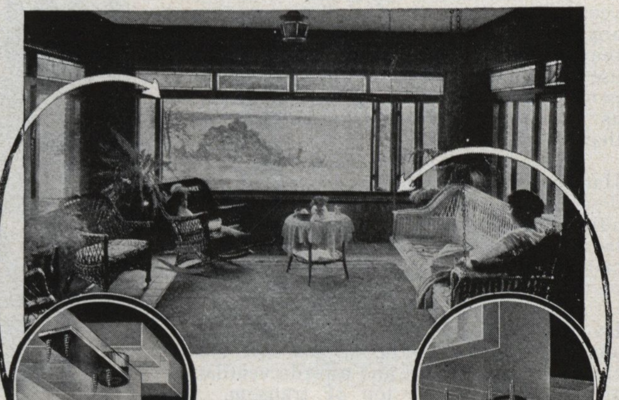

Dotted lines show position of sash fully open
Arm; Top and Bottom
Shoe
Sill plate.
Pivot plate top and bottom

Details of the Whitney Window


Joint A-A - Detail Showing Side Rail Joining Where Single And Double Sash Meet
Arm
Shoe
Joint A-A
Joint A-A
Shoe

Plan of Triple Sash Opening
Single sash may be situated at either side

Residence of Harry Fluhart, Dayton, Ohio
Harry Conway Griffith, Architect



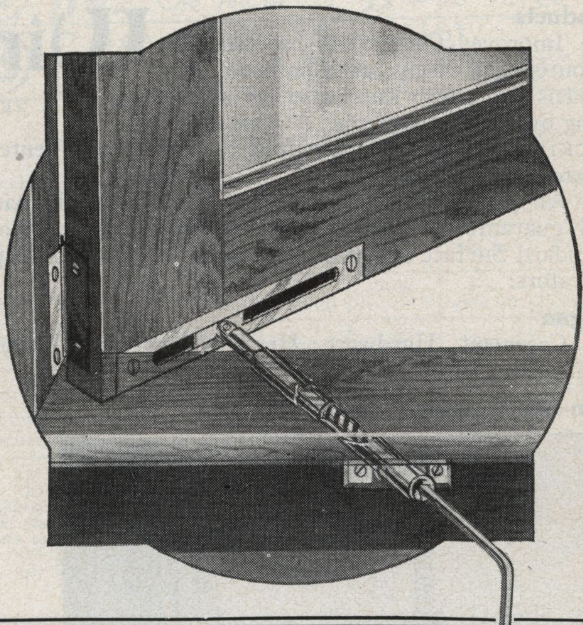
Whitney Casement Window Hardware

From the inside looking out; note the unobstructed view. Circular illustration are phantom views of hardware installed on sash

LOXRITE CORPORATION

Manufacturers of Casement Adjusters

GRAND RAPIDS, MICH.



Loxrite Casement Adjuster—Eight Salient Features

The operation of the Loxrite is a decided departure from all other casement adjusters on the market today.

It can be installed before or after the completion of the home or building.

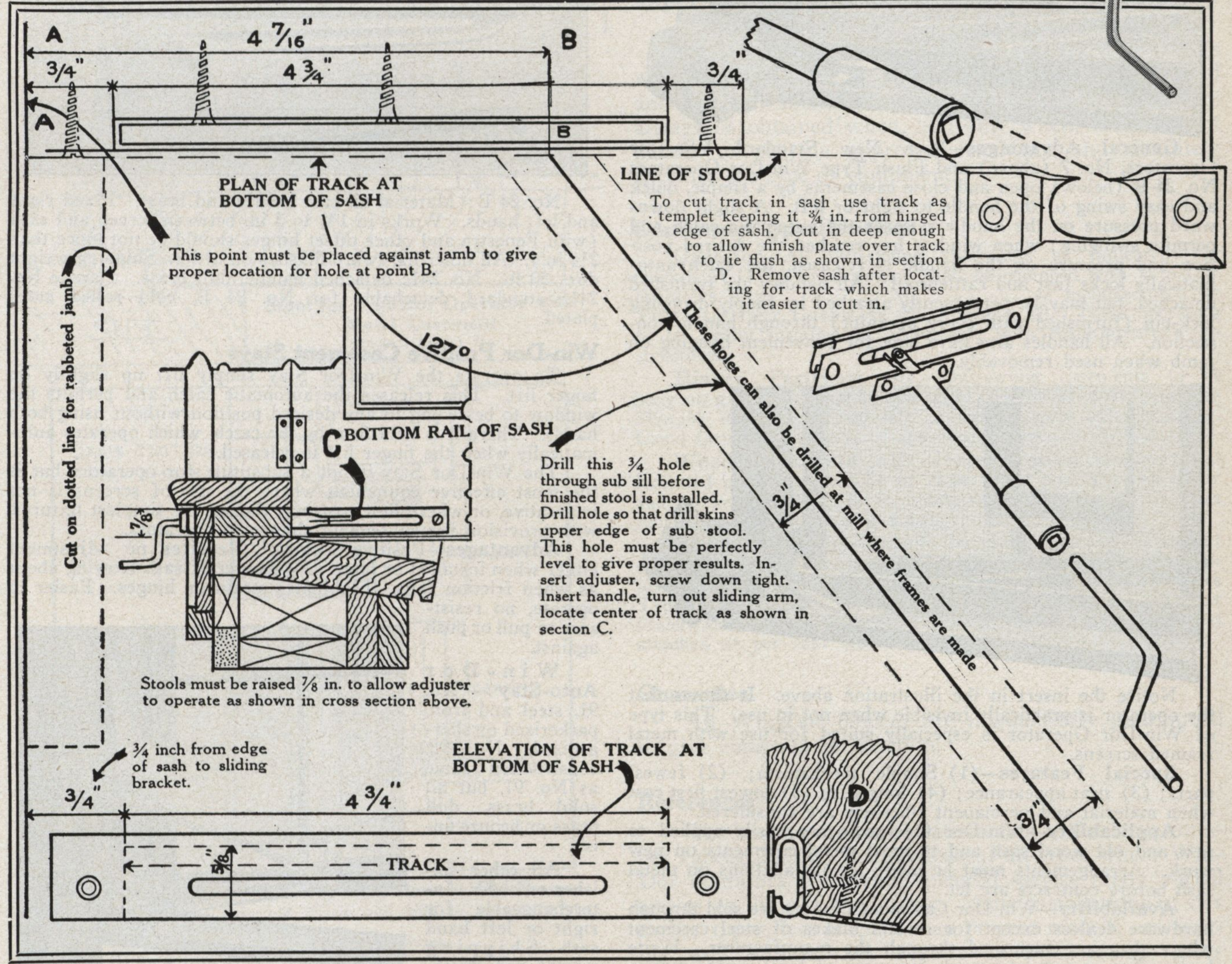
Just one hole is necessary through the sill and no special built sash is required.

No openings are left through which drafts can enter, making the Loxrite installation absolutely waterproof.

Loxrite does not interfere with Screens.

Substantially built from solid brass, finished and rustproof.

Loxrite has a smooth and positive action, easy of operation, sealing the window and making it airtight.


A
4 7/16"
B
3/4"
4 3/4"
3/4"
A
B
PLAN OF TRACK AT BOTTOM OF SASH
LINE OF STOOL
127°
C BOTTOM RAIL OF SASH
7/8
Cut on dotted line for rabbeted jamb
3/4"
3/4"
ELEVATION OF TRACK AT BOTTOM OF SASH
3/4"
4 3/4"
5/8"
TRACK
D

This point must be placed against jamb to give proper location for hole at point B.

To cut track in sash use track as templet keeping it ¾ in. from hinged edge of sash. Cut in deep enough to allow finish plate over track to lie flush as shown in section D. Remove sash after locating for track which makes it easier to cut in.

These holes can also be drilled at mill where frames are made

Drill this ¾ hole through sub sill before finished stool is installed. Drill hole so that drill skins upper edge of sub stool. This hole must be perfectly level to give proper results. Insert adjuster, screw down tight. Insert handle, turn out sliding arm, locate center of track as shown in section C.

Stools must be raised ⅞ in. to allow adjuster to operate as shown in cross section above.

¾ inch from edge of sash to sliding bracket.

Loxrite Casement Adjuster

THE CASEMENT HARDWARE CO.

Improved Hardware for Operating Out-swung Casement Windows

230 East Ohio Street, CHICAGO, ILL.

NEW YORK, N. Y., 25 W. 45th Street

SAN FRANCISCO, CAL., 417 Market Street

Win-Dor
TRADE-MARK

Products

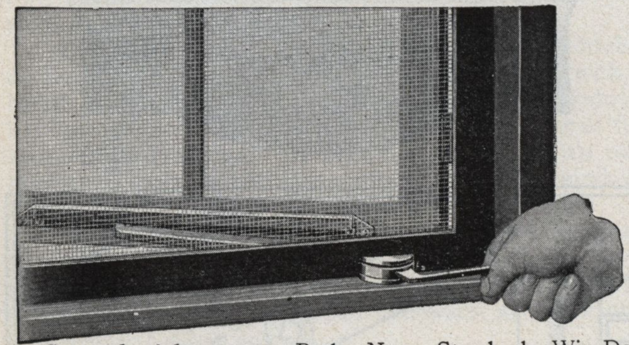
Improved Operators for control of out-swung casements from inside of screens and storm sash; also for side-hung overhead casements; Automatic Locking Stays for out-swung casements and center-pivoted sash.

All products are sold under Win-Dor trade-mark and guarantee. Special types and trade names: New Standard Surface and Flush Types, and "Bulldog" Type operators.

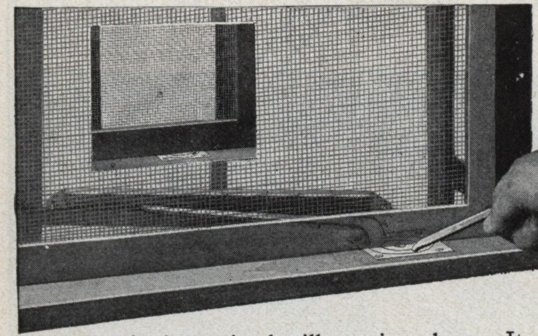
Slogan

Casement Hardware Headquarters for Twenty Years.

Win-Dor Casement Operators



General Advantages—Both New Standard Win-Dor Operators, No. 7 (above) and Flush Type Win-Dor Operators No. 24-B (below) open and close casements by a simple, quick and easy swing of the handle to right or left. A slight downward pressure on the handle releases the automatic catch and permits swinging; when window has reached the desired position and pressure on the handle is released, the catch automatically locks fast and rattleproof. All handles are furnished detached, but may be permanently attached by simply dropping lock-pin (furnished with every operator) through handle connection. All handles also have hole for convenient hanging on jamb when used removably.



Notice the insert in the illustration above. It shows that the operator is practically invisible when not in use. This type of Win-Dor Operator is especially suited for use with metal framed screens.

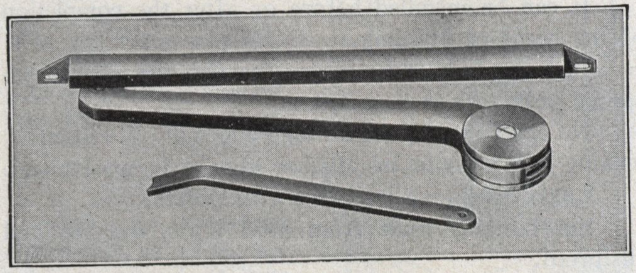
Special Features—(1) Simple mechanism; (2) fewest parts; (3) neat appearance; (4) long life; (5) lowest first cost when material and permanent efficiency are considered.

Applicability—Win-Dor Operators are easily applied to new and old wood sash and to most metal casements on new work. Arrangements must be made for installations on metal sash before contracts are let.

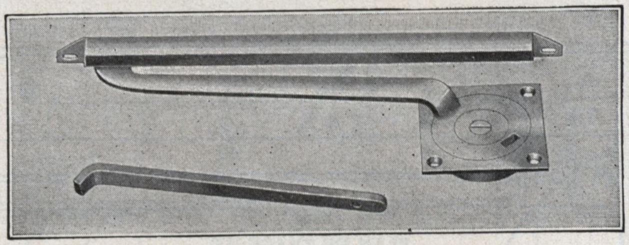
Availability—Win-Dor Casement Devices are sold through hardware dealers except for certain makes of steel casement where they are furnished through the manufacturer. Write home office or nearest branch for name of local representative or dealer.

New Improvements—During the past year we have installed new equipment of the highest efficiency. This enables us to reduce the cost of operators one-third and it is now possible to install them on any structure using windows. These savings are made without any lessening of quality.

Types—Win-Dor Universal No. 7: wrought steel, parkerized (rust resisting) dull black finish. Takes paint readily. Shipping weight per doz., 20 lb.



No. 6: construction same as No. 7, but all solid brass. Dull brass or bronze finish. All other hardware finishes on order. Handle No. 71: for Nos. 7 and 6.



No. 24 B: Material all cast bronze and brass. Fixed right and left hands. Works in 1¾ to 3 in. between screen and sash (with Fenestra and other offset hinges should be not more than 2½ in.). All other hardware finishes on order. Shipping weight doz., 30 lb. No. 241: detached handle, dull brass. Handle No. 241: standard detachable for No. 24 B, cold rolled steel, plated.

Win-Dor Positive Casement Stays

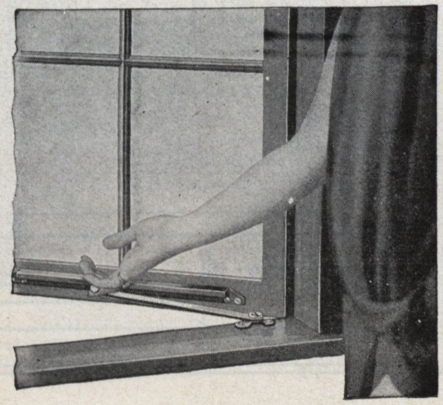
To operate the Win-Dor Stay simply lift up slightly on finger lift. This releases the automatic catch and permits the window to be swung to any desired position without using both hands. There it is held firm by the catch, which operates automatically when the finger lift is released.

The Win-Dor Stay is not a substitute for operators but is the most effective equipment where the use of screens is not imperative, or where first cost may dictate the simplest fixtures, with provision for subsequent change to operators.

Advantages—Positive locking. Requires no adjustment either when installed or later. No danger of sash blowing about as when friction fails. Eliminates strain on hinges. Easier to operate, no resistance to pull or push against.

Win-Dor Auto-Stay — No. 91, steel and iron, parkerized or sherardized. No. 92, construction same as No. 91, but all solid brass, dull brass or bronze finish.

All other finishes on order. Interchangeable for right or left hand sash. Shipping weight per dozen, 12 lb.



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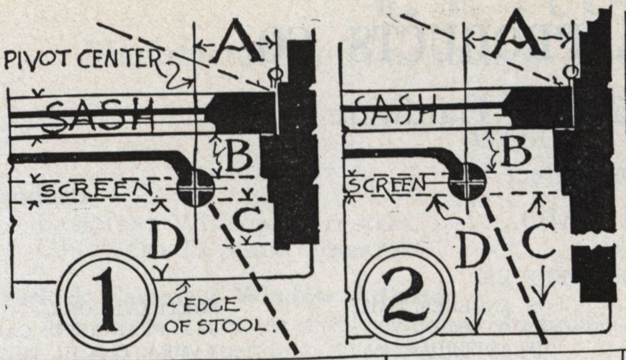
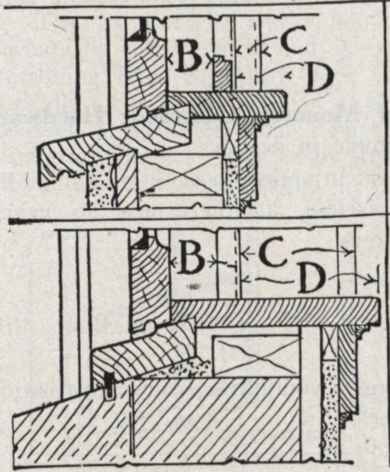


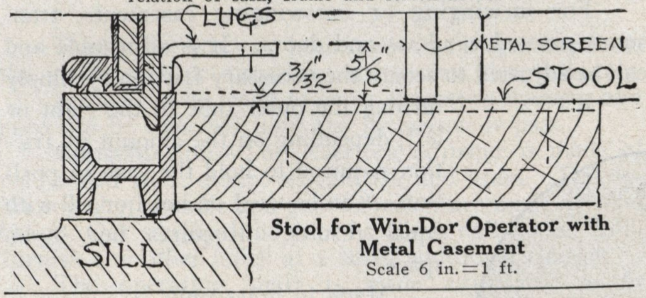


"WIN~DOR"
TYPICAL SILL
SECTION.–
STUD WALL.
(AT 1½" SCALE.)

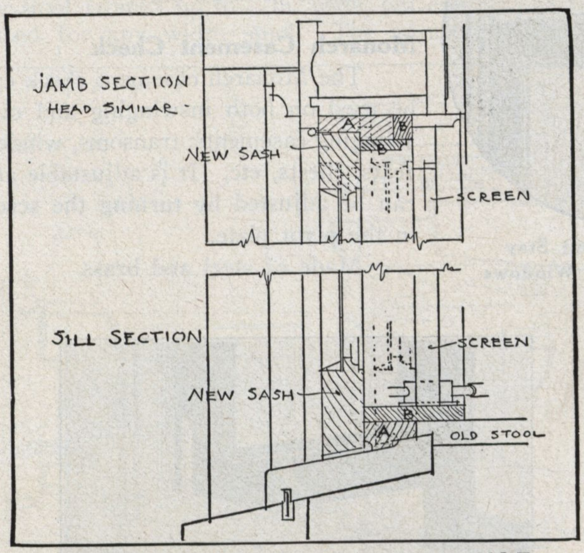
DITTO
MASONRY
WALL.
(.SAME SCALE.)

Masonry Stools

Wood sub-stool should be provided giving base for operator with relation of sash, frame and screen as above



Stool for Win-Dor Operator with Metal Casement
Scale 6 in.=1 ft.



Key to Installation of Win-Dor Operators in Old Frames

Unhatched portions show old frames and trim to remain in place. Old sash removed shown by dotted lines.
Pieces A: new pieces installed to convert frame.
Pieces B: new trim to match old.
One new casement sash in openings up to 30 in. wide. Wider openings, two rebated sash

INSTALLATION DATA FOR ALL TYPES.

① C≈NOT OVER 2" D≈2" OR MORE | A≈3½" TO 4" B≈2" TO 3"

② C≈OVER 2" D≈ " " | A≈4½" B≈2" TO 3"

TABLE OF STOCK AND SPECIAL SIZES OF WIN-DOR OPERATORS

	No. 24B	New Stand Surface	Bull Dog CB30-40	Stay No. 91
Space between sash and screen (B), minimum	2 in.	1⅝ in.	1¾ in.	1¾ in.
Maximum	2½ in. note (d)	3 in.	3 in. note (a)	
Minimum clear (flat) finish stool (D) inside of screen	2 in.	1 in.	2 in.	
Width of sash, minimum	16 in. note (c)	15 in.	16 in. note (c)	14 in.
Maximum	36 in.	30 in.	36 in.	30 in.

(a) May be increased up to 5 in. on order.
(b) May be increased to order but traveler type generally then preferable. For space over 2⅛ in. between stops specify standard long sash plates. Over 2¾ in. specify special long sash plates, giving dimensions to be fitted.
(c) 2 in. less for special short arms to order.
(d) Special Size "B" up to 3¾ in.

Importance of Adequate Casement Details and Specifications

It is our experience that all unsatisfactory results with casements have been due to failure to utilize tested and available methods and products. Good results can always be obtained when, and only when, the architect details to provide approved hardware and definitely specifies the type of equipment.

Condensed Specifications

Operator—All out-swung casements as indicated (or marked W.D.O.) on drawings shall be equipped with Win-Dor operators Type .... No. .... as manufactured by The Casement Hardware Co., Chicago, Ill. These operators to be neatly installed in accordance with manufacturer's instructions.

Hinges, Fasteners, etc.—Out-swung casements to be hung on galvanized butt hinges with loose brass pins (generally 3½x3½ in.) fitted accurately to swing freely after painting. Usual fasteners and bolts of approved design also to be installed.

Wood Casements—All out-swung wood casements as indicated on plans shall be of clear white pine, cypress or fir and as per details (1¾ in. thick with rails 2½ in. to glass rebate, except bottom rail which should be 3½ in.).

Metal Casements—(Insert in metal sash or casement specification)—Metal casements shall be furnished without adjusters but with lugs fitted for attachment of Win-Dor operators Type .... No. .... as made by The Casement Hardware Co., Chicago, Ill. These lugs to be located and attached as per that manufacturer's drawings.

Guarantee

All Win-Dor devices are unqualifiedly guaranteed to give complete satisfaction.

References

The best assurance of satisfaction is the large number (about 20,000) installations of all types where Win-Dor operators are giving splendid service under varied and often difficult conditions. Many installations of our earlier types, less efficient than present models, are serving well without any repairs or replacements after 15 years use and exposure.

MONARCH METAL PRODUCTS CO.

Manufacturers of Casement Hardware

5020 Penrose Street
ST. LOUIS, MO.

DISTRICT SALES OFFICES

ATLANTA, GA.
CHICAGO, ILL.
CLEVELAND, OHIO
DALLAS, TEX.
DETROIT, MICH.
INDIANAPOLIS, IND.
LOS ANGELES, CAL.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PORTLAND, ORE.
SAN FRANCISCO, CAL.
TAMPA, FLA.

Products

Casement Hardware, including:
Control Lock. Casement Check.
Automatic Stay. Surface Bolt.
For Metal Weatherstrips, see page 1419.

Service

Our representatives will be glad to call and demonstrate samples.

Monarch casement hardware is sold by all leading dealers.

Features of Monarch Casement Hardware

(1) Simple in design.
(2) Neat in appearance.
(3) Noiseless, as there are no gears, ratchets or keys.

Literature

Write for our A. I. A. Classification File 27c2.

This manual will give you all necessary information for specifications.

Monarch Control Lock

The control lock for the outswinging casement window will permit the operation of the sash without raising the inside screen. See illustration.

It can be used on top of the stool as well as underneath with equal results and will lock the sash securely without rattle.

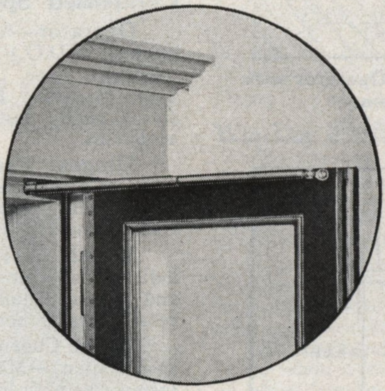
There are no gears, ratchets or keys in the Monarch control lock to become out of order and rattle.

Made in brass and steel.

Monarch Surface Bolt

The Monarch surface bolt is suited for use on casement windows, French doors or any type of hinged opening.

Made of brass and steel.
Sizes, 1/2 and 3/8 in.



Monarch Casement Stay
Applied at Head of Windows

Monarch Automatic Stay

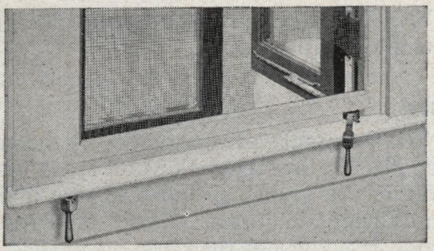
For inswinging or outswinging casements, transoms, pivoted windows and doors. It is adjustable and can be adjusted to secure the necessary friction by simply turning the outer tube to the right or left, depending on the amount of friction required to hold the sash in position. Can be used on head or sill with equal results. Requires but 3/4-in. space.

Made in brass only.

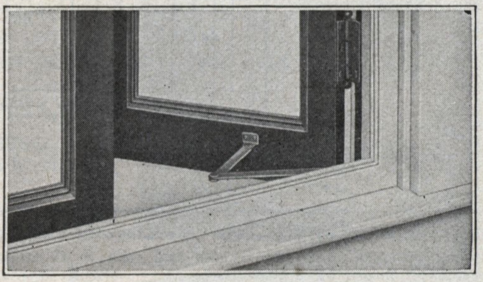
Monarch Casement Check

The Monarch casement check can be used on both inswinging and outswinging casements, transoms, window seats, chests, etc. It is adjustable and can be adjusted by turning the screw in the pivot plate.

Made of steel and brass.



Monarch Control Lock
Applied on Top and Below Stool, with Screen in Place



Monarch Casement Check
Applied on Sill of Casement Window

W. E. PUTNAM CO. INC.

Manufacturer of Casement Window Adjusters and Transom Operators

667 West Boylston Street
WORCESTER, MASS.

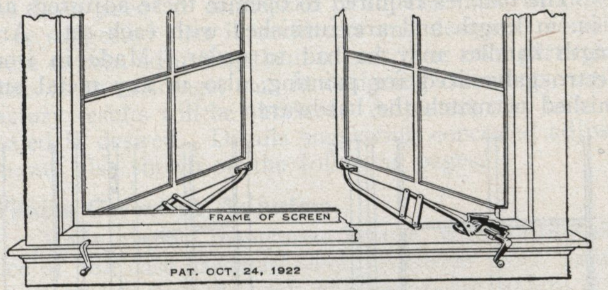
Products

CASEMENT WINDOW ADJUSTERS.
CONCEALED TRANSOM OPERATORS.

Everlock Casement Window Adjuster

The Everlock is a successful solution of the troublesome problem of operating out-swinging sash.

This is a rack, worm and lever device, whose mechanism is concealed and is operated by a handle protruding from the inside face of the trim. It automatically locks at any position of the window and works positively at all times. This device opens the window to a full right angle. It is easily installed in any new or old building without cutting.



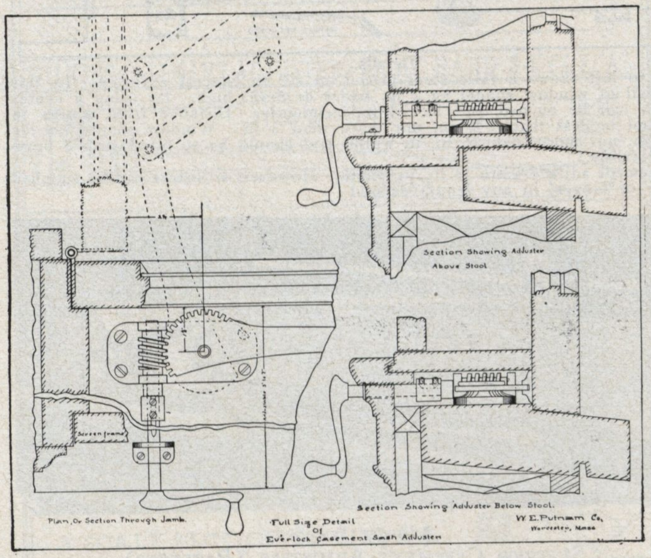
Casement Sash Adjuster Applied

This device has long been needed as it operates from the inside without disturbing the screen, draperies, etc.

Screen can be made to cover the entire opening and need not be removed until the fly season is past.

Construction—The Everlock adjuster is made of cold rolled steel, electro-galvanized, and brass. The operating shaft handle and guard bracket are made of solid brass. Our standard finish of handle is dull brass. Will furnish any other finish at a small additional charge.

The operating shaft is made adjustable to fit any stool from 5 up to 7 in. wide, but can also be furnished for any width stool. The adjuster should be placed on the stool so that the center of the pivot, on which the geared arm swings, will be 2¼ in. from face of sash when opened at right angles and 1⅜ in. when closed. Sash should be hung with narrow butts and set as near flush with outside of sash as possible.


Section Showing Adjuster Above Stool
Screen frame
Section Showing Adjuster Below Stool.
Plan, Or Section Through Jamb.
Full Size Detail Of Everlock Casement Sash Adjuster
W. E. Putnam Co. Worcester, Mass.

Details of Everlock Casement Window Adjuster

Electro Galvanized Made in Three Sizes—13 in. for sash not less than 13 in. wide; 15 in. for sash not less than 15 in. wide; 18 in. for sash not less than 18 in. wide.

Solid Brass Made in Two Sizes—13 in. for sash not less than 13 in. wide; 15 in. for sash not less than 15 in. wide.

Putnam Concealed Transom Operator

The Putnam concealed transom operator opens and closes transom smoothly and noiselessly. By turning the crank in one direction the transom is opened, by turning it in the other it is closed. The mechanism is such that transom becomes locked in any position desired.

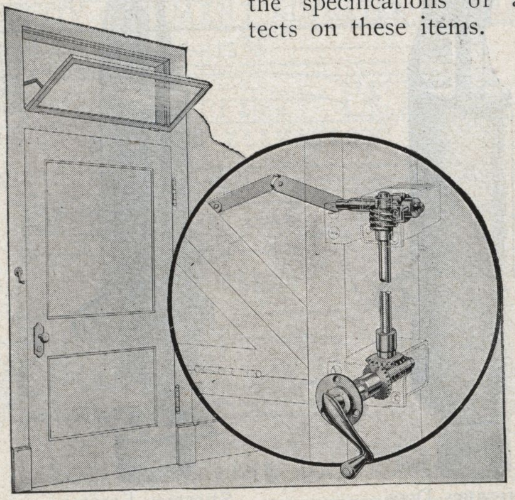
This device utilizes a system of gears which are entirely covered by the door casing. The crank handle may be located in the casing at any position desired and the lever and arm on the transom are the only parts exposed to view. It is made reversible and thus can be opened at either right or left hand.

The Putnam operator works easily and yet is very powerful. It is simple in construction, and there is nothing about it to get out of order.

Initial cost is low, prices running from $3.00 to $3.50 depending upon the finish required, and it is inexpensive to install. Crank handle is of solid brass either polished or finished dull. The handles are furnished in any finish desired. All concealed parts are of cold rolled steel.

The Putnam concealed transom operator has marked an advance similar to that made by the Everlock casement window adjuster. Until its introduction scarcely any improvement had been made in the old-fashioned slide transom operator which at best gave uncertain efficiency.

The plant of W. E. PUTNAM CO. INC. of Worcester is devoted entirely to the manufacture of casement window adjusters and transom operators, and this specializing enables the company to meet promptly and exactly the specifications of architects on these items.



Putnam Concealed Transom Operator

SUPERIOR SPRING HINGE CO.

Manufacturers of Hardware Specialties

550 West Lake Street
CHICAGO, ILL.

NEW YORK OFFICE: 16-18 Reade Street

Products

DOOR HOLDERS; CASEMENT ADJUSTERS.

Also manufacturers of Screen Door Checks; Surface Bolts; Casement Window Fasteners; Friction Stays for Windows or Doors.

Superior Door Holders (Patented)

The Superior door holder is neat, strong and durable, operated by foot pressure. Can not injure any kind of floor or carpet, nor is there any projection to catch on garments. These holders should be used on all doors equipped with spring hinges or door checks.

Sizes—Made in all finishes and in three sizes, as follows:

No. 1 size (for residence work) will reach 1½ in. from door to floor. Weight per dozen, 8 lb. Height, 5½ in.

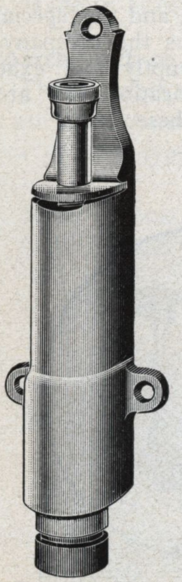
No. 2 size (for schools, offices and public buildings) will reach 1½ in. from door to floor. Weight per dozen, 13 lb. Height, 7 in.

No. 3 size (for extra heavy doors) will reach 2½ in. from door to floor. Weight per dozen, 18 lb. Height, 9 in.

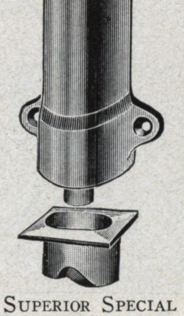
Special—Superior Special door holder is used and recommended for outside doors where it is convenient to make a recess or place a cement socket in the floor or ground, into which the ½-in. diameter steel rod may enter.

Made in two sizes: No. 2, 7 in. high, reach 2½ in.; No. 3, 9½ in. high, reach 3½ in.

Made in polished bronze or brass metal.



SUPERIOR DOOR HOLDER



SUPERIOR SPECIAL DOOR HOLDER

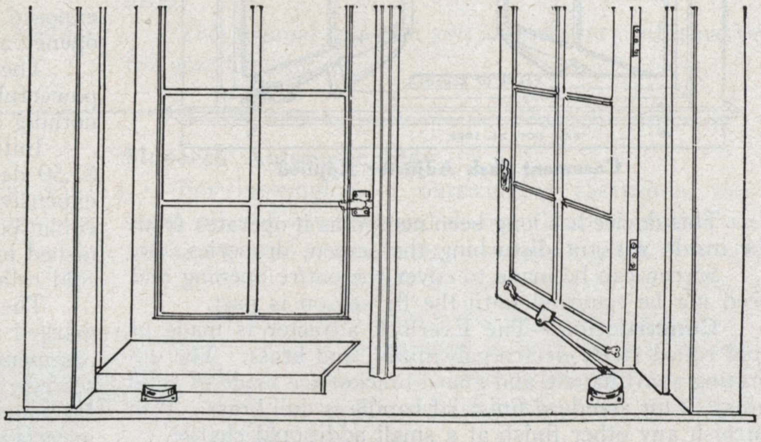
Superior Casement Adjusters (Patented)

The Superior casement adjuster locks automatically on the brass metal sliding rod at any position. Holds the window firmly without rattling.

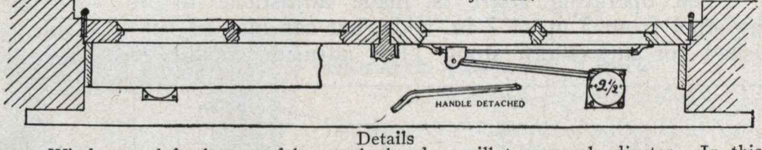
Works quickly, easily and smoothly. The window is easily cleaned on both sides from the inside of the room. The screen, being on the inside of the window, is protected from rain and dust.

Artistic and fine in appearance, and the cost is no more than for the old-fashioned windows without these advantages. No special detail or millwork required. Satisfaction is guaranteed.

The handles required to operate these adjusters are 9 in. in length and are furnished with each set. Any length handles may be had to order. Made in iron, electro galvanized for painting, also in any metal and finished to match the hardware.



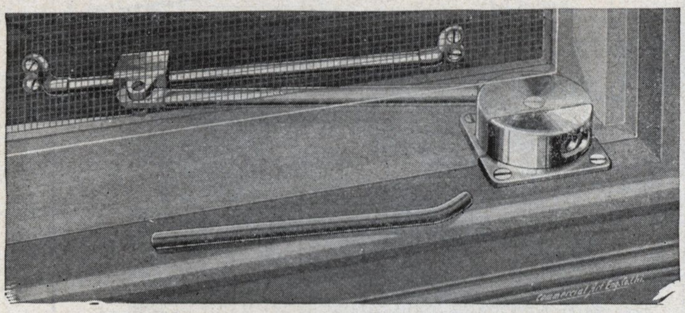
SUPERIOR CASEMENT ADJUSTER



Details

Window to left shows a false stool placed on sill to conceal adjuster. In this case bottom rail of window should be 2 in. wider or 5 in. high. By using a center post, windows can be opened and locked independently. Distance from screen to sash should not be less than 1¾ in. nor more than 3 in. Window should not be less than 16 in. nor more than 26 in. in width, and should be so fitted with 3 butts that it works freely.

Stock casement adjusters are 13 in. in length. However, adjusters can be supplied either shorter or longer, in any length desired



Adjuster Installed

SUPERIOR CASEMENT ADJUSTERS (PATENTED)

On the market since 1917. Several thousand now in satisfactory use

GEORGE LESTER WILKINS

Manufacturer of Casement Adjusters

1775 Lunt Avenue
CHICAGO, ILL.

Products

Casement Adjusters for Out-swinging Wood or Metal Casement Windows.

Casement Windows

The practicability of casement windows depends on two fundamental conditions. First, the design of the sash and frame, and second, the practicability of the casement adjuster used. Casement windows have been, are being, and will be designed and used satisfactorily in all classes of building work, which is convincing evidence of their popularity.

Details—Architectural drawings are given on the following pages, showing satisfactory construction that has been used in connection with casement windows. It is suggested that if architects and designers consult these details, adjusting them to suit their own particular ideas as to moldings, etc., in designing casements, satisfactory results will be obtained. Adjusters may be concealed if desired. Details suggesting concealed adjusters are also shown on the following pages.

Wilkins Casement Adjusters

Made of best manganese bronze, with locking device of best case hardened steel. Adjuster block should be so placed that the sash will swing out nearly to a right angle, but not past it. Finished as desired, and to match other manufacturers' hardware.

Style A, Size 1—For general use on sash 12 to 26 in. wide, where distance between screen and sash is not less than 1¾ in. nor more than 3 in. The most satisfactory result is obtained when distance between screen and sash is 2 in. and greatest width of sash does not exceed 24 in. Placing butts so pin is as close to sash and jamb as possible aids in making a satisfactory job.

Style A, Size 2—For use on sash 18 to 36 in. in width, where distance between screen and sash is not less than 1⅞ in. nor more than 5 in. Normal distance is about 2¼ in.

Style B, Size 1—Used on same size sash as Style A, Size 1, but minimum distance between screen and sash may be as narrow as ⅞ in. This distance between screen and sash is considered too close except for very special cases.

Style B, Size 2—Used on same size sash as Style A, Size 2, but minimum distance between screen and sash may be as narrow as 1⅛ in.

Details of Application, Style A—*Size 1*—Length of tube or track on sash, 12 in. Lever 7¾ in. from center of hub to end. Handle 4⅞ in. from end to center of hub. Block 4⅝ in. long over all, 1 in. wide and ⅞ in. high.

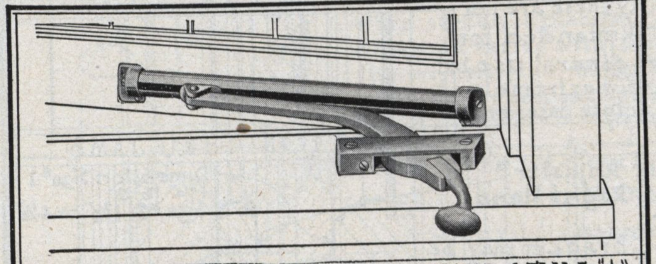
Size 2—Length of tube or track on sash, 14 in. Lever 12⅛ in. from center of hub to end. Handle 6¼ in. from end to center of hub. Block same as Size 1.

Security Casement Adjusters

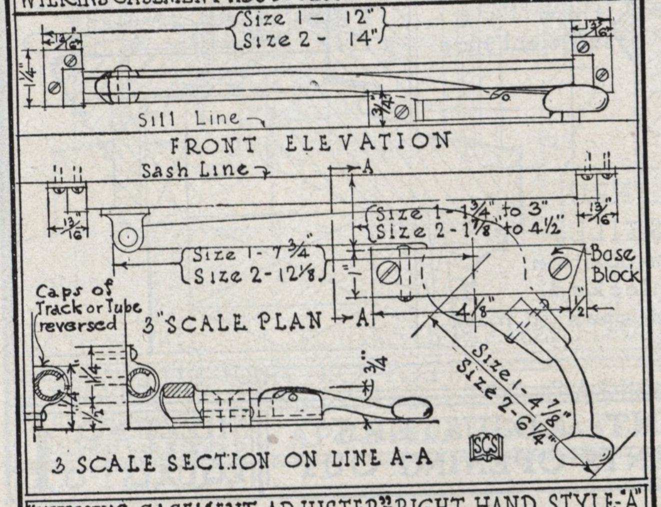
The Security casement adjuster is a modification of the Wilkins casement adjuster, both operating on the same principle although they are not exactly alike.

Costs less than Wilkins adjusters. Malleable iron, with slide and guide tube of steel. One style for sash not less than 15 in. wide, and where space between screen and sash is not less than 1¾ in. Adjuster should be so placed that sash can not swing beyond a right angle; or opening in lower rail of screen should be cut, so that adjuster can not swing farther. Finished as desired and to match other manufacturers' hardware.

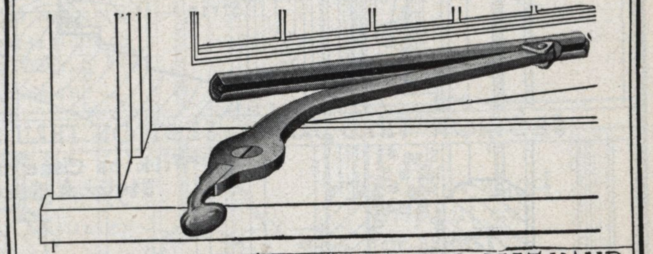
Any further measurements or details will be furnished on request.



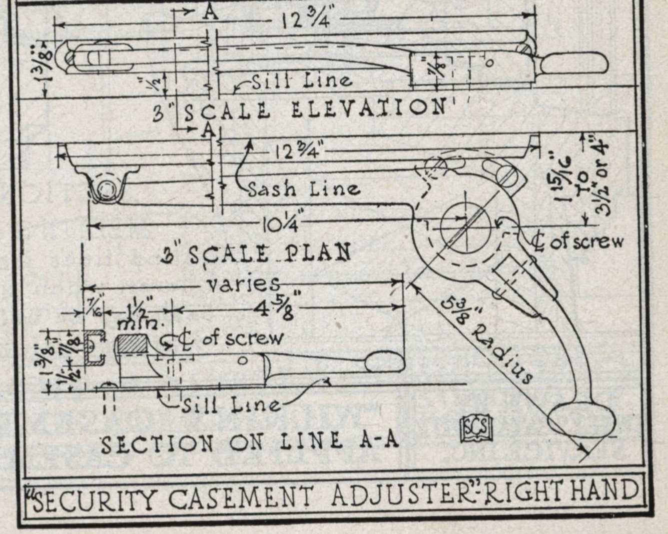
"WILKINS" CASEMENT ADJUSTER-RIGHT HAND STYLE "A"


Size 1 - 12"
Size 2 - 14"
13/16"
1¼"
¾"
Sill Line
FRONT ELEVATION
Sash Line
A
13/16"
Size 1 - 1¾" to 3"
Size 2 - 1⅞" to 4½"
Size 1 - 7¾"
Size 2 - 12⅛
Base Block
Caps of Track or Tube reversed
3" SCALE PLAN
A
4⅛"
½"
Size 1 - 4⅞"
Size 2 - 6¼"
¾"
1¼"
½
3 SCALE SECTION ON LINE A-A
SCS

"WILKINS CASEMENT ADJUSTER" RIGHT HAND STYLE-"A"

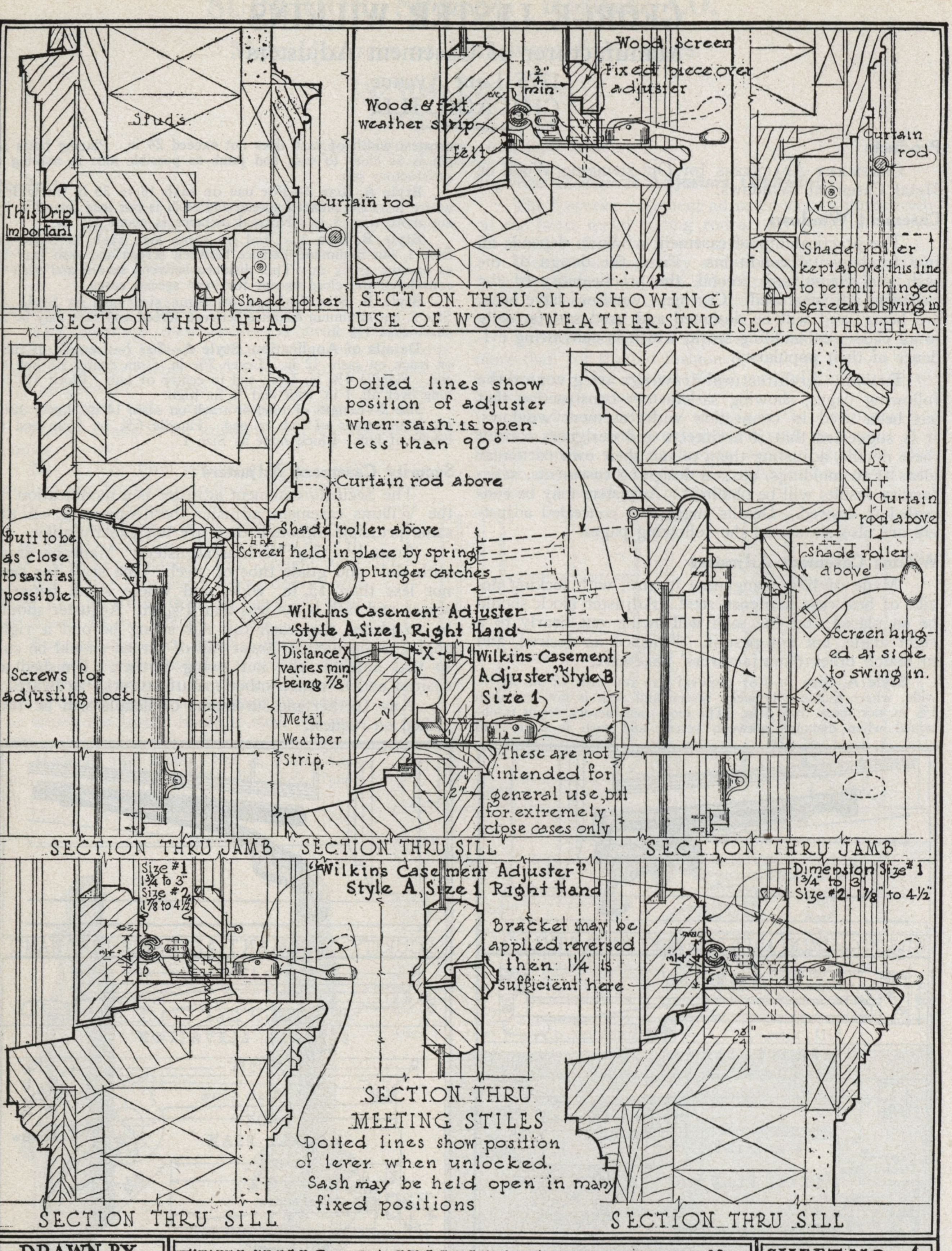


SECURITY CASEMENT ADJUSTER-LEFT HAND


A
12¾"
1⅜"
½"
⅞"
Sill Line
3" SCALE ELEVATION
A
12¾"
Sash Line
1 15/16" to 3½" or 4"
10¼"
℄ of screw
3" SCALE PLAN
varies
7/16"
1½" min.
4⅝"
5⅜" Radius
℄ of screw
1⅜"
⅞"
½"
Sill Line
SECTION ON LINE A-A
SCS

"SECURITY CASEMENT ADJUSTER"-RIGHT HAND

Continued on next page

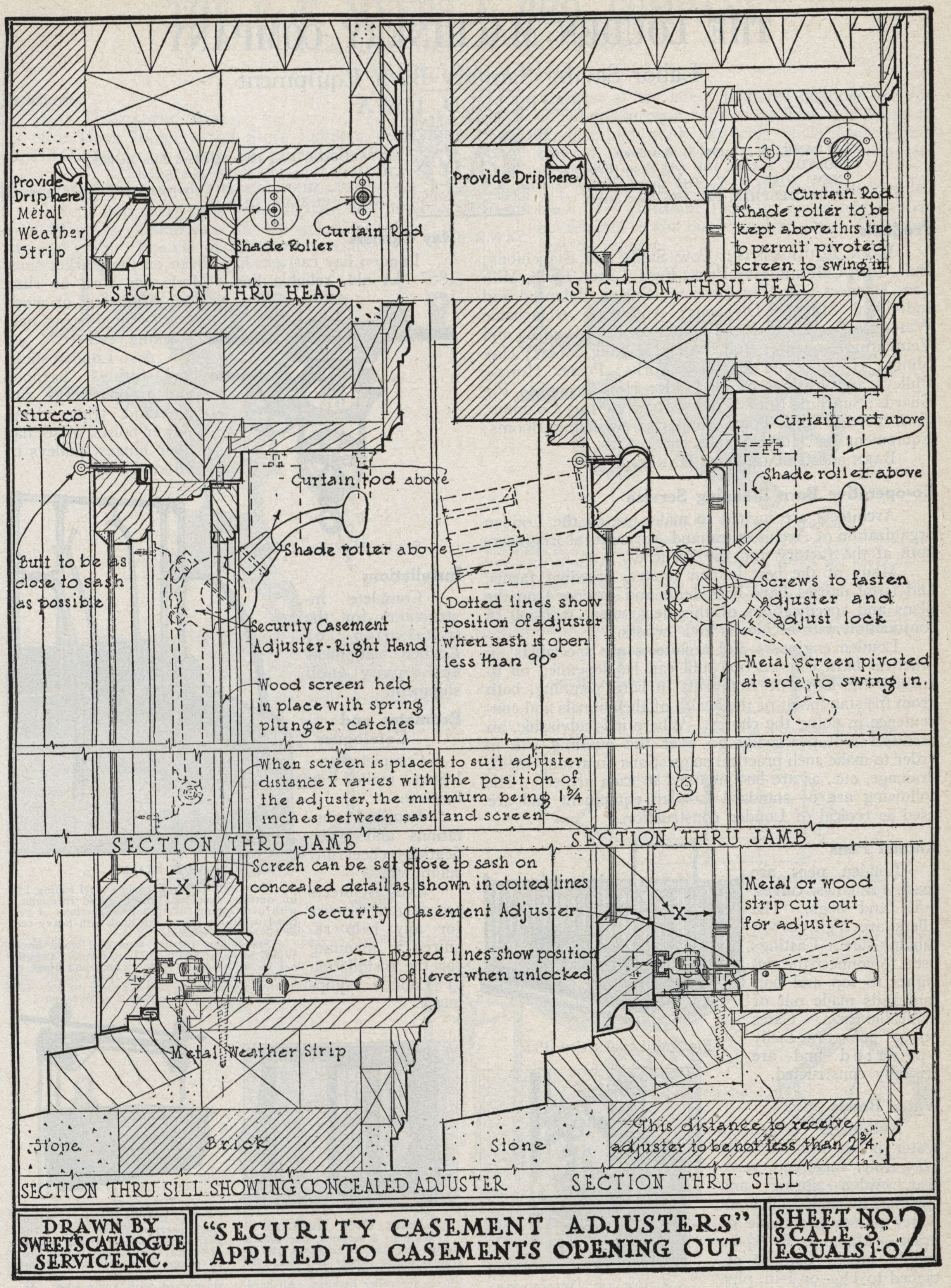

Studs
This Drip Important
Curtain rod
Shade roller
SECTION THRU HEAD
Wood Screen fixed piece over adjuster
3/4" min.
Wood & felt weather strip
Felt
SECTION THRU SILL SHOWING USE OF WOOD WEATHER STRIP
Curtain rod
Shade roller kept above this line to permit hinged screen to swing in.
SECTION THRU HEAD
Dotted lines show position of adjuster when sash is open less than 90°
Curtain rod above
Butt to be as close to sash as possible
Shade roller above
Screen held in place by spring plunger catches
Wilkins Casement Adjuster Style A, Size 1, Right Hand
Screws for adjusting lock
Distance X varies min. being 7/8"
X
Metal Weather Strip
Wilkins Casement Adjuster, Style B Size 1
These are not intended for general use, but for extremely close cases only
Curtain rod above
Shade roller above
Screen hinged at side to swing in.
SECTION THRU JAMB
SECTION THRU SILL
SECTION THRU JAMB
Size #1 1 3/4 to 3"
Size #2 1 7/8 to 4 1/2
"Wilkins Casement Adjuster" Style A, Size 1, Right Hand
Bracket may be applied reversed then 1 1/4 is sufficient here
Dimension Size #1 1 3/4" to 3"
Size #2 - 1 7/8" to 4 1/2"
SECTION THRU MEETING STILES
Dotted lines show position of lever when unlocked. Sash may be held open in many fixed positions
SECTION THRU SILL
SECTION THRU SILL

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

"WILKINS CASEMENT ADJUSTERS"
APPLIED TO CASEMENTS OPENING OUT

SHEET NO. 1
SCALE 3" EQUALS 1'-0"

Continued on next page


Provide Drip here
Metal Weather Strip
Shade Roller
Curtain Rod
SECTION THRU HEAD
Provide Drip here
Curtain Rod
Shade roller to be kept above this line to permit pivoted screen to swing in
SECTION THRU HEAD
Stucco
Curtain rod above
Shade roller above
Butt to be as close to sash as possible
Security Casement Adjuster - Right Hand
Wood screen held in place with spring plunger catches
Dotted lines show position of adjuster when sash is open less than 90°
Curtain rod above
Shade roller above
Screws to fasten adjuster and adjust lock
Metal screen pivoted at side to swing in.
When screen is placed to suit adjuster distance X varies with the position of the adjuster, the minimum being 1¾ inches between sash and screen
SECTION THRU JAMB
SECTION THRU JAMB
Screen can be set close to sash on concealed detail as shown in dotted lines
X
Security Casement Adjuster
Dotted lines show position of lever when unlocked
Metal Weather Strip
X
Metal or wood strip cut out for adjuster
Stone
Brick
Stone
This distance to receive adjuster to be not less than 2¾
SECTION THRU SILL SHOWING CONCEALED ADJUSTER
SECTION THRU SILL

DRAWN BY
SWEET'S CATALOGUE
SERVICE, INC.

"SECURITY CASEMENT ADJUSTERS"
APPLIED TO CASEMENTS OPENING OUT

SHEET NO. 2
SCALE 3" EQUALS 1'-0"

ESTABLISHED 1867

THE LOUDEN MACHINERY COMPANY

Labor Saving Sanitary Barn Equipment

FAIRFIELD, IOWA

BRANCH OFFICES

ALBANY, N. Y., 1047-53 Broadway
BOSTON, MASS., 1106 Old South Building
NEW YORK, N. Y., 4840 Grand Central Terminal
PHILADELPHIA, PA., 1505 Race Street

PITTSBURGH, PA., 1206 Standard Life Building
CHICAGO, ILL., 1051-59 W. 35th Street
ST. PAUL, MINN., 2282-88 University Avenue
CANADA: GUELPH, ONT.

Products

BARN EQUIPMENTS: Cow Stalls and Stanchions; Bull, Cow, Calf and Hog Pens; Feed, Litter, Swill, Milk Can, Harness and Hay Carriers; Spring Balanced and Individual Manger Divisions; Automatic Detachable Water Bowls; Manger and Gutter Drains; Cupolas and Ventilating Systems; Bull Staffs; Milking Stools; Hay Slings; Grapple and Harpoon Forks; Power Hoists; Pulleys and Fittings of all kinds; Hog Troughs; Pig Guards; Sunshine Roof Windows; Supporting Columns; Cork Brick; Yard Track Supports; Swinging Booms; Equipment for Horse Stable, etc.

BARN and GARAGE DOOR HANGERS.

Co-operative Barn Planning Service

Architects are invited to make use of the Louden organization of Architectural and Agricultural Engineers both at the factory and the branches.

Many of the best known estates, breeding farms, and large dairies have been built and equipped on the plans and specifications of this department working in conjunction with architects and owners.

Louden engineers and architects are specialists on practical barn construction and can be depended on to furnish the latest developments in barn planning, both from the standpoint of the health of the animals and convenience in doing the chores. Where it is advisable, an architect will personally go over the building site in order to make such practical suggestions on arrangement, drainage, etc., as are best adapted to each project. The following are of standard Louden equipment and are used as typical of Louden construction.

Animal Pens

Louden pens are made for cows, calves, bulls and hogs. The fillers are high carbon tubular steel. Castings used to connect the uprights to top and bottom rails made out of malleable iron. Gates on all pens are easily operated and are strongly constructed.

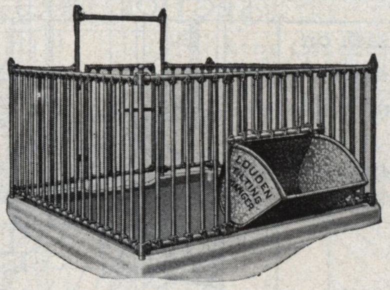
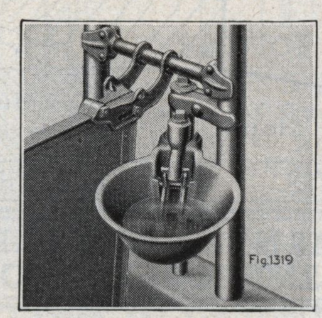


FIG. 996. LOUDEN COW PEN

Water Bowls

Automatic detachable water bowls are made of gray iron; valve rod, valve seat, valve spring and strainer through which all water passes are made of brass. Made to fit ¾-in. supply pipe. Can be attached to 1¼- or 1-in. pipe supports, or to wood posts.

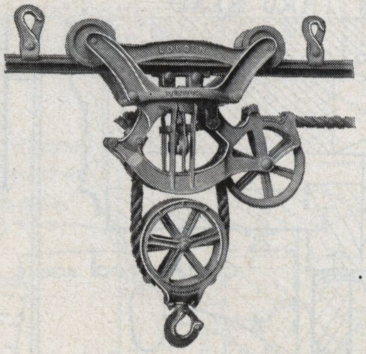


AUTOMATIC DETACHABLE WATER BOWL

Hay Carriers

Louden hay carriers have been on the market since 1867—an old, reliable line. Made for fork or sling use; for steel or wood track, round barns, field stacking, etc.

Also Louden slings and fittings, harpoon and grapple forks, single and triple drum power hoists, offset hay door hinges, pulleys of all kinds, etc.



SENIOR HAY FORK CARRIER

Installations

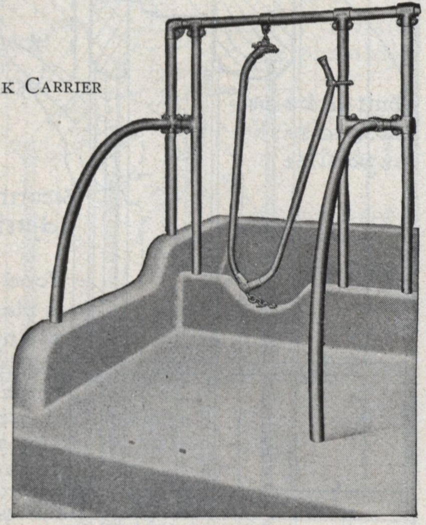
Complete instructions for the installation of Louden equipment accompany each shipment.

Estimates and Catalogues

Complete catalogues mailed on request.

Itemized quotations and specifications cheerfully submitted.

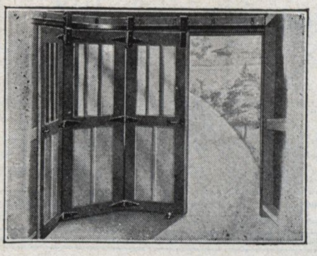
Our architects are at your service for any help required in planning for the installation of Louden equipment.



COW STALLS

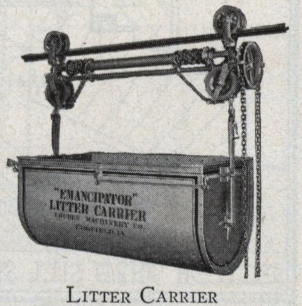
Framework of high carbon steel tubing 1⅝ in. outside diameter. Stalls fitted throughout with overlapping, dustproof connections of certified malleable iron. Finished with heavy coat of silver gray enamel.

Stanchions, tubular steel and wood lined. Width of each stanchion, 7 in. inside. Length, not including chain, 4 ft. Latch and hinge of malleable iron



GARAGE DOOR HANGERS

Made in 3 sections, one section swings free as foot entrance. Slides around inside corner and hangs flat against inside wall when open. Track wheels are roller bearing. All hardware furnished. Easily operated. Easily installed. Does not sag



LITTER CARRIER

For steel or rod track. Steel track carriers fitted with worm gear hoist—actual lifting power of 40 to 1. Watertight box of No. 20 gauge galvanized steel, ends of No. 16 gauge steel heavily reinforced with angle iron. 48 in. long, 27⅛ in. wide and 22 in. deep; capacity, 12 bushels

THE F. E. MYERS & BRO. COMPANY

Manufacturers of Hay Tools

ASHLAND, OHIO

Products

Hay Unloading Tools.

For Door Hangers and Store Ladders, see pages 1472-1475; for Pumps, see pages 1921-1923.

Myers Hay Tools

Myers hay tools have been recognized for over 40 years as standard for the unloading of hay and grain. The use of the best materials, the adoption of the latest improved methods and the adherence to rigid inspections have enabled us to produce high grade hay tools which insure speed, ease of operation, large capacity, uniform service and durability.

Only a few of our leaders are illustrated below. Hay unloading tools for any condition may be selected from our complete line. Catalogue sent on request.

TAKE OFF YOUR HAT TO THE MYERS
PUMPS FOR EVERY PURPOSE
HAY TOOLS & DOOR HANGERS
TRADE-MARK

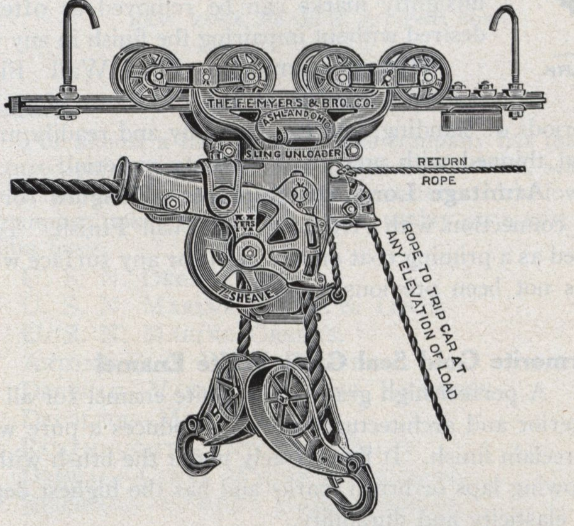
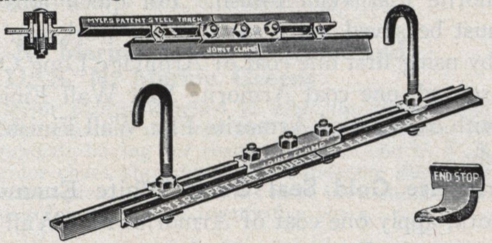

THE F.E. MYERS & BRO. CO.
ASHLAND OHIO
SLING UNLOADER
RETURN ROPE
ROPE TO TRIP CAR AT ANY ELEVATION OF LOAD
SHEAVE

Fig. 2054. Myers "Sure Lock" Hay Unloader

Used with slings or forks. Operates on double rail steel track; also constructed for wood track. Uses ¾ to ⅞-in. rope without adjustment. Elevates load to any height at right angles to track and discharges load parallel with load on wagon.

Operates automatically; has large capacity; easily operated; speedy; staunchly constructed; minimum labor required.

Heavy 18-in. wheel base; 8-wheel flexible trolley; 7-in. rope sheave with machined steel bearing. Rope lock arranged so that pressure on rope is proportioned to weight of load. Rope can not slip



Myers Double Rail Steel Track

Used with hay unloaders described above. Easy to install and carries exceptionally heavy loads without distorting.

Consists of 2 steel T-rails rigidly held by malleable iron joint clamps and hanging hooks with space between so that hook can be placed where it coincides with rafter.

Furnished in 6 and 12-ft. lengths.

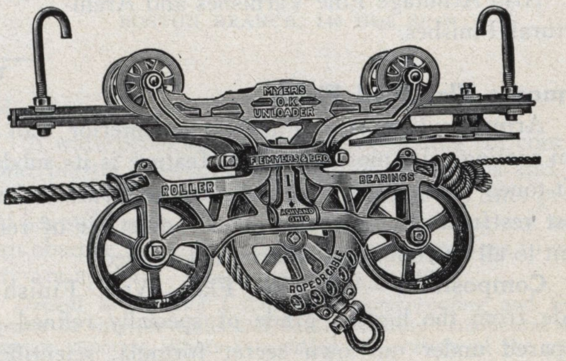


Fig. 1652. Myers O. K. Hay Unloaders

Combination reversible and swivel. Used with slings or forks and with either rope or cable draft. Operates on double rail steel track. Extra long truck distributes load on track, lessening strains and allows use of slings or 2 forks.

Has double lock. Wide open mouth permits fork pulley to enter when swinging at any angle. Large capacity; easily operated; speedy; exceptionally strong.

Heavy 16-in. wheel base; 7-in. rope sheaves with extra wide hubs and long bearing on axles; 3¼-in. track wheels and ⅞-in. turned steel axle

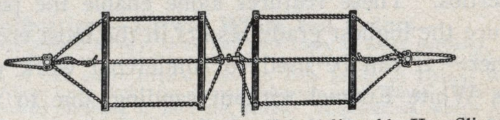


Fig. 1728. Myers 3-Rope Center Trip Adjustable Hay Sling

Has 4-ft. sticks and adjustable end rings. Rope fitted and trips from center lock

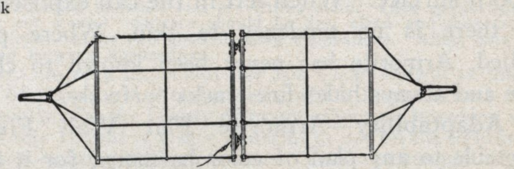


Fig. 1308. Myers Double Lock Adjustable Hay Sling

Has 6-ft. sticks, adjustable end rings, 4 ropes with 2 cross sections. Handles extra large drafts

Myers Hay Slings

Made of well seasoned hardwood. Ropes or cables securely attached by strong hook bolts. Malleable iron lock connects two halves of sling at center and is guaranteed to trip easily from any angle

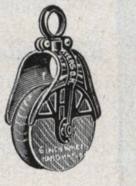


Fig. 1120. Myers O. K. Knot Passing Pulley

Heavy frame, 1-in. loose pin, 1⅛-in. axle, swivel eye and 6-in. hard maple sheave

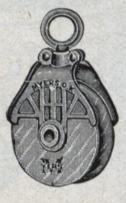


Fig. 1133. Myers O. K. Plain Pulley

Heavy ribbed cast frame, 1⅛-in. axle, swivel eye and 6-in. hard maple sheave

Myers Pulleys for Barn Service

Many other types may be selected from a full line

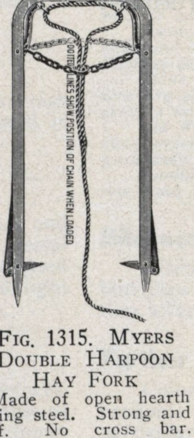


Fig. 1315. Myers Double Harpoon Hay Fork

Made of open hearth spring steel. Strong and stiff. No cross bar. Easily tripped from any direction

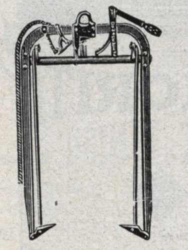


Fig. 671. Myers Lock Lever Hay Fork

Made of spring steel. Has 50% greater capacity than the Harpoon fork. Easily tripped from any direction

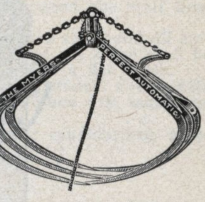


Fig. 1438. Myers Perfect Automatic Grapple Fork

Made of high carbon spring steel; 4 or 6 tines. Trips easily from any direction.

Closes and locks itself before returning to load. Handles loose or baled hay.

Width of head, 19 in.; spread when open, 55 in.

ESTABLISHED 1876 INCORPORATED 1895

ARMITAGE VARNISH CO.

Manufacturers of Varnishes, Enamels and Flat Finish Paints

MAIN OFFICES AND WORKS
NEWARK, N. J.

ARMITAGE VARNISHES
TRADE MARK

Products

ARMORITE FLAT WALL FINISH.

ARMORITE GOLD SEAL GLOSS WHITE ENAMEL.

Also Armitage Fine Varnishes and Architectural Finishes.

Armorite Flat Wall Finish

Armorite Flat Wall Finish is an interior wall and trim coating. Its most admirable feature is its subdued, soft-toned finish, which, under all conditions, makes it most restful to the eye, and gives a quiet air of refinement to all surroundings wherever it is used.

Composition—Armorite Flat Wall Finish is made from the highest grade of specially refined oils, prepared under our own secret formula, scientifically combined with the highest grades of pigment.

Advantages—Armorite Flat Wall Finish flows perfectly under the brush. It weighs about 20 lbs. to the gallon. Can be reduced—1½ gal. of thinner to 5 gal. of Armorite—and still has the finest of covering properties. These features alone enable the painter to produce the highest grade results in the most economical manner. It can be used for undercoat work with the Gloss White Enamel without sanding, due to the fact that being very finely ground it produces a perfectly smooth surface. When left in the can exposed to the air, there is no tendency to skin. Where properly applied, Armorite has never been known to check or flake and always hides fire cracks perfectly.

Adaptability—Armorite Flat Wall Finish is adaptable to any plan of color harmony, for it is made in a wide variety of colors and tints, as well as in a pure unchanging white.

It can be used on any kind of plaster or composition surface, all kinds of wood, burlap, wall paper, all metal surfaces and also window shades. It is particularly suitable for use in hospitals, schools, hotels and other public buildings as well as residences due to the fact that it can be washed with soap and water. Finger marks and other unsanitary or unsightly marks can be removed as often as desired without impairing the finish in any way.

Mixing—Armorite Flat Wall Finish does not harden in the can even after long periods of standing, and can be easily and readily mixed and thinned with any good thinning material.

Armitage Long Oil Surfacer—Designed for use in connection with Armorite Flat Wall Finish. To be used as a priming coat on new walls or any surface which has not been previously coated.

Armorite Gold Seal Gloss White Enamel

A perfect high grade gloss white enamel for all fine interior and architectural work. Produces a pure white porcelain finish. It flows freely under the brush without showing laps or brush marks and has the highest degree of elasticity and durability.

Specifications

Armorite Flat Wall Finish—On new walls, apply one coat of Armitage Long Oil Surfacer; three coats of Armorite Flat Wall Finish. For quick jobs where time must be saved, most satisfactory work can be obtained by using first one coat of Armitage Long Oil Surfacer; second, one coat Armorite Flat Wall Finish and finish with one coat of Armorite Flat Wall Finish flowed on freely.

Armorite Gold Seal Gloss White Enamel—On woodwork, apply one coat of Armorite Flat Wall Finish and two or three coats as desired of Armorite Gold Seal Gloss White Enamel.

ARMORITE
FLAT FINISH
ARMITAGE VARNISHES
WHITE
MANUFACTURED ONLY BY THE
ARMITAGE VARNISH CO.
NEWARK, NEW JERSEY

ARMORITE FLAT WALL FINISH CONTAINER

ARMORITE
GLOSS WHITE ENAMEL
ARMITAGE VARNISHES
GOLD SEAL
MANUFACTURED ONLY BY THE
ARMITAGE VARNISH CO.
NEWARK, NEW JERSEY

ARMORITE GOLD SEAL GLOSS WHITE ENAMEL CONTAINER

THE BILLINGS-CHAPIN CO.

ESTABLISHED 1879

Manufacturers of Paints, Varnishes, Stains, Enamels, Waterproof Coatings and Technical Products

MAIN OFFICE AND FACTORIES
1163 East 40th Street
CLEVELAND, OHIO

NEW YORK BRANCH, 438 Pearl Street

BOSTON BRANCH, 146 High Street

Products

For almost a half century, this company has manufactured paints and varnishes of the better kind, selling to discriminating users who are more interested in lowest per annum upkeep cost than initial outlay on a cost per gallon basis.

U. S. N. Deck Paint.
U. S. N. Marine White & Tints.
U. S. N. Marine Greens.
Artone Flat Wall Finish.
Decolac—Varnish, Stains, Enamels.
Decolite—Mill White.
Rustnaught—Anti-rust Paint.
Driwal—Clear White and Colors.
Bilchaco—Cement Floor Coating.

U. S. N. Deck Paint

A quick-drying, semi-gloss, enamel finish of unusual washability and durability, furnished in thirty standard shades, white, black and wall primer. Particularly adapted for wall and floor painting in schools, hospitals and other buildings. Far superior for wall painting to ordinary slow drying paint mixtures, which generally produce a soft, dirt-absorbing film.

U. S. N. Marine White & Tints and U. S. N. Marine Greens

Exterior paints designed to meet the requirements of the most discriminating painters and property owners. Architects will appreciate having for ready reference our U. S. N. Marine Green color chart, showing twelve handsome shades, which will be sent on request. These paints have been standard with many consumers for more than twenty-five years.

Artone Flat Wall Finish

A flat wall paint of pleasing appearance and serviceability. Soft harmonious tints of enduring color and easy washability. Standard with many Boards of Education.

Decolac

Under this brand may be obtained, clear varnish, varnish stains, penetrating oil stains, tinted enamels, white enamel in high gloss and dull finish—all of outstanding merit.

Decolite Mill White

Non-yellowing interior white in gloss and dull finishes and undercoater. Pigments and liquids processed by our special method with a view to meeting the requirements for large area painting of industrial plants, where cleanliness and good light reflection are to be maintained at lowest possible expense.

Rustnaught, Anti-rust Paint

For structural steel, bridges and all exposed metal surfaces. Made of pigments and liquids known to be of greatest value as rust inhibitors and moisture excluders, resisting to a maximum degree the action of electrolysis. Standard for many years with many large users of paint for protection of metal, obtaining low per annum upkeep cost.

Driwal

A waterproofing and decorative coating for concrete, stone, plaster, stucco, brick, etc. It penetrates and lines the pores with an insoluble material and the tints protect and beautify with soft, rich tones which bring out rather than obscure the artistic texture of the surfaces to which they are applied. Apply by brush or spray.

Driwal White and Colors, for waterproofing and tinting exterior or interior walls and decorating any ornamental work, stone or concrete, where reasonable penetration of the natural surface can be had.

Driwal Blacks, of three consistencies, for below grade waterproofing.

Driwal Clear, colorless, for excluding moisture and the prevention of staining.

Driwal is recommended only where a clean, reasonably porous surface affords good penetration, and best results are secured where the goods are so applied as to secure this penetration.

Specifications—Driwal White and Colors—

Surface should be dry, clean and free from all loose particles. Cracks should be pointed up. Average surface should receive two applications of a mixture of one quart Driwal Clear to each gallon of Driwal White or Colors. Allow over night for drying between applications. Use material freely, actually daubing it into the pores. (Consult us where it seems desirable to make special recommendations.)

Specifications—Driwal Clear—

For excluding moisture and preventing stain. (See special specifications for cut stone.) Surface should be dry, clean and free from all loose particles. Make two good flushing applications. Allow over night for drying between applications.

Note: A very important use for Clear Driwal is the prevention of stains and discoloration, which from various causes so frequently mar the beauty of many otherwise imposing structures. Clear Driwal is a safe material to use on the lightest colored, finest texture quarry products. Does not contain any wax or other material that would in any way mar the natural beautv of stone. Keeps stone in natural condition.

Specifications—Driwal Clear on Cut Stone—Stain Prevention—

New Work—The face and all exposed portions of all cut stone must be clean and all surfaces dry prior to treatment. The face and back of all stone shall be given a saturating coat of Clear Driwal, preferably with a flat brush allowing the brush to cover the edges of beds and builds one inch or more.

Cornice and projecting courses shall be treated face and back and *also* beds and builds for all areas extending outward beyond the wall line. Copings shall be treated on all six sides.

Stone Trim Jobs—The face of all cut stone must be clean and all surface dry prior to treatment. All six sides each unit of cut stone shall be given a saturating coat of Clear Driwal, preferably with a flat brush.

Old Work—Stone recently set or old discolored stone: Clean with clear water and sharp white sand and fiber brush. When dry, make one good flushing application Driwal Clear.

Sandblasting old discolored stone: Directly after sandblasting, make one good flushing application Clear Driwal.

Bilchaco Cement Floor Coating

White and six shades. Particularly adapted for use in large buildings where cement floors should be painted. Deep penetration affords long wear and low per annum upkeep cost.

Further Information

Color cards and complete specifications covering any of our products will gladly be furnished on request. We point with particular pride both to the character of many of the institutions we are serving and to the long, continuous use of our materials over periods of many years by an ever increasing number of large and discriminating buyers.

CERTAIN-TEED PRODUCTS CORPORATION

PAINT AND VARNISH DIVISION

100 East 42nd Street, NEW YORK, N. Y.

For Sales Offices and Mills, see page 590

Products

PAINTS, VARNISHES, ENAMELS, STAINS, and Related Products.

For Gypsum Products, see pages 363-365; for Linoleum, see pages 590-591; for Roll Roofing, Asphalt Shingles, etc., see page 1041.

Certain-teed Finishes for Exterior and Interior Uses

The finishes made by the CERTAIN-TEED PRODUCTS CORPORATION represent the highest grade products it is possible to produce, in each particular line. The utmost care is taken, not only in obtaining the raw materials, but in the manufacturing steps through which the raw material passes until it becomes the finished product. The Certain-teed line is complete, and includes finishes for practically every purpose and material for both interior and exterior uses.

Certain-teed House Paint (Exterior or Interior)

Contains the proper combinations of the best ingredients, thoroughly mixed and ground in strictly pure, thoroughly aged linseed oil to which is added turpentine and best grade of japan drier. Every ingredient of raw material is tested by expert paint chemists. The thoroughness and precision of mixing assures a much superior product than is made possible by hand methods of mixing.

The analysis of Certain-teed No. 448 Outside White (given here) is an indication of the quality of Certain-teed Paints.

NO. 448—OUTSIDE WHITE ANALYSIS	
Pigment	69.25
Vehicle	30.75
	100.00%
PIGMENT	
Basic Lead Carbonate	42.00
Basic Lead Sulphate	18.00
Oxide of Zinc	30.00
Silica and Silicates	10.00
	100.00%
VEHICLE	
Refined Linseed Oil	91.50
Turpentine	5.70
Japan Dryer	2.80
	100.00%

Certain-teed Varnishes
FLOOR VARNISH
Certain-teed Paint Products
HOUSE PAINT
448 OUTSIDE WHITE
Manufactured in U.S.A. by Certain-teed Products Corporation
Certain-teed Products Corporation

CERTAIN-TEED VARNISH AND PAINT PACKAGES

Covering capacity is approximately 350 sq. ft. per gallon, two coats, depending on the surface.

Specifications—

EXTERIOR PAINT

All exterior paint shall be Certain-teed House Paint and shall be delivered at the building in the manufacturer's original packages, unopened until inspected by the architect or his representative. Paint shall be of the colors selected. All paint from priming to finish coat shall be used and applied strictly according to the directions of the manufacturer on the container and thinned only as allowed.

New Work—Exterior finished woodwork to be given .... coats well brushed on, sufficient time being allowed between coats to allow the paint to dry thoroughly. All knots and sappy places shall be given a coat of shellac before applying the priming coat.

Old Work—All old woodwork to be given .... coats of paint of color selected. All old surfaces to be thoroughly dusted and cleaned. Any loose particles of paint or bubbles shall be removed and surface rubbed with wire brush before commencing painting.

Certain-teed Shingle Stain

For shingles, half timber and for unsurfaced as well as surfaced woods. This stain is a product of the highest quality creosote in which the proper mixture of pigments and oils necessary to give a permanent color are mixed. Applied either by brushing or dipping. We recommend dipping and the application of one brush coat as soon as laid; this requires 3½ gal. to cover 1000 shingles. For dipping 1000 shingles, 2½ gals. are required. To brush coat shingles on roof, 1 gal. covers approximately 150 sq. ft. on the first coat and approximately 300 sq. ft. on the second coat.

Specifications—

Shingles, Dipped—All shingles shall be dipped two-thirds their length in Certain-teed Shingle Stain No. ... Shingles shall be dipped in and out of the stain rapidly and then set to drain and the surplus stain allowed to run into the container. Shingles shall not be allowed to soak in the stain. Shingles must be dry when dipped.

Shingles, Brush Coated—Shingles shall be given two brush coats of Certain-teed Shingle Stain No. ... Stain butts and edges carefully. Stain shall be applied only when the shingles are dry.

Certain-teed Stucco and Cement Paint

Decorative and protective coating for concrete, cement, stucco, stone or brick—outside or inside use.

Seals the pores of the surface and prevents the absorption of moisture by forming a waterproof coating. Covers 150 to 300 sq. ft. per gallon, two coats, and dries in from 24 to 48 hours.

Specifications—

All surfaces (specify kind) shall be given two coats of Certain-teed Stucco and Cement Paint of color as selected. Paint shall not be brushed out, but flowed on and used strictly as per directions of manufacturer on label of container.

Note: Surfaces containing an excess of free alkali should be treated. See specifications for cement floor paint.

Certain-teed Varnishes

Certain-teed Varnishes are unexcelled for quality and service. They successfully meet all the "freak" tests and the more important test of actual service. Extensive manufacturing facilities, high standard of quality, ample resources and the most competent technical skill combine to make them the best that can be manufactured. Covering capacity, all varnishes, about 600 to 700 sq. ft. per gallon, one coat.

Certain-teed Universal Varnish No. 900—For both exterior and interior use. This varnish is a superior product and gives satisfaction in all of its many uses. It is pale in color, highly lustrous, waterproof, weather resisting, tough and elastic. Can be rubbed and polished, if desired. For use on exterior and interior woodwork, floors, etc. Dries dust free in from 4 to 6 hours and hard overnight.

Certain-teed Outside Spar Varnish—A pale, extremely durable, highly lustrous varnish for all outside purposes, such as store fronts, outside doors, marine work and similarly exposed surfaces. Flowing, working, and wearing qualities unsurpassed. Will dry dust free in from 4 to 6 hours and hard overnight.

Continued on next page

Certain-teed Interior Spar Varnish—This is a high grade interior varnish for general use. It is not affected by contact with water. Has a fine durable and permanent gloss which can be rubbed to a dull finish and polished, if desired. Dries dust free in about 4 hours, and hard in 18 to 20 hours; rubbed in about 72 hours.

Certain-teed Flat Varnish—For interior work where a flat or velvet finish is desired. Produces the effect of a rubbed varnish without the extra labor of rubbing. Contains no wax or pigment and requires no mixing before use. To obtain the best results, apply Certain-teed Flat Varnish over a gloss coat. Dries dust free in from 3 to 6 hours and hard in from 12 to 18 hours.

Certain-teed Floor Varnish—A high grade varnish in every respect. May be washed with hot or cold water and soap. Dries dust free in 3 hours and dry enough overnight to be walked upon, yet possesses the necessary elasticity so that it does not scratch or mar.

Certain-teed Flat Wall Paint

For plaster, wood, metal ceilings, wall board, etc. This high grade flat wall finish is widely used in homes, public buildings, office buildings, schools, etc. It may be used on wood, metal ceilings, wall boards, etc., as well as for plaster walls and ceilings. The painted surfaces may be washed with soap and water when soiled, without injuring.

Covering capacity will vary according to condition of the surface. One gallon, one coat, will cover approximately as follows:

Smooth plaster, metal ceilings, and painted smooth surfaces, 700 to 800 sq. ft.; rough plaster, wall board, wallpaper or burlap, 500 to 600 sq. ft.

Application—No size is needed on unpainted woodwork or metal ceilings. Sizing is required for new plaster work and for wall board. For old plaster kalsomined, wash off kalsomine or if it is tight, give one coat of Certain-teed Wall Size.

Specifications—

All wall paint shall be Certain-teed Flat Wall Paint used from the original containers and applied as per direction of manufacturer printed on the label of container.

All new plaster shall be clean and dry before applying one coat of Certain-teed Wall Size. All cracks in old work are to be filled with plaster of paris before applying size. All new plaster shall be given two coats of Flat Paint and old plaster shall be given one coat, unless undercoat is considerably darker than new color. Metal ceiling shall be given one good coat flowed on without the size. The walls and ceilings of the following rooms..... shall be stippled in the second coat, which shall be Certain-teed Flat Wall Paint.

Certain-teed Mill White

For use on interior walls and ceilings of factories, shops, industrial plants, schools, office buildings, etc., where a sanitary light reflecting finish is desired. It can be used on wood, plaster or brick surfaces. It will not turn yellow and can be washed with soap and water without affecting the surface. It may also be tinted if desired. Made in flat and gloss finishes. The gloss finish has the greatest light reflecting properties, but does not produce a glare. Its smooth surface resists dust and dirt and is more easily cleaned than the flat finish.

Specifications—

The ceilings and walls of .... shall be painted with Certain-teed Mill White Paint. Where one coat is required, this shall be the gloss finish, but where two coats are required, the first coat shall be Certain-teed Mill White (Flat) Paint and the second coat shall be Certain-teed Mill White (Gloss) Paint. All paint shall be used from the manufacturer's original container and only as prescribed by the label on the container.

Old walls and ceilings painted white and not very soiled, shall be given one coat of gloss finish. New work shall be given two coats.

Certain-teed Decorative Enamels

Enamels of the highest possible quality, and can be used where the very finest finish is required on wood, plaster or metal. The gloss finishes fulfill all the requirements desired in a highest grade enamel which can be used for interior or exterior work. The semi-gloss or eggshell finishes are for interior use only, where the effect of a rubbed finish is desired. These enamels flow out freely under the brush and form a smooth even finish free from brush marks. They harden to a very tough and durable finish that will not crack or chip and its luster is very enduring.

One gallon will cover 600 sq. ft. of surface, one coat. It dries hard in 36 hours. For the most satisfactory results, Certain-teed Enamel First Coater should be used for the undercoats. Made in both gloss and eggshell finishes.

Specifications—

Priming Coat—Apply two coats of Certain-teed First Coater as directed on the label of container sandpapering each coat lightly with 00 sandpaper before applying next coat. If enamel is to be tinted, the second coat should be tinted to harmonize with the enamel.

Two coats of enamel shall be applied, using enamel of kind selected or tinted, as directed. The first coat to be sanded lightly with 00 sandpaper before applying the finish coat. The second coat to be left with gloss finish; or the second coat to be gloss finish rubbed to an eggshell finish with pumicestone and water; or the second coat to be Certain-teed No. ..... eggshell finish.

Certain-teed Penetrating Oil Stains

These are the highest quality penetrating oil stains for interior finish. They may be used on either hard or soft woods. They are in liquid form and penetrate deeply, but do not raise the grain of the wood. As they are clear and transparent, they show off the grain of the wood. Open grain woods must be filled over the stain and given time to dry before being shellacked. As the color of the stain will vary on different woods, because of the nature and color of the wood itself, samples of the stained finishes should be required before proceeding with the work. Covering capacity, 800 to 1000 sq. ft. per gallon, one coat, depending upon the wood to be stained.

Specifications—

Apply one brush coat of No. .... Certain-teed Penetrating Oil Stain. Allow stain to remain for four or five minutes, then wipe off with a rag. If not dark enough, apply second coat and wipe off. Stain to be equalized as the grain of the wood requires. Allow 24 hours for the stain to dry before filling or shellacking. Colors are to be selected by the architect and samples of finish shall have his approval before proceeding with the work.

Certain-teed Cement Floor Paint

This paint is designed principally for preventing dusting, crumbling, and disintegrating of cement floors. It is not only very durable and resists wear, but furnishes a glossy, dampproof and sanitary surface on cement floors, which is easy to keep clean. Cement floors having an excess of free alkali should be treated before Certain-teed Cement Floor Paint is applied. Floors painted with it do not dust.

Covering capacity, approximately 500 sq. ft. per gallon, one coat. Dries in about 12 hours. Two coats are recommended, allowing the first coat to become thoroughly dry.

Specifications—

All cement floors must be dry, clean and free from all loose particles and grease before applying the paint.

When cement floor paint is to be used on new floors (that is floors laid less than 3 months) they must be treated with a coat of zinc sulphate solution, to neutralize any excess alkali, and allowed to dry thoroughly. For the best results, apply a coat of boiled linseed oil, and when thoroughly dry, apply two coats of cement floor paint as per directions of manufacturer.

CARTER WHITE LEAD CO.

12042 South Peoria Street
CHICAGO, ILL.

DISTRIBUTING POINTS

ALBANY, N. Y.
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CARTER WHITE LEAD CO.
STRICTLY PURE
WHITE LEAD
CHICAGO & OMAHA
CARTER
STRICTLY PURE
WHITE LEAD

TRADE-MARK

Products

Manufacturers of Strictly Pure White Lead and Red Lead.

Also manufacturers of Litharge.

Carter White Lead

Carter White Lead is a high grade and standard product, noted for its extreme whiteness, fineness, superior body, uniformity and great durability, because it is perfectly corroded by the only modern and scientific process in the white lead industry.

Architects should not fail to specify "Carter" when white paint or soft, clear tints are desired.

Carter Coach and Car Lead

Carter Coach and Car Lead is a particularly high grade product, especially ground in bleached oil with reference to interior and surfacing work. It is extremely white and fine. It flats and dries well. Equally good for exterior work.

Red Lead

Carter Dry Red Lead contains no adulterants and conforms to government specifications.

Distribution

Carter White Lead is widely distributed through jobbers, and is retailed by local dealers in every locality. It is thus easily obtainable anywhere in the country.

Architects may specify "Carter" to be used on a building anywhere and the contractor can secure it.

Prices

Prices are governed by the fluctuations of the metal market.

Carter Lead is sold for about the same price as other standard brands.

White Lead Specifications

White Lead for Exterior—Before any paint is applied, woodwork to be thoroughly dry. Apply no paint when raining or snowing. All knots and sappy places to be varnished with best grain-alcohol shellac.

Priming Coat—To be a thin coat of Carter Strictly Pure White Lead, linseed oil and turpentine, properly brushed into the pores. On yellow pine, spruce, hemlock and all sappy woods, a mixture of red lead and white lead is necessary to secure the best anchorage and insure a tenacious foundation for succeeding coats.

All nailholes, joints and other defects in surface to be puttied thoroughly after priming coat is dry, with a pure linseed oil putty made by thickening Carter White Lead with bolted whiting to putty consistency.

Second and Third Coats—To be Carter Pure White Lead, pure, well-settled linseed oil, pure turpentine and drier, mixed to proper consistency and colored to suit.

All new lumber requires 3 coats to produce a durable job.

White Lead for Interior Woodwork—Surface to be put in proper condition for paint; all dust, dirt, loose paint, etc., removed; all knots and sappy places to be varnished with pure grain-alcohol shellac varnish.

Priming Coat—To be a thin coat of Carter White Lead (Coach and Car preferred), pure linseed oil, turpentine and white turpentine japan drier, thoroughly mixed and properly applied.

Putty all nailholes, cracks and other defects with linseed oil putty, composed of equal parts of Carter Lead and whiting, after priming coat is thoroughly dry.

Second and Third Coats—Paint to be Carter White Lead (Coach and Car preferred), thinned with either Flatting Oil, pure turpentine or pure linseed oil and pure turpentine white drier, to produce eggshell, flat or a full gloss finish, and colored as desired. Architect to specify the finish desired.

Flat Finish for Plaster Walls

Carter White Lead, Flatting Oil and oil colors are used for the finest decorating on canvas, plaster or compo walls. While the first cost of such decorating may exceed other methods a little, the ultimate cost is less.

White Lead thinned with Flatting Oil and tinted with oil colors produces clear and delicate tints which are truly washable.

Decorating of this character is good for long service; in fact, until a change in color is wanted. These walls may be washed as often as need be to keep them fresh and clean.

Important to Architects

We recommend letting the painting contract separately from the general contract, and that estimates be asked only from competent and reliable contracting painters.

In order to insure the carrying out of the specifications we have stamped the name "Carter" on the side of every keg. When the head is removed, the superintendent can still identify the package.

Guarantee

Carter White Lead is sold under the following guarantee, which is printed on every package:

This package contains 8% linseed oil, 92% carbonate of lead. The Carter White Lead Co. will pay $100.00 if adulterant is found in this package.

Useful Information

Architects are invited to put their paint problems up to our Paint Information Bureau. Its services are given without charge.

ESTABLISHED 1827

JOSEPH DIXON CRUCIBLE COMPANY

Manufacturers of Silica-Graphite Paint and Red Lead-Graphite Primer

WORKS AND GENERAL OFFICES

JERSEY CITY, N. J.

DISTRICT SALES OFFICES

NEW YORK, N. Y., 68 Reade Street
PHILADELPHIA, PA., 801 Finance Building
SAN FRANCISCO, CAL., 444 Market Street
CHICAGO, ILL., Monadnock Block
ST. LOUIS, MO., Victoria Building
BOSTON, MASS., 80 Federal Street
BUFFALO, N. Y., Erie County Savings Bank Building
BALTIMORE, MD., Professional Building

Products

DIXON'S SILICA-GRAPHITE PAINT.
DIXON'S RED LEAD-GRAPHITE PRIMER.

Dixon's Silica-Graphite Paint

A protective coating against the action of weather, heat, moisture, corrosive gases, etc., for use on all exposed metal, such as galvanized iron, metal roofing, gutters, cornices, fences, fire escapes, tanks, boiler and engine room equipment and piping. Equally serviceable on woodwork.

Special Pigment Processing—Dixon's Silica-Graphite Paint consists of flake silica-graphite with linseed oil vehicle. Additional smoothness, adhesion and toughness are gained by our processing of the pigment. Silica is not mechanically added to graphite as is usual with paints of this purpose, but coming directly from our own mines, the silica and flake graphite are kept largely united, particle to particle, as in their natural formation. This produces an exceptionally inert pigment. The usual destructive chemical action between pigment and vehicle is prevented, insuring the amazing lasting quality which has made this paint so popular for 65 years.

Colors—Made in four colors: olive green, dark red, "natural" (dark gray), and black. The dark red, or else Dixon's Red Lead-Graphite Primer, is generally used as a shop coat, followed by a field coat of whatever other color is desired. The black is specially prepared for steel smokestacks, boiler fronts, ornamental iron work and surfaces subject to corrosion, fumes or destructive gases.

Covering Power—Dixon's Silica-Graphite Paint covers, approximately, 500 sq. ft. to the gallon for the first coat and 550 sq. ft. for the second coat.

Specifications for Steel and Iron Construction Work—
NEW WORK

At the Mill—Before painting, all surfaces shall be thoroughly cleaned and be free from loose scale, dirt and moisture. The entire surface shall then be given a well-applied coating of Dixon's Dark Red Silica-Graphite Paint or Dixon's Red Lead-Graphite Primer. Parts to be in contact and enclosed shall receive, before assembling, a coat of the same material.

After Erection—Places damaged by abrasion shall first be retouched. The entire work shall then be given a second coat of Dixon's Silica-Graphite Paint of a different color than the mill coat. The top of the package to be removed, and the paint properly stirred. No adulterating oils or thinners shall be used. The cleaning, painting and materials to be subject to inspection. The paint to be furnished to the mill or structure shall be in original packages, *ready mixed,* for use.

MAINTENANCE

Cleaning—All broken or blistered paint, all rust, grease and dirt, must be removed by wire brushes, scrapers, blow torch, or by sandblasting with fine sand. The method to be selected and made part of the contract. Surfaces must be painted the day they are cleaned.

Repainting—All surfaces shall be given two thorough coats of Dixon's Silica-Graphite Paint. The second coat to be applied when the first is thoroughly dry, and to be of different color. Surfaces must be perfectly dry when painted. The top of the package to be removed and the paint properly stirred. No adulterating oils or thinners shall be used. The cleaning, painting and materials to be subject to inspection. The paint to be furnished in original packages *ready* mixed for use.

For Roofs—The same two qualities which make Dixon's Silica-Graphite Paint so efficient for other exposed surfaces account for its great protection to roofs, namely: a practically inert pigment and a linseed oil vehicle. We recommend three coats for new metal work, and two coats for metal previously painted. This paint is suitable for canvas roof. It is not recommended, however, for mastic, paraffin or tar roofing.

Galvanized Iron or Tin Roofing—Before Dixon's Silica-Graphite Paint is applied to a new roof, it is recommended that roofing be first washed clean of oil, etc., with a solution of sal-soda. When dry, apply a first coat of Dixon's Dark Red, then a second and third coat of color desired—red or olive green.

Shingle Roofing—Where the wood is dry, the shingles should receive a coat of oil, otherwise they will quickly absorb oil from the paint, leaving the pigment without sufficient binding material. Shingles should really be dipped in oil before painting, and it is well to paint the under part of the shingle before laying.

Shingle roofing is painted with Dixon's Dark Red or Oil Green for beautifying effect, and is painted with Dixon's Natural Color for slate effect.

For Smokestacks—Dixon's Silica-Graphite Paint is widely used on smokestacks and other heated surfaces. Frequent testimonials from users prove that it remains thoroughly protective to stacks after even 9 years, without recoating. Such severe service easily demonstrates its superior economy.

Dixon's Black is peculiarly suited for heated surfaces. Where degree of heat is over 500° F. we do not recommend it, as no oil paint can give satisfactory service under such conditions. Stacks previously painted require two coats. New stacks require three.

Put surface in proper painting condition as recommended on manufacturer's label. Paint should be applied when stack is cold. Allow it to dry thoroughly so that the oil oxidizes and is able to stand maximum degree of heat. Purchase in original cans, ready mixed.

Dixon's Red Lead-Graphite Primer

Pigment consists of silica-graphite, red lead and English oxide of iron, and linseed oil vehicle. Dries perfectly in 22 hours under normal conditions. Covers, approximately, 400 sq. ft. to the gallon on metal surfaces.

Dixon's Red Lead-Graphite Primer does not "drag" and wear the brushes because of the flake-graphite in the pigment. It is strongly adhesive to metal, never becomes hard or brittle, and will not chip or scale off.

This new product is backed by the Dixon reputation and experience of 65 years in manufacturing paint. It fully meets the requirements of those who prefer a red lead paint for priming coats.

Put up in 5 and 10-gallon containers, also half-barrels and barrels.

DETROIT GRAPHITE COMPANY

Makers of Paints in all Colors for all Purposes

DETROIT, MICH.

ATLANTA, GA.
BOSTON, MASS.
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CHICAGO, ILL.
CINCINNATI, OHIO
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COLUMBUS, OHIO
DALLAS, TEX.
DES MOINES, IOWA
EL PASO, TEX.
GREENVILLE, S. C.
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HUNTINGTON, W. VA.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
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PHILADELPHIA, PA.
PITTSBURGH, PA.
SALT LAKE CITY, UTAH
SAN FRANCISCO, CAL.
ST. LOUIS, MO.
SPRINGFIELD, MASS.
TULSA, OKLA.

DEGRACO PAINTS
All Colors for Your Particular Needs

Products

- Superior Graphite Paint
  - A Metal Protective Coating
- Sta-White
  - White Oil Paint for Interior Use
- Degraco Wall Finishes
  - for Interior Decorating
- Degraco Brick and Concrete Paints
- Stiploid
  - A Flat Wall Finish

Also manufacturers of:

- Degraco
  - Acid Resisting Paints
  - Machinery Enamels
  - Flat Machine Colors
  - Industrial Finishes
  - Railway Paints
  - Marine Paints
  - Gas Holder Paints
  - Exterior and Interior Enamels
  - Building and House Paints
- Degracolin
  - Concrete Floor Hardener
- Cemtex
  - Portland Cement Paint
- Prime-Rite
  - Red Lead Base Paint for Metal Surfaces
- Crometan
  - Lead Cromate Base Primer for Metal

Distribution and Warehouse Stocks

Detroit Graphite Company's products are sold through branch offices with warehouse stocks in all principal cities.

Superior Graphite Paint

SUPERIOR GRAPHITE PAINT
It Prevents Rust
TRADE-MARK

Lake Superior Amorphous Graphite ore, a natural combination of graphitic carbon and silica, is the base of Superior Graphite Paint.

The ore is ground to extreme fineness and has a greater affinity for linseed oil than commercial graphites. Its inert nature prevents chemical action between pigment and vehicle.

Large covering capacity, opacity and ease of application make for economy in the use of Superior Graphite Paint. Durability (proved in service) results in low ultimate cost.

Superior Graphite Paint has established its reputation as the leader among metal protective paints through service records covering a long period of years.

Manufactured in black, brown, red and green, also stack black.

Brown is generally used as a shop coat; black for first field coat and olive green as a finish coat, a combination that assures complete coats being applied. Other colors or combinations may be used with equal success.

Book Cadillac Hotel

Structural steel protected with Degraco Metal Paints, walls and ceilings painted with Degraco Wall Finishes

Specifications—Remove all scale, dirt and foreign matter from structural steel before any painting is done in the shop.

Covered surfaces, surfaces in contact and surfaces enclosed and all parts of riveted members shall receive 1 coat of Superior Graphite Paint (color and number) after pieces are punched and before assembled.

All finished members shall receive 1 coat of Superior Graphite Paint (color and number) before taken from shops or exposed to weather. Foundation beams and connections shall receive 1 coat in shop. All bolts used in erection and remaining permanently in the structure shall be dipped in Superior Graphite Paint. All pins or bored pinholes or other planed surfaces shall be coated with white lead and tallow before leaving shop. All surfaces accessible after erection shall receive 2 coats of Superior Graphite Paint (colors and numbers) after being placed in position. All paints shall be made by the Detroit Graphite Company and shall be delivered to erection site in unbroken packages, subject to inspection and approval of architect or engineer.

Repainting Specifications—All metal work and other exposed surfaces to be repainted shall be thoroughly cleaned with steel brushes and, where necessary, all loose scale shall be removed with a three-cornered steel scraper and hammer. No paint shall be applied until all dust, mud and grease have been carefully removed, nor shall any paint be applied during wet or foggy weather or upon a wet surface.

First coat shall be Superior Graphite Paint (color and number) applied as soon as parts are cleaned. Any part of structure liable to hold moisture shall be cleaned and slushed with the paint.

Second coat shall be Superior Graphite Paint (color and number) and shall be applied after first coat has been allowed to dry for a period of one week.

All paint used shall be that manufactured by the Detroit Graphite Company.

Sta-White

Sta-White is a pure white oil paint for industrial interiors with unusual light reflecting qualities. It contains no lead, glue or other harmful or easily affected ingredients, bleached oil or pigments, and consequently shows no tendency to turn yellow. It will not chip, flake or peel.

STA-WHITE
THE WHITE PAINT THAT STAYS WHITE
TRADE-MARK

Recommended for interior painting of mills, factories, offices, public buildings, schools, hospitals, theaters, hotels, restaurants, etc.

May be used on wood, concrete, metal, plaster, brick and other surfaces. When, after a period of years,

Continued on next page

Sta-White becomes soiled, covered with dust or other settlings, the original whiteness and reflecting qualities are easily restored by washing without injury to the finish.

Sta-White will give the maximum service that is expected of highest grade of interior white, both as to light reflecting qualities and durability.

Furnished in high gloss enamel, eggshell or flat finish.

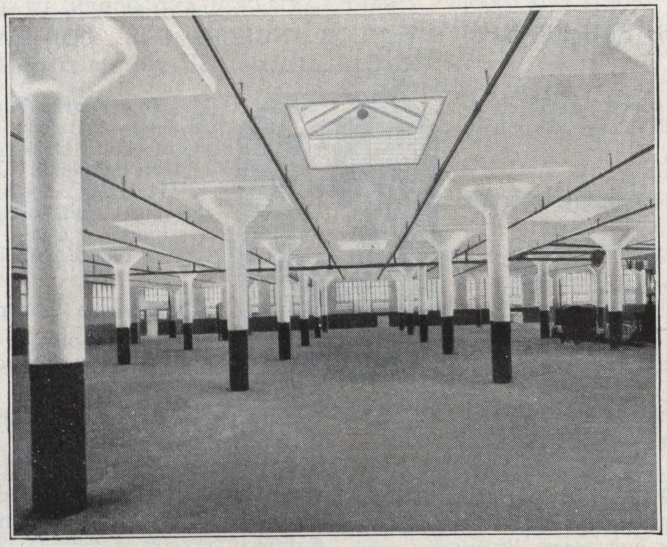
Specifications—*General*—Surfaces to be painted shall be dry and free from dust and loosely attached matter such as old paint, rust, scale, etc. All oil spots shall receive one coat of shellac.

Concrete, Brick and Plaster—First coat shall be Sta-White Primer thinned (according to the porosity of the surface) with a mixture of equal parts raw linseed oil and turpentine or approved turpentine substitute and allowed to dry hard before application of the second coat.

Second coat: Sta-White Primer shall be thinned to a good brushing consistency with pure turpentine or approved turpentine substitute. Ample time shall be allowed for drying before application of the finish coat.

Third coat: Sta-White shall be applied as received. If paint has thickened somewhat from exposure, a small quantity of turpentine or approved turpentine substitute may be added. In no case shall linseed oil or varnish be used for thinning.

Wood, Wall Board and Metal Surfaces—First coat: Sta-White Primer shall be thinned to a good brushing consistency with pure turpentine or approved turpentine substitute.



Walls, Ceilings and Pillars Painted with Sta-White

Second coat: Sta-White Primer, thinned as above. This coat shall be allowed to become thoroughly hard and dry before application of the finish coat.

Third coat: Sta-White Finish shall be applied as received. If paint has thickened somewhat from exposure, a small quantity of turpentine or approved turpentine substitute may be added. In no case shall linseed oil or varnish be used for thinning.

Two-coat Work—On account of the unusual opacity of Sta-White Primer and Finish, it is possible in many cases to secure a satisfactory solid white finish with 2 coats. In such cases, the second or intermediate coats (as outlined above) may be omitted.

Buildings in which painting is done should be warm and well ventilated. Surfaces should be thoroughly cleaned before application of paint, and all wood surfaces should have knots and sappy places properly shellacked. Surfaces should be free from all forms of moisture before paint is applied.

All paint used shall be that manufactured by Detroit Graphite Company, Detroit, Mich., and shall be delivered to the job in unbroken packages, subject to inspection and approval of the architect or engineer.

Degraco-Tone

DEGRACO-TONE
A FLAT WALL PAINT

TRADE-MARK

Degraco-Tone is an oil paint in flat finish for interior use on plaster walls, cement, brick, wall board, burlap, metal ceilings, radiators, etc. It produces that soft, velvet finish so much desired for interior decoration. It is the ideal paint for office buildings, schools, hotels, hospitals, residences, public buildings, etc.

Specifications—*Plaster*—Allow sufficient time for new walls to become hard and thoroughly dry before painting. Seal all cracks and uneven places with plaster of paris. The first or priming coat shall be Degraco Wall Primer. Second and third coats shall be Degraco-Tone, as furnished; if thinning is required, use only turpentine or good turpentine substitute.

Woodwork—The surface shall be sanded until thoroughly smooth. The first coat shall be Degraco-Tone thinned with 1 qt. of linseed oil to the gallon. Second and third coats Degraco-Tone as furnished.

Burlap—The first or priming coat shall be Degraco Wall Primer. Second and third coats shall be Degraco-Tone as furnished; if thinning is required, use only turpentine or approved turpentine substitute.

Wall Board—The first or priming coat shall be Degraco Wall Primer. Second and third coats shall be Degraco-Tone as furnished; if thinning is required, use only turpentine or approved turpentine substitute.

Metal—Apply 2 coats of Degraco-Tone, thinning first coat with 1 pt. linseed oil and a little turpentine to the gallon.

Repainting—This shall be done on dry surfaces which have been washed and grease spots removed. Apply 1 or 2 coats of Degraco-Tone, depending on condition of the surfaces and the colors.

When 2 coats are applied, thin the first coat with ½ pt. turpentine to the gallon.

Drying Time—At least 48 hours shall be allowed between coats.

Application—A 4 or 5-in. wall brush shall be used, constantly keeping a wet edge to avoid showing laps. Keep the paint well stirred. If Degraco-Tone becomes a little thick from exposure, thin slightly with turpentine or approved turpentine substitute.

All paint used shall be that manufactured by Detroit Graphite Company.

Stiploid

Stiploid is a non-porous, washable wall finish. It is furnished in two parts—Stiploid Body and Stiploid Reducer.

Specifications—Repair all cracks and damaged places. Before painting be sure that surface is dry and free from dirt, grease or other foreign deposits.

First Coat—Mix equal parts of Stiploid Body with Stiploid Reducer. After thorough mixing tint with pure colors in oil to a shade slightly darker than that of the finish coat. If this priming coat pulls excessively under the brush, particularly when applied in cold weather or on a cold surface, add not to exceed ½ pt. of pure raw linseed oil to the gallon.

If flatted spots appear after priming coat is dry, they must be retouched with same material.

Allow at least seventy-two hours for drying before applying succeeding coat.

This priming coat will cover approximately 750 sq. ft. per gallon on smooth plaster.

Brush out to a smooth, even finish.

Second Coat—To every gallon of Stiploid Body add 1½ pt. turpentine (or turpentine substitute) and ½ pt. Stiploid Reducer. After thorough mixing tint to desired shade using only pure colors in oil.

Finish coat should be applied freely with a full brush. If it is desired to produce a washable gloss finish no further attention is necessary.

If stippled finish is desired, allow sufficient time for proper stippling set, then stipple with standard stippling brush. The time elapsing between application of finish coat and development of proper stippling set is dependent upon ventilation and atmospheric conditions. Under normal conditions, the proper stippling set is reached within a period of twenty minutes after application.

Covering capacity of finish coat is approximately 450 sq. ft. per gallon.

Above specifications cover application on plaster, all types of masonry surfaces, composition board, etc. Use long bristle 4½-in. brushes.

Degraco Paints in General

Degraco paints are made in all colors for all purposes and complete sets of color cards and recommendations will be furnished on request.

Special data also furnished on acid resisting paints and other special coatings for unusual service conditions.

ESTABLISHED 1849

W. P. FULLER & CO.

Manufacturers of Paints, Enamels, Stains, Varnishes and Pioneer White Lead

MAIN OFFICE
SAN FRANCISCO, CAL.

BRANCHES IN THE STATE OF CALIFORNIA

FRESNO
HOLLYWOOD
BERKELEY
SANTA BARBARA
LONG BEACH
LOS ANGELES
SANTA MONICA
SAN DIEGO
OAKLAND
PASADENA
STOCKTON
HUNTINGTON PARK
SANTA ANA
SACRAMENTO
SAN BERNARDINO
GLENDALE

BRANCHES IN THE STATE OF WASHINGTON

SEATTLE
SPOKANE
TACOMA
WALLA WALLA
YAKIMA

OTHER BRANCHES

NEW YORK, N. Y.
PORTLAND, ORE.
SALT LAKE CITY AND OGDEN, UTAH
BOISE, IDAHO

FACTORIES: SAN FRANCISCO and LOS ANGELES, CAL.; PORTLAND, ORE.

Products

- Pioneer White Lead.
- Pure Prepared Paint.
- Phoenix Pure Paint.
- Silkenwhite Enamel (Gloss and Eggshell).
- Silkenwhite Undercoat.
- Fullerlite (Factory White Enamel).
- Fullerlite Primer.
- Concreta.
- Washable Wall Finish (Flat).
- Fullerglo.
- Pioneer Shingle Stains.
- Armorite Damp Resisting Paint.
- Fifteen for Floors Varnish.
- Forty for Finishing Varnish.
- Fifty for Flatting Varnish.
- Fullerwear Varnish.
- Pioneer Reinforcing Oil.

Also agents for Glass: Plate, Window or Sheet, Wire, Rough and Polished Ornamental.

Pioneer White Lead

A strictly pure, basic carbonate of lead made by the Old Dutch process of slow corrosion, a method that insures maximum density, hiding power and spreading properties. It is extraordinarily white, due to our patented process which removes all foreign material from the dry white lead before it is combined with refined linseed oil. The white lead paste is then ground between double buhr-stone mills to a degree of fineness that enables it to pass through a silk bolting cloth having 30,000 meshes to the square inch.

It is one of few leads in the United States to pass government specifications for chemical purity, whiteness, opacity and covering qualities.

Pure Prepared Paint; Phoenix Pure Paint

These paints are composed of pure white lead, pure oxide of zinc, pure linseed oil, coloring pigments and the correct percentage of dryer and thinners.

In our Pure Prepared Paint and Phoenix Pure Paint we use pure white lead to give body and elasticity; pure oxide of zinc to secure spreading capacity and hardness and pure linseed oil because it is the life of all paint. We thoroughly grind and perfectly mix the ingredients by specially devised and powerful machinery.

Fine grinding greatly increases the covering capacity, insures ease of application and admits of the use of a greater percentage of linseed oil. Thorough mixing perfectly fixes the bond between the pigments and oil, thus securing the greatest possible durability.

Directions for Using—*For Inside Work*—Add about 1 pt. turpentine to each gallon of paint for all coats.

FULLER
Since '49

TRADE-MARK

New Work, Outside Surfaces, Three Coats—*Priming*—Add about 4 pt. raw linseed oil to each gallon of paint. Dark colors will stand addition of more oil than light ones.

Second Coat—Add 1 pt. each, turpentine and raw linseed oil, to each gallon of paint.

Finishing Coat—Use the paint as put up at factory or reduce with linseed oil if necessary.

Silkenwhite Enamel (Gloss)

Our highest grade enamel for exterior and interior surfaces. Dries with a full, brilliant gloss, stays white and wears well. It has perfect flowing and leveling properties.

Silkenwhite produces a rich, beautiful enamel finish on interior woodwork. It is unexcelled for enameling walls, doors and woodwork of bathrooms. Dries hard in 72 hours and can be safely rubbed in 4 days.

Made in white, ivory and gray tints.

Covering Capacity—1 gal. covers approximately 700 sq. ft., 1 coat.

Priming Coats—Apply a lead priming coat, brush out evenly and when dry (in about 48 hours) sandpaper with No. 00 sandpaper. Fill all indentations with pure linseed oil putty, stiffened with dry white lead. When this is sufficiently dry, sandpaper smooth and dust off, after which apply 2 or 3 coats of Silkenwhite Undercoat. Allow 24 hours between coats. Flow on and brush out well. Lightly sandpaper each coat smooth and dust clean.

Finishing Coats—Stir enamel thoroughly before applying. Flow on and brush out evenly. Allow 3 days for the first coat of enamel to dry thoroughly. Then lightly sandpaper the surface of work with No. 00 sandpaper. Dust clean and follow with finishing coat of enamel.

Silkenwhite Enamel (Eggshell or Semi-gloss)

For interior woodwork and furniture. Resembles perfectly an enamel finish that has been rubbed. A very attractive velvet toned enamel, beautiful in its depth and richness. Has protective as well as ornamental value.

Made in white and old ivory. Special tints to order.

Covering Capacity—1 gal. covers approximately 700 sq. ft., 1 coat.

Silkenwhite Undercoat

A high grade, uniform, and dependable quality of flat white. Designed for use as a foundation coat for our Silkenwhite Enamels. Produces a very smooth, firm and hard surface. Has superior hiding and covering properties. Can be applied to wood, metal or plaster surfaces. Sets dust free in about 6 hours and dries hard in 24 hours.

Covering Capacity—1 gal. covers approximately 700 sq. ft., 1 coat.

Continued on next page

Fullerlite (Factory White Enamel)

For daylighting interiors. An enamel of high gloss and snowy whiteness adapted for enameling interior walls and ceilings of mills, factories, creameries, packing plants, bakeries, warehouses, washrooms and lavatories.

By its use full benefit of daytime hours may be taken advantage of indoors.

In the manufacture of Factory White Enamel research has enabled us to select and use ingredients of proved sanitary and protective value. Non-poisonous pigments are combined in correct proportions with an elastic and durable long oil varnish, producing an enamel finish that is non-absorbent and washable, also oilproof and moistureproof. Can be applied with a brush or sprayed.

Covering Capacity—Approximately 325 sq. ft., 1 coat.

Fullerlite Primer

Is especially prepared for use as a first coater for interior surfaces of concrete or brick. It is made of carefully selected pigments and an elastic, moistureproof vehicle. It spreads easily, covers perfectly and hermetically seals the surface so that the enamel will not strike in and dry flat in spots. Can be applied with a brush or sprayed.

Directions for Applying on New Concrete or Brick Walls—Clean the surfaces of walls with a steel brush and apply 1 or 2 coats of primer. Allow a reasonable time for first coat to dry before applying the second coat. When second coat of primer is thoroughly dry, apply a coat of Fullerlite. The hiding qualities of the primer and enamel are such that 1 coat of each will often be found sufficient to produce a satisfactory finish.

For spraying purposes add from 5 to 10% of gasoline to the primer.

Do not add more than 5% of gasoline to the enamel if it is to be sprayed.

Concreta

A superior quality paint made expressly for finishing exterior and interior surfaces of concrete, brick, stucco, etc. Has ornamental value as well as excellent protective and wearing properties.

Concreta covers well, adheres firmly and dries with a dull finish that resembles the texture of concrete.

Made in twelve colors, also inside and outside white.

Covering Capacity—1 gal. covers approximately 200 sq. ft., 2 coats, on a smooth surface.

Directions for Using, Brush Coat Work—Paint must be thoroughly stirred. Extreme care must be observed in the painting of concrete surfaces. Some are porous and inclined to crumble, while others are as hard as flint, demanding different treatment.

All new concrete contains a percentage of free caustic lime, which can only neutralize by aging for at least six months.

Surface of work should be dry before paint is applied. At least 48 hours should be allowed between coats.

For first coat on concrete surfaces, thin each gallon of Concreta with 1 to 2 qts. of boiled linseed oil or Pioneer Reinforcing Oil.

For second coat, thin each gallon of Concreta with 1 or 2 qts. of a mixture composed of equal parts of boiled linseed oil or Pioneer Reinforcing Oil and mineral spirits.

Dark shades, particularly dark grays, should be thinned with as much pure boiled linseed oil as possible without impairing their hiding properties. Second coat should be thinned with a mixture of 1 part pure raw linseed oil and 2 parts mineral spirits.

Directions for Spraying—For spraying it is necessary that Concreta be thinned. In order to obtain the proper consistency more mineral spirits must be added for spraying than is required for brush coat work. No definite amount of mineral spirits to be added for spraying can be given, as much depends on the type of spraying machine and pressure used.

Fuller Washable Wall Finish

A decorative, durable and sanitary finish for interior walls of plaster, metal or wall board. Dries with a velvetlike finish of very fine texture, and while resembling a water color finish, is far superior to it.

Extreme durability combined with decorative qualities make it very desirable for use in the home, hospitals, hotels and other public buildings.

Made in twenty attractive tints, also white.

Directions for Using—*Preparation of New Plastered Walls*—New walls must be thoroughly dry and hard and should not contain free lime. Fill cracks and wall imperfections with a putty made of plaster of paris and Fuller Washable Wall Finish mixed to a stiff consistency. When putty is dry, sandpaper to a smooth surface.

Sizing Coat—To obtain a reliable and satisfactory sizing coat apply a mixture of 3 parts Fuller Stopping Liquid and 1 part Fuller Washable Wall Finish. This will seal all wall imperfections. The sizing coat should be flowed on, well brushed, and laid off smooth. Allow coating 24 hours to harden thoroughly.

Finishing Coats—Apply a good flowing coat of Fuller Washable Wall Finish. Use as it comes in the can. Allow 24 hours for the first coat of finish to dry, then apply a second coat.

Fullerglo

A semi-gloss finish for walls and ceilings, but can be used with great satisfaction on woodwork.

When dry, it is remarkably tough, resists abrasion and will not easily chip.

Fullerglo is particularly useful for hallways and walls of apartment houses, banks and other public buildings, where constant use necessitates frequent washing.

Walls or woodwork finished with Fullerglo can be washed often without spoiling its satinlike finish.

Made in twelve colors, also white.

Covering Capacity—The covering capacity of Fullerglo is approximately 300 sq. ft. per gal.

Specifications for New Plaster Walls—*Preparation of the Surface*—Walls should be thoroughly dry and free from lime. Putty all cracks and wall imperfections with a putty made of plaster of paris and water mixed to a stiff consistency, or Fuller Water Putty. When dry, sandpaper smooth.

Sizing Coat on Rough or Porous Walls—Apply a coat of equal parts Fuller Stopping Liquid and Fullerglo.

Sizing Coat for Smooth, Hard Walls—Apply a coat consisting of 1 part Fuller Stopping Liquid and 2 parts Fullerglo, desired shade. Allow 24 hours to dry.

Finishing Coat—Apply a coat of Fullerglo, desired shade as it comes in the can. Many good jobs are obtained by the application of one finishing coat over the sizing coat. A second finishing coat may be applied, however, in cases where found necessary.

Painted Surfaces—Surfaces that have previously been finished with paint and in reasonably good condition may be refinished by the application of 1 or 2 coats of Fullerglo as the condition of the surface demands. If 2 coats are necessary, the first coat should be thinned about 10% with mineral spirits or pure spirits of turpentine.

After Wall Paper Is Removed—If, on removing the wall paper, it is found that the surface has not been painted, treat the same as in new work.

Pioneer Shingle Stains

Our best grade of shingle stain intended for use on shingles and all classes of rough woodwork. Made from creosote, linseed oil and special pigments selected for their preservative properties. Pioneer Shingle Stains possess superior penetrative and preservative qualities that prolong the life of shingles by retarding decay.

Manufactured in 12 colors. These are soft and mellow in tone and wear well.

Covering Capacity—For brush coat work 1 gal. will stain approximately 125 sq. ft., 2 coats. When shingles are dipped it will require 2½ gal. of stain for every 1000 shingles.

Directions for Applying (New Work)—Shingle stain should never be applied to wet or unseasoned wood. Shingles should be dipped to about 8 in. of their length and then a good brush coat applied after they are laid. Pioneer Shingle Stain must be thoroughly brushed into the pores of the wood, otherwise the wood fiber will not properly absorb it.

Continued on next page

Armorite Damp Resisting Paint

Applied to wood, metal, cement, plaster, brick, stone or concrete. Unequalled for dampproofing foundations, fresh or salt water tanks, reservoirs, flumes, swimming tanks, irrigation runways, storage and septic tanks.

Insoluble in water or acid; will not contaminate drinking water; a remarkable anticorrosive paint.

When applied to inside walls before plastering, it prevents discoloration due to moisture.

Manufactured in black only. Can be brush or spray applied.

Covering Capacity—1 gal. covers approximately 150 sq. ft. on smooth metal; on rough concrete 1 gal. covers approximately 50 sq. ft.

Directions for Applying—***Dampproofing Basement Walls***—*Outside*—Apply 2 coats Armorite on outside walls. Brush the paint well into the pores of the cement. The first coat should be thinned about 25% with mineral spirits.

Inside—Apply 2 coats Armorite on the inside walls, brushing the paint well into the pores of the cement. One coat Dekorato or Fuller Hot Water Kalsomine, color as selected.

Dampproofing Concrete Walls—Apply 2 coats Armorite on the outside wall of concrete [brick] under the stucco [brick] facing, brushing well into the pores of the surface.

Fifteen for Floors Varnish

This varnish combines the qualities of quick drying, toughness, durability, beauty of finish and resisting qualities to hot or cold water. In wearing quality it is unsurpassed. Dries dust free in 4 hours and hard overnight. May be rubbed or polished. Three coats of varnish are advised as specified below for best work; very satisfactory results may be obtained with 2 coats.

Specifications—Floor shall be sanded smooth and in a proper condition to be finished.

Apply 1 coat Fuller Oil Wood Stain, color as selected, for close grained woods; or 1 coat Pioneer Paste Filler, color as selected, for open grained woods.

Three coats (or 2) Fifteen for Floors Varnish (or Fullerwear Varnish) thinning first coat with 10% pure turpentine.

After staining, knife putty all holes, coloring putty to match wood; sand between coats.

The last varnish coat shall be: (1) left in the natural gloss, or (2) rubbed to an eggshell finish with pumicestone and oil, or with steel wool for less expensive work.

For a natural finish, omit stain coat for close grained woods; use Pioneer Paste Filler, natural, for open grained woods.

Forty for Finishing

This is W. P. Fuller & Co.'s highest quality of interior varnish. Dries with a fine natural gloss, dust free in 4 hours and may be rubbed or polished in 2 or 3 days.

Specifications for Staining and Varnishing Standing Woodwork—Wood shall be sanded smooth and in a proper condition to be finished.

Apply 1 coat Fuller Oil Wood Stain, color as selected, for close grained wood. For open grain wood apply stain as above, followed by 1 coat Pioneer Paste Filler, color to match stain. Three coats Forty for Finishing Varnish. For a less expensive job apply 2 coats of varnish instead of 3.

After staining, knife putty all holes, coloring putty to match wood; sand between coats. Shellac knots and sappy places after staining.

The last coat shall be: (1) left in the natural gloss, or (2) rubbed to a dull finish with pumicestone and water, or (3) rubbed to an eggshell finish with pumicestone and oil.

On all window mouldings and sills, around washbowls and kitchen sinks substitute Fullerwear Varnish for the last 2 coats of Forty for Finishing.

Fifty for Flatting Varnish

Produces a soft, semi-gloss finish, imitating with accuracy the effect of a rubbed varnish, thereby saving the expense of rubbing. It is not a wax varnish and will not mar or scratch white and is highly satisfactory for floors or standing woodwork. Dries dust free in 3 hours and hard overnight.

Specifications for Flat Finish Standing Woodwork—Wood should be sanded smooth and in proper condition to be finished. Apply 1 coat Fuller Oil Wood Stain, color as selected for close grain woods. For open grain woods apply stain as above followed by 1 coat Pioneer Paste Filler, color to match stain. Then apply 1 or 2 coats of shellac or Fuller Elastic White Rubbing Varnish. For the finishing coat apply Fifty for Flatting Varnish. After staining, knife putty all holes, coloring putty to match wood; sandpaper smooth between coats. Shellac knots and sappy places after staining. If used on floors, apply over a first coat of Fullerwear or Fifteen for Floors Varnish.

Fullerwear Varnish

Fullerwear Varnish is a spar varnish, remarkably tough and water resistant. It is designed for use on either exterior or interior surfaces. It will not turn white with either hot or cold water, or on continued exposure in damp weather.

Fullerwear Varnish is also an ideal varnish for floors and may be substituted in the specifications for Fifteen for Floors Varnish. It should also be specified on such surfaces as window sills and woodwork in bathrooms and around kitchen sinks which are subject to what practically amounts to exterior exposure or frequent splashings of soapy water.

Specifications—Wood shall be sanded smooth and in proper condition to be finished. Apply 1 coat Fuller Oil Stain of desired color; 1 coat Pioneer Paste Filler, color to match stain. (Filler should be omitted on close grain woods.) Finish with 1 or 2 coats of Fullerwear Varnish. After staining, knife putty all holes, coloring putty to match wood; sand smooth between coats.

The last coat shall be left (1) in the natural gloss or (2) rubbed to an eggshell finish with pumicestone and oil.

Pioneer Reinforcing Oil

This is designed as a reinforcing agent for use with linseed oil or linseed oil paints. It strengthens and increases the waterproofing qualities of the film of which it is a part, thereby adding considerably to its usefulness, life and durability. It is also a safe dryer and is particularly useful to add to linseed oil paints that are to be applied during damp or humid weather.

Wherever linseed oil may be used, it will be found that a mixture of equal parts Pioneer Reinforcing Oil and raw linseed oil will give most satisfactory results. It is recommended for use extensively for thinning ready-mixed paints for priming coats on wood, plaster or cement surfaces. It will successfully meet the requirements of railroads and other industries where quick drying qualities with maximum elasticity and durability are required.

Plate Glass

We are agents on the Pacific Coast for the Pittsburgh Plate Glass Co., largest manufacturers of plate glass in America, and we carry at all points large stocks and are equipped to handle any orders of plate glass for all building purposes.

Window or Sheet Glass

All sizes of single and double thick window glass of the best manufacture are stocked. We are able to fill any order for full box lots on short notice, as well as to contract for furnishing and glazing any glass required for building purposes.

Wire Glass—Rough and Polished Ornamental Glass

We handle the product of the Mississippi Wire Glass Co. of New York, and stock their glass at all points. Prompt delivery of any specification can be made.

ESTABLISHED 1888

GOHEEN CORPORATION

OF NEW JERSEY

NEW YORK OFFICE
331 Madison Avenue

FACTORY
NEWARK, N. J.

Paint Engineers

Makers of Paints, Dampproofing, Waterproofing

NEWARK, N. J.

Products

GOHEEN'S PAINT PRODUCTS, including Protective Coatings for iron and steel; Interior and Exterior Wood Paints and Enamels; Dampproofings and Waterproofings for concrete and masonry surfaces; Concrete Floor Paints and Hardeners; Canvas Waterproofings; Wood Floor Preservatives; Shingle Stains.

GOHEEN CORPORATION
OF NEW JERSEY
PAINT ENGINEERS
SINCE 1888

TRADE-MARK

Facilities and Quality of Products

To meet the requirements of industrial corporations, manufacturers and architects, Goheen's paints are manufactured in a strictly paint engineering manner. They are based upon scientific principles to give the desired result on the surface for which the specific product is to be used.

As Paint Engineers, the GOHEEN CORPORATION of New Jersey are glad to act as Consulting Engineers to architects and engineers on their paint products.

Galvanum

Galvanum, on the market since 1888, is noted for its ability to adhere to galvanized iron. The process of galvanizing leaves a film of basic zinc chloride upon the metal, which prevents ordinary paint from forming a perfect bond and causes it to peel and blister. The use of Galvanum eliminates the necessity of washing the metal with solutions to neutralize this acid film, or of allowing the metal to weather before painting.

Galvanum
FOR GALVANIZED IRON
TRADE MARK

Applied with brush or spray directly to new or old galvanized iron without the use of a primer. Two coats of Galvanum are all that are necessary for the average job. On some jobs a single coat is sufficient. Covering capacity, about 600 sq. ft. per gal.

Carbonizing Coating

An inhibitive and protective coating for iron and steel with a perfect chemical combination between pigment and vehicle. It is chemically combined, not mechanically mixed. Remarkable elasticity and durability. Carbonizing Coating will give from 7 to 10 years' service under normal conditions. Covers about 1000 sq. ft. per gal., reducing cost far below the ordinary metal coating, and at the same time doubling the service given. Has the same co-efficient of expansion as the metal, dries uniformly throughout and is less liable to peel. Withstands the action of salt air, gases and chemical mill fumes. A non-conductor of electricity, will not re-act with the steel and prohibits electrolytic action.

CARBONIZING COATING
TRADE MARK
FOR IRON AND STEEL

Fume Proof Mill White

Unlike other mill whites, Goheen's Fume Proof Mill White is made to meet abnormal conditions. Due to the exclusive feature of its manufacture, it is especially recommended for use where there are excessive acid fumes. Covering capacity, about 400 sq. ft. per gal.

Thermokote

A paint for stacks and hot surfaces that will withstand a temperature of 700° F. Free from coal tar or asphalt. Covering capacity, about 700 sq. ft. per gal.

THERMOKOTE
A GOHEEN PRODUCT
A PAINT FOR ALL HOT SURFACES
TRADE MARK REGISTERED

Concrewaltum

A paint for dampproofing and beautifying all concrete, brick and masonry surfaces. Prevents efflorescence and staining of walls. Where used on concrete floors, it prevents dusting and sanding of the surface and presents a neat and clean appearance. Particularly recommended for use on concrete floors which have been treated with a chemical floor hardener, such as Goheen's Rockote. Covering capacity, about 275 sq. ft. per gal.

CONCREWALTUM PAINT
(TRADE MARK)

Goheen's Highway Red

A chemically combined red lead paint which has a spreading capacity of 800 sq. ft. per gal. and spreads freely and smoothly, giving a very uniform coat throughout. The base of Highway Red is pure red lead, combined with certain inert materials that combine with the vehicle and lead to prevent the red lead from separating and settling to the bottom, and which accounts for its large spreading capacity and uniform coating.

HIGHWAY RED
TRADE MARK
A CHEMICALLY COMBINED RED LEAD PAINT

Highway Red is a product combining all of the merits of red lead without its deficiencies.

Goheen's Old Honesty

Recommended where the highest grade paint for exterior and interior wood surfaces is desired. A combination of lead, zinc and linseed oil and is recommended particularly where a high grade outside white is desired. Made in all colors. Covering capacity, 600 to 700 sq. ft. per gal. under normal conditions.

Old Honesty
TRADE MARK
FOR ALL WOOD SURFACES

Goheen's Flat Wall Finish

A sanitary, washable flat paint which dries with a rich velvet effect. Covers 600 sq. ft. per gal. Hides in 1 coat.

GOHEENS
FLAT WALL FINISH
TRADE MARK

Other Products

Also a complete line of paints, enamels, waterproofing compounds, etc., meeting the requirements of all large buildings, industrial and public utilities. Literature and color cards supplied on request.

THE HOCKADAY COMPANY

Manufacturer of Interior Wall Paints

MAIN OFFICE AND FACTORY
1823 Carroll Avenue
CHICAGO, ILL.

BRANCHES

DETROIT, MICH. ATLANTA, GA. NEW YORK, N. Y. LOS ANGELES, CAL.
MINNEAPOLIS, MINN. MILWAUKEE, WIS. SAN FRANCISCO, CAL. OKLAHOMA CITY, OKLA.
INDIANAPOLIS, IND. CLEVELAND, OHIO BOSTON, MASS. DENVER, COLO.
WATERLOO, IOWA PHILADELPHIA, PA. HOUSTON, TEXAS

REPRESENTATIVES

BALTIMORE, MD., Colonial Distributing Co.
WASHINGTON, D. C., W. R. Winslow
CINCINNATI, OHIO, Doermann-Roehrer Co.
NEW ORLEANS, LA., The Baldwin Co.
SEATTLE, WASH., D. E. Fryer & Company

Products

Hockaday; a Semi-gloss Wall Paint.
Hockaday "Mill-White."

Hockaday

Hockaday is a non-porous interior paint that can be repeatedly washed. Hockaday comes in two parts: body—a paste; and reducer—a liquid.

Hockaday's Ten Exclusive Features—

(1) No lime burning. The binder (the liquid that binds the particles of pigment together and holds them to the wall) is the only binder that lime in plaster will not burn and destroy. The action of lime is neutralized and entirely overcome. It works the same on old as well as on new walls.

(2) No air checks. Both coats are the same. They have the same rubbery-like elasticity, therefore, unlike paints where different undercoat is used, they contract and expand together.

(3) No peeling: applied according to our instructions, Hockaday will not peel.

(4) No size or primer used: Hockaday is complete in itself.

(5) Only two coats required. The foundation coat, which is also a color coat, seals the pores and stops all suction. New work in white takes three coats. Only two coats are required in colors on new work and previously painted white. The elimination of size often saves one-third material and one-third labor.

(6) Easier to apply: Hockaday levels itself. Our instructions read: "do not brush out—flow on." This may not appear to be a major advantage, but it is. Hockaday takes less time to apply. A painter can turn out more squares a day.

(7) Spreads further. Careful tests over a period of years, under varied conditions, prove this. Hockaday can be relied upon to spread 10 to 15% further than any gloss or semi-gloss paint that we know of.

(8) Really washable. When washing is mentioned "sponging off" is not implied. Hockaday is washable. Repeated washings do not mar its original beauty. Hockaday is non-porous. Microscopically it seals the wall within an enamellike finish.

A washed Hockaday wall looks clean—yes, and it is clean. There are no pores for lurking bacteria to lodge. Hospitals especially like this sanitary feature.

(9) Lasts longer. As time is reckoned, ten years is not long. But as the life of paint is figured, ten years is a century. Hockaday will give ten years' service. Hundreds of jobs bear testimony to Hockaday's flippant scoff at time.

(10) Brings down up-keep: Hockaday will cut down maintenance cost. One building manager accurately figured Hockaday's maintenance cost for ten years at .0025 a sq. ft.

Hockaday as an Undercoater for All Finishes—When nationally known decorators—such as Mandel Brothers of Chicago—standardize on Hockaday as a first coater, they must have good reasons. And they have—profit-increasing reasons.

Hockaday takes the gamble out of interior painting. You can size with Hockaday, knowing that the greedy hands of those old profit-robbers—air checking, suction and lime burning—can not reach you.

One coat of Hockaday applied as directed with one coat of any material applied over it will produce a more even and better job. The finish coat will stand out far better—and last longer—than would one coat of cheap size and two coats of any kind of material.

Architects' Specification

It is recommended that this specification be incorporated by architects in their specification of Hockaday. Its use will do two things: make certain that Hockaday is used; assure best results.

Note: Wherever the word "Hockaday" is mentioned in this specification, it shall be the trade-marked product manufactured only by The Hockaday Company of Chicago, and shall consist of a foundation and finish coat as recommended by the manufacturers. Hockaday is to be delivered in unbroken original containers.

Application—All plastered surfaces are to be given two coats (white and No. 111 take three) of Hockaday.

Hockaday is to be applied under the supervision of a Hockaday representative in strict accordance with the manufacturer's printed specification. Said manufacturer's specification (attached) is made a part of this specification. The painter must follow it without any deviation.

Positively no thinner other than the Reducer supplied by The Hockaday Company is to be used.

The application of glue or any size, before or between coats, on new or old surfaces, is strictly prohibited.

Stippling—The mixture should be a trifle heavier than material used for brush coat finish. Let stand 20 to 30 minutes until tacky. Stipple in a straight-across movement.

Optional—The following paragraph is optional. If you consider it advisable, it should be included. It is taken in part from the Government specification of Hockaday:

"Two coats, without a size, must produce a surface of such a nature that air cracks, water stains, suction spots, and lime burns must be overcome and from which defacements, caused by grease, ink, match scratches, or pencil marks, may be easily removed by the use of soap and water or an abrasive washing compound, without injury to the paint surface."

Hockaday "Mill-White"

All of the ten exclusive features of Hockaday apply to "Mill-White."

Hockaday "Mill-White" can be used throughout a textile mill without a special size or undercoat. Moisture and dampness do not affect it. Extensively used in cold storage plants.

Our Service

Tell us when Hockaday is specified so that our Service Department can supervise the painting. Let us send you "Paint Mileage" and "Solving Your Painting Problems."

INDUSTRIAL PAINT COMPANY

1941 Oliver Building, PITTSBURGH, PA.

BRANCH OFFICES

NEW YORK, N. Y.	PHILADELPHIA, PA.	CHICAGO, ILL.	ST. LOUIS, MO.	ST. PAUL, MINN.
52 Vanderbilt Avenue	1505 Race Street	3135 So. Central Park Avenue	Laclede-Merchants Building	Endicott Building

TRADE-MARK REG. U. S. PATENT OFFICE

Nocoro

NON-CORROSIVE

THE PERFECT ANTI-RUST PAINT

Products

"Nocoro," the ideal Shop Coat. Also, Special Second Coats.

"Nocoro"

"Nocoro" is an anti-corrosive paint which insulates steel and iron against electrolytic or galvanic action. "Nocoro" prevents corrosion because of its scientific composition of pigments such as lead chromate, willow charcoal, zinc chromate, chemically pure iron oxides. These pigments are incorporated into a vehicle consisting of linseed oil, chinawood oil and varnish gums (heat treated) by virtue of which "Nocoro" dries with a nonporous film making penetration of moisture virtually impossible. The pigments are inhibitive and nonconductors of electric current. The vehicle is waterproof.

In addition to its anti-corrosive qualities "Nocoro" is non-saponifiable and effects a perfect bond between concrete and steel, for which reason it is specified by many architects and engineers for the shop coat on structural steel ultimately to be embedded in concrete.

393 Seventh Avenue Building, New York, N. Y. (18,000 Tons)

Starrett & Van Vleck, Architects
Purdy & Henderson, Engineers
Thompson-Starrett, General Contractors
Shop coat, Red "Nocoro"; field coat, Special 2nd Coat Black

For Buildings

Shop coat, brown "Nocoro." Field coat, special 2nd-coat black.

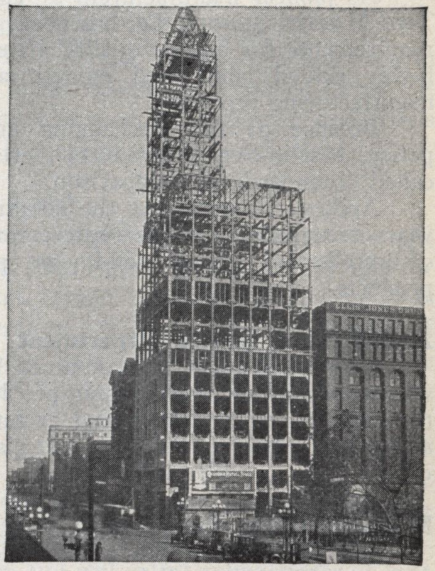
Our special second coats are manufactured in any color desired. Detailed information on pages 22 and 23 in our "Nocoro" book.

For Industrial Plants

"The perfect protective and light producing combination." See "Nocoro" book, pages 20 and 21. Shop coat, brown "Nocoro." Field coat, special 2nd-coat inside gray.

For Bridges, Transmission Towers, etc.

Shop coat, brown "Nocoro." Field coat, special 2nd-coat outside gray.



Columbia Mutual Tower, Memphis, Tenn.

Boyer & Baum, St. Louis, Mo., Architects
Shop coat, Brown "Nocoro"

"Nocoro" Protected Structures

Steel work, New Philadelphia Subway.

Roosevelt Hotel, New York, N. Y., Geo. B. Post, Architect—12,000 tons.

U. S. Mail Terminal Building, Chicago, Ill., Graham, Anderson, Probst & White, Architects—7,000 tons.

Lehigh Coal & Navigation Company's Coal Breaker, Coaldale, Pa.

Putnam Building, Davenport, Iowa, Graham, Anderson, Probst & White, Architects.

Wisconsin Steel Company, Open Hearth Plant, South Chicago, Ill.—6,000 tons.

Inland Steel Company, Open Hearth Plant, Indiana Harbor, Ind.

Thermit & Metal Corporation, Pittsburgh, Cal.

International Nickel Company, Huntington, W. Va.

Pennsylvania-Detroit R. R. Freight House, Detroit, Mich.

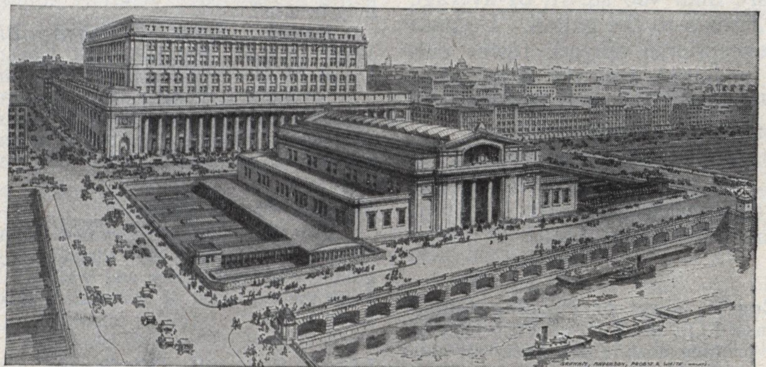
St. Paul Union Station, St. Paul, Minn.

H. J. Heinz Spaghetti Building, Pittsburgh, Pa., Hunting & Davis Co., Architects.

Apartment Building, 277 Park Avenue, New York, N. Y.—10,000 tons.

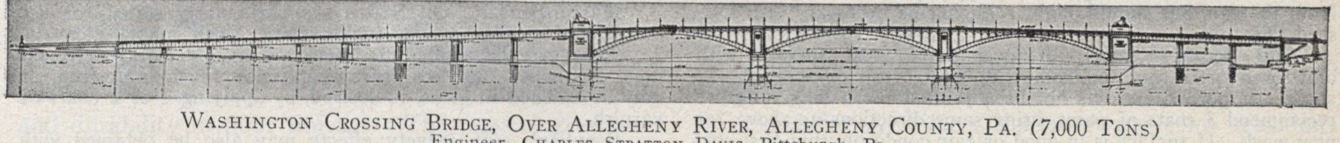
Wheeling Steel Corporation, Wheeling, W. Va.

Railroad Bridges, Great Northern, Northern Pacific and Western Maryland Railroads.



Chicago Union Station, Chicago, Ill.

Graham, Anderson, Probst & White, Architects   J. D'Esposito, Chief Engineer
Including Mail Terminal Building, 24,000 tons



Washington Crossing Bridge, Over Allegheny River, Allegheny County, Pa. (7,000 Tons)

Engineer, Charles Stratton Davis, Pittsburgh, Pa.
Shop coat, Red "Nocoro"; first field coat, Brown "Nocoro"; second field coat, Black "Nocoro"

The new Sixth, Seventh and Ninth Street Bridges over the Allegheny River, Pittsburgh, painted with Brown, Red and Green Nocoro

THE MARTIN-SENOUR CO.

Pioneers of Pure Paint

2520 Quarry Street
CHICAGO, ILL.

FACTORIES
CHICAGO LINCOLN BROOKLYN LOS ANGELES SAN FRANCISCO DALLAS HOUSTON

Products

Manufacturers of a complete line of Paints, Stains, Enamels, Enamel Undercoaters, Fillers, Concrete Finishes, Wood Preservatives, Waxes, etc.

Quality Standards

As pioneer manufacturers of *pure* paint, The Martin-Senour Co. has always maintained rigid requirements for highest quality materials, efficient and highly skilled labor, and modern and individualized manufacturing processes.

Because of this unchanging and never varying policy, Martin-Senour products therefore can be truly called "Standards of Comparison."

Architects throughout the country have for many years recognized them as representing the very "peak of excellence" among well-known paint and varnish products.

Architectural Service Department

This department is maintained to assist in every way with painting and finishing problems. It welcomes the inquiries of architects and architectural engineers, and expert advice is promptly and gladly given without charge.

Monarch 100% Pure Paint

For painting exterior and interior wood surfaces, Monarch 100% Pure Paint is above comparison. Containing only Pure Carbonate of White Lead, Zinc Oxide, Linseed Oil, Turpentine and Drier scientifically combined by the most efficient and modern type of machinery, Monarch 100% Pure Paint covers better, spreads farther and lasts longer than adulterated paint.

MONARCH
100% PURE PAINT
The Martin-Senour Company
CHICAGO
MONTREAL
OW

Monarch 100% Pure Paint will cover more than 400 sq. ft. of average surface, 2 coats to the gallon. Because of this exceptional spread, fewer gallons are required and the total paint material cost will be lower, resulting in maximum value at minimum cost.

Inerts, extenders or substitutes for White Lead and Zinc Oxide in any quantity cut down coverage, spread and life of paint. There are absolutely none of them in Monarch 100% Pure Paint.

Directions—

New Work (Three Coats)—***First or Priming Coat***—Thin with ½ gal. of pure Linseed Oil and 1 pt. of Turpentine to each gallon of paint. After priming coat is dry, putty all nailholes, cracks and crevices with Martin-Senour's Absolutely Pure Putty.

Second Coat—Add 1 pt. of Turpentine to each gallon of paint.

Third or Finishing Coat—Apply paint just as it comes from the can, but should slight reducing be necessary, use Linseed Oil only.

Old Work—Remove all loose paint from surface with blowtorch or, if not too bad, with steel brush or scraper. If surface is porous and has not been painted for a long time, we recommend 3 coats of paint, using same directions as above for new work. If surface is in good or fair condition, thin first coat with 1 pt. of Turpentine and 1 pt. of pure Linseed Oil to each gallon of paint.

Second or Finishing Coat—Apply paint just as it comes from the can.

Note: The foregoing directions will cover the average conditions in painting. Remember that 2 thin coats brushed well into the surface are better than 2 thick coats.

Exterior Wood Surfaces and Shingles

For preserving exterior wood surfaces without hiding the grain of the wood, or where shingles are to be stained for beautifying and preserving them, Martin-Senour's Shingle Stain can not be excelled.

Martin-Senour's Shingle Stain is a scientific combination of coloring matter, wood preserving oils and creosote.

Martin-Senour's Shingle Stain is made in the following permanent colors: Light Brown, Light Green, Cherry, Red, Medium Green, Dark Brown, Dark Green, Black, Yellow and Maroon.

Because of the preserving qualities of Martin-Senour's Shingle Stain, the wood and shingles are protected against the elements, decay germs and boring insects.

Neu-Tone Flat Wall Paint

Neu-Tone is a washable, sanitary, flat, interior decorative wall paint. It is manufactured in 16 attractive colors that blend and harmonize artistically with any interior color scheme. It is easy to apply, will not show brush marks or laps and dries with a beautiful velour finish.

Neu-Tone will cover 300 to 350 sq. ft., *two coats to the gallon,* over treated plaster surfaces, and 350 to 400 sq. ft., *two coats to the gallon,* on metal ceilings, etc.

Neu-Tone Service Department—This department is composed of thoroughly trained technical paint men and artists who are able to offer the architect the full benefit of both the practical and artistic side of their knowledge and experience.

Color combinations, recommendations and specifications will be gladly given on request.

NEU-TONE
FLAT INTERIOR PAINT
679 FRENCH GRAY
The Martin-Senour Company

Directions—***Hard Troweled Walls***—First Coat: Fill all nailholes, cracks and crevices with Plaster Paris. If needed, reduce in a proportion of 1 gal. of boiled Linseed Oil to each gallon of Neu-Tone. Apply liberally with a wide flat bristle brush and allow 18 to 24 hours to dry.

Second and Third Coats: Apply material as received in the can. However, if thinning is necessary, a small amount of Turpentine may be used.

Rough, Sand Finished Plastered Walls—(New Work)—First Coat: Apply 1 coat of Martin's Sizing Varnish and allow to thoroughly dry.

Second and Third Coats: Apply Neu-Tone just as it comes from the can, allowing 18 to 24 hours to completely dry between each coat. Should thinning be necessary, reduce with a small amount of Turpentine.

Eureka Paste Filler

For filling all open grained hardwoods, Eureka Paste Filler dries hard and does not shrink. It is made in light, dark and golden oak, mahogany and walnut. It is scientifically prepared from the very best of materials and will always give the greatest satisfaction.

Martin-Senour's Oil Stain

Martin-Senour's Oil Stain is an exceptionally high quality product that meets fully the exacting requirements of the discriminating architect for a stain of this kind.

Martin-Senour's Oil Stains are particularly suited for use on all close-grained woods such as pine, birch, maple, etc.

They may be applied to interior trim, exterior porch ceilings, etc., where an Art Craft or Mission finish is desired, or may be finished in gloss, if desired, by applying 1 or 2 coats of varnish.

Beautiful, soft, velvety effects may also be obtained with Martin-Senour's Oil Stain by applying one coat of varnish and Martin-Senour's Floor Wax.

McDOUGALL-BUTLER CO., INC.

Manufacturers of Varnishes, Enamels, Paints, Colors and Stains

MAIN OFFICE AND FACTORY
Evans, Water and Norton Streets
BUFFALO, N. Y.

NEW YORK BRANCH, 10 Christopher Street
CHICAGO BRANCH, 1141 Madison Street

Products

The McDougall-Butler line of Varnishes, Enamels and Paints includes:

MATTONA FLAT WALL FINISH
MATTONA SEALER
ZANZITE ENAMEL and UNDERCOAT
COLORS IN OIL
FLOOROLEUM FLOOR VARNISH
FLATVAR VARNISH
PERMANITE WOOD FINISH
UTILIVAR VARNISH
ECOLITE (GLOSS AND FLAT) WHITE
BUFFALO QUALITY HOUSE PAINT
BUFFALO QUALITY SEMI-PASTE WHITE

Also Concrete and Cement Paint, Oil Stains, Structural Steel Paints, etc.

Mattona Flat Wall Finish

Mattona Flat Wall Finish is an oil paint which dries with a soft, rich, flat finish. It may be used on plaster and cement walls or over wall-paper, burlap, or other coverings. Mattona may also be successfully applied to metal ceilings and wainscotings, interior woodwork and radiators. The Mattona finish will withstand repeated washing.

Mattona is manufactured in white and 20 pastel shades that master painters and interior decorators highly commend.

Mattona Sealer, a varnish wall size, is recommended as a first coater for surfaces to be finished with Mattona.

Zanzite Enamel and Undercoat

Zanzite, the *"lily among enamels,"* provides a finish comparable to the oldest and finest porcelain. It is extremely elastic and made in three shades—white, ivory and gray; and in two finishes—gloss and eggshell.

The Zanzite finish will retain its original tone. It may be rubbed to eggshell or dull finish with pumice stone and water 72 hours after application.

Zanzite Enamel Undercoat for foundation coats completes the Zanzite group.

Colors in Oil

McDougall-Butler Colors in Oil for tinting purposes are made from selected pigments finely ground in pure linseed oil. They excel in strength, tone and uniformity.

Flooroleum Floor Varnish

A varnish as clear, clean and hard as Chinese amber. Flooroleum gives the maximum toughness, lustre and durability in floor finishes. The natural gloss may be rubbed to a beautiful dull finish if desired. It will not mar white and is indifferent to thorough scrubbing with soap and water. By using Flooroleum on hardwood floors treated first with McDougall-Butler Whitelex Paste Wood Filler, effects can be produced which have the flavor of originality and unusual beauty.

Flatvar Varnish

Flatvar is a tough durable varnish which dries with a velvety eggshell finish resembling a rubbed effect. It may be used on either new or old work over undercoats of gloss varnish. It contains no wax or pigment.

Permanite Wood Finish

Permanite is an ultra-durable varnish of the old school, long oil and fossil gum variety, for all interior work in public and private buildings where quality is the prime consideration. The richness and depths of mahogany and walnut can best be brought out by the use of Permanite Wood Finish. Permanite can be rubbed and polished.

Utilivar Varnish

Utilivar is an unexcelled, every purpose, clear varnish. It is adapted for both interior and exterior use, does not turn white, and will withstand extremes of heat and cold without stint. Utilivar dries dust free in three to four hours and dries hard over night.

Ecolite (Gloss and Flat) White

Ecolite echoes light. It is a white enamel paint made in gloss and flat effects for use in offices, schools, hotels, mills, factories, laundries, bakeries, dairies, hospitals and other institutions.

Department for Architects and Engineers

We maintain a consulting laboratory in charge of chemists experienced in research work on behalf of architects. Our policy is to avoid rawness and crudity in paints and to work for mellowness, harmony and reliability.

We place our staff and plant at your command—make us your paint and varnish advisory board.

Note: Color cards illustrating the McDougall-Butler products in which you are interested will be sent on application. Correspondence relative to prices and other information is solicited, and should be addressed to us at Buffalo, N. Y.

Directions for Using

Directions for the use and application of McDougall-Butler Products are printed on every package.

Send for Architects' folder giving color selections and suggested specifications.

MONROE, LEDERER & TAUSSIG

Manufacturing Specialists of Enamels and Undercoatings

606-608 American Street, North
PHILADELPHIA, PA.

Products

Moleta Flat White for interior use.

Moleta White Enamel (Flat and Gloss) for interior and exterior use.

Moleta White Enamel (Eggshell).

TRADE-MARK

Moleta Flat White Finish

Moleta Flat White is a washable oil paint for use as a finishing coat for interior work only where a flat effect is desired and as an undercoater for enamel work.

When used as a finishing coat Moleta Flat White will be found to be very durable, and when properly treated may be washed repeatedly without fear of injury. It is furnished in white only but can be colored to any tint desired. With a minimum amount of material Moleta Flat White will produce a beautiful flat finish, the number of coats necessary depending upon the condition of the surface to be painted and the effect desired.

Moleta
White Products
Flat White
for INTERIOR USE ONLY
Manufacturers
Monroe Lederer & Taussig
Phila. Pa.
U.S. Standard
1 Gal.

Moleta Flat White Container

Covering Capacity—Under ordinary conditions Moleta Flat White will cover approximately 600 sq. ft. to the gallon on plaster and 500 sq. ft. to the gallon on wood, 1 coat.

Specifications for Applying Moleta Flat White

On Wood—All surfaces must be sandpapered smooth and free from grease and dirt. Knots and sappy places shall be shellacked before painting and nailholes puttied after first coat.

First Coat—Thin 1 gal. of Moleta Flat White (tinted to suit) with ⅛ gal. of pure raw linseed oil. Apply and allow to dry for 24 hours.

Second Coat—Apply a coat of Moleta Flat White as it comes from the can (tinted to suit). When thinning is necessary, use pure turpentine. Let dry for 24 hours.

Third Coat—Same as second coat.

On Plastered Surfaces—New plaster surfaces must be thoroughly dry. All cracks and holes in wall surfaces shall be filled with plaster of paris and allowed to dry.

Apply a priming coat made of 3 parts of wall size and 1 part of Moleta Flat White. Let dry for 24 hours.

Second and third coats to be Moleta Flat White (tinted to suit) as it comes from the can. If thinning is necessary dilute with pure turpentine.

Moleta White Enamel

This is a very durable and high grade pure white zinc enamel for use on the finest interior and exterior surfaces.

It is remarkably elastic, at the same time being so tough, that, when thoroughly dry, it will bend or dent with the material it covers, without cracking. Repeated washings do not affect it and it is impervious to the action of acids or the weather.

Moleta White Enamel should be used with Moleta Flat White as an undercoating to give the best results.

Moleta White Enamel is very easy to apply and never shows a brush or lap mark no matter at what point or how often the work is started or stopped.

Moleta
White Enamel
Gloss
for INTERIOR or EXTERIOR
Manufacturers
Monroe Lederer & Taussig
Phila. Pa.
U.S.A.
U.S. Standard
1 Gal.

Moleta White Enamel Container

Covering Capacity—It covers approximately 500 sq. ft. to the gallon, 1 coat.

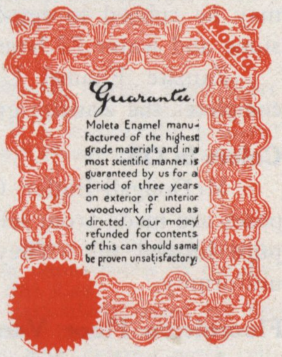
Enamel Work Specifications

Before applying see that the surface is thoroughly dry, free from dirt and grease, sandpapered smooth and all loose matter entirely removed.

On New Woodwork—First give a thin coat of shellac. When dry, sandpaper lightly and apply 1 coat of Moleta Flat White to which has been added 1 pt. pure linseed oil to the gallon of flat. Then apply 2 or more coats of Moleta Flat White Undercoat as it comes from the can. Finish with 2 or more coats of Moleta White Enamel, each coat to be rubbed down lightly with pumice or the finest sandpaper. Where gloss finish is desired omit rubbing on final coat.

On Metal Surfaces—Same as specifications for woodwork, except for eliminating the linseed oil.

On Plaster Surfaces—Wall surfaces to be prepared as described in specifications for Moleta Flat White. Then apply 2 coats of Moleta Flat White as undercoats and 2 coats of Moleta Enamel, proceeding as in specifications for wood.



Guarantee

Moleta Enamel manufactured of the highest grade materials and in a most scientific manner is guaranteed by us for a period of three years on exterior or interior woodwork if used as directed. Your money refunded for contents of this can should same be proven unsatisfactory.

The Moleta Guarantee on Each Can

ESTABLISHED 1883

BENJAMIN MOORE & COMPANY

Manufacturers of High Grade Paint Products

231 Front Street
BROOKLYN, N. Y.

FACTORIES

NEW YORK, N.Y. CHICAGO, ILL. CLEVELAND, OHIO CARTERET, N. J. ST. LOUIS, MO. TORONTO, CAN.

TRADE-MARK

Products

Complete line of PAINTS, ENAMELS and WALL FINISHES, including such specialties as: SANI-FLAT, MOORAMEL, MURESCO, IMPERVO SURFACER.

Also Varnishes for all purposes.

Sani-Flat

A washable flat oil paint for interior use. Manufactured in white and 20 beautiful shades, which may be intermixed to obtain modifications of the standard colors It is durable, and when properly cleansed may be washed repeatedly without fear of injury. It will produce a beautiful flat finish with a minimum amount of material, the number of coats necessary to obtain a satisfactory finish depending upon the condition of the surface.

Sani-Flat, ordinarily, will cover an average of approximately 600 sq. ft. to the gallon on plaster surfaces, and 500 sq. ft. on wood surfaces.

Specifications—*New Plastered Walls and Ceilings (Smooth Plaster)*—Large breaks and patches should be attended to by a competent mason before any painting is attempted.

Cracks—Cut out all cracks that are of any importance in a V-shape, so that the point of the V is on the surface and the widest part inside the plaster body. This will prevent the filling from coming out. Dampen the cracks thoroughly with water before puttying with a stiff mixture of plaster paris and Sani-Flat. The Sani-Flat in this mixture to be of the same color as used for the finishing coat.

Sizing—When this has thoroughly dried, paint the entire wall or ceiling with a size made of 1 part of Impervo Surfacer and 1 part of Sani-Flat of the same color as finishing coat, to which mixture add 1 pt. of linseed oil to the gallon.

Second Coat—This should be Sani-Flat of the desired shade, thinned with 1 pt. of linseed oil to the gallon of paint.

Third Coat—This should be straight Sani-Flat of the desired shade, used as received in the package.

If a stippled or rough finish is desired, a heavy coat of Sani-Flat should be flowed on and allowed to partially set, when it should be pounced with a stippling brush. Stippling brushes should be kept clean by frequent washing in a suitable petroleum spirit or other solvent.

A SANITARY
SANI-FLAT
FLAT OIL PAINT
PURE WHITE
Benjamin Moore & Co.

SANI-FLAT CONTAINER

It is important that each coat of paint should thoroughly dry before applying subsequent coats. Ordinarily, Sani-Flat will dry thoroughly in 24 hours. Atmospheric conditions may necessitate a longer time.

Mooramel

An oil enamel of beautiful whiteness and permanence of color, which can be used for both interior and exterior decoration, and which may be tinted to any desired shade by the proper addition of color. Mooramel works easily, flows out freely and dries with a high luster, which may be rubbed when an eggshell finish is required. Will not yellow perceptibly with age, will hold its luster and will not alligator, check or crack.

Specifications—On new wood such as maple, birch, whitewood, etc.

Priming Coat—Moore's White Enamel Underbody to which has been added 1 pt. of linseed oil to the gallon.

Second Coat—Moore's White Enamel Underbody as received in the package.

MOORAMEL
EXCELLING ENDURING ENAMEL
HIGH GLOSS WHITE
Benjamin Moore & Co

MOORAMEL CONTAINER

Third Coat—One-half Moore's White Enamel Underbody and one-half White Mooramel.

Fourth Coat—Mooramel Enamel as received in the package.

For three-coat work the second coat may be omitted.

Muresco

Muresco is a dry powder and is prepared for use by mixing with boiling water.

Combines beauty of color and texture with great durability, unusual hiding power and extreme ease of application. It is perfectly sanitary and highly economical, producing the ideal, flat velvety finish. It brushes so freely and sets so slowly that large surfaces can be worked without danger of showing laps or brush marks. It is also adapted for applying with a spray and covers perfectly with one coat. If, however, it is desired to apply a second coat it will be found that this will adhere as perfectly as if it were one with the first. It has exceptional durability and presents a surface which will not crack, chip nor peel. It positively will not rub off on clothing or disintegrate into powder with the action of time.

Muresco is offered in a pure white (XX White), a Tinting White, and a wide range of practical and artistic colors. The XX White is intended for use where a pure, clear, permanent white is desired. It will retain its purity and clearness indefinitely. The Tinting White is used for toning down the other colors to the desired tint. The Tinting White, the Muresco Tints and the Muresco Fresco Colors can be mixed in any proportions to obtain an infinite variety of tints and shades.

Muresco can be used on plaster, brick, concrete, wood or metal. On smooth surfaces 1 lb. will cover from 50 to 75 sq. ft.; on rough surfaces from 35 to 50 sq. ft.

To secure the best results on newly plastered walls, these should first be sized. For this purpose we recommend Moore's Muresco Dry Size, or Moore's Impervo Surfacer.

MURESCO
SUPERIOR TO KALSOMINE
WALL FINISH
Benjamin Moore & Co.

MURESCO CONTAINER

Impervo Surfacer

Impervo Surfacer is an especially prepared oil base liquid of light color, which works easily, spreads freely, drying with a tough, impervious elastic, and durable film, upon which Muresco, flat paints, or enamels may be economically and easily applied and eliminates painting failures due to suction, saltpeter and stains. Decidedly different in character from most other sizes, as it contains no alum, glue, rosin, or other ingredients which are liable to cause defects in the finishing coats, such as peeling, cracking, alligatoring, or saponification.

Vari-Tone Sponge Roller

A new and practical method of applying Muresco or Sani-Flat for wall decoration, giving effects which are beautiful, characteristic and highly decorative. We will gladly send, on request, one of our beautifully illustrated booklets, "Interior and Exterior Decoration."

NATIONAL LEAD COMPANY

Paint Materials for the Protection and Decoration of Wood, Plaster, Masonry and Metal

NEW YORK, N. Y., 111 Broadway
BOSTON, MASS., 131 State Street
BUFFALO, N. Y., 116 Oak Street
CHICAGO, ILL., 900 West 18th Street
PHILADELPHIA, PA., JOHN T. LEWIS & BROS. Co., 437 Chestnut Street
CINCINNATI, OHIO, 659 Freeman Avenue
CLEVELAND, OHIO, 820 West Superior Avenue
ST. LOUIS, MO., 722 Chestnut Street
SAN FRANCISCO, CAL., 485 California Street
PITTSBURGH, PA., NATIONAL LEAD & OIL Co., 316 Fourth Avenue

TRADE-MARK

Products

WHITE LEAD (Dry and in Oil); RED LEAD (Dry, in Oil, Liquid); LINSEED OIL (Raw and Boiled); FLATTING OIL.

White Lead for General Painting

Gloss paint made of pure white lead and pure linseed oil has long been the standard protective and decorative coating for wood, plaster, brick, stone, concrete and stucco. It forms a tough, tenacious film that does not crack and scale but wears down smooth and even, leaving the surface ready for repainting without expensive preparation. Being mixed to order, lead-and-oil paint can be adapted to meet all surface and weather conditions. It can also be varied in color from pure white to every desirable shade and tint by the addition of the proper tinting materials.

Our Dutch Boy white lead is the highest grade white lead that can be made. It is pure, finely ground, smooth, excellent in spreading and hiding properties—a perfect paint material. Sold in 12½, 25, 50 and 100-lb. steel kegs. Our well-known trade-mark, the Dutch Boy Painter, is on every package and guarantees the purity of the contents.

Dutch Boy linseed oil is pure, clear, carefully filtered and well settled. Sold in 1 and 5-gal. sealed cans bearing the Dutch Boy Painter trade-mark as a guarantee of purity. We also sell pure linseed oil in half barrels and barrels.

Flat Finishes for Interiors

Most inside painting nowadays is done in dull or so-called flat effects. Up to a few years ago, these flat effects were always obtained with white lead by thinning it with turpentine. At that time, special flatting oils for use with white lead were developed. These flatting oils are largely superseding turpentine. The handsome, washable, soft tone finish which they give is resulting in a marked increase in the popularity of the painted wall.

One of the most successful flatting oils on the market today is our own Dutch Boy flatting oil. It flats white lead better than turpentine does, yet binds the pigment particles together with the tenacity of pure linseed oil, insuring a paint film which will not chip off. Dutch Boy flatting oil is designed especially for use with Dutch Boy white lead. Used with our white lead, it produces a soft, glossless finish that has a depth of tone and a richness which most flat paints lack.

Aside from the remarkable beauty of a Dutch Boy white lead and Dutch Boy flatting oil finish, the paint merits consideration from the standpoint of cleanliness and service. The hard, tilelike film it forms stands frequent washing with warm water, mild soap and a soft cloth or a sponge and thus can be kept absolutely clean and sanitary. The durability of the paint is not affected in any way and there is no unsightly streaking as often occurs when a less stable paint is washed. Dutch Boy flatting oil is sold in 1 and 5-gal. cans, sealed at the spout.

Red Lead for Metal

Pure white lead, properly thinned to suit the special conditions under which the paint is to be used, gives the best protection for wood and other building materials except metal. When it comes to the painting of metal, white lead (though good for the purpose) must yield first place to pure red lead.

The chief requirements of a protective coating for metal are that it should have the ability to stick firmly to metal and that it should keep moisture, which combined with air forms rust, from getting through. The paint must also be able to resist the destructive action of atmospheric gases, acid from the surface oil, and salt spray near the seacoast.

Paint made of pure red lead meets these requirements. It is insoluble in water, unaffected by ordinary atmospheric gases, adheres closely to metal, and is a true rust preventive. A great advance in the quality of red lead was made a few years ago when Dutch Boy red lead-in-oil was perfected. It is a more highly oxidized product than old style dry red lead and is sold in paste form, ready to use after the addition of more pure linseed oil. Being more highly oxidized, Dutch Boy red lead in oil is finer and covers better. Being in paste form, it is more convenient to handle.

Dutch Boy red lead-in-oil is sold in 12½, 25, 50 and 100-lb. steel kegs under the Dutch Boy Painter trade-mark.

We also make dry red lead of the highest grade as well as red lead in liquid form. The liquid product is known as Dutch Boy liquid red lead and is ready for use. It comes in natural red lead color, light and dark brown, light and dark green, and black. Sold in 1-gal. cans and 2½-gal. kegs.

General Painting Specifications

Following are general specifications for the painting of interior and exterior surfaces:

Preparation of Surface—*(1) Woodwork*—All woodwork should be thoroughly dry and seasoned before any paint is applied. New woodwork shall be smoothed off with sandpaper where required and dusted clean before priming. From old woodwork which has been painted before, all loose paint, scales, dirt and dust shall be removed. Where old painted work shows cracks or scales, use a paint burner or liquid paint remover to take off the old paint. Wash off with benzine or turpentine all parts where liquid paint remover has been used. Where no scales or cracks appear, sandpaper the surface gently with No. ½ or No. 1 sandpaper and follow with a good dusting.

Before priming new woodwork, all knots and sappy streaks shall receive 1 coat of grain alcohol shellac, brushed out thin. After the priming coat of paint,

Continued on next page

as hereinafter specified, is thoroughly dry, putty up all knotholes, dents, cracks, and other defects in the surface with a pure linseed oil putty composed of equal parts of white lead and whiting. If desired, 1 part powdered litharge to 5 parts each of white lead and whiting may be added, except on light tinted work.

(2) Plaster—Before applying any paint to plaster, either new or old, see that it is clean and smooth. Go over the surface very lightly with fine sandpaper or a wide putty knife removing all grit and any loose plaster or paint. Fill all cracks with plaster of paris. In the case of large cracks, open them up clear down to the lath, soaking the edges with water, and then fill the openings with plaster of paris. Level off smooth and even with adjoining plaster surfaces. When the plaster of paris has dried thoroughly, sandpaper down to a smooth, even surface. Where new plaster is to be painted before it is thoroughly dried out, it shall be treated with 20% solution of zinc sulphate in water before priming.

(3) Brick and Stone—New brickwork shall not be primed until dry. At least 2 or 3 days of dry weather should precede painting. If any mortar has become loose or washed out, repoint all such damaged places with mortar or portland cement before applying paint. After priming, correct small defects in the surface with putty.

(4) Stucco and Concrete—Stucco or concrete should be allowed to stand and dry a year before paint is applied. If painted within less than a year, it shall be aged artificially by washing with 20 parts zinc sulphate to 80 parts water or with carbonic acid water.

(5) Metal Work—Iron, steel and other metal work shall be cleaned thoroughly of all loose paint, dirt, oil, grease, rust, scale and other foreign matter before paint is applied. This cleaning should be done with scrapers and wire brushes. Where soldering fluids have been used, the surface shall be scrubbed carefully with sandsoap and water and dried thoroughly before paint is applied.

The Paint and Its Application—*(6) Designation of Paint to be Used*—All woodwork, plaster, brick, stone, concrete and stucco which are to be painted, shall be painted with National Lead Company's Dutch Boy white lead, Dutch Boy flatting oil, pure linseed oil, pure turpentine and pure turpentine drier mixed according to the formulas hereinafter designated for each kind of work. All metal shall be painted with National Lead Company's Dutch Boy red lead-in-oil, Dutch Boy liquid red lead, or pure dry red lead and pure linseed oil mixed according to formulas hereafter given for each specific purpose.

(7) Tinting Materials—In producing tints and shades, John T. Lewis & Bros. Company colors-in-oil or those of equally high grade shall be used. If colors-in-oil are used in quantities large enough to affect the consistency of the paint, the quantities of thinners named in the formulas shall be increased in amount equal to one-half the weight of the tinting material.

(8) Applying the Paint—No exterior painting shall be done when rain or snow is falling, during fog, or until after dew or moisture which may be on the surface has completely disappeared. Painting done in winter weather shall only be done when the temperature is above 50° F. and when all surfaces are dry. All exterior work shall be allowed to dry from 2 to 4 days before the next coat is applied and at least 24 hours shall be allowed between coats on interior work.

(9) Finishing Metal to Suit Color Scheme—Where the color of red lead paint specified for metal work does not conform to color scheme, white lead-and-oil paint tinted as desired shall be applied over the red lead paint.

Formulas—The following formulas take no account of tinting materials. See Paragraph No. 7 when adding colors to the formulas.

(10) New Woodwork Outside—Three coats of paint, mixed as follows, shall be applied to new unpainted woodwork outside:

	(a) Priming coat	(b) Second coat
Dutch Boy white lead	100 lb.	100 lb.
Pure raw linseed oil	4 gal.	1½ gal.
Pure turpentine	2 gal.	1½ gal.
Pure drier	1 pt.	1 pt.

	(c) Third coat
Dutch Boy white lead	100 lb.
Pure raw linseed oil	3½ to 4 gal.
Pure turpentine	1 pt.
Pure drier	1 pt.

Note: The painter may exercise his discretion in using a larger or smaller quantity of oil according to whether the wood is oil absorbing, as white pine, poplar and basswood; or less permeable, as yellow pine, cypress, spruce and hemlock. The painter may, in rare cases, find it advisable to increase the quantity of turpentine, as in southern exposure to prevent blistering. Where this is done, a corresponding decrease should be made in the specified amount of linseed oil. If the wood is very resinous, such as cypress, prepare it for priming by brushing on a mixture of 1 pt. linseed oil, 1 pt. turpentine and 1 pt. drier.

(11) Old Woodwork Outside—Two coats of paint as follows shall be applied in repainting old woodwork outside:

	(a) First coat	(b) Second coat
Dutch Boy white lead	100 lb.	100 lb.
Pure raw linseed oil	2 gal.	3½ to 4 gal.
Pure turpentine	2 gal.	1 pt.
Pure drier	1 pt.	1 pt.

(12) New Woodwork Inside—Three coats of paint, mixed as follows, shall be applied to new unpainted woodwork inside:

	(a) Priming coat	(b) Second coat
Dutch Boy white lead	100 lb.	100 lb.
Dutch Boy flatting oil	4 gal.	2 to 3 gal.
Pure raw linseed oil	3 gal.	None
Pure drier	1 pt.	None

	(c) Third coat (Flat finish)	(d) Third coat (Eggshell gloss finish)
Dutch Boy white lead	100 lb.	100 lb.
Dutch Boy flatting oil	2 to 3 gal.	1½ to 2 gal.
Pure raw linseed oil	None	None
Pale varnish (suitable for enamel)	None	¾ gal.
Pure drier	None	None

Note: As on outside wood, the painter may exercise his discretion in the use of the thinners prescribed—thus on white pine, poplar and basswood, which more readily absorb oil, increase the quantity of linseed oil for the priming coat. On yellow pine, cypress, spruce and hemlock, use less linseed oil and more flatting oil.

(13) Old Woodwork Inside—Two coats of paint shall be used in repainting woodwork inside. For a flat finish, mix the paint for the first and second coats according to formula B in paragraph 12. For an eggshell gloss finish, mix the paint for the first coat according to formula B in paragraph 12 and according to formula D for the finishing coat.

(14) Plaster Walls—Three coats of paint shall be applied to plaster which has never before been painted. The priming coat shall be mixed as follows:

Priming coat	
Dutch Boy white lead	100 lb.
Pure kettled-boiled linseed oil	7 gal.
Pure turpentine	1 gal.

Note: If boiled linseed oil can not be obtained, 7 gal. raw linseed oil with 3 pt. drier may be used instead, and will in most cases give satisfactory results. Boiled oil is much superior, however, and will obviate trouble when conditions are difficult. It seals pores in the plaster and prevents suction. Contrary to the belief of many, boiled oil can be had.

Continued on next page

Mix the paint for the second coat according to formula B in paragraph 12 and according to formula C for the finishing coat if a flat finish is desired. If an eggshell finish is wanted, mix the paint for the finishing coat according to formula D.

In repainting plaster walls, follow the practice recommended for new plaster, except that the priming coat may be omitted.

(15) Brick and Stucco—Three coats of paint, mixed as follows shall be applied to brick or stucco which has never before been painted:

	(a) Priming coat	(b) Second coat
Dutch Boy white lead	100 lb.	100 lb.
Pure linseed oil	7 gal. boiled or 7 gal. raw and 1½ pt. drier	4 gal. (⅓ boiled, ⅔ raw) or 4 gal. raw and 1 pt. drier
Pure turpentine	1 gal.	1 gal.

	(c) Third coat
Dutch Boy white lead	100 lb.
Pure linseed oil	3½ gal. (⅓ boiled, ⅔ raw) or 3½ gal. raw and 1 pt. drier
Pure turpentine	1 pt.

Two coats of paint shall be applied in repainting brick and stucco. For the first coat, mix the paint according to formula B in paragraph 15 and for the finishing coat according to formula C.

(16) Concrete and Stone—Three coats of paint, mixed as follows, shall be applied to concrete and stone which have never before been painted:

	(a) Priming coat	(b) Second coat
Dutch Boy white lead	100 lb.	100 lb.
Pure linseed oil	5 gal. boiled or 5 gal. raw and 1 pt. drier	3 gal. (⅓ boiled, ⅔ raw) or 3 gal. raw and 1 pt. drier
Pure turpentine	1 gal.	½ gal.

	(c) Third coat
Dutch Boy white lead	100 lb.
Pure linseed oil	3½ gal. (⅓ boiled, ⅔ raw) or 3½ gal. raw and 1 pt. drier
Pure turpentine	1 pt.

In repainting concrete and stone, apply 2 coats. Mix the paint for the first coat according to formula B in paragraph 16 and according to formula C for the second coat.

Excellent flat and semi-flat finishes on brick, stone, concrete and stucco can be secured by applying over the second coat 1 or 2 coats of paint made with Dutch Boy white lead and Dutch Boy flatting oil. For flat Milwaukee finish, the proportion should be 2 to 3 gal. of flatting oil to 100 lb. of white lead. For eggshell gloss finish, use 1½ to 2 gal. of flatting oil and ¾ gal. of spar varnish to 100 lb. of white lead. For brick red finish on outside brick, thin the color with Dutch Boy flatting oil.

(17) Interiorly Exposed Metal Work—Two coats of paint, mixed as follows shall be applied to interior metal work:

	(a) First coat	(b) Second coat (slightly shaded)
Dutch Boy red lead-in-oil	100 lb.	100 lb.
Pure linseed oil	2½ gal.	2⅝ gal.
Lampblack-in-oil	None	12 oz.
	or	
Pure dry red lead	100 lb.	100 lb.
Pure linseed oil	3⅝ gal.	3¾ gal.
Lampblack-in-oil	None	13 oz.

Note: If geniune boiled linseed oil is available, use one-third boiled and two-thirds raw oil. If raw oil only is used, add ½ pt. drier to every gallon of paint. One-half pint of turpentine may be added to each 2 gal. of paint whenever it is deemed advisable to make the paint produced by any formula work more easily.

If liquid red lead is to be used, specify Dutch Boy liquid red lead No. 1 (natural red lead color) for first coat and Dutch Boy liquid red lead No. 6 (light brown) for second coat.

(18) Exteriorly Exposed Metal Work—Three coats of paint shall be applied to exterior metal work. The first 2 coats shall be mixed according to formulas A and B in paragraph 17 and the third coat shall be mixed as follows:

	Third coat (dark brown)
Dutch Boy red lead-in-oil	100 lb.
Pure linseed oil	3⅝ gal.
Lampblack-in-oil	6 lb.
	or
Pure dry red lead	100 lb.
Pure linseed oil	4¾ gal.
Lampblack-in-oil	6 lb.

Where a dark color other than brown is desired for the finishing coat, the following formula shall be used according to the color desired:

	Light green	Dark green
Dutch Boy red lead-in-oil	100 lb.	100 lb.
Pure linseed oil	6⅛ gal.	4½ gal.
Medium chrome yellow	31 lb.	12½ lb.
Prussian blue	13 lb.	7½ lb.

	Black
Dutch Boy red lead-in-oil	100 lb.
Pure linseed oil	15¼ gal.
Prussian	16 lb.
Lampblack	52 lb.

If liquid red lead is to be used, specify Dutch Boy liquid red lead according to the finishing color desired, that is: No. 7—dark brown; No. 8—light green; No. 9—dark green or No. 5—black.

Printed Specifications Furnished

To any architect who desires, we will supply printed specifications containing full and complete directions for the proper use of white lead in the painting of woodwork, plaster, brick, stone, concrete and stucco, and of red lead in the painting of metal.

Write for NATIONAL LEAD COMPANY'S standard specifications for white lead or for red lead.

Publications

A practical handbook, of unusual value to those interested in the subject of painting, is our "Handy Book on Painting." This book gives formulas and directions for exterior and interior painting of all kinds.

We also publish a booklet "The Protection of Structural Metal" which discusses the causes of corrosion and remedies for it, besides giving formulas and going into detail on the subject of painting metallic surfaces.

Another of our publications is "Painting—Protective and Decorative." It tells what paint is, what paint does and what paint costs and gives color scheme suggestions for the decoration of the interiors and exteriors of homes.

We also have booklets which deal specifically with the decoration of hotels, hospitals and public buildings. These booklets describe the various finishes and effects obtainable with white lead paint such as two-tone figured, glazed, tiffany, stenciled, striped, etc.

Any or all of these booklets will be sent on request. Write our nearest branch office.

THE NEW JERSEY ZINC COMPANY

ESTABLISHED 1848

Manufacturer of Paint Pigments

PRODUCTS DISTRIBUTED BY

THE NEW JERSEY ZINC SALES COMPANY

160 Front Street
NEW YORK, N. Y.

1111 Marquette Building
CHICAGO, ILL.

1439 Oliver Building
PITTSBURGH, PA.

1531 Guardian Building
CLEVELAND, OHIO

1205 Merchants Exchange Building
SAN FRANCISCO, CAL.

Products

New Jersey Zinc
TRADE-MARK

Paint Pigments: Zinc Oxide and "Albalith" (Lithopone).

For Standing Seam "Horse Head" Zinc Roofing, see page 1125; for "Horse Head" Rolled Zinc, and history and advantages of zinc installations, see page 1144.

Introduction

Zinc Oxide—Briefly, Zinc Oxide's value as a paint pigment, for both exterior and interior jobs, is found in these qualities:

(1) It prolongs the life of the luster. (2) It reduces chalking when used in combination with other pigments; and when used alone, it does not chalk. (3) It assures a smooth, clean surface. (4) It increases the durability of paint. (5) It reduces fading tendencies. (6) It does not darken on exposure.

"Albalith"—Is a light resisting lithopone and is brilliantly white. It possesses characteristics which render it especially valuable for use in wall tints, flat finishes, and other painting work of the most exacting nature.

Interior and Exterior Finishes

Interior wall paints consisting of these pigments in accordance with the following specifications are unequaled for purity of tints, finish and appearance, sanitation (that is, they are washable), and do not darken.

Exterior paints containing Zinc Oxide and "Albalith" (Lithopone) are unequaled for durability and retention of gloss and color.

Paint Specifications

The paint accepted shall be subject to tests to be prescribed by the architect for light resistance, opacity, brushing qualities, drying, and purity of color.

Interior Flat Finish—The pigment portion shall consist of not less than 75% of "Albalith" (Lithopone), and not more than 15% of inert pigment (preferably asbestine). The liquid portion shall consist of treated oils and volatile thinners, or varnishes which produce a satisfactory washable flat finish.

Undercoater for Enamel Finishes—The pigment portion shall contain not less than 75% of "Albalith" (Lithopone), not less than 5% of Florence Brand French Process Zinc Oxide or "XX" American Process Zinc Oxide, and not more than 20% of inert pigment (preferably asbestine). The liquid portion shall consist of treated oils and volatile thinners, or varnishes which produce a satisfactory undercoat.

Oil or Gloss Finish—The pigment shall consist of a minimum of 25% or a maximum of 75% of "Albalith" (Lithopone), and a minimum of 25% of Florence Brand French Process Zinc Oxide or "XX" American Process Zinc Oxide. In every case the sum of Zinc Oxide and "Albalith" (Lithopone) shall be 100%. The liquid portion shall be pure linseed oil (refined linseed oil if paint is white) with the necessary volatile thinners and dryers. The dryer shall be the best grade lead-free oil dryer.

Enamel Finish—The undercoat, or in the case of 4-coat work or over, the first 2 coats, shall be as specified under "Undercoater for Enamel Finishes."

The succeeding coats shall be of an approved high grade enamel containing no pigment except French Process Zinc Oxide, Florence Brand (preferably White Seal). The liquid portion shall consist of high grade varnish or treated oils with such volatile thinners as are necessary. It shall be capable of being rubbed without softening, to a gloss, eggshell or flat finish. (The finish desired to be specified by the architect in each particular instance.)

Floor Paint—(Tinted, not applicable to browns, reds, greens, etc.). The pigment portion shall contain not less than 75% of "Albalith" (Lithopone), not less than 10% of "XX" American Process Zinc Oxide or "Standard" Zinc Oxide, and not more than 15% of inert pigment (preferably asbestine). The liquid portion shall consist of varnishes or such combination of oils and varnish as is necessary to produce a satisfactory, hard, tough, rapid-drying floor paint.

Exterior Paint—When exterior paint of superior whiteness, and assurance against discoloration and deterioration are desired, the pigment portion shall contain 40% of "XX" American Process Zinc Oxide, 40% of "Albalith" (Lithopone), 10% of silica and 10% of magnesium silicate.

The liquid portion shall contain not less than 80% pure linseed oil, and 5 to 10% of heavy bodied linseed oil, with the proper amount of dryer and volatile thinners to produce a satisfactory paint. The content of water shall not be over 1%.

Note: Paints and enamels as described above, are available as products of many of the reputable paint manufacturers of the United States.

Application of Paints

Introduction—Suggestions affecting the manner of applying exterior and interior finishes are given below. These are submitted for the consideration of architects, and are designed to aid them in issuing instructions to those who may be engaged to do the actual painting work.

General—All surfaces shall be thoroughly dry before applying paint. The work shall be thoroughly cleaned, sandpapered and dusted before applying paint.

Unless otherwise specified, on new exterior work the priming coat shall have the same pigment formula as the subsequent coats of paint, but shall differ from them in pigment-vehicle ratio. It shall be well and thoroughly brushed into the surface.

After priming, all nailholes, open joints and other imperfections shall be solidly and smoothly filled with pure linseed oil (whiting or white lead) putty. After putty has dried, 2 additional coats of paint of the color selected shall be applied and if a superior job is desired, the specification should call for 3 instead of 2 coats in addition to the priming coat. Each coat shall be thoroughly dry before the succeeding coat is applied.

Interior and Exterior Woodwork—If wood to be painted is new yellow pine, the priming coat shall contain 1½ pt. of pure wood or gum turpentine to gallon in addition to other thinners used.

If extra thinning of the paint is required, equal parts of pure linseed oil and turpentine should be used. This thinning is necessary for the priming coat on wood.

If the wood to be painted is new cypress or redwood, priming coat shall contain in addition to the other thinners used 1 pt. of solvent naphtha, benzol, or toluol to 1 gal. of paint ready for the brush.

Plaster and Cement Surfaces (except Floors)—If the surface to be painted has stood less than a year, it shall be treated before painting with a solution of zinc sulphate (4 lb. of zinc sulphate crystals to 1 gal. of water). The surface shall be thoroughly coated with this solution, applied by a broad, soft brush (a kalsomine brush) and allowed to stand not less than 48 hours before painting.

Cement or Concrete Floors—In painting new cement or concrete floors, first close all cracks and other surface imperfections with plaster or cement. After drying, apply to the entire surface a solution of zinc sulphate dissolved in water (4 lb. of zinc sulphate crystals to 1 gal. of water); allow 48 hours for drying, then apply 4 coats of paint. For the priming coat, approved high grade cement primer may be used. The floor paint may be thinned as specified by the manufacturer.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST 1913

PITTSBURGH PLATE GLASS CO.

Manufacturers of Paints and Varnishes for All Purposes

PITTSBURGH, PA.

For Distributing Warehouses, see page 1760

Products

Manufacturers of Paints and Varnishes for all purposes, including:

Sun-Proof Liquid Paint.
Snolite.
Velumina Interior Flat Wall Paint.
Ironhide Steel Protective Paint.
Pitcairn Aged Mast Spar, for exposed work.
Pitcairn Aged Finishing Spar, for fine interiors.
Pitcairn Aged Floor Spar, for fine floors.
Pitcairn Aged Flat Finish.
Pitcairn Tector, an Undercoat for all purposes.
Pitcairn Wood Stains, for all wood tinting.
Pitcairn Banzai Enamel, for all white work.

Also, Alba-Lux Mill White, Florhide Enamels, Tor-on Shingle Stain, Cementhide, Concrete and Cement Paint, Graphite, Paste Wood Filler, 17th Century Wax; Pitcairn Aged Church Pew and Seat Finish, for church and school seats, desks, chairs, etc.

For Store Fronts, see pages 1224-1225; for Tapestry Glass, see pages 1760-61.

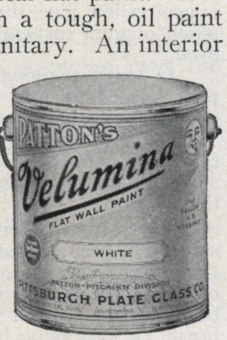
Sun-Proof Paint

PATTON'S
Sun-Proof Liquid Paint
OUTSIDE WHITE
PITTSBURGH PLATE GLASS CO

Sun-Proof Liquid Paint is made from white lead, oxide of zinc, silica and coloring matter, ground in strictly pure linseed oil, and specially prepared drier.

Sun-Proof Paint contains the maximum quantity of linseed oil consistent with good paint, and the quantity of linseed oil is in the proper relative proportion to the pigment to produce a tough, durable wear resisting paint film—a paint that can be spread uniformly and a paint that is suitable for all general purposes.

Velumina Interior Flat Wall Paint



Velumina is, first of all, a practical flat paint. It is an oil paint, covering the walls with a tough, oil paint film at once durable, washable and sanitary. An interior decorated with Velumina adds refinement and distinction to the surroundings.

Pigments are smooth in texture, possess extreme opacity or hiding properties, and liquids used are free from varnish and resinous substances. Being an oil base paint, it works easily and can be spread and brushed without showing brush marks or laps. Dries with a smooth, tough, washable, elastic coat which will not readily collect dust or dirt.

Ironhide Steel Protective Paint

Ironhide (inhibitive red and finishing black) is a liquid paint, ready for use for painting and preserving iron and steel work, inside and outside. Suitable for structural steel, bridges, gas holders, smokestacks, railway cranes, oil tanks, iron or steel wire or light poles, coal loaders, steel cars, tank cars, air drafts, metal silos, fire hydrants, cranes, ventilating fans, etc.

Snolite (a Semipaste Paint)

Snolite is a semipaste paint, but so heavy that it requires thinning and manipulation by the master painter. Snolite is distinctly different from any product heretofore offered, possessing the following exceptional points:

When thinned for painting, Snolite has fully one-half greater opacity than paints now considered standard.

Is furnished in semipaste consistency that permits of reduction at minimum expense, while at the same time meeting all conditions of surface and drying.

Can be used for tinting with any color and can be mixed with any other white pigment.

Produces a paint which is incomparably superior for spray painting because it can be applied thin, covers perfectly and is non-poisonous.

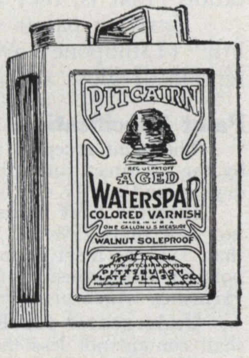
Dries to a smooth, high gloss surface of superior whiteness, which eventually chalks moderately, leaving an excellent surface for repainting.

Can be used in industrial sections around gas works, or oil fields, without discoloration from hydrogen sulphide fumes.

Distinctive Varnish Finishes

The Pitcairn label and trade-mark guarantee *quality as represented* and insure the economical securing of results that will be most satisfactory.

Pitcairn Aged Mast Spar for Exposed Work



Possesses the maximum of durability obtainable in exterior finishing varnish. Use on all surfaces subjected to severest exposure, whether marine finishing, outside doors, window casings, signs, etc., on new or old work. It has great elasticity and wear resisting qualities. Will not scratch or mar white, dries dust free in 10 to 12 hours and hardens in 48 hours.

One gallon covers 550 to 600 sq. ft.

Pitcairn Aged Finishing Spar for Finest Interiors

Rich and lasting. Use on new or old work, whether full gloss, rubbed dull or polished. It is unexcelled in brilliance, body, working qualities and durability. Insures style and individuality to the work. Dries dust free in 8 to 10 hours, hardens in 2 days and may be rubbed the third day.

One gallon covers 550 to 600 sq. ft.

Pitcairn Aged Floor Spar for Finest Floor Finishing

Withstands severest wear. Use on new or old work. It has wonderfully free, easy working qualities, extraordinary permanence, toughness, brilliance and elasticity. Dries dust free in 6 to 8 hours and hardens in 24 hours.

One gallon covers 550 to 600 sq. ft.

Continued on next page

Pitcairn Aged Flat Finish for Artistic Interior Work

Produces a rich, silky dull rubbed effect. Use for mission finish and in place of hand rubbing. This varnish dries with an even flat finish that has the appearance of being rubbed. Has the body of gloss varnish, protects perfectly the surface to which it is applied, and may be used on either new or old work. One coat is sufficient to produce a dull rubbed effect on old work or over an undercoater of gloss varnish for new work. Two coats applied to new wood over filler will produce a silky, soft, mission effect. Works nicely under the brush; flows out well. Dries dust free in 2 hours and hardens in 24 hours. Contains no paraffin or beeswax and may be coated with a gloss varnish, or as many coats may be applied as are necessary.

One gallon covers 650 to 700 sq. ft.

Pitcairn Tector (the Right Foundation)

Pitcairn Tector practically provides one undercoater for all purposes, interior and exterior.

Tector has a greater range of usefulness than any other undercoater. It may be used as an undercoater on any surface, interior or exterior—wood, metal, cement, plaster, burlap, canvas; and under oil paints, enamels, varnishes, flat wall paint, calcimine and floor wax.

Pitcairn Tector is a discovery of far reaching importance, imparting durability under conditions where finishing materials have never been durable before, and greatly multiplying durability of paints, enamels, stains and varnishes under all circumstances.

Note: A book of Tector specifications, demonstration panels, and test tins will be furnished on request.

Pitcairn Wood Stains

PITCAIRN
WOODSTAIN
Pitcairn Varnish Co.

Excell in penetrating qualities, clearness and richness. Used on all kinds of wood, whether soft, spongy or the hardest close grain. They produce beautiful, deep, rich soft visual effects. They bring out the high lights and beauty of wood without obscuring the grain or causing cloudiness. They lend tone and impart an air of refinement to the surroundings. They do not raise the grain of wood nor affect thin veneers, being free from water, acid or alcohol. They may be mixed with the filler for tinting, or be reduced with turpentine or benzine. They set slowly, thus admitting of the surplus being removed from the surface with a cloth or sponge without showing cloudiness or laps. The work may be finished with wax or varnish as desired.

There are 14 beautiful colors in imitation of all popular woods and shades.

One gallon covers from 800 to 1000 sq. ft.

Note: Stain set, consisting of 20 wood panels, mounted on cloth, showing the color of Pitcairn Wood Stains on various kinds of wood, will be sent to all architects and their clients or to painters on request.

Pitcairn Banzai Enamel for All White Work

Rich and permanent. Used for all white work whether natural gloss, rubbed dull, polished or flat enamel finish. It is marvelously tough and elastic, approximately 50% more durable than ordinary enamels. Will not chip or crack, is stable in color and retains its immaculate, grainless surface regardless of frequency of washing or method of house heating.

The free flowing qualities of Banzai Enamel enable the work to be accomplished about 25% faster than with ordinary enamels.

BANZAI
ENAMEL
GLOSS WHITE
PITTSBURGH PLATE GLASS CO.

Its splendid hiding qualities in many instances save the cost of work and time of an extra coat. Its great covering capacity and labor saving characteristics make it more economical to use than the cheaper ordinary enamels—not to consider its greater durability. Banzai Enamel furnishes a safety factor for the architect who demands flawless work, gives the decorator protection against blemishes, and reduces the labor costs; while the building owner gets a far greater durability than with the use of ordinary enamels. Dries dust free in 6 hours, and hardens in 48 hours.

One gallon covers approximately 500 sq. ft.

Note: Portfolio showing reproductions of 30 modern white enamel interiors will be sent to architects or their clients, on request.

Specifications

The specifications which follow are necessarily somewhat abridged. A very complete and highly detailed set of specifications will be sent on request. Write to the nearest warehouse of Pittsburgh Plate Glass Company, and ask for book entitled "Paints."

General

(a) Unless otherwise specified, the contractor or painter shall furnish all materials, provide labor, transportation, scaffolding and all other essential equipment and shall assume all liability of every character whatsoever in connection with the work.

(b) Care shall be taken that surface to be finished is thoroughly dry before applying any coating whatever.

(c) No ochre shall be used for priming.

(d) All finger marks, dirt, grease or other objectionable matter shall be carefully removed by the painter before commencing to fill, varnish or paint.

(e) The work shall be carried on continuously except for delays due to unfavorable weather and the time allowed for proper drying between coats.

(f) In painting new work, all knots and sappy places shall be coated with shellac before priming, care being taken to cover completely without spreading over more of the surrounding surface than is necessary.

(g) In painting new work, all cracks and nailholes shall be filled with putty after the priming coat.

(h) On a varnish job, putty shall match the wood after the coat of filler is applied.

(i) On plaster work, all cracks which can be filled with putty shall be filled with soft putty made of equal parts plaster of paris and flour before applying priming coat. A putty which will give excellent results can be made from Patton's Velumina stiffened with whiting. Edges of cracks shall be sealed with a good varnish to prevent absorption of oil by plaster. When too large for puttying, they shall be carefully plastered. No painting shall be done until plaster is thoroughly dry.

(j) No painting or varnishing of outside work will be allowed in wet or freezing weather, nor of inside work except where the building can be properly heated to at least 65° F.

(k) On old paint, the surface shall be first brushed with a wire brush and where it is scaling badly shall be scraped or burned off.

(l) All paint is to be well brushed out, and all paint, enamel, varnish, stain, and filler to be applied

Continued on next page

in a workmanlike manner, and as furnished by the manufacturer, without any thinning or addition whatever, except as noted on direction label. Care to be taken to keep paint properly stirred.

(m) All materials shall be brought on the job in manufacturer's original package. Paints and enamel shall be thoroughly stirred before, and kept at a uniform consistency during application.

Painting Exteriors

Woodwork—

All exterior woodwork (except as otherwise specified) shall be painted with 3 coats of Patton's Sun-Proof Paint or Snolite, color selected by the architect, and applied as per directions on can.

Painting Porch Floors and Decks—

All porch floors shall be painted with 3 coats of Florhide, the color to be selected by the architect.

Painting Roofs—

Shingle Roofs—(a) All shingles shall be dipped full length in Tor-on Shingle Stain of the color selected by the architect before being laid.

(b) After laying, follow with a brush or spray coat of Tor-On Shingle Stain. The addition of 1 qt. of boiled linseed oil to each gallon of stain is recommended.

Tin Roofs, Leaders, Gutters—Wash with benzine to remove dirt and grease, then finish according to the following:

First coat shall be Pitcairn Tector reduced with 1 qt. of Leptyne or turpentine per gallon.

Second coat shall be Patton's Inhibitive Red Ironhide as it comes in the can. At least 48 hours must be allowed for drying.

Third coat shall be Ironhide Finishing Green or Brown applied as it comes in the can.

Plaster Walls—New or Old Work—
Flat Effect

Preparation of Surface—Wash or scrape off all calcimine, loose paint, dirt, grease, etc. Smooth or glossy paint shall be roughened with steel wool or sandpaper. Fill cracks with a stiff paste made from plaster of paris and flour and allow at least 24 hours for drying. Edges of cracks shall be sealed with a good varnish.

First Coat: The first coat shall consist of Velumina reduced with ¼ gal. of pure boiled linseed oil, except for new and exceedingly porous walls; in which case, more satisfactory results will be obtained by using a mixture of 1 gal. of Velumina, 1 qt. of boiled linseed oil and 1 qt. Pitcairn Tector. Mix only as used, as mixture may thicken on prolonged standing. It is absolutely necessary that boiled oil be used with Tector as above directed to insure results. Do not use any Leptyne, turpentine or benzine in first coat under any circumstances, unless to thin mixture of boiled oil and Tector slightly. Allow at least 24 hours for drying, more time being required in cold or damp weather.

Suction or so-called "hot-spots" which may show up through first coat, shall, when dry, be touched up with first-coat mixture, allowing at least 24 hours for drying. Otherwise, these suction spots may appear through the following coats.

To insure perfect results, never apply the finishing coat until first coat presents a uniform surface. Extremely bad walls may require an additional application of the first-coat mixture to accomplish this, or, if preferred, a thin coat of glue size may be applied over the first coat. The use of glue is something that should be attempted only by one thoroughly experienced, as, if too heavy, it is likely to cause peeling later. In general, it is well to avoid the use of glue size wherever possible. Never apply glue or varnish size direct to plaster as it will prevent proper penetration of the paint.

Finishing Coat: The finishing coat shall be Velumina as it comes in the can. Do not use any of the material left over from the first coat in the finishing coat as it will impair the perfect flatness of Velumina. Velumina is made heavy in body, but brushes easily and should be flowed on with a wide wall brush. If too heavy, add Leptyne or turpentine, not to exceed ⅛ gal. to each gallon of Velumina. Never add thinners, however, until a brushing test shows it is necessary; then add very sparingly. After the finishing coat has set for about 30 minutes it may be stippled, if such finish is desired.

Note: Velumina should be flowed on like a high grade enamel and not brushed out like a paint.

Natural Wood Finishes

Oak and Ash—

Varnish Finish—Four-coat Work—Standing Trim—All oak or ash wood (locations designated) shall receive a coat of natural paste wood filler, properly reduced with Leptyne, turpentine or benzine, and brushed well into the grain. (Excess of filler must be carefully and neatly cleaned from the surface by rubbing across the grain.)

Care must be taken that all grooves and corners are well cleaned with a hardwood stick. Fill all nailholes with putty tinted to match the wood.

The surface shall then receive a coat of Pitcairn Tector, reduced with Leptyne or turpentine, ½ gal. to the gallon. After 24 hours, sandpaper carefully. Then apply 2 coats of Pitcairn Aged Finishing Spar Varnish, allowing at least 48 hours between coats for drying. Sand lightly between varnish coats with No. 0 paper.

For an extra fine job, apply a third coat of Pitcairn Aged Finishing Spar Varnish.

For dull finish, rub the last coat with fine pumicestone and rubbing oil.

For dull finish without the expense of rubbing, substitute Pitcairn Aged Flat Finish for the last varnish coat.

Apply flat varnish freely with a badger-hair or black fitch flowing brush.

Birch and Maple—

Varnish Finish—Three-coat Work—Standing Trim—All birch or maple wood (locations designated) shall receive acoat of Pitcairn Tector reduced with Leptyne or turpentine, gallon for gallon. After 24 hours, sandpaper carefully. Fill all nailholes with putty tinted to match the wood.

Apply 2 coats of Pitcairn Aged Finishing Spar Varnish, allowing at least 48 hours drying between coats. Sand lightly between coats.

If an extra fine job is desired, apply a third coat of Pitcairn Aged Finishing Spar Varnish.

If dull rubbed finish is desired, rub the last varnish coat.

If a dull finish is desired without the expense of rubbing, substitute Pitcairn Aged Flat Finish for the last varnish coat. Apply flat varnish freely with a badger-hair or black fitch flowing brush.

Gum, Pine, Fir and Redwood—

Varnish Finish—Three-coat Work—Standing Trim—All gumwood, pine, fir or redwood (locations designated) shall receive 1 coat of Pitcairn Tector reduced with Leptyne or turpentine ½ gal. to the gallon. After 24 hours sandpaper carefully. Fill all nailholes with putty tinted to match the wood.

Apply 2 coats of Pitcairn Aged Finishing Spar

Continued on next page

Varnish, allowing at least 48 hours' drying between coats. Sand lightly between coats.

If an extra fine job is desired, apply a third coat of Pitcairn Aged Finishing Spar Varnish. If desired, the last coat may be rubbed to a dull finish with fine pumicestone and rubbing oil.

If a dull finish is desired without the expense of rubbing, substitute Pitcairn Aged Flat Finish for the last varnish coat. Apply flat varnish freely with a badger-hair or black fitch flowing brush.

Genuine Mahogany—

Varnish Finish—Four-coat Work—Standing Trim—All mahogany wood (locations designated) shall receive 1 coat of mahogany paste wood filler, properly reduced with Leptyne, turpentine or benzine, and brushed well into the grain. (The excess of filler must be carefully and neatly cleaned from the surface by rubbing across the grain.)

Care must be taken that all grooves and corners are well cleaned with a hardwood stick. Fill all nailholes with putty tinted to match the finish.

The surface shall then receive 1 coat of Pitcairn Tector reduced with Leptyne or turpentine, ½ gal. to the gallon. After 24 hours, sand carefully.

Sand lightly between coats with No. 0 paper.

If an extra fine job is desired, apply a third coat of Pitcairn Aged Finishing Spar Varnish.

For dull finish, rub the last coat with fine pumicestone and rubbing oil.

If a dull finish is desired without the expense of rubbing, substitute Pitcairn Aged Flat Varnish for the last Varnish coat. Apply flat varnish freely with a badger-hair or black fitch flowing brush.

Stained Wood Finishes

Note: Soft, porous woods absorb stain more readily than hard, close grained pieces. Painters will use care and judgment to get uniform effects. When necessary, reduce stain with Leptyne, turpentine or naphtha.

Oak Wood—

Four-coat Work—Standing Trim—All oak wood (locations designated) shall receive a coat of color designated, the excess being removed with a cloth after sufficient time has elapsed for penetration. Fill all nailholes with putty tinted to match the finish.

After 12 hours, a thin coat of Pitcairn Spirit Lacquer or pure gum shellac shall be applied.

Apply 2 coats of Pitcairn Aged Flat Finish, flowed on with a badger-hair or black fitch flowing brush to insure a smooth dull finish. Allow at least 24 hours between coats for drying.

Apply only enough lacquer or shellac to seal the stain. Avoid a heavy coating.

All Soft Woods—

Varnish Finish—All soft wood (locations designated) shall receive a coat of color designated, the excess being removed with a cloth after sufficient time has elapsed for penetration. Fill all nailholes with putty tinted to match the finish.

After 12 hours, a thin coat of Pitcairn Spirit Lacquer or pure gum shellac shall be applied.

Apply 2 coats of Pitcairn Aged Finishing Spar Varnish, allowing at least 48 hours between coats for drying. Sand lightly between varnish coats with No. 0 paper.

If an extra fine job is desired, apply a third coat of Pitcairn Aged Finishing Spar Varnish.

If desired, the last coat may be rubbed to a dull finish with fine pumicestone and rubbing oil.

If a dull finish is desired without the expense of rubbing, substitute Pitcairn Aged Flat Finish for the last varnish coat.

Apply flat varnish freely with a badger-hair or black fitch flowing brush.

Apply only enough spirit varnish to seal the stain. Avoid a heavy coating.

White Enamel Finishes—Banzai System

Oak and Ash Woods—

High Gloss Enamel Finish—Five-coat Work—All oak and ash woods (locations designated) shall receive a coat of natural wood paste filler, properly reduced with Leptyne, turpentine or benzine, brushed well into the grain. (The excess of filler must be carefully and neatly cleaned from the surface by rubbing across the grain.)

Care must be taken that all grooves and corners are well cleaned with a hardwood stick. Fill all nailholes with putty.

Then apply 2 coats of Banzai Double Cover Undercoater as it comes in the can, allowing 24 hours between coats. Sand the last coat to a smooth surface.

For the next coat use a mixture of 2 parts of Banzai Enamel and 1 part Banzai Double Cover Undercoater. Sand lightly after allowing 48 hours for this coat to dry.

The last coat shall be flowed on freely—using Banzai Enamel as it comes in the can.

If an extra fine finish is desired, rub the enamel coat and flow on another coat of Banzai Enamel.

Birch, Maple, Cypress, Gum, Whitewood, Redwood and Poplar Wood—Metal and Plaster—

High Gloss Enamel Finish—Five-coat Work—All birch, maple, cypress, gum, whitewood, redwood and poplar wood, and metal and plastered surfaces (locations designated) shall receive 1 coat of Pitcairn Tector, reduced according to directions on the can, with Leptyne, turpentine or benzine. If desired, covering will be improved by use of a priming mixture of 1 gal. Pitcairn Tector reduced with 1 gal. Banzai Double Cover Undercoater and ½ gal. boiled linseed oil. After 24 hours, sandpaper carefully. Fill all nailholes with putty.

Then apply 2 coats of Banzai Double Cover Undercoater as it comes in the can, allowing 24 hours between coats. Sand between coats to a smooth surface.

For the next coat use a mixture of 2 parts of Banzai Enamel and 1 part Banzai Double Cover Undercoater. Sand lightly after allowing 48 hours for this coat to dry.

The last coat shall be flowed on freely, using Banzai Enamel as it comes in the can.

If an extra fine finish is desired, rub the last enamel coat and flow on another coat of Banzai Enamel.

THE SHERWIN-WILLIAMS CO.

Paints, Varnishes, Enamels, Stains, Wood Preservatives, Dampproofings

EXECUTIVE OFFICES
601 Canal Road, CLEVELAND, OHIO

FACTORIES IN UNITED STATES, CANADA, ENGLAND AND AUSTRALIA
AGENCIES THROUGHOUT THE WORLD

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Products

Manufacturers of a complete line of Paints, Varnishes, Stains, Fillers, Enamels, Enamel Undercoaters, Concrete Finishes.

Also, Waxes, Dampproofing, Plaster Bond, Wood Preservatives and Concrete Hardener.

Safeguarding of Quality

The Sherwin-Williams Co. is the largest manufacturer of paints, varnishes, stains, and enamels in the world. The business has grown from a small storeroom to its present proportions in 60 years. The one thing which has made this success possible, was the strict adherence to the Company's policy of "Quality First."

The majority of the leading architects in the United States and the United Kingdom are specifying Sherwin-Williams Architectural Finishes, because they have the utmost belief in their quality.

Department of Architectural Service

The Department of Architectural Service is always ready to assist in any way with painting and finishing problems. It is an organized service of the highest type whose method of co-operation with architects and architectural engineers, it is said by many members of the profession, is of the greatest value.

Complete Specification Book

The Sherwin-Williams new Book of Painting and Varnishing Specifications is now ready. It is believed to be the most complete book of its kind which has ever been compiled. A copy of this book will be sent to architects or engineers without charge.

Opex Lacquer

Sherwin-Williams Opex lacquers and enamels have an unending number of uses. The architect will find them particularly adaptable to his needs as a finish for walls, metal trim, in fact, nearly any surface. He will find them a highly developed product with many advantages over older methods, such as a more durable and lasting finish, longer permanency of color, an extreme saving in both time and convenience. With Opex it is possible to finish a given surface, as many coats as required, without once leaving the job, and due to this quick drying quality, the necessity of "damping down," etc., is eliminated.

Instead of printing specifications in these columns we ask that a request, addressed to Opex Headquarters, 601 Canal Road, Cleveland, Ohio, be sent us. This will enable us to give our customer the advantages of any recent developments in the lacquer field and throws open to him the services of our Technical Service Department and Research Laboratories.

COVER THE EARTH

TRADE-MARK

Painting of Iron and Steel Surfaces

For 60 years The Sherwin-Williams Co. has made an exhaustive study of metal protective paints. Test panels of every conceivable class of metal protective paint have been exposed to the elements for long periods of time on the Company's factory roofs, under the careful observation of the Research Department. As a result of these years of research work, they now manufacture a widely diversified line of metal protective paints, and where an architect or engineer is a particular believer in one certain type of material, they are in a position to supply the highest grade of paint in this class.

There is, however, one metal protective paint specification which the Company's experience with paints of this character causes them to recommend above all others as the ideal specification, and it is as follows:

Specification—*Preparation*—Before applying priming coat or shop coat, all mill scale shall be completely removed from the surface of the steel.

Priming Coat (or Shop Coat)—Sherwin-Williams Kromik Steel Primer applied in the consistency supplied by the manufacturer.

Second Coat (or First Field Coat)—Sherwin-Williams Metalastic Brown in the consistency supplied by the manufacturer.

Third Coat—Sherwin-Williams Metalastic Black in the consistency supplied by the manufacturer.

Staining Exterior Wood Surfaces and Shingles

Where the architect desires to stain and preserve exterior wood surfaces without hiding the grain of the wood, or where shingles are to be stained for preservation and beautifying purposes, Sherwin-Williams Preservative Shingle Stains are the material which should be specified.

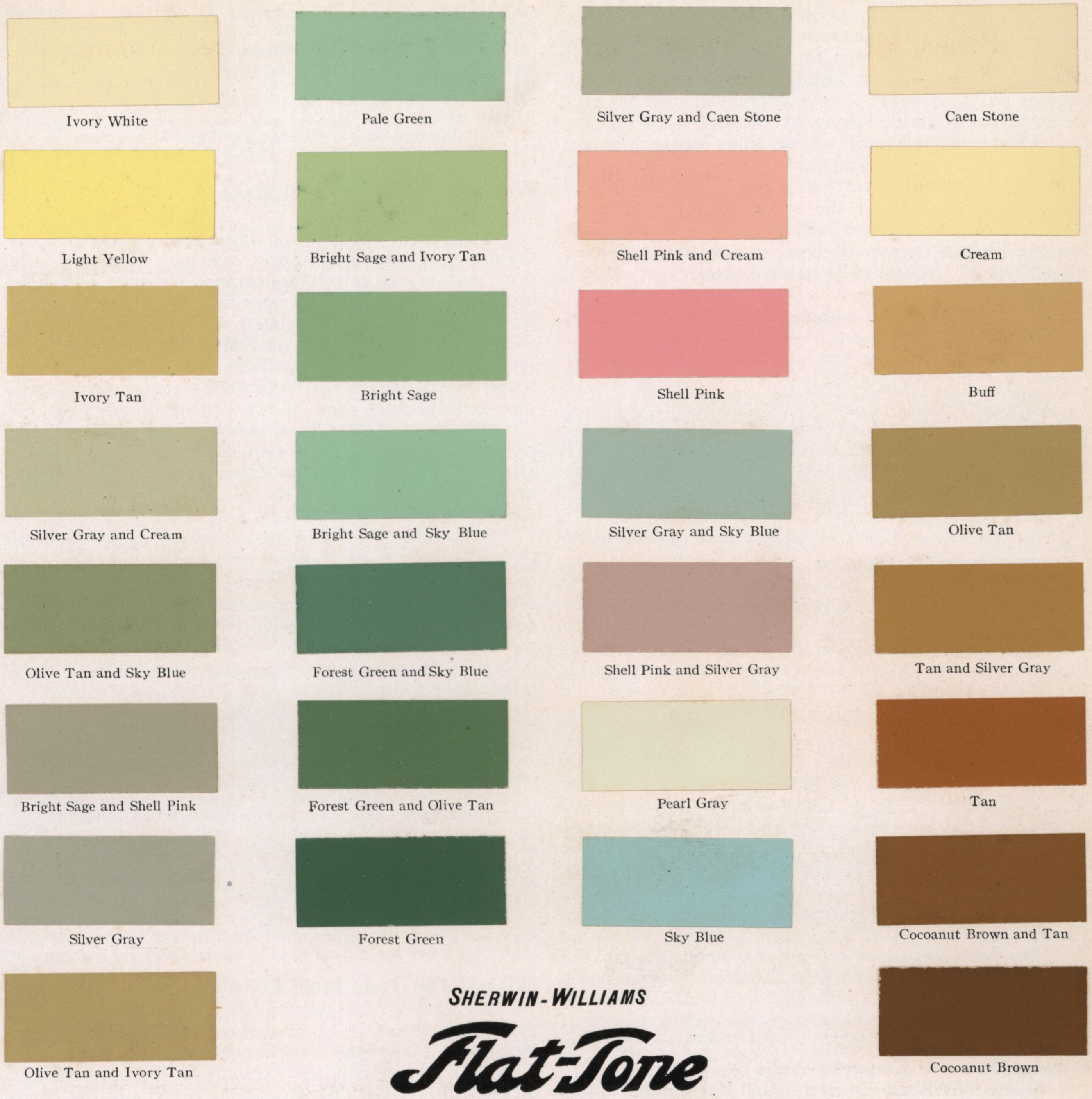
These stains contain creosote, the well-known preservative of all vegetable tissue. Creosote fills the wood with a fatty substance and unites with the sappy part in forming a peculiar compound which resists organic decomposition. The coloring pigments used in Sherwin-Williams Shingle Stains are strong, pure and as fast to light as it is possible to secure.

Specification—For exterior wood specify 2 brush coats. For shingles specify 1 dip coat prior to application and 1 brush coat subsequent to the laying of the shingles.

Painting Exterior Wood Surfaces

SWP (Sherwin-Williams Paint, Prepared) is the exemplification of the victory of science and machinery

Continued on next page

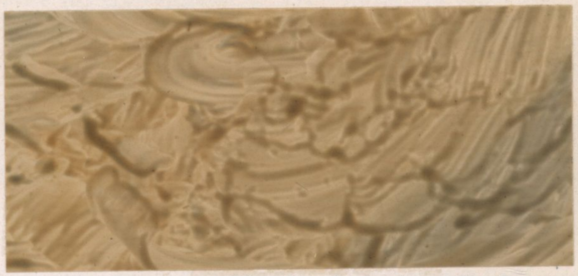

Ivory White
Pale Green
Silver Gray and Caen Stone
Caen Stone
Light Yellow
Bright Sage and Ivory Tan
Shell Pink and Cream
Cream
Ivory Tan
Bright Sage
Shell Pink
Buff
Silver Gray and Cream
Bright Sage and Sky Blue
Silver Gray and Sky Blue
Olive Tan
Olive Tan and Sky Blue
Forest Green and Sky Blue
Shell Pink and Silver Gray
Tan and Silver Gray
Bright Sage and Shell Pink
Forest Green and Olive Tan
Pearl Gray
Tan
Silver Gray
Forest Green
Sky Blue
Cocoanut Brown and Tan
Olive Tan and Ivory Tan
Cocoanut Brown

SHERWIN-WILLIAMS

Flat-Tone

A WASHABLE FLAT WALL PAINT

Flat-Tone Multi-Color Effect No. 25, produced with combination of two of the regular colors shown above. No tinting required.



Flat-Tone System Effect No. 29, glazed over Flat-Tone Caen Stone with two tinted mixtures of Flat-Tone Glazing Liquid, tinted with Glaze Colors Japanese Brown and Cobalt Blue.

For further information, see following page

Continued on next page

over handwork. It proves the advantage of scientific formulæ over human guesswork; certainty of matching colors against uncertainty; fine grinding against hand mixing and stirring. It makes it unnecessary to take chances on the quality of raw materials against the certainty of our scientific laboratory.

SWP is made from the purest white lead, zinc oxide, linseed oil, turpentine and japan drier. These ingredients are combined in the proportions which this Company's 60 years of the study of scientific paint making has demonstrated will produce a paint which has the highest degree of wood preservative qualities, gloss, beauty, maximum covering capacity per gallon, and longest life.

SWP is made in a complete line of colors. Color card on request.

Specification—*Preparation*—All wood shall be thoroughly dry and all knots and pitchy places in the wood shall be given a coat of pure orange shellac before any paint is applied.

First or "Priming" Coat—SWP (Sherwin-Williams Paint —Prepared) in colors selected by architect. Thin with 1 gal. of pure raw linseed oil, and 1 qt. of pure turpentine to each gallon of SWP.

Note: For hard or resinous woods, such as pine or cypress, thin with 2 qts. of pure turpentine, and 1 qt. of raw linseed oil to each gallon of SWP.

Second Coat—SWP, thinned with 1 pt. of pure turpentine to each gallon of paint.

Note: For hard or resinous woods, add 1 qt. of turpentine to each gallon of SWP.

Third Coat—SWP, thinned with 1 pt. of linseed oil to the gallon of paint.

Priming of Metal—All galvanized iron work to be painted with SWP shall be primed with Sherwin-Williams Galvanized Iron Primer instead of first coat specified above.

Porch Floors and Decks—Three coats of Sherwin-Williams Porch and Deck Paint, in the color selected by the architect, shall be applied to porches and decks.

Pure White Lead and Zinc

For those architects who favor the mixing of white lead and oil paints by the painting contractor on the job, and who recognize the advantage of the addition of approximately 25% of zinc oxide to the white lead to improve the whiteness, gloss and wearing properties of the paint, we recommend Sherwin-Williams Zilo, which is purest white lead with pure zinc added, ground in strictly pure linseed oil. Paint made from Zilo will look better, wear longer and give greater satisfaction than straight white lead when used alone.

The following guarantee appears upon every package of Zilo, which is put up in the same size packages as pure white lead:

"This package is guaranteed to contain nothing other than pure White Lead, pure Zinc Oxide and refined Linseed Oil."

Painting Exterior Concrete Walls

Sherwin-Williams Concrete Wall Finish relieves the cold monotony of untreated concrete, adds life and color to the appearance of the building, and reduces streaking of the walls by rain or dirt. It dampproofs the concrete, guards against disintegration and protects against the destructive action of gases from industrial plants or railways.

Sherwin-Williams Concrete Wall Finish is very dense in covering, making necessary only 2 coats of the material for a most satisfactory finish. It dries with a beautiful flat finish which is far more attractive and suitable than a gloss finish for such surfaces. Full line of colors.

Specification—All exterior concrete or stucco wall surfaces shall receive 2 coats of Sherwin-Williams Concrete Wall Finish in the colors selected by the architect. Before proceeding with the painting the painting contractor shall make sure, through careful inspection, that the surface to be painted is thoroughly dry and free from dirt.

Any salts or efflorescence on the surface to be finished shall be carefully scraped off and the surface washed with a solution of zinc sulphate (3 lb. to the gallon of water). Sufficient time shall be allowed for the moisture to dry out thoroughly before painting.

First coat of Sherwin-Williams Concrete Wall Finish shall be thinned with pure turpentine in the proportion of 1 qt. of turpentine to the gallon of paint. At least 48 hours shall be allowed for the first coat to dry, after which the second coat, thinned with 1 pt. to 1 qt. of raw linseed oil, shall be applied.

Note: Sherwin-Williams Concrete Wall Finish is very finely ground, and consequently, where desired, can be applied with air brush. Color card on request.

Washable Flat-Tone Wall Finish (See Colors on Following Page)

Flat-Tone is a flat wall finish manufactured from the highest grade of lithopone, zinc and oil varnish. It dries with a soft velvety appearance and does not show brush or lap marks. It is very durable, economical and sanitary. Any surface painted with Flat-Tone can be washed whenever it becomes soiled, without fear of injury to the paint. Flat-Tone can be applied over rough or smooth plaster, wall board, metal, wood, canvas, or Keene's cement.

The fame of Flat-Tone is international. Hundreds of thousands of gallons are used yearly upon the walls and ceilings of the world's finest structures. Many architects will not permit the use of any other flat wall finish.

Flat-Tone is an extremely opaque paint, and has unusual hiding powers and covering capacity. The first coat serves as a sizing or sealing coat, as well as a color coat, thereby eliminating the necessity of a special sizing coat. While 3 coats of Flat-Tone are always recommended to secure the most desirable effect on new work, it is possible under normal conditions, to obtain a very satisfactory finish with the first 2 coats, as specified.

Specification—***First Coat***—Sherwin-Williams Flat-Tone in color selected by architect, reduced equal parts with Flat-Tone Mixing Size.

Second and Third Coats—Flat-Tone of like color without reduction.

Due to the fact that plaster for walls is running somewhat ununiform these days, all specifications should instruct the painting contractor to inspect the walls carefully for signs of "burning" or extreme porosity. If it is evident that the first coat has not thoroughly sealed the wall, a straight coat of Flat-Tone Mixing Size should be applied, prior to the application of the second coat of Flat-Tone.

Where burning is apparent, test out a small section by applying a coat of clear Flat-Tone Mixing Size, which will invariably solve the difficulty, unless conditions are extreme.

Original Flat-Tone Multi-Color Effects for Walls

The number of unusual and attractive decorative effects which can be secured through blending or stippling Flat-Tone, are unlimited. It is a modern interior decoration and was introduced to the architects of this country by The Sherwin-Williams Co. more than six years ago. It has already been advantageously used in many theaters, clubs, residences and other buildings. The colors to be used are specified for each effect and may be used as they come from the can, although for best results we recommend adding Flat-Tone Mixing Size to each stipple color, 1 part of Size to 3 parts Flat-Tone.

On new walls, the preparation (ground coats) for the stipple coat should be secured in accordance with the foregoing specification for the first 2 coats of flat wall finish.

For the stippling, use a sponge of good even, open texture, not necessarily a large one. The bottom of the sponge is the surface best suited for stippling and should be trimmed or sliced off if necessary to get the interesting flat printing surface. When ready to stipple—which can be done as soon as the foundation color is flatted out and fairly hard—pour or brush out a small quantity of the first stipple color on a piece of board or tin, as con-

Continued on next page

venient. After wringing the sponge out of water so as to open it up, dip it in this color, not in the can. Tap the sponge once or twice on the board to remove surplus paint and stipple directly on wall. A firm, straight tap on the wall is best. Do not use a twisting or turning motion.

When two or more stipple colors are specified, the next color may, but need not, follow immediately. It is not necessary to wait until the first color is dry or hard. Use a separate sponge for each color specified.

A special portfolio of Flat-Tone Multi-Color Effects, showing large samples of many different beautiful effects which can be secured with Flat-Tone Multi-Color Effects, will be gladly sent on request.

Flat-Tone System Effects

Flat-Tone System Effects, sometimes known as Tiffany Effects, are secured by using a ground coat similar to the ground coat used in Flat-Tone Multi-Color Effects and glazing over this with a special varnish glazing liquid tinted to the desired color. This glazing liquid, when tinted, is semitransparent and the whole effect is most pleasing.

Specification—Two or 3 coats of Sherwin-Williams Flat-Tone as required, in the color selected, first coat being thinned equal parts with Flat-Tone Mixing Size. Over the ground coats, a coat of Flat-Tone Glazing Liquid, tinted to the approved color with Flat-Tone Glaze and Stencil Colors, shall be applied and stippled with a rag crushed in the hand, according to manufacturer's specific directions.

White Paint for Factory and Garage Walls

It is now recognized that paints of the high gloss type formerly used extensively in manufacturing plants cause reflection and glare conducive to eyestrain among the employees. This promotes ill health and lowers the general efficiency. Illuminating engineers the country over now seek to supplant the use of gloss paint for this reason.

An "eggshell" mill white not only eliminates glare, but reflects light more efficiently than does a gloss paint. Sherwin-Williams Eg-Shel Mill White is a paint of highest quality. It possesses enough gloss or "sheen" to permit easy cleaning whenever necessary. It is very white and retains its whiteness.

Specification—***Preparation***—Before beginning the painting of the walls and ceilings, the contractor shall make sure, through careful inspection, that all surfaces to be painted are in proper condition for finishing.

First and Second Coats—Two coats of Sherwin-Williams Eg-Shel Mill White shall be applied to all interior walls, columns, ceilings, beams and girders above 5 ft. from the floor. Both coats shall be thinned with Eg-Shel Mill White Reducer in the proportion of 1 qt. of Reducer to 1 gal. of Eg-Shel Mill White.

Dado—A dado 5 ft. in height shall be painted with 2 coats of Sherwin-Williams Dado Enamel in color selected. A stripe 3 in. wide separating the dado from the wall finish shall be painted with Sherwin-Williams Dado Enamel in color selected.

Varnishing of Interior Floors

Sherwin-Williams Mar-Not Floor Varnish is made both to beautify and to wear. It will not crack, scratch, mar or turn white when rain or snow is tracked over it, or when radiators leak upon it. It has a beautiful fullness of body and gloss which lasts as long as the varnish. It is the kind of varnish that architects search for, that painters like to use, and that property owners swear by.

Specification—***Preparation***—The floors shall be sanded to a perfectly smooth surface and thoroughly cleaned of all dust, stains, etc., before any finish is applied. No finish shall be applied unless the floors are absolutely dry.

First Coat—(For open grain woods only.) Sherwin-Williams Paste Filler, Transparent (or color desired). Before filler has set, wipe off clean across grain with burlap or excelsior.

Second Coat—(On close grain woods this will be First Coat.) Sherwin-Williams Mar-Not Floor Varnish thinned with pure turpentine in proportion of 1 pt. to 1 gal. of varnish. When dry, sand lightly with No. 00 sandpaper.

Third and Fourth Coats—Sherwin-Williams Mar-Not Floor Varnish as it comes from the package, sanding third coat, when dry, with No. 00 sandpaper.

Painting of Cement Floors

Sherwin-Williams Concrete Floor Paint is a hard drying, tough, wear-resisting floor enamel. It produces a sanitary, washable surface, which will give the greatest satisfaction in performance and service. It is made in 8 colors. Color folder will be sent on request.

Specification—Contractor shall make sure that all cement floors to be painted are *thoroughly dry* and free from dust, dirt and grease before beginning work. Two (or 3) coats of Sherwin-Williams Concrete Floor Paint, in color selected, shall be applied. The first coat shall be thinned in the proportion of 1 pt. of pure turpentine to the gallon of paint. The second coat shall be applied in the consistency supplied in the original container.

Wood Floor Preservative

There is such a thing as a wood floor being subjected to so much wear that it is not practical to finish it with a paint or varnish, because paint or varnish, like linoleum, wears through in time under excessive foot traffic. Schoolroom, office and corridor floors are excellent examples of this type of surface.

Rather than using hot boiled linseed oil and turpentine, which has been used in the past and which results in discoloring the floor and producing a finish which will collect dust, dirt and germs, THE SHERWIN-WILLIAMS CO. has developed a special floor preservative, known as Floor-Seal, which is designed to penetrate into the pores of the wood, seal the wood against penetration of moisture and protect the wood against wear.

A very slight varnishlike finish appears on the surface of a newly finished floor. This soon wears away, leaving no traces of the finish, but the Floor-Seal continues on in the pores of the wood, rendering its service of preserving the wood and guarding against penetration of moisture. Renewal of the treatment once every year will preserve the floor for an indefinite period.

Specification—All wood floors to be treated with preservative shall be smooth, clean and free from all grease, stains, etc. Two applications of Sherwin-Williams Floor-Seal shall be made in the consistency supplied by the manufacturer. Allow sufficient time for drying between coats. (On maple floors apply 1 coat only, unless it is evident that 1 coat has not thoroughly sealed the surface.)

Staining and Varnishing Interior Trim

The specification "Sherwin-Williams Scar-Not Varnish" for the finishing of interior trim, insures the application of the varnish of the right type.

Scar-Not Varnish is made especially for this class of finishing. It is very full in body, which makes it possible to build up a beautiful finish with the least number of coats. It is pale in color, dries dustfree in 4 hours and readily takes a beautiful, rubbed finish polish in 2 or 3 days.

Scar-Not Varnish is highly water-resisting. Steam from a radiator or water falling upon a window sill will not affect it. It possesses years of life and will render the greatest service and satisfaction.

Specification—***Preparation***—All wood shall be dry, clean and smooth before any finishing materials are applied. All nail-

Continued on next page

holes, cuts, cracks and other defects shall be treated so as to render them unnoticeable.

First Coat—Sherwin-Williams Handcraft Stain in shade selected by architect.

Second Coat—Sherwin-Williams Paste Filler in color selected by architect. Wipe off across grain with burlap or excelsior, before filler has set, to remove excess filler. Allow 24 hours for drying.

Note: The use of filler should only be specified for open grain woods. Where close grain woods are to be finished, specify what is the third coat in this specification, as the second coat.

Third Coat—A *thin* coat of Sherwin-Williams Marvelac or pure shellac.

Fourth and Fifth Coats—Sherwin-Williams Scar-Not Varnish. Sufficient time for thorough drying shall be allowed between coats. The third and fourth coats shall be lightly sanded before applying subsequent coats. (For rubbed finish, the last coat, when sufficiently hard, shall be rubbed with powdered pumicestone and oil or water to a full finish.)

Note: Where an imitation rubbed effect is desired, Sherwin-Williams Velvet Finish Varnish should be substituted for the fifth coat.

Imitation Rubbed Varnish Finish

The dull rubbed varnish finish, obtained by rubbing the final coat of varnish on interior trim with powdered pumicestone and rubbing oil, is the present day vogue. Where the money allowed for painting and decorating does not permit of a genuine rubbed varnish finish, the use of Sherwin-Williams Velvet Finish Varnish is recommended.

This varnish is applied in place of the final coat of varnish on interior wood trim and produces an effect which is so like a genuine rubbed finish that it is very difficult to detect the difference.

A panel showing the finish produced by Sherwin-Williams Velvet Finish Varnish will be sent to any architect or contractor on request.

Enamel Finish on Interior Trim

Old Dutch Enamel, American made, might well be called the aristocrat of the world's enamels. With whiteness and beautiful full body unsurpassed by any enamel, either domestic or imported, Old Dutch Enamel has won the favor of architect, client and painter alike wherever this unusual enamel has been used.

Old Dutch Enamel is made in the popular tints of Ivory and French Gray. Should an architect desire to secure some other tint, this can easily be done by the painting contractor or decorator, by tinting Old Dutch Enamel with Sherwin-Williams First Quality Oil Colors. In tinting, the color should be added to a small amount of Old Dutch Enamel, which after thorough mixing, should be added to the rest of the enamel, a little at a time, until the desired tint is obtained. Where the enamel is tinted, the undercoater should likewise be tinted to a similar color.

Old Dutch Enamel is also made in the dull finish to imitate rubbed work. This material can be used for the final coat in the following specifications, where an imitation rubbed effect is desired.

Specification—*Priming Coat*—Sherwin-Williams Flat-Rite Enamel Undercoater, thinned with pure linseed oil in the proportion of 1 pt. of oil to 1 gal. of undercoater, shall be applied.

Second and Third Coats—Flat-Rite shall be applied, in the consistency supplied by the manufacturer, allowing sufficient time for thorough drying between coats. The first and second coats shall be sanded to a smooth surface with No. 0 sandpaper; the third or last undercoat shall be sanded smooth with No. 0000 sandpaper.

Fourth Coat—Sherwin-Williams Old Dutch Enamel, Gloss, mixed equal parts with Flat-Rite Undercoater.

Fifth Coat—Old Dutch Enamel applied in the consistency supplied by the manufacturer, as soon as the fourth coat will permit.

For a Dull Finish—When sufficiently hard, the last coat shall be rubbed to a dull finish with powdered pumicestone and water.

Enamel Finish on Interior Walls

Specification—Before any paint is applied to the walls, contractor should be sure that the walls are perfectly dry and free from dust and dirt.

First Coat—Shall consist of Sherwin-Williams ODP White Lead in Oil and Turpentine, mixed in proportion with 3 qt. of boiled oil, 3 qt. of turpentine to 25 lb. of lead, with the addition of a small amount of drier.

Second Coat—Shall consist of Sherwin-Williams Flat-Rite Enamel Undercoater mixed with Sherwin-Williams Flat-Tone Mixing Size, in proportion 1 qt. of undercoater to 1 gal. of mixing size.

Third Coat—Shall consist of Flat-Rite Enamel Undercoater in consistency supplied by manufacturer.

Fourth Coat—Shall consist of Sherwin-Williams Old Dutch Enamel and Flat-Rite Undercoater, mixed equal parts. When dry sand lightly.

Fifth Coat—Shall consist of Sherwin-Williams Old Dutch Enamel in consistency supplied by manufacturer.

Alternative Specification—The contractor shall make sure, before applying any paint to walls or ceilings, that same are perfectly dry and free from dust and dirt.

First Coat—Consisting of Sherwin-Williams Flat-Tone and Flat-Tone Mixing Size, mixed equal parts, shall be applied.

Second Coat—Shall consist of Sherwin-Williams Flat-Tone and Sherwin-Williams Enameloid in color selected by architect.

Third Coat—Shall consist of Sherwin-Williams Enameloid in consistency supplied by the manufacturer.

Painting of Radiators

Tests made by the American Society of Heating and Ventilating Engineers, and also by the Paint Manufacturers Association of the United States, indicate that paints made from bronze powders retard the radiation of heat approximately 25%, while paints and enamels made from zinc oxide or lithopone do not appreciably affect radiation one way or the other.

Recent tests prove that the use of the lighter tints of Sherwin-Williams Flat-Tone Wall Finish will produce a highly satisfactory finish on radiators and will not affect the efficiency of the radiation.

This paint tends to bake to a hard film on radiator surfaces, and tests made by the Paint Manufacturers Association of the United States upon raidators in their laboratories indicate that such a finish has a life of as high as nine to ten years without showing defects.

Regardless of what types of paint are used in painting radiators, there is bound to be a slight change of color.

White Damar enamels will yellow slightly, while flat finishes, like Flat-Tone and colored enamels, will likewise change color slightly.

This is a condition for which remedy has not been found up to the present, but the results all in all are highly satisfactory.

THE SHERWIN-WILLIAMS CO. will be glad to send, on request, a copy of Professional Bulletin No. 4, which discusses at some length the painting of radiators and the relation of paint colors to heat radiation.

Specification—Before applying paint, clean off dust, dirt and rust from radiators by wire brushing. Also remove any grease which may be present. Radiators must not be painted while they are hot. Allow paint to dry thoroughly before turning on heat.

Where a white finish is desired on radiators, specify 2 coats of Sherwin-Williams Flat-Tone White and 1 coat of Sherwin-Williams Snow White Enamel.

For a colored enamel finish on radiators, specify 2 coats of Sherwin-Williams Flat-Tone and 1 coat of Sherwin-Williams Enameloid in the color selected.

For a flat finish on radiators, specify 2 coats of Sherwin-Williams Flat-Tone in the color selected.

Continued on next page

ARCHITECTS' GUIDE

FOR PAINTING, VARNISHING, STAINING AND ENAMELING

IMPORTANT: EACH OF THE PRODUCTS SPECIFIED BELOW BEARS OUR NAME AND TRADE-MARK

SURFACE	TO PAINT	TO ENAMEL	TO STAIN	TO VARNISH
	Use product named below	*Use product named below*	*Use product named below*	*Use product named below*
BRICK WALLS (ext) ...	*S-W Concrete Wall Finish*	*Old Dutch Enamel,* Gloss		
CONCRETE WALLS..	*S-W Concrete Wall Finish*	*Old Dutch Enamel,* Gloss		
CEMENT FLOORS....	*S-W Concrete Floor Paint*	*S-W Concrete Floor Paint*		
EXTERIOR WOOD SURFACES	*S W P* (Sherwin-Williams Prepared Paint)	*Old Dutch Enamel,* Gloss	*S-W Preservative Shingle Stain* *S-W Acid* or *Oil Stain*	*Rexpar Varnish*
EXTERIOR METAL SURFACES	*Kromik Structural Steel Primer* *Metalastic* (for finishing coats)	*Old Dutch Enamel,* Gloss		
FACTORY WALLS (Interior)	*S-W Eg-Shel Mill White* *S-W Fume Resisting White*	*Old Dutch Enamel* or *Enameloid*		
FLOORS (Interior Wood)	*S-W Inside Floor Paint* (the enamel-like finish)	*S-W Inside Floor Paint* (the enamel-like finish)	*Oil Stain* or *Floorlac Varnish Stain*	*Mar-Not Floor Varnish*
GALVANIZED IRON SURFACES	*S-W Galvanized Iron Primer* (finish with any paint)	*S-W Galvanized Iron Primer* and *Old Dutch Enamel*		
INTERIOR WALLS AND CEILINGS...	*Flat-Tone Wall Finish* *S-W Semi-Gloss Wall Finish*	*Old Dutch Enamel* or *Enameloid*		
INTERIOR WOOD TRIM	*S W P* (Sherwin-Williams Prepared Paint)	*Old Dutch Enamel* or *Enameloid*	*S-W Acid Stain* *S-W Handcraft Stain* *S-W Oil Stain*	*Scar-Not Varnish* *Velvet Finish Varnish* (for imitation rubbed effect)
PORCH FLOORS AND DECKS	*S-W Porch and Deck Paint*			
RADIATORS AND PIPES	*S-W Flat-Tone Wall Finish or* *S-W Gold Paint* *S-W Aluminum Paint*	*For White—S-W Snow White Enamel* *For colors—Enameloid*		
ROOFS—Metal	*S W P* or *Metalastic* (if galvanized, prime with S-W Galvanized Iron Primer)			
ROOFS—Wood Shingle...	*S W P*		*S-W Preservative Shingle Stain*	
STACKS AND HOT SURFACES	*Salamander Smoke-Stack Black*			
STRUCTURAL STEEL	*Kromik Structural Steel Primer* *Metalastic* (for finishing coats)			
TO DAMPPROOF FOUNDATIONS ...	*S-W Antydamp*			
TO DAMPPROOF INTERIOR WALLS ABOVE GRADE....	*S-W Plaster Bond*			
WOOD PRESERVATIVE			*S-W Carbolic-ol*	

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ESTABLISHED 1847

THOMPSON & COMPANY

Manufacturers of Paints
857 W. North Avenue, PITTSBURGH, PA.

TRADE-MARK

Products

Pro-Tex-Cide Metal Protective Paint.
Daylight Mill White.
Also "Cementite" Concrete Floor Hardener; "Waterseal" Damp-proofing Paint; "Diamond" Paint for cement and wood floors; Dado Paints.

Pro-Tex-Cide Non-corrosive Paint

Pro-Tex-Cide is a scientific paint, built on engineering lines and used for protecting iron and steel against corrosion. It dries non-porous, so that moisture can not reach the metal, and forms a long wearing film, strongly resistant to corroding gases.

PROTEXCIDE
TRADE-MARK

The Vehicle—The linseed oil selected for Pro-Tex-Cide is heated and mixed with china wood oil and certain varnish gums to overcome the voids which exist in single vehicle paints.

The Pigments—The pigments selected reduce polar activity to a minimum. They are so proportioned as to form the proper mixture of coarse, fine, minute, fibrous, and crystalline particles to insure an even, enduring film and are basic by nature to reduce electrolytic action.

The Product—As result of this choice of oils and pigments, Pro-Tex-Cide is proof against electrolytic action, and leaves no pores through which moisture and gases can attack the metal.

Greater Covering Capacity—Pro-Tex-Cide is strong and dense in body, and is easily applied. It covers from 600 to 800 sq. ft. per gal., 1 coat, which is the equivalent of 3 or 4 tons of steel per gallon for heavy construction.

Colors—Six standard colors, as follows:
No. 330 Pro-Tex-Cide Red Lead.
No. 331 Pro-Tex-Cide Carbon Black.
No. 332 Pro-Tex-Cide Graphite.
No. 333 Pro-Tex-Cide Elastic Red.
No. 334 Pro-Tex-Cide Elastic Brown.
No. 335 Pro-Tex-Cide Blue Lead.

No. 330 is used for the first coat next to iron and steel. Inhibitive and affinitive.

Nos. 331-334 are used for second and third coats, the choice being determined by the color desired. They are moisture resisting and impermeable.

No. 335 is used over red lead for special resistance to injurious gases.

Specifications—*New Work*—For shop coat or first coat use Pro-Tex-Cide Red Lead or Elastic Red. For field coat or second coat, use Pro-Tex-Cide Elastic Brown or Pro-Tex-Cide Graphite. For three-coat work, the second coat should be Elastic Brown and the final coat Graphite or Elastic Red, according to color desired.

Repainting—Pro-Tex-Cide Elastic Red, Elastic Brown, Carbon Black or Graphite, according to color desired.

Special Interior—See specifications for Daylight Mill White—Over Iron and Steel. Our Gray Mill Finish may also be used for second and third coats.

General—Stir Pro-Tex-Cide thoroughly in the package before applying. Pro-Tex-Cide is furnished ready for application, but if a particular condition requires a thinner consistency, it may be thinned not to exceed 10% with pure boiled linseed oil and pure spirits of gum turpentine, in the proportion of three parts of oil to one part of turpentine.

Metal surfaces to be coated shall be wire brushed free from mill scale, rust and dirt. Grease and oil spots shall be removed by washing with benzine or gasoline. Apply Pro-Tex-Cide by hand, using a 4 or 4½-in. brush. At least 48 hours shall elapse between coats.

Daylight Mill White

Daylight White is a full bodied standard light distributing paint—non-yellowing and non-porous. At a moderate cost it offers the highest grade of interior white finishing, both as to light reflecting range and permanence of its luminous brightness. Daylight White is prepared from treated linseed oil, hardening fossil gums and pigments of great light refractivity to produce the following results:

(1) Proper radiation and diffusion of light.

(2) Retention of the soft, snowy whiteness.

(3) Adhesion to any interior surface—brick, cement, plaster, wood, wallboard or metal—without chipping or scaling. Withstands vibration and temperature changes.

(4) Cohesion and durability of film—withstands soap, water and repeated scrubbings.

(5) Evenness of film—prevents accumulation of dust.

DAYLIGHT MILL WHITE
TRADE-MARK

Greater Hiding Power—Because of its opacity, Daylight White requires less labor and spreads farther. Covering capacity, by brushing, is 500 sq. ft. per gal., 1 coat. When sprayed, 200 sq. ft. per gal., 1 coat.

Three Finishes—Gloss, semigloss and flat.

Specifications—*Over Concrete, Brick and Plaster*—First coat, Thompson's Cementite Primer, thinned according to the porosity of the surface with equal parts of linseed oil and turpentine. Second coat, Daylight White, Flat. Third coat, Daylight White, Gloss or Semigloss.

Over Woodwork and Wall Board—(Before painting, new lumber should be allowed to dry out as much as possible.) First coat, Daylight White, Flat, reduced with turpentine to priming consistency. Shellac knots and sappy places. Second coat, Daylight White Flat. Third coat, Daylight White, Gloss or Semigloss.

Over Iron and Steel—(Surface should be scraped or wire brushed to remove rust.) On new work, apply a priming coat or Pro-Tex-Cide Red lead. When repainting, touch up rusty places with red lead. Follow the red lead with a coat of Daylight White, Flat, and finish with Daylight White, Gloss or Semigloss.

Over Water Paints or Calcimine—Remove all loose scale. Cut through surface of calcimine with wire brushes. First coat, Daylight White, Flat, thinned liberally with Thompson's Dry-O-Lin Oil (Alkaliproof), about one-third oil to two-thirds Daylight White. Second Coat, Daylight White, Gloss, Semigloss or Flat.

Repainting—First coat, Daylight White, Flat, thinned with turpentine. Second coat, Daylight White, Gloss, Semigloss or Flat.

General—Stir thoroughly in the package. Daylight White is furnished ready for application, but if a particular condition requires a thinner consistency, turpentine may be added not to exceed 10%. When spraying, thin just sufficiently with turpentine to pass through the spraying machine.

All surfaces to be painted shall be dry and free from dirt or loose particles. Clean off the oily spots with naphtha and seal them with shellac. Allow at least 48 hours between coats.

Paint Engineering Service

We make a specialty of paints for industrial construction. Wherever special problems are encountered in this field, an experienced representative of our Company is available without cost to suggest the nature of protection required, and to establish the proper use of our products to insure economy and effective results.

Write for our folder "Paint Achievements."

THE TRUSCON LABORATORIES

Paints, Varnishes, Enamels and Maintenance Products

DETROIT, MICH.
BRANCH OFFICES IN PRINCIPAL CITIES

Products

- Industrial White (Mill White).
- Bar-Ox (Inhibitive Steel Paint).
- StoneTex (Concrete and Masonry Paint).
- Asepticote (Interior Flat Wall Finish).
- Concrete Floor Enamels.
- Wood Floor Preservatives.

Also Paints, Varnishes and Enamels for every purpose.

For Integral Waterproofing, Dampproofings and Floor Hardeners, see pages 122-123.

You could dip this house in water
Protected with TRUSCON
TRADE-MARK

Building Maintenance Service

Truscon products are a complete line, specially made and tested for each condition. To assist architects, engineers and owners in the selection of the right products, Truscon maintenance engineers will make a complete study of the requirements and furnish detailed recommendations without obligation on your part.

Daylighting Industrial Interiors (Industrial White)

Truscon Industrial White, furnished in enamel, eggshell and flat, has high light-reflecting value and will not dust, flake, peel or turn yellow with age. The enamel and eggshell finishes are recommended and are readily washable. Used over wood, plaster, concrete, brick, tile or stone. We also manufacture special mill white paints for rubber mills, dyehouses and other conditions where fumes darken other coatings. Let our maintenance engineers submit recommendations.

Application—Either brush or spray method may be used. All surfaces must be dry; mortar and concrete, thoroughly hard; wood, well seasoned; knots and pitch marks, shellacked.

For three-coat work: first coat, Truscon Industrial White Primer; second coat, flat Truscon Industrial White; third coat, eggshell or enamel Truscon Industrial White. For two-coat work, omit the Primer. For one-coat work, use eggshell Truscon Industrial White.

Protecting Steel Work from Corrosion (Bar-Ox)

Truscon Bar-Ox is a scientific steel paint compounded according to the most advanced principles for protecting steel from corrosion. It has excelled in tests under conditions of severe exposure. It is absolutely waterproof, bonds perfectly, expands with the steel and inhibits corrosion. Furnished in various colors.

Iron and Steel Work Exposed to Atmospheric Conditions—All surfaces must be thoroughly clean and free from rust, scale, grease, oil or foreign matter. No paint shall be applied in wet weather or to damp surfaces. Three coats of Bar-Ox Inhibitive Paint shall be applied to all steel work.

Shop Coats—For shop riveted steel, two coats of Truscon Bar-Ox Red before assembling; for field riveted steel, one coat of Truscon Bar-Ox Red and one coat of Bar-Ox Green.

Field Coat—All abrasions shall be touched up with Bar-Ox Green. All steel work shall receive a thorough coating of Truscon Bar-Ox Black.

Other Truscon Bar-Ox Steel Paints

Bar-Ox Coating, Bar-Ox Smokestack Coating, Bar-Ox Boiler Front Coating, Bar-Ox Acid Coating, Bar-Ox Alkali Coating, Bar-Ox Embedded Coating, Bar-Ox Conduit Coating, Bar-Ox Gas Holder Coating, Bar-Ox Aluminum Coating.

For Exterior Concrete, Brick or Masonry (StoneTex)

StoneTex makes an old masonry building look like new. It beautifies and uniforms the appearance of stucco, brick or concrete. It eliminates stains and weather discolorations. It gives a soft, flat finish that looks like stone. StoneTex is not an ordinary paint. It will not chip, flake or peel. It rainproofs walls and saves repainting for years. Write for StoneTex color chart showing 10 attractive masonry colors.

Application—All surfaces must be absolutely dry and free from dirt, dust, loose material or foreign matter. If applied over old paint, old coatings must show no indications of cracking, peeling or scaling from surface; all defective old paint must be scraped or burnt off the surface. The contents of StoneTex package must be thoroughly stirred and mixed until uniform. For priming coat over new and unpainted surfaces add 1½ pints of special StoneTex Liquid to each gallon of StoneTex as furnished. For second coat apply StoneTex as furnished in original package without any thinner.

Truscon Wood Floor Preservative

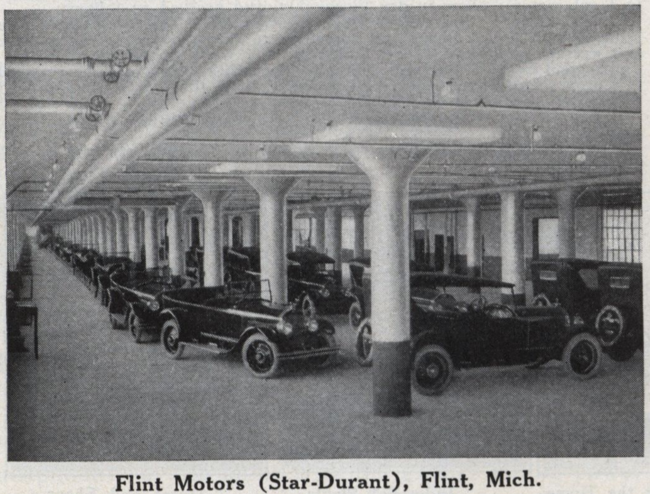
For preserving wood floors against dry rot and decay. Different from ordinary floor oils in that Truscon Wood Preservative is absorbed into the wood and dries, binding the fibers into a tough, wear-resisting mass. Truscon Wood Floor Preservative darkens the floor slightly (usually a desirable feature), but leaves no slippery film.

Truscon Floor Enamel

An economical and convenient enamel for decorating concrete floors. Obtainable in tile red, brown and four other attractive shades. Some very fine effects are made on concrete floors through the use of Truscon Floor Enamel. Readily washable. Adaptable to hospitals, office buildings, garages, auditoria and other concrete floors. Color card on request.

Asepticote (Flat Wall Finish)

An interior flat wall finish, durable, washable and aseptic. Contains no poisonous pigments. Color card sent on request.



Flint Motors (Star-Durant), Flint, Mich.
Entire interior daylighted with *Truscon Industrial White*

H. J. Heinz Co. (57 Varieties), Pittsburgh, Pa.
Bar-Ox Steel Paint, *Bar-Ox* Acid Resisting Black and *Industrial White* Enamel (special) used for interiors. *StoneTex* used for preserving exterior concrete

U. S. GUTTA PERCHA PAINT COMPANY

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Products

"BARRELED SUNLIGHT," the RICE PROCESS WHITE—GLOSS, EGGSHELL and FLAT FINISH; "BARRELED SUNLIGHT" UNDERCOAT, "BARRELED SUNLIGHT" GRANOLITH; "BARRELED SUNLIGHT" CHEMIC ENAMEL; "BARRELED SUNLIGHT" DADO PAINTS; RICE'S FLOW-ON.

Barreled Sunlight
Reg. U.S. Pat. Off.
THE RICE PROCESS WHITE
TRADE-MARK

"Barreled Sunlight" for Industrial Interiors

In thousands of industrial plants of every description, including textile mills, machine shops, paper mills, food product plants, laundries, etc., "Barreled Sunlight" is recognized as the standard white coating for interior ceilings and walls.

Plain facts about the remarkable service this product offers are the strongest arguments in its favor. Here are six important features:

(1) Increases light from 19 to 36%.

(2) Presents a smooth, impervious finish that is washable and sanitary like tile (see photomicrographs on following page).

(3) Has a soft luster peculiar to itself without glare.

(4) Contains no varnish, so is easily applied by brush or spray at lowest cost per square foot of surface covered (convincing figures shown on request).

(5) Guaranteed to remain white longest. See guarantee paragraph.

(6) Can be readily tinted for dado work.

Send for booklet, "More Light," giving complete information.

"Barreled Sunlight" for Hotels, Apartment Houses, Institutions, Office Buildings, Stores, Homes, etc.

In every kind of building from a mansion to an office building there are places where a handsome finish of surpassing *smoothness* is desired—a finish that not only resists dirt but can be readily cleaned when soiled without wearing away the surface; a finish that is actually *improved* by washing. "Barreled Sunlight" meets these requirements ideally.

"Barreled Sunlight" is ground to the very finest degree. Its finish is a soft luster peculiar to itself—without glare and handsome as a beautiful rubbed down enamel.

The great *hiding* power of "Barreled Sunlight" enables it to do a three-coat enamel job with two coats or a four-coat enamel job with three coats. Two coats equal three of lead and oil in covering power. "Barreled Sunlight" combines in one material the *hiding* power of paint with the durability of enamel.

For walls of rooms or corridors or for trim where white is not always desirable, "Barreled Sunlight" can be readily tinted. That smooth, velvety luster that everywhere identifies it in the white, gives it, when tinted, a richness and depth of finish both practical and pleasing to the eye. For attractive tints to specify, see our "Suggestions for Tinting" color card.

"Barreled Sunlight" Guarantee

We guarantee "Barreled Sunlight"—The Rice Process White—to remain white longer than any gloss paint or enamel, domestic or foreign, applied at the same time under the same conditions. We guarantee also that applied in accordance with our instructions it will not flake or scale.

"Barreled Sunlight" Specifications

General Precautions—No painting should be done until the building is enclosed and heated, except in dry summer weather. At all times have room well ventilated where paint is being applied, in order to prevent condensation; and apply the paint, especially the finishing coat, when the air is free from moisture. Always allow each coat of paint to dry *hard* before the application of each succeeding coat. When applying on cold surfaces it has been found that warming the paint assists in ease of spreading.

Never use oil as a thinner for finishing coats. If finishing coats have thickened a trifle on standing, thin with not more than a quarter of a pint of turpentine (or approved turpentine substitute) to the gallon of paint.

For best results with any paint, time should be allowed for plaster, concrete, cement and unseasoned lumber to become as dry as possible before painting.

Woodwork and Wall Board—Allow as much time as practicable for wood to season. Clean the surfaces from mildew or anything else detrimental to paint.

First Coat: "Barreled Sunlight" Undercoat. This may be reduced to a proper brushing or spraying consistency with turpentine (or approved turpentine substitute).

Second Coat: If knots or sappy spots show through priming coat, shellac these well. Then apply second coat of "Barreled Sunlight" Undercoat. Reduce if necessary as above.

Third Coat: "Barreled Sunlight," the Rice Process White (Gloss, Eggshell or Flat).

When applying this coat, paint should be "flowed" on with a well filled brush.

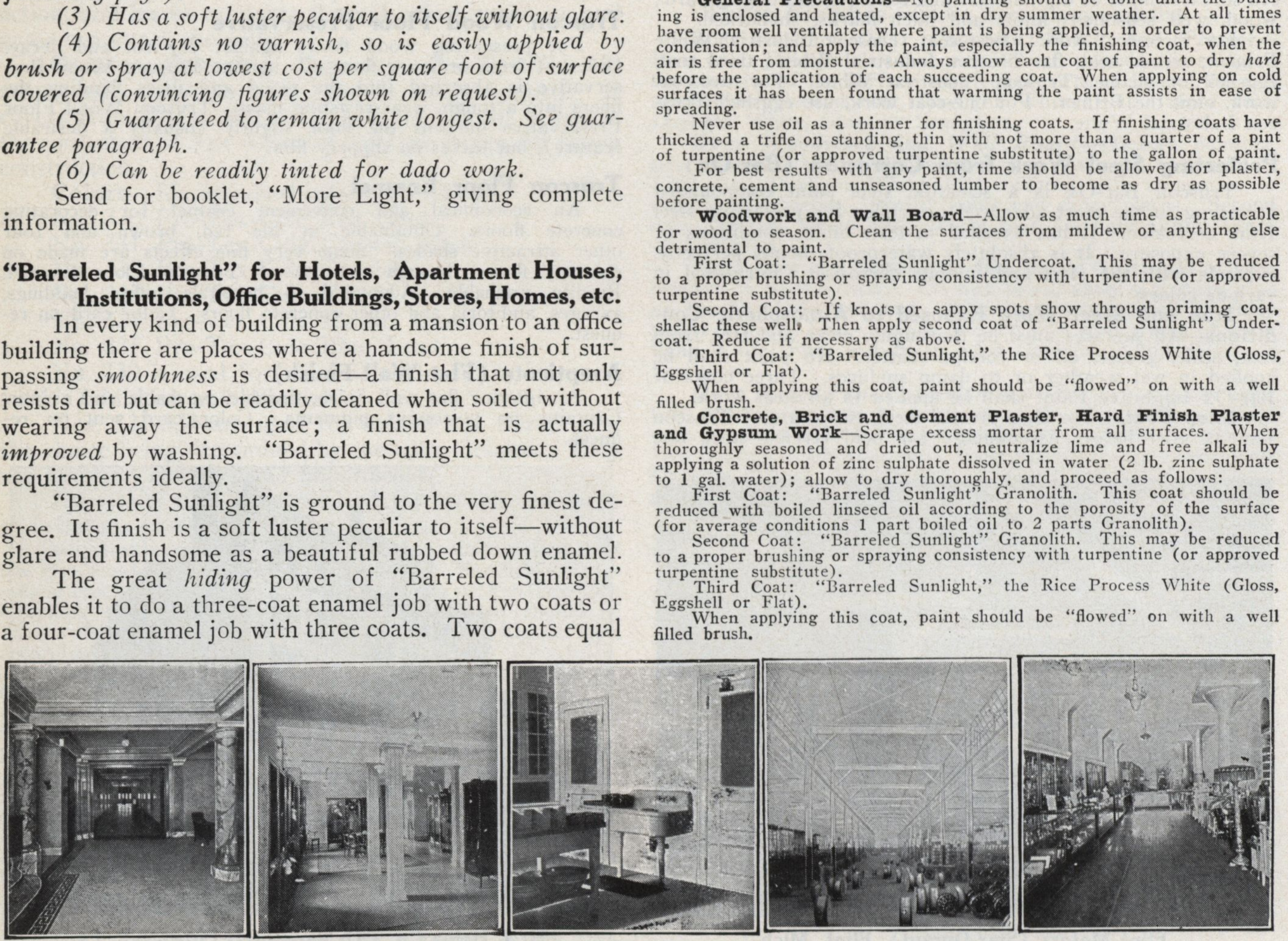
Concrete, Brick and Cement Plaster, Hard Finish Plaster and Gypsum Work—Scrape excess mortar from all surfaces. When thoroughly seasoned and dried out, neutralize lime and free alkali by applying a solution of zinc sulphate dissolved in water (2 lb. zinc sulphate to 1 gal. water); allow to dry thoroughly, and proceed as follows:

First Coat: "Barreled Sunlight" Granolith. This coat should be reduced with boiled linseed oil according to the porosity of the surface (for average conditions 1 part boiled oil to 2 parts Granolith).

Second Coat: "Barreled Sunlight" Granolith. This may be reduced to a proper brushing or spraying consistency with turpentine (or approved turpentine substitute).

Third Coat: "Barreled Sunlight," the Rice Process White (Gloss, Eggshell or Flat).

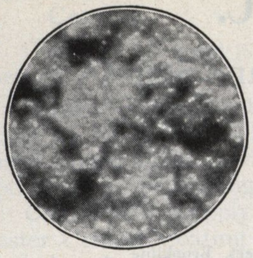
When applying this coat, paint should be "flowed" on with a well filled brush.



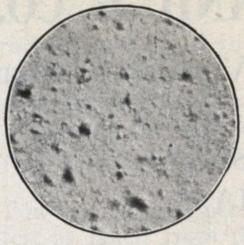
Schools and Institutions
Hotels and Club Houses
Throughout the Home
Industrial Plants
Stores and Shops

"Barreled Sunlight" for All Interiors Where a Smooth Washable Finish Is Desired

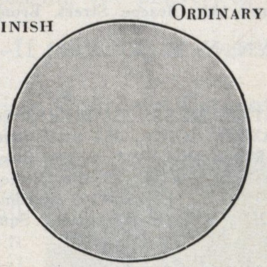
Continued on next page



Ordinary Flat Finish Paint



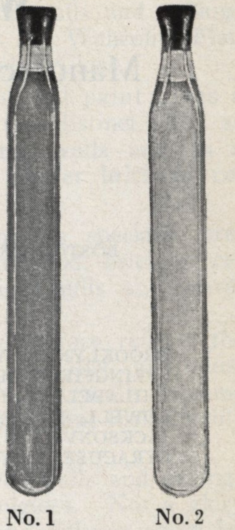
Ordinary Eggshell Finish Paint



"Barreled Sunlight"

On the left are shown reproductions of photomicrographs taken through a powerful microscope, each paint surface being magnified to the same high degree.
The astonishing contrast shows why Barreled Sunlight is so easily kept clean. Its surface is smooth and non-porous.

On the right are photographs of two vials. No. 1 contains refined linseed oil such as is used in the vehicle of the highest quality oil paints. It is amber color.
No. 2 contains the same oil after being treated by the "Rice Process." It is practically colorless, the yellowing element having been substantially removed so that we can guarantee "Barreled Sunlight" as in paragraph on preceding page.
These oil vial illustrations are reproduced from actual photographs and show the difference in shade as well as is possible in black and white.



Exclusive Features of "Barreled Sunlight"

Iron, Steel and Metal Work—Remove all mill scale, rust or grease by scraping. Apply a coat of pure red lead paint.
First Coat: "Barreled Sunlight" Undercoat. This may be reduced to a proper brushing or spraying consistency with turpentine (or approved turpentine substitute).
Second Coat: "Barreled Sunlight" Undercoat. Reduce if necessary, as above.
Third Coat: "Barreled Sunlight," the Rice Process White (Gloss, Eggshell or Flat).
When applying this coat, paint should be "flowed" on with a well filled brush.

Tints and Colors for Wall and Dado Work—First and Second Coats: "Barreled Sunlight" Granolith (for new brick, concrete, plaster or cement), or "Barreled Sunlight" Undercoat (for new wood, metal or previously painted surfaces) in color to match third coat.
Third Coat: "Barreled Sunlight," the Rice Process White (Gloss, Eggshell or Flat) tinted as specified.

Two Coat Work—By reason of the intense opacity of "Barreled Sunlight," the Rice Process White and where economy is desired, it will be found possible to obtain a solid white finish with two-coat work. On new woodwork, metal, or when repainting, use "Barreled Sunlight" Undercoat for the first coat. On new brick, concrete and plaster, use "Barreled Sunlight" Granolith for the first coat.

Repainting—On surfaces previously painted with a white oil paint in fairly good condition, generally a single coat of "Barreled Sunlight," Gloss, Eggshell or Flat is sufficient. Where two-coat work is necessary as over another color or where the white now on is in poor condition, specify "Barreled Sunlight" Undercoat as a primer thinned down as recommended.

Over Cold Water Paint and Whitewash—Scrape all loose scale and dirt from surface, using wire brushes. Brush off with brooms. Apply "Barreled Sunlight" Undercoat liberally thinned with boiled linseed oil. About 1 qt. of boiled oil to 1 gal. of paint for painting over two or three coats of cold water paint; equal parts boiled linseed oil and paint, when painting over three or more coats. Allow 3 or 4 days for drying, then apply finishing coat of "Barreled Sunlight" as received.

Spreading Capacity of "Barreled Sunlight"—On any primed or previously painted surface, "Barreled Sunlight" finishing coats and Undercoat will cover about 400 sq. ft. per gal. On new wood or metal, "Barreled Sunlight" Undercoat somewhat less. Over new brick, concrete or plaster, "Barreled Sunlight" Granolith from 200 to 300 sq. ft. per gal., depending on the porosity of the surface.

"Barreled Sunlight" Chemic Enamel for Use Where Unusual Conditions Prevail

For hotel and restaurant kitchens, oven rooms in bakeries, dye and bleach houses, boiler rooms, laboratories and other places where chemical fumes, excessive heat, steam or other discoloring agents may be prevalent. Provides a smooth, white, washable finish as does "Barreled Sunlight," but has the added properties of being fume and heat resisting.

Specifications—In specifying Chemic Enamel, follow regular "Barreled Sunlight" specifications in every case, but specify "Barreled Sunlight" Flat instead of "Barreled Sunlight" Undercoat or Granolith for the intermediate coat. For the finishing coat substitute "Barreled Sunlight" Chemic Enamel (Gloss, Eggshell or Flat) in the place of "Barreled Sunlight." Where two-coat work is desired, omit the intermediate coat.

Rice's Flow-On, the Practical, Flat Wall Paint in Semi-paste Form

Rice's Flow-On is the lithopone counterpart of "lead and oil," combining the handy form, simplicity and adaptability of the latter with the greater hiding power and superior tinting quality of lithopone.

Rice's Flow-On (weighing 20 lb. per gal.) is reduced and tinted by the painter to suit the requirements of each individual job and coat.

Contains the highest grade of lithopone and linseed oil; no china wood oil, varnish or rosin. Its semi-paste form and the way it will cover, even when tinted way down, make it remarkably economical. Flow-On when properly thinned down flows freely, shows no laps and is washable.

Rice's Flow-On Specifications

General Precautions—No painting should be done until the building is enclosed and heated, except in dry summer weather. At all times have room well ventilated where paint is being applied in order to prevent condensation. Always allow each coat of paint to dry hard before the application of each succeeding coat.

For best results with any paint, time should be allowed for plaster, concrete, cement and unseasoned lumber to become as dry as possible before painting.

Hard Finish Plaster, Cement Plaster and Gypsum Work—Neutralize lime and free alkali by applying zinc sulphate dissolved in water (2 lb. zinc sulphate crystals to 1 gal. of water), allow 36 hours for drying, and proceed as follows:
First Coat: Rice's Flow-On. Reduce with 1½ gal. boiled linseed oil to 1 gal. Flow-On.
Second Coat: Rice's Flow-On. Reduce with about ⅓ gal. turpentine (or approved turpentine substitute) to 1 gal. of Flow-On.
Third Coat: Rice's Flow-On. Reduce with about ½ gal. turpentine (or approved turpentine substitute) to 1 gal. Flow-On.

Wood and Similar Surfaces—Allow as much time as practicable for wood to season. Clean the surfaces free from mildew or anything else detrimental to paint.
First Coat: Rice's Flow-On. Reduce with about 1 gal. of a mixture of equal parts of boiled linseed oil and turpentine (or approved turpentine substitute) to 1 gal. Flow-On.
Second Coat: Rice's Flow-On. Reduce with about ⅓ gal. turpentine (or approved turpentine substitute) to 1 gal. of Flow-On.
Third Coat: Rice's Flow-On. Reduce with about ½ gal. turpentine (or approved turpentine substitute) to 1 gal. Flow-On.

Tinting

Rice's Flow-On is furnished principally in white ready for tinting by the painter as desired. In 5-gal. packages and larger we tint to order at the same price as the white.

Packages

All paints and enamels are shipped in churn equipped steel drums of 55 and 30 gal. each, 5-gal. steel buckets, and in cans down to ½-pt. size.

Service

Our local representative is always ready to discuss any of our products with you at your convenience and offer practical suggestions in terms of the specific job on hand. Furthermore, he will follow up the actual work and co-operate with the painter to get the results you want.

References

We shall be glad to furnish both national and local references on request.

WADSWORTH, HOWLAND & CO., INC.

Manufacturers of Coatings, Paints, Varnishes, Enamels and Stains

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HARTFORD, CONN., 153 Asylum Street
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PORTLAND, ME., 15 Monument Square
LYNN, MASS., 52 Market Street

Distributing Agents in all large cities in the United States and Canada

Products

PAINTS, COATINGS and ENAMELS, which include "Bay State" Brick and Cement Coating, a Sanitary, Damp and Fire Resisting Finish Coating for cement, concrete, brick, plaster and wood; "Bay State" Cement Crack Filler; "Bay State" Cement Floor Hardener, a Cement Floor Filler, which hardens and makes concrete floors proof against wear, dust, water and oil; "Bay State" Enamels for applications where gloss or eggshell finish is desired; Wahcolite, a White Paint for millwork; "Bay State" Steel Protective Coating; Felkim Enamel.

THE BAY STATER
TRADE-MARK
(Reg. U. S. Pat. Off.)

"Bay State" Brick and Cement Coating

Composed of carefully selected pigments, carried in a volatile liquid which evaporates upon application, and when applied to concrete, cement, brick, plaster or interior wood, incorporates itself as a part of the material, resisting dampness, and thus affording protection to the surface upon which it is applied.

It contains no lead, glue, casein or water, and resists the attacks of alkalis, acid fumes, gases, steam, and extremes of temperature. It dries with a dull, uniform finish, and is made in white and in several soft, rich color tones.

The superiority of this, the original of all cement coatings, is also indicated in the facts that it is applicable to nearly all surfaces, even when somewhat moist, and that it will not turn yellow from exposure.

Before applying "Bay State" Brick and Cement Coating, all cracks should be filled with "Bay State" Cement Crack Filler.

"Bay State" Brick and Cement Coating is supplied in several modifications to particularly suit it for the services indicated below:

For Exterior and Interior Cement, Concrete, Porous Brick and Plaster Surfaces—In these applications "Bay State" Coating serves both as decoration and protection, and prevents exposed surfaces from absorbing and showing dampness after storms.

It has been effectively applied in cases of factories, hospitals, laboratories, laundries, mills, dwellings, lightshafts, cold storage, grain elevators and packing houses, office buildings, hotels, etc.

For Cement Floors—"Bay State" Cement Floor Coating overcomes the annoyance and damage occasioned by the dusting of cement floors. It provides a surface of exceptional wearing and sanitary qualities. Prevents staining and absorption and reduces traction noise.

Can be readily washed with soap and hot water.

Made in several special colors, and in first and second coats.

For Millwork, etc.—Its sanitary and fire resisting qualities find effective application in mill and factory interiors and in boiler and engine rooms. "Bay State" Coating for millwork protects the surface against disintegration and scaling, a feature valuable in the preservation of intricate machinery.

Its flat, velvety water-color finish reflects light very effectively.

Can be washed with soap and water.

For Dampproofing Above Grade—In this use, on exterior surfaces, "Bay State" Coating is characteristically effective. A sure bar against exterior moisture and will prevent hair cracking on exterior cement surfaces.

For Interior Woodwork—Can be used on interior woodwork by itself as a dull finish, and over such surfaces it serves as an approved fire retardant coating. Can also be used as an undercoat for "Bay State" No. 222 or Wahcolite Enamels.

Comparative Cost—"Bay State" Brick and Cement Coating costs less per gallon than lead and oil paint.

While it covers slightly less surface in area, one coat covers better than two and frequently better than three coats of lead and oil or other paints, showing a reduction in cost of material, with a great saving of labor and time.

It being a permanent finish, it is not in the class with water paints which show rapid disintegration.

Application Data—Brick, cement, concrete, stucco and wood, unless excessively rough, porous and weather beaten, will ordinarily require but 1 coat of "Bay State" Brick and Cement Coating.

Interior plaster will require 2 or 3 coats of "Bay-State" Brick and Cement Coating.

Continued on next page

Specifications for "Bay State" Brick and Cement Coating

Clean off all loose particles from all surfaces before priming.

New Interior Plaster Walls—*Coat No. 1*—Apply 1 coat of "Bay State" Brick and Cement Coating for plaster, thinned with *pure* spirits of turpentine, not over 1 pt. to 1 gal. of coating.

Coat No. 2—Apply 1 good, flowing coat of Special Plaster Cement Coating for plaster, as taken from the original package.

Coat No. 3—If third coat is necessary, apply same as Coat No. 2.

Exterior Brick, Concrete, Cement and Stucco—*Coat No. 1*—Apply 1 flowing coat of Cement Coating with a wide wall brush, as taken from the original package.

Note: This 1 coat should cover sufficiently well to give a good finish. If a more dense surface is desired an extra coat may be applied, allowing 24 to 48 hours between coats.

A Home That Is Finished with Bay State Brick and Cement Coating

Cement Floors—Always apply 2 coats of "Bay State" Cement Floor Coating; the first coat as a priming coat, which insures a proper foundation for the finish coat. "First coat" (a liquid of neutral color) to be tinted with a small quantity of the finish coat (about ¼ gal. to 1 gal.).

On cement floors of ordinary texture and condition, 1 coat of "Bay State" Cement Floor Hardener applied as it comes from the package is sufficient to produce satisfactory results.

On very porous and soft floors, 2 coats should be applied, the first coat thinned slightly with about ½ pt. of turpentine to the gal.

On very hard, close texture floors, only 1 coat is necessary, and should be thinned with about ½ pt. of turpentine to the gal.

General Interior Finish—*Priming Note*—"Bay State" Brick and Cement Coating or Wahcolite Flat will make an excellent ground coat for "Bay State" Enamel No. 222 or No. 333 or Wahcolite Gloss Enamel, as either dries perfectly flat and hard.

Enamel Finish—Sandpaper the primed surface thoroughly (see Priming Note above) and apply a good flowing coat of "Bay State" Enamel No. 222 [No. 333] [Wahcolite Enamel]. Do not apply on surfaces which contain any dampness, as moisture will cause blisters and peeling.

Woodwork—Sandpaper the priming surface thoroughly (see Priming Note above) and apply 1 or 2 heavy coats of "Bay State" Enamel No. 222 [No. 333] [Wahcolite Enamel]. If 2 coats of enamel are used, sandpaper lightly the first coat.

Note: Do not use "Bay State" Brick and Cement Coating on vitrified, granolithic or any other non-absorbent surface, nor over a surface that has been smoothed up with neat cement.

"Bay State" Brick and Cement Coating is especially adapted as an undercoat for mill white work on brick and concrete.

Wahcolite

The perfect white finishes for walls and ceilings of mills, factories and warehouses are Wahcolite Flat, Wahcolite Semi-Gloss, and Wahcolite Gloss.

Wahcolite Flat White—This mill paint gives a dull white, lasting finish. It has two distinct uses: as a finish coat on previously coated walls and as a first coat on interior woodwork, plaster brick or cement.

Wahcolite Gloss—This Gloss is specially prepared as a finish coat for use on wood, brick or cement for the interior of factories, mills and warehouses.

Its wonderfully white, glossy surface reflects the maximum of light and holds less dirt and dust than any other surface. When the walls become soiled, soap and water will make the plant look freshly painted.

Wahcolite Semi-Gloss—Gives walls and ceilings of mill interiors a pure white semigloss. Not a glary white but a white that magnifies and diffuses every bit of light to every corner of the room. There is such a striking difference before and after Wahcolite is put on the job that it appears as if extra windows had been installed.

Besides this, Wahcolite has a remarkable permanence of color that defies time. No matter how old, Wahcolite keeps that same snow-white complexion it had when it left the brush.

Specifications for Using Wahcolite White (Flat, Gloss and Semi-Gloss) for Interior Work

For Wood Surfaces—All wood surfaces should be cleaned smooth and dry before application. One or more coats of Wahcolite Flat succeeded by 1 coat Semi-Gloss or Gloss White as specified or required. First coat should have at least 48 hours for drying before subsequent coats are applied.

If any thinning is necessary use pure spirits of turpentine.

For Plaster Surfaces—For hard plaster, size composed of good varnish, turpentine and a little of the Wahcolite Flat of proportions to be governed by the absorbent properties of the surface. After this coat is thoroughly dry, 1 coat or more of Wahcolite Flat succeeded by 1 coat of Semi-Gloss or Gloss White as specified or required.

For soft plaster, size composed of linseed oil, dryer, turpentine and a little Wahcolite Flat. These proportions vary according to the absorbent properties of the plaster.

After this sizing coat is thoroughly dry proceed with 1 coat or more of Wahcolite Flat, Semi-Gloss or Gloss White as required or specified.

For Concrete, Brick and General Masonry—All surfaces must be clean, excess mortar between the bricks removed, and absolutely free from all moisture. All holes, defects or imperfections on any surface shall be sealed and uniformed in a workmanlike manner, then apply 1 or more coats of Wahcolite Flat, succeeded by 1 coat of Semi-Gloss or Gloss White as specified. On brick work, 2 coats of Wahcolite Flat may be required.

BRADLEY STUC-O-TINT COMPANY, INC.

Manufacturers of Interior Textured Finishes

80 Boylston Street

BOSTON, MASS.

Products

Interior Textured Finishes:
Stuc-o-Tint
Stuc-o-Finish
Stuc-o-Flat

Stuc-o-Tint

Stuc-o-Tint is a colorless powder which is to be mixed with water and applied with a brush upon any interior surface to produce a textured finish.

Experts have agreed that a textured surface is superior to a plain, smooth surface because it produces a more soft and harmonious appearance.

Dry color may be mixed with the powder to produce finished color effects or the colorless material may be applied for the texture; and the resulting surface treated in colors as desired.

If a uniform color is desired apply one coat of flat paint over the surface when dry.

When a transparent or stained effect is desired, apply one coat of finish which has been colored to suit taste and, before allowing to dry, wipe with cloth to produce the high light effects.

If a blending of several colors is desired, this is accomplished by spotting of other colors over the coat of finish while wet and blending together with a brush or cloth.

When Stuc-o-Tint is used the skim coat of plaster may be omitted, thus effecting a saving.

On rough plaster, brick, concrete, terra cotta, wood and similar materials, Stuc-o-Tint is applied with equal results and requires no sizing before applying.

On plaster board, cork board and other boards, this material will eliminate the showing of joints when filled smoothly.

Finished Effects—The finished effects, other than simple textures and stipples, which may be produced with Stuc-o-Tint are travertine or other marbles, caen stone and other cut, split or rough stone surface; also grass cloth, burlap, canvas, lincrusta and leather effects.

Period, Rough, etc., Effects—Plaster effects such as period, Spanish, rough or float and the various antique finishes are easily reproduced when Stuc-o-Tint is used for the texture surface.

Economical to Use—Stuc-o-Tint costs no more to apply, and finish than a good wall paper or paint job and, when upkeep is considered, it is a saving for it can be washed and is more sanitary.

Stuc-o-Finish

Stuc-o-Finish is an emulsified colorless liquid, made to use over Stuc-o-Tint surfaces, which can be colored or tinted as desired before applying. It produces a washable finish and will allow ample time to wipe out color, as desired, before drying.

Stuc-o-Flat

Stuc-o-Flat is a first class lithopone paint made to a special formula containing all elements necessary for easy application, covering and spreading qualities.

Specifications for Standard Finishes

Flat Paint Stipple Finish—Apply 1 coat Stuc-o-Tint in proportion of 2 lbs. of Stuc-o-Tint to 1 qt. of water, and stipple. When dry, sandpaper surface to remove sharp edges and apply 1 coat of flat paint.

Texture Finish (One Color)—Apply 1 coat of Stuc-o-Tint mixed in proportion of 2½ lbs. Stuc-o-Tint to 1 qt. of water and, while wet, texture the surface with brush, sponge, trowel or any tool necessary to get the desired impression. When dry, sandpaper to remove sharp edges and apply 1 coat of Stuc-o-Finish tinted to desired shade and wipe with cloth to suit taste.

Texture Finish (Blended Colors)—Apply 1 coat Stuc-o-Tint in the stipple or texture effect as above specified. When dry, sandpaper and apply 1 coat of Stuc-o-Finish tinted and, while the surface is still wet, spot selected colors upon the surface and blend together with a dry brush and wipe over with cloth.

Special Finishes—The above specifications will cover the average condition, but there is no limit to the many artistic effects that can be obtained. Our Service Department is prepared to answer inquiries regarding the process required to produce any other effects with Stuc-o-Tint and will be pleased to submit samples of the finish requested upon application.

Directions for Variations of Standard Finishes

For Medium and Heavy Texture—Mix in consistency of 2½ lbs. Stuc-o-Tint to 1 quart of water for a medium texture or heavy stipple. If a finer stipple is required add more water. If a heavier texture is required use less water.

For Stained Glazed Effect—For a stained or glazed effect mix color with Stuc-o-Finish to get the selected shade. Apply over the Stuc-o-Tint surface with a brush and before allowing to dry wipe off with cloth as desired.

Blending of Colors—A blending of colors can be made by spotting of other colors over the above surface while wet and working into the texture and wiping off.

Flat Paint Finish—If a flat paint finish is desired, apply 1 coat of Stuc-o-Flat paint and the result will be a flat eggshell finish.

General—If to be used immediately, mix with hot water and allow to cool before applying. If mixed with cold water, it should be allowed to stand about 12 hours so that all ingredients will have time to dissolve. Water should not be colder than 70°.

For Applying Over Damp Surfaces—If applied upon a surface where an extraordinary amount of dampness exists, it should have an extra coat of dead flat varnish or polish with wax.

Consistency Unchangeable—Stuc-o-Tint will not change in consistency by standing and will not harden unless it has been allowed to stand for an unreasonable time. It will, however, dry hard in 6 to 12 hours after being applied.

After Stuc-o-Tint has thoroughly dried, if the sharp edges or points are objectionable, sandpaper lightly and it is ready for finishing.

When Waterproof Finish Is Not Necessary—Tint Stuc-o-Tint before applying with dry or oil colors, apply and stipple or texture with tool to get desired effect.

For Applying Over Wall Paper—If applying over old wall paper, be sure and scrape off all loose places before applying. If wall paper has colors that may bleed through Stuc-o-Tint, apply a coat of varnish size over old wall paper, or a thin coat of Stuc-o-Flat White over Stuc-o-Tint when dry.

No Sizing—No sizing of other surfaces is necessary before or after applying Stuc-o-Tint. All elements necessary to stop suction or effervescence are contained in the powder.

Covering Capacity—Stuc-o-Tint will cover an average of 10 to 18 sq. ft. to 1 lb. according to the density of texture used and the surface upon which it is being applied.

Service Department

The manufacturers of Stuc-o-Tint will gladly extend the experience of their Stuc-o-Tint department in order to convey conclusively its practical, economical and artistic effects and will be pleased to send literature and finished samples upon request.

ALABASTINE COMPANY

Manufacturers of the Sanitary Cold Water Color Wall Coating

1645 Grandville Avenue
GRAND RAPIDS, MICH.

Product

ALABASTINE, a Water Color Wall Coating.

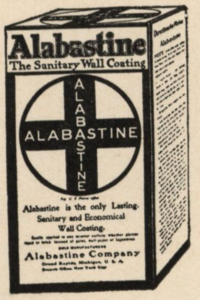
Alabastine Sanitary Water Color Wall Coating

Uses—A beautiful wall tint for homes, apartment buildings, hotels, clubs, schools, hospitals, churches, libraries, offices, stores, and all interior wall surfaces.

Surfaces on Which Alabastine May Be Used—Alabastine may be used successfully over smooth or rough plastered walls, wall boards of all makes, plaster board, burlap, canvas and like fabrics. Over cement, brick, and steel ceilings. Alabastine is admirably suited for use over painted walls that have become soiled and require renewing, at much less cost than painting.

Preparation—Alabastine comes in dry powder form, all ready to be mixed with cold or warm water, has excellent brushing qualities, flows together, making a solid matlike surface. In redecorating over Alabastine it can be applied directly over the old coats, or the former coats may be easily washed from the wall if desired.

Colors—Alabastine is packed in 5-lb. packages in 20 tints and white. These tints, by combining and intermixing or by being toned down through the addition of a certain proportion of white Alabastine, give an unlimited range in water color decorative effects. White Alabastine as a carrier or base enables the decorator to add his own color and produce any color known to the art and producible in water colors. This company also manufactures fresco colors for lining and stenciling which are packed in 1-lb. packages.


Alabastine
The Sanitary Wall Coating
ALABASTINE
ALABASTINE
Alabastine is the only Lasting Sanitary and Economical Wall Coating
Alabastine Company

Package
No package genuine without Cross and Circle printed in red

Specifications for the Use of Alabastine

All plastered walls, ceilings and steel ceilings throughout the building in the following rooms........................... to be given 1 or 2 coats of Alabastine, as necessary to produce a satisfactory job, and as per following specifications and instructions:

Preparation of Surface—All plaster on walls and ceilings must be perfectly dry before decorating. If any cracks or holes exist in the plaster, the loose plaster must be removed with a putty knife and dampened by applying water to the crack or hole with a small brush. For filling these cracks and holes use one-half stucco and one-half Alabastine mixed together, to be used with a trowel or putty knife. Care must be taken to fill the hole or crack flush so as to produce an even, smooth surface.

Sizing—All plaster throughout the building must be sized with a hard oil or a good quality of varnish two-thirds oil or varnish thinned down with one-third turpentine and in each gallon of size a handful of dry Alabastine should be used. It will give a tooth or surface that will improve the spreading. After the size is dry, should any flat spots appear on ceiling or walls, these spots must be touched up with a coat of shellac size (one-half shellac and one-half wood alcohol). Flat spots here mean "lime spots" or where the cracks or defects in plaster have been refilled.

Should the walls have lime stains, water stains, or creosote stains, they should be treated as follows:

Directions—To each 5-lb. package of Alabastine, white or any tint, add 1 pt. of boiled linseed oil, then add 1 pt. of any grade of varnish. When both of these liquids are added this will stir into paste form; stir thoroughly and thin with naphtha, gasoline or turpentine until it spreads easily under the brush. Use this mixture a little heavier over stains, if the stains are severe, and coat the entire surface to be covered. Or better yet, touch up the stains, let stand for 24 hours and then go over the entire surface, thus giving the stained portions 2 coats of the size. This sized surface must stand from 24 to 36 hours. This size is also desirable as a first coat on walls before applying oil or flat paint. For interiors of cement buildings, first give 1 coat of this size, using the Alabastine color desired; then apply 1 coat of the goods mixed in the regular way with cold water to give a perfect surface.

As a Priming or First Coat for Exterior Paint—To each 5-lb. package of Alabastine approaching the nearest to the color of the finishing coat of paint to be used, add just enough boiling water so that when stirred it will make a thick paste or putty. When this is in thick paste form, hot, stir in to each 5-lb. package 1 pt. (2 pts. may be used if desired) of boiled linseed oil; stir thoroughly until the oil disappears; then add 2 pts. of hot water. If the surface is rough or very porous hot water must be added until the mixture is quite thin and spreads freely. This should be put on when the surface is dry, and, after standing 24 hours, gone over with an oil paint. Better results at a great saving in expense will follow than if all oil paint had been used. The first coat fills the pores, which is where so much of the expense of an oil paint is incurred.

Application of Alabastine—A good 7-in. or 8-in. wall brush is suitable for applying Alabastine. It should be flowed on with a good full brush and only brushed sufficiently to spread evenly over the surface. Printed directions as to mixing and the quantity of water to be used must be observed.

Stippling—If a stippling effect is desired, mix somewhat thicker than for regular wall work and use an ordinary wall stippler.

Steel Ceilings—Any steel ceiling that has been properly dipped, or given a priming coat of paint, can be successfully treated with Alabastine tints.

Do not use Alabastine on raw steel until it has been painted or properly prepared. Observe general directions on this work as to mixing and spreading.

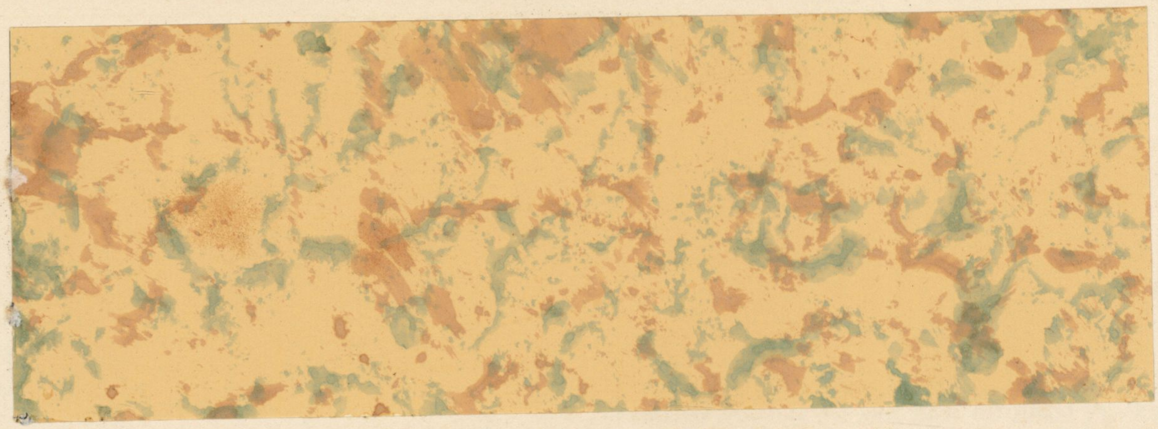
Caution—Alabastine must be delivered on the job in original sealed packages with the manufacturer's label, the Red Cross and Circle. No whiting, glue or kalsomine may be mixed with the Alabastine.

Notice—On ordinary side walls and ceilings properly sized, 1 coat will produce a perfect surface in the majority of cases and under those conditions no second coat is required.

Further Information

Any further information regarding any uses of Alabastine, together with circulars of tints, color demonstrators, etc., gladly sent on application.

Continued on next page



Alabastine Opaline Effect

How to secure beautiful Opaline Effects with Alabastine as shown above. No. 52 Alabastine for background; for the Opaline Effect use equal parts Nos. 52 and 17 Alabastine for first color, and 4 parts No. 52 and 1 part No. 2 Alabastine for second color

Directions for Producing Alabastine Opaline Effects

Alabastine-Opaline

TRADE-MARK
Registered U. S. Patent Office

An untold variety of Opaline or mottled effects can be produced by the use of Alabastine, the mottling being added over a plain coating of Alabastine.

For the background, or first coat, apply Alabastine in the ordinary way, mixed and applied in accordance with the directions on the preceding page.

For producing the Opaline or mottled effects, it is necessary to use a sponge of good quality, firm, but with coarse or fair-sized openings. Cut the sponge straight and evenly across the grain so as to produce a flat or level surface.

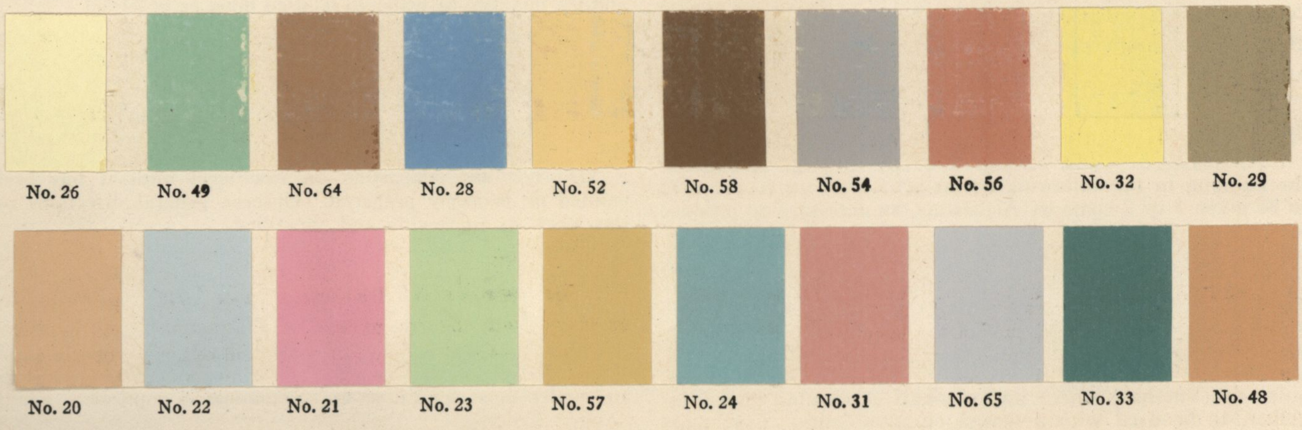
Mix the colors desired, one or more of them according to the work to be done, in separate dishes.

The mix for these colors should be somewhat thinner than for regular wall work—about the proportion of 2 lbs. of Alabastine to 3 pts. of water.

Dip the flat surface of the sponge in the mixture to be used; then squeeze out the excess, as it is essential not to have too much material on the sponge. Dab the sponge on a small piece of glass, tin, or some other smooth surface, in order to distribute the Alabastine evenly over the surface of the sponge.

Then stipple or dab the sponge over the wall, one color at a time. By the time a room has been completed, one color, the first stippling applied will be dry; the following color may be applied at once, without loss of time for drying as with oil paints. For obtaining this Opaline effect, 1 lb. of each color used will probably be found to be sufficient for a medium sized room.

Opaline color effects may be carried out with plain Alabastine tints, or with Alabastine strong colors. Individual room effects to harmonize with rugs, draperies, standing woodwork, etc., may be worked out the same as with regular plain Alabastine flat work.



Regular Alabastine Tints Applied on Paper with a Brush

These tints by combining and intermixing are susceptible of producing an innumerable variety of up-to-date water color effects. Alabastine is also packed in white

THE MURALO COMPANY, INC.

Manufacturers of Decorative Wall Coatings, Cold Water Paints and Wall Sizes

GENERAL OFFICES AND FACTORY
NEW BRIGHTON, N. Y.

BRANCH OFFICES AND WAREHOUSES

BOSTON, MASS., 141 Milk Street
CHICAGO, ILL., 63-65 E. South Water Street
SAN FRANCISCO, CAL., 1151-1153 Mission Street

Products

- Muralo Sanitary Wall Coatings.
- Mural-Tex Decorative Finish.
- Indeliblo Exterior Cold Water Paint.
- Salamander Interior Cold Water Paint.
- Muralo Wall Size.

Largest manufacturers in the world specializing exclusively in Wall Coatings, Cold Water Paints and Wall Sizes.

Muralo Sanitary Wall Coatings

The ideal material for decorating interior walls and ceilings in all manner of residences and public buildings, where harmonious color treatments are essential factors.

Composition—Muralo Sanitary Wall Coatings are manufactured in dry powder form from the best selected raw materials, and compounded in such a manner that they require only mixing with either cold, warm or hot water, whichever is most convenient, to prepare them for immediate application over plaster, wood, burlap or any of the various wall boards.

Expert supervision over all manufacturing processes insures a uniform product that always meets the most axacting of decorative requirements.

Range of Colors—Muralo Sanitary Wall Coatings are milled in the 18 light tints featured on the accompanying color chart, 18 deep colors, white and black.

By intermixing the white with the tints and deep colors, or intermixing the tints and deep wall colors an infinite variety of intermediate shades may be developed to suit individual requirements.

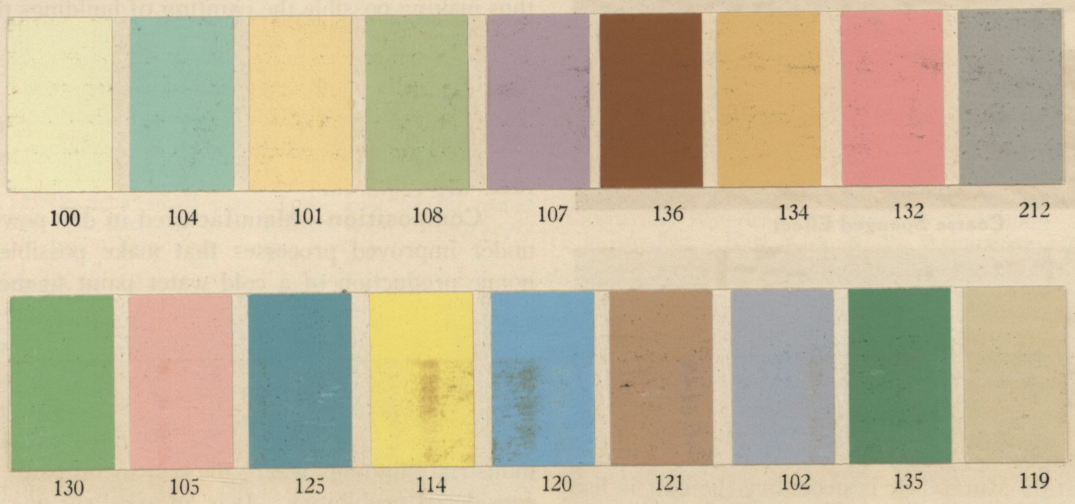
The possibilities for soft blending of tints and shades and artistic harmonizing of colors are unlimited.

Decorative Value—No matter what the style, the general treatment or proposed color scheme for a room may be, Muralo shades harmonize perfectly. They adapt themselves to any type of decoration, from the plain, severe Colonial to the highly ornate.

The deep subdued colors, the range of dainty, delicate tints with their rich velvety finish, devoid of gloss or glare, create an atmosphere of elegance, distinction and refinement, adding new charm to the cottage and mansion alike.

MURALO STANDARD TINTS

These samples are made by spreading the actual material on paper with a wall brush



ALSO MADE IN 18 DEEP WALL COLORS, WHITE AND BLACK

Continued on next page

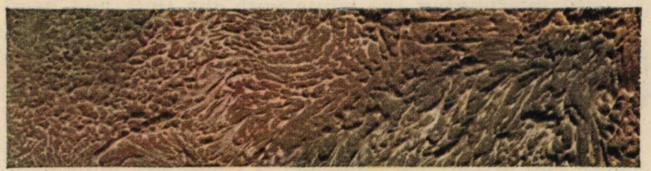
Mural-Tex for Textured Relief Decoration

A plastic composition designed to make possible the reproduction of historic wall textures, and the development of new and novel decorative color effects in both high and low relief. It is manufactured in dry powder form and simply requires mixing with cold water to prepare it for immediate application.

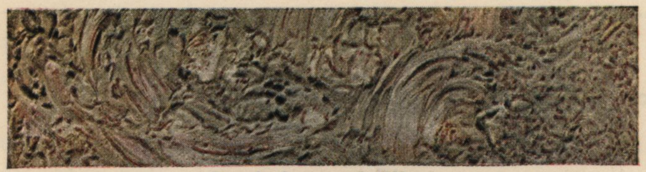
Effects Obtainable—

Roman Travertine	Italian Plaster
French Caen Stone	Spanish Palm Finish
Roman Tile Finish	Old English Plaster
Holland Finish	Novel Textures & Color Effects

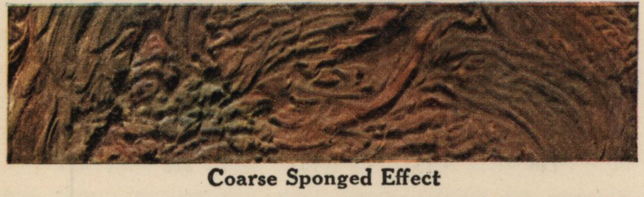
Originally the beautiful historic patterns which have come down to us through the ages were made with mud, cement, or lime plasters of varying composition. Today these artistic designs can be readily duplicated with Mural-Tex—the scientifically prepared plastic wall finish; and innumerable unusual plain and colored relief effects produced as well.



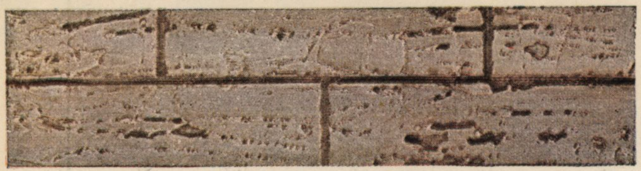
Fine Sponged Effect



Brush Sponged Effect



Coarse Sponged Effect



Tooled Sponged Effect

Advantages—*(1) Low Cost*—Due to the fact that only one coat of Mural-Tex is necessary the cost is less than when oil paint is used.

(2) Permanence—Mural-Tex will withstand, without injury, the wear and tear that comes from furniture knocks and the usual treatment to which a wall finish is subjected.

(3) Wide Range of Decoration—Beside the effects listed above, Mural-Tex makes possible wall treatments that will harmonize and lend character to whatever furnishing and decorative scheme it is desired to enhance.

Mural-Tex Glaze (Egg Shell)

A transparent protective coating to be applied over Mural-Tex rendering the surface washable, and lending richness and character to the color tones and texture of the plastic relief.

Muralo Wall Size

Preliminary treatment of wall surfaces prior to applying wall coatings in general is very essential.

A priming coat of Muralo Wall Size produces a perfect foundation and insures the successful outcome of the completed work. Compounded in dry powder form and is ready for use when dissolved with boiling water.

Indeliblo Exterior Cold Water Paint

A perfectly blended, smooth, fine-spreading paint mixture, which possesses all the adhesive and covering properties of oil paint at only a fraction of the cost. In addition it has fire-retarding properties of recognized value. Furnished in 18 standard colors, white and black.

Composition—Manufactured in dry powder form from the most durable and lasting paint pigments, combined with certain cementing and waterproofing compounds, and so treated by certain processes that it is at once soluble and ready for use when mixed with ordinary cold water, forming a durable cold water paint which has remarkable weather-resisting qualities.

Adaptability—Especially designed for painting the exteriors of factories, warehouses, and all types of industrial buildings. In the larger cities it is used extensively for the painting of airshafts and courtyards of apartment buildings and tenements, due to its sanitary and light-reflecting properties. In the country and farming sections it provides a means of painting farm buildings at a relatively low cost as compared with oil paint, thus making possible the painting of buildings that would ordinarily remain unpainted.

Salamander Interior Cold Water Paint

A high grade snow white paint for interior surfaces, where sanitary, fireproof and light-reflecting surfaces are required.

Composition—Manufactured in dry powder form, under improved processes that make possible the economic production of a cold water paint to meet certain industrial requirements. Ready for immediate use when mixed with cold water, and may be applied with brush or spraying machine.

Adaptability—Particularly adaptable for painting the interiors of factories, warehouses and all types of industrial buildings where the cost of oil paint is usually considered prohibitive. It is an excellent fire retardant, affording ample protection against the spread of fire.

Specifications

Directions for mixing and applying our products are given in detail in our "Mixing Directions" circular, a copy of which is inserted in each container of the respective products. Architects may safely refer to same in lieu of specifying in detail.

Samples, Literature, Information

Samples of our several products, and descriptive literature and further information pertaining thereto will be cheerfully furnished on request.

Correspondence invited.

CRAFTEX COMPANY

Texture Wall and Ceiling Finishes

146 Summer Street, BOSTON, MASS.

NEW YORK OFFICE, 101 Park Avenue
CHICAGO OFFICE, 220 South State Street
ST. LOUIS OFFICE, 6843 Scanlan Avenue
ATLANTA OFFICE, 726 Murphy Street

CRAFTEX
TRADE-MARK
(Reg. U. S. Pat. Off.)
A Texture Wall Finish Applied with a Brush

Products

Craftex, a Plastic Paint Wall Finish. Also Lacquersize, a Size for use over Craftex or plaster; Craftcoat, a glaze for use over Craftex and Lacquersize.

One-coat Craftex

Craftex (supplied in powder form) is mixed with hot water and applied with brush to wall. Textured with brush, sponge, trowel, etc. Can be colored before application.

Glaze Coat Craftex

Made by sizing and glazing the above base coat of Craftex. Color is added with the glaze.

Finishes

Limitless original textures and color combinations. Also Caen stone, Travertine and rough plaster effects.

Surfaces Covered

Craftex covers not only wood, plaster, metal, glass, wall board, masonry and other surfaces successfully, but is the *one material which will give a uniform unbroken wall treatment over a combination of different surfaces.* Saves expense of skim coat plaster when applied direct to brown plaster floated or troweled comparatively smooth.

Advantages

Craftex gives a permanent, distinctive wall treatment that harmonizes with any desired color scheme.

Cost

The labor saving on One-coat Craftex work brings the applied cost down to a figure that approximates three-coat paint work. For large areas, the material cost runs from 10¢ to 25¢ per sq. yd.; on small installations, from 12¢ to 35¢.

For Glaze Coat finishes (Craftex, Lacquersize and Craftcoat) the material cost averages 10¢ to 15¢ more per sq. yd.

Caen stone, Travertine and rough plaster effects are reproduced in Craftex at a small part of the cost of the usual methods. The fact that any good interior painter can apply Craftex also helps to keep costs down.

Specifications

List under *Painting* Specifications. *Where used in place of skim coat, note under Plastering Specifications that brown coat must be troweled smooth.*

Work Included—The following surfaces (list location) shall be finished with Craftex as supplied by the Craftex Company, and in finishes as hereinafter specified.

Workmanship—The Craftex shall be applied in strict accordance with the standard directions of the Craftex Company and shall be finished (One-coat or Glaze Coat—Colors and Texture) to match sample (or samples) on file at the office of the architect.

Service

The Craftex Company has offices in Boston, New York, Chicago, Atlanta and St. Louis, as well as representative decorators throughout the country and is ready at all times to co-operate with any architect in working with local painters who may not be familiar with Craftex, furnishing samples, detailed instructions for securing various finishes, working out special textures, colors, etc. A wide range of finishes are on display at the Architects Samples Corporation, New York City, for the benefit of architects and their clients.

Representative Craftex Installations

The earliest Craftex installations (1911) are in perfect condition today. The following list includes a few of the buildings in which Craftex has been extensively used.

Residences

Edward Bok, Florida, E. M. Parsons & Co., Architects
Adolph S. Ochs, Lake George, N. Y., Ludlow & Peabody, Architects
J. Scott Parish, Richmond, Va., Tiffany Studios, Decorators

Hotels and Clubs

New Colonial Hotel, Nassau, Bahama Islands, Kenneth M. Murchison, Architect
Englewood Country Club, Englewood, N. J., Frank A. Moore, Architect
Architectural Club, Boston, Mass.

Theaters

Toytown, New York Hippodrome, Joseph Wickes, Decorator
Redecoration of Century Theater, New York, N. Y., for "The Miracle," Norman-Bel Geddes, Designer

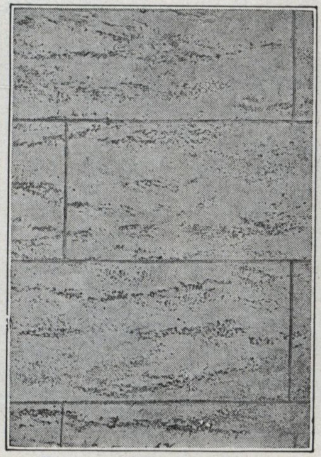
Banks and Office Buildings

Bank of New York, New York, N. Y., Frank E. Newman, Architect
Second National Bank, Houston, Tex., Thomas M. James, Architect
Cafeterias, American Telegraph & Telephone Building, 195 Broadway, New York, N. Y., Wells Bosworth, Architect

Architects' Offices

Ludlow & Peabody, New York, N. Y.
Buchman & Kahn, New York, N. Y.
Coffin & Coffin, New York, N. Y.
C. C. Wendehack, New York, N. Y.

Rough Texture Craftex Finish



Roman Travertine Effect
Other stones, notably Caen stone, are easily reproduced

Innumerable Ornamental Plaster Effects Are Made from Craftex

A New Wall Finish Made with Craftex

Finishes Are Attained with Craftex Impossible with Any Other Material

MORENE PRODUCTS CO., INC.

Wall Finish

245-247 West 28th Street, NEW YORK, N. Y.

For Waterproofing and Preserving Specialties, see page 108

Morene—the Wall Finish Distinctive

Morene is a wall finish composed of Atlas white portland cement, sand, asbestos, oils and chemicals, all ingredients being so mixed and the oils so emulsified that they remain in suspension.

Morene is used chiefly for obtaining interior and exterior textured wall finishes, from the plainest to the most elaborate, and it will enhance the appearance of any type of building, whether it be a residence, apartment house, church, hospital, office building or store. It is easily and quickly applied to all kinds of surfaces—brown or white plaster coats, wood, metal, old painted surfaces, gypsum or fiber wall board, brickwork, masonry, etc. In new buildings, Morene serves as a finishing coat of plaster.

Morene adapts itself to produce various texture and color combinations, including stipples, tapestry effects, sand finishes, travertine, caen stone, limestone or unpolished marbles.

The selection of Morene as a medium for expressing the artist's skill in the decoration of many fine buildings is proof of the unusual effects possible to produce with this material. Combining as it does the permanency of concrete with the utmost in artistic expression, a casual inspection of the murals executed with Morene will convince even the most skeptical that it has been brought to a point of perfection beyond even the most sanguine expectation.

Morene will not crack or check if the structural surface to which it is applied remains intact, and it may be scrubbed with soap and water without harmful effects. Unevenness and defects in the joints of wall boards and cracks in plastered walls are easily made invisible.

Samples and specifications sent on request.

How Applied

Morene is applied with a brush or trowel, variation in texture being obtained by stippling, troweling, brushing, etc. Include in painting specifications if it is to be applied with a brush, and in the plastering specifications if it is to be troweled.

Colors

Morene is shipped in white only. Oil colors are added on the job, so that all colors from the most vivid hues to the most delicate pastel shades can be produced.

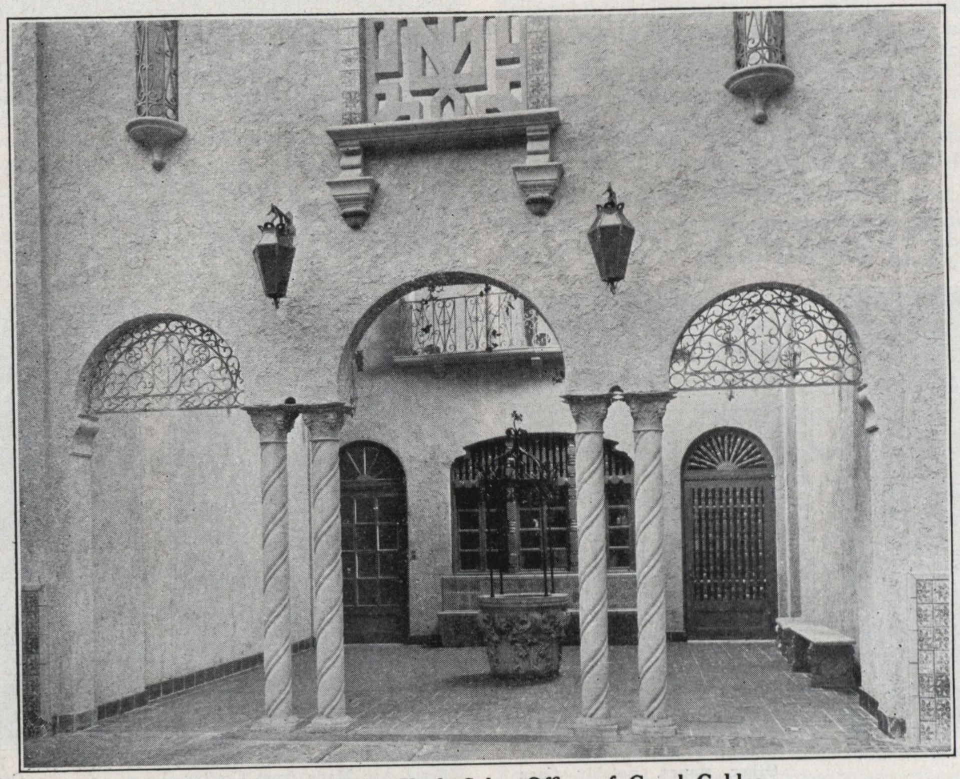
Cost

Approximately the same as a good 3-coat paint job.

Containers and Capacities

Morene is shipped in ½ and 1-gal. cans, 5-gal. steel pails and 25 and 50-gal. barrels or steel drums.

Average covering capacity is 1 gal. per 50 sq. ft., the amount required varying with the texture desired and the condition of the surface to which it is applied.



Entrance of New York Sales Office of Coral Gables

Polychrome treatment is Morene applied with brush over portland cement base. Interior finished in Morene over gypsum wall board

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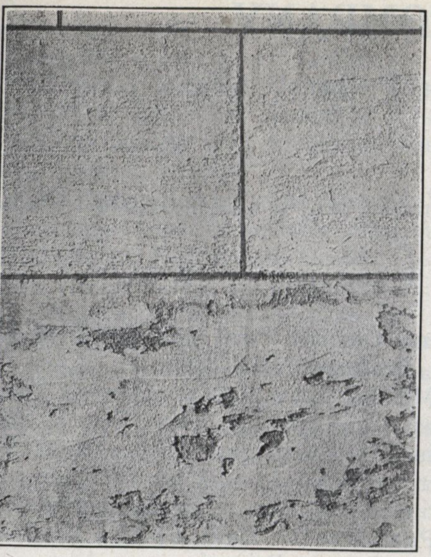
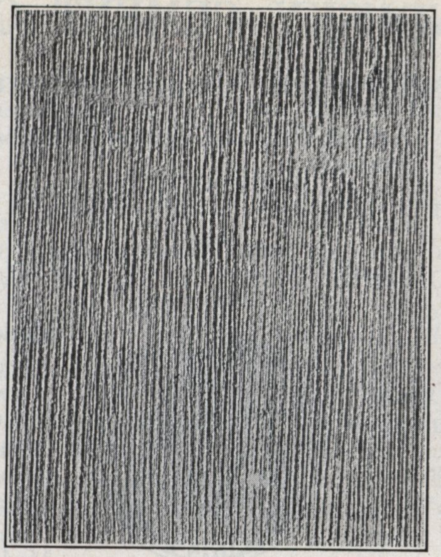
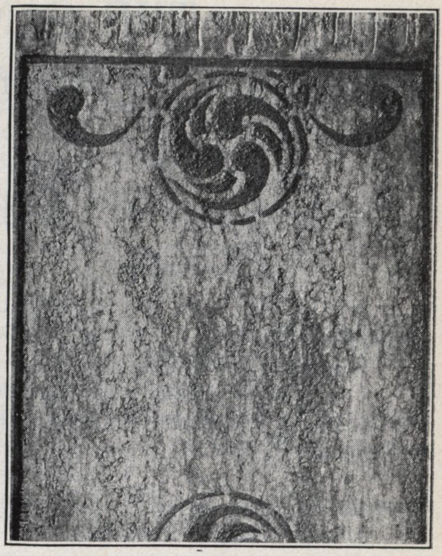


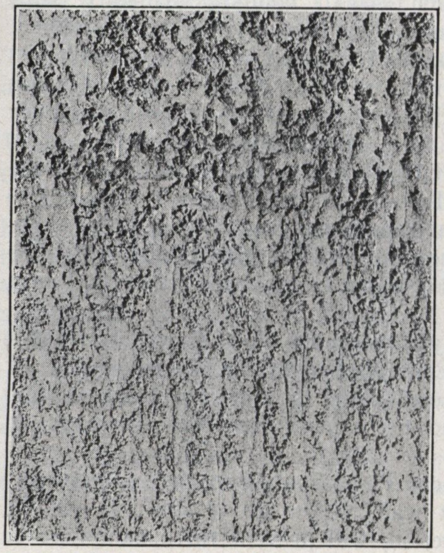
Brushed on and Flattened with Palette Knife



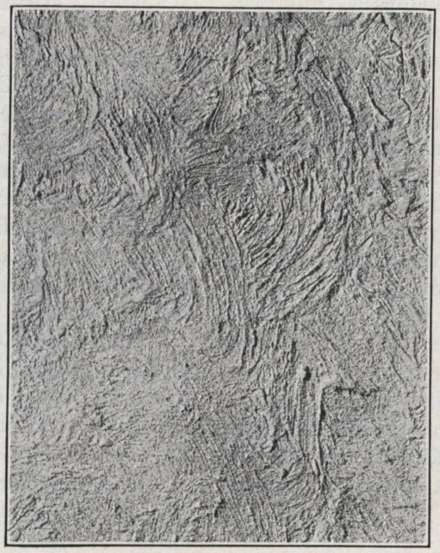
Heavily Brushed on and Raked Out with Wire Brush



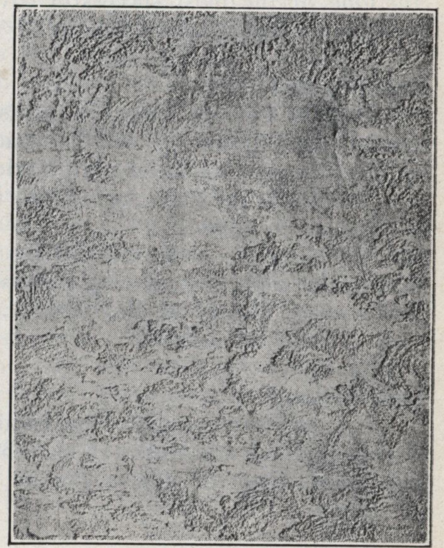
Sponge Stippled and Flattened. Morene Relief Ornaments Brush Stencilled



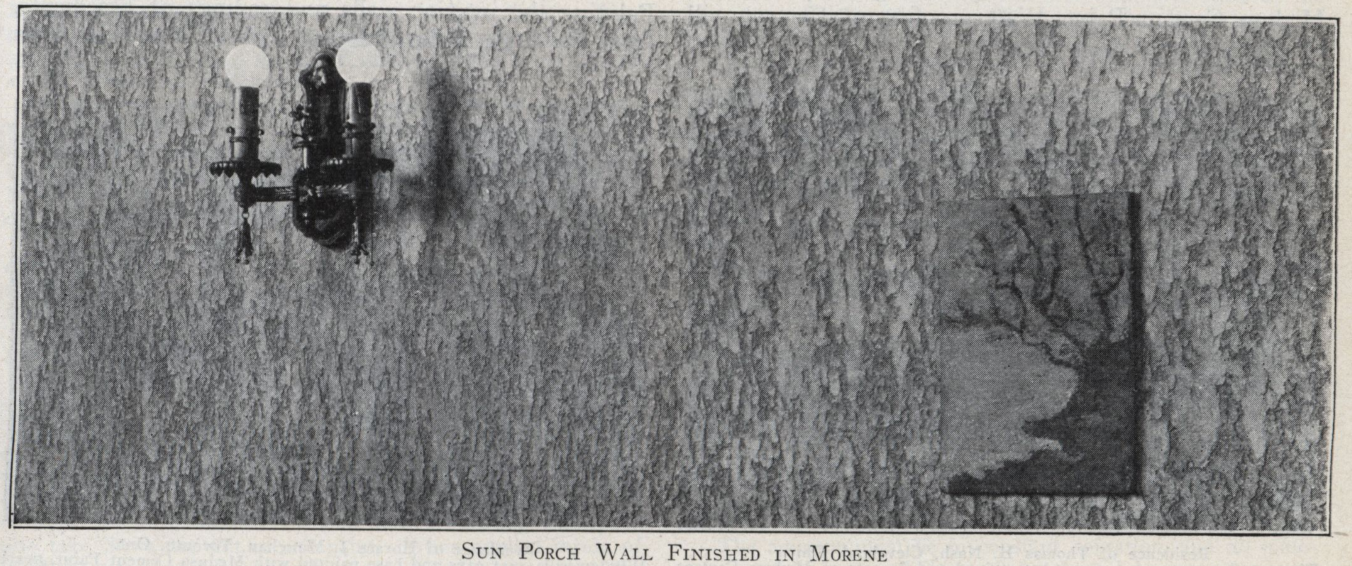
Brushed on, Roughly Stippled and Partially Flattened with Palette Knife



Brushed on Roughly



Roughly Brushed on and Partially Flattened with Palette Knife



Sun Porch Wall Finished in Morene

Heavy brush coat stippled and flattened with palette knife

Various Finishes and Textures Obtainable with Morene

THE SANDUSKY CEMENT COMPANY

Manufacturers of Medusa Cement Paint

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 350 Madison Avenue TOLEDO, OHIO, 1004 Second National Bank Building DIXON, ILL., 34 Dixon National Bank Building

FACTORIES

BAY BRIDGE, OHIO SILICA, OHIO DIXON, ILL. YORK, PA.

Products

Medusa Cement Paint.

For Medusa Waterproofing, see pages 118-121; for Medusa Portland Cements, see pages 341-349.

Output

3,000,000 lbs. a year.

Quality

One of the most successful coverings for concrete and masonry surfaces.

How Packed

Medusa Cement Paint is furnished in neat, substantial steel drums of 350 lbs. each; 50 and 10-lb. metal containers, all having large friction covers.

The 50-lb. cans are packed two in a crate, and 10-lb. cans six in a case.

We allow one dollar refund for the return of each steel drum with cover, if in good condition, freight prepaid to our factory at Bay Bridge, Ohio, New York Central Railroad delivery.

Distribution

Our product is handled by reliable building supply dealers and paint stores. If not obtainable locally we will quote direct or advise you of the nearest source of supply.

Literature

New Medusa literature describing many uses for Medusa Cement Paint, Waterproofing or Cement will be gladly sent at your request.

MEDUSA WHITE PORTLAND CEMENT THE SANDUSKY CEMENT CO. CLEVELAND, OHIO STAINLESS.

TRADE-MARK

Medusa Cement Paint and Some of Its Features

Medusa Cement Paint is made from Medusa Non-staining White Cement and certain chemicals thoroughly ground together and shipped in dry powder form. It contains no oils, glue, or similar ingredients.

Practically Part of the Wall—Medusa Cement Paint forms a dense and hard coating and the nature and action are such that it bonds permanently with the base or surface to which it is applied. It is successfully applied to *damp* or *moist* concrete.

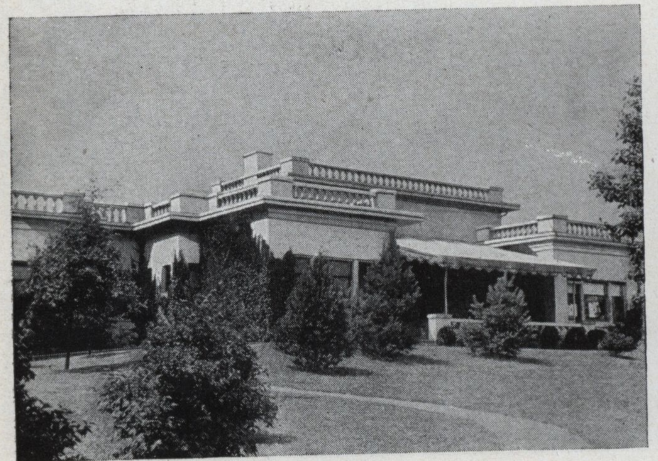
Will Not Dust or Flake Off—Medusa Cement Paint when applied according to directions will positively not dust, powder, flake, chalk, blister, or peel.

Will Prevent Concrete or Brick Walls Absorbing Moisture—Medusa Cement Paint when applied to any masonry surface above the grade line, not only ornaments and decorates, but also prevents the masonry surface from absorbing water or moisture from rain, mist, fogs, or snow.

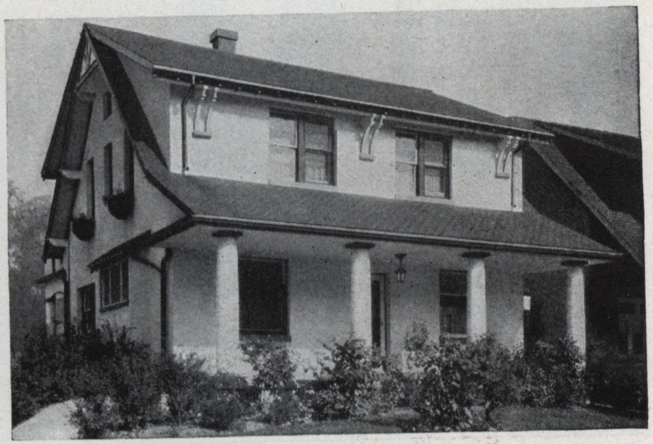
Damp, Musty Basements Made Dry and Sweet—Medusa Cement Paint applied to the interior surface of basement walls, constructed of concrete, brick or tile, will positively and permanently prevent dampness on interior.

Medusa Cement Paint applied to the exterior surface of basement walls below grade line, during the course of construction, will prevent earth dampness or moisture working through the walls to the interior.

Will Improve Lighting of Dark Interiors—Painting the interior walls and ceilings of basements, farm buildings, industrial plants of all kinds, subways



Residence of Thomas H. Nash, Cleveland, Ohio
The exterior stucco was somewhat stained and 2 coats of Medusa Cement Paint were applied



Residence of Horace J. Maughan, Toronto, Ont.
Window sills, pier caps and base painted with Medusa Cement Paint, pearl gray. Balance of walls covered with Medusa White Cement Paint

Buildings on Which Medusa Cement Paint Has Been Used

Continued on next page

and tunnels, with Medusa Cement Paint simplifies the lighting and distribution of light.

Cleaned without Damage—Where Medusa Cement Paint has been applied and has become dirty, it may be washed with strong soap and water without being injured.

Withstands Action of Chemical Fumes—Industries, using chemicals in large amounts, such as paper mills, will find that Medusa Cement Paint withstands the action of chemical fumes and that it will give perfect service both as a preservative and for distributing light.

Quantity When Mixed and Covering Capacity—When mixed with proper amount of water, 10 lbs. of Medusa Cement Paint is equivalent to 1 liquid gallon.

One pound covers 12 sq. ft. with 2 coats, as an average over floated or sand finished surfaces.

Colors—Medusa Cement Paint is made in the following colors: white, cream, stone gray, pearl gray, brick red and light green.

Many Uses for Medusa Cement Paint

There are many uses for Medusa Cement Paint. The following are a few which indicate the important and unique place it fills:

Cement Stucco, Concrete and Other Masonry Walls—If stained, discolored or cracked they can be renewed in white or five non-fading colors.

Medusa Cement Paint makes a permanent filler for large cracks in stucco, when mixed with enough water to make a thick paste. By tinting the paste to match the color of the stucco, the cracks are hardly visible and are entirely covered with 2 coats of Medusa Cement Paint.

Cracks should be raked and cleaned out as much as possible and soaked with water before the paste is worked in.

For small cracks and hairlike checks, mix Medusa Cement Paint with the regular amount of water and force the paint into the cracks by brushing over them several times.

Porch Columns, Pilasters, Copings, Building Trim, Garden Furniture, etc.—Can be renewed with 2 coats, and rendered dampproof.

Basements, Subways, Tunnels, etc.—For better lighting and excluding dampness.

Residences, Barns, Dairy Buildings, Silos, Posts, etc.—For both exterior and interior use.

Public and Office Buildings—For exterior and ornamental work, also for interior walls and ceilings.

Industrial Plants, Factories, Warehouses, etc.—To make exterior walls more attractive and for better lighting of the interior.

Swimming Pools—For coating inside of pools for ornamental and sanitary purposes. For filling cracks and preventing leakage.

Highway Work—For bridges, traffic markers, posts, balustrades, for structural protection and to increase visibility.

General—Medusa Cement Paint can be used on all Portland cement stucco, concrete, brick, tile and any other porous or absorbent masonry surface.

Cautions—Do not apply Medusa Cement Paint over masonry which is coated with a film of efflorescence, magnesia or saltpeter. The film can be removed by scrubbing with a brush using a 10% solution of muriatic acid and water to insure a perfect bond.

Oil painted surfaces must be washed with a 15% solution of hydrochloric or muriatic acid.

Where masonry surfaces have been previously whitewashed, kalsomined, or covered with cold water paint, it will be necessary to remove the old finish before applying the Medusa Cement Paint.

Medusa Cement Paint will not bond permanently to a non-absorbent surface such as enameled brick, vitrified or glazed brick, or hard burned non-porous tile.

Do not apply Medusa Cement Paint during freezing weather.

Directions for the Proper Application of Medusa Cement Paint

For Application with Whitewash Brush or with Dutch Brush—***Covering Capacity***—1 lb. of Medusa Cement Paint, dry powder, when mixed according to specifications, will cover approximately 10 to 12 sq. ft. of surface, 2 coats, on concrete, stucco, cement, tile, brick, etc.

Brush off all dirt and dust; thoroughly wet the surface with a hose or otherwise. *If any whitish efflorescence is present, it must be scrubbed off* with a brush and water or a solution of 1 part muriatic acid to 10 parts of water, and a sizing coat of Medusa Waterproofing Paste Solution 1:20, applied before first coat of paint is applied.

First Coat—Mix 10 lbs. of Medusa Cement Paint with *exactly* 3 qts. of water. Apply with brush, employing a horizontal sweeping motion, being careful to cover all points in-so-far as possible with the first coat.

Keep brush full of paint. Do not wipe on edge of bucket. Use a stiff bristled brush. Stir thoroughly and *mash all lumps.*

Do not mix up more paint with water than will be used within two hours.

Weather conditions will be the governing factor of how quickly the film of Medusa Cement Paint hardens. In hot weather, care must be exercised to prevent the water from evaporating so rapidly that the paint will not have enough moisture left in it to make the film harden. Strong winds will also take the water out of the paint. When applied inside of buildings, close to boilers, radiators or heating apparatus, the heat will draw the water out too quickly.

Under any condition, wet the surface as in second paragraph above, before applying the first coat. As soon as the first coat is hard enough, sprinkle it gently, but do not wash the film off.

After paint is once applied, do not work over as it will only pull and leave an uneven coat.

Second Coat—Same directions should be followed except only 2½ qts. of water should be used to each 10 lbs. of paint.

Apply the second coat the next day, if first coat is hard, *but wet down the first coat before applying the second coat.*

In applying the second coat, be careful to cover all pinholes or spots that were not entirely covered by the first coat.

After the second coat is hard enough, sprinkle it the same as for the first coat.

After paint is once applied, do not work over, as it will only pull and leave an uneven coat.

For Application with Spraying Outfit—For use in spray outfits add 3 pts. of water to 10 lbs. of paint. Let stand for 10 minutes, then stir in 3 pts. more of water. *An agitator must be used with spray outfit.*

In preparing Medusa Cement Paint for use in spraying machine, we advise the addition of about 5% more water than where brushes are used; as in applying Cement Paint with a sprayer, a certain amount of water evaporates during the operation.

The agitator must be in constant operation, and all materials must be removed from the tank and hose at the completion of the day's work to avoid the possibility of the cement paint hardening and clogging the machine.

ESTABLISHED 1916

AMERICAN CEMENT PAINT COMPANY

Manufacturers of Zemco-lite Cement Paint

CHATTANOOGA, TENN.

FACTORY: ROSSVILLE, GA.

BRANCH AGENCIES

DETROIT, MICH., S. L. JOSEPH, 1537 Center Street

BOSTON, MASS., THE AMERICAN MFRS.' CO. OF NEW ENGLAND, 755 Boylston Street

Zemco-lite
TRADE MARK
PORTLAND CEMENT PAINT
PAT. AUG. 20. 1912

Products

ZEMCO-LITE CEMENT COATING.

Composition and Qualifications of "Zemco-lite"

Composition—Zemco-lite is a coating made from white or gray portland cement reprocessed with sufficient mineral filler or pigment to prevent checking, and ground to a great degree of fineness. In our process, the active colloidal properties (aluminates) of the cement are increased, thereby giving smoothness in application, strong adhesion, and greater resistance to water penetration after the coating has hardened.

Uses—It is strictly a portland cement coating made especially for use on inside or outside surfaces of stucco, concrete, brick and plaster, and for mill-whiting interiors.

It is also largely used for interior decorative work on plaster or plaster board walls, and for use on interior wood, metals, etc.

Zemco-lite gives effective service on subsurface or basement walls exposed to dampness, preventing seepage and insuring a dry, wholesome interior.

We also prepare a special coating for swimming pools.

Colors and Packages—Zemco-lite is made in white and colors, put up in dry powder form. The different sized packages are 400-lb. barrels, 200-lb. half-barrels, 100-lb. kegs, 50 and 25-lb. boxes; and 5-lb. packets, 20 to the case.

Mixed with Water, Spreads Readily—Being a cement product, it requires water for mixing, the water not only serving as its vehicle, but combining chemically with it to set and harden it. It mixes readily, spreads smoothly, adheres strongly and hardens into an ornate cement coating, unaffected by moisture or weather conditions.

Specifications

Mixing—To obtain proper results, Zemco-lite must be used rather heavy.

A mixture suited to average use is composed of 2 qt. of water blended with 5 lb. of the dry paint. In mixing, the water should always be put to the dry paint, and not the paint to the water. Use half the amount of water as proportioned above at first, to a given amount of dry paint, and mix into a stiff paste, adding a little more of the water, if necessary. Work this with a paddle until all lumpy particles are broken down. Then, gradually thin down with the rest of the water, stirring in until all of the water is used, and paint of the right consistency will result.

Where extra fine work is desired, screen the paint. Stir from time to time when using to prevent any settling.

In cold weather use water slightly warm.

Application—Zemco-lite covers well—2 coats seldom being necessary. Outside surfaces of brick, concrete or stucco should be well moistened with water before brushing on the paint. This is very essential, especially in dry weather and where the surface is exposed to the sun, as Zemco-lite requires dampness to harden it. All surfaces should be brushed clean and all loose particles or scale removed before applying.

Plastered walls, unless the plaster is green, should be given a coat of size. A varnish size gives best results; but Munn's Wall Size, or a soap and alum size give satisfactory service. Glue sizes should never be used, as glue is detrimental to the hardening action of the paint. Where a varnish size is used, a small amount of turpentine added to the paint and well stirred in will give proper toothing, and lessen the possibility of laps showing.

Zemco-lite is very effective on green plastered sand finished walls, no size being necessary. Simply dampen the plaster with water and brush on the paint. It will harden, becoming an integral part of the wall.

Zemco-lite should be brushed on the same as any oil paint; or it can be sprayed on with any of the sprays suitable for using oil paints.

In mixing, do not prepare more than a day's supply of paint at any one time. In fact, half a day's supply is better. Do not let the mixed paint stand overnight, as it is cement and if left too long will harden. Brushes and buckets should be thoroughly cleaned with water when the day's work is finished.

Spreading Capacity and Gallon Requirements—6 lb. of dry Zemco-lite mixed with the proper amount of water will produce 1 gal. of paint of the right consistency. All gallon estimates should be calculated on this basis.

Running from rough to smooth surface, 1 gal. of Zemco-lite should cover approximately:

200 to 300 sq. ft. on stucco or plaster.
125 to 250 sq. ft. on concrete or brick.
225 to 300 sq. ft. on wood, plaster board or metal.

Architects' Service

Our laboratory at the factory is always open without charge for special service. Particular attention is given to color blending and the development of color designs and effects; likewise special wall treatment where conditions call for particular service. Color cards, literature and fuller information gladly given, and samples supplied when desired without charge.

ALUMINUM COMPANY OF AMERICA

Manufacturers of Aluminum Bronze Powder for Paint

PITTSBURGH, PA.

Products

Aluminum Bronze Powder for Paint.

For Aluminum and Aluminum Alloy, see page 737; for Aluminum Roofing, see page 1139.

Growth of the Use of Aluminum Paint in the Architectural and Engineering Fields

Until recent years, aluminum paint has been chiefly used on radiators, exposed piping and other metal work. Recently, however, its highly protective, lasting, light reflecting and covering qualities have become more generally known and appreciated.

Our powder is of the very highest quality, free from mica and other adulterants. To be sure of obtaining pure and highest grade powder, specify "Aluminum Bronze Powder made by the Aluminum Company of America."

A variety of vehicles can be used with aluminum powder. These, and the making of aluminum paint, are discussed later.

Process of Making Aluminum Bronze Powder

Aluminum bronze powder for paint is made by stamping pure aluminum into very small, thin flakes, which are carefully sized by sieves to give a uniform product. The flakes are put through a special polishing process which gives them a high luster. Used in the proper vehicle, the powder produces a metallic film over the surface covered, much like a layer of fallen leaves. This action, known as "leafing," is totally unlike that of ordinary paint pigments, which are granular in their nature.

Durability of Aluminum Paint

As metallic aluminum is non-transparent, the flakes of aluminum powder produce a paint film which is opaque to light. The vehicle is thus protected from the deteriorating action of sunlight and is given great durability.

Hiding and Covering Properties of Aluminum Paint

Because of the "leafing" of aluminum flakes and the opacity of the metal itself, the paint has great hiding properties. Even on very dirty walls, one coat will ordinarily cover and give a surface of good appearance. Two coats are especially recommended for surfaces exposed to the weather and where long life is required. One gallon of aluminum paint will cover from 500 to 600 sq. ft., or even more, of smooth surface.

Superior Protective Properties

Aluminum paint has proven itself in actual service a superior paint for protecting structural steel, metal, wood, brick and all outside structures. This is due not only to its durability, but also to its high waterproofing qualities. The United States Forest Products Laboratory has shown that aluminum paint on wood has a waterproofing efficiency as high as 96%. Its light and heat reflecting properties make it valuable for protecting oil storage tanks and other structures which are exposed to sunlight and which it is desired to keep as cool as possible.

Light Reflecting Qualities for Interiors

The use of aluminum paint is especially recommended for the interior of factory and industrial buildings on account of its light reflecting qualities. A well made aluminum paint will reflect 60% to 70% of the light. It does not tarnish and keeps its brilliancy for a long time. It can also be washed with soap and water in the event that dust and dirt settle on it. Sulphur and sulphurous gases do not darken aluminum paint.

How Made and Where Obtained

An excellent aluminum paint can be readily made by stirring aluminum bronze powder into a suitable vehicle. Liquids necessary to make this paint may be obtained from practically any paint manufacturer and the aluminum bronze powder or pigment may be obtained from paint manufacturers, bronze powder jobbers or from the Aluminum Company of America. Aluminum paint, when left standing for a long time after being mixed, loses somewhat its "leafing" qualities.

Importance of the Vehicle

The type of vehicle influences the lasting and working qualities of aluminum paint. Spar varnish or long oil varnishes and heavy bodied linseed oil combined with drier and thinner are good vehicles for use with aluminum powder. The use to which the paint is to be put also determines the character of the vehicle to be used. As the vehicle is the binder for the metallic flakes of aluminum, the quality of the binder also determines the quality of the paint. There are a variety of suitable vehicles made by different manufacturers especially for use with aluminum powder.

Specifications for Aluminum Paint

Note: Aluminum paint is made by stirring together, without grinding, aluminum bronze powder and a suitable oil or varnish vehicle.

Aluminum Bronze Powder—The pigment portion of the paint shall consist of Standard Varnish Aluminum Bronze Powder, manufactured by the Aluminum Company of America.

Note: The powder made by this company is in the form of flakes stamped from sheet aluminum and contains no filler or adulterant such as mica.

Tests—A sample of the aluminum powder shall be tested on standard mesh screens and shall pass 100% through a 100-mesh screen. When suspended in the vehicles hereafter described, the powder shall form a brilliant and apparently continuous metallic layer on the surface of the liquid promptly after stirring is discontinued.

Exterior Varnish Vehicle—The vehicle for use with aluminum bronze powder shall be either a specially prepared spar mixing varnish or a bodied linseed oil. The spar mixing varnish for exterior use should fulfill the following requirements.

The varnish shall contain not less than 50% by weight of non-volatile oils and gums and the ratio of oil to gum shall be not less than 3 to 1. The varnish shall pass a 60% Kauri reduction test, the draft test and the water resistance as specified in Federal Specification Board Standard Specification No. 18. The varnish shall set to touch in not more than 8 hours and dry hard and tough in not more than 24 hours. It shall contain no lead drier. The varnish shall be of such consistency that when thoroughly mixed with aluminum bronze powder in the proportion of 2 lb. per gallon of vehicle, the paint shall show satisfactory spreading qualities and shall not run or sag when applied to a vertical surface.

Bodied Oil Vehicle—The bodied linseed oil shall be a linseed oil bodied by heat alone, known to the trade as a "kettle bodied" linseed oil or lithographic oil. Raw or boiled linseed oil shall not be used. It shall be of such consistency that when diluted with a volatile thinner in the ratio of 6 parts linseed oil to 4 parts thinner and then mixed with 2 lb. of aluminum bronze powder per gallon of vehicle, the paint shall show satisfactory spreading qualities and shall not run or sag when applied to a vertical surface. The paint shall set to touch in not more than 10 hours and dry hard in not more than 30 hours. It shall contain no lead drier.

Mixing the Paint—The paint shall be mixed in the proportion of 2 lb. of aluminum bronze powder per gallon of vehicle. This makes a paint containing 21% pigment and 79% vehicle. The weighed amount of powder shall be placed in a suitable mixing container and the measured volume of vehicle then poured over it. The powder shall be incorporated with the paint by vigorous stirring with a paddle. The powder will readily disperse in the vehicle. Before removing any paint from the mixing container, the paint shall be thoroughly stirred to insure a uniform mixture and the paint shall be suitably stirred during use.

Application—Before applying any paint, the surface shall be thoroughly clean and dry and all loose paint or scale shall be removed. In the case of steel, all bare spots shall be primed after cleaning. No exterior painting shall be done in wet or freezing weather. Each coat of paint shall be allowed to dry for 48 hours before a succeeding coat is applied. Aluminum paint shall be applied by brushing (or spraying). If a spraying equipment is employed, the usual precautions shall be exercised. In applying the aluminum paint with a brush, care shall be taken that all of the final strokes are made in the same direction in order that the particles of aluminum powder may "leaf" uniformly in the paint film.

Number of Coats—Two coats of aluminum paint shall be applied over the priming coat of all new work having an exterior exposure. In the case of old work, two coats of aluminum paint shall be applied over the old paint. Where unusual exposure conditions are encountered, three coats are recommended.

Interior Work—For interior work, one coat of aluminum paint may suffice. The liquid portion of the paint shall consist of any high grade interior varnish or kettle bodied linseed oil of the consistency hereinbefore described. The work shall be carried on in the same manner as for exterior work.

Painting Wood Surfaces—Wood surfaces which are to be painted, shall be dry and free from dust or old loose paint before any paint is applied. The paint to be used on wood shall consist of aluminum bronze powder suspended in kettle bodied linseed oil or a very long oil spar varnish in the proportions named above. Three coats shall be applied to new exterior work and the composition of the paint shall be the same for all three coats. In the case of old work, two coats of aluminum paint shall be used in all cases of exterior exposure.

Painting Concrete, Plaster, etc.—The aluminum paint for this class of work shall consist of aluminum bronze powder suspended in spar varnish. Linseed oil alone shall not be used. The surface shall be free from all loose dust, plaster and calcimine.

Note: The pigment described above may be secured from the Aluminum Company of America, or from any reputable jobber or paint and varnish manufacturer.

ESTABLISHED 1840

CARPENTER-MORTON COMPANY

Manufacturers of Varnishes, Enamels and Paint Specialties

HOME OFFICES
77-79 Sudbury Street
BOSTON, MASS.

FACTORY: 376 West Third Street, EVERETT, MASS.

CHICAGO, ILL., 527 W. Roosevelt Road
CLEVELAND, OHIO, 1140 W. Sixth Street
SAN FRANCISCO, CAL., 1151 Mission Street
MONTREAL, QUE., 2951 Greenshields Avenue

Products

- Carmote Architectural Varnishes.
- Kaurinoil Interior Waterproof Varnish.
- Carmote Filler and Sealer.
- Carmote White Enamel, also Ivory, High Gloss and Eggshell Finish.
- Carmote Enamel Undercoating.
- Carmote Medium Gloss Interior Enamel.
- Carmote Liquid Wax and Paste Wax.
- C.M. Co.'s Penetrating Oil Stains.
- Pure Orange Shellac Varnish.
- Pure White Shellac Varnish.
- Carmolight, High Grade Mill White Paint.
- Carmote Cement and Brick Coating.
- Carmote Concrete or Cement Floor Paint.
- Carmote Galvanized Iron Paint.
- Carmote Midnight Black Enamel.
- Carmote Gold and Aluminum Enamel.
- C.M. Co.'s Graphite Paint.
- C.M. Co.'s Undercoaters and Sealers.
- C.M. Co.'s Perfectly Pure Oil Colors.

Experience

Our business was established in 1840. During the past 85 years, we have accumulated a vast amount of practical knowledge of the manufacture and application of surface coatings of all kinds. We invite architects, engineers and others to submit their varnish or paint problems to our chemists. We freely offer the facilities of our laboratory for the purpose of working out special formulas for varnishes and paints designed to meet special or unusual conditions. Upon request, a representative will gladly call and aid you in taking advantage of the facilities that we have to offer.

Our varnishes and japans are very carefully made from pure gums, oils and thinners and are carefully filtered and aged before shipment. We obtain absolute uniformity by our new and improved method of melting gums in covered kettles from which the fumes are removed through a pipe to a condenser operated by forced draft. This process eleminates all soot and dirt and prevents loss of material by evaporation, assuring a light colored, uniform product.

For heating our kettles, we use the Gilbert system of oil fuel and heat control called "radiant combustion."

Carmote Architectural Varnishes

Carmote Floor Varnish—An extremely durable finish for floors and all surfaces subject to hard usage. It is made to walk on. This varnish will not turn white and is unaffected by boiling water.

Carmote Transparent Interior Varnish—A pale, free-working varnish that dries with a smooth, full, brilliant luster. Will not scratch or mar and is unaffected by boiling water. Can be rubbed to eggshell finish after 6 days. Designed for all interior woodwork.

Dulspar Interior Varnish—This varnish is especially designed for use on interior woodwork where a rubbed finish is desired (without going to the expense of rubbing down a gloss finish varnish). Flows freely under the brush, dries hard and is very durable.

Interior Spar Varnish—An excellent interior varnish for use on public buildings, hospitals and dwellings. Flows freely under the brush, is elastic and withstands water.

White Damar Varnish—Made from imported Batavia damar gum and pure southern turpentine. A white varnish of heavy body designed for mixing with zinc for enamel white interior finish.

Elastic Spar Varnish—A high grade exterior varnish for all woodwork subject to outdoor exposure, such as front doors, yachts and motor boats. This varnish resists the action of salt water. Dries with a brilliant luster.

Carmote Table Top Varnish—Until the discovery of this varnish, it was customary to finish dining room table tops with several coats of oil rubbed in, which made an expensive job. This varnish is light colored, free-working and dries hard. Hot dishes and boiling water will not injure the surface of this varnish. Allow 6 days to harden before rubbing to eggshell or dull finish.

Kaurinoil Interior Waterproof Varnish—Designed to meet the demand for a durable, all-around interior varnish. As its name implies, it is made from high grade Kauri gum and selected oils, possessing waterproof qualities. May be used on all interior woodwork, floors, bathrooms and vestibules. Can be rubbed to a dull finish if desired.

Note: Our complete line of varnishes, japans and driers comprises 37 products in addition to those listed above. Descriptive price list on application.

Carmote Filler and Sealer

A light colored liquid filler for giving a surface to close grained woods, also an exceptionally good sealer for use on plastered walls. Dries with a non-porous film. When used as a wood filler, oil stain can be added, if desired. When used as a sealer for plastered walls, no thinning is required. This filler is especially good for piazza floor dressing.

Carmote White Enamel, Also Ivory

A high grade white enamel that gives a chinalike finish to woodwork. It flows freely under the brush. Dries dust-free in 24 hours, hard in 3 days. It may be used either indoors or outdoors. It is prepared in high gloss and eggshell finish, in white, also ivory It is also made in a special white designed for tinting. This enamel is equal to the very best imported enamels.

Carmote Enamel Undercoating

A white paint, having proper sealing and great covering capacity. Especially designed for foundation coats before applying our Carmote White Enamel. On new woodwork we recommend three coats of undercoating (the first coat thinned with ½ each boiled linseed oil and turpentine) as a foundation for the finishing coat of enamel. Where colored enamel surface is desired, we recommend that our undercoating be colored to the same shade as the enamel that is to be applied over it.

Continued on next page

Carmote Medium Gloss Interior Enamel

Produces a subdued luster finish which is very popular for use in office buildings, institutions and residences. Has several advantages over ordinary wall paints as it forms an enamel film that is more elastic, will not crack, peel off or wash off, and does not show finger prints as readily as ordinary paints.

Carmote Liquid Wax and Paste Wax

A ready-for-use wax polish. For polishing and finishing floors, linoleums and woodwork. We recommend a coat of this wax applied to inlaid or battleship linoleum, when new. Keeps the life in the linoleum, preventing it from drying up and cracking, and causes it to be more easily cleaned with a dry mop.

We also make paste wax, where the paste form material is desired.

C.M. Co.'s Penetrating Oil Stains

Line comprises Flemish Oak, Bog Oak, Dark Mahogany, Mahogany, Mission Oak, Walnut, Light Oak, Dark Oak. One gallon covers about 600 square feet. The stains give a depth of color depending on the time the stain is allowed to remain on the wood before wiping off.

These stains may be finished with our Paste Wax, Shellac, Kaurinoil or Dulspar Varnish. We recommend a thin coat of white shellac varnish over the stains before finishing coat is applied.

We are prepared to make, at short notice, any color of stain desired by architects who are working out a special decorative plan. If architects send us samples of the interior woodwork to be used, we will finish them in the stain desired and submit for approval.

Pure Orange and White Shellac Varnish

We are specializing on absolutely pure shellac varnishes, made from high grade gum, cut in specially denatured alcohol. (Formula No. 1.) We guarantee our shellac varnish to be free from all adulteration.

We can furnish any of the standard makes of shellac gum. Our regular product is cut either 3, 4 or 5 pounds to the gallon, according to the work on which it is to be used. Our white shellac is cut from a high grade bleached gum. We make a specialty of filtering our shellac so as to remove every particle of dirt or undissolved gum.

Carmolight

A high grade white paint for use in factories, office buildings, hotels, apartment houses, stores and homes, made in gloss, eggshell or flat finish and is especially designed for a popular priced white paint that will promote cleanliness and good lighting.

We recommend one coat of Carmolight over a surface previously painted with white paint and in fair condition; otherwise, we recommend one coat of our Carmolight Undercoating and one coat of Carmolight, which covers thoroughly and gives as good results as three coats of ordinary white paint.

With Carmolight, we supply dado paints that dry with a gloss and clean easily. These are made in several suitable colors.

Cement and Brick Coating

Carmote Cement and Brick Coating is designed for painting on cement, concrete, stucco, brick and stone. It can be used on either interior or exterior surfaces, and will resist the action of alkali and free lime in cement or bricks and protects against destructive action of gases from industrial plants or railways. Made in white, and a variety of suitable colors in either flat, eggshell or gloss finish.

On unfinished concrete, two coats will give a very satisfactory job.

Concrete or Cement Floor Paints

Flow freely under the brush, cover well and give a gloss finish of extreme durability. They should always be applied over a coat of C.M. Co.'s Concrete Liquid Sealer which prevents powdering and dusting of cement floors subject to hard usage.

Galvanized Iron Paint

Especially prepared to adhere to galvanized iron. Equally good for iron or steel construction, gas holders and metal garages, as it withstands the expansion and contraction of metals without cracking. It is made from pigments that are the best known rust preventives. Prepared in dark green, gray, white or color desired. Dries in 24 hours.

Carmote Gold and Aluminum Enamel

Carmote Gold Enamel comes in the following shades: rich gold, Roman gold, natural copper, and a variety of colors for home decorating to harmonize with general color scheme.

Carmote Aluminum Enamel is prepared for inside work on radiators, metal or wood surfaces, sprinkler pipes. Also put up in one-gallon cans for outdoor use on tanks, gas holders, car tops, standpipes, roofs or any metal surface where a paint that will deflect heat is desired. U. S. Government tests proved *Aluminum paint* to have great heat-deflecting powers.

Midnight Black Enamel

A jet black, hard drying, high gloss enamel for finishing all kinds of architectural ironwork. Dries dust-free in 8 hours and withstands extreme heat.

Genuine Graphite Paint

Made from Lake Superior graphite and treated oils designed to give an elastic film allowing for expansion and contraction of metal. Designed for painting structural steel, water tanks, iron fences or woodwork. Made in dark green, red, black, also a special grade for use on hot iron. Put up in cans, also in steel drums with agitator for stirring up contents before using.

Special Undercoaters and Sealers

The success of all surface finishing depends on the use of wood fillers and undercoaters designed for the purpose for which they are to be used and tinted so as to give full depth of color to finishing coat.

Our paste wood filler, for open grained woods, comes light, also, with stain combined for all stain colors.

We make especially to order undercoaters or sealers for wood, plaster, brick and concrete surfaces.

Perfectly Pure Oil Colors

We guarantee our oil colors to be absolutely pure, subject to chemical analysis. These colors possess unusual tinting strength.

Our representative will be glad to conduct a test of the relative tinting strength of different brands of oil colors to show the real value in our goods.

Correspondence, Specifications, Samples, etc.

All correspondence on technical matters should be addressed to our Boston Office. Specifications in detail for the application of any of our products will be gladly furnished on request. Color cards and samples sent free.

ESTABLISHED 1858

BERRY BROTHERS, INC.

Varnishes, Architectural Finishes and Shingle Stains

FACTORY AND MAIN OFFICE
DETROIT, MICH.
CANADIAN FACTORY: WALKERVILLE, ONT.
SOLD IN THE PRINCIPAL CITIES OF THE WORLD

Products

Manufacturers of Wood Finishes: Liquid Granite Floor Varnish, Luxeberry White Enamel, Luxeberry Wood Finish, Elastic Interior Finish, Luxeberry Spar Varnish, Luxeberry Wall Finish, Lionoil Metal Trim Enamel.

Also Shingletint; Lacklustre.

Liquid Granite

The most durable floor varnish made, and, combining the three principal requisites—elasticity, durability and appearance—is after 30 years' severe service, recognized by master painters as the best of its kind.

Specify—On open grained woods, 2 coats of Liquid Granite applied over 1 coat Berry Brothers' Paste Filler. On close grained woods omit filler. Eliminate use of shellac and liquid wood fillers on all floor work.

Liquid Granite Dull

This is the same quality and for the same uses as Liquid Granite described above, but dries flat and saves the expense of rubbing when a dull finish is wanted.

Specify—On open grained woods, 1 coat of Liquid Granite "A" and 1 coat Liquid Granite Dull over a coat of Berry Brothers' Paste Filler. On close grained woods omit filler. Eliminate use of shellac and liquid wood fillers on all floor work.

Luxeberry Wood Finish, Light

Possesses exceptional qualities as a rubbing varnish. Extensively used for trim work, such as doors, casings, etc., in hotel buildings, office buildings and residential work. Luxeberry Wood Finish is the registered trademark name now used to designate the finish long and favorably known as "Berry Brothers' Hard Oil Finish."

Specify—On open grained woods, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Filler, 1 coat Berry Brothers' S. D. C. Shellac and 3 coats Luxeberry Wood Finish. On close grained woods omit filler. (Staining is optional.)

Elastic Interior Finish

For interior trim subjected to severe usage. It possesses great elasticity and durability, and will resist the action of hot water, soap, etc., to a greater degree than any other varnish.

Specify—On open grained woods, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac, and 2 coats Elastic Interior. On close grained woods omit filler. (Staining is optional.)

Luxeberry Spar Varnish

For front doors, store fronts and exterior work subjected to severe exposure and changing weather conditions. The standard of quality with a reputation of 56 years. Made especially for use on all types of marine architecture, wherever a durable and lasting finish is desired. It can be used as both an exterior and interior varnish, as it is made to withstand severe wind, weather and water exposure and does not turn white.

Specify—On open grained woods, 2 coats Luxeberry Spar Varnish over 1 coat Berry Brothers' Paste Wood Filler. Omit filler on close grained woods.

Lionoil Metal Trim Enamel

So closely resembles baked enamel as to be commonly mistaken for it. Very desirable for metal trim work, its special mission being finishing metal doors, window sash, stairs, elevator wells, etc. Flows on perfectly, showing no brush marks, giving a semi-gloss effect. Adheres tenaciously to bare metal or priming coat, is a rust preventive, and resists the action of water, heat and extreme cold.

Specify—First, steel wool or sandpaper the shop or priming coat where necessary to bring to a smooth surface, and remove all rust spots. Then apply two coats Berry Brothers' Lionoil Metal Trim Enamel, color selected, flowing it on with a soft brush.

Finished steel panels and further information furnished upon request.

Luxeberry Wood Finish, Dull

For interior trim where a flat varnish is desirable. Produces in 1 coat an imitation rubbed effect over a varnished surface. It is light in color, flows freely under the brush, dries dust-free in about 1 hour; hardens in 12 hours with a soft velvety finish.

Specify—*For Imitation Waxed Effect*—On open grained woods, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac and 1 coat Luxeberry Wood Finish, Dull. On close grained woods omit filler.

For Imitation Rubbed Effect—On open grained woods, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac, 2 coats Luxeberry Wood Finish and 1 coat Luxeberry Wood Finish, Dull. On close grained woods omit filler.

Luxeberry White Enamel

For fine interiors and furniture work. Especially designed for the practical finisher and decorator. Has full body, flows freely, dries to a beautiful smooth luster without showing brush marks and can be rubbed in from 3 to 4 days. It is pure white and stays white.

Ivory, cream, gray, pale blue and green tints furnished when desired.

Specify—1 coat lead and oil (pure white lead mixed with equal parts turpentine and linseed oil to brushing consistency), 2 coats Luxeberry Enamel Undercoat, 2 coats Luxeberry Enamel —white or desired tint. Sand each coat lightly with 00 sandpaper before applying succeeding coats.

Luxeberry Wall Finish

For interior walls, ceilings and trim. May be applied to plaster, cement, wood, metal, burlap or canvas. Produces a soft velvety surface which can be washed without injury to the finish. It is permanent in color, is composed of oil colors of the highest grade, and the very best vehicle is used as a binder.

Specify—*On Plaster and Cement Walls*—To 3 parts of Luxeberry Wall Size add 1 part Luxeberry Wall Finish of the desired shade, allowing plenty of time for drying. Follow with 2 or more coats of Luxeberry Wall Finish, allowing sufficient time between coats for drying.

On Woodwork, Metal and Fiber Board—Apply 2 or 3 coats of Luxeberry Wall Finish of the desired shade, each coat being allowed at least 48 hours to thoroughly harden before the succeeding coats are applied.

Note: On interior trim, where wood is of a sappy nature, apply a thin coat of Berry Brothers' S. D. C. White Shellac to prevent the sap from working through and discoloring the final coat.

Literature and Information

Write Berry Brothers' Architectural Department for a set of wood finishing formulas, finished panels or technical information on the subject of wood finishing.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

DENNY, HILBORN & ROSENBACH

Manufacturers of Enamels and Paints

FACTORY AND MAIN OFFICES
230-238 North Twelfth Street
PHILADELPHIA, PA.

BRANCH OFFICES
CHICAGO, ILL., 318 West Washington Street
NEW YORK, N. Y., 15 East 40th Street

CAMEO

White Enamels and White Flat

Products

Cameo White Enamel—Gloss; Cameo White Enamel—Matte; and Cameo White Flat, made for high grade architectural requirements.

Also, makers of D. H. R. Enamels, Flat Wall Coating and Enamel Undercoatings for every purpose; D. H. R. Mill White and Samaurai Cement and Brick Coating.

Cameo White Enamel—Gloss

Cameo White Enamel—Gloss has that lustrous, glossy whiteness usually termed "Porcelain-like," and maintains its wearing qualities, whiteness and gloss far beyond the usual life of enamel. Cameo flows on smoothly, sets readily, and levels perfectly, resulting in a glossy white hard surface which is free from irregularities and porosities. Cameo Gloss may be rubbed to a satin finish with pumicestone and water. Repeated washings will not mar Cameo enameled surface. Can be tinted to shade desired with oil or japan color.

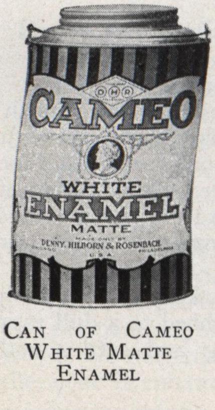
The great coverage and splendid gloss of Cameo White Enamel make it both economical and highly satisfactory. It fulfills the utmost in architectural requirements from a decorative and sanitary standpoint.

Can of Cameo White Gloss Enamel

Cameo White Enamel—Matte

Cameo White Enamel—Matte produces an eggshell, satin or semigloss finish that bears all the ear marks of hand rubbing without the extra costly hours of labor usually necessary to produce that delightfully decorative texture of finish.

It has exceptional covering power and durability. *Easily applied, it levels free from brush marks into a satiny surface that is tough and elastic, and will successfully withstand wear and washing.* The remarkable permanence of whiteness of Cameo-Matte assures exceptional light diffusion, while its satiny texture gives the utmost in wear and beauty. It can be tinted with oil or japan color.



Can of Cameo White Matte Enamel

Cameo White Flat

Cameo White Flat is an extremely opaque paint, with unusual hiding power, and covering capacity. It flows out, leveling into a surpassingly smooth velvety surface, free from brush marks, laps and irregularities. Ideal both as an enamel undercoat and flat wall coating. Cameo White Flat presents just that smooth impervious velvet-like surface that washes easily, resists dirt and wears to a remarkable degree. It has unusual light diffusing qualities. This with color permanence recommends it as a wall flat. Cameo White Flat not only holds up enamel better than any flat, but its smoothness makes the brushing of enamel over it the easiest of enamel tasks.

The tenacity of Cameo White Flat to wood, metal, plaster, composition, etc., is wonderful. It may be tinted with oil or japan color.

Can of Cameo Flat White

Specifications for Enamel Work

Hard Finish Plaster and Gypsum Work—Neutralize lime and free alkali, and be sure plaster is dry.

Concrete, Brick and Cement Work—Scrape excess mortar from all surfaces and neutralize lime and free alkali.

Wood and Similar Surfaces—Shellac all knots and sappy streaks, sandpapering if necessary.

Priming Coat—On new work, Cameo White Flat shall be applied thinned with pure linseed oil in the proportion of 1 pt. to 1 gal. of Flat. Sandpaper lightly after 24 hr.

Second and Third Coat—Cameo White Flat shall be applied allowing 24 hr. between coats. Sandpaper lightly between coats, and on last coat use very fine sandpaper, preferably 0000.

Fourth Coat—Cameo White Enamel Gloss (or Matte) shall be applied flowing out well, allow fourth coat 48 hr. to dry then apply last coat.

Fifth Coat—Cameo White Enamel Gloss. All Enamel and White Flat to be brought on job in manufacturer's original packages, unopened.

Note: Cameo White Enamel Gloss may be rubbed to satin finish, though Cameo White Enamel Matte saves this labor and should be specified, using above specifications inserting Cameo White Enamel Matte instead of Gloss.

Old Work—If not in good condition, remove all paint and proceed as per above specifications. If in good condition, apply 2 coats of Cameo White Flat, and 1 coat Cameo White Enamel Gloss or Matte.

Flat Wall Finish for Ceilings and Walls—***First Coat***—Cameo White Flat reduced about 1 pt. to 1 gal. with linseed oil.

Second and Third Coat—Cameo White Flat without reduction except a small portion of pure turpentine, not over 1 pt. to 1 gal.

FOUNDED 1754

DEVOE & RAYNOLDS CO., INC.

Makers of Paint and Varnish Products of Quality

NEW YORK, N. Y. CHICAGO, ILL.

BRANCH OFFICES AND SALESROOMS

ATLANTA, GA., 78 North Broad Street
BOSTON, MASS., Summer and High Streets; also 7 Elkins Street, South Boston
BUFFALO, N. Y., 479 Main Street
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ST. PAUL, MINN., 104 East 5th Street
SAVANNAH, GA., 116-118 Barnard Street
WICHITA, KAN., 127 North Market Street

Products

Devoe Holland Enamel.
Devoe Roman Enamel.
Devoe Pale Interior Varnish.
Devoe Marble Floor Varnish.
Devoe Rubbed Effect Varnish.
Devoe Spar Varnishes.
Devoe Paste Fillers.
Devoe Penetrating Stains.
Devoe Oil Stains.
Devoe Mitis Green (The Permanent Green).
Devoe Velour Finish (Flat Wall Paint).
Devoe Velour Finish Undercoat.
Devoe Tuf-Seal First Coater.
Devoe Lead and Zinc Exterior Paint.
Devoe Concrete Floor Paint.
Devoe Stucco and Concrete Coating.
Devoe Double Daylight Mill White.
Also Devoe Wax and Devoe Colors in Oil.

TRADE-MARK

Architectural Service

Complete Architectural Service Departments are maintained in the New York and Chicago offices. Architects are invited to submit their problems. The most approved methods and materials used in the decorating or preserving of any kind of surface will be recommended. Color charts and specially finished samples as well as specifications will be supplied on request. Immediate service may be had through the local Devoe branch house or the local Devoe merchant.

Specification Booklet

This booklet not only contains comprehensive specifications for treating any kind of surface, but also much general information that is valuable to the architect. A copy will be sent on request.

Paint Manual

This book has been compiled from a series of educational letters sent to the Architects during the past three years dealing with every-day problems and is extremely valuable to an architect desiring correct information on paint and varnish questions. Write for your copy.

Holland Enamel

Gloss White	Gloss Gray
Eggshell White	Eggshell Gray
Flat White	Flat Gray

Gloss Extra Light Ivory
Eggshell Extra Light Ivory
Flat Extra Light Ivory

Highest grade, interior or exterior.

The white is a permanent white. All the gloss effects are waterproof and weatherproof, withstanding the frequent washings required in kitchens and bathrooms as well as the chemicals used to cleanse and disinfect hospital walls. They will last longer on exterior surfaces than white lead and oil.

The eggshell and flat effects are for interior use only. Gloss, eggshell and flat effects are free flowing and self-leveling. The finished surface is most beautiful and durable.

Specify Devoe Flat White Undercoat for Enamel to prepare the surface.

Specifications—*Interior*—*Priming Coat*—For soft woods add 1 pt. boiled linseed oil, or for hard or semihard woods add 1 pt. turpentine to each gallon undercoat. When dry, sand lightly and dust clean.

Second Coat—Flow full body undercoat on evenly. When dry, sand lightly and dust clean.

Third Coat—Same as second. Sandpaper with 00 sandpaper.

Fourth Coat—Mix thoroughly with each gallon of undercoat, 1 qt. Holland Enamel and flow on full body. When dry, sand lightly with 00 sandpaper and dust clean.

Fifth Coat—Flow on Holland Enamel evenly as it comes from the container.

Note: If a rubbed job is desired rub with fine pumicestone and water. The Eggshell Holland Enamel may be specified for reasons of economy where the rubbed effect is desired.

If tinted enamel is specified for finishing, specify also that the undercoats be tinted to match.

Devoe Roman Enamel

A less expensive product, but one of splendid value. For interior use only, made in full gloss and eggshell white.

Devoe Pale Interior Varnish

Highest grade gloss varnish for trim.

Devoe Pale Interior Varnish gives a depth of finish that is extraordinary. The light strikes down through the varnish film as though it were of polished glass. The wood takes on the character not only of a surface but of a body. Its color and pattern seem to have depth behind them; the wood seems more solid, more enduring and more beautiful.

This varnish is hard drying, takes an extremely high gloss by polishing, or may be rubbed to a dull satin sheen. It is washable, easy flowing and settles with glasslike smoothness.

Continued on next page

Specifications—*First Coat*—Flow on a full body coat of Devoe Pale Interior Varnish. When dry, sand lightly and dust clean.

Second Coat—Same as above, sanding with 00 sandpaper or fine steel wool and dust clean.

Third Coat—Flow on full body coat Devoe Pale Interior Varnish.

The third coat may be omitted for reasons of economy. If a rubbed job is desired, 3 coats should be specified and extra drying time allowed between coats. Rub with fine pumicestone and oil.

Devoe Marble Floor Varnish

Devoe Marble Floor Varnish is the highest grade and is a pale, heavy bodied, hard drying, tough and elastic varnish. It is waterproof and heelproof, protecting the wood from wear, dirt and decay. It dries hard overnight and can be rubbed.

Mossed down with fine steel wool, it makes the ideal undercoating for waxed floors.

Specifications—Apply 3 coats Marble Floor Varnish. Two coats will produce a fine surface, but 3 coats are better. Allow 24 hours between coats, sanding and dusting the undercoats. It may be rubbed, when dry, with pumicestone and oil, or mossed with steel wool and waxed.

Devoe Rubbed Effect Varnish

This is a full bodied, hard drying semigloss varnish, designed as a substitute for the hand-rubbed effect. It contains no wax, flows on smoothly, dries in 12 to 24 hours and is durable.

Specifications—Specify Devoe Pale Interior Varnish for the undercoats. Finish with 1 coat Rubbed Effect Varnish. Sand and dust the undercoats.

Devoe Aqua Spar Varnish

For exterior or interior use, is very pale; is proof against hot and cold water and is durable. May be rubbed to a dull finish.

Devoe Yacht Spar Varnish

Highest grade exterior varnish. Made of best oils and gums. Medium slow drying with maximum durability.

Devoe Paste Filler

Light Oak
Dark Oak
Golden Oak
Mahogany

Dries bone hard in 24 hours. Absorbs none of the succeeding coats, thereby eliminating "pitting."

Devoe Concrete Floor Paint

Highest grade. Dries hard with a high gloss. Is durable, elastic, waterproof and oilproof. The first coat should be reduced one-fourth with turpentine.

Devoe Penetrating Stains

No. 20 Fumed Oak
No. 21 Silvery Gray
No. 50 Flemish Oak
No. 51 Mission Oak
No. 52 Antwerp Oak
No. 53 Weathered Oak
No. 54 Golden Oak
No. 55 Dark Antique
No. 58 Malachite Green
No. 59 Light Oak
No. 61 Green Oak
No. 62 Brown Mahogany
No. 64 Antique Oak
No. 65 Dark Mahogany
No. 66 English Oak
No. 68 American Walnut
No. 69 Circassian Walnut

Highest grade for interior work. Effects are clear and permanent. Show no laps and do not raise grain of wood. Do not require wiping; however, the character of the wood is enhanced if stains are wiped before they set.

Devoe Oil Stains

Light Oak
Dark Oak
Golden Oak
Fumed Oak
Weathered Oak
Malachite Green
Mahogany
Brown Mahogany
Walnut
Ebony

Highest grade, exterior and interior. Permanent as to color and do not raise the grain. Especially adapted for soft woods. The effects are not quite as clear as obtained with the Penetrating Stains.

Devoe Mitis Green

A strictly permanent green especially desirable on blinds and trimmings. To get maximum results, use 2 coats over an undercoat of Devoe Mitis Green Ground Color.

Made in 3 shades—light, medium and deep. A beautiful "Italian Green" can be obtained by mixing together equal parts of light and deep.

Devoe Velour Finish Flat Wall Paint

Highest grade. Maximum elasticity. Will not check, peel nor crack. Dirt and grease may be washed off its surface without injury to the paint. Hiding power and working qualities unexcelled. Clear, beautiful and permanent tints.

Devoe Velour Undercoat for Walls

High grade pigment size for walls of plaster, cement or wall board. Is elastic and will not chip, crack nor peel. Resists alkali and holds out the succeeding coats.

Devoe Tuf-Seal First Coater

Tuf-Seal is a first coater for any interior surface. It forms a transparent and exceedingly tough, elastic and durable coating, which clings tenaciously.

As a primer for exterior metal surfaces, it has no equal. For interior work on metal, natural wood, or mixed about half and half with an undercoater for enamel, it obviates all tendency to check, crack or peel and seals the surface thoroughly.

Mixed 50-50 with a varnish or oil wall size, or with the wall paint, it thoroughly seals the surface against dampness and minimizes the tendency of burns or discolorations coming through to the surface.

It is the safest and surest sizing material on new and difficult walls.

Devoe Lead and Zinc Exterior Paint

Highest grade, for exterior use. There is no purer or better paint made. It contains carbonate of lead, oxide of zinc, raw linseed oil, pure turpentine drier, pure tinting colors *and nothing else*. Its life is approximately one-half longer and its covering capacity is about 30% greater than lead and oil.

Devoe Stucco and Concrete Coating

Highest grade. A weatherproof, flat paint in white and colors.

A durable, elastic, preservative coating for exterior or interior use.

Devoe Double Daylight Mill White

Highest grade. Gloss and flat for interior walls. Easy working, durable and stays white. Two coats of the flat or 1 coat flat and 1 coat gloss will cover. For interior use on wood, plaster, wall board, brick or stone.

SAMUEL CABOT, INC.

Manufacturing Chemists

141 Milk Street
BOSTON, MASS.

NEW YORK, N. Y., 342 Madison Avenue
PHILADELPHIA, PA.. Real Estate Trust Building
SAN FRANCISCO, CAL., 444 Market Street
KANSAS CITY, MO., 2035 East 19th Street
CHICAGO, ILL., 5000 Bloomingdale Avenue
MINNEAPOLIS, MINN., Lumber Exchange Building
LOS ANGELES, CAL., Hibernian Building
PORTLAND, ORE., 96 Front Street

PRINCIPAL AGENCIES

ATLANTA, GA., Atlanta Paint Co.
BALTIMORE, MD., National Building Supply Co.
BIRMINGHAM, ALA., Moore-Handley Hardware Co.
BUFFALO, N. Y., (Quilt) M. A. Reeb Corporation; (Stains) Schuele & Co.
CINCINNATI, OHIO (Stains) Saeger-Winstel Co.; (Quilt) Cincinnati Builders Supply Co.
CLEVELAND, OHIO, Cleveland Builders' Supply Co. and Cleveland Window Glass & Door Co.
COLUMBUS, OHIO, Marietta Paint & Color Co.
DALLAS, TEX., W. L. Macatee & Sons.
DAYTON, OHIO, Delscamp Paint & Glass Co.
DENVER, COLO., Colorado Builders' Supply Co.
DETROIT, MICH., Clyde C. Crane Co. and Rinshed-Gagnier Co.
DULUTH, MINN., Thomson-Williams Co.
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SAVANNAH, GA., Neal-Blun Co.
SEATTLE, WASH., S. W. R. Dally
SIOUX CITY, IOWA, Hansen Glass and Paint Co.
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SYRACUSE, N. Y., Alex. Grant's Sons
TAMPA, FLA., Knight & Wall Co.
TOLEDO, OHIO, Toledo Builders' Supply Co.
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TULSA, OKLA., Builders' Supply Co.

Products

Cabot's "Creosote" Shingle Stains; Old Virginia White; Double White; Waterproof Stucco and Brick Stains; Clear Brick and Clear Cement Waterproofing; "Conservo" Wood Preservative; Dampproofing; Protective Paints; Mortar Colors.

For Stained Shingles see page 1107; for Building Insulation, see pages 1342-1343.

Cabot's "Creosote" Shingle Stains

Cabot's "Creosote" Shingle Stains are the original stains invented by Samuel Cabot 43 years ago.

Uses—For coloring and preserving shingles, rough or dressed siding boards, half-timbering, cornice and trimmings of cement houses, etc.

Coloring Effects—Stains are made of the finest and strongest pigments, colloidally compounded and suspended in a vehicle of specially refined creosote. The coloring effects are soft and rich, and also transparent, so that the wood is beautifully colored without covering the grain.

The colors are guaranteed fast.

Wood Preservation—The creosote penetrates the wood and thoroughly preserves it against decay or insects.

"Creosote is the best wood preservative known."—Trautwein.

"Wood treated with it is not subject to dry rot or other decay."—Century Dictionary.

Imitations—Can be recognized by coarse pigments; tawdry, opaque colors; and the smell of kerosene, benzine, or similar cheapener. Cabot's stains contain no petroleum distillate or other adulterant.

Application—Shingles may be dipped before laying; or dipped, and brushed once after laying (the most thorough method), or merely brush-coated twice after laying. The coloring effect is the same, but dipping preserves the shingles better. Other woodwork is stained with the brush.

Always use 2 coats, and 3 coats are advisable on smooth wood.

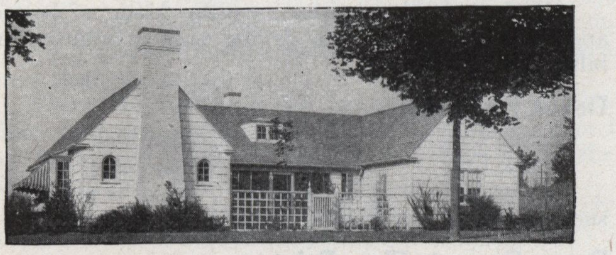
Covering Capacity—One gallon covers 100 sq. ft., 2 coats, on rough wood, or 200 to 250 sq. ft. on smooth wood; 2½ to 2¾ gal. will dip 1000 shingles two-thirds their length; 3-gal. will dip and brush-coat.

Samples—Samples of stained wood, showing the colors on cedar, will be furnished on request.

Special Colors—Special colors and shades will be made for architects who wish to produce special effects and will send samples to match or suggestions to follow.

Specification—Specify: "Cabot's 'Creosote' Shingle Stains, in original packages bearing Cabot's trademark. Color to be selected by architect or owner."

State whether work is to be dipped or brush-coated, or both, and that stains must be thoroughly stirred and be applied, without dilution or adulteration, to dry wood only. This will insure uniform color and durability.



Cabot's Creosote Stained Shingles on Roof; Wall Shingles Finished with Cabot's Old Virginia White; Insulated with Cabot's Quilt for Warmth

Harold Doty, Architect, Portland, Ore.

Cabot's Old Virginia White

Gives a clean, brilliant "whitewash effect," combining the soft, cool whiteness of whitewash with the wearing qualities of paint; but it is not opaque and heavy like paint. It is a colloidal compound and more transparent, covering the surface as a good coat of whitewash covers it, and not with the hard, veneering surface that paint forms. It faithfully reproduces the peculiarly desirable qualities of whitewash; but is finer in tone and texture, simple and easy to apply, clean and lasting.

Many attempts have been made to obtain this result with paint, but without success, because the hard, cold "paintiness" of paint is so essentially different from the soft brilliancy of whitewash.

Continued on next page

Adaptability—Old Virginia White is used for shingles, siding, boards, and timbers, and for brick, stone and cement work. It has been especially successful on brickwork, giving striking and picturesque effects that can be obtained in no other way.

Application—Apply with a brush or by dipping. If dipped, shingles should be brushed off when dipped and 1 or 2 brush coats applied after laying; or dip in White Shingle Stain No. 1166 and apply 2 brush coats of Old Virginia White.

Covering Capacity—One gallon covers 125 to 150 sq. ft., 2 coats, on shingles and other undressed wood and on brick or cement work, and it goes about twice as far on smooth wood.

Cypress Shingles, Brick Chimneys and Stonework Finished with Cabot's Double-White; Roof in Blended Brown of Cabot's Creosote Stain
Clark & Arms, Architects, New York

Cabot's Double-White

A brilliant, flat white of fine texture and wonderful hiding power. It is so opaque that two coats will cover better than three coats of white lead paint, and it is much whiter. This is another one of Cabot's colloidal compounds and has flowing qualities, priming qualities, and textural qualities entirely different from paints.

Adaptability—For all exterior surfaces of wood, cement, brick or metal, as well as for interior work.

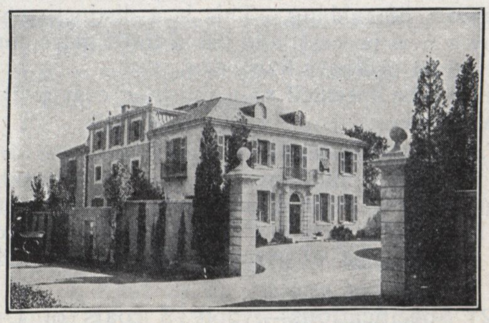
Application—Applied with a brush, like paint, or with spray-gun.

Covering Capacity—300 sq. ft., 2 coats, per gallon, on dressed lumber or other smooth surfaces.

Cabot's Waterproof Stucco and Brick Stains

Adaptability—These stains enter and seal the pores of brick, or concrete, making them rainproof and producing beautiful coloring effects without weakening the cement.

For evening up off-colored and mismatched brick, or restoring the color of old, faded and discolored walls, they are unequalled. They sink into the surface, and form no skin, so that they can not chalk or peel like paints and other coatings.



Stained with Cabot's Stucco Stains
Bigelow & Wadsworth, Architects, Boston, Mass.

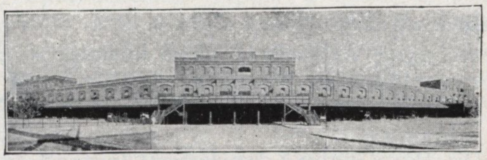
Being transparent, they show the variations of texture, tone and density of the concrete almost as perfectly as in its uncolored state. Made in all colors.

Covering Capacity—One gallon covers from 100 to 250 sq. ft., 2 coats, depending upon the surface.

Cabot's Clear Brick Waterproofing and Cabot's Clear Cement Waterproofing

Transparent liquid waterproofings applied to the surface with a brush. They penetrate and seal the pores, making the surface completely and permanently rainproof.

Covering Capacity—One gallon will cover from 200 to 300 sq. ft., 2 coats, on common brick or smooth concrete.



Piers, Hoboken, N. J., Waterproofed with Cabot's Clear Brick Waterproofing

Cabot's Dampproofing

For direct plastering on brick and concrete walls and stonebacking on marble and other delicate stones. A permanently waterproof and adhesive coating that forms a perfect bond between the plaster and the wall, making furring and lathing unnecessary. It penetrates both plaster and wall, knitting them firmly and permanently together.

Covering Capacity—One gallon covers 80 to 100 sq. ft., 2 coats. The first coat should stand 24 hours before the second is applied, and the second should stand 24 hours before the plaster is applied. This insures perfect adhesion and a complete bonding.

Cabot's Flexiblac Protective Paint

A chemically pure bitumen paint, thoroughly clarified and refined, which forms an elastic non-oxidizable bituminous coating that permanently protects iron and steel from rust, electrolysis and corrosion. Linseed oil paints will not last on metal construction, because oxidation and electrolytic action destroy them. Cabot's Flexiblac will not oxidize, is not affected by acids or electrolysis, will not crack nor peel. It is permanent and a perfect protection, and costs only half as much as linseed oil paint.

Covering Capacity—One gallon covers 300 to 400 sq. ft., 2 coats.

Cabot's "Conservo" Wood Preservative

For preserving all kinds of woodwork from decay, worms, and insects.

At a cost of 2¢ or 3¢ per stick, "Conservo" will almost double the life of piles, posts, sills; bridge, mine, wharf and dam timbers, and all kinds of planking.

It is as perfect a preservative as can be made with the present scientific knowledge of the subject. It gives a butternut brown tone.

Apply with a brush, as heavily as possible, or dip the lumber before using.

Covering Capacity—One gallon covers about 200 sq. ft. of dressed lumber with 2 coats.

Cabot's Mortar Colors

For 35 years the strongest and most durable colors for mortar.

Made in pulp form to insure uniform mixing and to save labor.

E. I. DU PONT DE NEMOURS & CO., INC.

Paint and Varnish Division

3500 Gray's Ferry Road, PHILADELPHIA, PA.

BRANCH OFFICES

BOSTON, MASS., Everett Station (49)
CHICAGO, ILL., 2100 Elston Avenue
NEW YORK, N. Y., 21 East Fortieth Street

Products

Paints and Varnishes which include:
- Former Harrison Products:
  - Du Pont Prepared Paint (Town and Country)
  - Du Pont FlowKote Enamel
  - Du Pont Flat Wall Paint
  - Du Pont Elastic Wall Primer
  - Du Pont White Enamel Undercoat
  - Du Pont Kromate Metal Primer
  - Du Pont Antoxide (Rust Inhibitive)
  - Du Pont Du-Lite (Mill White)
- Former Bridgeport Products:
  - Du Pont Wheeler's Paste Wood Filler
  - Du Pont Penetrating Stain
  - Du Pont Acid Stain
  - Du Pont Stain Sealer
  - Du Pont Wonderlac
  - Du Pont Prepared Wax
- Former Chicago Architectural Varnishes:
  - Du Pont Shipoleum Interior Finish
  - Du Pont Supremis Floor Finish
  - Du Pont Chi-Vo (to Approximate Rubbed Finish)
  - Du Pont Navalite (Exterior)

The Du Pont Line

This is a combination of three of America's best known lines, each famous for a certain class of products:

First, the former Harrison Bros. & Co., makers of high grade paints, oil colors and enamels for over a century.

Second, the former Bridgeport Wood Finishing Co., whose stains, fillers and finishes have been the standard for nearly 50 years.

Third, completing the circle, the Chicago Varnish Co., whose varnishes have been specified by architects for over 50 years.

Du Pont Wheeler's Paste Wood Filler

The original silex wood filler, and used by the leading piano and furniture manufacturers for over 40 years. It is specified by critical architects for all types of building construction, including the finest public and residential work.

Forms a permanent, unshrinkable, transparent foundation in the pores of the wood for the support of the finishing coats.

Supplied in Transparent, Walnut or Light Antique, Golden Oak, Mahogany, Mahogany N (for dark mahogany effects), Ebony and Special White.

1793 · BORN WITH THE REPUBLIC · 1802
DU PONT
PAINTS AND VARNISHES

TRADE-MARK

THE CHEMICAL ENGINEER

Symbol of du Pont services to industry—the explanation of the varied line of du Pont products—and of du Pont quality leadership in the paint field. The work of du Pont Chemical Engineers is to improve and standardize quality and lower costs

(1) Specifications—Filler to be reduced with turpentine or benzine at the rate of 8 to 10 lb. of filler to 1 gal. of reducer. Apply 1 brush coat of Du Pont Wheeler's (   ) Paste Wood Filler. Allow work to stand until the filler has set or become dull, then rub the filler well into the pores of the wood, wiping off the surplus with a cloth or sea moss, rubbing across the grain. Allow to dry at least 24 hours before finishing coats are applied.

Du Pont (Chicago) Architectural Varnishes

These varnishes have been specified by architects for the past 50 years, and are accorded first place in the varnish field.

The same identical varnishes are now sold under the Du Pont label.

There is a grade for each specific purpose:

Shipoleum Interior Finish—The very highest grade of interior varnish. Should be specified for use on fine residences, hospitals, asylums, public buildings, bathrooms, basements, stables, laundries and places exposed to the fumes of ammonia and dampness. It stands heat and moisture, is very elastic and never cracks. May be rubbed and polished.

Supremis Floor Finish—The first varnish put on the market especially for floors, and one that has always retained its leadership. It is a remarkable wood preservative, dries hard and elastic, is thoroughly waterproof and will not mark or scratch white.

When rubbed, it produces the soft eggshell luster of French polish.

DU PONT
VARNISH
FINEST QUALITY
VARNISHES AND FINISHES
SUPREMIS
Floor Finish
E. I. DU PONT DE NEMOURS & CO.
WILMINGTON, DELAWARE

Chi-Vo—Noted for its beautiful rubbed appearance without the labor and expense of rubbing. This is a distinctive varnish, made by a new process, and has a third more spreading capacity than ordinary varnishes.

Should be specified as a finishing coat over Shipoleum Varnish.

Navalite—Especially adapted for use on front doors, vestibules and any exterior surface subject to all kinds of weather conditions. It will retain its luster and elasticity under severe conditions and meets every requirement of drying, appearance and durability.

(2) Specifications—Apply 3 coats of Du Pont Architectural (   ) Varnish. Each coat to be sanded

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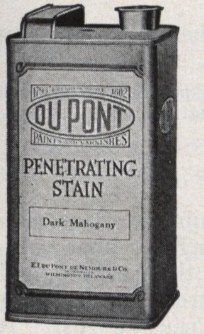
(except Chi-Vo) when thoroughly dry, with No. 00 sandpaper, and dusted. Final coat to be rubbed to (flat, eggshell or polish), as desired.

Du Pont Penetrating Stain



For producing on practically all woods, with the possible exceptions of mahogany and walnut, clear toned stained effects.

These stains do not raise the grain of the wood or show laps. They penetrate the wood deeply, bringing out the full beauty of the grain.

Where economy of finish is a factor, the oak shades may be used as a 1-coat finish, but are generally finished over with stain sealer and wax; stain sealer and varnish; filler, stain sealer and wax; or filler and varnish. On close grained woods, the use of filler is not necessary.

The mahogany shades are generally used on such close grained woods as birch, gumwood, pine, fir, cypress and whitewood, and should be finished over with stain sealer and varnish coats.

Regularly supplied in the following colors:

Light Oak, Brown Oak, Golden Oak, English Oak, Flemish Oak, Walnut, Light Mahogany, Dark Mahogany, Brown Mahogany, Mission Green, and Circassian Walnut (for gumwood only).

(3) Specifications—Apply brush coat of Du Pont ( ) Penetrating Stain. Allow work to stand for 4 or 5 minutes and wipe off surplus stain with a cloth. Allow to dry 24 hours before applying further finishing coats.

Du Pont Stain Sealer

A sealing coat for Penetrating Stains, also perfectly supports the varnish coats.

This product is much superior to shellac for the purpose, as it prevents the stain from "bleeding" through the varnish coats. Do not specify the use of Penetrating Stains without the use of Stain Sealer.

(4) Specifications—Apply 1 brush coat of Stain Sealer over Penetrating Stain; allow to dry 24 hours and sand or hair lightly. Dust work before applying varnish coats.

Du Pont Acid Stain

Intended for use on all types of wood in producing the artistic effects not possible with any other type of stain.

The mahogany effects are generally used on genuine mahogany wood in connection with Wheeler's Paste Wood Filler, such effects being finished over with varnish coats. The grays and fumes are generally finished over with Wonderlac.

Regularly supplied in the following colors:

No. 1000 Dark Fumed Oak, No. 1314 Light Fumed Oak, Standard Gray, Satin Gray, Steel Gray, Smoked Pearl, Mahogany, Dark Mahogany, Brown Mahogany.

Write for panels showing new gray and brown tones.

(5) Specifications—Apply 1 brush coat of Du Pont ( ) Acid Stain. Allow work to dry thoroughly, about 12 to 24 hours, and sand surface smooth with No. 00 sandpaper. Dust work before applying further finishing coats.

Wonderlac

A dull lusterless finish adapted for use *only* over the Gray and Fumed Acid Stains. Does not change the color of the most delicate shades and forms a dampproof finish.

(6) Specifications—Apply 2 brush coats of Wonderlac over Standard Gray (or Fumed Oak) Acid Stain, allowing 8 hours between coats for drying.

Du Pont Prepared Wax

Used in producing the waxed effect on interior woodwork and floors.

(7) Specifications—Apply 2 coats of Prepared Wax. Apply with a cloth evenly over the entire surface; allow to stand 10 to 20 minutes and polish with a soft cloth. The second coat may be applied in the same manner 24 hours after the first coat has been polished.

Du Pont Enamel Undercoat (White)

This is the proper undercoat for an enamel finish. Forms a hard, smooth finish, causing the enamel to stand out with full gloss and luster.

(8) Specifications—Apply 3 brush coats of Du Pont Enamel Undercoat as follows:

First Coat—Thin with linseed oil at the rate of 1 qt. of pure raw linseed oil to 1 gal. of Undercoat. For pine or cypress, substitute turpentine for linseed oil. Allow to dry 48 hours and sand with No. 00 sandpaper.

Second Coat—Apply Undercoat as it comes from the can. Allow to dry 48 hours and sand with No. 00 sandpaper.

Third Coat—Same as second coat. Dust work before applying enamel coats.

FlowKote Enamel

FlowKote
ENAMEL
Gloss White

A high grade enamel that will not change color. Adapted for both interior and exterior work.

Supplied in White and Ivory, in both gloss and rubbed finish. The latter type gives the hand rubbed effect without the labor and expense of rubbing; and if rubbed finish is specified, no rubbing is necessary for the final coat.

(9) Specifications—Apply 2 coats of Du Pont FlowKote ( ) Enamel. Sand first coat when thoroughly dry with No. 00 sandpaper. Dust work and apply second coat. Final coat to be (left in gloss or rubbed eggshell) as desired.

Du Pont Prepared Paint

An exceptionally durable house paint made to withstand extreme weather conditions. Has exceptional durability and covers well.

Color card on request, showing 30 attractive colors.

(10) Specifications—*Preparation*—Coat all knots and sappy streaks with shellac, to prevent showing through subsequent paint coats. Apply 3 coats Du Pont Prepared Paint ( ) as follows:

On very resinous knots the resinous matter should be "pulled out" of the surface by the use of the blow torch, followed by a brush coat of turpentine or benzole just before application of the priming coat. Apply 3 coats of Du Pont Prepared Paint ( ) as follows:

Priming Coat—Thin to priming consistency with

Continued on next page

equal parts linseed oil and turpentine. (For soft, open grained woods like white pine and poplar, thin with 3 parts oil and 1 part turpentine. On resinous woods, such as yellow pine, reduce with 1 part oil and 3 parts turpentine.)

Second Coat—Thin to working consistency with 2 parts raw linseed oil and 1 part turpentine. Brush out well.

Third Coat—Apply without thinning, except when conditions warrant the use of a little linseed oil.

Du Pont Flat Wall Paint

A ready-to-use interior wall finish, producing a soft, matte surface that can be repeatedly washed. Covers exceedingly well and does not show brush marks.

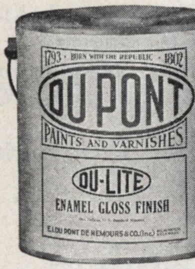
Supplied in 10 colors and white. Send for color card, showing these colors in various combinations.

(11) Specifications—*First Coat*—Du Pont Flat Wall Paint, to each gallon of which has been added from a quart to a half gallon of Du Pont Elastic Wall Primer, depending on porosity of surface.

Second Coat—Du Pont Flat Wall Paint of package consistency.

Third Coat—Same as second coat.

Du-Lite (Mill White)


1793 · BORN WITH THE REPUBLIC · 1802
DU PONT
PAINTS AND VARNISHES
DU-LITE
ENAMEL GLOSS FINISH
E.I. DU PONT DE NEMOURS & CO. (Inc.)

Three coats recommended for all new or unpainted work.

(12) Specifications for Use Over Cement, Concrete, Brick and Plaster—*Preparation*—All surfaces must be thoroughly dry and free from grease and dirt.

Finishing—First Coat: Du Pont Du-Lite Undercoater to each gallon of which has been added an equal amount of Du Pont Elastic Wall Primer.

Second Coat: Du Pont Du-Lite Undercoater.

Third Coat: Du Pont Du-Lite Gloss, Eggshell or Flat.

Where only 2 coats are used, the following specification is recommended:

First Coat: Du Pont Du-Lite Undercoater.

Note: Where brick and concrete surfaces are very porous, 1 qt. of Du Pont Elastic Wall Primer should be added to each gallon of Du-Lite Undercoater for first coat.

Second Coat: Du Pont Du-Lite Gloss, Eggshell or Flat.

(*Caution:* New or green surfaces particularly strong in alkalies, should first be washed with a solution made by dissolving 3 lb. of zinc sulphate in 1 gal. of water.)

(13) Specifications for Use Over Wood and Wall Board—*Preparation*—All surfaces must be thoroughly dry and free from grease and dirt. Knots and sappy places in wood shall be shellacked before painting and all nailholes puttied after first coat.

Finishing—First Coat: Du Pont Du-Lite Undercoater reduced to priming consistency with equal parts of pure raw linseed oil and spirits of turpentine or turpentine substitute.

Second Coat: Du Pont Du-Lite Undercoater.

Third Coat: Du Pont Du-Lite Gloss, Eggshell or Flat.

Where only 2 coats are used, the second coat may be omitted.

(14) Specifications for Use Over Structural Iron or Steel and All Metal Work (except Galvanized Iron)—*Preparation*—Metal surfaces shall be cleaned of all scale, dirt, rust and grease.

Finishing—First Coat: Du Pont Kromate Metal Primer.

Second Coat: Du Pont Du-Lite Undercoater.

Third Coat: Du Pont Du-Lite Gloss, Eggshell or Flat.

Where only 2 coats are used, the first coat may be omitted.

Note: When galvanized iron is used, special treatment is required before painting. Special information will be furnished on request.

Antoxide (Rust Inhibitive)

1793 · BORN WITH THE REPUBLIC · 1802
DU PONT
PAINTS AND VARNISHES
ANTOXIDE
(Rust-Inhibitive)
Bronze Green
E.I. DU PONT DE NEMOURS & CO. (Inc.)

A rust inhibitive paint with a varnishlike vehicle, that completely covers the surface and prevents moisture from attacking the metal and causing rust. It prevents the formation of rust beneath the coating as well as progressive oxidation where it has already begun.

This paint withstands acid fumes to a most unusual degree, therefore is peculiarly adapted for use around smelters, acid plants, paper and other mills. It is also used on water towers, inside and out, as it does not foul water.

(15) Specifications—*Preparation*—Surface to be free from grease, dirt and dust. Wire brush to remove scale.

First Coat—Du Pont Kromate Metal Primer.

Second Coat—Du Pont Antoxide (   ), to each gallon of which has been added 1 pt. of turpentine.

Third Coat—Du Pont Antoxide (   ), as contained in package.

Du Pont Elastic Wall Primer

The proper foundation for Du Pont Flat Wall Paint and Du-Lite. Stops the suction in plaster walls and prevents plaster burns from showing through subsequent coatings.

(16) Specifications—See Du Pont Flat Wall Paint and Du-Lite Specifications.

Du Pont Kromate Metal Primer

One of the latest developments in metal primers for structural steel or sheet metal. Supplied in ready mixed form and is far superior to red lead in rust inhibitive properties.

(17) Specifications—See Du Pont Flat Wall Paint and Antoxide specifications.

Special Note

For the convenience of the architect, an Architectural Specification Book has been prepared. This booklet gives to all architects a service of technical specifications carefully prepared and made easily adaptable for specification writers.

You will note in the foregoing pages that the specifications have been numbered. This is so arranged that the proper paragraphs may be combined in the architect's specification details.

If detailed specifications are desired covering a particular project, complete information may be had by addressing our Architectural Service Bureau, Paint and Varnish Division, E. I. du Pont de Nemours & Co., Inc., 3500 Gray's Ferry Road, Philadelphia, Pa. This is available for the asking and involves no obligation.

KEYSTONE VARNISH COMPANY

Manufacturers of Paints, Wall Finishes, Enamels, Varnishes

CHICAGO, ILL. BROOKLYN, N. Y. BOSTON, MASS.
KEYSTONE VARNISH COMPANY, LTD., HULL, ENGLAND

Specialties

"Keystona," the original Flat Finish Linseed Oil Paint for interior plaster work, woodwork, wall board, etc.

"Degrah," for floors, interior trim, furniture, exterior wood work, and for every purpose where varnish is required.

"Edelvice," a Porcelain White Enamel, for interior and exterior use.

"Keystona" Caen Stone Finish, a Flat Finish Linseed Oil Paint for rough or smooth caen stone effects.

"Zinolin," the "Arnold-ized" Zinc, an All-zinc Paint made for outside use.

"Degrah"

"Degrah" is *the* Varnish that can be "treated rough." It stands the movement of furniture and the scuff of shoes on floors; the nails in heels will dent the wood but will not crack "Degrah." Any varnish that will stand this abuse, will naturally do satisfactory work on doors, furniture and woodwork. *Because of the Sheep's Wool Grease.*

Although "Degrah" is waterproof and is not turned white by boiling water, salt or soapy water, we do not base our claims of "Quality" on this feature, but on the elasticity, toughness and durability of "Degrah" and that it is not affected by steam. *Let some dry on a glass then boil it for 15 minutes.*

"Degrah" is made in six colors, natural and ground color and is recommended for use on floors, furniture, and all interior woodwork. Due to its special "Qualities," "Degrah" is used largely on table tops, bathroom floors, linoleum and such places where cologne or alcohol preparations are liable to be spilled and on stairs and floors of playrooms.

"Degrah" is made in natural, dark oak, light oak, cherry, mahogany, black walnut, green and ground colors.

"Edelvice" Enamel

This enamel produces a beautiful, clear, white, high gloss porcelain finish that will not turn yellow, bloom, or become dull. For hard service, as on exterior surfaces, "Edelvice" will wear for years. It "works like butter," and allows of perfect freedom in applying, so that, no matter how large the surface, one man can do the work alone, without danger of laps or brush marks. Can be washed with warm soap-water.

"Edelvice" is made in gloss, eggshell gloss and flat. Colors, white, ivory, cream and gray.

Covering capacity, 300 sq. ft. per gal., one coat.

"Keystona" Caen Stone Finish

This paint is the result of years of experimenting, and will produce a beautiful caen stone finish on plaster or brick surfaces. Can be washed with warm soap-water.

Full directions for application, samples, etc., sent on request.

Covering capacity, 1 coat on primer, brick, or rough plaster surfaces, 150 sq. ft. per gal.; smooth plaster surface, 210 sq. ft. per gal., one coat.

"Keystona"

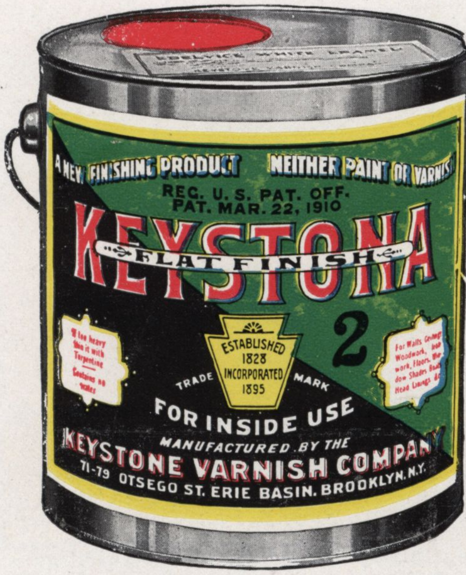
A flat finish linseed oil interior paint, prepared by a secret process and according to exclusive patents. Has a reputation of 18 years, and is used most extensively throughout the world. Soft in effect as water paints, yet permanent in color, sanitary, germproof, verminproof and washable as marble. "Keystona" is easy to apply. It does not produce glossy spots, shows no lap or brush marks, and will not sag. Touching-up on finishing coat does not show. Marks of striking matches, and pencil marks, can be easily removed by washing.

Primarily a plaster wall, woodwork and wall board finish, "Keystona" can also be applied with assuredly satisfactory results as an undercoating for enamel, as a groundwork for staining, glazing and graining, and on metal ceiling, wallpaper, burlap, canvas, galvanized iron and radiators. "Keystona" adheres to all non-absorbent surfaces upon which oil paint shells, such as patent cement, marble and slate.

"Keystona" colors, as shown on color card herewith, are rich and subdued in tone. Special tints to match any color scheme can be supplied at short notice, at slight increase in cost. Our Primer must be used to prepare walls before appying "Keystona."

"Keystona" is also made in gloss (white and full range of tints) which has been perfected to meet a demand for a washable gloss finish that can be easily applied without brush marks or laps. For use in mills, factories, general offices, lofts, kitchens, pantries and servants' stairs or where a flat finish might not be desirable.

Covering capacity of "Keystona" (flat and gloss), 1 coat: on plaster, 600 sq. ft. per gal.; on woodwork, 500 sq. ft. per gal.; on metal, 550 sq. ft. per gal.



Exact Color Reproduction of "Keystona" Can
Shown to help architects guard against substitution
Color card on next page

"Zinolin," the "Arnold-ized" Zinc

The only all-zinc outside paint. Comes in paste form, similar to white lead. Contains 15% coarser inert pigment to allow for expansion, contraction and greater oil absorption. Recommended for its superior whiteness, durability and covering properties. Holds colors

Continued on next page

and gloss indefinitely. Especially recommended where white paint is to be used and for the seashore. Covering capacity, 2 coats over primer, 250 sq. ft. per gal. Can also be used in combination with white lead in any proportion, eliminating straight zinc entirely. The more "Zinolin," is used, the more oil is required and the lower in cost per gallon and more durable the paint will be.

Specifications

"Degrah"—All interior floors to be filled with paste filler followed by a first coat of "Degrah" thinned half with turpentine. Sandpaper lightly, and apply second coat of "Degrah" thinned one-third with turpentine.

All interior trim to be properly filled, and stained (or left in natural wood color), followed by 3 applications: first coat thinned half, second and third coats thinned 1 pt. to the gallon, with turpentine. Third coat to be rubbed down to a dead finish with pumice and water or oil. If you wish to save cost of rubbing, specify dull finish "Degrah" for third coat.

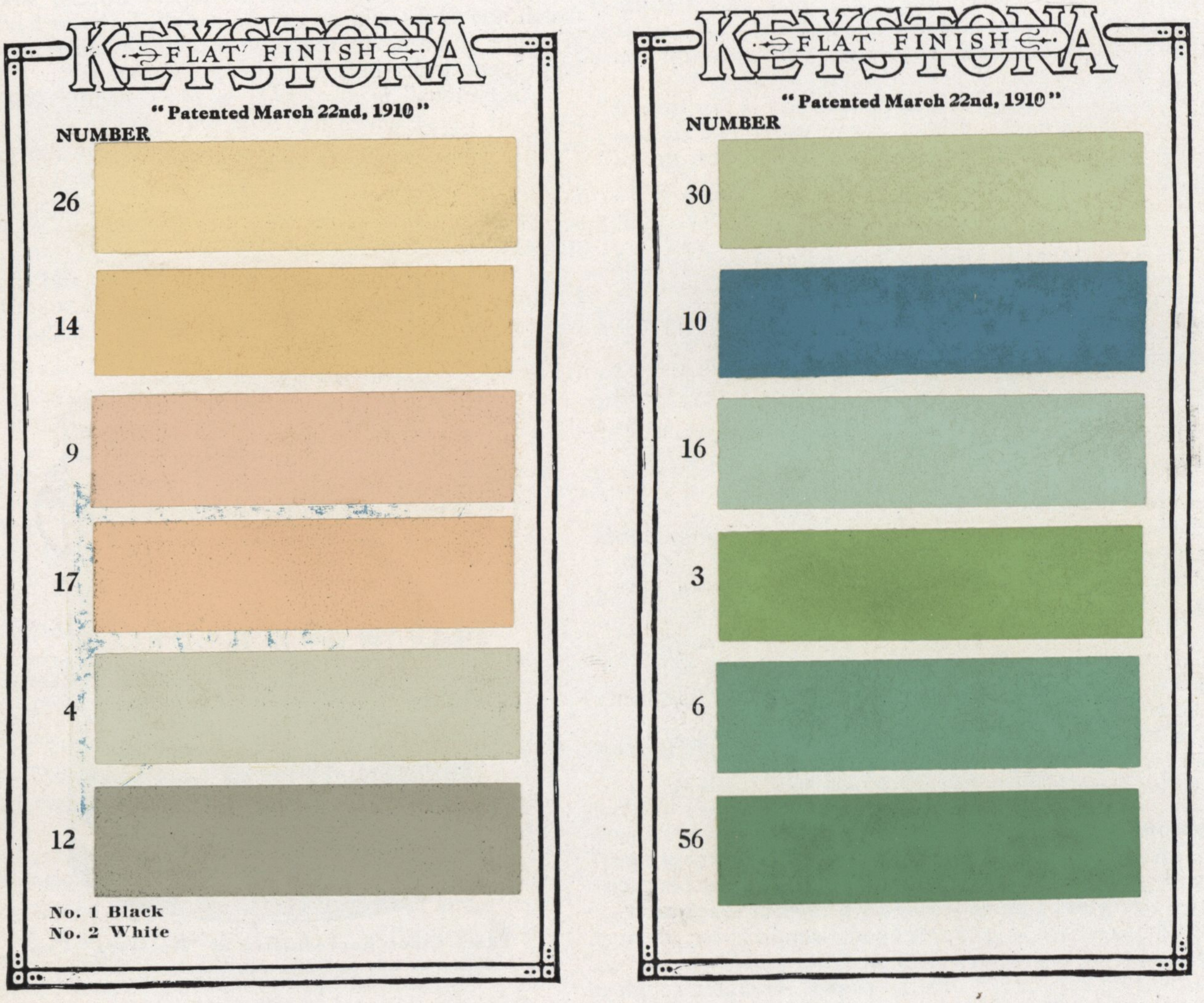
For exterior woodwork specify same as for interior except do not rub final coat.

"Keystona"—All the walls in halls and rooms to be prepared with "Keystona" Primer and finished with 3 coats of "Keystona," according to directions furnished by the manufacturer.

"Edelvice" Enamel—All the woodwork in rooms, excepting the doors, to be finished with 3 coats of "Keystona" and 2 coats of "Edelvice" Enamel, according to directions furnished by the manufacturers. Doors to be stained and filled mahogany color and finished with 3 coats of "Degrah" rubbed.

"Zinolin"—All the outside woodwork to be primed and then given 2 coats of "Zinolin," according to the directions furnished by the manufacturers.

These are a few Keystona Tints



Keystona is made in many shades, from the most delicate to the deepest
Keystona is higher in price—*Naturally!*

MARTIN VARNISH COMPANY

Manufacturers of Varnishes and Enamels

TELEPHONE
VICTORY 7000

2520 Quarry Street
CHICAGO, ILL.

Pioneers of Martin Varnish Co 100% PURE Varnishes
TRADE MARK

Products

MARTIN'S 100% PURE VARNISHES: Floor, Interior, Outside Spar, and Velour; MARTIN'S AMBER-LYTE FLOOR FINISH; MARTIN'S ENAMELS: Full Gloss or Eggshell, and Undercoat.

Quality of Martin's 100% Pure Varnishes

A striking and outstanding feature of Martin's Varnishes is that they are 100% pure. By this we mean that they are composed of *pure gums, oils* and *turpentine,* and contain *no* benzine, and *no* rosin. Martin's 100% Pure Varnishes retain their elasticity for a remarkably long time and protect surfaces on which they are properly applied, most economically.

It is suggested that members of the profession use these specifications on projects where they require the highest grade finished surfaces.

Complete Specification Book

A complete specification book, prepared with the co-operation of architects, will be furnished upon request. This book contains a great deal of valuable information, photographs, and specifications, and will be of assistance to every architect.

Suggestions for Finishing Floors

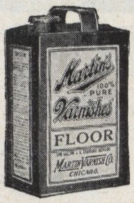
Do not use shellac or liquid fillers under any high grade varnish or floor finish when best results are desired.

Specifications No. 1 (Open Grained Woods, Such As Oak)—(a) Fill floor with good paste filler; before thoroughly dry wipe off across grain of wood with burlap or excelsior. Sand when dry, with No. 0 sandpaper; wipe up dust.

(b) First coat to be Martin's 100% Pure Floor Varnish reduced with ½ pt. of pure turpentine to the gallon of varnish. Allow 12 to 24 hr. for drying. Sand with No. 00 sandpaper; clean up dust.

(c) Second coat to be Martin's 100% Pure Floor Varnish, full body as taken from can. Allow 12 to 24 hr. for drying. Sand with No. 00 sandpaper; clean up dust.

(d) Third and final coat to be Martin's 100% Pure Floor Varnish, full body as taken from can.



MARTIN'S
FLOOR
VARNISH

Rubbed Finish—Rub with pumicestone and oil 4 days after final coat is applied.

Rubbed Finish Effect—To secure rubbed finish effect without labor cost of rubbing, substitute for third coat Martin's 100% Pure *Velour* Finish. No rubbing is necessary.

Specifications No. 2 (Close Grained Woods, Such As Maple, Birch, Beech, Pine, Yellow Pine and Cypress)—(a) Omit filler and apply first coat of Martin's Amber-Lyte Floor Finish full body as taken from can, *well brushed out.* (Do not flow on like a varnish.) After 15 to 30 hr., sand with No. 0 sandpaper; clean up dust.

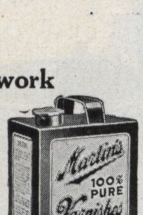
(b) Finish as in Specifications No. 1.

Suggestions for Finishing Interior Woodwork

Do not use shellac or liquid fillers under any high grade varnish for best results.

Specifications No. 3 (Open Grained Woods, Such As Oak, Walnut, Ash, etc.)—(a) Should be done same as in Specifications No. 1, substituting Martin's 100% Pure Interior Finish for Martin's 100% Pure Floor Varnish.

Specifications No. 4 (Close Grained Woods, Such As Maple, Birch, Beech, Pine, Yellow Pine and Cypress)—(a) See Specifications No. 2, but substitute Martin's 100% Pure Interior Finish, instead of 100% Pure Floor Varnish, for final coats.

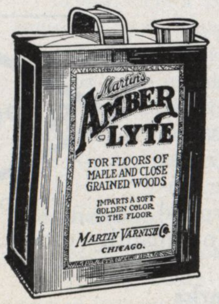


MARTIN'S
INTERIOR
FINISH

Suggestions for Hospitals, Schools, Public Buildings, Kitchens, Hallways, etc.

The highly unsatisfactory results which have always accompanied the use of oils or varnishes on floors of maple or other close grained hardwoods in hospitals, schools, public buildings, kitchens, etc., can now be avoided.

Martin's Amber-Lyte Floor Finish penetrates farther into maple than linseed oil penetrates into pine, and dries overnight with a tough, durable film similar to varnish; sanitary and economical. Even after the surface of the wood wears away, the beautiful Amber-Lyte finish and protection remains.


Martin's
AMBER
LYTE
FOR FLOORS OF MAPLE AND CLOSE GRAINED WOODS
IMPARTS A SOFT GOLDEN COLOR TO THE FLOOR
MARTIN VARNISH CO.
CHICAGO.

MARTIN'S
AMBER-LYTE

Specifications No. 5 (For Floors of Maple and Other Close Grained Hardwoods)—(a) Floors to be free from grease and dirt. Do not use shellac or liquid fillers under any high grade varnish or finish. Apply first, thin coat, *well brushed out,* of Martin's Amber-Lyte. Do not thin. Sandpaper with No. 0 sandpaper when dry; clean up dust.

(b) Apply second coat, well brushed out, of Martin's Amber-Lyte 15 to 30 hr. after first coat. Sand with No. 00 sandpaper; clean up dust.

(c) Apply third and last coat of Martin's Amber-Lyte as it comes from can.

Martin's Enamel

This gives a remarkably beautiful finish. It meets the exacting demands of leaders in the profession. Where economy is a very important consideration, the second coat of Martin's Enamel Undercoat may be omitted with entirely satisfactory results.

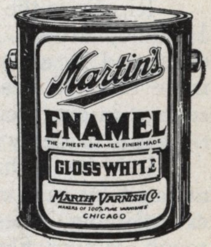
Made in white, ivory and gray; full gloss or eggshell finish.

Specifications No. 6 (Pine or Similar Woods)—(a) Apply 1 priming coat of Martin's Enamel Undercoat reduced with 1 pt. pure linseed oil per gallon of Undercoat. When dry sand with No. 00 sandpaper; dust off.

(b) Apply 1 coat Martin's Enamel Undercoat, full body as taken from can. Allow 48 hr. for drying. Sand with No. 00 sandpaper or rub with steel wool; clean up dust.

(c) Apply 1 coat Martin's Eggshell (white, gray or ivory) Enamel, full body as taken from can. Allow 48 hr. for drying. Sand with No. 00 sandpaper, or rub with steel wool; dust off.

(d) Apply 1 coat Martin's Enamel Gloss (white, gray or ivory), full body as taken from can.



MARTIN'S ENAMEL

Rubbed Finish—Martin's Enamel may be rubbed in 5 or 6 days with pumicestone and water.

Rubbed Finish Effect—If rubbed finished effect is desired without labor cost of rubbing use as fourth coat Martin's Enamel Eggshell.

Specifications No. 7 (Birch, Cherry, Maple or Other Hardwoods)—(a) Reduce first coat with 1 pt. turpentine per gallon of Undercoat and follow Specifications No. 6.

Specifications No. 8 (Plaster, Concrete, Cement, Brick or Stone)—(a) Reduce first coat with ½ pt. of pure turpentine per gallon of Undercoat and follow Specifications No. 6.

Installations

Martin Varnish Products have recently been specified for use on the following well-known buildings:

University of Vermont Memorial Medical College (all buildings), Burlington, Vt.
Midland Club, Chicago, Ill., Paul Gerhardt, Architect
Fitzsimmons General Hospital, Denver, Colo.
Alden Park Manor, Detroit, Mich., Kenneth M. deVos, Architect

RIPOLIN ENAMEL PRODUCTS

THE RIPOLIN COMPANY

HOLLAND FRANCE ENGLAND UNITED STATES CANADA

THE GLIDDEN COMPANY

NATIONAL HEADQUARTERS
CLEVELAND, OHIO

Associated with The Glidden Company and its fourteen affiliated companies to whom manufacturing and distribution rights in North America have been granted

The Heath & Milligan Mfg. Co., Chicago, Ill.
Adams and Elting Co., Chicago, Ill.
Campbell Paint & Varnish Co., St. Louis, Mo.
Campbell Paint & Varnish Co., Dallas, Tex.
The A. Wilhelm Co., Reading, Pa.
T. L. Blood & Co., St. Paul, Minn.
American Paint Works, New Orleans, La.
Twin City Varnish Co., St. Paul, Minn.
The Forest City Paint & Varnish Co., Cleveland, Ohio
Nubian Paint & Varnish Co., Chicago, Ill.
The Glidden Company of Massachusetts, Boston, Mass.
The Glidden Company of Texas, Dallas, Tex.
The Glidden Company of California, San Francisco, Cal.
The Glidden Company, Limited, Toronto, Ont., Canada

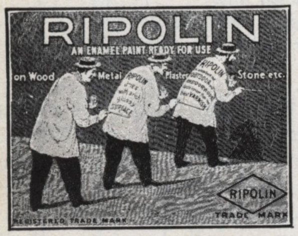
Product

Ripolin Enamels, including:

Gloss, Semi-gloss (Eggshell), Flat White and Decorative Tints including ivory, cream, pearl gray, light gray, sea green, light blue and pink; other tints are obtainable by addition of pure colors ground in japan, or will be manufactured for quantity orders.

RIPOLIN

TRADE-MARK



Another Ripolin Mark of International Fame

Trade-marks

This design is the identification mark for *genuine Ripolin Enamel.* All Europe knows this famous trade-mark. The secret process of making Ripolin was discovered in Holland thirty years ago. Since that time Ripolin has been used throughout the civilized world.

Description of Ripolin Enamel

Ripolin is the original Holland enamel, now made in Holland, France, United States and Canada. It was developed by a Dutch painter and chemist named Reip, more than 30 years ago, and since then has met with success in every civilized country.

It is made by a secret process.

It is for both exterior and interior uses and is little affected by salt water and atmospheric changes. It is easy-flowing, dries without brush marks and forms a tough, lasting film. Specifications for special conditions supplied upon request.

Scope of Use and Cost

For architectural, general, commercial, marine, railway and manufacturing purposes, where a permanent high grade, elastic enamel paint is required.

Ripolin is used largely throughout the United States in private residences, hospitals, hotels, etc.

Economical

Ripolin has much greater covering capacity than other enamels. Because of this fact and its wonderful opacity, and also owing to its easy and even flow under the brush, it is economical.

Quality B.L.T
RIPOLIN
THE RIPOLIN COMPANY

Ripolin Containers—Every Package Sealed

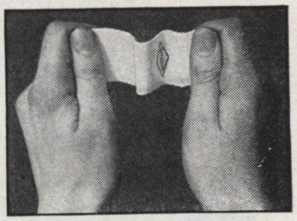
Production

Ripolin is made in America by European experts and American workmen who have been taught the European methods. It is made under the direct supervision of "Ripolin, Limited."

Specification Data and Distribution

Ripolin specifications for every conceivable purpose have been compiled in a convenient form for architects' handy reference. Copies will be gladly sent on request.

Following are specifications of most general use:



The Famous Ripolin Bending Tin Test

Specification No. 1

Specification for All Fine Grained Interior New Woodwork—(Including all fine grained woods, white pine, whitewood, bass wood, etc.)

Coat No. 1—A priming coat of Ripolin Enamel Undercoating, thinned with 1 qt. of raw linseed oil and ½ pt. of pure turpentine to the gallon.

Coat No. 2—Full coat of Ripolin Enamel Undercoating.

Coat No. 3—Full coat of Ripolin Enamel Undercoating.

Coat No. 4—Ripolin Enamel Undercoating re-enforced with 1 qt. Gloss Ripolin added to the gallon to stop suction.

Coat No. 5—A good flowing coat of Ripolin. It is allowable to thin this coat with ½ pt. of pure turpentine to the gallon.

Coat No. 6—A good flowing coat of Ripolin as it comes from the can. Do not thin finishing coat of Ripolin.

Notes: If expense is of prime importance, either coat No. 3 or Coat No. 5 (only one) may be omitted.

Care must be taken to sandpaper lightly each coat so that there will be absolutely no brush marks on the surface to which the Ripolin is to be applied. Ripolin in itself will show no brush marks, but will magnify brush marks left in the undercoats.

Continued on next page

Specification No. 2

Specification for Interior New Woodwork—(Cedar, cypress, hemlock, yellow and Georgia pine, and other heavy-grained, sappy woods; also birch and maple.)

Coat No. 1—A priming coat of Ripolin Enamel Undercoating thinned with 1½ pt. raw linseed oil and 1½ pt. pure turpentine to the gallon.

Notes: After applying coat No. 1 all woodwork should be thoroughly rubbed down with fine sandpaper or steel wool. Give the whole surface a light coat of thin white shellac which has been strained through cheesecloth.

For coats Nos. 2, 3, 4, 5 and 6 proceed as in Specification No. 1.

Specification No. 3

Specification for New or Unpainted Plaster Walls—

Coat No. 1—A sizing coat made of 3 parts of alkali proof wall size and 1 part of Ripolin Enamel Undercoating.

Coat No. 2—A full coat of 3 parts of Ripolin Enamel Undercoating and 1 part of alkali proof wall size.

For coats Nos. 3, 4, 5 and 6 proceed as in Specification No. 1.

Specification No. 4

Specification for Imitation Tile on Keene's Cement, King's Windsor or Adamant Plaster—

Any of the above plasters are especially good for this purpose. The plaster should be troweled as smoothly as possible, and while wet scored to the depth of ⅛ to $\frac{3}{16}$ in. as desired. The most popular and satisfactory size tile for this purpose has been the 6-in. square or the oblong tile, about the shape and size of building brick. These effects are sometimes attempted with plaster of paris, but we would advise against this as unsatisfactory, owing to the extreme brittleness of plaster of paris and its tendency to crack easily.

Notes: First wash the walls with weak vinegar or zinc sulphate to neutralize all free alkali present. Thoroughly dry before painting.

Coat No. 1—A coat of Ripolin Enamel Undercoating, thinned with 1 qt. linseed oil and 1 pt. turpentine to the gallon.

Coat No. 2—One coat of Flat Ripolin to be applied as it comes from the can.

Coat No. 3—One coat of Gloss Ripolin which may be thinned with 1 qt. of turpentine to the gallon.

Coat No. 4—A good flowing coat of Gloss Ripolin as it comes from the can. The joints should be lined up with Flat Ripolin to give a cement effect.

The above method in bathrooms is more economical than tile and its resemblance to tile is most striking.

Specification No. 5

Specification for Concrete or Portland Cement—

Owing to the excess of free alkali and occasionally certain chemical conditions created by the process of manufacture of portland cement or concrete under various formulas, difficulty has been experienced in obtaining paints to adhere firmly to these surfaces.

The concrete or cement must be thoroughly dry. All new concrete should be washed with a 30% zinc sulphate solution.

Coat No. 1—Stucolor cement coating which may be thinned with about a quart of turpentine to the gallon.

Coat No. 2—The same approved cement coating.

Coat No. 3—A good full coat of Ripolin of the luster desired as taken from the can.

Notes: On a very rough laid cement an extra coat may be required to thoroughly cover the color of the surface, this being Ripolin Enamel Undercoating.

For much exposed surfaces it is well to add one more coat of Ripolin as it comes from the can. In case two coats of enamel seem necessary it is well to make the first coat Semi-gloss Ripolin, the finish coat to be of the luster desired.

Specification No. 6

Specification for Galvanized Iron Interior or Exterior—

Priming coats of lead should never be used on galvanized iron under Ripolin.

Wash surface with 10% solution of acetic acid; all trace of acid should be removed before painting.

Coat No. 1—Add 1 qt. of turpentine to a gallon of Gloss Ripolin. Apply a thin coat well brushed out. Allow this to dry at least 24 hours.

Coat No. 2—Semi-gloss Ripolin as it comes from the can.

Coat No. 3—A full coat of Ripolin of the luster desired as it comes out of the can.

For all exterior work the final coat should always be Gloss Ripolin as it is more weather resistant than the lesser degrees of gloss.

Specification No. 7

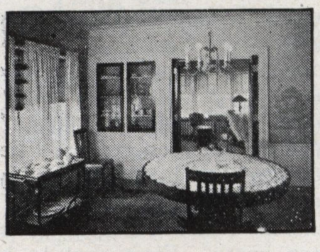
Specification for Exterior or Interior Iron Work—

See that the surface of the iron is thoroughly clean and free from rust, grease and dirt.

Coat No. 1—Gloss Ripolin thinned with 3 pt. of turpentine to the gallon. This is used in this way to bond perfectly to the metal.

Coat No. 2—Semi-gloss Ripolin as it comes from the can.

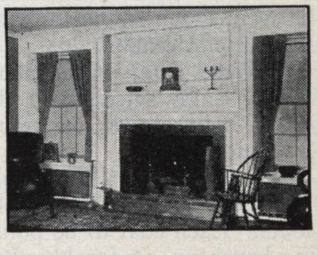
Coat No. 3—Good full coat of Ripolin of the luster desired as taken from the can.



Dining Room Finished in Ripolin

Quality BLT
RIPOLIN
Registered Trade Mark
No. 1 Gloss White
1 Gall.
FRANCE ~ HOLLAND ~ U.S.A.
THE RIPOLIN COMPANY
PARIS ~ LONDON ~ AMSTERDAM ~ CLEVELAND

Typical Ripolin Package



A Ripolin Finished Living Room

S. C. JOHNSON & SON

Manufacturers of Wood Finishes

RACINE, WIS.

FACTORIES: RACINE, WIS.; BRANTFORD, CANADA; WEST DRAYTON, MIDDLESEX, ENGLAND; SYDNEY, AUSTRALIA

BRANCHES

CLEVELAND, OHIO, 7106 Superior Avenue
DENVER, COLO., 1846 Arapahoe Street
DES MOINES, IOWA, 1435 W. 29th Street
DETROIT, MICH., 3155 Grand River Avenue
KANSAS CITY, MO., 611 Delaware Street
LOS ANGELES, CAL., 1151 Santee Street
LOUISVILLE, KY., 623 W. Market Street
MILWAUKEE, WIS., 864 Third Street
NEW ORLEANS, LA., 508 Magazine Street
NEW YORK, N. Y., 46-48 Lispenard Street
OMAHA, NEB., 1407 Harney Street
PHILADELPHIA, PA., 410-412 Commerce St.
SAN FRANCISCO, CAL., 1250 Folsom Street
ST. LOUIS, MO., 2116 Locust Street
ST. PAUL, MINN., 1930 St. Anthony Avenue

Products

JOHNSON'S ARTISTIC INTERIOR FINISHES, including:

- Perfectone Undercoat
- Perfectone Enamel
- Glo-Coat Enamel
- Wood Dyes (Penetrating)
- Oil Stain
- Spirit Stain
- Prepared Polishing Wax (Paste and Liquid)
- Johnson's Wax Electric Floor Polisher
- Paste Wood Filler
- Permacote Wall Finish
- Flat Varnish
- Floor Varnish
- Interior Trim Varnish
- Finishing Varnish
- Sani-Spar Varnish
- Sani-Spar Varnish Stain
- Electric Solvo Varnish Remover

Slogan

"The Wood Finishing Authorities"

Scope and General Information

S. C. JOHNSON & SON, "The Wood Finishing Authorities," have been in business at Racine, Wis., for nearly 50 years. They manufacture all their own products in one of the finest plants in the world equipped with most up-to-date mills and machinery and under the strictest laboratory supervision.

S. C. JOHNSON & SON do not manufacture paint—they specialize on highest quality interior finishes. Every Johnson product is right when it goes into the package, absolute uniformity is assured, there is no deterioration.

S. C. JOHNSON & SON, beginning as manufacturers of hardwood flooring, have developed logically to the outstanding wood finishing authoritiy among American manufacturers. Johnson products, for instance, are the standard in nine-tenths of American schools where Manual Training and Vocational Education are taught.

S. C. JOHNSON & SON maintain a Service Department on Wood Finishing Problems which is utilized by the most particular manufacturers, builders and educational institutions in the country; available without charge to any individual. Johnson's specifications are regarded as standard for high grade construction.

Of especial interest to builders is the new Johnson's Wax Electric Floor Polisher, a general utility machine for polishing all floors—the only small, efficient, easily handled, floor machine available for the average job, large or small, at a low cost.

Specifications for Finishing Hardwood and Softwood Floors

For a Wax or Varnish Finish on Oak, Chestnut, Ash, Mahogany, and Other Open Grain Woods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler so as to render them unnoticeable.

First Coat—One coat of Johnson's Paste Wood Filler—color selected by client—on bare wood. Wipe off with burlap or excelsior across the grain and allow 24 hours to dry.

Second and Third Coats—Two coats of Johnson's Prepared Wax. Allow 1 hour for hardening between coats. Each coat to be polished with a weighted polishing brush or, preferably, Johnson's Wax Electric Floor Polisher.

Or—Two coats of Johnson's Floor Varnish, allowing 24 hours between coats. Sandpaper first coat with No. 00 sandpaper.

Note: We do not recommend shellac or shellac substitute on floors where a spirit or oil dye is not used.

For Stained Effects on Oak, Chestnut, Ash, Mahogany and Other Open Grain Woods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler so as to render them unnoticeable.

First Coat—One coat of Johnson's Wood Dye, shade to be selected by client.

Second Coat—One coat of Johnson's Paste Wood Filler—color selected by client—on bare wood. Wipe off with burlap across grain and allow 24 hours to dry.

Third Coat—One thin coat of Johnson's Under-Lac or pure shellac. Sandpaper very lightly with No. 00 sandpaper.

Fourth and Fifth Coats—Two coats of Johnson's Prepared Wax, allowing an hour between coats. Each coat to be polished with weighted brush or, preferably, Johnson's Wax Electric Floor Polisher.

Or—Two coats of Johnson's Floor Varnish, allowing 24 hours to dry between coats. First coat to be sanded before applying subsequent coat.

For a Natural Wax or Varnish Finish on Maple, Birch, Georgia Pine, Oregon Pine, Gum Wood, Poplar, Redwood, and Other Close Grain Hardwoods and Softwoods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes and other defects shall be treated with Johnson's Crack Filler so as to render them unnoticeable.

First and Second Coats—Two coats of Johnson's Prepared Wax, allowing an hour between coats. Each coat to be polished with weighted brush or, preferably, Johnson's Wax Electric Floor Polisher.

Or—Two coats of Johnson's Floor Varnish allowing 24 hours to dry between coats. First coat to be sanded before applying subsequent coat.

For a Stained Effect Wax or Varnish Finish on Maple, Birch, and Other Close Grain Hardwoods and Softwoods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler so as to render them unnoticeable.

First Coat—One coat of Johnson's Wood Dye, shade to be selected by client.

Second Coat—One coat of Johnson's Under-Lac, sanded and dusted.

Third and Fourth Coats—Two coats of Johnson's Prepared Wax, allowing an hour between coats. Each coat to be polished with weighted brush or, preferably, Johnson's Wax Electric Floor Polisher.

Or—Two coats of Johnson's Floor Varnish, allowing 24 hours to dry between coats. First coat to be sanded before applying subsequent coat.

Continued on next page

Specifications for Finishing New Woodwork

For a Natural Finish on Oak, Chestnut, Ash, Mahogany and Other Open Grain Woods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler so as to render them unnoticeable.

First Coat—One coat of Johnson's Natural Paste Wood Filler No. 10. As soon as filler begins to lose gloss and before it hardens wipe off across the grain with burlap or excelsior to remove excess. Allow 24 hours to dry before applying succeeding coat. Johnson's Paste Wood Filler also made in Mahogany, Golden Oak, Dark Oak and Antwerp.

Second and Third Coats—Two coats Johnson's Prepared Wax; allowing an hour or more between coats. Each coat to be polished with soft rag or Johnson's Polishing Mitt.

Or—Two coats of Johnson's Sani-Spar allowing 24 hours between coats. First coat to be sanded with No. 00 sandpaper.

Or—Two coats of Johnson's Floor Varnish allowing 24 hours between coats. First coat to be sanded with No. 00 sandpaper.

Or—One coat of Johnson's Floor Varnish and one coat of Johnson's Flat Varnish if dull finish is desired. First coat to be sanded before applying subsequent coat.

Note: If a rubbed finish is desired over Johnson's Sani-Spar or Floor Varnishes use pumicestone and oil or pumicestone and water, allowing 48 to 72 hours for last coat to dry.

For a Natural Finish on Softwoods and Close Grain Hardwood on Maple, Birch, Beech, Pine, Oregon Pine, Gum Wood—

Preparation—Have the surface dry, sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler.

First and Second Coats—Two coats of Johnson's Sani-Spar or Floor Varnish on the bare wood, allowing at least 24 hours between coats. First coat to be sandpapered with No. 00 sandpaper before applying subsequent coat. (May be rubbed if desired.)

Or—One coat of Johnson's Sani-Spar Varnish and one coat of Johnson's Prepared Wax. Wax coat to be polished with soft rag or Johnson's Polishing Mitt.

Or—One coat of Johnson's Floor Varnish and one coat of Johnson's Flat Varnish if a dull finish is desired. First coat to be sanded with No. 00 sandpaper before applying subsequent coat.

For Stained Effects on Open Grain Woods—

Preparation—Have the surface sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler.

First Coat—One coat of Johnson's Wood Dye, shade to be selected by client. Allow 12 hours to dry.

Second Coat—One coat of Johnson's Paste Wood Filler to match the stain. Wipe off across grain with burlap or excelsior to remove excess filler and allow 24 hours to dry.

Third Coat—One coat of Johnson's Under-Lac or pure shellac. Sandpaper lightly with No. 00 sandpaper.

Fourth and Fifth Coats—Two coats of Johnson's Prepared Wax, allowing an hour or more between coats. Each coat to be polished with soft rag or Johnson's Polishing Mitt.

Or—Two coats of Johnson's Sani-Spar Varnish or Johnson's Floor Varnish. Sand first coat with No. 00 sandpaper and allow 24 hours to dry. May be rubbed if desired.

Or—One coat of Johnson's Flat Varnish for a dull finish.

For Stained Effects on Close Grain Hard and Soft Woods—

Preparation—Have the surface dry, sanded smooth and thoroughly dusted. All nailholes, and other defects shall be treated with Johnson's Crack Filler.

First Coat—One coat of Johnson's Wood Dye, shade to be selected by client.

Second Coat—One coat Johnson's Under-Lac or pure shellac. Sand lightly with No. 00 sandpaper.

Third Coat—One coat of Johnson's Prepared Wax. Allow to dry 10 minutes and polish with soft rag or Johnson's Polishing Mitt.

Or—One coat Johnson's Flat Varnish for a rubbed finish.

Or—One coat Johnson's Sani-Spar Varnish or Floor Varnish clear. May be rubbed if desired.

For Interior Enamel Finish on Woodwork, Kitchens, Pantries and Bathrooms—

Preparation—Before any finish is applied have surface sanded smooth and thoroughly dusted.

Priming Coat—One coat of Johnson's Perfectone Undercoat—thinned with 1 pint raw linseed oil, ½ pint pure spirits of turpentine and 3 ounces white japan drier to 1 gallon of Undercoat. Brush out well and allow 24 to 36 hours for drying. Sand with No. 00 paper. All nailholes and other defects to be puttied with lead and whiting putty. A light coat of white shellac should be applied on knots and all pitchy wood. Sand with No. 00 sandpaper and dust.

Second or Body Coat—One coat of Johnson's Perfectone Undercoat as comes in the can. If necessary to reduce, use pure spirits turpentine *only*. Apply freely, *flowing* it on, and allow 24 to 36 hours for drying. Sand with No. 00 paper. Dust and apply—

First Enamel Coat—One coat of Johnson's Perfectone Enamel Gloss or Perfectone Enamel Satine, or Johnson's Glo-coat Enamel. A flowing coat which has been reduced with ½ pint pure turpentine to the gallon. Allow this coat 4 or 5 days to harden. Sand lightly with No. 00 paper. Dust carefully and apply—

Finish Enamel Coat—Johnson's Perfectone Enamel or Johnson's Glo-Coat Enamel. A flowing coat as it comes in the can. Last may be rubbed with pumice and water if desired.

Note: Care should be taken that building be well heated when applying material.

For Walls—Johnson's Permacote—

Preparation—Remove all old finish, sand, and dust off. Fill all cracks with heavy paste made from equal parts of Permacote and plaster of paris.

First Coat—Johnson's Permacote (tinted to suit taste of client) reduced equal parts with Johnson's Wall Size or reduced with ½ gallon of pure boiled linseed oil to 1 gallon Johnson's Permacote. Allow 24 hours for drying. If suction or "hot spots" show through, touch up with above mixture.

Second and Third Coats—Apply Johnson's Permacote as it comes in the can (tinted to suit the taste of client). If thinning is necessary, use pure gum turpentine, not more than 1 pint to a gallon. May be stippled if desired.

Price List

Tell your painting contractor to write for our special net price list.

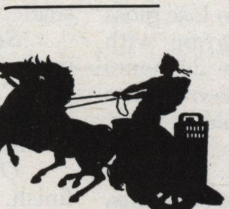
MURPHY VARNISH COMPANY

Chestnut and McWhorter Streets
NEWARK, N. J.

553-555 Mission Street
SAN FRANCISCO, CAL.

50 West 22nd Street
CHICAGO, ILL.

305 Manufacturers Street
MONTREAL, QUE.



TRADE SYMBOL

Products

- Murphy Transparent Interior Varnish.
- Murphy Nogloss Interior Varnish.
- Murphy Semi-gloss Interior Varnish.
- Murphy Transparent Floor Varnish.
- Murphy Velvet Floor Varnish.
- Murphy Transparent Spar Varnish.
- Murphy Univernish.
- Murphy Muronic White, Gray and Ivory Enamels.
- Murphy Muronic Semi-gloss Enamel.
- Murphy Muronic Enamel Undercoating.
- Murphy Penetrating Oil Stains.
- Murphy Konkreto.

Scope

The Murphy Varnish Company has been in existence 61 years.

Most of the railways, the manufacturers of fine furniture, pianos, automobiles, and the other large consumers who are experts in the use of varnish are supplied by this company. Many of the finest buildings, public and private, are finished with its materials.

Where Murphy Materials Can Be Obtained

Murphy finishing materials are for sale by dealers and jobbers everywhere; but if not easily obtainable in any locality, they will be shipped direct from the factory for any architectural work.

Architectural Varnishes

The varnishes and enamels described herein are those which time and experience have proved best for fine architectural work.

Murphy Transparent Interior Varnish

A fine transparent, lustrous varnish which brings out the grain of the wood, flows freely, covers a great deal of surface, rubs easily, and keeps its full beauty for many years. Used extensively in fine residences, hotels, public buildings, office buildings and wherever fine woodwork needs to be beautified, protected and made sanitary.

Murphy Nogloss Interior Varnish

This varnish, used for the final coat over Murphy Transparent Interior, gives a rubbed effect without the labor of rubbing. Beautifully shows the grain of the wood. Can be used alone by applying the proper number of coats.

Murphy Semi-gloss Interior Varnish

As the name implies, this varnish is half way between the Nogloss rubbed effect and the Transparent Interior (unrubbed) and gives a slightly rubbed appearance.

Murphy Transparent Floor Varnish

A fine free flowing varnish that rubs easily, producing a very smooth, beautiful surface. Does not flake off; is not affected by reasonable exposure to moisture, air, or water.

It can be covered year after year with a new coat, whenever required, without removing the original coat. Stands the wear of passing feet; is not affected by heavy furniture rolled over it, and is, besides, the most enduring of floor varnishes.

Used in thousands of fine homes, hotels, office buildings, etc.

Murphy Velvet Floor Finish

For final coats only over Transparent Floor Varnish when a semi-gloss finish is desired. Has the effect of wax without the slipperiness, and requires no rubbing.

Murphy Transparent Spar Varnish

A fine durable outdoor varnish for all outside work except floors.

It is moistureproof, endures heat and cold, and resists grit and smut as long as any varnish possibly can. It lasts a long time and remains attractive as long as it lasts.

Murphy Univernish

A varnish for many uses—for inside and outside work and for floors. Proof against hot or cold water, steam, hot dishes, alkali, alcohol, ammonia, etc. Nothing turns it white. For these reasons, it is a particularly good varnish for kitchen sinks, bathrooms and all places which are unduly exposed to rough use.

While the name suggests its all-round use where these qualities are desired, it is not, and no one varnish can be, the best varnish for every technical purpose. Univernish does, however, approximate the good qualities of many fine varnishes and may be relied upon for elegant finish and durability.

Murphy Univernish stands the extremes of weather wonderfully, does not thicken in the can, nor clog the painter's brush; it works easily and flows out smooth. Do not apply Univernish over shellac or liquid fillers.

Murphy Muronic White Enamel

A pure white enamel of the finest grade and long life. Designed for use either indoors or outdoors—dries hard for indoors and wears wonderfully well for outdoors. Much quicker drying than our old style "Murphy White Enamel"—dries out of danger overnight. Can be tinted, of course.

Murphy Muronic Enamels, Gray and Ivory

Of the same grade as Muronic White Enamel.

Continued on next page

Murphy Muronic Semi-gloss Enamel

As a final coat over Murphy Muronic White Enamel, it produces a beautiful semi-gloss effect without the expense of rubbing. Also furnished in gray and ivory where desired.

Murphy Muronic Enamel Undercoating

Dense covering, flat drying. Is used for foundation coats for Murphy Muronic White Enamel. Much more suitable for this work than lead-and-oil.

If colored enamel surface is wanted, the second and succeeding coats should be colored to match the enamel.

Murphy Konkreto

For the sanitary treatment of concrete or cement floors, walls, or ceilings. Gives smooth surface. Prevents them from wearing, dusting and getting mouldy. Makes them as easy to clean and keep clean as tiling.

Murphy Penetrating Oil Stains

A quality line of stains—sample panels supplied to any architect.

Specification Guide for Varnish and Enamel

Below is a convenient reference guide to specifications for varnish and enamel. A book of specifications covering the entire subject will be sent to any architect who desires it.

It is urged that not only the maker be named, but the particular kind of varnish desired. It is not sufficient, for example, to say "Murphy Varnish." Many grades are made, each one the best for its special purpose, but no one the best for every purpose.

The use of the phrase "or equal" in any specification often results in the use of inferior varnish. The client's interest, the architect's interest, and each bidder's interest will be better served by specifying directly what is wanted, whether it is Murphy Varnish or some other make.

Specifications for Wood Finishing

Interior Work—*Mahogany, Oak, White Mahogany, Walnut, Ash, Butternut and all Open Grained Woods*—To be properly filled with Murphy Varnish Company's Paste Filler, care being taken to have filler match the natural color of the wood or the color desired by owner or architect; to receive 1 coat of shellac (except on floors, and in bathrooms and laundries) and 3 coats of Murphy Transparent Interior Varnish or Univernish. Shellac coat, and first and second coats of varnish to be sandpapered with 00 sandpaper; the third coat of varnish to be carefully rubbed with pumicestone and water to a dead and even surface (finisher to use rubbing felt), then oiled and thoroughly wiped, where necessary. Where gloss finish is desired, omit rubbing on final coat.

Pine, Maple, Cypress, Whitewood, Cherry, Birch, Sycamore, Beech, Holly and all Close Grained Woods—To be finished same as above, except that the filler be omitted.

For a Dull Finish, Without Rubbing—Wood to be brought up same as above, except that 1 coat of Murphy Nogloss Interior is to be used in place of the final coat of Murphy Transparent Interior Varnish or Univernish.

For a Semi-gloss Finish, Without Rubbing—Wood to be brought up same as above, except that 1 coat of Murphy Semi-gloss Interior is to be used in place of the final coat of Murphy Transparent Interior or Univernish.

Floors and Bathrooms—All open grained, hardwood floors and bathrooms to be properly filled with Murphy Varnish Company's Paste Filler, and receive 3 coats of Murphy Transparent Floor Varnish or Univernish, the last coat to be rubbed lightly with oil and pumicestone. Thin the first coat with turpentine in the proportion of 1 pt. to 1 gal. of varnish. Pine, maple, cherry and all other close grained woods, used for floors, to be finished precisely as above, except that filler is to be omitted.

For a Dull Floor Finish Without Rubbing—Floors to be treated as above, except that 1 coat of Murphy Velvet Floor Varnish is to be used in place of the final coat of Murphy Transparent Floor Varnish or Univernish.

Enamel Work—*Treatment of White Enamel Work*—First, give the wood a thin coat of shellac, lightly sandpaper when dry, and follow with 3 coats of Murphy Muronic White Enamel Undercoating and 2 coats of Murphy Muronic White Enamel, the last coat to be rubbed down to a fine surface with either pumicestone and water, or rottenstone and water. Omit rubbing on final coat, if gloss finish is desired. (Muronic Enamel is also supplied in gray and ivory.) If a special color is wanted, tint with Murphy Varnish Company's Japan Color.

For a Semi-gloss White Enamel Effect Without Rubbing—Treat work as above except that 1 coat of Murphy Muronic Semi-gloss Enamel is to be used instead of the final coat of Murphy Muronic Enamel.

Exterior Work—The surface of all woods must be sandpapered smoothly and properly cleaned before finishing. No shellac to be used on outside work, inside sash, window sills, floors or other surfaces exposed to great dampness. Use 3 coats of Murphy Transparent Spar Varnish or Univernish for all the above work. The first coat to be applied directly on the wood, if it is close grained, or, after the wood is filled, on open grained wood.

Note: On all inside work, care must be taken to have premises properly heated and free from dampness to secure best possible finish.

For outside work a dry warm windless day is essential for best work.

Free Educational Murphy Books

Eight Periods and Their Modern Adaptation. A careful treatise, beautifully illustrated, on decorative periods. Includes specifications for securing period finishes.

Spanish Interiors. Supplementary to our book Eight Periods.

Specifications for Wood Finishing.

Architectural Varnishes and Enamels. Pocket edition, alike helpful to architects, painters and owners.

Beautiful Floors and How to Care for Them.

Murphy Univernish—the universal varnish.

Murphy Muronic Enamels, Color Card.

The Charm of Simplicity. Leaflet on the beauty of white enamel finish for interiors.

O'BRIEN VARNISH COMPANY

Manufacturers of Varnishes, Wall Finishes, Enamels, Stains, Fillers

GENERAL OFFICES AND FACTORY

SOUTH BEND, IND.

BRANCH OFFICES

CHICAGO, ILL., 2140 Clybourn Avenue
DETROIT, MICH., 28 E. Larned Street
NEW YORK, N. Y., 130 W. 42nd Street
PITTSBURGH, PA., Saybrook Apartments, Craft Avenue
MILWAUKEE, WIS., 658 Third Street
MINNEAPOLIS, MINN., 210 Third Avenue
ATLANTA, GA., 8 Courtland Street

Quality

O'Brien products have been on the market for nearly fifty years, and the fact that each succeeding year finds them in more general use bears silent testimony to their quality and durability. O'Brien products are made on a quality basis with cost considered as of secondary importance. The architect can, therefore, specify their use with complete assurance of giving his client the maximum in beauty and durability.

TRADE-MARK

Service to the Architect

The O'Brien Varnish Company is anxious to co-operate with the architect in the solution of his painting and decorating problems. With this aim in view, an Architects' Service Department is maintained, the services of which are always at the disposal of the architect who feels a need for service of this kind. Specimen panels, descriptive literature and special information on any subject will be gladly submitted on request.

Liquid Velvet—the Washable Wall Enamel

Liquid Velvet is a high grade, *oil base* flat wall *enamel,* and should not be confused with water colors, kalsomine, or other wall finishes of a like nature. Liquid Velvet is thoroughly waterproof, permitting surfaces finished with it to be washed many times without danger of having them crack, chip, peel or fade. This, together with its unusual covering capacity and extreme durability, makes it the most economical finish possible for the decoration of the walls and ceilings of residences, hotels, hospitals, schools, churches, theaters, office buildings and similar institutions.

Velva Size—Prevents Spotting, Suction, Burning and Bleaching

Velva Size provides a perfectly neutral sizing coat for new or old plaster walls, and positively prevents spotting, suction, bleaching and burning. This material is made especially for use as a sizing coat in connection with the application of Liquid Velvet. It forms a perfectly non-porous film which thoroughly seals the surface, and one which penetrates the plaster to a depth sufficient to insure proper adherence of the subsequent coats. The use of Velva Size in connection with Liquid Velvet will eliminate the difficulties so frequently experienced in the finishing of walls and ceilings.

Specifications—for Interior Plaster Surfaces

Condition—All walls and ceilings must be thoroughly dry, in good condition, and properly prepared before the painting is started.

Preparation—Repair all cracks and damaged surfaces in an approved manner.

First Coat—To be composed of equal parts of O'Brien's Velva-Size and No. .... Liquid Velvet. Allow at least 24 hours for drying before second coat is applied.

Second Coat—Use exactly the same mixture specified for the first coat, allowing 24 hours for drying.

Third Coat—No. .... Liquid Velvet, as it comes from the can.

Flexico White Enamel—for All White Enamel Work

Flexico is a pure, lily-white, white enamel of the very highest type, intended for both inside and outside work wherever a glistening finish of snowy whiteness is desired.

Flexico is thoroughly waterproof and is in no way affected by the use of strong soaps and cleaning compounds. It is unusually elastic and will not check or crack. It is made from carefully selected materials which entirely eliminate the possibility of its ever turning yellow.

All of these characteristics make it particularly well adapted to use in public buildings.

O'Brien's Undercoat for White Enamel

This material is ground very finely, and is a much better undercoating for white enamel than either lead and oil or flat wall enamel.

This material is pure white in color and dries perfectly smooth, providing a surface over which white enamel will stand out in its full gloss and luster.

Specifications—for White Enamel Work

Preparation—All surfaces must be prepared in an approved manner, be perfectly dry and in good condition.

Filling—Fill all nailholes and depressions with putty to match the woodwork. When dry, sandpaper to a perfectly smooth surface.

Undercoat—Apply (specify two or three) coats of O'Brien's Undercoat for White Enamel, allowing sufficient time between coats for drying. Sandpaper each coat lightly, when dry.

Enamel—Apply (specify two or three) coats of O'Brien's Flexico White Enamel, allowing 3 days between coats for drying. Sandpaper each coat lightly before next coat is applied.

Tinting—Where tinted effects are desired in a gloss

Continued on next page

enamel finish, tint Flexico White Enamel with pure oil colors to match finishes selected and approved by the architect.

Eggshell Finish—If an eggshell finish is desired, apply Flexico Eggshell Enamel instead of Flexico White Enamel.

Master Varnish—for Every Surface, Inside and Outside

MASTER VARNISH is unusually well adapted to use on floors, mop boards, woodwork, etc., in hotels, hospitals, public buildings and institutions of a similar nature, because it stands a remarkable hot and cold water test and is in no way affected by the chemical action of the free alkali contained in the soaps and cleaning compounds used to wash varnished surfaces.

MASTER VARNISH can be used on any surface—inside or outside—because it stands *every* test that any other varnish will and wears considerably longer. The more severe the test, the better satisfied your clients will be with MASTER VARNISH.

Specifications—for All Stained and Varnished Surfaces

CLOSE GRAIN WOODS

Stained Effects—*Stain* with O'Brien's No. —— Pyramid Paste Oil Stain; to be wiped off before drying. When dry, fill all nailholes, etc., and apply the

First coat of O'Brien's MASTER VARNISH, thinned 10% with turpentine. When dry, sandpaper lightly and apply the

Second coat of MASTER VARNISH as it comes from the can. Allow to dry, sand lightly, and apply the

Third coat of MASTER VARNISH as it comes from the can.

Natural Effects—*Fill* all nailholes to match the natural color of the wood and apply the

First coat of O'Brien's MASTER VARNISH, thinned 10% with turpentine. When dry, sandpaper lightly, and apply the

Second coat of MASTER VARNISH as it comes from the can. Allow to dry, sandpaper lightly, and apply the

Third coat of MASTER VARNISH as it comes from the can.

OPEN GRAIN WOODS

Stained Effects—*Stain* with O'Brien's No. —— Pyramid Paste Oil Stain; to be wiped off before drying. When dry, fill all nailholes to match the stain and

Fill with O'Brien's No. —— Pyramid Stained Paste Filler; to be wiped off across grain with burlap or excelsior. When dry, sandpaper lightly, dust carefully, and apply the

First coat of O'Brien's MASTER VARNISH, thinning 10% with turpentine. When dry, sandpaper lightly and apply the

Second coat of MASTER VARNISH as it comes from the can. Allow to dry, sandpaper lightly, and apply the

Third coat of MASTER VARNISH, as it comes from the can.

Natural Effects—*Fill* all nailholes to match the natural color of the wood and

Fill with O'Brien's Pyramid Paste Filler, Natural; to be wiped across grain with burlap or excelsior. When dry, sandpaper lightly, dust carefully, and apply the

First coat of O'Brien's MASTER VARNISH, thinned 10% with turpentine. Allow to dry, sandpaper lightly, and apply the

Second coat of MASTER VARNISH as it comes from the can. When dry, sandpaper lightly and apply the

Third coat of MASTER VARNISH as it comes from the can.

FINISH COAT

Eggshell Finish—Allow the final coat of MASTER VARNISH to dry for 3 days. Rub carefully with pumicestone in oil, just enough to kill the gloss and produce an eggshell finish.

Rubbed Finish—Allow the final coat of MASTER VARNISH to dry for 3 days. Rub carefully with pumicestone and water, cleaning the surface carefully after rubbing is completed.

Polished Finish—Allow the final coat of MASTER VARNISH to dry for 3 days. Rub surface carefully with pumicestone and water. Clean carefully and polish with rottenstone and oil.

Pyramid Paste Oil Stain

Pyramid Oil Stains are made in paste form, which permits the use of an increased amount of actual coloring matter. Consequently, the finishes they produce are clearer in tone and have a greater depth of beauty.

Pyramid Stains are made of the very best of raw materials, are non-fading and are practically permanent. Being ground in oil, they do not raise the grain of the wood, thereby eliminating sandpapering, which is usually necessary where water, spirit or acid stains are used.

Specifications covering the use of Pyramid Paste Oil Stains will be found in the preceding specifications under the heading of MASTER VARNISH.

Velvet Blends—for Producing Mottled or "Tiffany" Wall Finishes

Through the use of this system, any decorator can secure a perfectly uniform mottled effect. "Tiffany" finishes are particularly well adapted to use in residences, theaters, hotels, schools, office buildings and similar institutions where the plain colors of flat wall enamel do not quite answer the purpose.

Velvet Blends have been used in many of the finest buildings erected during the past year or so, and are recommended for the very highest class of work, where a variety of decorative effects is wanted.

Specifications—for Mottled Effects on Interior Plaster Surfaces

Condition—All surfaces must be thoroughly dry, in good condition, and properly prepared before painting is started.

Preparation—Repair all cracks and damaged surfaces in an approved manner.

First Coat—To be composed of equal parts of O'Brien's Velva-Size and No. —— LIQUID VELVET. Allow 24 hours for drying.

Second Coat—To be composed of one part of O'Brien's Velva-Size to each four parts of No. —— LIQUID VELVET. Allow to dry thoroughly and apply the

Third Coat—Velvet Blend ———, mottled. Allow to dry for 24 hours and apply

Fourth Coat (If Three-tone Effect Is Desired)—Velvet Blend ———, mottled.

PRATT & LAMBERT-INC.

Varnish Makers

73-97 Tonawanda Street, BUFFALO, N. Y.

393-407 Freeman Avenue
LONG ISLAND CITY, N. Y.

320-338 West 26th Street
CHICAGO, ILL.

54 Courtwright Street
BRIDGEBURG, ONTARIO

Products

- "38" Preservative Varnish.
- Fullcote Interior Varnish.
- Dulkote.
- Tonetic Flat Varnish.
- "61" Floor Varnish.
- "61" Floor Varnish, Dull Finish.
- Spar Finishing Varnish.
- Filtex.

Products (Cont.)

- Acid Stains.
- Oil Stains.
- Paste Fillers.
- Vitralite, the Long-life Enamel.
- Vitralite Enamel Undercoating.
- Vitralite Cement Coating.
- Lyt-all.
- Expedite, Paint and Varnish Remover.

Experience

In the following specifications this company has embodied the fruits of over 75 years' experience in studying wood finishing conditions and in working out materials and methods which best fulfill requirements. The attainment of success is evident from the use of Pratt & Lambert Varnish Products in finishing some of the world's best known buildings.

Co-operative Service

Sample panels showing standard effects obtainable with Pratt & Lambert stains, fillers and varnishes will be sent on request. If some distinctive finish is required, specify the wood to be used and the general color desired, and the architect's ideas will be carried out on specially made up sample panels. Should information be desired on any wood finishing problem, the opportunity to be of service would be welcomed. Address letters to the Architectural Service Departments, special departments in the Pratt & Lambert organization devoted entirely to the interests of architects.

Specification Book

Most wood finishing problems are solved in the Pratt & Lambert Specification Book, which gives complete specifications for every kind of finish, and contains thorough, reliable treatises which cover the entire field of wood finishing. A request to the Architectural Service Department at the nearest office will bring it gratis.

"38" Preservative Varnish

This varnish is the ideal finish for all high grade work except floors. It brings out the natural beauty of the wood and, as its name implies, preserves it indefinitely. This varnish is not affected by hot or cold water, will not crack, blister, nor turn white. It has a fine natural gloss, which may be rubbed to a dull finish or polished.

Fullcote Interior Varnish

This is an unusually full-bodied varnish for general interior use, except floors, and is recommended in place of "38" Preservative Varnish when first cost must be considered. It is light in color, free-flowing, and dries quickly with a good luster. Fullcote Interior Varnish may be rubbed to a dull finish.

Dulkote

This varnish is an improved form of dull-drying varnish for interior trim. Under no circumstances will any of the ingredients settle. It contains no wax or pigment, and dries with a beautiful, velvety eggshell or dull surface, resulting in a tough, waterproof finish. It is not recommended for exterior work.

Tonetic Flat Varnish

As the name indicates, this varnish dries perfectly flat. It is recommended for hard and soft woods and gives the architect, decorator and painter the greatest latitude in producing those much desired period effects, such as Jacobean, Elizabethan and Italian, now so greatly admired. For interior use only.

"61" Floor Varnish

The only floor varnish made by this company, and considered the most durable finish made for the purpose. "61" is marproof, heelproof and waterproof.

"61" Floor Varnish, Dull Finish

This varnish is especially designed to provide a dull finish on floors without the labor and expense of rubbing, or the use of the troublesome and unsatisfactory wax finish. Unlike ordinary dull varnishes, "61" Dull possesses the same degree of durability as does "61" Gloss. It is also water resistant.

Spar Finishing Varnish

A weather resisting varnish for exterior work, such as front doors, store fronts, vestibules, porch ceilings and all other woodwork subject to moisture or exposed to the weather. Made especially, as the name indicates, for the spars of yachts, it is the most perfect and lasting type of varnish for all exterior architectural work.

Acid Stains

The ideal stains for all hard close- and open-grain woods, as they in no way cloud or hide the grain of the wood. However, they are not suitable for soft woods, as they raise the grain of such woods, making it difficult to get a smooth varnish surface. Made in the following colors:

Old Oak
Silver Gray
Early English
Dark Mahogany
Antique Mahogany

Oil Stains

These non-fading oil stains give best results on the soft, close-grain woods, but may also be used on hard close- and open-grain woods. They do not raise the grain, are easily applied, will not fade, and are always uniform. They are made in the following colors:

Light Oak
Dark Oak
Walnut
Golden Oak
Rosewood
Weathered Oak
Forest Green
Brown Mahogany
Dark Mahogany
Extra Dark Mahogany

Paste Fillers

Used for filling open-grain woods to give a smooth foundation over which to apply varnish and to impart the desired color either alone or in conjunction with Acid or Oil Stains. Made from finely ground silex, they adhere to the wood and do not crumble, powder or perish. The colors are permanent. Paste Fillers are made in the following colors:

Light or Natural Oak
Dark or Antique Oak
Golden Oak
Fumed
Mahogany

Filtex

A practical first coater which is elastic and durable, making it adaptable for a wide variety of uses. It produces a smooth, impervious coating which prevents suction and holds out the finishing coats to an unusual degree.

Vitralite, the Long-Life Enamel

The enamel that lasts longer than paint outside or inside, on wood, metal, concrete, plaster, stucco, brick or stone. In addition to the white, which may be had in gloss or eggshell, there are five tints as follows:

Continued on next page

Putty Gray, Ivory and Cream in gloss or eggshell, and Chinese Blue and Leaf Green in gloss only.

These tints are authoritative in color in that they harmonize perfectly with the prevailing modes in fabrics, wall coverings and upholstery. The white Vitralite will not turn yellow. Wherever the gloss enamel is used it may be readily rubbed to a dull finish.

Vitralite Enamel Undercoating

An undercoating for Vitralite on wood, metal, plaster or Keene's Cement surfaces, which gives a smooth, opaque foundation in the fewest possible coats and holds out the finishing coats of enamel in full rich body. Has no tendency to turn the finishing coats of enamel yellow, like lead and oil.

Vitralite Cement Coating

A flat, waterproof finish for cement, concrete, stucco, brick and stone, interior or exterior. It resists the alkali in cement and concrete, penetrates and fills the pores, and waterproofs the surface. Is especially recommended as an undercoating for Vitralite, *the long-life enamel,* on the above mentioned surfaces.

Lyt-all

Lyt-all is intended for industrial plants, office buildings, schools, residences, theaters, warehouses, stores, etc. It is made in Gloss, Eggshell, Flat, Flowing Flat and Cement Coating. Lyt-all is a real white so that it can be tinted to any desired shade. It is not intended for exterior work.

Lyt-all Gloss—A high gloss enamel designed for use on interior walls or woodwork. It has unusual flowing and covering properties and will retain its gloss and color.

Lyt-all Eggshell—An enamel to be used where a semi-gloss finish is desired.

Lyt-all Flat—A flat finish which may be used also as an undercoating for Lyt-all Gloss or Eggshell.

Lyt-all Flowing Flat—Is especially designed for use on plaster walls, wall board, etc. It is the highest type of interior flat wall coating and is intended for the finest work in residences, office buildings, schools and similar structures. Its remarkable flowing properties distinguish it from ordinary wall coatings. Lyt-all Flowing Flat produces an unusual satin-like dull finish which is readily washable. Its uniformity of texture makes it more desirable than a stippled surface.

Lyt-all Cement Coating—A flat finish having an extremely dense and compact film, holding out perfectly the succeeding coats of Lyt-all Gloss or Eggshell and intended especially for new concrete work on account of its extreme resistance to alkali and moisture. Has remarkably good covering capacity, and may be used as an undercoating or as a finishing coat.

Expedite, Paint and Varnish Remover

An exceptionally powerful agent for removing paint, varnish, shellac, etc. It will not injure the hands, does not raise the grain of the wood, nor affect its fiber in any way. Unlike other removers, it is free from objectionable odor and evaporates slowly. Paint or varnish on which it is used can be removed an hour after applying Expedite.

Condensed Specifications

Exterior Woodwork—

HARD WOOD, NATURAL—1 coat of Paste Filler, Natural; 3 coats of Spar Finishing Varnish.

HARD WOOD, STAINED—1 coat of Paste Filler of desired color; 3 coats of Spar Finishing Varnish.

SOFT WOOD, NATURAL—3 coats of Spar Finishing Varnish.

SOFT WOOD, STAINED—1 coat of Oil Stain of desired color; 3 coats of Spar Finishing Varnish.

Interior Woodwork—

HARD WOOD, NATURAL—1 coat of Paste Filler, Natural; 1 coat of Shellac; 2 coats of "38" Preservative Varnish, left in gloss or rubbed dull.

HARD WOOD, STAINED—1 coat of Acid Stain of desired color; 1 coat of Paste Filler of desired color; 1 coat of shellac; 2 coats of "38" Preservative Varnish, left in gloss or rubbed dull.

SOFT WOOD, NATURAL—1 coat of Filtex; 2 coats of "38" Preservative Varnish, left in gloss or rubbed dull.

SOFT WOOD, STAINED—1 coat of Oil Stain of desired color; 1 coat of Filtex; 2 coats of "38" Preservative Varnish, left in gloss or rubbed dull.

Note: For a dull finish without rubbing, substitute a coat of Dulkote for the last coat of "38" Preservative Varnish, and omit rubbing.

For a flat finish, use 1 coat only of Tonetic Flat Varnish over the shellac or Filtex and omit "38" Preservative Varnish or Dulkote.

Floors, Interior—

HARD WOOD, NATURAL—1 coat of Paste Filler, Natural; 3 coats of "61" Floor Varnish, left in gloss or rubbed dull.

HARD WOOD, STAINED—1 coat of Paste Filler of desired color; if a stronger or deeper color is desired, apply a coat of Oil Stain before the Paste Filler; 3 coats of "61" Floor Varnish, left in gloss or rubbed dull.

SOFT WOOD, NATURAL—3 coats of "61" Floor Varnish, left in gloss or rubbed dull.

SOFT WOOD, STAINED—1 coat of Oil Stain of desired color; 3 coats of "61" Floor Varnish, left in gloss or rubbed dull.

Note: For a dull finish without rubbing, substitute a coat of "61" Floor Varnish, Dull Finish, for the final coat of "61," Clear Gloss.

Close-grain hard woods, such as birch, maple, etc., may be finished as specified above, but Paste Filler should not be used.

Enamel—

INTERIOR WOODWORK—1 coat of lead and oil; 2 coats of Vitralite Enamel Undercoating; 2 coats of Vitralite Enamel, left in gloss or rubbed dull.

INTERIOR PLASTER AND KEENE'S CEMENT—1 coat of a mixture of equal parts of Vitralite Enamel Undercoating and Filtex, thinned with raw linseed oil and turpentine, with a small amount of dryer added; 1 coat of Vitralite Enamel Undercoating; 1 coat of Vitralite Enamel.

Note: For an eggshell or dull finish without rubbing, substitute a coat of Vitralite Enamel, Eggshell, for the last coat of Vitralite Enamel, Gloss.

EXTERIOR WOODWORK—2 coats of lead and oil; 1 coat of Vitralite Enamel, Gloss.

Note: If Vitralite Tints are used, it will be advisable to tint the undercoating to the approximate shade selected, with color ground in japan.

INTERIOR AND EXTERIOR CEMENT, CONCRETE, BRICK AND STUCCO, GLOSS FINISH—1 coat of Vitralite Cement Coating, reduced in the proportion of 10 parts of Vitralite Cement Coating to 1 part of turpentine; 2 coats of Vitralite Enamel, Gloss.

INTERIOR AND EXTERIOR CEMENT, CONCRETE, BRICK AND STUCCO, FLAT FINISH—2 coats of Vitralite Cement Coating, reduced in the proportion of 10 parts of Vitralite Cement Coating to 1 part of turpentine.

EXTERIOR HOUSE PAINTING—2 coats of lead and oil, followed by a final coat of a mixture of 3 parts lead and oil and 1 part Vitralite Enamel, Gloss.

INTERIOR PLASTER AND WALL BOARD, FLAT FINISH—1 coat of a mixture of equal parts of Lyt-all Flowing Flat and Filtex, thinned with raw linseed oil and turpentine or mineral spirits, with a small amount of dryer added; 1 or 2 coats of Lyt-all Flowing Flat.

Industrial Wall Work, Interior—

NEW WOOD, PLASTER AND BRICK—1 coat of Lyt-all Flat; 1 coat of Lyt-all Gloss, Eggshell or Flat, as desired.

NEW CEMENT AND CONCRETE—1 coat of Lyt-all Cement Coating reduced in the proportion of 10 parts of Lyt-all Cement Coating to 1 part of turpentine or mineral spirits; 1 coat of Lyt-all Gloss, Eggshell or Flat, as desired.

OLD PAINTED SURFACES—1 or 2 coats of Lyt-all Gloss, Eggshell or Flat, as desired.

Note: On very porous new surfaces it may sometimes be necessary to apply an additional coat of Lyt-all Gloss, Eggshell or Flat. For best results on new wood, it is advisable to touch up all knots and sappy spots with shellac before applying the first coat of Lyt-all.

STANDARD VARNISH WORKS

443 Fourth Avenue
NEW YORK, N. Y.

SAN FRANCISCO, CAL. GRAND RAPIDS, MICH.

CHICAGO STANDARD VARNISH CO. OF ILL., 2600 Federal Street
Licensee and Western Manufacturer

Products

ELASTICA VARNISHES; SATINETTE WHITE ENAMEL; KLEARTONE OIL STAIN; KLEARTONE ACID STAIN; KLEARTONE PASTE WOOD FILLER; STANVAR, a Wax-like Wood Finish; FLATTINE CABINET FINISH.

KOVERFLOR, a Liquid Floor Covering for wood or cement floors, inside or outside.

Architectural Service Department

The purpose of this department is to give accurate information relating to the choice and use of finishing materials as applied not only to standard effects, but also to individual ideas. To this end, the preparation of finished samples has been made a feature of this department. We are always pleased to extend the benefit of our knowledge of the manufacture and use of wood finishes for we realize that architects are just as anxious to have their projects properly finished as we are to have our products properly used.

Specification Data

Complete specifications for varnishes, stains, fillers and enamel are given in our Architectural Reference Book, a readily accessible compilation of practical finishing information from which complete specifications can be written. It will be supplied promptly on request.

Standard Elastica Varnishes

This line of Elastica Varnish products represents a superior quality in varnishes, the very best it is possible to manufacture. There is a specific varnish for each specific requirement that will give the highest type of service and economy when used for the purpose for which it is intended.

Elastica Exterior Varnish

For all architectural outside work—front doors, sash, trim, etc.—where greatest durability and weather protection are necessary. It possesses maximum elasticity, dries dust free in 8 to 10 hours and sufficiently hard in about 5 days to admit of being rubbed.

(Formerly called Elastica No. 1)

Elastica Interior Varnish

A varnish of extreme paleness and durability for interior woodwork. It produces a permanent gloss finish, dries free from dust in 4 to 6 hours and may be rubbed to a dull finish in from 3 to 4 days.

(Formerly called Elastica No. 2)

Elastica Floor Finish

This varnish is the one perfect floor varnish. It combines quick and hard drying properties, without sacrificing elasticity or durability in any degree; protects floors and linoleum under the most severe wear and frequent washing; does not mar, scratch white or spot; dries dust free in 4 to 6 hours and hardens overnight; may be rubbed in 48 hours.

Elastica Polishing Varnish

A high grade, hard drying rubbing and polishing varnish, that does not sweat or gloss up after rubbing; for all classes of interior trim work; dries free from dust quickly; can be rubbed within 3 days.

Elastica White Polishing Varnish

An interior rubbing and polishing varnish of the highest quality; extremely light in color for use over light colored woods or tints.

Elastica Seat Varnish

A very hard drying varnish for church and school seats, porch furniture, chairs, etc. Dries free from dust in from 2 to 3 hours, and hard overnight. May be rubbed in from 3 to 4 days.

Elastica Flat Varnish

For use where a rubbed effect is desired without the labor and cost of rubbing; over stained or natural woods, it produces an effect closely resembling a gloss varnish rubbed. Dries free from dust in from 3 to 4 hours and hard overnight.

Elastica Spar Varnish

This varnish is manufactured to meet the needs of those requiring an ultra-durable waterproof spar varnish for exterior or interior use of any kind. It is a protection for surfaces that come in direct contact with water or dampness, extreme exposure and excessive wear and tear, on which it gives a type of service heretofore unattainable with varnish. It possesses extraordinary resistance to hot, cold, fresh or salt water, and frequent washing with soap and water, and is serviceable on woodwork around sinks, in bathrooms, lavatories, laundries, etc., as it is on steamships, water-craft, etc. Dries free from dust in from 5 to 6 hours and hardens overnight with a brilliant gloss. It should not be applied over shellac, liquid fillers or patent first coaters.

Stanvar, the Wax-like Wood Finish

Superior to wax for wood finishing. It is applied with a rag; requires no polishing and is unaffected by water, while the surface after application is not slippery, but is a waxed effect.

Stanvar Undercoat—An undercoating for Stanvar on new work only. Applied with brush.

Continued on next page

Standard Flattine Cabinet Finish

TRADE FLATTINE MARK

This product is intended for producing a dull, flat or mission effect. It is the one satisfactory pigment flat varnish. It dries hard overnight, contains no wax and surfaces well.

Satinette White Enamel

Satinette ENAMEL

An enamel of pure whiteness and ultra-durability that gives a perfect, smooth, washable finish to everything it covers; its economy in use makes it available for any grade of work.

Gloss White—Adaptable for interior or exterior work, produces a beautiful gloss finish—or may be rubbed with pumicestone and water to produce a semi-gloss finish.

Flat White—For interior work where a dead white enamel finish is desired.

White Rubbed Effect—For interior work where a rubbed finish is desired without the labor cost of rubbing.

Satinette Undercoat—For preparatory coats on woodwork to be finished with Satinette enamel.

Satinette Cement Undercoat—For preparatory coats on cement to be finished with Satinette enamel.

Standard Kleartone Oil Stain

STANDARD KLEARTONE TRADE MARK OIL STAIN

This stain is known as the *labor saving stain,* as it requires only one brushing operation and no wiping. It penetrates as deeply as acid stain, but, unlike acid stain, does not require that the wood be sponged first or sandpapered after staining. It does not show laps no matter how heavily applied and dries rapidly, lighter shades in about 12 hours, darker shades in about 24 hours. The shades are transparent and emphasize the natural beauty of the grain of the wood. They will not settle in the can, as Kleartone Oil Stain is a non-pigment stain. Always use Kleartone Sealers or Coaters in conjunction with Kleartone Oil Stain.

Standard Kleartone Acid Stain

STANDARD KLEARTONE TRADE MARK ACID STAIN

This stain is supplied to produce certain stained effects that are only obtainable with an acid stain. It is not injurious to the wood and the colors are absolutely fast. Always use Kleartone Sealers or Kleartone Coaters in conjunction with Kleartone Acid Stain.

Standard Kleartone Paste Wood Filler

STANDARD KLEARTONE TRADE MARK PASTE WOOD FILLER

For filling up open grained woods. It gives a satisfactory foundation over which to apply varnish, and is supplied in the following effects:

Antique; Antwerp; Forest Green; Fumed Oak; Golden Oak; Natural; Mahogany; White.

Koverflor

S·V·W KOVERFLOR TRADE MARK

Koverflor is a sound and economical development in floor treatment—a perfect floor covering scientifically prepared in solid colors for the preservation of interior and exterior floor surfaces of wood or cement. It combines attractive appearance, absolute protection and unusually long service at moderate expense.

Its characteristics of extraordinary merit are to be found in its super-resistance to water, weather, oil, grease, alkali, lime, dirt, and extreme hard wear.

For Wood and Cement Floors—There are no surfaces called upon to withstand such severe usage as wood and cement flooring, and if not thoroughly protected they become impaired, unsightly and costly to restore. If, on the other hand, wood and cement flooring, either inside or outside, are efficiently cared for with Koverflor, wear and tear are reduced to a minimum, repair expense eliminated, and the flooring material saved.

With particular reference to cement floor surfaces Koverflor makes them dustproof, washable, impervious to dampness, and sanitary; it also prevents the bad effects due to freezing.

Being oilproof and waterproof, Koverflor is especially recommended for use on cement floors, which in use undergo a superficial disintegration, yielding a fine dust that is not only unsanitary and disagreeable. but very injurious to the delicate parts of electrical and other kinds of machinery—therefore it eliminates many expensive repairs.

Other Uses—Koverflor is just as serviceable on steamship and boat decks, and on railroad and street railway car floors, as it is on the cement floors of buildings.

Colors—All Koverflor colors, including the Ivory, White and Black, are alkaliproof and limeproof; therefore Koverflor prevents efflorescence on cement floors.

Covering Capacity—The covering capacity of Koverflor depends entirely upon the porosity of the surface and the thoroughness with which it is brushed into it; consequently only approximate averages can be quoted for estimating purposes, namely: on wood, 400 sq. ft. per gal.; on cement and concrete, 300 sq. ft. per gal.

Specifications—All wood or cement floor surfaces to be treated with Koverflor must be free from grease, dirt, absolutely dry, and all loose and disintegrating matter entirely removed.

First Coat—The Koverflor as received in the container must be thoroughly stirred to insure complete amalgamation of the content; it should then be thinned with turpentine, well stirred in, which should be added in the proportions of 1 to 2 qts. to each gallon of Koverflor, depending upon the porosity of the surface.

It is important that the Koverflor employed for this coat thoroughly penetrates into the flooring material; when applying it brush the Koverflor well into the surface, and allow it ample time to become dry and hard before applying the second coat.

Second Coat—The Koverflor as received in the container should be thoroughly stirred to insure complete amalgamation of the content; it should then be thinned with turpentine, well stirred in, which should be added in the proportions of 1 pt. to each gallon of Koverflor. This coat should not be applied too heavy; therefore, it should be well brushed out.

Caution: Occasionally cement surfaces are encountered that require special treatment before applying Koverflor on them such as those indicated in the following paragraphs:

Very smooth, hard, glasslike cement, and cement work where compositions that create a surface of this character have been used to fill the pores. They lack porosity, and should be given a vigorous wire brushing in order to create a surface on which Koverflor will take hold and form a bond with the cement.

Comparatively new cement containing a substantial percentage of free lime, strongly alkaline cement, and cement work where alkaline hardeners have been introduced; also, composition flooring material. These should be scrubbed with hydrochloric acid reduced to a 5% solution (5 parts acid and 95 parts water), then washed with clear, clean water to remove all trace of the acid, and allowed to become thoroughly dry.

VALENTINE & COMPANY

Varnishes, Varnish-Stains, Enamels, Colors, Primers and Fillers

TELEPHONE
ASHLAND 4920

456 Fourth Avenue
NEW YORK, N. Y.

CHICAGO, ILL., 343 South Dearborn Street
BOSTON, MASS., 49-51 Purchase Street
DISTRIBUTERS FOR PACIFIC COAST, W. P. FULLER & Co., SAN FRANCISCO, CAL.

TRADE VALENTINES VARNISHES MARK

Products

VALENTINE'S VALSPAR VARNISH, VALSPAR VARNISH-STAINS, VALSPAR-ENAMELS, VAL-ENAMEL, VAL-ENAMEL UNDERCOATING, SATINAMEL, VAL-PRIMERS, and VAL-FILLER; COLORS in OIL; VALSEMENT, a paint for concrete floors.

Also manufacturers of Valentine's Superfine Japan Colors.

Valentine Valspar Quality

VALENTINE & COMPANY were established in 1832. Valentine's Varnishes, Varnish-Stains, and Enamels have been subject to constant experimentation and improvement, till today Valspar—clear and in colors—is known the world over as "the varnish that won't turn white." Other varnishes may withstand water and endurance tests at intervals and for limited periods of time; but Valspar stands them constantly and *never* turns white. This may be easily demonstrated by actual water tests.

For jobs that demand a varnish, varnish stain, or enamel of unquestioned waterproofness, elasticity, durability, and beauty, architects the world over specify *Valspar*.

What We Mean by "Waterproofness"

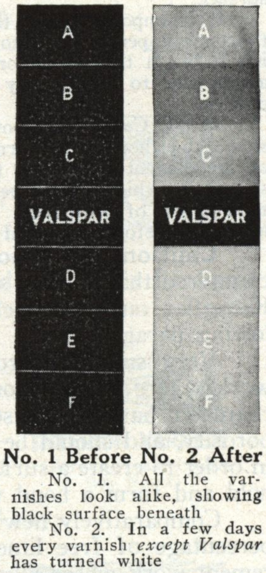
By waterproofness we mean that Valspar may be exposed to the action of water for months or even years at a time, without suffering the slightest physical or chemical change.

There are, it is true, a number of other varnishes on the market that will withstand temporary water exposure. But given enough time or a severe enough test, they discolor and turn white.

Valspar remains absolutely unchanged under long continued exposure. In fact, in our laboratories in New York are a number of panels finished with Valspar that have been immersed in water 7 and 9 years, and in every case the Valspar is in as good condition as the day it went in.

One of our laboratory tests will serve very well to demonstrate this absolute waterproofness. A metal panel is first painted black. Then it is varnished—the middle section with Valspar, the upper sections with three well-known spar varnishes, and the lower sections with three well-known floor varnishes.

The panel is then immersed in a jar of water. Almost immediately several of the varnishes begin to change color and turn white, and after a lapse of a short time all the varnishes, *except Valspar,* turn dull, cloudy and white through absorption of water. Valspar alone remains unchanged, clear and transparent, showing the black surface underneath.



No. 1 Before No. 2 After

No. 1. All the varnishes look alike, showing black surface beneath

No. 2. In a few days every varnish *except Valspar* has turned white

This quality of absolute waterproofness applies equally to Valspar Varnish-Stains and Valspar-Enamels, because they *are* Valspar, with colors added. Therefore, in specifying any of the Valspar family, an architect may rest assured that he is obtaining a product of the highest quality and durability—one that will give maximum service and satisfaction.

Valspar

Valspar Varnish is an original invention, entirely different from any other varnish and not successfully duplicated by any other manufacturer. It is the one absolutely waterproof varnish. Its durability and elasticity are such as to recommend it for all uses indoors and out.

The unique waterproofness of Valspar has not been attained at the cost of any other varnish virtue. On the contrary Valspar, being a long oil varnish, is more durable, tough and elastic than any interior varnish heretofore made. Valspar dries dust free in 4 hours and hard in 24, regardless of the weather. It is ideally pale, easy flowing and of good body. It may be rubbed down to a dull finish if desired.

VALENTINE'S VALSPAR
The Varnish That Won't Turn White
TRADE-MARK

The Valspar finish can be kept in condition simply by washing, and without resort to special oil polishes.

Valspar covers about 450 sq. ft. to a gallon, 1 flowing coat.

Why to Specify Valspar

Architects are specifying Valspar because it has the greatest factor of safety. It is the varnish on which water, hot or cold, soapy or clear has absolutely no chemical or physical effect. Also it possesses great elasticity and toughness, and more wearing power. It is, therefore, the one varnish to use in kitchens, pantries, bathrooms, hallways—wherever woodwork is subjected to unusual water exposure or wear. The use of Valspar always insures satisfied clients.

Valspar costs more than ordinary varnishes, but the infinitely greater service it renders more than justifies the small additional cost. There is no wisdom in specifying a varnish that will crack, bloom or peel when the first real occasion for resistance arrives. Such a varnish negatives a job and brings discomfort to the architect and dissatisfaction to the owner. It pays far more to specify Valspar, even if it does cost a little more, and to be assured that, no matter how hard the wear or hazardous the tests it undergoes, Valspar will resist permanently. You can absolutely rely on the performance of Valspar.

Furthermore, the use of Valspar is true economy. Because of its absolute waterproofness, unusual elasticity and greater durability, Valspar's cost of maintenance per year is considerably lower than that of other varnishes. Also it eliminates the need and bother of frequent refinishings.

The Kauri Reduction Test

During the war, the U. S. Government adopted the Kauri Reduction test for elasticity—a test developed by VALENTINE & COMPANY to determine the relative durability of varnishes.

A good varnish stands 50% reduction in elasticity without cracking. Valspar stands 75% reduction—a greater reduction than is possible with any other spar, floor or architectural varnish. This is an illuminating measure of Valspar's superior elasticity, which in turn represents its superior durability.

Continued on next page

Specifications That Varnish Should Meet

Floor Work—(1) Must be pale enough not to discolor maple flooring. (2) Must work freely and flow out smooth. (3) Must dry dust free in 2 to 4 hours. (4) Must dry hard enough in 24 hours to receive next coat. (5) Must dry hard enough in 24 hours to use. (6) Must be waterproof—not injured by frequent washing or by hot water from a leaky radiator. (7) Must have toughness not to scratch white or chip, even after 1 year's use. (8) Must dry hard enough to be rubbed down in 48 hours and when rubbed must not sweat out. (9) Must dry out clear and bright after 20 minutes' immersion in boiling water or 10 minutes in standard soap solution (½ oz. Ivory soap dissolved in 1 gal. of water, 160° F.).

Exterior Work—(1) Must be sufficiently pale not to discolor light woods or colors. (2) Must dry dust free in 2 to 4 hours. (3) Must dry hard enough in 24 hours for next coat. (4) Must be waterproof—not injured by dew or rain, no matter how long continued. A varnished panel must stand immersion in water for 1 week without turning white (test to be made over black metal surface). (5) Must dry hard enough in 48 hours to be rubbed flat, and when rubbed must not sweat out. (6) When dry must be free from tackiness. (7) Must be sufficiently elastic and durable to stand 1 year's exposure.

Interior Woodwork—(1) Must be sufficiently pale not to discolor light woods. (2) Must work freely and flow out smooth. (3) Must dry free from dust in 2 to 4 hours. (4) Must dry hard enough in 24 hours to receive next coat. (5) Must be hard, and free from tackiness, when dry. (6) Must be waterproof—must not be injured by frequent washing and must not turn white when wet. Panel coated with the varnish must stand 1 week's immersion without turning white (test to be made over black metal surface). (7) Must dry hard enough in 48 hours to be rubbed dull, and when rubbed must not sweat out. (8) Must dry hard enough to be polished in 4 to 6 days. (9) Must not scratch or mar white. (10) Must be elastic and durable enough not to crack under changes in temperature.

Reg U.S.Pat.Off.

The Famous Valspar Boiling Water Test

Working Specifications for Valspar for Interior and Exterior Work, Floors, etc.

Caution: Shellac or other so-called first coaters should never be used as a primer or filler for surfaces exposed to the weather, or on floors. Ordinary shellac contains a large percentage of water which penetrates the wood and is liable to be brought out by a hot sun in the form of steam that will cause the shellac to bloom beneath the surface, and in extreme cases will blister the best varnish. Before varnishing, see that surface is perfectly clean, dry and free from oil, grease, or grit.

(1) **Open Grain Woods: Oak, Ash, Walnut, Mahogany**—Sandpaper smooth; putty-stop all nailholes, using putty colored to match wood. Fill thoroughly with *Valentine's Val-Filler—Wood;* allow filler to set a few minutes, then rub off clean, rubbing across grain. Allow 24 hours to harden, then sandpaper lightly with No. 00 sandpaper.

(1A) **Close Grain Woods: Cherry, Birch, White Wood, Maple, Pine, Cypress**—Sandpaper smooth; putty-stop all nailholes, using putty, colored to match wood. Use no filler or shellac.

(2) Then apply 3 coats of *Valentine's Valspar Varnish,* giving full, flowing coats (thin first coat with 20% pure turpentine for close grained woods). Allow at least 24 hours between coats. Rub first and second coats with curled hair or moss. Then apply the final coat of *Valspar.* This gives a bright gloss finish. (3) If an eggshell gloss or dull finish is desired, 48 hours after the final coat is applied, rub with powdered pumice and water. (4) For a polished finish, after 6 days polish final coat with rottenstone and oil.

On Old Varnished Woodwork—If surface is in good condition sandpaper down and apply *Valspar* direct; if in poor condition, scrape or burn it off, apply a light coat of *Valentine's Val-Primer—Wood,* and proceed with *Valspar.* For best results all previous coats should be removed.

On Metal Work—The process is same as for wood. First coat should be thinned with 20% pure turpentine.

Valspar Varnish-Stains

These are Valspar itself, with all the Valspar qualities, combined with transparent color. They stain and varnish in one operation. Valspar Varnish-Stains never settle or become uneven. Absolutely waterproof, extremely durable, these stains are as unaffected by the famous Valspar tests as clear Valspar Varnish itself. Come in Mahogany, Walnut, Light Oak, Dark Oak, Cherry, Moss Green, and Ground Color.

VALENTINE'S
VALSPAR
VARNISH-STAIN
TRADE-MARK

Varnish-Stain Specifications, Interior—Exterior Work

(1) Prepare wood as for *Valspar* for open or close grained woods. (2) Apply 2 or 3 coats of *Valspar Varnish-Stain,* allowing 24 hours between coats. Since each coat gives a slightly darker color than the preceding, desired effect may be obtained with 2 coats. In that case finish with Clear Valspar. When a light color is desired over a dark surface, use 1 or 2 coats of *Valspar Ground Color,* sandpaper and proceed as above.

Valspar-Enamels

VALENTINE'S
VALSPAR
ENAMEL
TRADE-MARK

Made of finest pigments ground in Valspar, they possess all the desirable qualities of Valspar itself. Come in 12 standard colors: Red, *light and deep;* Blue, *light, medium and deep;* Green, *medium and deep;* Ivory, Bright Yellow, Vermilion, Gray and Brown. Also White, Black, Gold, Bronze, Aluminum, and Flat Black. Any other desired color may be obtained by mixing.

Enamel Specifications, Interior and Exterior Work

(1) **Open Grain Woods: Oak, Ash, Walnut, Mahogany**—Sandpaper smooth; putty-stop all nailholes. See that surface is clean and free from oil, or moisture. Apply 1 coat of *Valentine's Val-Enamel Primer-Filler,* allowing 24 hours to dry.

(1A) **Close Grain Woods: Cherry, Birch, White Wood, Maple, Pine, Cypress**—Omit Primer-Filler, as called for above. (2) If necessary, sandpaper with No. 00 sandpaper. (3) Apply 3 coats of *Valentine's Val-Enamel Undercoating,* allowing 24 hours between coats. (4) Apply 2 coats of *Valentine's Valspar Enamel,* allowing 3 days between coats. (5) For a rubbed finish, allow at least 1 week for drying, then rub with pumice and water.

Note: If a rubbed effect is desired, specify Val-Enamel Eggshell Gloss. If a flat effect is desired, specify Val-Enamel Mat.

Val-Enamel

VALENTINE'S
Val-Enamel
TRADE-MARK

A long oil enamel which "starts white and stays white." May be tinted with oil colors as desired. Presents a non-porous perfectly sanitary surface that may be washed with hot or cold water. Comes in Gloss, Eggshell Gloss or Mat finish.

Valspar Satinamel

VALENTINE'S
VALSPAR
SATINAMEL
TRADE-MARK

An eggshell-gloss finishing enamel that works like oil paint, flows free from brush marks and may be washed with soap and water. It should be used on walls and all woodwork where an artistic dull finish is desired, without the usual labor or expense of rubbing.

Val-Enamel Undercoating

A white undercoating, suitable for undercoat working under Val-Enamel or Valspar-Enamel.

Val-Primer—Wood, and Val-Primer—Metal

For very first coat on new surfaces. In two forms: one for wood, the other for metal.

Val-Filler—Wood

For use over Val-Primer—Wood, to fill the grain of wood surfaces and prepare them for the enamel coats.

Val-Enamel Primer-Filler

A first coater on new open-grain woodwork, and cement or plaster walls.

Valentine's Colors in Oil

For use in tinting enamels.

Valsement

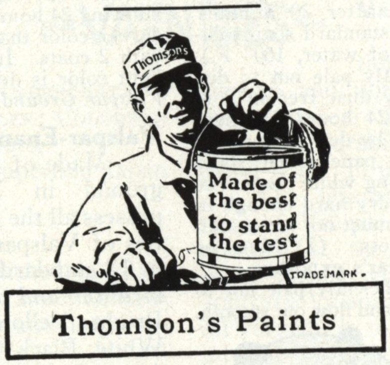
A protective paint for concrete floors.

ESTABLISHED 1874 INCORPORATED 1879

THOMSON WOOD FINISHING COMPANY

Enamels, Varnishes and Paints

829-835 North Third Street
PHILADELPHIA, PA.



TRADE-MARK

Products

We are the oldest enamel makers in the United States; inventors and sole manufacturers of Porcelite Enamels, Undercoats, Sanatone Mill Whites, Zanzibolio Varnishes, Structural Paints.

Also manufacturers of Wood Fillers, Cement Coatings, Technical Enamels and Paints for specific purposes.

Thomson Policy

For more than forty-five years we have typified our products with our slogan *"Made of the Best—To Stand the Test."* Not forty-five years of experimentation, but forty-five years of producing paints that meet the practical needs of architects, the home owner, decorator, engineer, and painter. Poor painting can kill the best designs and plans, so when you select paints be sure they are dependable. You can rely on Thomson's.

Porcelite Enamels

Porcelite enamel was the first high grade white enamel made in this country. Since 1883 it has been admittedly the standard for enamel finishing. Porcelite is different from other enamels because it dries by oxidation to a degree of hardness never attained by damar, long-oil, or imported enamels. Even hard scrubbing will not harm its porcelainlike surface.

A durable porcelainlike finish is obtained by the use of Porcelite, which can be rubbed dull or polished to a mirrorlike surface. It is impervious to steam, soap, acids and antiseptic solutions. Porcelite does not yellow with age, but retains its unexcelled whiteness indefinitely. It will not crack, chip or craze.

Kinds of Porcelite

As no one enamel can meet all requirements, we manufacture various kinds of Porcelite.

Purpose	Name of Material
Interior gloss (rubbing—cold white)	Porcelite Black Label
Interior gloss (rubbing—Colonial white)	Porcelite Special White
Interior (imitation) rubbed effect	Porcelite Matte
General use, exteriors, and large areas	Porcelite Easy Flowing (Master-Painters)

Specification for Porcelite

Woodwork—Cover knot-holes with pure shellac. Fill all holes, etc., with white lead putty. Apply 3 coats of Porcelite Undercoat (sandpapering lightly) then 2 coats of Porcelite.

Rubbed Work—Last coat to be rubbed with pumicestone and water.

Polished Work—Last coat to be rubbed with rottenstone and water.

Plaster, Brick or Concrete—Dust down thoroughly, apply 2 or 3 coats of Porcelite Undercoat and 2 coats of Porcelite, following same directions as for wood.

Metal—2 coats of Porcelite Undercoat and 2 coats of Porcelite, same specifications as for woodwork. Remove all grease before finishing.

Porcelite Matte—The same specifications, except specify "Porcelite Matte."

Porcelite Floor Enamels

A sanitary and durable floor coating for concrete and wooden floors that penetrates into and preserves the surface, imparting a hard beautiful finish. Made in eight attractive colors.

Zanzibolio Varnishes

Zanzibolio Varnishes are all made from the best possible ingredients and are used where the finest possible results are desired.

Specify whether you want Zanzibolio Exterior Varnish, Zanzibolio Interior Varnish or Zanzibolio Floor Varnish.

Sanatone

Sanatone is a washable oil paint that dries with a soft, velvety lustre. Made in sixteen cheerful tints. Especially adapted for use in institutions, public buildings and schools.

Sanatone Mill Whites

Gloss and flat. Famous for their great covering body and stay whiteness. For concrete, brick, plaster, metal or woodwork. Use 3 coats for best results, although 2 coats are generally ample.

MP (Moisture Proof) Structural Coating

A real rust preventive. A carbonite coating with special treated waterproof oils. MP coating will stand up under all climatic conditions. Made in different shades so you can be assured as to the number of coats you receive.

INCORPORATED 1889

CARBOLINEUM WOOD PRESERVING CO.

518-520 Prairie Street, MILWAUKEE, WIS.
PACIFIC COAST OFFICE, 222 East Water Street, PORTLAND, ORE.

CABLE ADDRESS
"CARBOLINUM"

Product

AVENARIUS CARBOLINEUM for preserving wood.

ORIGINAL AVENARIUS TRADE MARK CARBOLINEUM GENUINE
Made in U. S. A.

Material

Avenarius Carbolineum is of the non-volatile anthracene oils, derived in coal tar distillation above 500° F. Filtered carefully and treated with chlorine gas to increase its toxic and fungicidal qualities, specific gravity, viscosity, stability and wood preserving properties.

It is uniform and liquid at temperatures as low as 60° F.

Avenarius Carbolineum is prepared under formula as originated by Richard Avenarius nearly 50 years ago. Supplied in one grade only and guaranteed to be of the same high quality maintained during this length of time.

Uses

Avenarius Carbolineum is used for preserving lumber and timber of all types, kinds and sizes—exterior house trim, shingles, etc.; all woods that are to be used in the ground or water or exposed to the elements of the air; piles, poles, sills, sleepers, silos, water tanks, towers and timbers of every use. A few of many reasons for its use are:

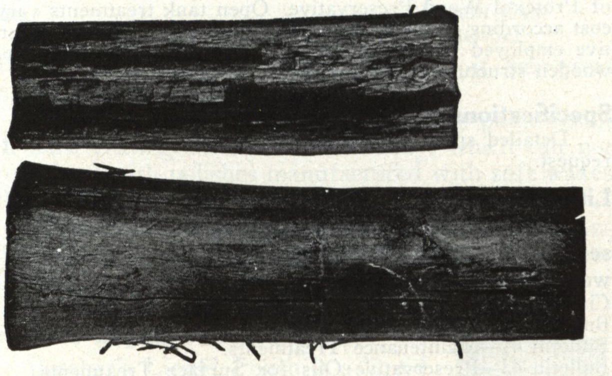
For preserving wood by preventing rot, mildew and decay, thereby increasing the life and usefulness and decreasing the cost and trouble of repair or replacement.

For preventing and destroying insect life—no insects or germs will attack or live on treated woods.

For making possible the use, in many cases, of less costly and less durable timber.

For waterproofing—water, heat, cold or moisture will not affect the coating after it has dried.

For use as a prime coat on unpainted wood—dark colored lead paints or varnish will adhere and wear over it.



Treated and Untreated Ties After Use Same Length of Time on Hutchinson Interurban Ry. Co.

Advantages

Some of the advantages in the use of Avenarius Carbolineum are:

It is self-impregnating—no force required to press it into the wood.

It stays where it is put without "backing" or evaporation from the treated wood. It does not crack or peel.

It is not explosive or volatile and therefore does not increase the inflammability of the wood.

It does not weaken the wood fiber.

It comes ready for use and does not deteriorate or evaporate.

It is rustic nut brown in color and can be used as a stain, where brown coloring is not objectionable.

It does not require experienced men nor elaborate plant facilities to apply. Applied with brush or mop, by spraying or immersion.

Covering Capacity of Avenarius Carbolineum

Brushed On—*First Coat*—Dressed lumber, 350 sq. ft. per gal.; rough lumber, 250 sq. ft.; shingle roof, 100 sq. ft.

Second Coat—Approximately one-third of above quantities.

Sprayed On—Two Coats—Dressed lumber, 250 sq. ft. per gal.; rough lumber, 150 sq. ft.; shingle roof, 75 sq. ft.

Dipped or Immersed—For 10 minutes requires 12 gal. per 1000 ft. b.m. of lumber for heavy coating.

Wood Preservation Specifications

All wood used for .... is to be treated with "Avenarius Carbolineum" manufactured by the CARBOLINEUM WOOD PRESERVING CO., 518-520 Prairie Street, Milwaukee, Wis., and applied as directed.

Brush Coat—After all lumber and timber are trimmed and framed, but before erection, apply Avenarius Carbolineum liberally with a wire bound or rubber set long handled brush or mop. All cracks, cross cuts, mortises, tenons and knotty spots shall be well saturated. Carbolineum to be heated in a suitable container to a maximum of 150° F. for seasoned lumber and to a maximum of 220° F. for damp or partly seasoned lumber.

Before erection, and after first coat has dried, apply second coat of Carbolineum, in the same manner as the first.

Note: Should timber have any decay spots, all decay should be removed leaving good clean wood before applying.

Dipping or Immersion—Where large amount of timber is to be treated, dipping is the more economical method. After all timber is trimmed and framed it shall be immersed in Avenarius Carbolineum. The Carbolineum, before immersion of timber, shall be heated to the same temperature as specified under Brush Coat in above paragraph. The timber shall be submerged in the Carbolineum as follows:

For lumber 1 in. thick, submerged 2 minutes.
For each additional 1 in. of thickness add 2 minutes.

Spraying—Where large amount of surface is exposed in a structure already erected the spraying method is best. All exposed surfaces of lumber or timber shall be sprayed with Avenarius Carbolineum. Carbolineum to be heated to 220° F. before spraying. Any efficient spraying or paint machine can be used.

Among Our Many References

Union Bag & Paper Co., New York, N. Y.
Texas & Pacific Railway Co., Dallas, Tex.
Wilmington & Philadelphia Traction Co., Wilmington, Del.
Madison Coal Corp, Chicago, Ill.
North West Fuel Co., St. Paul, Minn.
Munising Paper Co., Munising, Mich.
Nolde & Horst Co., Reading, Pa.
Rueping Leather Co., Fond du Lac, Wis.
U. S. Light House Service
U. S. Coast Guard Service
U. S. Navy
J. E. Barbour Co., Paterson, N. J.
Cleveland Marine Railways, Cleveland. Fla.
Dwight P. Robinson & Co., Engrs., New York
Consolidated Coal Co., Saginaw, Mich.
Illinois Central Railway Co., Chicago, Ill.
Southern Pacific Railway Co., San Francisco, Cal.
Gulf Fertilizer Co., Tampa, Fla.
Peerless Quarries Co., Utica, N. Y.
New York State Railways, Rochester, N. Y.

IN NEW YORK SINCE 1887

PROTEXOL CORPORATION

SUCCESSOR TO CARBOLINEUM WOOD PRESERVING CO., INC.

37 Barclay Street, NEW YORK, N. Y.

WORKS
KENILWORTH, N. J.

LOCAL REPRESENTATIVES AND SHIPPING DEPOTS

BOSTON, MASS., 6 Beacon Street
PITTSBURGH, PA.
PHILADELPHIA, PA., 26 S. 17th Street
CHICAGO, ILL.
SAN FRANCISCO, CAL.
DENVER, COLO., 510 California Building
ST. LOUIS, MO.
HAVANA, CUBA, Union Comercial de Cuba, S. A. Mercaderes 14
SAN JUAN, PORTO RICO, Edward Mayers, Ochoa Building
MANILA, P. I., Atlantic Gulf & Pacific Co., 77 Muelle de la Industria
HONOLULU, T. H., American Factors, Ltd.

Products

Protexol Wood Preservatives.

Neosote Wood Preservatives.

Protexide, the colorless and odorless Preservative.

Also, Creosote Oils, all standard grades.

Protexol
WOOD PRESERVATIVE
REG US PAT OFF
PRESERVES WOOD EVERYWHERE
TRADE-MARK

Service

Producing wood preservatives as primary products requires a specialized knowledge of the structure of wood, the causes of decay, antiseptics and means for carrying into effect satisfactory methods of treatment. This organization acts as consultants on all matters pertaining to timber preservation.

Experience

For 49 years Protexol quality applied by brush, spray or open tank has been successfully used for the surface treatment of timber to prevent decay and the attack of insects. Protexol (protects all) represents value demonstrated by actual time tests—by results. It is the "standard" wood preservative for surface treatments established by practice.

Also as a permanent rich, walnut stain and preservative for shingles, half timbers, trellises, arbors, etc. Correspondence is invited on any stated requirements.

Wood Preservative Manufactured for Various Conditions

Where the Greatest Protection Against Decay Is Desired—

Protexol Wood Preservative No. 1 is recommended especially for use where brush or spray treatments are used. Also where non-inflammability of the treated timber is an important factor, and the color of the treated wood is important. Made to the 49-year old standardized quality.

It is a non-volatile, heavy oil derived from the highest boiling distillate of coal tar. Its constituents belong to the anthracene group, the permanent antiseptic properties of which are acknowledged.

After filtration and refining, the oil is chemically treated to improve its character and to increase its efficiency.

Where Structures Are Temporary and a Lesser Degree of Protection Is Required and Lower Cost Is a Factor—

Protexol Wood Preservative No. 2 is recommended where waterproofing of timber is the prime object sought. Also recommended for heavy open tank treatment. It is a straight run anthracene oil which meets the chemical standard of the carbolineum type.

Where It Is Desired to Destroy, at a Low Cost, Organism on Sound Timber Not Liable to Decay—

Neosote Wood Preservative No. 1 is recommended where the lowest cost compatible with a satisfactory return is sought. Also used for open tank treatments where depth of penetration only is considered the means of preservation or as a temporary preservative agent. It is a mixture of lighter anthracene oils and heavy creosote oils to give a liquid grade of preservative suitable for surface treatments.

Neosote Wood Preservative No. 2 is a heavy distillate oil for the same purposes as Neosote No. 1 but is less permanent and less expensive than Neosote No. 1.

Standard grades of creosote oils for pressure treatments because of their volatility are not suitable for surface treatments.

Notes: It is worth bearing in mind that the item of labor cost will be substantially the same in the application of any one of the four grades. Equipment cost will likewise be substantially the same except where heavy open tank treatments are desired.

Protexol No. 2 and Neosote are more volatile and their use is not expected to insure the factor of safety to be had from the use of Protexol No. 1, except that a larger quantity of Protexol No. 2 and Neosote will probably give the same results as a smaller quantity of Protexol No. 1.

Colorless and Odorless Wood Preservative—Protexide—

A metallic salt preparation combining high toxicity with low solubility. Non-corrosive and applied in an aqueous solution of 3 to 5%. Especially prepared for surface treatments which will require subsequent applications of varnish or decorative paint or for woods with low absorbing qualities.

Cost

While variable, will run from 1 to 1½¢ per sq. ft. of surface area. Brush treatments will add approximately 1% to the cost of a completed wooden structure. Spray treatments will run about $1.00 per gallon applied or 1¢ per sq. ft. for the best grade of Protexol Wood Preservative. Open tank treatments vary in cost according to the desired absorption and grade of preservative employed from 4 to 10% of the total cost of a complete wooden structure or 10 to 15% of the timber used.

Specifications and Absorption Requirements

Detailed specifications and absorptive data will be sent on request.

Literature

A list of all available bulletins and circulars will be sent on request. Each answers definite questions on wood preservation.

Circular 68—Deterioration of Timber and Its Causes.
Bulletin 40—The Annual Charge Against Treated Timber.
Bulletin 41—Maintenance Treatments.
Bulletin 43—Preservative Oils for Surface Treatments.
Bulletin 44—Line Timber Preservation.
Bulletin 45—Specifications for Surface Treatment of Structural Timber.
Wood Preserving Terms (for sale at $1.00 per copy).

Representative Users and Operations

Standard Oil Co.
General Electric Co.
Bethlehem Steel Co.
Armour & Co.
American Car & Foundry Co.
General Chemical Co.
Panama Canal, U. S. Government Operation
U. S. Submarine Base, San Diego, Cal.
Hell Gate Bridge, New York Connecting R. R., Gustav Lindenthal, Consulting Engineer
Pennsylvania Hotel, New York, N. Y., McKim, Mead and White, Architects

THE BUTCHER POLISH CO.

Manufacturers of Floor Polish and Floor Wax

245 State Street
BOSTON, MASS.

Products

Butcher's Boston Polish (for Floors) or Floor Wax; Butcher's Liquid Polish (Wax); Butcher's No. 3 Reviver.

Also, Butcher's Weighted Floor Polishing Brushes.

Scope and General Information

The products of this company, having been on the market for over 40 years and having given throughout that period consistent satisfaction, have become recognized as standard by architects, interior decorators and painters.

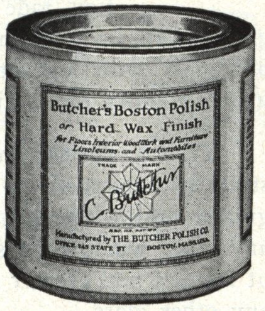
This is particularly true in the case of large institutions, hospitals, colleges, etc., which employ superintendents whose purchases are based on experience.

Butcher's Boston Polish (for Floors)

Butcher's Boston Polish is a perfectly transparent finish for floors, interior woodwork, furniture and linoleum.

It preserves the natural color and beauty of the wood, and as it is not brittle it will not scratch or deface like shellac or varnish, nor will it become soft and sticky like beeswax.

It has the reputation of being the best floor polish made and the only one without objectionable features, and is especially adapted for hardwood floors, bowling alleys and linoleum.


Butcher's Boston Polish
or Hard Wax Finish
for Floors Interior Woodwork and Furniture Linoleum and Automobiles
Trade Mark
C. Butcher
Manufactured by THE BUTCHER POLISH CO.
OFFICE 245 STATE ST BOSTON, MASS.

Butcher's Boston Polish or Hard Wax Finish Can
(1-lb. size)

It is manufactured from pure materials perfectly blended so that it has great density and lasting qualities.

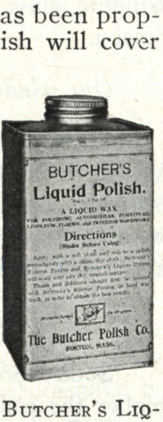
Its extreme density and high melting point result in a hard coating of considerable body, which can not be obtained with polishes manufactured with soft waxes and cheap highly volatile solvents.

Covering Capacity—After surface has been properly filled, 1 lb. of Butcher's Boston Polish will cover 300 sq. ft.

Butcher's Liquid Polish (Wax)

Butcher's Liquid Polish is a liquid wax polish used for repolishing floors, furniture or interior woodwork and is particularly adapted to the maintenance of linoleum as recommended by linoleum manufacturers.

After the floors, or other woodwork, have been properly finished with Butcher's Boston Floor Polish and require freshening up, dampen a cloth or mop with Butcher's Liquid Polish, rub over the surface and polish at once by rubbing with a dry, soft cloth.



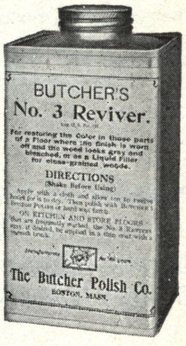
Butcher's Liquid Polish Can
(¼-gal. size)

Butcher's No. 3 Reviver

Floors of hard pine, maple, or other close grained woods will not take a filler. For such floors apply a coat of Butcher's No. 3 Reviver, which will give a warm and even color to the wood. It should be left overnight to dry and then treated with Butcher's Boston Polish according to the directions given herewith.

To restore the color of the parts of the floor where the finish is worn off and the wood looks gray and bleached, dampen a cloth with the Reviver and rub over the defaced portions; let it remain 24 hours to dry; then polish with Butcher's Boston Polish according to directions.

For kitchen, store, and piazza floors that need to be washed often, lay on a thin coat of Butcher's No. 3 Reviver, with an ordinary varnish brush, or dampen a cloth and go over as directed above, rubbing off well before leaving to dry. Repeat when the wood begins to look gray and worn.



Butcher's No. 3 Reviver Can
(¼-gal. size)

Covering Capacity—1 gal. will cover about 1200 sq. ft. of surface.

General Specifications

Do not specify "or equal" as this only leads to the use of inferior grades. Experience in actual use should be the determining factor in specifying a wax polish.

Floors (Without Varnish)—*(a) Open Grain Woods, Oak and Others*—The floors shall first be filled with a paste filler satisfactory to the architect, allowed to dry and thoroughly rubbed off.

After 24 hours a coat of Butcher's Boston Polish or Hard Wax Finish shall be spread evenly over the floor with a cloth and allowed to dry for ½ hour. The floor shall then be polished with a long handled weighted brush (25-lb.) rubbing first across the grain and then with the grain.

Just before the floors are put in use a second coat shall be applied and finished as the first.

Note: In addition to the filler a thin coat of shellac may be laid on and sandpapered slightly before applying the finish coat of wax.

(b) Close Grained Wood (Hard Pine, Maple, etc.)—The floors shall first receive a coat of Butcher's No. 3 Reviver applied with a cloth and allowed to dry for 24 hours.

Then apply Butcher's Boston Polish as above.

Varnished Floors—Insert varnish specification, then specification for 1 coat of Butcher's Boston Polish.

Interior Woodwork and Standing Finish—Specifications similar to the foregoing, except that after applying Butcher's Boston Polish it shall be polished with a brush of the stiffness of a shoe brush and afterwards with dry soft cloths.

Kitchen and Piazza Floors—Shall be finished with a thin coat of Butcher's No. 3 Reviver laid on with a varnish brush.

Territory

Butcher's products are for sale everywhere by paint and hardware dealers and department and drug stores.

W. L. Monro, President and General Manager
A. E. Braun, Vice-president
R. M. Speer, Secretary
W. A. Esselstyn, Treasurer
George H. Mayer, General Sales Agent
C. W. Kurtz, Superintendent of Factories

AMERICAN WINDOW GLASS COMPANY

GENERAL OFFICES
Farmers Bank Building
PITTSBURGH, PA.

DISTRICT SALES OFFICES

NEW YORK, N. Y.
BOSTON, MASS.
CHICAGO, ILL.
ST. LOUIS, MO.
ATLANTA, GA.
SAN FRANCISCO, CAL.
NEW ORLEANS, LA.
MEMPHIS, TENN.

EXPORT OFFICES

MEXICO CITY, MEXICO
SAN JUAN, PORTO RICO
HAVANA, CUBA

FACTORIES

ARNOLD, PA.
KANE, PA.
JEANNETTE, PA.
MONONGAHELA CITY, PA.
BELLE VERNON, PA.
HARTFORD CITY, IND.

Products

Window Glass; Picture Glass; Crystal Sheet Glass; Photo Glass; Ground Glass; and Chipped Glass.

AMERICAN WINDOW GLASS CO. PITTSBURGH, PA. U.S.A.

Process and Production

All of the glass manufactured by the American Window Glass Company is machine-made, thus insuring uniformity of thickness which can not be obtained by hand-blown manipulation. Production of this company is the largest in the world, the annual capacity being 300,000,000 sq. ft.

"Flatness" (U. S. Government Specifications)

"All clear window glass shall be relatively flat. Slight curvature, provided it is regular, will be allowed, but the maximum deformation or bow shall not make an arc higher than 0.5% of the length of the sheet. Reverse curve or crooked glass is not allowable."

Flatness (American Window Glass Co. Specifications)

We have perfected a new process of flattening which enables us to produce window glass that is absolutely flat. The scientific development of the flattening lehr and the mechanical control of temperatures maintain this flatness after the glass leaves the flattening ovens. The consumer receives lights that are *perfectly flat.* (We are the only manufacturers thus far able to make glass sufficiently flat for use as camera and X-Ray plates.)

Glazing

Our new-process-flattened glass may be glazed with either side out.

Chemical and Physical Properties

A *chemical* analysis of our glass demonstrates it is less susceptible to discoloration, fade or stain than any other window glass. We invite comparison of the composition of our glass with any other window glass made either in this country or in Europe.

Tests of the *physical* properties of our glass demonstrate its superiority to all other window glass. It has greater tensile strength than plate glass, rolled glass or any other window glass. It also has a higher modulus of rupture and greater resistance to wind pressure than any other glass.

Window glass contains the following ingredients:

Silica—The principal ingredient of all glass, imparting to it lower coefficients of expansion. The higher the percentage of silica in glass, the greater its ability to withstand sudden heating and cooling without breaking. It is the lack of sufficient silica which often causes window glass to break in the sash without apparent reason.

Our window glass contains about 73% silica.

Lime—Lime gives glass durability and strength. When, as is often the case, the amount of lime in glass is reduced on account of the mechanical difficulties met with in drawing molten glass into sheets, it is done at a sacrifice of the strength of the finished product.

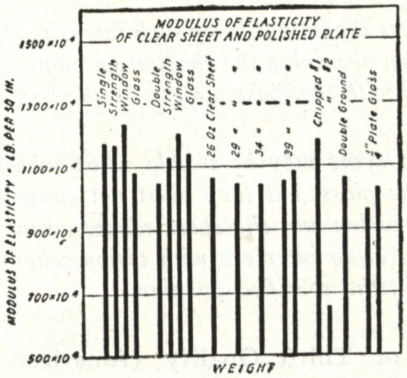
Our window glass contains about 12.5% lime.

Soda—Soda lowers the melting point of glass—the higher the soda (which means a smaller percentage of silica and lime content) the easier is the melting of the glass. Soda used in excess, however, will not only kill

Continued on next page

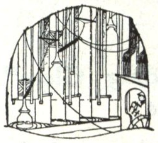
the good properties imparted to glass by the other ingredients, silica and lime, but will make the glass susceptible to weather conditions, the solvent action of atmospheric moisture dissolving the lime and causing stains.

Our window glass contains about 12.5% soda.



Comparative Strength of Various Glasses
From "Mechanical Strength of Glazed Glass," by Arthur E. Williams

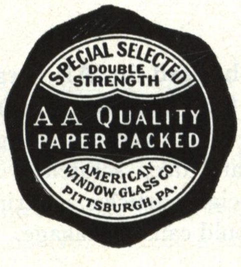
Annealing



Two annealing processes—the first embodied in the drawing of the cylinder, and the second accomplished within the lehrs—guarantee perfect annealing, upon which depends the nature of the glass, its strength and its freedom from excessive breakage.

Identification Label

Each light of single strength or double strength "AA" or first quality window glass, as well as 16-oz. first and second quality picture glass of American Window Glass Company's manufacture is either labeled as shown herewith or else the label appears upon the paper between the lights. This label identifies the quality.

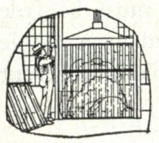


"A" and "B" grades of window glass are not labeled, but have a quality brand stamped on each original box and a quality slip in each box, showing the grade and thickness.

Packing

All "AA" or first quality window glass is packed with paper between the lights to prevent marring and scratching of the surface.

"Definition of Clear Window Glass" (U. S. Government Specifications)



"Clear Window Glass—Transparent, relatively thin, flat glass having glossy, fire finished, apparently plane and smooth surfaces, but having a characteristic waviness of surface which is visible when viewed at an acute angle or in reflected light.

"Clear Window Glass is made at present by hand blowing or by machine blowing and drawing into cylinders and flattening, or by drawing directly into a sheet, the surface finish being that obtained during the drawing process."

"Specifications for Clear Window Glass for Glazing" (U. S. Government Specifications)

"Clear window glass for glazing is made in several different qualities and in the varying thicknesses shown in Table 1.

"Single strength and double strength window glass is regularly supplied in two standard qualities, known as A quality and B quality. A limited amount of this glass, known as AA quality, which is especially free from defects, is sometimes selected for special purposes and may be specified if desired. It must be borne in mind, however, that the total amount of AA glass produced by the manufacturers does not exceed 3% of the total amount of window glass produced.

"There is also a limited amount of single strength and double strength glass produced in a quality inferior to B quality, and is known as Fourth quality. The amount of glass produced in this quality also represents a very small percentage of the total window glass produced.

"A quality of single strength glass inferior to Fourth Quality is also produced in very limited quantities, and is known as C quality. This is the lowest grade of glass that is packed and marketed in this country.

"Window glass is also produced in thicknesses heavier than double strength, and according to its thickness it is classified as (1) 26-oz. glass; (2) 29-oz. glass; (3) 34-oz. glass; (4) 39-oz. or $\frac{3}{16}$-in. glass.

"26-oz. and 29-oz. glass are produced only in A and B qualities.

"34-oz. and 39-oz. or $\frac{3}{16}$-in. glass are produced in glazing and factory run quality."

Continued on next page

Grades and Qualities

"AA," or First Quality (American Window Glass Co. Specifications)—This quality requires the best grade of glass, but it does not require perfect glass, or substantially perfect glass. Defects of various kinds are permissible in this quality, but they should be very slight, or not discoverable except on close inspection.

In general, the center of each light must be free from defects. Each light must be viewed as a whole and not judged by single defects discoverable in different parts of the light.

"A," or Second Quality (U. S. Government Specifications)—*"The defects permitted in this quality are faint strings or lines, slight burn, small seeds, small blisters, and light scratches.*

"No light shall contain all of these defects, and those present may not be grouped when in the central area of the sheet.

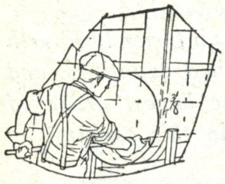
"Strings, lines, or burn specks shall not be of such intensity that they are visible when observing the sheet at an angle greater than 30 degrees between the line of sight and the glass.

"Waves shall not be visible at an angle greater than 20 degrees with the glass.

"Blisters shall not exceed ¼ in. in length unless they occur near the edge of the sheet.

"In general, the central area of the light shall be practically free from defects, and the appearance of the light as a whole shall be such that there is no perceptible interference with the vision as long as one is not looking through the glass at an acute angle."

"A," or Second Quality (American Window Glass Co. Specifications)—No specific rule can be laid down as to the size of any defect permitted. A defect too large for a small light might be permissible in a much larger light. The location of the defects also determines the number and size permitted. Seeds and small blisters that would not be permissible in the center of the light, would be permissible if remote from the center.



In general, the appearance of the light as a whole should be such as, on casual inspection, will not cause the attention of the inspector to be focused on the defects rather than on the general appearance of the light.

"B," or Third Quality (U. S. Government Specifications)—*"This quality admits of the same kind of defects as A quality, but they may be larger, heavier and more numerous.*

"Occasional scattered blisters not more than ½ in. long may occur over the central area of the sheet. Larger blisters up to 1 in. in length may occur about the bordering areas.

"Waves should not be of such intensity that they are visible when observing the sheet at an angle greater than 45 degrees with the glass, unless on the border.

"Burn spots may be visible when looking directly through the glass, but they must not cause any appreciable depression and the speckled appearance must not be so great as to interfere with vision when examining the glass in the specified position."

"B," or Third Quality (American Window Glass Co. Specifications)—In general, the defects permitted in this glass are so prominent as to at once attract the attention of the casual inspector, but they should not be so numerous as to prevent a considerable portion of each light from being reasonably free from them.

"General Principles Involved in Grading Glass" (U. S. Government Specifications)

"All flat glass contains some imperfections and the principle employed in grading is to exclude all defects that would be objectionable in a given grade. This is difficult to do since there are no sharp lines of demarcation between grades, and experienced inspectors will differ in judgment as the quality of the glass approaches the limits of the grades. Small lights must be quite free from imperfections as compared with larger ones, and the center of any sheet should be clear whereas the edges may contain more pronounced defects."

Defects Prohibited in All Grades (American Window Glass Co. Specifications)—Stones, heavy lines or cords that would cause breakage, long or raised blisters, wrinkles and deep scratches, fade or stain, or heavy burn or foreign particles adhering to the surface of the glass that could cause breakage.

"Tolerances in Thickness" (U. S. Government Specifications)

"Thickness of individual sheets shall not vary more than ½ of the total variation allowed for that particular strength of glass as shown in Table 1 for sizes up to 50 united inches. For larger sizes variations in thickness may be equal to the tolerance allowed for that class."

Continued on next page

"TABLE 1—TOLERANCES IN THICKNESS AND AVERAGE WEIGHT OF CLEAR WINDOW GLASS" *(U. S. Government Specifications)*

	Thickness in inches		*Number of lights per inch*		*Average weight in ounces per sq. ft.*
	Min.	*Max.*	*Min.*	*Max.*	
Single Strength	*.080*	*.100*	*10.5*	*12.0*	*18.5*
Double Strength	*.111*	*.125*	*8.0*	*9.0*	*24.5*
26-oz. Glass	*.125*	*.135*	*7.5*	*8.0*	*26.0*
29-oz. Glass	*.135*	*.148*	*6.5*	*7.0*	*29.0*
34-oz. Heavy Glass	*.150*	*.175*	*6.0*	*6.5*	*34.0*
39-oz. Heavy Glass	*.176*	*.205*	*5.0*	*5.5*	*39.0*

"Sizes Obtainable" (U. S. Government Specifications)

The maximum dimensions recommended are:

	Width in inches	*Length in inches*
For Single Strength	*40*	*50*
For Double Strength	*60*	*80*
For Heavy Sheet	*66*	*90*

"Dimensions" (U. S. Government Specifications)

"Glass must be cut to dimensions ordered with an allowable tolerance of $\frac{1}{32}$ in. per ⅛ in. of thickness."

Crystal Sheet Glass, or Heavy Sheet Glass

This glass is produced in 26-oz., 29-oz., 34-oz. and 39-oz. (or $\frac{3}{16}$ in.). The term "ounce" indicates the average weight per square foot. It is uniform in thickness, specially annealed and absolutely flat.

"Heavy Sheet Window Glass Glazing Quality" (U. S. Government Specifications)—

"The same specifications for selecting provided for A quality single strength and double strength glass shall apply."

"Factory Run Quality" (U. S. Government Specifications)—

"This quality is the run of glass as produced by the factory. It may contain glass of very good quality and some glass of very ordinary quality. However, the glass that contains heavy cords, lines or strings over the entire surface, raised blisters, cap strings, stones or batch particles causing a rough surface, or depression, or having its surface covered with heavy burns, wrinkles, deep scratches or stone, shall not be included in this quality."

Packing—Paper is placed next each light of 34-oz. and 39-oz. to prevent marring and scratching of the surface. Each light is labeled to identify the grading and quality.

Adaptability—Suitable for glazing office buildings, hotels, municipal and other public buildings, and for French doors, windows, table tops and glass shelving, automobiles, car windows, etc.

Advantages—Crystal sheet glass possesses a brilliant surface, uniform thickness, and with the special care given in flattening this glass, it is the flattest window glass produced by any process, and approximates the flatness of plate glass.

It is an acceptable substitute for a great many uses and is lower in price than polished plate. Being a lighter product than plate glass, approximately 25% of the cost of sash weights can be saved by its use.

Suggested Specifications—"All the clear window glass glazed in this building shall be the AMERICAN WINDOW GLASS COMPANY's make, or equal thereto."

Other Specialties

We make photo glass for camera use, lantern slides and glass for diagnostic X-ray plates.

Also 16-oz. picture glass 1st and 2nd qualities.

We also produce double strength ground glass, No. 1 process chipped and No. 2 process chipped.

Ground glass is produced by sand-blasting or grinding one surface of the sheet. The reverse side of ground and chipped glass is smooth.

Chipped glass is produced by processing the surface so that a chipped appearance is produced. No. 1 process chipped glass indicates that one process of chipping is applied to one surface. No. 2 process chipped glass indicates that one surface is chipped twice.

Ground and chipped glass should be glazed with the smooth side out.

HIRES TURNER GLASS COMPANY

PHILADELPHIA, PA.

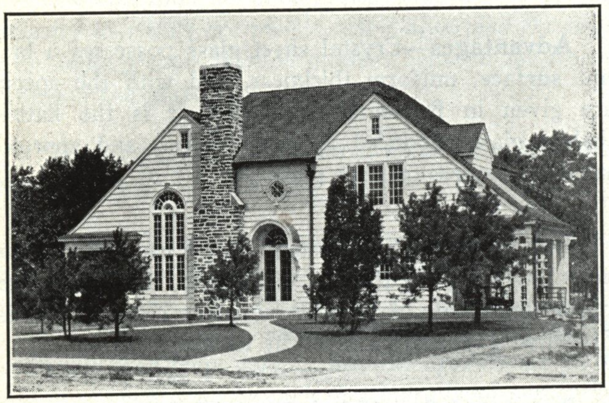
ROCHESTER, N. Y. WASHINGTON, D. C. ALBANY, N. Y. BALTIMORE, MD.

"Hires Turner Residential Glass" (Polished)

"Hires Turner Residential Glass" is polished and wave-free and can be used in ordinary stock sash. For years there has been genuine need for a glass possessing the ground and polished surfaces of plate glass without being thicker than double strength window glass. "Hires Turner Residential Glass" meets that demand.

Satisfaction—The cost per house of "Hires Turner Residential Glass" is so nominal and the satisfaction derived from its use so delightful and real that the home owner sees the possibilities in this new glass instantly and it takes little explanation to convince him that he needs it.

No Distortion—Like plate glass, "Hires Turner Residential Glass" is worked down, smoothed and polished like a fine wood panel. Even the best made window glass can not compare with it in any way. Its beautifully finished surfaces catch the high lights and shadows and reflect them without the ugly and disfiguring distortions found in every make of sheet glass. Objects are clear, distinct and natural. There are no disfiguring waves to distort the view.



Looking through "Hires Turner Residential Glass" is like looking through the open air itself.

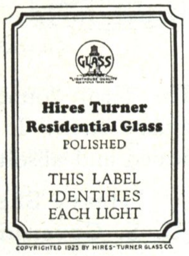
Saving in Dollars—In houses where stock size sash are to be installed, "Hires Turner Residential Glass" can be used without resorting to expensive lead weights or changing the sash in any way. Where the plans call for sash of odd sizes, "Residential Glass" likewise eliminates the necessity for lead weights, wide frames and heavy sash. In either case the use of "Hires Turner Residential Glass" results in a considerable saving in dollars over plate glass, while the windows retain the polished, wave-free effect of the latter.

No Change in Millwork—"Hires Turner Residential Glass" may be substituted for double strength window glass without change in millwork or hardware. This means that for any house in course of construction and for which the specifications call for ordinary sheet or window glass, the change to "Hires Turner Residential Glass" can be made easily and economically. It is as simple as changing the color of the paint so long as the work has not actually been performed.

How to Specify—"Glaze all windows and French doors with 'Hires Turner Residential Glass' (polished), each light labeled."

Note: "Hires Turner Residential Glass" is made in only one quality, one thickness and one brand. Each light is individually labeled to prevent substitution of an inferior product. Samples sent on request.

Note that even the words "crystal sheet" (of any weight) or "AA (first) quality" single or double thick window glass of any make do not mean "wave-free glass."



GLASS
"LIGHTHOUSE" QUALITY

Hires Turner
Residential Glass
POLISHED

THIS LABEL
IDENTIFIES
EACH LIGHT

COPYRIGHTED 1923 BY HIRES-TURNER GLASS CO.

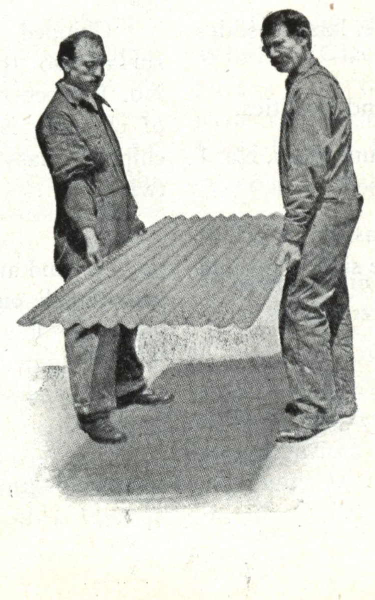
Corrugated Wire Glass

Manufactured by Pennsylvania Wire Glass Co. and distributed by Hires Turner Glass Company.

Corrugated wire glass is a translucent roofing material made like a sheet of corrugated iron with all its strength, yet possessing the transparency of glass. It is used as an entire roof covering, or as skylights and in sidewall construction in the place of sash.

It transmits a finely diffused, shadowless light. It possesses great strength and span coupled with flexibility, and is formed with the utmost ease into completely weatherproof and dustproof construction.

It is possible to treat this glass like other materials used in roofs and curtain walls. Instead of being a delicate, fragile substance requiring to be supported and protected by specially constructed framework, corrugated wire glass can be laid on the purlins like corrugated iron or boards, with no other protection than cushioning strips of asphalt roofing and with no other special treatment save the use of appropriate fittings at the glass joints which we supply.



In buildings needing less light, corrugated wire glass and opaque materials are laid in alternate bands, each extending from ridge to eaves, and the light is so diffused by the corrugations that an even illumination results.

Still other users have placed stationary corrugated wire glass in the northern slopes of sawtooth roofs, where ventilation is not required nor secured by other means. Others, who preferred sash with its attendant ventilation in the northern slopes of sawtooth roofs, have inserted panels or lines of corrugated wire glass in the southern slopes in order to obtain evenly distributed light.

Actinic Corrugated Wire Glass—This glass affords a completely diffused, shadowless daylight from which most of the offensive glare and heat of the sun have been removed.

Many types of skylights have been constructed of this glass in all parts of the world with most satisfactory results. It marks one of the most

Continued on next page

important advances made in the production of fine building materials of recent years. For more detailed data read the description of actinic glass below.

Important Facts—

(1) Corrugated wire glass has greater strength under an equally distributed load than any other sheet glass of equal thickness. Under test, standard sheets sustain 67 lb. per sq. ft. dead load.

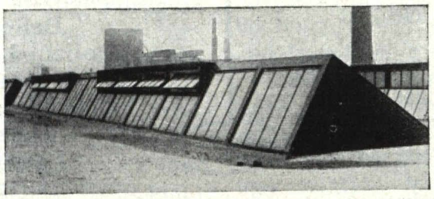
(2) The maximum weight, when installed, is 6 lb. per sq. ft. It is the lightest and strongest building material of this character obtainable.

(3) Corrugated wire glass sheets are standardized at 27¾ in. wide by 63 in. long. Deep angle corrugation, 2½-in. pitch. This permits about 5-ft. purlin spacing. It may be obtained in longer or shorter sheets where required. Longer lengths are not recommended.

(4) Corrugated wire glass is made by the Pennsylvania solid process and meets with every requirement of the National Board of Fire Underwriters for a fire retardant.

(5) Corrugated wire glass is adapted to and is used in every form of roof construction where daylight is required. It is placed directly upon steel and wood purlins or on concrete.

(6) The large corrugations of this glass completely break up the direct rays of the sun and a soft, equally diffused, shadowless light is the result. It reduces the heat and glare of sunlight.



Corrugated Wire Glass Skylight Made by Hires Turner Glass Company

(7) History proves that glass is practically everlasting. Corrugated wire glass is made only of the best ingredients with a thoroughly embedded wire mesh which the elements can not attack. Properly installed, it is a permanent construction.

(8) Corrugated wire glass is altogether economical—the "cheapest in the long run" glass construction, because if properly installed

(a) Breakage due to expansion is eliminated.

(b) There is no upkeep expense such as painting of parts, etc.

(c) There is no supplementary metal frame required as it supports itself directly on the roof purlins.

Service—We maintain a competent engineering staff which will give impartial advice relative to your daylighting problems. This service is entirely gratuitous.

Catalogue—Complete catalogue on corrugated wire glass showing numerous illustrations and complete erection data will be mailed on request. Ask for Catalogue No. 11-C.

Corrugated Wire Glass Skylights, etc.—We design, fabricate and erect complete, all types of skylights, canopies and marquises utilizing corrugated wire glass.

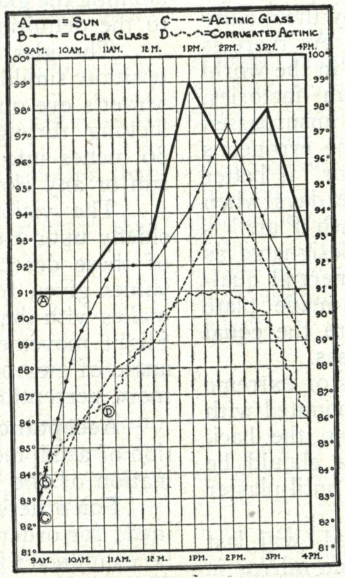
Actinic Glass—a Glass That Absorbs Heat Rays, Transmits Luminous Rays and Reduces Glare

Manufactured by Pennsylvania Wire Glass Co. and distributed by Hires Turner Glass Company.

Actinic glass No. 213 is a light, amber tinted glass that excludes 85% of the ultra violet rays and 55% of the radiant energy rays of the sun (from United States Bureau of Standards test). These properties permit its use as a protection from sun glare. While the color may vary at times, this variance in no way affects the properties of the glass. The character of the light afforded by this glass is most restful to the eyes, and, in addition, it has a tendency to give a light on cloudy days very close to sunlight. This has a stimulating effect on those working in this light, as cloudy days are very depressing to most people. There is a small percentage of light lost in transmission through this medium, but so small that it may be disregarded for all practical purposes.

An Anti-glare Glass—Many employees are accused of carelessness and inefficiency when the whole trouble lies in their eyes. Eminent authorities make the statements (and they are borne out in everyday experiences) that glare and heat rays, by their intense action, have a destructive effect upon certain tissues, causing eyestrain and irritation, with resultant bodily fatigue. The employee who works in the strong, glaring light pouring through exterior windows, or where this glare is reflected into the eyes, develops that tired, sleepy, listless feeling. Production slows down, output diminishes and accidents occur. Many industrial plants, by remedying these conditions, have found that production increased decisively.

Actinic glass is a tremendous aid in gaining the control of that dangerous portion of sunlight—glare. It is primarily an anti-glare glass.



Average Temperatures of 3688 Observations

Taken by Prof. Alleman of Swarthmore College showing the great advantage of using Actinic glass for excluding the sun's radiant energy

Advantages—Actinic glass retards fading and is particularly useful in the protection of paper, paper products, fabrics and textiles which are subject to injury by sunlight.

It reduces the deterioration of fabrics made entirely of or containing rubber and silk. Many experiments were made for and by the War Department upon this glass and it has been approved and recommended for use in hangars housing dirigibles and balloons in order to protect the silk and rubber fabrics with which they are covered. In the enormous hangar at Lakehurst, N. J., and in similar structures through the country, thousands of feet of actinic glass were installed.

Manufacturers of chemicals which are affected by sunlight will find this product of considerable interest and value. The hazard of rapid changes in certain of the products of explosive manufacturers, due to the action of light and heat rays, is considerably decreased.

Actinic glass entirely prevents algae growth.

Actinic glass is in use in automobile windshields and in street and railway cars to protect the drivers and operators from the glare of the sun and the headlights of approaching motor vehicles. Objects viewed through actinic polished plate glass appear in more striking contrast than when seen through ordinary glass, thereby aiding in a better view of the road.

In order to demonstrate on a practical scale the light and heat transmitting properties of this glass in comparison with the same properties of other building materials, 14 small houses were erected and hourly temperatures were made over a period of 28 days. The tests clearly demonstrated the advantages of actinic glass over ordinary glass and also showed the reduction in temperature which resulted from ventilating such houses.

Commercial Forms—Actinic glass No. 213 is now a commercial product adapted to present-day building requirements in the following forms:

Plain rough, ⅛ in. thick.
Plain ribbed, ⅛ in. thick.
Rough wire, ¼ in. thick.
Ribbed wire, ¼ in. thick.
Corrugated wire glass, ¼ in. thick.
Polished plate actinic, ¼ in. thick.

PLATE GLASS MANUFACTURERS OF AMERICA

First National Bank Building
PITTSBURGH, PA.

Practical Advantages of Plate Glass for Windows

The primary purpose of glass in windows is to admit light, to afford protection from the elements and to allow a clear view from the inside or outside, or both. Obviously, the most suitable glass is that which will transmit the greatest amount of light and afford the clearest view.

Polished plate glass answers these requirements. It is the optically perfect glass for windows. Looking through plate glass is like looking through the open air itself—the eye does not see the glass.

Plate glass is free from distortion when objects are viewed through it at any angle.

Aesthetic Quality of Plate Glass

In addition to the practical advantages, plate glass has one other advantage which is receiving more and more consideration from architects, that is, *advantage of beauty*. This quality of beauty is due to the clean-cut and distinct reflection free from distortion.

Plate glass increases the value of a residence far more than the additional cost of the plate glass. A building glazed with plate glass is more easily rented or sold.

Other Uses of Plate Glass

Plate glass is being used more and more as a protection to dining, library and console table tops, also desk, counter, buffet and dresser tops and window sills.

It is also used for push plates on swinging doors, for aquariums, pastry slabs and in store fixtures.

Polished Plate Glass Mirrors

The quality of a mirror is determined by the quality of the glass and the finish of its surface. As there is no finer polished plate glass made anywhere in the world than that which is produced by American factories, mirrors made from American plate glass are unsurpassed for brilliance, clearness and definition. The erroneous idea that the so-called "French Plate Mirror" is better than American-made is a heritage from the days when mirrors were first made in France. "French Plate" is a term no longer used. Mirrors are now designated as "first quality," "second quality" and "commercial quality." First quality mirrors of American-made plate glass and silvered in American factories are the equal or better than mirrors made of Belgian glass.

As mirrors are susceptible to the effects of extreme heat or cold, and moisture, they should be mounted with care. An air space should be left between the back of the mirror and the wall. Damp walls should be avoided, and mirrors should not be mounted until plaster has thoroughly dried.

A well made mirror, properly mounted, will last for years and years. But even the best made mirror is subject to deterioration. The architect should so design his stops that the mirror may be easily removed for re-silvering. This is an inexpensive process and will make the mirror as good as new.

Use PLATE *Glass*

Nothing Else is Like it

Specifications for Polished Plate Glass (Prepared by Department of Commerce, Bureau of Standards, Washington, D. C.)

Classification of Plate Glass for Glazing Purposes—Second silvering quality; glazing quality.

Definitions of the General Classes of Polished Plate Glass—Transparent, flat, relatively thin glass having plane polished surfaces and showing no distortion of vision when viewing objects through it at any angle.

Plate glass is made at present by casting and rolling large sheets periodically or by rolling a continuous sheet. The sheets are then ground and polished.

General—All flat glass contains some imperfections and the principle employed in grading is to exclude all defects that would be objectionable in a given grade. This is difficult to do since there are no sharp lines of demarcation between grades, and experienced inspectors will differ in judgment as the quality of the glass approaches the limits of the grades. Small lights must be quite free from imperfections as compared with larger ones, and the center of any sheet should be clear whereas the edges may contain more pronounced defects.

Method of Examination—The method of examination is described in these specifications in order to make the results more uniform, and to define the condition under which glass should be examined because the distance from the glass, the angle between the glass and the line of sight, and the intensity of light all affect the visibility of imperfections.

These specifications should be interpreted by examining the glass in the following manner, with reference to the definitions of defects listed in the glossary:

The glass should be examined when placed in a position similar to that of a glazed light with the observer's eye on a level with the center of the sheet, and looking through the glass from a distance of about 36 inches into the light from a clear sky without any sun or any close background.

The visibility of waves, lines or cords depends chiefly upon the angle of observation, and the intensity of these defects can be classified on this basis. The values given for angles are the angles the line of sight makes with the sheet of glass when in a vertical position. Slight movement of the head horizontally through an angle of two or three degrees will make waves or lines more perceptible.

Acceptance or Rejection—Acceptance or rejection of a shipment or delivery shall be based on an examination of the following quantities.

For orders of 100 lights or less, all shall be examined; for orders of 101 to 500 lights, at least 50% shall be examined; for orders of 501 or more lights, at least 25% shall be examined.

Boxes shall be selected from the shipment at random.

Continued on next page

If not more than 10% of the lights examined are below quality, the shipment shall be accepted, provided the lights below the specified grade are not distinctly below the upper limit of the next lower grade.

If, however, an *entire* shipment of 500 lights or more is examined, not more than 5% may be below quality.

Sizes and Thickness—The standard thicknesses of plate glass shall be ⅛, $\frac{3}{16}$, ¼, ⅜, ½, ⅝, ¾, 1, 1¼, and 1½ in. Sheets are available ¼ in. thick in sizes having a maximum area of 250 sq. ft. Glass of ¼-in. thickness may be furnished having practically any dimension desired under the following maximums—120x280, 144x260, and 160x240 in.

The standard stock thickness for glazing purposes is ¼ in., but this may vary between $\frac{7}{32}$ and $\frac{5}{16}$ in., although ⅛ and $\frac{3}{16}$-in. glass are carried in stock in the larger cities.

Tolerances in Thickness—The maximum and minimum thicknesses allowed shall not be more than the given thickness plus or minus one-half the difference between the standard thicknesses, although for ¼-in. glass occasional plates as thick as $\frac{5}{16}$ in. are supplied. The general variation in thickness should not be more than $\frac{1}{32}$ in. for individual lights under 10 sq. ft. in thicknesses up to ¼ in. The variation in lights over ¼-in. thickness should not exceed one-half the total tolerance for that thickness.

Tolerances in Dimensions—Variation from dimensions ordered shall not be more than $\frac{1}{32}$ in. per ⅛ in. of thickness.

Grades—Plate glass shall be furnished for glazing purposes in one of two grades as specified. These grades will be known as second silvering and glazing qualities.

Second silvering quality is invariably used where the highest standard of glazing is required and imperfections are discoverable only on close inspection. This quality is rarely sold for glazing purposes in sizes over 20 sq. ft. Glazing quality represents the usual selection of plate glass supplied when quality is not otherwise definitely specified.

As allowable tolerances in quality must vary considerably with size of sheet required, different specifications will apply in each of the following four divisions according to size.

Division I—Sheets up to and including 10 sq. ft. in area.

Division II—Sheets having an area greater than 10 sq. ft. but not greater than 25 sq. ft.

Division III—Sheets having an area greater than 25 sq. ft. but not greater than 75 sq. ft.

Division IV—Sheets having an area greater than 75 sq. ft.

Division I

Sizes up to and including 10 sq. ft.

Second Silvering Quality—This glass shall not contain any major defects. The central area of this glass may contain only well scattered seeds. Ream, skim, short finish, and scratches which can not be removed by buffing, are not permissible. The edges may contain coarse seeds, but none shall be larger than $\frac{1}{32}$ in. in diameter.

Glazing Quality—The central area of this quality may contain numerous scattered seed including an occasional coarse seed, but no heavy seed. Small bubbles may occur on the edge. Stones, large bubbles, skim, ream, or long or heavy scratches are not permissible. Faint strings in the corners or upper edges of the light are permissible. The polish shall not show areas of short finish.

Division II

Sizes from 10 sq. ft. to 25 sq. ft., inclusive

Second Silvering Quality—The central area of this quality may contain more numerous fine seed than the small sizes and an occasional coarse seed. The edges may contain occasional small bubbles and fine strings. No heavy defects or scratches which can not be removed by buffing are permissible. The polish must be good and free from visible short finish.

Glazing Quality—The central area may contain small bubbles and fine strings or ream which do not give visible distortion when looking straight through the glass, but no long or heavy scratches. The edges may contain bubbles over $\frac{3}{32}$ in., visible scratches shorter than 10 in., small areas of ream strings and small stones not larger than $\frac{1}{32}$ in., but these defects should not be grouped nor interfere with the vision. The polish over the central area should be good but patches of light short finish may be present about the edges.

General—None of the above grades or sizes may contain any heavy or long lines, streaks of ream, any bubbles larger than ⅛ in., visible poor polish, open bubbles, areas of skim or stones over $\frac{1}{32}$-in. in diameter.

Division III

Sizes from 25 sq. ft. to 75 sq. ft.

Glazing Quality—Lights of this size may contain numerous visible and larger imperfections not allowed in the smaller lights. But these must not be grouped or so prominent that they noticeably interfere with the vision. The central area of the plate shall be free from these larger defects.

The sheets may contain seed of any size, but not heavy seed, except in relatively small patches on the outer border of the sheet; occasional bubbles up to ⅛ in. in the center and up to $\frac{3}{16}$ in. on the borders; strings, ream and skim in very limited areas, if not causing a deformation of objects viewed through the plate; occasional scratches and small stones under $\frac{1}{16}$ in.

Heavy ream, heavy cords, bubbles larger than $\frac{3}{16}$ in. in diameter, stones larger than $\frac{1}{16}$ in. in diameter, large fire cracks, areas of unpolished glass, easily visible poor polish, large open bubbles, or sandholes, are not permitted. The large defects should be confined to the upper edge and upper corners of the sheet, the lower and central areas to be relatively free from major defects.

Division IV

Sizes greater than 75 sq. ft.

Sheets larger than 75 sq. ft. may contain defects of almost any kind, except that they must not show large areas of heavy seed or bubbles, nor have any defects which will cause spontaneous breakage—such as skim or large stones (⅛ in. in diameter), or show any areas of unpolished glass.

PITTSBURGH PLATE GLASS CO.

Exclusive Manufacturers of Tapestry Glass

PITTSBURGH, PA.

DISTRIBUTING WAREHOUSES OF THE PITTSBURGH PLATE GLASS CO.

(Carrying stocks of Tapestry Glass)

AKRON, OHIO
ALBANY, N. Y.
ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
BROOKLYN, N. Y.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
DAVENPORT, IOWA
DENVER, COLO.
DES MOINES, IOWA
DETROIT, MICH.
FT. WORTH, TEX.
GRAND RAPIDS, MICH.
HIGH POINT, N. C.
INDIANAPOLIS, IND.
HARRISBURG, PA.
HOUSTON, TEX.
JACKSONVILLE, FLA.
KANSAS CITY, MO.
LONG ISLAND CITY, N. Y.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEWARK, N. J.
NEW HAVEN, CONN.
NEW ORLEANS, LA.
OMAHA, NEB.
OKLAHOMA CITY, OKLA.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ROCHESTER, N. Y.
SAN ANTONIO, TEX.
SAVANNAH, GA.
SHREVEPORT, LA.
SPRINGFIELD, MASS.
ST. LOUIS, MO.
ST. PAUL, MINN.
SYRACUSE, N. Y.
TAMPA, FLA.
TOLEDO, OHIO
WASHINGTON, D. C.

Product

Tapestry Glass.

Also manufacturers of Mirrors and Plate Glass.

For Store Fronts, see pages 1224-1225; for Paints and Varnishes, see pages 1692-1695.

Tapestry Glass

Manufactured exclusively by the Pittsburgh Plate Glass Co. in $\frac{3}{16}$ and $\frac{5}{16}$-in. thicknesses.

Tapestry Glass is the result of an entirely new idea in plate glass manufacture.

By a special, exclusive process, the surfaces of Tapestry Glass are given a smoothly rounded texture not unlike fine fabric.

A tiny fraction of an inch beneath this gleaming surface, Tapestry Glass is perfectly clear, with all the purity of the finest plate glass.

Tapestry Glass disseminates the maximum of light in a brilliant flood, yet at a distance of a few feet it has all the qualities and advantages of a semi-opaque glass. A page of fine print is easily readable when placed close against Tapestry Glass, but a short distance away it becomes illegible.

Advantages of Tapestry Glass

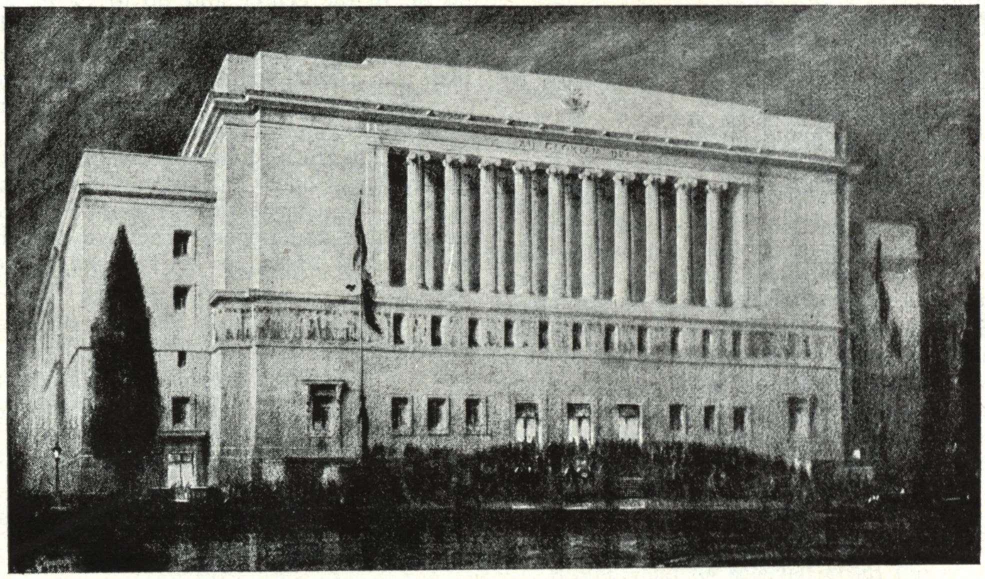
The advantages of Tapestry Glass are many and obvious. It admits and diffuses the maximum of light, yet it obstructs and obscures vision.

It is semi-opaque when used in office partitions, in windows or doors fronting on the street, or where there are distracting surroundings.

In stores, it may be used for side or rear windows and to replace prism glass in transoms above show windows.

In residences, Tapestry Glass is particularly suitable for fanlights, sidelights, transoms, front doors and windows.

In churches, banks, fraternal organizations, offices, schools—wherever a flood of clear light is necessary and privacy is desirable, Tapestry Glass will be used.



Scottish Rite Cathedral, St. Louis, Mo.
Wm. B. Ittner, Architect
Exterior doors, transoms and vestibule enclosures glazed with plain Tapestry Glass

Continued on next page

How Tapestry Glass May Be Decorated

Tapestry Glass may be beautifully decorated in a number of designs; ground, chipped or mitered permanently upon the surface.

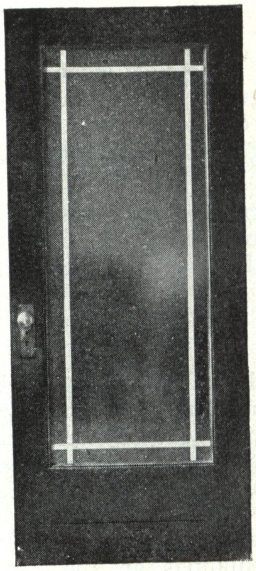
Numbers and names also look remarkably well when done in this manner.

Home owners and builders, architects and business men should investigate the many unusual qualities of this beautiful and useful product.

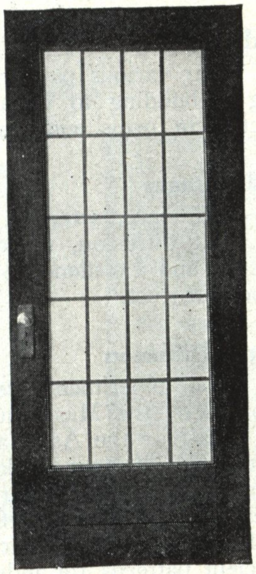
Samples

There have already been many cheaper glasses offered as a substitute for Tapestry Glass, but when you specify or order Tapestry Glass be sure that you get the genuine article.

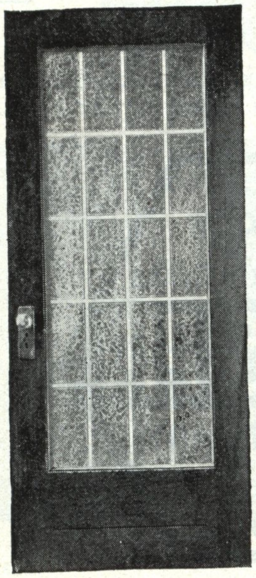
Samples, as well as any additional information desired will be gladly forwarded, on application from our warehouses.



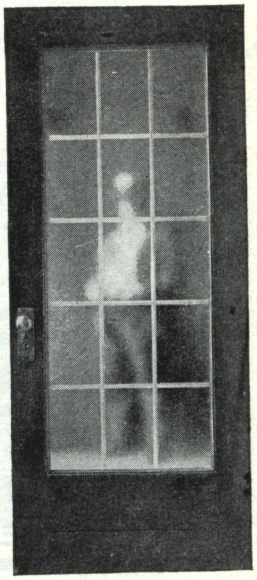
Plain Tapestry Glass with ¾-in. Sandblasted Lines 2½ in. from Edges



Tapestry Glass with Sandblasted Field, Leaving ½-in. Lines of Clear Glass

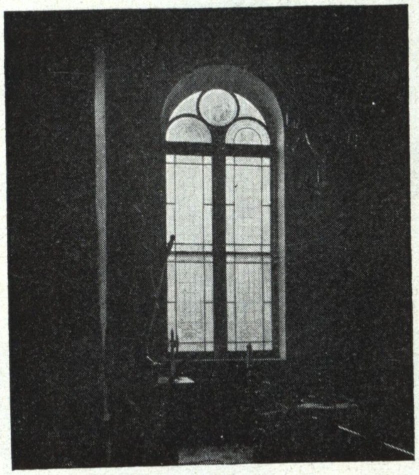


Tapestry Glass, Double Process Chipped in Panels, with Sandblasted Division Lines



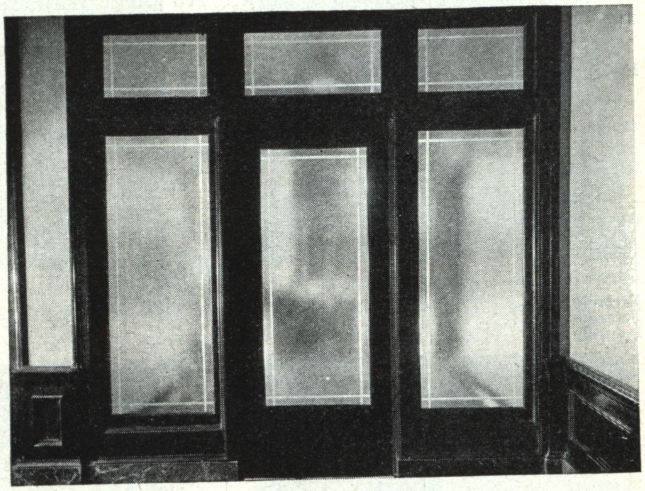
Tapestry Glass with Muntin Miter, Satin Finished

The figure 4 ft. from the door demonstrates the semi-opaque qualities of plain Tapestry Glass



Old St. Louis Cathedral

One of ten windows re-glazed with Tapestry Glass; sandblasted to design



Scottish Rite Cathedral

Section of office door, sidelights and transoms glazed with Tapestry Glass ornamented with ½-in. satin finish muntin miter

MISSISSIPPI GLASS CO.

220 Fifth Avenue
NEW YORK, N. Y.

TELEPHONE
Ashland 9550

BRANCH OFFICES

CHICAGO, ILL., 360 North Michigan Boulevard

ST. LOUIS, MO., 4070 North Main Street

Products

The best quality of Figured Building Glass and Standard Rough and Ribbed Glass for Skylights.

LARGEST
PRODUCER
OF
ROUGH ROLLED GLASS
MISSISSIPPI
GLASS COMPANY
220 FIFTH AVE.
NEW YORK

Identification Label

Description

Apex is a very high quality figured glass with the smooth surface polished, making it most brilliant and desirable for high class work. All other patterns are figured rolled glass with a natural smooth surface.

POLISHED BACK AND PLAIN FIGURED BUILDING GLASS, STANDARD ROUGH AND RIBBED GLASS, FACTROLITE AND PENTECOR

Type	Thickness, in.	Maximum width, in.	Maximum length, in.	Approximate weight per sq. ft., lb.
Apex (polished back)	¼	50	100	4
Aurora	⅛	48	130	2
Aurora	3/16	60	130	2½
Aurora	¼	60	130	3¾
Factrolite	⅛	48	130	2
Factrolite	3/16	48	130	2½
Factrolite	¼	48	130	3¾
Maze	⅛	48	130	2
Maze	3/16	60	130	2½
Florentine	⅛	48	130	2
Florentine	3/16	60	130	2½
Syenite	⅛	48	130	2
Syenite	3/16	60	130	2½
Muranese	⅛	42	110	2
Ondoyant	⅛	30	100	1¾
Fig. No. 2	⅛	42	110	2
Fig. No. 2	3/16	42	110	2½
Rough	⅛	48	130	2
Rough	3/16	48	130	2½
Rough	¼	48	130	3¾
Rough	⅜	48	130	5¼
Rough	½	48	130	7½
Ribbed	⅛	48	130	2
Ribbed	3/16	48	130	2½
Ribbed	¼	48	130	3¾
Ribbed	⅜	48	130	5¼
Ribbed	½	48	130	7½
Pentecor	⅛	48	130	2
Pentecor	3/16	48	130	2½

Adaptability

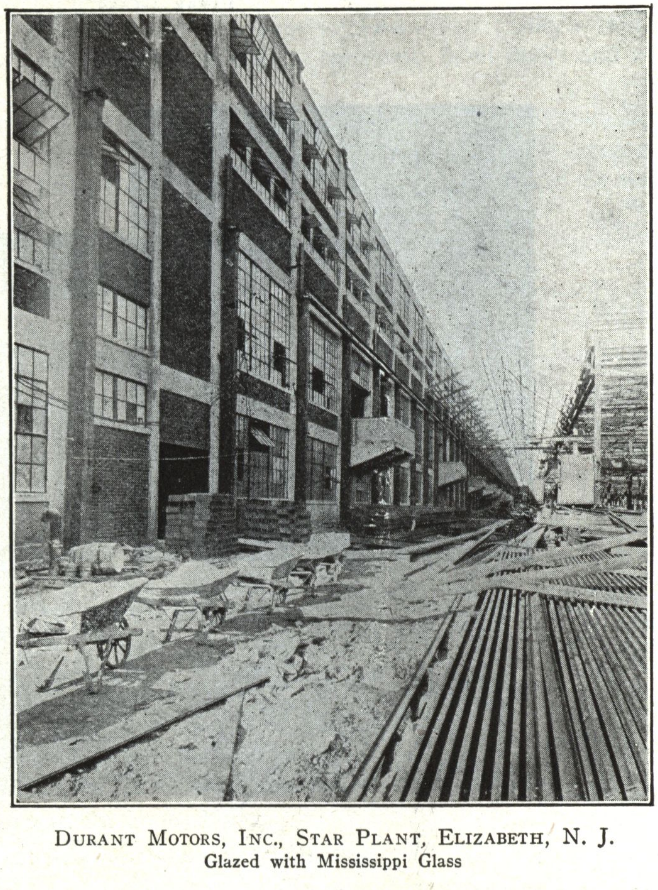
Our various patterns make it possible while erecting a building to install a figured glass which correctly conforms with any style of architecture.

Advantages

Brilliance, strength, true cutting surface, power of light diffusion, uniformity of color, originality of design and excellence of manufacture, combined with moderate cost.

Light Diffusion

The experiments conducted by Prof. Charles L. Norton of the Massachusetts Institute of Technology, on behalf of the Associated Factory Mutual Insurance Companies of New England, demonstrated that a proper combination of glass surfaces insures for a given floor area a vastly increased efficiency of light over that to be had by plain glass. Factrolite and Pentecor, the most efficient patterns for industrial buildings, are the result of extensive laboratory work on distribution of light through glass.



Durant Motors, Inc., Star Plant, Elizabeth, N. J.
Glazed with Mississippi Glass

Continued on next page

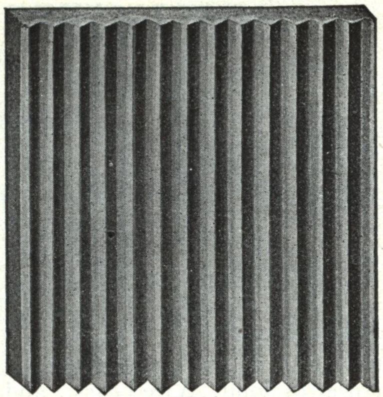
Ordering

Glass being one of the last materials to go into a building, it is often not ordered far enough ahead to give the manufacturer time to cut the glass to sizes and make shipment in time to enclose the building by the date desired. It is therefore advisable to give this point consideration in due time, as the tremendous demand for figured glass necessitates orders taking their turn as they are received.

In ordering, always specify width first.

Specifying

By specifying any of the patterns manufactured by the Mississippi Glass Co., the architect is insured against the substitution of inferior glass.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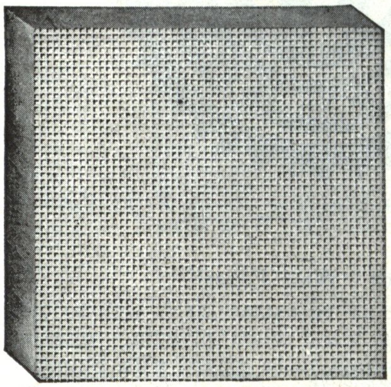
Pentecor Glass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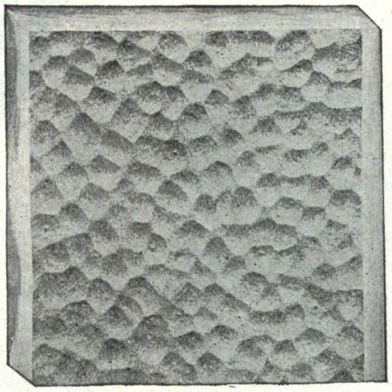
Factrolite Glass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Rough Glass

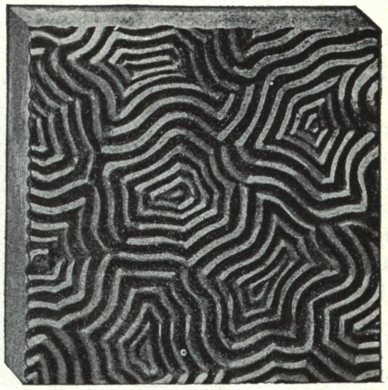
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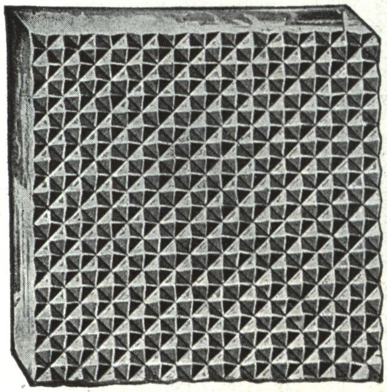
Figure No. 2 Glass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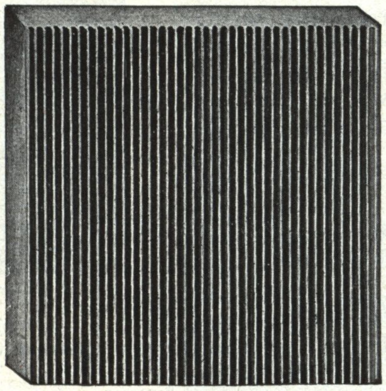
Aurora Glass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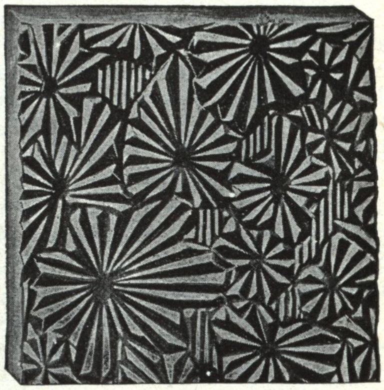
Ribbed Glass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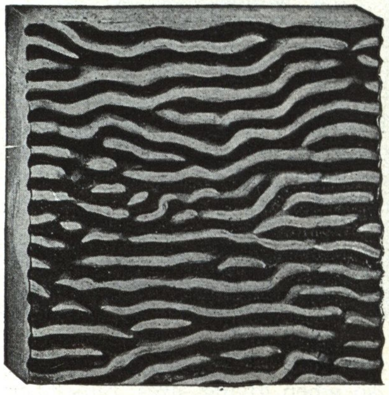
Florentine Glass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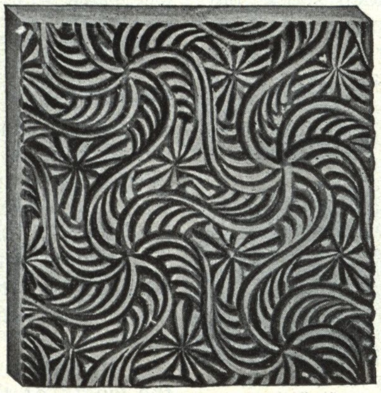
Ondoyant Glass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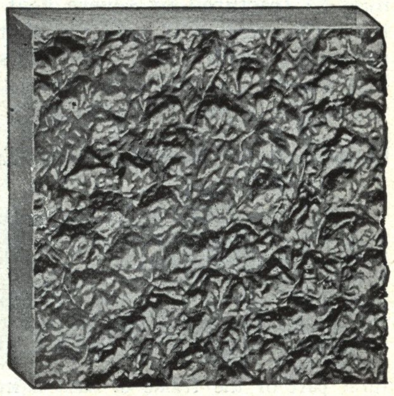
Maze Glass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Syenite Glass

MISSISSIPPI WIRE GLASS COMPANY

220 Fifth Avenue
NEW YORK, N. Y.

TELEPHONE
ASHLAND 9550

BRANCH OFFICES
CHICAGO, ILL., 360 North Michigan Boulevard
ST. LOUIS, MO., 4070 North Main Street

Products

"WIRE GLASS"; VAULT LIGHTS.

Mississippi "Wire Glass"

The MISSISSIPPI WIRE GLASS COMPANY is the original manufacturer of solid "Wire Glass," and its product is universally recognized as the standard wire glass, being the material upon which the underwriters' standard was based in 1899.

By our process of manufacture, Standard "Wire Glass" is cast solid, and has an average of fewer imperfections than any other wire glass on the market.

"Wire Glass" is rolled plate glass having a wire netting embedded equidistant from either surface. This process is automatically effected while the glass is in a molten state and, therefore, insures homogeneous and solid wire glass. The quality of metal and process of manufacturing Standard "Wire Glass" produce the very highest quality, with a tensile and transverse strength second to none.

Evidence of Quality—The fact that Mississippi "Wire Glass" is installed in all the better class buildings is unquestionable evidence of its superior quality and uniformity of color. Factory facilities enable us to furnish glass without unnecessary delay. At all times prompt service will be given.

Adaptability—The object of "Wire Glass" is to afford perfect and constant fire protection at a minimum cost, at the same time admitting and diffusing the light. It is particularly suitable for use in windows, doors, transoms, monitors, skylights and all places where fire or breakage protection is required.

Light Diffusion—The light may be increased in a room 30 ft. or more deep to from 3 to 15 times its present effect by using Factrolite, Pentecor, Maze, Syenite or Ribbed "Wire Glass," instead of plain glass in the upper sashes.

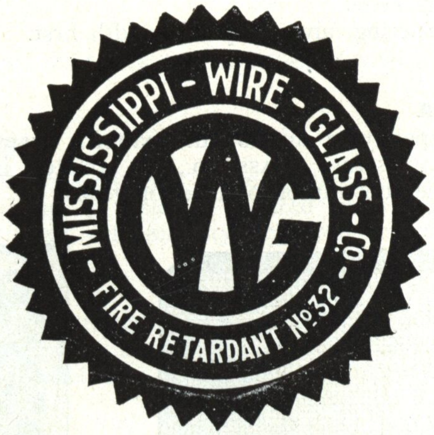
Conducting Condensation—Pentecor, when installed in skylights set at a proper angle, will conduct condensation and prevent dripping.

Advantages of "Wire Glass"

When employed as above mentioned, "Wire Glass" may be fractured by severe heat or sudden shock, but the wire mesh will hold the shattered pieces in place, preventing their falling and causing serious injury or loss of life. It will also prevent draft and hold a fire within the bounds of its origin.

Underwriters' Requirements, Extract from Rules—1906

(2) **Size of Glass**—(a) The unsupported surface of the glass allowed shall be governed by the severity of exposure and be determined in each case by the underwriters having jurisdiction, but in no case shall it be more than 48 in. in either dimension or exceed 720 sq. in. (b) The glass to be of such dimensions, after selvage is removed, that the bearing in the groove or rabbet is not to exceed ⅛ in. less than the full depth called for in rules 7 and 8. (c) The glass to be retained by the structural part of the frame or sash independently of the material which may be used for weatherproof purposes. Only non-inflammable material to be used in setting glass in the sash.



THIS LABEL (PRINTED IN RED) APPEARS ON EVERY PIECE OF STANDARD MISSISSIPPI "WIRE GLASS"

Advantageous Sizes of "Wire Glass"

In considering the above extract, it is well to bear in mind the following sizes when planning window, door and partition openings, to be glazed with Standard "Wire Glass," as these are the most advantageous sizes where glass is not to exceed 720 sq. in.

15x48 in. 18x40 in. 20x36 in. 24x30 in.

THICKNESSES, MAXIMUM SIZES AND APPROXIMATE WEIGHTS OF MISSISSIPPI "WIRE GLASS" AND VAULT OR FLOOR LIGHTS

Type	Thickness, in.	Maximum width, in.	Maximum length, in.	Approximate weight per sq. ft., lb.
"WIRE GLASS"				
Polished	5/16	48	130	4
Polished	5/8	30	72	8
Maze	1/4	48	130	3¾
Maze	3/8	48	130	5¼
Factrolite	1/4	48	130	3¾
Factrolite	3/8	48	130	5¼
Syenite	1/4	48	130	3¾
Rough	1/4	48	130	3¾
Rough	3/8	48	130	5¼
Ribbed	1/4	48	130	3¾
Ribbed	3/8	48	130	5¼
Pentecor	1/4	48	130	3¾
VAULT OR FLOOR LIGHTS				
Rough "Wire Glass"	3/4	30	72	9¾
Ribbed "Wire Glass"	3/4	30	72	9¾
Ground "Wire Glass"	3/4	30	72	9¾
Polished "Wire Glass"	3/4	30	72	9¾

Ordering

Glass being one of the last materials to go into a building, it is often not ordered far enough ahead to give the manufacturers opportunity to cut the glass to sizes and make shipment in time to enclose the building by the date desired.

It is therefore advisable to give this point consideration, as the tremendous demand for Standard "Wire Glass" necessitates orders taking their turn as they are received.

In "Wire Glass," the twist of the wire runs with the length of the sheet so when giving sizes, remember the first dimension is understood to be the width.

Continued on next page

How to Specify

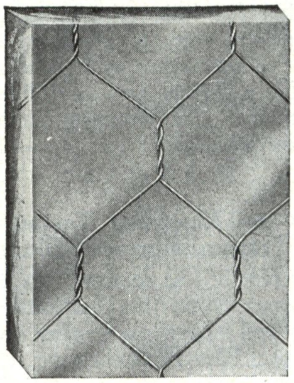
"Wire Glass" shall be installed in [specify location] and in all places marked "W. G." on plans and elevations.

The "Wire Glass" to have a thickness of at least ¼ in. at thinnest point. Wire mesh to be not larger than ⅞ in., and no wire used for such mesh to be smaller than No. 24 B. & S. gage. Plane of the wire mesh to be practically midway between the two surfaces of the glass.

Selvage shall be removed from glass before framing.

[State here type or types of glass to be used and where.]

Note: Where the recognized standard and perfected product is required, specifications should call for "'Wire Glass,' the product of MISSISSIPPI WIRE GLASS COMPANY."



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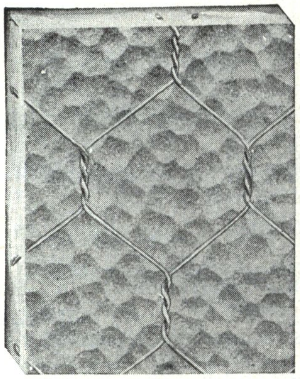
POLISHED "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thickness about 5/16 in.
Special ⅝ in. thick for port lights



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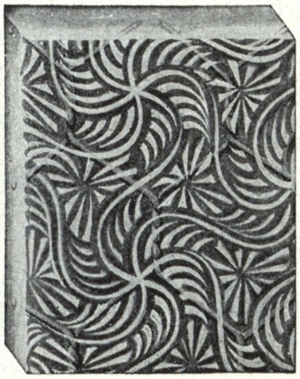
ROUGH "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thicknesses ¼ and ⅜ in.



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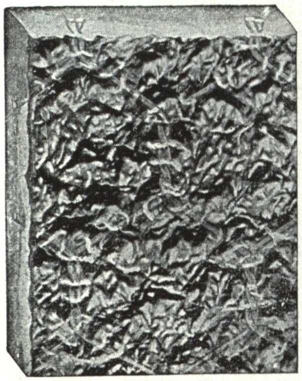
MAZE "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thicknesses ¼ and ⅜ in.



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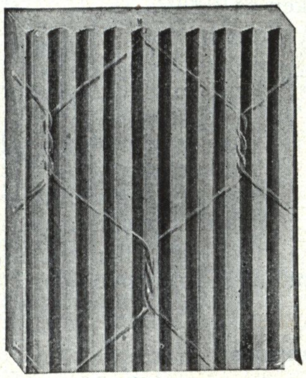
SYENITE "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thickness ¼ in.



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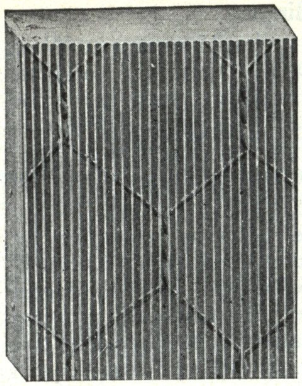
PENTECOR "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thickness ¼ in.



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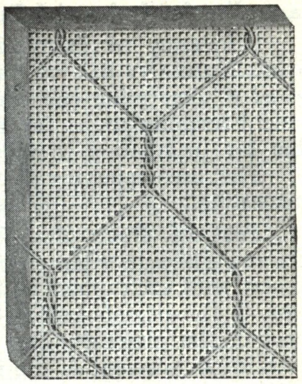
RIBBED "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thicknesses ¼ and ⅜ in.



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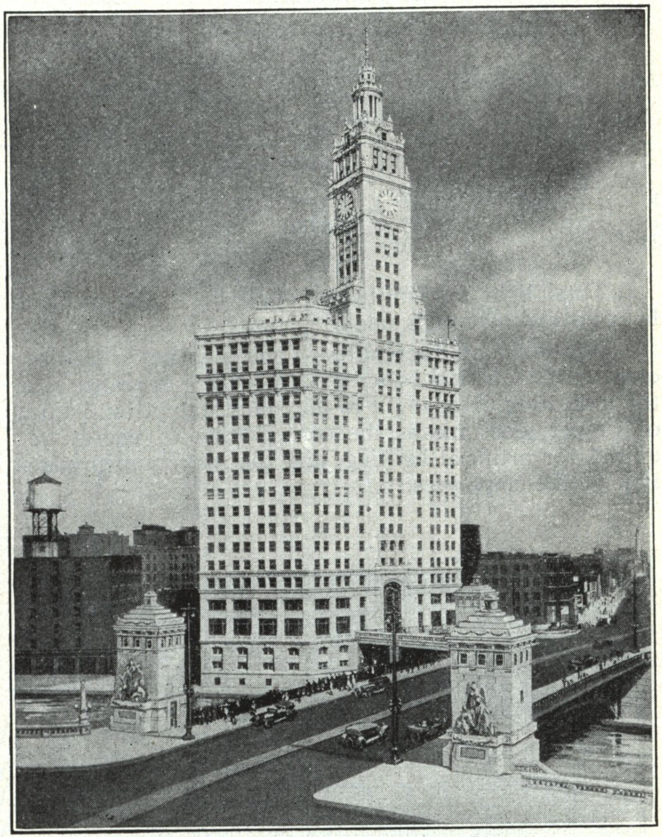
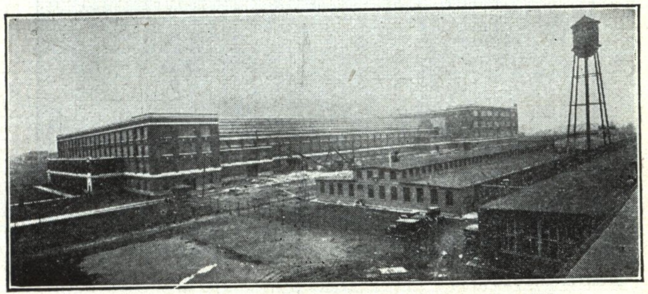
FACTROLITE "WIRE GLASS"
Sizes up to 48 in. wide and 130 in. long
Thicknesses ¼ and ⅜ in.



WRIGLEY BUILDING, CHICAGO, ILL.
An example of the type of building in which Mississippi Polished "Wire Glass" is used



A. O. SMITH CORP. BUILDING, MILWAUKEE, WIS.
An ideal example of an industrial building in which thousands of square feet of Factrolite "Wire Glass" were used

Continued on next page

Factrolite for Industrial Buildings

Efficiency of Factrolite—The Mississippi Wire Glass Company has had practically every kind of glass tested to determine efficiency in light transmission and finds Factrolite to be far ahead of anything else suitable for installation in industrial buildings.

The accompanying report and plotting speak for themselves.

Test of Factrolite—The tests were made by measuring the distribution of light in two planes perpendicular with each other, with light from an incandescent lamp 3 ft. distant falling normally upon and passing through the glasses. The relative light intensities are recorded in per cent of the normal (0°—normal—equals 100%).

REPORT No. 24558
DISTRIBUTION OF LIGHT TRANSMITTED THROUGH FACTROLITE—INCIDENT LIGHT ON ROUGH SIDE OF GLASS—RELATIVE LIGHT INTENSITIES

	First Plane		Plane Perpendicular to First Plane	
Angles	Right	Left	Right	Left
0 (Normal)	100%		100%	
2½	60.5	86.5	85.2	75.4
5	41.8	51.8	41.0	28.9
7½	24.0	30.6	15.8	13.8
10	9.88	13.3	1.33	9.14
15	1.43	4.45	.39	1.31
20	.101	.81		

Total light transmitted through Factrolite incident light normal on rough side of glass: 84.5%.

Economy of Factrolite—Today, as never before, owners of industrial buildings are coming to realize that the utilization of daylight to its fullest extent by the use of proper glass means the conservation of energy required for artificial lighting, and the maximum production of the employees.

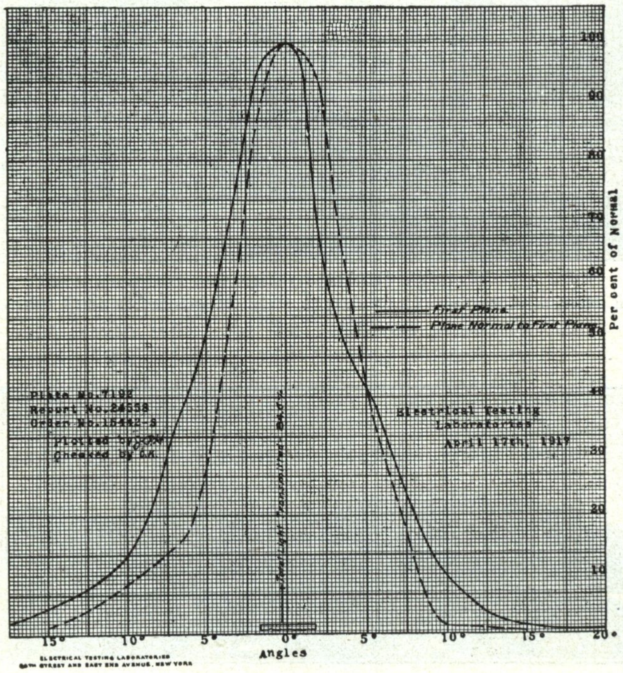


Chart Showing Efficiency in Light Transmission with Factrolite

Whereas more heat is required to maintain a given temperature in a building with 80% of its wall area glass than is required for a wall area of 20% glass, this additional heat is required for only five months of the year, whereas with the 20% glass area, it is necessary to artificially light the building a large part of the time.

Factrolite breaks up the rays of the sun, diffusing the light and distributing it equally.

Inspection Invited—Before placing a contract for glass, those interested are urged to get a sample of Factrolite and compare it with every other make of glass recommended for industrial buildings.

Without a doubt, they will become convinced that Factrolite offers the maximum of lighting efficiency with the minimum of cost, thus reducing the overhead and cost of maintenance, and increasing the efficiency of manufacturing the commodities.

Tests Made by the Electrical Testing Laboratories Showing Transmission and Illumination

Test Report No. 28482 rendered to the Mississippi Wire Glass Company on the distribution of illumination through figured sheet glass windows in a model room made by the Electrical Testing Laboratories of New York City.

Object—An investigation to study the distribution of daylight illumination in a room with various types of ¼-in. figured sheet glass used in the window.

Test Room—*Model*—Representing a room 50x100x14 ft.

Scale—1 ft. equals 25 ft. (24x48x7 in.)

Windows—Continuous on one side of room 3 ft. high, sill 4 ft. from floor.

Ceiling and Walls—White glass finish (commercial factory paint).

Floor—Brown linoleum (having reflection factor of average factory floor).

Test Stations—Test stations in five lines, as shown.

Source of Light—Concentrated filament incandescent lamp, representing the sun at 30° from horizon. The intensity of the sun was approximately proportioned to the size of the room.

Sky uniformly bright within ± 20%.

Light within the room—direct sunlight, 80%; skylight, 20%.

Result of Tests—Transmission of light through glass samples, in per cent of clear glass, Clear Glass taken as 100%.

Rough wire	98%
Syenite	87%
Maze wire	82%
Factrolite wire	88%
Pentecor wire horizontal	90%
Pentecor wire vertical	94%
Ribbed vertical	96%
Ribbed horizontal	99%

Horizontal illumination of working plane, equivalent to 40 in. above floor.

Samples

Samples of the Mississippi Wire Glass Company's products are filed with the Architects Samples Corporation, New York City, or will be supplied direct by us upon request.

Continued on next page

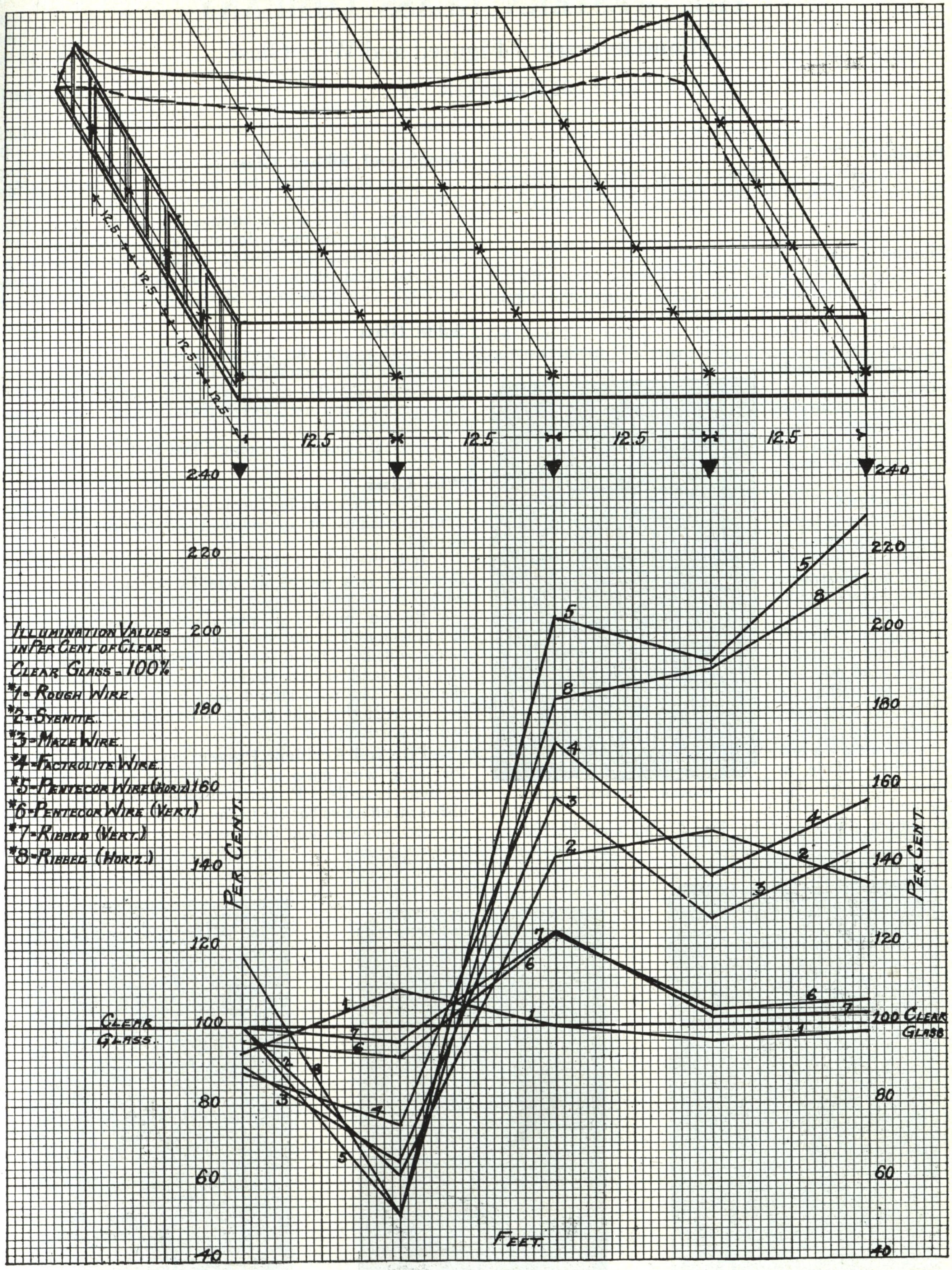


Chart of Illuminating Values of Mississippi "Wire Glass"
Horizontal illumination on working plane equivalent to 40 in. above floor

THE WESTERN GLASS COMPANY

Manufacturers of Figured and Wire Glass

STREATOR, ILL.

Products

Figured Glass; Wire Glass, Plain and Figured; Rough and Ribbed Glass; Sheet Prism Glass; Polished Wire Glass.

Figured Glass

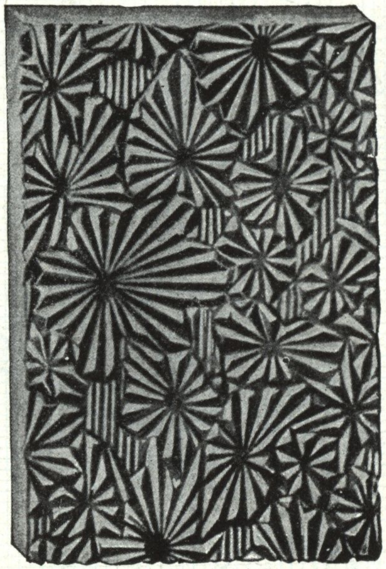
This is designed for use in hallways, areas, interior partitions, and similar constructions, where the admission of light without transparency is desired.

Made of the best materials obtainable and moulded in attractive patterns, it adds materially to the decorative effects of such installations.

Its distinctive advantages for this service have given it an established reputation.

Designs—The figured glass is made up in a large number of designs, some of which are illustrated in the accompanying cuts. This glass can be supplied to match any style of architecture and to conform to architect's or builder's requirements.

Sizes and Weights—Made in thicknesses of ⅛, $\frac{3}{16}$ and ¼ in., with maximum dimensions of 48x120 in., and 48x132 in.



Radiant Figured Glass

Rough and Ribbed Glass

Especially adapted for heavy service in skylights, partitions and factory windows.

Sizes—Made in thicknesses of ⅛, $\frac{3}{16}$, ¼, ⅜ and ½ in., with maximum dimensions of 48x120 in. for ⅛-in. thickness, and 48x132 in. for other thicknesses.

The ¾-in. thick glass is furnished in rough glass or rough wire glass in cut sizes, not in stock sheets.

Solite Glass

Used where the maximum *diffusion* of light, as well as the maximum *amount* of light is required.

Nearly 200,000 sq. ft. of ¼-in. Solite Wire Glass was specified and used in the Naval Supply Base building, Brooklyn, N. Y.

Special samples of Solite Glass sent on application.

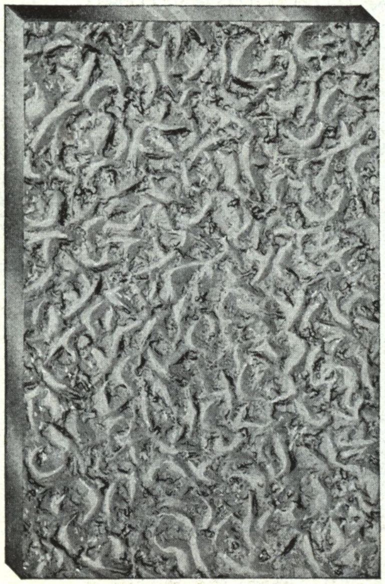
Wire Glass

Wire glass can be furnished in any of the regular figured designs or in polished transparent sheets, as desired.

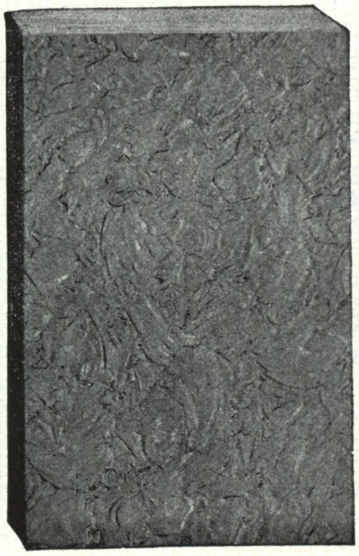
It is made by a single-pour process, and the reinforcement is a special wire fabric of our own design, with 3 twists and 5 loops at the vertical strand.

By our method of manufacture, this wire fabric is incorporated in the sheet of molten glass while it is being rolled. This makes the finished product better able to stand severe strains and sudden temperature changes. The wire strand used is so thin that it does not obstruct the light and is scarcely noticeable under ordinary conditions.

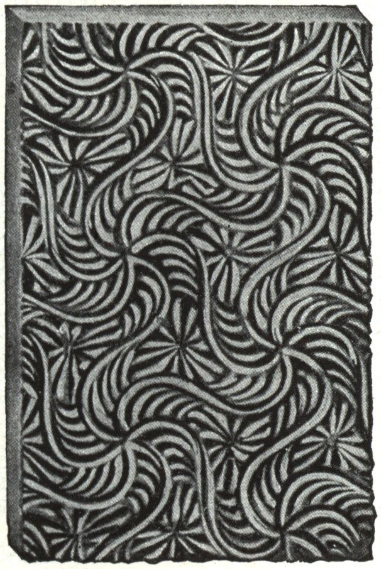
Fire and Accident Prevention—The main reason for using wire glass is the reduction of the fire and accident hazards. Properly installed, wire glass furnishes an effective barrier to the spread of flames through exposed windows and other openings.



Moss Figured Glass



Carnation Figured Glass



Comet Figured Glass

Continued on next page

In this connection our product has stood the severe tests imposed by the Underwriters' Laboratories, Inc., and has been fully approved by the Fire Underwriters' Association.

Each sheet bears the identification marks of the Underwriters' Laboratories, Inc.

In windows subject to heavy wind pressures or liable to injury from carelessness or from flying bodies, the installation of wire glass insures against injury to pedestrians from falling glass and against the resulting damage suits.

Sizes—Made in thicknesses of ¼, ⅜ and ½ in., sizes up to and including 48 in. wide by 132 in. long.

Standard wire glass is made as near as possible to 5/16 in. thick in accordance with the rules of the Underwriters' Laboratories, Inc., covering standard construction of fireproof windows and skylights.

All kinds of wire glass furnished in the standard ¼ and ⅜-in. thickness.

Wire glass is furnished in other thickness as called for by engineering requirements.

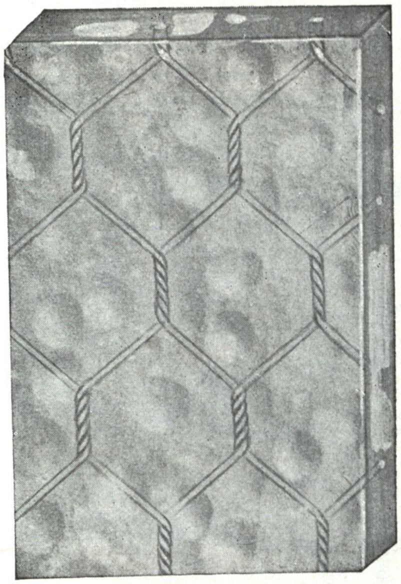
Sheet Prism Glass

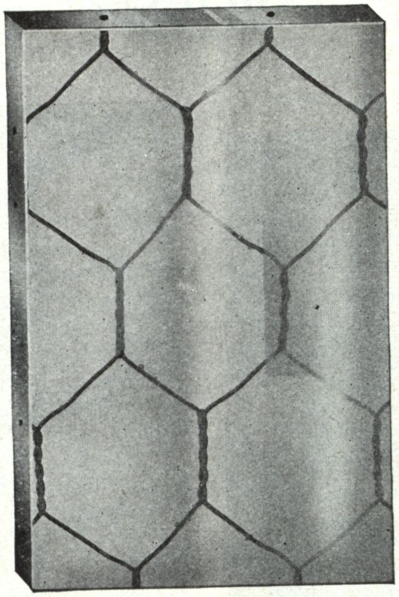
Where it is desired to project daylight well back into an interior, our sheet prism glass is an effective glazing medium for producing the maximum lighting efficiency.

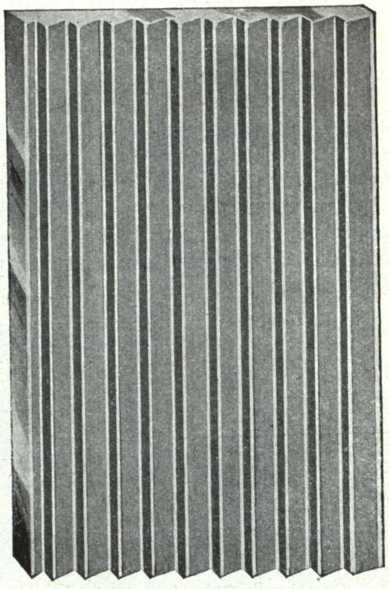
Furnished in standard thickness and in sizes up to 50 in. wide and 132 in. long.

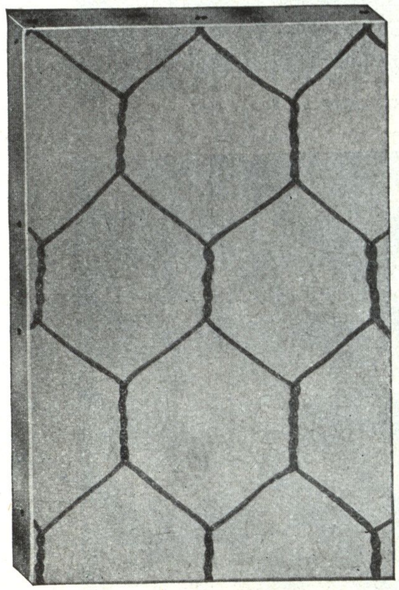
WEIGHTS OF GLASS PACKED FOR SHIPMENT

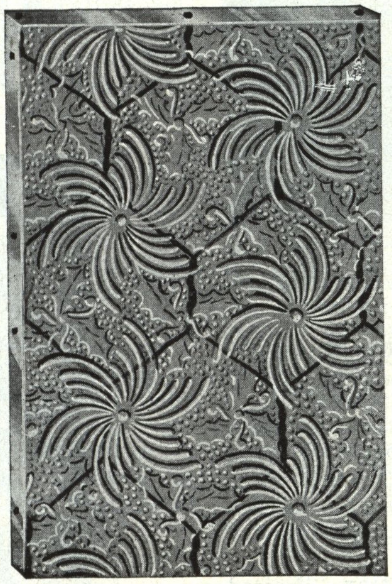
Thickness, in.	⅛	3/16	¼	⅜	½	¾
Weight, lbs. per sq. ft.	2½	3½	4½	6	8	11

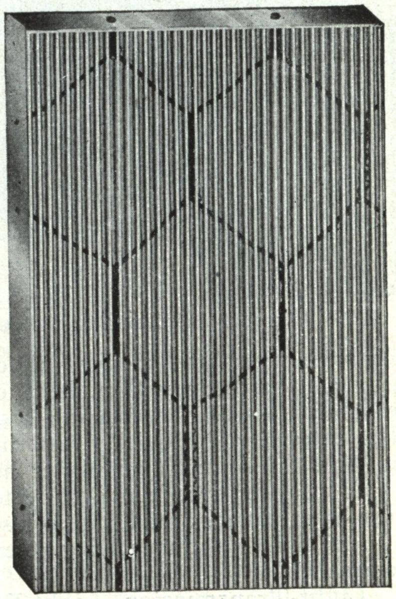

Solite Wire Glass


Rough Wire Glass


Sheet Prism Glass


Polished Wire Glass


Holly Wire Glass


Ribbed Wire Glass

MANUFACTURERS GLASS COMPANY

Manufacturers of Pressed Lens Glass

38 South Dearborn Street
CHICAGO, ILL.

SUPPLIED BY LEADING GLASS JOBBERS EVERYWHERE

IT'S
PRESSED
LENS
WIRE
GLASS

Pressed Lens Wire Glass

A non-transparent, highly translucent glass, both surfaces of which are made up of small overlapping lenses. Underwriters' Laboratories, Inc., standard wire netting is embedded midway between surfaces. The lens formation takes the light from any angle and breaks it up into a brilliant glow that practically eliminates shadows and reaches all parts of room evenly. The lenses themselves make the glass obscure. There is no opaque or rough surface to turn back the light.

Advantages—Briefly, Pressed Lens Wire Glass has perfect cleanability, extraordinary light transmission and light projection, combined with remarkably attractive appearance. It should always be used where no vision is required. No gloom—increased daylight.

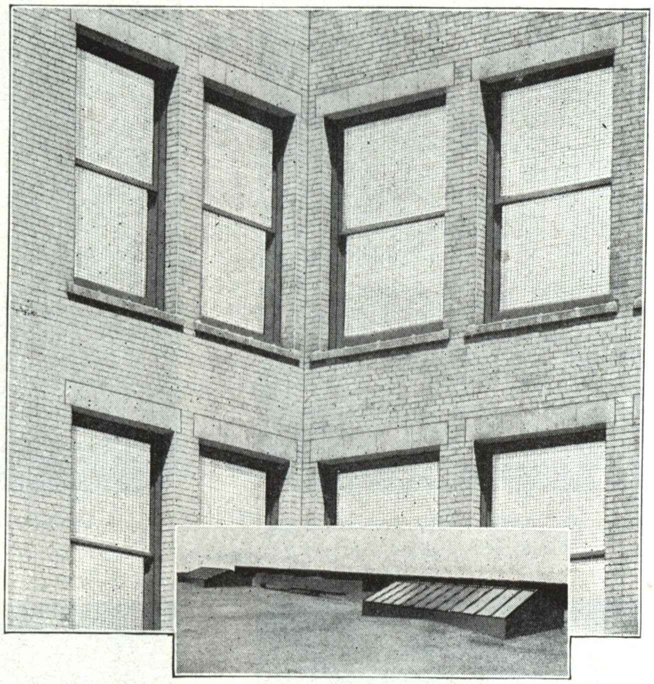
Perfect Cleanability—Pressed Lens Glass has a *high fire polish* which no dirt can penetrate. It has no indentations where dirt can lodge and presents a drainable surface without crevices which may be cleaned easily and perfectly with a damp cloth. This perfect cleanability makes the cleaning cost of Pressed Lens Glass extremely low, quickly restoring its original luster and light transmission no matter how long it is used.

ELEVATOR ENCLOSURE AND TRANSOM LIGHT

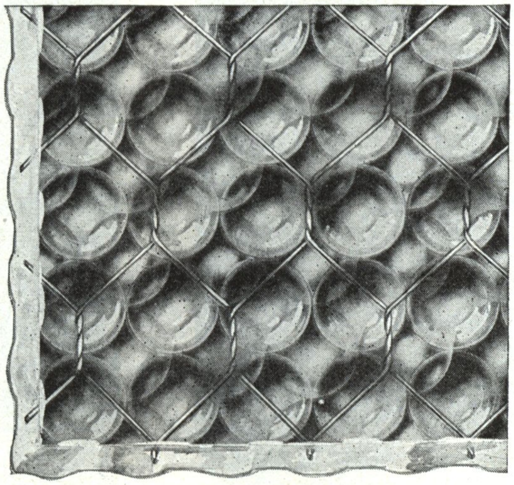
It is entirely free from grime catching crevices which cause other patterns gradually to lose their translucency and shut light out, thus solving a vexatious problem for the architect.

Light-Transmission, Light-Projection—Pressed Lens Glass affords 30% more light than most obscure wire glass by redirection of light through the overlapping lenses. Ordinary patterns in wire glass with more or less porous surfaces intercept light and dirt, decreasing transmission. See our comparative test folder D. 22.

Attractiveness—A high fire polish together with white-metal glass and distinctive lens design produce a sparkling white color and luster not found in any other obscure glass. It has the same quality as compared to ordinary wire glass that polished plate glass has to common glass. With Pressed Lens Wire Glass appearance



COURTS AND SKYLIGHTS



PRESSED LENS WIRE GLASS

Continued on next page

is not sacrificed in the many places where obscure wire glass must be used.

Fire Protection—The strength of the wire mesh, added to the exceptional strength of the lens formation, makes Pressed Lens Wire Glass an effective fire retardant. Even when cracked into many pieces by heat or impact of heavy objects, it will hold its place, stop draft, and prevent injuries or spread of fire.

Sizes—Sizes up to 52 in. wide and 100 in. long. Thickness, full ¼ in. Rabbet same as for plate glass. Send for sample of Pressed Lens Wire Glass.

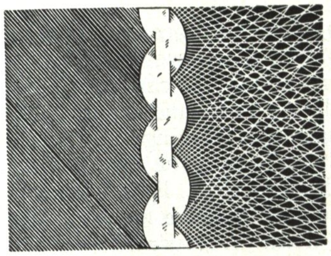
Weight—Weight per sq. ft., 4 lbs.

Cost—About half as much as polished plate glass. Supplied by glass jobbers everywhere.

Specifications—Pressed Lens Wire Glass as manufactured by the Manufacturers Glass Company, 1224 First National Bank Building, Chicago, Ill., full ¼ in. thickness to be glazed in all sash windows, doors, transoms, skylights, ceiling lights and other exterior openings and elevator enclosures where wire glass is required by the National Board of Underwriters, and elsewhere as shown by plans and specifications, all rabbets to be same as for plate glass.

Pressed Lens Glass

$\frac{3}{16}$-in. Pressed Lens Glass for daylighting offices, corridors, stores, assembly rooms and all other interiors where obscure glass is required.



The Principle Behind Pressed Lens Glass

Note the breaking up of direct light rays, even distribution to all parts of the room

Description — Both surfaces of Pressed Lens Glass are made up of many small overlapping lenses. Direct light, on hitting one side of the glass from any angle, is split up by the lenses into millions of rays that project in all directions into the room and the daylight glow reaches every corner. It is this breaking up of the rays that makes the glass non-transparent, obscure, glareless. There is no opaque substance in the glass itself and no roughness on its surface to hinder light transmission or turn back the light.

Features—Of a white color, the fire polished surface makes a brilliant, sparkling, attractive glass not equalled by any other pattern.

Its perfect cleanability through the mere application of soap and water assures economy of upkeep and lowers expense for artificial light, because the original sparkle and luster is always retained.

There are positively no sharp crevices where dirt can lodge, and the surface is perfectly drainable.

Adaptability—Pressed Lens Glass in office and corridor partitions, bank screens, window inclosures, casement sash, ceiling lights, etc., increases the value of the rentable area by virtue of its being the only cleanable obscure glass made, thus adding 25% more light to the interior. It may be lettered as flat glass.

Pressed Lens Glass eliminates all eyestrain due to poor daylighting when used in ceiling lights over auditoriums and assembly rooms, telephone exchanges, gymnasia, laboratories and manual training rooms of schools.

When used in sawtooth skylights it floodlights the entire area below, because of its *multiple-refraction* properties.

Its sanitary qualities make it especially adaptable to use in hospitals and sanitariums.

The use of Pressed Lens Glass in schools in the upper sash on those elevations facing the east, south and west, increases the daylight in cloudy weather and there is neither glare nor need of window shades under average conditions.

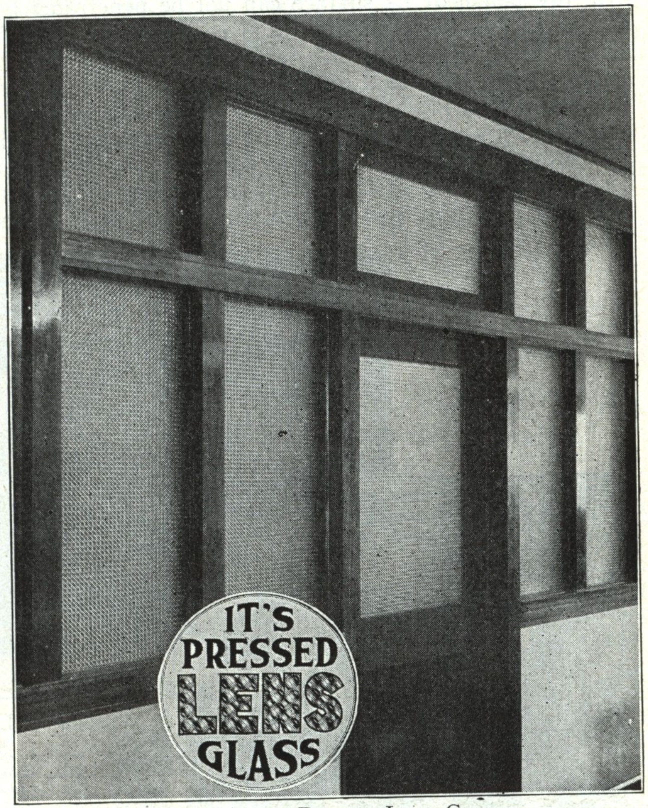
Light reflection in inner courts of public buildings such as schools, hospitals and libraries where sunlight enters, has until recently been a vexatious problem. The use of Pressed Lens Glass now arrests the reflection at its source, while ultimately directing the daylight to the farthest corner of each room.

Cut sizes of Pressed Lens Glass are used with division bars, divided into panels, if desired, in transoms over plate glass windows assuring maximum daylight and perfect cleanability at minimum cost.

Pressed Lens Glass in steel or wood sash solves almost all of the problems incident to proper daylight: transmission, refraction and reflection, and in all types of buildings—commercial, industrial and residential.

Tests—Comparative tests, Folder D-22, by The Electrical Testing Laboratories, of fourteen patterns of figured glass for light transmission show that Pressed Lens Glass transmits 95% of the light as against an average for other patterns of only 76%.

Sizes and Thickness—Cut sizes of practically any dimensions desired may be furnished from stock sheets maximum sizes 54x100 in. and the thickness is full $\frac{3}{16}$ in. Weight of this glass is 2½ lbs. per sq. ft. Rabbets to be same as for plate glass. Samples of Pressed Lens Glass furnished free on request.



Partition of Pressed Lens Glass

Specifications—Sheet Pressed Lens Glass, $\frac{3}{16}$ in. thickness, as manufactured by the Manufacturers Glass Company, 1224 First National Bank Building, Chicago, Ill., to be glazed in all interior communicating sash doors and partition openings, all toilet room windows, ceiling sash under skylights, casement doors, sash partitions on mezzanine, French doors and other openings, as shown by plans and specifications, all rabbets to be same as for plate glass.

Service Department—We maintain a Service Department which is operated to assist the designer and specification writer in solving any problem dealing with light refraction and reflection.

Send for free samples of Pressed Lens Glass.

Continued on next page

Pressed Lens Glass Tiles

IT'S PRESSED LENS GLASS TILE

Pressed Lens Glass 4x4-in. Tile, a cleanable glass, for daylighting interiors.

Pressed Lens Glass—Pressed Lens Glass is made on a strictly scientific principle of the re-direction and projection of light by an overlapping lens medium producing *multiple-refraction* of light. The entire surface of both sides of the glass is made up of small overlapping lenses (actual size shown below) which take the light at any angle and break it up evenly into a clear daylight glow that reaches every corner of the room without glare. The glass is rendered non-transparent by the refraction of light through the lenses—*not* by any opaque substance or roughness on the surface, such as hinders the passage of light through other obscure glass, yet no shades are required under average conditions.

Pressed Lens Glass is attractive, brilliant and sparkling, white in color. Because of the absolute absence of acute angles on its surfaces, this glass has no grime nor grease collecting prisms, shelves or pockets. The beautiful fire polish of its surface can not be penetrated by dirt or grease and it is easily and economically cleaned by the mere application of ordinary soap and water. Easy to clean because it drains. Its perfect cleanability, too, bespeaks a product that always maintains its maximum light projection qualities and luster wherever used.

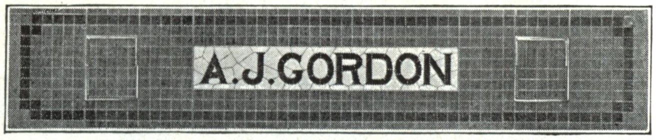
Store Front—For transom lights of store fronts it has no equal. Pressed Lens Glass is made of 4x4-in. *tiles* ready for glazing in any size panel required. Frames to fit any opening, set in reinforced metal sash, copperplated, geometrically correct and waterproof, unusually ornamental and pleasing to the eye. Also, geometric designs of any pattern or squares of any sizes, oblong or otherwise, made into copperplate frames to fit any opening for transoms or ceiling lights.

Day and night sign panels may be built into the frames of most attractive glass letter design and harmonious color combination.

Of greater advertising value than painted or other signs.

These units may be ventilated by modern types of sash which co-ordinate with the entire scheme.

Improved ventilator with *detachable copper screen* supplies maximum ventilation, is firmly secured by reinforced steel bars and prevents flies and dirt from entering.



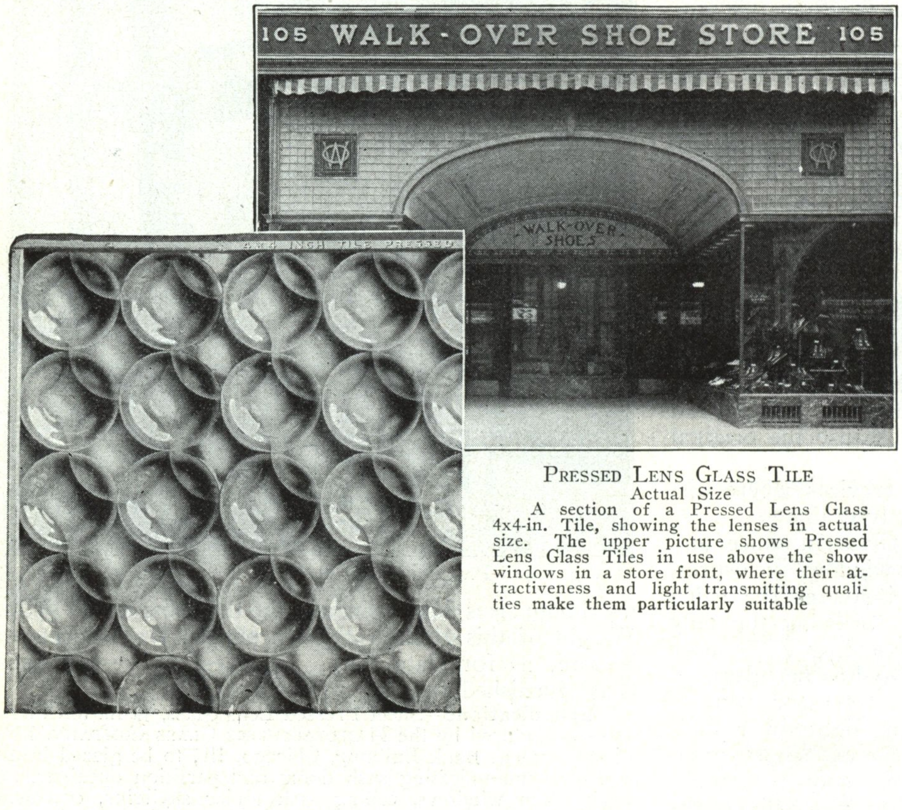
TRANSOM LIGHT

Perfect Cleanability—The surface of Pressed Lens Glass contains none of the sharp crevices common in other patterns of obscure glass. It can be cleaned quickly and easily with ordinary soap and water. The surface is perfectly drainable and, having no crevices to catch and retain the dirt, it keeps its high degree of light transmission and its attractive luster as long as it is used. Because of this perfect cleanability Pressed Lens Glass has a lower cleaning cost than other glass, while at the same time its translucency can not be diminished by an accumulation of grime embedded in its surface.

Sizes and Thickness—Frames to fit any opening made of 4x4-in. tile Pressed Lens Glass, thickness ¼ in. Weight about 3½ lbs. to sq. ft. Frames guaranteed to fit any standard copper store front construction.

Send for sample of Pressed Lens Glass Tile.

Specifications—Pressed Lens Glass 4x4-in. tile glazed in copperplated bars secured by strengthening bars, tile cemented and guaranteed waterproof. ¼-in. frames to fit openings as shown on plans and specifications, as manufactured by the MANUFACTURERS GLASS COMPANY, 1224 First National Bank Building, Chicago, Ill. All rabbets to be same as for plate glass.



PRESSED LENS GLASS TILE
Actual Size
A section of a Pressed Lens Glass 4x4-in. Tile, showing the lenses in actual size. The upper picture shows Pressed Lens Glass Tiles in use above the show windows in a store front, where their attractiveness and light transmitting qualities make them particularly suitable

PENNSYLVANIA WIRE GLASS COMPANY

WALTER COX, President

EXECUTIVE OFFICE
Pennsylvania Building
PHILADELPHIA, PA.

CABLE ADDRESS:
"Wire Glass, Philadelphia"

WORKS
DUNBAR, PA.

HIRES TURNER GLASS COMPANY, DISTRIBUTORS
ALBANY, N. Y. BALTIMORE, MD. ROCHESTER, N. Y. PHILADELPHIA, PA. WASHINGTON, D. C.
PACIFIC SLOPE DISTRIBUTORS, Rolph Mills and Co., SAN FRANCISCO, CAL.

PENNSYLVANIA WIRE GLASS CO.
PHILADELPHIA
APPROVED
SOLID
WIRE GLASS
FIRE RETARDANT
NEW YORK
UNDERWRITERS
IDENTIFICATION

TRADE-MARK

Products

Skylights and Glazed Roofing; Marquises; Glazed Canopies, Sidewalls, etc.

Solid Wire Glass, Plain, Polished, Corrugated (CWG) Figured and Actinic Glass (Heat-Intercepting) with and without wire netting.

Also Glass without wire netting, in various patterns and thicknesses to suit every requirement.

Glass Patterns and Thicknesses

Patterns—Rough, Ribbed, Figured (Cobweb and Florentine), and Polished (transparent).

Thicknesses—⅛, $\frac{3}{16}$, ¼, ⅜ in., etc. Also Corrugated Wire Glass, $\frac{5}{16}$ in. thick.

Wire Glass

Process—Solid wire glass, made by the Pennsylvania continuous process, is completely formed by one pouring and one rolling; the only process that makes possible the manufacture of wire glass as thin as ⅛ in.

Fire Protection—Wire glass is a valuable fire retardant—it prevents flames from attacking adjacent buildings.

Approval (Distinguishing Mark)—All of our wire glass ¼ in. and over in thickness has the full approval of the National Board of Fire Underwriters as a fire retardant, which requires a distinguishing mark to identify the glass. Our distinguishing mark is our *cabled strand,* appearing every 10 in. across the sheet and the full length of each sheet.

Service—We offer gratuitous engineering advice on all glass problems.

Samples—Samples, catalogues and circulars on request.

Specifications—Architects should always specify "Solid Wire Glass manufactured by the Pennsylvania Wire Glass Company."

SAMPLES
DISPLAYED
WITH
ARCHITECTS SAMPLES
CORPORATION
NEW YORK, N.Y.
EST 1913

Actinic Glass (Heat-Intercepting)

Properties—*Actinic Glass,* a special glass made by this Company, has been tested by the United States Bureau of Standards (report by us on request). This glass excludes 85% of the ultra-violet (glare) rays of the sun, and 55% of the sun's radiant energy.

Protection—*Actinic Glass* protects the eyes from the harmful action of these rays; it also affords protection (especially in the prevention of fading) in the course of manufacture and use of such materials as might be injured under their action, as silk, rubber, colored paper, etc.

Surfaces and Thicknesses—*Actinic Glass* is made in corrugated, rough, ribbed and polished surfaces and in ⅛, ¼ and $\frac{5}{16}$-in. thicknesses.

Corrugated Wire Glass (CWG)

Corrugated wire glass is made to meet the demand for a substantial skylight that can be placed on a roof of any material, including corrugated iron and corrugated asbestos.

CWG admits maximum daylight and diffuses it, making a well lighted building with practically no glare or shadow.

Uses—CWG can be used in skylights, roofs, sidewalls, marquises, canopies, and wherever *daylight* and *fire protection* are desired.

Weight—CWG weighs about 4½ lbs. per sq. ft.

Strength—CWG has strength many times greater than any other glass of equal thickness. This is due to the corrugations.

Kinds—CWG made in deep angle (2½ in. center to center of corrugations) and in shallow angle ($2\frac{11}{16}$ in. center to center of corrugations).

Standard Sizes—Deep angle, 27¾ in. wide by 42 or 64 in. long. Shallow angle, 26½ in. wide by 42 or 64 in. long.

Approval—CWG has the full approval of the National Board of Fire Underwriters and meets with their every requirement as a fire retardant glass. Its use on exposed openings reduces insurance.

Corrugated Wire Glass Marquise

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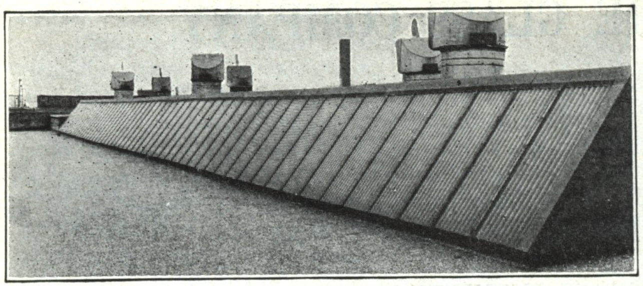
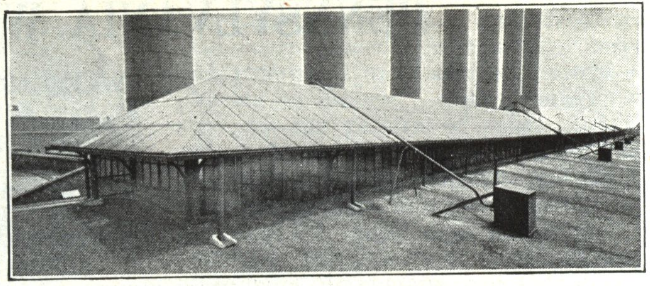
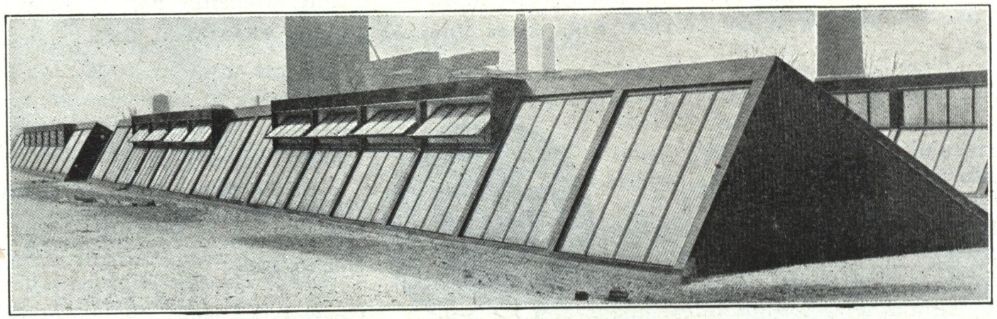


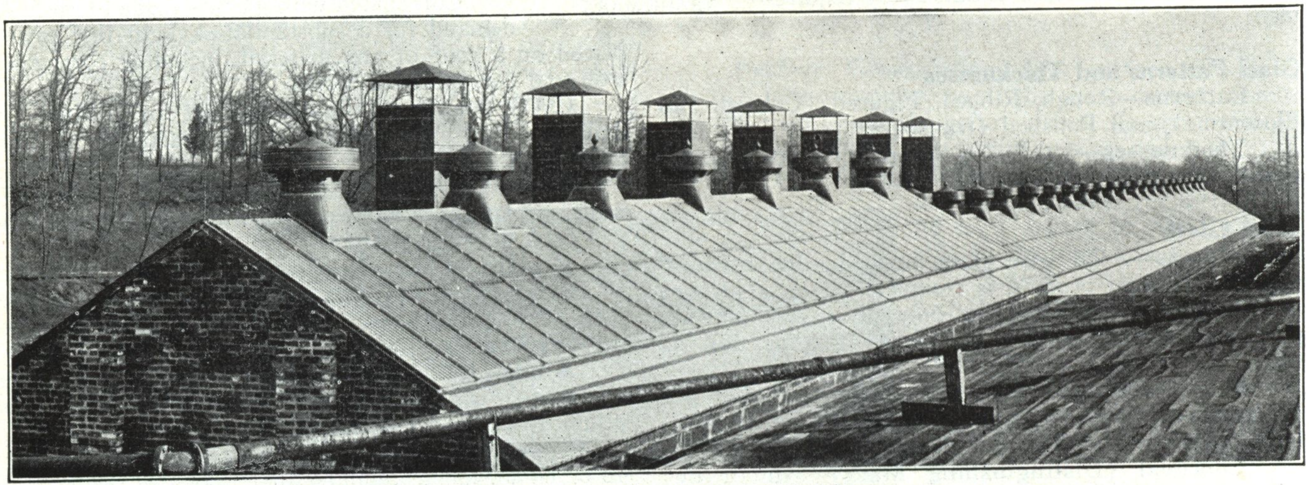
Corrugated Wire Glass Skylight (Sawtooth)



Corrugated Wire Glass Skylight (Hipped)

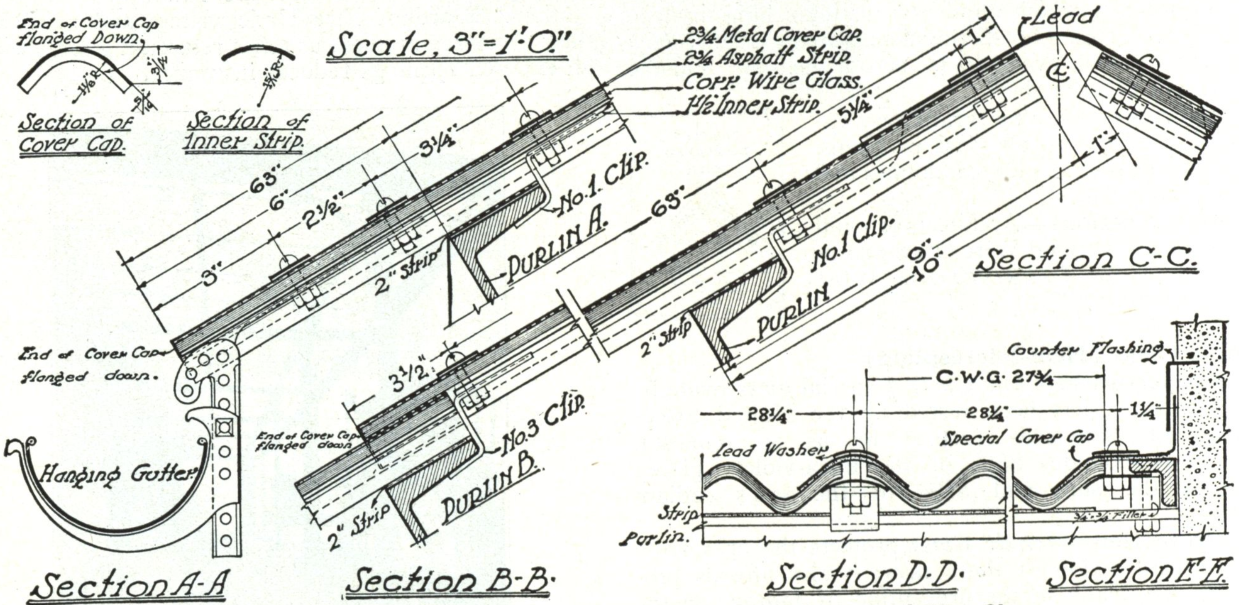


Corrugated Wire Glass Skylight (Sawtooth)



Corrugated Wire Glass Gable End Skylight

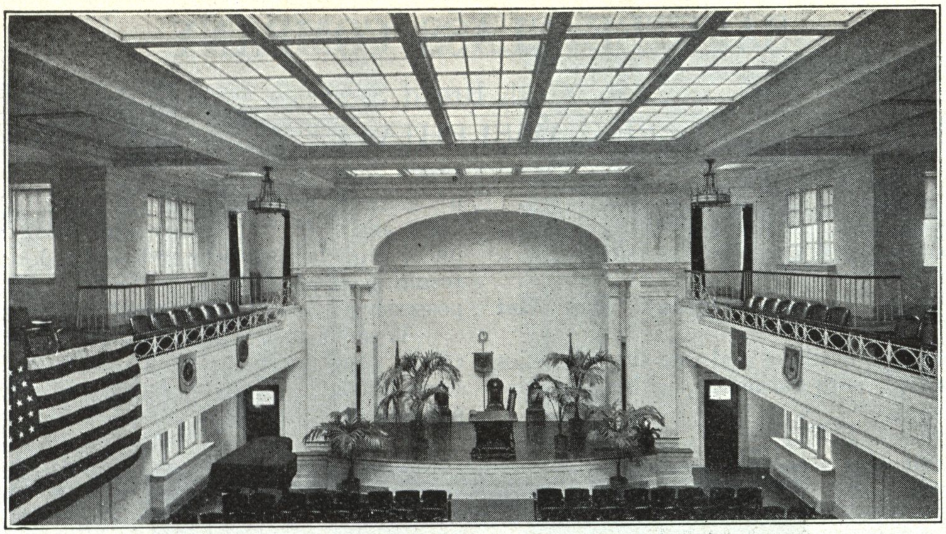
Skylights Manufactured and Executed by the Pennsylvania Wire Glass Company


End of Cover Cap flanged Down
1 1/8"R
3/4"
5/16"
Section of Cover Cap.
1 1/8"R
Section of Inner Strip.
Scale, 3"=1'-0"
2 3/4 Metal Cover Cap.
2 3/4 Asphalt Strip.
Corr. Wire Glass.
1 1/2 Inner Strip.
Lead
1"
5 1/4"
1"
3 1/4"
63"
6"
2 1/2"
3"
No. 1 Clip.
PURLIN A.
2" Strip
63"
No. 1 Clip.
9"
10"
PURLIN
2" Strip
Section C-C.
End of Cover Cap flanged down.
Hanging Gutter
3 1/2"
End of Cover Cap flanged down
No. 3 Clip.
PURLIN B.
2" Strip
Counter Flashing
C·W·G· 27 3/4
28 1/4"
28 1/4"
1 1/4"
Special Cover Cap
Lead Washer
Strip
Purlin.
3/4 x 2 1/2 Filler
Section A-A
Section B-B·
Section D-D·
Section E-E.

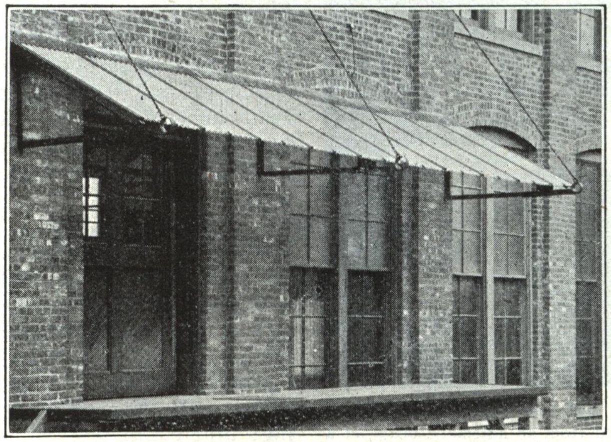
Details Showing Skylight and Roof Construction Using Corrugated Wire Glass

Send for catalogue No. 8 showing complete details

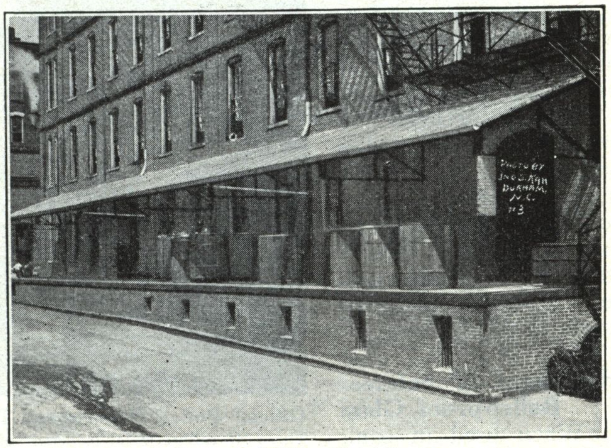
Continued on next page



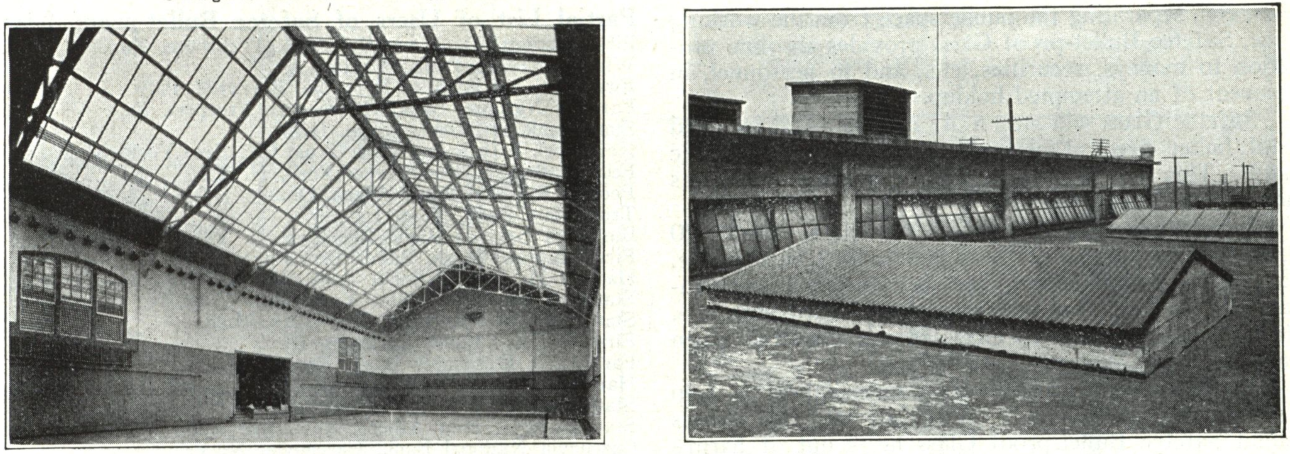
Corrugated Wire Glass Skylight Using Diffusing Sash. Note Splendid Lighting Effect



Corrugated Wire Glass Canopy



Corrugated Wire Glass Canopy



Corrugated Wire Glass Gable End Skylights

Skylights and Canopies Manufactured and Executed by the Pennsylvania Wire Glass Co.

Specifications for Installation of CWG

All glass shown or marked "CWG" on plans to consist of corrugated wire glass manufactured by the Pennsylvania "Solid" process. Roof purlins should be spaced 5 ft. center to center if I-beams, or back-to-back if channels, which allows 3 in. for lap at end joints. For sidewalls, the spacing of the T-iron girts should be 5 ft. 4 in. center to center of supporting girts.

Method of Laying—Lay glass edge to edge and allow ½ in. space between the sheets of glass. Cover joints with a 3-in. wide asphalt strip coated with elastic cover cap compound on side next to glass, the full length of sheet of glass. Then cover with a 2¾-in. wide metal strip, with turned down nose at bottom end of glass, full length of glass, and underneath place a 1½-in. metal strip. Main fasteners to be hooked to purlins with reinforcing clips securely fastened with ¼x1½-in. rustproof bolts with lead washers placed on top of cover caps. Between the purlins or main fasteners, put in intermediate bolts, not over 12-in. centers, consisting of rustproof ¼x1-in. bolts with lead washers securely screwed down. Tighten bolts snugly so as not to strain glass.

Roofing—Always have laps of glass come over purlins. Lay on purlins a 2-in. felt strip coated with Ruberine paint; also lay a 2-in. felt strip, coated on both sides with Ruberine paint, between glass at lap.

Accessories—Provide all metal caps and inner strips, bolts, washers, clips, protective Ruberine paint, elastic cover cap compound, asphalt strips, felt strips, etc., necessary to make a watertight and workmanlike job. Provide two coats of protective Ruberine paint for all metal work.

Provide ridge roll, securely bolted to purlins; all spaces to be made watertight by filling in with elastic sealing cement.

SAFETEE GLASS COMPANY

326 North Broad Street
PHILADELPHIA, PA.

Product

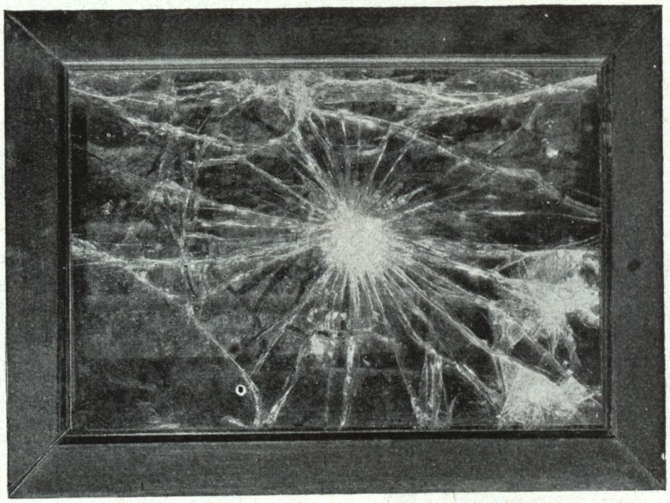
Safetee Bullet-proof Glass for Bank Enclosures and other places subject to the sudden attacks of robbers.

"Bandits Kill Bank Cashier—Holdup Men Get $28,000"

A familiar enough headline and one that statistics show will be repeated, with variations, within the next and succeeding hours.

To prevent this enormous loss of life and property, new and more efficient methods of protection are necessary — methods that will eliminate the factor chiefly responsible for the success of most holdups—intimidation.

This requires that the employee be placed beyond reach of the bandit's bullet. Safetee Bullet-proof Glass does just this, while at the same time it interferes in no way with the employee's ordinary duties.



Official Police Department Test of Safetee Bullet-proof Glass
Three .45 calibre metal jacketed bullets, fired from an automatic pistol, at a distance of 3 ft., did not penetrate the glass

Advantages of Safetee Bullet-proof Glass

When used in bank partitions, tellers' windows, etc., separating the public space from the working space, Safetee Bullet-proof Glass provides absolute protection to moneys, securities, etc., and to personnel, in the event of an attempted holdup.

Safetee Glass will stop a .45 calibre metal jacketed pistol bullet fired at close range from an automatic pistol. This has been well proven in numerous tests such as that illustrated.

Illustration shows sample of this glass, size 12x20 in. that stopped three of these bullets at 3 ft. distance. This sample is still intact, just as you see it, notwithstanding the fact that test was made four years ago. The integrity of Safetee Glass is not impaired when cracked.

Bandits depend largely upon intimidation to help them in making a "haul." When an employee stands behind Safetee Bullet-proof Glass he is out of harm's way and therefore can not be intimidated. If he can not be intimidated, the holdup can not be successful. Banks and cars protected by Safetee Bullet-proof Glass are left alone by bandits—they pick easier prey.

For all practical purposes Safetee Glass is as fully transparent as the best quality polished plate glass.

And no less important than the practical advantages above listed is the fact that Safetee Glass does not detract in the slightest from the artistic effect demanded in bank fixtures.

Construction Features

Safetee Bullet-proof Glass is made up of 5 layers of material, consisting of 3 pieces of polished plate glass and 2 binding layers, the whole welded together under high temperature and tremendous pressure. The resulting product is a perfectly solid sheet of glass possessing great strength and resiliency.

When struck a sharp, heavy blow the cushioning effect, resulting from the laminated construction, prevents the glass from shattering and the missile from penetrating. As shown in tests and in actual use strong impacts cause a multiple of hairlike cracks, but no breaks or splinters.

Sizes

Safetee glass can be furnished in sizes up to 33x55 in. and ⅞ in. thick. Allowance should be made for a variation of $\frac{1}{16}$ in. plus or minus in thickness.

Service

We will be glad to co-operate with the architect in furnishing suggestive designs for any desired installation, together with detailed drawings and estimates.

Partial List of Users of Safetee Bullet-proof Glass

First National Bank of Wellsboro, Wellsboro, Pa.
Windsor Savings Bank, Windsor, Vt.
First National Bank of Bernville, Bernville, Pa.
Farmers National Bank of Freeport, Freeport, Pa.
State Bank of Salem, Salem, Ind.
New York Life Insurance & Trust Co., New York, N. Y.
Federal Reserve Bank, New York, N. Y.
Peoples National Bank, Adena, Ohio
Troy State Bank, Troy, Ind.
Bushwick Savings Bank, Brooklyn, N. Y.
First National Bank, Bakertown, Pa.
Haddon Heights National Bank, Haddon Heights, N. J.
Standard Oil Co. of New York, New York, N. Y.
State Bank of Flat Rock, Flat Rock, Mich.
First National Bank, Lockport, Ill.
Farmers & Merchants Bank, Fenton, Mo.
Hanna City State Bank, Hanna City, Ill.
State Bank of Niantic, Niantic, Ill.
State Bank of New Athens, New Athens, Ill.
Cazenovia National Bank, Cazenovia, N. Y.
Cassandra Deposit Bank, Cassandra, Pa.
Farmers State Bank, Darien, Wis.
Greber State Bank, Argenta, Ill.
Lincoln National Bank, Hamlin, W. Va.
State Bank of Rockwood, Rockwood, Mich.
First National Bank, West Allis, Wis.
Florida National Bank, Florida, N. Y.
Caldwell State Bank, Cathan, Ill.
Bank of Detroit, Detroit, Mich.
John Hancock Life Insurance Co., Boston, Mass.
National Shawmut Bank of Boston, Boston, Mass.
Peninsular State Bank, Detroit, Mich.
American State Bank, Detroit, Mich.
Fletcher Savings and Trust Co., Indianapolis, Ind.
Murphy-Wall State Bank & Trust Co., Pinckneyville, Ill.
Norristown-Penn Trust Co., Norristown, Pa.
Trenton State Bank, Trenton, Mich.
Lyons State Bank, Lyons, Ill.

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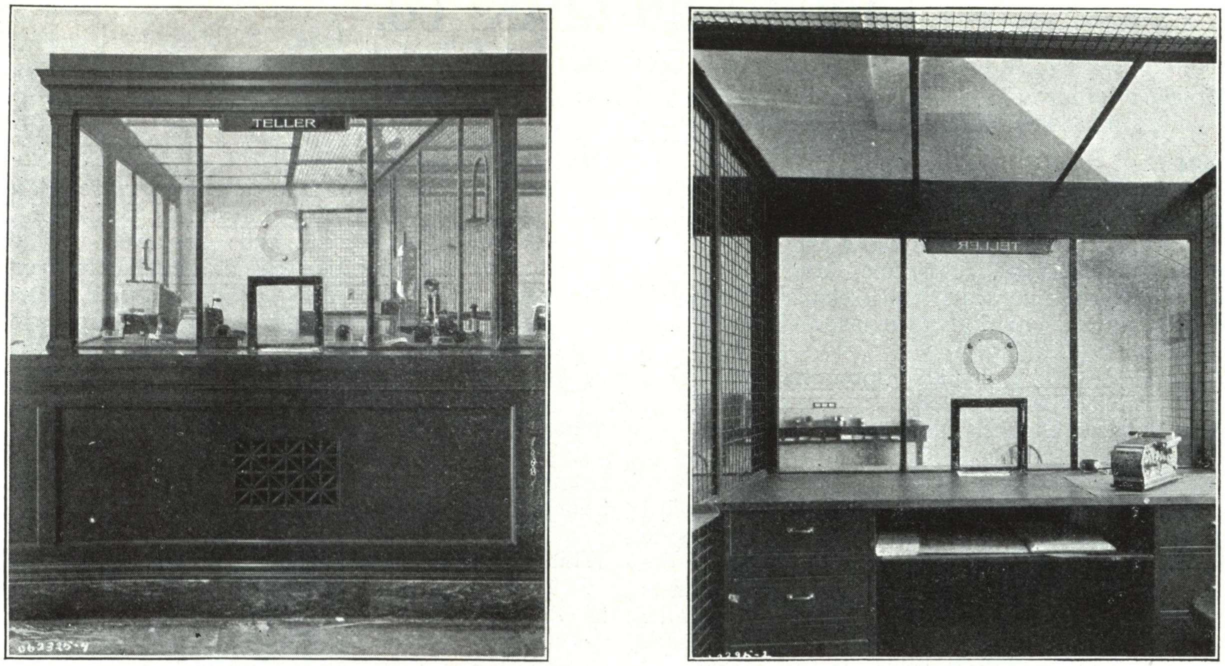
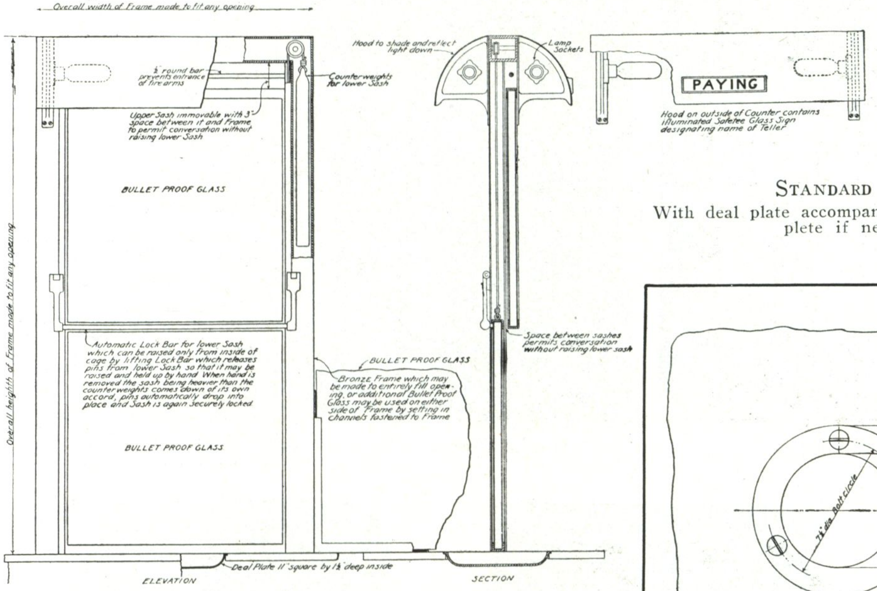


Outside of Cage

Inside of Cage

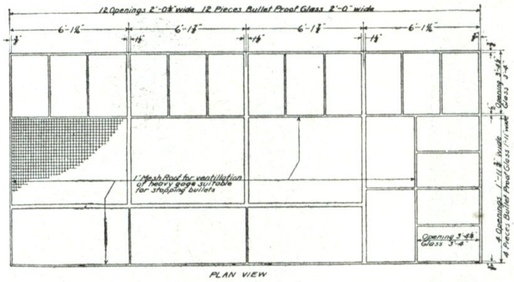
Safetee Bullet-proof Glass Installation in the Kenmore-Governor Square Branch, National Shawmut Bank, Boston, Mass.

The views above show Safetee Bullet-proof Glass installed in the front and roof of the teller's cage, including conversation hole with baffle plate attached, hinged door for passing large packages, sunken deal plate and roof protection extending 40 in. back from line of partition

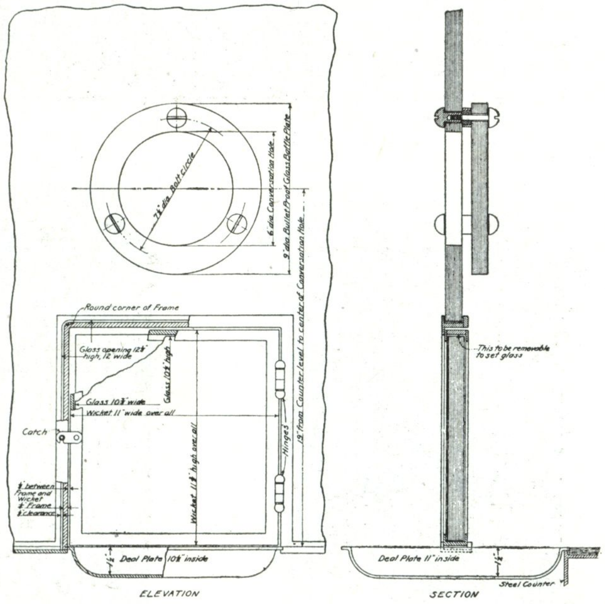

Overall width of Frame made to fit any opening
½" round bar prevents entrance of fire arms
Counterweights for lower Sash
Upper Sash immovable with 3" space between it and Frame to permit conversation without raising lower Sash
BULLET PROOF GLASS
Hood to shade and reflect light down
Lamp Sockets
PAYING
Hood on outside of Counter contains illuminated Safetee Glass Sign designating name of Teller
Overall heighth of Frame made to fit any opening
Automatic Lock Bar for lower Sash which can be raised only from inside of cage by lifting Lock Bar which releases pins from lower Sash so that it may be raised and held up by hand When hand is removed the sash being heavier than the counter weights comes down of its own accord, pins automatically drop into place and Sash is again securely locked
BULLET PROOF GLASS
BULLET PROOF GLASS
Bronze Frame which may be made to entirely fill opening, or additional Bullet Proof Glass may be used on either side of Frame by setting in channels fastened to Frame
Space between sashes permits conversation without raising lower sash
Deal Plate 11" square by 1½" deep inside
ELEVATION
SECTION

Standard Teller's Window

With deal plate accompanying which can be furnished complete if neat opening is given


12 Openings 2'-0⅛" wide 12 Pieces Bullet Proof Glass 2'-0" wide
6'-1½"
6'-1⅞"
6'-1⅞"
6'-1½"
⅞"
1½"
1½"
1½"
Opening 3'-4½"
Glass 3'-4"
1" Mesh Roof for ventillation of heavy gage suitable for stopping bullets
4 Openings 1'-11⅞" wide
4 Pieces Bullet Proof Glass 1'-11" wide
Opening 3'-4½"
Glass 3'-4"
PLAN VIEW

Typical Installation for Roof of Enclosure


7½" dia. Bolt circle
6" dia. Conversation Hole
9" dia. Bullet Proof Glass Baffle Plate
19" from Counter level to center of Conversation Hole
This to be removable to set glass
Round corner of Frame
Glass opening 12⅛" high, 12" wide
Glass 10⅞" high
Glass 10⅞" wide
Wicket 11" wide over all
Catch
Hinges
Wicket 11⅛" high over all
⅛" between Frame and Wicket
⅛" Frame
⅛" clearance
1½"
Deal Plate 10½" inside
Deal Plate 11" inside
1½"
Steel Counter
ELEVATION
SECTION

Typical Installation at Teller's Window

Installation Details of Safetee Bullet-proof Glass

HIGHLAND GLASS CO.

WASHINGTON, PA.

SALES OFFICES

NEW YORK, N. Y., 100 Hudson Street

CHICAGO, ILL., 111 West Washington Street

Products

Rolled Glass, including Hammered Cathedral and Smooth Cathedral in plain colors and combination of colors; Ripple Glass in white and colors; Figured Glass in Colonial, Florentine, Moss, Silverglas, Mystic and Peerless in white, and Colonial, Florentine and Moss in plain colors; Prism Glass; and Rough and Ribbed Skylight Glass.

Wire Glass in Colonial, Florentine, Silverglas, Moss, Prism, Rough and Ribbed.

Also Polished Glass in Ideal and Wire Glass.

Production

This company produces the greatest variety of rolled glass products in the United States. Having four separate plants, a continuous supply of their product can be depended on at all seasons. They control their own sources of supply of raw materials, are situated on both the Pennsylvania and Baltimore & Ohio Railroads and have removed as far as humanly possible the fuel troubles of so many other plants; thus assuring a constant operation.

Official Indorsement

The production of the Highland wire glass is under the supervision of the National Board of Fire Underwriters, is tested and approved by them periodically and carries their official indorsement as attested by their having designated it as "Fire Retardant No. 295." Additional information can be had by reference to the National Board of Fire Underwriters.

Where Obtainable

Highland Glass Co's. products may be secured from the leading jobbers of glass throughout the United States, Canada, Mexico, Cuba and Japan.

White Figured Glass

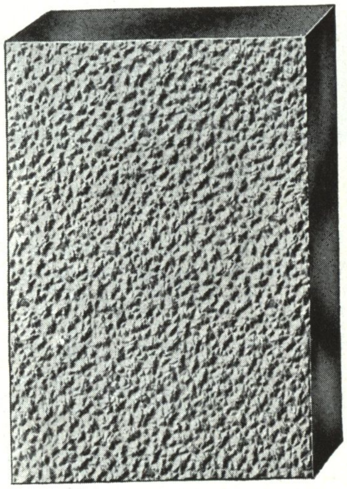
In ⅛-in. and 3/16-in. thicknesses; widths up to 48 in.; lengths up to 136 in. This company manufactures the largest variety of attractive patterns—clearly cut—giving the maximum diffusion of light.

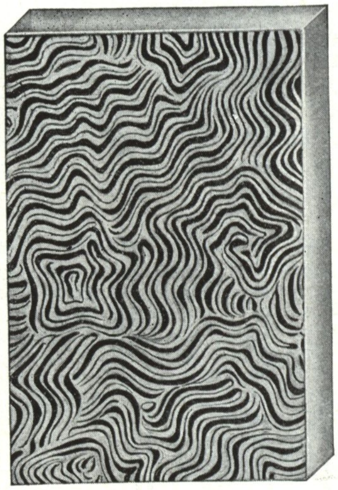
Esthetic Value

Highland products are recognized the country over for their superiority in brilliancy, color and durability, due to the proper selection of ingredients and careful workmanship throughout their manufacture.

Practical Value

For more than twenty years the products of this company have been recognized as standard. They excel in smooth surface, cutting qualities, flatness, durability and color.


Silverglas

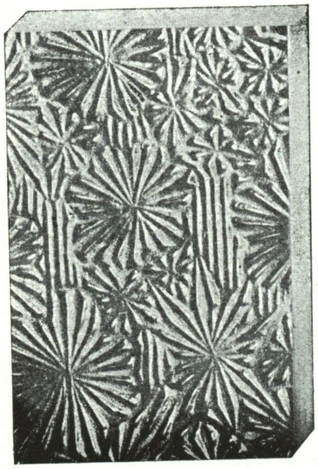

Colonial Figured Glass

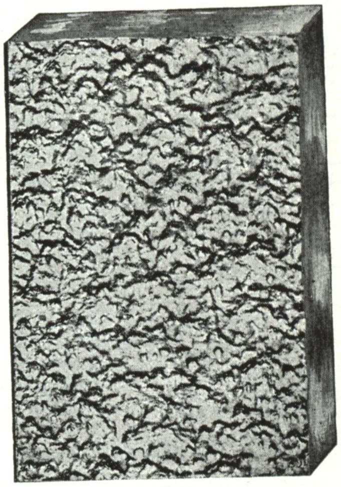
Prism Glass

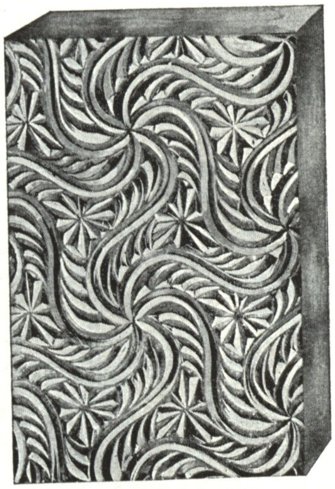
The Highland Glass Co's. prism glass has the smoothest surface of any rolled glass manufactured; the angles are scientifically designed to transmit the greatest quantity of light wherever it is desired. Widths up to 60 in. *high;* lengths up to 138 in.

Rough and Ribbed Skylight Glass Sizes

In ⅛-in., 3/16-in., ¼-in. and ⅜-in. thicknesses; widths up to and including 48 in.; lengths up to 144 in.


Florentine Figured Glass


Moss Figured Glass


Mystic Figured Glass

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Wire Glass Sizes

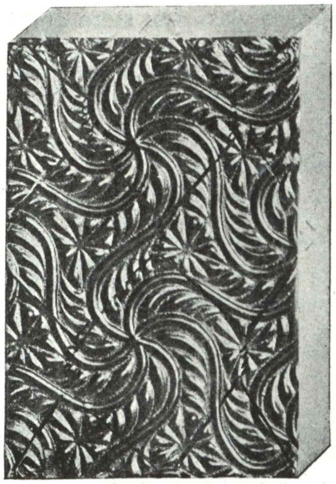
Colonial, Florentine, Silverglas, Moss, Mystic, Rough and Ribbed, in ¼-in. and ⅜-in. thicknesses; widths up to and including 48 in.; lengths figured up to 136 in.; rough and ribbed up to 144 in.

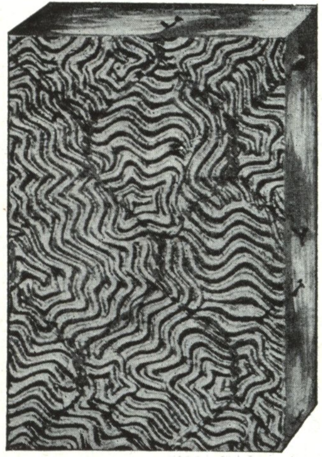
Prism wire glass is scant ⅜-in. thickness; widths up to and including 48 in.; lengths up to 144 in.

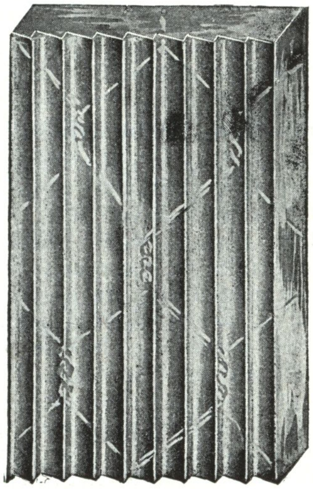
Colored Glass

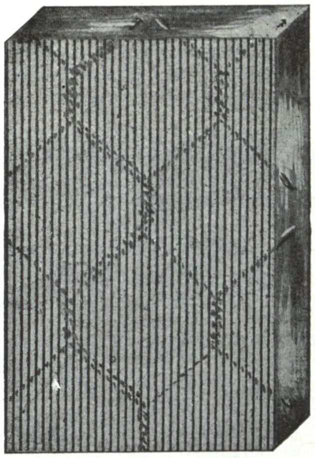
Made in ambers, blue, wine and green, in hammered and smooth Cathedral, Rippled, Ripple Moss, Florentine and Colonial. Dense white opal made in hammered and smooth Cathedral patterns, as well as in ⅛-in., $\frac{3}{16}$-in. and ¼-in. ribbed.

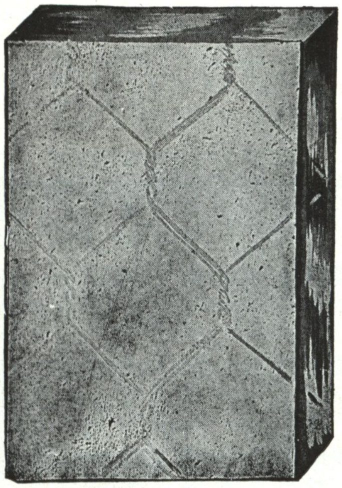
Widths 30 in.; lengths up to 90 in.

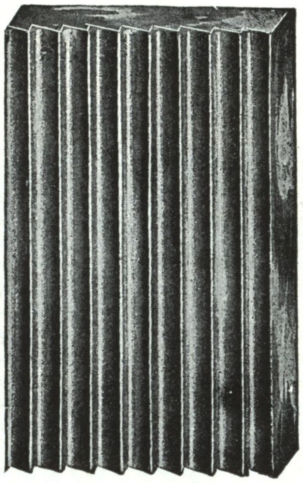

Mystic Wire Glass

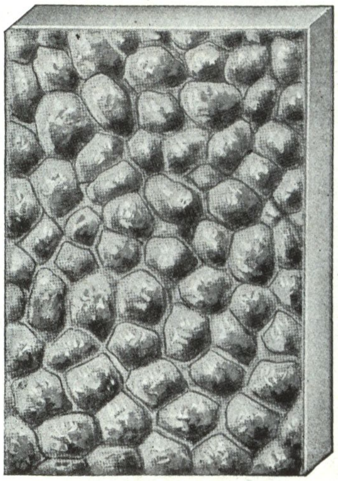

Colonial Wire Glass

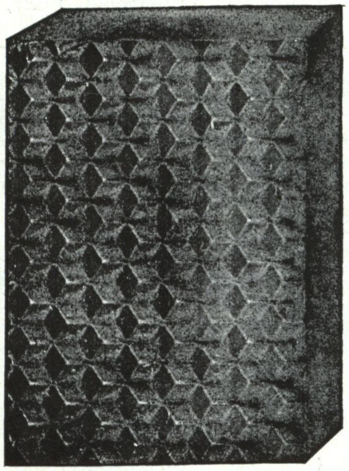

Prism Wire Glass

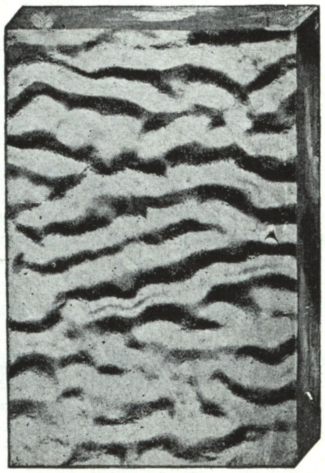

Ribbed Wire Glass


Rough Wire Glass


Prism Glass


Cathedral Glass


Polished Ideal Glass


Ripple Glass

PRESSED PRISM PLATE GLASS COMPANY

Manufacturers of Ornamental Polished Plate Glass Products

27 North Dearborn Street
CHICAGO

44 East 23rd Street
NEW YORK

TRADE MARK
IMPERIAL
P P
PLATE GLASS
P
PRODUCTS
REG.U.S.PAT.OFF.

Products

"Imperial" Ornamental Plate Glass in five styles; "Imperial" Prism-Plate Glass in large plates; "Imperial" Prism Skylight Glass (unit plates 18x60 in.).

Distinguishing Characteristics

All the products illustrated are ground and polished plate glass with clean-cut prismatic figures die pressed on one side.

They may be readily distinguished from all other figured glasses by their uniformity of pattern and absence of disfiguring waves or roller marks on either smooth surface or figured surface.

They are strong, durable and easily cleaned. The patterns harmonize with any style of finish and a wide range of modern architecture.

Being polished plate glass they blend as no other figured glass can with the plain polished plate glass windows which characterize modern building elevations and interiors.

Quality and Dimensions

The products are made in one standard polished plate glass quality and the ornamental patterns, Style O-1, O-2, O-3, O-4 and O-5, in standard plate glass thickness, namely, ¼ to $\frac{5}{16}$ in. Maximum size of all patterns 72x84 in.

The plate prism glass for store front transoms and upper sashes of exterior windows is ⅜ to $\frac{7}{16}$ in. thick. Maximum size of prism glass, 84 in. wide (horizontal dimension) by 72 in. high.

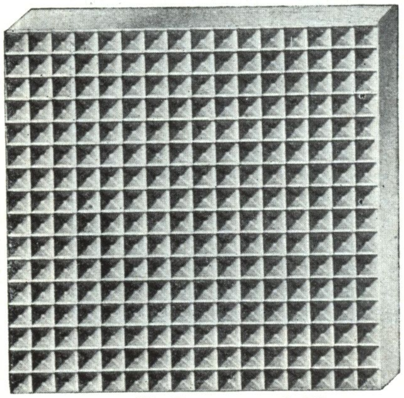
Suggested Specifications

All sash doors, transoms and other openings in corridor partitions and all interior communicating sash doors and partition openings, shown or indicated as containing glass, from the .... to the .... floors, inclusive, except *(Note 1)*, shall be glazed with "Imperial" Ornamental Plate Glass, Style *(Note 2)* as manufactured by Pressed Prism Plate Glass Co.

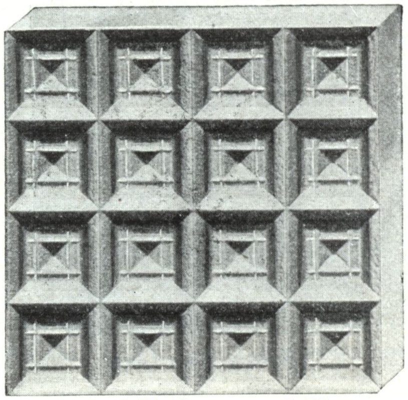
All exterior toilet room windows, the ceiling sash under skylights in the ...., casement doors and sash partitions on mezzanine and ...., and all other openings not otherwise mentioned which are shown or indicated as containing obscure glass or marked O-1, O-2, O-4, etc., shall be glazed with "Imperial" Ornamental Plate Glass of the style indicated, as manufactured by the Pressed Prism Plate Glass Co.

(Note 1) except (here may be mentioned fire exit doors, hose cabinet doors, elevator enclosures or other incidental openings which need to be of a clear plate glass or polished wire glass, etc.)

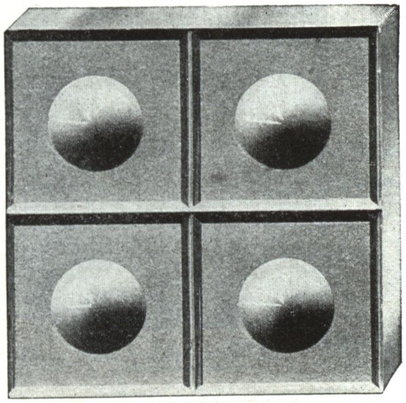
(Note 2) Style—(Insert here O-1, O-2, O-3, O-4 or O-5. Selection of a definite style prior to asking for bids minimizes the possibility of substitution or misunderstanding.)



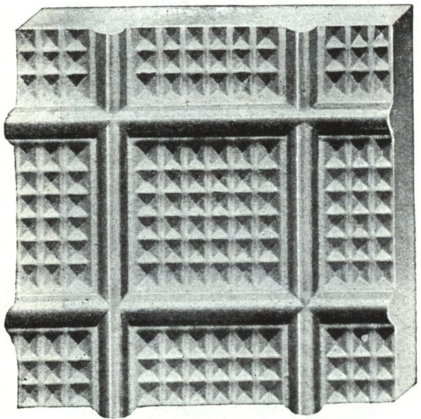
"Imperial" Ornamental Plate, Style O-1



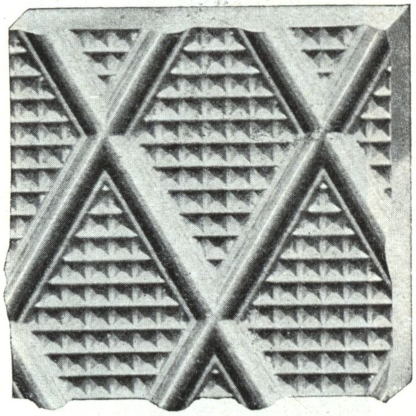
"Imperial" Ornamental Plate, Style O-2



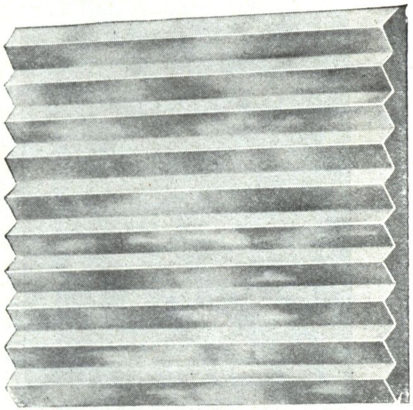
"Imperial" Ornamental Plate, Style O-3 (Semi-transparent)



"Imperial" Ornamental Plate, Style O-4



"Imperial" Ornamental Plate, Style O-5



"Imperial" Prism-Plate Glass

J. MERRILL RICHARDS

Magnalite—A Superior Obscuring Glass

119-122 West First Street
BOSTON, MASS.
SOLD THROUGH LEADING GLASS JOBBERS EVERYWHERE

Product

Richards Patented "Magnalite" Obscuring Glass.

For Richards' "Unity" Glass and Concrete Construction, see page 605.

Obscurity

Magnalite is an effective obscuring medium.

Easy to Clean

There are no deep pockets or sharp edges to collect and hold dirt, and Magnalite will clean to its original efficiency.

Maximum Light

Magnalite is a clear glass with both surfaces smooth and scientifically designed so as to collect and transmit the maximum of light. Luminometer tests show that 10 to 25% more light passes through Magnalite than many other types of obscuring glass.

Diffusion

The rays of light are thoroughly dispersed, giving an even distribution which tends to eliminate shadows and glare, thus producing an excellent work light.

Appearance

The cross ribbing produces a most pleasing rich waffle design harmonizing with any style of architecture.

Quality

Magnalite is rolled in sheets by the Mississippi Glass Co., thus ensuring a recognized standard of quality.

Construction

In order to accomplish the practical and scientific purposes for which Magnalite is designed, the ribs are constructed with ½-in. centers. This affords maximum strength and rigidity, most efficient curves for light transmission, and ease of cleaning, at the same time the conveniences of detailing, cutting and glazing are accomplished.

Adaptability

Partitions, doors, windows, ceiling lights, top lights, etc., in all types of buildings.

Installation

Magnalite is easily cut to size and lettered. The ribs run at right angles, eliminating the possibility of improper glazing. Cost of Magnalite is moderate.

SIZE

Type	Approx. thickness, in.	Maximum size sheets, in.	Approx. weight per sq. ft., lb.
Plain.......	¼	48 wide x 120 long	2½
Wired.......	⅜	48 wide x 120 long	4½

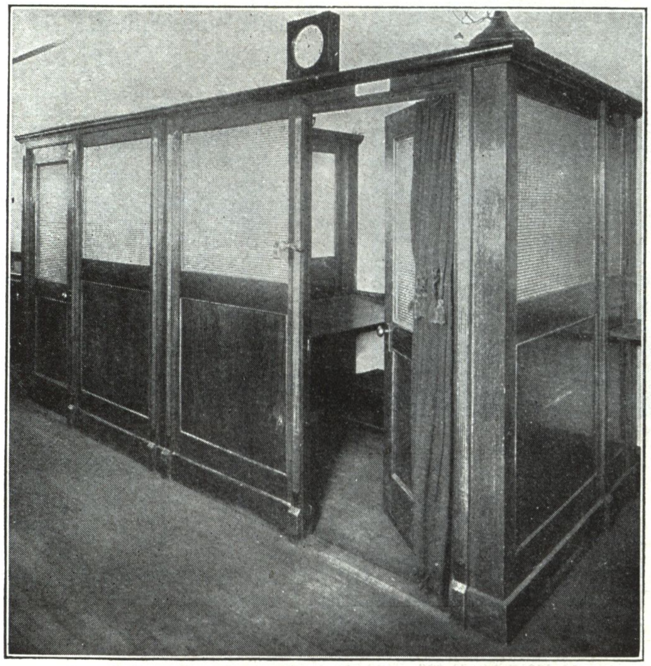
Magnalite is also furnished in 10x10-in. pressed crystal tiles approximately ⅜-in. thick.

Specification

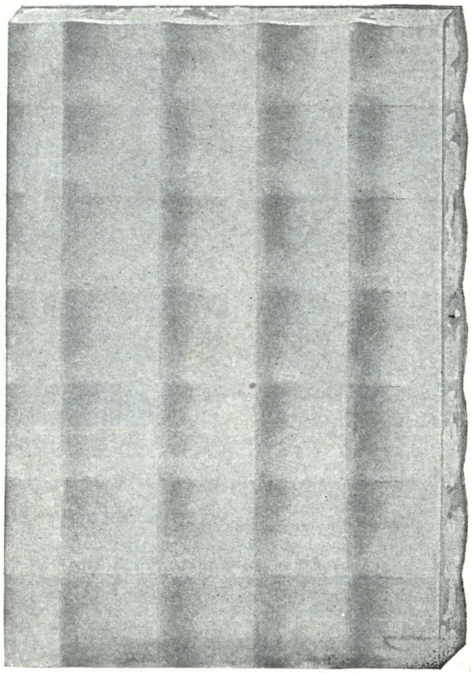
Richards' Magnalite obscuring glass, Mississippi quality.

Information

Write for additional information and samples which are necessary to appreciate this remarkable glass.



An Office Partition Glazed with Magnalite Glass



Magnalite Obscuring Glass

PITTSBURGH ART GLASS COMPANY

Stained Glass Windows

HOME OFFICE
Warden and McCartney Streets (West End), PITTSBURGH, PA.
EASTERN OFFICE, 2120 North 4th Street, HARRISBURG, PA.

A Company of Specialists

Designing, making, and installing church windows and other compositions of stained glass have been the occupation of the PITTSBURGH ART GLASS COMPANY for twenty years. The talent and sincerity of purpose which have characterized the work of the company have led to increasing recognition and continual growth.

A Helpful Service for Architects

In its relations with architects, the company has always desired and offered the utmost co-operation. Its first concern with any undertaking is to study the conception and general plan of the architect, in order that its ideas may be rightly related and subordinated to his. Printed matter has been devised, summarizing the points that an architect will wish to consider in any choice of leaded glass. The exhibit and consulting rooms of the company are commodious, well equipped, and rich in illustrative material.

A Very Important Accessory to Architecture

The entire success of a building, in the mood that it creates, may depend largely upon its lighting effects and the beauty and suitability of its window decorations. Window making is an ancient, highly specialized art, to which a highly skilled craft is tributary.

A Word About Mechanical Construction

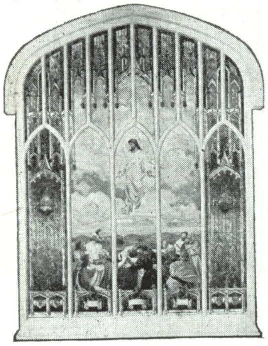
The beauty of a well made window is not for a day, but for many years—perhaps for generations.

Among the features that insure permanence in Pittsburgh Art Glass Windows are extra heavy, wide flanged leads in the main construction lines; a sufficient number of brace bars and tee irons, and last but not least, installation by experienced, skilled workmen.

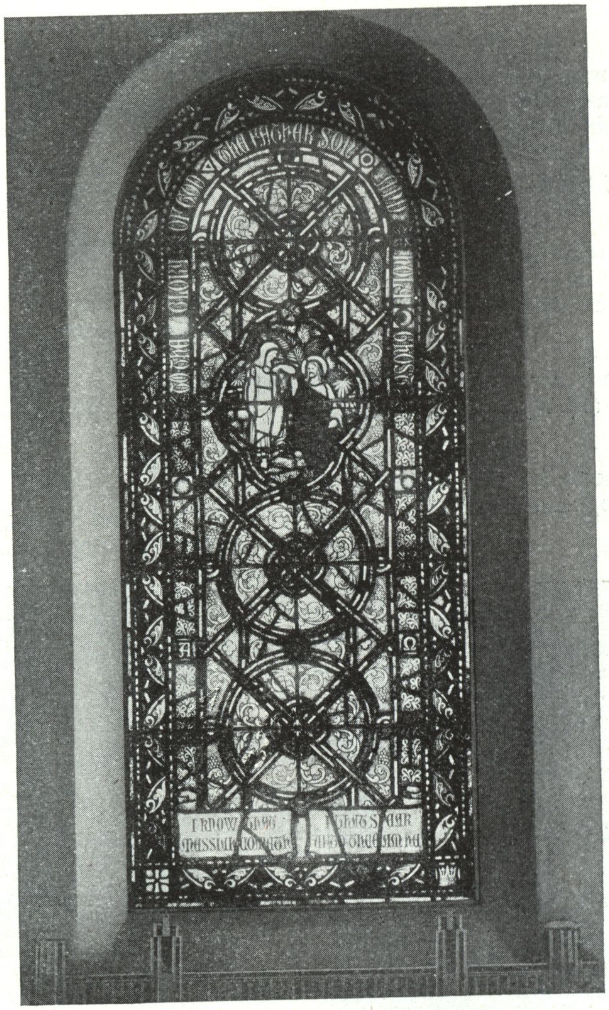
The brace bar used is a special device patented by the PITTSBURGH ART GLASS COMPANY and unequalled for the rigidity and durability that it insures. Firmly and completely encased between two lead channels, it is protected from corrosion or any effect of the weather. Such bars, set in parallel lines, spanning the panel, brace against wind pressure and vibration.

The load is distributed over the whole cross section of the encased bars, instead of hanging from soldered joints between the bars and the lead joints as it does in common practice. The encased bar can not tear loose. The panel can not sag or bulge. The design leaves no visible, unsightly joints. The windows are easily cleaned.

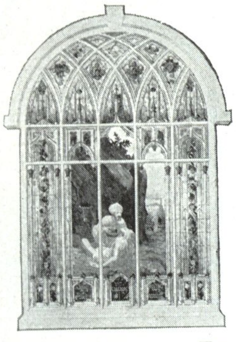
A copy of the patent, and some remarkable testimonials as to the behavior of Pittsburgh Art Glass Windows under extraordinary tests of fire and storm, will be mailed on request.



EAST WINDOW, FIRST M. E. CHURCH, DUNKIRK, N. Y.



ALTAR WINDOW, MESSIAH LUTHERAN CHURCH, PITTSBURGH, PA.



AUDITORIUM WINDOW, FIRST M. E. CHURCH, SEBRING, FLA.

Representative Installations of Pittsburgh Art Glass

St. Paul's Methodist Episcopal Church, Clarksburg, W. Va.
Center Avenue Methodist Episcopal Church, South, Cumberland, Md.
Sudley Methodist Episcopal Church, Gainesville, Va.
Epworth Methodist Episcopal Church, Harrisburg, Pa.
Winfield Memorial Methodist Episcopal, South, Little Rock, Ark.
Mary S. Brown Memorial, Pittsburgh, Pa.
Second Presbyterian Church, Little Rock, Ark.
First Presbyterian Church, Dormont, Pa.
Ruffner Memorial Presbyterian Church, Charleston, W. Va.
Heidelberg Reformed Church, Dayton, Ohio
Grace Reformed Church, Jeannette, Pa.
Martin Luther Congregation, Canton, Ohio
Benney Memorial, Church of the Ascension (Protestant Episcopal), Pittsburgh, Pa.
St. Mary's Chapel (Roman Catholic), Clarksburg, W. Va.
St. Stanislaus (Roman Catholic), Steubenville, Ohio
St. Ann's (Roman Catholic), Millvale, Pa.
Beth Shalom Synagogue, Pittsburgh, Pa.
Cabins of ocean liners for Newport News Shipbuilding and Dry Dock Co.
Theaters, banks, libraries, schools, etc.

Continued on next page

General Information on Stained Glass, Antique and Opalescent

Church windows are classified as "Antique" or "Opalescent." Antique glass owes its effects to the traditional use of stained material on which the artist works gradations and modulations of tone by brush painting and repeated kiln firing. An opalescent window is simply pieced together from bits of colored and clouded glass as they come from the factory, to approximate the desired effect. Opalescent glass has its advantage in the facility with which it is handled and the lower expense at which it can be obtained. Antique glass is commended by immemorial usage and by the incomparable loveliness that can be achieved in this medium alone. A free booklet, "The Crowning Beauty of the Church," discusses both styles more fully.

Specifications

A standard form of specifications for windows can not possibly be laid down because requirements vary so widely and in so many respects. The type of building, the architectural design, and the funds available may dictate almost unlimited permutations and combinations. Stained glass of merit can not be bought like the lumber, brick, or stone that goes into a building.

Inside Installation Is Preferable

Always design frames for inside installation. The result will be better and the cost much less. Outside installation requires expensive scaffolding to be built. For inside installation, the architect can obviate such expense by specifying that the general contractor or plastering contractor shall not remove interior scaffolding until the windows are installed, and that the glass contractor is to have the use of such scaffolding without cost. A watertight result is more difficult to obtain by installation from the outside; if wood frames are used it is almost impossible. In that case, outside bead strips must be applied; and no matter how well they are nailed and painted, or how well the glass is embedded in putty, in a few years the strips almost invariably loosen. The result is a leaky window. Inside installation, competently done, insures against such failure.

Method of Purchase

The most successful and satisfactory glass installations are found where the architect is made the judge of who shall or shall not be awarded the contract. The decision rightly belongs to the architect. It is not likely to be left with him, however, unless he so stipulates in his original arrangement with his client. Under the procedure here advised, glass would become a reserved item when the general contract is let, the architect being given power to install very plain leaded glass (temporary glass) if he finds that the funds immediately available are not enough to secure art windows of creditable character.

In case it is necessary, before letting the general contract, to give the client a figure for the entire cost of the building, the architect should make sure that the allowance is sufficient for windows in keeping with his design. He can best do this by consultation in advance with a reputable high grade glass concern. The Pittsburgh Art Glass Company will advise any architect in such a case without placing him under any obligation whatever. If discreditable glass is to be excluded, disappointment avoided, and worthy conceptions realized, this must come about by sincere co-operation between the architect and some glass concern whose talent, facilities and reputation inspire confidence.

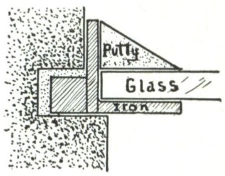


Fig. 1. Detail of Setting Iron Frame in Masonry Opening

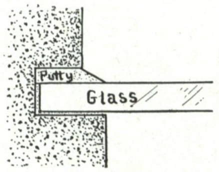


Fig. 2. Detail of Setting Glass in Stone Tracery

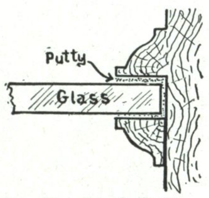


Fig. 3. Detail of Setting Glass in Wood Frame

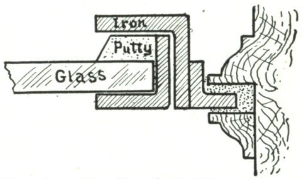


Fig. 4. Detail of Setting Glass Where Ventilators Are Used

VARIOUS METHODS OF SETTING GLASS IN RABBETS

Fig. 1, Rabbet Detail—Glass set with iron angle construction in stone window frame. The rabbet should be ¾ in. deep by ½ in. wide.

Fig. 2, Rabbet Detail—Glass set directly in stone window frame—no iron. Rabbet same as in Fig. 1. This installation saves the cost of so-called iron (steel) frames, which is altogether needless. It leaves the architect much freer to design his window frames as he will; curved lines and tracery parts occasion no difficulty. It has the advantage of greater durability. Steel, unless given exceptional care, soon rusts out and gives trouble.

Fig. 3, Rabbet Detail—Glass set directly in wood frames—no iron. The rabbet should be ½ in. deep by ½ in. wide. The outside bead should be part of the window frame—not nailed on. The inside bead should be a loose part, to be securely nailed in place when glass is installed. This is the installation in most general use and is in every way satisfactory. (See remarks about installation above.)

Fig. 4, Ventilator Detail—No special provision need be made for ventilators, so far as depth and width of rabbet is concerned. All ventilators, however, should be made with an angle iron on the outside to fit into the rabbet, thus permitting the ventilator to swing free of the beading and the window frame. This eliminates the necessity of cutting away any of the bead strips or frames, as would be the case without the outside angle, and makes possible the use of a sight size instead of full size ventilator. Bottom ventilators, which are usually about on a level with the heads of the seated congregation, should be hinged on the bottom and swing in, so as to direct drafts upward. All other ventilators are best pivoted at either side, near the center.

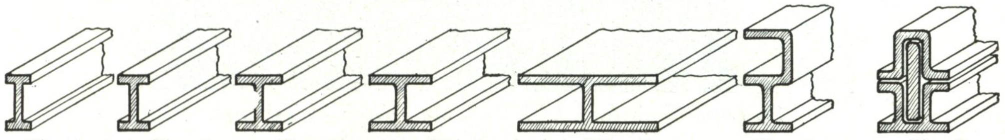


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6 Fig. 7

FULL SIZE OF PITTSBURGH ART GLASS STANDARD LEAD CAMES

The sizes shown are standard with the Pittsburgh Art Glass Company. Any other size must be specially made to order, from specially made dies.

Figs. 1 to 5 vary in width of flange from ⅛ to ¾ in.

Figs. 1, 2 and 3 are used in the ornamental parts of windows.

Fig. 4 is used in all the main background and construction lines to give the necessary strength.

Fig. 5 is principally for body or background work where the design of the glass is entirely in rectangles.

Fig. 6 is our specially designed Inscription Plate Lead, permitting the insertion of a name plate in the window, after it has been installed, without detriment or inconvenience. This particular device we have found almost invaluable because of the common practice of soliciting members and friends of a congregation to pay for windows as memorial gifts. A memorial plate is naturally desired in such cases; and often subscriptions are not obtained till after the windows have been installed. With our special Inscription Plate lead, the proper memorial inscription can be inserted at any time.

Fig. 7 shows the reinforcing bar built into the window and forming a part of it, with lead cap soldered and cemented in place to protect it from water and air. (See remarks about mechanical construction on opposite page.) Reinforcing bars are usually placed 12 to 18 in. apart, depending on the height and width of the opening. The window frame and bead strip must be notched out to receive brace bar; otherwise the crushing weight of the entire window or section will come upon the lower portions and one of the purposes of the bar will be defeated. This feature is taken care of by our experienced workmen, whether installing in sash at our own shops or in the frames at the building. A descriptive folder showing detail, will be mailed to any architect on request.

RAVENNA MOSAICS, INC.

Producers of and Contractors for Decorative Mosaics and Art Glass

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ST. LOUIS, MO., 3934 South Grand Avenue

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BERLIN, GERMANY
MUNICH, GERMANY

Products

Glass Mosaics.
Stained Glass Windows.

Ravenna Mosaics

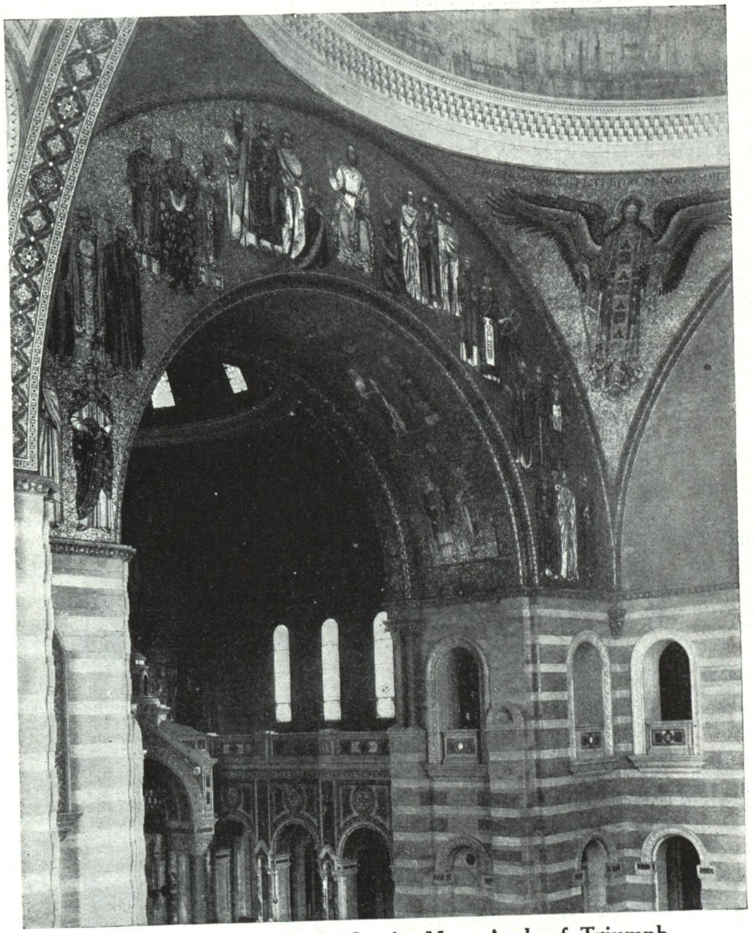
The ancient mode of decorating surfaces with bits of colored glass embedded in cement is being brought into a twentieth century activity through the efforts of Ravenna Mosaics, Inc.—an organization comprising the firms which have been most conspicuous during the past years in solving the largest mosaic problems. Many notable European edifices, such as the Cathedral at Aix-la-Chapelle, Church of the Redemption at Jerusalem, the German Church at Rome, the Golden Hall in the City Hall of Stockholm, beside many American churches and public buildings have been decorated by Ravenna Mosaics, Inc.

This company manufactures its own materials.

The name "Ravenna" was adopted because the Italian Government selected the glass tesserae of this company in the restoration of the ancient mosaics at Ravenna.

Stained Glass Windows

The Company is prepared to create designs and submit estimates for stained glass windows, as well as mosaic decoration. Striking effects are obtained in stained glass panels by the use of the Ravenna Company's special glass which has gold or silver leaf embedded therein and the whole fused by fire. This glass, under surface lighting, produces practically the same effect as when the light passes through from behind, in this way eliminating the dull effect of ordinary glass when seen without a backing of light.



St. Louis Cathedral, St. Louis, Mo.—Arch of Triumph Executed in Ravenna Mosaics

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ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST 1913

A Few of Our Important Installations

St. Louis Cathedral, St. Louis, Mo.	Mosaics	Aix-la-Chapelle Cathedral	Mosaics
St. Catharine of Alexandria, Brooklyn, N. Y.	Mosaics and Stained Glass	Chapel of St. Elizabeth, Wartburg	Mosaics
St. Clement's Church, Chicago, Ill.	Mosaics	Abbey Church Maria Laach	Mosaics
St. Joseph's Church, Baton Rouge, La.	Mosaics	Subway Terminal Building, Los Angeles, Cal.	Mosaics
Isaiah Temple, Chicago, Ill.	Stained Glass	No. 550 Seventh Avenue, New York, N. Y.	Mosaics and Gold Glass
Synagogue B'nai Jeshurum, Philadelphia, Pa.	Stained Glass	Golden Hall, City Hall, Stockholm, Sweden	Mosaics
		Thirty-ninth Street and Sixth Avenue, New York, N. Y.	Mosaics

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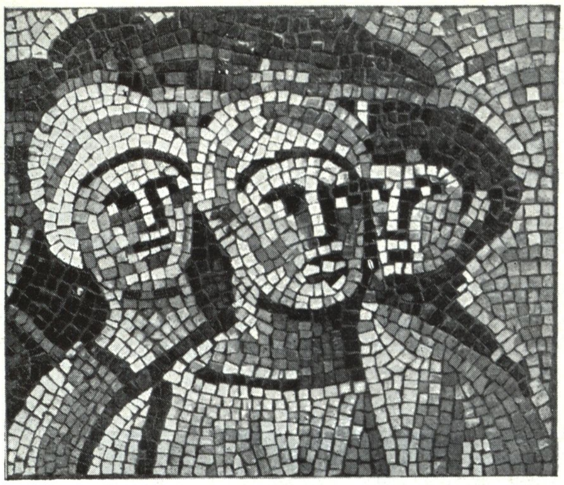
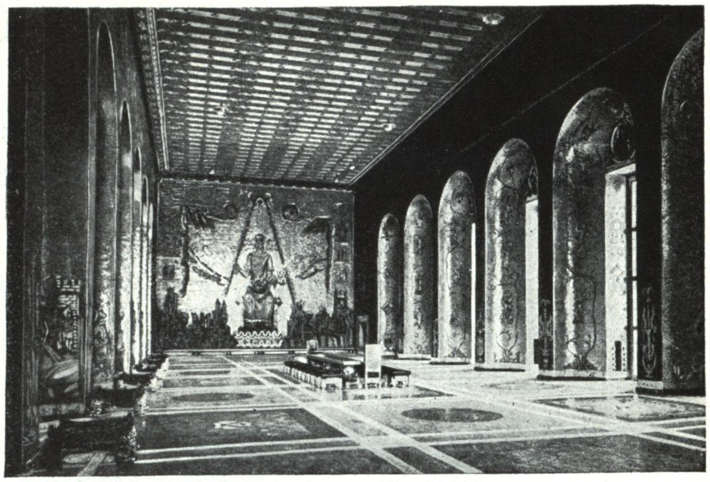
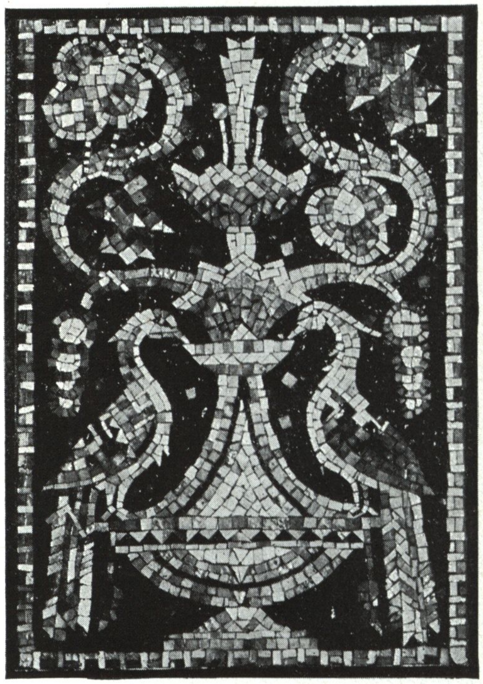


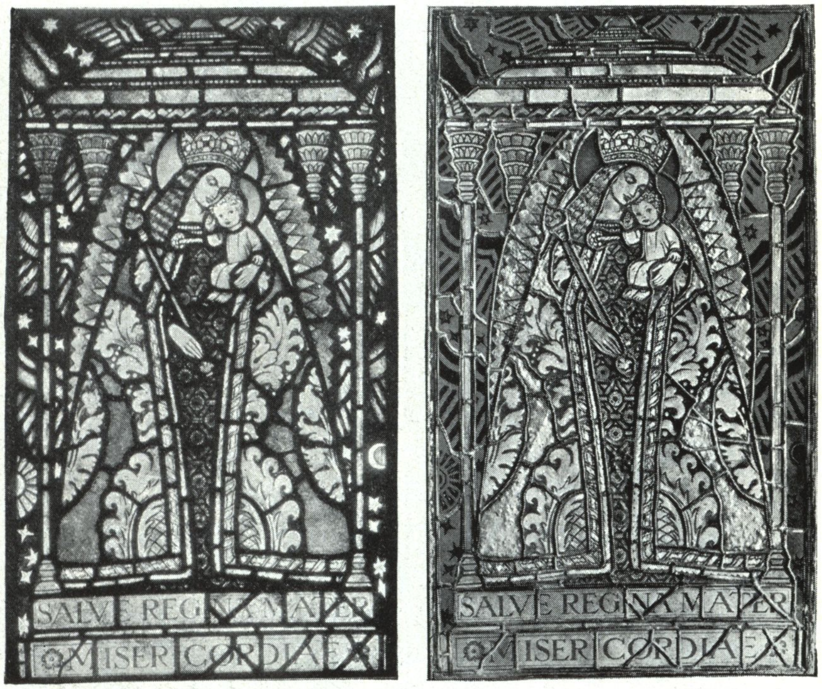
Reproduced by Ravenna Mosaics
Part of the "Separation of Lot from Abraham"
St. Maria Maggiore, 352-366 A. D.



The "Golden Hall" in the City Hall, Stockholm, Sweden
Ragner Ostberg, Architect, Stockholm Mosaic Designed by Einar Forseth
Length 135 ft., height 37 ft., width 45 ft. Executed by Ravenna Mosaics



Mural Mosaic Decoration
Executed by Ravenna Mosaics, Inc.



Effect with Light from the Back Effect with Surface Lighting
Leaded Glass Window Executed in Ravenna Gold Glass

Specifications for Glass Mosaics

All glass mosaics shall be those of the Ravenna Mosaics, Inc., executed in accordance with sketches submitted. Detail drawings showing color scheme are to be approved by the architect.

The material to be used for the execution of the mosaics shall be the so-called Venetian mosaic material (small pieces of glass of solid color, waterproof and acidproof), the gold and silver glass shall be the so-called Venetian gold and silver glass, each piece consisting of two layers of glass, the gold or silver leaf smelted in between. The solid color cubes shall be used with the broken surfaces to the front, the technique shall be the same as that used in the early Ravenna and Roman mosaics, as may be seen by the examples in the Metropolitan Museum of Art. All the glass pieces (especially the gold and silver pieces) shall be set irregularly so as to give the surface an uneven, interesting texture.

The mosaics shall be delivered at the building glued on paper and shall be mounted on the substructure on top of a scratch and float coat to be provided by the plasterer. The under construction must be either brick, tile or metal lath—no wooden lath. The first and second coats of cement plaster are to be furnished by the plasterer, the final coat shall be furnished by the mosaic contractor. The plasterer shall leave his scaffolding for the use of the mosaic workers. After the mosaics are applied they shall be thoroughly cleaned with acid. All the mosaic pieces shall be cut by hand; no machine or glazier's diamonds shall be used to break the mosaic glass to the proper size.

JACOBY ART GLASS CO.

Designers and Makers of Art Glass Windows

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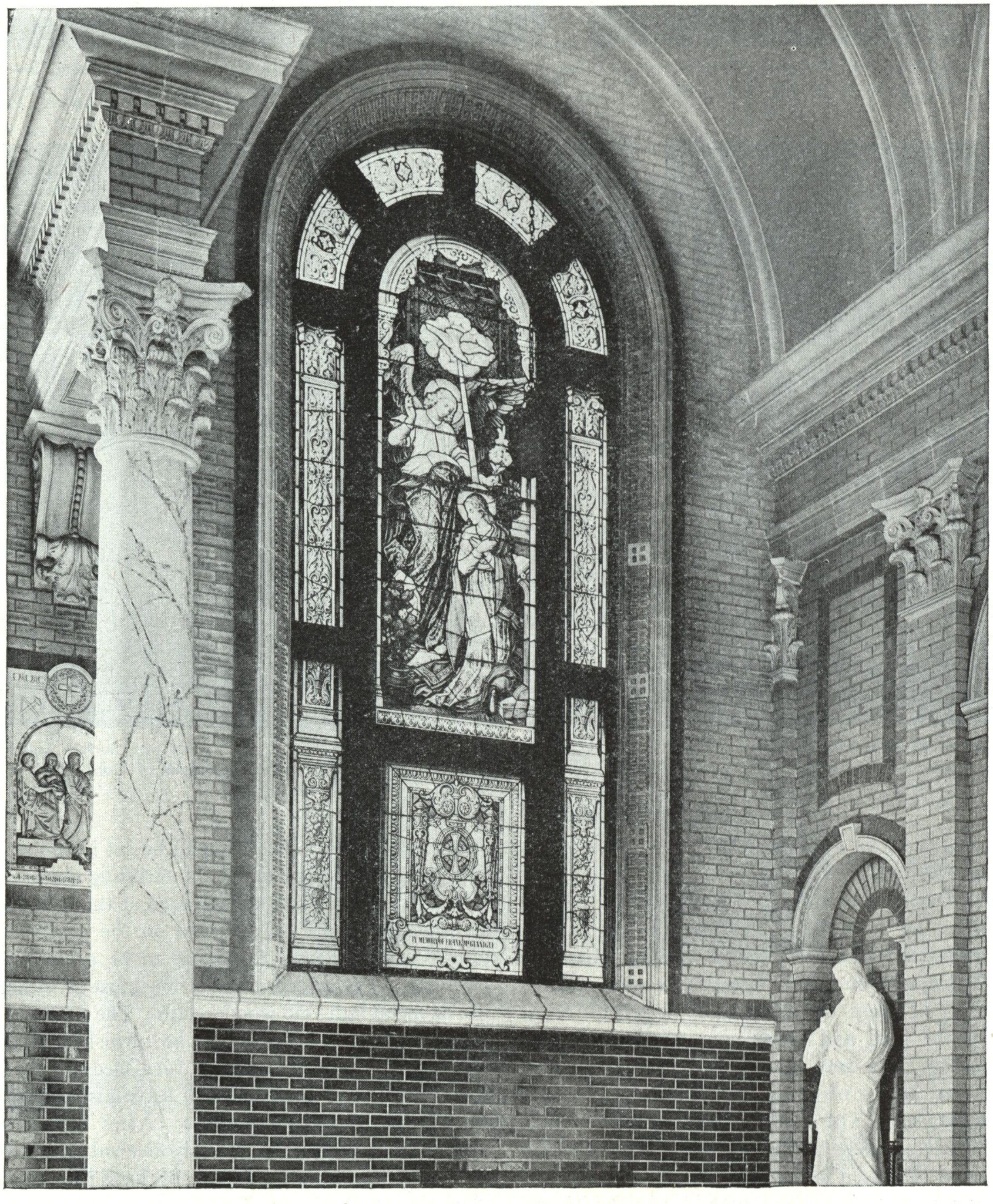

Holy Name Roman Catholic Church, St. Louis, Mo.
Lee & Rush, Architects

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Specialists in all kinds of Calking Problems, we assure:

Permanently Calked Weatherproof and Dustproof Joints between window frames and door frames and the surrounding masonry in exterior walls.

Permanent Weatherproof Protective Joints between stone, terra cotta or other masonry in cornices, capstones and copings on parapet walls, or in sills, or any projecting parts of a building exposed to action of the elements.

Leakproof Expansion Joints or Calked Cracks in concrete whether intentionally provided or caused by contraction or settlement.

Facilities

Materials, methods and men to meet the demand, which has become insistent, for weatherproof and leakproof joints in exterior walls of all classes of buildings to prevent deterioration, conserve fuel, reduce heating, cleaning, decorating and other operating expenses, and to insure against out-leakage of warmed air from the inside and in-leakage of cold air, dust or water from the outside.

Material and Labor

Exhaustive tests convinced us that Pecora Calking Compound is the most dependable product for lasting service for the uses which we have developed, and, therefore, we handle it exclusively in all Ev-air-Tight calking installations.

Our labor is specially trained to this work, and competent to handle intelligently the various conditions (ordinary or otherwise) that may present themselves.

Pneumatic Equipment

We invented and control a special calking gun from which the calking compound is forced under approximately 125-lb. air pressure, generated by portable motor driven compressor outfits, specially designed by us for this work.

By this pneumatic method, penetration of sufficient material to fill every cranny insures permanent plasticity of the compound.

The forcing pressure being even and the delivery outlet of the calking gun being gauged to deliver into the joint only, neither frames nor masonry can be smeared or stained, and the exposed finished surface of the joint is clean cut and smooth, better than any previously known methods for pointing.

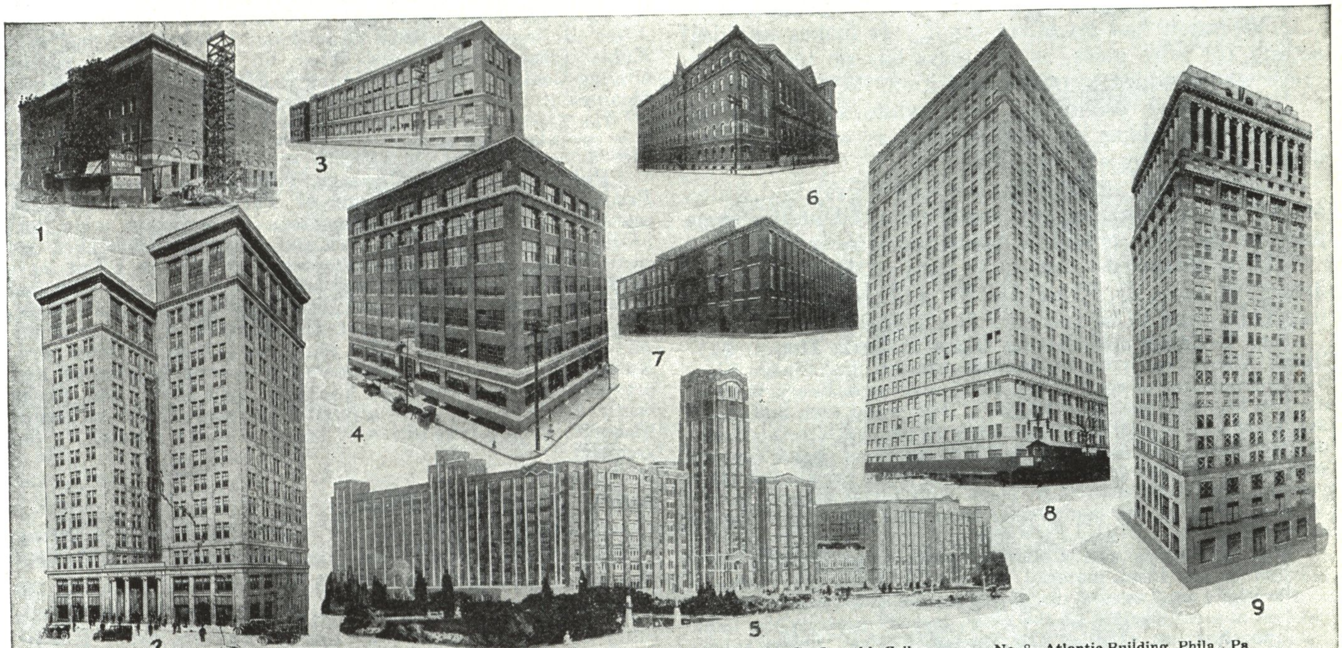
Specification Data

Specification forms have been compiled from various specifications, as developed by certain prominent architects, and will be sent on request.

Further Information

Upon receipt of request, on stationery containing their printed letterhead and address, we will send, to those interested, lists of installations and other data covering the subject generally.

Information requested on any specific detail, or out of the ordinary problem in connection with calking, cheerfully furnished.



No. 1—Y. M. C. A., Easton, Pa.
Architect:—Thos. Martin & Kirkpatrick, Phila.
Contractors:—Wark & Co., Phila.

No. 2—Standard Oil Bldg., Baltimore, Md.
Architect:—Guy Friz.
Contractors:—J. Henry Miller, Inc., Baltimore, Md.

No. 3—Walther Mfg. Co., Kensington, Phila.

No. 4—Wolf Building, 12th and Callowhill Sts., Phila.

No. 5—Sears-Roebuck, Roosevelt Blvd., Phila.
Architect:—George C. Nimmon, Chicago, Illinois.
Contractors:—Irwin & Leighton, Phila.

No. 6—St. Joseph's College, 18th and Thompson Streets, Philadelphia.

No. 7—American Worsted Co., Kensington, Philadelphia.

No. 8—Atlantic Building, Phila., Pa.
Architect:—J. F. Kuntz, Pittsburgh, Pa.
Contractors:—Metzger-Fisher & White, Philadelphia, Pa.

No. 9—New York Cotton Ex., New York, N.Y.
Architect:—Donn Barber
Contractors:—Geo. A. Fuller Company, New York.

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LOS ANGELES, CAL., W. C. Lea, 653 So. Clarence Street
NEW YORK, N. Y., Weinstock Bros., 384 Third Avenue
OMAHA, NEB., G. H. Alwine Co.
PHILADELPHIA, PA., E. Webb & Son Co., 136 So. Front Street
PITTSBURGH, PA., Pittsburgh Cut Flower Co., 116 7th Street
PORTLAND, ORE., Beebe Co., First and Washington Streets
SAN FRANCISCO, CAL., C. J. Henry Co., 25 Main Street
SEATTLE, WASH., F. W. Farrington & Co., L. C. Smith Building

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GLAZING
COMPOSITION.

Distribution and Service

Kuhls' Glazing Composition and Elastic Seam Composition are used in all parts of the country as well as in Canada, South America and Europe. There are over 70 agencies in the United States and Canada. A few stocking our products are listed above.

Kuhls' Elastic Glazing Composition for Use in Glazing, Calking and Pointing Up

This elastic compound never becomes hard and brittle but always remains elastic and flexible. It adheres strongly to galvanized and raw iron, steel, wood, glass, stone, concrete, etc., and never cracks or crumbles.

It withstands heat, cold, moisture, rapid changes of temperature and always makes a tight joint.

Vibration has no effect on it. It makes an ideal setting for wire glass, as the glass has no tendency to crack when bedded in this composition.

It is more economical than white lead putty on account of its long life and service, as well as having double the bulk by weight.

Color—The stock colors are a light gray and white, but it can be made in any shade required at the same price as the stock colors in quantities of over 500 lb.

How Shipped—Put up in cans of 1, 2 and 5 lb.; in kegs of 12½, 25, 50 and 100 lb.; in half-barrels of 100 to 500 lb.; and in barrels of 700 and 800 lb.

For Bedding and Setting Glass in Sash, Doors, Skylights, Conservatories, Marquises, etc.—Kuhls' Elastic Glazing Composition is used in the same way as ordinary putty is used in bedding and puttying glass. For wood sash and doors the wood should first be primed; or, on old work, scraped and painted before setting the glass. For metal or metal covered sash and doors the glass should be bedded in the glazing composition and then secured in place with metal clamps, sprigs or mouldings, or the composition smoothed off, depending on construction.

For Skylights and Conservatories—The Glazing Composition is the ideal material for setting glass. It makes a weathertight job, as well as giving ample chance for the expansion and contraction of the glass, and yet protects the joint.

Specification (Under Glazing)—All glass, unless otherwise specified, required for sash and doors of metal, metal covered or wood, shall be bedded and set or puttied with Kuhls' Elastic Glazing Composition (H. B. Fred Kuhls, Third Avenue and 65th Street, Brooklyn, N. Y.). It shall be secured either by clamps, metal or wood mouldings, sprigs, supplied by other contractors, or puttied as required.

The Elastic Glazing Composition shall be delivered at the job or factory, where glazing is to be done, and is not to be opened until after the inspection and approval of the architect.

Calking Exterior Windows and Door Frames—Kuhls' Elastic Glazing Composition is an ideal material for calking window and door frames. For new or old wood frames, remove staff bead and completely fill the joint between the frame and the masonry on all sides, jamb, head and sill, with Elastic Glazing Composition so that it will project out beyond the masonry. The staff bead, when placed in position, should be pressed into the Elastic Glazing Composition.

If the joints are wide and deep on old work, calk with oakum to within ¾ in. of the surface; then fill the remainder with Elastic Glazing Composition as for new work.

Steel or Metal Frames—When metal frames are set in masonry after opening has been built, the inside edge of the masonry opening or the frame should be buttered with the Elastic Glazing Composition and the frame pressed into place and secured.

Where frames are already set, thoroughly calk between the frame and the masonry, at head, jamb and sill, with Kuhls' Elastic Glazing Composition.

Pointing Up Stone, Terra Cotta and Flashings—Kuhls' Elastic Glazing Composition is very satisfactory for pointing up stone or terra cotta work and *does not stain the stone*. After the joints have been cleaned out thoroughly, paint with Kuhls' Elastic Joint Paint. Then fill the joint with Elastic Glazing Composition with pointing tool or knife. Colors can be obtained to match the stone or terra cotta.

The Elastic Joint Paint should always be used in the joints first, as it is especially prepared to prevent absorption of the oil in the Elastic Glazing Composition by the adjoining materials.

Pointing Joints in Copings, Tops of Cornices or Other Projecting Courses in Stone or Terra Cotta Work—The cross joints of all coping courses, tops of cornices or other projecting courses in stone or terra cotta work shall be raked out clean of all portland cement mortar for a depth of at least ¾ in. Sides of joints shall then be thoroughly painted with one or two coats of Kuhls' Elastic Joint Paint (H. B. Fred Kuhls, Third Avenue and 65th Street, Brooklyn, N. Y.) or until the surfaces show a gloss. The joints shall then be filled with Kuhls' Elastic Glazing Composition, thoroughly worked and pressed into the joint, to fill the entire joint, and to be neatly finished flush with adjoining surface. Color of Kuhls' Elastic Glazing Composition to be of color as selected by the architect.

Kuhls' Elastic Joint Paint

This paint is made for use with Elastic Glazing Composition. It will not stain limestone or marble and should always be specified to be used for pointing up work and used as specified above. It prevents the possibility of absorption by the stone of the oil in the Elastic Glazing Composition and keeps it in perfect condition.

Kuhls' Elastic Seam Composition for Expansion Joints

This is especially adapted when used with Kuhls' Elastic Seam Paint for expansion joints in promenade roofing tile, concrete work, etc. It has been success-

Continued on next page

fully used on the terraces of the Capitol at Washington, Army Base in Brooklyn, and for other prominent buildings, bridges, railroad work, etc. Originally used for calking seams of wooden ships, it was readily adapted to the building construction field. Exposure to sudden and extreme changes of temperature, as well as movement and vibration, does not affect it. It will remain elastic and stick to the sides of the joints for many years. The joint must always be painted with Kuhls' Elastic Seam Paint before applying the Elastic Seam Composition in order to secure the best results.

Specification for Expansion Joints in Promenade Tile Roofing—Provide expansion joints in promenade tile roofing where noted on drawings. All expansion joints shall be cleaned out down to the waterproofing course. Apply one or two coats of Kuhls' Elastic Seam Paint, or until the surfaces of the joint show a gloss. Then point up the joint with Kuhls' Elastic Seam Composition, thoroughly working the material into the joint to fill the entire space and finish to be left crowned above the adjoining surfaces.

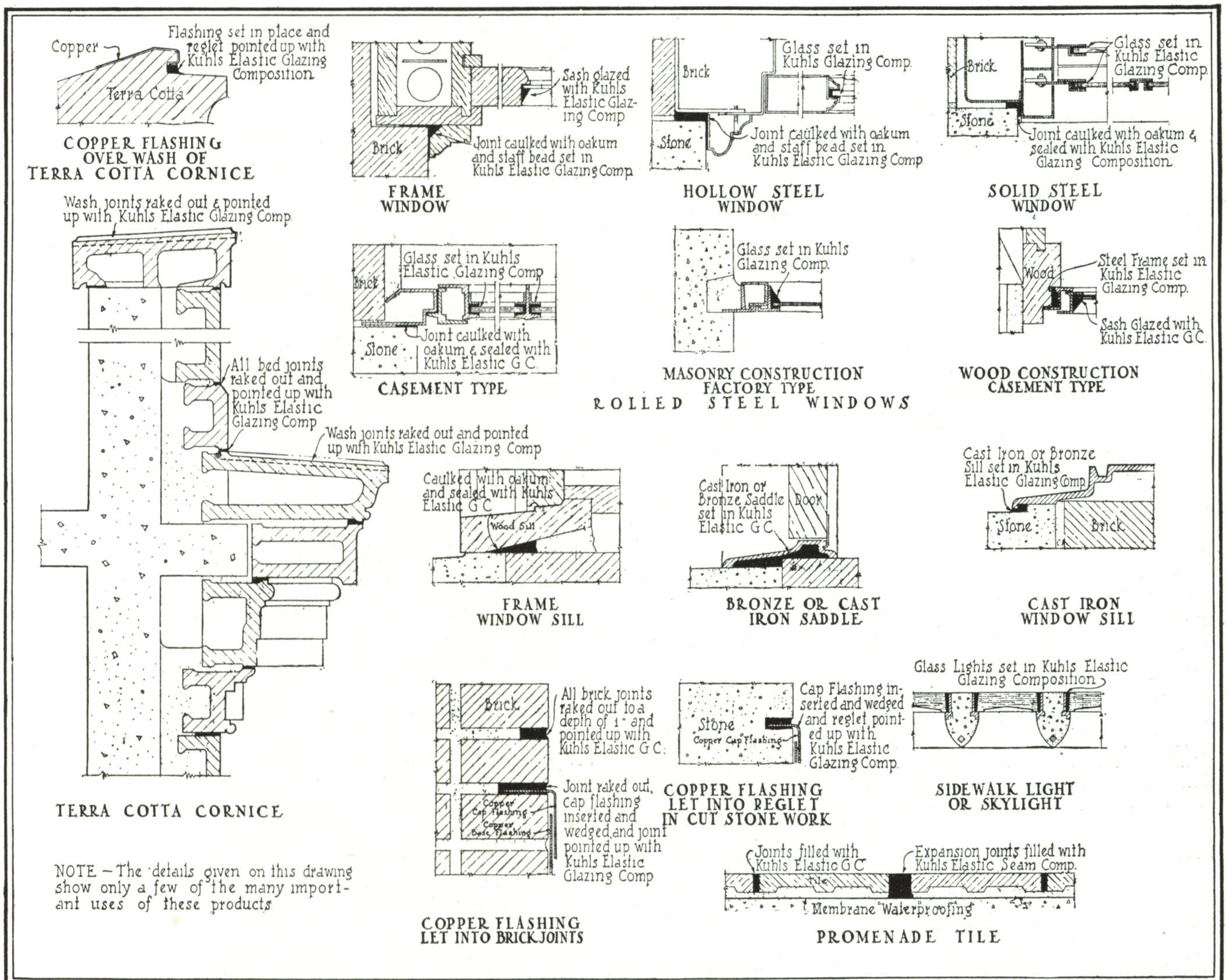
Kuhls' Elastic Seam Paint

This paint is made especially for use with Kuhls' Elastic Seam Composition and should always be specified to be applied before using the Elastic Seam Composition as it preserves the composition, preventing the oil from being absorbed by adjoining material.

A Few of the Buildings on Which Kuhls' Elastic Glazing Composition Has Been Used

- Pennsylvania Terminal, New York, N. Y., 20 tons for glazing
- Woolworth Building, New York, N. Y., 5 tons for glazing and pointing up
- Plaza Hotel, New York, N. Y., 1 ton for pointing up
- Racquet & Tennis Club, New York, N. Y., 2¼ tons for glazing
- Newcastle Leather Co., Wilmington, Del., 1½ tons for glazing
- New York Central R. R., 10 tons for reglazing
- Singer Sewing Machine Co., Elizabethport, N. J., 3 tons for glazing
- Massachusetts Institute of Technology, Cambridge, Mass., 2 tons for glazing
- U. S. Government Warehouses, Brooklyn, N. Y., 100,000 lb.
- State Educational Building, Albany, N. Y.
- Allegheny County Soldiers' Memorial Building, Pittsburgh, Pa.
- Oakland City Hall, Oakland, Cal.
- Northwestern University, Evanston, Ill.
- University of Pittsburgh, Pittsburgh, Pa.
- University of Texas, Educational Building, Austin, Tex.
- New Jersey Fire Insurance Building, Newark, N. J.
- Central Railroad of New Jersey
- Delaware, Lackawanna & Western R. R.
- Pennsylvania R. R.
- Interborough Rapid Transit R. R., New York, N. Y.

Further references and information on request.


Copper
Flashing set in place and reglet pointed up with Kuhls Elastic Glazing Composition
Terra Cotta
COPPER FLASHING OVER WASH OF TERRA COTTA CORNICE
Sash glazed with Kuhls Elastic Glazing Comp
Brick
Joint caulked with oakum and staff bead set in Kuhls Elastic Glazing Comp
FRAME WINDOW
Glass set in Kuhls Glazing Comp
Brick
Stone
Joint caulked with oakum and staff bead set in Kuhls Elastic Glazing Comp
HOLLOW STEEL WINDOW
Glass set in Kuhls Elastic Glazing Comp
Brick
Stone
Joint caulked with oakum & sealed with Kuhls Elastic Glazing Composition
SOLID STEEL WINDOW
Wash joints raked out & pointed up with Kuhls Elastic Glazing Comp
Glass set in Kuhls Elastic Glazing Comp
Brick
Stone
Joint caulked with oakum & sealed with Kuhls Elastic G C
CASEMENT TYPE
Glass set in Kuhls Glazing Comp.
MASONRY CONSTRUCTION FACTORY TYPE
Wood
Steel Frame set in Kuhls Elastic Glazing Comp.
Sash Glazed with Kuhls Elastic G C.
WOOD CONSTRUCTION CASEMENT TYPE
ROLLED STEEL WINDOWS
All bed joints raked out and pointed up with Kuhls Elastic Glazing Comp
Wash joints raked out and pointed up with Kuhls Elastic Glazing Comp
Caulked with oakum and sealed with Kuhls Elastic G C
Wood Sill
FRAME WINDOW SILL
Cast Iron or Bronze Saddle set in Kuhls Elastic G C
Door
BRONZE OR CAST IRON SADDLE
Cast Iron or Bronze Sill set in Kuhls Elastic Glazing Comp
Stone
Brick
CAST IRON WINDOW SILL
Brick
All brick joints raked out to a depth of 1" and pointed up with Kuhls Elastic G C.
Copper Cap Flashing
Copper Base Flashing
Joint raked out, cap flashing inserted and wedged and joint pointed up with Kuhls Elastic Glazing Comp
COPPER FLASHING LET INTO BRICK JOINTS
Stone
Copper Cap Flashing
Cap Flashing inserted and wedged and reglet pointed up with Kuhls Elastic Glazing Comp
COPPER FLASHING LET INTO REGLET IN CUT STONE WORK
Glass Lights set in Kuhls Elastic Glazing Composition
SIDEWALK LIGHT OR SKYLIGHT
TERRA COTTA CORNICE
NOTE — The details given on this drawing show only a few of the many important uses of these products
Joints filled with Kuhls Elastic G C
Expansion joints filled with Kuhls Elastic Seam Comp.
Tile
Membrane Waterproofing
PROMENADE TILE

A FEW OF THE MANY USES OF
KUHLS ELASTIC GLAZING COMPOSITION AND KUHLS ELASTIC SEAM COMPOSITION.

PECORA PAINT COMPANY

Calking and Glazing Compounds

Fourth Street and Erie Avenue
PHILADELPHIA, PA.

PECORA
Rhino Brand
CALKING GLAZING
"Tough as his Hide"
COMPOUND
TRADE-MARK

Products

Pecora Calking and Glazing Compound.

For Mortar Stains, Roofing Cements and Metal Sash Putty, see pages 162-163.

Pecora Calking and Glazing Compound

A plastic material, impervious to heat, cold and moisture, or acid fumes. When set it forms a tough skin on the surface but remains permanently pliable and elastic underneath, never cracking or drying out. It adheres tenaciously to wood, stone, concrete, iron, glass, or any other building material, while its permanent elasticity adjusts itself, under all ordinary conditions, to contraction, expansion, or warping of the surfaces it joins.

Its consistency is about that of putty and it is as easily applied. Stock color is light gray. Other shades furnished if ordered in not less than ½ barrel lots (400 to 500 lb.).

Air Leakage Prevention

The prevention of air leakage is a vital prerequisite to fuel saving and satisfactory heating, and to the subsequent comfort of the occupants of a building. Approximately 90% of the air leakage in all buildings occurs between the window and door frames and the surrounding masonry. Unless these spaces are calked with a permanently flexible material in place of the usual mortar joint and cement pointing, this air leakage is bound to continue.

Method of Calking Around Window and Door Frames

This necessarily varies with the conditions to be found in old buildings. In some cases it is advisable to remove staff beads and calk space between the frame proper and the wall, while in other cases the calking can be done satisfactorily without removing staff beads. For this class of work a reliable calking contractor should be consulted; a list of these will be furnished on request.

For calking frames in new buildings the following set of specifications, if rigidly enforced, will insure thoroughly weatherproof, windproof, and dustproof joints between frames and the surrounding masonry.

Specifications—In the last paragraph of the general conditions to the specifications insert under the following heading:

Substitution of Materials, etc.—For material, apparatus, and appliances specified, other articles of equal capacity, material, designs, workmanship, and space occupied may be substituted, providing that the written approval of the architect shall be given before the general contract is signed. After contract is signed, no substitutions will be allowed. Samples of such substitutions shall be submitted before signing the general contract.

In specifications for stone, hollow tile, or brick masonry, insert this paragraph:

This contractor shall rake out the mortar before it is set ½ in. deep from outside face of door and window frames, on jambs top and under wood sills.

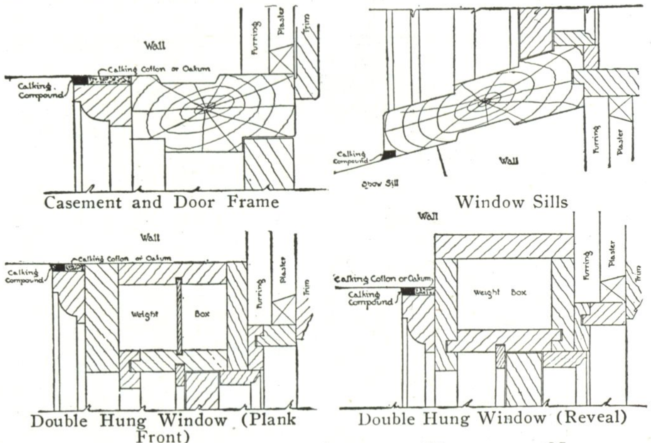
In specifications for carpenter and millwork insert this paragraph:

All staff beads on door frames and reveal window frames and back band moulding on plank front frames shall be loose and shall be put in place by the carpenter immediately after the calking is done.

In carpenter specifications after exterior door and window frames are specified add these paragraphs:

Calking—All exterior window and door frames shall be sealed with Pecora Calking Compound manufactured by the Pecora Paint Company of Philadelphia, Pa. This shall be executed so that the joint between masonry and frames (heads, jambs, and sills) will be rendered weatherproof, windproof, and dustproof, and guaranteed so to remain under all ordinary conditions for a period of 5 years from date of installation. When spaces between the frames and the surrounding masonry are wider or deeper than ½ in., these spaces shall be packed within ½ in. of frame surface with oakum and the remaining space filled solid with the calking compound.

The above work shall be done when all frames are set in place and primed and masonry joints raked out, as called for under masonry specifications.



Casement and Door Frame — Window Sills — Double Hung Window (Plank Front) — Double Hung Window (Reveal)

Suggestive Details for Applying Moulds to New Frames to Accommodate Calking and Undercut Sills for Same Purpose

Other Uses

Glazing—For any construction subject to severe conditions, such as excessive vibration, gas, acid fumes, extreme variations in temperature, etc., Pecora Calking and Glazing Compound should be used for bedding and glazing the skylights. Its permanent elasticity prevents the glass from cracking. It will go twice as far as white lead putty.

Pointing Stonework—It is difficult if not impossible, to get a cement mortar that will stand up in exposed joints in stone, terra cotta, or tile cornices. The cement cracks and becomes loose, causing leaks. To overcome this, set the masonry in portland cement in the usual way, but rake the joints back ½ in. before the cement hardens and fill in with Pecora Calking Compound.

In old work, clean the joints of all loose dirt or cement and grout with Pecora Calking Compound. This makes a positive seal against the action of the weather on the cement, insuring permanently tight, waterproof joints.

Packages

Pecora Calking Compound is packed in 12½, 25, 50, and 100-lb. kegs; also in ½ barrels (400 to 500 lb.) and barrels (800 to 900 lb.).

WEATHERPROOF CALKING COMPANY

Manufacturers of Hennen's Elastic Calking Paste

757 Washington Avenue North

MINNEAPOLIS, MINN.

Hennen's ELASTIC Calking Paste

TRADE-MARK

Hennen's Elastic Calking Paste

For calking door and window frames and for glazing sash.

For pointing terra cotta and coping-stone joint—a firm binder and a positive protection against leakage.

An elastic and adhesive compound of a formula of Extra Guilder's English whiting and vegetable and mineral oils. A tough and plastic waterproof compound of about the weight and consistency of putty, that adheres perfectly to wood, concrete, brick, terra cotta, stone, metal or glass.

Stock colors, gray and black.

What It Does

Hennen's Calking Paste hermetically seals all joints and openings between frames and masonry. Owing to its consistency, it can be easily installed in any joint or seam; is not affected by heat or cold, moisture or acid fumes.

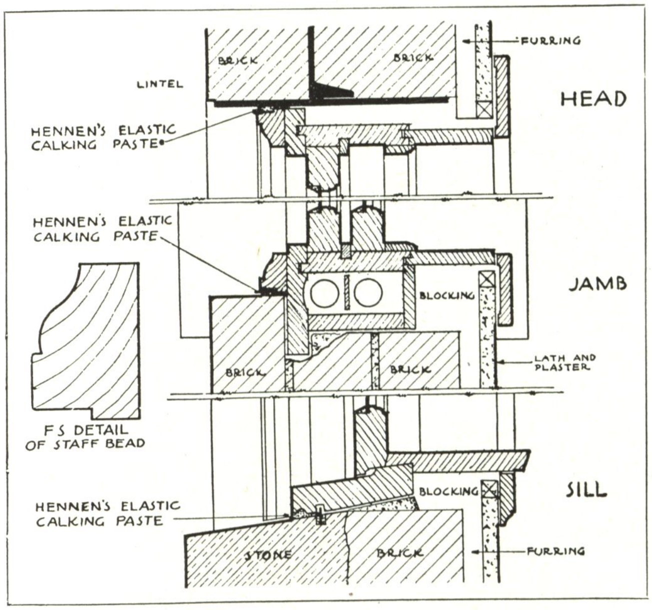
Because of its composition and elasticity, it does not crack nor deteriorate from expansion or contraction of the frames or from action of the weather. It is equally effective on old or new work and can be applied at any time of the year.

Hennen's Calking Paste is also an ideal glazing compound for either wood or metal sash or skylights. It adheres perfectly without becoming hard and is easily removed when necessary to reset glass.

Protection

The use of Hennen's Calking Paste saves fuel and cleaning and protects decoration by excluding wind, dust, soot and moisture. The exclusion of the moisture keeps the sills from rotting and prevents the deterioration of the masonry underneath.

Our experience with elastic calking paste through long years of usage has enabled us to make many improvements in the composition of Hennen's Paste.



Detail of Double Hung Window Showing Calking

Durability

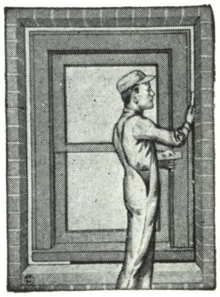
Hennen's Calking Paste has been in use for 18 years and is still giving effective and satisfactory service on the most prominent buildings in all parts of the country. It does not deteriorate with age. The first plastic calking put into use for sealing between frames and masonry. It has given continuous satisfaction and is still recommended by its first users.

Method of Installing

If oakum is desired between frames and masonry, before staff-beads are permanently fastened, all loose mortar should be removed and the joint thoroughly packed with the oakum, which should be driven back ¾ in. and pointed over with Hennen's Paste to hermetically seal the joint.

Oakum alone is not waterproof and, when dried out, is not air or dustproof; it will hold moisture and rot the frames—hence the necessity of the waterproof paste.

The expense of removing the staff-beads can be obviated by detailing as illustrated and specifying as follows:



Weatherproofing with Hennen's Elastic Calking Paste

Specification—After masonry walls have been cleaned and tuck pointed and all carpenter work on the windows has been completed, all exterior door and window frames, set in masonry, shall be sealed thoroughly between staff-beads and masonry on sides and heads and between wood sills and masonry with Hennen's Elastic Calking Paste, manufactured by Weatherproof Calking Company, Minneapolis, Minn., and finished or painted over to match the frames. Installation to be done by experienced workmen and guaranteed for a period of five years.

Estimate

If frames are detailed as illustrated, 1 lb. of Hennen's Paste will calk about 8 ft. of joint.

Guarantee

The 18 years of satisfactory service on many of the most prominent and costly buildings in the country and universal and continued recommendation by leading architects, builders and owners are the best proofs of effectiveness and permanency. Reliable references will be cheerfully furnished, if desired.

Distributers

Name and location of our nearest distributer will be gladly furnished on application to our office in Minneapolis.

VOLUME II

Building Equipment Section

For Building Material Section, see Volume I, following Index

1. **Plumbing**
    - Pipe and Fittings.
    - Valves and Fittings (see 2).
    - Drainage.
        - Sewage Ejectors and Sump Pumps.
        - Sewage Disposal Plants.
        - Septic Tank Systems.
        - Chemical Toilets.
        - Roof Sumps and Vent Connections, Roof Flanges, etc.
        - Drains and Traps, Floor, Showers, Closets, Grease.
    - Water Supply.
        - Meters.
        - Heaters, Range Boilers, etc.
        - Filters and Purifiers.
        - Softeners.
        - Well Drilling.
        - Private Water Supply Systems.
        - Pumps.
        - Water Wheels.
        - Storage Tanks and Steel Plate Work.
        - Lawn Sprinklers.
    - Fire Protection.
        - Automatic Sprinklers.
        - Fire Extinguishing Apparatus.
    - Gas Generators.
    - Toilet Partitions and Urinal Stalls.
        - Steel.
        - Structural Slate (see Vol. I, 11).
        - Soapstone.
        - Structural Glass.
        - Shower Stall Doors.
    - Plumbing Fixtures.
        - Bathtubs, Lavatories, Closets.
        - Sinks and Laundry Trays.
        - Flush Valves.
        - Closet Seats and Tanks.
            - Accessories.
        - Shower Baths.
        - Brass Goods.
        - Bathroom Accessories.
        - Industrial.
        - Drinking Fountains.
2. **Heating and Ventilating**
    - Gas Air Heaters.
    - Warm Air Furnaces.
    - Steam and Hot Water.
        - Boilers.
        - Grates.
        - Radiators.
        - Floor and Ceiling Plates, Radiator Hangers, Covers, etc.
        - Vacuum and Vapor Systems: Valves, Traps, etc.
        - Standard Radiator Supply Valves.
        - Hot Water Specialties.
        - Heating and Ventilating Units.
        - Temperature Regulators.
        - Piping.
        - Insulation.
    - Underground Systems.
    - Ventilation.
        - Blowers and Fans.
        - Heaters.
        - Air Conditioning Apparatus.
        - Air Filters.
    - Registers and Grilles.
3. **Refrigeration**
    - Refrigerators.
    - Small Domestic Units.
    - Ice Making Machines.
    - Cold Storage Doors.
    - Cold Storage Insulation.
    - Accessories.
4. **Electrical Work**
    - Wire.
    - Conduit and Fittings.
    - Panelboards and Accessories.
    - Wiring Devices: Switches, Plugs, Receptacles, etc.
    - Fuses.
    - Lighting Fixtures.
        - Interior Fixtures.
            - Hangers.
        - Reflectors.
        - Stage Fixtures and Signs.
        - Industrial Units.
        - Exterior Fixtures.
        - Illuminating Glassware.
        - Chain.
        - Floodlighting.
    - Lamps.
    - Heating Devices.
        - Ranges.
        - Household Appliances.
    - Power Equipment.
        - Complete Equipment.
        - Motors and Generators.
        - Switchboards.
        - Rheostats and Controllers.
        - Isolated Domestic Generating Units.
    - Low Voltage Equipment.
        - Signal Systems; Bells, Annunciators, Alarms, etc.
        - Telephones.
            - Mail Boxes.
        - Clocks.
        - Batteries.
        - Other Specialties.
        - Door Operators (see Vol. I, 21, and Vol. II, 5).
    - Curtain Operators.
    - Lightning Rods (see Vol. I, 7).
5. **Elevators, Dumbwaiters, etc.**
    - Elevators.
        - Cars.
        - Elevator Signal and Safety Devices, Guides, etc.
        - Gates (see Vol. I, 22).
    - Dumbwaiters.
    - Elevating and Conveying Machinery: Automatic Elevators, Conveyors, Spiral Chutes, Escalators, etc.
    - Ash Hoists (see Vol. I, 18).
    - Pneumatic Tubes.
6. **Power Plant**
    - Boiler Room Equipment.
        - Boilers and Accessories.
        - Condensers.
        - Economizers.
        - Superheaters.
        - Grates and Stokers.
        - Mechanical Draft.
        - Tube Cleaners.
        - Separators.
        - Fuel Oil Equipment.
        - Powdered Coal Equipment.
    - Coal and Ash Handling Machinery.
        - Cranes.
        - Conveyors, Pivoted Bucket.
        - Steam Jet Conveyors.
        - Crushers and Pulverizers.

6. **Power Plant—Cont'd**
    - Pumps (see 1).
    - Valves (see 2).
    - Regulators.
        - Pressure Reducing Valves.
        - Damper.
        - Feed Water.
        - Pressure, Water, Gas, Steam.
    - Engine Room Equipment.
        - Steam Engines.
        - Turbines.
        - Compressors.
    - Miscellaneous.
        - Gas Burners.
        - Gas Producers.
        - Oiling Systems.
        - Oil Storage.
        - Oil Filters.
        - Water Cooling Systems.
        - Combustion Recorders.
7. **Furnishings**
    - Wood Furniture.
        - Wardrobes.
    - Metal Equipment.
        - Lockers and Shelving.
        - Furniture.
        - Library Bookstacks.
    - Interior Decorations.
    - Wall Coverings.
    - Linoleum and Cement (see Vol. I, 17).
    - Rubber and Leather Mats.
    - Beds, Concealed or Wall.
    - Built-in Fixtures.
    - Kitchenettes
    - Garment Hangers and Shoe Racks.
    - Ventilating Window Shades.
        - Accessories.
    - Pipe Organs.
8. **Equipment**
    - Kitchen and Bakery.
        - Ranges, Coal.
        - Ranges, Gas.
        - Ranges, Electric (see 4).
        - Kettles, Cookers, Mixers.
        - Dishwashers.
        - Incinerators (Garbage Destroyers).
    - Laundry.
        - Washing Machines.
        - Dryers.
        - Ironing Equipment.
        - Chutes.
    - Barber Shop Chairs and Fittings.
    - Commercial Buildings.
        - Mail Chutes.
        - Directory Boards.
    - Store.
    - Vacuum Cleaners.
    - Blackboards (see also Vol. I, 11).
        - Accessories.
    - Bowling Alleys, Billiard Tables, etc.
    - Bells and Chimes.
9. **Dairy Barn Equipment (see Vol. I, 29)**
10. **Landscape**
    - Greenhouses.
    - Garden Furniture.

THE AMERICAN BRASS COMPANY

Manufacturers of Brass, Copper and Benedict Nickel Pipe

GENERAL OFFICES
WATERBURY, CONNECTICUT

MILLS AND FACTORIES
ANSONIA, CONN.
TORRINGTON, CONN.
WATERBURY, CONN.
HASTINGS-ON-HUDSON, N. Y.
KENOSHA, WIS.
BUFFALO, N. Y.

CANADIAN MILL: ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO

OFFICES AND AGENCIES
NEW YORK, N. Y., 25 Broadway
BOSTON, MASS., 201 Devonshire Street
PROVIDENCE, R. I., 131 Dorrance Street
PHILADELPHIA, PA., Widener Building
PITTSBURGH, PA., Oliver Building
NEW ORLEANS, LA., Hibernia Bank Building
CHICAGO, ILL., 111 W. Washington Street
CLEVELAND, OHIO, Union Trust Building
CINCINNATI, OHIO, Dixie Terminal Building
DETROIT, MICH., General Motors Building
ST. LOUIS, MO., Planters Building
SAN FRANCISCO, CAL., 2 Pine Street

ANACONDA
from mine to consumer
TRADE MARK

Products

Anaconda Pipe for water service, made of Brass, Red-Brass, Copper and Benedict Nickel.

For Anaconda Extruded Architectural Bronze Mouldings, etc., see pages 727-729; for Sheet, Roll and Strip Copper, see page 1124; for Ambrac Metal and Bronze Screen Wire, see page 939.

Corrosion in Water Service Lines

This problem is becoming more serious as time goes on because water pressures are higher and the use of corrosion-producing purifying agents is rapidly increasing. The report of the Special Plumbing Board of the Massachusetts Department of Health, states that "filtered waters are more corrosive than the same waters unfiltered because they do not form slimy layers in the pipes. Waters filtered by mechanical filtration are more corrosive than waters filtered by slow sand filtration because the use of alum increases the amount of carbonic acid in the water."

No protective coating in commercial use permanently protects iron and steel from rust, and rust clogs pipe, staining the water and reducing the flow to a trickle. In time, weak places, such as the threads, are eaten away and the pipe leaks.

Anaconda Brass Pipe

Anaconda Brass Pipe can not rust. It resists corrosion indefinitely and, properly installed, will last as long as the building. Anaconda Brass Pipe delivers a full flow of water, as clear and pure as its source, for rust deposits do not form to clog the pipe or discolor the water.

Anaconda Brass Pipe is semi-annealed and seamless, hard enough to stand threading and structural tension but soft enough to prevent season-cracking by internal strains. It is made by the world's largest manufacturers of copper and brass, from Anaconda mined and refined metals of highest quality. Over fifty years of experience in the manufacture of tubes, backed by the co-ordinated supervision of all operations from mine to finished product, assures uniform and dependable quality.

Guarantee—Every length of Anaconda Brass Pipe is guaranteed physically perfect and structurally sound. This complete assurance of perfect service is made possible by improved methods of manufacture and a system of inspection which permits no pipe to leave the mills until its freedom from defects has been demonstrated by tests exceeding those of actual service.

Anaconda Brass Pipe Is Trademarked

The Anaconda trade-mark is rolled in the metal on every length of Anaconda Brass Pipe. This mark provides permanent identification and is a protection to the architect, contractor and owner.

Anaconda Red-Brass Pipe for Exceptionally Severe Service

Where the pipe system must conduct water which is unusually corrosive, such as salt water or water high in chlorides or nitrates, The American Brass Company recommends the use of Anaconda Red-Brass Pipe. Laboratory tests and field investigations extending over the past twenty years conclusively prove that, of all commercial alloys, Anaconda Red-Brass Pipe most successfully resists the corrosive action of such waters.

Anaconda Red-Brass Pipe carries the same guarantee as Anaconda Brass Pipe.

Benedict Nickel Pipe

Benedict Nickel, a special copper-nickel alloy, white in color, is manufactured in the form of pipe for exposed plumbing. It is a corrosion resisting, strong and durable metal which retains its white color and luster—no plating to wear through exposing the base metal.

Sizes

Anaconda Brass, Red-Brass and Benedict Nickel Pipe is made in standard pipe sizes, both regular and extra heavy, and in such other commercial sizes and gauges as may be required.

Deliveries

Anaconda Brass Pipe is manufactured and stocked by the Waterbury, Conn., Torrington, Conn., Buffalo, N. Y., and Kenosha, Wis., Mills of The American Brass Company, and handled by leading plumbing material distributors everywhere. This assures prompt and dependable delivery of regular and special sizes to all parts of the country.

Service

The American Brass Company maintains an extensive Technical Department, whose services are at the disposal of architects requiring accurate information on copper, brass and bronze.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

AMERICAN TUBE WORKS

Seamless Drawn Brass and Copper Pipe

10 Oliver Street, BOSTON, MASS.
ESTABLISHED 1851

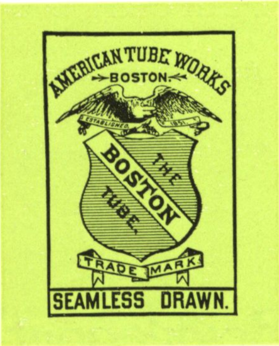
NEW YORK, N. Y. PHILADELPHIA, PA.

Products

SEAMLESS DRAWN BRASS and COPPER PIPE.

Original American Manufacturers of Seamless Drawn Brass and Copper Pipe

For 50 years every length of our brass and copper pipe, iron pipe sizes, has been stamped "A. T. W. Boston" on each end, has borne our green trade-mark as shown below and has been absolutely guaranteed.



TRADE-MARK

Superiority of "A. T. W. Boston" Pipe

The illustrations below are photographs of brass pipe exhibited at the Sanitary and Efficiency Show held at Pittsburgh, Pa., during the 38th annual convention of the National Association of Master Plumbers. They are given simply to show that seamless drawn pipes made by the exclusive process of the AMERICAN TUBE WORKS (at left of illustration) will stand, before bursting, a pressure which expands the pipe greatly beyond its original diameter—a pressure exceeding by many times any pressure not due to accident or to any extremely severe test. They also show that some seamless drawn brass pipes (at right of illustration and not made by the American Tube Works process) do not expand and burst, but simply give way by splitting.

All brass pipe is far superior to iron and steel in non-corrosive quality, but some brass pipe is more reliable than others and more durable under pressure.

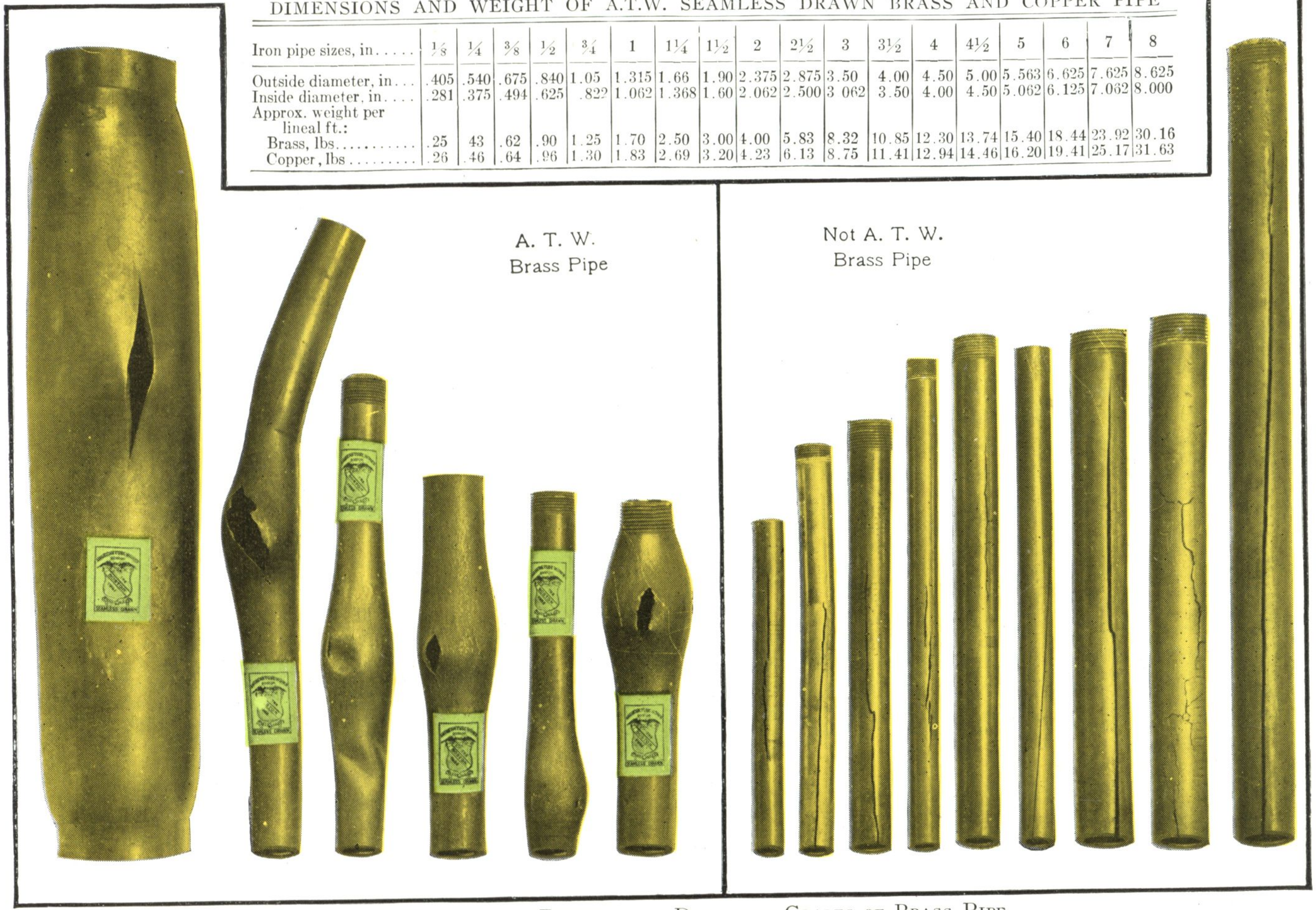
"A. T. W. Boston" pipe is tested to 1000 lbs. pressure before leaving the mill. It is positively guaranteed not to split. When specifying this pipe, please call for "American Tube Works Brass Pipe." We shall be pleased to furnish upon application a complete set of our architects' samples of seamless brass pipe, standard iron pipe sizes with weight per foot stamped on each piece, and threaded with standard thread.

A.T.W. BOSTON
A.T.W. BOSTON

EVERY LENGTH OF OUR BRASS PIPE, IRON PIPE SIZES, IS STAMPED "A.T.W. BOSTON" ON EACH END AND BEARS OUR TRADE-MARK

DIMENSIONS AND WEIGHT OF A.T.W. SEAMLESS DRAWN BRASS AND COPPER PIPE

Iron pipe sizes, in.	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Outside diameter, in.	.405	.540	.675	.840	1.05	1.315	1.66	1.90	2.375	2.875	3.50	4.00	4.50	5.00	5.563	6.625	7.625	8.625
Inside diameter, in.	.281	.375	.494	.625	.822	1.062	1.368	1.60	2.062	2.500	3 062	3.50	4.00	4.50	5.062	6.125	7.062	8.000
Approx. weight per lineal ft.:																		
Brass, lbs.	.25	43	.62	.90	1.25	1.70	2.50	3.00	4.00	5.83	8.32	10.85	12.30	13.74	15.40	18.44	23.92	30.16
Copper, lbs	.26	.46	.64	.96	1.30	1.83	2.69	3.20	4.23	6.13	8.75	11.41	12.94	14.46	16.20	19.41	25.17	31.63



EFFECT OF EXCESSIVE PRESSURE ON DIFFERENT GRADES OF BRASS PIPE

BRIDGEPORT BRASS COMPANY

Manufacturers of Electric Furnace Brass Pipe

BRIDGEPORT, CONN.

BRANCH OFFICES

NEW YORK, N. Y., Pershing Square Building
CHICAGO, ILL., Wrigley Building
PHILADELPHIA, PA., Bankers Trust Building
DETROIT, MICH., General Motors Building
CLEVELAND, OHIO, 2017 Superior Viaduct

Products

PLUMRITE BRASS PIPE.

Also manufacturers of Ledrite Brass Rod; Phono-Electric Contact Wire; Phono-Hi-Strength Wire; Tubular Plumbing Goods; Condenser Tubes, Sugar Tubes; Brass, Bronze and Copper Sheets; Brass, Bronze and Copper Tubes; Auto, Bicycle and Pressure Pumps; Auto Accessories; Stampings; Engravers' Copper Specialties; Screw Machine Products; Pressed or Drawn Products; Oil and Grease Guns.

For Bridgeport-Keating Flush Valves, see page 2018.

"Bridgeport"
BRASS
TRADE CO. MARK
Brass Products

Reasons for Brass Pipe

The reason for specifying brass pipe and fittings is found in their lower last cost. At the end of a period of years when a proper check up is made of the damage, repair and reduced service costs against the leaking water system, this expensive, unnecessary outgo is always demonstrated to be far in excess of the slight additional first cost of brass pipe. Iron and steel pipe rust under most water conditions and especially in hot water service. Lead fails in other ways and is no cheaper installed at current prices for labor and the pipe itself. Lead poisoning, an insidious slow-acting, cumulative process, is always a possibility and its effects by its very nature are discovered only after much damage has been suffered.

Brass Pipe Does Not Corrode

Brass pipe does not corrode nor clog up and hence a flow of water is obtained that is just as clean after years of service as immediately after installation. The beauty of high class bathroom fixtures is not impaired by rust marks. Smaller pipe size can be utilized because the whole cross sectional area is permanently effective. This reduces the total cost of brass more nearly to the cost of cheaper substitutes which have to be installed in larger sizes to allow for the reduction of area by rust and scale collection which is bound to ensue.

Why Bridgeport Plumrite Should Be Specified

Plumrite is the product of a Company which has made brass tubing and pipe for sixty years. It has been installed in many notable buildings long enough ago to have established its permanence, in many cases 25 to 30 years without trouble. It outlasts the building itself.

How to Specify Plumrite Brass Pipe

Brass Pipe—All brass pipe as hereinafter specified shall be Bridgeport Plumrite brass pipe as manufactured by the BRIDGEPORT BRASS COMPANY, Bridgeport, Conn.

All brass pipe shall withstand, without showing weakness or defects, 1000 lb. internal hydrostatic pressure per sq. in.

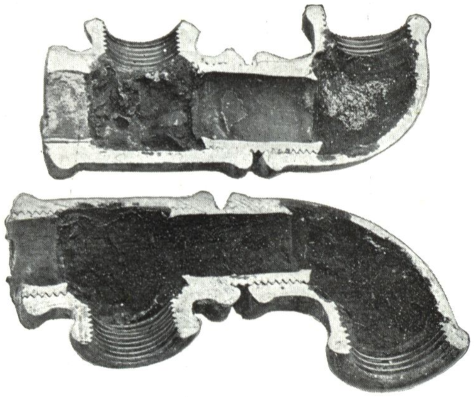
Plumrite Brass Pipe Affords Installation Economy

Plumrite is semi-annealed, removing any internal strain that might exist and is not, at the same time, too soft to thread easily and withstand rough usage. This factor, together with its lead content, makes it easily worked, threaded, cut and bent. This means a lower labor charge.

Special Properties of Plumrite

Plumrite is hydrostatically tested to a pressure of 1000 lb. per square inch, a pressure which is much in excess of service demands. Plumrite is melted in electric furnaces under close control of mixture and temperature, together with the elimination of most of the human element which insures a uniform, high quality product. Our pipe is stamped about three inches from the end of every length of pipe with our trade-mark shown below. This is to eliminate substitution and as an identification for the jobber, plumbing contractor, building contractor and inspecting architects.

Bridgeport
Plumrite
TRADE-MARK



Galvanized Iron Fittings with Brass Nipples

Brass untouched. Iron fittings filled with rust and at one point completely perforated. Be sure that both pipe and fittings are of high quality brass for in addition to rustless material, a fitting must possess the necessary body to resist the operation of insuring a tight joint

Continued on next page

Plumrited Buildings

Here are a few of the many well-known buildings which receive pure, rustless water through Plumrite brass pipe and whose costly interiors are protected by its installation from damage through leakage.

Banks

Federal Reserve Bank, New York, N. Y.
Greenwich Savings Bank, New York, N. Y.
Greenwich Bank, New York, N. Y.
Citizens' National Bank, Baltimore, Md.

Hotels

Shelton Club Hotel, New York, N. Y.
Roosevelt Hotel, New York, N. Y.
New Colonial Hotel, Nassau, W. I.
Royal Bermudian, Bermuda, B. W. I.
Robert Morris Hotel and Wesley Building, Philadelphia, Pa.
Pantland Hotel, Grand Rapids, Mich.
New Syracuse Hotel, Syracuse, N. Y.
Washington Hotel, Shreveport, La.

Store and Office Buildings

U. S. Chamber of Commerce, Washington, D. C.
New York Cotton Exchange, New York, N. Y.
Pershing Square Building, New York, N. Y.
New York Times Annex, New York, N. Y.
N. Y. Telephone Building, New York, N. Y.
Edw. Malley Department Store, New Haven, Conn.
383 Madison Avenue, New York, N. Y.
Central Square, New York, N. Y.
Candler Building, Atlanta, Ga.
American Radiator Building, New York, N. Y.

Miscellaneous

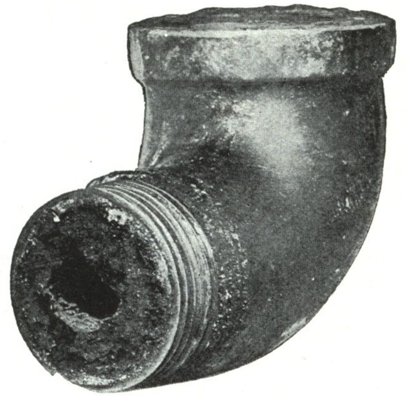
Manhattan College, New York, N. Y.
Temple University, Philadelphia, Pa.
Lafayette Gymnasium, Easton, Pa.
Fox Theater, Philadelphia, Pa.
Hospital for Blind (addition), New York, N. Y.
Jos. E. Widener Residence, Philadelphia, Pa.
Thos. McFadden Residence, Philadelphia, Pa.
Bonnie Briar Country Club, New Rochelle, N. Y.
Park Apartments, Bridgeport, Conn.
Wingfoot Country Club, Mamaroneck, N. Y.
Y. M. C. A., Flushing, L. I., N. Y.

DIMENSIONS AND WEIGHTS OF PLUM-RITE BRASS PIPE
(IRON PIPE SIZES)

Corresponding iron pipe size, in.	Diameter, in.		Approx. weight lb. p r lin. ft.
	Outside	Inside	
⅛	.405	.281	.24
¼	.540	.375	.43
⅜	.675	.494	.61
½	.840	.625	.91
¾	1.050	.822	1.23
1	1.315	1.062	1.74
1¼	1.660	1.368	2.55
1½	1.900	1.600	3.03
2	2.375	2.062	4.01
2½	2.875	2.500	5.83
3	3.500	3.062	8.30
3½	4.000	3.500	10.90
4	4.500	4.000	12.70
4½	5.000	4.500	13.90
5	5.563	5.062	15.75
6	6.625	6.125	18.30
7	7.625	7.062	25.30

Useful Tables

We have placed on this page for the convenience of the architect and specification writer some useful tables. For fuller information on the subject of water supply, corrosion and kindred themes, send for a copy of our "Brass Pipe and Piping." Some of the topics discussed are: Deactivation, deaeration, brass pipe manufacture, brass pipe layouts, piping system, design, mechanical pointers for installing, costs, endurance records.



Galvanized Iron Hot Water Fitting After a Few Years' Service

Galvanized iron hot water fittings after a few years service clogged with rust; flow of water reduced to a trickle, showing the importance of employing first class brass fittings in order to gain the permanent benefits of brass piping in a plumbing system. The same condition shown here occurs in just the same way in straight runs of galvanized iron pipe

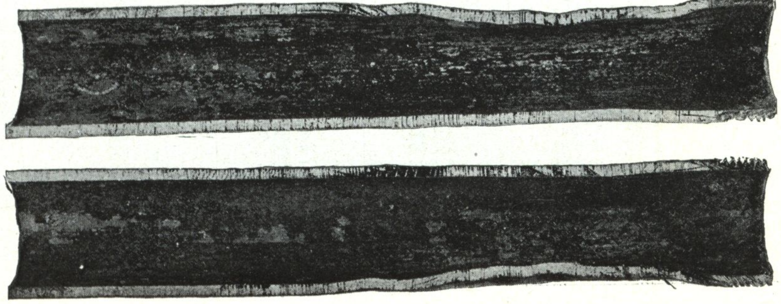
WATER DRAWN AT VARIOUS FIXTURES AND PIPE SIZES RECOMMENDED

*Water drawn at fixtures in various buildings, gal. per min.		Sizes of water supply branches to fixtures, in.		
		Pressures		
		High	Medium	Low
Baths	10	½	¾	1
Lavatories	5	⅜	½	½
Tank closets	5	⅜	½	½
Valve closets	30	¾	1	1¼
Shower baths	5	⅜	½	¾
Kitchen sinks	10	½	¾	¾
Pantry sinks	5	⅜	½	½
Slop sinks	10	½	¾	¾
Laundry tubs	10	½	¾	¾
Urinals	10	½	¾	¾
Fountains	3	⅜	⅜	½
Garden hose	10	½	¾	¾

*To find volume of water required per minute, take quantities from this table and divide by 4 for residences, apartments, schools and office buildings. For clubs and hotels, divide by 3. For gymnasiums, hospitals, Y. M. C. A.'s and public comfort stations, divide by 2.
For public baths, laundries and factories, allow full amount.

CAPACITIES OF WATER PIPING IN BUILDINGS

Main pressure less back pressure, lb.	Computed delivery in U. S. gallons per minute for 100-ft. length of piping								
	½-in.	¾-in.	1-in.	1¼-in.	1½-in.	2-in.	2½-in.	3-in.	4-in.
17	3.2	9.1	18.7	33.5	51.6	105.8	200.0	290.0	589.0
30	5.0	13.8	28.3	52.0	78.0	159.7	308.0	436.0	885.0
40	5.8	15.9	32.7	60.0	90.0	184.4	350.0	504.0	1023.0
50	6.5	17.5	36.6	70.0	100.7	206.2	390.0	564.0	1143.0
60	7.0	19.5	40.0	76.0	110.3	225.9	430.0	617.0	1252.0
75	7.5	21.8	44.8	85.0	123.4	252.6	480.0	690.0	1400.0
100	9.0	25.2	51.7	99.0	142.4	291.6	558.0	797.0	1617.0



Brass Hot Water Pipe After 21 Years Service

No signs of corrosion; original carrying capacity retained. The irregularity of outline was caused by the wrench in removing the sample shown; it serves, however, to demonstrate ably the sturdy ductility of the pipe which has in no wise been impaired by the 21 years of service. Contrast with the weakened condition of any iron or steel pipe after one-third the number of years of service with the attendant rust-demolished structure

BALTIMORE TUBE COMPANY, INC.

Manufacturers of Seamless Drawn Brass and Copper Pipe

BALTIMORE, MD.

BRANCH OFFICES AND AGENCIES

NEW YORK, N. Y. CHICAGO, ILL. PHILADELPHIA, PA. CLEVELAND, OHIO BOSTON, MASS.
DETROIT, MICH. PITTSBURGH, PA. DENVER, COLO. ROCHESTER, N. Y. OGDEN, UTAH
SAN FRANCISCO, CAL. NEW ORLEANS, LA. MONTREAL, QUE.

Brass Pipe for Permanence

The advantages of brass pipe for hot and cold water service lines, especially for hot water and all concealed lines, are now so well known and appreciated that detailed enumeration is unnecessary here.

Briefly the advantages of brass pipe are:

(1) Absolute immunity to corrosion.

(2) Elimination of the rusty water nuisance.

(3) Elimination of incessant repairs and replacement.

(4) Rust can not form and obstruct the flow of the water. Because of this fact, smaller sizes of brass pipe may be used; if corrodible pipe is installed it must be at least one size larger than brass for the same service.

(5) The slightly higher first cost of brass pipe is more than offset by the savings in repairs and replacements and the resultant damage to the building and its furnishings.

(6) The first cost of brass pipe is its only cost—it will outlast the usefulness of the building.

Why Baltimore Brass Pipe Should Be Specified

There are many grades of brass pipe on the market. The best grade is one which is seamless drawn, which has had its component metals mixed in the best possible manner, which is properly annealed so as to relieve all possible strains set up during fabrication (thus preventing splitting or season cracking) and which is inspected and tested in accordance with the best present-day practice.

Baltimore brass pipe is made by the electric furnace process, the most reliable process known. Electric furnaces eliminate guesswork, make possible the scientific mixture of the component metals and assure uniformity of quality and a close, homogeneous texture so much desired in brass pipe. It is seamless drawn, semiannealed in the most approved manner, subjected to the most rigid inspections and laboratory tests throughout all stages of its manufacture, and each length is tested to 1000 lb. hydrostatic pressure per sq. in.

Where Baltimore Brass Pipe Has Been Installed

Baltimore brass pipe is giving satisfactory expense-proof service in numerous prominent buildings throughout the United States. A few of the most prominent installations follow:

Equitable Building, New York, N. Y., Ernest R. Graham, Architect
William Penn Hotel, Pittsburgh, Pa., Benno Janssen, Architect
Hartford Trust Co. Building, Hartford, Conn., Benjamin Wistar Morris, Architect
Monticello Hotel, Norfolk, Va., Peebles & Ferguson, Architects
J. E. Aldred Residence, Glen Cove, L. I., N. Y., Bertram Grosvenor Goodhue, Architect
F. W. Woolworth Residence, Glen Cove, L. I., N. Y., C. P. H. Gilbert, Architect
Providence-Biltmore Hotel, Providence, R. I., Warren & Wetmore, Architects
John Hancock Mutual Life Insurance Co. Building, Boston, Mass., Parker, Thomas & Rice, Architects

Other Products

We also manufacture the following products and carry a large stock for immediate delivery.

Brass, Bronze and Copper Sheets, Rolls and Strips—Made in a large variety of lengths, widths and gauges, and in various anneals, tempers and finishes. Suitable for all architectural and engineering uses.

Seamless Brass and Copper Tubes—Produced in all commercial shapes, diameters and wall thicknesses. Uniform in quality, diameter and thickness.

Copper Busbars—Have highest conductivity and durability; drawn to perfect dimensions and free from imperfections. All commercial sizes in stock.

Condenser Tubing—Made of Admiralty and Muntz metal, either tinned or untinned, in all lengths, diameters and gauges.

BALTIMORE BRASS AND COPPER PIPE (IRON PIPE SIZES)

Iron pipe size, in.	Outside diameter, in.	Regular			Safe working pressures, lb. per sq. in.	Extra Heavy		
		Inside diameter, in.	Weight per lin. ft., lb.			Inside diameter, in.	Weight per lin. ft., lb.	
			Brass	Copper			Brass	Copper
⅛	.405	.281	.246	.259	3100	.205	.353	.371
¼	.540	.375	.437	.459	3080	.294	.593	.624
⅜	.675	.494	.612	.644	2560	.421	.805	.847
½	.840	.625	.911	.958	2320	.542	1.191	1.253
¾	1.050	.822	1.235	1.298	1940	.736	1.622	1.706
1	1.315	1.062	1.740	1.829	1660	.951	2.386	2.509
1¼	1.660	1.368	2.557	2.689	1490	1.272	3.291	3.460
1½	1.900	1.600	3.037	3.193	1310	1.494	3.986	4.191
2	2.375	2.062	4.017	4.224	1060	1.933	5.508	5.791
2½	2.875	2.500	5.830	6.130	1050	2.315	8.407	8.839
3	3.500	3.062	8.314	8.741	1000	2.892	11.24	11.82
3½	4.000	3.500	10.85	11.41	1000	3.358	13.66	14.37
4	4.500	4.000	12.29	12.93	875	3.818	16.41	17.25
4½	5.000	4.500	13.74	14.44	778	4.250	20.07	21.10
5	5.563	5.062	15.40	16.19	692	4.813	22.51	23.67
6	6.625	6.125	18.44	19.39	572	5.750	31.32	32.93
7	7.625	7.062	23.92	25.15	....	6.625	41.22	43.34
8	8.625	8.000	30.05	31.60	....	7.625	47.00	49.42
9	9.625	8.937	36.94	38.84	....	....	....	....
10	10.750	10.019	43.91	46.17	....	....	....	....

CHASE COMPANIES

INCORPORATED

CHASE METAL WORKS CHASE ROLLING MILLS

WATERBURY, CONN.

BRANCH OFFICES

NEW YORK, N. Y. NEWARK, N. J. BOSTON, MASS. ROCHESTER, N. Y. PITTSBURGH, PA. PHILADELPHIA, PA.
CHICAGO, ILL. ATLANTA, GA. ST. LOUIS, MO. DENVER, COLO.

CHASE COMPANIES OF CALIFORNIA, INC.
SAN FRANCISCO AND LOS ANGELES, CAL.

THE OHIO CHASE COMPANY
CLEVELAND, OHIO

CHASE BRASS COMPANIES, INC.
NEW YORK, N. Y.

CHASE COMPANIES OF NEW JERSEY
NEWARK, N. J.

Products

Seamless Brass Pipe.

Also Brass, Bronze, Copper and Nickel Silver in the form of Sheets, Rods, Tubes and Wire.

Brass Pipe for Permanence

Architects, recognizing that ultimate economy in the use of brass pipe has been convincingly proven, are specifying it instead of iron or steel pipe.

Iron or steel pipe corrodes and leaks after comparatively short service and requires repairs and replacement. It also becomes clogged with rust, which greatly decreases the flow of water, finally causing complete stoppage.

Alpha seamless brass pipe is proof against corrosion and clogging and has been proved by years of successful service.

By specifying Alpha pipe, corrosion and leaks are eliminated.

Brass Pipe for Economy

Anticipated economy in the use of iron pipe seldom materializes. Iron pipe rapidly rusts and disintegrates and either clogs or leaks, causing heavy damage to building and furnishings and necessitating costly repairs, the opening of walls and ripping up of floors or pavements to reach the concealed piping. Alpha seamless brass pipe once installed can be forgotten and the architect and owner can rest secure that it will give continued perfect service.

Trade CHASE Mark

Alpha Brass Pipe

Alpha Brass Pipe

Alpha seamless brass pipe is made of a high brass alloy containing more copper and more lead than is usually found in the ordinary grade of brass pipe. It is carefully "relief-annealed," or heat-treated to remove all strains within the metal which might cause "season cracking" and leaks.

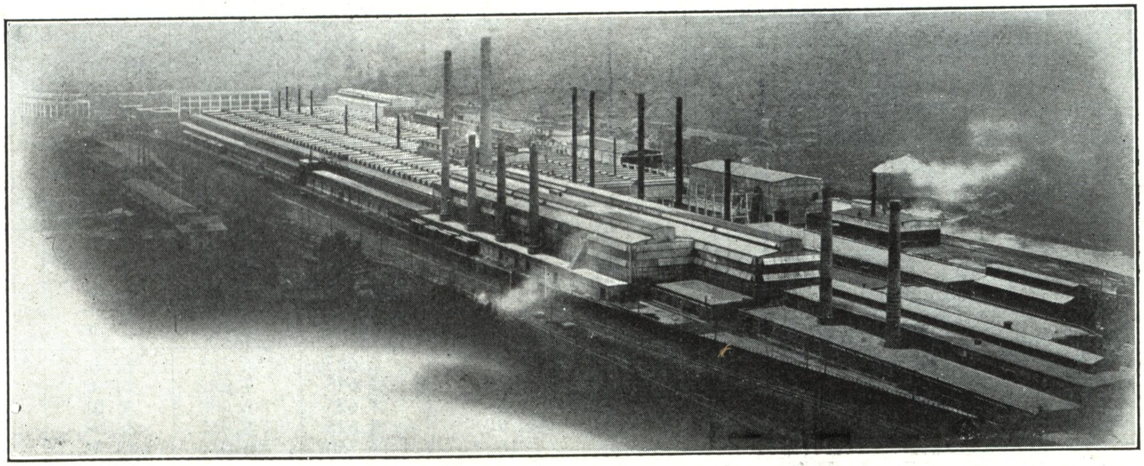
Alpha brass pipe is tested at a fifteen hundred pound water pressure, given the mercurous nitrate test for temper, chemical analysis for alloy, and its grain formation carefully checked for temper and structure.

Trade-marked

Each piece of Alpha seamless brass pipe is marked with the Alpha trade-mark. All pipe is uniform in diameter and thickness throughout, with inside and outside surfaces free from cracks, slivers or other defects. Furnished either plain, tinned or nickelplated in iron pipe sizes listed below:

IRON PIPE SIZES ALPHA SEAMLESS BRASS PIPE

Iron pipe size, in.	Outside diameter, in.	Inside diameter, in.	Weight per lin. ft., lb.	Iron pipe, size, in.	Outside diameter, in.	Inside diameter, in.	Weight per lin. ft., lb.
1/8	.405	.281	.246	3	3.500	3.062	8.314
1/4	.540	.375	.437	3½	4.000	3.500	10.85
3/8	.675	.494	.612	4	4.500	4.000	12.29
1/2	.840	.625	.911	4½	5.000	4.500	13.74
3/4	1.050	.822	1.235	5	5.563	5.062	15.40
1	1.315	1.062	1.740	6	6.625	6.125	18.44
1¼	1.660	1.368	2.557	7	7.625	7.062	23.92
1½	1.900	1.600	3.037	8	8.625	8.000	30.05
2	2.375	2.062	4.017	9	9.625	8.937	36.94
2½	2.875	2.500	5.830	10	10.750	10.019	43.91



Plant of the Chase Metal Works

PLUMBING

COPPER AND BRASS RESEARCH ASSOCIATION

25 Broadway
NEW YORK, N. Y.

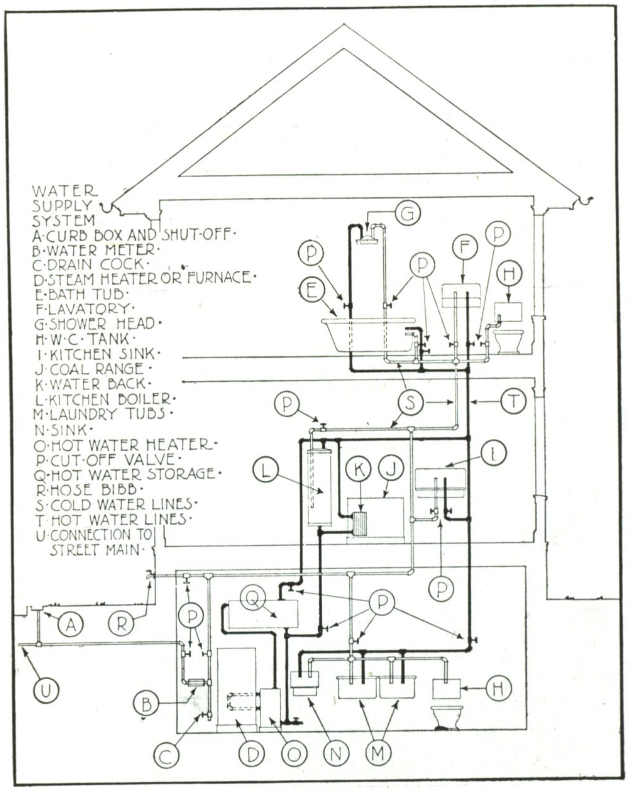
On the Uses and Application of Copper, Brass and Bronze, Consult Our Research and Building Service Departments

Copper and Brass are cheaper because you pay for them only ONCE

Brass Pipe

Brass pipe costs more than corrodible pipe, but it is in every way a superior material. In service it gives a clean, full flow of water—gives it for generations—because for durability in water supply service, brass pipe is unequaled. Instances of exceptional service imposed on brass and copper pipe under severe conditions, are its use as condenser tubes, heating coils, boiler tubes, and salt water lines.

Brass and copper pipes and tubes are made in many sizes, weights and mixtures for all purposes. Copper pipe is being largely used as service pipe to connect buildings with water mains and it possesses the advantages of ease of installation and elimination of rust troubles and replacement expense.


WATER SUPPLY SYSTEM
A·CURB BOX AND SHUT-OFF·
B·WATER METER·
C·DRAIN COCK·
D·STEAM HEATER OR FURNACE·
E·BATH TUB·
F·LAVATORY·
G·SHOWER HEAD·
H·W·C·TANK·
I·KITCHEN SINK·
J·COAL RANGE·
K·WATER BACK·
L·KITCHEN BOILER·
M·LAUNDRY TUBS·
N·SINK·
O·HOT WATER HEATER·
P·CUT-OFF VALVE·
Q·HOT WATER STORAGE·
R·HOSE BIBB·
S·COLD WATER LINES·
T·HOT WATER LINES·
U·CONNECTION TO STREET MAIN·
G
P
E
P
F
P
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The Water Supply Unit

For water supply in buildings, special brass pipe is made. This is known as iron pipe size. It is made in 12-foot lengths and is tested to 1000 pounds at the factory. All brass and copper pipe is sold by weight. Most fittings are sold by the piece; some are sold by the pound. The table below gives the weight per foot of the various sizes of brass and copper pipe.

Specifications for Brass Pipe—All water supply piping shall be of seamless drawn semiannealed brass of approved manufacture. Each length shall be plainly marked with the manufacturer's name and trade-mark. All fittings shall be cast brass malleable pattern, the product of an approved manufacture.

Note: Where salt water has to be piped or where unusual conditions prevail, architects and building contractors are invited to consult with the technical staff of the Association concerning the best suited pipe.

WEIGHTS OF SEAMLESS BRASS AND COPPER PIPE (REGULAR)
(IRON PIPE SIZE)

Standard size	Diameter, in.		Pounds per foot*	
	Outside	Inside	Brass	Copper
⅛	.405	.281	.246	.259
¼	.540	.375	.437	.459
⅜	.675	.494	.612	.644
½	.840	.625	.911	.958
¾	1.050	.822	1.235	1.298
1	1.315	1.062	1.740	1.829
1¼	1.660	1.368	2.557	2.689
1½	1.900	1.600	3.037	3.193
2	2.375	2.062	4.017	4.224
2½	2.875	2.500	5.830	6.130
3	3.500	3.062	8.314	8.741
3½	4.000	3.500	10.85	11.41
4	4.500	4.000	12.29	12.93
4½	5.000	4.500	13.74	14.44
5	5.563	5.062	15.40	16.19
6	6.625	6.125	18.44	19.39
7	7.625	7.062	23.92	25.15
8	8.625	8.000	30.05	31.60
9	9.625	8.937	36.94	38.84
10	10.750	10.019	43.91	46.17

*These weights vary somewhat in practice.

Continued on next page

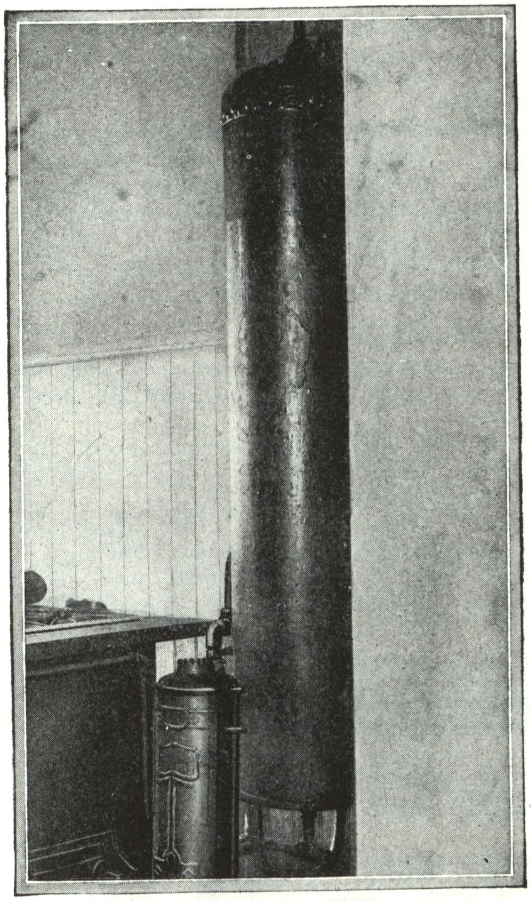
Plumbing Literature

The Association has issued "Practical Brass Pipe Plumbing," a complete handbook covering the best methods of installing brass pipe, the tools to use and other technical information concerning the work and the materials. It is fully illustrated.

Another book "Brass Pipe Plumbing for Your Home," is informative concerning the adaptability and service qualities of brass pipe for water supply in buildings of every character. These books will be forwarded upon request.

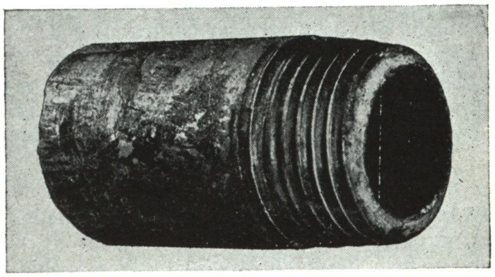
SOME USES OF COPPER AND BRASS FOR PLUMBING

1. PIPES	5. PLUMBING ACCESSORIES
2. TUBES	6. RANGE BOILERS
3. PIPE FITTINGS	7. WATER HEATERS
4. PLUMBING FIXTURES	8. STORAGE TANKS

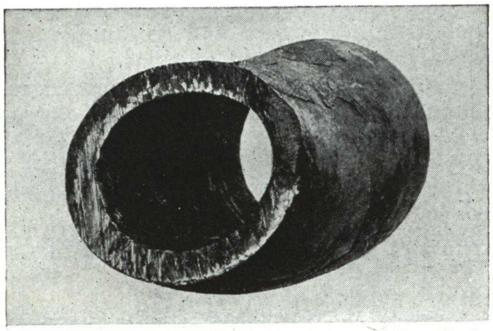


Copper Boiler 58 Years in Use

This copper range boiler was installed in 1857. It is still in use, giving satisfactory hot water service and will continue to do so



Outside of Pipe at Connection—Note the Perfect Condition of the Thread



Interior of the Pipe—Note the Absence of Rust Scale

Brass Pipe After 30 Years Service

These pieces of brass pipe were taken from the old building of the Continental Insurance Company, New York, after 30 years of service without repairs

ESTABLISHED 1860

T. E. CONKLIN BRASS & COPPER CO., INC.

TELEPHONE
FRANKLIN 2900

56 Lafayette Street
NEW YORK, N. Y.
Member of Copper and Brass Research Association

Products

ARCHITECTURAL BRONZE, BRASS, COPPER and NICKEL SILVER in the form of Sheets, Rods, Tubes, Wire, Angles, Channels and Extruded Shapes.

BRASS PIPE.

BRONZE and COPPER SCREEN CLOTH.

TECCO BRAND

Rods—Round, square, hexagon, half round and half oval.

Tubes—Round, square, rope, reeded and rectangular.

Wire—Hard, spring and rich low soft; high and low round, half round, square and flat.

Angles and Channels—With square edges.

Large Stocks of Architectural Bronze, Brass and Copper for Immediate Delivery

We carry one of the largest stocks of architectural bronze, brass, copper and nickel silver in the East, with a variety second to none. Quick shipments and deliveries are thus made possible, regardless of the geographical location of the job or contractor.

Architects are assured that contractors will have no difficulty in securing architectural bronze, etc., from us without delay. This is important in rush work and on large jobs, and eliminates the exasperating delays occasioned by failure of the mills to make prompt shipment.

Our exceptional facilities are nationally known and our unexcelled service is the cumulative result of over 60 years' experience with the trade.

Our modern gang slitters make it possible to furnish slit brass on very short notice.

Our complete line includes the following in a wide variety of sizes, gauges and tempers:

Bronze

Sheets—Half hard patent leveled and square edged; acid dipped patent leveled.

Rolls—Soft commercial in continuous rolls.

Strips—Commercial drawn with square corners.

Rods—Round, half round, square, rectangular, and hexagon. Round and hexagonal Naval bronze rods.

Tubes—Round, square and rectangular.

Wire—Half hard round and flat.

Channels and Angles—With square edges.

Phosphor Bronze—Sheets, rods and wire.

Brass

Sheets—Rich low, half hard, patent leveled and square edged.

Rolls—For spinning and deep drawing.

Strips—Flat and in coils.

Copper

Sheets and Rolls—Hot rolled; cold rolled; plain, polished or tinned. Sheet and roll copper for roofing and flashing.

Rods—Round, square and rectangular.

Tubes—Round, square, rope, reeded and rectangular.

Wire—Soft, hard or spring; round, hexagon, octagon, square, flat and half round.

Nickel Silver

Sheets—Plain or polished on one side and patent leveled.

Rolls—For spinning or drawing.

Rods—Round, square, half round and hexagon.

Wire—Soft, hard or spring; round, half round, hexagon, octagon, square and flat.

"Tecco" Brass Pipe

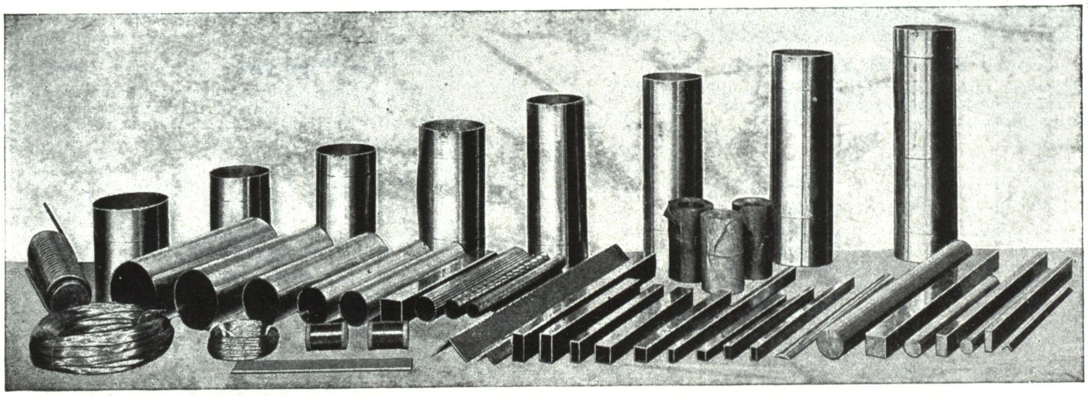
The advantages of brass pipe for hot and cold water lines are now so well known that they need not be stated here.

From our large stock, we can make immediate delivery of "Tecco" brand brass pipe in iron pipe and extra heavy pipe sizes.

"Tecco" brand is a high grade brass pipe sufficiently annealed to prevent season cracking. Thousands of feet of "Tecco" brass pipe have been installed in buildings of the finest character; by specifying this brand, architects are assured of immediate delivery.

Bronze and Copper Screen Cloth

We carry a large stock of bronze and copper screen cloth for immediate delivery, in 100-ft. rolls, in widths 18 in. and every 2 in. wider up to and including 48 in., and in 14, 16 and 18-mesh.



A FEW OF THE MANY FORMS OF BRONZE, BRASS, COPPER, ETC., CARRIED IN STOCK FOR IMMEDIATE DELIVERY

U. T. HUNGERFORD BRASS & COPPER CO.

Brass Plumbing Pipe and Fittings

Hungerford Building, Lafayette, White and Franklin Streets
NEW YORK, N. Y.

BRANCH WAREHOUSES AND OFFICES

BOSTON, MASS., 411-429 D Street
PHILADELPHIA, PA., 510 Arch Street
CLEVELAND, OHIO, 3035 St. Clair Avenue
ST. LOUIS, MO., Boatmen's Bank Building
PITTSBURGH, PA., Chamber of Commerce Building
BALTIMORE, MD., Lombard and South Streets
SAN FRANCISCO, CAL., 22 Battery Street

Products

"Hungerford Star Brand" Semi-annealed Brass Pipe and Fittings.

For Copper Roofing Materials, see pages 1140-1141; for Screen Cloth, see page 1407.

Why "Hungerford Star Brand" Semi-annealed Seamless Brass Plumbing Pipe?

Because of its non-corrodibility, permanence and rich appearance, seamless brass pipe is recognized as being superior to all other kinds of pipe for hot and cold water supply lines.

Endurance and permanency in brass pipe, however, are assured only if it is manufactured according to right principles.

"Hungerford Star Brand" Semi-annealed Seamless Brass Pipe is made of the very best grades of copper and zinc. Every stage in its manufacture is scientifically controlled by analysis and inspection. As a final test, before it is shipped from the mill, each length is subjected to an internal hydraulic pressure of 1000 pounds per square inch.

Annealing is only a relative term, and simply because tube or pipe can be said to have been "annealed" does not necessarily mean that the exact point of anneal has been reached to eliminate internal strains or on the other hand that too much anneal has not been obtained. If carried to extremes the annealing process will render brass pipe too soft for good threading and increase liability of damage through denting or bending out of shape with even the ordinary handling necessary to its installation.

It is evident, therefore, that pipe which is just sufficiently annealed to relieve all internal strains in the metal and yet not too soft for working requirements will have greatest endurance and lasting qualities.

"Hungerford Star Brand" Semi-annealed Brass Pipe is manufactured according to mixing, drawing and heat treating formulas developed as a result of more than fifty years of successful manufacturing experience and is unconditionally offered by us as being equal if not superior to any brass pipe on the market.

TRADE-MARK

HUNGERFORD
TRADE MARK
STAR BRAND
QUALITY UNEXCELLED
REG. U.S. PAT. OFF.

Trade-mark Label That Appears on Every Length of Genuine "Hungerford Star Brand" Seamless Brass Plumbing Pipe

SIZES AND WEIGHTS OF "HUNGERFORD STAR BRAND" SEAMLESS BRASS PIPE AVAILABLE FOR IMMEDIATE WAREHOUSE DELIVERY

Iron pipe size, in.	Inside diameter, in.	Outside diameter, in.	Approx. weight per ft., lb.
1/8	.281	.405	.2461
1/4	.375	.540	.4368
3/8	.494	.675	.6122
1/2	.625	.840	.9114
3/4	.822	1.05	1.235
1	1 062	1.315	1.740
1 1/4	1.368	1.66	2.558
1 1/2	1.600	1.90	3.037
2	2.062	2.375	4.017
2 1/2	2.500	2.875	5.830
3	3.062	3.500	8.314
3 1/2	3.500	4.000	10.85
4	4.000	4.500	12.29
5	5.062	5.563	15.40
6	6.125	6.625	18.44

"Hungerford Star Brand" Brass Plumbing Pipe fully complies with specifications adopted by The American Society for Testing Materials.

When you specify "Hungerford Star Brand" Semi-annealed Brass Pipe you have the assurance of knowing that a reputable, thoroughly experienced manufacturer stands ready to support your specification with every reasonable form of a guarantee.

Do not merely specify "brass pipe"—specify and insist upon having "Hungerford Star Brand" Semi-annealed Brass Pipe. For your guidance and protection each length is labeled and indelibly branded with our name and "star" trade-mark. See illustration.

Pipe Finish, Sizes and Delivery

"Hungerford Star Brand" Semi-annealed Brass Pipe is carried in our warehouse stocks available for immediate shipment, plain, nickelplated or tinned, in all standard iron pipe sizes, 12-foot lengths, as noted in accompanying table.

Pipe Fittings

Obviously the proper installation of brass pipe can only be effected with fittings of a quality equaling that of the pipe. It is therefore essential that "Star Brand" Brass Pipe Fittings be used exclusively with "Hungerford Star Brand" Semi-annealed Brass Pipe.

How to Specify Brass Pipe

(1) All hot and cold water piping throughout the building shall be "Hungerford Star Brand" Semi-annealed, Seamless Brass Pipe and Pipe Fittings of sizes hereinafter specified.

(2) *Note*: State here the various sizes of brass pipe to be used as given in accompanying table, also whether pipe is to be plain, nickelplated or tinned.

(3) All brass pipe shall be tested under a hydrostatic internal pressure of 1000 pounds per square inch and conform with A.S.T.M. specifications.

(4) All exposed brass pipe to be supported where required, with cast brass (rough or finished) supports.

ROME BRASS & COPPER CO.

Manufacturer of Seamless Brass Pipe and Brass, Copper and Bronze

ROME, N. Y.

BRANCH OFFICES

CHICAGO, ILL., 3649 So. Racine Avenue
NEW YORK, N. Y., Pershing Square Building
SAN FRANCISCO, CAL., Wells-Fargo Building

Products

Seamless Brass Pipe.

Also Brass, Copper and Bronze Sheets; Rolls; Rods; Anodes; Tubes, brazed and seamless; Strips; Extruded Shapes; Angles and Channels; Tapered Tubes and Hose Pipes; Door Rail; Commutator Bars and Segments; Electrical Copper Bar; Rivets and Burs.

Send for our Brass Pipe Bulletin and Estimating Chart.

Brass Pipe Is a Necessity—Not a Luxury

A plumbing job must be permanent. Down behind the walls, under the floors, embedded in the concrete, invincible enemies of any iron pipe are at work eating, picking and disintegrating—working destruction, not only on tangible things, but the reputation of the architect. Iron pipe of every kind *will* rust, will corrode and clog—resulting in water-soaked walls, torn out installations, ruined furnishing and equipment—*expense.*

Rome Quality brass pipe can not rust, corrode or clog. Nature provided perfect metals for this purpose, and their use means enduring satisfaction to the owner and credit to the architect.

Rome Quality Seamless Brass Pipe

Over half a century of manufacturing experience is behind this pipe.

The ever increasing demand for our products has necessitated the constant development of modern, labor-saving machinery for use in our mills. It is operated and supervised by a personnel devoted to the manufacture of a product capable not only of providing satisfactory service, but of the greater responsibility of upholding a highly prized and enviable reputation for quality. Latent defects are sought out by the chemists and metallurgists, and each tube, as a final proof of its worth, must withstand a bursting test of 1000 lbs. per sq. in. hydrostatic.

ROME
Quality
BRASS & COPPER

TRADE-MARK
Every Length of Rome Quality
Seamless Brass Pipe Is
Trade-marked Thus

To identify "Rome Quality" seamless brass pipe, every length now bears a mark which is a symbol of merit, and an assurance that the pipe so marked may be installed with utmost confidence.

This mark identifies a brass pipe which is seamless, hard enough to give clean sharp threads, but scientifically annealed to remove strains in the metal.

All pipe is tested before releasing for shipment.

With adequate facilities for the execution of any order, prompt deliveries are assured.

Specify Rome Quality for permanence and economy.

To Specify Rome Quality Brass Pipe

Brass Pipe—(Paragraph **1** should be inserted when brass pipe is to be used for hot and cold water supply lines only. Where any plumbing pipes are to be run through cinder concrete use paragraph 2).

(1) All hot and cold water supply lines, together with all fittings and branch supply lines therefrom to plumbing fixtures, shall be seamless drawn brass pipe of sizes, gauges and weights hereinafter specified, as manufactured by the Rome Brass & Copper Co., Rome, N. Y.

(2) All supply, waste and vent pipes running through cinder concrete (here state where such cinder concrete is located) shall be seamless drawn brass pipe as specified above, for hot and cold water supply lines, for such lengths as run through the cinder concrete.

(3) All brass pipe shall be tested under a hydrostatic internal pressure of 1000 lbs. per sq. in.

(4) (State here the various sizes, gauges and weights of brass pipe to be used, as given in table on this page.)

DIMENSIONS AND WEIGHTS OF ROME QUALITY SEAMLESS BRASS PIPE

*Iron Pipe Sizes					*Extra Heavy Iron Pipe Sizes				Plumbers' Sizes			
Iron pipe size, in.	Amer. or B. & S. gauge	Outside diameter, in.	Inside diameter, in.	Approx. weight per ft., lbs.	Extra heavy iron pipe size, in.	Outside diameter, in.	Inside diameter, in.	Approx. weight per ft., lbs.	Plumbers' size, in.	Outside diameter, in.	Inside diameter, in.	Approx. weight per ft., lbs.
⅛	14	.405	.281	.25								
¼	11	.540	.375	.43	⅛	.405	.205	.370	⅝	.654	.521	.46
⅜	11	.675	.494	.62	¼	.540	.294	.625	¾	.768	.631	.56
½	9½	.840	.625	.90	⅜	.675	.421	.830	⅞	.875	.728	.67
¾	9	1.05	.822	1.25	½	.840	.542	1.200				
1	7½	1.315	1.062	1.70	¾	1.050	.736	1.660	1	1.000	.836	.88
1¼	7	1.660	1.368	2.50					1¼	1.245	1.060	1.27
1½	7	1.900	1.600	3.00	1	1.315	.951	2.360	1½	1.508	1.311	1.55
2	6½	2.375	2.062	4.00	1¼	1.660	1.272	3.300	1¾	1.756	1.564	1.82
2½	4	2.875	2.500	5.75	1½	1.900	1.494	4.250				
3	7/32 in.	3.500	3.062	8.30					2	2.007	1.815	2.10
3½	15/64 in.	4.000	3.500	10.90	2	2.375	1.933	5.460				
4	¼ in.	4.500	4.000	12.70	2½	2.875	2.315	8.300				
4½	¼ in.	5.000	4.500	13.90								
5	17/64 in.	5.563	5.062	15.75	3	3.50	2.892	11.200				
6	¼ in.	6.625	6.125	18.31	3½	4.00	3.358	13.700				
7	19/16 in.	7.625	7.062	26.28	4	4.50	3.818	16.500				
8	21/64 in.	8.626	7.982	29.88								

Rome Quality seamless brass pipe is kept in stock in 12-ft. lengths. Special lengths to order. Furnished plain, tinned or nickel plated.

*Corresponds to outside measurements of iron pipe and made to fit iron fittings.

ESTABLISHED 1802

SCOVILL MANUFACTURING COMPANY

Manufacturers of Brass Mill Products and Brass Goods

WATERBURY, CONNECTICUT

SALES OFFICES

NEW YORK, N. Y., 280 Broadway
CHICAGO, ILL., 1229 W. Washington Boulevard
BOSTON, MASS., 80 Federal Street
PHILADELPHIA, PA., Franklin Trust Co. Building
CLEVELAND, OHIO, 1213 W. 3rd Street
SAN FRANCISCO, CAL., 651 Folsom Street
LOS ANGELES, CAL., 2261 E. 15th Street

Member of Copper and Brass Research Association

Products

SEAMLESS BRASS and COPPER PIPE and TUBING.

Also Brass, Bronze and Nickel Silver, furnished as Rod, Sheet or Wire.

ESTABLISHED 1802
SCOVILL
MANUFACTURING COMPANY

Brass Pipe a Necessity

Brass pipe, once a luxury, is now a necessity. Haphazard methods of manufacture once made the price prohibitive, but with the advance of manufacturing brass pipe came into the list of necessities.

Iron pipe will rust, corrode and clog, resulting in leaks that damage walls, floors and cause endless inconvenience, as well as making high priced replacement necessary. Scovill Seamless Brass Pipe will never rust, corrode or clog.

Engineers with years of experience developed a process which produces practically perfect brass pipe.

The pipe is made by hot piercing a long extruded brass rod called a billet. This operation produces a very dense structured brass tube. This tube is then annealed and drawn on huge draw benches with a pyrometrically controlled anneal between each drawing operation. When finished, the pipe is given an extra anneal to relieve the pressures produced in the drawing operations and make it impossible for the pipe to season crack or split when in use.

Trade-mark

All Scovill Seamless Brass Pipe is labeled with the blue and yellow Scovill label identical in form with the one at the heading of this page. Look for this label on brass pipe; it assures you of perfect brass pipe with the Scovill organization standing behind it.

Tests

All Scovill Seamless Brass Pipe is subjected to a severe test to assure users of a pipe free from all flaws. The pipe is tested with water at 1000 pounds pressure; any defect or hidden flaws will immediately show up under this enormous pressure. From time to time samples of pipe are taken and given a mercury test. This test shows up any tendencies to split or strains that the pipe may have. These tests, coupled with the Scovill process of manufacture, result in a pipe that is uniformly superior.

Perfect Threading

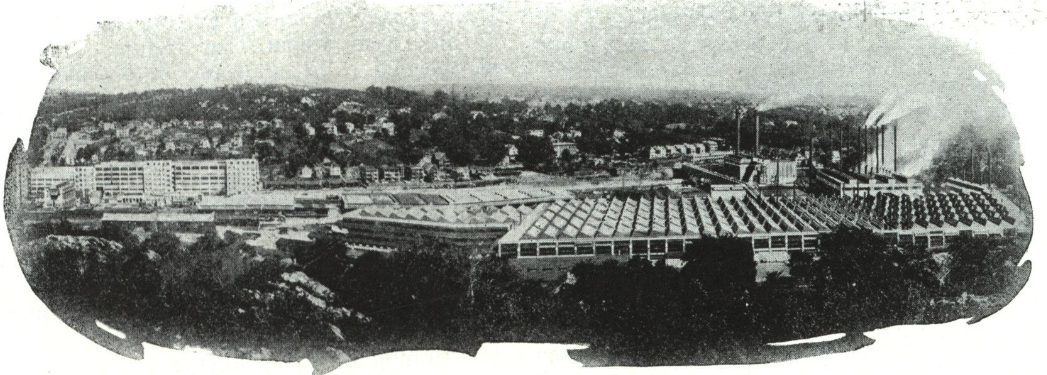
The ends of Scovill Seamless Brass Pipe are the same size and just as true as the rest of the pipe. The pipe takes a clean cut, accurate thread and is sufficiently hard to make perfect joints with a minimum amount of labor.

DIMENSIONS AND WEIGHTS OF BRASS PIPE
IRON PIPE SIZES—REGULAR

Iron pipe size, in.	Diameter, in.		Brass, lb. per ft.	Iron pipe size, in.	Diameter, in.		Brass, lb. per ft.
	Outside	Inside			Outside	Inside	
1/8	.405	.281	.246	3	3.500	3.062	8.314
1/4	.540	.375	.437	3½	4.000	3.500	10.85
3/8	.675	.494	.612	4	4.500	4.000	12.29
1/2	.840	.625	.911	4½	5.000	4.500	13.74
3/4	1.050	.822	1.235	5	5.563	5.062	15.40
1	1.315	1.062	1.740	6	6.625	6.125	18.44
1¼	1.660	1.368	2.557	7	7.625	7.062	23.92
1½	1.900	1.600	3.037	8	8.625	8.000	30.05
2	2.375	2.062	4.017	9	9.625	8.937	36.94
2½	2.875	2.500	5.830	10	10.750	10.019	43.91

Guarantee

Scovill Seamless Brass Pipe is guaranteed against splitting or season cracking.



East Plant, Scovill Manufacturing Company

THE DURIRON COMPANY, INC.

Sole Manufacturers of Duriron Acid-proof Drain Pipe and Fittings, Exhaust Fans, Laboratory Equipment and Special Castings

DAYTON, OHIO

SALES OFFICES

BOSTON, MASS., 348 Tremont Building
BUFFALO, N. Y., 306 Jackson Building
CHICAGO, ILL., 110 So. Dearborn Street
DENVER, COLO., 1718 California Street
DES MOINES, IOWA, Hubbell Building
DETROIT, MICH., 404 Lexington Building
HOUSTON, TEX., 2205 McKinney Avenue
KANSAS CITY, MO., 311 Mutual Building
LOS ANGELES, CAL., 522 F. W. Braun Building
MINNEAPOLIS, MINN., 923 Nicollet Avenue
MONTREAL, QUE., 285 Beaver Hall Hill
NEW ORLEANS, LA. 308 Title Guarantee Building
NEW YORK, N. Y., 1054 Grand Central Terminal
OKLAHOMA CITY, OKLA., 706 West 8th Street
PHILADELPHIA, PA., 823 Bankers Trust Building
PITTSBURGH, PA., 401 Aiken Avenue
SAN FRANCISCO, CAL., 830 Monadnock Building
ST. LOUIS, MO., 2233 Olive Street
TACOMA, WASH., 712 Tacoma Building
VANCOUVER, B. C., 315 Credit Foncier Building
WINNIPEG, MAN., 507 Banning Street

Products

Acid-proof Drain Pipe and Fittings (all extra heavy).

Acid-proof Ventilating Fans.

Laboratory Equipment, including Sinks, Outlets, Traps, "Josam-Duriron" Floor Drains, Beehive Strainers, Overflows, Glass Cleaning Kettles, Kjeldahl Apparatus, etc.

Acid-proof Pumps, Valves, Cocks, Tank Connections and Outlets, Flanged Pipe and Fittings, Ejectors, Kettles and Special Castings.

Duriron Engineering Service

We have extensive experience with all conditions in the handling of acids and acid wastes, and are familiar with building and plumbing codes throughout the country. This enables us to offer the fullest service in the layout of acid waste lines; to make definite recommendations on ventilating problems, and to be of help in all matters where corrosion must be considered.

Literature

"Duriron Acid-proof Building Equipment" (size 8½x11 in., published 1924) is a carefully prepared handbook for the architect and engineer, containing full information and dimensioned drawings of pipe, fittings, etc.

Duriron Bulletin No. 140, "Exhaust Fans," contains complete specifications and capacities of all Duriron ventilating fans. Both the above are prepared with special reference to architectural filing systems.

Duriron Pipe Installation

Duriron pipe is installed the same, as easily, and with the same labor cost as cast iron soil pipe. No special instruction to plumbing contractor is necessary.

Joints should be packed with asbestos wick packing rather than hemp or oakum, which are not acid-proof.

Any *pure* asbestos is suitable, but not always obtainable. For this reason we manufacture a specially treated pure asbestos packing for this purpose.

Duriron

Duriron is a hard, close grained cast metal that is *universally* resistant to the action of corrosives used commercially or in the laboratory.

Despite the similarity of names, Duriron should not be confused with iron. In analysis it differs more from iron than bronze from brass. Its signal advantages over other materials for acid handling are its greater strength, its universal resistance, and the fact that it does not depend on a coating, lining or glaze, but is equally resistant clear through its structure.

Duriron pipe joints, properly calked, will not loosen under ordinary building vibration. Its hardness is such that it is not at all affected by the scouring action of sharp solids carried in solutions. Duriron lines, once installed are permanent, and may be concealed in walls and floors without fear of disfigurement from leaks, and consequent tearing out of finish. Requiring no asphaltum coating, there is no danger of wall discoloration.

Corrosive Tests on Duriron

In 1919 the United States Bureau of Standards made tests of 120 days duration on Duriron with all of the corrosives in general commercial use. The tabulated result of their tests is contained in our handbook, from which it is plainly proved that the life of Duriron pipe for drain lines is virtually unlimited.

We have available for architects and engineers a great volume of data giving the action of corrosives on other materials.

Cost of Duriron Pipe

Compared to extra heavy cast iron soil pipe, the cost of a Duriron pipe installation, including labor, is about three times as great. The additional cost is usually but a small fraction of one per cent of the cost of the building while it results in permanent freedom from repairs or replacements due to corrosion, in addition to insuring the finish from damage due to leaking acid wastes.

After one replacement of a cast iron line the costs are about equal, and it should be remembered that replacement follows numerous repair jobs. Then, after the renewal, it is but a question of a limited time until repeated failure means duplicated expense.

Advantages of Duriron Drain Pipe

Easily installed and familiar work to plumbers. Duriron pipe joints, properly installed, *stay tight;* this is a serious limitation in other materials used to handle acid and acid waste.

Requires no protective coating inside or outside. Unnecessary to encase in concrete, provide drip pans, or otherwise prepare for failure. Elaborate supports not needed.

Lines may be concealed in walls and ceiling when desirable.

Fills all code requirements for sanitary drain, and may be used for dual service of acid and sanitary line, saving an extra line. No other material may be so used.

Does not warp nor sag from heat. No discoloration of walls when run in partitions. Takes paint readily when desired for decoration.

Permits the location of a department such as a laboratory anywhere in the structure.

Complete stocks always maintained, assuring immediate deliveries.

Continued on next page

Duriron Should Be Specified

For waste lines from educational, hospital and industrial laboratories. In structures devoted to crafts, such as: photo-engraving, electroplating, jewelry manufacture, etc. In loft buildings devoted to general commercial and manufacturing purposes. Battery repair stations. Waste lines from industrial plants whose processes require the use of corrosives.

In medical buildings housing physicians, surgeons and dentists. House drains for combination sanitary and acid wastes.

Waste lines through cinder concrete, and similar situations where corrosion attacks on the *outside* of pipe.

Exhaust fans and ducts for removal of corrosive fumes from chemical hoods, laboratories, pickling rooms, etc.

Roof vents exposed to coal smoke and moisture, or extreme atmospheric corrosion of any sort.

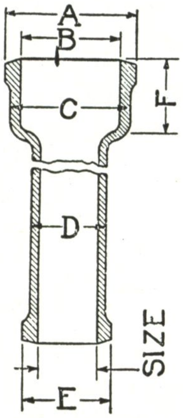
All wastes where absolute insurance against failure is desired, due either to corrosion or rust; such as memorials, public structures, and those erected to endure indefinitely.

DIMENSIONS (IN INCHES) OF DURIRON PIPE

Size	1½	2	3	4	6	8
A	3 13/16	4 5/16	5 5/16	6 5/16	8½	11¼
B	2 13/16	3 5/16	4 5/16	5 5/16	7 5/16	9 5/8
C	3 7/16	3 15/16	4 15/16	5 15/16	7 15/16	10¾
D	2 1/8	2 5/8	3 5/8	4 5/8	6¾	9
E	2 3/8	2 7/8	3 7/8	4 7/8	7 1/8	9¼
F	2 3/8	2½	2¾	3	3	3 3/8

OVER-ALL DIMENSIONS DURIRON BELL AND SPIGOT PIPE

Inside diam......in.	1½	2	3	4	6	8
SINGLE HUB						
Length of joint.....ft.	3	4	5	5	5	5
Average weight..lbs.	18	32	59	79	135	230
DOUBLE HUB						
Length of joint.....ft.	3	4	4	5	5	5
Average weight..lbs.	21	34	50	81	142	253



Dimension Diagram of Duriron Pipe

Duriron Pipe and Fittings Stocked

Complete stocks of Duriron drain pipe and fittings are carried in sizes to, and including, 8 in. The 10, 12, and 15-in. sizes are supplied promptly on order.

Typical Specifications for Duriron Drain Lines

(1) **Pipe**—All pipe and fittings carrying acid waste from .... to .... shall be of Duriron as manufactured by THE DURIRON COMPANY, INC., Dayton, Ohio, of the sizes shown on drawings ....

(2) All such pipe and fittings shall be of bell and spigot type, extra heavy weight and dimensions, and shall fulfill the requirements of the city plumbing code of the City of.........

(3) **Joints**—All joints in lines carrying acid wastes shall be made by ramming tightly in bottom of bell one ring of asbestos wick packing, upon which shall be poured sufficient molten lead to fill the bell completely, the lead being properly calked in the manner usual with cast iron soil pipe.

(4) **Cleanouts**—Suitable cleanout plugs shall be provided as shown on drawings.

(5) **Alignment**—All pipe lines shall be correctly aligned before joints are made. Proper supports shall be provided; at least one support to each length of pipe in horizontal lines, one at each bend, and supports at intervals no greater than 10 ft. in vertical lines.

(6) **Expansion Joints**—If lines are to handle wastes of high temperature, expansion joints shall be provided as shown on drawings.

(7) **Floor Drains**—Floor drains in .... shall be of Duriron, known as "Josam-Duriron" drains.

(8) **Vents**—Vent lines carrying acid fumes shall be of Duriron as specified for pipe above. (Unless fumes are of extreme strength other materials may be used.)

(9) **Sinks**—All sinks in .... shall be of Duriron, of the sizes and shapes as shown on detail drawings. Each sink shall bear the name "Duriron" cast thereon. Sink outlets shall be of Duriron.

(10) **Sink Connections**—All connections from sinks to waste lines, including traps, shall be Duriron as specified.

(11) **Exhaust Fans**—All exhaust fans for exhausting acid fumes from hoods, together with all suction and discharge pipes connected therewith, shall be of Duriron. Such fans shall be of the type, size and capacity as shown on drawings.

Important in Laboratory Specifications

It is important that the location of floor outlets follow exactly the specifications in laboratory installations.

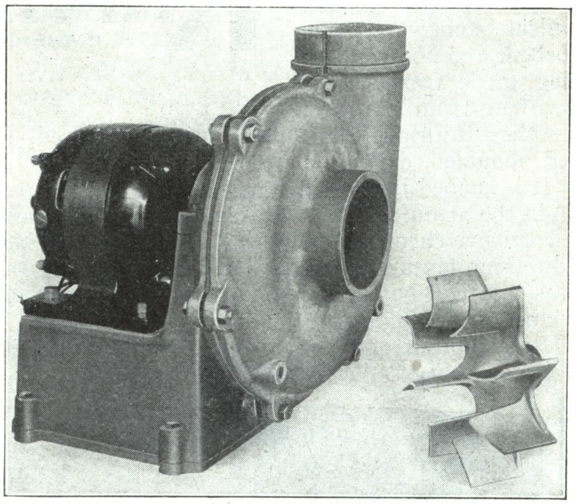
If this is not done within close limits, the laboratory furniture can not be properly located. Inaccurate location of floor openings by the plumbing contractor offers an excuse to the furniture contractor to substitute an inferior material to offset the extra fitting work made necessary by this deviation.

Duriron Ventilating Fans

Ventilation of laboratories, laboratory hoods, pickling rooms, and places where it is necessary to remove corrosive and noxious fumes, require an exhauster that will not be affected by the gases handled. All parts of Duriron fans that come in contact with the fumes carried are of Duriron, and are unaffected by vapors or condensate.

This type of equipment, employed only for bettering atmospheric conditions, is usually located in an inaccessible position and should, therefore, operate with the least amount of attention. Duriron fans are of simple and sturdy construction, and are furnished either direct connected or for belt drive. They require no coating or painting of the exposed surfaces, and give continuous and efficient service with little care other than lubrication.

The fans are built in sizes of 3, 6, 12 and 16-in. suction openings, and their capacities range from 60 to 4000 cu. ft. per minute. Full details in Bulletin No. 140.



No. 45 Duriron Fan and Impeller

Comparative Physical Tests on Drain Pipe

The Testing Laboratories of Columbia University in 1919 made an exhaustive series of tests, both physical and chemical, on vitrified tile, lead and Duriron pipe, the former of which is summarized below. Chemical tests show Duriron far superior in universal resistance.

COMPARATIVE PHYSICAL PROPERTIES DURIRON, LEAD AND VITRIFIED TILE PIPE

Compiled from Tests made by Testing Laboratories of Columbia University

	Vitrified Pipe	Lead Pipe	Duriron Pipe
Average ultimate crushing load, lbs. per ft....................	1556	1492	13490
Average transverse ultimate load, lbs., center load, span 21 in....	1813	400	11250
Modulus of rupture, computed from crushing load, lbs. per sq. in...........................	1644	*	17200

*Impossible to compute for a plastic material such as lead.

MAURICE A. KNIGHT

Manufacturer of Acid Proof Chemical Stoneware

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Kelley Avenue
EAST AKRON, OHIO

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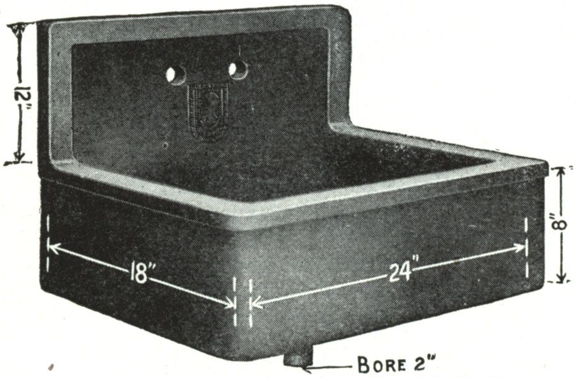
GUARANTEED SATISFACTORY — KNIGHT-WARE — ACID-PROOF CHEMICAL STONEWARE — "IT IS THE BODY ITSELF"

What Knight-ware Is

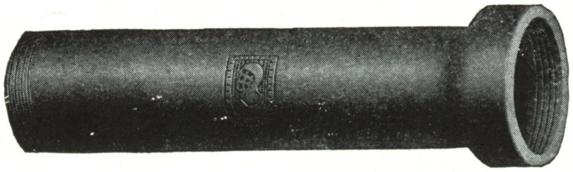
Knight-ware is a clean, vitrified, homogeneous chemical stoneware, non-absorbent and non-contaminating, made from selected clays, free from iron, lime and other injurious substances, properly mixed, tempered, moulded, dried and fired.

It is shaped into designs as required for equipment used in the manufacturing and handling of acids, alkalis and corrosive chemicals and gases, and is made in bodies of different textures, densities, vitrifications and thicknesses that will be best adapted to properly meet every working condition.

Its acidproof qualities do not depend upon a glaze, enamel or veneer. *"It is the body itself."*



Acid Proof Laboratory Sink with Back



Straight Length Acid Proof Socket Pipe

Uses of Knight-ware

Knight-ware is used extensively as plant equipment in the manufacture of acids, alkalis, chemicals and all corrosive chemicals and gases.

Because of the readiness with which Knight-ware lends itself to various shapes and designs, it is used as equipment for almost every purpose involving the use of acids and corrosive agents, and is especially adapted for *acidproof sinks, waste lines and fittings,* as well as many other types of apparatus for *high school, college and university chemistry laboratories, hospitals, newspaper buildings,* and any other buildings where acids and corrosive solutions are used and waste or sewer lines are necessary.

Knight-ware Sinks, Pipe and Fittings for the Laboratory

Because of the great diversity of shapes and sizes in which sinks are required by colleges, universities, commercial and private laboratories, it has been found inadvisable to carry any so-called standard sizes. We make sinks to your order and it costs you no more for this service.

Our laboratory sinks are made in one piece. They are non-absorbent, have very smooth faces and the corners are well rounded, making them very easy to clean and keep clean. Besides, you will find them very tough and durable and fully capable of performing all functions for which they are intended.

Pipe and fittings are available in any bore and design. Not only are they used for waste lines but they are ideally adapted for vent flues of all kinds.

Our Acid Proof Brick laid in our Acid Proof Cement are also favored for vent flue linings to carry waste gases from the laboratory.

Write for our booklet on Acid Proof Brick and Cement.

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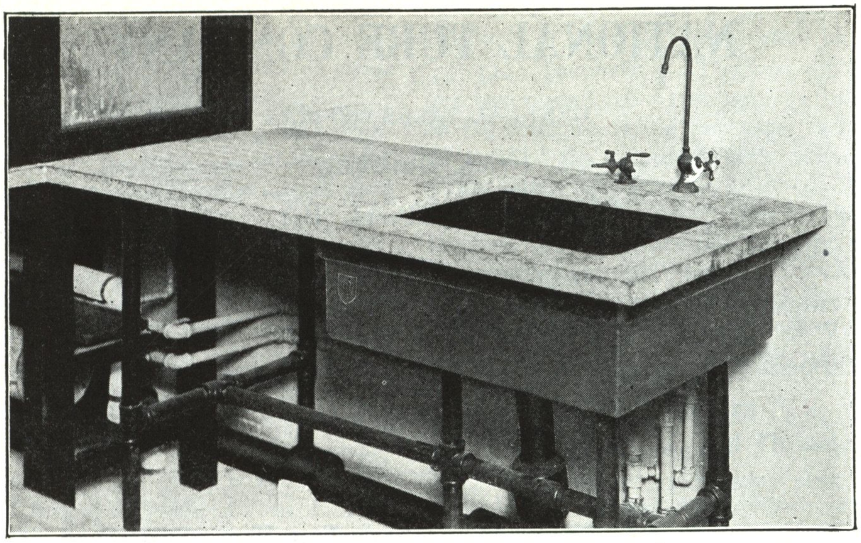


Knight-ware Sink and Waste Line Laboratory Setup

For Estimates on Laboratory Sinks

We ask that you give us the following detailed information:

(1) Length, width and depth, inside of sinks. (2) Bore and position of outlet. (3) Type of outlet, length, and outside diameter of pipe. (4) Size and depth and kind of rim, if rim required. (5) Height, thickness and width of back, if with or without faucet holes and position of same (if back is required). Also, if back is to be an integral part of sink or a loose plate. (6) Size, width, length and thickness, also design and number and size of grooves of drainboard, if drainboard is required. (7) Number of sinks required. (8) Preferably a pencil sketch with the measurements or a blue print of the sink and attachments required.

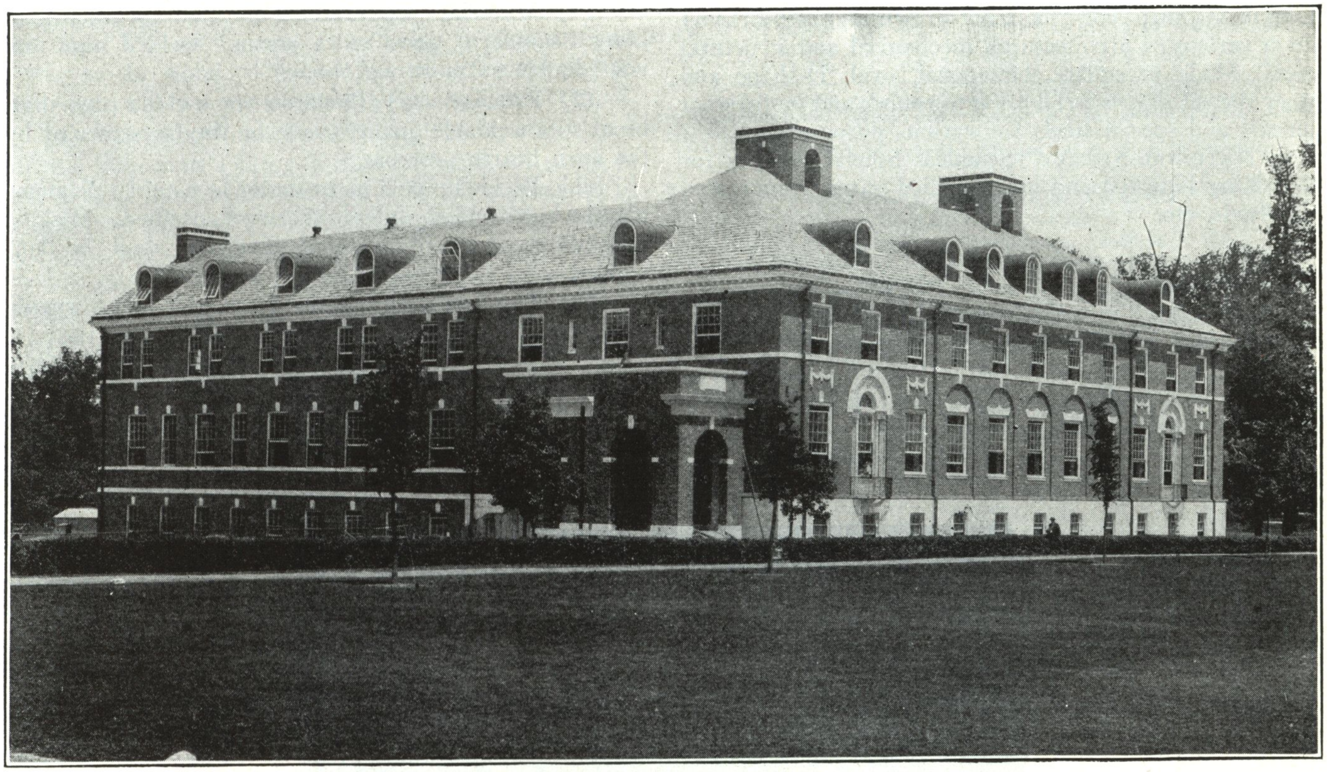
Knight-ware Installations

The new and very modern chemistry laboratory of *Johns Hopkins University at Baltimore, Md.*, is equipped throughout with Knight-ware Sinks and Drain Lines.

As this goes to press, we have the pleasure of stating that, among others, new chemistry laboratories at *West Virginia University, Morgantown, W. Va.*, and at *Columbia University, New York City,* are being equipped with Knight-ware.

Literature

We will be glad to send our fully illustrated and descriptive catalogue on request. Send us prints and specifications so that we may figure on your requirements.



Chemistry Laboratory at Johns Hopkins University
Courtesy of Charles K. Edmons, Provost of the University

NATIONAL TUBE COMPANY

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Products

STANDARD, EXTRA STRONG and DOUBLE EXTRA STRONG WROUGHT PIPE, either BLACK or GALVANIZED, or with special coatings, for Water, Steam, Gas, Air, Drainage, Sprinkler, Refrigeration and Hydraulic Installations; Conductor, Signal, Railing, Fence and Ladder Pipe; Pneumatic Conveying and Speaking Tubes. Hammer-weld Pipe, 20 to 96 in., for water, gas and steam mains and various types of high pressure containers; and especially for penstocks.

Also, Tubular Steel Poles for street lighting, electric transmission and traction purposes; Tubular Steel Flagpoles; Tubular Steel Masts, Booms and Kingposts for construction, engineering and marine purposes; Lap-welded and Seamless Steel (hot-rolled and cold-drawn) Boiler Tubes for stationary, locomotive and marine boilers.

"NATIONAL-SHELBY" Seamless Steel Tubing, sizes from ¼ in. to 20 in., and wall thicknesses from No. 20 gage to 1½ in.; (hot-rolled, hot-drawn and cold-drawn) for a variety of architectural, mechanical and structural uses. Made in square, hexagonal, oval, D-shape and other special shapes in addition to round, and in different anneals and special steels for various purposes.

"NATIONAL-SHELBY" Seamless Steel Cylinders for containing liquefied and non-liquefied gases, compressed air, fluids, etc.

The Company

NATIONAL TUBE COMPANY is the largest manufacturer in the world of a complete line of wrought tubular products, in sizes from ⅛-in. to 96-in. It has eleven plants, with a manufacturing capacity of approximately two million tons of the above products.

Scale Free Pipe—Spellerized

In addition to the Spellerizing (roll-knobbling) process "NATIONAL" butt-weld pipe (sizes ½-in. to 3-in.) is made by the *scale free process* which leaves the surfaces clean and smooth. This process consists of subjecting the pipe, while still hot, to the action of a series of rolls, which so work the pipe that the scale is cracked loose and falls from the pipe walls. The smooth surfaces furnish an ideal base for galvanizing and other coatings; reduce friction losses; increase the working capacity; and minimize any tendency to corrosion, especially pitting.

The *scale free process* is an exclusive feature developed by NATIONAL TUBE COMPANY and is applied only to "NATIONAL" pipe.

Specifications for "National" Pipe

(1) Material Covered—These specifications cover "standard" and "extra strong" welded pipe, but not "double extra strong" pipe.

(2) Process—(a) The steel for welded pipe shall be of soft weldable quality made by the Bessemer or by the open hearth process.

(b) Welded pipe 3 in. or under in nominal diameter may be butt-welded, unless otherwise specified. Welded pipe over 3 in. in nominal diameter shall be lap-welded.

(3) Tension Tests—Steel from which pipe is made must show following minimum physical properties:

	Bessemer	Open Hearth
Tensile strength, lb. per sq. in.	50,000	45,000
Yield point, lb. per sq. in.	30,000	25,000
Elongation in 8 in., per cent	18	20

Continued on next page

(4) Flattening Test—A test piece cut lengthwise from the pipe and filed smooth on the edges should bend through 180° with an inner diameter at the bend equal to the thickness of the material, without fracture.

(5) Hydrostatic Tests—The following test pressures will be applied to the respective sizes of standard and extra strong butt-weld and lap-weld pipe as indicated in tables:

STANDARD PIPE

Size, in.	Weight per foot complete, lb.	Test pressure in lb.	
		Butt	Lap
1/8	.245	700	....
1/4	.425	700	....
3/8	.568	700	....
1/2	.852	700	....
3/4	1.134	700	....
1	1.684	700	....
1 1/4	2.281	700	1000
1 1/2	2.731	700	1000
2	3.678	700	1000
2 1/2	5.819	800	1000
3	7.616	800	1000
3 1/2	9.202	....	1000
4	10.889	....	1000
4 1/2	12.642	....	1000
5	14.810	....	1000
6	19.185	....	1000
7	23.769	....	1000
8	25.000	....	800
8	28.809	....	1000
9	34.188	....	900
10	32.000	....	600
10	35.000	....	800
10	41.132	....	900
11	46.247	....	800
12	45.000	....	600
12	50.706	....	800

EXTRA STRONG PIPE

Size, in.	Weight per foot complete, lb.	Test pressure in lb.	
		Butt	Lap
1/8	.314	700	....
1/4	.535	700	....
3/8	.738	700	....
1/2	1.087	700	....
3/4	1.473	700	....
1	2.171	700	....
1 1/4	2.996	1500	2500
1 1/2	3.631	1500	2500
2	5.022	1500	2500
2 1/2	7.661	1500	2000
3	10.252	1500	2000
3 1/2	12.505	....	2000
4	14.983	....	2000
4 1/2	17.611	....	1800
5	20.778	....	1800
6	28.573	....	1800
7	38.048	....	1500
8	43.388	....	1500
9	48.728	....	1500
10	54.735	....	1200
11	60.075	....	1100
12	65.415	....	1100

In addition to the above test, on sizes 1/8 in. to 1 in., inclusive, the pipe is jarred with a hammer while under pressure.

(6) Standard Weights—The standard weights for pipe of various inside diameters are given in Section 5 and also in appended tables.

(7) Permissible Variations—The weight of the pipe shall not vary more than 5% from that specified in Section 5.

(8) Workmanship—The pipe shall not vary more than 1%, either way from being perfectly round or true to the standard outside diameter except on the small sizes where a variation of $\frac{1}{64}$ in. will be accepted.

(9) Threads*—All threads shall be in accordance with the American (Briggs) Standard and cut so as to make a tight joint when the pipe is tested at the mill to the specified internal hydrostatic pressure. The variation from the standard, when tested with the standard working gage, shall not exceed a maximum of one and one-half turns either way.

(10) Couplings—The material to be sound and free from injurious defects. Threads must be clean cut, tapped straight through, and of such pitch diameter as will make a tight joint. The ends must be countersunk.

(11) Thread Protection—Solid tapped rings or split couplings will be provided as thread protectors on all sizes 4 in. in diameter or larger. Protection will be provided for smaller sizes when specifically called for on order.

(12) Finish—The pipe must be reasonably straight and free from blisters, cracks or other injurious defects. Liquor marks incidental to the manufacture of lap-welded pipe will not be considered as surface defects. All burrs at the ends of pipe shall be removed.

(13) Inspection—The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the pipe ordered. The manufacturer shall afford the inspector, free of charge, all reasonable facilities to satisfy him that the pipe are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

Weights, Dimensions, and Threads per Inch

"NATIONAL" PIPE

FULL STANDARD WEIGHT—BLACK AND GALVANIZED

All weights and dimensions are nominal

Size	Diameters		Thickness	Weight per foot		Threads per inch
	External	Internal		Plain ends	Threads and couplings	
1/8	.405	.269	.068	.244	.245	27
1/4	.540	.364	.088	.424	.425	18
3/8	.675	.493	.091	.567	.568	18
1/2	.840	.622	.109	.850	.852	14
3/4	1.050	.824	.113	1.130	1.134	14
1	1.315	1.049	.133	1.678	1.684	11 1/2
1 1/4	1.660	1.380	.140	2.272	2.281	11 1/2
1 1/2	1.900	1.610	.145	2.717	2.731	11 1/2
2	2.375	2.067	.154	3.652	3.678	11 1/2
2 1/2	2.875	2.469	.203	5.793	5.819	8
3	3.500	3.068	.216	7.575	7.616	8
3 1/2	4.000	3.548	.226	9.109	9.202	8
4	4.500	4.026	.237	10.790	10.889	8
4 1/2	5.000	4.506	.247	12.538	12.642	8
5	5.563	5.047	.258	14.617	14.810	8
6	6.625	6.065	.280	18.974	19.185	8
7	7.625	7.023	.301	23.544	23.769	8
8	8.625	8.071	.277	24.696	25.000	8
8	8.625	7.981	.322	28.554	28.809	8
9	9.625	8.941	.342	33.907	34.188	8
10	10.750	10.192	.279	31.201	32.000	8
10	10.750	10.136	.307	34.240	35.000	8
10	10.750	10.020	.365	40.483	41.132	8
11	11.750	11.000	.375	45.557	46.247	8
12	12.750	12.090	.330	43.773	45.000	8
12	12.750	12.000	.375	49.562	50.706	8

The permissible variation in weight is 5% above and 5% below.

Furnished with threads and couplings and in random lengths, unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

"NATIONAL" EXTRA STRONG PIPE

BLACK AND GALVANIZED

All weights and dimensions are nominal

Size	Diameters		Thickness	Weight per foot, plain ends
	External	Internal		
1/8	.405	.215	.095	.314
1/4	.540	.302	.119	.535
3/8	.675	.423	.126	.738
1/2	.840	.546	.147	1.087
3/4	1.050	.742	.154	1.473
1	1.315	.957	.179	2.171
1 1/4	1.660	1.278	.191	2.996
1 1/2	1.900	1.500	.200	3.631
2	2.375	1.939	.218	5.022
2 1/2	2.875	2.323	.276	7.661
3	3.500	2.900	.300	10.252
3 1/2	4.000	3.364	.318	12.505
4	4.500	3.826	.337	14.983
4 1/2	5.000	4.290	.355	17.611
5	5.563	4.813	.375	20.778
6	6.625	5.761	.432	28.573
7	7.625	6.625	.500	38.048
8	8.625	7.625	.500	43.388
9	9.625	8.625	.500	48.728
10	10.750	9.750	.500	54.735
11	11.750	10.750	.500	60.075
12	12.750	11.750	.500	65.415

The permissible variation in weight is 5% above and 5% below.

Furnished with plain ends and in random lengths, unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

**Note:* When standard pipe is ordered, threads and couplings will be provided unless otherwise specified. When extra strong pipe is ordered, it will be furnished plain end, without threads or couplings, unless otherwise specified.

READING IRON COMPANY

World's Largest Manufacturers of Genuine Wrought Iron Pipe

READING, PA.

NEW YORK, N. Y. BOSTON, MASS. PHILADELPHIA, PA. CHICAGO, ILL. PITTSBURGH, PA. CINCINNATI, OHIO
BALTIMORE, MD. DALLAS, TEX. SAN FRANCISCO, CAL. LOS ANGELES, CAL. ST. LOUIS, MO.

Products

READING GUARANTEED GENUINE WROUGHT IRON PIPE.

Also manufacturers of Reading Charcoal Iron Boiler Tubes, Reading Cut Nails.

The Company

READING IRON COMPANY, established 1848, is the world's *oldest* and *largest* producer of genuine wrought iron pipe, manufacturing 552 different sizes and kinds of tubular products, ranging from 1/8 to 20 in. in diameter, suitable for every industrial piping requirement.

Guarantee

This company guarantees that all READING wrought iron pipe is made strictly from puddled pig iron without the use of any foreign scrap and that each individual length has passed the required testing and is full weight with the allowed variations below and above card weight. (See Book of Standards.)

Specification of Reading Genuine Wrought Iron Welded Pipe

Ordinary steel pipe is sold under the name wrought and a widely followed trade custom reserves the right to install this less enduring material even where "wrought iron pipe" is specified. These misleading terms have given rise to use of the term "genuine wrought iron pipe" to denote the more enduring pipe made from puddled pig iron. To assist buyers in securing genuine wrought iron pipe, READING IRON COMPANY urges the adoption of the following Model Specification where pipe of long life and ultimate economy is desired.

Material—All black and galvanized pipe, nipples and couplings shall be Reading, or equally approved, guaranteed quality genuine wrought iron standard, full weight, made from best grade pig iron by the process of puddling, and no scrap or cuttings except crop ends from the sheet or crop ends of the pipe shall be used in the manufacture. The use of steel scrap will not be permitted to enter into any part of the process of manufacture of the iron.

Trade or Identification Marks—All pipe, nipples and couplings must bear the diamond design identification mark rolled on the outside surface. This design shall be so placed that the mark can be quickly identified regardless of at what angle the pipe, nipple or coupling may be placed.

Pipe—All pipe 1½ in. and smaller, standard and special sizes, shall be buttwelded (1¼ and 1½ in. where specified can be made lapwelded). All pipe 2 in. and larger, standard and special sizes, shall be lapwelded. All in accordance with the best methods and practice.

Nipples—All nipples shall be cut from the same quality and weight of pipe as described and specified in the above specification.

Couplings—All couplings shall be of the same quality of material and made by the same process as that of genuine wrought iron pipe described above. Couplings for oil country goods must be made from double refined genuine wrought iron. Threads must be clean cut, tapped straight through, and of such pitch diameter as will make a tight joint; the ends must be countersunk. All couplings longer than 4 in., and all oil country couplings must be full taper-tapped on each end, facial and recessed.

Reading Wrought Iron and Steel Compared

The radical difference between READING genuine wrought iron and steel is due entirely to the totally dissimilar methods of production. Wrought iron is refined only in the puddle furnace; steel, as used for welded pipe, is produced either by the Bessemer or open-hearth processes. To the metallurgist, this difference is apparent in comparing the relative structures of the metals; to the architect it is most clearly demonstrated in the ability of genuine wrought iron to give satisfactory service for two to three times the average life of steel pipe under identical conditions of service. These and other differences which greatly affect the relative service rendered are briefly outlined below.

Structural Differences—During the puddling process, wrought iron receives as an inseparable component, a basic silicate of protoxide of iron. This content, known as slag or cinder, thinly coats each grain of iron, and during the subsequent rolling and re-rolling is elongated into minute threads or filaments (Fig. 1). These filaments divide the grains of ferrite (pure iron) into clusters, thus giving to genuine wrought iron its characteristic fibrous structure (Fig. 2). The siliceous slag, being incorrodible as glass and thoroughly distributed throughout the metal, protects each grain of iron from the attacks of corrosion. It is this inherent protection that in a large measure explains the unusually long life of READING genuine wrought iron pipe.

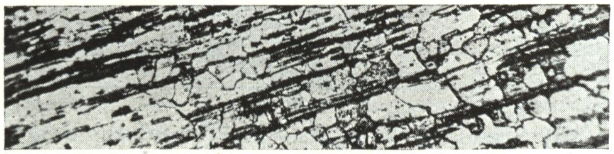

Fig. 1. Photo-Micrograph of a Longitudinal Section of Reading Wrought Iron, Magnified 100 Diameters
Black streaks indicate the fibers of corrosion-resisting siliceous slag

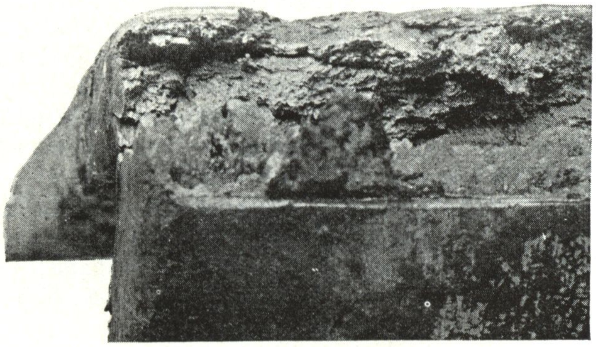

Fig. 2. Fracture in Reading Wrought Iron
Note the fibrous structure

In the Bessemer or open hearth processes, the formation of a siliceous slag is impossible. Steel, therefore, is totally lacking in this protection, and consists of a solid, crystalline mass of grains of ferrite (carbonless iron), and pearlite (iron containing carbon), which offers to the progress of corrosion a direct path through the metal from surface to surface (Fig. 3). It is largely due to this structural difference that an installation of READING wrought iron pipe will render satisfactory service through a period that would destroy two if not three successive steel pipe installations.

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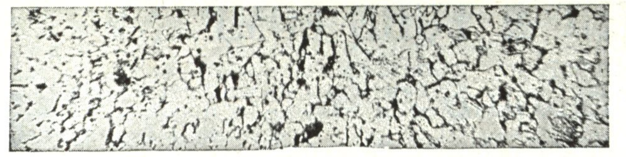


Fig. 3. Photo-Micrograph of a Longitudinal Steel Section (100 Diameters) Showing Low Carbon Structure and Total Absence of Protecting Slag
Dark spots indicate high-carbon areas

Segregation in Steel—Wrought iron is continually agitated during the puddling process and when thoroughly refined is taken from the furnace in the form of white-hot, semiplastic balls. Steel, on the other hand, is tapped in a liquid condition from the converter or furnace and poured into huge ingot moulds, where it is allowed to cool undisturbed. During this solidification, impurities segregate toward the slow-cooling center of the ingot, thus producing an irregularity in composition which is largely responsible for the known irregularity of steel pipe in service.

Tests to Distinguish Genuine Wrought Iron Pipe

Etch Test—After removing all marks of the cutting-off tool from a cross section of the pipe, making sure that the end of the pipe is smooth—accomplish this by thorough polishing—suspend it so that the end will dip into a solution of 25% hydrochloric acid, 25% sulphuric acid, and 50% water. Allow to remain long enough to develop the structure.

If the pipe is steel, the end will have been uniformly dissolved and smoothly eaten by the acid.

If material is *genuine wrought iron,* the end will show ridges or rings of non-corrodible slag, protruding a fraction of an inch beyond the softer and almost pure iron, which will be slightly dissolved.

Fracture Test—From a length of pipe, cut a small piece about 2 in. long and by repeated light blows of a hammer, or any kind of pressure, flatten until broken. If the material is *genuine wrought iron,* the fracture will show a ragged, dull gray, and fibrous structure. If steel, the fracture will be even, bright, and crystalline.

READING STANDARD GENUINE WROUGHT IRON PIPE
BLACK AND GALVANIZED

	Size, in.	List price per ft.	Diameters, in.		Thickness, in.	Weight per ft., lb.		Thds. per in.	Lgth. of thread, in.	Taper per ft., in.	Hydrostatic test, lbs.
			External	Internal		Plain ends	Thds. and couplings				
Buttweld	⅛	$0.05½	.405	.266	.070	.244	.245	27	½	¾	750
	¼	.06	.540	.360	.090	.424	.425	18	½	¾	750
	⅜	.06	.675	.489	.093	.567	.568	18	⅝	¾	750
	½	.08½	.840	.617	.111	.850	.852	14	⅝	¾	750
	¾	.11½	1.050	.819	.115	1.130	1.134	14	¾	¾	750
	1	.17	1.315	1.043	.136	1.678	1.684	11½	1	¾	750
	1¼	.23	1.660	1.374	.143	2.272	2.281	11½	1	¾	750
	1½	.27½	1.900	1.604	.148	2.717	2.731	11½	1	¾	750
Lapweld	1½	.27½	1.900	1.604	.148	2.717	2.731	11½	1	¾	1000
	2	.37	2.375	2.060	.158	3.652	3.678	11½	1	¾	1000
	2½	.58½	2.875	2.460	.208	5.793	5.819	8	1½	¾	1000
	3	.76½	3.500	3.059	.221	7.575	7.616	8	1⅝	¾	1000
	3½	.92	4.000	3.538	.231	9.109	9.202	8	1¾	¾	1000
	4	1.09	4.500	4.016	.242	10.790	10.889	8	1¾	¾	1000
	4½	1.27	5.000	4.496	.252	12.538	12.642	8	1¾	¾	1000
	5	1.48	5.563	5.036	.263	14.617	14.810	8	1¾	¾	1000
	6	1.92	6.625	6.053	.286	18.974	19.185	8	1¾	¾	1000
	7	2.38	7.625	7.010	.307	23.544	23.769	8	1¾	¾	1000
	8	2.50	8.625	8.059	.283	24.696	25.000	8	1¾	¾	800
	8	2.88	8.625	7.967	.329	28.554	28.809	8	1¾	¾	1000
	9	3.45	9.625	8.927	.349	33.907	34.188	8	2¼	¾	900
	10	3.20	10.750	10.181	.284	31.201	32.000	8	2¼	¾	600
	10	3.50	10.750	10.124	.313	34.240	35.000	8	2¼	¾	800
	10	4.12	10.750	10.005	.372	40.483	41.132	8	2¼	¾	900
	11	4.63	11.750	10.985	.382	45.557	46.247	8	2¼	¾	800
	12	4.50	12.750	12.077	.336	43.773	45.000	8	2½	¾	600
	12	5.07	12.750	11.985	.382	49.562	50.706	8	2½	¾	800
	13	5.60	14.000	13.250	.375	53.510	55.824	8	3	¾	700
	14	6.10	15.000	14.250	.375	57.437	60.375	8	3	¾	700
	15	6.50	16.000	15.250	.375	61.364	64.500	8	3	¾	600

Furnished with threads and couplings and in random lengths unless otherwise ordered.

All weights and dimensions are nominal.

Weight per foot of pipe with threads and couplings is based on a length of 20 ft., including the coupling, but shipping lengths of small sizes will usually average less than 20 ft.

Permissible variation in weight is 2½% below and 5% above weights given in tables.

All weights are figured on the basis of 1 cu. in. of wrought iron weighing .2778 lb.

All pipe threaded to Briggs' standard gauges as made by Pratt & Whitney Co., Hartford, Conn.

For cut lengths, an extra charge will be made above random lengths.

For pipe smoothed on the inside (known as plugged and reamed) an extra charge will be made above standard pipe.

For galvanized or coated pipe an extra charge will be made above black.

When ordering sizes 8 to 12 in., please state weight of pipe wanted.

Galvanizing Test—From a piece of galvanized pipe, hammer it repeatedly until broken. This operation is identical to the fracture test. If, as it flattens out, the galvanizing adheres firmly to the surface of the pipe, the material is *wrought iron.* If, on the other hand, the galvanized flakes off leaving the metal bare in spots, the pipe is steel.

Corrosive Effect on Pipe

Pipe in cold and hot water and steam service is subject to corrosion. To enter into the discussion here or approach it in any way would require many pages of text matter and, for that reason, we recommend the reading of our bulletins and pamphlets dealing exclusively with this subject.

Relative Cost of Pipe

As in other products of the same class, the cost of pipe should be based upon cost per year of service. A total wrought iron pipe installation will cost approximately 6% more than a total installation of steel pipe, yet replacement costs on steel pipe, which must be expected within 5 to 10 years, can always be figured at 20% to 30% more than the original saving effected by using steel pipe. It is, therefore, apparent that the additional cost of wrought iron, with its period of usefulness double that of steel, is a decided economy in the long run.

The Name and Year on Every Length

READING X STRONG AND XX STRONG GENUINE WROUGHT IRON PIPE

	Size, in.	List price per ft.	Diameters, in.		Thickness, in.	Weight, per ft., plain ends, lbs.	Hydrostatic test, lbs.
			External	Internal			
	EXTRA STRONG, BLACK AND GALVANIZED						
Buttweld	⅛	$0.12	.405	.210	.098	.314	750
	¼	.07½	.540	.295	.122	.535	750
	⅜	.07½	.675	.417	.129	.738	750
	½	.11	.840	.539	.151	1.087	750
	¾	.15	1.050	.735	.157	1.473	750
	1	.22	1.315	.949	.183	2.171	750
	1¼	.30	1.660	1.269	.195	2.996	1500
	1½	.36½	1.900	1.491	.204	3.631	1500
Lapweld	1½	.36½	1.900	1.491	.204	3.631	2500
	2	.50½	2.375	1.929	.223	5.022	2500
	2½	.77	2.875	2.311	.282	7.661	2000
	3	1.03	3.500	2.887	.306	10.252	2000
	3½	1.25	4.000	3.350	.325	12.505	2000
	4	1.50	4.500	3.811	.344	14.983	2000
	4½	1.80	5.000	4.275	.363	17.611	1800
	5	2.08	5.563	4.797	.383	20.778	1800
	6	2.86	6.625	5.743	.441	28.573	1800
	7	3.81	7.625	6.603	.511	38.048	1500
	8	4.34	8.625	7.604	.510	43.388	1500
	9	4.90	9.625	8.604	.510	48.728	1500
	10	5.48	10.750	9.729	.510	54.735	1200
	11	6.10	11.750	10.729	.510	60.075	1100
	12	6.55	12.750	11.729	.510	65.415	1100
	DOUBLE EXTRA STRONG, BLACK AND GALVANIZED						
Buttweld	½	.32	.840	.226	.307	1.714	750
	¾	.35	1.050	.413	.318	2.440	750
	1	.37	1.315	.576	.369	3.659	750
	1¼	.52½	1.660	.874	.393	5.214	2200
	1½	.65	1.900	1.078	.411	6.408	2200
Lapweld	2	.91	2.375	1.480	.447	9.029	3000
	2½	1.37	2.875	1.742	.567	13.695	3000
	3	1.86	3.500	2.270	.615	18.583	3000
	3½	2.30	4.000	2.697	.651	22.850	2500
	4	2.76	4.500	3.119	.690	27.541	2500
	4½	3.26	5.000	3.546	.727	32.530	2000
	5	3.86	5.563	4.028	.768	38.552	2000
	6	5.32	6.625	4.857	.884	53.160	2000
	7	6.35	7.625	5.835	.895	63.079	2000
	8	7.25	8.625	6.835	.895	72.424	2000

Extra strong and double extra strong pipe will be shipped in random lengths and with plain ends unless otherwise ordered.

All weights and dimensions are nominal.

Random lengths extra strong and double extra strong pipe are considered to be 12 to 20 ft.

If fitted with threads and couplings, an extra charge will be made above regular. When extra strong or double extra strong pipe is ordered with threads and couplings, regular line pipe couplings will be furnished, unless otherwise specified.

For cut lengths, an extra charge will be made above random lengths.

For galvanized or tar coated pipe, an extra charge will be made above black.

All double extra strong pipe made from a solid sheet—not telescoped.

THE YOUNGSTOWN SHEET & TUBE COMPANY

GENERAL OFFICES

YOUNGSTOWN, OHIO

DISTRICT SALES OFFICES

BOSTON, MASS., Massachusetts Trust Building
NEW YORK, N. Y., Hudson Terminal Building, 30 Church Street
PHILADELPHIA, PA., Franklin Trust Building
ATLANTA, GA., Healey Building
PITTSBURGH, PA., Oliver Building
CLEVELAND, OHIO, Union Trust Building
DETROIT, MICH., First National Bank Building
CINCINNATI, OHIO, Union Trust Building
CHICAGO, ILL., Conway Building
ST. LOUIS, MO., Missouri State Life Insurance Building
DENVER, COLO., First National Bank Building
DALLAS, TEX., Magnolia Building
SAN FRANCISCO, CAL., Sharon Building
SEATTLE, WASH., Central Building
KANSAS CITY, MO., Commerce Building
MINNEAPOLIS, MINN., Andrus Building
NEW ORLEANS, LA., Audubon Building

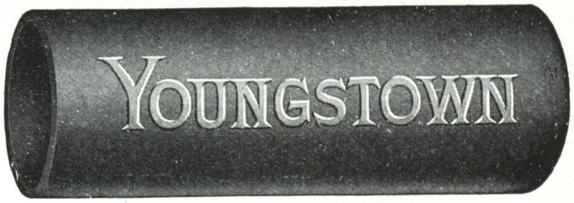
PLANTS AT YOUNGSTOWN, EAST YOUNGSTOWN, STRUTHERS, HUBBARD, GIRARD, WARREN and ZANESVILLE, OHIO
INDIANA HARBOR, IND.; SOUTH CHICAGO and EVANSTON, ILL.; MAYVILLE, WIS.; KALAMAZOO, MICH.

Products

"Youngstown" Pipe.
"Youngstown" Steel Sheets and Plates.
"Youngstown" Full Finished Steel Sheets.
"Youngstown" Copperoid Steel Sheets.
"Youngstown" Steel Bars.
"Buckeye" Electrical Conduit.
"Realflex" Steel Armored Cable.

Facilities

Operating twelve large plants located in the Chicago and Youngstown Districts, this company is equipped to manufacture and distribute its products economically and on a large scale. It has facilities for mining its own ores and fuel, manufacturing its own coke, making steel by the Bessemer, open-hearth and electric processes, and conducting every operation in the preparation of its products for the market. It is the largest independent manufacturer of pipe in America.



Quality of Products

The outstanding feature of steel and iron products bearing the trade-name "Youngstown" is high and uniform quality. They are regarded as standard all over the world, and are used in many of the most important structures in all parts of the United States. They may be specified by architects with absolute assurance that they can be readily obtained and will give entire satisfaction.

For the convenience of architects, specifications and other essential data concerning "Youngstown" steel pipe are given herewith.

SIZES, WEIGHTS, THICKNESSES, THREADS AND LIST PRICES OF "YOUNGSTOWN" PIPE

All Weights and Dimensions Are Nominal

Size, in.	List price per foot	Diameters, in.		Thick-ness, in.	Weight per foot, lb.		Threads per in.
		External	Internal		Plain ends	Threads and couplings	
Full Standard Weight—Black and Galvanized*							
⅛	$ .05½	.405	.269	.068	.244	.245	27
¼	.06	.540	.364	.088	.424	.425	18
⅜	.06	.675	.493	.091	.567	.568	18
½	.08½	.840	.622	.109	.850	.852	14
¾	.11½	1.050	.824	.113	1.130	1.134	14
1	.17	1.315	1.049	.133	1.678	1.684	11½
1¼	.23	1.660	1.380	.140	2.272	2.281	11½
1½	.27½	1.900	1.610	.145	2.717	2.731	11½
2	.37	2.375	2.067	.154	3.652	3.678	11½
2½	.58½	2.875	2.469	.203	5.793	5.819	8
3	.76½	3.500	3.068	.216	7.575	7.616	8
3½	.92	4.000	3.548	.226	9.109	9.202	8
4	1.09	4.500	4.026	.237	10.790	10.889	8
4½	1.27	5.000	4.506	.247	12.538	12.642	8
5	1.48	5.563	5.047	.258	14.617	14.810	8
6	1.92	6.625	6.065	.280	18.974	19.185	8
7	2.38	7.625	7.023	.301	23.544	23.769	8
8	2.50	8.625	8.071	.277	24.696	25.000	8
8	2.88	8.625	7.981	.322	28.554	28.809	8
9	3.45	9.625	8.941	.342	33.907	34.188	8
10	3.20	10.750	10.192	.279	31.201	32.000	8
10	3.50	10.750	10.136	.307	34.240	35.000	8
10	4.12	10.750	10.020	.365	40.483	41.132	8
12	4.50	12.750	12.090	.330	43.773	45.000	8
12	5.07	12.750	12.000	.375	49.562	50.706	8
13	5.60	14.000	13.250	.375	54.568	55.824	8
14	6.10	15.000	14.250	.375	58.573	60.375	8
15	6.50	16.000	15.250	.375	62.579	64.500	8

Size, in.	List price per foot	Diameters, in.		Thick-ness, in.	Weight per foot, lb., plain ends
		External	Internal		
Extra Strong Pipe—Black and Galvanized*†					
⅛	$ .12	.405	.215	.095	.314
¼	.07½	.540	.302	.119	.535
⅜	.07½	.675	.423	.126	.738
½	.11	.840	.546	.147	1.087
¾	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
1¼	.30	1.660	1.278	.191	2.996
1½	.36½	1.900	1.500	.200	3.631
2	.50½	2.375	1.939	.218	5.022
2½	.77	2.875	2.323	.276	7.661
3	1.03	3.500	2.900	.300	10.252
3½	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
4½	1.80	5.000	4.290	.355	17.611
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
7	3.81	7.625	6.625	.500	38.048
8	4.34	8.625	7.625	.500	43.388
9	4.90	9.625	8.625	.500	48.728
10	5.48	10.750	9.750	.500	54.735
11	6.10	11.750	10.750	.500	60.075
12	6.55	12.750	11.750	.500	65.415
Double Extra Strong Pipe—Black and Galvanized§†					
½	$ .32	.840	.252	.294	1.714
¾	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.659
1¼	.52½	1.660	.896	.382	5.214
1½	.65	1.900	1.100	.400	6.408
2	.91	2.375	1.503	.436	9.029
2½	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
3½	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
4½	3.26	5.000	3.580	.710	32.530
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160
7	6.35	7.625	5.875	.875	63.079
8	7.25	8.625	6.875	.875	72.424

Furnished with threads and couplings and in random lengths unless otherwise ordered.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge will be made above standard pipe.

For cut lengths, an extra charge will be made above random lengths. For galvanized or coated, an extra charge will be made above black. *The permissible variation in weight is 5% above and 5% below. §The permissible variation in weight is 10% above or 10% below. †Furnished with plain ends and in random lengths, unless otherwise ordered. Random length of Extra Strong and Double Extra Strong pipe is considered to be 12 to 22 ft.; we to have the privilege, however, of supplying not exceeding 5% of the total order in lengths of from 6 to 12 ft. For pipe fitted with threads and couplings, an extra charge will be made above plain ends.

Continued on next page

Specifications for "Youngstown" Standard Steel Pipe

Material—All "Youngstown" steel pipe shall be made of soft weldable steel of uniformly good quality. This steel to be particularly adaptable to the requirements for wrought pipe, and sufficient crop shall be cut from the top of each ingot to secure solid metal in the skelp.

Properties—The steel from which the pipe is made shall have approximately the following physical properties:

Tensile strength, not less than 50,000 lbs.
Elastic limit, not less than one-half tensile.
Elongation in 8 in., not less than 20%.
Reduction in area, not less than 50%.

Test Specimens—Test specimens for determining physical properties shall be cut from skelp or finished pipe.

Crushing Test—When required, cross sections cut from any pipe shall stand crushing down until the inside walls are three times the thickness of the wall from each other without showing cracks on the outside of the bend; except that, in the case of butt-welded pipe, any fracture at the weld must give evidence of having been firmly welded.

Bend Test—When required, a test specimen cut lengthwise from skelp or finished pipe and filed smooth on the edges shall bend through an angle of 180°, with an inner diameter equal to the thickness of the material, without fracture.

Hydrostatic Test—All sizes shall be tested at mill to an internal pressure, as shown in the following table:

⅛ to 2 in., butt-weld, 700 lbs.
2½ and 3 in., butt-weld, 800 lbs.
Up to 8 in., lap-weld, 1000 lbs.
9 and 10 in., lap-weld, 900 lbs.
11 and 12 in., lap-weld, 800 lbs.

On the 8-in., 10-in. and 12-in. sizes, which have more than one weight as standard, we have shown the test pressure for the heaviest weight.

Lengths—Unless otherwise specified, standard pipe will be furnished in random lengths with threads and couplings; extra strong pipe will be furnished plain ends.

Threading—Pipe and couplings shall be threaded and tapped according to Briggs' standard. Threads must be a good commercial thread and must not leak under the specified pressure (paragraph 5). The thread must not vary more than one and one-half turns, either way, when tested with a Pratt & Whitney Briggs' standard gauge. All burrs at the ends shall be removed.

Couplings—Chamfered or slightly beveled couplings will be furnished on all steam pipe, and shall be of soft puddled iron, thoroughly welded and free from all blisters, pits or other defects that would break the continuity of the thread.

Tolerance—The pipe shall not vary more than 1% either way from being perfectly round and true to the standard outside diameter, except on smaller sizes, where a variation of $\frac{1}{64}$ in. will be acceptable, and shall not vary more than 5% either way from weight as listed.

Tests—All tests shall be made at the mill.

"Youngstown Copperoid" Steel Sheets

In "Youngstown Copperoid" steel a material has been developed which resists corrosion under exposure to the atmosphere in such a surprising degree that it should receive special attention from all architects preparing specifications for steel roofing, siding, cornice work, steel window frames, sash, metal lath, and all other work in which metal sheets are used.

Exhaustive tests conducted by The American Society for Testing Materials have demonstrated the rust resisting qualities of "Copperoid" steel to be far superior to those of any other metal at approximately equal cost.

Full information on this subject can be had on application or by reference to the reports of this test as published by the Society.

Identification

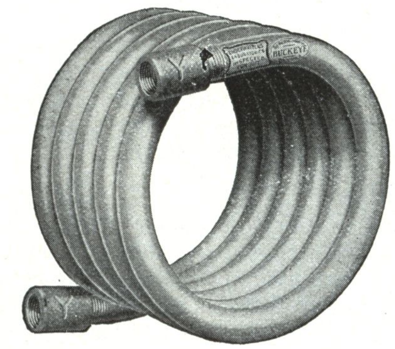
"Youngstown" steel pipe and "Youngstown" steel sheets are plainly marked.

In pipe, the name is rolled in the steel. On sheets, it is stenciled in the usual manner.

"Buckeye" Conduit

"Buckeye" electrical conduit is the most widely used material of this kind made in this country. It is made of mild steel "Youngstown" pipe, carefully and thoroughly enameled or electro-galvanized, as may be desired. It is regularly tested and inspected by the Underwriters' Laboratories, Inc., and is used extensively on government work. "Buckeye" conduit is a product of uniform excellence entitling it to the approval of the most careful architect.

The Youngstown Sheet & Tube Company is the largest producer of electrical conduit in the world—an indication of the superiority of its product.



"Buckeye" Conduit

"Realflex" Armored Cable

Architects who desire to secure safe and dependable electrical wiring in structures in which the use of rigid conduit may not be justified because of its higher cost, should investigate this cable. It is a flexible conductor containing two or more wires enclosed in a double wire steel armor, and is the highest grade material of its kind manufactured. It adds to the safety and efficiency of electrical wiring far beyond its slight additional cost.

Where old buildings are being remodeled, it can be used to great advantage owing to its flexibility and thorough protection.

Realflex costs no more than "single-strip" armored cables, but is heavier, on account of its double strip armor, and should be specified by name where its use is desired.

Sizes and Weights

All of these products are regularly manufactured in standard sizes and weights, but they can be furnished to meet special requirements within reasonable limits. All of them can be obtained from leading jobbers and dealers in all parts of the United States, as well as in most foreign countries.

UNDERWRITERS' LABORATORIES
INSPECTED
ARMORED CABLE

"Realflex" Armored Cable

Additional Information Supplied on Request

This company is always glad to furnish detailed information concerning any of its products and to render any assistance possible to architects who communicate with it direct or with any of its sales offices as listed on the preceding page.

ESTABLISHED 1854 INCORPORATED 1901

COHOES ROLLING MILL COMPANY

Manufacturers of Genuine Wrought Iron Pipe

COHOES, N. Y.

Products

Genuine Wrought Iron Pipe and Couplings.

Guarantee

Cohoes pipe is made from all genuine wrought iron guaranteed to conform with the requirement outlined by the various Societies for Testing Materials and is the equal or better than that of any competitor.

Identification

We were the first mill to brand our pipe in the rolling, while the metal is hot. Every piece of pipe bears the trade-mark "Cohoes" which insures to the buyer *genuine full weight wrought iron pipe.*

Fabricating Qualities

The fabricating qualities of Cohoes pipe are one of the most important features of its economic installation. Though its fiber is tough and strong enough to resist all shocks and vibrations, the softness of the metal and its freedom from hard spots makes it easy to cut and thread, saving labor and tools. In these days of high labor costs, this is a most important item.

Natural and Galvanized Finish

Cohoes pipe is produced with a natural iron finish, which is called "black pipe." But when used under severe conditions it is a wise precaution to have it galvanized. Because wrought iron is a more porous metal than steel, it takes or absorbs a greater quantity of the molten zinc. As zinc is not subject to corrosion, this thicker coating naturally means a much longer life for Cohoes wrought iron pipe.

Inspection and Testing

Every piece of pipe is tested by hydraulic pressure to prove that it is of the Cohoes standard of strength. Several hundred pounds higher pressure than is necessary in actual use is applied to give a reasonable factor of safety.

Exceptional Durability

The more severe the service demanded of pipe, the greater reason to insist upon Cohoes genuine wrought iron pipe. It is built to stand up under conditions where steel pipe would quickly deteriorate.

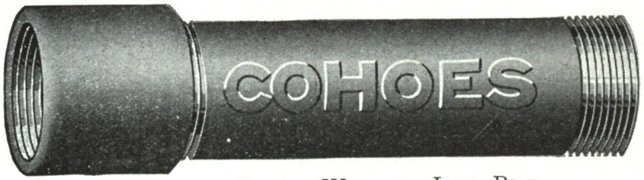
The Service Department

For the conveyance of gas, water, air, ammonia, salt water and other exceptionally hard usage, Cohoes gives the longest service. It has proved its superiority in use for railroad signal pipe, conduits, fence and steam pipe, and is the only pipe that gives satisfactory underground service.

We have a staff of specialists on pipe. They are thoroughly informed by experience and study on the many uses for which pipe is required.

They have at their disposal data that has been gathered from time to time during our seventy-one years of pipe manufacture. They never work on theory. They know the facts about the actual use of different kinds of pipe by demonstrations that have been years in the making.

The services of these experts are free to any one directly or indirectly interested in the use of pipe.



Section of Cohoes Wrought Iron Pipe

STANDARD FULL WEIGHT GENUINE WROUGHT IRON PIPE

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight per ft., lb.	Threads per in.
		External	Internal			
1/8	$ .05½	.405	.269	.068	.245	27
1/4	.06	.540	.364	.088	.425	18
3/8	.06	.675	.493	.091	.568	18
1/2	.08½	.840	.622	.109	.852	14
3/4	.11½	1.050	.824	.113	1.134	14
1	.17	1.315	1.049	.133	1.684	11½
1¼	.23	1.660	1.380	.140	2.281	11½
1½	.27½	1.900	1.610	.145	2.731	11½
2	.37	2.375	2.067	.154	3.678	11½
2½	.58½	2.875	2.469	.203	5.819	8
3	.76½	3.500	3.068	.216	7.616	8
3½	.92	4.000	3.548	.226	9.202	8
4	1.09	4.500	4.026	.237	10.889	8
4½	1.27	5.000	4.506	.247	12.642	8
5	1.48	5.563	5.047	.258	14.810	8
6	1.92	6.625	6.065	.280	19.185	8
7	2.38	7.625	7.023	.301	23.769	8
8	2.50	8.625	8.071	.277	25.000	8
8	2.88	8.625	7.981	.322	28.809	8
9	3.45	9.625	8.941	.342	24.188	8
10	3.20	10.750	10.192	.279	32.000	8
10	3.50	10.750	10.136	.307	35.000	8
10	4.12	10.750	10.020	.365	41.132	8
12	4.50	12.750	12.090	.330	45.000	8
12	5.07	12.750	12.000	.375	50.706	8
13	5.60	14.000	13.250	.375	55.824	8
14	6.10	15.000	14.250	.375	60.375	8
15	6.50	16.000	15.250	.375	64.500	8

EXTRA STRONG GENUINE WROUGHT IRON PIPE

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight, per ft., lb.
		External	Internal		
1/4	$ .07½	.540	.302	.119	.535
3/8	.07½	.675	.423	.126	.738
1/2	.11	.840	.546	.147	1.087
3/4	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
1¼	.30	1.660	1.278	.191	2.996
1½	.36½	1.900	1.500	.200	3.631
2	.50½	2.375	1.939	.218	5.022
2½	.77	2.875	3.323	.276	7.661
3	1.03	3.500	2.900	.300	10.252
3½	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
4½	1.80	5.000	4.209	.355	17.611
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
7	3.81	7.625	6.625	.500	38.048
8	4.34	8.625	7.625	.500	43.388
9	4.90	9.625	8.625	.500	48.728
10	5.48	10.750	9.750	.500	54.735
12	6.55	12.750	11.750	.500	65.415

DOUBLE EXTRA STRONG GENUINE WROUGHT IRON PIPE

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight per ft., lb.
		External	Internal		
1/2	$ .32	.840	.252	.294	1.714
3/4	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.659
1¼	.52½	1.660	.896	.382	5.214
1½	.65	1.900	1.100	.400	6.408
2	.91	2.375	1.503	.436	9.029
2½	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
3½	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
4½	3.26	5.000	3.580	.710	32.530
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160

ESTABLISHED 1886

PENBERTHY INJECTOR CO.

DETROIT, MICH.
CANADIAN FACTORY: WINDSOR, ONTARIO, CAN.

Products

"Penberthy" Automatic Cellar Drainer.

Also manufacturers of "Penberthy" Automatic Injector; Auto-Positive Injector; "XL-96" Swimming Pool Heater; "XL-96" Ejector; Safeguard Water Gages; Water Heaters; Oil Cups; Grease Cups; Air Cocks; Carburetors; Oil Gages; Oil Burners; Hose Nozzles; Radio Products, etc.

"Penberthy" Automatic Cellar Drainer

Advantages—(1) All parts are brass, except the copper float; all working parts are above water; no slime or corrosion.

(2) A foot valve in the strainer seals the suction pipe when the drainer stops working, holding the water in all the pipes, so that it is always primed ready to start instantly. Cellar can not flood with city water if for any reason the pressure is insufficient to operate the ejector.

(3) It takes up half the space of other drainers.

(4) The operating valves open and close instantly by action of the water pressure. (5) No leather washers used; leather dries and causes leaks. (6) It is most efficient drainer on the market and costs no more.

(7) All parts are instantly accessible, without disconnecting the pipes or removing the drainer. All working parts are conveniently located on top.

CAPACITIES AT DIFFERENT PRESSURES AND ELEVATIONS, PIPE SIZES, ETC.

Size and model	Pipe sizes, in.		Working head, ft	Maximum net capacities from sump in gallons per hour at 10 to 100 lbs. water pressure								
	Supply	Discharge		10	15	20	25	30	40	60	80	100
				Model "R'								
No. 1 Model "R"	½	1	3	80	210	300	340	400	510	700	720	700
			6	.....	90	140	240	300	390	570	670	690
			9	.....	.....	90	150	210	330	480	620	660
			12	.....	.....	....	100	150	220	390	550	630
			15	.....	.....	....	.....	90	190	300	450	600
			18	.....	.....	....	.....	....	120	250	320	550
No. 2 Model "R"	¾	1¼	3	190	390	550	620	750	910	1180	1240	1220
			6	.....	210	340	420	600	750	1020	1140	1200
			9	.....	.....	210	300	380	540	900	1090	1150
			12	.....	.....	....	210	300	420	780	1020	1110
			15	.....	.....	....	.....	210	370	570	940	1050
			18	.....	.....	....	.....	....	300	510	850	970

Discharge pipe should never be smaller than specifications shown in table.

Unless otherwise specified, the Model "R" drainer is supplied and used for all conditions above the heavy line running through the table of capacities (see table above).

For conditions below heavy line we furnish a low pressure drainer. The Model "R" drainer requires 5 lbs. water pressure or more for each one foot of elevation, while the low pressure drainer will work on 2 to 4 lbs. per foot of elevation. When it is desired to use steam pressure to operate drainer, we supply special steam jet at no additional cost.

Where higher capacities are required than those shown above we furnish Model "L" drainer.

Model "L"

Size and model	Pipe sizes, in.		Working head, ft.	Actual capacities in gallons of water per hour taken from sump and not total amount of discharged water				Dimensions over all, in.	
	Supply	Discharge and suction		At 25 lbs. will elevate	At 40 lbs. will elevate	At 60 lbs. will elevate	At 80 lbs. will elevate	Height	Diam.
No. 3 Model "L"	1	1½	3	660	1100	1440	1650	25½	15½
			6	520	860	1230	1440		
			9		720	1050	1320		
			12			840	1040		
			18				760		
No. 4 Model "L"	1¼	2	3	960	1600	2020	2400	27½	18½
			6	760	1240	1880	1980		
			9		1040	1600	1800		
			12			1280	1440		
			18				1050		
No. 5 Model "L"	1½	2½	3	1280	2100	2700	3200	27½	20⁹⁄₁₆
			6	1000	1620	2300	2820		
			9		1260	1960	2600		
			12			1560	2060		
			18				1500		

Note: Capacities are the *actual capacities of water taken from sump*, and not combined discharge of operating and drainage water as in most tables. **For higher elevations than above, special drainers can be made.**

PRICE LIST

Model "R" (Illustration No. 382)

Size No.	1	2			
List price	$25.00	40.00	....	....	....

Model "L"—Regular Model (Not Shown)

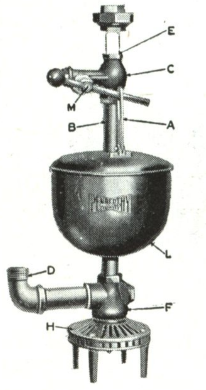
Size No.	....	....	3	4	5
List price	....	....	$55.00	80.00	110.00

Write for circular No. 93.

Non-automatic

Size No.	1	2	3	4	5
List price	$15.00	25.00	35.00	50.00	70.00

Capacities, pipe connections, etc. same as other models listed above.



"Penberthy" Automatic Cellar Drainer

E—Water pressure pipe
C—Water valve
D—Discharge pipe
F—Ejector
B—Suction pipe
H—Strainer

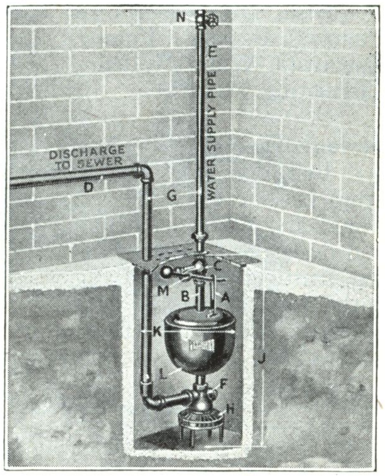


Fig. No. 382. Installation of "Penberthy" Automatic Cellar Drainer

Guarantee—All drainers absolutely guaranteed in operation, workmanship, and material.

Specifications

Furnish and install in a suitable sized pit (see mason specification) in cellar of building a "Penberthy" automatic cellar drainer (made by the Penberthy Injector Co., Detroit, Mich.) in accordance with directions furnished by the manufacturers, this outfit to be placed below the basement floor and conform to the following specifications:

Size No.	Power line iron pipe size	Discharge iron pipe size	Diam. of pit	Depth of pit

Additional Information—The pit should be placed so that all surplus water will drain to it, and it may be constructed of cement, brick, sewer crock or other suitable material.

A cover should be provided that is not airtight and should be made in two pieces, these halves being cut out to fit around the pipes, D and E (No. 382).

Below are given all necessary dimensions. Letters at top of columns refer to Fig. No. 382.

Size No.	E City pressure (or steam) line iron pipe size, in.	D Discharge line iron pipe size, in.	K Extreme diam. of drainer, in.	J Height of drainer (valve open), in.	G Approximate centers of pipe cut-outs in cover, in.	Minimum size sump	
						Diam., in.	Depth, in.
1	½	1	10⅜	21½	6	12	24
2	¾	1¼	12⅞	21½	7½	16	24
3	1	1½	15⅛	25⅜	13	20	28
4	1¼	2	18½	27½	15⅞	24	30
5	1½	2½	20⁹⁄₁₆	27⅝	17½	26	30

It is a good fault to have the pit a little larger than actually necessary, especially deeper to allow dirt to settle below strainer.

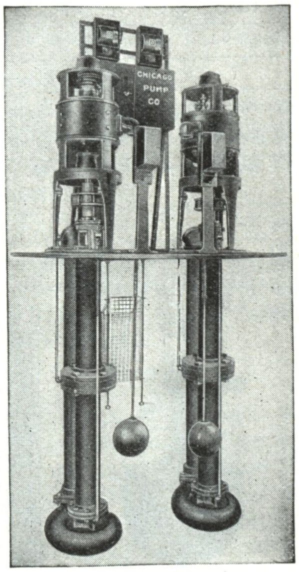
CHICAGO PUMP CO.

Electric Pumping Machinery
2332 Wolfram Street
CHICAGO, ILL.

Products

CENTRIFUGAL PUMPS for every use; SEWAGE EJECTORS, single and duplex; BILGE OR SUMP PUMPS, single and duplex; CONDENSATION PUMPS for high and low pressures; RETURN LINE VACUUM PUMPS; HORIZONTAL PUMPS for numerous purposes.

Also Boiler Feed Pumps, Booster Pumps, Pneumatic Water Systems, Circulating Pumps.



DUPLEX ELECTRIC SEWAGE EJECTOR

Sewage Ejectors

For pumping sewage from basement into sewer. Simplicity of construction and design are predominating features. All working parts are visible and of easy access. The equipment can be procured in single or duplex and is built in submerged and dry basin types.

CAPACITIES, HORSEPOWER AND FLOOR SPACE, DUPLEX ELECTRIC SEWAGE EJECTOR

Unit No.	Type of pump and frame No.	Capacity. g.p.m.	Discharge, in.	Hp. motor	Will pump against a total head, ft.	Floor space required Diam. basin, single pump, in.	Diam. basin, duplex set of pumps, in.
S.H. 300	L-3	75	3	¾	8	36	42
S.H. 301	L-3	75	3	1	11	36	42
S.H. 302	L-3	75	3	1½	16	36	42
S.H. 303	L-3	75	3	2	22	36	42
S.H. 304	L-3	75	3	3	32	36	42
S.H. 305	L-4	75	3	5	40	36	42
S.H. 306	L-3	100	3	¾	7	36	42
S.H. 307	L-3	100	3	1	10	36	42
S.H. 308	L-3	100	3	1½	15	36	42
S.H. 309	L-3	100	3	2	21	36	42
S.H. 310	L-4	100	3	3	30	36	42
S.H. 311	L-4	100	3	5	38	36	42
S.H. 312	L-3	125	3	1	8	42	48
S.H. 313	L-3	125	3	1½	13	42	48
S.H. 314	L-3	125	3	2	17	42	48
S.H. 315	L-3	125	3	3	26	42	48
S.H. 316	L-4	125	3	5	37	42	48
S.H. 317	L-3	150	3	1½	11	42	48
S.H. 318	L-3	150	3	2	15	42	48
S.H. 319	L-3	150	3	3	23	42	48
S.H. 320	L-4	150	3	5	36	42	48
S.H. 321	L-3	200	3	2	12	42	48
S.H. 322	L-3	200	3	3	19	42	48
S.H. 323	L-4	200	3	5	32	42	48
S.H. 324	L-4	200	3	7½	34	42	48
S.H. 325	L-3	250	4	2	10	48	60
S.H. 326	L-3	250	4	3	16	48	60
S.H. 327	L-4	250	4	5	27	48	60
S.H. 328	L-4	250	4	7½	33	48	60
S.H. 329	L-4	300	4	3	14	48	60
S.H. 330	L-4	300	4	5	23	48	60
S.H. 331	L-5	300	4	7½	35	48	60
S.H. 332	L-5	300	4	10	45	48	60
S.H. 333	L-4	350	4	3	12	48	60
S.H. 334	L-4	350	4	5	21	48	60
S.H. 335	L-5	350	4	7½	31	48	60
S.H. 336	L-5	350	4	10	42	48	60

Duplex units include two pumps, two motors, duplex automatic control, strainer and cast iron cover but do not include basin.

All basins should be 48 in. deeper than lowest inlet.

Ejectors up to 1500 g.p.m. are also manufactured; write for complete catalogue.

Bilge Pumps

For pumping water out of basements located below the sewer level.

They are the best that modern equipment and skill can produce.

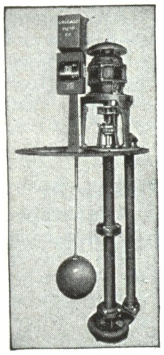
They are fitted with oil lubricated bronze bearings every 5 ft.; self-aligning ball thrust bearing, flexible couplings, a double carbon contact type float switch and a Square D main line switch.

All mounted on one pedestal.

Automatic apparatus is totally enclosed.

Made in all sizes from 15 to 1500 gal. per minute.

The smaller outfits are very reasonably priced and can be profitably used in small stores and residence buildings.



AUTOMATIC ELECTRIC BILGE PUMP

CAPACITIES, HORSEPOWER AND FLOOR SPACE, AUTOMATIC ELECTRIC BILGE PUMPS

Unit No.	Type of pump and frame No.	Capacity. g.p.m.	Discharge, in.	Hp. motor	Will pump against a total head, ft.	Floor space required Diam. basin, single pump, in.	Diam. basin, duplex set of pumps, in.
S.H. 290	L-1	15	1½	¼	10	30	42
S.H. 291	L-1	15	1½	½	23	30	42
S.H. 292	L-1	30	1⅛	¼	10	30	42
S.H. 293	L-1	30	1½	½	21	30	42
S.H. 475	L-1B	30	1½	¾	35	30	42
S.H. 476	L-1C	30	1½	1	46	30	42
S.H. 477	L-1C	30	1½	1½	60	30	42
S.H. 294	L-1	50	1½	¼	7	30	42
S.H. 295	L-1	50	1½	½	15	30	42
S.H. 478	L-1B	50	1½	¾	24	30	42
S.H. 479	L-1B	50	1½	1	32	30	42
S.H. 480	L-1C	50	1½	2	53	30	42
S.H. 486	L-1B	75	1½	¾	12	36	42
S.H. 487	L-1B	75	1½	1	16	36	42
S.H. 218	L-3	75	2	1½	22	36	42
S.H. 219	L-3	75	2	2	30	36	42
S.H. 220	L-3	75	2	3	48	36	42
S.H. 223	L-3	100	2½	1	14	36	42
S.H. 224	L-3	100	2½	1½	18	36	42
S.H. 225	L-3	100	2½	2	25	36	42
S.H. 226	L-3	100	2½	3	38	36	42
S.H. 228	L-3	125	2½	1	10	36	42
S.H. 229	L-3	125	2½	1½	15	36	42
S.H. 230	L-3	125	2½	2	21	36	42
S.H. 231	L-3	125	2½	3	33	36	42
S.H. 232	L-3	125	2½	5	55	36	42
S.H. 234	L-3	150	3	1½	14	42	48
S.H. 235	L-3	150	3	2	19	42	48
S.H. 236	L-3	150	3	3	28	42	48
S.H. 237	L-3	150	3	5	48	42	48
S.H. 239	L-3	200	3	2	14	42	48
S.H. 240	L-3	200	3	3	22	42	48
S.H. 241	L-3	200	3	5	37	42	48
S.H. 242	L-3	200	3	7½	55	42	48
S.H. 244	L-4	250	4	2	12	42	48
S.H. 245	L-4	250	4	3	20	42	48
S.H. 246	L-4	250	4	5	34	42	48
S.H. 247	L-4	250	4	7½	50	42	48
S.H. 249	L-4	300	4	3	17	48	60
S.H. 250	L-4	300	4	5	28	48	60
S.H. 251	L-4	300	4	7½	44	48	60

Units include pump, motor, complete automatic apparatus, cast iron basin cover, but do not include basin.

All basins should be 36 in. deeper than lowest inlet.

Bilge pumps up to 1500 g.p.m. are also manufactured; write for complete catalogue.

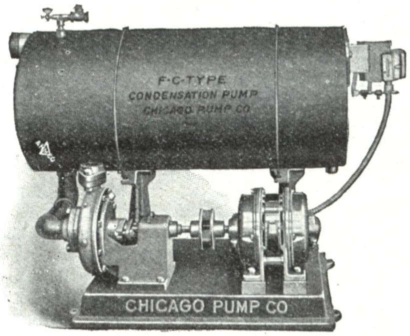
Continued on next page

Condensation Pumps and Receivers

Pump the heating returns into boiler from radiation, heating coils, cooking kettles, etc., that may be located below boiler level.

They are simple in construction, have very few moving parts and are quiet in operation. They are shipped all mounted on one base, connected up ready for final piping and wiring.

Various sizes from 2000 to 150,000 sq. ft. of radiation (high and low pressures).



Condensation Pump and Receiver

*CAPACITIES, HORSEPOWER AND FLOOR SPACE, LOW PRESSURE AUTOMATIC CONDENSATION PUMP AND RECEIVER

Unit No.	Max. sq. ft. direct radiation	Hp. motor	Approx. floor space required, in.	Highest water level in receiver from floor line, in.	Unit No.	Max. sq. ft. direct radiation	Hp. motor	Approx. floor space required, in.	Highest water level in receiver from floor line, in.
S.H.650	3,000	¼	43x28	26	S.H.654	20,000	¾	59x32	30
S.H.651	6,000	½	43x30	26	S.H.655	25,000	1	59x32	35
S.H.652	10,000	½	55x30	30	S.H.656	35,000	1	61x34	39
S.H.653	15,000	¾	57x32	30	S.H.657	50,000	1½	65x36	41

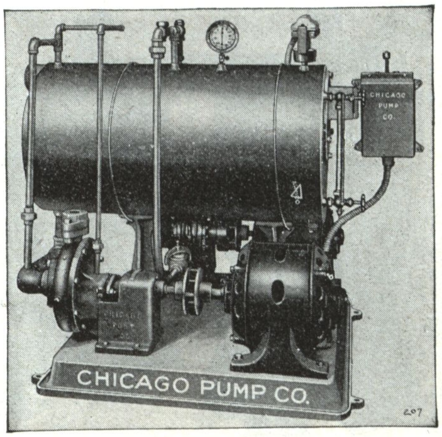
*Partial list.

Return Line Vacuum Pump

Condensation-vacuum, return line pump and receiver, with separate motors and individual automatic control of the water and air pumps, for maintaining a vacuum on the return lines of the heating system and returning condensation water directly to boiler.

Sizes range from 5000 to 65,000 sq. ft. of radiation (high and low pressures).

For table giving capacities, horsepower and floor space, see top of next column.



Two-motor Driven Double Automatic Control Return Line Vacuum Pump

*CAPACITIES, HORSEPOWER AND FLOOR SPACE, RETURN LINE VACUUM PUMPS

Unit No.	Sq. ft. radiation	Hp. motor		Approximate floor space required, in.
		Water pump	Air pump	
S-1040	8000	¾	⅓	55x32
S-1041	16000	1	¾	60x34
S-1042	26000	1	1	62x35
S-1043	40000	2	1½	65x37
S-1044	65000	3	2	68x40

*Partial list.

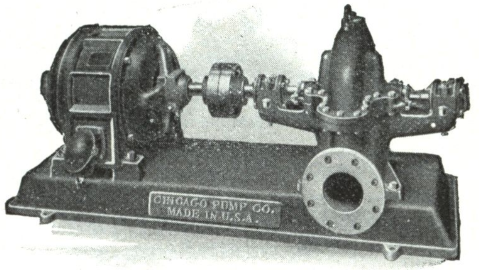
These pumps can be built for very high pressure boilers.

Horizontal Pumps

Made in both styles of casings—horizontally and vertically split. They are manufactured for numerous purposes, including: boiler feed; booster service for hotel, hospital, apartment and office buildings; pneumatic systems (in connection with air compressors); ice water circulating and hot water circulating, etc.

Small outfits, 5 gal. per minute.

Large outfits, 1000 gal. per minute. High pressures.



Type "D" Horizontally Split Pump

*CAPACITIES, HORSEPOWER AND FLOOR SPACE, TYPES M, D AND HS HORIZONTAL PUMPS

Unit No.	Type of pump and frame No.	Size of pump, in.	Number of stages	Capacity, g.p.m.	Will pump against a head, ft.	Hp. motor	Approx. floor space required, in.
S.K. 19	MA	1¼	1	25	19	½	18x 38
S.K. 21	MA	1¼	1	25	37	1	18x 39
S.K. 23	MA	1¼	2	25	56	1½	19x 44
S.K. 24	MA	1¼	2	25	71	2	19x 45
S.K. 26	MA	1¼	3	25	115	3	19x 50
S.K. 28	MA	1¼	4	25	192	5	24x 56
S.K. 47	MB	1½	3	35	260	7½	24x 59
S.K. 48	MB	1½	3	35	274	10	24x 62
S.K. 62	MB	1½	4	50	330	15	30x 65
S.K. 86	MB	2½	4	100	294	20	30x 67
S.K. 115	MB	2½	4	150	250	25	30x 70
S.K. 3010	D	2	1	50	68	5	24x 53
S.K. 3032	D	2	1	175	53	7½	24x 55
S.K. 3132	D	2½	1	225	84	10	24x 58
S.K. 3137	D	2½	1	250	112	15	24x 61
S. 3375	HS	3	1	400	38	7½	28x 55
S. 3179	HS	3	1	400	154	40	28x 65
S. 3317	HS	4	1	500	121	30	31x 70
S. 3335	HS	4	1	700	150	50	31x 73
S. 3054	HS	2	2	50	205	15	25x 69
S. 3203	HS	3	2	150	240	30	30x 80
S. 3242	HS	3	3	200	351	50	34x 92
S. 3362	HS	5	2	500	268	75	40x100
S. 3368	HS	5	2	600	280	100	42x102

*Partial list.

Engineering Department

Our engineers will gladly determine the size and style pumps required, prepare specifications and give detail information covering pumps. You will find this department a great help.

Helpful Data

Booklets and bulletins of any type of pump may be had for the asking. This literature contains valuable suggestions and engineering tables.

Our new catalogue would also make a worthwhile addition to your reference library. Write for it.

YEOMANS BROTHERS COMPANY

ESTABLISHED 1898

Sewage Ejectors and Pumping Machinery

1419 Dayton Street
CHICAGO, ILL.

REPRESENTATIVES

ATLANTA, GA., Burford, Hall & Smith, Red Rock Building
BALTIMORE, MD., Morton McI. Dukehart & Co., McComas and Race Streets
BIRMINGHAM, ALA., E. N. Cunningham, Brown-Marx Building
BOSTON, MASS., Power Equipment Co., 131 State Street
BUENOS AIRES, ARGENTINA, Buxton, Guilayn & Co.
CINCINNATI, OHIO, O. J. Allonier, 1231 Union Trust Building
CLEVELAND, OHIO, Cleveland Pump & Supply Co., 418 Rockefeller Building
DALLAS, TEX., John H. Van Zandt, 1903 Santa Fe Building
DAVENPORT, IOWA, D. C. Murphy, Security Building
DAYTON, OHIO, Chas. M. Kelso Co., Reibold Building
DENVER, COLO., The Daly Co., 1425 Sixteenth Street
DETROIT, MICH., Power Plant Supply Co., Penobscot Building
EL PASO, TEX., Geo. W. Herlin, 226 Mesa Avenue
HONOLULU, T. H., Honolulu Iron Works
INDIANAPOLIS, IND., S. E. Fenstermaker & Co., Hume-Mansur Building
KANSAS CITY, MO., Southwest Pump & Machinery Co., 2716 McGee Trafficway
LITTLE ROCK, ARK., Fallon & Schnelle, Gazette Building
LOS ANGELES, CAL., F. C. Millard Engineering Co., Rives-Strong Building
MEMPHIS, TENN., Hoshall Machinery Co., P. O. Box 187
MILWAUKEE, WIS., Chas. W. Miller, 194 Reed Street
MONTREAL, TORONTO, WINNIPEG, CANADA, Darling Bros., Ltd.
NEW ORLEANS, LA., H. J. Powers, Louisiana Building
NEW YORK, N. Y., E. A. Julie, 51 East 42d Street
OMAHA, NEB., D. E. McCulley, 1820 St. Marys Avenue
PHILADELPHIA, PA., Chas. C. Enderle, Commercial Trust Building
PITTSBURGH, PA., Bushnell Machinery Co., 309 Second Avenue
PORTLAND, ORE., Gordon & Finkbeiner, 224 Pine Street
ROCHESTER, N. Y., J. F. Brightman, Mercantile Bank Building
ST. LOUIS, MO., B. H. Mueller, Syndicate Trust Building
ST. PAUL, MINN., Healy-Ruff Co., 765 Hampden Avenue
SALT LAKE CITY, UTAH, Hawley-Richardson-Williams Co., Dooly Building
SAN FRANCISCO, CAL., C. H. Cobb, 55 New Montgomery Street
SEATTLE, WASH., Steam Appliance Co., L. C. Smith Building
TOLEDO, OHIO, A. Carle Rogers, 752 Euclid Avenue
VANCOUVER, B. C., Frank Darling Co., 1142 Homer Street

Products

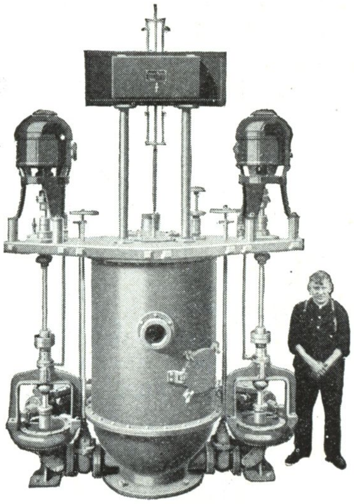
Yeomans Form "A" Duplex Centrifugal Electric Sewage Ejectors; Shone Pneumatic Sewage Ejectors; Yeomans Single and Duplex Electric Bilge or Sump Pumps; Yeomans Centrifugal Pumps; Yeomans Condensation Return Pumps.

Also manufacturers of Pumping Machinery for all purposes.

TRADE-MARK

Yeomans Form "A" Sewage Ejector

A duplex equipment consisting of two special vertical centrifugal pumps operating in dry pit, connected to cast iron sewage receiver and driven by direct connected vertical motors mounted on receiver cover, equipped with automatic controllers, high-water alarm, pit-drainage connections, cast iron bar screen of large area, gate and flush back check valves.



Form "A" Duplex Ejector

No.	3	4	5	6
Capacity each unit......g. p. m.	100–125	150–200	250–350	400–500
Pit diameter...............ft.	8	8	8	10
Depth of pit below inlet,......ft.	4	4	4	5

Pumps arranged so that top plate can be raised without disturbing shafting, bearings or impellers.

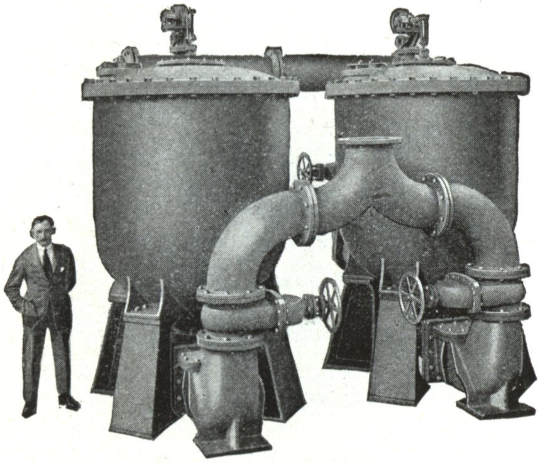
No accumulation of solids in receiver; minimum space requirements; high efficiency; noiseless; sanitary and reliable.

Shone Pneumatic Sewage Ejector

The Shone ejector has been in successful service in all parts of the world for over 40 years. Installations made in this country 35 years ago are still in operation. At the World's Fair in Chicago in 1893, 52 Shone ejectors handled all the sewage.

Unequaled for substantial design, durability, economy and reliability in operation. No screens required; bottom discharge and no accumulation of solids; special non-clogging check valves; no electric float switches or collapsible floats; bronze pressure operated piston valves located outside of ejector pit.

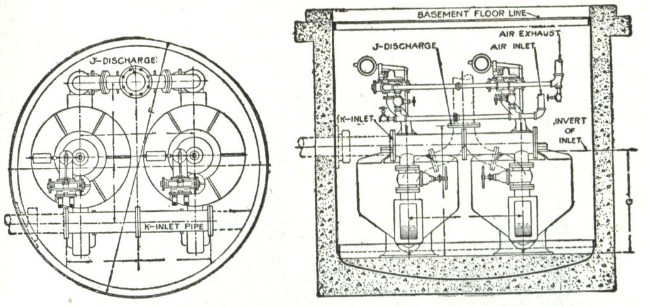
Furnished with either motor or steam driven air compressors. Compressors can be located at any desired



600-gallon Shone Duplex Ejector

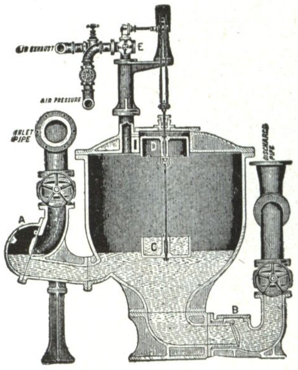
Continued on next page

distance from ejectors. Ejectors can be operated from air supply maintained for general purposes in industrial plants. Especially recommended for municipal work.

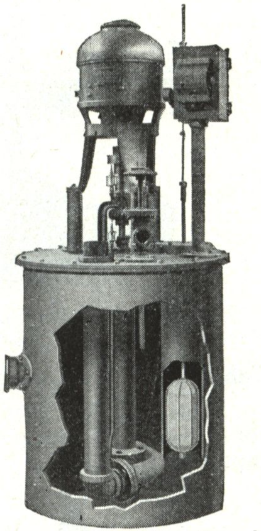


Dimension Diagram of Shone Duplex Ejector

G. p. m. each unit	G ft. in.	Single Ejectors			Duplex Ejectors	
		F, ft.	J, in.	K, in.	F, ft.	J and K, in.
50	3– 1	6	4	6	8	6
100	3– 7	7	5	6	9	8
150	4– 5	7	5	6	9	8
200	4–11	8	6	8	11	8
250	5– 6	8	6	8	11	8
300	7– 0	8	6	8	11	8
400	7– 3	13	12	12	14	12
500	8– 0	13	12	12	14	12
600	8– 9	13	12	12	14	12
750	8– 0	14	14	14	16	14
1000	9– 0	14	16	16	16	16



Shone Ejector, Sectional View



Heavy Duty Slow Speed Bilge Pump

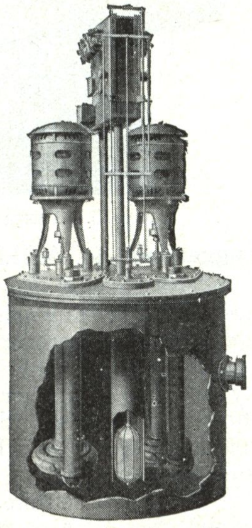
Yeomans Bilge Pumps

Single Electric—Automatic, self-contained, heavily constructed slow speed machines, with submerged centrifugal pumps, vertical direct connected motors and automatic controllers for handling waste water and sewage.

Built in two lines: Heavy Duty Pumps, operating at slow speeds and equipped with high-water alarm, pipe casing for float, force feed lubricated bearings, etc., and Standard Pumps, moderate speed.

SINGLE ELECTRIC BILGE PUMPS

No.	Capacity, g. p. m.	Basin diam., in.
½	15– 25	24
1	35– 50	36
2	50– 75	36
3	100–125	36
4	150–200	36
5	250–350	48
6	400–500	48



Yeomans Duplex Electric Bilge Pump

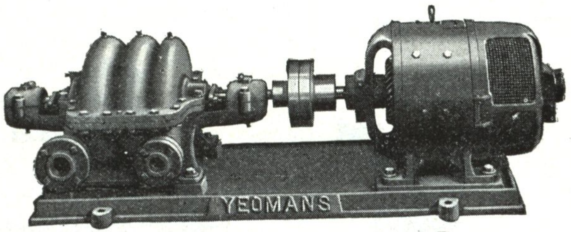
Duplex Electric Bilge Pumps or Submerged Sewage Ejectors—Construction similar to single bilge pumps; units arranged so that one can be removed without disturbing the other. Capacities per unit same as single bilge pumps.

Basin diameters: No. 1, 36 in.; No. 2, 42 in.; No. 3, 48 in.; Nos. 4 and 5, 60 in.

Yeomans Horizontal Centrifugal Pumps

For house supply and general service.

Most improved type, single and multistage, high efficiency, quiet running pumps with ring oiled, water cooled external shaft bearings, perfectly balanced rotors, flexible couplings. Special attention given to noiseless pumps for apartment buildings, residences and hotels. Complete automatic equipments furnished for either roof tank or compression tank service, any capacity.



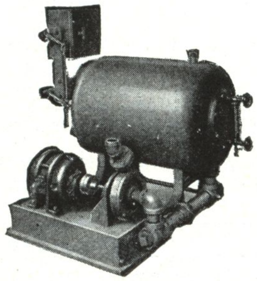
Yeomans Three-stage Centrifugal Pump

Yeomans Condensation Return Pumps

High grade equipments consisting of cast iron receiver with water glass, direct connected centrifugal pump and motor, all on one base, enclosed quick break butt contact automatic switch, seamless copper float and protective devices.

Type "H" Pumps—For returns above basement floor level.

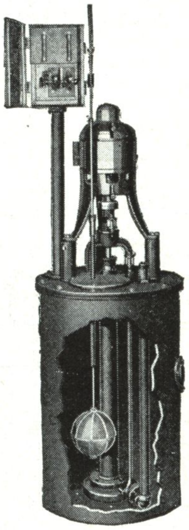
Type "V" Pumps—For returns close to or below basement floor.



Type "H," Condensation Return Pump

TYPES "H" AND "V" CONDENSATION RETURN PUMPS

No.	Capacity, g. p. m.	Maximum direct radiation, sq. ft.
1	5	1,000
2	10	3,000
3	15	6,000
4	20	10,000
5	30	15,000
6	60	30,000



Type "V," Condensation Return Pump

References

Yeomans pumps and Shone ejectors have been in service in important city buildings, industrial plants and municipalities for many years. Installations can be referred to in all parts of the world.

TABER PUMP COMPANY

295 Elm Street
BUFFALO, N. Y.

Products

SUMP PUMPS, CENTRIFUGAL BOOSTER PUMPS, DOUBLE SUCTION CENTRIFUGAL PUMPS.

Also manufacturers of Rotary Pumps, and Centrifugal Pumps for all purposes.

Taber Sump Pumps

Taber sump pumps have the built-in qualities which make for durability and satisfactory service.

There will be no attempt made here to go into the details of construction which are given in our Bulletin No. 120; this bulletin we shall gladly mail on request.

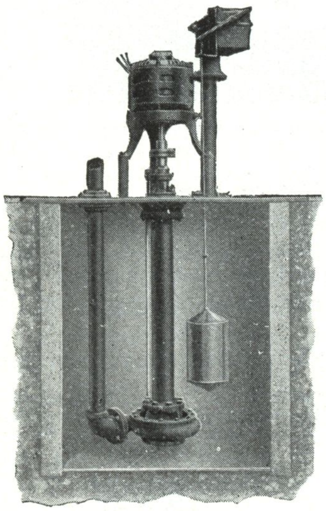


FIG. 194-B. TABER AUTOMATIC SUMP PUMP

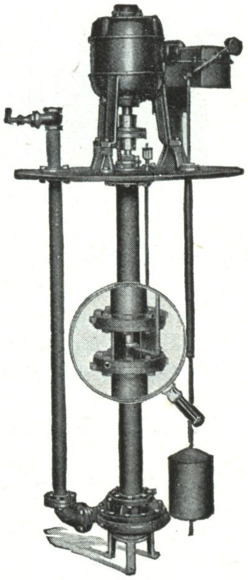


FIG. 194-L. TABER SUMP PUMP

Note the bronzed bushed intermediate bearing, lubricated from the sump plate

RATING TABLE, TABER STANDARD SUMP PUMPS

Pump No.	Suction, in.	Discharge, in.	Capacity up to, gal.	Head in feet				
				10	20	30	40	50
				Horsepower to be furnished				
FOR 1750 R. P. M.								
L-0	1¼	1	10	½	½	½*		
L-0	1¼	1	25	½	¾			
L-1	2	1½	35	½	¾	1	1½*	
L-1	2	1½	65	¾	1	1½	2 *	
L-2	2½	2	75	¾	1	1½	2	3*
L-2	2½	2	100	1	1½	2	3	5*
L-3	3	2½	125–150	1½	2–3	3–5	3–5	5
L-4	4	3	175–250	1½	2–3	3–5	5–7½	5–7½
FOR 1450 R. P. M.								
L-0	1¼	1	10	½				
L-0	1¼	1	25	½				
L-1	2	1½	35	½	¾			
L-1	2	1½	65	¾	1	2*	3*	
L-2	2½	2	75	¾	1	1½	2*	
L-2	2½	2	100	1	1½	2	3*	5
L-3	3	2½	125–150	1½	2	3	5	5
L-4	4	3	175–250	1½–2	2–3	3–5	5–7½	5–7½
L-5	5	4	300-450	2–3	3–5	5–7½	7½–10	10

Taber Centrifugal Booster Pump

Figs. 400 and 401, respectively, show a multistage house booster pump which is bronze fitted. The details of construction are apparent. The number of stages depend upon head and characteristics of current available.

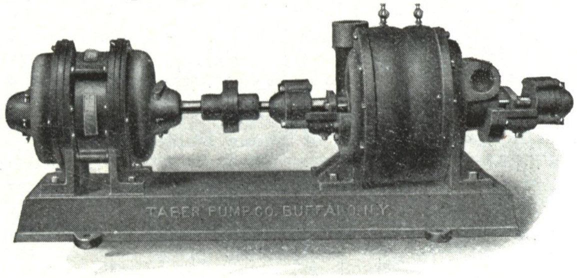


FIG. 400. TABER CENTRIFUGAL BOOSTER PUMP

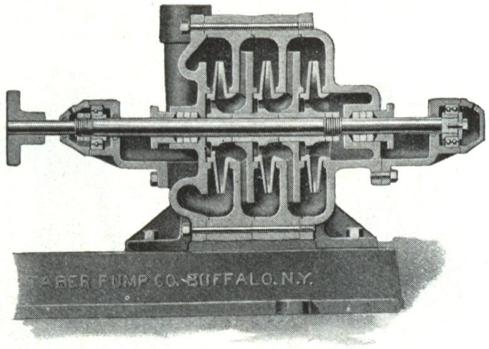


FIG. 401. SECTIONAL VIEW OF TABER CENTRIFUGAL BOOSTER PUMP

Taber SL Type Centrifugal Pump

Fig. 510 illustrates Taber double suction centrifugal pump which is designed and built with all the most approved features.

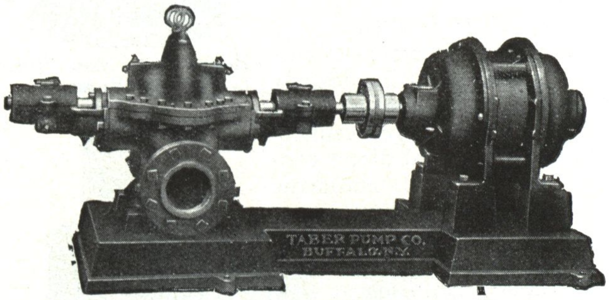


FIG. 510. TABER SL TYPE CENTRIFUGAL PUMP

Suggestions to Architects

The peculiar characteristics of centrifugal pumps are such that any tabular matter can at best be only approximate—therefore, frequently misleading. A correct selection can only be made after knowing the capacity, head and character of current available. With these three items known, the most efficient and economical combination can be selected, which will assure satisfactory results.

We invite architects and engineers to feel free to submit their data to us for recommendation. There is no obligation whatsoever connected therewith.

ATEN SEWAGE DISPOSAL CO.

TELEPHONE CONNECTION

286 Fifth Avenue
NEW YORK, N. Y.

Products and Services

Aten Sanitary System of Sewage Disposal.

Engineers for Sewage Disposal.

TRADE-MARK

Aten Service

The Aten Sewage Disposal Co. designs and furnishes sewage disposal systems for residences, clubs, schools, hotels, hospitals, factories or other institutions not connected with city sewers. We will contract for the complete installation of systems, but if desired, will furnish the special materials with complete installation instructions and blue prints to permit installation by purchaser.

Upon receipt of the necessary information, at no cost to the inquirer, we gladly specify the correct type of system and furnish an estimate of the cost of the complete installation.

Guarantee

When installed by us or in conformity with our directions, we guarantee the successful operation of our systems to dispose of the domestic sewage from the buildings served.

Aten Sewage Disposal Systems

The systems consist essentially of a septic tank and filtration fields or leaching chambers. A siphon tank, siphon, special fittings and special tile are features promoting automatic and efficient operation.

Septic Tank—Consists of an airtight, reinforced concrete tank which receives the sewage. Bacterial action liquefies the solids in the sewage and the effluent flows to the filtration fields or leaching chambers from where it is absorbed by the soil. No chemicals are used.

After many years of experience and experimenting, we have designed a reinforced wire form allowing a concrete tank to be built without the use of wooden forms. The Aten wire form is embedded and remains in the concrete, thus reinforcing it. This form saves about half the cost of concrete because thinner walls may be used; it saves the cost of wooden forms and it saves the time of a carpenter to erect wooden forms and to take them down.

Filtration Field—Consists of at least two sets of tile lines laid so as to properly distribute the sewage and gases to the soil. A diverting gate permits one set of tile lines to "rest" while the other is in operation. Tile are specially designed to allow air to reach sewage and to permit uniform seepage of sewage to soil.

Leaching Chambers—Used where land is not available for tile fields. Two or more are used for each septic tank so that one chamber may "rest" while the other is in operation. Constructed of stone, brick, or hollow building block.

Type A System—Consists of a septic tank, siphon chamber and tile fields. Used wherever practicable. Siphon chamber automatically provides a periodical flow of sewage to tile fields.

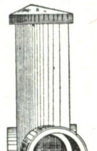
Type B System—Specially suited for places having very flat grades. Includes septic tank and tile fields but no siphon chamber.

Type C System—Consists of a septic tank and two or more leaching chambers. Used where land is not available for Type A or B Systems, or where subsoil is particularly suitable.

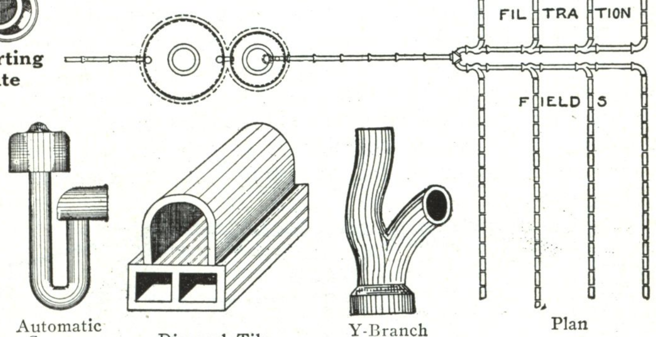
References

Aten systems are indorsed by all leading boards, including state boards of health and departments of engineering. Below are a few Aten installations:

Piping Rock Club, Locust Valley, L. I., N. Y.
Thos. Hastings (of Carrere & Hastings), Old Westbury, N. Y.
Engineers' Club, Roslyn, N. Y.
Grade and High School, Oceanside, L. I., N. Y.
Camp Pok-O-Moonshine, Willsborough, N. Y.
Blind Brook Country Club, Port Chester, N. Y.
Isolation Hospital, Perth Amboy, N. J.
O. L. L. Camp for Girls, Livingston Manor, N. Y.
Clifton Schools, Nos. 13 and 15, Clifton, N. J.
Floral Park School, Floral Park, L. I., N. Y.
S. Saito Shazo, Official Government Contractor, Osaki Station, Tokyo, Japan
C. S. Stolp, Contractor and Builder, Ellendale, N. D.
Nazareth Trade School, Farmingdale, N. Y.
Department of Parks, New York, N. Y.
Cherrydale Manor School, Darien, Conn.
Nelson Doubleday, Oyster Bay, L. I., N. Y.
Salisbury Golf Links, Garden City, L. I., N. Y.
Wm. Lyall, Passaic, N. J.
Gould Machinery Mfg. Co., Maspeth, L. I., N. Y.
District School, Valley Stream, L. I., N. Y.
Camp Dudley, Westport, N. Y.
Leake & Watts Orphan House, Tivoli, N. Y.
Delaware County Hospital, Delhi, N. Y.



Diverting Gate

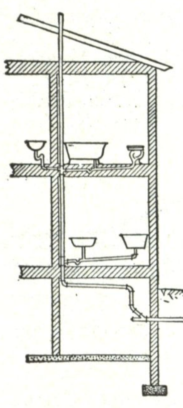


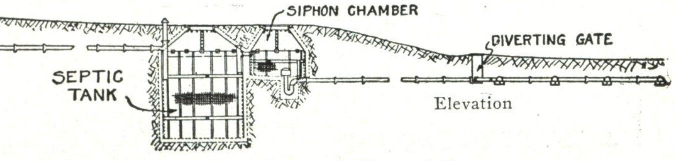
Plan

Automatic Sewage Siphon

Disposal Tile

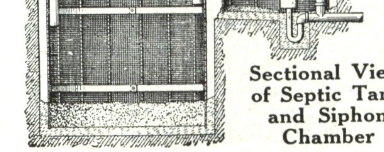
Y-Branch Tile





Elevation

Aten Type "A" Sanitary Sewage Disposal System



Sectional View of Septic Tank and Siphon Chamber

THE NEW YORK SEWAGE DISPOSAL CO.

Experts in Sanitary Engineering
5621 Grand Central Terminal
NEW YORK, N. Y.

Products and Services

Experts in the DESIGN and CONSTRUCTION of SEWAGE DISPOSAL, WATER SUPPLY and kindred SUBURBAN UTILITIES.

The engineering staff is made up of graduates of the best technical schools who are trained by years of experience in sanitary and mechanical engineering in the fullest meaning of the terms. They will investigate and report on Sewerage, Drainage, Water Supply, Pumps, Swimming Pools and kindred subjects.

They are also prepared to furnish reports on Chemical and Bacterial Condition of Water, and to conduct Gauging Tests, Surveys and Location of Plants.

Experience

Over twenty years' active work in design and construction. *More than 1000 plants* in all parts of the country and under the most widely divergent conditions have been built. Plans and work (approved by state, county and city health officers and engineers) have given such great satisfaction that frequent commissions for additional work are received from satisfied clients.

The scope of the work of this company extends from the smallest plant for a dwelling to the large municipal installations. Their experience in hospital work and golf clubs is unusually extensive.

Description of Residential and Institutional Sewage Disposal Plants

Special interest is given to the fact that this company has been the originator and developer of an automatic siphon which works properly; a diverting gate that does not rust or jam, and a type of sewage irrigation tile, designed after years of careful investigation, that accomplishes the best results.

Sewer—Vitrified or iron pipe; standard engineering specifications.

Settling Tank—A tight masonry structure provided with special inlet and outlet devices, baffle and weir walls and other arrangements, so that sewage will be received and held a proper length of time to permit the maximum degree of liquefaction—ripe for oxidation.

The particular design which may be selected depends upon the nature and volume of sewage to be treated.

Siphon Chamber—A tight masonry structure built in connection with settling tank. Receives liquid overflow and by means of an automatic siphon, *designed for the purpose,* discharges this effluent at periods. The function of the siphon chamber is to produce periodic discharges in order to fill uniformly the tile disposal field beyond, at the same time permitting a period of rest, during which the oxidation of the effluent will progress at a maximum rate.

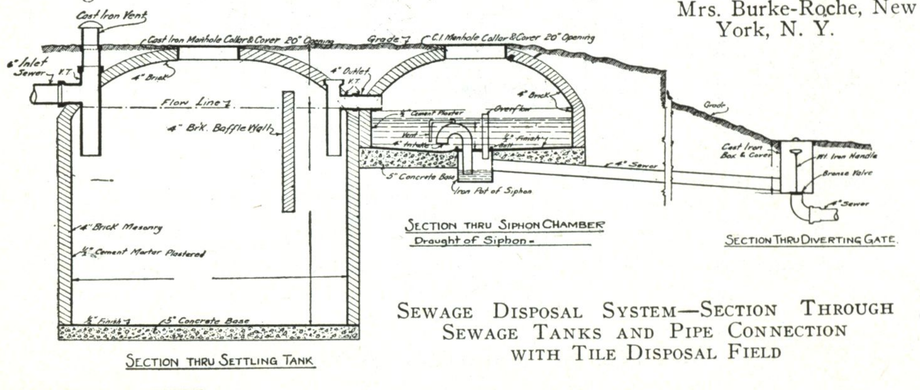
Tile Disposal Field—Made up of two or three divisions, or fields, of *special sewage irrigating tiles,* laid in a series of nearly parallel trenches following the contours. The type and quantity of absorption tiles used in disposal fields are determined by a study of the ground, and amount and nature of sewage to be treated.

Special Diverting Gate—Provided so that siphon discharge may be deflected into either of the fields. Merely turning a valve in this gate chamber once a week will accomplish this result and will permit a period of rest and recovery for the field last in use, while the next field is active.

Special Terra Cotta Fitting—Designed to set along the distribution lines so that the sewage will flow evenly and uniformly throughout each line of tile.

A Few of Our Noted Clients and Their Architects

Marshall Field, Lloyd Neck, N. Y., John Russell Pope, New York, N. Y.
Quaker Ridge Golf Club, Scarsdale, N. Y., Buchman & Kahn, New York, N. Y.
William F. Ladd, Cedarhurst, N. Y., Peabody, Wilson & Brown, New York, N. Y.
W. Redmond Cross, Morristown, N. J., Cross & Cross, New York, N. Y.
Rockville Centre Memorial High School, Rockville Centre, N. Y., Huse Templeton Blanchard, New York, N. Y.
Whitelaw Reid Estate, Purchase, N. Y., McKim, Mead & White, New York, N. Y.
H. H. Rogers, Southampton, N. Y., Walker & Gillette, New York, N. Y.
F. C. B. Page, Oyster Bay, N. Y., Little & Browne, Boston, Mass.
R. B. Ward, New Rochelle, N. Y., Chas. B. Keen, Philadelphia, Pa.
H. H. Houston, Chester, Pa., Savery & Scheetz, Philadelphia, Pa.
Dr. Cary Langhorne, Delaplane, Va., N. C. Wyeth, Washington, D. C.
W. C. Sproul, Chester, Pa., Price & McLanahan, Philadelphia, Pa.
Pierre S. duPont, Mendenhall, Pa., Longwood, Inc., Kennett Square, Pa.
Harvey S. Ladew, Glen Head, N. Y., James O'Connor, New York, N. Y.
Mrs. Robert L. Stevens, Bernardsville, N. J., Lord & Hewlett, New York, N. Y.
J. C. Milholland, Woodmere, N. Y., W. H. Beers, New York, N. Y.
Geo. W. Elkins, Elkins Park, Pa., H. Trumbauer, Philadelphia, Pa.
Robert Goelet, Goshen, N. Y., Carrére & Hastings, New York, N. Y.
Col. John Magee, Mt. Kisco, N. Y., Warren & Wetmore, New York, N. Y.
Mrs. Burke-Roche, New Hamburg, N. Y., H. O. Chapman, New York, N. Y.
Children's Vacation Home (Reed Farm), Nyack, N. Y., Jas. Gamble Rogers, New York, N. Y.
Rockefeller Institute for Medical Research, Princeton, N. J., Coolidge & Shattuck, Boston, Mass.
Metropolitan Sanatorium, Mt. McGregor, N. Y., D. Everett Waid, New York, N. Y.
Wilton Lloyd-Smith, Lloyd Neck, N. Y., Geo. P. Butler, Jr., New York, N. Y.
Nurses Home, Heywood Memorial Hospital, Gardner, Mass., Stevens & Lee, Boston, Mass.



SEWAGE DISPOSAL SYSTEM—SECTION THROUGH SEWAGE TANKS AND PIPE CONNECTION WITH TILE DISPOSAL FIELD

THE AMERICAN SANITARY PRODUCTS CO., INC.

Sanitary Engineers and Manufacturers of American Septic Tanks

STAMFORD, CONN.

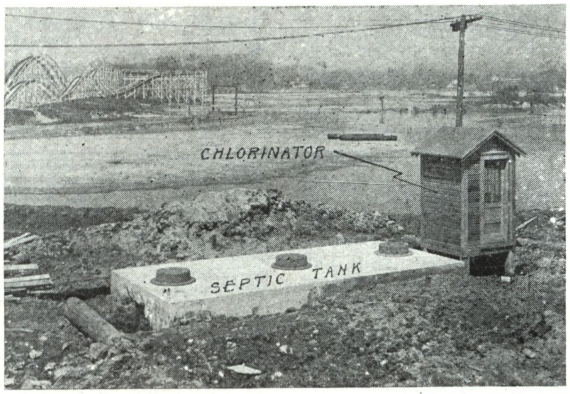
Products and Services

American Reinforced Concrete Septic Tanks.

Design and Installation of Sewage Disposal Systems for residences, schools, factories, institutions and municipalities.

Engineering Investigations of Sewage Disposal, Factory Waste Treatment and Water Supply Projects.

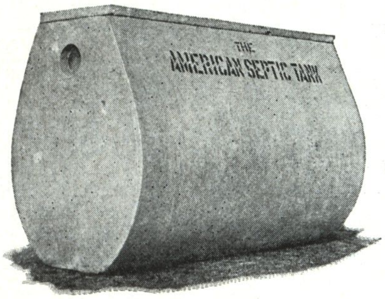
Our specialized experience in checking design and construction against actual operating results is an invaluable asset in accurately analyzing conditions encountered, permitting us to furnish our clients with recommendations, designs or installations properly meeting these conditions.



Septic Tank Installation, Roton Point Amusement Park, South Norwalk, Conn.

Complete Sewage Disposal Systems

Most installations provide for the absorption of the sewage by the soil, the system generally consisting of a septic tank and soil absorption area. For residential and smaller institutional systems, the precast American septic tank may be advantageously used. For larger installations, we design the tanks best adapted to the requirements and construct them on the job. To insure successful soil absorption, adequate contact between sewage and soil is provided by such units as tile fields, leaching wells or leaching trenches, using siphons and diverting gates when necessary. Where soil absorption is neither possible nor advisable, we provide the type of secondary treatment, such as open top or subsoil filters, sterilizing or other units which best meet the requirements of the case. To make our Engineering Service most helpful to our clients, we are not committed to any particular system or apparatus, but approach each problem with the idea of meeting the requirements of that problem in the most practical and economical manner.



American Septic Tank

Septic Tanks; Description, Operation and Capacity

Conforming to the best engineering specifications, American septic tanks, whether precast or built on the job, are of reinforced concrete, have sufficient depth, proper proportions and baffling to insure the maximum clarification, and avoid washing solids into the absorption area or secondary treatment unit. The precast American septic tank is cast in a single unit, provided with removable roof slabs. These tanks are properly cured and inspected prior to shipment.

Only two main purposes can be rightfully claimed for properly functioning septic tanks. First, they remove the coarser and heavier solids from the sewage so as to avoid clogging the soil absorption area or other necessary after-treatment unit. Second, they store the solids sufficiently long to permit septic action, which is really decomposition, to set in, thereby liquefying and gassifying a large proportion of these solids, hence substantially decreasing their volume and lengthening the intervals between necessary cleanings.

In residential systems, the solids which can not be further reduced usually accumulate at a rate of from 7 to 15 gallons per resident per year. Allowing for about three years storage before requiring cleaning, we recommend that the tank capacity be not less than 50 gallons per resident plus a proper allowance for guests.

In American installations, facilities are always provided to permit cleaning the tank.

DETAILS OF AMERICAN TANKS

No.	Size, in.	Capacity, gal.	Weight, lb.
5	36 x 60 x 45	200	1300
6	36 x 66 x 45	240	1550
7	42 x 66 x 45	300	1700

A Few American Sewage Disposal Installations

Roton Point Amusement Park, South Norwalk, Conn.
General Hospital, Milford, Conn., Walter John Skinner, Bridgeport, Conn., Architect
Carsonia Park, Reading, Pa.
Chippanee Golf Club, Bristol, Conn., R. H. Dana, Jr., New York, N. Y., Architect
Conde Nast Publishing Co., Greenwich, Conn., Wm. Higginson & Son, New York, N. Y., Architects
Glenbrook School, Stamford, Conn., Emmens & Abbott, Stamford, Conn., Architects
Cape Cod Hospital, Hyannis, Mass., Shepard & Stearns, Boston, Mass., Architects
H. B. Mallory, Danbury, Conn.
Long Island R. R. Station, Bayshore, L. I., N. Y.
Springfield Street School, Agawam, Mass., Paul B. Johnson, Springfield, Mass., Architect
E. J. Teagarden, Brewster, N. Y.
State Armory, Manchester, Conn., Payne & Keefe, New London, Conn., Architects
Halloween Park Bathing Pavilion, Stamford, Conn., E. B. Stratton, Boston, Mass., Architect
High School, Fairfield, Conn., O. C. S. Ziroli, Bridgeport, Conn., Architect
Col. L. D. Conley, Ridgefield, Conn.
Odd Fellows Infirmary, Groton, Conn., Whiton & McMahon, Hartford, Conn., Architects
Tumble Brook Country Club, Hartford, Conn., Smith & Bassett, Hartford, Conn., Architects
Worthington School, Berlin, Conn.
Nathan Hale School, New Haven, Conn., Brown & Von Beren, New Haven, Conn., Architects
G. Hazen Residence, Rye, N. Y., Clark & Arms, New York, N. Y., Architects
Adrian Von Sinderen, Washington, Conn., Clark & Arms, New York, N. Y., Architects
Immaculate Conception Parish, Millbury, Mass., O. E. Nault, Worcester, Mass., Architect

CHEMICAL TOILET CORPORATION

Sewage Disposal for Unsewered Buildings

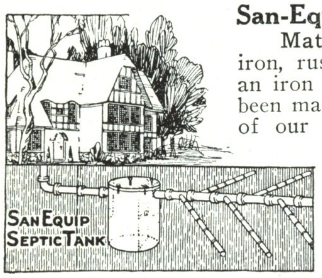
SYRACUSE, N. Y.

WAREHOUSE STOCKS

BOSTON, MASS.
TOLEDO, OHIO
PITTSBURGH, PA.
PHILADELPHIA, PA.
NEWARK, N. J.
HARTFORD, CONN.
CHICAGO, ILL.
CLEVELAND, OHIO
BIRMINGHAM, ALA.
BALTIMORE, MD.
COLUMBUS, OHIO

Products

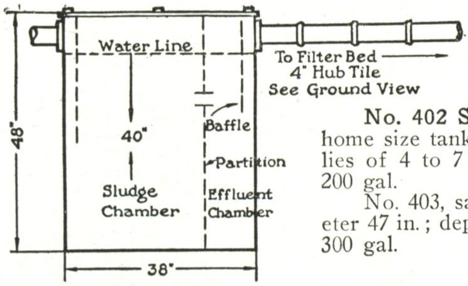
San-Equip Septic Tanks.
San-Equip Chemical Toilets.


SanEquip SepticTank

San-Equip Septic Tanks

Material—No. 14 gauge copper alloy iron, rustproof enameled. The use of an iron tank for sewage treatment has been made practicable by the perfecting of our process for proofing the tank against rust—using a mineral enamel, melted on to the entire surface of the tank. The 50 to 60 lb. of enamel on the smallest tank is equivalent to 15 to 20 coats of paint but more effective than a paint process because it is an all-mineral compound and becomes part of the tank itself, increasing the tank walls to double thickness. The enamel is unaffected by moisture, acids or soil.

Design—U. S. Public Health Service specifications.

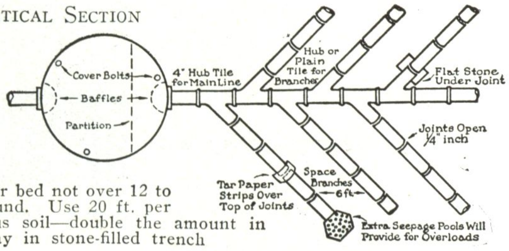

Water Line
40"
48"
Sludge Chamber
Baffle
Partition
Effluent Chamber
38"
To Filter Bed 4" Hub Tile See Ground View

No. 402, Vertical Section

Capacity—Single home to large schools, mills or communities.

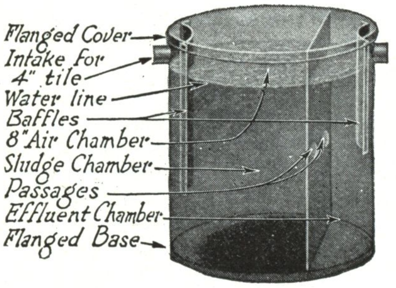
No. 402 Septic Tank—The home size tank for use of families of 4 to 7 persons; capacity 200 gal.

No. 403, same design; diameter 47 in.; depth 48 in.; capacity 300 gal.


Cover Bolts
Baffles
Partition
4" Hub Tile for Main Line
Hub or Plain Tile for Branches
Flat Stone Under Joint
Joints Open 1/4" inch
Space Branches 6 ft
Tar Paper Strips Over Top of Joints
Extra Seepage Pools Will Provide for Overloads

Ground View of Filter Bed

Note: Filter bed not over 12 to 18 in. underground. Use 20 ft. per person in porous soil—double the amount in tight soil and lay in stone-filled trench

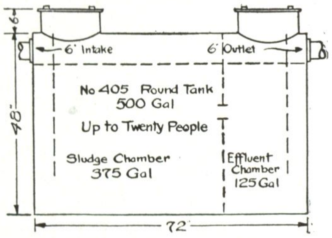

Flanged Cover
Intake for 4" tile
Water line
Baffles
8" Air Chamber
Sludge Chamber
Passages
Effluent Chamber
Flanged Base

San-Equip Septic Tank

SEPTIC TANK SIZES AND CAPACITIES

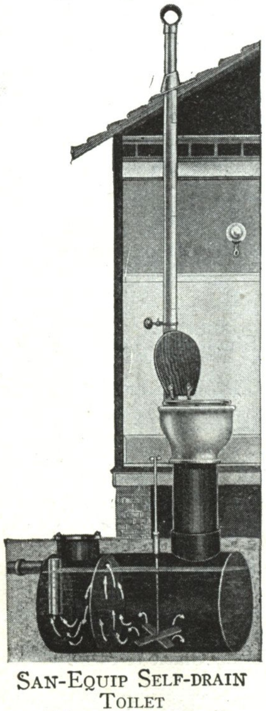
No.	Net gal.	Number of people			Dimensions, in.		Shipping wt. lb.	Retail price
		Home	School	Factory	Diameter	Depth		
402	200	6	12	10	38	48	295	$ 48.00
403	300	10	20	15	47	48	325	64.00
405	500	20	35	30	48	Length 72	420	96.00
410	1000	50	65	60	60	Length 96	950	192.00
415	1500	75	100	90	5 ft.	Length 12 ft.	1300	270.00
420	2000	100	130	120	5 ft.	Length 16 ft.	1650	360.00
425	2500	125	165	150	5 ft.	Length 20 ft.	2000	450.00
430	3000	150	200	180	5 ft.	Length 24 ft.	2350	540.00
435	3500	175	230	210	5 ft.	Length 28 ft.	2700	630.00
440	4000	200	260	240	5 ft.	Length 32 ft.	3050	720.00

For larger systems up to 36,000 gal., figure price at 16c per gallon capacity. Ask for plans.


6"
6' Intake
6' Outlet
No 405 Round Tank 500 Gal
Up to Twenty People
Sludge Chamber 375 Gal
Effluent Chamber 125 Gal
48"
72"

No. 405 Horizontal Tank

Nos. 410 to 440 are same design as 405, but larger capacity. Special openings made to specifications



San-Equip Self-drain Toilet
(All patents pending)

San-Equip Improved Self-drain Toilet

Provides a sanitary indoor toilet where water and sewers are not available. Necessity of emptying tanks by drain valve or pumping process overcome in the self-drain design.

The Self-drain storage tank provides for intensified chemical treatment of the sewage in the first chamber, and such an arrangement of partition and baffle as to insure a clear liquid discharge which is easily disposed of by a short line of filter tile or by a small seepage pool.

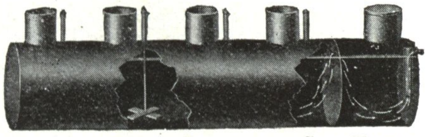
SIZES AND CAPACITIES SELF-DRAIN STORAGE TANK

No.	Net gal.	Number of people		Size of tank, in.		Price
		Home Camp	School Mill	Diam.	Lgth.	
360A	60	4	......	22½	36	$64.00
380A	80	7	15	22½	48	76.00
3128A	128	12	25	28	48	88.00

Specifications—Vitreous china bowl fitted with oak finish, post hinge, non-split seat. 8-ft. white enameled vent, 2-ft. galvanized 4-in. vent. Pipe stay, roof flange and vent cap, 24-in. drop tube connection (or special 18 to 24 in.). All small fittings required including first charge of chemical.

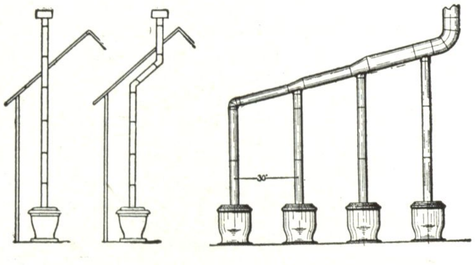
Storage tank, heavy gauge copperoid iron, full welded, rustproofed by mineral enamel melted on.

Simple instructions for installation and care.



Multiple Bowl System of San-Equip Self-drain Toilet

No.	Number of bowls	Capacity, gal.	Dimensions, in.	Price
352A	2	250	29x 88	176.00
353A	3	375	29x124	264.00
354A	4	500	32x144	352.00
355A	5	625	32x180	440.00
356A	6	750	32x216	528.00



Methods of Ventilation

NUSTONE PRODUCTS CORPORATION

Concrete Septic Tanks, Laundry Trays and Garbage Receivers

405 Lexington Avenue, NEW YORK, N. Y.

FACTORIES

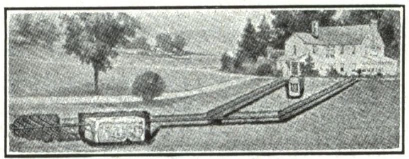
NEW YORK, N. Y. WEEHAWKEN, N. J. KINGSTON, N. Y. BUFFALO, N. Y. NEW HAVEN, CONN. BOSTON, MASS
PHILADELPHIA, PA. BALTIMORE, MD. JACKSONVILLE, FLA.

Products

Nustone Concrete Septic Tank; Nustone Concrete Grease Trap; Nustone Concrete Laundry Tubs, and Nustone Concrete Underground Garbage Receiver.

A Sanitary Sewerage System of Sensible Simplicity

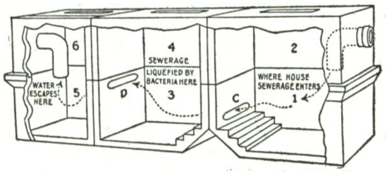
A complete portable sanitary sewerage system, available for any type of building, irrespective of location, giving every advantage of the city building connected with regular sewer lines. It does away with the filthy cesspool and all its dangers and attendant nuisance. Requires no attention for life, when properly installed.


Sewage Disposal System

Nustone Concrete Septic Tank

After repeated and finally successful experiments we have created the Nustone septic tank, constructed scientifically and simply, easy to install, automatically working by the balance of outflow with inflow.

Construction and Capacity—The Nustone septic tank is made of concrete with separate compartments. For ease of handling and installing, each compartment is made in six sections. The unit illustrated shows three compartments of a total length of 8 ft. 4 in., 3 ft. wide and 3 ft. high. It is of sufficient capacity for the needs of eight people of continuous residence, and extra compartments may be added to provide for any additional number of persons. One three-compartment tank is sufficient for twenty persons in school or factory.



Section of Nustone Septic Tank

The Nustone concrete septic tank is made with especial regard to economy and ease of installation. Unskilled labor may be used in setting and connecting.

Process of Disposal—The sewerage enters the Nustone septic tank and settles where it is destroyed by bacterial action. The solid matter is attacked by the bacteria and reduced to part liquid and part gaseous. Part of the settled matter, owing to the action of the bacteria and gas, by fermentation form a scum on the surface of the liquid in the first and second compartments. In the third compartment the sewerage has been entirely reduced to liquid effluent and may safely be disposed of through the seepage pits or drainage field.

Main Points to be Observed When Installing—The Nustone septic tank should be located as far from the house and source of water supply as conditions will permit. The sewerage should enter the septic tank, not with a rush, but gently. The pipe from the building to the tank should be laid with a pitch of not more than 1/8 in. to the foot, preferably 1/10 in.

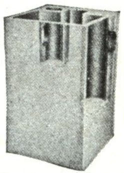
Rain water from the roofs or cistern should not be allowed to enter into the septic tank.

The waste from the kitchen sink, pantry sink and laundry tubs should be passed through a grease trap before entering the septic tank, to separate the grease and animal fats.

Installation instructions are furnished with each tank. The parts are numbered. When assembled, the joints are thoroughly pointed, manhole covers put in place. After installation of drainage system, the tank is ready for use.

Nustone Concrete Grease Trap

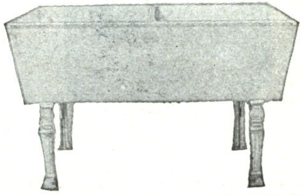
As previously stated, we strongly recommended a grease trap to which the kitchen and pantry sink, and laundry tubs are connected before this waste or sewerage is allowed to enter the septic tank, as grease and animal fat clogs the tank and is hostile to the bacteria.


Grease Trap

Traps are of ample size, simply constructed, inexpensive and require cleaning at infrequent intervals.

Nustone Concrete Laundry Tubs

Made of monolithic concrete with one, two or three compartments. They are sanitary, no seams or joints to leak, no sharp corners or angles to collect and retain impurities. The wringer may be fastened securely to end walls or partitions of tubs.


Two-Compartment Laundry Tub

DIMENSIONS NUSTONE CONCRETE LAUNDRY TUBS

One-compartment			Two-compartment			Three-compartment		
Length, in.	Width, in.	Depth, in.	Length, in.	Width, in.	Depth, in.	Length, in.	Width, in.	Depth, in.
24	21	16	42	21	16	72	21	16
*24	24	16	48	21	16	*72	24	16
27	24	16	*48	24	16	81	24	16
30	24	16	54	24	16	90	24	16
			60	24	16			

*These are standard sizes. Prices are for tubs only.

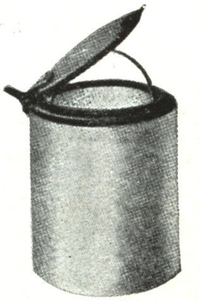
Special Styles on Request—Combination tub and sink with or without high back.

Tub with high back, soap dish, or wringer guard.

Sink with or without high back.

Nustone Concrete Underground Garbage Receiver

Made of monolithic concrete. Will not wear out, is frostproof; garbage will not ferment and is kept safe, odorless and inconspicuous underground. A heavy iron lid, raised by pressure of the foot, protects the contents. An inside galvanized iron pail can easily be removed and returned by garbage collectors. Insures absolute protection against fly plague and the spread of garbage and disease.


No. 22
Garbage Receiver

DIMENSIONS AND CAPACITIES, UNDERGROUND GARBAGE RECEIVERS

	Double cover type		Single cover type	
	No. 20	No. 21	No. 26	No. 22
Outside concrete cylinder . in.	24x30	18½x26	18½x25	18½x19
Inside containers . . . . in.	19x26	13 x24	13½x24	13½x18
Capacity of containers . . gal.	30	14	16	12
Shipping weight . . . . lb.	390	210	200	160

STROUDSBURG SEPTIC-TANK CO.

312 Main Street, STROUDSBURG, PA.

BRANCH OFFICES

NEW YORK, N. Y., Woolworth Building
HACKENSACK, N. J., 204 State Street
PHILADELPHIA, PA., 328 Chestnut Street
SCRANTON, PA., Board of Trade Building
ALLENTOWN, PA., 816 Chew Street

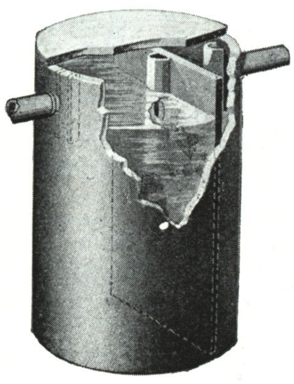
TRADE-MARK

Products

SEWAGE DISPOSAL SYSTEMS.
SEPTIC TANKS.
SEWAGE EJECTORS.

Also manufacturers of Concrete Drain Tile and Reinforced Concrete Sewer Pipe; Cast Iron Manholes, Covers and Fittings for sewage disposal systems.

Sep-Tank Sewage Disposal Systems



Sep-Tank

The Sep-Tank sewage disposal system consists of one or more Sep-Tank septic tanks and necessary drain tile.

Sep-Tank systems employ the L.R.S. system of sewage disposal devised by the United States Public Health Service. They have been commended by various State Boards of Health and other eminent authorities on sanitation.

Sep-Tanks—Sep-Tanks are permanent, made of concrete, thoroughly reinforced by steel fabric to prevent cracking, and waterproofed to prevent leaking and absorption. Only the best grades of portland cement, selected silica sand and special steel reinforcing are used.

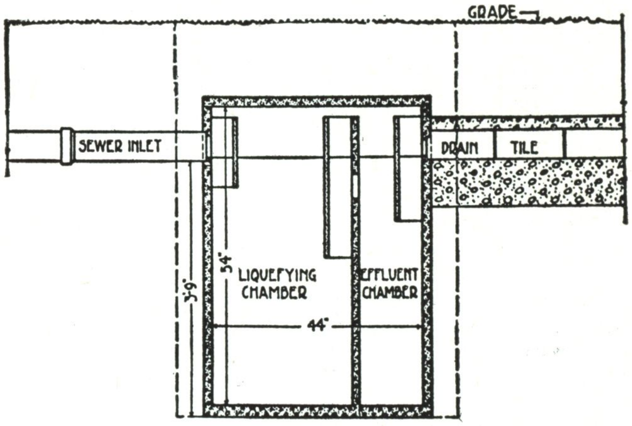
Sep-Tanks are cylindrical in shape and the sides, bottoms and partitions are moulded in one piece. There are no joints to open after installation, thus leakage is prevented and sufficient water in the tank is assured at all times to promote septic action. The covers are also made of reinforced concrete, moulded separately and waterproofed.

The corrosive action of the acids in the sewage will not affect Sep-Tanks.

Operation—The Sep-Tank has sufficient depth to insure complete digestion of the sewage and sufficient area for a proper bacterial mat. The flow of sewage through the Sep-Tank is retarded by curved pipes or baffles, preventing agitation.

Tile Disposal Field—This consists of porous drain tile, the length of which varies with the kind of soil. We manufacture drain tile for sewage disposal purposes and furnish it when specified.

Many Users—Over 50,000 tanks of this design are now in use.



Section Through Sep-Tank

SINGLE UNIT SYSTEMS
For ordinary single house use

Sep-tank No.	Size, in.	Capacity, gal.	Number of persons served, etc.	Approx. weight, lb.
20	32x54	200	5 persons; 1 bath	1450
21	38x54	250	7 persons; 1 bath	1600
22	44x54	300	10 persons; 2 baths	1750

*BATTERY SYSTEMS

Battery No.	Number and size of liquefying tank, in.	Number and size of effluent tank, in.	Total cap., gal.	Number of persons served			Approx. weight, lb.
				Residences	Factories	Schools	
12	1-44x52	1-28x42	450	15	30	45	2600
13	2-44x52	1-44x52	900	30	45	60	4650
14	3-44x52	1-44x52	1200	45	67	90	5600
15	4-44x52	1-44x52	1500	60	90	120	7000
16	5-44x52	1-44x52	1800	80	120	160	8400
17	6-44x52	1-44x52	2100	100	150	200	9800
18	7-44x52	1-44x52	2400	125	175	225	11350

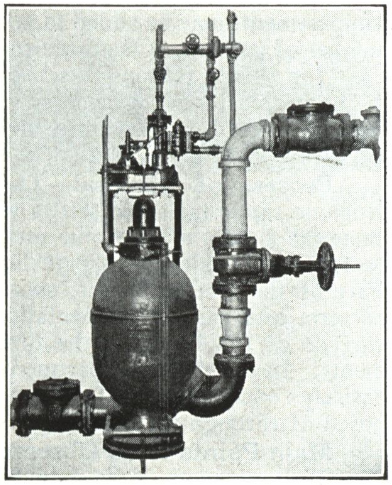
*For large installations to accommodate large residences, schools, hotels, factories, etc., where the single units are too small to take care of the sewage. The seven batteries listed above are carried in stock, but we can arrange tanks in batteries up to any number required. We are also prepared to supply systems for entire municipalities.

Priestman Sewage Ejector

Used principally for ejecting sewage from buildings in which the lower floors are below the level of the sewer. Consists of a cast iron sewage receiver, two special check valves and a special air controlling device as shown.

Operation is fully automatic. Sewage gravitates into the receiver and, when it has risen to a certain level, the pressure of the air in the receiver actuates the air control device, which admits compressed air into the receiver. This air pressure forces the sewage from the receiver into the sewer.

Moving parts have been reduced to a minimum and satisfactory operation for many years is assured without attention. No vital moving parts come in contact with the sewage; no floats; no corrosion; no trouble.



Priestman Sewage Ejector

STANDARD TYPES AND SIZES PRIESTMAN SEWAGE EJECTOR

Ejector No.	Capacity, gal. per min.	Head pumped against or lift, ft.	Inlet head, ft.	in.
1 V. F.	5 to 50	1 to 150	3	0
2 V.	75	1 to 150	3	0
3 V.	100	1 to 150	4	0
5 V.	200	1 to 150	5	2
7 V.	300	1 to 150	6	4

UNITED CEMENT PRODUCTS CO.

Sanitary Sewage Disposal Without Sewers

EXECUTIVE OFFICES
INDIANAPOLIS, IND.

Product

"Perfection" Septic Tank (Patented).

Adaptability

To be used in connection with inside closet, bathroom and kitchen sink, where there is no sewer connection, for *residences, schools, churches, factories, etc.*

Description

The "Perfection" septic tank reduces house sewage to water by the process of bacteria, which enter the tank with the sewage and, being increased by millions, literally devour and digest all contents, including tissue paper.

This tank is made of re-enforced cement concrete in sections for convenience in handling. These sections are cemented together in the ground forming a receptacle that is air- and water-tight.

The walls are 2 in. thick all around and every section is re-enforced with expanded metal.

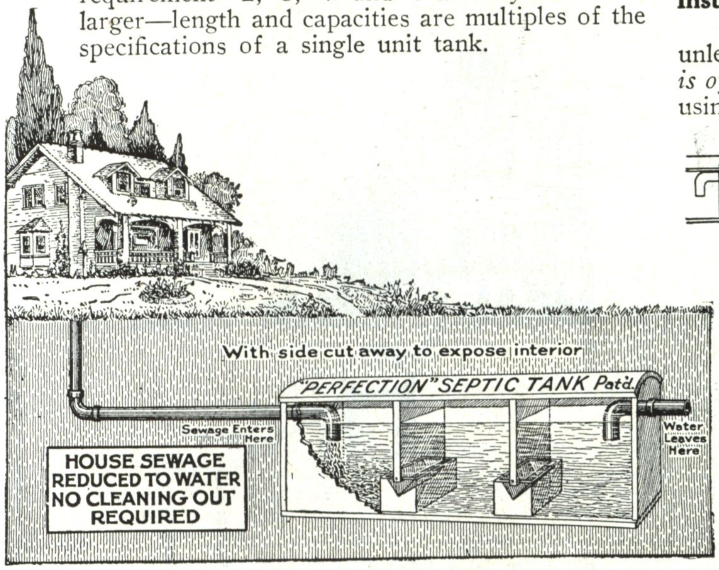
The residence size, which has 3 compartments is large enough for 8 people. This size is known as the unit and larger sizes are multiples of this unit. To preserve the life and activity of the bacteria, the excavation for this tank should be deep enough to maintain a temperature of not less than 50° in the coldest weather. This depth should be, approximately, 3 to 5 ft.

General Specifications

Construction—Re-enforced cement concrete. Made with grooves, easily fitted. Shipped in sections (crated). Weight, 2800 lb., single unit. Each additional unit 2300 lb.

Size of Single Unit Tank (Up to 8 People)—7 ft. 4 in. long, 32 in. wide, and 27 in. deep, inside. Walls, 2 in. thick. Size of elbows, 4 in. Elbows and farm tile necessary are not furnished as part of the standard equipment.

These tanks are furnished in any size to meet any requirement—2, 3, 4 and 5-unit systems and larger—length and capacities are multiples of the specifications of a single unit tank.


With side cut away to expose interior
"PERFECTION" SEPTIC TANK Pat'd.
Sewage Enters Here
Water Leaves Here
HOUSE SEWAGE REDUCED TO WATER NO CLEANING OUT REQUIRED

The "Perfection" Septic Tank Installed

CAPACITIES AND RATINGS

Number of units	*Size	Capacity based on number of persons using	
		Family, hotel or institution	School or factory
1	7′ 4″	8	20
2	15′ 4″	16	40
3	23′	24	60
4	30′ 8″	32	80
5	38′ 4″	40	100
6	46′	48	120
7	53′ 8″	56	140
8	61′ 4″	64	160
9	69′	72	180
10	76′ 8″	80	200
11	84′ 4″	88	220
12	92′	96	240
13	100′	104	260
14	107′ 4″	112	280
15	115′	120	300
16	122′ 8″	128	320
17	130′ 4″	136	340
18	138′	144	360
19	145′ 8″	152	380
20	153′ 4″	160	400
21	161′	168	420
22	168′ 8″	176	440
23	176′ 4″	184	460
24	184′	192	480
25	191′ 8″	200	500

*All units are 27 in. deep x 32 in. wide; walls 2 in. thick.

Guarantee

Where the directions for installing tanks are followed (which are simple and easy) this Company guarantees that contents of the tank will be reduced to water, which may be emptied anywhere without offense to sight or smell and that the tank will not require cleaning out.

Quick Shipments

Manufactured and shipped from 37 factories from coast to coast. Low freight rate.

There is a factory near you.

References

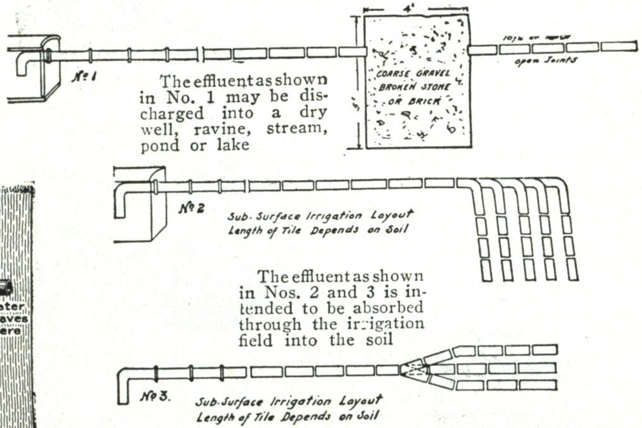
Thoroughly proved through years of use.

Over 15,000 "Perfection" tanks are now in use, some of them for 14 years, without any attention.

Prices, estimates and blue prints furnished on application.

Installation Data

The installation of a septic tank is not complete unless the effluent from the same is taken care of—*this is of vital importance.* Full directions for installing and using this tank go with every shipment.


4'
5'
No 1
COARSE GRAVEL BROKEN STONE OR BRICK
open Joints
No 2
Sub-Surface Irrigation Layout
Length of Tile Depends on Soil
No 3.
Sub-Surface Irrigation Layout
Length of Tile Depends on Soil

The effluent as shown in No. 1 may be discharged into a dry well, ravine, stream, pond or lake

The effluent as shown in Nos. 2 and 3 is intended to be absorbed through the irrigation field into the soil

Layouts for Disposal of Effluent from "Perfection" Septic Tanks

KAUSTINE COMPANY, INC.

Sanitation Engineers and Manufacturers of Sewage Disposal Equipment

BUFFALO, N. Y.

SALES OFFICES

NEW YORK, N. Y.
TRENTON, N. J.
CHICAGO, ILL.
WASHINGTON, D. C.
BOSTON, MASS.
MEMPHIS, TENN.
PHILADELPHIA, PA.
PORTLAND, ORE.
PITTSBURGH, PA.
HUNTINGTON, W. VA.
ALTOONA, PA.
DUNDAS, ONT.
HAWTHORNE, MELBOURNE, AUSTRALIA

Products

Chemical Toilets; Septic Tanks. Also manufacture Oil Tanks; Room Heaters.

Kaustine
TRADE-MARK

Construction of Kaustine Chemical Toilets

The tank is made of Armco Ingot Iron. The iron tank is coated heavily inside and outside with Hermastic enamel. Hermastic enamel is a bituminous product that positively protects the iron from acids, alkalis, gases and corrosion.

The agitator revolves. Blades are fastened to a horizontal bar. They whirl when the agitator rod at back of bowl is "worked" up and down. That cuts the sewage to pieces and mixes the chemical into it.

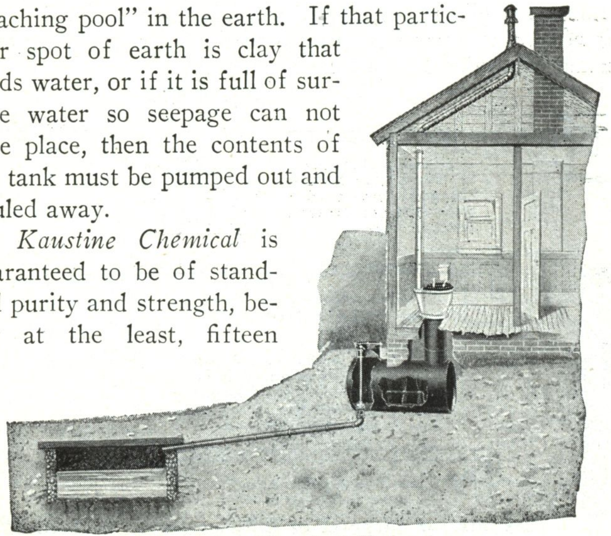
The vitreous china bowl with wood seat and lid is like that of any flush toilet, except the bowl is made without a trap. Where desired, in place of bowls, we can furnish vitreous china or enameled iron ventilated urinals of various sizes and styles.

The installing of the vent pipe is of great importance because by that means odors are carried off.

The tank, when full of Kaustinized, sterile, liquid sewage, is opened at manhole and by lifting the internal valve the contents are drained off into a "leaching pool" in the earth. If that particular spot of earth is clay that holds water, or if it is full of surface water so seepage can not take place, then the contents of the tank must be pumped out and hauled away.

Kaustine Chemical is guaranteed to be of standard purity and strength, being at the least, fifteen times stronger than phenol (carbolic acid).

Kaustine Toilets are adaptable to homes, schools, summer camps and cottages, factories, railroad stations, etc. Made in various sizes and styles to meet all requirements.



Kaustine Chemical Toilet

Kaustine Enameled Iron Septic Tanks

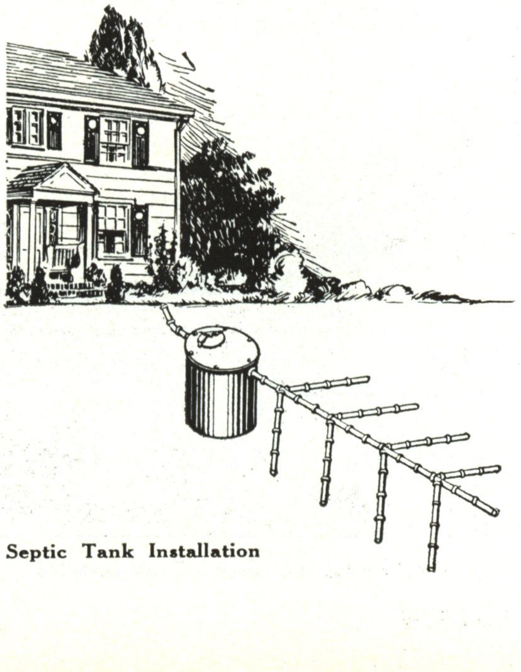
Made of *Armco Ingot Iron,* enameled inside and outside with Hermastic enamel, designed for use in homes, clubs, etc., where running water is available.

An Engineering Department is maintained to assist and advise our clients.

Specifications and data on the larger sizes than those specified below, mailed on request.

Standard domestic sizes as follows:

No.	Dimensions, in.	Total capacity, gal.	Working capacity, gal.	Number of persons designed to accommodate				Approx. shipping wt., lb.
				Home	Hotel	Factory	School	
111	32x50	170	140	4	......	....	......	250
112	38x50	245	200	7	8	10	12	295
113	48x50	390	320	10	12	15	20	470
114	55x60	615	535	17	20	25	32	800
115	65x60	860	735	25	30	35	50	1290
116	75x60	1150	1000	35	50	65	80	1650



Septic Tank Installation

BRAYMAN WATER-TIGHT DRAIN CO.

133 West 52nd Street
NEW YORK, N. Y.

Products

Brayman Watertight Drain Boxes.

Brayman Watertight Drain Boxes

Made for every purpose and suitable for every condition where drainage is required, especially for concrete construction. Different types for stables, garages, manure pits, ice plants, storage buildings, railroad yards, areas, courts, roofs, hospitals, powerhouses, mausoleums, roadways, bridges, showers, toilets, swimming pools, schools, cow barns, etc.

Where special drain boxes for particular purposes are required, castings will be made to suit drawings submitted. Brayman drains are made in cast iron, galvanized iron, polished brass or white metal. Covers are of cast iron, malleable iron, galvanized iron, or steel, polished brass or white metal. Standard 4-lb. sheet lead flashings are furnished, if ordered; heavier flashings furnished, if specified.

TRADE-MARK

Advantages of Brayman Watertight Drains

Brayman watertight drains may be set at the time the floors are laid, thereby avoiding possibility of improper levels, or any incorrect pitch to the drain. The flashing, when worked in with the waterproofing, becomes a part of it. The plumbing connections may be made at any time thereafter, as calked joint is made inside the drain from the top. Lead flashings may be made any dimension specified by the architect. There are no leaks or discolored ceilings where Brayman watertight drains are installed. Guaranteed absolutely non-freezing when used in exterior parts of buildings. Floor sweepings, or other solid matter, are prevented from passing through drain boxes and clogging pipes, being retained by means of sieves and dams which are readily accessible for the purpose of cleaning out accumulated sediment. Furnished with either side or bottom connections, making Brayman watertight drains practical in all locations.

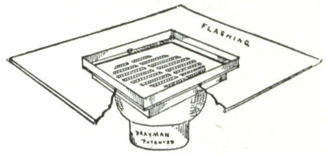


Fig. O-65

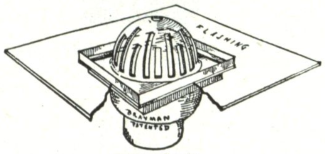


Fig. O-67

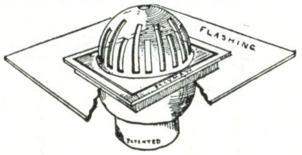


Fig. O-66

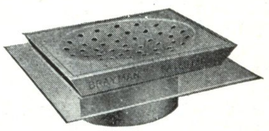
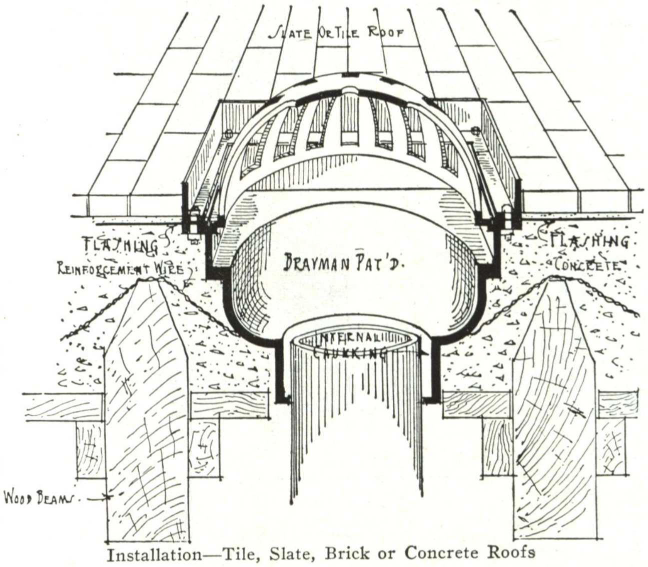
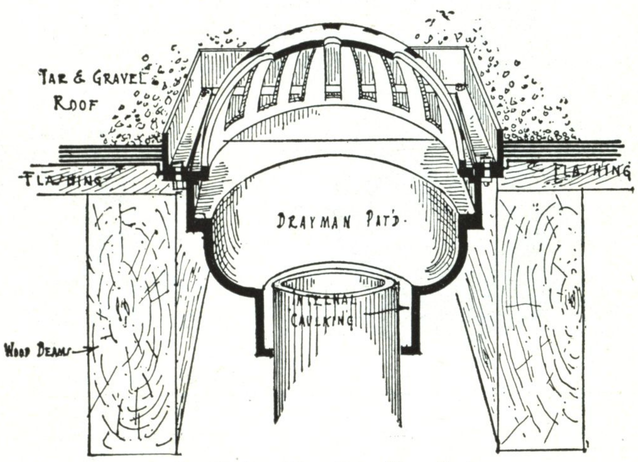


Fig. M. Shallow Roof Drain Perforated or Barred



Installation—Tile, Slate, Brick or Concrete Roofs



Installation—Gravel or Slag Roofs

Specification for Roof Drains

Provide and install, where shown on the drawings, a [cast iron] [galvanized iron] [polished brass] or [white metal] Fig. ...... Brayman Watertight Drain Box, ...x......x ...... in. deep, with (an abutment for gravel, slag, metal, tile, slate, brick or concrete roof), or (a flange for tile, slate, brick or concrete roof), with ......x...... in. 4-lb. sheet lead flashing ...... in. below roof level; provided with a (3, 4, 5 or 6)-in. (bottom or side) connection for internal calking.

Provide (removable or locked) (flat slotted or bee-hive slotted) covers of (cast iron, malleable iron, steel, galvanized iron or steel, polished brass, or white metal).

Provide and install strainers or inside baffle plates to prevent dirt or other solid matter passing through box trap.

BRAYMAN ROOF DRAINS

Fig. No.	Drain Boxes			4-lb. Sheet Lead Flashing	
	Size, in.	Diam. of outlets, in.		Size, in.	Below roof level, in.
		Bottom	Side		
O-65	10¾x10¾x7	3, 4, 5, 6	....	24x24	1½
O-66	10¾x10¾x9¾	3, 4, 5, 6	....	24x24	1¼
O-67	10¾x10¾x9¾	3, 4, 5, 6	....	24x24	1½
M	8½x 8½x4	2, 3, 4	....	12x12	1½
M	10 x10 x4	3, 4	....	18x18	1½
M	12 x12 x4	3, 4	....	18x18	1½

BRAYMAN WATERTIGHT ROOF DRAINS

Continued on next page

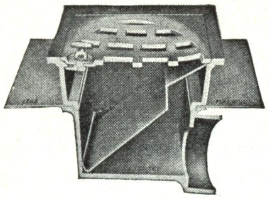
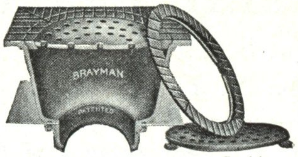


Fig. B. Building Department Floor or Vault Drain


BRAYMAN
PATENTED
Fig. C. Garage or Stable Washing Floor Drain Special device for locking ring and cover to drain

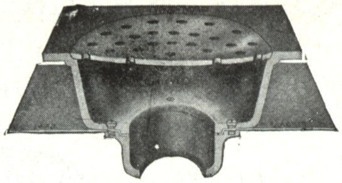
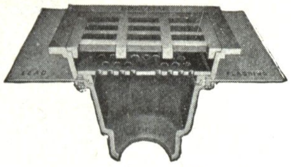
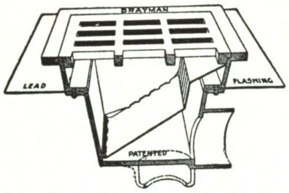
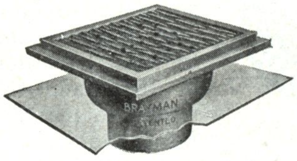


Fig. E. Automobile, Carriage or Wagon Wash Floor Drain


LEAD
FLASHING
Fig. H. Floor or Wagon Wash Stand Drain


BRAYMAN
LEAD
FLASHING
PATENTED
Fig. H, I, J. Watertight Drains for Abattoirs, Creameries, etc.


BRAYMAN
PATENTED
Fig. K. Drain for Shallow Depth Concrete Floors

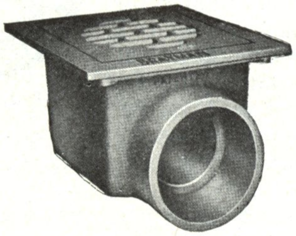
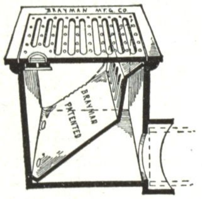


Fig. L. Shallow Floor Drain


BRAYMAN MFG. CO.
BRAYMAN
PATENTED
Fig. 90. Non-slip Top Drain, Board of Education Pattern

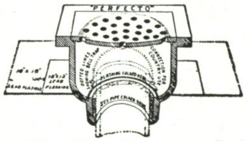
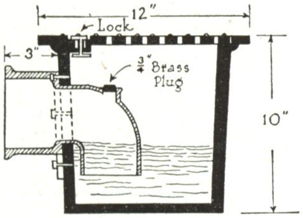


Fig. N. Cow Barn or Stable Floor Drain Perforated or Barred, Showing Installation of Bell Trap


12"
Lock
3"
¾" Brass Plug
10"
Fig. 89. Trap and Sand Arrestor for Stables and Garages

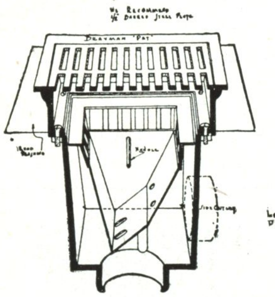


Fig. 97. Yard, Court and Garage Drain, Garage Pattern

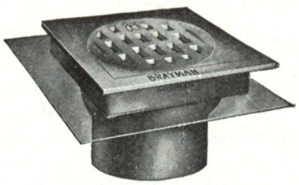
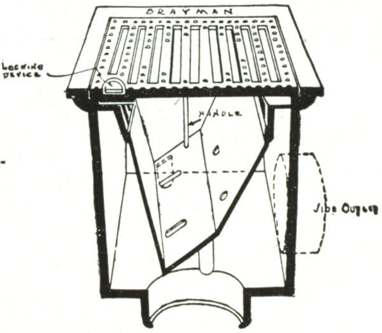


Fig. O. Shallow Floor or Stall Drain


BRAYMAN
Locking Device
Handle
Side Outlet
Fig. 96. Yard, Court and Garage Drain, Board of Education Pattern

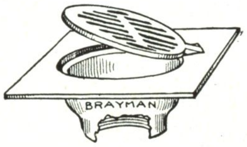


Fig. X-47. Floor Drain Heavy cast brass, for screw pipe

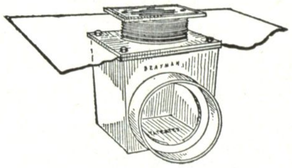


Fig. Y-10. Shower Drain with Adjustable Top for Floor Levels

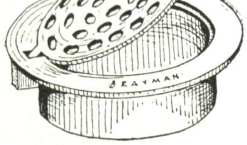
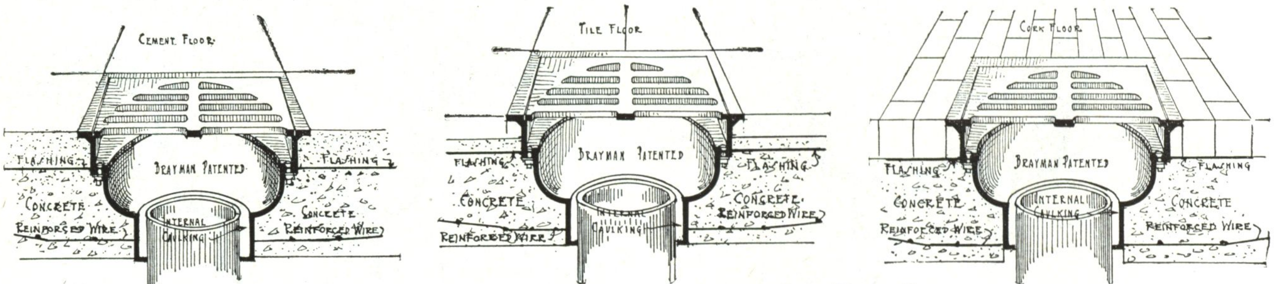


Fig. Z-131. Shallow, Toilet Floor Drain Polished brass


Cement Floor
Flashing
Brayman Patented
Flashing
Concrete
Concrete
Reinforced Wire
Internal Calking
Reinforced Wire
Tile Floor
Flashing
Brayman Patented
Flashing
Concrete
Concrete
Reinforced Wire
Internal Calking
Reinforced Wire
Cork Floor
Flashing
Brayman Patented
Flashing
Concrete
Internal Calking
Concrete
Reinforced Wire
Reinforced Wire
Fig. O-29. Showing Installations—Cement, Tile, Cork Floors, Etc.

BRAYMAN FLOOR DRAINS

Drain Boxes				4-lb. Sheet Lead Flashing		Drain Boxes				4-lb. Sheet Lead Flashing	
Fig. No.	Size, in.	Diam. of outlets, in.				Fig. No.	Size, in.	Diam. of outlets, in.			
		Bottom	Side	Size, in.	Below floor level, in.			Bottom	Side	Size, in.	Below floor level, in.
B	8½x 8½x 9¼	2, 3, 4	2, 3, 4	12x12	2½	90	12 x12 x10	....	3, 4, 5	....	....
B	10 x10 x 9¼	2, 3, 4	2, 3, 4	18x18	3½	96	12 x12 x10	3, 4, 5	3, 4, 5	....	....
B	12 x12 x 9½	2, 3, 4	2, 3, 4	18x18	2½	97	15½x15½x13½	3, 4, 5	3, 4 5	24x24	3½
C	13½x13½x 7¾	3, 4	....	18x18	5	N	10 x10 x 7	3, 4	....	18x18	4½
E	12¾x12¾x 7½	3, 4	....	18x18	5	O	8½x 8½x 7½	3, 4	....	12x12	2¼
H	12 x12 x 9½	3, 4	....	18x18	2¼–7½	O	10 x10 x 7½	2, 3, 4	....	18x18	3½
H	12 x12 x 9½	....	3, 4	18x18	3½	O	12 x12 x 7	2, 3, 4	....	18x18	2½
I	15½x15½x10	....	3, 4, 5, 6	24x24	3½	O-29	10 x10 x 5¼	3, 4	....	18x18	1¼
I	15½x15½x11½	3, 4, 5, 6	....	24x24	3½	X-47	8 x 8 x 2½	2, 3	....	....	....
J	18½x18½x14½	....	3, 4, 5, 6	30x30	5	X-47	9 x 9 x 2½	4	....	....	....
J	18½x18½x16	3, 4, 5, 6, 8	....	30x30	5	Y-10	3½x 3½x 6	....	2, 3	12x12	....
K	10½x10½x 5½	3, 4	....	18x18	3	Y-76	5 in. diam. x 2	2	....	....	....
L	8½x 8½x 6½	....	2, 3, 4	....	....	Y-76	6 in. diam. x 6	3	....	....	....
L	8½x 8½x 7¼	2, 3, 4	....	....	....	Z-131	6 in. diam. x 2	2, 3	....	....	....
89	12 x12 x10	....	3, 4	....	....	Z-136	6 x 6	2	....	12x12	....

FOR SPECIFICATIONS OF ABOVE DRAINS, SEE PAGE FOLLOWING

BRAYMAN WATERTIGHT FLOOR DRAINS

Continued on next page

Specification for Floor Drains

Provide and install, where shown on the drawings, a (cast iron, galvanized iron, polished brass, or white metal) Fig. .... Brayman Watertight Drain Box, ...x......x...... in. deep, with a (square or round) flange to receive floor finish, with ......x...... in. 4-lb. sheet lead flushing ...... in. below floor level; provided with a (2, 3, 4, 5, 6, or 8)-in. (bottom or side) connection for internal calking.

Note: Drains X-47 and Z-131 are furnished in all brass or iron. Drain X-47 is for screw pipe only.

Provide (removable or locked) (flat or concave, slotted or perforated) covers of (cast iron, malleable iron, steel, galvanized iron or steel, polished brass, or white metal).

Provide and install strainers or inside baffle plates to prevent dirt or other solid matter passing through box to trap.

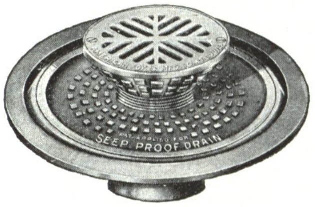

SEEP PROOF DRAIN

Fig. 30

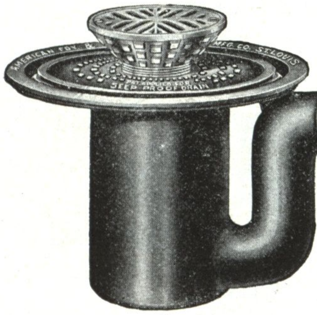

AMERICAN FDY. & ... MFG. CO. ST. LOUIS
SEEP PROOF DRAIN

Fig. 34

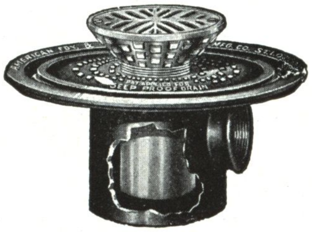

AMERICAN FDY. & ... MFG. CO. ST. LOUIS
SEEP PROOF DRAIN

Fig. 31

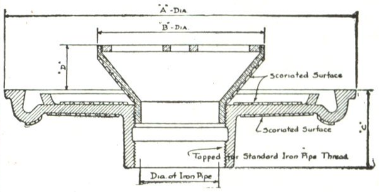

"A"-Dia.
"B"-Dia.
"D"
Scoriated Surface
Scoriated Surface
"C"
Tapped for Standard Iron Pipe Thread
Dia. of Iron Pipe

Fig. 30. Roughing in Dimensions

Size, in.	Pipe diam., in.	Dimensions, in.			
		A	B	C	D
1½	1½	7½	3¼	2	1⅛
2	2	9	4¼	2	1⅛
3	3	10½	5¼	2¼	1⅛
4	4	11½	6¼	2¼	1¾

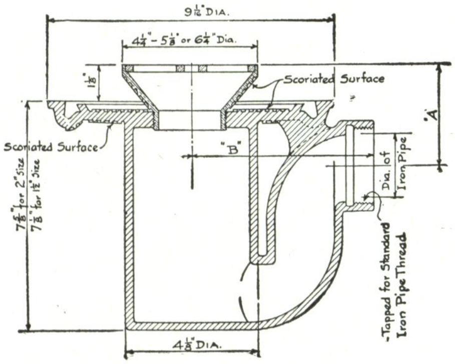

9¼" Dia.
4¼"-5⅜" or 6¼" Dia.
1⅜"
Scoriated Surface
Scoriated Surface
"B"
"A"
7⅝" for 2" Size
7⅛" for 1½" Size
Dia. of Iron Pipe
Tapped for Standard Iron Pipe Thread
4⅛" Dia.

Fig. 34. Roughing in Dimensions

Size, in.	Pipe diam., in.	Dimensions, in.		
		A	B	Seal
1½	1½	2⅞	5½	2½
2	2	2⅞	5¾	2½

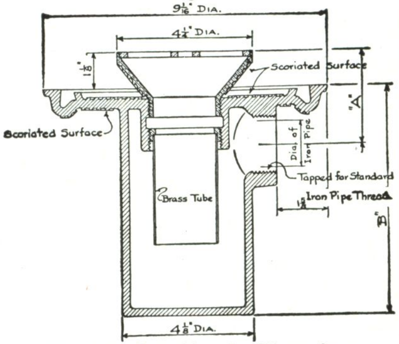

9⅛" Dia.
4¼" Dia.
1⅜"
Scoriated Surface
Scoriated Surface
"A"
Dia. of Iron Pipe
Brass Tube
Tapped for Standard Iron Pipe Thread
1½"
"B"
4⅛" Dia.

Fig. 31. Roughing in Dimensions

Size, in.	Pipe diam., in.	Dimensions, in.		
		A	B	Seal
1½	1½	3	7¼	2½
2	2	3¼	7¾	2½

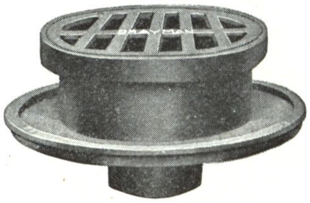


Fig. 1040

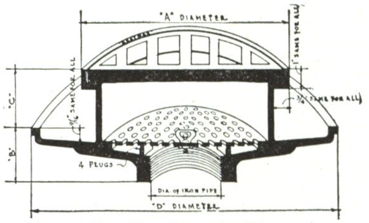

"A" DIAMETER
"C"
"B"
4 PLUGS
DIA. OF IRON PIPE
"D" DIAMETER

Fig. 1040. Roughing in Dimensions

Pipe diam., in.	A	B	C	D
3	10½	2½	3	14
4	10½	2½	3	14
5	13	2½	3	16½
6	13	2½	3	16½

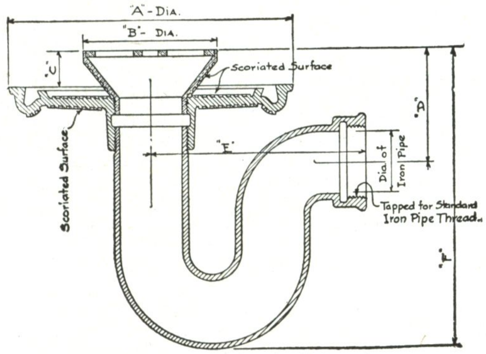

"A"-Dia.
"B"-Dia.
"C"
Scoriated Surface
Scoriated Surface
"D"
"E"
Dia. of Iron Pipe
Tapped for Standard Iron Pipe Thread
"F"

Fig. 32. Roughing in Dimensions

Size, in.	Pipe diam., in.	Dimensions, in.						
		A	B	C	D	E	F	Seal
1½	1½	7½	3¼	1⅛	5	6¾	10½	2½
2	2	9	4¼	1⅛	5¼	7	11	2½
3	3	10½	5¼	1⅛	3⅞	8¾	11⅛	2½
4	4	11½	6¼	1¾	4⅜	9¾	13⅞	3¼

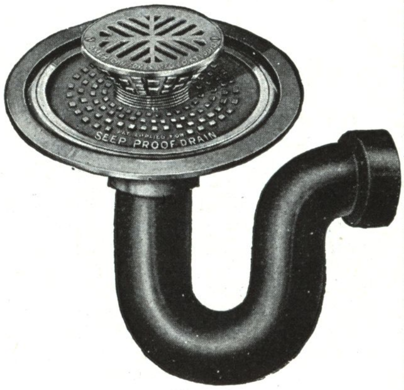

SEEP PROOF DRAIN

Fig. 32

Seep-proof Combined Floor Drain and Trap

Is suitable and recommended for concrete or tile floors. The construction consists of a cast iron body with a sub-dish receptor to take care of possible seepage of water between floor material and edge of flange; knobs or projections are provided for concrete bond. If desired, additional sheet lead flashing can be used and secured to edge of dish receptor, or membrane waterproofing can be used in a similar manner.

The drains are also provided with adjustable brass or nickelplated head and removable strainer. They are made ready to attach to traps provided by the plumber, or are made with trap in combination, as above illustrated.

Specification for Seep-proof Floor Drains

The contractor shall provide and install, where shown on drawings, a cast iron Fig. .... Seep-proof (drain, or combined drain and trap) with a ...... in. adjustable (brass, or nickelplated brass) head and removable strainer; and shall have a ...... in. water seal, and a ...... in. diam. pipe connection.

SEEP-PROOF COMBINED FLOOR DRAINS AND TRAP FOR CONCRETE OR TILE FLOORS

Continued on next page

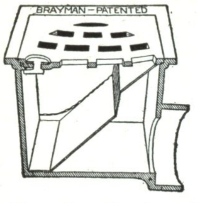


Fig. A. Yard and Area Drain, Removable Strainer Dam

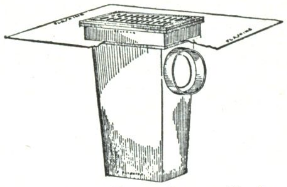


Fig. 45. Powerhouse Drain

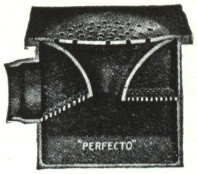


Fig. G. Manure Pit Drain

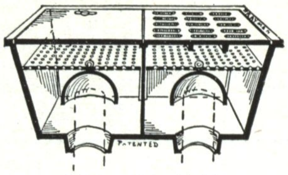


Fig. G-400. Liquid Manure Saver Drain for Cow Barns and Stables

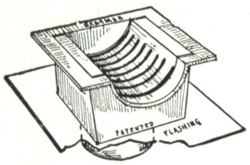


Fig. Q-1. Gutter Drain for Concrete Floors

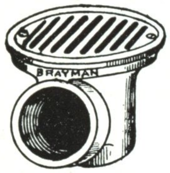


Fig. L-15. Shallow Fire Tower or Stairwell Drain

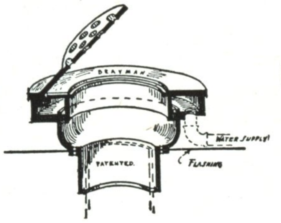


Fig. Y-1 Sanitary Flushing Drain for Hospital, Subway, Railway Station and Public Buildings

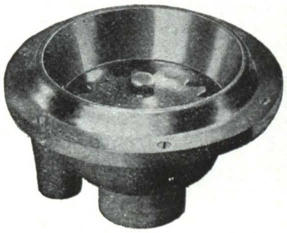


Fig. Y-28. Refrigerator Drip Receptor Made with Removable Cleaner

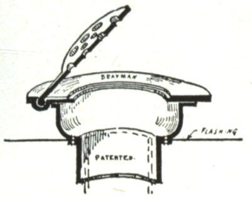


Fig. Y-2. Drain without Flushing Rim

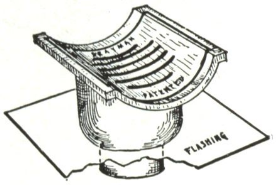


Fig. P-1. Gutter Drain for Continuous Concrete Gutter

BRAYMAN MISCELLANEOUS FLOOR DRAINS

	Drain Boxes							4-lb. Sheet Lead Flashing	
Fig. No.	Size, in.	Diam. of Outlets, in.		Water seal, in.	Gutter, in.		Water supply, in.	Size, in.	Below floor level, in.
		Bottom	Side		Width	Depth			
A	10 x10 x 9½	3,4	3,4	....	....	....	....	....	....
G	14 x14 x12	....	3,4,5	....	....	....	....	....	....
G-400	27½x14½x12	3,4	....	1½	....	....	....	....	....
L-15	6-in. diam. x 4½	....	2,3	....	....	....	....	....	....
45	18 x24 x30	....	2,3,4,6	....	....	....	....	36x36	4
P-1	10 x10 x 9¼	....	....	....	7¼	2¼	....	18x18	7
Q-1	8½x 9¾x 7½	....	3,4	....	5⅜	2½	....	18x18	5¼
Y-1	9½-in. diam. x 6½	2,2½,3	....	....	....	....	½	18x18	4
Y-1	11 -in. diam. x 6½	2,2½,3	....	....	....	....	¾	24x24	4
Y-2	9½-in. diam. x 4½	2,3	....	....	....	....	....	30x30	2⅛
Y-28	7 -in. diam. x 4	1¼	....	....	....	....	½	....	....

Specifications

Yard or Area Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or polished brass) Fig. A Brayman Watertight Drain Box, 10x10x9½ in. deep, with cover and interior removable strainer dam and brass locking device, provided with (side or bottom) outlet for (3 or 4)-in. pipe connection.

Manure Pit Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or polished brass) Fig. G Brayman Watertight Drain Box, 14x14x12 in. deep, with cover and all parts removable for cleaning; lower edge of outlet opening 5 in. from inside of bottom. Provided with side outlet for (3, 4, or 5)-in. pipe connection.

Liquid Manure Saver Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or polished brass) Fig. G-400 Brayman Watertight Drain Box, 27½x14½x12 in. deep, with covers, special partition for retention of liquids and with bells and inside strainers. Provided with 1½-in. water seal and bottom outlets for (3 or 4)-in. pipe connections.

Fire Tower or Stairwell Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron or brass) Fig. L-15 Brayman Watertight Drain, 6-in. diam. by 4½ in. deep, provided with a side outlet for (2 or 3)-in. (calked or screw) pipe connection.

Concrete Gutter Drain—***For Continuous Gutter***—The contractor shall provide and install, where shown on the drawings, a (cast iron or galvanized iron) Fig. P-1 Brayman Watertight Drain, 10x10x9¼ in. deep, with cover forming a gutter 7¼ in. wide by 2¼ in. deep, provided with an 18x18-in. 4-lb. sheet lead flashing 7-in. below top and a bottom outlet for (...... or ......)-in. pipe connection.

For End of Gutter—The contractor shall provide and install, where shown on the drawings, a (cast iron or galvanized iron) Fig. Q-1 Brayman Watertight Drain, 8½ in. long by 9¾ in. wide by 7½ in. deep, one end closed with cover forming gutter 5⅜ in. wide by 2½ in. deep, provided with an 18x18-in. 4-lb. sheet lead flashing 5¼ in. below top and a bottom outlet for (3 or 4)-in. pipe connection.

Powerhouse Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or all brass) Fig. 45 Brayman Watertight Drain, 18x24x30 in. deep, provided with a 36x36-in. 4-lb. sheet lead flashing 4 in. below top and a side outlet for (2, 3, 4 or 6)-in. pipe connection.

Sanitary Flushing Drain—The contractor shall provide and install, where shown on the drawings, a (polished brass or white metal) Fig. Y-1 Brayman Sanitary Flushing Drain ...... in. diam. by ...... in. deep, with ...... in. water supply, provided with (polished brass or nickelplated) cover and a ......x...... in. 4-lb. sheet lead flashing 4 in. below top and a bottom outlet for (2, 2½ or 3)-in. calked or screw pipe connection.

Sanitary Drain without Flushing Rim—The contractor shall provide and install, where shown on the drawings, a (polished brass or white metal) Fig. Y-2 Brayman Watertight Drain, 9½-in. diam. by 4½ in. deep without flushing rim, provided with (polished brass or nickelplated) cover and a 30x30-in. 4-lb. sheet lead flashing 2½ in. below top and a bottom outlet for (2 or 3)-in. calked or screw pipe connection.

Refrigerator Drip Receptor—The contractor shall provide and install, where shown on the drawings, an all-brass, polished inside and all exposed surfaces, Fig. Y-28 Brayman Refrigerator Drain, 7-in. diam. by 4 in. deep with a ½-in. water supply and 1¼-in. outlet; provided with a removable cleaner.

BRAYMAN WATERTIGHT FLOOR DRAINS—MISCELLANEOUS

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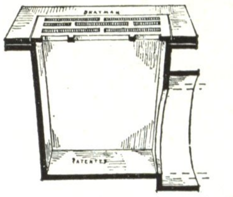

Fig. **Y-5.** Swimming Pool
Drain Outlet

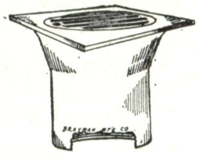

Fig. Y-6. Swimming Pool Scum
Gutter Drains—Barred
Flush Covers

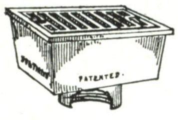

Fig. Y-11
(Flat Top)

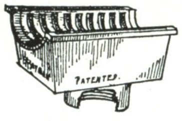

Fig. Y-12
(Curved Top)

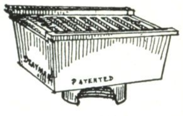

Fig. Y-13
(Depressed Top)

Swimming Pool Scum Gutter Drains

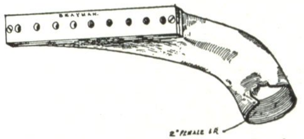

Fig. Y-161. Swimming Pool
Spray Outlet
Polished face, 9 in. long, 1½ in.
wide, 2-in. screw pipe

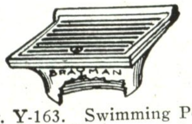

Fig. **Y**-163. Swimming Pool
Drain
Polished brass, 5⅜ in. long,
2 in. deep, 3-in. outlet

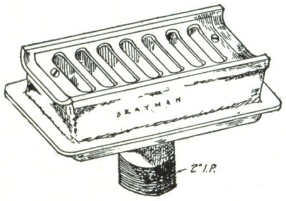

Fig. Y-30. Swimming Pool
Scum Gutter Drain,
Polished Brass
7¾ in. long, 3 in. wide, 2-in.
screw pipe (male or female)

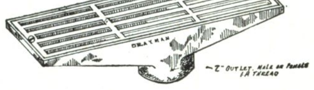

Fig. Y-31. Swimming Pool
Scum Gutter Drain,
Polished Brass
12 in. long, 2¾ in. wide, 2-in.
screw pipe (male or female)

BRAYMAN SWIMMING POOL DRAINS

DRAIN BOXES

Fig. No.	Size, in.	Diam. cf outlets, in.	Material	
			Body	Cover
Y- 5	13½x13½x9½	6	Galv. iron	Galv. iron
Y- 5	13½x13½x9½	6	Solid brass	Pol. brass
Y- 6	3⅝x 3⅝x3	2	Brass	Pol. brass
Y- 11	5½x 3½x3½	2	Brass	Pol. brass
Y- 12	5½x 3½x3½	2	Brass	Pol. brass
Y- 13	5½x 3½x3½	2	Brass	Pol. brass
Y- 30	7¾x 3	2	Brass	Pol. brass
Y- 31	12 x 2¾	2	Brass	Pol. brass
Y-161	9 x 1½	2	Brass	Pol. brass
Y-163	5⅜x 2	3	Brass	Pol. brass

Specifications for Swimming Pools

Drain Outlet—The contractor shall provide and install, where shown on the drawings, a (galvanized iron or solid brass) Fig. Y-5 Brayman Swimming Pool Drain Box, ...x......x...... in. deep, with floor flange, provided with a 6-in. side connection.

Provide removable slotted cover of (galvanized or polished brass).

Scum Gutter Drain Outlet—The contractor shall provide and install, where shown on the drawings, a (brass or polished brass) Fig. (Y-6, Y-11, Y-12, Y-13, Y-30, Y-031 or Y-163) Brayman Swimming Pool Scum Gutter Drain, ...x......x...... in. deep, with flange to receive adjoining finish, provided with ...... in. bottom screw pipe connection.

Provide removable slotted cover of polished brass.

Spray Outlet—The contractor shall provide and install, where shown on the drawings, a brass Fig. Y-161 Brayman Swimming Pool Spray Outlet with a polished brass perforated removable face plate 9x1½ in. wide, provided with a 2-in. screw pipe connection.

BRAYMAN SWIMMING POOL DRAINS

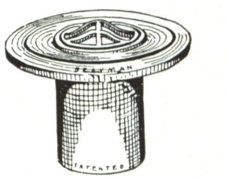

Fig. 46. Bridge Roadway
Drains (Patented)
12 in. diam., 11 in. deep;
flange, 2½ in. below top; 3
or 4-in. screw pipe

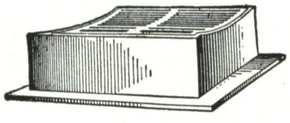

Fig. 86. Curved Roadway
Box Drain
Over bottom flange, 2 ft.
3¼ in. x 1 ft. 5½ in.; top,
1 ft. 9¼ in. x 11½ in. deep;
gratings, 1 ft. 7¾ in. x 9⅞
in.; depth, 8 in.

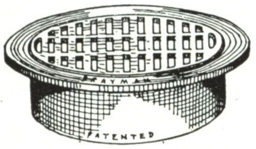

Fig. 88. Circular Roadway Box Drain
15 in. diam., 6 in. deep

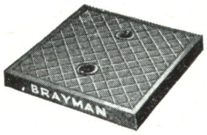

Fig. Z. Manhole
Frame and
Cover

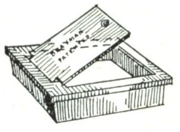

Fig. Z-129
Hinged Street
Washer
Non-rustable lock
and key

MANHOLE FRAMES AND COVERS

Fig. No.	Size, in.
Z-1	12x12x3—1 ring
Z-2	18x18x3—1 ring
Z-3	20x24x3—2 rings
Z-4	24x24x3—2 rings
Z-5	26x26x3—2 rings
Z-6	26x32x3—2 rings
Z-7	30x36x3—2 rings
Z-8	23x36x3—2 rings
Z-9	36x36x3—2 rings

HINGED STREET WASHERS

Fig. No.	Size, in.
Z-129	7x 7
Z-129	11x11
Z-129	11x15
Z-129	16x16

Specifications

Bridge Roadway Drain—The contractor shall provide and install, where shown on the drawings, a (cast iron or galvanized iron) Fig. 46 Brayman Extra Heavy Bridge Roadway Drain, 12-in. diam. by 11 in. deep with flange 2½ in. below top, provided with a (3 or 4)-in. screw pipe connection.

Note: Also made to conform to construction drawings furnished by architect or engineer.

Roadway Box Drains—The contractor shall provide and install, where shown on the drawings, a cast iron Fig. (86 or 88) Brayman (Curved or Circular) Roadway Drain Box of following dimensions: (over bottom flange, 2 ft. 3¼ in. x 1 ft. 5½ in.; top, 1 ft. 9¼ in. x 11½ in.; gratings, 1 ft. 7¾ in. x 9⅞ in. x 8 in. deep) or (15-in. diam. by 6 in. deep).

Note: Fig. 88—Circular drains are made in cast iron, galvanized iron or all brass, with covers of cast iron, galvanized iron or polished brass.

Manhole Frames and Covers—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or all brass) Fig. Z-(1, 2, 3, 4, 5, 6, 7, 8 or 9) Brayman Manhole Frame and Cover ......x......x ...... in. deep.

Hinged Street Washer Box—The contractor shall provide and install, where shown on the drawings, a (cast iron, galvanized iron or all brass polished) Brayman Hinged Street Washer Box ......x...... in. provided with non-rustable lock and key.

BRAYMAN ROADWAY DRAINS—MANHOLE COVERS

ESTABLISHED 1897

COMPOUND INJECTOR & SPECIALTY CO.

Manufacturers of Floor Drains and Grease Traps

LONG DISTANCE TELEPHONE
Austin 1861, 1862

419-421 North Laramie Avenue
CHICAGO, ILL.

CABLE ADDRESS
"Compound"

Products

Garage, Laundry, Stable, Residence and Public Building Floor Drains; Hygienic and "AcmE" Grease Traps, with and without Water Coolers.

Also manufacturers of "AcmE" Adjustable Floor Drains, with and without Automatic Backwater Valves; "PeerlesS" Garage Drains and "PeerlesS" Floor Drains, with and without Automatic Backwater Valves; Dehn's Automatic Water Softening and Scale Removing Devices, "PeerlesS" Water Softener, "KomposT" Bricks, "AcmE" Iron Closed-end Adjustable Closet Bends and Extensions; Iron Drum Traps, Clean-out Tees, End Ferrules, Refrigerator Drains; Blow-off Catch and Gravel Basins; and other accessories to make a complete, perfectly sanitary plumbing drainage system.

"ACME"
FLOOR DRAINS

"KOMPOST"
BRICKS

"DEEP SEAL"
FLOOR DRAINS

"PEERLESS"
WATER SOFTENER

All our TRADE-MARKS are Registered U. S. Patent Office

Sanitary Safeguards

Architects, sanitary engineers and contractors will safeguard the health and property of their clients by specifying this company's sanitary devices. As the trade-names "AcmE" and "PeerlesS" imply, they are unexcelled in design and operation. They are durable in make and in *every way reliable;* no other devices on the market may be substituted without *risk* for the "Dehn" Line as being "equally as good." The essential parts of these devices are patented.

DEHNSANIGARD
THE QUALITY GOODS
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This company manufactures the largest and most complete line of sanitary plumbing drainage specialties in the United States.

Garage Floor Drains

The following regulations governing drainage from garages and other establishments, where gasoline, oils or other inflammable materials are used or stored, have been adopted by a great many cities throughout the United States:

Garage floor drains (cast iron) shall be installed to avoid explosions, choked sewers, prevent accidents from formation of gases, and other complaints and nuisances common in automobile garages and other establishments.

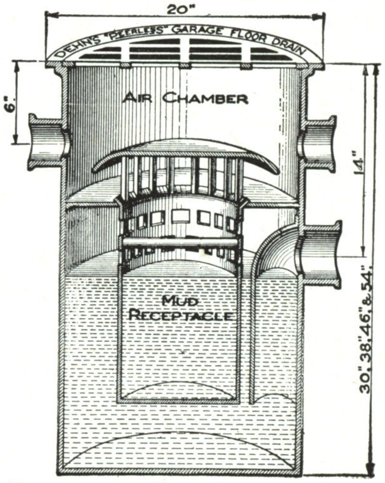


Fig. 62. Dehn's "PeerlesS" Garage Floor Drain (Patented)

Section 1: It shall be unlawful to use or attach any garage, dye, cleaning or other establishment with the public sewers where gasoline, oils or other inflammable materials are used or stored, unless a system of mud, gas and oil basin (cast iron) is installed. Garages shall be classified according to their construction and capacity of automobiles to be housed as follows: Class "A," Class "B," Class "C," Class "D," and Class "E."

Other establishments, Class "F," shall be classified according to the construction, size of the building, and number of persons employed on the premises.

Schedule of Capacity—The following schedule of capacities of "PeerlesS" Garage Floor Drains must be according to the following specifications here described and referred to as authority:

Every garage housing automobiles, hereafter constructed in the city of ———, shall install a system of drainage basin (cast iron) to be provided with a removable receptacle (cast iron) inside of the basin to receive the mud and other material washed into the basin. The basin must be provided with an air chamber in the receiver, with a separate compartment constructed in such a manner that the direct discharge of water and other material can not come in direct contact with the fluid in the basin. The inlet of the receptacle in the basin must be provided with a guard (cast iron), having a solid top of sufficient size to entirely conceal the opening of the receptacle when discharging water or other material into the basin. The air chamber compartment must be provided with one 2-in. and one 4-in. vent hub connection. Top of basin to be provided with bar grate (cast iron).

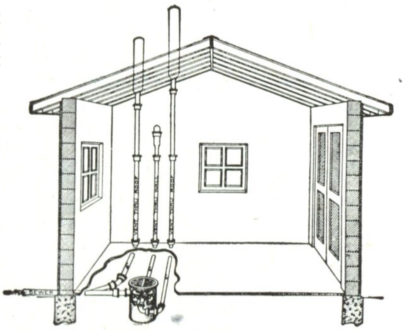


Fig. 62. (Patented) Showing Installation of Dehn's "PeerlesS" Garage Drainage System

One 2-in. and one 4-in. vent stack must be connected with the air chamber. The 2-in. vent stack must be extended outside of the building at least 8 ft. from the lot level, and the 4-in. vent stack must be extended through the roof.

Class "A"—Where not more than one automobile is housed, one 12-in. diameter of top and 14 in. deep "PeerlesS" Garage Floor Drain shall be installed.

Class "B"—Where more than one and less than five automobiles are housed, one 15 in. diameter of top and 22 in. deep "PeerlesS" Garage Floor Drain shall be installed.

Class "C"—Where from five to ten automobiles are housed, one 20 in. diameter of top and 30 in. deep "PeerlesS" Garage Floor Drain shall be installed.

Class "D"—Where from ten to twenty-five automobiles are housed, one 20 in. diameter of top and not less than 38 in. deep "PeerlesS" Garage Floor Drain shall be installed.

Class "E"—Where from twenty-five to fifty automobiles are housed, two 20 in. diameter of top and not less than 38 in. deep "PeerlesS" Garage Floor Drains shall be installed.

Class "F"—Other establishments shall be classified by the Fire Prevention Board according to the construction and size of the building and number of persons employed on the premises,

Continued on next page

and such drainage shall be installed as may be approved by one in authority.

FIG. 62. DIMENSIONS AND PRICES, GARAGE FLOOR DRAINS

Diameter of top, in.	20	20	20	20
Waste outlet, in.	4	4	4	4
Depth over all, in.	30	38	46	54
Two vent hub connections	One 2 in., one 4 in.			
Approximate weight, lbs.	400	500	600	700
Price, iron top and strainer, each	$75.00	95.00	110.00	125.00

Dehn's "AcmE" Grease Traps

Designed to keep the water in the basin at a low temperature. By connecting the cold water supply pipe leading to the kitchen sink, range boiler and other fixtures with the water jacket in the basin, the water in the basin will be continually chilled to a very low temperature.

As soon as the greasy water enters the basin, the grease congeals and floats to the top of the water. This grease can be very easily removed by any one. The handhole is provided with a malleable iron saddle and heavy thumbscrew.

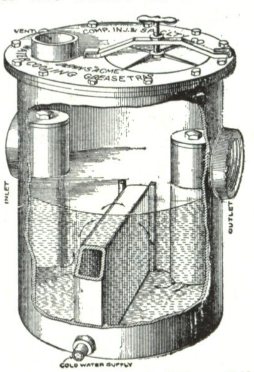


Fig. 113. Dehn's "AcmE" Double Trapped Water Cooling Grease Trap
(Patented)

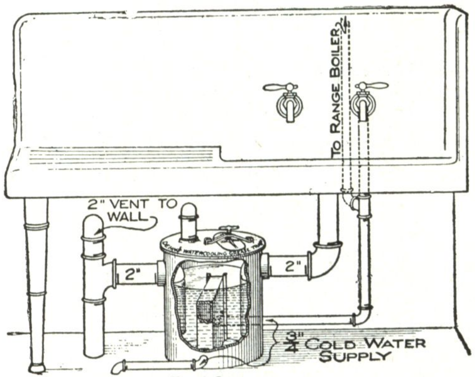


FIG. 113, PATENTED

Showing Dehn's "AcmE" Grease Trap Properly Installed in Kitchen

Schedule of Capacity—The following schedule of capacity applies to Dehn's "ACMEE" Water Cooling Grease Traps when installed in residences, restaurants, hotels, boarding houses, large and public institutions.

No. 15-1—12 in. diameter of top, 15 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 25 people with 3 meals each day.

No. 18-1—12 in. diameter of top, 18 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 35 people with 3 meals each day.

No. 24-1—20 in. diameter of top, 24 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 150 people with 3 meals each day.

No. 30-1—20 in. diameter of top, 30 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 100 people with 3 meals each day.

No. 36-1—20 in. diameter of top, 36 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 150 people with 3 meals each day.

No. 24-2—24 in. diameter of top, 24 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 100 people with 3 meals each day.

No. 30-2—24 in. diameter of top, 30 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 150 people with 3 meals each day.

No. 36-2—24 in. diameter at top, 36 in. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 200 people with 3 meals each day.

Suggestion for Grease Trap Installation—For large institutions, it is suggested that a grease trap be installed for each individual sink, dishwasher, etc. For such installations, the minimum capacity of grease trap should be installed.

FIG. 113. DIMENSIONS AND PRICES, GREASE TRAPS

No.	15–1	18–1	24–1	30–1	36–1	24–2	30–2	36–2
Diameter of top, in.	12	12	20	20	20	24	24	24
Depth over all, in.	15	18	24	30	36	24	30	36
Waste inlet connection, in.	2	2	4	4	4	4	4	4
Waste outlet connection, in.	2	2	4	4	4	4	4	4
Vent hub connection, in.	1½	1½	2	2	2	2	2	2
Water supply connection, in.	3–4	3–4	1	1	1	1	1	1
Price, painted	$35.00	40.00	65.00	75.00	90.00	80.00	95.00	110.00

Furnished enameled inside. Enameled inside and outside, prices on application.

When Dehn's "ACMEE" Double Trapped Water Cooling Grease Traps are installed and properly connected—i. e., the main cold water supply pipe connected with the inlet of the water cooler in the grease trap and the outlet of the water cooler with the cold water supply to range boiler or storage tank, and also with all the cold water faucets on the premises, including the cold water supply pipes to the closet tanks—the installation will permit the continuous circulation of cold water through the water cooler in the grease trap; hence, the grease accumulating in the grease trap will be congealed where it can easily be removed by any one.

Not a particle of grease can find its way out of the basin through the outlet into the sewer when Dehn's "ACMEE" Double Trapped Water Cooling Grease Traps are installed and connected according to these directions. (See illustration.)

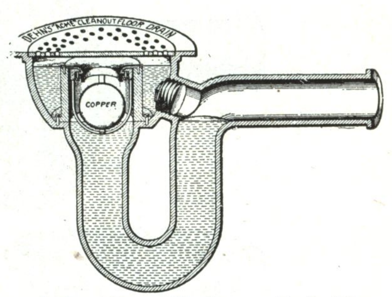
When the grease traps are installed in restaurants, hotels, large and public institutions, the grease should be removed from the grease trap at least 3 times each week.

From this it will be readily understood that the results to be obtained from the grease traps depend largely upon the plumbing contractor who has the supervision of the installation of the grease traps, and the owner whose duty it is to appoint or elect some one to give the grease traps the required attention.

Dehn's "AcmE" Deep Seal Floor Drains

These drains, with continuous pipe traps and automatic backwater valves, are also provided with large brass taper-threaded clean-out plugs and seamless metal ball floats.

These floats prevent flooding of cellars; can not get down into trap outlets and become air-bound, and can be easily removed with cage by unscrewing the four brass screws.



Dehn's "AcmE" Deep Seal Floor Drain
Fig. 9 Patented

DIMENSIONS AND PRICES, DEEP SEAL FLOOR DRAINS WITH AUTOMATIC BACKWATER VALVE AND CLEANOUT, FIG. 9

Size of outlet, in.	Depth of water seal, in.	Diameter of top, in.	Depth over all, in.	Length over all, in.	Receiver above outlet of trap, in.	Average weight, lb.	Price, each		
							A	B	C
							Iron top and strainer	Brass top and strainer	N. P. brass top and strainer
2	4	9	11	18	2	30	$ 7.50	$13.50	$15.50
3	4	10	13	20	2	40	10.00	17.00	19.00
4	4	12	15	22	2	65	14.00	22.00	25.00

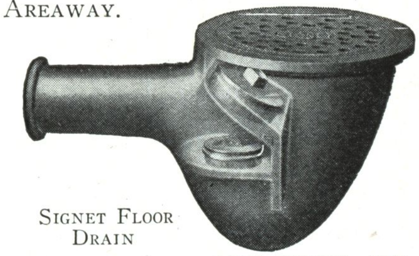
CRAMPTON-FARLEY BRASS CO.

Manufacturers of Plumbers' Specialties

KANSAS CITY, MO.

Products

Floor Drains: the Signet, San-Seal-O, Noxall and K. C. Areaway.



Signet Floor Drain

Also Manufacturers of

Valves for Oil Burners: ¼-in. Angle Union Needle and I. P. Signet Safety; Star Hopper Valves.

Signet Drains

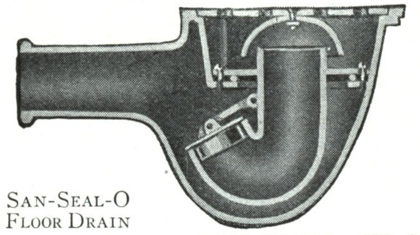
Signet floor drains have heavy cast iron bodies with clean-out opening affording easy access to valve and sewer. They are equipped with cast brass backwater valves, which work automatically by gravity. The valves being submerged, work easily, the grease, lint, etc., come to the surface, insuring a clean seat and a positive seal.

The drains are a positive insurance against backwater or sewer gas, wet or dry.

LIST PRICES AND SPECIFICATIONS, SIGNET FLOOR DRAINS

No.	Approximate weight, lb.	Diam. iron top strainer, in.	Size and style of outlet	Size and style of back inlet	Depth in clear, in.	Distance from top center to end of outlet, in.	Top diameter, in.	List price with iron top	List price with polished brass top
2	20	6¾	2-in. soil pipe	....	7¾	9½	8	$ 6.00	$ 8.50
3	50	11⅜	3-in. soil pipe	....	12	14¾	13	13.00	19.00
4	65	13	4-in. soil pipe	....	14	16¾	14¾	18.00	28.00
D-2	19	6¾	2-in. iron pipe	....	7¾	7⅝	8	6.50	9.00
2-R	22	6¾	2-in. soil pipe	1½-in. iron pipe	7¾	9½	8	7.00	9.50
3-H	55	11⅜	3-in. soil pipe	2-in. soil pipe	12	14¾	13	14.00	20.00
4-H	70	13	4-in. soil pipe	2-in. soil pipe	14	16¾	14¾	19.00	29.00

For extra heavy iron strainers, add to list as follows: 2 in., $1.00; 3 in., $2.00; 4 in., $2.50.
For nickelplated brass tops add to list as follows: 2 in., $0.50; 3 in., $0.70; 4 in., $0.80.



San-Seal-O Floor Drain

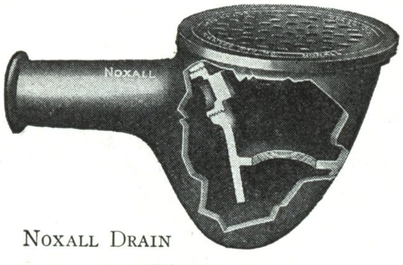
San-Seal-O Drains

Drains have heavy cast iron parts, and are made with brass backwater valves and also (plain) without valves. Unless definitely specified, we ship drains with valves. Body of drain is made in one piece with flange on inside to support the J-shaped inner, which is held in place by 4 brass screws. A rubber cord gasket forms the joint. Access to valve and sewer is obtained by removing the J-shaped inner.

LIST PRICES AND SPECIFICATIONS, SAN-SEAL-O FLOOR DRAIN

No.	Backwater trap drain		Approx. weight, lb.	Size and style of outlet	Depth in clear, in.	Distance from top center to outlet, in.	Style and diameter of top	Plain drains	
	Iron top	Polished brass top						Iron top	Polished brass top
0	$ 6.25	$ 8.75	22	1½-in. iron pipe	8½	8	Round, 8 in.	$ 4.00	$ 6.50
00	6.50	9.00	24	2-in. iron pipe	8½	8	Round, 8 in.	4.25	6.75
1	6.00	8.50	24	2-in. soil pipe	8½	9½	Round, 8 in.	3.75	6.25
2	8.00	13.00	35	2-in. soil pipe	9	13	Round, 11 in.	5.00	10.00
3	13.00	19.00	60	3-in. soil pipe	12	13½	Round. 13 in.	9.00	15.00
4	18.00	28.00	85	4-in. soil pipe	14½	16½	Round, 15 in.	13.00	23.50

For extra heavy iron strainers, add to list as follows: Nos. 0, 00 and 1, $1.00; No. 2, $1.50; No. 3, $2.00; No. 4, $2.50.
For nickelplated brass tops, add to list as follows: Nos. 0, 00 and 1, $0.50; No. 2, $0.60; No. 3, $0.70; No. 4, $0.80.



Noxall Drain

Noxall Drains

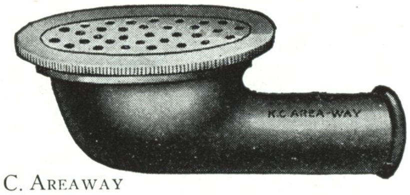
Noxall floor drains are heavy cast iron with 2-in. brass clean-out plug, very compact, and have large water seal and high outlet.

LIST PRICES AND SPECIFICATIONS, NOXALL DRAINS

No.	For soil pipe, in.	Depth, in.	Center of top to outlet, in.	List price, each	
				With iron top	With polished brass top
*D-2	2	8	8	$2.75	$ 5.50
†2-A	2	8	9½	2.25	5.00
2	2	8	9½	2.25	5.00
3	3	11	13¼	6.00	12.00
4	4	12	16	8.00	16.00

*Iron pipe.
†For No. 2 tapped for 2-in. test plug, specify No. 2-A.

For extra heavy iron strainer, add to list as follows: 2 in., $1.00; 3 in., $1.50 4 in., $2.00. For nickelplated brass tops, add to list as follows: 2 in., $0.50; 3 in., $0.70; 4 in., $0.80.



K. C. Areaway

Areaway Drains

Areaway drains are designed to take care of a demand for a drain without a water seal to be used in areaways, garages and other places where water would normally freeze. The parts are of heavy cast iron.

LIST PRICES AND SPECIFICATIONS, K. C. AREAWAY DRAINS

No.	Approx. weight, lb.	Size and style of outlet	Depth over all, in.	Drop from top of strainer to top of outlet, in.	Diam. of top in.	Diam. of strainer, in.	Length, over all, in.	List price, each	
								With iron top	With polished brass top
2	12	2-in. soil pipe	4	1½	8	6¾	14½	$1.50	$4.25
3	20	3-in. soil pipe	5	1¾	11	9¼	18	3.75	9.00
4	35	4-in. soil pipe	7	3	13	11⅜	21	6.00	13.00

For nickelplated brass tops, add to list as follows: No. 2, $0.50; No. 3, $0.60; No. 4, $0.70.

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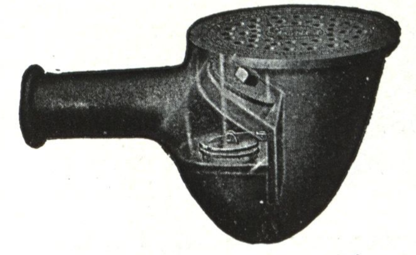
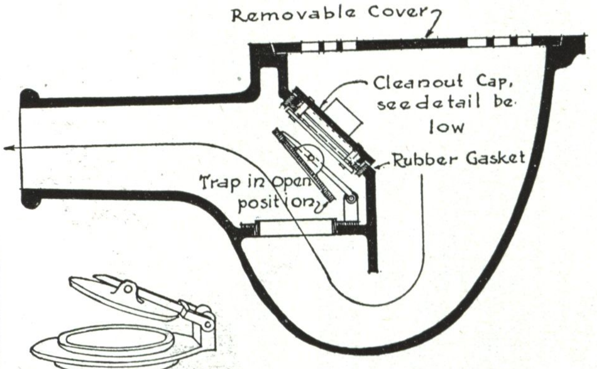
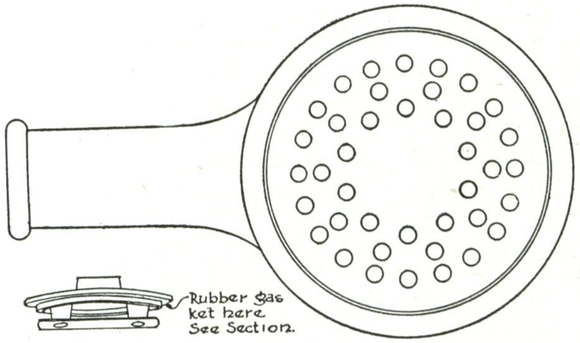


SIGNET FLOOR DRAIN


Removable Cover
Cleanout Cap, see detail below
Rubber Gasket
Trap in Open position

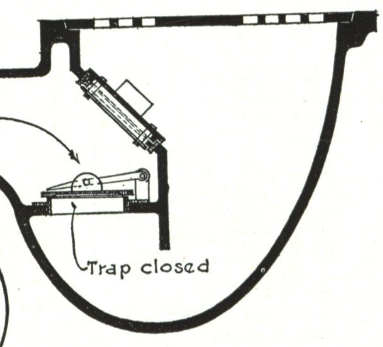
DETAIL OF TRAP

SECTION SHOWING TRAP OPEN WITH FLOW OF WATER TO OUTLET


Rubber gasket here See Section.

DETAIL OF CLEAN-OUT CAP

PLAN

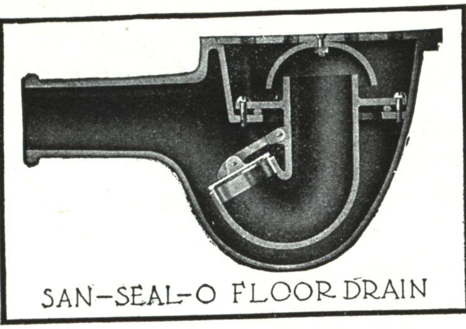

Trap closed

TRADE MARK SIGNET REG. U.S. PAT. OFF.

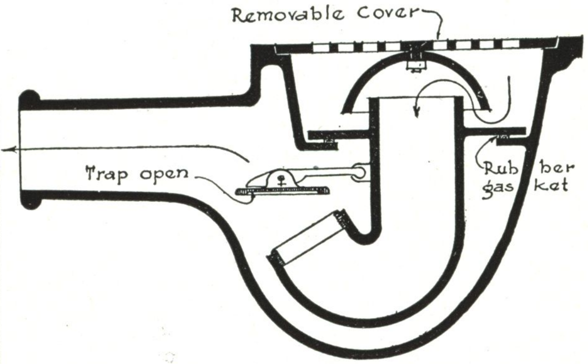
TRADE MARK

SECTION SHOWING THE TRAP CLOSED - PROTECTS AGAINST FOUL AIR AND SEWAGE

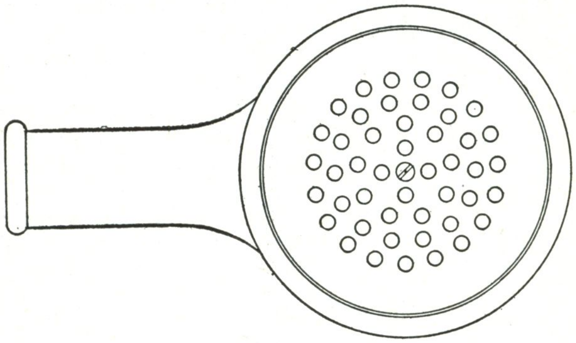
SIGNET FLOOR DRAIN



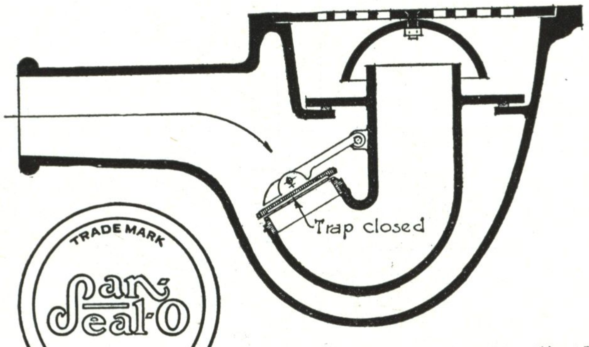
SAN-SEAL-O FLOOR DRAIN


Removable Cover
Trap open
Rubber gasket

SECTION SHOWING TRAP OPEN, WITH FLOW OF WATER TO OUTLET



PLAN


Trap closed

TRADE MARK San-Seal-O REG. U.S. PAT. OFF.

TRADE MARK

SECTION SHOWING THE TRAP CLOSED - PROTECTS AGAINST FOUL AIR AND SEWAGE

SAN-SEAL-O B.W.T FLOOR DRAIN

JOHN J. DONOVAN

Manufacturer of Plumbing Specialties

22 Church Street
BOSTON 11, MASS.

TELEPHONE
BEACH 7865

CABLE ADDRESS
"DONOVAN BOSTON"

SOLD BY ALL DEALERS IN PLUMBING MATERIAL

Products

"ECLIPSE" FLOOR DRAIN TRAP, SAND ARRESTER and BACKWATER VALVE; DONOVAN GREE-STOP (Grease Trap); SELF-REGULATING BUBBLE DRINKING FOUNTAIN and RECEPTOR; CANISTER BATH TRAP; WATER SEALED SELF-TESTING WATER CLOSET FLOOR FLANGE; UNIVERSAL WALL TYPE WATER CLOSET for schools, public comfort stations, etc.

Also Non-siphon Trap and Cooling Tank.

Experience

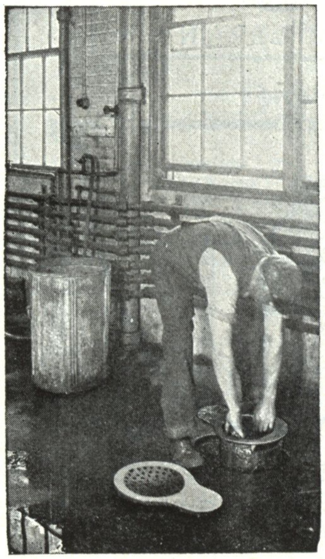
Forty years' experience as a practical plumber, fifteen of which as inspector for the city of Boston, warrants the assumption that I am conversant with the best practice in plumbing construction. To maintain such a reputation, I present only products of lasting quality, suitable for the several purposes for which they are designed. Comforming to the most exacting code, their cost is ultimately cheaper than many made for the same purpose but constructed to meet the lowest competitive price without regard to quality or efficiency.

"Eclipse" Floor Drain Trap, Sand Chamber, with or without Backwater Valve

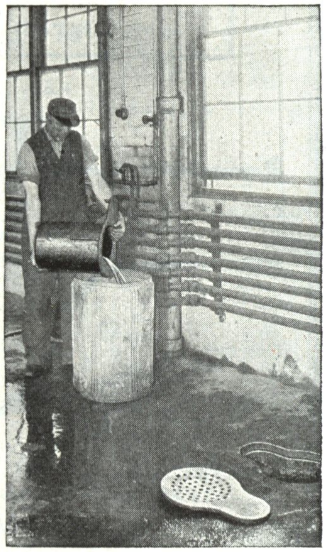
These features all embodied in one casting. Only one opening required in the floor. The "Eclipse" floor drain trap relieves surface quickly and prevents sand or sediment from entering and clogging drainage system. It retains all heavy matter in a removable chamber, which can be easily emptied.

A valve operated by inner chamber is always furnished on E20 and E25 traps. This compels immediate return of inner chamber when it has been removed for cleaning.

Traps furnished in plain cast iron. Strainers regularly furnished in iron, or, when specified, in polished or nickelplated brass.



REMOVING "ECLIPSE" FLOOR DRAIN TO EMPTY



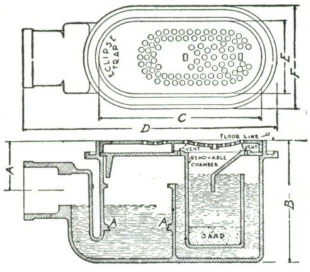
EMPTYING REFUSE FROM ECLIPSE FLOOR DRAIN

DATA, E10, E15 AND E20 FLOOR DRAIN TRAPS

Plate	Dimensions, in.						
	Outlet	A	B	C	D	E	F
E10	2	3½	8¼	10½	13	5	7¼
E15	3	4	9¼	10½	13	5	7¼
E20	3 Special	4¼	10	12	14½	6⅛	8⅝

How to Specify—Floor drain traps to be "Eclipse" Plate No. E (insert number) with iron [polished brass] [nickel-plated brass] strainer and with [without] backward valve, as manufactured by JOHN J. DONOVAN, Plumbing Specialties, Boston, 11, Mass.

Where Installed—The Eliot Garage, Boston, Mass., largest in New England, 10 4-in. "Eclipse" traps for wash stands and 32 3-in. specials for floor drains under cars. Twelve 4-in. traps in the Eager Garage and 32 3-in. traps in the U. S. Government Garage. Also used in many power plants in the United States.



PLATES E10, E15 AND E20 "ECLIPSE" FLOOR DRAIN TRAPS (PATENTED)

PLATE E10, 2-IN. OUTLET—For draining surface of one-car garage, toilet, shower or mercantile building floors. Weight, 50 lb.

PLATE E15, 3-IN. OUTLET—Practically same as E10 except that it has 3-in. outlet to conform to codes requiring this size. Weight, 55 lb.

PLATE E20, SPECIAL, 3-IN. OUTLET—Intended for garages where not more than 5 cars are housed and washed. Weight, 80 lb.

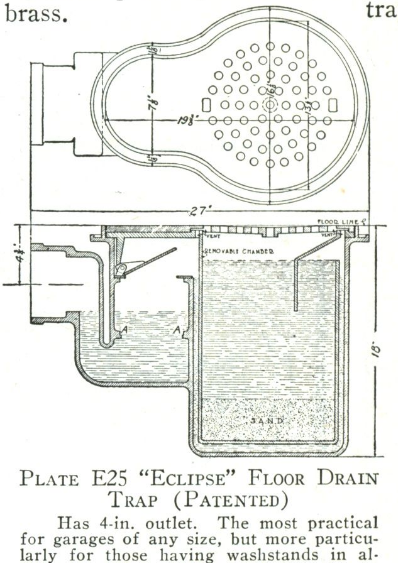


PLATE E25 "ECLIPSE" FLOOR DRAIN TRAP (PATENTED)

Has 4-in. outlet. The most practical for garages of any size, but more particularly for those having washstands in almost continuous use; also for boiler room, dairy and laundry floors or wherever much sand or sediment is anticipated. Weight, 225 lb.

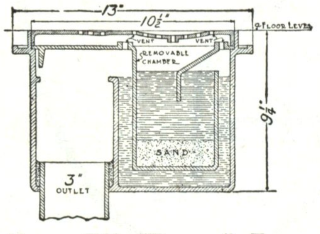
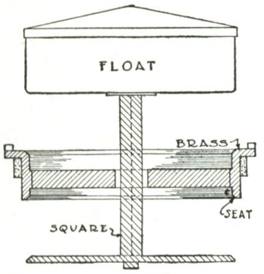


PLATE E30 "ECLIPSE" FLOOR DRAIN TRAP (PATENTED)

Has 3-in. outlet. Same as E15 except that trap to exclude sewer gas is omitted. If trap is required, it may be placed on outlet below drain. Drain is intended for draining floors into sump or open waterway where trap is not required. Its main purpose is to prevent sand or sediment from clogging drain or entering sump chamber and injuring pump or ejector. Weight, 50 lb.



BACKWATER VALVE FOR "ECLIPSE" TRAPS (PATENTED)

One-third actual size. Can be furnished in all traps except E30, when specified. May be placed in position at A-A after trap is installed if found necessary. Accessible by removing strainer and inner chamber

Continued on next page

Donovan Gree-stop (Grease Trap)

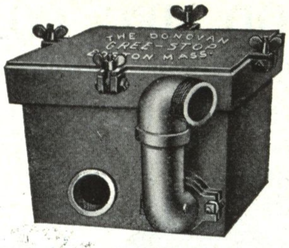


Plate G10 Donovan Gree-stop

Is 12x12x10 in. deep, with water sealed cover which prevents odor of grease in a building. More efficient than water cooled trap, as baffle plates cause grease to rise to top of trap. Also prevents plaster from dental laboratories, metal from jewelers' sinks, or optical sediment passing into drain.

Two opposite inlets and outlet, 2-in. iron pipe size. Furnished in cast iron, painted, or brass.

Donovan Drinking Fountain Receptor

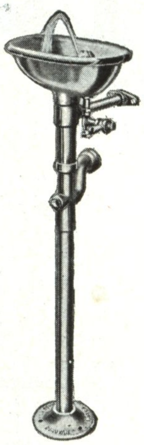


Plate F230 Donovan Drinking Fountain Receptor

Iron enameled inside. Size, 12x8x4 in. with 1½-in. iron pipe waste connection as shown. Furnished only with B140 bubbler, to prevent splashing on floor.

Plate F200—Receptor, bubbler and supply valve only.

Plate F210—As shown above, less support and flange at floor.

Plate F220—Receptor complete with waste to floor and supply to wall or floor.

Donovan Self-regulating Side Stream Bubbler (Patented)

B140 maintains fixed stream under varying pressures for high buildings where draft on supply from lower floors is liable to reduce pressure. Maintains same drinking stream with pressure reduced from 100 to 5 lb.

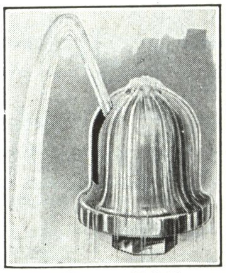


Plate B140
Donovan Self-regulating Side Stream Bubbler (Patented)

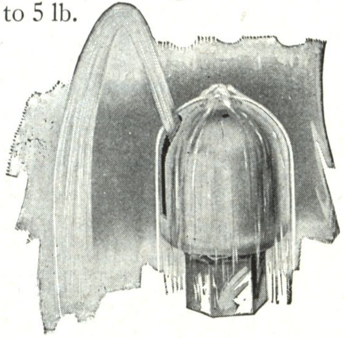


Plate B135
Donovan Side Stream Bubbler (Patented)

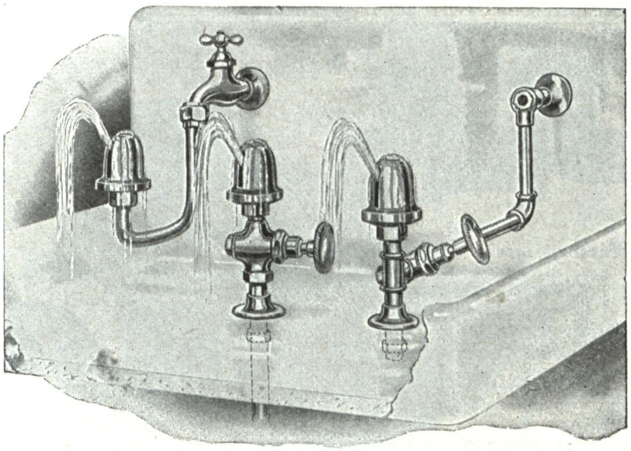


Plate B143 Plate B142 Plate B145
Three Methods of Installing Bubbler in Iron, Soapstone, Slate or Porcelain Sink

B135 bubble fountain head for use where there is only slight fluctuation in pressure. Used by school commission, city of Boston, Mass., and many cities and towns in the United States. Bubblers and connections regularly furnished in nickelplated brass. White metal when specified.

Donovan Improved Canister Heavy Cast Brass Bath Trap

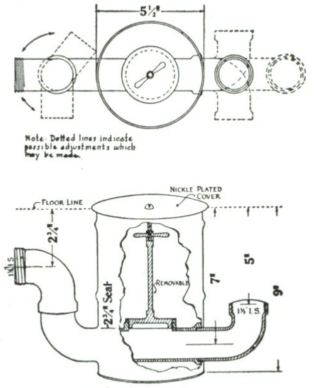


Plate CB5 Donovan Canister Bath Trap

A trap having adjustable features which appeal to the plumber when connecting high or low bathtubs. Canister body allows easy access to trap for cleaning and protects ceiling below. Canister can be shortened with snips if too high. No contraction in water way, which is 1½ in. throughout. All threads iron size. Applicable to all forms of construction and most desirable in frame buildings.

Donovan Water Sealed, Self-testing Water Closet Flange

Donovan Water Sealed Self-testing Water Closet Flange (Patented)

This flange provides a perfect connection between water closet, slop sink or any earthenware fixture, to prevent sewer air entering building. Any leakage of air is detected by water passing onto the floor and must be given immediate attention.

Manufactured by Trenton Potteries Co. and shown in their Catalogue R, page 125.

Universal Wall Water Closet

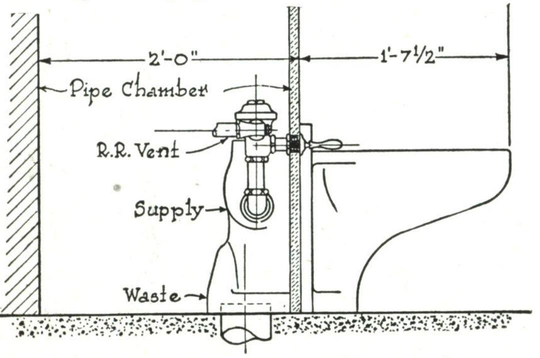
For schools, public comfort stations, etc., or wherever a pipe chamber at least 2 ft. wide can be provided. A closet with large waterway and raised vent in rear.

No dependence whatever on wall for support. Operated with tank or flush valve.

An otherwise inaccessible pipe chamber may be made accessible and, together with closet, not occupy any more space than when regular raised rear vent closet is used.

Saving is also made in width of marble partitions, as closet projects only 20 in. from wall.

Manufactured by Trenton Potteries Co. as shown in their Catalogue R, page 151.



Universal Wall Water Closet (Patented)

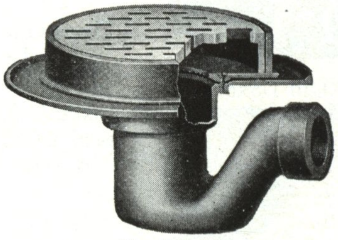
THE GREENWOOD MFG. CO.

Manufacturers of Cast Iron Plumbing Specialties

5140 Hamilton Avenue, DETROIT, MICH.

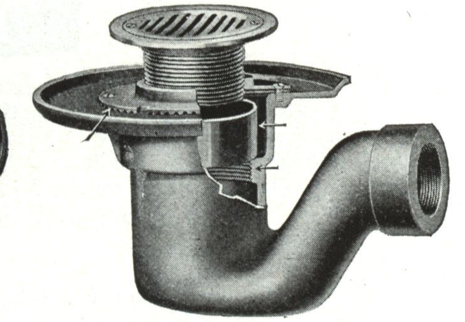
Products

Cast Iron Plumbing Specialties, including Seepage Factory, Urinal and Shower Drains; Seal Tight Closet Connections; Back Pressure Floor Drains; Roof Sumps; Centrifugal Bath Traps for Built-in Tubs; Floor Line Cleanouts.



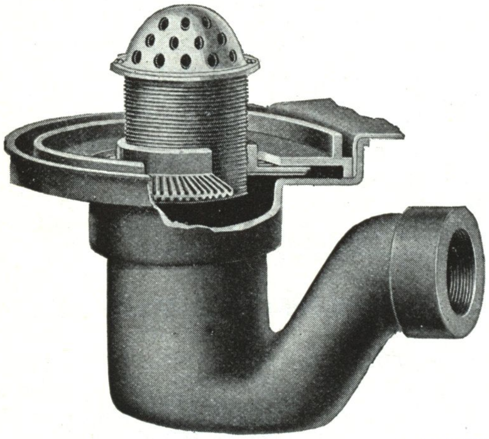
No. 126-131

Floor Drain



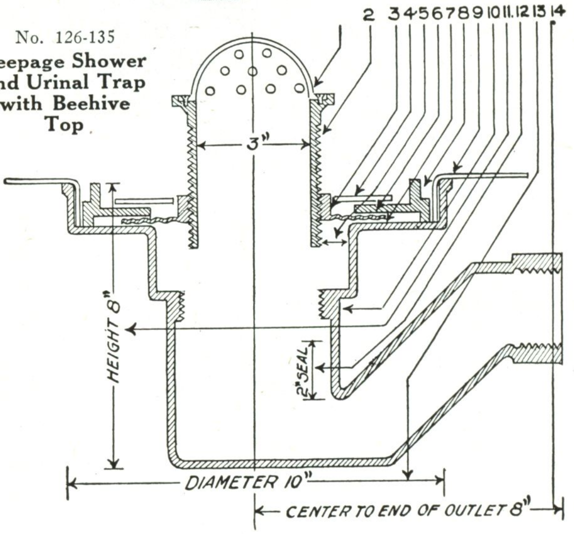
No. 126-130

Shower Trap or Floor Drain



No. 126-135

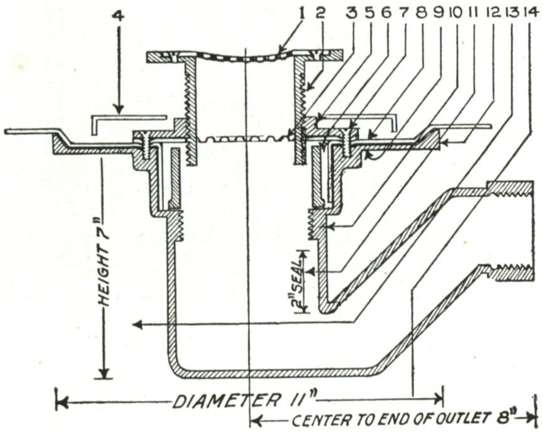
Seepage Shower and Urinal Trap with Beehive Top



No. 126-135

Seepage Shower and Urinal Trap

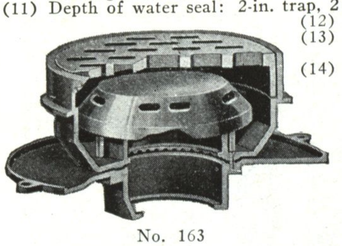
(1) Brass nickelplated beehive or flat strainer secured to tail piece with removable brass screws.
(2) Extra long brass tail piece, length 4½ in., threaded 3-in. standard iron pipe size.
(3) Seepage plate. Red brass, diameter 6 in. with grooves top and bottom of plate allowing seepage to pass over and under plate and drain back into waste.
(4) Loose pulp guard placed over seepage holes to prevent them from being filled with cement.
(5) Shows space into which the urinal tail piece may be adjusted either vertically or horizontally.
(6) Adjustment plate securely holds brass seepage plate in place, but allows plate to be moved in any horizontal direction for centering waste connection.
(7) Space under adjustment plate permits shifting of seepage plate for centering.
(8) Recess formed by adjustment plate for securing lead pan and adjustment plate to trap with calked joint.
(9) Lead pan permanently secured to urinal trap with a calked joint.
(10) Threads in upper portion of trap for securing an iron plug for rough test. Plug also prevents dirt entering trap and waste line during building construction.
(11) Height: 2-in. trap, 8 in.; 3-in. trap, 11½ in.
(12) Depth of seal: 2-in. trap, 2 in.; 3-in. trap, 3 in.
(13) Outside diameter of flange, 10 in.
(14) Center to end of outlet, 8 in.



No. 126-130

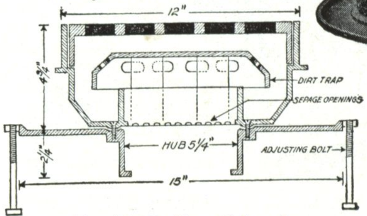
Shower Trap or Floor Drain

(1) Brass nickelplated strainer. Diameter, 5 in. Secured to brass extension tail piece with removable brass screws.
(2) Brass tail piece 2½ in. long, threaded 3-in. iron pipe size.
(3) Grooves on underside of seepage plate through which seepage drains back into trap.
(4) Loose pulp guard placed over seepage holes to prevent them from being filled with cement.
(5) Seepage plate tapped 3 in. Connects tailpiece to trap body with a screwed joint. Seepage plate placed over lead pan and connected to trap body by 4 brass bolts.
(6) Recess formed in upper portion of trap into which lead pan is secured to trap body by a calked joint.
(7) Brass bolts that secure seepage plate to trap.
(8) Lead pan permanently secured to trap by a calked joint.
(9) Cast anchor which securely holds trap body into cement and forms a basin for seepage waste.
(10) Threads in upper portion of trap for securing iron plug for rough test. Plug also prevents dirt entering trap and waste line during building construction.
(11) Depth of water seal: 2-in. trap, 2 in.; 3-in. trap, 3 in.
(12) Ring forming basin of trap anchor.
(13) Height of iron body: 2 in. trap, 7 in.; 3-in. trap, 10½ in.
(14) Outside diameter of flange, 11 in.

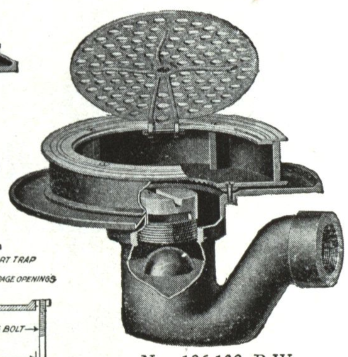


No. 163

Factory Drain (Iron Top)



No. 163 Roughing-in



No. 126-132 B.W.

Backwater Seepage Shower Trap

Continued on next page

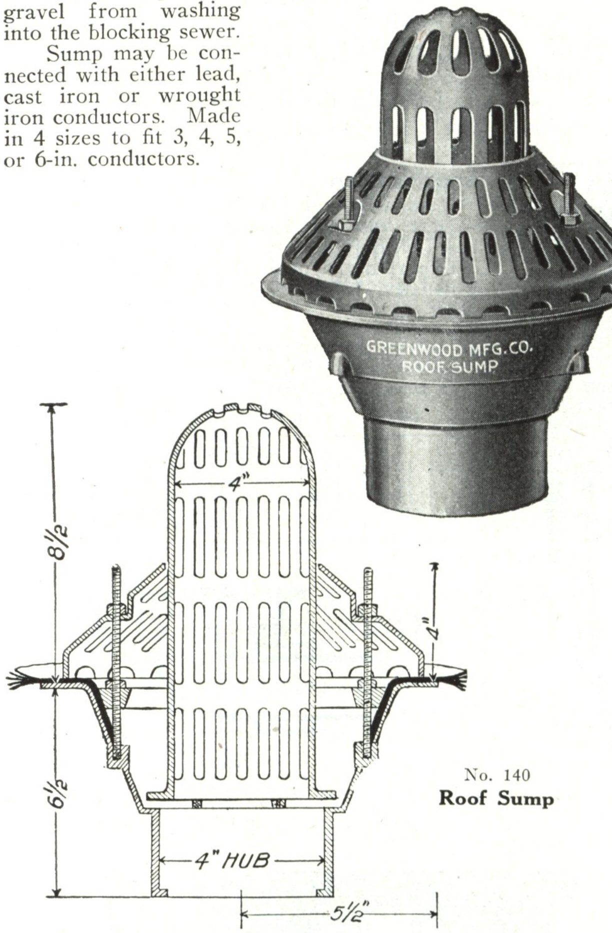
Roof Sump No. 140

An efficient non-freezing rain conductor roof connection made for all classes of buildings and various types of roof construction.

A permanent connection is easily made between roof and rain water leaders with this cast iron sump. Where felt roofing is used, no lead or copper flashings are necessary. The roofing felts are joined to drain by a V-shaped ring drawn to place with brass bolts and permanently holding the felts tightly against the inside of sump receptacle. This construction permits a continuous roof surface, secured direct to sump inlet.

Outer strainer or guard has inlet openings of more than twice the outlet area, an important feature in roof sump construction. It also guards against foreign substances entering the drain and prevents gravel from washing into the blocking sewer.

Sump may be connected with either lead, cast iron or wrought iron conductors. Made in 4 sizes to fit 3, 4, 5, or 6-in. conductors.

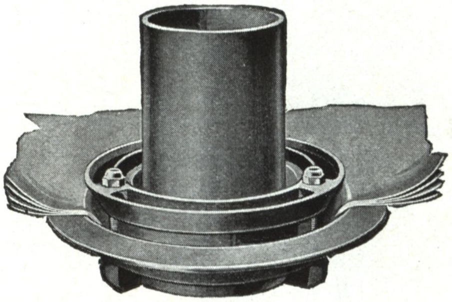

GREENWOOD MFG. CO.
ROOF SUMP
8½
4"
4"
6½
4" HUB
5½"

No. 140
Roof Sump

Roof Flange No. 145

A permanent cast iron connection between soil pipe stack and roof. Roofing is joined to flange by a V-shaped ring drawn to place with brass bolts which secures the felts permanently to roof flange. Flange is secured to stack with a calked joint, making this connection absolutely watertight on flat roofs.

Sizes, 3, 4, 5 and 6 in.

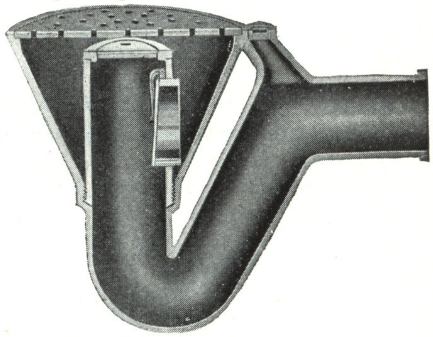


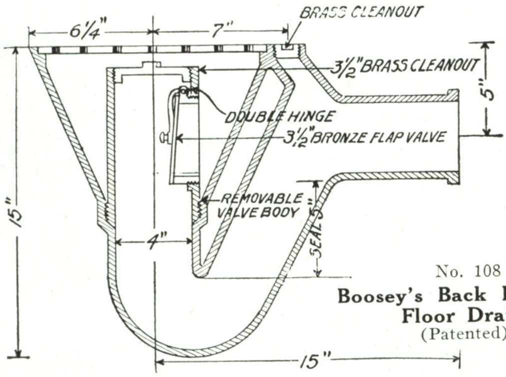
No. 145
Roof Flange

Boosey's Back Pressure Floor Drains

These single or double valve floor drains are positive in action and always accessible for cleaning or inspection. Especially suitable for cooling and storage rooms in public institutions, hotels, stores and packing houses.

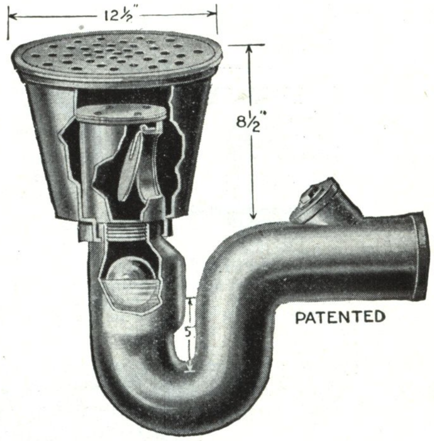
By using either of these floor drains equipped with visible bronze metal valve placed in the inlet side of trap and above the water seal, the trap seal is protected from back pressure and the evaporation of the seal is reduced to a minimum.

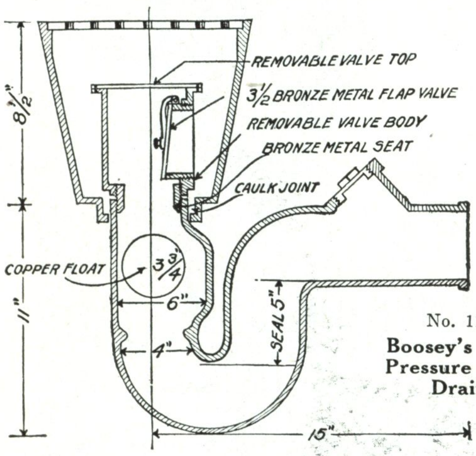



BRASS CLEANOUT
6¼"
7"
3½" BRASS CLEANOUT
5"
DOUBLE HINGE
3½" BRONZE FLAP VALVE
REMOVABLE VALVE BODY
15"
4"
SEAL 5"
15"

No. 108
Boosey's Back Pressure Floor Drain
(Patented)

If the trap loses its seal from evaporation, the fact that the check valve is set in a closed position prevents the free flow of sewer air into the building, making these traps doubly sealed against damage to property.


12½"
8½"
5"
PATENTED


12½"
8½"
REMOVABLE VALVE TOP
3½ BRONZE METAL FLAP VALVE
REMOVABLE VALVE BODY
BRONZE METAL SEAT
CAULK JOINT
COPPER FLOAT
3¾
6"
11"
4"
SEAL 5"
15"

No. 111
Boosey's Back Pressure Floor Drain

Catalogue

The Greenwood Mfg. Co.'s new 50-page catalogue will be sent free to architects on request.

THE H. W. COVERT COMPANY

Manufacturers of Drains
137 East 46th Street
NEW YORK, N. Y.

ANTI-CLOG FLOOR DRAINS
TRADE-MARK

Products

Anti-clog Drains for areas, garages, dairies, stables, etc.

For Fireplace Dampers, see pages 688-689.

Anti-clog Floor Drains

Made with side or bottom outlets, with or without lead flashings. They can be supplied with bell traps if desired. As the drain box is made in one piece there are no joints to loosen up and allow the water to seep into the floor.

Drains can be fitted with brass, nickel or malleable iron tops. The lead flashing may be worked into the waterproofing section and so make the drain absolutely watertight.

Special drains made up from drawings.

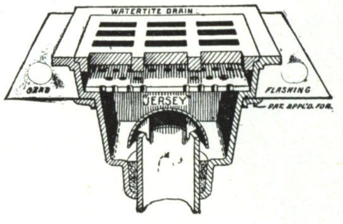
Advantages of Removable Dirt Box

Where floors are hosed down as in dairies, garages, areas, stables, hotel kitchens, etc., Anti-clog Drains catch the dirt, sand and debris in a dirt box inside the drain, preventing this debris from running down the soil pipe and clogging it at some inaccessible point.

By simply raising the cover the dirt box may be lifted out and emptied.

Anti-clog Drains are calked from the inside of the box, allowing a thorough, watertight job to be made.

The seepage holes in the dirt box allow no water to remain in the drain to stagnate or freeze.


WATERTITE DRAIN
FLASHING
JERSEY
PAT. APPL'D. FOR.

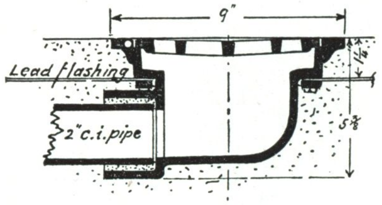
Anti-clog Drain with Bell Trap and Dirt Strainer
Bodies made same sizes as shown in table

Specification

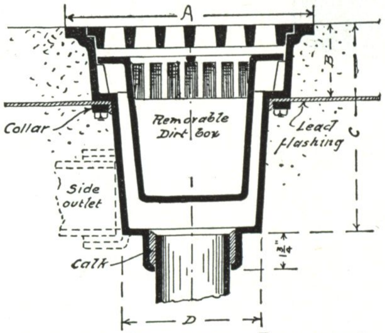
Furnish and install as shown on plans Covert Anti-clog Drains with removable dirt box [with] [without] lead flashings with [side] [bottom] outlet, made by The H. W. Covert Company, 137 East 46th Street, New York, N. Y.

DIMENSIONS OF ANTI-CLOG DRAIN WITH REMOVABLE DIRT BOX OR BELL TRAP

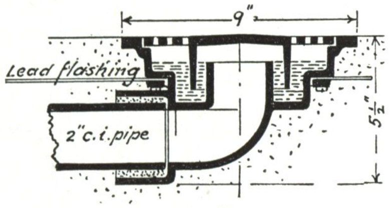
No.	A	B	C	D	Size outlet, in.
9	9	1¼	6	5	3
10	10	3½	8¼	6	3
12	12	3¾	10	6	3 or 4
15½	15½	3¾	9¼	8¾	4, 5 or 6
24	24	3¾	12½	15¼	4, 5 or 6


9"
Lead flashing
2"c.i.pipe

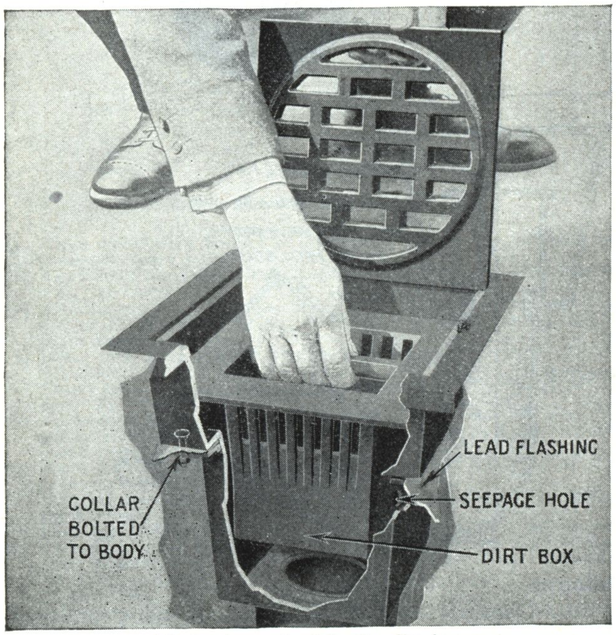
No. 1117 Drain
For bathroom floors and under showers in hotels, Y. M. C. A. buildings, etc., where fittings must not show in the ceiling below


A
B
C
D
Collar
Removable Dirt box
Lead flashing
Side outlet
Calk

Anti-clog Drain with Removable Dirt Box
(See table for dimensions)


9"
Lead flashing
2"c.i.pipe
5½"

No. 1120 Drain
Shallow floor drain with bell trap for the same purposes as the No. 1117. Bell prevents gases and odors from backing up through the soil pipe


LEAD FLASHING
COLLAR BOLTED TO BODY
SEEPAGE HOLE
DIRT BOX

All dirt is retained in the dirt box

DIRT EASILY REMOVED
CAULKED FROM INSIDE OF DRAIN

Dirt easily removed from dirt box

Anti-clog Floor Drain with Removable Dirt Box

WM. C. GROENIGER

THE GROENIGER MANUFACTURING CO.

Testite Sanitary Necessities
Michigan and Buttles Avenues
COLUMBUS, OHIO

Products

Closet Bowl Connections.
Wall Hung Closet Connecting Units.
Adjustable Shower and Floor Drains.
Urinal Connections.
Hospital Drains.
Roof Drains.
Garage Drains.
Heavy Iron Floor Drains.
Extra Heavy Iron Floor Drains.
O. S. Distributer Fittings.

Also Swimming Pool Drains, Hub Unions, Cleanout Ferrules, Drainage Fittings, Roof Flanges, Iron Closet Bends.

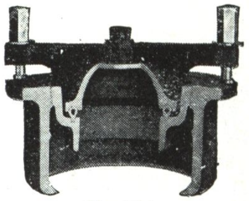
TESTITE
REG. U.S. PAT. OFF.
"Quality-Pressure Tested-Goods"

Testite Necessities

All Testite drains and connections are constructed to eliminate destructive drainage leaks and assure a permanent pressure tight connection between the fixture and waste line under any condition.

Provisions have been made in every fitting for ample vertical, tilting and horizontal adjustment, to overcome the irregularities due to building construction and plumbing roughing-in. All Testite products are air pressure tested under water and closely inspected before shipment to eliminate all leaky and defective materials.

This insures goods of the highest quality.



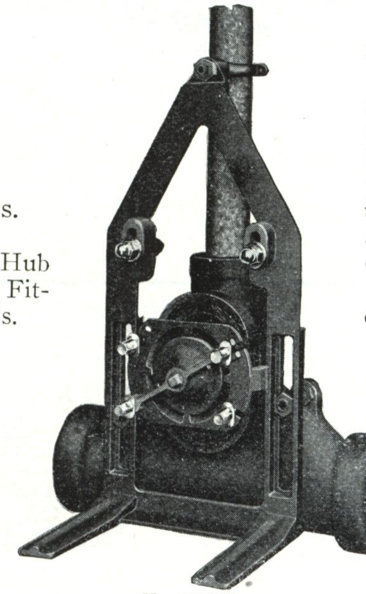
No. 21A

Closet Connection for Cast Iron Pipe

Testite Closet Connections provide a permanent leakproof joint between the closet bowl and soil pipe. The special non-corrosive hollow-lead gasket on which the end of the closet bowl horn is seated eliminates all putty, plaster of paris and other non-dependable plastic materials and makes a joint consistent with all other lead joints in the plumbing system.

The No. 21A connection is made of cast iron with hub outlet for calking to cast or wrought iron soil pipe, and can be tilted and adjusted vertically to floor level before calking. It is installed and tested with the rough work.

Made for long and short horn bowls in 3 and 4-in. sizes

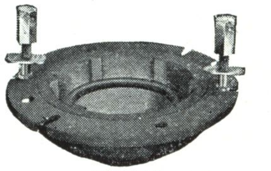


No. 151CU

Wall Hung Closet Connecting Units

Testite Wall Hung Closet Connecting Units eliminate all wall and stack strains, leaky joints, and the large expensive utility chambers heretofore necessary to house the piping construction—simplify construction and make a great saving in labor and material necessary to install wall hung closet bowls. They consist of three separate parts: wall hung closet fitting, floor supported chair hanger, and closet bowl connection.

The closet fitting is a combination of several fittings into one integral casting. It is of the TY type, provides vertical adjustment, has a 2-in. vent pipe connection at the top and is supported entirely above the floor slab. Is made in single and double types for screwed and cast iron pipe. The adjustable floor supported chair hanger will fit any make syphon jet or blow-out type closet bowl. It rests upon the floor slab and carries the entire load of the bowl independent of the wall and soil pipe. The joint at the back of the bowl is made by seating the end of the outlet horn on a special hollow-lead gasket the same as all other Testite Closet Bowl Connections



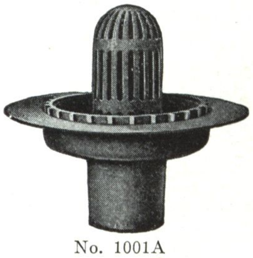
No. 23E

Closet Connection for Lead Pipe

Testite Closet Connections make the simplest and easiest means for connecting closet bowls. Their adjustability and labor saving features overcome the irregularities in building construction and reduce installation costs. They will fit any standard two or four-bolt floor outlet closet bowl and also are made for pedestal urinals and trap standard slop sinks.

The No. 23E connection has a heavy, red brass flange turned and polished in the inside for wiping to lead pipe. Furnished complete with test cap, gasket, bolts, nuts and washers.

Made for long or short horn bowls in 3 and 4-in. sizes

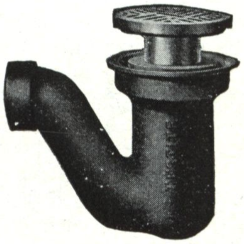


No. 1001A

Roof Drains

A three piece all cast iron drain for use on concrete or wood roofs with composition or tar and gravel roofing materials. Roofing is fastened to drain by a special tapered clamp ring; drain is connected to conductor pipe with a calked joint. The extra long calking hub permits vertical adjustment and the deep sump basin allows an excess of strainer opening area below the roof line.

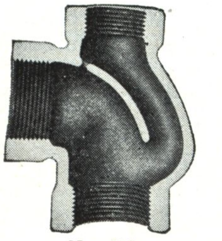
Made in 2, 3, 4, 5 and 6-in. sizes



No. 201C

Shower or Floor Drain with Trap

A combination trap and drain, with nickel plated brass strainer, for use in shower, wash or toilet rooms. Full protection against destructive drainage leaks is provided by calking safe pan into body of the drain. Strainer has a 15° tilting and 1-in. vertical adjustment. Made with spigot or screwed end outlets in 1½, 2, 3 and 4-in. sizes. Drains without trap furnished with female threaded or hub end outlets

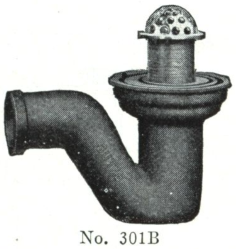


No. 100

O. S. Distributer Fitting

O. S. Fittings insure the highest efficiency in hot water heating systems and domestic hot water supply systems. They increase the circulation, prevent short circuiting, and assure an equal, uniform distribution to all radiators and fixtures. They eliminate entirely the use of ordinary elbows, nipples and tees, and keep risers in line

Made in 39 sizes varying from ½ to 2½ in. Furnished in cast iron or brass



No. 301B

Double Eccentric Urinal Connection with Trap

This connection provides the flexibility necessary to overcome the irregularities and distortions commonly found in urinals. Strainer has 3-in. vertical, 15° tilting and 1½-in. horizontal adjustment in any direction. Safe pan is turned into top of the drain and made tight by a calked joint. Made with spigot or screwed end outlets in 2 and 3-in. sizes. Connections without trap furnished with female threaded or hub end outlets. Bar or beehive strainers

No. 501A

Extra Heavy Iron Floor Drain

An extra heavy cast iron drain suitable for factory, garage and warehouse purposes. Grate is heavily constructed and is anti-tilting. The large flange securely anchors the drain body to concrete floor. Has hub outlet for calking to cast or wrought iron pipe. Can be furnished with brass rim and grate.

Made in 3, 4, and 6-in. sizes

THE JOSAM MANUFACTURING CO.

Manufacturers of Josam Floor and Roof Drains and Other Special Josam Products

MAIN SALES OFFICE
4900 Euclid Building, CLEVELAND, OHIO

FACTORY
MICHIGAN CITY, IND.

DISTRICT BRANCH OFFICES
NEW YORK, N. Y., 229 East 38th Street
CLEVELAND, OHIO, 4900 Euclid Building
CHICAGO, ILL., Majestic Theater Building
ATLANTA, GA., 209 Bona Allen Building
REPRESENTATIVES IN PRINCIPAL CITIES IN UNITED STATES AND CANADA

Products

Josam Floor and Roof Drains with and without the exclusive Double Drainage feature; Drains with and without traps for floors, garages, hospitals, shower stalls, swimming pools, urinals, gutters and roadways.

Roof, Promenade and Gutter Drains, with and without Double Drainage feature, all having removable combined sediment cup and dome strainer.

Vent Stack Flashing Sleeves.

Backwater Deep Seal Traps with automatic positive closing brass flap valve with brass seat.

Open Seat Backwater Sewer Valves (cast iron body).

Adjustable Heavy Duty Concrete Inserts in sizes to accommodate standard boltsizes.

Adjustable Double Eccentric Flange Unions.

Open Seat Swing Check Valves.

Combination Closet Bends and Fittings in various patterns; Expansion Joints for floor and roof drains; Eccentric Refrigerator Drains.

For Josam Swimming Pool Equipment, see page 495.

Materials

Cast iron, Duriron, bronze, "Benedict" nickel. Galvanized, Duriron or all-brass drains at extra cost.

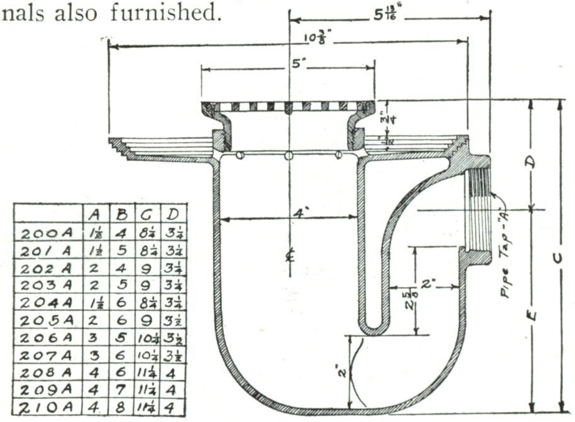
Josam Double Drainage Drains

Description—The double drainage feature is exclusive in Josam drains and positively prevents water seepage around drain through floor to ceiling beneath, thus providing *leakproof protection.* Indorsed and specified by the country's leading architectural, sanitary and mechanical engineers, making Josam the Standard Drain of America.

Catalogues, Literature, Service—"F;" Blue Print Portfolio; Drafting Room Standard Detail Sheets showing Josam shower, floor, urinal and roof drains in construction, for architects and engineers; "PJ" for plumbers and plumbing supply jobbers; "FR" for roofers and sheet metal men.

Josam Double Drainage Combined Trap and Drain

200A Series—Heavy cast iron body with adjustable brass strainer to suit floor thickness variations. Any Josam drain having flanged cup furnished with flashing ring and eccentric clamps, when so ordered, at $1.00 extra. Strainers for porcelain shower receptors and urinals also furnished.

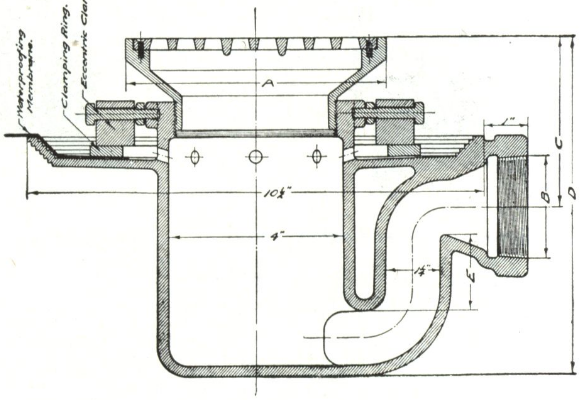


	A	B	C	D
200A	1½	4	8¼	3¼
201A	1½	5	8¼	3¼
202A	2	4	9	3¼
203A	2	5	9	3¼
204A	1½	6	8¼	3¼
205A	2	6	9	3½
206A	3	5	10¼	3½
207A	3	6	10¼	3½
208A	4	6	11¼	4
209A	4	7	11¼	4
210A	4	8	11¼	4

200A Series Drain and Trap

No.	200A	201A	202A	203A	204A	205A	206A	207A	208A	209A	210A
Strainer.. in.	4	5	4	5	6	6	5	6	6	7	8
Outlet... in.	1½	1½	2	2	1½	2	3	3	4	4	4
Price	$10.50	12.00	12.00	12.00	12.50	13.00	15.00	16.00	19.00	21.00	23.00

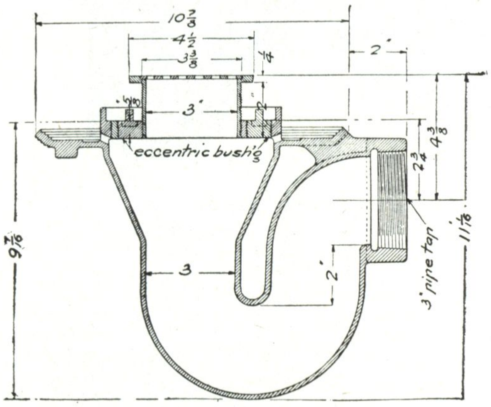
2003A Special Shallow Type—Same construction as 200A, but designed for shallow installation. Furnished with flashing ring and eccentric clamps to hold flashing permanently in flanged cup. Nickelplated brass strainer and adjustable collar. Made with hub or screw outlet.



2003A Special Shallow Type Drain

No.	2003A	2008A
Strainer.. in.	6	6
Outlet.. in.	2	3
Price	$15.00	18.00

2006A Series—Equipped with brass strainer for porcelain, enameled iron, slate or marble urinal and shower receptors and having brass adjustable double eccentric bushings which will compensate for inaccuracies in the roughing-in.



2006A Series Combined Trap and Drain

No.	2006A	2007A
Outlet.. in.	2	3
Price	$14.00	16.00

Continued on next page

Josam Double Drainage Drain without Trap for Shower Receptors and Urinals

With brass adjustable double eccentric bushings.

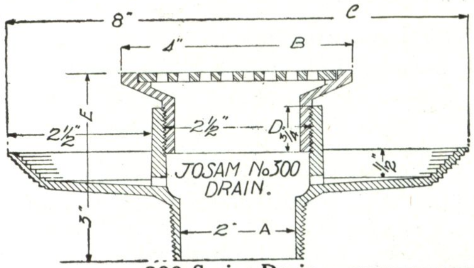
3001 Series—This drain serves all conditions as No. 2006A, except that it has no trap.

3001 SERIES DRAIN

Outlet . . . . in.	2	3
Price	$9.00	10.00

Josam Double Drainage Drain Without Trap

300 Series—Without trap, for shower stalls. Body is of cast iron and strainer nickelplated or polished brass. Can be installed in connection with independent trap to suit construction. Can furnish either flat, convex or concave strainers, adjustable to variations in floor thickness. With flashing ring and eccentric clamps, $1.00 extra.


8"
C
4"
B
2½"
E
2½"
D
¼
½
JOSAM No300 DRAIN.
5"
2"
A

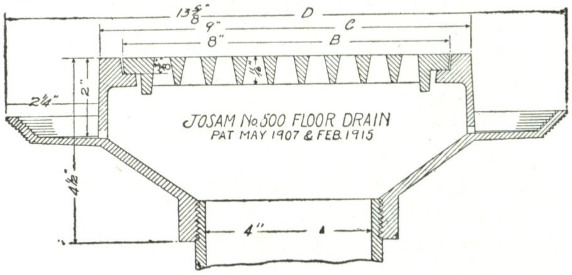
300 Series Drain

No.	300	301	302
Strainer . . . in.	4	5	6
Outlet . . . . in.	2	3	4
Price	$6.00	8.00	9.50

	A	B	C	D	E	WEIGHT MALE	WEIGHT FEMALE
300	2"	4"	8"	2½"	3¼"	5#	6#
301	3"	5"	9"	3½"	3¾"	6½#	8#

Josam Double Drainage Drain or Cesspool

500 Series—For dairy, laundry, warehouse or factory floors. Made of cast iron with anti-tilting cast iron grate. Brass top and grate at additional cost.

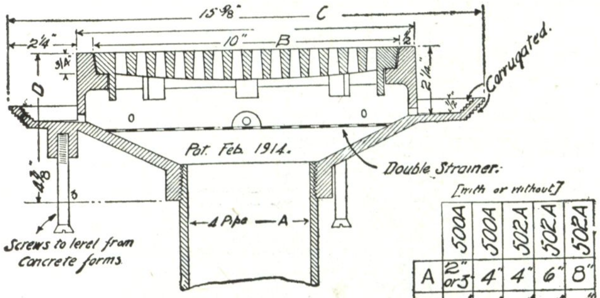

13⅝"
D
9"
C
8"
B
2¼"
2"
JOSAM No500 FLOOR DRAIN
PAT MAY 1907 & FEB. 1915
4½"
4"
A

500 Series Drain

No.	500	501
Strainer . . . . in.	8	11
Outlet . . . . in.	2, 3 or 4	6
Price	$6.00	9.00

	A	B	C	D	WGT.
500	2" 3 4	8"	9"	13⅝	18#
501	6"	11"	12"	17"	38#

500A Series—Extra heavy type made of cast iron, especially adapted for packing house, dairy, laundry or cold storage buildings where heavy trucking is necessary, also suitable as garage drain. Supplementary grate tends to prevent sewer stoppage. Tapped to receive leveling screws for adjustment to suit floor variations. Has an extra heavy cast iron non-tilting grate 1 in. thick.


15⅝"
C
2¼"
10"
B
⅛"
3/4"
D
2½"
½"
Corrugated.
Pat. Feb. 1914.
4⅞"
Double Strainer:
Screws to level from Concrete forms
4 Pipe
A

500A Series Drain

No.	500A	500A	502A	502A	502A	502A
Grate . . . . in.	10	10	14	14	14	14
Outlet . . . . in.	2 & 3	4	4	5	6	8
Price	$10.00	10.50	12.00	13.00	14.00	16.00

[with or without]

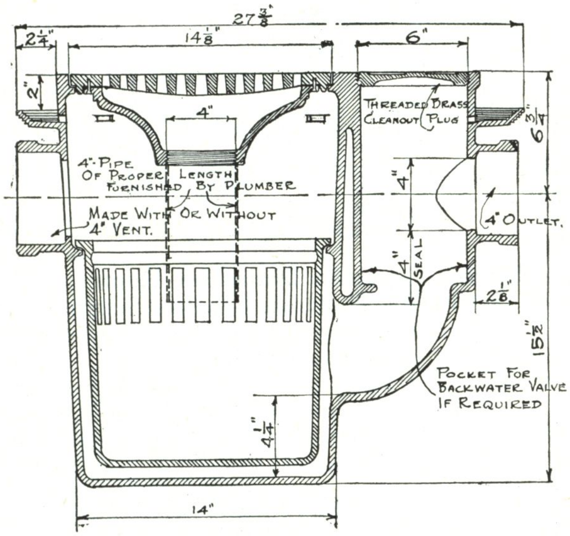
	500A	500A	502A	502A	502A
A	2" or 3	4"	4"	6"	8"
B	10"	10"	14"	14"	14"
C	15⅝"	15⅝"	19¾"	19¾"	19¾"
D	4⅞"	4⅞"	4⅞"	5⅜"	5⅜"
Weight	42# 40#	42#	73#	73#	77#

Josam Garage and Industrial Plant Floor Drain

900G Series—Designed primarily for garage and industrial plant floors where there is a large flow of water and heavy deposits of dirt and grease.

The heavy special anti-tilting grate lifts out, making the sediment basin of trap very accessible for cleaning-out purposes and has trap without pocket for sediment deposit. It has special brass cleanout plug flush with floor which permits positive means for removal.

Can be furnished with cast iron sand bucket, also cast iron dome, for deflecting gasoline fumes to vent pipe. Equipped with or without vent. Galvanized can be furnished at added cost. Can be furnished to apply to various floor slab thicknesses up to 12 in., at extra cost.

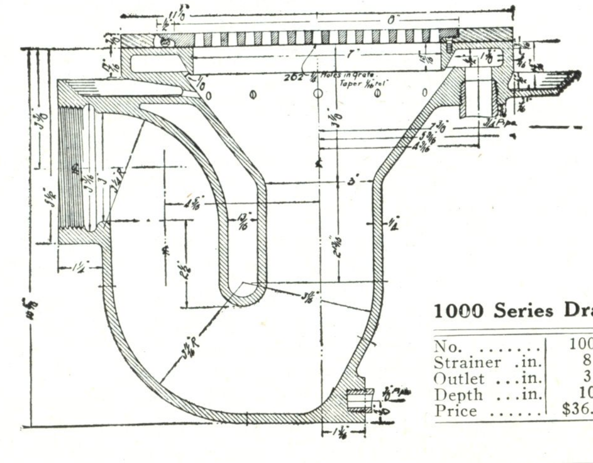

27⅜"
2¼"
14⅛"
6"
2"
4"
Threaded Brass Cleanout Plug
6¾"
4"-Pipe Of Proper Length Furnished By Plumber
4"
Made With Or Without 4" Vent.
4" Outlet.
4" Seal
2⅛"
15½"
Pocket For Backwater Valve If Required
4¼"
14"

900G Series Drain

No.	900G	With sand bucket	With gas deflector	Complete
Grate . . . . . in.	14			
Outlet . . . . . in.	4			
Weight . . . . lb.	197			
Price	$42.00	Add 8.00	Add 4.00	54.00

Josam Double Drainage Trap and Drain for Hospital Floors

1000 Series—This drain is furnished with brass top and special hinged strainer. Also provided with flushing rim and jet which thoroughly cleanse the interior of the drain, ejecting all sediment from bottom and sides of trap without wetting the floor. Positively eliminates any sediment, filth or germ accumulation.


1⅛"
9"
7"
3½"
5"
1¾"
1¼"
1¾"

1000 Series Drain

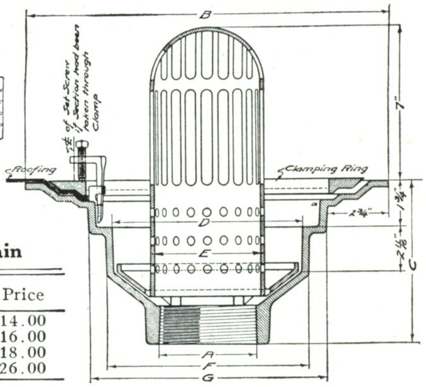
No.	1000
Strainer . in.	8
Outlet . . . in.	3
Depth . . . in.	10
Price	$36.75

Continued on next page

Improved Josam Roof Drain with Removable Sediment Cup for Wood, Concrete or Tile Roofs

400S Series—This drain affords an *absolutely watertight connection between the roofing and the drain body without the use of flashing.* This is accomplished by an improved type clamping ring which has the same surface contour as flange of drain. This clamping ring is held securely in place by four adjustable manganese bronze clamping posts, each of which receives a ⅜-in. setscrew, the tightening of which permits any desired pressure on clamping ring, under which roofing felts are clasped. Made of heavy cast iron, eliminating possibility of condensation when buried in roof slab.

Nº	Outlet	Weight	B	C	D	E	F	G
400S	2" 3" 4"		16¼"	6¼"	8⅜"	5"	9"	10¾"
401S	5		17¼"	"	9⅜"	6"	10"	11¾"
402S	6"		18¼"	"	10⅜"	7	11"	12¾"
404S	8"		20¼	7¼"	12⅜"	9"	13"	14¾"



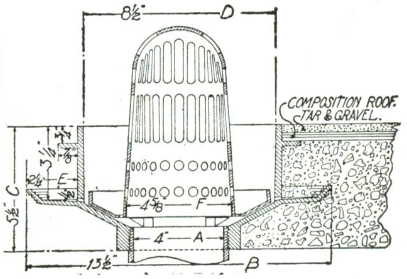
400S Series Drain

No.	Outlet, in.	Price
400S	2, 3, 4	$14.00
401S	5	16.00
402S	6	18.00
404S	8	26.00

Josam Double Drainage Drains for Roofs

400 Series for Concrete Roofs—Sediment cup and strainer are cast together and are easily removed. This cup retains tar, gravel or other sediment from roof and prevents clogging the drain. Tapped for standard iron pipe thread. All cast iron. Soil pipe connectors for all sizes and all series of roof drains can be furnished. Galvanized at added cost.

	400	401	402	404
A	2" 3" 4"	5"	6"	8"
B	13½	14⅝	16⅝"	22¾"
C	5½"	5½"	5¾	6
D	8½"	9¾	11¼"	16⅜"
E	2¼"	2¼"	2¼"	3"
F	4⅝"	4¾"	6"	10"
WEIGHT IN LBS.	26 25 24	34	43	85



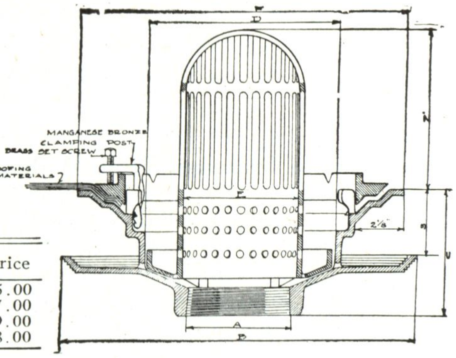
400 Series Roof Drain

No.	400	401	402	404
Outlet, in.	2, 3 or 4	5	6	8
Price	$12.00	14.00	16.00	20.00

Josam Improved Double Drainage Drain, with Removable Combined Sediment Cup and Dome Strainer for Concrete Roofs

400BS Series for Concrete Roofs—In addition to having the Josam double drainage feature this drain affords a positive means whereby roofing felts are joined to the drain body with an improved clamping ring, which has the same surface contour as the flange of the drain and is held securely in place by four adjustable manganese bronze clamping posts, each of which receives a ⅜-in. brass setscrew, the tightening of which permits any desired pressure on clamping ring, under which roofing felts are clasped. *This insures an absolutely watertight connection between roofing felts and body of the drain, and eliminates the use of flashing.*

Series 400BS has the Josam removable combined sediment cup and dome strainer which can be removed easily for cleaning, thus keeping the drain clean. Heavy cast iron construction eliminates the possibility of condensation when buried in the roof slab. Tapped for standard iron pipe thread. Soil pipe connectors for all sizes and all series of Josam roof drains can be furnished. Galvanized at added cost.



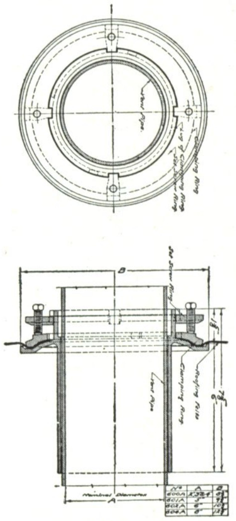
400BS Series

No.	Outlet, in.	Price
400BS	2, 3, 4	$15.00
401BS	5	17.00
402BS	6	19.00
404BS	8	28.00

Josam Vent Stack Sleeve

600A Series—This new type cast iron vent stack sleeve is designed to *positively eliminate the necessity of a copper or lead flashing.* This sleeve can be placed in position during the construction of a concrete or wood roof deck and the vent pipe carried through it at any time.

The hub or space at the top of sleeve between the pipe and sleeve should be filled with oakum and an elastic roofer's cement or poured lead joint, thereby making a watertight joint between sleeve and pipe.



Josam Vent Stack Sleeve

600A SERIES VENT STACK SLEEVE

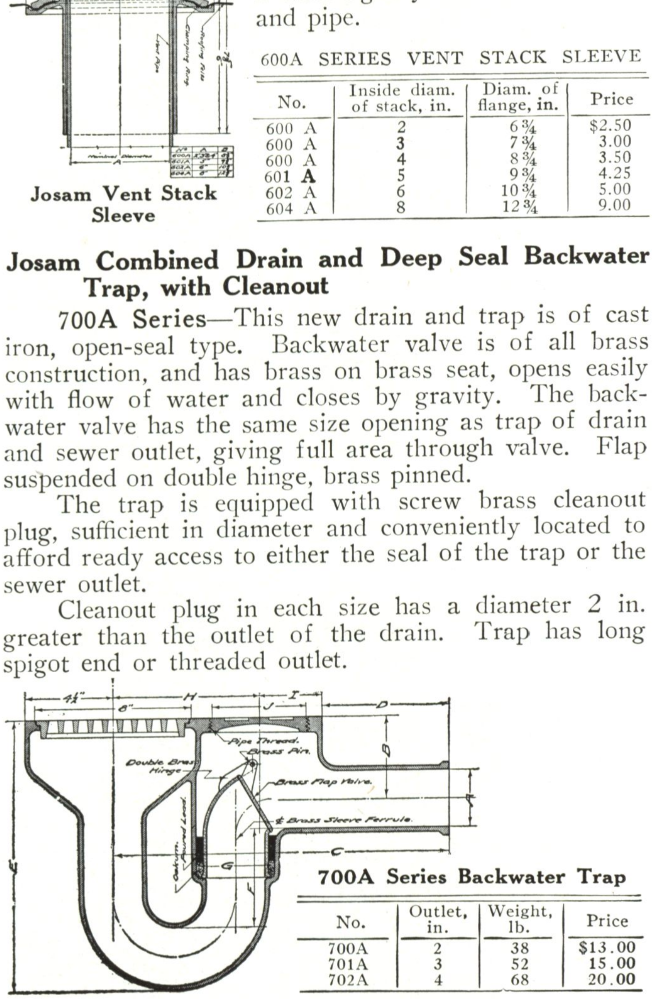
No.	Inside diam. of stack, in.	Diam. of flange, in.	Price
600 A	2	6¾	$2.50
600 A	3	7¾	3.00
600 A	4	8¾	3.50
601 **A**	5	9¾	4.25
602 A	6	10¾	5.00
604 A	8	12¾	9.00

Josam Combined Drain and Deep Seal Backwater Trap, with Cleanout

700A Series—This new drain and trap is of cast iron, open-seal type. Backwater valve is of all brass construction, and has brass on brass seat, opens easily with flow of water and closes by gravity. The backwater valve has the same size opening as trap of drain and sewer outlet, giving full area through valve. Flap suspended on double hinge, brass pinned.

The trap is equipped with screw brass cleanout plug, sufficient in diameter and conveniently located to afford ready access to either the seal of the trap or the sewer outlet.

Cleanout plug in each size has a diameter 2 in. greater than the outlet of the drain. Trap has long spigot end or threaded outlet.



700A Series Backwater Trap

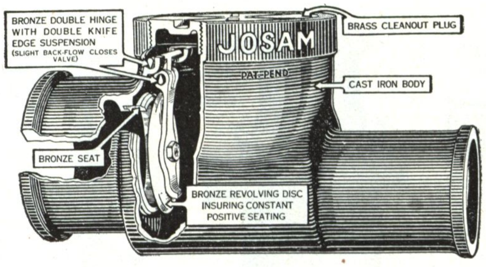
No.	Outlet, in.	Weight, lb.	Price
700A	2	38	$13.00
701A	3	52	15.00
702A	4	68	20.00

Continued on next page

Josam Open Seat Backwater Sewer Valve

Has bronze working parts, brass insert seat, and threaded brass cleanout plug. Body is of cast iron equivalent to extra heavy soil pipe. Outlet end is offset providing clearance of 1½ in. below the valve seat and valve disc allowing free passage of foreign matter through valve to outlet, precluding possibility of fouling valve.

Valve always open about ¾ in., except when functioning by flow of water in either direction. Double knife edge or fulcrum bearings positively respond to slightest movement required of valve. Revolving disc or flap valve insures positive seating. When required, opens sufficiently to permit full water way.


BRONZE DOUBLE HINGE WITH DOUBLE KNIFE EDGE SUSPENSION (SLIGHT BACK-FLOW CLOSES VALVE)
BRASS CLEANOUT PLUG
JOSAM
PAT-PEND
CAST IRON BODY
BRONZE SEAT
BRONZE REVOLVING DISC INSURING CONSTANT POSITIVE SEATING

Open Seat Backwater Sewer Valve, 1100 Series

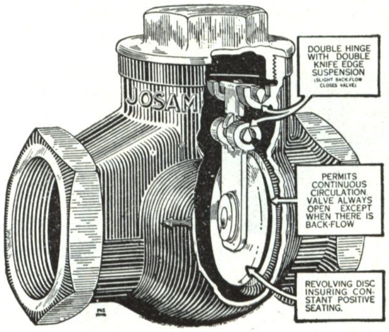
Number	1104	1105	1106	1108	1110	1112
Size, ...in.	4	5	6	8	10	12
Price............	$22.00	26.00	30.00	38.00	50.00	65.00

Josam Open Seat Swing Check Valve

Holds and controls bodies of liquid matter. Has open seat with revolving flap check or disc suspended on compound acting double knife edge bearings. The disc, normally, hangs open about ⅛ in., permitting continuous flow regardless of sluggishness in circulation and closes readily with the slightest back flow movement of the water.

The globe shape of the high grade red brass body permits circulation of water around and under valve disc when valve is partially open, and permits flow of full area of line when valve is completely open. Large hexagon cap plug permits easy accessibility to working parts.

Other than Josam check valves have closed seat and single pin bearings.


DOUBLE HINGE WITH DOUBLE KNIFE EDGE SUSPENSION (SLIGHT BACK-FLOW CLOSES VALVE)
JOSAM
PERMITS CONTINUOUS CIRCULATION. VALVE ALWAYS OPEN EXCEPT WHEN THERE IS BACK-FLOW
REVOLVING DISC INSURING CONSTANT POSITIVE SEATING.

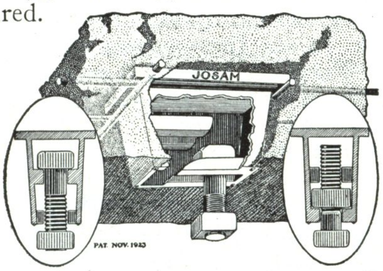
Open Seat Swing Check Valve

Size, ...in.	½	¾	1	1¼	1½	2	2½
Price..........	$2.00	2.25	2.80	3.65	4.75	6.75	15.00

Josam Duo-step Adjustable Concrete Insert

For attaching pipe or anything in any position in all-concrete construction.

More adjustable, greater bearing contact, quickly applied, forms easily removed, no protruding nails or wire. Will receive head or nut of bolt. Provides both vertical and horizontal adjustability and is furnished regularly with detachable spring clips for fastening on either horizontal or vertical forms as specified. Also furnished with special ¼, ⅜ or ½-in. iron pipe threaded nuts when required.


JOSAM
PAT. NOV. 1923

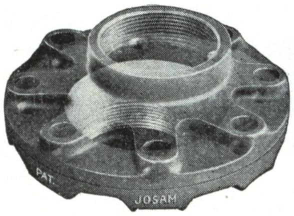
Duo-step Adjustable Concrete Insert (Iron)

Size of bolt..............in.	½ or ⅝	¾
Price of insert.............	.15	.20

¼, ⅜ or ½-in. iron pipe threaded nuts, 2 cents each extra

Josam Double Eccentric Adjustable Cast Iron Flange Union

Connects pipes directly *in line* or pipes *out of line* to the extent of an entire inch or fractional part thereof, making a permanently tight leakproof connection.

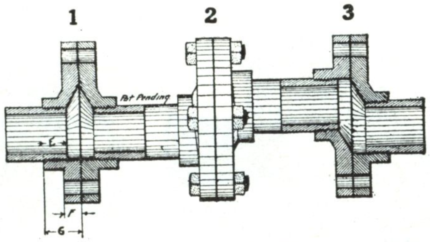


Double Eccentric Adjustable Cast Iron Flange Union

Volume can not be choked or flow impaired because the area through the Josam union is 50% greater than the pipes it connects, whether pipes are in line or out of line.

Variations of threads and tappings in pipe and fittings of various manufacture, slight miscalculations, mismeasurements, construction variances, and other causes beyond the control of the user, are readily compensated for by the adjustability of Josam Double Eccentric Adjustable Flange Unions.

The construction of this union eliminates the strain on the union, the gasket, the bolts, the pipes connected to union, and the pipe connections adjacent to it, necessity of bending or springing, taking out, cutting off or adding to the pipe.


1
2
3
Pat Pending
E
F
6

Three Views of Josam Double Eccentric Adjustable Flange Union

(1) Cross section of "in line" connection
(2) Exterior view of "out of line" connection
(3) Cross section of "out of line" connection

Size.........in.	2	2½	3	3½	4
Price, cast iron Black.... Galv.....	 $1.25 2.50	 $1.50 3.00	 $1.80 3.60	 $2.10 4.20	 $2.50 5.00

WADE IRON SANITARY MANUFACTURING CO.

Manufacturers of Sanitary Drainage Specialties

551-553 West Fulton Street
CHICAGO, ILL.

Products

Cast Iron Pump Basins, Cast Iron Catchbasins, Grease Basins, Steam Basins, Floor Drain Basins and Fittings, Floor Drains with Backwater Gate Valves and Fittings, Sewer Lockout and Backwater Valves, Garage Basins, Iron Catchbasin Covers, Down-Spout Heads.

Also Electric Bilge Pumps.

Co-operative Service

The experts of this company will gladly assist in drawing up plans for sanitary sewage systems that may be under contemplation.

Catalogues

Catalogues giving sizes and further details furnished on request.

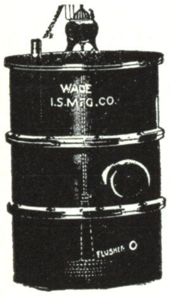

WADE
I.S.MFG.CO.
FLUSHER

Fig. 36

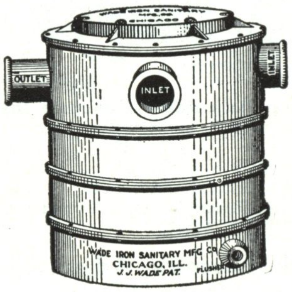

WADE IRON SANITARY MFG. CO. CHICAGO
OUTLET
INLET
WADE IRON SANITARY MFG CO.
CHICAGO, ILL.
J. J. WADE PAT.
FLUSHER

Fig. 38

Clean-out Sectional Basins
Each section easily added and made to reach any depth

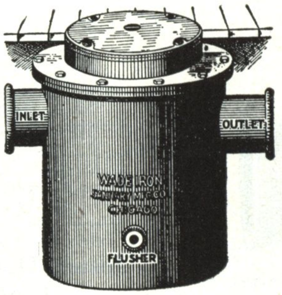

INLET
OUTLET
WADE IRON
SANITARY MFG CO
CHICAGO
FLUSHER

Fig. 31. Extra Heavy Catch Basin and Gravel Basin

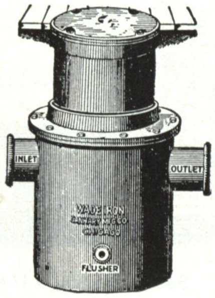

INLET
OUTLET
WADE IRON
SANITARY MFG CO
CHICAGO
FLUSHER

Fig. 32. Like Fig. 31 but Cast Iron Extension to Floor Level

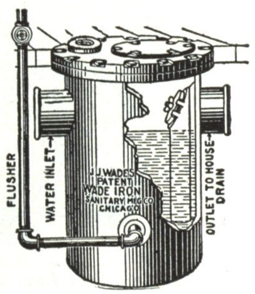

FLUSHER
WATER INLET
J. J. WADE'S PATENT
WADE IRON SANITARY MFG CO CHICAGO
OUTLET TO HOUSE DRAIN

Fig. 33. Steam Water Cooling and Condensing Catchbasin

Wade Accessible Flushing Clean-out Extra Heavy Cast Iron Basins

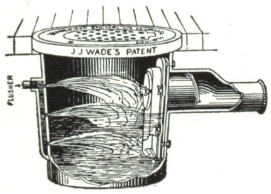

J. J. WADE'S PATENT
FLUSHER

Fig. 126. Floor Wash and Gate Valve Combination

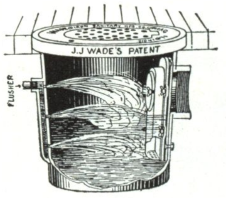

J. J. WADE'S PATENT
FLUSHER

Fig. 130. Floor Wash and Water Seal Trap Combination

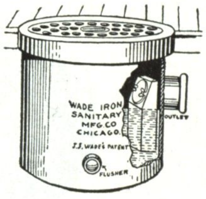

WADE IRON
SANITARY
MFG CO
CHICAGO
J. J. WADE'S PATENT
OUTLET
FLUSHER

Fig. 62. Floor Drain for Concrete Floors

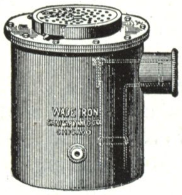

WADE IRON
SANITARY MFG CO
CHICAGO

Fig. 52. Extra Heavy Basin Floor Drain

Wade Accessible Flushing Clean-out Cast Iron Floor Drain Basins

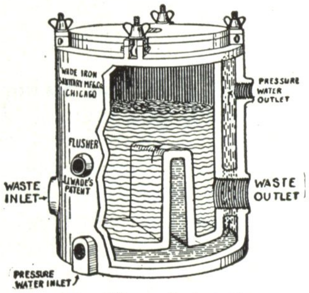

WADE IRON SANITARY MFG CO CHICAGO
PRESSURE WATER OUTLET
FLUSHER
J. J. WADE'S PATENT
WASTE INLET
WASTE OUTLET
PRESSURE WATER INLET

Fig. 27. Water Jacket Grease Catchbasin

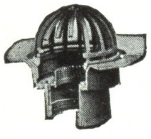


Fig. 237 Down-Spout Head

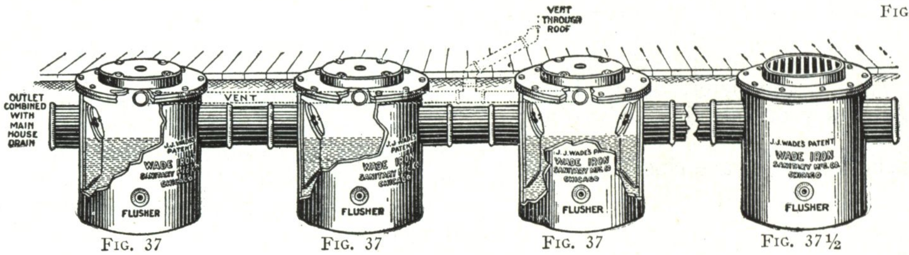

VENT THROUGH ROOF
OUTLET COMBINED WITH MAIN HOUSE DRAIN
VENT
J. J. WADE'S PATENT
WADE IRON SANITARY MFG CO CHICAGO
FLUSHER
FLUSHER
FLUSHER
FLUSHER

Fig. 37 Fig. 37 Fig. 37 Fig. 37½

Wade Accessible Flushing Clean-out, Extra Heavy Cast Iron, Triple Garage Gasoline and Oil Separating Catchbasins and Accessories

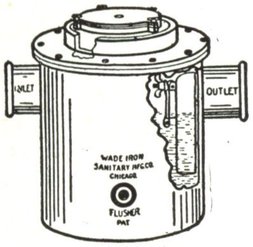

INLET
OUTLET
WADE IRON SANITARY MFG CO CHICAGO
FLUSHER PAT

Fig. 29. Grease Intercepting Catchbasin

Wade Accessible Flushing Clean-out Grease Basins

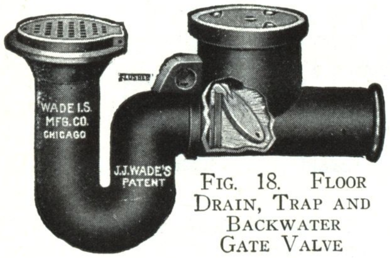

FLUSHER
WADE I.S. MFG. CO. CHICAGO
J.J. WADE'S PATENT

Fig. 18. Floor Drain, Trap and Backwater Gate Valve

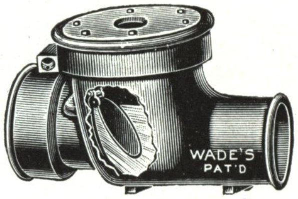


Fig. 1. Backwater Gate Valve

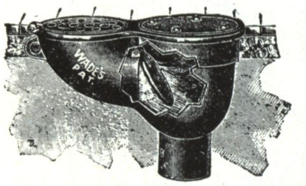


Fig. 20. Backwater Gate Area Drain

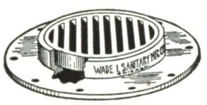

WADE I. S. SANITARY MFG

Fig. 224. Grated Center Floor Drain Cover

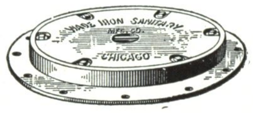

WADE IRON SANITARY MFG CO
CHICAGO

Fig. 44. Bolted Iron Catchbasin Cover

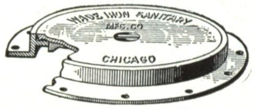

WADE IRON SANITARY MFG. CO.
CHICAGO

Fig. 93. Loose Center Catchbasin Iron Cover

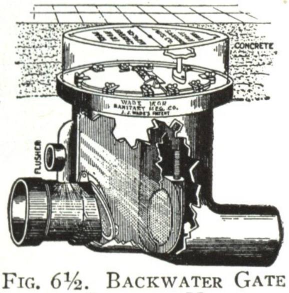

CONCRETE
WADE IRON SANITARY MFG. CO.
FLUSHER

Fig. 6½. Backwater Gate and Lockout Valve

THE BARRETT COMPANY

Roof Leaders and Roof Vent Connections

40 Rector Street
NEW YORK, N. Y.
For Branch Offices, see page 1038

Products

HOLT ROOF LEADER and ROOF VENT CONNECTIONS (Patented).

For Roofing, see pages 1038-1040; for Flashings for Brick and Concrete Walls, see page 1052.

Holt Roof Connections

Mechanically compact, Holt Roof Connections do not require the cutting away of a large amount of sustaining roof structure—which must be done to receive the old-style outlet boxes and cast-iron roof outlets.

A series of three gravel stops and a cast-iron strainer entirely prevent any loose gravel, leaves, or roof rubbish from washing into and clogging the leader lines.

The connection is made integral with the roof deck by means of a locking arrangement. This eliminates any strain or movement at the roof line.

The expansion joint or flexible connection creates a watertight and gastight joint, and prevents leaks around outlets due to settlement or shrinkage of roof deck and expansion and contraction in leader lines. It overcomes collapsing and condensation, which are the inherent weaknesses of old style connections. Made of heavy copper and cast-iron, it is durable.

Holt Roof Connections are easily specified, readily obtainable at the various Barrett branches and installed at minimum cost, and carry with them a positive assurance of uninterrupted service for as long a period of time as any other part of the roof construction.

Send for Service Sheets Numbers 4, 5, and 6.

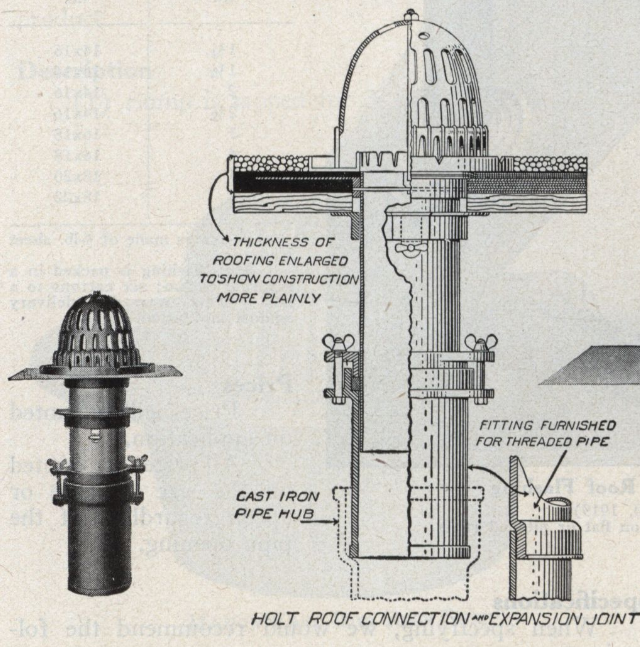
Types 1, 3, 4, 5, 6-L, 6-V, and 6-T are designed to meet the varying conditions presented by flat roof decks. Type 2 is especially designed for use with sloping roofs, and has a wide field in connection with sawtooth construction, and wherever valleys or parapet wall gutters are so narrow that a specially designed connection is required. Since this type is installed in an inclined roof deck, it obviates the necessity of constructing fills and crickets for drainage in valleys. It is adjustable to varying inclines.

For types 1, 3, and 4, a wide copper flashing flange is fused to each of these connections. Fusing joints requires intense heat and extreme care in workmanship. It is a factory job and is a necessary operation to provide a permanent watertight connection. It is not good or safe practice to permit flashing flanges to be soldered on the job. It is a difficult field operation even under the best of conditions.

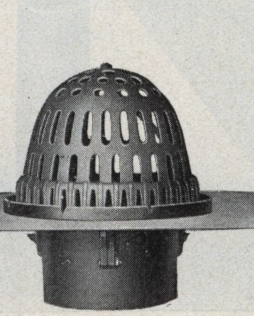
For types 2, 5, 6-L, 6-T, and 6-V, a wide copper flashing flange is furnished with each of these connections. All necessary parts are provided to bolt the flashing flange to the connection, an operation done in accordance with the best mechanical practice, and one that provides a permanent watertight joint. This is the only dependable method of creating a watertight flashing joint, where a field operation is necessary, and types 2, 5, 6-L, 6-T, and 6-V come under this classification.

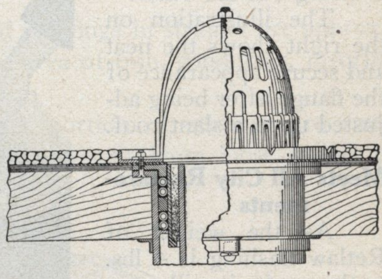
Specifications

For detailed specifications see Barrett Service Sheets Nos. 4, 5 and 6.

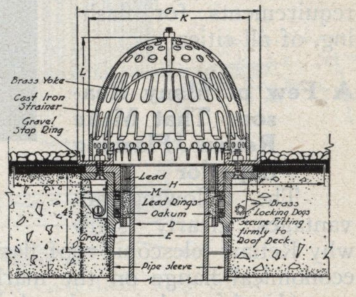

THICKNESS OF ROOFING ENLARGED TO SHOW CONSTRUCTION MORE PLAINLY
FITTING FURNISHED FOR THREADED PIPE
CAST IRON PIPE HUB
HOLT ROOF CONNECTION AND EXPANSION JOINT

TYPE 1, HOLT ROOF CONNECTION
Exterior and cross-section views. To connect with leader lines—flat surface





Cross Section of Fitting with Sliding Lock Collar for Wood Roof



For Use in Concrete, Gypsum, etc., Decks Over 3 in. Thick Provided with Brass Locking-dogs

TYPE 6-L, HOLT ROOF CONNECTION
To connect with leader lines—flat surface

HARKER MFG. CO.

Manufacturers of Roof Flashing

121-123 West 3rd Street
CINCINNATI, OHIO

Product

RETLAW TELESCOPIC ROOF FLASHING.

For Fire Protection Equipment, see page 1970.

Retlaw Telescopic Roof Flashing

The Retlaw telescopic roof flashing is the only elastic, collapsible, telescopic roof flange on the market.

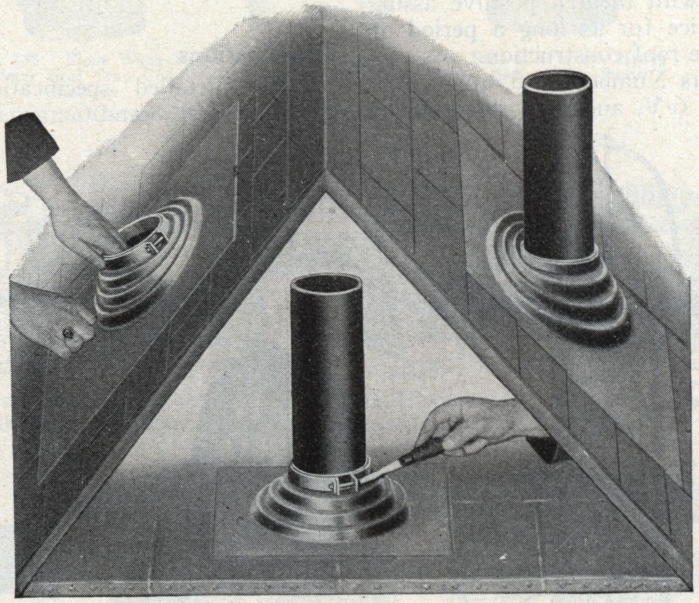
It is drawn out of one piece of pure soft lead into circular corrugations without a seam and weighs 4 lbs. to the sq. ft. It can be easily adjusted to any condition that may exist upon a roof, regardless of its extremity in pitch or covering. It needs no hub, excels a boot, and its flexibility and elasticity will allow for extreme settling of roof or soil pipe.

Ease of Retlaw Installation

The illustration in the center shows the flange in its manufactured state, on a flat roof. It clearly shows the heavy galvanized iron band and brass bolt, which can be drawn up with a screwdriver, thereby compressing lead around pipe and making an absolutely rigid and tight joint.

The illustration on the left shows how easily the flange can be adjusted, with the slightest effort, to fit any desired angle of roof, by simply collapsing one side and drawing out the other.

The illustration on the right shows the neat and secure appearance of the flange after being adjusted upon a slant roof.



Retlaw Telescopic Roof Flashing
(Pat. Sept. 30, 1919)
Showing ease of installation on flat or pitched roofs

Meets All City Requirements

As the weight of Retlaw flashing is 4 lbs. to the sq. ft., it will more than meet the ordinance requirements for flashing, of all cities.

A Few of Many Reasons That Make Retlaw Flashing Superior

The following advantages clearly show why Retlaw telescopic roof flashing is the best and most economical flange on the market:

(1) After being placed in position, there is no come-back for leaking seams.

(2) It can be placed equally well on a straight roof, an angle roof, or a round cupola.

(3) The material of which it is made is pure soft lead, which will wear as long as any roof.

(4) It can not cause a hitch under the most trying circumstances.

(5) It needs no hub at roof to make a watertight joint.

(6) It can be pulled over the soil pipe like a rubber boot and made to fit any condition that may exist.

(7) It will allow for relaxation in case of vibration, contraction, expansion or settling of either the soil pipe or roof, as it has extreme telescopic elasticity.

(8) It is indorsed by many leading plumbers as having many advantages over the hand made or boot flashing, and being considerably cheaper.

Sizes

The dimensions shown in the accompanying table are the standard sizes manufactured by this company.

We recommend their use as being most practical.

However, if relative sizes of pipe opening and base or apron do not conform with your opinion, Retlaw can be made up with any size apron.

SIZES OF RETLAW FLASHING

Pipe opening, in.	Size of base, in.
1¼	14x16
1½	14x16
2	14x16
2½	14x16
3	16x18
4	16x18
5	18x20
6	18x22

Retlaw is made of 4-lb. sheet lead.

Each flashing is packed in a separate carton; six cartons to a box. This warrants delivery against mutilation.

Prices

Prices will be quoted on application.

All prices are quoted on the size of base or apron regardless of the pipe opening.

Specifications

When specifying, we would recommend the following:

All the vent pipes to be flashed at the roof line with the Retlaw telescopic lead roof flashing.

THE R. C. MAHON COMPANY

Cast Iron Roof Sumps

St. Aubin Avenue and East Grand Boulevard

DETROIT, MICH.

Product

Mahon Cast Iron Roof Sumps.

For Fireproof Doors, see page 874.

Mahon Cast Iron Roof Sump

This sump is very simple in design, yet is absolutely watertight.

This sump is permanent and need not be disturbed to replace roof.

It was designed and is manufactured by a concern, with years of experience in roofing work, to fit a long-felt need for a permanent roof connection that is practical and actually watertight.

No springs, bolts or loose rings are required; no elastic cement or solder is used.

The dome is locked to sump but can be easily removed without disturbing sump or roofing.

Quantity Production Makes Possible Low Price

Quantity production enables us to market this sump at a cost which is exceptionally low for this type of product.

Description

(1) Sump is tapped for 3, 4, 5 and 6-in. standard wrought iron pipe. If cast iron conductors are used a short wrought iron pipe is screwed into sump and calked in hub of cast iron pipe.

(2) Four countersunk holes are provided for attaching sump to roof deck. Screws may be used for wood deck, machine bolts for anchoring into concrete.

(3) Circular wedge type ragglet is provided for attaching copper apron to cast iron sump. This is filled with lead to insure a watertight joint.

(4) A 16-oz. copper apron is calked into ragglet. This apron can be readily attached to any type of roofing. For gravel roofs a gravel stop is soldered to apron.

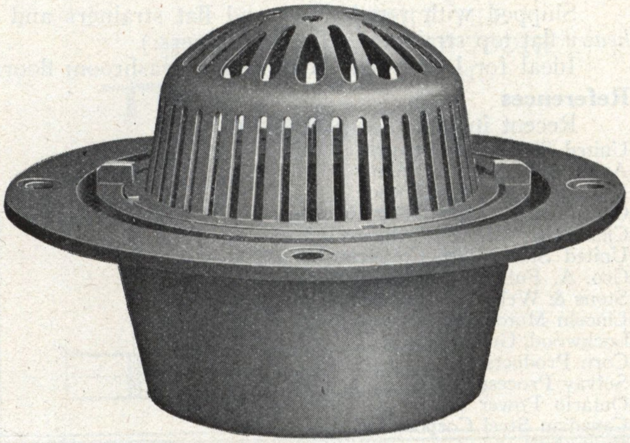
(5) Four shoulders are cast with sump bowl for dome strainer setting.

(6) Four cast iron lugs lock dome strainer to sump bowl.

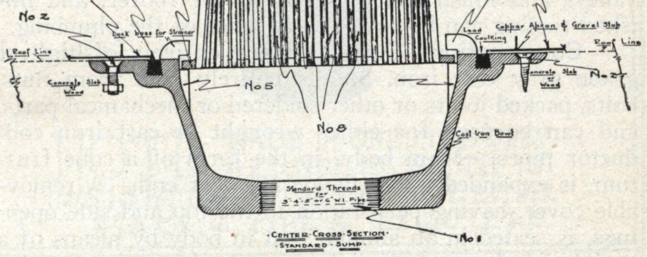
(7) Dome strainer seat is provided with four slotted openings to fit lugs (explained in 6) permitting strainer to set on shoulders described in 5. Rotating strainer to right or left will automatically lock it in place.

(8) Total area of openings in strainer are approximately three times the area of 6-in. conductor, insuring full capacity of drains.

Openings in lower portion of strainer are small enough to protect drain system from loose gravel or small particles.



Mahon Cast Iron Roof Sump


Removable Dome Strainer
No 7
No 3
No 4
No 2
Lock boss for Strainer
Roof Line
Concrete Slab or Wood
No 6
No 4
Lead Caulking
Copper Apron & Gravel Stop
Roof Line
Concrete Slab or Wood
No 2
No 5
No 8
Cast Iron Bowl
Standard Threads for 3"-4"-5" or 6" W.I. Pipe
No 1
·Center·Cross·Section·
·Standard·Sump·

Detail of Mahon Cast Iron Roof Sump

THE RILE COMPANY, INC.

Manufacturers of Roof and Floor Sumps

247 McDougall Avenue
DETROIT, MICH.

Products

Roof and Floor Sumps.

Introduction

There has been a long-felt want among architects and engineers for a more lasting, permanent connection between roof and rain leaders, than that afforded by ordinary sheet metal. The integrity of any roof is restricted to the duration of its materials, for no roof can be stronger than the connections between roofing and rain leaders.

Roof Sump

Description—The Rile roof sump is an efficient, non-freezing, permanent rain conductor roof connection, forming a part of the general roof construction. It will effectively exclude foreign matter from the eduction or leader pipe.

Made of cast iron, the Rile roof sump is standard with many of the best architects and engineers for all classes of buildings and the various types of roof construction, including concrete, wood, book tile, hollow tile, gypsum roof tile, Federal tile, American tile, Truscon tile, or Hy-Rib.

Advantages—The Rile roof sump can not be readily broken, or stopped up, and is always accessible for cleaning.

Costs no more than the old soldered sheet metal types. Tapped for 4, 5, and 6-in. soil or wrought iron pipe.

The action of steam or sewer gases leaking through the drainage system and vented through the rain leaders has no effect on the Rile roof sump.

There are no soldering acids to cause trouble; no breaking of joints by expansion, contraction and buckling.

It will outlast the average roofing materials and is in position for the renewal of roofing or plumbing connections.

The use of Rile roof sumps effects a saving of from 3 to 6 weeks' time in the completion of every concrete structure in which they are used. By simply screwing a nipple and elbow to base of sump with a temporary pipe to discharge water outside of the building, sumps are ready for service the minute the structural roof slab is in place. Until such time as centering can be removed, to allow plumber to extend conductors and connect same, the lower stories are kept dry for flooring, the roof valleys and finish can be prepared for roofer, and finished roofing can be placed in advance of the plumbing.

Construction—Sump is made entirely of highest grade gray cast iron, and is entirely free from nuts, bolts, packed joints or other soldered or mechanical parts, and can be used for either wrought or cast iron conductor pipes. Main body, in the form of a cone frustum, is expanded into a flange at upper end. A removable cover, having perforation in the top and side openings, is seated in an annular seat in body by means of a peripheral flange. Bottom of body is screw-threaded to connect the cast or wrought iron eduction pipe.

Within the body is placed a removable catchbasin with integral perforated standpipe. Over the top of the catchbasin is placed a strainer, having perforations arranged radially and increasing in size toward the periphery, so that bulk of water and any foreign substance will pass downwardly (if at all) between the walls of catchbasin and the walls of standpipe strainer, and any foreign substances be retained in catchbasin.

Operation—The coarser foreign substances will be kept out by the cap. Smaller particles which may pass through the cap will be stopped by the strainer. Still finer sediment will be arrested and held in catchbasin.

Sump is readily cleaned by removing cap, strainer and catchbasin.

Installation—In order to properly secure sump to roofing so as to form a perfectly tight and strong joint, there is provided in upper flange of the body an annular dovetail groove, into which the inner circular edge of flashing plate is placed, by being flanged downwardly and inwardly. Dovetail groove is then filled with molten lead and calked, forming a perfectly tight, strong and permanent joint.

This means of securing the roofing metal work or flashing to sump is an important feature, as well as the general design of main body containing catchbasin, strainers, etc., in which the major portion of sump is suspended below the roof and subject to action of dissipated heat units within building, thus insuring its non-freezing qualities—an important factor in the design of buildings containing high tension electrical generating and transmission apparatus.

Specifications—Contractor for plumbing (or roofing) will furnish and place as indicated on drawings (location of sumps should be indicated on architect's working drawings), or as required (state number required 4, 5, or 6 in.) standard cast iron Rile roof sumps (The Rile Company, Inc., 247 McDougall Avenue, Detroit, Mich.). Plumber to pour and calk final lead joint between flashings and sumps. Flashings to be provided and applied by contractor for roofing.

New Floor Sump

For use with any type of flooring—wood, plastic or cement. Dimensions: Body 11½ in. deep over all; tapped 4 in. only; top member round, 17-in. diameter, with cupped edge and heavy standing flange with 6 weep holes for seepage into sump.

Shipped with regular pot and flat strainers and a *heavy* flat top strainer. (Three strainers.)

Ideal for laboratory, laundry and washroom floors.

References

Recent installations and orders:

United States Government
Aviation Dept. U. S. Army
United States Warehouses
Great Lakes Shipbuilding Co.
Cincinnati Milling Machine Co.
United States Tire Corporation
Geo. A. Fuller Construction Co.
Stone & Webster Corporation
Lincoln Motor Co.
Lockwood, Greene & Co.
Corn Products Co.
Solvay Process Co.
Ontario Power Co.
Canadian Steel Corporation
General Electric Co.
Packard Motor Car Co.
Leonard Construction Co.
Ford Motor Co.
Dodge Brothers (Motor Cars)
Cadillac Motor Car Co.

And scores of other leading engineers and builders.

Continued on next page

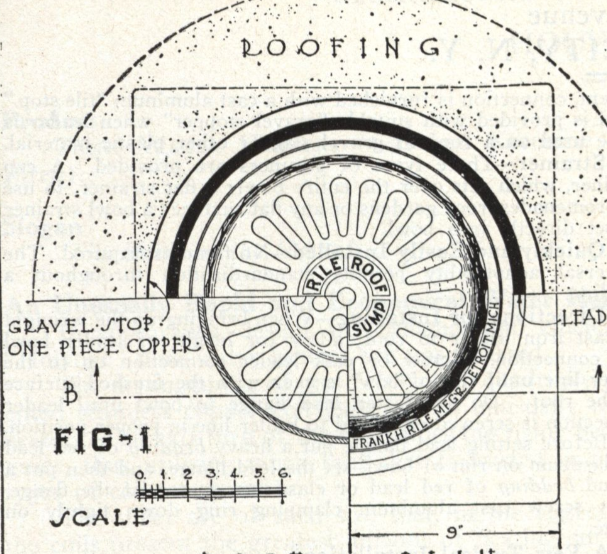

ROOFING
RILE ROOF SUMP
FRANK H RILE MFG'R DETROIT MICH
LEAD CAULKED JOINT
GRAVEL STOP ONE PIECE COPPER
B
B
0 1 2 3 4 5 6
SCALE
9"

FIG-1

ROOF PLAN

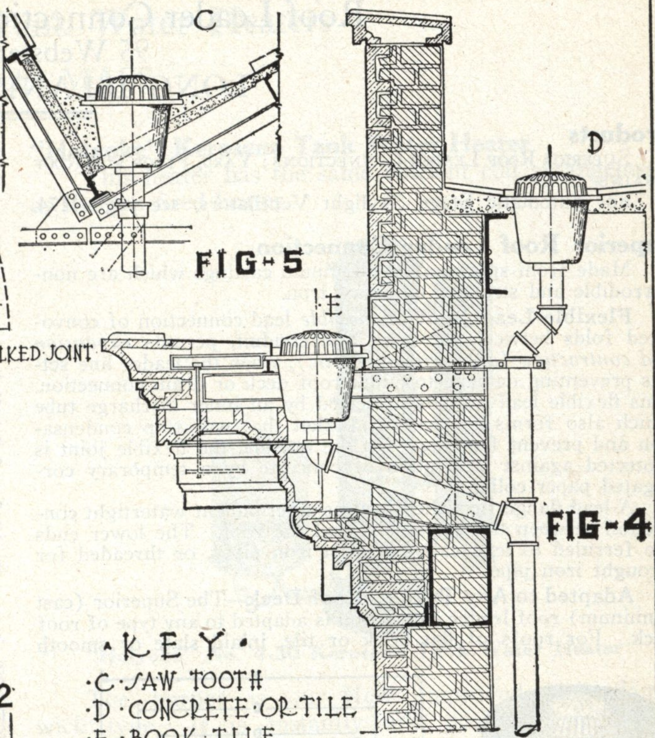


FIG-5

FIG-4

·KEY·
·C·SAW TOOTH
·D· CONCRETE OR TILE
·E· BOOK TILE
·F· CEMENT TILE

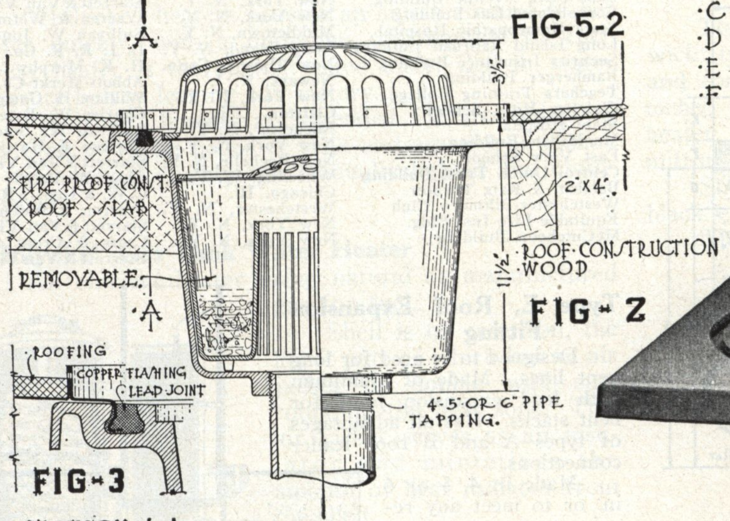

A
3½"
FIRE PROOF CONS'T. ROOF SLAB
REMOVABLE
A
2"x4"
ROOF CONSTRUCTION WOOD
11½"
4" 5" OR 6" PIPE TAPPING.
ROOFING
COPPER FLASHING
LEAD JOINT

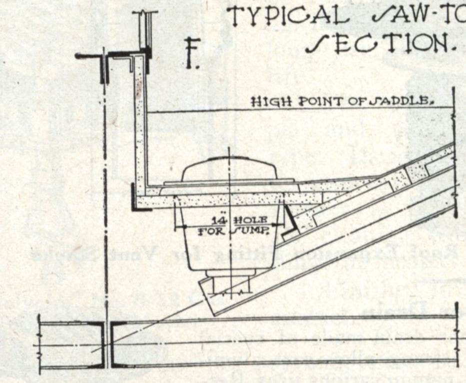
FIG-5-2

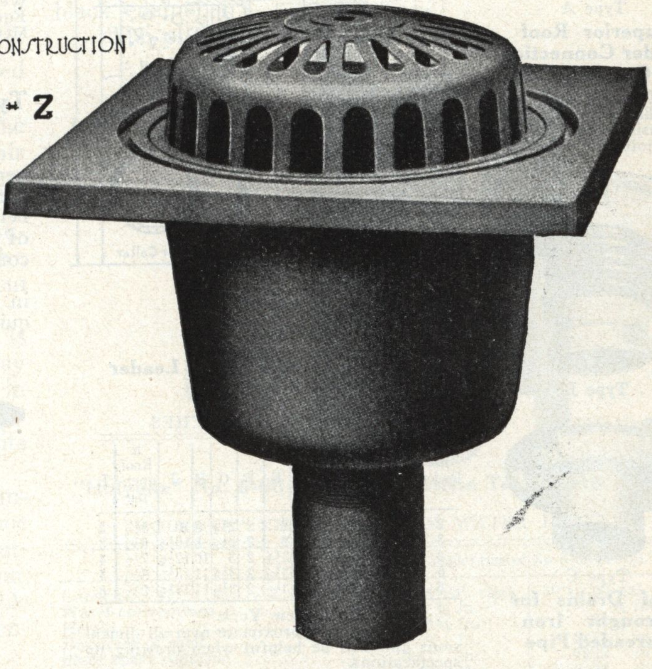
FIG-Z

FIG-3

SECTION-A-A

CEMENT TILE.
TYPICAL SAW-TOOTH
SECTION.


F.
HIGH POINT OF SADDLE.
14" HOLE FOR SUMP.



NOTE-MADE IN ONE SIZE ONLY
HEIGHT 15", WIDTH 18"
WEIGHT 100# TAPPED FOR EITHER
4", 5" OR 6" PIPE AS REQUIRED.

DRAWN FOR
THE RILE
COMPANY, INC.

METHODS OF INSTALLATION AND DETAILS OF RILE ROOF SUMPS

SHEET NO. 1
SCALE 3/8", 1½" & 3"
EQUALS 1'-0"

SUPERIOR SKYLIGHT COMPANY, INC.

Roof Leader Connections and Floor Drains

95 Webster Avenue
LONG ISLAND CITY, N. Y.

Products

Superior Roof Leader Connections; Yard, Floor and Roof Drains.

For automatic Stage Skylight Ventilators, see page 1174.

Superior Roof Leader Connection

Made from special alloy aluminum castings which are non-corrodible and stronger than cast iron.

Flexible Lead Joint—A *flexible* lead connection of convoluted folds between the bowl and conduit, permits *expansion and contraction* (*approximately 3 in.*), when the leader line settles preventing damage to either roof deck or drain connection. This flexible lead joint is protected by an inner discharge tube which also forms a warm air pocket that will stop condensation and prevent freezing. On the outside, the flexible joint is protected against infiltration of concrete by a temporary corrugated paper collar.

A lead flange furnished insures a permanent watertight connection between the leader box and the roof. The lower ends are ferruled to lead calk into cast iron pipes, or threaded for wrought iron pipe.

Adapted to Any Type of Roof Deck—The Superior (cast aluminum) roof leader connection is adapted to any type of roof deck. For roofs of flat brick or tile, inlaid slate or smooth cement, connection is furnished with a cast aluminum "tile stop." Bowl is provided with suitable "gravel stopper" when leader is to be used on a roof of gravel slag or other plastic material.

Strainer—Three types of strainers are provided. A cap strainer, which sets over the entire bowl; a flat strainer, to use on promenades, roof gardens or any flat surface; a bowl strainer to set directly into bowl.

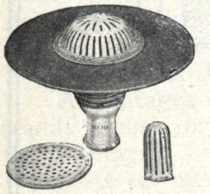
Quickly and Easily Installed—No fitments required. The universal adaptability permits standardization throughout a building.

Directions for Installing—When bringing up the wrought or cast iron leader to roof, allow for height of leader bowl and connection. Screw or calk leader connection on to the leader line until rim of bowl is even with the finished surface of the roof. Do not fasten lead flange to bowl until leader connection is screwed or calked to leader line in proper position.

Before setting lead flange, put a heavy *bedding* of red lead or elasticum on rim of bowl, set the lead flange, and then put a second *bedding* of red lead or elasticum on top of the flange. Then screw cast aluminum clamping ring down tightly on flange.

A Few Typical Installations—

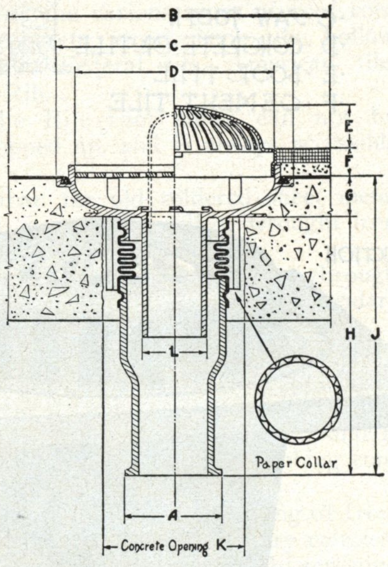
Building	Location	Architect
American Locomotive Building	Schenectady, N. Y.	R. G. White, Engineer
Saks Fifth Avenue Building	New York, N. Y.	Starrett & Van Vleck
Consolidated Gas Building	New York, N. Y.	Warren & Wetmore
State Homeopathic Hospital	Middletown, N. Y.	Sullivan W. Jones
Long Island Railroad Building	Long Island, N. Y.	L. I. R. R. Co.
Security Insurance Building	New Haven, Conn.	H. K. Murphy
Bamberger Building	Newark, N. J.	Abbott-Merkt Co.
Teachers Training College	New York, N. Y.	William H. Gompert
Clairton High School	Clairton, Ohio	Charles W. Bates
State Hospital	Rochester, N. Y.	Sullivan W. Jones
MacMillan Building	New York, N. Y.	Carrere & Hastings
East View School	New Rochelle, N. Y.	Starrett & Van Vleck
Central Union Trust Building	Wheeling, W. Va.	Chas. W. Bates
Balaban & Katz Theater	Chicago, Ill.	C. W. & Geo. L. Rapp
Westchester-Biltmore Club	Westchester, N. Y.	Warren & Wetmore
Equitable Life Ins. Bldg.	New York, N. Y.	Starrett & Van Vleck
McCutcheon Building	New York, N. Y.	Cross & Cross and Starrett & Van Vleck



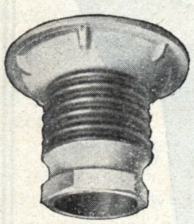
Type A

Superior Roof Leader Connection for Cast Iron Pipe

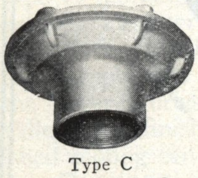
The only roof drain that has a flexible lead expansion and contraction joint



Detail of Superior Roof Leader Connection



Type B



Type C

Roof Drains for Wrought Iron Threaded Pipe

DIMENSIONS IN INCHES

Size leader	A	B	C	D	E	F	G	H	J	K Roof opening	L
2	2	13½	8½	7½	2	2	2½	8	10	5½	2
3	3	13½	8½	8	2	2	2½	8	10½	6½	3
4	4	19	12¼	11	3½	2	3	10	12½	7½	4
5	5	20	13¼	12	3½	2	3½	11	13½	8½	5
6	6	20½	13¾	12½	3½	2	3½	11	14½	9½	6

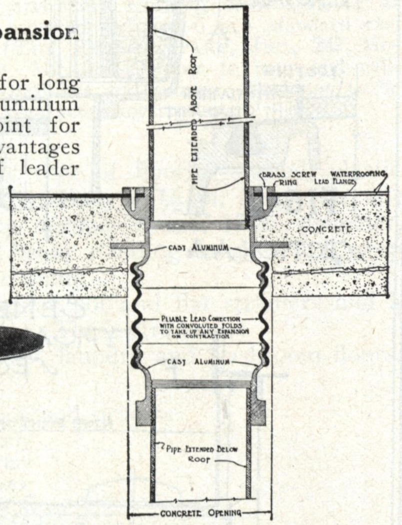
Prices f.o.b. New York.

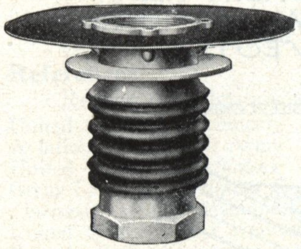
Table gives approximate over-all dimensions and will be helpful when drawing up specifications.

Type E, Roof Expansion Fitting

Designed to be used for long vent lines. Made of aluminum with lead expansion joint for bent stacks. Has all advantages of types A and B roof leader connections.

Made in 4, 5 or 6 in. or to meet any requirements.

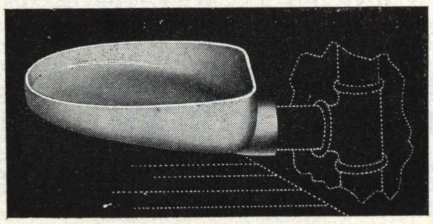




Type E Roof Expansion Fitting for Vent Stacks

Type G, Ice Box Drip Pan Floor Drain

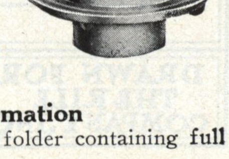
Sanitary cast aluminum icebox drip pan; sets above floor; effects cleanliness—drains into drip pipe; does not attract vermin.



Type F, Floor Drain

A small floor drain made of special strong alloy cast aluminum in various sizes. Recommended for shower baths and promenades.

SAMPLES
DISPLAYED
WITH
ARCHITECTS SAMPLES
CORPORATION
NEW YORK, N.Y.
EST. 1913



Catalogues and Information

Write for our latest folder containing full details and information.

HOLYOKE HEATER COMPANY

Manufacturers of Tank Water Heaters

HOLYOKE, MASS.

Product

Tank Water Heaters (Gas and Kerosene Oil Fired).

Slogan

"The Heart of the Home."

An Unusually Rapid and Economical Water Heater

In appearance, design, performance and efficiency, "Holyoke" tank water heaters are unsurpassed.

The arrangement of the "Holyoke" quadruple patented seamless copper coil makes it an unusually rapid heater. The half turn of the coil baffles the rising heated gases, thus utilizing much heat that is wasted in other types of coil construction.

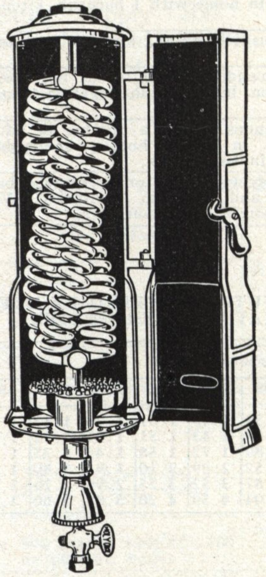
The tubes are of such size that, in the aggregate, the coils present the greatest amount of heating surface to a given volume of water passing through them. Each of the 4 tubes is $\frac{7}{16}$ in. in diameter with a total of 30 ft. of tubing per coil.

"Holyoke" heaters provide an ample amount of hot water quickly, with a minimum consumption of fuel. Every heater is thoroughly tested under 250 lb. water pressure before leaving our factory.

"Holyoke" heaters are intended for attachment to any type of range boiler or tank and are non-automatic in operation, i. e., they are manually lighted and extinquished.

"Holyoke" Gas Tank Water Heater

An efficient heater using natural or manufactured gas for fuel.



"Holyoke" No. 6-32 Gas Tank Water Heater

Shell is of cast iron, the lower part of which has an air jacket or double wall surrounding the heat zone. This air jacket serves as an insulator and minimizes the amount of heat radiated from the shell.

The "Holyoke" coil is reversible, that is, it may be removed and replaced in an inverted position after long use, thus doubling its life.

The burner is of the simple and efficient horseshoe type. Its adjustable air shutter insures perfect combustion. Burner is readily removable for cleaning without dismantling the heater.

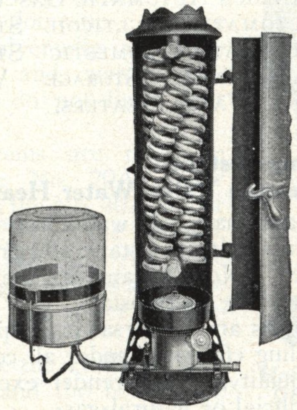
Finished in durable black enamel.

"HOLYOKE" NO. 6-32 GAS FIRED HEATER

Capacity	30 to 60-gal. tank
Water connections	¾ in.
Gas connections	½ in.
Height	24½ in.
Diameter of shell	8 in.
Net weight	41 lb.
Shipping weight	48 lb.

"Holyoke" Kerosene Tank Water Heater

This heater has the same efficient coil arrangement as the gas fired heater.

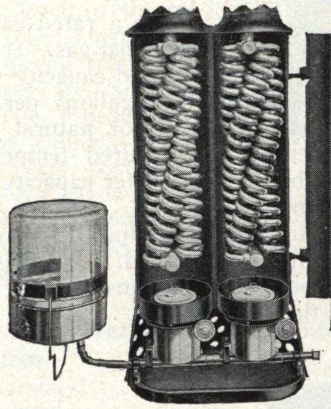


"Holyoke" No. 4-30 Kerosene Tank Water Heater

The burner is our New Improved blue flame wick type. It is instantly and positively regulated and combustion is practically odorless. Burner is attached to a removable cast iron plate supported by the heater back and held in place by a small screw, permitting easy removal for cleaning purposes.

Shell is of cast iron, attractively finished in durable black enamel.

The oil reservoir holds 9 pints.



"Holyoke" No. 5-60 (Twin) Kerosene Tank Water Heater

"HOLYOKE" KEROSENE TANK WATER HEATERS

	No. 2-32 (Single) Heater	No. 3-64 (Twin) Heater
Capacity	20 to 40-gal. tank	30 to 60-gal. tank
Water connections	¾ in.	¾ in.
Height	28¼ in.	28¼ in.
Diameter of shell	6 in.	6x12 in.
Floor space required	9x17 in.	9x22 in.
Net weight	40 lb.	75 lb.
Shipping weight	55 lb.	90 lb.

Guarantee

We guarantee that the "Holyoke" water heater, when installed and used in accordance with our printed instructions, will perform the work for which it is intended, and if any parts prove defective within one year from date of purchase, such parts will be repaired or replaced free of charge.

THE HOFFMAN HEATER COMPANY

Gas Water Heaters

1701-1715 Eighteenth Street
LOUISVILLE, KY.

Products

Instantaneous Automatic Gas Water Heaters; Automatic Multicoil Storage Systems; Automatic Domestic Storage Systems; Automatic Storage Water Heaters; Tank Water Heaters.

JUST TURN THE FAUCET GET HOFFMAN HOT WATER
HOFFMAN
Means Instant Hot Water

TRADE-MARK

Automatic Thermostatic and Pressure Valve Water Heaters

Hoffman automatic gas water heaters are made in two classes: thermostatic and pressure valve controlled. Nos. 35 and 45 are pressure valve type. All others are thermostatic.

These heaters are universal in adaptability, operating with unfailing efficiency under all conditions of gas pressure and quality. They render exceptional service with either artificial or natural gas.

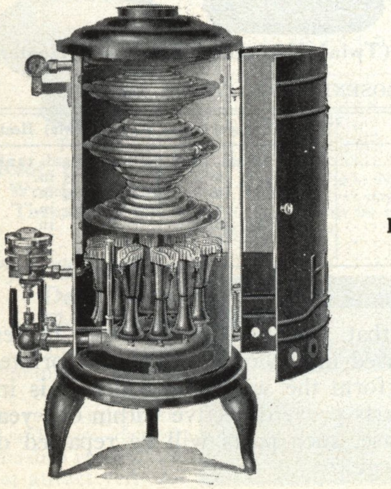
These heaters have very few parts and both types have the advantage of many exclusive inventions.

Selecting the Right Size—If the required gallonage and temperature both be known, the proper instantaneous automatic heater may be determined by multiplying the wanted temperature rise by the required gallonage, dividing the product by 63 for artificial gas or by 80 for natural gas, and the quotient will indicate the proper heater.

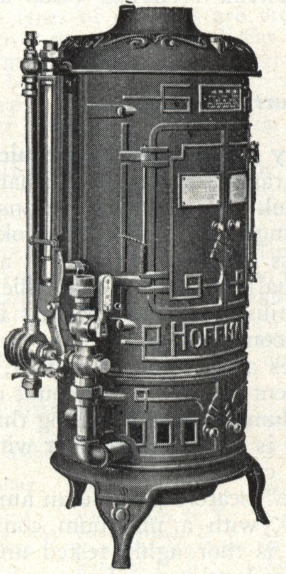
Select the heater numbered next higher than the result (note tables opposite).

The No. 4-H Hoffman has a rated capacity of 4 gal. per min. at 63° rise on artificial gas. If the desired temperature exceeds 63° the rated capacity will be less. Multiply the rated capacity in gallons per minute by 63 for artificial gas or by 80 for natural gas. Then divide the product by the required temperature rise. The quotient will be the rate heater capacity per minute at the desired temperature.

Determine total flow by adding delivery in gallons per minute of fixtures to be served. Determine temperature rise by subtracting temperature of cold water from that required of the hot water.



Hoffman No. 45 Small Home Water Heater



Hoffman Instantaneous Automatic Water Heater

RECOMMENDED SIZES OF HOFFMAN HEATERS

Heater No.	Gal. per min.	Requirements
35	2+	Suitable for cottage or bungalow with kitchen and bath.
45	2½	For adequate service in home with 1 bathtub, kitchen sink and laundry.
3	3	For small residences usually having kitchen, bath and laundry.
4H	4	Used in the average residence with usual hot water equipment in kitchen, bathroom, laundry and 1 extra lavatory.
6H	6	Used in larger residences having a number of bathrooms. Also used in small hotels, semipublic buildings, etc., for limited service.
8H	8	Suitable for large residences with 3 or more baths, butler's pantry, hall and bedroom lavatories. Well adapted for small hotels, restaurants, etc.

CAPACITIES IN GALLONS PER MINUTE DELIVERED BY HOFFMAN INSTANTANEOUS AUTOMATIC WATER HEATERS

Heater Model No.	Degrees of temperature rise										
	50	60	70	80	90	100	110	120	130	140	150
*35	3.15	2.62	2.25	1.97	1.75	1.58	1.43	1.31	1.21	1.12	1.05
*45	3.15	2.62	2.25	1.97	1.75	1.58	1.43	1.31	1.21	1.12	1.05
3	3.78	3.15	2.70	2.36	2.10	1.89	1.72	1.58	1.45	1.35	1.26
4H	5.05	4.20	3.60	3.15	2.80	2.52	2.29	2.10	1.94	1.80	1.68
6H	7.58	6.30	5.40	4.73	4.20	3.87	3.52	3.23	2.98	2.76	2.58
8H	10.10	8.40	7.20	6.30	5.60	5.04	4.59	4.20	3.88	3.60	3.36

*Non-thermostatic water heaters.

SMALL HOME WATER HEATER SPECIFICATIONS

Size No.	Gal. per min.	Temp. rise nat. gas, degrees	Temp. rise art. gas, degrees	Water inlet, in.	Water outlet, in.	Gas inlet, in.	Flue, in.	Gas meter	Gas per min., cu. ft.	Weight, lb.
35	2+	87	70	½	½	¾	5	10 lt. B	2+	120
45	2½	87	70	½	½	1	5	20 lt. B	2½	130

Note: A water pressure at highest faucet of at least 15 lb. per sq. in. is required to enable these heaters to deliver their capacity at that point.

Continued on next page

Automatic Multicoil Storage System

To determine the correct storage installation:

(1) Ascertain the flow per minute of each fixture.

(2) Estimate times per hour each fixture will be used during hour of maximum demand.

(3) Estimate how many minutes each fixture will be used each time.

(4) Multiply flow per minute of each fixture by total minutes fixtures will be in use and add products. The sum will be the hourly demand.

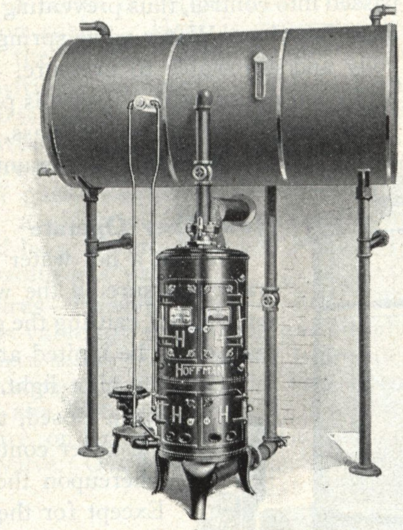
(5) Estimate number of hours maximum demand periods will continue.

(6) Estimate at what intervals maximum demand periods occur.

(7) Estimate hourly demand during intervals between maximum demand periods.

(8) Specify a system having a potential rated capacity sufficient for the maximum demand period and the rated capacity of which is sufficient for the minimum demand periods and to heat, during the intervals between maximum demand periods, the storage capacity of the tank.

It is recommended that a system with a potential capacity somewhat greater than the maximum demand service be specified. For example, should the maximum demand be 540 gal. we would recommend the No. 300-250 storage system as it would meet the demand with 250 gal. in the tank and the heater supply 300 gal. additional during the first hour and another 300 gal. during the second hour.



Hoffman Automatic Multicoil Storage System

Assembled and installed, fitted with thermostatic valve, circulators, etc.

SIZES OF HOFFMAN MULTICOIL STORAGE SYSTEMS

Size System	Requirements
No. 100 heater, with 100 or 150-gal. boiler	Residences having 3 to 5 bathrooms, bedroom lavatories, large kitchen sink, pantry sink and laundry. Apartment buildings with 6 apartments of 4 or 5 rooms each.
No. 200 heater, with 150, 200 or 250-gal. boiler	Residences having 5 to 8 bathrooms, large kitchen sink, dishwashing machine, large laundry. Apartment buildings having 6 to 12 apartments of 5 or 6 rooms each.
No. 300 heater, with 200, 250, 300 or 375-gal. boiler	Residences having 7 to 10 bathrooms, large kitchen sink, pantry sink, dishwashing machines, large laundry. Apartment buildings having 10 to 18 apartments of 5 or 6 rooms each.
No. 500 heater, with 425, 500 or 600-gal. boiler	Apartment buildings having 20 to 30 apartments of 5, 6 or 7 rooms each. Very large homes. 40 to 60-room hotels.

Rated capacities apply to heaters only and not to the storage tanks.

By careful combining of heaters and tanks it is possible to deliver a much greater capacity per hour than the heater's rated capacity.

Please refer to your copy of the Hoffman Data Book. If you have not a copy, please ask for one.

Hoffman Automatic Domestic Storage Systems

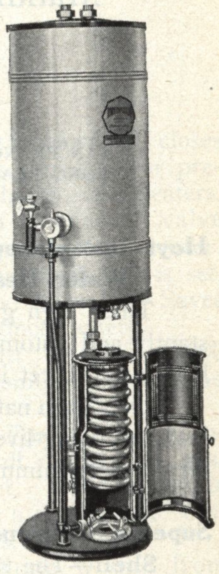
These systems are similar in principle of operation to Hoffman automatic multicoil storage systems. They maintain a fixed water temperature in the tank by a thermostatic control of the heating unit. They were designed to meet the requirements of the home where lower first cost and minimum operating expense are factors of vital importance.

Hoffman domestic storage systems are universally adaptable since low gas and water pressure conditions do not limit their use.

These systems are made in three sizes—the No. 20A, boiler capacity 20 gal.; the No. 40A, boiler capacity 40 gal.; and the No. 66, boiler capacity 66 gal. All three operate on 10-light meters and have ¾-in. cold and hot water connections.

Heaters are the Hoffman high efficiency type and the boilers are extra heavy and insulated with 1-in. hair felt, covered with a beautiful gray enameled jacket.

Made also in all-copper models.

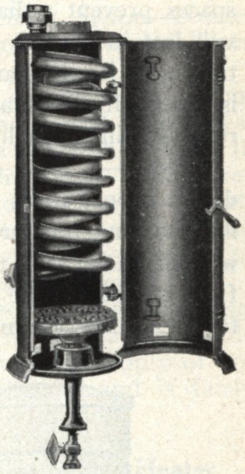


Hoffman Automatic Domestic Storage System

Hoffman Tank Water Heaters

Made in two sizes and in two finishes—have been as expertly designed and made as any other heater bearing the Hoffman name. Each of the models includes all the latest improvements and special features.

The sizes are No. 30 and No. 99. The finishes are jet black, baked enamel, and gray genuine vitreous porcelain enamel. The No. 30 is for tanks from 30 to 40-gal. and the No. 99 is for use with tanks from 40 to 66-gal. capacity.



Hoffman Tank Water Heater

Estimated Hot Water Requirements for Various Fixtures

Bathtub and lavatory	20 gal.
Shower: 4-in. head	2⅔ gal. per min.
6-in. head	4 gal. per min.
8-in. head	5⅓ gal. per min.
Kitchen sink	15 gal.
Butler's pantry	5 gal.
Slop sink	10 gal.

Shower heads will pass 1 gal. per inch of diameter.

The length of time showers are in use in residences varies from 5 to 15 minutes.

The average time showers are in use in public baths, gymnasiums and clubs is 20 minutes.

One 3-part laundry tray requires 15 gal. per compartment. Usually two compartments are in use for hot water at one time.

Inquiries

We invite inquiries, technical or otherwise, concerning any of the Hoffman line of gas water heaters.

HOYT HEATER CO.

Manufacturers of Instantaneous Automatic Gas Fired Water Heaters

2146 East 25th Street
LOS ANGELES, CAL.

BRANCH OFFICES

SAN FRANCISCO, CAL., 285 O'Farrell Street
LONG BEACH, CAL., 116 Locust Street
PORTLAND, ORE., 53 Fourth Street
OAKLAND, CAL., 4401 East 10th Street
SAN DIEGO, CAL., 121 Broadway

Hoyt Instantaneous Automatic Gas Fired Water Heaters

These high grade, dependable heaters instantly and automatically supply hot water whenever a hot water faucet is opened.

They burn natural or artificial gas, are simple, easily installed, long-lived and designed to give maximum service with minimum fuel consumption.

Superior Construction

Shell—The shell is double-walled, the outer shell being half-hard polished No. 20 gauge sheet aluminum and the inner shell being Bethlehem open hearth cold-rolled sheet steel. The inner and outer dead air spaces prevent radiation and the shell will last indefinitely because condensation, with its resultant acid formations, is practically eliminated. Shell may be removed simply by lifting.

Coils—Consist of three seamlessly drawn copper tubes tested to 250 lbs. working pressure. They are wound so as to baffle the rising heat from one coil to the other. Practically no lime accumulates in coils because the method used in heating the water prevents excessive temperature. Ground joint connections allow each coil to be removed separately.

Hoyt Automatic WATER ~ HEATER

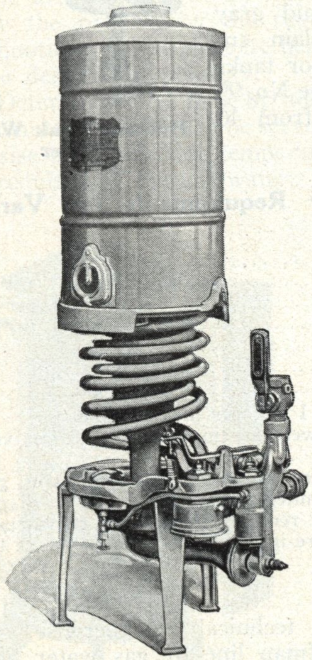
Burners—Single cast iron Bunsen type. Direct flame. Burner screen easily dust cleaned without removing. Burner removable by loosening three wing-nut bolts and dropping down.

Water Pressure Control Valve—Water is bypassed into control, thus preventing accumulation of sediment in valve. Water valve spring is outside of control body and adjustable to pressure. Spring not being in water can not corrode. Piston is packed with non-swelling packing. Valve body of brass.

Finish—Aluminum.

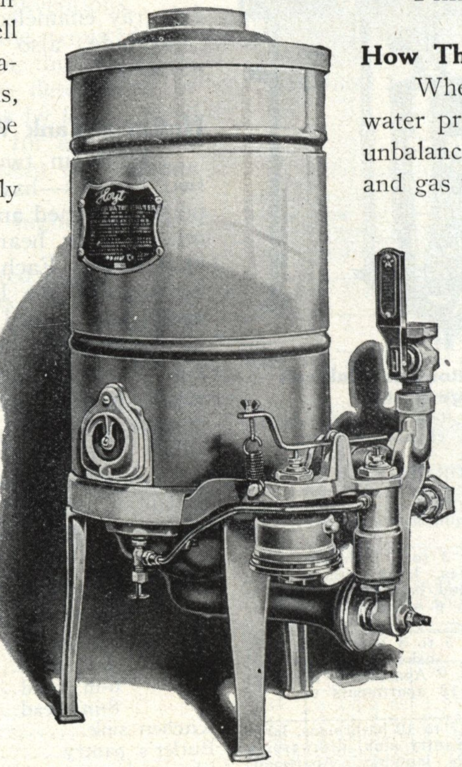
How They Operate

When a hot water faucet is opened, the water pressure in the water control valve is unbalanced, causing the gas valve to be opened and gas to be ignited at the main burners by the pilot light. When the faucet is again closed, the water pressure in the water control valve is balanced, whereupon the gas valve is closed. Except for the small pilot light, gas is only burned while faucets are open. A leaking faucet will not open the water control valve.



Floor Type Model 30

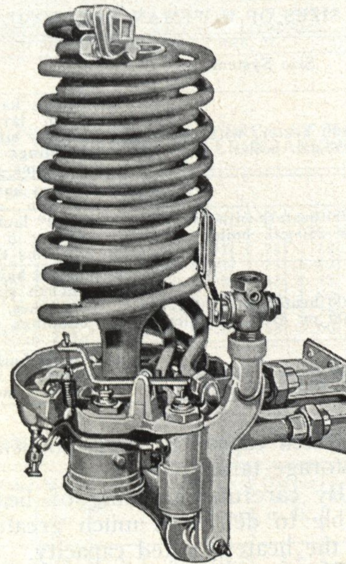
Showing removal of the shell, which permits of easy access to burner and coils



New Model 30 Aluminum Jacket

SPECIFICATIONS

Capacity, per minute	2 to 2½ gal.
Height, over all:	
On legs	30 in.
Wall type	26 in.
Diameter of heater:	
Heater proper	11 in.
Additional for automatic valve	5 in.
Hot and cold water pipes	½ in.
Gas line from meter to heater:	
30 ft. or less	1 in.
Over 30 ft.	1¼ in.
Gas connection at heater	¾ in.
Size of meter	20 lt.
Vent (center), inside area	12½ sq. in.
Weight:	
Shipping	80 lb.
Net	66 lb.



Wall Type Model 30 with Shell Removed

Note the sturdy bracket construction and the simplicity of the working parts

HUMPHREY COMPANY

DIV. RUUD MFG. CO.

Manufacturers of Gas Water Heaters

KALAMAZOO, MICH.

Products

Humphrey Gas Water Heaters: Type A Automatic Water Heaters, 6 sizes; Cottage Automatic Water Heaters; Nos. 20 and 25 Automatic Water Heaters; Multicoil Automatic Storage Systems; Junior Automatic Storage Systems; Acme Automatic Storage Systems; Copper Coil Tank Water Heaters; Instantaneous Bath Water Heaters.

Also Shower Bath Water Heaters.

Humphrey Automatic Gas Water Heater—Type A

This type of heater is designed to automatically supply hot water at any predetermined temperature. Water is heated in a series of copper coils enclosed in a double cast iron casing. Heat is generated by Bunsen burners at the bottom of the heater.

Operation—Positively automatic. Simply turning on a faucet starts water flowing through heater and turns on gas which is ignited by a pilot light; hot water is delivered at faucet instantly. Turning off faucet shuts off gas. Requires minimum water pressure of 20 lb. at highest faucet. Temperature of water is regulated by a thermo valve or "secondary" control through separate gas valve.

Special Features—*Primary Control*—An automatic water and gas valve for controlling gas supply. Consists of a two-piece safety piston, which is operated by pressure of incoming water which in turn opens gas valve. When any hot water faucet is opened the resulting pressure on water end of piston simultaneously opens gas valve. Gas flows to burners where it is ignited by pilot light. Closing faucet automatically closes gas valve. An adjustable by-pass is provided for preventing overheating of water in non-thermostatic heaters.

Secondary Control—Consists of a thermo valve for automatically controlling temperature of water. When water reaches temperature for which this is set, the gas supply is regulated by a second gas valve. Saves gas, prevents overheating, insures utmost safety.

Bunsen Burners—Specially built to give 100% heat from gas burned. Are very simple and can be readily cleaned.

Patented "Flash" Pilot Light—For lighting burners. Ordinarily burns a very small amount of gas. Gives a 2-in. flash at turn of faucet. When faucet is turned off, pilot light again becomes a tiny spark. Can not blow out. Adjustable. Saves gas.

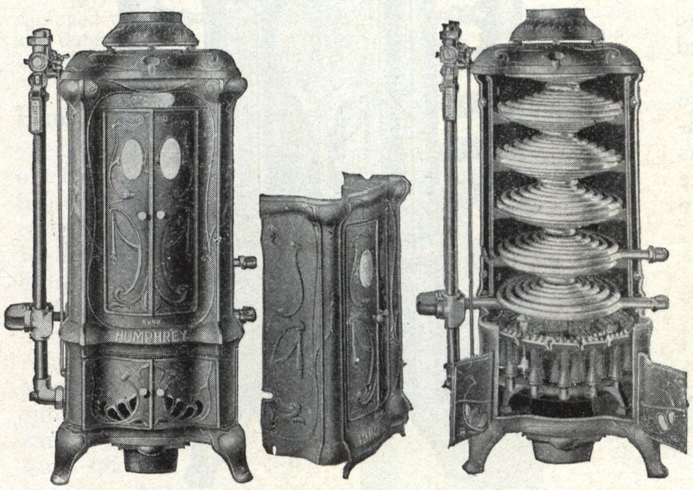
Copper Coils—Accurately machine wound from seamless copper tubing, tested to 600 lb. per sq. in. Lower section is made heavier, and is easily removable for cleaning or replacement. No. 17 gauge tubing is used.

Methods of Installation—*Direct System*—Heater is direct connected to cold water main and delivers hot water to hot water piping system.

Re-heating System—Heater draws water from tank and delivers hot water to hot water piping system. Water in tank is usually warmer than water in main, due to standing in heater room. This saves gas. Tank may be connected to furnace by a heating coil. When furnace is in use, less gas is required to heat water to proper point, due to regulation of gas supply by secondary thermostatic control.

This system is recommended wherever possible.

Uses—This type of heater is especially suitable for use in systems where an abundant supply of hot water is required and where the demand is fairly uniform.



Automatic Gas Water Heater, Type A

Heater No.	Height, in.	Diam. shell only, in.	Diam. shell including valve, in.	Diam. copper coils, in.	Length copper coils, ft.	Size flue pipe, in.	Number burners	Gas supply from meter, in.	Size gas meter, lights	Gas consumed per min., cu. ft.	Heats per min. 63° raise, gal.	Supply home with not more than	Net weight, lb.	Approx. shipping weight, lb.
20A	38½	13	19	⅝	60	4	9	¾	10	2	2	2 faucets	185	220
25A	41½	15⅛	22⅝	⅝	70	4	11	1	20	2½	2½	3 faucets	217	264
3A	44	16	25½	¾	74	5	12	1	20	3	3	3 faucets	220	295
4A	47	20	28½	¾	100	6	16	1	30	4	4	8 faucets	266	350
6A	52	22	32	⅞	124	6½	24	1½	45	6	6	14 faucets	394	490
8A	59	25	35½	⅞	156	8	32	2	60	8	8	22 faucets	452	580

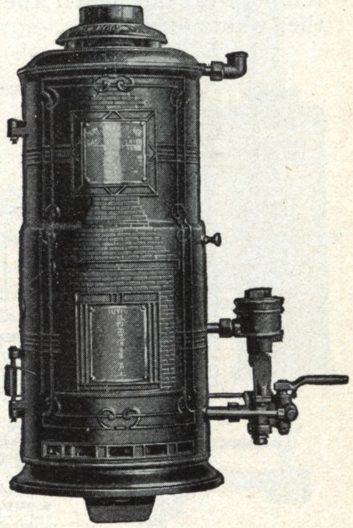
Humphrey Cottage Automatic Gas Water Heater

This type is similar in construction to Type A heater but is smaller in capacity. It is designed for cottages, bungalows, small homes, doctors' and dentists' offices, soda fountains, apartment houses where one heater is provided for each apartment, etc.

No. 50 Humphrey cottage automatic gas water heater has an olive green enameled jacket of pleasing design.

Delivery capacity, 2 gal. per minute.

All standard Humphrey features are embodied in this automatic instantaneous heater.



Cottage Automatic Gas Water Heater

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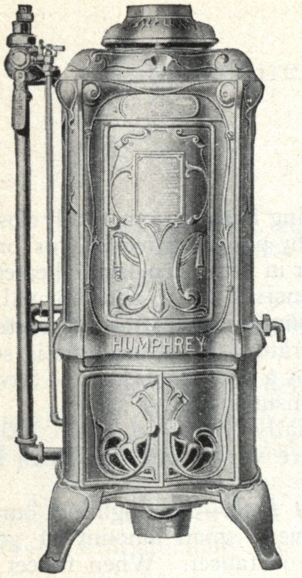


Nos. 20 and 25 Automatic Water Heaters

Humphrey Nos. 20 and 25 Automatic Gas Water Heaters

Identical with the Type A heater in design and operation, except for the thermo valve or secondary control.

Where the demands for hot water are comparatively light this type is recommended because of its lower first cost and efficient, inexpensive service.

No. 20 has a capacity of 2 gal. per minute, No. 25, 2½ gal. per minute.

By-pass temperature regulator assures safety and economy.

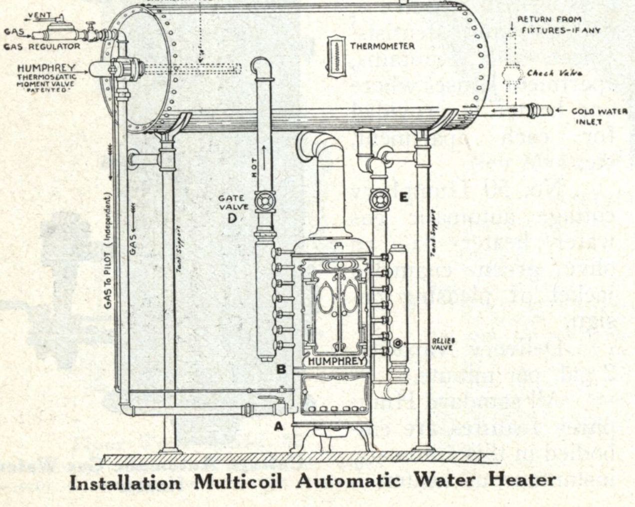
HUMPHREY NOS. 20 AND 25 AUTOMATIC GAS WATER HEATERS

Heater No.	Height, in.	Diam. shell only, in.	Diam. shell including valve in.	Diam. copper coil, in.	Length copper coil. ft.	Size flue pipe, in.	Number burners	Gas supply from meter, in.	Size gas meter, lights	Gas consumed per min., cu. ft.	Heats per min. 63° raise, gal.	Supply home with not more than	Net weight, lb.	Approx. shipping weight, lb.
20	38½	13	19	⅝	60	4	9	¾	10	2	2	2 faucets	176	220
25	41½	15⅛	22⅝	⅝	70	4	11	1	20	2½	2½	3 faucets	217	264

Humphrey Multicoil Automatic Storage System

Specially designed to meet heavy duty, periodic, and severe hot water demands, such as occur in apartment houses, hospitals, schools, bathhouses, gymnasiums, large residences, etc. Consists of an automatic gas water heater and an insulated storage tank of sufficient capacity to meet the maximum demand. The heater is built on the same principle as the Type A heater but has more and heavier copper coils, and is equipped with a patented thermostatic moment valve.

By means of this valve the water in the storage tank is kept at a predetermined temperature. Whenever the temperature of the water drops 20° the gas is turned on and burned until the water reaches the temperature at which the valve is set. The valve then shuts off the gas.



Installation Multicoil Automatic Water Heater

GALLONS PER HOUR, DELIVERED BY MULTICOIL STORAGE HEATER

Size of heater	Temperature raise										
	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°
No. 100	126	105	90	78.8	70	63	57.2	52.5	48.4	45	42
No. 200	252	210	180	157.5	140	126	114.5	105	97	90	84
No. 300	378	315	270	236	210	189	172	158	145	135	126
No. 500	630	525	450	394	350	315	287	262	242	225	210

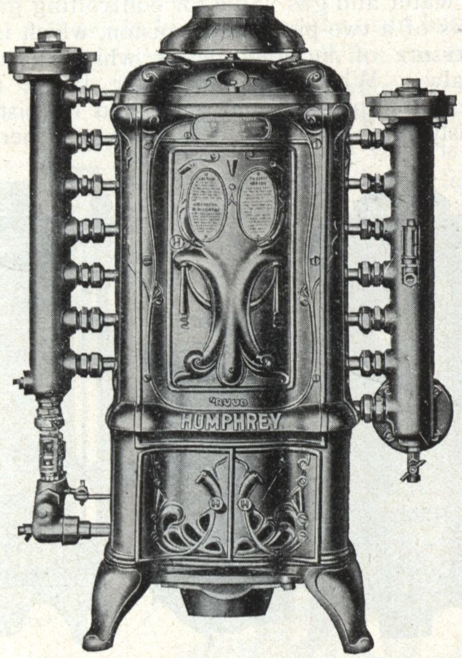
MULTICOIL AUTOMATIC STORAGE SYSTEMS

Heater No.	Height, in.	Diam., in.	Circulators betwe'n boiler and heater, in.	Size gas supply pipe, in.	Size gas meter, lights	Size flue pipe, in.	Size cold water inlet, in.	Use with tanks, gal.	Capacity per hour, gal.
100	39	13	1½	¾	10	4	1	80 to 150	100
200	44	16	2	1	20	5	1	100 to 300	200
300	47	20	2	1	30	6	1¼	200 to 365	300
500	59	25	2½	2	60	8	2	425 to 800	500

SIZES OF MULTICOIL SYSTEMS AND THEIR APPLICATIONS TO VARIOUS CONDITIONS

Size heater	Capacity of tank, gal.	Applications
100	80, 100 or 150	Residences with 2 or 3 baths, 1 shower bath, kitchen, pantry and laundry. Flat buildings with 3 to 6 apartments of 4 to 6 rooms each.
200	100,150,200 250 or 300	Residences with 3 to 6 baths, 1 or 2 showers, kitchen, pantry, laundry, etc. Flat buildings with 6 to 12 apartments, averaging 5 or 6 rooms, kitchen and bath in each. Small hotels with 3 to 5 baths, not more than 10 bedroom lavatories, kitchen, laundry, etc.
300	200, 250, 300 or 365	Residences having 8 to 15 baths, several showers, bedroom lavatories, kitchen, butler's pantry, laundry, etc. Flat buildings having 10 to 18 apartments, averaging 7 rooms and bath. Hotels having 4 to 10 baths, not over 50 bedroom lavatories, kitchen, large laundry, etc. Small gymnasiums, having not more than 10 to 15 hot water outlets and membership of not more than 200.
500	425, 500, 600, 700 or 800	Large hotels, large hospitals, office buildings, bath houses, large gymnasiums and other places requiring immense quantities of hot water.

For multicoil storage systems it is well to submit all data and information to the Humphrey Company for all calculation as to size of heater, storage tank, etc., proper to use.



Multicoil Automatic Gas Water Heater

Humphrey Junior Automatic Storage System

Similar in design to the Multicoil system but smaller. Designed to meet the hot water requirements of places having such gas and water pressure conditions that an instantaneous automatic heater of sufficient size can not be used and where the needs do not require the larger Multicoil system. Consists of an insulated storage tank, removable copper coil heater, and a patented timing moment valve heat control.

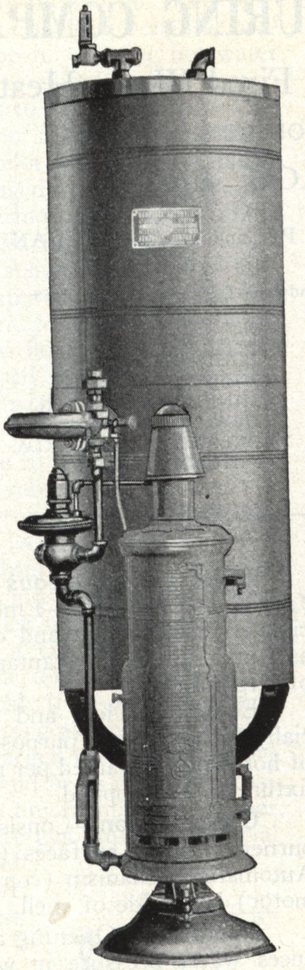
Continued on next page

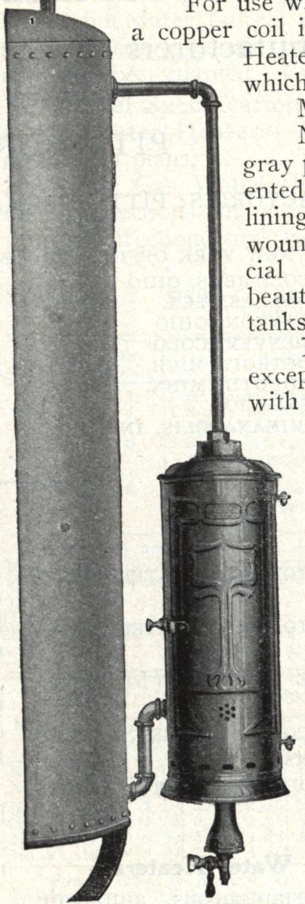
The moment valve control is all metal and is thermostatic in its action. It is called "moment" because it is full on and shuts off in a "moment." When water in the tank has dropped 20° below a set temperature the valve is turned on, allowing the gas to burn and heat the water until set temperature is again gained.

Made in 3 sizes: No. 24 with 24-gal. tank, No. 40 with 40-gal. tank, No. 66 with 66-gal. tank.

Tank is insulated by 1½ in. of granulated cork, firmly tamped, and loss of heat is at a minimum. Tank is constructed of extra heavy galvanized iron or copper. It has $\frac{3}{16}$-in. wall with ¼-in. ends. The shell seam is stitch riveted and copper brazed inside and out.

The Humphrey Dual Duty valve is a built-in feature of all Humphrey Junior storage systems. This late improvement acts in keeping heater coils free of sediment and retarding lime formation from hard water by energetically flushing coils whenever water is replaced in tank. When faucets are closed and no hot water is being drawn, circulation takes place in the usual manner.


Junior Storage System

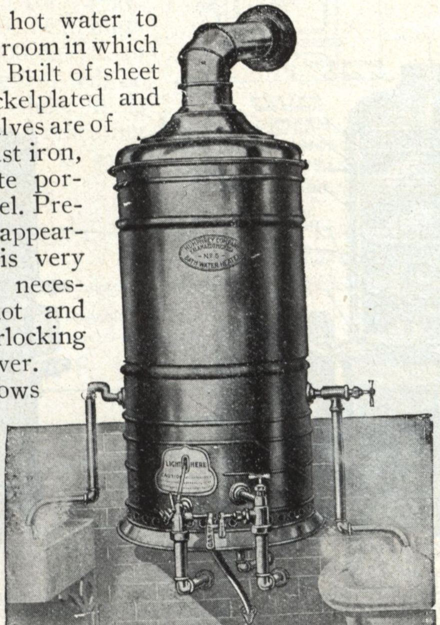

5-R Tank Water Heater

Special: At small additional cost, storage systems may be equipped with the new Humphrey pilot control which eliminates any danger or expense caused by escaping gas, by immediately closing main gas line, should pilot light become extinguished.

Humphrey Instantaneous Bath Water Heater

For supplying hot water to one room only—the room in which heater is installed. Built of sheet copper, heavily nickelplated and highly polished. Valves are of brass, burners of cast iron, and shelf of white porcelain enameled steel. Presents a very fine appearance. Operation is very simple. It is only necessary to light pilot and turn on the interlocking gas and water lever. Hot water then flows instantly. Turning off interlocking lever shuts off gas and water simultaneously.

Made with capacities of 2½ and 3 gal. per minute.


Instantaneous Bath Water Heater

Humphrey Copper Coil Tank Water Heater

For use with range boilers. Consists of a copper coil in a steel or cast iron casing. Heated by a special Bunsen burner which must be hand lighted.

Made in three sizes:

No. 5-R—Has a blue or ivory-gray pressed steel casing with a patented moisture-proof, heat resisting lining. Humphrey standard, reverse wound, double copper coil and special two-piece burner. Superior beauty and efficiency. Used with tanks of 30 to 40-gal. capacity.

No. 5-I—Is like the No. 5-R except that it has a cast iron jacket with black finish and gold ornamentation. Special one-piece burner.

No. 35—Is like the No. 5-R except that it is larger and has a triple coil for use with 40 to 80-gal. boilers.

All types have external unions making installations easier and cheaper.

Acme Automatic Storage System

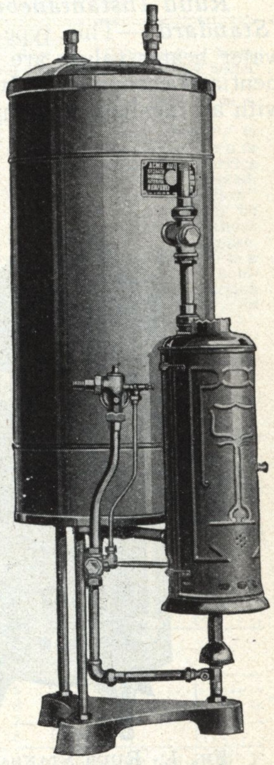
New and moderately priced automatic storage system designed to fulfill hot water requirements of small families.

Boiler is of copper bearing galvanized iron tested to 200 lb.; capacity, full 24 gal. Boiler is insulated with hair felt all enclosed within a rust and corrosion resisting jacket of Armco iron, finished in an attractive shade of olive green. All trimmings heavily nickeled. Circulating heater is the famous Humphrey No. 5-R double copper coil tank water heater with green porcelain enameled jacket.

The temperature control is all-metal and simple in construction, and will work dependably without necessity of adjustment.

Much care and thought has been put into making the Acme automatic storage system most attractive and well balanced. It is truly a beautiful piece of workmanship.

Special: For nominal charge the Acme can be fitted with the new Humphrey storage system features, namely the Dual Duty fitting which acts in flushing heater coils when water is being replaced in tank. This feature also retards lime deposit where hard water is used; and the Humphrey pilot control which eliminates danger and expense of unconsumed gas passing out vent pipe, by automatically closing main gas line, should pilot light become extinguished.


Acme Automatic Storage System

RUUD MANUFACTURING COMPANY

Manufacturers of Gas Fired Water Heaters

GENERAL OFFICES

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FACTORIES: PITTSBURGH, PA. and TORONTO, CAN.

NEW YORK OFFICE: 115 Broadway—Telephone, Rector 1668

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Products

RUUD INSTANTANEOUS AUTOMATIC WATER HEATERS (Standard).

RUUD INSTANTANEOUS AUTOMATIC WATER HEATERS (for small homes).

RUUD AUTOMATIC STORAGE SYSTEMS (for home, industrial and commercial use).

RUUD AUTOMATIC MULTI-COIL STORAGE SYSTEMS (for large hot water requirements).

RUUD TANK OR RANGE BOILER WATER HEATERS (non-automatic).

Ruud Instantaneous Automatic Water Heaters

Sizes—Ruud standard instantaneous automatic water heaters are made in four sizes, Nos. 3, 4, 6 and 8. In addition, there are two smaller sizes, Nos. 85 and 95, built especially for small homes.

Ruud Instantaneous Automatic Water Heaters (Standard)—This type is the standard by which all water heater values are measured. It is the most efficient and economical. It combines instantaneous service with an inexhaustible supply of hot water.

Ruud Instantaneous Automatic Water Heaters (for Small Homes)—Embodies the same general principle of construction and operates in the same manner as Ruud standard instantaneous automatic water heater of larger size.

Equally efficient and economical. Designed especially for places and purposes where only a small amount of hot water is wanted per minute, and generally but one fixture to be supplied.

Construction—Consists of cast iron shell enclosing burners, heating surfaces (copper coil) and thermostat. Automatic mechanism (comprising gas valves and water motor) is outside of shell.

Operation—Opening any hot water faucet unbalances water pressure in water motor causing plunger to move and open gas valve. Gas passes at once to a second gas valve, which is controlled by thermostat internally located in heat zone of heater. If this valve is open, gas goes to burners, where it ignites from a pilot flame. Pilot burner (fed by a separate line) is not affected by operation of automatic mechanism. Water is then heated as it flows through coil. Before water be-

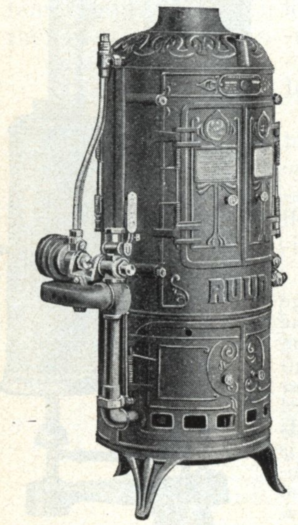

FIG. 1. RUUD STANDARD INSTANTANEOUS AUTOMATIC WATER HEATER

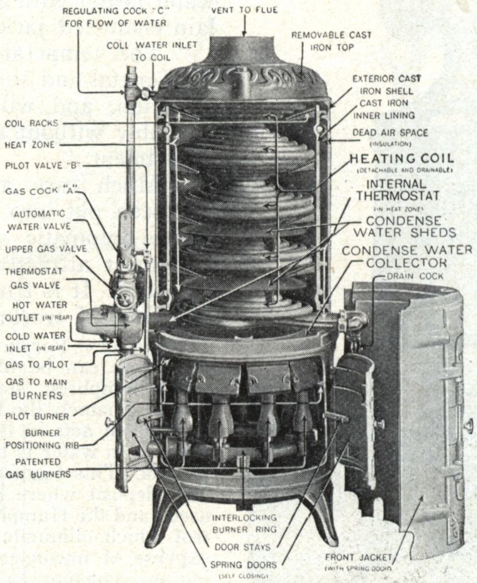
REGULATING COCK "C" FOR FLOW OF WATER
COIL WATER INLET TO COIL
VENT TO FLUE
REMOVABLE CAST IRON TOP
COIL RACKS
HEAT ZONE
PILOT VALVE "B"
GAS COCK "A"
AUTOMATIC WATER VALVE
UPPER GAS VALVE
THERMOSTAT GAS VALVE
HOT WATER OUTLET (IN REAR)
COLD WATER INLET (IN REAR)
GAS TO PILOT
GAS TO MAIN BURNERS
PILOT BURNER
BURNER POSITIONING RIB
PATENTED GAS BURNERS
EXTERIOR CAST IRON SHELL
CAST IRON INNER LINING
DEAD AIR SPACE (INSULATION)
HEATING COIL (DETACHABLE AND DRAINABLE)
INTERNAL THERMOSTAT (IN HEAT ZONE)
CONDENSE WATER SHEDS
CONDENSE WATER COLLECTOR
DRAIN COCK
INTERLOCKING BURNER RING
DOOR STAYS
SPRING DOORS (SELF CLOSING)
FRONT JACKET (WITH SPRING DOOR)

FIG 2. ANALYTICAL VIEW OF RUUD STANDARD WATER HEATER

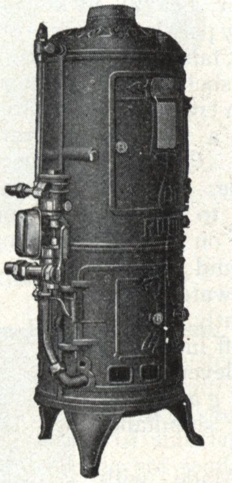

FIG. 3. RUUD AUTOMATIC WATER HEATER FOR SMALL HOMES Nos. 85 and 95

Continued on next page

comes too hot, gas is shut off by thermostat, until temperature has fallen somewhat. Gas then relights, providing hot water faucet is still open. Closing hot water faucet restores balance of water pressure in water motor, which immediately shuts off gas to main burners. This operation is repeated whenever a hot water faucet is opened. Except for small pilot flame, heater burns gas only when hot water is being drawn. Temperature of hot water is controlled by thermostat in heater, which is adjusted at factory at 140° F., high point.

Stones or other foreign substances in the inlet water, which might keep the water motor open, will not affect the operation of the heater, for the separate thermostatic valve will shut off the flow of gas when the water reaches the predetermined temperature. This double fuel control is an exclusive Ruud feature.

Installation—Designed to operate with artificial, natural or gasoline gas. Simple to install, involving no special fittings or devices. Delivered ready to attach to water and gas lines. All heaters should be connected to a flue having a good draft. An independent flue is desirable but not essential. Always set heater nearest point where hot water is used most frequently, giving flue line first consideration. When used with return circulation systems of plumbing, a circulator attachment which may be furnished with heater, is required. Hot water will be delivered more quickly if larger sizes of pipe are avoided. Keep hot water piping as small as possible, in no case exceeding one size larger than heater outlet. The runs to various faucets should be as direct as possible. A Ruud can be installed by any competent plumber, and in any place having suitable gas supply (artificial, natural or gasoline gas) and where at least 5 lbs. of water pressure is available at highest fixture.

Cost of Operation—The monthly operating cost is in direct proportion to the amount of hot water used. With artificial gas measuring 525 B.t.u. (heat units) at $1.00 per 1000 cu. ft. the Ruud furnishes 10 gal. of hot water for 1⅓¢, an ordinary hot bath for 2⅔¢. Natural gas has more heat units and costs less per 1000 cu. ft., so that the foregoing figures will be considerably lower where it is used. Under the Ruud reheating system, operating cost is even less than above estimate.

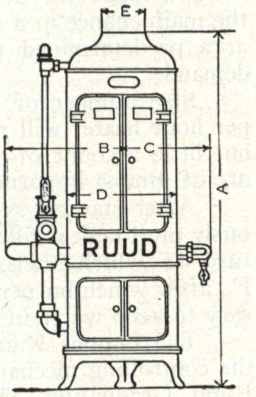

Fig. 4. Diagram Showing Dimensions of Ruud Instantaneous Automatic Heaters

Sizes, etc.—Size of heater should be based upon class of building, average number of occupants, number of hot water faucets and kind of fixtures supplied. Gas and water pressure conditions invariably govern type of heater best adapted. (Tables Nos. 1, 2, 3, and 4.)

Model Specification Ruud Instantaneous Automatic Water Heaters—Furnish and install where indicated on plans, ... No. .... Ruud Instantaneous Automatic Gas Water Heater. Make water, gas and flue connections in accordance with manufacturer's printed directions and local regulations.

TABLE NO. 2. SIZES OF HEATERS—THEIR APPLICATION TO RESIDENCES

Size heater	Gals. per min.	Residences having	
No. 3	3	1 bathroom and kitchen sink, small family	*Note:* The table "Sizes of Heaters" should be used only in conjunction with the table of "Capacities of Heaters." Table No. 3.
No. 4	4	1 family bathroom, 1 servants' bathroom, kitchen and laundry	
No. 6	6	2 family bathrooms, 1 servants' bathroom, kitchen, pantry, laundry and 1 or 2 lavatories	
No. 8	8	3 or 4 family bathrooms, servants' bathroom, kitchen, pantry, laundry and lavatories	

The small heaters, Nos. 85 and 95, are adapted for places and purposes where only a small amount of hot water is wanted per minute and usually where 1 fixture is to be supplied.

TABLE NO. 3. CAPACITIES OF HEATERS, IN GALLONS PER MINUTE

Size heater	Temperature raise										
	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°
No. 85	2.52	2.10	1.80	1.58	1.40	1.26	1.15	1.05	.97	.90	.83
No. 95	3.15	2.62	2.25	1.97	1.75	1.58	1.43	1.31	1.21	1.12	1.05
No. 3..	3.78	3.15	2.70	2.36	2.10	1.89	1.72	1.58	1.45	1.35	1.26
No. 4..	5.05	4.20	3.60	3.15	2.80	2.52	2.29	2.10	1.94	1.80	1.68
No. 6..	7.58	6.30	5.40	4.73	4.20	3.87	3.52	3.23	2.98	2.76	2.58
No. 8..	10.10	8.40	7.20	6.30	5.60	5.04	4.59	4.20	3.88	3.60	3.36

Faucet capacity of any size heater bears a definite relation to the temperature of the incoming water, which is governed by climatic conditions. Northern states ordinarily require one size larger than Southern states—other conditions being equal.

TABLE NO. 4. FLOW IN GALLONS PER MINUTE DELIVERED BY ORDINARY PLUMBING FIXTURES

Fixture	Fair flow	Good flow	Excellent flow	
Kitchen sink bibbs.......	2	4	6	Compiled from tests on 30 lbs. water pressure, and intended merely as a guide. "Fair Flow" is minimum from which good service could be expected. "Excellent Flow" is maximum to be obtained without splashing and noise. "Good Flow" is a stream which combines satisfaction and economy in most cases.
Pantry sink—high gooseneck bibbs...........	2	2	3	
Pantry sink—large plain bibbs...............	4	6	8	
Laundry tray bibbs......	4	6	8	
Slop sink bibbs..........	3	4	6	
Lavatory basin bibbs....	2	3	4	
Bathtub bibbs..........	3	4	6	
Shampoo spray..........	½	1	2	
Shower baths:				
5 -in. rain heads......	2	3	4	
6½-in. rain heads......	2	3	5	
8 -in. rain heads.....	4	6	8	
8 -in. tubular heads...	6	8	10	
Needle baths............	20	30	40	
Manicure tables.........	1	1½	2	

TABLE NO. 1. GENERAL TABLE, RUUD INSTANTANEOUS AUTOMATIC WATER HEATERS

(Thermal Valve or Type F Model—Natural or Artificial Gas)

Size number	Cap. per min., gals. †	Heater dimensions, in.					Average temp. rise, deg.	Size water inlet, in.	Size water outlet, in.	Min. water pressure, lbs. *	Size gas meter	Gas consumed per min., cu. ft.		Size gas line, in.	Size flue conn., in.	Net weight, lbs.	Prices on application	
		A	B	C	D	E						Art.	Nat.				Eastern district	Rocky Mt. district
Instantaneous Automatic Water Heaters for Small Homes																		
85	2	39¾	12	9	13⅛	4	63	½	½	25	10-L	2	1	¾	4	175	....	....
95	2½	42⅝	12½	9⅜	13⅞	5	63	½	½	25	10-L	3	1¾	¾	5	210	....	....
Standard Instantaneous Automatic Water Heaters																		
3	3	45½	14¾	11	14½	6	63	½	½	25	30-L	4	2	1	6	270	....	....
4	4	47¼	15⁷⁄₁₆	12	16⅜	6	63	½	½	25	45-L	5	3	1¼	6	330	....	....
6	6	55½	17¼	13⅜	19	7	63	¾	¾	25	60-L	7½	4	1½	7	475	....	....
8	8	58½	18⅜	14	21¼	8	63	¾	1	25	80-L	10	6	2	8	575	....	....

†Heater capacities for various locations depend on temperature of incoming water. Capacities listed here are based on a temperature rise of 63° F.
*Sizes Nos. 4, 6 and 8 heaters are also built for operating where water pressure is less than 25 lbs. and over 5 lbs. at highest faucet. For these conditions, specify "Low Pressure" heaters.

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Ruud Automatic Storage Systems for Home, Industrial and Commercial Use

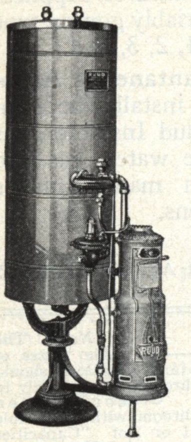

FIG. 5. RUUD AUTOMATIC STORAGE SYSTEM

These systems are self-contained and entirely automatic. Hot water from the heater is stored in a tank, from which several faucets may draw simultaneously, each faucet giving hot water as fast as a corresponding faucet flows cold water.

The fuel burned is controlled entirely by the temperature of the water in the tank. Cold water, coming into the tank to replace hot water drawn, lowers the temperature and gas is turned on when the change amounts to a few degrees. As soon as the temperature is raised to the desired point all gas is shut off. A tiny pilot light, whose function is to ignite the main burners, burns constantly.

No water pressure is required in the automatic operation, hence the system may be used with private water works or other low pressure conditions. Comparatively, gas is burned at a slower rate but over longer periods of time than in the instantaneous type. These inherent advantages make it adaptable for almost any condition of gas or water supply.

Fuel Control—The famous Ruud All-metal Thermostatic Moment Valve is unequalled for reliability, efficiency and long life. It is unaffected by corrosion or deterioration. A change of a few degrees results in a snap action, giving either full-fuel or no-fuel operation.

It eliminates "chimney losses" and the burner trouble so frequently caused by low-flame operation.

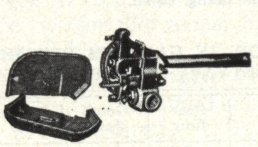

FIG. 6

Tanks—Ruud galvanized tanks, of $\frac{3}{16}$-in. plate and ¼-in. heads, average 50% heavier than "extra heavy" tanks. The copper brazed seams are corrosionproof and stronger than the plate itself. All-copper tanks of equal quality may be furnished when specified. Tanks are insulated with a layer of granulated cork 1⅜ in. thick, held in place by a porcelain enameled jacket. Tank and heater are separated in Ruud construction, hence stored water is not subjected to chilling flue drafts.

The proper size for any given condition depends upon the total number of gallons of hot water that will be used during the period of heaviest demand. In homes, this is usually in the morning or evening, and the tank capacity should be selected accordingly.

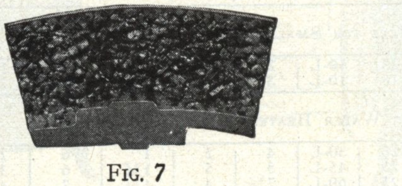

FIG. 7

Model Specification Ruud Domestic Automatic Storage Systems—Furnish and install, where indicated on plans .... No. .... Ruud Automatic Storage System with .... (galvanized iron or copper) tank. Make water, gas and flue connections in accordance with manufacturer's printed directions and local regulations.

TABLE NO. 5. RUUD AUTOMATIC STORAGE SYSTEMS

No. of system	Capacity of tank, gals.	Size of circulators, in.	Cold water inlet, in.	Hot water outlet, in.	Gas supply, in.	Size flue, in.	Size meter	Weight crated, lbs.
30	24	1	¾	¾	¾	3	10 light	395
40	40	1	¾	¾	¾	4	10 light	460
50	66	1¼	1	1	¾	4	10 light	695

TABLE NO. 6. SIZE OF SYSTEMS—THEIR APPLICATION TO RESIDENCES

Size heater	Capacity of tank, gals.	For residences having
30	24	Kitchen, bathroom and laundry. For small family.
40	40	Private bathroom, servants' bathroom, laundry and kitchen sink.
50	66	3 to 4 bathrooms, 1 or 2 bedroom lavatories, laundry and kitchen sink.

Ruud Automatic Multi-coil Storage System

Designed to supply demand for hot water in large quantities and to fulfill severe requirements frequently met in apartment houses, large residences, small hotels, hospitals, and in general, any institution or building where need for hot water and the conditions surrounding installation are more than ordinarily exacting.

Operation—System is entirely automatic, operating without any attention. Principle of operation is the maintenance in a storage tank of sufficient hot water at a predetermined temperature to supply anticipated demand.

Size number of heater denotes number of gallons per hour heater will raise 63° F. Storage systems take but little account of water pressure. Flue connections are of utmost importance.

After starting system, heater will operate continuously until tank is filled with hot water up to a temperature at which thermostat is adjusted—usually 140° F., after which burners will light up as often as is necessary to keep water in tank at this temperature.

The famous Ruud Thermostatic Moment Valve is the controlling mechanism for artificial gas installations. Ruud Graduating Thermostat is sometimes supplied where cheap natural gas is used but the Ruud Moment Valve is always recommended. Ruud multi-coil systems are universally adapted for return circulation systems of plumbing.

Model Specifications Ruud Automatic Multi-coil Storage Systems—A .... gal. (black iron, galvanized iron, or copper) tank, as supplied by RUUD MANUFACTURING COMPANY, to be supported in horizontal position on Ruud tank supports, and fitted in automatic connection with .... No. .... Ruud multi-coil storage heater[s], using .... in. brass pipe as circulators between heater and boiler, with .... gate valves and elbows; system to be fitted in exact accordance with RUUD MANUFACTURING COMPANY'S printed directions, running direct .... in. gas line direct from meter to heater, with .... in. gas cock in same.

A .... in. independent flue pipe to be run from heater to chimney having good draft, inserting draft hood in vent line in a vertical position.

Cover tank with a 2-in. wall of 85% Ruud magnesia insulation, canvassed.

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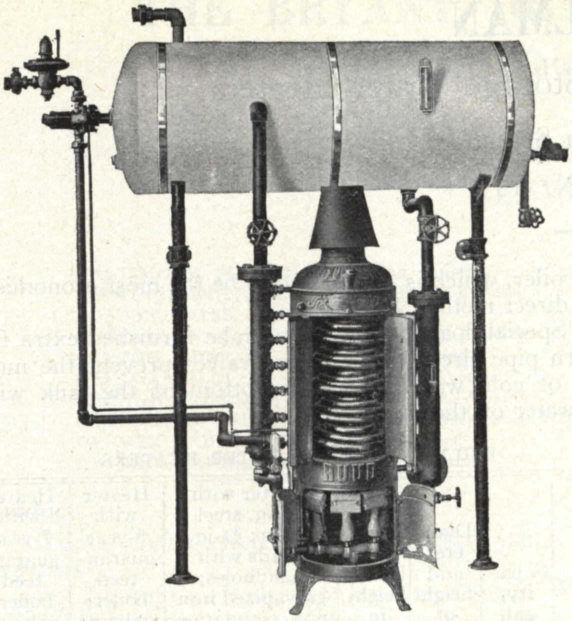


Fig. 8. Ruud Automatic Multi-coil Storage System

TABLE NO. 7. GENERAL TABLE RUUD MULTI-COIL STORAGE HEATERS

Size	Height of heater, in.	Width of heater, in.	Cap. per hr., gals.	Aver. tem. rise, deg.	Size manifold connection, in.	Size gas line, in.	Size flue connections, in.	Moment valve required, in.	Gas consumed per hr., cu. ft.		Size gas meter	Weight net (lbs.)
									Art.	Nat.		
100	45	27	100	63	1½	¾	4	¾	142	80	20	267
200	49⅞	29½	200	63	2	1	6	1	280	150	30	340
300	53⅜	32	300	63	2	1	6	1	375	225	45	422
500	64⅛	38½	500	63	2½	2	8	1½	650	375	80	730

Note: Tanks furnished with multicoil storage systems are equipped when so ordered with galvanized iron or copper steam heating coils and handholes or manholes. No manholes can be supplied on copper tanks. Prices on application.

TABLE NO. 8. GALLONS PER HOUR DELIVERED BY MULTI-COIL STORAGE HEATER

Size heater	Temperature raise						
	50°	60°	70°	80°	90°	100°	110°
No. 100	126	105	90	78.8	70	63	57.2
No. 200	252	210	180	157.5	140	126	114.5
No. 300	378	315	270	236	210	189	172
No. 500	630	525	450	394	350	315	287

TABLE NO. 9. SIZES OF SYSTEMS AND THEIR APPLICATION TO VARIOUS CONDITIONS

Size heater	Capacity of tank, gals.	Requirements
100	80, 100 or 150	Residences having 3 to 5 bathrooms, bedroom lavatories, large kitchen sink, pantry sink and laundry. Apartment buildings with 6 apartments of 4 or 5 rooms each.
200	150, 200 or 250	Residences having 5 to 8 bathrooms, large kitchen sink, dish-washing machine, large laundry. Apartment buildings having 6 to 12 apartments of 5 or 6 rooms each.
300	250, 300 or 365	Residences having 7 to 10 bathrooms, large kitchen sink, dish-washing machine, large laundry. Apartment buildings having 10 to 18 apartments of 5 or 6 rooms each.
500	425, 500, 600 or 700	Apartment buildings having 20 to 30 apartments of 5, 6 or 7 rooms each. Very large homes. 40 to 60-room hotels.

Ruud Tank or Range Boiler Heaters

The difference between these heaters and automatic heaters is only in the absence of automatic features. Ruud patented construction lessens cost of installation and maintenance. Coil arrangement is that of multicoil development. Quality of workmanship and material is same as employed in construction of Ruud automatic heaters. Tubing used in coils is, like tubing in automatic heaters, tested to 1000 lbs. per sq. in. before being coiled, and after assembly to 300 lbs. per sq. in. Made in 2 sizes.

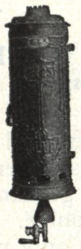


Fig. 8. Ruud Tank Heater No. 25
Black japan model

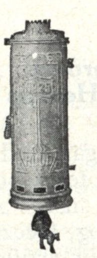


Fig. 9. Ruud Tank Heater No. 25
Gray porcelain enamel model

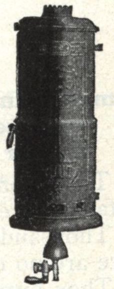


Fig. 10. Ruud Tank Heater No. 35
Black japan model

TABLE NO. 10. DIMENSIONS, WEIGHTS, ETC., TANK WATER HEATERS

Size of heater	For size tank, gals.	Diameter of coil, in.	Height, in.	Diam., in.	Net weight, lbs.	Weight crated, lbs.
No. 25 Black Japan Finish...	30–40	¾	22⅞	7	35	45
No. 25 Gray Porcelain Finish.....	30–40	¾	22⅞	7	38	47
No. 35..........	40–80	¾–⅞	25⅞	9⅝	71	95

Note: The No. 35 is equipped with triple coil.

Industrial Installations

Since Ruud water heaters were first manufactured, hundreds of uses have been found for the various heaters quite apart from the original purpose of domestic use or furnishing hot water for toilet or kitchen purposes. Wherever hot water is needed the Ruud of some type or size can supply it. Many other uses have been found for the heater besides furnishing hot water. It is impossible to enumerate these uses, but information pertaining to various industrial installations will be furnished on request.

Guarantee

This company guarantees all heaters delivered in perfect mechanical condition, and free from any defects in material or workmanship, for a period of 1 year from date of installation. With artificial gas testing 525 B.t.u. (heat units), the Ruud instantaneous automatic water heater will not require more than 1⅓ cu. ft. of gas to each gallon of water raised 63° F. in temperature; with natural gas, not more than ¾ cu. ft. of gas to each gallon of water raised 63° F. in temperature. With adequate gas and water supplies, a Ruud storage system (of proper size) will supply hot water in large quantities at any desired temperature, winter or summer, with a very reasonable consumption of gas.

Co-operation

This company maintains district offices in every large center together with a large number of traveling representatives. Their services are available at any time.

W. E. BEILMAN

Manufacturer of Automatic Storage Water Heaters

448-450 Niagara Street
BUFFALO, N. Y.

Beilman-Seamans Improved Automatic Gas Fired Storage Water Heaters with Automatic Pilot Burner

These combination gas fired water heaters and storage tanks have stood the test of over 35 years of service.

Thousands now in use. All heaters guaranteed. There are no coils to clog, freeze or give trouble.

They burn natural or artificial gas, the only modifications being in the burners.

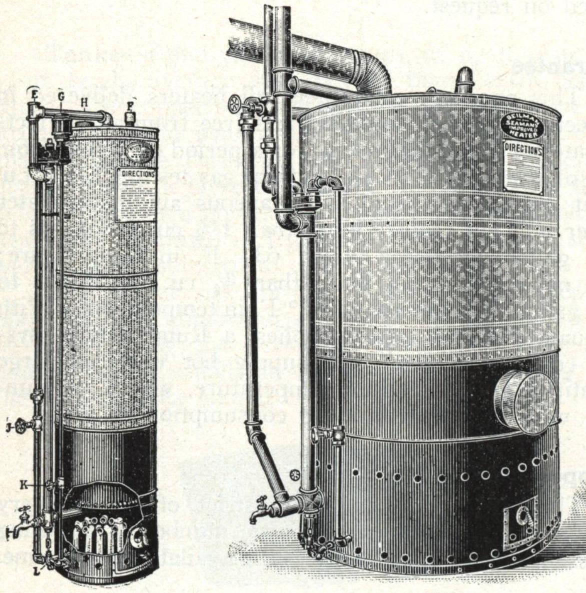
In artificial gas installations, heaters can be economically connected to the water section in the house furnace or kitchen range so that the gas can be cut off entirely when furnace or range is in operation, or, a coal fired heater can be supplementarily installed.

These heaters supply any quantity of hot water (temperature as desired) at an average consumption of 1000 cu. ft. of gas for every 1000 gal. of water heated. It takes 30 to 40 minutes to heat any capacity tank to 170° F. when started from cold. After contents of tank have been heated to the predetermined temperature, hot water can be drawn instantly, whenever desired, from all hot water faucets. After water in the tank is heated to the predetermined temperature, the main burners automatically shut off and the patented automatic pilot light (with by-pass, which prevents pilot from being extinguished) holds the water to the proper temperature until hot water is drawn, whereupon the main burners light from the pilot.

These heaters are easily adjusted to any predetermined temperature, also to high or low gas pressures.

The specially improved burners provide perfect combustion and give an intense heat. They are directly under the boiler, which is considered to be the most economical and direct method known.

Special float check valves can be furnished extra for return pipe circulation. These valves prevent the mixture of cold water from the bottom of the tank with hot water on the faucet line.



Style X Style XX

Beilman-Seamans Improved Automatic Gas Fired Tank Water Heaters
(Patented April 28, 1925)

E—cold water supply; F—hot water supply; G—gas supply; H—pipe to chimney; I—for sediment cock; J—main gas valve; K—pilot gas valve; L—automatic pilot valve

BEILMAN-SEAMANS WATER HEATERS

Heater No.	Capacity, gal.	Diameter and height of boiler, in.	Heater height, in.	Heater with ¼-in. steel boiler; ⅜-in. heads with handholes; galvanized iron pipe circulation; (5/16-in. shell and ½-in. heads on sizes above 390 gal.)	Heater with 5-year guaranteed boiler; galvanized iron pipe circulation	Heater with 7-year guaranteed boiler; galvanized iron pipe circulation
1	30	12x60	76	....	$ 89.25	$ 94.50
2	40	14x60	76	....	97.65	102.90
3	52	16x60	76	....	110.25	117.60
3	53	18x48	64	....	117.60	126.00
4	66	18x60	78	....	126.00	133.35
5	82	20x60	78	....	149.10	157.50
6	100	20x60	78	....	165.90	173.25
7	120	24x60	78	....	....	199.50
8	150	30x48	73	$220.50	....	....
9	165	30x54	80	236.25	....	....
10	185	30x60	86	254.10	....	....
11	210	36x48	74	270.90	....	....
12	225	30x72	98	285.60	....	....
13	265	36x60	86	306.60	....	....
14	290	36x66	92	325.50	....	....
15	315	36x72	98	351.75	....	....
16	350	38x72	100	386.40	....	....
17	390	40x72	100	417.90	....	....
18	430	42x72	102	458.85	....	....
19	470	48x60	90	483.00	....	....
20	515	46x72	102	546.00	....	....
21	570	48x72	104	577.50	....	....

Prices f.o.b. Buffalo. Crating extra.

*HEATER WITH COPPER BOILER SIZES ONLY

No	1	2	3	4	4	5	6	6	7	7½	8
Cap........gal.	30	40	50	60	60	80	100	100	120	125	150
Diam........in.	12	14	16	16	20	20	20	24	24	24	24
Height.......in.	60	60	60	70	44	59	76	60	65½	69	78½

*Furnished with Brown's seamless special copper boiler, 200-lb. test and with either galvanized iron pipe circulation or 1, 1¼ or 1½-in. brass pipe circulation. Prices on application.

General Notes

Any size heater up to 120 gal. can be run with ¾-in. gas pipe on natural or artificial gas, 1-in. pipe being required for larger sizes only. Some of our 30 and 40-gal. heaters are run on ½ and ⅜-in. gas supply.

Number of heater in price list corresponds to number of bathrooms that each size heater up to No. 15 will supply at one time. No. 16 will supply 20 baths; No 17, 24 baths; No. 18, 28 baths; No. 19, 32 baths; No. 20, 35 baths; No. 21, 40 baths, besides laundry and other fixtures.

All heaters with 5-ft. boilers (Styles X and XX) can be set under ceiling from 6½ to 7 ft. Larger size heaters than listed above can be supplied if required.

Where two like numbers are given for same capacity heaters, the difference is for a heater with short or long boiler to suit conditions; that with short boiler is listed higher in price.

Pipe to chimney should not be reduced in size and a damper should not be installed therein.

When heaters are set on a wood floor, the latter should be protected against fire.

THE BRYANT HEATER & MFG. COMPANY

Hot Water Storage Systems

FACTORY
952 East 72nd Street
CLEVELAND, OHIO

BRANCHES

BALTIMORE, MD., 1116 Lexington Building
BIRMINGHAM, ALA., American Trust Building
BOSTON, MASS., 126 High Street
BUFFALO, N. Y., 610 Erie County Bank Building
CANTON, OHIO, 415 Daily News Building
CHICAGO, ILL., 218 South Wabash Avenue
CINCINNATI, OHIO, 421 Union Trust Building
CLEVELAND, OHIO (Sales Service), 1454 East 17th Street
DENVER, COLO., 1425 Sixteenth Street
DETROIT, MICH., 7644 Woodward Avenue
KANSAS CITY, MO., 207 Davidson Building
MUSKOGEE, OKLA., 110 South Fourth Street
NEW YORK, N. Y., 353 Atlantic Avenue, Brooklyn
PHILADELPHIA, PA., 1518 Vine Street
PITTSBURGH, PA., East End Trust Building
ROCHESTER, N. Y., 112 South Clinton Street
ST. LOUIS, MO., 840 Planters Building
SAN FRANCISCO, CAL., 710 Polk Street
TOLEDO, OHIO, 405 Nicholas Building
WICHITA, KAN., 421 Sedgwick Building

Product

Bryant Automatic Hot Water Storage Systems.

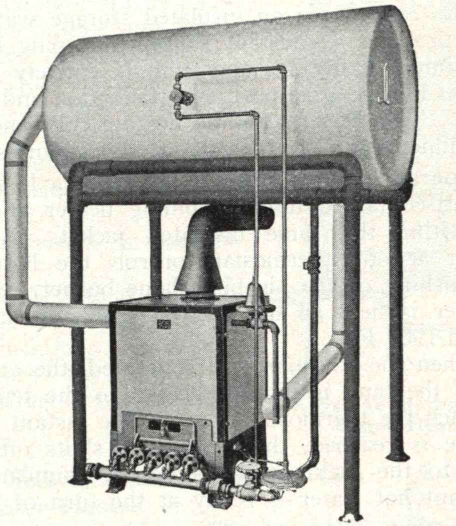
For Bryant Gas Boilers for hot water, steam and vapor heating, and low pressure steam for manufacturing purposes, see page 2210.

TUBULAR
TRADE MARK
REGISTERED

General Description of the Bryant Hot Water Storage Systems

This heavy duty system consists of a Bryant Gas Boiler of a size to fit the specific needs of the installation, hot water storage tank, thermostat and patented Bryant devices for proportioning the gas consumption to the consumption of water.

Cost per gallon of water heated is unusually low. Maximum demands of day or night are instantly met by hot water of a uniform temperature. Operation is entirely automatic—the system does not require even a thought of attention for months on end. A description of the ruggedly built, reliable heating unit is given on page 2210.



Bryant Automatic Hot Water Storage System

CAPACITIES OF BRYANT HOT WATER STORAGE SYSTEMS

Boiler hp.	Available B. t. u.	Boiler No.	Capacity, gal. per hr., raised					
			40°	60°	80°	100°	120°	140°
1.3	45,000	3—A—2	135	94	68	54	45	39
1.8	60,500	4—A—2	181	126	91	72	60	52
2.2	75,500	5—A—2	226	157	113	90	75	65
2.7	90,500	3—A—3	275	185	140	110	90	80
3.6	120,500	4—A—3	360	240	180	145	120	105
4.5	151,000	5—A—3	450	300	225	180	150	130
5.4	181,000	6—A—3	545	360	270	215	180	155
6.3	211,000	7—A—3	630	420	315	250	210	180
7.2	241,500	8—A—3	720	480	360	290	240	205
9	305,000	9—A—4	920	610	460	370	305	260
11	372,000	11—A—4	1120	735	560	450	370	320
13	439,000	13—A—4	1320	880	660	530	440	380
15	506,000	15—A—4	1520	1020	760	610	505	435
17	573,000	17—A—4	1720	1150	860	690	575	485
19	640,000	19—A—4	1920	1280	960	770	640	550
21	707,000	21—A—4	2120	1410	1060	850	705	605
23	774,000	23—A—4	2320	1540	1160	930	775	660
25	840,000	25—A—4	2520	1680	1260	1010	840	720
27	908,000	27—A—4	2720	1820	1360	1090	910	775
29	975,000	29—A—4	2920	1950	1460	1170	975	835
31	1,041,000	31—A—4	3130	2080	1565	1250	1040	890
33	1,109,000	33—A—4	3330	2220	1665	1330	1110	950
35	1,176,000	35—A—4	3530	2350	1765	1410	1175	1005
37	1,242,000	37—A—4	3730	2480	1865	1490	1240	1060
39	1,310,000	39—A—4	3930	2620	1965	1570	1310	1120
41	1,377,000	41—A—4	4130	2750	2065	1650	1375	1180

For Buildings and Industrial Uses

The range in sizes of Bryant Automatic Hot Water Storage Systems provides capacities to fill exactly the requirements of office buildings, apartments, restaurants, hotels, hospitals, clubs, residences, public garages, bathhouses, factories, bottling works, dairies, and so on.

Bryant Engineers

Bryant representatives travel the entire country in an endeavor to give wholehearted cooperation and service.

Complete information can be secured from any of the offices listed above.

CRANE CO.

Gas Water Heaters

836 South Michigan Avenue, CHICAGO, ILL.

For List of Branches and Sales Offices, see page 1999

Products

Automatic and Non-automatic Storage Gas Water Heaters.

For Water Softeners and Water Supply Systems, see pages 1930-1931; for Plumbing Fixtures and Radiator Valves, see pages 1999-2006.

The Premier Insulated Automatic Storage Gas Water Heater

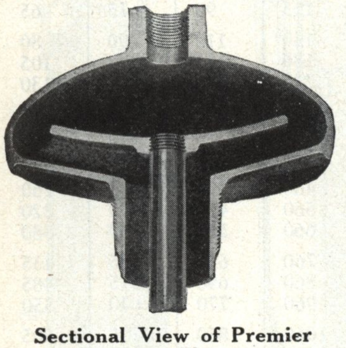
The *Premier* is an insulated storage water heater which provides a constant supply of piping hot water at minimum cost. Its operation is entirely automatic and it is built to give positive satisfaction and enduring service. The *Premier* has no heating coils and is practically limeproof. It is silent, safe and odorless.

Operation—The *Premier* is automatic in action. It is a self-contained unit combining heater and storage tank within the same insulated jacket. A positive "instant action" thermostat controls the lighting and extinguishing of the big blue flame burner. A tankful of water is held at any desired temperature between 80° and 190° F.

When the *Premier* is first lighted, the entire content of the tank is quickly heated to the temperature for which the thermostat is set. The instant this temperature is reached, the thermostat shuts off the gas supply to the main burner—and an abundant supply of instant hot water is ready at the turn of a faucet.

Heating Element—The cold water enters the heating element through the large opening at the top. Then it passes down through the channels or arms to the lower compartment, where it is spread in a thin flowing sheet. As the hottest part of the burner flame plays on this portion of the "spreader," the water absorbs the heat from the gas without waste. Immediately upon being heated, it rises through the central pipe and is discharged at the top of the tank.

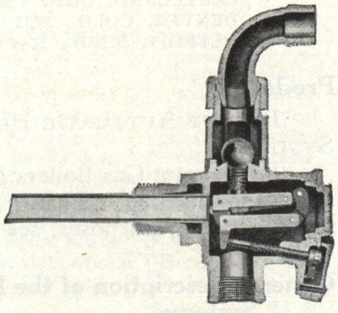
The water thus heated is replaced by cold water from the bottom of the tank, creating a constant and rapid circulation and heating the entire tank quickly and efficiently. This heating element with its spreader arms is an exclusive *Premier* feature. In addition to its great efficiency, the spreader can not burn out. Having no flat surfaces, pockets or dead ends, "lime up" troubles are also practically eliminated. It supplants the old-fashioned, troublesome coil or disc.



Sectional View of Premier Heating Element

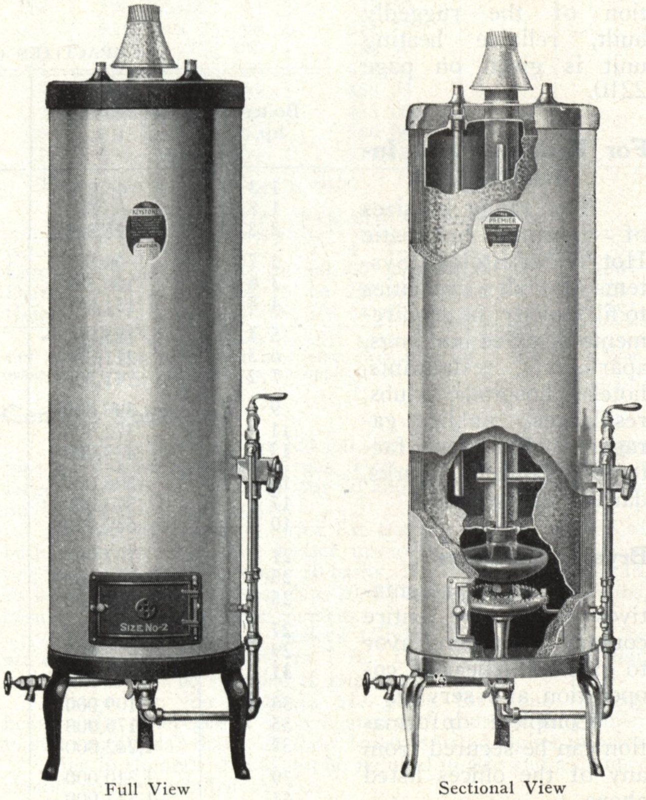
Thermostat Control—The sturdy construction and simple design of the *Premier* thermostat insure long years of accurate dependable service. The principle of the thermostat is based upon a natural law of physics—that copper expands when heated and contracts when cooled. The working parts consist of a long copper tube to which is attached a porcelain rod operating in conjunction with a set of levers as shown in the illustration.

The thermostat is placed at the side of the heater near the bottom. When hot water is drawn and cold water enters the tank, the copper rod contracts and the porcelain rod pushes against the levers, which raise the Monel metal ball opening the gas outlet to the burner. Then, as the water is heated, the copper rod expands and allows the ball to drop, shutting off the gas instantly. No gas is wasted.



Sectional View of Premier Thermostat

The action is quick and positive. It is the cushion spring under the ball that causes it to snap up and down so quickly that the burner is in full blast instantly or is extinguished completely—except, of course, for the tiny pilot light. A variation of only 14° to 18° F. is necessary to operate the thermostat. It is easily adjusted to maintain any temperature desired. Low gas or water pressures do not affect its operation.



Full View

Sectional View

No. 2 Premier Automatic Storage Gas Water Heater

Continued on next page

Burner—The *Premier* Bunsen burner is made in one piece and is so designed as to give a blue flame of maximum efficiency. No gauze is used and trouble from back-firing is eliminated. The burner is fitted with a specially designed mixer, assuring a correct proportion of gas and air. It has a special gas cock designed to give a high nozzle velocity on low gas pressure. It operates with either natural or artificial gas.

The *Premier* is a dry heater—condensation is eliminated. This means a clean, dry heater bottom at all times, a clean floor underneath, a clean burner, and above all a heater of greater efficiency.

Insulation—*Premier* economy of operation is further increased by the fact that when water is once heated it *stays hot* for many hours. The heavily insulated storage tank allows only a slight radiation loss. A thick jacket of asbestos completely surrounds the storage tank and heating chamber beneath. With its protective outer jacket of steel, this insulation conserves heat like a giant thermos bottle.

Storage Tank—The *Premier* tank is constructed of double extra heavy sheets, heavily galvanized both inside and outside, or the tank may be of double weight copper, if desired. All tanks are tested to 300 lb. hydrostatic pressure.

Piping and Fittings—Hot and cold water connections, cold water inlet pipe, hot water riser pipe and all fittings are brass.

Finish—The steel jacket which covers and protects the insulation is finished in smart gray enamel. The top, base, door and fittings are first copperplated and then are finished with a heavy nickelplate giving a beautiful lustrous appearance.

Installation—The *Premier* takes standard water and gas connections. Vent connection furnished. Venting all heaters is recommended.

Efficiency—We guarantee 80% recovery of the net heating value of the gas burned.

A Size to Fit Every Need—The *Premier* is built in 4 sizes for domestic and industrial use. We prefer to make an individual recommendation as to the size best suited to any specific need. The following serves as a general guide:

Size No. 2—For homes with 1 bath, kitchen sink, usual number of lavatories and laundry trays.

At factory, $125.00.

Size No. 3—For homes with 2 baths, kitchen sink, usual number of lavatories and laundry trays.

At factory, $160.00.

Size No. 4—For homes and apartments with 3 or 4 baths, large barber shops, restaurants, clubs, etc. Double burner equipment; double quick heating.

List price, $250.00.

Premier heaters are on display and ready for delivery at all Crane exhibit rooms.

All list prices are f.o.b. factory.

SPECIFICATIONS AND CAPACITIES PREMIER AUTOMATIC STORAGE GAS WATER HEATERS

Heater No.	Storage cap., gal.	Number of burners	Dimensions, in.						Approx. weight crated, lb.
			Cold water inlet	Hot water outlet	Gas connection	Flue connection	Headroom required	Width required over all	
2	23	1	¾	¾	¾	3	72	22	290
3	31	1	¾	¾	¾	3	72	24	335
4	48	2	¾	¾	¾	4	72	28	490

The Keystone Automatic Storage Gas Water Heater

The *Keystone* is very much like the *Premier* in appearance.

The tank is of extra heavy construction with an insulating jacket of heavy asbestos entirely enclosing the heater. The outer jacket is of steel finished in gray enamel with blue trim.

The *Keystone* is above all a quality heater, durable and handsome, and is sold at a moderate price. Its low operating cost puts a plentiful supply of piping hot water within reach of all.

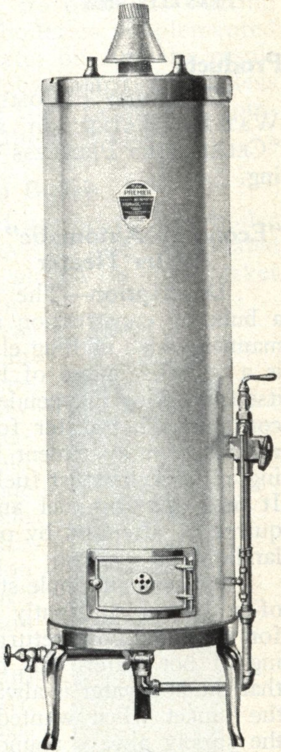
While the *Keystone* does not have the nickel trim or brass piping found in the *Premier*, the same sturdy thermostat and burner and heating element of identical design keep the operating cost down to a few cents a day.

Never before has so much real value been built into a water heater.

The *Keystone* is made in 2 sizes:

No. 2, $70.00 at factory.
No. 3, $97.50 at factory.

Specifications and capacities are the same as corresponding sizes of the *Premier*.



Keystone Storage Gas Water Heater

Marvel Non-automatic Storage Gas Water Heater

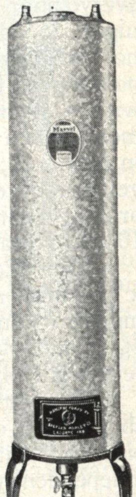
The *Marvel* is similar in many respects to the *Premier* but is not automatic and is not insulated.

When hot water is wanted, the burner is lighted by hand. In a short time the entire content of the tank is heated. The burner may then be turned low or out, as desired.

The *Marvel* is more efficient than the old side arm combination heater and tank, as it is built all in one piece and uses the rising heat to better advantage, recovering a much greater percentage of the heat units.

The tank is made of extra heavy galvanized sheets. Furnished with heat retaining pan stand.

Particularly suitable for basement or kitchen installation where space is limited, or for factory, office or garage where hot water is required only at intervals.



Marvel Storage Gas Water Heater

MARVEL NON-AUTOMATIC STORAGE GAS WATER HEATERS

Heater No.	18	24	*32	*42
Shell, in.	12x36	12x48	14x48	16x48
Approx. weight, lb.	82	95	125	150
Price at factory	$30.00	31.00	32.00	48.00

*For convenience, both No. 32 and No. 42 *Marvel* carry a 1-in. side spud in the middle of the tank on the right-hand side.

Prices on sizes larger than quoted above furnished on application.

Marvel size recommendations are the same as corresponding sizes in the *Premier* automatic.

ECONOMY HEATER COMPANY

Manufacturers of Combination Boilers and Gas Water Heaters

TELEPHONE
FRANKLIN 4668

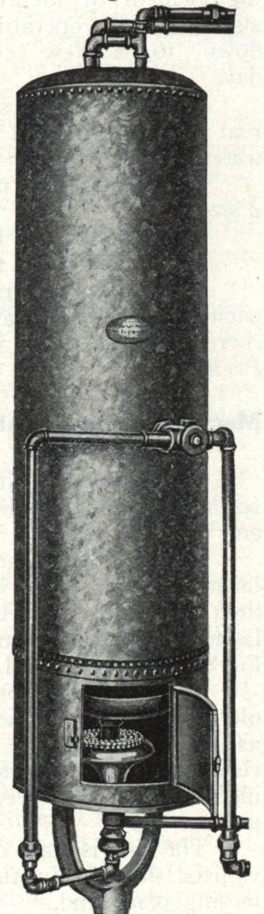
108 South La Salle Street
CHICAGO, ILL.

Products

"ECONOMY" COMBINATION BOILERS and GAS WATER HEATERS, in automatic and regular types; "CELEBRATED PEERLESS" KITCHEN BOILERS, Gas Heating.

"Economy Automatic" Combination Boiler and Gas Water Heater

Description—The "Economy Automatic" meets a building construction need ably and thoroughly in a manner which nothing else on the market can equal. It is a complete piece of hot water service equipment in itself, working independently and furnishing instant and continuous hot water for the residence or apartment building at a very modest fuel cost. It uses gas for fuel and requires no attention by owner, landlord or tenant.



"ECONOMY AUTOMATIC" COMBINATION BOILER AND GAS WATER HEATER
Showing thermo-valve control

It keeps an ample storage of hot water constantly ready for use; and with return piping of hot water, this means that the hot water is always at the faucet when wanted and the supply always abundant.

It renders true, instantaneous hot water service every hour of the day and night, 365 days in the year—no bother, no worry, no dirt, no danger of any kind, and all with a plain piece of equipment which is not expensive in first cost; no mechanism to get out of order and under ordinary conditions good for 10 to 15 years of service.

The "Economy Automatic" requires no special gas piping for its supply—the regular ⅜-in and ½-in. house supply serves it fully.

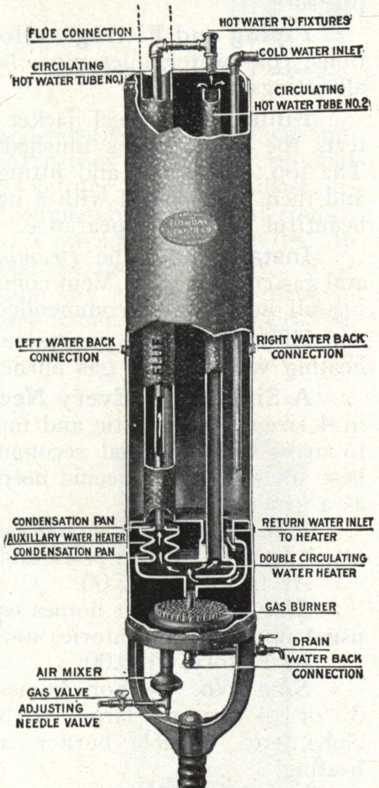
In addition to its serviceability as a distinctly separate piece of equipment working independently as outlined, it is in every respect a practical boiler for hot water storage to be served by the regular heating plant.

It can be connected with the water coil in the furnace, and thus during the months when the house heating system is operating it becomes the plain boiler and need not be operated with its own interior gas heating equipment except at such times as the furnace fire is kept low and hotter water is desired than that which the heating plant is making.

Advantages—The "Economy Automatic" combination boiler and gas water heater recommends itself to the architect and the professional builder because it solves many of their problems, and once specified and installed completely provides for all the hot water needs in the home and apartment building.

Where a plain boiler is specified, then something in addition is required. Perhaps it will be a coal stove side heater or a gas side heater. In the case of the coal stove side heater it is quite certain that sooner or later something instead of it will be wanted.

Owners do not want to be their own janitors for a coal stove in the basement merely to get hot water, nor can they afford to pay for janitor service just to have the hot water needs looked after during the many months of the year when the house heating plant is shut down. As a result they turn to gas to do away with the work and dirt and annoyance of the coal heater. If they then install a gas side heater to furnish the hot water for the boiler it has no control and needs personal and careful attention. In addition, no auxiliary gas side heater, even of the most expensive type, can make the hot water as economically as the "Economy" boiler makes it. But if, in the first place, the "Economy Automatic" boiler is installed, every need is met. The burner is lighted, the boiler is soon filled with hot water of the temperature desired, and the positive thermostatic control valve operates to turn the flame down to a point which keeps the water in the boiler constantly at the predetermined desired temperature. The expense is not more than would be the cost of coal for a side heating stove and much less than would be the cost for gas consumed by a gas side heater, and no one needs to go near the equipment from month's end to month's end. The owner of the two-flat or three-story apartment building who lives in one of the apartments and undertakes to furnish hot water for the tenants will, with the "Economy Automatic" boiler installed, have all the hot water needs looked after completely by the boiler itself. This relieves him of all care in the matter, and at a monthly cost less than would be sustained by any other method of providing the hot water, and with



"ECONOMY" COMBINATION BOILER AND GAS WATER HEATER
Showing interior patented construction

Continued on next page

a certainty of freedom from complaint which could not be accomplished in any other way or with any other equipment.

The "Economy Automatic" combination boiler and gas water heater is manufactured under patent No. 1,035,636 and is not competed with by anything else on the market. The ordinary type of center flue combination boilers made automatic by the use of a thermostat are entirely different from the "Economy Automatic" in their operation—more expensive in their fuel cost, and do not accomplish the results of our piece of equipment.

Also bear in mind that the "Economy Automatic" combination boiler and gas water heater is not one of the so-called "instantaneous water heaters," the machines which heat water instantly by throwing on a tremendous volume of gas to do it and which are open to serious objections in respect to danger, to complicated mechanism, to expensive piping for gas supply, to heavy operation expense and to unnecessarily large first cost. They are subject as well to the very practical objection that while they may heat water instantly, they can not possibly deliver hot water at the faucet instantly, and also that they can not serve as the boiler for storage of hot water when the house heating plant is able to make it.

The "Economy Automatic" combination boiler and gas water heater is open to no criticism. First cost is reasonable; cost of operation is very modest; its service is universal. It renders true instantaneous hot water service on the storage principle and only by the storage principle can complete and perfect hot water service be had. In specifying, it is well to be sure that the size boiler selected is large enough. Do not make the mistake of putting in a number 52 or 66 where a number 82 or 100 should go. Greatest economy is achieved with ample reserve storage. It is always better to have oversize than a boiler too small.

"Economy Regular" Combination Boiler and Gas Water Heater

The "Economy Regular" combination boiler and gas water heater is identical in construction and material with the "Economy Automatic" in the respective sizes, but it is not provided with the thermostatic control valve, nor is it tapped with the opening for the valve.

The combination gas heating boiler has become so well known and its advantages so fully recognized, that no argument for its use need be presented here. However, some parts of the United States are far behind others in the adoption of this type of boiler. As a general statement we would say that in a majority of cases it would be better to install "Economy Regular" combination boilers and gas water heaters than to install plain boilers. The combination boiler does everything that the plain boiler does, and in addition it is capable of independently providing hot water through its own gas heating equipment. Usually a plain boiler is supplemented by a gas or coal side heater later on, and the result is that more expense is thereby incurred and less efficiency secured than where the "Economy" combination boiler is installed in the first place.

"ECONOMY" COMBINATION BOILERS AND GAS WATER HEATERS

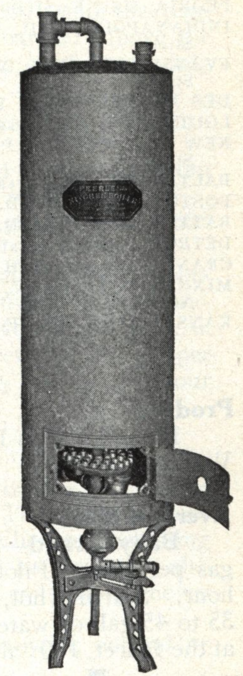
No.	Actual capacity, gals.	Size		Shipping weight, lbs.	Prices	
		Height, ft.	Diam., in.		Automatic with thermo-valve control	Non-automatic "Regular" type without thermo-valve control
18	13	3	12	115	$ 46.00	$23.00
24	17	4	12	135	47.00	23.50
30	21	5	12	155	48.00	24.00
32	23	4	14	165	51.00	....
40	30	5	14	175	54.50	32.50
42	32	4	16	180	57.00	....
52	40	5	16	195	67.20	52.80
66	51	5	18	235	81.60	67.20
82	64	5	20	255	96.00	76.80
100	78	5	22	300	117.60	98.40
120	94	5	24	365	129.60	108.00

Stands Extra. Above prices are f.o.b. Chicago and include contracting plumbing cost; these prices are taken from Clow Bulletin.

"Celebrated Peerless" Kitchen Boiler

The logic of the combined gas heater and boiler is so strong that as soon as the first "Celebrated Peerless" kitchen boiler was placed on the market the trade felt its influence. This was many years ago, and now we can point to many spots in this country, and in fact to entire sections of the country where the gas heating combination boiler so dominates the field that the copper coil gas side heater scarcely has any sale whatever. It is right that this should be so. The combination gas heating boiler has so much greater efficiency in operation and so much longer life in service than the side heater connected with a range boiler that, once introduced, the combination gas heating boiler is bound to win the popular demand.

It is much more economical on gas—it is neat in appearance—requires less floor space—is more easily installed—and on every point of comparison it wins out. Builders and owners would do well to see that "Celebrated Peerless" boilers are specified for them instead of plain range boilers. With a plain range boiler installed a deficiency exists. That deficiency is the need of getting hot water from the boiler with gas as the fuel. To meet this need side gas heaters are then connected to the boiler. The result is an inefficient outfit, but one which will after a manner serve. Better do it right in the first place and put in "Celebrated Peerless" kitchen boilers. They can be installed in the basement, to be connected by coil with the heating plant, and thus during the winter months will serve as the plain range boiler serves—then during the open season they can be operated by gas on their own interior built-in gas heating equipment; or they can be installed in the kitchen or the bathroom.



"Celebrated Peerless" Kitchen Boiler

"CELEBRATED PEERLESS" KITCHEN BOILERS

No.	Actual capacity, gals.	Diameter, in.	Height, ft.	Shipping weight, lbs.	Price
18	13	12	3	105	$ 21.25
24	17	12	4	125	22.00
30	22	12	5	140	22.50
40	30	14	5	160	29.00
52	40	16	5	190	52.80
66	51	18	5	227	67.20
82	64	20	5	240	76.80
100	78	22	5	290	98.40
120	94	24	5	355	108.00

Stands not furnished. Use any type of range boiler stand.

Above prices are f.o.b. Chicago and include contracting plumbing cost; these prices are taken from Clow Bulletin.

EVERHOT HEATER COMPANY

Manufacturers of Gas Fired, Automatic Storage Water Heaters

FACTORY AND GENERAL OFFICES
DETROIT, MICH.

PRINCIPAL OFFICES AND SALESROOMS
Carrying Stock and Rendering Sales and Engineering Service

LOS ANGELES, CAL., EverHot Heater Co., 357 So. Hill Street
OAKLAND, CAL., Robert Howden & Sons Co., 1602 Webster Street
TORONTO, CAN., Riley Engineering & Supply Co., Ltd.
DENVER, COL., Steiner Brothers, 235 15th Street
JACKSONVILLE, FLA., Bowlin Plumbing Specialties Co., 509 East Bay Street
CHICAGO, ILL., EverHot Heater Sales Co., 29 West Lake Street
PEORIA, ILL., EverHot Heater Sales Co., 234 So. Jefferson Street
INDIANAPOLIS, IND., EverHot Heater Sales Co., 115 E. Michigan Street
EVANSVILLE, IND., Newman-Johnson Plumbing Co., 217 Locust Street
DES MOINES, IOWA, EverHot Heater Sales Co., 218 Ninth Street
LOUISVILLE, KY., EverHot Heater Co., 525 So. Third Street
NEW ORLEANS, LA., Plumbing & Heating Supply Co., 840 Baronne Street
BALTIMORE, MD., EverHot Heater Sales Co., 15 E. Fayette Street
BOSTON, MASS., W. D. Cashin Co., 35 Hartford Street
BATTLE CREEK, MICH., C. M. Rolfe
DETROIT, MICH., EverHot Heater Co., 4460 Cass Avenue
GRAND RAPIDS, MICH., Richards Manufacturing Co.
MINNEAPOLIS, MINN., EverHot Heater Sales Co., 1316 Marquette Avenue
KANSAS CITY, MO., EverHot Heater Sales Co., 817 Walnut Street
ST. LOUIS, MO., EverHot Heater Sales Co., 4133 Olive Street
OMAHA, NEB., EverHot Heater Sales Co., 2402 So. Tenth Street
NEWARK, N. J., EverHot Heater Sales Co., 20 William Street
BUFFALO, N. Y., EverHot Heater Sales Co., 54 Otis Place
NEW YORK, N. Y., EverHot Heater Sales Co., 101 Park Avenue
ROCHESTER, N. Y., EverHot Heater Sales Co., 212 East Avenue
SYRACUSE, N. Y., EverHot Heater Sales Co., 524 No. Salina Street
CINCINNATI, OHIO, The Doermann-Roehrer Co., 450 E. Pearl Street
CLEVELAND, OHIO, The E. J. Hungerford Co., 1327 E. 105th Street
COLUMBUS, OHIO, Dennis Engineering Co., 243 No. High Street
PORTLAND, ORE., EverHot Heater Co., 12th and Alder Streets
PHILADELPHIA, PA., EverHot Heater Sales Co., 2401 Chestnut Street
PITTSBURGH, PA., EverHot Heater Sales Co., 132 No. Highland Avenue
CHARLESTON, S. C., The Gas Engine & Electric Co., 280 Meeting Street
MEMPHIS, TENN., EverHot Heater Sales Co., 905½ Union Avenue
DALLAS, TEX., Huey & Philip Co., Elm and Griffin Streets
HOUSTON, TEX., Way Engineering Co., 1510 Main Street
SALT LAKE CITY, UTAH, Williams & Derrah, 402 Scott Building
SEATTLE, WASH., EverHot Heater Sales Co., 310 Mutual Life Building
MILWAUKEE, WIS., EverHot Heater Sales Co., 137 Oneida Street

Product

EverHot Gas Fired, Automatic Storage Water Heaters.

EverHot
TRADE-MARK

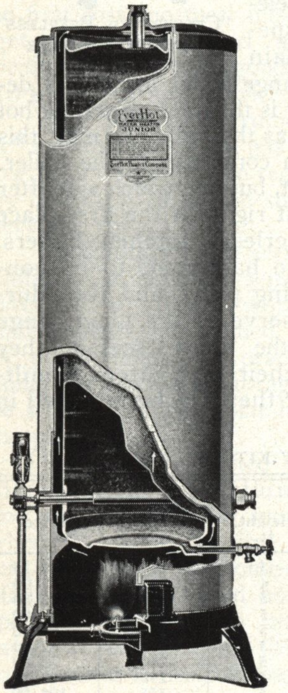
EverHot Sizes

Baby Grand—Burner capacity 40 to 60 cu. ft. of gas per hour. Pilot light burns ¾ cu. ft. of gas per hour. Starting hot, the Baby Grand will deliver from 35 to 45 gal. of water within one hour at a temperature, at the faucet, 100° above that of the incoming cold water.

Junior—Burner capacity 60 to 90 cu. ft. of gas per hour. Pilot light burns 1¼ cu. ft. of gas per hour. Starting hot, the Junior will deliver from 50 to 65 gal. of hot water within one hour at a temperature, at the faucet, 100° above that of the incoming cold water.

Senior—Burner capacity 120 to 180 cu. ft. of gas per hour. Pilot light burns 1¾ cu. ft. of gas per hour. Starting hot, the Senior will deliver from 90 to 120 gal. of hot water within one hour, at a temperature, at the faucet, 100° above that of the incoming cold water.

How to Figure Size for Job—Estimate the number of gallons of hot water used per day. Use a heater that will deliver one day's requirements within one hour, starting hot. This will be ample capacity for perfect service at all times.



Interior Construction of the EverHot

Advantages of the EverHot

Service—Immediate hot water service is rendered because the water in storage is *always* hot. Being a storage heater, the EverHot delivers hot water at the same pressure as cold, insuring a full stream to every faucet at the same time.

Operating Cost—Due to the effective manner in which every particle of the heat generated is used, the cost of operating the EverHot is considerably less than any other heater.

Maintenance Cost—No copper coils—no complicated parts. Condensation and precipitation of lime are practically eliminated, insuring long life to the heating element. Repairs and maintenance on the EverHot are practically unknown.

Price—The low price brings automatic hot water service within the reach of every family.

Construction

Boiler—The heating element is the sturdy boiler in which the water is stored. It is built of heavy copperoid steel, thoroughly galvanized, making it rustproof. The location of the drain cock opening in the bottom assures a perfect drain.

Boilers are tested in the black at 200 lb. pressure per square inch.

Burner—The combustion chamber is directly beneath the boiler. The burner is a specially designed, semi-bunsen type. It is non-carbonizing, and can not burn backfired. This burner permits of an unlimited turndown. The combustion with it is always complete, with no carbon monoxide.

Heat Travel—Completely surrounding the boiler, but separated from it, is the inner shell. The lower third of the inner shell, which forms the combustion chamber, is cast iron in the Junior and Senior, and nickeled steel in the Baby Grand. The highest temperatures are developed within this length. These

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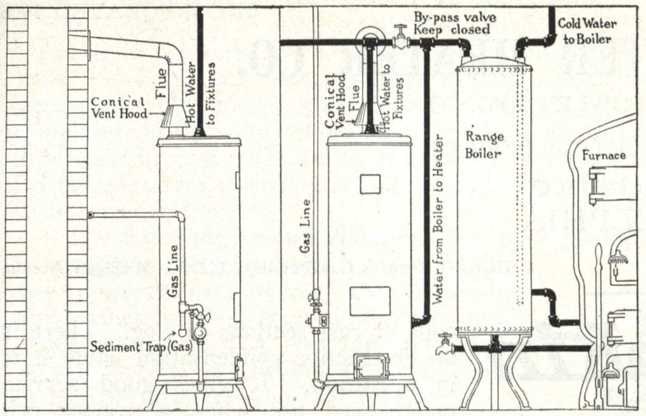


Direct System Reheating System

Methods of Connecting EverHot Heaters

combustion chambers are practically unaffected by heat and will last indefinitely. The upper section of the inner shell is heavy terne plate.

Insulation—The entire heater is thoroughly insulated with rock wool, which is packed between the inner and outer shells and prevents heat loss. In addition to being one of the best insulators known, it has a high refractory value.

Thermostat—The operation of the heater is controlled by a thermo valve. This is a simple, graduated all-metal type of thermostat with a copper tube as the expansion member and a carbon rod as the fixed member. It may be set to keep the water at any desired temperature.

Operation of the EverHot

When first lighted, the burner operates at full capacity until the water in storage is heated. As the temperature of the water nears the set temperature, the thermostat gradually closes off the gas until only the pilot is burning.

When a hot faucet is opened, hot water flows immediately. The cold water, entering the boiler, causes the thermo valve to open, admitting the maximum amount of gas to the burner. The full flame burns only until the water is heated when it automatically returns to pilot.

The entire surface of the boiler is the heating area. It is from two to four times as large as that of any other heater, burner capacity considered. The long narrow stepped flueway gives the gases a "scrubbing" action which insures all the heat being used.

The EverHot has a very high thermal efficiency. This is due to its large heating area, its long heat travel through narrow stepped flueway and the thorough insulation.

Temperature Maintained by the Pilot—When the burner is down to pilot the combustion chamber temperature is only about 140°. With a room temperature of 70° the difference is only 70°. Consequently the gases move through the heater very slowly. Due to the fact that the flueway is long and narrow there is enough friction to stop circulation of the hot gases through the flueway almost completely. Therefore, the only heat loss to make up is the very slight amount that is able to get through the heavily insulated jacket.

One of the greatest wastes resulting from the operation of ordinary automatic heaters is due to the heating of water that later cools and must be reheated. This does not happen with the EverHot.

Only 4.4% Stack Loss—When the burner is operating at full capacity the temperature in the combustion chamber is approximately 1800° and the temperature in the stack is never more than 80° above the temperature in the boiler, therefore, our stack loss is only 80 divided by 18, or 4.4%.

Guarantee

EverHot Heaters are guaranteed to be free from defects in workmanship and materials for 1 year.

They are guaranteed to raise 1 gal. of water 60° on 1 cu. ft. of 600 B. t. u. gas.

The pilot light is guaranteed to maintain the temperature of the water in storage at 70° above room temperature while burning not over 1¾ cu. ft. of 600 B. t. u. gas per hour for the Senior, not over 1¼ cu. ft. per hour for the Junior and not over ¾ cu. ft. per hour for the Baby Grand.

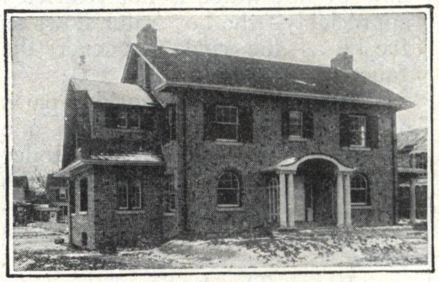
Installation

Installation of EverHot Heaters is easy and can be handled by any competent plumber. They may be connected either direct or reheating. When a circulating system is installed, water lines should be insulated, also long runs on direct systems. Furnace coils should never be connected direct to the heater.

The EverHot will operate on artificial, natural or gasoline gas.

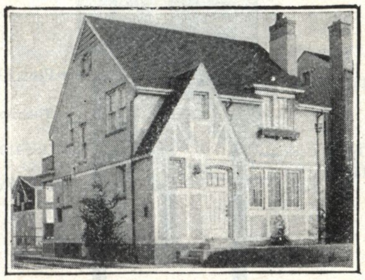
Specifications of EverHot Heater

	Baby Grand	Junior	Senior
Water connections, in.	¾	¾	¾
Gas connections, in.	½	½	¾
Flue pipe, in.	3	4	5
Gas meter	3 light	5 light	10 light
Height, in.	55	57½	62
Width, in.	21	23	25½
Depth (over all), in.	17	19	22
Weights, crated, lb.	155	285	400
Prices	$66.00	99.00	160.00



The Home Beautiful, River Forest, Chicago

Ryan Bros. & Sather, Builders



The Straphanger Model Home, Detroit

G. H. Gustaf Steffens, Architect

Electrical League Model Home, Cleveland

Phil Marquand, Architect

The EverHot was selected for each of the above model homes and is universally used in model homes all over the country

ESTABLISHED 1842 INCORPORATED 1908

THE LOVEKIN WATER HEATER CO.

FORMERLY DEILY & FOWLER MFG. CO.

FACTORY AND EXECUTIVE OFFICES
21-43 Laurel Street
PHILADELPHIA

NEW YORK, Hudson Terminal Building, 30 Church Street
CHICAGO, Peoples Gas Building, 122 So. Michigan Avenue

Lovekin
TRADE-MARK

Product

Lovekin Storage-Automatic Water Heaters.

A Continuous Supply of Hot Water

The Lovekin supplies hot water at all times by maintaining a large advance supply of hot water in storage, always ready for immediate use and at minimum expenditure of gas. It is entirely automatic in its operation.

This storage system insures a full flow even when all hot water faucets are opened simultaneously, whereas, ordinary instantaneous water heaters fail in responding to such heavy demands. The heat is applied directly to the water reservoir, enabling this heater to absorb maximum heat from all gas used.

Quality materials throughout and uniform construction in accordance with the latest advances in heat engineering assure unfailing service and fuel economy with every Lovekin installed.

Thermostatic Operation

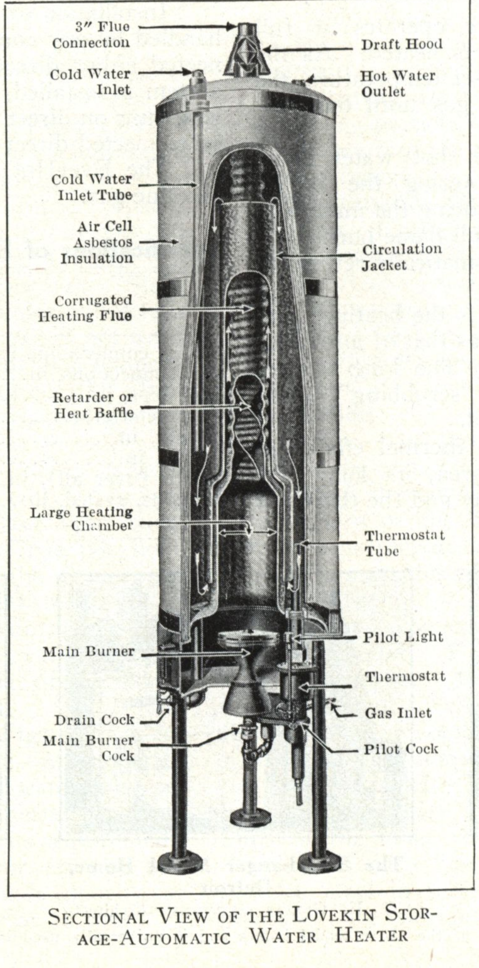
The temperature of the water is completely controlled by means of the Lovekin "Sylphon" gas thermostat which has been proven highly satisfactory by twelve years of practical use.

When hot water is drawn from the top of the heater, cold water enters at the bottom near the thermostat, causing the thermostat to function and bring on the gas. The gas burns until the incoming cold water is heated; then the thermostat again operates and shuts off the gas. This operation is repeated as hot water is used. Small withdrawals, however, may be made without bringing on the gas, resulting in a saving in operating cost. The temperature of the hot water supply does not vary materially in normal use, because the cold water enters at the bottom of the heater while the hot water is taken off at the top.

The thermostat is set to heat water to approximately 140°, and can be adjusted for heating either 10° above or below this temperature. Adjustments for greater range of temperatures are special and must be made at the factory.

Construction

No Copper Coils—The Lovekin is essential where bad water conditions exist. It has no copper coils or cast sections to clog. There is no destructive condensation while it is in operation. It gives good service under hard use where a copper coil heater would quickly burn out.



Sectional View of the Lovekin Storage-Automatic Water Heater

Boiler Construction—See illustration. The boiler is constructed with a central heating chamber and flue. Inside, a circulating tube or partition encircles the corrugated flue. When the main burner lights, the water in the space between the corrugated flue and the circulating partition ascends, starting the circulation which continues until the water in the entire boiler is uniformly heated. Complete absorption of heat by surrounding water is insured by the corrugated spiral retarder extending through the flue, which baffles the ascending heat.

Single, Self-guarding Burner—One of the most remarkable features of the Lovekin is the efficient small burner designed with horizontal openings around the circumference through which the gas flows, so that all dirt is prevented from falling into the openings and clogging them.

The burner is secured in the base of the heater and a door provided so that the burner may be easily inspected and removed for cleaning. The pilot light is protected from drafts and only enough air for proper gas combustion enters the combustion chamber. This results in a great saving of fuel.

The gas rate consumption of the burner is small—about 50 cu. ft. per hour (natural or artificial gas), making it unnecessary to put in a larger gas meter or larger gas service pipes.

Not Affected by Water Pressure—The Lovekin operates independently of the water pressure, and works perfectly where the pressure is poor or variable, and the flow of hot water is not restricted appreciably—the hot water flows as freely as the cold whenever the faucet is opened.

Insulation—All working parts of the heater are enclosed in one housing. The outside of the boiler is heavily insulated with four layers of heavy corrugated air cell asbestos, and is covered with a white cover.

Base—The boiler rests on a heavy cast iron enclosed base supported by three 1-in. legs with floor flanges.

Continued on next page

How to Choose Sizes for Various Requirements

It is advisable to make certain that the size Lovekin specified is adequate to the needs under consideration. Where there is any question between two consecutive sizes it is better to select the larger, thus insuring the complete comfort and convenience of the users. The difference in cost and operation between two sizes of Lovekin Heaters is comparatively negligible in view of such considerations.

The following recommendations are to be modified according to the requirements. In selecting size, however, bear in mind that the Lovekin "comes back" quicker than a coal fired water heater and it is, therefore, not necessary to specify a Lovekin as large as the boiler necessary to be used if coal fired.

No. 22 Lovekin—For houses, bungalows or cottages with one bath, kitchen and laundry. Also small barber shops and beauty parlors.

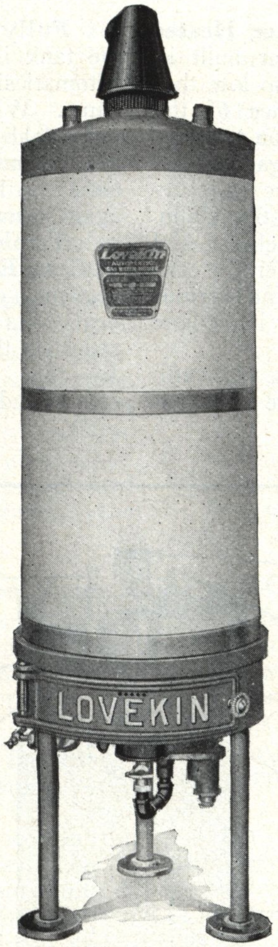
No. 28 Lovekin—For houses with one bath, kitchen, laundry, and an extra lavatory.

No. 35 Lovekin—For houses with two baths and other regulation fixtures. Also two-family houses with one bath and other regulation fixtures in each apartment.

No. 45 Lovekin—For a residence with three baths and other regulation fixtures.

No. 60 Lovekin—For residences where a large instant demand is required. For two-family houses with two baths and other regulation fixtures in each apartment.

No. 75 Lovekin—Small office buildings, apartments, industrial plants.



One of 6 Sizes of Lovekin Heaters Described Below

Installation Notes

Where to Place the Heater—The Lovekin should usually be installed in the basement or laundry; occasionally, for small installations, in the kitchen.

To avoid a long run of flue pipe, the heater should be near a flue, and it should be as close as conveniently possible to the faucets most frequently used (i. e. the kitchen faucet in the case of domestic installations).

Return Circulation—Return circulating systems can be used in connection with a Lovekin, but the operating expense is higher than with the direct system.

In planning new houses, operating cost can be reduced in either direct or circulating systems by insulating the hot water supply pipes throughout the house.

Gas Connection—½-in. on all sizes. The burner is the same capacity on all sizes of Lovekins, i. e., only, approximately, 50 ft. per hour, or about the consumption of the large burner on a gas range. It, therefore, requires only a ½-in. gas line and no larger meter, nor a separate line from meter to heater.

Venting—A 3-in. vent, preferably to a separate chimney, should be provided for in all cases. A draft hood is always furnished with heater. This draft hood is placed at top of the heater and prevents strong drafts either up or down the chimney from affecting the action of the burner or pilot.

Specification

Install where indicated on plans .... No. ...... Lovekin Storage Automatic Water Heater. Connect ½-in. gas line to heater from gas line to nearest point to heater, and cold and hot water to heater as with a range boiler.

Place a gas shut-off valve on the gas line near thermostat and a valve on cold water line near where it enters heater. Vent to flue as indicated on plan.

Some Lovekin Users

Consolidated Gas Company of New York
Brooklyn Union Gas Company, Brooklyn, N. Y.
Westchester Lighting Company, Mount Vernon, N. Y.
Kings County Lighting Company, Brooklyn, N. Y.
Public Service Company of Northern Illinois
United Gas Improvement Company of Philadelphia
Atlantic City Gas Company, Atlantic City, N. J.
Peoples Light & Coke Company, Chicago, Ill.
Wilmington Gas Co., Wilmington, Del.
Northern Indiana Gas & Electric Co.
North Shore Gas Co.
Consolidated Gas, Electric Light & Power Company, Baltimore, Md.
Allentown-Bethlehem Gas Company, Allentown, Pa.
Washington Gas Light Company, Washington, D. C.
United Cigar Stores
Union News Company
Mohican Stores

TYPES OF LOVEKIN HEATER

Size No. and approximate capacities in gal.	Water connection, in.	Gas supply, in.	Flue connection, in.	*Standard headroom, ft.	in.	Headroom on special order only, ft.	in.	Minimum floor space, in.	Average weight uncrated, lb.	Average weight crated, lb.
22	¾	½	3	*5	8	5	½	18x18	207	260
28	¾	½	3	6	4	6	½	18x18	235	300
35	¾	½	3	6	4	6	½	21x21	272	335
45	1	½	3	6	6	6	4	22x22	315	390
60	1	½	3	6	6	6	4	25x25	358	435
75	1	½	3	7	6	7	4	25x25	410	520

*_Note:_ Headroom on No. 22 can be made 5 ft. 4 in. by ordering an angle draft hood instead of the standard straight draft hood when ordering heater. The headroom figures include space for placing draft hood and flue connection.

JOHN WOOD MANUFACTURING COMPANY

Manufacturers of Automatic and Non-automatic Gas Fired, Storage Water Heaters

CONSHOHOCKEN, PA. LOS ANGELES, CALIF.

The Merion Automatic Storage Gas Water Heater

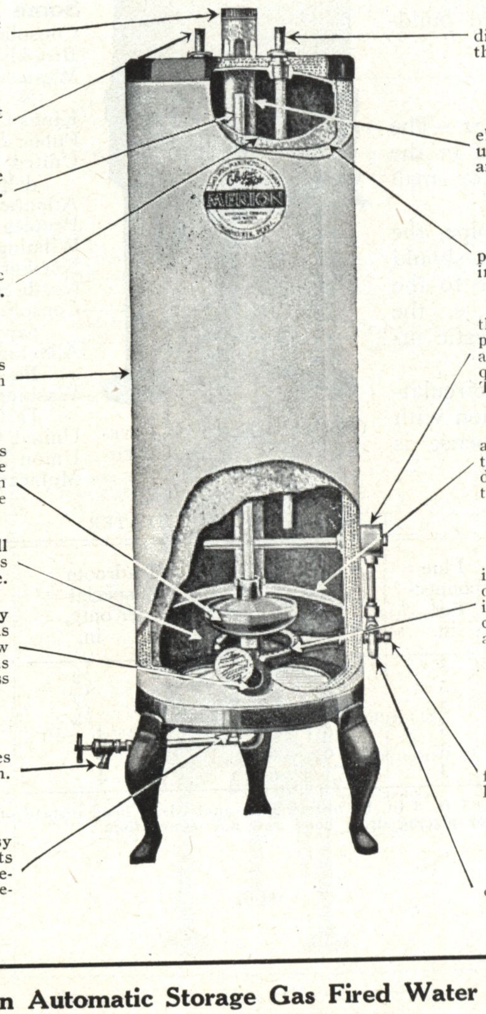
A high quality automatic storage heater built in large volume, at a price and operating cost so low that every home can afford one. The low price of the Merion ($70 for the family size) permits you to place this modern convenience in every home, regardless of price. It has a low gas bill. On request, we will furnish records or copies of gas bills to prove this claim.

The Merion Automatic is a highly developed and efficient storage water heater that heats the entire contents of the tank to 160° F., and, like a giant thermos bottle, keeps the water at this temperature for immediate use at all hot water faucets.

The construction and operation of this high efficiency, silent, safe and economical heater are fully explained in the illustration below.

Fully Automatic in Operation—When water in the tank is heated to 160° F., the thermostatic valve automatically reduces the gas supply and lowers the flame. When hot water is drawn from the top of the tank, cold water replaces it at the bottom. This causes the thermostatic valve to increase the size of the flame until the hot water is replenished, when the flame is again automatically lowered.

Triple Heating Method Utilizes Heat Units to Fullest Extent Possible—In addition to the heating element (which has a swift thermo-siphon action), the heat units from the gas flame in the Merion are also absorbed through the tank bottom and the internal flue. In this manner, maximum heat transmission is established and the heat losses at the vent are negligible.



Draft Hood—Burned gases pass out here and into the flue.

Hot Water Outlet—A supply of hot water at 160° F., is always available.

Hot Water Riser—Through this tube the hot water rises directly to the top of the tank. No coils are used in the Merion.

Storage Tank—Extra heavy "electric weld" boiler. No solder, no rivets, no leaks.

Casing—Heavy steel. Finished in robin's egg blue enamel (Automobile Lacquer) which is practically indestructible.

Heating Element—Cold water descends into the heating element, spreads over the hot inner surface of the element in a thin sheet, and rises through the tube in the center to the top of the tank.

Combustion Chamber—Enclosed and well insulated. Never gets hot on outside. Takes care of condensation and draft interference.

Self-closing Lighting Hole—Used only when lighting the heater. The Merion has no door or other openings that would allow drafts to affect the burner. This also means safety, as no explosion caused by careless lighting can burn the user.

Drain Cock—Periodical drainage carries off sediment and keeps bottom of tank clean.

Removable Bottom Cover—Allows easy access to heating parts. One-third of its area is asbestos made to push out and release pressure downward if exploded by careless lighting.

Cold Water Inlet—Cold water is immediately carried to the bottom of the tank through the cold water pipe.

Flue—After the hot gases have heated the element and bottom of the tank, they pass up this flue, helping to further heat the water and balancing temperature top and bottom.

Asbestos Insulation—Heater is completely surrounded by cellular asbestos 1¼ in. thick. Radiation losses are very low.

Graduated Thermostatic Valve—Controls the burner. Needs no adjustment, as it is permanently set at the factory. It is full automatic and will adjust itself to different qualities of gas and to varying gas pressures. This feature means low gas bills.

Tank Bottom—Heated over its entire area by the gas flame which is deflected by the heating element, thus heat which is ordinarily wasted is utilized to advantage in the Merion.

Burner—Has no pilot light. When tank is full of hot water, thermostatic valve reduces the gas flow so that the burner acts as its own pilot. Has no gauze and will not clog nor backfire. Has a perfect range of adjustment from 1 to 30 ft. of gas per hour.

Needle Valve Gas Mixer—Set for artificial gas. Adjustable for natural gas. Has high nozzle velocity.

Gas Cock—Can be shut off with one-quarter turn.

Merion Automatic Storage Gas Fired Water Heater

Continued on next page

Merion Dual Action Thermostatic Valve—The thermostatic valve in the Merion controls both the "pilot feature" (low flame) of the burner, also the main heat (high flame)—fluctuating gas pressures or varying qualities of gas can not cause trouble as in cases where separate pilot lights are used.

The one action of this valve provides a small gas flow opening for the low flame (pilot feature) or for small demands, and passes from 1 to 8 cu. ft. of gas an hour. The other action provides a larger gas flow opening for a high flame (operating only when the demand for hot water is great) and passes up to 30 cu. ft. of gas an hour. Both actions are of the graduated type.

The temperature of the water is held practically constant (160° F.) due to the perfect control of all gas flows by this dual action valve.

No Separate Pilot Light—No separate pilot light is used in the Merion, but instead, a low flame is maintained by the burner through the action of the thermostatic valve, and thus, while serving as its own pilot, the burner keeps the water in the tank at the predetermined temperature until heavy demands require a larger flame.

Economical Operation—The Merion principle of dual action thermostat valve and continuously maintained water temperature works a real saving in cost of operation. Instead of using small storage, low temperature, and extravagant burners that burn intermittently, and create hot water by short, fierce, wasteful blasts of gas, we have taken full advantage of the possibilities of storage and temperature. The Merion can be operated at lower cost than any automatic gas water heater on the market.

Easily Installed—The Merion is a self-contained unit ready for installation. Only two water connections and one gas connection are necessary. Rapid and inexpensive installation is therefore assured.

"Electric Weld" Tank—The storage tank is extra heavy "Electric Weld" construction—there are no rivets nor seams that can leak. Thoroughly inspected and tested before shipment.

Stocked Everywhere and Serviced Free—Merion heaters are carried in stock by leading plumbing supply jobbers and sold by plumbers everywhere.

Suggestions and sketches for installing Merion heaters in tandem, or battery formation, or in connection with furnace coil, for winter service, will be supplied by us on request.

They are serviced free by John Wood Manufacturing Company, which has trained service men available in every section.

MERION AUTOMATIC STORAGE GAS FIRED WATER HEATERS

Size, No.	Cap., gal.	*Diam., in.	*Height, in.	Price	Service
1	15	14	38	$60	For small homes, bungalows, apartments, barber shops and beauty parlors.
2	20	14	50	$70	For homes with 1 bath, laundry and kitchen fixtures or any place requiring a good volume of hot water.
4	36	18	50	$90	For 2-family houses or large homes with 2 or 3 baths, small apartments, office buildings, large barber shops and restaurants.

*Dimensions given are those of the body of the heater. Legs raise the heater 10 in.

On the right side, the thermo valve and gas cock project 2 in.

Drain cock is below heater.

The following dimensions apply to all heaters: vent connection, 3 in.; gas connection, ½ in.; water connection, ¾ in.

Standard Combination Range Boiler and Gas Fired Water Heater

This combination range boiler and heater is without thermostatic control and is intended for intermittent service. It must be lighted manually when hot water is required and the gas shut off manually when the demand for hot water has been met.

Economical in Fuel Consumption—The Standard has the same principle of internal heater, special design burner, heating element and heating flue that is incorporated in the Merion heater described on the preceding page. This principle means fullest possible utilization of the heat units from the gas, minimum gas consumption and *hot water at the faucet in five minutes.*

The Standard, with its built-in heater, is much more economical in the consumption of gas than an independent gas heater connected to the boiler. Independent heaters have extremely large radiation losses, and it is this lost heat that is used in the Standard for practical heating service.

Hot Water in Five Minutes—The incoming cold water descends to the bottom of the boiler and enters the heating element. When the burner is lighted, hot water immediately starts flowing from the heating element up through the hot water riser to the top of the boiler.

NON-AUTOMATIC STANDARD COMBINATION RANGE BOILERS AND GAS FIRED WATER HEATERS
(Hot Water in 5 Minutes)

Size, No.	Cap., gal.	*Diam., in.	*Height, in.	Service
1	12	12	36	For small homes, barber shops, beauty parlors, etc., where only a moderate supply of hot water is required.
2	17	12	48	For average size homes with 1 bath, kitchen sink and lavatory.
3	24	14	48	For large homes, etc., with more than the ordinary number of fixtures and where an unusual supply of hot water is required.

*Dimensions listed are those of the tank only.

The following dimensions apply to all sizes: vent connection, 3 in.; water connection, ¾ in.; gas connection, ½ in.

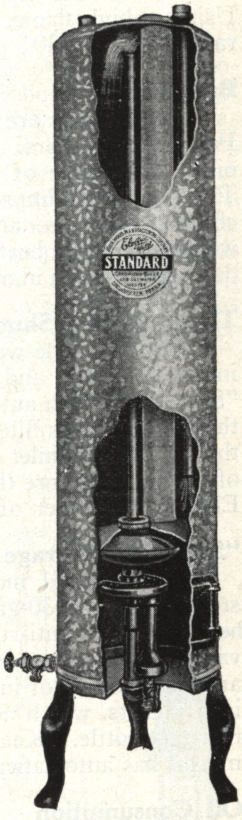
This quick action gives *hot water in five minutes* and a tank full of hot water in a very short time.

No Condensation — Condensation troubles have been prevented in the Standard by the use of a special design spreader and a pan stand that closes the combustion chamber. All moisture is quickly evaporated—there is no moisture dripping on the floor.

Easily Connected—There are only two water connections and one gas connection to be made, therefore installation is rapid and inexpensive.

The Standard can be connected to the heating boiler or to the kitchen range for winter service, but it is more economical to use gas the "Standard" way.

"Electric Weld" Construction—The boiler is electrically welded. There are no rivets, solder or seams to leak. Each boiler is fully tested and inspected before shipment, and bears the tester's stamp.



Standard Combination Range Boiler and Gas Fired Water Heater

THE CLEVELAND METAL PRODUCTS COMPANY

Manufacturers of Perfection Water Heaters

FACTORIES AND GENERAL OFFICES
CLEVELAND, OHIO

DISTRICT OFFICES
KANSAS CITY, MO. CHICAGO, ILL. ST. PAUL, MINN. CLEVELAND, OHIO OAKLAND, CAL. DALLAS, TEX.

Products

Perfection Kerosene Burning Water Heaters.

Also makers of Perfection Oil Cook Stoves and Ranges, Ovens, Cabinets; Puritan Oil Cook Stoves; Perfection Oil Heaters.

A Great New Invention

The first and only kerosene burning water heaters which offer the satisfaction, dependability and operating economy of the gas heater.

Models

No. 431—Complete with Giant Superfex burner, thermostatic "Shut-offs," Stay-hot tank and copper coils.

No. 421—Side arm type, with Giant Superfex burner, thermostatic "Shut-offs," and copper coils.

No. 412—Side arm type, with *two* improved double wall blue chimney burners and cast iron heating units.

No. 411—Side arm type, with one double wall "Cobalt" blue chimney burner and copper coils.

Performance

Light any one of these new heaters (except Model No. 411 which is not quite so fast) and in 5 minutes hot water may be had for washing or shaving; in 10 minutes for washing dishes; for a bath in 30 minutes. Using a high flame, water temperature is raised at the rate of 25° to 30° per gal. per minute.

Burners

All heaters are equipped with the world famous Perfection burners. Giant Superfex burner, the fastest oil burner made of its kind, equals the speed of gas. The latest type improved double wall, double draft blue chimney burners, are the recognized standard of the world for quick heating and dependability—now giving daily satisfaction in over four and one half million homes.

Thermostatic "Shut-offs"

Built into the water heating element and the burner in the Nos. 431 and 421 models, is a dual thermostatic "Shut-off" which automatically turns out the flame when the tank becomes filled with hot water. Its position near the cold water inlet from the tank insures a tank *full* of hot water before the flame is automatically turned out. Eliminates danger of burner overheating.

"Stay-hot" Storage Tank

The No. 431 model is equipped with a "Stay-hot" storage tank of 30-gal. capacity. It is made of copper-bearing steel (anti-rust), welded and riveted, then galvanized. Tested at pressure of 200 lbs. Fitting over and around the main or inside tank are two 24-gal. galvanized iron jackets, which act in a manner similar to that of a thermos bottle. Keeps water hot 36 hours after thermostat has automatically turned out the flame.

Oil Consumption

Giant Superfex burner will operate steadily at low flame on 1 gallon of oil for *27* hours; at medium flame 13 hours; at high flame 8 hours.

Improved blue chimney burner will operate steadily on 1 gallon of oil for 36 hours at low flame; at medium flame 20 hours; at high flame 13 hours.

Heater No. 431

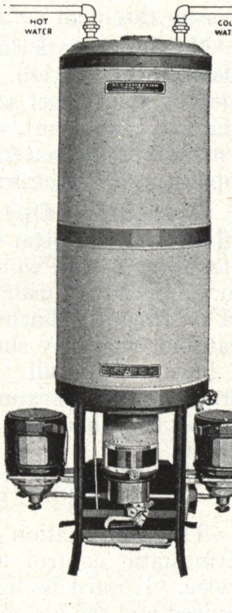
The finest and most completely equipped of all kerosene burning water heaters. Has powerful Giant Superfex burner, thermostatic "Shut-offs," "Stay-hot" tank and copper heating coils. The material and workmanship in this superquality heater, are the best that money can buy. Its service is so efficient and economical, that it rivals the best gas heater the market affords. Compact in design, and attractively finished in gray and black with japanned standard.

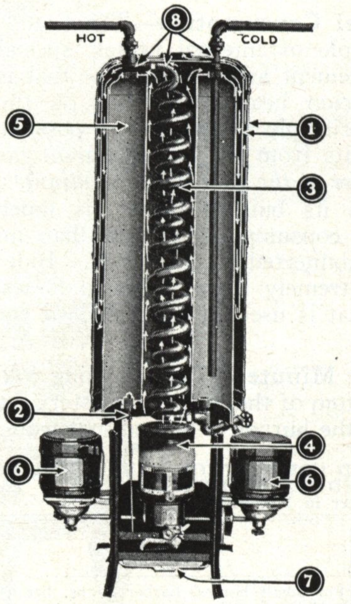
"Stay-hot" tank will keep water at:

Clothes-washing temperature for 6 hours.

Dishwashing temperature for 13 hours.

Bath temperature for 36 hours.





(1) The "Stay-hot" tank, like a giant thermos bottle, keeps the water hot for hours—saves fuel.

(2) The thermostat shuts off the flame just as soon as the tank is *full* of hot water—convenient and economical.

(3) Copper coils, 28 ft. long of No. 20 gauge copper tubing ⅝ in. in size, connect the top and bottom of tank by means of solderless union nuts and special cast brass fittings, placed in superheated center flue.

(4) Big Giant Superfex burner, furnishes a tremendous volume of heat. Equipped with automatic wick stop.

(5) Extra heavy 30-gal. storage tank of copper-bearing steel, welded, riveted and then galvanized. Guaranteed test pressure, 200 lbs.

(6) Two 1-gal. reversible oil reservoirs; visible oil level.

(7) Porcelain enameled burner tray removable for easy cleaning.

(8) A complete, self-contained outfit, simplified piping, no separate storage tank required.

DIMENSIONS AND SHIPPING WEIGHTS OF HEATER NO. 431

Height, including tank, in.	Width over all, in.	Diameter of tank at greatest depth, in.	Capacity of tank, gal.	Weight of heater, lb.	Shipping weight, crated, lb.
66⅜	31	18 3/16	30	238	318

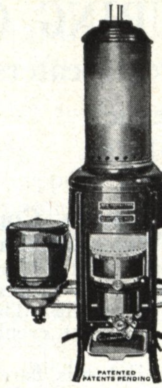
Note: Size of crate, 69 in. wide, 21⅜ in. deep and 32⅜ in. high.

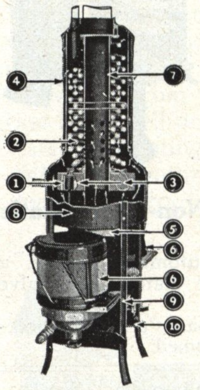
Continued on next page

Heater No. 421 (Side Arm Type)

This model has been designed for use with the regular 30-gal. tank. It combines the high quality of material and workmanship characteristic of heater No. 431. Has Giant Superfex burner, thermostatic "Shut-offs," and copper coils.

To those who already have a hot water storage tank, or who prefer a separate tank installation because of its lower cost, this model offers splendid service and satisfaction.





(1) The thermostat shuts off the flame just as soon as the tank is *full* of hot water—convenient and economical.

(2) Triple copper coil connected direct to heater in three places. ½-in. No. 20 gauge tubing, 36 ft. long. Will not clog.

(3) Heavy cast bronze header with special heat collecting fins.

(4) Double insulating jacket around coils—holds the heat—saves fuel.

(5) Big Giant Superfex burner has automatic wick stop.

(6) Two 1-gal. reversible oil reservoirs; visible oil level.

(7) Coils supported on heavy, vitreous enameled standard.

(8) Entire heater supported by substantial frame, eliminating strain on piping or tank.

(9) Strong rigid legs, adjustable to variations in piping.

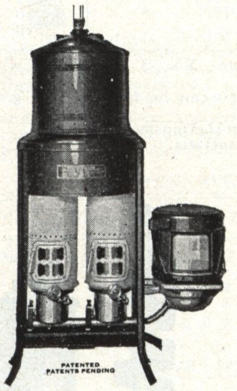
(10) Porcelain enameled burner tray, removable for easy cleaning.

DIMENSIONS AND SHIPPING WEIGHTS OF HEATER NO. 421

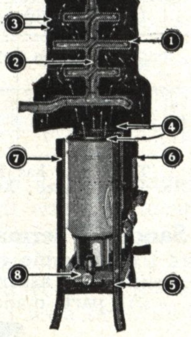
Height, over all, in.	Width over all, in.	Diam. of lower jacket, at greatest depth, in.	Size tank recommended, gal.	Weight of heater, lb.	Shipping weight, crated, lb.
42¼	27¼	11¾	30	62½	92

Note: Size of crate, 43½ in. wide, 29¼ in. deep and 13½ in. high.

Heater No. 412 (Side Arm Type)



A heater without equal in the popular priced field. Has *two* double wall, double draft blue chimney burners and cast iron heating units. It is of the same Perfection quality as heaters 431 and 421, but without thermostatic "Shut-off." Quick to heat, simple to clean and operate, and dependable.



(1) Four cast iron heating units with special heat-collecting fins. Exceptionally efficient.

(2) Extra large water passages insure circulation of water.

(3) Double wall jacket around the heating units—holds the heat—saves fuel.

(4) *Two* improved double draft blue chimney burners—our latest burner development.

(5) Entire heater supported by substantial frame, eliminating strain on piping or tank.

(6) One-gallon reversible oil reservoir. Visible oil level.

(7) Substantial frame with legs adjustable to variations in piping.

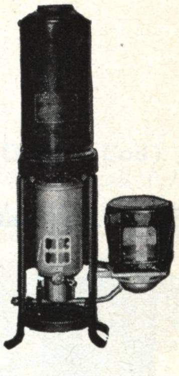
(8) Porcelain enameled burner tray, removable for easy cleaning.

DIMENSIONS AND SHIPPING WEIGHTS OF HEATER NO. 412

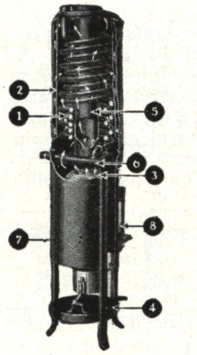
Height, over all, in.	Width over all, in.	Diam. of lower jacket, at greatest depth, in.	Size tank recommended, gal.	Weight of heater, lb.	Shipping weight, crated, lb.
35	23	13⅛	30	62¾	85

Note: Size of crate, 37¾ in. wide, 15¼ in. deep and 25 in. high.

Heater No. 411 (Side Arm Type)



A new, efficient water heater with double copper heating coils. It is built solidly and is of highest quality throughout. For those people who do not need a water heater with as large a heating capacity as our other models, this Perfection will meet all requirements. It will give very satisfactory, dependable service. At its moderate price, it is an unequalled water heater value.



(1) Double copper heating coil ½ in., No. 20 gauge, 26 ft. long, fastened top and bottom to brass headers by solderless unions. Will not clog.

(2) Double insulating jacket around coils holds heat—saves fuel.

(3) One double wall "Cobalt" blue chimney burner—extra fast.

(4) Built-in burner tray, black japanned finish—easily cleaned.

(5) The copper coils are supported by a No. 18 gauge steel tube, porcelain enameled to prevent rusting. This construction gives heater great strength.

(6) Heavy cast brass header provides rigid support for coils—will not rust.

(7) Entire heater supported by substantial frame—no strain on piping or tank.

(8) One-gallon glass reversible oil reservoir, easy to fill—visible oil level.

DIMENSIONS AND SHIPPING WEIGHTS OF HEATER NO. 411

Height, over all, in.	Width over all, in.	Diam. of lower jacket, at greatest depth, in.	Size tank recommended, gal.	Weight of heater, lb.	Shipping weight, crated, lb.
38	19	8⅝	30	34½	50½

Note: Size of crate, 20¾ in. wide, 13½ in. deep, 39¼ in. high.

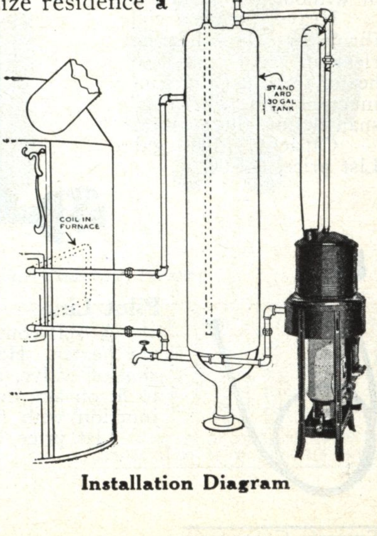
Correct Installation Important

The most important points to be observed when installing these water heaters are as follows:

Service pipes to faucets should be made as short as possible and never larger than ¾ in. in diameter, to keep radiation losses at a minimum. Never run hot water pipes out doors unless they are heavily insulated. In the installation of Model No. 431, the cold water inlet pipe should be connected to the down pipe that extends inside the tank almost to the bottom. Models 421, 412 and 411 heaters must be connected to a storage tank as shown in the illustration. A drain faucet should be placed at the lowest point in each system to draw off sediment from the tank.

For the average size residence a 30-gal. tank is most satisfactory. Larger residences require tanks with 40 to 60-gal. capacity. Never attempt to use these heaters with a tank having less than 20-gal. capacity.

Complete instructions for installing Perfection kerosene burning water heaters are furnished with each water heater or will be sent on request. Catalogue will be mailed promptly.



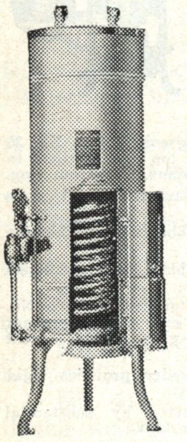
Installation Diagram

THE SANDS MANUFACTURING COMPANY

Manufacturers of Water Heaters

5407 Sweeney Avenue
CLEVELAND, OHIO

Sands Automatic Storage Gas Water Heater



Tank is extra heavy copper bearing steel, riveted and welded; 250 lb. cold water pressure, working pressure 125 lb. No. 20 gauge terne plate.

Heater with cast iron jacket, fire japanned; No. 18 gauge extra heavy copper coil. Two-piece burner, japanned heavy bronze screen.

Cold water drop inside boiler of copper, insuring against rust and corrosion. All connections and fittings of high grade brass.

Snap action type valve, easily removable.

Burner will consume 50 cu. ft. of artificial gas and 35 ft. of natural gas per hour.

No.	Capacity, gal.	Weight, lb.
20	18	190
22	20	273
30	28	331
50	45	448
100	100	675

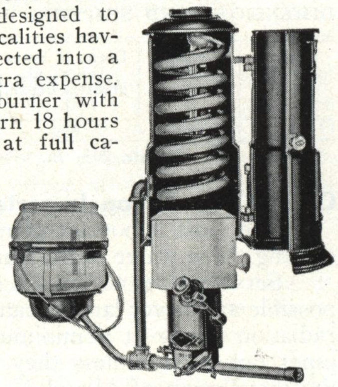
Nos. 22, 30 and 50 made with copper boiler also

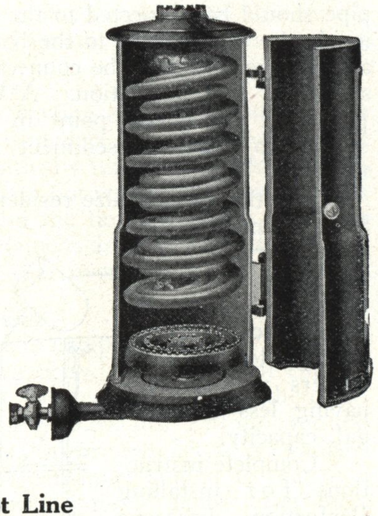
Sands Wick Type Kerosene Water Heater

This heater has been designed to satisfy the requirements of localities having no gas. It can be connected into a gas heater with but little extra expense.

The heater has a wick burner with a smokeless flame. It will burn 18 hours on one gallon of kerosene at full capacity. A gallon glass container is furnished with each heater.

Cap., gal.	Diam. tube, in.	Diam. shell, in.	Wt. crated, lb.	Price, each
30	¾	8	49	$25.00





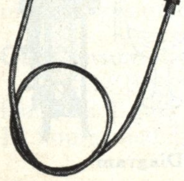
Sands Triple Coil Water Heater No. 80

Designed for storage systems. Furnished with or without gauze burner.

Heavy triple coil furnishes the heating element. An excellent heater to be used in conjunction with "Thermag" snap action thermostat.

Capacity, 100 gal.

List price, $45.00.

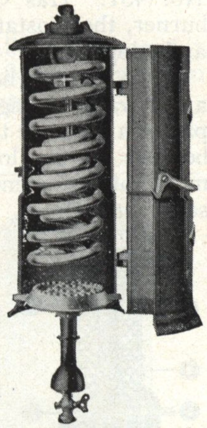


Pilot Line

A self-contained unit for use with any heater. Has lava pilot tip, red brass shut-off valve, and flexible copper tubing to fit on any outfit. Can be used in conjunction with the "Thermag" valve.

List price, $3.00.

Sands Double Copper Coil Gas Water Heater



Cast jacket. The specially constructed burner forces its intense heat directly into coils. The baffle plate distributes the heat evenly to all parts of the coil.

The jacket is flared out where heat is most intense. Can be used with natural or artificial gas.

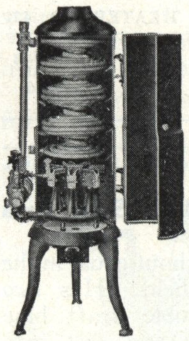
No.	Cap., gal.	Tube, in.	Diam., in.	Ht., in.	Wt., lb.	Price, each
115	30	¾	8½	13	27	$14.00
40	30	¾	8	18	33	18.00
50	30	¾	8	24	43	20.00
70	40	¾	8	24	45	25.00

Nos. 50 and 70 furnished with union couplings.

Sands Automatic Water Heater, Non-thermostatic and Thermostatic

This heater has a Sands patented automatic burner, a Sands patented automatic valve and baffle plate. The valve is solid brass.

It has a combination drip pan and base, a large three-legged stand. It is all cast iron, fire japanned.



No.	Cap. per min., gal.	Weight, lb.
200	2	84
250	2½	110
2NT	2	135
2½NT	2½	175
3NT	3	235
4NT	4	260
5NT	5	320
2½T	2½	185
3T	3	242
4T	4	291
5T	5	350
7T	7	520

All sizes up to No. 3 furnished with brackets or legs.

Nos. 200 and 250 can be furnished in gray enamel, if desired.

NT denotes non-thermostatic.

T denotes thermostatic.

Sands Augmore Water Heater

The patent step coil makes this heater especially suitable for hard water districts.

The jacket is double Russian iron or enamel, asbestos lined.

Has self-cleaning combination burner and mixer.

Capacity, 30 to 40-gal. tank.

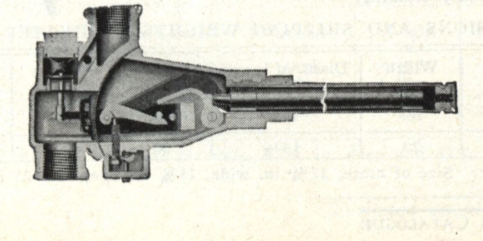
No.	Diam., in.	Ht., in.	Wt., lb.	Price, each
9	7	27	35	$12.00
10	7	27	35	15.00
11	7	27	43	18.00

The No. 9 has Russian iron jacket; No. 10, enameled; No. 11, cast.

Sands "Thermag" Snap Action Control

The thermo magnetic control makes the valve absolutely positive and assures simplicity of control.

All parts made of red brass. Crated shipping weight, 8 lb.



EXCELSO SPECIALTY WORKS

Manufacturers of Water Heaters
119 Clinton Street, BUFFALO, N. Y.

NEW YORK OFFICE, 210 East 44th Street

CHICAGO OFFICE, 610 Wrigley Building

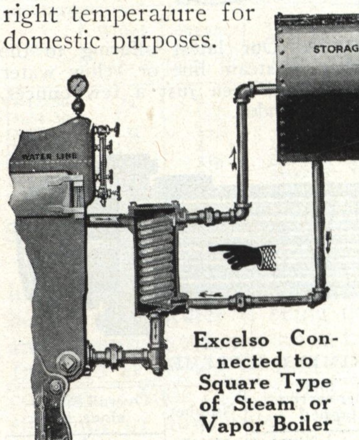
EXCELSO
TRADE-MARK

Excelso Water Heater (Single Coil)

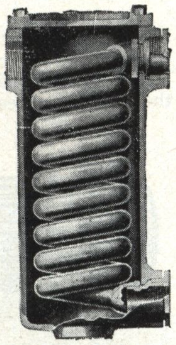
The Excelso consists of a heavy copper coil heating element fitted in a cast iron shell by means of patented ground joint connections. All parts are interchangeable and easily accessible.

Operation—When connected on the outside of steam or vapor boilers, the Excelso eliminates the necessity of a fire pot coil and insures an absolutely constant supply of domestic hot water all during the heating season at an even temperature.

Application to Any Steam or Vapor Boiler—The Excelso can be easily connected to any steam or vapor heating boiler, new or old. The heater is connected below the water line on the outside of the boiler; the water from the heating boiler flowing through the cast iron shell at boiling temperature heats the domestic water circulating through the copper coil to just the right temperature for domestic purposes.



Excelso Connected to Square Type of Steam or Vapor Boiler



Interior of Single Coil Excelso Heater

Note that the *shell* of the Excelso is connected *below* the water line and that the *boiling* water from the steam or vapor boiler *flows* down through the heater and *heats* the *domestic water* which *circulates* up through the *copper coil*

Note: Many of the leading boiler manufacturers stock the Excelso and provide boiler tappings. Where such tappings are not provided they can be easily and quickly made by means of a rotary hack saw tool, sold by us to the plumbing and heating trade.

DIMENSIONS EXCELSO WATER HEATERS

Number of Coils	Single						Double				Triple	
Size..........	Jr.	11	12	13	14	15	25	*26	*27	*28	35	36
Length......in.	8½	10½	14	11½	15	19½	12½	15	19	23¼	21	25
Diam.......in.	5	5	5	6½	6½	6½	9	9	9	9	13¾	13¾
Shell open'gs, in.	1	1	1	1½	1½	1½	2	2	2	2	3	3
Coil open'gs, in.	¾	¾	¾	1	1	1	1½	1½	1½	1½	2½	2½
Wt., crated, lb.	11	17	23	31	39	46	58	68	82	95	185	210
List price......	$12.50	$30	$40	$50	$60	$70	$120	$150	$180	$210	$310	$400

CAPACITY HEATING WATER BELOW WATER LINE OF STEAM OR VAPOR BOILERS

Size..........	Jr.	11	12	13	14	15	25	26	27	28	35	36
Tank cap...gal.	30	30	45	60	90	120	160	200	300	400	600	800

Temperature rise 100° in 3 hours.

Heating Domestic Water With Live Steam—The Excelso is extensively used to heat water by means of live steam or vapor. Its large heating surface makes it efficient and its cost is less than installing a coil and manhole in a storage tank. Can be connected to storage tanks in many different ways and used with or without thermostatic control. Capacities as follows:

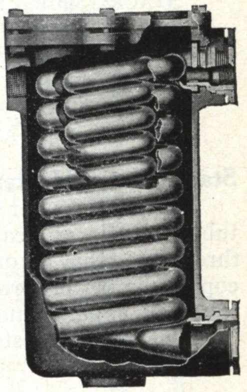
Size..........	Jr.	11	12	13	14	15	25	26	27	28	35	36
Tank cap...gal.	45	50	75	100	150	200	250	300	450	600	900	1200

Temperature rise 100° in 3 hours at 5-lb. pressure.

Note: Many tanks are installed too small, so heaters should correspond with work required and not size of tank. Also make liberal allowance if circulating system is used.

Excelso Water Heater (Double Coil)

The new *heavy duty double coil Excelso heater is* designed for larger installations, where large quantities of hot water are required. It supplies, at practically no cost for fuel, abundant hot water for apartment houses, medium sized hospitals, small hotels, business blocks, factories and garages. Takes care of installations up to 400 gal., or doubled up, 800 gal. Operation and construction are identical with single coil heater except for double copper coil in place of single.



Interior Excelso Double Coil Water Heater

Excelso Water Heater (Triple Coil)

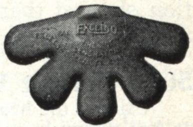
These new heaters are designed for even larger installations than double coil heaters, such as laundries, hotels and apartments, or wherever a very large quantity of hot water is required. Design is the same throughout as the smaller sizes and just as accessible for cleaning and repairing. Capacities from 600 to 800 gal. when used below water line; 900 to 1200 gal. when used with live steam. Batteries of triple coil heaters will supply thousands of gallons of perfectly heated water per day.

Excelso Fire Pot Generator

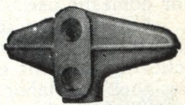
Heating domestic water in connection with hot water boilers and hot air furnaces requires the use of a fire pot generator because boiling water is not available.

The Excelso fire pot generator is designed to insure maximum heating surface, and being entirely above the fire, does not interfere with the combustion of fuel or firing of boiler. This feature is important, as many of the troubles of the ordinary type fire pot generator are due to its being located in the fuel bed and seriously interfering with the fire. Made in cast iron and brass in two sizes:

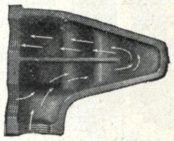
Size No. 1 up to 40-gal. capacity.
Size No. 2 over 40-gal. capacity.



Top View

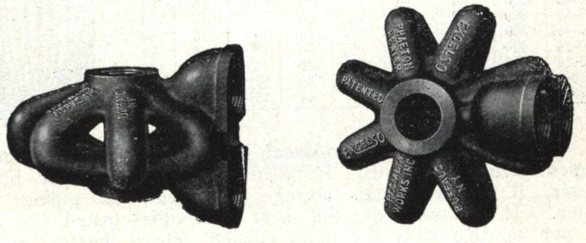


Side View



Sectional View

Fire Pot Generator



Side View

Top View

Excelso Phaeton Heater

Size, diam.......................in.	6	8	10	12	15	18
Height.......................in.	3½	4½	5¼	6	7	8
Tappings.......................in.	1	1	1½	2	2½	3
Side outlets, c to c.......................in.	2½	2½	3	3½	4½	5½
Tank cap.......................gal.	30	45	80	100	150	250
Direct water radiation...........sq. ft.	40	75	100	150	250	400
Approx. shipping weight ....lb.	6	11	18	30	60	85
List price, iron.......................	$ 7.50	12.00	20.00	24.00	50.00	70.00
List price, brass.......................	$15.00	28.00	45.00	54.00	115.00	160.00

ESTABLISHED 1894

STACK HEATER COMPANY

INCORPORATED 1912

Manufacturers and Designers of Water Heaters and Allied Specialties

33 Sudbury Street, BOSTON, MASS.

DISTRIBUTED THROUGH WALWORTH MANUFACTURING CO.

NEW YORK, N. Y.
CLEVELAND, OHIO
BUFFALO, N. Y.
CHICAGO, ILL.
YOUNGSTOWN, OHIO
PHILADELPHIA, PA.
SEATTLE, WASH.
BOSTON, MASS.
PORTLAND, ORE.
LONDON, ENGLAND
KEWANEE, ILL.
ERIE, PA.

Products

- STACK INDIRECT WATER HEATERS.
- STACK INSTANTANEOUS STEAM WATER HEATERS.
- STACK AUTOMATIC STORAGE SYSTEMS.
- STACK NON-BY-PASS TEES and SAFETY RELIEF VALVES.
- STACK GAS WATER HEATERS.

Stack Water Heater Construction

All Stack water heaters have seamless drawn copper tubes. Ratio of heating surface to volume of water is three times that of other heaters. All waterways are of copper, brass or bronze. No expansion joints. Each tube can expand and contract without stress or strain.

All coils are tested to 600 lbs. water pressure before assembling.

Advantages of Stack Water Heaters

Speed in heating water.

Free circulation.

Highly efficient and economical.

Manufactured since 1894.

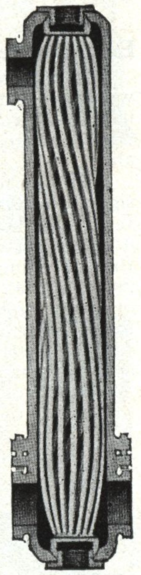
Actual service tests made at International Exposition showed that Stack heaters have the greatest speed and efficiency in each test.

Stack Indirect Water Heater

Utilizes the heat in the water of any steam or hot water heating plant for heating water for domestic use. The two waters do not mix.

Can also be installed in connection with cast iron water jacketed coal burning heaters, relieving them of excessive pressure, and saving fuel and labor.

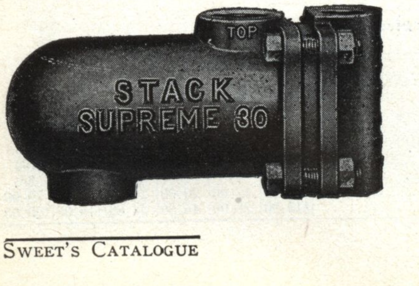
The combination of Stack gas water heater for summer use and Stack indirect water heater for winter use is ideal.



STACK INDIRECT WATER HEATER

Size	Tank capacity rated on		Shell opening, in.	Hot water conn., in.	L'gth., in.	Diam., in.	Shell openings on centers, in.	Wt., lbs.
	3 hrs.	1 hr.						
D-6-13	40	15	1	¾	18	4	13	18
D-12-13	60	24	1¼	¾	18	6	13	24
D-24-15	100	40	1½	1	24	6	15	32
D-37-15	200	80	1½	1¼	24	8	15	50
D-50-15	300	120	2	1½	24	10	15	60
D-50-24	400	150	2	1½	36	10	24	70
D-85-24	700	250	2	2	36	13½	24	120
D-120-24	1000	400	3	3	36	13½	24	200
D-120-36	1200	500	3	3	44	13½	36	250

Stack Supreme 30 Indirect Water Heater—For small homes having one bath. Installed on steam or vapor house heater, it keeps 30-gal. storage tank full of piping hot water. It is built of the best materials tested to 300 lb. per sq. in.; it is the most efficient 30-gal. heater on the market.



Stack Supreme 60—Is designed for homes with two or three baths.

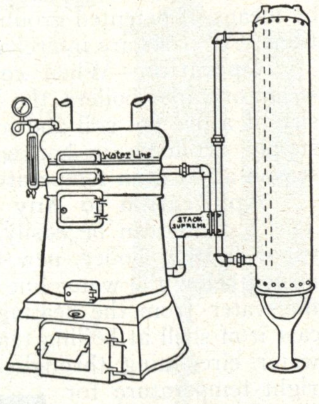
Stack Supreme 100 — Designed for two or three family houses.

Stack Supreme 160—Best suited for 4 to 6 families.

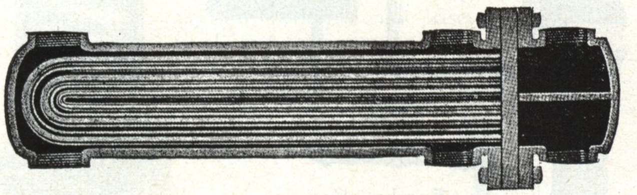
The Stack Supreme 30 indirect water heater can be installed with storage tank in basement, as illustrated, or in kitchen above.

DIMENSIONS OF SUPREME HEATERS

Size	30	60	100	160
H. W. conn., in.	¾	¾	1	1½
Shell openings, in.	1	1	1¼	1½
Length over all, in.	8⅛	11⅝	15¼	15¾
Diam. over all, in.	4$\frac{13}{16}$	5⅛	6	7¼



Stack Apartment Supreme—Our latest offering to the trade. Can be connected either in steam line or below water line. When steam flow is constant, even just a few ounces, the steam connections are recommended.



STACK APARTMENT SUPREME

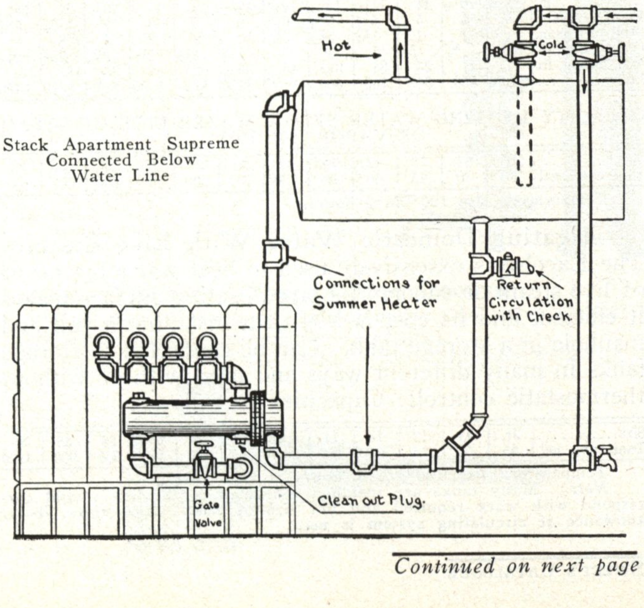
No. of heater	Connections, in.		Boiler sections tapped		Number of suites supplied	Overall dimensions, in.	
	Shell	Water	Connection, in.	Number of sections		Length	Diam.
250	(4) 1½	1½	1¼	4	8–10	24	8
400	(4) 2	2	1½	4	12–16	25½	11
600	(4) 2	2	1½	4–6	20–25	34½	11
1000	(4) 3	3	1½	6–8	40–50	38	13½

No. of heater indicates gallons delivered in 3 hrs., 100° rise with water in steam boiler at 210°. Connected below water line.

Suites are figured at 4 rooms and bath with a minimum storage tank capacity of 25 gals. per suite.

For ratings with heater connected in steam line 5 lbs. pressure maintained, multiply ratings by two.

Stack Apartment Supreme Connected Below Water Line



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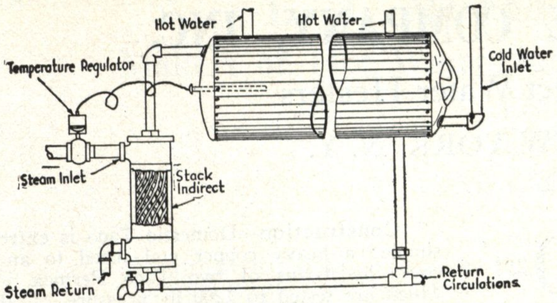


STACK SYSTEM

STACK INDIRECT HEATER CONNECTED TO HORIZONTAL BOILER FOR USE WITH THERMOSTATIC CONTROL ON STEAM SUPPLY

For use when exhaust or low pressure steam is used. Steam inlet and return should be same size as tappings of indirect heater

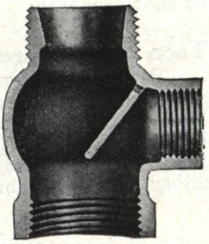
Size heater....	D-12-13	D-24-15	D-37-15	D-50-15	D-50-24	D-85-24	D-120-24
Tank capacity (gals.) 100° rise in 1 hour with 5 lbs. steam.	60	120	250	350	500	750	1000

STACK INDIRECT HEATER CONNECTED TO HORIZONTAL BOILER WHERE THERE IS A CONSTANTLY LARGE SUPPLY OF STEAM AT 35 LBS. OR MORE PRESSURE

(Special Blue Print for Installation, on Application)

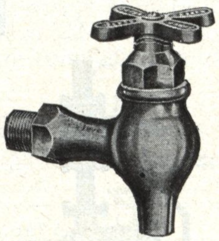
Size	Water connections, in.	Steam connections, in.	Tank capacity, gal.	Gals. per hr. 100° rise	Length, ft.	Diam., in.	Weight, lbs.
D-12-36	¾	1	150	400	5	4	50
D-24-36	1	1¼	300	750	5	5	60
D-37-36	1¼	1½	500	1000	5	6	75
D-50-36	1½	2	1000	2500	6	7	95
D-85-36	2	2½	2000	4000	6	12	160
D-120-36	3	3	3500	7000	6	12	210

Stack Non-by-pass Tee



Prevents mixing of hot water in range boiler with cold water from heater while water is being drawn, and prevents condensation in heater. Installed as shown at foot of next column. Adds 15% to 20% to the efficiency of any heater. Made in 26 styles.

Stack Safety Relief Valve



A combination faucet and relief valve (made of best steam metal). Constant use insures that the seats are free. Flow of water through the valve proves that pressure has access to the valve. Does not water-hammer. Is foolproof. Relieves into sink, saving separate drain. Order valves set 25 lbs. higher than normal water pressure at outlet.

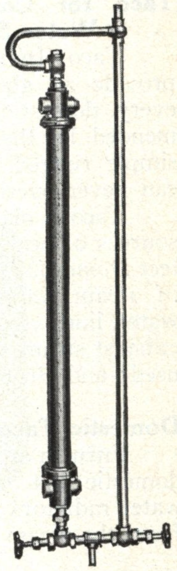
Stack Instantaneous Steam Water Heater

Vertical Type—Suitable for moderate hot water demands in factories, office buildings, institutions, hotels, restaurants, clubs, laundries, etc. Utilizes the heat from either exhaust or high pressure steam. Steam and heated water do not mix. Steam is used only when water is being drawn. Temperature of water delivered is governed by simple temperating method. No moving parts.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1913

Horizontal Type—Suitable for heavy demands. Capacities are based on actual service tests which we guarantee, provided steam and water pressures are maintained in the heater. Flow from heater is based on 30 lbs. water pressure.

Steam thermostatic control can be used for any combination of steam and water pressures, or mixing valve control can be used when water pressure exceeds steam pressure.



STACK INSTANTANEOUS STEAM WATER HEATERS

For water pressures up to 250 lbs. and steam pressures up to 100 lbs. Water pressure must exceed steam pressure

No.	Water inlet and outlet, in.	Steam connection in.	Gallons per min.		Length, ft.	Diam., in.	Weight, lbs.
			5-10 lbs. steam	30 lbs. steam			
Vertical Type							
IS-12-48	½	1¼	6	8	6	4	60
IS-37-48	¾	1½	12	16	6	5	100
IS-50-48	¾	2	15	20	6	7	120
Horizontal Type							
IS-100-36	1	2½	30	45	5	12	200
IS-100-48	1	2½	40	60	6	12	240
IS-100-72	1½	2½	60	90	8	12	320
IS-150-72	2	2½	100	150	8	16	550
IS-150-144	2	2½	150	225	10	16	700
IS-200-144	3	4	225	500	10	24	1000

IS-100 and IS-150 furnished with larger steam connection when required.

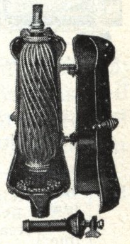
Larger sizes on application.

Stack Gas Water Heater

In this heater, the small columns of water in the almost vertical copper tubes are heated very rapidly, the proportion of heating surface to volume of water being 20 to 1.

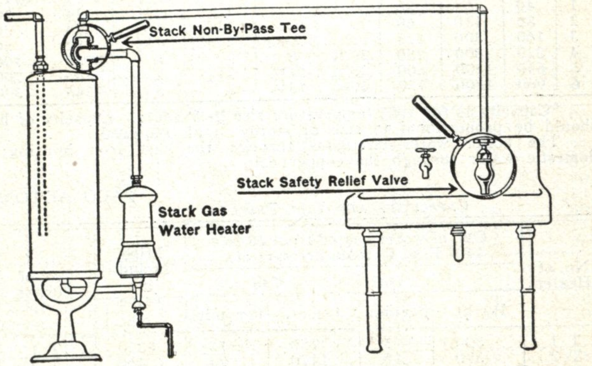
Its rapid circulation results in economy and absence of sediment.

Can be used in combination with the Stack indirect water heater.



STACK GAS WATER HEATER

No.	Boiler capacity, gals.	Cu. ft. gas per hour	Length, in.	Diam., in.	Weight, lbs.
1	30	40–50	20	7½	20
2	40	50–60	20	9½	25
3	60	70–80	20	9½	42
6	100	100–120	28	10½	75



Stack Gas Water Heater Connected to Range Boiler

THERMAL APPLIANCE COMPANY, INC.

Manufacturers of Indirect Water Heaters

342 Madison Avenue, NEW YORK, N. Y.

Trade Mark TACO Reg US Pat Off

Taco for Constant, Economical Hot Water Supply

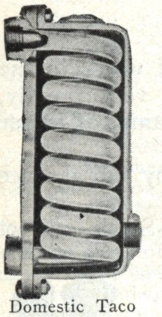
Taco Indirect Hot Water Heaters provide an abundance of hot water for every domestic need. They are recommended by their extreme economy of operation, their simple rugged construction and by the fact that they can never overheat the water.

Taco is made in several types for use with different sources of heat. We especially recommend to the architect *Domestic* and *Apartment* Taco attached to the boiler of steam, vapor, or vacuum heating plant below the water line; *Automatic* Taco, for connection to live or exhaust steam, using steam only when hot water is being used; and *Bronze* Taco, for hard or soft water.

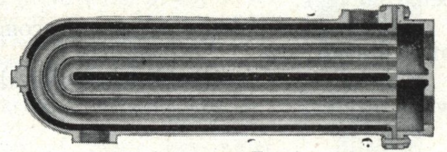
Domestic Taco and Apartment Taco

Furnish at minimum cost a uniform and continuous domestic hot water supply. Also used to heat hot water radiators in garages, greenhouses, bathrooms, etc., from the steam boiler.

Since they are connected to the steam heating boiler below the water line, they are unaffected by changes in steam pressure and continue to operate when the fire is banked at night. They add no appreciable load to the boiler.



Domestic Taco



Apartment Taco

Domestic and Apartment Taco

No.	*Capacity, gal.		For garage heating—sq. ft. radiation	Lgth., in,	Diam., in.	Boiler connection, in.	Tank connection in.	Ship. wt., lb.	List price
	Below water line	With live steam							
30	30	50	......	......	......	1	¾	11	$ 15.00
1	40	75	30	......	......	1	¾	14	20.00
2	80	150	60	......	......	1¼	1	24	30.00
3	160	300	125	......	......	2	1¼	52	50.00
4	320	600	250	26⅜	8	2	2	85	100.00
5	640	1200	500	38 7/16	11¾	2½	2½	195	200.00
6	960	1800	750	40 3/16	13½	3	3	265	300.00

*Capacity is for 100° temperature rise in 3 hours. Capacity of heater should be proportional to size of storage tank required.

The boiler water circulates through the cast iron housing; the domestic water through the copper coil.

Construction—Domestic Taco is extremely simple: a heavy copper coil fitted to an iron cover by means of two Taco Permex joints, which are tested to 1200 lb. pressure. Coil and cover removable for cleaning without breaking Permex joint.

Apartment Taco has large section copper U-bends, securely fastened to the tube plate by the Permex joint. Free waterways for easy, quick circulation. Taco heaters last indefinitely.

Automatic Taco

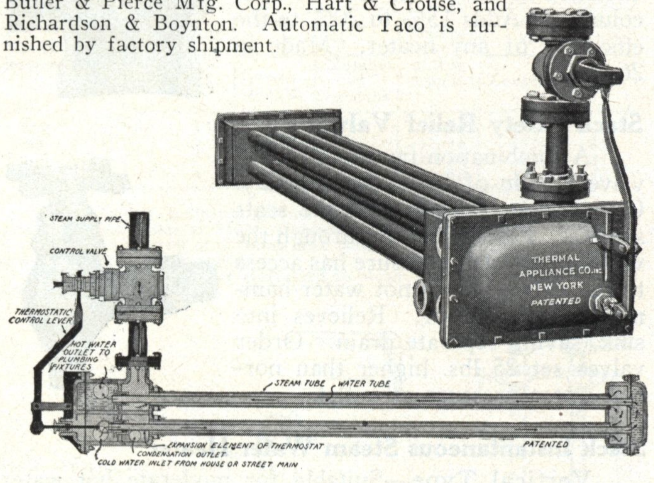
An instantaneous heater which occupies a minimum of space and requires no storage tank. It can be used wherever a constant supply of live or exhaust steam is available, notably in hotels, hospitals, clubs, restaurants, apartments and industrial plants.

Automatic Taco consists of two headers connected by a series of double pipes, one set within the other; the inner pipes being heavy copper and the outer steel. Water and steam flow through them in opposite directions, the steam giving up its heat to the water.

Control—A thermostatic valve controls the admission of steam. It can be set to heat the water to any desired temperature. When no hot water is required, it closes the steam connection automatically, making operation extremely economical. Capacities of Automatic Taco range to 7000 gal. per hour, as shown in table.

Taco Stocks Are Carried in All Principal Cities

Regular plumbing and heating jobbers carry Taco stocks, as do leading boiler and radiator manufacturers, including U. S. Radiator Corp., American Radiator Co., Pierce, Butler & Pierce Mfg. Corp., Hart & Crouse, and Richardson & Boynton. Automatic Taco is furnished by factory shipment.


THERMAL
APPLIANCE CO. INC
NEW YORK
PATENTED
STEAM SUPPLY PIPE
CONTROL VALVE
THERMOSTATIC CONTROL LEVER
HOT WATER OUTLET TO PLUMBING FIXTURES
STEAM TUBE
WATER TUBE
EXPANSION ELEMENT OF THERMOSTAT
CONDENSATION OUTLET
COLD WATER INLET FROM HOUSE OR STREET MAIN
PATENTED

Automatic Taco

TACO AUTOMATIC WATER HEATERS

Capacities and List Price

No. of Heater	Gal. of water heated from 40 to 140° F. at a steam pressure of:				Price, including valve
	5 lb.		40 lb.		
	Per hr.	Per min.	Per hr.	Per min.	
T 1	300	5	750	12	$320
T 2	590	10	1470	24	440
T 3	865	14	2130	35	560
T 4	1130	18	2810	47	680
T 5	1360	23	3340	56	800
T 6	1620	27	4050	67	920
T 7	1850	31	4630	77	1040
T 8	2070	34	5030	86	1160
T 9	2290	38	5740	95	1280
T10	2460	41	6150	102	1400
T11	2640	44	6600	110	1520
T12	2800	47	7000	117	1640

Dimensions and Shipping Weights

No. of Heater	Shipping weight, lb.	Length, ft.	Width, in.	Height, in.		Size valve, in.		Drip connection, in.	Water con'n inlet and outlet, in.
				Heater only	Incl'g valve	High press.	Low press.		
T 1	190	10	7	11	24½	1	1¼	¾	1
T 2	300	10	11	11	26½	1	1½	1	1¼
T 3	425	10	14	11	26½	1¼	1½	1	1¼
T 4	550	10	17	11	26½	1¼	1½	1¼	1½
T 5	675	10	20	11	26½	1½	2	1¼	1½
T 6	800	10	23	11	26½	1½	2	1¼	1½
T 7	925	10	26	11	27½	2	2½	1½	2
T 8	1050	10	29	11	27½	2	2½	1½	2
T 9	1175	10	32	11	27½	2½	2½	2	2
T10	1300	10	35	11	27½	2½	2½	2	2
T11	1425	10	38	11	30	2½	3	2	2½
T12	1700	10	41	11	30	2½	3	2	2½

ESTABLISHED 1857

L. J. MUELLER FURNACE CO.

Makers of Hot Water Supply Boilers and Garbage Burners

GENERAL OFFICES
230 Reed Street,
MILWAUKEE, WIS.

BRANCH OFFICES

ST. LOUIS, MO., 1409-11 Olive Street
SEATTLE, WASH., 1929 Second Avenue
PORTLAND, ORE., 53 Fourth Street
MINNEAPOLIS, MINN., 631 Third Avenue, S.
ST. PAUL, MINN., 158 East Fifth Street
CHICAGO, ILL., 60 East Lake Street
DETROIT, MICH., 426 Jefferson Avenue, E.
FORT COLLINS, COLO.
SALT LAKE CITY, UTAH, 331 South Rio Grande Street

Products

Combination Hot Water Supply Boilers and Garbage Burners.

Also All-cast Warm Air Furnaces; Horizontal Tubular Heaters for large schools and churches; Steam and Hot Water Boilers.

For Registers, Grilles and Mushroom Ventilators, see page 2328.

Mueller Combination Hot Water Supply Boiler and Garbage Burner

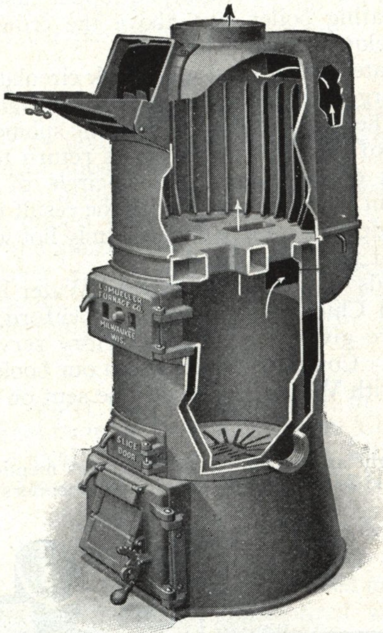
Designed to dispose of household garbage with the same fire that furnishes an abundance of hot water quickly and economically for domestic use.

Simple in operation, has but few parts and is quickly and easily erected. Draw-center shaking and dumping grate with ample air space. Pea or slack coal can be used. This is the regular Mueller hot water supply boiler with addition of heavy cast iron garbage chamber.

Special flue construction carries smoke and gas to the rear and over top of garbage chamber until garbage is dried. The garbage is then burned by flame passing through the water filled garbage grate below and up through the garbage.

Erected and tested before shipment; cored castings tested under 250 lb. pressure.

Stock of both tank heaters and garbage burners in 4 sizes. Our 1926 line will include a 22-in. garbage burner on which we will gladly furnish complete data on request.



Garbage Burning Hot Water Supply Boiler

A shovel or two of coal a day heats an ample supply of water for domestic use, and burns the garbage as well.

Hot water and garbage holding capacities for all sizes are listed below. Dimensions and complete information on request.

MUELLER HOT WATER SUPPLY BOILER CAPACITIES
T—Tank Heater G—Garbage-burning Tank Heater

Hours between firing	5	6	7	8	9	10	5	6	7	8	9	10
	No. 10T and No. 10G						**No. 12T and No. 12G**					
Hard coal per hr ....lb.	6.40	5.33	4.57	4.00	3.55	3.20	10.00	8.33	7.14	6.25	5.55	5.00
Power per hr, B.t.u.......	49280	41066	35200	30800	27377	24640	77000	64141	54978	48125	42735	38500
	Capacity in Gallons per Hour						Capacity in Gallons per Hour					
Temp. rise, deg. F. per hr.												
25	158	132	114	99	88	79	211	176	150	132	117	105
35	113	94	81	70	62	56	150	126	107	94	83	75
45	88	73	63	55	49	44	117	97	83	73	66	58
55	72	60	51	45	39	35	95	80	68	60	53	52
65	62	50	44	38	34	30	81	68	58	50	45	40
75	52	44	38	33	29	26	70	58	50	44	39	35
85	46	38	34	30	26	23	62	51	44	38	34	30
95	41	35	29	26	23	21	56	46	39	35	30	27
105	37	33	27	23	21	19	50	41	36	31	27	25
	No. 14T and No. 14G						**No. 16T and No. 16G**					
Hard coal per hr ....lb.	11.6	9.66	8.29	7.25	6.44	5.80	15.0	12.5	10.7	9.38	8.33	7.50
Power per hr, B.t.u.......	89320	74382	63833	55825	49588	44660	115500	96250	82390	72226	64141	57750
	Capacity in Gallons per Hour						Capacity in Gallons per Hour					
Temp. rise, deg. F, per hr.												
25	316	264	220	195	174	158	392	327	281	246	219	188
35	226	188	157	139	125	113	280	234	201	174	156	134
45	176	146	122	108	96	88	217	181	156	136	122	104
55	144	119	100	89	79	72	177	149	128	111	100	86
65	122	102	84	75	67	60	150	126	109	93	85	72
75	105	88	73	64	58	52	131	109	93	81	72	62
85	93	78	64	57	51	47	115	96	82	72	65	56
95	83	69	58	51	46	41	103	87	74	65	57	49
105	76	62	52	46	41	37	93	78	67	58	52	45

Garbage capacities: 10G, ½ bu.; 12G, ¾ bu.; 14G, 1½ bu.; 16G, 1¾ bu.

BELL & GOSSETT COMPANY

Manufacturers of The Unitem Submerged Water Heater

3002 Wallace Street
CHICAGO, ILL.

Unitem Submerged Water Heater

In apartment building basements there are the heating boiler and the independent water heater. The Unitem Submerged Water Heater eliminates the separate water heater altogether by installing a series of telescoped copper tubes into the heating boiler just above the crown sheet and below the water line.

UNITEM
SUBMERGED
WATER HEATER
HEATS WATER
WITH WATER

TRADE-MARK

Cold water from the storage tank circulates through these submerged copper tubes, enters through the inner tubes and is heated as it travels over the submerged heating surface of the outer tubes on its return to the tank, describing a complete, continuous circle of extraordinarily efficient heating surface with the result that always there is an adequate supply of uniformly hot water ready at the turn of the faucet handle.

Hundreds of Unitem Submerged Water Heaters are in service in Chicago, Milwaukee, Rockford and other cities and are giving highly satisfactory service winter and summer. Complete details are in our booklet "Heating Water with Water" which will be sent on request.

Types

On the right are details of various types mentioned below.

"S"—Single 2-in. heater for small firebox boilers of the locomotive and brickset types. Cold water chamber permits cross connection under handhole.

"T"—Single 2-in. Heater similar to "S," except cold water chamber of head is above line of heaters to avoid boiler flues; for return tubular boilers, small size detachable firebox and similar types.

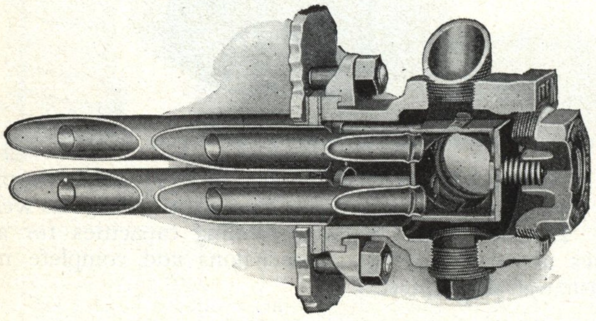
"M"—Multiple has 4 1¼-in. heaters to each unit—see sectional view. Long head for brickset or portable return tubular boilers. Short head for straight or down-draft firebox boilers—portable or brickset. See typical installation. Over 80% of Unitems used are of the "M" type.

"MM"—Multiple of two or more "M" heaters are used with portable firebox boilers. Heads located in the unused part of smoke chamber. This method applies to all Unitem heaters and many boilers.

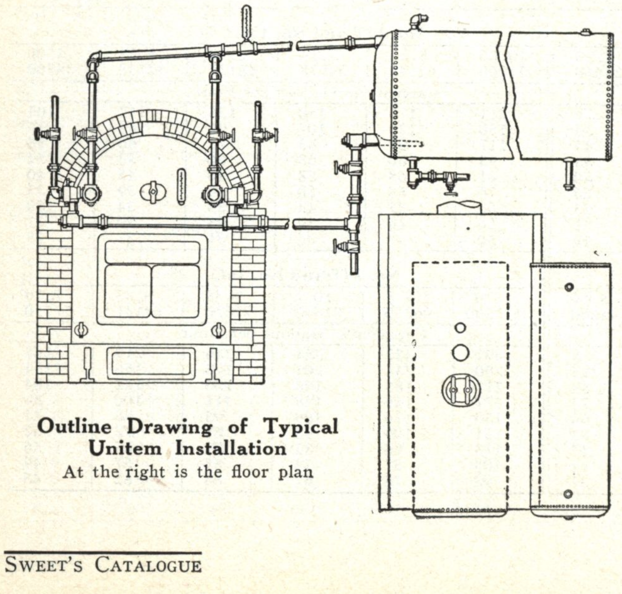
"V"—Vertical has three heaters to each unit (one above the other) for use in water spaces of sides of the firebox portion of the combined tubular and firebox type of boilers.

"MO"—Outside type submerged heaters are for cast iron sectional and other special boilers.

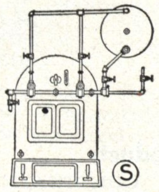
"D"—Double has two 2-in. heaters which give large circulation capacity for hot water heating of garages and low rooms from steam boiler.

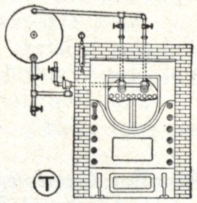


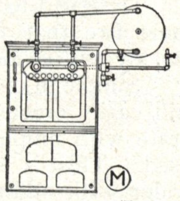
Sectional View of Complete "M" Heater
Tubes projecting through boiler into the water

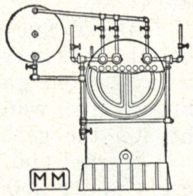


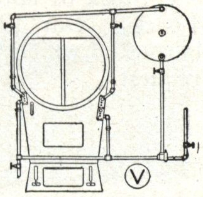
Outline Drawing of Typical Unitem Installation
At the right is the floor plan

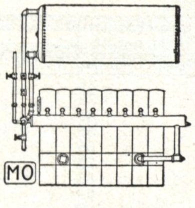


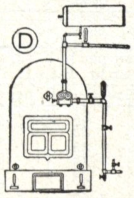












Specifications

For the convenience of the specification writer the following wording will cover the Unitem specification:

Water Heater and Connections—In connection with the steam heating boiler and hot water storage tank install a Unitem Submerged Water Heating System manufactured by Bell & Gossett Company, Chicago, Ill.

The system to consist of the required number of heaters assembled in most adaptable units, submerged in the water of the steam heating boiler and equipped as necessary with feed and return piping to storage tank having Unitem openings, water temperature adjustment, clean-out openings, summer firing thermometer, and circulation controls to maintain an abundance of hot water.

The installation to provide for easy cleaning, inspection or repairs of heating boiler. All handholes and similar openings of the boiler to remain unused or new and equal ones provided.

The manufacturers furnish complete plans and specifications for the installation of the Unitem Submerged Water Heaters and guarantee the capacity and operation of this system when so installed.

Helpful Service

We maintain a staff of engineers whose experience and training has been in heating water and we shall be glad to have the architect call upon us to assist in laying out the hot water supply system in any building he may be interested in.

FERGUSON & LANGE FOUNDRY CO.

Manufacturers of "B.S.T." Hot Water Heaters

1039 Willow Street
CHICAGO, ILL.

TELEPHONE
Lincoln 5575

"B.S.T." Hot Water Heaters

"B.S.T." water heaters eliminate the separately fired tank heater or steam coil the year around, and furnish an abundance of steaming hot water 24 hours per day, at only a small fraction of the cost of heating it any other way.

"B.S.T." water heaters are placed inside of the heating boiler below the water line, and are submerged in the hot boiler water at all times.

"B.S.T." water heaters never come in contact with the fire, hence it is impossible to overheat the water to be used for domestic purposes.

Construction

"B.S.T." water heaters consist of long copper tubes closed at the rear end, into which is inserted a slightly shorter inner tube of brass which is open at the rear end. The front ends of both outer and inner tubes are connected to a specially partitioned and chambered head, which is securely fastened to the heating boiler.

The water to be heated is introduced through the bottom chamber of the head and into the inner brass tube, through which it is carried to the rear of the larger copper heating tube, and is heated on its way back to the upper chamber of the head from whence it is conducted to the storage tank or directly to the fixtures as conditions demand.

Capacities

"B.S.T." water heaters are built in capacities to care for all buildings from the smallest to the largest where low pressure steam, vapor or vacuum systems of heating are used, and can be installed in old as well as new boilers any place in the United States or Canada.

Tankless Systems

"B.S.T." tankless systems are of the same construction as where the storage tanks are used, with the exception of the method of connecting.

The tankless system can be installed at quite a saving over the storage tank system. You save the tank, tank stands, cost of handling and connecting, also a large amount of floor space.

The tankless system is adaptable to any size building and to most types of heating boilers.

Performance

"B.S.T." water heaters maintain an even temperature of water 24 hours per day without the aid of temperature control apparatus.

During the heating season "B.S.T." water heaters require no attention whatever.

During the summer months a small banked fire is maintained over a small portion of the grate area of the heating boiler and is tended only once or twice every 24 hours, hence a great saving of labor.

Installation

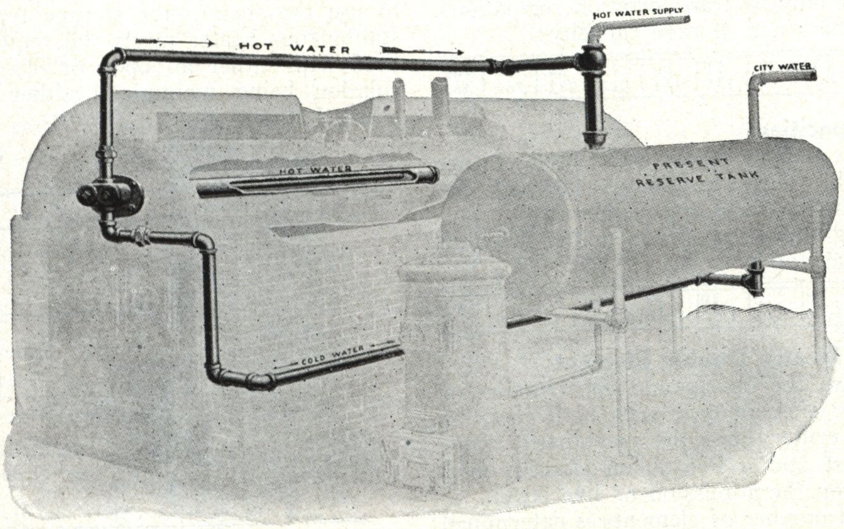
"B.S.T." water heaters are installed in the heating boilers by Ferguson & Lange Foundry Co. and connected by the local plumber in accordance with plans and specification furnished by Ferguson & Lange Engineering Dept.

Guarantee

"B.S.T." water heaters are guaranteed to operate on 50% less fuel than any separately fired water heater or steam coil, and to be of sufficient size and capacity to furnish an adequate supply of hot water at all times for the building in which they are installed.

Specification

Install "B.S.T." water heaters made by Ferguson & Lange Foundry Co., 1039 Willow Street, Chicago, Ill., and guaranteed by them to furnish an adequate supply of hot water at all times when the water in the heating boiler is 170° F. or over.



"B.S.T." Hot Water Heater Installed

THE NATIONAL PIPE BENDING CO.

Manufacturers of Steam Actuated Water Heaters

156 River Street
NEW HAVEN, CONN.

OFFICES IN THE FOLLOWING CITIES

NEW YORK, N. Y. BOSTON, MASS. PHILADELPHIA, PA. WASHINGTON, D. C. PITTSBURGH, PA.
BUFFALO, N. Y. CHARLOTTE, N. C. CLEVELAND, OHIO DULUTH, MINN. BUTTE, MONT.
CHICAGO, ILL. CINCINNATI, OHIO ST. PAUL, MINN. TORONTO, ONT.

Products

Process Water Storage Heaters (Bulletin No. 65); Instantaneous Water Heaters (Bulletin No. 55).

Also, Coal Burning Tank Heaters (Bulletin No. 62); Coils, Pipe and Tube (Bulletin No. 60); Feed Water Heaters (Bulletins Nos. 51, 52, 53); Exchangers, Waste Water—designed to suit service; Fuel Oil Heaters—designed for operating conditions.

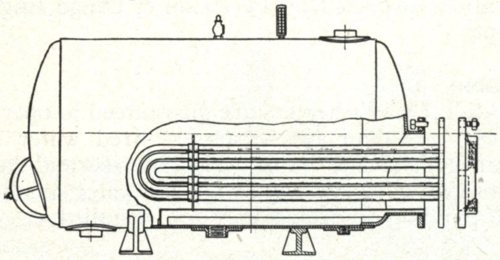
Facilities

Large, well lighted, fully equipped plant; close connections with producers of steel, brass and copper tubing; large stocks of steel and iron pipe for coiling.

Process Water Storage Heaters

Equipment of this type is satisfactory only when it meets conditions of service and utilizes available waste heat to the fullest extent. The proportions of storage capacity to heating capacity depend upon operating conditions.

We furnish process water heaters in either vertical or horizontal types; with shells of steel plate or cast iron; with heating capacities and location of heating elements suited to conditions of service. Storage capacities are limited only by transportation regulations.



Single Element Type, National Storage Heater

Standard diameters and storage capacity:

Shell diameter......in.	36	42	48	54	60	72	84	96	108
Gals. per ft. of length..	52	72	95	131	142	215	282	366	462

Hourly Heating Capacities

These capacities depend upon water temperature required and available steam pressure. Heating elements can be furnished to meet any requirements.

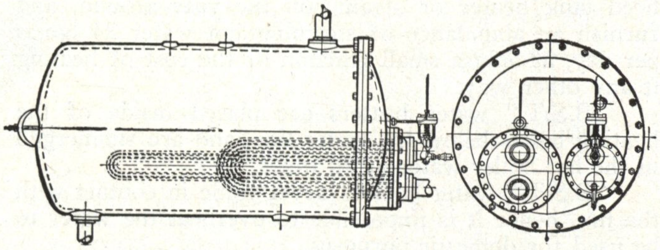
Relative heating value to steam under different steam pressures are as follows:

Steam pressure.....lb.	0	2	5	10	20	30	50	75	100
Ratio...............	1	1.09	1.22	1.39	1.67	1.87	2.18	2.47	2.70

Horizontal Storage Heater Double Element

Illustration shows the design and construction of our horizontal double element type with both elements on same horizontal center line; the combination consisting of an exhaust and a live steam element with thermostatic control on the admission of live steam.

The location and number of elements is determined by plant conditions.

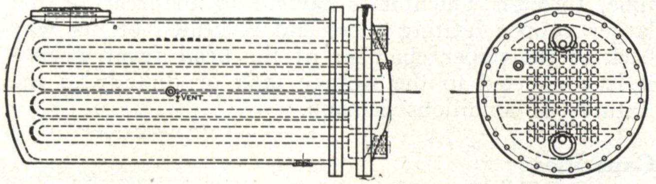


Horizontal Storage Heater, Double Element

Instantaneous Process Water Heater

This illustrates a well-designed multipass "U" bend heater consisting of several groups of U-shaped copper tubes expanded into a heavy cast iron tube head. All tubes are duplicates and each is independently removable.

Construction and materials used insure maximum service.



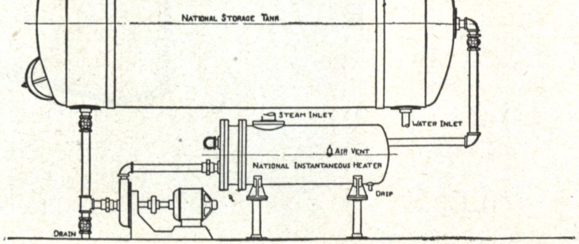
Instantaneous Process Water Heater

Capacities

These heaters can be furnished in any capacity, for all temperature ranges, for any operating steam pressure.

Service

When space or other conditions make it impossible to use the steam tube storage type of heater, the instantaneous heater meets the requirements. It may be used with either an open or closed storage tank, circulation being maintained either by gravity or centrifugal pump.



Instantaneous Process Water Heater and Pump

THE WHITLOCK COIL PIPE COMPANY

MANUFACTURERS AND ENGINEERS

Hot Water Heaters

HARTFORD, CONN.

BRANCH OFFICES

NEW YORK, N. Y.
BOSTON, MASS.
PHILADELPHIA, PA.
CHICAGO, ILL.
BALTIMORE, MD.
BUFFALO, N. Y.
CHARLOTTE, N. C.
CINCINNATI, OHIO
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
DENVER, COLO.
TROY, N. Y.
DES MOINES, IOWA
DETROIT, MICH.
HOUSTON, TEX.
INDIANAPOLIS, IND.
KANSAS CITY, MO.
MEMPHIS, TENN.
NEW ORLEANS, LA.
OMAHA, NEB.
PITTSBURGH, PA.
PORTLAND, ORE.
ROCHESTER, N. Y.
SAN ANTONIO, TEX.
TULSA, OKLA.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
ST. LOUIS, MO.
ST. PAUL, MINN.
TACOMA, WASH.
TOLEDO, OHIO

MANUFACTURERS OF WHITLOCK HEATERS IN CANADA: Darling Bros., MONTREAL

See Telephone Directory for local address

WHITLOCK HEAT TRANSFER PRODUCTS

Products

Manufacturers of Storage Heaters, Instantaneous Heaters, Swimming Pool Heaters, Converters (hot water heating systems), Condensation Coolers, Indirect Heaters, Feed Water Heaters, Fuel Oil Heaters and Special Heat Exchangers for heating and cooling liquids, vapors and gases.

Also makers of Coils of any size and shape from Iron, Steel, Copper and Brass Pipe and Tubing.

Storage Heaters

Whitlock storage heaters are particularly well suited for conditions demanding large quantities of hot water at irregular intervals. By using a small amount of steam, steadily, sufficient heat is stored to maintain a satisfactory supply of hot water even at peak load periods.

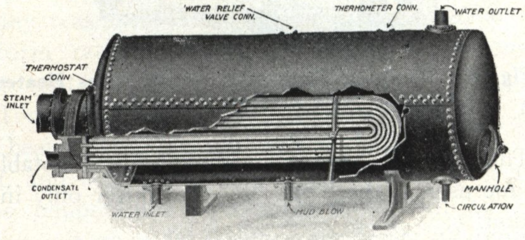


Fig. 1. Type "K" Storage Heater
Patent Applied for

Heaters of this type are made in three patterns, as illustrated. The construction is practically the same in each pattern. The shell is made extra heavy and of Class A tank steel designed in accordance with the A.S.M.E. boiler code. For special conditions, shells can be furnished of cast iron, sheet copper, or steel coated with a rustproof white enamel.

The heating section consists of U-bends of seamless drawn copper tubing, firmly expanded into a heavy rolled steel tube sheet. Copper is an ideal material for this use as it is the best conductor of heat, which it is commercially possible to use, and it is mechanically more reliable than brass.

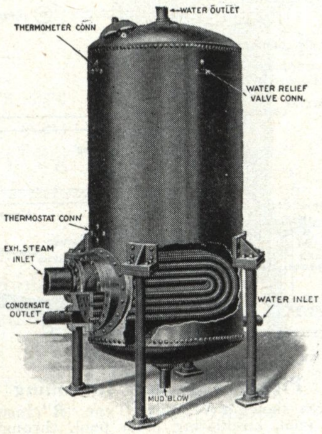


Fig. 2. Type "K" Storage Heater, Vertical Pattern

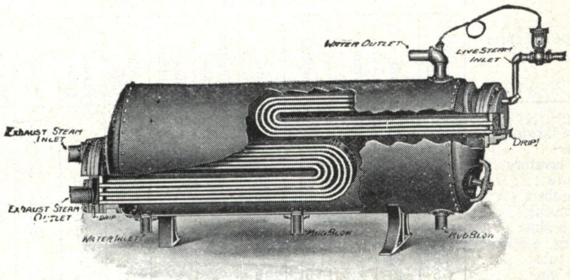


Fig. 3. Type "K" Storage Heater, Combination Live and Exhaust Steam Pattern

WHITLOCK AMERICAN TYPE "K" STORAGE HEATERS, HORIZONTAL

Shells To be used with Type "K" heating section. Shell prices include cradle. Manhole 11 x 15 in.							Heating Sections Capacity based on heating from 40° to 180° with steam at 0 lb. pressure.				
No.	Gal. one filling	Diam., in.	Length, in.	Thickness, in.	Thickness of head, in.	Weight, lb.	No.	Gal. per hour	Maximum size steam pipe, in.	Smallest shell into which section will fit, in	Weight of entire heating section, lb.
1	65	18	60	1/4	3/8	400	H 0	100	2	18x48	75
2	80	18	72	1/4	3/8	450	H 1	150	2	18x60	80
3	118	24	60	1/4	3/8	600	H 2	200	2	18x72	90
4	141	24	72	1/4	3/8	700	H 3	250	3 1/2	18x48	175
5	164	24	84	1/4	3/8	800	H 4	300	3 1/2	18x48	185
6	185	30	60	1/4	3/8	750	H 5	350	3 1/2	18x60	190
7	220	30	72	1/4	3/8	850	H 6	400	3 1/2	18x60	200
8	255	30	84	1/4	3/8	950	H 7	500	3 1/2	18x72	210
9	290	30	96	1/4	3/8	1050	H 8	550	3 1/2	18x72	215
10	365	36	84	5/16	1/2	1300	H 9	600	3 1/2	18x84	220
11	420	36	96	5/16	1/2	1450	H10	710	5	24x60	300
12	475	36	108	5/16	1/2	1600	H11	800	3 1/2	18x96	260
13	525	36	120	5/16	1/2	1800	H12	900	3 1/2	18x108	270
14	575	42	96	5/16	1/2	1850	H13	1000	3 1/2	18x120	285
15	720	42	120	5/16	1/2	2150	H14	1250	5	24x84	370
16	860	42	144	5/16	1/2	2500	H15	1500	5	24x108	425
17	1000	42	168	5/16	1/2	2900	H16	1750	5	24x120	450
18	950	48	120	3/8	1/2	2850	H17	2000	6	30x96	570
19	1140	48	144	3/8	1/2	3250	H18	2400	6	30x120	620
20	1310	48	168	3/8	1/2	3700	H19	2800	6	30x132	670
21	1480	48	192	3/8	1/2	4100	H20	3200	8	36x96	860
22	1190	54	120	3/8	1/2	3250	H21	3600	8	36x108	920
23	1430	54	144	3/8	1/2	3700	H22	4000	8	36x120	950
24	1670	54	168	3/8	1/2	4200	H23	4400	8	36x132	1020
25	1900	54	192	3/8	1/2	4700	H24	4800	10	36x96	1200
26	1420	60	120	7/16	9/16	4300	H25	5400	10	36x108	1300
27	1710	60	144	7/16	9/16	4900	H26	6000	10	36x120	1380
28	2000	60	168	7/16	9/16	5600	H27	7000	12	42x96	1950
29	2300	60	192	7/16	9/16	6200	H28	8000	12	42x96	2000
30	2460	72	144	7/16	9/16	5700	H29	9000	12	42x108	2300
31	2880	72	168	7/16	9/16	6400	H30	10000	12	42x108	2460

Larger sizes both of shells and heating sections regularly built but omitted from this list on account of limited space. Write for bulletin giving particulars of shells up to 108x264 in. and heating sections up to 20,000 gal. per hour capacity.

Directions for use—Select the size storage you require and combine its designating number with the number which designates the desired hourly output. Assuming a required storage of 1000 gal. (No. 17 shell 42x168) and a required hourly output of 1750 gal. (No. H16 heating unit) you would specify a Whitlock Type "K," No. 17H16. For additional details, see Bulletin 40.

Continued on next page

The horizontal heater shown in Fig. 1 is designed to utilize exhaust steam if it is available, or, if not, live steam.

The vertical heater shown in Fig. 2 is designed for conditions where floor space is limited.

The position of the heating section low in the shell in contact with the coldest water is especially advantageous.

The combination type storage heater shown in Fig. 3 is designed for conditions where a limited supply of exhaust steam must be supplemented by live steam.

A temperature regulator serves to admit live steam in the auxiliary heating section only when needed.

HOT WATER FIXTURE CAPACITIES FOR VARIOUS TYPES OF BUILDINGS
Figured at a final temp. of 180° F.

Type of fixture	Gal. of water per hour per fixture										
	Apartment house	Club	Gymnasium	Hospital	Hotel	Industrial plant	Office building	Public bath	Private residence	School	Y. M. C. A. buildings
Basins—Private lavatory		2	2	2	2	2	2	2	2	2	2
Basins—Public lavatory	4	6	8	6	8	12	6	12	....	15	8
Bathtubs	20	20	30	20	20	30	....	45	20	....	30
Dishwashers	20	30	....	30	30	30	....	....	15	15	30
Foot basins	3	3	12	3	3	12	....	....	3	3	12
Kitchen sink	10	20	....	20	20	20	....	....	10	10	20
Laundry stationary tubs	20	28	....	28	28	....	....	....	20	....	28
Pantry sink	5	10	....	10	10	....	....	....	5	10	10
Showers	75	150	225	75	75	225	....	225	75	225	225
Slop sink	20	20	....	20	30	20	15	15	15	20	20
Hourly heating capacity factor percentage	20	30	40	25	25	40	10	50	30	40	40
Storage capacity factor percentage	80	90	100	60	80	100	60	120	70	100	100

Apartments	One Kitchen and One Bath				
Number of families	Up to 25	25-50	50-75	75-100	Over 100
Gals. per hour per family	35	30	25	20	15

The size of storage heater required for a certain building can be found from this table as follows:

Hourly heating capacity=hourly requirements from table x hourly heating capacity.

Storage capacity=hourly heating capacity x storage capacity factor.

Reference to THE WHITLOCK COIL PIPE COMPANY's bulletin No. 40 will show correct size of shell and heating section at once.

Tests

All Whitlock heaters are tested under hydrostatic pressure and made absolutely tight before leaving the shop.

A "Test Certificate" to this effect accompanies each heater.

Instantaneous Heaters

Whitlock instantaneous heaters are made in different types to serve various purposes.

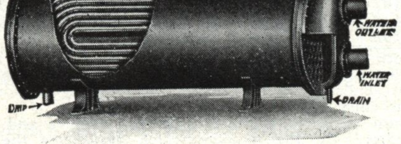

STEAM INLET
WATER OUTLET
WATER INLET
DRAIN
DRIP

Fig. 4. Whitlock Type "R" Instantaneous Heater, U-Bend Straight Tube Pattern

Type "AC" is the copper coil type similar in construction to the type "A" feed water heater shown in Fig. 6.

In this type, water comes only in contact with copper and bronze, so corrosion is entirely eliminated.

Liquids other than water which would corrode iron or steel may be heated advantageously in these heaters.

The Type "R" heaters, as shown in Fig. 4, are of the U-bend construction which has proven satisfactory under many conditions.

This type of heater is adaptable to a widely varying range of conditions.

It may be used as an instantaneous heater under forced circulation (in which case the multipass pattern is generally used, see table), or it may be used with gravity circulation—as for instance, circulating to a storage tank, or swimming pool heater, in which cases the two pass heaters shown in the table are used.

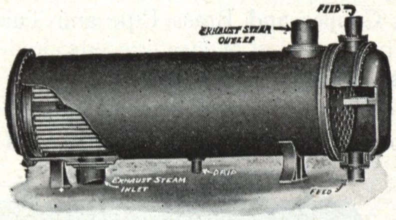
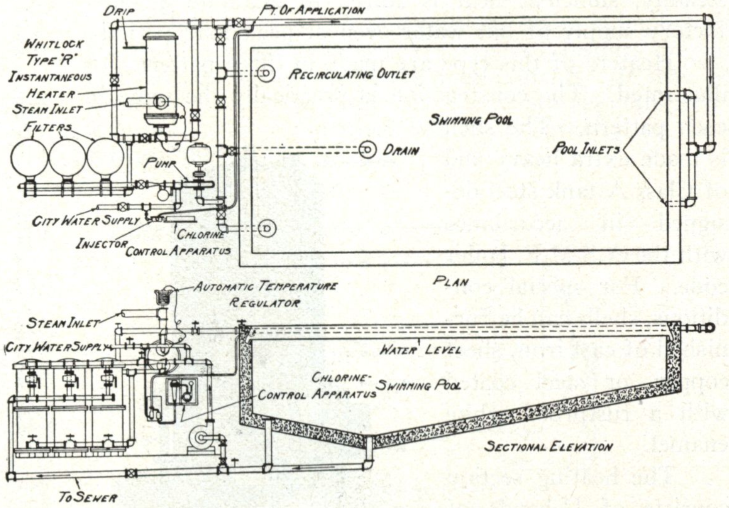

FEED
EXHAUST STEAM OUTLET
EXHAUST STEAM INLET
DRIP
FEED

Fig. 5. Whitlock Type "S" Instantaneous Heater, Straight Tube Floating Head Pattern

The Type "S" heaters (Fig. 5) are adaptable for the same uses as the Type "R" and differ only in construction.

The straight tube, floating head, design of this type allows easy cleaning where the water supply deposits an unusual quantity of mud or scale forming materials.


DRIP
PT. OF APPLICATION
WHITLOCK TYPE 'R' INSTANTANEOUS HEATER
STEAM INLET
FILTERS
RECIRCULATING OUTLET
SWIMMING POOL
DRAIN
POOL INLETS
PUMP
CITY WATER SUPPLY
CHLORINE CONTROL APPARATUS
INJECTOR
PLAN
AUTOMATIC TEMPERATURE REGULATOR
STEAM INLET
CITY WATER SUPPLY
WATER LEVEL
CHLORINE-CONTROL APPARATUS
SWIMMING POOL
SECTIONAL ELEVATION
TO SEWER

Piping Plan for Swimming Pool Water Heater

Diagram shows a Whitlock Type "R" instantaneous heater in connection with swimming pool, circulating from pool, through pump, filter, to heater thence to pool. Other piping diagrams for swimming pools, apartment houses, public buildings, etc., are available for architects and consulting engineers.

Continued on next page

WHITLOCK AMERICAN TYPE "R" INSTANTANEOUS HEATERS
STANDARD SIZES, CAPACITIES, DIMENSIONS AND WEIGHTS

	Two-pass. Temp. Range 40° to 80° F.						Four-pass. Temp. Range 40° to 120° F.						Multi-pass. Temp. Range 40° to 180° F.					
Size No.	Capacity, gal. per hour	Over-all length, in.	Diam. shell, in.	Water connections, in.	Steam connections, in.	Weight, lb.	Capacity, gal. per hour	Over-all length, in.	Diam. shell, in.	Water connections, in.	Steam connections, in.	Weight, lb.	Capacity, gal. per hour	Over-all length, in.	Diam. shell, in.	Water connections, in.	Steam connections, in.	Weight, lb.
0	150	11⅝	7	¾	1¼	80	80	11⅝	7	¾	1	80	25	15⅝	7	¾	1	90
1	350	14⅝	7	1¼	1½	90	150	16⅝	7	¾	1¼	100	60	26⅝	7	¾	1¼	125
2	650	19⅝	7	1½	1½	110	300	21⅝	7	1	2	115	150	37⅝	7	¾	1½	158
3	1100	23⅝	7	2	2	145	480	26⅝	7	1	2	135	200	39¾	9½	1	1½	280
4	1600	29⅝	7	2	2½	170	650	31⅝	7	1¼	2½	150	250	48¾	9½	1	2	325
5	1900	34⅝	7	2	3	240	800	38⅝	7	1¼	2½	170	300	31¾	9½	1	2	250
6	2550	24¾	9½	2½	3	270	960	24¾	9½	1½	3	220	400	40¾	9½	1¼	2½	300
7	3200	30¾	9½	2½	3½	300	1350	30¾	9½	2	3	270	500	43¾	9½	1¼	3	350
8	3800	35¾	9½	2½	4	360	1600	35¾	9½	2	3½	300	600	48¾	9½	1¼	3	575
9	5100	43¾	9½	3	5	420	2100	43¾	9½	2	4	350	800	52	12	1½	3½	645
10	6350	55¾	9½	3	5	610	2600	55¾	9½	2½	5	420	1000	61	12	1½	3½	760
11	7950	45	12	4	6	670	3300	52	12	2½	5	620	1250	74	12	1½	4	870
12	9550	52	12	4	6	810	4000	61	12	3	6	700	1500	59⅞	15	2	5	1020
13	12700	67	12	4	8	850	5300	79	12	3	6	860	2000	72⅞	15	2	5	1035
14	15900	51⅞	15	5	8	930	6600	55⅞	15	3½	8	940	2500	59	17	2½	6	1175
15	19100	59⅞	15	5	8	1040	8000	65⅞	15	4	8	1070	3000	71	17	2½	6	1250
16	25600	59	17	6	10	1320	10500	71	17	5	10	1390	4000	89	17	2½	8	1420
	Sizes 0 to 10, inclusive, have ¾-in. o. d. No. 18 B. W. G. copper tubes. Remainder have 1-in. o. d. No. 17 B. W. G. copper tubes.						Sizes 0 to 10, inclusive, have ¾-in. o. d. No. 18 B. W. G. copper tubes. Remainder have 1-in. o. d. No. 17 B. W. G copper tubes.						Sizes 0 to 8, inclusive, have ¾-in. o. d. No. 18 B. W. G. copper tubes. Remainder have 1-in. o. d. No. 17 B. W. G. copper tubes.					

Above capacities based with steam at atmospheric pressure corresponding to a temperature of 212° F. Companion flanges are furnished for connections 3-in. and larger. Supporting cradles will be furnished only when specified.

Indirect or Submerged Type Heaters

In the submerged type water heaters the copper tube heating section is located below the water line of the steam boiler. Boiling water from the steam boiler then heats the domestic water supply. The storage tank is preferably a part of the submerged heater, Type "K," construction—but it may be independent of it and of Type "R" construction.

This type of heater is proving very satisfactory for many reasons. It takes the heat required at such a uniform rate that it gives better fuel economy. It uses heat otherwise wasted by uneven firing and general overheating. It eliminates a separately fired water heater, can be used where headroom is very limited, and requires no condensation pumps, or traps and no temperature regulator. And with all these advantages it gives satisfactory service at all times of the day.

Feed Water Heaters

The Type "A" American standard feed water heater shown in Fig. 6 has been the standard design for this service for over 30 years. For some cases, heaters of type "R" or type "S" construction are used for this service also.

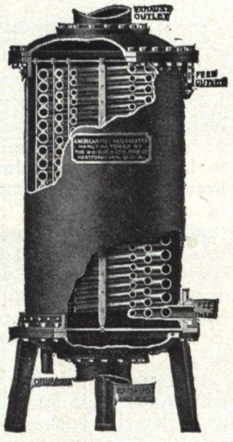


Fig. 6. Type "A" Standard Feed Water Heater

Converters

The Type "R" heaters are used in large buildings as converters in hot water heating systems.

Condensation Coolers

Whitlock condensation coolers are designed to heat domestic service water while cooling condensate from the heating system. In many buildings where steam is purchased from outside sources there is no way of returning the condensate to the boilers and the condensate must be cooled before it can be discharged to the sewer. These coolers perform a very useful function under these circumstances.

Fuel Oil Heaters—Special Apparatus

In addition to the apparatus described in these pages, we manufacture all types of heat transfer products. Our years of experience in this line are at the command of prospective customers everywhere.

With the increasing use of oil as fuel the importance of a properly designed fuel oil heater becomes more and more evident. We offer several types fitting every possible condition as to capacity, temperature range and cost. For some conditions and some oils the coil type is preferable and for other conditions the U-bend construction or straight tube construction is more desirable.

We are prepared to recommend the proper type for any conditions.

Engineering Service

Architects and engineers interested in heat transfer apparatus will be interested in literature and data which we are publishing from time to time.

Whitlock Engineers will gladly furnish sample specification sheets, typical installation diagrams, and specific advice on any problem in this line which comes to your attention.

Personal Service

We maintain sales offices or representatives in each of the cities listed at the beginning of these catalogue pages. Many of these men were trained in our factory and thus have had practical experience in both laboratory and field. All of them are fully qualified to give personal service on any specific problem, without cost or obligation.

ESTABLISHED 1841

E. B. BADGER & SONS CO.

Manufacturers of Hot Water Boilers and Pantry Sinks

75 Pitts Street
BOSTON, MASS.

NEW YORK OFFICE, 101 Park Avenue
CHICAGO OFFICE, 8 South Dearborn Street

Products

Badger Copper Hot Water Boilers.

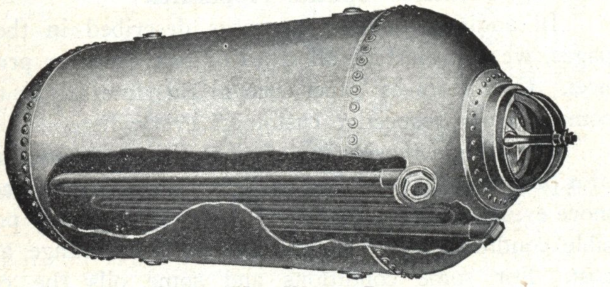
Also manufacturers of Copper and White Metal Pantry Sinks.

Copper Boilers

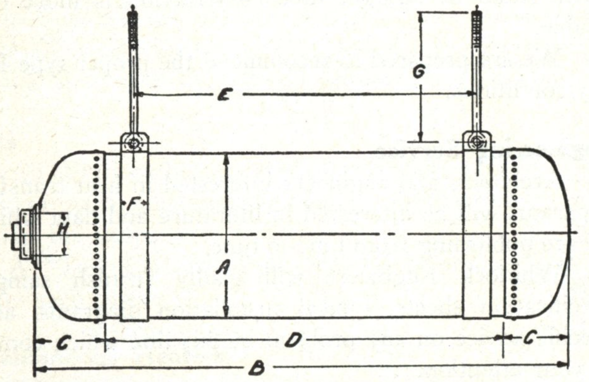
Badger copper boilers have always been made from the very best materials by the most expert workmen.

Boiler interiors are thoroughly tinned to insure clean water; the shell has one longitudinal seam brazed and hard hammered; the heads are of the half-round type, riveted to shell, and thoroughly sweat on the inside with solder. Furnished in sizes from 30 to 1500 gal., inclusive, with special size connections, manholes, and steam coils, if specified.

Every boiler is subjected to a hydrostatic test of at least 200 lbs. Boilers of 250 or 300-lb. test can be furnished, if required. The working pressure of a boiler should never exceed 42½% of its hydrostatic test.



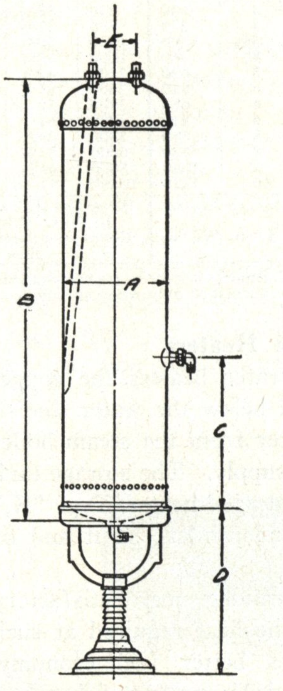
Copper Hot Water Boiler



Dimension Diagram Horizontal Pressure Boiler
30 to 300 gal.
Wall brackets may be used instead of hangers

Size, gal.	A	B	C	D	E	F	G	H
30	12	62	5	52	47	3	15	3
40	14	61¾	6	49¾	45	3	15	3
50	16	60½	6½	47½	42	4	15	3
60	17	65	7	51	45	4	15	3
70	18	66½	7	52½	47	4	15	3
80	20	62	8¼	45½	40	4	16½	3
90	20	70	8¼	53½	48	4	16½	3
100	20	78	8¼	61½	56	4	16½	3
125	22	81	9¼	60½	55	4	18½	4½
150	24	80	10	60	54	4	18½	4½
175	28	72	11	50	44	4	18½	6
200	30	72	12	48	42	4	18½	6
225	30	80	12	56	50	4	18½	6
250	30	90	12	66	60	4	18½	6
275	30	97½	12	73½	68	4	18½	6
300	30	106½	12	82⅓	77	4	18½	6

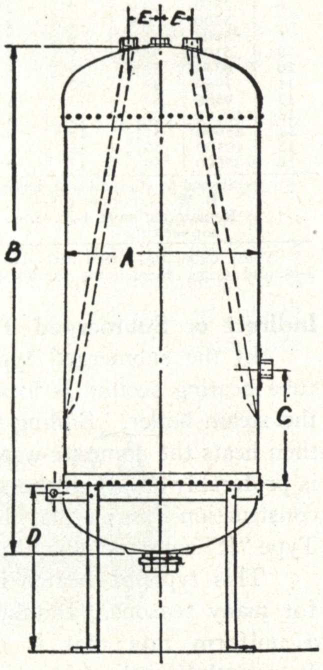
All dimensions are in inches.



Dimension Diagram Vertical Pressure Boiler
30 to 100 gal.

Size, gal.	A	B	C	D	E
30	12	62	20½	21⅞	6
40	14	61¾	20½	21⅞	6
50	16	60½	25	21⅞	7
60	17	65	25	21⅞	7
70	18	66½	25	21⅞	7½
80	20	62	25	21⅞	7½
90	20	70	25	21⅞	7½
100	20	78	25	21⅞	7½

All dimensions are in inches.
Sizes 70 to 100 gal., inclusive, have a third connection in center of top



Dimension Diagram Vertical Pressure Boiler
125 to 300 gal.

Size, gal.	A	B	C	D	E
125	22	81	24	20	4
150	24	80	24	20	4½
175	28	72	24	20	4½
200	30	72	24	20	5
225	30	80	24	20	5
250	30	90	24	20	5
275	30	97½	24	20	5
300	30	106½	24	20	5

All dimensions are in inches.
The 125-gal. size has bent side and bottom connections.
All others as shown

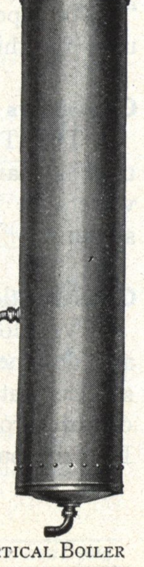
Boiler Specification—The following is frequently used by architects and found to be very satisfactory:

Furnish ... gal. Badger Copper Boiler to be ... diameter x ... long; shell to be made of sheet copper weighing ... lbs. per sq. ft.; to have one longitudinal seam, said seam to be brazed and hard hammered; heads to be made of copper weighing ... lbs. per sq. ft.; said heads to be half-round type, riveted to the shell and thoroughly sweat on the inside with solder; one head to be fitted with ... x ... composition manhole and cover; all connections in head to be standard type, brazed to copper. All connections on shell to be standard flanged type riveted on outside.

Material in boiler to be tinned on the inside with block tin, and all seams and connections to be heavily backed with solder.

Boiler to be tested to ... lbs. hydrostatic pressure.

Note: This company will supply weights for this specification to any architect who will furnish information regarding volume of hot water required and the water pressure.



Vertical Boiler

DAHLQUIST MFG. COMPANY

TELEPHONE
South Boston 2160

Coppersmiths and Metal Workers

30-40 West Third Street, SOUTH BOSTON, MASS.

FACTORY
9-19 Bolton Street

Products

Copper Boilers including Heavy Pressure Boilers, Direct or Street Pressure Boilers, Tank Pressure Boilers, Wash Boilers and Pressure Barber Boilers.

Dahlquist Copper Range Boiler and Aquatherm (Patented).

Steam Jacketed Copper Kettles.

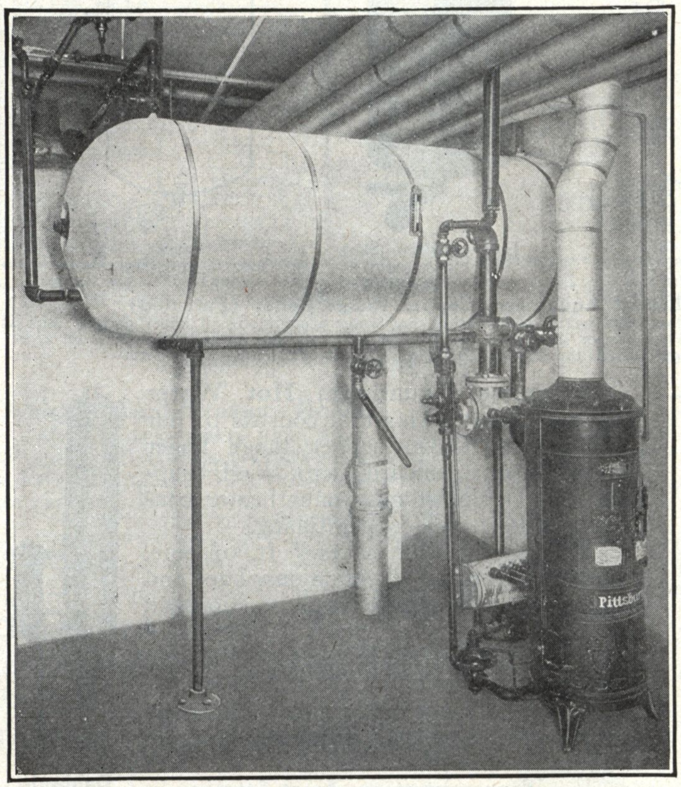
Corrugated Copper Expansion Joints.

Also Metal Spinning of all kinds, Boiler Stands and Gas Water Heaters.

Dahlquist Copper Boilers

Satisfaction is assured. In durability, neat appearance and cleanliness, copper is beyond comparison. Copper resists rust and corrosion as no other tank metal can.

Heavy Pressure Boilers—For residences, apartment houses, office buildings, hospitals, etc., requiring a constant supply of hot water, heavy pressure boilers are made in varying capacities from 100 to 3000 gal. Working pressures up to 200 lb., with or without coils. In ordering, state whether coil is required.



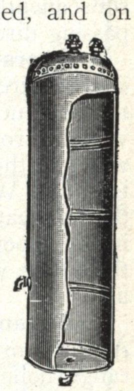
A 300-gallon Dahlquist Copper Tank
Installed in the residence of T. R. McCune, president of the Union National Bank of Pittsburgh, Pa.

Material and workmanship are thoroughly inspected and tested, and best possible results guaranteed.

Direct or Street Pressure Boilers—Heavily reinforced with brass rings. Tops are riveted, and on the 250 and 300-lb. pressure boilers both ends are riveted. In all direct pressure boilers over 80 gal. capacity, a handhole is placed in the bottom.

Capacities range from 5 to 500 gal. Test pressures, 200, 250 and 300 lb. Stock range boilers are made for various pressures up to 250 lb. Boilers made to order for pressures over 250 lb. and up to 300 lb. Working pressures in all cases comply with the Massachusetts Plumbing Regulations.

For buildings requiring a constant supply of hot water, heavy pressure copper boilers are made in varying capacities from 100 to 3000 gal. The latter boilers frequently require a working pressure of 200 lb. Supplied with or without coils.



Direct or Street Pressure Boiler

*MASSACHUSETTS STANDARD COPPER PRESSURE BOILERS

Cap., gal.	Dimensions		200-lb. test, 85-lb. water pressure	250-lb. test 106-lb. water pressure	300-lb. test, 127-lb. water pressure
	Diam., in.	Length, ft.			
25	11⅜	4¾	$ 30.00	$ 35.00	$ 45.00
30	12	5	36.00	42.00	54.00
40	14	5	48.00	56.00	72.00
50	16	5	60.00	70.00	90.00
60	17	5	72.00	84.00	108.00
70	18	5	84.00	98.00	126.00
80	20	5	96.00	112.00	144.00
90	20	5½	108.00	126.00	162.00
100	20	6	120.00	140.00	180.00
125	22	6	150.00	175.00	225.00
150	25	6	180.00	210.00	270.00
175	25	7	210.00	245.00	315.00
200	30	6	240.00	280.00	360.00
225	30	6½	270.00	315.00	405.00
250	30	7	300.00	350.00	450.00
275	30	7½	330.00	385.00	495.00
300	35	6	360.00	420.00	540.00
350	35	7	420.00	490.00	630.00
400	35	8	480.00	560.00	720.00
450	35	9	540.00	630.00	810.00
500	35	10	600.00	700.00	900.00

*All boilers listed above can be equipped with the Aquatherm heating element (described on following page) at additional cost.

References—

Two 800-gal. boilers for the John Hancock Mutual Life Insurance Building, installed by W. G. Cornell Co.

One 750-gal. boiler for St. Mary's Hospital, Waterbury, Conn., installed by M. J. Daly & Co.

One 350-gal. boiler for the Lowell High School, installed by J. J. Hurley.

One 350-gal. boiler for new high school at Manchester, N. H., installed by John H. Stevens.

Four 250-gal. boilers, all of which were installed by W. G. Cornell Co. of New York City, as follows:

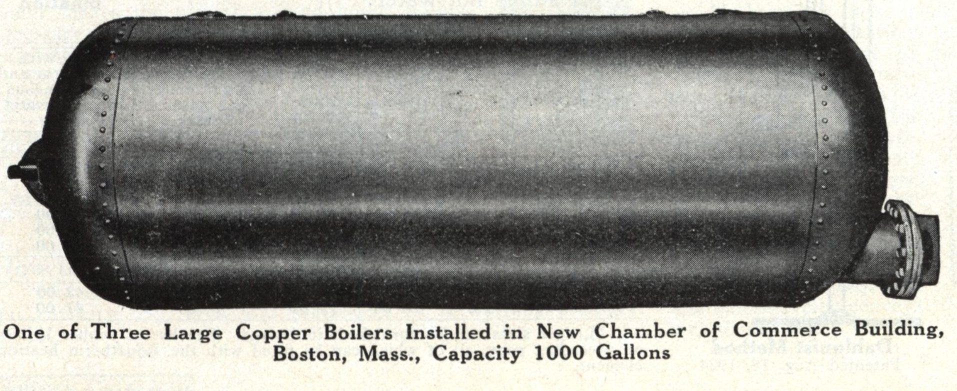
One 250-gal. boiler for 14 East Eighty-ninth Street.

One 250-gal. boiler for 15 East Eighty-eighth Street.

Two 250-gal. boilers for 12-16 East Eighty-ninth Street.

One 500-gal. boiler for Greenwood Memorial Building at Gardner, Mass., installed by Royal Steam Heating Co.

One 500-gal. boiler for Women's Educational and Industrial Building, installed by D. J. Farrell, Boston, Mass.



One of Three Large Copper Boilers Installed in New Chamber of Commerce Building, Boston, Mass., Capacity 1000 Gallons

Continued on next page

Dahlquist Aquatherm Copper Range Boiler (Patented)

Construction—The Dahlquist Aquatherm range boiler consists of a Massachusetts standard copper pressure boiler with the Dahlquist Aquatherm (patented heating element) for use in homes, small apartments, etc. The Aquatherm is made entirely of brass and copper and will not rust. It is insulated with a shell containing dead air space, consequently no heat is lost by the water passing directly to the faucet.

Operation—The hot water is conducted direct from the heating source to the faucet and is automatically prevented from mingling with the cold water in the boiler as long as the faucet is open. When the faucet is turned off the hot water passes through the ports in the upper part of the Aquatherm into the boiler, where it is stored for further use.

Advantages—The Dahlquist Aquatherm provides the user with a range boiler, instantaneous heater and storage system complete in one system. Hot water is delivered as quickly as the range or gas heater can heat it, which means that water is heated in from 2 to 3 minutes as it is conveyed directly to the faucet.

This method assures maximum fuel economy in heating water and does away with the usual danger of steam forming in the pipe running from the gas water heater on the outside of the boiler and to the top of the boiler. It also has the unusual advantage of operating equally well in connection with any of the following heating units (illustrations on following page):

(1) Waterback in coal or wood kitchen range.

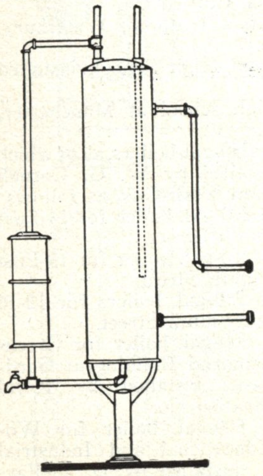
(2) Gas (or kerosene) tank water heater and waterback in coal or wood kitchen range.

(3) Gas (or kerosene) tank water heater.

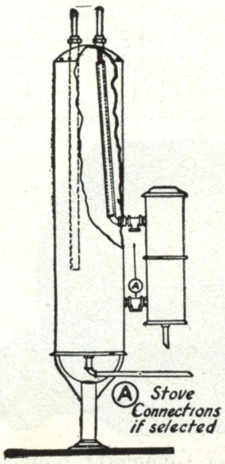
(4) Gas (or kerosene) tank water heater, waterback in coal or wood kitchen range in kitchen, and indirect water heater in cellar.

(5) Gas (or kerosene) water heater and indirect water heater in cellar.

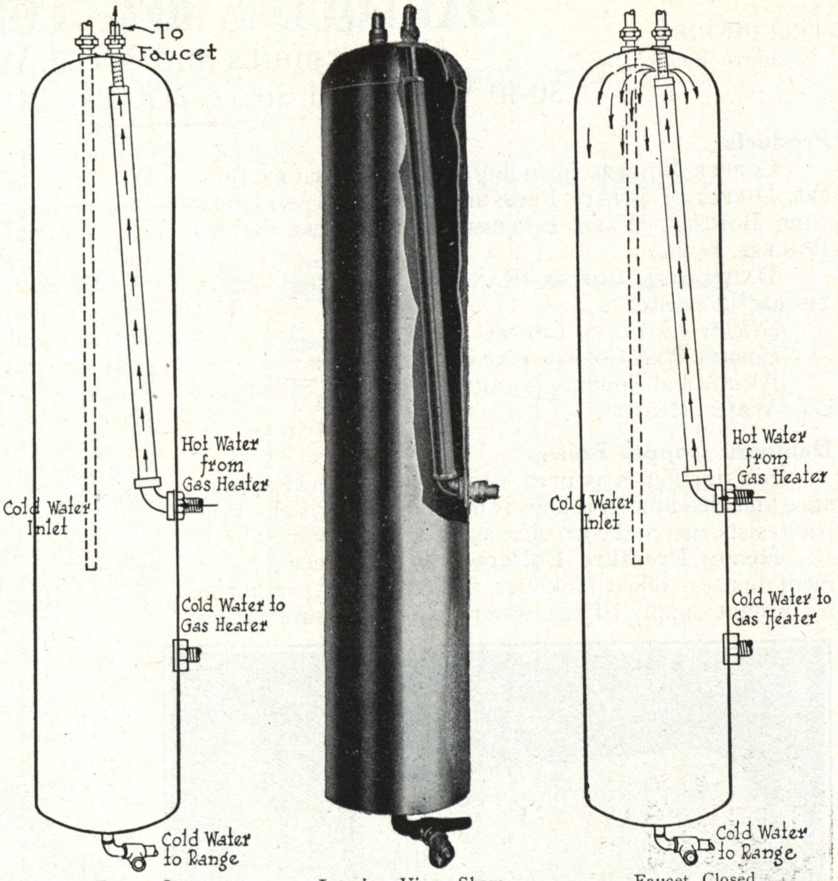
(6) Indirect water heater and coal fired water heater in cellar.



Old Method



Dahlquist Method
Patented Aug. 18, 1924



Faucet Open
Water being drawn directly from heater

Interior View Showing the Aquatherm Heating Element

Faucet Closed
Water flowing from heater into range boiler for storage

Dahlquist Aquatherm Copper Range Boiler (Patented)
When faucet is closed and heater is operating, hot water accumulates in upper part of tank as shown. When faucet is open and heater is shut off hot water is drawn from boiler through the holes in the tube at upper part of the Aquatherm

Complete Aquatherm Hot Water Heating Outfit—This unit consists of our patented Aquatherm copper range boiler (Massachusetts standard) with stand, couplings and Dahlquist gas water heater containing 20½ ft. of copper tubing.

This combination saves 7 ft. of pipe, 1 non-by-pass tee, 3 ells, 2 unions, 1 tee and 4 hours labor (comparative illustrations on this page).

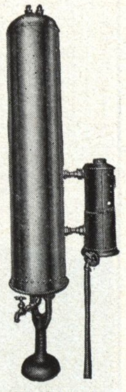
It will prevent the hot water circulation from reversing itself.

It will do away with water hammering.

It will prevent mud and sediment from clogging circulation.

It will prevent steam from forming in the return pipe from the gas heater.

It stores hot water.



Dahlquist Aquatherm Gas Combination

AQUATHERM RANGE BOILER

*Cap., gal.	Test pressure, lb.	Working pressure, lb.	Boiler only	Boiler with Aquatherm	Boiler with Aquatherm and instantaneous gas water heater	Boiler with Aquatherm and instantaneous kerosene water heater
			Copper Boilers			
25	200	85	$30.00	$35.00	$47.00	$57.00
25	250	106	35.00	40.00	52.00	62.00
25	300	127	45.00	50.00	62.00	72.00
30	200	85	36.00	41.00	53.00	63.00
30	250	106	42.00	47.00	59.00	69.00
30	300	127	54.00	59.00	71.00	81.00
			Galvanized Boilers			
30	200	85	15.00	20.00	32.00	42.00
30	300	127	20.00	25.00	37.00	47.00

*Larger sizes can be furnished, if desired. See list of copper boilers on preceding page, all of which can be fitted with the Aquatherm heating element.

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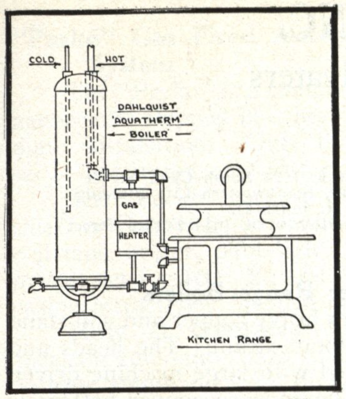
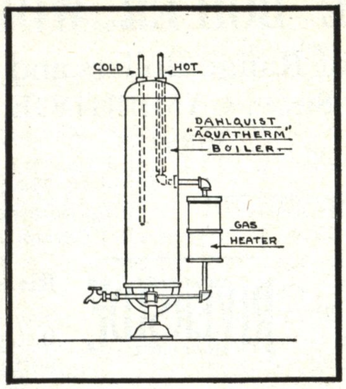
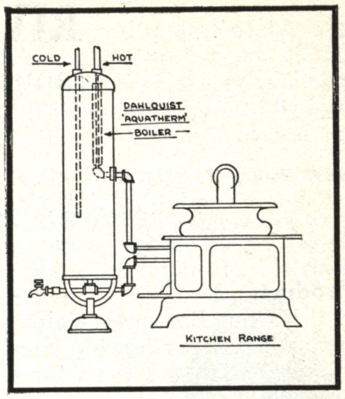

COLD
HOT
DAHLQUIST "AQUATHERM" BOILER
GAS HEATER
KITCHEN RANGE

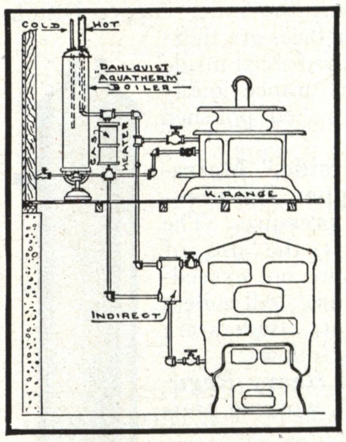
Connected with Gas Tank Water Heater and Waterback in Coal or Wood Kitchen Range


COLD
HOT
DAHLQUIST "AQUATHERM" BOILER
GAS HEATER

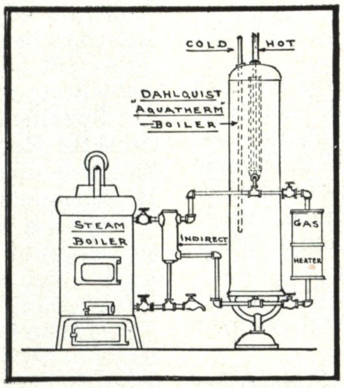
Connected with Gas Tank Water Heater in Kitchen
Note the simplicity and neat appearance of installation. Hot water in three minutes


COLD
HOT
DAHLQUIST "AQUATHERM" BOILER
KITCHEN RANGE

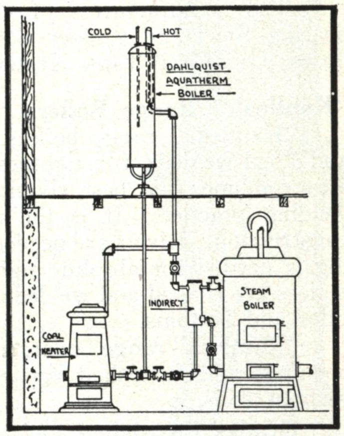
Connected with Waterback in Coal or Wood Kitchen Range


COLD
HOT
DAHLQUIST "AQUATHERM" BOILER
GAS HEATER
K. RANGE
INDIRECT

Connected with Gas Tank Water Heater, Waterback in Coal or Wood Kitchen Range in Kitchen and Indirect Water Heater in Cellar


COLD
HOT
DAHLQUIST "AQUATHERM" BOILER
STEAM BOILER
INDIRECT
GAS HEATER

Connected with Gas Water Heater and Indirect Water Heater in Cellar


COLD
HOT
DAHLQUIST AQUATHERM BOILER
STEAM BOILER
INDIRECT
COAL HEATER

Connected with Indirect Water Heater and Coal Fired Water Heater in Cellar

Methods of Connecting Dahlquist Aquatherm Range Boilers to Various Heating Appliances

Dahlquist Tank Pressure Boilers

Made of best quality Lake copper, in capacities from 25 to 300 gal. Will stand a pressure of about 25 lb. Stock sizes up to 100-gal. capacity. When ordering, state clearly what couplings are required. Extra charge for large connections.

TANK PRESSURE BOILERS

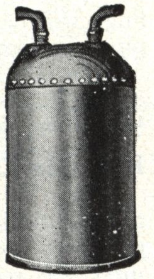
Capacity............gal.	25	30	40	50	60	70	80	100
Price....................	$21.00	25.00	31.00	45.00	54.00	63.00	72.00	90.00

Copper Wash Boilers

Generally used in connection with wash trays, and are set in brickwork. Bottom is double seamed and soldered; interior is tinned.

Dahlquist Copper Pressure Barber Boilers

The strain caused by the direct pressure and expansion which invariably takes place under the great demand in barber shops for hot water makes the use of a good boiler highly necessary. These boilers are built for such an exacting demand.



Copper Barber Boiler

COPPER PRESSURE BARBER BOILERS

Capacity..........gal.	5	6	7	8	9	10	11	12	15	18	20
Diameter..........in.	10	10	10	12	12	12	12	12	12	12	12
Height.............in.	13	16	20	16	18	20	22	24	30	36	40

Coils

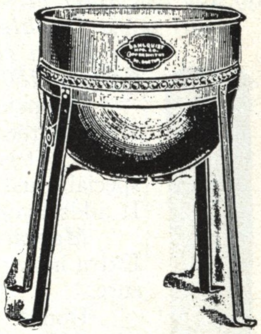
Coils may be had, if desired, with all boilers.

How to Specify Copper Boilers

Hot water boiler shall be a Dahlquist copper boiler of .... gal. capacity, ... type, and guaranteed for a working pressure of .... lb.

Dahlquist Steam Jacketed Copper Kettles

Made with extra heavy copper bottoms, on wrought iron legs.



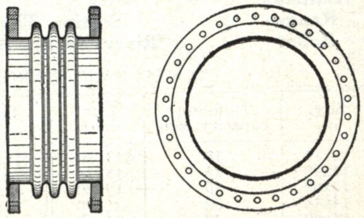
Steam Jacketed Copper Kettle

STEAM JACKETED COPPER KETTLES

Cap., gal.	Diam., in.	Depth, in.	Cap., gal.	Diam., in.	Depth, in.
3	13	8	25	24	18
4	14	9	30	25	20
5	14	11	35	28	18
6	15	11½	40	30	19½
7	15	13	50	32	20
8	16	13	60	33	24
9	17	13	75	35	24
10	17	14	100	38	28
12	17	16	125	40	30
15	19	16	150	40	36
18	20	18	200	45	39
20	22	18	...	..	..

Dahlquist Corrugated Copper Expansion Joints

Made of the finest quality Lake copper. The deep corrugations afford the elasticity and strength necessary to withstand constant changes due to fluctuating temperatures. The joints are made in 3 corrugations. They are simple in construction, built for durability and are safe, compact and efficient. Made in any size required and to meet customers' specifications When ordering, state size of pipe, working pressure, amount of expansion required, and whether pipe conveys air, steam, water or gas.



Corrugated Copper Expansion Joint

RIVERSIDE BOILER WORKS, INC.

Manufacturers of Range Boilers and Water Heaters
491 Main Street, CAMBRIDGE, MASS.

AGENTS

NEW YORK, N. Y., John G. Kelly, 210 East 45th Street
A. W. O'Brien, 1 Hudson Street
Eastern Gas Appliance Co., 47 West 42nd Street
SAN FRANCISCO, CAL., A. B. Ambler, 444 Market Street
CHICAGO, ILL., Lehnen & Webb, 1624 South Clark Street
DALLAS, TEX., M. D. Willhite, Southwestern Life Building
SALT LAKE CITY, UTAH, C. H. Jones Co.
JACKSONVILLE, FLA., O. H. Slaughter, 1634 Forbes Street
DENVER, COLO., L. B. Youngs, 723 Colorado Building

TRADE MARK RIVERSIDE REG. U.S. PAT. OFF.

Products

Range Boilers: Galvanized Steel, Copper, and Copper-bearing Steel.

Expansion Tanks for hot water heating systems.

Automatic Gas Fired Hot Water Storage Systems.

Indirect Water Heaters.

Also manufacturers of Galvanized Steel, Copper-bearing Steel and Copper Storage Tanks for all purposes; Gas Fired Tank Heaters.

"Kantleak" Range Boilers

"Kantleak" range boilers are riveted for strength and "seal-welded" for tightness. "Kantleak" construction combines the best riveting practice with the best welding practice. It is the modern, up-to-the-minute construction. Rivets are needed for strength; hand welding is needed for absolute tightness—"Kantleak" range boilers are riveted and welded at all seams, and at heads, sides and bottoms.

"Kantleak" range boilers are made with "Hilowtap" openings and furnished vertical or horizontal, with or without coils.

Grades Furnished (All Full Size)—***Standard***—Marked *"Standard: guaranteed for 85 lbs. water pressure."*

Made of galvanized steel.

Extra Heavy—Marked *"Extra Heavy: guaranteed for 150 lbs. water pressure."* Made of galvanized steel.

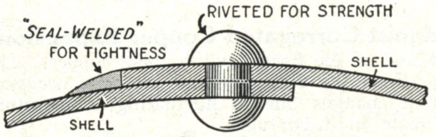
Double Extra Heavy—Marked *"Double Extra Heavy 'Kopsteel': guaranteed for 6 years; 150 lbs. water pressure."*

"Kopsteel" is a registered trade-mark which is the exclusive property of this corporation. It is applied to range boilers made of special rust resisting copper-bearing steel. It adds many years to the life of the boiler.

Massachusetts Regulation Boilers—Extra heavy: 200 lbs. test; 85 lbs. water pressure.

Double extra heavy "Kopsteel": 300 lbs. test, 127½ lbs. water pressure; guaranteed 6 years.

"Kantleak" Range Boiler



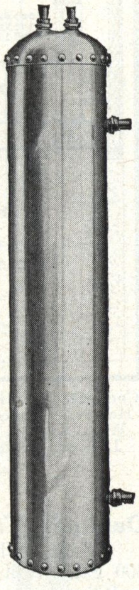
Section Through Seam of "Riverside Kantleak" Range Boiler

"KANTLEAK" RANGE BOILERS

Size, in.	Nominal capacity, gal.	List price	Size, in.	Nominal capacity, gal.	List price
12x36	18	$14.50	18x60	66	$38.00
12x48	24	15.75	20x60	82	45.50
12x60	30	19.00	22x60	100	63.50
14x48	32	21.00	24x60	120	72.50
14x60	40	24.00	24x72	144	103.00
16x48	42	26.00	24x96	192	132.00
16x60	52	31.00	.....	...	......

Riverside Copper Range Boilers

Made of extra heavy copper and will stand test pressures without strain. The heads and bottoms are riveted with large machine driven copper rivets. The concave copper bottom is reinforced with a heavy steel bottom. This adds strength to the boiler at the point where most copper boilers are very weak. There is absolutely no contact between the water and the steel bottom; the inner copper bottom prevents this. All inside surfaces are thoroughly tinned and shell is reinforced inside with copper rings to make assurance doubly sure. All boilers are furnished polished and with couplings.



Riverside Copper Range Boiler

Specifications "Riverside," Massachusetts Regulation Copper Boilers—Built for direct or street pressure. The Massachusetts law permits the use of boilers on a working pressure not exceeding 42½% of the test pressure. All boilers are full size and full weight. Boilers are furnished in two grades as follows:

Massachusetts Extra Heavy Regulation—200 lbs. test; 85 lbs. working pressure.

Massachusetts Double Extra Heavy—300 lbs. test; 127½ lbs. working pressure.

Markings—Boilers are marked with capacity, test pressures, and working pressures as above, and our name. Each boiler bears a serial number for permanent record.

STANDARDIZED LIST OF SIZES

Capacity, gal.	30	40	52	66	82	100
Size, in.	12x60	14x60	16x60	18x60	20x60	22x60

Couplings Furnished—On boilers 12 and 14-in. diameter, five couplings are regularly furnished, these being ¾-in. iron pipe size male. Upon special request, couplings threaded ½-in. iron pipe size female or ¾-in. fine thread female will be furnished.

On boilers 16, 18, 20, and 22-in. diameter, five couplings will be furnished, these being threaded 1-in. iron pipe size female, unless otherwise ordered.

On 18, 20, and 22-in. boilers, short, straight spuds can be furnished with taper female threads in sizes from ½ to 1-in., inclusive, iron pipe size.

Riverside Expansion Tanks

For hot water heating systems. Same construction as "Kantleak" range boilers. Stand up under working pressures up to 20 lbs. per sq. in. without leaking, and meet the requirements of the most exacting heating engineers.

RIVERSIDE EXPANSION TANKS

Size, in.	Capacity, gal.	List price	Size, in.	Capacity, gal.	List price
12x20	10	$ 8.00	16x30	26	$14.00
12x30	15	9.00	16x36	32	15.00
14x30	20	12.50	16x48	42	16.50

Gauge glass tappings, 13½ in. on centers.

Continued on next page

"Packo" Gas Fired Automatic Hot Water Storage System

The "Packo" is a complete hot water automatic storage system shipped in a heavy box and ready for immediate installation. Only three connections are necessary—hot water, cold water and gas.

The "Packo" consists of a heavily insulated "Kopsteel" or Copper boiler connected to a high quality double coil tank heater, pilot light, snap-action "Klixon" thermostat set for 160° F., and a heavy stand. Outer metal casing attractively finished in gray enamel.

How It Operates—"Packo" hot water service means a full faucet flow of hot water from one or more faucets simultaneously, quickly, and at any time. The water is heated and stored ready for immediate use. As hot water is drawn, cold water replaces it, lowering the temperature of the water in the tank. The thermostat, operated by the temperature of the water, automatically turns on the gas. The gas burns only until the incoming cold water is heated to a predetermined temperature. The thermostat then operates again, this time shutting off the gas supply. This operation is repeated as the heater is used.

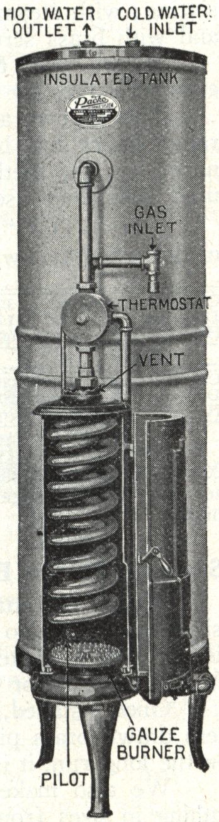
Boilers—The boiler may be of "Kopsteel" or of copper, both built according to the strict Massachusetts code.

"Kopsteel" Boilers—Boilers are made of double extra heavy "Kopsteel," a special rust-resisting copper-bearing steel, thoroughly galvanized inside and outside. They more than cover the strict Massachusetts code and are guaranteed for 127½ lbs. working pressure. Test pressure is 300 lbs.

Extra Heavy Copper Boilers—Conform strictly to the Massachusetts code. Tested to 250 lbs. pressure, guaranteed for 106 lbs. working pressure. Riveted heads and bottoms; brazed seams.

Thermostat—The thermostat is of the positive, snap-action "Klixon" type. It operates equally well with artificial or natural gas. Shipped set at 160° F., but may be higher or lower.

Heater—Has extra length double copper coil with new type powerful burner.



"Packo" System with Heater Door Open

"PACKO" GAS FIRED AUTOMATIC HOT WATER STORAGE SYSTEMS

"Packo" No.	Capacity, gal.	Height overall, in.	Width, including heater, in.	Approximate boxed weight, lb.
14-30-20	20	47	28	250
14-48-32	32	65	28	300
18-38-42	42	55	32	420
18-48-52	52	65	32	520

All hot and cold water tappings, also gas connections, are ¾-in. iron pipe size. All systems (except 20 gal.) are tapped ¾-in. iron pipe size for indirect heaters. All connections and piping for water are of brass. "Klixon" thermostat control set to deliver water at faucet at 140° F.

Safety Valve—We recommend that a safety valve be installed with every "Packo" storage system or any other storage system in order to relieve any possible excessive pressure. Install a make that is approved by local plumbing ordinances. All "Packo" systems have a tag attached to this effect.

Riverside Indirect Water Heaters

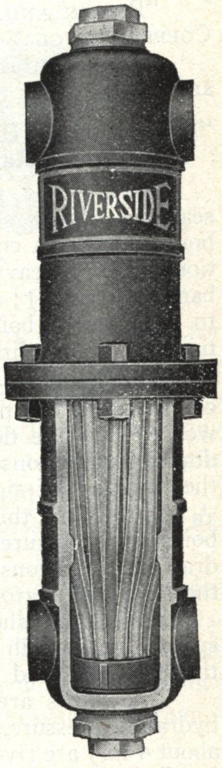
The Riverside indirect water heater is the fastest and most efficient indirect water heater made. It takes the place of the old-fashioned fire pot pipe coil which is now condemned by all who have studied the question.

This indirect heater is a most compact outfit and may be readily connected to any steam or vapor heating boiler in new or old installations.

An Ideal Installation—A Riverside indirect water heater connected between a steam or vapor heating boiler and a "Packo" automatic gas fired hot water storage system makes an ideal installation. During the heating season (when the steam or vapor boiler is in operation), the indirect heater will take care of all ordinary hot water requirements.

Large Installations—The Riverside indirect heater works very satisfactorily on large installations such as apartment houses, clubs, large residences, etc.

It may be connected up singly or in tandem. It is quick in operation, as the incoming water is divided into a number of small streams and the heating surface is therefore, very large.



Riverside Indirect Water Heater

SPECIFICATIONS AND RATINGS OF RIVERSIDE INDIRECT WATER HEATERS WHEN CONNECTED TO STEAM BOILERS

Size No.	Water heated per hour, gal.	Maximum capacity of tank, *gal.	List price
07	10	30	$ 18.50
113	20	50	25.50
226	40	100	45.00
352	80	250	80.00
480	120	350	125.00
500	300	500	145.00
600	500	1000	360.00

*Will take care of boilers or tanks not exceeding capacity indicated.

In selecting the proper size heater, remember that the larger the heater the better the service rendered. Make liberal allowance on circulating systems.

CONNECTIONS, TAPPINGS, WEIGHTS, ETC., OF RIVERSIDE INDIRECT HEATERS

Size No.	Shell tappings, in.	Tappings on centers, in.	Hot water connection, in.	Length, in.	Diam., in.	Boxed weight, lb.
07	1	14	¾	19	4	16
113	1	14	¾	19	6	24
226	1¼	14	1	19	6	27
352	1½	14	1¼	19	8¼	60
480	2	14	1½	19	8¼	65
500	2	21	2	27¾	11½	130
600	2½	30	2½	37	13½	250

ESTABLISHED 1830

THE RANDOLPH-CLOWES COMPANY

FORMERLY BROWN AND BROTHERS

Manufacturers of Copper Range Boilers

WATERBURY, CONN.

BRANCH OFFICE: 253 Broadway, NEW YORK, N. Y.

Products

"Brown and Brothers" Cold Drawn Seamless Copper Range Boilers; Brass Pipe and Tubing.

Also manufacturers of Brass and Bronze Sheets and Rods.

"Brown and Brothers" Cold Drawn Seamless Copper Range Boilers

Parts—The parts consist of two cold drawn seamless copper shells, each forming one-half of the boiler proper; a corrugated spiral interior rib (see sectional cut); a heavy seamless copper exterior reinforcing band (at center); a seamless copper band at the bottom to support the boiler on its stand; the necessary connections or couplings.

Construction—The two cold drawn seamless copper shells are made from flat rolled discs of copper worked into the desired shape and size by a series of drawing operations which gradually elongate and reduce the thickness of sides from ⅛ or ¼ in. down to about 1/16 in., the final thickness of sides depending on size of boiler and pressure under which it will be used. These drawing operations do not reduce thickness of ends, or the head and bottom of boiler.

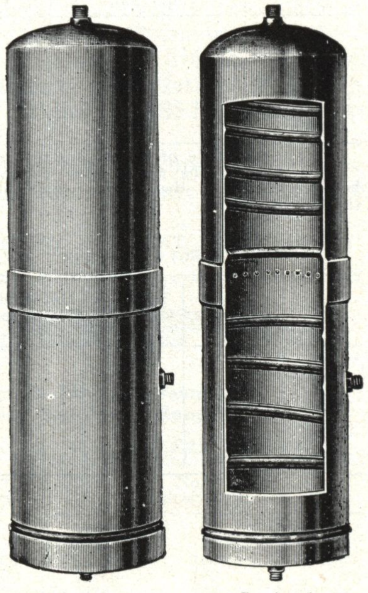
After these shells are completed and the corrugated spiral interior rib put in place, they are thoroughly tinned inside and connections bolted and soldered in.

The shells are then telescoped together by heavy hydraulic pressure. Overlapping parts (which overlap about 4 in.) are riveted together, the exterior reinforcing band shrunk on over telescope joint and rivet heads, and the whole sweated together with solder.

Points of Superiority—The cold drawing process used in forming the shells very materially increases the tensile strength of the copper.

The boiler is without a longitudinal seam, thus eliminating one element of the risk of leakage. The sides and ends are in one piece, whereas in other boilers the heads have to be jointed to the side.

The greater thickness of metal in ends, or head and bottom of boiler, the double thickness of metal in the middle due to telescoping one shell into the other and the further reinforcing at this point by heavy copper band, provide a maximum of strength at points where greatest pressure is exerted when boiler is in service. Ribs inside the boiler absolutely guard against collapse.



Exterior Sectional

"Brown and Brothers" Copper Boiler, Showing Spiral Ribs

The riveting of the two shells together (see sectional cut), insures against their pulling apart.

Every "Brown and Brothers" boiler is subjected to a rigid inspection and water pressure test, the regular pressure boiler being tested to 200 lb. and the extra heavy to 300 lb. to the sq. in.

Can be furnished for either vertical or horizontal setting; with steam coil of either brass or copper pipe; and with brass screw cap handhole.

Where over 85 lb. working pressure exists, the extra heavy boiler should be used.

The "Brown and Brothers" seamless drawn copper range boiler has been on the market since 1876, and never has the method of construction, or the material used, been the cause of any trouble or complaint.

Sizes—The "Brown and Brothers" boilers are made in the following capacities and sizes:

Capacity .... gal.	30	35	40	45	50	60	80	60	80
Diameter ...... in.	12	14	14	14	16	16	16	20	20
Height .... in.	60	53	60	68	60	70	96	44	59

Capacity .... gal.	100	100	120	125	150	180	200	250	300
Diameter ...... in.	20	24	24	24	24	24	24	24	24
Height .... in.	76	60	65½	69	78½	92½	103	129	155

How to Specify—Provide and install where shown a 200-lb. test (or 300-lb. test) "Brown and Brothers" cold drawn seamless copper range boiler .... in. in diameter, and .... in. high.

Seamless Drawn Brass Pipe

We manufacture seamless drawn brass pipe in all sizes from ⅛-in. to 12-in. iron pipe size, inclusive. This is particularly suited to high grade plumbing work, as it does not rust or corrode, and can not clog.

Once installed, repair bills are eliminated, as seamless drawn brass pipe is practically everlasting. Thus, in the long run, it is more economical than iron.

We also make seamless drawn brass and copper tubing in sizes from 3/16-in. to 32-in. diameter.

WEIGHT PER LINEAL FOOT, SEAMLESS BRASS AND COPPER TUBING, IRON PIPE SIZES

Iron pipe size, in.	Outside diameter, in.	Regular			Extra Heavy		
		Inside diam., in.	Weight, lb.		Inside diam., in.	Weight, lb.	
			Brass	Copper		Brass	Copper
⅛	.405	.281	.246	.259	.205	.353	.371
¼	.540	.375	.437	.459	.294	.593	.624
⅜	.675	.494	.612	.644	.421	.805	.847
½	.840	.625	.911	.958	.542	1.191	1.253
¾	1.050	.822	1.235	1.298	.736	1.622	1.706
1	1.315	1.062	1.740	1.829	.951	2.386	2.509
1¼	1.660	1.368	2.557	2.689	1.272	3.291	3.460
1½	1.900	1.600	3.037	3.193	1.494	3.986	4.191
2	2.375	2.062	4.017	4.224	1.933	5.508	5.791
2½	2.875	2.500	5.830	6.130	2.315	8.407	8.839
3	3.500	3.062	8.314	8.741	2.892	11.24	11.82
3½	4.000	3.500	10.85	11.41	3.358	13.66	14.37
4	4.500	4.000	12.29	12.93	3.818	16.41	17.25
4½	5.000	4.500	13.74	14.44	4.250	20.07	21.10
5	5.563	5.062	15.40	16.19	4.813	22.51	23.67
6	6.625	6.125	18.44	19.39	5.750	31.32	32.93
7	7.625	7.062	23.92	25.15	6.625	41.22	43.34
8	8.625	8.000	30.05	31.60	7.625	47.00	49.42
9	9.625	8.937	36.94	38.84	....	....	....
10	10.750	10.019	43.91	46.17	....	....	....

Variations from these weights must be expected in practice.

THE NELSON CO.

Manufacturers of Relief Valves for Boiler Protection

Ten High Street
BOSTON, MASS.

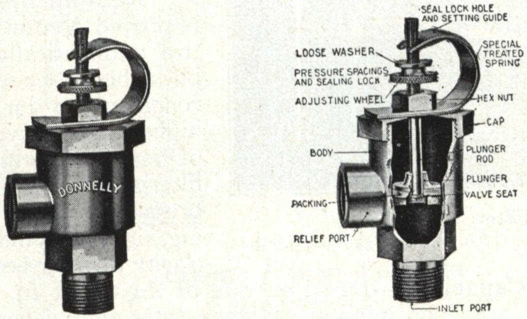
Products

- Donnelly Relief Valves for:
  - Pressure
  - Temperature
  - Vacuum

Donnelly Pressure Relief Valve

The Donnelly Pressure Relief Valve is designed for use on range boilers, all closed plumbing systems and hot water heating systems. It should be installed in a vertical position, at any point in the system, but preferably should be placed over the top of the boiler and should be connected to a drain in order to carry away the excess water when it functions.

Should the pressure become too great, the Donnelly Pressure Relief Valve operates automatically, draining just the right amount of water to reduce the pressure to within proper bounds, when it automatically closes. It will also relieve pressure and air when installed on any vessel or tank.


DONNELLY
SEAL LOCK HOLE AND SETTING GUIDE
LOOSE WASHER
SPECIAL TREATED SPRING
PRESSURE SPACINGS AND SEALING LOCK
ADJUSTING WHEEL
HEX NUT
CAP
BODY
PLUNGER ROD
PLUNGER
VALVE SEAT
PACKING
RELIEF PORT
INLET PORT

Pressure Relief Valve

The external spring on the Donnelly Relief Valve assures proper functioning, as internal springs corrode and lose their tension, which would change the adjustment and defeat the purpose of the valve.

The Donnelly Pressure Relief Valve may be adjusted by any mechanic in thirty seconds to operate at any required pressure, from a fraction of a pound upward, as may be found necessary.

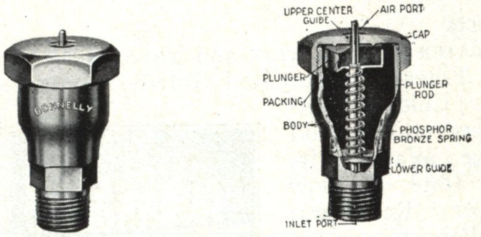
Made in the following sizes: ½, ¾ and 1-inch iron pipe, and ¾-inch fine thread tubing connections.

Donnelly Vacuum Relief Valve

The Donnelly Vacuum Relief Valve is designed for use in connection with all makes of range boilers. It will break a vacuum of one inch of mercury and up when siphonage occurs, thus preventing the boiler from collapsing through siphonage. It should be placed in a vertical position at the top of the boiler and as near to it as possible.

Although primarily used for range boilers, it may be used on any tank or receptacle which might be supjected to the same conditions.

Made in the following sizes: ½-inch iron pipe and ¾-inch fine thread tubing connections. These sizes may be increased or decreased at will by bushing the thread, which procedure will not affect the functioning of the valve.


DONNELLY
UPPER CENTER GUIDE
AIR PORT
CAP
PLUNGER
PACKING
BODY
PLUNGER ROD
PHOSPHOR BRONZE SPRING
LOWER GUIDE
INLET PORT

Vacuum Relief Valve

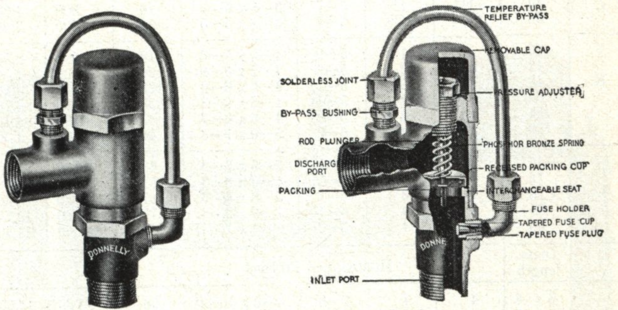
Donnelly Dual Relief Valve

The Donnelly Dual Relief Valve is designed for use on range boilers and domestic hot water heating systems. It provides both pressure and temperature relief, and should be installed in a vertical position at any point in the system, but preferably over the top of the boiler on the hot water line. It should be connected to a drain which will carry away the excess water when the valve functions.

Should the pressure become too great, this valve will function in the same manner as the Donnelly Pressure Relief Valve already described. Should the system become overheated, the fusible plug will melt and relieve the excess temperature, which will necessitate the changing of the fuse.

This valve is also recommended where instantaneous gas coil heaters are used. It is a compact job, functions perfectly, and is a marvel of simplicity and dependability.

It is made in the following sizes: ½-in. iron pipe, and ¾-in. fine thread tubing connections. These sizes may be increased or decreased at will by bushing the thread, which procedure will not affect the functioning of the valve.


DONNELLY
TEMPERATURE RELIEF BY-PASS
REMOVABLE CAP
SOLDERLESS JOINT
PRESSURE ADJUSTER
BY-PASS BUSHING
ROD PLUNGER
PHOSPHOR BRONZE SPRING
DISCHARGE PORT
RECESSED PACKING CUP
PACKING
INTERCHANGEABLE SEAT
FUSE HOLDER
TAPERED FUSE CUP
TAPERED FUSE PLUG
INLET PORT

Donnelly Dual Relief Valve

Guarantee

All Donnelly products are made of the highest grade materials. They are tested when assembled and inspected thoroughly before packing.

All valves proving unsatisfactory in any way will be replaced or repaired free of charge.

CALIFORNIA FILTER COMPANY, INC.

The Merchants Exchange

SAN FRANCISCO, CALIF.

DISTRICT SALES OFFICES

SEATTLE, WASH., 202 Securities Building
LOS ANGELES, CALIF., 1230 West Adams Street

Products

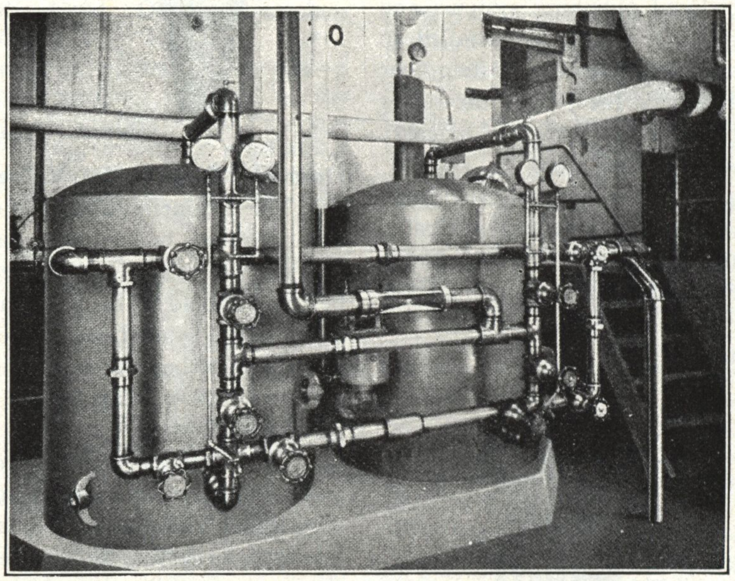
Water Purification and Treating Equipment: Water Filters, Pressure and Gravity; Hypo Sterilizing Devices; Chlorine Control Apparatus; Liquid Chlorine; Water Softeners; Rate of Flow Indicator; Recorders; Controllers.

Water Filters

Pressure Type—Constructed of steel plate; underdrain systems, cast or galvanized iron pipe; strainer heads, zinc-free bronze; coagulant tanks of cast iron.

Gravity Type—Steel, wood or concrete.

Operation—Pressure Type—Usually connected directly to existing water systems without change of piping arrangements or supplying additional pumping equipment.



Duplex Vertical Pressure Filter, Type K

Sizes: 40 to 60 in. diameter; capacities, from 1600 to 3600 gal. per hour

FILTER SPECIFICATIONS AND SCHEDULE OF SIZES AND CAPACITIES

Type	Size diameter, in.	Inlet, outlet piping, in.	Waste pipe, in.	Height over all, ft. in.	Floor Space required, ft. in.	Capacity in U. S. Gallons At 2-gal. rate		
						Min.	Hour	Total wt., lb.
	Vertical Filters							
A	16	1	1¼	5—0	1—10 x 2—11	4	240	750
	20	1	1¼	5—0	2—0 x 3—3	7	420	950
J	30	1½	1½	5—7	3—6 x 5—0	10	600	1,300
	36	1½	1½	5—7	3—6 x 5—5	15	900	2,000
K	40	2	1	5—9	4—0 x 5—6	18	1,080	2,500
	42	2	2	5—9	4—2 x 5—9	20	1,200	2,700
	48	2½	2½	5—11	4—6 x 6—0	25	1,500	3,500
	50	2½	2½	5—11	4—6 x 6—3	28	1,680	3,700
	54	2½	2½	6—0	4—6 x 6—7	32	1,920	4,400
	60	2½	2½	6—0	5—0 x 7—3	40	2,400	5,500
L	66	3	3	6—2	5—6 x 7—9	48	2,880	6,700
	72	3	3	6—5	6—0 x 8—3	57	3,420	8,000
	78	3	3	6—6	6—6 x 8—9	67	4,020	9,300
	84	4	4	6—10	7—0 x 9—6	77	4,620	10,700
	96	4	4	7—2	8—6 x 10—7	100	6,000	13,400
	Diam. length	Horizontal Filters						
H-6	6 x 8	4	4	7—6	6—6 x 10—9	96	5,760	17,000
	6 x 10	4	4	7—6	6—6 x 12—9	120	7,200	21,300
	6 x 12	4	6	7—6	6—6 x 14—10	144	8,640	25,500
	6 x 14	6	6	7—6	6—6 x 17—0	168	10,080	29,750
	6 x 16	6	6	7—6	6—6 x 19—0	192	11,520	34,000
	6 x 18	6	6	7—6	6—6 x 21—0	216	12,960	38,250
	6 x 20	6	6	7—6	6—6 x 23—0	240	14,400	42,500
H-8	8 x 10	4	6	10—2	10—0 x 16—0	160	9,600	29,200
	8 x 12	6	6	10—2	10—0 x 18—0	192	11,520	35,100
	8 x 14	6	6	10—2	10—0 x 20—0	224	13,440	40,900
	8 x 16	6	8	10—2	10—0 x 22—0	256	15,360	46,800
	8 x 18	6	8	10—2	10—0 x 24—0	288	17,280	52,600
	8 x 20	8	8	10—2	10—0 x 26—0	320	19,200	58,400
	8 x 25	8	10	10—2	10—0 x 31—0	400	24,000	73,300

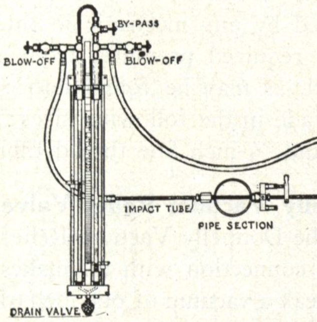
Comparison of Pressure and Gravity Types—Principles in pressure and gravity filters are the same, the difference being in mechanical arrangement. Pressure filter contains filtering material in a closed pressure tank, allowing filtration to take place under pressure. Gravity filter is an open compartment allowing filtration without additional pressure other than depth of water over filter bed. Washing of filter beds in both types is accomplished by reversal of flow.

Equipment—Our improved Venturi control automatically supplies the necessary coagulant to insure highest efficiency. Loss of head gauges indicate filtering friction or back pressure. During washing, sight glass indicates clarity of filter bed.

Capacities—Based on rate of 2 gal. per sq. ft. of filter area per minute. Higher rates will depend on character of suspended matter and degree of efficiency required.

Rate of Flow Indicator

Designed for accurate, simple indication of water velocities by means of a Pitot tube inserted in any size line — wood, steel or cast iron. Manometer indicates velocities in feet per second or gallons per minute. Very easily installed. Guaranteed accuracy. Orifices examined without removing tube. Reversible columns in U-tube.



Collins Rate of Flow Indicator Type "B"

Lime Soda Water Softener

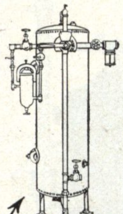
For specially hard waters. A motor driven agitating and mixing tank with necessary regulating devices. Complete layouts for iron removal plants.

EVERSON FILTER CO.

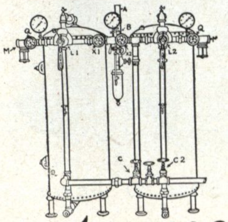
Water Purifiers, Filters, Cooler Fountains, Pool Vacuum Cleaners, Hair Catchers, Swimming Pool Equipment

TELEPHONE
HAYMARKET 7005

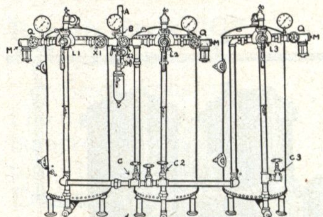
647 North Green Street
CHICAGO, ILL.



C1066-1



C1066-2



C1066-3

Type C Filters (Shown at Left)

In sizes from 12 to 42 in. diam. with galvanized tanks, galvanized fittings and single control valves for simplifying operation. Made in single units for quartz; two units for quartz and bone black double filtration; or three units, two quartz and one bone black, for triple filtration. Capacity 2 to 30 gal. per minute.

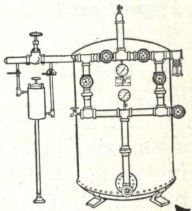
Type M Filters (Shown at Right)

Made in sizes from 30 to 96 in. in diameter. Capacities up to 500 gal. per minute. Each filter equipped with five valves for complete operation. Units can be arranged to meet requirements.

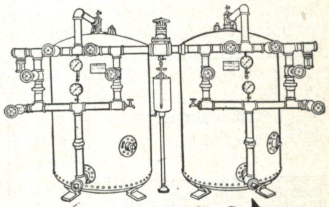
Accessories

All filters equipped with Everson strainers, coagulator, sight glasses, test cocks, tank support, filtering material, etc.

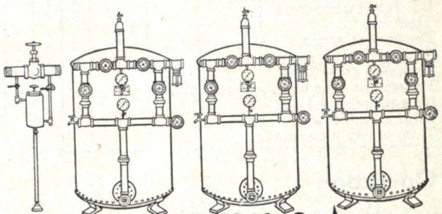
Send for descriptive bulletins.
General Filter Systems, No. 502.
Swimming Pool Equipment, No. 525.



M1016-1



M1016-2



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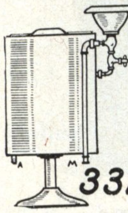
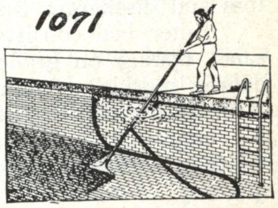


332

Eskimo Cooler Fountain

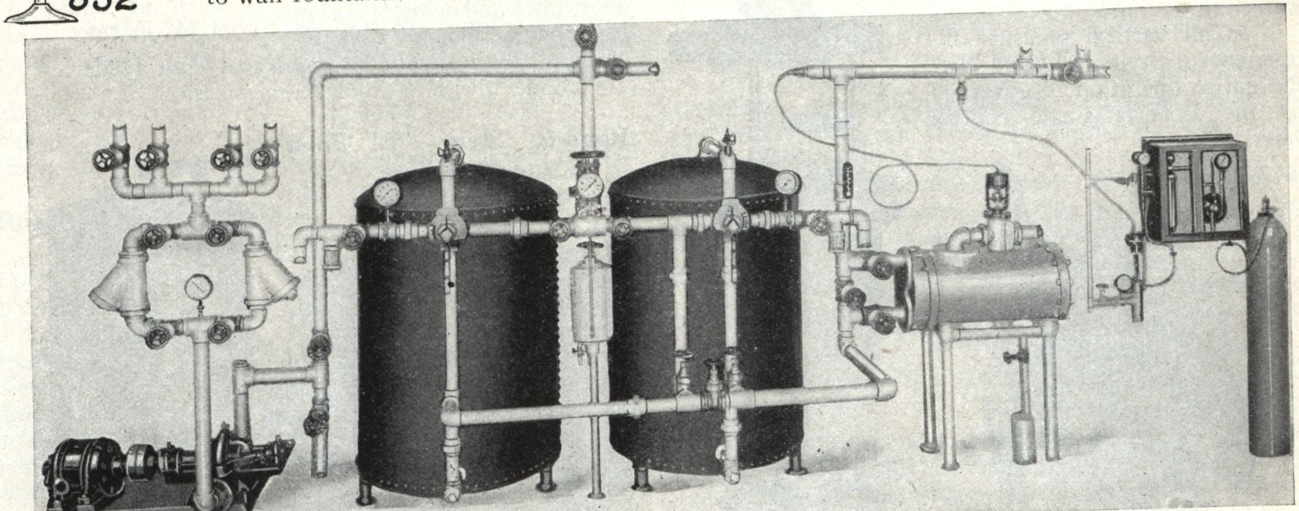
Instantaneous water cooler, 75-lb. ice capacity, suitable for factories and all public places. Also furnished without bubbler for attaching to wall fountains.

1071



Everson's Pool Vacuum Cleaner

No. 1071, made of brass or aluminum, consists of: 50-ft. hose with swivel couplings, 6-ft. and 7-ft. extension handles, 36-in. tool and wall flange.



EVERSON'S NO. 1094 SWIMMING POOL PURIFYING SYSTEM

Consists of Hair Catcher (No. 1013); Pump and Motor (No. 1097); Type S Filters (No. 1096-2); Instantaneous Heater; Chlorinator; and Pool Vacuum Cleaner (No. 1071). Provision is made to use R.U.V. sterilizer at option of architect.

Complete specifications, on request, for pools of different sizes.

Type S: These filters are made 30 to 60 in. diam. with single control valves as shown, for more convenient operation.

ROBERTS FILTER MANUFACTURING CO.

MAIN OFFICE AND FACTORY
DARBY, PA.

Products

Roberts Filters, Filtration Plants and Filter Appliances for every water purification requirement.

Types and Uses

Pressure type and gravity type filters, with capacities from 1 gal. per hour to 1,000,000 gal. an hour and larger.

Filters for residences, apartment houses, hotels, institutions, hospitals, swimming pools, industrial drinking water systems, mills and factories, water works and municipalities.

See table below, classifying filters as to type of service.

CLASSIFICATION AS TO TYPE OF SERVICE

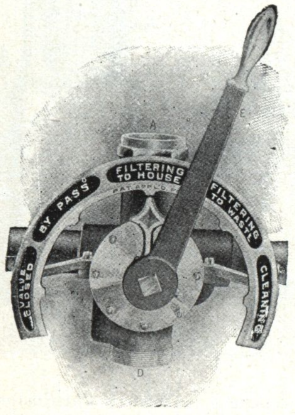
Type of Service	Roberts Germproof Stone Filters	Vertical Pressure Filters							Horizontal Pressure Filters	Wood Tank Gravity Filters	Rectangular Concrete Gravity Filters
		Style D	Style M	Style E	Style O	Style G	Style H	Style L			
Individual faucet use	x										
Residences (small and medium)		x	x	x	x						
Residences (large)				x	x						
Apartment houses				x	x	x					
Hotels and institutions				x	x	x	x	x			
Theaters		x	x	x	x	x					
Department stores				x	x	x		x			
Swimming pools (ordinary)				x	x	x	x				
Swimming pools (large)								x	x		
Factory drinking water systems		x	x	x	x	x	x				
General industrial use				x	x	x	x	x	x		
Large industrial water supply									x	x	x
Town or city water works								x	x	x	x

Operation

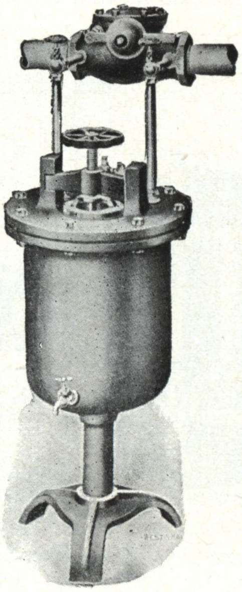
Water enters filter at top, passing downward through the filter bed, collects in strainer system at bottom and discharges through outlet.

Filter bed consists of specially graded pure silica sand, resting on graded silica gravel. In some cases quartz, marble, or refined bone charcoal are employed. Attached to inlet line of filter there may be (and usually is) employed a Roberts automatic coagulant feeder, which accurately feeds a slight quantity of alum into the raw water.

In all vertical pressure filters, except Styles "H" and "L," the entire operation is governed by the Roberts single control valve.



Roberts Single Control Valve



Roberts Automatic Coagulant Feeder

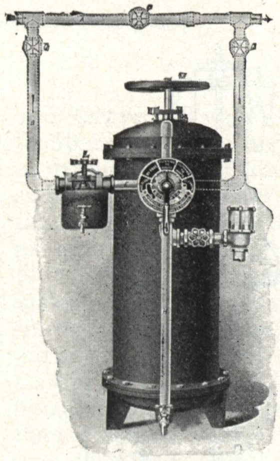
Cleaning of all Roberts filters is thoroughly and easily accomplished by a reverse flow of water, which lifts and "liquefies" the sand bed, scouring it on itself and flushing the removed matter to the sewer.

A sight glass on the waste line indicates when the washing is complete.

Roberts Style "D" Filter

The model household filter. Cast iron construction. Equipped with coagulant feeder, single control valve, sight glass. Also has agitator, operated by hand wheel, which is used during washing to assist in breaking up the filter bed.

Made in 12, 16 and 20-in. sizes.

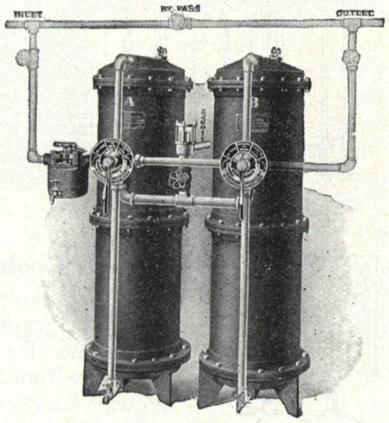


Style "D" Filter

Roberts Style "M" Filter

Widely used in residences of the better class. Consists of two cast iron filters, connected *in tandem* for double filtration. First cylinder charged with sand and ground marble; second cylinder with refined bone charcoal. First cylinder removes suspended matter; second cylinder reduces or removes odor, taste and color. Equipped with single control valves, sight glass and coagulant feeder.

Made in 12, 16 and 20-in. sizes.

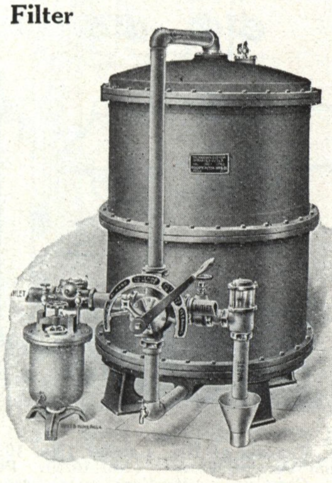


Style "M" Filter

Roberts Style "E" Filter

Cast iron construction—in sections. Can readily be taken through small doorways. Equipped with coagulant feeder, single control valve and sight glass. Filling and inspection hole (4 in.) in top; larger sizes also have standard manhole in each shell section. (See illustration Style "O.") Pleasing appearance; substantial in looks and in fact.

Made in 8 sizes, 12 to 48 in.



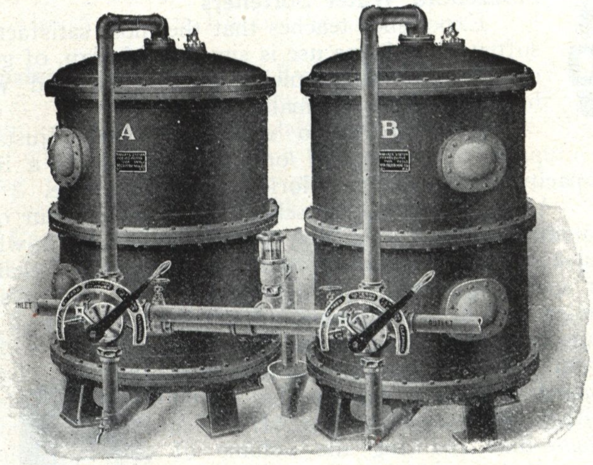
Style "E" Filter

Continued on next page

Roberts Style "O" Filter

Consists of two Style "E" filters connected *in tandem* for double filtration. Principle similar to Style "M," but larger units. Two Style "G," or Style "H" units may also be connected up as a double filter. Specially adapted for waters containing dissolved color, taste and odor.

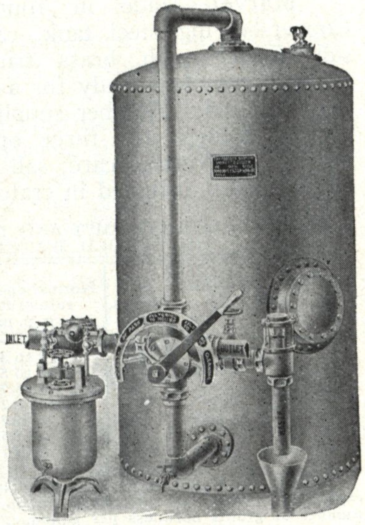
Made in 5 sizes, 24 to 48 in.



Style "O" Filter

Roberts Style "G" Filter

Steel construction; top head bumped convex, bottom head concave. Equipment and connections similar to Style "E." Handhole in top, manhole in shell. Made in 5 sizes, 30 to 60 in.



Style "G" Filter

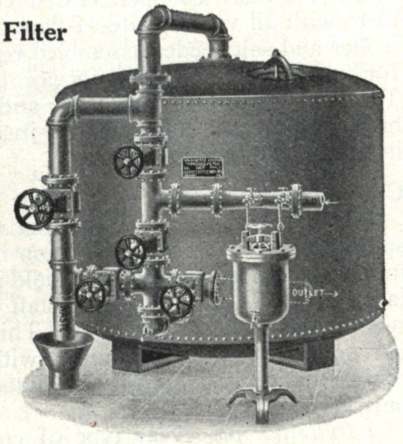
Roberts Style "H" Filter

Same as Style "G," except single control valve omitted. Operation controlled by 5 gate valves. Made in 5 sizes, 30 to 60 in. Connections as illustrated on Style "L."

Roberts Style "L" Filter

Steel construction; both heads bumped convex. Filtered water collector system consists of central manifold and laterals; all to be embedded in concrete. Equipped with gate valve control, coagulant feeder and waste funnel. Manhole in top head.

Made in 72, 78, 84 and 96-in sizes.



Style "L" Filter

VERTICAL PRESSURE FILTERS, DIMENSIONS AND CAPACITIES

Size (inside diam.) in.	Filtering area, sq. ft.	Capacity, gal. per min.*				Height overall, in.	Pipe connections in.†		Floor space, ft.
		Unit rate 2	Unit rate 3	Unit rate 4	Unit rate 5		Inlet and outlet	Waste to sewer	
12	.78	1.56	2.34	3.12	3.90	58	1	1¼	3 x2½
16	1.39	2.78	4.17	5.56	6.95	63	1	1¼	3 x3
20	2.19	4.38	6.57	8.76	10.95	64	1	1¼	3 x3
24	3.14	6.28	9.42	12.56	15.70	64	1¼	1½	3¼x3
30	4.91	9.82	14.73	19.64	24.55	74	1½	2	4½x3
36	7.07	14.14	21.21	28.28	35.35	76	2	2½	5 x3½
42	9.62	19.24	28.86	38.48	48.10	78	2	2½	6 x4
48	12.56	25.13	37.70	50.24	62.80	77	2½	3	6½x4½
54	15.90	31.80	47.70	63.60	79.50	78	2½	3	7 x5
60	19.63	39.26	58.89	78.52	98.15	82	2½	3	7 x5½
72	28.27	56.54	84.81	113.10	141.40	94	3	4	8½x6½
78	33.17	66.34	99.51	132.70	165.90	96	3	4	9 x7
84	38.48	76.96	115.40	153.90	192.40	98	4	5	10 x7½
96	50.26	100.50	150.80	201.00	251.30	100	4	5	10½x8½

*See "Notes on Specifications."
†Special or oversize connections can be furnished.

Notes on Specifications

Specify filters by *inside diameter*. If diameter is not specified, the term "capacity" is meaningless unless accompanied by the following "at a unit rate of filtration not exceeding . . . gal. per min. per sq. ft. of effective cross-sectional filter area." Example: A 42-in. (inside diameter) filter has an area of 9.62 sq. ft. (42-in. circle) and at a unit rate of 4 has a capacity of 38.48 gal. per min.; while at a unit rate of 3, capacity is 28.86 gal. per min.

The *unit* rate of filtration that may be safely employed in a given case is determined by two factors: (a) the character of the raw water, and (b) the quality of filtered water desired. When bacterial efficiency and complete clarification are desired, a 2-gal. unit rate is the maximum. For clarification of a turbid water use a 2-gal. unit rate; of a slightly turbid water, a 3-gal. unit rate; and of a good water (such as New York City) a 4 or 5-gal. unit rate. For recirculating *swimming pools* the standard unit rate is 3. *No unit rate in excess of 5 gal. should ever be employed.*

In filter practice, the accepted meaning of clarification is the removal of practically all suspended matter visible to the naked eye, rendering the water bright, clear and sparkling.

Capacity of a double filter (two cylinders *in tandem*) is that of a single filter of same diameter cylinder.

Always specify maximum pressure to which filters will be subjected in operation.

Roberts standard cast iron filters are built for a working pressure of 60 lb. and tested to 100 lb.; steel filters are for working pressure of 100 lb. and tested to 150 lb.

Filters for higher pressures supplied, where required.

Other Styles

We manufacture Roberts stone filters for individual faucet use. Over 500,000 in use. Capacities 1 to 60 gal. per hour. Prices $5.00 to $70.00. Catalogue on request.

Horizontal pressure filters, wood tank gravity filters and rectangular concrete gravity filters for large installations. Complete information upon application.

Send for bulletins or, if more convenient, see Sweet's Engineering Catalogue for data on larger sizes.

General

Roberts equipment is being used satisfactorily for domestic, industrial and municipal installations. The pure, clear and sparkling water delivered at all times is convincing proof of its efficiency.

More than 900,000,000 gal. of water are being satisfactorily treated daily by Roberts filters.

Strength and durability are two of their main characteristics.

INTERNATIONAL FILTER CO.

Water Softening and Filtration Plants

333 West 25th Place
CHICAGO, ILL.

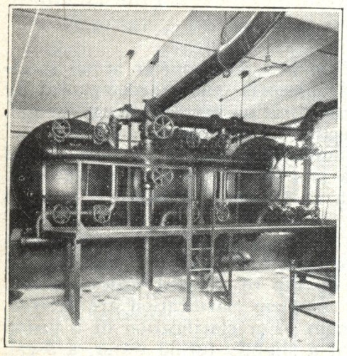
NEW YORK, N. Y., Woolworth Building
PITTSBURGH, PA., Arrott Building
PHILADELPHIA, PA., 1234 Callowhill Street
LOS ANGELES, CAL., Terminal Sales Building
SAN FRANCISCO, CAL., Monadnock Building
TORONTO, ONT.: CANADIAN INTERNATIONAL FILTER COMPANY, LTD.

Products

WATER PURIFICATION EQUIPMENT of every type and size, for every need and purpose.

International Sand Filter, Pressure Type

Built in four styles. Styles D, I, and L with vertical steel shells, and style H with horizontal steel shells. Filters can be used singly or in a battery of two or more units. Filters are furnished complete with wash and collecting manifold system, full charge of filtering material, wash water trough or funnel, all immediate pipes, valves and fittings necessary for operation, pressure coagulant feeder, pressure gauges, sampling cocks and air relief valve.


Battery of 3 Pressure Filters

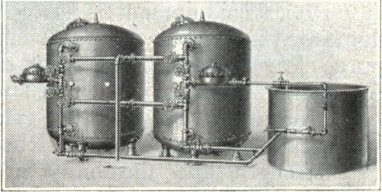
PRESSURE TYPE CAPACITY TABLE

Style	Size	Area, sq. ft.	Capacity gal. per hr. based on the rates per sq. ft. per min.		Approx. wt., lb. each filter	
			2 gal.	3 gal.	Shell and ftgs.	Filter bed
D	16″	1.40	167	250	460	460
D	20″	2.18	267	400	535	700
D	24″	3.14	400	600	670	1010
I	30″	4.91	600	900	1000	1570
I	36″	7.07	846	1270	1200	2275
I	42″	9.62	1155	1730	1600	3130
I	48″	12.57	1510	2260	1900	4050
I	54″	15.90	1910	2860	2500	5200
I	60″	19.63	2365	3550	2800	6400
L	60″	19.63	2365	3550	2800	6400
L	66″	23.76	2870	4300	3300	7700
L	72″	28.27	3400	5100	3800	9300
L	78″	33.18	4000	6000	4200	10800
L	84″	38.48	4670	7000	4700	12600
L	90″	44.18	5340	8000	5100	14400
L	96″	50.26	6000	9000	5800	16400

International Exchange Type Softener (Zeolite)

Built in standard sizes, vertical and horizontal pressure types. Will meet the most exacting requirements in laundries, textile mills, hotels, hospitals, office buildings, and wherever a pressure softener and water of "zero" hardness is required and the alkaline character of the zeolite softened water is unobjectionable. Smaller units, particularly designed for residential softening are also built.

The International zeolite or exchange mineral is capable of very quick regeneration; considerable overload capacity and operation at high rates of flow. The industrial units are furnished in either one or two unit types, complete with brine tank, brine control, operating valves and piping, meter, etc.

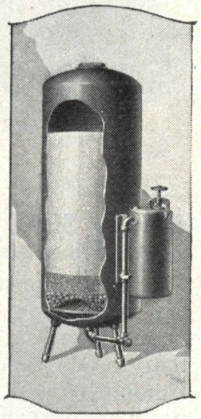

Zeolite Softener Battery of Two

Household Water Softeners

Experience teaches that the most satisfactory softener for home use is simple in design, of good quality materials, quick regeneration, and with high capacity in a small unit.

This means no complicated or adjustable parts to get out of order, and requires a high capacity, quick acting, colorless, reliable zeolite.

All International household softeners use our own patented zeolite, called "Crystalite." It is a hard, white substance which possesses about four times the exchange or softening capacity of the "green sand" zeolite sold under various trade names. Its high capacity, quick action, and freedom from color permit the use of small diameter tanks which can be served without increasing the size of service lines—thus reducing the volume of waste water. Also smaller units mean lower cost—usually less than a cistern.

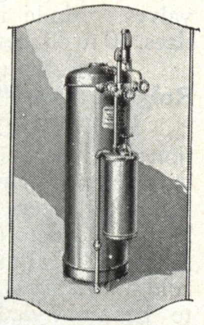


Marvel—Made in four sizes. Copper-bearing steel tank, cast iron salt feeder with brass trimmings. Shipped complete ready for assembly, as illustrated. Plumber supplies connecting fittings and three operating valves. Instruction card, salt funnel, and soap test included in crate.

MARVEL (LOT NO. "M") AND SUPERIOR (LOT NO. "B")
HOUSEHOLD WATER SOFTENERS

Lot No.	Tank size, in.	Size valves, in.	Normal operating rate of flow, g. p. m.	Approximate shipping weight, lb.	Salt used, lb.
M1375	12x40	¾	2 to 3	330	10
M2460	16x41	¾	3 to 5	485	16
M3870	20x42	¾	5 to 7	730	26
M9000	28x48	1	18 to 25	1545	65
B2060	12x48	¾	2 to 3	385	15
B3680	16x49	¾	3 to 5	585	26
B5760	20x50	1	5 to 7	870	38

Note: Lot numbers indicate capacity on 10-grain water. To find capacity on waters of other hardness, multiply by ten and divide by the number of grains hardness per gallon.



Superior—All brass construction to prevent rust and corrosion. Made in three sizes. Shipped crated complete with all valves, rate-of-flow controller and salt feeder assembled ready for connection with the service line. This unit should last a lifetime and its high quality and completeness justify its somewhat higher price.

Co-operative Service

The INTERNATIONAL FILTER CO. specializes on water purification for industrial, municipal and household purposes. We maintain a complete laboratory and staff of engineers to make reports and recommendations. This service is intended to cooperate and not conflict with the work of any representative or engineer appointed by the prospective purchaser.

Bulletins for every type of equipment gladly sent on request.

BARNSTEAD STILL AND STERILIZER CO.

6 Lanesville Terrace
BOSTON (30), MASS.

Products

Barnstead Automatic Water Stills; Storage Tanks for Distilled Water; Hospital Sterilizing Equipment.

Also Automatic Electric Steam Boilers.

TRADE-MARK

Barnstead Water Stills for Every Purpose

A complete line of automatic water stills for the continuous production of chemically pure, sterile, distilled water as required for a wide variety of manufacturing processes, scientific and laboratory uses, and hospitals, as well as for drinking water.

Capacities and Fuels—Manufactured in various capacities ranging from 1 to 100 gal. per hour; they may be heated by electricity, gas or high pressure steam.

Selection of the Proper Still—Depends first upon facilities available for heating and second upon the estimated hourly rate of production of the still in order to satisfy the institutions' requirements. If more than one method of heating is available, the most economical should be chosen.

Steam Heated Stills—Capacities 1 to 100 gal. per hour. Produce rated capacities at 60 lb. pressure although any pressure from 25 to 100 lb. may be used with corresponding varying capacities. Cost of distilled water thus produced averages two-thirds of a cent per gallon.

Gas Heated Stills—Capacities 1 to 10 gal. per hour. Equipped with an efficient type of radial burner incased under boiler; heat loss is reduced to a minimum. Boiler is constructed along line of the most approved type of tubular evaporator, presenting to flame a maximum heating surface in minimum space. Gas consumption is about 20 cu. ft. per gal. of distilled water produced.

Electrically Heated Stills—Capacities from 1 to 10 gal. per hour. Equipped with total immersion type heating units—the best type of construction—manufactured exclusively for us. Unit is quickly removed from or applied to still. Current consumption is 2.4 kw-hr. per gal. of distilled water produced, cost per gallon depending upon rate paid for electricity. 110 or 220-volt a-c. or d-c. may be used.

General Characteristics of Barnstead Stills—Cut shows typical Barnstead water still in detail. It is always necessary to provide for water supply at "A", hot water waste at "G" and the heating connections at "J". Process of operation is as follows:

Water to be purified enters still at point "A" and, in passing up through cooler and around condensing tubes, becomes preheated almost to boiling, being thus freed of all volatile impurities when discharged at "B". Hot water thus purified enters boiler through open pipe "C", the excess (which might well be utilized) wasting at "G", and is converted into pure steam passing up pipe "D" into condenser where it is condensed, cooled and delivered at "E", distilled—sterile—chemically pure.

Note: The above information should enable you to select from table catalogue number of the still best suited to the given conditions.

Blue Prints, Details, etc.—Write us giving the catalogue number, for detailed blue print of this still or any alternative still. In the meantime the table will give the necessary information to allow for space and to provide for water, waste and heating lines.

Barnstead Storage Tanks for Distilled Water

A full line of tanks of cypress 2-in. stock box type, lined with cold rolled copper heavily coated with pure block tin; or in all-metal or slate box; or cylinder type made of copper, Monel metal, nickel, slate or chemical stoneware, is carried. Tanks complete with cover and all necessary fittings. Recommendations together with prices and specifications will be forwarded upon receipt of information as to approximate capacity of tank desired and space limitations.

Hospital Sterilizing Equipment

A complete line of dressing sterilizers (autoclaves), utensil and instrument sterilizers, etc., to meet every hospital requirement. There is such a variety of sizes and types that the selection of sterilizers is best made from our literature.

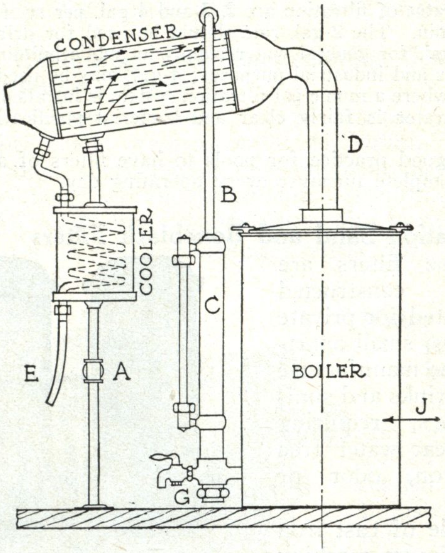


Diagram of Barnstead Water Still

SCHEDULE OF SIZES AND TYPES OF WATER STILLS

Steam Heated Stills

Cat. No.	Cap., gal. per hr.	Steam consumed per hr., lb.	Space required, in.			Connections I. P. S., in.			
			Width	Depth	Height	Water	Waste	Steam	Return
SL-1	1	9½	18	9	23	⅛	⅜	⅜	¼
SL-2	2	19	20	9	26	⅛	⅜	⅜	¼
SM-5	5	48	22	9	26	¼	½	⅜	¼
SM-10	10	95	36	12	42	½	¾	½	⅜
SM-15	15	143	48	17	60	½	1¼	¾	½
SM-20	20	190	50	17	64	½	1¼	¾	½
SM-25	25	240	54	19	64	½	1¼	¾	½
SS-30	30	290	62	26	75	¾	1¼	1	¾
SS-50	50	475	66	26	82	¾	1¼	1	¾
SS-75	75	710	73	31	94	1	2	1	¾
SS-100	100	958	76	31	100	1	2	1	¾

Gas Heated Stills

Cat. No.	Cap., gal. per hr.	Gas consumed per hr., cu. ft.	Space required, in.			Connections, I.P.S., in.		
			Width	Depth	Height	Water	Waste	Gas
GL-1	1	20	19	8	23	⅛	⅜	⅛
GL-1½	1½	30	21	9	24	⅛	⅜	⅛
GL-2	2	40	22	9	24	⅛	⅜	½
GL-2½	2½	50	22	9	24	⅛	⅜	½
GM-5	5	100	23	12	38	¼	½	1
GM-10	10	200	44	16	44	½	¾	1½

Electrically Heated Stills

Cat. No.	Cap., gal. per hr.	Kw. rating	Space required, in.			Conn., in.		Amperage	
			Width	Depth	Height	Water	Waste	110 V.	220 V.
EL-1	1	2.4	17	8	23	⅛	⅜	24	12
EL-1½	1½	4	17	9	23	⅛	⅜	40	20
EL-2	2	6	19	9	23	⅛	⅜	60	30
EL-3	3	7.2	21	9	23	⅛	⅜	72	36
EL-5	5	12	23	9	28	¼	½	120	60
EM-10	10	24	23	12	38	½	¾	240	120

WM. B. SCAIFE & SONS CO.

FOUNDED 1802

Water Filters and Water Softening Systems

Executive Offices, Laboratory and Works
OAKMONT, PA.

PITTSBURGH OFFICE, First National Bank Building
CHICAGO OFFICE, First National Bank Building
NEW YORK OFFICE, 26 Cortlandt Street

Products

SCAIFE PATENTED PRESSURE and GRAVITY FILTERS for all industrial uses, for municipalities, public buildings, swimming pools, residences.

SCAIFE and WE-FU-GO CONTINUOUS and INTERMITTENT WATER SOFTENING SYSTEMS for boiler feed, for domestic use, and all industrial uses.

Specification Data for Filters

Specify working pressure (usually 100 lb.), diameter of filter, number of units and the capacity in accordance with following:

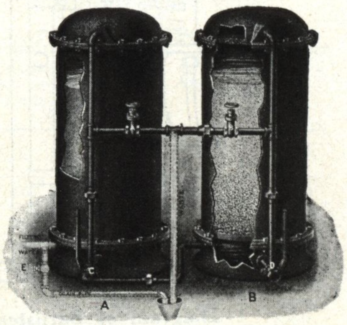
The rates of filtration are 2, 3 and 4 gal. per sq. ft. filtering area per min. The 2-gal. rate should be used for drinking purposes; 3-gal. for general water supply in public buildings, swimming pools and industrial purposes; 4-gal may be used in public buildings where a municipal filtration system is installed, or where the raw water is fairly clear and bacterial purification is not essential.

It is good practice for pools to have filters of ample size to give complete turnover every operating day.

Combination Sand and Boneblack Filters

These filters are specially constructed and adapted for private residences, small apartments, the manufacture of soft drinks and similar uses, requiring bright clear water free from iron, odor or taste.

Made of cast iron for maximum working pressure of 100 lb. per sq. in.



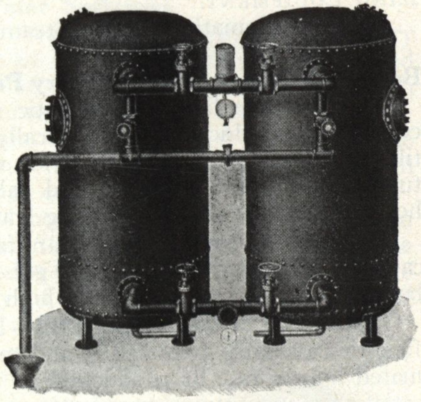
DOUBLE COMBINATION CAST IRON SAND AND BONEBLACK FILTER

COMBINATION SAND AND BONEBLACK FILTERS

Cat. No.	2 units diam. of unit, in.	Height, ft. in.	Filter area single unit, sq. ft.	Floor space Length, ft. in.	Floor space Width, ft. in.	Size supply pipe, in.	Capacity per hour based on 2, 3 and 4 gal. per sq. ft. per min. 2 gal.	3 gal.	4 gal.	Approx. shipping weight, lb.
55	16	4 0	1.40	4 2	2 6	1	165	250	335	1700
66	20	4 0	2.18	4 6	2 10	1	260	390	520	2800
77	24	4 6	3.14	4 10	3 2	1¼	375	565	750	4200

Patented Steel Pressure Filters, Vertical and Horizontal

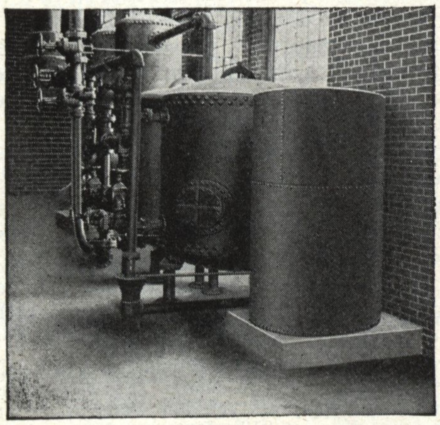
Furnished in any required number of units. When operated in units they are connected so that any filter is cleaned with filtered water. They are equipped with efficient strainers of special form to insure thorough washing by reversing the flow of water. Built for any required working pressure and with filtering material varied to meet any special requirement.



TANDEM STEEL QUARTZ PRESSURE FILTERS

Water Softening and Purifying Systems

We can furnish any type to meet specific requirements for softening water by precipitation, using either cold or hot processes, or by the zeolite exchange process for zero hardness by soap test. Water purification is our specialty and we guarantee definite results.



Bulletins and Information

Special bulletins and data gladly furnished, on request, on filters or water softening equipments.

SCAIFE VERTICAL STEEL PRESSURE FILTERS (Single Unit)

Cat. No.	Diam., in.	Area, sq. ft.	Floor space occupied ft. in. ft. in.	Height, ft. in.	Capacity per minute for rate per sq. ft. 2 gal.	3 gal.	4 gal.	Capacity per 24 hours 2 gal.	3 gal.	4 gal.	Approx. shipping weight, lb.	Weight when full of water, lb.	Pipe sizes, in. Inlet and outlet	Waste
8	30	4.9	3 6 x 4 0	7 0	9.8	14.7	19.6	14,100	21,170	28,220	3,000	5,400	1½	2
9	36	7.0	4 0 x 4 9	7 0	14.0	21.0	28.0	20,160	30,240	40,320	3,900	7,400	2	2½
10	42	9.6	4 6 x 5 3	7 0	19.2	28.8	38.4	27,640	41,470	55,290	5,250	10,250	2	2½
11	48	12.5	5 0 x 5 10	7 0	25.0	37.5	50.0	36,000	54,000	72,000	6,200	12,700	2½	3
12	54	15.9	5 6 x 6 4	7 0	31.8	47.7	63.6	45,790	68,680	91,580	8,150	16,500	2½	3
13	60	19.6	6 0 x 7 0	7 6	39.2	58.8	78.4	56,440	84,670	112,890	9,700	20,000	3	4
*14	66	23.7	6 6 x 7 6	7 6	47.4	71.1	94.8	68,250	102,380	136,510	11,850	24,300	3	4
15	72	28.2	7 0 x 8 3	7 6	56.4	84.6	112.8	81,210	121,820	162,430	13,600	28,400	4	5
*16	78	33.1	7 6 x 8 9	8 0	66.2	99.3	132.4	95,320	142,990	190,650	16,000	33,500	4	5
17	84	38.4	8 0 x 9 3	8 0	76.8	115.2	153.6	110,590	165,880	221,760	18,200	38,400	4	5
*18	90	44.1	8 6 x 10 0	8 0	88.2	132.3	176.4	127,000	190,510	254,010	21,600	44,600	4	5
19	96	50.2	9 0 x 10 6	8 3	100.4	150.6	200.8	144,570	216,860	289,150	23,900	49,300	5	6

*Only built to order.

GRAVER CORPORATION

Water Softening and Purifying Equipment and General Steel Plate Construction

4040 Todd Avenue, EAST CHICAGO, IND.

BRANCH OFFICES

NEW YORK, Grand Central Terminal TULSA, Haver Building HOUSTON, West Building CHICAGO, Steger Building

Member Associated Manufacturers of Water Purifying Equipment

Products

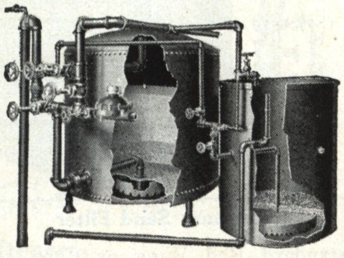
WATER SOFTENERS, all types, Hot, Cold, Intermittent, Zeolite; WATER FILTERS, Gravity and Pressure type, Swimming Pool Recirculating Equipment.

Also, Tanks, any size or pressure, welded or riveted, shop or field erected; Elevated Water Storage Tanks; General Steel Plate Construction.

Water Softeners

Special local conditions render it impossible to use the same type of water softening equipment for every use and secure the maximum possible results. GRAVER CORPORATION builds all types, complete in its own shop, and makes a recommendation after an analysis of the water and a survey of local conditions show the most advantageous type. The patented features of Graver Softeners give them advantages over other makes.

All softeners and filters are built in a complete range of standardized sizes which materially reduce the cost and allow prompt shipment.



Zeolite Water Softener

A Complete File of Bulletins Sent on Request—

BULLETIN A 504—Hot Process Softener for Boiler Plants

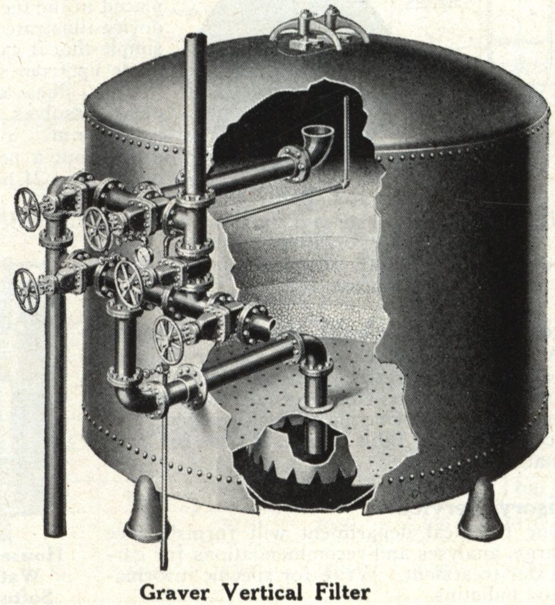
BULLETIN A 5051—Intermittent Softener for Ice and Boiler Plants

BULLETIN A 506—Large Cold Process Softener for Railroads

BULLETIN A 507—Cold Process Softener for Industrial Use

BULLETIN A 508—Cold Process Softener for Ice Plants

BULLETIN A 509—Zeolite Softeners for Industrial and Boiler Use.



Graver Vertical Filter

Filters

Graver filters are built in standardized sizes in horizontal and vertical types. The filtering medium is crushed quartz. All interconnecting piping, valves and gauges are furnished. When required, an automatic coagulent feed tank is furnished. Either the perforated plate or strainer type manifold can be furnished. All filters conform to recommended standards of the Associated Manufacturers of Water Purifying Equipment.

BULLETIN A 501—Horizontal and Vertical Pressure Filters.

Graver Refiltering and Recirculating System for Swimming Pools

This system includes filters, pumps, sterilizing equipment, heater (when required), drain, inlet and outlet fittings, suction cleaning equipment, hair catcher and everything for the satisfactory operation of the system for maintaining a safe water and hygienic pool.

BULLETIN A 500—Recirculating System for Swimming Pools.

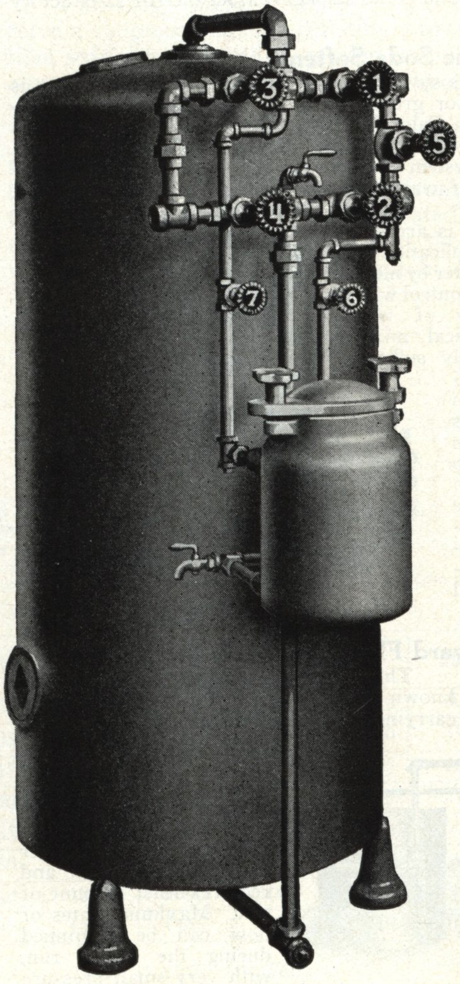
Water Softener for Households

An adaptation for domestic use of the successful Graver Industrial Zeolite Softener. The softener is shipped with piping completely assembled. Only three connections necessary to make installation.

The Graver Zeolite is reconditioned quickly with common salt, has an exceptionally high softening capacity and an exceedingly long life.

Built in standard sizes for water of any hardness and dwellings of any size.

BULLETIN A 509 H — Household Zeolite Softeners.



Household Water Softener

PAIGE & JONES CHEMICAL CO., INC.

Water Softening Systems; Pressure Sand Filters; Boiler Water Treatments

GENERAL SALES OFFICES, TECHNICAL DEPARTMENT AND WORKS
HAMMOND, IND.
EXECUTIVE OFFICES: 248 Fulton Street, NEW YORK, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., 248 Fulton Street
PITTSBURGH, PA., 506 Bakewell Building
DES MOINES, IOWA, 507 Youngerman Building
CLEVELAND, OHIO, 3515 Euclid Avenue
SIDNEY, OHIO, 830 South Main St.
PHILADELPHIA, PA., 1015 Chestnut Street
DETROIT, MICH., 446 Book Building
DENVER, COLO., 928 So. Williams Street
KANSAS CITY, MO., 201 Mutual Building
WICHITA, KAN., 409 Orpheum Building
BALTIMORE, MD., 43 So. Gay Street
CHICAGO, ILL., 417 So. Dearborn Street
LOS ANGELES, CAL., 409 Grant Building
SALT LAKE CITY, UTAH, 201 Dooley Building
SAN FRANCISCO, CAL., 510 Balboa Building

Products

Paige-Jones Upward Flow Zeolite Water Softeners, Lime Soda Water Softeners, Pressure Sand Filters, FFF Boiler Feed Water Treatments, Household Water Softeners.

Service

Industrial Plants—For boiler feed and water used in manufacturing processes—in power plants, chemical works, ice plants, hospitals, laundries, hotels, paper mills, textile mills, food product plants, canners, soft drink manufacturers, etc.

Railroads—For locomotive and power plant feed water, both at terminals and in wayside tanks.

Steamships—For boiler feed water—a special treatment that counteracts both galvanic action and scale forming salts.

Household—For washing, cooking, drinking, bathing and all domestic purposes.

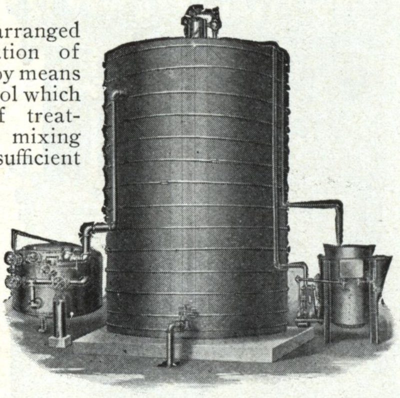
Advantages

Paige-Jones *manufacture every known type of water treating equipment.* This offers the architect, engineer and purchaser a free unbiased selection of the system best suited to the individual need. It is important, because it is well known that no single type of equipment can possibly serve for all conditions. An unbiased recommendation, backed by the equipment which can best meet the need, is the strongest assurance of satisfactory service.

Paige-Jones Lime Soda Softener

This continuous system for hot or cold process softening is built in all sizes, for ground or head operation, and each installation includes a Paige-Jones pressure sand filter to remove any suspended matter from the water, making it clear and sparkling. This system has proven exceptionally satisfactory in the treatment of water for ice making.

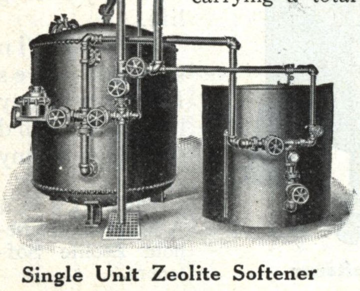
The apparatus is arranged for automatic application of chemicals to the water by means of a double orifice control which insures uniformity of treatment. The chemical mixing tank holds a supply sufficient for 12 hours operation at maximum capacity and is equipped with an agitating system to maintain a uniform mixture. A sludge removal system permits of easy discharge of the precipitated mineral salts.



Continuous Lime Soda Softener

Paige-Jones Upward Flow Zeolite Softener

This system will produce a water known as of "zero" hardness, or water carrying a total hardness of less than ½ grain per U. S. gallon. The Paige-Jones exclusive *upward flow* method of operation gives the greatest volume of soft water per cubic foot of zeolite and requires least amount of salt. Maximum rates of flow can be continued during the entire run, with very small pressure loss.

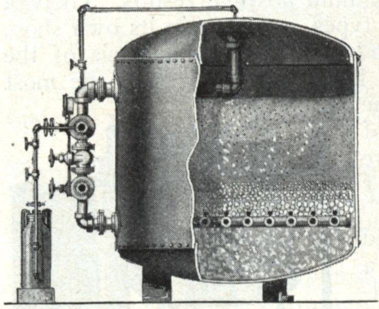


Single Unit Zeolite Softener

The brine tank holds a salt charge sufficient for an operating period of 5 to 8 days and is equipped with a brine delivery and reflushing system that is semiautomatic and scientifically correct. A signal warns when regeneration is required. Paige-Jones zeolite is a permanent, quick acting material which permits high rates of flow when needed, an advantage where the consumption fluctuates widely, and permits regeneration within about 30 minutes. This equipment is built in both vertical and horizontal designs, singly or as a double unit, for operation with or without storage tank, in all sizes.

Paige-Jones Pressure Sand Filters

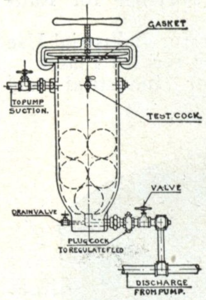
These filters effectively remove suspended matter from the water, furnishing a clean, clear supply for industrial plants, public buildings, swimming pools, schools, homes, etc. They are of standard construction, durable and tested to 50% above maximum operating pressure. They are built in both vertical and horizontal design: vertical, in sizes from 12 to 96 in. in diameter, and horizontal, 8 ft. in diameter and 8 to 24 ft. in length. Each filter is fully equipped, including flanged boiler steel shells, valve assembly, sight glass, gauges, coagulant feeder, standard Red Wing or Cape May filter sand, washed and screened with graded gravel.



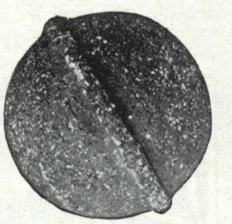
Pressure Sand Filter

Paige-Jones FFF Boiler Feed Water Treatments

The Paige-Jones principle of internal treatment is based on a scientific analysis of the feed water and application of the proper reagents to counteract the harmful ingredients. These reagents for each individual case are pressed into hard form, ball shaped, each weighing 1 lb., so that no other weighing or measuring is necessary. When placed in the feeding device illustrated, so simple that it can be made up from stock fittings, the treatment dissolves at a uniform rate throughout a period of 8, 12 or 24 hours as desired.



Feeder

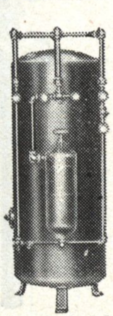


Ball

This ball system insures a uniform treatment far different from the usual under or over treatment from compounds. It is highly successful in all industrial, railroad and marine service.

Paige-Jones Household Water Softener

A simple, dependable unit especially designed for easy installation and operation in the home. It is an *upward flow* zeolite softener with all the advantages of this principle. Quickly regenerated with common salt. Built in several sizes for large or small homes.



Household Water Softener

Advisory Service

Our technical department will furnish, free of charge, analyses and recommendations for correct water treatment. Write for specific information and bulletins.

THE PERMUTIT COMPANY

Water Softeners, Filters, Water Treating Apparatus for Every Purpose

440 Fourth Avenue
NEW YORK, N. Y.

BRANCH OFFICES

ALBANY, N. Y., 615 Childs Building
BOSTON, MASS., 467 Massachusetts Trust Building
BUFFALO, N. Y., 304 Brisbane Building
CHATTANOOGA, TENN., 435 Volunteer State Life Building
CHICAGO, ILL., 208 So. La Salle Street
CLEVELAND, OHIO, 700 Keith Building
DAYTON, OHIO, 1068 Reibold Building
DETROIT, MICH., 204 Owen Building
KANSAS CITY, MO., 2020 Grand Avenue
LOS ANGELES, CAL., 909 Wright-Callender Bldg.
MINNEAPOLIS, MINN., 1046 McKnight Building
PHILADELPHIA, PA., 515 Liberty Building
PITTSBURGH, PA., 921 Union Trust Building
SAN FRANCISCO, CAL., 509 Balboa Building

Products

"PERMUTIT" WATER SOFTENERS and WATER FILTERS.

Where Permutit Water Systems Have Been Used

For years, Permutit systems have been utilized industrially in mills, hotels, laundries, hospitals and similar places to render water pure, soft and clean for various exacting purposes. Thousands of Permutit water softeners and filters are in daily use in private houses, where soft water is supplied for all domestic purposes.

The Need for a Specialized Engineering Service

In addition to manufacturing all types of apparatus used for treating water, we have a specially trained technical staff with extensive laboratory facilities; which assures a satisfactory, economic solution to water problems.

The water problem of each building project should be considered individually.

We offer the full co-operation of our organization to all architects and engineers.

All water analyses and recommendations for overcoming difficulties are made free of charge.

Installation of Water Softeners

Softeners are usually installed in the basement as close to the street supply as convenient. Provide for carrying off the wash water by means of a sump or pipe connecting into a sink, laundry tray, etc. See table for gallons per minute capacity required.

Specifications for "Permutit" Household Softeners

Water Service—Provide and install a service line from the street main to the house meter of ample size to deliver....gals. of water per minute and not less than.... in. in diameter.

Cesspool Floor Drain—Provide and install an approved cesspool type floor drain adjacent to the softener connected to the main house drain with a....in. waste pipe with sufficient fall to carry away....gals. of water per minute.

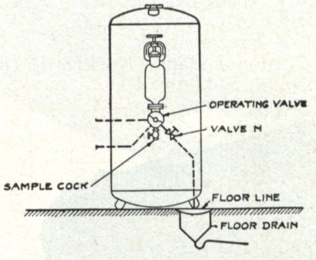
Water Softener—Provide and install complete with all accessories a type....Permutit Water Softener.... diam. and containing not less than....cu. ft. of nonporous zeolite. The softener shall have a capacity between regenerations of....gals. of zero soft water when the water entering the softener is....grains hard.

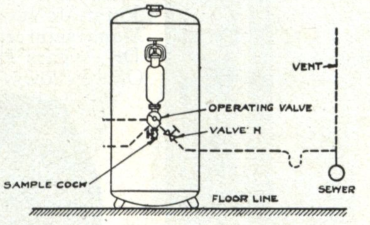
Hard Water Connections—Provide and install hard water connections to yard hydrants.

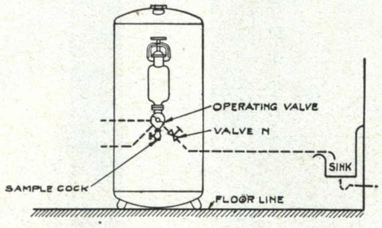
Note: Mention all other hard water outlets required.

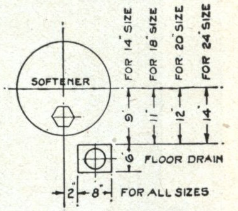
Painting—Before shipment, the softener shall receive a shop coat of rust resisting paint. After installation, softener tank and all piping, etc., shall be given two coats of tank enamel of color as directed by the architect.

Guarantee—The contractor shall guarantee in writing the complete installation against all structural defects that may develop within one year from date of completion. Also that, if properly operated, it will furnish completely softened water and that the water delivered will be clear and suitable for household use.









B and Bp		HARDNESS OF WATER IN GRAINS PER GALLON											
Diam.	Size	5	10	12	14	16	18	20	22	24	26	28	30
14"	Jr.	1680	840	700	600	525	465	420	380	350	320	300	280
	Sr.	2180	1090	910	780	680	605	545	495	455	420	390	365
18"	Jr.	2580	1290	1075	925	805	717	645	585	540	495	460	430
	Sr.	3420	1710	1425	1220	1070	950	855	775	715	660	610	570
20"	Jr.	3360	1680	1400	1200	1050	935	840	764	700	645	600	560
	Sr.	4480	2240	1865	1600	1400	1250	1120	1020	935	860	800	745
24"	Jr.	4820	2410	2010	1725	1500	1340	1210	1090	1000	930	860	805
	Sr.	6440	3220	2680	2300	2010	1790	1610	1465	1340	1240	1150	1075
30"	Sr.	8400	4200	3500	3000	2624	2333	2100	1910	1750	1615	1500	1400

STOVER STEEL TANK & MFG. COMPANY

Water Softeners and Filters; Tank and Plate Work

FREEPORT, ILL.

Products

Water Softeners and Filters.
Steel Plate and Tank Work.

Stover One-valve Water Softeners

For use in houses, apartments, hotels, office buildings, restaurants, swimming pools, barber shops and beauty parlors; in bottling and canning plants, ice plants, textile mills, power and heating installations and, in general, wherever filtered soft water is required for domestic or industrial purposes.

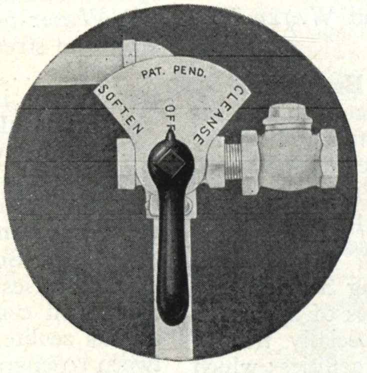
The Stover One-valve Softener, developed after nearly 20 years of experience in this line, incorporates many advantages over the older types of softeners. Chief among these advantages are the one-valve simplified control and the use of Per-Min-Ex (the *permanent* mineral extractor).

One Valve Gives Complete Control—A single valve (see illustration) opens for softening, closes for stopping the flow, and reverses for cleansing. This one-valve operation is exclusive with Stover Softeners (patents pending).

Per-Min-Ex—We use the natural Per-Min-Ex softening mineral, exclusive Stover feature, which gives maximum softening capacity and delivers pure, neutral, filtered water. Per-Min-Ex can be reclaimed in less than an hour by adding salt and reversing the valve. No other softener uses this mineral, and no other known softening mineral will do better work.

Other Advantages of Stover Water Softeners—Factory filled, assembled and tested. Ready for immediate connection to house piping.

Sturdily Built—Tank is of $\frac{3}{16}$-in. copper bearing steel, welded construction; suitable for pressures up to 125 lb. (when desired for higher pressures slight additional charge is made). Inside of tank is glazed; exterior is white enameled.



A Single Valve Opens, Closes and Reverses for Cleansing

Compact—Requiring less floor space and headroom than other softeners.

Cost Less for Maintenance—Less salt, waste water and time are required for the re-cleansing process.

Permanent—The tank itself is rustproofed. The Per-Min-Ex mineral, under ordinary circumstances, should last indefinitely.

Guaranteed—That the rated capacity for removing hardness from the water is exactly as stated—that all workmanship and materials will be free from defects for a period of one year.

Drink Stover softened and filtered water—pure, neutral, positively safe.

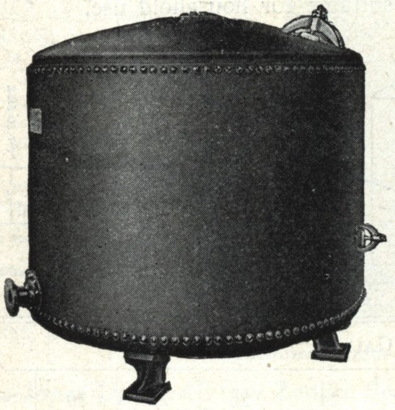
Large Water Softeners and Filters for Industrial Use

Two types are illustrated on this page. The vertical type is used for large capacities and the horizontal type for use where very large capacities are required. Either may be installed as a single unit or in batteries, as conditions require.

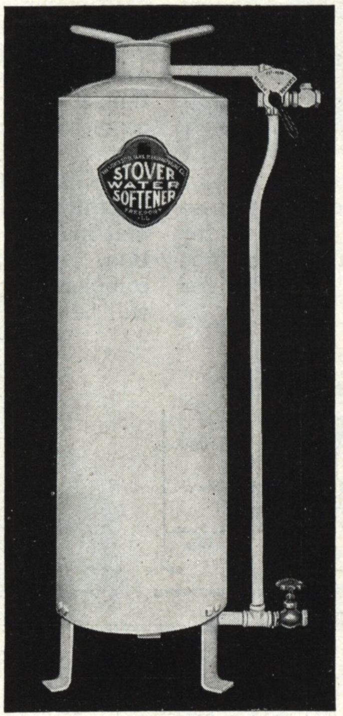
Consult our Engineering Department.

References Regarding Larger Installations

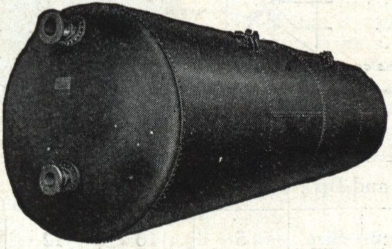
W. T. Rawleigh Company, Freeport, Ill.
Premier Rose Gardens, Maywood, Ill.
Masonic Temple, Freeport, Ill.
U. S. Post Office Building, Mason City, Iowa
St. John's Military Academy, Delafield, Wis.
Phenolic Products Corp., Rockford, Ill.
Furst-McNess Co., Freeport, Ill.
Manufacturers National Bank, Rockford, Ill.
Dr. Angars Hospital, Sublette, Ill.
Odd Fellows Temple, Green Bay, Wis.



Vertical Type Softener and Filter
Large capacities



One-valve Domestic Softener
See table for capacities



Horizontal Type Softener and Filter
Very large capacities

Stover Water Softeners and Filters

SIZES, WEIGHTS AND CAPACITIES OF STOVER ONE-VALVE WATER SOFTENERS

Model	Piping, in.	Floor space, in.	Height overall, in.	Shipping weight, lb.	Capacity in gallons of water softened without re-cleansing the softener																	
					6*	8*	10*	12*	14*	16*	18*	20*	22*	24*	26*	28*	30*	32*	34*	36*	38*	40*
SW	½	13x19	52	340	2000	1500	1200	1000	860	750	670	600	550	500	460	430	400	380	350	330	315	300
SH	½	14x20	52	375	3000	2250	1800	1500	1290	1130	1000	900	820	750	690	650	600	560	530	500	425	450
S2	½	16x22	52	400	4000	3000	2400	2000	1720	1500	1350	1200	1100	1000	920	860	800	760	700	660	630	600
S3	¾	17x24	60	550	6000	4500	3600	3000	2580	2250	2010	1800	1650	1500	1380	1290	1200	1140	1050	990	945	900
S4	¾	21x27	60	750	8000	6000	4800	4000	3440	3000	2680	2400	2200	2000	1840	1720	1600	1520	1400	1320	1260	1200
S5	¾	22x28	60	850	10000	7500	6000	5000	4300	3750	3350	3000	2750	2500	2300	2150	2000	1900	1750	1650	1575	1500
S6	¾	25x32	60	950	12000	9000	7200	6000	5160	4500	4020	3600	3300	3000	2760	2580	2400	2280	2100	1980	1890	1800
S9	1	32x38	72	1500	18000	13500	10800	9000	7740	6750	6030	5400	4950	4500	4140	3870	3600	3420	3150	2970	2835	2700
S15	1¼	38x44	72	2550	30000	22500	18000	15000	12900	11250	10050	9000	8250	7500	6900	6450	6000	5700	5250	4950	4725	4500
S20	1½	44x50	72	3500	40000	30000	24000	20000	17200	15000	13400	12000	11000	10000	9200	8600	8000	7600	7000	6600	6300	6000
S24	2	50x56	72	4500	48000	36000	28800	24000	20640	18000	16080	14400	13200	12000	11040	10320	9600	9120	8400	7920	7560	7200

*Hardness of water in grains per gallon.

Continued on next page

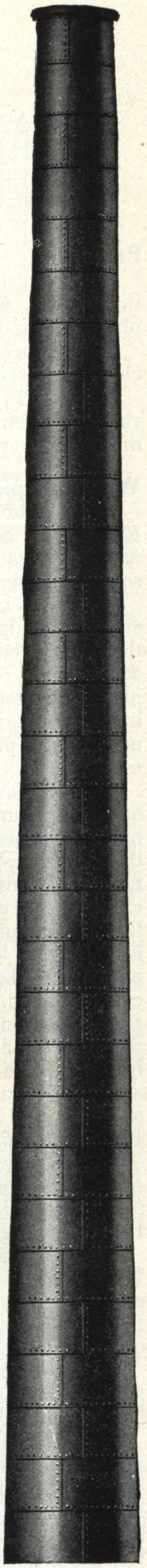
A General Line of Steel Plate and Tank Work

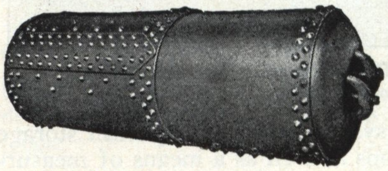
The Stover line of steel plate and tank work comprises the following items:

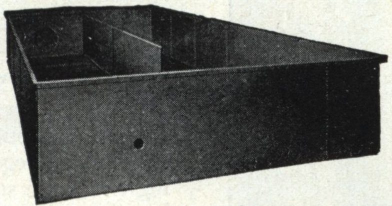
Bins and Bunkers, Coal.
Bins and Hoppers, Measuring.
Bodies, Truck and Oil Delivery.
Boiler Breechings.
Boxes: Annealing, Steel.
Buckets, Steel.
Caissons, Steel.
Cars: Ash, Charging, Creosoting Tank, Dump, Hopper.
Casings, Boiler, Steel.
Chutes: Coal, Gravity, Straight or Spiral.
Coal Mining Steel Plate Equipment.
Condensers, Oil Refinery.
Crutchers, Soap.
Ducts.
Filters: Oil, Water, Gravity or Pressure.
Flumes, Steel Plate.
Forms, Metal, Concrete.
Gates, Sluice.
Guard Material, Safety.
Heaters: Asphalt, Tar and Pitch.
Hoods: Laboratory, Fume or Vapor.
Hoppers.
Kettles, Chemical Process, Steam and Oil Jacketed.
Ladles.
Oil and Gasoline Storage and Distributing Systems.
Pans: Shop, Oil and Lathe.
Penstocks, Steel.
Pipe: Riveted and Welded.
Receivers, Air.
Refrigerating and Ice Making Tanks and Plate Equipment.
Screens: Sand and Gravel.
Smoke Stacks: Steel, Guyed or Self-supporting.
Softeners (Water): Domestic and Industrial.
Spouts, Stoker.
Stills, Oil Refining, etc.
Tanks: Acid Storage, Blow-off, Brine, Compressed Air, Filter, Gasoline Storage, Hydro-pneumatic, Jacketed, Mixing, Molasses Storage, Oil Storage, Platers, Pressure, Settling, Sherardizing, Vacuum, Water Softener, Water Storage.
Vulcanizers.
Washers, Air.
Water Softeners: Domestic and Industrial.

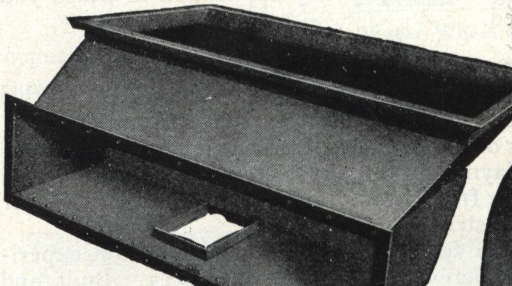
Estimates—The largest concerns in the United States depend upon STOVER STEEL TANK & MFG. COMPANY for constructions in steel, regardless of the nature of the specifications, shape or size.

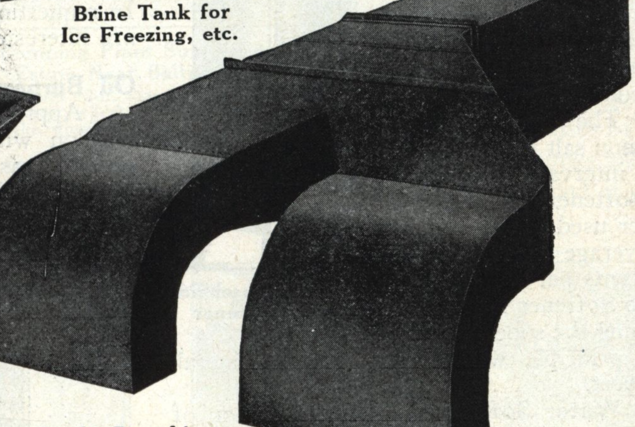
Send blue prints, sketches or specifications and we will submit estimates. Correspondence invited.

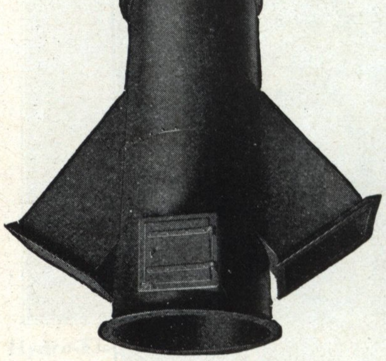

Smoke Stack
Guyed or self-supporting

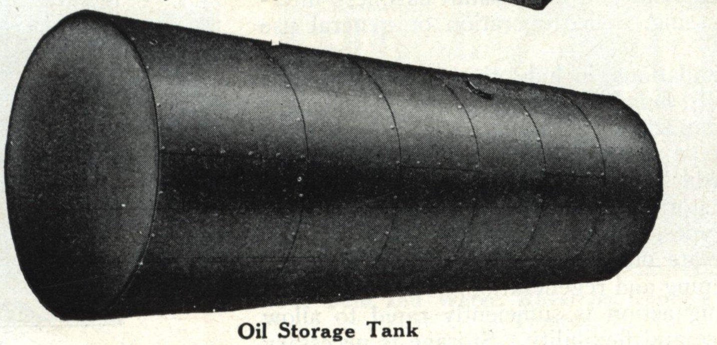

High Pressure Tank
All sizes


Brine Tank for Ice Freezing, etc.


Intake
Any size or shape


Smoke Breeching
Any size or shape


Special Chute and Spouts
To any specifications


Oil Storage Tank
Aboveground or underground; horizontal or vertical

WAYNE TANK AND PUMP CO.

Original Rapid Rate Water Softeners and Oil Burners

726 Canal Street, FORT WAYNE, IND.

BRANCH AND SALES OFFICES

ATLANTA, GA., 1221 Candler Building
BOSTON, MASS., Room 506, 110 Tremont Street
BUFFALO, N. Y., 505 Ellicott Square Building
CHICAGO, ILL., 32 W. Lake Street
CLEVELAND, OHIO, 1833 East 13th Street
COLUMBUS, OHIO, 607 First National Bank Building
DALLAS, TEX., 1905 Commerce Street
DETROIT, MICH., 23 Parsons Street
KANSAS CITY, MO., 1828 Grand Avenue
LOS ANGELES, CAL., 135 W. Washington Street
MINNEAPOLIS, MINN., 122 So. Ninth Street
NEW YORK, N. Y., 1780 Broadway
PHILADELPHIA, PA., 4030 North Broad Street
PITTSBURGH, PA., 20 Wood Street
ST. LOUIS, MO., 707 Boatman's Bank Building
SAN FRANCISCO, CAL., 430 Fourth Avenue

Products

Wayne Rapid Rate Water Softeners for homes, institutions, hotels, clubs, laundries, hospitals, textile plants and industrial purposes.

Wayne Oil Burners for homes, apartments, clubs, storerooms, etc.

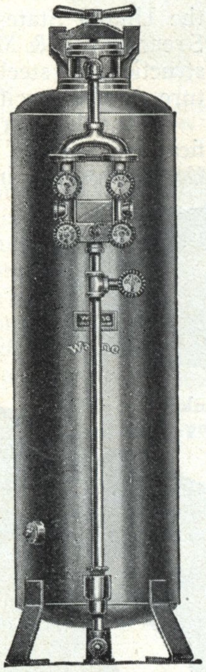
Also Wayne Honest Measure Pumps, Oil Conservation Systems for filling stations, garages, factories, mills, mines, railroads, etc.

Wayne Rapid Rate Water Softeners

Household Water Softeners—The Wayne Rapid Rate Water Softeners for homes are made in five standard sizes—100% soft water service for any home.

Easy to install and operate. The city water supply is tapped and only three connections—inlet, outlet and drain—are required. Soft water, ideally adapted to every use of water in the home, is delivered to fixtures under city pressure. Over 10,000 now in use.

The Wayne Softener operates on the pressure filter principle. The hard water passes downward through the Wayne Mineral Bed, is instantaneously softened by the base-exchange method and delivered through regular house piping with less than 1 grain of calcium and magnesium hardness per United States gallon. The only operating cost is for common salt to regenerate the mineral at intervals determined by the size of softener installed and amount of water used. The cost of salt for the average home size is from 10 to 15 cents per week.



Wayne Household Water Softener

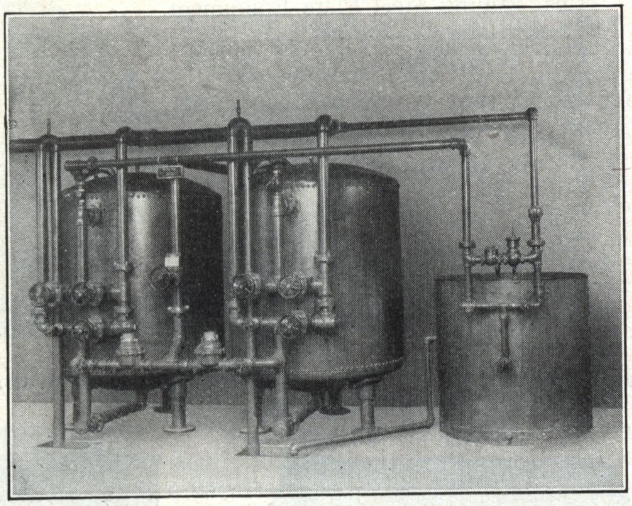
The Wayne Softener is the only softener combining the superiority of the down-flow principle with high capacity mineral. Bulletin on request.

Industrial Water Softeners—The installation of Wayne Rapid Rate Industrial Water Softeners is indicated wherever calcium and magnesium hardness interferes with processing, boiler operation or general use of water.

Present installations include thousands of power plants, textile mills, laundries, hotels, hospitals and other industries requiring the use of water.

Industrial type water softeners are available in standard sizes which may be arranged to operate as single units with storage or double units without storage. All Industrial Types, horizontal and vertical, single or battery unit, operate on the same superior principle of Rapid Rate softening and regeneration.

The softening action is sufficiently rapid to allow direct flow service and flexibility. Storage is necessary only for the single unit type to tide over the regeneration period, all operations of which are handled in 25 minutes or less.



Wayne Two-unit Direct Service Industrial Water Softener Service

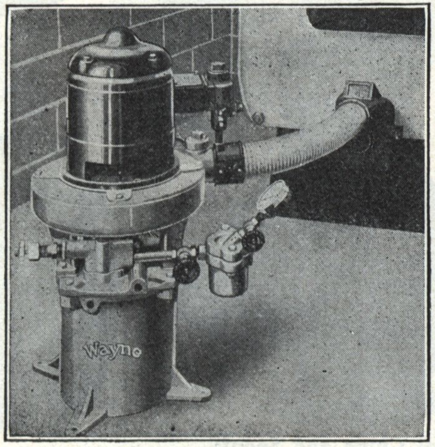
The regeneration system provides ample salt storage for several regenerations as well as a means of measuring the brine solution without weighing salt at any time. In requesting bulletins, specify application in which you are interested.

Oil Burners

Approved type, oil under pump pressure, positive ignition with automatic heat control. Burns 32-36° Baume "gas oil" with guaranteed efficiency.

The Wayne Oil Burner is safe and sane. Small size will heat from five to fifteen-room home. Larger sizes for industries.

Backed by four years of actual installation experience; unqualifiedly endorsed by all users. Built and guaranteed direct by Wayne. Write for bulletin.



Wayne Oil Burner

J. B. CAMPBELL CO.

Water Wheels

Lafayette Building
PHILADELPHIA, PA.

Products

Water Wheels; Water Wheel Pumping Plants and Water Supply Systems; Hydro-Electric Plants; Dams; Turbines.

TRADE-MARK

Value of Water Power

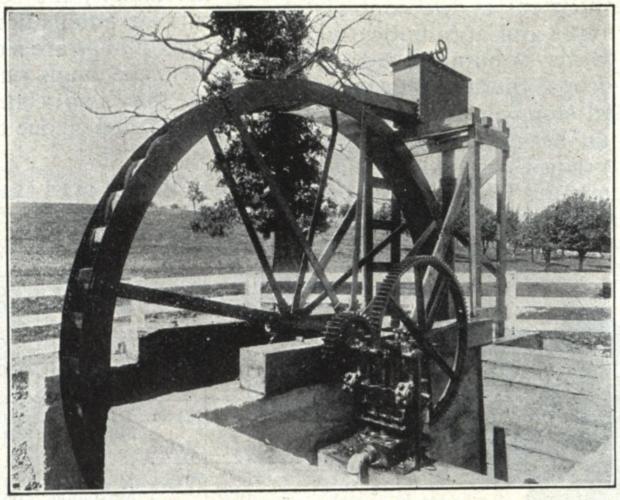
Water power will pump water or will furnish electric light and power continuously without cost excepting the lubricating oil and an occasional repacking of a pump or the renewing of the brushes on a generator.

Almost every country estate has a water power which can be developed for useful purposes.

Uses of Water Wheels

To pump water for country estates, country homes, swimming pools, fountains, towns.

To generate electric light and power for country estates, country homes, farms, towns.



Water Wheel Pumping Plant Supplying Water to Country Estate Near Baltimore, Md.

Size of water wheel 12-ft. diameter by 1-ft. width. Size of pipe carrying water to water wheel, 4 in. The water wheel pumps pure spring water, but the wheel itself is driven by water from a stream

Size of Stream

A stream of water that can fill a 2-inch pipe can be made to do useful work to pump water or to furnish electric light and power.

The exact amount of work which it will do will depend upon the amount of fall available.

Fall of Stream

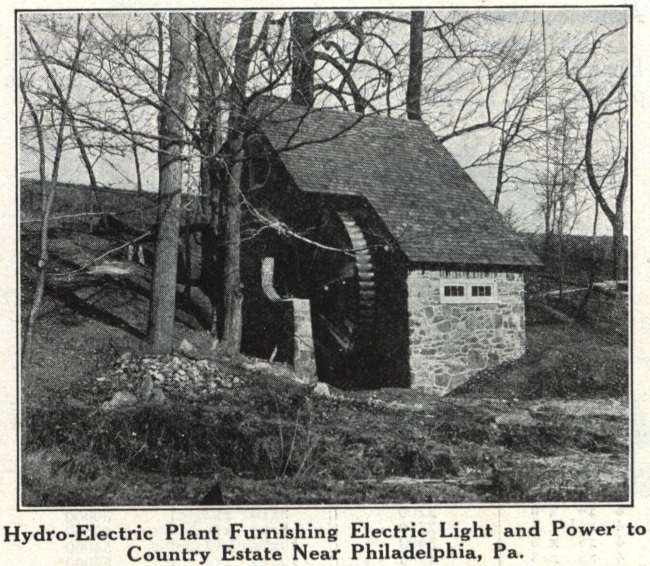
A fall of water in a stream of from one foot to several hundred feet in height can be utilized to generate electric light and power or to pump water.

Almost any water power, no matter how small, is worth developing.

Engineer

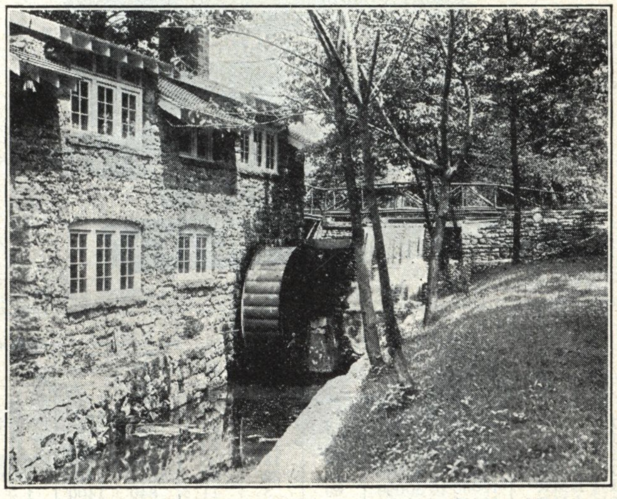
We furnish an engineer to make surveys and to plan water power developments, water supply systems and dams.

A small charge to cover the time and traveling expenses of our engineer is often made, but part, and sometimes all, of this charge is refunded in the event that a plant is purchased.



Hydro-Electric Plant Furnishing Electric Light and Power to Country Estate Near Philadelphia, Pa.

Water wheel 16-ft. diameter by 1½-ft. face. Size of pipe supplying water to water wheel, 10 in.



Dam and Water Wheel on Country Estate Near Trenton, N. J.

AMERICAN STEAM PUMP COMPANY

BATTLE CREEK, MICH.

NEW YORK OFFICE, 17 Battery Place

CHICAGO OFFICE, 926 Monadnock Block

Products

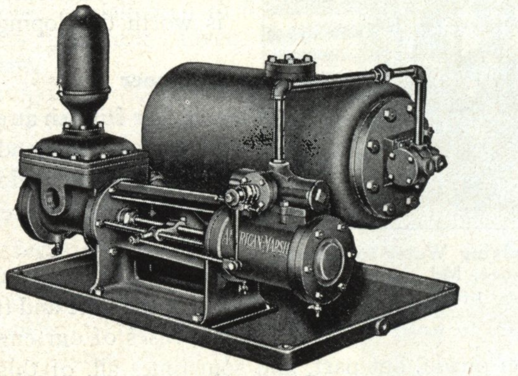
AMERICAN-MARSH PUMPS, "Simplex" and "Duplex": Vacuum, Condensation, Sump and Centrifugal.

Also manufacturers of Compound Pumps, Elevator Pumps; Belt or Steam Driven Air Compressors; Automatic Boiler Feed Pumps and Receivers, Hydraulic Pressure Pumps, Tank Pumps, Magma Pumps, Oil Pumps, Brine Pumps, Sinking Pumps, Jet Condensers, Bilge Pumps, Power Pumps, Spray Pumps; Marsh Deep Well Engines.

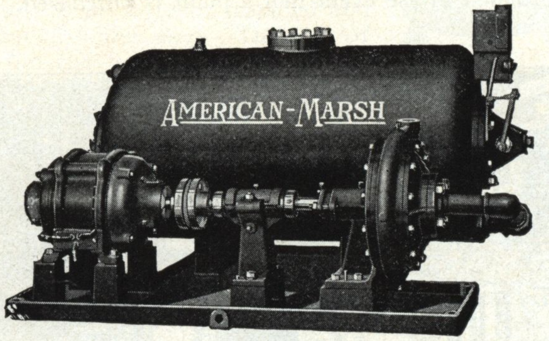
American-Marsh Condensation Pumps

Where, on account of low steam pressure, it is not practical to operate a steam pump, the motor driven centrifugal pump and receiver may be used to advantage. With this device, the water of condensation flows by gravity into the receiver tank. As it accumulates, a copper ball float raises the control apparatus which closes the circuit and automatically starts the motor. When the water is pumped out of the tank, the float of course drops, thereby shutting off the current to the motor and stopping the pump.

Pump and tank mounted on heavy cast iron drip pan. Tank is made of close grained cast iron firmly mounted on cast iron legs. Pump and motor connected by flexible coupling. Bearing is babbitted and equipped with thrust collar.



AMERICAN-MARSH STEAM DRIVEN CONDENSATION PUMP



AMERICAN-MARSH MOTOR DRIVEN CONDENSATION PUMP

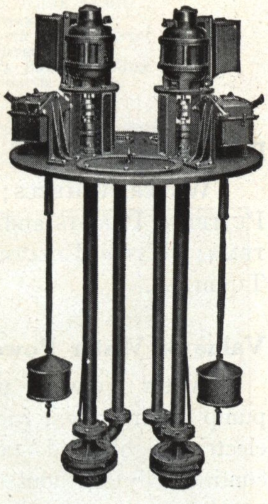
Size of pump	Radiation surface, sq. ft.	G.p.m.	Max. delivery pressure		Speed		Motor hp.
			lb.	ft.	Min.	Max.	
¾ AMR	2000 to 3500	10	8	18	1400	2330	½
¾ BMR	5000 to 7000	10	10	23	1600	2500	½
1 AMR	7000 to 12000	25	5	11.5	1200	1800	¾
1 AMR	7000 to 12000	25	10	23	1600	2500	¾
1 BMR	7000 to 12000	25	15	35	1450	2350	1
1 BMR	7000 to 12000	25	20	46	1660	2650	1½
1½ AMR	12000 to 30000	60	5	11.5	840	1400	1
1½ AMR	12000 to 30000	60	10	23	1200	2000	1½
1½ AMR	12000 to 30000	60	15	35	1450	2320	1½
1½ AMR	12000 to 30000	60	20	46	1660	2650	2
1½ BMR	25000 to 50000	70	25	58	1270	1905	3
1½ BMR	25000 to 50000	70	30	70	1360	2040	5
1½ BMR	25000 to 50000	70	35	81	1450	2175	5

American-Marsh Vertical Sump Pumps

Especially designed for elevating liquids from points below sewers. They can also be used for cellar drains, etc. Built for capacities from 5 to 300 g. p. m. Simplicity in design throughout and all parts of ample strength for this service.

Any of the "SAM" pumps listed, can be furnished in the duplex type. With this unit, one float is set at a higher level than the other, so that, if water rises faster than one pump can handle, the second pump cuts in automatically.

Duplex pumps are similar in design to the single pumps, excepting that two complete units are installed on one cover plate.



DUPLEX TYPE

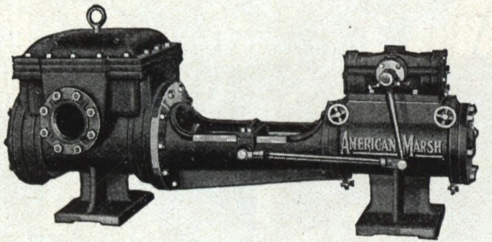
AMERICAN-MARSH TYPE "SAM" SINGLE PATTERN SUMP PUMP

Pump No.	Gal. per min.	Head..........ft.	10	15	20	25	30	35	40	45	50
¾	10	R.p.m.: Minimum .	1280	1570	1805	2005	2210	2310	2505	2610	2750
		Maximum.	2130	2615	3000	3340	3680	3850	4175	4350	4600
		Motor.........hp.	½	½	½	½	¾	¾	¾	1	1
1	25	R.p.m.: Minimum .	1080	1315	1505	1675	1850	1930	2090	2210	2330
		Maximum.	1620	1970	2275	2510	2775	2895	3135	3315	3495
		Motor.........hp.	½	¾	¾	¾	1	1	1½	1½	1½
1½	55	R.p.m.: Minimum .	820	980	1150	1260	1390	1450	1575	1660	1750
		Maximum.	1310	1565	1840	2020	2225	2320	2520	2650	2800
		Motor.........hp.	¾	¾	1	1½	1½	2	2	2	3
2	100	R.p.m.: Minimum .	820	980	1150	1260	1390	1450	1575	1660	1750
		Maximum.	1190	1425	1670	1835	2025	2105	2290	2415	2545
		Motor.........hp.	1	1½	2	2	2	3	3	3	3
2½	150	R.p.m.: Minimum .	655	800	915	1015	1120	1180	1275	1330	1420
		Maximum.	1090	1330	1525	1690	1870	1970	2125	2215	2375
		Motor.........hp.	2	2	3	3	3	3	5	5	5
3	225	R.p.m.: Minimum .	655	800	915	1015	1120	1180	1275	1330	1420
		Maximum.	935	1140	1305	1450	1600	1685	1825	1900	2030
		Motor.........hp.	2	2	3	5	5	5	5	5	7½

Maximum head is figured from the bottom of pit or sump to the highest point in discharge pipe to sewer.

American-Marsh Vacuum Pumps

Designed for use on vacuum heating systems. Bronze removable water cylinder bushings, bronze piston rods, bronze valve seats, bolts and springs.



AMERICAN-MARSH VACUUM PUMP

Size of pumps for steam pressure over 50 lb.	Radiation handled at moderate speed, sq. ft.	Size of pumps for steam pressure over 50 lb.	Radiation handled at moderate speed, sq. ft.
4 x3 x 6	1200	5x 7¼x10	12000
4 x3⅝x 6	1800	6x 8 x12	18000
4 x4 x 6	2200	8x10 x12	30000
4 x4½x 6	2750	8x12 x12	40000
4 x5 x 6	3400	10x14 x12	54000
4 x5 x 8	4500	10x14 x16	57000
4½x6 x 8	7000	10x14 x20	70000
5 x6 x10	8000	12x16 x20	87000
5 x6½x10	9000		

ECONOMY PUMPING MACHINERY CO.

TELEPHONE
MONROE 5941

122-124 North Curtis Street
CHICAGO, ILL.

ATLANTA, GA., Bona Allen Building
BALTIMORE, MD., 15 E. Fayette Street
BOSTON, MASS., 141 Milk Street
DENVER, COLO., 1631 15th Street
DETROIT, MICH., 517 E. Larned Street
GRAND RAPIDS, MICH., 223 Shepard Building
INDIANAPOLIS, IND., Board of Trade Building
KANSAS CITY, MO., 207 Davidson Building
LOS ANGELES, CAL., 1819 Georgia Street
MILWAUKEE, WIS., 616 Caswell Block
NEW ORLEANS, LA., 415 Gravier Street
OKLAHOMA CITY, OKLA., Empress Theater Building
NEW YORK, N. Y., 39 Cortlandt Street
PHILADELPHIA, PA., 604 Arch Street
PITTSBURGH, PA., 207 Fulton Building
PORTLAND, ORE., 201 Worcester Building
SALT LAKE CITY, UTAH, Dooly Building
SAN FRANCISCO, CAL., Monadnock Building
SEATTLE, WASH., 309 Crown Building
ST. PAUL, MINN., 503 Hamm Building
WICHITA, KAN., 302 Orpheum Building

Products

CONDENSATION PUMPS and RECEIVERS, Centrifugal and Reciprocating; CENTRIFUGAL VACUUM PUMPS; AUTOMATIC BILGE PUMPS; SEWAGE EJECTORS; CENTRIFUGAL PUMPS, Single and Multistage, for every purpose.

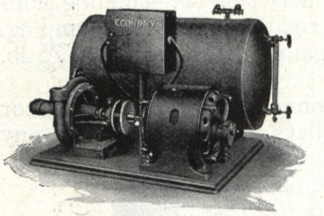


Fig. 2176. Type C.S.S.

AUTOMATIC CONDENSATION PUMPS AND RECEIVERS

No. of unit	Cap. sq. ft. direct radiation	Motor hp.	Boiler pressure, lb.	Cap. receiver, gal.	Pump cap., gal. per min.	Size inlet, in.	Discharge pipe, in.	No. of unit	Motor hp.	Boiler pressure, lb.
5	1,000	⅙	10	11	5	2	¾	....	....	....
6	2,000	¼	10	13	7½	2	1	....	....	....
6½	3,500	⅓	10	16	12	2½	1	....	....	....
7	5,000	½	10	20	15	3	1	7 -B	1	25
7½	7,500	¾	15	26	20	3½	1	7½-B	1½	25
8	10,000	1	15	33	25	4	1¼	8 -B	1½	25
8½	15,000	1½	15	41	37	5	1¼	8½-B	2	25
9	25,000	2	15	49	60	5	1½	9 -B	3	25
9½	35,000	3	15	57	80	6	2	9½-B	5	30
10	50,000	5	15	82	110	6	2	10 -B	5	35

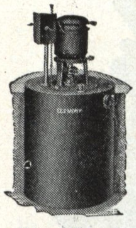


Fig. 2175
Type C.U.

UNDERGROUND PUMP AND RECEIVER

No. of unit	Cap. sq. ft. direct C. I. radiation	Boiler pressure, lb.	Motor hp.	Basin size, in.	
				Dia.	Depth
9	2,000	10	¼	24	30
12	3,500	10	⅓	24	30
15	5,000	10	½	24	36
17	7,500	15	¾	30	36
20	10,000	15	1	30	36
21	15,000	15	1½	36	36
23	25,000	15	2	36	42
25	50,000	20	3	36	48

RECIPROCATING PUMP AND RECEIVER

Unit No.	Cap. sq. ft. direct C. I. radiation	Motor hp.	Pump size, in.	Pump cap., gal. per min.
1	2,500	½	2 x5	8
2	4,500	¾	2½x5	13
3	7,000	1	3 x5	22
4	10,000	1½	3½x5	29
5	15,000	2	4 x5	39
6	25,000	3	5 x6	61

Moderate priced electrical unit for medium and high pressure.

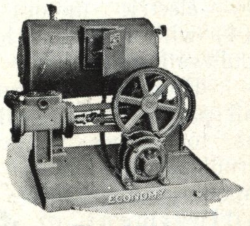


Fig. 2230
Type C.R.

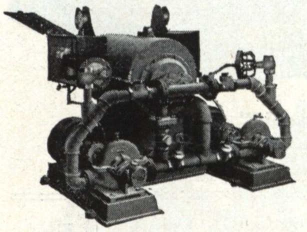


Fig. 2234
Duplex

ECONOMY CENTRIFUGAL VACUUM PUMP

Unit No.	Cap. sq. ft. direct C. I. radiation	Motor h.p.	Cubic feet air per min.	Discharge to boiler, in.	Return inlet, in.	Shipping wt., lb.
CV 1	2,500	¾	1¾	¾	1½	650
CV 2	5,000	1	4	1	2	750
CV 3	8,000	1½	6	1	2½	900
CV 4	16,000	2	10	1¼	3	1,025
CV 5	20,000	3	15	1¼	3	1,150
CV 6	27,500	5	19	1½	3½	1,300
CV 7	40,000	5	24	1½	4	1,550
CV 8	65,000	7½	40	2	5	1,800

Duplex units consisting of single tank, two pumps, motors and control apparatus will approximate 75% addition to the weights above listed.

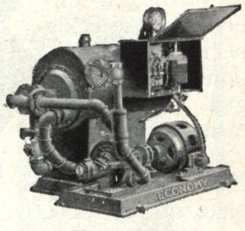


Fig. 2234
Single

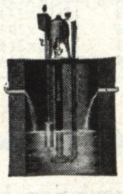


Fig. 2104
Type C Single

ECONOMY AUTOMATIC SEWAGE AND BILGE PUMPS AND CELLAR DRAINERS

Gal. per min. per pump	7 to 12	10 to 15	15 to 20	20 to 30	35 to 50	60 to 75	80 to 100	125 to 150	200 to 250	300 to 400	500 to 725	800 to 1200
To pump against head, ft.	8 to 10	10 to 14	12 to 20	15 to 30	15 to 30	15 to 35	15 to 35	15 to 35	15 to 40	15 to 40	15 to 40	15 to 40
Hp.	⅙	¼	⅓	⅓ to ¾	½ to 1	1 to 1½	1 to 2	2 to 3	3 to 5	5 to 7½	7½ to 10	7½ to 15
Discharge pipe, in.	¾	1	1	1¼	1½	2	2½	2½ to 3½	3½ to 4	4 to 5	5 to 6	7 to 8

Speed of all units up to 95 gallons per minute, 1750 r.p.m.
Speed of all units above 100 gallons per minute, 900 to 1200 r.p.m.
In ordering always specify dimensions of basin or sump.

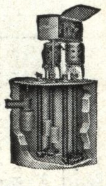


Fig. 2104
Type B Duplex

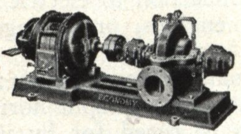


Fig. 2235
Horizontal Split Case Double Suction Pump

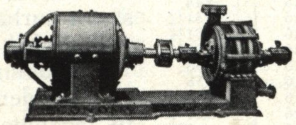


Fig. 2179
Multistage Pump

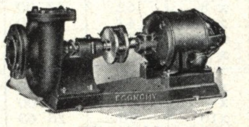


Fig. 2132
Single Stage Side Suction Pump

Double Suction Single and Multistage Centrifugal Pumps for Every Purpose

Capacities, 10 to 4000 gallons per minute

PUMPS FOR EVERY SERVICE

THE GOULDS MANUFACTURING COMPANY

SENECA FALLS, N. Y.

BRANCHES

NEW YORK, N. Y., 16 Murray Street and 19 Park Place
BOSTON, MASS., 177 High Street
PITTSBURGH, PA., 636 H. W. Oliver Building
CHICAGO, ILL., 12-14 South Clinton Street
PHILADELPHIA, PA., 111 North 3rd Street
ATLANTA, GA., Citizens & Southern Bank Building
HOUSTON, TEX., 1001 Second National Bank Building
REPRESENTATIVES IN ALL OTHER PRINCIPAL CITIES

Products

Single and Double Acting Triplex Pumps; Single Cylinder Double Acting Piston Pumps; Single and Multistage Centrifugal Pumps; Centrifugal Fire Pumps; Centrifugal Sump Pumps.

Shallow and Deep Well Water Supply Outfits.

Goulds Single Acting Triplex Plunger Pumps

For general water supply, hydraulic elevators, municipal waterworks, boiler feeding, etc.

Suitable for pumping to a total elevation of 350 ft. or against 150 lb. working pressure.

Furnished for either (1) direct connection to gas, gasoline or oil engines; (2) with geared connection for electric motor; (3) with silent chain drive by electric motor; or (4) with tight and loose pulleys for belt drive.

Prominent features: all parts proportioned so as to reduce operating troubles to a minimum; occasional adjustment of glands and renewal of valves are simply and quickly performed operations; simple, rugged construction insures long life.

See Bulletin No. 101 for complete information.

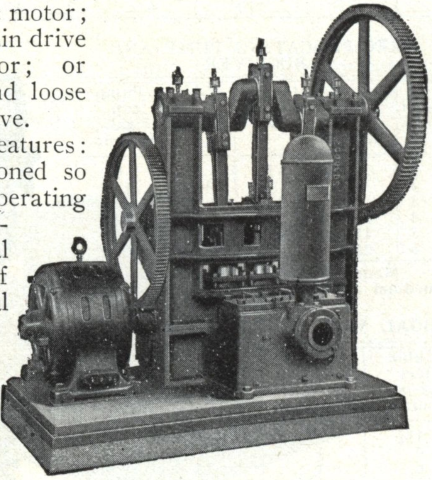


Fig. 1696. Goulds Single Acting Triplex Plunger Pump with Gear Connected Motor

SIZES AND CAPACITIES OF FIG. 1696

Cap., g.p.m.	Pump size, diam. x stroke, in.	R.p.m.	Hp., catalogue rating	Suction and discharge, in.	Tight and loose pulleys, in.	Floor space, in.
2	1¼x 2	67	.35	¾	12x1½	16½x14
4	1¾x 2½	52	.64	1	12x2½	22½x16
6	2 x 3	50	.96	1¼	12x2½	24 x17⅝
6	1¾x 2½	77	.89	1	12x2½	22½x16
9	2 x 3	75	1.33	1¼	12x2½	24 x17⅝
12	2½x 4	48	1.71	1½	15x3	29 x20¾
18	2½x 4	71	2.46	1½	15x3	29 x20¾
18	3 x 4	50	2.29	1½	15x3	32¼x21½
25	3 x 4	70	3.07	1½	15x3	32¼x21½
25	3½x 4	50	3.07	2	15x3	34¾x24½
30	3½x 4	60	3.50	2	15x3	34¾x24½
35	3½x 4	70	4.00	2	15x3	34¾x24½
40	4 x 6	42	4.60	2	20x3	38 x32
50	4 x 6	52	5.65	2	20x3	38 x32
60	4 x 6	62	6.72	2	20x3	38 x32
100	5 x 8	50	10.60	3	30x5	51 x44
125	5 x 8	62	13.00	3	30x5	51 x44
125	6 x 8	43	13.20	4	30x6	62⅝x51¼
150	6 x 8	52	15.80	4	30x6	62⅝x51¼
175	6 x 8	60	18.30	4	30x6	62⅝x51¼
175	7 x 8	44	19.00	4	36x6	68⅝x58
200	7 x 8	50	21.30	4	36x6	68⅝x58
250	7 x 8	63	26.00	4	36x6	68⅝x58
250	7 x10	50	26.60	5	36x6	71 x60⅞
300	7 x10	60	31.30	5	36x6	71 x60⅞
300	8 x10	46	32.00	5	42x6	74½x66½
350	8 x10	54	36.50	5	42x6	74½x66½

Ratings based on pumping cold water. For high suction lifts, select pumps to run at low speeds.

Goulds "Pyramid" Single Cylinder Double Acting Piston Pump

For general water supply and fire protection on farms, in suburban homes, dairies, small hotels, schools, etc. Also used to pump light oils such as kerosene, gasoline, etc. (for which purpose it is approved by the National Board of Fire Underwriters); handling condensation, vacuum service, irrigation, and mine pumping.

Suitable for pumping against pressures up to 75 lb. or up to 175-ft. elevation.

Furnished with gear connection to electric motor or with tight and loose pulleys for belt drive by any type of prime mover.

Prominent features; remarkably strong and rigid construction; few parts; simple and durable; valves easily accessible; large capacity in the most compact form—smaller than any similar pump of same capacity and pressure; large and free waterways.

See Bulletin No. 100 for complete information.

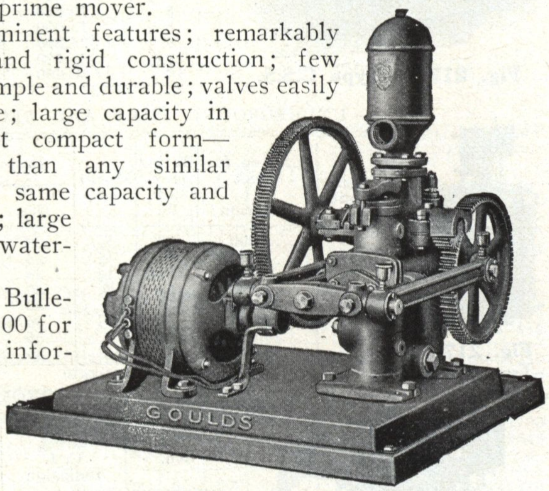


Fig. 1531. Goulds "Pyramid" Single Cylinder Double Acting Piston Pump

SIZES AND CAPACITIES OF FIG. 1531

Cap., g.p.m.	Pistons, diam. x stroke, in.	R.p.m.	Hp., catalogue rating	Suction and discharge, in.	Tight and loose pulleys, in.	Floor space, in.
6	2½x 4	38	.50	1¼	8x2½	25 x18
12	3 x 5	41	1.00	1½	15x2½	31⅝x22¼
21	4 x 5	40	1.50	2	15x3	31⅝x24¼
33	5 x 5	40	3.00	2½	16x4	35¼x29¼
57	6 x 6	40	5.00	3	20x4	39⅛x31⅜
114	6 x12	40	7.50	4	26x4	55¼x31⅜

Ratings based on pumping cold water.

Goulds Single Stage Double Suction Centrifugal Pumps

For general water supply, hot water circulation in heating systems, and booster or mine service.

Built in single units for heads up to 231 ft. or against an average maximum working pressure of 100 lb. Furnished for direct connection to electric motors, steam turbines or gasoline engines, or arranged with pulleys for belt drive.

Prominent features: simple construction; single moving element; casings and bearings split horizontally to facilitate inspection; can be cared for by unskilled labor; no valves to get out of order; operate noiselessly; durably built.

See Bulletin No. 125 for complete information.

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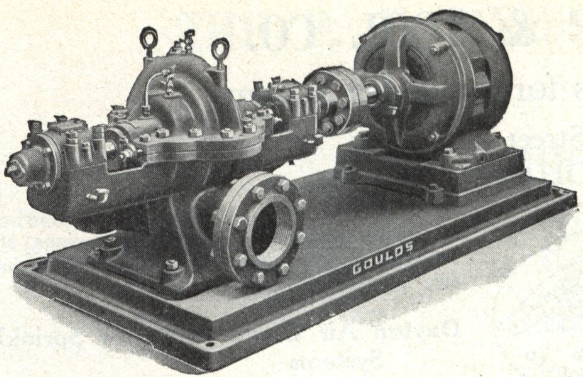


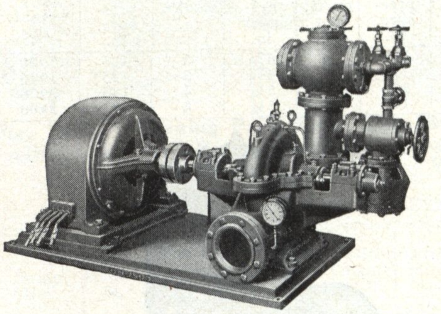
Fig. 3065. **Goulds Single Stage Double Suction Centrifugal Pump Direct Connected to Electric Motor**

Fig. No.	Pump No.	Approx. cap., gal. per min.		Discharge, in.	Suction, in,	Pulleys, diam. x face, in.	*Floor space, in.
		Min.	Max.				
3065	5	400	800	5	6	8x 8	42 x21¼
	6	600	1300	6	8	10x10	44¾x24½
	8	1000	2700	8	10	12x12	51¼x28
3075	5	400	900	5	6	8x 8	42 x23½
	6	600	1500	6	8	10x10	44¾x26½
	8	1100	2900	8	10	12x12	51¼x31
3085	2	50	325	2	3	5x 5	32¼x16½
	3	150	350	3	4	6x 6	39¼x20¼
	4	250	750	4	5	10x10	42 x23½
	5	400	1000	5	6	10x10	44¾x26
	6	800	1700	6	8	12x12	51¼x30
	8	1300	3000	8	10	12x15	52¾x33½
3095	2	50	250	2	3	6x 6	39¼x20
	3	200	450	3	4	8x 8	42 x24
	4	400	800	4	5	10x10	44¾x27½
	6	500	2000	6	8	12x13	51¼x33

Ratings based on pumping cold water.
*Pump only. Over-all dimensions of unit depend on size and type of driver.

Goulds Centrifugal Fire Pumps

Goulds centrifugal fire pumps can be used to discharge direct into hose lines, or in connection with automatic sprinkler systems. Designed for direct connection to electric motors, gasoline engines or steam turbines.



Goulds 1000-gal. Single Stage Centrifugal Fire Pump

Built to specifications of the National Fire Protective Association and approved by the Underwriters' Laboratories, Inc.

Built in single and multistage types.

For complete data, see Bulletin 118.

FIGS. 3089 AND 3099 SINGLE STAGE FIRE PUMPS
Ratings for constant speed electric motor, steam turbine or gasoline engine drive.

Fig. No.	Pump No.	Gal. per min.	No. of 1⅛-in. fire streams	Suction and discharge, in.	100 lb. total head	
					Approx. r.p.m.	Hp. of motor (40°)
3099	5	750	3	8	1740	75
3099	6	1000	4	8	1740	100
3089	8	1500	6	10	1740	150

Goulds Centrifugal Sump Pumps

These automatic electric driven pumps are used for elevating to sewers the drainage in buildings where the basement floors, boilers and elevator pits are below sewer level and for any other service where the hot or cold liquid to be pumped accumulates in a catchbasin, pit or tank. The direct connected driving motor is started and stopped by the rise and fall of a float in the sump. This float can be adjusted to start and stop the motor when the liquid in the sump reaches any desired level.

Furnished complete with motor and float switch for pits 2 ft. deep and with 20-in. outside diameter pit cover to fit a standard 18-in. sewer tile.

Furnished: (1) for 20-ft. head, 20 gal. per min. capacity, with ¼ hp., 1750 r.p.m. 110 or 220-volt, 60-cycle, single phase direct connected a-c. motor, or 110 or 220-volt compound wound d-c. motor. (2) for 15-ft. head, 12 gal. per min. capacity, with ¼ hp., 1450 r.p.m., 110 or 220-volt, 25-cycle, single phase direct connected a-c. motor.

Prominent features: automatic operation; require minimum attention; occupy little floor space; simple and rugged construction; economical and quiet operation; self-contained and compact; easily removed without emptying catchbasin.

For sump pumps of larger capacity, see Bulletin No. 111.

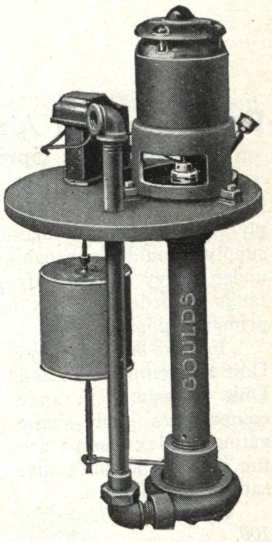


Fig. 3029. **Goulds Centrifugal Sump Pump**

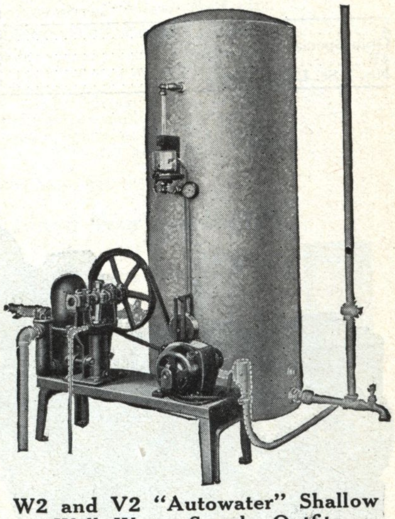
"Autowater" Shallow Well Water Supply Outfits

These electric motor driven outfits are used to pump water from wells, lakes, streams, etc. (where the suction lift does not exceed 22 ft.) into pneumatic pressure tanks and deliver it to the fixtures at a maximum pressure of 43 lb. Also used to pump water into open or gravity tanks.

These outfits work automatically on pneumatic pressure tanks by the use of pressure regulators and on open (gravity) tanks by the use of float switches. The pressure regulator is adjusted to start the motor at 23 lb. and to stop it at 43 lb.

We furnish our outfits complete, including pump, pneumatic pressure tank, electric motor, idler, belt, heavy oak base with cast iron legs, air attachment, pressure regulator or float switch, relief valve, and water and pressure gauges. Capacities up to 1260 gal. per hour.

See Catalogue 12 for information on complete line.



W2 and V2 "Autowater" Shallow Well Water Supply Outfits

"AUTOWATER" WATER SUPPLY OUTFITS

Outfit No.	Capacity, gal. per hr.	*Motor, hp.	Suction and discharge, in.	Over-all dimensions of pump, in.	Shipping weight, lb.
W2	180	¼	¾	33x13x25½	146
V2	360	⅓	1	33x14x27½	170

*Repulsion induction motors.

Electrically welded pneumatic pressure tanks are furnished as follows:

Capacity, gal.......	42	82	120	180	220	315	530
Dimensions, in.....	16x48	20x60	24x60	30x60	30x72	36x72	36x120

THE LUCAS PUMP & TOOL CO.

Air Compressors and Pumps for Sprinkler Systems

427 Valley Street
DAYTON, OHIO

Duit Pumps and Air Compressors for Automatic Sprinkler Systems

Standard sprinkler equipment requires two independent water supplies. The primary supply should be automatic and the secondary supply should be capable of furnishing water under heavy pressure from pneumatic pressure tanks in order to back up a weak or doubtful primary supply.

For the latter service, Duit air compressors and Duit combination air compressors and single acting triplex pumps are the most dependable and satisfactory known.

Send for bulletin No. 100.

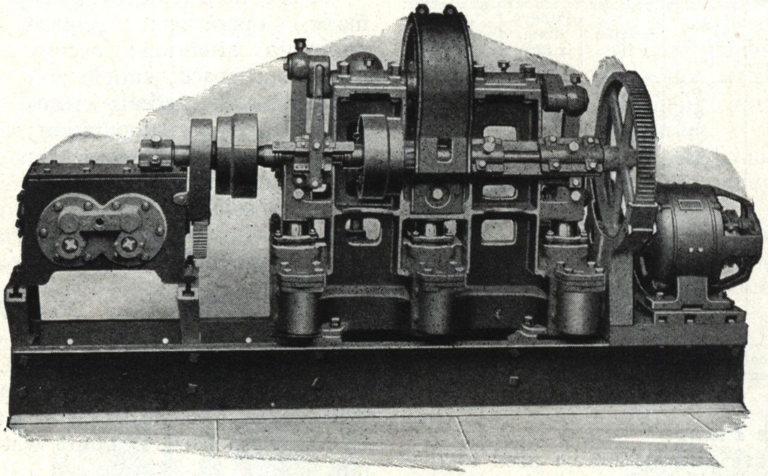
Duit Combination Single Acting Triplex Pumps and Air Compressors

Furnished complete with the famous Duit single acting triplex pumps, horizontal air cooled compressors, electric motors, connecting gears and pinions, steel subbases and friction clutch drives with single fulcrum lever hand control.

Dayton Air Compressors for Sprinkler Systems

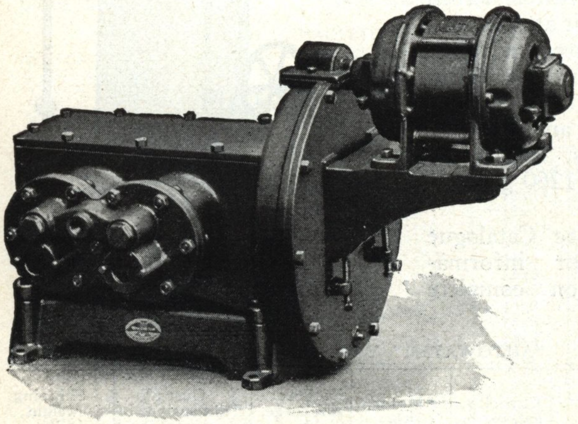
Style 800—Air cooled for intermittent service; water cooled for continuous service. Gears run in oil. Motors mounted on bracket with take-up for wear. Splash system of lubrication throughout. Specify current available when ordering. Furnished with larger motors for higher pressures.

Style B—For intermittent and continuous service according to required pressure. Air cooled. Splash system of lubrication. Bearing and connecting rods made of bronze; valves made of steel. Crankshafts are drop forged. Always specify current available. Pressure depends on kind of motor used.

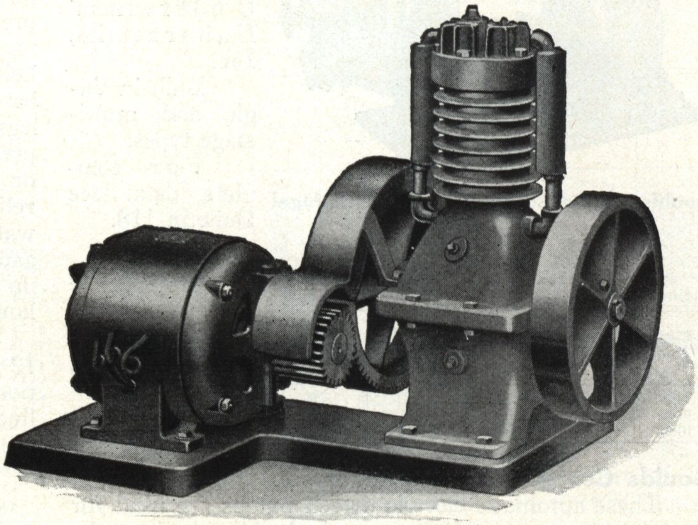


Duit Combination Single Acting Pump Triplex Pump and Air Compressor for Automatic Sprinkler Systems

Outfit No.	Pump No.	Suction, in.	Discharge, in.	Motor, hp.	Pump				Compressor				Shipping weight, lb.
					Cap., gal. per min.	Diam. plunger, in.	Stroke, in.	Max. pressure, lb.	Cap., cu. ft. per min.	Diam. cylinder, in.	Stroke, in.	Max. pressure, lb.	
2	3	1½	1¼	3	20	3	5	135	11	4⅞	3	125	1900
Ohio Special	3A	2	2	3	35	3	5	135	11	4⅞	3	125	1940
4B	5	2½	2	7½	65	4	6	135	20	5¼	4	125	3900
No. 1 St. Louis Special	3B	2	2	5	35	3¼	5	135	20	5¼	4	125	2100



Style 800 Dayton Air Compressor



Style B Dayton Air Compressor

Style	Piston displacement, cu. ft. per min.	Diam. cylinder, in.	Stroke, in.	R.p.m.	Pressure, lb.	Hp.	Discharge, in.	Shipping weight, lb.
800	11	4¾	3	192	100	2	¾	550
801	16	5¼	4	179	100	3	¾	600
802	20	5¼	4	203	100	5	¾	800

Style	Piston displacement, cu. ft. per min.	Diam. cylinder, in.	Stroke, in.	R.p.m.	Pressure, lb.	Hp.	Discharge, in.	Shipping weight, lb.
B-1	4¼	2¾	3¼	400	80	¾	½	210
B-2	6	2¾	3¼	600	90	1	½	220
B-3	8	3¼	3¼	550	100	1½	½	225
B-4	11	4¼	4½	375	100	2	¾	400

THE F. E. MYERS & BRO. COMPANY

Manufacturers of Pumps

ASHLAND, OHIO

TRADE-MARK

Products

Deep Well Power Pumps.

Shallow Well Power Pumps.

For Door Hangers, Store Ladders, Lift and Force Pumps, see pages 1472-1475; for Hay Tools, see page 1669.

Myers Self-oiling Deep Well Power Pumps

For lifting water from wells of greater depth than 22 ft. and delivering it to ground level or forcing it into elevated tanks or reservoir.

Made in sizes 6, 9, 12, 18, and 24-in. stroke.

All working parts fully enclosed and run in oil. Main frame forms oil reservoir from which the gears distribute oil to moving parts. Bearing shafts are high grade machinery steel; bearings and working parts removable. Gears and pinions machine cut.

Regularly fitted with tight and loose pulleys for engine drive; single pulley and belt tightener for motor drive. Anti-freezing set length furnished when desired.

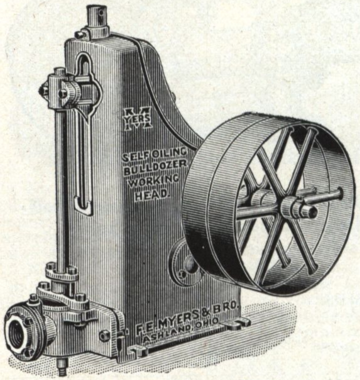

MYERS
SELF-OILING BULLDOZER WORKING HEAD
F. E. MYERS & BRO. ASHLAND, OHIO

Fig. 1996. Working Parts Self-oiling Deep Well Power Pump

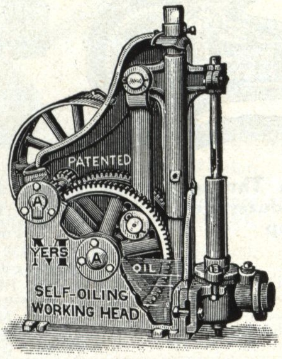


Fig. 1997. Sectional View Deep Well Self-oiling Working Head

MYERS POWER PUMPS FOR DEEP WELLS

Pump No.	Length stroke, in.	Max. speed up strokes, min.	Diam. cyl., in.	Drop pipe, in.	Min. diam. well, in.	Disch. pipe tap, in.	Rod coup. in.	Total vert. head, ft.	G.p.m.	Hp., 40 lb. tank pres.,	Total head open tank, ft.
650-650A 650AM	6	48	1 13/16	2	3	1¼	½x⅜	150	2½	½	242
650S-650AS 650AMS	6	48	2¼	2½	3½	1¼	½x⅜	75	4½	½	167
1655AM	6	48	3	1¼	3½	1¼	½x⅜	50	6½	¾	142
							Rod			50 lb.	
658-658A	9	40	1 13/16	2	3	2	⅝x½	200	3½	1	315
	9	35	1 13/16	2	3	2	⅝x½	300	3	1	415
	9	30	1 13/16	2	3	2	⅝x½	500	2½	1½	615
658AM	9	40	2¼	2½	3½	2	⅝x½	200	5½	1½	315
	9	35	2¼	2½	3½	2	⅝x½	300	4½	1½	415
	9	30	2¼	2½	3½	2	⅝x½	400	4	2	515
6585-658AS	9	40	2¾	3	4	2	⅝x½	100	7½	1½	215
	9	35	2¾	3	4	2	⅝x½	200	7	2	315
	9	30	2¾	3	4	2	⅝x½	300	6	2	415
658AMS	9	40	3½	1½	4	2	⅝x½	100	12	2½	215
	9	35	3½	1½	4	2	⅝x½	150	10	2½	265
	9	30	3½	1½	4	2	⅝x½	200	8½	2½	315
660-660A	12	35	2¼	2½	3½	3	⅞	300	6	2	415
	12	30	2¼	2½	3½	3	⅞	400	5½	2½	515
	12	25	2¼	2½	3½	3	⅞	600	4½	2½	715
660AM	12	35	2¾	3	4	3	⅞	200	10	2½	315
	12	30	2¾	3	4	3	⅞	300	8½	3	415
	12	25	2¾	3	4	3	⅞	400	7	3	515
660S-660AS	12	35	3¼	3½	5	3	⅞	100	13½	2½	215
	12	30	3¼	3½	5	3	⅞	200	11	3	315
	12	25	3¼	3½	5	3	⅞	300	10	3½	415
660AMS	12	35	3¾	4	6	3	⅞	100	18	3	215
	12	30	3¾	4	6	3	⅞	150	15½	3–3½	265
	12	25	3¾	4	6	3	⅞	200	13	3–3½	315
† 665-655M	18	25	5¾	6	8	4	1⅛	200	45	10	315
670-670M	24	20	7 7/16	8	10	6	1½	140	80	15	255

*Fitted with differential plunger. †Also constructed with 18-in. stroke.

Myers Self-oiling 18 and 24-in. Stroke Deep Well Power Pumps

Designed for railroads, manufacturing plants, mines, village water works, apartment houses, hotels, etc.

Head is constructed on the walking beam principle.

The cross head sleeve is extra heavy and babbitted full length. On down-stroke it dips into oil, carrying the oil up the post to the top of cross head.

Bearing shafts are high grade machinery steel, bearings and working parts are removable, gears and pinions are machine cut. The pinions and shaft are cut integral from a solid steel shaft.

Plunger can be withdrawn without disturbing suction or discharge pipe.

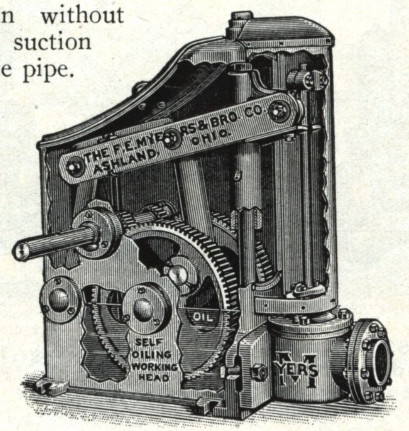


Fig. 2147. Sectional View Self-oiling 18-in. Deep Well Power Pump

No. 665 18-in. stroke; 24x5-in. tight and loose pulleys, tapped for 6-in. suction and 4-in. discharge pipe.

No. 665M Motor drive, 18-in. stroke, with 36x5-in. tight pulley and belt tightener.

Either of above power pumps fitted with 4-ft. anti-freezing set length at a small additional charge.

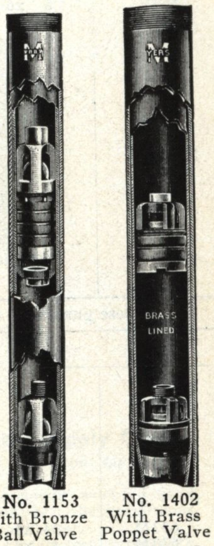
24-in. stroke head not listed

Myers Brass Lined Working Barrels

Designed for use with Myers power pumps and working heads for pumping water from deep wells. They are furnished with brass poppet, bronze spool or bronze ball valves.

Shell is heavy wrought steel, lined with special heavy seamless drawn brass tube, swaged out at upper end and tapered to form seat for check valve. Composition metal fills space between lining and shell.

Made in different styles and all standard sizes, meeting depth, capacity and operation requirements.



No. 1153 With Bronze Ball Valve

No. 1402 With Brass Poppet Valve

Myers Brass Lined Working Barrels

Continued on next page

Myers Self-oiling Shallow Well Pumps

These pumps are of the horizontal double acting self-oiling type. They are designed for lifting water from wells, cisterns, etc., 22 ft. or less in depth and forcing it to an elevation. Suitable for general service, such as pumping hot or cold water, oil, gasoline and similar liquids. They are also excellent boiler feed or booster pumps.

Construction — Bulldozer pumps are extremely simple in construction, easily installed and economically operated by either hand power, motor or engine drive. The power end consists of a one-piece casting forming the base of the pump and oil reservoir and enclosing all working parts. The brass lined cylinder is a one-piece casting attached to the power end by heavy bolts. The large valves, liberal and direct waterways and positive self-oiling system insure safe and economical operation against heavy pressures or at high speeds, securing large volume with largely increased efficiency. All sizes are equipped with air valve for pneumatic water systems, where desired.

Sizes and Capacities—Bulldozer pumps are made in twelve sizes from 2½x3 in. to 8x8 in., having capacities from 500 to 9000 gal. per hour.

Types—They are furnished in two general types: standard type, for pressures up to 100 lb. or 230-ft. elevation; high duty type, for pressures up to 250 lb. or 580-ft. elevation.

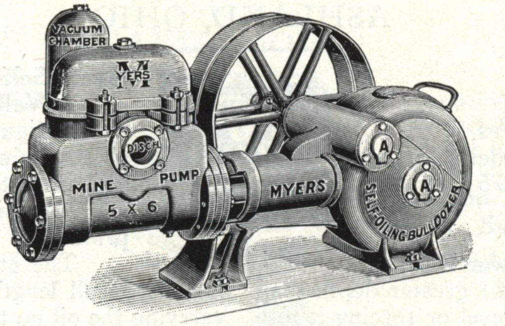


Fig. 2101. Myers Self-oiling Bulldozer Mine Pump

For use in coal mines and similar places where water is badly mineralized with sulphur, 100 lb. pressure

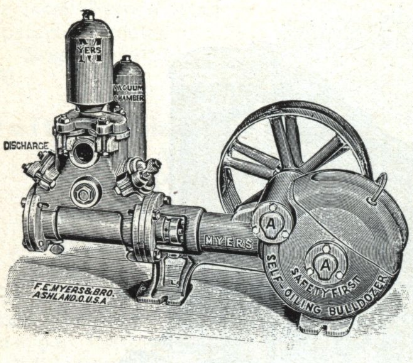


Fig. 1866. Myers Self-oiling Bulldozer Power Pump

For service against 100-lb. pressure or 230-ft. elevation

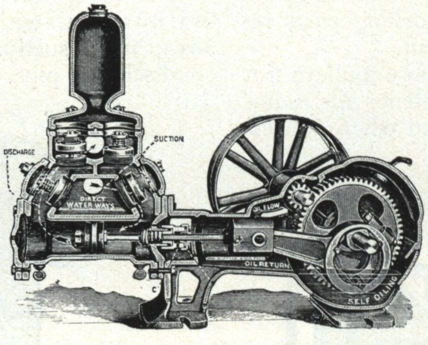


Fig. 1819. Section Through Myers Self-oiling Bulldozer Power Pump

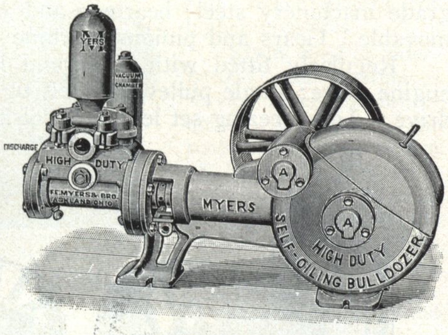


Fig. 1929. Myers High Pressure Self-oiling Bulldozer Power Pump

For service against 250 lb. pressure or 580-ft. elevation

SPECIFICATIONS MYERS SELF-OILING BULLDOZER POWER PUMPS

Pump No.	Diam. and stroke, in.	Maximum r. p. m.	Maximum gal. per hour	Pulleys, in.	Suction and discharge, in.	Lift, ft.	Maximum pressure, lb.	Floor space, in.	Code Word
			FIG. 1866—100-LB. PRESSURE						
			FOR ENGINE DRIVE						
				T. & L.					
612	2½x3	70	500	12x2	1¼	22	100	15x31	Terry
613	3 x4	70	1000	14x2½	1½	22	100	18x37	Tent
614	4 x5	65	2000	16x4	2	22	100	24x46½	Tenter
615	5 x5	60	3000	16x4	2½	22	100	24x48	Tenure
*644	4 x5	65	2100	16x4	2	22	100	24x48	Tumble
*645	5 x6	60	3600	24x4	2½	22	100	27x55½	Truster
616	6 x6	52	4500	24x4	3	22	100	27x56	Thou
618	8 x8	45	9000	30x6	4	22	100	46x75	Toddle
			HAND POWER						
610	2½x3	70	500	12x2	1¼	22	100	15x34	Toast
			FOR MOTOR DRIVE						
				Tight					
612M	2½x3	70	500	15x2½	1¼	22	100	15x31	Terse
613M	3 x4	70	1000	20x3	1½	22	100	18x37	Tesla
614M	4 x5	65	2000	24x4	2	22	100	20x46½	Test
615M	5 x5	60	3000	24x4	2½	22	100	20x48	Testa
*644M	4 x5	65	2100	24x4	2	22	100	24x48	Tumbler
*645M	5 x6	60	3600	30x4	2½	22	100	23x55½	Trusty
616M	6 x6	52	4500	30x4	3	22	100	23x55½	Thrall
618M	8 x8	45	9000	42x6	4	22	100	40x76	Toddy
			HAND AND POWER						
610M	7½x3	70	500	15x2½	1¼	22	100	15x34	Trull

*These pumps are illustrated by Fig. 2101.

Pump No.	Diam. and stroke, in.	Maximum r. p. m.	Maximum gal. per hour	Pulleys, in.	Suction and discharge, in.	Lift, ft.	Maximum pressure, lb.	Floor space, in.	Code Word
			FIG. 1929—250-LB PRESSURE						
			FOR ENGINE DRIVE						
				T. & L.					
632	2¼x4	65	500	14x2½	1¼	22	250	18x38	Toby
633	3 x5	60	1100	16x4	1½	22	250	24x44	Thwack
634	4 x6	50	1900	24x4	2	22	250	25x51	Thwart
635	5 x8	45	3600	30x6	2½	22	250	42x76	Tod
			FOR MOTOR DRIVE						
				Tight					
632M	2¼x4	65	500	20x3	1¼	22	250	18x38	Toco
633M	3 x5	60	1100	24x4	1½	22	250	24x44	Thyme
634M	4 x6	50	1900	30x4	2	22	250	25x51	Tiao
635M	5 x8	45	3600	42x6	2½	22	250	42x76	Toda

Continued on next page

Myers Electric Driven Pneumatic and Open Tank Water Supply Systems

Myers self-oiling double acting electric house pumps are designed for pumping water from shallow wells, cisterns, springs, lakes or other sources not more than 22 ft. in depth and forcing it into pneumatic tanks or into open gravity tanks. Operate on any electric light or power current. An automatic pressure controller is furnished with pneumatic tank outfits; air chambers eliminate water hammer; relief valve protects pump and motor from excessive pressure; power end has long self-oiling, easily renewable bearings.

Simple power transmission; few working parts fully enclosed; runs in oil; water end has liberal and direct waterways; large valves. These features result in high efficiency, long life and large pumping capacity at low current cost. Easily installed, quiet in operation, safe, dependable and require little or no attention.

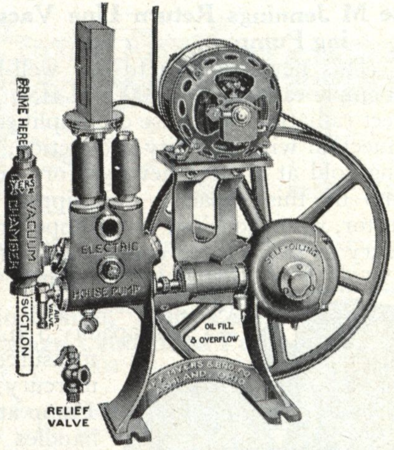

PRIME HERE
VACUUM CHAMBER
ELECTRIC HOUSE PUMP
SELF-OILING
SUCTION
AIR VALVE
OIL FILL & OVERFLOW
RELIEF VALVE
F. E. MYERS & BRO. ASHLAND, OHIO

Fig. 2180. Myers Electric Self-oiling House Pump

No. 606A for pressure tank systems. 200 gal. per hour. Suction and discharge, ¾ in. Floor space, 12x24 in.; height, 24 in. Equipment consists of pump with vacuum chamber, relief valve, air valve, pressure controller, endless belt, and ⅙ hp., 110-volt, 60-cycle, single-phase a-c. motor or 32, 110 or 220-volt d-c. motor.

No. 608A for pressure tank systems. 300 gal. per hour. Suction, 1 in.; discharge, ¾ in. Balance same as No. 606A, except has ¼ hp., 110-volt, 60-cycle, single-phase a-c. motor.

Above pumps also built for open tank systems

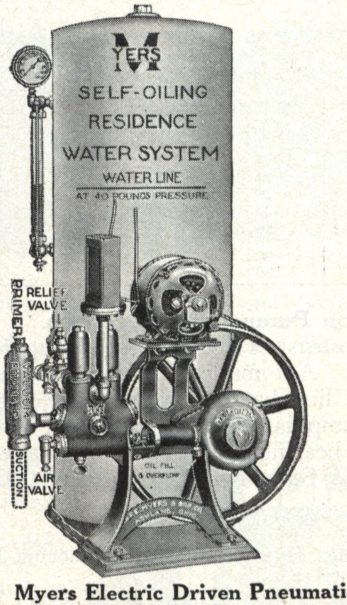

MYERS
SELF-OILING
RESIDENCE
WATER SYSTEM
WATER LINE
AT 40 POUNDS PRESSURE
PRIMER
RELIEF VALVE
SUCTION
AIR VALVE
OIL FILL & OVERFLOW

Fig. 2181. Myers Electric Driven Pneumatic Water Supply Outfit

No. 606AT—Capacity, 200 gal. per hour. Outfit consists of Myers electric house pump with vacuum chamber; relief valve, air valve, pressure controller, endless belt and ⅙ hp., 110-volt, 60-cycle, single-phase a-c. motor or 32, 110 or 220-volt d-c. motor, with 42-gal. galvanized tank, base, water gauge, pressure gauge and fittings, completely assembled ready to install. Suction and discharge are ¾ in. Floor space, 25x29 in.; height, 51 in.

No. 608AT—Capacity, 300 gal. per hour. Same as No. 606AT, except it is equipped with ¼ hp., 110-volt, 60-cycle, single-phase a-c. motor, and the suction is 1 in., while the discharge is ¾ in.

Myers "Direct from Well" Water Supply System

The Myers direct water system will supply an abundance of fresh water direct from the well. No storage tank is used. The opening of a faucet after discharging 1 gal. of water immediately starts the pump and delivers fresh water to all parts of the building. Current is consumed only when water is drawn. The ordinary leakage of a defective faucet will not start the pump, as there is a gallon of water in reserve to take care of any minor defects in the plumbing.

Shallow Well Direct Water Supply Outfit—Fig. 1980 direct water system is suitable for shallow wells not more than 22 ft. in depth. It will furnish 450 gal. of water per hour and has sufficient capacity to supply water for lawn sprinkling. The unit is complete—it is only necessary to connect the discharge to house line.

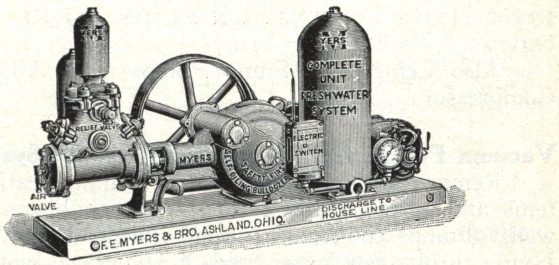

RELIEF VALVE
AIR VALVE
MYERS
SELF-OILING BULLDOZER
ELECTRIC SWITCH
MYERS
COMPLETE UNIT FRESH WATER SYSTEM
DISCHARGE TO HOUSE LINE
©F. E. MYERS & BRO. ASHLAND, OHIO.

Fig. 1980. Myers Shallow Well Direct Water Supply Outfit

Capacity, 450 gal. per hour. Width, 15 in.; length, 50 in.; height, 25 in. Suction tapped 1¼ in.

No. 622AM outfit consists of Myers No. 612AM self-oiling Bulldozer 2½x3-in. power pump, wood base, ½ hp. 110-220-volt 60-cycle single-phase a-c. motor, belt tightener, pressure gauge, electric switch and air chamber for discharge

Deep Well Direct Water Supply Outfit—Fig. 2253 direct water supply system is suitable for deep well service where depth is greater than 22 ft. Operates in same manner as Fig. 1980 outfit except that it is fitted with a Myers deep well self-oiling power working head. Will furnish 200 gal. of water per hour with 2-in. cylinder, 300 gal. with 2½-in. cylinder and 450 gal. with 3-in. cylinder, and has sufficient capacity to supply water for lawn sprinkling at 30 lb. pressure.

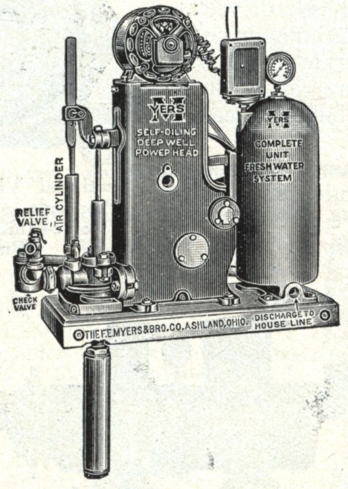

MYERS
SELF-OILING DEEP WELL POWER HEAD
AIR CYLINDER
RELIEF VALVE
CHECK VALVE
MYERS
COMPLETE UNIT FRESH WATER SYSTEM
©THE F.E.MYERS & BRO.CO. ASHLAND, OHIO.
DISCHARGE TO HOUSE LINE

Fig. 2253. Myers Deep Well Direct Water Supply Outfit

Width, 15 in.; length, 30 in.; height, 30 in. Suction tapped 2½ in. and bushed to 1¼ in.

No. 1655AM outfit consists of Myers self-oiling power working head, ½ hp., 110-220-volt, 60-cycle single-phase a-c. motor, belt, belt tightener, pressure gauge, electric switch, air chamber and wood base.

No. 1655AMS outfit is same as above with anti-freezing set length.

Also furnished with ⅓ or ¾ hp. motor at an extra cost.

Brass body cylinders, 2½x14 or 3x14 in., two leather plungers furnished extra

THE NASH ENGINEERING COMPANY

Return Line Vacuum Pumps, Condensation and Circulating Pumps

PLANT AND GENERAL OFFICES
SOUTH NORWALK, CONN.

SALES OFFICES

ATLANTA, GA., 1328 Atlanta Trust Co. Building
BOSTON, MASS., Nottingham Building, Copley Square
BUFFALO, N. Y., 840 Ellicott Square
CHICAGO, ILL., 925 Monadnock Block
CLEVELAND, OHIO, 1629 Union Trust Building
DALLAS, TEX., 1020 Mercantile Bank Building
DENVER, COLO., 1226-28 California Street
DETROIT, MICH., Kerr Building
HOUSTON, TEX., Southern Pacific Building
INDIANAPOLIS, IND., 821 Hume-Mansur Building
KANSAS CITY, MO., 208 Mutual Building
LOS ANGELES, CAL., 1824 So. Hope Street
MINNEAPOLIS, MINN., 800 La Salle Avenue
MONTREAL, QUE., 84 St. Antoine Street
NEW ORLEANS, LA., 521 Baronne Street
NEW YORK, N. Y., 350 Madison Avenue
PHILADELPHIA, PA., 254 So. 15th Street
PITTSBURGH, PA., Oliver Building
PORTLAND, ORE., 224 Pine Street
RICHMOND, VA., American Nat'l Bank Building
ST. LOUIS, MO., 4200 Forest Park Boulevard
SALT LAKE CITY, UTAH, 204 Dooly Building
SAN FRANCISCO, CAL., Sharon Building
SEATTLE, WASH., 220 Railway Exchange
TORONTO, ONT., 1123 Bay Street
VANCOUVER, B. C., 315 Credit Foncier Building
WASHINGTON, D. C., 710 14th Street, N. W.

Products

JENNINGS HYTOR VACUUM PUMPS for Return Line and Air Line Heating Systems; JENNINGS HYTOR CONDENSATION PUMPS and RECEIVERS.

Also Centrifugal Sump Pumps and Air Compressors.

"HYTOR"

TRADE-MARK

Vacuum Pumps for Return Line Heating Systems

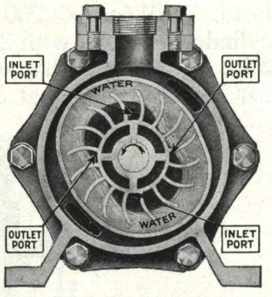
Remove air and water from vacuum heating systems and automatically return water to boiler or hot well. Pump consists of two independent units—a Hytor turbine air pump and a Jennings centrifugal water pump—combined in one casing. Air and water are pumped separately saving over 50% in horsepower with a proportionate reduction in the cost of current.

Compact design permits Jennings Hytors to be installed in one-third the space necessary for other apparatus. All interior parts are bronze. Moving parts revolve without contact and are supported on annular ball bearings mounted outside of casing.

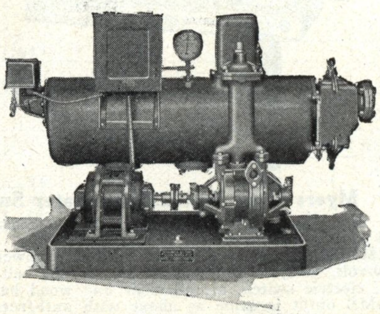
Jennings Pumps assure quiet, reliable operation without annoyance or shutdowns and minimum expense for repairs.

Furnished direct connected to standard electric motors or for belt drive, also with steam turbine drive designed to operate at a normal steam pressure of 75-lb. at the turbine, but this can be varied.

Turbine units designed to discharge condensate against boiler pressure not exceeding 15 lb. at the pump.



Sectional View, Showing Principle of Operation of Jennings Hytor Pump

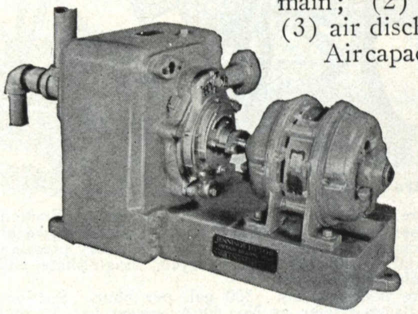


Jennings Hytor Return Line Vacuum Heating Pump, Complete for Automatic Control

Size M Jennings Return Line Vacuum Heating Pump

This new addition to our well-known line has ample capacity for 5000 sq. ft. of equivalent direct radiation. Because of simplified design, in connection with quantity production, this unit is being sold at a price never before possible in a pump of this capacity. Equipped with solid bronze air rotor, rotor housing, water impeller and shaft. Only necessary to make three connections: (1) Return main; (2) water discharge; (3) air discharge.

Air capacity, 3 cu. ft. per min., measured at 10-in. mercury vacuum. Pump at same time handles 8 gal. water per minute from vacuum of 10-in. mercury against 10-lb. gauge pressure at pump. Under these conditions pump requires 3/4 hp. motor.



Jennings Hytor Return Line Vacuum Heating Pump, Size M

JENNINGS HYTOR VACUUM PUMPS

Size	Sq. ft. direct equivalent radiation surface	Air capacity, cu. ft. per min.	Water capacity, g.p.m. 10 lb. pres. 180° F.	Actual hp.	R.p.m.	Hp. cf motor
M	5,000	3	8	.6	1700	¾
A	8,000	6	11	.9	1800	1
B	16,000	11	22	1.4	1800	1½
C	26,000	19	35	2.0	1800	2
D	40,000	25	60	2.8	1200	3
E	65,000	42	90	3.9	1200	5
F	100,000	75	140	9.	1200	10
G	150,000	90	200	10.	900	10
H	250,000	180	400	19.	720	20

Condensation Pumps and Receivers

Outfit consists of efficient centrifugal pump and receiving tank. Automatically returns condensation water from return line heating systems direct to boiler. Interior of pump is bronze. Equipped with high grade annular ball bearings. Operated by rugged open bucket float control. Standard sizes up to 65,000 sq. ft.

Bulletins

No. 37, Jennings Hytor Return Line Vacuum Heating Pumps, Electric Driven
No. 25, Jennings Hytor Return Line Vacuum Heating Pumps, Size M
No. 18, Jennings Hytor Return Line Vacuum Heating Pumps, Steam Turbine Driven
No. 16, Jennings Hytor Condensation Pumps
No. 29, Jennings Hytor Condensation Pumps, Unit Type
No. 17, Jennings Hytor Air Line Heating Pumps
No. 10, Nash Hytor Compressors
No. 11, Nash Hytor Vacuum Pumps
No. 19, Jennings Sump Pumps

ESTABLISHED 1894

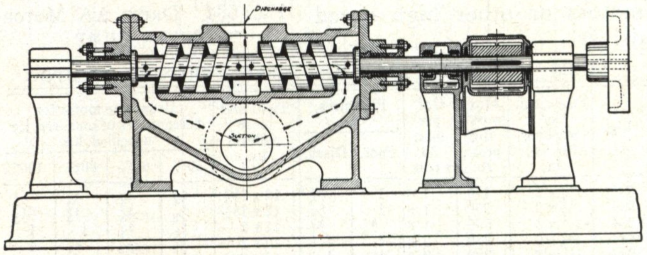
WILLIAM E. QUIMBY, INC.

MAIN OFFICE AND WORKS
211 Parkhurst Street, NEWARK, N. J.

BRANCH OFFICES AND SALES REPRESENTATIVES
BALTIMORE, MD. BOSTON, MASS. DENVER, COLO. HOUSTON, TEX. LOS ANGELES, CAL. NEW HAVEN, CONN.
NEW YORK, N. Y. PHILADELPHIA, PA. ST. PAUL, MINN. SYRACUSE, N. Y. TULSA, OKLA.

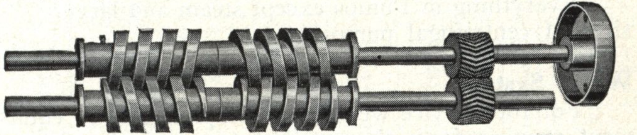
Quimby Screw Pumps

Quimby screw pumps handle any liquid that will flow through a suction pipe; capacities, 2 to 4200 gal. per min.; maximum pressure for gasoline, naphtha, turpentine and other irritant liquids, 100 lb.; inert liquids, such as water or calcium brine having same viscosity as water, 200 lb.; liquids or semi-liquids, such as oil, tar, grease, soap, fats, paste, etc., maximum pressure apparently unlimited, highest pressure on pumps built, 1000 lb. Handle oil at temperatures up to 800° F. with maximum pressure of 100 lb.



Sectional View of Quimby Screw Pump

Features—Positive displacement; pulseless discharge; valveless, having only two moving parts; suitable for direct connection to motor or turbine; no reducing gears; noiseless operation; durable (25 years' continuous service without repairs); high efficiency; rugged construction; dependability.



The Only Two Moving Parts in a Quimby Screw Pump

References—

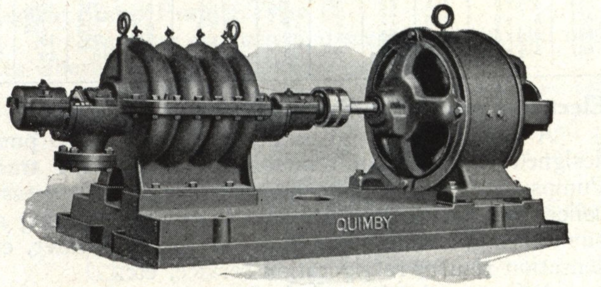
FUEL OIL SERVICE
Stone & Webster, Inc., Boston, Mass.
Peabody Engineering Corporation, New York, N. Y.
Bethlehem Shipbuilding Corporation, New York, N. Y.
Todd Shipbuilding & Dry Dock Co., New York, N. Y.
Bureau of Engineering, Navy Department, Washington, D. C.
U. S. Navy Fuel Oil Testing Plant, Philadelphia, Pa.
REFINERY SERVICE
Most of the larger oil companies.

Quimby Horizontal, Split Case, Single Stage and Multistage Centrifugal Pumps

Capacities up to 500 gal. per min. at heads up to and including 400 ft.

Since the first of many hundreds of these pumps went out into use many years ago, to date, not one has required repairing.

The standard pump is bronze fitted with bronze impellers, and has two heavy bronze ring oiler outboard bearings. The single stage pump is of the double suction type, in which the water is taken in on both sides of the impeller. In the multistage pump the impellers are of the side suction balanced type. Both types are designed to operate without thrust, should the suction be under pressure or a lift.



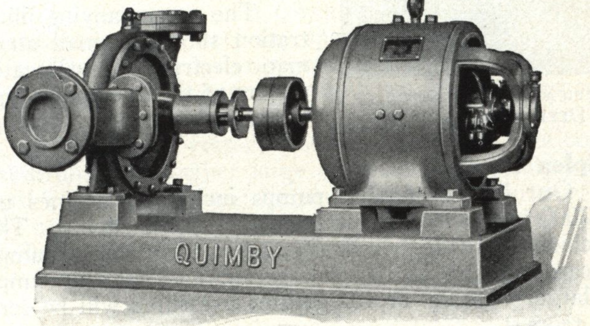
Quimby Split Case Centrifugal Pump

Quimby Solid Case, Single Stage, Open Impeller, Double Suction Centrifugal Pumps

Capacities up to 200 gal. per min. at heads up to 100 ft.

These pumps are hydraulically balanced for either a suction lift or a suction pressure, and are suitable for circulating hot water, ice water, calcium or salt brine, where the static head is considerable, or as a booster pump where there is a pressure on the suction side of the pump. For clear water they are bronze fitted; for calcium brine, all-iron; and for salt brine, all-bronze.

These pumps are capable of operating with a suction lift up to 15 ft. when primed and a foot valve is used. The casings are strong enough to withstand a pressure of 150 lb. per sq. in.



Quimby Solid Case Centrifugal Pump

Quimby Electric Single and Duplex Sewage Ejectors

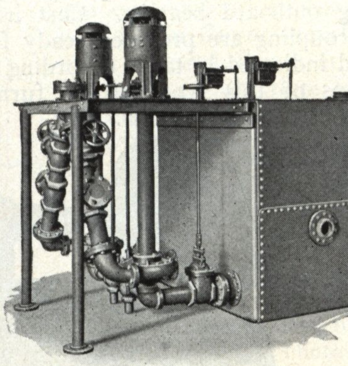
Capacities from 30 to 500 gal. per min. at 70 ft.

Sewage Receiver—Gastight steel receiver, gastight manhole cover.

Hinged bar screen over suction outlet.

Ejector Pump—Noiseless; no valve control. Substantially the same as sump pump.

Angle iron curb with checkered steel carrying and cover plates. Automatically controlled, also high water alarm furnished.



Quimby Type "Y" Sewage Ejector

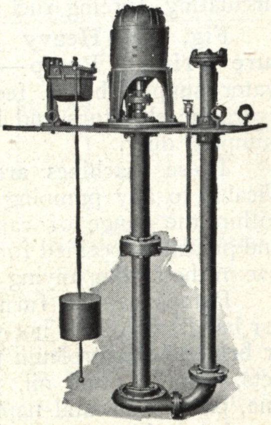
Quimby Electric Submerged Vertical Sump Pumps and Bilge Pumps

Capacities up to 500 gal. per min. at heads up to 70 ft.

Quimby sump pumps are ruggedly built and the bearing which carries the impeller and vertical shaft is situated at the level of the sump pit cover, instead of being at the pump and thus underneath the gritty water. Coupling is flexible and noiseless.

Maximum speed is 1200 rev. per min. We do not run our vertical pumps at higher speeds, as experience shows that the slightly reduced first cost due to a high speed and cheaper motor seriously impairs the life of the apparatus.

Angle iron curb with checkered steel carrying and cover plates built to specifications.



Quimby Sump Pump

ESTABLISHED 1840

RUMSEY PUMP COMPANY, LTD.

109 Johnson Street
SENECA FALLS, N. Y.

TRADE-MARK

Products

Complete line of Pumping Machinery for domestic, municipal, industrial, agricultural and marine uses, including Rotary, Centrifugal, Double-acting, Triplex, Deep Well, Power and Spray Pumps; Water Systems and Hydraulic Rams.

Everything in Pumps except steam and larger sizes of centrifugal pumps.

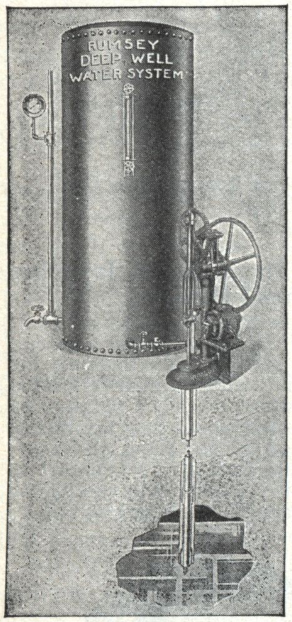
Water Systems

For this service we offer a complete line of equipment ranging from the smallest types of electric and engine driven pumps for domestic supply, through the larger machines for country clubs and estates, apartment houses and hotels, to complete municipal systems.

Under this same head fall pumps for irrigation systems, golf courses, for decorative and swimming pools, for community fire protection, etc.

Either gravity systems with their elevated storage tanks or reservoirs may be installed, or air pressure supply systems with pneumatic storage tanks, the type of pumping apparatus being approximately the same in either case.

The accompanying illustration shows a small automatic electric deep well water system of the pneumatic type for suburban supply.



Typical Installation of Deep Well System

Triplex Pumps

Our line of triplex pumps includes machines up to 2000 gal. per min. for municipal water supply. The machines here described are the smaller, staple pumps in capacities up to 100 gal. per min. Data on pumps of larger capacity or for greater pressures will be sent on request.

Fig. 681 Moderate Pressure Triplex Pump—For domestic and industrial water supply, boiler feeding, circulating, forcing fuel oil to burners, etc.

Fig. 684 Heavy Pressure Triplex Pump—For water supply, boiler feeding, hydraulic elevators and heavy pumping duty.

These machines are applicable to any pumping duty within the range of capacity and pressure specified for each size in the accompanying table.

Pumps can be furnished for handling cold or hot water or brine; for petroleum products, such as fuel oil, gasoline, paraffin oil and naphtha; for chemicals such as cyanide ammonia, etc.; for food products, such as chocolate, etc.; for thick liquids like tar, etc.

Pumps may be belt driven, may be direct connected to driving shafts of suitable speed, or may be geared, belted or chain connected to electric motors or other high speed driver.

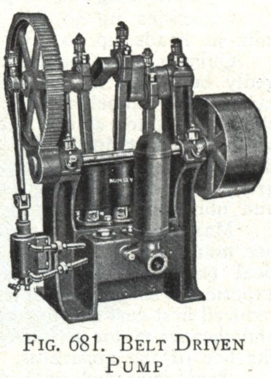


Fig. 681. Belt Driven Pump
Showing air compressor attachment as supplied to order for pneumatic tank duty

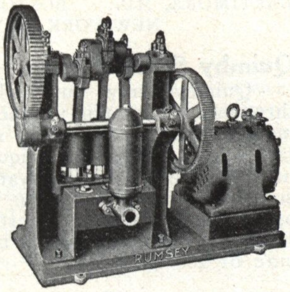


Fig. 684. Drive AA Motor Driven Pump

SIZES AND CAPACITIES OF SMALL TRIPLEX PUMPS

Fig.	Size diam. by working stroke, in.	Max. working pres., lb.	Gal. per min. 50 r.p.m.	Pipe sizes, in.		Tight and loose pulleys, in.	Usual size motor for percentages of max. service specified, hp.			
				Suct.	Disch.		50%	60%	80%	100%
681	1¼ x 2	150	1.6	1	¾	12 x 1½	¼	¼	¼	¼
684	1¼ x 2	200	1.6	1	¾	12 x 1½	½	¼	¼	⅓
684	1 x 3	500	1.6	¾	¾	12 x 2	¾	¾	1	1
684	1⅜ x 3	250	2.8	1	1	12 x 2	½	½	¾	1
684	1½ x 3	200	3.5	1	1	12 x 2	½	½	¾	1
681	1¾ x 3	150	4.5	1	1	12 x 2	½	½	¾	1
684	1½ x 4	330	4.5	1¼	1	12 x 2½	1	1½	1½	2
681	2 x 3	130	6	1¼	1¼	12 x 2	¾	¾	1	1
684	1¾ x 4	250	6	1¼	1¼	12 x 2½	1	1½	1½	2
684	2 x 4	200	8	1¼	1¼	12 x 2½	1	1½	1½	2
684	2 x 4½	330	9	1½	1¼	15 x 2½	1½	2	2	3
681	2¼ x 4	150	10	1¼	1¼	12 x 2½	1	1½	1½	2
681	2½ x 4	150	12	1¼	1¼	12 x 2½	1½	1½	1½	2
684	2¼ x 4½	250	12	1¼	1¼	15 x 2½	1½	2	2	3
684	2½ x 4½	200	14	1½	1½	15 x 2½	1½	2	2	3
684	2½ x 5	250	16	1½	1½	20 x 3	2	3	3	5
684	2½ x 6	375	19	2	1½	20 x 4	5	5	5	7½
681	3 x 4½	150	20	1½	1½	15 x 2½	1½	2	2	3
684	3 x 5	200	23	1½	1½	20 x 3	3	3	3	5
681	3⁵⁄₁₆ x 4½	150	25	1½	1½	15 x 2½	2	2	3	3
684	3 x 6	250	27	2	2	20 x 4	5	5	5	7½
684	3 x 6	400	27	2	2	24 x 5	5	7½	7½	10
681	3½ x 5	150	31	2	2	20 x 3	3	3	5	5
684	3½ x 6	200	37	2	2	20 x 4	5	5	5	7½
681	4 x 6	150	50	2½	2	20 x 4	5	5	5	7½
684	4 x 6	230	50	2½	2	24 x 5	5	7½	7½	10
681	4½ x 6	120	62	3	2½	20 x 4	5	5	5	7½
684	4½ x 6	185	62	3	2½	24 x 5	5	7½	7½	10
681	5 x 6	150	75	3	3	24 x 5	5	7½	7½	10
681	5½ x 6	120	92	3	3	24 x 5	7½	7½	10	10
681	5½ x 6½	150	100	3	3	24 x 5	7½	10	10	15

Electric Centrifugal Pumps

A limited range of single and multi-stage pumps designed for the requirements of the building trades. Pumps for water supply, booster service, low pressure boiler feeding, theater fire protection, air washing and humidifying, circulating hot water and ice water, condensation return, refrigeration service, etc.

A few staple sizes of single stage enclosed impeller pumps for general service are here listed. Machines are of the best standard construction and show good efficiencies. Case is of volute type, impeller is of enclosed balanced pattern, pump has water seal and ring oiling outboard bearing. Cast iron subbase and flexible coupling are provided ready for motor of size and speed indicated in table, according to service conditions. Pumps of this type can be furnished in iron; iron, brass fitted; or all brass.

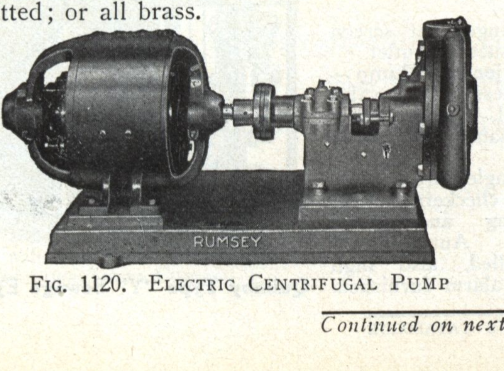


Fig. 1120. Electric Centrifugal Pump

Continued on next page

Fig. 1120, SIZES AND DIMENSIONS

Size	Approx. cap., gal. per min.	Max. head, ft.	Pipe sizes, in.	Approx. wt., lb.*	Approx. floor space required, in.*
1¼	20 to 30	110	1¼	180	35 x 18
1½	40 to 60	110	1½	180	35 x 18
2	75 to 100	110	2	310	50 x 18
2½	150 to 200	110	2½	310	50 x 18
3	250 to 350	110	3	500	56 x 22
4	350 to 500	110	4	700	64 x 26

*Weight and floor space vary greatly with size of motor used.

CAPACITY, SPEED AND POWER REQUIRED*

Size pump	Cap., gal. per min.	Total head in ft.	50	60	70	80	90	100	110
No. 1¼	20	Brake hp..	1	1.2	1.4	1.5	1.75	2	2.4
		r.p.m......	1200	1300	1375	1470	1550	1650	1750
	30	Brake hp..	1.1	1.3	1.6	1.8	2	2.4	3
		r.p.m......	1225	1320	1380	1480	1565	1670	1760
No. 1½	40	Brake hp..	1.3	1.5	1.7	2	2.4	2.8	3.5
		r.p.m......	1240	1335	1420	1510	1600	1700	1775
	50	Brake hp..	1.5	1.7	2.	2.4	2.8	3.2	3.8
		r.p.m......	1250	1350	1450	1545	1630	1730	1800
	60	Brake hp..	1.7	2	2.3	2.8	3.2	3.6	4
		r.p.m......	1275	1375	1480	1585	1680	1750	1825
No. 2	75	Brake hp..	2.3	2.7	3.2	3.6	4.1	4.5	5
		r.p.m......	1230	1330	1420	1525	1620	1715	1780
	100	Brake hp..	2.6	3.2	3.7	4.2	4.7	5.3	5.9
		r.p.m......	1250	1345	1445	1540	1635	1725	1800
No. 2½	150	Brake hp..	3.3	4	4.6	5.2	5.8	6.4	7.5
		r.p.m......	1275	1375	1475	1575	1675	1760	1850
	200	Brake hp..	4	4.7	5.4	6.1	6.8	7.5	8.4
		r.p.m......	1300	1400	1500	1600	1700	1800	1900
No. 3	250	Brake hp..	5.5	6.65	7.75	8.87	10.	11.1	12.2
		r.p.m......	1250	1340	1480	1580	1680	1760	1850
	300	Brake hp..	6.2	7.45	8.7	9.9	11.15	12.4	13.65
		r.p.m......	1265	1350	1500	1600	1700	1775	1865
	350	Brake hp..	6.9	8.28	9.65	11	12.4	13.8	15.2
		r.p.m......	1300	1380	1530	1625	1730	1810	1900
No. 4	350	Brake hp..	7.4	8.9	10.5	12.6	14.5	17	19.4
		r.p.m......	900	965	1015	1075	1150	1200	1260
	400	Brake hp..	8.4	10	11.6	13.4	15.4	18	20
		r.p.m......	925	975	1030	1100	1175	1225	1285
	450	Brake hp..	9.7	11.3	13	14.6	16.7	19.1	21
		r.p.m......	950	1000	1060	1125	1190	1250	1310
	500	Brake hp..	11	12.3	14.8	16	18	20.4	23
		r.p.m......	1000	1050	1100	1150	1210	1275	1340

**Explanation:* Total head equals vertical suction lift in feet plus vertical discharge head in feet plus all pipe friction.

Each electric centrifugal pump is built to order with impeller of proper diameter to suit capacity, head and motor speed required for the particular service for which the pump is specified. Employ above table same as for belt driven pumps. Use forty degree rating motors of size specified or, if not a commercial size, the next larger motor. Select motor of full load speed not less than speed named in table: i. e., consider speed specified in table minimum speed and select motor of nearest higher standard speed.

Electric Sump Pump, Type B

For handling drainage and seepage water, and other uses where gastight cover is not required.

Note: For similar pumps with gastight cover for sewage, boiler blowoffs, etc. see Type C in Bulletin No. 139.

Standard Type B outfit is arranged for round pit 36-in. diameter and 60-in. depth (to order for pits of other size, shape and depth) and consists of:

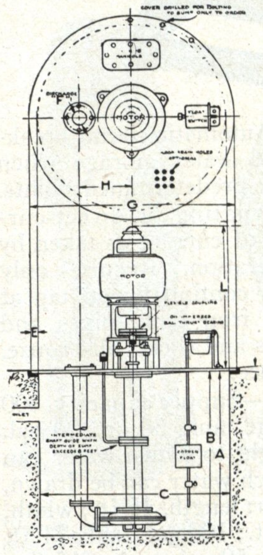

COVER DRILLED FOR BOLTING TO SUMP ONLY TO ORDER
MANHOLE
DISCHARGE
F
MOTOR
FLOAT SWITCH
FLOOR DRAIN HOLES OPTIONAL
H
G
MOTOR
L
FLEXIBLE COUPLING
OIL IMMERSED BALL THRUST BEARING
E
D
INLET
INTERMEDIATE SHAFT GUIDE WHEN DEPTH OF SUMP EXCEEDS 6 FEET
COPPER FLOAT
B
A
C

Diagram of Electric Sump Pump, Type B

Pump—Iron centrifugal pump of vertical, submerged type with open impeller, steel shaft, shaft casing, discharge pipe to cover, adjustable oil immersed ball bearing, flexible coupling, brass gland, inlet provided with strainer, shaft guide if pit depth exceeds 6 ft.

Basin Cover—Cast iron with screwed flange for discharge pipe connection. Drilled to order with floor drain holes or with bolt holes for fastening to sump curb. Provided with 11x15-in. manhole with plate, gasket and bolts. Cover not gastight.

Motor—Forty degree rating, vertical type with tripod base, selected according to service conditions and characteristics of electric current available.

Control—Automatic float switch with copper float and brass rod; fused knife switch; self-starter for motor where required; phase failure protection for polyphase motors.

Sump—To be furnished by customer, of concrete, brick or other material as desired, of inside dimensions specified, and with curb recessed ¾ in. deep by 2 in. wide all around to give cover proper lap over curb and make cover flush with floor.

SIZES AND DIMENSIONS (SEE DIAGRAM)

Pump No.	Cap., gal. per min.	For elevations up to—ft.*	Approximate dimensions, in.								
			A‡	B‡	C, usual	C, min.	D	E	F‡	G‡	H
1	10 to 20	20	60	57	36	15	¾	2	1	40	7
2	50 to 100	30	60	57	36	20	¾	2	2	40	10⅛
3	150 to 200	30	60	57	36	25	¾	2	2½	40	12
4	250 to 300	30	60	57	36	31	¾	2	3	40	16⅛
5	350 to 500	30	60	57	36	35	¾	2	4	40	18

*All outfits, except No. 1, can be furnished to order for greater elevations. Data on request, advising capacity and total head required.

‡Unless otherwise specified in ordering.

SIZE AND CAPACITY OF PUMPS AND SPEED OF MOTORS

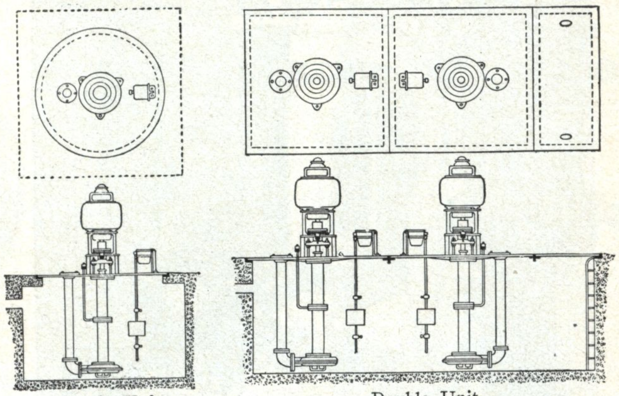
Pump No.	App'x. cap., gals. per min.	Total head, 15 ft.		Total head, 20 ft.		Total head, 25 ft.		Total head, 30 ft.	
		Hp.	Range of motor speed	Hp.	Range of motor speed	Hp.	Range of motor speed	Hp.	Range of motor speed
1	10	½	1475 to 1800	½	1700 to 1800	...	....	...	....
1	20	½	1650 to 1800	½	1750 to 1800	...	....	...	....
1	30	½	1625 to 1800	...	....	...	....	...	....
2	50	1	850 to 1500	1	980 to 1700	1½	1090 to 1800	1½	1200 to 1800
2	75	1	885 to 1560	1½	1030 to 1800	2	1150 to 1800	2	1250 to 1800
2	100	1½	920 to 1630	1½	1070 to 1800	2	1190 to 1800	2	1300 to 1800
3	150	1½	680 to 1400	2	790 to 1600	3	880 to 1800	3	965 to 1800
3	200	2	710 to 1450	3	825 to 1700	3	920 to 1800	5	1000 to 1800
4	250	3	550 to 1170	5	640 to 1360	5	710 to 1500	5	770 to 1650
4	300	3	580 to 1220	5	670 to 1415	5	750 to 1575	7½	810 to 1750
5	350	5	530 to 860	5	615 to 1000	7½	680 to 1100	7½	745 to 1200
5	500	5	560 to 910	7½	640 to 1045	10	710 to 1150	10	780 to 1265

Duplex Outfits and Modifications—The simplest method of providing for a duplex installation is to roof the pit with concrete or steel, leaving two 36-in. openings for the insertion of two standard Type B single pumps.

However, we can furnish two pumps mounted on a common cover or on a cover in two sections, or other arrangements to meet any specifications.

The standard size covers with which Type B outfit is listed are less expensive and can be delivered more promptly than special covers.

Standard covers can be used with odd size sumps according to whether large or small by allowing standard cover more than the usual 2-in. lap over curb, or by roofing sump with concrete or with steel plate to reduce opening to proper size for standard cover.



Single Unit

Double Unit

Duplex Pumps

Catalogue

General Catalogue, 58th edition, published in 1924, our 84th anniversary number—the most complete catalogue of pumps. Separate bulletins available for our individual products.

THE AMERICAN MACHINE & FOUNDRY CO.

Pumps and Water Supply Systems

5520 Second Avenue
BROOKLYN, N. Y.

Products

AMF Rotary Vacuum Pumps for hospitals, dispensaries, chemical and scientific laboratories, etc.

AMF Automatic Water Supply Circulating System for farms, estates, schools, camps, horticultural nurseries, etc.

Business Experience

Years of experience in producing vacuum and circulating pumps has enabled The American Machine & Foundry Co. to incorporate many practical and essential features of great importance in pumps of this type.

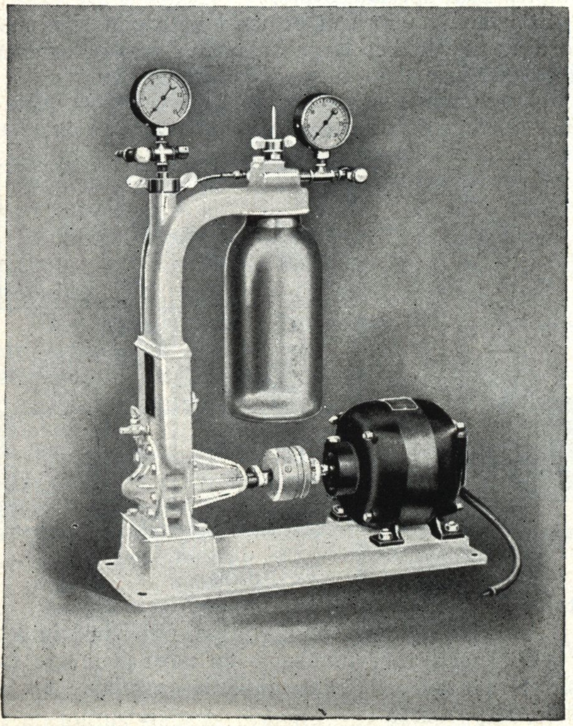
Specification Facilities

We render complete engineering and service facilities to architects in preparing specifications to meet the necessary equipment and installation requirements.

AMF Rotary Vacuum Pump

Uses—The AMF Rotary Vacuum Pump is especially adapted for use in hospitals and dispensaries, chemical, scientific and technical laboratories for furnishing vacuum service for general use such as electric ovens, for filtering, for concentrating liquors, lecture purposes, demonstrations, for use with milk machines, etc. AMF Vacuum Pumps may be applied to any vacuum requirement within the limit of their capacity.

Advantages—Efficient, light in weight and compact. Especially adapted for direct connection to commercial high speed motors. Minimum power and upkeep cost. Operates free of attention. Dangerproof if vacuum is broken. Operates without noise and is practically vibrationless. Continuous flow without pulsation. Simple in construction and easy to install. Wearing parts may be easily replaced.

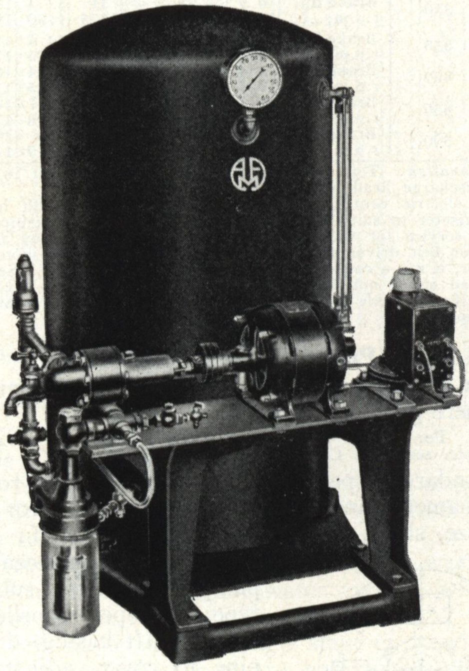


Description—The AMF Vacuum Pumps consist essentially of an oil sealed rotor operating in an airtight housing. A sliding vane separates suction and discharge parts, obviating the need of valves.

Oil compartment above pump holds sufficient oil to seal pump and parts at all times. Discharge passage leads to top of oil compartment where the discharge striking a baffle causes the oil to separate and drop to the bottom. All parts of various sizes are interchangeable.

AMF Automatic Water Supply and Circulating System

Description—This unit consists of a water storage tank and a motor directly connected to rotary pump mounted on cast iron bed plate. Automatic circuit breaking device controls pressure and water storage when water rises above or drops below predetermined points.



Advantages—A ¼-hp. alternating or direct-current motor, utilizes same amount of current as taken by a 25-watt lamp. Noiseless in operation. Requires only occasional lubricating. Water is continually on tap at maximum pressure. Galvanized iron tank, pipes and fittings throughout. Pump, valves and cocks, all-bronze. Simple and attractive in appearance.

Capacity and Specifications—Supply capacity, 300 gal. per hour. Capacity of storage tank, 50 or 100 gal. Maximum pressure, 40 lbs. Height to which water can be forced, 40 ft. Depth from which water can be drawn, 20 ft. Over-all unit measurements: length, 35 ft.; width, 29 ft.; height of 50-gal. tank, 38 ft.; 100 gal. tank, 71 ft. Net weight of complete unit with 50-gal. tank, 215 lb.; ¼-hp. motor.

THE DURO PUMP & MANUFACTURING CO.

Manufacturers of Pumps, Electric Water Pressure Systems, Automatic Water Softeners and Filters

DAYTON, OHIO

BRANCH OFFICES AND REPRESENTATIVES IN ALL THE IMPORTANT CITIES IN THE UNITED STATES AND CANADA

Products

Duro Shallow and Deep Well Pumps and Complete Water Supply Systems.

Duro Automatic Water Softeners and Water Filters.

Guarantee

Guaranteed in writing, for one year against defects in workmanship, material or design.

When Duro Advisory Service is used, Duro is ready and willing to assume full responsibility for the installation of the pump or softener—guaranteeing satisfactory water service or money refunded.

Where Duro Pumps Can Be Used

Duro will automatically supply running water under strong, dependable pressure, "Just like City Water Service," from deep or shallow wells, lakes, streams, cisterns, etc., for homes, hotels, farms, camps, ranches, golf and country clubs, greenhouses, yachts, dairies, and scores of other places. Furnished in capacities from 120 to 2150 gallons per hour, with any size storage tanks.

How to Specify Duro Pumps, etc.

Simply state depth of well, the distance from service fixtures, size of storage tank, and the approximate usage during the peak period, and the average weekly usage.

TRADE-MARK

Automatic Water Softeners

Duro manufactures completely automatic water softeners for domestic and commercial purposes, softening up to 30,000 gallons of hard city water between salt fillings. Perfectly softened water is supplied at city water pressure, and with an unrestricted flow.

Supplies 22 to 50% more zero soft water per pound of salt. Pure rock salt gives best results.

Not limited to any certain city water pressure. Easily adjusted for any hardness of water.

Supply of water is constant—no interruption while softener is automatically regenerating.

Fully covered by Duro Guarantee Bond. Priced as low as $175.00 for ordinary home.

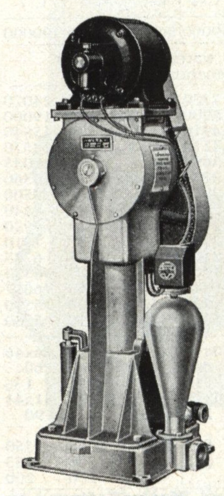
Bungalow type hand operated softeners as low as $99.50.

How to Specify Softeners

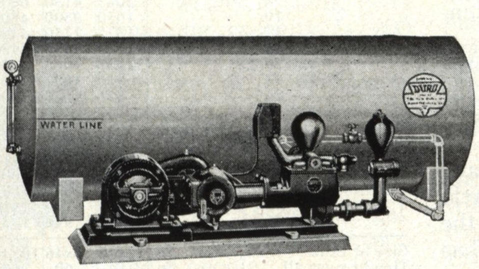
Advise the hardness of the city or well water and the average daily requirements, and our engineer will promptly submit full and complete details. Catalogues upon request.

Advisory Service

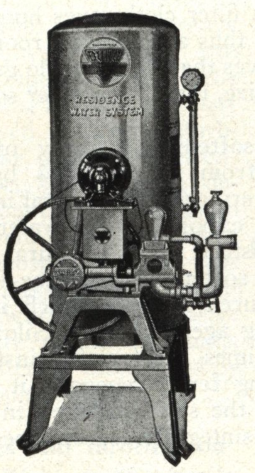
There is a Duro Engineer in your locality and it is his job to consult with you without expense or obligation on your part. Our volume of business as one of the largest manufacturers of water supply systems makes possible this important and valuable service.



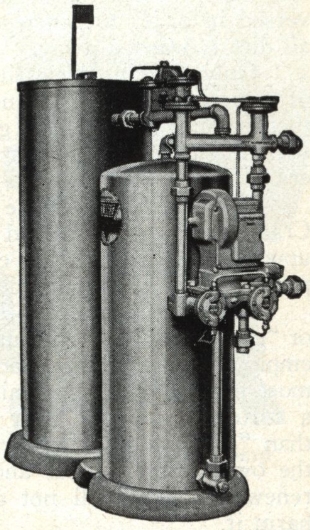
Super Deep Well Pump
With capacities of more than 2150 gal. per hour



Powerful Shallow Well Pump
For supplying large estates, golf and country clubs, dairy farms and even small villages. Automatically operated, with a steady, constant, dependable supply of water for all purposes. This is the Type 100 Shallow Well Suction Pump



Popular Vertitank Self-contained Unit
For average suburban or farm use



A Completely Automatic Water Softener That Regenerates Itself
Operated by hydraulic pressure

A Few of Scores of Sizes and Types of Pumps, Systems and Automatic Softeners

CRANE CO.

Water Softeners and Water Supply Systems

836 South Michigan Avenue, CHICAGO, ILL.

For List of Branches and Sales Offices, see page 1999

Products

Water Softeners.

Deep and Shallow Well Pumps and Water Supply Systems.

For Gas Water Heaters, see pages 1870-1871; for Plumbing Fixtures and Radiator Valves, see pages 1999-2006.

Crane-Warlo Water Softeners

Knowledge of the many advantages of soft water over hard water is becoming widespread. With it there has developed a growing demand for individual water softeners for homes, schools, etc.

The Crane-Warlo is a simple, compact machine which makes hard water soft. It takes from the water those minerals which "lime up" pipes and kettles. It does away with the hard water film which clouds glassware, robs foods of their finest flavor, irritates the skin, stains clothing in the wash and leaves "high water marks" around the sides of tub and bowl. It does all this, and more, in the easiest, surest and cheapest way.

Of all the softeners on the market, we believe the Crane-Warlo costs the least to operate and that it is most effective and dependable in action. The only attention it requires is to pour ordinary salt through the salt cap, reverse the flow of water and thus thoroughly wash and renew the mineral. This is done about twice a month. Every part is guaranteed.

Crane-Warlo Features—*Special Filter Cloth*—Replacing the bulky layer of sand and gravel used in other water softeners, the Crane-Warlo uses a special filter cloth (patent applied for). This strong, durable cloth is of rustproof Monel metal so finely woven that in the size C-2 softener there are, approximately, 12,000,000 tiny holes for water to pass through. This filter cloth not only distributes the water but also eliminates all foreign particles. Because of its high filter capacity it will soften muddy or cloudy water which would soon clog other softeners. When the flow of water is reversed in order to renew the water softening mineral, all dirt is washed away.

Only .027 in. thick, this filter cloth saves hundreds of cubic inches of space and thus allows more room for the softening material. It gives the Crane-Warlo greater softening capacity, size for size, than some other softeners.

Upward Flow—The softening capacity of the Crane-Warlo is increased from 7% to 11% by the upward flow, which keeps every grain of mineral in suspension with all of its sides exposed to the water.

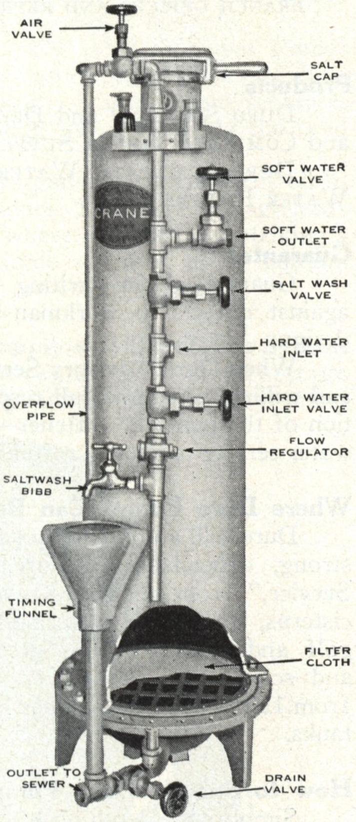
Chemical Mineral—Instead of the "natural clay" or "greensand" used in some softeners, the Crane-Warlo employs Silox, a manufactured mineral which is the most perfect water softening agent known. Silox has a softening capacity four times greater, for instance, than "greensand." Requiring fewer renewals, it saves the owner time, bother and the salt consumed in each renewal. Silox will not disintegrate. Iron does not harm it.

Improved Salt Cap—The special gasket of the Crane-Warlo salt cap lasts for years without leakage. The jack screw operating principle of the salt cap positively prevents jamming.

Glass Lined Tank—The Crane-Warlo is the only water softener supplied with a glass lined tank. Fused to the inner side of the tank, the glass forms a permanent protection against rust or corrosion. It withstands the brine of the salt wash which soon eats away even the heaviest galvanized coating.

Measure and Funnel—Crane-Warlo renewals are made easy and effective. A copper salt receiver measures the exact amount of salt needed. A timing funnel assures the proper flow of water regardless of what the city pressure may be.

Construction—Simple and sturdy construction in every part distinguishes the Crane-Warlo water softener. Only Crane valves and fittings are used. All materials are of the highest grade. The handsome blue tank is bolted to a heavy cast iron base. It is the only softener which, if necessary, could be taken apart and reassembled without damage.



Sectional View of Crane-Warlo Water Softener

Showing special filter cloth supported by cast iron grid over sediment chamber. Note that tank is bolted to base

CRANE-WARLO WATER SOFTENERS

Size	C-1	C-2	C-3	C-4	C-5	C-6	C-7
Capacity in grains hardness	16500	33000	48000	59000	86000	130000	190000
Hardness of water in grains per gallon	Gallons of soft water delivered per regeneration						
8	2065	4130	6000	7380	10730	16250	24070
10	1650	3300	4800	5900	8600	13000	19000
12	1375	2750	4000	4910	7160	10830	15840
14	1178	2356	3430	4210	6130	9290	13570
16	1033	2066	3000	3690	5365	8125	12035
18	916	1832	2665	3275	4770	7220	10560
20	825	1650	2400	2950	4300	6500	9500
22	750	1500	2182	2680	3910	5910	8640
24	688	1376	2000	2460	3580	5415	7920
26	634	1268	1845	2270	3310	4990	7310
28	589	1178	1715	2105	3065	4645	6785
30	550	1100	1600	1966	2867	4333	6333
32	517	1034	1500	1845	2687	4063	6017
34	485	970	1410	1735	2530	3825	5590
36	458	916	1332	1637	2385	3610	5280
Size of tank . . . in.	12x40	16x46	18x46	20x46	24x46	30x46	36x46
Height over all . . . in.	54	60	60	60	60	60	60
Valves and fittings . . . in.	½	¾	¾	1	1	1¼	1½
Floor space required . . . in.	17x20	21x24	23x26	25x28	29x32	35x38	41x44
Salt, per regeneration . . . lb.	7½	15	19	27	40	60	90
Shipping weight:							
Tank and fittings . . . lb.	250	360	410	540	700	1050	1350
Mineral . . . lb.	95	180	230	325	475	700	935
Brine tank . . . lb.	. . .	. . .	. . .	. . .	100	150	200

How to Determine the Proper Size Crane-Warlo Softener to Install—*Example:* Suppose the water supply has 22 grains hardness and there are 4 persons in the household. 25 gal. per day per person means about 1400 gal. needed over the convenient 2-week period. The table shows that for 22-grain water, Size C-2 gives 1500 gal. of soft water before renewal is necessary. Size C-2, therefore, is the proper unit to install in this case.

Continued on next page

Crane-Warlo Deep Well and Shallow Well Water Systems

There is a Crane-Warlo water system to meet every requirement.

Capacities from 200 to 6000 gal. per hour for deep or shallow wells.

Electric or gasoline power.

Stoutly Constructed—The *oversized* parts of a Crane-Warlo system mean *underworked* parts with minimum strains and wear.

Quality Materials—Crank shafts have double bearings of highest quality carbon steel, forged and specially heat treated.

Every bronze part is forged, not merely cast.

Perfected Design—Design is simple. No delicate or complicated parts to get out of order.

Flood lubrication saves wear.

Even in a dimly lighted basement the patented visible oil gauge tells when more oil is needed.

The special device which prevents the oil from mixing with the water has no packing to wear, leak and need replacing.

Completely Accessible—In no other pump are parts so easy to get at. For example, the suction valve can be reached by merely removing one nut.

Parts Interchangeable—Bearings are machined to .0005 in.

So exact is the precision that parts are interchangeable without fitting.

Thoroughly Tested—Every Crane-Warlo system is tested for 5 hours under full working load. It must prove its ability to pump its full capacity with standard current consumption before it is allowed to leave the factory.

Crane-Warlo Automatic Shallow Well Unit

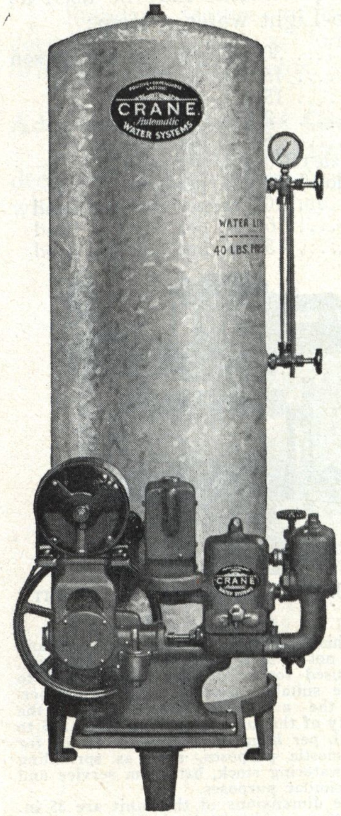
Crane-Warlo shallow well systems are furnished in various capacities with electric or gasoline motor pump and storage tank, ready for all plumbing and electrical connections.

Size 215-A shown here, has a 42-gal. storage tank, galvanized inside and outside, with electrically welded seams. Its pumping capacity is 200 gal. per hour, ample for families of 3 to 5 persons.

System No. 215-B and 215-C use the same pump and motor with tanks of 53 and 82-gal. capacity for families of 6 and 8 people.

Where larger capacity is required, we recommend the use of Crane-Warlo No. 400 outfit.

Shallow well pumps have maximum lift capacity of 22 ft.



Crane Shallow Well Pump No. 215-A

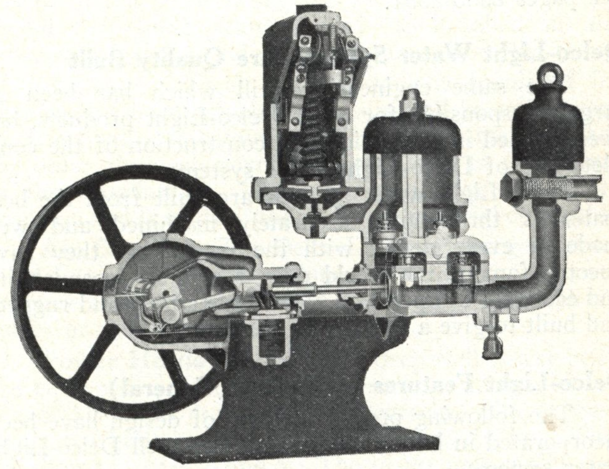
42-gal. tank, ⅙ hp. electric motor. Complete, f.o.b. factory, $120.00

Crane-Warlo Automatic Shallow Well Pump

Furnished for either electric or gasoline power. Easy to get at and easy to operate.

The Crane-Warlo automatic pump is a perfected design created by experienced hydraulic engineers. After years of service, any part which needs to be removed will be found easy to get at.

Ample lubrication of all parts is assured at all times by the "splash" system; there are no hidden oiling places to forget. The ⅙ hp. motor is the best made for pumping purposes. An improved 2-pole switch insures automatic starting and stopping. All valves, fittings and trimmings are thoroughly tested. Built to give years of reliable service with a minimum of attention and cost.



Crane-Warlo Shallow Well Pump No. 215
Capacity, 200 gal. per hour

Crane-Warlo Automatic Deep Well Unit

The Crane-Warlo deep well pump has a capacity of 150 to 250 gal. per hour. It is ideally suited for use with wells that range from 35 to 200 ft. in depth. All working parts are enclosed from dust and grit in a permanent housing. Pistons, gears, plunger rods, etc., are balanced to give efficient service. Every moving part operates in a flood of oil from a small rotary pump, yet no water can reach the oil side of the pump. Plungers are easily renewed without disturbing the pump head itself. Motor, ¼ to 1 hp., depending on size and depth of well, is of the latest and most economical type with 2-pole automatic control switch. An exclusive feature is the air pump, operated or disengaged by a simple lever.

POSITIVE · DEPENDABLE · LASTING
CRANE
Automatic
WATER SYSTEMS
PATENT PENDING
MADE FOR
CRANE CO.
BY
WARD-LOVE
PUMP CORP.
ROCKFORD, ILL.
U.S.A.

Crane Deep Well Pump

Prices and Information

Write to Crane Co. or call at the nearest Crane branch or sales office for prices and specific information covering your requirements.

DELCO-LIGHT COMPANY

SUBSIDIARY OF GENERAL MOTORS CORPORATION

Manufacturers of Electrically Operated Water Supply Systems

DAYTON, OHIO

DEALERS IN PRINCIPAL CITIES

Products

WATER SUPPLY SYSTEMS: Automatic, with or without pressure tank.

For Electrically Operated Automatic Refrigerators, see pages 2330-2331.

Delco-Light Water Systems Are Quality Built

The same engineering skill which has been so largely responsible for other Delco-Light products, has been applied in the design and construction of the complete line of Delco-Light water systems.

Delco-Light water systems are built from the best materials throughout, accurately machined and well made in every detail, with the result that they have become famous the world over for their dependability and economy of operation. They are strong and rugged, and built to give a lifetime of service.

Delco-Light Features of Design (General)

The following proved features of design have been incorporated in both shallow and deep well Delco-Light water systems.

Splash System of Lubrication—The splash system of lubrication is employed, consequently there is only one place to oil, and positive and adequate lubrication of all moving parts is assured. Bottom of gear case forms a generous oil reservoir, fully protected from dirt and grit. No grease or oil cups.

Built-in Motors—Motors are built especially for Delco-Light water systems, insuring dependability and economy of operation. Motors are "inbuilt" and form an integral unit with the gear case. They have ball bearing shafts and overhanging armatures.

No Belts or Chains—Direct worm gear drive is quiet, positive and efficient. It eliminates troublesome belts and chains.

No External Moving Parts—Delco-Light water systems are self-contained, simple, compact units, with totally enclosed working parts. No danger of injury.

Efficient Cylinder and Valve Mechanism—Delco-Light shallow well units employ the double action principle in pumping. Water is drawn, therefore, on each forward and backward stroke of the piston.

Delco-Light deep well units employ the differential principle in pumping; i. e., two cylinders are used, an upper and a lower. The lower cylinder lifts the water and the upper cylinder acts as a relay to the tank.

The two principles mentioned above ensure a smooth running unit which will not cause lights to flicker when the pump is in operation.

Automatic Operation—Delco-Light water systems are automatic. They are controlled by an automatic pressure switch which starts the motor when the pressure lowers and stops it when the pressure reaches its maximum.

How to Figure Water Requirements

The following water requirements may be used as a guide in selecting a Delco-Light water system:

For all household uses	30 gal. per day per person
To fill an ordinary bath tub	15 gal.
Average shower bath	15 gal.
Ordinary lavatory	2 gal. per filling
Flushing water closet	5 gal. per flush
Sprinkling (½-in. hose with nozzle)	250 gal. per hour
Drinking fountains (continuous flow)	50 gal. per hour
Cattle	10 gal. per day per head
Horses	6 gal. per day per head
Hogs and sheep	3 gal. per day per head

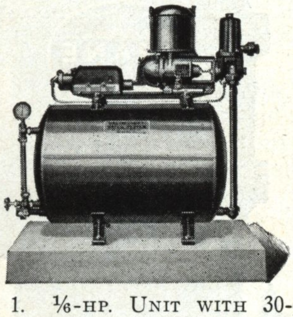


FIG. 1. ⅙-HP. UNIT WITH 30-GAL. PRESSURE TANK

This unit is suitable for use where the water requirements will not exceed the capacity of the unit, which is approximately 160 gal. per hour (except where 25-cycle current is supplied. In such cases the capacity is figured at 120 gal. per hour).

This unit is 35 in. high; 18¼ in. wide; 33⅝ in. long.

It is supplied with 110 or 32-volt d-c., 110-220-volt a-c., 60 or 25-cycle motors.

This unit can also be supplied without pressure tank for installation where a pressure tank has been in use with another system, or where a special large pressure tank is required.

Can be supplied with 11-gal. tank also. Dimensions: 33⅝ in. long; 18¼ in. wide; 35 in. high

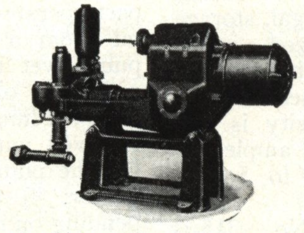


FIG. 2. ¼-HP. UNIT WITHOUT TANK

Suitable for pumping into a large pressure tank. This unit has a capacity of 300 gal. per hour.

The dimensions of this unit are 37 in. long; 23 in. high; 15 in. wide

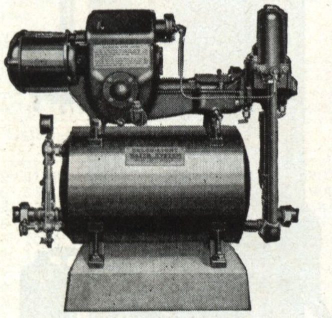


FIG. 3. STANDARD ¼-HP. UNIT WITH 11-GAL. TANK

This tank is only a small pressure tank and is not to be regarded as a storage tank. It is used for regulating pressure and to provide suitable pressure ranges for operating the automatic switch. Since the capacity of this unit is approximately 275 to 300 gal. per hour it will provide water for all domestic purposes, such as sprinkling lawn, watering stock, bathroom service and other similar purposes.

The dimensions of this unit are 35 in. long; 15 in. wide; 28 in. high

Continued on next page

Delco-Light Shallow Well Water Systems

Suitable for wells where the vertical lift is not more than 22 ft.

Figs. 1 and 3 are of the unit construction type, using a small pressure tank, while Fig. 2 is for use in connection with a detached storage tank.

The unit construction type pumps water directly from the source of supply into a small pressure tank where it is constantly being replaced as water is drawn at the faucet. This small tank saves installation cost and insures cool, fresh water at all times.

Automatic and Positive Operation—Switch stops motor as pressure rises. When pressure falls, switch closes circuit and starts motor.

Pressure Tanks—A strong integral unit made from heavy steel, welded throughout. Baked enamel finish inside and out.

Special Features of Design—Self-priming; valves made from best rubber composition; piston leathers made from highest quality tanned leather. Other features same as explained under "Delco-Light Features of Design."

What We Furnish—Our shallow well systems are delivered as complete, compact units, all set up ready to bolt to base, as shown in illustrations. We recommend that they be installed on a cement base. Installation instructions are furnished with each unit. We do not furnish fittings between pump and well or between pump and detached storage tanks.

Delco-Light Deep Well Water Systems

These units are suitable for wells where the vertical distance to water is over 22 ft. and to depths where water must be lifted from as far as 250 ft.

Standard features of design are carried out in all deep well units, such as "one place to oil," worm gear drive and overhung motor.

Additional Features of Great Advantage

Totally Enclosed and Protected—Delco-Light deep well power heads may be installed out of doors with no protection, as they are weatherproof. This is due to the enclosed features of the gear case. A pit is unnecessary and a pump house is not needed. As a result the cost of a pit and pump house is saved to the user. Working parts are readily accessible by removing a cover plate. The discharge head which is located below the frost line is sealed with concrete on cased well installation. This protects the well from all kinds of pollution from surface water.

Easy to Install—These units are easy to install and easy to remove from the installation whenever inspection is necessary. The cylinders and valves may all be removed without removing or disturbing the discharge head.

Control—There is no switch, air pump or tank attached to the power head and the apparatus is so designed that these features may be installed in any frostproof location and at any distance from the pump.

Tank—A 120-gal. pressure tank is furnished for all standard installations. This size will be satisfactory for nearly all installations. Arrangements may be made for other sizes whenever necessary due to the nature of the installation. This tank is of rivet-weld construction and is made of the very best material obtainable.

Air Charger—The Delco-Light air charger is used to maintain the proper volume of air in a deep well pressure tank. It is a simple device having no delicate valves or delicate moving parts.

Power Heads—Delco-Light deep well power heads are equipped with motors to operate on 32 or 110-volt d-c. or 110-220-volt a-c., 60-cycle current. These power heads are built in two sizes, ¼ hp. and ½ hp. They are shown in Figs. 4 and 5. The ¼-hp. unit can be supplied with 25-cycle motors.

The ¼-hp. unit may be used for pumping from a depth as low as 125 ft. and the ½-hp. unit may be used for pumping from a depth as low as 250 ft. Further data upon depths and capacities are furnished upon application.

Cylinders—Pumping cylinders consist of an upper or differential cylinder and a lower or bottom cylinder. All working parts of both cylinders are made of brass to insure long life and durability.

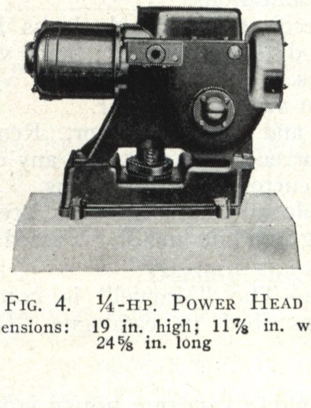


FIG. 4. ¼-HP. POWER HEAD
Dimensions: 19 in. high; 11⅞ in. wide; 24⅝ in. long

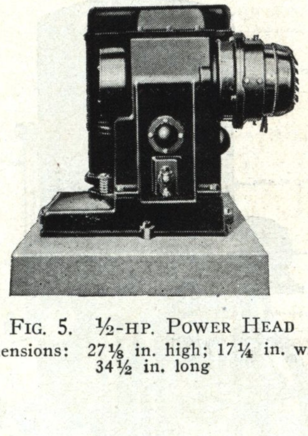


FIG. 5. ½-HP. POWER HEAD
Dimensions: 27⅛ in. high; 17¼ in. wide; 34½ in. long

ESTABLISHED 1880

THE DEMING COMPANY

Hand and Power Pumps; Complete Water Systems

SALEM, OHIO

GENERAL AGENCIES SPECIALIZING IN DEMING POWER PUMPS

BALTIMORE, Southern Supply Co.
BOSTON, Chas. J. Jager Co., 13-15 Custom House Street
BUFFALO, Root, Neal & Co., 178-180 Main Street
CHARLESTON, W. VA., Charleston Electrical Supply Co.
CHARLOTTE, The Deming Co., Realty Building
CHICAGO, Henion & Hubbell, 217-21 N. Jefferson Street
CLEVELAND, Strong, Carlisle & Hammond Co.
COLUMBUS, Scioto Valley Supply Co.
DENVER, Hendrie & Bolthoff Mfg. & Supply Co.
DETROIT, Kerr Machinery Corporation, Kerr Building
EL PASO, Momsen-Dunnegan-Ryan Co.
KANSAS CITY, MO., English Tool & Supply Co.
LOS ANGELES, R. W. Sparling
LOUISVILLE, Laib Co.
MIAMI, Miami Supply Co., 253 W. Flagler Street
MINNEAPOLIS, Central Supply Co.
MUSKOGEE, Atlas Supply Co.
NEW ORLEANS, Stauffer Eshleman Co.
NEW YORK, Ralph B. Carter Co., 152 Chambers Street
PHILADELPHIA, W. P. Dallett Co., 922-24 Sansom Street
PITTSBURGH, Harris Pump & Supply Co.
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CANADA: MONTREAL, TORONTO, WINNIPEG, Darling Bros., Ltd.

Products

Deming Hydro-pneumatic Systems, operated by Hand or Windmill, Gasoline Engine, or Electric Motor.

Pumping Machinery, for operation by any power, including Single and Double Acting Triplex Pumps for various services, Deep Well Power Working Heads, Artesian Well Cylinders.

Also manufacturers of Rotary Pumps, Hydraulic Rams, Spray Pumps and Accessories.

Co-operative Engineering Service

Architects and engineers are invited to refer their pumping and water system problems to the Deming engineering department.

On receipt of layout of conditions and statement of requirements, an estimate for the pumping equipment will be submitted.

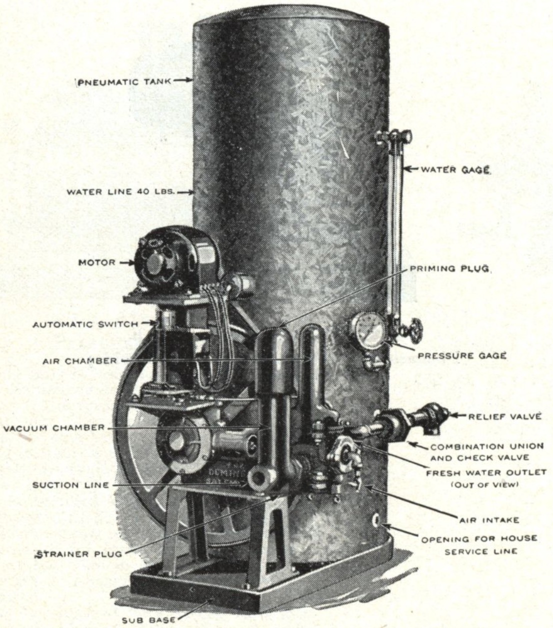
Blue prints and photographs showing typical installations will be sent on request.

Deming "Marvel" Electric Water System

For wells 25 ft. deep or less.

Will supply plenty of water for all the requirements of the bathroom, laundry and kitchen in the average home at a cost for current that seldom exceeds 2 cents a day and is usually under 1 cent. Does its work silently, efficiently and practically without supervision. Is self-starting; self-stopping; self-oiling; self-priming—entirely automatic.

May be operated by power generated by any standard farm lighting plant.



Marvel System No. 2085, No. 1

Equipment Specifications—System No. 2085 is furnished complete as illustrated, ready for use as soon as connections are made to pipes and electric wires, and includes:

"Marvel" electric house pump with electric motor; automatic switch; pulleys; spring belt tightener, flat belt; galvanized steel tank; pressure gauge; water gauge; relief valve; fresh water outlet and cast iron subbase or floor plate.

Marvel Features—

Slow speed pump. About 130 strokes per minute.

Power end, water end, and *cylinder* are cast separate, thereby reducing repair costs.

Valves are accessible without disturbing the suction or discharge connections.

Pump specifications include brass lined cylinder; brass piston rod; brass plunger; brass valve seats and noiseless valves.

Strainer in vacuum chamber.

Repulsion and induction motor. Requires less than one-half the current to start it than any other type, and consumes less current when operating.

Double pole automatic switch. Breaks both lines and prevents ground to motor. Passed by *all* underwriters.

Catalogue—The "Marvel" is completely illustrated and described in catalogue "Deming Water Systems."

NO. 2085. "MARVEL" ELECTRIC HOUSE PUMPING OUTFIT

No.	Capacity of pump per hr., gal.	Diam. pipes, in.		Capacity of galv. tank, gal.	Maximum working pressure, lb.	Over-all dimensions, in.			Shipping weight of outfit, lb.
		Suction	Discharge			Height	Length	Width	
1	240	1	½	53	50	53	25	33	340
2	450	1¼	¾	120	50	65	27	40	500
1-A	240	1	½	15	50	33	25	28½	250
2-A	450	1¼	¾	15	50	33	27	30	365

Continued on next page

Deming "Oil-Rite" Double Acting Piston Pump, Fig. 809

For supplying water to farms, country estates, golf and country clubs, greenhouses, schools, institutions, factories, railways, etc., where vertical suction lift is 25 ft. or less.

Specifications—From the reservoir in the base, the oil is carried by the *main gear* and distributed to all bearings and moving parts.

Double flange in crank case cover prevents oil from splashing out and water or dirt from working in.

Crank case is fitted with substantial hinge for easy handling of case cover.

Renewable bronze "slip in" bearings on pinion shaft. No need to tear down pump when bearings become worn.

Suction and discharge valves are accessible, without disturbing any pipe connections. Suction valves are removed through handhole plate; discharge valves, by removing air chamber.

Many brass and bronze parts. Piston rod is drawn bronze. *Valve seats* are bronze, of the grid type, securely screwed into valve decks. *Cylinder liner, stuffing box glands, valve stems and springs* are brass.

Gear and main bearings are cast integral, insuring perfect alignment of all moving parts. *Gears* are machine cut.

Safety. All gears are fully enclosed.

Types of Drive—Type "B" drive includes standard pump without pulley, but with subbase and gearing for electric motor.

Type "C" drive includes iron bed plate under pump and motor, with connection through short belt and spring tightener.

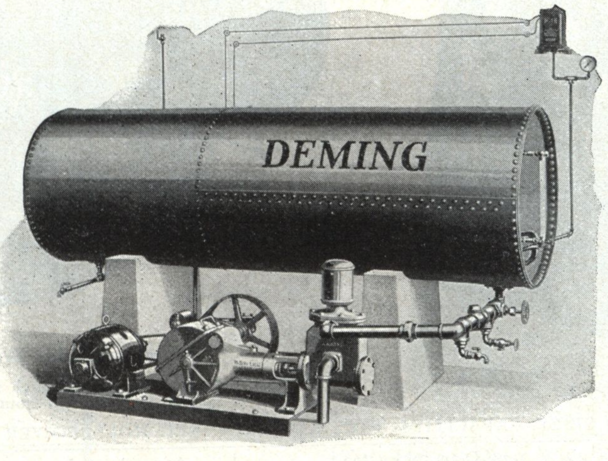
Type "CH" drive includes one-piece channel iron base, belt, idler and large tight pulley.

Type "CHD" drive includes one-piece channel iron base and silent chain drive.

Type "G" drive includes standard pump without pulleys, but with subbase and gearing for gasoline engine.

Electric motors or gasoline engines are not included with above drives.

Bulletin—Special bulletin concerning complete systems in connection with Fig. 809 pump on request.



Complete "Oil-Rite" System with Type "CH" Drive

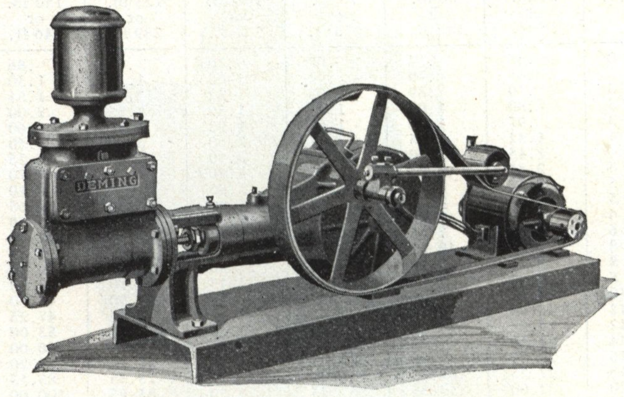


Fig. 809 with Type "CH" Drive

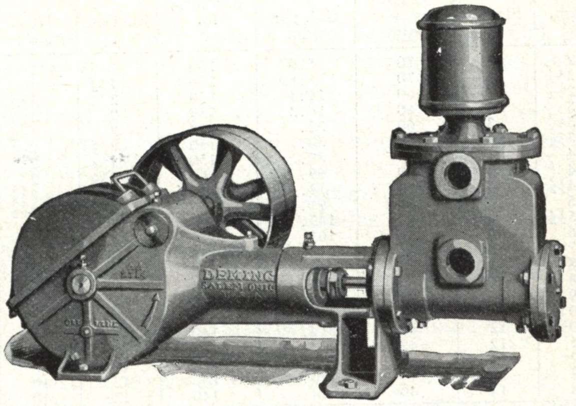


Fig. 809, All Sizes with Tight and Loose Pulleys

SIZES, CAPACITIES, ETC., FIG. 809 AND COMPLETE WATER SYSTEM FITTINGS

Cylinder, in.		Capacity			Diameter pipes, in.		Tight and loose pulleys	Hp. of motor generally used		Fittings included in complete motor driven system							
											Number of gauges furnished		Valves, in.				
Diameter	Stroke	Gal. per rev.	Rev. per min.	Gal. per min. at maximum speed	Suction	Discharge		Electric motor	Gasoline motor	Cat. No. of automatic switch	Pressure	Water	Pressure	Gate	Relief	Hose bibb, in.	Stop and waste cock, in.
2½	2½	.106	60 to 70	7.42	1¼	1¼	10x2	½	1	Fig. 1608	1	1	1	1	¾	½	¾
3	3	.184	50 to 60	11.04	1½	1½	12x3	¾	1½	Fig. 1608	1	1	1¼	1¼	1	½	¾
4	4	.427	50 to 60	25.62	2	2	14x3	1½	2½	Fig. 2352	1	1	2	2	1	¾	¾
5	5	.833	50 to 60	49.98	2½	2	16x4	3	4	Fig. 2352	1	1	2½	2½	1½	¾	¾
6	6	1.444	45 to 55	79.64	3	2½	20x5	......	......	......	......	......	......	......	......	......	......

Maximum working pressure, 75 lb. Gear ratio, 5 to 1

Deming Single Acting Triplex Plunger Pump, Fig. 50

For office buildings, hotels, hospitals, theaters, country clubs, factories, municipalities, etc., where the vertical suction distance is not more than 25 ft.

Specifications—*Frame*—Of large sizes, made in one casting, with guides and crank shaft bearings lined with antifriction metal. In sizes 4x4 and smaller, frame and cylinder cast in one piece. *Gearing*—Machine cut, double in sizes 9x10 and larger. *Pinion Shaft*—Of steel, running in antifriction metal bolted to main housing. *Connecting Rods*—In sizes 4x6 and larger, have bronze boxes with wedge and screw adjustments at crosshead end and marine type babbitted boxes at crank end. Smaller sizes have bronze bushings at crosshead ends. *Crossheads*—Run in bored guides. Sizes 4x6 and larger have bronze adjustable shoes. *Plungers*—Of best cast iron, finished true and smooth; packing of ample depth. *Cylinders and Base*—In one casting in sizes 10x10 and smaller. In larger sizes, cylinders are separate castings. *Valve Chambers*—In sizes 3½x4 and larger, separate castings bolted to cylinders.

Valves—Of large area and readily accessible; for cold water are rubber disks, protected on top from cylindrically wound springs by brass plates; for hot water, either special hard composition or bronze valves. *Valve Seats*—Bronze, of grid type, screwed into decks. Iron seats and valves furnished, if required. *Grease Cups*—With all pumps. Gear ratios 5 to 1.

Pumps furnished with bronze plungers, and varying otherwise from standard construction, at extra price.

For other Deming triplex pumps with various types of drives, see bulletin No. 300-A.

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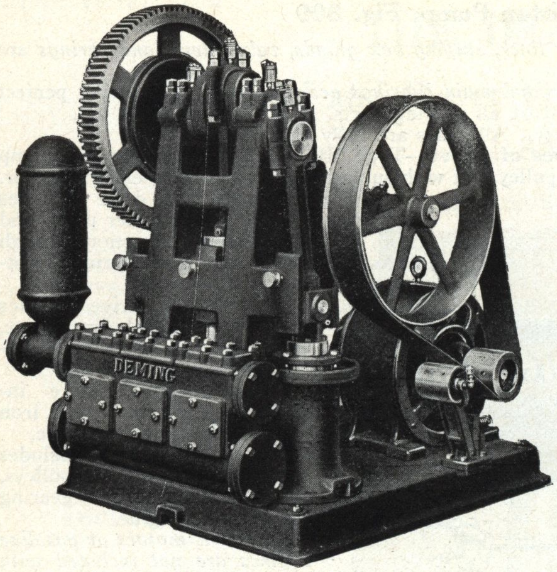
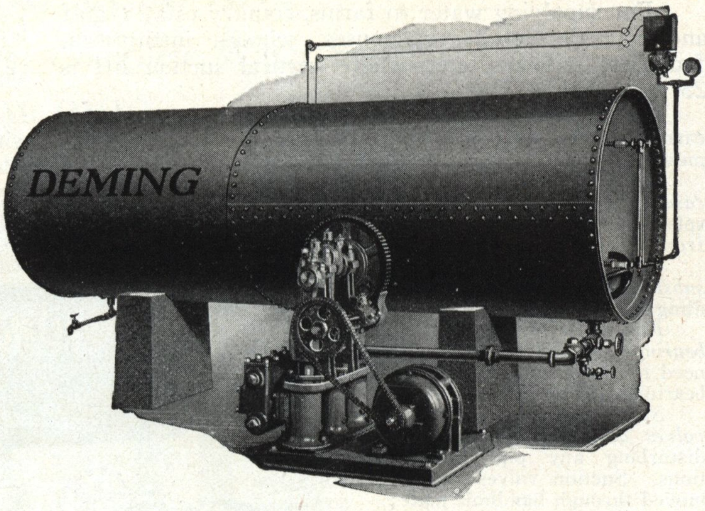


Fig. 50. Deming Triplex Plunger Pump
Size 5½x8 in. with Type "C" drive



Deming Triplex Water System No. 2025
Fig. 50 pump connected through silent chain drive to 5 hp. electric motor. Capacity of system 2300 gal. per hour. For suction lift of 20 ft. or less

STANDARD SIZES, CAPACITIES, ETC., AND REQUIRED HORSEPOWER FOR FIG. 50

Plungers, in.		Capacity		Maximum working pressure, lb.	Diam. pipes, in.		*Tight and loose pulleys, in.	Approximate horsepower required to operate Fig. 50 pumps					
Diam.	Stroke	Usual rev. per min.	Gal. per min.		Suction	Dis-charge		25 lb. or 58 ft.	50 lb. or 115 ft.	75 lb. or 175 ft.	100 lb. or 231 ft.	125 lb. or 289 ft.	150 lb. or 346 ft.
2	2	70	5.67	150	1½	1	8x 2	.46	.54	.62	.70	.79	.86
2½	2	70	8.89	150	1½	1	10x 2	.65	.78	.92	1.03	1.16	1.30
2½	3	60	11.4	150	2	1½	12x 3	.70	.89	1.03	1.22	1.38	1.54
3	3	60	16.2	150	2	1½	14x 3	.80	1.03	1.26	1.50	1.75	2.00
3½	3	60	22.	150	2	1½	16x 3	.97	1.30	1.60	1.92	2.25	2.60
3½	4	60	30.	150	2½	2	16x 4	1.32	1.75	2.17	2.60	3.05	3.50
4	4	60	39.	150	2½	2	18x 4	1.45	2.00	2.55	3.10	3.65	4.25
4	6	60	59.	160	2½	2	20x 5	2.35	3.25	4.05	4.90	5.80	6.70
4½	6	60	74.	150	3	2½	20x 5	2.70	3.70	4.80	5.90	7.00	8.10
5	6	60	91.	150	3	2½	24x 5	3.00	4.35	4.65	7.00	8.35	9.65
5½	8	60	147.	150	4	3	28x 6	4.90	7.00	9.15	11.30	13.50	15.60
6	8	55	161.	140	4	3	30x 6	5.35	7.85	10.00	12.40	14.80	17.10
7	8	55	220.	150	5	4	30x 8	7.00	10.00	13.15	16.25	19.60	22.65
8	8	55	287.	150	5	4	36x 8	8.75	12.90	17.10	21.20	25.55	30.00
8	10	55	326.	140	6	5	36x 8	9.90	14.65	19.45	24.15	29.10	34.00
9	10	50	413.	160	8	6	42x10	13.70	19.60	25.65	31.70	37.90	43.80
10	10	45	459.	150	8	6	42x12	13.95	20.60	27.35	33.90	40.85	47.25
10	12	42	514.	140	8	8	42x12	15.65	23.10	30.60	38.00	45.75	53.00
11	12	42	622.	160	10	8	48x14	21.10	29.50	38.60	47.75	57.00	66.00
12	12	42	740.	150	10	8	48x16	22.50	33.25	44.05	54.70	61.50	76.20
12	14	40	820.	150	12	10	48x18	27.25	39.00	51.00	63.10	75.35	85.15
13	14	40	964.	140	12	10	48x20	32.00	43.35	57.45	71.30	85.85	100.00

*Sizes 9x10 and larger regularly furnished with tight pulley only.

Deming Geared Deep Well Power Working Head, Fig. 66

For wells 375 ft. deep or less (when pumping against 50-lb. tank pressure).

This head is adapted especially for suburban homes and other places requiring a moderate water supply. All parts are readily accessible.

Specifications—The sucker rod and cylinder valves can be withdrawn without disturbing any pipe connections.

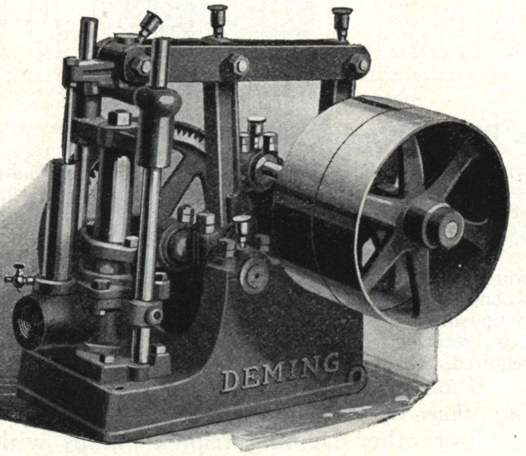


Fig. 66. With Tight and Loose Pulleys and Air Compressor

The standard head includes cut gearing, tight and loose pulleys and oil cups. For hydro-pneumatic service an air compressor will be supplied at extra cost. When desired, an extended walking beam and counterweight for equalizing the plunger load will be furnished at extra cost.

Our Fig. 311 or 324 cylinders are recommended for use with this head.

Type "B" drive consists of a cast iron bed plate, on which working head and electric motor are mounted with motor direct connected by gearing.

Type "CS" drive consists of a cast iron shelf hinged to the back of working head frame, the motor being mounted on the shelf and bolted to the working head. Quieter in operation than the Type "B" drive.

SIZES, CAPACITIES, ETC., FIG. 66

Stroke, in.	Maximum diam. of pipes, in.		Gear ratio	Tight and loose pulleys, in.	Maximum height, in.	Weight with tight and loose pulleys, lb.	Weight with Type"B" or Type"C" drive, lb.
	Suction	Dis-charge					
6	3	1½	6 to 1	12 x 3	25	215	315

Diam. cylinder, in.	Capacity			†Maximum lift, ft.
	Gal. per rev. of crank shaft	Usual rev. per min.	Gal. per min.	
1¾	.063	40	2.52	375
2¼	.103	40	4.12	225
2¾	.154	40	6.16	140
3¼	.215	40	8.60	100

†Refers to vertical distance from surface of water to point of delivery or equivalent pressure.

Continued on next page

Deming "Oil-Rite" Deep Well Working Head, Fig. 1062

The Fig. 1062 deep well power head is adapted for use in suburban homes, farms, apartment houses, hotels, industrial plants, etc. It is intended for service where the distance from the water level to the surface is greater than 25 ft.

Because of the simplicity of its construction, together with the fact that the gears run constantly in an oil bath, the head will require only the minimum amount of attention and operating expense.

Only six principal moving parts. Pinion shaft and pinion (integral machined from one piece), crank shaft, main gear, connecting rod, crosshead and plunger rod.

Crosshead has exceptionally large wearing surface and the crosshead guide is designed to permit quick adjustment for wear.

Plunger and lower valve may be withdrawn from the cylinder without disturbing suction and discharge pipe connections.

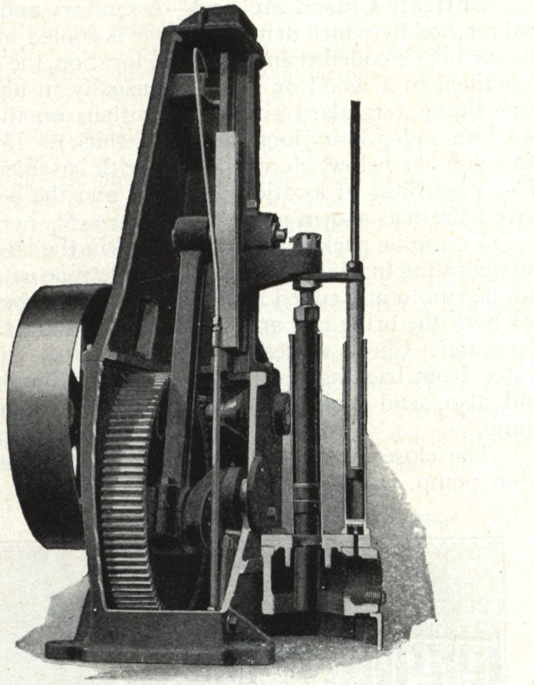


Fig. 1062. Sectional View Showing Working Parts

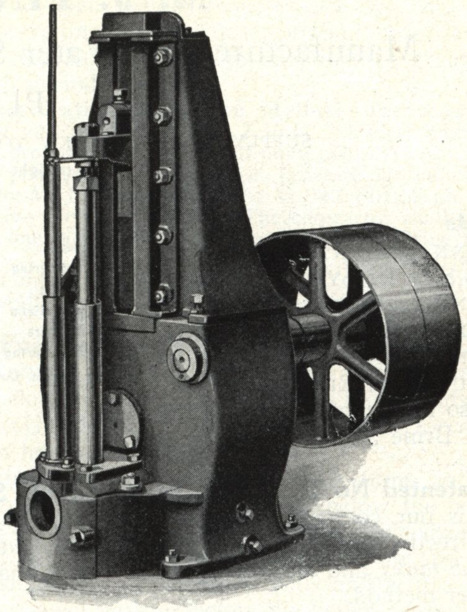


Fig. 1062. Deep Well Working Head with Tight and Loose Pulleys

Combination Splash and Force Feed Oil System—The lower part of the housing acts as an oil reservoir from which the main gear carries oil to the pinion and all main bearings. In addition to the splash oiling there is an auxiliary oil pump which insures that the connecting rod bearings and the crosshead are supplied with fresh oil at every stroke of the pump.

Standard construction includes tight and loose pulleys and differential plunger.

Single tight pulley for engine or motor drive will be furnished when desired.

Air pump will be attached for pneumatic tank service when specified, at extra cost.

A frostproof set length which places discharge pipe below the frost level can be supplied at extra cost.

Our Fig. 311 and Fig. 324 cylinders are recommended for use with these heads.

Send for complete bulletin on Fig. 1062 "Oil-Rite" deep well working head.

SPECIFICATIONS, WEIGHT, ETC., FIG. 1062

Stroke, in.	Max. diam. pipes, in.		Tight and loose pulleys, in.	Tight pulley only, in.	Max. height, in.	Floor space, in.	Weight with tight and loose pulleys, lb.	Cipher code
	Suction	Discharge						
6	2½	1½	12x2	20x3	24½	15x20	160	Orpin
10	4	2½	16x3	24x3	39½	24x36	405	Orolo
14	5	3	20x4	30x4	53	30x32	970	Orsed
18	6	3	24x5	36x5	68	36x45	1400	Orlet

Made in four sizes—6, 10, 14 and 18-in. stroke. Gear ratio 5 to 1, except 14-in. stroke, 7 to 1.

CAPACITIES, LIFT, ETC., FIG. 1062

Length stroke, in.	Hp. for maximum lift		Maximum r. p. m.	Capacities in gal. per min. with maximum lift in ft. for various conbinations of well heads and single acting cylinders										
	Motor	Gasoline Engine		Inside diameter cylinder............in.	1⅜	1¾	2¼	2¾	3¼	3¾	4¼	4¾	5¼	5¾
6	¾	1½	45	Capacity........................g. p. m.	1.7	2.8	4.6							
				*Maximum lift........................ft.	310	220	135							
10	3	5	40	Capacity........................g. p. m.		4.1	6.8	10.2	14.3	19.1				
				*Maximum lift........................ft.		810	500	330	230	170				
14	7½	12	35	Capacity........................g. p. m.			8.4	12.6	17.6	23.4	30.1	37.6		
				*Maximum lift........................ft.			1080	725	500	375	315	270		
18	10	15	30	Capacity........................g. p. m.				13.8	19.2	25.8	33.1	41.4	50.5	60.6
				*Maximum lift........................ft.				1085	750	565	475	405	315	270

*Maximum lift is vertical distance from lowest surface of water in the well to highest point of delivery or equivalent pressure.

M. J. FINN PUMP MFG. CO.

Manufacturers of Water Supply Systems and Centrifugal Pumps

PITTSBURGH, PA.

SUPPLY HOUSES IN NEW YORK, CHICAGO, MINNEAPOLIS and SAN FRANCISCO

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Products

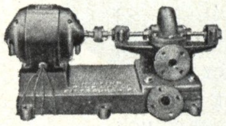
Finn Patented No Tank Water Supply Systems.

Finn Drinking Water Circulating and Booster Pumps.

Finn Patented Condensation Pump and Receiver.

Also manufacturers of Refrigeration, Brine and Booster Pumps.

No gears
No chattering
No piston
No pulsations
No leathers
No hammering



No valves
No springs
No pulleys
No belts
No tank
No rust

For Farms, Country Estates, High Buildings and Suburban Homes

TRADE-MARK

Finn Patented No Tank Pure Water Supply Systems

It is our contention that it is essential to deliver water directly from the source of supply *without storing it in steel tanks,* and that architects will agree that this is the better method.

The Finn patented centrifugal pump or water system *requires no tank* and delivers large quantities of water, under high pressure, direct from its source to the faucets in a steady, even flow (without pulsation). It has few parts and runs smoothly and quietly.

The pump has bronze body, monel metal shaft, heavy cast iron base and high grade motor. Pump impeller touches water only. No metal rub; no wear.

The Finn pump does away with gears, pulleys, buckets, belts, pump valves, wire springs and rusty water tanks.

Even though made of highest grade materials, Finn pumps are not expensive, because they consist of only a few parts. It is, therefore, economical to use two Finn pumps should the water requirements be large. When the demand for water becomes too great for one pump, the other automatically starts doubling the capacity, thus making an ideal electric current saving arrangement. Two pumps connected side by side give twice the capacity of one pump, while two pumps connected one in front of the other give twice the pressure of one pump. It is possible and economical to use 3 or 4 Finn pumps connected together rather than one large pump for most general requirements. They can be controlled automatically to start all at one time or to automatically start consecutively, one after the other, depending upon the demand for water at different times.

While a storage tank is not required in the Finn system, and while we do not recommend the use of a tank, the Finn pump can be connected to and used with any size or kind of tank.

Dimensions—Floor space: No. 1 pump, 16x26 in.; No. 2 pump, 16x30 in. Approximate weight, 195 lb. Either opening serves as inlet or outlet. Tappings suitable for all buildings. Can be connected into any service line regardless of size.

Specifications—*For Average Homes Having One Bathroom and Other Usual Plumbing Fixtures—*

Note: To be furnished and installed by the Plumbing Contractor: One No. 1 Finn Patented Pure Water (No Tank) System with ¼ hp. .... cycle, ... phase, ... volt, direct [alternating] current motor manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa.

For Larger Homes Having 2 or 3 Bathrooms, etc.—

The contractor shall furnish and install one No. 2 Finn Patented Pure Water (No Tank) System with ½ hp. .... cycle, ... phase, ... volt, direct [alternating] current motor manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa.

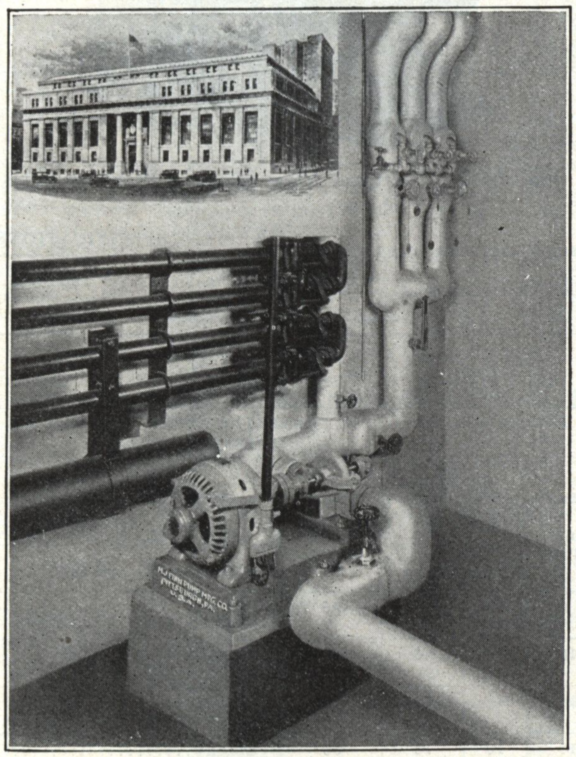
Finn Drinking Water Circulating and Booster Pumps.

Used for circulating drinking water in all classes of buildings: hospitals, schools, institutions, hotels, restaurants, factories, and office buildings. These pumps are the same as those used in the Finn water supply system described in opposite column.

Entirely Closed Method—A sanitary and economical method by which drinking water is cooled in the pipe main which is coiled at any desirable location, the coil being contained in a wood or steel box usually insulated with cork lining (standard size of cork slabs on the market is 12 in. wide, 36 in. long, and 3 in. thick). Box can be placed either below, above or level with basement or any floor regardless of location of pump, and the box should have a drain as shown in the sketch.

Ice can be packed around the coil in the box, or, if a refrigerating machine is used, the brine pipe of the latter can be run to and coiled inside the box, there being room for both the brine coil and the coil containing the drinking water. Check valves shown in sketch keep the cold water from backing up into the street or building main and also send make-up water direct to the coils and pump.

The closed method, using either a No. 1 or No. 2 Finn pump, will provide abundant circulation and take



Finn Pump Supplying Crystal-clear Pure Water in Mellon National Bank, Pittsburgh

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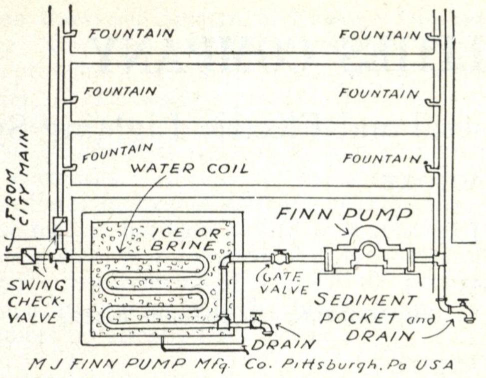

FOUNTAIN
FOUNTAIN
FOUNTAIN
FOUNTAIN
FOUNTAIN
FOUNTAIN
FROM CITY MAIN
WATER COIL
ICE OR BRINE
FINN PUMP
SWING CHECK-VALVE
GATE VALVE
SEDIMENT POCKET and DRAIN
DRAIN
M J FINN PUMP Mfg. Co. Pittsburgh, Pa USA

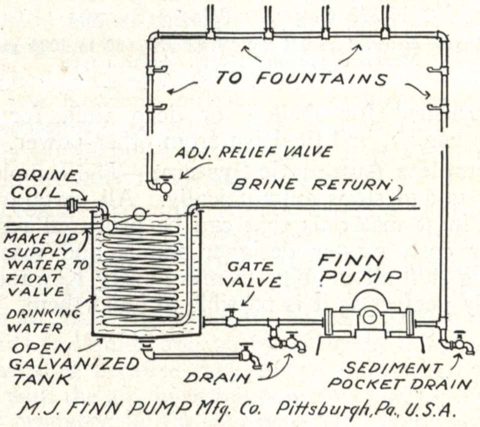
Closed Method of Drinking Water Circulation

care of maximum demands during rush periods in the largest buildings.

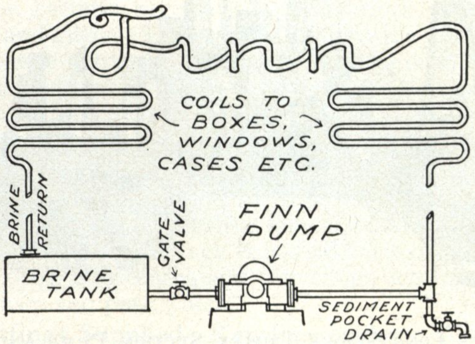
Specifications for Closed Method—The contractor shall furnish and install one No. 1 Finn Noiseless pure drinking water bronze and monel metal pump with ¼ hp., ... cycle, ...phase, ... volt, direct [alternating] current motor and two brass swing check valves manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa., or,

The contractor shall furnish and install one No. 2 Finn Noiseless Pure Drinking Water bronze and monel metal pump with ½ hp., ... cycle, ... phase, ... volt, direct [alternating] current motor and two brass swing check valves manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa.

Open Method—By this method, drinking water contained in an open galvanized tank is cooled by brine coils submerged in the water. The Finn pump should be located in the drinking water main on the house side of the cooling tank. A wheel handle relief valve can be easily set by the user to suit any kind or size of building. The relief valve partly closes when faucets or fountains are open; when the latter are closed, the relief valve opens a little more permitting water to return to the tank, thereby maintaining constant circulation.


TO FOUNTAINS
ADJ. RELIEF VALVE
BRINE COIL
BRINE RETURN
MAKE UP SUPPLY WATER TO FLOAT VALVE
DRINKING WATER
OPEN GALVANIZED TANK
GATE VALVE
FINN PUMP
DRAIN
SEDIMENT POCKET DRAIN
M.J. FINN PUMP Mfg. Co. Pittsburgh, Pa., U.S.A.

Open Method of Drinking Water Circulation


Finn
COILS TO BOXES, WINDOWS, CASES ETC.
BRINE
RETURN
GATE VALVE
FINN PUMP
BRINE TANK
SEDIMENT POCKET DRAIN
M.J. FINN PUMP Mfg. Co., Pittsburgh, Pa., U.S.A.

Method of Brine Circulation

The open system requires one No. 2 Finn pump (see preceding page for description); or for large operations, two No. 2 pumps to take care of great demands in rush periods.

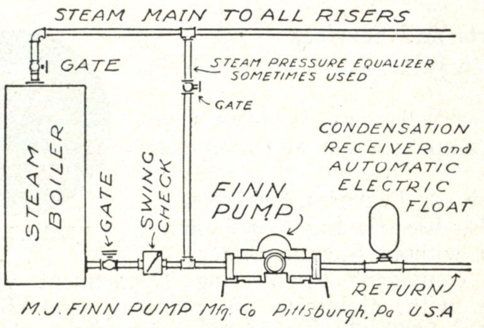
Specifications for Open Method—The contractor shall furnish and install one No. 2 Finn Noiseless Pure Drinking Water bronze and monel metal pump with ½ hp., ... cycle, ... phase, ... volt, direct [alternating] motor manufactured by M. J. Finn Pump Mfg. Co., of Pittsburgh, Pa.

Brine Circulation Pump—The contractor shall furnish and install one No. 2 Finn Calcium or Sodium Brine Pump with ½ hp., ... cycle, ... phase, ... volt direct [alternating] current motor manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa.

Finn Fuel Saving Condensation Pump and Receiver

Returns condensation from radiators and return lines below the water line of boilers in all kinds of buildings, drying kilns, greenhouses, etc., also forces circulation in hot water heating systems.

Finn fuel saving condensation pump and receiver can be located on a level with or below the boiler. By means of automatic electric control (furnished with the pump), it will return condensation from and eliminate sluggishness in all radiators, coils and return lines that are on a level with or below the boiler, permitting them to be filled with live steam instead of cold condensation.


STEAM MAIN TO ALL RISERS
GATE
STEAM PRESSURE EQUALIZER SOMETIMES USED
GATE
STEAM BOILER
GATE
SWING CHECK
FINN PUMP
CONDENSATION RECEIVER and AUTOMATIC ELECTRIC FLOAT
RETURN
M.J. FINN PUMP Mfg. Co Pittsburgh, Pa USA

Typical Layout of Finn Condensation Pump and Receiver

In returning the condensation to the boiler intermittently, the Finn pump creates a vacuum in the system, permitting the water in the boiler to boil at a lower temperature and, consequently, reduces the fuel consumption. In addition to the fuel saving feature, a better circulation is produced in all return lines, consequently these lines become very hot and serve as additional radiation.

The pump is the same as that used in the Finn water supply system described on the preceding page. It consists of only a few parts, is made of high grade materials, and, because of its simplicity, is not expensive. Impeller touches water only. No metal rub; no wear. The cost of the electricity required is insignificant.

Capacities—No. 1 pump, 4000 sq. ft. of direct radiation; No. 2 pump, 7000 sq. ft. direct radiation.

For larger operations, two or more pumps can be connected in the same manner as explained on preceding page.

Specifications—The contractor shall furnish and install one No. .... Finn Automatic Electric Condensation Pump and Receiver, with horizontal split case, all-bronze pump with monel metal shaft, automatic control and .... hp., ... cycle, ... phase, ... volt direct [alternating] current motor manufactured by M. J. Finn Pump Mfg. Co., Pittsburgh, Pa.

Prompt Shipments

We maintain a large and complete stock of all pumping units described herein in all principal cities so that prompt deliveries can be made. Plumbers, steamfitters, sprinkler men and others understand our products and can install them without any special directions. The installation, being very simple, requires only ordinary care.

KEWANEE PRIVATE UTILITIES COMPANY

Manufacturers of Water Supply, Sewage Disposal and Electric Lighting Systems

MAIN OFFICE AND FACTORY

KEWANEE, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street

CHICAGO, ILL., 1224 Marquette Building

DISTRICT REPRESENTATIVES

BIRMINGHAM, ALA., Young & Vann Supply Company
DES MOINES, IOWA, C. L. Knehr, 521 Hubbell Building
DETROIT, MICH., Wm. A. DaLee, 800 Washington Boulevard Building
HAVANA, CUBA, Purdy & Henderson
INDIANAPOLIS, IND., Jackson Engineering Company, 49 South Capitol Avenue
JACKSONVILLE, FLA., C. F. Smith, 401 Graham Building
KANSAS CITY, MO., J. T. Thurman, 1 Reliance Building
LITTLE ROCK, ARK., J. C. Lewis, 1004 Trust Building
LOS ANGELES, CAL., H. Burbridge, 329 East Second Street
MINNEAPOLIS, MINN., Earll W. Norton, 649 Plymouth Building
MORRISTOWN, TENN., Henry B. Havely
MONTREAL, QUE., Williams & Wilson, 84 Inspector Street
OMAHA, NEB., Omaha Sanitary & Supply Co., 15th and Jackson Streets
PHILADELPHIA, PA., J. F. Alexander, 330 Presser Building
PITTSBURGH, PA., Bushnell Machinery Co., Wood Street at Second Avenue
PORTLAND, ORE., M. D. Spencer, 40 First Street
PROVIDENCE, R. I., Walter H. Jackson Company, 510 Industrial Trust Building
SAN FRANCISCO, CAL., Simonds Machinery Co., 816 Folsom Street
SALT LAKE CITY, UTAH, Hawley-Richardson-Williams Co.
SEATTLE, WASH., Walworth Mfg. Co.
ST. LOUIS, MO., H. J. Wobus, 2835 Washington Avenue

Products and Services

Kewanee Systems, which include:

Water Supply Systems, Complete Pumping Units, and Pneumatic Tanks.

Sewage Disposal Systems.

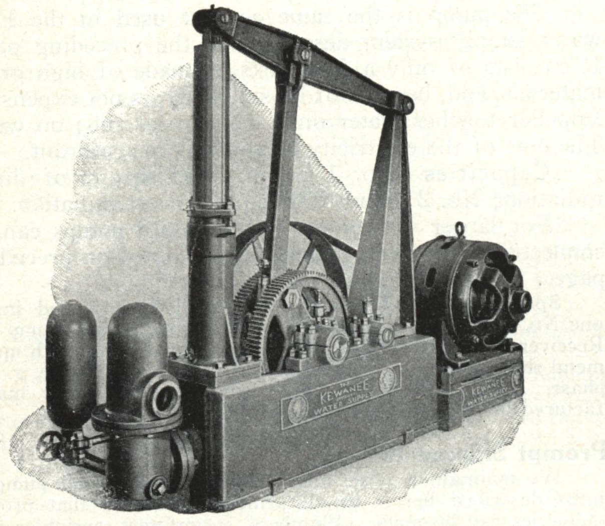
Also Electric Lighting Systems, with or without Storage Battery.

TRADE-MARK

A competent Engineering Department will cooperate with architects in planning and selecting apparatus for each particular requirement, and layouts will be made and submitted free of charge.

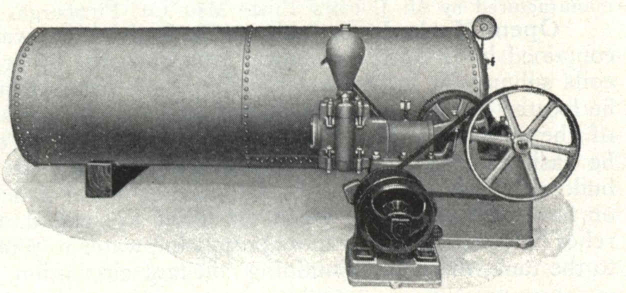
Water Supply Systems

Furnished in capacities to take care of smallest requirements, up to largest country homes and estates. Also especially designed for isolated institutions, country clubs, etc



No. 74. Kewanee Pumping Unit, Deep Well Type

Power, electric motor, 2 to 10 hp. Capacity, 594 to 3420 gal. per hr. Maximum depth to water, 300 ft.

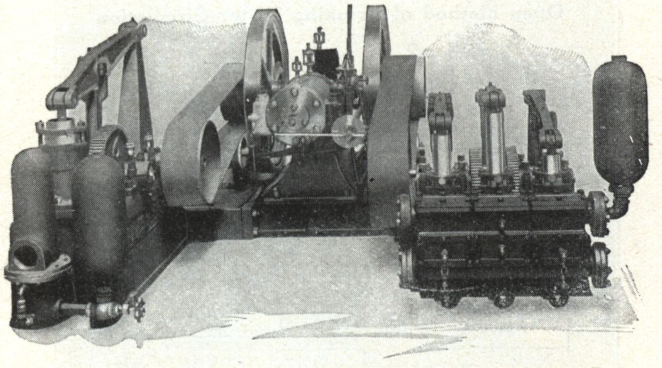


N-350 Complete Water System

Power, electric motor, 1 to 1½ hp. Capacity, 600 to 1000 gal. per hr. Maximum pressure 150 lb. Suction type

Furnished for shallow or deep well, for motor, gasoline engine, or belt drive from other power.

Complete Automatic Systems—The complete system starts and stops automatically. All parts are oversize. Finest materials that can be procured regardless of their cost, master designer minds and master engineering skill all combine to make every Kewanee plant as nearly perfect as it is possible to build them.



Kewanee Long Stroke Triplex Suction Pump and Deep Well Working Head, Driven by Gasoline Engine

Triplex pump capacity 1500 to 10,000 gal. Equipped with engine or electric motor or made for belt drive

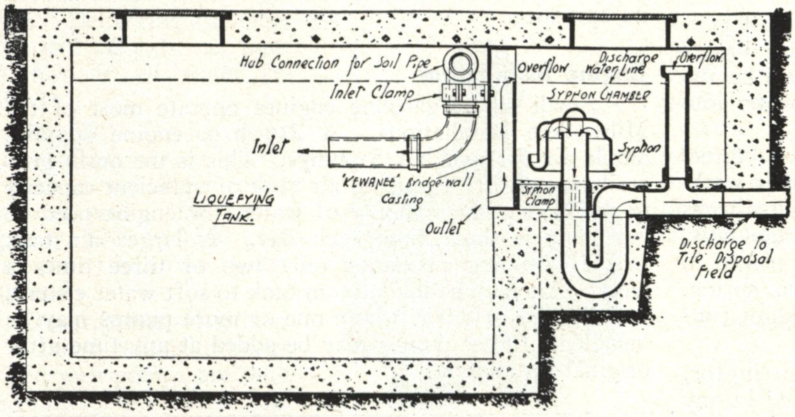
Continued on next page

Kewanee Bacterial System of Sewage Disposal

The Kewanee bacterial system of sewage disposal represents a scientific and highly approved simplification of the sewage problem for residences and other buildings not served by public sewers. It accomplishes its results bacteriologically, and without the use of any chemicals. It converts the sewage into liquid and distributes it, over a disposal field, as pure, clean, inorganic matter, harmless to life or vegetation.

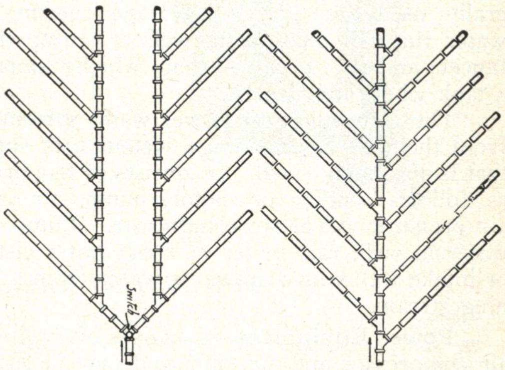
This system is recommended for installations having capacity requirements of not over 100 persons. For these capacities, it is entirely automatic in operation, and requires no attention whatsoever.

Information Required when Ordering—(1) Number and kind of buildings; of plumbing fixtures. (2) Number of people using fixtures. Fixtures in basement. (3) Depth of basement floor below ground level. (4) Fall of ground in yard. (5) Is brook, ditch, or drain tile available for purified water? (6) City or private water supply. If private, give description of plant and well. (7) Kind and depth of surface soil; of subsoil. (8) Make rough sketch of buildings and grounds, giving distances. (9) Show direction and amount of fall of ground from buildings. Show location of well. (10) Show preferred location of liquefying tank and tile disposal field.



Vertical Section Showing Construction of Sewage Tank

Tank of concrete and carefully proportioned according to capacity requirements. A simple casting carries inlet, outlet and vent openings, bridge wall and baffle plate between the two chambers, and fixes position of siphon. Entrance to outlet is vertical, and does not collect solid matter. Automatic siphon discharges periodically into the disposal field



Double Tile for Large Systems or Heavy Soil

Single Tile for Small Systems and Light Soil

Disposal Fields

Distributing lines of 4-in. land tile laid in long or short runs, straight or curved, with ¼-in. spaces between the 1-ft. lengths of tile

The system is unaffected by changes in temperature, and is vented through the soil pipe, all odors and gases being discharged through the soil pipe stack above the roof.

A few Kewanee operating specialties and installation instructions, together with necessary construction materials purchasable locally, make it possible for any mechanic properly to install this system.

Bacterial Principle Involved—The principle involved in a bacterial sewage disposal plant is very simple.

Certain bacteria, called anaerobes because they thrive only when kept in the dark and out of contact with the air, have the power to reduce vegetable and animal solids to liquids and gases. Certain other bacteria, called aerobes because they thrive only when kept in contact with the air, have the power to purify this liquid product produced by the anaerobes, by oxydizing it and reducing it to pure water and harmless gases.

The bacteria necessary for this work exist everywhere, and all that is necessary to do in the development of a sewage system is to provide the best conditions for them to live and multiply in, subjecting the sewage, in turn, to each of the two kinds of bacteria.

Brief Description—The Kewanee system consists, primarily, of a septic tank, or anaerobian breeding plant, into which the sewage is first passed and in which it is liquefied, and of a subsurface disposal field through which the liquefied sewage is passed for exposure to air and aerobes, and consequent conversion into clean inorganic gases and pure water.

Fittings Supplied—Kewanee bridge wall casting, inlet clamps, siphon and all necessary bolts; also two manhole rings and covers, when specified.

Summary

The Kewanee Private Utilities Company provides high grade equipment and dependable service for the average man in the out-of-the-way place.

The equipments go together without mistake, start without coaxing, run without skilled attention, wear the longest time possible, and can be repaired by the unskilled man without experience.

Bulletins on Private Utilities

A Complete Handbook of Information on Private Utilities for Country Homes is contained in our set of bulletins which total almost 200 pages with only the necessary information and details.

The complete set of bulletins, in neatly bound form, or any separate bulletins, will be sent to any architect on request.

The complete list of bulletins, with the subjects covered, follows:

Bulletin "E"—Kewanee Standard Service Pumping Machinery with capacities from 150 to 1000 gal. per hr.

Bulletin "F"—Kewanee Long Stroke Triplex Pumps with capacities from 1500 to 10,000 gal. per hr., and working pressures from 75 lb. to 200 lb.

Bulletin "G"—Kewanee Deep Well Working Heads. Capacity from 600 to 7500 gal. per hr. Maximum depth to water 300 ft.

Bulletin "H"—Kewanee Sewage Disposal System, explaining septic tank action and showing method of construction.

Bulletin "L"—Kewanee Electric Light and Power Plants.

Specifications—A special bulletin, called "Specifications," has been prepared for the architect. It covers detailed drawings of all Kewanee equipment.

MILWAUKEE AIR POWER PUMP CO.

Private Water Supply System

8 Keefe Avenue
MILWAUKEE, WIS.

Product

MILWAUKEE AIR POWER WATER SYSTEM for country homes, schools, clubs, institutions, farms and other places where city water systems do not reach; also for private wells and cisterns in the city.

Milwaukee Air Power Water System

The two types of water supply systems most generally used are: the non-storage system that brings water through pipes from well or spring direct to the faucet; and the storage system, which pumps water into a tank where it is stored.

The Milwaukee air power water system is a "direct from the well," non-storage system, and supplies water that is absolutely fresh. It consists of five principal parts as follows: engine or motor, pump, air storage tank, air pressure valve, air compressor. Pump is placed in water in well, rain water or fresh water cistern, spring, or intake well which draws its water from a lake or running stream.

Power Equipment—Consists of engine or motor, air compressor and air tank, and may be located in any existing building or in small shed erected especially for it. The average power equipment occupies about 4x14-ft. floor space, and is 5 ft. high.

Flexibility of System—Power equipment does not have to be at well, but located anywhere, thus utilizing engine to operate other machinery such as electric generators, feed grinders, washing machines and cream separators, charging storage batteries, inflating tires. A dozen or more pumps may be operated by one power equipment of size giving sufficient air capacity.

Hot and Cold, Hard and Soft Water—One power equipment and two pumps with piping will give hard and soft, hot and cold water, any place desired.

Advantages of Non-storage Systems

Water always fresh, right from well or spring — cool in summer, and in winter of the same temperature as that in well or spring.

With tanks of equal size, it delivers about five times as much water as a storage system; for a given quantity of water, requires a much smaller tank.

Air tank placed anywhere; air does not freeze. Power equipment may be placed where engine or motor may be used for other work. One or a dozen springs, wells or cisterns may be pumped with one tank and one power equipment. Always plenty of air to operate pump. Water for fire protection is at *high* pressure.

Milwaukee Air Power
WATER SYSTEM

WATER DELIVERED "DIRECT FROM THE WELL"

Pump is submerged in the source of supply and delivery is made to *all points,* regardless of distance

Motor Installation

Where current is available, a motor installation is always recommended, as it can be made automatic in its operation.

Engine Installation

Small oil or gasoline engines operate most of the Milwaukee installations. A 2½ h. p. engine supplies ample air for two No. 5 pumps. This is the outfit generally installed. By using air tank of sufficient capacity to pump one day's supply of water, the engine need be run only a short time each day. A larger air tank makes pumping necessary only two or three times a week. Air may be taken from tank to soft water cistern, spring, lake or river, where one or more pumps may be installed. Other pumps may be added at any time after original installation.

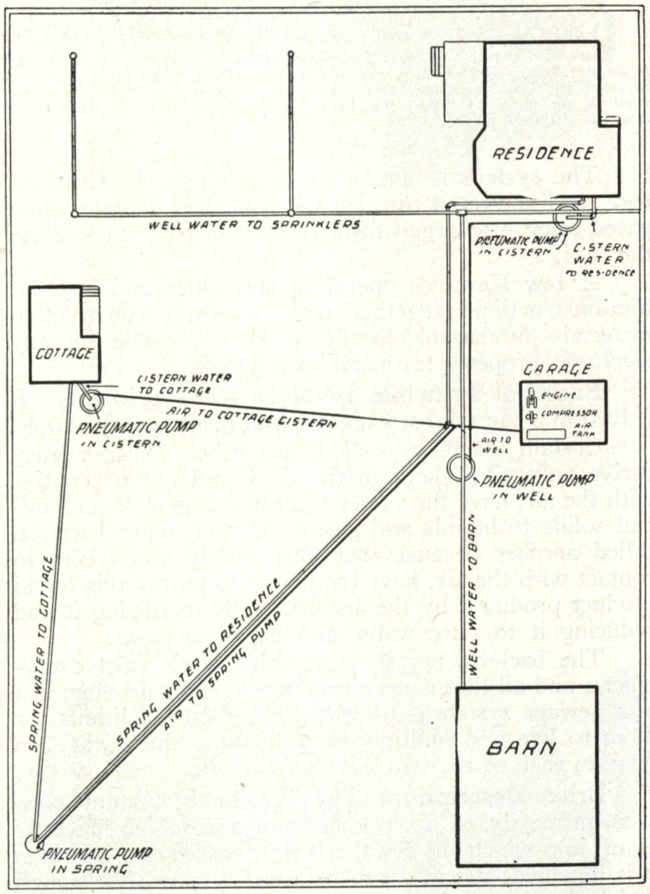


DIAGRAM SHOWING INSTALLATION OF MILWAUKEE AIR POWER WATER SYSTEM

Pumping equipment installed in existing buildings at any convenient point. In this case it is a garage. Pump is placed in well or cistern. 4 pumps used in this installation, 1 each for 2 cisterns, 1 in spring and 1 in well. The air lines are carried underground to each of 4 pumps. Thus there are 2 systems of pipes, 1 for air and 1 for water.

Spring, well or cistern water can be supplied to any building or point by merely adding necessary piping

Continued on next page

Important Feature

A storage water system generally can be changed into a Milwaukee air power "direct from the well" water system at comparatively small cost, as the water storage tank may be used for an air reservoir.

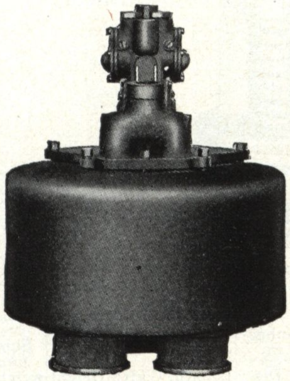
Milwaukee Double Cylinder Pumps

No. 4 "B"—For 4-in. or larger inside diameter wells. Delivering capacity, 700 gals. per hour (4 to 6 ft. of water required.)

No. 5 "B"—For 5-in. or larger inside diameter wells. Delivering capacity, 900 to 1000 gals. per hour (4 to 6 ft. of water required).

No. 6 "B"—For 6-in or larger inside diameter wells. Delivering capacity, 1200 to 1300 gals. per hour (4 to 6 ft. of water required).

12 "B"—Double cylinder shallow water pump. For 15-in. or larger inside diameter wells. Delivering capacity, 1200 to 1500 gals. per hour (1 to 3 ft. of water required).



Shallow Water Double Cylinder 12-B Pump

Description—The Nos. 4, 5 and 6 double cylinder drilled well pumps are built entirely of brass and bronze, and all working parts of the 12 "B" shallow water pump are brass and bronze. This point should be given special consideration for the reason that brass and bronze working parts will last longer in water than any other material from which pumps are built.

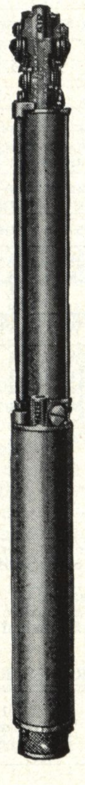
For the reason that the air exhaust valve seats independent of the air inlet valve, no fine adjustments are necessary. The operation of these pumps is governed entirely by two floats, so that no motive power, spring action, pistons or latches are required. There being no frictional parts, they will handle more sand, lime, iron and other solid matter than any pneumatic pump ever built.

For simplicity in construction, accessibility, delivering capacity, economy of operation and durability, these pumps have no equal.

These pumps are all double cylinder so that no expansion chamber is needed to maintain a steady flow of water at the faucets.

It will be noted that there is a pump for almost every condition and requirement; Nos. 4, 5 and 6 for drilled wells and 12 "B" for cisterns, shallow wells, springs, lakes and streams.

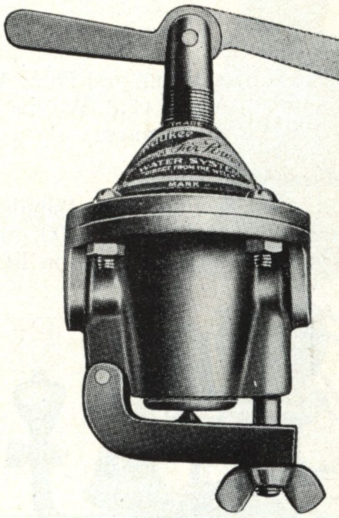
From the fact that the pump in the well is the most important part of a water system, we are sure that you will buy only the best, and from a manufacturer who has had years of experience in building pneumatic pumps.



4-B, 5-B, 6-B Drilled Well Pumps

Fire Protection

A Milwaukee air power system is specially adapted for fire use, and supplies an unbroken stream of water of steady volume and even pressure. Normal pressure of 5 to 10 lbs. can be increased almost instantly by simply turning a valve to give a pressure of from 50 to 100 lbs., sufficient to throw a stream to any point on the gables or roof of the ordinary house or barn. This is accomplished by use of the Milwaukee pressure regulator, an exclusive feature and one which may be worth in five minutes five times the cost of the entire plant.



Air Pressure Regulator

Cost of Milwaukee Water System

Cost of any individual installation and full particulars will be given on receipt of necessary data as indicated on information blank, copy of which follows. Estimate will be furnished either directly by the company or by dealer.

Dealers who install this system are widely distributed over the United States; and where no such dealer is located, a competent plumber or steamfitter does the work.

Information Required to Make Specifications

(1) Give depth of well.
(2) Give depth to the water from top of well.
(3) Give diameter of well at smallest place in inches.
(4) Give amount of water required each 24 hours.
(5) How many, and what, plumbing fixtures in house, barn and on lawn to be provided with water?
(6) What power do you have?
(7) If electric motor or gasoline engine, give horsepower.
(8) Do you want to draw or raise water from both rain water cistern and well?
(9) How high do you want to deliver water from mouth of well?
(10) Make rough diagram showing points to which you wish to deliver water from well, giving distance in feet.
(11) Will you want pressure enough for sprinkling purposes?
(12) If you have no power at present, or are in need of a new power, what do you prefer—electric motor or gasoline engine?
(13) If electric motor, state voltage and whether direct or alternating current; and if alternating current, whether 1-, 2- or 3-phase. Also give number of cycles.
(14) State whether or not current is continuous. If interrupted any time during 24 hours, give hours when there is no current.
(15) Do you need power for any purpose other than supplying water?
(16) Do you separate cream every day?
(17) Give distance of well to location of motive power.

References

Up to date 20,000 installations have been made in all parts of the country. List will be furnished on application.

THE MONARCH ENGINEERING CO.

Manufacturers of Pumps, Water Systems and Water Softeners

DAYTON, OHIO

TRADE-MARK

Products

Shallow Well and Deep Well Pumps.
Hydro-pneumatic Water Systems.
Water Softeners.

Shallow Well Pumps

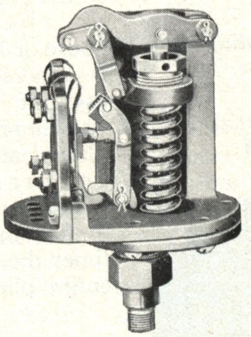
Double acting type, single and duplex cylinder. Capacities, 120, 200, 400 and 550 gal. per hour. Maximum suction lift, 22 ft.

Working pressure, total head, 100 ft.

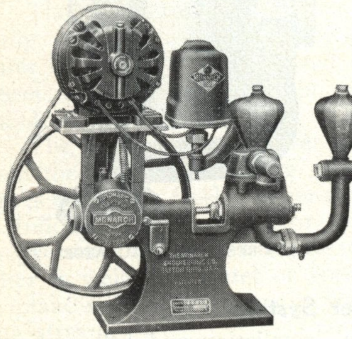
Automatic Control Switch—Monarch two-pole type, automatic pressure control with safety cut-out (see illustration).

Float Control Automatic Switch—Can be furnished for open tank system.

Electric Motors—Regular equipment is 110 or 220 volts, 60-cycle, repulsion-induction type. Motors for any kind of current can be furnished.



Automatic Two-pole Pressure Control Switch



No. 200 Monarch Double Acting Shallow Well Pump

Complete with motor, automatic pressure control switch, relief valve and adjustable air valve.

The special features embodied in this pump are:

Two-pole switch with safety cut-out.

Sleeve guards over piston rod.

Crank shaft adjustment.

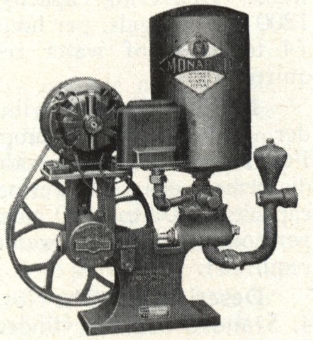
Piston leather expanders.

Two-bearing crank shaft.

Self-aligning stuffing box packing.

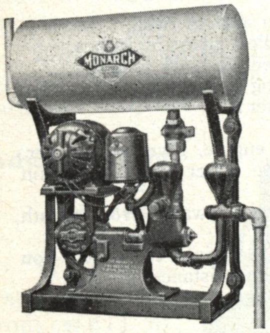
For data, see table No. 1

Style No.	Cap., gal. per hr.	Max. pressure, lb.	Motor hp.	Pipe connections, in. Suction	Pipe connections, in. Discharge	Dimensions, in. Length	Dimensions, in. Width	Dimensions, in. Height	Shipping weight, lb.
Table No. 1. Monarch Double Acting Shallow Well Pumps									
100	120	50	⅛	¾	¾	22½	10	18½	80
200	200	50	1/6	¾	¾	23½	10½	20½	85
400	400	50	¼	1	¾	24	11½	20½	125
450	550	50	1/3	1	¾	24	11½	21	125
Table No. 2. Monarch Junior Shallow Well System									
111	120	50	⅛	¾	¾	22½	12½	26	85
211	200	50	1/6	¾	¾	23½	12½	26	90
411	400	50	¼	1	¾	24	13½	26	125
415	550	50	1/3	1	¾	24	13½	26	125



No. 211 Monarch Junior Shallow Well System (Direct Pressure Outfit)

For small residences, summer camps, irrigating, etc., where storage of water is of no importance. Compact; light in weight; desirable as portable outfit. Also used in combination with storage tanks on installations where tank is placed more than 25 ft. from pump. Large air chamber on pump provides necessary air cushion for pump and pressure control switch on installations of this kind. See table No. 2



No. 2000 Shallow Well System

Complete with shallow well pump for installation on sidewall. Designed for residences where floor space is limited and storage of water of minor importance. Shipped completely assembled.

See table No. 3

Style No.	Pump cap., gal. per hr.	Max. pressure, lb.	Motor hp.	Galvanized iron tank Cap., gal.	Galvanized iron tank Size, in.	Pipe connections, in. Suction	Pipe connections, in. Discharge	Dimensions, in. Length	Dimensions, in. Width	Dimensions, in. Height	Shipping weight, lb.
Table No. 3. Monarch Shallow Well Systems For Sidewall Installation											
1000	120	50	⅛	8	10x22	¾	¾	24	12½	33½	150
2000	200	50	1/6	8	10x22	¾	¾	24	12½	33½	180
4000	400	50	¼	8	10x22	1	¾	24	13½	33½	210
4500	550	50	1/3	8	10x22	1	¾	24	13½	33½	210
Table No. 4. Monarch Automatic Shallow Well Systems With Vertical Tanks											
102	120	50	⅛	35	18x30	¾	¾	29	22½	35	215
104	120	50	⅛	70	18x60	¾	¾	29	22½	65	255
106	120	50	⅛	120	24x60	¾	¾	35	22½	65	360
202	200	50	1/6	35	18x30	¾	¾	30	23½	35	220
204	200	50	1/6	70	18x60	¾	¾	30	23½	65	265
206	200	50	1/6	120	24x60	¾	¾	36	23½	65	365
402	400	50	¼	35	18x30	1	¾	30½	24	35	260
404	400	50	¼	70	18x60	1	¾	30½	24	65	305
406	400	50	¼	120	24x60	1	¾	36½	24	65	405
452	550	50	1/3	35	18x30	1	¾	31	24	35	260
454	550	50	1/3	70	18x60	1	¾	31	24	65	305
456	550	50	1/3	120	24x60	1	¾	37	24	65	405

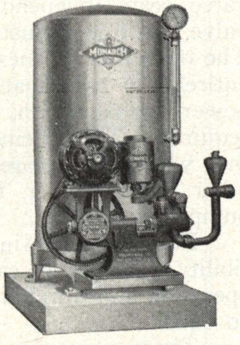
Larger size storage tanks can be furnished, either vertical or horizontal.

When ordering electric pump, give style No. and specify 32, 110 or 220 volts if D-C., 110 or 220 volts if A-C. and number of cycles.

When fresh water valve is desired, specify same.

When open tanks are used, specify Monarch automatic float switch.

Tanks of 315-gal. capacity or less can be furnished in galvanized or black iron; larger sizes in black iron only.



No. 202 Automatic Shallow Well System

Complete with vertical storage tank, shallow well pump, water and pressure gauges, cast iron base for pump and tank, and discharge connection with union and shut-off valve

See table No. 4

SUGGESTED SHALLOW WELL WATER SYSTEMS FOR VARIOUS REQUIREMENTS—MAXIMUM LIFT 22 FT.

Requirements	5 to 7-room house 1 bathroom, 1 kitchen sink, 1 set laundry tubs		8 to 10-room house 1 bathroom, 1 kitchen sink, 1 set laundry tubs, 1 shower bath		12 to 14-room house 2 bathrooms with showers, 1 kitchen sink, 1 set laundry tubs		Large country house and small hotel 3 bathrooms with showers, 1 kitchen sink, 1 set laundry tubs	
Conditions*	1	2	1	2	1	2	1	2
Outfit recommended...	System Nos. 102 or 202	System Nos. 204 or 206	System Nos. 204 or 206	No. 200 pump; 220-gal. tank	No. 400 pump; 220-gal. tank	No. 400 pump; 315-gal. tank	400 Series pump; 315-gal. tank	400 series pump; 720 or 1000-gal. tank

* Condition No. 1—For use with cistern for supplying soft water for bath, kitchen and laundry.

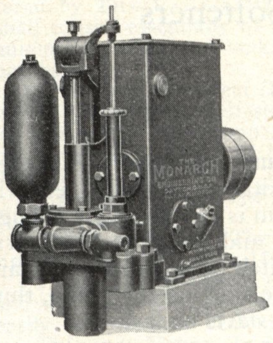
Condition No. 2—For use on well or spring for drinking, cooking, toilet, watering stock, sprinkling, etc.

Note: For domestic use where storage of water is of minor importance Monarch wall unit systems Nos. 1000, 2000 or 4000 are recommended. Supply may be from cistern, lake, well or spring.

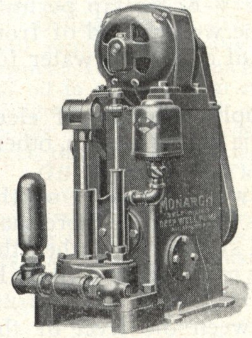
Continued on next page

Deep Well Pumps

Capacities, 120 to 1000 gal. per hr. Well depths, 25 to 650 ft. Working pressure at head, 50 lb. Furnished with either automatic pressure control, or float control switch, or with automatic circuit breaker for gas engine drive.



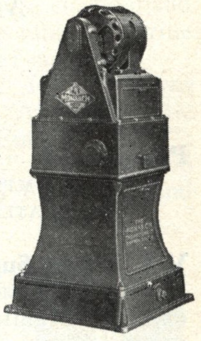
No. 601 Pump for Belt Drive



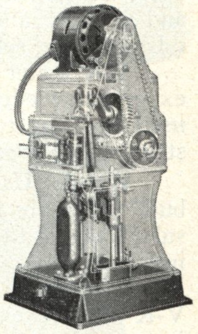
No. 650 Pump for Electric Drive

600 Series Deep Well Head—Compact and highly efficient. Working parts enclosed and run in bath of oil. Quiet in operation. Furnished complete with motor, silent chain drive, control switch, differential cylinder, air pump and relief valve. Also furnished with 6x2-in. tight and loose pulleys for belt drive.

700 Series Deep Well Head—A highly efficient, quiet operating head with entire mechanism enclosed. All moving parts are automatically lubricated. Crank shaft and worm shaft equipped with deep groove ball bearings. Furnished complete with motor, pressure control switch, air pump, fuse block and relief valve. Also furnished with 6x2-in. pulley for belt drive.



No. 746 Deep Well Pump



Interior of No. 746 Pump

Pump No.	Motor hp.	Distance from pump to well cyl. at 50 lb. working pressure, not more than (ft.)	Rated cap., gal. per hr.	Inside diam. well cyl., in.	Differential cyl., in.	Stroke, size and n'mber per min.	Drop pipe, in.	Min. size well casing, in.	Dimensions pump head, in.			Shipping weight lb.
									Length	Width	Height	
No. 600 Series Monarch Deep Well Pump Heads												
610	1/3	35	120	1 13/16	1 9/16	6–32	2	3	21	13 1/2	25	210
630	1/2	75	120	1 13/16	1 9/16	6–32	2	3	21	13 1/2	25	220
650	3/4	150	150	1 13/16	1 9/16	6–41	2	3	21	13 1/2	25 1/2	235
650	3/4	50	250	2 1/4	2 1/16	6–41	2 1/2	4	21	13 1/2	25 1/2	235
670	1	250	150	1 13/16	1 9/16	6–41	2	3	21	13 1/2	26	250
670	1	125	250	2 1/4	2 1/16	6–41	2 1/2	4	21	13 1/2	26	250
670	1	50	375	2 3/4	2 1/16	6–41	3	4 1/2	21	13 1/2	26	250
No. 700 Series Monarch Deep Well Pump Heads												
746	1	50	581	3 1/4	2 1/16	6–45	3 1/2	5	20	20	45	625
746	1	100	416	2 3/4	2 9/16	6–45	3	4 1/2	20	20	45	625
746	1	200	278	2 1/4	2 1/16	6–45	2 1/2	4	20	20	45	625
766	1 1/2	80	774	3 3/4	2 9/16	6–45	4	5 1/2	20	20	46	670
766	1 1/2	135	581	3 1/4	2 9/16	6–45	3 1/2	5	20	20	46	670
766	1 1/2	250	416	2 3/4	2 9/16	6–45	3	4 1/2	20	20	46	670
766	1 1/2	400	278	2 1/4	2 1/16	6–45	2 1/2	4	20	20	46	670
766	1 1/2	650	175	1 13/16	1 9/16	6–45	2	3	20	20	46	670
768	1 1/2	30	1032	3 3/4	2 1/16	8–40	4	5 1/2	20	20	46	670
768	1 1/2	100	680	3 1/4	2 9/16	8–40	3 1/2	5	20	20	46	675
768	1 1/2	200	493	2 3/4	2 9/16	8–40	3	4 1/2	20	20	46	675
768	1 1/2	300	330	2 1/4	2 1/16	8–40	2 1/2	4	20	20	46	675
768	1 1/2	500	207	1 13/16	1 9/16	8–40	2	3	20	20	46	675

For detailed information send for our latest catalogue. We can furnish 5-ft. frostproof attachments for above pumps and longer lengths if desired. Automatic float switches also supplied for open tank installations. In ordering, give pump number above and specify motor for direct or alternating current, giving voltage and cycles.

SUGGESTED DEEP WELL WATER SYSTEMS FOR VARIOUS REQUIREMENTS, 22 TO 650-FT. LIFTS

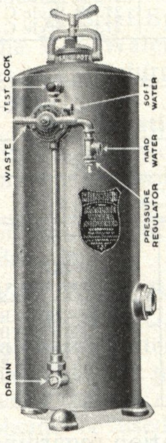
Requirements	5 to 7-room house—1 bath, garage, 3 persons, sprinkling, etc.				8 to 10-room house—2 baths, garage, 5 persons, sprinkling, etc.					12 to 14-room house—3 baths, garage, 8 persons, sprinkling, etc.					Large country home, country club, small hotel				
Depth of well, ft.	Pump		Tank		Depth of well, ft.	Pump		Tank		Depth of well, ft.	Pump		Tank		Depth of well, ft.	Pump		Tank	
	No.	Gal. per hr.	Size, in.	Cap., gal.		No.	Gal. per hr.	Size, in.	Cap., gal.		No.	Gal. per hr.	Size, in.	Cap., gal.		No.	Gal. per hr.	Size, in.	Cap., gal.
35	610	120	24x60	120	50	650	250	30x72	220	50	670	375	36x72	315	50	746	581	36x120	525
75	630	120	24x60	120	125	670	250	30x72	220	100	746	416	36x72	315	135	766	581	36x120	525
150	650	120	24x60	120	400	766	278	30x72	220	250	766	416	36x72	315	200	768	493	36x120	525
250	670	150	24x60	120	500	768	207	30x72	220	400	766	278	36x120	525	300	768	330	42x120	720
400	766	278	24x60	120						500	768	207	42x120	720	400	766	278	48x120	1000
650	766	175	24x60	120											500	768	207	48x192	1500

Example: Given a 9-room house with 2 baths, etc. and a 400-ft. well to determine proper size system. In second section of table under "Depth of Well," 400 ft. indicates that Pump No. 766 (278 gal. per min. capacity) and a 30x72-in. tank (220-gal. capacity) should be specified.

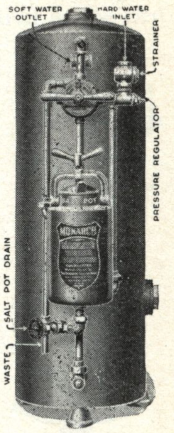
Monarch Naolite Water Softeners

Designed and constructed to meet the requirements for simplified and dependable water softening systems. The single unit control valve is very easy to operate. It is constructed of solid bronze and is leakproof. Tank made of rust resisting Armco iron; enamel finish.

All Monarch water softeners are fully guaranteed to soften water containing calcium (lime) and magnesium. The specifications below designate the number of gallons of water of various degrees of hardness that will be softened between re-conditioning periods by the several sizes of softeners. After the designated number of gallons of water have passed through the softener the softening material must be re-conditioned by a salt brine wash. The softener will then again produce its rated capacity of softened water. It is important that a softener of ample size is selected for an installation to provide the required supply between the re-conditioning periods. Do not install a softener if water contains acid, oil or mud.



MD-20 and MD-21 Water Softener



MD-31, 32 and 33, and M-11, 12 and 13 Water Softener

Style No.	Total grains capacity	Capacity in gallons between re-conditioning periods (water of 10 to 30 grains hardness)							Salt required for reconditioning lb.	Rate of flow per min., gal.	Pipe size, in.	Tank size, in.	Approx. shipping weight, lb.
		10 gr.	14 gr.	18 gr.	20 gr.	22 gr.	26 gr.	30 gr.					
High Capacity Mineral—Arranged for Internal Salting													
MD-20	10000	1000	715	555	500	455	385	335	6 1/2	2 1/2	1/2	12x36	200
MD-21	20000	2000	1430	1110	1000	910	770	670	13	4	1/2	16x42	360
High Capacity Mineral—Provided With External Salt Pot													
MD-31	20000	2000	1430	1110	1000	910	770	670	13	4	3/4	16x48	425
MD-32	30000	3000	2145	1665	1500	1365	1155	1000	20	6	3/4	18x48	585
MD-33	50000	5000	3575	2775	2500	2275	1925	1670	30	8	3/4	20x54	810
Natural Green Mineral—Provided With External Salt Pot													
M-11	9000	900	635	500	450	410	350	300	8	6	3/4	16x42	620
M-12	13650	1365	975	760	685	620	525	455	12	8	3/4	18x48	850
M-13	23625	2365	1685	1310	1180	1070	910	785	18	12	3/4	20x54	1230

Example: For a residence requiring 700 gal. of softened water per week (5 persons) and where water is 20 grains hard, install softener style No. MD-31, which will soften 1000 gal. of 20 grains hard water and provide 10 days' supply of softened water; or, install style No. MD-32 which has a capacity of 1500 gal. of softened water (approximately 2 weeks' supply).

THE VAILE-KIMES CO.

Manufacturers of Pumps, Water Systems and Water Softeners

DAYTON, OHIO

Products

V-K Pumps and Water Systems.
V-K Water Softeners.

V-K Water Supply Systems

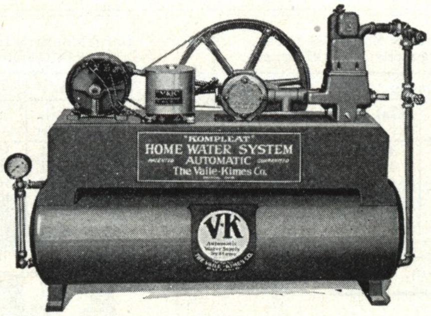
The Vaile-Kimes Co. is the oldest and largest exclusive manufacturer of water supply systems in the country.

V-K electric water supply systems, for shallow and deep wells, are noiseless and economical in operation and entirely automatic; that is, they are self-starting, self-stopping, self-lubricating and self-priming.

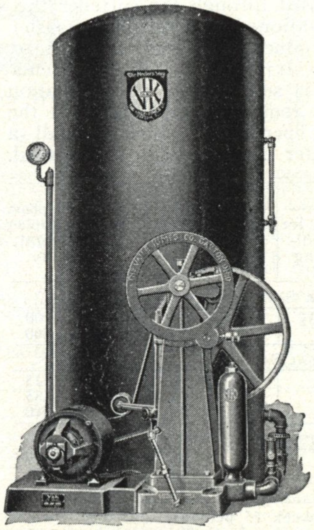
V-K water supply systems are simple, require no expert knowledge to install or operate, and the materials used in their construction, also the workmanship, are strictly high grade.

Where Used—V-K water supply systems are built to supply running water under pressure for city, suburban and farm homes, and for schools, churches and institutions.

Where rain water is used for washing and bathing, V-K water supply systems are installed to supply the rain water under pressure from cisterns.



"Kompleat" Shallow Well Water Supply System



Style G Deep Well Water Supply System

Automatic Electric Pressure Switch—V-K water supply systems are equipped with an automatic electric pressure switch. This mechanism is actuated by a change of pressure in the tank, starting and stopping the electric motor automatically. This switch permits of a certain drop in the tank pressure before starting the pump, thus greatly reducing the number of starts each day.

Air Attachment—All V-K pumps are fitted with an attachment for supplying air to the tank.

Fresh Water Service—The V-K Koltap permits water to be drawn direct from the well instead of from the storage tank, giving a supply of cool fresh water for drinking or cooking purposes.

Selection of a Water Supply System—If electricity is available, select an electric driven system, otherwise select gasoline engine drive.

If the vertical distance between the level of the water in the well and the pump is likely to be more than 22 ft., select a Style G deep well system, and, when the capacity of the tank is 525 gal. or more, select a Style H deep well system.

If the vertical distance between the level of the water in the well and the pump is 22 ft. or less, select a shallow well system such as the Kompleat, Style B or Style C.

Proper Capacity of Water Supply Systems—The following tables will serve as a guide in the selection of a pumping system:

RESIDENCE PUMPING SYSTEMS (CITY OR SUBURBAN)

Number of bathrooms	Number of persons in family	Proper capacity of pump, gal. per hour	Proper capacity of tank, gal.	Symbol of V-K system to meet requirements
1	4	150	35	K-2-YKompleat
2	8	210	80	192-E-Y Style B
3	12	300	220	357-E-X Style B

HOTELS, APARTMENTS OR PUBLIC BUILDINGS

Number of bathrooms	Number of occupants	Proper capacity of pump, gal. per hour	Proper capacity of tank, gal.	Symbol of V-K system to meet requirements
6	30	420	315	358-F-X Style B
10	50	720	525	273-A Style C
15	75	720	720	273-B Style C
....	100	720	1000	273-C Style C

SCHOOLS

Number of pupils	Proper capacity of pump, gal. per hour	Proper capacity of tank, gal.	Symbol of V-K system
100	720	1500	273-D Style C

COUNTRY HOMES

Head of stock	Proper capacity of pump, gal. per hour	Proper capacity of tank, gal.	Symbol of V-K system
5	210	120	192-A-Y Style B
15	300	220	357-E-X Style B
35	420	220	358-E-X Style B
50	420	315	358-F-Y Style B
75	720	525	273-A Style C
200	720	1500	273-D Style C

Deep Well Systems—Full information regarding capacities of deep well and engine driven pumps and systems will be given on application.

Continued on next page

Architects' Specification for a Motor Driven Shallow Well Water Supply System—

General—The pumping system shall be V-K as manufactured by The Vaile-Kimes Co., Dayton, Ohio, or equal, and shall consist essentially of a motor driven, reciprocating pump, automatic switch and tank, all of which shall be mounted on one base.

The pumping system shall be automatic in operation, self-oiling, self-priming, self-starting and self-stopping.

Capacity—The pump shall have a capacity of ...... gal. per hour. The tank shall be ...... in. in diameter and ...... in. high.

Type of Pump—The pump shall be of the reciprocating, double acting type.

Speed of Pump—The pump shall operate at not over 150 r.p.m. and not less than 115 r.p.m.

Pump Valves—The valves shall be of non-blooming rubber and so situated that they will rise vertically upward and will be easily accessible by removing the discharge chamber.

Priming Tubes—In order to prevent the pump from becoming airbound, it shall be provided with vertical priming tubes in the discharge plate, so designed that dirt or rust can not collect in them.

Oiling System—The oiling system shall be such that it will require practically no attention on the part of the owner. It shall be such that it will insure a proper supply of oil to all parts that require it, at all times. It shall be so designed that the oil will be automatically carried to the points where it is needed rather than splashed. It shall be such that oil can not leak out on the floor or belt.

Oil Protection—The oil reservoir shall be so designed that any water that might collect on the piston rod will not be carried into it, thus eliminating the necessity of separating the oil from the water, after the water has worked its way into the oil chamber.

Piston Rod—The piston rod shall be of bronze and shall be free from sleeves of any character.

Idler—The idler shall be so designed that it will maintain a tight belt at all times and also cause the belt to be in contact with at least 50% of the motor pulley.

Tank—The tank shall be galvanized inside and outside and shall be provided with all the necessary openings, with gauge glass, gauge glass fittings and pressure gauge. The tank shall have a coat of aluminum bronze over the outside.

Pressure Switch—The switch shall be positive in its action and it is to be free from toggle joints or vibrating contacts.

Relief Valve—The pumping system shall be equipped with a relief valve guaranteed not to leak and so designed that it will open should the pressure in the tank reach 70 lb. per sq. in.

Motor—The motor shall be a Westinghouse Clutch Type or equal. It shall be of such capacity that it will bring the pump up to full speed in three seconds, with the terminal voltage 20% below the rated voltage of the motor against a pressure of 50 lb. per sq. in.

Drive—The pump shall be driven by a belt and shall be free from gears of any character.

Workmanship and Guarantee—The workmanship shall be first class in every respect. Should any part or parts prove defective within one year, from date of installation, the manufacturer shall replace the said part or parts, without charge to the purchaser.

A Brief Specification Form—Furnish and install the V-K Water Supply System No. ...... (or equal) as manufactured by The Vaile-Kimes Co., Dayton, Ohio.

Specification Blanks—Complete sample specifications covering deep well or gas engine driven water supply systems will be sent on application.

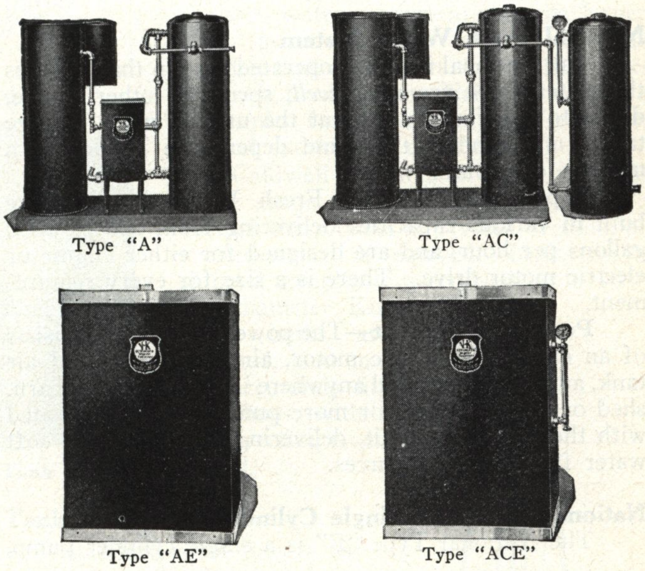
Bulletins—For full information regarding the proper size of shallow well pumps and systems, see Bulletin 713.

V-K Water Softeners

Where Used—V-K water softeners are designed to supply water of zero hardness in private residences, hair dressing parlors, barber shops, laundries, factories, boiler plants, etc. In private residences, the softeners should be used to supply soft water to the bathroom, kitchen, laundry, garage, all hot water lines, and to all cold water lines except toilet flushes and lawn and hose connections.

Automatic—V-K automatic softeners recondition themselves. They are simple in construction, consisting of a few well-known mechanical parts assembled in a different way. All their working parts are enclosed and protected against corrosion. The brine tank and brine pipe are covered with a special rustproof coating.

Automatic softeners are made in four different types, as follows: Automatic Open, "A"; Automatic Open Continuous, "AC"; Automatic Enclosed, "AE"; Automatic Enclosed Continuous, "ACE." The "A" and "AC" are each built in six sizes, and the "AE" and "ACE" are each built in five sizes.



Type "A" Type "AC"

Type "AE" Type "ACE"

V-K Automatic Water Softeners

Types "A" and "AC" have soft water capacities as follows: 2½, 3½, 4¾, 6¼, 8 and 10 gal. per minute. Types "AE" and "ACE" have the following soft water capacities: 3½, 4¾, 6¼, 8 and 10 gal. per minute.

Types "A" and "AE" function alike, but the "AE" softeners have larger salt storage capacities than type "A." Types "AC" and "ACE" are different from the "A" and "AE" in that they permit the use of soft water at all times, including the 12-minute reconditioning period. Types "AE" and "ACE" are enclosed in a beautiful casing which conceals all the parts.

Automatic softeners are equipped with the V-K protector, which automatically prevents an excessive flow of water through the V-Kalite softening mineral during either the reconditioning or service periods. This protector valve acts regardless of any fluctuation in the city water pressure; it is properly adjusted before it leaves the factory.

Automatic softeners take care of themselves, except that they need to be supplied with salt a few times a year. The number of times the salt container must be filled depends upon the hardness of the water and the amount of water used. They are *guaranteed*.

Hand Operated—V-K hand operated water softeners are made in two different types, as follows: "V" and "Minute." Both are equipped with the V-K protector.

The "Minute" softener has only two valves, and can be reconditioned in 12 minutes. It will supply 2000 gal. of velvety soft water on one salt charge.

Type "V" Hand Operated

NATIONAL UTILITIES CORPORATION

Private Fresh Water Supply Systems

306 Belleview Place
MILWAUKEE, WIS.

Products

NATIONAL FRESH WATER SYSTEMS for country and suburban homes, farms, schools, sanitariums, hotels, golf and country clubs, institutions, etc., where city water is not available.

SHALLOW and DEEP WELL PUMPS.

National Fresh Water System

The National is an air operated system that delivers the water *fresh from the well,* spring or other source, direct to the faucets without the use of water storage tanks, and renders the same dependable service as a modern city water works.

Capacities—National Fresh Water Systems are built in various capacities delivering from 500 to 3000 gallons per hour, and are designed for either engine or electric motor drive. There is a size for every requirement.

Power Equipment—The power equipment consists of an engine or electric motor, air compressor and air tank, and may be located anywhere in the basement, barn, shed or garage. Two or more pumps may be operated with the one power unit, delivering both hard and soft water from several sources.

National Type "F" Single Cylinder Pump

The National Type "F" is a single cylinder pump, of exceedingly simple and sturdy construction, that contains less than one-half the number of parts contained in pumps of the double cylinder type. There is nothing to get out of order, no parts that require adjustment.

This pump is built in several sizes, suitable for drilled wells from 4 to 6 in. as well as for dug wells, springs, etc.

National Type "H" Shallow Submergence Pump

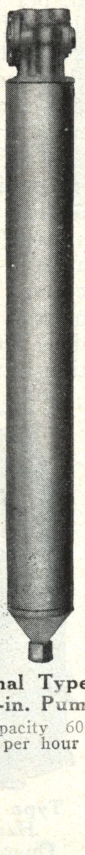
We also build the Type "H" shallow submergence pump designed for use in open wells, lakes, rivers and cisterns, where the depth of the water is limited. While this pump is of larger diameter, it is of the same general design as the Type "F" deep well pump.

How The National System Operates

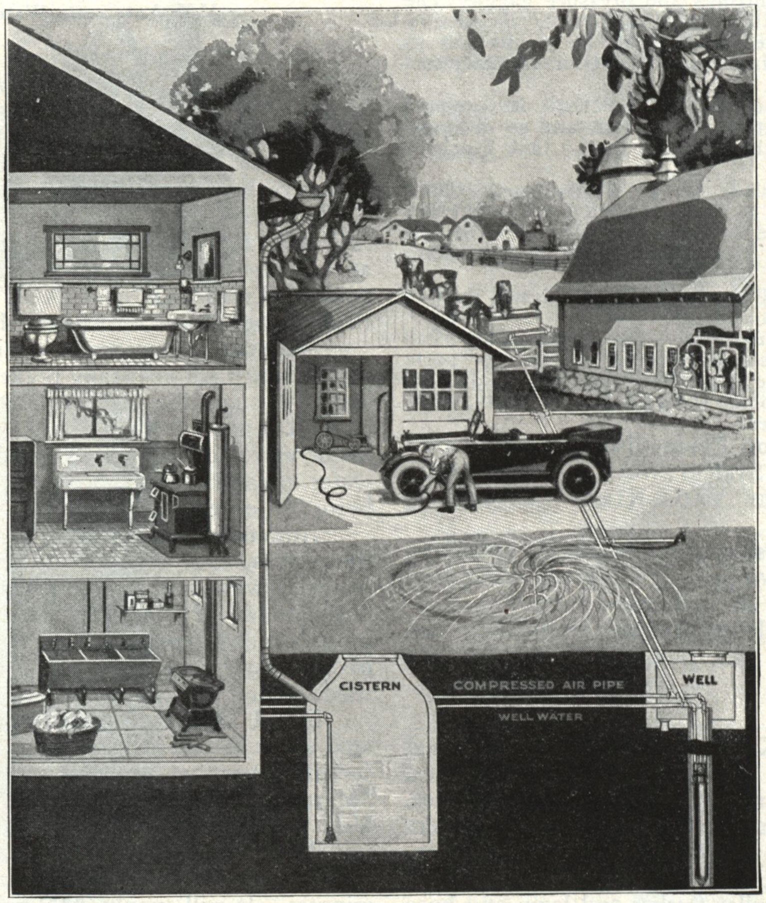
The engine or electric motor operates the air compressor which charges the air tank with compressed air, which in turn operates the pump when water is being drawn. The electric motor driven system is entirely automatic in operation, and has both the tire inflating and high pressure fire protection features.

Specifications and Prices

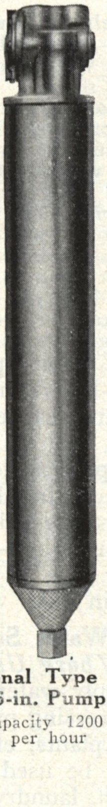
Complete specifications and prices will be furnished on request. Write for catalogues.



National Type "F"
4-in. Pump
Rated capacity 600 gallons per hour



Typical Installation of a National Fresh Water System



National Type "F"
6-in. Pump
Rated capacity 1200 gallons per hour

W. E. CALDWELL CO.

INCORPORATED

Manufacturers of Tanks and Tank Towers

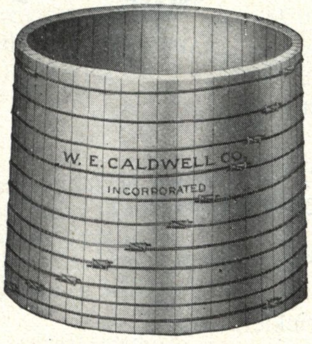
2290 Brook Street
LOUISVILLE, KY.

THE TANK WITH A REPUTATION Caldwell TANKS AND TOWERS
TRADE-MARK

Products

Wood, Steel and Galvanized Tanks, any shape or size, for any purpose; Tubular, Angle or Channel Column Steel and Wood Towers.

Also manufacturers of Railroad Water Stations, Tank Agitators; Steel Standpipes, Tanners' Drums; Power Transmission Machinery which includes: Friction Clutches, Friction Clutch Cut-off Couplings, Cast Iron Pulleys, Shaft Hangers, Safety Set Shaft Collars.



Cypress Tank

Cypress Tanks

This company specializes in cypress, as it is the best wood for tanks for most purposes. It has great durability with minimum shrinking and swelling, and gives no taste or coloring.

For some acids, yellow pine is recommended. Poplar, white pine, cedar and fir are also used.

Made round, elliptical and rectangular.

Specifications—Lumber to be thoroughly dry, without loose or unsound knots, splits, shakes, pecks, wormholes or other defects; all heart on inside; sound sap on outside, and then not to exceed one-half of the thickness of stave.

Thickness—2 in. for 10,000 gal. or less; 2½ in. up to 20,000 gal.; 3 in. for larger sizes. Finished thicknesses to be ¼ in. less than above.

Standard Inside Diameters of Round Tank—Every 6 in. from 3 to 9 ft.; every foot to 16 ft.; and every 2 ft. above 16 ft.

Standard Inside Depths of Round Tanks—

1 ft. 5 in.
2 ft.
2 ft. 5 in.
3 ft.
3 ft. 5 in.
4 ft.
4 ft. 5 in.
5 ft.
5 ft. 5 in.
6 ft.
6 ft. 5 in.
7 ft. 5 in.
9 ft. 5 in.
11 ft. 5 in.
13 ft. 5 in.
15 ft. 4 in.
17 ft. 4 in.
19 ft. 4 in.
21 ft. 4 in.
23 ft. 4 in.

Finish—Staves to be dressed both sides with edges machine jointed to proper bevel. Bottom to be dressed on top side only with edges machine jointed and square and well doweled.

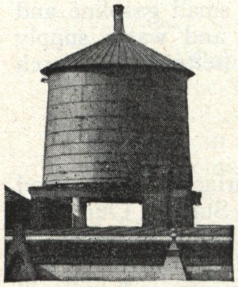
Hoops—Round hoops to be of wrought iron (not steel) with malleable iron draw lugs; sizes and spacing to give a factor of safety of 4 to 1 or greater if required.

We also manufacture rectangular tanks of all dimensions and capacities.

Our Research Department will be glad to go into any special problem with you.

Tank Covers—Standard wood covers are supported by trusses and rafters and covered with 1-in. sheathing and Ruberoid roofing.

Flat wood covers are also furnished for frost protection when specified.



Tank and Foundation, Colonial Hotel, York, Pa.

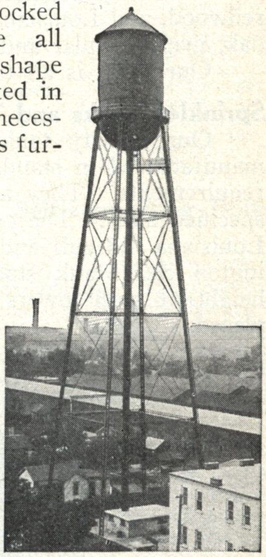
Tank Foundations

Realizing to what an extent the success of the tank depends on its foundation, we have made a careful study of tank foundations and have developed a series of standard designs which are not only of the proper strength but also use the minimum of material.

Steel Tanks

Hemispherical bottom steel tanks for elevated water storage are, in the larger sizes, as inexpensive in first cost as wooden tanks. Steel tanks are being extensively used in industrial plants and are the tanks for storage of oils, gasoline, alcohol and certain chemicals.

Caldwell steel tanks are made in every shape and for all purposes. We furnish these tanks all riveted, welded, or riveted-welded as required. Tanks can be shipped completely assembled up to 10½ ft. in diameter. Knocked down tanks are all punched, bent to shape and accurately fitted in our shops, with necessary erecting rivets furnished.



150,000-gal. Tank, 205-ft. Tower, Studebaker Bros. Mfg. Co., South Bend, Ind.

Tank Towers

Standard steel towers are of the following types: tubular column and angle column for flat bottom wood and steel tanks; latticed channel column for wood and hemispherical bottom steel tanks.

Standard Heights—*Tubular*—Every 12 ft. from 15 ft. to 100 ft.

Angle—Every 10 ft. from 12 ft. up.

Latticed—Every 5 ft. from 20 ft. up.

Erected anywhere.

DIMENSIONS AND CAPACITIES OF STANDARD TOWER TANKS

Class towers	Capacity, gal.	Standard wood tanks				Standard steel or galvanized tanks			
		Diameter		Depth		Diameter		Depth	
		ft.	in.	ft.	in.	ft.	in.	ft.	in.
O tubular	1,000	6	6	4	5	6	0	5	0
or CC angle	1,500	6	6	6	5	6	6	6	6
A tubular	2,800	8	0	7	5				
or FF angle	3,000	8	0	8	5	8	0	8	0
B tubular	5,000	10	0	9	5				
or HH angle	6,000	10	0	11	5	10	0	10	0
C tubular	10,000	12	6	11	5	12	0	12	0
or JJ angle	12,000	12	6	13	5				
D tubular	15,000	14	0	13	5	14	0	14	0
or KK angle or LD latticed	17,000	14	0	15	5				
E tubular	20,000	16	0	13	5	16	0	14	0
or LL angle or LE latticed	22,000	16	0	15	5				
ES tubular or LES latticed	25,000	16	0	17	4	16	0	18	0
F tubular	30,000	18	0	15	4	18	0	16	0
or LF latticed	33,000	18	0	17	4				
FS tubular or LFS latticed	35,000	18	0	19	4	18	0	20	0
G tubular	36,000	19	6	17	4				
or LG latticed	40,000	19	6	19	4	20	0	18	0
LH latticed	50,000	22	0	17	4	22	0	18	0
	55,000	22	0	19	4	22	0	20	0

Hemispherical bottom steel tanks and towers are regularly made in capacities from 10,000 gal. up. Any of the above towers can be made to suit special conditions.

ESTABLISHED 1870

CHALLENGE COMPANY

TELEPHONE
1202

Tanks and Towers

201 River Street
BATAVIA, ILL.

BRANCHES

CHICAGO, ILL., 1825 Harris Trust Building—Telephone, Dearborn 2779
CLEVELAND, OHIO, 808 Leader Building—Telephone, Main 1948
KANSAS CITY, MO., 1404 West 12th Street—Telephone, Delaware 1252
MINNEAPOLIS, MINN., 112 Third Avenue, N.—Telephone, Main 3979
OMAHA, NEB., 1007 Leavenworth Avenue—Telephone, Atlantic 1654

TRADE-MARK

Products

Wood Tanks and Vats, Tubs and Drums, for

Hot and Cold Water Storage
Water Softening
Pulp Slush
Acid Storage
Ruffle Boxes
Vinegar Generating
Settling
Polishing
Stuff Chests
Vent Stacks
etc.

Steel Tanks and Supports, for all purposes.

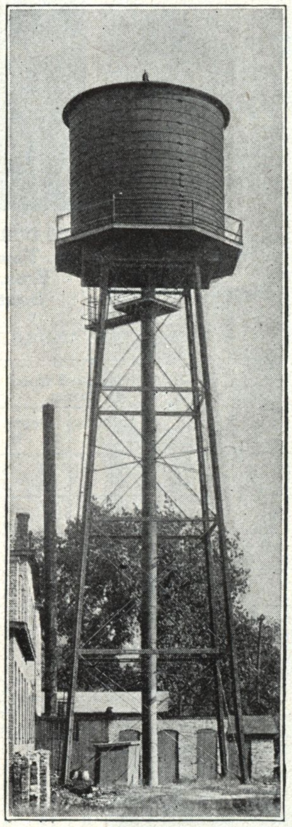
Materials

We carry a large stock of Oregon fir, California redwood, and Louisiana cypress, as well as yellow pine, oak, maple, poplar and Norway pine.

Our stock is all tank grade and thoroughly dried.

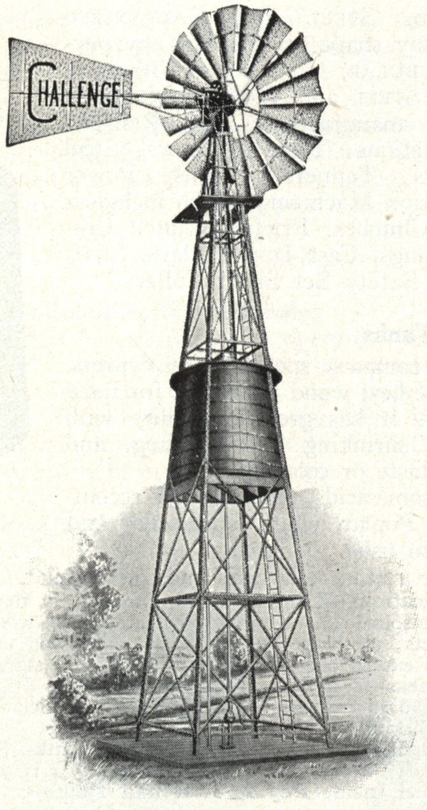
Sprinkler Tanks and Towers

Our gravity tanks for automatic sprinklers are manufactured in standard sizes according to insurance requirements. They are provided with iron hoops of specified sizes. The cypress used is the best grade of Louisiana red gulf and the fir the best grade of Washington clear tank stock. We can also furnish any height of steel towers upon which these tanks can be placed.



Challenge Sprinkler Tank and Tower

One of the 32 sprinkler tanks and towers we have furnished for the International Shoe Co., St. Louis, Mo.



Challenge Suburban Outfits

Capacity of tank.........bbl.	20					60			
Height of tower...........in.	40	50	60	70	80	50	60	70	80
Distance to bottom of tank.in.	20	30	40	50	60	20	30	40	50
Weight of tower...........lb.	1050	1375	1735	2090	2465	1550	1945	2380	2775
Weight of tank...........lb.	785					1375			

Challenge Suburban Outfits

An ideal outfit for the suburban or summer home as it will supply an abundance of water for the kitchen, bathroom, garden, lawn, barn and fire protection. It is made in several standard sizes and furnished with either wood or galvanized steel tank.

We solicit inquiries for prices or any other information wanted.

We also manufacture a line of small gasoline and kerosene engines, pumps, cylinders and water supply goods of all kinds. Lawn swings, settees and porch swings.

Prices quoted on application.

Service to Architects

We are one of the largest manufacturers of wood tanks and steel towers in the United States. Our engineers are at your service and will gladly advise in reference to tank supports, etc., without obligating you in any way. Send us the requirements and we will gladly advise the most economical way to build your tank and tower equipment.

CHICAGO BRIDGE & IRON WORKS

FOUNDED BY HORACE E. HORTON IN 1865

Designers and Builders of Horton Steel Tanks and Plate Work

OFFICES

CHICAGO, ILL., 2020 Old Colony Building
NEW YORK, N. Y., 3122 Hudson Terminal Building
ATLANTA, GA., 1012 Healey Building
DALLAS, TEX., 1612 Pretorian Building
SAN FRANCISCO, CAL., 1075 Rialto Building
BRIDGEBURG, ONT., CAN., 160 Janet Street
MONTREAL, QUE., CAN., 1025 Bank of Toronto Building

PLANTS IN CHICAGO; GREENVILLE, PA. (PITTSBURGH DISTRICT); and BRIDGEBURG, ONT. (HORTON STEEL WORKS, LTD.)

Products

HORTON STEEL TANKS: Elevated Water Tanks for Sprinkler, Mill, Private Estate, Golf Club and Municipal Service; also Storage Tanks for Oil and other Liquids.

HORTON STEEL PLATE CONSTRUCTION, including Steel Stacks, Coal Bins, Ash Tanks, Standpipes, Riveted Steel Pipes, Gas Holders, Hortonspheres, etc.

HORTON TANKS
TRADE-MARK

Advantages of Steel Tanks

The elevated *steel* tank is the modern device for storing water at an elevation. This structure is so much more economical than those made of other materials, and its appearance is so much more attractive, that good architectural judgment dictates its selection even without reference to its other advantages.

Steel is the ideal tank material. It has great strength. It resists the strains of settlement and shock. It is impervious to water and, when painted every four or five years, to the influence of weather.

A steel tank has a greater factor of safety than any other because the action of steel under stress is more definitely known.

Some structures have been placed on buildings without adequate factors of safety and these constitute a constant menace which eventually may reflect seriously upon the authority which permitted it.

Horton elevated steel tanks were the first commercial hemispherical- and elliptical-bottom tanks in America. The first one, built in 1894, still stands and is good for many more years of useful life.

In spite of a first cost slightly higher than wooden towers and tanks, steel tanks cost less in the end, because they will last longer with no maintenance except painting.

ELLIPTICAL-BOTTOM AND HEMISPHERICAL-BOTTOM ELEVATED TANKS

Capacity, gal.	Height to bottom	Capacity, gal.	Height to bottom
40,000	Any even foot	250,000	Any even foot
50,000	Any even foot	300,000	Any even foot
60,000	Any even foot	350,000	Any even foot
75,000	Any even foot	400,000	Any even foot
100,000	Any even foot	500,000	Any even foot
125,000	Any even foot	750,000	Any even foot
150,000	Any even foot	1,000,000	Any even foot
200,000	Any even foot		

Small Capacity Tanks (with Angle Posts)—For the first time there is available a first grade elevated tank of small capacity which sells at a practicable price. This tank is in every essential particular the same as our standard hemispherical-bottom tanks. It has a full hemispherical bottom; adequate plate thicknesses; low unit stresses; $\frac{3}{16}$-in. roof; steel ladder, revolving on roof and side of tank and fixed on one column; expansion joint; and a balcony on capacities larger than 20,000 gallons.

This style of tank is standardized both in height and capacity. It is furnished only as follows. You may select the capacity and height next higher than any odd size you may need with assurance that we can furnish it at a lower price than the odd size.

CAPACITIES AND HEIGHTS OF HORTON ANGLE POST ELEVATED TANKS

Capacity (gal.)	Height to bottom	Capacity (gal.)	Height to bottom
5,000.......	6′ 7″ 16′ 7″ 26′ 7″ 36′ 7″ 46′ 7″ 56′ 7″	20,000........	5′ 6″ 15′ 6″ 25′ 6″ 35′ 6″ 45′ 6″ 55′ 6″ 65′ 6″ 75′ 6″
10,000.......	5′ 9″ 15′ 9″ 25′ 9″ 35′ 9″ 45′ 9″ 55′ 9″ 65′ 9″ 75′ 9″	25,000........	7′ 4″ 19′10″ 32′ 4″ 44′10″ 57′ 4″ 69′10″ 82′ 4″ 94′10″ 107′ 4″
15,000.......	4′ 5″ 14′ 5″ 24′ 5″ 34′ 5″ 44′ 5″ 54′ 5″ 64′ 5″ 74′ 5″	30,000........	6′ 9″ 19′ 3″ 31′ 9″ 44′ 3″ 56′ 9″ 69′ 3″ 81′ 9″ 94′ 3″ 106′ 9″

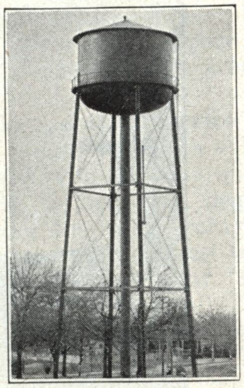
Advantages of Tanks with Self-supporting Bottoms in Masonry Towers

The most uneconomical way of supporting an elevated tank is to rest it upon a slab or grillage. The cost of the slab or grillage generally makes the cost of a flat-bottom tank greater than the cost of installing a Horton elevated steel tank with hemispherical or elliptical bottom. Horton tanks have all points open to inspection and painting. They will last a long, long time without leaking or rusting.

Designing Service for Architects

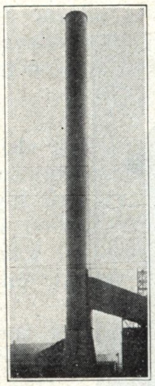
When masonry towers are designed, it is now customary for the architect to send our Chicago office a preliminary sketch, and ask us to supply the data which will enable the owner or architect to install a tank with self-supporting bottom.

We lay great stress on the importance of correct design. Our engineers are specialists in the design of steel plate structures and our long experience has enabled us to develop important applications of engineering principles to steel plate design. No one need hesitate to specify either our standard or special products. We guarantee them to be correctly designed with adequate factors of safety.



Elliptical Bottom Elevated Tank

This type delivers clean water to sprinkler systems



Horton Steel Stack

Self-supporting stacks for all purposes

Brick Tower Around Tanks

Two elliptical bottom tanks erected in a brick tower

ESTABLISHED 1865

A. J. CORCORAN, INC.

Manufacturers of Tanks, Towers, Pumps and Windmills

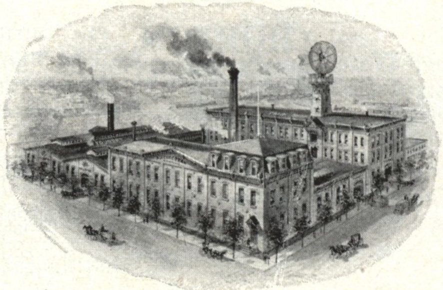
766 Jersey Avenue
JERSEY CITY, N. J.

WORKS: JERSEY CITY, N. J., Jersey Avenue and 13th Street—Telephone, Montgomery 238

Products

Manufacturers of TANKS, including SPECIAL TANKS for all purposes; WINDMILL PUMPING OUTFITS.

Also Tank Sundries, Tank Gauges, Towers, Dye Tubs, Vats, Pumps.



Factory of A. J. Corcoran, Inc., Jersey City, N. J.

Experience and Prestige Make Us Authorities

Sixty years of practical experience in the manufacture and erection of tanks and windmills have made this house an authority on the essentials that tanks and windmills should possess for general utility and efficient service.

Corcoran Tanks Are Warranted

All Corcoran tanks are warranted to be absolutely watertight; and while the initial cost may be slightly higher than numerous unknown tanks, they are always cheaper in the end.

Corcoran tanks are indorsed by the New York Building and Fire Departments, Fire Insurance Exchange and the Associated Factory Mutual Fire Insurance Companies.

Corcoran Water Storage Tanks Are Standard Quality

Corcoran water storage tanks are constructed of best grade cypress or fir. They are substantially designed to resist all outward and downward pressures.

A modern factory adequately equipped with the best machinery insures the highest standard of tank construction. All staves are accurately beveled and uniformly grooved at lower end to secure bottom, making absolutely watertight joints. High grade iron bands painted with a rustproof paint are used, for they have greater tensile strength and will last three times as long as steel. Bands are placed in right position on tank and brought together by means of lugs with drawrods with nut on each end. Staves are protected from injury by friction plates under lugs. Lugs are accessibly placed on tank to take up shrinkage of wood and make tank as tight as a water pail—a far superior method to the old style riveted band. On large tanks, several lugs are placed on each band.

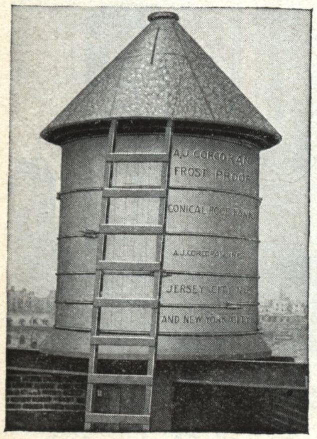
Standard tanks of various styles and sizes are kept in stock, so, for ordinary usage, it is possible to make delivery within a day or two after order is received.

Special Tanks

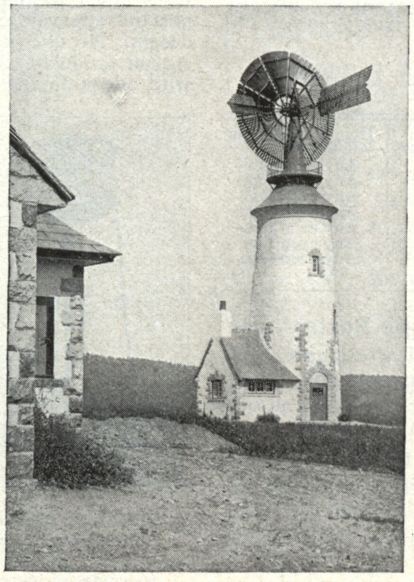
Quotations will be made for special tanks upon receipt of information. Tanks for special purposes are made of whitewood, cypress, oak, ash, yellow pine, maple or other woods best fitted to service required.

Estimates and Co-operative Service

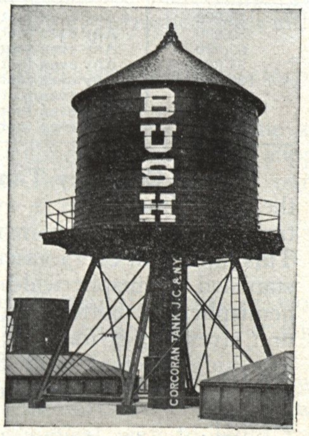
Our prices are as low as is consistent with first class material and workmanship. We will furnish estimates for any size, delivered in "knock down" or erected, and also for the frame and bed pieces for the bottom to rest upon. The structures upon which it is intended to place the tanks must be of the requisite strength so distributed as to afford the best results. On this point we shall be pleased to give purchasers information based upon long experience; also, concerning tanks for various purposes, their uses and the material most appropriate, as well as for the substructures, from the least expensive to the most ornamental, and, in short, on anything pertaining to water supply.



Frostproof Tank



Corcoran Windmill Pumping Outfit



Sprinkler Tank

PITTSBURGH-DES MOINES STEEL COMPANY

Elevated Steel Tanks, Storage Tanks and Structural Steel

802 Curry Building
PITTSBURGH, PA.

SALES OFFICES

NEW YORK, N. Y., 202 Hudson Terminal Building
RICHMOND, VA., 1202 Virginia Railway & Power Building
DETROIT, MICH., 602 Book Building
CHICAGO, ILL., 1202 First National Bank Building
DES MOINES, IOWA., 902 Tuttle Street
DALLAS, TEX., 1202 Praetorian Building
SEATTLE, WASH., 302 Pioneer Building
SAN FRANCISCO, CAL., 302 Rialto Building

PLANTS: PITTSBURGH, PA. and DES MOINES, IOWA

Products

Elevated Steel Tanks: for water storage and fire protection for buildings, plants, factories, golf clubs, private estates, municipalities and railroads.

Also Standpipes and Steel Reservoirs for water storage; Storage Tanks for oil, acid, gasoline, molasses and other liquids; Surge Tanks, either simple or differential for hydroelectric projects; Steel Stacks; Penstocks and Steel Pipe; Structural Steel and Steel Plate Work.

Elevated Steel Tanks

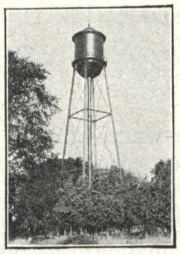
An elevated steel tank is the efficient, economical way to store water for a sprinkler or hydrant system. A steel tank will not rot, leak, burn or burst. It is reasonable in first cost, requires no upkeep except an occasional coat of paint, and will last indefinitely. The first Pittsburgh-Des Moines elevated steel tank built at Scranton, Iowa, in 1897, is still in service today. A steel tank means a permanent, worthwhile investment.

TRADE-MARK

Standard Tanks and Towers

We have standardized our tanks and towers most generally used, and carry them in stock, completely fabricated and ready for immediate shipment.

Various heights and capacities are offered in the table below.

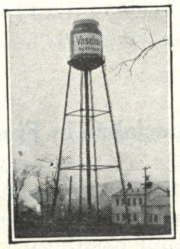


Homeopathic Hospital, Rochester, N. Y.
50,000 gal., 100 ft. to bottom

FISHER BODY
CORPORATION
PLANT
34

Fisher Body Corp., Detroit, Mich.
40,000 gal., 20 ft. to bottom

Oshkosh Country Club, Oshkosh, Wis.
40,000 gal., 75 ft. to bottom



Chesebrough Mfg. Co., McKees Rocks, Pa.
50,000 gal., 100 ft. to bottom

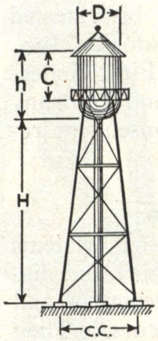
DIMENSIONS OF STANDARD TANKS AND TOWERS

Capacity U. S. gal.	Diameter (D) ft.	Range of Head (h) ft.—in.	Height to bottom of tank (H) ft.—in.									
25,000	15	19—11	44—8	50—0	69—8	**75—0**	94—8	**100—0**	125—0			
30,000	15	23—9	44—8	50—0	69—8	**75—0**	94—8	**100—0**	125—0			
40,000	17	25—1	46—3	**75—0**	96—3	**100—0**	125—0					
50,000	19	25—7	55—0	63—4	**75—0**	83—4	91—8	**100—0**	111—8	120—0	128—4	140—0
60,000	19	29—9	55—0	63—4	**75—0**	83—4	91—8	**100—0**	111—8	120—0	128—4	140—0
75,000	21	30—6	55—0	63—4	**75—0**	83—4	91—8	**100—0**	111—8	120—0	128—4	140—0
100,000	24	31—0	50—0	63—1	**75—0**	79—7	91—6	**100—0**	113—1	116—6	125—0	141—6
150,000	28	34—7	50—0	75—0	100—0	125—0	150—0					
200,000	32	36—1	50—0	75—0	100—0	125—0	150—0					

Boldface type indicates towers and tanks already fabricated and in stock. Other towers listed are partially fabricated and can be shipped very promptly.

150,000 and 200,000-gallon tanks are carried in stock.

Designs and material for these towers are on hand ready for immediate fabrication. We also have designs ready for immediate fabrication for tanks and towers of 250,000, 300,000, 500,000 and 1,000,000-gallon capacity.

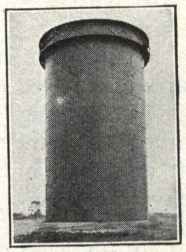


Note: Distance center to center of adjacent columns (c.c.) is (.707D.2H+1½"), and the length of one side of the square plot of ground required may be determined roughly by adding 10 ft. to above formula.

Roof Tanks

Should be used only when no suitable ground space is available for a standard water tower.

If you contemplate a roof tank on a new building, it will pay to consult us in regard to the proper spacing for the tower supports when you first plan the building.



City Waterworks, Marblehead, Mass.
1,430,000 gal., 90 ft. high

Special Towers

Will be designed, fabricated and erected to meet unusual conditions. Write for plans and estimates.

If possible, give us the following information about the tower under consideration:

(1) Use — for factory, plant, office building, golf course or municipality.

(2) Capacity.

(3) Height of tower to bottom of tank.

(4) Erection conditions at proposed site: if on a building, give number of stories and spacing of the supporting columns; if on the ground, give the area of clear ground space available.

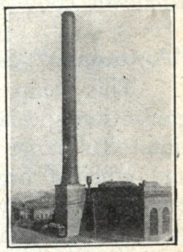
(5) Distance from nearest railroad.

Co-operative Service

Our engineers will be glad to discuss with you any questions concerning use, capacity, height and erection sites for water storage tanks. Write or wire our nearest office for designs and estimates of the tanks you need.

Plans, specifications and quotations will be promptly sent, without any obligation on your part.

Send for our Industrial Tank Catalog No. 2, or our Municipal Tank Catalog No. 2.



Des Moines City Ry. Co., Des Moines, Iowa
217 ft. high, 13 ft. diam. at top

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA

Underwriters' Building, 123-133 William Street

NEW YORK, N. Y.

PLANT
YOUNGSTOWN, OHIO

DEPARTMENT OFFICES

ATLANTA, GA., 433 Candler Building
BALTIMORE, MD., 212 Morris Building
BOSTON, MASS., 141 Milk Street
BUFFALO, N. Y., 822 Prudential Building
CHARLOTTE, N. C., 1117-19 Johnston Building
CHICAGO, ILL., 209 South La Salle Street
CINCINNATI, OHIO, 1817-18 First National Bank Building
CLEVELAND, OHIO, 1006-16 Euclid Avenue
DALLAS, TEX., 1608 Main Street
DETROIT, MICH., 1416 David Whitney Building
KANSAS CITY, MO., 112 West 9th Street
KNOXVILLE, TENN., 824 Holston National Bank Building
LOS ANGELES, CAL., 610 South Broadway
MINNEAPOLIS, MINN., 550-52 McKnight Building
MILWAUKEE, WIS., 421 Caswell Block Building
NEW ORLEANS, LA., 534 Whitney Central Building
NEW YORK, N. Y., 123-33 William Street
PHILADELPHIA, PA., 328 Chestnut Street
PORTLAND, ORE., 636 Railway Exchange Building
ROCHESTER, N. Y., 130 Main Street, East
SAN FRANCISCO, CAL., 519 California Street
ST. LOUIS, MO., 309 Pierce Building
SEATTLE, WASH., 1906 Third Avenue
SYRACUSE, N. Y., 423½ South Salina Street
TAMPA, FLA., 621 Citrus Exchange
YOUNGSTOWN, OHIO, Brittain Street

"AUTOMATIC" SPRINKLER CO. OF CANADA, LIMITED

MONTREAL, QUE., 3214 Jeanne Mance Street
TORONTO, ONT., 405 McKinnon Building

We Do Nothing But Specialize in Fire Protection

Our sole aim is to afford customers the highest possible character of equipment designed to automatically and positively control fire. It is an utter impossibility to eradicate the occurence of fire, but the little fire can be kept little—automatically, positively.

We do nothing but specialize in Fire Protection—create, manufacture and install Sprinkler Systems and all auxiliaries to complete systems of protection on ordinary and unusual fire hazards.

These equipments include Standard Sprinkler Apparatus, Wet and Dry Pipe; Apparatus for Protection against Special Hazards, such as powder manufacturing, pyroxyline products, varnish dip tanks, oil and grease; Automatic Draft Stops; Automatic Water Curtains; Automatic Drainage of Hazardous Liquids; Automatic Fuel Oil Stops; Automatic Chemical Equipments for Supplying Automatic Sprinklers and Hose Standpipes Independent of Water Supplies; Sprinkler Heads, Dry Valves; Alarms, water and electric; Automatic Fire Door Releases and Deluge Valves.

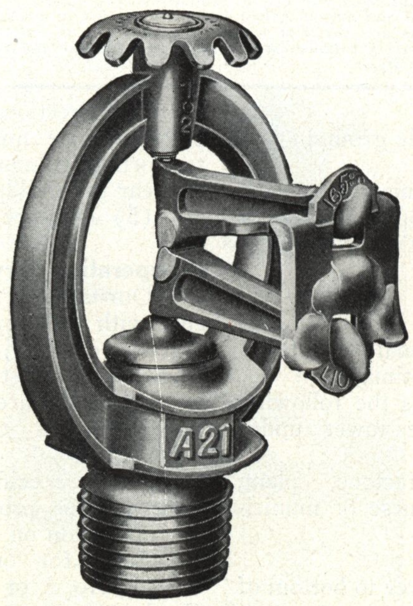
"Automatic" installations assure the automatic control of fire under whatever conditions may exist.

"Automatic" Service

This company is the largest organization specializing in fire protection. Its large volume of business and efficient organization make for economy on any individual installation, yet first cost is not lowered at the expense of the service expected or of the protection acquired.

The actual basis on which fire protection can be acquired must necessarily vary according to the conditions bearing upon each case. Without expense or obligation on your part, this company will make a survey of the situation and report explicitly.

We maintain a complete inspection service in many locations with competent repair men available at any time, skilled inspectors and technical advisers.



"AUTOMATIC" SPRINKLER HEAD

Official Approval

"Automatic" sprinkler apparatus has been tested and approved by the Underwriters' Laboratories, Inc., and accepted by the National Board of Fire Underwriters and every insurance association and company in the United States and Canada, with consequent reduction of insurance.

The Most Efficient Fire Fighters Known

"Automatic" sprinkler systems embody the scientific supply and distribution of water immediately and automatically a fire occurs. They make the spreading of fire impossible—they do not prevent fires, but extinguish them with minimum loss.

Besides reducing fire losses, they considerably reduce the cost of insurance and the risk of delay and loss of business resulting from fire.

Sprinkler Heads

Sprinkler heads are considered to be the most thorough fire fighting device. A fire seldom opens more than a few—85% of all fires in sprinklered buildings have been controlled by five heads or less.

We have installed the largest equipments in the country, one plant alone requiring 126,512 sprinkler heads.

GRINNELL COMPANY, INC.

Manufacturers of Fire Protection Systems

EXECUTIVE OFFICES
PROVIDENCE, R. I.

NEW YORK, N. Y.
PROVIDENCE, R. I. (Plant)
BUFFALO, N. Y.
MINNEAPOLIS, MINN.
COLUMBUS, OHIO
BOSTON, MASS.
HARTFORD, CONN.
ALBANY, N. Y.
DALLAS, TEX.
ST. PAUL, MINN.
ATLANTA, GA. (Plant)
PHILADELPHIA, PA. (Plant)
CINCINNATI, OHIO
CLEVELAND, OHIO
NORTH CHARLOTTE, N. C. (Plant)
AUBURN, R. I. (Plant)
BALTIMORE, MD.
CHICAGO, ILL. (Plant)
ST. LOUIS, MO.
DETROIT, MICH.
NEW ORLEANS, LA.
ROCHESTER, N. Y.
MILWAUKEE, WIS.
KANSAS CITY, MO.
WARREN, OHIO (Plant)
GREENVILLE, S. C.

GRINNELL COMPANY OF THE PACIFIC

LOS ANGELES, CAL.
SAN FRANCISCO, CAL.
SEATTLE, WASH.

GRINNELL COMPANY OF CANADA, LTD.

MONTREAL, QUE. (Plant)
TORONTO, ONT. (Plant)
VANCOUVER, B. C.
WINNIPEG, MAN.

Products and Services

GRINNELL AUTOMATIC SPRINKLER SYSTEMS and AUTOMATIC FIRE ALARM.

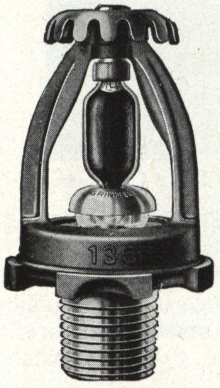
For Power Piping, Heating and Industrial Piping Equipment, see pages 2285-2287.

Grinnell Automatic Sprinkler System

This system has been in successful operation for more than 40 years.

Today, over 20,000,000 Grinnell sprinkler heads are safeguarding business property valued at approximately three billion dollars. The average loss per fire in Grinnell protected buildings in over 22,000 recorded fires is less than $300.00—a reduction of over 96% on the lowest average fire loss previous to the invention of this system.

GRINNELL COMPANY, INC., has introduced a new and revolutionary sprinkler head which differs in many respects from the ordinary solder type head through the use of a silica bulb. Descriptive literature on this head, which is more sensitive and absolutely proof against corrosion and loading, will be sent on request.



Grinnell Silica Bulb Sprinkler Head
Proof against corrosion and loading

Operation—When fire breaks out, temperature at the ceiling rapidly increases and causes the fusible strut of the sprinkler head to melt. Thereupon, the glass valve, found only in the Grinnell head, is instantly thrown from its seat on the unique flexible diaphragm. This allows the water to rush out and strike the deflector, which breaks it into a heavy spray. One sprinkler head effectively drenches an area of 80 to 100 sq. ft.

The operation of the sprinkler head immediately and automatically gives the fire alarm, a water motor alarm being usually installed on the outside of the building.

Connections and Piping—An ample supply of water is furnished, either from tanks, a fire pump or a connection with city water, or a combination of two or more of these units. Often city water alone is sufficient.

From this abundant source of water a large riser or supply pipe extends from the top to the bottom of the building to be protected. Connected with this large pipe are branch lines of smaller pipe. These run near the ceiling to all parts of the building. They are carefully graded in size in order that the water everywhere throughout the building may be under good pressure and ample in volume. At stated intervals along these branch lines (usually 8 to 10 ft.) are placed Grinnell automatic sprinkler heads.

Grinnell Dry Pipe System—To obviate freezing in the sprinkler piping in buildings which are unheated, GRINNELL COMPANY, INC., installs a dry pipe system. In this system the water is held back of any point where it might freeze by the Grinnell dry pipe valve. The pipes in this system are filled with air under moderate pressure, but when a sprinkler head opens, the air escapes and the dry valve operates, admitting water to the system.

The system is further improved by the Grinnell Dry Valve Accelerator, an important invention which makes dry pipe systems practically as quick in operation as wet ones.

Installation—Grinnell Automatic Sprinkler Systems are factory-assembled to blue prints, fittings being made-on as far as possible by machinery. The result is that the equipment comes to the job ready for quick and botherless installation by our highly trained erecting crews. This reduces interference with usual plant operation to a minimum.

Inspection and Service—This company has instituted a special department whose sole duty it is to inspect Grinnell sprinkler equipments and render full reports to the owners on such inspections with practical suggestions for needed changes. A corps of expert sprinkler engineers is engaged in this work and the success with which it has already been attended is ample evidence of the necessity of this independent inspection service.

Designs and Estimates—Inquiries addressed to the head office of GRINNELL COMPANY, INC., or to any of the branches will immediately receive the attention of the engineering staff, who will promptly furnish expert advice with designs or estimates as required.

W. D. ALLEN MANUFACTURING CO.

Fire Protection Equipment
566-570 West Lake Street, CHICAGO, ILL.

FACTORY
5630-5658 Roosevelt Road
CHICAGO, ILL.

BRANCH OFFICES
NEW YORK, N. Y., 69 Warren Street
BOSTON, MASS., 224 State Street
DENVER, COLO, 1410 Sixteenth Street
SALT LAKE CITY, UTAH, Scott Building
NEW ORLEANS, LA., Godchaux Building

Products

GENERAL FIRE PROTECTION and STANDPIPE EQUIPMENT for interior and exterior use, comprising: Hose Racks and Reels; Fire Hose, linen and cotton rubber lined; Brass Hose Couplings, Valves and Nozzles; Steel Hose Cabinets; Fire Extinguishers; Brass Siamese Standpipe Connections; Hose Spanners, Fire Axes and other auxiliary equipment.

Note: Brief specifications for standpipe equipment and installation will be be found on second following page.

Facilities

Allen products include the most modern fire fighting appliances on the market. Twenty-five years' experience, harmonious co-operation with insurance companies and underwriters, coupled with a close study of their requirements, have enabled this company to satisfy the most exacting specifications.

Literature and Co-operation

Our specification and detail brochure, No. 200A, covering interior fire protection equipment in a most comprehensive way, will be mailed on request. Correspondence is also invited on special problems and our service department will co-operate to the fullest extent possible in furnishing data and information.

"Alenco" Pressed Steel Cabinets for Hose and Equipment

These cabinets are recommended for all installations, particularly for Bowes hose racks. They protect the equipment from dirt; prevent indiscriminate handling, yet provide easy access in emergency. "Alenco" cabinets are sightly in appearance and finish and will harmonize with other high grade fittings used in public buildings, institutions, schools and similar structures. They can be finished in any special color to match trim.

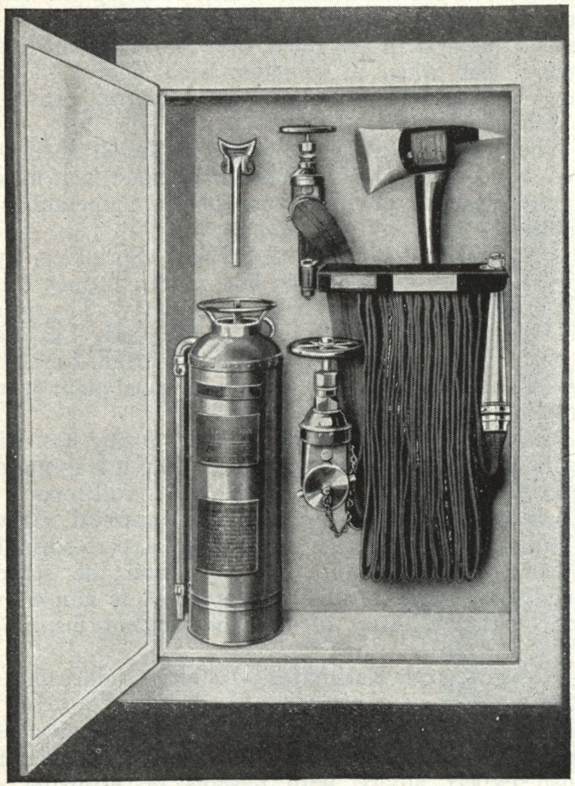


Fig. S-190. Chicago Type Hose Cabinet

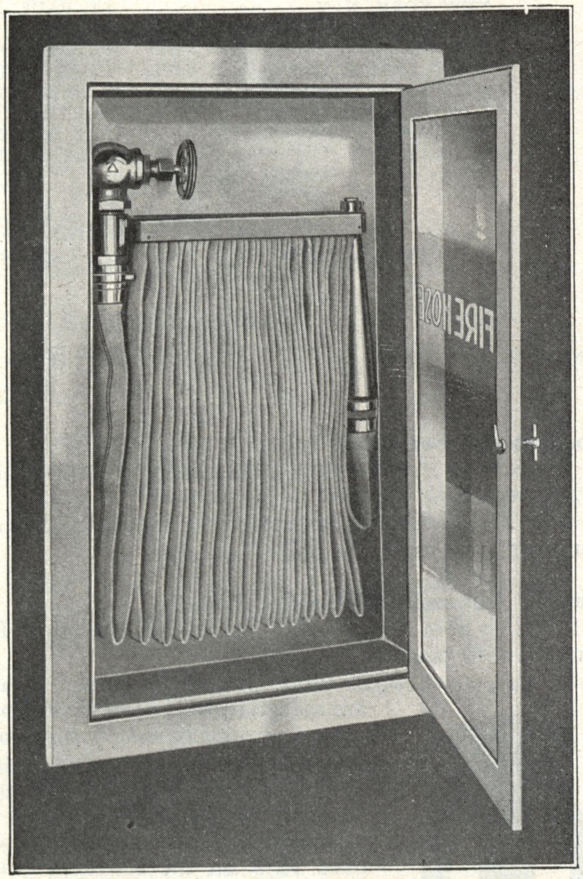


Fig. S-262. "Alenco" Standardized Hose Cabinet

We have standardized on certain stock sizes, which have been designed for Bowes racks, but can furnish other sizes to meet individual requirements.

For specifications, see second page following.

Underwriters' Approved Fire Extinguisher

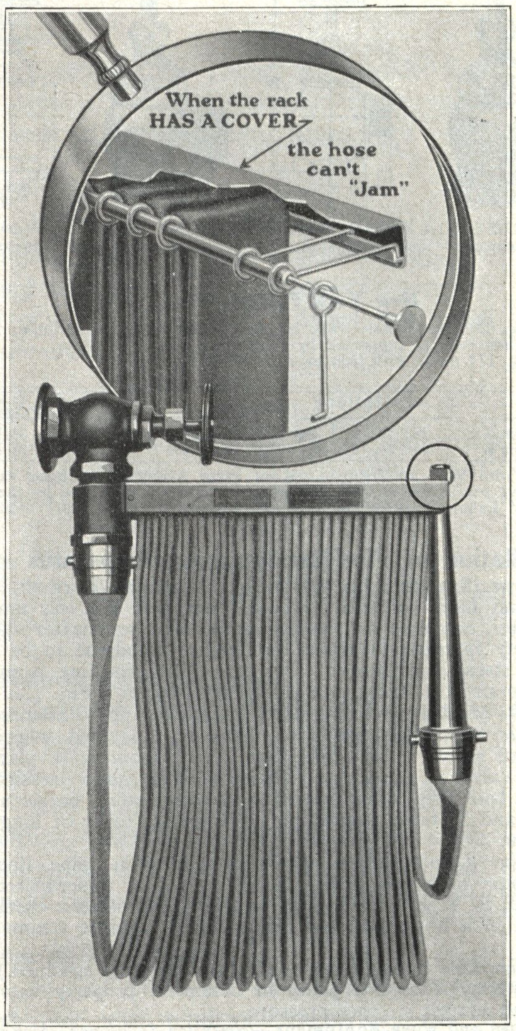
Allen's "First Aid" extinguishers are the standard soda and acid tipover type, $2\frac{1}{2}$-gal. capacity. These are made according to Underwriters' specification and bear their approving label, thus assuring full credit from insurance companies. Steel cabinets, as illustrated, to hold these extinguishers can be furnished from stock.

First Aid Extinguisher and Cabinet

Continued on next page

Bowes Hose Rack for Linen Hose

To get the water to the fire in the quickest time is the function of interior fire protection equipment. When Bowes racks are installed, it is only necessary to (1) turn on the water (2) take the nozzle from the clip (3) run to the fire. The action of the Bowes steel cover rack is easy, simple and automatic—the hose can not tangle nor snarl.



Bowes Hose Rack for Linen Hose

The Bowes idea, embodied in our several types of racks, consists of a tubular arm on which eyeleted pins are slidably mounted. The opposite ends of the pins are designed to fit in a channel parallel to the tubular arm, thus supporting the folded hose. This patented design gives a positive support, with equal pressure on both sides; the hose, without being pinched, is absolutely held in place until forcibly withdrawn at the open end. The pins remain on the extension arm, as shown.

The cover and sides are formed from one piece of heavy sheet steel, which, firmly joined to the malleable iron back, gives a rigid sturdy rack designed for heavy service. The big feature of the cover, however, is that it controls the fire stream in case the water is turned on before the hose is withdrawn; the hose, therefore, comes off the Bowes rack, loop by loop, in an orderly way, instead of being forced up through the top of the rack as is the case with all open top racks.

Bowes racks can be supported by (E) wall bracket; (F) pipe clamp; (G) valve nipple; or (J) combination escutcheon and wall bracket.

Bowes Underwriters' Labeled Semiautomatic Rack

The Bowes idea of the positive supports and extension arm has been incorporated into our semiautomatic Underwriters' labeled rack. In case of fire the valve is opened, and a simple arrangement automatically holds the water at the first fold of hose until a slight tug at the nozzle end releases it. This rack is labeled and approved by the Underwriters' Laboratories, Inc.

Architects wishing to secure the lowest possible insurance rates for their clients should specify the Bowes labeled rack.

Made for 1¼-in. and 1½-in. unlined hose only.

The regular finish on the Bowes rack is aluminum bronze. Red enamel or gold bronze finish is optional. Also furnished dead black finish, nickelplated on iron, polished brass, and polished brass nickelplated.

Bowes Storage Rack

For 2 and 2½-in. Underwriters' unlined linen hose only. Labeled to Underwriters' specifications, but is without the semiautomatic feature.

Bowes Regular Type Rack

This rack, as shown below, is recommended where the semiautomatic features of the Underwriters' racks are not desired. Made in the same manner, of the same material, but without the semiautomatic feature.

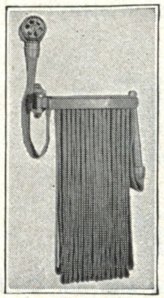


Fig. 137
Style E, with Wall Bracket

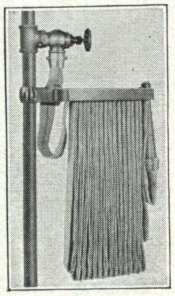


Fig. 138
Style F, with Pipe Clamp

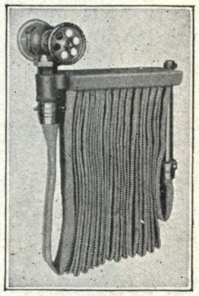
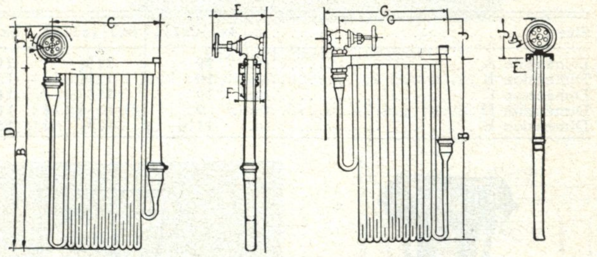


Fig. 139
Style G, with Valve Nipple



DIMENSIONS BOWES RACKS

Capacity ....ft.	50	50	50	75	75	75	100	100	100
Hose size........in.	1½	2	2½	1½	2	2½	1½	2	2½
Dimension A ....in.	2¾	3⅛	3½	2¾	3⅛	3½	2¾	3⅛	3½
Dimension B ....in.	20½	20½	20½	24	24	24	26½	26½	26½
Dimension C.....in.	15	15½	16	18	18½	19	20	20½	21
Dimension D ....in.	27¼	27½	28½	30¾	31	32	33¼	33½	34½
Dimension E ....in.	7	9	10½	7	9	10½	7	9	10½
Dimension F ....in.	4¼	5⅛	5⅝	4¼	5⅛	5⅝	4¼	5⅛	5⅝
Dimension G ....in.	17½	18	19	20½	21	22	22½	23	24
Dimension J.....in.	6¾	7	8	6¾	7	8	6¾	7	8

Note—If dimensions are wanted with escutcheons add 4½ in. to dimension "B."

Racks and Reels for Mill Hose

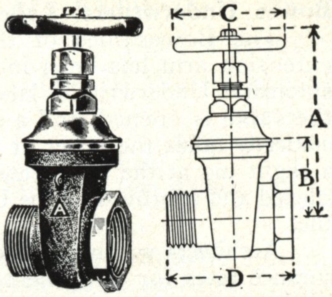
Cotton rubber lined hose for mill, warehouse and factory use should be folded horizontally or coiled. For this purpose we furnish our "Hartford" hose rack or "Ryerson" reel, both of which are listed and approved by the Associated Factory Mutual Insurance Companies. Write for additional data on these two devices, if interested.

Continued on next page

Hose Gate Valves

These heavy rough body valves are designed for use on inside standpipe with ordinary pressure. They have an adjustable double disc and stationary stem. Individually tested before shipment and warranted tight on delivery.

Made in following sizes: 1-in. inlet, 1¼-in. outlet; *1-in. inlet, 1½-in. outlet; straightway, 1¼, 1½, 2 and *2½-in.



Hose Gate Valve and Dimension Diagram

DIMENSIONS, HOSE GATE VALVES

Size ....in.	1½	2	2½	Size ....in.	1½	2	2½
Dimension A ..in.	6½	7¾	11	Dimension C ..in.	4	4½	6
Dimension B ..in.	2½	3¼	4	Dimension D ..in.	3½	3¾	4¼

**Note*—These two sizes also made extra heavy for use on standpipes where pressure is excessive (over 125 lb.). The 1-in. inlet on small valves automatically reduces pressure at the nozzle by cutting down flow of water.

Siamese Connections

A Siamese connection can be made an ornament to any building.

Figs. 232 and 231 are made of bronze, well proportioned, highly polished; and are distinctively handsome.

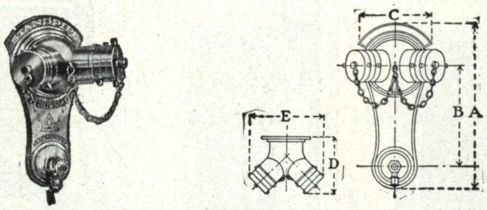


Fig. 232. Combination Siamese Connection and Sill Cock, and Dimension Diagrams

For use where inlet pipe is run through side of building. Furnished with double clapper closing valve

Size ....in.	4x2½x2½	6x2½x2½	6x3x3
Dimension A ....in.	19	21¾	21¾
Dimension B ....in.	10	12¼	12¼
Dimension C ....in.	10	11½	11½
Dimension D ....in.	9	11½	11½
Dimension E ....in.	11½	12¾	12¾

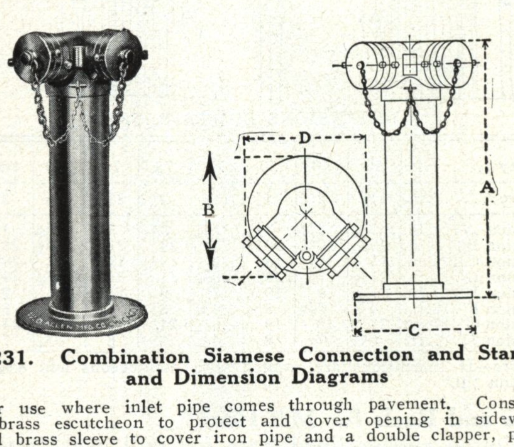


Fig. 231. Combination Siamese Connection and Standpipe and Dimension Diagrams

For use where inlet pipe comes through pavement. Consists of heavy brass escutcheon to protect and cover opening in sidewalk, a polished brass sleeve to cover iron pipe and a double clapper, polished brass Siamese connection.

Made for either a 4 or 6-in. standpipe and with either 2½ or 3-in. inlets

Size ....in.	4x2½x2½	4x3x3	6x2½x2½	6x3x3
Dimension A ....in.	24	24	24	24
Dimension B ....in.	11	14½	13½	14½
Dimension C ....in.	10¼	10¼	12	12
Dimension D ....in.	11½	13½	12	13½

New York Pattern Hose Valves

Heavy* and well finished. Have rubber discs which can be renewed as occasion requires. Intended for use on systems where there is a continuous pressure on the standpipe.

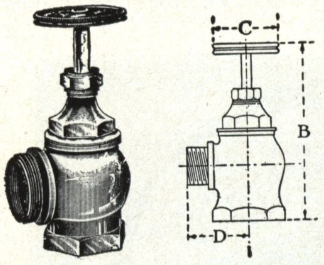


Fig. 170. Valve with Male Hose Connection and Dimension Diagram

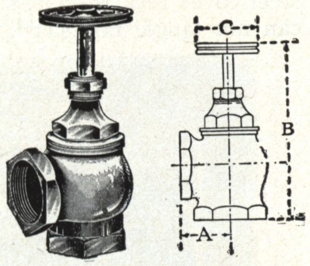


Fig. 171. Valve with Female Hose Connection and Dimension Diagram

New York Pattern Hose Valves

Fig. 170 used where rack is attached to wall or standpipe; Fig. 171 used when rack is supported by special nipple

Fig. 171 made with iron pipe thread at both ends

Size ....in.	1¼	1½	2	2½	Size .... in	1¼	1½	2	2½
Dimension A ....in.	1¾	2	2⅜	3	Dimension C ......in.	3¼	3¼	4	4¾
Dimension B ....in.	7⅛	7⅛	9	10¼	Dimension D .....in.	2⅛	2½	2¾	3¼

**Note*—We can furnish 2½-in. extra heavy angle hose valves for excessive pressures—125 lb. or higher. These are approved by the Underwriters' Laboratories of the National Board.

Installation of Fire Extinguishing Apparatus

Specifications for Interior Standpipe—Furnish, set up and run from sidewalk to roof, riser pipe not less than 4-in. diameter, complete with valves as specified hereinafter; all to be securely fastened to beams and walls; standpipe to be carried up as shown in diagram. Run main 4-in. pipe line from standpipe to street at front wall as directed, attach a Fig. .... W. D. ALLEN MANUFACTURING CO.'s double clapper Siamese with *sensible caps.* On inside of main wall, located where frost can not affect it, not less than 10 ft. from wall, place 4-in. check valve, to check against hose tank or pump pressure, with ½-in. ball drip cock, placed at lowest point between check valve and Siamese connection. All fittings to be of long sweep pattern.

Pipe Line to House Tank—Connect 4-in. pipe line from standpipe to house tank at roof with 4-in. underwriters' pattern O. S. Y. gate valve and underwriters' pattern check valve placed in a horizontal position to check against steamer pressure.

Pipe Line to Fire Pump—(If a fire pump is specified.) Connect standpipe to fire pump in basement, properly valved and checked against steamer pressure.

Hose and Hose Equipment—*Dimension Suggestion*—Size of valves and hose depends largely on local conditions. Insurance and municipal authorities having jurisdiction should be consulted. In the absence of specific requirements, it is recommended that on all buildings, 1½-in. valves and hose be installed. On buildings over 5 stories in height, an additional 2½-in. valve should be provided for use of the fire department. The following is the most common form of installation:

Specifications—At each point indicated on plans, provide and install 5 ft. 6 in. above floor:

(A1) A 2½-in. hose angle valve, complete, with a 2½-in brass rack supporting nipple and a 2½x1½-in. brass reducing coupling; or (A2) a 1½-in. hose angle valve, complete, with a rack supporting nipple.

Furnish and connect sufficient 1½-in. underwriters' linen hose to reach any portion of the floor served by this standpipe; hose to be coupled in lengths not longer than 50 ft. and equipped with one plain hose nozzle, 1½x12x½ in. with lugs. Provide a "First Aid" 2½-gal. labeled extinguisher and fire axe.

Fire hose to be properly folded and installed on: (a) Bowes Regular hose rack, (b) Bowes Underwriters' Labeled Semi-automatic hose rack.

Specifications for Steel Hose Cabinets—Furnish and install Alenco pressed steel fire hose cabinets where shown on plan. Body of cabinets to be made of heavy furniture steel. Door and casing around door to be pressed out of one piece, avoiding joints on face. Inside of door is also to be made of one piece, pressed into shape and so arranged that the glass will be rigidly held in place. The glass is to be polished plate (or DSA glass) with words "FIRE HOSE" 1½ in. high across face inside.

ELKHART BRASS MANUFACTURING COMPANY

Manufacturers of Inside Fire Protection

HOME OFFICE AND FACTORY
1307 West Beardsley Avenue
ELKHART, IND.

ELK HART
IND
REGISTERED TRADE-MARK

Products

Complete Equipment for Inside Fire Protection: FIRE DEPARTMENT SUPPLIES, CHEMICAL FIRE EXTINGUISHERS.

Experience and Facilities

With our large modern factory and foundry and 25 years' experience, we are prepared to furnish highest quality equipment all guaranteed by the Elkhart registered trade-mark.

Distribution

Elkhart Products are known and sold throughout the United States and Canada, many of the country's finest buildings being equipped complete.

For Your Convenience

Blue prints and additional data gladly furnished on request.

Installation Suggestions

Interior Standpipe—Run from basement to roof, riser pipe not less than 4-in. diameter, with necessary valves, all securely installed.

Run 4-in. pipe line from standpipe to front of building, where Elkhart double clapper siamese No. 155, with polished bronze wall plate should be attached. See second page following for different styles of siamese.

Hose and Equipment

Size of valves and hose come under jurisdiction of insurance and municipal authorities who will furnish necessary data. When not otherwise required, we recommend the installation of 1½-in. valves and hose, with an additional 2½-in. valve in buildings over five stories high, for use by fire department.

A practical method is to omit the 1½-in. valve, attaching 1½-in. hose directly to 2½-in. valve or valve nipple by means of female reducing coupling Fig. No. 335 with 2½-in. thread and tail piece for 1½-in. linen hose.

Connect enough 1½-in. underwriters' linen hose to reach every part of the floor served by each standpipe. Hose to be coupled in 50-ft. lengths and equipped with plain hose nozzle 1½x12x½ in. and to be folded and installed on Elkhart covered hose rack, or Elkhart underwriter's labeled semi-automatic hose rack. Racks should be installed 5 ft. 6 in. above floor at each point indicated on plans.

Each unit should include an Elkhart 2½-gal. labeled and approved fire extinguisher.

Steel Hose Cabinets

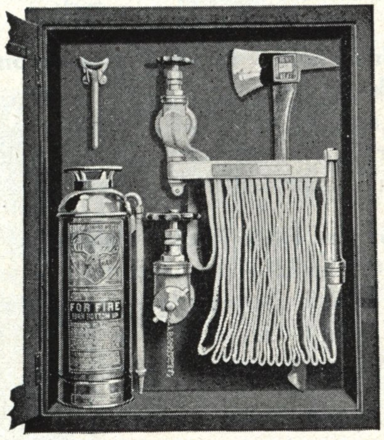
Install Elkhart pressed steel hose cabinet at each point indicated on the plan. This cabinet has flush front, door and casing, pressed from one piece of steel.

No joints or rivets on face of cabinet.

Door is fitted with polished plate or DSA glass with words "Fire Hose" in letters 1½-in. high across face inside.

Standard finish is white prime coat, inside and out. In addition to sizes listed, cabinets can be furnished in any size required.

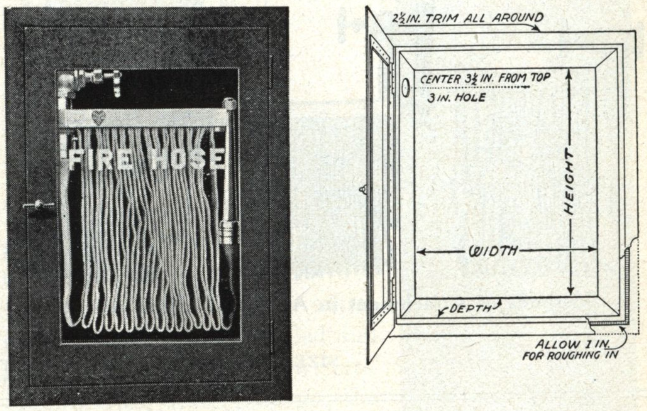
Complete specifications on request.



Elkhart Steel Cabinet

Cabinets to hold complete equipment as shown for 50, 75 or 100 ft. of 1½-in. hose.

Inside width, 31 in.; inside height, 39 in.; inside depth, 8 in.; size of glass, 26x32 in.



Elkhart Hose Cabinet

Capacity, ft. 1½, 2, 2½-in. hose	Width, in.	Height, in.	Depth, in.	Size glass, in.
50	20	30	7	16 x 24
75	22½	33	7	18 x 28
100	23½	35½	7	18 x 30

Allow 1 in. on width and height for roughing-in.

Hole for inlet to valve may be had on either right-hand or left-hand side of cabinet. Center of hole 3½ in. down from top.

Continued on next page

Elkhart Underwriter Labeled Semi-automatic Hose Rack

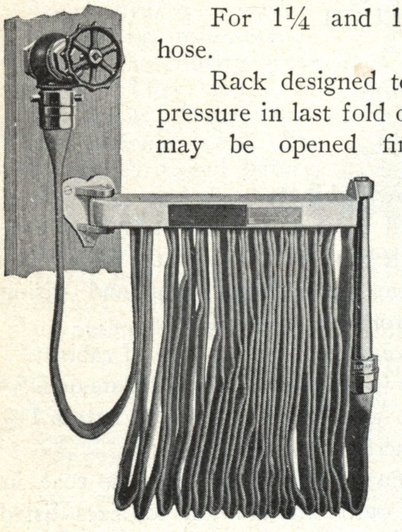


Plate 50

Methods of attachment: N, nipple; P, pipe clamps; W, wall bracket; X, combination wall bracket and escutcheon

For 1¼ and 1½-in. unlined linen hose.

Rack designed to hold 150-lb. water pressure in last fold of hose, so that valve may be opened first and then hose pulled off. When last fold is pulled off, water is released, coming through nozzle. Heavily built of one piece of pressed steel fastened to bronze castings. A tempered steel spring holds nozzle and another prevents hose from accidentally coming off rack.

Elkhart Underwriter Labeled Non-automatic Hose Rack

For 2 and 2½-in. unlined linen hose.

Similar in construction to Plate 50 but not automatic. Fully approved and labeled.

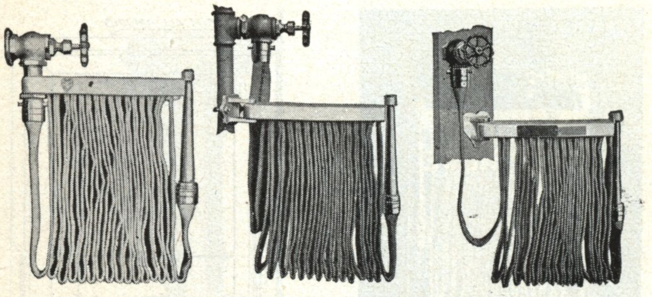
Elkhart Covered Hose Rack Unlabeled

For 1½, 2 and 2½-in. unlined linen hose.

Same general appearance as underwriter rack. Handsome design, and acceptable for all installations where labeled racks are not required.

Finish for Above Racks

All above racks can be furnished in aluminum bronze, red enamel or nickelplated. Also made in polished brass and polished brass nickelplated.



Methods of Attachment in All Racks Listed Above

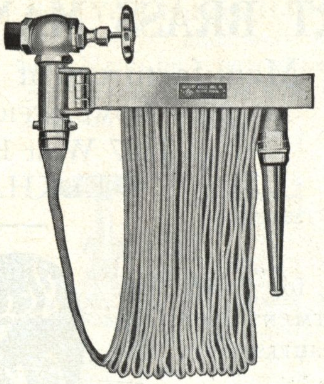


Plate 70

Elkhart A & A Nickel-plated Rack

Approved and labeled by Associated Factory Mutual Fire Insurance Companies, Boston.

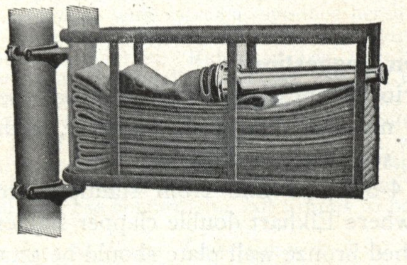
This rack is made of drawn steel, hinged to open and facilitate discharge of hose, and is a handsome piece of equipment. Furnished with nipple, as shown, with wall bracket or pipe clamp.

SIZES AND CAPACITIES OF A & A RACKS FOR LINEN HOSE

Number of rack........	70	71	80	81	90	91
Size hose............in.	1½	1½	2	2	2½	2½
Length hose.........ft.	50–75	100	50–75	100	50–75	100
Rack length..........in.	17¾	22½	17¾	22½	17¾	22½

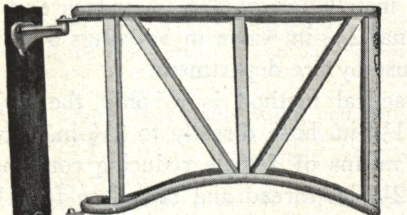
Elk Improved Hose Rack

Made of half oval steel, light, of fine appearance—a convenient method for holding hose for inside fire protection. Finished in aluminum bronze unless otherwise ordered.



Elk Improved Hose Rack with Hump

The hump takes the strain off the folded ends when hose is stored on rack, which prevents hose from breaking on the folds.



SIZES AND CARRYING CAPACITY OF ELK IMPROVED HOSE RACKS AND ELK IMPROVED HOSE RACKS WITH HUMP

No.	101	102	103	104	105	106	107	108	109	110	111	112
Dimensions............in.	10x20x3	15x22x3	22x24x3	32x30x3	10x20x3¾	15x22x3¾	22x24x3¾	32x30x3¾	10x20x4½	15x22x4½	22x24x4½	32x30x4½
Size hose.............in.	1¼ 1½	1¼ 1½	1¼ 1½	1¼ 1½	2	2	2	2	2½	2½	2½	2½
Capacity linen hose.....ft.	50	100	150	200	50	100	150	200	50	100	150	200
Capacity cotton rubber lined hose...........ft.	25	50	75	100	25	50	75	100	25	50	75	100

Methods of Attachment—Specify Plate 20 for wall brackets, Plate 21 for pipe clamps, for either of the Elk improved racks.

Continued on next page

Elkhart Swinging Hose Reel

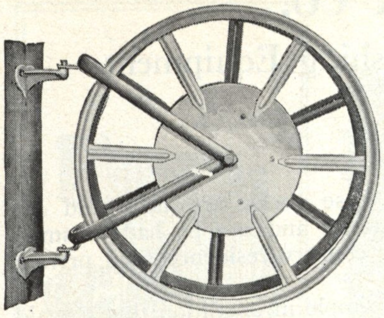


Plate 30 with Wall Bracket
Plate 31 with pipe clamp

For linen or single jacket cotton rubber lined hose. Sides larger than 16 in. made of pressed steel electrically welded. Strongest reel made, handsome design. Finish aluminum bronze.

In ordering give plate number.

SIZES AND CAPACITIES OF ELKHART REELS

No.	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12
Diameter of sides......in.	16	16	16	24	24	24	32	32	32	34	34	34	36	36	36
Size hose....in.	1¼ 1½	2	2½	1¼ 1½	2	2½	¼ 1½	2	2½	1¼ 1½	2	2½	1¼ 1½	2	2½
Unlined linen......ft.	75	75	75	175	150	150	250	250	250	350	350	350	400	400	400
Rubber lined cotton....ft.	25	25	25	50	50	50	100	100	100	150	150	150	200	200	200

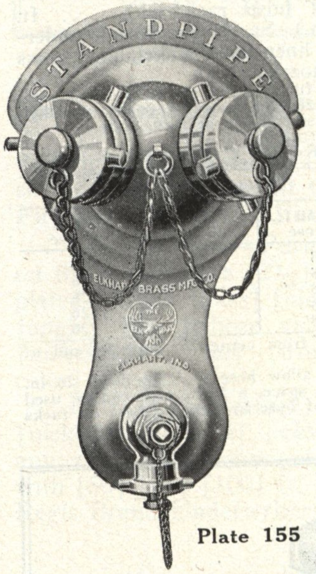


Plate 155

Siamese Connection with Sidewalk Inlet

Plate 15 shows a standpipe connection with 90° siamese used where the inlet pipe comes through the sidewalk. The complete connection consists of a polished brass sleeve to cover the pipe, heavy brass escutcheon and polished bronze siamese with caps and chains. To fit 3, 4 or 6-in. standpipe with 2½-in. inlets and has two clapper valves. Contractor's name can be put in the recess in the escutcheon.

Give length of pipe when ordering.

Siamese Connection and Sill Cock

Made of heavy bronze, highly polished. Handsome design. Used where inlet pipe runs through the wall. Has double clapper valve.

Dimensions: for 4 or 6-in. pipe. Greatest length, 19 in. Greatest width, 12½ in. Stands out from wall 10½ in. Center of pipe opening to center of sill cock with 4-in. pipe, 9⅝ in.; with 6-in. pipe, 10 in.

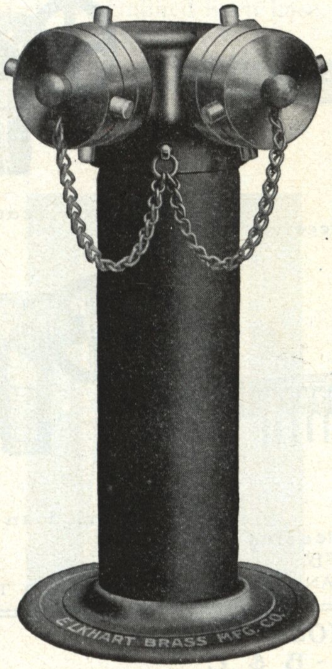


Plate 15

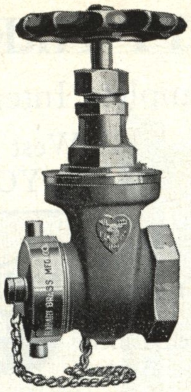


Plate 88

Bronze Hose Gate Valve

For use with inside standpipe. Has stationary stem, adjustable double disc. Every valve tested before leaving the factory.

GATE VALVE DIMENSIONS

Size valve..........in.	1¼	1½	2	2½
Radius of swing mounted......in.	6½	7	8	9½
Radius of swing demounted....in.	2½	3	3½	4½
Distance face to face..........in.	3	3¼	3½	4½
Distance with cap and chain...in.	4	4¼	4½	5½
Diam. hand wheel..........in.	4	4	4½	5

Elkhart Pattern Angle Valve

With leather or rubber seat for water only. Handsome in design and very durable. Specially designed for inside fire protection, and for high pressure work.

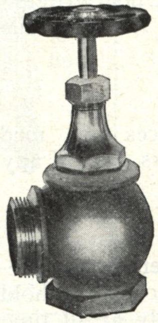


Plate 25
Male hose connection

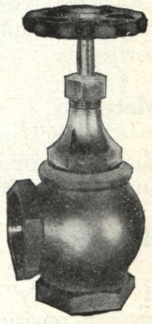


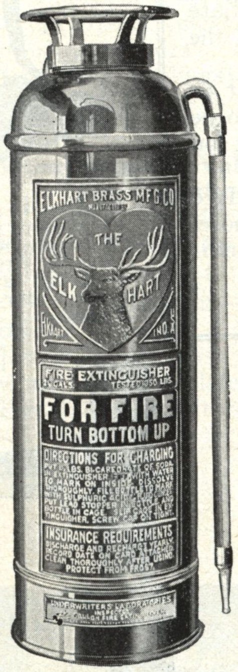
Plate 20
Female hose connection

All valves packed before they leave the factory.

Fire Extinguishers

To protect property, and also to get lowest possible insurance rates, install Elkhart 2½-gal. fire extinguishers. Made of copper, highly polished and lacquered. An ornament to any building.

Mechanically perfect. Instantly discharged by simply turning upside down.



Every one tested to 350-lb. pressure before it leaves our factory.

The Elkhart fire extinguisher is examined, labeled and listed by The Underwriters' Laboratories, Inc., Chicago, the Factory Mutual Fire Insurance Companies, Boston, and the U. S. Department of Commerce Steamboat Inspection Service for use on all vessels under their jurisdiction.

FOR FIRE
TURN BOTTOM UP

Cabinet for 2½-Gal. Fire Extinguisher
Inside measurement 9 in. wide, 27 in. high, 8 in. deep. Glass, 6x24 in.
Made of pressed steel. Finished in one coat black japan

THE JIFFY FIRE HOSE RACK CO.

Manufacturers of Complete Interior Fire Extinguishing Equipment

133 West 52nd Street
NEW YORK, N. Y.

Products

Hose Racks, Hose Cabinets, Siamese Connections, Fire Hose Valves, Chemical Fire Extinguishers.

Also Nozzles, Underwriters' Unlined Linen Hose, Couplings, Axes, Pails and Accessories.

Materials

"Jiffy" appliances are made in malleable iron (bronzed) or of brass, and in any style finish as required.

Hose Racks

Principle of Operation—The comb of the "Jiffy" fire hose rack holds the hose in position ready at all times for instant release. A pull upon the nozzle releases the arm holding the comb, letting the hose fall to the floor.

Advantages of "Jiffy" Fire Hose Racks—Always ready for immediate use. Automatic in operation; pull the nozzle and turn on the water.

No loose parts to become lost or broken. No metal rings or links to be dragged over furniture or caught on trim.

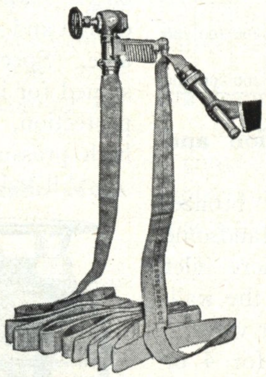
So constructed as to permit a free circulation of air around the hose, keeping it dry and in reliable condition.

JIFFY
FIRE HOSE
RACK

TRADE-MARK

"Jiffy" fire hose racks are neat and attractive in appearance and can be had in small compact sizes for country residences and private homes.

They are so simple in operation that a maid or child can handle them. Non-corrosive, will not rust.



Hose rack attached to extension piece showing 50 ft. of 2½ in. hose released from height of 6 ft. by layman. Note orderly layout of hose.

Standpipe and Hose Equipment Specifications

Standpipe—Where shown on plans, furnish and erect standpipe with necessary check valves, shut-off valves and Siamese connections, properly connected to meet requirements of Fire Prevention Bureau and governing departments.

Hose Equipment—Where shown on plans, furnish and install "Jiffy" nickel-plated brass angle hose valve, nickelplated milled wheel, "Jiffy" Type ("A," "B" or "C") improved hose rack with .... ft. (1½, 2, 2½-in.) St. Regis brand underwriters' labeled linen hose, nickelplated brass couplings and nozzles.

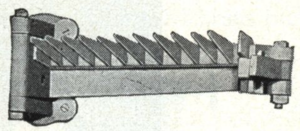
Note: Racks furnished in malleable iron aluminum or gold bronzed, enameled in color or nickelplated; also in brass polished or nickelplated.

DIMENSIONS OF "JIFFY" FIRE HOSE RACKS

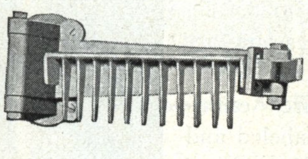
Diam. of hose, in.	Length of rack, in.		
	25 or 50 ft. of hose	75 ft. of hose	100 ft. of hose
¾	18	21	26
1	18	21	26
1½	18	21	26
2	18	21	26
2½	18	21	26

Measurements from center of pipe to end of nozzle holder.

Measurements allow hose to hang down 26 in. If limited for wall space, a 50-ft. rack can be used for 75 or 100 ft. of hose by hanging hose on racks in longer loops.

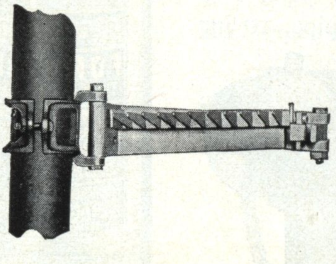


Comb ready to receive hose.

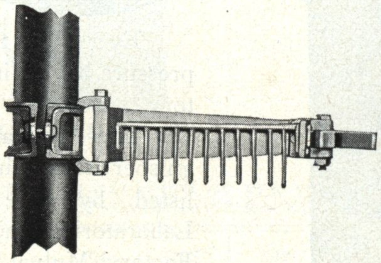


Comb down after releasing hose.

TYPE-"A"
ATTACHED TO WALL.

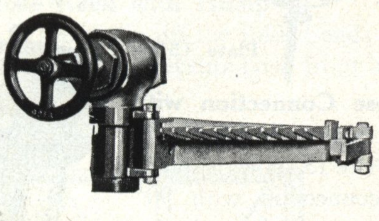


Comb ready to receive hose.

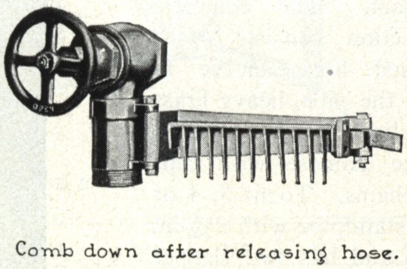


Comb down after releasing hose.

TYPE-"B"
ATTACHED TO STAND PIPE.



Comb ready to receive hose.



Comb down after releasing hose.

TYPE-"C"
ATTACHED TO EXTENSION PIECE.

"JIFFY" FIRE HOSE RACKS
TYPES A-B & C

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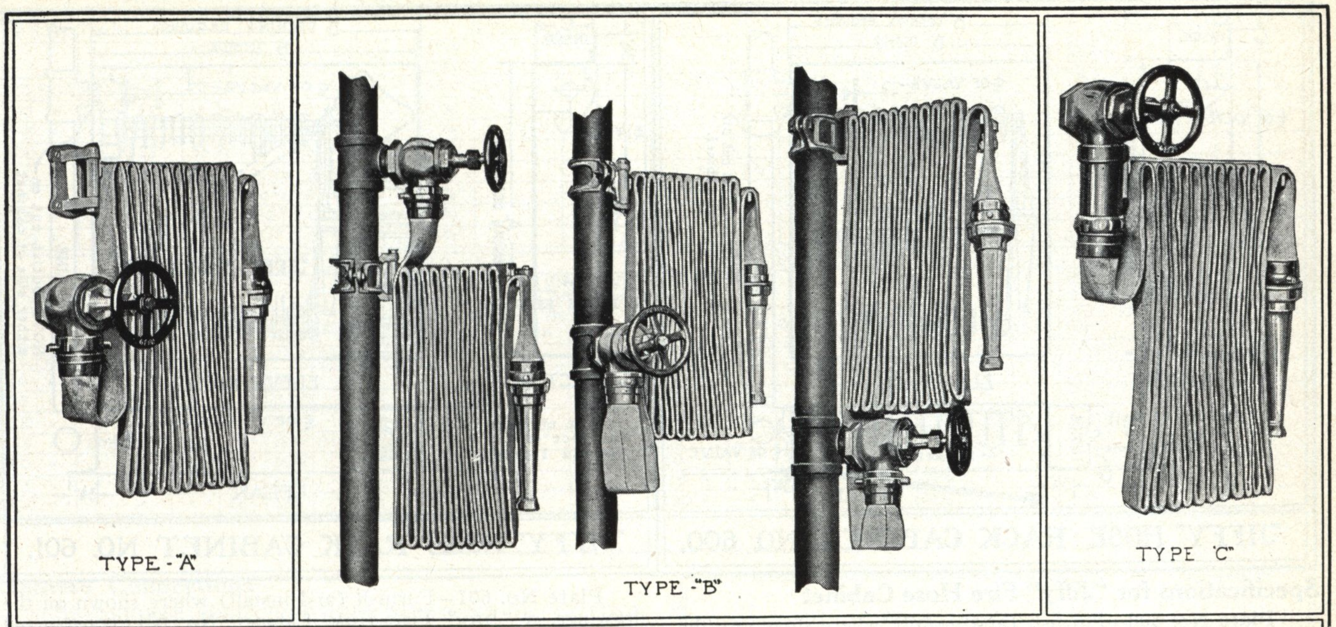


THE "JIFFY" FIRE HOSE RACK EQUIPMENT TYPES A B & C

Specifications for "Jiffy" Fire Hose Rack Equipments

Note: The following blanket specification covers our entire equipment. The sizes of the various units should be selected to fit the requirements of the Local Fire Department and Fire Prevention Bureau.

Specification—Furnish (and install) where shown on the drawings, a [2½] [2] [1½] [1¼]-in. [nickelplated polished brass] [nickelplated brass] [rough brass] [angle] [gate] hose valve with [nickelplated brass] [nickelplated iron] [iron painted or enameled any color] wheel.

Furnish (and attach) a "Jiffy" Type [A] [B] [C] [nickelplated brass] [nickelplated] [baked enameled—any color] [aluminum painted malleable iron] hose rack with [50] [75] [100] ft. [2½] [2] [1½] [1¼]-in. St. Regis Brand Underwriters' Labeled Unlined linen hose.

Furnish (and attach) a [2½x15] [2x11] [1½x10] [1¼x10]-in. [nickelplated brass] [aluminum painted iron] hose nozzle and nickelplated brass [couplings] [reducing couplings].

Note: The above mentioned gate valves can be furnished with ¼-in. drip cocks.

Where Separate Valve Outlets are Required by Local Fire Departments

Note: In addition to the specification above, following is a blanket specification covering a separate valve installation for Local Fire Department.

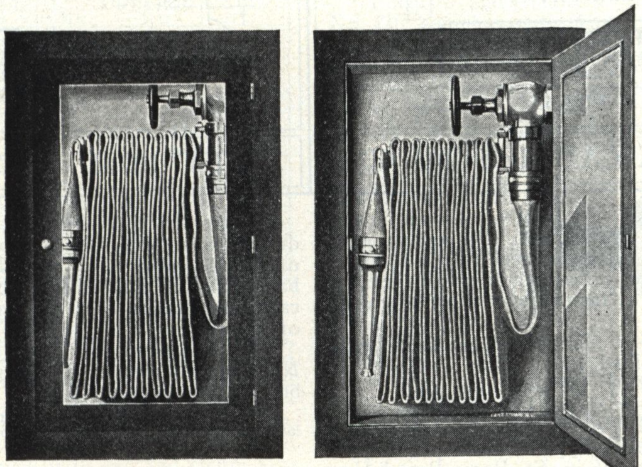
Specification—Furnish (and install) where shown on the drawings a 2½-in. nickelplated polished brass [angle] [gate] hose valve with nickelplated brass milled wheel and nickelplated brass cap and chain, having Local Fire Department thread.

Hose Cabinets

The "Jiffy" hose cabinet has been designed to fit a need for a cabinet to accommodate the "Jiffy" rack and equipment.

The "Jiffy" hose cabinets are made in iron or in other metal, either painted, enameled any color or plated as desired.

They are constructed of No. 16 gage metal, with No. 12 gage metal trim and door. The door is provided with polished plate glass panel. The hardware can be of concealed or exposed type as desired, and can be furnished to match adjacent hardware.



Closed Open

Hose Rack Installed in Cabinet

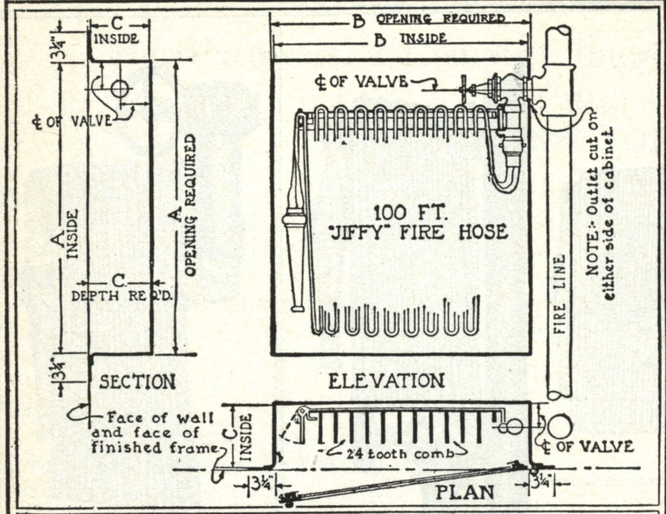
The equipments are arranged so that the roughing-in for the valves extends through the side of the cabinet.

The accompanying illustrations show the typical "Jiffy" cabinet closed and open. Note the neatness, the compactness and the accessibility of the equipment.

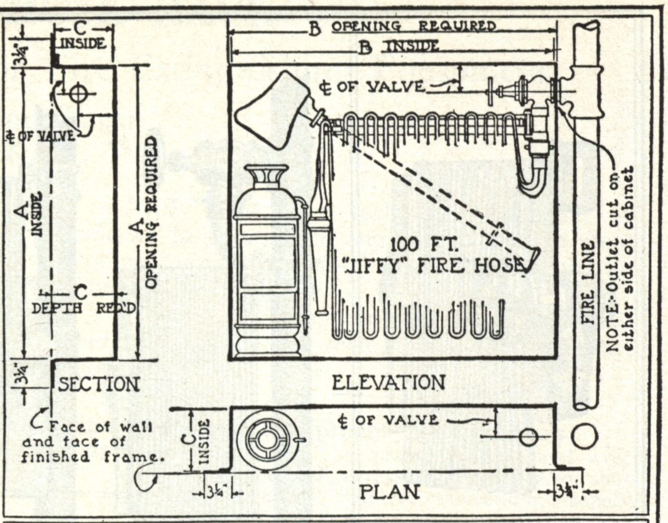
"Jiffy" cabinets can also be furnished to include a fire extinguisher, an axe and other accessories that may be required by Local Fire Departments and Fire Prevention Bureau.

Note: For details, specifications and dimensions, see following pages.

Continued on next page


C
INSIDE
3¼"
℄ OF VALVE
A INSIDE
A OPENING REQUIRED
C
DEPTH REQ'D.
3¼"
SECTION
B OPENING REQUIRED
B INSIDE
℄ OF VALVE
100 FT. "JIFFY" FIRE HOSE
NOTE:- Outlet cut on either side of cabinet
FIRE LINE
ELEVATION
Face of wall and face of finished frame
C INSIDE
24 tooth comb
℄ OF VALVE
3¼"
3¼"
PLAN

"JIFFY" HOSE RACK CABINET NO. 600.


C
INSIDE
3¼"
℄ OF VALVE
A INSIDE
A OPENING REQUIRED
C
DEPTH REQ'D
3¼"
SECTION
B OPENING REQUIRED
B INSIDE
℄ OF VALVE
100 FT. "JIFFY" FIRE HOSE
FIRE LINE
NOTE:- Outlet cut on either side of cabinet
ELEVATION
Face of wall and face of finished frame.
C INSIDE
℄ OF VALVE
3¼"
3¼"
PLAN

"JIFFY" HOSE RACK CABINET NO. 601.

Specifications for "Jiffy" Fire Hose Cabinet

Plate No. 600—Furnish (and install) where shown on the drawings, a "Jiffy" Fire Hose Cabinet, No. 600, constructed of No. 16 gage steel, with No. 12 gage steel trim and door having polished plate glass panel, concealed hinges, concealed catch and pull handle. Finished at factory with a priming coat of white paint.

Furnish (and install) a 2½-in. nickelplated polished brass angle hose valve with nickelplated brass milled wheel.

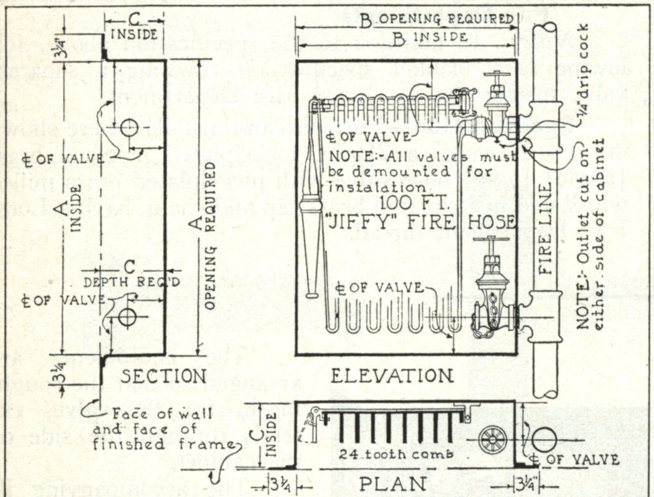
Furnish (and attach) a "Jiffy" Type C nickelplated polished brass hose rack with 50 ft. 2½-in. St. Regis Brand Underwriters' Labeled Unlined linen hose.

Furnish (and attach) a 2½x15-in. nickelplated polished brass hose nozzle and nickelplated polished brass couplings.

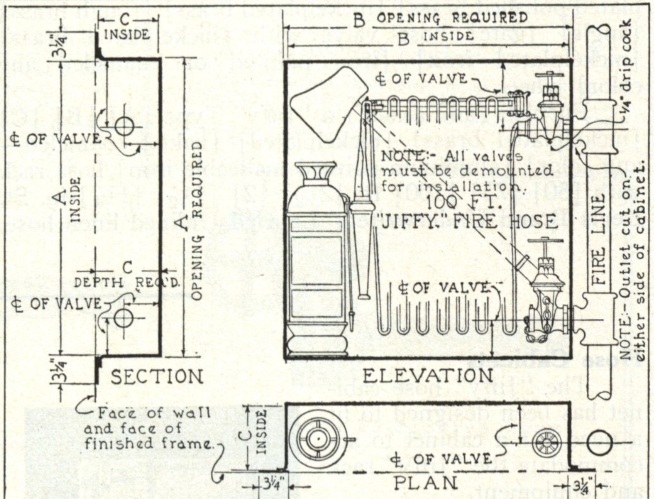
Plate No. 601—Furnish (and install) where shown on the drawings, a "Jiffy" Fire Hose Cabinet, No. 601, constructed of No. 16 gage steel, with No. 12 gage steel trim and door having polished plate glass panel, concealed hinges, concealed catch and pull handle. Finished at factory with a priming coat of white paint.

Furnish (and install) a "Jiffy" Chemical Fire Extinguisher, No. 710, complete with charge, and Fire Axe with necessary brackets securely mounted.

Note: For balance of equipment shown on Plate No. 601 use the last three paragraphs of specification for Plate No. 600.


C
INSIDE
3¼"
℄ OF VALVE
A INSIDE
A OPENING REQUIRED
C
DEPTH REQ'D
℄ OF VALVE
3¼"
SECTION
B OPENING REQUIRED
B INSIDE
¼" drip cock
℄ OF VALVE
NOTE:-All valves must be demounted for instalation
100 FT. "JIFFY" FIRE HOSE
℄ OF VALVE
FIRE LINE
NOTE:- Outlet cut on either side of cabinet
ELEVATION
Face of wall and face of finished frame
C INSIDE
24 tooth comb
℄ OF VALVE
3¼"
3¼"
PLAN

"JIFFY" HOSE RACK CABINET NO. 604.


C
INSIDE
3¼"
℄ OF VALVE
A INSIDE
A OPENING REQUIRED
C
DEPTH REQ'D.
℄ OF VALVE
3¼"
SECTION
B OPENING REQUIRED
B INSIDE
¼" drip cock
℄ OF VALVE
NOTE:- All valves must be demounted for installation.
100 FT. "JIFFY" FIRE HOSE
℄ OF VALVE
FIRE LINE
NOTE:- Outlet cut on either side of cabinet.
ELEVATION
Face of wall and face of finished frame.
C INSIDE
℄ OF VALVE
3¼"
3¼"
PLAN

"JIFFY" HOSE RACK CABINET NO 605.

Plate No. 604—Furnish (and install) where shown on the drawings, a "Jiffy" Fire Hose Cabinet, No. 604, constructed of No. 16 gage steel, with No. 12 gage steel trim and door having polished plate glass panel, concealed hinges, concealed catch and pull handle. Finished at factory with a priming coat of white paint.

Furnish (and install) a 2½-in. nickelplated polished brass gate valve, nickelplated brass milled wheel, nickelplated brass cap and chain, having Local Fire Department thread.

Furnish (and install) a 1½-in. nickelplated polished brass gate valve, nickelplated brass milled wheel with ¼-in. drip cock.

Furnish (and attach) a "Jiffy" Type A nickelplated polished brass hose rack with 50 ft. 1½-in. St. Regis Brand Underwriters' Labeled Unlined linen hose.

Furnish (and attach) a 1½x10-in. nickelplated polished brass hose nozzle and nickelplated polished brass couplings.

Plate No. 605—Furnish (and install) where shown on the drawings, a "Jiffy" Fire Hose Cabinet, No. 605, constructed of No. 16 gage steel, with No. 12 gage steel trim and door having polished plate glass panel, concealed hinges, concealed catch and pull handle. Finished at factory with a priming coat of white paint.

Furnish (and install) a "Jiffy" Chemical Fire Extinguisher, No. 710, complete with charge, and Fire Axe with necessary brackets securely mounted.

Note: For balance of equipment shown on Plate No. 605 use the last four paragraphs of specification for Plate No. 604.

Continued on next page

DIMENSIONS FOR CABINET NO. 600.

LENGTH OF HOSE	SIZE	A		B		C		CENTRE OF VALVE F'M. BACK	CENTRE OF VALVE F'M. TOP
		INSIDE	OPENING REQUIRED	INSIDE	OPENING REQUIRED	INSIDE	DEPTH REQUIRED		
25 FEET	1½" OR 2"	22"	22¾"	20½"	21¼"	5½"	6¼"	FOR 1½ - 2¾"	2¾"
50 "	"	35"	35¾"	20½"	21¼"	5½"	6¼"	" 2 - 3"	3"
75 "	"	35"	35¾"	26"	26¾"	5½"	6¼"	" 2½ - 3½"	3½"
100 "	"	35"	35¾"	31"	31¾"	5½"	6¼"		
25 "	2½"	25½"	26¼"	20½"	21¼"	7"	7¾"		
50 "	"	35½"	36¼"	20½"	21¼"	7"	7¾"		
75 "	"	35½"	36¼"	26"	26¾"	7"	7¾"		
100 "	"	35½"	36¼"	31"	31¾"	7"	7¾"		

DIMENSIONS FOR CABINET NO. 601.

LENGTH OF HOSE	SIZE	A		B		C		CENTRE OF VALVE F'M BACK	CENTRE OF VALVE F'M TOP
		INSIDE	OPEN'G REQ'D.	INSIDE	OPEN'G REQ'D.	INSIDE	DEPTH REQ'D.		
25 FEET	1½" OR 2"	22"	22¾"	28½"	29¼"	8"	8½"	FOR 1½ - 4"	2¾"
50 "	"	35"	35¾"	28½"	29¼"	"	"	" 2 - 4"	3"
75 "	"	35"	35¾"	34"	34¾"	"	"	" 2½ - 4"	3½"
100 "	"	35"	35¾"	39"	39¾"	"	"		
25 "	2½"	25½"	26¼"	28½"	29¼"	8"	8½"		
50 "	"	35½"	36¼"	28½"	29¼"	"	"		
75 "	"	35½"	36¼"	34"	34¾"	"	"		
100 "	"	35½"	36¼"	39"	39¾"	"	"		

DIMENSIONS FOR CABINET NO. 604.

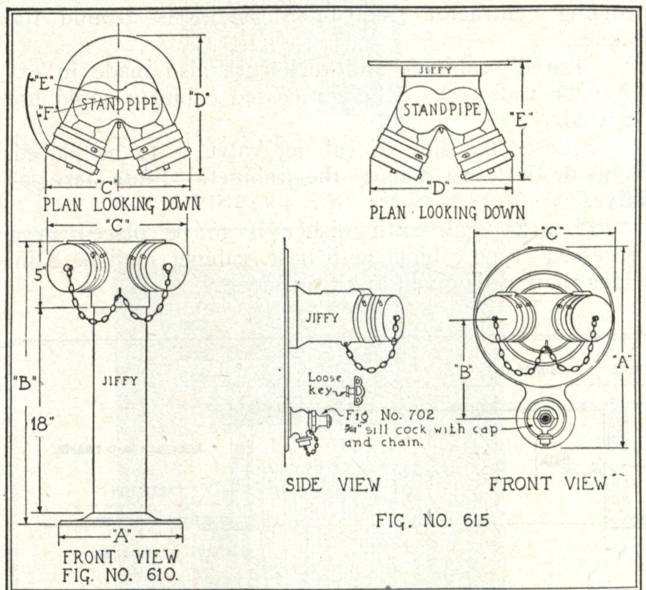
LENGTH OF HOSE	SIZE	A		B		C		TOP VALVE. CENTRE OF VALVE F'M TOP.	BOTTOM V'LV. CENTRE OF VALVE F'M BOTTOM.	BOTH V'LV'S. CENTRE OF VALVE F'M BACK.
		INSIDE	OPEN'G REQ'D.	INSIDE	OPEN'G REQ'D.	INSIDE	DEPTH REQ'D			
25 FEET	1½" OR 2"	30"	30¾"	16"	16¾"	8½"	9¼"	8"	4½"	4½"
50 "	"	36"	36¾"	16"	16¾"		"	"	"	"
75 "	"	"	"	21"	21¾"		"	"	"	"
100 "	"	"	"	26"	26¾"		"	"	"	"
25 "	2½"	30"	30¾"	16"	16¾"	8½"	9¼"	8"	4½"	4½"
50 "	"	36"	36¾"	16"	16¾"		"	"	"	"
75 "	"	"	"	21"	21¾"		"	"	"	"
100 "	"	"	"	26"	26¾"		"	"	"	"

DIMENSIONS FOR CABINET NO. 605.

LENGTH OF HOSE	SIZE	A		B		C		TOP VALVE CENTRE OF VALVE F'M. TOP	BOTTOM VALV. CENTRE OF VALVE F'M. BOTTOM	BOTH VALVES CENTRE OF VALVE F'M. BACK
		INSIDE	OPEN'G REQ'D.	INSIDE	OPEN'G REQ'D.	INSIDE	DEPTH REQ'D.			
25 FEET	1½" OR 2"	30"	30¾"	24"	24¾"	8½"	9¼"	8"	4½"	4½"
50 "	"	36"	36¾"	"	"	"	"	"	"	"
75 "	"	"	"	29"	29¾"	"	"	"	"	"
100 "	"	"	"	34"	34¾"	"	"	"	"	"
25 "	2½"	30"	30¾"	24"	24¾"	8½"	9¼"	8"	4½"	4½"
50 "	"	36"	36¾"	"	"	"	"	"	"	"
75 "	"	"	"	29"	29¾"	"	"	"	"	"
100 "	"	"	"	34"	34¾"	"	"	"	"	"

Siamese Connections

As Siamese connections are placed on the exterior of buildings, they should be ornamental and attractive. We offer our Figs. 610 and 615 for your consideration.


"E"
STANDPIPE
"F"
"D"
"C"
PLAN LOOKING DOWN
"C"
5"
"B"
JIFFY
18"
"A"
FRONT VIEW
FIG. NO. 610.
JIFFY
STANDPIPE
"E"
"D"
PLAN · LOOKING DOWN
"C"
JIFFY
Loose key
Fig No. 702
¾" sill cock with cap and chain.
"B"
"A"
SIDE VIEW
FRONT VIEW
FIG. NO. 615

DIMENSIONS FOR FIG. NO 610

SIZE IN INCHES	4×2½×2½	4×3×3	5×3×3	6×2½×2½	6×3×3
DIMENSION "A" INCHES	10½	10½	11½	11½	11½
" " "B" "	24	24	24	24	24
" " "C" "	11½	11½	11½	11½	11½
" " "D" "	11½	11½	11½	11½	11½
" " "E" "	8	8	8	8	8
" " "F" "	7½	7½	7½	7½	7½

DIMENSIONS FOR FIG NO. 615

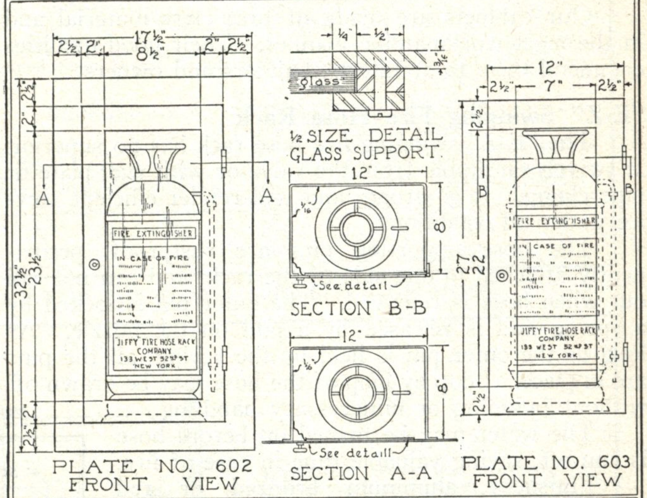
SIZE IN INCHES	4×2½×2½	4×3×3	5×3×3	6×2½×2½	6×3×3
DIMENSION "A" INCHES	16¼	16¼	17¼	17¼	17¼
" " "B" "	9¼	9¼	9¼	9¼	9¼
" " "C" "	9⅝	9⅝	11¾	11¾	11¾
" " "D" "	11½	11½	11½	11½	11½
" " "E" "	10	10	10	10	10

DIAGRAMS OF "JIFFY" SIAMESE CONNECTIONS

Specifications for "Jiffy" Siamese Connections

Plate No. 610—Furnish where shown on the drawings, a "Jiffy" Polished Brass 90° Siamese Connection with polished brass caps and chains; also covering tube (18 in. long) and flange. Made to fit [2½] [3] [4] [5] [6] [8]-in. iron pipe.

Plate No. 615—Furnish where shown on the drawings, a "Jiffy" Polished Brass Siamese Connection with polished brass caps and chains; ¾-in. sill cock with cap and chain, also polished brass combination flange. Made to fit [2½] [3] [4] [5] [6] [8]-in. iron pipe.


17½"
8½"
2½"
2"
2"
2½"
¼"
½"
Glass
½ SIZE DETAIL GLASS SUPPORT
12"
12"
2½"
7"
2½"
A
A
B
B
8"
32½"
23½"
27
22
FIRE EXTINGUISHER
IN CASE OF FIRE
JIFFY FIRE HOSE RACK COMPANY 133 WEST 52ND ST NEW YORK
See detail
SECTION B-B
12"
8"
See detail
PLATE NO. 602 FRONT VIEW
SECTION A-A
PLATE NO. 603 FRONT VIEW

DIAGRAMS OF "JIFFY" FIRE EXTINGUISHER CABINETS

Specifications for "Jiffy" Fire Extinguisher Cabinets

Plate No, 602—Furnish (and install) where shown on the drawings, a "Jiffy" Recessed Plate, No. 602, Fire Extinguisher Cabinet, constructed of No. 16 gage steel with No. 12 gage steel trim and door having a polished plate glass panel, concealed hinges, concealed catch and pull handle. Finished at factory with a priming coat of white paint.

Furnish (and install) a "Jiffy" Chemical Fire Extinguisher, No. 710, complete with charge.

Fire Hose Angle and Gate Valves

These valves are made in six sizes, ¾, 1, 1¼, 1½, 2 and 2½ in.

Made rough body with iron wheel, painted or enameled any color, polished or nickel-plated all over with polished or nickelplated brass wheel, When ordering, state finish.

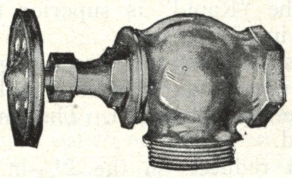


FIG. 701
"JIFFY" FIRE HOSE VALVE

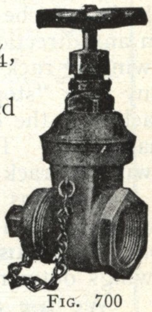


FIG. 700
"JIFFY" HOSE GATE VALVE

Other "Jiffy" Specialties

Fire extinguishers, fire axes, fire hooks, fire pails, bucket tanks, spanner wrenches, play pipes, nozzles, etc., always carried in stock.

CHAS. NUHRING & BROTHER

Fire Hose Cabinets and Racks

1212 Walnut Street
CINCINNATI, OHIO

Products

"Rapid" Patented Combined Fire Hose Cabinet and Rack; Swinging Hose Racks for 1¼, 1½, 2 and 2½-in. unlined linen hose.

Experience

Over 30 years' experience in the manufacture of fire hose racks and cabinets has made for the superiority of our products. Leading architects specify them.

Hose Cabinets Are a Necessity

Hose cabinets are especially adapted for use in hospitals, hotels, theaters and office buildings where sanitation and good appearance are important factors, and where the best fire hose supporting devices are required.

Our cabinets are made of first class material and in the most workmanlike manner. Their good qualities commend them to architects, builders and owners.

"E-Z" Swinging Fire Hose Rack

The "E-Z" swinging fire hose rack has no superior. It swivels on nipple from the valve or with wall plate or pipe clamp. It is strong, and will render efficient service under all conditions.

The hose-supporting pins are rustproof, permanently attached to one side of the rack, and can not fall out when hose is removed. The outer pin is locked by a spring and is released by a pull on the nozzle. As long as the outer pin is held by the spring, all the pins are in place. Loop by loop of the hose may be drawn off without jamming or unnecessary handling.

The water may be turned on before hose is run off, saving valuable time in case of fire.

Finishes: aluminum bronzed or red japanned; brass, polished or nickelplated.

Racks hold 50 to 100 ft. of unlined linen hose. Always state size of hose to be used.

May be had with or without cabinet, but we highly recommend the installation of a cabinet for the proper protection of the hose.

"Rapid" Combined Fire Hose Cabinet and Rack

The "Rapid" rack is stationary and allows the hose to be quickly run off at any angle and in any direction which can not be done with a swinging rack in a hose cabinet. The swing of any rack "stops" at the point where it is attached in the cabinet—either the right or left-hand side. The "Rapid" is superior to any swinging rack in a cabinet.

The pins supporting the hose swing down as the hose, in unracking, trips the double-eyed pin off the hose-supporting pin. The small pin swings outward.

We use a reducer on the 2½-in. main valve so that a 1½-in. hose may be used. It is the work of a moment should the fire department desire to remove this coupling and attach their own 2½-in. hose.

Many of the finest buildings are equipped with our appliances.

Specification Data for Steel Hose Cabinet for the "E-Z" Swinging Rack and the "Rapid" Combined Cabinet and Rack

Trim and door of our cabinets are made of No. 12 gauge steel, each cut from one piece of sheet steel; have no seams or joints, can not have seam cracks in painting or enameling. The box part of the cabinet is made of No. 16 gauge steel, making a very strong and neat looking cabinet. Both trim and the door are 2¾ in. wide.

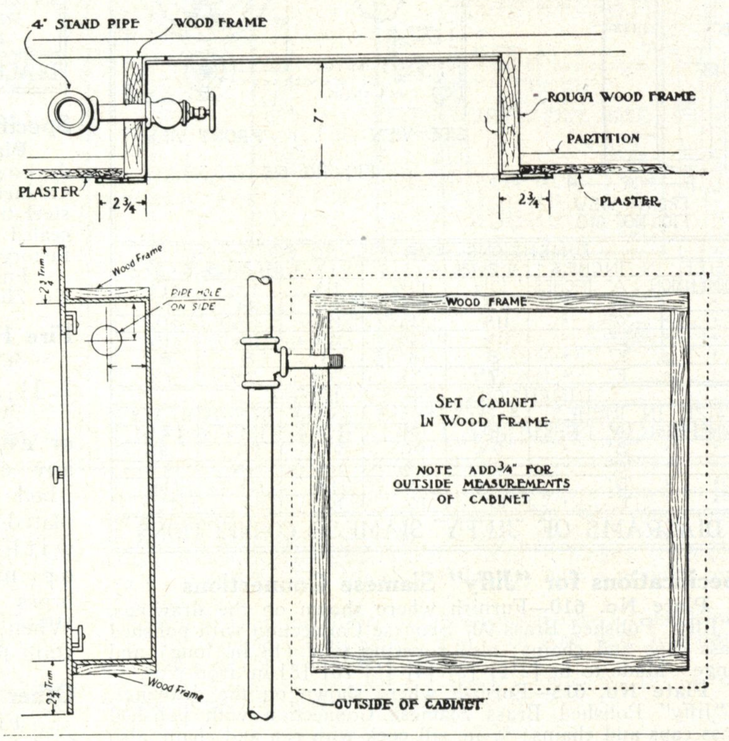
Include in carpenter's specifications:

Furnish and install a ⅞-in. thick rough wood frame, 7 in. wide, of proper size for the cabinet, located as shown on plans. Front of the frame to be placed flush with the finished plaster line, securely fastened together and anchored to partition or wall. Set frame plumb and straight, so the cabinet will set plumb and straight with finished plaster line. Fireproofing contractor shall build partitions around the frames.

"Rapid" cabinets and racks are also made in exposed or wall types, where recessed cabinets could not be used.

Specify the side of cabinet valve is to be placed, right or left, as facing the cabinet. State size of valve.

If a 2½-gal. extinguisher is to be placed in a "recessed" type cabinet with hose, cabinet shall be 8 in. wider than sizes given and 8 in. deep.



SPECIFICATION DATA

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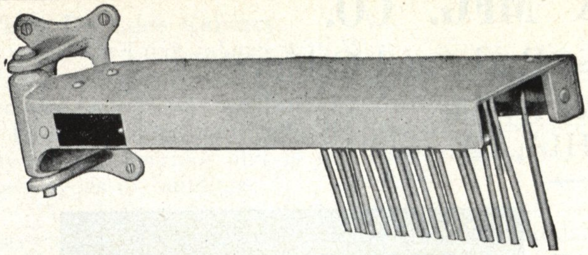
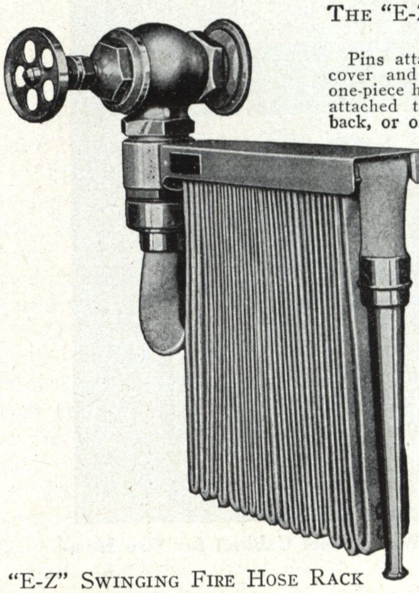


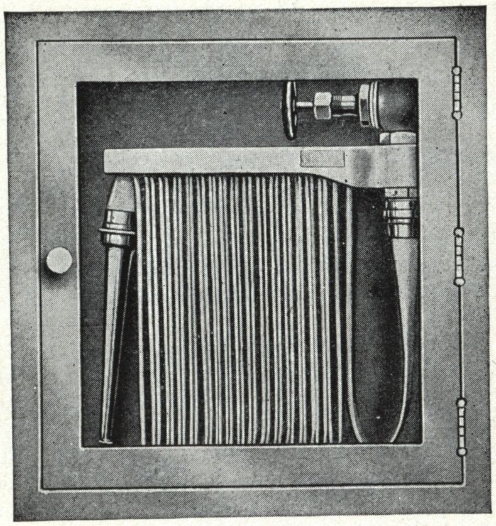
The "E-Z" Swinging Hose Rack

Pins attached—hose off. The cover and sides are formed of one-piece heavy sheet steel firmly attached to the malleable iron back, or of solid brass



"E-Z" Swinging Fire Hose Rack

For unlined linen hose



"E-Z" Steel Hose Cabinet

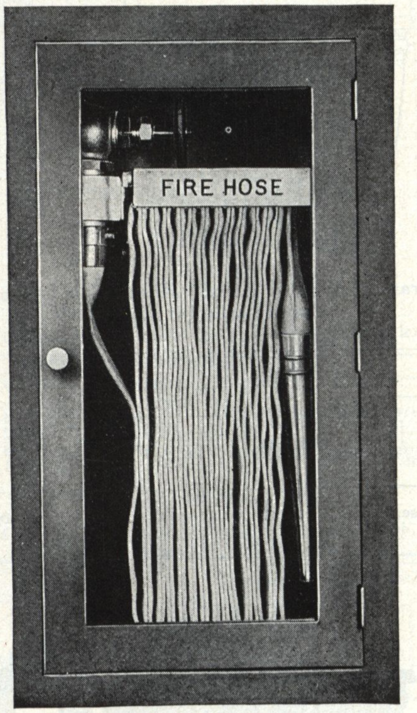
For "E-Z" swinging hose rack containing 1¼, 1½, 2 or 2½-in. unlined linen hose. Installed flush with the wall

DIMENSIONS OF "E-Z" RACKS AND CABINETS

For 1½, 2 and 2½-in. sizes of hose

"E-Z" swinging racks		Cabinets and "E-Z" racks			
Size of hose, in.	Width of rack, in.	Hose length, ft.	Height, in.	Width, in.	Depth, in.
1½	4⅜	50	24	22	7
2	5⅜	75	30	22	7
2½	5⅞	100	36	22	7

"E-Z" SWINGING FIRE HOSE RACKS AND CABINET FOR 1½, 2 OR 2½-IN. SIZES OF HOSE

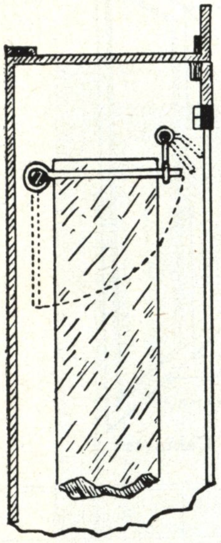


"Rapid" Combined Cabinet and Rack

Recessed Type

For installation flush with the wall.

Illustration shows equipment with a 2½-in. angle valve with 2½x1½-in. removable reducer to which 1½-in. hose is attached, or a 2½-in. reducing coupling



Sectional Side View of "Rapid" Rack

Illustration shows hose supported on pins; the dotted lines show movement of pins as hose is withdrawn. The pins supporting the hose swing down as the hose in unracking trips the double eyed pin off the hose-supporting pin. The small pin swings outward.

The name plate marked "Fire Hose" is of aluminum hinged on the rod—of the small upper pins—covers the ends of the hose supporting pins. This plate acts as a check, preventing the pins to trip accidentally.

The plate moves out, as each loop of hose is withdrawn, the same as the small pin moves out that supports the pins on which the hose is hung.

The rack being firmly attached to nipple in valve is stationary or fixed, and does not swing. The new novel method of the hose supporting pins allows the hose to be run off *in any possible angle or direction which can not be done with a swinging rack in a hose cabinet.*

DIMENSIONS OF "RAPID" RACKS AND CABINETS

For 1½, 2 and 2½-in. sizes of hose

Hose		Inside dimensions of cabinets, in.	
		Recessed type*	
Size, in.	Length, ft.	Height	Width
1½, 2 or 2½	50	30	17
1½, 2 or 2½	75	30	22
1½, 2 or 2½	100	36	24

*Recessed type cabinet is made 7 in. deep.

With 2½-gal. extinguisher, 8 in. deep and 8 in. wider to sizes given.

"RAPID" COMBINED FIRE HOSE RACK AND CABINETS FOR 1½, 2 OR 2½-IN. SIZES OF HOSE

WIRT & KNOX MFG. CO.

Manufacturers of Fire Hose Racks and Cabinets

2355-2366 Sedgley Avenue
PHILADELPHIA, PA.

Products

Wirt's "Royal" Hose Rack; Steel Hose Cabinets.

Also manufacturers of a most complete line of Fire Fighting Equipment for buildings, including Reels, Hose Carts, Extinguisher Cabinets, etc.

Wirt's "Royal" Hose Rack

Wirt's fire hose rack is particularly recommended for office buildings, hotels, public buildings, railroad stations, etc.

It is semi-automatic in action, has attached pins, prevents tangling of hose and is made of malleable iron and steel or of brass. No cast iron is used in the construction of this equipment.

Approved by Architects—Wirt's "Royal" hose rack has enjoyed the confidence of architects and contractors for ten years. It has been installed in many of the finest buildings.

Wirt's Steel Hose Cabinets (Type AA)

The cabinets are neat in design, harmonizing with any style of architecture. The trim and door are made of No. 12 gauge steel and box portion of No. 18 gauge. There are no joints on face of door or trim and the steel cabinet is practically dustproof.

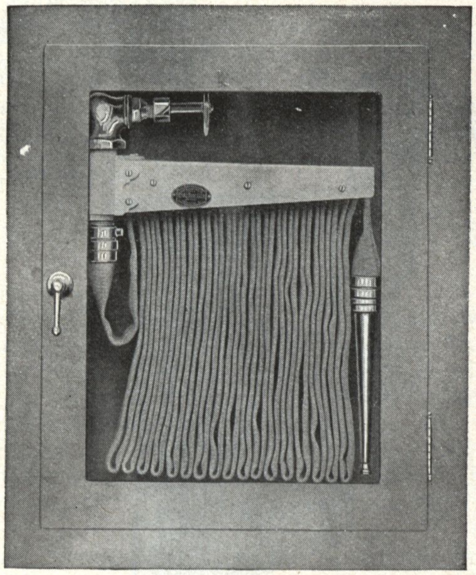


Plate AA. Wirt's Steel Cabinet for Fire Hose

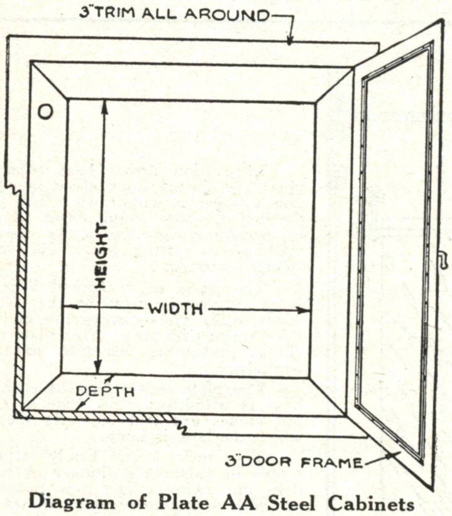


Diagram of Plate AA Steel Cabinets

DIMENSIONS

No.	Length of hose, ft.	Size linen hose, in.	Inside dimensions of cabinet, in.			Recess, in.		
			Width	Height	Depth	Width	Height	Depth
7S	50	1¼, 1½, 2 or 2½	21	27½	7½	22½	29	7¾
8S	75		21	35½	7½	22½	37	7¾
9S	100		28	33	7½	29½	34½	7¾
*7RX	50 With extinguisher		29	27½	8	30½	29	8¼
*8RX	75		29	35½	8	30½	37	8¼
*9RX	100		36	33	8	37½	34½	8¼
Special residence size	25 linen hose	1	12¼	16½	4¼	13¾	18	4½

*These cabinets are made to take a 2½-gal. soda and acid fire extinguisher in addition to the hose, making a very complete outfit.

Note: If so specified, Nos. 7S, 8S and 9S cabinets can be made 5½ in. in depth where 1½-in. valve is used, and 6 in. in depth where 2-in. valve is used, otherwise regulation depth of 7½ in. will be furnished.

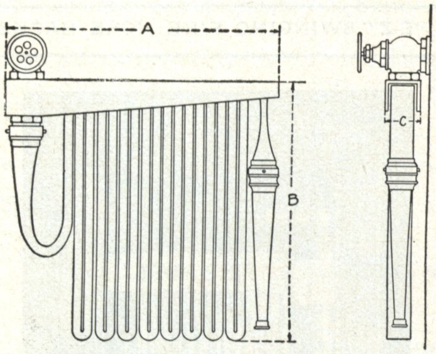
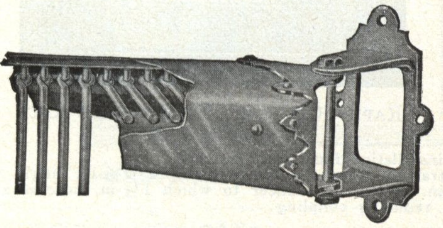


Diagram of Wirt's "Royal" Hose Rack Swiveling on Nipple without Cabinet

DIMENSIONS TYPE A, USED WITH CONCEALED PIPING

Rack No.	18W	18X	18Y	18Z	19W	19X	19Y	19Z
Hose size, in.	1	1½	2	2½	1	1½	2	2½
Dimension A, in.	16¼	16¾	17⅝	18	22¼	22¾	23⅝	24
Dimension C, in.	3¾	4⅞	5⅝	6¼	3¾	4⅞	5⅝	6¼
Nipple size, in.	1	1½	2	2½	1	1½	2	2½

Length of hose, ft.	50	75	100	150
Dimension B, in.	18⅝	26⅞	24⅜	34¾



"Royal" Rack

Sectional view (side) showing top, pins, etc.

Continued on next page

Wirt's De Luxe Cabinet

The De Luxe cabinet with Wirt's "Royal" rack and Wirt's equipment makes a most attractive hose station, and one which we can fully recommend for any type of building. This outfit will improve the appearance of any hall or corridor and is particularly suited for the finest types of buildings.

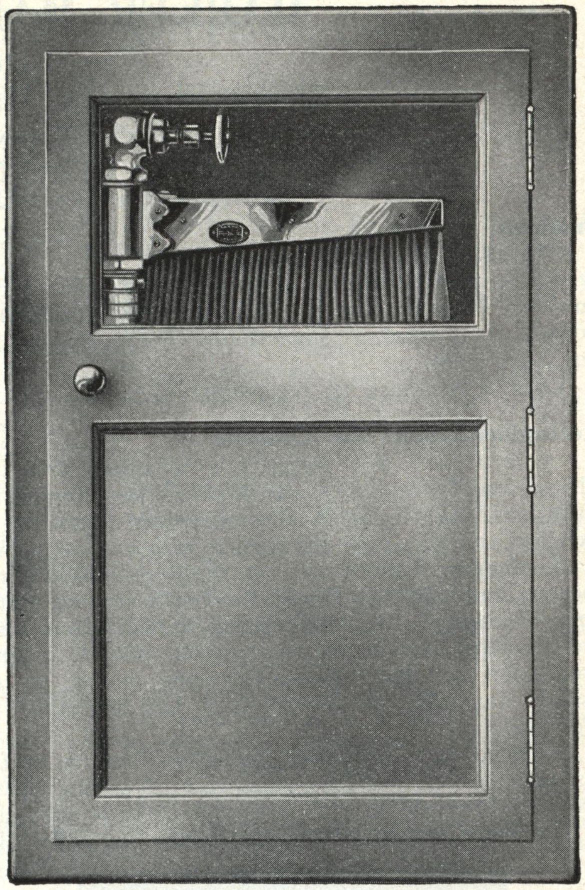
The door and trim of the De Luxe cabinet is of heavy metal construction and in appearance is similar to hollow metal, but differs from all other hose cabinets. The two-panel effect with plate glass at top showing only a portion of the hose gives that artistic touch to the fire hose cabinet which is so much desired in modern buildings.

Specifications—Detailed specifications of the De Luxe (Plate T) cabinet are:

Trim and door front made of No. 12 gauge sheet steel cut from one piece, no corner seams. Trim to have ¾-in. return on outside edge. Two-panel door, upper panel with ¼-in. beveled polished plate glass, lower panel of sheet steel. Both panels edged with steel moulding.

Door ¾ in. thick, with ½-in. lap over box trim, inside of door formed up with No. 18 gauge sheet steel. Door hinged on ball head brass hinges and equipped with brass pull knob and bullet catch. Box part of cabinet of No. 18 gauge sheet steel, all finished in prime coat.

Installation—The De Luxe cabinet should be placed in the wall before the finishing coat of plaster is applied and the plaster worked up to the edge of the cabinet, allowing about ⅜ in. to extend beyond the finished plaster line.



Wirt's De Luxe Cabinet (Plate T)
Showing two-panel door effect

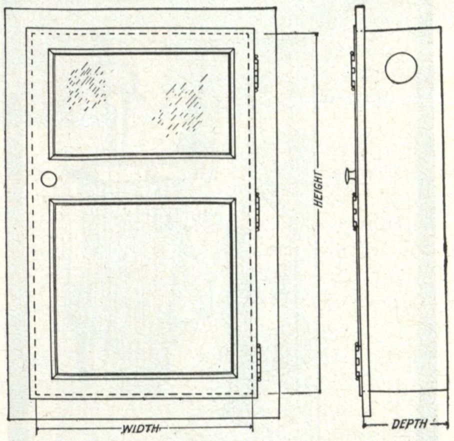


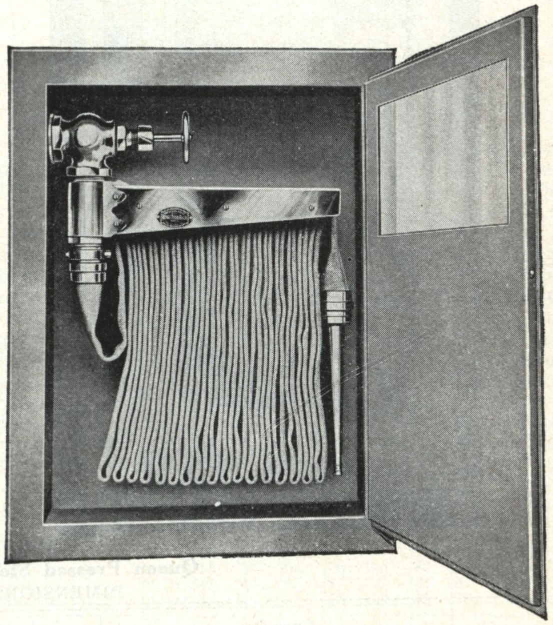
Diagram of Wirt's "De Luxe" Cabinet

DIMENSIONS

No.	Length of hose, ft.	Size linen hose, in.	Inside dimensions of cabinet, in.			Recess, in.		
			Width	Height	Depth	Width	Height	Depth
7T	50	1¼, 1½, 2 or 2½	21	27½	8	22½	29	7⅞
8T	75		21	35½	8	22½	37	7⅞
9T	100		28	33	8	29½	34½	7⅞
*7TX	50 With extinguisher		29	27½	8½	30½	29	8⅜
*8TX	75		29	35½	8½	30½	37	8⅜
*9TX	100		36	33	8½	37½	34½	8⅜

*These cabinets are made to take a 2½-gal. soda and acid fire extinguisher in addition to the hose, making a very complete outfit.

Note: If so specified numbers 7T, 8T and 9T cabinets can be made 5½ in. in depth where 1½-in. valve is used and 6 in. in depth where 2-in. valve is used, otherwise regulation depth of 8 in. will be furnished.



Inside View of Wirt's De Luxe Cabinet
Showing "Royal" rack and equipment

Estimates and Information

Complete details, specifications, estimates, blue prints, and catalogues will gladly be furnished on application.

See copy of our catalogue "J" in your files.

HARKER MANUFACTURING CO.

Fire Protection Engineers
Queen Fire Hose Cabinets, Racks and Fittings

FACTORY AND GENERAL OFFICES
CINCINNATI, OHIO

Products

Queen Fire Hose Cabinets.

Also manufacturers of Hose Racks, Fire Extinguishers, Nozzles, Valves, Couplings, Siamese Connections, etc.—in brief, a complete line of Fire Extinguishing Equipment.

For Roof Flashing, see page 1852.

Recommendations for Cabinets

Our pressed steel cabinets with hollow steel trim (Figs. No. 53 and 54) are recommended for all installations. Their finish and appearance can not be excelled and they will harmonize with the other high grade interior fittings used in hotels, office buildings, theaters and schools. We have concentrated on certain sizes of pressed steel cabinets, as shown below, which are standard equipment, and on account of quantity production of these sizes, they are offered at unusually favorable prices, whether few or many are required.

Special sizes in pressed steel can of course be furnished to order, but the initial cost of setting up the presses and other factory operations make it impossible to run these special sizes economically in lots of less than 50 cabinets. Where less than 50 special-size cabinets are required, we advise the use of our sheet metal cabinet.

Description of Queen Pressed Steel Cabinets

The doors and casings around the doors of these cabinets are pressed from one piece of furniture steel, without joints or rivets. The door, fitting in a rabbet, excludes dust and dirt. The construction gives maximum capacity with minimum wall depth. All hinges and handles are brass, nickelplated. The standard finish is snow white enamel, baked on, inside; white priming coat outside. Can be furnished with snow white enamel doors and trim at an additional charge.

Queen pressed steel cabinets are furnished with double thick glass panel or plate glass panel, as desired. The words "Fire Hose" in gold letters on glass panel at slight extra charge.

Note: Inlet openings will not be cut unless specified. For roughing-in measurements add ¾ in. to height and width shown in table below, but nothing extra for depth.

Full detail drawings on request.

Bulletins

Write for bulletins descriptive of Queen products.

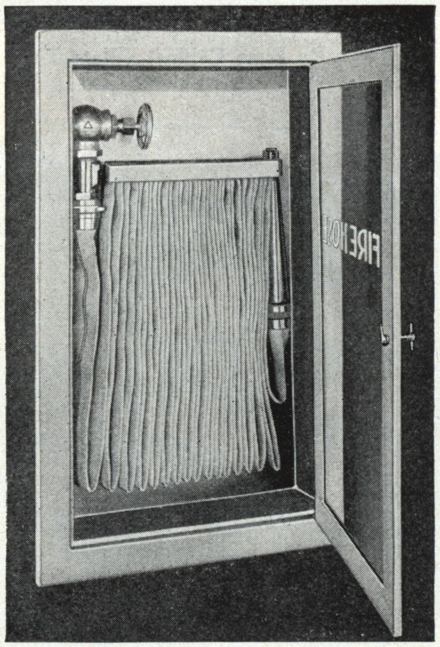


Fig. 53

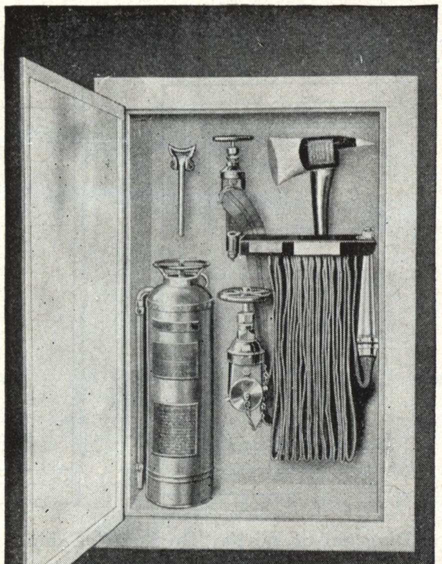


Fig. 54

Queen Pressed Steel Cabinets—Hollow Steel Trim

DIMENSIONS OF FIGS. NO. 53 AND 54

No.	Capacity		Inside height, in.	Inside width, in.	Inside depth, in.	Height of trim, in.	Width of trim, in.	Size of glass, in.	Inlet of angle valve from top, in.
	Hose, ft.	Size valve, in.							
A-53	50	1¼ or 1½	28¾	19¾	7½	33½	24½	26x17	2¾
B-53	75	1¼ or 1½	30¾	20¾	7½	35½	25½	28x18	2¾
C-53	100	1¼ or 1½	32¾	22¾	7½	37½	27½	30x20	2¾
D-53	50	2	28¾	19¾	7½	33½	24½	26x17	3⅛
E-53	75	2	32¾	22¾	7½	37½	27½	30x20	3⅛
F-53	100	2	34¾	24¾	7½	39½	29½	32x22	3⅛
G-53	50	2½	28¾	19¾	7½	33¾	24½	26x17	3½
H-53	75	2½	32¾	22¾	7½	37½	27½	30x20	3½
I-53	100	2½	34¾	24¾	7½	39½	29½	32x22	3½
54	50, 75, 100	1½	38¾	30¾	8½	43½	35½	36x28	8

ESTABLISHED 1864

THE TIRRILL GAS MACHINE LIGHTING COMPANY

50 Church Street
NEW YORK, N. Y.

Tirrill's Equalizing Gas Machine

A machine that generates and delivers a steady supply of *non-poisonous* gasoline gas that burns smokelessly with a brilliant white or blue flame as desired, and without odor.

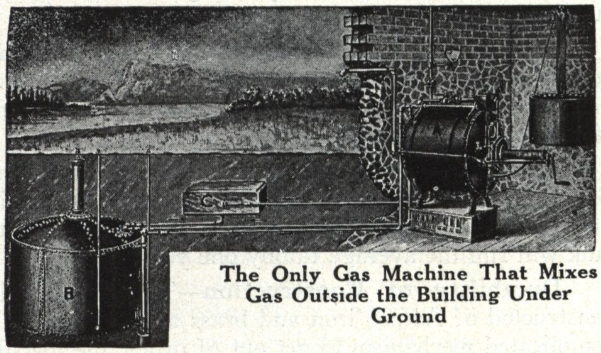
It is suitable for cooking, heating, lighting and fuel purposes in residences, laboratories, colleges, hospitals, hotels, churches, schools and factories.

Complete specification forms sent on request.

Materials—The entire plant is constructed of the best quality Bessemer steel, galvanized inside and outside, all joints riveted and heavily soldered and all thoroughly tested and proven tight.

Description and Operation—The plant consists of an *equalizing pressure meter* (A) inside, and a *generator* (B) and *mixing chamber* (C) buried in the ground about 30 ft. from the building.

The *equalizing pressure meter* (A) operates on the principle of measuring air by volume. It can be operated by suspended weight, waterwheel or power blower, as desired. It insures easy, convenient and positive regulation of proportions of air and gas required. *Winding of the weight does not affect operation of system or quality or pressure of gas;* exclusive features.



The Only Gas Machine That Mixes Gas Outside the Building Under Ground

The highly efficient *generator* (B) requires no attention save refilling once or twice a year. In it a carburetor floats on the gasoline and the air is always brought into the same intimate contact with the gasoline, whether the supply is large or small. The carburetor surface being ample, the air in the generator is always thoroughly saturated with gasoline vapor.

The *mixing chamber* (C) has no moving parts inside and requires no attention. Gas and diluting air enter through the bottom and are spread in layers by a baffle plate immediately over the inlet. Outlet pipe has vertical slots which cut through the strata of air and gas, supplying a perfectly uniform homogeneous gas.

Industrial Installations—Where power is available, an exhaust blower, which may be installed in any part of the building, is added to the regular equipment, described above. The *equalizing pressure meter* (A) may then be omitted, but its inclusion in the system is recommended to assure continuous operation should the power supply fail. A steam coil of 1-in. pipe around the generator is optionally used to keep the gasoline temperature normal in very cold places.

Underwriters' Approval

The Tirrill Gas Machine is listed by the National Board of Fire Underwriters as Standard Class "A" equipment and is permitted by all fire insurance companies without additional insurance risk or expense.

Guarantee

We guarantee every machine to be of perfect construction throughout, simple to operate with no delicate mechanism, and to be always available for cooking, lighting, laboratory and industrial purposes.

Economy of Tirrill Gas

Tirrill gas is cheaper than kerosene, acetylene or blaugas, very much cheaper than electricity and as cheap or cheaper than city gas per thousand cubic feet. Its cost for cooking, heating and lighting for the average Tirrill installation throughout the United States amounts to only a few cents per day.

Advantages of Tirrill Gas Machines

Safety—Mixes gas outside of building (underground); makes gas containing fresh oxygen, therefore non-poisonous; produces and distributes gas noiselessly; requires no heat to operate; no dangerous gas pressures.

Simplicity—Easily installed and operated; complete instructions with each machine; any gas fitter can install it and any novice operate it; requires no attention beyond refilling of generator tank and occasional rewinding of weight.

Convenience—Tirrill gas affords the same comfort and convenience as city gas.

Efficiency—Gives positive, continuous service, gas being automatically made as needed, and none is stored; variations in temperature do not affect efficient operation; gas can be supplied to adjacent houses and metered like city gas.

Durability—Only the highest grade materials and workmanship are employed; once installed the system requires *no upkeep or repairs.*

To Select the Proper Machine

Calculate the *maximum amount of gas* that will be *consumed per hour* in simultaneous operation of all gas burning appliances in the building. Then select the proper number of Tirrill Gas Machine from table.

The following appliance consumption per hour will serve as a guide in estimating the gas requirements of the various appliances: incandescent mantle burners, 3 to 6 cu. ft.; bunsen burners 6 to 12 cu. ft.; side tank water heaters, 40 to 60 cu. ft.; gas range or hot plate (single burner), 12 to 16 cu. ft.; gas range oven (pipe burners), 22 to 30 cu. ft.; radiators and radiant heaters, 30 to 60 cu. ft. Other domestic or industrial heating appliances to be figured according to manufacturers' specifications.

CAPACITIES AND DIMENSIONS OF TIRRILL GAS MACHINES

Machine No.	1	2	3	4	5	6	7	8	9
Gas delivered per hr. cu. ft.	180	300	400	550	850	1100	1500	2200	5000
Gas pressure........inches	1¾	2	2	2½	2½	3	3	4	6
Equalizing Pressure Meter (A):									
Length..........inches	48	56	64	70	75	86	97	154	180
Height..........inches	45	45	47½	47½	57	61	61	87	120
Diameter........inches	29	29	35	35	42	48	48	56	81
Weight Box:									
Height..........inches	24	24	24	24	24	24	24	30	30*
Diameter........inches	26¼	26¼	34½	39½	44	52½	60¼	75¼	75¼*
Generator (B):									
Height (with dome) inches	67	68	69	70	80	82	82	96	96*
Capacity........barrels	3	4	5	6	10	14	14	25	50†
Mixer (C):									
Height..........inches	11	12	14	14	14	15	15	18	26
Diameter........inches	32	42	46	46	46	52	52	65	80
Shipping weight....pounds	942	1222	1500	1775	2260	3475	3840	4470	9590

*A battery of two is used, each having this dimension. †Two 25-bbl. generators coupled together.

AMERICAN HEATING & LIGHTING CO.

Manufacturers of the Clark Gas Producer

MORENCI, MICH.

The Clark Gas Producer

The Clark Gas Producer is an efficient and perfectly safe machine that produces and delivers, at one-half the cost, a gas fuel that is the equal for every purpose, to manufactured city gas. Over a period of 30 years and in hundreds of installations the Clark Gas Producer has solved the problems of supplying gas for cooking, baking, broiling, heating water, etc., in suburban homes, farms, country clubs, hotels, summer resorts and domestic science departments.

Description

The Clark Gas Producer is absolutely automatic, easily installed and unusually durable. It consists of two principal parts, namely:

(1) A combination storage tank and gas generator or carburetor, and;

(2) Weight machine or electric blower.

The combination carburetor and storage tank is constructed of heavy Armco galvanized iron, which has a worldwide reputation for its rust resisting and lasting qualities. All castings are of solid brass.

This part of the system is buried in the ground outside and 10 ft. from the building.

The weight driven air blower is built of the same materials as the generator and is located in the basement or other convenient storage place. It consists of the weight blower, weight case, cable and pulleys and is connected with the carburetor by piping.

Wherever electricity is available the weight driven blower can be replaced with an electric blower. This can be placed in any convenient location and thus saves space. The electric blower may be controlled from each room where the gas is used.

Operation

To operate the Clark Gas Producer all that is required is to fill the carburetor with gasoline, start the blower and the machine does the rest. The air furnished by the blower enters the carburetor, passes around the baffle plates, where it is thoroughly mixed and saturated with gasoline and finally discharged in the form of a perfectly uniform gas to the burners.

Where the electric blower is used nothing is required but turning on the switch; and with the weight blower an occasional rewinding of the weight and oiling of the bearings is the only attention required.

Outstanding Features

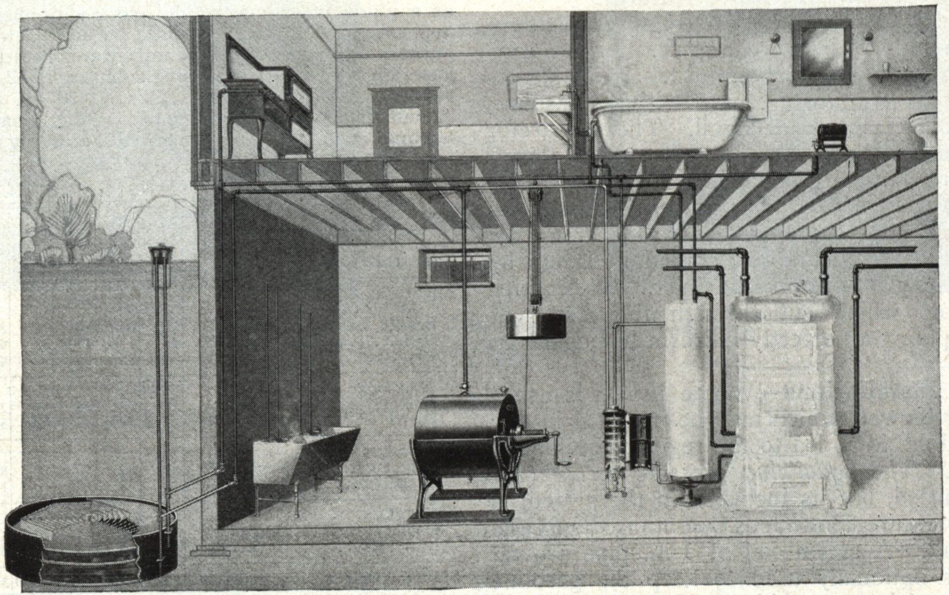
Safety in Operation—As all mixing is done in the carburetor outside, absolutely no gasoline enters the building at any time.

No Increase in Insurance—The Clark Gas Producer has been approved and passed by the State Inspection Bureau and, therefore, the installation does not affect the insurance rates on the building.

Ease of Operation—The simplicity of the Clark Gas Producer permits its operation by any one having little or no mechanical knowledge. One filling of the tank will run the average family one year.

Durability of Construction—The parts being constructed of Armco iron and brass and containing no complicated mechanism to get out of order, the machine will last a lifetime.

Economy—The cost of operation is much less than with other fuels, and the upkeep of the machine is practically nil.



Clark Gas Producer Operated by Weight Blower

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SIZES AND CAPACITIES OF CLARK GAS PRODUCER

No. of machine	Cu. ft. gas per hour	Carburetor				Weight machine			Electric blower		
						Blower		Shell			
		Capacity, gal.	Number cells	Diam., in.	Height, in.	Length, in.	Width, in.	Diam., in.	Width, in.	Length, in.	Height, in.
1	300	110	2	50½	18	48	29	31	12	15	16
2	450	162	2	60	18	51	32	37	12	15	16
3	600	243	3	60	27	60	32	37	12	15	16
4	900	324	4	60	36	66	38	47	12	15	16
5	1200	470	4	72	45	72	53	48	12	15	16

Guarantee

The Clark Gas Producer should last a lifetime with very little attention, and if the operator will take reasonable care of the Producer, we guarantee it against defects in material and will replace any repairs, free of charge, providing the instructions for the care and management of the producer are followed.

We furnish a written guarantee with every Clark Gas Producer.

Brief Specification

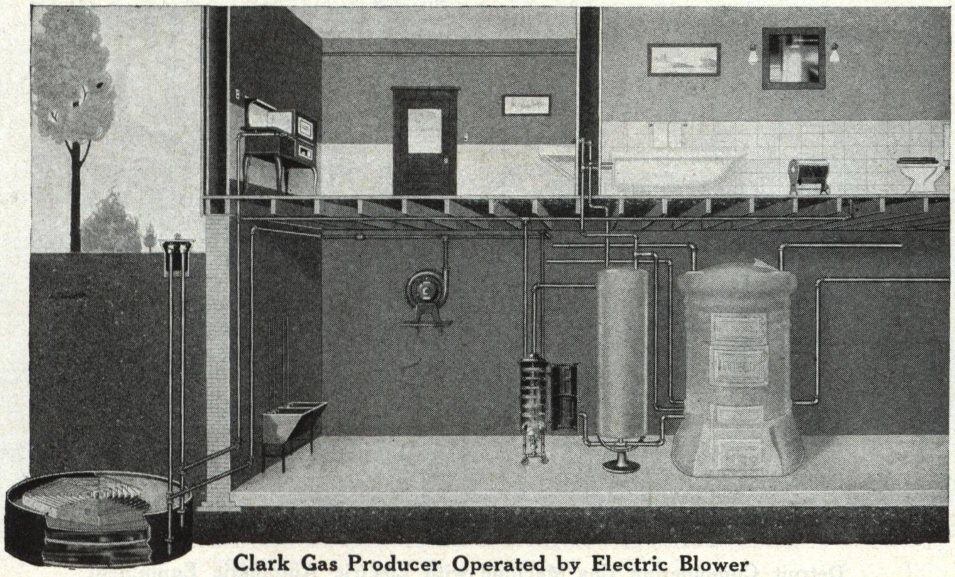
Furnish and install, where shown on plans, one complete Clark Gas Producer, electric or weight, having a capacity of .... cu. ft. per hour, as manufactured by the American Heating & Lighting Co., Morenci, Mich.

Some Typical Installations

Sunny Banks Preventorium for Children, Grand Rapids, Mich.
The Hal. C. Blair Hospital, Morenci, Mich.
J. H. Edwards Residence, Leipsic, Ohio
John Myers Residence, Toledo, Ohio
National Dairy Co., Morenci, Mich.
A. W. Roseneraus & Co., Ashton, Ill.
Frank Weston Residence, Madison, Wis.
Cleveland Woolen Mills, Cleveland, Tenn.
Paul P. Prudden Residence, Palm Beach, Fla.
Oklahoma Portland Cement Co., Ada, Okla.
George D. O'Brien Residence, Rochelle, Ill.
Northwestern State Portland Cement Co., Mason City, Iowa
Southern State Portland Cement Co., Atlanta, Ga.
C. O. Roe Residence, Clermont, Fla.
Thomas' Restaurant, Angola, Ind.
A. J. Graves Residence, Wolf Lake, Ind.
P. Medalie Residence, Mancelona, Mich.
Evans & Wertman, Detroit, Mich.
Hartman Bros., Woodville, Ohio
Lakeview Club, Lakeland, Mich.
Dr. R. L. Davis Residence, Hamler, Ohio
Dr. W. S. Gehrett Residence, Deschler, Ohio
Sand Beach Co., Oak Harbor, Ohio
C. F. Manly, Birmingham, Ala.
H. H. Bassett, Pres. Buick Motor Co., Flint, Mich.
W. E. Hupp, Lexington, Ky.
W. H. Lane, M. D., Angola, Ind.
Thos. J. Trutna, M. D., Silver Lake, Minn.
Ned L. Kiser, Trout, La.
H. H. Smith, Palm Beach, Fla.
U. S. Veterans Hospital, Camp Custer, Mich.
Notre Dame Academy, Toledo, Ohio
John Onken & Brother, Chapin, Ill.
Butler Mfg. Co., Butler, Ind.
D. J. Curtiss, Jamestown, N. Y.
A. DeRosa, Utica, N. Y.
Methodist Children's Home, Buffalo, N. Y.

A Few School Installations—

Lincoln Consolidated School (Branch Ypsilanti Normal), Whittaker, Mich.
Sylvania High School, Sylvania, Ohio
Tecumseh Public Schools, Tecumseh, Mich.
Butler Public School, Butler, Ind.
Grass Lake Public School, Grass Lake, Mich.
Redford Public School, Redford, Mich.



Clark Gas Producer Operated by Electric Blower

DETROIT SUBURBAN GAS PLANT COMPANY

SUCCESSORS TO DETROIT HEATING & LIGHTING CO. and SUBURBAN GAS CO.

In the Manufacture of the Detroit Combination Gas Machine

TELEPHONE
EMPIRE 3447

2151 East Milwaukee Avenue
DETROIT, MICH.

Product

COLD PROCESS SUBURBAN GAS PLANTS and equipment.

Detroit Combination Gas Machine

Architects, contractors, builders and home owners requiring gas service in places where natural, or city gas, is not available will find that the Detroit Combination Gas Machine will meet every requirement. Thousands of these machines are in daily use, proving their dependability under all conditions.

A superior quality of gas, producing over 800 B. t. u.'s per cubic foot, is made from gas machine gasoline, which is placed in combination carburetor and storage tank in ground outside of building. No gasoline is stored in building at any time.

Where electricity is not available, a weight driven compressor (see illustration on following page) is used to blow air out into carburetor over gasoline, vaporizing it into gas, it being returned to equipment in fuel form the same as any other gas.

This construction is entirely automatic, noiseless, and may be relied upon to furnish a satisfactory volume of gas under all conditions.

It has been listed by the Underwriters' Laboratories, Inc., in "Class A," and buildings where it is installed carry the same rate of insurance as where natural or city gas is used.

Electric Automatic Equipment

See illustration below. Built along the same general lines, except that an electric motor-blower in combination with airometer produces a steady flow of air which is controlled automatically. This construction is very popular where owners object to winding the weight driven blower.

Satisfied Users

On request we can supply names of users in any part of the country. Many of these plants have been in continuous operation for over 30 years. Among our users appear such names as the following:

INDUSTRIAL

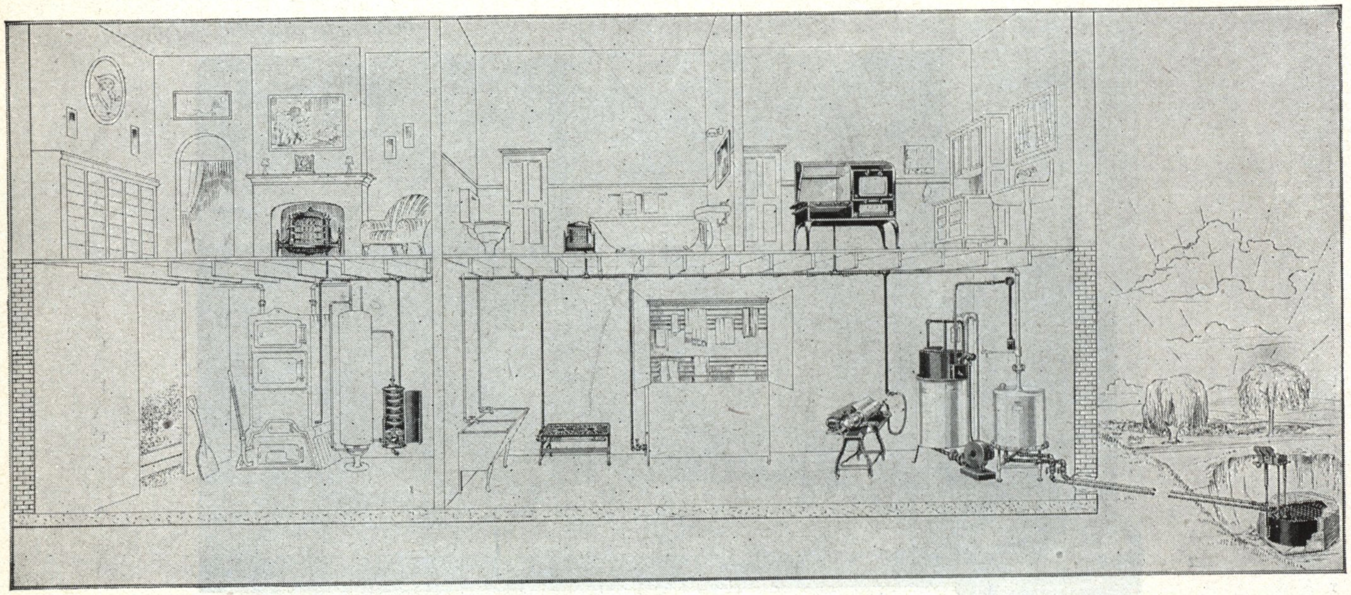
Great Western Sugar Co.—10 plants
Seth Thomas Clock Co.
Swift & Company—5 plants
Sandusky Portland Cement Co.—4 plants
United Fruit Co.—4 plants
Calumet & Hecla Mining Co.
Armour Packing Co.—4 plants
New Jersey Zinc Co.—5 plants
American Smelting & Refining Co.

EDUCATIONAL

State College of Washington
State College of South Dakota
Hazel Park High School, Detroit, Mich.
Shaker Heights High School, Cleveland, Ohio
Dartmouth College, Hanover, N. H.
Colorado School of Mines, Golden, Colo.
Culver Military Academy, Culver, Ind.
Agricultural College of Utah, Logan, Utah
New York State College of Agriculture, Morrisville, N. Y.
Marysville College, Maryville, Tenn.
National Park Seminary, Forest Glen, Md.
Connecticut Agricultural College, Storrs, Conn.
Providence Convent, Saint Mary of the Woods, Indiana

HOMES

C. B. Van Dusen, Detroit, Mich.
Howard E. Coffin, Detroit, Mich.
R. L. Dorrity, Toledo, Ohio
Geo. B. MacNichol Jr., Toledo, Ohio



Detroit Combination Gas Machine with Electric Automatic Equipment

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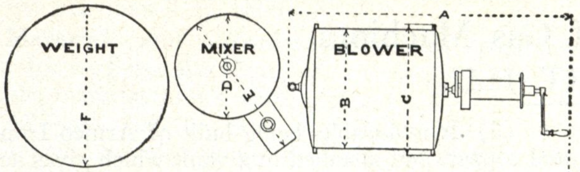
DIMENSIONS, WEIGHT DRIVEN COMPRESSOR TYPE


WEIGHT
MIXER
BLOWER
A
B
C
D
E
F
G

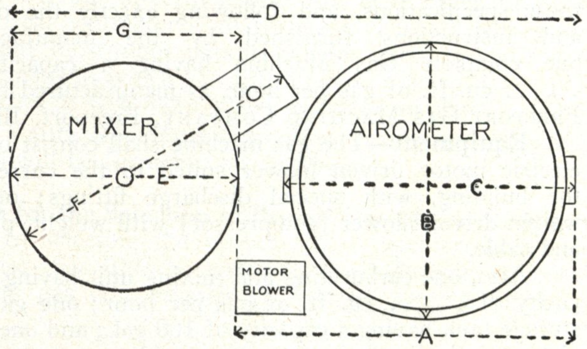
Floor space required

Size	A	B	C	D	E	F	G
240	53″	26″	30″	27″	....	30″	8′ 8″
450	62″	32″	36″	27″	....	36″	10′ 4″
600	70″	32″	36″	27″	....	36″	11′ 0″
900	73″	37″	42″	27″	....	42″	11′ 9″
1200	79″	37″	42″	27″	....	50″	12′ 11″
1800	91″	43″	48″	28″	40″	50″	14′ 4″
3000	107″	56″	62″	28″	40″	66″	16′ 6″
Laboratory plant	53″	26″	30″	27″	....	30″	8′ 8″

Plant size in cubic feet of gas per hour	Size of main gas riser pipe, in.	Storage capacity of carburetor in gals. of gasoline	Carburetor diameter, in.	Carburetor depth, in.	Shipping weight of plant complete, lb.
240	1¼	160	60	20	1300
450	1½	350	72	28½	1980
600	1½	370	78	31	2575
900	2	425	84	31	3050
1200	2	500	90	31	3235
1800	2½	750	102	35	4560
3000	3	1040	108	44	5880
66	1¼	54	46	12	863

Note: The weight as shown in above detail is hung in straight line with compressor and mixer by using the intermediate pulley furnished with every plant. By using this pulley the weight can be located in any position desired.

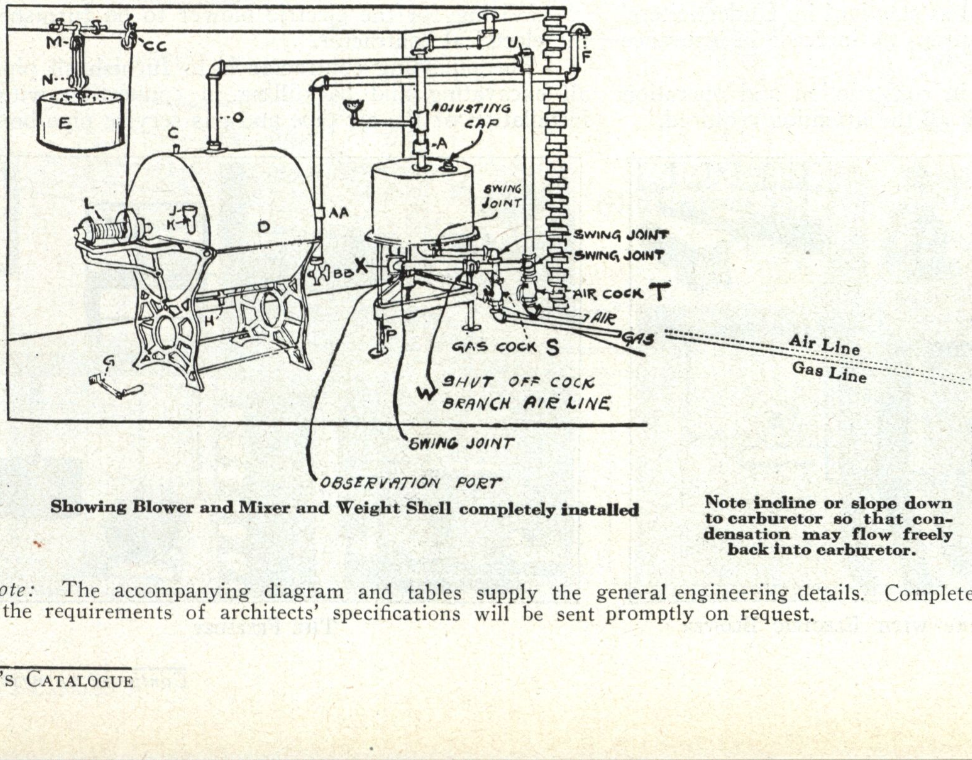
DIMENSIONS, ELECTRIC DRIVEN AIROMETER TYPE


D
G
MIXER
E
F
AIROMETER
C
B
A
MOTOR
BLOWER

Floor space required

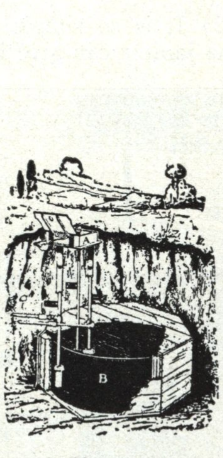
Size	A	B	C	D	E	F	G
240	40″	28″	31″	57″	27″	....	27″
450	40″	28″	31″	57″	27″	....	27″
600	40″	28″	31″	57″	27″	....	27″
900		Write	factory for information		27″	....	27″
1200					27″	....	27″
1800					28″	40″	28″
3000					28″	40″	28″
Laboratory plant	40″	28″	31″	57″	27″	....	27″

Plant size in cubic feet of gas per hour	Size of main gas riser pipe, in.	Storage capacity of carburetor in gals. of gasoline	Carburetor diameter, in.	Carburetor depth, in.	Shipping weight of plant complete, lb.
240	1¼	160	60	20	1263
450	1½	350	72	28½	1564
600	1½	370	78	31	2082
900	2	425	84	31	2344
1200	2	500	90	31	2480
1800	2½	750	102	35	Write factory
3000	3	1040	108	44	Write factory
66	1¼	54	46	12	750


M
CC
N
E
O
C
L
J
K
D
AA
BB
X
H
G
U
F
ADJUSTING CAP
A
SWING JOINT
SWING JOINT
SWING JOINT
AIR COCK T
AIR
GAS
GAS COCK S
P
W
SHUT OFF COCK BRANCH AIR LINE
SWING JOINT
OBSERVATION PORT
Air Line
Gas Line

Showing Blower and Mixer and Weight Shell completely installed

Note incline or slope down to carburetor so that condensation may flow freely back into carburetor.



Showing buried Carburetor

Note: The accompanying diagram and tables supply the general engineering details. Complete engineering details in form to fit the requirements of architects' specifications will be sent promptly on request.

FREEPORT GAS MACHINE COMPANY

Manufacturers of Gas Machines

FREEPORT, ILL.

Product

Freeport Cold Process Gasoline Gas Machine.

What the Machine Does

The Freeport gas machine produces and delivers gas that is a perfect fuel for domestic science kitchens, lunch rooms, and for work in the different laboratories. It is equally well suited for use in suburban and country homes for lighting, cooking, heating water, etc.

The machine consists of two principal parts: (1) a combined carburetor and mixing equipment, and storage tank and (2) air supplying equipment.

Gas Carbureting Equipment—Consists of one or more flat oblong tanks and a storage tank. This part of the equipment is installed in a vault at a distance (usually 30 feet) from the building. The interior of the carburetor is broken up by parallel division plates or baffles, in which wicking is installed. Air furnished by the blower enters the carburetor, passes around baffle plates where it is thoroughly saturated with gasoline and is finally discharged to burners in the form of a uniform gas ready for use.

Air Supplying Equipment—Consists of an electric blower and fittings, or a weight blower, weight case, cable and pulleys usually located in basement or convenient storeroom and is connected by piping to carburetor in vault. In the case of the weight blower, the winding of the weight and keeping the bearings oiled is a simple matter requiring very little of the janitor's time two or three times a week.

Where electricity is available the electric blower is used in place of the weight blower. Much space is then saved, as the electric blower can be placed on the wall out of the way and requires no winding or special care. Motor is controlled from each room where gas is used.

Fuel Used—Gas is made from what is known commercially as "gas machine gasoline" (84-88° gravity test).

Advantages of the Freeport

(1) It has been listed as standard by Underwriters' Laboratories, Inc. This means *no* increase in insurance rates.

(2) It is so simple in construction and operation that the janitor can give it all the attention required.

(3) It is durable, being built of Armco Iron, brass and copper, and installed in a vault which gives access to all parts of the machine and adds to the lasting qualities of all materials.

(4) It is safe; all gasoline is stored outside and away from the building. There is not a drop of gasoline in the building at any time.

(5) Low in cost of operation, doing the work at one third the expense necessary to do the same work with blau gas, acetylene gas, or electricity at 5¢ per kw. Blue prints and instruction sheet for installing furnished with each machine.

Specifications for Gas Machine

The plumbing contractor shall furnish and install complete where shown on plans, and in accordance with these specifications, and following exactly the details and instructions furnished by the manufacturer, one complete Gas Machine having a capacity of ...... cu. ft. of gas per hour, as manufactured by the Freeport Gas Machine Company, Freeport, Ill.

Equipment—The gas machine shall consist of one electric motor driven blower suited to the current in the building, with special discharge fittings; or one weight driven blower [compressor] with weight, pulleys and cable.

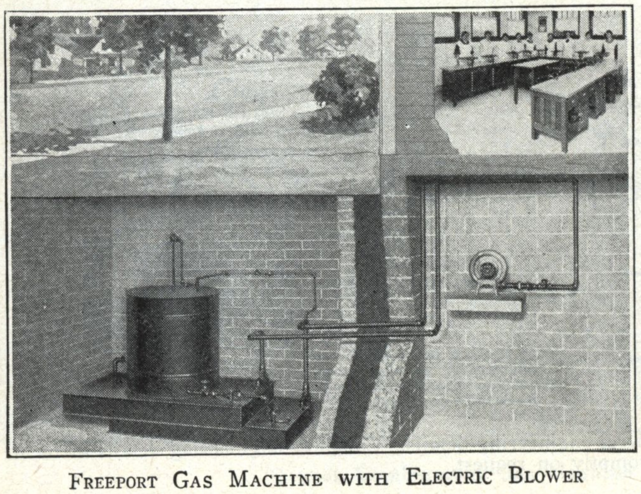
Also, one carbureting and mixing unit having a capacity of ...... cu. ft. of gas per hour; one gasoline storage tank having a capacity of 160 gal.; and one complete set of pipe fittings to connect blower, carbureting units and supply tank.

Installation—The carbureting and mixing unit with the supply tank shall be installed in a vault 30 ft. from the building (the vault to be furnished by the general contractor) and connection made with the main gas pipe in the building, in accordance with the specifications and instructions furnished by the manufacturer.

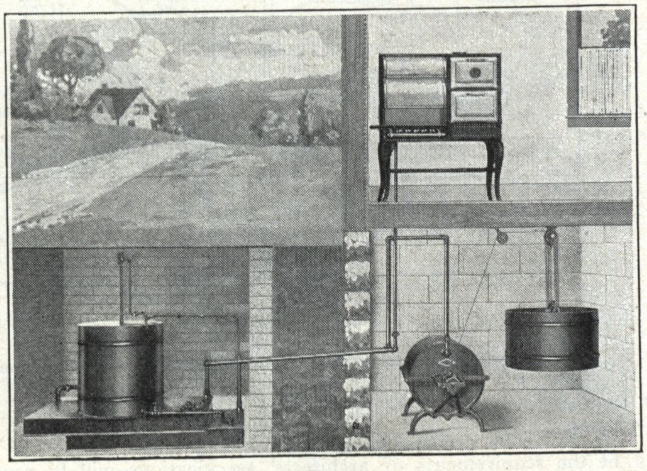
The blower shall be installed in the room and place shown on the plans, and the air line connection made with carburetor unit in the vault.

Wiring for the electric blower to be furnished by the electrical contractor.

The plumbing contractor is to furnish all pipe, do all excavating and backfilling in connection with the installation of the air pipe and gas service pipe between



Freeport Gas Machine with Electric Blower



The Freeport

Continued on next page

vault and building. These pipes to be placed in a trench and not less than 4 ft. below grade.

Material and Workmanship—All equipment called for in these specifications is to be new and shall bear the manufacturer's name plate.

All pipe shall be new, of full internal diameter, ends reamed to full size and carefully examined for any internal obstructions.

All work to be done in a good and workmanlike manner.

Test and Responsibility—Before setting the machine, the plumbing contractor shall carefully examine and thoroughly test the gasoline storage tank and carburetor for any leaks that may have been caused by damage in transit. Should any leaks develop, these shall be repaired before installing. The plumbing contractor is to be solely responsible for the proper care and protection of the gas machine until such a time as it is taken over by the owners, at which time the complete gas machine is to be in proper working order.

Wiring Specifications for Gas Machine—The electrical contractor shall furnish and install wiring and conduit in straight parallel wiring, from the motor to the rooms in which gas will be used, placing single pole switches in each room where indicated on plans.

Vault Specifications—Blue prints and specifications will be furnished on request.

Data for the Selection of Proper Size of Gas Producer

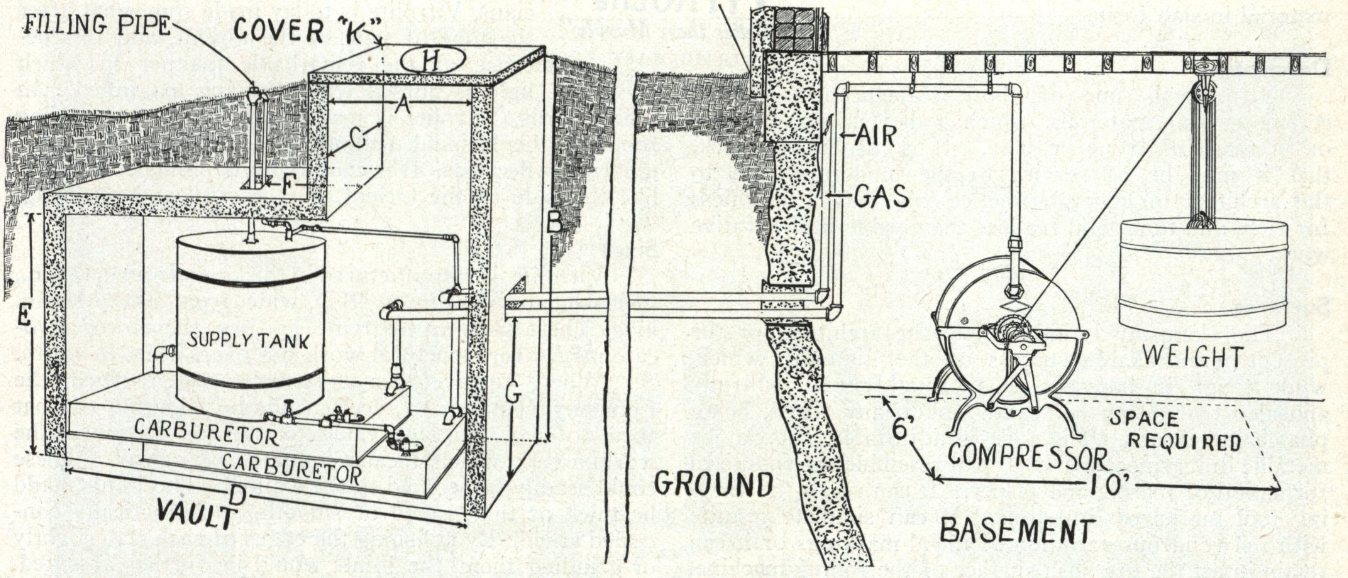
In selecting the proper size of gas producer, we suggest that 10% be added to the following estimated hourly gas consumption of various heating units, as given by appliance manufacturers, to provide for maximum loads and future needs.

For the best results, piping for cold process gasoline gas should be one size larger than for coal gas.

Laboratory Bunsen—6 to 8 cu. ft. per hour per burner.
No. 50 Domestic Science Stove—12 to 15 cu. ft. per hour per burner.
No. 9—23 Domestic Science Range—15 to 18 cu. ft. per hour per burner.
Glue Pot Stove—8 to 10 cu. ft. per hour per burner.
Soldering Furnace—24 to 36 cu. ft. per hour per burner.
Steam Table—12 to 16 cu. ft. per hour per burner.
Coffee or Hot Water Urn—15 cu. ft. per hour per burner.
Gas Range—15 to 18 cu. ft. per hour per burner.
Simmering Burner—5 to 6 cu. ft. per hour per burner.
Coil Water Heater—20 to 30 cu. ft. per hour per burner.
Ironer—20 to 30 cu. ft. per hour per burner.
Radiant Fire Heater—25 to 35 cu. ft. per hour per burner.

A Few Installations

Carthage College, Carthage, Ill.
Nebraska State Normal School, Chadron, Neb.
Pleasant Hill High School, Pleasant Hill, Ohio
Alabama Girls Technical Institute, Montevallo, Ala.
Freeport Country Club, Freeport, Ill.
Methodist State Hospital, Mitchell, S. D.
Caroline Mark Home, Mt. Carroll, Ill.
Rockford Municipal Tubercular Sanitarium, Rockford, Ill.
Story City High School, Story City, Iowa
Canton Public High School, Canton, S. D.
Horicon High School, Horicon, Wis.
North Judson High School, North Judson, Ind.
Three Oaks High School, Three Oaks, Mich.
Davies Shoe Manufacturing Co., Horicon, Wis.
Broadhead High School, Broadhead, Wis.
St. Patrick's Church, O'Neill, Neb.
Lakeside Hotel, Burlington, Wis.
Chapel Hill High School, Chapel Hill, N. C.
Beloit High School, Beloit, Kan.
New Prague High School, New Prague, Minn.



Typical Installation of "The Freeport" Cold Process Gasoline Gas Machine

Machine No.	Cu. ft. gas per hour	Vault dimensions, in.									Pipe, in.		Blower space, ft.	
		A	B	C	D	E	F	G	H	K	Air	Gas	Electric	Weight
1	100	39	96	42	72	48	9	36	28-in. Cistern cover	Removable reinforced concrete cover	1¼	1¼	2 x 3	5 x 8
2	200	39	96	42	72	48	9	36			1¼	1¼	2 x 3	5 x 8
3	300	39	96	42	78	62	11	36			1½	1¼	2 x 3	6 x 10
5	500	39	96	54	84	62	11	36			2	1¼	2 x 3	6 x 10
6	600	39	96	54	96	62	12	36			2	1½	2 x 3	6 x 10
7	700	39	96	54	96	62	12	36			2	2	2 x 3	6 x 10
8	800	49	96	54	96	62	12	36			2	2	2 x 3	6 x 10
*9	900	49	96	60	96	62	12	36			2	2	2 x 3	6 x 10

*Machines of greater capacity furnished on request.

THE VITROLITE COMPANY

TELEPHONE
FRANKLIN 3511

Ceramo-Crystal Slabs

FACTORY
PARKERSBURG, W. VA.

Chamber of Commerce Building

CHICAGO, ILL.

VITROLITE SERVICE ORGANIZATIONS AND REPRESENTATIVES

ATLANTA, GA., VITROLITE PRODUCTS Co., 10 West Baker Street
BALTIMORE, MD., VITROLITE CONSTRUCTION Co., 15 East Fayette Street
BOSTON, MASS., VITROLITE PRODUCTS Co., 462 Boylston Street
BUFFALO, N. Y., VITROLITE PRODUCTS Co., 56 East Huron Street
CHICAGO, ILL., VITROLITE PRODUCTS Co., 711 Fulton Street
CINCINNATI, OHIO, VITROLITE CONSTRUCTION Co., 306 East Third Street
CLEVELAND, OHIO, VITROLITE CONSTRUCTION Co., 2909 Detroit Avenue
COLUMBUS, OHIO, VITROLITE CONSTRUCTION Co., 850 North High Street
DALLAS, TEX., VITROLITE CONSTRUCTION Co., 3209 Commerce Street
DENVER, COLO., MCPHEE & MCGINNITY, 23rd and Blake Street
DETROIT, MICH., VITROLITE CONSTRUCTION Co., 407 East Fort Street
KANSAS CITY, MO., VITROLITE CONTRACTING Co., 203 Reliance Building
LOS ANGELES, CAL., VITROLITE CONSTRUCTION Co., 829 South Los Angeles Street
MIAMI, FLA., VITROLITE PRODUCTS Co., 1110 N. E. First Street
MINNEAPOLIS, MINN., VITROLITE PRODUCTS Co., 928 South Fourth Street
NEW YORK, N. Y., VITROLITE COMPANY, 1103 Pershing Square Building
OMAHA, NEB., VITROLITE SALES Co., 2857 Farnum Avenue
PHILADELPHIA, PA., VITROLITE PRODUCTS Co., 1218 Chestnut Street
PITTSBURGH, PA., VITROLITE CONSTRUCTION Co., 902 Federal Street, N. S.
PORTLAND ORE., VITROLITE CONSTRUCTION Co., 80 Grand Avenue
SAN FRANCISCO, CAL., VITROLITE CONSTRUCTION Co., 1492 Mission Street
SEATTLE, WASH., VITROLITE CONSTRUCTION Co., 514 Westlake Avenue
SPRINGFIELD, MASS., VITROLITE CONSTRUCTION Co., 360 Worthington Street
ST. LOUIS, MO., VITROLITE SALES Co., 320 Chamber of Commerce Building
TAMPA, FLA., VITROLITE PRODUCTS Co., 718 Grand Central Avenue

FOREIGN COUNTRIES

MONTREAL, QUE., J. P. O'SHEA & Co., Perrault and St. Agatha Street
HAVANA, CUBA., CUBAN VITROLITE Co., P. O. Box 1070
LONDON, S. W. 1, ENG., VITROLITE CONSTRUCTION Co., 1 Victoria Street, Westminster
OSAKA, JAPAN, HARADA SHOJI KAISHA, LTD., 3 Itachibori Katadori, 3-chome, Nishiku
SHANGHAI, CHINA, VITROLITE CONSTRUCTION Co., Cor. E. Yuhang and Alcock Roads
MELBOURNE, AUS., GEO. B. FETHERS Co., 492 Collins Street, Church Lane

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VITROLITE
"Better than Marble"
TRADE-MARK

Product

VITROLITE, an up-to-date alabaster-like material in slab form.

Description

Vitrolite is one of those translucent ceramo-crystal materials which today is made white or in tones of ivory or jade. It is also made black, that it may be of service to the modernist and to the architect in general practice who has a fondness for rich, dull tones and realizes their value in decorative work.

Surfaces

The Company is indebted to the architect for the present unmistakable success of the material, which, while tough in body, is so thoroughly and skillfully annealed that it can be readily cut to any shape, being pliable in texture. The face is adjustable. It can be metallic in its smoothness. It can resemble the fossilized formation of marble and jasper. It can recall the varying tool marks of limestone. It can simulate granite with its wondrous variation of metal markings or it can retain intact the fire flash surface of the rolling machine.

Write for catalogue sheet on surfaces.

Uses

The uses vary as do the purposes for which Vitrolite would be required. The qualities recommending it for one purpose might unfit it for another.

For light shafts, for laboratory walls and ceilings, for bakeries and electric power stations, for cooling rooms and refrigerators, for creameries and dairies and for industrial lunchrooms, the architect would naturally prefer and specify white, with the ability to transmit light, whereas the hospital physicians require an altogether different quality.

Hospitals

Thanks to certain distinguished physicians, Vitrolite is today made somewhat after the tone of jade of the Orient, and this because of the remarkable manner in which light is nursed without being magnified. In other words, Vitrolite is made today for the operating room of the hospital without glare. It absorbs light, ignoring reflections. It is cooling in its influence and yet, like the jade of the Orient, it is wistful and inspiring.

Sizes

Vitrolite is manufactured in thickness from ¼ to 1 in., inclusive, and slabs up to 48 in. wide, from 100 to 120 in. long. These sizes are extreme, and we, therefore, advocate panels for structural work not over 30 in. in width.

Where relatively large surfaces are involved, the Company ventures to recommend the adoption of that form of construction characteristic of masonry the world over; which means—courses of ashlar. These could readily be secured to the walling. The joints could be thick or thin, raked or smooth, and practically concealed at will. By polishing the edges of each slab slightly or grinding them, the joints would be further accented.

Decoration

Vitrolite is receptive of individual expression in the form of ornament in relief, color or finish. Ceramic chemicals and lusters are used and fired as in the old days of Persia and Mesopotamia.

Erecting Vitrolite and Vitrolite Service

THE VITROLITE COMPANY thoroughly recognizes the technical character of structural work and the necessity of skill and training in serving the architect as well as properly executing a contract if satisfactory results are to be assured.

Continued on next page

For these reasons there have been formed in the principal cities of America and foreign countries, Vitrolite Service Organizations which assume all responsibility for the correct application, detailing and installation of Vitrolite. Architects will find these Service Organizations of unusual value, able and anxious to co-operate by supplying data, suggestions or detailing to cover the practical use of Vitrolite necessary for submitting bids or installing Vitrolite.

Our nearest Service Organization will be pleased to respond promptly to your request for consultation without your incurring the slightest obligation.

That the performance of the Vitrolite Service Organizations is adequate may be judged by many voluntary and enthusiastic letters of recommendation.

Vitrolite Wainscoting—Specification Suggestions

For wainscoting, ceiling surfacing and other structural uses, Vitrolite is furnished in various thicknesses. To avoid controversies that may arise in the absence of explicit instructions, the thickness and size of material should be definitely specified or clearly shown on plan.

The following sizes of Vitrolite are recommended for the different purposes classified below:

Base—Vitrolite from $\frac{7}{16}$ to 1 in. thick, inclusive, in heights varying in accordance with over-all height of wainscoting. If tile cove base is specified to be installed by another contractor, it should be indicated and the sizes given.

Panels—Vitrolite $\frac{7}{16}$ in. thick, from 24 to 30 in. in width, and heights depending upon over-all height of complete wainscoting.

Ashlar—To consist of square Vitrolite plates or sizes of 6x6 in., 6x12 in., 8x16 in., 9x18 in., 10x20 in. or 12x24 in. of $\frac{5}{16}$ or $\frac{7}{16}$-in. material.

Caps, Borders, Cornices, etc.—Vitrolite from $\frac{5}{16}$ to 3/4 in. thick, in heights varying according to detail of room.

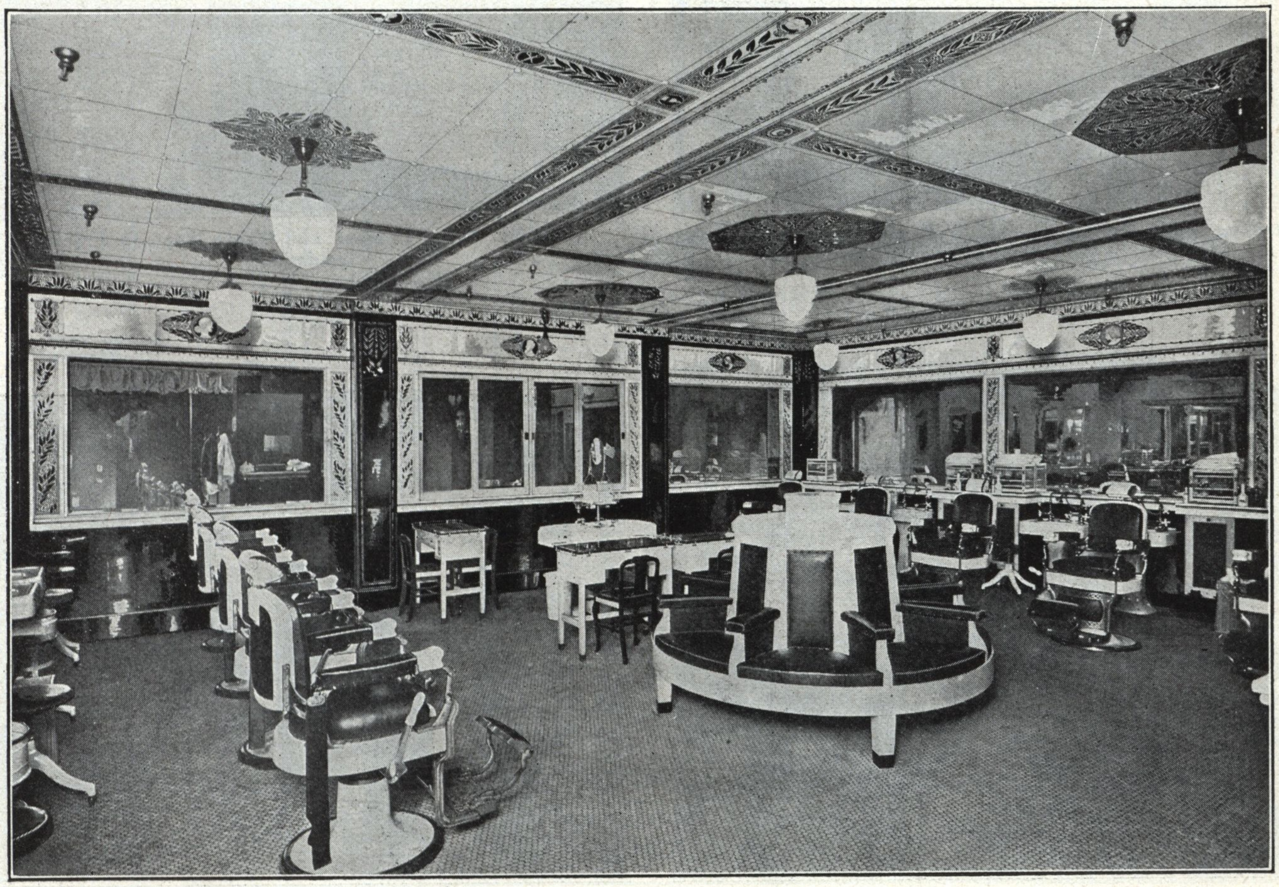
Walls Above Wainscot Line—Walls above wainscot line may be surfaced with Vitrolite panels, ashlars, or divided into borders, frieze and cornices.

Ceilings—Vitrolite plates $\frac{5}{16}$ in. thick and not to exceed 20x20 in. held securely in position with vitreous china buttons screwed to wood furring strips which are anchored to ceiling.

Miscellaneous—Window stools, door and window casings, plinth blocks, etc., should consist of 5/8 to 1-in. thick Vitrolite.

Due to technical nature of details required for toilet compartments and shower enclosures, we suggest that you get in touch with the Vitrolite Service Organization in your vicinity, who will be glad to furnish any details or drawings to aid in drawing up specifications and blue prints.

Note: The above outline is submitted as an aid in framing specifications for architects. In using it, care should be taken to cover thoroughly the preference of architect with reference to thickness and size of Vitrolite, as well as any special details involved. THE VITROLITE COMPANY, through its different Service Organizations, will gladly confer with architects with reference to the adaptability of Vitrolite, and co-operate with them in detailing its use, preparation of specifications, etc.



Decorated Vitrolite Barber Shop

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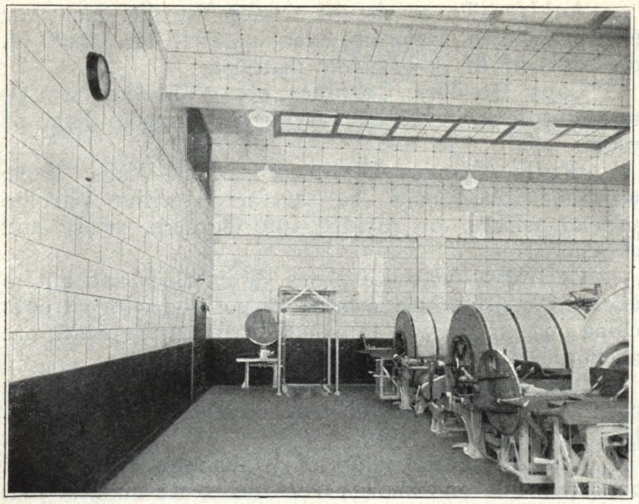
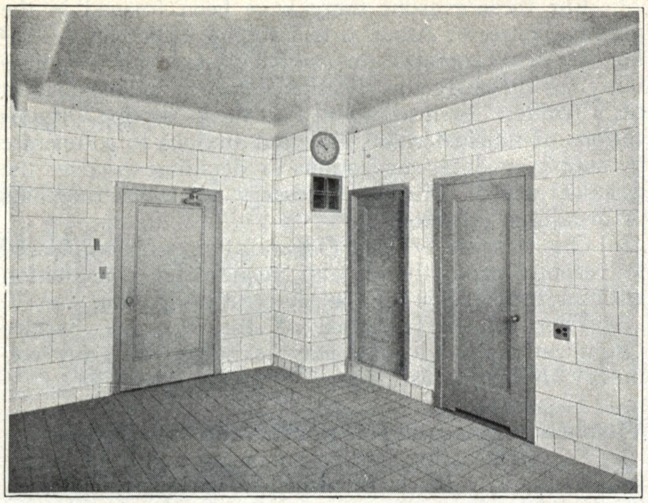
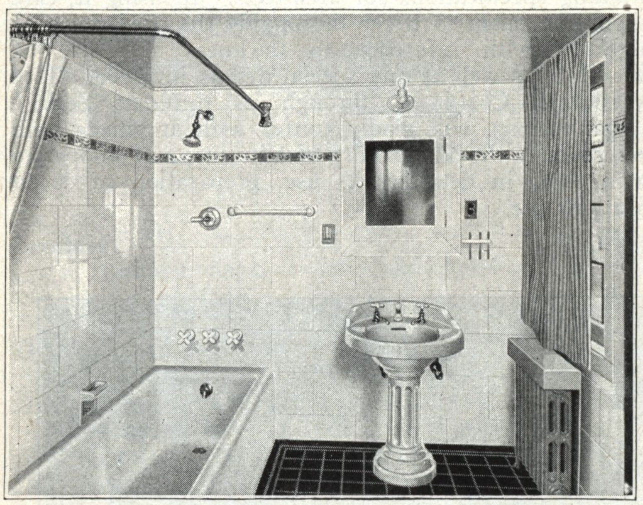


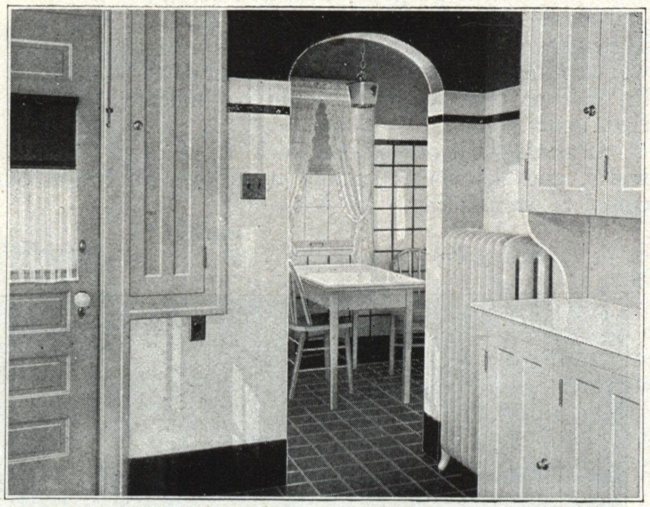
Vitrolite Walls and Ceiling in Creamery Building



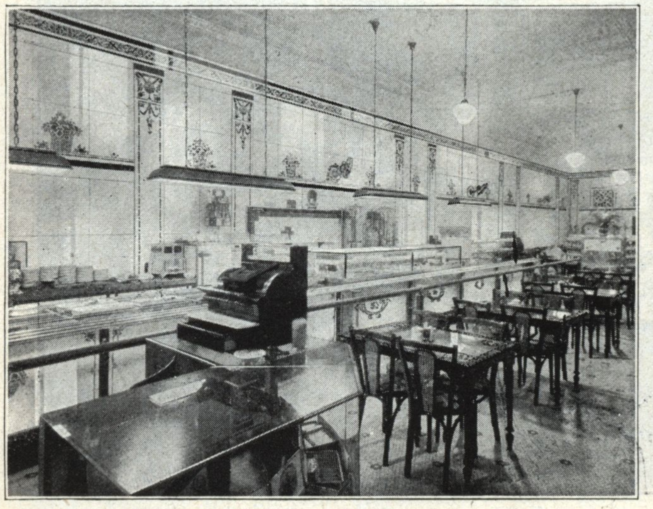
Vitrolite Walls in Operating Room of Hospital



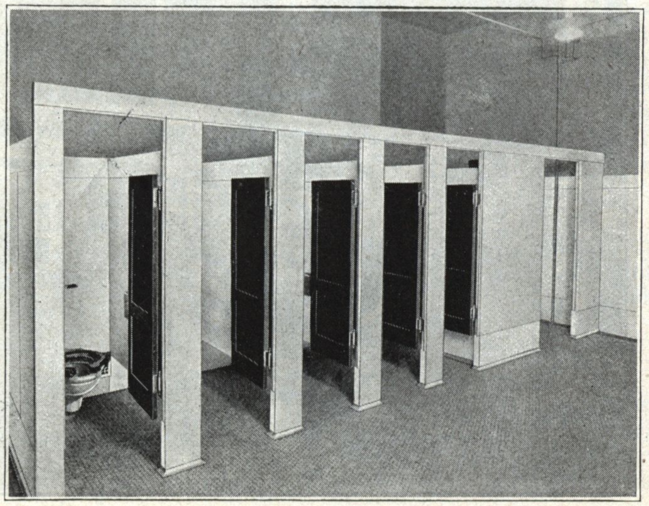
Vitrolite (Plain and Decorated) Walls in Bathroom of Private Residence



Vitrolite Walls, Cabinet and Table Tops in Private Residence



Vitrolite Walls, Counters and Table Tops in Restaurant



Vitrolite Walls and Partitions in Toilet Stalls

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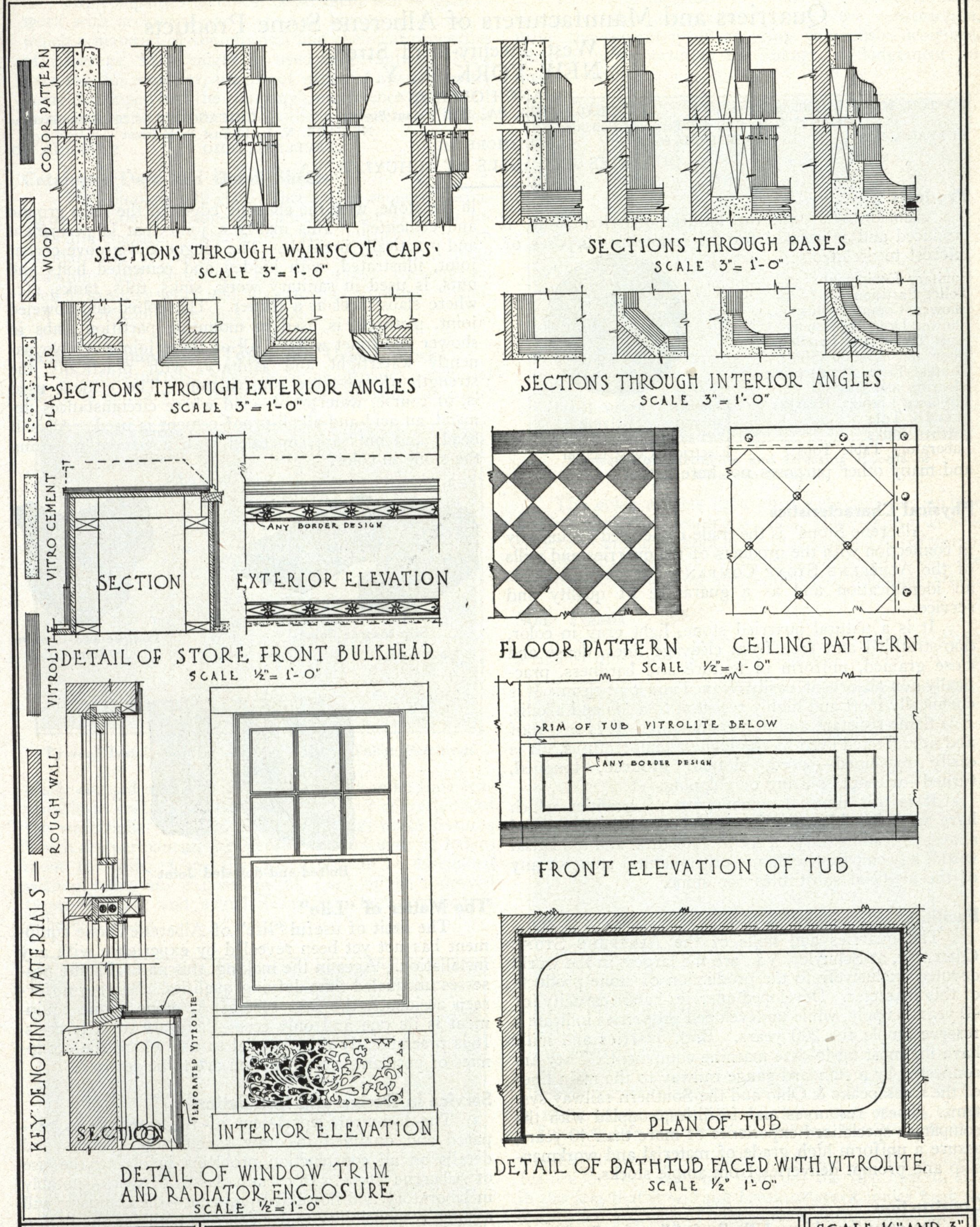

SECTIONS THROUGH WAINSCOT CAPS. SCALE 3" = 1'-0"

SECTIONS THROUGH BASES SCALE 3" = 1'-0"

SECTIONS THROUGH EXTERIOR ANGLES SCALE 3" = 1'-0"

SECTIONS THROUGH INTERIOR ANGLES SCALE 3" = 1'-0"

DETAIL OF STORE FRONT BULKHEAD SCALE 1/2" = 1'-0"

FLOOR PATTERN SCALE 1/2" = 1'-0" CEILING PATTERN

FRONT ELEVATION OF TUB

DETAIL OF WINDOW TRIM AND RADIATOR ENCLOSURE SCALE 1/2" = 1'-0"

DETAIL OF BATHTUB FACED WITH VITROLITE SCALE 1/2" 1'-0"

KEY DENOTING MATERIALS —
COLOR PATTERN
WOOD
PLASTER
VITRO CEMENT
VITROLITE
ROUGH WALL
SECTION
EXTERIOR ELEVATION
ANY BORDER DESIGN
RIM OF TUB VITROLITE BELOW
ANY BORDER DESIGN
PLAN OF TUB
PERFORATED VITROLITE
SECTION
INTERIOR ELEVATION

THE VITROLITE CO. CHICAGO.
VITROLITE
BETTER THAN MARBLE

TYPICAL DETAILS OF VITROLITE CONSTRUCTION
SPECIAL COLOR COMBINATIONS AS DESIRED

SCALE 1/2" AND 3" EQUALS 1'-0"
DATE JUNE 30

ALBERENE STONE COMPANY

Quarriers and Manufacturers of Alberene Stone Products

153 West Twenty-third Street
NEW YORK, N. Y.

BRANCH OFFICES
BOSTON, MASS., 37 Stilling Street
PHILADELPHIA, PA., 1511 Walnut Street
CHICAGO, ILL., 1700 Elston Avenue
PITTSBURGH, PA., 617 Ferguson Building
NEWARK, N. J., 12 East Park Street
BUFFALO, N. Y.
RICHMOND, VA.
BALTIMORE, MD.
CLEVELAND, OHIO
ST. LOUIS, MO.

QUARRIES AND MILLS AT SCHUYLER, VA.

Products

Alberene Stone, the natural quarried stone, is produced and fabricated for the following purposes of interest to architects:

Sanitary Equipment
Toilet Partitions
Shower Compartments
Shower Dressing Rooms
Stair Treads and Landings
Door and Window Sills
Plinths, Trim, Wainscoting
Flooring and Bases
Fireplace Linings, Hearths
Laundry Tubs
Kitchen Sinks
Laboratory Table Tops
Laboratory Fume Hoods
Laboratory Shelving
Laboratory Cabinet Work
Electrical Construction

and many other purposes not here listed.

Physical Characteristics

"Alberene Stone" is the trade-name used exclusively in connection with the products of the quarries and mills of the Alberene Stone Company. It serves both as an identification and as a guarantee of quality and service.

It is a natural quarried stone, light gray in color, non-stratified and free from cleavage lines, dense and close grained, uniform in texture and hardness, practically non-absorbent, easily cleaned and kept clean. It is chemically inert and highly resistant to acids and alkalis. It is flame-resistant and non-conducting. It is fireproof and not affected even by the highest temperatures. It is easily machined—bored, slotted, grooved, tongued, turned—without splitting or chipping.

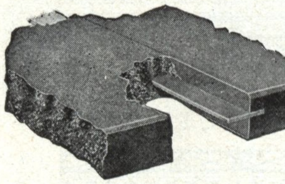
It is this unusual combination of qualities which have won for Alberene Stone, for the purposes listed above, its leading place in the architectural and industrial world, as compared with any other natural stone or any of the artificial substitutes for stone.

Facilities

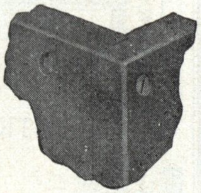
The quarries and mills of the Alberene Stone Company, at Schuyler, Va., are the largest in the world devoted exclusively to the production of stone products of this character. Developed quarries have a capacity for 40 years' supply, while undeveloped properties indicate a reserve ample for 200 years. Both quarries and mills have the most up-to-date machine equipment. They are connected by a standard gauge railway to the main lines of the Chesapeake & Ohio and the Southern railway systems. These resources and facilities, coupled with the company's specialized experience of more than 40 years, assure a uniform high grade of material and workmanship and prompt deliveries from ample stocks.

Construction

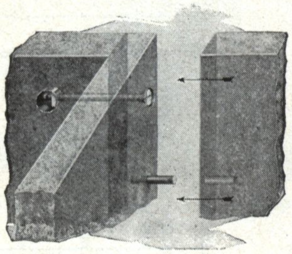
The easy "machine-ability" of Alberene Stone permits the use of construction methods impossible either with other natural stones or artificial materials. The slip-tongue joint, illustrated, is used in laboratory table tops—a strip of non-corrosive metal cemented in grooves in the stone, with the abutting edges of the slabs ground and cemented. This makes a joint that is permanent and practically invisible. The tongue-and-groove corner joint, illustrated, with hidden and cemented bolts and nuts, is used in sanitary work, sinks, tubs, tanks, etc., where slabs meet at a corner. The bolted-and-doweled joint, pictured, is used in mounting partition slabs in shower and toilet work. All of these joints are permanently watertight and sanitary, with practically the strength of one-piece construction. The cement used is, of course, waterproof—and where circumstances demand, an acid-and-alkali-proof cement is used. All bolt heads and nuts are concealed with a cement matching the stone in color.



Slip-tongue Joint



Tongue-and-Groove Joint



Bolted-and-doweled Joint

The Matter of "Life"

The limit of useful "life" of Alberene Stone equipment has not yet been revealed by experience with any installation. Ages in the making, this natural stone possesses unequaled time-defying qualities. Barring unforseen accidents, the first cost of Alberene Stone equipment is its one and only cost—there are no aftercosts. It is preeminently the material to use where the economies of permanent construction are to be realized.

Service in Design and Installation

The technical department of the company is prepared and qualified to draw specifications, plans and details on all construction problems involving the use of Alberene Stone. In certain classes of work—notably in laboratory and hospital equipment—the company will assume responsibility under contract both for the design and installation of its stone products and for iron pipe supports or for enameled steel or wood cabinets. In all cases, the experienced counsel of the company's specialists is freely offered to all who may wish to avail themselves of it—without obligation.

Continued on next page

Special Applications

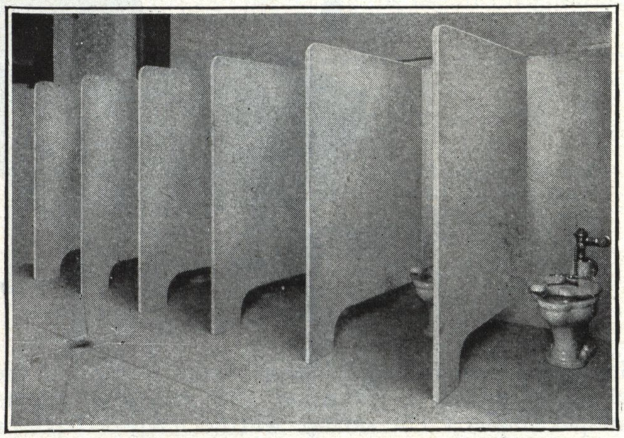
The company's technical department will be glad to work with architects and engineers having problems in which a material of the physical and chemical properties of Alberene Stone might be used to advantage. New uses for this superior, timeproof material are constantly being developed and the company's experience may be of great service to architects and others in meeting difficult conditions.

Catalogue Data and Detail Sheets

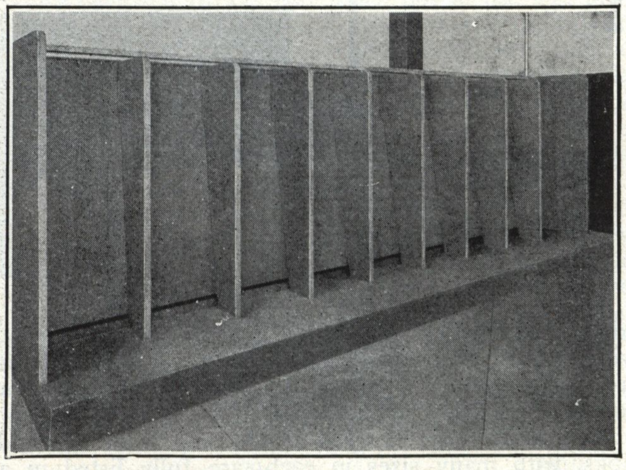
The company will gladly furnish, on request, a catalogue of Alberene Stone equipment of interest to architects and engineers—giving sizes and dimensions on such standardized products as tubs and sinks, with detail drawings and dimension data on other construction such as sanitary work and laboratory equipment. Standard specifications are also included.

Sanitary Equipment (Toilet and Urinal Work)

For this purpose Alberene Stone provides a material which is sanitary in highest degree, pleasing in color, easily cleaned and kept clean, and at the same time reasonable in cost. Its dense, non-absorbent character and the watertight joints used in assembling, make fixtures which are permanent, free from odor and with no lodgement for filth. Generally this work can be assembled without using any exposed metal. Any of the approved types of toilet and urinal design can be furnished in Alberene Stone.



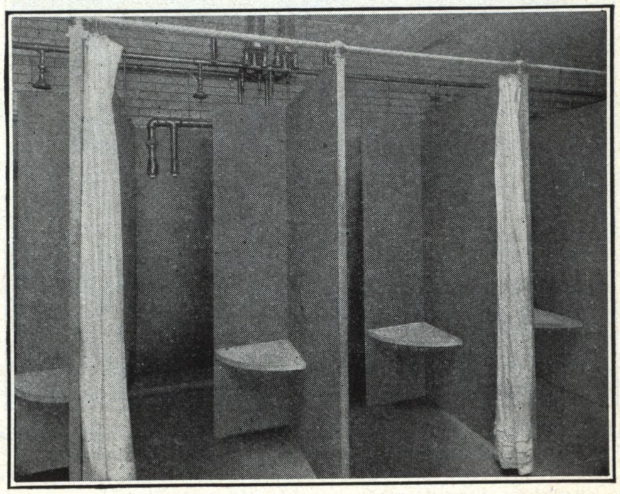
Typical Installation of Alberene Stone Toilet Partitions



Ventilated Urinals Constructed of Alberene Stone—Partitions, Backs and Floor

Shower Compartments and Dressing Rooms

With this material, it is easily possible to build assemblies that are practically one-piece construction, using the several types of joints previously described. There is no opportunity for leakage, no lodgement for dirt or vermin.

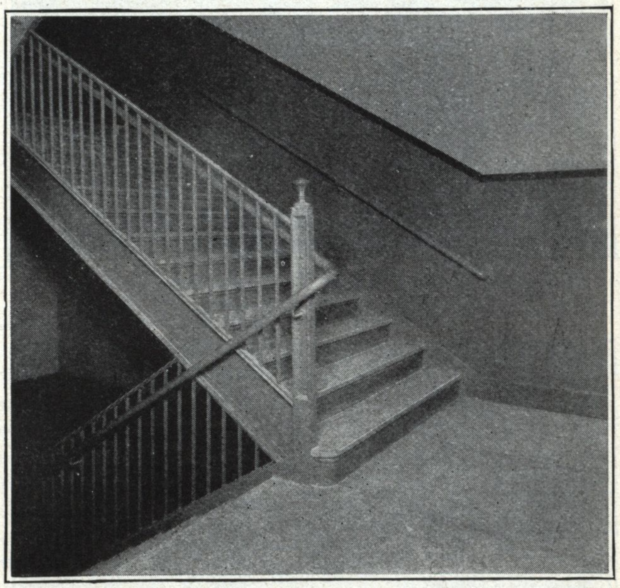


Shower Compartments and Dressing Rooms of Alberene Stone

The color reflects light effectively and the surface finish is such that cleaning is easy. Here again it is possible to assemble without any metal exposed to corrosion. Installations in schools, institutions, public baths, etc., the country over, attest the serviceability of Alberene Stone.

Stair Treads

A selected hard stone is used for this purpose, given a rubbed finish which leaves a "toothed" surface of pronounced non-slipping quality. One specially valuable feature of this material, reducing the fire hazard, lies in the fact that it will not break or crack under heat, or even when a stream of cold water is turned upon it when the stone is at a high temperature. This, combined with the pleasing light color, makes Alberene Stone a superior material for stair treads and landings where safety and durability are factors. Instances are known where these treads have been in hard service for more than 20 years.

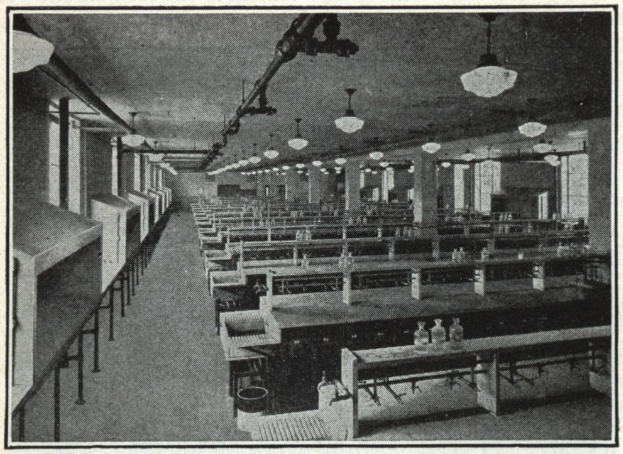


A Flight of the 6000 Alberene Stone Stair Treads in the Equitable Life Insurance Co.'s Building, New York, N. Y.

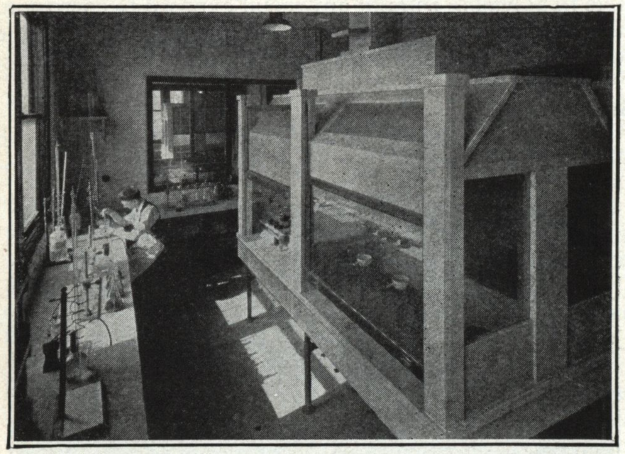
Continued on next page

Laboratory Equipment

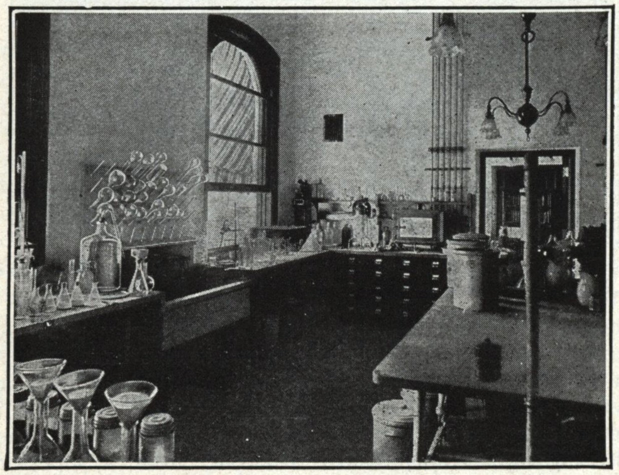
In this field Alberene Stone stands supreme—as is evidenced by its general use and its ever increasing adoption by schools, colleges, hospitals, industrial plants, and the United States Government. No other material so well withstands the hard service of laboratory work. No other material so well lends itself to the types of construction laboratory service requires. With no other material can absolute "bacteria-proof" construction be secured—a factor of vital importance in hospitals and research institutions. This is a specialty in which the company has had an experience absolutely unequaled and its technical department is ready with invaluable assistance on the difficult problems of laboratory design and equipment. A special section in the general catalogue gives more complete description, representative illustrations, and detail drawings.



Alberene Stone Table Tops, Shelving, Sinks and Fume Hoods, Baker Chemistry Laboratory, Cornell University



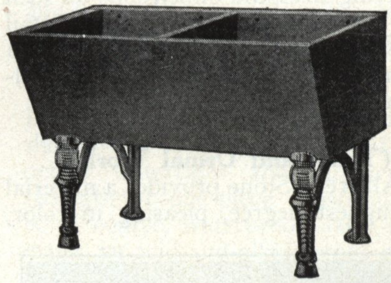
Fume Hoods and Table Tops of Alberene Stone, Colonial Steel Co., Colona, Pa.



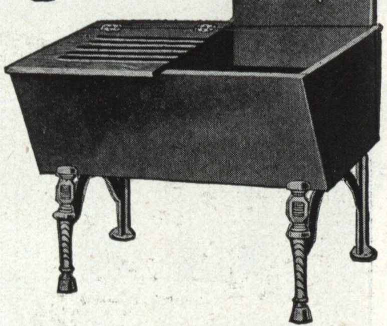
One of More Than 50 Government Installations of Alberene Stone Laboratory Equipment Over a Period of 20 Years—U. S. Department of Agriculture

Laundry Tubs and Kitchen Sinks

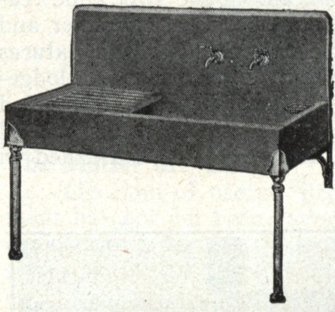
For permanence, sanitaryness, cleanability, watertightness, and lasting smooth surface, these Alberene Stone specialties are beyond comparison. Because of the tongue-and-groove construction, they are to all intents one-piece units. The surface will not chip or flake or crack. The pleasing light color is permanent. The nonabsorbent quality of the stone eliminates dampness and odor. Tubs are furnished in 1, 2, and 3 compartments, without back, with plain back, or with box back. Sinks are supplied with or without drainboards, with plain or box backs, and in combination with 1 or 2 laundry tubs. More than 25 standard styles in Alberene Stone tubs and sinks, with many sizes in each, are fully listed in a special section of the catalogue.



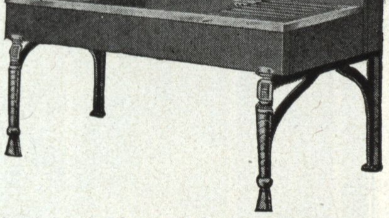
One of Many Styles of Alberene Stone Laundry Tubs



One of Several Combinations of Laundry Tubs and Sinks of Alberene Stone



Alberene Stone Sink with Drainboard and Plain High Back



Alberene Stone Sink with Double Drainboard, Box Back, Shelf and Return Ends

L. H. LEHMAN

Manufacturer of Patent Glass Framed Shower Bath Enclosures

1210 North 8th Street
PHILADELPHIA, PA.

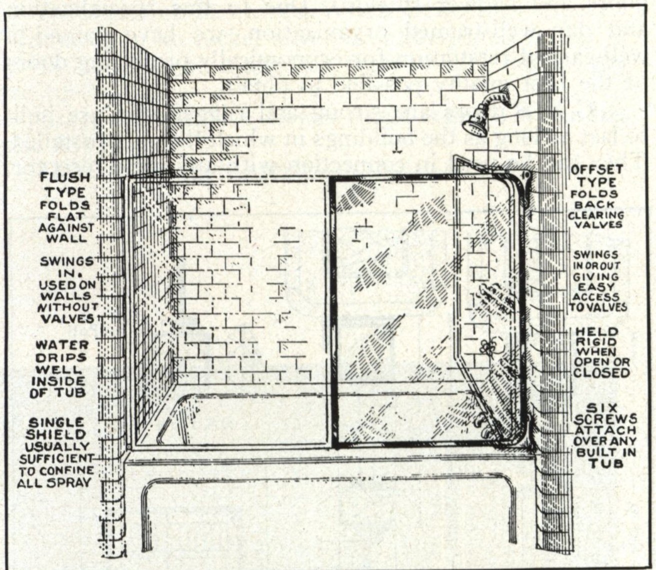
Products

Bathtub Shower Shields.
Shower Bath Stall Doors.
For Cylinder Socket Hinges and Casement Fittings, see page 1653.

Lehman Shower Bath Shields

Are efficient, ornamental, sanitary splash guards of polished plate glass and german silver (in standard models). They replace the ugly, leaky unhealthy duck curtains which become soggy, stained and mildewed and need frequent laundering and replacement.

Lehman splash deflectors are beautiful, clean, permanent, and watertight, protecting the bathroom, admitting light and air, and permitting the use of invigorating needle sprays.


FLUSH TYPE FOLDS FLAT AGAINST WALL
SWINGS IN. USED ON WALLS WITHOUT VALVES
WATER DRIPS WELL INSIDE OF TUB
SINGLE SHIELD USUALLY SUFFICIENT TO CONFINE ALL SPRAY
OFFSET TYPE FOLDS BACK CLEARING VALVES
SWINGS IN OR OUT GIVING EASY ACCESS TO VALVES
HELD RIGID WHEN OPEN OR CLOSED
SIX SCREWS ATTACH OVER ANY BUILT IN TUB

Lehman Patent Bathtub Shower Shield

Lehman Patent Overtub Shower Shields

Make a shower stall out of any built-in bathtub, folding back out of the way when not in use and permitting full use of the tub and free access to the valves. They are sightly, efficient and everlasting, and can be installed in a few minutes. With most shower heads and recessed tubs a single shower shield will confine all the splash, and we recommend this type except where the spray is placed at the center of the bath. Models are made to fit various conditions.

Standard overtub shower shields can be attached quickly with a few screws and expansion anchors. They swing interchangeably right or left and snap into either open or closed positions hanging inside the roll of the tub to keep in seepage. Frame, brackets and hinges nickel silver with polished plate or wire glass in standard models.

Special finishes and sizes to order.

Retail Price List—Subject to trade, quantity and supply house discounts; boxed, f.o.b. factory, with all erection materials.

Offset bracket type 29x41 in....................	$60.00
Flush hinge type 25x41 in....................	$55.00

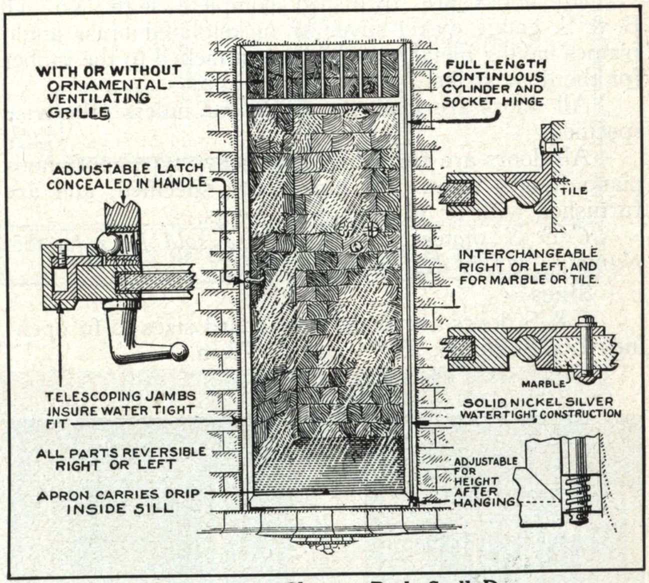
SHOWER
SHIELD
L.H.LEHMAN
PHILA. PA.
PATS.PEND.

The Modern Bathroom

Requires the enclosed shower. The soggy, clammy curtains do not belong with porcelain and tile furnishings. Sanitary and durable Lehman splash protectors are rapidly taking their place, increasing the rentability, saleability, value and comfort of the entire building. A shower also saves space, saves water consumption, saves bathing time and tub scrubbing.

Lehman Shower Stall Doors are carried in stock and their exclusive interchangeable and adjustable features make them extremely simple to erect.

Lehman Bathtub Shields fold inward out of the way, permitting full use of the tub and easy access to the valves. They are well constructed, moderately priced, and easy to attach.


WITH OR WITHOUT ORNAMENTAL VENTILATING GRILLE
ADJUSTABLE LATCH CONCEALED IN HANDLE
TELESCOPING JAMBS INSURE WATER TIGHT FIT
ALL PARTS REVERSIBLE RIGHT OR LEFT
APRON CARRIES DRIP INSIDE SILL
FULL LENGTH CONTINUOUS CYLINDER AND SOCKET HINGE
TILE
INTERCHANGEABLE RIGHT OR LEFT, AND FOR MARBLE OR TILE.
MARBLE
SOLID NICKEL SILVER WATERTIGHT CONSTRUCTION
ADJUSTABLE FOR HEIGHT AFTER HANGING

Lehman Patent Shower Bath Stall Door

Lehman Patent Shower Bath Stall Doors

All doors fit both marble and tile, are reversible right and left, and are adjustable after hanging both in width and height. Frame is solid bar nickel silver with slot cut for plate glass, cushion glazed watertight. Full length continuous cylinder and socket hinge integral with frame —leak and sagproof. Bottom drip apron. Nickel silver telescoping jambs. Interlocking mitered corners. No hollow construction to sag and warp; no wood to rot and swell; no plating or iron to wear or rust. Standard model furnished with polished plate glass.

Wired, frosted or monogram glass, and special finishes to order.

STANDARD SIZES AND *PRICES SHOWER BATH STALL DOORS

Sizes to fit openings, in.	*Prices, subject to discount	
	Without grille	With grille
24x72	$155.00	$175.00
26x72	160.00	180.00
28x72	165.00	185.00

*Discount for quantity, to the trade and supply houses; prices are f.o.b. factory and include boxing.

Doors adjustable to fit openings ¼ in. over or under above sizes.
For 78-in. height add $10.00 to list prices. Special sizes to order.
Tile screws, standard; specify thickness of marble for bolts.
Order direct or through the jobber.

CRIST & SCHILKEN CO., INC.

Manufacturers of Shower Stall Doors and Shower Shields

PITTSBURGH, PA.

C & S Shower Stall Doors

The C & S shower stall door confines the spray of the shower within the stall and keeps the bathroom floor dry. It is absolutely waterproof and greatly improves the appearance of any bathroom.

The C & S door is made of No. 17 B. & S. gauge seamless nickel silver or nickelplated brass tubing with well-seasoned hardwood core. It has a polished plate glass panel 1/4 in. thick embedded in rubber, a cut glass knob on the outside, and a nickel silver pull on the inside. A metal apron and a metal bound rubber strip on the bottom rail prevents water from flowing out beneath the door.

A special spring catch is mortised in the rail of door to keep it properly closed and allows the door to be opened from the inside (without gripping the pull) by pushing outward on any part of the door.

All doors are furnished complete with No. 11 B. & S. gauge nickel silver or nickelplated brass angle frames having metal bound rubber attached to the rabbet for the door strike.

All doors are made to swing *out* unless otherwise specified.

All doors are furnished with heavy type continuous piano hinges unless tee hinges are specified, and are furnished with or without grille vents.

C & S shower stall doors are sold by reputable plumbing supply dealers everywhere.

Sizes—

C & S doors are made in standard sizes to fit openings 27x78, 26x76, 25x74 and 24x72 in.

Other sizes are made to order.

Information Required for Estimates or When Ordering—

Give exact size (height and width) of opening between jambs.

State whether nickel silver or nickelplated brass doors are wanted.

State whether door is to be furnished with or without grille vent.

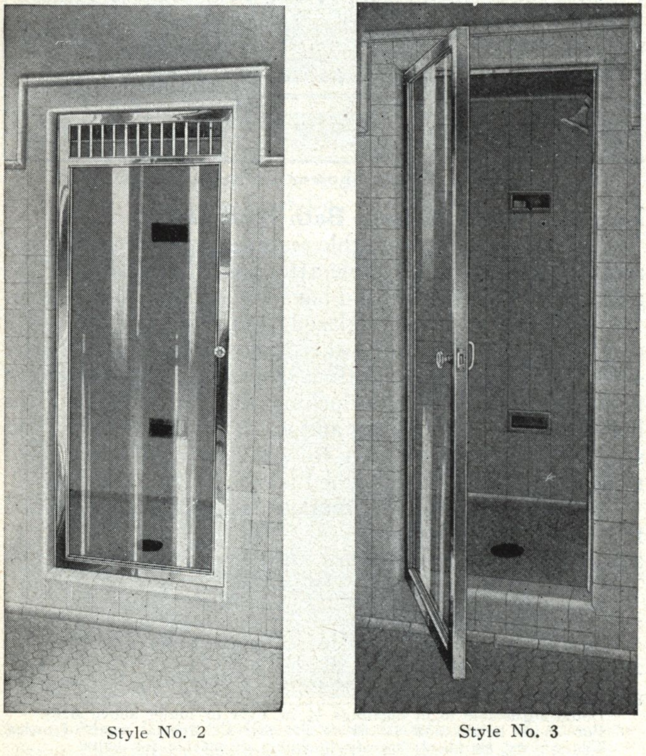
State whether door is to be hinged on right or left jamb (right or left when facing the stall).

State whether door is to be used in connection with tile or marble stall (marble jambs should be at least 1½ in. thick, otherwise special frame will be required).

Quality-built Throughout

We specialize in the manufacture of shower stall doors and shower shields. Due to this specialization and our well-trained organization, we have gained a well-earned reputation for economically producing doors of the best quality possible to obtain.

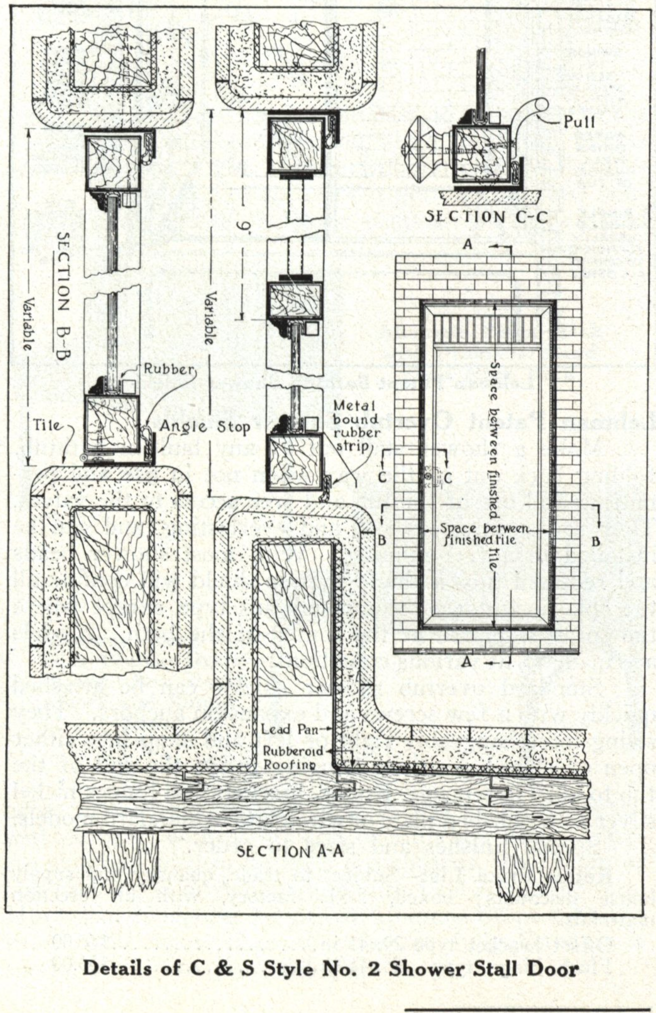
C & S doors are strong and rugged and are built to last as long as the buildings in which they are installed. They can be used in connection with any style receptor.



Style No. 2

Style No. 3

C & S Shower Stall Doors (Patented)



Details of C & S Style No. 2 Shower Stall Door

Continued on next page

C & S Shower Bath Shields

The C & S shower bath shields are for use in bathrooms having a tub shower and not a separate shower compartment or room. Can be used over any built-in bathtub, on wall of marble, tile or other up-to-date bathroom wall covering.

Like the C & S shower stall door, the C & S shower shields are built of the highest grade materials and under working supervision of a reputation maintaining organization. Patents have been applied for.

The bath shield keeps the spray within the tub and in so doing keeps the floor dry. It also does away with the unsightly and oft times useless curtain and curtain rod.

The C & S bath shield is made of heavy nickel silver or nickelplated brass framed with polished plate glass panel, ¼ in. thick, embedded in rubber.

The frame has a continuous piano hinge on right or left-hand side and can be swung out giving access to end of tub and faucets.

When in use, the shield is held in place by a hook on top rail.

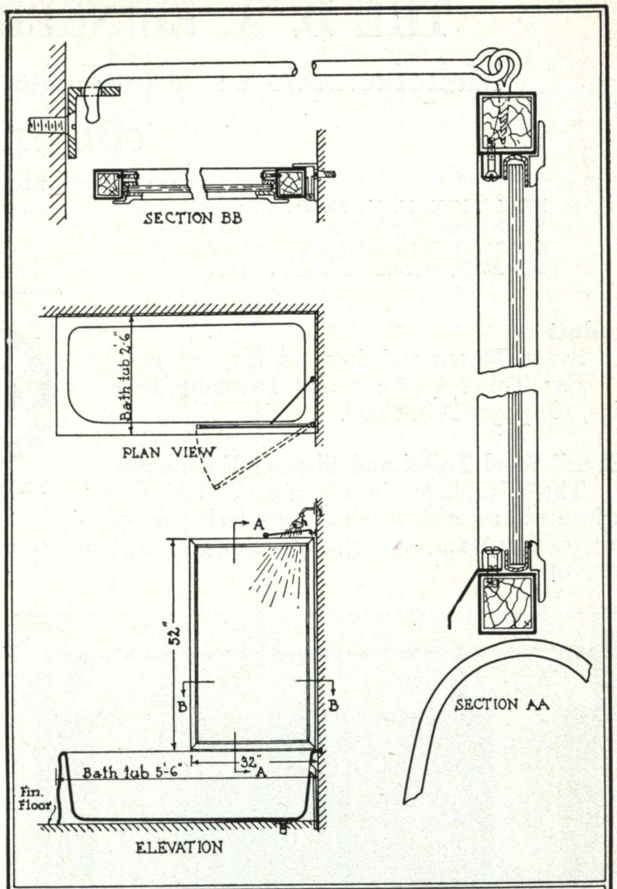
It is an absolute water shield—a water shed on lower rail which hangs within the inner rim of tub, deflects all dripping into tub.

Information Required When Ordering—Specify if frame is to be nickel silver or nickelplated brass.

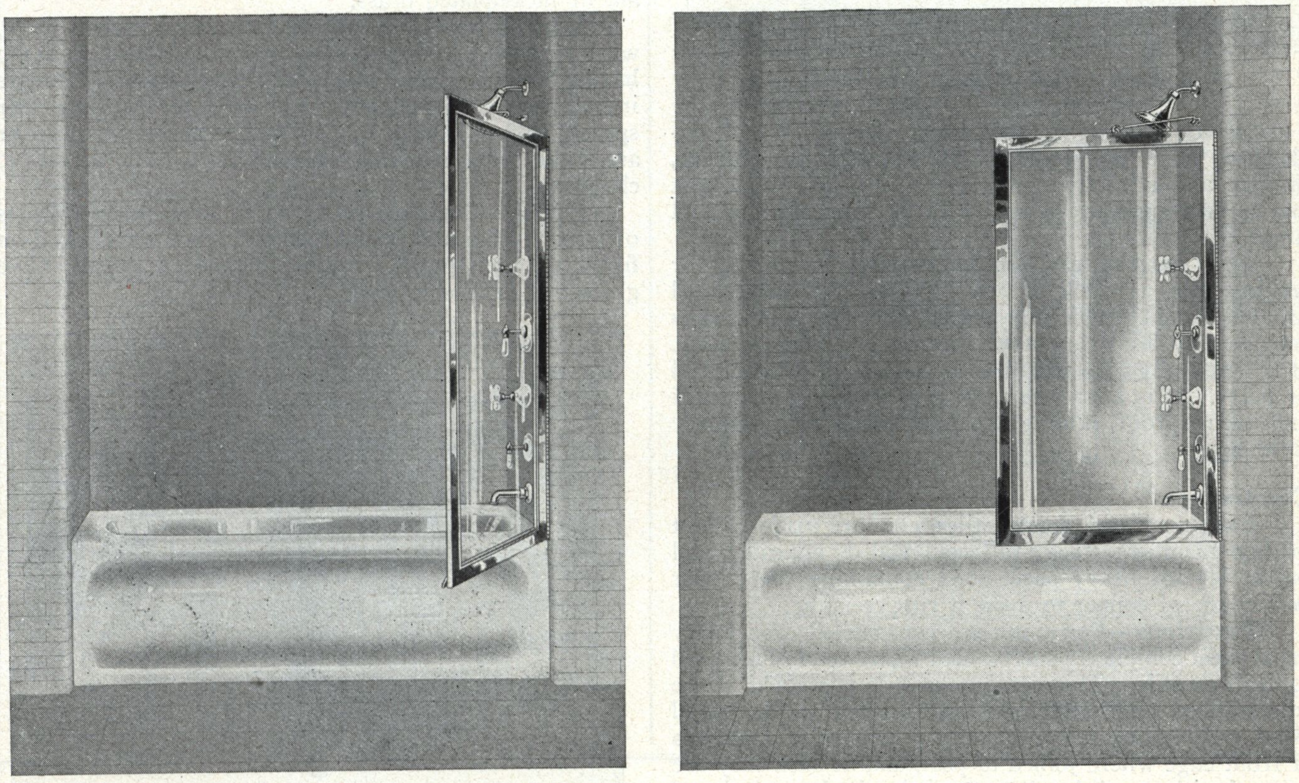
Is shield to be hinged on right or left side as you face tub?

Sizes—The C & S shower shield is made in one size only, 32x52 in.

Other sizes made special.



DETAILS OF C&S SHOWER BATH SHIELD



Open

Closed

C & S Shower Shield (Patent Pending)

THE D. A. EBINGER SANITARY MFG. CO.

Manufacturers of "Ebco" Steel Toilet and Shower Enclosures

COLUMBUS, OHIO

BRANCH OFFICES AND AGENCIES

NEW YORK, N. Y., 101 Park Avenue
MINNEAPOLIS, MINN., Hampshire Arms
CHICAGO, ILL., 343 South Dearborn Street
DETROIT, MICH., 424 Book Building

KANSAS CITY, MO., Jno. H. Kitchen & Co.
CLEVELAND, OHIO, 401 Advance Building
CHARLESTON, S. C., 258 Congress Street
PITTSBURGH, PA., 309 Second Avenue

TRADE-MARK

Product

Steel Toilet and Shower Enclosures.

For Toilet Fixtures and Drinking Fountains, see pages 2008-2009.

"Ebco" Steel Toilet and Shower Enclosures

The advantages in the use of steel toilet enclosures are evident when considering permanent, sanitary and economical results in building construction.

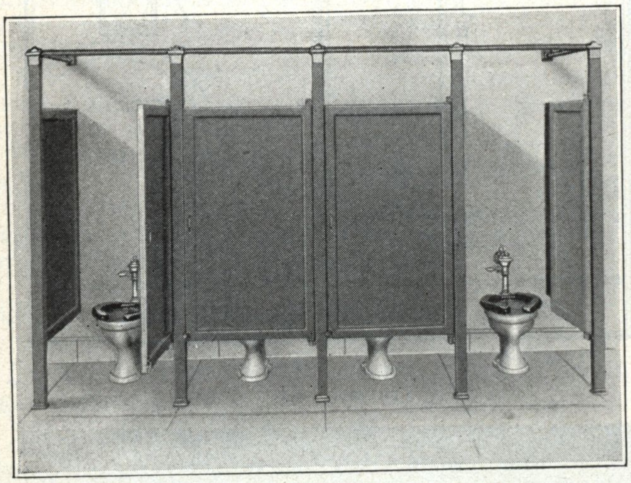


Plate E-557. "Ebco" Steel Toilet Enclosures

"Ebco" enameled steel toilet partitions and enclosures solve the problem of securing an efficient, durable and attractive toilet room at a minimum cost and a maximum of safety, both as to sanitation and fireproof qualities.

This material can not be defaced by cutting or writing upon as chalk or pencil marks are easily wiped off the enamel. It is non-absorbent. The first cost is considerably less than other materials of equal quality. It is practically indestructible for it will not break, bend or bulge. It is attractive; and is germproof, dustproof and verminproof, adding the final touch to a sanitary toilet room.

Construction

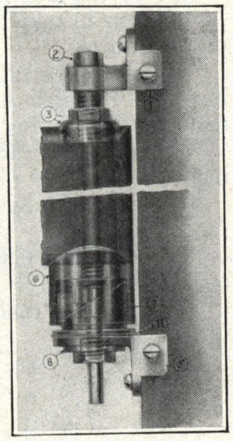
Panels—Panel sheets, stiles, etc., are made of best quality furniture stock, full cold rolled, annealed and patent leveled heavy sheet steel containing the proper percentage of copper to make it rust resisting.

Partitions—Partitions are constructed of a heavy panel sheet completely surrounded with a formed rounded top rail or stile. This continuous stile is welded at the intersections and electrically spot-welded to the panel sheet. Partitions are secured with concealed fasteners at front edge where joined to post, and at back they are secured with a wall bracket permitting both vertical and horizontal adjustment.

Posts—Posts are 2½x2½ in. square in cross section with rounded corners.

Doors—Doors are constructed of a panel sheet and stile welded together, same as partition. They may swing in or out or may be double acting, and can be set to remain at rest in either open or shut position by a simple adjustment of the hinge.

Hinges—Doors are hung on aluminum bronze incased roller bearing gravity hinges. The top and bottom hinges are properly aligned by the hinge rod which is continuous through the door stile, insuring at all times a free and perfect operating door.



"Ebco" Gravity Hinge

Fittings—Rust resisting castings are provided at floor. Caps and wall plates have concealed clamp with bolts to secure the rails and permit of adjustment. Bases are secured to the floor with concealed bolt and have vertical adjustment to compensate for unevenness in floor.

Bumpers, pulls and latch bolts are of nickelplated brass.

Vent Space—The utility chamber or vent space, when desired, is constructed of reinforced sheets, with top having formed edges. The reinforcing frame is of angle iron properly shaped and reinforced to insure proper spacing and alignment of backs. End sheets of chamber are held with machine screws to permit access to chamber.

Finish—Standard finish of all steel parts consists of a metal filler and prime coat only, or a hard baked-on finish of high grade enamel. Standard colors, olive green and battleship gray.

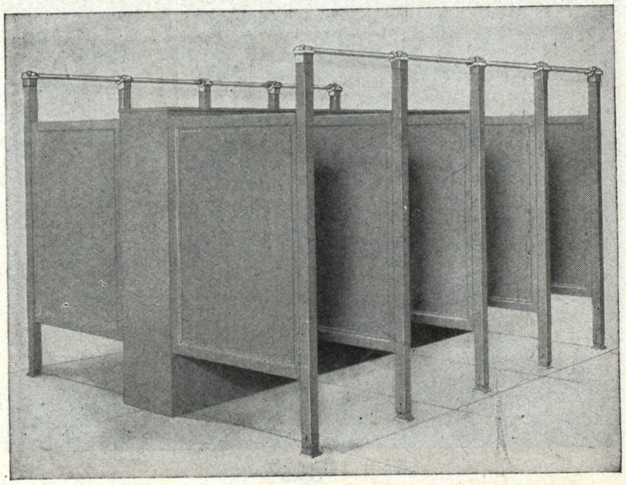
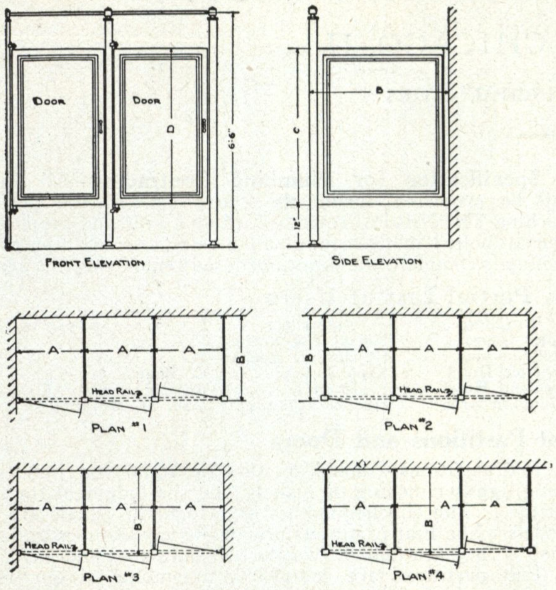


Plate E-556. Enclosures Arranged in Double Battery

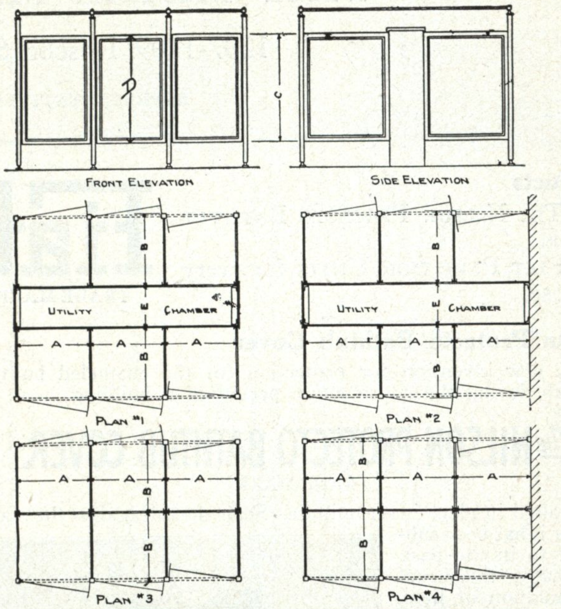
Continued on next page


Door
Door
D
6'-6"
C
B
12"
Front Elevation
Side Elevation
A
B
Head Rail
Plan #1
Plan #2
Plan #3
Plan #4

Standard Sizes	A	B	C	D [Door]
	2'-6"	3'-0"	4'-6"	4'-6"
	2'-9"	3'-6"	5'-0"	
	3'-0"	4'-0"		
		4'-6"		
		5'-0"		

NOTE:—This detail shows standard sizes without utility chamber. In ordering specify which arrangement is desired, giving all measurements as noted. State whether doors swing in or out or to be double acting.

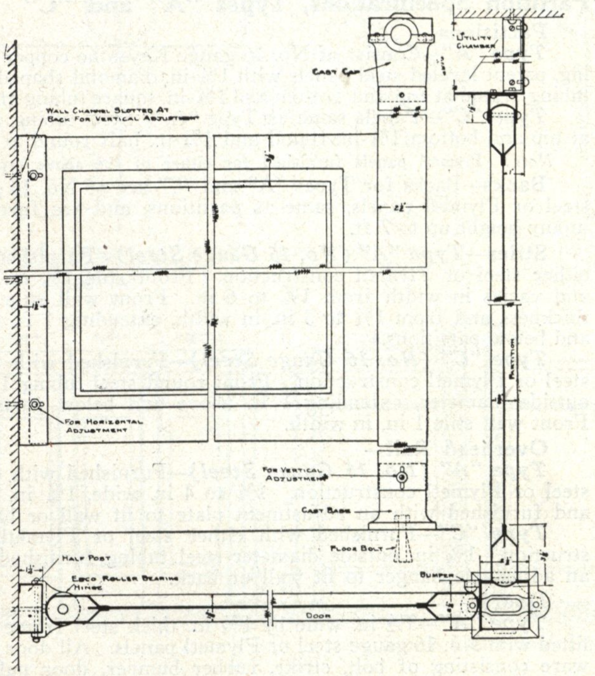
Dimensions Data, Plate E557


D
C
Front Elevation
Side Elevation
A
B
E
Utility Chamber
Plan #1
Plan #2
Plan #3
Plan #4

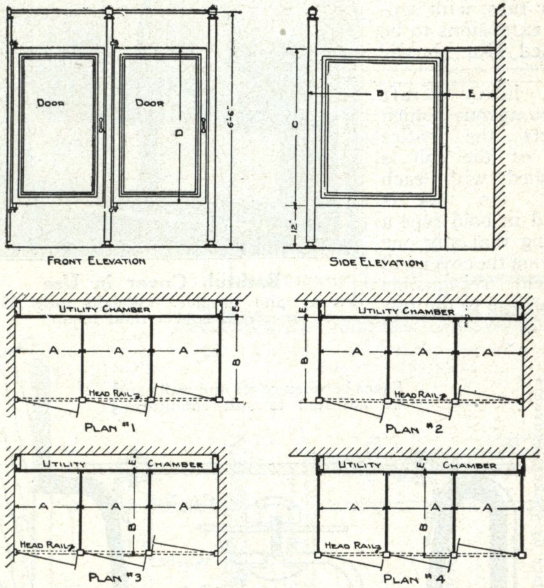
Standard Sizes	A	B	C	D	E
	2'-6"	3'-0"	4'-6"	4'6"	12"
	2'-9"	3'-6"	5'-0"	(Door)	18"
	3'-0"	4'-0"			24"
		4'-6"			
		5'-0"			

NOTE:—This detail shows partitions with and without utility chamber placed back to back. In ordering specify which arrangement is desired giving all measurements as noted. Specify whether doors are to swing in, out or to be double acting.

Dimensions Data, Plate E556


Wall Channel Slotted At Back For Vertical Adjustment
For Horizontal Adjustment
Cast Cap
Utility Chamber
Partition
For Vertical Adjustment
Cast Base
Floor Bolt
Half Post
Ebco Roller Bearing Hinge
Bumper
Door

Construction Details


Door
Door
D
6'-6"
C
B
12"
Front Elevation
Side Elevation
Utility Chamber
A
B
E
Head Rail
Plan #1
Plan #2
Plan #3
Plan #4

Standard Sizes	A	B	C	D	E
	2'-6"	3'-0"	4'-6"	4'-6"	9"
	2'-9"	3'-6"	5'-0"		12"
	3'-0"	4'-0"			18"
		4'-6"			24"
		5'-0"			

NOTE:—This detail shows partitions and utility chamber. In ordering specify which arrangement is desired giving all measurements as noted. Specify whether doors are to swing in, out, or to be double acting.

Dimensions Data, Plate E552

DETAILS OF "EBCO" STEEL TOILET AND SHOWER ENCLOSURES

FIAT METAL MANUFACTURING CO.

1207-1209 Roscoe Street, CHICAGO, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

The Nilson Protecto Bathtub Cover.

Fiat Partition Units for every purpose.

Fiat

TRADE-MARK

Nilson Protecto Bathtub Cover

A new invention for protection for the enameled built-in bathtub during the construction period of a building

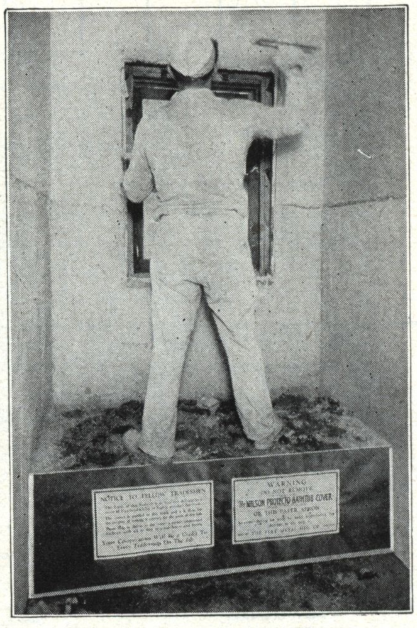
The NILSON PROTECTO BATHTUB COVER·

TRADE-MARK

Bolted in place in one minute. Seals the tub against the many abuses it has been subjected to in the past. Eliminates the usual accumulation of lime, plaster, cement and paint and saves the fine finish and luster of the tub from scratches that occur when cement and plaster are removed.

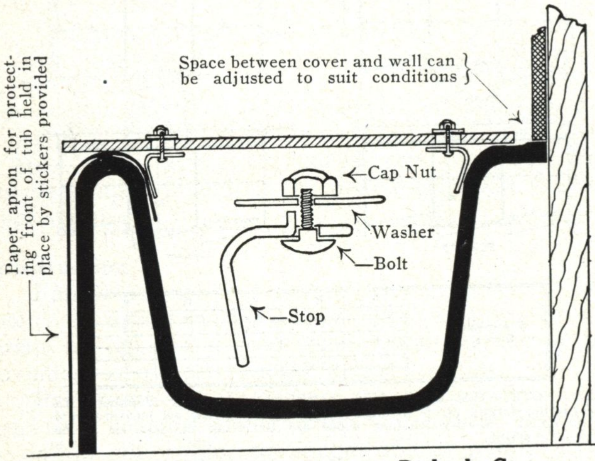
The Nilson Protecto Bathtub Cover is made in sizes to fit all built-in tubs. Standard sizes are for 4½ and 5-ft. recess or corner tubs, with separate extensions to be attached for larger sizes.

A heavy Kraft paper apron which protects the entire front of the tub is furnished with each cover. On this is printed in bold type a warning that any one removing the cover will be held responsible for damage to the tub.



Bathtub Cover in Use

Strong and durable. Weighs only 25 lb. Will hold several men


Paper apron for protecting front of tub held in place by stickers provided
Space between cover and wall can be adjusted to suit conditions
Cap Nut
Washer
Bolt
Stop

Cross Section Nilson Protecto Bathtub Cover

The Nilson Protecto Bathtub Cover can be rented or bought. Bathtub cover protection through the use of The Nilson Protecto Bathtub Cover (patented) can be secured on a very economical basis, either through direct purchase or rental plan. Write for details. Address department S. C.

Specification for Plumbing Contractor—All bathtubs shall be protected during the entire construction period by attaching The Nilson Protecto Bathtub Cover and keeping same securely bolted in place until all plaster, cement, tilework and painting is completed, and until ordered removed by the architect.

Partial List of Users—

Building	Architect	Plumbing Contractor	Baths
Palmer House	Holabird & Roche	J. J. Daley	1200
Hotel Sherman	Holabird & Roche	M. J. Corboy	600
Randolph Hotel	Rapp & Rapp	E. Baggot Co.	500
Shoreland Hotel	Fridstein & Co.	Katz & Lewis	450
Wellington Arms	Hooper & Janusch	Wm. D. Morant	400

Fiat Partitions and Doors

Fiat partitions, framed in either the square or round shaped tubing tightly clinching the panels, offer no lodgment for filth or moisture. The clincher method in which the panels are firmly gripped, make Fiat partitions practically vibrationless and soundproof. They are light in weight, yet built to stand hard usage.

Fiat partitions are completely assembled at our factory, therefore, erection in accordance with shop drawings is a very simple matter. No drilling or fitting on the job, it merely being necessary to anchor them to the walls and floor with a few bolts.

Co-operative Service—Our Engineering Department is at your service in the layout of ideal toilet arrangement.

Fiat partitions and doors are furnished in two designs: Type "A" wide stile, and Type "C" tubular stile, in either steel or Plymetl.

Plymetl Construction—Consists of a plywood core and two galvanized steel faces, cemented and hydraulically pressed together with perpendicular joint between panels. Offers the only way of getting toilet partitions that embody absolute sound-deadening.

A ¼-in. Plymetl panel such as is used in Fiat partitions is very stiff, and consequently can not be bent or set in vibration and is practically sound-proof.

It is light in weight, yet possesses marked advantages in stiffness, elastic energy and heat resistance.

Partition Specifications, Types "A" and "C"

Partitions—

Type "A"—Consist of No. 16 gauge Keystone copper bearing, patent leveled steel panels with 1¾-in. diamond shaped steel tubing frame at top and bottom and 1¾-in. square tubing at back.

Type "C"—Panels same as Type "A." Steel tubing frame at top and bottom 1¾-in. round and 1¾-in. half round at back.

Note: Plymetl panels furnished for either of the above types.

Backs—Backs for Types "A" and "C" are of No. 16 gauge steel or Plymetl panels, same as partitions, and are furnished in any height up to 7 ft.

Stiles—*Type "A" (No. 16 Gauge Steel)*—Furnished with either steel or Plymetl construction. Front stile 1¾ in. thick and varies in width from 1¾ to 6 in. Front wall stile same thickness and from 1¾ to 3 in. in width, extending 1 ft. above and below partitions.

Type "C" (No. 16 Gauge Steel)—Furnished with either steel or Plymetl construction. Front round steel tubing 1¾ in. outside diameter, extending 1 ft. above and below partitions. Front wall stile 1 in. in width.

Overhead Rail—

Type "A" (No. 16 Gauge Steel)—Furnished with either steel or Plymetl construction. 1¾ to 4 in. wide, 1¾ in. thick, and furnished with an adjustment plate to fit wall or back.

Type "C"—Furnished with either steel or Plymetl construction. 1¾ in. outside diameter steel tubing furnished with an adjustable hanger to fit wall or back.

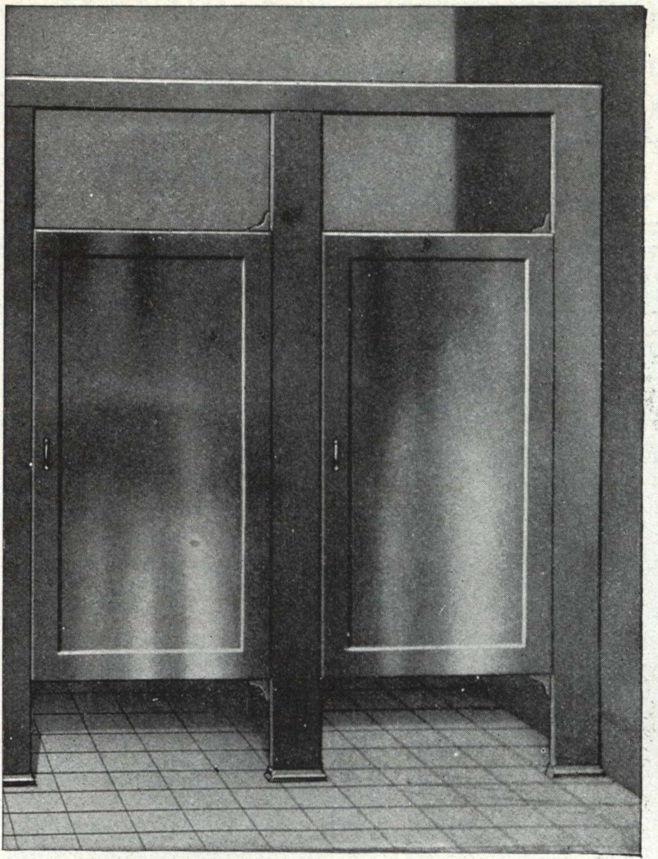
Doors—

Type "A"—3½ in. wide by 1⅛ in. thick steel frame stiles fitted with No. 16 gauge steel or Plymetl panels. All door hardware consisting of bolt, strike, rubber bumper, door pull and hinge bracket are furnished in nickel or finished to match partition color. Hinge is Fiat pivot spring design, concealed in door frame stile, or Lawson Universal hinge.

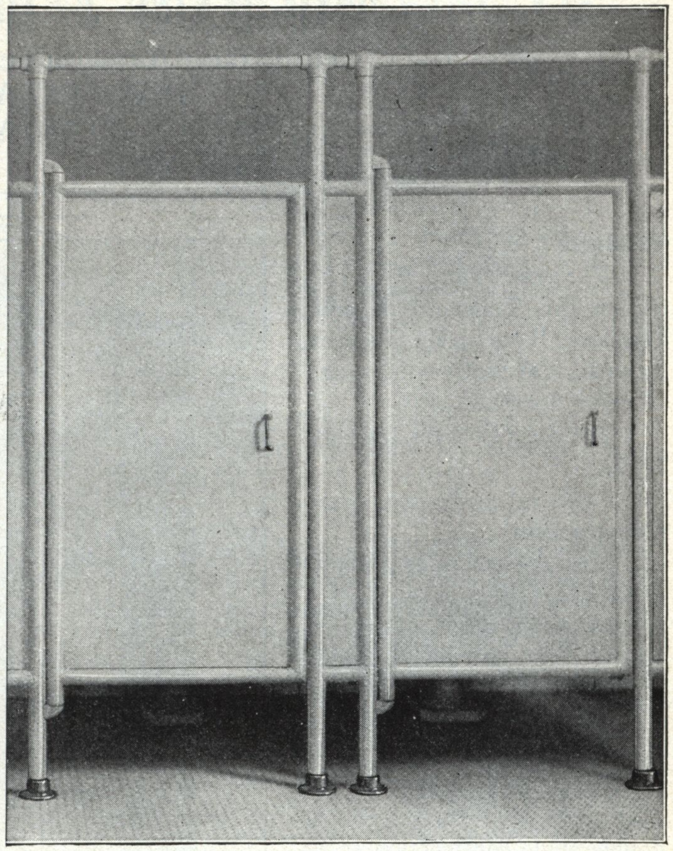
Type "C"—1¾ in. outside diameter round steel tubing stiles. Panels of No. 16 gauge steel or Plymetl. Door hardware same as Type "A."

Floor Flanges—Malleable iron.

Continued on next page

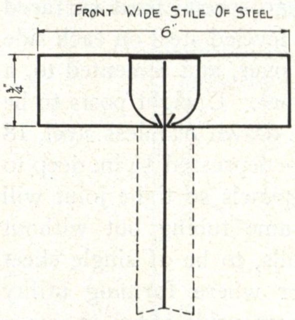


Type "A" Wide Stile Fiat Partition Unit

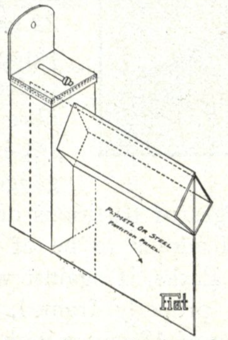


Type "C" Tubular Stile Fiat Partition Unit

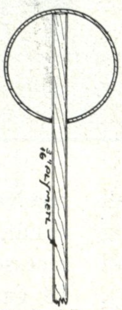
Fiat Partitions may not be the cheapest, but they are of superior quality



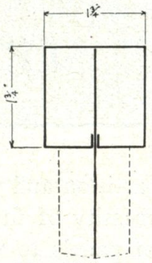
Method of Insertion of Plymetl and Steel Panels into Stile, Type "A"



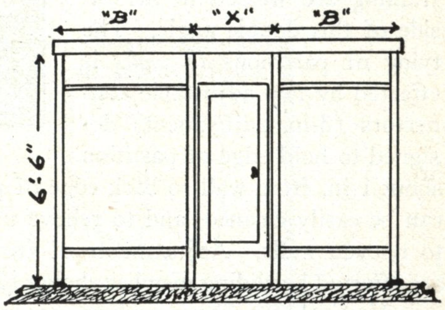
Rear Corner Section of Type "C" Construction



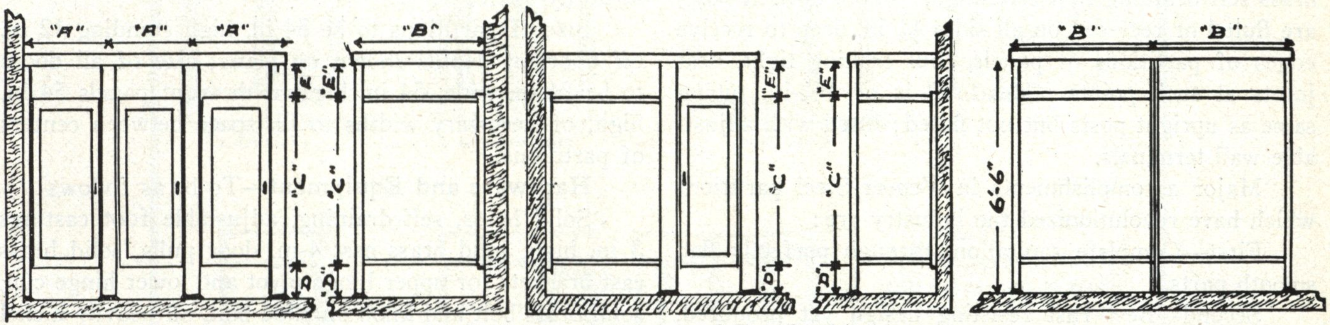
Method of Insertion of Plymetl and Steel Panels into Stile, Type "C"



Plymetl Square Construction
Note how tubing is forged to give strength and rigidity



Side Elevation of Double Batteries with Pipe or Vent Space



Stock Units and Layouts of Fiat Partitions

Fiat partitions and doors are made to fit the requirements of any toilet room layout in the wide stile Type "A" or Type "C" tubular stile. Special sizes made to order. All partitions furnished with or without doors. Doors can be set to open either in or out. Backs can be used to form a pipe space and are furnished in widths to meet required centers of stalls, in heights up to 7 ft.

STOCK SIZES OF LAYOUTS NOS. 7 and 8

Dimension A, 2′ 4″, 2′ 6″, 2′ 10″, 3′ 0″, 3′ 4″ and 3′ 6″
Dimension B, 3′ 0″, 3′ 6″, 4′ 0″, 4′ 6″, 5′ 0″, 5′ 6″ and 6′ 0″
Dimension C, 4′ 6″, 5′ 0″ and 5′ 6″
Dimension D, 0′ 0″, 0′ 4″, 0′ 6″ and 1′ 0″
Dimension E, 0′ 0″, 0′ 4″, 0′ 6″ and 1′ 0″

STOCK SIZES OF LAYOUTS NOS. 1, 2, 3, 4, 5 and 6

Dimension A, as required
Dimension B, 3′ 0″, 3′ 6″, 4′ 0″, 4′ 6″ and 5′ 0″
Dimension C, 4′ 6″, 5′ 0″, 5′ 6″, 6′ 0″, 6′ 6″ and 7′ 0″

Note: Dimension "X" is from 6 to 24 in. to meet requirements.

THE HART & HUTCHINSON CO.

Manufacturers of Veneer-Steel Partitions
NEW BRITAIN, CONN.

BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 501 Fifth Avenue
PHILADELPHIA, PA., Real Estate Trust Building
CHICAGO, ILL., 73 East Lake Street
BOSTON, MASS., 141 Milk Street
IN CANADA: DOMINION STEEL EQUIPMENT CO., Toronto, Ont.

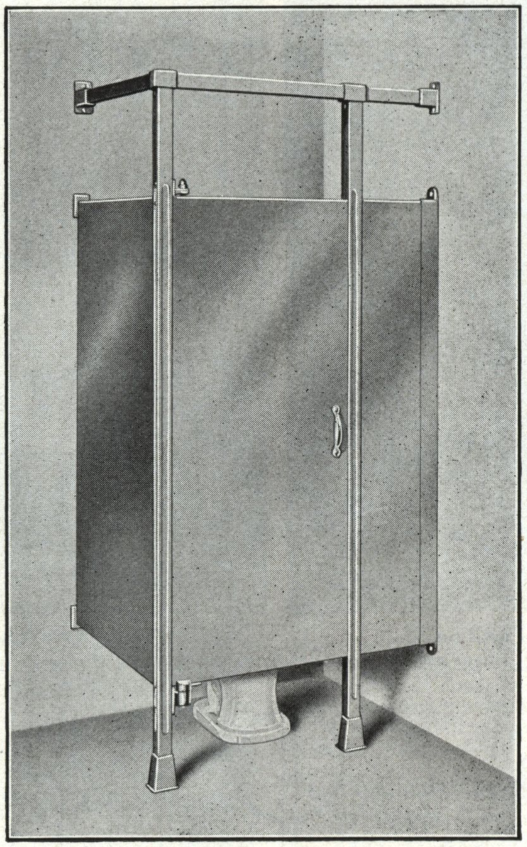
Products

VENEER-STEEL PARTITIONS for Toilet Enclosures, Dressing Booths, Showers, Screens, Office Partitions and Coupon Booths.

For Steel Lockers, see page 2677.

Construction

Veneer-Steel is, as its name implies, a veneer or sheet of a special hard surfaced patent leveled steel, 22 gauge, *sealed over,* and *cemented to,* a fibre core. Stiffness of such formed doors, partitions and panels rely partly on the stiffness of the fibre core, but largely on a double angle construction at all edges. All attachments for fastening to walls or tubular framing are welded to the inside of this double angle. The tying of partitions *to walls* is effected by two adjustable connectors (3-in. adjustment) designed to hold edge of partition about 1 in. from wall so back edge of partition and wall can be easily cleaned, and to relieve necessity of fitting to uneven walls. Adjustments of front panels to wall are effected by sliding member shown (2-in. adjustment).



Vertical framing members are of 1⅝-in. hollow drawn seamless tubing of 18 gauge steel fitted with solid brass self-draining foot 3 in. high. These upright posts are fluted or recessed on all sides ⅛ in. deep to receive edges of partitions or panels, thus making tight, neat joints at such points. Head-rail is of 1⅝-in. tubing same as upright posts but not fluted; fitted with adjustable wall terminals.

Major accomplishments in Veneer-Steel partitions which have revolutionized the industry are:

First—Complete sanitation, through perfectly flat, smooth parts.

Second—Best rust resisting design yet produced, because of no ledges or surfaces upon which water may remain long enough to start a corrosive condition.

Third—Sound proof—a result of the fibre core—of very great importance, in such as school work.

Fourth—Beautiful appearance. The rectangular effect carried out through all parts, being relieved by the recessed panel on upright posts, makes for dignity without being too severe.

Finish

All Veneer-Steel parts are finished with two coats, either one coat special primer and one coat finish or two coats special primer, and all tubular parts are finished inside as well as out.

Equipment

As covered under the heading "Hardware and Equipment" in the following suggested specifications:

Suggested Specifications

Provide where shown "Veneer-Steel" partitions, doors and panels ⅝ in. thick having 22 gauge special hard surfaced patent leveled steel on each side sealed over, and cemented to, a fibre core. Upright posts to be 1⅝-in. drawn seamless steel, 18 gauge—depressed ⅛ in. deep to receive edges of partitions or panels so tight joint will result. Headrails to be of same tubing but without recesses. Backs, if against walls, to be of single sheet 18 gauge, properly framed, or where forming utility space to be of 18 gauge with removable panel so upper part of back can be quickly removed for repair of pipes in utility space.

Size of partitions to be 54 in. high standing 12 in. off floor, of depths shown on plans; size of all doors to be 24 in. wide, 54 in. high, with front panels 54 in. high, of necessary widths to fill space between centers of partitions.

Hardware and Equipment—To be as follows:

Solid brass, self-draining, adjustable foot castings 3 in. high, solid brass cast 4-in. door pulls, solid brass cast brackets for upper hinge pivot and lower hinge cup, solid brass bolt and knob on slide bolt, all heavily nickel plated. Provide solid rubber bumper 4 in. long at center of door. Provide springe hinge with adjustable tension. Supply upper hinge pivot with ball bearings.

Finish—Apply best universal filler (two coats for prime) or one coat prime and one coat medium gray finish. All tubing to be finished inside as well as outside.

MANUFACTURING EQUIPMENT & ENGINEERING CO.

Steel Toilet Enclosures

FRAMINGHAM, MASS.

BRANCHES

BOSTON, MASS.
NEW YORK, N. Y.
PHILADELPHIA, PA.
DETROIT, MICH.
CLEVELAND, OHIO
BUFFALO, N. Y.

METAL
MEECO
PRODUCTS
TRADE-MARK

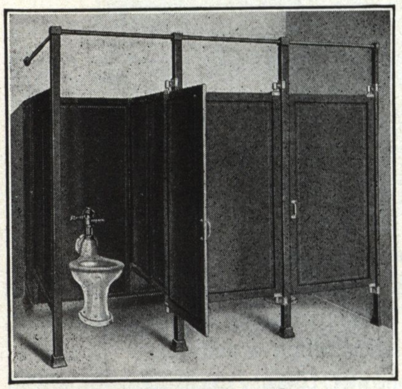
Products

STEEL TOILET ENCLOSURES.

For Sanitary Washbowls, see page 2063; for Sanitary Drinking Fountains, see page 2060; for Metal Lockers, Shelving, etc., see page 2682.

Toilet Enclosures

General—Meeco toilet enclosures are built for service without sacrificing their pleasing design and neat appearance. They are in great demand for factories, schoolhouses, office buildings, and all places where sanitary, permanent enclosures are needed for toilets, showers, or other purposes.



TOILET PARTITION—OPEN

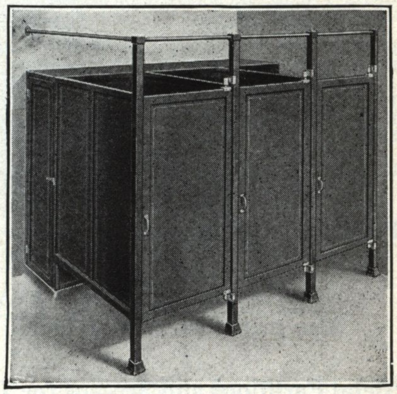
Material—All parts are made of high grade material, thoroughly finished in baked on japan, to suit requirements.

Construction—Partitions are made with hollow posts and stiles, and doors with hollow stiles and rails securely and neatly welded to the panels. The partition feet and wall brackets are so made as to give necessary adjustment for uneven floors and walls. Hinges are of heavy gravity or spring type, especially adapted for this class of work. Standard parts are all made on the unit principle, and can easily be relocated or rearranged if desired, without depreciation.

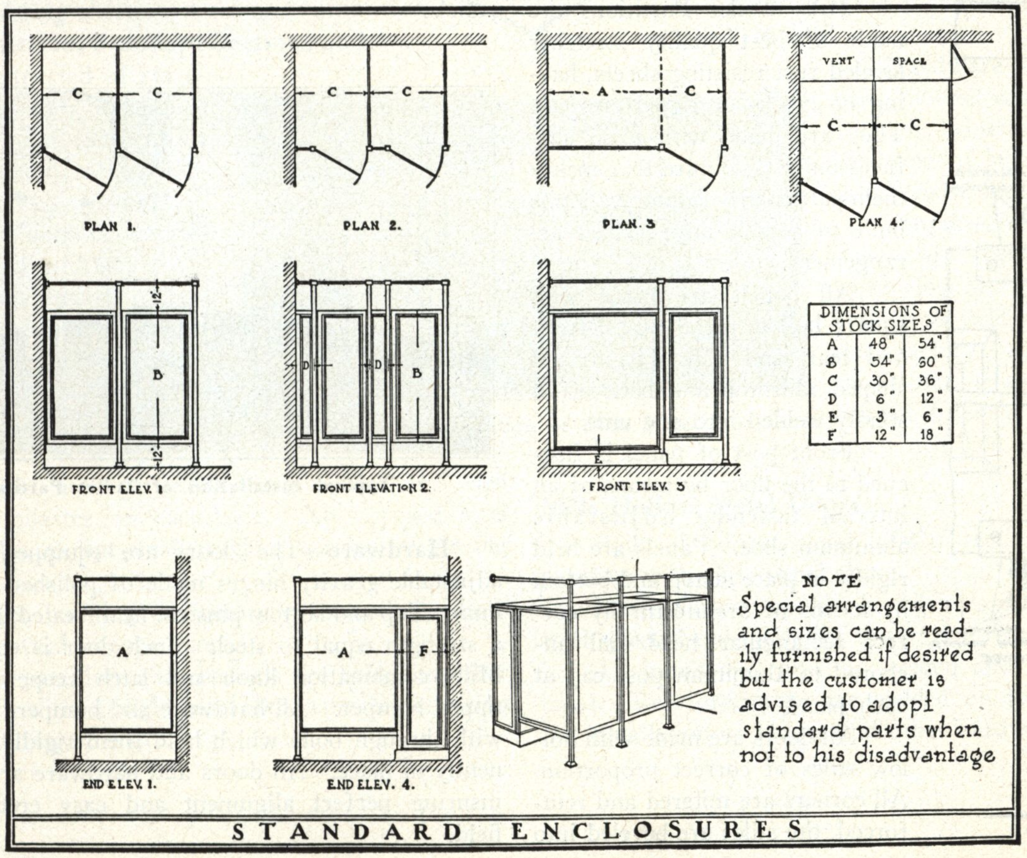
Arrangement—Standard parts allow for either single or double row enclosures with or without vent space, doors or backs.

Erection

The enclosures are very easy to erect and where necessary a simple diagram is furnished to assist the erector. Prices are generally quoted knocked down, crated.



TOILET PARTITION—CLOSED



DIMENSIONS OF STOCK SIZES

A	48"	54"
B	54"	60"
C	30"	36"
D	6"	12"
E	3"	6"
F	12"	18"

NOTE
Special arrangements and sizes can be readily furnished if desired but the customer is advised to adopt standard parts when not to his disadvantage

STANDARD ENCLOSURES

THE MILLS COMPANY

Metal Toilet, Shower and Dressing Room Partitions

5320 St. Clair Avenue, CLEVELAND, OHIO

NEW YORK OFFICE, 7 West 42nd Street

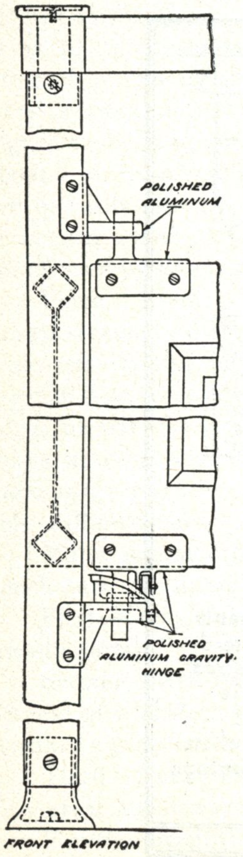
SALES AGENTS

AKRON, OHIO, Charles Haas Co., 220 Maple Street, Cuyahoga Falls, Ohio
ALBANY, N. Y., Heafner & Harding, 562 Broadway
ATLANTA, GA., Luke Seawell, 420 Brown Building
BALTIMORE, MD., Edward J. Seager, Gunther Building
BOSTON, MASS., Rubin Burke Co., 333 Washington Street
BUFFALO, N. Y., E. H. Wood, 316 Jackson Building
CHARLOTTE, N. C., W. L. McDonald, 804 Realty Building
CHICAGO, ILL., Roy A. Edgren, 440 S. Dearborn Street
CINCINNATI, OHIO, L. D. Zellner Co., 310 Southern Ohio Bank Building
COLUMBUS, OHIO, Otto Nehrenst, 766 Euclaire Avenue
DALLAS, TEX., Southern Ornamental Iron Works
DAVENPORT, IOWA, The Whitaker Co., 420 Harrison Street
DAYTON, OHIO, Wm. V. Knoll, 26 Mutual Home Building
DENVER, COLO., C. L. Patterson, 1741 Champa Street
DETROIT, MICH., E. A. Lembeck, 400 Penobscot Building
EL PASO, TEX., Neff Stiles Co., 400 N. Santa Fe Street
ERIE, PA., L. R. Maxon, 714 Commerce Building
GRAND RAPIDS, MICH., Lincoln Brick Co., 406 Michigan Trust Building
HUNTINGTON, W. VA., James J. Weiler & Sons Co., 202 Elm Street
INDIANAPOLIS, IND., James H. Carnine, 220 Indiana Terminal Warehouse Building
JACKSONVILLE, FLA., Emmet H. Jones, 2720 Main Street
KANSAS CITY, MO., W. R. Henry, 717 Pioneer Building
LITTLE ROCK, ARK., Pease Brick & Builders Supply Company, 710 Boyle Building
LOS ANGELES, CAL., E. R. Kuns Co., Inc., 226 W. 9th Street
LOUISVILLE, KY., Thomas L. Barret, 112 S. Second Street
MILWAUKEE, WIS., Andrew K. Robertson, Stephenson Building
NASHVILLE, TENN., E. T. Kirkpatrick & Co., 57 Arcade
NEW ORLEANS, LA., Perry C. Dowell, 4920 S. Robertson Street
NEW YORK, N. Y., Edwin A. Fraser, 7 West 42nd Street
NORFOLK, VA., S. H. Hodges, 721 Citizens Bank Building
NUTLEY, N. J., S. E. Van Divort, 25 Oak Ridge Avenue
OKLAHOMA CITY, OKLA., Hansen Building Specialties Co., 200¼ W. Reno Avenue
OMAHA, NEB., Kraus & Trustin, 533 Peters Trust Building
PHILADELPHIA, PA., E. F. Johnson, 1619 Sansom Street
PITTSBURGH, PA., Kirk Supply Co., 303 Bowman Building
PORTLAND, ORE., D. E. Fryer Co., Exchange Building
ROCHESTER, N. Y., Francis Metal Door & Window Corp., 46 Cortland Street
SALT LAKE CITY, UTAH, Manufacturers Specialties Co., Boston Building
SAN ANTONIO, TEX., Wm. S. Seng, 201 Maverick Building
SAN FRANCISCO, CAL., H. M. Holway, Hobart Building
SCRANTON, PA., Frank E. Ryan, 1335 Capoose Avenue
SEATTLE, WASH., D. E. Fryer & Co., 1105 Second Avenue
SPOKANE, WASH., D. E. Fryer & Co., Paulson Building
ST. LOUIS, MO., H. C. Morrison Co., 2011 Railway Exchange Building
SYRACUSE, N. Y., Francis Metal Door & Window Corp., 428 S. Salina Street
TACOMA, WASH., D. E. Fryer & Co., Provident Building
TAMPA, FLA., Ben Clyburn, Builders Exchange
TOLEDO, OHIO, DeRonde Steel Products Co., 328 Nasby Building
WASHINGTON, D. C., R. T. McKnew, 607 Lennox Building

Products

Metal Factory, Office and Toilet Partitions.
Hollow Metal Doors.
Also manufacturers of Metal Shelving and Bins.

Metal Partitions and Screens for Toilets, Shower Baths and Dressing Rooms



Mills Toilet Partitions are made of best quality stretcher leveled rust resisting sheets, having no cracks or fluted crevices. They are made with plain surfaces only—a feature that makes them particularly sanitary. Units built to permit any desired arrangement.

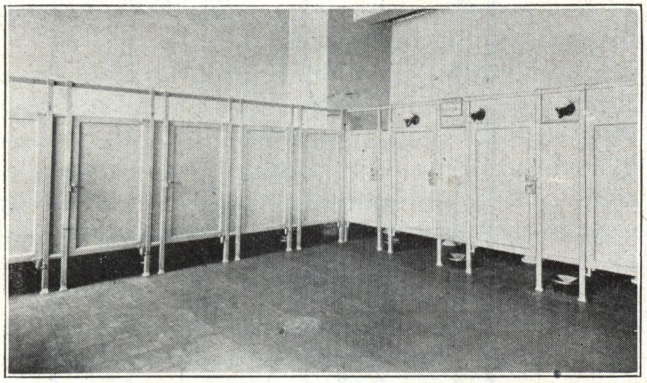
All panels are made with square hollow metal posts, front and rear, and with diamond shaped rails top and bottom, all solidly welded into one unit.

Front post of panel is fastened to the floor by means of an internal fastening adjustable aluminum shoe. Panels are held rigidly in place at top and bottom by means of architecturally correct rectangular head rail anchored to aluminum post cap at each panel.

All doors are made with hollow stiles of correct proportion. All corners are mitered and reinforced, the stiles are beveled into the panel with a flat sanitary surface and all intersections are solidly welded into one unit.

Shower partitions are built to the curb or up from the floor allowing for combination drain. Curtains and curtain rods are furnished when specified.

Combination of shower rooms, dressing rooms and toilet rooms can be made of Mills metal standard panels.



Typical Installation of Toilet Partitions

Hardware—The doors are equipped with Mills adjustable gravity hinges made of polished alloy aluminum. Top and bottom pins are heat treated, guaranteeing a strength equal to steel. Each door is equipped with Mills combination knob and latch keeper and rubber tipped bumper. All hardware and bumpers are attached with through bolts which hold them rigidly and permanently in place. All doors and hardware are jig-drilled, insuring perfect alignment and easy erection in the field.

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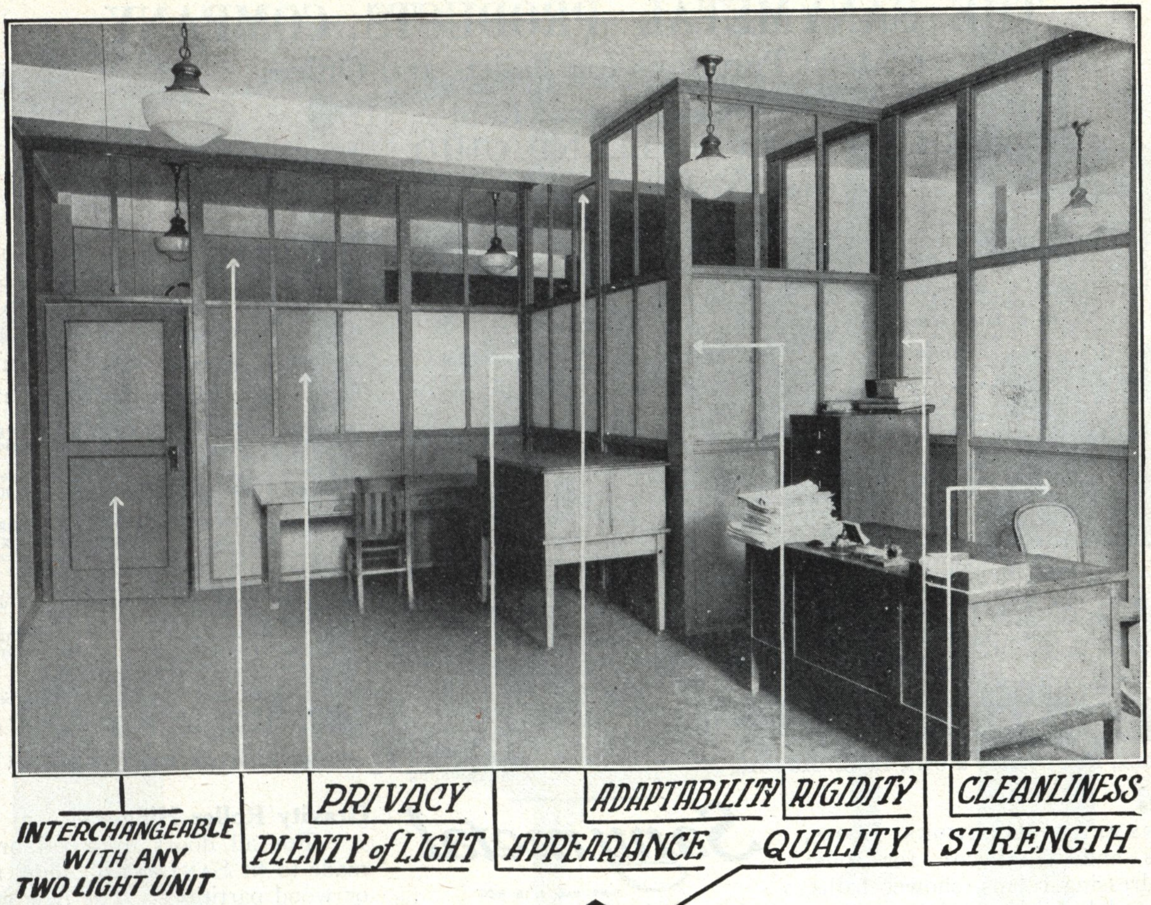


MILLS METAL

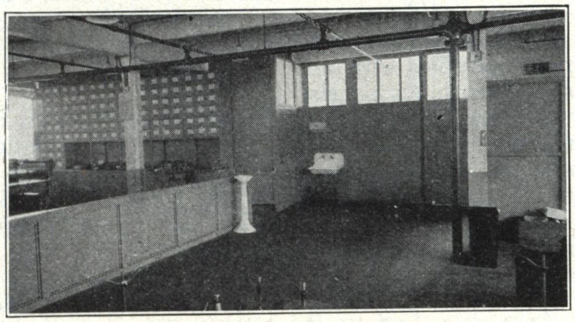
Mills Metal Factory and Office Partitions

Materials—Best quality stretcher leveled rust resisting sheets.

Construction, Standard Sections and Units—Constructed of standard sections and assembled in units at our factory for easy and economical installation.

Standard units in one, two and three-light widths.

Each unit consists of bottom panel, sash, top panel, and 1½-in. wide horizontal rail to cover joints between bottom panel and sash, and sash and top panel and between sash when two-light high partitions are provided and each post has a pilaster on each side. No exposed steel edges or bolts, except small machine screws on glazing beads.



Typical Factory Installation of Mills Metal Partitions

For office building or factory construction. Both sides are identical in appearance.

For low partitions the channels are bolted together and covered with a rigid neat box cornice, covering joints and adding strength.

Door with Transom Above—A standard unit consisting of a 3x7-ft. door, with or without transom above, interchanges with two-light unit.

Hardware—All partitions, doors, ventilators, etc., are provided with all necessary hardware of standard type or as otherwise specified.

Finish—Partitions and doors are furnished either with prime coat and final finish applied in field *or* finished in the factory with standard three-coat gray or green enamel, baked on. Other finishes furnished when specified.

Mills Hollow Metal Doors

Built of hollow metal tubular section, either full panel or with glass panel above.

Materials used are the best grades of smooth sheet steel selected especially for the service required.

All joints are carefully welded and smoothly finished. Reinforcements are welded on to door proper for installation of hinges and other hardware.

THE SANYMETAL PRODUCTS COMPANY

Metal Partitions for Toilets and Offices

1690 Urbana Road
CLEVELAND, OHIO
NEW YORK OFFICE, 1170 Broadway
EASTERN WAREHOUSE, 36 Spring Street, NEWARK, N. J.

AGENCIES

ALBANY, N. Y., Harvey B. Kimmey, 27 Columbia Street
ATLANTA, GA., S. R. Hewitt, 608 Walton Building
BILLINGS, MONT., F. W. Richardson, Inc., Fratt Building
BIRMINGHAM, ALA., C. M. McCrum Co., 513 No. 21st Street
BOSTON, 9, MASS., Seeley & Lawson, 73 Tremont Street
BUFFALO, N. Y., W. C. McQueeney, 71 Victoria Avenue
CASPER, WYO., H. E. Champion, P. O. Box 687
CEDAR RAPIDS, IOWA, Builders Material Co., 601 S. Third Street
CHARLOTTE, N. C., Walter L. Hoover, 21 Winifred Place
CHATTANOOGA, TENN., Campbell Supply Co., 823 Chestnut Street
CHICAGO, ILL., H. J. Baker & Co., 428 Monadnock Block
CINCINNATI, OHIO, Durbrow & Otte, 206 W. Court Street
COLUMBUS, OHIO, Columbus Builders Supply Co., 145 No. Front Street
DAYTON, OHIO, H. J. Baker & Co., 613 Dayton Savings & Trust Building
DECATUR, ILL., H. J. Baker & Co., 327 Citizens Bank Building
DENVER, COLO., Sheffer, Nicoll & Co., 1742 Glenarm Street
DES MOINES, IOWA, C. P. Massard, 621 Securities Building
DETROIT, MICH., Edwin L. Downs, 457 Book Building
DULUTH, MINN., Henry P. Hasemeyer, 8 W. Michigan Street
EL PASO, TEX., Sheehan & Co., Inc., 2 Republic Building
FORT WAYNE, IND., H. J. Baker & Co., 704 First National Bank Building
FORT WORTH, TEX., Collinsville Mfg. Co., 1009-15 Front Street
GRAND RAPIDS, MICH., Chas. Vandervelde, 757 Hawthorne Street
HOUSTON, TEX., Vandaveer, Brown & Story, 507 Goggan Building
HUNTINGTON, W. VA., Bailey Farrell Mfg. Co., Second Avenue and Ninth Street
INDIANAPOLIS, IND., H. J. Baker & Co., 602 W. McCarty Street
KANSAS CITY, MO., Kellogg-Mackay Co., 2020 Walnut Street
LITTLE ROCK, ARK., C. G. Leonard, 335 Hall Building
LOS ANGELES, CAL., Waterhouse-Wilcox Pacific Co., 331 E. Fourth Street
LOUISVILLE, KY., Durbrow & Otte, 117 So. 2nd Street
MEMPHIS, TENN., J. H. Miller Co., 404 Fidelity Bank Building
MIAMI, FLA., W. L. Rocke, First National Bank Building
MILWAUKEE, WIS., S. A. Smith, 228 Third Street, Room 600
MINNEAPOLIS, MINN., The Hustad Co., 126 S. 9th Street
NASHVILLE, TENN., Ryan Sales Co., Stahlman Building
NEWARK, N. J., Sanymetal Products Co., (Wholesale) 36 Spring Street
NEW ORLEANS, LA., Southern Builders Material Co., 1010 Maison Blanche Building
OKLAHOMA CITY, OKLA., Bissell Builders Supply Co., 717 Colcord Building
OMAHA, NEB., Earl S. Lewis & Co., 407 Sunderland Building
PHILADELPHIA, PA., James A. Clancy, 1018 Harrison Building
PITTSBURGH, PA., E. H. Dermitt, 336 Fourth Avenue
PORTLAND, ORE., McCraken-Ripley Co., 61 Albina Avenue
ROCHESTER, N. Y., Swalbach Building Products Co., 200 Central Bank Building
SALT LAKE CITY, UTAH, S. A. Roberts, 212 Dooly Building
SAN DIEGO, CAL., Theo. F. Snyder, 536 Spreckels Building
SAN FRANCISCO, CAL., Price Teltz Co., 534 Market Street
SCRANTON, PA., LaBar, Parsons & Pierce, Cedar Avenue
SEATTLE, WASH., S. W. R. Dally, 332 Pioneer Building
SIOUX FALLS, S. D., Builders Supply Co., Boyce Greeley Building
SPOKANE, WASH., R. H. Hoskins, Hyde Block
ST. LOUIS, MO., Herbert Golterman, 722 Wainwright Building
SYRACUSE, N. Y., Roesch Engineering Corp., 807 So. Salina Street
TAMPA, FLA., John Williams Co., 306 Krause Building
TOLEDO, OHIO, S. L. Everitt, 614 Ohio Building
TORONTO, CAN., Geo. B. Meadows, Ltd., 479 Wellington Street, W.
WASHINGTON, D. C., Harry Schnabel, 4316 15th Street, N. W.
WICHITA, KAN., Grabendike Engineering Sales Co., 419 Sedgwick Building
WILKES-BARRE, PA., LaBar, Parsons & Pierce, 904 Second National Bank Building

Sanymetal
TRADE MARK U S REG

Products

Sanymetal Partitions, Doors, Screens and Wainscot for toilet rooms, dressing rooms, shower baths, urinals, and hospital wards.

Sanymetal Partitions for offices, factories, hospitals, churches, schools, hotels, etc.

Sanymetal Gravity Roller Hinges for all toilet and part-length swinging doors.

Sanymetal Toilet Room Hardware.

Toilet Partitions

Sanymetal toilet partitions are made of fine heavy gauge furniture steel. They are now assembled with our improved interlocking construction, which binds panels, stiles and posts into one rigid unit. Panel stiles are set into recess of a new design sunken-panel drawn post, and into adjustable boxed wall channel, all with concealed fastenings. Posts are fitted with die-cast composition aluminum top casting to take pipe rail bracing, and secured to floor with die-cast aluminum base. All metal edges are concealed and interlocked—Sanymetal construction eliminates all unsightly spot welds, projecting bolts, nuts and screws. Panels and doors are finished with drawn metal trim. Stock fronts, panels and doors are adaptable to compartments of any width or depth desired.

Finish of Partitions and Doors—One priming coat of sublimed blue lead and two coats of olive green or gray enamel, baked on by high temperature.

Hardware—Polished aluminum die-cast gravity roller hinges, rubber bumper and pull, set with bonnet nuts. New design aluminum self-draining base shoe, 3 in. high, coved at bottom, adjustable to floor.

Erection Simple—Adjustable base casting fastened to floor by screws; a U-channel (adjustable to any unevenness) is fastened to the walls; partitions securely fastened to the U-channel; caps inserted in tops of posts; head rail brace is installed and fastened to walls; doors are then hung on partition posts. No drilling necessary on job. Quotations furnished erected or f.o.b. factory.

Gravity Roller Hinges

For all doors of wood or steel, made to fit Sanymetal, slate, marble or wood partitions. The new encased type Sanymetal gravity roller hinge, made of die-cast polished aluminum, is now adaptable to self-closing or self-opening doors of *any* type. A perfected development of the original Sanymetal springless hinge. Doors operate silently, and do not bang.

Shower and Urinal Partitions

Construction same as toilet partitions. Baked enamel finish. Can be furnished to fit special container or cement curb.

Partitions for Offices, Factories, Hospitals, Schools

Office type partitions are assembled at the plant and installed on the job with the new Sanymetal interlocking construction. Steel or glass panels interchangeable; panel stiles rigidly gripped in steel uprights. Hollow base, top rail, and all trim closely fitted and mitered. Neat drawn moulding surrounds panel on inside and outside. No bolts or screws show at any joint; all are covered with trim held by concealed locking device. Standard unit widths are from 3 to 4½ ft. Glass, divided as desired by muntins, is stopped in, without bolts or putty, by a continuous drawn metal stop. Doors well proportioned, substantially built; equipped with high grade hardware. Standard baked enamel hand rubbed finish applied at factory, or enameling can be done after erection. Partitions can be furnished grained.

Sanymetal factory partitions, for departmental plant offices and ordinary shop purposes are similar in design and construction; cost, somewhat lower. Glazed like standard office partitions, or fitted with steel sash and glazed. Wire mesh or steel may be substituted for glass in any panels. Cost little more than the equivalent installation of wood, and have the advantage of being interchangeable, durable, sanitary, and fireproof.

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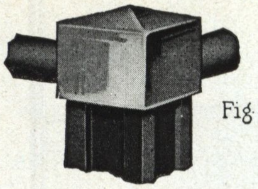


Fig 1

Top Casting

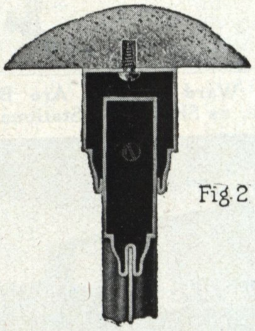


Fig 2

Wall Channel

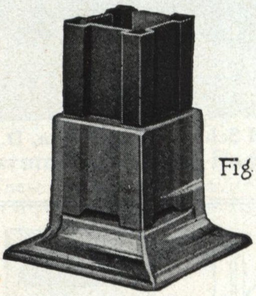
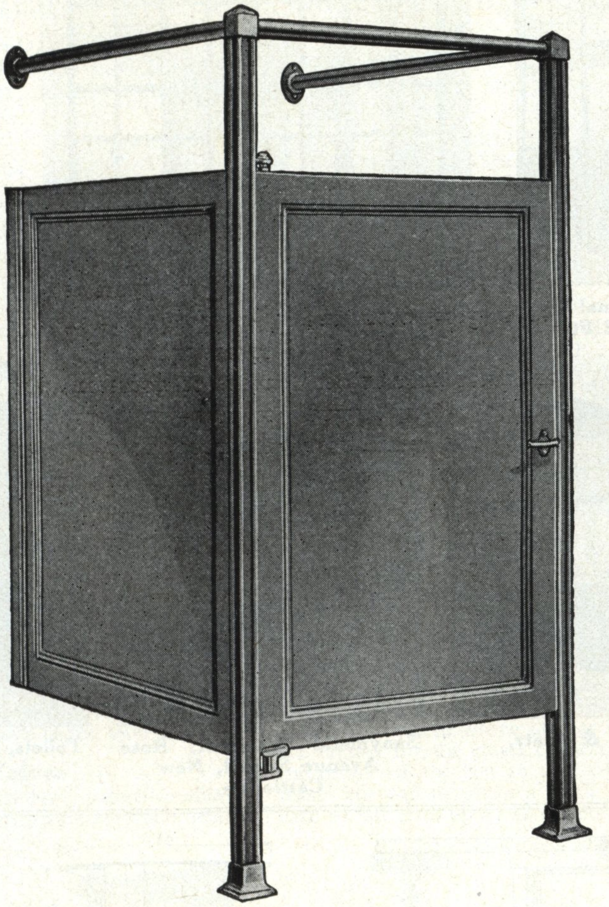


Fig 3

Base Casting



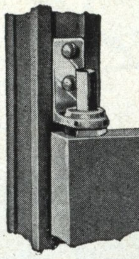


Fig 4

Top Hinge

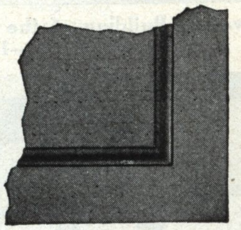


Fig 5

Door and Panel Trim

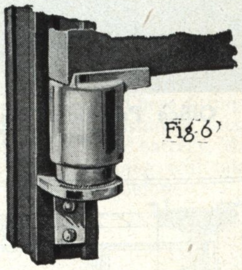
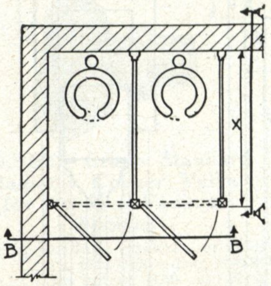


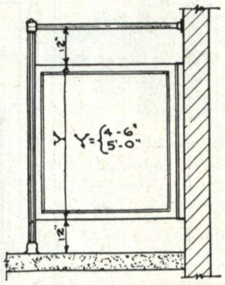
Fig 6

Bottom Hinge

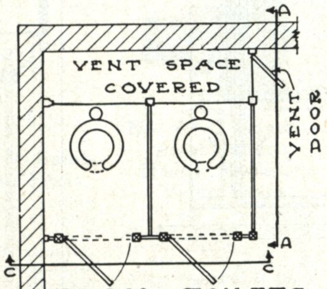

X
B
B

PLAN OF TOILETS SINGLE DOORS

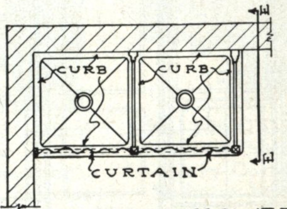
X = {3-0"
3 6
4 0"
4 6"
5 0"


Y
Y={4-6"
5-0"
12"
12"

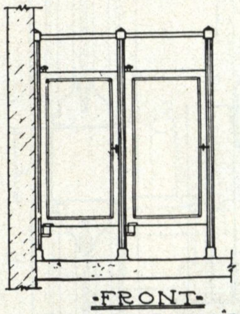
END ELEVATION "AA"


VENT SPACE COVERED
VENT DOOR
D
A
C
C

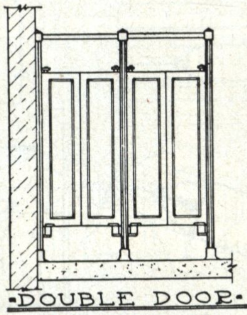
PLAN OF TOILETS WITH VENT SPACE AND WIDE FRONTS


CURB
CURB
CURTAIN
E
E

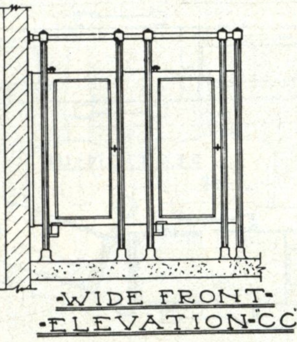
PLAN OF SHOWER PARTITIONS ON CURB



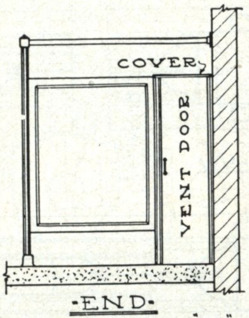
FRONT ELEVATION BB



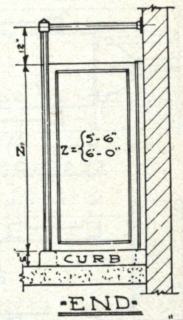
DOUBLE DOOR ELEVATION



WIDE FRONT ELEVATION "CC"


COVER
VENT DOOR

END ELEVATION "DD"


Z
Z={5-6"
6-0"
12"
CURB

END ELEVATION "EE"

Installation Details—Sanymetal Toilet Partitions

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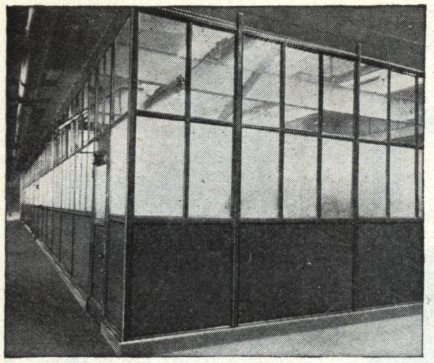
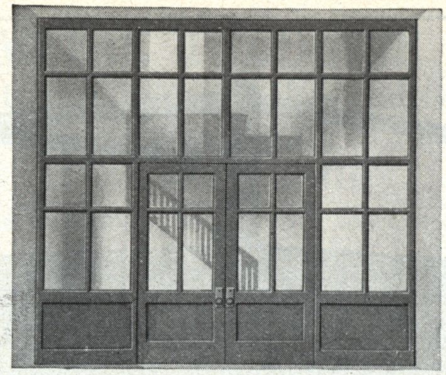
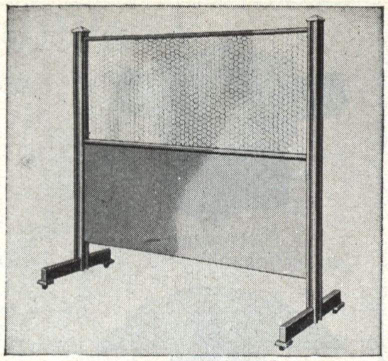


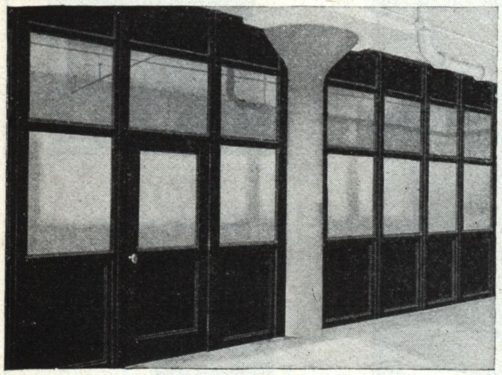
Lavatory Building of the National Tube Co., Lorain, Ohio—110x32 Ft.



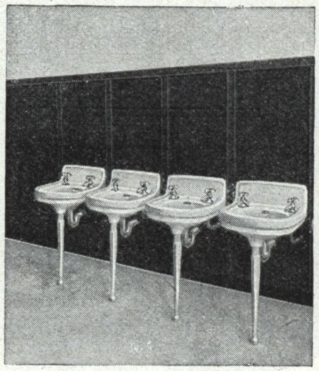
Smoke Screen in the School of the Immaculate Conception, Bellevue, Ohio



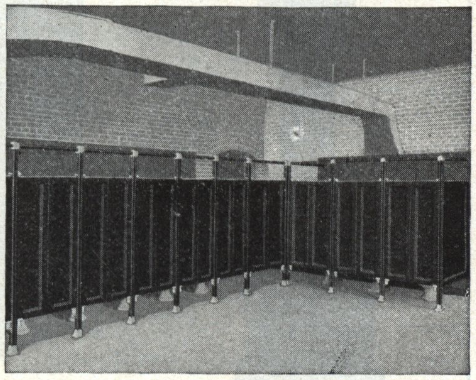
Hospital Ward Screens Are Built Movable, as Shown, or Stationary



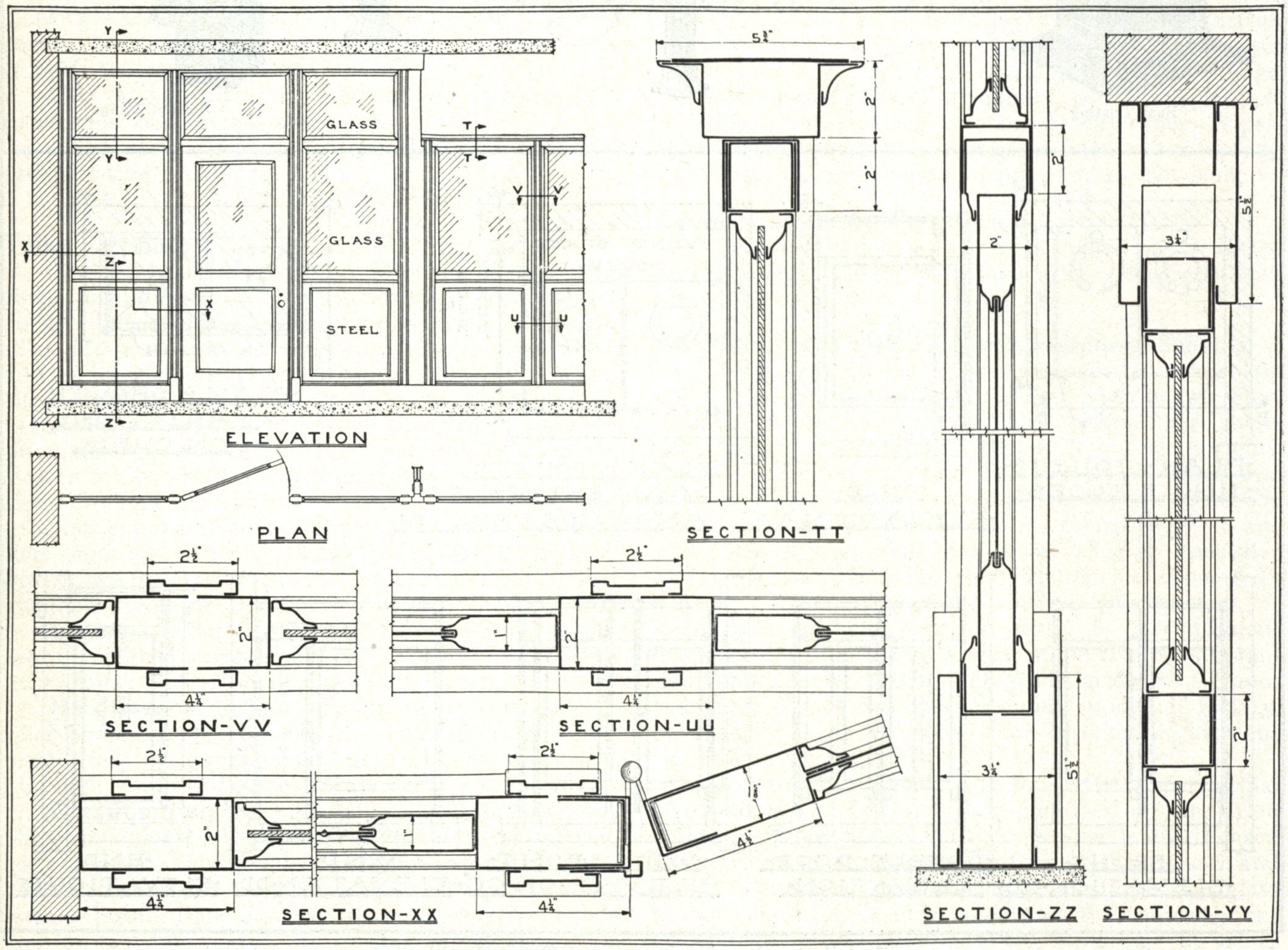
Office Partitions, Shering & Glatz, Newark, N. J.



Sanymetal Wainscot, Rose Avenue School, New Castle, Pa.



Toilets, Raymond School, Washington, D. C.


Y
Y
T
T
GLASS
V
V
X
Z
X
GLASS
STEEL
U
U
Z
ELEVATION
PLAN
5¼"
2"
2"
SECTION-TT
2"
2"
5½"
3¼"
2½"
2"
4¼"
SECTION-VV
2½"
1"
2"
4¼"
SECTION-UU
2½"
2"
4¼"
2½"
1"
4¼"
1¾"
4½"
SECTION-XX
3¼"
5½"
SECTION-ZZ
2"
SECTION-YY

Details—Sanymetal Office and Factory Partitions

CRANE CO.

Plumbing and Heating Fixtures, Valves, Fittings and Specialties

CRANE CO. GENERAL OFFICES: Crane Building, 836 So. Michigan Avenue, CHICAGO, ILL.
NATIONAL EXHIBIT ROOMS: CHICAGO, NEW YORK, ATLANTIC CITY, SAN FRANCISCO, MONTREAL
WORKS: CHICAGO, BRIDGEPORT, BIRMINGHAM, CHATTANOOGA, TRENTON, MONTREAL and ST. JOHNS, QUE.

BRANCH HOUSES

ABERDEEN
ALBANY
ASHEVILLE
ATLANTA
BALTIMORE
BILLINGS
BIRMINGHAM
BOSTON
BRIDGEPORT
BROOKLYN
BUFFALO
CAMDEN
CEDAR RAPIDS
CHARLESTON, W. VA.
CHATTANOOGA
CHICAGO
CINCINNATI
DAVENPORT
DES MOINES
DETROIT
DULUTH
EAST CHICAGO
EVANSTON
EVANSVILLE
FARGO
FORT SMITH
GRAND RAPIDS
GREAT FALLS
GREENVILLE
HARTFORD
HIBBING
HOLLYWOOD
HOUSTON
INDIANAPOLIS
JACKSONVILLE
JERSEY CITY
KANSAS CITY
KNOXVILLE
LEXINGTON
LIMA
LITTLE ROCK
LONG BEACH
LOS ANGELES
MADISON
MANKATO
MEMPHIS
MIAMI
MINNEAPOLIS
MOBILE
MUSKOGEE
NEWARK
NEW HAVEN
NEW ORLEANS
NEW YORK
NORFOLK
OAKLAND
OGDEN
OKLAHOMA CITY
OMAHA
OSHKOSH
PASADENA
PHILADELPHIA
PHOENIX
PITTSBURGH
POCATELLO
PORTLAND, ME.
PORTLAND, ORE.
PROVIDENCE
READING
RENO
RICHMOND
ROCHESTER
ROCKFORD
SACRAMENTO
ST. LOUIS
ST. PAUL
SALT LAKE CITY
SAN BERNARDINO
SAN DIEGO
SAN FRANCISCO
SANTA ANA
SAVANNAH
SEATTLE
SHREVEPORT
SIOUX CITY
SIOUX FALLS
SOUTH BEND
SPOKANE
SPRINGFIELD, ILL.
SPRINGFIELD, MASS.
SPRINGFIELD, MO.
SYRACUSE
TACOMA
TAMPA
TERRE HAUTE
TRENTON
TUCSON
TULSA
WASHINGTON
WICHITA
WILKES-BARRE
WINONA

Products

Radiator Valves; Drainage Fittings; Sanitary Fixtures of all types; Hospital Fixtures; Drinking Fountains; Shower Mixing Valves.

Also manufacturers of Globe Valves and Gate Valves of brass, cast iron, ferrosteel, cast steel and forged steel; Pipe Fittings of cast iron, malleable iron, brass and steel; Headers, Unions and Union Fittings; Railing Fittings; Pipe Hangers; Steam Specialties; Fabricated Piping.

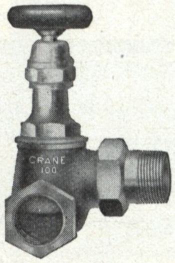
For Gas Water Heaters, see pages 1870-1871; for Water Softeners and Water Supply Systems, see pages 1930-1931.

Government Pattern Radiator Valves

These valves are heavier than standard pattern radiator valves and are suitable for installation in public buildings where a strong type of valve is needed. Rough body, plated all over, finished all over, or finished and plated all over, as ordered.

Drainage Fittings for Wall Closets

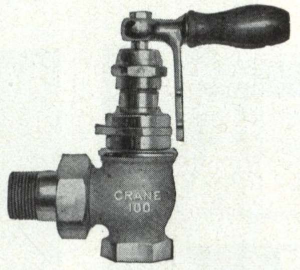
Especially adapted for buildings of reinforced concrete construction. Used in connection with wall-hung closets, they eliminate the necessity of cutting and subsequently weakening floors, since the horizontal waste line is above floor level. Each fitting takes the place of a drainage tee, nipple and "Y," which would be required where regular fittings are used. These fittings are tapped for the closet connections at different distances from the center of the run so that with closets set in a battery, the waste line can be given a pitch. The regular tapping will take care of batteries up to 12 closets. See illustration below.



No. 222 Crane Standard Radiator Corner Valve for Steam or Vacuum Systems

Self-adjusting packed stuffing box. Crane renewable disc, rising stem, Crane patent stop and disc spring. Right or left hand with union outlet.

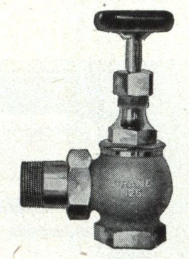
Sizes, ½, ¾, 1, 1¼, 1½ and 2 in.



No. 231 Standard Modulating Radiator Valve, Brass

Self-adjusting packed stuffing box. Area of opening is variable to enable control of the steam flow to the individual radiator. Valve seat, which is self-cleaning, is not exposed to wire-drawing action of the steam.

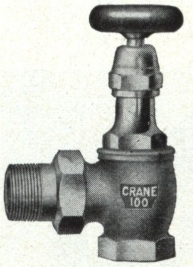
Sizes, ½, ¾, 1, 1¼ in.



No. 67-G Government Pattern Heavy Radiator Valve, Brass

Crane renewable disc, wood wheel, union outlet.

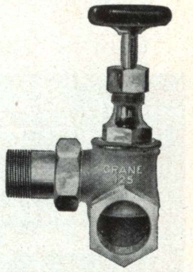
Sizes, ½, ¾, 1, 1¼, 1½ and 2 in.



No. 220 Standard Radiator Valve for Steam or Vacuum Systems

Self-adjusting packed stuffing box. Crane renewable disc. Rising stem. Crane patent stop and disc spring. Rough body, plated all over.

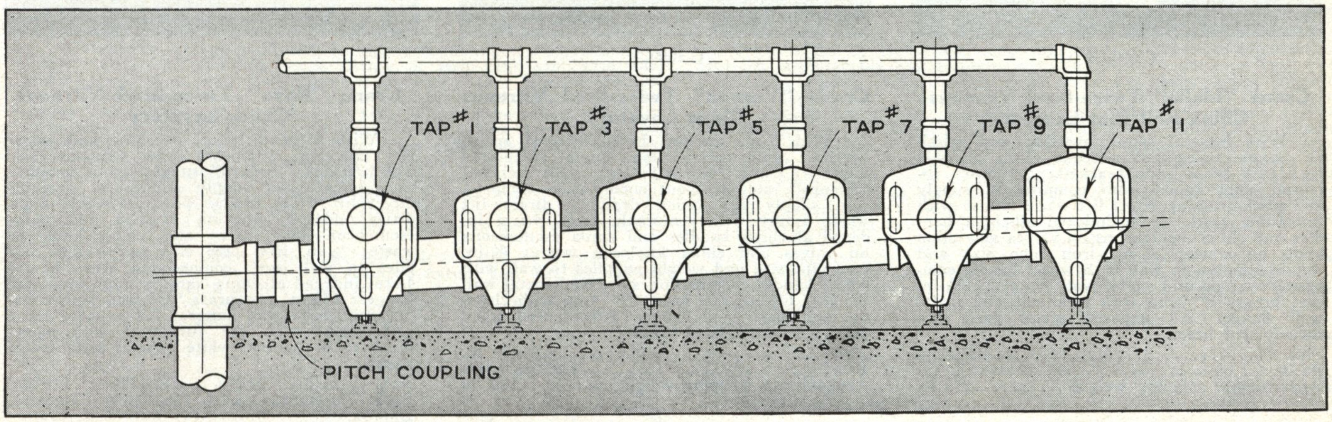
Sizes, ½, ¾, 1, 1¼, 1½ and 2 in.



No. 145-G Government Pattern Heavy Corner Radiator Valve

Crane renewable disc. Wood wheel. Rough body, plated all over.

Sizes, ½, ¾, 1, 1¼, 1½ and 2 in.



General Arrangement of Drainage Fittings, Showing Installation of a Battery of Closets

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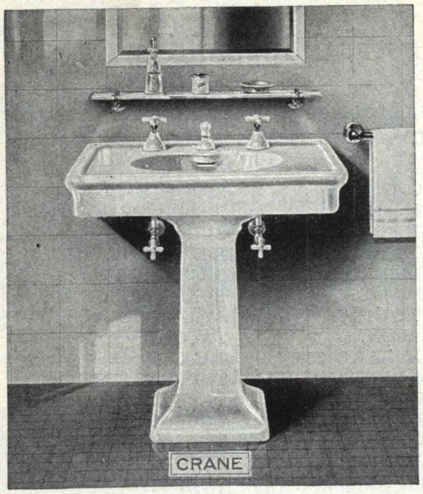
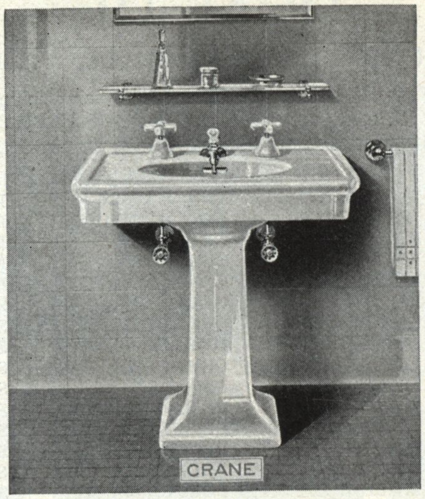


C 260-C1

Crane "Nova" Twice-fired Vitreous China Pedestal Lavatory

With integral spout, overflow and splash lip; cast brass wall brackets; "Securo" integral spout combination compression supply and quick draining direct lift waste fixture with renewable seats, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ½-in. iron pipe size and weight supplies to wall with compression stops having 4-arm indexed all-chain handles and china wall flanges; 1½-in. cast brass "P" trap with cleanout and china wall flange. All exposed metal parts are nickelplated brass.

Slab .....in.	24x30	22x27	21x24
Basin ....in.	13x18x6½	13x17x6½	12x16x6½
Approx. ship. wt.lb.	265	250	210

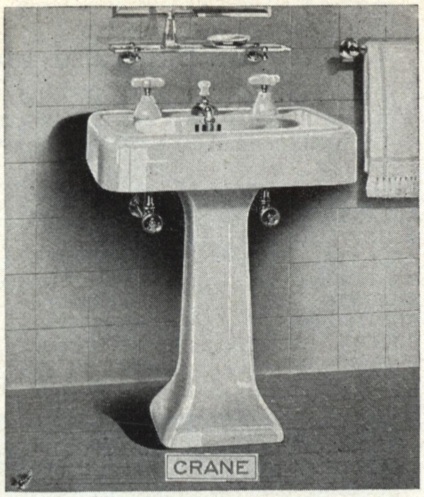


C 264-M1

Crane "Nova" Twice-fired Vitreous China Pedestal Lavatory

With integral overflow and splash lip; cast brass wall brackets; "Securo" combination compression supply and quick draining direct lift waste fixture with renewable seats, metal spout, shampoo connection, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ½-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1½-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab .....in.	24x30	22x27	21x24
Basin ....in.	13x18x6½	13x17x6½	12x16x6½
Approx. ship. wt.lb.	265	250	210

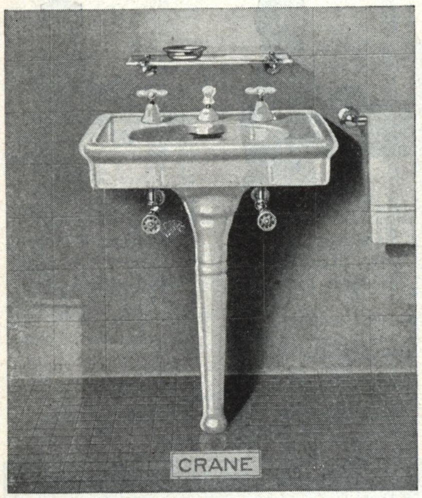


C 2002-M1

Crane "Majestic" Porcelain Enameled Iron Pedestal Lavatory

With integral overflow and apron; "Securo" combination compression supply and quick draining direct lift waste fixture with renewable seats, metal spout, shampoo connection, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1½-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab ....in.	20x24	22x27
Basin ....in.	12x16x6½	13x17x6½
Approx. ship. wt.........lb.	210	250

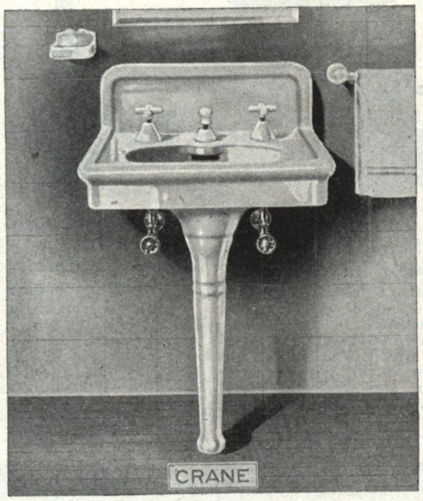


C 600-C1

Crane "Idalia" Twice-fired Vitreous China Roll Rim Lavatory

With integral spout, overflow and splash lip; single twice-fired vitreous china pedestal leg; cast brass wall brackets; "Securo" integral spout combination compression supply and quick-draining direct lift waste fixture with renewable seats, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1½-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab	21x24 in.
Basin.	12x16x6¼ in.
Approximate shipping weight	155 lb.

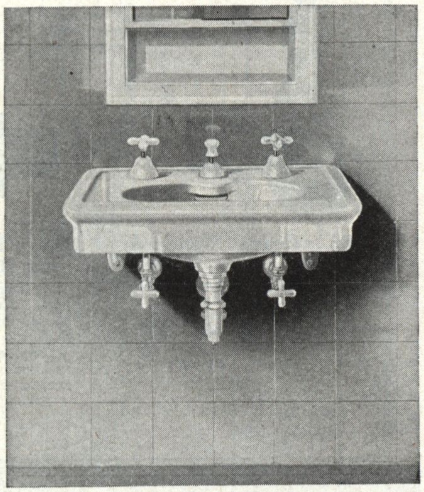


C 500-C1

Crane "Vernon" Twice-fired Vitreous China Lavatory

With 7-in. integral back, integral spout, overflow and splash lip; single twice-fired vitreous china pedestal leg; wall screws; "Securo" integral spout combination compression supply and quick draining direct lift waste fixture with renewable seats, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1½-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab	21x24 in.
Basin.	12x16x6¼ in.
Approximate shipping weight	180 lb.



C 402-C1

Crane "Nova" Twice-fired Vitreous China Lavatory

With integral spout, overflow and splash lip; porcelain enameled iron semi-concealed wall brackets; "Securo" integral spout combination compression supply and quick draining direct lift waste fixture with renewable seats, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ½-in. iron pipe size and weight supplies to wall with compression stops having 4-arm indexed all-china handles and china wall flanges; 1½-in. cast brass "P" trap with clean-out and china wall flange. All exposed metal parts below slab are furnished with emery finish to be painted white enamel after installation.

Slab .....in.	24x30	22x27	21x24
Basin ....in.	13x18x6½	13x17x6½	12x16x6½
Approx. ship. wt.lb.	210	200	170

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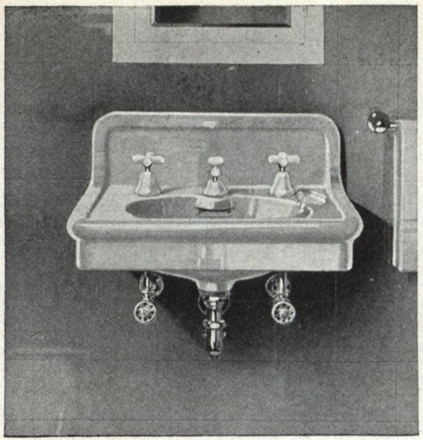
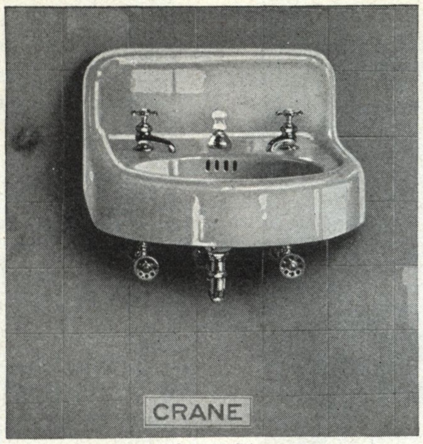


C 750-C1

Crane "Clermont" Twice-fired Vitreous China Lavatory

With 7-in. integral back, spout, overflow, splash lip and soap depression; concealed hanger; wall screws; "Securo" integral spout combination compression supply and quick draining direct lift waste fixture with renewable seats, 4-arm indexed all-china handles and china escutcheons on valves and china knob on waste; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1¼-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab	21x24 in.
Basin	12x16x6¼ in.
Approximate shipping weight	155 lb.

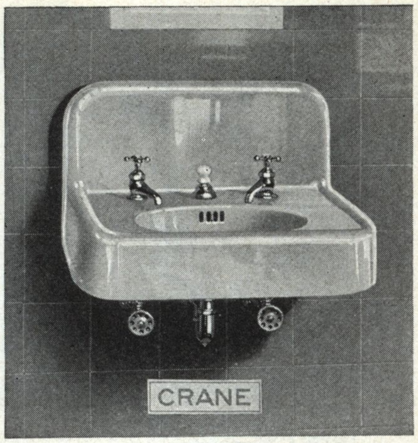


C 2240-S5

Crane "Norfolk" Porcelain Enameled Iron One-piece Lavatory

With 8-in. integral back, overflow and apron; concealed hanger; "Telsa, Jr." compression lavatory faucets with 4-ball china indexed handles; "Securo" quick draining direct lift waste with china knob and metal escutcheon; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1¼-in. cast brass "P" trap with clean-out and metal wall flanges. All exposed metal parts are nickelplated brass.

Slab	18x21 in.
Basin	10½x16½x6½ in.
Approximate shipping weight	95 lb.

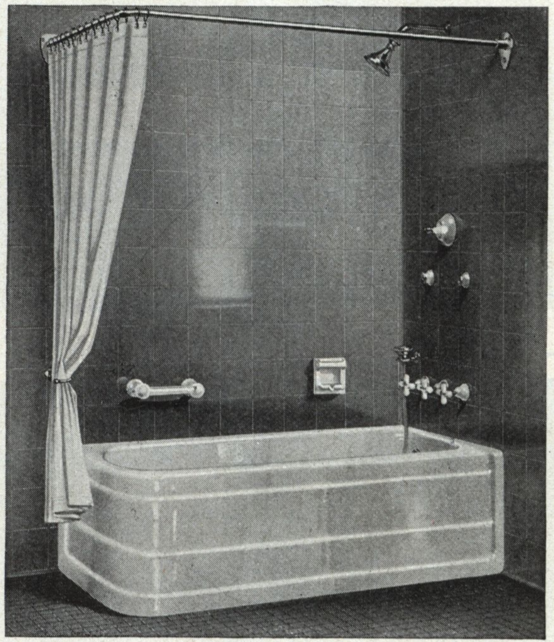


C 2200-S5

Crane "Nevada" Porcelain Enameled Iron One-piece Lavatory

With integral back, overflow and apron; concealed hanger; "Telsa, Jr." compression lavatory faucets with 4-ball china indexed handles; "Securo" quick draining direct lift waste with china knob and metal escutcheon; ⅜-in. iron pipe size and weight supplies to wall with wheel handle compression stops and metal wall flanges; 1¼-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Slab	in.	18x24	20x24
Basin	in.	11x16x6½	12x16x6½
Back	in.	10	12
Approx. ship. wt.	lb.	125	145



C 3284-RA

Crane "Corwith" One-piece Built-in Porcelain Enameled Iron Slope End Bath Tub for Right-hand Corner

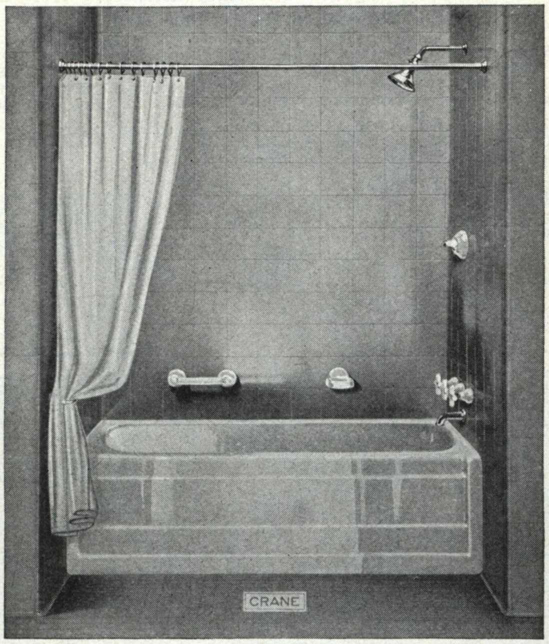
With outlet in right-hand end; concealed combination compression top nozzle supply and standing waste fixture at right-hand end with 2-in. waste barrel, ½-in. valves with renewable seats, 4-arm indexed all-china handles and china escutcheons, shampoo with reinforced rubber hose, 3-in. rubber bound spray and hook; shower with ½-in. Crane concealed mixing valve with renewable seats, china lever handle, china escutcheon, concealed stops with screwdriver slots and china escutcheons, and 5-in. cast brass shower head with removable face, adjustable ball joint and ½-in. iron pipe size and weight bent arm to wall with metal wall flange; 1⅛-in. outside diameter adjustable curtain rod with snap hooks and 10¼-oz. white duck triple tuck curtain with grommets and hold-back hook. All exposed metal parts are nickelplated brass. All valves may be re-washered from face of wall.

The "Corwith" bath tub tiles into the back and end walls, also in the floor. The spray may be used as a shampoo fixture and also for rinsing the surface of the bath after draining.

Utility cupboard with door should be provided for fixtures.

White vitreous china grab rod and soap dish, extra.

Nominal sizes	ft.	4½	5	5½	6
Length over all	in.	54	60	66	72
Width over all	in.	30½	30½	30½	30½
Depth inside	in.	17	17	17	17
Height over all	in.	18	18	18	18
Builds into wall	in.	¾	¾	¾	¾
Approximate shipping weight	lb.	545	595	655	705



C 3308-RA

Crane "Corwith" One-piece Built-in Porcelain Enameled Iron Slope End Apron Recess Bath Tub

With outlet at right-hand end; concealed combination compression over-rim spout supply and standing waste fixture at right-hand end with 2-in. waste barrel, ½-in. valves with renewable seats, 4-arm indexed all-china handles and china escutcheons; shower with ½-in. Crane concealed mixing valve with renewable seats, china lever handle, china escutcheon, 5-in. cast brass shower head with removable face, adjustable ball joint and ½-in. iron pipe size and weight arm to wall with metal wall flange; 1⅛-in. outside diameter curtain rod with snap hooks and 10¼-oz. white duck triple tuck curtain with grommets and hold-back hook. All exposed metal parts are nickelplated brass. All valves may be re-washered from face of wall.

Utility cupboard with door should be provided for fixtures.

White vitreous china grab rod and soap dish, extra.

The "Corwith" bath tub is easily kept clean because there are no joints or sharp corners in which dirt may lodge. The controlling valves and waste are concealed in the wall so that few metal parts are exposed.

Nominal sizes	ft.	4½	5	5½	6
Length over all	in.	54	60	66	72
Width over all	in.	30½	30½	30½	30½
Depth inside	in.	17	17	17	17
Height over all	in.	18	18	18	18
Builds into wall	in.	¾	¾	¾	¾
Approximate shipping weight	lb.	505	555	620	670

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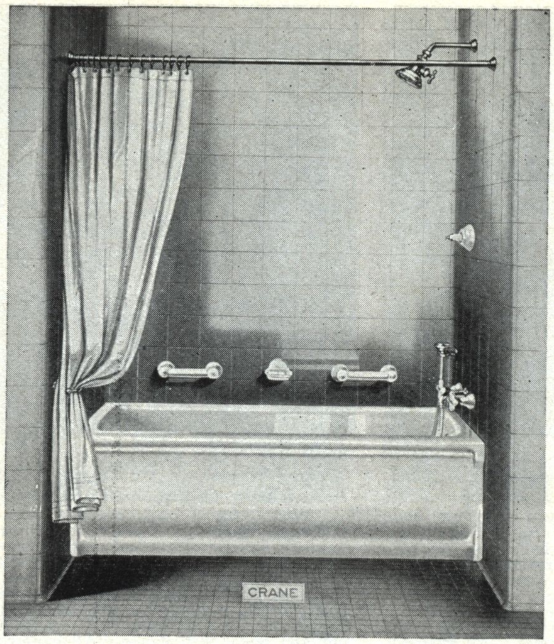


C 3040-RA

Crane "Linova" Light Weight White Solid Porcelain Recess Bath Tub

(Patented)

Glazed white inside and outside, to build into recess, with outlet at right-hand end; concealed combination compression over-rim spout supply fixture with hose connection at right-hand end, with ½-in. valves with renewable seats, 4-arm indexed all-china handles, china escutcheons and reinforced rubber hose with 3-in. rubber bound spray and hook; 1½-in. connected waste and overflow with chain and solid rubber stopper; shower with ½-in. Crane concealed mixing valve with renewable seats, china lever handle and china escutcheon, 5-in. cast brass needle head with integral volume regulator with tee handle, removable face, adjustable ball joint and ½-in. iron pipe size bent arm to wall with metal wall flange; 1⅛-in. outside diameter curtain rod with snap hooks and 10¼-oz. white duck triple tuck curtain with grommets and hold-back hook.

All valves may be rewashered from face of wall.

All exposed metal parts are nickelplated brass.

Utility cupboards with doors should be provided for fixtures.

Furnished in regular and special selection, as specified.

White vitreous china grab rods and soap dish, extra.

Nominal sizes	ft.	5	5½	6
Length over all	in.	60	66	72
Width over all	in.	29	29	29
Depth inside	in.	17	17	17
Height over all	in.	19½	19½	19½
Approx. shipping weight	lb.	900	950	1000

Crane "Tarnia" One-piece Porcelain Enameled Iron Slope End Reversible Recess Bath Tub

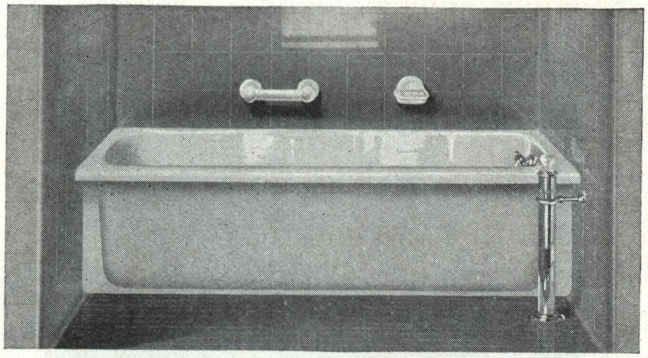
With legs and end outlet to build into recess and arranged for tiled front panel; concealed combination compression top bell supply and standing waste fixture at end, with 2-in. waste barrel, ½-in. supply valves with renewable seats, 4-arm indexed all-china handles and china escutcheons.

Utility cupboard with door should be provided for fixture.

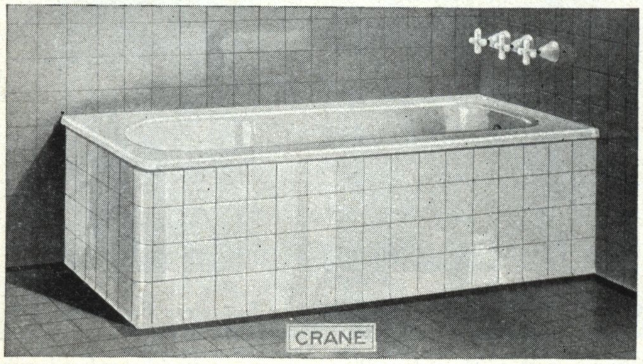
All exposed metal parts are nickelplated brass.

All valves may be re-washered from face of wall.

Nominal sizes	ft.	5	5½	5½	6
Length over all	in.	61	67	68½	73½
Width over all	in.	32	32	36½	32
Width of rim	in.	3¾	3¾	3¾	3¾
Depth inside	in.	17	17	17	17
Height over all (on feet)	in.	20	20	20	20
Approx. shipping weight	lb.	380	410	430	440



C 3336-E1



C 3330-E1

Crane "Tarnia" One-piece Porcelain Enameled Iron Slope End Reversible Bath Tub

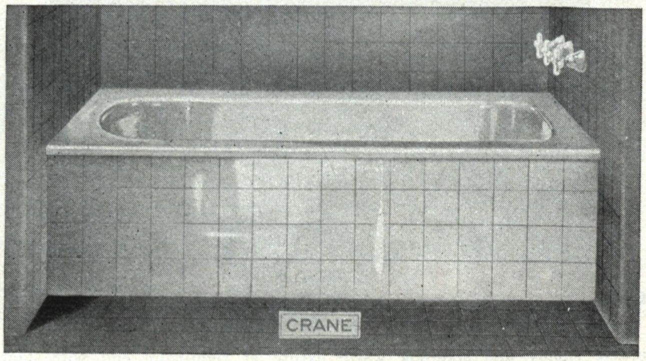
With legs and end outlet to build into corner and arranged for tiled front and end panel; concealed combination compression top bell supply and standing waste fixture at end, with 2-in. waste barrel, ½-in. supply valves with renewable seats, 4-arm indexed all-china handles and china escutcheons.

Utility cupboard with door should be provided for fixture.

All exposed metal parts are nickelplated brass.

All valves may be re-washered from face of wall.

Nominal sizes	ft.	5	5½	5½	6
Length over all	in.	61	67	68½	73½
Width over all	in.	32	32	36½	32
Width of rim	in.	3¾	3¾	3¾	3¾
Depth inside	in.	17	17	17	17
Height over all (on feet)	in.	20	20	20	20
Approx. shipping weight	lb.	380	410	430	440



C 3370-RA

Crane "Verna" One-piece Built-in Roll Rim Porcelain Enameled Inside Iron Bath Tub

On base to build into recess, with outlet at right-hand end, painted white outside; "Meritus" Fuller double bath faucet with shampoo connection and indexed china lever handles in right-hand end; 2-in. exposed standing waste and overflow with brace to wall and indexed china knob at side of tub near right-hand end.

All exposed metal parts are nickelplated brass.

White vitreous china grab rod and soap dish, extra.

Regularly furnished enameled inside and painted outside. Can also be furnished enameled inside and outside when so specified.

Nominal sizes	ft.	4½	5	5½
Length over all	in.	53½	59½	65½
Width over all	in.	29	29	29
Depth inside	in.	17	17	17
Height over all	in.	18	18	18
Builds into wall	in.	½	½	½
Approx. shipping weight (boxed)	lb.	455	480	510
Approx. shipping weight (crated)	lb.	390	410	455

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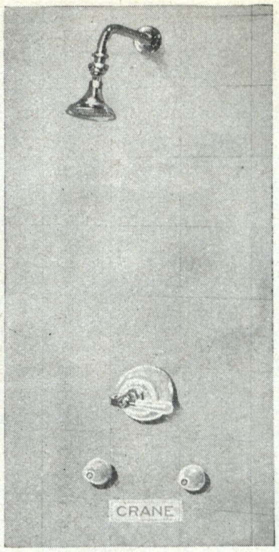
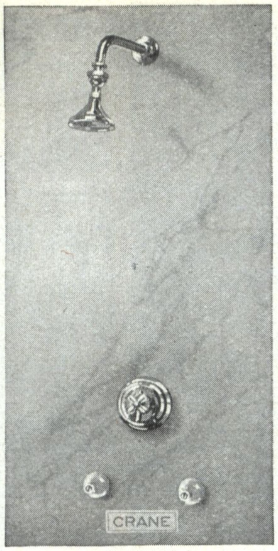


C 4360-B

Crane Concealed Shower

With Crane mixing valve with renewable seats, self-adjusting stuffing box, union bonnet connection extending beyond face of partition, indexed china escutcheon, china lever handle and ½-in. lock-shield concealed compression stops with china escutcheons, 4-in. cast brass shower head with removable face, adjustable ball joint with ½-in. iron pipe size and weight bent arm to wall with metal wall flange.

All exposed metal parts are nickelplated brass.



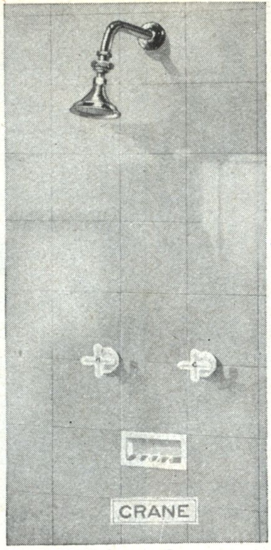
C 4420-B

Crane Concealed Thermostatic Mixing Valve Shower

(Patented)

With thermostatic anti-scalding mixing valve with 4-arm indexed china handle for volume control and metal lever handle for temperature control, with ½-in. iron pipe size inlets and ¾-in. iron pipe size outlets; ½-in. lock-shield concealed compression stops with china escutcheons; 4-in. cast brass shower head with removable face, adjustable ball joint and ½-in. iron pipe size and weight bent arm to wall with metal wall flange.

All exposed metal parts are nickelplated brass.



C 4400-B

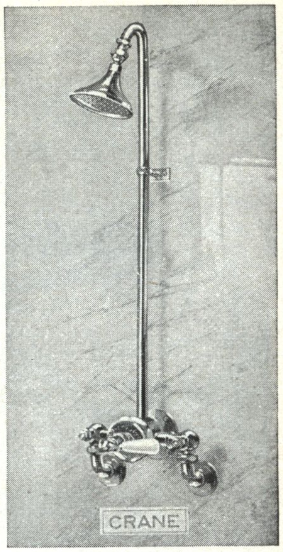
Crane Concealed Shower

With ½-in. compression supply valves with renewable seats, 4-arm indexed all-china handles, china escutcheons and ½-in. supply connections; 4-in. cast brass shower head with removable face and ½-in. iron pipe size and weight bent arm to wall with adjustable ball joint and metal wall flange.

All exposed metal parts are nickelplated brass.

Valves may be re-washered from face of wall.

3x6-in. china built-in soap dish, extra.

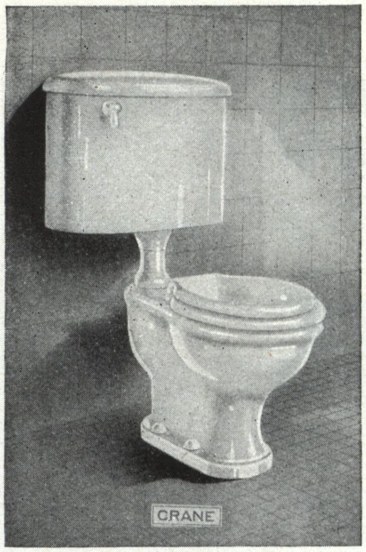


C 4436-G

Crane Exposed Shower

With Crane mixing valve with wall support, renewable seats, self-adjusting stuffing box, union bonnet connection, china lever handle and ½-in. lock-shield stops with union supply connections to wall and metal wall flanges; 4-in. cast brass shower head with removable face, adjustable ball joint and ½-in. iron pipe size and weight gooseneck riser with wall support.

All exposed metal parts are nickelplated brass.



C 10400

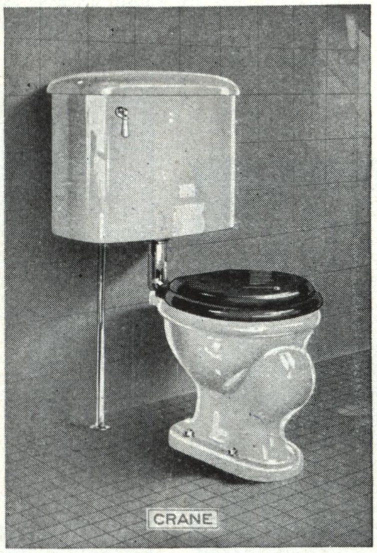
Crane "Corsyn" Twice-fired Vitreous China Noiseless Siphon Jet Closet

(Patented)

With top inlet; twice-fired vitreous china low tank with concealed back supply high pressure float valve with integral stop, flush valve and double acting china operating lever; wall brackets and screws; china flush connection with coupling nut and china spud flange; 1½-in. white Sanitoure finish seat and cover with white finish concealed hinge; cast brass floor flange with rubber gasket, bolts, screws and china bolt caps.

All exposed metal parts are white.

Approximate shipping weight, 195 lb.



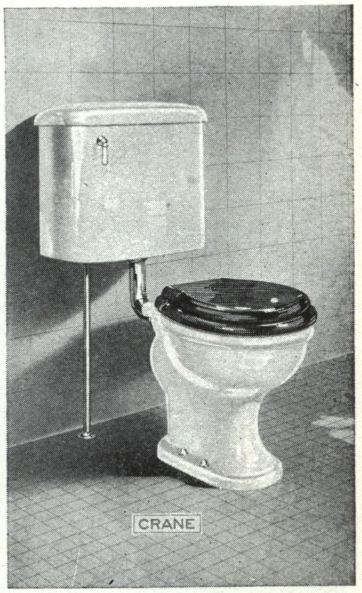
C 11180

Crane "Illini" Twice-fired Vitreous China Siphon Action Washdown Closet

With back inlet; twice-fired vitreous china low tank with bottom supply high pressure float valve, flush valve with rubber float, double acting china operating lever and ⅜-in. iron pipe size supply pipe to floor with metal floor flange; wall screws; 2-in. outside diameter elbow flush connection with coupling nut and spud escutcheon; 1¼-in. birch mahogany finish square back ring seat and cover with bar hinge; cast brass floor flange with rubber gasket, bolts and screws.

All exposed metal parts are nickelplated brass.

Approximate shipping weight, 160 lb.



C 11010

Crane "Mauretania" Twice-fired Vitreous China Reverse Trap Siphon Action Washdown Closet

With back inlet; twice-fired vitreous china low tank with bottom supply high pressure float valve with integral stop, flush valve with rubber float, double acting china operating lever and ⅜-in. iron pipe size supply pipe to floor with metal floor flange; wall screws; 2-in. outside diameter elbow flush connection with coupling nut and spud escutcheon; 1¼-in. birch mahogany finish square back ring seat and cover with bar hinge; cast brass floor flange with rubber gasket, bolts and screws.

All exposed metal parts are nickelplated brass.

Approximate shipping weight, 160 lb.

This closet can also be furnished in the Junior size, which is 14 in. high.

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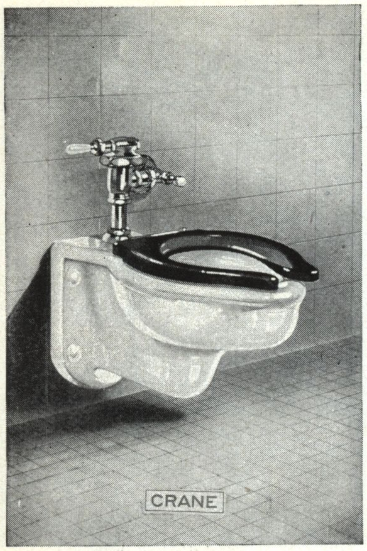


C 10050

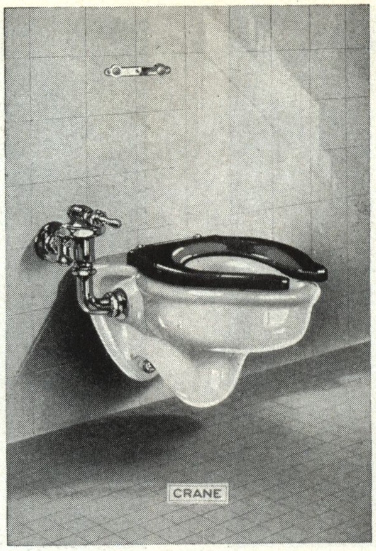
Crane "Walsyn" Twice-fired Vitreous China Noiseless Siphon Jet Wall Closet

(Patented)

With extended lip and top inlet; exposed "water controlled" direct flushing valve with china oscillating handle, 1-in. angle stop with seat bumper, metal wall flange with adjustable sleeve and 1½-in. outside diameter straight flush connection with coupling nut and spud escutcheon; ebony finish "Whaleboneite" open front Serpentine seat with heavy concealed bar hinge; Crane "Hulbert" long turn drainage fitting with supporting flange, four ⅝-in. supporting studs, hexagon nuts, washers, china bolt caps, asbestos gasket and 4-in. electro-galvanized outlet nipple. All exposed metal parts are nickelplated brass.

Approximate shipping weight, 175 lb.

When ordering, specify whether drainage fittings are wanted black or galvanized. Also state thickness of partition through which fixture is to operate.



C 10204

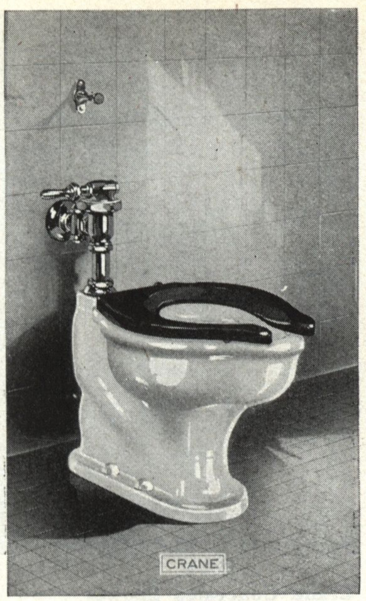
Crane "Expedio" Twice-fired Vitreous China Blowout Wall Closet

(Patented)

With jet, extended lip and side inlet; exposed "water controlled" direct flushing valve with metal oscillating handle, 1-in. straightway stop, metal wall flange with adjustable sleeve and 1½x1½-in. outside diameter elbow flush connection with coupling nut and spud escutcheon; cast double seat bumper; ebony finish "Whaleboneite" open front Serpentine seat with heavy concealed bar hinge; Crane "Hulbert" long turn drainage fitting with supporting flange, three ⅝-in. supporting studs, capnuts, washers, asbestos gasket and 4-in. electro-galvanized outlet nipple. All exposed metal parts are nickelplated brass.

Approximate shipping weight, 170 lb.

When ordering, specify whether drainage fittings are wanted black or galvanized. Also state thickness of partition through which fixture is to operate.



C 10502

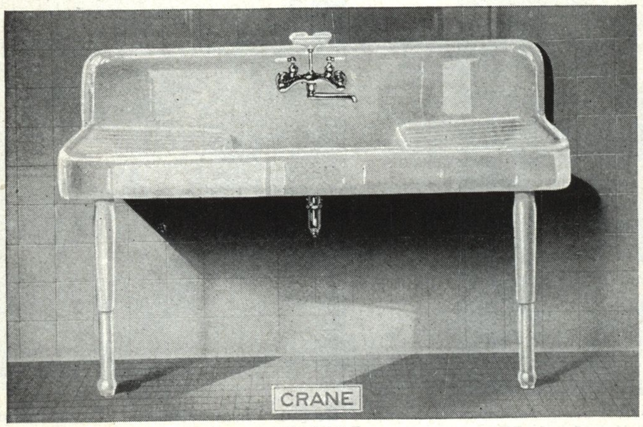
Crane "Purus" Twice-fired Vitreous China Siphon Jet Closet

(Patented)

With extended lip, top inlet and extra large trapway passing 2⅝-in. solid ball; exposed "water controlled" direct flushing valve with metal oscillating handle, 1-in. straightway stop, metal wall flange with adjustable sleeve and 1½-in. outside diameter straight flush connection with coupling nut and spud escutcheon; cast seat bumper; ebony finish "Whaleboneite" open front Serpentine seat with heavy concealed bar hinge; cast brass floor flange with rubber gasket, bolts, screws and china bolt cap. All exposed metal parts are nickelplated brass.

Approximate shipping weight, 115 lb.

This closet can also be furnished in the Junior size, which is 13½ in. high.



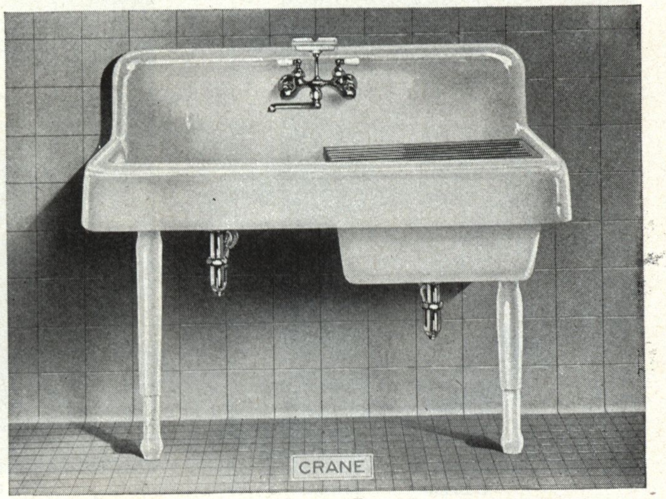
C 19180-J

Crane One-piece Porcelain Enameled Iron Apron Kitchen Sink

With integral back and double drainboards; porcelain enameled iron adjustable legs; concealed hangers; "Agilis" quick compression double sink faucet with china soap dish, swinging spout, indexed china lever handles, renewable seats and female union supply connections for ½-in. iron pipe; brass waste strainer with coupling and tailpiece; 1½-in. cast brass "P" trap with clean-out and metal wall flange. All exposed metal parts are nickelplated brass.

Length over all	in.	60½	74½	74½
Width over all	in.	20½	20½	22½
Size of sink	in.	20x24	20x30	22x30
Height of back	in.	12	12	12
Approximate shipping weight	lb.	450	525	540

Legs furnished allow rim of sink to be adjusted from 30 to 36 in. above the floor.



C 21116-R

Crane One-piece Porcelain Enameled Iron Combination Sink and Laundry Tray

With integral back and apron, with sink compartment on left side and laundry tray on right side; painted white enamel iron adjustable legs; concealed hangers; "Agilis" quick compression double faucet with china soap dish, swinging spout, indexed china lever handles, renewable seats and female union supply connections for ½-in. iron pipe; brass waste strainer in sink with coupling and tailpiece; brass waste plug in laundry tray with chain, rubber stopper, coupling and tailpiece; 1½-in. cast brass "P" traps with clean-outs and metal wall flanges; removable ash drainboard over tray. All exposed metal parts are nickelplated brass.

Length over all	50 in.
Width over all	22 in.
Sink (inside)	22x17½x7 in.
Laundry tray (inside)	22x17½x14 in.
Height of back	10 in.
Approximate shipping weight	430 lb.

Legs furnished allow rim of sink to be adjusted from 32½ to 36½ in. above floor.

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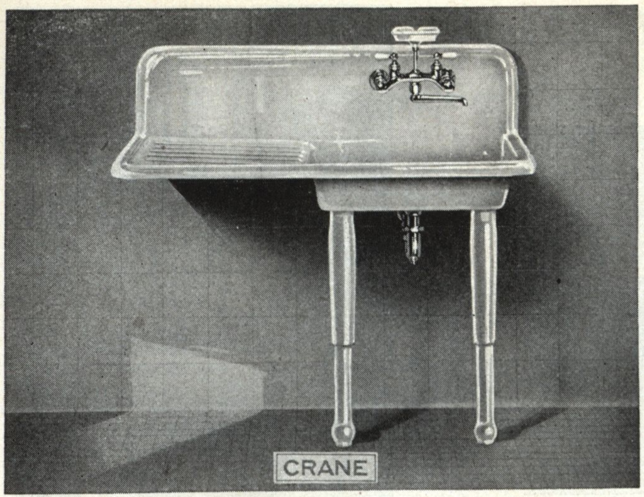


C 19250-LJ

Crane One-piece Porcelain Enameled Iron Roll Rim Kitchen Sink

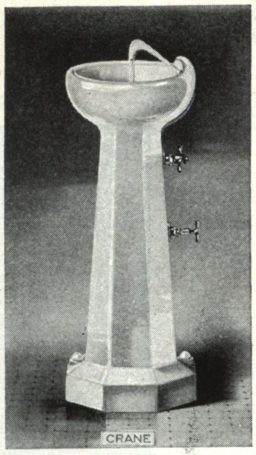
With integral back and left-hand drainboard; painted white enamel iron adjustable legs; concealed hangers; "Agilis" quick compression double sink faucet with china soap dish, swinging spout, indexed china lever handles, renewable seats and female union supply connections for ½-in. iron pipe; brass waste strainer with coupling and tailpiece; 1½-in. cast brass "P" trap with clean-out and metal wall flange.

All exposed metal parts are nickelplated brass.

Length over all	52¼ in.
Width over all	20¼ in.
Size of sink	20x30 in.
Height of back	12 in.
Approximate shipping weight	275 lb.

Legs furnished allow rim of sink to be adjusted from 30 to 36 in. above the floor.

Sinks can also be furnished supported on wall hangers only, without legs, when so specified.

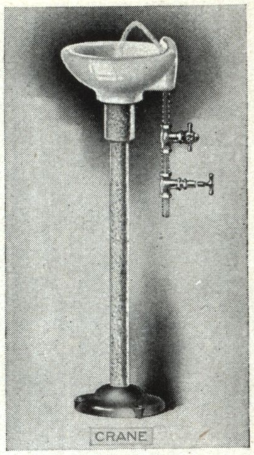


C 9030-A

Crane "Tyrone" Twice-fired Vitreous China Pedestal Drinking Fountain

With 14-in. receptor with integral angle stream bubbler and protecting hood; china strainer; cast brass supply and waste connection; galvanized iron pipe supply to floor with union; "Triumph" ball bearing self-closing controlling valve with finishing flange and 4-ball metal handle and lock-shield compression stop with finishing flange; 1-in. galvanized iron pipe waste to floor with coupling; floor screws with expansion shields, cap nuts and china bolt caps. All exposed metal parts are nickelplated brass.

Height to top of pedestal .....in.	30	36
Depth of receptor (inside) ....in.	4½	4½
Width of pedestal at floor ....in.	14	14
Approx. ship. wt..lb.	150	160



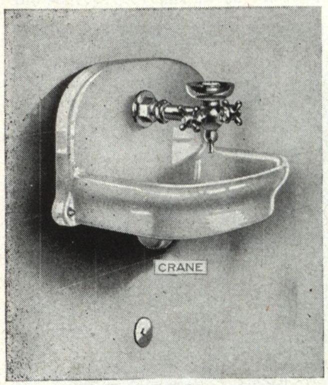
C 9140-A

Crane "Luxton" Pedestal Drinking Fountain

With 12-in. twice-fired vitreous china receptor, integral angle stream bubbler with protecting hood and supply connection; nickelplated "Triumph" ball bearing self-closing controlling valve with 4-ball metal handle; nickelplated lock-shield compression stop; nickelplated cast brass strainer; galvanized cast iron waste connection; 2-in. galvanized iron pipe pedestal with painted cast iron flange base; 1-in. galvanized iron pipe waste to floor.

Height to top of receptor	40 in.
Depth of receptor inside	3½ in.
Approx. ship. wt.	75 lb.

Can be furnished with base and pedestal painted white enamel finish when so specified. Can also be furnished in any height up to 40 in. when desired.



C 9190

Crane "Media" Twice-fired Vitreous China Wall Drinking Fountain

With integral back, trap and strainer; "Whitney" combination bubbler and ice water faucet with china nozzle bubbler, metal receptor, ice water spout, "Triumph" ball bearing self-closing controlling valves with 4-ball metal handles, concealed regulating screw, waste to wall with 1¼-in. female iron pipe size connection and ¼-in. female iron pipe size supply connection being inside of waste; 1¼-in. cast brass outlet connection; metal clean-out plug; wall screws with expansion shields and cap nuts. All exposed metal parts are nickelplated brass.

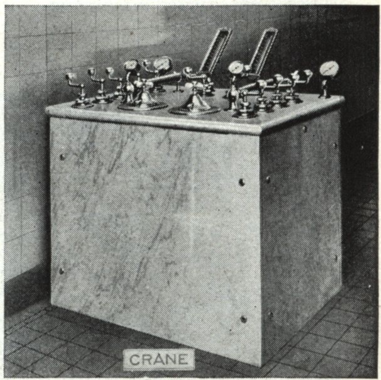
Wall to front.......in.	14	13
Width over all......in.	18	12
Height of back.....in.	8	8
Approx. ship. wt....lb.	75	65

Above bubblers can also be furnished with china or glass receptors when so specified.

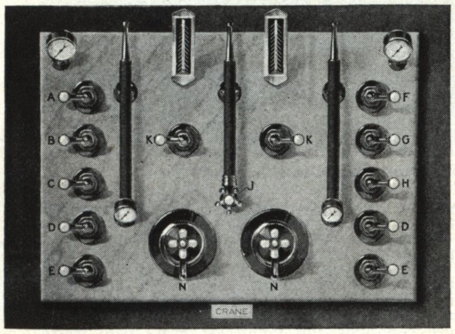
Crane Italian Marble Control Table

With thermostatic anti-scalding mixing valves; thermometers; pressure gauges; Scotch douches and quick compression type controlling valves which are re-washerable from top of table.

Furnished in the styles and sizes listed in table below.



C 6100



C 6100

Top View

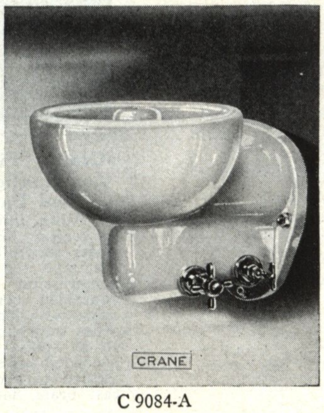
Table No.	1	2	3	4
Size	28x36	28x36	28x36	28x40
Needle spray	A	A	A	A
Sitz bath	B	B	B	B
Perineal	C	C	C	C
Scotch douche	D	D	D	D
Waste	E	E	E	E
Shower	F	F	F	F
Wave spray	G	G	G	G
Bath	H	H	H	H
Steam douche	J	...	...	...
Ice water	...	...	K	K
Thermostatic valves	N	N	N	N

Crane "Creta" Twice-fired Vitreous China Wall Drinking Fountain

With 12-in. receptor and integral trap housing; china non-squirting bubbler and strainer with concealed regulating screw; cast brass supply and waste connection; 1¼-in. galvanized cast iron trap to wall; galvanized iron supply pipe to wall with union and "Triumph" ball bearing self-closing controlling valve with finishing flange and 4-ball metal handle and lock-shield compression stop with finishing flange; wall screws with expansion shields and cap nuts. All exposed metal parts are nickelplated brass.

Depth of receptor	3½ in.
Wall to front of receptor	16 in.
Approximate shipping wt.	80 lb.

Above drinking fountain can be furnished with all concealed parts of brass when so specified.



C 9084-A

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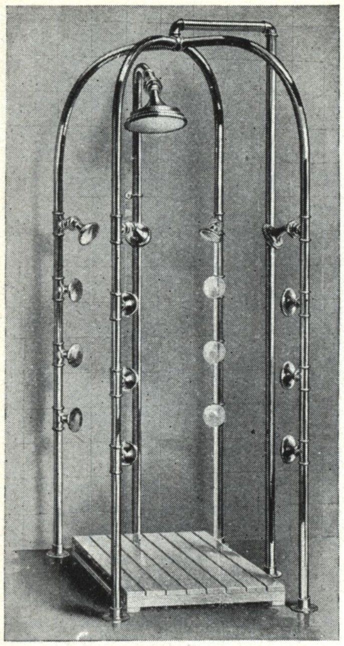


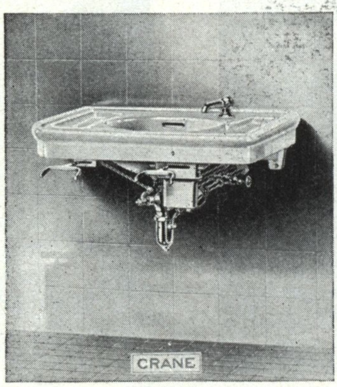
C 6350

Crane Nickelplated Brass Hydrotherapeutic Shower

With four 1-in. iron pipe size standards with metal floor flanges and 4 sets of four 3-in. diameter cast brass needle sprays, upper row of sprays having adjustable ball joint; 8-in. diameter cast brass shower head with removable face, adjustable ball joint and ¾-in. iron pipe size and weight supply riser from floor with metal floor flange; 1¼-in. iron pipe size and weight brass supply riser to sprays with metal floor flange.

Shower head operates independently of the needle sprays.

Wooden platform not included.



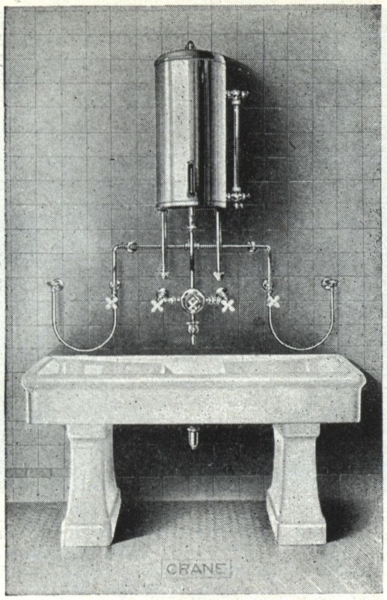
C 5340

Crane "Surbas" Twice-fired Vitreous China Roll Rim Surgeon's Lavatory

With integral overflow and instrument trays, supported on white porcelain enameled cast iron semi-concealed brackets; brass spout; brass knee action supply valve with stirrup handle and ½-in. iron pipe size and weight supplies to wall with unions, lock-shield compression stops and metal wall flanges; brass knee action pop-up waste with stirrup handle; 1½-in. cast brass "P" trap with clean-out and metal wall flange.

All exposed metal parts are nickelplated brass.

Slab ....in.	20x28	24x36
Approx. ship. wt...lb.	175	225

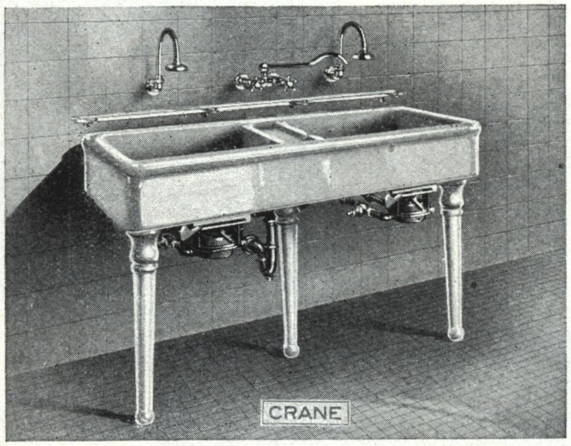


C 5800

Crane White Solid Porcelain Hospital Infant's Bath

With 2 integral smooth drain slabs; white solid porcelain pedestals; 16x36-in. nickelplated copper supply tank, tinned on inside, with thermometer and water gauge, with guards; tank support with braces to wall, combination shampoo fixture with thermostatic anti-scalding valve, reinforced rubber hose and shampoo sprays, with wall hooks; compression drain faucet to sink, ½-in. iron pipe size and weight supplies to wall with compression stops; waste strainer; nickelplated cast brass swivel pattern "P" trap with clean-out and wall flange.

Length	72 in.
Width	26 in.
Height, floor to top of rim..........	34 in.



C 5608-A

Crane "Vincent" White Solid Porcelain Two-compartment Surgeon's Scrub Sink

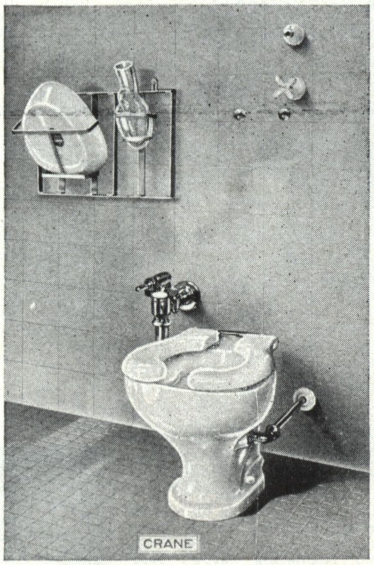
With integral instrument tray with drains; white solid porcelain legs with supports to wall; gooseneck spouts with swivel and removable rose sprays; thermostatic anti-scalding knee action mixing valves with separate lever control for temperature and volume and ½-in. iron pipe size and weight brass supplies to wall with lock-shield compression stops and metal wall flanges and ¾-in. iron pipe size and weight brass supplies to gooseneck spouts; combination compression exposed supply fixture with swinging spout and 5-ball china indexed handles; cast brass waste strainers with couplings and tailpieces; brass twin waste connection with 1½-in. cast brass "P" trap with clean-out and metal wall flange.

All exposed metal parts are nickelplated brass.

Crystal glass shelf not included.

Furnished in regular or special selection white solid porcelain as specified.

Length over all	62 in.
Width over all	26 in.
Sink compartments	20x24 in.
Depth inside	7 in.
Trays	5x21x1½ in.
Approximate shipping weight	530 lb.



C 7186

Crane "Fifth Avenue" Vitroware Combination Siphon Jet Closet and Bed Pan Cleansing Hopper

With integral cleansing jet and rests to receive bed pan when emptied; Crane water controlled flushing valve; ½-in. supply pipe to wall for cleansing jet with compression concealed supply valve and concealed compression volume regulating valve with loose key; white Sanitoure open front and back seat, no cover, with hinges to fit special sleeves in shelf of bowl; 2 special brass sleeves mounted in wall above fixture to receive seat when not in use; cast brass floor flanges, gaskets and bolts.

COLUMBIA SANITARY MANUFACTURING CO.

INCORPORATED

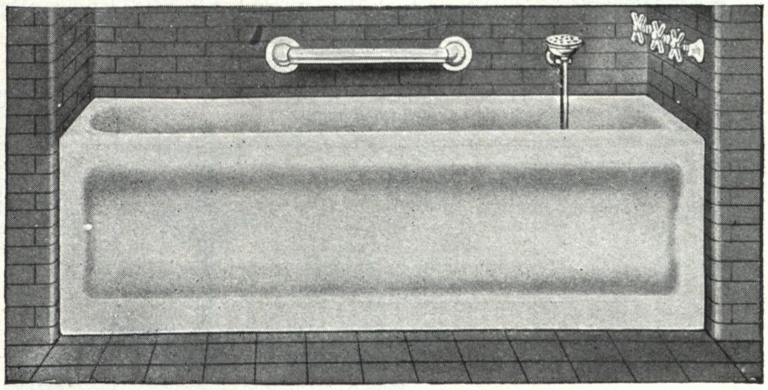
Manufacturers of Enamel Ware and Sanitary Products

LOUISVILLE, KY.

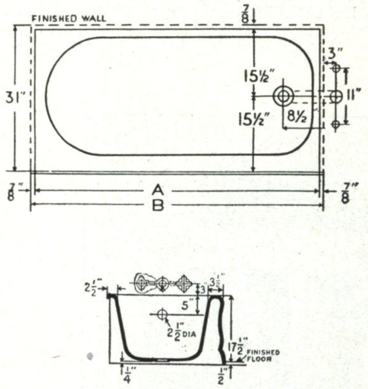
Columbia Enameled Cast Iron Plumbing Fixtures

The patterns below indicate the essentials of our ware by which all our other products may be safely judged.

We recognize the necessity of applying the enamel for service and durability—as well as for beauty and luster. We have from the first realized that only through strict adherence to the highest standards of material and workmanship could we aspire to the production of a superior enamel ware.



C-140 "Perennial"

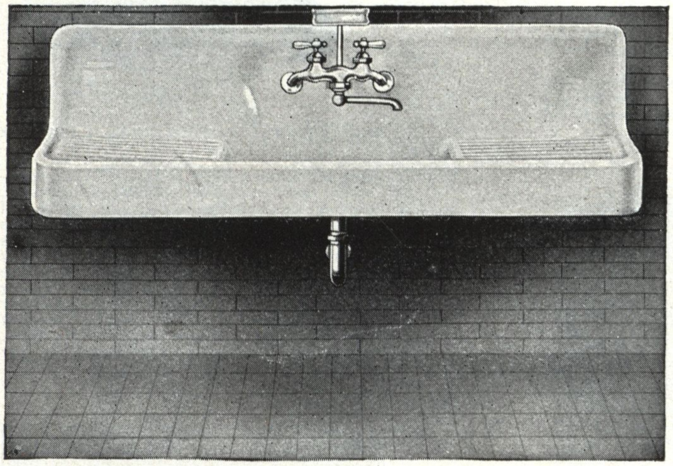


Roughing-in Measurements

"Columbia" Porcelain Enameled One-piece Built-in Bathtub to Tile Into Recess

Dimensions

	A	B
5 foot	58¼ in.	60 in.
5½ foot	64¼ in.	66 in.



C-405 "Hyperion"

"Columbia" Porcelain Enameled Cast Iron Kitchenette Sink

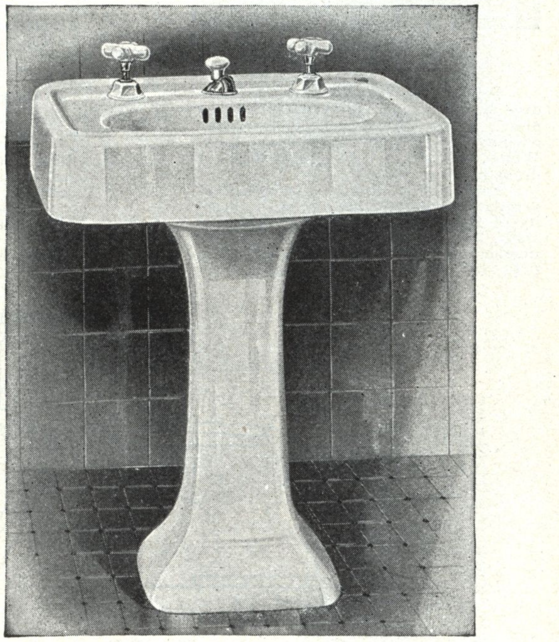
With apron, back and double drainboard cast in one piece. Supported on enameled adjustable legs and concealed wall hangers. Drains are pronounced and definite, slightly tapered to insure their function. Apron, also slightly tapered, perfects the design and renders this sink a model for the modern home, very pleasing in appearance and a joy to the housewife.

Dimensions

Sink	20x24 in.
Drainboard	20x20 in.
Apron	5 in.
Back	12 in.
Length over all	60 in.

Roughing-in Measurements

Wall to center of waste	10 in.
End of fixture to center of waste	30 in.
Center to center of supply	8 in.
Top of rim to center of supply	7½ in.



C-225 "Paladin"

"Columbia" Porcelain Enameled Cast Iron Pedestal Lavatory

With D pattern bowl, rear outlet. Smooth all over, pedestal enameled inside and outside, which precludes the possibility of rust developing on tiled floors. Provisions are made in the base for fastening firmly to the floor.

Dimensions

Slab	20x24 in.
Bowl	12x16 in.
Depth of apron	5 in.
Height from floor to top of rim	30 in.

Roughing-in Measurements

When 2 inches from the wall and with trap and supplies to floor

Center to center of supply	12 in.
Wall to center of supply	6½ in.
Wall to center of waste	9¼ in.

THE D. A. EBINGER SANITARY MFG. CO.

"Ebco" Ventilated Toilet Fixtures and Drinking Fountains

COLUMBUS, OHIO

For list of Branch Offices and Agencies, see page 1988

Products

VENTILATED INDIVIDUAL and RANGE CLOSETS.
VENTILATED VITRO PORCELAIN URINALS.
VENTILATED OCTAGON and WALL URINALS.
LAVATORIES.
DRINKING FOUNTAINS
WASH SINKS AND SHOWERS.
For Steel Toilet and Shower Enclosures see pages 1988-1989.

VENTILATION INSURES SANITATION
EBCO
TRADE MARK
THE SAFE WAY TO HEALTH

TRADE-MARK

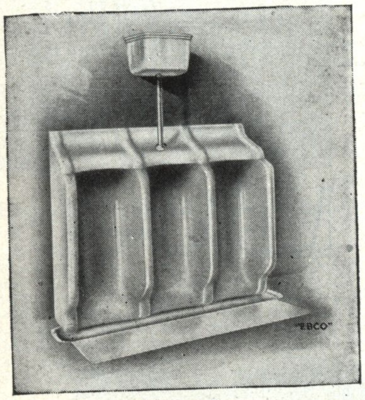
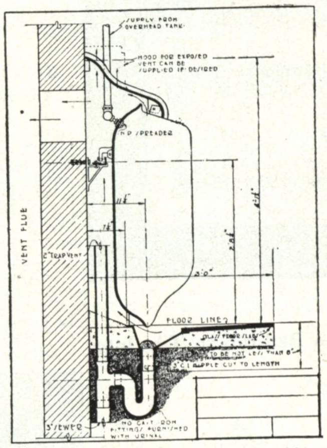


Plate A-3

"EBCO" VENTED URINAL

SPECIFICATIONS, Plate A-3—Concave back and partitions made in one piece. Each urinal back flushed periodically from automatic flush tank. White glass floor slabs (if desired) drain into receptor.

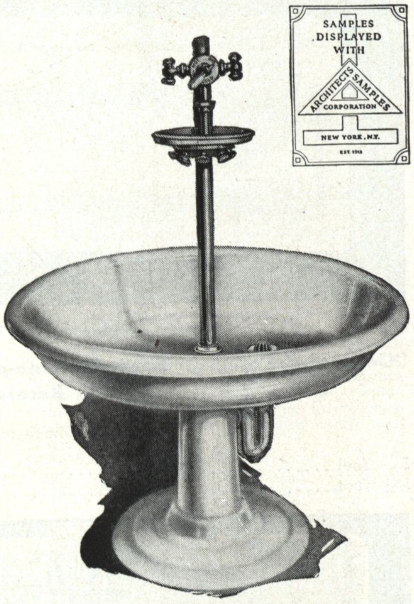
Each stall shall have two points of ventilation, top and bottom, with capacity of 25 sq. in. per section. Width of stalls, 20 in.; over-all length of battery, number of stalls x 20 in. + 2½ in. (2½ in. allows for end projections.)


SUPPLY FROM OVERHEAD TANK
HOOD FOR EXPOSED VENT CAN BE SUPPLIED IF DESIRED
N P SPREADER
11"
1¼"
2" TRAP VENT
VENT FLUE
3'0"
2'8"
4'1"
FLOOR LINES
GLASS FLOOR SLABS
TO BE NOT LESS THAN 6"
3" C I NIPPLE CUT TO LENGTH
3" SEWER
NO CAST IRON FITTINGS FURNISHED WITH URINAL

SECTIONAL DETAIL A-3
URINAL

Showing method of ventilation through rear wall. Can also be furnished for overhead ventilation.

"Ebco" vitreous enameled ventilated urinals may consist of any number of stalls, with underground or overhead ventilation



SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1910

Plate D-311

"EBCO" PORCELAIN ENAMELED CIRCULAR WASH SINK

SPECIFICATIONS, Plate D-311—"Ebco" circular wash sink, enameled inside and outside, mounted on enameled pedestal; 2-in. waste and trap with cleanout; 1½-in. nickelplated brass iron pipe size continuous vent, to which is fitted porcelain enameled soap tray; rose sprays equipped with individual stops; temperate water is furnished through anti-scalding mixing valve. This sink is designed for shoulder shower or ordinary lavatory facilities without interference from pipes or supports to users.

Diameter, 48 in. for 8 men; 54 in. for 10 men

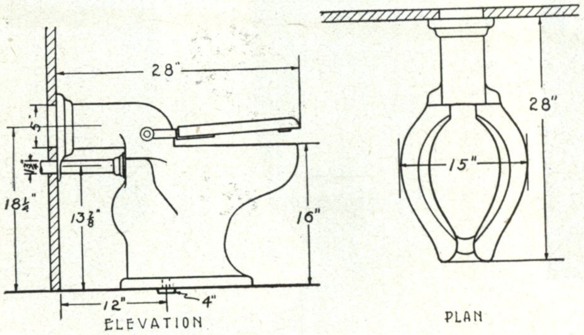

28"
5"
1¾"
18¼"
13⅞"
16"
12"
4"
ELEVATION
28"
15"
PLAN

Plate B-61

"EBCO" SPECIAL VENTED CLOSET

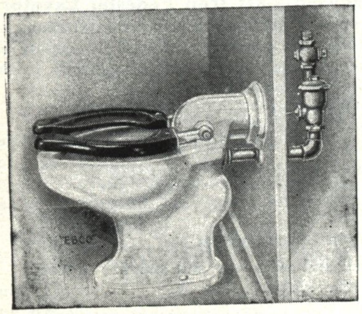


Plate B-61

"EBCO" SPECIAL VENTILATED AUTOMATIC CLOSET

SPECIFICATIONS, Plate B-61—"Ebco" special ventilated automatic closet; heavy vitreous china bowl, extended front and rear, with large raised rear vent; automatic seat-operated concealed Sloan flush valve; heavily reinforced oak or Whalebonite seat, open front and rear

"EBCO" SPECIAL VENTILATED CLOSET COMBINATION

SPECIFICATIONS, Plate B-59 — "Ebco" special ventilated closet combination; heavy vitreous china vented closet, extended front, with large raised rear vent; hand operated Sloan flush valve with oscillating handle; reinforced oak or Whalebonite seat, open front and rear

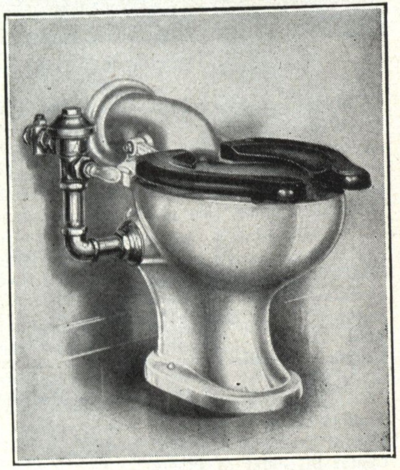


Plate B-59

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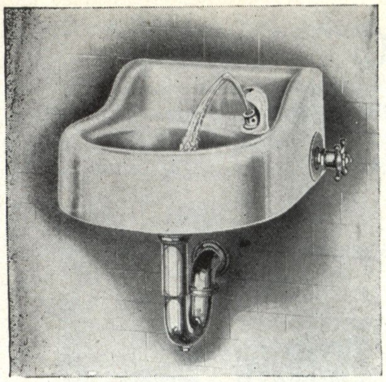


Plate C-243

"Ebco" Vitreous Enameled Wall Fountain

Specifications — "Ebco" vitreous enameled wall fountain with angle jet bubbler; self-closing and loose key stop valve; nickelplated "P" trap.
Width across back, 11½ in.
Projection from wall, 14 in.
⅜-in. supply.
1¼-in. nickelplated "P" trap

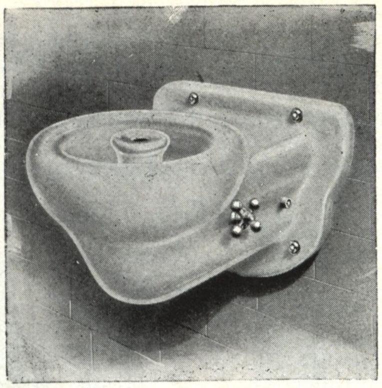


Plate C-242

"Ebco" Vitreous China Wall Fountain

Specifications—"Ebco" vitreous china wall fountain with china or nickelplated bubbler; self-closing and loose key stop valve; concealed trap.
Width across back, 13½ in.
Projection from wall, 14½ in.
⅜-in. supply.
1¼-in. nickelplated "P" trap

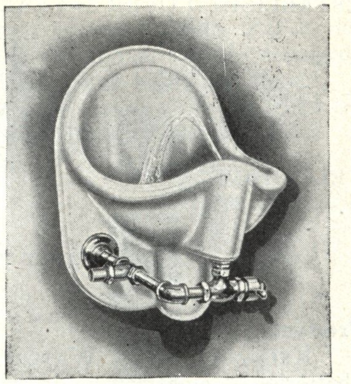


Plate C-245

"Ebco" Vitreous China Wall Fountain

Specifications—"Ebco" vitreous china wall fountain with integral angle jet bubbler; self-closing and loose key stop valve; integral trap to wall with connecting flange.
Width across back, 11 in.
Projection from wall, 12 in.
⅜-in. supply.
Trap connection, 1¼-in. I. P. S.

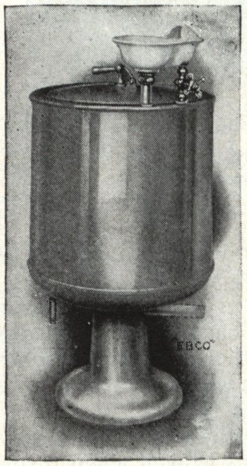


Plate C-271

"Ebco" Cooler Fountain

Specifications, Plate C-271—"Ebco" combination water cooler and drinking fountain. Ice capacity, 75 lb. Supplied with copper cooling coil and enameled receptor. Thoroughly insulated with ground cork. Can also be supplied with 2 bubblers or without any bubblers if desired.
Diameter of tank 19½ in.

"Ebco" Frigidaire Drinking Fountain

Plate C-301. The latest development in drinking fountains. Requires no ice or icing and is equipped with Frigidaire cooling unit as manufactured by the Delco Light Co. Simply specify "Ebco" Frigidaire cooler. Equipped as shown, or can be supplied with 2 bubblers or without any bubbler, or also cafeteria type for filling glasses

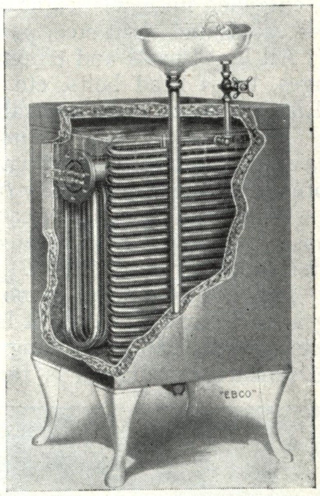


Plate C-301

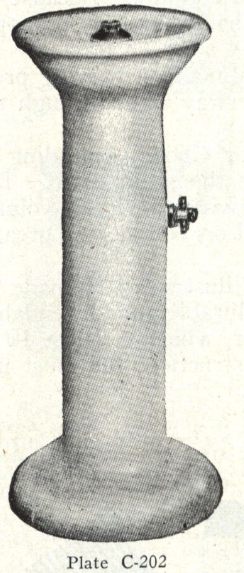


Plate C-202

"Ebco" Vitreous Enameled Pedestal Fountain

Heights, 30, 36 and 42 in.
Specifications—"Ebco" pedestal fountain (indicate height desired) with nickelplated bubbler with guard ring; self-closing and stop valves.
Diam. of base, 14¼ in.
Diam. of bowl, 13 in.

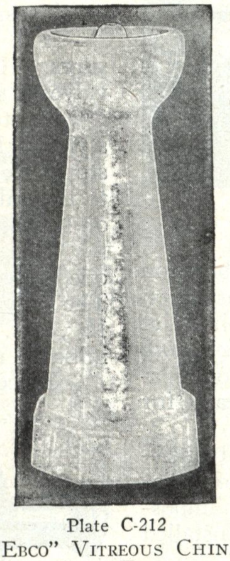


Plate C-212

"Ebco" Vitreous China Pedestal Fountain

Height 30 in.
Specifications—"Ebco" vitreous china pedestal fountain complete with china or nickelplated bubbler; self-closing and stop valve.
Diam. of base, 11½ in.
Diam. of bowl, 11½ in.

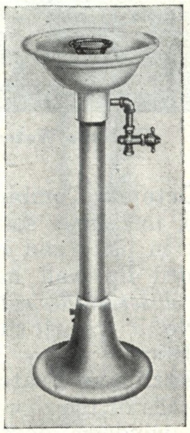


Plate C-228

"Ebco" Pedestal Drinking Fountain

Heights, 30 to 42 in.
Specifications—Vitreous enameled bowl; painted galvanized pedestal and waste with adjustable cast iron base; self-closing valve; nickelplated bubbler.
Diam. of base, 11½ in.
Diam. of bowl, 13 in.

ESTABLISHED OVER 35 YEARS

THOS. KELLY & BROS., INC.

Manufacturers of Plumbing Supplies

3422-3426 West Lake Street
CHICAGO, ILL.

TELEPHONE
Kedzie 0083

KELLY PRODUCTS ARE SOLD BY ALL JOBBERS OF PLUMBING SUPPLIES

Products

Kelly Octopus Water Closet Combinations (batteries of eight closets on a single soil fitting).

Kelly Flush Valves.

Kelly Automatic Seat-action Compression Tank After-flush Water Closets.

Kelly Frostproof Water Closets.

Kelly Octopus Water Closet Combinations

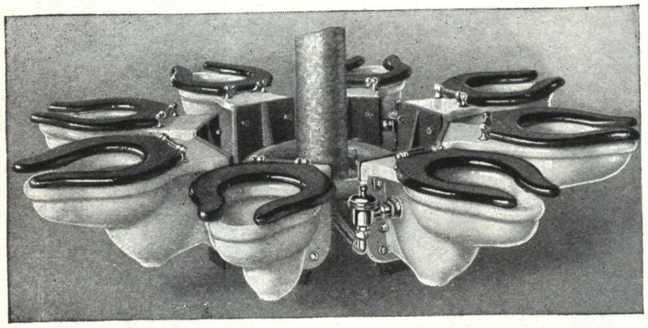
Octopus Combination No. 5—This outfit comprises an installation of eight complete wall hung, siphon jet, extended lip bowls, eight open front oak seats, eight flush valves and eight steel partitions.

All brass parts and trimmings such as flush valves, hinges, brass head bolts, etc., are polished nickelplate. All iron or steel parts are galvanized.

The roughing-in is completed with the installation of a single Octopus soil fitting. This fitting obviates the scores of fittings used in any other ordinary installation.

Water supply is taken care of by only two fittings, whose roughing-in is completed with and met by a 2-in. water supply from the main.

Labor is minimized, as no cutting, fitting or threading is necessary. The outfit is shipped ready to install. Bolts, gaskets and everything necessary for a complete and finished installation is furnished.



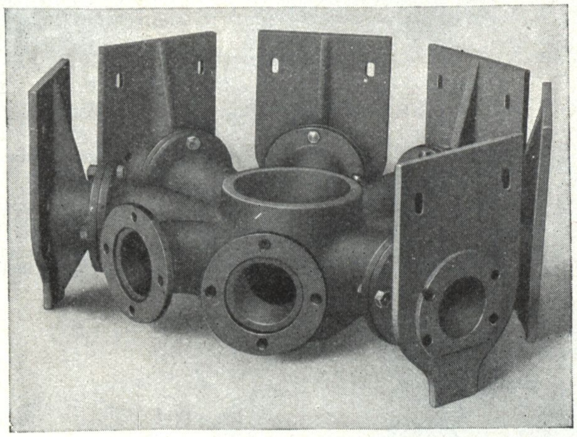
Octopus Water Closet Combination No. 5
Partitions removed

Octopus Combination No. 6—As in combination No. 5, the single soil fitting shown in the illustration is put in place and is equipped with eight siphon jet extended lip wall hung *seat-action compression tank water closet outfits complete*, and, like Octopus combination No. 5, it is all cut to fit and is complete, ready for installation.

Exclusive Feature of Octopus Combinations—The walls of the room may be used for urinals or lavatories, windows, doors or ventilation, which is impossible where eight ordinary water closets are installed along the wall.

Extras—Marble partitions of any kind, also slate partitions, will be furnished at additional cost. This type of installation is equipped with heavy brass standards and fittings in keeping with such equipment.

Doors furnished at additional cost.



Octopus Soil Fitting
Two flanges removed

Kelly Flush Valve

The Kelly flush valve has only one moving part—a bronze bellows.

Through many years of use in steam and pressure applications, this bellows principle has been demonstrated to be far superior to rubber or leather diaphragms, which are the uncertain mediums through which numerous other flush valves are operated.

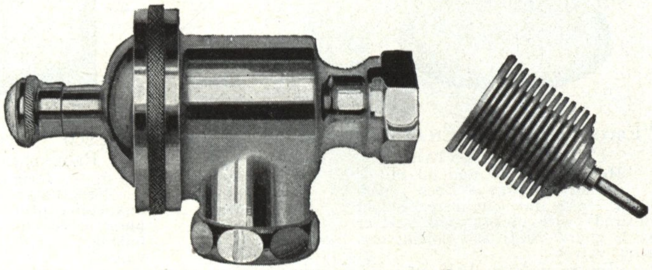
Because of its construction, the Kelly flush valve is universal; that is, it operates just as well when turned to right or left, vertically or horizontally. Because of this, the same style is used on a back supply, top supply or side supply bowl.

The valve requires no adjustment on varying pressures. Having a clear 1-in. waterway right through the valve, a strong flush results.

A stop cock and tailpiece or elbow (according to style of bowl) are furnished at the same price. The stop cock opens to one full inch, giving maximum volume to the valve (flush valves depend on volume for greater or less satisfaction).

The bellows shown in the illustration is made of one piece of metal and is most durable and dependable. The only packing is sheet rubber, which will last 10 to 15 years. With this simple construction, the most uninitiated may easily make a repair.

Prices on application.



Kelly Flush Valve and Bellows

Continued on next page

Kelly Automatic Compression Tank Seat-action Water Closets

All Kelly automatic compression tank seat-action water closets shown below flush easily at 20 lb. pressure.

Closets are furnished with concealed tank, if desired, at the same price. Polished nickelplated trim is extra. Open front seats, same price as closed front. All valves are simple, need no adjusting, and are easily repaired.

Fig. 100 may be had with tank below the floor.

We are the oldest manufacturers of this type of closet and our prices are most reasonable.

Prices on application.

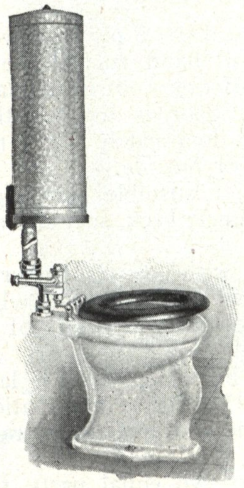


Fig. 131

Kelly two-fired vitreous china bowl with *jet* and beveled base; equipped with heavy bronze automatic seat-action flush valve; galvanized iron pressure tank and japanned iron tank bracket; 1¼-in. galvanized flush pipe; golden quarter-sawed oak seat with bronze hinge and trimmings.

Roughs in 15½ in. from finished wall to center of floor outlet of bowl.

All moving parts above bowl

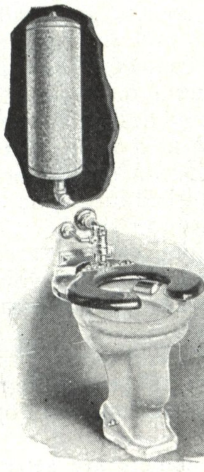


Fig. 132½

Kelly two-fired vitreous china siphon action bowl with *jet* and raised rear polished cast aluminum vent (indestructible); polished nickelplated heavy bronze automatic seat-action flush valve; galvanized iron concealed pressure tank; japanned iron tank bracket; 1¼-in. flush couplings; heavy golden quarter-sawed oak open front seat; polished nickelplated hinge and trimmings.

All moving parts above bowl

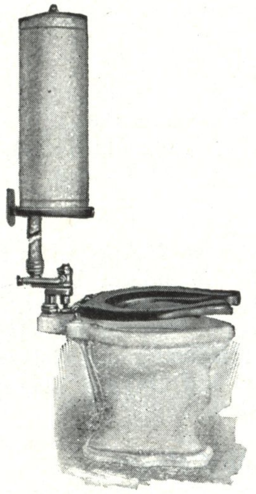


Fig. 137

Kelly two-fired vitreous china siphon action washdown bowl with *jet*, extended lip and beveled base; heavy bronze automatic seat-action flush valve; galvanized iron pressure tank; japanned iron tank bracket; 1¼-in. galvanized flush pipe; heavy golden quarter-sawed oak open front crescent seat; bronze hinge and trimmings.

Roughs in 15½ in. from finished wall to center of floor outlet of bowl.

All moving parts above bowl

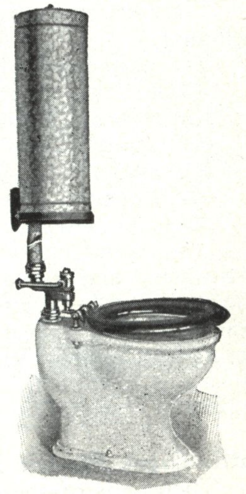


Fig. 129

Kelly two-fired vitreous china siphon *jet* bowl with beveled base; heavy bronze seat-action flush valve; galvanized iron pressure tank; japanned iron tank bracket; 1¼-in. flush pipe; golden quarter-sawed oak seat; bronze hinge and trimmings.

Roughs in 10½ in. from finished wall to center of floor outlet of bowl.

All moving parts above bowl

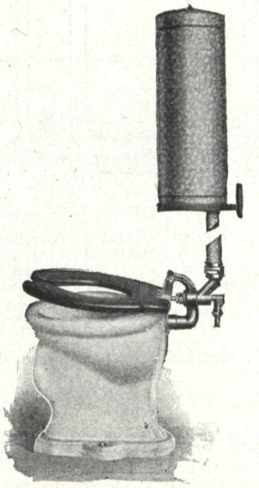


Fig. 109

Kelly two-fired vitreous china siphon action bowl with *jet* and beveled base; heavy bronze automatic seat-action flush valve; galvanized iron pressure tank; strong japanned iron tank bracket; 1¼-in. flush pipe; golden quarter-sawed oak open front seat; bronze hinge integral with valve.

All moving parts above top of bowl.

Roughs in 15½ in. from finished wall to center of floor outlet of bowl

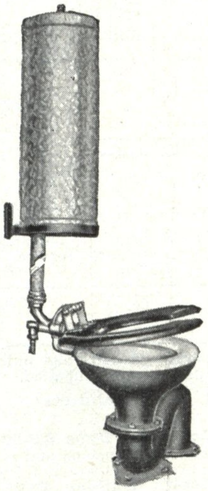


Fig. 105

Kelly round iron hopper with S trap to calk or with flange at floor as shown; hopper white enameled inside, painted outside; white enameled roll rim; heavy bronze automatic seat-action flush valve; galvanized iron pressure tank (8x24 in.); japanned iron tank bracket; 1¼-in. flush pipe; quarter-sawed oak extra heavy open front seat with bronze hinge integral with valve.

Roughs in 13½ in. from wall to center of bowl; 11 in. from center of bowl to center of trap outlet in any direction, backward or to side.

All moving parts above bowl

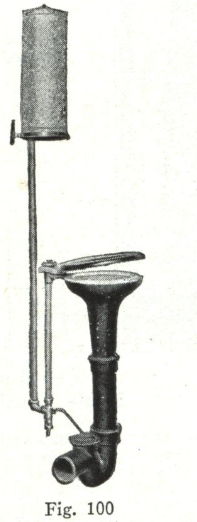


Fig. 100

Kelly frostproof hopper, white enameled inside, painted outside, white enameled roll rim; reinforced quarter-sawed oak seat; galvanized iron pressure tank (8x24 in.); heavy japanned iron tank bracket; galvanized iron flush pipes; heavy brass valve; lead waste connection. All tested under hydraulic pressure.

Tank fills when seat is occupied and closet flushes when seat is released. All water then drains out of every part of the fixture above the waste, which is below the frost line.

Hoppers furnished to calk unless ordered with flange at floor. Soil pipe and trap excluded

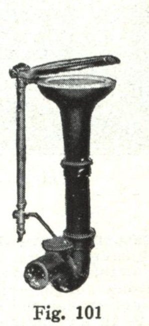


Fig. 101

A frostproof hopper having the same construction as Fig. 100 except that there is no tank and but one flush pipe.

Closet flushes while seat is occupied. When seat is released, all water drains out of every part of the fixture above the waste, which is below the frost line.

Hoppers furnished to calk unless ordered with flange at floor. Soil pipe and trap excluded

Kelly Automatic Compression Tank Seat-action Water Closets (Patented)

SANITARIUM AND HOSPITAL EQUIPMENT CO.

Manufacturers of Physiotherapy Appliances

BATTLE CREEK, MICH.

Products

THERAPEUTIC and PHYSIOTHERAPY APPLIANCES, including:

ELECTRIC LIGHT BATH CABINETS.
HYDROTHERAPEUTIC or DOUCHE APPARATUS.
RADIANTOR (Portable Electric Light Bath).
OSCILLO-MANIPULATORS (Massaging Machines).
KNEADING (Mechanical Massaging) TABLES.
MECHANICAL HORSES.
MASSAGE TABLES.

Also manufacturers of other Health Appliances for institutions and private homes, including Vibratory Chairs, Solar Arc Lamps, Photophores (appliances for local application of heat), Thermophores (Electric Heating Pads), Electric Vibrators, Sinusoidal and Galvanic Apparatus, Automatic Exercisers and Oxygen Therapy Apparatus, Incline Exercise Tables.

Battle Creek Electric Light Bath Cabinets

Thousands of these cabinets have been in constant use in the great health institutions for many years and are favorably known the world over for their high class construction and lasting qualities.

Following are the characteristics that are common to all cabinets listed under the accompanying illustration.

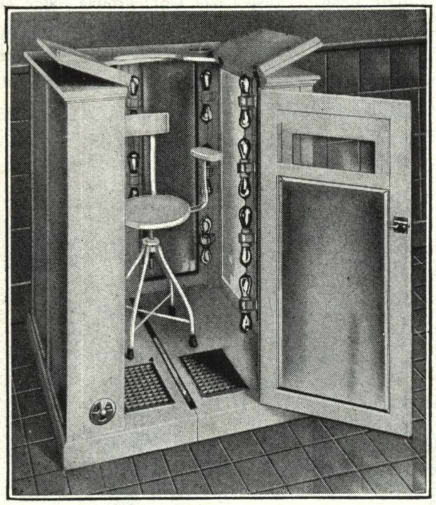
Cabinets are made of the best 5-ply hardwood veneer and finished in beautiful hand rubbed aseptic white enamel. Trimmings are of rustproof nickelplated aluminum or brass. Entrance door is fitted with a specially designed lever handle door catch which may be operated from either inside or outside.

Special spring-back chairs, adjustable for height, are finished in aseptic white enamel; back, seat and arm are made of wood.

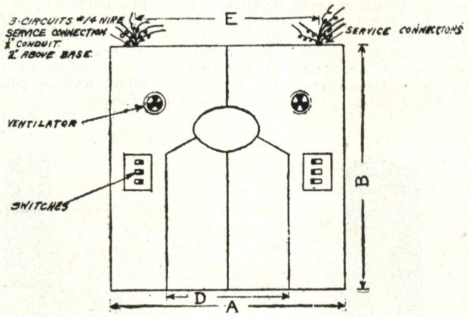
Foot warmers are covered with smooth, rustproof nickelplated grates which are easy to walk on and which will not cut, bend, break or give with the weight of the body.

All entrance doors are 22 in. wide, which is large enough to permit ingress and egress to any patient. Two small top doors open to the width of the entrance door.

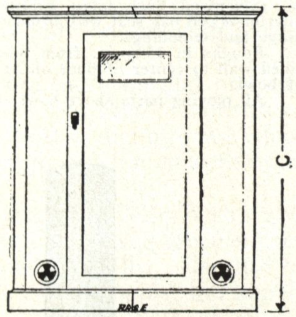
Cabinets are separable into two equal parts, permitting easy carriage through any ordinary door and convenient transportation from one place to another. The special sectional wiring is not affected by separation of the cabinet.



Universal Type SP-50



Plan



Front Elevation

Type	Width (A), in.	Depth (B), in.	Height (C), in.	Width of front door, (D), in.	Distance between service connections (E), in.	Number of lamps	Total watts	Number of circuits in each half
J-50	42	44	50	22	33	50	2940	3
SP-50	40	42	50	22	31	50	2940	3
C-32	34	36	50	22	29	34	1980	1

All types are made to operate on 110 volts unless otherwise specified. Each half of cabinet is wired in three circuits. Fuse box not supplied.

Battle Creek Electric Light Bath Cabinets

Aristocrat Type J-50—Has 50 standard 100-volt 60-watt bulbs, two special footlights, French bevel plate mirrors, observation window, and two adjustable rustproof ventilators built into the top and two in the lower front. Eight sanitary metal legs with adjustable ball tips raise the cabinet to convenient stepping distance and assure solid contact at all points on an uneven floor. All switches are conveniently located at top of cabinet.

Universal Type SP-50—Same general design as the Aristocrat has but smaller dimensions and is equipped with crystal plate mirrors. Adjustable sanitary legs are not furnished unless otherwise specified.

Health Builder Type C-34—Very similar in design to the two preceding types, but has smaller dimensions and is equipped with 32 Mazda mirror reflector type lamps controlled by convenient switches located inside the cabinet within easy reach of the bather. Has crystal plate mirrors. Not equipped with observation window or ventilators.

Hydrotherapeutic or Douche Apparatus

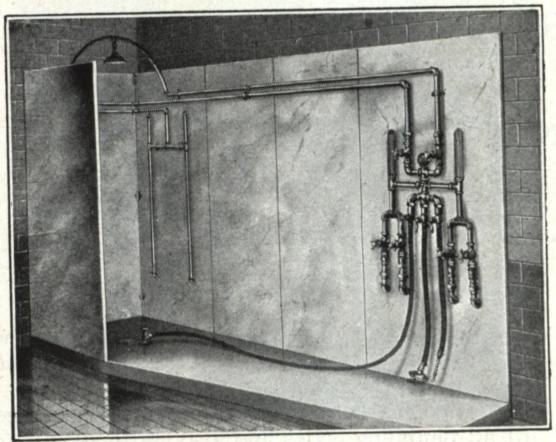
Type G-3—Intended for hospitals and other large institutions, and requires the services of an attendant. It has wall type control and gives the jet, rain or shower, perineal, needle, spray and Scotch forms of douches.

The temperature regulating valves and the needle and overhead shower control valves are of the quick-acting compression type; less than one-half turn of the lever handle opens or closes the valves. The simple, quick-change valve located in center of control unit consists of very few moving parts. To change from one side to the other requires only a small movement of the handle. The two high grade, quick-acting mercury type thermometers have nickelplated bronze cases and glass faces. An accurate pressure gauge shows the pressure of any application. Constructed throughout of high quality, heavily nickelplated brass. Piping is heavy brass, 1-in. iron pipe size.

The supply pipes (2 hot and 2 cold) may be run in through the wall or floor. Wall connectors are

Continued on next page

furnished unless otherwise specified. The apparatus is shipped in assembled sections and the control board is one unit, therefore installation is easy. May be placed anywhere and requires little floor space (see detail). Marble slabs not included.

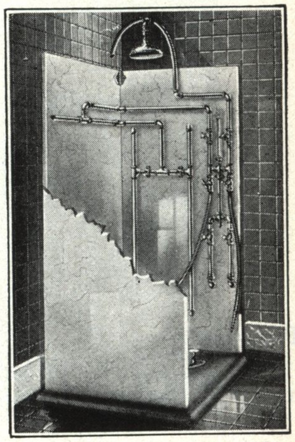


Type G-3 Hydrotherapeutic or Douche Apparatus

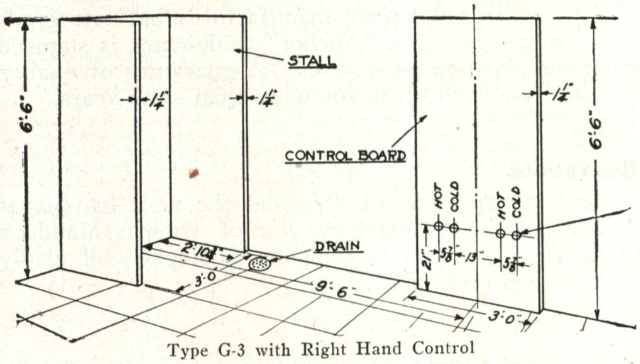
Type H-34—A simplified form of Type G-3 apparatus, the range of application obtainable being sufficient for ordinary purposes. Suitable for private homes, gymnasiums and other places where improved douche or shower bath apparatus is wanted that does not require an attendant. All the attachments that go with the Type G-3 apparatus are supplied with Type H-34, therefore the same forms of douches are obtainable.

All piping is extra heavy brass, ¾-in. iron pipe size. The supply pipes (one hot and one cold) may be run in through wall or floor. Wall connections furnished unless otherwise specified. Marble slabs not included.

Shipped in assembled sections, same as Type G-3, making installation easy.



Type H-34 Home Douche



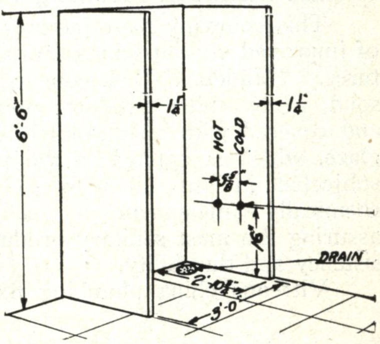
Type G-3 with Right Hand Control

Apparatus is built to fit the dimensions given, unless otherwise specified. Any dimension can be changed as desired.

Left hand control can be made, if desired.

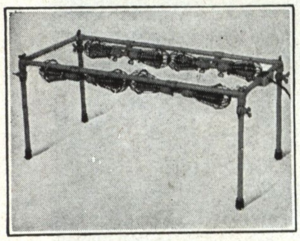
Drain should be located near outer edge of stall so that patient need not stand on it.

Supply pipes should be of 1-in. size for Type G-3 and ¾-in. for Type H-34, and they should protrude just enough so that the ells of the apparatus can be screwed on to them against the wall or slab.



Type H-34 with Right Hand Control

Roughing-in Dimensions of Battle Creek Hydrotherapeutic or Douche Control Apparatus



Radiantor

A portable electric light bath made of steel tubing which conducts the wires to which lamp sockets are attached. Reflector lamps used, protected by wire guards. Each lamp has a switch; any number of lamps can be used. Legs can be placed at any angle or folded up. Furnished with service cord and plug for connection to ordinary light socket. Finished in gray enamel. Three models, with 8, 12 and 18 lamps; total wattage, 480, 720 and 1080, respectively.

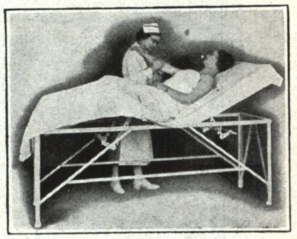
Massage Table

Type R-1 consists of an angle steel welded frame finished in aseptic white enamel throughout. Top made of 5-ply hardwood veneer and constructed in three sections, which are easily and quickly adjusted to any position.

Legs are provided with sliding casters.

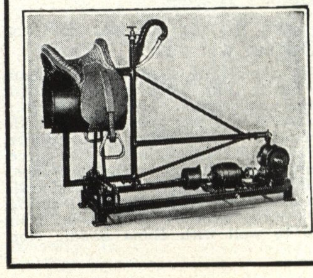
Length, 80 in.; width, 25½ in.; height, 30 in.

Type R-2 is the same as Type R-1 except that the top is in one piece.



Oscillo-Manipulator

A mechanical massaging machine having heavy angle steel frame. Finished in Duco gray enamel with nickelplated trimmings. Oscillating discs are mounted on a shaft rotated by a ¼ hp. electric motor and are so connected that a slow, medium or fast rate may be secured. Motion or stroke readily lengthened or shortened. Furnished with service cord and plug for connection to ordinary lamp socket. Length, 20 in.; width, 14 in.; height, 44 in. Current consumption, 500 watts.

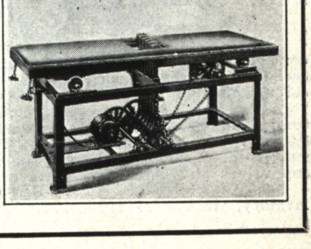


Mechanical Horse

Consists of a very strong tubular steel frame mounted on an angle steel base and furnished with or without genuine russet leather saddle. Finished in gray enamel, with nickelplated trimmings. Three gaits are obtainable—trot, canter and gallop. Furnished with service cord and plug for connection to ordinary lamp socket. Length, 71 in.; width, 24 in.; height, 40 in. Current consumption, 660 watts. ½ hp. motor. Gears are enclosed in a tank of oil, which eliminates friction and noise.

Kneading Table

A mechanical massaging table having sturdy angle steel frame, finished in black enamel with nickelplated trimmings. Has removable top upholstered in black leather. The 6 kneading arms are operated by a ½ hp. electric motor. Toggle switch for starting and stopping is conveniently placed at one end. Furnished with service cord and attachment plug for connection to ordinary lamp socket. Length, 73 in.; width, 29 in.; height, 33 in. Current consumption, 660 watts.



THOMAS MADDOCK'S SONS CO.

Manufacturers of Vitreous China Sanitary Plumbing Fixtures

TRENTON, N. J.

Products

Manufacturers of VITREOUS CHINA PLUMBING FIXTURES.

Thomas Maddock Plumbing Fixtures

This company manufactures a complete line of improved vitreous china sanitary plumbing fixtures. "Maddock's" vitreous china sanitary ware is a solid white china product, non-absorbent throughout and covered with an absolutely impervious transparent glaze, which is applied to the vitreous chinaware and subjected in our kilns to so intense a heat as to chemically amalgamate all substances used, thereby assuring the most sanitary product of the greatest consistency and durability.

Vitreous china plumbing fixtures can not become discolored through usage, and are kept clean with but ordinary attention, the glaze permanently maintaining its lustrous gloss.

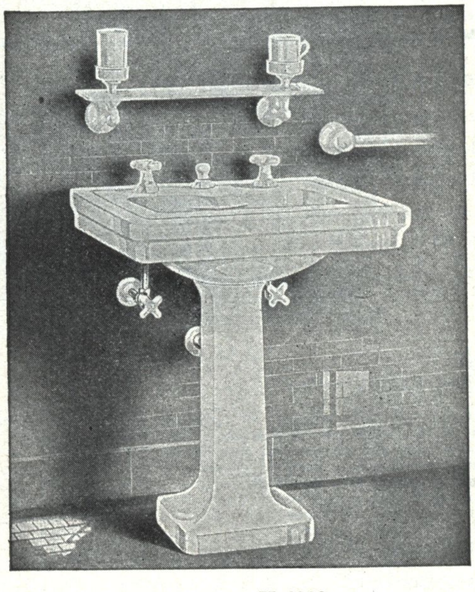
In construction they meet the requirements of all plumbing codes and also conform in design to architectural ideas as to style and adaptability.

This company manufactures but one grade of goods. The "Anchor" trade-mark is stamped under the glaze on all fixtures. A guarantee of quality that we have lived up to for more than sixty years.

TRADE-MARK

Illustrations

The illustrations on this and the next two pages show a part of the extensive line of Thomas Maddock Plumbing Fixtures. A complete catalogue will gladly be furnished on request.



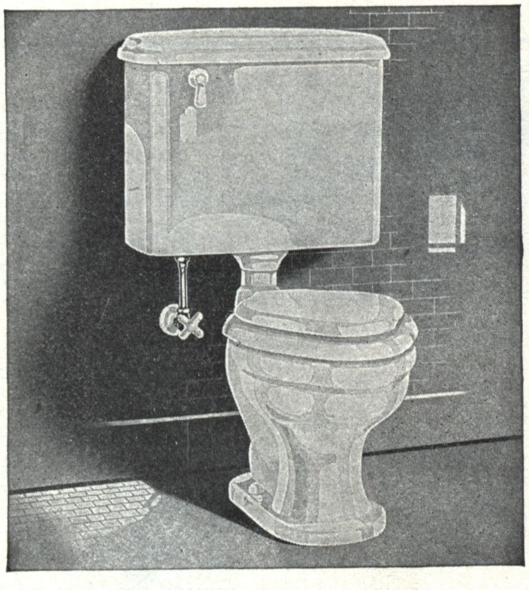
MADBURY K-2000

WHITE VITREOUS CHINA STRAIGHT FRONT INTEGRAL SUPPLY NOZZLE LAVATORY AND PEDESTAL

SPECIFICATION—White vitreous china straight front lavatory; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl 6½ in. deep, hooded overflow, antisplash rim, plain square pedestal and nickelplated brass wall brackets.

Fitted with compression supply valves with all-china cross arm handles and escutcheons, pop-up waste with all-china knob and escutcheon, 1¼ or 1½-in. nickelplated brass "P" trap to wall with china escutcheon and ⅜-in. nickelplated brass supply pipes to wall with china handle stop valves and china wall escutcheons

	DIMENSIONS		
Lavatory, in.	20x24	22x27	24x30



ARISTON-MADERA SILENT K-2904

WHITE VITREOUS CHINA NON-SOILING SILENT ACTION SIPHON JET CLOSET; TOP INLET, FLOOR OUTLET WITH K-3110 TANK

SPECIFICATION—White vitreous china non-soiling silent action siphon jet closet with extended top inlet, floor outlet, 2-in. brass spud, extended front bowl and cut-back rim flushed all the way around. Height, 14½ in.; opening of bowl, 10x16 in.; water surface, 10x14 in.; sanitary rim with 1¼-in. downward projection inside of bowl and 3-in. water seal. White celluloid-covered seat and cover with concealed post hinge. One-piece white vitreous china flush pipe cover and white vitreous china bolt caps.

K-3110 white vitreous china tank, fitted with nickelplated brass flush connection, top side lever with china handle and escutcheon, silent acting ball cock, extra heavy flush valve with large overflow and ⅜-in. iron pipe size nickelplated brass supply pipe to wall with china handle stop valve and china wall escutcheon

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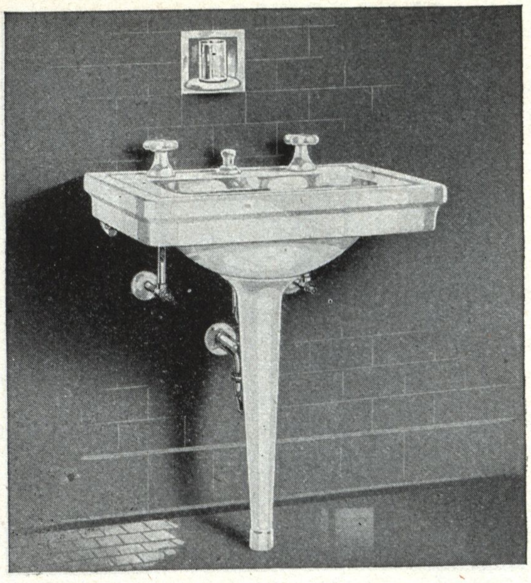


Madbury K-2201

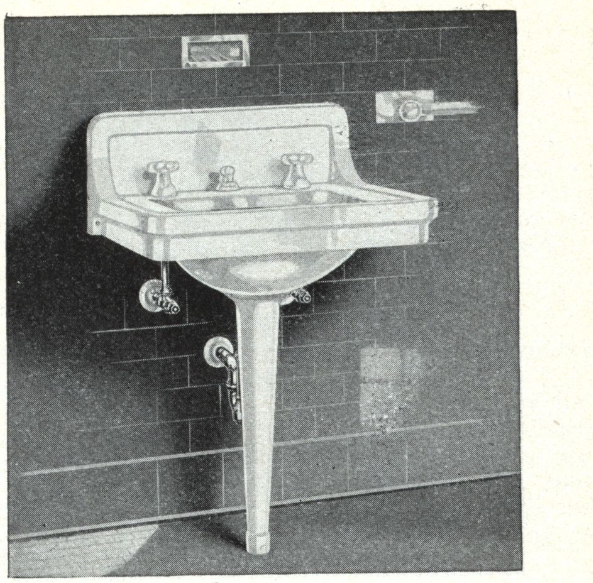
White Vitreous China Straight Front Integral Supply Nozzle Lavatory and Leg

Specification—White vitreous china straight front lavatory; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl 6½ in. deep, hooded overflow, antisplash rim, vitreous china leg with rod and nickelplated brass wall brackets.

Fitted with compression supply valves with all-china cross arm handles and escutcheons, pop-up waste with all-china knob and escutcheon, 1¼ or 1½-in. nickelplated brass "P" trap to wall with china escutcheon and ⅜-in. nickelplated brass supply pipes to wall with loose key stop valves and china wall escutcheons

Dimensions

Lavatory, in.	18x20	20x24



Madbury K-2204

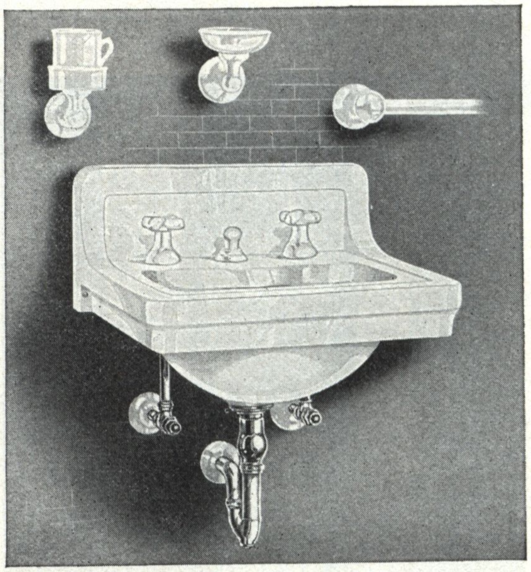
White Vitreous China Straight Front Integral Supply Nozzle Lavatory with 6-in. Integral Back and Leg

Specification—White vitreous china straight front lavatory with 6-in. integral back; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl 6½ in. deep, hooded overflow, antisplash rim, vitreous china leg with rod and concealed hanger.

Fitted with compression supply valves with all-china cross arm handles and escutcheons, pop-up waste with all-china knob and escutcheon, 1¼ or 1½-in. nickelplated brass "P" trap to wall with china escutcheon and ⅜-in. nickelplated brass supply pipes to wall with loose key stop valves and china wall escutcheons

Dimensions

Lavatory, in.	19x20	21x24



Madbury K-2403

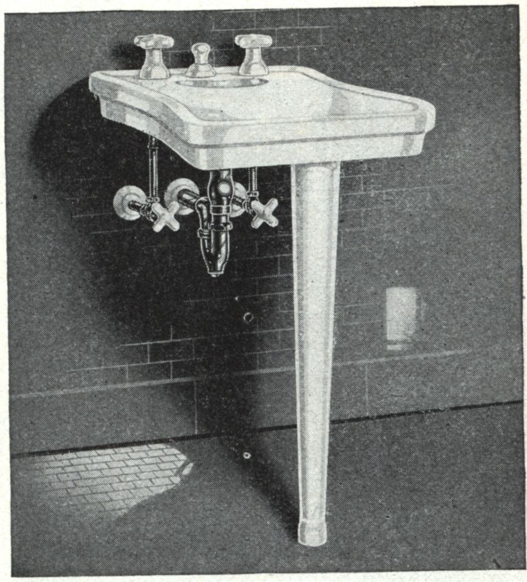
White Vitreous China Straight Front Integral Supply Nozzle Lavatory with 6-in. Integral Back and Concealed Hanger

Specification—White vitreous china straight front lavatory with 6-in. integral back; size 19x20 in., with integral supply nozzle, cleansing overflow feature, square bowl 6½ in. deep, hooded overflow, antisplash rim and concealed hanger.

Fitted with compression supply valves with all-china cross arm handles and escutcheons, pop-up waste with all-china knob and escutcheon, 1¼ or 1½-in. nickelplated brass "P" trap to wall with china escutcheon and ⅜-in. nickelplated brass supply pipes to wall with loose key stop valves and china wall escutcheons

Dimensions

Lavatory, in.	19x20



Madadore K-2303

White Vitreous China Manicuring Table and Leg

Specification—White vitreous china manicuring table; size 18x32 in., diameter of bowl 6½ in., with integral supply, hooded overflow, vitreous china leg with rod and nickelplated brass wall brackets.

Fitted with compression supply valves with all-china cross arm handles and escutcheons, pop-up waste with all-china knob and escutcheon, 1¼-in. nickelplated brass "P" trap to wall with china escutcheon and ⅜-in. nickelplated brass supply pipes to wall with china handle stop valves and china wall escutcheons

Dimensions

Table, in.	18x32

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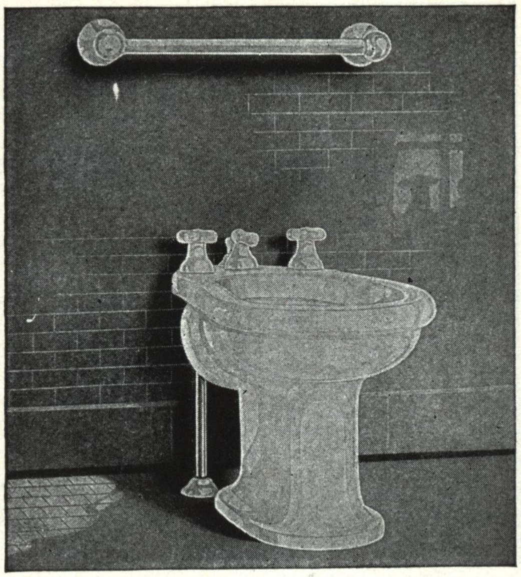
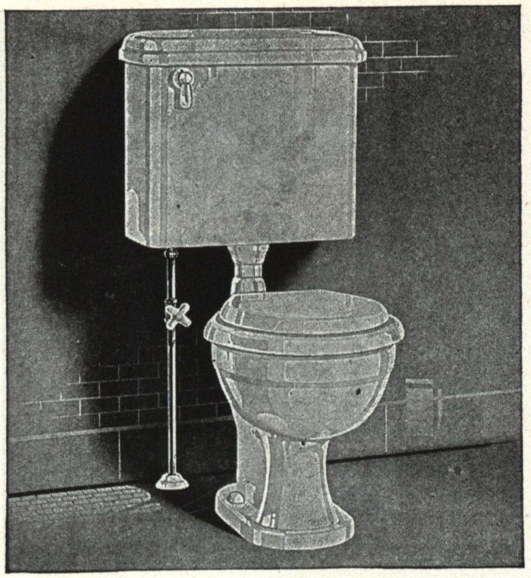


Madval K-2831

White Vitreous China Flushing Rim Pedestal Bidet with Douche

Specification—White vitreous china flushing rim pedestal bidet with douche; height, 15 in.; opening of bowl, 10x16 in.

Fitted with two compression supply valves with all-china cross arm handles and escutcheons and transfer valve with all-china lever handle and escutcheon, supplying hot and cold water to either flushing rim or center douche; pop-up waste with all-china knob and escutcheon and 1¼-in. outside diameter tail piece and ⅜-in. nickelplated brass supply pipes to floor with china floor escutcheons

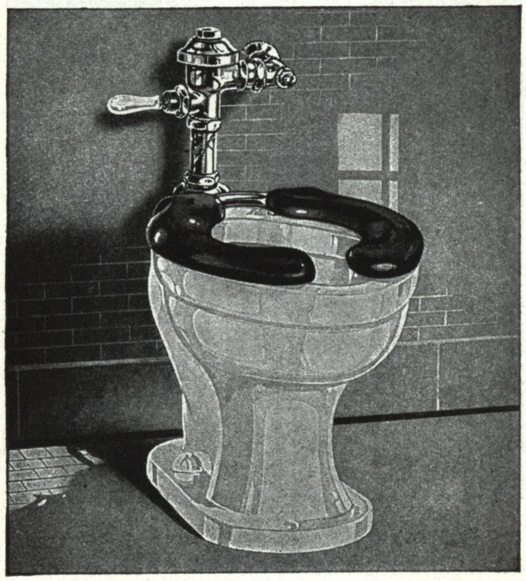


Madcliff K-3034

White Vitreous China Siphon Jet Closet; Top Inlet, Floor Outlet with K-3111 Tank

Specification—White vitreous china siphon jet closet with top inlet, floor outlet and 2-in. brass spud. Height, 15 in.; opening of bowl, 11x13 in.; water surface, 10x12 in. and 3-in. water seal. White celluloid covered seat and cover with heavy nickelplated brass bar hinge. One-piece white vitreous china flush pipe cover and white vitreous china bolt caps.

K-3111 white vitreous china tank, fitted with nickelplated brass flush connection, top side lever with china handle and escutcheon, heavy brass ball cock, flush valve with large overflow and ⅜-in. iron pipe size nickelplated brass supply pipe to floor with china handle stop valve and china floor escutcheon

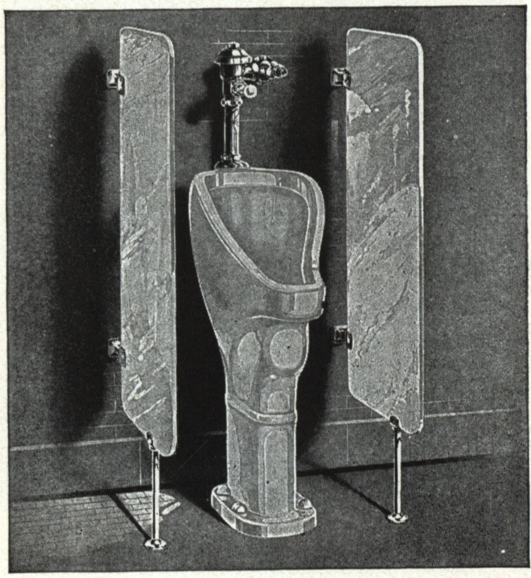


Ariston-Madera Silent K-2908V

White Vitreous China Non-soiling Siphon Jet Closet; Top Inlet, Floor Outlet with Flush Valve

Specification—White vitreous china non-soiling siphon jet closet with extended top inlet, floor outlet, 1¼ or 1½-in. brass spud, extended front bowl and cut-back rim flushed all the way around. Height, 14½ in.; opening of bowl, 10x16 in.; water surface, 10x14 in.; sanitary rim with 1¼-in. downward projection inside of bowl and 3-in. water seal.

Mahogany finished seat, no cover, open front and back, with heavy nickelplated brass bar hinge, white vitreous china bolt caps and nickelplated brass flush valve with china oscillating handle



Madstone K-3211V

White Vitreous China Siphon Jet Pedestal Urinal with Extended Lip; Top Inlet, Floor Outlet with Flush Valve

Specification—White vitreous china siphon jet pedestal urinal with top inlet, floor outlet, high back, extended front lip, flushing rim and 1¼ or 1½-in. brass spud. Opening of bowl, 10x18 in.; water surface, 6½x6½ in. and 3-in. water seal. Waterway through trap same size as water closet. White vitreous china bolt caps and nickelplated brass flush valve with china oscillating handle

AMERICAN AIRDRY CORPORATION

7722 South Chicago Avenue
CHICAGO, ILL.

·AIRDRY·

Airdry—The "Electric Towel"

Airdry, the "electric towel," is a complete unit consisting of an electric motor, a heating element and a fan, all enclosed in a beautiful white porcelain enameled case, and controlled by a conveniently located foot pedal.

When the pedal is pressed down with the foot, electrically heated air rushes out and dries the hands and face in a quick, *sanitary* way—by evaporation.

The Airdry nozzle is adjustable up and down, therefore it is equally suitable for drying the face and hands.

Drying can be accomplished as quickly with Airdry as with cloth or paper towels, and, while towels seldom dry thoroughly, Airdry completely evaporates all moisture which prevents chapping the skin.

Saves 60% to 85% of Towel Cost

Hundreds of Airdry users report savings of from 60% to 85% in towel cost since installation of Airdry in their establishments.

Airdry effects savings in towel cost as follows:

Laundering of 1500 individual cloth towels at the rate of 50 cents per hundred.......	$7.50
A standard case of paper towels contains 25 packages of 150 towels each, or 3750 towels per case. Conservatively estimating 2½ towels for the average dry, each case gives 1500 dries at an approximate cost of..........................	5.00
Airdry consumes 1000 watts (1 kilowatt) of current per hour of continuous service. Timing of thousands of Airdry machines shows 36 seconds to be the duration of the average dry. At 3 cents per kilowatt, 1500 dries with Airdry cost only........	.45

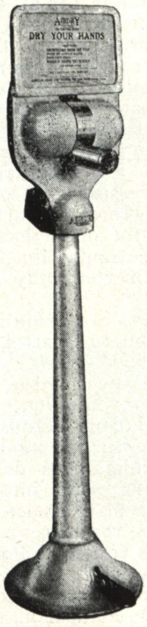
It is not unusual for Airdry to pay for itself in extremely busy lavatories in six months.

Absolutely Sanitary

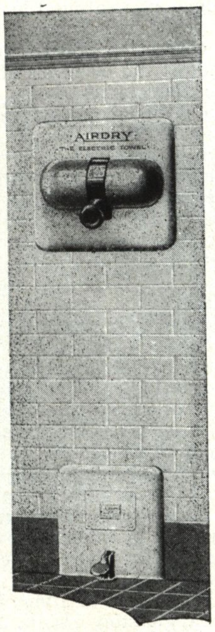
Airdry prevents the communication of disease by eliminating the cloth towel. It also reduces janitor work in washrooms because there are no soiled towels littering the floor where it is used. Furthermore, Airdry prevents clogged toilets, and the loss or theft of towels.

Number of Airdry Machines Required

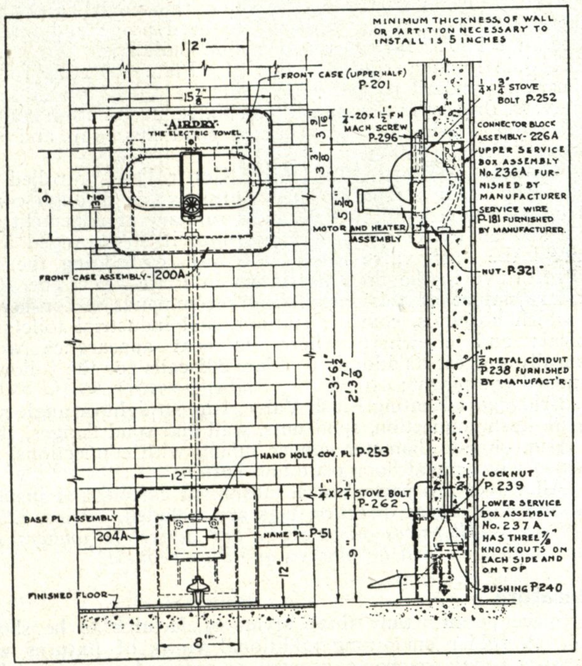
In extremely busy lavatories, one Airdry is often required for each washbowl to prevent confusion. Usually 2 machines for 3 washbowls, 3 for 5, 5 for 8, etc., prove sufficient. Considering the large saving in towel expense, the cost of the number of machines required is nominal.


AIRDRY
DRY YOUR HANDS

Pedestal Airdry


AIRDRY
THE ELECTRIC TOWEL

Recessed Airdry


MINIMUM THICKNESS OF WALL OR PARTITION NECESSARY TO INSTALL IS 5 INCHES
1'2"
15 7/8"
FRONT CASE (UPPER HALF) P-201
AIRDRY
THE ELECTRIC TOWEL
3 9/16"
3 3/8"
9"
13 7/8"
5 5/8"
FRONT CASE ASSEMBLY-200A
1/4 x 1 3/4" STOVE BOLT P-252
1/4-20 x 1 1/2" FH MACH SCREW P-296
CONNECTOR BLOCK ASSEMBLY-226A
UPPER SERVICE BOX ASSEMBLY No. 236A FURNISHED BY MANUFACTURER
SERVICE WIRE P-181 FURNISHED BY MANUFACTURER.
MOTOR AND HEATER ASSEMBLY
NUT-P321
1/2" METAL CONDUIT P238 FURNISHED BY MANUFACT'R.
3'-6 1/2"
2'-3 7/8"
HAND HOLE COV. PL. P-253
12"
1/4 x 2 1/4" STOVE BOLT P-262
LOCKNUT P. 239
LOWER SERVICE BOX ASSEMBLY No. 237A HAS THREE 7/8" KNOCKOUTS ON EACH SIDE AND ON TOP
BASE PL ASSEMBLY 204A
NAME PL. P-51
12"
9"
FINISHED FLOOR
BUSHING P240
8"

Details of Recessed Airdry

Models

There are two Airdry models—recessed wall model and standard pedestal model, as illustrated.

Only a simple wiring connection is necessary for the pedestal model. For the recessed model, service boxes and the conduit between these boxes are built into the walls during construction and the balance of the machines installed when building is completed.

Both models are supplied for either 110 volts (9.1 amperes) or 220 volts (4.5 amperes) and are equipped with universal motors for either direct or alternating current.

Both models are approved by the National Board of Fire Underwriters.

Representative List of Users

The following representative list of users have in service a total of 1246 Airdry machines:

Aetna Life Insurance Co., Hartford, Conn.
Balaban & Katz Theaters, Chicago, Ill.
Buffalo Athletic Club, Buffalo, N. Y.
Carson, Pirie, Scott & Co., Chicago, Ill.
Federal Reserve Bank, St. Louis, Mo.
Gilchrist Co., Boston, Mass.
John Hancock Mutual Life Insurance Co., Boston, Mass.
Hudson Motor Car Co., Detroit, Mich.
Harvard University, Cambridge, Mass.
Jordan Marsh & Co., Boston, Mass.
The May Co., Cleveland, Ohio
McCormick Building, Chicago, Ill.
Metropolitan Building, Seattle, Wash.
Minneapolis Public Schools
Munsingwear Corporation, Minneapolis, Minn.
National Life Insurance Co., Montpelier, Vt.
National Vaudeville Artists Club, New York, N. Y.
New York & Queens Electric Light & Power Co., Long Island City, N. Y.
Old Colony Trust Co., Boston, Mass.
Philadelphia Rapid Transit Co., Philadelphia, Pa.
Rand, McNally & Co., Chicago, Ill.
Remington Typewriter Co., New York, N. Y.
Salada Tea Co., Boston, Mass.
San Joaquin Light and Power Co., Freno, Cal.
A. W. Shaw Co., Chicago, Ill.
Steele Wedeles Co., Chicago, Ill.
Sprague Warner & Co., Chicago, Ill.
Title Guarantee & Trust Co., New York, N. Y.
Travelers Insurance Co., Hartford, Conn.
Trianon Ball Room, Chicago, Ill.

BRIDGEPORT BRASS COMPANY

Manufacturers of Bridgeport-Keating Flush Valves

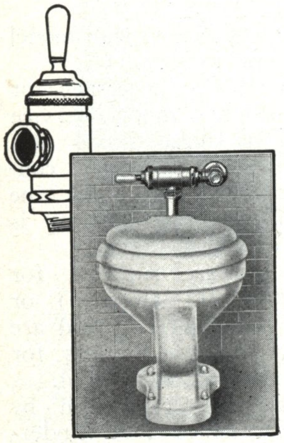
BRIDGEPORT, CONN.

BRANCH OFFICES

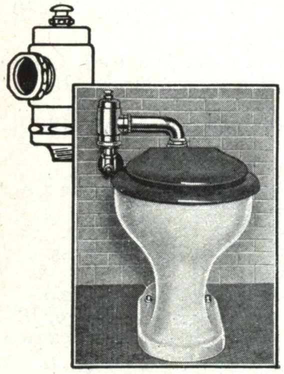
NEW YORK, N. Y., Pershing Square Building
CHICAGO, ILL., Wrigley Building
PHILADELPHIA, PA., Bankers Trust Building
DETROIT, MICH., General Motors Building
CLEVELAND, OHIO, 2017 Superior Viaduct

For Bridgeport Plumrite Brass Pipe, see pages 1796-1797

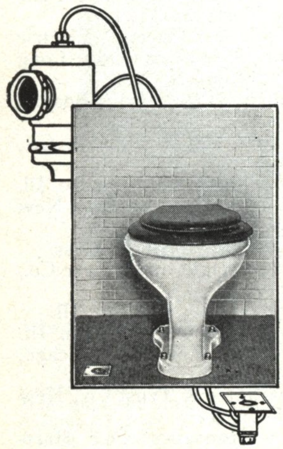
Bridgeport-Keating FLUSH VALVE



Model B
Plate 200



Model A
Plate 100



Model C
Plate 305

Bridgeport-Keating Flush Valve

No flushing device made offers more desirable features than a Bridgeport-Keating Flush Valve for all around service. To the 15 years' experience of the Keating Valve Company in proving correct the operating principles of the valve, have now been added the 60 years of wrought brass-making experience of the Bridgeport Brass Company. Its construction is simple. No sediment found in water lines affects its proper functioning. After installation, without shutting off the water, the valve can be adjusted to operate on pressures from 5 to 150 lb. It always delivers the volume of water for which it is regulated regardless of variable pressures. It operates in any position on any type of fixture. Internal parts may be removed from the body in one unit for inspection. Not injured by freezing—always drained with supply line. Contains no diaphragm, air or oil. Operated mechanically and controlled hydraulically.

Bridgeport-Keating Flush Valves are made in three styles, Oscillating Handle Control, Push Button Control, Foot Control, with the attendant advantages outlined below.

When ordering, always state plate number, size of spud, size and style of stop (1-in. angle or straight).

Model B—Plate 200 (Oscillating Handle Control)—Operated by a china oscillating handle, this model is the most attractive where an exposed installation is desired. Placed horizontally, it brings the operating point into the handiest location. This feature makes it the main choice for that class of service typified by office buildings, residences and the private bathrooms in hotels. Plate 200 calls for the following standard equipment:

N. P. Bridgeport-Keating Flush Valve, oscillating china handle; 1-in. angle stop, 1¼-in. flush connection, spud nut, wall and spud flanges. Price, $19.00.

Model A—Plate 100 (Push Button Control)—Operated by a push button on top of the valve, this model is the most rugged for installations subjected to hard usage and finds its place in schools, factories and public buildings. No part is susceptible to tampering or removal. Plate 100 calls for the following standard packed equipment:

N. P. Bridgeport-Keating Flush Valve, push button control; angle stop, 1¼-in. flush connection, spud nut, wall and spud flanges. Price, $18.00.

Model C—Plate 305 (Foot Control)—Controlled hydraulically from a separate push button valve through copper tubing, this model presents the most sanitary arrangement possible and an extremely neat appearance if so arranged as to conceal the flush valve behind the wall, embedding the foot control valve in the floor as shown in Plate 305. The 100% sanitary nature of this installation recommends it for service of which hospitals, comfort stations, and industrial toilets are typical; and elsewhere where its neat appearance would naturally suggest its adoption. Plate 305 calls for the following standard equipment:

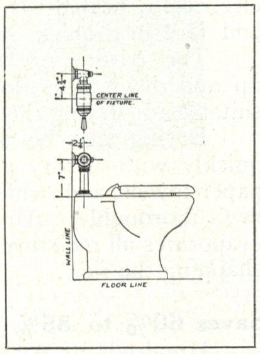
Bridgeport-Keating Flush Valve, 1-in. straight or angle stop, 1¼-in. flush connection, spud nuts, wall and spud flanges, 10 ft. of $\frac{5}{16}$-in. outside diameter copper tubing with connections, and finished white metal floor plate and button.

All valves are packed in a substantial carton, and installation and adjustment direction tags are included. Price, $25.00.

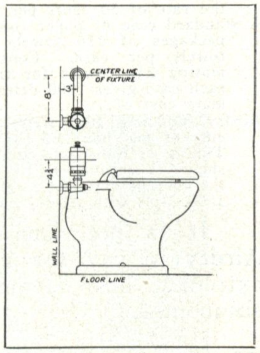
Prices—All prices given above are subject to jobbers' discount, which we will be glad to quote on request.

Literature

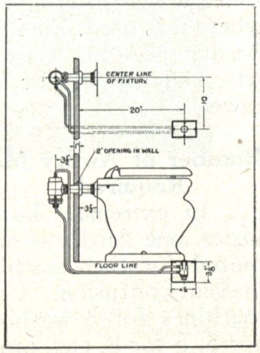
Space permits only three styles of fixtures to be shown here. A folder containing additional views of fixtures with necessary roughing charts, as well as required pipe size tables will gladly be sent on request.



Roughing Chart 200



Roughing Chart 100



Roughing Chart 305

PHILIP HAAS COMPANY

Manufacturers of Flush Valves and Water Closets

123 North Webster Street
DAYTON, OHIO

Products

"HAAS" FLUSH VALVES; "HAAS" AUTOMATIC and PRESSURE TANK CLOSET COMBINATIONS.

Also "Haas" Ventilating Closets; "Haas" Wall Hanging Closets; "Haas" Frost Proof Closets.

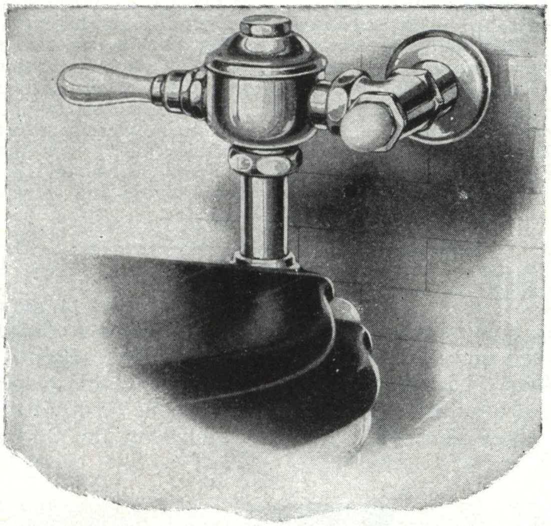
"Haas" Universal Flush Valve

Delivers a uniform measured flush at any pressure from 5 to 100 lb.; has no fine ports to become clogged; no metal guides to wear loose. Operates by improved fully reinforced diaphragm and is equipped with compression stop having ground joint union; seat bumper in offset position for open front as well as ring seats or lids.

Specification Notes for Valve SD—"Haas" Universal flush valve with ground joint union, angle compression control tapped for 1-in. supply; porcelain oscillating handle; rubber seat bumper; 5-in. flush tube; 1¼-in. spud connection (or size specified); wall and spud flanges; all heavily nickeled and highly polished.

Other models with straight or globe pattern compression stop; flush ell instead of flush tube; push button instead of oscillating handle, or metal in place of porcelain, can be furnished when specified.

See types, styles and models shown on the following pages.



"HAAS" UNIVERSAL FLUSH VALVE SD

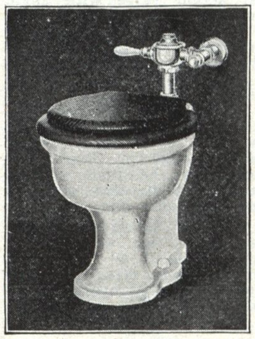


PLATE 1200
Valve SD

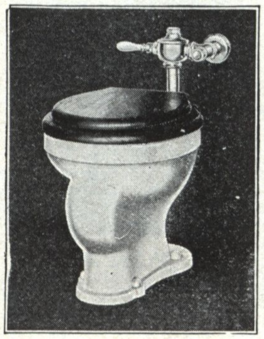


PLATE 1210
Valve LD

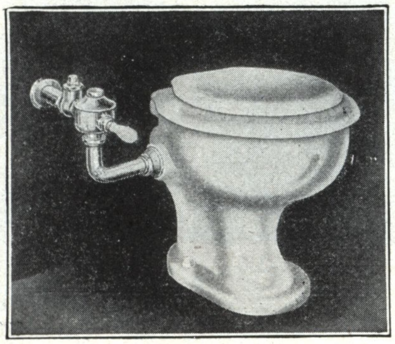


PLATE 1225
Valve LG

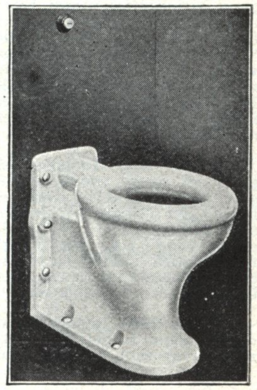


PLATE 600
Valve PI

Requirements for Flush Valve Operation—Sufficient water volume and pressure are essential to the operation of every flush valve. For this reason all "Haas" flush valves for water closets are tapped for 1-in. inlet. Valves for urinals are tapped for ¾-in. inlet. If for low pressure or with supply piping of considerable length, larger size piping should be run to within a short distance of valve.

Avoid all long runs of pipe and 90° ells possible to eliminate friction. All supply pipe should be reamed to remove burrs, and pipe newly installed should be thoroughly flushed out before connecting the valve.

Following is a table for determining size of supply pipe necessary for one closet or three urinals. Supply to batteries should be increased accordingly, and due allowance made for all other fixtures feeding from the same line.

SIZE OF PIPING FOR FLUSH VALVES

Minimum pressure at flush valve, lb.	Total feet of supply pipe from flush valve to street main or storage tank									
	5	10	20	30	40	60	80	100	150	200
	Size of pipe for one water closet									
5	1¼	1½	1½	1½	2	2	2	2½	2½	3
10	1	1¼	1½	1½	1½	1½	2	2	2½	2½
20	1	1	1¼	1¼	1¼	1½	1½	1½	2	2
30	1	1	1	1¼	1¼	1¼	1½	1½	1½	1½
40	1	1	1	1	1¼	1¼	1¼	1½	1½	1½
60	¾	1	1	1	1	1¼	1¼	1¼	1½	1½
80	¾	¾	1	1	1	1	1¼	1¼	1¼	1½
100	¾	¾	¾	1	1	1	1	1¼	1¼	1¼

Add 10 ft. for each 90° fitting.

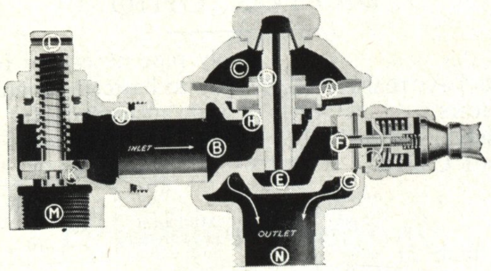
Individual specifications for size of supply will be furnished upon receipt of information as to the number of flush valves to a battery, the total number of valves, the minimum pressure at main, or the elevation of bottom of tank, the size of tank, the size of tap and service line from main or tank, the height of riser, the length of lateral run from riser, and list of other fixtures operating from the same supply.

Instructions for Specifying—When ordering "Haas" flush valves, style and model letters should be given for each valve, made up from those illustrated. The styles, as explained on following pages, refer to the flush tubes or flush ells; push buttons or handles and urinal valves. All valves will be furnished with porcelain oscillating handles unless push button is designated by the style letter "P"; or metal handle is specified by addition of style letter "M"; or metal push button by style letter "MP."

The Standard flush tubes furnished are 5 in. and flush ells 6x4 in. When combinations are desired which require a different length tube or ell, the size in inches should follow the style and model letters of the valve. Standard bowl spud connections are for 1¼-in. spud. When other size spud connection is desired the size in inches should follow the style and model letters of the valves specified.

Continued on next page

Detail of Operation—The top surface of diaphragm (A) is greater than the exposed surface of the lower inlet side in such proportion that an equal water pressure on both sides positively holds the valve shut. The water from the inlet (B) passes into the top pressure chamber (C) through a clearance of .0035 in. around center stem (D). This fills the upper chamber with water under the same pressure as that below, closing the valve securely.



Cross Section Haas Universal Flush Valve
Patented July 28 '08—Others pending

When the valve is operated, pressure in the top chamber is released by water passing down through the center stem, release channel (E) around the stem valve (F), momentarily open, and down escape port (G) to bowl. Pressure below thereupon forces the diaphragm up from its seat, permitting an instant and thorough flush, direct from the supply. Water immediately passes around the center stem and into the upper chamber, building pressure therein and steadily closing the valve.

While flush valves are adjusted at the factory to deliver a uniform flush at any pressure from 10 to 100 lb. (5 lb. upon specification) a further simple adjustment to accommodate variations in pottery is provided. To shorten flush, one or more of the extra spacing washers furnished is slipped over the central stem above the diaphragm. This limits the upward movement of the diaphragm in pressure chamber (C), and permits it to return in shorter time. Removing one or more of these washers will lengthen flush in the same manner. The afterfill, or seal, in different bowls can be adjusted also by similar spacing washers below the diaphragm which are retained by nut (H). Removing these washers decreases the afterfill, and adding washers increases it.

It is easy to see how the water passage to the upper chamber is constantly self-cleansing through the movement of the diaphragm sleeve on the central stem. Sediment or alkali in the water does not have a chance to collect on these moving surfaces. In addition, a special non-corrosive tobin bronze is used here in place of regular brass.

The careful design of the handle construction is worthy of particular notice. There is no stuffing box to wear loose and leak. The stem valve operates through a flexible diaphragm (I) which moves with it. This offers permanent protection from water in the spring chamber. Springs are of the highest grade phosphor bronze, thoroughly tested for strength and endurance.

The connection of the control valve with the inlet nipple is by means of a ground joint union (J) secured by heavy nut. Obstructive lugs on the inside of the inlet passage are avoided and nipple is assembled to valve by means of a hex wrench grip.

The control valve is of the lock shield compression type, operated by the valve pin furnished, or a common nail through the hole (L) and having a quick closing double thread. Lateral guides keep the disc (K) from turning in operation and it seats solidly by pure straight compression. Control valves can be furnished in globe pattern as well as angle.

A rubber seat bumper is furnished to fit over the upper valve stem, thereby affording separate bumper installation on all valves, where it is in the correct position.

Supply inlet (M) is tapped for 1-in. iron pipe (except urinal valves) and valve outlet (N) will slip 1¼-in. tubing.

Universal Seat Action Valve

A seat controlled, direct action type of valve and is furnished in either rough or polished nickel. The construction follows closely the "Haas" Universal flush valve, with a simple automatic feature added.

They are adapted for use in schools, hospitals, factories and other public and semi-public institutions where constant use is accompanied by frequent abuse.

They are supplied in complete combination or less bowl, and in this respect well fitted for the replacement of wornout or obsolete equipment, without the necessity of sacrificing the old bowls.

Plate 200—Includes siphon action wash down bowl, two-piece oak seat with malleable galvanized hinge, and "Haas" Universal seat action valve and angle compression stop in rough nickel finish. Metal parts can be furnished in heavy cast brass polished nickelplated.

Plate 205—Includes siphon jet bowl, two-piece oak seat, with malleable galvanized hinge and "Haas" Universal seat action valve with angle compression stop in rough nickel finish. Metal parts can be furnished in heavy cast brass polished nickelplated.

Plate 220—Includes wash down siphon action bowl with raised rear vent, two-piece oak seat with cast brass hinge and adjustable operating lever, 8x30-in. galvanized pressure tank and "Haas" Universal seat action valve with angle compression stop.

Plate 200

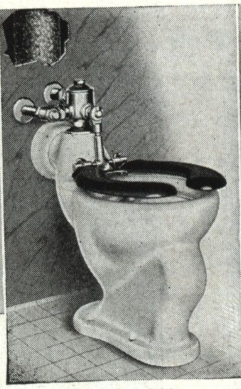


Plate 220

Plate 205

Valve and trimmings are furnished rough nickel unless otherwise specified. Seat can be furnished in any finish desired.

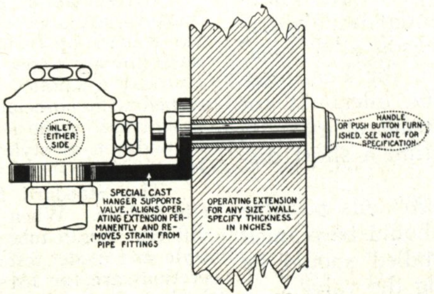
The valve operates on a ¾-in. line and must have not less than 25 lb. pressure at point of delivery. Due allowance must be made for a number of fixtures operated from the same line.

Note: When ordering—less bowls, we will require one sample bowl to which valves will be fitted to insure proper fitting of operating device and valve.

Styles of "Haas" Flush Valves

The corridor flush valve indicated by model letters I, T, R and V on next page, is here illustrated. Porcelain oscillating handle will be furnished unless letter "P" specifying porcelain push button, letters "MP" specifying metal push button, or letter "M" specifying metal handle, are given.

Flush tube is not furnished with this valve unless specified. Slip joint connection at valve for 1-in. iron pipe and for 1¼-in. spud at bowl furnished unless otherwise specified.


INLET EITHER SIDE
SPECIAL CAST HANGER SUPPORTS VALVE, ALIGNS OPERATING EXTENSION PERMANENTLY AND REMOVES STRAIN FROM PIPE FITTINGS
OPERATING EXTENSION FOR ANY SIZE WALL. SPECIFY THICKNESS IN INCHES
HANDLE OR PUSH BUTTON FURNISHED. SEE NOTE FOR SPECIFICATION

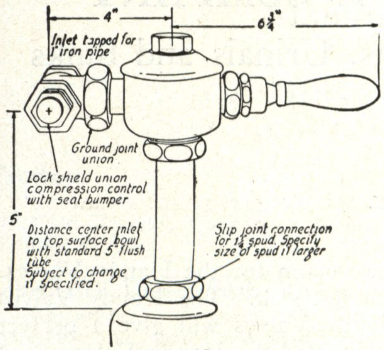
Corridor Flush Valve

Please note, that thickness of wall must be specified on this valve also, by number indicating this thickness in inches to follow style and model letters desired.

Special attention is directed to substantial cast iron hanger which directly supports the valve and aligns the operating extension permanently.

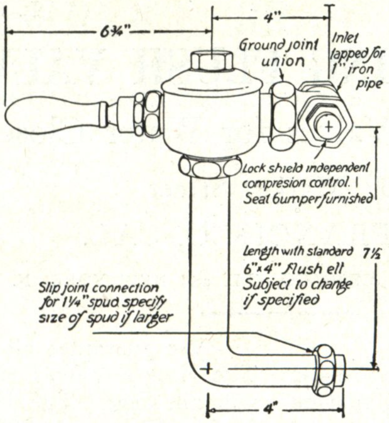
Continued on next page

Styles of "Haas" Flush Valves


4"
6¾"
Inlet tapped for 1" iron pipe
Ground joint union
Lock shield union compression control with seat bumper
5"
Distance center inlet to top surface bowl with standard 5" flush tube
Subject to change if specified.
Slip joint connection for 1¼ spud. Specify size of spud if larger

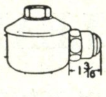
Style S

Flush valve with straight flush tube, and slip joint connection for 1¼-in. spud. Furnished with any model. Specify size of spud if larger, by numbers indicating this size in inches following style and model letters. Standard length of flush tube 5 in. If other length is desired, specify in numbers indicating this length in inches following style and model letters


6¾"
4"
Ground joint union
Inlet tapped for 1" iron pipe
Lock shield independent compresion control. Seat bumper furnished
Length with standard 6"x4" flush ell Subject to change if specified
7½
Slip joint connection for 1¼" spud specify size of spud if larger
4"

Style L

Flush valve with flush ell and slip joint connection for 1¼-in. spud. Furnished with any model. Specify size of spud if larger, by number indicating size in inches following style and model letters. Standard flush ell is 6x4 in. If other size is required specify by number representing distance from center of inlet to center of spud in inches following the style and model letters



Style P

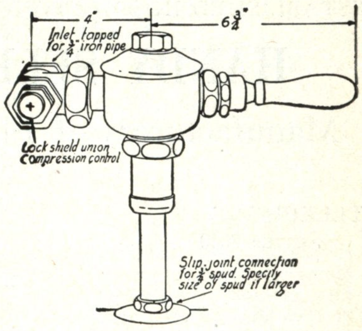
Flush valve with porcelain push button. Any model valve so equipped by adding this style letter to other style and model letters. Concealed corridor valve can be equipped in same manner

Style MP

When metal push button is desired, add the style letter "M" to the letter "P," as here indicated

Style M

When metal handle is desired, add letter "M" to other style and model letters


4"
6¾"
Inlet tapped for ¾" iron pipe
Lock shield union Compression control
Slip joint connection for ¾ spud. Specify size of spud if larger

Style SU

Urinal flush valve with straight flush tube, and slip joint connection for ¾-in. spud. Furnished with any model. Inlet tapped for ¾-in. iron pipe, unless otherwise specified

Standard flush tube length 5 in. If other length desired, specify

Style LU

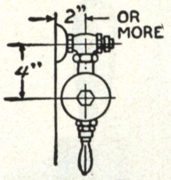
Urinal flush valve with flush ell, with slip joint connection for 1¼-in. spud. Furnished with any model. If other size spud connection is required, specify

Standard 15x4-in. flush ell furnished. If other size is required, specify

Styles of "Haas" Flush Valves

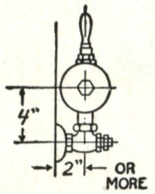
For every model "Haas" flush valve a choice of styles in operation and installation is provided

Models of "Haas" Flush Valves



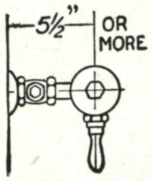
Model D

Exposed valve with handle at left when facing bowl, and angle union compression stop for wall supply



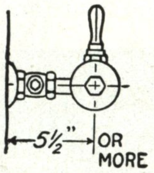
Model D

Exposed valve with handle at right when facing bowl, and angle union compression stop for wall supply



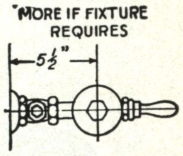
Model H

Exposed valve with handle at left when facing bowl, and straight union compression stop to wall supply



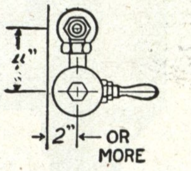
Model J

Exposed valve with handle at right when facing bowl, and straight union compression stop to wall supply


*MORE IF FIXTURE REQUIRES
5½"

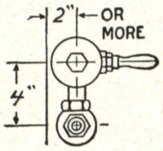
Model G

Exposed valve with front handle and straight union compression stop for wall supply



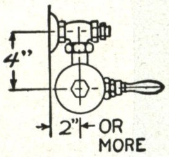
Model K

Exposed valve with front handle, and angle union compression stop for floor supply from the right of bowl when facing it



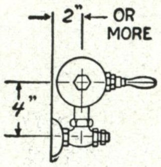
Model O

Exposed valve with front handle, and angle union compression stop for floor supply from the left of bowl when facing it



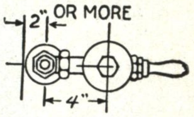
Model K

Exposed valve with front handle, and angle union compression stop for wall supply from the right of bowl when facing it



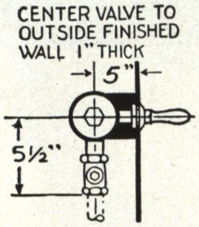
Model O

Exposed valve with front handle, and angle union compression stop for wall supply from the left of bowl when facing it



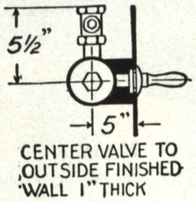
Model D

Exposed valve with front handle and angle union compression stop for floor supply


CENTER VALVE TO OUTSIDE FINISHED WALL 1" THICK
5"
5½"

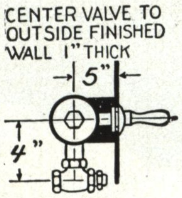
Model I

Utility corridor valve with wall extension and straight union compression stop for supply from the left of valve when facing handle


5½"
5"
CENTER VALVE TO OUTSIDE FINISHED WALL 1" THICK

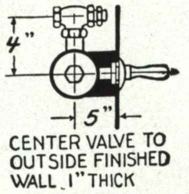
Model T

Utility corridor valve with wall extension and straight union compression stop for supply from the right of valve when facing handle


CENTER VALVE TO OUTSIDE FINISHED WALL 1" THICK
5"
4"

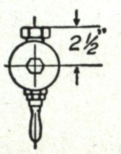
Model R

Utility corridor valve with wall extension and angle union compression stop for supply from the left of valve when facing handle


4"
5"
CENTER VALVE TO OUTSIDE FINISHED WALL 1" THICK

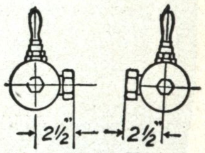
Model V

Utility corridor valve with wall extension and angle union compression stop for supply from the right of valve when facing handle



Model X

Exposed valve without stop but with back inlet nipple tapped for 1-in. iron pipe



Model Y

Exposed valve without stop but with left hand inlet nipple tapped for 1-in. iron pipe

Model Z

Exposed valve without stop but with right hand inlet nipple tapped for 1-in. iron pipe

Models of "Haas" Flush Valves

Valve models are illustrated above from a top view, with wall line indicated.

These model letters should be accompanied by style letters illustrated above, indicating whether valves are to be equipped with flush tubes or flush ells, porcelain handles or push buttons, metal handles or push buttons, or if they are urinal valves instead of water closet valves

ESTABLISHED IN SAN FRANCISCO 1873

L. H. MOISE, President and Manager

HANDY SELF-CLEANING FLUSH VALVE COMPANY

Manufacturers of Flushometer Valves for Water Closets, Urinals and Sinks

369 Market Street
SAN FRANCISCO, CAL.

TELEPHONE
Sutter 7040

BRANCH OFFICES: CHICAGO, ILL. and NEW YORK, N. Y.

Handy Self-cleaning Flushometer Valves

Our Flushometers have been especially designed for hotels, apartments, hospitals, schools, homes, marine work, salt water, etc.

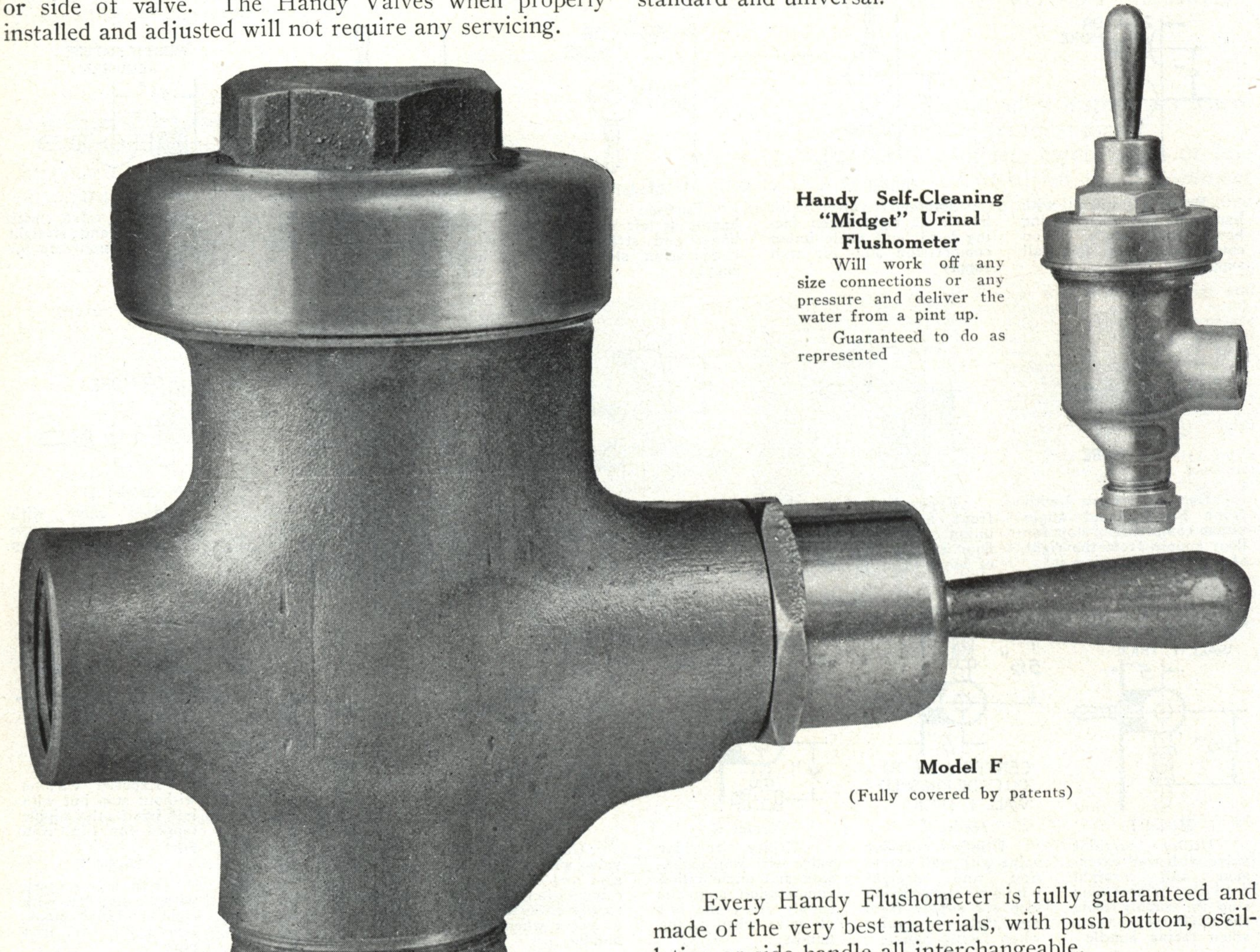
The Handy Valves are made in two standard sizes and with either straight or angle stops. For pressures from 15 lb. up we advise using Handy Valves on 1-in. pipe and for lower pressures we recommend Handy Valves to be used on 1¼-in. pipe. When pressure is low, 4 to 15 lb., we recommend our low pressure 1¼-in. valve with 1¼-in. angle or 1¼-in. straight stop.

Handy Valves are adjustable and can be set to use any amount of water (1 qt. or 5 gal.). Handy Valves are made with push buttons or oscillating handles on top or side of valve. The Handy Valves when properly installed and adjusted will not require any servicing.

We guarantee all we claim for the Handy Valves. The Handy Valves will not leak. The Handy Valves will not clog. The Handy Valves will give a perfect flush. When properly installed the Handy Valves need no service man. For replacements on old work the Handy Valves have no equal. The Handy Valves are working perfectly in salt water on marine work. Remember our Handy Valves have *no diaphragm*. The Handy Valves are self-lubricating, always primed ready for action.

Made as nearly foolproof as possible, valves have only two parts. Any one can install the Handy Valves.

The Handy Valves roughing-in measurements are standard and universal.



Handy Self-Cleaning "Midget" Urinal Flushometer

Will work off any size connections or any pressure and deliver the water from a pint up.

Guaranteed to do as represented

Model F

(Fully covered by patents)

Every Handy Flushometer is fully guaranteed and made of the very best materials, with push button, oscillating or side handle all interchangeable.

PUBLIC SERVICE BRASS CORPORATION

(A CONSOLIDATION WITH THE SCHROEDER FLUSH VALVE CO.)

Manufacturers of Schroeder Direct-flush Valves

721 East Slauson Avenue
HUNTINGTON PARK (LOS ANGELES), CAL.
SALES REPRESENTATION IN SAN FRANCISCO, PORTLAND, DENVER

Product

Schroeder Direct-flush Valves.

Also Faucets, Cocks and Bibbs, Plumbers' Brass Goods, Bathtub Fittings.

Schroeder Direct-flush Valves

An all-brass (nickelplated) flush valve, having ground valve seat and opened and closed by water pressure. It can be used with plumbing fixtures of any make or type.

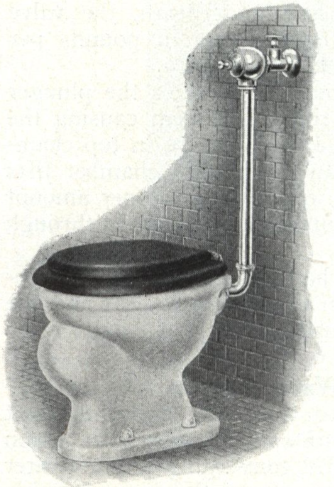
The Schroeder valve has been giving satisfactory service for the past ten years, saving time, money and annoyance wherever it has been installed. It has no by-passes, weights, leather valve seats or rubber diaphragms, consequently, it is not subject to electrolytic action or corrosion. Durable in construction, simple in operation, and economical in its consumption of water.

The Schroeder valve closes with (not against) the water pressure and is positive, closing regardless of pressure. No waterhammer or noise. Metal stem in the handle and small pilot valve are so connected that if pressure fails or water supply is suddenly cut off, the small spring which operates oscillating handle or push button pulls the valve back to its seat. This feature is of vital interest to architect, plumber, and the owner, and is unequalled in certainty of performance. It will function satisfactorily on sufficient pressure to properly siphon a toilet bowl.

Schroeder valves have a lever adjustment and cleaning feature on outside of valve unequalled by any other valve on the market. In the event of occasional clogging of valve by sediment or sand, it is possible to throw over this small lever and clean the valve by flushing once or twice, then returning lever to set position for proper length flush.

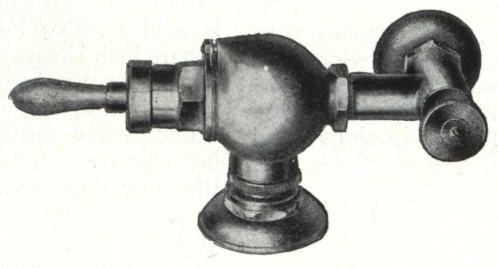
Each valve is furnished complete with necessary fittings for installation. Two sizes: ¾ in. for urinals and 1 in. for toilets. Toilet valves equipped with fittings for either 1¼- or 1½-in. spud.

Guarantee—We guarantee that the Schroeder valve will withstand the effects of corrosion and ordinary wear and tear for a period of 5 years, and we agree to furnish and supply upon demand any part or parts which either wear out, corrode or prove defective within said period.



Type A

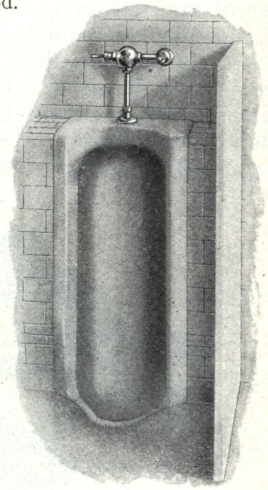
Includes nickelplated push button valve with 1-in. inlet, 1-in. straight control stop, 1¼x18-in. tail piece, 1¼x4-in. flush ell, wall and spud flanges, and bumper for closed-front seat. This type can be used on any make of back-inlet bowl



SCHEDULE OF WATER SERVICE AND PRESSURE FOR SCHROEDER DIRECT-FLUSH VALVES

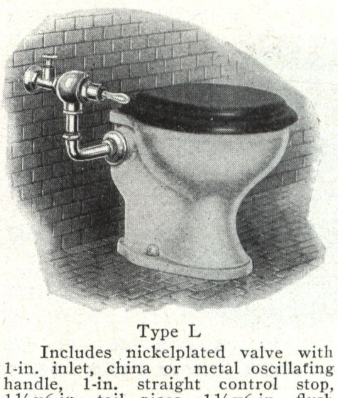
Minimum pressure at valve, lb.	1-in. service	1¼-in. service	1½-in. service	2-in. service
5 to 10	1 valve	1 valve	2 valves	3 valves
20	3 valves	8 valves	14 valves	20 valves
30	5 valves	12 valves	21 valves	30 valves
40	8 valves	18 valves	30 valves	50 valves
50	10 valves	25 valves	40 valves	65 valves
60	12 valves	30 valves	50 valves	75 valves

We do not accept responsibility for unsatisfactory service if this schedule is not adhered to. Recommendations under special conditions differing from the above will be gladly furnished on request.



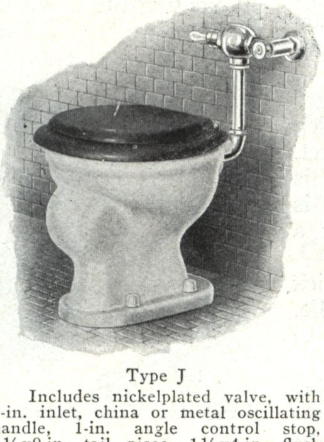
Type E

Includes nickelplated valve with ¾-in. inlet, metal oscillating handle, ¾-in. angle control stop, ¾x6-in. tail piece with spud nut, wall and spud flanges



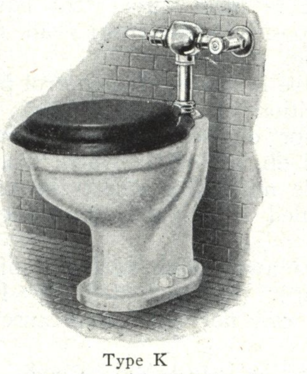
Type L

Includes nickelplated valve with 1-in. inlet, china or metal oscillating handle, 1-in. straight control stop, 1¼x6-in. tail piece, 1¼x6-in. flush ell, wall and spud flanges. This type can be used on any make of side inlet bowl. (1½-in. fittings furnished if so specified)



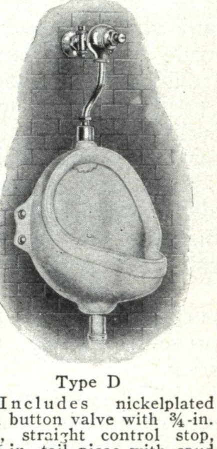
Type J

Includes nickelplated valve, with 1-in. inlet, china or metal oscillating handle, 1-in. angle control stop, 1¼x9-in. tail piece, 1¼x4-in. flush ell, wall and spud flanges, and top bumper for closed-front seat. This type can be used on any make of back-inlet bowl. (1½-in. fittings furnished if so specified)



Type K

Includes nickelplated valve with 1-in. inlet, china or metal oscillating handle, 1-in. angle control stop, 1½x9-in. tail piece with spud nut, wall and spud flanges. Top bumper furnished for closed-front seat. This type can be used on any make of top-inlet bowl



Type D

Includes nickelplated push button valve with ¾-in. inlet, straight control stop, ¾x6-in. tail piece with spud nut, wall and spud flanges. (Tail piece will be offset to meet requirements where needed)

Typical Schroeder Direct-flush Valve Installations

THE IMPERIAL BRASS MFG. CO.

Manufacturers of Plumbing Specialties

1222 West Harrison Street
CHICAGO, ILL.

Products

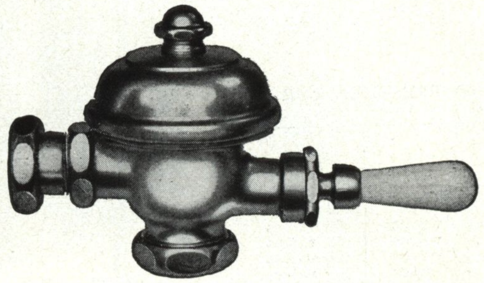
Flush Valves; Duojet Water Closets; Combination Lavatory Fixtures; Lavatory Wastes; Self-closing Faucets; Bubblers; Drinking Fountains; Gravity Liquid Soap Systems; Individual Liquid Soap Fixtures.

WATROUS PATENT PLUMBING FIXTURES AND DUOJET WATER CLOSETS
TRADE-MARK

Watrous Patent Flush Valve

The Watrous Valve is a simple, positive acting, reliable device for flushing water closets and urinals. It is the result of over twenty years' experience in designing and making flush valves, and possesses a number of vital advantages over other types, insuring years of satisfactory, uninterrupted service.

It is the only flush valve that has a pressure control that is positively non-clogging and self-cleansing. A slight movement of the handle causes a prompt, complete flush and refill. Installation is quick and easy and regulation of the duration of the flush is simple and positive.


Watrous Patent Flush Valve

Advantages—Our new non-clogging, self-cleansing regulating screw with spring plunger, which controls the duration of the flush, is the most important and vital improvement in flush valves that has been made for years and positively overcomes all former troubles due to clogging.

Every time the valve is flushed, the control plunger is lifted from its position by the main valve, which makes it impossible for dirt or sediment to collect. This control is located on top of the valve bonnet, is always readily available no matter where the valve is installed and is concealed from public meddling by a cap screw.

A diaphragm does away with necessity of wick packing around plunger rod actuated by handle, prevents leaking, and can not bind and cause it to stick.

The cover of the valve is attached to body by five screws and is easily removable. Valves in which the cover is threaded directly upon the body necessitate the application of considerable force to remove it, which often breaks the bowl at the spud.

Operating valve stem is so designed that it can not wear a groove in its seat, as often happens in other valves where the stem has a tilting motion.

Main diaphragm is pure gum rubber reinforced in the center, insuring a positive durable shutoff, lasts for years, and is easily and quickly replaced at low cost without removing valve from the line or interfering with its adjustment.

Operation—The sequence of operation is as follows:

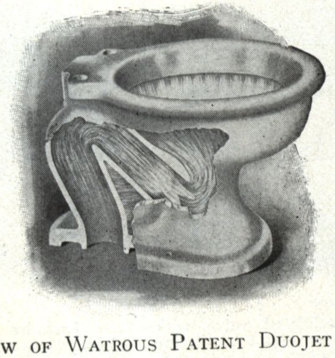
Water enters valve from supply and fills bottom chamber and at same time passes through a port and fills top chamber. Because the area on top is much greater than on that part of the diaphragm which is exposed to the water pressure underneath, the valve is held tightly closed, as the pressure in pounds per square inch is equal in both chambers.

When the handle is moved, it actuates the plunger in horizontal direction and tilts valve stem causing the water to flow out and relieve the pressure in top chamber and then the pressure in the bottom chamber lifts the main diaphragm off its seat and the proper amount of water for flushing then enters the closet bowl through outlet.

The pressure in top chamber is then quickly reestablished causing the main diaphragm to seat and the valve is again ready to flush.

Watrous Patent Duojet Water Closets

The principle of action is a new and important development in the flushing of water closets. The action is derived from two powerful converging jets of water coming together at the entrance of the trap, forming a spray which completely fills it and produces a strong instantaneous action using less water than any other type of closet; dispensing with the siphonic feature, thus eliminating the down leg as an operative element of the closet.


Sectional View of Watrous Patent Duojet Floor Closets

Advantages—The objection to a closet having a zigzag down leg (notably siphon closets) that necessitates taking up the bowl if it should become clogged, has been entirely removed.

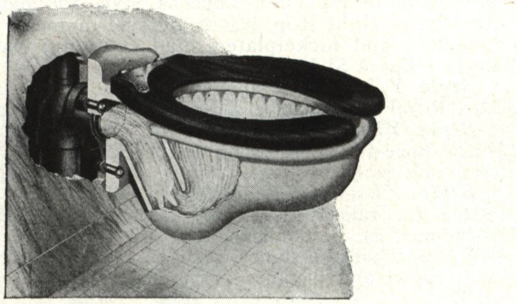
Continued on next page

The Watrous Duojet has a full 3-in. unobstructed opening throughout, and, as the smallest part is at the mouth of the trap, it will be seen that no obstruction can lodge beyond the reach of the hand. A deep refill is obtained at all times, as the gradual receding of the converging jets, due to the gradual stopping of the flushing supply, causes the action to cease and produces a perfect and most natural refill.

This is in direct contrast to the siphon closets, where the siphonic process often continues until after the water supply has been completely shut off, making necessary the addition of refill chambers and other devices to insure the proper, though still uncertain water seal in the bowl.

Watrous Patent Duojet Wall Closet

The latest advance in sanitary science made possible by the invention of the Duojet principle. Designed to meet the requirements of most modern buildings, where saving of valuable space and the elimination of obstructions from the floor are important factors, it introduces a new era in bathroom equipment.



Sectional View Showing Method of Support of Watrous Patent Duojet Wall Closet

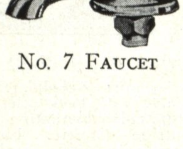
The illustration shows the Duojet action as well as the method of support. Three heavy bolts clamp the closet to the supporting flange or hanger which in turn screws directly upon the waste pipe. Nothing could be more simple, yet it is stronger than any other device, and when properly installed will sustain a load of nearly 2000 lbs.

The simple one-piece supporting flange supports the closet rigidly, and entirely independent of wall or floor; all yokes, setscrews, adjustments, special fittings, etc., formerly considered necessary in supporting wall closets have been entirely eliminated. The supporting device here shown is for use with screw threaded waste pipe. Can also be furnished in modified forms for either cast iron soil pipe or lead pipe connection.

Various Types—Watrous Duojet combinations are made in various forms, both floor and wall closets, for all service conditions and requirements, including a complete line for prisons.

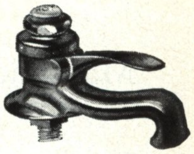
Watrous Self-closing Faucets

No. 7—This is the only push button self-closing faucet, closing against pressure. It is easily operated, no packing, no leakage, no corrosion of working parts. Time and trouble saving.



No. 7 Faucet

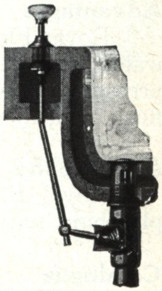
No. 8—The simplest self-closing faucet made. Has only 2 working parts—a spring and a valve stem. Easily operated accessible parts, well designed.



No. 8 Faucet

Watrous Lavatory Waste

The most simple, easily adjusted waste yet developed. Has only one-third as many parts as any other. Fits any type of enameled iron, porcelain or vitreous lavatory. The operating rod has a universal ball joint which allows for distance variations between the two lavatory openings, and a series of holes in the shank of the stopper plug takes care of varying thicknesses of lavatory openings. Open or closed, the action is always positive. The drain area empties 3 times as fast as the ordinary waste, saving time. The conical expansion spring minimizes friction and adjustments.

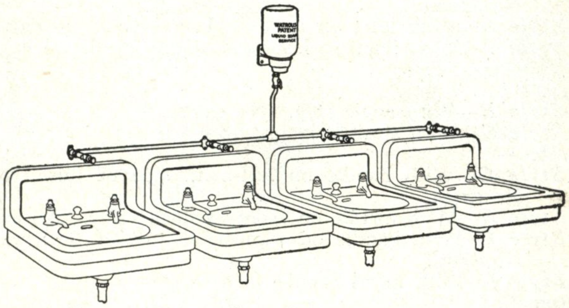


Watrous Lavatory Waste

Watrous Gravity Liquid Soap System

Operates wholly by the time-proved gravity principle. No moving parts to get out of order. A simple valve delivers a pre-determined supply of soap without drip or waste. The large soap container is simply placed on its receptacle as shown in the illustration and replaced by a full one in a moment's time.

One sanitary glass container serves any number of washstands, thus eliminating the tedious filling of individual fixtures formerly used.

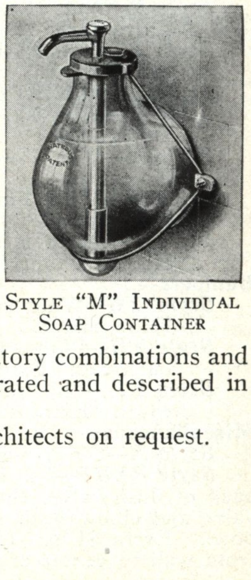


Watrous Gravity Liquid Soap System (Patented) as Applied to Series of Lavatories

Watrous Style "M" Individual Soap Container

The illustration shows but one of many types of our individual containers.

Strongly attached to the wall waste; clogproof and very durable. Full details on request.



Style "M" Individual Soap Container

Catalogue

The complete line of Watrous patent water closet combinations, flush valves, drinking fountains, self-closing faucets, lavatory combinations and liquid soap fixtures, is fully illustrated and described in our new plumbing catalogue.

Copy will be mailed to all architects on request.

SLOAN VALVE COMPANY

Manufacturers of Flush Valves for Water Closets, Urinals and Slop Sinks

Lake Street and Kildare Avenue
CHICAGO, ILL.

Product

ROYAL FLUSH VALVES. (Awarded Gold Medal, San Francisco, 1915.)

Advantages

Royal Flush Valves can not be held open to waste water; require no regulating for any variation in water pressure between 5 and 100 lbs.; deliver a uniform flush regardless of how operated.

Adaptability

Royal Flush Valves can be used on old or new plumbing fixtures of any manufacture.

Catalogue

Complete catalogue, containing detailed illustrations and descriptions, furnished on request.

Styles

The Royal Flush Valves, shown on these pages, are those most frequently used. However, they can also be equipped in the manner indicated by any of the following styles or combinations thereof. When any of these styles are wanted, specify number of valve, followed by letters designating style desired.

Inlets—

Style A—With inlet on right-hand side of flush valve. No extra.

Style B—With inlet on back of flush valve. No extra.

Style C—With inlet on left-hand side of flush valve. No extra.

Stops—

Style D—With angle stop. No extra.

Style E—With straight stop. No extra.

Handles—

Style G—With handle on left-hand side of flush valve. No extra.

Style H—With handle on front of flush valve. No extra.

Style I—With handle on right-hand side of flush valve. No extra.

Style J—With metal handle. No extra.

Buttons—

Style K—With china push button. No extra.

Style L—With metal push button. No extra.

Outlets—

Style P—With elbow flush connection for back spud closet. Extra $1.50.

Style R—With 1¼-in. female iron pipe union outlet. No extra.

Style S—With 2x1½-in. spud reducer. Extra $1.00.

Style T—With 1½-in. outside diameter flush connection. No extra.

Style U—With 1¼-in. outside diameter flush connection. No extra.

Style V—With 1-in. outside diameter flush connection. No extra.

Style W—With ¾-in. outside diameter flush connection. No extra.

Bumpers—

Style YG—With bumper on valve for seat with cover. Extra charge.

Style YH—With wall bumper for closed-front seat without cover. Extra charge.

Style YI—With wall bumper for open-front seat without cover. Extra charge.

Miscellaneous—

Style X—For pressures from 5 to 12 lbs. No extra.

Style BEHP—Can be applied to F-54 only. With inlet on back of flush valve, 1-in. straight stop, handle on front of valve and elbow flush connection for side spud wall hung bowl. Extra $1.50. (*Note:* Orders must state distance from wall to center of side spud.)

Style YA—Can be applied to F-54 only. Includes concealed rough brass Royal Flush Valve with left-hand inlet, 1-in. straight stop, 1½-in. outside diameter elbow flush connection, spud coupling, nickelplated wall flange, wall bumper for closed front seat and china handle suitable for wall 0 to 1 in. thick. Extra $3.00.

Style YB—Can be applied to F-54 only. Includes concealed Royal Flush Valve same as Style YA, except with push button on center line of fixture 22½ in. above center of spud. Extra $2.00.

Style O—Can be applied to F-56 only. With brass slip joint flush connection complete to fixture spud. Extra $4.00.

Style YF—Can be applied to F-57 only. Includes concealed rough brass Royal Flush Valve with left-hand inlet, ½-in. straight stop, ¾-in. outside diameter elbow flush connection, spud coupling, nickelplated wall flange and china handle suitable for wall 0 to 1 in. thick. No extra.

Style YD—Can be applied to F-58 only. Includes concealed Royal Flush Valve same as Style YF. No extra.

Style YE—Can be applied to F-59 only. Includes concealed Royal Flush Valve same as Style YF and YD, except with 1-in. straight stop, 1½-in. outside diameter elbow flush connection and nickelplated spud coupling, wall and spud flanges. Extra $1.50.

Style YC—Can be applied to F-60 only. Includes concealed Royal Flush Valve same as Style YE. Extra $1.50.

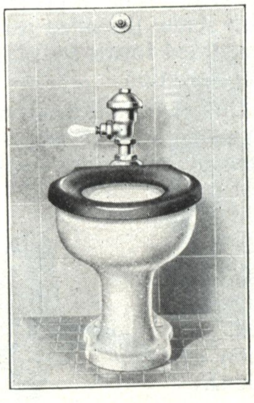
Style YK—Can be applied to F-61 only. With ebony "Whale-Bone-Ite" open-front and back seat for extended lip closet. Extra $1.00.

Style YL—Can be applied to F-61 only. With hinge suitable for raised rear vent closet. Extra $1.00. (*Note:* Order must be accompanied by full sized side elevation of closet, specifying distance face of spud is elevated above rim of bowl and distance from center of spud to center of post holes.)

Style YM—Can be applied to F-61 only. Includes concealed rough brass Royal Flush Valve, seat operated, with left-hand inlet, 1-in. straight stop, 1½-in. outside diameter flush connection, nickelplated spud coupling, wall and spud flanges, adjustable bar check hinge, ebony "Whale-Bone-Ite" open-front and back seat for regular round front bowl, and nickelplated wall extension suitable for wall 0 to 1 in. thick. Extra $2.50. (*Note:* Order must specify distance from face of finished wall to center of seat post holes.)

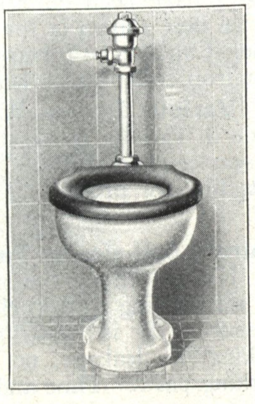
Thickness of Wall

Orders for concealed Royal Flush Valves must state if thickness of wall exceeds 1 in. An additional charge is made when wall is more than 1 in. thick. Prices sent on application.



F-50

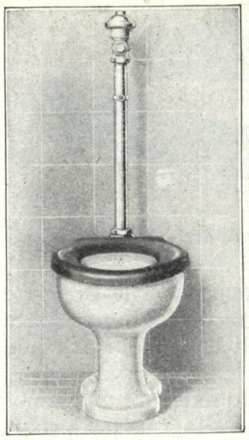
Includes nickelplated Royal Flush Valve with back inlet, 1-in. straight stop, china oscillating handle, 1½-in. outside diameter flush connection, spud coupling, wall and spud flanges.
Price $23.00



F-51

Includes nickelplated Royal Flush Valve with back inlet, 1-in. union straight stop, china oscillating handle, 1½-in. outside diameter flush connection. spud coupling, wall and spud flanges.
Price $24.00

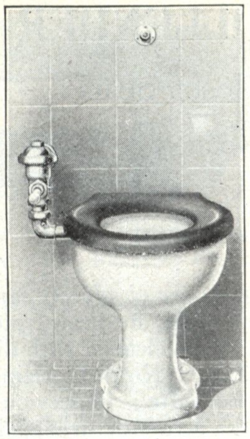
Continued on next page



F-52

Includes nickelplated Royal Flush Valve with back inlet, 1-in. straight stop, china push button, 1½-in. outside diameter flush connection, spud coupling, wall and spud flanges.

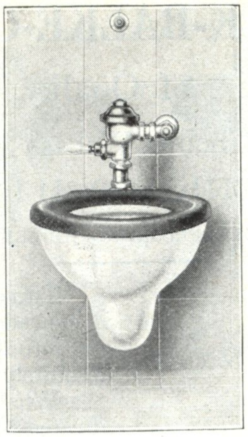
Price $24.50



F-53

Includes nickelplated Royal Flush Valve with back inlet, 1-in. straight stop, china oscillating handle, 1½-in. outside diameter elbow flush connection, spud coupling, wall and spud flanges.

Price $24.50

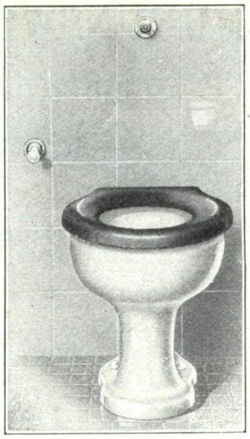


F-54

Includes nickelplated Royal Flush Valve with side inlet, 1-in. angle stop, china oscillating handle, 1½-in. outside diameter flush connection, spud coupling, wall and spud flanges.

Price $23.00.

Note: Wall hung closets require a pressure maintained at the valve of not less than 20 lbs. for blowout type or 15 lbs. for siphon jet type

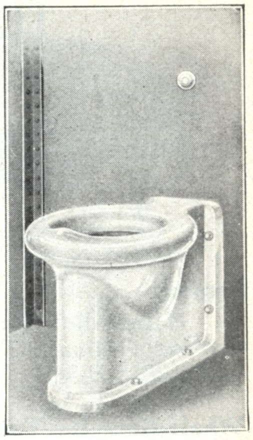


F-55

Includes concealed rough brass Royal Flush Valve with inlet on left-hand side, 1-in. straight stop, 1½-in. outside diameter elbow flush connection, nickelplated spud coupling, wall and spud flanges and china oscillating handle suitable for wall 0 to 1 in. thick.

Price $26.00.

Note: Orders for concealed flush valves must state thickness of wall

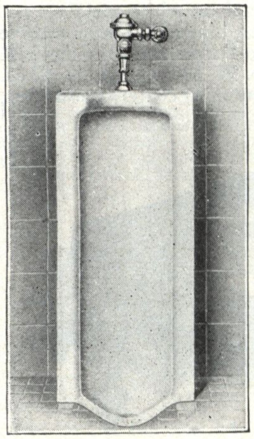


F-56

Includes concealed rough brass Royal Flush Valve with inlet on left-hand side, 1-in. straight stop, 1-in. female iron pipe union outlet (no flush connection), china push button suitable for wall 0 to 1 in. thick.

Price $21.00.

Note: Orders for concealed flush valves must state thickness of wall

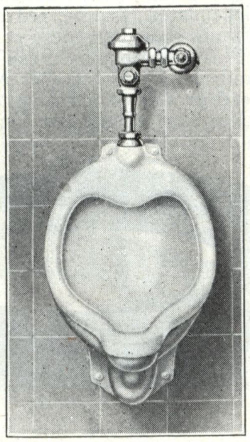


F-57

Includes nickelplated Royal Flush Valve with right-hand inlet ½-in. angle stop, china push button, ¾-in. outside diameter flush connection, spud coupling, wall and spud flanges.

Price $22.00.

Note: State distance from wall to center of spud

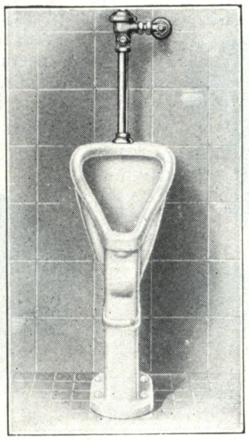


F-58

Includes nickelplated Royal Flush Valve with right-hand inlet ½-in. angle stop, china push button, ¾-in. outside diameter flush connection, spud coupling, wall and spud flanges.

Price $22.00.

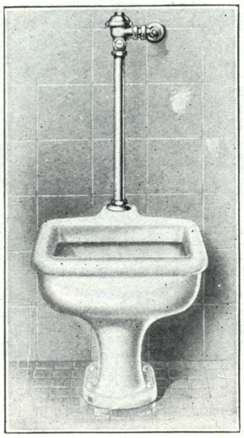
Note: State distance from wall to center of spud and whether urinal is siphon jet or washout



F-59

Includes nickelplated Royal Flush Valve with right-hand inlet, 1-in. angle stop, china push button, 1½-in. outside diameter flush connection, spud coupling, wall and spud flanges.

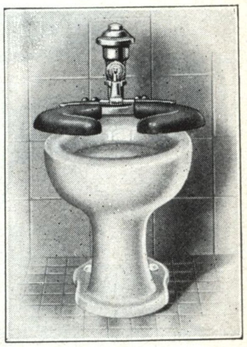
Price $23.00



F-60

Includes nickelplated Royal Flush Valve with right-hand inlet, 1-in. angle stop, china push button, 1½-in. outside diameter flush connection, spud coupling, wall and spud flanges.

Price $24.00



F-61

Includes nickelplated Royal Flush Valve, seat-operated with back inlet, 1-in. straight stop, 1½-in. outside diameter flush connection for top spud bowl, spud coupling, nickelplated adjustable bar check hinge and ebony "Whale-Bone-Ite" open-front and back seat.

Price $53.00.

Note: Order must specify distance from center of spud to center of seat post holes for top spud bowl or distance from face of spud to center of seat post holes for back spud bowl

Installation

The water supply must be sufficient to properly flush the fixture without tank or flush valve. The pressure should never be less than 5 lbs. at the flush valve. The pressure at the flush valve and the length of the supply line determine the size required. The sizes indicated in the table are suitable for one to three closets. The size of pipe required to supply any installation of Royal Flush Valves will be furnished on receipt of the building plans or a sketch giving name and location of job; number, location and elevation of each flush valve above grade; minimum water pressure at grade; length of supply pipe from each flush valve to the street main or storage tank.

SIZE OF PIPE FOR SMALL BUILDINGS WITH ONE TO THREE WATER CLOSETS

Table No. 4-A	Total feet of supply pipe from the flush valve to the street main or storage tank—no meter										
Minimum pressure at the flush valve, lbs.	20	25	30	40	50	60	80	100	125	150	200
7	1½	1½	1½	1½	2	2	2	2	2	2	2½
10	1¼	1¼	1¼	1¼	1½	1½	1½	1½	2	2	2
15	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½
20	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½
25	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼
30	1	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼
40	¾	1	1	1	1	1	1	1	1¼	1¼	1¼
50	¾	¾	1	1	1	1	1	1	1	1¼	1¼
60	¾	¾	¾	1	1	1	1	1	1	1	1¼
70	¾	¾	¾	¾	1	1	1	1	1	1	1¼
80	¾	¾	¾	¾	1	1	1	1	1	1	1

THE BRUNSWICK-BALKE-COLLENDER CO.

Manufacturers of Quality Closet Seats

623-633 South Wabash Avenue
CHICAGO, ILL.

TELEPHONE
WABASH 7060

SOLD BY ALL LEADING PLUMBERS, PLUMBING JOBBERS AND WATER CLOSET MAKERS

Product

WHALE-BONE-ITE TOILET SEATS.

For Billiard Tables and Bowling Alleys, see pages 2836-2838.

Whale-Bone-Ite Toilet Seat

For hotels, hospitals, schools, industrial buildings, and wherever the best is desired.

Made of a compact laminated core, covered with a hermetically sealed composition of Whale-Bone-Ite. Whale-Bone-Ite is put on in its softened state under heavy hydraulic pressure, thus anchoring the covering to the core and making one solid piece. It is then vulcanized, which produces the hard surface capable of taking a high grade, lasting polish. The Whale-Bone-Ite is the "quality seat."

These seats are *absolutely sanitary*. Whale-Bone-Ite is conceded by the medical fraternity to be positively germproof. When cleaned with diluted alcohol it is made absolutely aseptic. No deodorizing is necessary.

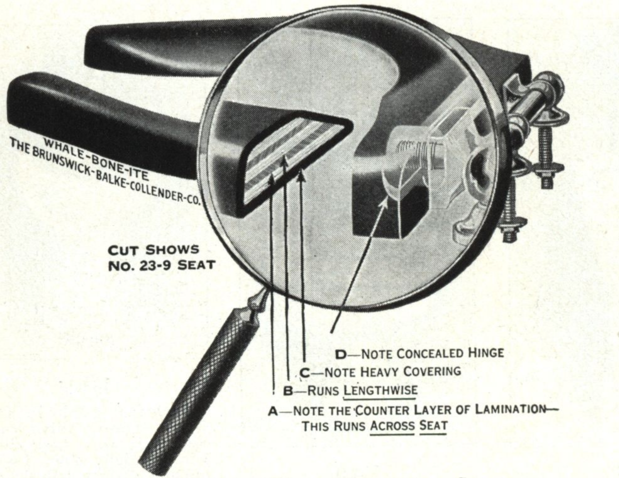
Whale-Bone-Ite is impervious to moisture and is not affected by the action of uric acid—in fact, is acidproof.

"This seat is unqualifiedly guaranteed not to split, crack or craze." There are no joints to open. The seat is light in weight, indestructible and of life-long durability.

The Whale-Bone-Ite seat is comfortable and of pleasing appearance. Colors are ebony and mahogany, which readily show all dust, dirt, etc. The seats will not discolor—they improve from use and eliminate all maintainance costs.

Corrosion Resistant Hinges—The patented, concealed hinges are most rigid and reduce corrosion to a minimum, having the least possible exposed metal. They are made from cast brass, nickelplated; bronze, red metal or white metal.

With all seats shown on these pages, hinges in non-corrosive white metal, 5½-in. center posts, can be furnished when desired. For prices, add to list: No. 9, 80¢; No. 91, $1.20; No. 59, $2.00. For white metal greater than 5½ in., center to center, up to 9 in., add to list: No. 9 or 91, 80¢ per inch.


WHALE-BONE-ITE
THE BRUNSWICK-BALKE-COLLENDER-CO.
CUT SHOWS
NO. 23-9 SEAT
D—NOTE CONCEALED HINGE
C—NOTE HEAVY COVERING
B—RUNS LENGTHWISE
A—NOTE THE COUNTER LAYER OF LAMINATION—
THIS RUNS ACROSS SEAT

CONSTRUCTION OF WHALE-BONE-ITE SEATS

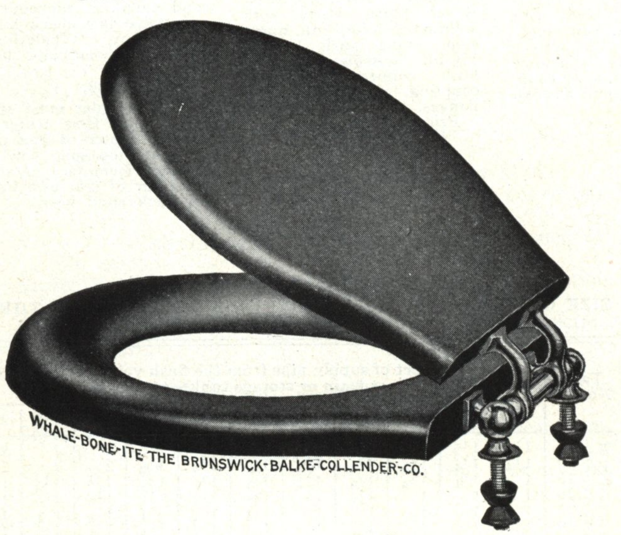
WHALE-BONE-ITE THE BRUNSWICK-BALKE-COLLENDER-CO.

NO. 24-9 SEAT ONLY WITH NO. 9 HINGE

Measures 17¾ in. center of hinge posts to front edge of seat; 14½ in. wide; hole, 9¾x8 in.

List price: Ebony, $13.50; mahogany, $15.25. No. 247-9—Seat only; juvenile use. Hole, 7x8 in.

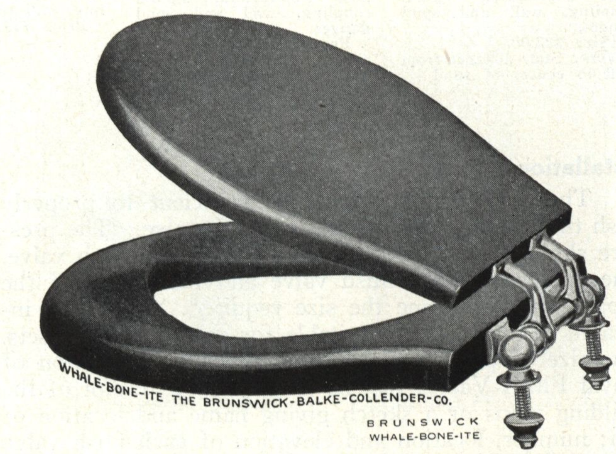
List price: Ebony, $15.20; mahogany, $18.25


WHALE-BONE-ITE THE BRUNSWICK-BALKE-COLLENDER-CO.

NO. 24-91 SEAT AND COVER

Measures 17¾ in. center of hinge posts to front edge of seat; 14½ in. wide; hole, 9¾x8 in.

List price: Ebony, $24.50; mahogany, $28.50. For No. 96 check-hinge, add $1.00; for white metal hinges, add (No. 91) $1.20

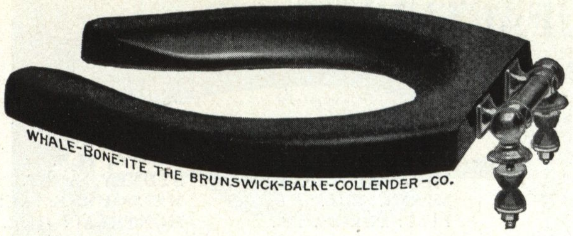

WHALE-BONE-ITE THE BRUNSWICK-BALKE-COLLENDER-CO.
BRUNSWICK
WHALE-BONE-ITE

NO. 16-91 SADDLE SEAT AND COVER WITH NO. 91 HINGE

Measures 17¾ in. center of hinge posts to front edge of seat; 15⅝ in. wide; hole, 10½x8 in.

List price: Ebony, $25.80; mahogany, $30.00

Continued on next page



No. 23-9 Seat Only. For Regular Bowls with No. 9 Hinge

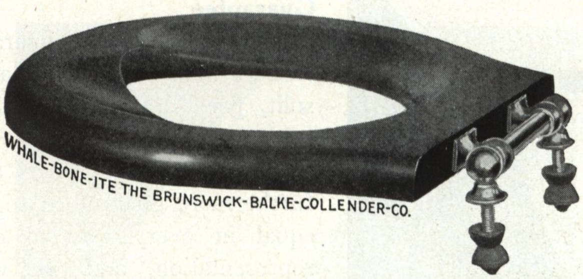
Measures 16½ in. center of hinge posts to front edge of seat; 15½ in. wide; front opening 4 in. List price: Ebony $14.00; mahogany $16.70.

No. 23-91—Seat and cover. List price: Ebony $25.00; mahogany $29.00.

No. 237-9—Open front; seat only; juvenile use. Hole, 7x8 in.; 3-in. front opening. List price: Ebony $17.20; mahogany $20.20

No. 23½-9—Seat only, for raised front bowls: 5½-in. opening to fit *raised front lip* bowls when specified. List price: Ebony $26.70; mahogany $30.95. All hinges furnished with 5½-in. centers. Posts can be supplied interchangeable up to 9-in. centers. Add to list 40¢ per inch.

White metal hinges supplied on request

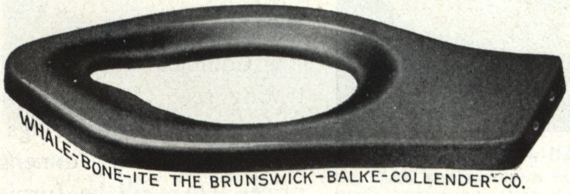


No. 16-9 Seat Only, without Cover

Measures 17¾ in. center of hinge posts to front edge of seat; 15⅝ in. wide; hole, 10½x8 in.

List price: Ebony $14.70; mahogany $17.30. For No. 96 check hinge, add $1.00. Hinge posts supplied at 5½-in. centers or can be furnished up to 9 in. on all hinges for all seats except Nos. 22, 26 and 27.

White metal hinges supplied on request



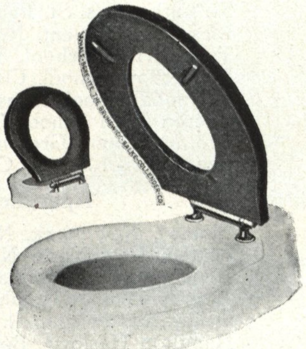
No. 26-C Seat for Seat Action Pocket or Integral Valve Closets

Measures 24 in. center of hinge posts to front edge of seat; 16⅜ in. wide; hole, 12½x8½ in. Special hinges supplied as occasion demands. List price on request.

No. 26½—same as above, except open front.

No. 26-9—same as above, with 5½-in. center hinge.

List price: Ebony $22.00; mahogany $26.30



No. 16-99 Seat with Patented Concealed Spring Hinge, Nickelplated Cast Brass

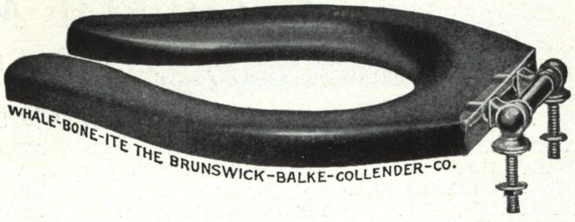
Hinge post centers regularly furnished, 5½ in. Also supplied in 9 in. Both top and bottom free from metal.

List price: Ebony $23.70; mahogany $26.30.

No. 99 hinge fits any closed back seat. Add to list $9.00.

No. 599 hinge fits No. 18-59 seat. Add to list $11.00.

White metal hinges supplied on request

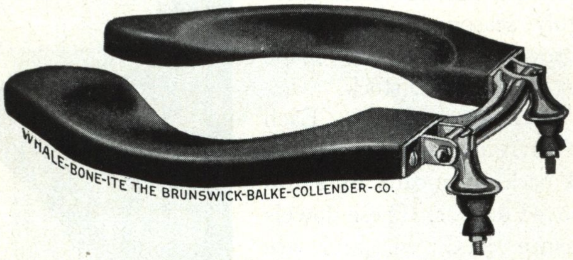


No. 21-9 Seat Only. Fits All Standard Extended Lip Bowls

Measures 19 in. center of hinge posts to front; 15½ in. wide; hole, 8 in. wide.

List price: Ebony $14.80; mahogany $18.30.

No. 21-91—Seat and cover. List price: Ebony $26.00; mahogany $30.00



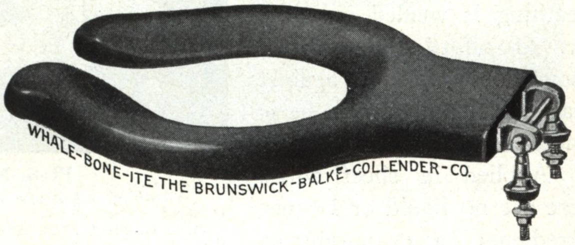
No. 18-59 Seat Only, with No. 59 Heavy Nickelplated, Concealed Hinges, for Bowls with Extended Lips

Measures 18¾ in. center of hinge posts to front edge of seat; 15 in. wide; front and back openings 3¼ in. wide.

List price: Ebony $18.00; mahogany $20.20.

No. 18½-59—Same as above for regular bowls. List price: Ebony $18.00; mahogany $20.20.

No. 28-59—Same as above for bowls with raised front, flushing lips. White metal hinges supplied on request. List price: Ebony $20.50; mahogany $22.20

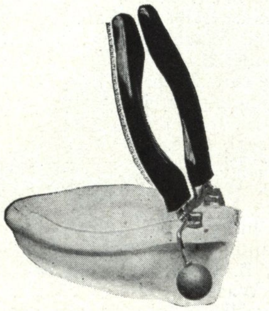


No. 27-9 Open Seat for Seat Action Pocket Valves in Ware Closets

Measures 22 in. center of hinge posts to front edge of seat; 15½ in. wide.

List price: Ebony $21.00; mahogany $23.50.

White metal hinges supplied on request



No. 18-595 Seat Only, with No. 95 Hinge and Two Nickelplated, Cast Brass, Lead Filled Ball Weights

Measures 18¾ in. center of hinge posts to front edge of seat; 15 in. wide; front and back openings 3¼ in. wide.

List price: Ebony $29.00; mahogany $31.20. With iron weights, bronzed or nickeled, ebony $23.00; mahogany $25.20.

No. 95—For closed back seats. For two nickelplated, cast brass, lead filled ball weights, add to list $11.00, or in iron, bronzed or nickeled, add to list $5.00.

White metal hinges supplied on request

C. F. CHURCH MANUFACTURING CO.

HOLYOKE, MASS.

SERVICE

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PITTSBURGH, PA.
TAMPA, FLA.
SYDNEY, AUST.
MELBOURNE, AUST.
MONTREAL, QUE.

Product

Church Sani-White Toilet Seats.

Construction

Lumber—The wood used in Church seats is selected hardwood, dried and thoroughly seasoned in our own kilns. All seats are made from full 1½-in. stock.

Reinforcement — Each seat is reinforced both front and back by means of spiral grooved dowels. These dowels measure ⅝x7 in. and are forced into the seat cross grain, rendering it practically splitproof.

Finish—Church Sani-White seats are *sheet covered,* which means that a pure white sheathing is welded over the seat to afford the greatest amount of protection against wear, tear and atmospheric conditions.

Applied in sheet form, there are no liquid or lacquer ingredients to evaporate or cause the finish to crack, craze, chip or flake.

Hinges—Hinges are cast from pure Ingot brass, heavily nickelplated and buffed. Guaranteed against breakage. Brass wing nuts, nickelplated washers and rubber washers furnished on all hinges.

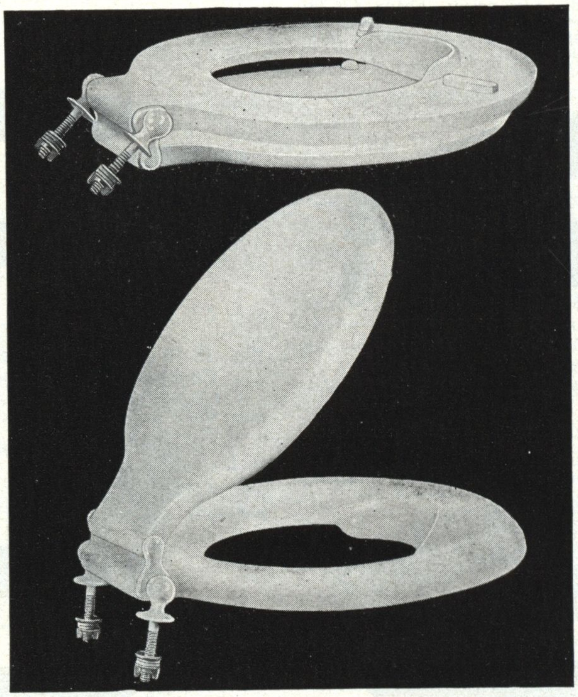

Plate No. 102, All-white

All-white full saddle seat and cover with "sanitary lip." All exposed metal eliminated, no nuts, no bolts, no screws above surface of bowl when attached; no waste can pass the "sanitary lip"

Guarantee

Church seats are guaranteed for five years not to crack, split, peel, craze nor to discolor.

All Church products are furthermore guaranteed to be equal in every way to our representation, and we will replace any part that may become defective by reason of workmanship or material, ordinary wear and tear excepted.

Catalogue

Complete catalogue illustrating seats for every need, including line drawings of every necessary dimension, prices, etc., will be furnished on request.

A Few of the Notable Buildings Equipped with Church Sani-White Toilet Seats

Hotels

Roosevelt, New York, N. Y.
Commodore, New York, N. Y.
Shelton Club, New York, N. Y.
Biltmore, New York, N. Y.
Chateau Lake Louise, Alberta, Can.
Winthrop, Tacoma, Wash.
Poinsette, Greenville, S. C.
Book Cadillac, Detroit, Mich.
Ben Franklin, Philadelphia, Pa.
Belden, Chicago, Ill.
Mt. Royal, Montreal, Que.
Admiral, Chicago, Ill.
Monticello, Kelso, Wash.
Citizens, Charlotte, N. C.
Commonwealth, Chicago, Ill.
Ambassador, Atlantic City, N. J.
Colonial, Nassau, B. W. I.
Olympic, Seattle, Wash.
Belmont, Chicago, Ill.
Chateau Frontenac, Quebec, Que.
Atlanta Biltmore, Atlanta, Ga.
George Vanderbilt, Asheville, N. C.
Francis Marion, Charleston, S. C.
Nautilus, Miami, Fla.
Federal, Melbourne, Australia
Miami-Biltmore, Coral Gables, Fla.
Roney-Plaza, Miami, Fla.
Admiral Beatty, St. Johns, N. B.
Lafayette, Little Rock, Ark.
York, York, Pa.
Roosevelt, Washington, D. C.
Venetian, Miami, Fla.
Ambassador, Palm Beach, Fla.
D'Alba, Palm Beach, Fla.
Blue Heron, Palm Beach, Fla.

Hospitals

Fifth Avenue, New York, N. Y.
Lutheran, New York, N. Y.
Hollywood, Hollywood, Cal.
Los Angeles General, Los Angeles, Cal.
St. Francis', San Francisco, Cal.
St. Joseph's, St. Paul, Minn.
St. Leo's, Greensboro, N. C.
New Britain, New Britain, Conn.
Masonic Home, Elizabethtown, Pa.
Mantetsu General, Manchuria, China
Glendale Sanitarium, Glendale, Cal.
Forest Hills, Boston, Mass.
Methodist, Los Angeles, Cal.
Austin, Melbourne, Australia

Schools and Colleges

Harvard, Cambridge, Mass.
Boston College, Boston, Mass.
Holy Cross, Worcester, Mass.
New Hampshire, Durham, N. H.
Smith, Northampton, Mass.
M. A. C. Memorial, Amherst, Mass.
St. Catherine's, St. Paul, Minn.
Blessed Sacrament, Newark, N. J.
Taylor High School, Taylor, Tex.
Longfellow School, Cleveland, Ohio
Magnolia School, Houston, Tex.
Tucson High School, Tucson, Ariz.
Groton School, Groton, Mass.
Central High School, Charlotte, N. C.

Apartments

Pintard, New York, N. Y.
Seaton, New York, N. Y.
Anderson, Forest Hills, L. I., N. Y.
Jackson Heights, Elmhurst, L. I., N. Y.
Delaware, Chicago, Ill.
Hamilton Harlowe, Boston, Mass.
Ambassador Hotel, St. Louis, Mo.
Berman, Detroit, Mich.
Cockrell, Houston, Tex.
Temple Court, Melbourne, Australia
Beechwood, Springfield, Mass.
Shelbourne, Milwaukee, Wis.
Kennedy, Washington, D. C.

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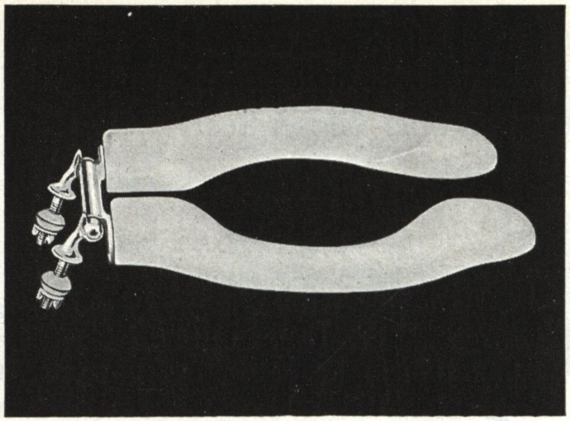


Plate No. 510

Open front and open back seat, no cover, with No. 47 brass nickelplated heavy check hinge. The check hinge is so designed that it allows the seat to stand in a vertical position when raised without striking the tank or flush valve

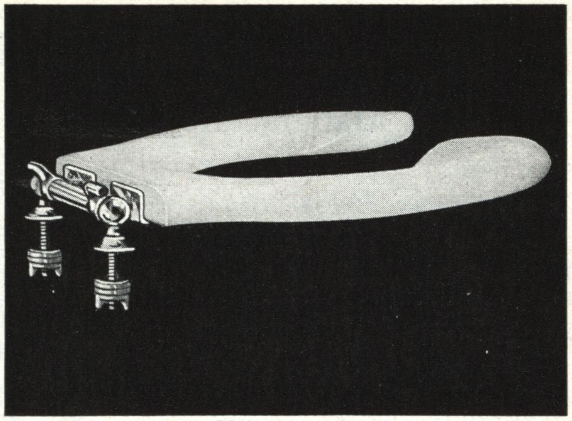


Plate No. 251

Open front full saddle seat, no cover, with No. 45 brass nickelplated heavy check hinge. The check hinge is so designed that it allows the seat to stand in a vertical position when raised without striking the tank or flush valve

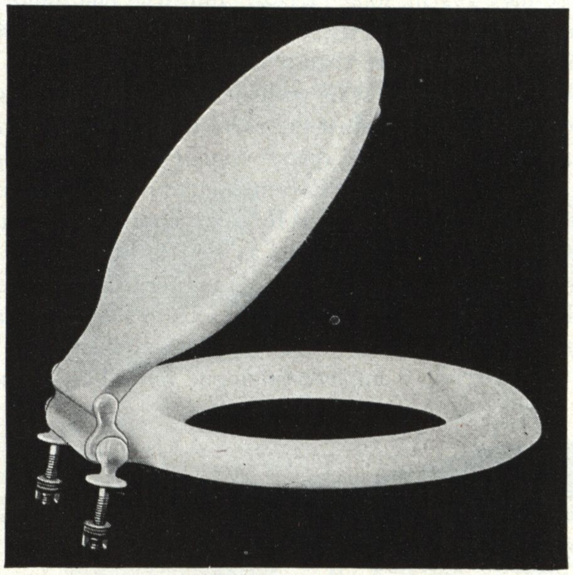


Plate No. 142

All-white plain pattern seat and cover with white cushion bar bumpers. All exposed metal eliminated. No nuts, bolts, screws appear above surface of bowl when attached

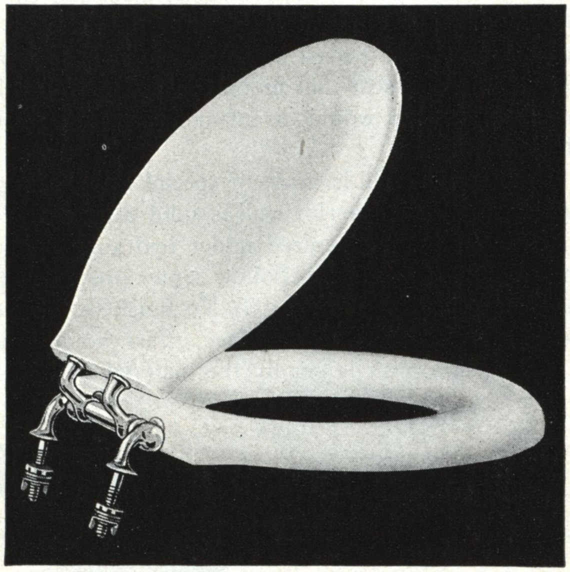


Plate No. 220

Plain pattern seat and cover with No. 32 heavy nickelplated brass non-soil bar hinge. No metal showing on underside of seat or cover

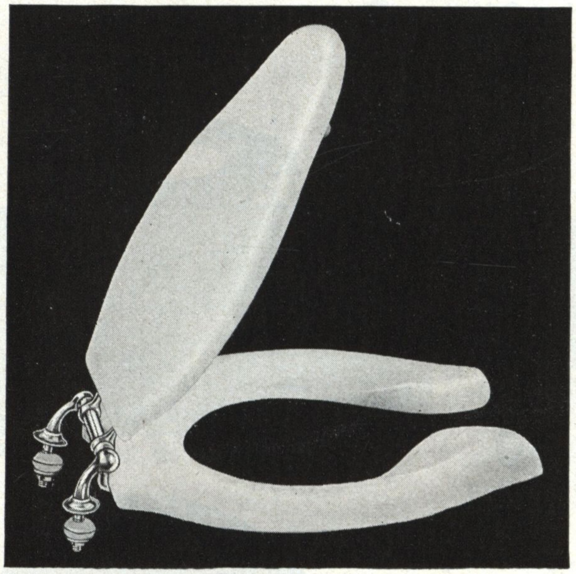


Plate No. 360

Open front full saddle seat and cover for extended lip bowl with No. 88 extra heavy brass nickelplated bar hinge

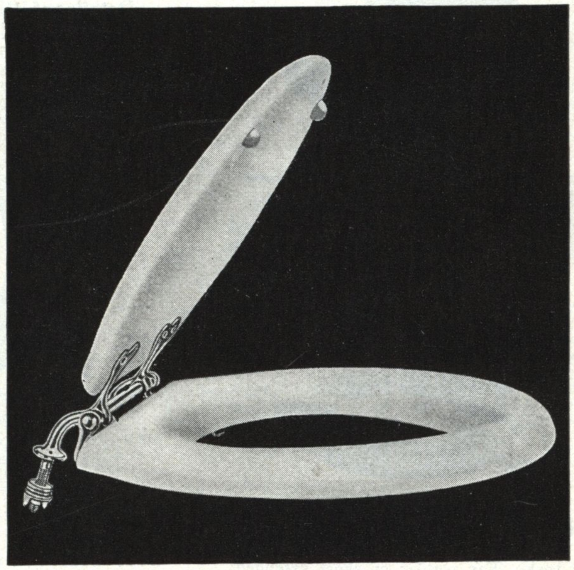


Plate No. 425

Seat and cover with heavy nickelplated brass bar hinge and white cushion bar bumpers. Plain pattern for regular bowl

Church Sani-White Toilet Seats

Church Sani-White seats and covers fit all standard makes of bowls

NEVER-SPLIT SEAT CO.

Manufacturers of Wood and Hard Rubber Closet Seats

EVANSVILLE, IND.

Products

"EVERNU" HARD RUBBER CLOSET SEATS.

"NEVER-SPLIT" WOOD CLOSET SEATS.

Evernu
Everlasting Hard Rubber
Seats

"Evernu" Hard Rubber Toilet Seats

A toilet seat, to give permanent satisfaction must be almost indestructible, impervious to acid, and endure constant cleansing without deterioration of its fine appearance—in brief, it must be an "Evernu" hard rubber seat. This is the seat that architects have long wished some manufacturer would invent and produce economically.

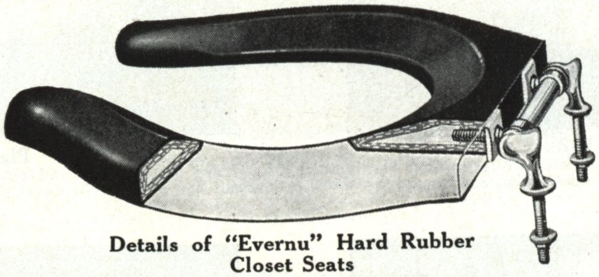
The interior wall is made of special hard rubber of great strength; the exterior wall is solid color hard rubber. The two are vulcanized under hydraulic pressure into one lasting piece. The hollow center provides lightness with strength. No joints. No finish to wear off. Seamless and smooth, the surface offers no lodgment for dirt. The finish is simply the material of the seat buffed to a beautiful luster. The fine appearance is as deep and enduring as the hard rubber itself.

The regular equipment is a nickel-plated cast brass hinge of the extra heavy concealed type. (No metal on top or bottom of seat or cover.)

The hard rubber takes a steellike thread and the hinge lugs 1⅞ in. long "freeze" into it. The hinge becomes even tighter as its service lengthens. It will withstand a pull of more than a ton without loosening. A check is provided on seats without lids to prevent the seat from falling back against the valve wall or tank. *Architects may if they wish, specify any special metal hinges.*

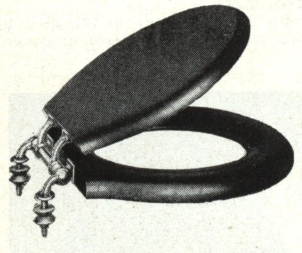
Guarantee—The "Evernu" guarantee is unconditional. It is the perfect seat for apartments, hotels, clubs, office and industrial buildings as well as fine homes. It can not crack, craze or warp. It is unaffected by steam and low temperature. It is impervious to acid, water and alkali. Everlasting, it is always new and sanitary.

Catalogue—Complete catalogue mailed on request.



Details of "Evernu" Hard Rubber Closet Seats

The interior wall of special hard rubber of great strength and the outside wall of solid color hard rubber are vulcanized under hydraulic pressure into one lasting piece

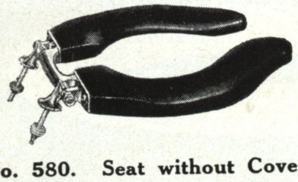


No. 500. Ebony or Mahogany Finish Seat for Regular Bowl with Cover

No. 500-W. Same as No. 500 without cover. Check hinge.

No. 510. Same except full saddle shape and greater dimensions to fit bowls with oversize rims. Also fits regular size rims.

No. 510-W. Same as No. 510 except without cover

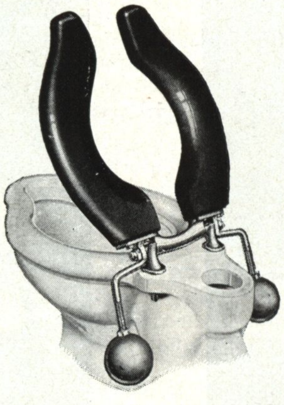


No. 580. Seat without Cover

Ebony or mahogany open front and open back. For regular or short extended lip bowl. Extra heavy check hinge.

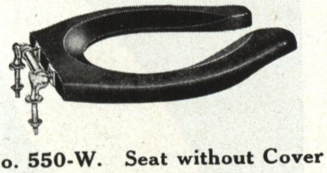
No. 590. Same as No. 580 except for large extended lip bowl

No. 580 and No. 590 can also be furnished with cover



Seat with Self-raising Weighted Hinges

Any seats without cover listed in the catalogue can be furnished with self-raising weighted hinges with either nickelplated iron or brass weights. Self-raising spring hinges with no weights, fully guaranteed, can also be furnished



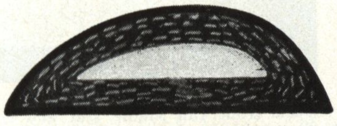
No. 550-W. Seat without Cover

Ebony or mahogany. Without cover. Saddle shape. For large extended lip bowl. Check hinge.

Above seat regularly furnished to hinge 19 in. Can also be furnished to hinge 18, 18½ or 19¼ in.

No. 550. Same as No. 550-W except with cover.

No. 525 and No. 525-W same as No. 550 and No. 550-W except for regular bowls and hinges 16¼, 17¼ or 17½ in. long



Free Cross Section Sent on Request

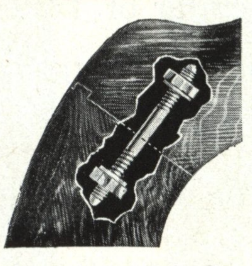
Continued on next page

Never-Split
Wood Toilet SEATS

"Never-Split" Wood Toilet Seats

"Never-Split" seats are made of quarter-sawed oak and quarter-sawed red gum. The lumber is carefully selected, thoroughly seasoned and dried in our own kilns.

Each seat is skilfully fashioned in four sections so that the cross grain of the *quarter-sawed* lumber runs around the hole. These sections are then united in an inseparable unit by four bolts concealed in the wood. The bolts are let in at the ends. The nuts and washers are inserted through small mortised holes in the bottom. After the glue is applied, the bolts are tightened until the washers sink into the wood. The joints are held together as in a vise. Small mortised holes are then filled with a composition that hardens and takes the same finished color as the seat. So tight is the grip of the bolt, so accurately machined are the tongues and grooves that it is impossible for the joint to split or come apart. This is the "Never-Split" construction famous for its durability.

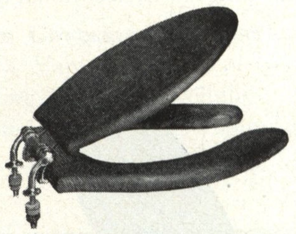

Special Steel Bolt Concealed within the Wood

The hinge is made of the finest quality new brass and is so well set in that it is as long lasting as the seat itself. Every "Never-Split" is hand brushed and beautifully finished.

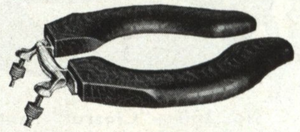
Guarantee—Many "Never-Split" seats have service records of more than twenty years. Every "Never-Split" seat is unconditionally guaranteed not to split for five years.

Catalogue

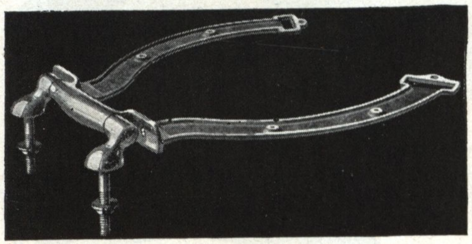
In addition to the few models listed on these pages, the company makes seats of every type equipped with any needed style of hinge, including ball, self-raising hinges, reinforcing plates, etc. All seats illustrated with a cover can be ordered without covers at a slight reduction in price. Catalogue showing all styles and complete specifications will be mailed on request.

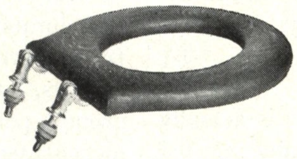

No. 251. Closet Seat

Also furnished without cover.
No. 250-W same for regular bowl.
Natural, antique, golden oak or imitation mahogany; white enameled, white "Duco" celluloid or genuine mahogany

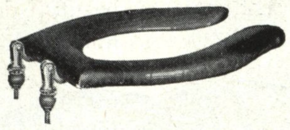

No. 266-W Seat for Extended Lip Bowl

No. 266. Same with cover.
Finished in natural, antique or golden oak, imitation mahogany, imitation cherry, rub finish.
Finished in white enamel, white "Duco" celluloid, genuine Mexican mahogany, genuine cherry or walnut, piano polish.
No. 265 and 265-W. Same for regular bowl

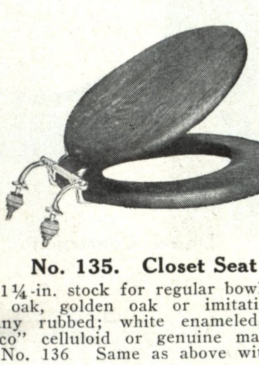

No. 266-W Hinge


No. 175. Closet Seat

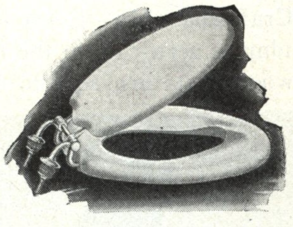
1½-in. stock for regular bowl. Hotel hinge. Natural, antique or golden oak or imitation mahogany rubbed; white enameled, white "Duco" celluloid or genuine mahogany.
No. 176. Same as No. 175 with open front


No. 177. Closet Seat

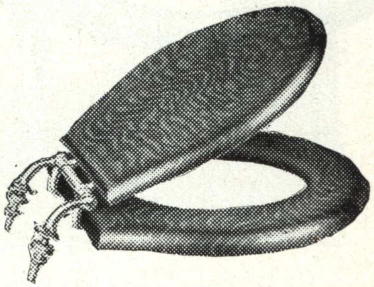
Same as No. 175 except for extended lip bowl.
No. 175, 176 and 177 are exceptionally strong seats for public buildings and public toilets


No. 135. Closet Seat

1¼-in. stock for regular bowl. Natural oak, golden oak or imitation mahogany rubbed; white enameled, white "Duco" celluloid or genuine mahogany.
No. 136 Same as above with open front.
No. 137. Same as above with open front for extended lip bowl


No. 300. Closet Seat

Full saddle for regular bowl. Hinge same as No. 251. Also furnished without cover.
Natural, antique, golden oak or imitation mahogany; white enameled, white "Duco" celluloid, genuine mahogany or walnut.
All white seats can be furnished with a genuine white "Duco" finish, and white or nickelplated brass hinges


No. 120. Closet Seat

1¼-in. stock for regular bowl. Natural, antique or golden oak gloss; oak or imitation mahogany rubbed; white enameled, white "Duco" celluloid or genuine mahogany polished.
No. 121. Same as above with open front.
No. 122. Same as above with open front for extended lip bowl

ESTABLISHED 1900

VAN ARNAM MANUFACTURING CO.

Manufacturer of Toilet Seats

FORT WAYNE, IND.

Product

VAN ARNAM GENUINE SHEET COVERED TOILET SEATS.

Also Van Arnam Wood Toilet Seats.

NONE BETTER VANARCO MADE

TRADE-MARK

Van Arnam Toilet Seats

The Van Arnam line of seats is backed by a quarter century's experience in the manufacture of a quality line of wood toilet seats.

Lumber from the mill is carefully kiln dried, milled and finished in our factory. Only the best of material and workmanship is accepted.

Designs are stocked for every requirement from the most modern office or institutional installation to the medium priced residence.

Van Arnam Sheet Covered Toilet Seats

Craftsmanship—Every seat in this line is actually a handmade seat. From the time the carefully selected hardwood seats are sent to the celluloid division the process is one of real handicraft, every emphasis being on making as fine a seat as possible.

Construction Details—*Covering*—Celluloid sheets (.020 in. thick).

Edge—The edge is lapped from both top and bottom making a double reinforcement, welded to make a seamless joint.

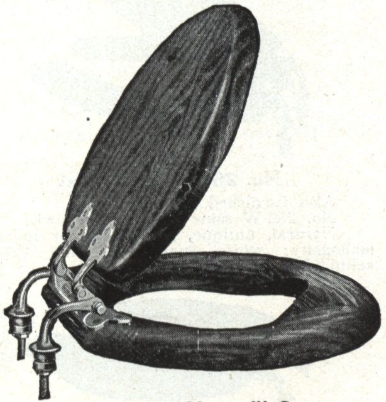
Finish—The sheathing is then scraped, sanded and polished by hand, and is finally brought to the sheen of fine porcelain by a final polishing upon cotton-flannel wheels.

Furnished in white or black.

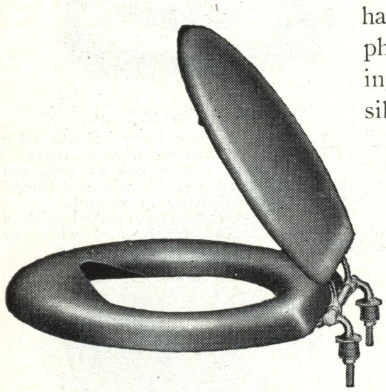
Stock—1½-in. hard maple.

Joint—Double dowel reinforced in front and back (see sectional view).

Hardware—Heavy bar hinges of exceptional beauty and durability. Cast from pure ingot brass, they are ground, polished and nickelplated in our own factory. Guaranteed against breakage. Particular attention is paid to beauty, design and finish.

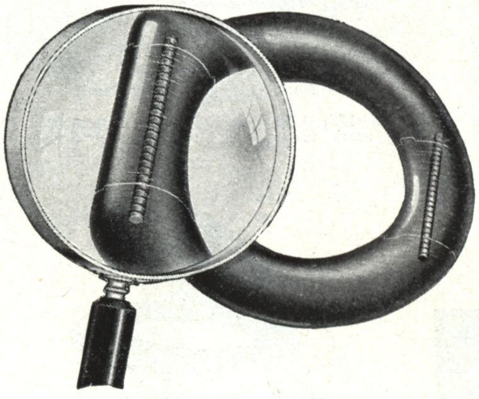


No. 260—"Closruf" Seat
(Cannot be furnished less cover)

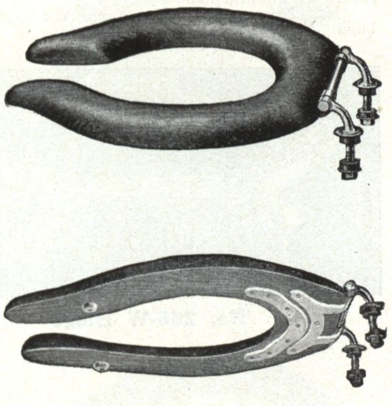


Seats Nos. 3 and 30

No. 3—Dowel reinforced—ring shape
No. 30—Same except saddle shape

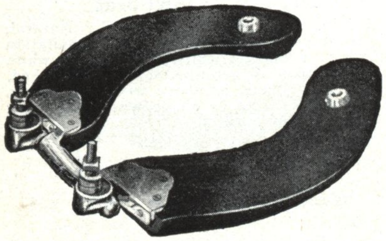


Dowel Construction



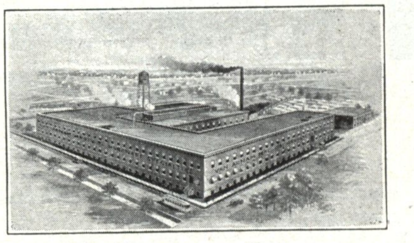
Seats Nos. 170-173

No. 171—For regular bowl
No. 170—Same with cover
No. 173—For extended bowl
No. 172—Same with cover



Seats Nos. 192 and 194

No. 192—For regular bowl
No. 194—For extended bowl



The Van Arnam Factory at Fort Wayne, Ind.

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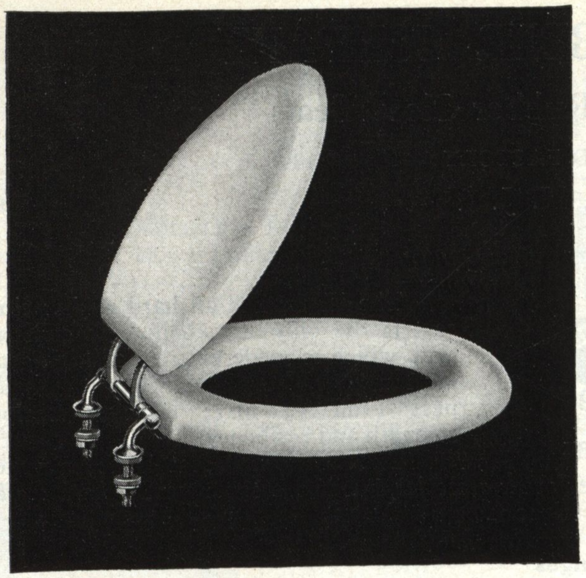
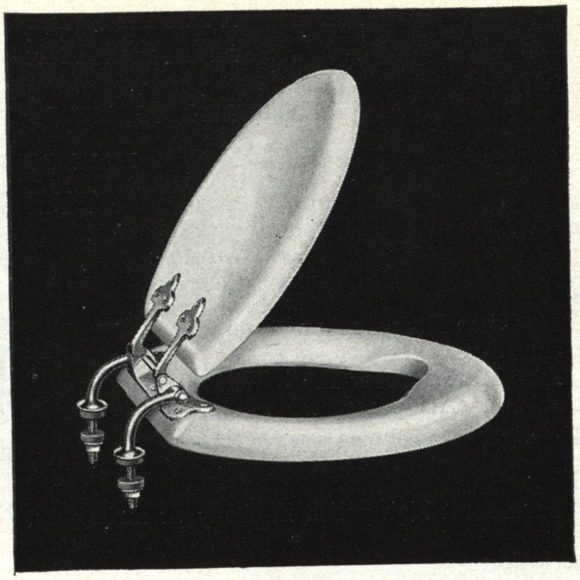


Seats Nos. 1055 and 1550

No. 1055—Plain pattern seat and cover

No. 1550—Saddle shape seat and cover. Heavy, reinforced bar hinge (brass) "Turtle-back" cover gives streamline effect



Seats Nos. 1026 and 1260

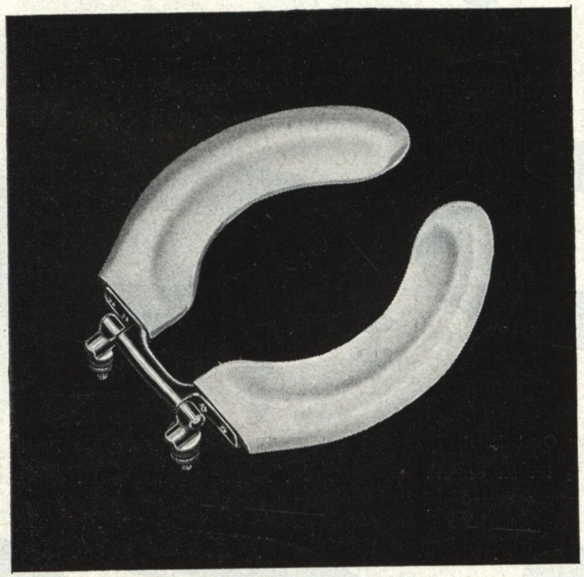
No. 1026—Plain pattern seat and cover.

No. 1260—Saddle shape seat and cover. Special hinge for close-roughing work allows seat to balance on extra short radius. Saves inches in the small bathroom

Pyralin Covering Construction

All Van Arnam sheet covered toilet seats have a sheathing of thick celluloid (pyralin) moulded and cemented to carefully manufactured hardwood stock 1½ in. thick.

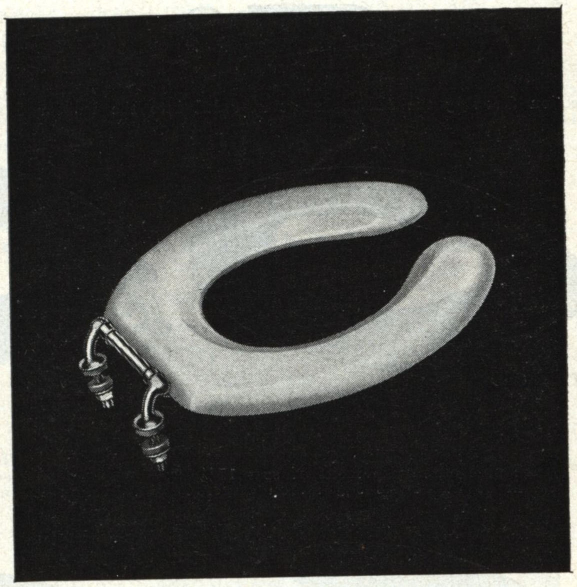
The edges of these seats have two thicknesses of sheet celluloid which overlap to make a perfectly seamless joint. The finished seat looks like a solid piece of gleaming china.



Seats Nos. 1292 and 1294

No. 1292—Open front and back seat, less cover for regular bowl

No. 1294—Open front and back for extended lip bowl. Very massive hinge, heavily nickelplated, provides strength and beauty



Seats Nos. 1270-1273

No. 1271—Open front saddle shape, less cover for regular bowl

No. 1270—Open front saddle shape with cover for regular bowl

No. 1273—Open front saddle shape, less cover for extended lip bowl

No. 1272—Open front saddle shape with cover for extended lip bowl. Extra heavy hinge and special reinforcing plate

ESTABLISHED 1905

THE LUZERNE RUBBER COMPANY

Manufacturers of Hard Rubber Closet Seats

MAIN OFFICE AND FACTORY
TRENTON, N. J.

Product

Luzerne Hollow All Hard Rubber Closet Seats.

Also Hard Rubber Flush Valves, Ball Cocks and Acidproof Pipe and Fittings.

THE LUZERNE RUBBER CO.
LRCo
TRENTON, N.J. U.S.A.
TRADE-MARK

The "Luzerne" all hard rubber closet seat is the only seat, hollow in construction, which is made entirely of high grade hard rubber, with unvarying wall thickness (full $\frac{3}{16}$ in.); insuring uniform strength and resiliency.

The "Luzerne" seat is *not* a veneer over other material, but is the same quality *hard rubber* throughout.

Finish

Permanent high polish in ebony or mahogany.

Description

The Luzerne is a sanitary closet seat made of the highest grade hard rubber. In construction it is hollow, airtight, light in weight, very resilient and practically unbreakable. It will stand up under the most severe conditions in schools, public and office buildings, hospitals, comfort stations and factories.

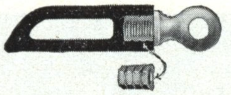
Hard rubber is not affected by acid, water or weather conditions.

Guaranteed not to crack or break under the most severe conditions attending the use of a closet seat.

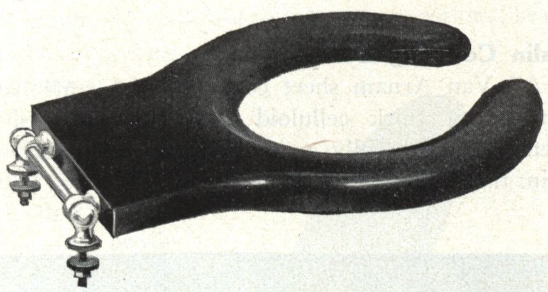
Hard rubber is specified by the United States Government as slow-burning.

Hinges

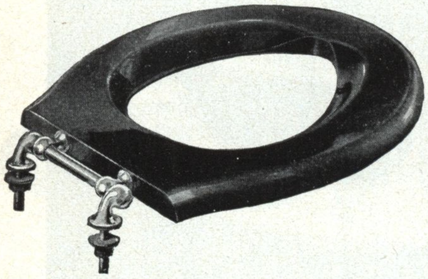
Heavy metal hinges are screwed into metal inserts securely embedded in hard rubber. Other styles made which are not shown on this page. Send for descriptive catalogue and section.



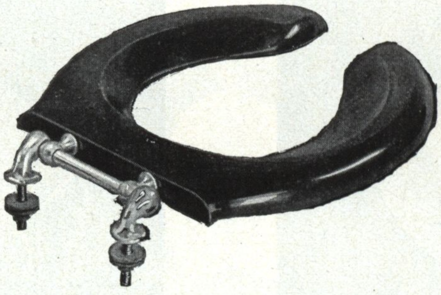
Section Showing the Hinge Insert Moulded into the Rubber Seat



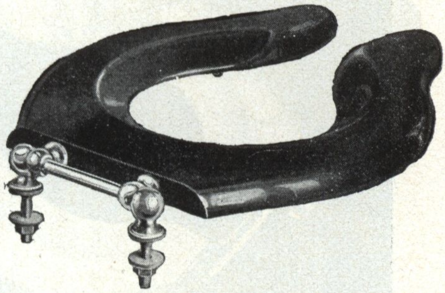
L—Open Front Seat for Seat Action Valve Closets
Hinge post centers to front of seat 22 in. Width 15¼ in. Posts 5½ in. on centers



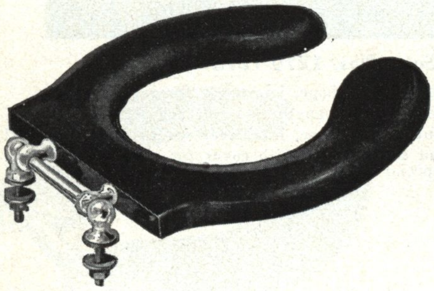
A—Saddle Hole Seat
Hinge post centers to front of seat 17¼ in. Width 15 in. Posts 5½ in. on centers



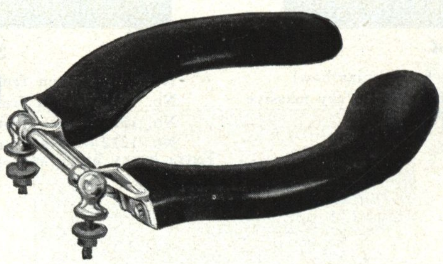
B—Saddle Hole Seat for Oval Bowl
Hinge post centers to front of seat 17¼ in. Width 15 in. Posts 5½ in. on centers



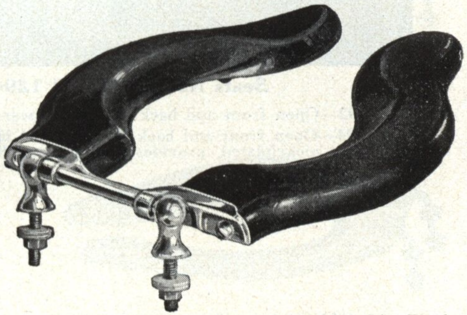
C—Saddle Hole Seat for Lip Bowl
Hinge post centers to front of seat 17¾ Width 15 in. Posts 5½ in. on centers



K—Open Front Seat for Oval or Lip Bowl
Hinge post centers to front of seat 16¼ in. Width 15 in. Posts 5½ in. on centers



H—Open Front and Back Seat for Oval Bowl
Hinge post centers to front edge of seat 16½ in. Width 15½ in. Posts 5½ in. on centers



N—Open Front and Back Seat for Lip Bowl
Hinge post center to front edge of seat 18½ in. Width 15½ in. Posts 5½ in. on centers

Luzerne Hard Rubber Closet Seats

A. F. CURTIN VALVE CO.

Manufacturers of Noiseless Water Closet Tank Fittings

MEDFORD, MASS.

All Leading Plumbing Supply Houses Will Now Equip Tanks with Curtin Fittings.

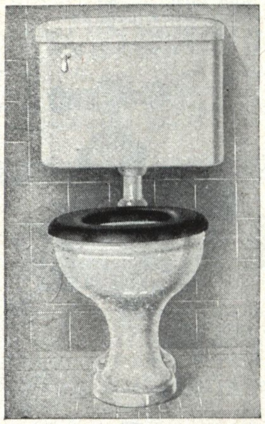
Products

CURTIN NOISELESS TANK FITTINGS for low down water closet tanks include the "CURTIN VICTORY" VALVE, the CURTIN LEVER, the CURTIN ALL-WHITE LEVER and the "CURTIN ROTARY" BALL COCK.

CURTIN
TRADE MARK

Why the Closet Tank Is Used

Water closets flushed from tanks equipped with Curtin Fittings will give a strong and perfect flush with only 4 gal. of water—a great saving. Economical to install, as the ordinary 5/8-in. service pipe from street gives ample water supply to any residence. With water closets flushed by direct pressure flush valves, however, a 1-in. or larger service is required, and in flushing directly from service pipe there is danger of contaminating the water supply. The Curtin Fittings require no attention or repairs. They operate quietly under all conditions. This is a most desirable feature, particularly in homes, apartments and hotels, where people should not be disturbed by noisy water closets.


A CURTIN EQUIPPED WATER CLOSET TANK

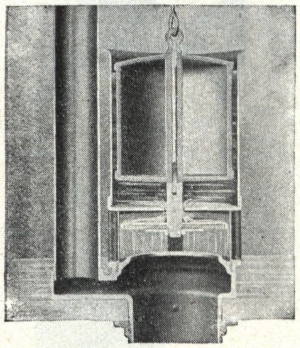
"Curtin Victory" Valve

This valve has a full, unrestricted waterway, and starts the siphon action immediately. It will, therefore, operate even the largest closet with a minimum amount of water. It takes out all the water and the tank fills with clean water. Refills any closet. No refill tube is required.

Has a flat leather seat washer which will not leak.

Easily operated; a slight touch of the lever lifts the valve. It always finds its seat; there are no close fitting parts. Silent in operation, it falls gently on its seat.

This valve, including the large overflow tube, is made of copper and cast composition metal with no soldered parts. It will last many years in any water.

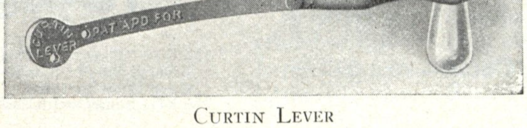

SECTIONAL VIEW "CURTIN VICTORY" VALVE

Float slowly falling as water leaves float chamber; valve but partly closed, yet tank already emptied

Curtin Lever and Curtin All-White Lever

This Curtin Lever is made of composition castings. It is very strong and always in alignment. There are no stamped parts. An oversize nickel plated flange covers lever opening in any tank without addition of plates or washers.

This double action lever exerts a powerful lift in either direction with a slight touch of handle. Once attached to the tank, it will neither work loose, nor shift position. The Curtin All-White Lever, shown in the tank fittings illustration, has a neat all-china handle which adds much to the appearance of any tank where an all-white bathroom is desired.



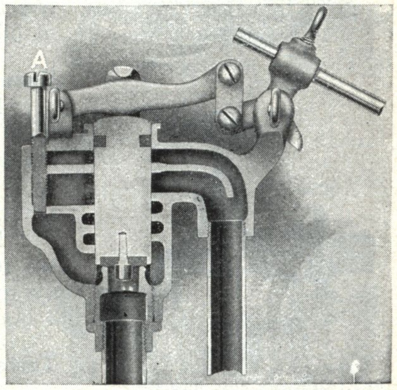
CURTIN LEVER

"Curtin Rotary" Ball Cock

We are the originators of the rotary ball cock, which was the first silent ball cock. Time has shown that revolving the stream of water, as in the "Curtin Rotary" Ball Cock, is the only practical method of eliminating the noise.

On very low pressure, opening the by-pass screw "A" permits free passage of water through ball cock and insures quick filling of tank. With its powerful compound leverage, ball cock will operate satisfactorily under any pressure. Made from composition castings and copper, it is non-corrosive.

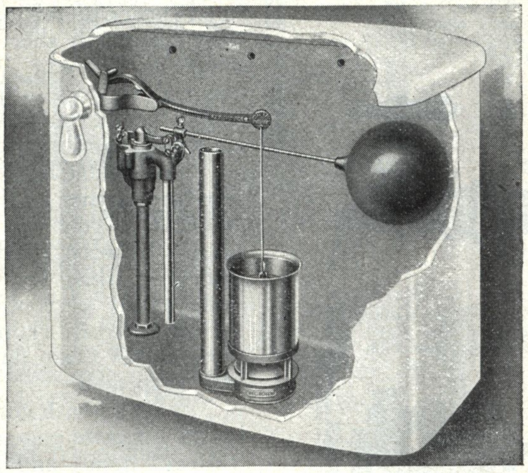
Back supply type can also be furnished for the *all-white* bathroom, with no exposed metal.



SECTIONAL VIEW "CURTIN ROTARY" BALL COCK OR FLOAT VALVE

Curtin Noiseless Fittings Installed in Low Tank

They will fit and operate in any low tank for any style of water closet and are often used on replacements.



These fittings afford a most silent, sanitary and satisfactory method for the flushing of water closets.

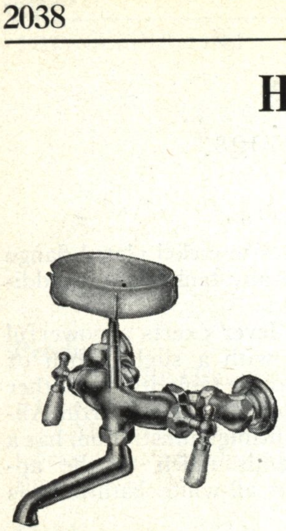
Specifications

The words "Curtin Fittings including Lever" with plate number of any low closet tank insure the installation of these noiseless tank fittings on your work.

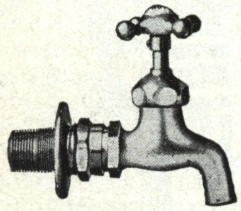
HAYS MANUFACTURING COMPANY

Plumbers' Brass Goods

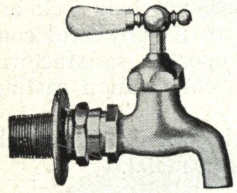
ERIE, PA.



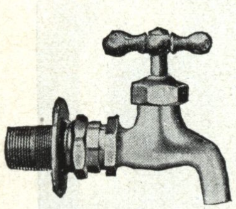
187 E2—PATENTED
187 E2—"Mova" Double Sink Fixture, flanged female iron pipe.
187 E1—Same, less soap tray



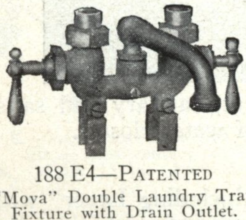
142 E13
142 E13—High grade, screw flange, plain bibb iron pipe.
142 E14—Same, hose bibb.
142 E19—Haysco plain bibb.
142 E20—Haysco hose bibb



142 E9
142 E 9—High grade q. o. screw flange, plain bibb iron pipe.
142 E10—Same, hose bibb.
142 E 7—Same, tee metal handle, plain bibb.
142 E 8—Same as 142 E7, hose bibb



142 E5
142 E5—Standard screw flange, plain bibb iron pipe.
142 E6—Same, hose bibb



188 E4—PATENTED
"Mova" Double Laundry Tray Fixture with Drain Outlet.
188 E5—Brass Soap Dish only, Rough Nickelplated

Manufacturing Policies

Established in 1869 as a small foundry catering to the nearby trade, we have kept pace with the development of manufacturing and marketing until now we do a national business of decidedly large proportions.

The policies laid down more than fifty years ago by the young Hays brothers, that every product must be of the kind that could bear an honorable name, have been vigorously and enthusiastically kept in force.

This is particularly worthy of note in the brass goods business where bright and shining nickelplating, like a new coat of paint on an aged and decrepit automobile, can be made to cover a multitude of sins.

Care for Essentials

For architects, plumbers and others who have intimate working knowledge of the inside of a faucet well know that aside from design and finishing, the outside of a faucet means nothing, that the inside, the unseen parts, are the factors that determine worth.

Realizing this, we have been especially careful to see to it that our water chambers were of the correct design, that valves seat perfectly, and that in every way a Hays fitting would justify the confidence of the user.

Tested Materials

Beginning with the metal used in our castings we maintain a laboratory for testing incoming metals and for gauging our metal mixes so that, day in and day out, all castings are in accordance with the standard we have set.

How well our policies have succeeded is shown by the fact that practically every plumbing supply house in the United States carries "Haysco" products in stock.

The "Mova" Line

This comprises Figs. 187 E2, 188 E4, 188 E1, and 188 E3—double sink fixture, double laundry tray fixtures, bath cock and basin cock.

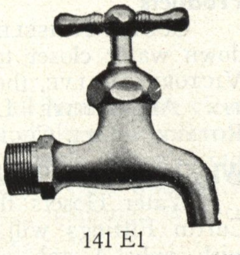
The double sink fixture, shown in the upper left hand corner of this page, has swinging spout, the newest development in sink fixtures. Runs with hot and cold water as desired. With or without soap dish. Inlet connections have adjustable feature with a spread of 7½ to 8½ in. center to center. Also furnished rigid 8-in. center connections raising spout 2 in.

The double laundry tray fixture, shown in the lower left hand corner of this page, is of the same design. Is installed merely by operating one screw. Full 3-in. spread between inside of clamps. It is important to remember this, for often the tray partitions are so wide as to prevent the use of fixture with narrow spread between clamps. Equipped with our patented "Opewaste" drain outlet. Can furnish separate detachable soap dish.

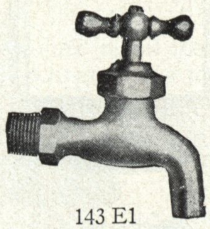
"Mova" bath cock and "Mova" basin cocks, shown on the opposite page are of the same design as the other "Mova" items, and each of the "Mova" fixtures has extraordinarily generous waterways.

The four fixtures harmonize more with present day architecture and are being widely used by the trade in all parts of the country.

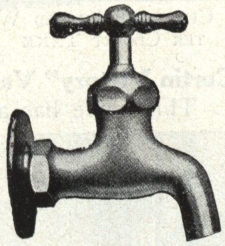
"Aristo" and "Excel" Basin Cocks—Are 3½ in. center of inlet to center of outlet.



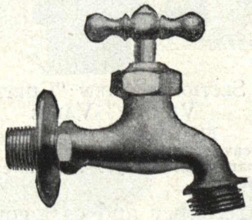
141 E1
141 E1—High grade plain bibb iron pipe.
141 E2—Same, hose bibb.
141 E3—Haysco plain bibb.
141-E4—Haysco hose bibb



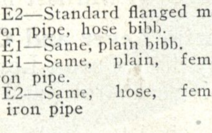
143 E1
143 E1—Standard plain bibb iron pipe.
145 E1—Same, hose bibb.
147 E1—Screw on tail (s. o. t.) for iron pipe, plain bibb.
148 E1—Same, hose bibb



141 E5
141 E5—High grade, flanged female iron pipe, plain bibb.
141 E6—Same, hose bibb.
141 E9—Same, plain, male iron pipe.
141 E10—Same, hose, male iron pipe

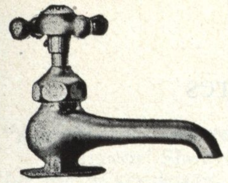


152 E2
152 E2—Standard flanged male iron pipe, hose bibb.
152 E1—Same, plain bibb.
151 E1—Same, plain, female iron pipe.
151 E2—Same, hose, female iron pipe



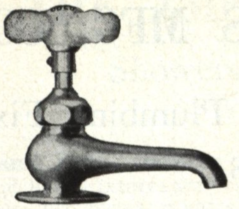
156 E6
156 E6—"Haysco" Wash Tray Bibb, flanged, male iron pipe, stub pattern.
156 E7—Same, with hose end

Continued on next page



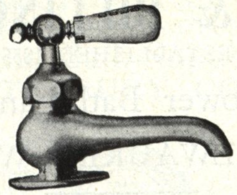
169 E2

"Aristo" Q. O. Four-ball China Index Handle



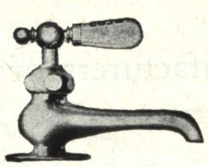
169 E9

"Aristo" Q. O. Four-prong All-china Index Handle



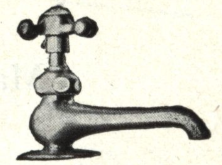
169 E4

"Aristo" Q. O. China Index Lever Handle



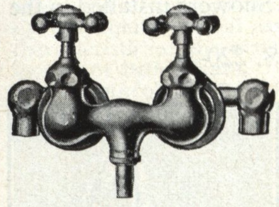
169 E6

"Excel" Q. O. China Index Lever Handle



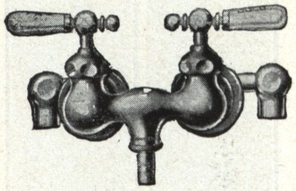
169 E3

169 E3—"Excel" Q. O. Four-ball China Index Handle.
169 E5—Same with four-prong all-china index handle



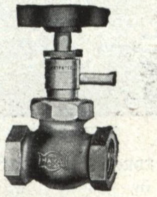
170 E3

170 E3—"Haysco" Q. O., Four-ball China Index Handle.
170 E5—Same with four-prong all-china index handle



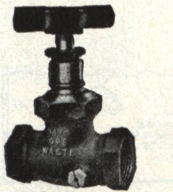
170 E4

"Haysco," Q. O., China Lever Handle



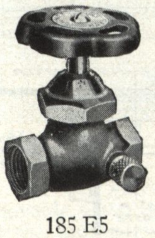
175 E2, Patented

"Haysco," Reversible Automatic Waste



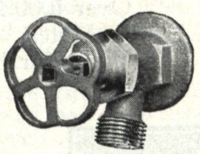
185 E3, Patented

185 E3—"Opewaste," with S. B., with two Waste Controls, also with One Waste Control.
185 E4—With Dome Bonnet and Two Waste Controls, also with One Waste Control



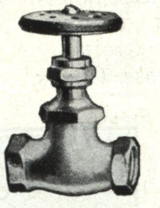
185 E5

Wheel Patent Pending "Signet" Compression Stop and Waste Cocks



178 E4

178 E4—"Haysco" Keywheel Sill Cock



172 E1

172 E1—Compression Lavatory Valves. For iron pipe.
172 E2—Same, angle pattern

"Haysco" Key-wheel Sill Cock (Fig. 178 E4)

By removing the screw and wheel the sill cock is converted into a lock pattern as shown. Furnished in rough nickelplated only.

Compression Stop and Wastes

The following styles of compression stop and wastes are often used instead of ground key work.

"Haysco" Automatic Stop and Waste Cock (Fig. 175 E2)—This is the most widely used of all compression stop and waste cocks. The name automatic comes from the fact that the waste closes rapidly when opening the cock and immediately opens the waste when closing the cock to drain water in the return piping.

"Opewaste" Stop and Waste Cock (Fig. 185 E3) Has two waste controls, left and right. No matter how the piping connections are laid out, either the left waste or right waste is accessible.

"Signet" Stop and Waste Cock (Fig. 185 E5)—Is a well made medium priced compression stop and waste cock with either dome bonnet or bonnet with stuffing box; either bonnet with asbestos ring packing. Encased seat washers. Made with one drain outlet only.

Dry Pipe Hydrants and Street Washers

McNamara Patent Compression Valve—These hydrants and street washers are thoroughly protected, both at the top and bottom, so that they are not affected by frost in the colder weather.

All working parts are made of brass, to prevent their rusting together, and allow greater wear.

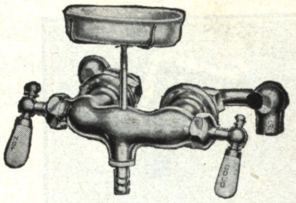
These are the original McNamara hydrants and street washers bearing our name and date of patent, March 12, 1878. If offered otherwise they are imitations, and are not interchangeable in working parts.

We put up the hydrants in three different styles—all one and the same in materials and workmanship—giving option of three prices.

All these are recommended for country estates.

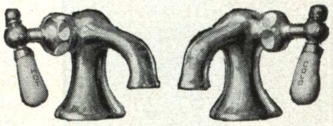
"Haysco" Catalogue

We have arranged fourteen pages of compact readily readable information about the "Haysco" line especially for jobbers and architects. The pages are loose leaf and letter file size. Sent free on request.



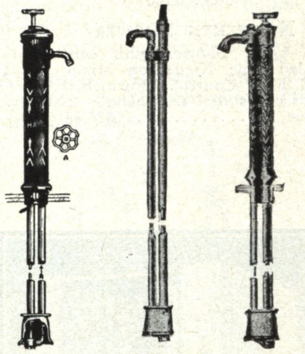
188 E1

"Mova" Q. O., Bath Cock, China Index Lever Handle.
188 E1—With soap tray.
188 E2—Same, without soap tray



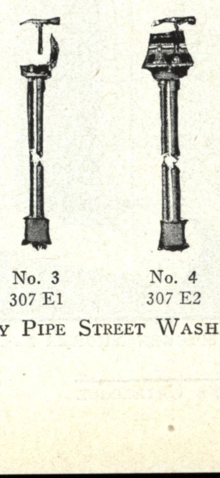
188 E3

"Mova" Q. O., China Index Lever Handle



No. 1 306 E1 | No. 2 306 E2 | No. 5 306 E3

Dry Pipe Hydrants



No. 3 307 E1 | No. 4 307 E2

Dry Pipe Street Washers

HOFFMANN & BILLINGS MFG. CO.

ESTABLISHED 1855

Manufacturers of Shower Baths and Plumbing Fixtures

MILWAUKEE, WIS.

Products

NIEDECKEN SHOWERS, for residences, hotels, industrial plants, etc.; NIEDECKEN SHOWER STALLS for residences, hotels, etc.

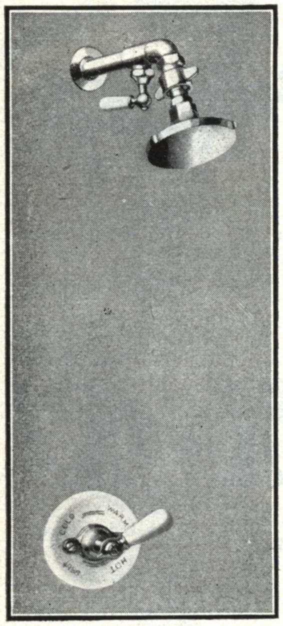
Also High Grade Plumbers' Brass Goods.

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK, N.Y. EST 1915

Used Exclusively by Prominent Hotels

Over 4000 Niedecken Showers installed in the Statler Hotels.

Write for Bulletin S.S. 220-N.

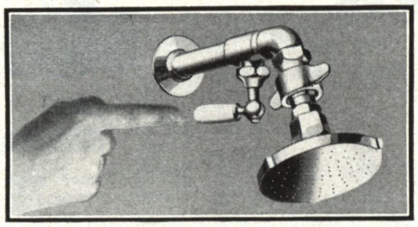


N.C. 1100

NIEDECKEN SHOWER

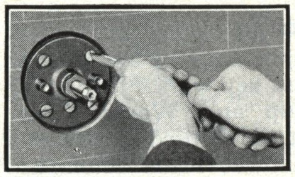
½-in. Shower with concealed type Niedecken Mixer and Flow Control. Furnished with china dial and handle

Price $26.35

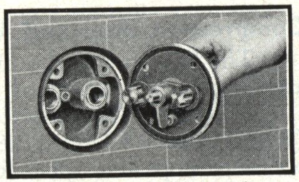


THE FLOW CONTROL

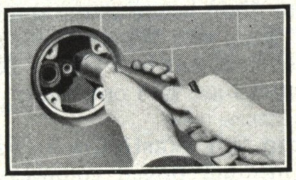
Regulates the flow or pressure of water from the shower head. All Niedecken Showers are furnished with Flow Control



Dial Removed. The Only Tool Required to Take the Mixer Apart is a Screw-driver



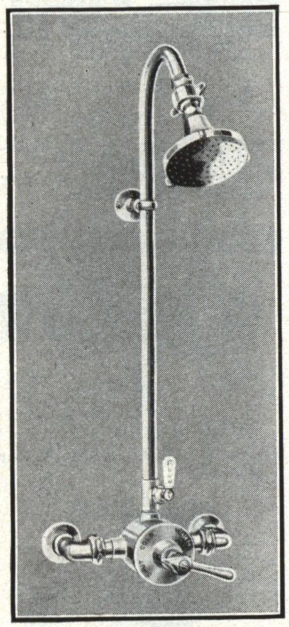
Cover Removed, Giving Access to Valve Discs and Seats



Replacing Valve Seats

THE NIEDECKEN MIXER

The three engravings above show the ease of access and simple construction of the Niedecken Mixer

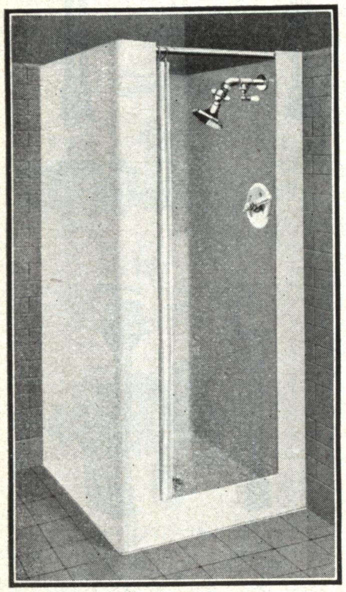


N.F. 1050

NIEDECKEN SHOWER

½-in. Shower with exposed type Niedecken Mixer and Flow Control. Furnished with nickel-plated dial and handle

Price $33.70



NIEDECKEN SHOWER STALL

The Niedecken Shower Stall

Is sanitary, occupies least space and is absolutely leakproof.

The walls of the stall are made of a continuous sheet of No. 10 gauge copper bearing steel which with the riser are welded to a dished bottom with waste outlet in center.

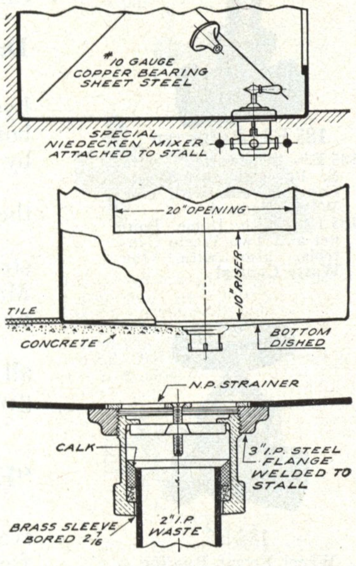
Equipment—Consists of a special concealed type Niedecken Shower, with 4-in. cast brass ball joint shower head, flow control, curtain rail, duck curtain and nickel-plated strainer arranged for 2-in. waste outlet, for either lead or iron pipe.

After installation, the interior and exposed exterior of the stall should be finished with waterproof enamel paint.

PRICES AND DIMENSIONS OF NIEDECKEN SHOWER STALLS

Stalls are 6 ft. high

Width, in.	Depth, in.	Weight, lb.	Price
30	32	350	$135.00
32	32	375	135.00
36	36	425	145.00


#10 GAUGE COPPER BEARING SHEET STEEL
SPECIAL NIEDECKEN MIXER ATTACHED TO STALL
20" OPENING
10" RISER
TILE
CONCRETE
BOTTOM DISHED
N.P. STRAINER
CALK
3" I.P. STEEL FLANGE WELDED TO STALL
BRASS SLEEVE BORED 2 7/16
2" I.P. WASTE

CONSTRUCTION OF NIEDECKEN SHOWER STALL

THE AMERICAN PIN COMPANY

DIVISION SCOVILL MANUFACTURING COMPANY

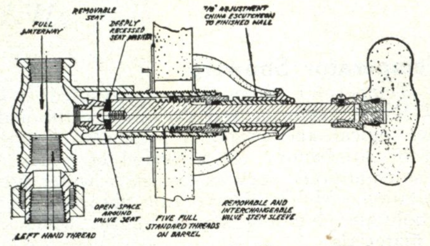
Showers and Bath Supply Fixtures

WATERBURY, CONN.

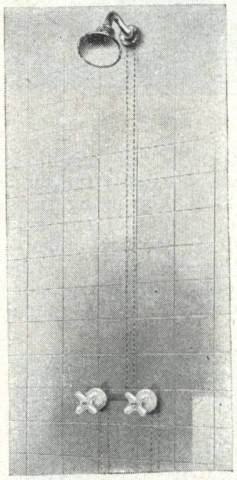
"Ampinco" Showers and Bath Fixtures

"AMPINCO" Showers and Bath Fixtures are designed for use in residences, hotels, apartments, country clubs and various institutional buildings. The valves are made from genuine red ingot metal and have ½-inch removable bronze seats. Scovill brass pipe is used in connecting the valves and all connections are thoroughly soldered. Precise machining, careful assembling and rigid testing are characteristic of the manufacture of every "AMPINCO" shower or bath fixture.

"AMPINCO" plumbers' brass goods are distributed throughout the United States with the co-operation of those plumbing supply houses which specialize in quality products.

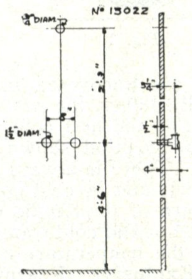

REMOVABLE SEAT
FULL WATERWAY
DEEPLY RECESSED SEAT WASHER
⅞" ADJUSTMENT CHINA ESCUTCHEON TO FINISHED WALL
OPEN SPACE AROUND VALVE SEAT
FIVE FULL STANDARD THREADS ON BARREL
REMOVABLE AND INTERCHANGEABLE VALVE STEM SLEEVE
LEFT HAND THREAD

Detail of "Ampinco" Shower Valve



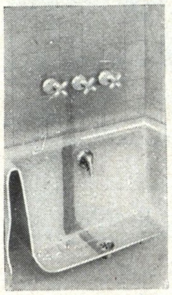
No. 13022

"Ampinco" Concealed Two Valve Showers with Shower Head Combination "A"—



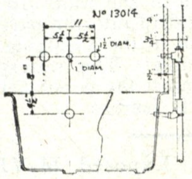
No. 13022 Roughing-in

The two shower valves have ½-inch high removable seats, ⅞-inch adjustment between the china escutcheons and the finished wall, ground joint unions for connecting pipes and are 8 inches center to center.



No. 13014

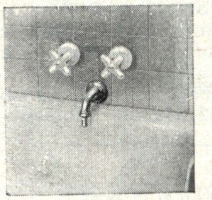
"Ampinco" Concealed Bath Supply and Waste Fixture No. 13014—



No. 13014 Roughing-in

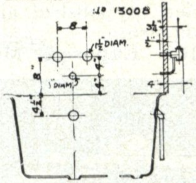
The two valves used in this installation have ½-inch high removable seats, ⅞-inch adjustment between the china escutcheons and the finished wall, ground joint unions for connecting pipes and are 11 inches center to center. The bi-transit waste has a 2-inch standpipe with 1½-inch outlet.

The bath supply tee has a ball joint which permits the adjustment of the nozzle to any angle of the tub. The nozzle is tapped for hose connection which is regular equipment. The waste handle may be turned either to the right or the left to a stop past center, holding the plunger in the open position.



No. 13008

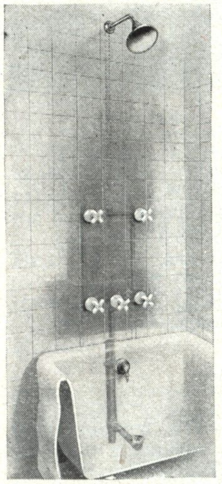
"Ampinco" Concealed Bath Supply and Waste Fixture No. 13008—



No. 13008 Roughing-in

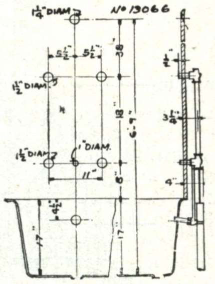
The two valves used in this installation have ½-inch high removable seats, ⅞-inch adjustment between the china escutcheons and the finished wall, ground joint unions for connecting pipes and are 11 inches center to center.

The overrim nozzle is polished and nickeled and tapped for hose nozzle which is regular equipment.



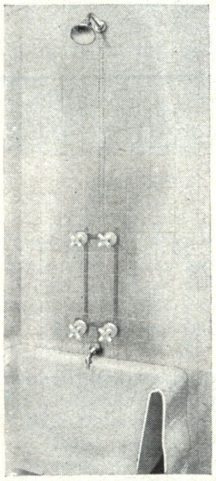
No. 13066

"Ampinco" Shower and Bath Combination with Shower Head Combination "A"—



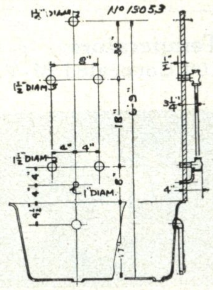
No. 13066 Roughing-in

This installation is a combination of No. 13014 concealed bath supply and waste fixture and No. 13055 concealed two valve shower. The shower valves have ½-inch high removable seats, ⅞-inch adjustment between the china escutcheon and finished wall, ground joint unions for connecting pipes and are 11 inches center to center. The bath supply tee has a ball joint which permits the adjustment of the nozzle to any angle of the tub. The nozzle is tapped for hose connection which is regular equipment. The waste handle may be turned either to the right or to the left to a stop past center, holding the plunger in the open position.



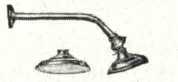
No. 13053

"Ampinco" Shower and Bath Combination with Shower Head Combination "A"—

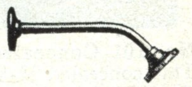


No. 13053 Roughing-in

This installation is a combination of No. 13008 concealed overrim bath fixture and No. 13022 concealed two valve shower. The shower valves have ½-inch high removable seats, ⅞-inch adjustment between the china escutcheon and the finished wall, ground joint unions for connecting pipes and are 8 inches center to center. The overrim nozzle is polished and nickeled and tapped for hose nozzle which is regular equipment.



Shower Head Combination "A"



Shower Head Combination "H"

Note: Shower head combination "G," as shown on second page following, may be furnished when specified.

MORENCY-VAN BUREN MFG. DIVISION

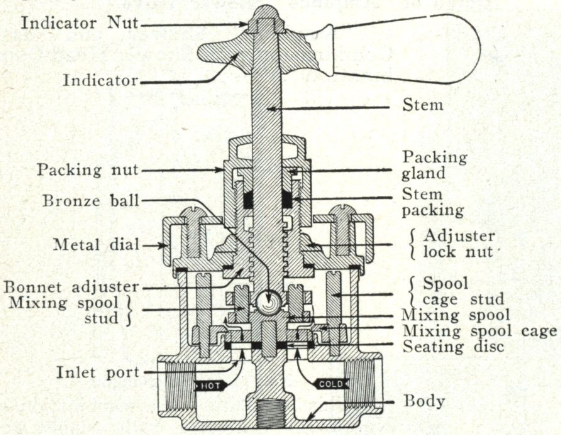
SCOVILL MANUFACTURING COMPANY

The M-VB Temperator and Shower Installations

WATERBURY, CONN.

M-VB Temperator Showers

M-VB Temperator Showers are installed in residences, apartments, hotels, factories and various institutional buildings. The simple, logical and practical principle of operation has proved highly satisfactory for a period of years even under most adverse conditions, such as excessive water pressures and lime precipitation. M-VB Temperator Showers are distributed through wholesale plumbing supply houses which standardize on quality materials.



Action of the M-VB Temperator—The sectional view together with Figs. 1, 2, 3 and **4** show to advantage the principle of operation upon which the M-VB Temperator is based.

When the Temperator is closed, the opening in the mixing spool is directly over the upper part of the seating disc (Fig. 1) and the bronze ball exerts an even pressure on the mixing spool in order to guarantee a complete shut-off. As soon as the valve is opened, this excess pressure is released and the spool cage exerts an even pressure on the shoulder of the mixing spool, permitting a clearance of 1/1000 of an inch between the mixing spool and the seating disc and enabling the mixing spool to rotate smoothly, opening and closing the two hot and the two cold water ports in different variations.

There are two cold water ports and two hot water ports.

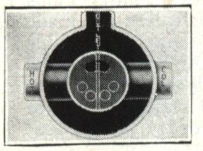


Fig. 1

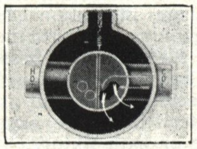


Fig. 2

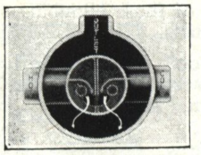


Fig. 3

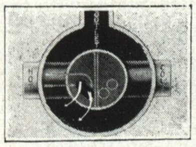
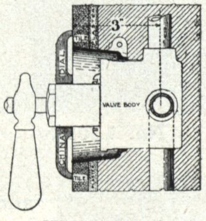


Fig. 4

The cold are uncovered first, Fig. 2, then as the handle is turned still further, the first hot port opens in exactly the same proportion as the first cold port closes, until the mixing spool reaches the position shown in Fig. 3—one hot and one cold port open. There is always the equivalent of two ports open—1½ hot ports and ½ cold port or vice versa, etc., therefore, the slightest turn of the handle will bring about a different proportion of the hot and cold water ports and, consequently, a gradual change in the temperature of the water.

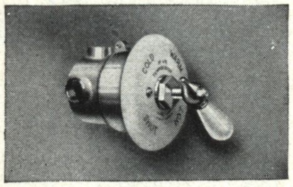
An Exclusive Feature—A cast brass, adjustable, waterproofing flange is provided with every concealed M-VB Temperator. It can be moved either backward or forward on the valve in order to compensate for any variations in the tile or plaster and when flush with exterior of the wall, it is tightened. In the event of a leak in the gasket or the packing, the water will drip into the waterproofing flange and be conducted to the outside of the wall. In this way no water can drip into the partition and ruin the finish in the adjoining room or the room below. The waterproofing flange is a permanent safeguard against the possibility of future damage and is a distinctive M-VB feature.

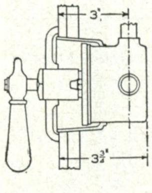


Waterproofing Flange

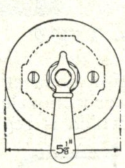
M-VB Temperators

No. 100 Concealed M-VB Temperator—





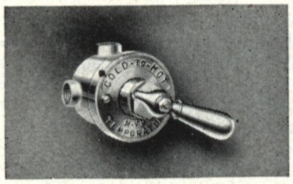
This concealed M-VB Temperator is provided with ½-inch inlets and outlet. Diameter of dial 5⅛ inches. Waterproofing flange, china dial and china handle are regular equipment.

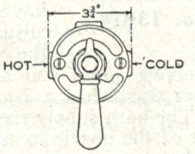


No. 101 Concealed M-VB Temperator—

This concealed M-VB Temperator is provided with ½-inch inlets and outlet. Diameter of dial 5⅛ inches. Waterproofing flange, polished and nickeled dial and polished and nickeled handle are regular equipment. Satin nickeled dial and handle furnished when specified.

No. 103 Exposed M-VB Temperator Polished and Nickeled—



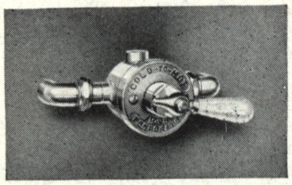


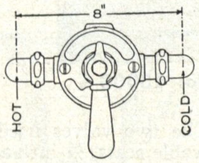
This exposed M-VB Temperator is provided with ½-inch inlets and outlet. Diameter of dial 3½ inches. China handle is regular equipment.

No. 104 Exposed M-VB Temperator—

Not illustrated. Same as No. 103 fixture, except finish is satin nickeled or polished and nickeled, and metal handle is regular equipment.

No. 103 Exposed M-VB Temperator with Two No. 102 Union Elbows—



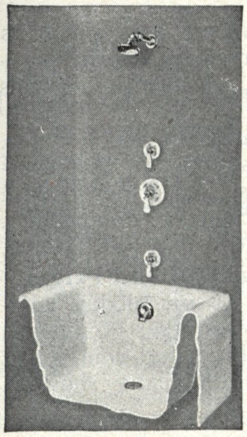


This exposed M-VB Temperator is provided with ½-inch inlets and outlet. Diameter of dial 3½ inches. China handle is regular equipment.

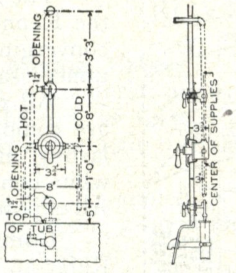
Continued on next page

M-VB Showers

No. 65 Concealed M-VB Bath Fixture with Transfer Valve and Shower Head Combination "G"—



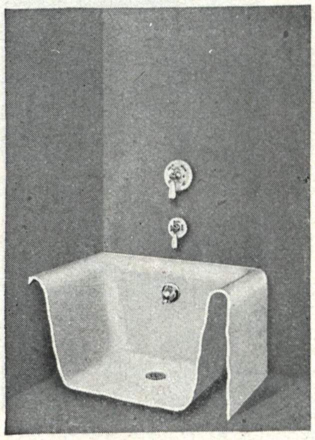
No. 65


1½" OPENING
HOT
3'-3"
COLD
8"
3½"
1'-0"
1½" OPENING
TOP OF TUB
CENTER OF SUPPLIES

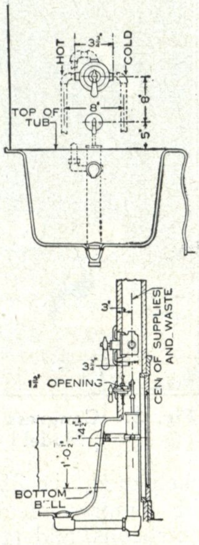
No. 65
Roughing-in

This concealed bath and shower combination is made up of No. 50 Concealed M-VB Bath and Waste Fixture which is described and illustrated below and the M-VB Transfer Valve which directs the flow of the water, after it is mixed, either to the tub by half a turn of the handle. The volume valve which is a part of shower head combination "G" enables the bather to have absolute control over the pressure.

No. 50 Concealed M-VB Bath Supply and Waste Fixture—



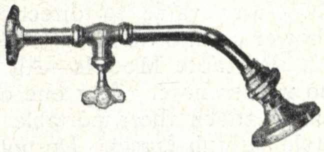
No. 50


HOT
COLD
3½"
8"
6"
5"
TOP OF TUB
3"
3½"
1½" OPENING
CEN. OF SUPPLIES AND WASTE
1'-0½"
BOTTOM BALL

No. 50
Roughing-in

This concealed bath supply and waste fixture is provided with a 2-inch 17 gauge standpipe, cast tee with 1½-inch outlet, 17 gauge bottom elbow tube, heavy cast bottom strainer polished and nickeled, direct action lever, china dial and handle. It is equipped with No. 100 M-VB Temperator as illustrated and described on the preceding page. The nozzle is polished and nickeled and is tapped for hose nozzle which is part of this fixture.

Shower Head Combination "G" Polished and Nickeled—

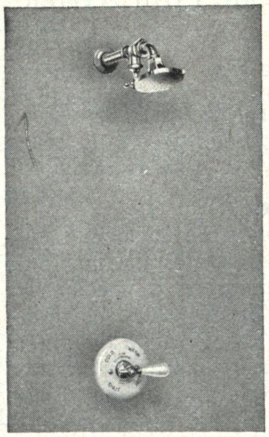


Shower Head Combination "G"

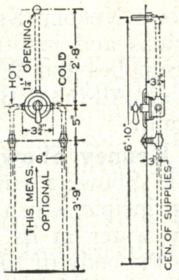
This combination is made up of a 4-inch nipple, M-VB Volume Valve which is designed to assure the bather absolute volume regulation, 5-inch offset arm, ball joint and 4-inch cast brass head.

Note: Shower head combinations "A" or "H," as shown on second page preceding (The American Pin Company), may be furnished when specified.

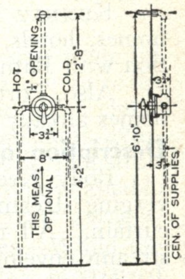
No. 100 Concealed M-VB Temperator with Shower Head Combination "G"—



No. 100


HOT
1½" OPENING
COLD
2'-8"
3½"
6'-10"
5"
THIS MEAS. OPTIONAL
8"
3'-9"
CEN. OF SUPPLIES

No. 100
Roughing-in with Shower Head Combination "G"


HOT
1½" OPENING
COLD
2'-8"
3½"
6'-10"
THIS MEAS. OPTIONAL
8"
4'-2"
CEN. OF SUPPLIES

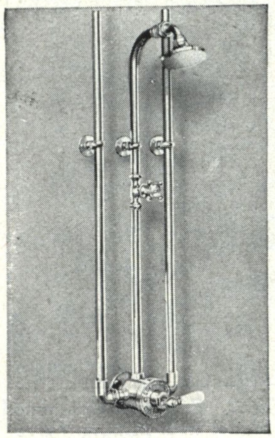
No. 100
Roughing-in with No. 107 Stops and Shower Head Combination "G"

This shower is equipped with No. 100 M-VB Temperator as illustrated and described on the preceding page. The volume valve which is a part of shower head combination "G" assures the bather of absolute volume regulation.

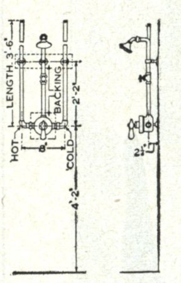
No. 100 Concealed M-VB Temperator with Shower Head Combination "G" and No. 107 Stops—

Not illustrated. Same as above, excepting for the two slotted stops which are furnished as an aid to pressure regulation.

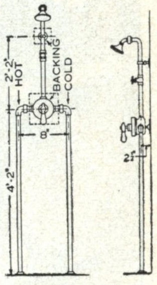
No. 325 Exposed M-VB Shower Bath Polished and Nickeled—



No. 325


LENGTH 3'-6"
BACKING
2'-2"
HOT
COLD
8"
2½"
4'-2"

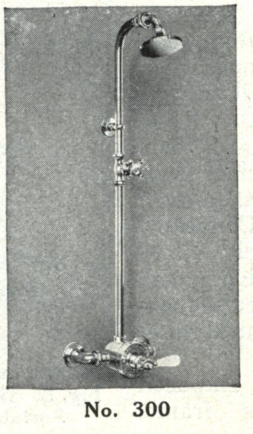
No. 325
Roughing-in


2'-2"
HOT
BACKING
COLD
8"
2½"
4'-2"

No. 335
Roughing-in

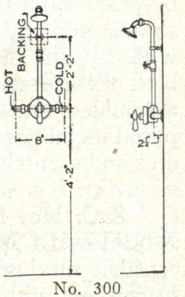
This exposed shower bath is made up of No. 103 M-VB Temperator together with No. 102 unions as described and illustrated on the preceding page and includes a valve supporting flange, discharge pipes and pipe supports, ball joint, M-VB Volume Valve, 4-inch cast brass head and ½-in. supplies to the ceiling.

No. 335—Not illustrated. Polished and nickeled. This exposed M-VB Shower is the same as No. 325, excepting the supplies are to the floor.



No. 300

No. 300 Exposed M-VB Shower Bath Polished and Nickeled—


HOT
BACKING
COLD
2'-2"
8"
2½"
4'-2"

No. 300
Roughing-in

This exposed M-VB Shower Bath is made up of No. 103 M-VB Temperator together with No. 102 union elbows as described and illustrated on the preceding page and includes discharge pipes, M-VB Volume Valve, pipe support, ball joint, wall flanges, and 4-inch cast brass head.

THE KENNEY-CUTTING PRODUCTS CORPORATION

507 Fifth Avenue, NEW YORK, N. Y.

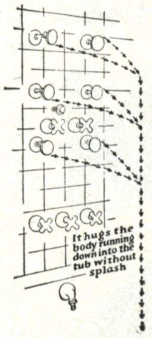
Product

Kenney Body Needle Showers, for apartments, homes, hotels, clubs and institutions, and in Combination with Bath Supplies and Waste Fixtures.

Also, Portable, All-brass Body Needle Showers for homes already built.

Description of Kenney Showers

Body Needle Showers embody an exclusive converging stream principle which eliminates the unsightly curtain. All the water in its hundreds of needle-like streams envelops the body of the bather from the shoulders down—no overhead deluge. It affords a delightful time-saving bathing facility which has demonstrated itself a definite influence on rentals and selling prices.



The diagram shown here visualizes the Kenney Shower patented principle—converging streams, which make curtains unnecessary.

All models, stationary and portable, are completely constructed of that everlasting metal, brass, and trimmed with white bone china escutcheons and handles. All exposed parts are heavily nickelplated.

Complete Catalogue and Prices—Refer to Catalogue A for models additional to those shown here. Catalogue free on request. Plumbing contractors can furnish estimates on Kenney showers.

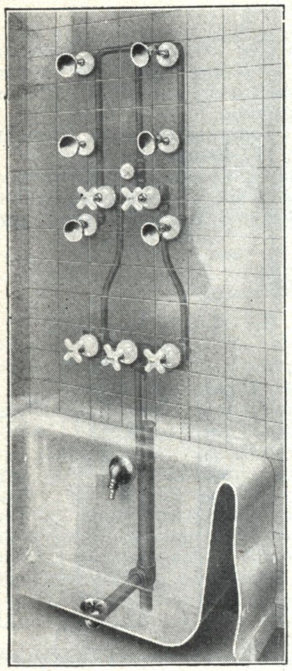


Fig. 1. Congress Concealed Model
Illustrated in phantom

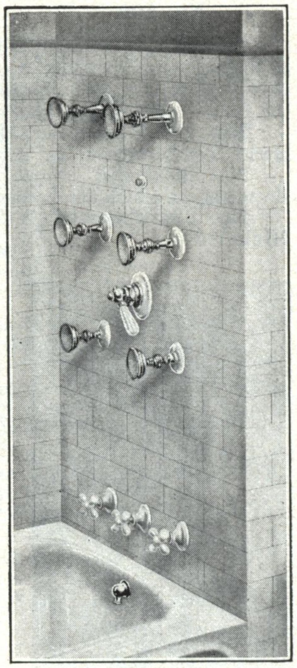


Fig. 2. Congress Concealed Model with Mixing Valve

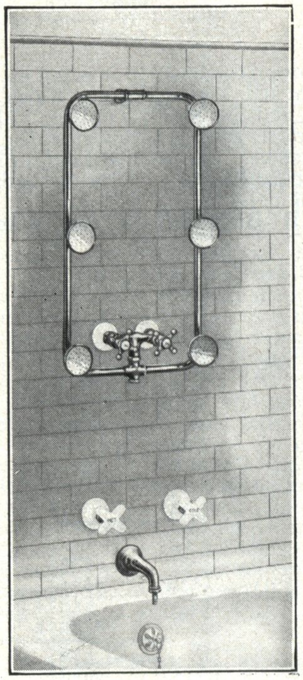


Fig. 3. Congress Exposed Model

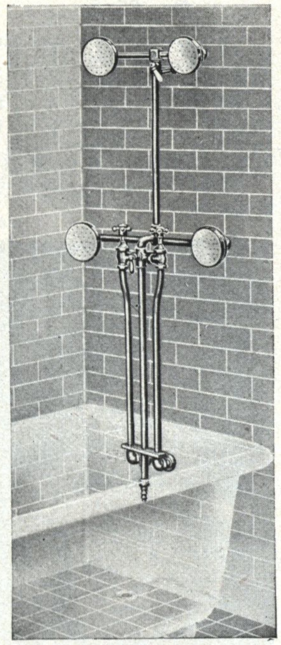


Fig. 4. De Luxe Tub Model

Kenney Shower Models

K.C. No. 13054, Congress Concealed Shower and Concealed Bath Fixture (Fig. 1)—All concealed parts are of heavy brass construction. Six 2½-in. removable face nickelplated heads on ball joint for vertical adjustment only, has governor valve to control water volume, ½-in. by-pass valves with renewable seats on shower and bath fixture, 2-in. standing waste with 1½-in. outlet. Shower connected to bath fixture with brass pipe. All fixtures assembled and tested at factory. All exposed metal parts are nickelplated. All handles and escutcheons white bone china. *Furnished with or without concealed bath fixture.*

K.C. No. 13019, Congress Concealed Model with Mixer—Same as Fig. 1, except has mixing valve with china index dial. Furnished with or without concealed bath fixture. Has governor valve to control water volume.

K.C. No. 12328, Congress Exposed Model—Exposed heavy brass frame, nickelplated, six 2½-in. removable face heads, hot and cold compression valves, 4 ball china index handles, escutcheons, and tail pieces on 3⅜-in. centers for connection to supply pipes. Has governor valve to control water volume. Furnished complete.

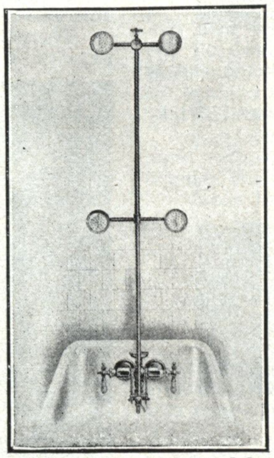


Fig. 5. Niagara Model, Portable Shower

K.C. No. 13049, De Luxe Tub Model (Fig. 4)—For permanent installation, combining shower, tub supply and shampoo, all in one fixture. Heavy brass pipe construction, china index, hot and cold valves, and three-way valve to direct water through shower or into tub.

Portable Models—All metal fixtures; no rubber hose. Any one can quickly and easily attach these portable models to any style bathtub faucet. Do not interfere with use of tub.

K.C. No. 12248, Niagara Model (Fig. 5)—½-in. nickelplated brass tubing and four 2½-in. adjustable heads.

K.C. No. 12371, Palm Beach Model—Heavier and massive, ⅝-in. nickelplated brass tubing and four 3-in. adjustable heads.

LEONARD-ROOKE COMPANY

Manufacturer of Leonard Thermostatic Water Mixing Valves

(PATENTED)

PROVIDENCE, R. I.

Leonard Thermostatic Water Mixing Valves

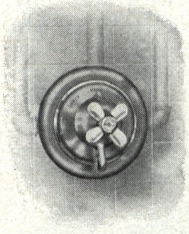
Description—The castings and interior parts are made of bronze and phosphor bronze, as these metals have proved the best adapted to resist action of water containing mineral matter.

Check valves and strainers are assembled in the base and prevent sediment and vegetable growth entering valve to clog or hinder it in operation.

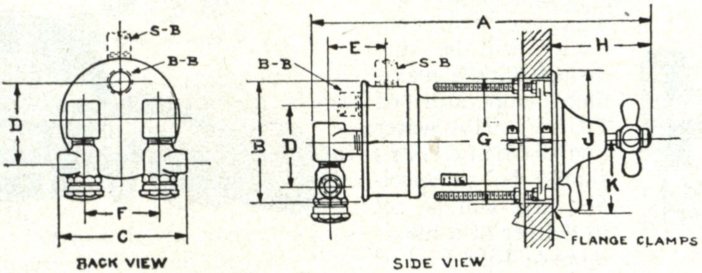
Where a set temperature of water and volume supply is required as in schools, asylums, hospitals and factory washrooms, Leonard valves are supplied with lock escutcheons at a small added cost. This eliminates the need of placing valves in locked cabinet.

Uses—Leonard thermostatic valves are made in several styles; there is a type adaptable for use on bathtub, hammock bath, shower bath, and lavatories in clubs, schools, hotels, sanitariums, hospitals, turkish baths, gymnasiums, residences, garages, railroad stations, industrial plants, office buildings, etc. There is also a type adaptable for automobile washstands in public or private garages.

Adaptable to Many Industrial Uses—While the Leonard thermostatic valves have generally been used in connection with bath and shower equipment, they are now being adapted as the ideal equipment for industrial plants where accurate and predetermined temperature of liquids must be maintained. These installations include bakeries, tanneries, laboratories, laundries, dark rooms where moving picture and color films are developed, and many others where a highly specialized process of work is maintained.

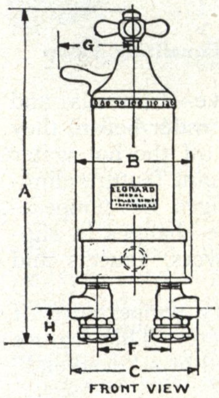


Type L-9 Valve

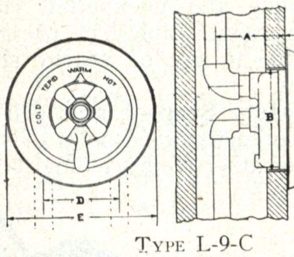


Model B Valve
For concealed piping

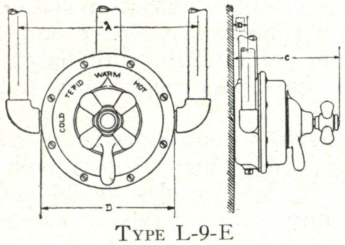
Model B Valve



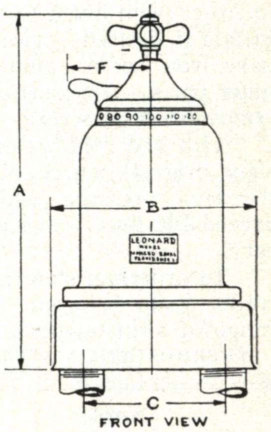
Model B Valve
For exposed piping



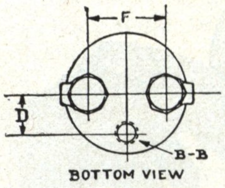
Type L-9-C
For concealed piping



Type L-9-E
For exposed piping

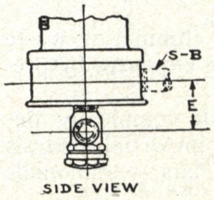


Model B-120 and B-200
For exposed piping

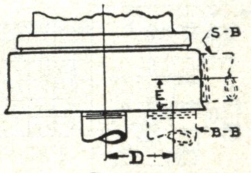


ROUGHING-IN DIMENSIONS LEONARD THERMOSTATIC WATER MIXING VALVES

	For exposed piping								For concealed piping				
Models	B-5	B-10	B-20	B-40	B-60	B-120	B-200	L-9-E	B-10	B-20	B-40	B-60	L-9-C
Cap., gal. per minute, 40 lb. pressure	5	15	25	45	55	120	200	9	15	25	45	55	9
Inlet, in	½	½	¾	1	1¼	1½	2	½	½	¾	1	1¼	½
Outlet, in	¾	¾	1	1¼	1½	2	2½	¾	¾	1	1¼	1½	¾
A	14 5/16	14 5/16	14 5/16	18 1/16	18 1/16	15	16⅞	7¾	13 13/16	13 13/16	17 9/16	17 9/16	3½
B	5	5	5	6⅞	6⅞	9⅛	9⅝	5¾	5	5	6⅞	6⅞	4⅞
C	5 11/16	5 11/16	5 13/16	7¾	8¾	6½	6½	6	5 11/16	5 13/16	7¾	8¾	4½
D	1 9/16	1 9/16	1 9/16	2⅛	2⅛	3	3	⅞	3 9/16	3 9/16	4¾	4¾	3½
E	2¼	2¼	2¼	2¾	2¾	1⅝	2⅛	.....	2⅝	2⅝	3½	3½	6⅞
F	3 5/16	3 5/16	3 5/16	4¾	4¾	3¾	3¾	.....	3 5/16	3 5/16	4¾	4¾	.....
G	3⅛	3⅛	3⅛	3¾	3¾	8¾	11¼	.....	5¼	5¼	5⅝	5⅝	.....
H	1 9/16	1 9/16	1 9/16	2	2	4⅝	5⅜	.....	3 11/16	3 11/16	3 13/16	3 13/16	.....
J	.....	.....	.....	.....	.....	7⅜	9⅝	.....	6	6	7¼	7¼	.....
K	.....	.....	.....	.....	.....	4¼	5¼	.....	3⅛	3⅛	3¾	3¾	.....



Outlet



Outlet

THE POWERS REGULATOR CO.

Thermostatic Water Controllers and Shower Bath Mixing Valves

2722 Greenview Avenue
CHICAGO, ILL.

BRANCH OFFICES IN THIRTY-FIVE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

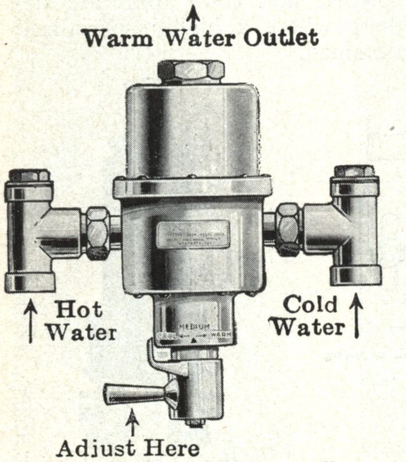
For Automatic Temperature Controlling Apparatus, see pages 2270-2271

Powers Thermostatic Water Controller

For shower baths, singly or in gangs, continuous flowing baths, baby baths, hot water lines, lavatories, factory washrooms, garages, laundries, and various industrial processes where warm water at a constant temperature is required.

This controller is accurate, dependable and reasonably priced. Mixes hot and cold water, and delivers warm water at any desired temperature between 70° and 135° F. Entirely automatic in operation, positively scaldproof. Failure of cold water supply cuts off delivery. Can be provided with variable or locked adjustment.

Unless otherwise specified, controller will be furnished with a maximum temperature of 110° F. Hot water line controllers should be so specified and will be set to deliver at a maximum of 135° F. For continuous flowing baths, specify downward discharge if wanted, otherwise upward discharge will be supplied.



Thermostatic Water Controller

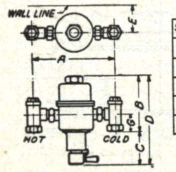
Controllers Nos. 1 to 4, inclusive, are made of brass, in either plain finish or full nickelplate. Made in special metals if desired—prices on application. Nos. 5 and 6 have iron bodies, aluminum paint finish, with bronze inner parts. All controllers have inlet check valves and removable filter screens.

Hot and cold water should always come from the same original source, or at least be under substantially the same pressure, which for best results should not exceed 100 lbs. Use a pressure reducing valve if necessary.

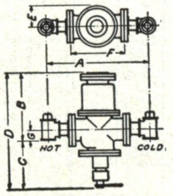
In ordering, state fully the purpose for which controller is to be used, with temperature required, and range of adjustment desired.

THERMOSTATIC WATER CONTROLLER, PRICE LIST AND SHIPPING WEIGHT

Capacities	Connections, in.		Shipping weight, lb.	Price
	Inlets	Outlet		
No. 1—For individual shower	½	¾	35	$100
No. 3-4 shower heads, 25 g.p.m	¾	1	35	125
No. 4-8 shower heads, 50 g.p.m	1	1¼	50	150
No. 5-15 shower heads, 80 g.p.m	1¼	1½	85	175
No. 6-20 shower heads, 100 g.p.m	1½	2	90	185



SIZE NO.	INLET SIZE	OUTLET SIZE	A	B	C	D	E	F	G
1	½	¾	9	6⅝	7¾	14⅜	4	–	1 7/16
3	¾	1	10½	6¾	7¾	14½	4	–	1⅝
4	1	1¼	12¼	8⅞	5¾	14⅝	4	–	2
5	1¼	1½	16	12⅞	9¾	22¾	4	9	1¾
6	1½	2	16¾	13⅛	9¾	22⅞	4	9	1⅞



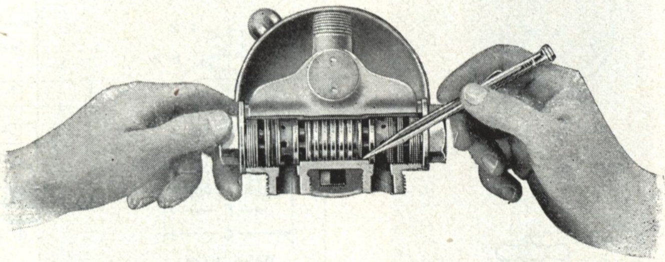
Specification—In supply to groups of showers [fixtures] in [shower room] [toilet] [bathroom], furnish and install Powers Thermostatic Water Controller No. ...., placing it as close to fixtures as possible.

Note: Provide that plumber include stop valves in hot and cold water supplies.

Powers Shower Bath Mixing Valve

The Powers Shower Mixer will keep a shower at the desired temperature under *all* conditions. It is absolutely *scaldproof*. It is not thermostatic, yet it has the safety feature found in thermostatic mixers, with less complication and at a lower cost.

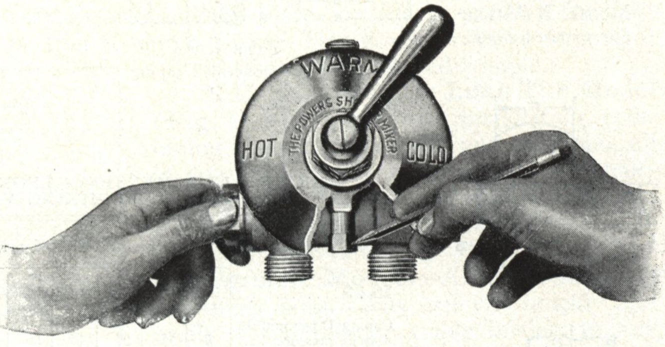
Do not confuse the Powers Mixer with any other mixing valve made. It is entirely different. It has two remarkable features found in no other mixer. They are:



Rear View of Mixer Showing Pressure Equalizing Value

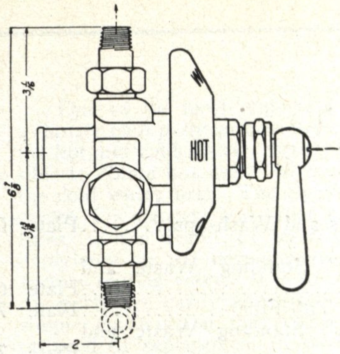
(1) Pressure Equalizing Valve—Controls and equalizes the pressures of hot and cold water before they enter the mixing chamber; and shuts off the hot water if cold water supply fails. This important feature eliminates scalding and unexpected changes of temperature in the shower caused by pressure changes in supply lines due to use of nearby showers, faucets and flush valves.

(2) Safety Stop—Limits delivery temperature of water to a predetermined point of safety. This feature protects the bather from scalding caused by a "dead end" in the hot water line; it saves fuel by eliminating waste of hot water; and it reduces decorating expenses by preventing steamed-up bathrooms.

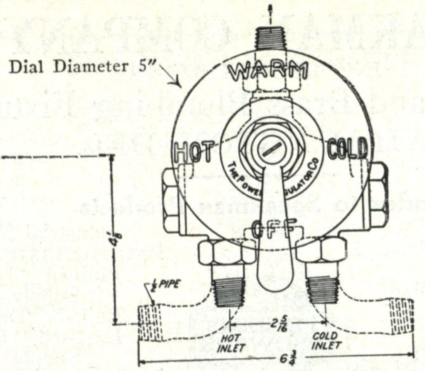


Catalogue—Get our book which completely describes this mixing valve. It gives an impartial analysis of the various types of mixers, test data, testimonials and other interesting information.

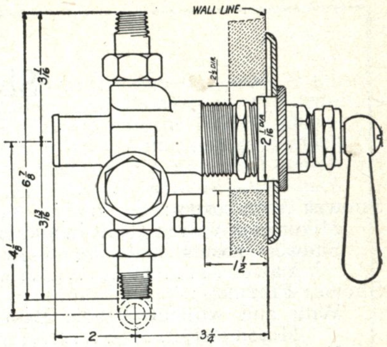
Continued on next page



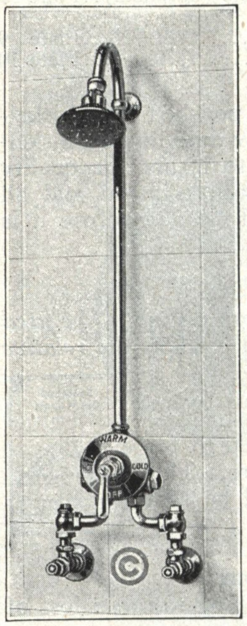
Style A Elevation


Dial Diameter 5"
WARM
HOT
COLD
OFF
THE POWERS REGULATOR Co
1/2 PIPE
HOT INLET
COLD INLET
6 3/4

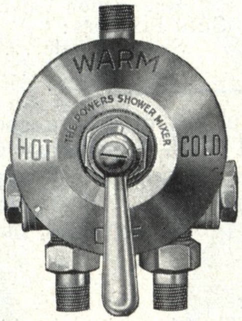
Style A and B Front View


WALL LINE
2
3 1/4
1 1/2

Style B Elevation



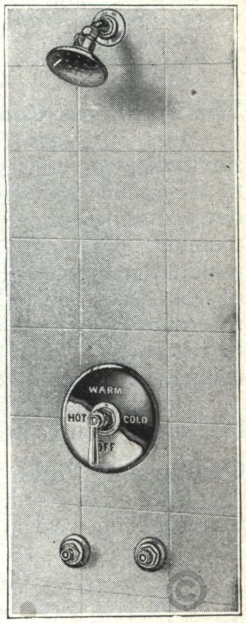
Style A Mixer


WARM
HOT
COLD
THE POWERS SHOWER MIXER
OFF

Styles A and B

WARM
HOT
COLD
THE POWERS REGULATOR CO.
OFF

Style C


WARM
HOT
COLD
OFF

Style C Mixer

Style A is for exposed piping. Has nickel plated dial and handle. If wall flange is required, distance from center of inlet to wall should be specified.

Style B is for concealed piping accessible from the rear. The neck of the mixer is provided with a 1½-in. extension to accommodate thickness of marble slab, tile or panel on which dial and handle are mounted.

Style C is for concealed piping not accessible from the rear. For this is provided a metal box to be inserted in wall flush surface, to receive pipe connections and mixer. The large dial is afterwards placed against the wall, and when removed makes the instrument accessible.

Powers Mixers are built entirely of brass with internal parts of bronze and are finished in rough nickel with dials and handles polished. China dials and handles will be furnished for Styles B and C, if desired, without extra charge.

All Powers Shower Mixers are now supplied with inlet check valves as standard equipment. This should be noted in making price comparisons.

All mixers are furnished with ½-in. union connections, as illustrated. Elbow connections will be substituted without extra charge, if specified.

Capacity is 10 gal. per minute under 40 lbs. pressure.

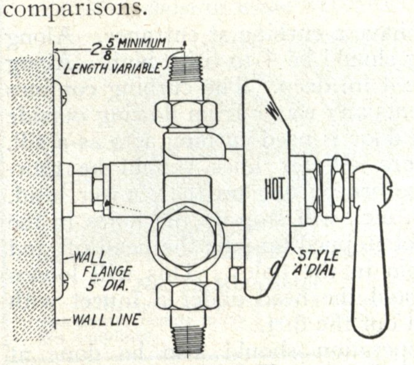
The Style D Mixer is thoroughly efficient for shower baths supplied with steam at 5 to 100 lbs. pressure and cold water at any pressure. Absolutely scald-proof; easy to install; noiseless; saves steam. Write for Bulletin No. 137-A.

Specifications—In .... shower room(s) where indicated on the drawings, furnish and install the Powers Shower Mixing Valve, Style [A] [B] [C] with [nickelplated] [china] dials and handles.

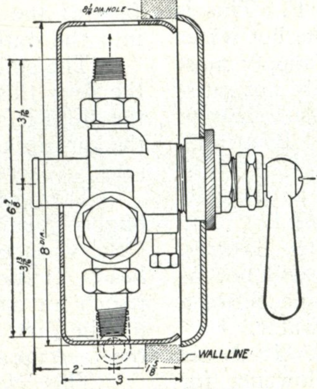
Note: The plumber shall furnish and install nickelplated brass discharge pipe with gooseneck [ball joint] and 4-in. diameter [nickelplated cast brass] [china] adjustable needle shower head with removable face.

[Loose key] stop valves (with china escutcheons) shall be provided in hot and cold water supplies.

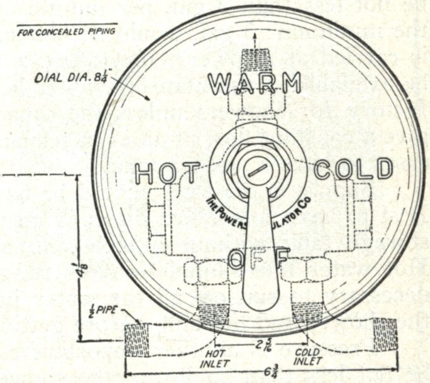
For exposed type, provide heavy nickelplated cast brass supports to secure piping to wall, wainscoting, etc.


2 5/8 MINIMUM
LENGTH VARIABLE
HOT
WALL FLANGE 5" DIA.
STYLE 'A' DIAL
WALL LINE

Style A with Wall Flange


8 1/4 DIA. HOLE
WALL LINE
2
3

Style C Front View


FOR CONCEALED PIPING
DIAL DIA. 8 1/4
WARM
HOT
COLD
THE POWERS REGULATOR Co
OFF
1/2 PIPE
HOT INLET
COLD INLET
6 3/4

Style C Elevation

SPEAKMAN COMPANY

INCORPORATED 1889

Showers and Brass Plumbing Fixtures

WILMINGTON, DEL.

Index to Speakman Products

Shower Accessories:
- Mixometer Valves (built-in and exposed) . . Plate 1
- Shower Heads and Renewable Hi-Seat Valves . . . . . Plate 2

Shower Fixtures:
- With and without Needle Bath (built-in Mixometer) . . . . . Plate 3
- Exposed and Built-in (with and without Mixometer) . . . . . Plate 4
- Built-in Showers over Bathtubs (Mixometer) . . . . . Plate 5
- Compression Showers (built-in and exposed) . . . . . Plate 4

TRADE-MARK

- Industrial Showers and Wash-ups . . . . . Plate 10

Bathtub Fixtures:
- Built-in "Deshler" Standing Waste and Supply . . . . . Plate 6
- Built-in "Dupont" Tub Filler . . . . . Plate 7
- Exposed "Legless" Standing Waste and Supply . . . . . Plate 7

Lavatory Fixtures:
- "Acto" Pop-Up Waste and "Unit Acto" . . . Plate 8
- Knee-action Valve and Waste (hospitals) . . Plate 9

Sink Fixtures:
- Swing Nozzle . . . . . Plate 9
- Slop (heavy) . . . . . Plate 10

The Speakman Company—Its Facilities and Service

For 56 years Speakman Company has built a reputation for efficient, dependable and prompt service to the architect and owner. During the past 30 years, devoted especially to the manufacture of showers and plumbing brass goods, Speakman Company has accumulated complete engineering data on the proper types of fixtures to install under various conditions. This information, of real constructive value to the architect, is readily available from our home office or through competent representatives in our branch offices.

Speakman Products are handled by most of the best supply houses in the United States and Canada.

Quality and Finish

Speakman Products have always enjoyed a reputation for long wearing beauty. All exposed metal parts are (unless otherwise specified) polished and nickelplated brass. Speakman Company does its own nickelplating, having special apparatus to insure the quality of this work. All corners are well rounded and all metal properly ground, buffed and cleaned before it is plated.

Prices

The prices given in this catalogue are *not to be used as a basis of cost.* They are given to show the *relative cost* of the different fixtures.

Complete Catalogue

Catalogue H should be referred to for types additional to those shown here. This catalogue, in loose leaf form, will be sent on request.

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

General Technical and Construction Data for Shower Bath Installations

The first essential of a satisfactory shower installation is a sufficient supply of both hot and cold water. A common mistake is to use piping of insufficient size. This most frequently occurs where battery of showers is supplied from one line. As a guide in determining proper size of piping the following table will be useful:

TABLE SHOWING CONSUMPTION OF WATER BY SPEAKMAN SHOWERS EQUIPPED WITH OUR 4-INCH KAS-BRAS HEAD

Pounds pressure	20	30	40	50	60
Gallons per minute	6	10¾	13½	15½	17½

The temperature of a hot shower is about 100° F. If the hot water is carried at 160° and the cold will run as low as 40° there will be about an equal amount of hot and cold water used.

Hot water should be carried in a storage tank. The supply of hot water for each single-head shower should be not less than 3 gal. per minute at 160° F. This is the minimum; 5 gal. would be better. If the hot water is carried at a lower temperature a larger supply must be available. Instantaneous water heaters are not satisfactory for showers unless the capacity is sufficient to give a constant flow at an even temperature. Best in all cases to have a storage tank.

Supply to showers should be as direct as possible. Best to have cold taken direct from main and hot from storage tank without branches to any other fixtures. Hot water line should be circulating so it will not be necessary to run off all the water in the pipe between the shower and the tank before getting hot water.

Pressure is another important essential. It should be not less than 25 lbs. at the shower. Allowance for loss of pressure from friction must be made. Long runs and turns must have extra large piping to offset loss of pressure from friction.

Size of Stalls—Stalls for showers should be 36 to 38 in. square inside; 38 is preferable. If with ceiling, the height should be 7½ ft. with a grill in the ceiling to allow the steam to escape. If the stall is without ceiling, the height should be not less than 6 ft. and preferably 7.

Construction of Stalls—Tiled floors for shower baths where the space below is intended for occupancy should have a pan or safing of lead or other metal below the tile work. The pan should be turned up on all sides and made watertight. Cinder concrete, on account of its corrosive action, should not be placed over metal pans.

Plumber to furnish and install a nickelplated brass drain with not less than 2-in. outlet. The finished surface of the tile floor shall be sloped to drain properly into the outlet.

The stall should have a curbing at entrance. Along the floor this curbing should be 4 to 6 in. high. Along the sides it should be 4 in. deep. The curbing confines the curtain and prevents any water from flowing outside stall. Where a glass door is used curbing acts as a sill.

Care of Showers—Water lines should be thoroughly cleaned out before putting on the shower head. Otherwise scale, dirt, etc., will stop up the holes in the head. If the holes get stopped up take the head off and punch an ordinary pin in the holes. This will loosen up the dirt. Then hold the head under a faucet with the face up and wash out the dirt.

This cleaning operation should also be done at regular intervals after showers are in use.

Continued on next page

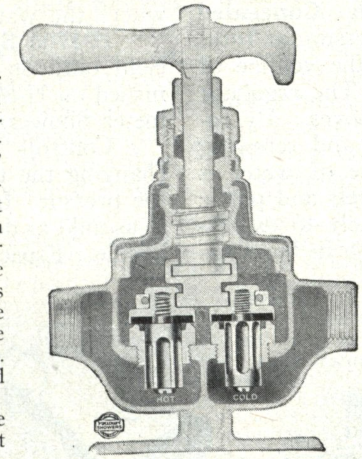
SPEAKMAN MIXOMETER

One of the most important features of a shower bath is the proper control of mixing the hot and cold water. It should be impossible to obtain hot water without turning on the cold water first. The Speakman Mixometer, for showers and other plumbing fixtures, is the result of over thirty years' experience in the development of a satisfactory mixing valve. It is so arranged that the parts are easily accessible and of such simple construction that there is no wear or need of replacement of parts. Positive and rapid mixing of the water, by means of this valve, eliminates unnecessary waste of water, such as happens when separate valves are used in hot and cold water lines.

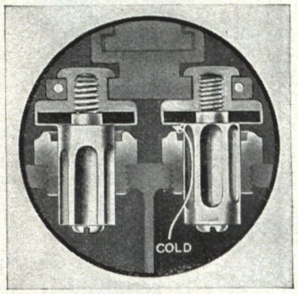
The Mixometer is made in both exposed and built-in types in ½ and ¾-in. sizes.

The body of the valve consists of three chambers—two lower chambers, one for hot and one for cold water, and one upper chamber for mixed water. The inlets are attached to the lower chambers and the outlet to the upper chamber. Graduation of the temperature of the water in the "mixed" chamber is obtained by operating plungers which control the flow of hot and cold water. Plungers are provided with grooves, each of a different length, and are attached to a yoke which is raised or lowered by a threaded spindle operated by a lever handle. In opening the valve, cold water is admitted first. Turning the handle gradually increases the hot and lessens the cold water admitted into the "mixed" chamber.

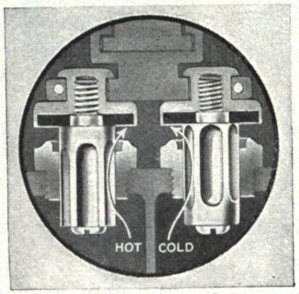
The volume of water through the valve is kept constant by the plungers being so arranged that as the volume through the hot port is increased the volume through the cold port is reduced in like proportion. There are five grooves in each plunger and *each groove is of different length*, thus gradually admitting or shutting off the flow of water through the ports.



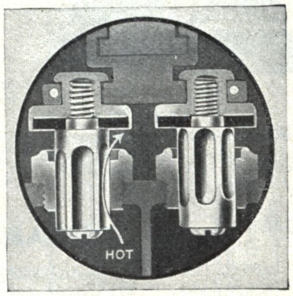
Working Parts of Speakman Mixometer



Cold Water Port Open
The grooves in the hot plunger have not yet reached the top of the port. Cold water only can be discharged at this point—scalding is impossible as valve must first be turned to this position

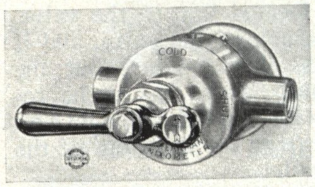


Both Ports Open
Water now passes through grooves of both hot and cold plungers giving "mixed" water. By moving handle gradually an absolutely accurate graduation of the temperature is obtained

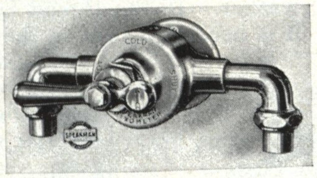


Hot Water Port Open
Hot water plunger wide open and cold plunger entirely shut off. If temperature of hot water system is not more than 110° F. it may be necessary to open valve wide as shown

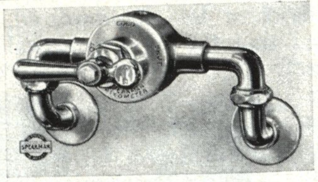
EXPOSED TYPES OF SPEAKMAN MIXOMETER



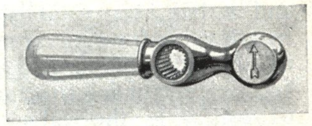
No. 5 Mixometer
Has horizontal female inlets 5¼ in. end to end.
No couplings



No. 8 Mixometer
With union couplings, 8-in. center to center, to take supplies from below, overhead or wall. When intended to take supplies from below check valves can be furnished in the union couplings when specified



No. 10 Mixometer
With union couplings, 8 in. center to center, to take supplies from wall. Check valves furnished in union couplings when specified. Regularly furnished without wall flange as connections to supply pipes give sufficient support to the valve



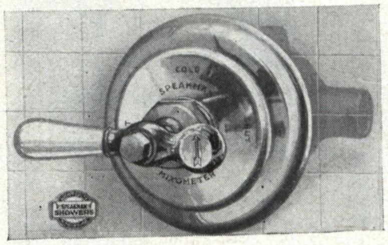
China Handle
On Nos. 5, 8 and 10 Mixometer metal handle is regularly furnished, but china handle shown above can be furnished when specified. Metal handle is recommended for public institutions and places where valves are likely to get rough usage. China handles for homes, hotels, clubs, etc.

BUILT-IN TYPES OF SPEAKMAN MIXOMETER

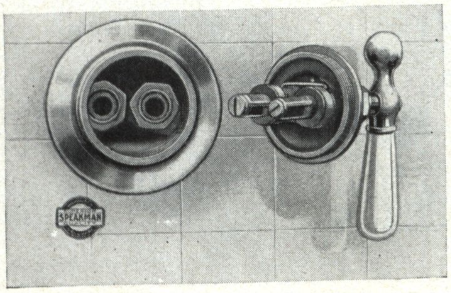
These are of the same mechanical construction as the exposed types described above. They are designed to be built into the wall and are furnished with a china handle and either china or metal wall plate.

Valve body extends beyond the face of the wall and working parts can be drawn from the valve in a unit by unscrewing the cap.

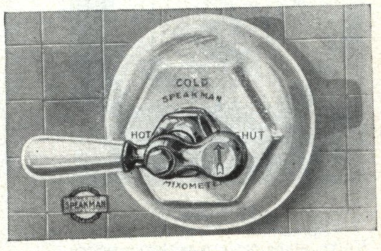
Made in ½ and ¾-in. sizes.



No. 12 Mixometer
With metal wall plate and china handle.
Horizontal female inlets 5¼ in. end to end.
No couplings



Built-in Type—Working Unit Removed
Working parts drawn from valve in a unit by unscrewing the cap



No. 15 Mixometer
With china wall plate and china handle.
Horizontal female inlets 5¼ in. end to end.
No couplings

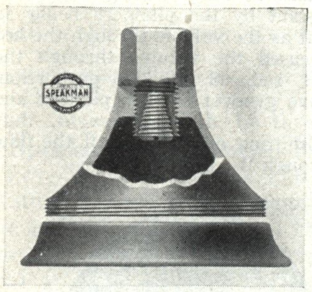
Continued on next page

SPEAKMAN SHOWER HEADS

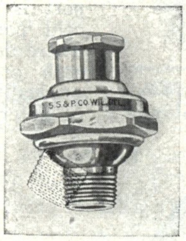
H-1704 Kas-Bras Head with Concealed Regulator—Permits regulating the pressure or force of the shower and also of reducing the volume of water where necessary for economy. The regulator consists of a plug having tapered grooves. By removing the face of the shower head and screwing the plug in or out the desired volume of water is fixed. This feature is desirable in hotels and public shower rooms where the bather is likely to experiment with the ordinary regulator. Also in buildings where the water pressure varies on different floors.

H-1705 Speakman Anyforce Shower Head—Sold only on Speakman Showers. Regularly furnished on H-895, H-952½ and similar type of Mixometer Showers.

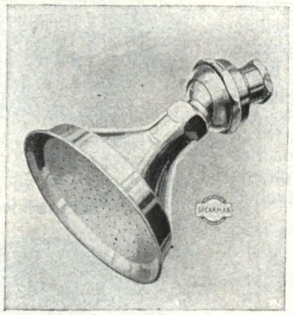
Controls the pressure of the shower without changing the temperature. The bather can regulate the pressure from as strong as the shower will give to as mild as desired by simply turning the china lever handle. Especially desirable in the home.



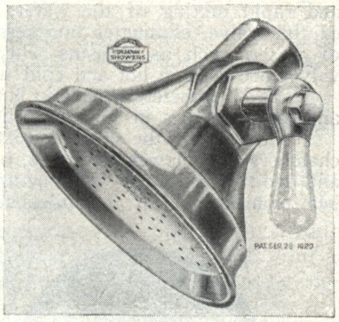
H-1704
Kas-Bras Head with removable face, ½-in. female inlet and hidden regulator. Made in 4, 5 and 6-in. sizes



H-1718
Nickelplated brass ball joint. Made in ½ and ¾-in. sizes



H-1700
Speakman Kas-Bras Shower Head with removable face and ball joint, having ½-in. female inlet. Made in 4, 5 and 6-in. sizes



H-1705
Speakman Anyforce Kas-Bras Shower Head with removable face, ½-in. female inlet and china lever handle volume control. Made only in 4-in. size

SPEAKMAN RENEWABLE HI-SEAT VALVES (Patented)

Used on all Speakman Built-in Bath Fixtures and Showers. Escutcheon adjusts from 2⅝ to 3⅜ in.

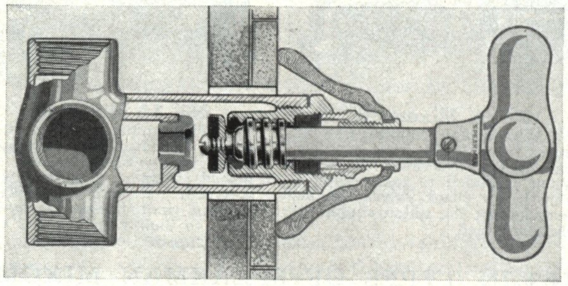
Made in ½ and ¾-in. sizes.

This is a Speakman improvement in the construction of valves for building in the wall—usually referred to as built-in or concealed valves.

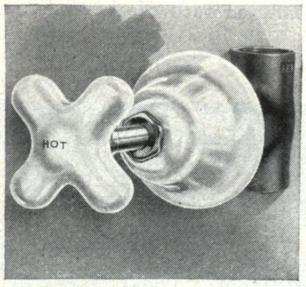
Wall construction is more or less standardized, and it has been established that the most practical length valve for general use in built-in plumbing is 3 in. from center of inlet to face of wall. If the valve is constructed in the usual way with the seat in line with the inlet and outlet, the seat is so low in the valve that it is difficult to examine or to re-seat. If the low seat is made renewable it is difficult to remove. The seat on the Speakman Renewable Hi-Seat Valve is removed by inserting any square or flat tool in the waterway.

The low seat also requires a long spindle, and if the thread is located near the outer end of the valve, the spindle will have to be well "guided" or it will not seat true and will rapidly wear out the washer. If the thread is located low in the valve, it is necessarily cut in the shank of the valve, and if the thread wears out the entire valve has to be renewed, which requires tearing the valve out of the wall.

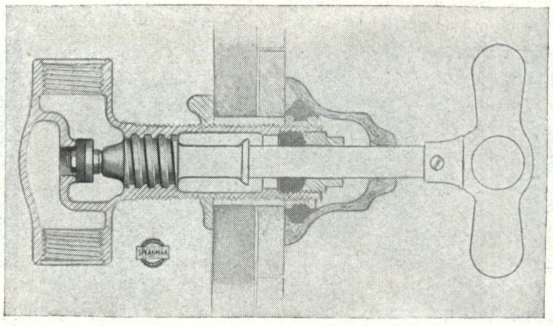
Comparison of these points with the usual construction (low seat valve) shows the great superiority of the Speakman Renewable Hi-Seat Valve.



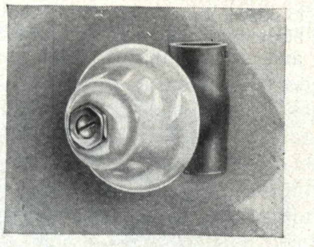
Renewable Hi-Seat Valve
(Patented)



H-1744
Speakman Hi-Seat Built-in Valve, globe pattern with renewable seat, china escutcheon and handle. Also furnished in corner pattern.
In ordering state which is desired



Old Style Valve—Low Seat



H-1746
Speakman Hi-Seat Built-in Valve, globe pattern with renewable seat, china escutcheon and screwdriver slot spindle. Also furnished in corner pattern.
In ordering state which is desired

Continued on next page

SPEAKMAN BUILT-IN MIXOMETER SHOWERS WITH NEEDLE BATH

Speakman Mixometer H-965 Stall Shower and 6 Needle Bath Sprays—For use where the highest grade stall shower with needle bath is desired. The temperature of the bath is controlled by the Mixometer located close enough to entrance of stall that it can be easily reached for regulating before entering the stall. This also is true of two valves, one for controlling the force of the overhead shower, the other the needle sprays—

Complete Outfit—¾-in. size, No. 15 Mixometer (Plate 1) with china wall plate, 2 renewable Hi-Seat volume controlling valves (Plate 2), 5-in. No. H-1700 Kas-Bras head (Plate 2) and 6 Kas-Bras needle sprays (two top sprays adjustable).

Note: Volume regulating valves are furnished connected to Mixometer by brass pipe. Needle sprays are furnished already connected by brass pipes in sets of three, complete ready for connection to other concealed piping furnished by plumbing contractor. Make provision for access to check valves from rear.

List Price—$85.00; add for curtain rod and curtain $6.00.

Speakman Mixometer H-961 Stall Shower and 3 Needle Bath Sprays—Similar to H-965 except that it has only 3 needle sprays. Can be set in stall or at end of built-in tub.

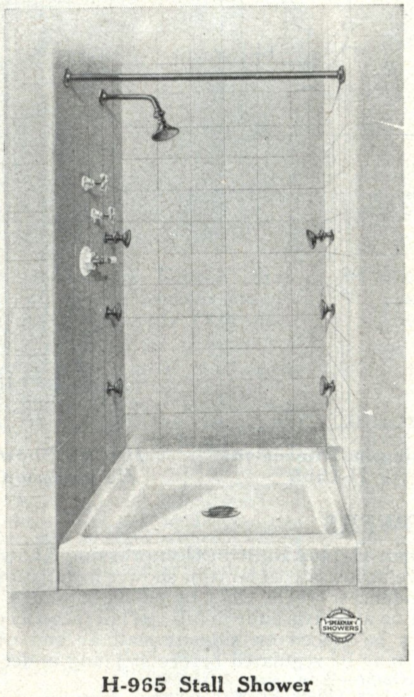
Complete Outfit—½-in. size No. 15 Mixometer (Plate 1) with china wall plate, 2 renewable Hi-Seat volume controlling valves (Plate 2), 4-in. No. H-1700 Kas-Bras head (Plate 2) with ball joint, attached to bent arm discharge pipe and 3 Kas-Bras needle sprays (top spray adjustable).

Note: Valves are furnished connected same as H-965 and also the needle sprays.

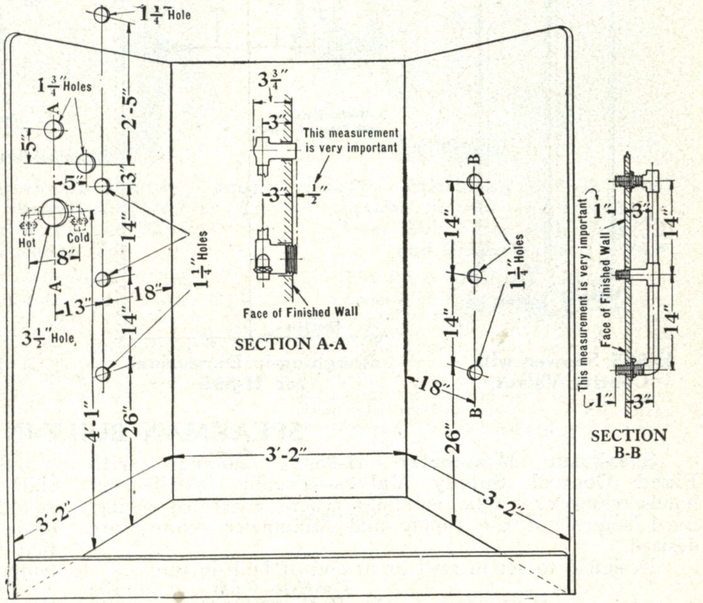
Provision should also be made for access to check valves from rear.

List Price—$65.00. Curtain rod extra depending upon style.

Note: In all Speakman Needle Showers the feed to each spray is graduated so they all give an equal flow of water. Without this graduation the bottom sprays would be strong and the top ones weak.

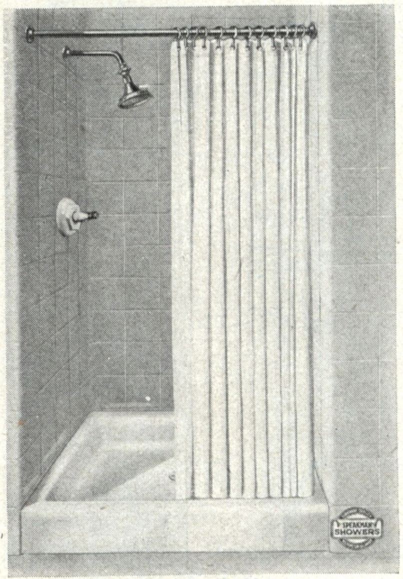

SPEAKMAN SHOWERS

H-965 Stall Shower With Six Needle Sprays


1¼" Hole
1¾" Holes
A
5"
5"
2'-5"
3"
Hot
Cold
8"
14"
18"
A
13"
3½" Hole
14"
1¼" Holes
4'-1"
26"
3¾"
3"
This measurement is very important
3"
½"
Face of Finished Wall
SECTION A-A
B
14"
1¼" Holes
14"
18"
B
26"
3'-2"
3'-2"
3'-2"
1"
3"
This measurement is very important
Face of Finished Wall
14"
14"
1"
3"
SECTION B-B

Roughing-in Dimensions of H-965

SPEAKMAN BUILT-IN MIXOMETER H-952½ SHOWER WITHOUT NEEDLE BATH


SPEAKMAN SHOWERS

H-952½ Stall Shower (Also for Built-in Tub)

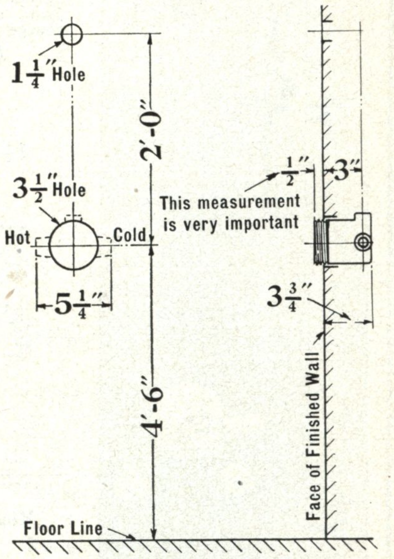
Speakman Built-in Mixometer H-952½ Shower without Needle Bath—Usually installed in residences, hotels and clubs where a much less expensive installation than the H-965 is desired. Can be set in stall or at end of built-in tub.

Complete Outfit—½ in. size No. 15 Mixometer (Plate 1) with china wall plate and 4-in. No. H-1705 Kas-Bras Anyforce head (Plate 2) with ball joint, attached to bent arm discharge pipe.

List Price—$28.00.

H-952—Same as H-952½ but with No. 12 Mixometer having metal wall plate (Plate 1).

List Price—$27.00


1¼" Hole
2'-0"
3½" Hole
Hot
Cold
5¼"
4'-6"
½"
3"
This measurement is very important
3¾"
Face of Finished Wall
Floor Line

Roughing-in Dimensions of H-952½, also H-952

Continued on next page

SPEAKMAN EXPOSED SHOWERS

Speakman Mixometer H-895 Stall Shower with Fixed Control Supply Valves—Extensively used in schools, Y. M. C. A.'s and similar institutions on account of the Mixometer feature and fixed control supply valves. Can be installed singly in stalls or in open battery of several showers and on either the wall or partitions of the stalls, as the entire installation is exposed. Will stand rough use without breakage.

Complete Outfit—½-in. size No. 5 Mixometer (Plate 1), lock shield controlling valves, supplies to overhead, 4-in. No. H-1705 Kas-Bras Anyforce head with ball joint (Plate 2), attached to gooseneck discharge pipe and supporting strap.

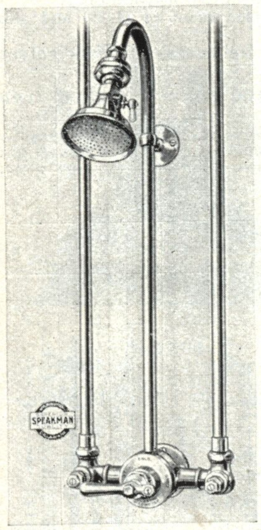
List Price—$39.00.

Speakman H-1555 Compression Stall Shower—The lowest cost installation for a sturdy and serviceable institution shower. Can be installed same as the H-895 but does not have the Mixometer feature.

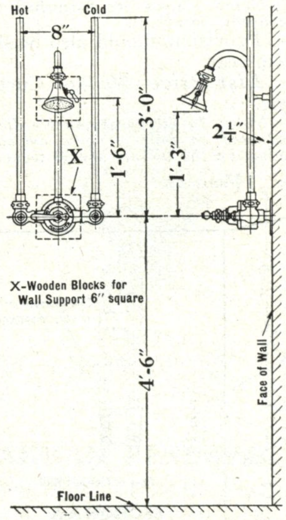
It is especially desirable to place these showers on the partition stalls so that temperature may be regulated before stepping under the shower.

Complete Outfit—½-in. size, supplies to overhead, 2 index compression valves, 4-in. No. H-1700 Kas-Bras head (Plate 2) with ball joint, attached to gooseneck dischareg pipe and supporting strap.

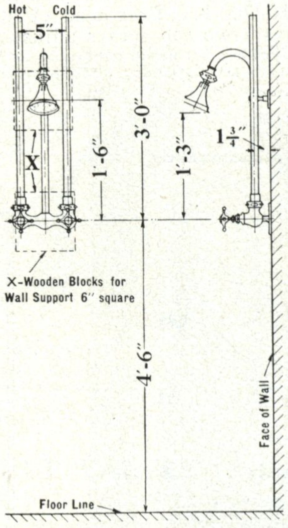
List Price—$19.00.



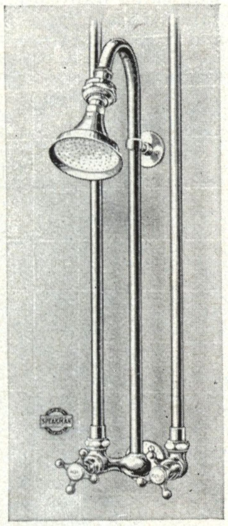
H-895 Shower with Control Valves


Hot
Cold
8"
3'-0"
1'-6"
1'-3"
2¼"
X
X-Wooden Blocks for Wall Support 6" square
4'-6"
Face of Wall
Floor Line

Roughing-in Dimensions for H-895


Hot
Cold
5"
3'-0"
1'-6"
1'-3"
1¾"
X
X-Wooden Blocks for Wall Support 6" square
4'-6"
Face of Wall
Floor Line

Roughing-in Dimensions for H-1555



H-1555 Shower with Compression Valve

SPEAKMAN BUILT-IN SHOWERS

Speakman Mixometer H-954½ Shower with Fixed Control Supply Valves—Usually installed in hotels, clubs or public buildings where concealed piping, fixed control of the supply and Mixometer feature are desired.

Designed to set in stall or at end of built-in tub.

Complete Outfit— ½-in. size No. 15 Mixometer (Plate 1) with china wall plate, lock shield controlling valves with china escutcheons, 4-in. No. H-1705 Kas-Bras Anyforce head (Plate 2) with ball joint, attached to bent arm discharge pipe.

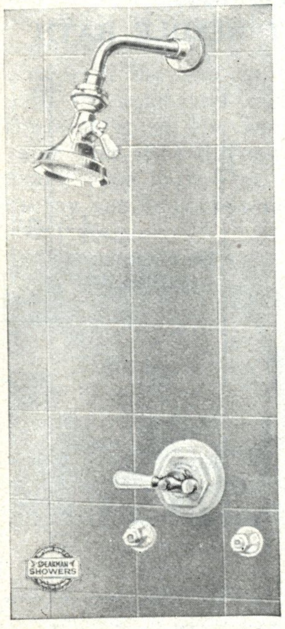
List Price—$32.00.

Speakman H-1402 Built-in Compression Shower—Designed to give as low a cost built-in shower installation as possible for residences, hotels, clubs or public buildings. Can be set in a stall or at end of built-in tub. It is especially desirable that showers be placed on side of stall or end of tub so temperature may be regulated before stepping under shower.

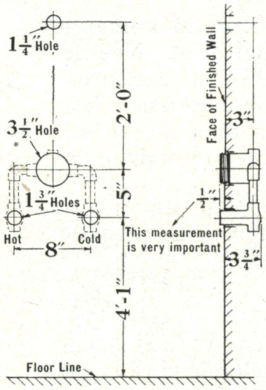
Complete Outfit—½-in. size, 2 renewable Hi-Seat valves (Plate 2) with china escutcheons and handles, 4-in. No. H-1700 Kas-Bras head (Plate 2) with ball joint, attached to bent arm discharge pipe.

List Price—$12.00.

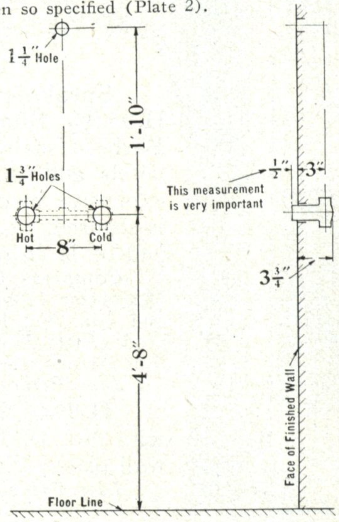
Note: All these showers can be furnished with H-1704 hidden control head when so specified (Plate 2).


SPEAKMAN SHOWERS

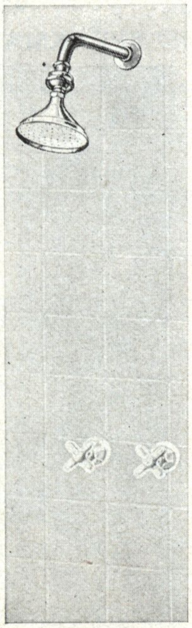
H-954½ Shower with Control Valve H-1746


1¼" Hole
2'-0"
Face of Finished Wall
3"
3½" Hole
5"
1¾" Holes
½"
This measurement is very important
Hot
Cold
8"
3¾"
4'-1"
Floor Line

Roughing-in Dimensions for H-954½


1¼" Hole
1'-10"
1¾" Holes
½"
3"
This measurement is very important
Hot
Cold
8"
3¼"
4'-8"
Face of Finished Wall
Floor Line

Roughing-in Dimensions for H-1402

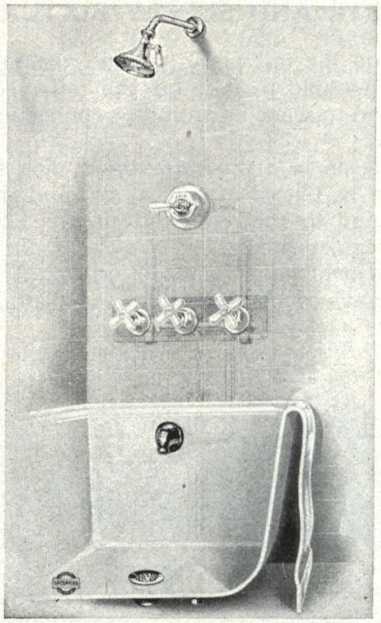


H-1402 Built-in Shower

SPEAKMAN COMPANY **PLATE 4**

Continued on next page

SPEAKMAN BUILT-IN SHOWERS OVER BATHTUBS



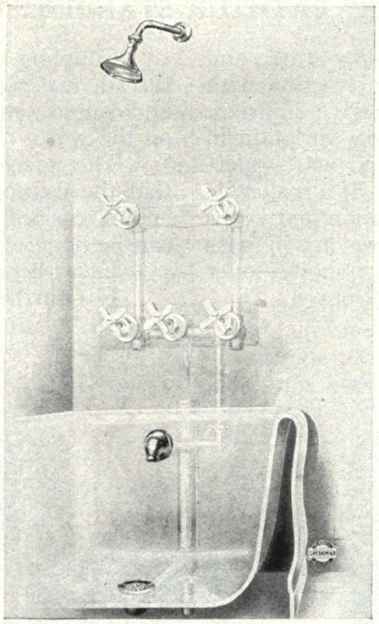
H-2370. Speakman Built-in Mixometer Shower and Deshler Standing Waste and Supply Through Tub

List Price—Complete $45.00, less curtain and rod.

The ideal installation of a shower over a built-in tub. The combination of the H-952½ Mixometer Shower (Plate 3) with the Deshler Bath Fixture (Plate 6) is known as the H-2370 fixture. Can be used over recess tub or corner tub, the only difference would be in the curtain rod used.

The shower head is at an angle so that the shower can be used without wetting the head. The space available with this type of shower is the entire length of the tub inside the curtain.

The bath fixture and Mixometer are connected with brass piping and tested. Bath valves are all by-pass pattern. Provide for door or panel so that access can be had to rear of Deshler fixture

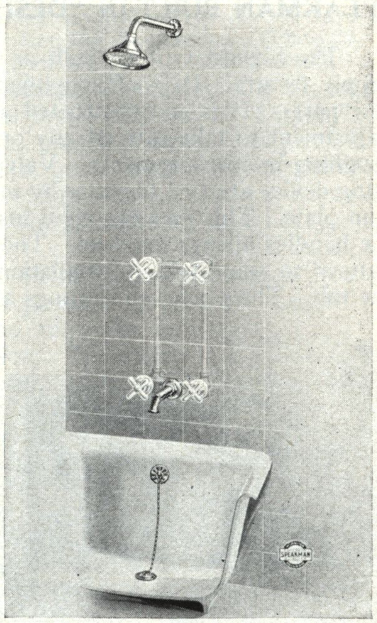


H-2355. Speakman Built-in Compression Shower and Deshler Standing Waste and Supply Through Tub

List Price—Complete, $32.00.

This combination is the Deshler Bath Fixture (Plate 6) connected up with the H-1402 compression valve shower (Plate 4) making a slightly less expensive combination than the H-2370, but not having the advantage of the Mixometer feature, separate control valves being used to mix the water.

The fixture simplifies the piping. The bath valves are by-pass pattern. All valves are connected with brass piping and tested. Brass piping to nozzle is also furnished



H-2350. Speakman Built-in Compression Shower and Dupont Over Tub Filler with Plug and Chain Waste

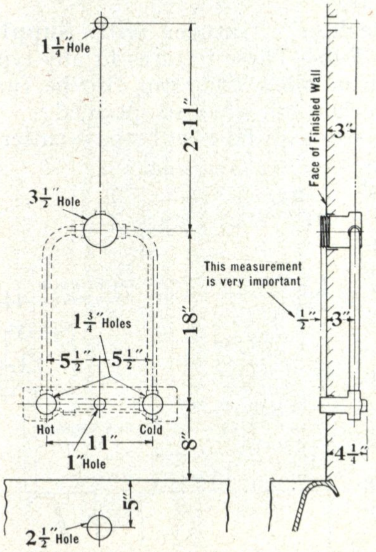
List Price—$21.00; waste $6.00.

Combination consists of H-1402 compression valve shower (Plate 4) and the H-2476 Dupont Tub Filler (Plate 7). Our lowest priced combination and should be used where economy is necessary. It saves the cost of a door or panel in the rear, and because of the simplicity of the connected waste and overflow costs less. All valves are renewable Hi-Seat pattern and are also by-pass as in the Deshler Fixture.

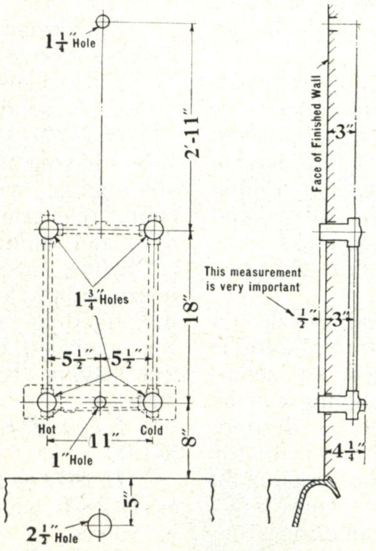
All valves are connected by brass piping.

Mixometer and Anyforce head can also be made up with the Dupont Tub Filler

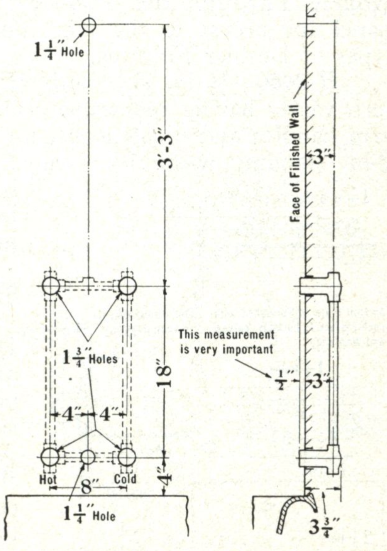
Note: On all the above combinations the valves are connected. The threaded joints and all parts tested. Piping to the nozzle is furnished. All piping is brass.


1¼" Hole
2'-11"
3½" Hole
Face of Finished Wall
3"
This measurement is very important
½"
3"
18"
1¾" Holes
5½"
5½"
Hot
Cold
11"
1" Hole
8"
4¼"
5"
2½" Hole

Roughing-in Dimensions for H-2370


1¼" Hole
2'-11"
Face of Finished Wall
3"
1¼" Holes
This measurement is very important
½"
3"
18"
5½"
5½"
Hot
Cold
11"
1" Hole
8"
4¼"
5"
2½" Hole

Roughing-in Dimensions for H-2355


1¼" Hole
3'-3"
Face of Finished Wall
3"
This measurement is very important
½"
3"
1¾" Holes
18"
4"
4"
Hot
8"
Cold
4"
1¼" Hole
3¾"

Roughing-in Dimensions for H-2350

Continued on next page

SPEAKMAN BUILT-IN "DESHLER" BATHTUB STANDING WASTE AND SUPPLY FIXTURE

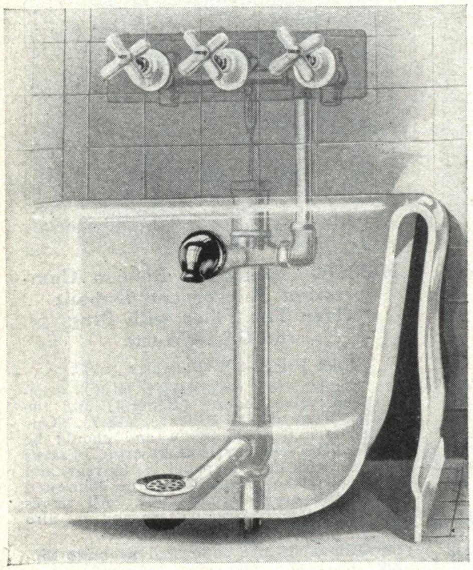
The highest type of built-in standing waste and supply fixture. It is of simplified construction with few parts. It is so constructed as to give sufficient adjustment to take care of any ordinary variation in roughing-in measurements. Valves and waste-operating device are tied together by means of a malleable iron plate. This makes a rigid installation and keeps the handles always lined up. The valves are by-pass pattern to simplify the installation of a shower over the tub. The piping and fittings are all brass.

Coupling nut on the tail piece has an iron pipe thread, making it possible to take off the tail piece and coupling nut, and to make an iron pipe connection on the waste outlet.

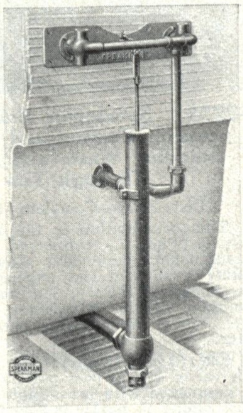
The nozzle tube is iron pipe size brass pipe so that the fixture can be placed at side of tub and the supply carried around to the end, if desired. This can be done with regular fittings.

Escutcheons adjust from 2⅝ to 3⅜ in.

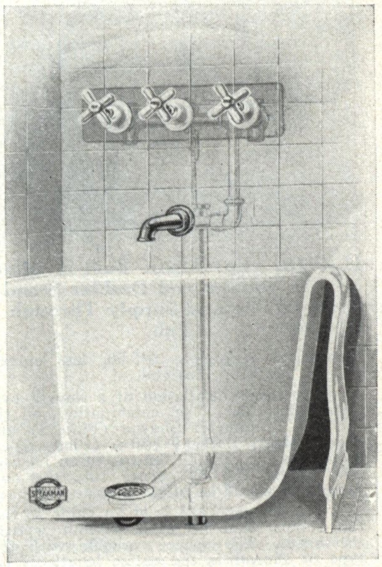
For further details of Hi-Seat valve, see Plate 2.



H-2460, ½-in. Size "Deshler" Fixture with Supply Nozzle Through Tub



Details of Speakman "Deshler" Bath Fixture



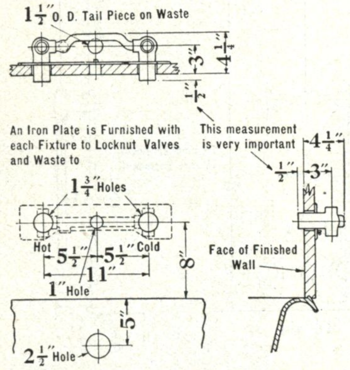
H-2470, ½-in. Size "Deshler" Fixture with Supply Nozzle Above Tub

Speakman "Deshler" Fixtures with Supply Nozzle Through the Tub—Provision for door or panel for access to the rear must be made on all types of Deshler Fixtures.

H-2460—½-in. size with Hi-Seat by-pass pattern valves having renewable seats, solid china cross arm handles and escutcheons, top nozzle supply and 2-in. standing waste for enameled iron tub having bottom outlet. Piping between valves and nozzle is brass.

List Price, $19.00.

The nozzle on H-2460 to H-2467 is arranged so shampoo coupling can be supplied if desired. Add to list price for shampoo coupling 50 cents. These fixtures can also be furnished with top bell or low bell if desired.


1½" O. D. Tail Piece on Waste
3"
4¼"
½"
An Iron Plate is Furnished with each Fixture to Locknut Valves and Waste to
This measurement is very important
4¼"
½"
3"
1¾" Holes
Hot
5½"
5½"
Cold
11"
8"
1" Hole
Face of Finished Wall
5"
2½" Hole

Roughing-in Dimensions for H-2460

H-2461—Same as H-2460 but with ¾-in. valves. *List Price,* $22.00.

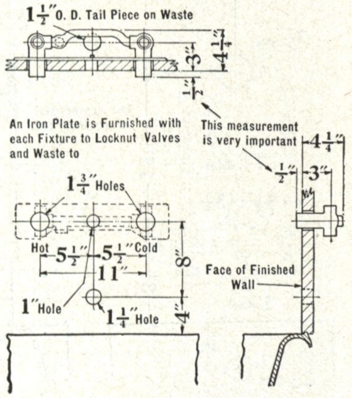
Speakman "Deshler" Fixtures with Supply Nozzle Above the Tub—These fixtures fit any type of built-in enamel iron tub. They can also be furnished for solid porcelain tub when so specified.

H-2470—½-in. size with Hi-Seat by-pass pattern valves having renewable seats, solid china cross arm handles and china escutcheons, over-rim nozzle supply and 2-in. standing waste for enameled iron tub having bottom outlet.

List Price, $21.00.

H-2471 — Same as H-2470 with ¾-in. valves.

List Price, $24.00.


1½" O. D. Tail Piece on Waste
3"
4¼"
½"
An Iron Plate is Furnished with each Fixture to Locknut Valves and Waste to
This measurement is very important
4¼"
½"
3"
1¾" Holes
Hot
5½"
5½"
Cold
11"
8"
1" Hole
1¼" Hole
4"
Face of Finished Wall

Roughing-in Dimensions for H-2470

Continued on next page

SPEAKMAN BUILT-IN "DUPONT" BATHTUB FILLER WITH HI-SEAT VALVES

H-2476 Speakman "Dupont" Tub Filler—This is a simplified and inexpensive type of bath fixture with the nozzle above the rim of the tub. The valves are the same Hi-Seat renewable type as used on the high class "Deshler" Fixture (Plate 6) and have the by-pass feature. Allows a shower to be installed with either Mixometer or compression control valve, if desired. The waste that is used with this fixture is the rubber plug and chain type, described opposite as the H-2480 concealed connected waste and overflow.

Complete Outfit—½-in. size. Consists of nozzle with adjustable flange over rim of tub, 2 renewable Hi-Seat by-pass pattern valves, furnished connected by brass piping, 8 in. center to center—tested at the factory. Valves have solid china cross arm handles and escutcheons. (Plate 2).

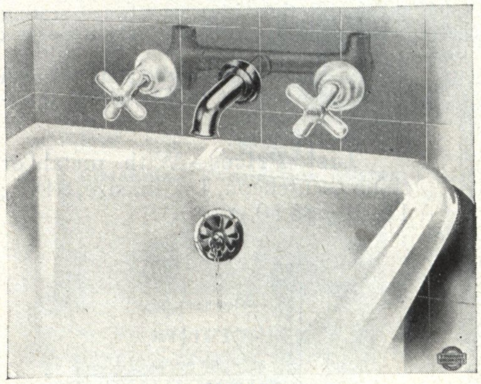
List Price—$9.00 (waste not included).

H-2480 Speakman Concealed Connected Waste and Overflow—Used with "Dupont" Tub Filler. Has 1½-in. outside diameter tail piece, heavy cast brass overflow grate with integral shank that screws into the overflow elbow. Chain is heavy solid link with bronze rings, soldered, and heavy rubber stopper.

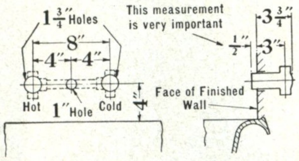
The slip nut on the tail piece has an iron pipe thread, making it possible to take off the tail piece and slip nut, and to make an iron pipe connection. The outlet tee can be reversed, if desired, and the threaded tail screwed into the horizontal run for shallow floor construction. If slip joints are not desired, they can be sweated either by taking slip nuts off or by sweating over them.

Also made in 2-in. size.

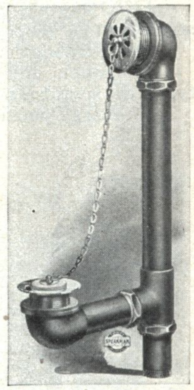
List Price—$9.00.



H-2476
Speakman "Dupont" Tub Filler



Roughing-in Dimensions for H-2476



H-2480. Speakman Concealed Connected Waste and Overflow

SPEAKMAN EXPOSED "LEGLESS" BATHTUB STANDING WASTE AND SUPPLY FIXTURE

A high grade exposed type fixture for "legless" bathtubs. Can easily be put on any "legless" tub and is extensively used where a built-in tub is installed to replace a tub on feet. These fixtures will fit any type of low pattern or "legless" enameled iron bathtub, either single shell or double shell. In specifying, give plate number of tub or specify whether for single shell or double shell tub.

H-2457—The tail piece of waste is 1½-in. outside diameter. The waste body is also threaded 1½-in. iron pipe size; so, if desired, the tail piece may be discarded and iron pipe connection can be used.

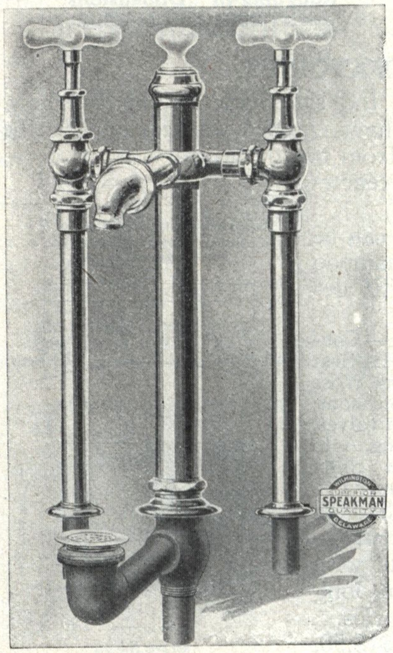
Solid china cross arm handles, top nozzle, ½-in. supplies, 2-in. standing waste with china knob, for "legless" or low pattern tub where the waste arm is under the floor.

Where the floor is shallow, we can furnish when specified, a special elbow as shown, 1½-in. iron pipe female by 1½-in. inside diameter female fine thread. This elbow can be screwed on the waste tee, and the perpendicular tail can be screwed into the elbow, making a horizontal tail.

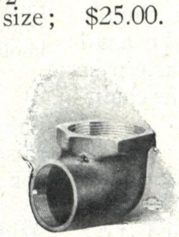
List Price—$25.00; add for shampoo coupling on nozzle, 50 cents.

H-2458—Same as H-2457 but with top bell supply.

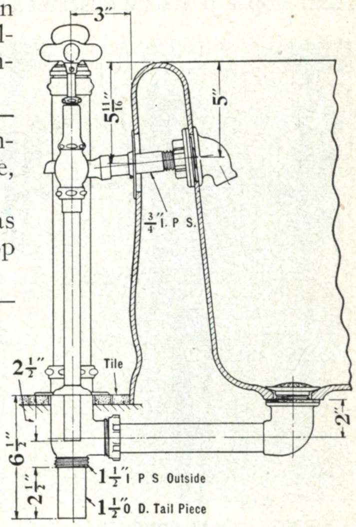
List Price—$25.00.



H-2457
Speakman Exposed "Legless" Bath Fixture



Elbow B—Special Elbow for Shallow Floors



Roughing-in Dimensions for H-2457 Legless Fixture on Double Shell Tub

Continued on next page

SPEAKMAN "ACTO" POP-UP WASTE FOR LAVATORIES

This is a simple, dependable and popular priced waste and operating device for lavatories. Has ample and easy adjustment to suit various styles and sizes of lavatories. It operates entirely on a simple lever principle.

Made in 1¼ and 1½-in. sizes with either metal or china escutcheon.

Details of Construction, Installation and Operation Shown in Cut View Fig. 1—

A—Push down to open. Pull up to close.

B—Guide tube which serves as a stop when rod "C" is raised, thus preventing any possible strain on other working parts.

C—Operating rod revolves freely in turnbuckle, so no strain can be placed on other working parts.

D—Turnbuckle.

E—Ample and easy adjustment to suit various sizes and types of lavatories.

F—Large packing chamber and packing nut, giving friction to hold plug open when lifted. No danger of plug dropping.

G—Packing.

H—Cam which lifts plug. When plug is fully lifted, cam "H" is past center, and plug can not be pushed down without lifting the knob.

J—Metal plug.

J1—Bottom of plug—"J" rests freely on cam "H." No connection link to restrict waterway and complicate removing of plug.

K—Screw to prevent removal of plug. Especially desirable in public rooms. However, plug can be easily removed for cleaning by loosening the screw. No necessity for removing any other parts.

L—Note large waterway through plug body.

M—Beveled rubber washer for countersunk outlet. This washer can be discarded when used on lavatories having tapered outlet.

N—One established measure for lift of metal plug. No adjustment of plug necessary, thus insuring always seating and rapid discharge when opened. This is a very important feature.

P—Plug body with ample length thread and locknut to fit varying thickness of lavatories.

Q—Tail piece.

List Prices—With metal or china escutcheon, 1¼-in. size, $4.75; 1½-in., $6.50.

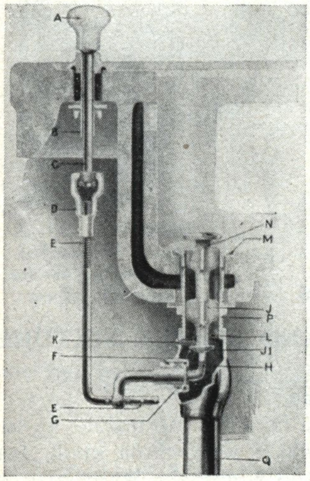
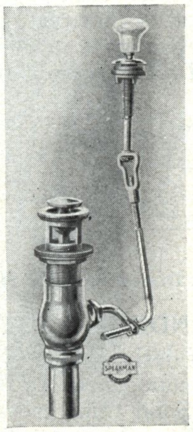
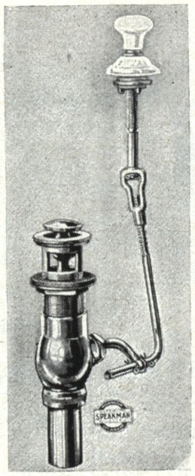

A
B
C
D
E
N
M
J
P
L
J1
H
K
F
E
G
Q

Fig. 1. Cut View of Speakman "Acto" Pop-Up Waste

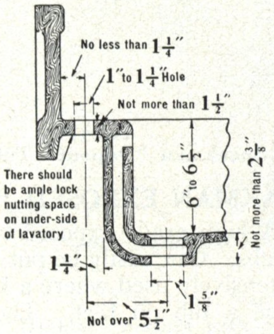


H-2001 with Metal Escutcheon



H-2002 with China Escutcheon

Made in both 1¼ and 1½-in. sizes. The 1¼-in. size is always furnished unless otherwise specified

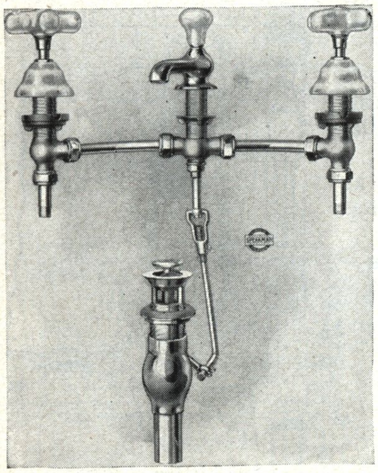

No less than 1¼"
1" to 1¼" Hole
Not more than 1½"
There should be ample lock nutting space on under-side of lavatory
6" to 6½"
Not more than 2⅜"
1¼"
1⅝"
Not over 5½"

Roughing-in Dimensions for H-2001 and H-2002

SPEAKMAN "UNIT-ACTO" FIXTURE FOR LAVATORIES

This is a simplified combination fixture of the Acto Pop-Up Waste described above and a one-nozzle discharge. With this fixture it is possible to wash in running water at the desired and comfortable temperature. The central knob operates the waste, which is more desirable than the stopper and chain. Supply to nozzle and pop-up waste pass through the chain-stay hole.

This fixture will fit stock lavatories with overflow drilled for two faucets and chain-stay through the slab back to the overflow.



H-2276 Speakman "Unit-Acto" Lavatory Fixture

Supply valves have encased washers and can be easily rewashered from top of lavatory.

Valves have renewable seats.

These fixtures can be furnished with shampoo coupling on nozzle if desired.

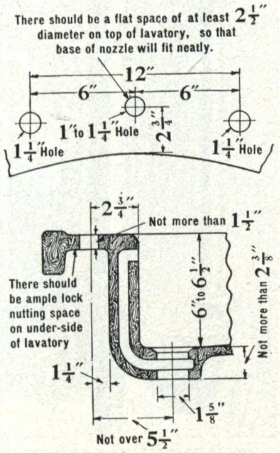
H-2276 Fixture—Consists of 2 renewable Hi-Seat valves with solid china cross arm handles and escutcheons, ¼-in. threaded tails on valves, raised nozzle 3¼ in. long, Acto Pop-Up Waste with china knob and 1¼-in. diameter tail.

List Price—$13.00.

H-2276-D Fixture—Same as H-2276 but with raised nozzle 4¼ in. long for large size lavatories.

List Price—$13.50.

Add for 1½-in. waste, $1.50.


There should be a flat space of at least 2½" diameter on top of lavatory, so that base of nozzle will fit neatly.
12"
6"
6"
2¾"
1" to 1¼" Hole
1¼" Hole
1¼" Hole
2¾"
Not more than 1½"
There should be ample lock nutting space on under-side of lavatory
6" to 6½"
Not more than 2⅜"
1¼"
1⅝"
Not over 5½"

Roughing-in Dimensions for H-2276

Continued on next page

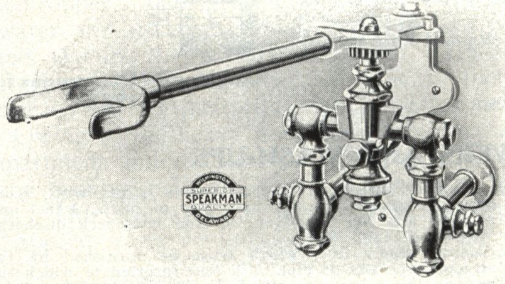
SPEAKMAN KNEE-ACTION VALVE AND WASTE FOR LAVATORIES IN HOSPITALS

The Speakman Knee-action Mixing Valve H-2554 with the H-2556 Knee-action Waste and H-2540 Gooseneck Nozzle make a complete sanitary hospital lavatory fixture, entirely operated by knee-action. Either of the three units making up this combination can be bought and installed separately.

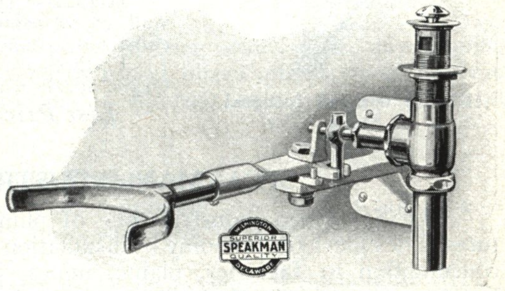
The valve and waste are designed to be attached to wall under a lavatory or sink where there is sufficient space between the supports to operate the levers. The controlling non-splash valves regulate the flow of water and prevent splashing. The mixing valve arrangement enables the operator to obtain any desired temperature of water by moving the lever handle with the knee. Lever stays in whatever position it is placed.

Has ½-in. inlets to wall with lockshield controlling valves and ½-in. outlet. Wall bracket is malleable iron, white enameled.

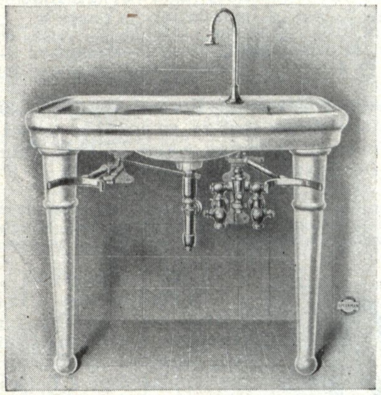
List Prices—Valve H-2554, $62.00; waste H-2556, $24.00; nozzle H-2540, $8.00.



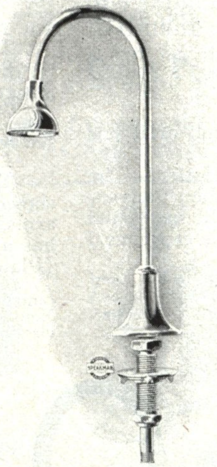
H-2554
Speakman Knee-action Mixing Valve



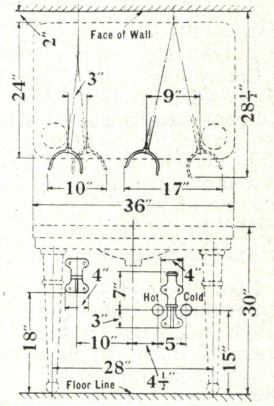
H-2556
Speakman Knee-action Waste



Speakman Knee-action Valve and Waste Under Lavatory
H-2540, H-2554, H-2556



H-2540
Speakman Gooseneck Nozzle



Roughing-in Dimensions for H-2540, H-2554, H-2556, H-2557

SPEAKMAN SWING NOZZLE SINK FIXTURE

This is a one-nozzle discharge fixture that permits the temperature of the water to be regulated, and by swinging the nozzle to run the hot, cold or medium warm water in any part of the sink.

There are four types of these fixtures: with and without soap dish; with and without spray head.

The fixture with spray head appeals to most women as it is convenient for spraying dishes, vegetables or for cleaning the sink.

Any of these fixtures can be installed in place of present faucets.

Detailed Description—

Soap Dish Large and Extra Heavy—It is *removable* and is on a post instead of prongs which might break or become bent.

Broached Spindles—As the washers wear in any valve, the handle turns further around. This broached spindle permits easily lining up the handles by removing one screw and turning the handle further to the front.

Wide Clearance Between Soap Dish and Handles—This is very convenient in operating and cleaning about the fixture. Ball on short end permits easy turning.

Integral Stops—These allow regulating the force of the hot and cold water so that there is a balance between them.

Transfer Valve—In the fixture with the hose and spray head the transfer valve is very important. This turns the water from the swing nozzle to the spray head.

This transfer valve in this fixture is designed for the fixture and will never give any trouble.

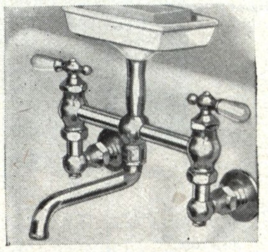
Hose and Spray Head—This hose is made to give especially long service.

It has a fabric web like an automobile tire.

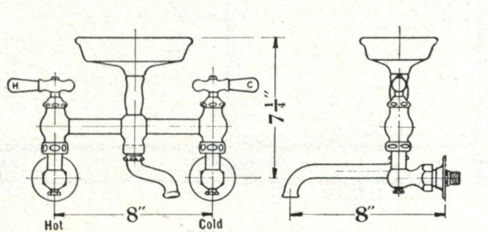
It will wear for years.

Holes in the spray head are designed to give a fair force at moderate house pressure.

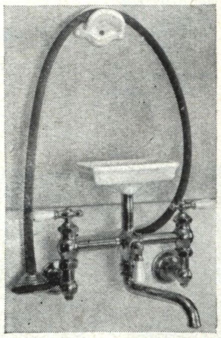
List Prices—H-1890, $8.50; H-1894, $13.00. Deduct for soap dish, $1.25.



H-1890
Speakman Swing Nozzle Sink Fixture with Soap Dish



Roughing-in Dimensions for H-1890 and H-1894



H-1894
Speakman Swing Nozzle Sink Fixture with Soap Dish and Spray Head

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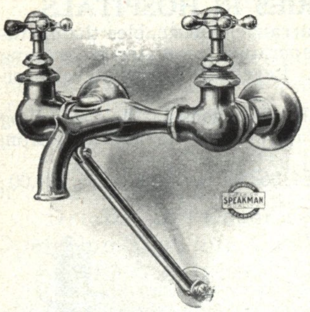


H-1922 without Integral Stops

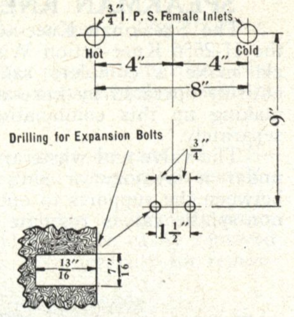
SPEAKMAN HEAVY SLOP SINK FIXTURES

This is another example of the Speakman one-nozzle discharge feature which allows the temperature of the water to be regulated. This fixture is built extra heavy to withstand rough use. It has a bucket hook on the nozzle and the nozzle is braced by a heavy rod to prevent springing of the fixture when a heavy load is placed on the bucket hook.

H-1922—Consists of ¾-in. fixture with supplies to the wall (8 in. center to center), brace and bucket hook and china index handles.

Fixtures are also made with integral stops or hose thread on the nozzle where desired.

List Price—$19.00.



Roughing-in Dimensions for H-1922

SPEAKMAN INDUSTRIAL LINE—SHOWERS AND WASH-UPS

The Speakman industrial line of plumbing fixtures is designed for economy of installation and water consumption in factories, plants, mines, etc. The fixtures are made exceptionally sturdy and durable to stand up under rough use. All Speakman Industrial Fixtures are made of rough nickel finish on brass parts. This finish corresponds closely to the finish of the galvanized supply pipe.

Controlling stops should be placed in all industrial line fixtures when installing them.

Speakman Industrial Mixometer Shower H-1600—The most expensive industrial shower. The chief advantage to the employer in this type of shower is the quick and easy control of temperature. It saves time and is economical in the use of water.

Complete Outfit—½-in. size Mixometer supply valve and elbow couplings to take supplies from overhead, wall or floor, and 4-in. Kas-Bras head attached to galvanized iron gooseneck discharge pipe.

List Price—$24.00.

Speakman Industrial Combination Valve Shower H-1625—An ideal low cost fixture where showers are to be installed in a battery. The horizontal supply pipes effect a saving in the cost of installation.

Complete Outfit—Consists of 2 compression valves with ¾-in. union male couplings attached (center to center of inlets, 3 in.) and 4-in. Kas-Bras head attached to galvanized iron gooseneck discharge pipe.

The horizontal supply line, which must be furnished by the plumbing contractor, consists of pipe with tees inserted to which the union couplings on the valves are attached. Pipes should be placed 5 ft. from the floor.

List Price—$10.50 (does not include horizontal pipes).

Speakman Industrial Columbia Shower H-1630—Is designed to give as low a cost of installation as possible.

Complete Outfit—½-in. size, consists of 2 compression valves with union couplings attached to take supplies from overhead, and 4-in. Kas-Bras head attached to galvanized iron gooseneck discharge pipe.

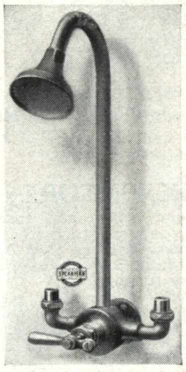
List Price—$10.50.

Speakman Industrial Wash-up Fixture H-1635—Designed with high gooseneck so that it is possible to wash arms, shoulders and head in "running water." This fixture has a non-splashable head with hidden control as in H-1704 (Plate 2).

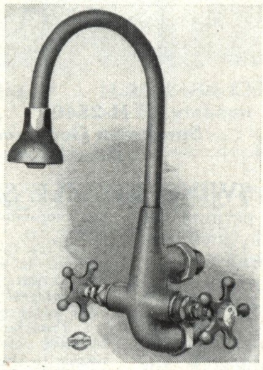
Complete Outfit—Consists of ¾-in. male union couplings (3-in. center to center), 2 heavy pattern combination valves and Kas-Bras Non-splashing Spray Regulator attached to galvanized iron gooseneck discharge pipe.

List Price—$8.50.

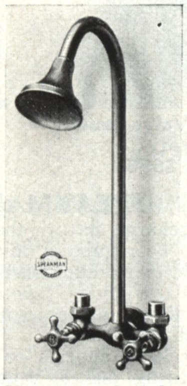
Installation — Plain piping and fittings only required when installing. Any number of fixtures can be placed on a line and line extended from time to time as required. Cold water pipe should be placed above.



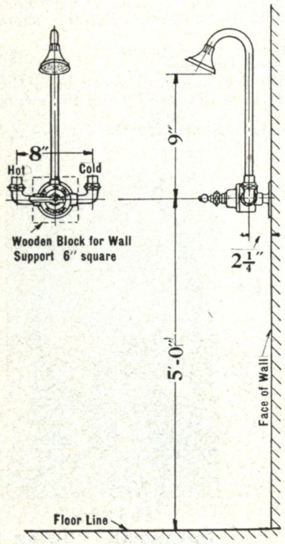
H-1600. Speakman Industrial Mixometer Shower



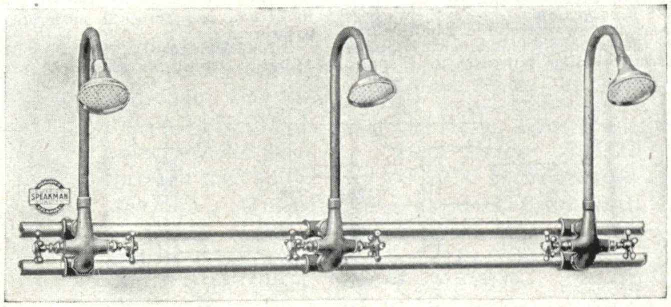
H-1635. Speakman Industrial Wash-up Fixture



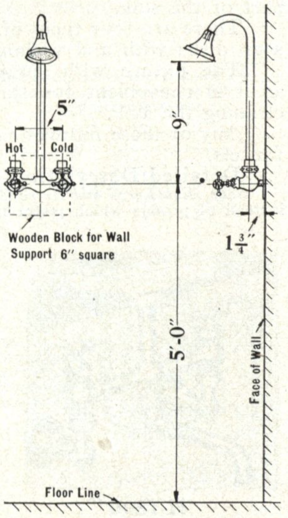
H-1630. Speakman Industrial Columbia Shower



Roughing-in Dimensions for H-1600



H-1625
Speakman Industrial Combination Valve Shower



Roughing-in Dimensions for H-1630

SPEAKMAN COMPANY **PLATE 10**

HENRY G. LOEBER COMPANY

Water Coolers, Drinking Fountains, Filters and Soda Fountains

151 East 126th Street, NEW YORK, N. Y.

Loeber Water Coolers—Incomparable Construction

The outer shell of Loeber water coolers is made of heavy galvanized steel finished in olive enamel. All ice compartments are lined with 16-oz. tinned copper and insulated with 2-in. compressed cork. The horizontal water cooling coils are made of 2-in. diameter heavy tinned copper. They are continually submerged in waste ice water, and are covered with ice till the last pound has melted. Hence, they are 100% efficient. The advantage of horizontal coils over vertical coils is the fact that the former do not lose their efficiency as the ice melts down.

Owing to the heavy tinned copper lining of the ice compartment and the heavy tinned copper construction of the cooling coils, no guard is necessary to protect them. This increases the efficiency of Loeber coolers. Special water cooling boxes can be built to order.

Loeber Drinking Fountains

Loeber drinking fountains, either separately or in combination with Loeber water coolers and Loeber filters, are used by schools, factories and government institutions. Our Rainbow and Sanitor fountains pass all Board of Health restrictions.

Loeber Combined Water Coolers and Filters

Supply pure cool water in an endless stream. Loeber combined water coolers and filters are used by the Cunard and Anchor Lines on passenger piers; by the Standard Oil Co., many banks, etc.

Loeber Filters

Furnish pure drinking water from any municipal supply. Henglob faucet filters offer a most simple and compact means of filtering water for drinking purposes.

Loeber Soda Fountains

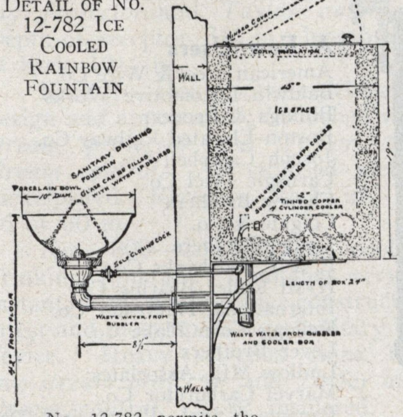
Loeber soda fountains are made in all sizes and styles, with automatic electric refrigeration and for ice as desired.

The Irvington soda fountain is made in all sizes and styles, and with the latest sanitary equipment.

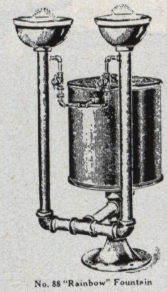
Other Products

We manufacture german silver and monel metal sinks and drainers, milk cabinets, automatic electric refrigerated soda fountains and ice cream storage boxes.

DETAIL OF No. 12-782 ICE COOLED RAINBOW FOUNTAIN

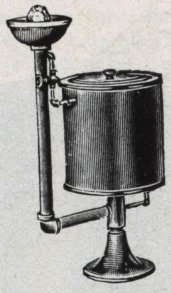

Wall
Cork Insulation
Ice Space
Sanitary Drinking Fountain
Porcelain Bowl
Self Closing Cock
Tinned Copper Cylinder Cooler
Length of Box 24"
Waste Water from Bubbler
Wall

No. 12-782 permits the use of a glass. Can be furnished with german silver drip cup and splasher, and with automatic glass rinser like Nos. 15 and 157 coolers


No. 88 "Rainbow" Fountain

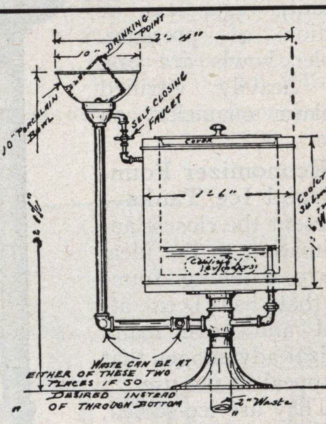
No. 88 RAINBOW DOUBLE FOUNTAIN AND COOLER

Can have extra large ice compartment with lock

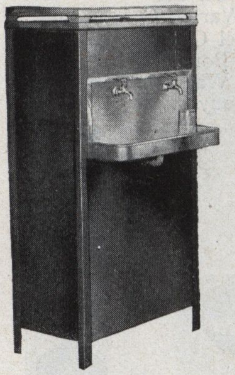


No. 77 RAINBOW WATER COOLER AND FOUNTAIN

See dimensions in detail drawing at right

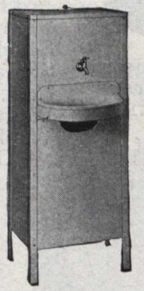

2' 4"
10"
Drinking Point
10" Porcelain Bowl
Self Closing Faucet
Cover
1' 2 6"
Coolers Submerged in Ice Water
Waste can be at either of these two places if so desired instead of through bottom
¾" Waste

DETAIL OF No. 77 RAINBOW WATER COOLER AND FOUNTAIN



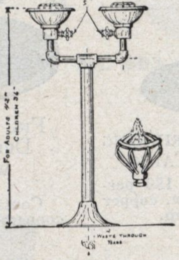
No. 157 WATER COOLER AND FILTER

With german silver drip cup and splasher, and automatic rinser for glasses. Height, 50 in.; width, 25½ in.; depth, 15¼ in.



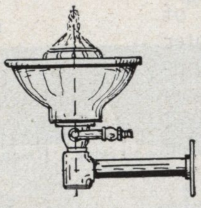
No. 15X SNOW WHITE FINISH COMBINED WATER COOLER AND FILTER

With automatic glass rinser in drip cup and splasher; self-closing nickel faucet. Height, 48 in.; width, 18½ in.; depth, 13½ in.

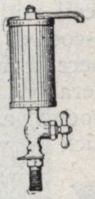


No. 42 SANITOR FOUNTAIN

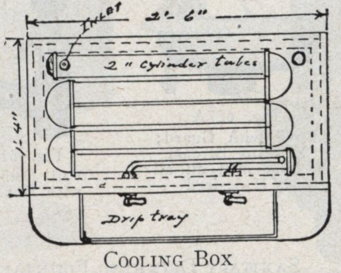
Height: adult, 42 in.; children, 36 in. Also made with Rainbow fountain, single and wall types



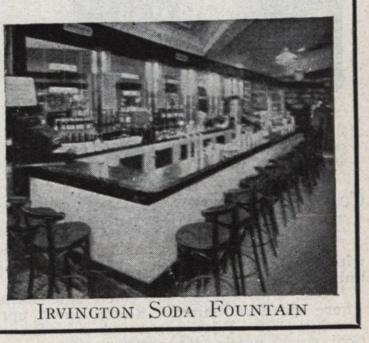
No. 782 SANITOR WALL FOUNTAIN



No. 14 BASIN FILTER


Inlet
2' 6"
2" Cylinder tubes
1' 4"
Drip tray

COOLING BOX



IRVINGTON SODA FOUNTAIN

A Few Loeber Drinking Fountains, Coolers, Filters and Soda Fountains

MANUFACTURING EQUIPMENT & ENGINEERING CO.

Sanitary Drinking Fountains

FRAMINGHAM, MASS.

BRANCHES

BOSTON, MASS. NEW YORK, N. Y. DETROIT, MICH. BUFFALO, N. Y.
PHILADELPHIA, PA. CLEVELAND, OHIO

METAL MEECO PRODUCTS

TRADE-MARK

Products

Sanitary Drinking Fountains.

For Metal Toilet Enclosures, see page 1993; for Sanitary Washbowls, see page 2063; for Metal Lockers, Shelving, etc., see page 2682.

Combined Sanitary Drinking Fountain and Ice Tank

Designed for connection to municipal water supply or gravity tank and to furnish water sufficiently ice-cooled to supply a continuous procession of persons such as is customary under practical conditions. Their wide adoption attests their popularity.

Furnished with any kind of bubbler, or without bubblers. Our standard bubblers have an oblique or vertical stream so as to meet various Board of Health regulations, and can be regulated to suit any water pressure, so that height of stream will always be constant, regardless of variation of pressure. Bubbler bowls are cast iron, heavily vitrified porcelain enameled on inside.

Economizer Fountains and Ice Tanks—Represent the closest approximation to the ideal sanitary drinking fountain that has been attained and have many practical advantages that will appeal to the user.

They are ice-cooled, having two tanks and two coils. Incoming water first passes through a coil within a tank of ice-cooled waste water where it is cooled considerably. It then passes through a second coil which is within the ice tank and becomes ice cold. Then the water passes through the bubbler and down to the waste water tank where it helps cool incoming water. Overflow pipe in waste water tank carries off excess water.

In this way, full use is made of the cooling effect of the ice with a great resultant reduction in the amount of ice consumed.

Construction of Combined Drinking Fountains and Ice Tanks—Ice tank is cork insulated; watertight parts are galvanized after fabrication. Finished with two coats of dark olive brown baked enamel. Small fittings are nickelplated. Supply connections, ¼ in.; waste connections, 2 in. Standard fountains waste through base, but can be furnished to waste through elbow above floor. Operated by self-closing stops.

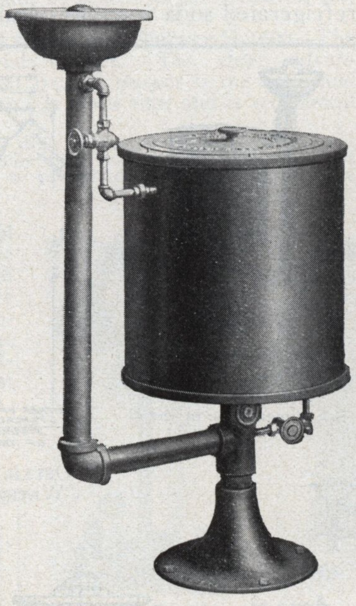


Fig. 604. Sanitary Drinking Fountain with Ice Tank

Supply capacity, 125 to 150 persons. Has 15½ coils of ½-in. copper tubing. Heights, 36 and 42 in.

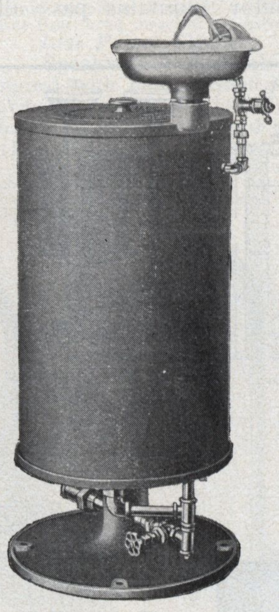


Fig. 627. Economizer Drinking Fountain with Ice Tank

(Patented)

Contains 105 ft. of ½-in. copper coil. Height, 43 in.

Sanitary Drinking Fountains

We illustrate a few of our fountains for use with concealed ice tanks or for direct connection to municipal water supply. Any kind of bubbler furnished.

A Few Users

- American Steel & Wire Co.
- Baldwin Locomotive Works
- Billings & Spencer
- Boston Elevated Railway Co.
- Joseph Campbell Co.
- Carnegie Steel Co.
- Cheney Brothers
- Colgate & Co.
- Dodge Brothers
- E. & T. Fairbanks Co.
- Hyatt Roller Bearing Co.
- International Harvester Co.
- Kellogg Corn Flake Co.
- Lever Brothers
- Ludlow Mfg. Associates
- Marvel Carburetor Co.
- Panama Canal, Purchasing Department
- Procter & Gamble Co.
- Remington Arms Co.
- Standard Oil Co.
- Stewart-Warner Corporation
- U. S. Steel Corporation
- Waitt & Bond, Inc.
- Waltham Watch Company

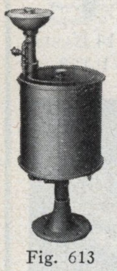


Fig. 613

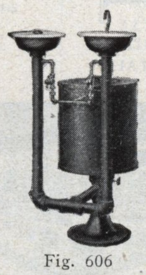


Fig. 606

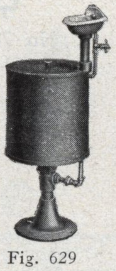


Fig. 629

Combined Sanitary Drinking Fountains and Ice Tanks

Fig. 606—Double capacity, being furnished either with 2 bubblers, 2 goosenecks for filling glasses, or 1 bubbler and 1 gooseneck

Fig. 613.—With concealed side fixture; for use where space is limited. Round bowl; upright stream.

Fig. 629—With concealed side fixture and elliptical guard bowl: slanting stream

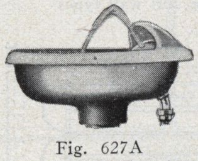


Fig. 627A

Bowl with Guard; Slanting Stream Furnished on all types if desired

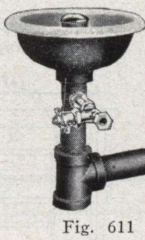


Fig. 611

Wall Fountain with Bubbler

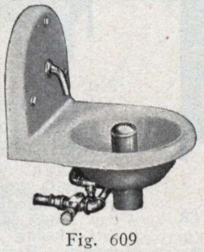


Fig. 609

Wall Fountain with Bubbler and Spout Spout or bibb optional Not furnished with lag screws

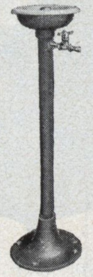


Fig. 602

Pedestal Fountain Standard heights 36 and 42 in.; also special heights

Sanitary Drinking Fountains for Connection with Concealed Ice Tanks or Municipal Water Supply

THE HALSEY W. TAYLOR CO.

Sanitary Drinking Fountains with Automatic Stream Control

WARREN, OHIO

Products

Halsey Taylor Sanitary Drinking Fountains (Patented) and Combination Cooler and Drinking Fountains, with practical Automatic Stream Control, Ideal Drinking Mound, Non-squirting Two-stream Projector.

Styles of Halsey Taylor Drinking Fountains

No. 605—Heavy vitreous china with integral trap; self-closing stop; *"Cantonment" two-stream projector* and *Taylor automatic stream control.* All exposed metal parts nickelplated. Dimensions, 10x13 in. Supply, 3/8 in.; waste, 1 1/4-in. rough brass trap.

Ideal for schools and public buildings.

No. 603—Heavy vitreous china with integral trap, lever handle, self-closing stop. Furnished with *two-stream mound-building projector, Taylor automatic stream control.* Receptor, 3 1/2 in. deep; 12 in. from wall; 9 1/2 in. wide. A popular low priced wall type.

No. 610—Another popular school type. Heavy vitreous china with integral back. All exposed parts nickelplated. Furnished with *two-stream mound-building projector* and *Taylor automatic stream control.* Depth of receptor, 3 1/2 in.; length over all 24 in.; height of back, 10 1/2 in.

No. 616—Heavy vitreous china pedestal of beautiful design and appearance; furnished with *two-stream projector* and *Taylor automatic stream control.* All exposed metal parts nickelplated. Receptor, 10x13 in. Heights, 36 or 30 in.

No. 800—Combination cooler and drinking fountain. Combines very best in instantaneous water cooler construction with latest and most up-to-date sanitary drinking device. Heavy vitreous china receptor; *two-stream projector* and *Taylor automatic stream control.* Cork insulated. Dimensions of cooling tank, 19 in. outside diameter by 19 in. high. Ice capacity 80 lb.

No. 592—Halsey Taylor fountain head designed to replace present unsanitary bubblers in receptors on drinking fountains already installed. Made from nickelplated brass with loose key volume regulator; *furnished with two-stream mound-building projector* and *Taylor automatic stream control;* 3/8-in. female thread; length over all, 3 1/2 in. from center of supply.

Catalogue and Data

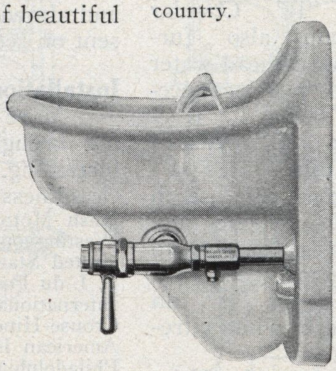
From time to time we issue special literature for architects' use giving plates of buildings in which installations have been made and special data on new types. Write for it.

A Few Prominent Users

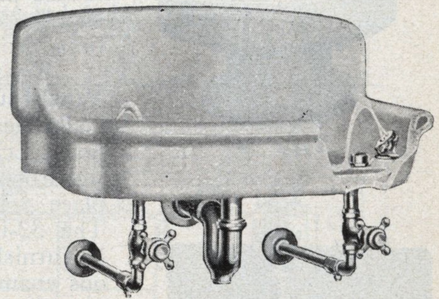
Schools in Cleveland, Youngstown, Denver, Atlanta, Kansas City, Jacksonville, Baltimore, Washington, Los Angeles, Albany and other cities from coast to coast.

Westinghouse Electric & Mfg Co.
American Sheet & Tin Plate Co.
American Steel & Wire Co.
Jones & Laughlin Steel Co.
B. F. Goodrich Co.
Kelly-Springfield Co.
Fisher Body Co.
Hudson Motor Car Co.
Willard Storage Battery Co.
General Electric Co.
Packard Electric Co.
American Woolen Mills Co.

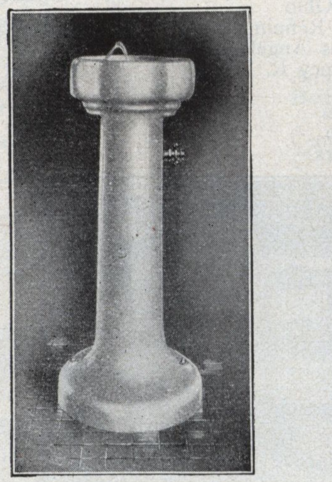
and literally hundreds of industrial concerns throughout the country.



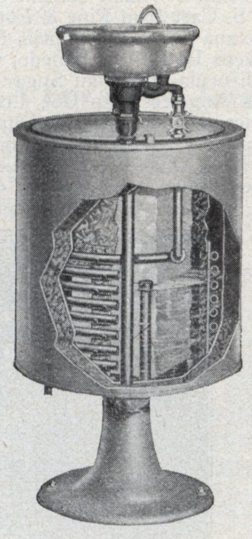
No. 603



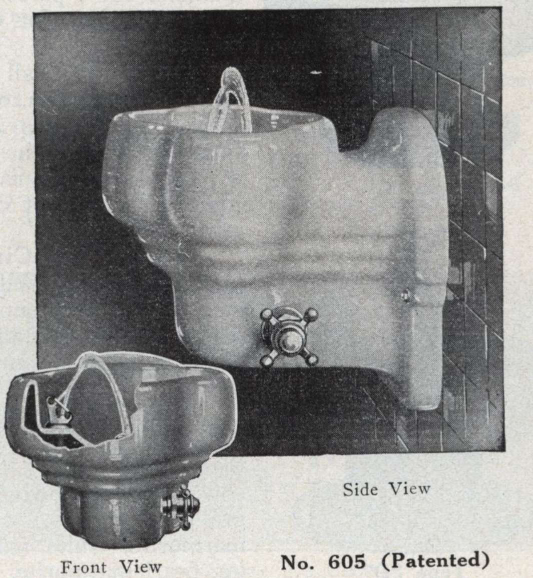
No. 610



No. 616



No. 800
A favorite cooler everywhere



Side View

Front View

No. 605 (Patented)

BRADLEY WASHFOUNTAIN CO.

Manufacturers of Lavatory Fixtures

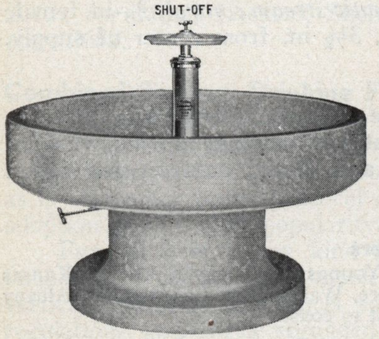
MILWAUKEE, WIS.

Washfountains

Four types for every demand and contingency to meet advanced and modern equipment. Four grades.

Grades—Pearl marmorite, white marmorite, colored marmorite, granito and 32-in. in porcelain as well.

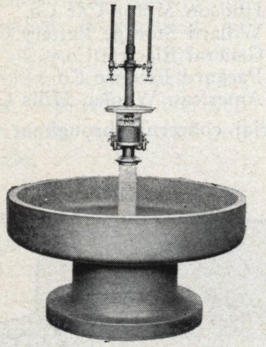
Type "A" Standard Circular Washfountain—Manufactured in 32-in. diameter for 6 persons and 54-in. diameter for 10 persons in the following four grades: pearl marmorite, white marmorite, colored marmorite, granito. The 32-in. fountain is also furnished with white porcelain bowl and pearl marmorite pedestal.



Type "A"

Type "B" Circular Washfountain—With overhead water supply vent connections, and is designed for places where pipe connections from below are impractical or difficult to make. Made in 32 and 54-in. diameter and the same grades as Type "A."

Type "B" Circular Washfountain also furnished with overhead water supply and vent connections from below.

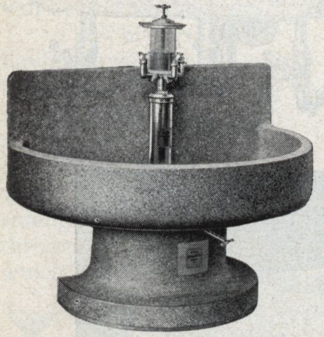


Type "B"

Type "C" Wall Washfountain — Especially designed for use in hotels, clubs, schools and washrooms too narrow to place circular fountains. The 32-in. Type "C" can be furnished in white vitreous enamel.

They are made 32-in. diameter for 4 persons and 54-in. diameter for 6 persons.

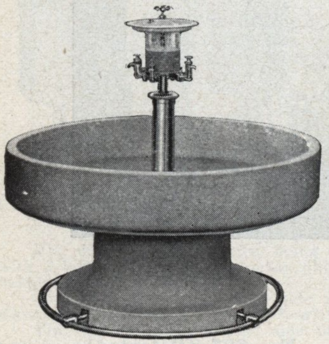
The 32-in. wall fountain takes up 32 in. of wall space and extends 21 in. from the wall. The 54-in. wall fountain can be equipped with foot control same as Type "D."



Type "C"

Type "D" Circular Washfountain—With foot controlled water supply is designed for installations where automatic shutoff is wanted.

These fountains are made only in the 54-in. diameter size for 10 persons in the following four grades: granito, colored marmorite, white marmorite, pearl marmorite.



Type "D"

The shutoff valve in Type "D" Fountain is of the Fuller type and positioned on the outside of the pedestal below the fountain bowl, easy to get at for repacking, etc.

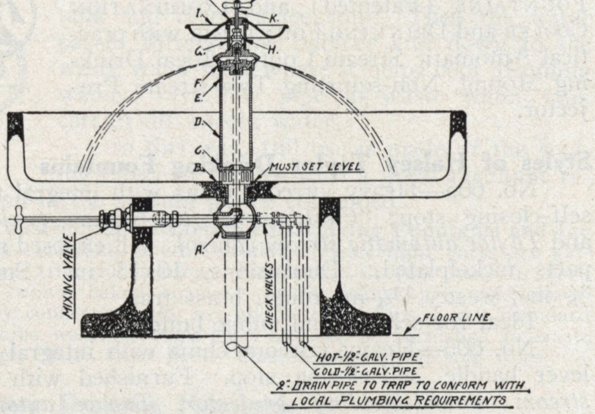


Diagram of Roughing-in Details

Showing pipe connections and how fixtures are assembled and set up

Soap Fixtures—Liquid soap dispensers and cake-soap tray, combined. Shaved soap attachment and soap tray combined. Shaved soap attachment without cake-soap tray. Soap tray for cake soap only.

Specification Details—Size. Grade. Soap fixtures.

Catalogue and Information—Complete catalogue and drawings with instructions for installation gladly sent on request.

Installations

More than 3000 Bradley Washfountains now in daily use throughout the country and their numbers constantly increasing. They are used in public washrooms where cleanliness and sanitation are an object.

Nash Motor Co., Kenosha and Milwaukee, Wis.
Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.
United States Gypsum Co., Chicago, Ill.
E. I. du Pont de Nemours & Co., Wilmington, Del.
International Nickel Co., Huntington, W. Va.
Crouse-Hinds Co., Syracuse, N. Y.
American Radiator Co., Buffalo, N. Y.
Philadelphia Rapid Transit Co., Philadelphia, Pa.
Campbell Soup Co., Camden, N. J.
Phoenix Portland Cement Co., Birmingham, Ala., Nazareth, Pa.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
Roxana Petroleum Corp., St. Louis, Mo.
Owens Bottle Co., Toledo, Ohio
California-Hawaiian Sugar Refining Corp., San Francisco, Cal.
Los Angeles Soap Co., Los Angeles, Cal.
Chicago, Burlington & Quincy R. R. Co.
Southern Pacific R. R. Co.
Norfolk & Western Ry. Co.
Chesapeake & Ohio Ry. Co.
and over 600 other users.

CHICAGO, BURLINGTON & QUINCY R.R.CO.
DENVER SHOPS
30 54" COLORED MARMORITE
WASHFOUNTAINS
USED IN THIS PLANT

Typical Industrial Washfountain Installation

MANUFACTURING EQUIPMENT & ENGINEERING CO.

Sanitary Washbowls

FRAMINGHAM, MASS.

BRANCHES

BOSTON, MASS. NEW YORK, N. Y. DETROIT, MICH. BUFFALO, N. Y.
PHILADELPHIA, PA. CLEVELAND, OHIO

METAL MEECO PRODUCTS

TRADE-MARK

Products

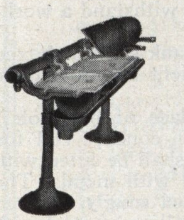
SANITARY WASHBOWLS.

For Metal Toilet Enclosures, see page 1993; for Sanitary Drinking Fountains and Water Coolers, see page 2060; for Metal Lockers, Shelving, etc., see page 2682.

Victory Washbowls (Patented)

Have common water supply, common waste and common vent. Every bowl trapped and vented. Meet most technical Board of Health regulations.

Shipped largely erected, greatly reducing cost of installation. All that is necessary is to connect water supply, vent and waste. Bowl holds 2 gal. of water. Extremely simple in construction and staunchly built for long service.



ECONOMY WASHBOWL

Economy Washbowls (Patented)

Have common water supply and common waste. Only one trap per battery is necessary even when as many as 20 bowls are used.

A 1-gal. bowl is usually furnished but a 2½-gal. bowl can be provided.

Shipped knocked down, crated.

How Our Washbowls Are Furnished

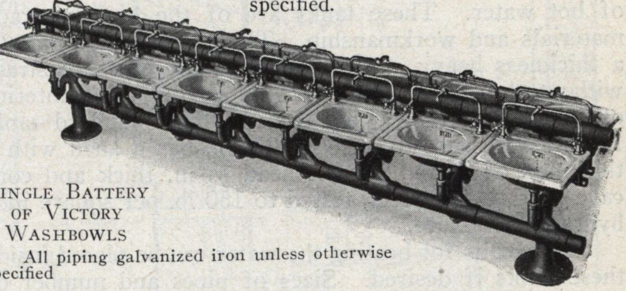
(1) In single or double batteries.

(2) For hot and cold or one temperature of water.

(3) With vitrified porcelain enameled, plain iron or galvanized iron bowls.

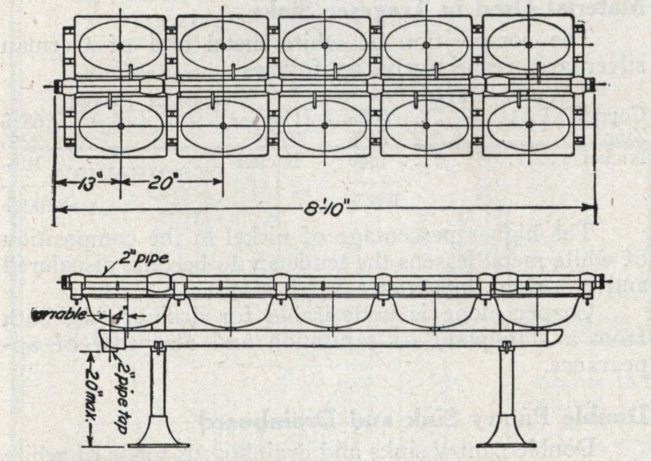
(4) With compression or self-closing bibbs, Economy bowls being also furnished with plain nozzle.

All piping for Economy bowls black iron unless otherwise specified.

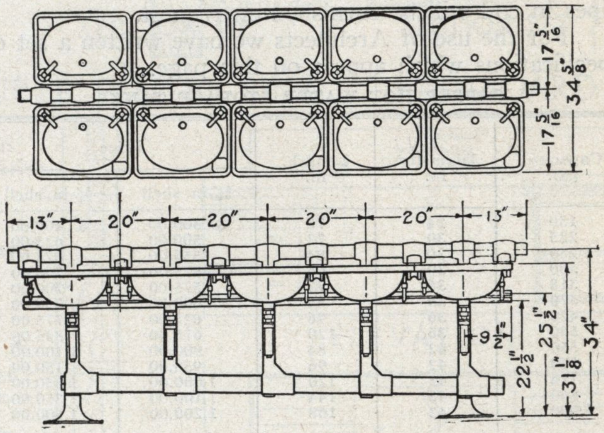


SINGLE BATTERY OF VICTORY WASHBOWLS

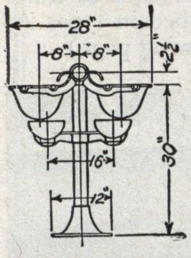
All piping galvanized iron unless otherwise specified

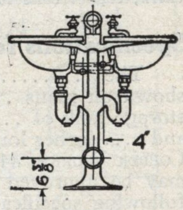


DIMENSION DIAGRAM OF ECONOMY WASHBOWLS



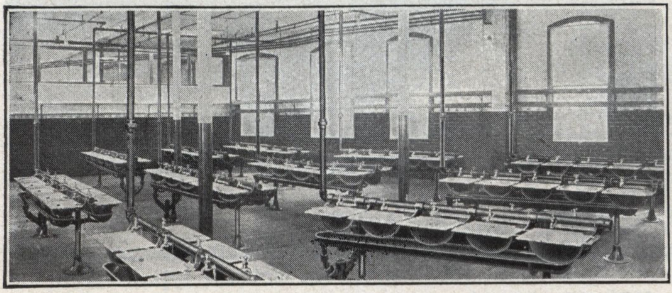
DIMENSION DIAGRAMS OF VICTORY WASHBOWLS



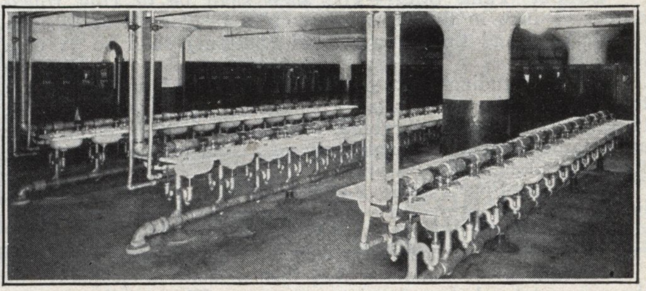


A Few of Our Large Washbowl Installations

Amoskeag Mfg. Co.
Bethlehem Shipbuilding Corp.
(Fore River Works)
Central of Georgia R. R.
Colt's Patent Fire Arms Mfg. Co.
General Fire Extinguisher Co.
New Departure Mfg. Co.
Pratt & Whitney Co.
Taft-Peirce Mfg. Co.
Underwood Typewriter Co.
F. L. Smythe Machine Co.
United Shoe Machinery Co.



INSTALLATION OF ECONOMY WASHBOWLS



INSTALLATION OF VICTORY WASHBOWLS

JOHN TRAGESER STEAM COPPER WORKS

Manufacturers of Range Boilers, White Metal Pantry Sinks and Drainboards

445-459 West 26th Street

NEW YORK, N. Y.

Products

COPPER HOT WATER STORAGE TANKS; WHITE METAL PANTRY SINKS and DRAINBOARDS.

Also Range Boilers.

Copper Hot Water Storage Tanks

We make a specialty of copper tanks for the storage of hot water. These tanks are of the highest grade materials and workmanship. The copper shells are of a thickness heavy enough to stand the pressure strain without the aid of rings on the inside. The interior of the tank is thoroughly tinned. The standard tank, for pressures not to exceed 125 lb., has a shell with a thickness of $\frac{3}{16}$-in., convex head ¼-in. thick and concave head $\frac{5}{16}$-in. thick., tested to 150 lb. per square inch hydraulic pressure.

Pipe coils for heating the water can be placed inside these tanks if desired. Sizes of pipes and number of pipes in coil will be furnished on request.

For the use of Architects we have written a set of specifications which appear on this page.

COPPER HOT WATER STORAGE TANKS

Capacity, gal.	Diameter, in.	Length, in.	Price	
			$\frac{3}{16}$-in. shell	¼-in. shell
150	24	78	$ 300.00	$ 400.00
225	30	72	500.00	625.00
250	30	84	550.00	675.00
300	30	96	575.00	700.00
318	36	72	575.00	700.00
370	36	84	600.00	750.00
420	36	96	625.00	775.00
530	36	120	675.00	825.00
550	42	84	900.00	1,100.00
570	42	96	950.00	1,150.00
716	42	120	1,000.00	1,250.00
860	42	144	1,100.00	1,350.00
1,000	42	168	1,200.00	1,500.00

Note: All tanks are tapped for 2-in. iron pipe. Relief valves $5.00 extra; copper coils for heating by steam extra; manhole $35.00 net extra.

Specifications for Standard Copper Hot Water Tanks

The .... contractor shall furnish and install where shown on plans ...... horizontal (vertical) copper hot water storage tank of ...... gallons capacity, ... inches in diameter and .... inches long, as manufactured by JOHN TRAGESER STEAM COPPER WORKS, 445-459 West 26th St., New York, or equal as may be approved by the architect, and shall conform to the following specifications.

Copper Tank Shell—The shell shall be of cold rolled copper $\frac{3}{16}$ inch in thickness, the convex head shall be ¼ inch in thickness and the concave head (bottom) shall be $\frac{5}{16}$ inch in thickness.

The longitudinal seam of the shell shall be lapped and have two rows of rivets. Rivets to be ½x1½ inch spaced 1½ inch on centers and rows staggered. The head shall be set in shell and seams shall have single row of rivets of same size and spacing as longitudinal seam.

Outlets—Five female 2-inch iron pipe size outlets, two in one side, one in opposite side and one in each end. Outlets shall be of heavy bronze castings flanged on inside and triple riveted to shell and heavily banked with solder.

Handhole—A handhole 3x4 inches shall be provided in the concave head, for cleaning purposes. The opening in the shell fitted with a bronze ring, riveted to shell and banked with solder.

The handhole plate shall fit snugly and be of cast steel plate, covered with sheet copper and tinned on inside, bolt shall be of steel. Crowfoot yoke shall be of cast iron.

Relief Valve—Tank shall be fitted with a 1-inch relief valve of approved pattern and all pipe and fittings shall be of brass.

Guarantee—Tank shall be guaranteed to withstand a working pressure up to 125 lb. per square inch.

Cased for Shipping—Before shipping, tank shall be boxed securely and be mounted on skids of sufficient size to ensure safety.

Manhole—(If manhole is desired in place of handhole.) A manhole 11x15 inches shall be provided in concave end for cleaning purposes. The opening in the shell shall be fitted with bronze ring, riveted and brazed and banked with metal. The manhole plate shall be of cast steel plate, fitted snugly, covered with sheet copper, tinned on inside. Bolts shall be of steel with double yoke of cast iron.

Material Used in Trageser Sinks

The composition of white metal and of German silver are, respectively, as follows:

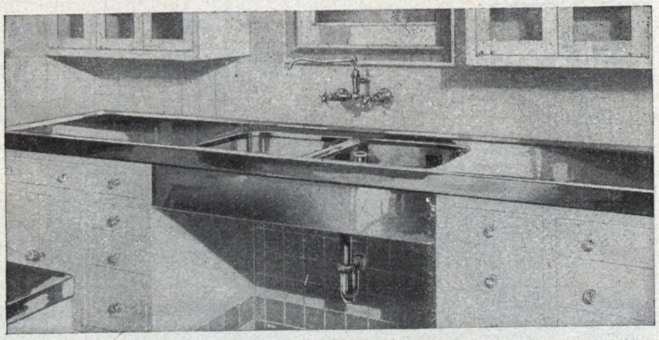
WHITE METAL		GERMAN SILVER	
Copper	60%	Copper	68%
Zinc	22%	Zinc	22%
Nickel	18%	Nickel	10%
	100%		100%

The higher percentage of nickel in the composition of white metal lessens the tendency to become discolored and brassy in appearance.

Copper alone is undesirable for drainboards, both from a standpoint of sanitation and also that of appearance.

Double Pantry Sink and Drainboard

Double pantry sinks and drainboards made of white metal or German silver. Can be furnished in types A, B, C or D (see the drawing on the following page).

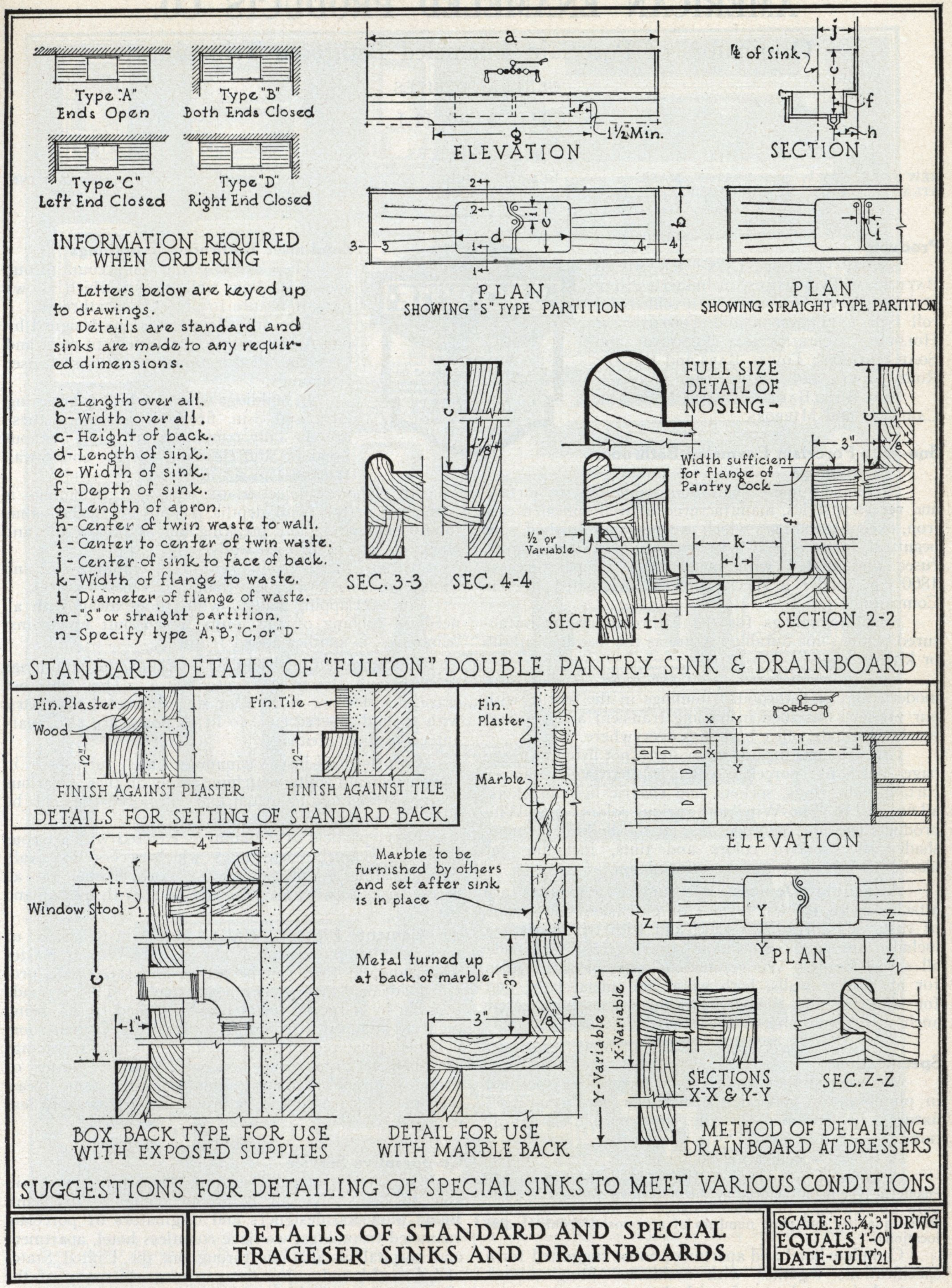


Types of Double Sinks and Drainboards

Catalogue

We have just published a new catalogue, T, on pantry sinks with illustrations of several types. Will be sent, on request.

Continued on next page


Type "A"
Ends Open
Type "B"
Both Ends Closed
Type "C"
Left End Closed
Type "D"
Right End Closed
a
g
1½" Min.
ELEVATION
j
℄ of Sink
c
f
h
SECTION
2
2
3
3
d
e
i
b
4
4
1
1
PLAN
SHOWING "S" TYPE PARTITION
i
PLAN
SHOWING STRAIGHT TYPE PARTITION
c
⅞"
SEC. 3-3
SEC. 4-4
FULL SIZE DETAIL OF NOSING-
½" or Variable
k
l
f
SECTION 1-1
Width sufficient for flange of Pantry Cock
3"
⅞"
c
SECTION 2-2
Fin. Plaster
Wood
12"
FINISH AGAINST PLASTER
Fin. Tile
12"
FINISH AGAINST TILE
4"
Window Stool
c
1"
BOX BACK TYPE FOR USE WITH EXPOSED SUPPLIES
Fin. Plaster
Marble
Marble to be furnished by others and set after sink is in place
Metal turned up at back of marble
3"
3"
⅞"
DETAIL FOR USE WITH MARBLE BACK
X
Y
X
Y
ELEVATION
Z
Z
Y
Y
Z
Z
PLAN
Y-Variable
X-Variable
SECTIONS X-X & Y-Y
SEC. Z-Z
METHOD OF DETAILING DRAINBOARD AT DRESSERS

INFORMATION REQUIRED WHEN ORDERING

Letters below are keyed up to drawings.

Details are standard and sinks are made to any required dimensions.

a-Length over all.
b-Width over all.
c-Height of back.
d-Length of sink.
e-Width of sink.
f-Depth of sink.
g-Length of apron.
h-Center of twin waste to wall.
i-Center to center of twin waste.
j-Center of sink to face of back.
k-Width of flange to waste.
l-Diameter of flange of waste.
m-"S" or straight partition.
n-Specify type "A", "B", "C", or "D"

STANDARD DETAILS OF "FULTON" DOUBLE PANTRY SINK & DRAINBOARD

DETAILS FOR SETTING OF STANDARD BACK

SUGGESTIONS FOR DETAILING OF SPECIAL SINKS TO MEET VARIOUS CONDITIONS

DETAILS OF STANDARD AND SPECIAL TRAGESER SINKS AND DRAINBOARDS

SCALE: F.S., ¼, 3" EQUALS 1'-0"
DATE-JULY '21
DRWG 1

AMERICAN ENAMELED PRODUCTS CO.

Originators of Porcelain Enameled Bathroom Trimmings

GENERAL OFFICES

CHICAGO, ILL.

SALES OFFICES

NEW YORK, N. Y.
ATLANTA, GA.
BOSTON, MASS.
PHILADELPHIA, PA.
DETROIT, MICH.
SAN FRANCISCO, CAL.
CINCINNATI, OHIO
LOS ANGELES, CAL.
MINNEAPOLIS, MINN.
TORONTO, ONT.

Products

Sno-Wite Porcelain Enameled Bathroom Trimmings, including: Soap Dishes, Paper Holders (both folded and roll types); Tumbler and Toothbrush Holders; Combination Tumbler and Soap Holders; Towel Bars and Racks; Robe, Towel and Razor Strop Hooks.

Sno-Wite Baked Enamel Medicine Cabinets and Mirrors.

GENUINE TRADE ·SNO-WITE· MARK ENAMEL

GUARANTEE

This article is guaranteed for 10 years not to chip, change color, rust, break or deteriorate. Made of genuine porcelain enameled metal same as large plumbing fixtures.

Sno-Wite Porcelain Enameled Bathroom Trimmings

A complete line of bathroom trimmings, in surface and recessed styles, manufactured of well annealed cast iron, except towel bars which are steel; all finished with beautiful, lustrous Sno-Wite vitreous porcelain enamel, fused and united with metal at a temperature of 1800° F., under a special process originated by our Company.

Small trimmings for the bathroom are manufactured of the same durable texture as the massive bathtub or kitchen sink.

We are manufacturers of the most complete and modern line of bathroom trimmings in the world, with our products installed in leading transient and resident hotels, hospitals, office buildings everywhere.

Our products include many items not listed on these pages, such as: porcelain enameled hardware, shower curtain rods, rings, sockets, and electric light brackets, all finished in "Sno-Wite" and various colors. Sno-Wite products can also be furnished to the builder in many shades of standard colors and tints, including jet black. Send for complete information.

Attaching Devices—All surface trimmings are attached with screws, toggles or extension bolts made of rustproof galvanized steel; and with trimmings are included our patented celluloid covering caps to seclude all screw heads. We recommend our special toggles for all plaster walls, both wood and metal lath; and for all brick and tile walls, wood screws with screw anchors or wall plugs.

Specifications

We suggest that surface type fixtures be specified in plumbing or general specifications, and semi-inset fixtures be specified in tile and marble specifications.

A typical specification follows:

All bathroom trimmings shall be of the genuine porcelain enameled type manufactured by the American Enameled Products Co., Chicago, Ill., to be installed as follows: (architect to list quantity and plate numbers of accessories required, also location).

Complete hotel and apartment house suggested form specifications together with architects' filing cabinet standard size catalogue, furnished on request.

Semi-inset Bathroom Trimmings

These are so termed on account of our special shallow wall recess, which allows part of fixture to project in bathroom.

Semi-inset trimmings are designed by our Architectural Department to meet and overcome all objectionable features of inset trimmings.

In buildings where architects are using 2-in. and 3-in. fireproof partitions these are the only trimmings adaptable without breaking and chiseling out the entire wall thickness to set in recess.

An elaborate selection of semi-inset trimmings is furnished in two wall depths, 1 and 1¾ inches, thus totally eliminating any breaking out of hollow tile and chopping into solid brick walls.

Setting charge on our semi-inset trimmings is, and should be, considerably less than deep recess fixtures.

An overlapping flange, which does away with all needless rubbing of tile joints which butt up against trimmings, is another added feature.

Breakage—We absolutely guarantee our trimmings to withstand the most severe abuse. They will not craze, discolor nor rust. Our steel enameled tube bars, with ground tapered ends to fit all posts, are also guaranteed against breakage.

Color—Semi-inset trimmings are furnished in standard cream white, matching nearly all tiles. Various colored trimmings to match glazed colored tiles can be made up special, on application.

Every particle of trimming is covered with vitreous porcelain enamel, even backs which recess into wall. Sand coating is placed over glazed enamel on all recess backs to warrant a perfect bond with mortar and tile.

Cement Plaster Walls—Many installations of semi-inset trimmings are being set into cement plaster walls, and, in fact, can be set in any style wall, provided advance arrangements are made. This is made possible by a special metal box furnished by us, being securely attached to studding by carpenters; then room is lathed, plastered and decorated. Semi-inset trimmings are then set into metal box with mortar, plaster of paris or Keene's cement. This gives the same pleasing appearance as a tile bathroom at considerably less expense.

Co-operative Service

Our Architectural Designing Department is available to help solve all bathroom trimming problems. Being pioneers, designers and originators of porcelain enameled trimmings, we have countless hotel, apartment and hospital installations throughout the United States and Canada, and enjoy the patronage of many of the most prominent architects.

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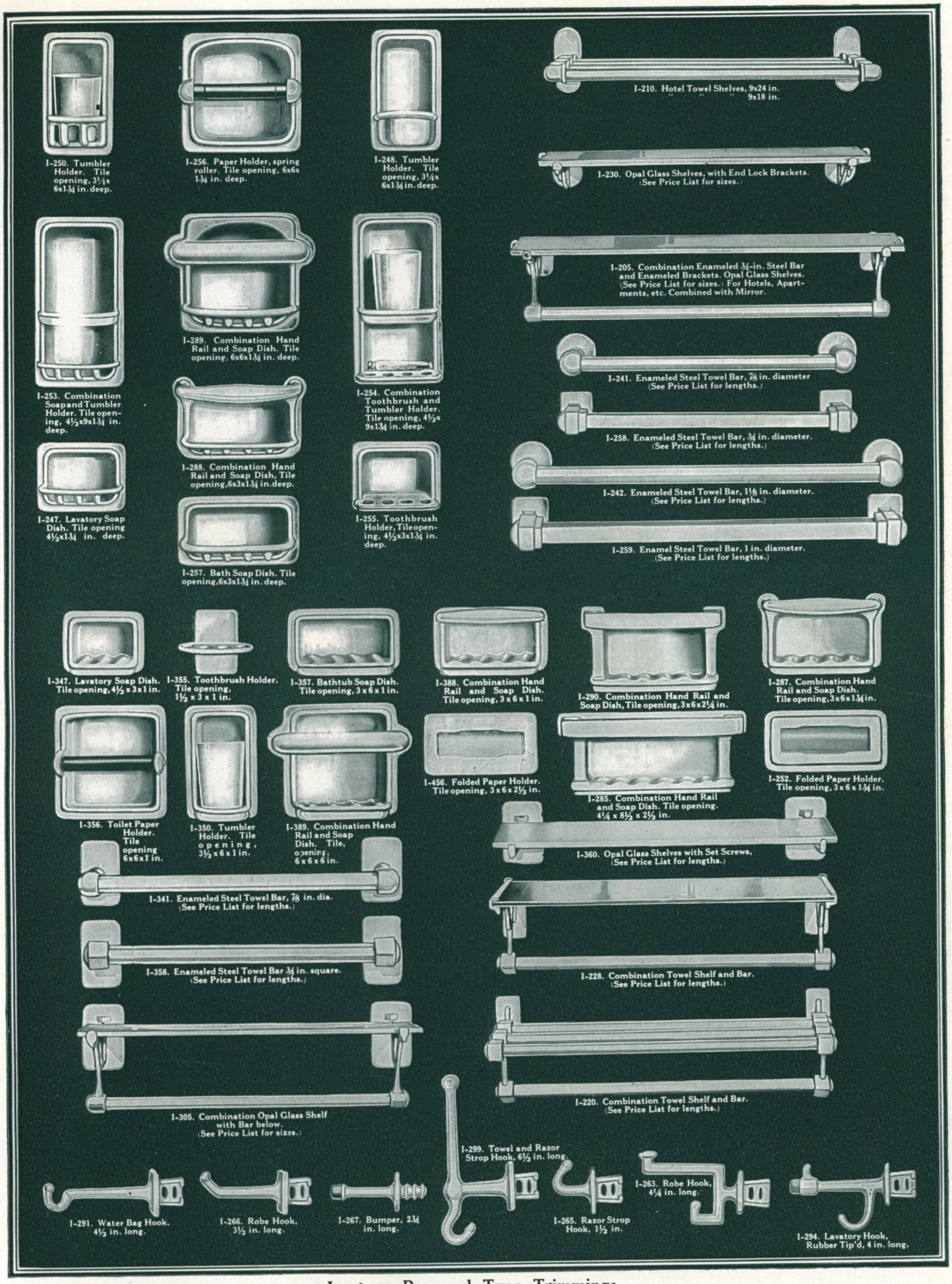

I-250. Tumbler Holder. Tile opening, 3¼x 6x1¾ in. deep.

I-256. Paper Holder, spring roller. Tile opening, 6x6x 1¾ in. deep.

I-248. Tumbler Holder. Tile opening, 3¼x 6x1¾ in. deep.

I-253. Combination Soap and Tumbler Holder. Tile opening, 4½x9x1¾ in. deep.

I-289. Combination Hand Rail and Soap Dish. Tile opening, 6x6x1¾ in. deep.

I-254. Combination Toothbrush and Tumbler Holder. Tile opening, 4½x 9x1¾ in. deep.

I-288. Combination Hand Rail and Soap Dish, Tile opening, 6x3x1¾ in. deep.

I-247. Lavatory Soap Dish. Tile opening 4½x1¾ in. deep.

I-255. Toothbrush Holder, Tile opening, 4½x3x1¾ in. deep.

I-257. Bath Soap Dish. Tile opening, 6x3x1¾ in. deep.

I-210. Hotel Towel Shelves, 9x24 in.
" " " 9x18 in.

I-230. Opal Glass Shelves, with End Lock Brackets. (See Price List for sizes.)

I-205. Combination Enameled ¾-in. Steel Bar and Enameled Brackets. Opal Glass Shelves. (See Price List for sizes.) For Hotels, Apartments, etc. Combined with Mirror.

I-241. Enameled Steel Towel Bar, ⅞ in. diameter (See Price List for lengths.)

I-258. Enameled Steel Towel Bar, ¾ in. diameter. (See Price List for lengths.)

I-242. Enameled Steel Towel Bar, 1⅛ in. diameter. (See Price List for lengths.)

I-259. Enamel Steel Towel Bar, 1 in. diameter. (See Price List for lengths.)

I-347. Lavatory Soap Dish. Tile opening, 4½ x 3 x 1 in.

I-355. Toothbrush Holder. Tile opening, 1½ x 3 x 1 in.

I-357. Bathtub Soap Dish. Tile opening, 3 x 6 x 1 in.

I-388. Combination Hand Rail and Soap Dish. Tile opening, 3 x 6 x 1 in.

I-290. Combination Hand Rail and Soap Dish, Tile opening, 3x6x2¼ in.

I-287. Combination Hand Rail and Soap Dish. Tile opening, 3x6x1¾ in.

I-356. Toilet Paper Holder. Tile opening 6x6x1 in.

I-350. Tumbler Holder. Tile opening, 3½ x 6 x 1 in.

I-389. Combination Hand Rail and Soap Dish. Tile, opening, 6 x 6 x 6 in.

I-456. Folded Paper Holder. Tile opening, 3 x 6 x 2½ in.

I-285. Combination Hand Rail and Soap Dish. Tile opening. 4¼ x 8½ x 2½ in.

I-252. Folded Paper Holder. Tile opening, 3 x 6 x 1¾ in.

I-341. Enameled Steel Towel Bar, ⅞ in. dia. (See Price List for lengths.)

I-358. Enameled Steel Towel Bar ¾ in. square. (See Price List for lengths.)

I-305. Combination Opal Glass Shelf with Bar below. (See Price List for sizes.)

I-360. Opal Glass Shelves with Set Screws, (See Price List for lengths.)

I-228. Combination Towel Shelf and Bar. (See Price List for lengths.)

I-220. Combination Towel Shelf and Bar. (See Price List for lengths.)

I-299. Towel and Razor Strop Hook, 6½ in. long.

I-291. Water Bag Hook. 4½ in. long.

I-266. Robe Hook, 3½ in. long.

I-267. Bumper, 2¾ in. long.

I-265. Razor Strop Hook, 1½ in.

I-263. Robe Hook, 4¼ in. long.

I-294. Lavatory Hook, Rubber Tip'd, 4 in. long.

Inset or Recessed Type Trimmings

All bars, shelves or combination shelves illustrated on this page furnished with inset lugs for building in tile or fireproof walls.
Towel shelves furnished in 18, 24, and 30-in. lengths.
Towel bars furnished in 12, 18, 20, 24, 30 and 36-in. lengths.
Opal glass shelves and combination shelves furnished in 18, 24, 30 and 36-in. lengths, or any special lengths to order, not over 36 in.
Standard 4¼x4¼-in. trimmings can be furnished on application.

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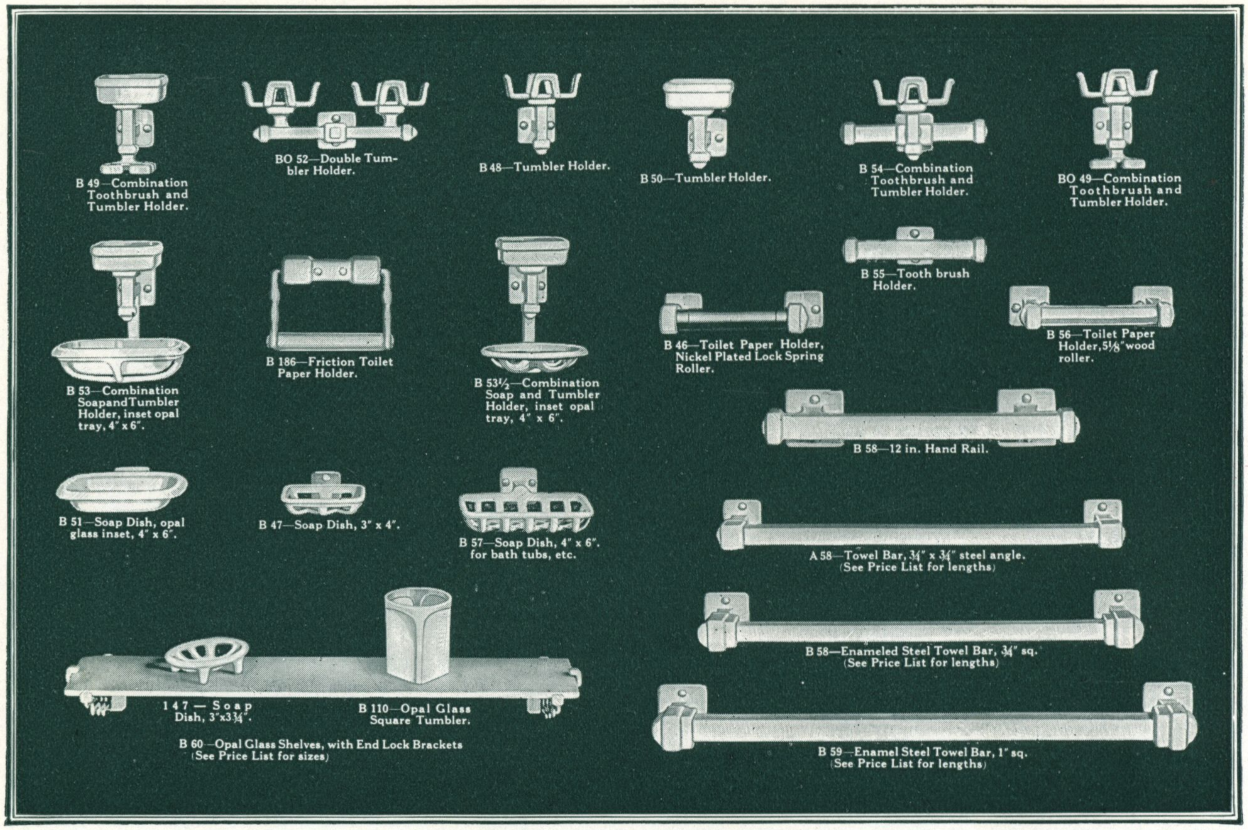


B 49—Combination Toothbrush and Tumbler Holder.

BO 52—Double Tumbler Holder.

B 48—Tumbler Holder.

B 50—Tumbler Holder.

B 54—Combination Toothbrush and Tumbler Holder.

BO 49—Combination Toothbrush and Tumbler Holder.

B 55—Tooth brush Holder.

B 53—Combination Soap and Tumbler Holder, inset opal tray, 4" x 6".

B 186—Friction Toilet Paper Holder.

B 53½—Combination Soap and Tumbler Holder, inset opal tray, 4" x 6".

B 46—Toilet Paper Holder, Nickel Plated Lock Spring Roller.

B 56—Toilet Paper Holder, 5⅛" wood roller.

B 58—12 in. Hand Rail.

B 51—Soap Dish, opal glass inset, 4" x 6".

B 47—Soap Dish, 3" x 4".

B 57—Soap Dish, 4" x 6". for bath tubs, etc.

A 58—Towel Bar, ¾" x ¾" steel angle. (See Price List for lengths)

B 58—Enameled Steel Towel Bar, ¾" sq. (See Price List for lengths)

147—Soap Dish, 3"x3¾".

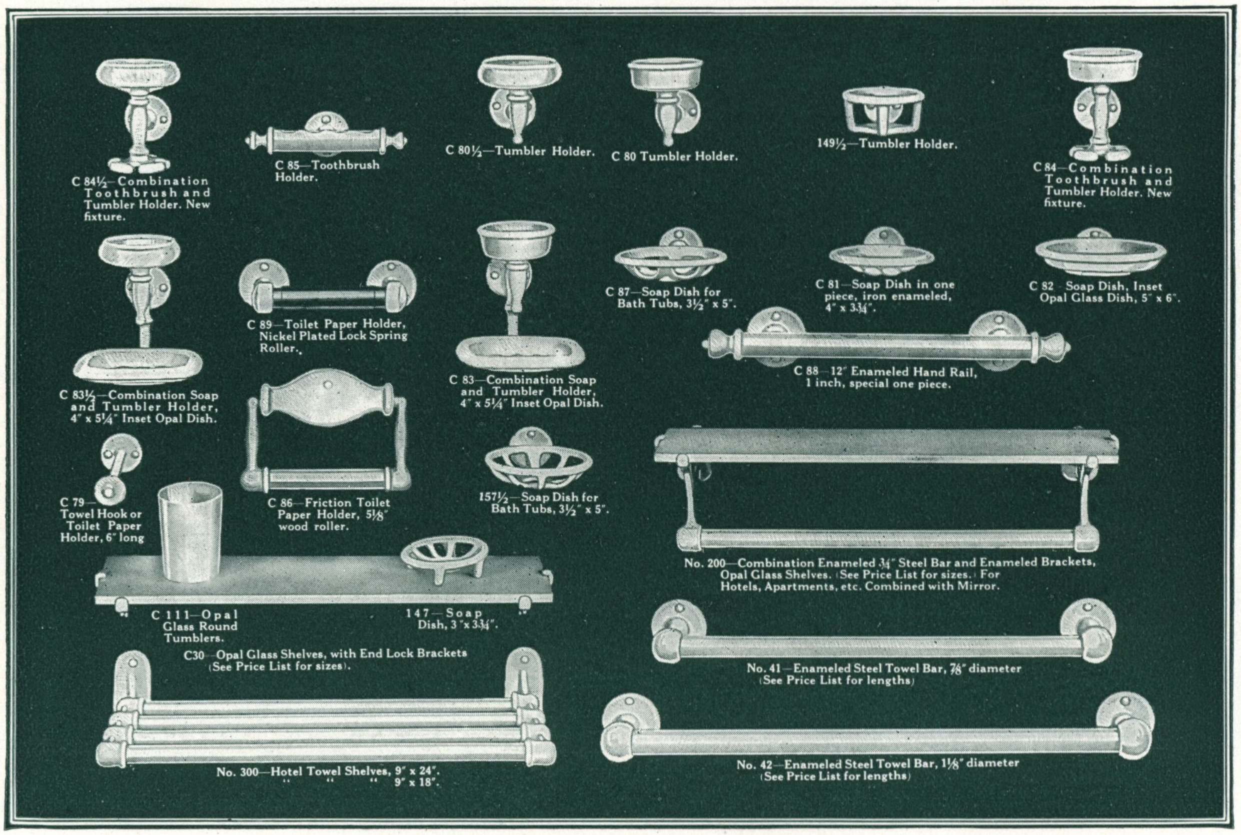
B 110—Opal Glass Square Tumbler.

B 60—Opal Glass Shelves, with End Lock Brackets (See Price List for sizes)

B 59—Enamel Steel Towel Bar, 1" sq. (See Price List for lengths)

Bungalow Design Trimmings

Towel bars furnished in 12, 16, 18, 20, 24, 30 and 36-in. lengths or any special lengths to order, not over 36 in.
Shelves furnished in same lengths as towel bars



C 84½—Combination Toothbrush and Tumbler Holder. New fixture.

C 85—Toothbrush Holder.

C 80½—Tumbler Holder.

C 80 Tumbler Holder.

149½—Tumbler Holder.

C 84—Combination Toothbrush and Tumbler Holder. New fixture.

C 83½—Combination Soap and Tumbler Holder, 4" x 5¼" Inset Opal Dish.

C 89—Toilet Paper Holder, Nickel Plated Lock Spring Roller.

C 83—Combination Soap and Tumbler Holder, 4" x 5¼" Inset Opal Dish.

C 87—Soap Dish for Bath Tubs, 3½" x 5".

C 81—Soap Dish in one piece, iron enameled, 4" x 3¾".

C 82—Soap Dish, Inset Opal Glass Dish, 5" x 6".

C 88—12" Enameled Hand Rail, 1 inch, special one piece.

C 79—Towel Hook or Toilet Paper Holder, 6" long

C 86—Friction Toilet Paper Holder, 5⅛" wood roller.

157½—Soap Dish for Bath Tubs, 3½" x 5".

No. 200—Combination Enameled ¾" Steel Bar and Enameled Brackets, Opal Glass Shelves. (See Price List for sizes.) For Hotels, Apartments, etc. Combined with Mirror.

C 111—Opal Glass Round Tumblers.

147—Soap Dish, 3"x3¾".

C30—Opal Glass Shelves, with End Lock Brackets (See Price List for sizes).

No. 41—Enameled Steel Towel Bar, ⅞" diameter (See Price List for lengths)

No. 300—Hotel Towel Shelves, 9" x 24".
" " " 9" x 18".

No. 42—Enameled Steel Towel Bar, 1⅛" diameter (See Price List for lengths)

Colonial Design Trimmings

Towel bars furnished in 12, 16, 18, 20, 24, 30 and 36-in. lengths or any special lengths to order, not over 36 in.
Shelves furnished in same lengths as towel bars

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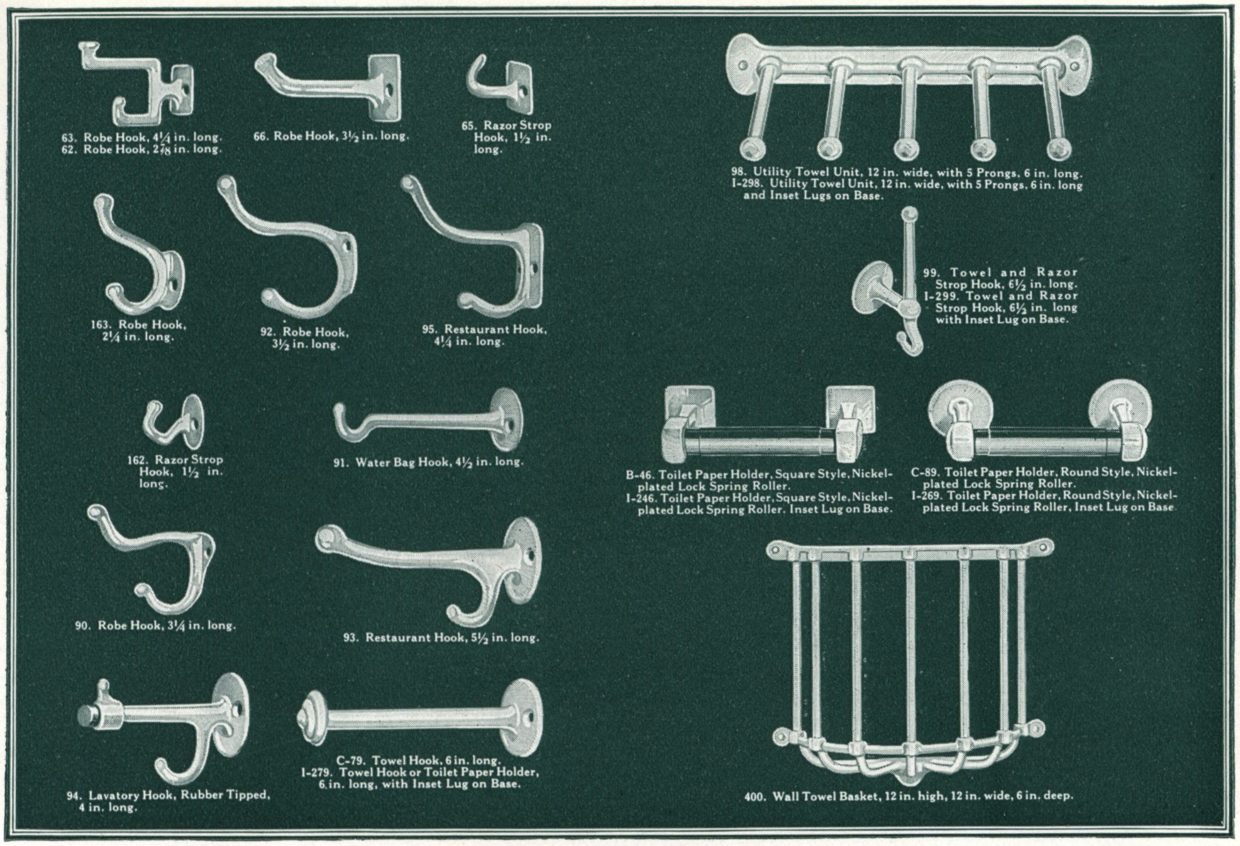


63. Robe Hook, 4¼ in. long.
62. Robe Hook, 2⅞ in. long.

66. Robe Hook, 3½ in. long.

65. Razor Strop Hook, 1½ in. long.

98. Utility Towel Unit, 12 in. wide, with 5 Prongs, 6 in. long.
I-298. Utility Towel Unit, 12 in. wide, with 5 Prongs, 6 in. long and Inset Lugs on Base.

163. Robe Hook, 2¼ in. long.

92. Robe Hook, 3½ in. long.

95. Restaurant Hook, 4¼ in. long.

99. Towel and Razor Strop Hook, 6½ in. long.
I-299. Towel and Razor Strop Hook, 6½ in. long with Inset Lug on Base.

162. Razor Strop Hook, 1½ in. long.

91. Water Bag Hook, 4½ in. long.

B-46. Toilet Paper Holder, Square Style, Nickel-plated Lock Spring Roller.
I-246. Toilet Paper Holder, Square Style, Nickel-plated Lock Spring Roller. Inset Lug on Base.

C-89. Toilet Paper Holder, Round Style, Nickel-plated Lock Spring Roller.
I-269. Toilet Paper Holder, Round Style, Nickel-plated Lock Spring Roller, Inset Lug on Base.

90. Robe Hook, 3¼ in. long.

93. Restaurant Hook, 5½ in. long.

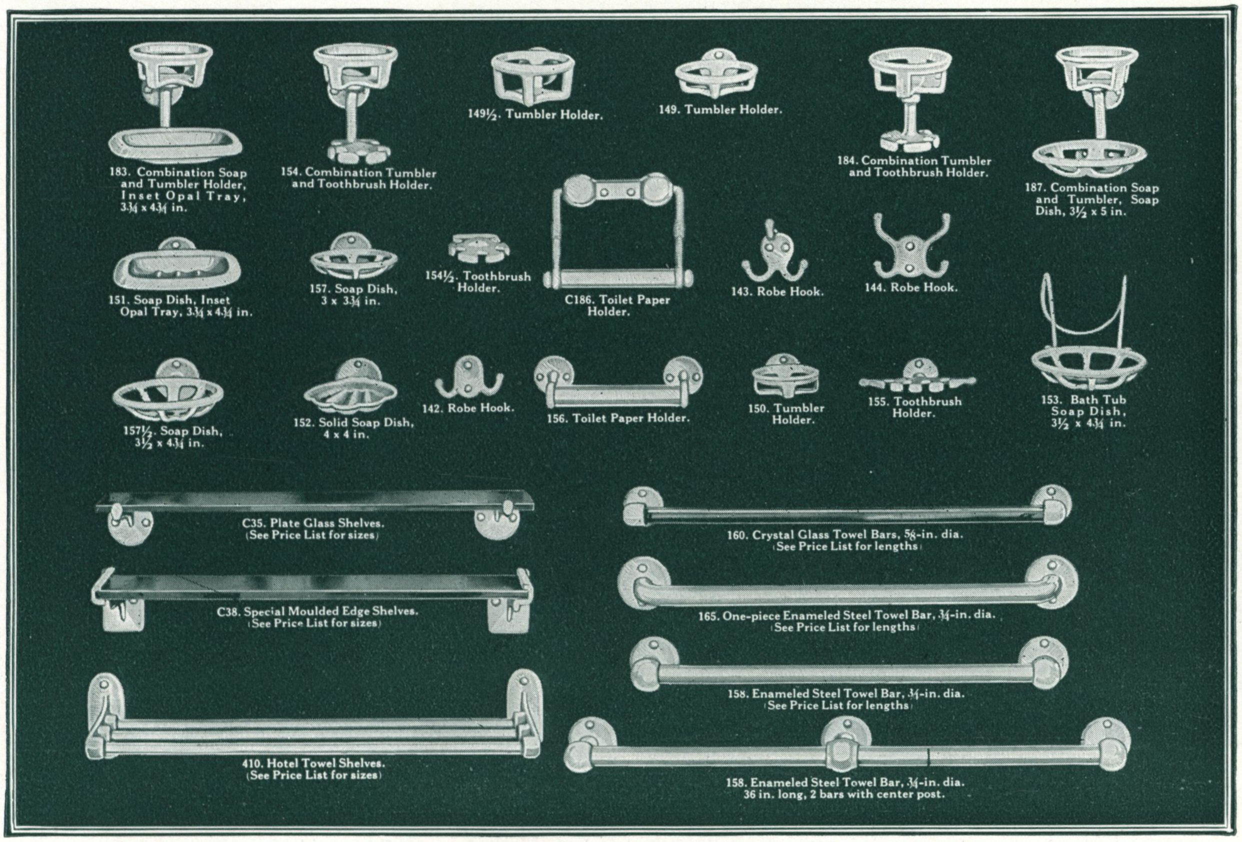
94. Lavatory Hook, Rubber Tipped, 4 in. long.

C-79. Towel Hook, 6 in. long.
I-279. Towel Hook or Toilet Paper Holder, 6 in. long, with Inset Lug on Base.

400. Wall Towel Basket, 12 in. high, 12 in. wide, 6 in. deep.

General Utility Trimmings

All above trimmings furnished drilled for attaching with wood screws.
Same trimmings can be furnished with inset lugs for cementing or building in wainscot



183. Combination Soap and Tumbler Holder, Inset Opal Tray, 3¾ x 4¾ in.

154. Combination Tumbler and Toothbrush Holder.

149½. Tumbler Holder.

149. Tumbler Holder.

184. Combination Tumbler and Toothbrush Holder.

187. Combination Soap and Tumbler, Soap Dish, 3½ x 5 in.

151. Soap Dish, Inset Opal Tray, 3¾ x 4¾ in.

157. Soap Dish, 3 x 3¾ in.

154½. Toothbrush Holder.

C186. Toilet Paper Holder.

143. Robe Hook.

144. Robe Hook.

157½. Soap Dish, 3½ x 4¾ in.

152. Solid Soap Dish, 4 x 4 in.

142. Robe Hook.

156. Toilet Paper Holder.

150. Tumbler Holder.

155. Toothbrush Holder.

153. Bath Tub Soap Dish, 3½ x 4¾ in.

C35. Plate Glass Shelves. (See Price List for sizes)

160. Crystal Glass Towel Bars, ⅝-in. dia. (See Price List for lengths)

C38. Special Moulded Edge Shelves. (See Price List for sizes)

165. One-piece Enameled Steel Towel Bar, ¾-in. dia. (See Price List for lengths)

158. Enameled Steel Towel Bar, ¾-in. dia. (See Price List for lengths)

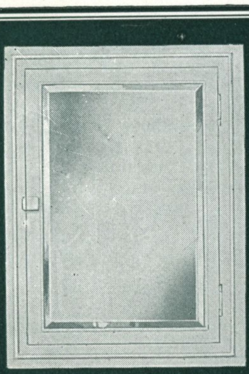
410. Hotel Towel Shelves. (See Price List for sizes)

158. Enameled Steel Towel Bar, ¾-in. dia. 36 in. long, 2 bars with center post.

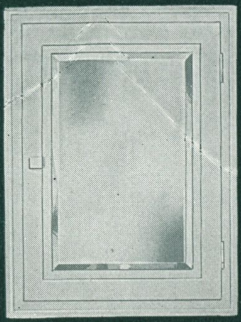
Junior Design Trimmings

Very adaptable for moderate priced hotels or apartment buildings. *Bars and shelves* furnished in 18 and 24-in. lengths only.

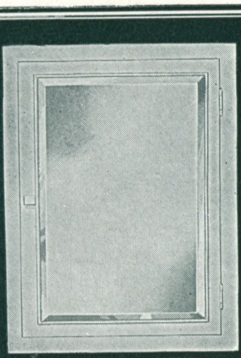
Continued on next page



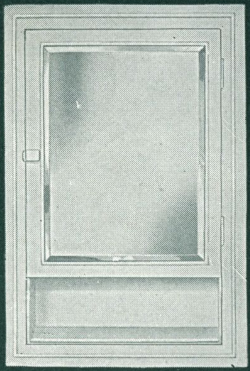
I-1602



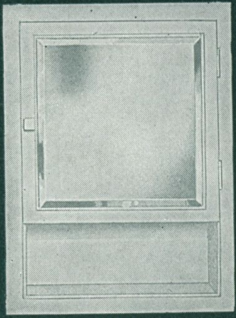
I-1708



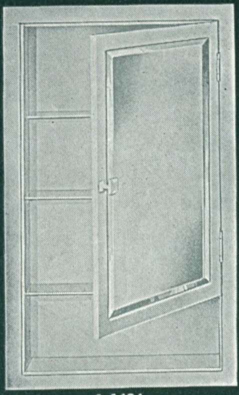
I-1410



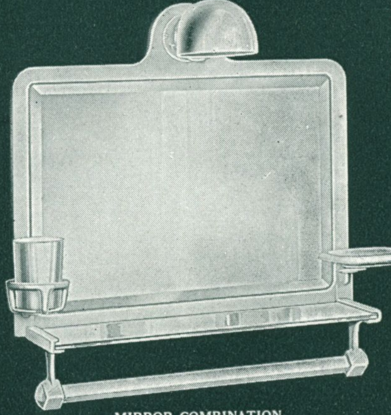
I-1600



I-1420



I-1424



MIRROR COMBINATION

Furnished in 2 Sizes

Mirror—American polished plate glass best quality, 1-inch beveled or plain. Fitted in frame with galvanized steel back, making easy replacements without marring frame.

Mirror Frame—Cast aluminum (one piece) light in construction with no welds, 1⅛-inch wide moulding. Finished with several coats of special pyralin celluoid enamel, being properly rubbed between each coat.

Electric Light Bracket—Cast aluminum (same finish as frame) fitted with brass adjustable attaching plate for standard electric outlet box. Shade, opal glass attached with 3 thumb screws.

Shelf—Plate glass special moulded edge 5" wide x ¼" thick. Slides from brackets very easily for cleaning.

Brackets—Cast iron porcelain enameled, tumbler holder or soap dish, can be detached or interchanged. Can be furnished with two tumbler holders or two opal glass soap dishes, such as B-53 soap dish and ring or as illustrated—towel bar ¾-inch steel tubing, same as B-58 bars.

Notice—Brackets, shelf and bar can be furnished for attaching to other style mirror or mirror with recess below. *See price list for dimensions*

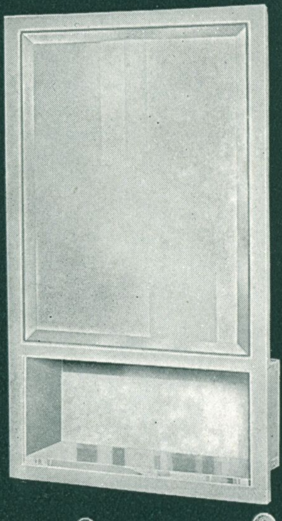
RECESSED SHELF MIRROR

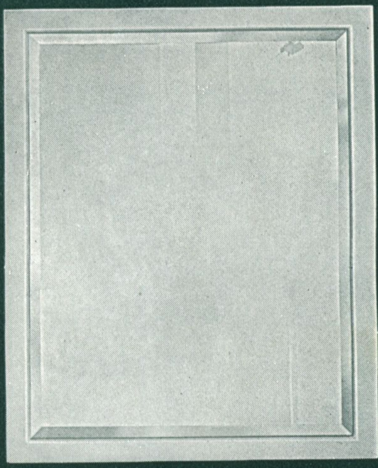
Furnished in 5 Sizes

Mirrors best quality polished plate glass, furnished in plain or one-inch bevel. Frames same as regular mirrors.

Recess mirror shelf made of 20-gauge steel, welded at corners, same finish as frame and furnished with $\frac{5}{16}$-inch opal glass plate in bottom. Furnished for installation on pipe shaft opening or wall, with four capped head wood screws unless otherwise specified. This fixture can also be installed on fireproof walls with concealed attachments.

See price list for dimensions





MIRRORS

Furnished in 16 Sizes

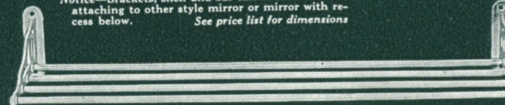
Mirrors best quality polished plate glass, furnished in plain or one-inch bevel.

Frames made of 1"x½" brass moulding, securely soldered at corners and covered with several coats of special celluloid pyralin enamel, being properly rubbed between each coat.

Backs of frames 20-gauge galvanized steel, fastened securely to frame with screws.

Mirror can be hung horizontal or vertical on any wall by means of concealed slotted hangers in back which leave no screws in sight.

See price list for dimensions



No. 412 Hotel towel shelf 6" wide.

No. 411 Hotel towel shelf 8" wide.

Recessed Cabinets, Mirrors and Combination Mirrors

Towel shelves with cast aluminum brackets and $\frac{5}{16}$-in. steel rods, *pyralin enameled finish*. Furnished in 12, 16, 18, 20, 24, 30 and 36-in. lengths. Special lengths to order. Same type towel shelves can be furnished with arch in center over electric light.

See following page for specifications of cabinets and mirrors.

We are prepared to furnish side or top electric light brackets for any type cabinet or mirror listed on this page

Continued on next page

Sno-Wite Medicine Cabinets and Mirrors

We manufacture a complete line of medicine cabinets made of cold rolled steel and enameled in good baked white enamel; furnished in various sizes. Also, made up in accordance with architects' specifications.

We are prepared to furnish pipe shaft cabinets or metal bucks and mirrors.

Our cabinets are designed in two wall recess depths 3 and 4 in., to conform with the largest hotel requirements where thin partitions form all inner walls, and necessitating only recessing a part of the cabinet depth.

The same design cabinet in portable type can be furnished for the builder who has not provided the recessed opening for building into the bathroom walls.

Many well appointed bathrooms with expensive plumbing, beautiful tile and elaborate trimmings, are completely ruined by the installation of a cheap mirror surrounded with wide wood mouldings.

"Sno-Wite" mirrors are constructed to last a lifetime, made of best grade American plate glass with metal backs and brass moulding securely soldered at mitered corners. Our finish being many coats of special *pyralin celluloid enamel,* rubbed smooth between each coat, and in perfect harmony with other "Sno-Wite" trimmings.

Our mirror with recess shelf below is especially adapted for very compact bathrooms and apartment hotels where the lavatory shelf is required, but through lack of proper space it should be recessed into the wall.

We very recently developed our beautiful combination mirror with electric light attached and special moulded edged shelf below. This fixture has already won favor with leading architects, being specified and installed in many noted hotels.

On installing, much costly labor is saved as several respective trimmings and electric light bracket are held firmly on wall by means of two concealed hangers with only four tiny setscrews appearing at edges after fixture is placed.

Representative Installations

The American Enameled Products Co. has equipped hotels, apartment houses and hospitals in every State of the Union, as well as in Canada and other countries.

The following are a few installations which include cabinets, mirrors and bathroom trimmings:

Drake Hotel, Chicago, Ill., Marshall & Fox, Architects
New Edgewater Beach Hotel, Chicago, Ill., Marshall & Fox, Architects
Biltmore Hotel, Miami, Fla., Schultz & Weaver, New York, N. Y., Architects
Ford Nurses' Training Home, Detroit, Mich., Albert Kahn, Architect
Neil House, Columbus, Ohio, Gustav Drach, Cincinnati, Ohio, Architect
Kentucky Hotel, Louisville, Ky., Brinton B. Davis, Architect
Palmer House, Chicago, Ill., Holabird & Roche, Architects
Alden Park Manor, Brookline, Mass., K. M. DeVoss, Architect
Baker Hotel, Dallas, Tex., Preston Bradshaw, Architect
Windermere Hotel, Chicago, Ill., Rapp & Rapp, Architects
Belmont Hotel, Chicago, Ill., Fugard & Knapp, Architects
Pearson Hotel, Chicago, Ill., Robert DeGoyler, Architect
Marlborough Apartments, Chicago, Ill., Robert DeGoyler, Architect
Nicollet Hotel, Minneapolis, Minn., Holabird & Roche, Architects
Book-Cadillac Hotel, Detroit, Mich., Louis Kamper, Architect
Peabody Hotel, Memphis, Tenn., Walter W. Ahlschlager, Architect
King Edward Hotel, Toronto, Ont.
Missouri Pacific Hospital, St. Louis, Mo.
Vernon Manor, Cincinnati, Ohio, Hannaford & Sons, Architects

SNO-WITE MIRRORS

Mirror No.	Size of mirror, in.	Price		Mirror No.	Size of mirror, in.	Price	
		Plain	Beveled			Plain	Beveled
M-1014	10x14	$ 8.70	$ 9.30	M-1420	14x20	$11.60	$12.40
M-1016	10x16	9.50	10.00	M-1616	16x16	11.00	11.80
M-1214	12x14	9.50	10.00	M-1618	16x18	11.60	12.40
M-1216	12x16	10.00	10.60	M-1620	16x20	12.00	13.00
M-1218	12x18	10.50	11.00	M-1622	16x22	13.00	14.00
M-1414	14x14	11.20	10.80	M-1818	18x18	12.20	13.20
M-1416	14x16	10.40	11.20	M-1824	18x24	16.00	17.50
M-1418	14x18	11.00	12.00	M-2430	24x30	24.00	26.00

MIRRORS WITH RECESS SHELF

Mirror No.	Size of mirror, in.	Wall opening for recess and shelf, in.	Recess shelf below, in.	Outside measurements, in.	Price	
					Plain	Beveled
R-1418	14x18	4x6x14	4x6x14	15½x27¼	$19.00	$20.00
R-1616	16x16	4x6x16	4x6x16	17½x25¼	19.50	20.50
R-1618	16x18	4x6x16	4x6x16	17½x27¼	20.00	21.00
R-1620	16x20	4x6x16	4x6x16	17½x29¼	21.00	22.00
R-1824	18x24	4x6x18	4x6x18	19½x33¼	25.00	26.00

MIRROR COMBINATION WITH ELECTRIC LIGHT BRACKETS

Mirror No.	Size of mirror, in.	Size of bar-square, in.	Size of shelf, in.	Style of shelf	Outside dimensions, in.	Price	
						Plain	Bev'l'd
P-1220	14x20	¾x20	5x20	Bulge edge plate glass	23x22	$36.00	$38.00
P-1224	18x24	¾x24	5x24	Bulge edge plate glass	27x26	43.00	45.00

SIZES AND DIMENSIONS OF SNO-WITE INSET CABINETS
All cabinets equipped with friction catch and porcelain enameled knobs

Cabinet No.	Style	Mirror, in.	Wall opening, in.	Outside measurement, in.	Wall recess, in.	Depth overall outside, in.	Shelves	Hinges	Recess shelf below, in.	List price
I-1410	I-1410	14x20	16½x22½	18½x24½	4	4¾	2 pl. glass	N. P. brass	....	$28.00
I-1412	I-1410	16x22	18½x24½	20½x26½	4	4¾	3 pl. glass	N. P. brass	....	30.00
I-1414	I-1410	18x24	20½x26½	22½x28½	4	4¾	3 pl. glass	N. P. brass	....	36.00
I-1416	I-1410	20x26	22½x28½	24½x30½	4	4¾	3 pl. glass	N. P. brass	....	40.00
I-1418	I-1410	22x28	24½x30½	26½x32½	4	4¾	3 pl. glass	N. P. brass	....	46.00
I-1420	I-1420	14x14	16½x22½	18½x24½	4	4¾	3 pl. glass	N. P. brass	6x15½	26.00
I-1422	I-1420	16x16	18½x24½	20½x26½	4	4¾	4 pl. glass	N. P. brass	6x18	28.00
I-1424	I-1424	18x18	20½x26½	22½x28½	4	4¾	4 pl. glass	N. P. brass	6x20	34.00
I-1426	I-1424	20x20	22½x28½	24½x30½	4	4¾	4 pl. glass	N. P. brass	6x22	38.00
I-1600	I-1600	14x18	16 x25	20½x29	3	4¾	4 pl. glass	N. P. brass	5x15½	30.00
I-1602	I-1602	14x20	16 x22	20½x26½	3	4¾	3 pl. glass	N. P. brass	....	32.00
		Plain								
I-1708	I-1708	10x16	14¼x20¼	17¼x23¼	3	4½	2 en. steel	En. steel	....	14.00
I-1710	I-1708	12x18	16¼x22¼	19¼x25¼	3	4½	2 en. steel	En. steel	....	18.00
I-1712	I-1708	14x20	18¼x24¼	21¼x27¼	3	4½	3 en. steel	En. steel	....	22.00

Special sizes made to order. All cabinets can be furnished with beveled or plain mirror.

J. H. BALMER CO.

China Bathroom Accessories

259-267 Plane Street
NEWARK, N. J.

AGENCIES
PITTSBURGH, PA.
NEW YORK, N. Y.
CINCINNATI, OHIO
PHILADELPHIA, PA.
PORTLAND, ORE.
CHICAGO, ILL.
MINNEAPOLIS, MINN.
SAN FRANCISCO, CAL.
DALLAS, TEX.
JACKSONVILLE, FLA.
BOSTON, MASS.
BUFFALO, N. Y.
LOS ANGELES, CAL.

"Easy-Set" China Bathroom Accessories, to Be Installed on Face of Wall

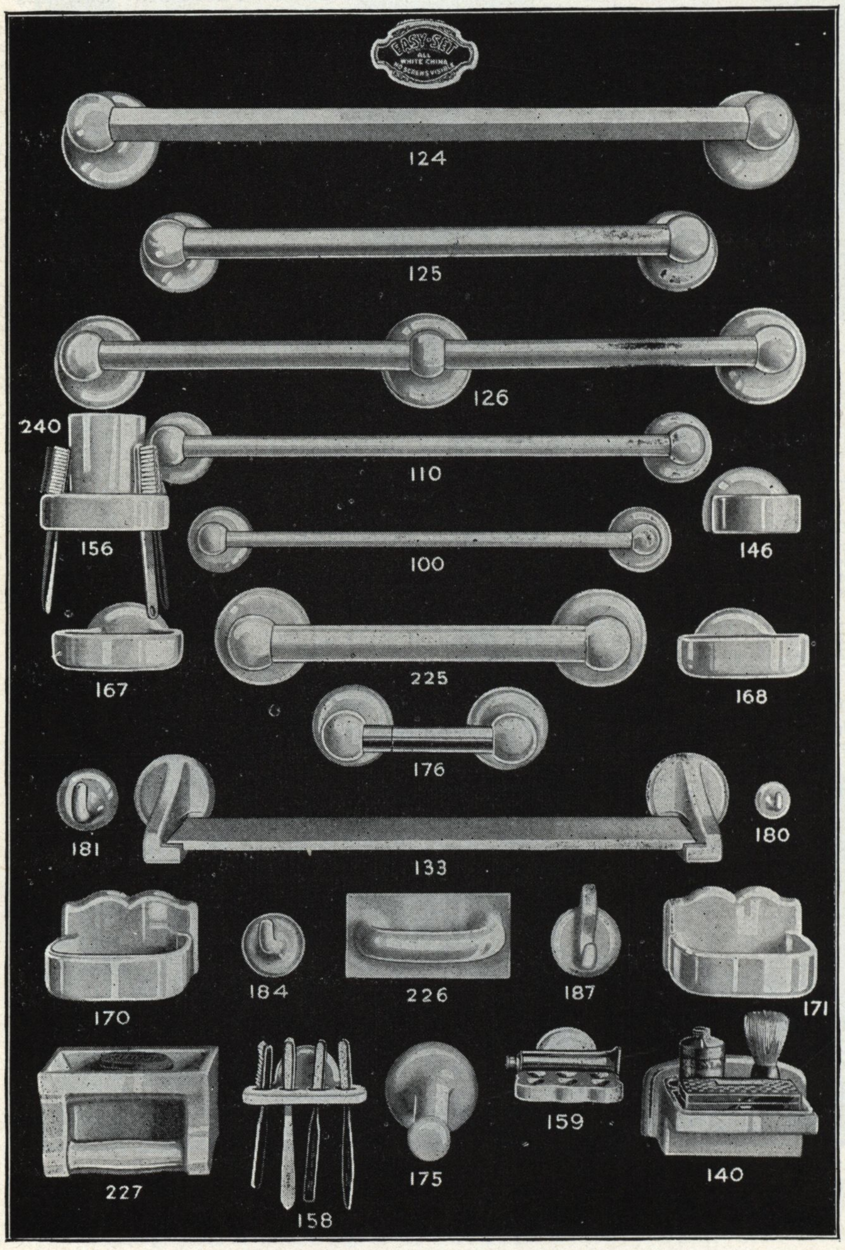
"Easy-Set" is made in a complete line substantially constructed. Simplicity of construction and the concealed attachment are responsible for the low cost.

EASY-SET
ALL
WHITE CHINA
NO SCREWS VISIBLE

TRADE-MARK
Patented July 16, 1918

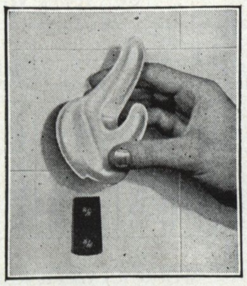
A few items are shown on this page. For entire line, ask for catalogue which is published for the architect and client.

Distribution—"Easy-Set" is carried in stock by the best plumbing supply houses, where architects or clients may make selection.



Standard Items in the Easy-Set Line

For complete specifications of full line, write to us.



Can Be Lifted from the Wall and Cleaned

Every "Easy-Set" fixture is mortised out in back to fit a composition cleat which is screwed to the wall. All attaching elements are concealed, and the fixtures can be easily removed for cleaning.

For permanent installations, a touch of litharge and glycerine, or glue, on the cleat will make the fixture immovable

LIST OF STANDARD ITEMS

No. 100. Round China Post, ½-in. solid Opal Bar
No. 110. Round China Post, ¾-in. solid Opal Bar
No. 124. Square White Wood Bar, ⅞-in. square; round China Posts
No. 125. Towel Bar; 1-in. diameter; lengths, 15, 18, 24, 30 and 36 in.
No. 126. Towel Bar; 1-in. diameter with center post; 24, 30, 36, 48 and 60 in. long
No. 133. Opal Shelf with one-piece china brackets; 18, 24, 30 and 36 in. long
No. 140. Shaving Set Holder
No. 146. Tumbler Holder
No. 156. For Tumbler and Six Toothbrushes
No. 158. Toothbrush Holder
No. 159. Tooth Paste and Toothbrush Holder
No. 167. Soap Holder for lavatory
No. 168. Soap Dish for shower
No. 170. Soap Holder for bath or kitchen
No. 171. Soap Dish for bath or shower
No. 175. Paper Holder; also used as individual towel rack
No. 176. Toilet Paper Holder with nickel-plated spring roller
No. 180. Washcloth or Water Bag Hook
No. 181. Razor Strop or Shower Curtain Hook
No. 184. Robe Hook
No. 187. Double Robe Hook
No. 225. Hand Rail; 9, 12 and 16-in. lengths
No. 226. Hand Rail; one-piece, 6x3 in.
No. 227. Soap Dish and Hand Rail
No. 240. China Tumbler

Continued on next page

“Unity” China Bathroom Accessories, to Build into the Wall

“Unity” is made in a complete line for standard tile sizes. All fixtures are of *one-piece construction.*

Fixtures with hand rails have the hand rail made in the clay as part of the body itself, and because of this *one-piece construction,* the hand rails can never break off, nor can they loosen. They last forever—yet *they cost no more.*

TRADE-MARK

This care and attention to details is carried throughout the “Unity” line.
The *designs* are right.
The *construction* is right.
The *color* is right.
The *price* is right.

Distribution—For sale through all tile contractors.

Catalogue—Complete catalogue will be mailed on request.

LIST OF STANDARD ITEMS

No. 320. Toothbrush Holder—holds 6 brushes
Size, 6x3 in.
Projects from wall, 1⅞ in.

No. 324. Towel Bar—with ⅞-in. square white wood bar
Wall flanges, 3x3 in.
Projection from face of wall, 4 in.
Length, center to center of posts, 18, 24, 30 and 36 in.

No. 334. Loose Fitting Opal Shelf—5 in. wide
Supported on one-piece bracket
Bracket flanges, 3x3 in.
Projection over all, 5¾ in.
Length of shelf, 18, 24, 30 and 36 in.

No. 346. Tumbler Holder
Size, 6x3 in.
Projects from wall, 3⅜ in.

No. 356. Tumbler and Toothbrush Holder—holds 6 brushes
Size, 6x3 in.
Projects from wall, 3$\frac{1}{16}$ in.

No. 365. Soap Holder
Size, 6x3 in.
Projects from wall, 3 in.

No. 366. Soap Holder—with flush drain
Size, 6x3 in.
Depth over all, 2⅞ in.

No. 367. Soap Holder—with non-draining rim
Size, 6x3 in.
Depth over all, 2⅞ in.
Projection from wall, ¾ in.

No. 375. Towel Bar—with 1-in. round white wood bar
Wall flanges, 6x3 in.
Projection from face of wall, 4 in.
Length c. to c., 18, 24, 30 and 36 in.

No. 381. Razor Strop Hook
Size, 3x3 in.
Projects from wall, 1¾ in.

No. 382. Razor Strop Hook—with wall plug
Size, 2x3 in.
Projects from wall, 2¼ in.

No. 384. Single Robe Hook—with wall plug
Size, 2x3 in.
Projects from wall, 2½ in.

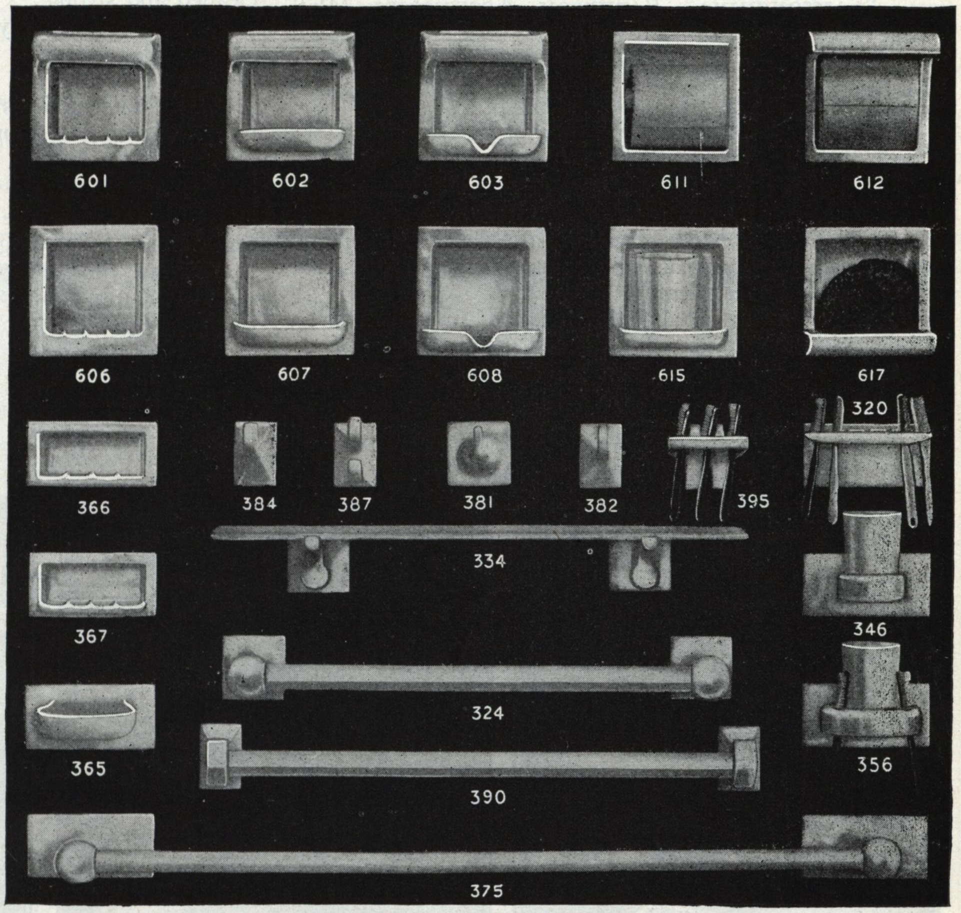
No. 390. Towel Bar—with plug type post, ⅞ in. square white wood bar
Wall flanges, 2x3 in.
Projection from face of wall, 2$\frac{3}{16}$ in.
Length c. to c., 18, 24, 30 and 36 in.

No. 395. Toothbrush Holder—with wall plug
Size, 2x3 in.
Projects from wall, 3½ in.

No. 601. Soap Holder—with hand rail
Size, 6x6 in.
Depth from face of wall, 2⅝ in.
Projection from wall, 2¼ in.

No. 602. Soap Holder and Hand Rail—non-draining lip
Size, 6x6 in.
Depth from face of wall, 2⅝ in.
Projection from wall, 2¼ in.

No. 603. Soap Holder and Hand Rail—self-draining lip
Size, 6x6 in.
Depth from face of wall, 2⅝ in.
Projection from wall, 2¼ in.



Unity Built-in Fixtures for the Bathroom

For complete specifications of full line, write to us.

No. 606. Soap Holder
Size, 6x6 in.
Depth from face of wall, 2⅝ in.

No. 607. Soap Holder—non-draining lip
Size, 6x6 in.
Depth from face of wall, 2⅝ in.
Projection from wall, ⅞ in.

No. 608. Soap Holder—self-draining lip
Size, 6x6 in.
Depth from face of wall, 2⅝ in.
Projection from wall, 1 in.

No. 611. Toilet Paper Holder
Size, 6x6 in.
Recessed into wall, 3⅜ in.

No. 612. Toilet Paper Holder—with hood
Size, 6x6 in.
Recessed into wall, 3⅜ in.
Hood projects, 2¼ in.

No. 615. Tumbler Holder
Size, 6x6 in.
Depth inside over all, 3¼ in.
Recessed into wall, 2½ in.
Projection from wall, 1⅛ in.

No. 617. Sponge Holder
Size, 6x6 in.
Recessed into wall, 3⅜ in.
Projects from wall, 2¼ in.

S. D. BAKER MANUFACTURING CO.

"Samsonchina" Bathroom Accessories

234 West 14th Street
NEW YORK, N. Y.

Product

"SAMSONCHINA" BATHROOM ACCESSORIES (Patented and Patents applied for).

Material

This is an all-china line of accessories meeting every demand of the modern bathroom.

Application

They are screwed to walls in the usual manner and the screws then concealed by china buttons or caps that are cemented over them.

These fixtures take the place of metal fixtures, either nickelplated or white coated.

Design

The numerous pieces have been made with careful regard to their various uses, and are sanitary, easily cleaned and strong.

There is harmony of design not usually found.

Size

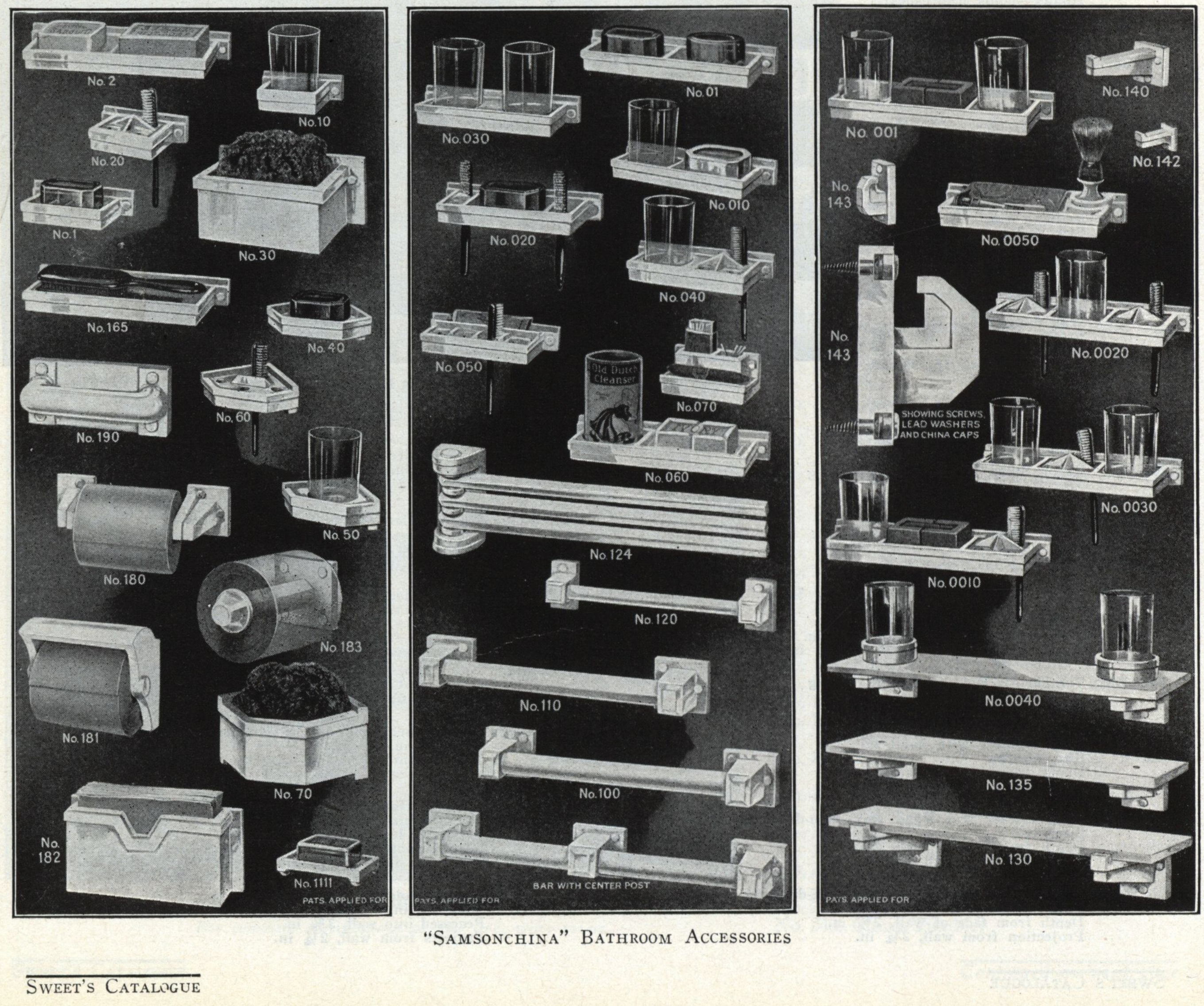
The toilet articles shown with these fixtures enable one to determine approximate sizes.

Distribution

They are for sale by wholesale and retail hardware and house furnishing houses and department stores throughout the United States, and specifications need only to mention "SAMSONCHINA," the plate number, and the quantity desired.

Catalogue

Catalogues have been published for the use of architects and their clients, and will be mailed on request.


No. 2
No. 10
No. 20
No. 1
No. 30
No. 165
No. 40
No. 190
No. 60
No. 50
No. 180
No. 183
No. 181
No. 70
No. 182
No. 1111
PATS. APPLIED FOR
No. 01
No. 030
No. 010
No. 020
No. 040
No. 050
No. 070
Old Dutch Cleanser
No. 060
No. 124
No. 120
No. 110
No. 100
BAR WITH CENTER POST
PATS. APPLIED FOR
No. 140
No. 001
No. 142
No. 143
No. 0050
No. 143
No. 0020
SHOWING SCREWS, LEAD WASHERS AND CHINA CAPS
No. 0030
No. 0010
No. 0040
No. 135
No. 130
PATS APPLIED FOR

"SAMSONCHINA" BATHROOM ACCESSORIES

BAY RIDGE SPECIALTY CO., INC.

Vitreous China Bathroom Accessories

PLANT AND GENERAL OFFICES
TRENTON, N. J.

Vitreous China Bathroom Accessories

The Bay Ridge line of bathroom accessories is made of high grade vitreous china which is hard, non-porous, pure white ceramic body covered with a highly lustrous, durable glaze that harmonizes with the tile so generally used in modern bathrooms.

ALL WHITE RIGHT

All designs are strong and practical, will not crack, check or discolor, and are made in standard tile sizes.

The five series of Bay Ridge bathroom accessories shown in these pages are:

Recess Series, a built-in recess type (see illustrations below).

R100 Series, a built-in projecting type (see following page).

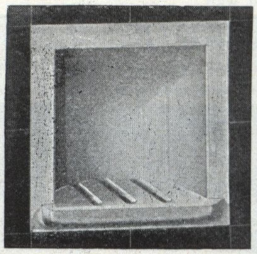
R900 Series, a built-in projecting plug grip type (see following page).

Iris 800 Series, made in the same styles as R900 Series, but is not a built-in type, being fastened by a concealed screw (see following page).

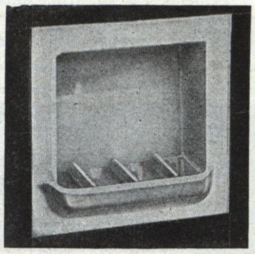
R200 Series, a built-in double flange recess type of shallow depth for installation in thin walls (see second page following).

A combination of series may be used in the same room; for instance, soap holders may be of the built-in recess type, or R200 double flange type, toilet paper holders of the R900 Series built-in plug projecting type and the towel bars of the R100 built-in projecting type.

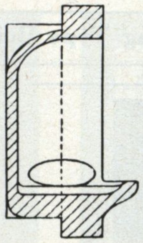
All series, except No. 800, are cemented into the wall when tile is set or plaster applied, and should be included in the tile or plastering specifications and contract. No. 800 Series is usually set by the plumber. Various other styles are shown in our complete catalogue which will be sent on request.



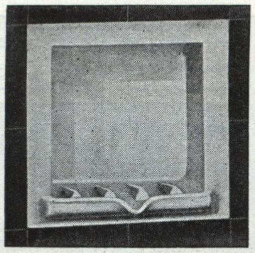
R16 Tumbler Holder
Wall opening, 6x6x.. in.



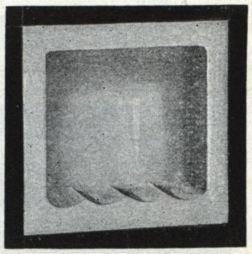
R10 Soap Holder
Wall opening, 6x6x.. in.



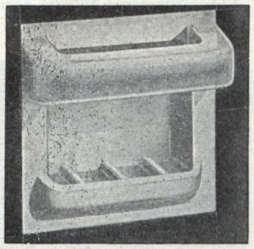
Sectional View of Recess Series



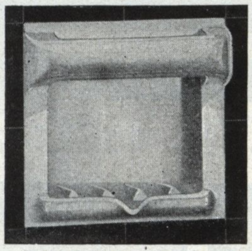
R13 Soap Holder with Center Drain
Wall opening, 6x6x.. in.



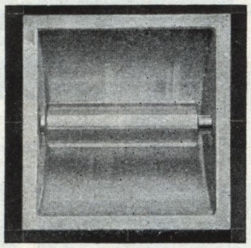
R18 Soap Holder with Flush Drain
Wall opening, 6x6x.. in.



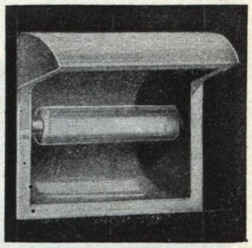
R11 Combination Soap Holder and Hand Rail
Wall opening, 6x6x.. in.



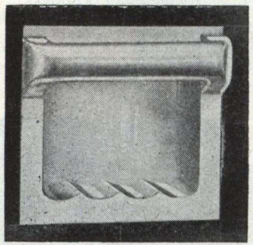
R15 Combination Soap Holder with Center Drain
Wall opening, 6x6x.. in.



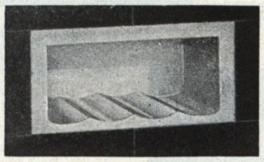
R12 Toilet Paper Holder
Wall opening, 6x6x.. in.



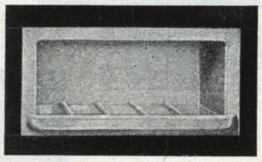
R20 Toilet Paper Holder
Wall opening, 6x6x.. in.



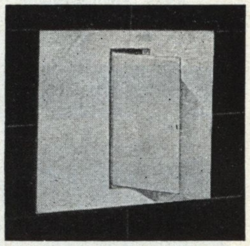
R19 Combination Soap Holder and Hand Rail with Flush Drain
Wall opening, 6x6x.. in.



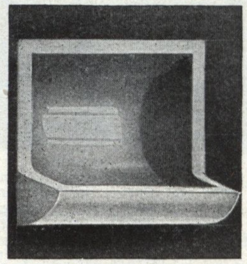
R14 Soap Holder with Flush Drain
Wall opening, 3x6x.. in.



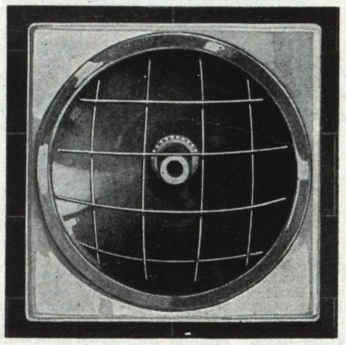
R17 Soap Holder
Wall opening, 3x6x.. in.



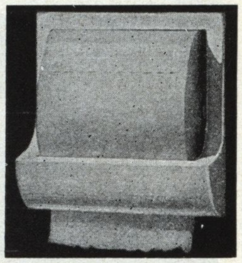
R30 Single Sheet Toilet Paper Holder
Wall opening, 6x6x.. in.



R21 Recess Sponge Holder
Wall opening, 6x6 in.



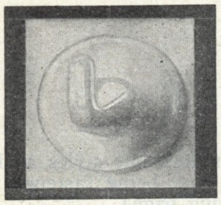
R23 Electric Heater
Recesses into wall. White vitreous china with metal reflector and guard. Current consumption, 660 watts. Wall opening, 9x9x.. in.



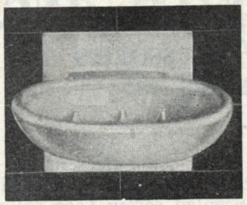
R22 Recess Toilet Paper Holder
Wall opening, 6x6 in.

Recess Series of Built-in Bathroom Accessories

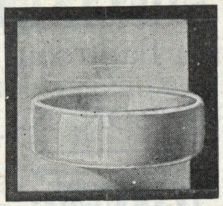
Continued on next page



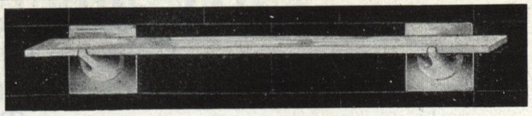
R144 Tile Projecting Robe Hook
Wall opening, 3x3 in.



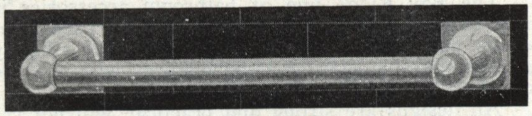
R146 Soap Holder
Wall opening, 3x3 in. Projects 3⅝ in. from finished wall



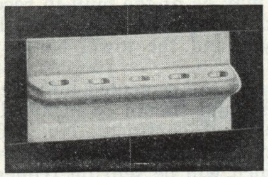
R145 Tumbler Holder
Wall opening, 3x3x.. in. Projects 3⅜ in. from finished wall



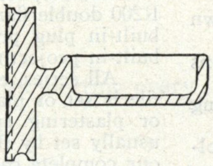
R141 Shelf
Opal glass shelf 5 in. wide, $\frac{7}{16}$ in. thick and 18, 24, 30 and 36 in. long. Vitreous china brackets require 3x3x.. in. wall openings. Projects 5½ in. from finished wall



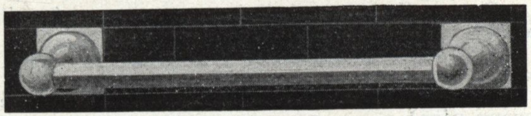
R140 Towel Bar
1-in. round Pyralin or opal glass bar. Length, 18, 24, 30 and 36 in. Vitreous china ends require 3x3.. in. wall openings. Projects 3¾ in. from finished wall



R143 Tooth Brush Holder
Wall opening, 3x6x.. in. Projects $1\frac{3}{16}$ in. from finished wall

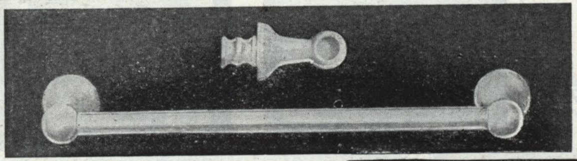


Sectional View of R100 Series

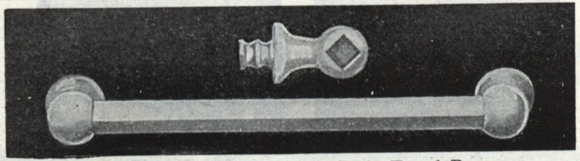


R150 Towel Bar
1 in. square Pyralin bar. Length, 18, 24, 30 and 36 in. Vitreous china ends require 3x3x.. in. wall openings. Projects 4⅛ in. from finished wall

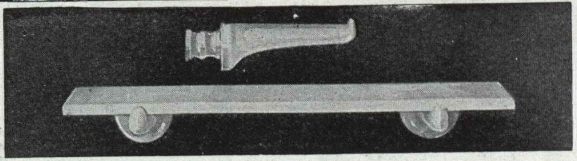
R100 Series of Projecting Type Built-in Bathroom Accessories



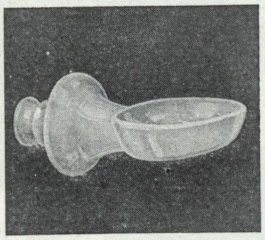
R925 Towel Bar
1-in. round opal glass or Pyralin bar. Length, 18, 24, 30 and 36 in. Ends are vitreous china. Projects 3¾ in. from finished wall



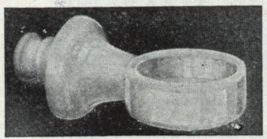
R950 Towel Bar
1-in. square Pyralin bar. Length, 18, 24, 30 and 36 in. Ends are vitreous china. Projects 3⅞ in. from finished wall



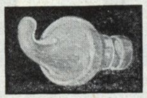
R935 Shelf
Opal glass shelf 5 in. wide, $\frac{7}{16}$ in. thick and 18, 24, 30 and 36 in. long. Brackets are vitreous china. Projects 5½ in. from finished wall



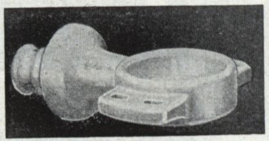
R965 Soap Holder
Projects 4⅞ in. from finished wall



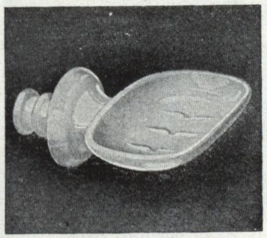
R945 Tumbler Holder
Projects 5 in. from finished wall



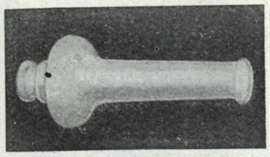
R988 Strop Hook
Projects 1⅞ in. from finished wall



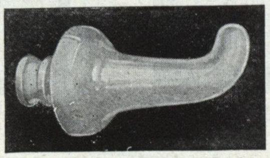
R955 Tumbler and Tooth Brush Holder
Projects 4⅞ in. from finished wall



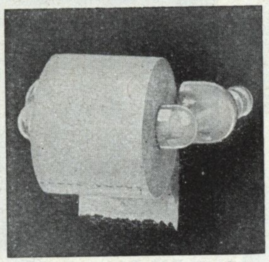
R969 Soap Holder
Projects 4⅞ in. from finished wall



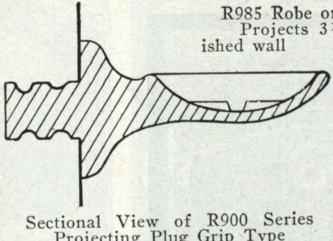
R975 Toilet Paper Holder
Projects 5¾ in. from finished wall



R985 Robe or Towel Hook
Projects 3½ in. from finished wall

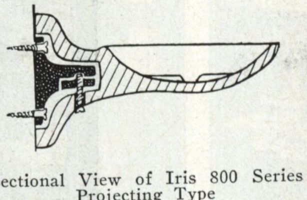


R977 Toilet Paper Holder
Projects 3⅞ in. from finished wall



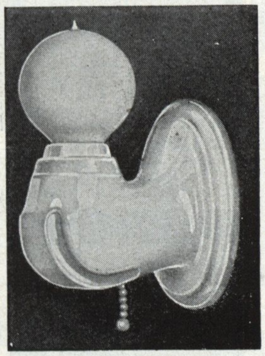
Sectional View of R900 Series Projecting Plug Grip Type

The built-in plug is a new idea in china bathroom accessories and one of the simplest and most secure methods of wall attachment. Accessories in this series are made in one piece, including the corrugated plug which is 1¼ in. in diameter and 1⅛ in. deep. A hole in the wall large enough to take the plug and a little cement is all that is necessary to set the fixture firmly and permanently



Sectional View of Iris 800 Series Projecting Type

A one-piece concealed fastener type made in the same styles as the R900 Series but is fastened to the wall in the manner shown above. The concealed wall attachment eliminates screwholes. Simple in construction and easy to install. Prevents tipping and holds the fixture securely in place



No. 801 Chinalite

An all-vitreous china bathroom fixture having concealed hanger (no exposed screws). Easily attached to an ordinary outlet. Wall flange, 5¾x4¾ in. Projects 5¼ in. from finished wall. This fixture is made only in the Iris 800 Series

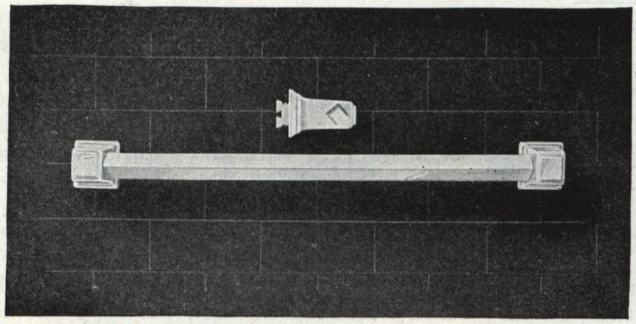
R900 and Iris 800 Series of One-piece Projecting Type of Bathroom Accessories

Continued on next page

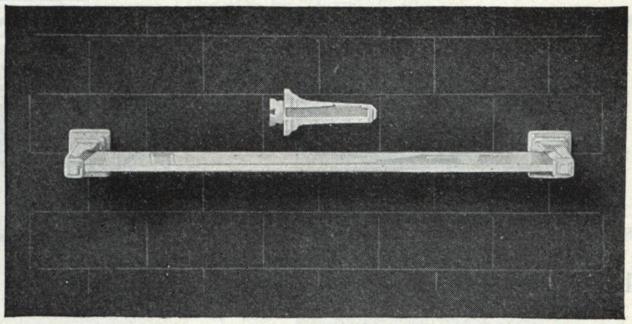
Double Flange Recess Type Accessories for Thin Walls

This series recesses into the wall to a depth of only 1¼ in. and is therefore especially suitable for installation in thin walls. The outer flange is sufficiently large to cover the edges of the tile surrounding the fixture, consequently these fixtures can be set much more easily and quickly, and "pointing up" is eliminated. The double flange, projecting from the wall, allows the usual full depth of the ordinary recessed fixture.

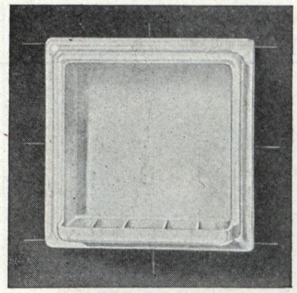
Patent applied for.



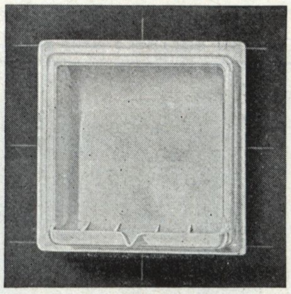
R250 Towel Bar
1-in. square Pyralin bar. Length, 18, 24, 30 and 36 in. Vitreous china ends require 1½x1⅞-in. wall openings. Projects 3½ in. from finished wall



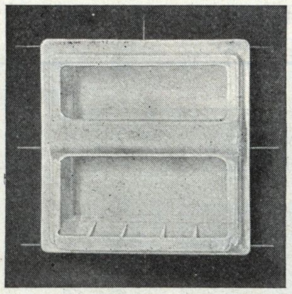
R241 Shelf
Opal glass shelf 5 in. wide, $\frac{5}{16}$ in. thick and 18, 24, 30 and 36 in. long. Vitreous china brackets require 1⅞x1⅞-in. wall openings. Projects 5⅝ in. from finished wall



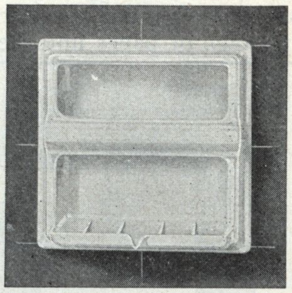
R210 Soap Holder
Wall opening, 6x6x1¼ in.



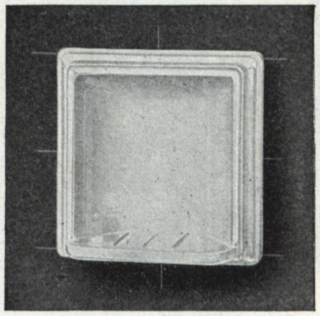
R213 Soap Holder
Wall opening, 6x6x1¼ in.



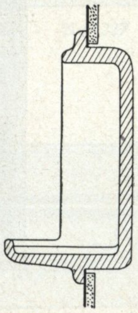
R211 Combination Soap Holder and Hand Rail
Wall opening, 6x6x1¼ in.



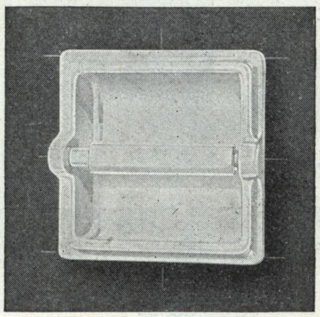
R215 Combination Soap Holder and Hand Rail with Center Drain
Wall opening, 6x6x1¼ in.



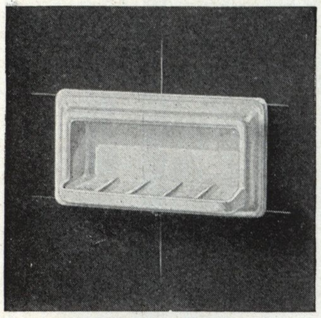
R216 Tumbler Holder
Wall opening, 6x6x1¼ in.



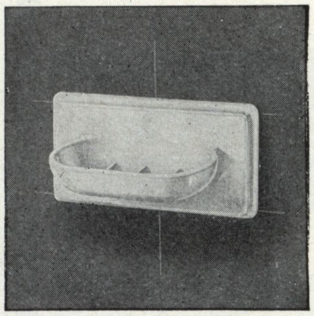
Sectional View of R-210 Soap Holder
Also typical of the setting of the R200 series



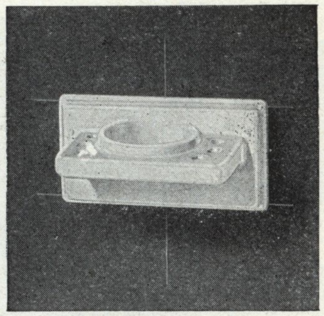
R212 Toilet Paper Holder
Wall opening, 6x6x1¼ in.



R217 Soap Holder
Wall opening, 3x6x1¼ in.



R246 Soap Holder
Wall opening, 3x6 in.



R255 Tumbler and Tooth Brush Holder
Wall opening, 3x6x1¼ in.

R200 Series Double Flange Recess Type Accessories for Thin Walls

GOLCO SANITARY SYSTEM, INC.

Manufacturers of Bathroom Accessories
618-620 Cherry Street
PHILADELPHIA, PA.
BRANCH OFFICES: CHICAGO, ILL., and LOS ANGELES, CAL.

Products

- Golco Toilet Paper Holder.
- Golco China Bathroom Accessories.
- Golco Enameled Bathroom Accessories.
- Luxor Bathroom Accessories.
- "Perfek" Square Glass Towel Bar.

Golco Toilet Paper Holder

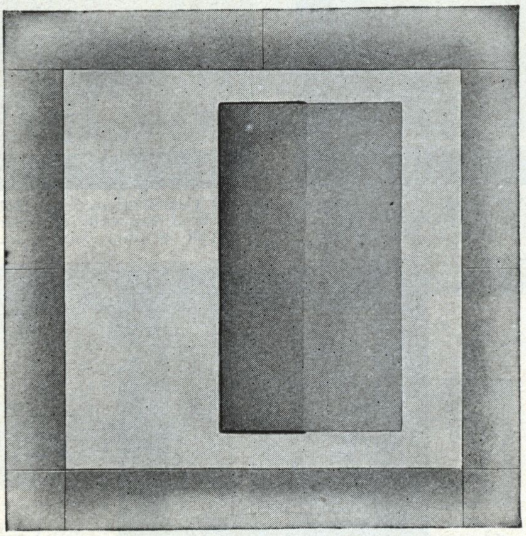
The Golco Toilet Paper Holder is clean, sanitary and sightly. It has become standard wherever fine fixtures are installed in the bathroom. Made in either tile or china, it will not rust or tarnish. No doors, no locks, no springs to get out of order. Easily filled by inserting the package of paper into the opening.

The Golco Toilet Paper Holder may be used in tile or Keene's cement wainscoting.

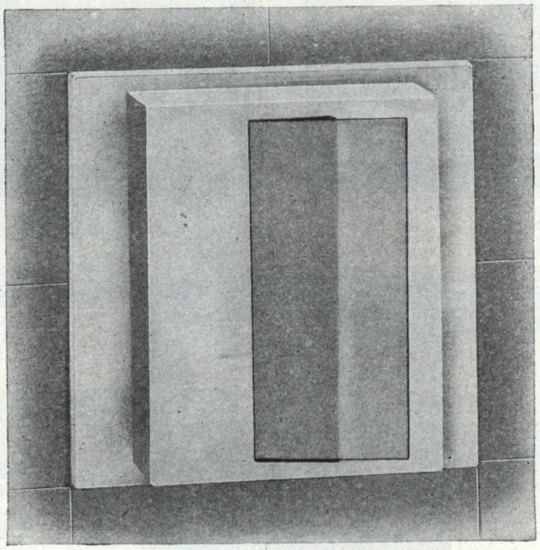
Recessed Model—No. 201 Golco Toilet Paper Holder, recessed model, is built in flush with the wall, taking the space of standard size tile. No. 202 is made for 4¼-inch tile.

Projecting Model—No. 203 projecting model is used on wall surfaces and partitions. It is easily attached to any wall with two ordinary screws inserted through the slots in the back of the holder. The flange covers any holes exposed by the removal of other holders. It is the thickness of tile and may be recessed to that depth.

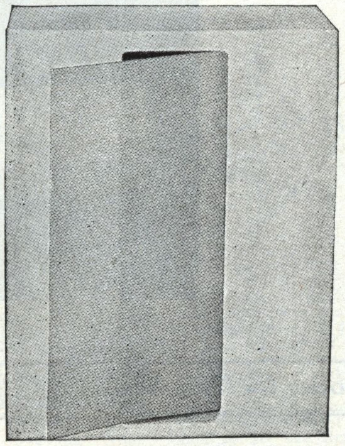
No. 200, projecting model without flange, is made for wall surfaces and marble partitions.



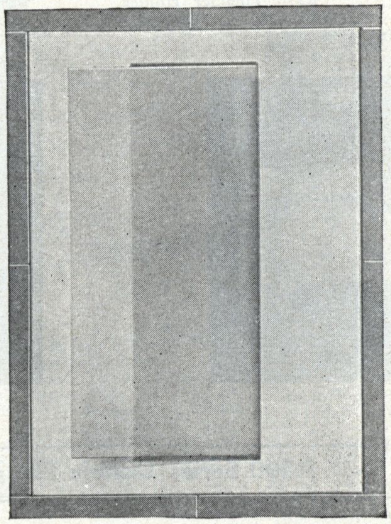
No. 201. Recessed Model
6x6 in.



No. 203. Projecting Model
6x6 in.



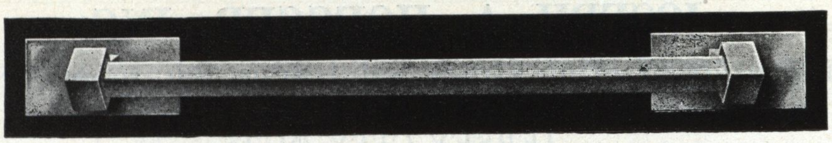
No. 200. Projecting Model
5¼x4⅜ in.



No. 202. Recessed Model
6x4¼ in.

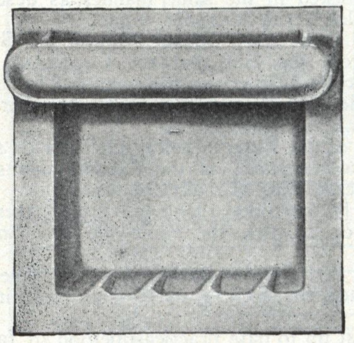
Illustrations of Golco Toilet Paper Holders

Continued on next page



The "Perfek" Towel Bar

A non-slip bar made of *square opal glass.* Always clean, smooth, straight and white. Neither age nor atmospheric conditions affect it. 1 in. square. Lengths, 18, 24 and 30 in.



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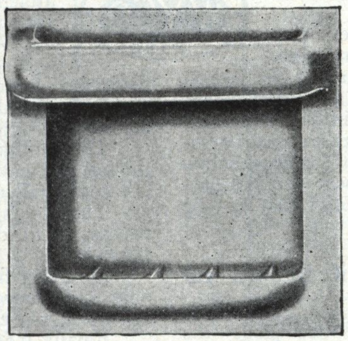

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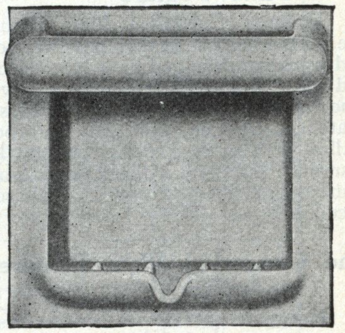

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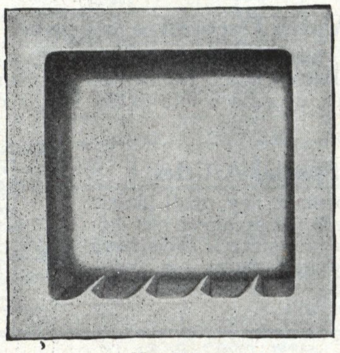

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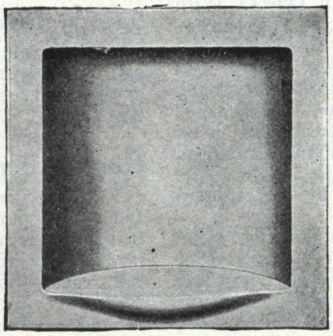

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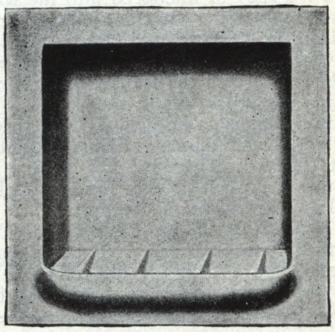

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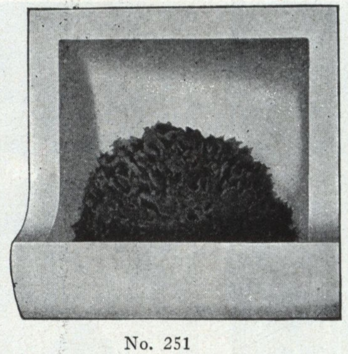

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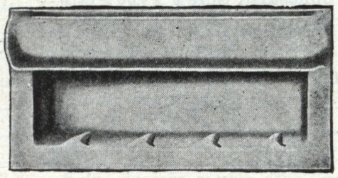

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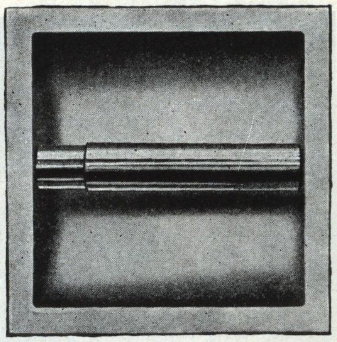

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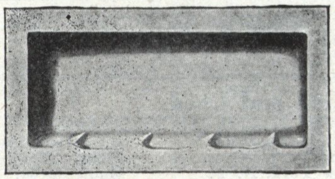

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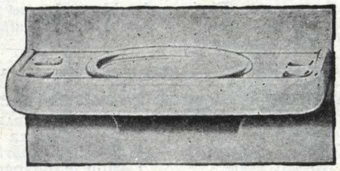

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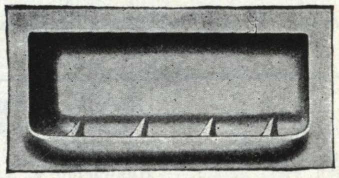

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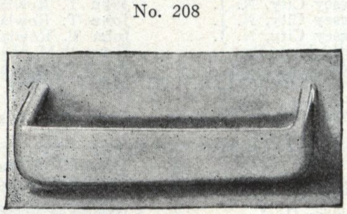

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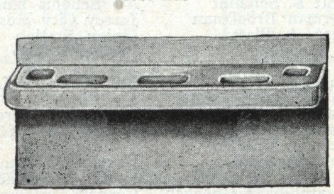

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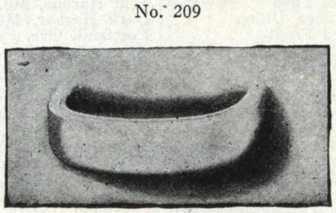


No. 210

Typical Golco Vitreous China Bathroom Accessories

TELEPHONE
WEBSTER 4332, 5952

JOSEPH A. HOEGGER, INC.

Manufacturers of High Grade Solid Brass Bathroom Accessories

351 Palisade Avenue
JERSEY CITY, N. J.

For Medicine Cabinets, see pages 2098-2101

TRADE WYCO MARK

Hoegger Quality Products with Concealed Plate Feature

Hoegger Concealed Plate Bathroom Accessories are of the highest quality possible, both as to materials and workmanship, and have been specified in many of the largest and most prominent buildings, a few of which are listed below. Due to the special patented features involved in the Concealed Plate construction, Hoegger Bathroom Accessories can be installed with great rapidity on any kind of wall with absolute assurance that they will not work loose. In appearance and permanence of finish, Hoegger Bathroom Accessories can not be excelled.

The Concealed Plate Feature—Why it Should be Specified

Hoegger Accessories consist essentially of two parts—the fixture proper and the solid brass plate to which the fixture is attached. This plate is either screwed to the wall (Concealed Screw Type) or anchored into the wall (Anker-In Type). With either method of fastening the outside appearance is the same—a clean flush job with no screw heads visible.

Concealed Screw Type Plate Fastening—Consists of a plate fastened to the wall with 2 screws. This plate has a strong projecting brass lug in the center. The flange of the Hoegger fixture, that is to be held by this screwed on plate and lug, is of slightly larger diameter than the plate and is centrally drilled so that the projecting lug fits snugly into the drilled hole. The fixture is pushed on this lug and locked in place by the countersunk set screw at the bottom.

Anker-In Type Fastening—This is essentially the same as the Concealed Screw Type method with the exception that no screws are used for fastening the concealed plate. The plate and projecting lug being supported by the patented anchor embedded in the wall itself. The fixtures proper are attached and locked in the same manner as described for the Concealed Screw Type fastening.

Why the Concealed Plate Should Be Specified—Aside from the fact that the Concealed Plate method of fastening makes a handsome appearance and is durable and economical it should be specified for its many other outstanding features:

There is no danger of the fixtures being damaged or stolen during the course of construction, as the fixtures themselves are not installed until the building is ready for occupancy.

The accessories can be taken down by any one whenever it is necessary to decorate or refinish the room—no mechanic is required.

Should a fixture be destroyed or damaged at any time it is only necessary to replace the fixture itself—the fastening is always in place.

Finally it is the latest up to date practical method of fastening and adds to the monetary value of any building.

Special Finishes to Match Decorative Schemes

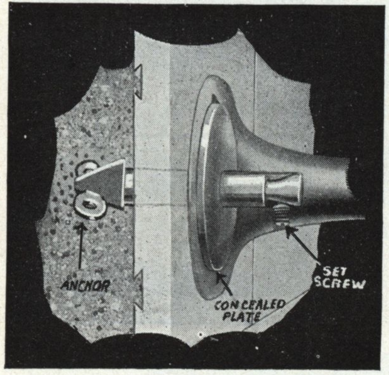
White glass shelves, bars, soap dishes and tumblers can be had in Hoegger Patent Design Black Double Stripes (burnt-in) or any other color stripes, or solid colors to match any decorative scheme.

Hoegger Service on Special Articles

We are equipped to make any small article for special purposes where the architect has difficulty in locating a manufacturer. We have made many of these special features for architects and solicit inquiries—if we can not make them we will advise who will.

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK, N.Y.

Concealed Screw and Anker-in Type Plate Accessories



Anker-in Type Plate (Trade-mark Reg.)

Directions for Installing

Concealed Screw Type Plate—Measure center to center distance of the holder brackets on the accessories and screw the plates on wall so lugs will be on top (Fig. 1) centrally. Slip on fittings and tighten up set screw.

Anker-in Type Plate—Used on any kind of wall. Measure center to center distances as for Concealed Screw Plate and cut hole in wall about 1½-in. wide and 1-in. high. Fill hole in wall with plaster of paris, placing some on the anchor and insert plate like Fig. 2, and press to the wall, then turn like Fig. 1 so lug will be centrally on top. Hold until set—about 1 minute.

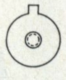


Fig. 1

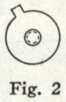
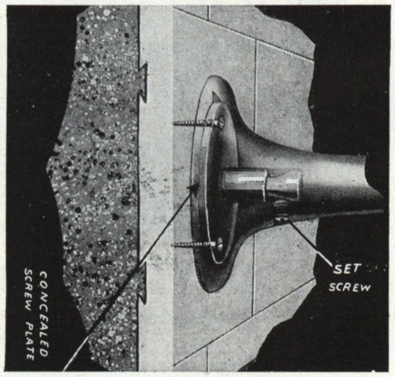


Fig. 2

Important—Fittings should not be put on until at least 1 hour later or after room is painted and ready for occupancy.



Concealed Screw Type Plate

*A Few Buildings Where Hoegger Fixtures Were Specified and Used

RESIDENCES

OWNER	LOCATION	ARCHITECTS
Harry Payne Whitney	Wheatley Hills, L. I., N. Y.	Walker & Gillette
Evelyn Field Estate	Huntington, L. I., N. Y.	J. Russell Pope
Edsel Ford	Seal Harbor, Me.	Duncan Candler
Clarence Dillon	Dark Harbor, Me.	Mott B. Schmidt
Floyd Frank	Portland, Ore.	Herman Brookman
Vincent Astor	Newport, R. I.	Chas. A. Platt
J. H. Hillman	Pittsburgh, Pa.	E. P. Mellon
	HOTELS	
New Willard	Washington, D. C.	Marsh & Peters
Mayflower	Washington, D. C.	Robert F. Beresford
Whitehall	Palm Beach, Fla.	Martin L. Hampton
Bristol	New York, N. Y.	Ewing & Allen
Jung	New Orleans, La.	Herman Biedler
Ft. Hayes	Columbus, Ohio	Herman Biedler

APARTMENTS, CLUBS, SCHOOLS AND MISCELLANEOUS

OWNER	LOCATION	ARCHITECTS
Hersksher Apartments	New York, N. Y.	McKim, Meade & White
Cotton Exchange	New York, N. Y.	Donn Barber
Duncan Apartments	Jersey City, N. J.	John T. Rowland, Jr.
All Schools since 1910	Jersey City, N. J.	John T. Rowland, Jr.
Jersey City Hospital	Jersey City, N. J.	John T. Rowland, Jr.
Union Station	Bethlehem, Pa.	Kenneth M. Murchison
Women's Club	Glen Ridge, N. J.	Davis McGrath
Meadow Club	Southhampton, L. I., N. Y.	Henry Pelham Robbin
St. Luke's Lutheran Church	Brooklyn, N. Y.	Clark & Arms
Rectory, Church and School of Sacred Heart	Troy, N. Y.	Thos. L. Gleason
Hartford Orphan Asylum	Hartford, Conn.	Grosvenor Atterbury
Keith Theater and Hotel	Brooklyn, N. Y.	Thos. Lamb
Cornell Union	Ithaca, N. Y.	Delano & Aldrich
Yale University Dormitory	New Haven, Conn.	J. Gamble Rogers

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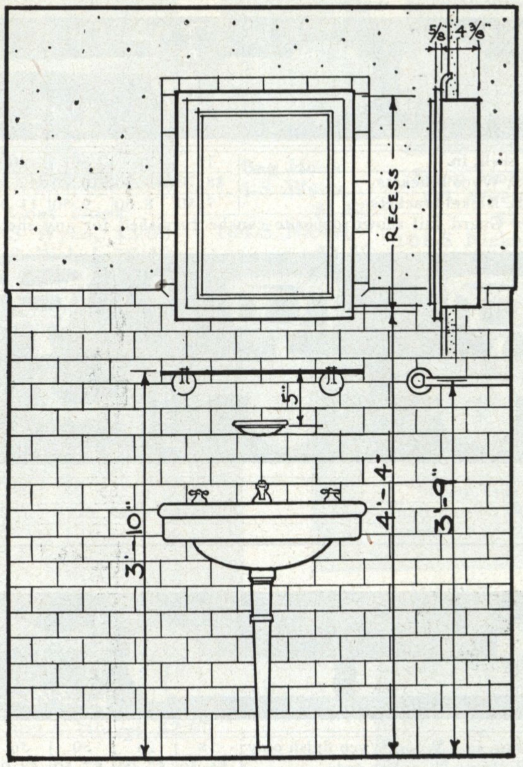
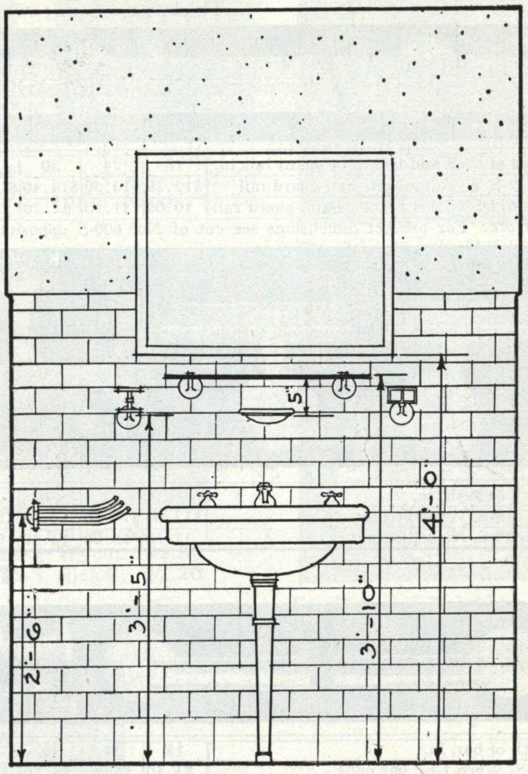
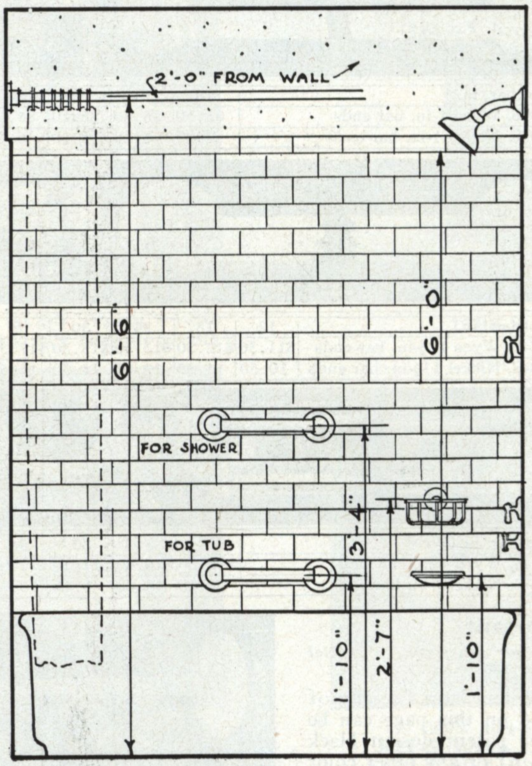
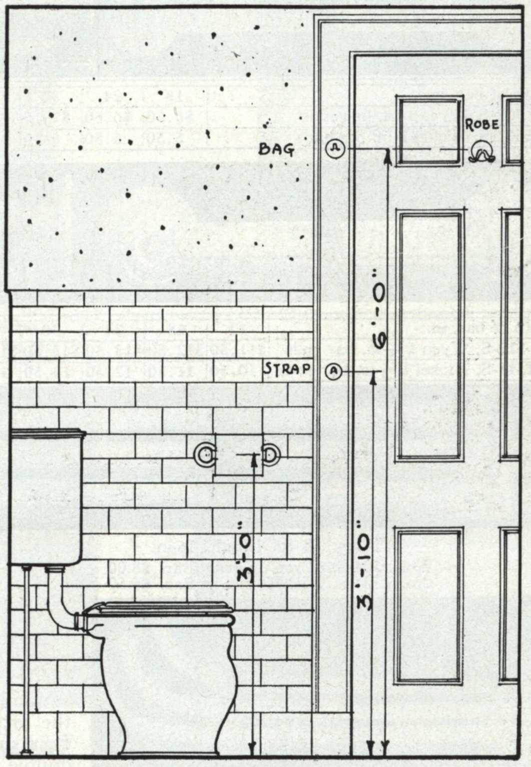
*This list is picked at random. With many of the architects Hoegger Accessories have been specified repeatedly. A complete list of installations on request or a list of the nearest to your locality.

Continued on next page


5/8"
4 3/8"
RECESS
5"
3'-10"
4'-4"
3'-9"


5"
4'-0"
2'-6"
3'-5"
3'-10"


2'-0" FROM WALL
6'-6"
6'-0"
FOR SHOWER
3'-4"
FOR TUB
1'-10"
2'-7"
1'-10"


BAG
ROBE
6'-0"
STRAP
3'-0"
3'-10"

Note: Standard height card for your drafting room sent on request

TRADE WYCO MARK

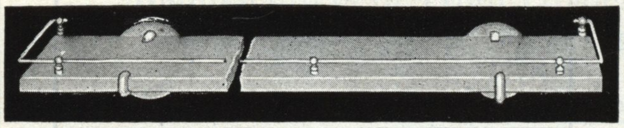
STANDARD HEIGHTS OF MEDICINE CABINETS AND BATHROOM ACCESSORIES

JERSEY CITY HOEGGER NEW JERSEY

Continued on next page

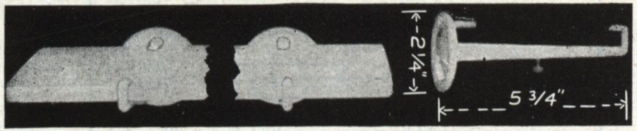
Crystal and Opal Shelves

Thickness, ⅜-in.; width, 5-in. Also made 6-in. wide



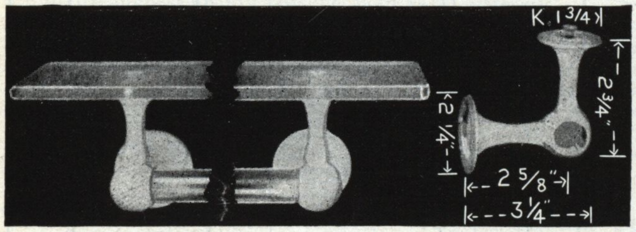
Length of shelf and length of guard rail, in.	18	24	30	36
600-612-S Wyco brackets and guard rail	$12.20	$13.30	$14.40	$16.70
1600-1612-S Nickel brackets and guard rail	10.00	11.10	12.20	14.50

Note: For bracket dimensions see cut of No. 600-S opposite.

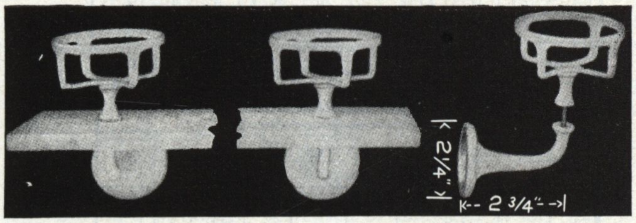


Length of shelf, in.	18	24	30	36
No. 600-S, Wyco brackets	$8.70	$9.70	$10.70	$12.20
No. 1600-S, Nickel brackets	7.50	8.50	9.50	11.00

Note: Guard rail shown opposite can be furnished for any shelf.

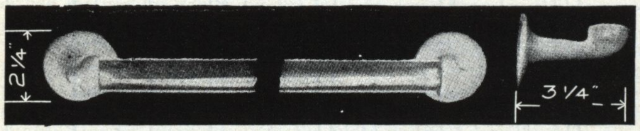


Length of shelf, in.	18	24	30	36
No. 614-S, Wyco fittings	$13.00	$14.50	$16.00	$18.00
No. 1614-S, Nickel fittings	11.50	13.00	14.50	16.50

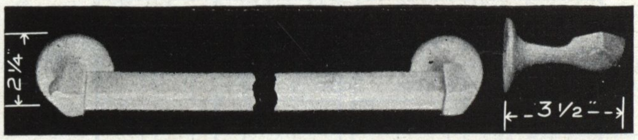


Length of shelf, in.	24	30	36
No. 601-S, Wyco fittings	$14.00	$15.00	16.50
No. 1601-S, Nickel fittings	12.00	13.00	14.50

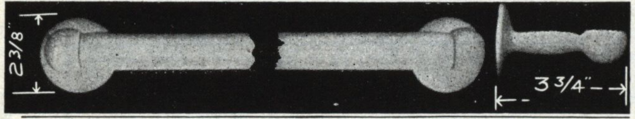
Towel Bars



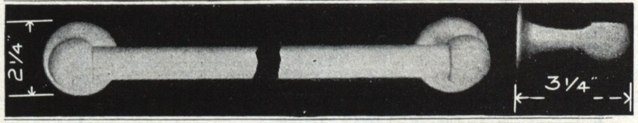
Length of bar, in.	18	24	30	36
507-S, Wyco 1-in. bar ends	$5.50	$5.80	$6.10	$6.50
1507-S, Nickel 1-in. bar ends	4.50	4.80	5.10	5.50



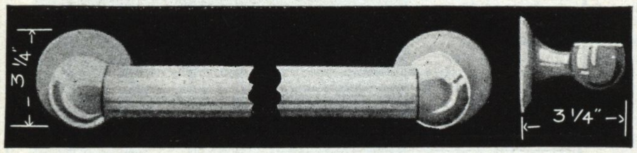
Length of bar, in. Wood Wyco finish only	18	24	30	36
No. 506-S, Wyco ⅞-in. bar ends	$6.50	$7.00	$7.50	$8.00
No. 1506-S, Nickel ⅞-in. bar ends	5.50	6.00	6.50	7.00



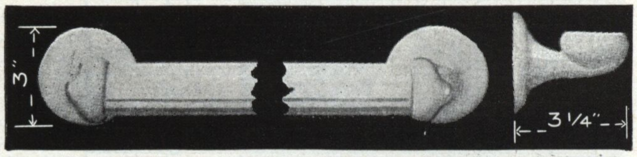
Length of bar, in.	18	24	30	36
No. 502-S, Wyco 1-in. bar ends	$6.50	$6.80	$7.10	$7.50
No. 1502-S, Nickel 1-in. bar ends	5.50	5.80	6.10	6.50



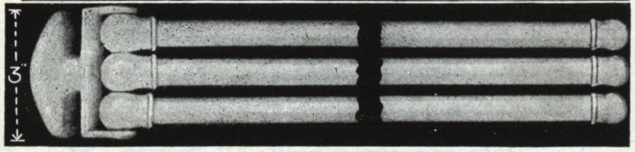
Length of bar, in.	18	24	30	36
No. 509-S, Wyco 1-in. bar ends	$5.50	$5.80	$6.20	$6.60
No. 1509-S, Nickel 1-in. bar ends	4.90	5.20	5.60	6.00



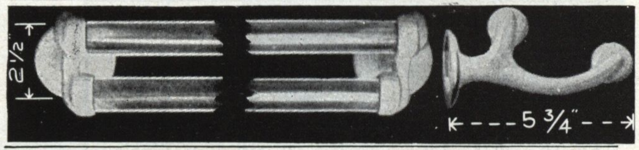
Length of bar, in.	12	18	24	30	36
No. 513-S, Wyco 1½-in. bar ends	$11.50	$12.50	$13.50	$15.50	$17.50
No. 1513-S, Nickel 1½-in. bar ends	10.50	11.50	12.50	14.50	16.50



Length of bar, in.	12	18	24	30	36
No. 518-S, Wyco 1½-in. bar ends	$11.50	$12.50	$13.50	$15.50	$17.50
No. 1518-S, Nickel 1½-in. bar ends	10.50	11.50	12.50	14.50	16.50



Diam., $\frac{9}{16}$-in. length, 16-in.
No. 504-S, Wyco Swing Bar, $8.00
No. 1504-S, Nickel Swing Bar, $6.50



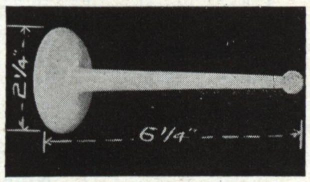
Length of bar, in.	18	24	30	36
No. 517-S, Wyco 1-in. bar ends	$10.00	$10.60	$11.20	$12.00
No. 1517-S, Nickel 1-in. bar ends	8.00	8.60	9.20	10.00

Diam., ⅜-in.; length, 11-in.
500-S, Wyco Swing Towel Bar, $4.00
1500-S, Nickel Swing Towel Bar, $3.00

Important

All prices shown are for either opal or crystal glass (except as noted for 506-S style).

Opal glass shelves and bars for any of the products described on this page can be furnished in Hoegger patent design black double stripes (burnt-in) or any other color to match any decorative scheme. Also in solid black or other solid colors.



No. 514-S, Wyco Towel Pin, $2.20
No. 1514-S, Nickel, $1.80

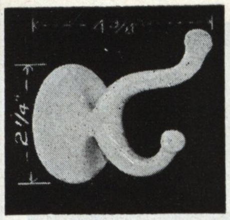
TRADE WYCO MARK

CRYSTAL AND OPAL SHELVES AND TOWEL BARS

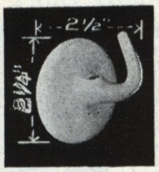
JERSEY CITY HOEGGER NEW JERSEY

Continued on next page

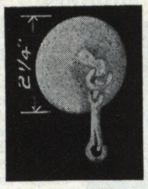
Coat, Towel, Robe and Utility Hooks



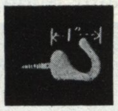
Coat Hook
13-S Wyco, $3.00
113-S Nickel, $2.40



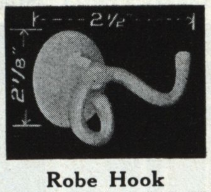
Bag Hook
4-S Wyco, $1.60
104-S Nickel, $1.40



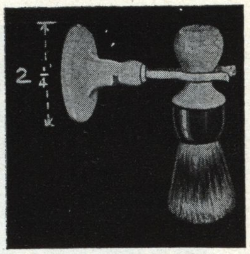
Strop Hook
1-S Wyco, $2.20
101-S Nickel, $1.80



Strop Hook
2-S Wyco, $0.60
102-S Nickel, $0.40

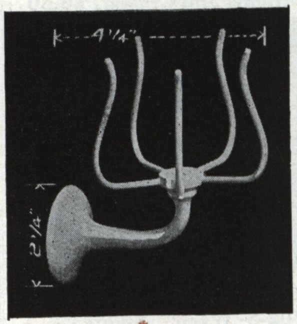


Robe Hook
8-S Wyco, $2.00
108-S Nickel, $1.70

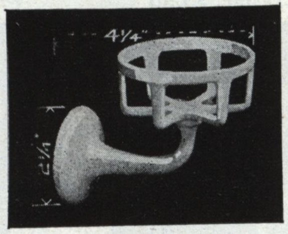


Shaving Brush Holder
840-S Wyco, $1.80
1840-S Nickel, $1.50

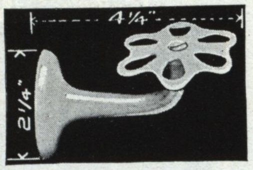
Tumbler, Toothbrush and Soap Holder Combinations



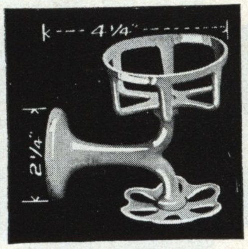
Tumbler
802-S Wyco, $3.30
1802-S Nickel, $2.80



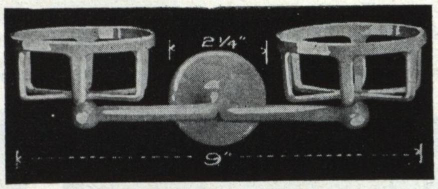
Tumbler
801-S Wyco, $3.60
1801-S Nickel, $3.10



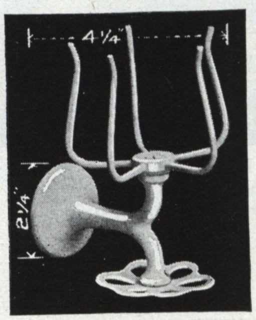
Toothbrush
813-S Wyco, $2.80
1813-S Nickel, $2.20



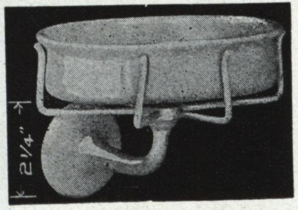
Tumbler and Toothbrush Combination
811-S Wyco, $4.80
1811-S Nickel, $3.80



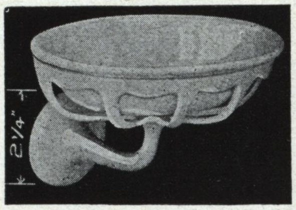
816-S Wyco Combination, $6.40
1816-S Nickel, $5.40



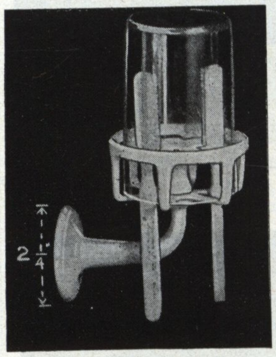
Tumbler and Toothbrush Combination
812-S Wyco, $4.80
1812-S Nickel, $3.80



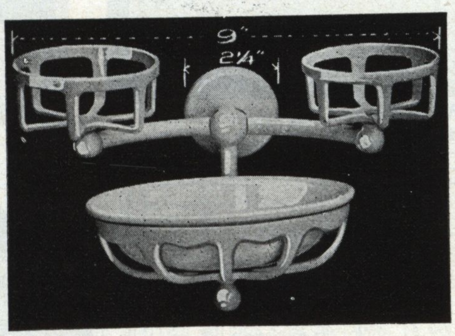
China dish size, 5 1/2x3 3/4x1 1/4-in.
706-S Wyco and China, $4.80
1706-S Nickel and China, $4.00
With opal dish deduct, $0.50



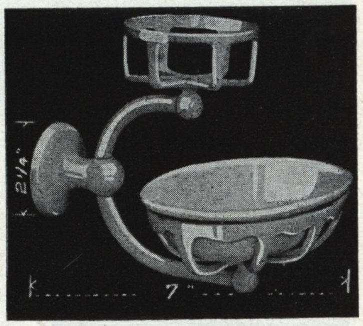
China dish size, 5 3/4x4 1/2x1-in.
705-S Wyco and China, $4.80
1705-S Nickel and China, $4.00
With opal dish deduct, $0.50



805-S Wyco Combination, $5.00
1805-S Nickel, $4.00



China dish size, 5 3/4x4 1/2x1-in.
821-S Wyco Combination, $10.80
1821-S Nickel, $8.80
With opal dish deduct, $0.50



China dish size, 5 3/4x4 1/2x1-in.
822-S Wyco Combination, $8.30
1822-S Nickel, $6.80
With opal dish deduct, $0.50

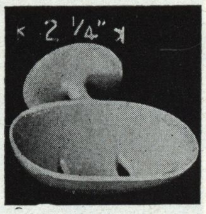
TRADE WYCO MARK

HOOKS, TUMBLER, TOOTHBRUSH AND SOAP HOLDERS AND COMBINATIONS

JERSEY CITY HOEGGER NEW JERSEY

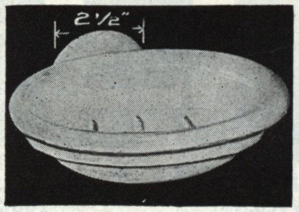
Continued on next page

Soap and Sponge Holders



Soap size 4½x2¾x1-in.
One piece cast brass

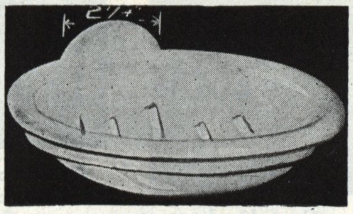
717-S Wyco, $5.00
717-S Nickel, $4.00



Dish size, 6x4¾x1¼-in.

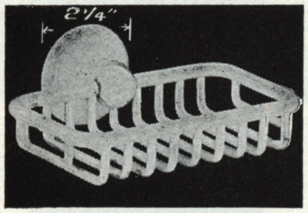
714-S Wyco and China, $6.00
704-S Wyco and Opal, $3.80
734-S Wyco and Crystal, $4.30
1714-S Nickel and China, $5.00
1704-S Nickel and Opal, $3.00
1734-S Nickel and Crystal, $3.50

Important
Soap dishes 714-S, 704-S, 715-S and 735-S can be furnished in Hoegger patent design black stripes or other colors to match any decorative scheme at extra cost.



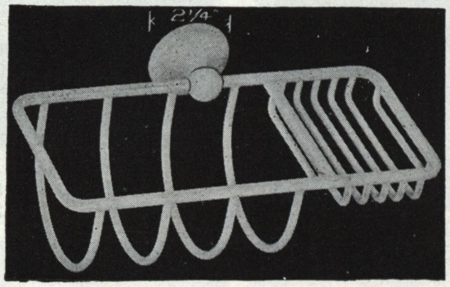
Dish size 7¼x5½x1½-in.

715-S Wyco and China, $7.80
735-S Wyco and Opal, $6.80
738-S Wyco and Crystal, $7.30
1715-S Nickel and China, $6.80
1735-S Nickel and Opal, $5.80
1738-S Nickel and Crystal, $6.30



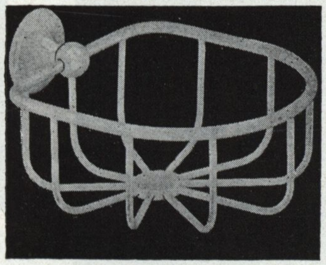
Soap size, 6x3½x1-in.

711-S Wyco, $4.00
1711-S Nickel, $3.00
Also made to hang over a tub.



Size Overall, 10½x5x3-in.

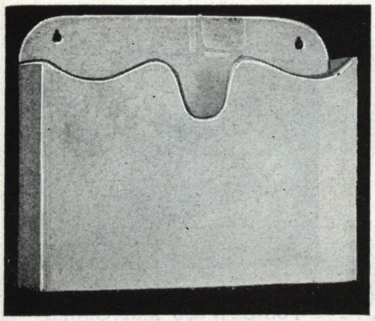
725-S Wyco, $7.30; 1725-S Nickel, $5.30
Also made to hang over a tub



Sponge size, 7x7x3-in.

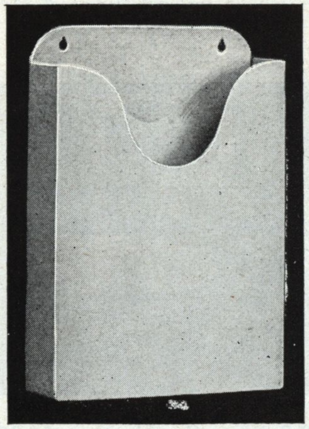
702-S Wyco, $6.80
1702-S Nickel, $4.80
Also made to hang over a tub

Paper Holders



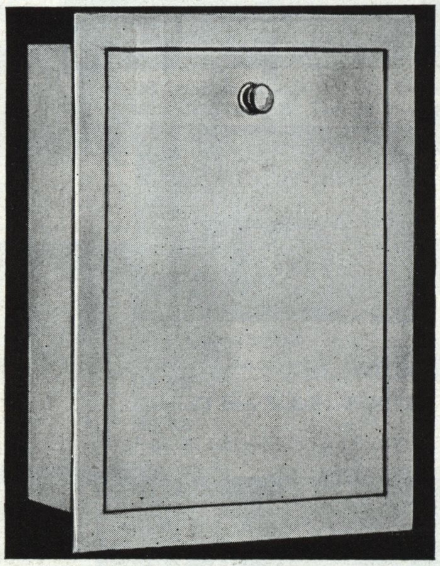
Size, 5x7x1¾-in.

851 Wyco Paper Box, $4.00
1851 Nickel, $3.00

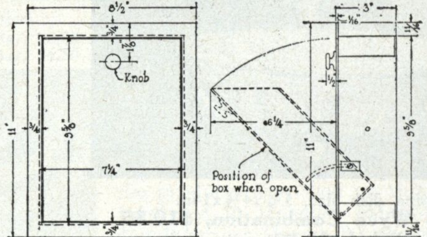


Size, 7x5x1¾-in.

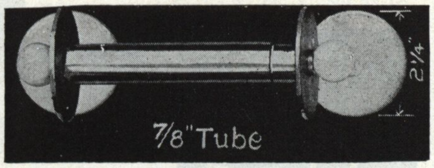
855 Wyco Paper Box, $4.00
1855 Nickel, $3.00



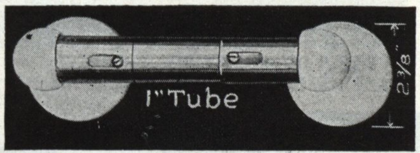
845 Wyco Recess Paper Box, $14.00
2854 Steel White Enamel, $10.00



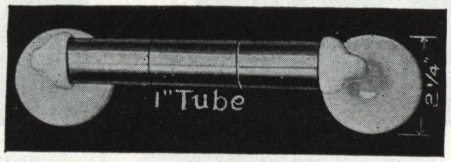
Dimensions of 845 and 2854



Roll Paper Holder
857-S Wyco, $6.50
1857-S Nickel, $5.50



Roll Paper Holder
856-S Wyco, $6.50
1856-S Nickel, $5.50



Roll Paper Holder
850-S Wyco, $6.00
1850-S Nickel, $5.00

TRADE WYCO MARK

SOAP, SPONGE AND PAPER HOLDERS

JERSEY CITY HOEGGER NEW JERSEY

Continued on next page

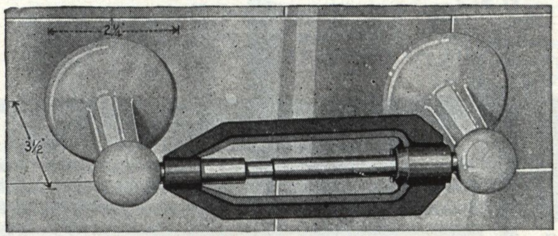
Paper Holders for Public Toilets and Soiled Towel Baskets

No. 1862-S Roll Toilet Paper Holder—5-in. Size—Will use any ordinary roll toilet paper. Prevents waste and theft of paper. Neat and strong—has no exposed screws but special vandalproof set screws on the brackets for concealed wall plates. Brackets are 18% white metal; balance of brass. Will last as long as the building.

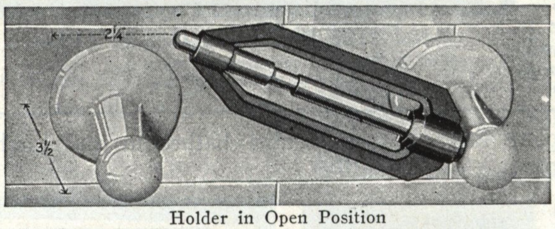
List Price—$6.00; No. 862 Wyco on brass, same price.

No. 1863-S Towel Holder—11-in. long—Made with the same features as the toilet paper holder but 11-in. long.

List Price—$9.00; No. 863 Wyco on brass, same price.

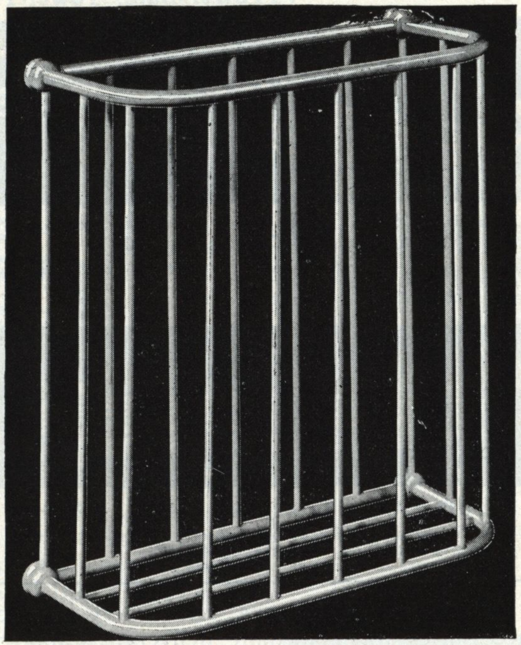


Holder in Locked Position



Holder in Open Position

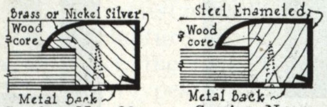
Hoegger Lock Spring Holders (Pat. Applied for)



Has concealed screw holes
Size, 13½ wide x 15 high x 6-in. deep

No. 5230-S Wyco Soiled Towel Basket, $20.00
No. 15230-S Nickel, $14.00

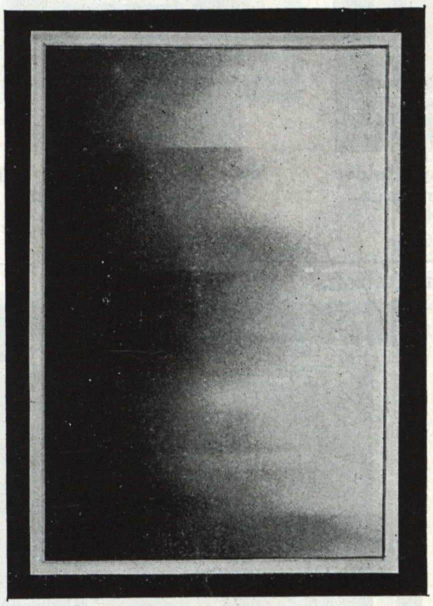
Concealed Hanger Mirrors



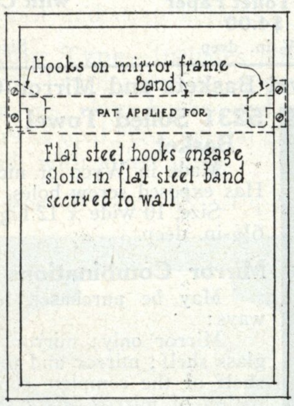
Section No. 901

Section Nos. 906 and 900

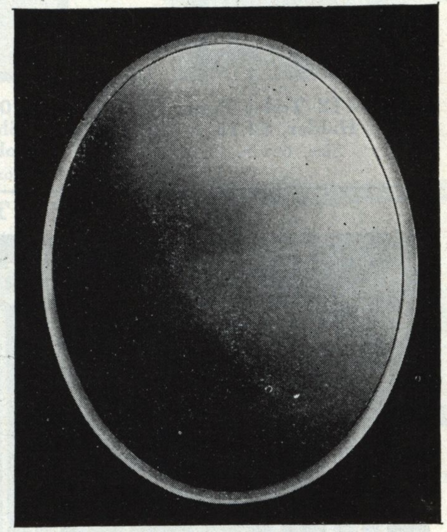
Full Size Sections Through Frames



No. 901 Rectangular Mirror
Specify which way mirrors are to be hung


Hooks on mirror frame band
PAT. APPLIED FOR
Flat steel hooks engage slots in flat steel band secured to wall

Hoegger Patented Concealed Hanger



No. 900 Oval Mirror
Specify which way mirrors are to be hung

Actual mirror size, in.	Rectangular mirrors with ¾-in. wide frame												Oval mirrors with ¾-in. wide frame							
	Brass Wyco				Nickel silver				Steel white enamel				Brass Wyco				Nickelplated			
	Plain		Beveled		Plain		Beveled		Plain		Beveled		Plain		Beveled		Plain		Beveled	
	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price
12x18	901	$18.00	2901	$19.00	1901	$15.00	3901	$16.00	906	$11.00	2906	$12.00	900	$19.00	3900	$20.00	1900	$17.00	4900	$18.00
14x20	901	22.00	2901	24.00	1901	18.00	3901	20.00	906	12.00	2906	14.00	900	20.00	3900	22.00	1900	18.00	4900	20.00
18x24	901	26.00	2901	28.00	1901	22.00	3901	24.00	906	16.00	2906	18.00	900	25.00	3900	27.00	1900	23.00	4900	25.00
20x30	901	36.00	2901	39.00	1901	32.00	3901	35.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
24x30	901	42.00	2901	45.00	1901	36.00	3901	39.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
24x36	901	48.00	2901	52.00	1901	42.00	3901	46.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Plain or beveled mirrors same style as 901 but with 1, 1½ or 2-in. wide brass Wyco or nickelsilver frame made in 24x18, 27x20 and 30x22 in. outside sizes. Other sizes to order.

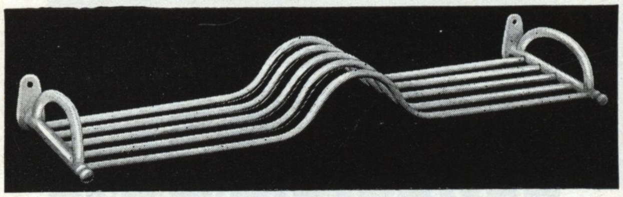
TRADE WYCO MARK

SOILED TOWEL BASKETS, PUBLIC TOILET PAPER HOLDERS AND CONCEALED HANGER MIRRORS

JERSEY CITY HOEGGER NEW JERSEY

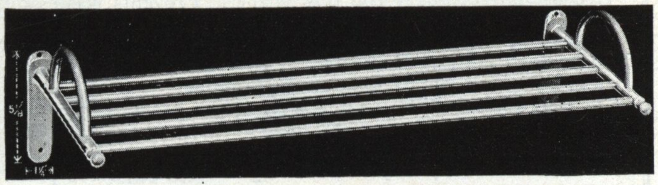
Continued on next page

Towel Bars, Towel Pins and Recess China Accessories



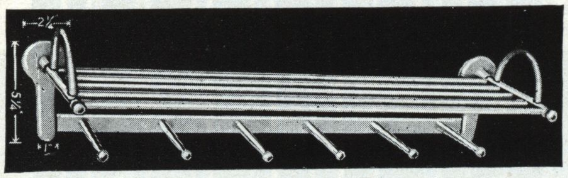
No. 620 Wyco Towel Shelf for Over Mirror or Medicine Cabinet, $12.50

Bars are bent in center to a 3-in. radius for electric light outlet. Has exposed wood screw fastening.
Size, 8x24 in. Other sizes to order.



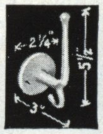
No. 621 Wyco Towel Shelf, $10.00

Size, 8x24-in. Other sizes to order.
This type has exposed wood screws

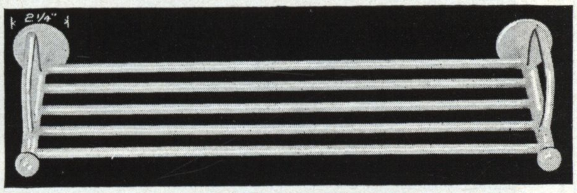


No. 619-S Wyco Towel Shelf and Pins, $20.00

For towel shelf without pins, specify No. 618-S, $14.50.
Sizes of both Nos. are same, 8x24-in.
These types have concealed wall plates



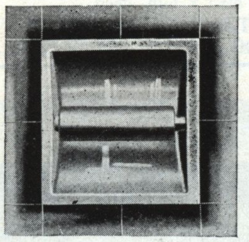
No. 3-S Wyco Razor Strop and Towel Hook, $3.00



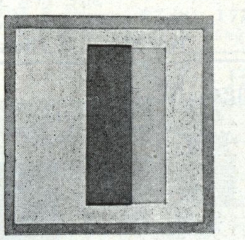
No. 616S Wyco Towel Shelf, $13.00

Size, 8x24-in. Other sizes to order.
Has concealed wall plate but is not to be used on plaster wall

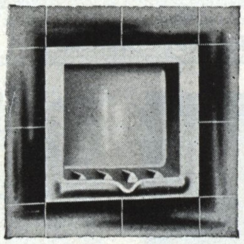
Joseph A. Hoegger, Inc., carry in stock a complete line of recess china bathroom and kitchen accessories for immediate delivery. Catalogue on request.



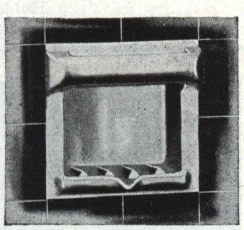
No. 112 Toilet Paper Holder, $4.75
Size, 6x6-in.



No. 1201 Recess Type Folded Sheet Toilet Paper Holder, $4.00
Size, 6x6x2½-in. deep

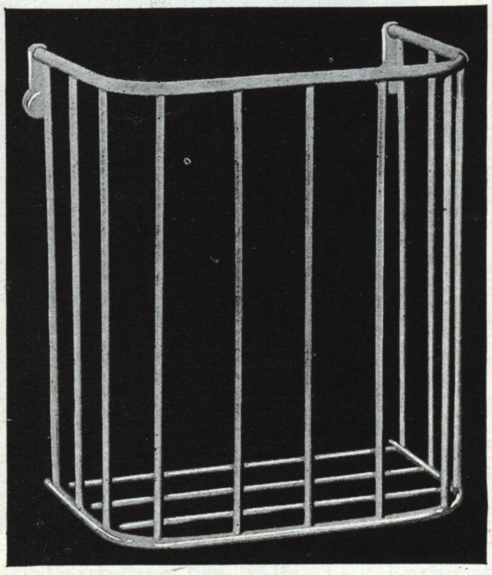


No. 113 Soap Holder with Center Drain, $4.50
Size, 6x6-in.



No. 115 Soap Holder with Grab Rail and Center Drain, $7.00
Size, 6x6 in.

Soiled Towel Baskets and Mirror Combinations



5231 Wyco Soiled Towel Basket, $10.00
15231 Nickel, $9.00

5231 Soiled Towel Basket

Made in Wyco or nickel. Has exposed screw holes.

Size, 10 wide x 12 high x 6½-in. deep.

Mirror Combinations

May be purchased in 4 ways:

Mirror only; mirror and glass shelf; mirror and towel shelf or the complete combination of mirror, glass shelf and towel shelf.

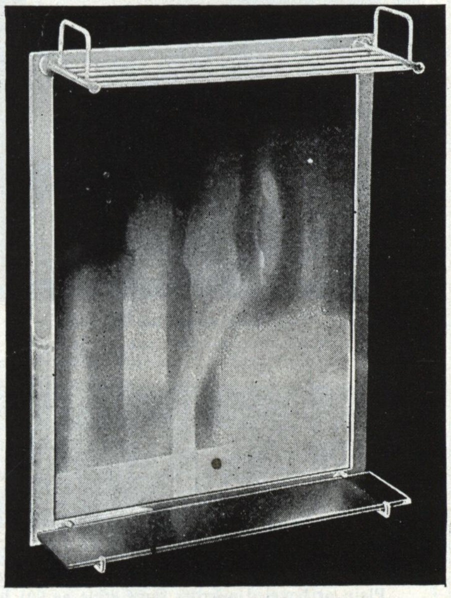
In Ordering Specify—

For plain mirror, glass shelf and towel shelf combination:
930; price, $26.00

For plain mirror and glass shelf only:
931; price, $20.00

For plain mirror and towel shelf only:
932; price, $21.00

Note: For beveled mirror, prefix 2 to catalogue No. above and add $2.00 to prices shown.



930 Mirror and Shelf Combination

TRADE WYCO MARK

HOTEL AND INSTITUTIONAL SUPPLIES

JERSEY CITY HOEGGER NEW JERSEY

THE WILLETTE CORPORATION

Manufacturers of China Bathroom Accessories

138 Franklin Street
NEW YORK, N. Y.

WILLETTE
MADE OF
STAEFAST
VITREOUS CHINA
SANITARY BUILT-IN
BATH-ROOM ACCESSORIES
REG. U. S. PAT. OFF.

Product

Vitreous China Bathroom Accessories, in Recessed and Projecting Types, to be cemented into walls when tile is laid. (Patented July 1, 1924.)

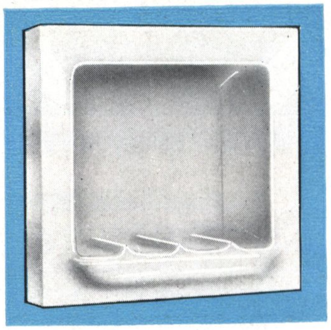
Willette Stae-fast Bathroom Accessories

Stae-fast vitreous china accessories fill a long-felt need for fixtures that are both economical and of enduring beauty. By reason of their absolute sanitation, perfect condition and certain permanence, they insure lasting satisfaction with a minimum initial and *final* expenditure, meeting every requirement of the architect, the builder and the owner. They are made in two types.

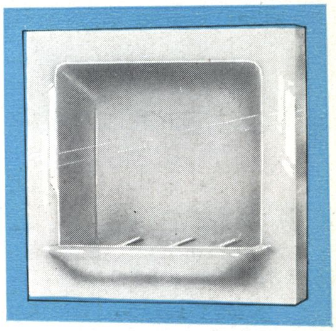
Recessed Type—Includes holders for soap, tumblers, sponges, toilet paper; also combination safety grab rail and soap holders.

Projecting Type—Includes holders for soap, tumblers, tooth brushes and toilet paper; crystal or opal glass shelves; china hooks; and round and non-slip towel bars of opal glass, crystal glass or celluloid-covered wood, with china posts.

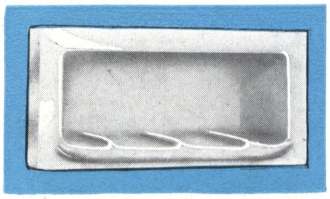
Sizes—For 3x6-in., 4¼x4¼-in. and 6x6-in. tile sizes.



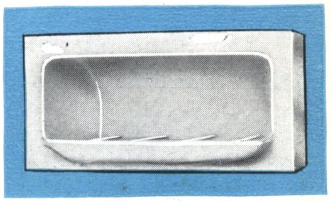
No. W 205
Recess Soap Dish
(Drain Type)
6x6-in. base



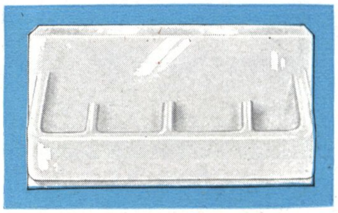
No. W 200
Recess Soap Dish
(Lip Type)
6x6-in. base



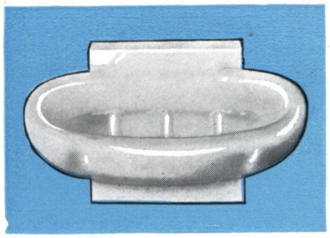
No. W 210
Recess Soap Dish
(Drain Type)
3x6-in. base



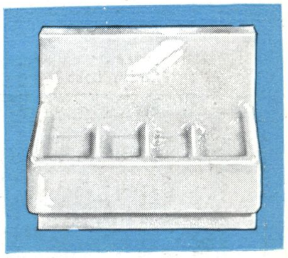
No. W 215
Recess Soap Dish
(Lip Type)
3x6-in. base



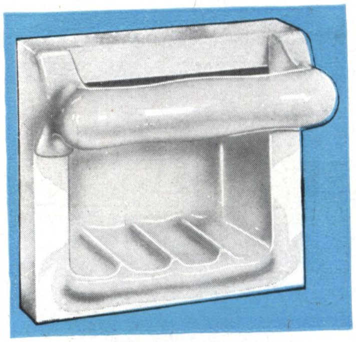
No. E 480
Projecting Soap Dish
3x6-in. base



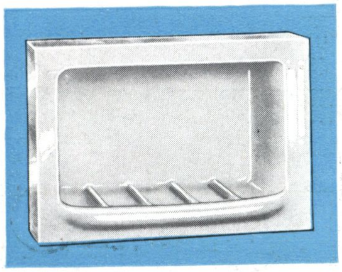
No. E 415
Projecting Soap Dish
3x3-in. base



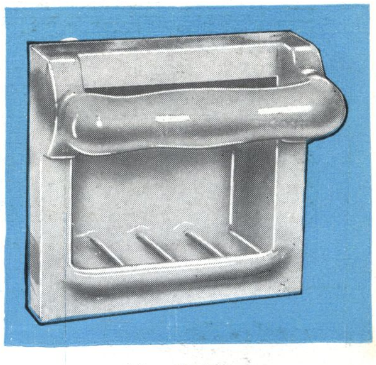
No. R 615
Projecting Soap Dish
4¼x4¼-in. base



No. W 230
Combination Soap Dish and
Grab Rail (Drain Type)
6x6-in. base

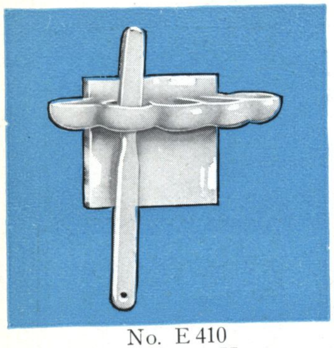


No. W 265
Recess Soap Dish
(Lip Type)
4¼x6-in. base

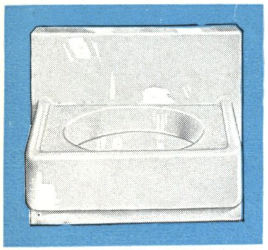


No. W 250
Combination Soap Dish and
Grab Rail (Lip Type)
6x6-in. base

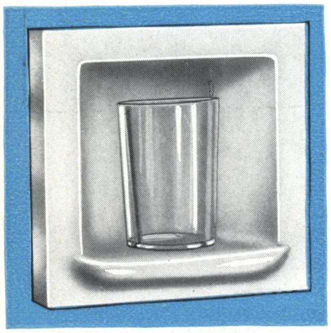
Continued on next page



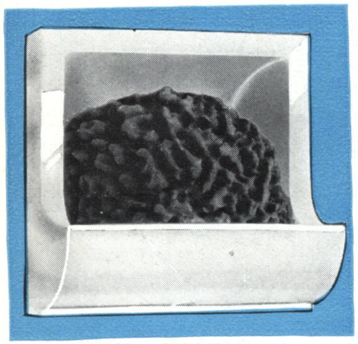
No. E 410
Tooth Brush Holder
3x3-in. base



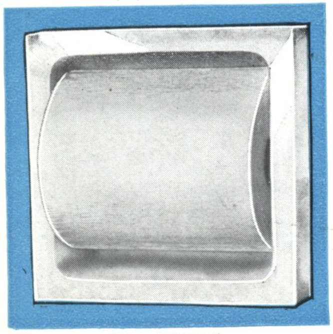
No. R 605
Projecting Tumbler Holder
4¼x4¼-in. base



No. W 220
Recess Tumbler Holder
6x6-in. base



No. W 240
Sponge Holder
6x6-in. base



No. W 225
Recess Paper Holder
6x6-in. base

Qualities of Willette Stae-fast Accessories

Sanitary—The lustrous porcelain finish of Willette Stae-fast Vitreous China Accessories is lasting and durable and will not discolor, stain, or develop any surface imperfections. A damp cloth is all that is needed to keep them spotlessly clean.

Convenient—Spacious recess compartments and well-proportioned arrangement for accommodating toilet requisites make Willette Stae-fast Accessories a continual source of delight to the user.

Permanent—Exceptional strength is built into every Willette Stae-fast Accessory. In every detail from the selection and testing of materials to the design and construction, *durability* is made a consideration of the first importance.

Beautiful in Color—The rich white of Willette Stae-fast Accessories harmonizes with the tile, adding a decorative effect and accentuating the pleasing designs of the accessories themselves.

Beautiful in Design—Willette Stae-fast Accessories lend themselves admirably to securing a harmonious bathroom. Their uniform designs enhance the beauty of tile walls and conform with the plumbing fixtures.

Installation of Willette Stae-fast Accessories

Both the recessed and the projecting type are simple to install in any kind of bathroom wall. They are specially suited for tile, being made in tile sizes, but are also satisfactory in Keene's cement wainscots. When used with tile they should be cemented into the wall at the time the tile is laid.

Accessories of the projecting type have a special shank device which, if properly set, can not be dislodged. Base of accessories should be set flush with the wall tile to insure permanence and strength.

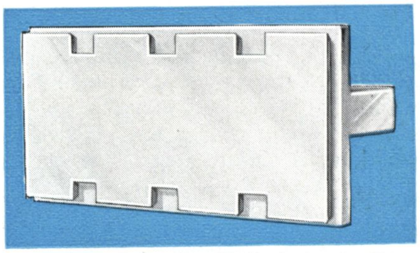
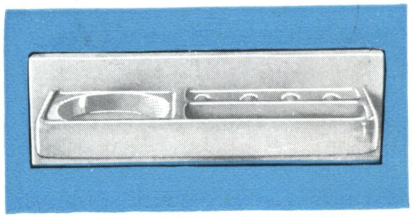
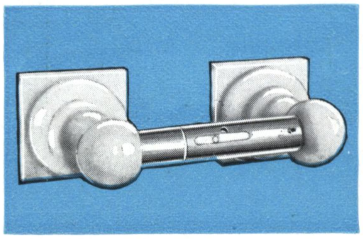


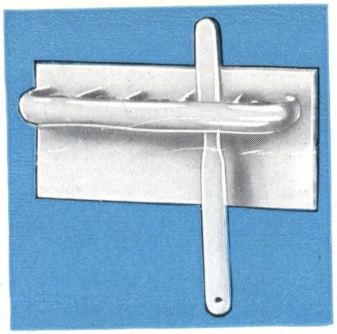
Illustration above shows the thin back construction of projecting type fixtures. Note the design of the Stae-fast flanged edge cementing back



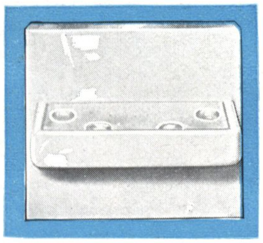
No. E 460
Projecting Combination Fixture
For tooth brush, tumbler and tooth paste
3x9-in. base



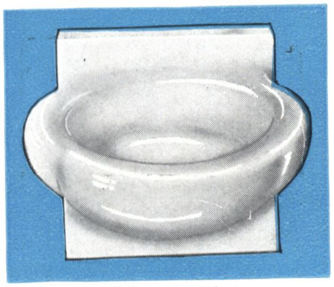
No. E 440
Projecting Paper Holder
Base of posts, 3x3 in.



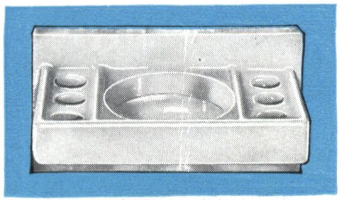
No. E 445
Tooth Brush Holder
3x6-in. base



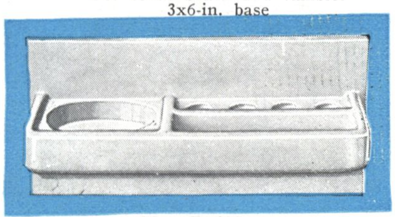
No. R 610
Tooth Brush Holder
4¼x4¼-in. base



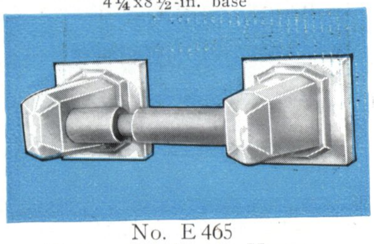
No. E 405
Projecting Tumbler Holder
3x3-in. base



No. E 475
Projecting Combination Fixture
For tooth brush and tumbler
3x6-in. base

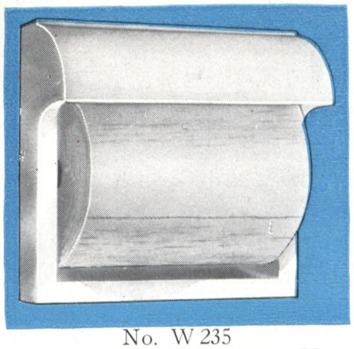


No. R 630
Projecting Combination Fixture
For tooth brush, tumbler and tooth paste
4¼x8½-in. base

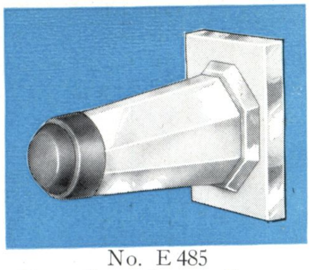


No. E 465
Projecting Paper Holder
Base of posts, 3x3 in.
No. E 470. Same with Nickel Roller

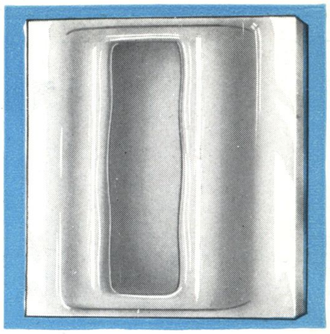
Continued on next page



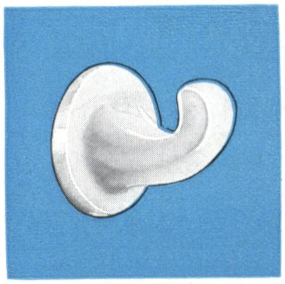
No. W 235
Recess Paper Holder with Hood
6x6-in. base



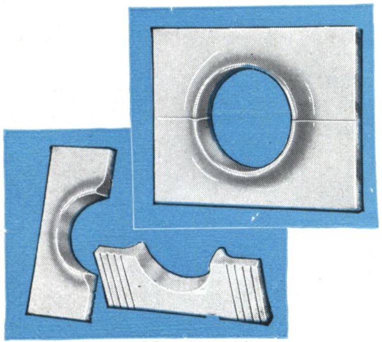
No. E 485
Door Stop (with Rubber Tip)
2x3-in. base



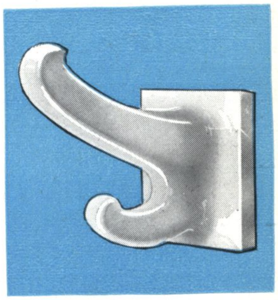
No. W 245
Recess Flat Paper Holder
6x6-in. base



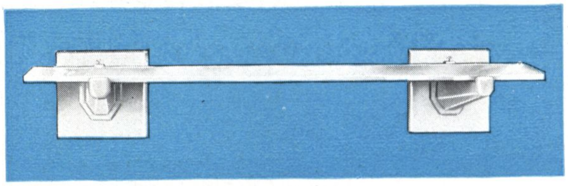
No. E 430
Single Hook
2¼-in. diam.



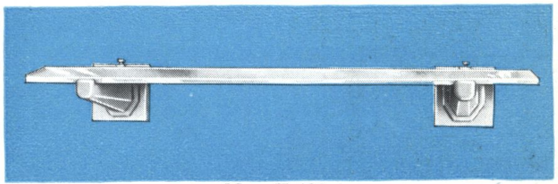
No. W 255
Pipe Ring for 1½-in. Pipe
No. W 260. Same, for 2-in. Pipe



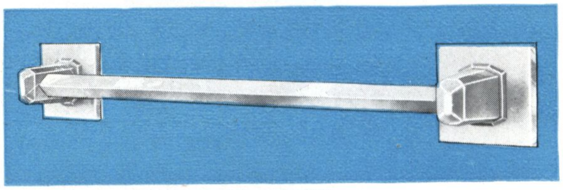
No. E 435
Double Hook
3x3-in. base



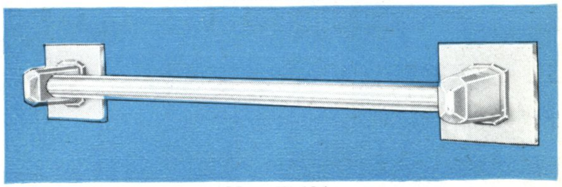
No. R 600
Projecting Shelf
Width of shelf, 5 in. Lengths, 18, 24, 30 and 36 in.
Base of brackets 4¼x4¼ in.



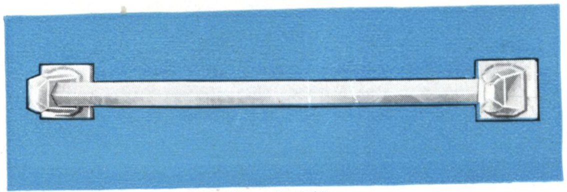
No. E 400
Projecting Shelf
Width of shelf, 5 in. Lengths, 18, 24, 30 and 36 in.
Base of brackets, 3x3 in.



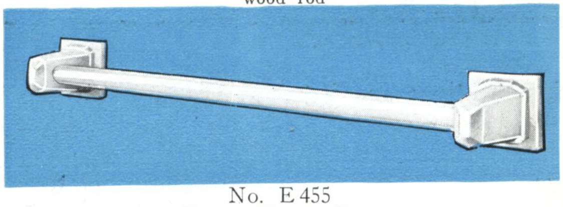
No. R 620
Square Non-slip Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 4¼x4¼ in.
Supplied with celluloid covered wood rod only



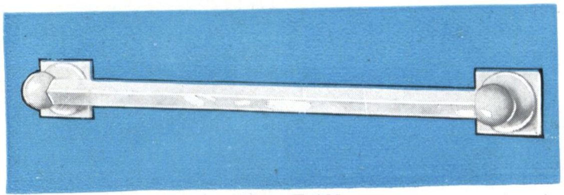
No. R 625
Round Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 4¼x4¼ in.
Supplied with opal glass, crystal glass or celluloid covered wood rod



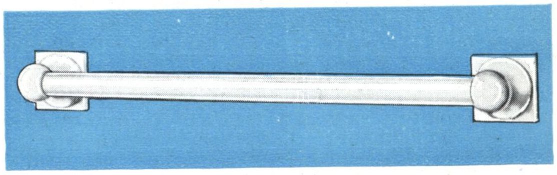
No. E 450
Square Non-slip Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 3x3 in.
Supplied with celluloid covered wood rod only
No. E 500. Same, with 2x3-in. Base



No. E 455
Round Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 3x3 in.
Supplied with opal glass, crystal glass or celluloid covered wood rod
No. E 505. Same, with 2x3-in. Base

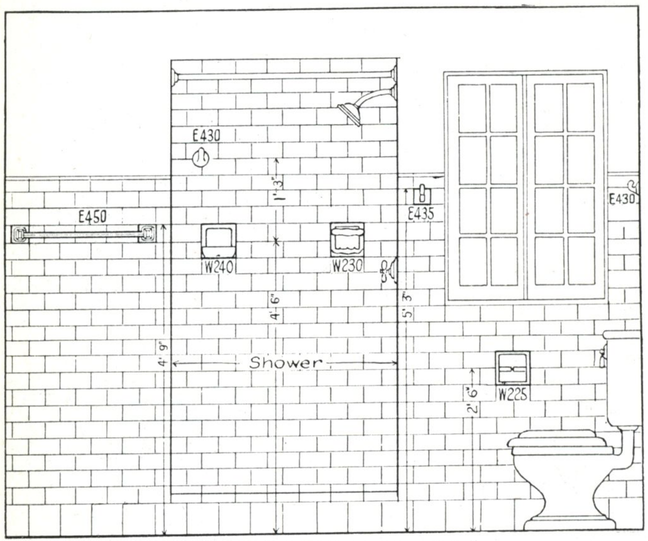


No. E 420
Square Non-slip Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 3x3 in.
Supplied with celluloid covered wood rod only

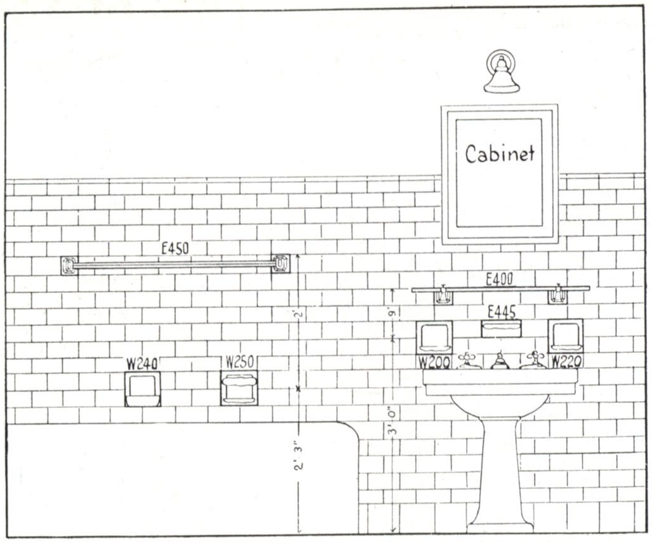


No. E 425
Round Towel Bar
Lengths, 18, 24, 30 and 36 in. Base of posts, 3x3 in.
Supplied with opal glass, crystal glass or celluloid covered wood rod

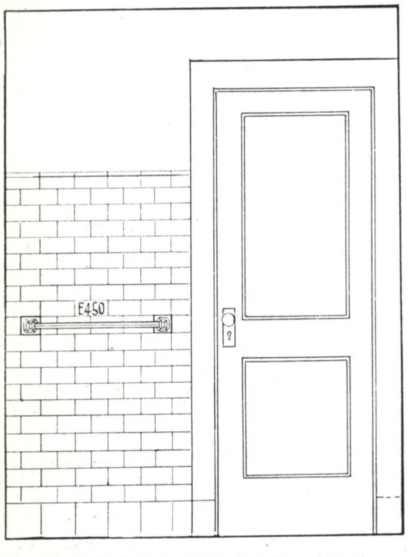
Continued on next page



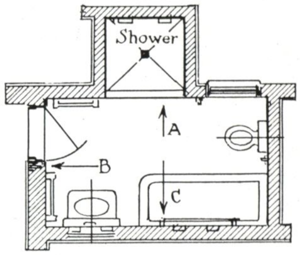
ELEVATION "A"



ELEVATION "C"



ELEVATION "B"



PLAN·DIAGRAM

For dimensions of the Accessories shown here, see illustrations on preceding pages.

SIZE OF TILE 3×6 INCHES

KEY TABLE TO ACCESSORIES

NUMBER	ARTICLE
W200	Recess Soap Holder
W220	Recess Tumbler Holder
W225	Recess, Roll Paper Holder
W230	Soap Holder & Grab (drain)
W240	Recess Sponge Holder
W250	Soap Holder & Grab (lip)
E400	Opal Glass Shelf
E430	Single Hook for Strop, etc.
E435	Double Hook for Robe, etc.
E445	Tooth Brush Holder
E450	Non-Slip Towel Bar

TYPICAL BATHROOM SHOWING WILLETTE STAE-FAST ACCESSORIES

Specifications for Vitreous China Bathroom Accessories

(1) The tile contractor shall furnish and set Vitreous China Bathroom Accessories as manufactured by The Willette Corporation, New York, N. Y., in accordance with the following Specification and Schedule:

(2) **Setting**—(A) ***Recessed Type***—(a) For Metal Lath Partitions—Cut the metal lath across the top and down each side of the opening, and bend the flap back at the bottom to form a shelf; complete the pocket by stuffing the space around the opening with excelsior bound together with plaster of paris. Then set pieces in rich cement mortar the same as for tile.

(b) For Masonry Partitions—Where not allowed for by masonry contractor, cut out pockets as required, and fill up any openings that would allow bonding mortar to escape. Then set pieces in rich cement mortar the same as for tile.

(B) ***Projecting Type***—Pieces shall be set in rich cement mortar, the same as for tile, and at the same or a later time.

(C) ***Both Types***—All pieces shall be set flush with tile, in order to secure greatest strength.

(3) **Location**—Shall be as shown on drawings or as directed by the architect. Tile joints shall be so located that each piece can be set without cutting the tile around it. Unless otherwise specified, accessories shall be centered over fixtures.

Note: The following schedule is suggested as typical, and can be varied as desired to fit requirements of any particular installation:

(4) **Schedule of Accessories**—(A) ***Bathrooms***—(a) For Each Lavatory—W 200 Soap Holder; E 445 Tooth Brush Holder; W 220 Tumbler Holder; E 400 Glass Shelf; E 450 Towel Bar.

(b) For Each Water Closet—W 225 Paper Holder.

(c) For Each Bathtub—W 250 Combination Soap Holder and Grab Rail; W 240 Sponge Holder; E 450 Towel Bar.

(d) For Each Shower Compartment—W 230 Combination Soap Holder and Grab Rail; W 240 Sponge Holder; E 430 Hook.

(e) Miscellaneous, for Each Bathroom—E 435 Robe Hook; E 430 Strop or Douche Hook.

(B) ***Kitchens***—For Each Kitchen—W 200 Soap Holder; W 220 Tumbler Holder; E 455 Towel Bar; E 400 Glass Shelf.

THE BENNETT MFG. CO.

Manufacturers of Enameled Steel Medicine Cabinets

ALDEN, N. Y.

NEW YORK OFFICE: 234 Bridge Street, BROOKLYN, N. Y.

Product

Enameled Steel Medicine and Service Cabinets.

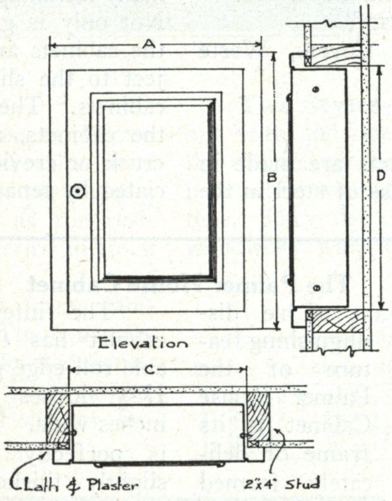
"Steel Maid" Cabinets

Constructed of full finished furniture steel of the proper gauge to produce cabinets of rigid strength. The finish is high grade baked white enamel which produces a finished article that can be washed and cleaned without affecting its appearance and matches the best interior white finish.

All cabinets are equipped with a glass knob, positive friction catch, hinges which allow door to be opened flat against the wall, adjustable shelf brackets for either steel or glass shelves and which allow cabinet to be reversed so it can be used with door opening to right or left.

MEDICINE STEEL MAID CABINETS

TRADE-MARK



Elevation and Sections showing method of installation – See table below for dimensions A-B-C and D.

Installation Details Medicine Cabinets

The regular depth of all recessed cabinets is about 4¼ in. inside, with a return of 1¼ in. They can be set in the usual 3-in. wall without the extra expense of building up.

Mirrors

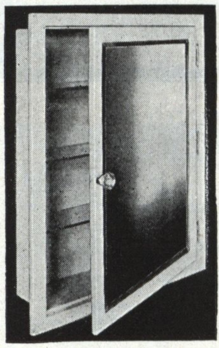
All mirrors are polished plate and will not cloud when washed. They can be furnished bevel or plain, as desired.

Special Sizes

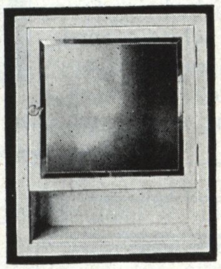
Cabinets can be made to conform to architects specifications or to meet special conditions.

Catalogue

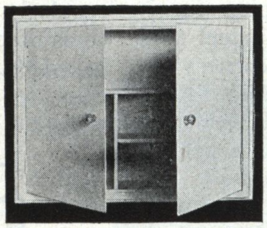
Write for descriptive booklet.



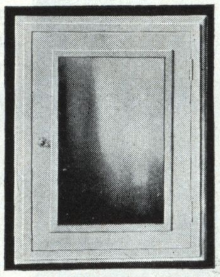
400 Line



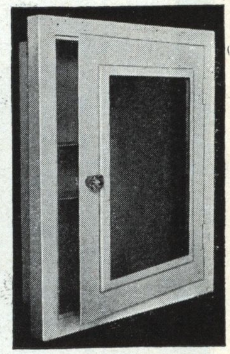
420 Line



1712 Recess Kitchen Service
1012 Wall Kitchen Service



700 Line



200 Line

"Steel Maid" Cabinets

MEDICINE CABINETS

Plate No.	Interior, in.	Exterior, in. A	Exterior, in. B	Wall opening, in. C	Wall opening, in. D	Mirror bevel or plain, in.	Number adjustable shelves, glass or steel	Plate No.	Interior, in.	Exterior, in. A	Exterior, in. B	Wall opening, in. C	Wall opening, in. D	Mirror bevel or plain, in.	Number adjustable shelves, glass or steel
410	16x22	18¾	24¾	16¼	22¼	14 x 20 Bv.	2 glass	207	14¼x18¼	17¼	21¼	14½	18½	10 x 14 Pl.	2 glass
412	18x24	20¾	26¾	18¼	24¼	16 x 22 Bv.	3 glass	208	13¾x19¾	16¾	22¾	14¼	20¼	10 x 16 Pl.	2 glass
414	20x26	22¾	28¾	20¼	26¼	18 x 24 Bv.	3 glass	209	15¾x19¾	18¾	22¾	16¼	20¼	12 x 16 Bv.	2 glass
416	22x28	24¾	30¾	22¼	28¼	20 x 26 Bv.	3 glass	210	15¾x21¾	18¾	24¾	16¼	22¼	12 x 18 Bv.	3 glass
418	24x30	26¾	32¾	24¼	30¼	22 x 28 Bv.	3 glass	212	17¾x23¾	20¾	26¾	18¼	24¼	14 x 20 Bv.	3 glass
420	16x22	18¾	24¾	16¼	22¼	14 x 14 Bv.	2 glass	708	13¾x19¾	17¼	23¼	14¼	20¼	10 x 16 Pl.	2 steel
422	18x24	20¾	26¾	18¼	24¼	16 x 16 Bv.	3 glass	709	15¾x19¾	19¼	23¼	16¼	20¼	12 x 16 Bv.	2 steel
424	20x26	22¾	28¾	20¼	26¼	18 x 18 Bv.	3 glass	710	15¾x21¾	19¼	25¼	16¼	22¼	12 x 18 Bv.	3 steel
426	22x28	24¾	30¾	22¼	28¼	20 x 20 Bv.	3 glass	712	17¾x23¾	21¼	27¼	18¼	24¼	14 x 20 Bv.	3 steel

KITCHEN SERVICE CABINETS

Plate No.	Interior, in.	Exterior, in. A	Exterior, in. B	Wall opening, in. C	Wall opening, in. D	Type	Shelves	Plate No.	Interior, in.	Exterior, in. A	Exterior, in. B	Wall opening, in. C	Wall opening, in. D	Type	Shelves
1712	23¾x17¾	27¼	21¼	24¼	18¼	Recess	2 steel	1012	23¾x17¾	24	18	....		Wall	2 steel

FRANK S. BETZ COMPANY

Manufacturers of Medicine Cabinets

HAMMOND, IND.

CONTRACT DEPARTMENT AND SALES ROOMS: CHICAGO, ILL., 634 So. Wabash Avenue—Telephone, Wabash 5912
NEW YORK OFFICE: 6-8 West 48th Street—Telephone, Bryant 6142
DALLAS OFFICE: 3213 Swiss Avenue

Products

Betzco Enameled Steel Medicine Cabinets.

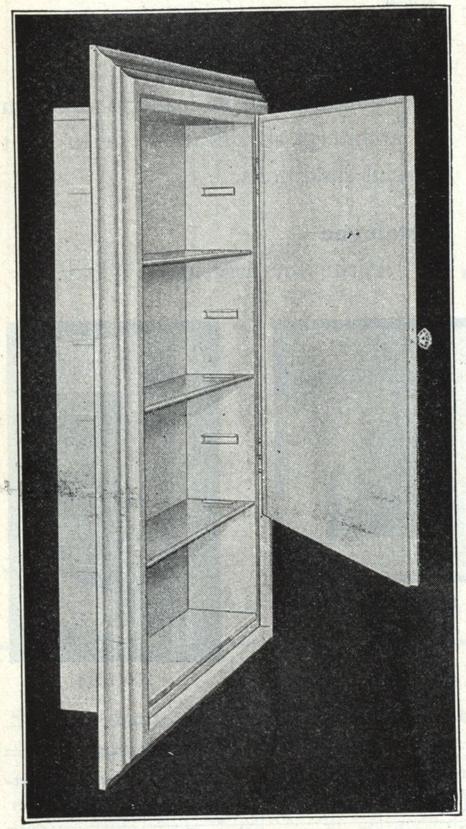
All-steel Standard "Kitchunits."

Also manufacturers of Radiator Covers, Waste Pails and Hospital Furniture.

Betzco Steel Medicine Cabinets

The Betzco Steel Medicine Cabinets are made in both built-in and exposed types. The use of steel in the construction of bathroom or medicine cabinets offers many advantages, obvious to both architect and builder. Not only is greater strength and rigidity secured, but the cabinets are more easily installed, and are not subject to the shrinkage which generally occurs in wood cabinets. The clean, washable white enamel finish of the cabinets, and the welded joints without opening, crack or crevice, make them sanitary—a quality appreciated by tenant and owner alike.

The Palmer House Cabinet



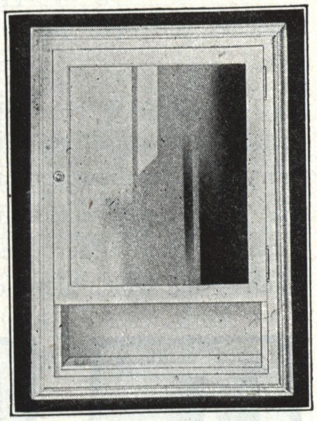
The distinguishing feature of the Palmer House Cabinet is its frame of delicately formed moulding. This is drawn from the best full-pickeled non-warping furniture steel and the corners are mitered and torch-welded to form a perfect union.

The door is of the flush type made with Betzco one-piece removable steel back for removing or replacing mirror. The mirror is the finest quality, polished plate glass. The door is equipped with crystal glass knob and bullet catch.

Convenient Open Recess—Below the cabinet door is an open recess equipped with an opalite glass bottom.

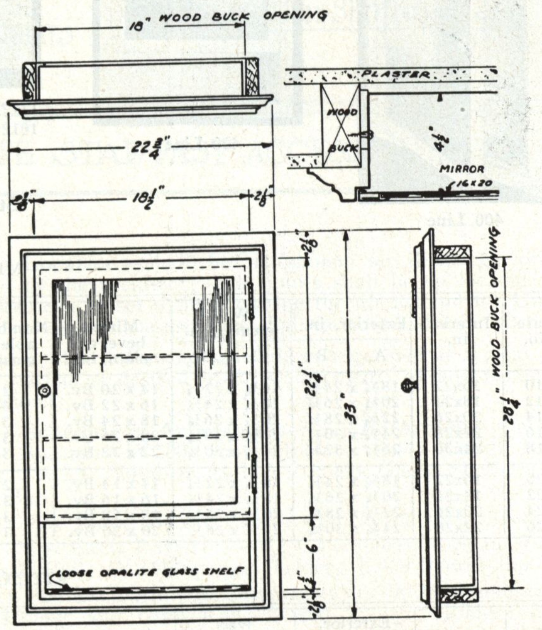
CABINET SIZES IN INCHES

	Wide	High	Deep
Overall	22¾	33	4¾
Mirror	16	20	....
Inside	17¼	27½	4
Recess shelf	17¼	6	4
Wall opening	18	28¼	4



The interior of the cabinet has three adjustable roll edge glass shelves, 17¼ inches long by 4 inches wide. The roll edge is perfectly smooth and slightly thicker than the shelf to prevent small objects from falling.

Any Finish—The Palmer House Cabinet is regularly finished in four coats of pure white enamel, baked on. Samples of any color to match woodwork, walls or tiling can be matched accurately.



Note: The space of ¼-inch is left between the body of the cabinet and the wood buck for the insertion of wood wedges to aid truing the cabinet.

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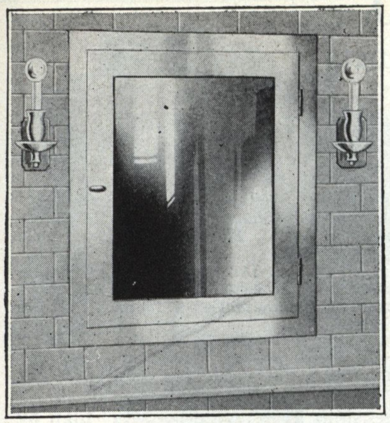
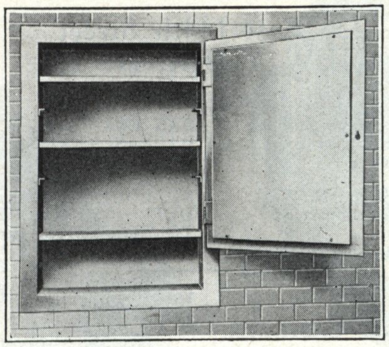
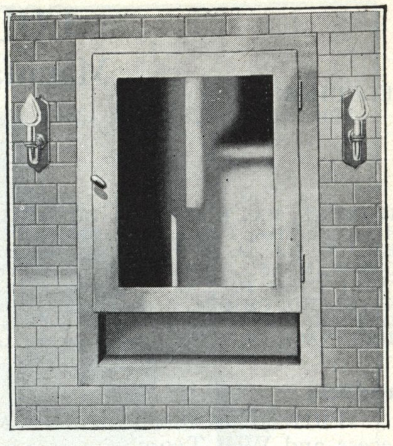






Standard All-steel Bathroom Cabinets

For utility, permanence and attractiveness, Betzco Steel Bathroom Cabinets offer exceptional value at a moderate price. This type of cabinet is particularly suitable for apartment buildings as well as for residences. The four sizes listed below are carried in stock for immediate delivery.

Electrically Welded—The plain flat frame cabinets are constructed with flat-lap doors. The construction throughout is of best grade stretcher-leveled furniture steel with electrically welded joints. Each cabinet is regularly equipped with adjustable steel shelves, finished in oven baked enamel.

Two Styles—The cabinets are made in two styles, one with and one without the open recess shelf below the cabinet proper. They are regularly finished with a pure white washable enamel, baked on at high temperature. They also can be furnished in any color to match woodwork, walls or tiling.

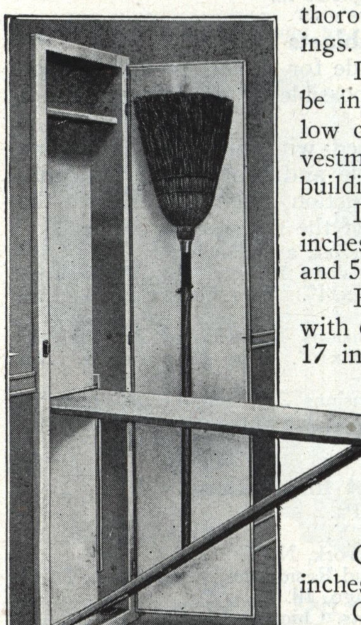
ALL-STEEL CABINET SIZES IN INCHES

Factory No.	Mirror size	Open recess	Outside	Wall opening
17 R 1518	16 x 12	4 x 15 x 4½	25½ x 17⅝	23 x 15 x 4½
17 R 1519	16 x 12	None	21½ x 17⅝	19 x 15 x 4½
17 R 1522	20 x 14	5 x 17 x 4½	30½ x 19⅝	28 x 17 x 4½
17 R 1523	20 x 14	None	25½ x 19⅝	23 x 17 x 4½

Combination Broom and Ironing Board Closet

The convenience of built-in cabinets such as the combination broom and iron-board closet shown here is becoming a great factor in the construction of modern homes and apartments.

This is a space saving and time saving device already installed in many of the most thoroughly modernized buildings.



Its size permits it to be installed in any wall. Its low cost makes it a good investment for any residential building.

Interior of cabinet, 65 inches high, 14 inches wide and 5 inches deep.

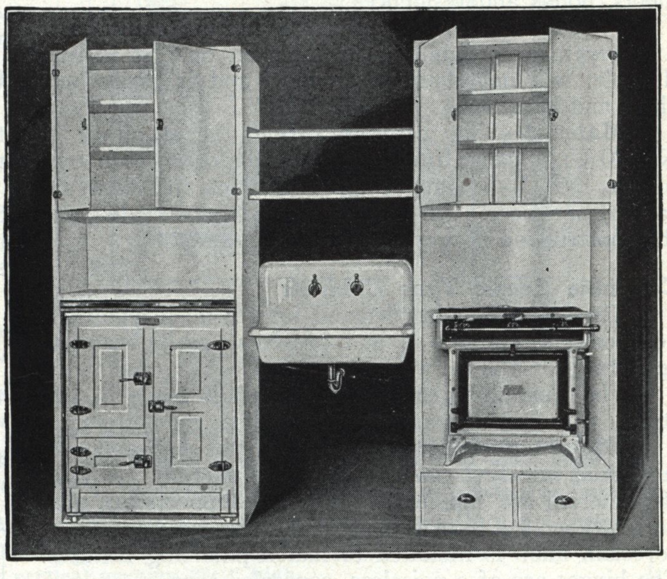
Front has 1½-inch trim with outside dimensions 68 by 17 inches.

Cabinet has steel shelf, 6 inches from top.

Constructed with all-steel double wall door, reinforced sides and back.

Standard All-steel "Kitchunits"—Ready Built Kitchens of Steel

Betzco All-steel "Kitchunits" are made in one standard size, 84 inches high, 34½ inches wide and 20 inches deep. There are four styles (styles C and D illustrated).



Style A is a refrigerator unit with large refrigerator and Style B is a gas range unit with gas plate but no oven.

"Kitchunits" come ready for installation. Made from enameled steel, they are attractive, sanitary and inexpensive. Cheaper than wood—and everlasting.

COLUMBIA METAL BOX CO.

Manufacturers of Steel Bathroom Cabinets

TELEPHONE
Mott Haven 1282, 1283, 1284

226 East 144th Street
NEW YORK, N. Y.

SALES REPRESENTATIVES

RICHMOND, VA., J. S. Archer, 203 Real Estate Exchange Building
PHILADELPHIA, PA., E. Cadwallader, 6023 Market Street
CHICAGO, ILL., A. D. Daniels, 717 Monadnock Block
BOSTON, MASS., A. F. McCarthy, 65 Oliver Street
WASHINGTON, D. C., G. E. Mattingly, 3158 18th Street, N. W.
CLEVELAND, OHIO, C. L. Porter, 3144 Meadowbrook Boulevard
NORFOLK, VA., G. L. White, 340 Withers Building
CINCINNATI, OHIO, Ruehrwein Sales Co., 304 East 3rd Street
SAN FRANCISCO, CAL., The Hoosier Store, 821 Market Street
DALLAS, TEX., M. R. MacKinnon, 317 Simpson-Whiteman Building
KANSAS CITY, MO., Builders Material & Supply Co., Republic Building
ST. LOUIS, MO., Kingsland & Rawlings, Inc., 1230 Arcade Building
DETROIT, MICH., H. J. Donovan, 1029 Majestic Building
TOLEDO, OHIO, Imperial Building Specialty Co., 412 Smith & Baker Building

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Products

White Enameled Steel Bathroom Cabinets, Recess and Wall Types.

Also manufacturers of Sanitary Sink Cabinets, Garbage Boxes and Enclosing Cabinets for Electrical Devices.

For Radiator Enclosure Cabinets, see page 2223.

Moderate Price—An Asset

The Columbia Metal Box Co. have standardized on a few sizes and styles which they produce in large quantities.

Quantity production enables them to sell these cabinets at prices comparing very favorably to wood cabinet prices.

Columbia White Enameled Steel Cabinets

Advantages—The white enameled steel cabinet is a modern convenience which can not be overlooked. It is sanitary in every respect. There are no seams to open. The baked-on white enamel finish is lasting. It will not discolor and is easily cleaned with soap and water.

The Columbia cabinets are made of heavy furniture steel, and are substantially constructed throughout. They are being used extensively today in the finest of apartments, hotels and residences.

Finish—The finish on all Columbia cabinets is a heavy lustrous white enamel, baked on. It is very durable, will not stain or discolor, and is easily kept clean and beautiful.

Material—The cabinet proper is stamped of No. 20 U. S. gauge furniture steel; the door is stamped of No. 16 U. S. gauge steel. Cabinet and door are each of one piece. All joints are electrically welded, and the construction is very substantial.

Columbia Recess Type Cabinets

There is a growing demand for the flush type cabinet recessed into the wall, as it presents a really beautiful appearance in the bathroom.

The Columbia recess type cabinet is made in two styles: with and without the open shelf at the bottom.

Equipment—Columbia recess type cabinets are furnished with first quality plate glass mirrors. Adjustable shelves are supplied. The shelf supports are permanently welded in place so that they can not be lost. A porcelain knob is mounted to match plumbing fixtures. The hinges are of a noiseless, concealed type.

Without Open Shelf at Bottom—These cabinets are made in three sizes, as follows:

Dimensions—No. 1900—Over-all dimensions 17½″ wide by 21½″ high by 4¼″ deep. Plain mirror 10″x14″. Size of hole in wall 14½″ wide by 18½″ high. Two glass shelves. Net weight, 20 lb.

No. 1901—Over-all dimensions 19½″ wide by 23½″ high by 4¼″ deep. Beveled mirror 12″x16″. Size of hole in wall 16½″ wide by 20½″ high. Two glass shelves. Net weight 22 lb.

No. 1902—Over-all dimensions 21½″ wide by 27½″ high by 4¼″ deep. Beveled mirror 14″x20″. Size of hole in wall 18½″ wide by 24½″ high. Three glass shelves. Net weight 30 lb.

With Open Shelf at Bottom—This style of cabinet makes a splendid installation in the bathrooms of hotels, apartment hotels, clubs or other institutions where transient guests are accommodated. The open shelf is very convenient for the guests' toilet necessities. It increases the efficiency and greatly improves the appearance of the bathroom. It is made in three sizes, which are suitable for either the medium or large size bathroom.

Dimensions—No. 1910 (with towel bar at bottom)—Over-all dimensions 17½″ wide by 23½″ high by 4¼″ deep. Beveled mirror 12″x12″. Size of hole in wall 14½″ wide by 20½″ high. Two glass shelves. Net weight 23 lb.

No. 1911—Over-all dimensions 19½″ wide by 25½″ high by 4¼″ deep. Beveled mirror 14″x14″. Size of hole in wall 16½″ wide by 22½″ high. Two glass shelves. Net weight 25 lb.

No. 1912—Over-all dimensions 21½″ wide by 27½″ high by 4¼″ deep. Beveled mirror 16″x16″. Size of hole in wall 18½″ wide by 24½″ high. Three glass shelves. Net weight 29 lb.

Access Door Cabinet

Designed especially for hotels. This cabinet affords easy access to pipes, valves and switches contained in a shaft in the wall. It is made in one size only, as follows:

No. 1922—Over-all dimensions 21½″ wide by 27½″ high by 4¼″ deep. Beveled mirror 16″x16″. Size of hole in wall 18½″ wide by 24½″ high. Net weight 25 lb.

Columbia Wall Type Cabinets

These cabinets are made for surface mounting upon the wall where it is not possible or desirable to use a recess type cabinet.

Equipment—Furnished with plate glass mirrors. Shelves are both adjustable and removable. The material used in their construction and the finish are the same high quality as that of the recess type cabinets.

Dimensions—Made in 3 sizes, as follows:

No. 1801—Over-all dimensions 16″ wide by 20″ high by 4¼″ deep. Plain mirror 10″x14″. Two glass shelves. Net weight 21 lb.

No. 1803—Over-all dimensions 18″ wide by 22″ high by 4¼″ deep. Beveled mirror 12″x16″. Two glass shelves. Net weight 23 lb.

No. 1804—Over-all dimensions 20″ wide by 26″ high by 4¼″ deep. Beveled mirror 12″x16″. Three glass shelves. Net weight 32 lb.

A Few Recent Prominent Installations

Pelham Courts, Philadelphia, Pa.
Hotel Shelton, New York, N. Y.
Hudson View Gardens, New York, N. Y.
Morris Cafritz, Apartments and Residences, Washington, D. C.
1110 Lake Shore Drive, Chicago, Ill.
Sheridan-Brompton Apartments, Chicago, Ill.
James Apartments, Syracuse, N. Y.
Commonwealth Apartments, Cedar Rapids, Iowa
Webster Hall, Detroit, Mich.
Hotel Imperial, Detroit, Mich.
Pilgrim Court Apartments, Boston, Mass.

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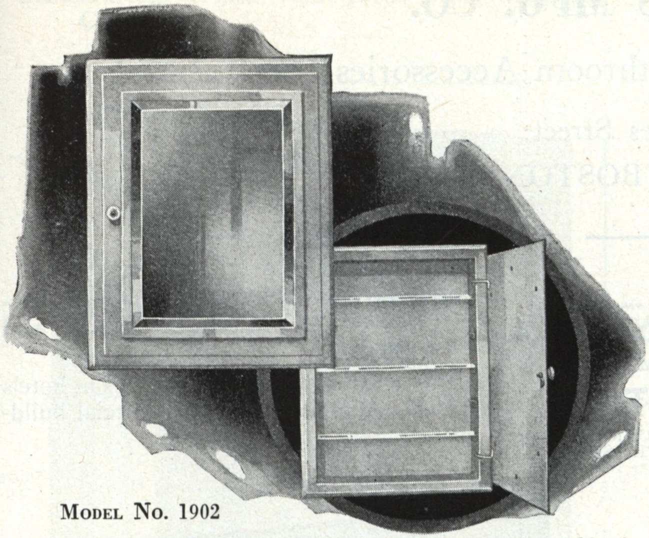
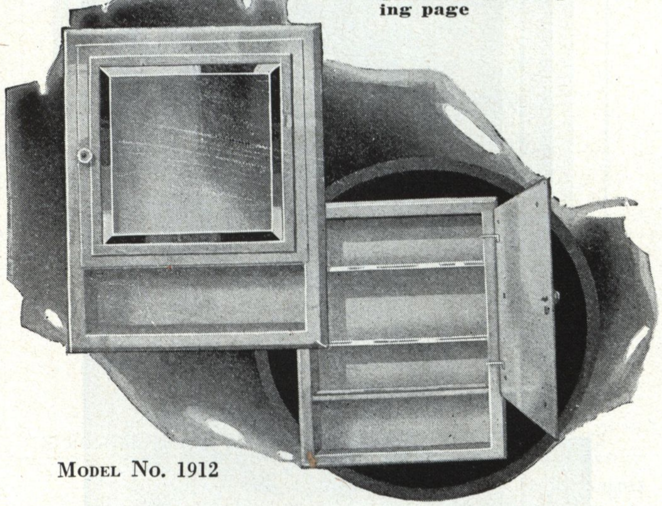


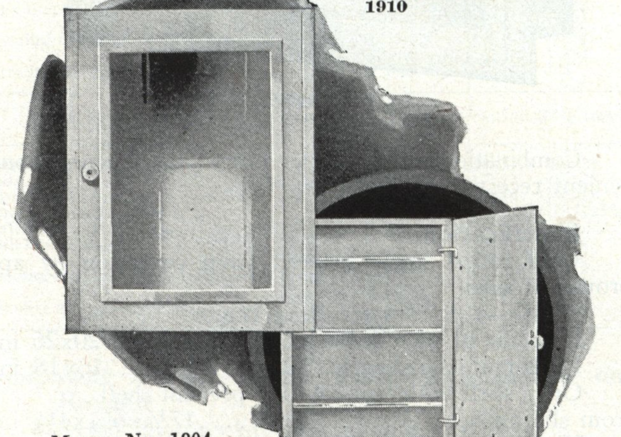
Model No. 1902

For flush mounting. This is the same type of cabinet as Models No. 1900 and No. 1901 described on the preceding page



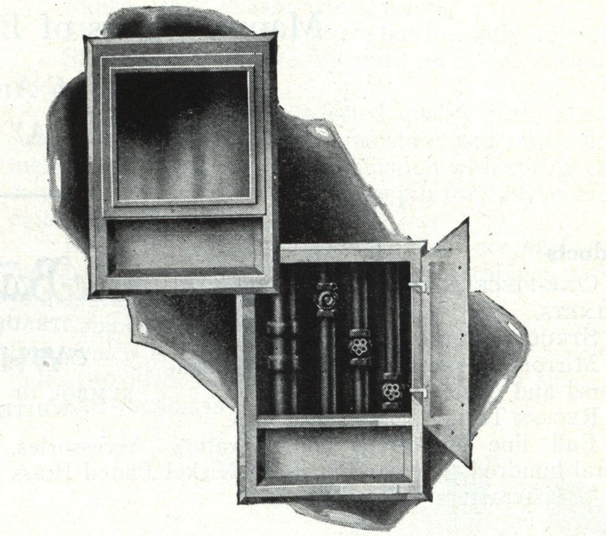
Model No. 1912

For flush mounting. This is the same type of cabinet as our Models No. 1911 and No. 1910 described on the preceding page with the exception of the towel bar attachment on the No. 1910



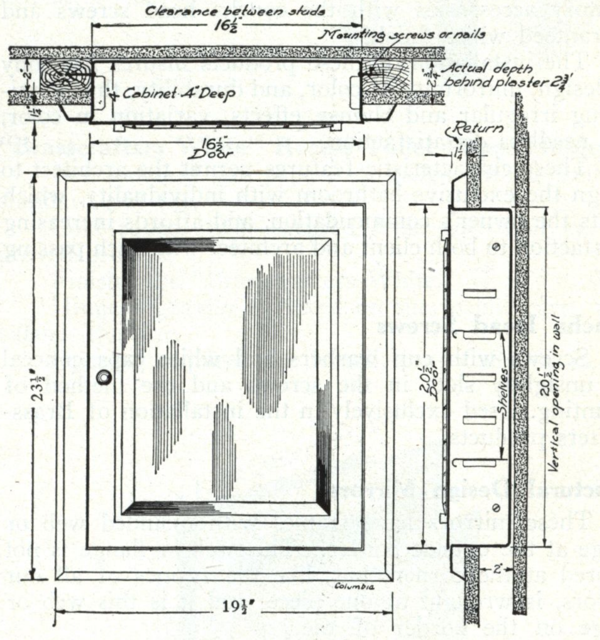
Model No. 1804

For wall mounting. This is the same type of cabinet as our Models No. 1801 and No. 1803 described on the preceding page



Model No. 1922

(Access Type)


Clearance between studs
16½"
Mounting screws or nails
2"
4"
Cabinet 4" Deep
1¼"
2¾"
Actual depth behind plaster 2¾"
16½" Door
Return
1¼"
23½"
20½" Door
Shelves
20½" Vertical opening in wall
2"
Columbia
19½"

Installation Details

The above dimensions are for Model No. 1901.

For No. 1900, the clearance between studs shall be 14½" wide and the vertical opening in wall 18½" high.

For Nos. 1902, 1912 and 1922, clearance between studs should be 18½" wide and the vertical opening in wall 24½" high.

For No. 1910, clearance studs 14½" wide and vertical opening in wall 20½" high.

For No. 1911, clearance between studs 16¼" wide and vertical opening 22½" high.

COLUMBIA WHITE ENAMELED STEEL BATHROOM CABINETS

J. P. EUSTIS MFG. CO.

Manufacturers of Bathroom Accessories

12-16 Ames Street
CAMBRIDGE "A" (BOSTON), MASS.

The Brasscrafters TRADE MARK
TRADE-MARK
The Brasscrafters WHITE
SYMBOL OF GUARANTEED
WHITE FINISH

Products

One-piece Recess Steel Medicine Cabinets.

Structural Design Mirrors.

Mirrors to specifications for all institutional and commercial buildings.

Recess Toilet Paper Holders.

Full line Bathroom and Lavatory Accessories, several hundred styles and sizes, in Nickel Plated Brass and "Brasscrafters White" finishes.

General

Brasscrafters accessories with joints silver-soldered wherever desirable, cover practically every need for residential, institutional and commercial building installation.

"Brasscrafters White"

This trade-mark is the symbol of bathroom and lavatory accessories with the concha head screws and guaranteed white finish.

The installation of these products insures harmony of design, uniformity of color, and durability, thus eliminating irregular and clumsy effects, variation in color, and needless dissatisfaction.

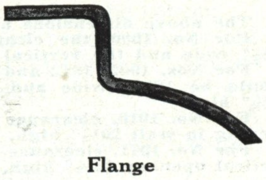
These characteristic features permit the architect to design the exclusive bathroom with individuality, which elicits the owner's commendation, and affords increasing satisfaction to both client and architect with each passing year.

Concha Head Screws

Screws with cup washers and white caps conceal the unsightly slots in the screws and the method of mounting. Used exclusively in the installation of Brasscrafters products.

Structural Design Mirrors

These mirrors have frames with moulded web or flange at the outside border. This web or flange is not mitered at the corners but, like the frames of all our mirrors, is wrought of one piece, and it is this web or flange on the border of the mirror frame which makes the whole a structural part of the panel or wall whereon it is placed. No openings or changes are required in marble or tile walls to install these and make them a part of the structure.



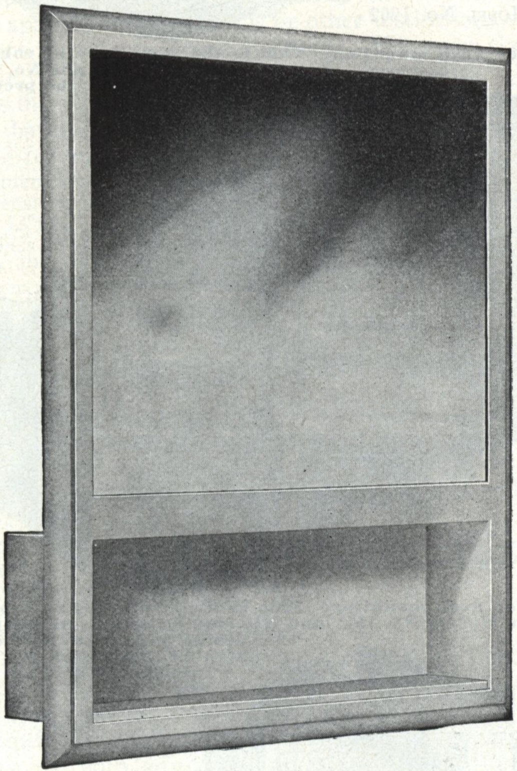
Flange

Specifications

Complete specifications are in Brasscrafters Hand Book. It is our aim to have a copy in every architect's and engineer's office. If the information is not on file in your office we will send the handbook on request.

"Brasscrafters White" Structural Design Combination Mirror and Shelf

For bathrooms and lavatories in hotels and all institutional and commercial buildings.



No. 16050

Combination, with ample mirror surface and convenient recess open shelf.

Specifications—

Cold rolled steel—secured from corrosion by approved process.

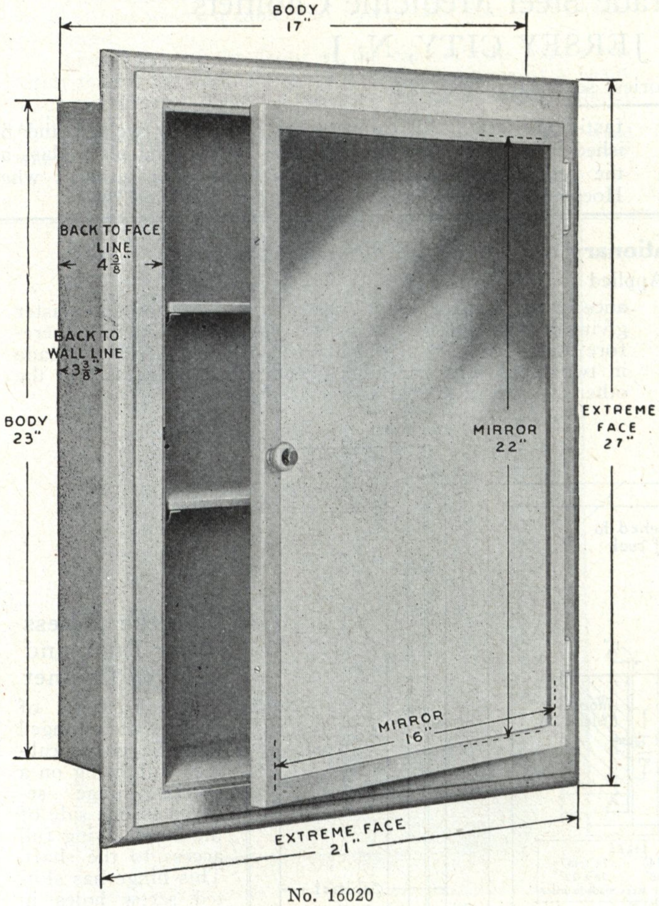
Finish—the "Brasscrafters White."

Extreme of moulded edges	20x26 in.
Mirror without bevel	16x18 in.
Open shelf with front stop to prevent shelf from sliding out	17⅛x6⅝x4⅛ in.
Vitrolite glass shelf in bottom of open shelf	17x4 in.
Wall line to face	⅞ in.
Wall line to back of open shelf	3⅜ in.
Opening required for recessing the open shelf	17½x7⅝x3½ in.

Screw holes in vertical sides of open shelf and concha head screws for mounting.

Continued on next page

"Brasscrafters White" One-piece Steel Medicine Cabinets


BODY 17"
BACK TO FACE LINE 4⅜"
BACK TO WALL LINE 3⅜"
BODY 23"
MIRROR 22"
EXTREME FACE 27"
MIRROR 16"
EXTREME FACE 21"

No. 16020
Full Mirror Door Type

SPECIFICATIONS AND ROUGHING-IN MEASUREMENTS

Full Mirror Door		No.16010	No.16020	No.16025
Extreme of moulded edges	in.	19x25	21x27	23x29
Body	in.	15x21	17x23	19x25
Mirror without bevel	in.	14x20	16x22	18x24
Wall line to face	in.	1	1	1
Wall line to back	in.	3⅜	3⅜	3⅜
Opening required for installation	Wide...in.	15¼	17¼	19¼
	High...in.	21¼	23¼	25¼
	Deep...in.	3⅜	3⅜	3⅜
Vitrolite glass shelves in each		2	2	3

Part Mirror Door and Open Shelf		No.16015	No.16030	No.16035
Extreme of moulded edges	in.	19x25	21x27	23x29
Body	in.	15x21	17x23	19x25
Mirror in door without bevel	in.	14x14	16x16	18x18
Open shelf under door	in.	14¾x5¾	16¾x5¾	18¾x5¾
Wall line to face	in.	1	1	1
Wall line to back	in.	3⅜	3⅜	3⅜
Opening required for installation	Wide...in.	15¼	17¼	19¼
	High...in.	21¼	23¼	25¼
	Deep...in.	3⅜	3⅜	3⅜
Vitrolite glass shelves in each		3	3	3

Equipment Subject to the Following Changes on Request

Beveled mirror plate instead of plain.
Plain metal panel instead of mirror plate.
Brass cylinder lock in addition to catch.
Polished plate glass shelves instead of Vitrolite glass.

Cold rolled steel—secured from corrosion by approved process.

Finish—the "Brasscrafters White."

Shelf rests—securely fixed, but instantly adjustable.

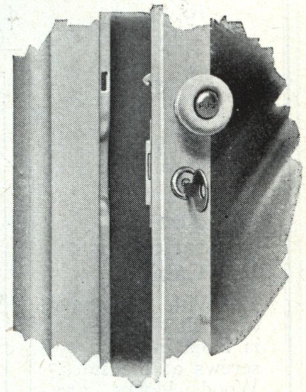
Shelves—pure white Vitrolite glass, impervious to acids and chemicals.

Mirror door—plain selected quality plate glass, in seamless metal frame, with moisture pad, flush fitting metal back, china knob in combination with spring catch, concealed hinge flanges, and loose pin for convenience in detaching the door.

Body and moulding are integral, or are made so by oxy-acetylene welding, thus securing a cabinet without joints, seams or cracks.

Cabinets—delivered ready for immediate installation, which is completed by using two wood screws in holes provided in the middle of the vertical sides.

Satisfaction is guaranteed.



Section of Cabinet with Brass Cylinder Lock

The lock is designed and fitted free from construction defects and to insure security

"Brasscrafters White" Recess Toilet Paper Holder

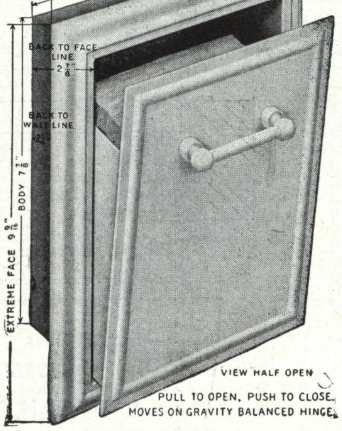
For standard size paper. Installed without cutting standard size tile.

Cold rolled steel—secured from corrosion by approved process.

Finish—the "Brasscrafters White."

Hinges—gravity balanced on the inside, carry and balance the box.

Opening required for installation—6x8x2⅜ in.


EXTREME FACE 7 9/16"
BODY 5 7/8"
BACK TO FACE LINE 2 7/8"
BACK TO WALL LINE 2¼
BODY 7 7/8"
EXTREME FACE 9 9/16"
VIEW HALF OPEN
PULL TO OPEN, PUSH TO CLOSE, MOVES ON GRAVITY BALANCED HINGE

No. 15475

TELEPHONE
Webster 4332, 5952

JOSEPH A. HOEGGER, INC.

Manufacturers of High Grade Steel Medicine Cabinets

351 Palisade Avenue, JERSEY CITY, N. J.

For Bathroom Accessories, see pages 2080-2086

Hoegger Electrically Welded Steel Medicine Cabinets

All Hoegger Medicine Cabinets, like Hoegger Bathroom Accessories, are made of the finest materials obtainable, and in recess or wall types in a range of styles to suit the most fastidious taste. All cabinets are electrically welded and finished in a beautiful white enamel. Mirror and plate glass are the best obtainable. For a partial list of references where Hoegger Products have been installed, see page 2080.

Hoegger Access Door Buck for Stationary or Hinged Medicine Cabinets

(Patent Applied for)

A pressed steel buck which is built into place in a definite location at the time the terra cotta partition is laid up. Eliminates necessity of cutting the required opening in the partition after the walls have been laid and finished. Saves much time and labor and gives a much better appearance to the finished job. Buck acts as a ground for plaster giving a straight, flush finished plaster job—cabinet therefore fits absolutely flush against the wall in all cases. Made in two types—one for fixed or stationary cabinets and the other type for a hinged cabinet.

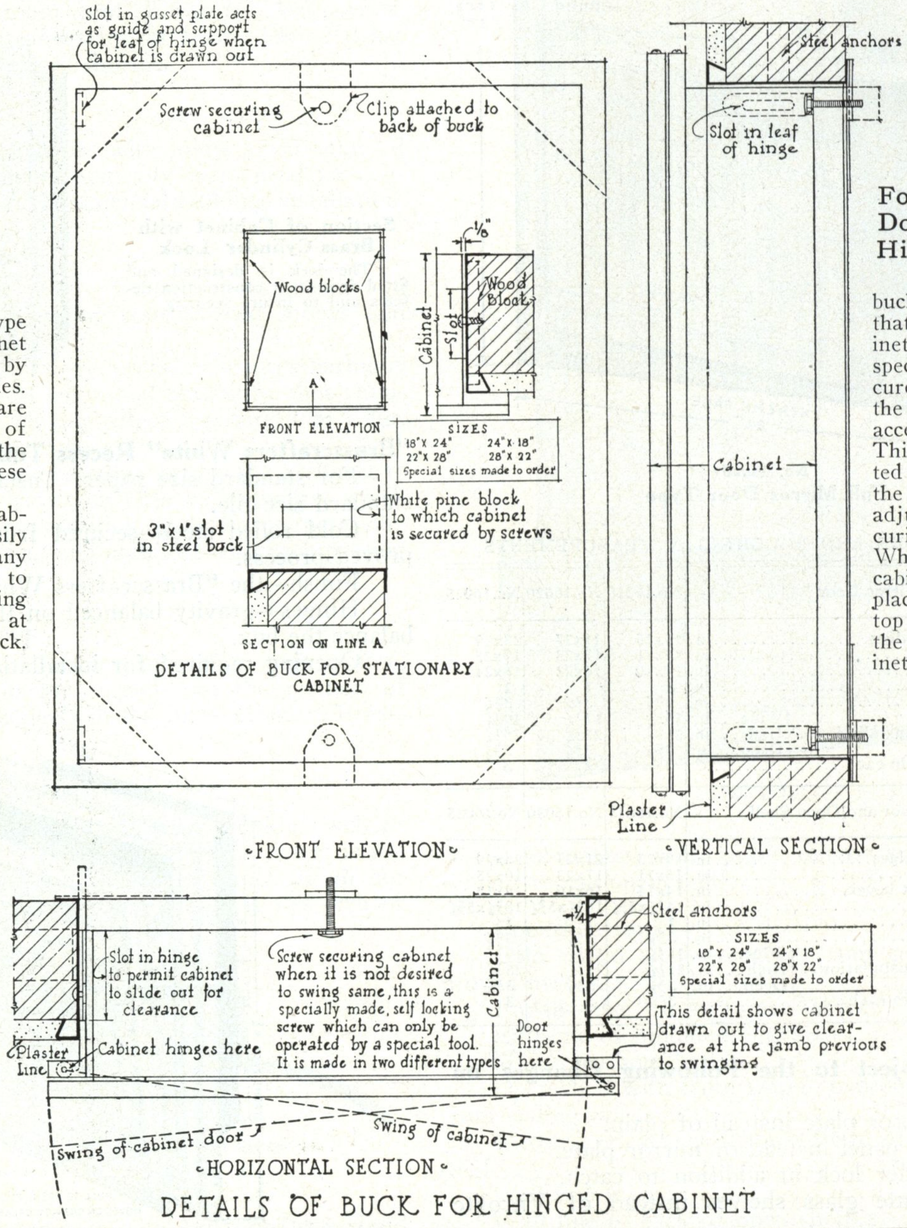
For the Stationary Cabinet

With this type of buck the cabinet is fixed in place by screws at the sides. Wood blocks are provided back of 1x3-in. slots in the buck to receive these screws.

The entire cabinet can be easily removed, at any time, for access to the shaft by taking out these screws at the side of the buck.

For the Access Door Buck and Hinged Cabinet

This type of buck is so arranged that the entire cabinet will swing on a special hinge secured to one side of the buck, giving full access to the shaft. This hinge has slotted screw holes in the leaf for 1-in. adjustment when securing to buck. When closed, the cabinet is locked in place by set screws, top and bottom, at the back of the cabinet.


Slot in gasset plate acts as guide and support for leaf of hinge when cabinet is drawn out
Screw securing cabinet
Clip attached to back of buck
Wood blocks
A
FRONT ELEVATION
1/8"
Wood Block
Cabinet
Slot
SIZES
18" X 24"
24" X 18"
22" X 28"
28" X 22"
Special sizes made to order
3"x1" slot in steel back
White pine block to which cabinet is secured by screws
SECTION ON LINE A
Steel anchors
Slot in leaf of hinge
Cabinet
Plaster Line
·FRONT ELEVATION·
·VERTICAL SECTION·
Slot in hinge to permit cabinet to slide out for clearance
Screw securing cabinet when it is not desired to swing same, this is a specially made, self locking screw which can only be operated by a special tool. It is made in two different types
Cabinet
1/4
Steel anchors
SIZES
18" X 24"
24" X 18"
22" X 28"
28" X 22"
Special sizes made to order
This detail shows cabinet drawn out to give clearance at the jamb previous to swinging
Plaster Line
Cabinet hinges here
Door hinges here
Swing of cabinet door
Swing of cabinet
·HORIZONTAL SECTION·

DETAILS OF BUCK FOR STATIONARY CABINET

DETAILS OF BUCK FOR HINGED CABINET

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.

TRADE WYCO MARK

HOEGGER ACCESS DOOR BUCK FOR FIXED AND HINGED MEDICINE CABINETS

JERSEY CITY HOEGGER NEW JERSEY

Continued on next page

Hoegger "Parfait" Recess Medicine Cabinet (Pat. Applied for)

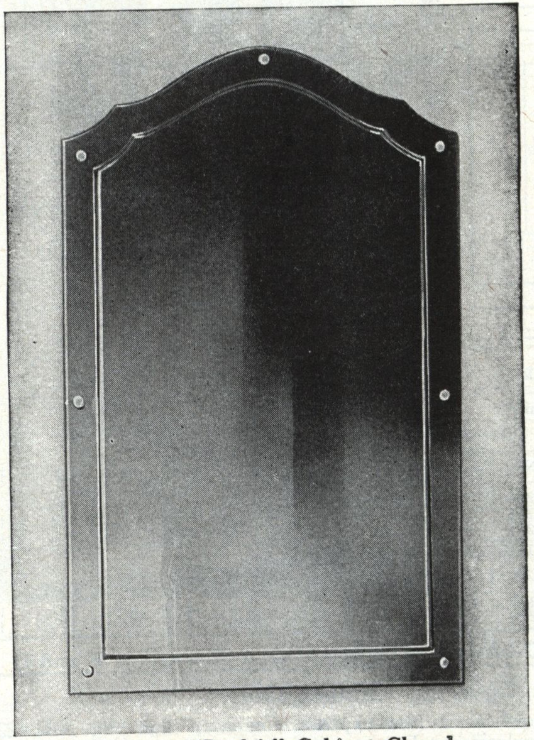
This cabinet is for use in high class residence, club or hotel rooms where a cabinet of exceptional beauty of design is desired.

The design of the front of the cabinet (the mirror entirely covers the cabinet) gives it the appearance of a beautiful mirror and conceals the fact that a medicine cabinet is housed behind the mirror.

Constructional Features—Door itself is made of white wood with a three-ply panel and concealed hinges braced with a brass corner piece embedded into this door—no tinning sound when door is closed. Doors open to the right but opening to left can be had on order. Door has a stop so it cannot be wrenched off the hinges. Has no knob—beautiful clip-on buttons conceal the special screws and washers used to screw the mirror to the wood frame. These buttons are white or colored as desired. Mirror is very easily kept clean.

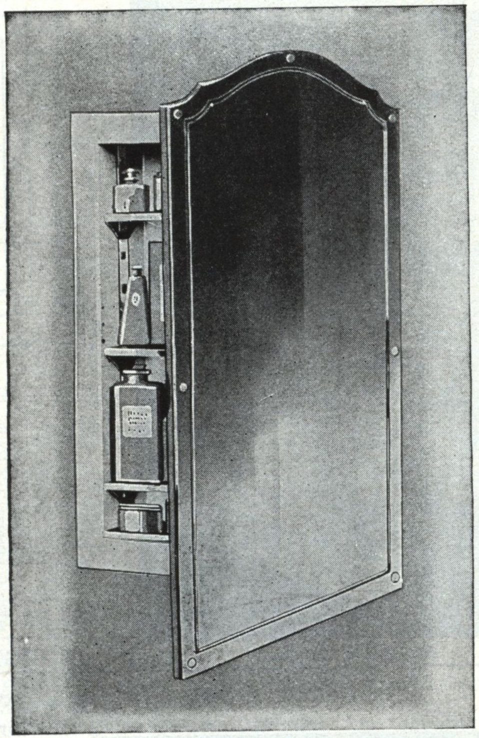
We also make up any design mirror without a cabinet including the triplicate mirror which has the same feature as the "Parfait" mirror.

Note: On new work where this cabinet is to be installed in brick or gypsum wall, the Hoegger Buck, described opposite, should be specified.

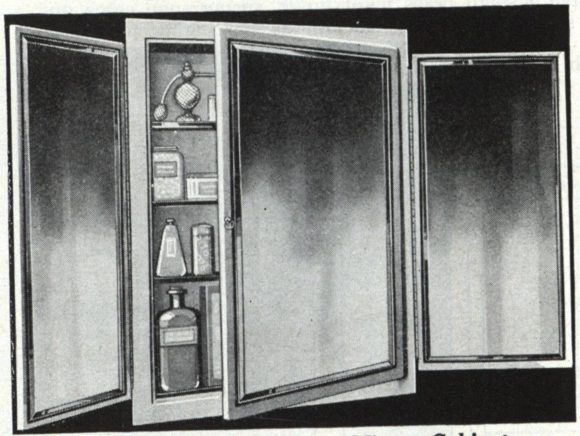


Hoegger "Parfait" Cabinet Closed

$125.00



Hoegger "Parfait" Cabinet Open



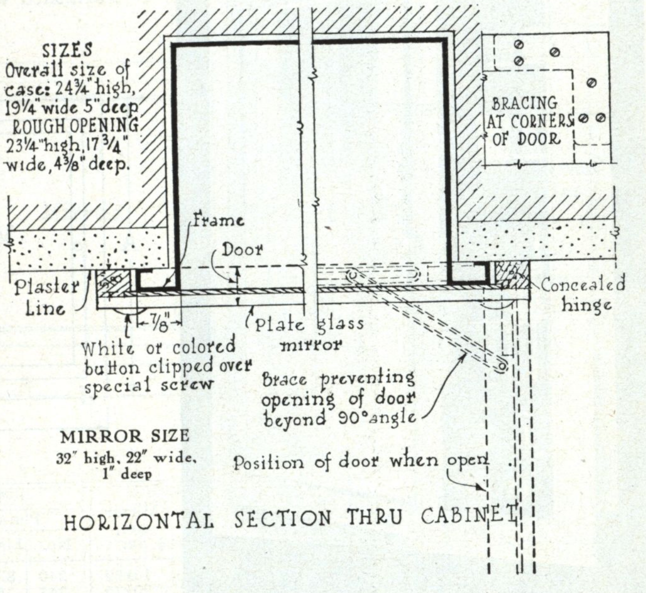
WBS Hoegger Side-Swing Mirror Cabinets

Side-swing mirrors may also be had on the "Parfait" design without a medicine cabinet

WBS- 240—Plain Mirror, $100.00	WBS- 241—Plain Mirror, $130.00
WBS-2240—Beveled Mirror, $110.00	WBS-2241—Beveled Mirror, $140.00
Swing mirror size, 10x22-in.	Swing mirror size, 12x26-in.
Swing mirror frames ¾-in. wide	Swing mirror frame, 1-in. wide
Width of cabinet and mirrors over all, 43-in.	Width of cabinet and mirrors over all, 51-in.
Height of cabinet over all, 27-in.	Height of cabinet over all, 31-in.
Leave hole in wall, 4⅜x18x24-in. high	Leave hole in wall, 4⅜x22x28-in.

For cabinet dimensions, see Nos. 240 and 241 on next page

All have three adjustable and one stationary, either crystal, opal or black shelves. Black stripes or any other colors on frames, near mirrors. Nickelsilver piano hinges.


SIZES
Overall size of case: 24¾" high, 19¼" wide 5" deep
ROUGH OPENING 23¼" high, 17¾" wide, 4⅜" deep.
BRACING AT CORNERS OF DOOR
Frame
Door
Plaster Line
7/8"
Plate glass mirror
Concealed hinge
White or colored button clipped over special screw
Brace preventing opening of door beyond 90° angle
MIRROR SIZE
32" high, 22" wide, 1" deep
Position of door when open
HORIZONTAL SECTION THRU CABINET

Roughing-in Measurements and Constructional Features of Hoegger "Parfait" Cabinet

TRADE WYCO MARK

HOEGGER "PARFAIT" RECESS MEDICINE CABINET

JERSEY CITY HOEGGER NEW JERSEY

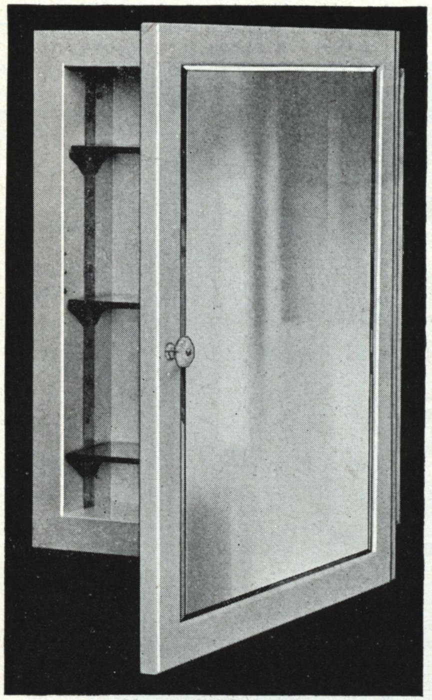
Continued on next page

Cabinets with Full Door Covering Cabinets and Flanges

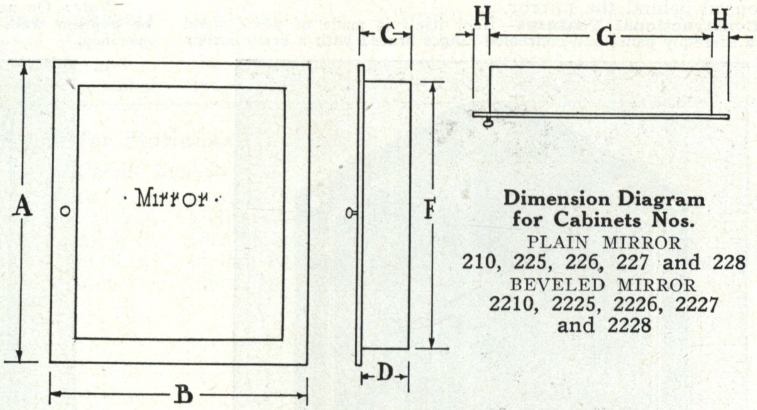
Next to the "Parfait" Cabinet, described on previous page, these cabinets should be specified where the highest grade medicine cabinet is desired. All doors cover cabinet and flanges and swing right or left. They have concealed hinges and spring snap catch.

Series Nos. 210, 227 and 228 have 2 adjustable glass shelves and crystal knob.

Series Nos. 225 and 226 have 3 adjustable and 1 stationary glass shelves and crystal knob.



No. 2225 Cabinet



Dimension Diagram for Cabinets Nos.
PLAIN MIRROR
210, 225, 226, 227 and 228
BEVELED MIRROR
2210, 2225, 2226, 2227 and 2228

MIRROR, LONG DIMENSION VERTICAL

Mirror size, in.	Type of mirror				Dimensions in inches						
	Plain		Beveled								
	No.	List price	No.	List price	A	B	C	D	F	G	H
14x18	210	$28.00	2210	$29.00	20	16	5	3½	18½	14½	¾
18x24	225	*48.00	2225	*50.00	27⅛	21⅛	5 15/16	4⅜	23½	17½	1½
22x28	226	64.00	2226	66.00	31	25	5 15/16	4⅜	27½	21½	1½

*Add $25.00 extra for 18% Hoegger Solid Nickel Door Frame.

MIRROR, LONG DIMENSION HORIZONTAL

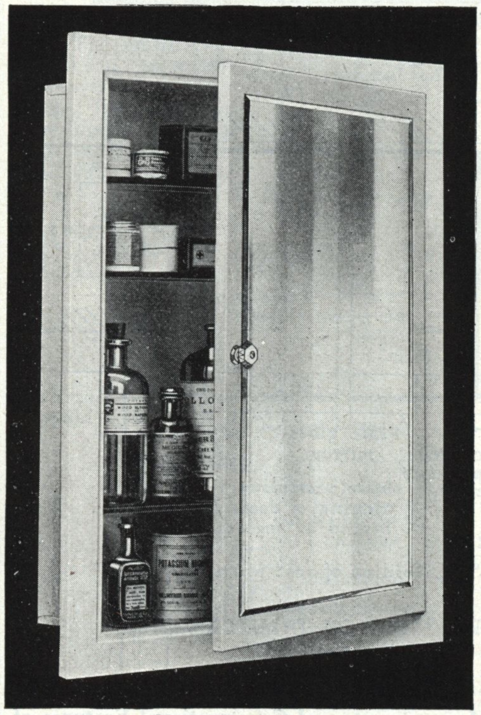
Mirror size, in.	Plain No.	Plain List price	Beveled No.	Beveled List price	A	B	C	D	F	G	H
24x18	227	58.00	2227	60.00	21⅛	27⅛	5 15/16	4⅜	17¾	23¾	1½
28x22	228	80.00	2228	84.00	25	31	5 15/16	4⅜	21½	27½	1½

ROUGH OPENING—Allow ½-in. larger than dimensions F and G

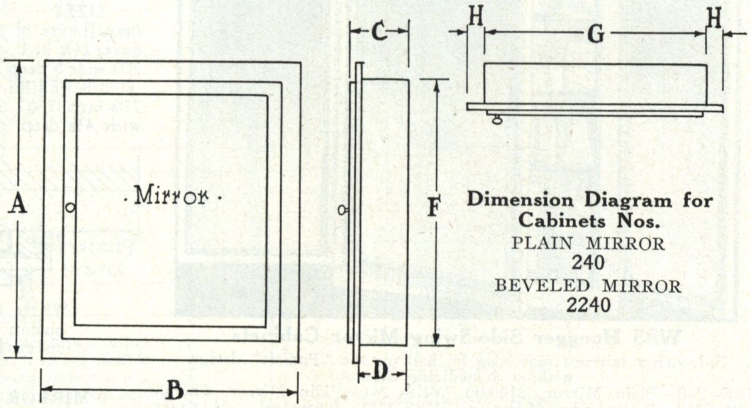
Cabinets with Flanges Exposed—Doors Covering Cabinet Only

For installations where a less expensive cabinet than the Nos. 225, 226, 227 and 228 are desired. Doors cover cabinet only and flanges are exposed. They have a small brass pivot hinge, spring snap catch and are otherwise of the same general construction as the higher priced cabinet described above.

Furnished with 3 adjustable glass shelves and crystal knob.



No. 2240 Cabinet



Dimension Diagram for Cabinets Nos.
PLAIN MIRROR
240
BEVELED MIRROR
2240

Mirror size, in.	Type of mirror				Dimensions in inches						
	Plain		Beveled								
	No.	List price	No.	List price	A	B	C	D	F	G	H
16x22	240	$36.00	2240	$38.00	27	21	5⅜	4⅜	23¾	17¾	1½
20x26	241	50.00	2241	52.00	31	25	5⅜	4⅜	27½	21½	1½

ROUGH OPENING—Allow ½-in. larger than dimensions F and G

Note: Special return flanges for 3-in. partitions for any recess cabinet where O.D. dimensions are 21x27 or 25x31-in.

TRADE WYCO MARK

HOEGGER "STANDARD" RECESS MEDICINE CABINETS

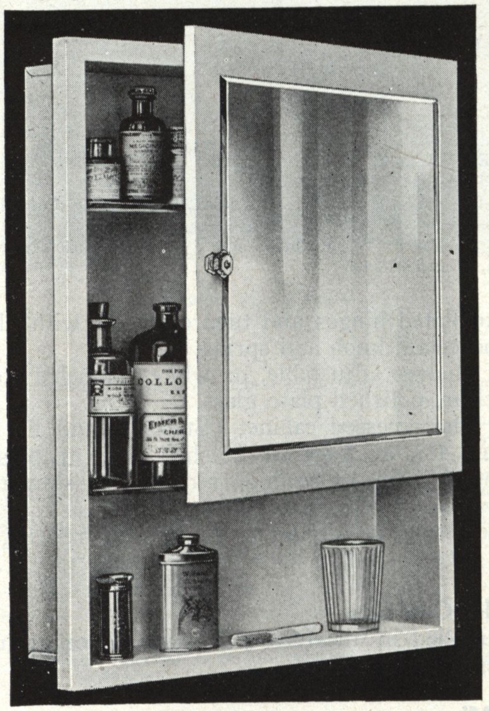
JERSEY CITY HOEGGER NEW JERSEY

Continued on next page

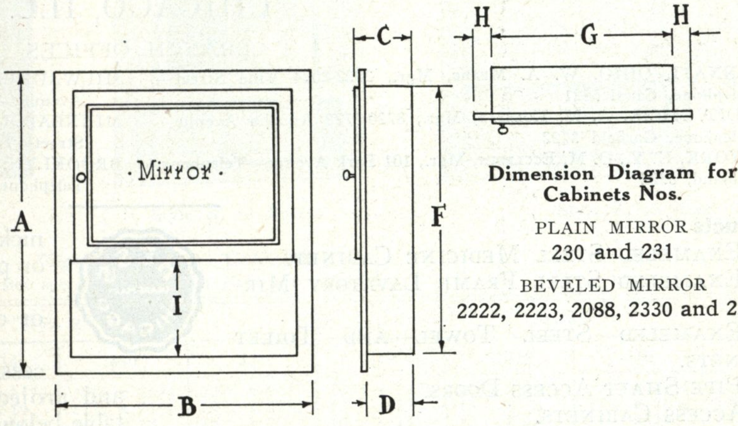
Cabinets with Short Door and Exposed Shelf

For installations where a medium priced cabinet of this style is desired. This cabinet is built with the same high grade materials and workmanship as all Hoegger Cabinets. Has concealed hinges and spring snap catch and crystal knob; 2 adjustable shelves in the door part of the cabinet and 1 stationary glass shelf on the exposed bottom.

Cabinets Nos. 230, 231, 2330, 2231 and 2088 have door covering cabinets and flanges. Nos. 2222 and 2223 have door covering cabinet only—flanges are exposed.



No. 2330 Cabinet



Dimension Diagram for Cabinets Nos.

PLAIN MIRROR
230 and 231

BEVELED MIRROR
2222, 2223, 2088, 2330 and 2231

Mirror size, in.	Type of mirror				Dimensions in inches							
	Plain		Beveled									
	No.	Price	No.	Price	A	B	C	D	F	G	H	I
16x18	230	$40.00	2330	$42.00	27	21	5	4⅜	23½	17⅜	1½	6¼
20x22	231	52.00	2231	54.00	31	25	5	4⅜	27½	21½	1½	6
14x14	.....	......	2222	30.00	27	21	5	4⅜	23¾	17¾	1½	6¾
18x18	.....	......	2223	40.00	31	25	5	4⅜	27½	21½	1½	7
14x14	.....	......	2088	24.00	26	18	4½	3½	20¼	16½	1	7

ROUGH OPENINGS—Allow ½-in. larger than dimensions F and G

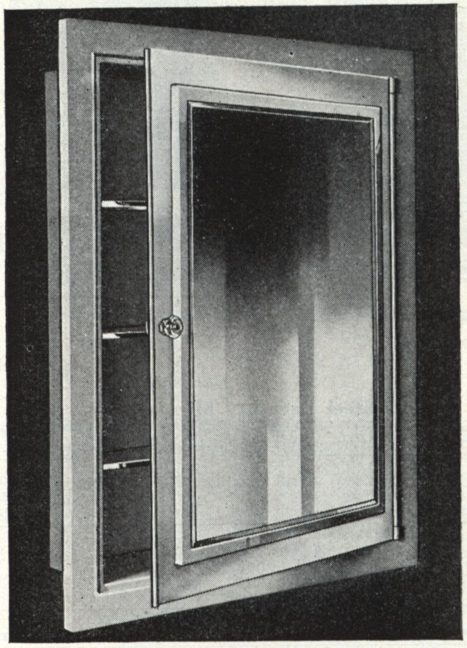
Lowest Priced Hoegger Full Door Cabinet

For installations where the lowest priced Hoegger Medicine Cabinet of this style is desired. This cabinet is built with the same high grade materials and workmanship as all Hoegger Cabinets but the mirror size is smaller in comparison with the size of this cabinet than on the higher priced cabinets.

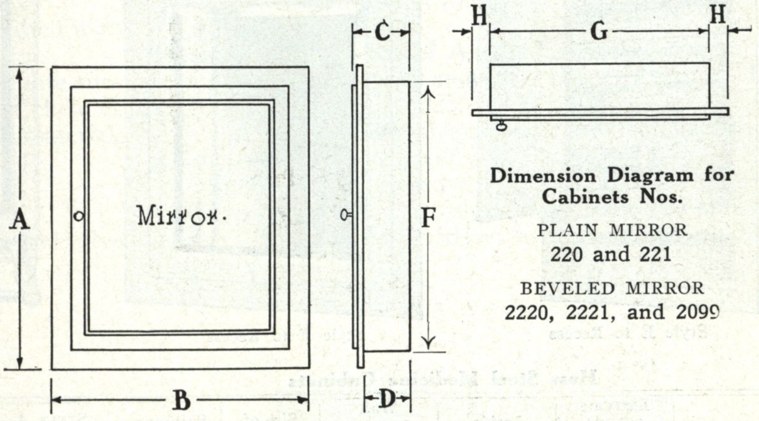
Has pivot hinge, spring snap catch, glass knob and 3 adjustable glass shelves.

Cabinets Nos. 220, 221, 2220 and 2221 have doors covering cabinets only—flanges are exposed.

Cabinet No. 2099 has door covering cabinet and flanges and 2 adjustable glass shelves.



No. 2220 Cabinet



Dimension Diagram for Cabinets Nos.

PLAIN MIRROR
220 and 221

BEVELED MIRROR
2220, 2221, and 2099

Mirror size, in.	Type of mirror				Dimensions in inches						
	Plain		Beveled								
	No.	Price	No.	Price	A	B	C	D	F	G	H
14x20	220	$30.00	2220	$31.00	27	21	5	4⅜	23¾	17¾	1½
18x24	221	42.00	2221	44.00	31	25	5	4⅜	27½	21½	1½
12x16	....	....	2099	20.00	22	18	4½	3½	24½	16¼	1

ROUGH OPENINGS—Allow ½-in. larger than dimensions F and G

Note: Special return flanges for 3-in. partitions for any recess cabinet where O.D. dimensions are 21x27 or 25x31-in.

TRADE WYCO MARK

HOEGGER "COMMERCIAL" RECESS MEDICINE CABINETS

JERSEY CITY HOEGGER NEW JERSEY

HESS WARMING & VENTILATING CO.

Snow White Steel Medicine Cabinets and Lavatory Mirrors

MAIN OFFICE
1207-1229 South Western Avenue
CHICAGO, ILL.

BRANCH OFFICES
CINCINNATI, OHIO, W. A. Meade, Mgr., 2022-2024 Vine Street—Telephone, Canal 6821
DETROIT, MICH., A. M. Kolstad, Mgr., 8720-8722 Arcadia Avenue—Telephone, Garfield 3722
NEW YORK, N. Y., O. M. Ecclesin, Mgr., 101 Park Avenue—Telephone, Ashland, 6322
MILWAUKEE, WIS., I. O. Blankenberg, Mgr., 594-596 National Avenue—Telephone, Hanover 962
MINNEAPOLIS, MINN., T. W. Ingersoll, Mgr., 709 East Lake Street—Telephone, South 3507
BROOKLYN, N. Y., S. W. Molokie, Mgr., 1374 Flatbush Avenue—Telephone, Mansfield 7426

Products

Enameled Steel Medicine Cabinets.
Enameled Steel Frame Lavatory Mirrors.
Enameled Steel Towel and Toilet Cabinets.
Pipe Shaft Access Doors.
Access Cabinets.
Welded Steel Hot Air Furnaces.
Also manufacturers of Grain Dryers, Steel Register Faces.

Hess White Steel Medicine Cabinets

Made of smooth, soft steel, enameled inside and out with best white varnish enamel baked in ovens and carefully rubbed to a satin finish. You can not buy a cabinet with finer finish.

The mirror is of best American plate glass, beveled or plain. The door, ½ in. thick, closes flush with the front in a rabbeted opening. Furnished with brass nickelplated hinges and turn catch, or with glass or porcelain knob and spring catch.

Shelves adjustable, of white enameled steel, or clear, polished plate glass.

The recessed cabinet (Styles E and F) recesses 4¼ in. back of finished face of plaster and projects 1¼ in. Openings required as shown in table below.

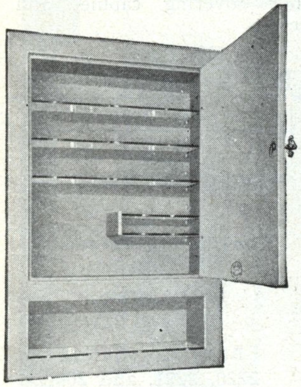
Another style, H, similar to F, does not recess, but attaches to face of wall.

Office Toilet Cabinets

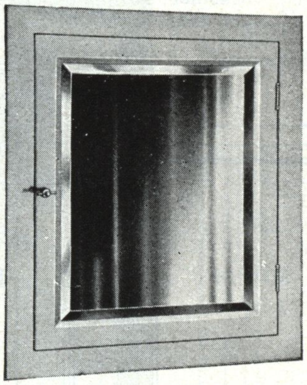
Are supplied in all stock sizes, colored or grained to match the woodwork.

Lavatory Mirrors

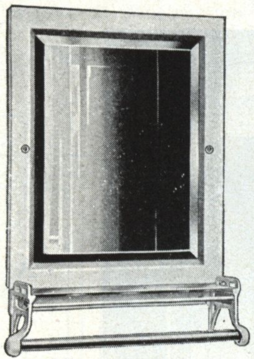
Similar in construction to mirror doors of the cabinets. Made with or without shelves and towel bars; also with pocket shelf to recess. Five sizes.



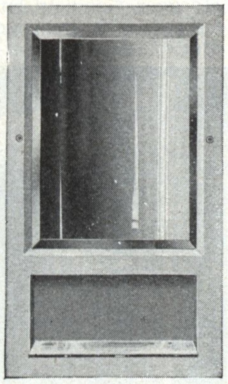
Style E to Recess



Style F to Recess



Mirror, Style A



Mirror, Style AA
Open Shelf below with glass bottom

Hess Steel Medicine Cabinets

No.	Extreme outside dimensions, in.	Inside dimensions, in.	Wall opening required, 4¼ in. deep	Size of mirror, in.	Shipping weight, lb.
Style E—To Recess, with Pocket Shelf Below					
19	16 x 27½	13½ x 16	13¾ x 24¼	10 x 14	42
20	21½ x 33½	18½ x 21	18¾ x 29¾	14 x 18	60
21	23½ x 35½	20½ x 23	20¾ x 31¾	16 x 20	70
22	25½ x 37½	22½ x 25	22¾ x 33¾	18 x 22	75
23	27½ x 39½	24½ x 27	24¾ x 35¾	20 x 24	80
Style F—To Recess					
29	16 x 20	13½ x 16	13¾ x 16¼	10 x 14	35
30	21½ x 25½	18½ x 21	18¾ x 21¼	14 x 18	50
31	23½ x 27½	20½ x 23	20¾ x 23¼	16 x 20	55
32	25½ x 29½	22½ x 25	22¾ x 25¼	18 x 22	65
33	27½ x 31½	24½ x 27	24¾ x 27¼	20 x 24	70
Style H—To Hang on Wall					
49	16¾ x 20	15⅜ x 18	....	10 x 14	47
50	21¾ x 24¾	20½ x 22¾	....	14 x 18	57
51	23¾ x 26¾	22½ x 24¾	....	16 x 20	75

Hess Steel Lavatory Mirrors

Style A—Mirror Only, with or without Glass Shelf and Towel Bar

No.	Outside dimensions (shelf and bar not included), in.	Wall opening, in.	Size of mirror, in.	Shipping weight, lb.
6	12⅜ x 16⅜	No opening required	10 x 14	30
60	17⅜ x 21⅜		14 x 18	35
61	19⅜ x 23⅜		16 x 20	38
62	21⅜ x 25⅜		18 x 22	40
63	23⅜ x 27⅜		20 x 24	43

Style AA—Mirror with Glass Bottom Open Recess Shelf Below

No.	Size over all, in.	Recess required, in.	Size of mirror, in.	Shipping weight, lb.
16	13¼x25¼	9½x6¼	10x14	30
160	17¼x29¼	13½x6¼	14x18	35
161	19¼x31¼	15½x6¼	16x20	38
162	21¼x33¼	17½x6¼	18x22	40
163	23¼x25¼	19½x6¼	20x24	43

Styles B and C are *access doors* and frame like Styles F and E, respectively, the box and shelves back of the door being omitted.

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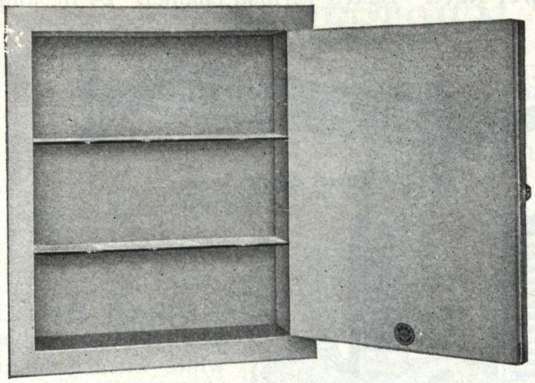
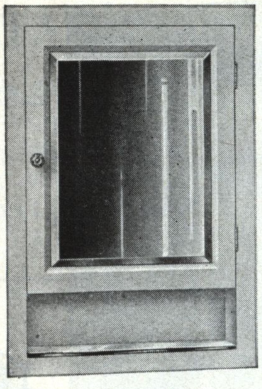
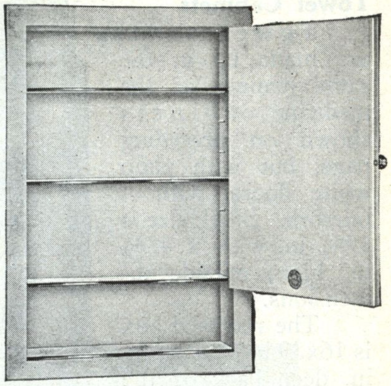

Style R, to Recess


Style S, to Recess


Style S, to Recess

"Special" Recess Cabinets
Do not specify if less than eight are required

	Style R				Style S			
	329	329½	330	331	319	319½	320	321
Outside dimensions.............in.	15⅝ x 19⅝	17⅝ x 21⅝	20½ x 24½	22½ x 26½	15⅝ x 24⅝	17⅝ x 26⅝	20½ x 29½	22½ x 31½
Wall openings.................in.	13 x 17	15 x 19	17¾ x 21¾	19¾ x 23¾	13 x 22	15 x 24	17¾ x 26¾	19¾ x 28¾
Size of mirrors...............in.	10 x 14	12 x 16	14 x 18	16 x 20	10 x 14	12 x 16	14 x 18	16 x 20
Shipping weight...............lb.	22	26	30	35	27	31	35	40
Price:								
Plain mirror and steel shelves..	$14.50	$16.25	$18.00	$23.00	$16.00	$17.75	$20.00	$25.00
Beveled mirror...............	15.40	17.15	19.00	24.50	16.90	18.65	21.00	26.50
Extra for plate glass shelves...	.80	.80	1.00	1.50	1.20	1.20	1.50	2.25

No order accepted for less than eight.
Sold at a discount of 50% or better, depending on quantity.
Ask to be shown a sample so you may know what real quality is.

Hess Special Cabinets, Styles R and S

Intended for the large projects only and are sold only in lots of eight or more. The standard depth of recess is 4¼ in., but special depth will be provided without extra charge in lots of 50 or more.

Best grade polished patent back plate glass mirror, plain or beveled, moulded glass knob, brass nickelplated hinges, brass spring bullet catch. Enameled steel or polished plate glass shelves.

The pocket shelf below in Style S is also fitted with a plate glass shelf.

Our "Special" cabinets are priced to compete successfully with wooden cabinets and with the cheaper lines of steel, yet they are of the best quality, in material, workmanship and finish.

Pipe Shaft Access Doors and Cabinets

Similar in appearance to the cabinets, and give access to pipes and valves back of them. For hotels, apartments, etc. Two styles: stationary cabinet with removable back (patented) or the whole cabinet on hinges, to swing out.

Provided with locks and keys if desired. Three styles: plain door and frame; with shelf and towel bar; with pocket shelf below.

Five sizes in each style.

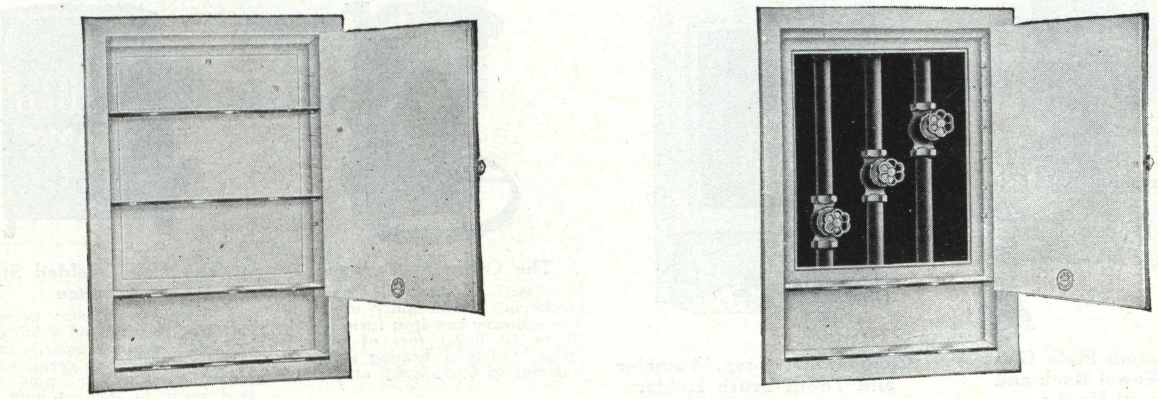
Illustrated booklet and price list on request.

Hess Snow White Steel Access Cabinets

For access to pipes and shaft back of cabinet. Patented November 6th, 1923.

The back is removable through the door, by turning a catch with a screwdriver.

Simple and inexpensive. Does away with extra frame and hinges. Furnished in all sizes and styles of Hess cabinets. Add $1.50 net to price of cabinet.


Hess Snow White Access Cabinets

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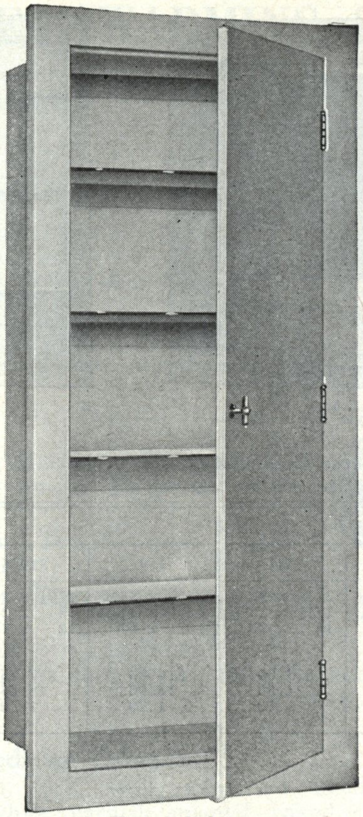
Towel Cabinets

Towel cabinets are made up in the same manner as the medicine cabinets shown on preceding page, but with plain white doors, without mirrors. Stock size is 19¾ in. wide x 43¾ in. high, outside dimensions.

The recessed box is 16x39 in. and is 8¾ in. deep back of the face of the plaster. It projects 1¼ in.

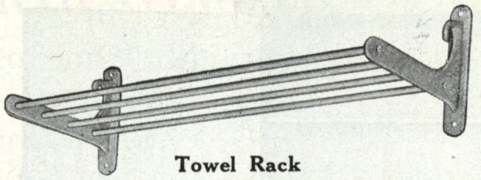
Four plate glass shelves are supplied. Special depth will be provided if necessary.

The hardware is of nickelplated brass, and the white enamel the same as that of standard medicine cabinets.

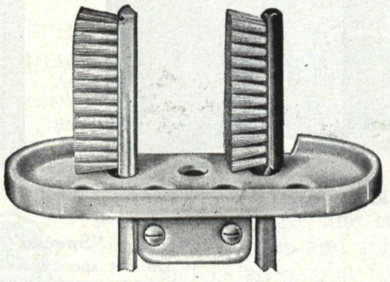


Towel Cabinet

Towel Rack—Baked varnish enamel. 24 in. long.

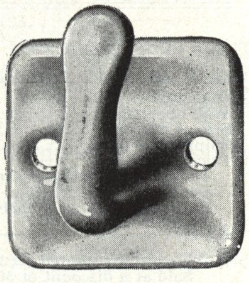


Towel Rack



Tooth Brush Holder

Tooth Brush Holder—Baked white varnish enameled.



Strop Hook

Strop Hook—Vitrified porcelain enameled.

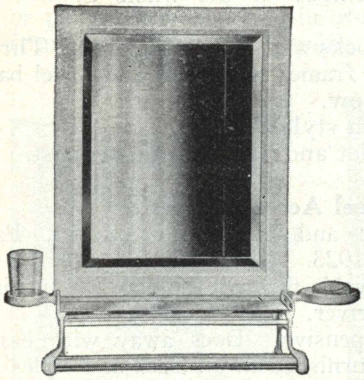
Accessories

Tumbler Holder—Baked white varnish enameled.

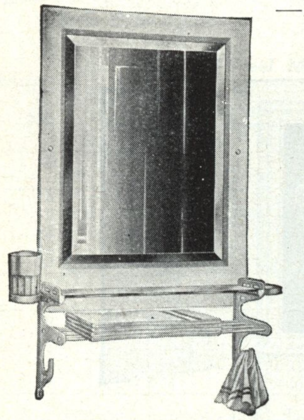
Soap Holder—Vitrified porcelain enameled. To attach to shelf holder on Style A mirror.

Combination Soap, Tumbler and Tooth Brush Holder—To attach to Style E and S cabinets or to the wall independently of the cabinet. Vitrified porcelain enameled. Convenient, high class, inexpensive.

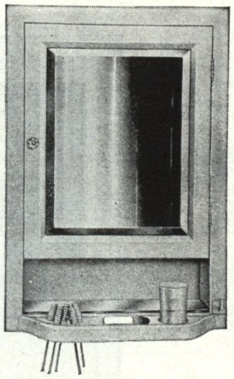
Combination Plate Glass Shelf, Towel Rack and Towel Hooks—Baked white varnish enameled.



Cabinet with Tumbler Holder and Soap Holder



Combination Plate Glass Shelf, Towel Rack and Towel Hooks



Combination Soap, Tumbler and Tooth Brush Holder

Our Guarantee

Specify all cabinets to be made by Hess Warming & Ventilating Co., and to bear the trade-mark Hess. The enamel on such goods is guaranteed not to crack, flake nor blister (external violence excepted). Our trade-mark is a promise to restore any enamel showing such defect or to replace with a new cabinet, without expense to the purchaser.

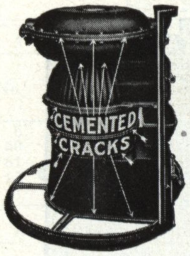
Hess Welded Steel Furnaces

Fully described in a 48-page illustrated handbook on heating. It is instructive and useful—no matter what furnace you use, and is sent free on request.

Hess furnaces are guaranteed. They burn any fuel and are specially adapted to oil; they deliver all the heat. Can not leak under pressure of motor driven fan.

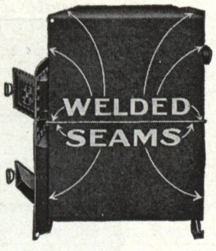
The difference between Hess furnaces and ordinary furnaces is radical.

It will pay to get full information.



The Ordinary Furnace

Rough castings; piled up with cracks filled with putty or sand. The ordinary cast iron furnace has 30 to 50 lineal feet of puttied joints. Limited heating surface; wasteful of fuel, leaky and dirty



The Hess Welded Steel Furnace

A solid steel box; every seam closed by riveting and welding. Firebox and grates inside. Immense radiating surface, evenly heated; never overheated. Seams guaranteed never to leak as long as the furnace stands

JAMESTOWN METAL PRODUCTS, INC.

Sanisteel Products

Chandler and River Streets
JAMESTOWN, N. Y.

Products

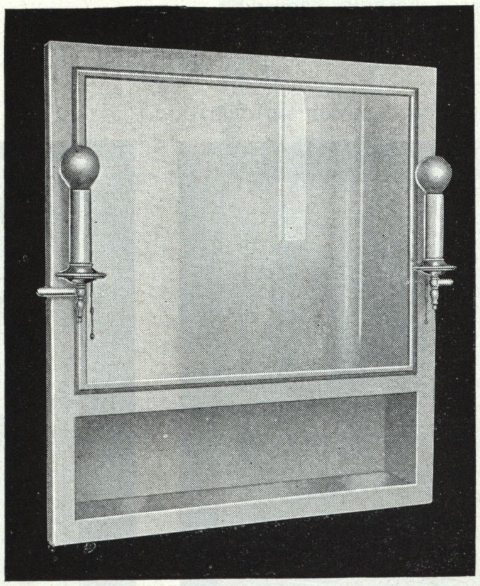
"SANISTEEL": Medicine Cabinets, Metal Frame Mirrors, Bathroom Accessories, Fire Hose Cabinets, etc.

Sanisteel Products

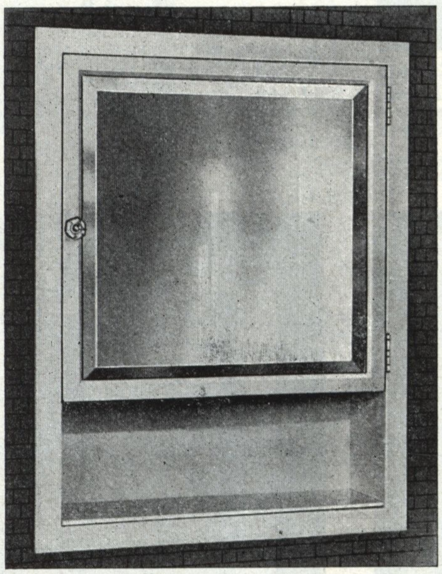
We build sheet metal equipment for hotels, apartments, clubs, hospitals, etc., according to the architect's specifications. These are finished in white enamel or any other finish desired. The "Pure White" enamel finish is applied and baked on by modern processes.

The construction is adaptable to meet any condition and the highest quality of work is guaranteed.

Estimates and designs furnished on application.



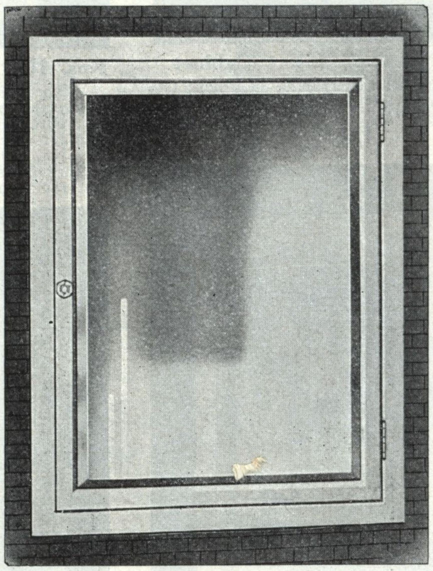
NO. 100 BATHROOM MIRROR WITH RECESS SHELF



NOS. 18½, 20½, 21½ AND 22½ RECESS CABINET

Plate No.	Extreme outside, in.	Recess depth, in.	Return flange, depth, in.	Mirror, in.	Wall opening required, in.
18½	18x24	3¾	1¼	14x14	16x22x4
20½	20x26	3¾	1¼	16x16	18x24x4
21½	22x28	3¾	1¼	18x18	20x26x4
22½	24x30	3¾	1¼	20x20	22x28x4

Fitted with 3 plate glass shelves, adjustable aluminum shelf supports, glass knob and friction catch. All screws and hinges nickelplated brass. Finished in four coats of white enamel baked on, gloss or rubbed finish



NOS. 18, 20, 21 AND 22 RECESS CABINET

Plate No.	Extreme outside, in.	Recess depth, in.	Return flange, depth, in.	Mirror, in.	Wall opening required, in.
18	18x24	3¾	1¼	14x20	15¼x21¼x4
20	20x26	3¾	1¼	16x22	17¼x23¼x4
21	22x28	3¾	1¼	18x24	19¼x25¼x4
22	24x30	3¾	1¼	20x26	21¼x27¼x4

Fitted with 3 plate glass shelves, adjustable aluminum shelf supports, glass knob and friction catch, all screws and hinges nickelplated brass. Can be used as right or left-hand cabinet. Finished in four coats of white enamel baked on, gloss or rubbed finish

ESTABLISHED 1816

THE F. H. LAWSON COMPANY

Manufacturers of Lawco Bathroom Cabinets

CINCINNATI, OHIO

BRANCH OFFICES

CHICAGO, ILL., 60 East Lake Street

BROOKLYN, N. Y., 33 Bush Terminal

Quality Cabinets at Reasonable Prices

Lawco Bathroom Cabinets are made of heavy sheet steel. All parts are cut and formed with specially made dies and jigs. All joints are welded and soldered. Hinges are sufficiently strong to carry door with plate glass mirror without sagging.

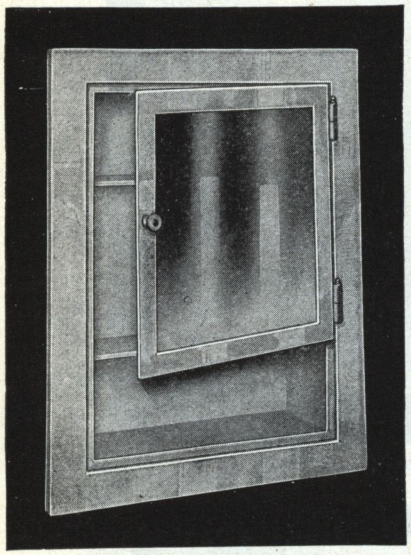
Finished inside and out with a beautiful white lacquer enamel, which is permanent and almost indestructible.

Write for complete information.

DIMENSIONS (INCHES) OF LAWCO INSERT CABINETS

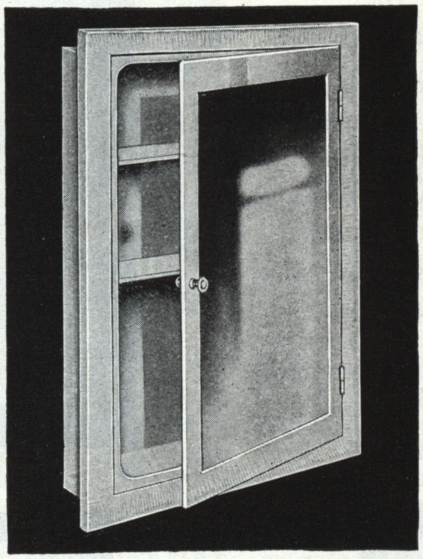
No.	Outside dimension, wall flange	Wall opening	Flange		Door	Mirror	Ship'g wt., lb.
			Depth	Width			
100	17¾x22⅝	13¼x19¼x3½	1¼	1¾	14 x19	10x14	30
150	17¾x22⅝	13¼x19¼x3½	1¼	1¾	14 x14	12x12	35
200	17¾x22⅝	13¼x19¼x3½	1¼	1¾	14 x19	11x16	35
250	16¾x22¾	12¾x19½x3½	1⅝	1½	13⅜x13⅜	12x12	45
300	16¾x22¾	12¾x19½x3½	1⅝	1½	13⅜x19⅜	12x18	45
350	18¾x24¾	14¾x21½x3½	1⅝	1½	15⅜x15⅜	14x14	50
400	18¾x24¾	14¾x21½x3½	1⅝	1½	15⅜x21⅜	14x20	50
450	20¾x26¾	16¾x23½x3½	1⅝	1½	17⅜x17⅜	16x16	55
500	20¾x26¾	16¾x23½x3½	1⅝	1½	17⅜x23⅜	16x22	55

All above from 250 to 500, inclusive, can be furnished in the patented "Access" Type.



No. 150. Lawco Insert Cabinet

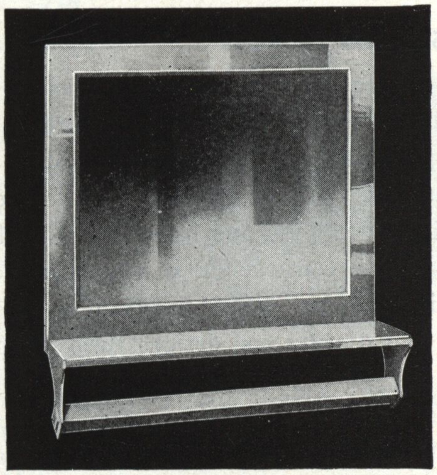
Best quality plate mirror ¼ in. thick; two adjustable glass shelves; hexagon porcelain knob operating adjustable spring plunger catch. Hinges, white enamel steel



Nos. 100, 200. Lawco Insert Cabinet

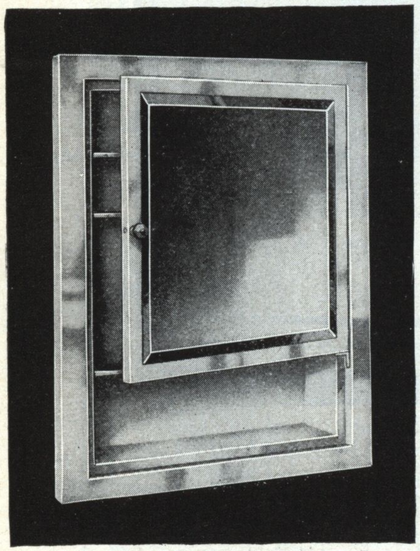
No. 200—Best quality plain plate mirror ¼ in. thick; two adjustable glass shelves 13x14 in.; porcelain knob operating inside, adjustable plunger catch; hinges, white enamel.

No. 100—Similar to No. 200, except 10x14 in. mirror, stationary metal shelves and mirror not removable



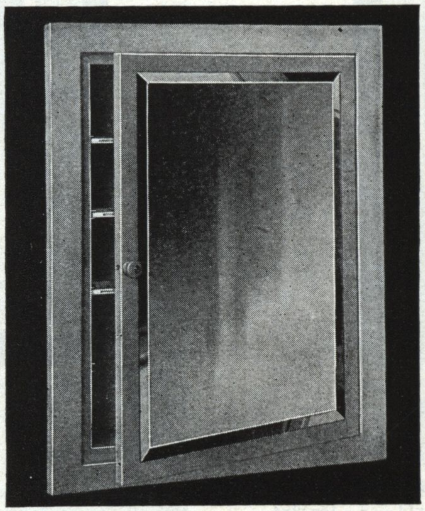
Lawco Combination Mirror, Shelf and Towel Bar

Best quality plain mirror 13¼x15½, ¼ in. thick; white opal glass shelf 5x18, 3/16 in. thick; mirror flange 1⅝ in. wide, ⅞ in. deep; Armco ingot iron towel bar with three coats of white vitreous enamel, burnt on. Over-all dimensions, 20 in. high, 18½ in. wide, 6 in. deep from front edge of shelf to back of mirror flange



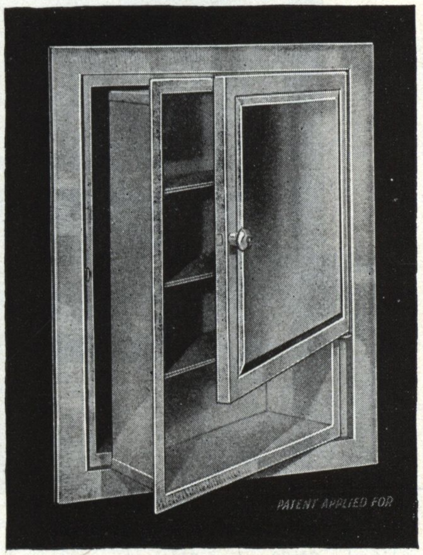
Nos. 250, 350, 450. Lawco Insert Cabinets with Short Door and Exposed Shelf

Best quality bevel plate mirror ¼ in. thick; three adjustable ¼-in. plate glass shelves; white porcelain hexagon knob operating inside, adjustable spring plunger catch; concealed pin hinges



Nos. 300, 400, 500. Lawco Insert Cabinets with Long Door

Best quality bevel plate mirror ¼ in. thick; three adjustable ¼-in. plate glass shelves; white porcelain hexagon knob, operating inside, adjustable brass spring plunger catch; concealed pin hinges



Lawco "Access" Insert Cabinet

The only practical access cabinet on the market. This type can be furnished in No 250 to 500

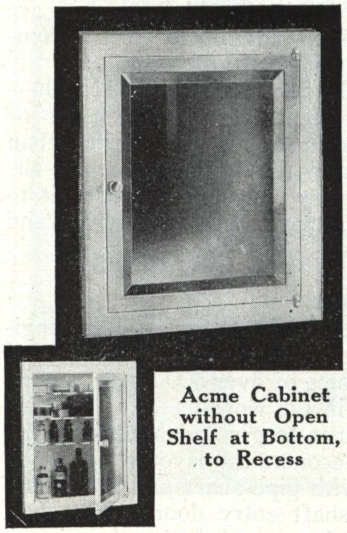
MORTON MANUFACTURING COMPANY

Acme Sanitary Steel Medicine Cabinets

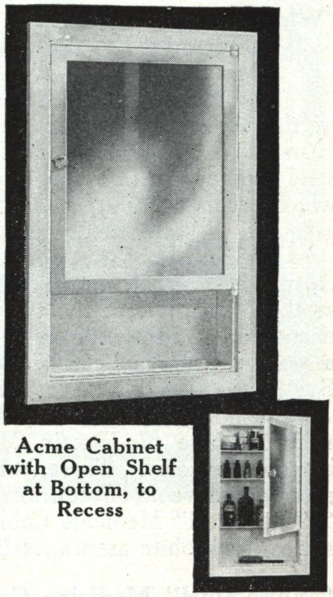
CABLE ADDRESS
"MORMANCO CHICAGO"

GENERAL OFFICES AND FACTORY
5133-5143 West Lake Street
CHICAGO, ILL.

Codes A.B.C.
5th Edition, Bentley's
Lieber's



Acme Cabinet without Open Shelf at Bottom, to Recess



Acme Cabinet with Open Shelf at Bottom, to Recess

Products

ACME SANITARY STEEL MEDICINE CABINETS.

Also Kass Safety Treads for Stairs and Floors; Acme Line of Steel Doors, Welded Tubing and Steel Products.

Materials

Acme Cabinets are made of heavy gauge, rust resisting steel, properly fabricated to insure rugged durability and permanently satisfactory operation without sagging or warping. This Company has specialized for years in the fabrication of highly finished steel doors and interior trim for railway passenger cars and, consequently, we have an unusual equipment of machinery, sandblasters, sprayers, and ovens for producing the highest grade enameled steel cabinets *at attractive prices.*

Principal Excelling Features

(1) Sanitary coved (rounded) corners in which dust can not collect—easy to clean.

(2) Sanitary white metal brackets to support shelves; edges and corners rounded—no cracks or joints to collect dust.

(3) Sanitary hinges, made of white metal—will not rust.

(4) Specially designed combination ball and spring catch.

(5) Clear crystal cut-glass knob with rubber protecting cushion.

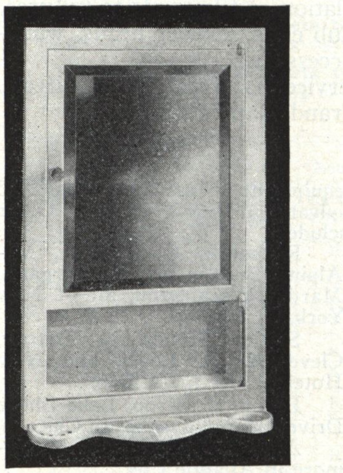
(6) Selected mirror.

(7) Mirror easily replaced, if found necessary.

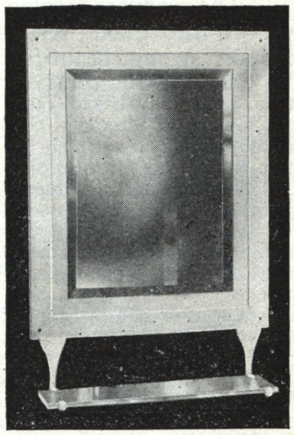
(8) Vastly stronger—heavier gauge metal.

(9) High quality baked enamel finish. Our sandblasting, spraying and baking facilities are unsurpassed.

(10) Low prices—on either large or small quantities.



Acme Open Shelf Cabinet with Attachment

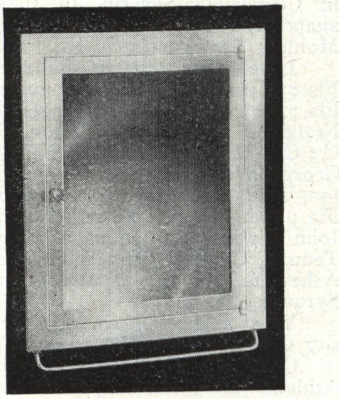


Acme Mirror with Glass Shelf

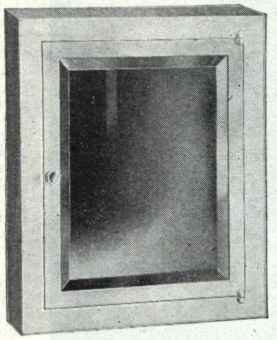
DIMENSIONS AND WEIGHTS

CABINET WITHOUT OPEN SHELF				CABINET WITH OPEN SHELF			
Mirror size				Mirror size			
10"x14"	12"x16"	14"x18"	16"x20"	10"x14"	12"x16"	14"x18"	16"x20"
Outside dimensions				Outside dimensions			
15½"x19½"	17½"x21½"	19½"x23½"	21½"x25½"	15½"x26¼"	17½"x28¼"	19½"x30¼"	21½"x32¼"
Inside dimensions				Inside dimensions			
12"x16"	14"x18"	16"x20"	18"x22"	12"x22¾"	14"x24¾"	16"x26¾"	18"x28¾"
Wall opening required				Wall opening required			
12¼"x16¼"	14¼"x18¼"	16¼"x20¼"	18¼"x22¼"	12¼"x23"	14¼"x25"	16¼"x27"	18¼"x29"
Approximate shipping weight				Approximate shipping weight			
30 lbs.	35 lbs.	40 lbs.	45 lbs.	35 lbs.	40 lbs.	45 lbs.	50 lbs.

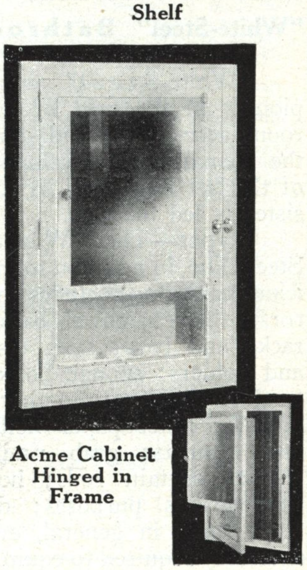
Other types of Cabinets, special or otherwise, furnished where quantity warrants.



Acme Cabinet without Shelf, with Towel Rack



Acme Wall Type Cabinet for Use without Recess



Acme Cabinet Hinged in Frame

"WHITE-STEEL" SANITARY FURNITURE CO.

Manufacturers of Bathroom Medicine Cabinets, Mirrors and Toilet Fittings

GRAND RAPIDS, MICH.

NEW YORK, N. Y., 507 Fifth Avenue—Telephone, Vanderbilt 2745
DETROIT, MICH., 404 Murphy Building—Telephone, Randolph 2994
CHICAGO, ILL., 310 S. Michigan Avenue, Room 925, Straus Building—Telephone, Harrison 6261
PHILADELPHIA, PA., 6023 Market Street—Telephone Sherwood 1423
BRANCHES IN ALL LARGE CITIES

"White-Steel" Products Are Built on a Base of Henzin Metal

The dampness and moisture of the bathroom, with its sudden changes of temperature, is a condition which ordinary steel enamel work can not successfully meet. Any rust which forms on the metal base causes enamel to lose its grip and to scale off or discolor.

Henzin Metal was developed to overcome this difficulty. It is an armored and sealed undercoating over steel, which gives it the two properties of adhering to enamel and of resisting rust. Henzin Metal is made by a secret process and can be obtained only from "WHITE-STEEL" SANITARY FURNITURE Co., Grand Rapids, Mich.

"White-Steel" enamel, which is baked on a rust-resisting base of Henzin Metal, can not check, peel, craze or discolor. The expansion or contraction of the metal can have no effect on its lasting beauty. To specify "White-Steel" Medicine Cabinets and Bathroom Accessories is absolute assurance of a permanent installation.

"White-Steel" Medicine Cabinets

The seamless Henzin Metal construction, electrically welded throughout, results in a finished product which is forever strong, beautiful and durable.

Enamel—Six coats of "White-Steel" enamel, each of them separately baked, on a base of Henzin Metal.

Gauge of Sheets—.050 to .250 (approximately 1/16 to ¼ in.), except for bodies, which are .025 in. Our dies and shop practice forbid the substitution of lighter gauges.

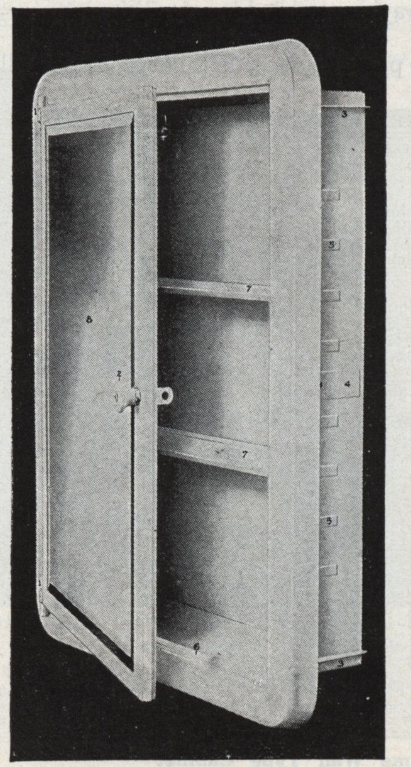
Mirrors and Shelves—Only first quality mirror plate, plain or with a sharp steep bevel is used. The backs are properly silvered and are not affected by the temperature of moisture of the room. Adjustable shelves are of polished plate glass ¼ in. thick.

Types—"White-Steel" Medicine Cabinets are built in the inset, wall and corner types, and in styles to meet every architectural requirement. Styles and dimensions are shown in the plate on the following page.

"White-Steel" Bathroom Accessories

"White-Steel" was a pioneer in the field of bathroom accessories, and during the remarkable development of the last few years has consistently led the way.

Types—The "White-Steel" line, in addition to medicine cabinets, includes mirrors; shelves; towel baskets, racks and bars; soap dishes and holders; sponge holders; tumbler holders; toothbrush holders; toilet paper holders and cabinets; grab rails; shower curtain rods; hooks for various purposes; door stops; and, in general, every accessory required to equip the most modern bathroom.



(1) Adjustable lock pivot hinge (patent applied for). Doors can always be properly centered, thus eliminating wear.

(2) Mounted white ceramic knob (demountable) to match the white handles of plumbing fixtures.

(3) Shear clips provide easy installation in variable openings.

(4) Heavily reinforced at anchorage.

(5) No floating shelf supports. Supports spot welded—*you can not lose them.*

(6) Step-in door and step-in door jamb providing sufficient and invisible ventilation—an important factor.

(7) Polished edge glass shelves (adjustable).

(8) Demountable mirrors (installed by any competent workman).

CONSTRUCTION OF "WHITE-STEEL" MEDICINE CABINET

"White-Steel" Accessories are supplied individually or in complete matched sets.

Recommended for Hotels—The beauty and permanence of "White-Steel" Accessories at a cost no higher than for ordinary equipment, and the completeness of the "White-Steel" line are factors which have caused it to be selected for fine hotels, apartment hotels, clubs and homes all over the country.

Service to Hotel Architects

For the benefit of hotel architects and sanitary engineers we maintain a service department which has helped in the design of the bathrooms of over 500 hotels, among them many of the largest in the world.

We are glad at all times to give advance information regarding the most economical layouts for hotel bathrooms in connection with pipe shafts, and the spacing and location of pipe-shaft entry doors. The best practice is to combine these latter with bathroom mirrors or medicine cabinets.

We also advise in all such matters as height of wainscoting, size of tile, relation of tile joints to fixtures, and the best location for tub ends, shower heads, washstands, toilets, lights and accessories.

This consultation service is free to architects. Write or telegraph our Grand Rapids Office.

References

Complete "White-Steel" equipment is installed in the 2500 bathrooms of the Hotel Pennsylvania in New York City. Other hotel and club installations include:

Roosevelt, Commodore, McAlpin, Bretton Hall, Margaret, Martha Washington, all of New York.

Statler Hotels in Detroit, Cleveland, St. Louis, and New Hotel Statler in Buffalo.

Hotels Morrison, Lake Shore Drive and Ambassador in Chicago.

Ambassador Annex and Traymore in Atlantic City.

Robert Treat in Newark and Stacy-Trent in Trenton.

Hotels Champlain, on Lake Champlain; Ten Eyck, in Albany; Schenley, in Pittsburgh; Winton, in Cleveland; Severin, in Indianapolis; Fort Des Moines, in Des Moines; St. Francis, in St. Paul.

Hotels Bellevue in Bellaire, Fla.; Seminole, in Jacksonville, Fla.; Ambassador, in Los Angeles; Francis Marion in Charleston, S. C.; Charlotte, in Charlotte, N. C.; George Washington, in Washington, Pa.; San Juan, in Orlando, Fla.; Mayo, in Tulsa, Okla.; John Sevier, in Johnson City, Tenn.; George Vanderbilt, in Asheville, N. C.; Syracuse, in Syracuse, N. Y.

Yale, Princeton and University Clubs of New York.

Chicago Athletic Club, Detroit Athletic Club, Indianapolis Athletic Club, Los Angeles Athletic Club.

And thousands of others.

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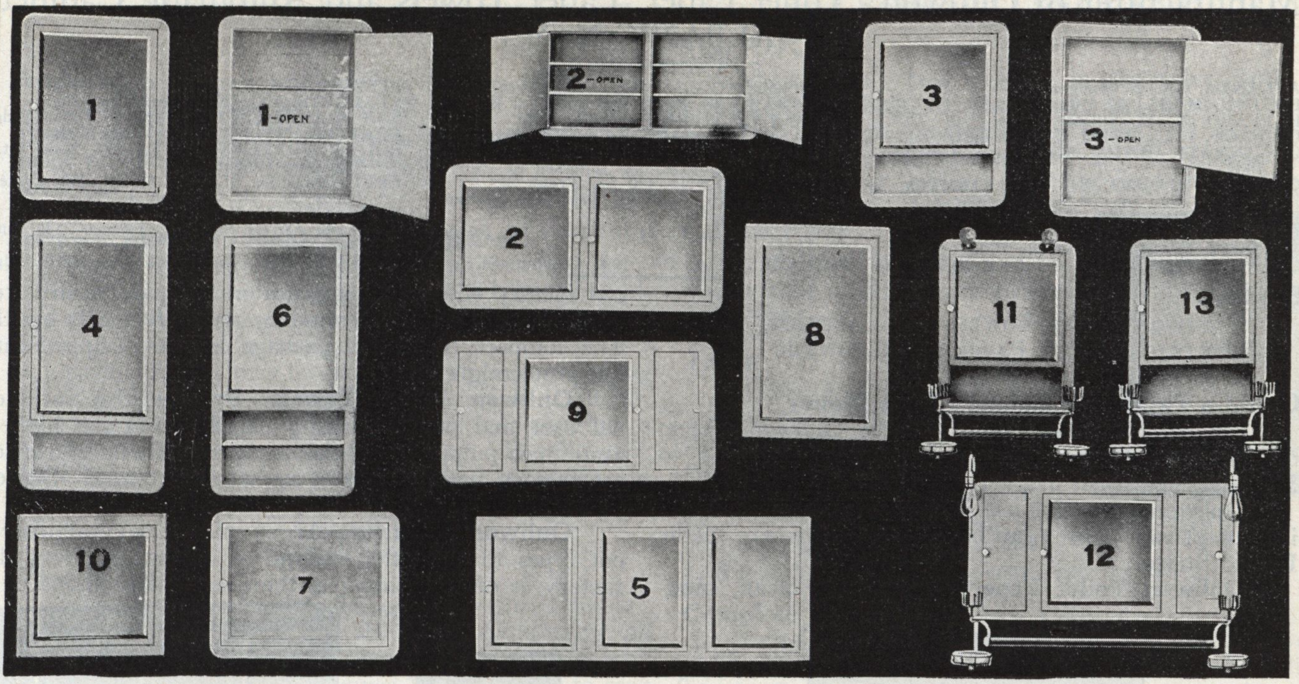


PLATE A INDEX MEDICINE CABINETS

The Cabinets illustrated above and described in the table below are of the Inset Type. Wall Cabinets and Corner Cabinets are also furnished, as follows:

Plate A Index Cabinets to Hang on Wall—*Any square-cornered Inset Cabinet can be furnished as a Wall Cabinet,* but over-all length and width is ⅛ in. greater than for square-cornered Inset Cabinets.

Plate A Index Cabinets to Fit in Corner—Plate Nos. 3, 4, 6, 7, 8 and 10 square-cornered cabinets can be supplied as Corner Cabinets. Over-all height is ⅛ in. greater than for Inset Cabinets. Figure the wall space required as about ⅘ of width plus 1 in. each way from apex.

Plate No.	Shop No.	Over-all size, in.		*Round or square corner	Interior depth, in.	Flange depth, in.	Hole in wall, in.			Approx. height from floor, in.	†Size mirror plate, in.	Glass shelves	Approx. ship. wt., lb.	Light fixture	Glass shelves and brackets, in.	Towel bar, in.	Tumbler holders	Soap dishes and holders
		High	Wide		††		High	Wide	Deep									
1	20	27 26½	21 20½	R S	4⅞	1⅛	24	18¼	3¾	48	22x16	2	50					
2	12	15⅜	29⅞	S	4⅞	1⅛	14	28¾	3¾	54	(2)12x12	4	55					
	22	21 20½	39¾ 39	R S	4⅞	1⅛	18	36¾	3¾	54	(2)16x16	4	70					
	32	25¾	50	S	4⅞	1⅛	23¼	47¾	3¾	48	(2)20x20	4	90					
	1010	21⅜	29⅞	S	4⅞	1⅛	20	28¾	3¾	54	(2)18x12	4	60					
3-?	1012½	21⅜	15⅜	S	4⅞	1⅛	20	14¼	3¾	48	12x12	2	38					
	14	25⅜	15⅜	S	4⅞	1⅛	24	14¼	3¾	48	16x12	2	45					
	2022½	27 26½	21 20½	R S	4⅞	1⅛	24	18¼	3¾	48	16x16	2	50					
	3032½	31¾	25¾	S	4⅞	1⅛	29¼	23½	3¾	48	20x20	2	63					
4-?	24	39¾ 39	21 20½	R S	4⅞	1⅛	36	18¼	3¾	37	26x16	3	70					
	34	42½	25¾	S	4⅞	1⅛	40	23½	3¾	36	26x20	3	80					
5	T-10	21⅜	46⅛	S	4⅞	1⅛	20	45	3¾	54	(3)18x12	6	90					
	T-20	26½	60¾	S	4⅞	1⅛	24	59¼	3¾	48	(3)22x16	6	100					
6-?	11	25⅜	15⅜	S	4⅞	1⅛	24	14¼	3¾	48	12x12	3	55					
	21	39¾ 39	21 20½	R S	4⅞	1⅛	36	18¼	3¾	37	22x16	3	70					
7	10-H	15⅜	21⅜	S	4⅞	1⅛	14	20¼	3¾	48	18x12	2	38					
	1014-H	15⅜	25⅜	S	4⅞	1⅛	14	24¼	3¾	48	22x12	2	45					
	20-H	21 20½	27 26½	R S	4⅞	1⅛	18	24¼	3¾	48	22x16	2	50					
	2024-H	20½	30½	S	4⅞	1⅛	18	28¼	3¾	48	26x16	2	55					
	30-H	25¾	31¾	S	4⅞	1⅛	23¼	29½	3¾	48	26x20	2	63					
8	10	21⅜	15⅜	S	4⅞	1⅛	20	14¼	3¾	54	18x12	2	38					
	1014	25⅜	15⅜	S	4⅞	1⅛	24	14¼	3¾	48	22x12	3	45					
	20	27 26½	21 20½	R S	4⅞	1⅛	24	18¼	3¾	48	22x16	2	50					
	2024	30½	20½	S	4⅞	1⅛	28	18¼	3¾	48	26x16	3	55					
	30	31¾	25¾	S	4⅞	1⅛	29¼	23½	3¾	42	26x20	3	63					
9	27	21 20½	39¾ 39	R S	4⅞	1⅛	18	36¾	3¾	54	16x16	6	70					
10	12½	15⅜	15⅜	S	4⅞	1⅛	14	14¼	3¾	60	12x12	2	28					
	22½	20½	20½	S	4⅞	1⅛	18	18¼	3¾	54	16x16	2	37					
	32½	25¾	25¾	S	4⅞	1⅛	23¼	23½	3¾	48	20x20	2	46					
11-?	2022½-C	27 26½	21 20½	R S	4⅞	1⅛	24	18¼	3¾	48	16x16	2	60	2	5x19	1x16	2	2
12-?	27-C	21 20½	39¾ 39	R S	4⅞	1⅛	18	36¼	3¾	54	16x16	6	80	2	5x36	1x33	2	2
13-?	2022½-D	27 26½	21 20½	R S	4⅞	1⅛	24	18¼	3¾	48	16x16	2	60	......	5x19	1x16	2	2

NOTES

Cabinets are reversible, except those marked with ? in column headed "Plate No." When ordering cabinets so marked, specify "Hinges on right" or "Hinges on left." Otherwise shipments will be random.

*When cabinets are made in both styles, state preference for round or square-cornered flange. Otherwise round-cornered cabinets will be supplied.

†14x20-in. mirror plates can be supplied at a reduction in price for all cabinets listed with 16x22-in. mirror plates.

††Depth of square-cornered cabinets can be increased or diminished by increasing or diminishing either the flange or the body or both.

When Specifying or Ordering—*Always mention shop number.*

A. P. W. PAPER COMPANY

Manufacturer of Onliwon* Toilet Paper, Paper Towels and Automatic Cabinets

ALBANY, N. Y.

BRANCH OFFICES

ATLANTA, GA., 26 Mangum St.
BOSTON, MASS., 79 Milk St.
BUFFALO, N. Y., Ellicott Square
CHICAGO, ILL., 213-217 E. Illinois St.
CINCINNATI, OHIO, 827 Union Central Bldg.
CLEVELAND, OHIO, 1847 Union Trust Bldg.
DALLAS, TEX., 406-408 South Lamar St.
DENVER, COLO., Box 1903
DES MOINES, IOWA
DETROIT, MICH., 511 Murphy Bldg.
GRAND RAPIDS, MICH., 3 Ionia Ave., N. W.
HARTFORD, CONN., 76 Deerfield Ave.
INDIANAPOLIS, IND., 616 Terminal Bldg.
KANSAS CITY, MO., 626 Lee Bldg.
LOS ANGELES, CAL., 1340-1356 E. Sixth St.
LOUISVILLE, KY., 1208 Starks Bldg.
MILWAUKEE, WIS., 340 Jefferson St.
MEMPHIS, TENN., 420 So. Front St.
MINNEAPOLIS, MINN., 615 Metropolitan Bank Bldg.
NEW YORK, N. Y., 23-25 E. 26th St., Room 1109
PHILADELPHIA, PA., 1001 Chestnut St.
PITTSBURGH, PA., 1536 Oliver Bldg.
ST. LOUIS, MO., Ninth and Olive Sts.
SAN FRANCISCO, CAL., 228-230 Balboa Bldg.
SEATTLE, WASH., 3322 White Bldg.
SOUTH PORTLAND, ME., 597 Main St., Thornton Heights
SPRINGFIELD, MASS., % H. W. Carter Paper Co., 237 Chestnut St.
SYRACUSE, N. Y., 216 Cahill Bldg.
TOLEDO, OHIO, % R. L. Turner, 2324 Putnam St.
WASHINGTON, D. C., 305 Woodward Bldg.

Products

ONLIWON PAPER TOWELS and CABINETS.
ONLIWON TOILET PAPER and CABINETS.

Onliwon Paper and Cabinets Save Money

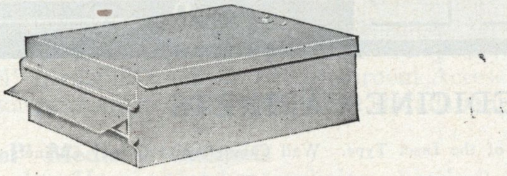
Comparative tests prove that the Onliwon system of serving toilet paper and towels saves from 15 to 50% over the usual methods employed.

Onliwon paper for use in either large public buildings or private houses can be obtained anywhere in the United States.

Onliwon Toilet Paper—Made in a clean, modern factory with every precaution taken to insure sterility—a paper that saves money and safeguards health. The compact 1000-sheet package is easily slipped into the protecting cabinet.

Onliwon Paper Towels—Protect the individual user and prevent waste. Made from the highest grade new pulp, cut and folded by machinery in a modern factory, under the most sanitary conditions. Served folded double, one towel really equals two.

Onliwon Cabinets—Are made in several different types to meet the various requirements, from the factory or office building to the finest mansion.

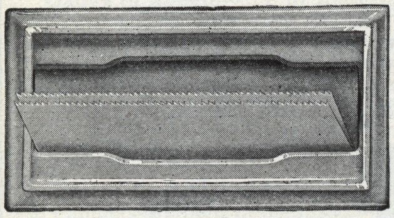


HOSPITAL BEDSIDE CABINET

Code 619. Portable cabinet finished in white enamel to match white furnishings of the hospital room. Has lock and key.

Dimensions: 5¼ in. wide, 6⅜ in. long, 2⅛ in. deep.

Capacity, 1000 sheets of Onliwon toilet tissue



NO. 11 PORCELAIN RECESS TYPE CABINET WITH FLANGE

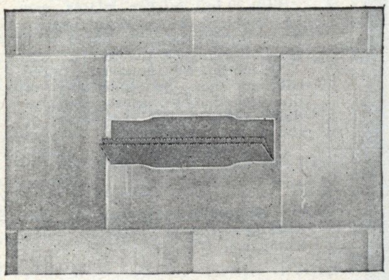
Code 623 and 624. This cabinet is cast in a single piece of white porcelain. Replaces 3x6-in. standard tile.

American Encaustic Tile Co. flange.

No. 623, 2⅜ in. deep.

No. 624, 2⅞ in. deep.

Capacity, 500 sheets of Onliwon toilet tissue

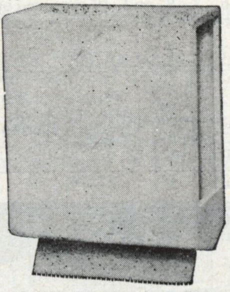


NO. 14 PORCELAIN RECESS TYPE CABINET

Code 621. One-piece porcelain. Designed to place in recess with its face flush with surface of wall. Face is size of 6x6-in. standard tile.

Recess required: 5¾ in. wide, 5¾ in. high, 3⅜ in. deep.

Capacity, 500 sheets of Onliwon toilet tissue

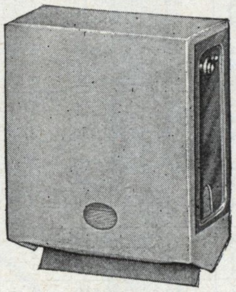


NO. 9 PORCELAIN SURFACE TYPE CABINET

Code 615. Suitable for use in hotels and residences. Made from solid piece of porcelain. Opening for filling on right or left side.

Dimensions: 5¾ in. wide, 6¾ in. high, 3 in. deep.

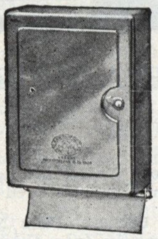
Capacity, 1000 sheets of Onliwon toilet tissue



NO. 9A PORCELAIN SURFACE TYPE CABINET

Code 616. Same as No. 9 excepting nickeled silver door with Corbin lock.

Dimensions: 5¾ in. wide, 6¾ in. high, 3 in. deep



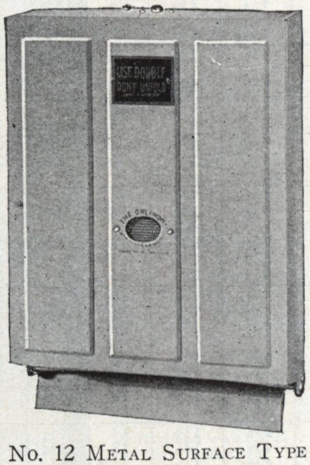
NO. 8 METAL SURFACE TYPE CABINET

Code 606, gunmetal; code 633, nickel silver.

Especially desirable for buildings having public lavatories. Will not rust or tarnish. Has lock and key. Indicator tells when to refill. Adjustable to space formerly occupied by other fixtures.

Dimensions: 5½ in. wide, 8 in. high, 2¾ in. deep.

Capacity, 1000 sheets of Onliwon toilet tissue

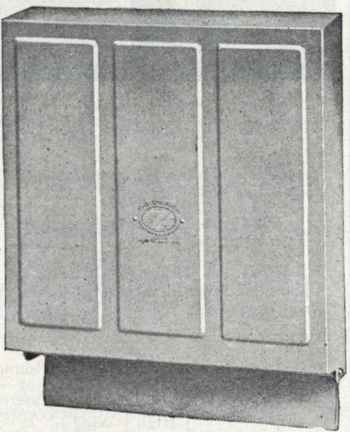


NO. 12 METAL SURFACE TYPE TOWEL CABINET

Code 653, white enamel; code 654, gunmetal. Same as No. 6 except that it accommodates towels 9x14¾ in. Especially recommended for schools.

Dimensions: 9¾ in. wide, 13 in. high, 3⅛ in. deep.

Capacity, 150 sheets of Onliwon paper towels

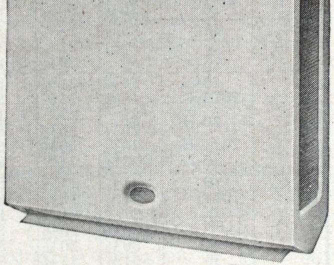


NO. 6 METAL SURFACE TYPE TOWEL CABINET

Code 651, white enamel; code 652, gunmetal; code 657, nickel silver. For hotels, railroad stations, department stores or other buildings having public lavatories. Has lock and key. Bullseye tells when supply of towels is needed. Accommodates towels, 11¼x14¾ in.

Dimensions: 12 in. wide, 13 in. high, 3⅛ in. deep.

Capacity, 150 sheets of Onliwon paper towels



NO. 32 PORCELAIN SURFACE TYPE TOWEL CABINET

Code 659. Adapted to public lavatories finished in white tile or marble, especially in fine hotels, department stores and theaters.

One-piece porcelain with opening for filling on the right-hand side. Bullseye signals for refilling. Accommodates towels, 11¼x14¾ in.

Fastens on any type of wall.

Dimensions: 12¾ in. wide. 10½ in. high, 4 in. deep.

Capacity, 150 sheets of Onliwon paper towels

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*Reg. U. S. Pat. Off.

THE GERSON-STEWART CORPORATION

Manufacturers of Liquid Soap Systems and Softasilk Liquid Soap
CLEVELAND, OHIO

Softasilk
TRADE-MARK
(Registered)

Products

Softasilk Gravity Liquid Soap System for factories, hotels, clubs, homes, public buildings, schools, hospitals, institutions, etc.

Softasilk Modern Liquid Soap Equipment

This is the modern and proved solution of the lavatory washing problem, easily installed in old or new buildings at low cost. Liquid soap is fed by gravity from a single tank through a small pipe to valves directly over each basin. Piping may be concealed similar to plumbing with only the valve exposed. The principle is simple, there is nothing to get out of order and it is pleasing to the eye as it looks a part of the plumbing. The Softasilk Valve is guaranteed to give uninterrupted service indefinitely. It is performing perfectly in many of the finest buildings in the United States.

What It Does

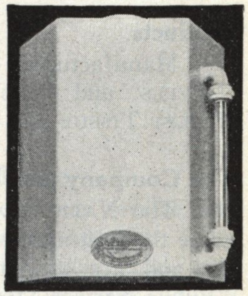
A push of the button delivers a measured amount of liquid soap directly into the palm, eliminating all contact with the dispenser. There is nothing to fool with and it is easy to operate. It gives 16,200 pushes to each gallon of soap.

What It Saves

The Softasilk Gravity System saves one-third of the soap bill by eliminating waste in using and waste in filling small individual dispensers; saves breakage of individual glass containers, and the time required to fill and clean same; avoids constant annoyance of replacement of individual containers.

The Perfected Softasilk Valve

The Softasilk Valve is giving complete satisfaction in actual use—operated by pushing the button, which forces the displaced soap out of the discharge. Each push of the button discharges a measured amount and no more. The closing and opening are alternate and there is therefore no point in the travel of the piston at which a continuous flow may be obtained. There are only two washers in the valve, both of which are stationary, and there is therefore practically no wear. If absolutely necessary, a washer may be replaced in a few minutes by unscrewing the front locked nut. The body of the valve is a heavy casting, highly finished in nickel and so sturdy that its life is practically indefinite.



Softasilk System Tank

Tanks

Tanks, as shown in the illustration, are beautifully finished in white baked-on enamel; special colors to order. A glass gauge shows the soap level. Tanks may be erected on the wall or concealed with the piping. In stock, 1, 3 and 5-gal. tanks. Special sizes to order.

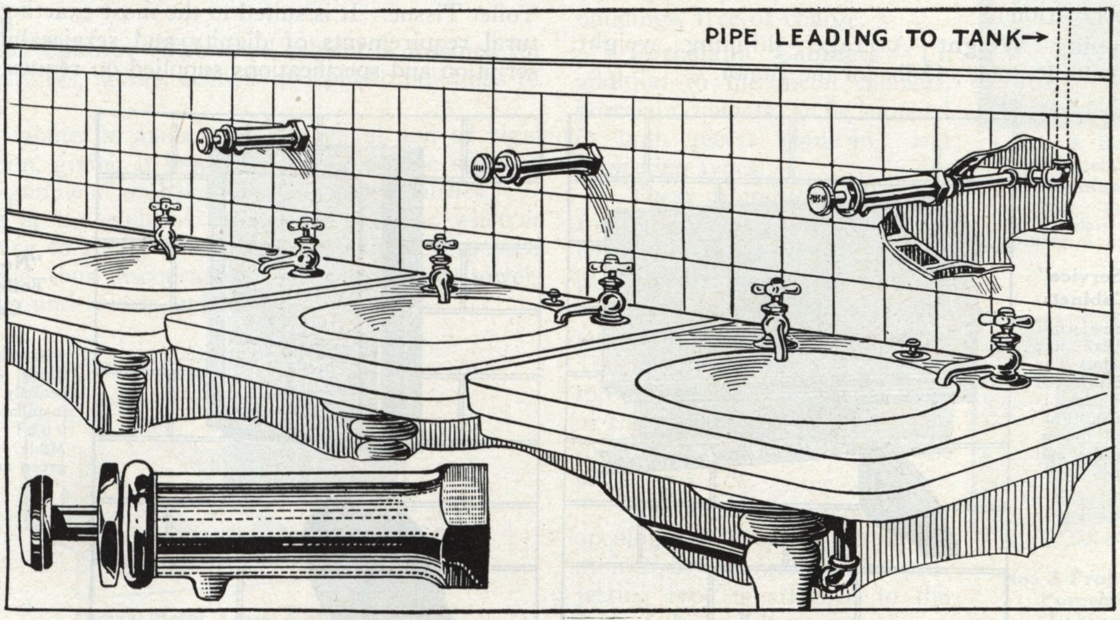
Complete Service

The Gerson-Stewart Corporation supply valves, piping, fittings, tanks, etc., complete. All carefully finished. By giving us sketch of the equipment to be provided for, we can quickly recommend the proper installation, and quote, advising the best way to install. There is no charge for this service.

The proof of the success of the Softasilk Gravity Valve is our unqualified guarantee of *"After-Sale Satisfaction,"* or no cost.

Softasilk Gravity Specifications

Furnish and erect complete a liquid soap supply system with outlets at every lavatory and shower, located as directed. This system shall include enameled tanks, capacity ½ gal. per fixture; galvanized piping and fittings as specified for cold water, and delivery valves, and shall be the Softasilk Gravity System as made by The Gerson-Stewart Corporation, Cleveland, Ohio. All piping to be concealed. The lines from the tanks shall be ⅜-in. pipe with ⅜-in. branches to dispenser. Where necessary, the tanks may be installed on the face of the wall, and piping extended to the wall with nickelplated brass piping. Over each lavatory furnish and install one Softasilk Soap Dispensing Valve.



Installation of Softasilk System with Concealed Pipes
Pipes and tanks may be exposed on wall, or concealed, as conditions warrant

NATIONAL PAPER PRODUCTS CO.

Manufacturers of Paper Towels, Toilet Paper and Cabinets

MILLS AND SALES OFFICE
CARTHAGE, N. Y.

NEW YORK OFFICE: 15 East 26th Street

WESTERN OFFICE: SAN FRANCISCO, CAL.

PUBLIC SERVICE TOWELS
U.S. PATENT 1236055 AUG. 7, 1917
TRADE Public Service MARK
NATIONAL PAPER PRODUCTS COMPANY
SAN FRANCISCO CALIFORNIA · CARTHAGE NEW YORK · BROCKVILLE ONT. CANADA

NATIONAL PAPER PRODUCTS COMPANY
CARTHAGE N.Y. · SAN FRANCISCO CAL.
NATIONAL
NO WASTE TISSUE

TRADE-MARKS

Products

Manufacturers of "Public Service" Towels and Cabinets; "No-Waste" Toilet Tissue and Cabinets.

The Company and Its Products

The National Paper Products Co. were the first makers of folded paper towels and are now the largest producers. "Public Service" towels and "No-Waste" toilet tissue are sold by paper jobbers throughout the United States.

The Perfect Paper Towel and Its Economy

"Public Service" towels answer all the requirements of the perfect towel in that they are sanitary, strong, absorbent and economical.

The Paper—Made of a clean spruce wood, especially treated so that the towels do not leave bits of paper on the face and hands.

Strength—They are made so strong, that, instead of being used as blotters as many paper towels are used, the hands can be dried by rubbing as with cloth towels.

Economy—Only one towel is withdrawn from the cabinet at a time and economy is forced on the user. A double folded hem where the wet hand grasps towel to pull it from the cabinet prevents tearing and waste. The cabinet stops pilfering.

Sizes of Towels—Regular: 13½x11 in.; Junior (for schools) 11½x11 in. They come packed in fiber cartons containing 25 packages of 150 towels each (3750 towels per carton).

Shipping Weight—Average shipping weight, 54 lb. for the Regular; 45 lb. for the Junior.

"Public Service" Towel Cabinets

Made especially for use with "Public Service" towels.

No mechanical features and nothing to get out of order. Secured to the wall by means of four screws on the inside. Can not be removed as it is under lock and key.

Made of sheet steel and finished in baked-on enamel in white or olive green.

"No-Waste" Toilet Tissue

Made from clean, fresh spruce wood only. No old paper refuse. Special process of manufacture gives it a soft, velvety texture combined with strength, not found in ordinary grades of toilet paper.

Sheets are 4½x5 in. Come packed 800 sheets in a package, 125 packages (100,000 sheets) in a fiber case.

Average shipping weight of case, 70 lb.

"No-Waste" Toilet Tissue Cabinets

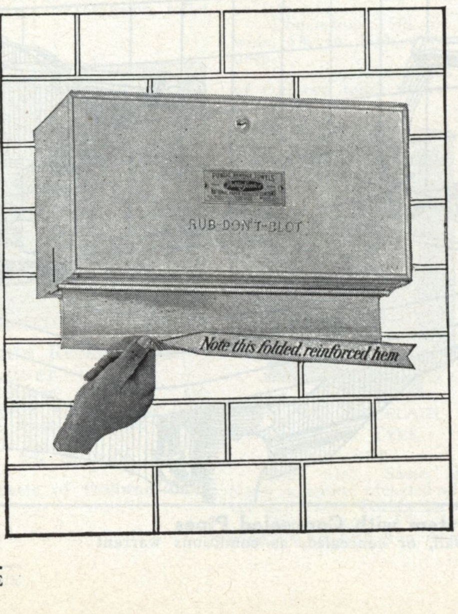
Made especially for the "No-Waste" toilet tissue, of steel finished in heavy nickelplate, baked-on olive green enamel or white pyralin. It is secured to the wall or partition by means of two screws on the inside and can not be removed as it is under lock and key.

Delivers but two sheets at a time, which enforces economy. Stops all pilfering.

These fixtures are leased without charge for the use of "No-Waste" Toilet Tissue in public washrooms.

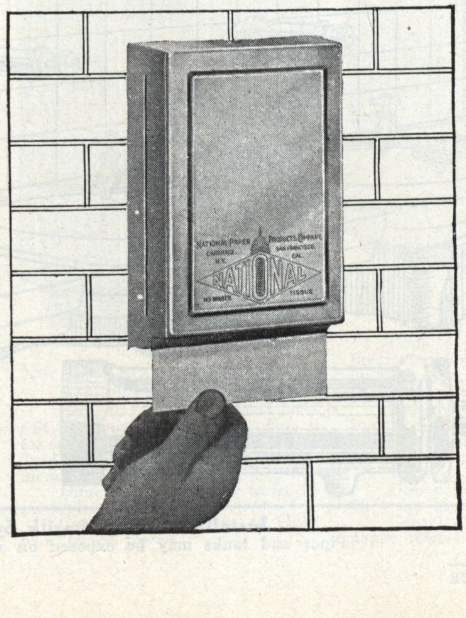
Porcelain Cabinets

A new vitrified porcelain cabinet with a special locking device has been prepared for "No-Waste" Toilet Tissue. It is suited to the most exacting architectural requirements of dignity and serviceability. Description and specifications supplied on request.



"Public Service" Towel Cabinets

Dimensions: front, 14½x7 in.; depth, 6¼ in. The folded reinforced edge of the paper is exclusive with "Public Service" towels. Made in white and olive green



"No-Waste" Toilet Tissue Cabinets

Dimensions: wall side, 8¼x5 in.; depth, 2¾ in. Especially adapted for installation in all public buildings. Made in nickel, green and white

THE NORTHERN PAPER MILLS

Manufacturers of Bathroom and Lavatory Equipment

MILLS AND SALES OFFICE
GREEN BAY, WIS.

Northern
TRADE MARK
TRADE-MARK

Products

Northern Folded Paper Towels and Cabinets.

Northern Cabinet Tissue and Cabinets.

Northern Folded Towels

The Northern Paper Mills were among the early pioneers in the development of interfolded paper towels. The products of the company are distributed nationally through wholesale paper merchants located in all principal cities of the United States.

Towels—Northern folded towels are made to meet the rigid demands of a quality product. The paper stock used is made of all new clean wood pulp and is surfaced to give it a soft pliable finish.

The towels are so made as to quickly absorb moisture and at the same time are sufficiently heavy to permit them to be really used as a rub towel rather than just to blot the moisture from the hands and face. One towel is sufficient to dry a pair of hands.

The towels are made in bleached, known as the 135 grade and unbleached, known as the 235 grade.

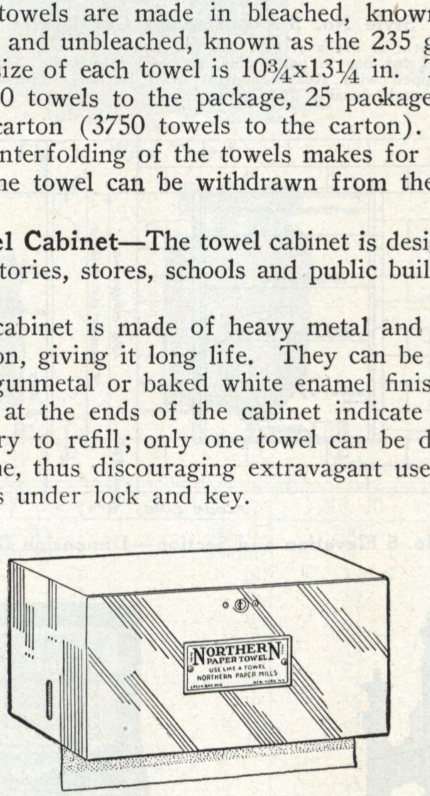
The size of each towel is 10¾x13¼ in. They are packed 150 towels to the package, 25 packages to the shipping carton (3750 towels to the carton).

The interfolding of the towels makes for economy as only one towel can be withdrawn from the cabinet at a time.

Towel Cabinet—The towel cabinet is designed for use in factories, stores, schools and public buildings of all kinds.

The cabinet is made of heavy metal and of rigid construction, giving it long life. They can be supplied in either gunmetal or baked white enamel finishes.

Slots at the ends of the cabinet indicate when it is necessary to refill; only one towel can be dispensed at one time, thus discouraging extravagant use; towels are always under lock and key.



Heavy Metal Towel Cabinet
Finished in white enamel or gun metal
Dimensions: 14 in. wide; 6¾ in. high; 6 in. deep

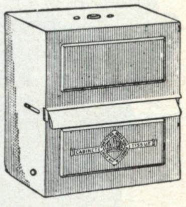
Northern Cabinet Tissue

Northern cabinet tissue service was developed to provide an adequate toilet service which would be economical, convenient and sanitary. The tissue cabinets have no mechanical features to get out of order and the paper when placed in the cabinet is under lock and key, preventing wanton destruction.

Paper—Northern cabinet tissue paper is made from clean fresh wood pulp. It is a strong, pliable sheet and of better quality than is found in the ordinary grades of toilet tissue.

Each sheet is 4½x9 in. in size and is delivered from the cabinet one sheet at a time. The stock is packed 1000 sheets 4½x4½ in., cut 500 sheets 4½x9 in. to the package and 100 packages to the shipping unit.

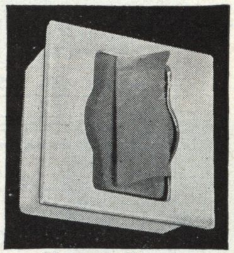
Metal Cabinets—These cabinets are made of heavy metal and rigid construction and are finished in either gunmetal, baked white enamel or nickel.



No. 1 Heavy Metal Cabinet
Dimensions: 4⅛ in. wide; 5¾ in. high; 3 in. deep

They are designed to meet the varied needs of factory, public building and home. The gunmetal finished cabinets are leased for use in public lavatories of buildings, free of charge.

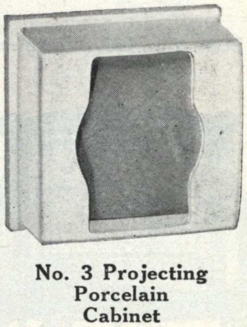
Porcelain Cabinets—In addition to the metal cabinets, porcelain cabinets can be supplied in both recess (built-in) and projecting types.



No. 2 Recess Porcelain Cabinet
Face, 6x6 in. (2 standard tile); opening, 3 in. deep

These cabinets are designed for use in hotels and residences where the better type of fixture is desired. They are made of one piece of porcelain and contain no moving or working parts. The supply of tissue is inserted through the opening on the face of the cabinet and is served one sheet at a time up to the last piece.

The recess type requires an opening 3 in. deep for setting the cabinet in the wall. The projecting type is attached to the face of the wall by means of two screws.



No. 3 Projecting Porcelain Cabinet
Dimensions: 6x 6x3 in.

ESTABLISHED 1898

ADAMS BROTHERS MFG. CO., INC.

Manufacturers of Adams Cheerful Heating Appliances

1500 Fayette Street, PITTSBURGH, PA.

Adams Cheerful Heating Appliances

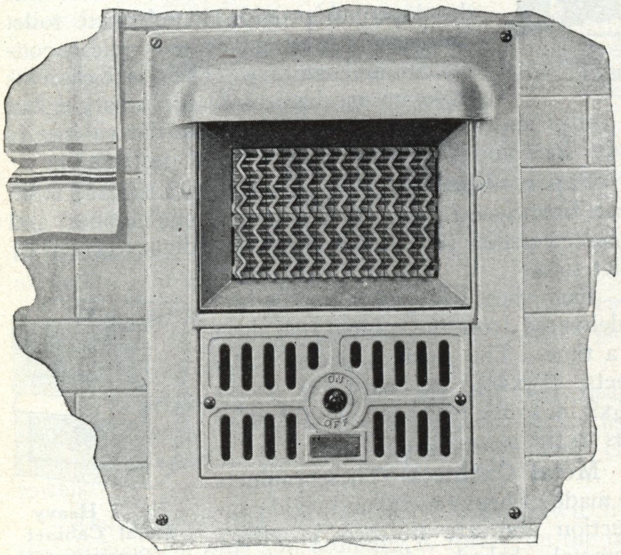
Gas and electric recessed wall heaters for heating rooms where floor space is limited, such as bathrooms.

Radiant gas heaters for use in fire places.

Adams CHEERFUL Radiant Heaters

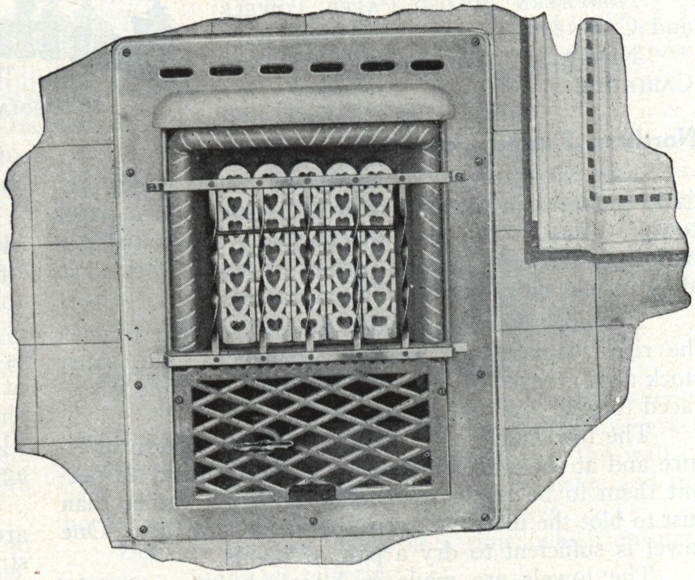
Write for our catalogue showing 40 styles of heaters.

Always specify Adams Cheerful Radiant Heaters by name.



Style No. 13E Electric Wall Heater

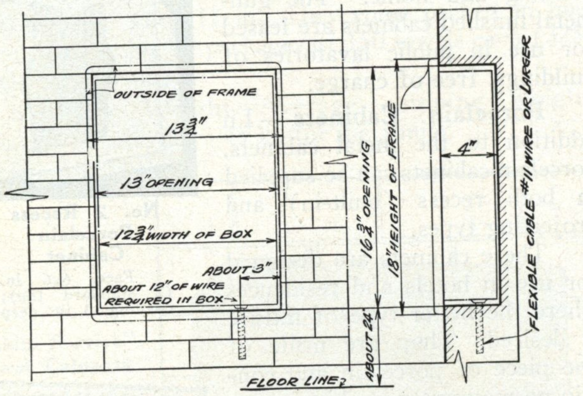
Ideal for use in bathrooms, clean and convenient. Rugged in construction with heating elements perfectly supported and protected. All parts accessible and easily removed. Finished in white porcelain enamel. Standard for 110-120 volts, capacity, 1300 watts



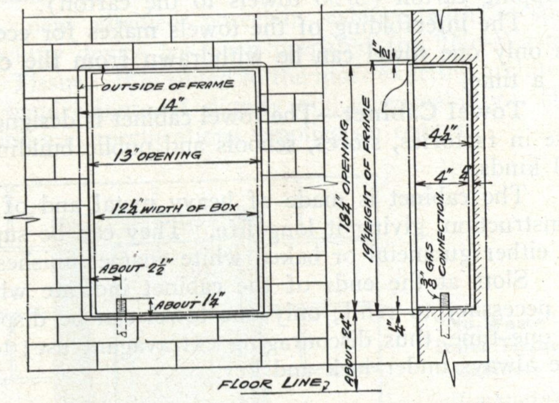
Style No. 5 Five-Radiant Gas Heater

For natural or artificial gas.

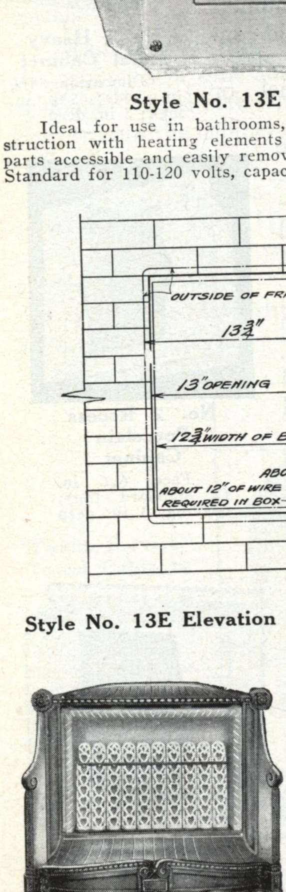
Designed for use in bathrooms, recessed into wall. Has 5 radiants and is equipped with Adams central draft burner. Finished in white porcelain enamel, durable and lasting

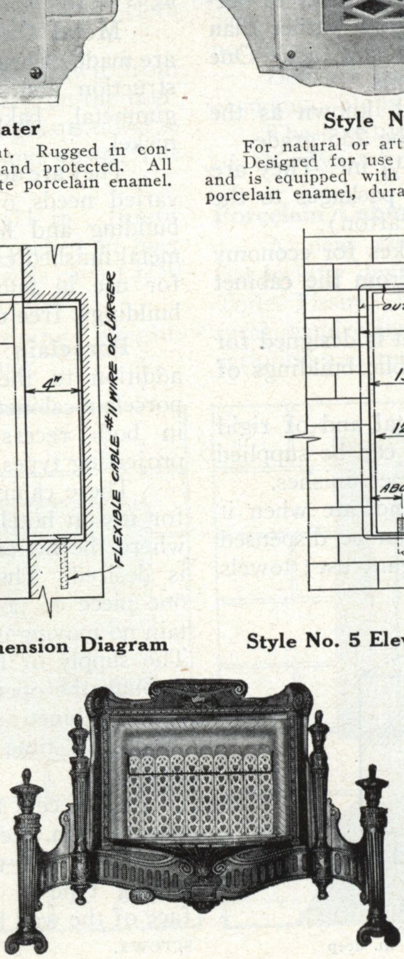

OUTSIDE OF FRAME
13¾"
13" OPENING
12¾" WIDTH OF BOX
ABOUT 3"
ABOUT 12" OF WIRE REQUIRED IN BOX
16¾" OPENING
18" HEIGHT OF FRAME
4"
FLEXIBLE CABLE #11 WIRE OR LARGER
ABOUT 24"
FLOOR LINE

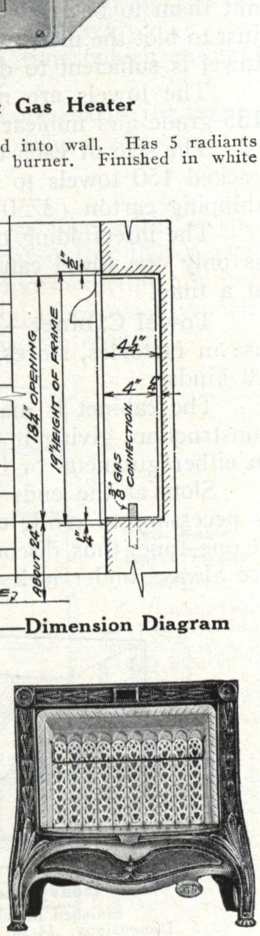
Style No. 13E Elevation and Section—Dimension Diagram


OUTSIDE OF FRAME
14"
13" OPENING
12¼" WIDTH OF BOX
ABOUT 2½"
ABOUT 1¼"
18¼" OPENING
19½" HEIGHT OF FRAME
½"
4¼"
4"
⅛"
⅜" GAS CONNECTION
¼"
ABOUT 24"
FLOOR LINE

Style No. 5 Elevation and Section—Dimension Diagram







C. B. BABCOCK COMPANY

Manufacturers of Gas Furnaces

135 Bluxome Street, SAN FRANCISCO, CAL.
BRANCH OFFICE, 909 Rives-Strong Building, LOS ANGELES, CAL.

Babcock Gas Fired Warm Air Furnaces

Designed by gas engineers and approved by experts from twenty leading gas companies, the Babcock "High Efficiency" Gas Furnace was selected after exhaustive tests as a furnace that could be recommended to consumers for efficiency, safety and maximum results.

Thousands of Babcock furnaces have given satisfaction, many of them over a period of 10 years, under the most exacting conditions. The furnace is made in the Babcock factory, San Francisco, by experienced men with the finest materials available.

Ten Basic Points of Superiority

(1) Longer fire travel and greater radiating surface, effecting gas economy and preventing "cooking" or scorching of the air, which is delivered with its natural moisture retained. (See Fig. 1—"Fire Travel.")

(2) Scientific construction prevents leaks. Proper stack temperature reduces condensation and prevents corrosion, the most common cause of leaks.

(3) Welded seams and joints are an absolute safeguard against the products of combustion entering the rooms. Baffles are spot-welded, eliminating use of bolts and nuts in radiator and drum of furnace.

(4) The burner is enclosed in a sealed cast iron burner pot.

(5) Radiators and tubes are made of special heavy copper-bearing steel.

(6) Operation by natural gravity—cold air enters from below and rises as it becomes heated, without forced draft. Where conditions make it necessary, however, fan blower creating forced draft may be installed.

(7) Cold air return system can be installed, thus economizing gas and insuring perfect circulation.

(8) Pilots are equipped with patent lava tips which do not corrode.

(9) The patented alternating valve makes operation possible with full or half burner and thus delivers modified heat and economizes gas, without impairing combustion, as proper proportions of gas and air are retained.

(10) Electrically operated by thermostat or push button control from any part of the home; or directly operated at the furnace.

Built for long service; designed by gas engineers.

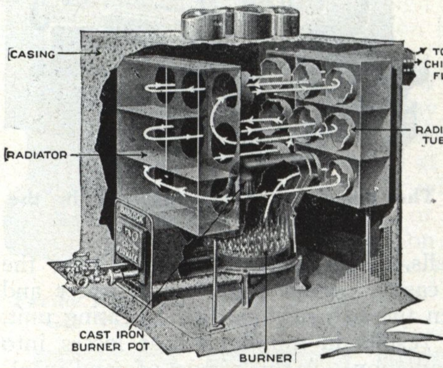


Fig. 1. Fire Travel

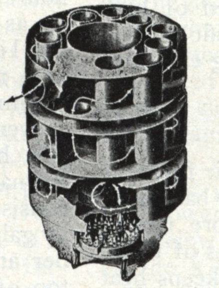


Fig. 3. Diagram Showing Long Fire Travel in Round Type Babcock Furnace

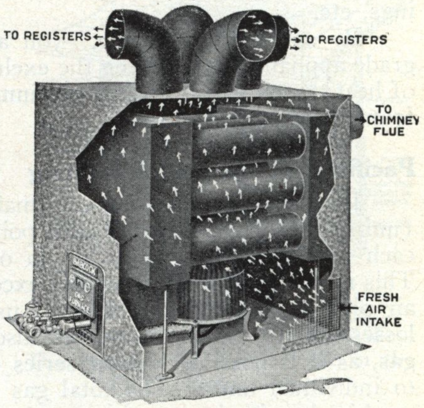
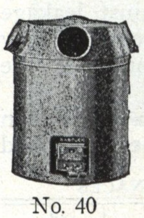
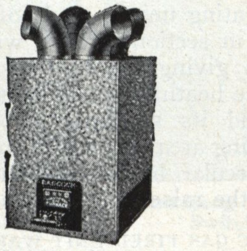


Fig. 2. Air Travel



No. 40



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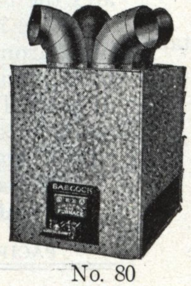
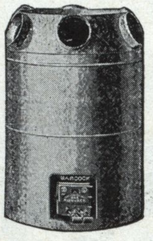


No. 80



No. 183

No. 223

Babcock Gas Fired Warm Air Furnaces

Furnace	No. 40	No. 50	No. 80	No. 183	No. 223
Heating capacity..............cu. ft.	7000	10,000-13,000	15,000-20,000	20,000-25,000	30,000-50,000
Heating capacity..............rooms	4	5 to 7	8 to 10	10 to 12	15 to 20
Diameter....................in.	29	..	..	42	54
Height......................in.	39	54	54	63	63
Width.......................in.	..	29	33	..	..
Depth.......................in.	..	40	48	..	..
Floor to center of vent...........in.	29	37¾	37¾	43	67
Diameter of vent................in.	4	6	6	6	8
Gas connection.................in.	¾	1	1	1	1
*Insulating surface............sq. ft.	24	52	63	58	75
Fire travel....................ft.	11	28	38	32	40
Gas consumption in cu. ft. per hr.:					
Natural.....................	45	76	96	115	200
Manufactured..................	75	125	175	225	350
Shipping Weight................lb.	186	310	366	393	689

*We recommend Johns-Manville Asbestocel insulation, ¼-in. thickness.

PACIFIC GAS RADIATOR COMPANY

Manufacturers of Gas Heating Systems

1732-1740 West Washington Street, LOS ANGELES, CAL.

FACTORY AND FOUNDRY: Roseberry and Walter Streets, LOS ANGELES, CAL.

SALES AGENTS

ANAHEIM, CAL., Modern Appliance Co.
BAKERSFIELD, CAL., Max Gundlach, 2014 Chester Street
HUNTINGTON PARK, CAL., Gas Appliance Sales Co., 339 South Pacific Boulevard.
COLTON, CAL., Hub Hardware Co.
FRESNO, CAL., Midstate Pipe & Supply Co., 434 P Street
LONG BEACH, CAL., W. T. Nichols, 328 American Avenue
OAKLAND, CAL., Pacific Gas Appliance Co., 16th and Clay Streets
SAN DIEGO, CAL., San Diego Stove & Appliance Co., 931 Broadway
SAN BERNARDINO, CAL., Ezell Sales & Engineering Co., 441 Fourth Street
TUCSON, ARIZ., Gas Appliance Stove Co., 237 East Congress Street
SAN ANTONIO, TEX., S. A. Freeborn, 538 Moore Building
WHITTIER, CAL., J. C. Staats, 234 Bright Street
NEW ORLEANS, LA., Southern Gas Appliance Co., 818 Carondolet Street
PORTLAND, ORE., General Heating Co., 88-92 North Second Street

Products

Pacific Gas Fired Warm Air Furnaces.

Pacific Gas Fired Pipeless Floor Furnaces.

For Gas Fired Radiators and Fireplace Heaters, see pages 2220-2221.

Over 200,000 Installations

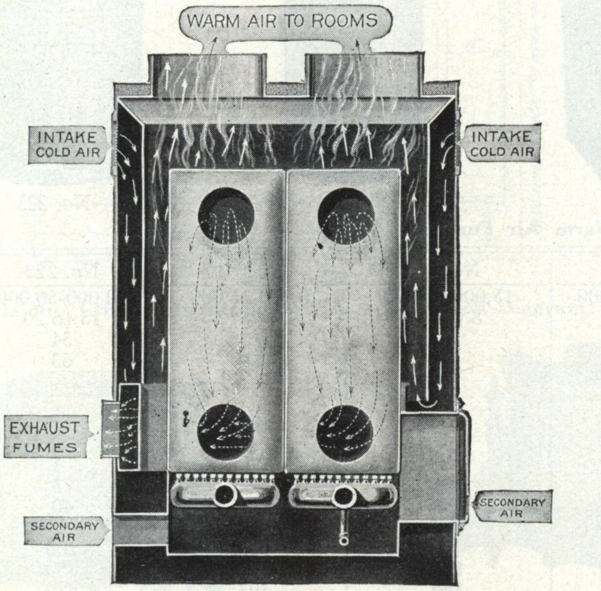
Pacific gas heating systems have been the standard since 1913 and include types to cover every heating requirement. During the past 12 years, more than 200,000 Pacific installations have been made in all types of buildings, including residences, apartment houses, hospitals, schools, churches, libraries, theaters, office buildings, etc.

By specifying "Pacific," you are assured of high grade appliances embodying the exclusive Pacific method of heat travel, which assures maximum heating efficiency from the gas consumed.

Pacific Unit System of Heating

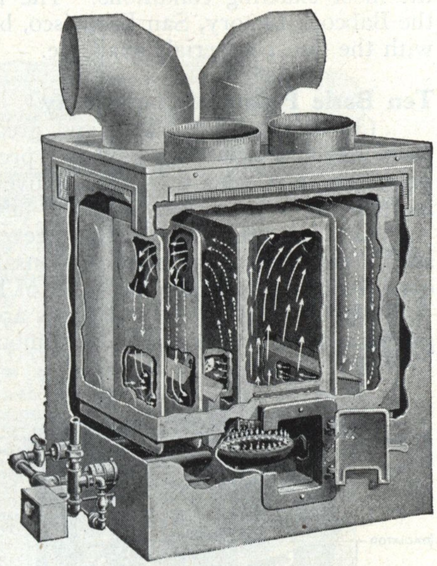
In this system, two or more small warm air furnaces (units) are placed at convenient points in the basement, each unit supplying warm air to one or more rooms. This method not only eliminates excessive runs of warm air pipe (also cold air returns, if used) and keeps heat losses down to a minimum, but also saves considerable gas, as it is possible to heat series of rooms connected to individual units. The total gas consumption of the combined units is never more than that of a central furnace of equal capacity.

The Pacific system of heating assures a constant and positive supply of heat to all rooms served by the various units under all weather conditions.



Sectional View of Pacific Gas Fired Unit Furnace No. 2

Pacific Gas Fired Unit Furnaces—These furnaces are placed as near the center of distribution as the design of house will allow, so as to reduce the length of pipe runs to a minimum and to prevent excessive heat losses. Furnace casing consists of heavily galvanized inner and outer shells. The screened openings near the top of the outer casing permit fresh air to enter and flow down between the two casings to the heating unit. This construction results in minimum heat losses into the basement by radiation. A thick layer of sand insulates the top of the furnace.



The Principle of Heating Air in the Pacific Gas Fired Unit Furnace

The heating unit is made of No. 20 gauge Toncan ingot iron, in sectional form, with pressed and welded joints, thus giving absolute assurance against leakage of gas. The heating unit is built of exceptionally heavy material and its sectional ribbed form provides the largest heating area possible in the space.

The circular burners are made of gray cast iron and are of the raised tip Bunsen type with clean drilled

PACIFIC GAS FIRED UNIT WARM AIR FURNACES

Size No.	5	6½	10	15	20	25	30	40	50
Number of burners	1	1	2	3	4	5	6	8	10
Approximate heating capacity ... cu. ft.	5000	6500	10000	15000	20000	25000	30000	40000	50000
Gas connection ... in.	½	½	½	¾	1	1	1¼	1¼	1¼
*Inside area of vent required ... sq. in.	12	12	12	20	20	28	36	40	50
Diam. vent outlet ... in.	3	3	4	5	5	6	6	7	8
Height to center of vent outlet ... in.	10¾	10¾	10¾	24	24	24	24	24	24
Free air area ... sq. in.	120	150	236	354	472	590	708	944	1180
Radiation ... sq. ft.	18	23	35	52	69	86	104	138	172
Hot air take-off area ... sq. in.	160	200	320	480	640	800	960	1280	1600
Width ... in.	28	33	28	28	28	28	56	56	56
Depth ... in.	15	15	24	35	44	53	70	88	106
§Height ... in.	35	35	35	35	35	35	35	35	35
Code word	Basef	Basso	Basco	Baset	Basum	Bastel	Basker	Basket	Basin

*Round or square. Vent is made preferably of concrete or terra cotta, and is usually installed between partitions when building is under course of construction. If copper or galvanized pipe is used for the vent, it should be well insulated with asbestos.

§When cold air return system is used, height of furnace is 4 ft.

Water pans for humidifying the air will be furnished when specified.

Continued on next page

flame holes. The flame surface has full clearance from the walls and top of the burner chamber, assuring odorless and smokeless combustion. Each gas valve is adjustable to proper air and gas regulation, so as to provide perfect combustion.

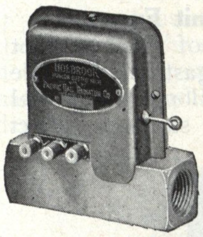
All pilot lights are connected with by-pass pipes, each having a separate valve control. Pilot burners have soapstone tips.

Registers are of the Tuttle & Bailey make and are of the latest patterns. Stock finishes of registers are bronze, brass and enamel. Special finishes made to order. Each register box should have a full unobstructed air passage so that a full volume of heat is delivered under all conditions.

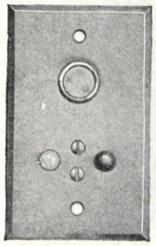
The illustration on the preceding page shows the long heat travel from the burner chamber to the vent manifold and the unobstructed fresh air passage between the furnace casings to the heating unit. With this great amount of exposed heating surface and the long, indirect venting method, the maximum amount of heat is obtained with a minimum of gas and there are no excessive losses at the vent.

Pacific unit furnaces may be controlled either electrically, thermostatically or manually.

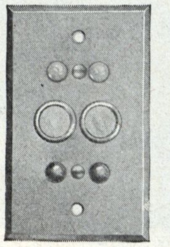
Electric Push Button Control—Consists of the Pacific high-low electro-magnetic gas valve, transformer, push button switches and necessary wiring. The switch plates are equipped with signal lights which indicate whether furnace flame is burning high or low, or whether it is turned off. Each switch action is positive and responds readily to the touch of the button. The low heat position is adjustable to any heating requirement. Any number of these switches may be installed at convenient points in the rooms by wiring them in parallel. A master or gang switch (regular equipment on installations of 2 or more furnaces) controls all furnace units, either separately or in series.



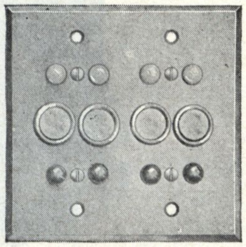
Pacific High-low Gas Valve



Push Button Plate

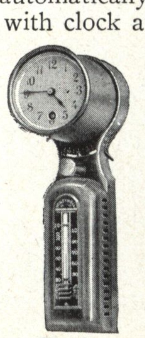


Two-gang Master Switch



Four-gang Master Switch

Thermostatic Control—Pacific furnaces may be automatically controlled by a Honeywell heat regulator with clock attachment. This device automatically turns the gas on or off at any predetermined time and maintains a uniform temperature in the rooms.



Clock Thermostat

Manual Control—The manual dial control illustrated is located on the first floor and connected to the gas valve with a chain. A turn of the handle either opens or closes the gas valve.

Manual Dial Control

Pacific Gas Fired Pipeless Floor Furnace

This furnace consists of a specially made radiator (a heating element containing 8, 10 or 14 sq. ft. of radiation), a cast iron burner and combustion chamber, all contained in a heavily galvanized iron double casing fitted on top with a two-part register finished in statuary bronze.

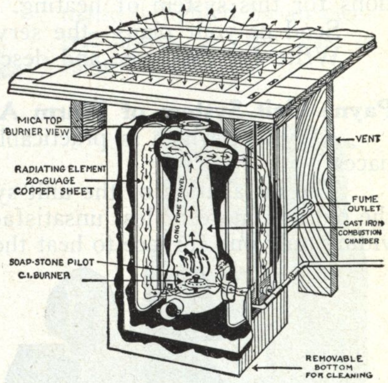
The central portion of the register forms the warm air outlet and the surrounding portion forms the cold air inlet.

This furnace is installed with the register flush with the floor and the furnace protruding under the floor. The air from the rooms to be heated descends through the outer or cold air portion of the register, thence downward through the 2-in. space between the inner and outer casings of the furnace, thence over the surface of the heating element and thence upward through the central portion of the register and into the room.

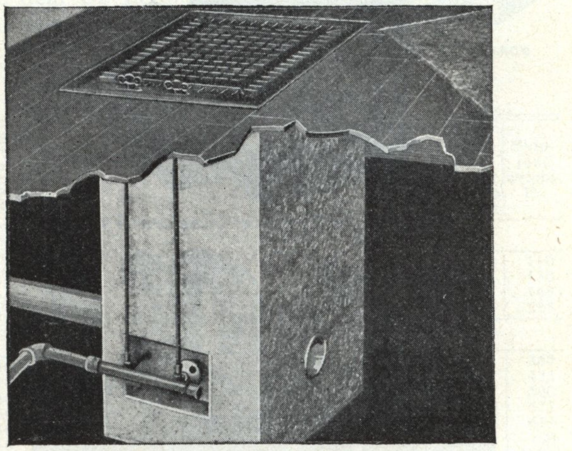
The combustion chamber or fire box is completely sealed to prevent burned or raw gases entering room. Burned gases are removed by connecting to *vent* which expels them into the outer air.

This system provides quick, safe heat at a low cost.

A key is furnished with each furnace for operating the gas valve and pilot light. The key is inserted in the margin of the register, a slot in the key engaging a rod which is connected with the gas valve (see lower illustration below). A turn of the key either opens or closes the gas valve, as desired.



The Principle of Heating Air in the Pacific Floor Furnace



Pacific Gas Fired Pipeless Floor Furnace

Designation	Johnson hot blast	Pacific No. 01	Pacific No. 02
Approx. heating capacity.........cu. ft.	3500	4500	6000
Radiation.........................sq. ft.	8	10	14
Gas connection.......................in.	½	½	½
Inside area of vent required......sq. in.	12	12	12
Size of register.......................in.	15¼x15¼	17x20	17x24
Floor opening required...............in.	14x14	16x19	16x23
Height...................................in.	24	30	30
Code word................................	Florist	Florida	Flood

Vent outlet, 3 in. round hole.

PAYNE FURNACE & SUPPLY CO., INC.

Manufacturers of Gas Fired Warm Air Furnaces

P. O. Box 496
LOS ANGELES, CAL.

FACTORY
BEVERLY HILLS, CAL.

EASTERN REPRESENTATIVES

BROOKLYN, N. Y., Kings Gas Appliance Co., 4802 New Utrecht Avenue
LOUISVILLE, KY., J. F. Wagner's Sons Co., 1227 South Sixth Street
NEW ORLEANS, LA., Southern Gas Appliance Co., 818 Carondolet Street
TULSA, OKLA., Moran Furnace & Sheet Metal Co., 807 Fifth Place
SAN ANTONIO, TEX., Eagle Sheet Metal Works, 615-621 Nogalitos Street
OMAHA, NEB., Standard Furnace Co., 407 South Tenth Street

WESTERN REPRESENTATIVES

SAN FRANCISCO, CAL., Gas Heating Co., 2129 Geary Street
SEATTLE, WASH., Eckart Bros., 320 Westlake North
PORTLAND, ORE., General Heating Co., 480 Hawthorne Avenue
SAN DIEGO, CAL., Robertson Bros., 1328 Fifth Street

AGENTS IN MOST OF THE PRINCIPAL CITIES OF CALIFORNIA (Names on Request)

Products

Payne Gas Fired Warm Air Furnaces.

Payne Service

The unit system of gas furnace heating may be unfamiliar to many Eastern architects, but we have pioneered the system and with eleven years of success behind us, we are capable and willing to assist architects everywhere by making layouts and preparing specifications for this system of heating.

Send us your plans—the service is free.

Write for catalogue and descriptive literature.

Payne Unit System of Warm Air Heating

A system which is practicable only with gas furnaces.

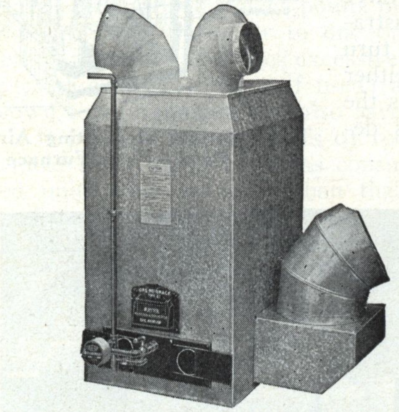
The installation of the unit system does away with the old and more or less unsatisfactory practice of providing only one furnace to heat the entire house. Small gas furnaces called "units" are advantageously located in various parts of the basement so as to shorten the runs of pipes, reduce heat losses and effect positive delivery of heat to every room no matter from which direction the wind may blow.

Advantages of Payne Gas Furnaces

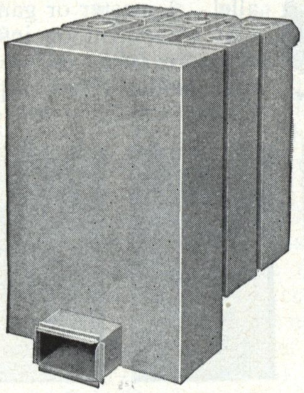
The most healthful system known at low first cost, low cost of operation and absolute freedom from the drudgery and dirt incidental to the use of coal fired furnaces. While coal fired furnaces are the systems of yesterday, the Payne unit system is tomorrow's system ready for your clients today.

Construction of Payne Gas Fired Unit Furnaces

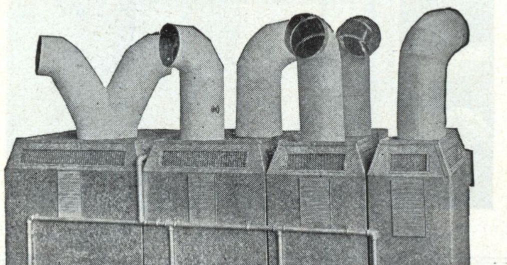
All radiating surfaces are made of Armco ingot iron. Seams are welded, making them gastight. Double galvanized iron casings. Extremely long fire travel and enormous areas of radiating surfaces effect



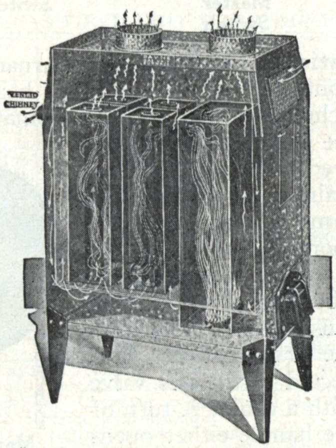
Payne Unit Furnace (Eastern Type)



Interior of Payne Eastern Type Furnace



Battery of the Four Sizes of Unit Furnaces (California Type)



Phantom View of California Type Unit Furnace

Continued on next page

unusual economy and make possible the use of a very small, economical gas burner.

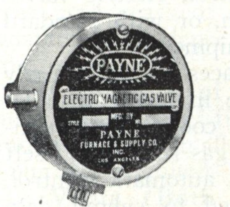
All radiating surfaces are vertical and air passages are large, thus permitting the flow of great quantities of air at high velocities with low healthful temperatures.

Electric Control Equipment

You may have your choice of thermostatic or push button control.

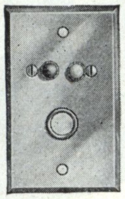
The thermostat needs no description.

The push buttons can be put wherever they can be most easily reached. To push the button operates the Payne "Hi-Lo" electromagnetic gas valve. High or low heat is generated by pushing this button and an electric signal light indicates at all times at just what heat the furnaces are burning. Wonderfully convenient.



"Hi-Lo" Electric Gas Valve

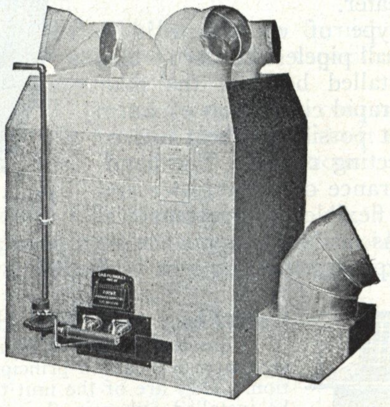
Payne Gas Burner



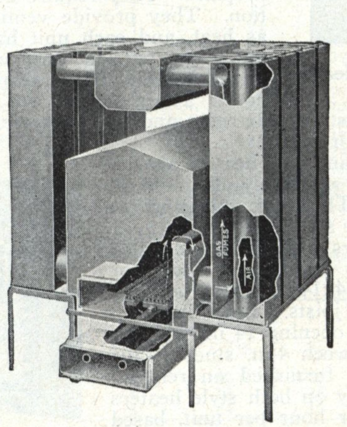
Electric Control Switch

Automatic Safety Pilot

This device is better than an insurance policy for it prevents disasters rather than making them good after they occur. The satisfying assurance that all is well at home will be greatly appreciated by your client. Furnaces are furnished with or without this equipment as desired.



Payne Central Type Furnace (Eastern)



Interior of Central Type Furnace

Automatic Humidifiers

Healthful humid heat, so necessary in a tightly closed home is supplied by our humidifiers without going near the basement.

Furnaces are furnished with or without this equipment, as desired.

Central Furnace Systems

While years of experience have very conclusively proven the unit system of warm air heating with gas to be far superior to the old central furnace system, every person is not going to be converted in a day.

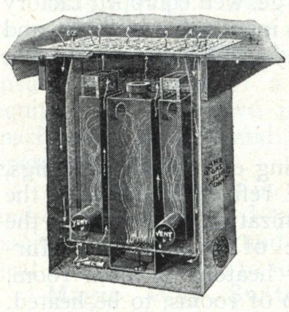
In order that your clients may have the advantages of Payne gas heating, we make larger furnaces for central plant systems, as listed in table below.

Floor Furnaces

The floor furnace is really a miniature pipeless furnace just large enough for one or two rooms. It requires no basement. It is lighted and regulated at the floor register.

It is supplied with water pans to furnish proper humidity. Useful as an auxiliary heater for other systems.

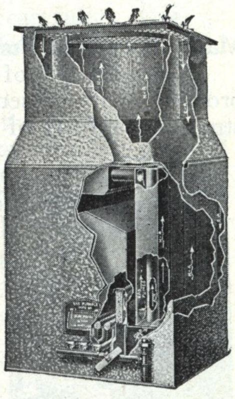
We make 3 sizes in each of 2 types. The standard type is equipped with the ordinary gas pilot. The automatic is lighted by an electric spark as the gas is turned on.



Floor Furnace

Pipeless Furnaces

The very low cost of this furnace installed causes it to find a great deal of favor in many parts of the country. We make 4 sizes of this type.



Pipeless Furnace

PAYNE GAS FIRED FURNACES

Size No.	Width, in.	Depth, in.	Height, in.	Number of burners	Gas supply, in.	Diam. vent, in.	Radiation surface. sq. ft.	Heat pipe cap., sq. in.	Approx. number of rooms furnaces will heat	Shipping weight, lb.
PAYNE UNIT FURNACES										
0	14	30	45	1	½	3	16.5	63	1	110
1	18	30	45	1	¾	3	31.5	113	2	130
2	26	30	45	1	¾	4	44.5	156	3	168
3	32	30	45	1	1	4	59.5	210	4	225
PAYNE CENTRAL PLANT FURNACES										
3½	46	30	52	2	1	4	65.0	300	5	360
4	46	36	52	2	1	5	80.0	350	6	425
5	46	42	52	2	1¼	5	95.0	410	7	500
6	46	48	52	4	1¼	6	110.0	470	8	575
7	46	54	52	4	1½	6	125.0	525	9	655
8	46	60	52	4	1½	7	140.0	585	10	760
10	46	72	52	4	2	8	170.0	700	12	1000
PAYNE PIPELESS FURNACES										
30	32	30	86	1	1	4	59.5	*16	4	285
35	46	30	86	2	1	4	65.0	*18	5	425
40	46	36	86	2	1¼	5	80.0	*20	6	510
50	46	42	86	2	1¼	5	95.0	*22	7	585
PAYNE FLOOR FURNACES										
11	13¾	13¾	30	1	½	3	6.2	§16x16	1	90
22	13¾	22	30	1	½	3	10.3	§16x24	2	115
33	22	22	30	1	¾	4	20.0	§24x24	3	150

*Diameter of warm air pipe.
§Size of register.

POTTER RADIATOR CORPORATION

Manufacturers of Modern Gas Heating Systems

FACTORY AND EXECUTIVE OFFICES
NATIONAL CITY, CAL.
BRANCH SALES AND CONTRACTING OFFICES
LOS ANGELES, CAL., 3517 West Washington Street
SAN FRANCISCO, CAL., 1345 Howard Street
OAKLAND, CAL., Broadway at 51st Street
AGENCIES IN ALL PRINCIPAL CITIES

Products

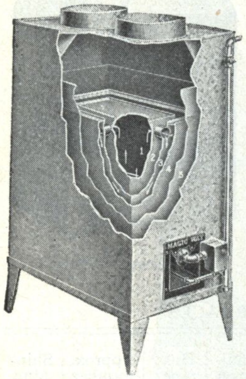
Magic Way Unit Furnaces.
Gas-fired Central Furnaces of all capacities.
Floor Furnaces, pilot or electric spark ignition.
Cole Floor Heaters.
Cole Wall Heaters.
Potter Cast Iron Vented Gas Radiators.
Potter Steel-made Vented Gas Radiators.
Ra-Do Filtering Gas Radiators.
Magic Way Valves and Switches (heat control).

Organization

The Potter Radiator Corporation is one of the largest organizations in the United States devoted exclusively to the manufacture and development of gas-fired heating equipment. Its large, well equipped factory and its many factory branches insure the architect and the owner of conscientious and intelligent engineering service at all times.

Magic Way Unit Furnaces

The principle of unit heating of modern buildings, brought to its present state of refinement through the study and efforts of this organization, is based on the principle of an individual furnace, or heater, for each room, or group of rooms, to be heated. This type of installation allows accurate temperature control in each room regardless of the demand in other sections of the home.


Interior Construction

Construction—In the construction of Magic Way Unit furnaces, copper alloy steel is used throughout and all joints are welded to insure a perfectly sealed heating chamber. The fire travel is long and so arranged as to insure maximum efficiency, and at the same time eliminate undue condensation.

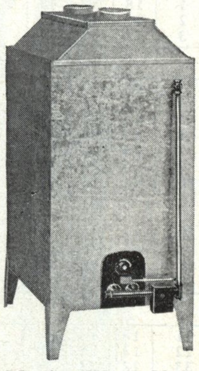
The burners are designed along the lines approved by the Bureau of Standards, American Gas Association and leading gas companies. They are so arranged as to insure a short, sharp flame and, at the same time, distribute the fire evenly throughout the combustion chamber.

Adjustment and inspection of the pilot are readily made by means of our special pilot control block.

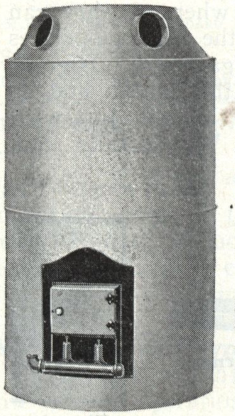
All sizes are furnished either with legs, where cold air is to be taken from furnace room, or with solid base where standard cold air ducts are desired.

By the use of electrically operated valves, one of which is a part of each Magic Way unit, the temperature of any room in the home may be regulated merely by pressing a button. This valve not only turns the heat on, but it regulates the heat to suit your exact wants.

A small electric signal lamp indicates the amount of gas supplied to the burner.


Magic Way Unit Furnace

Central Plant Furnaces


Central Plant Furnace

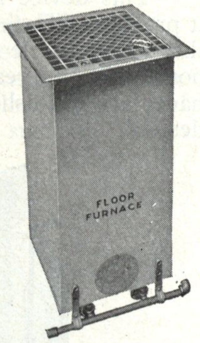
We manufacture a complete line of gas-fired central heating plants with a wide range of capacities. These furnaces are constructed of very heavy copper alloy steel and welded joints. They are equipped for manual control, electric valves and push button, or with standard thermostatic equipment.

These furnaces are particularly adapted for use in larger installation of heating, cooling and ventilating plants, as gas fuel lends itself to perfect, safe automatic control. We are prepared to submit data showing the saving in operating and first costs as compared with equipment using other fuels.

Floor Furnaces

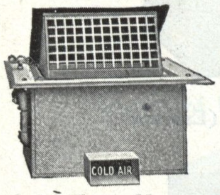
We can furnish floor furnaces in various capacities and with pilot or electric spark. Our electric spark ignition has special safety features that can not be found on any other make of heater.

This type of equipment is in reality a small pipeless furnace which can be installed between the floor joists. Its rapid circulation of warm air makes it possible to heat one or more connecting rooms. The handsome appearance of the register and its quick, flexible and economical operation has made this appliance very popular where a simple, inexpensive heating unit is desired.



Floor Furnace

Cole Floor and Wall Heaters



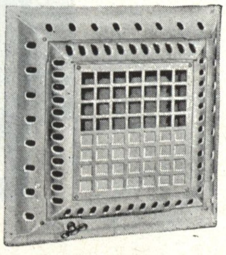
Cole Floor Heater

Cole heaters are "different" in design, appearance and principle of operation. They are of the unit type and can be installed either in the wall, floor or fireplace. They require no vent connection. They provide ventilation as well as heat, and each unit has a fresh air intake to outside wall which supplies approximately 700 cu. ft. of pure air per hour. These heaters are equipped with special luminous flame burners and are entirely free from obnoxious odors or fumes.

Both floor and wall heaters are designed so as to absolutely eliminate all fire hazard. They are pleasing in appearance and simple to operate.

Cole heaters are readily installed in old or new buildings. The floor type requires 14x14-in. space between standard floor joists. Wall type requires a rough opening 14 in. wide by 17 in. high between 4-in. studs. Pipe diagram gladly furnished on request.

Gas capacity on both style heaters is 20 cu. ft. per hour per unit, based on 550 B.t.u. gas.


Cole Wall Heater

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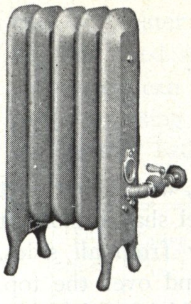
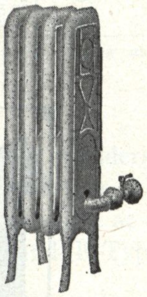
Potter Vented Gas Radiation



Potter Cast Iron Radiator

Cast Iron—Potter vented gas radiation, rugged and substantially constructed of cast iron, has gained wide popularity in the last few years owing to the fact that it brings healthful heat and good ventilation at low cost. This type of heating is now widely used in apartment houses, schools, auditoriums, churches and public buildings. Condensation and corrosion have been practically abolished by the Potter design, which heats every section quickly and evenly.

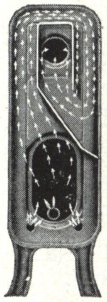


Steel-made Radiator

Steel-made—Steel-made radiators, designed along the same general characteristic lines as the Potter cast iron radiator, have proved through extensive tests and years of use to be admirably adapted to residence and apartment heating.

Constructed of heavy gauge copper alloy steel, they function quickly and radiate heat from all sections immediately upon being ignited.

Vents (Both Types)—Both cast iron and steel-made radiators are equipped with special down-draft check and a 3-in. vent collar.



Potter Radiator
Showing heat travel

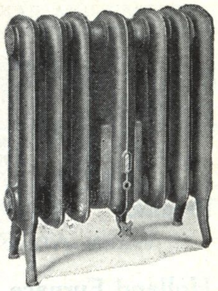
Terra cotta or concrete flues are generally provided in partitions, and should be extended well above roof line. Minimum cross-sectional area of flue should be 12 sq. in., which will provide the proper area for 18 sections of radiation. For each additional 10 sections increase the flue area by 6 sq. in.

We will be glad to furnish architects with valuable data on flue capacities, radiator grouping, etc.

Potter radiators, used in conjunction with a simple form of mechanical draft equipment, are ideal for larger installations.

Ra-Do Filtering Gas Radiators

This appliance solves the heating problem where vents are impractical to install. Re-heating combustion chamber and chemical filtering outlet eliminate all possibility of fumes or odor. The chemical compound needs renewing only once a season. These renewals are sold at a nominal expense and can be changed readily by the owner. The special features of combustion and filtering are covered by patents and can not be found in any other appliance.

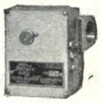


Ra-do Radiator

Ra-Do radiators are pleasing in appearance and are made of heavy cast iron construction, insuring long, satisfactory use. There is nothing to get out of order or require attention and there is no possibility of ruining floors with Ra-Do radiator.

The Ra-Do is a proved success. It has been on the market for eight years and has thousands of satisfied users from coast to coast.

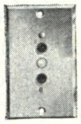
Magic Way Electric Valves and Switches



Magic Way Electro Magnetic Valve

This type of equipment is really what the name implies, as by its use it is now possible to control the temperature of the home, office or store by merely pressing a button conveniently located at any desired point.

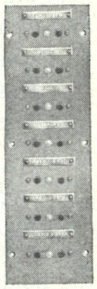
Magic Way Valve—This is the pioneer in its field, and our vast experience, coupled with our modern machine and tool equipment, insures the owner of a superior piece of equipment. All valve parts are carefully machined, inspected and tested under actual operating conditions.



Single Switch

The valve comes in two styles: the on-and-off type, and the 3-speed type, the latter having low, medium and high heats. Each heat can be regulated to suit conditions.

Magic Way Switches—Switches in pleasing finishes are provided with minute electric lamps placed beneath each push button, indicating to the operator the amount of gas turned on.



Master Switch

Individual switches are placed wherever desirable, and can be connected in multiple with the one or more master control plates. This allows the furnace to be operated from one or more locations.

DIMENSIONS AND RATINGS OF POTTER WARM AIR FURNACES

Type of equipment	Size No.	Width, in.	Depth, in.	Height, in.	Gas supply, in.	Height center of gas, in.	Vent diam., in.	Height center of vent, in.	Area free air, sq. in.	Ft. of mfd. gas consumed	Gross B.t.u. hourly imput	Net B.t.u. hourly at furnace	Ship. wt., lb.
Magic Way Units	1	15	32	42½	½	9½	3	22	250	40	22,000	17,000	110
	2	21	32	42½	¾	9½	4	22	325	75	41,000	35,000	140
	3	25	32	42½	¾	9½	4	22	385	90	49,000	42,000	170
	4	27	32	42½	¾	9½	5	22	430	120	65,000	57,000	210
Central Plant Furnaces	32-in.	32	round	49	¾	8½	4	19	480	90	49,000	42,000	215
	35-in.	35	round	55	1	8½	5	22	530	120	65,000	57,000	250
	43-in.	43	round	58	1¼	10½	6	23	....	210	114,000	100,000	345
Floor Furnaces	Jr.	14	14	33	½	....	3	7	60	35	20,000	17,000	85
	1	18	18	39	¾	....	3	7	84	45	25,000	20,000	105
	2	24	24	39	¾	....	4	7	187	70	38,000	32,000	135

DIMENSIONS AND RATINGS OF GAS-FIRED RADIATORS

Type of equipment	Size No.	Number of Sections per radiator	Width, in.	Height, in.	Depth, in.	Vent diam., in.	Height center of vent, in.	Gas supply, in.	Height center of gas, in.	Ft. of mfd. gas consumed	B.t.u. imput	B.t.u. emission	Sq. ft. steam equivalent	Ship. wt., lb.
Potter Cast Iron (per section)		3 to 10	2⅞	27	8	3	16½	½ to ¾	8¾	3	1650	1400	5	27
Potter Steel made (per section)		4 to 8	2¹⁄₁₆	27	8½	3	16½	½ to ¾	7¾	3	1650	1400	5	5
Ra-Do Filtering Radiator	2	4	12	26	12	none	none	½ to ¾	4½	15—18	9000	8000	25	90
	4	6	18	26	12	none	none	½ to ¾	4½	20—30	13000	12000	33	125
	6	8	24	26	12	none	none	½ to ¾	4½	30—40	19000	17000	40	160

HOLLAND FURNACE COMPANY

HOLLAND, MICH.

Product

Warm Air Furnaces.

Holland Furnace

Advantages—The Holland furnace will burn any and all grades of fuel—hard coal, soft coal, lignite or wood—without waste of gases, without internal explosions and without opening of joints.

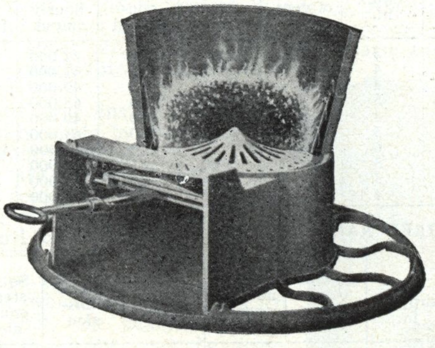
It gives the maximum heat for the fuel consumed, because it has the air-admitting fire pot, the one-piece radiator and the most perfect and natural way of burning the fuel.

Description—The special patented features are necessary common sense improvements. The castings are heavy and well made, and the fittings are the best that can be provided. The new Holland humidifier is, we claim, the simplest air moistener ever devised and by far the most efficient.

Grate and Ash Pit—The Holland grate, as illustrated herewith, is slightly cone shaped, which breaks up all clinkers and makes the fuel roll towards the wall of the fire pot, where air is mixed with the gas. This generates a much greater degree of heat than it is possible to obtain with the old duplex and flat grates, and clinkers that would form and be wasted in other furnaces are thereby consumed.

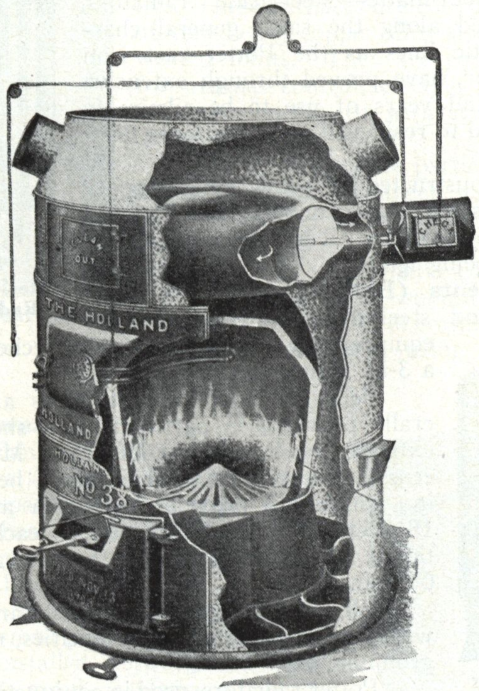
Resting on a pivot, it is easily operated, and for convenience and simplicity it has no equal. Either the solid or open construction is furnished; both have the pivot center, and either can be removed through door of ash pit. By lifting grate slightly and moving sidewise, the grate can be lowered, giving an opening of 7 in., and the holding bar locks back in position by simply raising grate with shaker or lifter.

The ash pit is large and roomy on the inside, and is provided with a very large door, which makes it convenient for the removal of ashes.



Holland Grate, Ash Pit and Patented Fire Pot

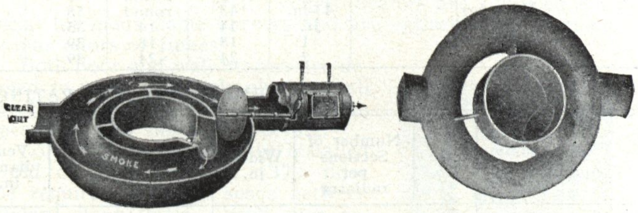
Patented Fire Pot—The Holland air-admitting fire pot insures fuel economy, durability and cleanliness. Made in two heavy corrugated sections, with lower part provided with a large number of funnel shaped slots, it supplies the fuel with superheated air from all sides. This burns the fuel from the sides and over the top. The gases and soot are consumed, which means fuel saving in place of trouble and dirt.



Sectional View of Holland Furnace

Patented Radiator—The Holland radiator is cast in one piece, with no joints to be cemented or bolted together. It has three heating surfaces, and longest possible smoke travel, so produces the greatest amount of radiation, all heat being utilized.

The damper, operated from the outside of casing, makes all smoke travel the full circuit, when closed; or allows a direct draft, when open. It opens and closes by lifting and lowering the weight hanging in front of furnace. With this damper arrangement the smoke has to travel twice as far in the "Holland" as it does in other furnaces similarly constructed, and the heat is equal for all warm air pipes taken off.



Patented Radiator of the Holland Furnace

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Combination Heating—For combination heating, cast iron water rings can be supplied to go between fire pot and feed section. Through recess in feed section water coil can be placed for combination heating purposes, by using a radiator or two, or the coil can be used for heating bath and kitchen water.

HOLLAND FURNACES AND CASINGS

No.	Fire pot diam., in.	Casing diam., in.	Casting height, in.	Residence capacity, cu. ft.	One-room capacity, cu. ft.	Weight, lb.	
37	19	37	49	8,000	12,000	925	Prices and plans on application
40	22	40	50	10,000	16,000	1,080	
45	25	45	52	14,000	21,000	1,240	
50	28	50	54	18,000	28,000	1,540	
60	32	60	55	25,000	40,000	1,930	

No. 40 Pipeless and No. 3-40 Pipeless, with special casing and register—prices and plans on application.

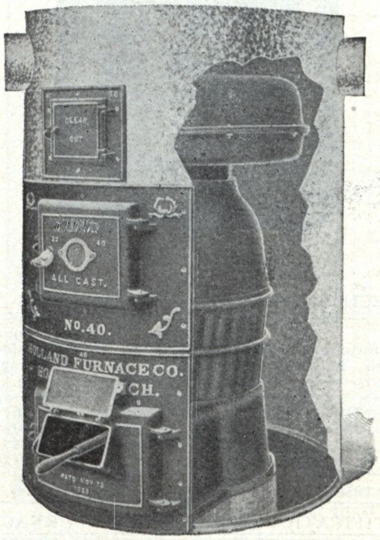
All-cast Holland B-Type Furnace

The demand by real estate dealers and builders, who build houses to sell, has made such a strong call for an ordinary all-cast furnace which can be sold at a price consideration, that the All-cast Holland B-Type has been added to the line.

This furnace is heavy and well made; and while the radiator is cast in two pieces and bolted together, and the smoke travels only half as far as in the Holland, it is fully as good as other furnaces of similar construction that have not the patented "direct-indirect" damper feature of the Holland. The fire pot is in two plain sections, with outside surfaces corrugated. The furnace is also provided with the cone grate.

The All-cast Holland B-Type is an ideal heating plant for those who want an ordinary all-cast furnace, to gain a saving in first cost.

A recess is provided in the feed section for the admittance of a water coil.



All-cast Holland B-Type Furnace

ALL-CAST HOLLAND B-TYPE FURNACES AND CASINGS

No.	Fire pot diam., in.	Casing diam., in.	Casting height, in.	Residence capacity, cu. ft.	One-room capacity, cu. ft.	Weight, lb.	
19	19	37	48	7,500	11,000	825	Prices and plans on application
22	22	40	49	9,000	15,000	965	
25	25	45	50	12,500	20,000	1,045	

No. 22-40 Pipeless and No. 25-40 Pipeless, with special casing and register—prices and plans on application.

Holland Service

Customers do not merely buy a furnace—a heating plant. They buy experience, the ripeness of years of dealing with heating problems and difficulties. To be sure, the HOLLAND FURNACE COMPANY sells the best furnace that it can manufacture, but the service does not end there. A special feature is made of knowing positively that every furnace installed by this company will give satisfaction.

Write to the service department about heating problems.

Holland Transferable Guarantee Bond

There are several reasons why real estate dealers feature the Holland furnace in the advertisements of their houses, but no reason carries more weight than the transferability of the Holland Guarantee.

No matter who moves into a Holland-heated home, there is only one place to put responsibility with respect to the heating system. The Holland furnace is manufactured, sold and completely installed by the HOLLAND FURNACE COMPANY. That is why the Holland Bond can and does mean undivided responsibility. And that is why the bond can be transferred from one buyer of a house to another.

Architects, contractors and real estate men are more and more realizing the demand on the part of their clients for the transferable heating guarantee. And they appreciate the value of a guarantee which is the direct pledge of the greatest organization of heating experts in the world.

Every Holland Branch is a permanent, local institution. It is permanent because it is an important part of a national institution. It is local because every Holland man is primarily interested in things local. Holland Branch managers are allowed to remain where they have been established residents whenever that is possible. When they are sent away from home they are put to stay. The Holland man is selected and trained to give high grade heating service, he does a good business, and is respected in his community.

The Holland man is trained particularly to have Holland work done in harmony with other building equipment work, and to hold courtesy, promptness and thoroughness, foremost. Architects who are friends of the Holland are strong friends.

THE FOX FURNACE COMPANY

Manufacturers of Pipe and Pipeless Furnaces

ELYRIA, OHIO

BRANCH OFFICES

BOSTON, MASS. ATLANTA, GA. CLEVELAND, OHIO CHICAGO, ILL. DENVER, COLO. SAN FRANCISCO, CAL.

Copyrighted, by The Fox Furnace Company

SUNBEAM
WARM-AIR FURNACES

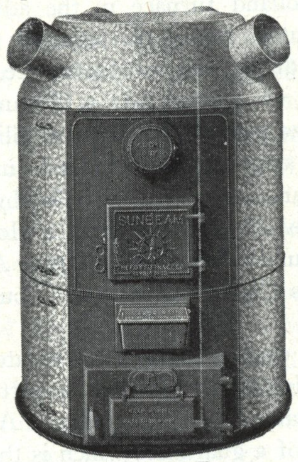
Products

Sunbeam Pipe and Pipeless Furnaces.

Also Sunbeam Cabinet Heaters.

Sunbeametal

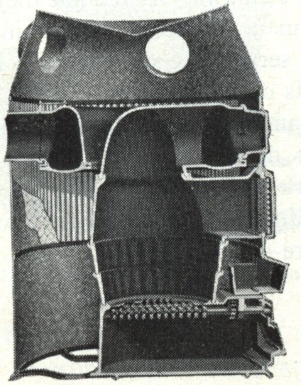
To deliver permanently satisfactory service with low cost of upkeep, a furnace must be built of quality materials. Long life and trouble-free service have been amply provided for in Sunbeam Furnaces through the use of a newly developed furnace iron called "Sunbeametal". Every Sunbeam casting is made of this new metal, whose uniform quality and greater strength enable the Sunbeam Furnace to withstand the severest usage to which furnaces are subjected, as well as the extremes of expansion and contraction resulting from irregular firing. The tensile strength of "Sunbeametal" as shown by break test is 28,000 lbs. per sq. in. as compared with about 15,000 lbs. per sq. in. for ordinary cast iron.



Sunbeam Pipe Furnace

Sunbeam Capacities

Heating capacity and efficiency in any warm-air system depend on the air-passing capacity of the furnace. The ideal condition exists when the air-passing spaces are so designed and proportioned as to provide a large volume of properly warmed air at a steady rate of circulation instead of a small volume of very hot air at high velocity. This desirable result is accomplished in Sunbeam Furnaces by reason of the special design of the castings and the extra large casing diameters which provide the necessary air spaces. The Sunbeam's unusually large casing dimensions and air-passing spaces are readily apparent in the illustrations and specifications.



Cross Section of Pipe Furnace

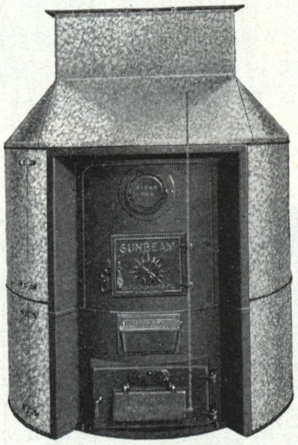
Adaptability

Sunbeam Furnaces are made in 7 sizes of the "pipe" type ranging from an 18-in. diam. fire pot furnace to a 32-in. diam. fire pot furnace and in 5 sizes of the "pipeless" type ranging from an 18-in. diam. fire pot to a 26-in. fire pot. This gives a range of capacities and prices to meet every heating need whether a pipe or a pipeless system is required.

Sunbeam Engineering Service

Through Sunbeam Engineering Service complete warm-air heating plans and specifications will be supplied without cost, indicating the proper type and size of furnace and a complete layout of leaders, wall stacks and registers. Our Engineering Department will gladly make up heating recommendations for standardized house plans for architects, contractors, or others contemplating the use of Sunbeam Warm-air Heating.

We will gladly supply a complete catalogue of Sunbeam Furnaces, parts and accessories, also booklets on warm-air heating; installation service blanks, etc.



Sunbeam Pipeless Furnace

SPECIFICATIONS OF PIPE FURNACES

Furnace No.	Capacities, sq. in.	Inside diam. of fire pot, in.	Size of flue required, in.	Diam. of outside casing, in.	Shipping weight, lbs.
18C	310	18	8x12	36	690
20C	395	20	8x12	40	800
22C	475	22	8x12	44	1030
24C	565	24	8x12	47	1210
26C	795	26	8x12	52	1385
30C	1050	30	12x12	60	2100

SPECIFICATIONS OF PIPELESS FURNACES

Furnace No.	Number of rooms to be heated	Inside diam. of fire pot, in.	Size of flue required, in.	Diam. of outside casing, in.	Shipping weight, lbs.
5034B	3 to 5	18	8x12	42	895
5038B	5 to 7	20	8x12	47	1040
5040B	7 to 10	22	8x12	52	1295
5047B	10 to 12	24	8x12	60	1550
5052B	12 to 14	26	12x12	64	1675

KELSEY HEATING COMPANY

Manufacturers of Warm Air Heating Systems

SYRACUSE, N. Y.

BRANCH OFFICES

NEW YORK, N. Y.
BROCKVILLE, CAN., CANADA FOUNDRIES AND FORGINGS, LTD.
BOSTON, MASS.

DEALERS IN ALL PRINCIPAL CITIES

KELSEY HEALTH HEAT

TRADE-MARK

Products

- KELSEY FRESH AIR HEATING and VENTILATING SYSTEMS.
- KELSEY WARM AIR GENERATORS.
- KELSEY MECHANICAL WARM AIR SYSTEM.
- KELSEY AUTOMATIC HUMIDIFIER.

Kelsey Service

The KELSEY HEATING COMPANY are designers of fresh air heating and ventilating systems, as well as being manufacturers of the apparatus and appliances.

An engineering Service Department is maintained to properly design heating and ventilating systems, and its technical knowledge and experience are available to architects and owners. Each proposed installation is carefully analyzed, and individual recommendations are made as to the best methods of meeting the requirements of the architect or owner of the building to be served. This department does not operate on the prejudiced plan of "free service." A fair charge is made for service rendered. General information concerning Kelsey systems will be furnished on receipt of inquiry.

Record of Installations

A list indicating the character of buildings in various parts of the country, where Kelsey systems are in successful operation, will be furnished on request.

Kelsey Fresh Air Heating and Ventilating Systems

Kelsey systems are designed to fulfill the requirements of the particular installations. They have peculiar advantages that especially fit them to given conditions, and are complete and satisfactory units for the purposes designed and recommended.

Kelsey fresh air heating and ventilating systems are adaptable to any type or size of residential work and are particularly efficient in the heating and ventilating of the larger residences, churches and schoolhouses.

Kelsey systems not only heat but ventilate at the same time. They have not only established a record for being the most efficient, economical, easily managed and regulated, but differ from other systems in that they deliver the correct volume of properly warmed and automatically humidified clean, fresh air accurately and scientifically mixed, and maintain the proper amount and proportion of heat and humidity throughout the building.

Operation and fuel consumption are decidedly economical where Kelsey systems are employed.

Distant and exposed rooms can be positively and accurately served with the same satisfactory volume and quality of heat and ventilation as are those of lesser dimensions and closer proximity, no matter how hard or from what direction the wind blows.

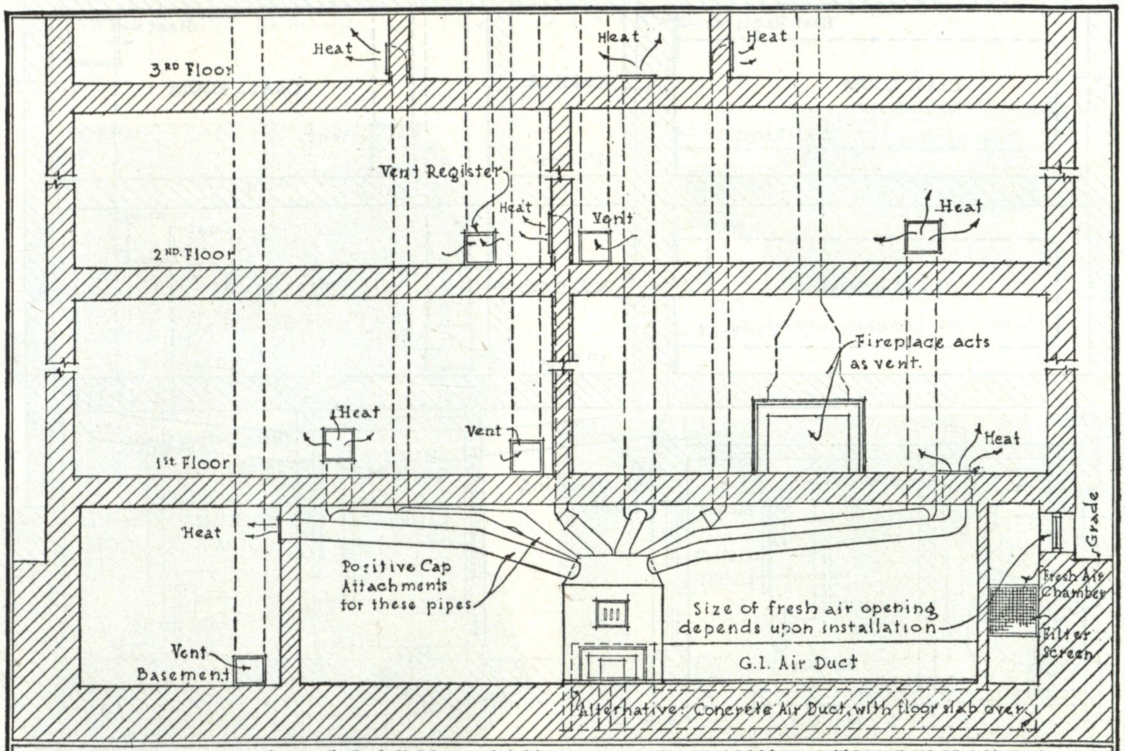

Heat
3RD Floor
Heat
Heat
Vent Register
Heat
Vent
Heat
2ND Floor
Fireplace acts as vent.
Heat
1st Floor
Vent
Heat
Grade
Heat
Positive Cap Attachments for these pipes
Fresh Air Chamber
Size of fresh air opening depends upon installation
Filter Screen
Vent
Basement
G.I. Air Duct
Alternative: Concrete Air Duct, with floor slab over.

DIAGRAM OF KELSEY HEATING AND VENTILATING SYSTEM AS APPLIED TO RESIDENCES.

Continued on next page

Kelsey Mechanical or Fan Blast System

The Kelsey mechanical system has shown its adaptability for perfectly warming and ventilating large residences, schools, churches and public buildings, as the simplicity of operation, the great economy of fuel, the even distribution of the heat with positive ventilation and the durability of the apparatus have been thoroughly established.

The Kelsey generator usually used in mechanical systems has 16 long cast iron zigzag heat tubes forming the fire cylinder, each weighing about 70 lb., 40 in. in length, with a total of 211 sq. ft. of primary heating surfaces in each generator.

These heat tubes have separate deeply corrugated passages, so that the air, even when forced at high velocity by a fan or blower, must come in direct contact with extensive heating surfaces, thus giving every facility for the transmission of the heat units from the burning fuel to the fresh outside air in its passage through the generator.

With the mechanical system, the heaters may be arranged in battery form with two or more generators enclosed in a brick or metal casing, making it possible to heat all the rooms connected with the battery in moderate weather by operating one generator.

Operation—By this system, a fan or blower driven by gasoline engine, electric or water motor, draws the fresh air in and forces it under and through the one or more generators and the heat pipes extending to all parts of the building.

Delivers Large Quantities of Air—The Kelsey mechanical system has most successfully met all the requirements in supplying 30 cu. ft. of fresh air (properly warmed) per minute for each occupant in many school building and has also been installed in a number of churches and large, fine residences.

One No. 30 Kelsey generator has by actual test heated 4500 cu. ft. of air per minute through 130° temperature with fan pressure. The efficiency shown by this test was 85.7%.

It is possible with the fan system to completely change the air at 15-minute intervals without increasing the cost for fuel over an ordinary direct steam or gravity system.

SIZES, WEIGHTS AND CAPACITIES, KELSEY WARM AIR GENERATORS

	Grates		Heating surfaces		Weights	Heights	Base	Heating capacities		
								House heating		Church heating
Number of generator	Diameter grate and fire cylinder, in.	Grate area, sq. in.	Sq. ft. of heating surfaces	Sq. ft. of heating surfaces to each sq. ft. grate surface	Weight generators complete, lb.	Height generator, cased complete, in.	Diameter floor space, in.	Number average sized pipes or rooms	Total area heating pipes supplied by each generator, sq. in.	Estimated capacity in cu. ft. using 1 to 4 pipes
14	14	154	91	85	1008	61	38	3 to 4	280 to 350	8,000
16	16	201	114	82	1168	63	42	4 to 6	350 to 420	10,000 to 14,000
18	18	254	135	78	1635	68	46	6 to 8	450 to 500	16,000 to 20,000
21	21	346	146	61	2033	69	53	9 to 11	575 to 625	25,000 to 35,000
24	24	452	161	51	2300	69	56	10 to 13	675 to 750	35,000 to 45,000
27	27	572	176	44	2600	72	60	12 to 15	850 to 925	50,000 to 60,000
30	30	707	211	43	3124	76	64	14 to 19	975 to 1,000	70,000 to 90,000

The capacities given for house and church heating are estimated averages under varying conditions, and are based on heating to 70° F., with temperature outside registering at zero.

All weights include refined sheet iron inside casings. Series A or B with cast inside casings add about 300 lb. for each heater.

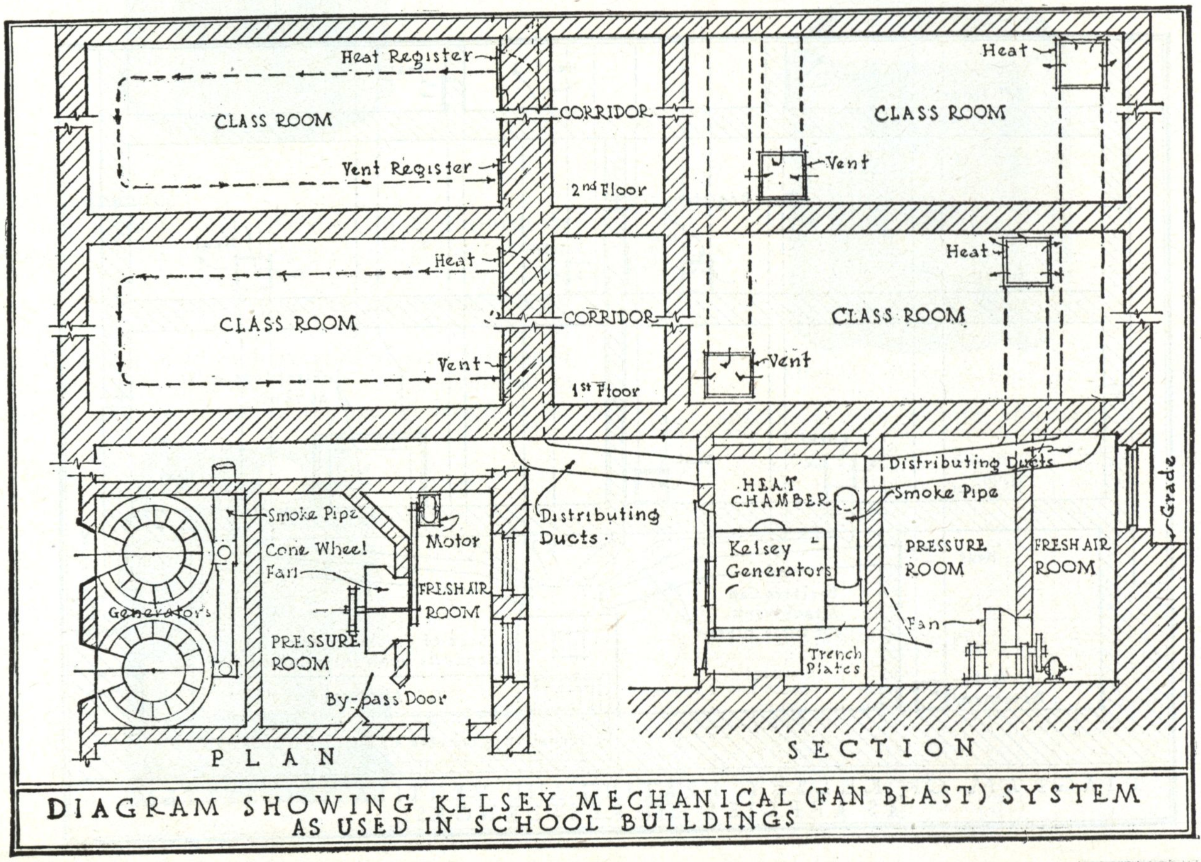
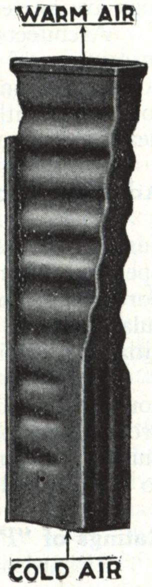


DIAGRAM SHOWING KELSEY MECHANICAL (FAN BLAST) SYSTEM AS USED IN SCHOOL BUILDINGS

Continued on next page

Generator

The Kelsey generator receives, warms, humidifies and delivers fresh air by a distinct and improved method peculiar to itself. Great volumes of air are warmed by being brought into contact with very extensive and properly heated surfaces, which is accomplished by sending the air in separate channels through the battery of cast iron zigzag heat tubes which surrounds the fire. By dividing the air into as many currents as there are heating tubes, it is more thoroughly and evenly heated than by simply passing a body of air over or next to a hot surface.



Kelsey Zigzag Heat Tube

Zigzag Heat Tubes—These tubes, through which most of the air passes in being heated, have corrugations on the inside as well as the outside. These corrugations cause the air in passing through to deflect from a straight course and to become more thoroughly mixed, thereby bringing more of the air particles into contact with the heated surfaces than would be possible with any other construction.

At the back, the tubes overlap each other, confining the fire within, but at the top between the tubes, there is 6 in. of space left open, through which the products of combustion pass to the draft chamber and thence down the backs of the tubes to the indirect draft opening.

Construction—***Ash Pit***—Fitted to base with cup joint. Absolutely no escape of dust. Sides are straight and an ash pan can be furnished at extra cost.

Grates—Of the Smyth pattern having 4 revolving bars, triangular in shape. At each one-third revolution they present a new surface to the fire.

Lower Deck—A cast iron "ring section" 3¼ in. wide is fitted in a cup joint to ash pit. On this ring rests the lower deck, the latter supporting the heating tubes or sections above, which fit into it with deep cup joints. This ring section is also used for natural gas burner. Lower deck extends beyond line of the back of the heat tubes 4 in. and then upwards 7 in., forming a flange upon which rests the inside casing and in it are cast the indirect smoke pipe collar and the clean-out openings on each side.

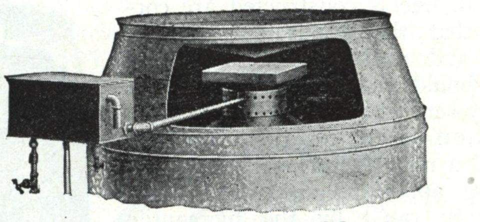
Upper Deck—Heat tubes or sections are held in position at the top by an upper deck ring fitted to each section with a deep cup joint. The upper and lower decks, with heat tubes between, are securely fastened together by heavy iron rods or bolts. These pass through the air chamber of the heat tubes.

Inside Casing—Extends from lower deck to upper deck and confines products of combustion. Between the backs of the heat tubes and inside casing there is a space of 4 in., which forms the draft chamber. Made of copper bearing heavy refined sheets or of cast iron plates.

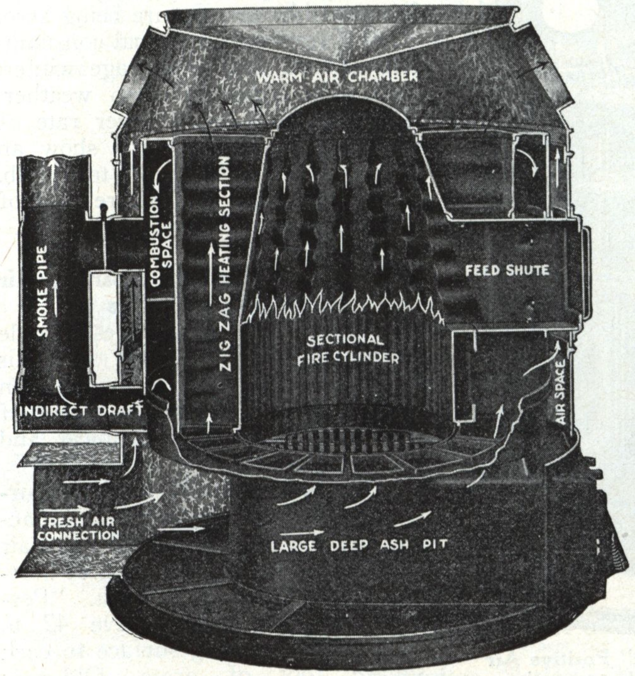
Outside Casing—Made of galvanized metal; upper half lined with asbestos sheathing and tin plates. Between inside and outside casing there is a space of 3 in. through which the air passes and is heated by being brought in contact with the inner casing, thus giving additional heating surface.

Baffle Plate—The direct draft provides for passage of smoke and gases directly from combustion chamber to chimney. This direct draft is never opened except when a new fire is built or when fire is low. With the direct draft closed, all products of combustion must pass down around the end of the baffle plate which fills up the space between the backs of the heat tubes and inner casing and extends around on each side to within about 14 in. of the feed door section. All heat regenerated is thus utilized by being brought into contact with the backs of the heat tubes and the inner casing before making its escape to the indirect draft.

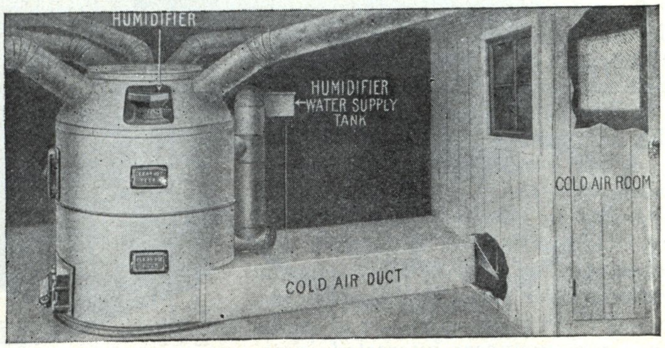
Fuel—The Kelsey generator uses anthracite coal, a good grade of coal, oil, natural gas and wood.



Kelsey Automatic Humidifier



Kelsey Warm Air Generator with Zigzag Heat Construction



Arrangement of a Model Kelsey Installation
The fresh, pure air from outside with regulating damper—Kelsey automatic humidifier in warm air chamber

RICHARDSON & BOYNTON CO.

SINCE 1837

Manufacturers of "Richardson" "Perfect" Heating and Cooking Apparatus

EXECUTIVE OFFICES
260 Fifth Avenue
NEW YORK, N. Y.

FACTORY
DOVER, N. J.

BOSTON, MASS.
BUFFALO, N. Y.
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NEWARK, N. J.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PROVIDENCE, R. I.
SPRINGFIELD, MASS.

Products

RICHARDSON "PERFECT" POSITIVE AIR CIRCULATING HEATERS; "PERFECT" WARM AIR HEATERS; "PERFECT" PIPELESS WARM AIR HEATERS.

For Low Pressure Boilers for Steam, Vapor and Hot Water, Domestic Hot Water Supply, Tank and Laundry Heaters, see pages 2177-2181; for Richardson Vapor-Vacuum-Pressure System of Heating, see pages 2254-2256; for Coal and Gas Cooking Ranges, see pages 2762-2764.

Endorsement by Architects and Engineers

Note: An impartial investigating committee, composed of architects and engineers of high standing in their respective professions, recently visited the Dover, N. J., plant of RICHARDSON & BOYNTON CO. The abstract of their report which follows will be of interest to every architect who is called on to specify heating or cooking apparatus.

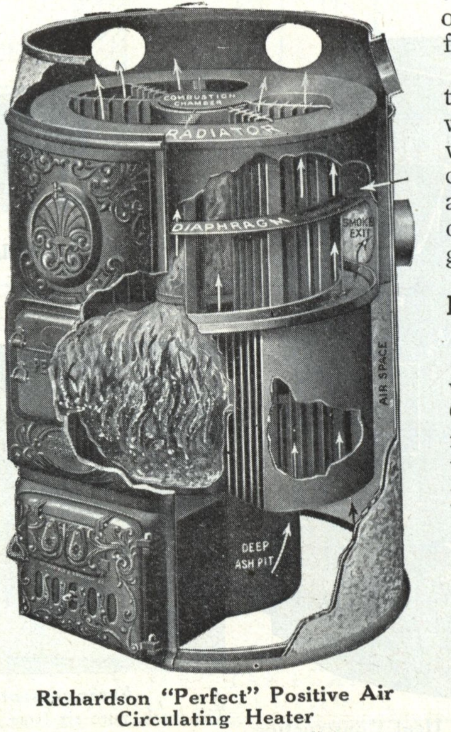
The Committee found a very large and up-to-date foundry where nearly a thousand men were employed in the manufacture of the Richardson products described and illustrated in this Catalogue. Every opportunity was afforded them to examine the plant and to inspect the goods in the process of manufacture. They found that the plant was so laid out as to facilitate an orderly and economical handling of the work; that the buildings and machinery offered ample facilities for the large-scale production of goods of a high quality, and that the provision for testing and inspection before shipment was such as to insure reliable goods.

It was their opinion that the mechanical principles on which the RICHARDSON & BOYNTON CO. line is constructed are correct; that the goods are durably made and well finished; and that they should give efficient and satisfactory service.

RICHARDSON & BOYNTON CO. has been manufacturing heating and cooking apparatus since 1837, and is highly rated by the mercantile agencies. The Committee was pleased with the attitude of the officers and employees of the Company whom it met, and feels confident they can be depended upon to co-operate with the architect in every way possible to secure satisfactory results for the client.

The Committee's report contains this significant judgment:

"As a result of its careful investigation, the Committee grants full approval to the goods manufactured by RICHARDSON & BOYNTON CO. *when installed in accordance with the manufacturer's instructions, and commends them to the attention of architects and engineers interested in securing for their clients high-grade heating or cooking apparatus."*



Richardson "Perfect" Positive Air Circulating Heater
With steel or cast iron radiator

Richardson & Boynton Engineering Service

This Company maintains an Engineering Department, composed of experts whose skill is the result of years of experience with a vast number of installations distributed over every part of the world where buildings are heated.

Architects are invited to submit their plans for the inspection of this Department, which will cheerfully advise, not only as to the best type of heating system to use, but with reference to the selection of the particular heating device and its installation.

Advantages of Heating with Warm Air Heaters

A warm air heating system is both the most economical to install and the lowest in maintenance and operating charges. An added advantage of great importance is the fact that it does not necessarily recirculate the air in the room, but can constantly replace vitiated air with air from outside the building.

It is not always the best system to use, but for houses of moderate size, not exceeding 1500 sq. ft. of ground area, there is no other method by which the required amount of ventilation and heat can be obtained so economically.

Ratings of "Perfect" Warm Air Heaters

Richardson "Perfect" heaters have guaranteed ratings, and are rated according to the average area of warm air piping in square inches that can be supplied by the heater, based on a temperature of 140° F. and a velocity of 240 ft. per min. at the first floor register, maintaining a rate of combustion of 6 lb. of coal per square foot of grate surface, outside temperature being zero.

Of course, the normal consumption of coal for an average winter, with only occasional zero weather, would be at a much lower rate of combustion. Our records show an average consumption of 2 to 2½ lb. of coal per hour per square foot of grate surface.

Richardson "Perfect" Positive Air Circulating Heaters

These are the highest grade warm air heaters made by this Company. They are constructed on modern lines, and are the result of the most exhaustive technical and practical tests.

Extra Large Radiating Surface—The heating power, or capacity, and the efficiency of a warm air heater depend upon the ratio of heating surface to the grate area. "Perfect" positive heaters have 42 to 53 sq. ft. of heating surface to each square foot of grate. Old-style heaters have only 15 to 23 sq. ft.

Continued on next page

The illustrations at the foot of this and the preceding page show how this result is accomplished. The air chamber surrounding the combustion chamber is so divided as to largely increase the radiating surfaces. Similar divisions, or flanges, also surround the fire pot, drawing the heat out from the fire pot as well as adding to the radiating surface. In addition there is a double casing with an air space between.

To assist in heating these added radiating surfaces, a diaphragm is inserted in the radiator. This forms a double return flue of the down-draft type and greatly extends the fire travel, thus utilizing to the utmost the heat from the smoke and gases released by the process of combustion.

Quick Response to Increased Draft—These numerous divisions also increase the velocity of both the air and the fire travel, making the heater respond more rapidly to a new fire or increased draft. The acceleration of the heated currents both heats the building more quickly and drives the heat to the farthest and most exposed rooms.

The direct air travel through numerous channels or tubes is another reason for the prompt action of "Perfect" positive heaters.

Ash Pits—High, large and mounted complete. They provide plenty of room for air circulation, and allow easy removal of the ashes.

Grates—Of the triangular type, properly ventilated to allow the correct amount of air to pass through them for complete fuel combustion. They have sharp cutting edges to remove clinkers and are strong, easy to operate and durable.

Fire Pot—15 in. deep, and has straight sides to which ashes and clinkers can not adhere. The straight sides give a large grate area in comparison to the diameter of the fire pot as listed in table, since that measurement is taken at the top of the fire pot. The fire pot also heats more evenly from top to bottom, removing the danger of cracking from uneven expansion.

Special Features—There are only three joints—pot, body and radiator—making the heater practically gas and dustproof when these three joints are properly sealed. Each heater has coil openings for domestic water heating, and a special vapor pan, furnished as an integral part of the heater, through which a healthful moisture is introduced into the warm air. The vapor pan can be furnished with an automatic feed valve if desired.

Fuels—Richardson "Perfect" Positive Air Circulating Heaters can be furnished to burn hard or soft coal, wood, gas or coke as ordered.

If the heater is to be exposed to the sulphuric acid gases from soft coal, a one-piece cast iron radiator with an attachment for injecting preheated air into the combustion chamber will be furnished. This takes the place of the steel radiator with which the heater is usually constructed.

Quality—Richardson "Perfect" Positive Heaters are made from the highest grades of iron and steel obtainable. All raw materials are accepted only after inspection and chemical analysis have shown that in every respect they are up to our standards.

The result of the care in design, workmanship and the choice of materials is that Richardson "Perfect" Positive Air Circulating Heaters will maintain a uniformly high degree of efficiency with low maintenance and operating charges, which, in a comparatively short time, will offset the somewhat higher initial cost.

"PERFECT" POSITIVE AIR CIRCULATING HEATER

No.	Grate area	Case diameter, in.	Height of panel front, in.	Smoke collar diameter, in. Steel or cast iron radiator	Heat pipe capacity sq. in. Steel or cast iron radiator
2901	283.53	46¾	55¼	8	484
2902	346.36	52¾	56⅛	9	626
2904	415.48	58	57½	9	812
2906	572.56	61⅝	59¾	10	1024
2908	804.25	68¾	62	10	1369

Richardson Mechanical System of Warm Air Heating

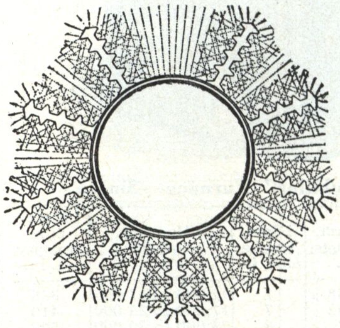
An ideal method for heating and ventilating schools, churches and large residences.

With this system pure warmed air can be delivered wherever wanted and the vitiated air exhausted into vent stacks through grilles at the floor line.

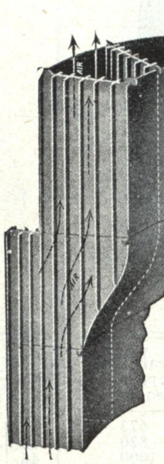
Some of Its Many Advantages—Original installation and operating costs always show a comfortable saving over indirect steam or other methods.

It complies with every state law on ventilation in every building.

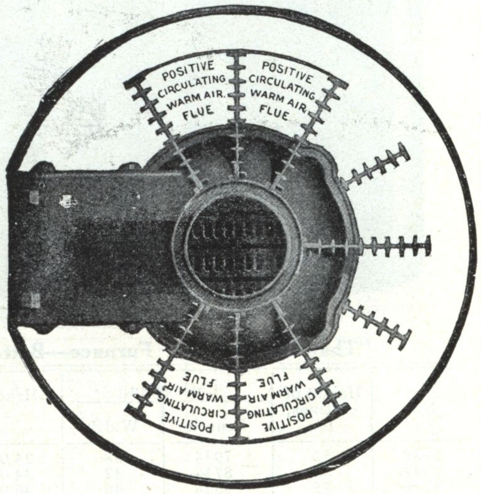
Sufficient fresh air is at all times delivered to each room to permit of from 3 to 7 changes per hour, according to requirements.



Radiation Diagram Showing Effect of Extended Heating Surfaces



Positive Circulating Warm Air Tube


POSITIVE CIRCULATING WARM AIR FLUE
POSITIVE CIRCULATING WARM AIR FLUE
POSITIVE CIRCULATING WARM AIR FLUE
POSITIVE CIRCULATING WARM AIR FLUE

Section Through Radiator

Richardson "Perfect" Positive Air Circulating Heater

ESTABLISHED 1850

THE THATCHER COMPANY

Warm Air Furnaces

39-41 St. Francis Street
NEWARK, N. J.

TELEPHONES
Mulberry 4480 (Newark)
Murray Hill 4072 (New York)

PLANTS
NEWARK, N. J.
GARWOOD, N. J.

NEW YORK SALES OFFICE: 21 West 44th Street

WESTERN OFFICE: CHICAGO, 341 North Clark Street

Products

Thatcher Warm Air Furnaces, including Tubular, Meteor and Pipeless.

For Steam and Hot Water Boilers, Garage Heaters and Hot Water Supply Boilers, see pages 2189-2191; for Coal and Gas Ranges, see page 2765.

Thatcher Warm Air Furnaces

Thatcher warm air furnaces include many different types, in all suitable sizes. They are efficient and economical for heating residences, churches, stores, schools, etc., where they may be used *singly* or in *battery form.* They are guaranteed to be gastight, dustproof, durable, and free from defects in material and workmanship.

Equipment—All heaters are supplied with a large water pan and cover, as well as a complete damper regulator, consisting of a brass safety chain and nickel-plated adjuster for upstairs damper control.

Disc Water Heater—Furnished extra. A convenient attachment for supplying hot water for domestic purposes. It is suspended in the furnace and will supply from 40 to 50 gal. per hour.

The Celebrated "Thatcher Tubular" Furnace

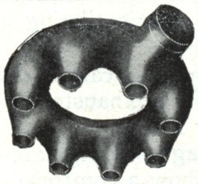
The highest type of warm air furnace made. This furnace has many *original patented features,* among the most important of which are:

Gastight Radiator—Rests on combustion chamber and is cast in one piece. It is self-cleaning and absolutely gastight, cup joints preventing escape of gas from combustion chamber. Legs of radiator may be placed into corresponding cup joints of combustion chamber so that smoke pipe will lead in any direction required by chimney construction.

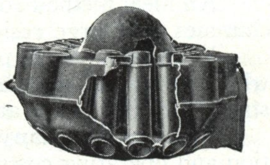
Tubular Combustion Chamber—Rests on firepot and allows ample space for complete combustion of hot gases. Tubes conduct *fresh* air through heated chambers so rapidly that the air is warmed without being either burned or scorched, or losing any of its healthful qualities.

Porcupine Fire Pot—Rests on anticlinker grate. Is circular with straight sides, insuring a live and efficient fire throughout. The projecting pins provide double the ordinary radiating surface and lengthen life of fire pot.

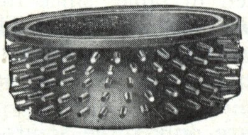
Anticlinker Grate—Is ball bearing and easily operated. Grates move in a circular manner, insuring a clean fire on all sides and quick combustion.



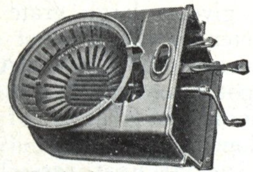
Gastight Radiator



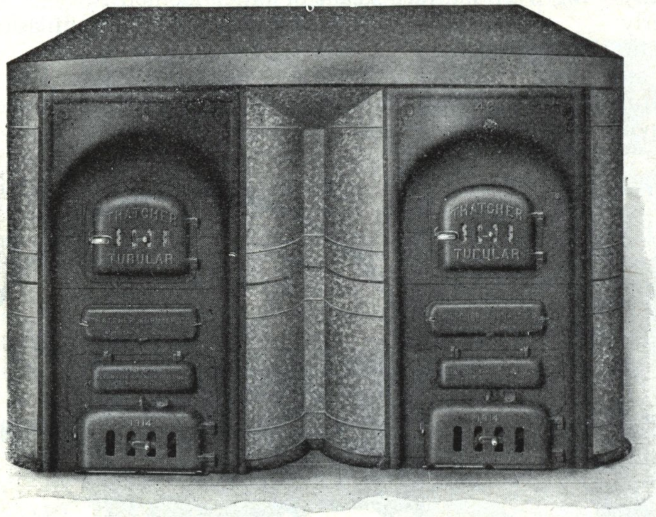
Tubular Combustion Chamber



Porcupine Fire Pot

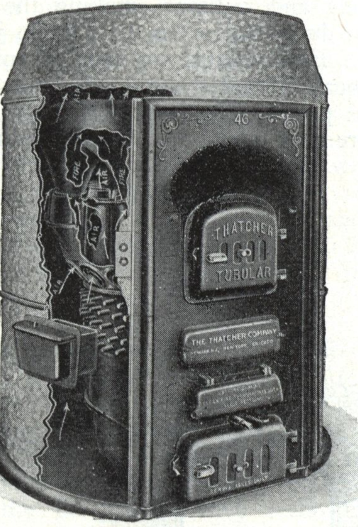


Anticlinker Grate



"Thatcher Tubular" Furnace—Battery Installation

No.	Height of castings, in.	Casings, in.		Heating capacity, cu. ft.	Heat pipe capacity, sq. in.
		Length	Width		
2–38	52	79½	38	24,000 to 34,000	672
2–42	53	87½	42	34,000 to 46,000	820
2–46	55	95½	46	46,000 to 60,000	1000
2–50	58	103½	50	60,000 to 76,000	1200
2–54	59	111½	54	76,000 to 96,000	1400
2–58	62	119½	58	96,000 to 124,000	1600
2–62	64	127½	62	124,000 to 160,000	2200



"Thatcher Tubular" Furnace—Single

No.	Castings, in.		Diam. casings, in.	Diam. smoke pipe, in.	Heating capacity, cu. ft.	Heat pipe capacity, sq. in.
	Height	Diam.				
38	52	32	38	7	12,000 to 17,000	336
42	53	37	42	7	17,000 to 23,000	410
46	55	39	46	8	23,000 to 30,000	500
50	58	42	50	8	30,000 to 38,000	600
54	59	45	54	8	38,000 to 48,000	700
58	62	48	58	9	48,000 to 62,000	800
62	64	53	62	9	62,000 to 80,000	1100

Continued on next page

"Thatcher Pipeless" Furnace

A reasonably priced furnace that is easily and quickly installed without tearing up the walls or ceiling of the house. The casings are supported on a heavy ring resting directly on the cellar floor. It burns all kinds of fuel and has several clean-out doors making cleaning unusually easy.

Special "Thatcher" Register—Black japanned face. Register fits snugly and neatly into floor. Has an inner chamber for warm air and outer chamber for cold air. Can also be furnished with oxidized copper finish.

Water Pan—Specially designed and most efficient, placed beneath the feed door causing the heated air to mingle with the water vapor.

Horseshoe Radiator—Provides double amount of fire travel over ordinary radiator, insuring greater amount of heat for fuel consumed. Furnished in either one-piece cast iron or steel plate construction.

Anticlinker Grates and Ash Pit—Prevent the formation of clinkers, reduce coal to fine ash, provide proper amount of draft and are easy to operate.

"Thatcher Meteor" Furnace

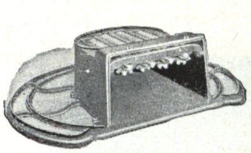
An efficient, economical and durable warm air furnace designed to burn either soft or hard coal. This furnace has a deep fire pot, large area of heating surface, a high ash pit, in fact all necessary labor saving features.

Horseshoe Radiator—Has the longest possible fire travel and is therefore the most efficient in reducing fuel consumption. Furnished either in one-piece cast iron construction or with cast iron top and bottom and cold rolled steel sides.

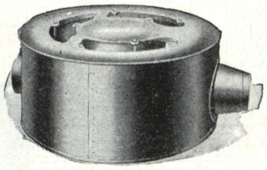
Combustion Chamber—Allows ample space for perfect combustion of coal gases and has an especially large feed door to assure easy firing. The chamber is uniform throughout and of ample size for heavy firing.

Fire Pot—The straight fire pot as well as the full rounded combustion chamber are deeply corrugated, insuring greater efficiency and strength.

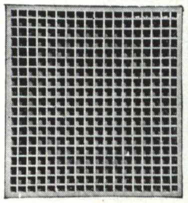
Base and Grate—Base plate is cast in one piece, lower section being fitted with deep cup joints to receive the one-piece ash pit preventing leakage of ashes into air chamber. Grate is of the triangular revolving pattern which crushes the clinkers and allows the free circulation of air essential to perfect combustion.



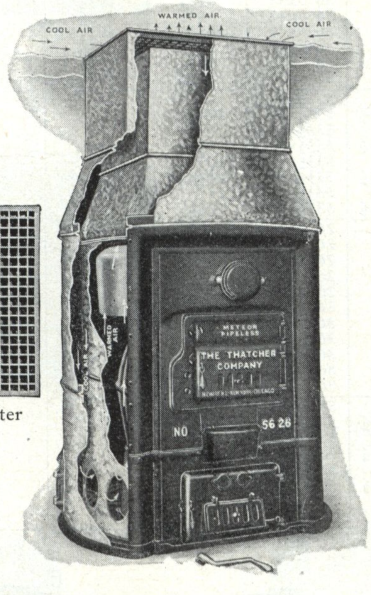
Anticlinker Grate One-piece Ash Pit and Bottom



Steel Horseshoe Radiator

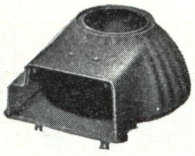


Special Register

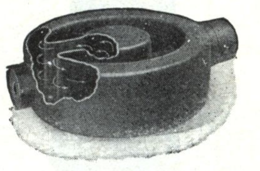


"Thatcher Pipeless" Furnace

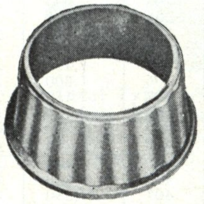
No.	Diam. firepot, in.	Diam. outer casing, in.	Diam. smoke pipe, in.		Approximate heating capacity, cu. ft.
			Steel rad.	C. I. rad.	
36–16	16	36	7	7	5 to 8,000
40–18	18	40	7	7	8 to 12,000
44–20	20	44	8	8	12 to 15,000
48–22	22	48	8	8	15 to 20,000
52–24	24	52	8	9	20 to 26,000
56–26	26	56	8	9	26 to 35,000



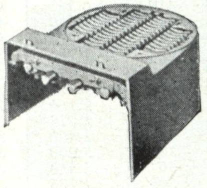
Dome Section



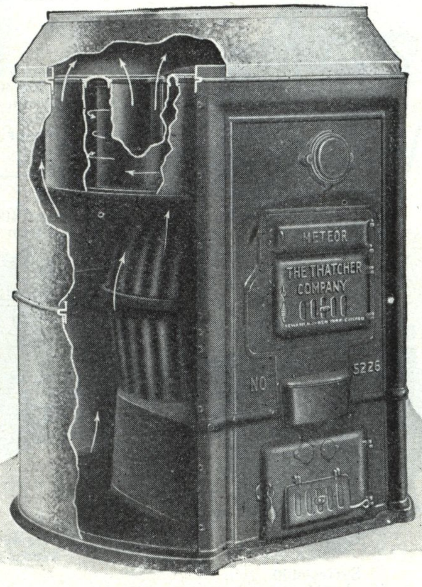
Cast Iron Horseshoe Radiator



Corrugated Fire Pot



Anticlinker Grate and Ash Pit



"Thatcher Meteor" Furnace

No.	Diam. casing, in.	Diam. fire pot, in.	Height castings, in.	Diam. steel radiator, in.	Diam. smoke pipe, in.		Heating capacity, cu. ft.	Heat pipe capacity sq. in.
					Steel rad.	C. I. rad.		
32–16	32	16	47¾	25	7	7	6– 9,000	220
36–18	36	18	50	26½	7	7	9–11,000	240
40–20	40	20	50½	27¾	8	8	11–13,000	280
44–22	44	22	51½	31¾	8	8	13–17,000	400
48–24	48	24	53¾	35¾	8	9	17–23,000	503
52–26	52	26	54⅝	39½	8	9	23–28,000	590
*158	58	30	62½	49	10	10	33–38,000	866
*165	65	34	62½	53	10	10	38–43,000	1040

*All Meteor furnaces made with either steel radiator or one-piece cast iron radiator except these two largest sizes which are furnished with steel radiator only.

ESTABLISHED 1840

ABENDROTH BROTHERS

Manufacturers of Steam, Vapor and Water Heaters

PORT CHESTER, N. Y.

Products

York Abendroth Round and Square Sectional Steam, Vapor and Water Heaters; Tank Heaters.

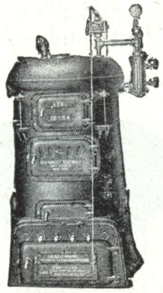
For Gas Ranges, see page 2768.

YORK ABENDROTH

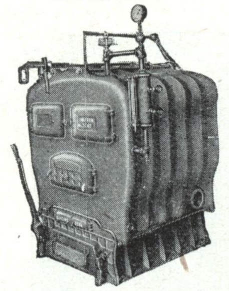
York Abendroth Heaters

These well-known heaters have been carefully designed by our own staff of heating engineers and are built by master craftsmen, skilled in heater construction. They are extremely simple and economical in operation, easily erected and their installation is positive insurance of satisfaction.

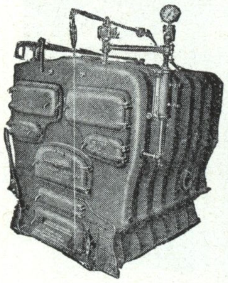
Both round and square types can be equipped for burning all grades of coal.



No. 25 Y S 4



Series 200-300



Series 400

York Heaters

YORK ROUND SECTIONAL STEAM VAPOR AND WATER HEATERS

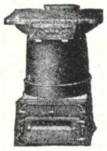
Description	No.	Rating, sq. ft.	Diam. fire pot at grate, in.	Water line, in.	Smoke pipe, in.	Tappings each, in., flow and return
No. 3 Series Steam and vapor consisting of: base, fire pot (with crown sheet) and dome..........	16 Y S 3	275	16	38¾	7	2-2
	19 Y S 3	350	19	39¾	7	2-2½
	20 Y S 3	450	20	42¾	8	2-2½
	22 Y S 3	550	22	45	9	2-3
	25 Y S 3	700	25	47¾	9	2-3
	28 Y S 3	900	28	49	10	2-4
No. 4 Series Steam and vapor consisting of: base, fire pot (with crown sheet), middle section and dome..................	16 Y S 4	300	16	43¼	7	2-2
	19 Y S 4	375	19	44¾	7	2-2½
	20 Y S 4	475	20	48	8	2-2½
	22 Y S 4	575	22	50	9	2-3
	25 Y S 4	750	25	53¾	9	2-3
	28 Y S 4	965	28	54½	10	2-4
No. 5 Series Steam and vapor consisting of: base, fire pot (with crown sheet), 2 middle sections and dome..................	16 Y S 5	325	16	47½	7	2-2
	19 Y S 5	400	19	49¾	7	2-2½
	20 Y S 5	500	20	53¼	8	2-2½
	22 Y S 5	600	22	55	9	2-3
	25 Y S 5	800	25	59¾	9	2-3
	28 Y S 5	1025	28	60	10	2-4
No. 3 Series Water......................	16 Y W 3	450	16	....	7	2-2
	19 Y W 3	575	19	....	7	2-2½
	20 Y W 3	740	20	....	8	2-2½
	22 Y W 3	900	22	....	9	2-3
	25 Y W 3	1150	25	....	9	2-3
	28 Y W 3	1485	28	....	10	2-4
No. 4 Series Water......................	16 Y W 4	500	16	....	7	2-2
	19 Y W 4	620	19	....	7	2-2½
	20 Y W 4	780	20	....	8	2-2½
	22 Y W 4	950	22	....	9	2-3
	25 Y W 4	1240	25	....	9	2-3
	28 Y W 4	1590	28	....	10	2-4
No. 5 Series Water......................	16 Y W 5	540	16	....	7	2-2
	19 Y W 5	660	19	....	7	2-2½
	20 Y W 5	825	20	....	8	2-2½
	22 Y W 5	990	22	....	9	2-3
	25 Y W 5	1320	25	....	9	2-3
	28 W Y 5	1690	28	....	10	2-4

YORK SQUARE SECTIONAL STEAM VAPOR AND WATER HEATERS

Description	No.	Rating, sq. ft.	Grate dimen., in.	Foundations, in.	Total length, in.	Water line, in.	Tapping each, in., flow and return	Smoke pipe, in.
Series 200 and 300 Steam and Vapor	204	700	20x23	26 x28	40½	44½	2-4	10
	205	900	20x30	26 x35	47½	44½	2-4	10
	206	1,100	20x37	26 x42	54½	44½	2-4	10
	207	1,300	20x44	26 x49	61½	44½	2-4	10
	208	1,500	20x51	26 x56	68½	44½	2-4	10
	305	1,450	30x30	36 x35	51½	49½	2-4	13
	306	1,800	30x37	36 x42	58½	49½	2-4	13
	307	2,150	30x44	36 x49	65½	49½	2-4	13
	308	2,500	30x51	36 x56	72½	49½	3-4	13
	309	2,850	30x58	36 x63	79½	49½	3-4	13
	310	3,200	30x65	36 x70	86½	49½	3-4	13
Series 400 Steam and Vapor	405	2,900	40x34	53½x43½	66	57	2-5	16
	406	3,625	40x42½	53½x52	74½	57	2-5	16
	407	4,350	40x51	53½x60½	83	57	2-5	16
	408	5,075	40x59½	53½x69	91½	57	3-5	16
	409	5,800	40x68	53½x77½	100	57	3-5	16
	410	6,525	40x76½	53½x86	108½	57	4-5	16
	411	7,250	40x85	53½x94½	117	57	4-5	16
	412	7,975	40x93½	53½x103	125½	57	4-5	16
Series 200 and 300 Water	204	1,150	20x23	26 x28	40½	....	2-4	10
	205	1,475	20x30	26 x35	47½	....	2-4	10
	206	1,800	20x37	26 x42	54½	....	2-4	10
	207	2,150	20x44	26 x49	61½	....	2-4	10
	208	2,475	20x51	26 x56	68½	....	2-4	10
	305	2,400	30x30	36 x35	51½	....	2-4	13
	306	3,000	30x37	36 x42	58½	....	2-4	13
	307	3,550	30x44	36 x49	65½	....	2-4	13
	308	4,125	30x51	36 x56	72½	....	3-4	13
	309	4,700	30x58	36 x63	79½	....	3-4	13
	310	5,280	30x65	36 x70	86½	....	3-4	13
Series 400 Water	405	4,800	40x34	53½x43½	66	....	2-5	16
	406	6,000	40x42½	53½x52	74½	....	2-5	16
	407	7,200	40x51	53½x60½	83	....	2-5	16
	408	8,400	40x59½	53½x69	91½	....	3-5	16
	409	9,600	40x68	53½x77½	100	....	3-5	16
	410	10,800	40x76½	53½x86	108½	....	4-5	16
	411	12,000	40x85	53½x94½	117	....	4-5	16
	412	13,200	40x93½	53½x103	125½	....	4-5	16

No. 1611

No. 12



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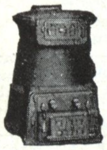

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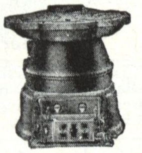


No. 201

Abendroth Tank Heaters

40 to 1800 gallons capacity

Description..................	Laundry						Flat top	Dome top							
Heater No..................	012	10W	10WT	201	212	112	12	110	120	601	1611	2011	2211	2511	2811
Tank capac., gal..................	50	80	80	100	125	125	200	150	250	350	600	800	1000	1400	1800

AMERICAN RADIATOR COMPANY

WESTERN EXECUTIVE OFFICE
816-820 South Michigan Ave.
CHICAGO, ILL.

GENERAL SALES DEPARTMENT
1807 Elmwood Avenue
BUFFALO, N. Y.

EASTERN EXECUTIVE OFFICE
40 West 40th Street
NEW YORK, N. Y.

SALES OFFICES AND SHOWROOMS IN ALL PRINCIPAL CITIES

(Telephone Book: AMERICAN RADIATOR COMPANY)

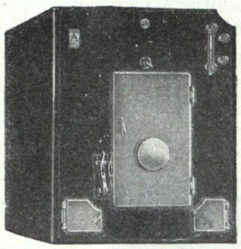
Products	Page
HEATING BOILERS	2133
RADIATORS	2147
RADIATOR BRACKETS	2150 and 2152
RADIATOR VALVES	2154
TEMPERATURE REGULATING and CONTROL DEVICES	2155

For Gas Boilers, see page 2209.

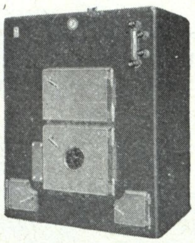
Ideal Heating Boilers

The series of Ideal Boilers and other heating equipment here described is the best and most comprehensive that has ever been offered to the heating profession. It is complete in type range, heating range and price range. It extends specifically to smaller homes of moderate circumstances, the opportunity to enjoy completely the genuine comfort and economy of radiator heating.

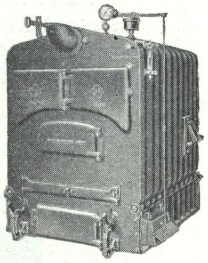
We guarantee that all Ideal Boilers will develop their stated capacities when tested in accordance with the standard testing code of the American Society of Heating and Ventilating Engineers and fired with hard coal of 13,000 B.t.u. heat value per pound.



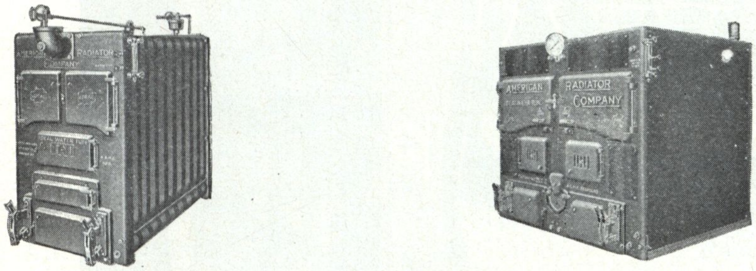
Ideal Type "A" Heat Machine
Described on pages 2134-2135



Ideal Type "A" Heat Machine for Oil
Described on page 2136



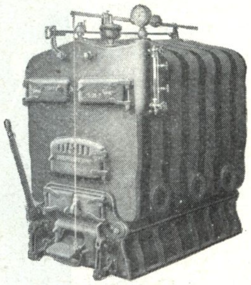
Ideal Smokeless Boilers
36-Inch Series
Described on pages 2140-2142



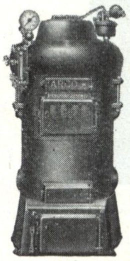
29-Inch Series

79-Inch Series

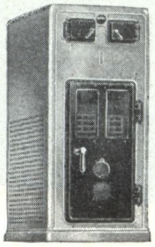
Ideal Water Tube Boilers
Described on pages 2137-2139



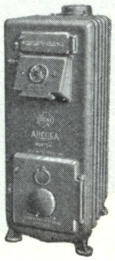
Ideal Sectional Boiler
Described on page 2143



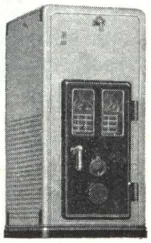
Ideal Arco Round Boiler
Described on page 2144



Ideal Arcola Parlor Heater
Described on page 2145



Ideal Arcola Heater
Described on page 2146



Ideal Vecto Heater
Described on page 2146

Continued on next page

Ideal Type "A" Heat Machine

Steam capacity, 1500 to 6000 sq. ft.

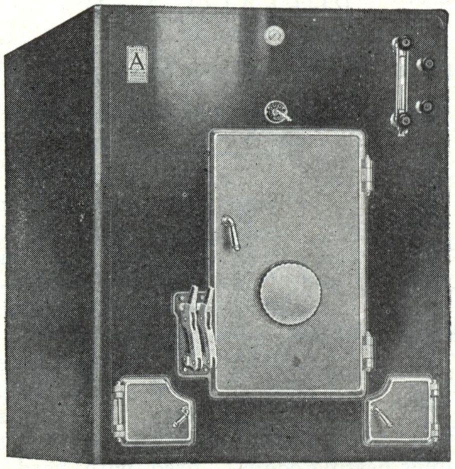
Water capacity, 1600 to 9600 sq. ft.

The Ideal Type "A" Heat Machine is especially designed for owners of residences, hotels, banks, theaters, and other buildings who want the best that is made.

Saves One-third of the Fuel Bill—The Ideal Type "A" Heat Machine is a powerful dependable heat generator that operates with a saving to the owner of one-third his annual coal bill. This means that it will have paid for its additional cost in approximately, three years; thereafter representing a high interest-bearing investment.

Requires Little Attention—It runs from eight to thirty-five hours without firing, depending upon the weather. Its heat production is maintained automatically at any desired point. To regulate it requires only a simple turn of a conveniently placed handle. And it is so clean and handsome that it allows the owner to use his basement as a more livable place.

This is all made possible by the special and exclusive features in the design and construction of this heat machine.



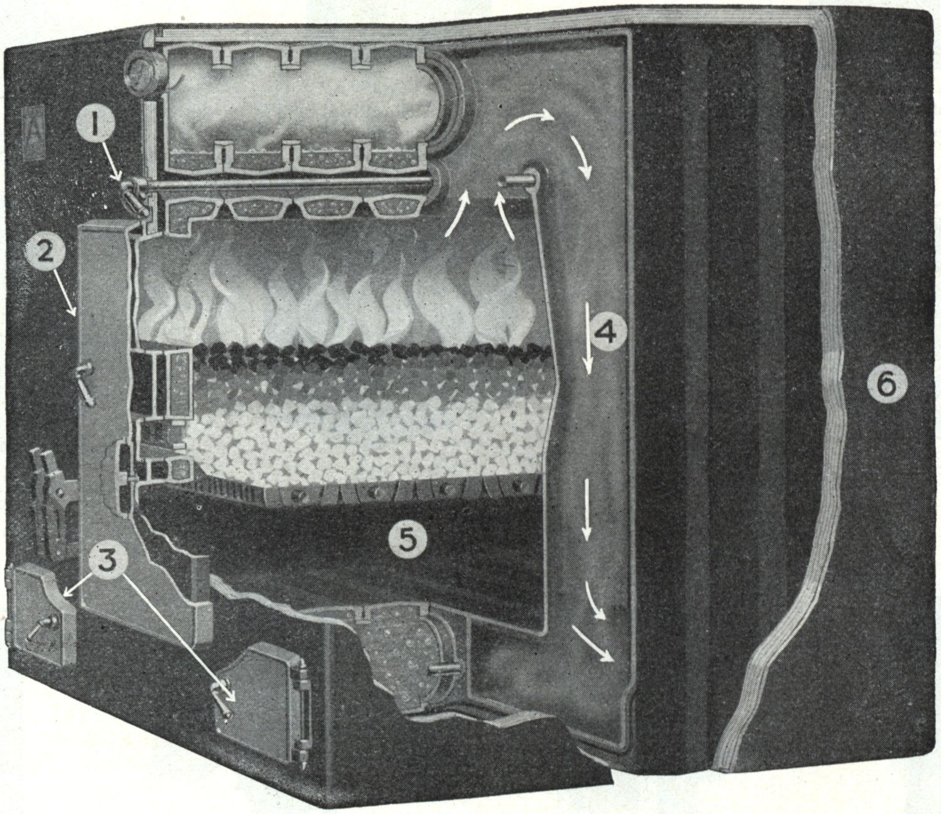
Ideal Type "A" Heat Machine

Water-surrounded Ash Pit—First, it maintains perfectly controlled combustion of its fuel supply. The *special water-surrounded ash pit construction* seals the combustion chamber as effectively as the glass container within a thermos bottle.

Only that much primary air supply is admitted to the combustion chamber as comes through the draft inlet, and this supply is under perfect regulation. A perfectly regulated fire is the first essential for the attainment of maximum operating efficiency.

Dial Control—Second, set in front of the machine directly over the large door, is a graduated dial with control handle. This is connected with the automatic draft control mechanism at the rear. A turn of the handle for more heat opens the draft panel; more air is admitted to the combustion chamber and the fire speeds up to the rate desired. It is now automatically maintained at the desired rate.

The automatic regulating device is the most sensitive and accurate in operation that has ever been developed. The draft panel hangs like a pendulum, and like a pendulum swings, weight-free and frictionless.



Sectional View Ideal Type "A" Heat Machine

See next page for explanation of numbers

Continued on next page

Lock-safe Door—Third, the lock-safe door—the large outside door—prevents any loss of heat due to carelessness, inexperience or guesswork on the part of the operator. It is an entirely new accomplishment in heating apparatus.

When this door is closed, none of the smaller doors inside may be opened. It is impossible to force the fire by the wasteful practice of opening the ash pit door; and the fire can not be killed at night by the ordinary wasteful method of opening the furnace door. Regulation, therefore, is simple, dependable, and foolproof.

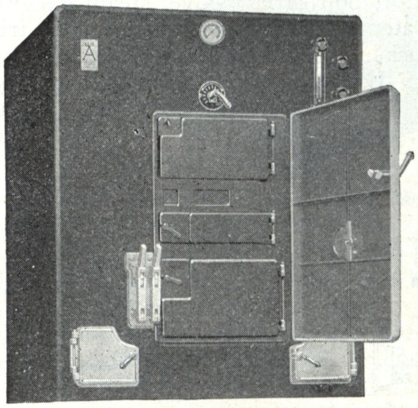
Revertible Flue—Fourth, the revertible flue—one of the most distinctive features in the Type "A" Heat Machine—effects a transmission of every possible heat unit from the gases of combustion to the water in the boiler.

The illustration of the revertible flue shows clearly the travel of the gases and the coördination of their travel with the movement of the water. Not only does the revertible flue offer an enormous amount of heating surface above that found in the usual boiler, but it is so designed as to force a close rubbing contact with the gases and to bring these in contact with the coolest portions of waterbacked heating surface before they leave the boiler. The result is that the gases are robbed of almost all their heat before they are allowed to enter the chimney.

Metal Jacket—Fifth, and finally, attention should be directed to the Ideal metal jacket. This is lined with sixteen plies of air-celled asbestos reinforced on both sides with 1/8-in. 98% pure asbestos board. The lining is scientifically gauged to prevent radiation heat loss. The exterior of the jacket is baked enamel—permanently handsome.

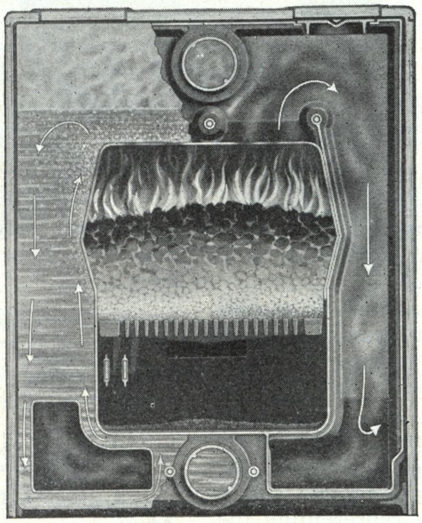
The Ideal metal jacket will serve efficiently during the life of the boiler.

The Ideal Type "A" Heat Machine has not been built to a price. It is the best that modern science and American ingenuity can produce.



View Showing Lock-safe Fire Door Open

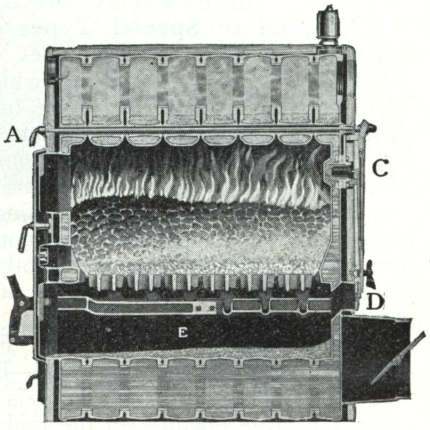
Closing the large door automatically closes the ash pit and small doors



Cutaway, Showing the Tapered, Revertible Flue

An exclusive, patented feature in the Ideal Type "A" Heat Machine.

Arrows indicate the downward flow of the gases through the flue. The left side has been cut away to show the circulation of the water within the section



Side Sectional View Showing Mechanism Which Secures Perfectly Controlled Combustion

A=Dial indicator and heat control lever
B=Connecting rod
C=Metal bellows regulator
D=Draft panel
E=Water surrounded ash pit

Important Features of the Type "A" Heat Machine

(See illustration at bottom of preceding page)

(1) **Automatic Dial Heat Control**—The control handle need only be set for more or less heat as desired. The machine quickly responds to every heating need, automatically maintaining the required flow of warmth. The dial is graduated and conveniently placed in front.

(2) **Lock-safe Door**—This is an entirely new feature. It removes the human element as a controlling factor of efficient operation, prevents the "forcing" or "killing" of the fire by ordinary, wasteful methods, and saves the time and steps of the owner or caretaker.

(3) **Enamel Finish and Gastight Construction**—All doors and plate work are finished with gray vitreous enamel—clean, beautiful, and permanently lustrous. The contact faces on all doors and plate work are ground down to smoothness on immense machinery.

When the doors are closed, a gastight construction is secured. Cleanliness of operation is insured.

(4) **Revertible Flue**—The arrows show the downward travel of the gases through the revertible flue. This flue offers much more heat absorbing surface than is found in the usual boiler, and is scientifically designed to secure the closest possible rubbing contact with the gases and the utilization of every possible heat unit.

(5) **Water-surrounded Ash Pit**—This new feature seals the combustion chamber against air leakage as effectively as a thermos bottle seals its glass container. Operating in conjunction with the automatic dial heat control, it secures perfectly controlled combustion.

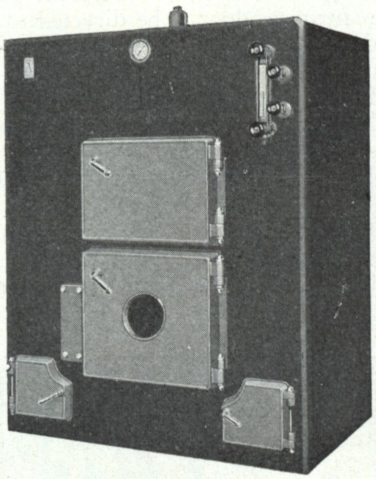
(6) **Ideal Metal Jacket**—The jacket on the Type "A" Machine is a combination of beauty and utility. Its sheet steel exterior is finished with a beautiful, deep green enamel, while it is lined with sixteen plies of air-celled asbestos. A unique, handsome covering, it is a scientific heat insulator of the highest order. The Ideal metal jacket is dustproof, moistureproof and durable.

Continued on next page

Ideal Type "A" Oil Burning Heat Machine

With the increasing popularity of oil as a fuel, numerous home owners have continued to ask for a special oil burning model of the Ideal Type "A" Heat Machine—the famous "aristocrat of heating boilers."

Most frequently, the demand has come from discriminating home owners who are anxious to enjoy the advantages of the most highly refined heating apparatus made, and at the same time convert their cellars into more useful, livable places. Many inquiries have come from persons who, having investigated the desirability of using oil fuel, have been advised that the Ideal Type "A" Heat Machine was especially adapted to a particular oil burner.


Ideal Type "A"
Oil Burning Heat Machine

An Elite Model with Exclusive Features—The special oil burning model Ideal Type "A" Heat Machine is unquestionably the most elite heating instrument of its kind in existence—clean, handsome, efficient and durable—a heat machine which one may well be proud to own and display.

Adapted to Special Types of Oil Burners—For certain types of oil burners, specifically those which burn the oil so that the flame uniformly fills the entire combustion chamber, the Ideal Type "A" Oil Burning Heat Machine is superbly well adapted.

But the special features through which it accomplishes this very superiority are not adjustable to meet perfectly all the requirements of other types of burners. *Boiler and burner must always be suited to each other to insure best results.*

Combustion Chamber and Flue Travel Especially Suited to Oil Burning—Each section of the Ideal Type "A" Heat Machine is cast in one single piece, the large opening in the middle representing the design and shape of the combustion chamber. Abundant space is allowed for the placement of the oil burner within the chamber, and for the complete combustion of the expanded volume of ignited oil mixture to take place within the chamber itself—thus accomplishing the first requisite for the maximum utilization of the heating value of the fuel.

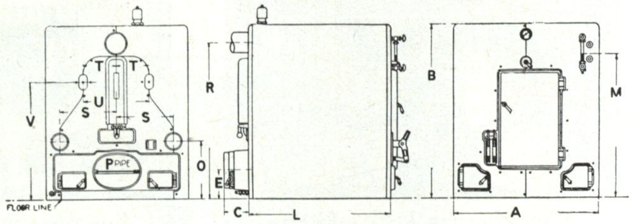
It will be noted that the travel of the hot gases takes place between the sections; upward to the top, then downward at the sides. Here is a very great advantage from the viewpoint of efficient operation, and one which will be realized in the fullest measure by the use of those types of burners which are suited to the Type "A" Heat Machine.

Full Utilization of Radiant Heat—The special design of the sections in this elite machine possesses an advantage of particular importance; the combustion chamber is completely surrounded by water.

Radiant heat, it is well known, travels, like light, in straight lines and in all directions. The advantage of the water-surrounded combustion chamber is at once obvious. Provided an appropriate type of oil burner is employed, every unit of the radiant heat generated by the burning oil is completely absorbed by the water. And as the water becomes heated it rises, maintaining a steady, uninterrupted circulation within the sections—the foundation for dry steam generation and immediate responses to heating requirements.

Boiler Equipment—***Steam Boiler***—Ideal asbestos lined metal jacket, Arco automatic steam regulator, pop safety valve, steam gauges, water column and trimmings, tri-cocks, draw-off cock and firing tools.

Water Boiler—Ideal asbestos lined metal jacket, Arco automatic temperature regulator, thermometor, altitude gauge, draw-off cock and firing tools.



MEASUREMENTS IN INCHES*

Boiler	A	B	C	E	M	O	P	R	S	T	U	V
S or W-2204-A to 2209-A....	41½	61¼	8¼	8⅜	50	19¾	12	56	15⁹⁄₁₆	9⅛	18¼	41
S or W-3205-A to 3212-A....	57½	69	10¼	11⁵⁄₁₆	56¾	23	18	63⅛	22⅞	13⅜	26¾	47

S or W-2204-A to 2209-A, boiler has 12-in. round smoke pipe collar.

S or W-3205-A to 3212-A, boiler has oval smoke pipe collar for 18-in. pipe

*Dimensions for Type "A" Oil Burning Heat Machine given in special book "Ideal Boilers for Oil Burning."

RATINGS AND DATA

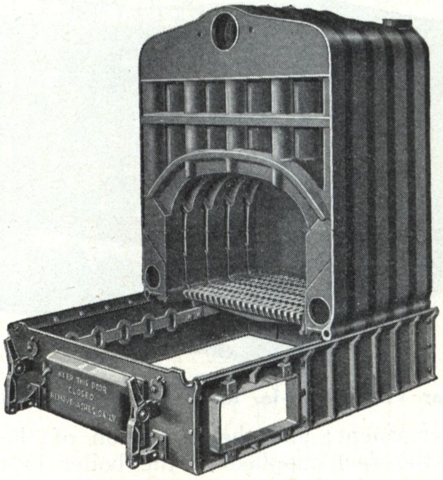
Boiler No.		Ratings, sq. ft.		Grate area, sq. ft.	Fuel capacity, lb.	Outlets, number and size. in.	Inlets, number and size. in.	Chimney	
Steam	Water	Steam	Water					Size, in.	Height, ft.
S-2204-A	W-2204-A	1000	1,600	2.76	245	1-6	2-5	12x12	35
S-2205-A	W-2205-A	1250	2,000	3.68	328	1-6	2-5	12x16	35
S-2206-A	W-2206-A	1500	2,400	4.60	411	1-6	2-5	12x16	35
S-2207-A	W-2207-A	1750	2,800	5.52	494	1-6	2-5	12x16	40
S-2208-A	W-2208-A	2000	3,200	6.44	577	1-6	2-5	12x16	45
S-2209-A	W-2209-A	2250	3,600	7.36	660	1-6	2-5	12x16	45
S-3205-A	W-3205-A	2500	4,000	6.22	660	1-8	2-6	16x16	40
S-3206-A	W-3206-A	3000	4,800	7.77	825	1-8	2-6	16x16	40
S-3207-A	W-3207-A	3500	5,600	9.32	990	1-8	2-6	16x20	40
S-3208-A	W-3208-A	4000	6,400	10.87	1155	1-8	2-6	16x20	45
S-3209-A	W-3209-A	4500	7,200	12.42	1320	1-8	2-6	20x20	45
S-3210-A	W-3210-A	5000	8,000	13.97	1485	1-8	2-6	20x20	50
S-3211-A	W-3211-A	5500	8,800	15.52	1650	1-8	2-6	20x20	50
S-3212-A	W-3212-A	6000	9,600	17.07	1815	1-8	2-6	20x20	55

Continued on next page

Ideal Water Tube Boiler

Steam capacity, 600 to 20,400 sq. ft.
Water capacity, 975 to 32,640 sq. ft.

The Ideal Water Tube Boiler is the perfected product of many years of experience. To the solution of actual heating problems as they have presented themselves in buildings of all types and sizes, in all sections of the country, have been brought the service of our staff of heating engineers and the experimental equipment of the largest heating laboratory in the world—the Institute of Thermal Research. Today, the Ideal Water Tube Boiler embodies every desirable feature, adapting it, especially, to the actual working conditions obtaining in its field of service.


36-in. Boiler Partly Assembled Showing Sectional Construction

Complete Range of Sizes—The boiler is made in a complete range of sizes. No building is too large to secure its heating advantages.

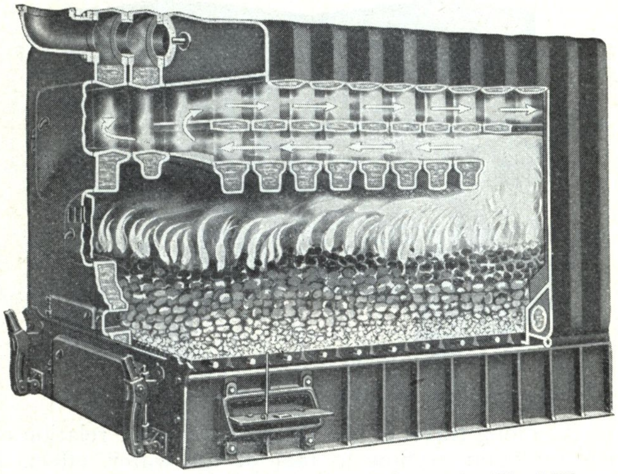
Easily Installed—Ideal Water Tube Boiler is made up of individual sections. These sections, even of the largest boiler, may be carried into the cellar through any average sized doorway or elevator hatch. No tearing down of walls or ripping up of floors is necessary; nor does the boiler require, for erection, any special masonry in the way of pits or brick setting.

The constructional advantage of the Ideal Water Tube Boiler in this respect commends it especially to owners of old buildings as well as new. In both instances, an installation cost of considerable magnitude is eliminated.

Enlarged at Any Time—The sections of the boiler are connected by push nipples, lathe-turned to the thousandth part of an inch, which fit snugly into the carefully machined holes at the top and base of the sections. These nipples are made of the same carefully selected iron mixture that is used in the sections. Durability of service and permanently steamtight and watertight connections are assured.

Should it be desired at any time to increase the size of the boiler to meet an enlarged heating requirement, new sections may be readily and inexpensively added at the rear; or, if necessary, a battery of two or more boilers can be installed.

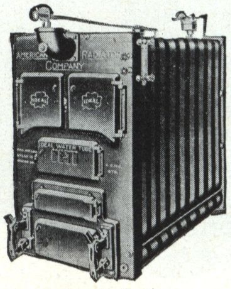
Quick Heating Responses—It is highly important that a boiler intended for an apartment, hotel, store, industrial building, public building, etc., be capable of developing a large heat output within a very short space of time to meet rapidly fluctuating heating loads, and that it be able to perform in this respect and operate also throughout a normal part of the heating year, with a definite regard for economy in fuel consumption.

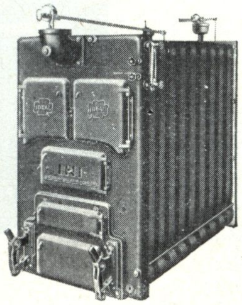

Front-to-rear Cross Section View of the 36-in. Ideal Water Tube Boiler

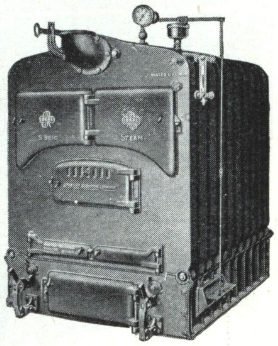
The rapidity with which a boiler generates steam or vapor, or produces hot water at this outlet, is a function of no one single feature of its design, but depends, rather, upon the relative proportions existing between all features and the construction of the boiler. There are not twenty or thirty best designs; there is one—and it may be arrived at and recognized only through very careful experimentation and testing conducted by engineers of skill and practical experience.

The Ideal Water Tube Boiler is a highly refined product of extensive tests carried out under the supervision of our engineers, supplemented by many years of service under varying conditions, in buildings of all kinds and sizes.

The boiler is well known for its unusual "pick-up," heat generating capacity, and for its continuous economy of fuel consumption with the minimum amount of attention.


23-inch Series

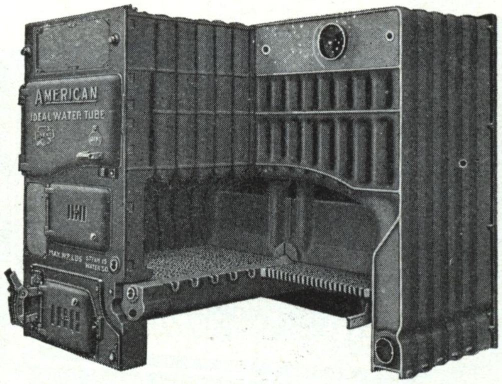

29-inch Series


36-inch Series

Ideal Water Tube Boilers

Continued on next page

Unrestricted Internal Water Flow and Long Flue Travel—Outstanding among the features effecting the extraordinary quick heating response and economical operation of the Ideal Water Tube Boiler, is its extensive array of waterbacked vertical tubes. These tubes divide the body of water in the boiler into many thin streams, and intercept the horizontal flow of the hot gases in the upper and lower flue galleries. As the broad sheet of water surrounding the sides and top of the combustion chamber absorbs the radiant heat of the fire, it quickly rises through the vertical tubes, establishing a flow at right angles to the movement of the gases.

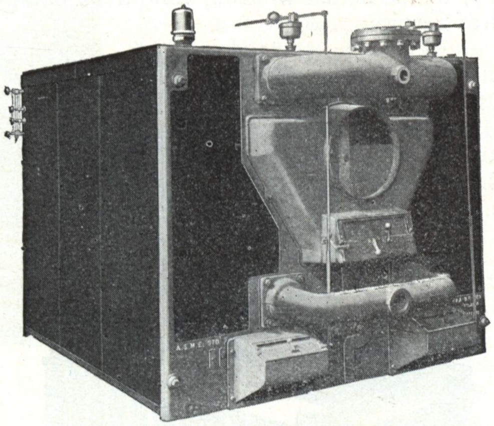


Interior View of 79-in. Ideal Water Tube Boiler

The long travel of the hot gases, and the relation of their direction of flow to that of the water, effects a rapid heat transmission from the gases to the water. The waterways throughout are smooth, and the steam disengaging area is large. Quick heating, dry steam generation, and the utilization of the heating value of the fuel to the fullest possible extent, are the results.

Gastight Iron-to-iron Construction Insures Permanent Economy—The Ideal Water Tube Boiler incorporates one exclusive feature of construction that insures high operating efficiency during its lifetime—which is that of the building it serves.

All contacting surfaces on the individual sections are machine ground to smoothness on special grinding machines. Held rigidly in great iron jaws, each section is worked back and forth through two huge carborundum wheels, until its contacting faces are ground straight and virtually as smooth as marble. When the sections are assembled, therefore, their iron-to-iron contact joints form a gas-tight construction. The hot gases rising out of the combustion chamber are forced to travel through the entire flue course: forward through the lower gallery to the front of the boiler, thence upward and backward through the length of the boiler. Because of the gas-tight construction, it is impossible for the gases to short circuit to the smokehood from any point. The construction is permanent; and the utilization of the heating value of the fuel supplied to the boiler in the most efficient degree is also permanent.

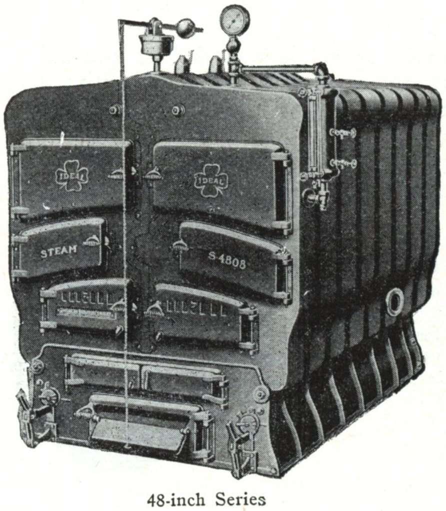


Rear View of 79-in. Ideal Water Tube Boiler

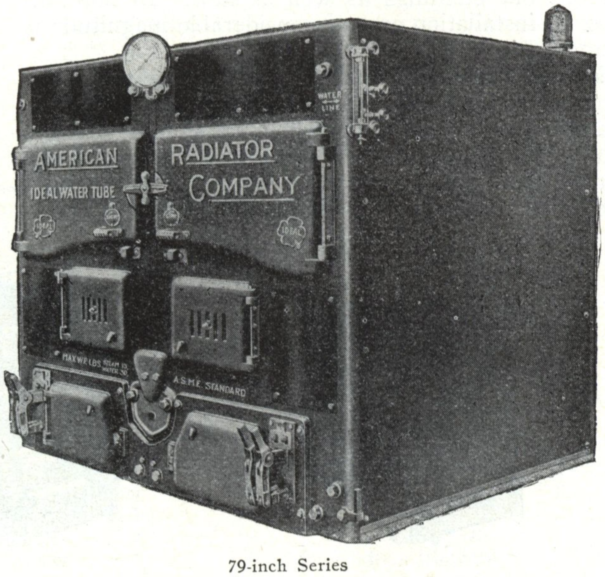
Thorough Testing—Each section of every boiler is subjected to an individual hydraulic test of 80 lbs. Representative boilers from every run are then completely assembled and subjected to another 80-lb. hydraulic test. Only when it is certain that the boilers are practically perfect in every respect are they passed for shipment.

Boiler Equipment—*Steam Boilers*—Steam gauge, pop safety valve, water column and trimmings, Arco damper regulator and firing tools.

Water Boilers—Ideal damper control and firing tools.



48-inch Series



79-inch Series

Ideal Water Tube Boilers

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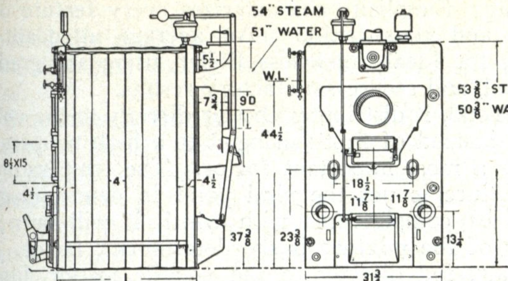
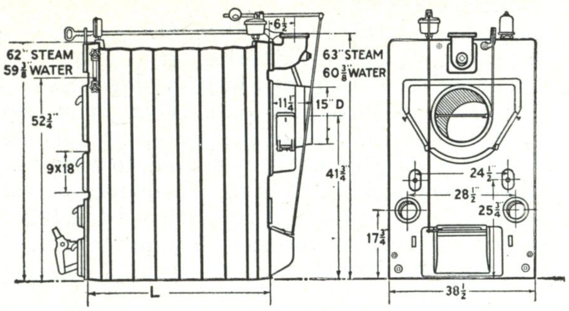
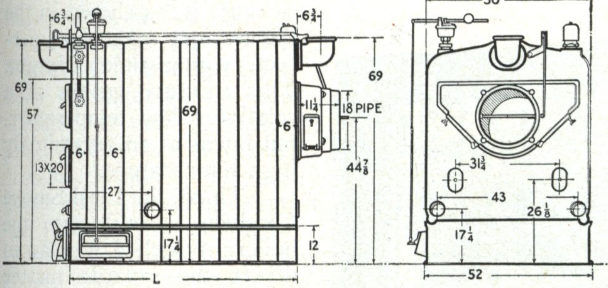

54" STEAM
51" WATER
W.L.
53⅜" STEAM
50⅜" WATER
5½
7¾
9D
44½
8½X15
4½
4
4½
18½
11⅞
11⅞
37⅜
23⅜
13¼
L
31¾

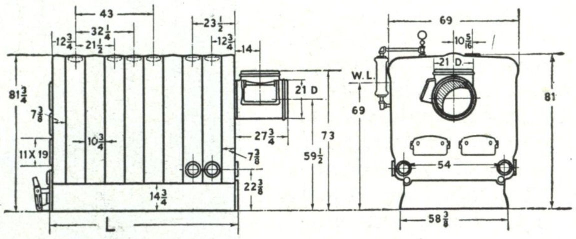
23-inch Series


62" STEAM
59⅜ WATER
6½
63" STEAM
60⅜ WATER
52¾"
11¼
15" D
9X18
41¾
24½
28½
25¾
17¾
L
38½

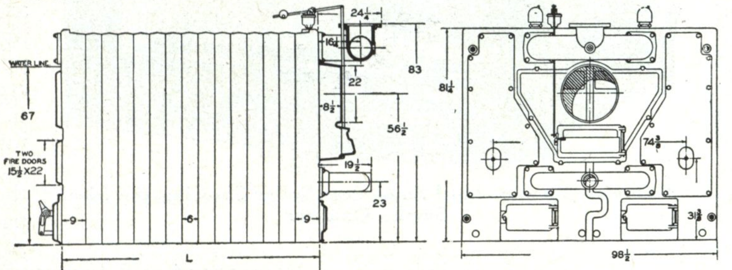
29-inch Series


6¾
6¾
50
69
57
69
69
11¼
18 PIPE
6
13X20
6
6
44⅞
31¼
27
43
26⅛
17¼
17¼
12
L
52

36-inch Series


43
32¼
23½
12¾
21½
12¾
14
69
10 5/16
21 D
W.L.
81¾
7⅜
21 D
69
81
10¾
27¾
73
11X19
7⅜
59½
54
22⅝
14¾
L
58⅜

48-inch Series


24¼
16¼
WATER LINE
83
22
81¼
67
8¾
56½
74⅜
TWO FIRE DOORS 15½X22
19¼
23
9
6
9
31⅜
L
98½

79-inch Series

Ideal Water Tube Boilers

RATINGS AND DATA, IDEAL WATER TUBE BOILERS

Boiler No.		Ratings, sq. ft.		Grate area, sq. ft.	Fuel capacity, lb.	Length "L," in.	Outlets number and size, in.		Inlets, number and size, in.		Chimney	
Steam	Water	Steam	Water				Steam	Water	Steam	Water	Flue size, (sea level), §in.	Height, ft.
S-2305	W-2305	600	975	2.72	164	21	1-4	1-4	2-3	2-3	8x12	30
S-2306	W-2306	750	1,200	3.36	203	25	1-4	1-4	2-3	2-3	8x12	35
S-2307	W-2307	900	1,425	4.00	242	29	1-4	1-4	2-3	2-3	8x12	35
S-2308	W-2308	1,050	1,650	4.64	281	33	1-4	1-4	2-3	2-3	12x12	35
S-2309	W-2309	1,200	1,875	5.28	320	37	1-4	1-4	2-3	2-3	12x12	35
S-2905	W-2905	1,600	2,600	4.84	347	30	1-5	1-5	2-4	2-5	12x16	35
S-2906	W-2906	2,000	3,250	6.05	435	36	1-5	1-5	2-4	2-5	12x16	40
S-2907	W-2907	2,400	3,900	7.26	523	42	1-5	2-5	2-4	2-5	16x16	40
S-2908	W-2908	2,800	4,550	8.47	611	48	1-5	2-5	2-4	2-5	16x16	45
S-2909	W-2909	3,200	5,200	9.68	699	54	2-5	2-5	2-4	2-5	16x20	50
S-2910	W-2910	3,600	5,850	10.89	787	60	2-5	2-5	2-4	2-5	16x20	55
S-2911	W-2911	4,000	6,500	12.10	875	66	2-5	2-5	2-4	2-5	20x20	60
S-3605	W-3605	2,500	4,000	6.00	540	30	1-6	1-6	2-4	2-4	16x16	45
S-3606	W-3606	3,150	5,100	7.50	684	36	1-6	1-6	2-4	2-4	16x20	45
S-3607	W-3607	3,800	6,200	9.00	828	42	2-6	2-6	2-4	*	16x20	50
S-3608	W-3608	4,450	7,300	10.50	972	48	2-6	2-6	2-4	*	20x20	50
S-3609	W-3609	5,100	8,400	12.00	1,116	54	2-6	2-6	2-4	*	20x20	55
S-3610	W-3610	5,750	9,500	13.50	1,260	60	2-6	2-6	2-4	*	20x20	55
S-3611	W-3611	6,400	10,600	15.00	1,404	66	2-6	2-6	2-4	*	20x20	60
S-3612	W-3612	7,050	11,700	16.50	1,548	72	2-6	2-6	2-4	†	20x24	60
S-3613	W-3613	7,700	12,800	18.00	1,692	78	2-6	2-6	2-4	†	20x24	65
S-3614	W-3614	8,350	13,900	19.50	1,836	84	2-6	2-6	2-4	†	20x24	70
S-3615	W-3615	9,000	15,000	21.00	1,980	90	2-6	2-6	2-4	†	24x24	75
S-4806	W-4806	7,750	12,500	18.00	1,475	57¾	2-6	2-6	4-4	4-6	24x24	65
S-4807	W-4807	9,000	14,500	21.60	1,770	68½	3-6	3-6	4-4	4-6	24x24	70
S-4808	W-4808	10,250	16,500	25.20	2,065	79¼	3-6	3-6	4-4	4-6	24x24	75
S-4809	W-4809	11,500	18,500	25.20	2,065	90	3-6	3-6	4-4	4-6	24x28	80
S-4810	W-4810	12,750	20,500	28.80	2,360	100¾	3-6	3-6	4-4	4-6	24x28	85
S-4811	W-4811	14,000	22,500	28.80	2,360	111½	4-6	4-6	4-4	4-6	28x28	95
S-4812	W-4812	15,250	24,500	28.80	2,360	122¼	4-6	4-6	4-4	4-6	28x28	100
S-4813	W-4813	16,500	26,500	32.40	2,655	133	4-6	4-6	4-4	4-6	28x32	105
S-4814	W-4814	17,750	28,500	32.40	2,655	143¾	4-6	4-6	4-4	4-6	28x32	110
S-7907	W-7907	8,400	13,440	22.96	....	48	1-10	1-10	1-4	2-10	20x24	60
S-7908	W-7908	9,600	15,360	26.24	....	54	1-10	1-10	1-4	2-10	20x24	65
S-7909	W-7909	10,800	17,280	29.52	....	60	1-10	1-10	1-4	2-10	24x24	70
S-7910	W-7910	12,000	19,200	32.80	....	66	1-10	1-10	1-4	2-10	24x24	75
S-7911	W-7911	13,200	21,120	36.08	....	72	1-10	1-10	1-4	2-10	24x28	80
S-7912	W-7912	14,400	23,040	39.36	....	78	1-10	1-10	1-4	2-10	24x28	85
S-7913	W-7913	15,600	24,960	42.64	....	84	1-10	1-10	1-4	2-10	24x28	90
S-7914	W-7914	16,800	26,880	45.92	....	90	1-10	1-10	1-4	2-10	28x28	95
S-7915	W-7915	18,000	28,800	41.00	....	96	1-10	1-10	1-4	2-10	28x28	100
S-7916	W-7916	19,200	30,720	44.28	....	102	1-10	1-10	1-4	2-10	30x30	105
S-7917	W-7917	20.400	32.640	44.28	....	108	1-10	1-10	1-4	2-10	30x30	110

§Add 2% to area of chimney for each 500-ft. elevation above sea level. *Two 3½-in. and two 4-in. †Four 3½-in. and two 4-in.

23, 29 and 79-in. boilers are furnished with or without jacket, as desired

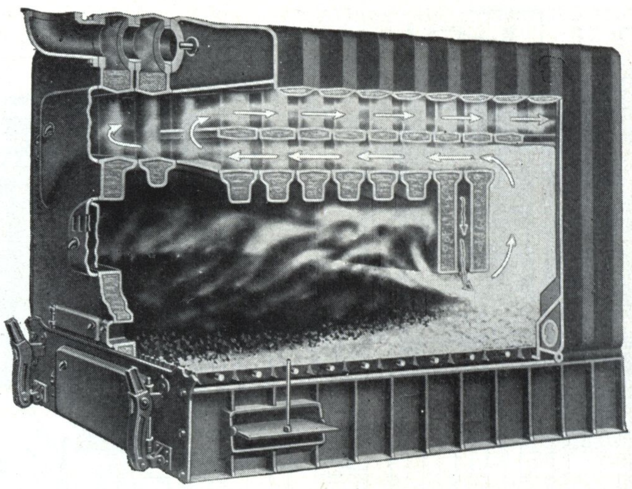
Continued on next page

Ideal Smokeless Boiler

Steam capacity, 2000 to 20,400 sq. ft.
Water capacity, 3250 to 32,640 sq. ft.

The four different sizes in which the Ideal Smokeless Boiler is made are illustrated here. There is an Ideal Boiler for every size and type of home or other building. No building is too large or small, or too old, to secure the smokeless performance and heating advantages of this boiler, for it may be easily and inexpensively installed, either singly or in battery, to meet all requirements.

Ideal Smoke Oxidizer—The Ideal Smokeless Boiler admits air necessary for complete combustion through two adjustable side shutters which form part of the special smoke preventing device—the Ideal Smoke Oxidizer. Through these shutters the secondary air is drawn in by the action of the draft, and swept downward through the Ideal Smoke Oxidizer, into intimate contact with the volatile matter as it is passing through the mixing channel. The mixture is ignited by the glowing coals at the base of the channel and bursts into an intensely hot flame. At the temperature of this flame the soot making carbon particles can not exist. Gases and carbon particles alike are burned and their heat is made available for practical purposes.



Cutaway View of Ideal Smokeless Boiler Showing the Ideal Smoke Oxidizer

The superiority of the Ideal Smoke Oxidizer over preceding and contemporary devices rests upon its unique ability to effect a thorough commingling of the volatile matter distilled from the coal, and a proper supply of air at just the proper place in the boiler.

The Ideal Smoke Oxidizer is mathematically proportioned throughout—wide at the center, tapering off at either side. As a result of its studied design, the air inducted through the shutters at the sides of the boiler is distributed finely and in uniform streams into the mixing channel.

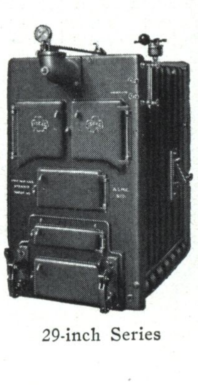
No Special Skill Required—Although the Ideal Smokeless Boiler, through this special, new device, has established an altogether higher standard of economy and smokeless performance, its operation does not depend upon any special degree of skill in firing or handling. Simplicity characterizes every feature of its design and construction. An average attendant can operate the Ideal Smokeless Boiler, using any grade of soft coal, and secure satisfactory results.

Second, it distributes the air directly to the volatile matter instead of first raising it to a high temperature. This is a most important factor. The temperature of the mixture is not the vital point in determining the degree of completeness with which it will burn; the quality of the mixture is the determinant factor. The fresh air, fed directly to the volatile matter, literally penetrates and sweeps through it, as shown in the illustration, securing a perfect, combustible mixture. This mixture ignites at a relatively low temperature, but burns at an exceedingly high temperature.

Third, the Ideal Smoke Oxidizer is built into the boiler in such a way as to divert the volatile matter downward, compressing it as it mixes with the air in the mixing channel. Compression materially increases the speed of ignition, and the flame bursts into the secondary combustion chamber where the soot making carbon particles are entirely consumed.

Permanent and Indestructible—Particular attention is invited to the fact that the Ideal Smoke Oxidizer forms an integral part of the boiler. It is actually formed by the prolongation of two sections of the boiler, especially designed for the purpose. It is waterbacked at the base and sides and can not burn out. Nothing about it can get out of order. It is permanently as effective as it is simple in operation.

No Fire Brick Lining Required—In this fact lies an important consideration to every owner. He has the satisfaction of knowing that the first cost on the Ideal Smokeless Boiler is the last. There are no complicated mechanisms that require continued adjustment; no brick linings or other accessories, which are not only a trouble and an expense to install, but are a source of constant repair bills. Fire brick linings are ordinarily used to keep the mixture at a high temperature until combustion is obtained. The Ideal Smokeless Boiler has not only



29-inch Series

36-inch Series

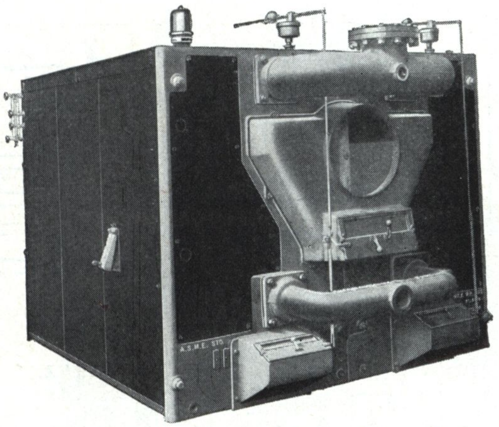
Ideal Smokeless Boilers

Continued on next page

simplified the problem by dispensing with the need of special, additional lining, but functions perfectly without its use.

Smokelessly Burns All Grades of Soft Coal—The question of quality of available soft coal supply need never become a source of apprehension. The Ideal Smokeless Boiler is prepared to burn smokelessly all grades, from the western lignite to the semibituminous or semianthracite coals. Should it become necessary to use coals of different grades, at different times, the side shutters of the Ideal Smoke Oxidizer may be easily adjusted in two or three minutes.

Free and Rapid Internal Water Circulation—The body of water in the boiler, as shown in the illustration, is divided into numerous fine streams, exposing an unusually large heat absorbing surface in the primary and secondary gas chambers, and in the flue galleries above. As a result of this design, the heat generated by the combustion is quickly absorbed by the water. The heated water, being lighter in weight, at once rises. The internal surfaces of the tubular waterways are smooth, and the water circulates freely and rapidly within the boiler. The area for steam release is large. The rapid development of dry steam is insured; or, in the case of a hot water heating plant, the quickest possible flow of hot water through the system is secured.


Rear View of 79-in. Ideal Smokeless Boiler

Long Horizontal Flue Travel—In order that the maximum amount of heat may be extracted from the hot gases of combustion, the Ideal Smokeless Boiler incorporates two special features: long flue travel and a gastight flue travel construction.

As the gases rise out of the secondary gas chamber in this boiler, they pass into the lower flue gallery, as illustrated, travel completely forward to the front of the boiler, thence upward to the upper gallery and backward to the rear—a distance twice the length of the boiler!

As the gases move horizontally forward and backward through these galleries, they come in contact with the tubes within which the water is flowing upward, i. e. at right angles to the movement of the gases. The extensive rubbing contact thus secured between the gases and heat absorbing surface, and the relative directions of flow of the gases and the water, accomplish a continuous exchange of heat from the gases to the water in the maximum degree.

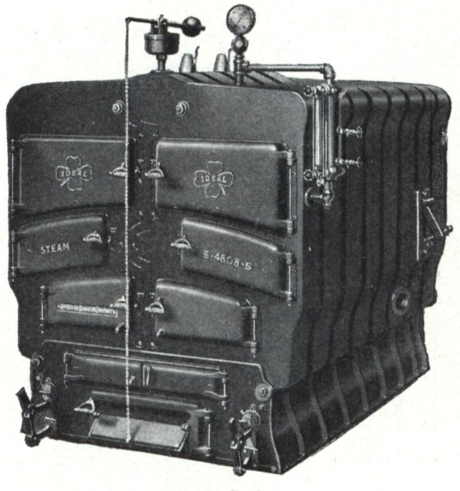
Gastight, Iron-to-iron Construction—Contact faces on each section in the Ideal Smokeless Boiler are ground down to smoothness on immense, specially designed machinery. Held rigidly in place in the grinding machine, as shown in the picture, each section is worked back and forth between two enormous revolving grinding wheels which plane down the contacting surfaces. When the sections are assembled their points of contact form a gastight construction.

This is a special, exclusive construction in Ideal Boilers. It means that the gases of combustion are forced to travel through every square inch of heat absorbing surface. They can not short circuit to the chimney from any point. The iron-to-iron gastight construction is permanent, and permanent operating economy is insured.

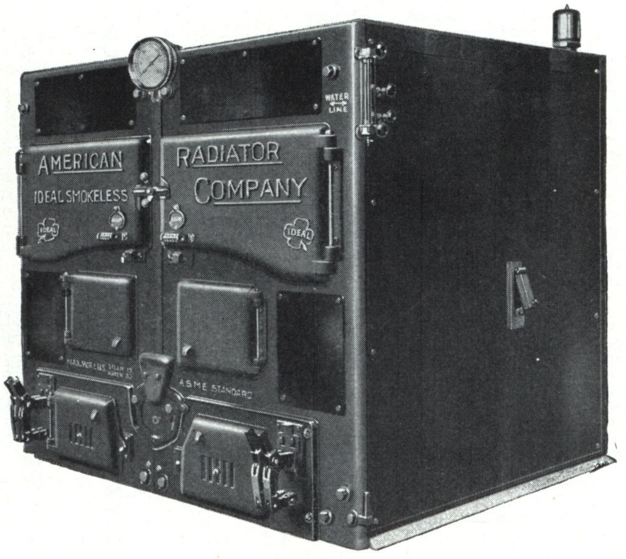
As no part of the hot gases can short circuit to the chimney, neither can they escape into the cellar; nor can air ever leak into the combustion chamber or flue galleries of this boiler. The Ideal Smokeless Boiler means cleanliness of operation, as well as permanent economy.

Boiler Equipment—***Steam Boilers***—Steam gauge, pop safety valve, water column and trimmings, Arco automatic steam regulator and firing tools.

Water Boilers—Ideal damper control and firing tools.



48-inch Series



79-inch Series

Ideal Smokeless Boilers

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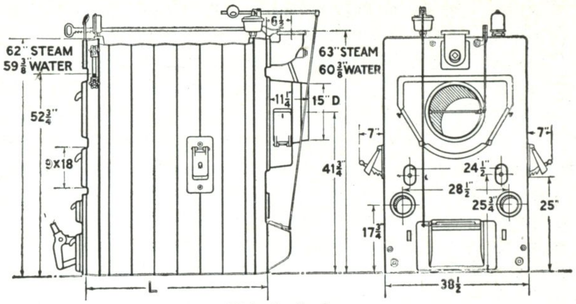
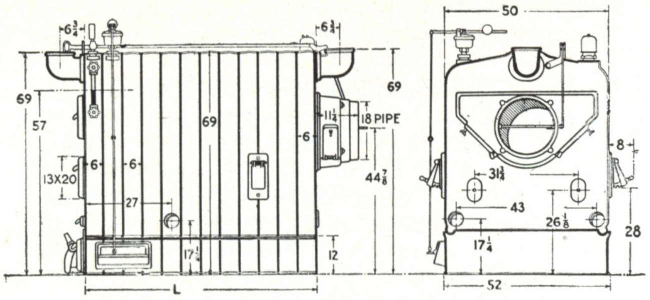
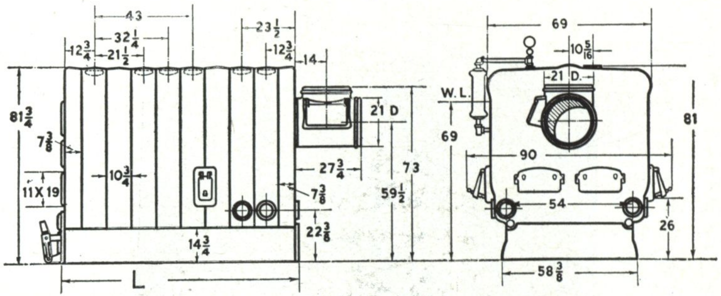

62" STEAM
59⅜ WATER
52¾"
9x18
L
6½
63" STEAM
60⅜ WATER
11¼
15" D
41¾
7
24½"
28½"
25½"
25"
17¾
38½

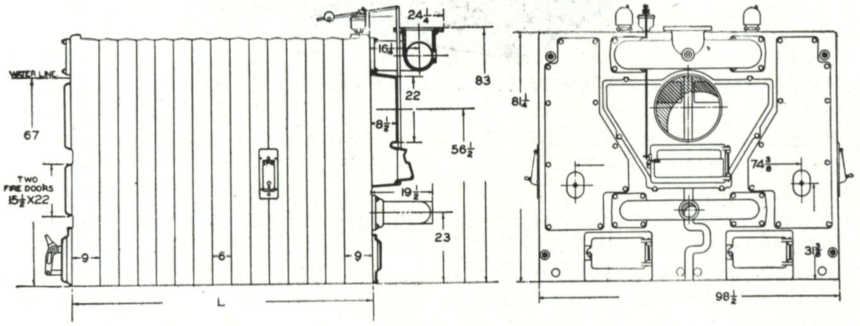
29-inch Series


6¾
6½
69
57
69
11¼
18 PIPE
6
44⅞
13X20
6
6
27
17½
12
L
50
8
31¼
43
26⅛
17¼
28
52

36-inch Series


43
32¼
12¾
21½
23½
12¾
14
81¾
7⅜
21 D
10¾
27¾
73
7⅜
59½
11X19
22⅜
14¾
L
69
10 5/16
21 D.
W.L.
69
81
90
54
26
58⅜

48-inch Series


24¼
16½
83
22
WATER LINE
8½
67
56½
TWO FIRE DOORS 15½X22
19½
23
9
6
9
L
81¼
74⅜
31⅜
98½

79-inch Series

Ideal Smokeless Water Tube Boilers

RATINGS AND DATA, IDEAL SMOKELESS WATER TUBE BOILERS

Boiler No.		Ratings, sq. ft.		Fuel capacity, lb.	Grate area, sq. ft.	Length "L," in.	Outlets number and size, in.		Inlets, number and size, in.		Chimney	
Steam	Water	Steam	Water				Steam	Water	Steam	Water	Flue size, (sea level), § in.	Height, ft.
S-2906-S	W-2906-S	2,000	3,250	435	6.05	36	1-5	1-5	2-4	2-5	12x16	40
S-2907-S	W-2907-S	2,400	3,900	523	7.26	42	1-5	2-5	2-4	2-5	16x16	40
S-2908-S	W-2908-S	2,800	4,550	611	8.47	48	1-5	2-5	2-4	2-5	16x16	45
S-2909-S	W-2909-S	3,200	5,200	699	9.68	54	2-5	2-5	2-4	2-5	16x20	50
S-2910-S	W-2910-S	3,600	5,850	787	10.89	60	2-5	2-5	2-4	2-5	16x20	55
S-2911-S	W-2911-S	4,000	6,500	875	12.10	66	2-5	2-5	2-4	2-5	20x20	60
S-3607-S	W-3607-S	3,800	6,200	828	9.00	42	2-6	2-6	2-4	*	16x20	50
S-3608-S	W-3608-S	4,450	7,300	972	10.50	48	2-6	2-6	2-4	*	20x20	50
S-3609-S	W-3609-S	5,100	8,400	1,116	12.00	54	2-6	2-6	2-4	*	20x20	55
S-3610-S	W-3610-S	5,750	9,500	1,260	13.50	60	2-6	2-6	2-4	*	20x20	55
S-3611-S	W-3611-S	6,400	10,600	1,404	15.00	66	2-6	2-6	2-4	*	20x20	60
S-3612-S	W-3612-S	7,050	11,700	1,548	16.50	72	2-6	2-6	2-4	†	20x24	60
S-3613-S	W-3613-S	7,700	12,800	1,692	18.00	78	2-6	2-6	2-4	†	20x24	65
S-3614-S	W-3614-S	8,350	13,900	1,836	19.50	84	2-6	2-6	2-4	†	20x24	70
S-3615-S	W-3615-S	9,000	15,000	1,980	21.00	90	2-6	2-6	2-4	†	24x24	75
S-4807-S	W-4807-S	9,000	14,500	1,770	21.60	68½	3-6	3-6	4-4	4-6	24x24	70
S-4808-S	W-4808-S	10,250	16,500	2,065	25.20	79¼	3-6	3-6	4-4	4-6	24x24	75
S-4809-S	W-4809-S	11,500	18,500	2,065	25.20	90	3-6	3-6	4-4	4-6	24x28	80
S-4810-S	W-4810-S	12,750	20,500	2,360	28.80	100¾	3-6	3-6	4-4	4-6	24x28	85
S-4811-S	W-4811-S	14,000	22,500	2,360	28.80	111½	4-6	4-6	4-4	4-6	28x28	95
S-4812-S	W-4812-S	15,250	24,500	2,360	28.80	122¼	4-6	4-6	4-4	4-6	28x28	100
S-4813-S	W-4813-S	16,500	26,500	2,655	32.40	133	4-6	4-6	4-4	4-6	28x32	105
S-4814-S	W-4814-S	17,750	28,500	2,655	32.40	143¾	4-6	4-6	4-4	4-6	28x32	110
S-7909-S	W-7909-S	10,800	17,280	....	29.52	60	1-10	1-10	1-4	2-10	24x24	70
S-7910-S	W-7910-S	12,000	19,200	....	32.80	66	1-10	1-10	1-4	2-10	24x24	75
S-7911-S	W-7911-S	13,200	21,120	....	36.08	72	1-10	1-10	1-4	2-10	24x28	80
S-7912-S	W-7912-S	14,400	23,040	....	39.36	78	1-10	1-10	1-4	2-10	24x28	85
S-7913-S	W-7913-S	15,600	24,960	....	42.64	84	1-10	1-10	1-4	2-10	24x28	90
S-7914-S	W-7914-S	16,800	26,880	....	45.92	90	1-10	1-10	1-4	2-10	28x28	95
S-7915-S	W-7915-S	18,000	28,800	....	41.00	96	1-10	1-10	1-4	2-10	28x28	100
S-7916-S	W-7916-S	19,200	30,720	....	44.28	102	1-10	1-10	1-4	2-10	30x30	105
S-7917-S	W-7917-S	20,400	32,640	....	44.28	108	1-10	1-10	1-4	2-10	30x30	110

§Add 2% to area of chimney for each 500-ft. elevation above sea level. *Two 3½-in. and two 4-in. †Four 3½-in. and two 4-in.

Continued on next page

Ideal Sectional Boilers

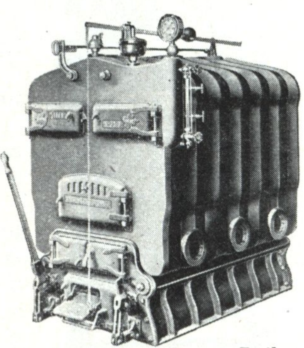
Singly or in batteries of two or more, they are extensively used for heating homes, schools, factories, churches, hotels, stores, public buildings, etc. They are also used for heating water for shower baths, washrooms, etc., and for industrial purposes.

Large, Direct Heating Surface—An exceptionally large heating surface is directly next to the fire; rapid water circulation and the quickest and most economical heating results at the radiators are assured. Ample space is provided in which the gases are turned into heat as fast as liberated and made to yield their full heat making value to the water.

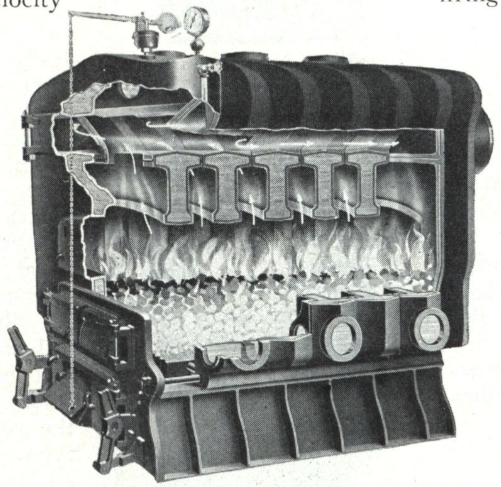
Free and Effective Circulation—The thin waterways give a high velocity to the water across the heating surface with quick, effective heating. The circulation of water within the sections distributes the water in thin volumes which move with minimum friction and absorb the heat rapidly.

In the steam boiler, water is rapidly generated into steam by the extensive water line. The design of the waterways throws the rising current of water away from the outlets, and assures free and rapid steaming. No water is carried into the piping by the steam.

In the water boilers, this same rapid circulation insures a quick distribution of the heated water to the radiators.



Ideal Sectional Steam Boiler



Sectional View of Ideal Sectional Boiler

Sectional Construction—Sections are easily handled and carried through any standard doorway. It is possible to add to the capacity of the boiler to fill the need for more heat should an addition to the building require it.

Heavy Trussed Grate Bars—Will last as long as the boiler. Ample air spaces insure a full supply of oxygen to promote effective combustion and burn the heat making gases.

Other Features—The best grade of cast iron is used throughout. All parts are made to endure and never rust through.

Boilers are assembled with cast iron push nipples machined to one-thousandth of an inch, making permanently tight joints.

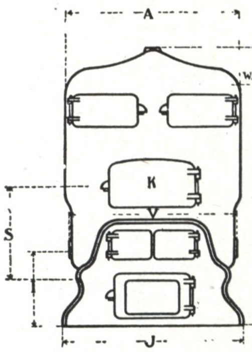
Fire doors are ample in size, making firing easy. Ash pits are wide and deep. Clean-out doors provide easy access to the flues for cleaning.

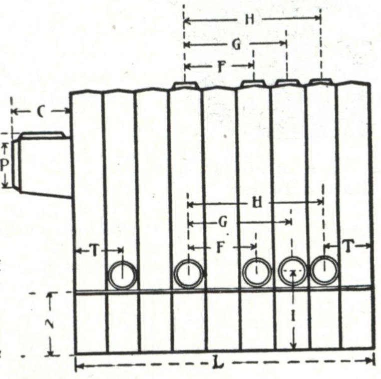
Tight fitting balanced inlet draft door insures complete control of the fire.

The low construction and ample steam domes (which eliminate headers and complicated piping over the boiler) make for easy erection in low cellars without the expense of digging pits.

Boiler Equipment—***Steam Boilers***—Steam gauge, Arco automatic damper regulator, pop safety valve, water column, tricocks and firing tools.

Water Boiler—Firing tools only.





RATINGS OF IDEAL SECTIONAL BOILERS

Boiler No.		Ratings, sq. ft.		Length "L," in.	Grate area, sq.ft.	*Outlets, number and size, in.	Chimney	
Steam	Water	Steam	Water				Flue area sq.in.	Hgt., ft.
S-19-5	W-19-5	600	1000	30½	3.32	2-3	96	35
S-19-6	W-19-6	750	1250	37⅛	4.15	2-3	96	35
S-19-7	W-19-7	900	1500	43¾	4.98	3-3	96	35
S-22-5	W-22-5	800	1300	32 15/16	4.08	2-4	96	35
S-22-6	W-22-6	1000	1650	40	5.10	2-4	96	35
S-22-7	W-22-7	1200	2000	47 1/16	6.12	3-4	96	40
S-25-5	W-25-5	1100	1825	35⅜	5.44	2-4	96	40
S-25-6	W-25-6	1350	2225	43 1/16	6.80	2-4	96	40
S-25-7	W-25-7	1600	2650	50¾	8.16	3-4	144	40
S-25-8	W-25-8	1850	3050	58 7/16	9.52	3-4	144	45
S-28-5	W-28-5	1300	2150	36¼	6.24	2-4	144	40
S-28-6	W-28-6	1625	2675	44¼	7.80	2-4	144	40
S-28-7	W-28-7	1950	3200	52¼	9.36	3-4	192	40
S-28-8	W-28-8	2275	3725	60¼	10.92	3-4	192	45

*For each supply outlet on top of boiler there are corresponding return inlets on both sides.

DIMENSIONS (IN INCHES) OF IDEAL SECTIONAL BOILERS

	19-in. Boilers		22-in. Boilers		25-in. Boilers		28-in. Boilers	
	Water	Steam	Water	Steam	Water	Steam	Water	Steam
A	31¼	32¼	35¼	36¼	40⅜	41⅜	43½	44½
B	50	50	53	53	57⅞	57⅞	60⅝	60⅝
*C	15⅝	15⅝	15¼	15¼	17½	17½	18⅛	18⅛
†D	45⅛	45⅛	47¾	47¾	53	53	55⅞	55⅞
E	37¾	37¾	40½	40½	44⅛	44⅛	46¼	46¼
F	13¼	13¼	14⅛	14⅛	15⅜	15⅜	16	16
G	19⅞	19⅞	21¼	21¼	23 1/16	23 1/16	24	24
H	26½	26½	28¼	28¼	30¾	30¾	32	32
I	16	16	16¾	16¾	17¾	17¾	17⅞	17⅞
J	26	26	29⅛	29⅛	34½	34½	37⅛	37⅛
§K	8x14	8x14	8x14	8x14	9x18	9x18	9x18	9x18
L	**	**	**	**	**	**	**	**
M	......	43⅜	......	46¼	......	51	......	53⅜
N	9⅜	9⅜	9½	9½	9⅞	9⅞	10	10
P	9	9	10	10	11	11	12	12
S	12⅝	12⅝	12⅜	12⅜	14¼	14¼	14¼	14¼
T	8	8	8½	8½	9⅛	9⅛	9½	9½
V	29⅝	29⅝	33 9/16	33 9/16	39⅜	39⅜	41 13/16	41 13/16

*Measured without smokehood cover. †Measured with smokehood cover on. **See rating table on this page.
§For burning wood, feed door K on 19-in. boilers is 10¼x18 in.; on 22 and 25-in. boilers, 11⅛x18 in.; on 28-in. boilers, 12 13/16x19⅞ in.

Continued on next page

Arco Round Boiler

Steam capacity, 350 to 1700 sq. ft.

Water capacity, 600 to 2825 sq. ft.

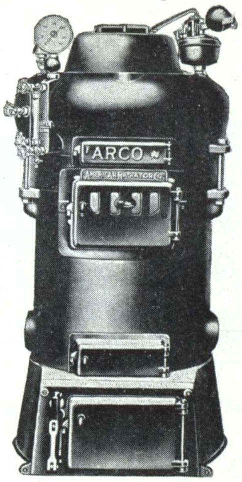
For homes and all other buildings within the limits of its rated capacities, the Ideal Arco Round Boiler may be offered with one of the greatest recommendations that any boiler can command—years of distinguished service. Today it is undoubtedly the most popular boiler of its kind in America.

The special favor in which this boiler is held is due to the many superior features of merit in its design and construction. To house owners and caretakers, these features have meant quick heat generation on every desired occasion; absolutely dependable heating service with economy in fuel consumption; and continued, satisfactory performance with a very small amount of attention.

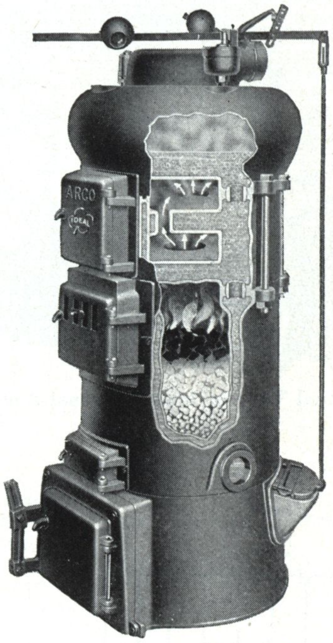
The Ideal Arco Round Boiler described and illustrated herein unites every point of excellence which has contributed to the establishment of its reputation; but it combines other factors which still further commend it. Outstanding among these is the increase in the boiler's direct, fire-contact heating surface, fuel capacity, and heat generating capacity.

Quick Heating—The quick heating response and economy of operation characterizing the Ideal Arco Round Boiler are due in large measure to its exclusive *third nipple* construction. This construction effects a continuous, rapid, unimpeded circulation of the water within the boiler—giving to it an exceptional "pick-up" capacity. In the case of the water boiler, hot water begins to rise out of the boiler and flow through the heating system almost immediately after the fire is lighted; while in the steam boiler, the quickest possible steam generation after firing is insured.

Where the Ideal Arco Round Boiler is installed, the occupants of the home can rise and breakfast in comfort on the coldest mornings of midwinter.



Ideal Arco Round Boiler



Sectional View of Ideal Arco Round Boiler

Third Nipple—Balancing the third nipple construction is the large, well designed fire pot, the carefully proportioned flue areas and baffled gas travel—the entire design calculated to give the best performance under chimney conditions as they are actually found in practice, and at the same time maintain the greatest economy of fuel consumption.

Large Dome—Attention is also directed to the broad and high dome on the Ideal Arco Steam Boiler. This provides an unusually large steam disengaging surface and storage space, commensurate with the exceptionally rapid steam generating capacity of the boiler. Dry steam at the outlet is insured.

And in common with the construction of all Ideal Boilers, the contact faces of all doors on this boiler are ground to smoothness, so preventing excess air infiltration at these sources. Excess air infiltration at a boiler reduces the temperature of the gases of combustion and causes considerable heat waste.

All points of construction in the Ideal Arco Round Boiler lead to permanent efficiency.

Substantial—The heavy, substantial character of the doors, plate work, and hinge pins; the well proportioned shaking apparatus, the large ash pit, the specially trussed and justly famous Arco grates, the large clean-cut door—all bear witness to the thoroughness with which each detail has been designed to insure perfectly satisfactory service with the least amount of attention.

Boiler Equipment—***Steam Boiler***—Regular trimmings, including safety valve, steam gauge and regulator and firing tools.

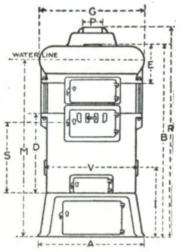
Water Boiler—Firing tools only.

RATINGS AND DIMENSIONS OF IDEAL ARCO ROUND BOILERS

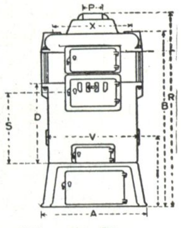
Boiler No.		Ratings, sq. ft.		Grate area, sq. ft.	Hard coal cap., lb.	Outlets *and inlets, in.	Chimney		Measurements in inches													
							Flue size (sea level), §in.	Hgt. ft.	Steam or Water						Steam					Water		
Steam	Water	Steam	Water						A	D	I	P	S	V	B	E	G	M	R	B	R	X
S-1704	W-1704	350	600	1.40	140	2½	8x 8	30	24⅝	24¾	16⅜	8	21½	21¾	53⅛	10⅞	24¼	47	60¼	47⅛	54⅜	18⅛
S-1904	W-1904	500	850	1.88	184	2½	8x 8	30	27	23⅜	16¼	8	20⅜	24⅛	52½	11½	26¾	45	59⅝	45⅞	52⅝	19¼
S-2004	W-2004	625	1050	2.23	217	3	8x 8	30	28⅞	23⅜	16¼	8	20½	25½	51½	11⅛	28⅜	46	58¼	45½	52	20⅝
S-2204	W-2204	775	1300	2.62	268	3	10x10	35	30⅛	24⅜	16⅞	9	21¼	27⅝	54	11½	30⅜	47	62¼	47⅝	55⅝	23
S-2504	W-2504	950	1575	3.53	355	3½	10x10	35	33⅛	25¼	17	9	22	30⅛	55⅝	12⅜	33⅛	48	63⅜	48¾	56¼	25½
S-2804	W-2804	1200	1975	4.36	476	4	10x10	35	36¾	26¼	17⅝	10	23⅛	34⅛	57⅝	13⅛	37⅛	49	66⅝	50¾	59½	29⅜
S-3104	W-3104	1500	2475	5.30	608	4	12x12	40	39⅛	27⅜	16¾	10	23⅞	36⅞	59¾	14	40⅜	51	68⅝	53⅛	61⅝	32¼
S-1705	W-1705	400	675	1.40	140	2½	8x 8	30	24⅝	24¾	16⅜	8	21½	21¾	57⅝	10⅞	24¼	51	64¾	51⅝	58⅞	18⅛
S-1905	W-1905	550	925	1.88	184	2½	8x 8	35	27	23⅜	16¼	8	20⅜	24⅛	57	11½	26¾	50	64⅛	50⅜	57⅛	19¼
S-2005	W-2005	675	1125	2.23	217	3	8x 8	35	28⅞	23⅜	16¼	8	20½	25½	56⅛	11⅛	28⅜	51	62⅞	51⅛	56⅝	20⅝
S-2205	W-2205	825	1375	2.62	268	3	10x10	35	30⅛	24⅜	16⅞	9	21¼	27⅝	58½	11½	30⅜	52	66¾	52	60	23
S-2505	W-2505	1025	1700	3.53	355	3½	10x10	40	33⅛	25¼	17	9	22	30⅛	60¼	12⅜	33⅛	53	68	53½	61	25½
S-2805	W-2805	1300	2150	4.36	476	4	12x12	40	36¾	26¼	17⅝	10	23⅛	34⅛	62⅝	13⅛	37⅛	54	71⅝	55¾	64½	29⅜
S-3105	W-3105	1600	2650	5.30	608	4	12x12	40	39⅛	27⅜	16¾	10	23⅞	36⅞	65	14	40⅜	56	73⅞	58¼	66¾	32¼
S-1706	W-1706	450	750	1.40	140	2½	8x 8	35	24⅝	24¾	16⅜	8	21½	21¾	62¼	10⅞	24¼	56	69⅜	56¼	63½	18⅛
S-1906	W-1906	600	1000	1.88	184	2½	8x 8	35	27	23⅜	16¼	8	20⅜	24⅛	61⅝	11½	26¾	55	68¾	55	61¾	19¼
S-2006	W-2006	725	1200	2.23	217	3	10x10	35	28⅞	23⅜	16¼	8	20½	25½	60¾	11⅛	28⅜	55	67½	54¾	61¼	20⅝
S-2206	W-2206	875	1450	2.62	268	3	10x10	40	30⅛	24⅜	16⅞	9	21¼	27⅝	63¼	11½	30⅜	56	71½	56⅞	64⅞	23
S-2506	W-2506	1100	1825	3.53	355	3½	10x10	40	33⅛	25¼	17	9	22	30⅛	65⅜	12⅜	33⅛	58	73⅛	58⅝	66⅛	25½
S-2806	W-2806	1400	2325	4.36	476	4	12x12	45	36¾	26¼	17⅝	10	23⅛	34⅛	67⅞	13⅛	37⅛	59	76⅞	60⅞	69⅝	29⅜
S-3106	W-3106	1700	2825	5.30	608	4	12x12	45	39⅛	27⅜	16¾	10	23⅞	36⅞	70⅜	14	40⅜	62	79¼	63¾	72¼	32¼

*Steam boilers have one outlet and two inlets; water boilers have two outlets and two inlets.

§Add 2% to area of chimney flue for each 500-ft. elevation above sea level.



STEAM BOILER



WATER BOILER

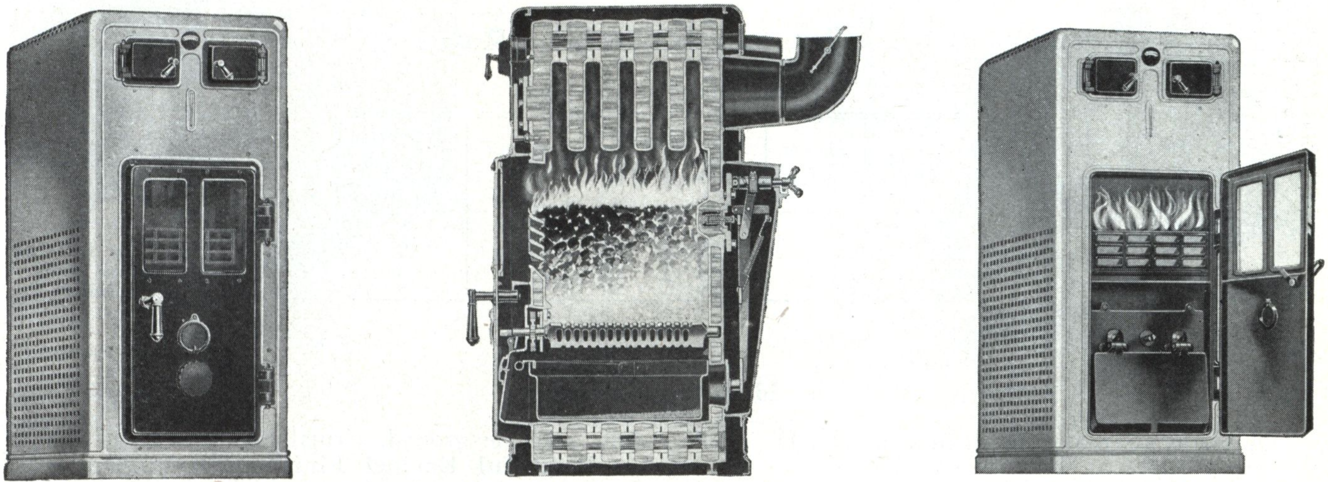
Continued on next page

Arcola Parlor Heater

To all who are eager to enjoy the great economy and convenience of having an ideal hot water heating outfit entirely within the rooms of the home, whether that home be of the cellar or cellarless type, the Ideal Arcola Parlor Heater will have an instant appeal.

For the Ideal Arcola Parlor Heater is truly a thing of beauty, in perfect harmony with any scheme of interior decoration; and its special design and construction insure cleanliness and ease of operation.

Attractive Appearance—The new model herein offered unites the very latest improvements in modern heating equipment. The smooth exterior finish glows with the bright luster found on the most expensive new automobile; but the Arcola finish is permanent, for it is vitreous enamel, applied under careful supervision in our own specially erected enameling plant. In contrast to the glistening gray cover are the black doors of the same enduring luster.


Front View

Sectional View

Lock-safe Fire Door

Arcola Parlor Heater

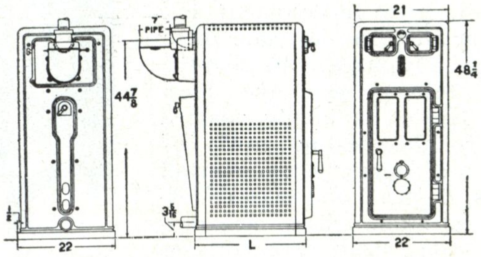
Glow Panels—The glow panels in the large front door are made of a special glass mixture, prepared particularly to withstand fire temperatures without flaking, breaking or losing transparency. A damp cloth with ordinary cleansing powder is all that is required to keep them clean.

Automatic Control and Lock-safe Door—The Ideal Arcola Parlor Heater is equipped with a new automatic heat control device, accurate, dependable and easily regulated. The regulating handle on the graduated dial at the rear need only be turned for more or less heat as required. Setting the handle adjusts the automatic mechanism. The frictionless operating draft panel at the base, maintains a precise and automatic control over the supply of air admitted to support combustion. No air may enter the fire chamber at any other place, for the gastight construction formed by the water-surrounded ash pit and the lock-safe fire door seals the combustion chamber as tightly as the glass container is sealed within a thermos bottle.

The large front door—the lock-safe fire door—deserves especial commendation to the house owner. For it takes guesswork out of caretaking and saves times and trouble to the housewife. It allows no dust or gas or soot to escape into the room, for its contact face is ground as smooth as a marble surface. This door, covering both the ash pit and fire pot, makes it impossible to force or check the fire in any wasteful manner, and is a guarantee of perfect operation.

Fuel Saving—One of the greatest advantages of the Ideal Arcola Parlor Heater is the remarkable saving in fuel which it accomplishes. As compared with a cellar installation, it saves to the owner one-third his annual coal bill; while as compared with old-fashioned heating methods, its saving is considerably greater. The superiority of the Ideal Arcola Parlor Heater in this respect is due to its unique scientific design. By its economy of operation, the Ideal Arcola Parlor Heater will soon have saved its own cost, thereafter representing a high interest bearing investment to the owner—and an investment that will pay dividends also in the form of better health and genuine comfort.

Equipment—The Ideal Arcola Parlor Heater comes completely equipped with automatic heat regulator and all other accessories.



Dimension Diagram, Arcola Parlor Heater

DIMENSIONS AND RATINGS

No. of boiler	Number of sections	Water rating, sq. ft.	Grate area, sq. ft.	Hard coal fuel cap., lb.	Length "L," in.	Chimney size (sea level), in.	Size of outlets and inlets, in.	Chimney height, ft.	Radiating surface of Arcola and exp. tank, sq. ft.
40	4	375	.81	66	17	8x8	2½	25	45
50	5	500	1.08	88	20½	8x8	2½	25	50
60	6	625	1.35	110	24	8x8	2½	30	55
70	7	750	1.62	132	27½	8x8	2½	30	60

Tappings: one 2½-in. outlet and one 2½-in. inlet

Continued on next page

Ideal Arcola Heater

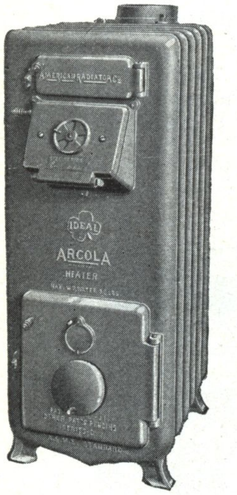
More than a half million people now enjoy the economy and comfort of Ideal Arcola Heaters. Used for heating homes with or without basements, stores, apartments, garages and other small buildings, they have made hot water radiator heat available where before only old-fashioned and less efficient methods could be used.

The Ideal Arcola Heater is similar in principle to the Ideal Arcola Parlor Heater but is not equipped with the enameled cover, automatic damper regulator, altitude gauge or thermometer.

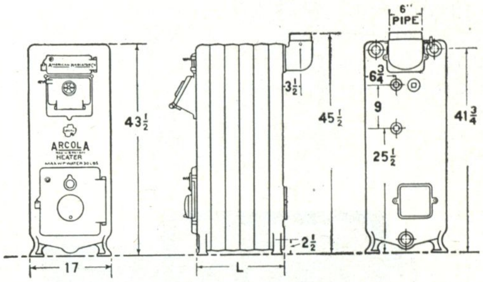
An Added Convenience—Although the Ideal Arcola Heater is not regularly supplied with automatic regulation, it is designed so that an automatic heat regulating device may easily be added at any time.

The automatic heat regulator is placed at the rear of the Arcola.

To obtain more or less heat, it is only necessary to turn the handle on its dial. The automatic mechanism then accurately maintains the desired heat output without further attention.

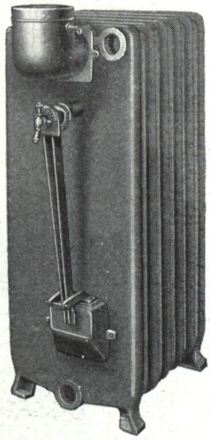


Ideal Arcola Heater



DIMENSIONS AND RATINGS

No. of boiler	Number of sections	Rating, sq. ft.	Fuel capacity, lb.	Length "L" in.	Radiating surface of Arcola and exp. tank, sq. ft.
4H.......	4	200	60	12	45
5H.......	5	300	80	15	50
6H.......	6	400	100	18	55
7H.......	7	500	120	21	60
8H.......	8	600	140	24	65

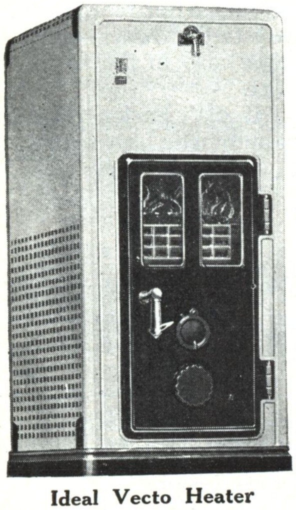


Rear View Showing Automatic Heat Regulator

Ideal Vecto Heater

A warm air heater for homes up to 8000 cu. ft. capacity.

Scientifically Designed Heating Surface—The body of the Vecto Heater is cast with high projecting fins, giving an unusually large heating surface for the volume of space occupied. There are many more square feet of heating surface in the Vecto Heater than in any other known heating apparatus occupying, even approximately, a similar amount of space. Large volumes of air are warmed at moderate temperatures, and the vital, healthful qualities of the air are preserved.



Ideal Vecto Heater

Heat Control Handle—For more or less heat this handle need only be turned on the graduated dial. The Vecto Heater responds quickly with the desired flow of warmth. No bending or fussing with a damper.

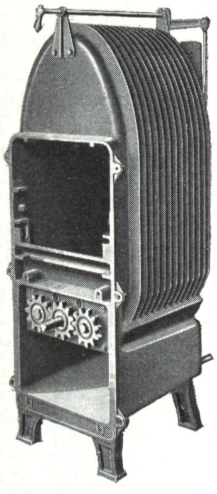
Gastight, Dustproof Construction — The entire body is cast in one seamless piece. Excess air can not filter inward, nor can dust or gas escape into the home. Cleanliness of operation is insured.

Lock-safe Door—This novel feature seals the fire tightly in front and makes it impossible to force it in any unsafe or wasteful manner. Its contact facing is especially machine ground, virtually as smooth as marble.

Beautiful Enamel Finish—The finish is gray, porcelain enamel, baked on at high temperature. It glows like polished china, and its beauty is practically everlasting. The Ideal Vecto Heater harmonizes with any interior. It is truly a decorative ornament in any room.

Window Glow-Panels—Made of a special, chemically prepared mixture, the glow-panels allow the firelights to shine clearly through, giving the cheer of an open fire. They do not flake, and resist all fire temperatures.

Requiring no basement for installation; easily and inexpensively installed; compact and self-contained; fool-proof in construction; quickly responding to heating needs; clean and safe in operation; beautiful in appearance and permanently so; very simple to run; portable, like an article of furniture; saving its cost many times over by its great fuel economy, and very low in price—to state these points of advantage is to give the special reasons why the Ideal Vecto Heater is ideally adapted to serve the heating needs of bungalows, stores, garages, small schools, dentists' and doctors' offices, real estate offices, etc., railroad stations, shops, farm cottages and detached buildings of all kinds.



Vecto Heater with Jacket Removed

Continued on next page

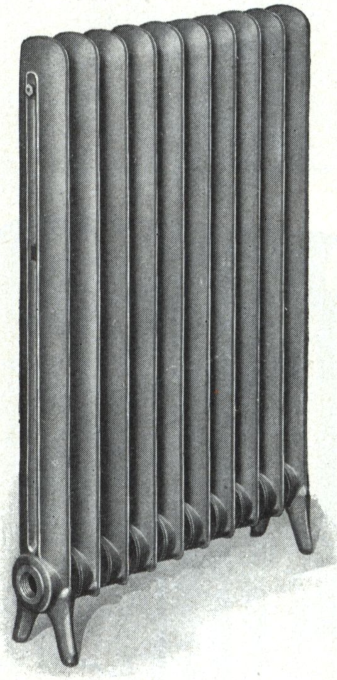
American Peerless Radiators

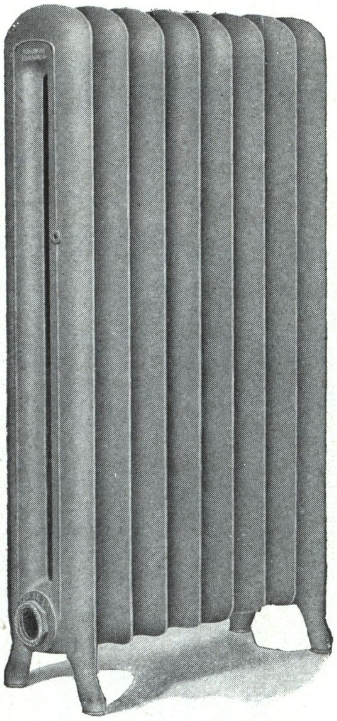
American Peerless Radiators have long been standard for industrial buildings, offices, etc., where American Peerless Wall Radiators are not practical.

The quality of the castings is unsurpassed for smoothness of surface, clean-cut lines and freedom from dust-catching embossed designs.

Made in the factories of the largest founder of cored castings in the world, they are subjected to thorough tests of strength, appearance and symmetry of assembled radiator. An American Peerless Radiator always sets firmly on the floor.

American Peerless Radiators are carried in stock at practically every large city in the United States,


Single-column


Two-column

American Peerless Radiators

HEATING SURFACE OF AMERICAN PEERLESS RADIATORS

Number of sections	Single-column radiator						Two-column radiator						
	* Length, in.	Catalogue height					* Length, in.	Catalogue height					
		38 in.	32 in.	26 in.	23 in.	20 in.		45 in.	38 in.	32 in.	26 in.	23 in.	20 in.
		Nominal heating surface, sq.ft.						Nominal heating surface, sq. ft.					
1	2½	3	2½	2	1⅔	1½	2½	5	4	3⅓	2⅔	2⅓	2
2	5	6	5	4	3⅓	3	5	10	8	6⅔	5⅓	4⅔	4
3	7½	9	7½	6	5	4½	7½	15	12	10	8	7	6
4	10	12	10	8	6⅔	6	10	20	16	13⅓	10⅔	9⅓	8
5	12½	15	12½	10	8⅓	7½	12½	25	20	16⅔	13⅓	11⅔	10
6	15	18	15	12	10	9	15	30	24	20	16	14	12
7	17½	21	17½	14	11⅔	10½	17½	35	28	23⅓	18⅔	16⅓	14
8	20	24	20	16	13⅓	12	20	40	32	26⅔	21⅓	18⅔	16
9	22½	27	22½	18	15	13½	22½	45	36	30	24	21	18
10	25	30	25	20	16⅔	15	25	50	40	33⅓	26⅔	23⅓	20
11	27½	33	27½	22	18⅓	16½	27½	55	44	36⅔	29⅓	25⅔	22
12	30	36	30	24	20	18	30	60	48	40	32	28	24
13	32½	39	32½	26	21⅔	19½	32½	65	52	43⅓	34⅔	30⅓	26
14	35	42	35	28	23⅓	21	35	70	56	46⅔	37⅓	32⅔	28
15	37½	45	37½	30	25	22½	37½	75	60	50	40	35	30
16	40	48	40	32	26⅔	24	40	80	64	53⅓	42⅔	37⅓	32
17	42½	51	42½	34	28⅓	25½	42½	85	68	56⅔	45⅓	39⅔	34
18	45	54	45	36	30	27	45	90	72	60	48	42	36
19	47½	57	47½	38	31⅔	28½	47½	95	76	63⅓	50⅔	44⅓	38
20	50	60	50	40	33⅓	30	50	100	80	66⅔	53⅓	46⅔	40
21	52½	63	52½	42	35	31½	52½	105	84	70	56	49	42
22	55	66	55	44	36⅔	33	55	110	88	73⅓	58⅔	51⅓	44
23	57½	69	57½	46	38⅓	34½	57½	115	92	76⅔	61⅓	53⅔	46
24	60	72	60	48	40	36	60	120	96	80	64	56	48
25	62½	75	62½	50	41⅔	37½	62½	125	100	83⅓	66⅔	58⅓	50
26	65	78	65	52	43⅓	39	65	130	104	86⅔	69⅓	60⅔	52
27	67½	81	67½	54	45	40½	67½	135	108	90	72	63	54
28	70	84	70	56	46⅔	42	70	140	112	93⅓	74⅔	65⅓	56
29	72½	87	72½	58	48⅓	43½	72½	145	116	96⅔	77⅓	67⅔	58
30	75	90	75	60	50	45	75	150	120	100	80	70	60
31	77½	93	77½	62	51⅔	46½	77½	155	124	103⅓	82⅔	72⅓	62
32	80	96	80	64	53⅓	48	80	160	128	106⅔	85⅓	74⅔	64

Number of sections	Three-column radiator							Four-column radiator						
	* Length, in.	Catalogue height						* Length, in.	Catalogue height					
		45 in.	38 in.	32 in.	26 in.	22 in.	18 in.		45 in.	38 in.	32 in.	26 in.	22 in.	18 in.
		Nominal heating surface, sq. ft.							Nominal heating surface, sq. ft.					
1	2½	6	5	4½	3¾	3	2¼	3	10	8	6½	5	4	3
2	5	12	10	9	7½	6	4½	6	20	16	13	10	8	6
3	7½	18	15	13½	11¼	9	6¾	9	30	24	19½	15	12	9
4	10	24	20	18	15	12	9	12	40	32	26	20	16	12
5	12½	30	25	22½	18¾	15	11¼	15	50	40	32½	25	20	15
6	15	36	30	27	22½	18	13½	18	60	48	39	30	24	18
7	17½	42	35	31½	26¼	21	15¾	21	70	56	45½	35	28	21
8	20	48	40	36	30	24	18	24	80	64	52	40	32	24
9	22½	54	45	40½	33¾	27	20¼	27	90	72	58½	45	36	27
10	25	60	50	45	37½	30	22½	30	100	80	65	50	40	30
11	27½	66	55	49½	41¼	33	24¾	33	110	88	71½	55	44	33
12	30	72	60	54	45	36	27	36	120	96	78	60	48	36
13	32½	78	65	58½	48¾	39	29¼	39	130	104	84½	65	52	39
14	35	84	70	63	52½	42	31½	42	140	112	91	70	56	42
15	37½	90	75	67½	56¼	45	33¾	45	150	120	97½	75	60	45
16	40	96	80	72	60	48	36	48	160	128	104	80	64	48
17	42½	102	85	76½	63¾	51	38¼	51	170	136	110½	85	68	51
18	45	108	90	81	67½	54	40½	54	180	144	117	90	72	54
19	47½	114	95	85½	71¼	57	42¾	57	190	152	123½	95	76	57
20	50	120	100	90	75	60	45	60	200	160	130	100	80	60
21	52½	126	105	94½	78¾	63	47¼	63	210	168	136½	105	84	63
22	55	132	110	99	82½	66	49½	66	220	176	143	110	88	66
23	57½	138	115	103½	86¼	69	51¾	69	230	184	149½	115	92	69
24	60	144	120	108	90	72	54	72	240	192	156	120	96	72
25	62½	150	125	112½	93¾	75	56¼	75	250	200	162½	125	100	75
26	65	156	130	117	97½	78	58½	78	260	208	169	130	104	78
27	67½	162	135	121½	101¼	81	60¾	81	270	216	175½	135	108	81
28	70	168	140	126	105	84	63	84	280	224	182	140	112	84
29	72½	174	145	130½	108¾	87	65¼	87	290	232	188½	145	116	87
30	75	180	150	135	112½	90	67½	90	300	240	195	150	120	90
31	77½	186	155	139½	116¼	93	69¾	93	310	248	201½	155	124	93
32	80	192	160	144	120	96	72	96	320	256	208	160	128	96

Single-column, two-column and three-column radiators are tapped as follows: for water, 1½ in. top and 2 in. bottom; for steam, 2 in. at bottom only. Water connections: extra heavy 1½-in. right and left threaded nipples at top and bottom. Steam connections: extra heavy 2-in. right and left threaded nipples at bottom only. Low drip hubs: for one-pipe steam, on supply leg-section; for two-pipe steam, on return leg-section.

Four-column radiators are tapped 2 in. top and bottom. Connections for both steam and water: extra heavy 2-in. right and left threaded nipples top and bottom.

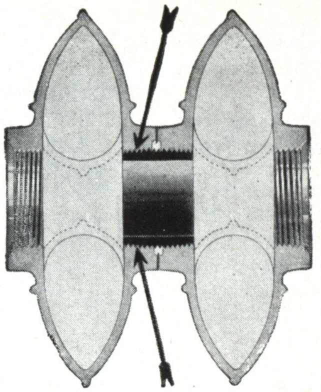
*Add ½ in. to length for each bushing.

Continued on next page

and are always quickly obtained on short notice.

American Peerless Radiators, like all American Radiators, have the sections connected by right and left threaded internal screw nipples (see illustration opposite).

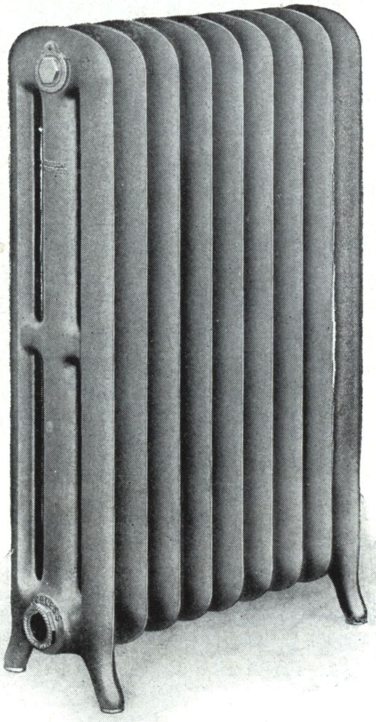
This type of construction, regularly found in American Radiators, is the only method of assembling which will not permit them to warp and become out of alignment, or leak around connections.



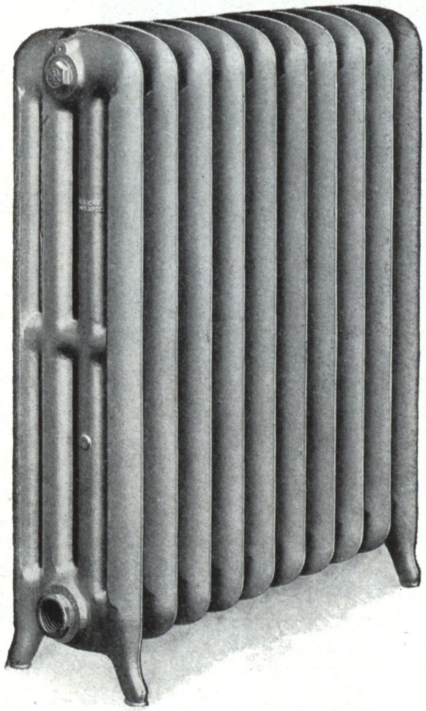
Detail of Screw Nipple Connection

The sections being screwed together, there is no necessity for draw rods. This permits of easy cleaning between sections and ensures freedom from dust pocket above the bottom hub.

American Peerless Radiators are furnished on special order with extra high (6 or 8-in.) legs as shown on page 2150. They can also be furnished legless and fastened to the wall with concealed brackets (page 2150).

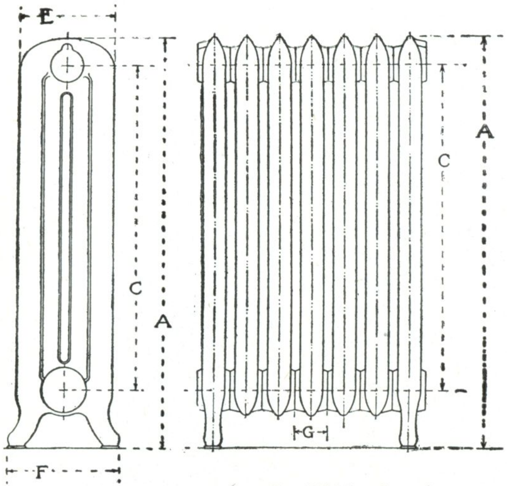


Three-column



Four-column

American Peerless Radiators



- A. Total height.
- C. Distance from center of top to center of bottom opening of water radiators.
- E. Width of sections.
- F. Width at feet.
- G. Distance from center to center (length) of sections.

Pattern	Catalogue height, in.	Heating surface per section, sq. ft.	Dimensions, in.					*Distance from floor to center of lower tappings			
			A	C	E	F	G	Water supply and return, in.	Single-pipe steam, in.	Two-pipe steam, in.	
										Supply	Return
Single-column	38	3	37 13/32	31 3/32	4 13/32	5⅜	2½	4½	4	4½	4
	32	2½	31 33/64	25 13/64	4 13/32	5⅜	2½				
	26	2	25 25/32	19 15/32	4 13/32	5⅜	2½				
	23	1⅔	22⅞	16 9/16	4 13/32	5⅜	2½				
	20	1½	19 61/64	13 41/64	4 13/32	5⅜	2½				
Two-column	45	5	45 5/16	38 25/32	7⅜	8¼	2½	4½	4	4½	4
	38	4	37⅝	31 3/32	7⅜	8¼	2½				
	32	3⅓	31 47/64	25 13/64	7⅜	8¼	2½				
	26	2⅔	26	19 15/32	7⅜	8¼	2½				
	23	2⅓	23 3/32	16 9/16	7⅜	8¼	2½				
	20	2	20 11/64	13 41/64	7⅜	8¼	2½				
	15	1½	15	....	7⅜	8¼	2½				
Three-column	45	6	45¾	38 25/32	9	9¾	2½	4½	4	4½	4
	38	5	38 1/16	31 3/32	9	9¾	2½				
	32	4½	32 11/64	25 13/64	9	9¾	2½				
	26	3¾	26 7/16	19 15/32	9	9¾	2½				
	22	3	22 3/16	15 7/32	9	9¾	2½				
	18	2¼	18 5/32	11 3/16	9	9¾	2½				
Four-column	45	10	46 1/64	38 25/32	10½	11¼	3	4½	4½	4½	4½
	38	8	38 21/64	31 3/32	10½	11¼	3				
	32	6½	32 7/16	25 13/64	10½	11¼	3				
	26	5	26 45/64	19 15/32	10½	11¼	3				
	22	4	22	15 7/32	10½	11¼	3				
	18	3	18 27/64	11 3/16	10½	11¼	3				

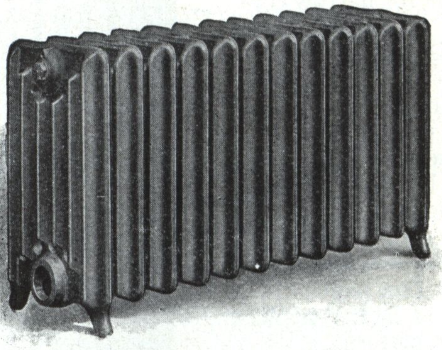
*Distance from bottom of hub to floor on center sections of radiators with regular height legs is approximately 2¼ in. on 1, 2, 3 and 4-column radiators

American Peerless Radiators

Continued on next page

Peerless Window Radiators

These radiators can be built up like all American Radiators to any practical number of sections. They may be furnished with extra high legs on special order (see page 2150) or curved as shown at the foot of this column.



Peerless Window Radiator

Number of sections	*Length, in.	Nominal heating surface, sq. ft.			
		20-in. height	18-in. height	16-in. height	13-in. height
1	3	5	4½	3¾	3
2	6	10	9	7½	6
3	9	15	13½	11¼	9
4	12	20	18	15	12
5	15	25	22½	18¾	15
6	18	30	27	22½	18
7	21	35	31½	26¼	21
8	24	40	36	30	24
9	27	45	40½	33¾	27
10	30	50	45	37½	30
11	33	55	49½	41¼	33
12	36	60	54	45	36
13	39	65	58½	48¾	39
14	42	70	63	52½	42
15	45	75	67½	56¼	45
16	48	80	72	60	48
17	51	85	76½	63¾	51
18	54	90	81	67½	54
19	57	95	85½	71¼	57
20	60	100	90	75	60

Width of sections, 12½ in.

Distance from center of top opening to center of bottom opening of water radiators: 20-in. height, $15\frac{1}{16}$ in.; 18-in. height, $13\frac{1}{16}$ in.; 16-in. height, $11\frac{1}{32}$ in.; 13-in. height, $8\frac{1}{16}$ in.

Distance from bottom of hub to floor on center sections of radiators with regular height legs is approximately 2¼ in.

Distance from floor to center of lower tapping, 3 in.

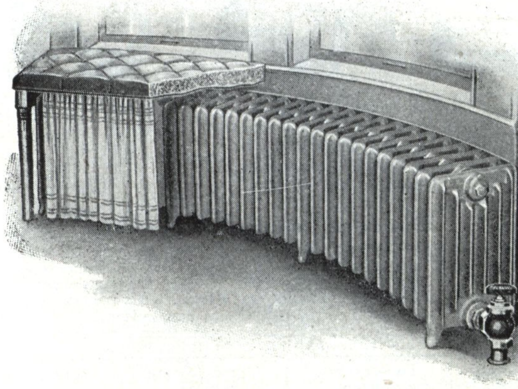
Tapped 1½ in. at top and 2 in. at bottom.

Connections: extra heavy 1½-in. right and left threaded nipples at top and 2-in. nipples at bottom.

*Add ½ in. to length for each bushing.

Peerless Curved Radiators

Curved steam and water radiators are made in all heights of Peerless single-column, two-column, three-column and window patterns. They are made special, and architect should furnish paper templates showing exact size and radius, and advise from which end of curve (right or left hand when facing the radiator) supply is to be taken.

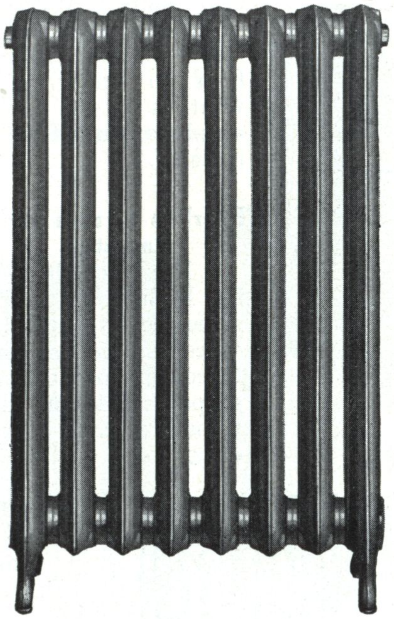


Peerless Curved Radiator

Peerless Hospital Radiators

Peerless Hospital Radiators, for steam or water, are made especially for hospitals, sanitoriums and all buildings where a radiator having separated sections, easily cleaned, supplies the need for a heating surface which meets all the sanitary demands of such institutions.

These radiators are not made in special shapes, but can be equipped with extra high (6 or 8-in.) legs or can be furnished legless so that they can be attached to the wall with concealed brackets described on page 2150.



Peerless Hospital Radiator

One-column

§Number of sections	*Length, in.	Nominal heating surface, sq. ft.				
		38-in. height	32-in. height	26-in. height	23-in. height	20-in. height
1	3	3	2½	2	1⅔	1½
2	5½	6	5	4	3⅓	3
3	8½	9	7½	6	5	4½
4	11½	12	10	8	6⅔	6
5	14½	15	12½	10	8⅓	7½

Two-column

§Number of sections	*Length, in.	Nominal heating surface, sq. ft.					
		45-in. height	38-in. height	32-in. height	26-in. height	23-in. height	20-in. height
1	3	5	4	3⅓	2⅔	2⅓	2
2	5½	10	8	6⅔	5⅓	4⅔	4
3	8½	15	12	10	8	7	6
4	11½	20	16	13⅓	10⅔	9⅓	8
5	14½	25	20	16⅔	13⅓	11⅔	10

Three-column

§Number of sections	*Length, in.	Nominal heating surface, sq. ft.					
		45-in. height	38-in. height	32-in. height	26-in. height	22-in. height	18-in. height
1	3	6	5	4½	3¾	3	2¼
2	5½	12	10	9	7½	6	4½
3	8½	18	15	13½	11¼	9	6¾
4	11½	24	20	18	15	12	9
5	14½	30	25	22½	18¾	15	11¼

Four-column

§Number of sections	*Length, in.	Nominal heating surface, sq. ft.					
		45-in. height	38-in. height	32-in. height	26-in. height	22-in. height	18-in. height
1	3½	10	8	6½	5	4	3
2	6½	20	16	13	10	8	6
3	10	30	24	19½	15	12	9
4	13½	40	32	26	20	16	12
5	17	50	40	32½	25	20	15

For dimensions other than those given above, also for data on tappings and connections, see dimensions of standard Peerless Radiators (of the same number of columns) on pages 2147 and 2148.

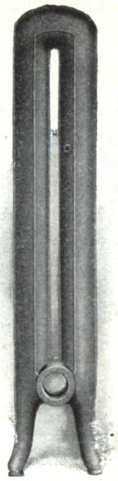
*Add ½ in. to length for each bushing.

§Not limited to five sections, above table being illustrative only.

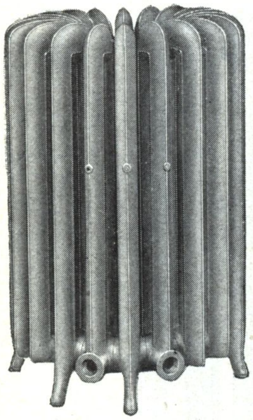
Continued on next page

Radiators with Extra High Solid Legs

Radiators with extra high solid legs, as illustrated, can be furnished on special order only (at additional charge) for all heights of radiators, so that the distance from floor to center of bottom tapping will be 6 to 8 in., inclusive. Corto Radiators can not be furnished with legs higher than 6 in. Radiators with extra high solid legs are tapped 2 in. They are not equipped with low drip hubs. When specifying, give distance required from floor to center of what is to be the supply tapping of the radiator.



Radiator with Extra High Legs



Peerless Circular Radiator

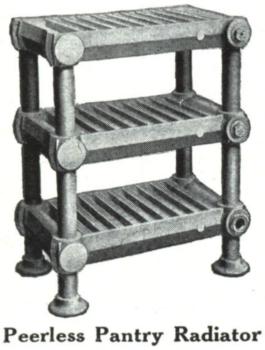
Peerless Circular Radiators

Peerless Circular Radiators are made in the same heights and heating surfaces as Peerless one, two and three-column radiators described on pages 2147 and 2148. All patterns are made on special order only.

Peerless Corner Radiator

Peerless Corner and 45° Angle Radiators

Peerless Corner and 45° Angle Radiators are made on special order only, in all heights and heating surfaces of Peerless one, two and three-column patterns (see pages 2147 and 2148), also window pattern (see page 2149), for steam or water.



Peerless Pantry Radiator

Peerless Pantry Radiators

These combination radiators and plate warmers are suitable for residence pantries, also hotel and restaurant kitchens, for keeping plates and dishes warm and ready for service.

They are made up of Peerless wall radiator sections (7 ft. only) for steam or water. Shipped assembled.

PEERLESS PANTRY RADIATORS

Number of sections	Heating surface, sq. ft.	Height, in.	Length, in.	Width, in.
2	15	17	23	13¼
3	23	27	23	13¼
4	31	37	23	13¼
5	39	47	23	13¼

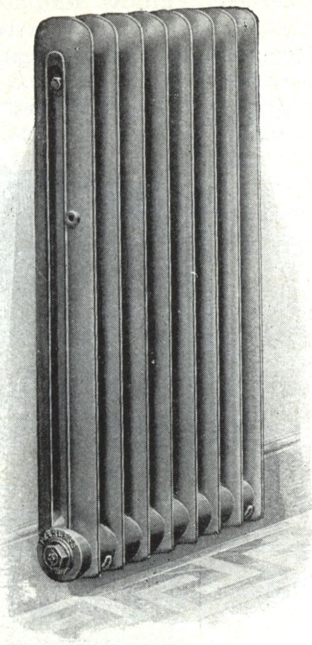
Height from floor to bottom of lower section, 4 in. Distance from floor to center of tapping of bottom section, 5¾ in. Regularly tapped 1½ in. and bushed. Specify whether for steam or water, size of tapping required, locations of tappings and state what section is to be tapped. B and F are the regular tappings on each section; the others are cast solid.

Direct Radiators on Brackets

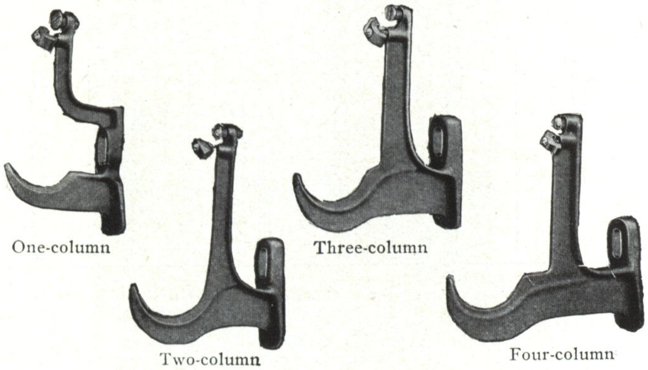
Direct radiators, supported on walls with concealed brackets, are very desirable for narrow corridors or where floor space is limited. They are also used for heating aspirating shafts in ventilating work, etc.

The same data as regards heating surface, dimensions, threading, nipple connections and tapping of radiators having feet (see pages 2147, 2148 and 2149) applies to these patterns.

Radiators supported on concealed brackets are not equipped with low drip hubs.



Peerless Radiator Supported by Concealed Brackets



One-column

Three-column

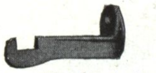
Two-column

Four-column

Peerless Radiator Brackets

Made for supporting 1, 2, 3 and 4-column Peerless Radiators, for steam or water. Only one bracket of this type is necessary to support a radiator, and only one stud bolt or lag screw with expansion bolt is used, thereby greatly reducing the cost of installation

Pattern of radiator	Bracket No.	Distance from wall, in.	Pattern of radiator	Bracket No.	Distance from wall, in.
Single-column	102	2	Three-column	302	2
	103	3		303	3
	104	4		304	4
	105	5		305	5
Two-column	202	2	Four-column	402	2
	203	3		403	3
	204	4		404	4
	205	5		405	5



Top guide for 1, 2 and 3-col. Peerless Steam Radiators

Top guide for 1, 2, 3 and 4-col. Peerless Water Radiators

Bottom support for 1, 2, 3 and 4-col. Peerless Steam and Water Radiators, also Corto Radiators

Concealed Radiator Brackets

One set consists of a top guide and bottom support as illustrated, and ordinarily two sets will support a radiator of medium size. Top guides require one expansion bolt each; bottom supports require two each. When specifying these brackets for steam radiators, state whether for use on left or right-hand threaded nipple connection.

Distance from wall to front of radiator, in.			
Single-column radiator	Two-column radiator	Three-column radiator	Four-column radiator
5½	8 11/16	10¼	11¾

Continued on next page

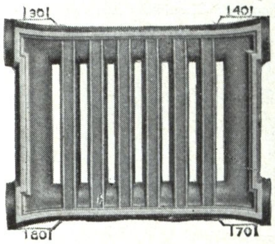
American Peerless Wall Radiators

American Peerless Wall Radiators are particularly adapted to fit into limited wall space by reason of their flexibility and varying sizes. They are suitable for all classes of buildings, and, on account of their many advantages (which cover all features of economy and efficiency), have rapidly superseded old-fashioned coils. Through their use, the required amount of heating surface can be installed in restricted places where coils and column radiators can not be used.

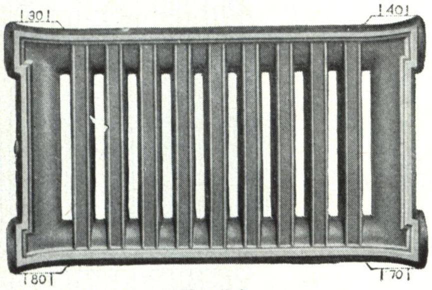
American Peerless Wall Radiators, by reason of their low first cost, flexibility and adaptability to space conditions, economy in operation and maintenance and negligible depreciation with a maximum value for re-arrangements, have caused manufacturers, architects, engineers and contractors very generally to adopt them as the type of heating surface best meeting their requirements for direct heating.

American Peerless Wall Radiators save one-third to one-half the space occupied by coils. The saving which they effect in both floor and wall space is highly valuable to both owners and tenants. They are made in sections of many sizes, with provisions for numerous groupings, so that they may be assembled to meet any structural condition. They may be installed in long runs or divided into small units on walls or ceilings.

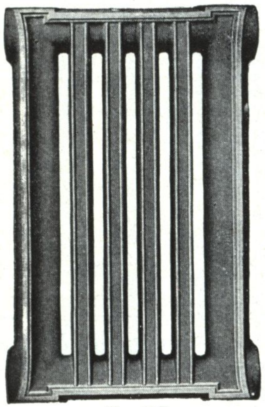
Made of non-corroding cast iron, American Peerless Wall Radiators will outlast the building in which they are installed. Pitting of their inner or outer surfaces is unknown.



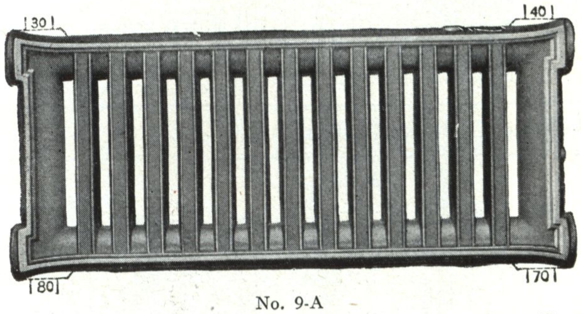
No. 5-A



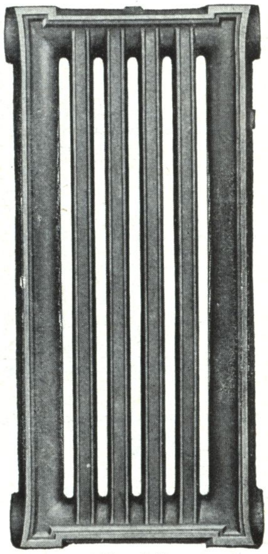
No. 7-A



No. 7-B



No. 9-A



No. 9-B

American Peerless Wall Radiators

Peerless Wall Radiators should always be assembled with bars vertical to secure greatest heating efficiency. The 7 and 9-ft. sections are, therefore, made in two styles: Nos. 7-A and 9-A have bars running crosswise of the section and are regularly tapped for connecting end to end as illustrated. Nos. 7-B and 9-B have bars running lengthwise of the section and are regularly tapped for connecting side by side as illustrated. No. 5-A is made with bars running crosswise of the section only and is regularly tapped for connecting end to end. On special order, Nos. 5-A, 7-A and 9-A sections can be furnished with tappings at 30, 40, 70 and 80 as illustrated.

Peerless wall radiation is tapped for 1½-in. supply and return and bushed as desired. It is connected with 1½-in. right and left threaded internal nipples

Number of sections	Nominal heating surface			*Length of space occupied			
	Type 5, sq. ft.	Type 7, sq. ft.	Type 9, sq. ft.	Type 5-A, ft.-in.	Type 7-A, ft.-in.	Type 9-A, ft.-in.	Types 7-B and 9-B, ft.-in.
1	5	7	9	1- 4⅝	1- 9⅞	2- 5 1/16	1- 1 5/16
2	10	14	18	2- 9¼	3- 7¾	4-10⅛	2- 2⅝
3	15	21	27	4- 1⅞	5- 5⅝	7- 3 3/16	3- 3 15/16
4	20	28	36	5- 6½	7- 3½	9- 8¼	4- 5¼
5	25	35	45	6-11⅛	9- 1⅜	12- 1 5/16	5- 6 9/16
6	30	42	54	8- 3¾	10-11¼	14- 6⅜	6- 7⅞
7	35	49	63	9- 8⅜	12- 9⅛	16-11 7/16	7- 9 3/16
8	40	56	72	11- 1	14- 7	19- 4½	8-10½
9	45	63	81	12- 5⅝	16- 4⅞	21- 9 9/16	9-11 13/16
10	50	70	90	13-10¼	18- 2¾	24- 2⅝	11- 1⅛
11	55	77	99	15- 2⅞	20- 0⅝	26- 7 11/16	12- 2 7/16
12	60	84	108	16- 7½	21-10½	29- 0¾	13- 3¾
13	65	91	117	18- 0⅛	23- 8⅜	31- 5 13/16	14- 5 1/16
14	70	98	126	19- 4¾	25- 6¼	33-10⅞	15- 6⅜
15	75	105	135	20- 9⅜	27- 4⅛	36- 3 15/16	16- 7 11/16
16	80	112	144	22- 2	29- 2	38- 9	17- 9
17	85	119	153	23- 6⅝	30-11⅞	41- 2 1/16	18-10 5/16
18	90	126	162	24-11¼	32- 9¾	43- 7⅛	19-11⅝
19	95	133	171	26- 3⅞	34- 7⅝	46- 0 3/16	21- 0 15/16
20	100	140	180	27- 8½	36- 5½	48- 5¼	22- 2¼
21	105	147	189	29- 1⅛	38- 3⅜	50-10 5/16	23- 3 9/16
22	110	154	198	30- 5¾	40- 1¼	53- 3⅜	24- 4⅞
23	115	161	207	31-10⅜	41-11⅛	55- 8 7/16	25- 6 3/16
24	120	168	216	33- 3	43- 9	58- 1½	26- 7½
25	125	175	225	34- 7⅝	45- 6⅞	60- 6 9/16	27- 8 13/16
26	130	182	234	36- 0¼	47- 4¾	62-11⅝	28-10⅛
27	135	189	243	37- 4⅞	49- 2⅝	65- 4 11/16	29-11 7/16
28	140	196	252	38- 9½	51- 0½	67- 9¾	31- 0¾
29	145	203	261	40- 2⅛	52-10⅜	70-2 13/16	32- 2 1/16
30	150	210	270	41- 6¾	54- 8¼	72- 7⅞	33- 3⅜
31	155	217	279	42-11⅜	56- 6⅛	75- 0 15/16	34- 4 11/16
32	160	224	288	44- 4	58- 4	77- 6	35- 6
33	165	231	297	45- 8⅝	60- 1⅞	79-11 1/16	36- 7 5/16
34	170	238	306	47- 1¼	61-11¾	82- 4⅛	37- 8⅝
35	175	245	315	48- 5⅞	63- 9⅝	84- 9 3/16	38- 9 15/16
36	180	252	324	49-10½	65- 7½	87- 2¼	39-11¼
37	185	259	333	51- 3⅛	67- 5⅜	89- 7 5/16	41- 0 9/16
38	190	266	342	52- 7¾	69- 3¼	92- 0⅜	42- 1⅞
39	195	273	351	54- 0⅜	71- 1⅛	94- 5 7/16	43- 3 3/16
40	200	280	360	55- 5	72-11	96-10½	44- 4½

*To above lengths, add ½ in. for each end bushed, and 1⅛ in. for each hexagon nipple used in assembling.

Where steam pressure above 25 lb. is to be used, hexagon nipples will be furnished in place of the internal nipple, and 1⅛ in. additional space must be allowed for each nipple.

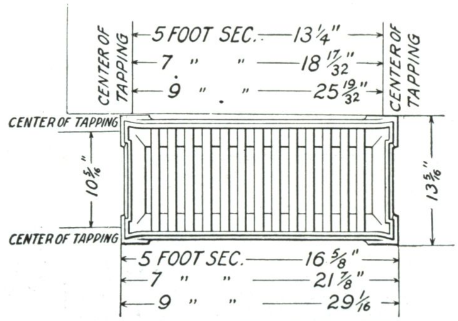
By additions or multiplications, dimensions and heating surfaces can be calculated readily for any greater number of sections.

American Peerless Wall Radiators

Continued on next page

The modern type of industrial building includes a comparatively high percentage of glass area and a consequently limited wall space available for the installation of heating surface. It is essential to steadiness of temperature that the heating surface be installed in such position as to intercept the body of rapidly descending air which has been cooled by contact with the extended glass areas. Peerless Wall Radiators installed beneath the windows fill this requirement to a large degree. With certain construction, however, it is necessary to place the radiation in louvers in sawtooth sections of the roof, or on center columns and other parts of the building, all depending upon its size and construction.

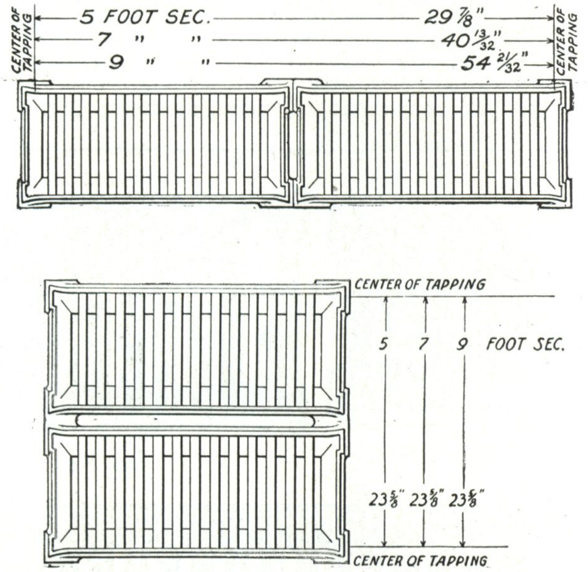
Brackets of various types for supporting American Peerless Wall Radiators either in single or double tier, are described below. Catalogue containing engineering data furnished on request.



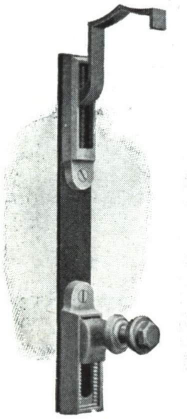
Above measurements apply to either "A" or "B" styles.

The regular tappings of American Wall Radiators are 1½-in. supply and return, and bushed as desired. Add 1⅛ in. to length measurement for each hexagonal nipple used in assembling

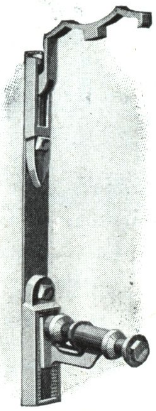
Section No.	Heating surface, sq. ft.	Height, in.	Length or width, in.	Thickness, in.	Thickness (with bracket), in.
5-A	5	13 5/16	16⅝	2⅞	3½
7-A	7	13 5/16	21⅞	2⅞	3½
7-B	7	21⅞	13 5/16	3 1/16	3 11/16
9-A	9	13 5/16	29 1/16	2⅞	3½
9-B	9	29 1/16	13 5/16	3 1/16	3 11/16



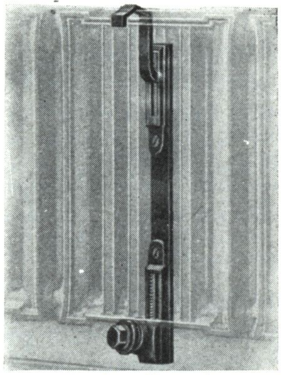
Dimensions of American Peerless Wall Radiators



Single Spool Bracket for Single Row of Radiation



Double Spool Bracket for Double Row of Radiation



View Showing How American Peerless Wall Radiators Are Held by the Arco Adjustable Bracket

Arco Adjustable Wall Brackets

Patented July 5, 1910; March 18, 1913

Made for all runs of wall radiators in factories, warehouses, theaters, railroad stations, garages, schools, churches, residences and other buildings.

By use of these brackets, which permit vertical adjustment of 2 in., the fitter can adjust for "pitch" after they have been attached to the wall. Brackets set outer face of radiator 4¾ in. from the wall.

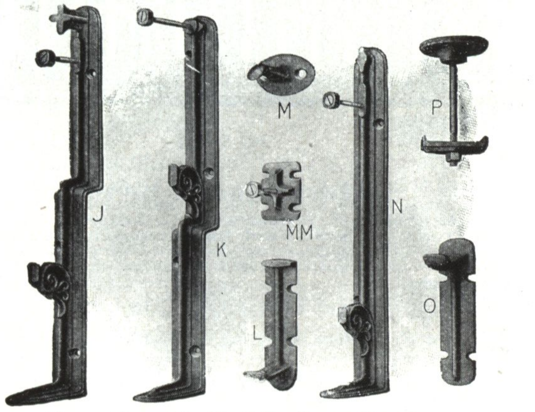
Spools on bottom bracket allow a free horizontal movement of the radiators, thus taking care of any difference in "roughing-in" measurements, and afford free play for expansion and contraction. The V-shape formed by the divided spool fits the edges of Peerless wall sections, thus keeping them securely in place.

The malleable iron finger of top bracket is set at its highest point and then screwed down to the radiator, merely guiding it and keeping it from tipping forward.

Number of brackets required to properly support Peerless Wall Radiators:

	For single row of radiators	For double row of radiators
5 to 8 sections	2 brackets	2 brackets
9 to 14 sections	2 brackets	3 brackets
15 to 24 sections	3 brackets	5 brackets
25 to 30 sections	4 brackets	7 brackets

On runs of 30 to 50 sections or more, the brackets should be placed approximately 10 ft. apart



Non-adjustable Wall Radiator Brackets

Bracket J: fits over a 9½-in. high baseboard or skirting, and supports wall radiators 7-B and 9-B. One ¼-in. stove bolt and one button furnished with each bracket.

Bracket K: fits over baseboard or skirting and supports wall radiators 5-A, 7-A and 9-A. One ¼-in. stove bolt and one button furnished with each bracket. Height from floor to center of lowest tapping (supply or return):

K-1 bracket will fit over 11½-in. high baseboard................16 in.
K-2 bracket will fit over 9½-in. high baseboard................14 in.
K-3 bracket will fit over 7½-in. high baseboard................12 in.
K-4 bracket will fit over 5½-in. high baseboard................10 in.
K-5 bracket will fit over 3½-in. high baseboard................ 8 in.
K-6 bracket will fit over 1½-in. high baseboard................ 6 in.

Brackets L, O, MM and M: screwed to wall, baseboard or wainscoting. L and O brackets are bottom supports for all sizes of wall radiators. M and MM brackets are top guides to hold radiator in place. L and MM brackets are concealed, O and M brackets are not. One M or MM bracket should always be provided for use with each L or O bracket. L, MM and O brackets are slotted for four wood screws and the M bracket for two (screws not furnished by us). With each MM bracket we furnish one ¼-in. stove bolt and one button.

Bracket N: a straight right angle bracket without offset. Supports all sizes of wall radiators. Height from floor to center of end tapping bosses, 5½ in. One ¼-in. stove bolt and one button furnished with each bracket.

Ceiling bracket P: made of cast plate, 3½ in. diameter and screwed to ceiling joists by 4 screws (the latter not furnished by us). The bolt furnished gives a distance of 3½ to 5 in. from bottom of radiator to ceiling. Other length bolts can be furnished on special order.

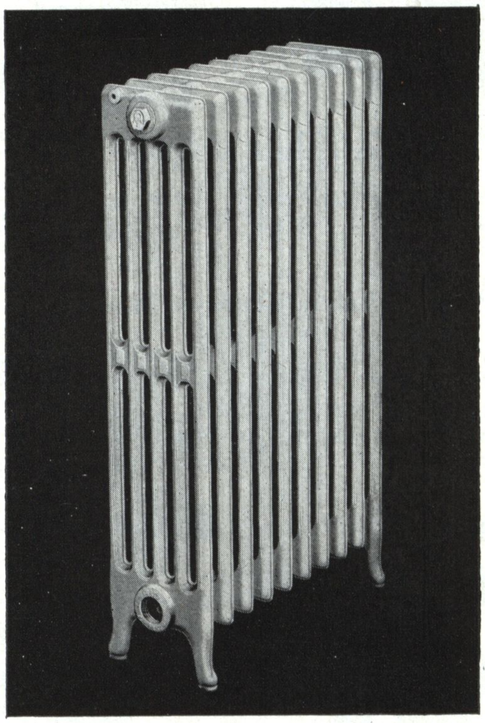
Note: In ordering buttons and stove bolts separately, state for which bracket because of different lengths of bolts

Continued on next page

Corto Radiator

The Corto Radiator is particularly adapted for use in offices, assembly halls, auditoriums, schools and churches; in fact in any building where floor space is at a premium and where beauty of appearance will be appreciated.

Because of its unique design the Corto Radiator occupies 30% less floor space than the equivalent standard radiator. The slender, tubular construction of the section results in a tremendous quantity of surface and will resist an exceptionally high internal pressure.



Corto Radiator

HEATING SURFACE OF CORTO RADIATORS

Number of sections	*Length, in.	Catalogue height					
		38 in.	34½ in.	31 in.	27 in.	23 in.	19½ in.
		Nominal heating surface, sq. ft.					
1	2	4½	4	3½	3	2½	2
2	4	9	8	7	6	5	4
3	6	13½	12	10½	9	7½	6
4	8	18	16	14	12	10	8
5	10	22½	20	17½	15	12½	10
6	12	27	24	21	18	15	12
7	14	31½	28	24½	21	17½	14
8	16	36	32	28	24	20	16
9	18	40½	36	31½	27	22½	18
10	20	45	40	35	30	25	20
11	22	49½	44	38½	33	27½	22
12	24	54	48	42	36	30	24
13	26	58½	52	45½	39	32½	26
14	28	63	56	49	42	35	28
15	30	67½	60	52½	45	37½	30
16	32	72	64	56	48	40	32
17	34	76½	68	59½	51	42½	34
18	36	81	72	63	54	45	36
19	38	85½	76	66½	57	47½	38
20	40	90	80	70	60	50	40
21	42	94½	84	73½	63	52½	42
22	44	99	88	77	66	55	44
23	46	103½	92	80½	69	57½	46
24	48	108	96	84	72	60	48
25	50	112½	100	87½	75	62½	50
26	52	117	104	91	78	65	52
27	54	121½	108	94½	81	67½	54
28	56	126	112	98	84	70	56
29	58	130½	116	101½	87	72½	58
30	60	135	120	105	90	75	60
31	62	139½	124	108½	93	77½	62
32	64	144	128	112	96	80	64

Tappings: 1½ in. top and bottom and bushed for water; 2 in. at bottom only and bushed for steam.

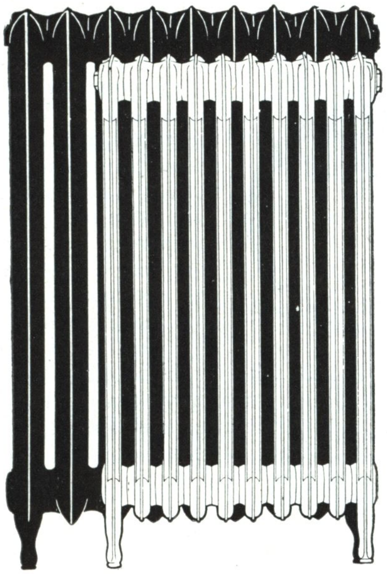
Connections: extra heavy right and left threaded nipples.

Corto Radiators are furnished, upon special order, with 6-in. legs (see page 2150) or legless. Concealed brackets for Corto Radiators without legs are described on page 2150.

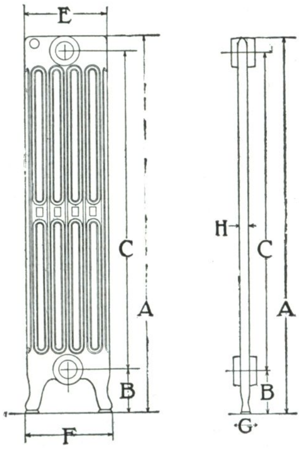
*Add ½ in. to length for each bushing.

The interior area of its tubes in relation to the heating surface has been reduced to about one-quarter of that now generally in use. Not only has this invention increased the pressure-resisting ability of the Corto Radiator, but in reducing the water area, the water or steam contents are likewise decreased.

The water content of the Corto is equal to ¾ lb. per sq. ft. of heating surface or about one-half the water content of the average radiator. This assures quick and positive venting for all kinds of steam and vapor systems, while in water installations it provides a rapid circulation, causing the radiator to respond more quickly to immediate heating needs.



Relative Space Occupied by Corto and Ordinary Radiator



Dimension Diagrams of Corto Radiators

A. Total height.
B. Distance from floor to center of tapping.
C. Distance from center of top to center of bottom opening of water radiators.
E. Width of sections.
F. Width at feet.
G. Distance from center to center (length of sections).
H. Width of column.

Catalogue height, in.	Heating surface, per section, sq. ft.	Dimensions, in.						
		A	B	C	E	F	G	H
38	4½	37⅝	4½	31 7/16	8	8⅜	2	1⅛
34½	4	34⅜	4½	28 5/16	8	8⅜	2	1⅛
31	3½	30⅝	4½	24 7/16	8	8⅜	2	1⅛
27	3	26⅝	4½	20 9/16	8	8⅜	2	1⅛
23	2½	23	4½	16 27/32	8	8⅜	2	1⅛
19½	2	19⅛	4½	12 15/16	8	8⅜	2	1⅛

Distance from bottom of hub to floor, on center sections of radiators, is approximately 3 1/16 in.

Continued on next page

No. 500 Ideal Airid Siphon Valve

For venting steam radiators.

The Ideal Airid Siphon Valve will automatically rid any steam radiator of air under any conditions which would permit venting by hand. It opens quickly to allow any pocket of air to escape, yet closes instantly should water or steam reach the valve. This means complete venting of the radiator—a saving in coal by preventing unnecessary steam pressure to force out the air—insurance that boiler and radiators will do all expected of them.

PANY
PAT PNDG

No. 500. Ideal Airid Siphon Valve

The Ideal Airid Siphon Valve is made entirely of metal and has no perishable parts to wear. It requires no adjustment.

Frequently water collects in radiators. When steam is turned on, it pushes this water ahead through the loops until it finally floods the air valve. The valve must instantly close to prevent leakage, but unless it is relieved of this water, it will not open and the radiator will remain cold.

The Ideal Airid Siphon Valve is equipped with a drain tube extending into the radiator, which instantly drains the water out of the valve, leaving it free and open to rid the radiator of air. Leaking or sputtering is entirely eliminated.

Price, $1.60.

No. 815 Ideal Quick Vent

IDEAL QUICK VENT

No. 815. Ideal Quick Vent

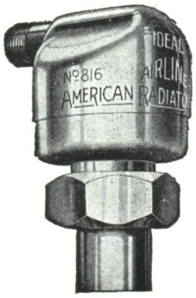
For venting steam mains.

The Ideal Quick Vent quickly frees the mains so that the steam can immediately pass up to the radiators, but it closes instantly when steam reaches it. Heat can be obtained in the radiators much more quickly by providing an independent valve on the extreme end of each main. Coal will be saved since less fuel will be burned in merely forcing the air out of the system.

Made entirely of metal. Requires no adjustment. Connection, ⅜ or ¾ in.

Price, $3.00.

No. 816 Ideal Air Line Valve



No. 816. Ideal Air Line Valve

For venting steam radiators where drip line, air line, or vacuum air line is used.

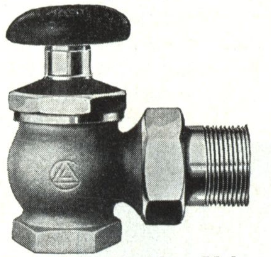
The Ideal Air Line Valve is always open to the passage of air but closes tight when steam reaches it. It insures hot radiators but keeps the air line cold. Non-adjustable; can not be tampered with; made entirely of metal; sensitive in operation.

Radiator connection, ⅛ in. ¼-in. female union on outlet for drip line.

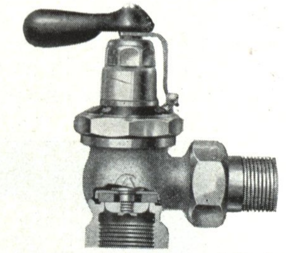
Price, $3.50 each.

Arco Packless Valves

For low pressure steam, water or vacuum heating. Arco Packless Valves turn easily, are quick opening, non-leaking and require no repacking. All types furnished with either round or lever handle. Fractional type has graduated dial. Simplified design makes possible a moderate price.



No. 988. Packless Valve



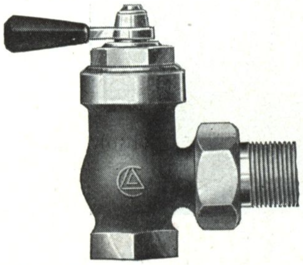
No. 968. Fractional Valve

LIST PRICES ARCO PACKLESS VALVES

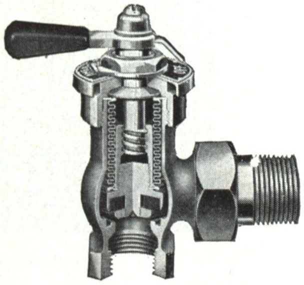
Size, in.	½	¾	1	1¼	1½	2
No. 988 Angle	$3.70	$4.30	$5.10	$6.40	$8.40	$13.60
Nos. 955-960 Corner	4.10	4.75	5.60	7.05	9.25	15.00
No. 970 Globe	3.70	4.30	5.10	6.40	8.40	13.60
No. 968 Fractional	3.70	4.30	5.10	6.40	......	......

Ideal Packless Valves—Bellows Type

A complete line is available where packless valves of the bellows type are desired—No. 850 type, rising stem; No. 878 type, quick opening. All metal, no packing. A metallic bellows provides a flexible wall around the stem and working parts. Quick opening. Round or lever handle for all types. Graduated dial on fractional valves.



No. 878. Packless Valve



No. 868. Fractional Valve

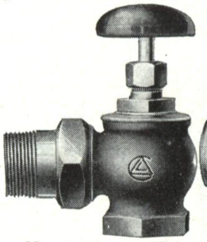
LIST PRICES IDEAL PACKLESS VALVES

Size, in.	½	¾	1	1¼	1½	2″
Angle	$5.50	$5.50	$6.75	$7.75	$9.50	$13.75
Corner	6.00	6.00	7.25	8.50	10.50	15.00
Globe	5.50	5.50	6.75	7.75	9.50	13.75
Fractional	5.50	5.50	6.75	7.75	......	......

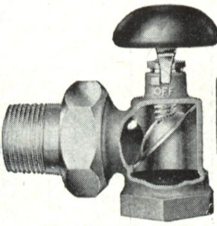
Detroit Radiator Valves

For steam and hot water heating.

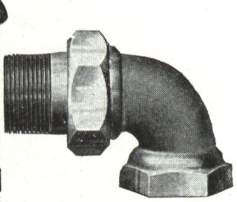
Well made, carefully inspected and tested. Equipped with composition non-breakable handles. The water valve is of the improved "swinging plate" type. Will not corrode and "stick." The scraper edge keeps the interior of valve clean. Indicator shows "on" and "off" positions clearly.



No. 72 Steam Valve



No. 101 Water Valve



No. 132 Union Elbow

Detroit Radiator Valves

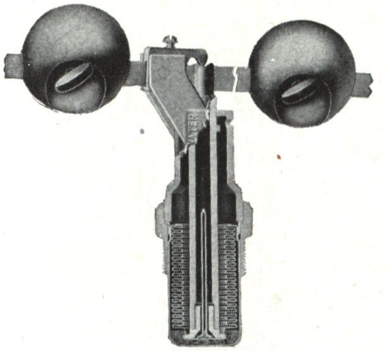
LIST PRICES OF DETROIT RADIATOR VALVES

Size, in.	½	¾	1	1¼	1½	2
No. 72	$3.70	$4.30	$5.10	$6.40	$8.40	$13.60
No. 101	3.25	3.70	4.50	5.75	7.30	12.00
No. 132	1.75	2.00	2.50	3.30	4.25	7.20

Continued on next page

No. 800 Arco Water Regulator

For temperature control on hot water heating boilers.



No. 800. Arco Water Regulator

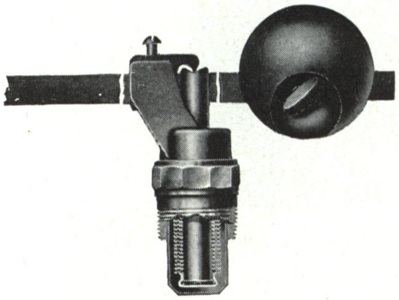
A damper regulator which opens and closes drafts on hot water boilers to maintain constant water temperature.

Made entirely of metal. By adjusting weights, it will control water at any degree between 100° and 220° F. Threaded connection, 2 in. iron pipe size.

List price, $18.00.

No. 801 Arco Junior Water Regulator

For temperature control on hot water supply boilers only.



No. 801. Arco Junior Water Regulator

Made similarly to No. 800 (above) but smaller.

By adjusting weight, it will control water temperature on any degree between 130° and 180° F.

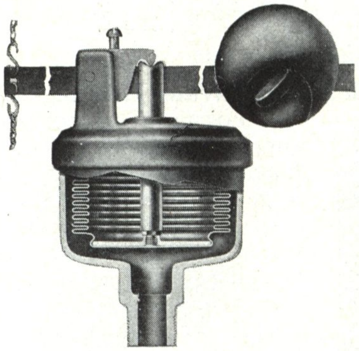
Threaded connection, 1½ in. iron pipe size.

List price, $16.00.

No. 805 Arco Steam Regulator

For pressure control on low pressure steam heating boilers.

Contains no perishable rubber diaphragm.



No. 805. Arco Steam Regulator

Steam pressure operates dampers by acting directly on an all-metal flexible bellows made from one piece of brass. Saves expense of renewing rubber diaphragms. Sensitive control.

For pressures up to 15 lb. Threaded connection, 1 in. iron pipe size.

List price, $16.00.

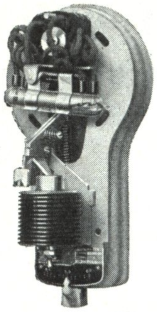
Mercoid Controls

Mercoid Controls are made in various models to make and break an electric circuit automatically according to change in temperature, pressure or vacuum. Employ the Mercoid Switch—a glass tube containing suitable leads and mercury, which makes or breaks the circuit as the tube is tilted. Mercoid Controls take the full line voltage without arcing or corrosion of contacts. Will carry 10 amperes at 110 volts (or the equivalent) direct or alternating current without relays or transformers. Relay used on greater current.

Mercoid Controls have many and various applications: oil burner control, refrigeration, electric heaters, control of motors, pumps, fans. In combination with the Arco Motor Valve, control is obtained on: liquid heaters of all kinds, dry rooms, kilns, sterilizers, cookers, condensers, stills, evaporators, cold storage rooms, etc., wherever it is desired to open and close a valve with change in temperature, pressure or vacuum.

The No. 848 Mercoid Control is not only adjustable for operating point, but also for differential or "closeness of control."

Write for complete data.

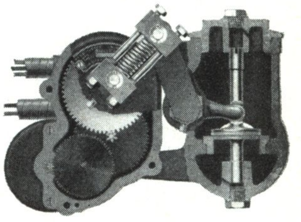


No. 845. Mercoid Thermostat Cover Removed

No. 848. Mercoid Control Pressure Type

No. 847 Arco Motor Valve

For control of steam, water, air, oil, gas, brine, etc., motor takes 110-volt, d-c. or a-c. 25 to 60 cycle. Single seated valve closes tight. Size A for ½, ¾ and 1-in. pipe, 250 lb. pressure. Size B for 1¼ and 1½-in. pipe, 150 lb. pressure. Size C for 2 and 2½-in. pipe, 75 lb. pressure. Write for complete data.

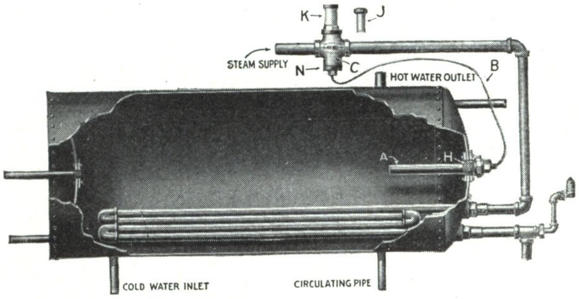


No. 847. Arco Motor Valve

Arco Tank Regulator

For automatic regulation of the temperature of water heated by steam. For steam pressures up to 15 lb. Temperature range, 140° to 180° F.

Automatically opens or closes valve in steam supply as the temperature of the water changes. No auxiliary power required. Operates by expansion of volatile liquid. Working parts entirely enclosed. Has single seated valve and can be placed in any position. Made with flexible tube or in direct-connected type without flexible tube.



No. 826. Arco Tank Regulator with Flexible Tube

No.	Size	For pipe connection, in.	Type	Price
825	A	½, ¾ and 1 in.	Direct connected	$50.00
825	B	1¼ and 1½ in.	Direct connected	60.00
826	A	½, ¾ and 1 in.	Flexible tube	60.00
826	B	1¼ and 1½ in.	Flexible tube	70.00
826	C	2 in.	Flexible tube	80.00
826	D	2½ and 3 in.	Flexible tube	90.00

BURNHAM BOILER CORPORATION

Manufacturers of Steam and Hot Water Boilers

IRVINGTON-ON-HUDSON, N. Y.

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CHICAGO, ILL., 220 South State Street
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PLANTS: IRVINGTON, N. Y.; ELIZABETH, N. J.; LANCASTER, PA.

Products

Sectional Steam and Hot Water Boilers.
Hot Water Tank Heaters.
Laundry Stoves.

Burnham Square Sectional Boilers

Burnham square sectional boilers are based on the principle that a long fire travel (correctly proportioned) reduces fuel bills.

RATINGS—BURNHAM SQUARE SECTIONAL BOILERS

Series	No.	Direct radiat'n, sq. ft.	Sections	Fire pot, in.	Grate area, sq. ft.	Grate, in.	Tappings, in.		Length, in.
							Supply	Return	
Hot Water Boilers									
18-in.	W-18-4	1,250	4	24x24	3.00	18x24	2-3½	2-3½	41
	W-18-5	1,575	5	24x31½	3.94	18x31½	2-3½	2-3½	48½
	W-18-6	1,900	6	24x39	4.88	18x39	2-3½	2-3½	56
	W-18-7	2,225	7	24x46½	5.81	18x46½	3-3½	3-3½	63½
24-in.	W-24-5	2,225	5	30x31	5.17	24x31	2-4	2-4	49½
	W-24-6	2,800	6	30x38½	6.42	24x38½	2-4	2-4	57
	W-24-7	3,375	7	30x46	7.67	24x46	2-4	2-4	64½
	W-24-8	3,950	8	30x53½	8.92	24x53½	3-4	3-4	72
30-in.	W-30-5	2,900	5	36x31	6.46	30x31	2-4	2-4	52½
	W-30-6	3,715	6	36x38½	8.02	30x38½	2-4	2-4	60
	W-30-7	4,530	7	36x46	9.58	30x46	3-4	3-4	67½
	W-30-8	5,345	8	36x53½	11.15	30x53½	3-4	3-4	75
	W-30-9	6,160	9	36x61	12.71	30x61	4-4	4-4	82½
36-in.	W-36-6	4,700	6	41x39½	9.88	36x39½	3-4	3-4	63
	W-36-7	5,775	7	41x47	11.75	36x47	3-4	3-4	70½
	W-36-8	6,850	8	41x54½	13.63	36x54½	4-4	4-4	78
	W-36-9	7,925	9	41x62	15.50	36x62	4-4	4-4	85½
	W-36-10	9,000	10	41x69½	17.38	36x69½	5-4	5-4	93
	W-36-11	10,075	11	41x77	19.25	36x77	5-4	5-4	100½
50-in. twin section	W-50-6	12,600	6	55x55½	19.27	50x55½	4-5	4-5	91
	W-50-7	15,000	7	55x66	22.92	50x66	4-5	4-5	101½
	W-50-8	17,400	8	55x76½	26.56	50x76½	5-5	5-5	112
	W-50-9	19,800	9	55x87	30.20	50x87	5-5	5-5	122½
	W-50-10	22,200	10	55x97½	33.85	50x97½	5-5	5-5	133
Steam Boilers									
18-in.	S-18-4	750	4	24x24	3.00	18x24	1-3½	1-3½	41
	S-18-5	950	5	24x31½	3.94	18x31½	2-3½	2-3½	48½
	S-18-6	1,150	6	24x39	4.88	18x39	2-3½	2-3½	56
	S-18-7	1,350	7	24x46½	5.81	18x46½	2-3½	2-3½	63½
24-in.	S-24-5	1,350	5	30x31	5.17	24x31	2-4	2-4	49½
	S-24-6	1,700	6	30x38½	6.42	24x38½	2-4	2-4	57
	S-24-7	2,050	7	30x46	7.67	24x46	2-4	2-4	64½
	S-24-8	2,400	8	30x53½	8.92	24x53½	2-4	2-4	72
30-in.	S-30-5	1,750	5	36x31	6.46	30x31	2-4	2-4	52½
	S-30-6	2,250	6	36x38½	8.02	30x38½	2-4	2-4	60
	S-30-7	2,750	7	36x46	9.58	30x46	2-4	2-4	67½
	S-30-8	3,250	8	36x53½	11.15	30x53½	3-4	2-4	75
	S-30-9	3,750	9	36x61	12.71	30x61	3-4	2-4	82½
36-in.	S-36-6	2,850	6	41x39½	9.88	36x39½	2-4	2-4	63
	S-36-7	3,500	7	41x47	11.75	36x47	3-4	2-4	70½
	S-36-8	4,150	8	41x54½	13.63	36x54½	3-4	2-4	78
	S-36-9	4,700	9	41x62	15.50	36x62	3-4	2-4	85½
	S-36-10	5,350	10	41x69½	17.38	36x69½	4-4	2-4	93
	S-36-11	6,000	11	41x77	19.25	36x77	4-4	2-4	100½
50-in. twin section	S-50-6	7,850	6	55x55½	19.27	50x55½	3-5	3-5	91
	S-50-7	9,300	7	55x66	22.92	50x66	3-5	3-5	101½
	S-50-8	10,750	8	55x76½	26.56	50x76½	4-5	4-5	112
	S-50-9	12,200	9	55x87	30.20	50x87	4-5	4-5	122½
	S-50-10	13,650	10	55x97½	33.85	50x97½	4-5	4-5	133

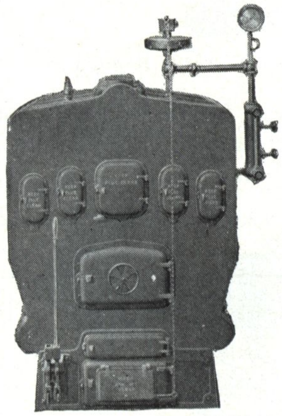
All boilers (except S-18-4 and W-18-4) have double shaker bar, operating grate in two sections.

MEASUREMENTS AND RATING OF BURNHAM BOILERS WITH STORAGE CAPACITIES FOR HOT WATER SERVICE SUPPLY

Size	Sections	Grate area, sq. ft.	Grate, in.	Water rating, sq. ft.	Storage tank		Families*	Total length, in.
					Cap., gal.	Size, in.		
W-21-4	4	2.47	21x17	1,000	865	42x12	28-31	24
W-21-5	5	3.20	21x22	1,300	1,000	42x14	32-37	29
W-21-6	6	3.93	21x27	1,600	1,130	48x12	38-42	34
W-21-7	7	4.66	21x32	1,900	1,300	48x14	43-47	39
W-21-8	8	5.39	21x37	2,200	1,500	48x16	48-52	44
W-21-9	9	6.12	21x42	2,500	1,665	54x14	53-57	49
W-21-10	10	6.85	21x47	2,800	1,757	60x12	58-62	54

Tappings: two 3-in. supplies. Two 3-in. returns on rear section.
Size of smoke pipe, 10 in.
Special equipment furnished with high pressure series: automatic damper regulator, water relief valve, two 2-in. brass cleanout plugs on front section.
*Average 3 to 4-room apartments.

The hot gases go back and forth three times the length of the boiler, *on each side of the boiler,* before they are led to the smoke box opening. Because of the individual side flue openings, each section absorbs an equal amount of heat.



Burnham Square Sectional Steam Boiler

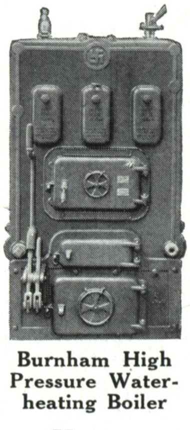
Burnham steam boilers have such a low water line that they can be used in shallow cellars.

They are so constructed that the size of the steam dome is not sacrificed.

Every operating part is handy in front of the boiler. Every flue has a separate clean-out door.

The Burnham Big Twin Section Boiler, for steam and hot water heating, is shown on the following page.

Burnham High Pressure Water Heating Boiler



Burnham High Pressure Water-heating Boiler

For unfailing hot water supply in apartment houses, hotels, laundries and other large buildings.

Guaranteed for 80 lbs.; tested to 2½ times its ratio working pressure. Has automatic damper regulator that operates the drafts as the temperature of the water rises and falls. Hot water relief value, 2-in. clean-out plugs and the usual Burnham long fire travel.

No large areas of flat surfaces; even the rear section is corrugated.

Heavy cast iron construction, so proportioned that utmost strength and long life are secured without interfering with the heating efficiency.

Tubular waterways; double shaker grates, separate clean-out doors for each flue; all operating parts in front.

Continued on next page

The Big Twin Section Burnham Boiler

The Burnham Twin Type Sectional boiler does more than tubulars at less cost.

It is a low pressure boiler.

Unlicensed firemen can run it.

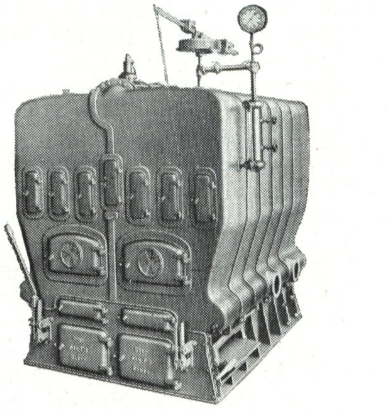
Cast iron construction—lasts longer.

The sections pass through any ordinary door.

Three men can set it up.

The right and left sections are interchangeable; no chance of a mix-up.

Ratings for both hot water and steam are given on preceding page.

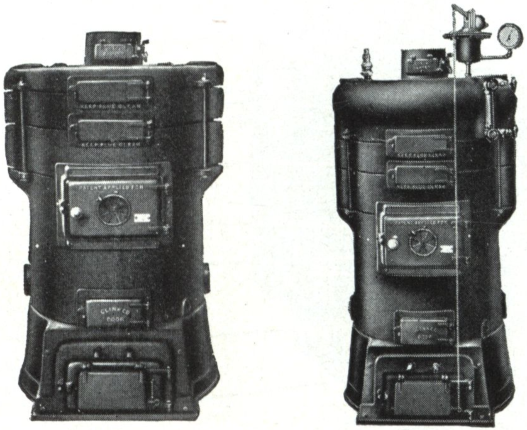


The Big Twin Section Burnham Boiler

Burnham Round Sectional Boilers

The crown sheet is *corrugated,* more than doubling the surface directly over the fire. The nipple openings are beyond the sides of the boiler where they do not take up fire-surface room. The intermediate sections have flue clean-out openings at both front and rear, so that no matter how many sections are added, the back and front fire travel will be maintained, and the outlet in the dome section will always come to the rear. The fire pot and crown sheet are in separate sections, making it easier to handle. In case of breakage, only the part broken need be repaired.

On steam boilers, the top or dome section is half again as large as on the water boiler, and considerably longer than on any other round boiler made. There is plenty of room for rapid, frictionless expansion.



Water Steam

Burnham Round Sectional Boilers

RATINGS—BURNHAM IMPROVED ROUND SECTIONAL BOILERS

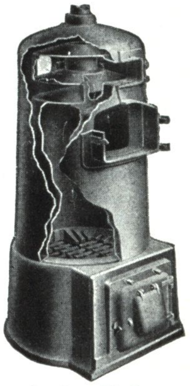
No.	Direct radiation, sq. ft.	Nominal diameter of grate, in.	Grate area, sq. ft.	Tappings, in.		Smoke box diameter, in.
				Supply	Return	
			HOT WATER BOILERS			
184-W	550	18	1.77	2-2	2-2	7
185-W	600	18	1.77	2-2	2-2	7
186-W	650	18	1.77	2-2	2-2	7
204-W	725	20	2.18	2-2½	2-2½	7
205-W	810	20	2.18	2-2½	2-2½	7
206-W	875	20	2.18	2-2½	2-2½	7
234-W	990	23	2.89	2-2½	2-2½	8
235-W	1115	23	2.89	2-2½	2-2½	8
236-W	1200	23	2.89	2-2½	2-2½	8
264-W	1280	26	3.69	2-3	2-3	9
265-W	1445	26	3.69	2-3	2-3	9
266-W	1570	26	3.69	2-3	2-3	9
W-28-4	1860	28	4.28	2-3½	2-3½	10
W-28-5	2075	28	4.28	2-3½	2-3½	10
W-28-6	2230	28	4.28	2-3½	2-3½	10
W-31-4	2230	31	5.25	2-4	2-4	11
W-31-5	2450	31	5.25	2-4	2-4	11
W-31-6	2560	31	5.25	2-4	2-4	11
			STEAM BOILERS			
184-S	330	18	1.77	2-2	2-2	7
185-S	360	18	1.77	2-2	2-2	7
186-S	390	18	1.77	2-2	2-2	7
204-S	440	20	2.18	2-2½	2-2½	7
205-S	490	20	2.18	2-2½	2-2½	7
206-S	530	20	2.18	2-2½	2-2½	7
234-S	600	23	2.89	2-2½	2-2½	8
235-S	675	23	2.89	2-2½	2-2½	8
236-S	725	23	2.89	2-2½	2-2½	8
264-S	775	26	3.69	2-3	2-3	9
265-S	875	26	3.69	2-3	2-3	9
266-S	950	26	3.69	2-3	2-3	9
S-28-4	1125	28	4.28	2-3½	2-3½	10
S-28-5	1250	28	4.28	2-3½	2-3½	10
S-28-6	1350	28	4.28	2-3½	2-3½	10
S-31-4	1350	31	5.25	2-4	2-4	11
S-31-5	1475	31	5.25	2-4	2-4	11
S-31-6	1550	31	5.25	2-4	2-4	11

Round Junior Hot Water Tank Boilers

As gas ranges are now almost universally used, it is often a good plan to have a round boiler installed and connected to the hot water tank. Insures a plentiful supply of hot water at minimum cost.

Also adapted to the heating of small garages, chicken and brooder houses.

The Junior boiler is built along the same sturdy lines as the larger Burnham boilers.



Junior Boiler

RATINGS—ROUND JUNIOR BOILERS

No.	110	112	114	61	81
Diameter grate . . . in.	10	12	14	16	18
Direct radiation . . . sq. ft.	125	200	300	450	550
Tank capacity . . . gal.	175	275	375	550	700
Total diameter . . . in.	16	18	20	26	27
Total height . . . in.	32¾	36⅝	39	40¼	41¼
Size, supply . . . in.	2	2	2½	3	3
Size, return . . . in.	2	2	2½	3	3
Diameter smoke pipe . . . in.	5	6	7	7	7

Cast iron bases with legs, suitable for setting boiler on wood floor, can be furnished with Nos. 110, 112 and 114 boilers at special prices.

Brass water sections can be furnished in Nos. 110, 112 and 114 sizes. Special prices on application.

Laundry Stove

A combination stove and hot water heater.

Can be connected directly to hot water supply tank.

Top can be used for flat irons or wash boiler.

ABRAM COX STOVE CO.

American and Dauphin Streets, PHILADELPHIA, PA.

NEW YORK, N. Y., 113 East 34th Street BOSTON, MASS., 826 Park Square Building CHICAGO, ILL., 736 West Monroe Street

Products

Novelty Steam and Water Boilers.

Novelty Coal Tank Heaters.

Novelty Warm Air Furnaces (Pipe and Pipeless).

Also Novelty Kitchener Coal Ranges, Novelty Fortune Combination Coal and Gas Ranges, Fortune Gas Ranges; Gas Water Heaters.

78 Years of Continuous Manufacture

This company has been manufacturing heating and cooking appliances for the past 78 years under the tradenames of Novelty and Fortune.

Boiler Ratings

Cast iron boiler ratings have been changed so many times in recent years that it has become next to impossible to make use of them intelligently. Because of this fact, the Abram Cox Stove Co. has abandoned boiler ratings entirely and has instead evolved a plan known as the Novelty Boiler Selection-Plan. This plan makes use of the inter-relation of size and height of flue, rate of combustion, rate of evaporation, kind of fuel and gives the *net* radiation that each boiler will carry under seven different conditions found on the job.

Write for our Handbook and Catalogue No. 78.

Novelty Side-Feed Boilers

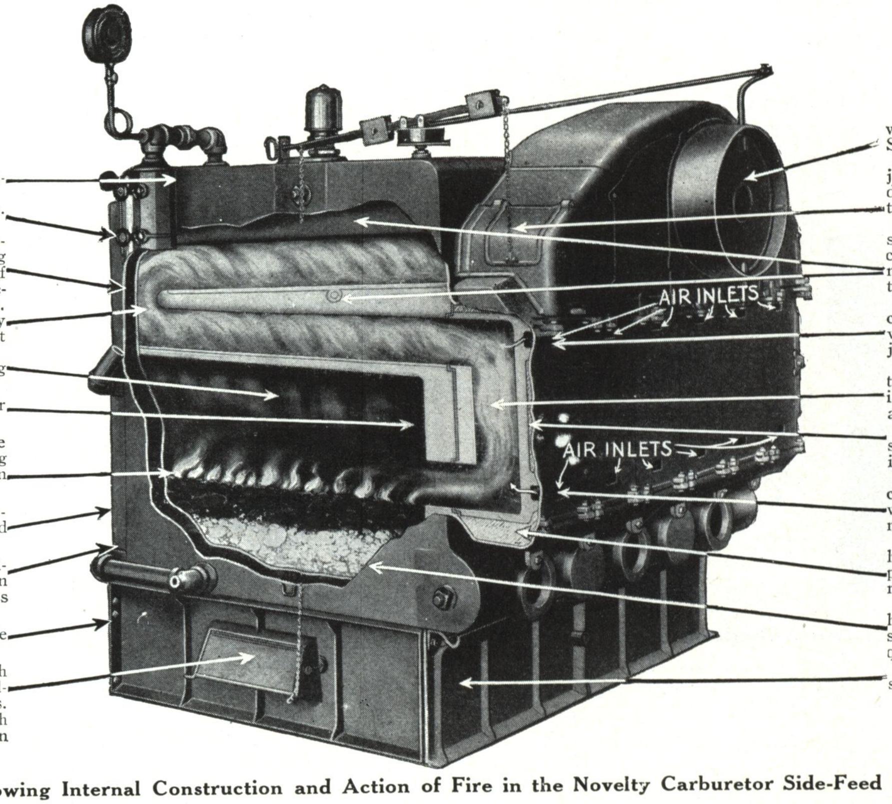
Over 37 years ago the advantages of feeding a steam or water boiler from the side were recognized by this company. The boiler they brought out at that time remains unchanged in its fundamental principles. As a section is added, the grate surface, fire surface and flue surface are increased in equal proportion, giving every size from the smallest (made for homes) to the largest (made for schools, churches, apartments, office buildings and public buildings), a balance which is not possible with the end-feed type.

Distance from fire door to back of fire pot is only 40 in. in the largest boiler. Low water line is only 50 in. in all sizes—saves excavating—*a valuable space saver.*

Novelty Carburetor (Side-Feed) Sectional Boiler

The carburetors on this boiler are separate chambers connected to the rear of each section. By means of airslots at top and bottom of each carburetor, air is drawn in which furnishes oxygen for mixing with the smoke and unburned gases. After the smoke and gases have come in contact with the extensive, overhanging, direct heating surface in the fire box of the boiler, they are drawn into the carburetting chamber. They mix with the oxygen from the air brought in at the rear and are instantly ignited and break into flames. The smoke and gases which usually pass into the chimney and are wasted, are thoroughly consumed and the only thing that passes out the chimney is a mist, practically invisible, making the carburetor boiler a smokeless one. At least 20% more heat units are liberated in the Novelty carburetor boiler than is possible in the regular surface-feed boiler of any make. No adjustment of air intake is necessary. Rate of combustion determines amount of air required.

The fundamental side-feed principle is maintained in the Novelty carburetor boiler the same as in the regular sectional boiler. As a section is added, grate surface, fire surface, carburetting chamber and flue surface are increased in equal proportion, giving every size from the smallest (made for homes) to the largest (made for schools, churches, apartments, office buildings and public buildings), a balance which is not possible with the end-feed type.


Large steam space insuring steady water line.
Low water line—50 in. in all sizes.
Gases travel from firebox into carburetting chamber, to front of boiler, to lower flue and return to rear in upper flue.
Separate flues for every section—unusual amount heating surface.
Extensive overhanging direct heating surface.
Depth of grate not over 40 in. in any size
Much deeper fire can be carried. Longer firing period. Will not burn out in spots.
Cored water front—entire firebox surrounded by water.
Large clinker door—although slow combustion practically eliminates clinkers.
Large doors provide easy access to ash pit.
Side draft door (both sides) gives uniform volume of air under grates. No interference with automatic regulator when attending fire.
AIR INLETS
AIR INLETS
Round smoke outlet with inside damper. Standard smoke pipe size.
Check draft—in conjunction with side draft door insures positive control of fire.
High temperature resulting from action in carburetting chamber makes flue surface equal to prime heating surface.
Oxygen admitted to carburetor and mixed with the gases. No adjustments needed.
Gases entering carburetor from fire chamber are immediately fully ignited and converted into flame.
Insulation (chamber insulated) from surrounding air—no lost heat.
Oxygen admitted to carburetor and mixed with gases. No adjustments needed.
Insulation — prevents heat loss from high temperature gases in carburetor.
Novelty grate — burns hard or soft coal. No special size or grade required.
Portable base—no brick setting required.

End View, Showing Internal Construction and Action of Fire in the Novelty Carburetor Side-Feed Sectional Boiler

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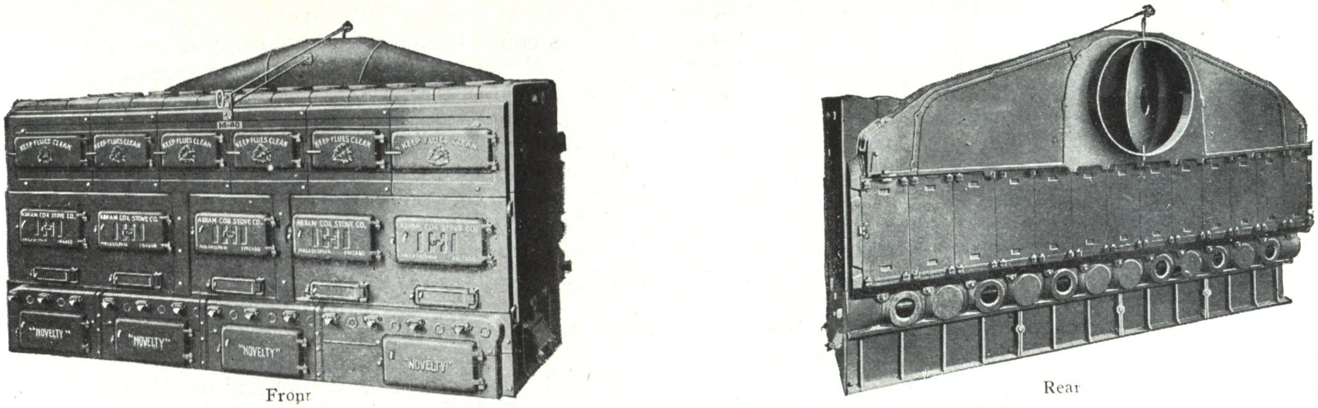


Front

Rear

Front and Rear Views of Novelty Carburetor Side-feed Sectional Boiler

NOVELTY CARBURETOR SIDE-FEED SECTIONAL BOILERS

No.	*Comparative Ratings, sq. ft.,		Size of grate, in.	Grate area, sq. ft. *	Base dimensions, in. (outside)		Boiler dimensions, in. (outside), including smoke box and trimmings		Supply outlets, in.	Return inlets, in.	Smoke outlets, in.
	Steam	Water			Depth	Width	Depth	Width			
3–30	1676	2682	30 x 18½	3.85	39	24	54	36	1–4	1–4	9
4–30	2502	4004	30 x 27⅝	5.76	39	33	55	45	2–4	2–4	12
5–30	3328	5324	30 x 36¾	7.66	39	42	56	54	2–4	2–4	14
6–30	4154	6646	30 x 45⅞	9.56	39	51	56	63	3–4	3–4	16
7–30	4980	7968	30 x 55	11.45	39	60	57	72	3–4	3–4	16
8–30	5804	9286	30 x 64⅛	13.36	39	69	57	81	4–4	4–4	18
4–40	3354	5366	40 x 27⅝	7.67	49	33	64	45	2–4	2–4	12
5–40	4410	7056	40 x 36¾	10.21	49	42	66	54	2–4	2–4	14
6–40	5524	8838	40 x 45⅞	12.74	49	51	66	63	3–4	3–4	16
7–40	6644	10630	40 x 55	15.28	49	60	67	72	3–4	3–4	16
8–40	8230	13168	40 x 64⅛	17.81	49	69	67	81	4–4	4–4	18
9–40	8812	14100	40 x 73¼	20.35	49	78	70	90	4–4	4–4	20
10–40	10566	16906	40 x 82⅜	22.88	49	87	70	99	5–4	5–4	20
11–40	11738	18780	40 x 91½	25.42	49	96	72	108	5–4	5–4	22
12–40	12902	20644	40 x 100⅝	27.95	49	105	72	117	5–4	5–4	22
13–40	14068	22508	40 x 109¾	30.49	49	114	72	126	5–4	5–4	25
14–40	15238	24380	40 x 118⅞	33.02	49	123	75	135	6–4	6–4	25
15–40	16404	26246	40 x 128	35.55	49	132	75	144	6–4	6–4	25
16–40	17574	28118	40 x 137⅛	38.09	49	141	75	153	7–4	7–4	25
17–40	18740	29984	40 x 146¼	40.62	49	150	72	162	7–4	7–4	2–20
18–40	19904	31846	40 x 155⅜	43.16	49	159	72	171	8–4	8–4	2–20
19–40	21076	33722	40 x 164½	45.69	49	168	72	180	8–4	8–4	2–20
20–40	22240	35584	40 x 173⅝	48.23	49	177	72	189	8–4	8–4	1–20 1–22

*While the actual surface on the carburetor boiler is the same as the boiler without carburetors, the additional work is obtained by the action of the carburetors as explained on the previous page.

NOVELTY SIDE-FEED SECTIONAL BOILERS (WITHOUT CARBURETOR)

No.	*Comparative Ratings, sq. ft.,		Size of grate, in.	Grate area, sq. ft.	Base dimensions in. (outside)		Boiler dimensions, in. (outside)			Supply outlets, in.	Return inlets, in.	Smoke outlets, in.
	Steam	Water			Depth	Width	Depth		Width			
18– 3	404	646	10 x 18	1.25	19½	13½	....	32	17½	1–2½	1–2½	7
18– 4	608	972	15 x 18	1.88	19½	18½	....	32	22½	2–2½	2–2½	7
18– 5	806	1288	20 x 18	2.50	19½	23½	....	33	27½	2–2½	2–2½	8
18– 6	1010	1616	25 x 18	3.13	19½	28½	....	33	32½	2–2½	2–2½	8
18– 7	1208	1932	30 x 18	3.75	19½	33½	....	34	37½	3–2½	3–2½	8
18– 8	1414	2262	35 x 18	4.38	19½	38½	....	34	42½	3–2½	3–2½	9
18– 9	1580	2528	40 x 18	5.00	19½	43½	....	34	47½	3–2½	3–2½	9
18–10	1772	2836	45 x 18	5.62	19½	48½	....	34	52½	3–2½	3–2½	10
25– 4	1772	2836	25 x 27⅝	4.80	34	33	....	55	45	2–3	2–3	10
25– 5	2360	3776	25 x 36¾	6.38	34	42	....	57	54	2–3	2–3	12
25– 6	2944	4710	25 x 45⅞	7.96	34	51	....	57	63	3–3	3–3	12
25– 7	3538	5660	25 x 55	9.55	34	60	....	57	72	3–3	3–3	14
25– 8	4116	6586	25 x 64⅛	11.13	34	69	47	....	81	4–3	4–3	18
25– 9	4704	7526	25 x 73¼	12.71	34	78	47	....	90	4–3	4–3	20
30– 4	2176	3480	30 x 27⅝	5.76	39	33	....	60	45	2–4	2–4	10
30– 5	2898	4636	30 x 36¾	7.66	39	42	....	60	54	2–4	2–4	12
30– 6	3616	5786	30 x 45⅞	9.56	39	51	....	62	63	3–4	3–4	14
30– 7	4340	6944	30 x 55	11.45	39	60	....	62	72	3–4	3–4	14
30– 8	5056	8090	30 x 64⅛	13.36	39	69	52	....	81	4–4	4–4	18
30– 9	5778	9244	30 x 73¼	15.26	39	78	52	....	90	4–4	4–4	20
40– 4	2906	4650	40 x 27⅝	7.67	49	33	....	70	45	2–4	2–4	12
40– 5	3868	6188	40 x 36¾	10.21	49	42	....	70	54	2–4	2–4	14
40– 6	4822	7714	40 x 45⅞	12.74	49	51	....	72	63	3–4	3–4	16
40– 7	5782	9252	40 x 55	15.28	49	60	....	72	72	3–4	3–4	16
40– 8	7262	11620	40 x 64⅛	17.81	49	69	62	....	81	4–4	4–4	18
40– 9	8298	13276	40 x 73¼	20.35	49	78	62	....	90	4–4	4–4	20
40–10	9330	14928	40 x 82⅜	22.88	49	87	64	....	99	5–4	5–4	20
40–11	10360	16576	40 x 91½	25.42	49	96	64	....	108	5–4	5–4	22
40–12	11398	18236	40 x 100⅝	27.95	49	105	64	....	117	5–4	5–4	22
40–13	12428	19884	40 x 109¾	30.49	49	114	64	....	126	5–4	5–4	25
40–14	13460	21536	40 x 118⅞	33.02	49	123	64	....	135	6–4	6–4	25
40–15	14498	23192	40 x 128	35.55	49	132	64	....	144	6–4	6–4	25
40–16	15552	24884	40 x 137⅛	38.09	49	141	64	....	153	7–4	7–4	25
40–17	16538	26460	40 x 146¼	40.62	49	150	64	....	162	7–4	7–4	2–20
40–18	17588	28140	40 x 155⅜	43.16	49	159	64	....	171	8–4	8–4	2–20
40–19	18636	29414	40 x 164½	45.69	49	168	64	....	180	8–4	8–4	2–20
40–20	19686	31498	40 x 173⅝	48.23	49	177	64	....	189	8–4	8–4	1–20 1–22

*Since many architects and engineers, in selecting boilers of some makes based on present day ratings are accustomed to taking the actual net equivalent column radiation on each job and adding 100% to arrive at the size of boiler, we have printed for their convenience a column which, for want of a better term, we have called "comparative rating." This comparative rating is arrived at by taking the *net equivalent column radiation* which each boiler will carry under a specified average condition and adding 100% to that amount.

Continued on next page

Novelty Side-Feed Sectional Boiler (without Carburetor)

This boiler has all the advantages of the side-feed construction explained on preceding pages. It is the same as the carburetor boiler except that it does not have the carburetting chamber.

The gases from the fire box travel upward at the rear of the fire box into the rear of the lower flues and thence to the front, passing into the upper flues and returning to the back of the boiler. This boiler burns any size or grade of coal, oil, gas, etc. Where soft coal is used, it does not meet the requirements of some city ordinances for the burning of smoke, as does the Novelty carburetor boiler.

Novelty Square Sectional Boilers Made Especially for Heating 5 to 10-room Houses Where Only Round Boilers Have Heretofore Been Used

In the 18 series square boiler, as shown below, the heating surfaces surrounding the fire are so arranged that these surfaces, backed with water, come in direct contact with the flames. These surfaces are designed like tubes which hang in the flames, obtaining the most heat from the fuel burned.

The flat crown sheet high above the flame in most round boilers does not have the heating surface to absorb the heat generated from the fuel burned.

The Novelty square sectional boiler fills a long felt want for a square boiler for house heating. It takes up less space, allows more fuel on each square foot of grate, and permits of a longer firing period. In steam boilers, the waterline is only 38 in.

Novelty Round Steam and Water Boilers

Novelty round boilers are complete in three parts—base, fire pot section, and dome section. No intermediate sections are used, because from the experience of 78 years of manufacturing, this company is convinced that every time the size of the boiler is increased, the grate surface, fire surface, and flue surface should be increased.

All Novelty round boilers are now equipped with a combustion ring 3 in. in height, except the No. 1417 which has a 6-in. combustion ring.

This combustion ring, which is made of brick, prevents the lower portion of the fire bed from coming in contact with the iron sides of the fire pot which has a cooling effect upon the fire and chills it below the temperature of combustion.

The combustion ring gives the boiler a longer firing period, enables it to use less fuel and produce more heat than the old style round boiler, because there is no water back of the ring to draw the heat from the fire and chill it below the temperature of combustion. Thus a fuel bed is formed over the entire area of the fire pot.

The waterways are constructed on the outside of the fire pot instead of on the inside, which gives the full diameter of the pot and a larger coal carrying capacity.

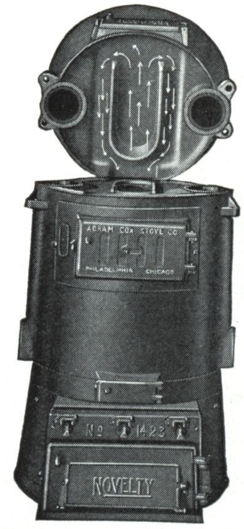
The crown sheet of Novelty round boilers has three water tubes directly over the fire instead of the sheet being flat as in some other makes. This feature increases the heating surface and saves fuel.

Due to the extended baffled cast to the dome, which intersects with the fire pot section and forms the flue, it will readily be seen that the Novelty boiler has an unusually long flue travel. In the flue travel, the gases pass to the front of the boiler, as indicated by the arrows in the cut below, then they split and pass to the rear of the boiler by circulating over the crown sheet. During this circulation, the gases give off their heat to the water that surrounds the flue. This feature insures the extraction of the greatest number of heat units from the gases before they reach the smoke outlet.

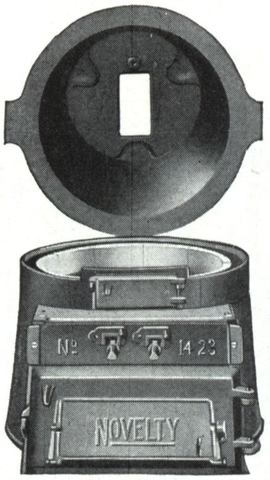
18-5
NOVELTY
ABRAM COX STOVE CO
PHILA. CHICAGO
NOVELTY

Novelty Side-Feed Sectional Boiler

38-in. waterline



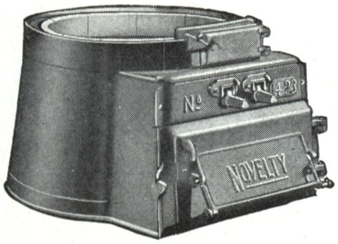
Dome Section Raised, Showing Definite Flue Travel, Nipple Connections and Outside Waterways



Main Section Tilted, Showing Extensive Direct Heating Surface and the Novelty Combustion Ring

Novelty Round Boiler

Novelty Cast Iron Push Nipple Used with All Novelty Boilers



Novelty Base Showing the Deep Ash Pit and the Novelty Combustion Ring

NOVELTY ROUND STEAM AND WATER BOILERS

No.	Comparative ratings, sq. ft.		Actual diam. fire pot, in.	Grate area, sq. ft.	Total height, in.				Supply outlets, in.	Return inlets, in.	Smoke outlet, in.
					Steam		Water				
	Steam	Water			Outlet	Inlet	Outlet	Inlet			
*1417	452	724	17	1.58	41½	21	41½	21	2-2½	1-2½	7
*1418	556	890	18	1.76	49½	18	49½	18	2-2	2-2	7
1420	680	1100	20	2.12	54	18	50	18	2-2½	2-2½	7
1423	908	1452	23	2.88	54	18	50	18	2-3	2-3	8
1425	1070	1712	25	3.40	55	18	50	18	2-3	2-3	8
1428	1344	2150	28	4.27	55	19	51	19	2-4	2-4	10
1431	1648	2636	31	5.24	55	19	51	19	2-4	2-4	10

*Firepot and dome of Nos. 1417 and 1418 shipped assembled. Novelty boilers are so designed that any section or base may be taken through an opening 24 in. wide or more.

Continued on next page

Novelty Hevy-Dutee Coal Tank Heaters

Novelty coal tank heaters for supplying hot water for domestic use and for many other needs are the development of an increased demand for a means of supplying an adequate amount of hot water at all times. These tank heaters are tested to 300 lb. pressure and are guaranteed to a working pressure of 125 lb. They are equipped with a combustion ring in the fire pot, 6 in. in height. The purpose of this brick lined fire pot is to prevent heat loss and to keep the fire alive over a long period of time.

No. 10-A (40-gal. Capacity)—The size that is installed for furnishing hot water for household and family use. This family heater requires only a moment's attention night and morning. There is nothing to light; nothing to get out of order; no waiting; and it burns less than a bucket of coal a day.

Like all Novelty tank heaters up to and including those of 125-gal. capacity, the No. 10-A may be furnished on legs with a cast iron bottom in the ash pit, for use on wooden floors. It is then known as the No. 10-C.

No. 10-A
Capacity, 40 gal.

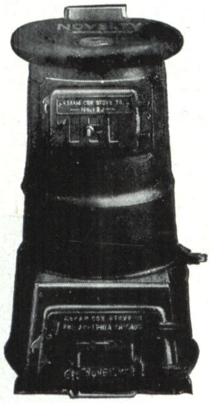
No. 121-A (80-gal. Capacity)—Where the laundry is done at home and the demand for hot water for kitchen and laundry purposes is unusually large, then the Novelty coal tank heater with a laundry top will meet the need. There is no worrying and waiting for hot water when there is washing to be done. Besides laundry purposes, the top may be used for light cooking. In any coal tank heater, the essential requirement, except the actual furnishing of the hot water, is that it will carry fire from 12 to 15 hours. The combustion ring makes this possible.

No. 121-A
Capacity, 80 gal.

No. 123 (300-gal. Capacity)—The No. 123 Novelty tank heater is built upon the same principle as a round house heating boiler.

Built with a combustion ring between the grates and the water section, the boiler dome is connected over the water section, making this heater a complete hot water boiler to be used for hot water heating and furnishing hot water for domestic supply.

It will furnish plenty of hot water for apartment houses, restaurants, or garages, or will heat the small house or bungalow. There are many places of business such as garages and restaurants that demand unusually large quantities of hot water. The No. 123 is especially suitable for that purpose, in that it will heat 300 gal. of water.



No. 123
Capacity, 300 gal.

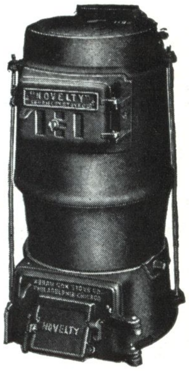
No. 12-A (80-gal. Capacity)—In many of the homes that are being renovated today there will be two bathrooms where formerly there was only one. For this reason, the heating appliances in such homes, although satisfactory in years past, are no longer large enough to take care of the increased hot water need.

The No. 12-A with its brick lined fire pot section and large water section will take care of an 80-gal. tank of hot water and will furnish plenty of hot water for two bathrooms and household use.

No. 12-A
Capacity, 80 gal.

No. 110-A (125-gal. Capacity)—The No. 110-A is equipped with a large water section 10 in. deep and is constructed so that the water surrounds the fire on all sides and the top. The crown sheet is of the type found in house heating boilers. The cover on the water section serves as a flue for the gases to pass over which increases the heating capacity.

The No. 110-A can be used for heating radiator and for heating hot water for household use at the same time. Whether you have one or two radiators to heat, together with furnishing plenty of hot water for a 30 or 40-gal. tank, or if your problem is one of storing water in a 100 or 125-gal. tank without any radiators to heat, the No. 110-A will efficiently perform this service.

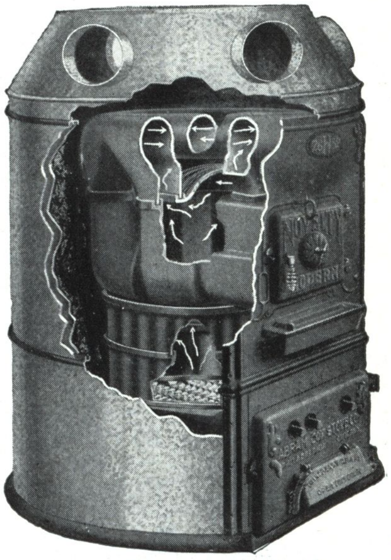


No. 110-A
Capacity, 125 gal.

Other Sizes—There is a size in the line of Novlety coal tank heaters to meet every need. If you do not find here the size required, write us and we will send information on it.

Novelty Warm Air Furnaces

Novelty warm air furnaces are original in design. They are built with grate surface in exact proportion as in Novelty boilers. The fire pot is straight and corrugated. The straight pot not only gives more grate surface and larger coal carrying capacity, but it prevents the collection of ashes along the sides, which happens in furnaces with tapered pots. The collection of ashes on the sides deadens the fire at that point and prevents that fire surface from giving off heat. The corrugations in the pot furnish air space around the side for admitting the proper amount of air for good combustion.



Cut-out View of the Novelty Modern Warm Air Furnace

The crab type of flue construction in the Novelty Modern permits of a greater fire surface than is possible on other makes. Imagine a string being passed in and out and around all these crabs compared to a string passed around a furnace without this crab construction. In addition to the extra fire surface available, this construction is a self-cleaning feature found in no other furnace.

The Novelty warm air furnaces are made in 20 different sizes for pipe and pipeless installation.

HEGGIE-SIMPLEX BOILER COMPANY

JOLIET, ILLINOIS

REPRESENTATIVES IN THE FOLLOWING CITIES

AKRON
ALBURQUERQUE
AMARILLO
ATLANTA
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DAYTON
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DETROIT
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HOUSTON
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NEW ORLEANS
NEW YORK
OKLAHOMA CITY
OMAHA
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PITTSBURGH
RALEIGH
ROCHESTER
ST. LOUIS
SAN ANTONIO
SCHENECTADY
SHREVEPORT
SPARTANBURG
TAMPA
TOLEDO

Look up "Heggie-Simplex Boiler Co." in the telephone book for Representative's number and address

Products

Electric-welded Steel Heating Boilers for Steam and Hot Water.

Also Water Heating-Garbage Burners.

ELECTRIC-WELDED
HEGGIE-SIMPLEX
STEEL BOILERS

Heggie-Simplex Heating Boilers

The Heggie-Simplex boiler combines in one portable, electrically welded steel unit all the recognized advantages of both firebox and return tubular, double pass boilers. It has four distinctive features of fundamental importance:

(1) Extra large firebox and *direct* heating surface.

(2) Secondary combustion chamber to provide ample room for complete combustion before entering flues.

(3) "Rear-front-rear" flue passage for the gases.

(4) A single, unimpeded, freely circulating body of water.

Advantages of Improved Design

Correct heating principles find their most perfect expression in this boiler design. It secures complete combustion whether of coal or oil, and full application of the heat units. The results are a saving of 25% to 45% in fuel, an equal saving in ash handling and in the number of firings. The boiler is simpler, more compact, more durable and of smaller size for its proved rating. The perfect circulation secured through an unimpeded unit body of water assures dry steam and quick, steady heat.

Heggie-Simplex boilers also afford other important advantages. There is a space economy of at least one-third, due to the fact that the smoke outlet is in the rear and below the top of the boiler, while all flues are cleaned from the front. The boiler may be installed with unexampled ease. It requires no bricking, packing, or other laborious and costly operations. Simply set the base; place the boiler on it; connect the smoke pipe, the intake, the outlet and return, and the trim, and the Heggie-Simplex is ready.

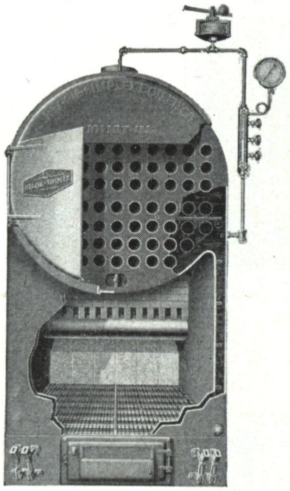
How Quality Is Built into Heggie-Simplex Boilers

In quality of materials and workmanship as well as in *design,* Heggie-Simplex boilers unmistakably express that superiority which has made them so popular with thousands of users in all classes of buildings.

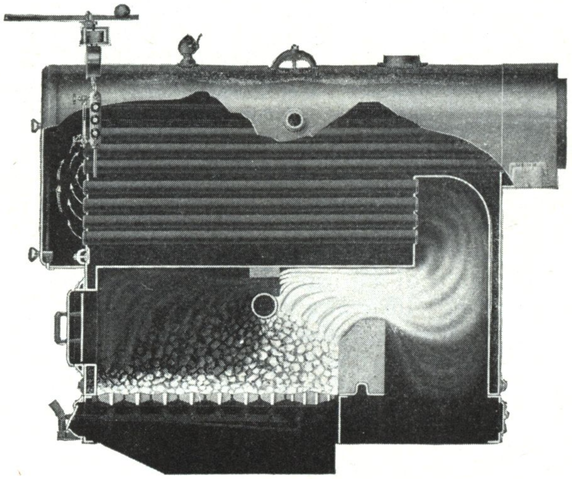
All plates are of firebox steel of guaranteed tenacity and low carbon content—because such steel welds better, fuses better and affords greater strength than ordinary flange steel. Thicker plates are found in no other boiler—but Heggie-Simplex boilers employ thicker plates than are ordinarily used in many others. The fact that breakage is almost unknown is proved by the low insurance rate which Heggie-Simplex boilers enjoy.

Heggie-Simplex welding is the expert workmanship of pioneers in electric welding. The plates are beveled, then abutted. This assures fusion of a solid joint. The plates become as one. The work is never hurried—Heggie welding costs more per hour and per foot.

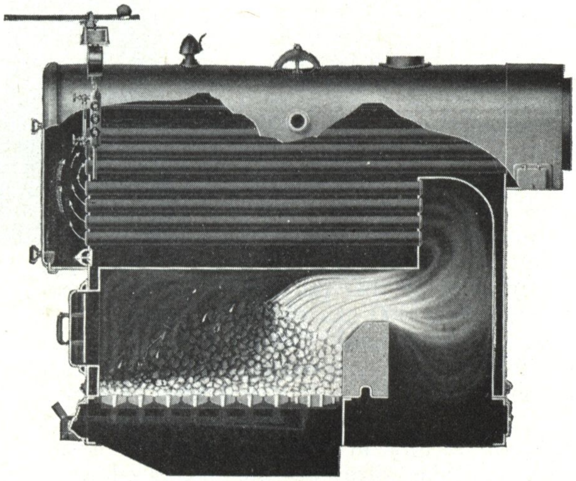
All boiler bases are of rolled channel steel. Grates are of first quality gray iron—of the heavy-durable rocking type. Individual grate brackets, permitting better adjustment for contraction and expansion, smoother grate action and simpler replacement, are used instead of the ordinary single bar. The larger fire and ash doors are an important everyday convenience, too.



Front View Smokeless Boiler



Heggie-Simplex Smokeless Heating Boiler



Heggie-Simplex Direct Draft Boiler

Continued on next page

A.S.M.E. Standard—Fully Guaranteed

The Heggie-Simplex boiler combines to a remarkable degree the advantages of all previous types of boiler design. Every Heggie-Simplex unit is positively guaranteed to develop its full rated capacity. Warranted to be in strict accordance with the A.S.M.E. code for low pressure heating boilers—built for 15 lbs. working pressure.

Service records and installation references, which will gladly be supplied, indicate that upon a basis of results rather than weight or price, the Heggie-Simplex is the most reassuring investment that can be made in boiler equipment.

Made in smokeless and direct draft types—in a complete range of sizes for bungalows, residences and all larger installations.

SPECIFICATIONS ON HEGGIE-SIMPLEX SMOKELESS, STEAM HEATING BOILERS

No. boiler	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133
Cap., steam, sq ft.	2000	2400	2800	3300	3700	4100	4500	5000	5500	6500	7000	7500	8500	10000	11000	12000	13000	14500	15500	16500	18000	20000	22000	25000	28000	31000	34000
Boiler:																											
Height, in.	72	72	72	79	79	79	86	86	86	91	91	91	97	97	108	108	108	116	116	116	126	126	132	132	132	141	141
Width, in.	34	34	34	40	40	40	47	47	47	52	52	52	57	57	63	63	63	70	70	70	78	78	84	84	84	90	90
Length, in.	79	91	103	92	98	104	101	107	113	109	115	121	121	133	123	129	135	129	135	141	141	153	153	165	177	177	189
Firebox:																											
Width, in.	29	29	29	34	34	34	41	41	41	46	46	46	51	51	57	57	57	63	63	63	71	71	76	76	76	82	82
Length, in.	53	65	77	65	71	77	71	77	83	77	83	89	89	101	89	95	101	94	100	106	100	112	112	124	136	136	148
Base:																											
Width, in.	35	35	35	41	41	41	48	48	48	53	53	53	58	58	64	64	64	71	71	71	79	79	85	85	85	91	91
Length, in.	60	72	84	72	78	84	78	84	90	84	90	96	96	108	96	102	108	102	108	114	108	120	120	132	144	144	156
Height, in.	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15
Ash pit:																											
Width, in.	28	28	28	34	34	34	41	41	41	46	46	46	51	51	57	57	57	64	64	64	72	72	78	78	78	84	84
Length, in.	51	51	57½	50½	57	63½	50½	57	63½	57	63½	70½	63½	63½	63½	63½	63½	70	70	70	70	70	70	70	70	70	70
Grate area, sq ft.	10.6	10.6	11.8	12.2	13.7	15.2	14.7	16.5	18.3	18.6	20.7	22.7	22.9	22.9	25.5	25.5	25.5	31.0	31.0	31.0	35.8	35.8	38.0	38.0	38.0	41.1	41.1
Heating surface, sq. ft.	158	189	220	271	294	317	365	394	423	514	550	585	722	810	922	985	1047	1166	1238	1310	1403	1565	1911	2110	2309	2481	2695
Hgt. center smoke connection, in.	61	61	61	66	66	66	72	72	72	77	77	77	81	81	90	90	90	96	96	96	105	105	110	110	110	115	115
Diam. breeching, in.	20	20	20	22	22	22	24	24	24	26	26	26	28	28	30	30	30	34	34	34	38	38	42	42	42	46	46
Diam. stack, in.	18	18	18	20	20	20	22	22	22	24	24	24	26	26	28	28	28	32	32	32	36	36	40	40	40	44	44
Min. Height stack, ft.	55	55	55	60	60	60	65	65	65	70	70	70	75	75	75	75	75	80	80	80	90	90	100	100	100	110	110
2 boilers:																											
Diam. breeching, in.	28	28	28	30	30	30	34	34	34	38	38	38	40	40	44	44	44	50	50	50	54	54	56	56	56	64	64
Diam. stack, in.	26	26	26	28	28	28	32	32	32	34	34	34	36	36	40	40	40	46	46	46	50	50	54	54	54	60	60
Min. Height stack, ft.	65	65	65	70	70	70	75	75	75	80	80	80	85	85	85	85	85	90	90	90	100	100	110	110	110	125	125
Steam openings, in.	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	10	10	10	10	12	12	12	12	12	12	12
Return, in.	3	3	3	3	3	3	4	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	6	6	6
Safety valve, in.	2	2	2	2½	2½	2½	3	3	3	3	3	3	3½	3½	2-3	2-3	2-3	2-3	2-3	2-3	2-3½	2-3½	2-4	2-4	2-4	3-3½	3-3½
Boiler covering required, sq. ft.	78	89	101	104	110	116	125	133	141	144	152	160	176	193	197	206	215	230	240	250	270	293	314	337	361	403	428
Height water line, in.	62	62	62	69	69	69	72	72	72	78½	78½	78½	81	81	92¾	92¾	92¾	96	96	96	104¾	104¾	111¼	111¼	111¼	120	120

SPECIFICATIONS ON HEGGIE-SIMPLEX SMOKELESS, HOT WATER HEATING BOILERS

No. Boiler	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233
Cap, sq ft.	3300	3900	4500	5450	6100	6750	7400	8250	9100	10700	11500	12300	13950	16400	18050	19700	21300	23800	25400	27100	29700	32800	36100	41000	45900	51200	56100
Openings:																											
Supply, in.	2-6	2-6	2-6	2-6	2-6	2-6	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10
Return, in.	2-6	2-6	2-6	2-6	2-6	2-6	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10

Note: All other measurements on 207 to 233 are the same as on steam boilers 107 to 133.

SPECIFICATIONS ON HEGGIE-SIMPLEX DIRECT DRAFT, STEAM HEATING BOILERS

No. boiler	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333
Cap., steam, sq. ft.	600	750	900	1050	1200	1450	1700	2000	2400	2800	3300	3700	4100	4500	5000	5500	6500	7000	7500	8500	10000	11000	12000	13000	14500	15500	16500	18000	20000	22000	25000	28000	31000	34000
Boiler:																																		
Height, in.	54	61¼	61¼	61¼	66	66	66	72	72	72	79	79	79	86	86	86	91	91	91	97	97	108	108	108	116	116	116	126	126	132	132	132	141	141
Width, in.	24	27	27	27	30	30	30	34	34	34	40	40	40	47	47	47	52	52	52	57	57	63	63	63	70	70	70	78	78	84	84	84	90	90
Length, in.	48	52	58	64	58	70	82	79	91	103	92	98	104	101	107	113	109	115	121	121	133	123	129	135	129	135	141	141	153	153	165	177	177	189
Firebox:																																		
Width, in.	19	22	22	22	25	25	25	29	29	29	34	34	34	41	41	41	46	46	46	51	51	57	57	57	63	63	63	71	71	76	76	76	82	82
Length, in.	26	29	35	41	35	47	59	53	65	77	65	71	77	71	77	83	77	83	89	89	101	89	95	101	94	100	106	100	112	112	124	136	136	148
Base:																																		
Width, in.	25	28	28	28	31	31	31	35	35	35	41	41	41	48	48	48	53	53	53	58	58	64	64	64	71	71	71	79	79	85	85	85	91	91
Length, in.	33¾	36	42	48	42	54	66	60	72	84	72	78	84	78	84	90	84	90	96	96	108	96	102	108	102	108	114	108	120	120	132	144	144	156
Height, in.	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15
Ash pit:																																		
Width, in.	18	21	21	21	24	24	24	28	28	28	34	34	34	41	41	41	46	46	46	51	51	57	57	57	64	64	64	72	72	78	78	78	84	84
Length, in.	25	25	31½	38	31½	44½	56	51	51	57½	50½	57	63½	50½	57	63½	57	63½	70½	63½	63½	63½	63½	63½	70	70	70	70	70	70	70	70	70	70
Grate area, sq. ft.	3.4	4.4	5.3	6.2	6.3	8.1	10.2	10.6	10.6	11.8	12.2	13.7	15.2	14.7	16.5	18.3	18.6	20.7	22.7	22.9	22.9	25.5	25.5	25.5	31.0	31.0	31.0	35.8	35.8	38.0	38.0	38.0	41.1	41.1
Heating surface, sq. ft.	50	64	75	86	97	116	141	158	189	220	271	294	317	365	394	423	514	550	585	772	810	922	985	1047	1166	1238	1310	1403	1565	1911	2110	2309	2481	2695
Hgt. center smoke connection, in.	45¾	53	53	53	56	56	56	61	61	61	66	66	66	72	72	72	77	77	77	81	81	90	90	90	96	96	96	105	105	110	110	110	115	115
Diam. breeching, in.	10	14	14	14	18	18	18	20	20	20	22	22	22	24	24	24	26	26	26	28	28	30	30	30	34	34	34	38	38	42	42	42	46	46
Diam. stack, in.	10	12	12	12	16	16	16	18	18	18	20	20	20	22	22	22	24	24	24	26	26	28	28	28	32	32	32	36	36	40	40	40	44	44
Min. Height stack, ft.	30	40	40	40	50	50	50	55	55	55	60	60	60	65	65	65	70	70	70	75	75	75	75	75	80	80	80	90	90	100	100	100	110	110
2 boilers:																																		
Diam. breeching, in.	16	20	20	20	26	26	26	28	28	28	30	30	30	34	34	34	38	38	38	40	40	44	44	44	50	50	50	54	54	56	56	56	64	64
Diam. stack, in.	16	18	18	18	24	24	24	26	26	26	28	28	28	32	32	32	34	34	34	36	36	40	40	40	46	46	46	50	50	54	54	54	60	60
Min. Height stack, ft	40	50	50	50	60	60	60	65	65	65	70	70	70	75	75	75	80	80	80	85	85	85	85	85	90	90	90	100	100	110	110	110	125	125
Steam openings, in.	3	4	4	4	4	4	4	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	10	10	10	10	12	12	12	12	12	12	12
Return, in.	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	6	6	6
Safety valve, in.	1	1½	1½	1½	1½	1½	1½	2	2	2	2½	2½	2½	3	3	3	3	3	3	3½	3½	2-3	2-3	2-3	2-3	2-3	2-3	2-3½	2-3½	2-4	2-4	2-4	3-3½	3-3½
Covering required, sq. ft.	33	41	46	51	51	62	73	78	89	101	104	110	116	125	133	141	144	152	160	176	193	197	206	215	230	240	250	270	293	314	337	361	403	428
Height water line, in.	48¾	55	55	55	58	58	58	62	62	62	69	69	69	72	72	72	78½	78½	78½	81	81	92¾	92¾	92¾	96	96	96	104¾	104¾	111¼	111¼	111¼	120	120

SPECIFICATIONS ON HEGGIE-SIMPLEX DIRECT DRAFT, HOT WATER HEATING BOILERS

No. boiler	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433
Cap., sq. ft.	1000	1250	1500	1750	2000	2400	2800	3300	3900	4500	5450	6100	6750	7400	8250	9100	10700	11500	12300	13950	16400	18050	19700	21300	23800	25400	27100	29700	32800	36100	41000	45900	51200	56100
Openings:																																		
Supply, in.	3	4	4	4	2-4	2-4	2-4	2-6	2-6	2-6	2-6	2-6	2-6	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10
Return, in.	2-3	2-4	2-4	2-4	2-4	2-4	2-4	2-6	2-6	2-6	2-6	2-6	2-6	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-8	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10

Note.—All other measurements on 400 to 432 are the same as a steam boiler 300 to 332.

KEWANEE BOILER COMPANY

KEWANEE, ILL.

BRANCHES

ATLANTA, 1522 Candler Building
BIRMINGHAM, 2233 Arlington Ave.
CHARLOTTE, N. C., 1016 Johnston Building
CHATTANOOGA, 1203 James Building
CHICAGO, 822 W. Washington Boulevard
CINCINNATI, P. O. Box 75
CLEVELAND, Superior Avenue N. E. at 17th Street
DALLAS, 1903-4 Santa Fe Building
DENVER, 1226-28 California Street
DES MOINES, 707 Hubbell Building
DETROIT, 1772 West LaFayette Boulevard
EL PASO, 226 Mesa Avenue
GRAND RAPIDS, 402½ Michigan Trust Building
INDIANAPOLIS, 221 Indiana Terminal Warehouse
KANSAS CITY, MO., 2014 Wyandotte Street
LOS ANGELES, 420 East Third Street
MEMPHIS, 1812 Exchange Building
MILWAUKEE, 440 Barclay Street
MINNEAPOLIS, 708 Builders Exchange Building
NEW ORLEANS, 314 Carondelet Building
PITTSBURGH, Empire Building
ST. LOUIS, 4200 Forest Park Boulevard
SALT LAKE CITY, 204 Dooly Building
SAN ANTONIO, 502 Calcasieu Building
SAN FRANCISCO, 635 Mission Street
SEATTLE, 326 Columbia Street
SPOKANE, 507 Empire Street Building
TOLEDO, 1121-1122 Nicholas Building
NEW YORK, 47 W. 42nd Street
BOSTON, 555 Little Building, 90 Bolyston Street
PHILADELPHIA, 510 Real Estate Trust Building

DOMINION KEWANEE BOILER COMPANY, LTD., 66 Richmond Street, East, TORONTO, 2, ONT.

Products

Kewanee Steel Riveted Firebox Heating Boilers, including:

Brick-set Down-draft Smokeless Boilers, 1600 to 16,000 sq. ft. radiation (steam), Plate No. 1.

Portable Down-draft Smokeless Boilers, 3000 to 30,000 sq. ft. radiation (steam), Plate No. 3.

Brick-set Up-draft Boilers, 900 to 14,000 sq. ft. radiation (steam), Plate No. 2.

Portable Up-draft Boilers, 2500 to 28,000 sq. ft. radiation (steam), Plate No. 4.

Type K Down-draft Smokeless Boilers, 1500 to 15,200 sq. ft. radiation (steam), Plate No. 5.

Type K Up-draft, 600 to 13,300 sq. ft. radiation (steam), Plate No. 6.

Kewanee Radiators, Plates Nos. 7, 8 and 9.

Kewanee Steel Tanks (Storage, Pneumatic Pressure, Gravel Basins, Blow-off and Air Receivers), Plate No. 9.

Tabasco Water Heaters and Kewanee Water Heating Garbage Burners, Plate No. 10.

Kewanee Power Boilers, Plate No. 11.

Steel Is Used Very Advantageously for Boiler Construction

It has a high coefficient of heat transmission. Steel boiler shells can be made of exactly the same thickness throughout, insuring a uniform transmission of heat and uniform mechanical strength that can be accurately determined.

A steel boiler goes into the building in one piece; making the pipe connections, bricking in or covering the boiler completes the installation. There are no sections to bolt together—no joints to leak or sections to crack. Insurance companies' tables of rates for cracked sections indicate that this item is an important consideration.

Kewanee Steel Riveted Heating Boilers Are Sturdy

They are built of the best steel obtainable—mild, open hearth plate with a tensile strength of 60,000 lbs. per sq. in.—riveted the same as high pressure boilers.

Although it is seldom necessary to carry more than 2 lbs. of steam on a low pressure heating boiler, Kewanee Firebox Boilers are all tested for 75 lbs. and insurance companies will insure them for from 40 to 60 lbs. working pressure. By the addition of extra stays and braces Kewanee Boilers regularly built for low pressure heating may be used for high pressure work.

Boiler Proportions Should All Be Based on Rated Capacity

Every boiler should be designed so that all essential features for continuous, economical steaming are provided and are properly proportioned to each other.

The chief fundamentals of successful boiler design are:

A firebox spacious enough to permit complete combustion of fuel before the hot gases enter the flues.

Heating surface so extensive that all the heat may be transmitted to the inside of the boiler.

Water content of large volume to hold water line level, but kept in active circulation to free the heating surface of bubbles.

Sufficient disengaging area for the liberation of steam from water without undue commotion.

Steam space of such dimensions as to insure dry steam, especially with overloads.

KEWANEE
TRADE-MARK

All Kewanee Boilers are designed with all essentials correctly proportioned.

Repair Cost of Kewanee Boilers Is Very Low

The average repair cost of a Kewanee Firebox Boiler is less than $2.00 per year. Many of the boilers making up this average have been in constant use for 25 years. Most repairs consisted of replacing grate bars—an inexpensive operation.

Economy of Kewanee Down-draft Smokeless Boilers Designed Especially for Soft Coal

A Kewanee Smokeless Boiler actually cuts overhead costs in two ways. (1) It encourages the use of soft coal; (2) the smokeless boiler burns soft coal so perfectly that no fuel is wasted.

In a Kewanee Smokeless Boiler, fuel is fed on to the upper water tube grates, the fire on the lower grates being maintained by the hot coals dropping on to them from above.

The draft is *down.* This draws all of the heat giving gases, which are distilled from the coal, down through the fire on the upper grate, then over the hot coals on the lower grate. This path of travel prevents any of the gases from passing up the stack unburned.

A Kewanee Smokeless Boiler is practically foolproof. Once installed it is impossible for it to get out of order if the janitor or fireman fires it according to directions and uses the same care in cleaning that every boiler requires.

Kewanee Up-draft Firebox Boilers for Any Kind of Fuel

Have the same long travel of the gases as the down-draft boilers but do not have water tube gates for distilling and preheating the gases in soft coal. If soft coal is to be burned in up-draft boilers with least smoke, the dead-plate or coking method of firing should be used.

The up-draft boilers have proved to be exceptionally long lived. Many of the first, built 36 years ago, are still giving good service. They burn any kind of fuel—hard, soft or lignite coal, coke, gas or oil—and will secure the maximum efficiency for an up-draft boiler; but when soft coal is to be burned in accordance with the most stringent smoke regulations, we recommend our down-draft type of boiler.

Specifications of Kewanee Boilers

Built in accordance with A.S.M.E. boiler code. Working pressure: regular, 15 lbs.; special, 100 lbs. This code is used only as a minimum limit. The equipment on all brick-set boilers includes Century rocking grates, fire door and frame, ash pit front with ash door and draft doors, necessary soot doors, and bearing plates with expansion rollers for supporting boiler shell on brick pier at rear. Firing tools include hoe, poker, slice bar and tube scraper. Rear flue clean-out doors are furnished with smokeless boilers, brick-set type. Special firebrick tile to fit header, is furnished with all smokeless boilers. With portable type boilers we furnish all castings for erecting boilers, including cast iron ash pit base for smaller sizes.

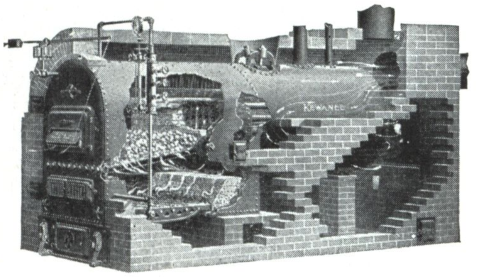
Extra trimmings for steam boilers consist of water column with water gauge and three compression cocks, steam gauge with siphon and cock, pop safety valve, and Kewanee automatic Sylphon draft regulator with lever, weights, pulleys, chains and angle valve. No trimmings are furnished with water boilers.

Sufficient handholes are provided for cleaning purposes, and manholes are included in brick-set boilers 42 in. in diameter and larger, and in portable boilers 54 in. and larger.

The rated capacity of every Kewanee Boiler is the number of square feet of direct cast iron radiating surface, or equivalent, which the boiler will carry if sufficient radiation is installed to heat the building to a temperature of 70° F. Rating is based on a standard for steam of 2 lbs. pressure at the boiler, and for water on a mean temperature of 180° F. as the water leaves the boiler.

Continued on next page

PLATE NO. 1. KEWANEE BRICK-SET SMOKELESS BOILERS FOR HEATING



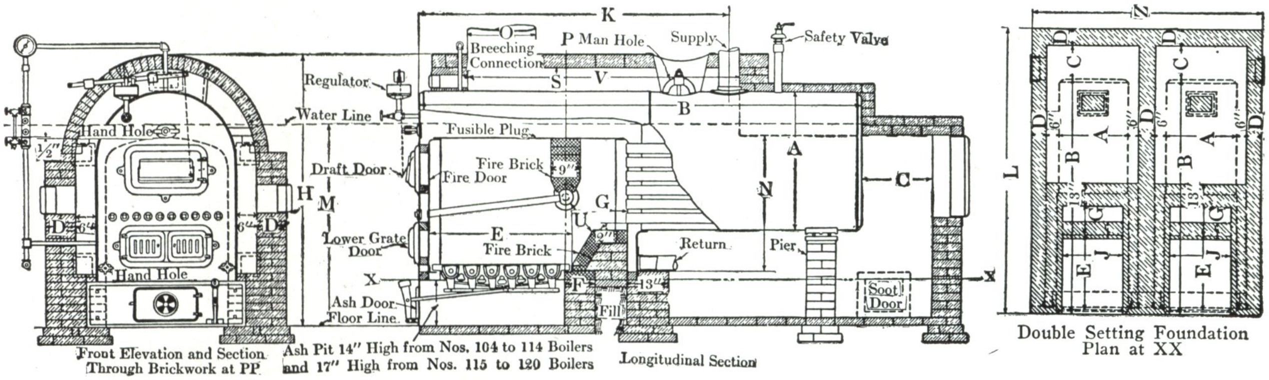
This boiler is intended for use in apartment houses, hotels, office buildings, factories or garages, where the fuel to be burned is bituminous (soft) coal, oil, sawdust or refuse, although anthracite (hard) coal can also be burned in this boiler with good results. When this boiler is used for oil burning, the extreme heat of the burning oil is developed and absorbed by the large water content kept in rapid circulation by the water grate.

The first cost of this type of boiler set in place, with a good brick setting is, approximately, the same as that of the portable covered with asbestos.

Setting can be arranged for either front or rear smoke outlet.

It frequently happens that an owner will have sufficient brick left over from his building construction for his boiler setting, in which case he saves money in the use of this type of boiler. In fuel saving the brick-set *if kept clean* is as economical as the portable type.

The illustration shows the arrangement of the double grate and long travel of the gases. Recent tests of these boilers prove that when burning soft coal, under conditions prevailing in most large buildings, their efficiency ranges from 73% to 81%.


K
O
Breeching Connection
P Man Hole
Supply
Safety Valve
Regulator
S
V
Water Line
B
Hand Hole
Fusible Plug
½″
A
Draft Door
Fire Brick
Fire Door
9″
H
M
N
C
D
6″
G
U
Lower Grate Door
E
Fire Brick
Return
Pier
X
Hand Hole
F
13″
Ash Door
Floor Line
Fill
Soot Door
X
Z
L
D
C
A
B
6″
13″
G
E
J

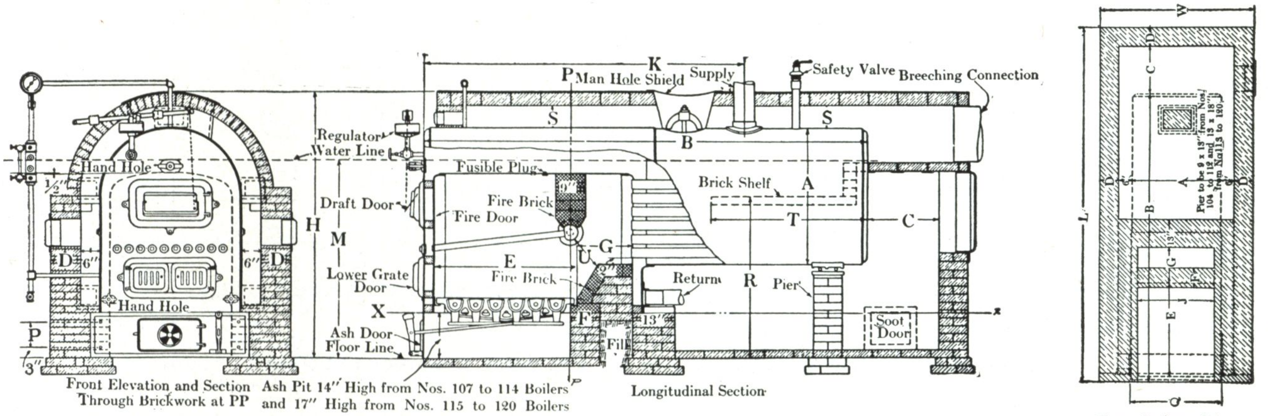
Front Elevation and Section Through Brickwork at PP

Ash Pit 14″ High from Nos. 104 to 114 Boilers and 17″ High from Nos. 115 to 120 Boilers

Longitudinal Section

Double Setting Foundation Plan at XX

Kewanee Smokeless Boiler, Nos. 104 to 120, with Stack Connection at Front


K
P
Man Hole Shield
Supply
Safety Valve
Breeching Connection
S
S
B
Regulator
Water Line
Hand Hole
Fusible Plug
Brick Shelf
A
Fire Brick
Fire Door
Draft Door
H
M
T
C
½″
D
6″
G
U
E
Lower Grate Door
Fire Brick
Return
R
Pier
X
Hand Hole
F
13″
P
Ash Door
Floor Line
Fill
Soot Door
3″
W
L
C
D
A
B
G
E
J
Q
Pier to be 9 x 18″ from Nos. 104 to 112 and 13 x 18″ from Nos. 113 to 120

Front Elevation and Section Through Brickwork at PP

Ash Pit 14″ High from Nos. 107 to 114 Boilers and 17″ High from Nos. 115 to 120 Boilers

Longitudinal Section

Foundation Plan at XX

Kewanee Smokeless Boiler, Nos. 104 to 120, with Stack Connection at Rear

Boiler No.	Ratings, sq. ft.		Upper grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																							*Number of brick	
					Breeching		Stack																															
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Z	Common	Fire
104	1600	2600	5.9	206	20	26	18	24	45	55	5	3	1½	36	103	17	9	31	9	14	77	31	72	129	55	36	20	8	36	47	7	36	7	63	66	123	2200	85
105	2000	3300	7.2	243	20	26	18	24	45	55	6	3	2	36	121	17	9	37	9	14	77	31	84	147	55	36	20	8	36	47	7	42	8	75	66	123	2350	85
106	2300	3800	8.4	288	22	28	20	26	45	55	6	3	2	36	138	17	9	43	9	14	77	31	96	165	55	36	22	8	36	47	7	54	9	87	66	123	2450	85
107	2600	4300	8.6	297	22	28	20	26	50	60	6	4	2	42	118	22	9	37	9	17	83	37	90	149	58½	39	22	8	36	50	7	36	9	84	60	135	2600	100
108	3100	5100	10.1	345	22	30	20	28	50	60	6	4	2	42	136	22	9	43	9	17	83	37	96	167	58½	39	22	8	42	50	7	48	10	90	60	135	2850	100
109	3600	5900	11.4	393	24	32	22	30	50	60	6	4	2½	42	154	22	9	49	9	17	83	37	105	185	58½	39	24	8	42	50	7	60	12	96	60	135	3100	100
110	4000	6600	11.8	425	24	32	22	30	50	60	6	4	2½	48	148	22	9	43	13	23	90	43	106	179	61	42	24	8	48	53	8	54	10	97	66	147	3700	130
111	4700	7800	13.2	480	27	34	24	32	55	60	6	4	2½	48	166	22	9	49	13	23	90	43	116	197	61	42	27	8	48	53	8	66	11	107	66	147	4000	130
112	5500	9100	15.0	535	27	34	24	32	55	60	7	5	3	48	184	22	9	55	13	23	90	43	124	215	61	42	27	8	48	53	8	80	12½	117	66	147	4300	130
113	6500	10700	17.1	628	30	36	28	34	60	70	7	5	3	54	189	24	13	55	18	23	96	49	132	226	66	48	30	8	54	56	8	84	13	120	92	171	6000	155
114	7500	12400	19.1	741	30	38	28	36	60	70	7	5	3½	54	219	24	13	61	18	23	96	49	138	256	66	48	30	8	54	56	8	102	14	126	92	171	6600	155
115	8500	14000	21.1	839	34	42	32	38	60	70	7	5	3½	60	214	24	13	61	18	29	108	54	142	251	75	51	34	11	60	63	10	90	14	130	98	183	7350	215
116	10000	16500	23.3	973	34	42	32	38	60	75	7	5	4	60	244	24	13	67	18	29	108	54	156	281	75	51	34	11	60	63	10	108	15½	144	98	183	7900	215
117	11500	19000	23.5	1064	36	44	34	40	70	75	8	6	4	66	220	24	13	61	18	29	114	60	144	257	80	58	36	11	66	66	10	90	14	132	104	195	7800	250
118	13000	21500	25.9	1194	36	45	34	42	70	80	8	6	4	66	244	24	13	67	18	29	114	60	156	281	80	58	36	11	66	66	10	108	15½	144	104	195	8300	250
119	14000	23100	28.5	1291	38	48	36	44	70	80	8	6	2–2½	72	220	28	13	67	18	29	120	66	145	271	85½	63	38	11	72	69	10	84	16	133	110	207	8700	310
120	16000	26400	31.3	1456	38	50	36	46	70	80	8	6	2–3	72	244	28	13	73	18	29	120	66	157	285	85½	63	38	11	72	69	10	102	17	145	110	207	9300	310

*Foundations not included.

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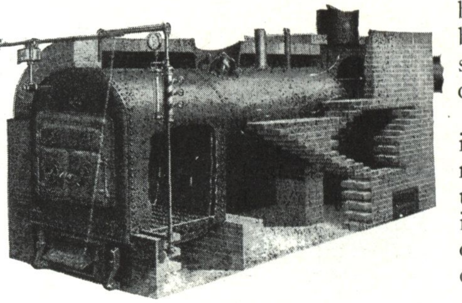
PLATE NO. 2. KEWANEE BRICK-SET UP-DRAFT BOILERS FOR HEATING

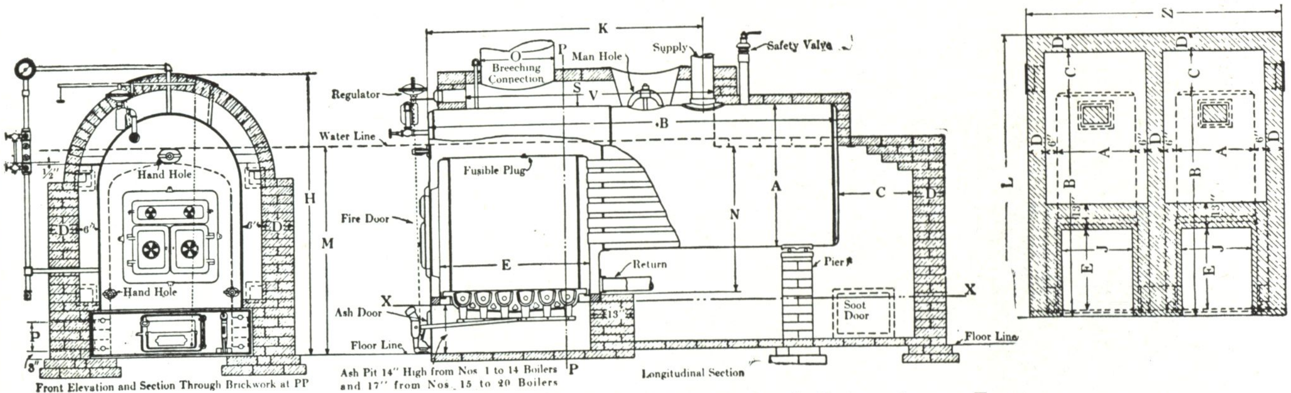


For apartment houses, hotels, office buildings, factories, garages, etc. Will burn any kind of fuel—hard, soft or lignite coal or oil, but should only be used for soft coal in territories where there are no stringent smoke laws.

Setting can be arranged for either front or rear smoke outlet.

The first cost of this type of boiler set in place with a good brick setting is, approximately, the same as that of the portable up-draft covered with asbestos.

The efficiency and fuel saving of the brick-set is, approximately, the same as the portable up-draft of the same rated capacity and it is generally only a matter of preference with the architect or owner which to select.

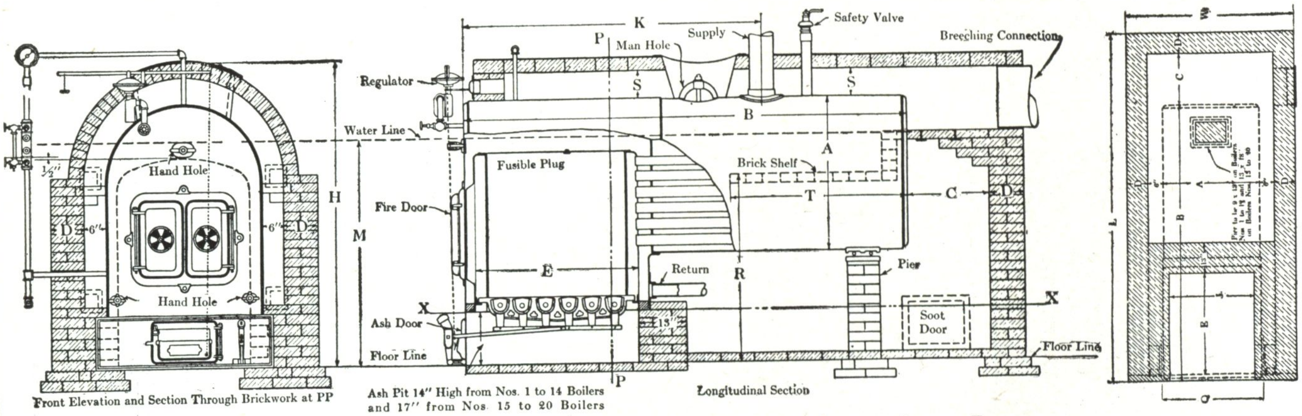

Hand Hole
D
6"
½"
Hand Hole
H
M
P
8"
K
O
Breeching Connection
P
Man Hole
Supply
Safety Valve
Regulator
S
V
B
Water Line
Fusible Plug
Fire Door
A
N
C
D
E
Return
Pier
X
Ash Door
13"
Soot Door
X
Floor Line
P
Floor Line
Z
L
D
C
A
B
E
J
6"
13"

Front Elevation and Section Through Brickwork at PP

Ash Pit 14" High from Nos 1 to 14 Boilers and 17" from Nos. 15 to 20 Boilers

Longitudinal Section

Kewanee Up-draft Boiler, Nos. 1 to 20, with Stack Connection at Front


Hand Hole
D
6"
½"
Hand Hole
H
M
K
P
Man Hole
Supply
Safety Valve
Breeching Connection
Regulator
S
S
B
Water Line
A
Fusible Plug
Brick Shelf
Fire Door
T
C
D
E
Return
R
Pier
X
Ash Door
13"
Soot Door
X
Floor Line
P
Floor Line
W
L
D
C
A
B
J
E
G

Front Elevation and Section Through Brickwork at PP

Ash Pit 14" High from Nos. 1 to 14 Boilers and 17" from Nos. 15 to 20 Boilers

Longitudinal Section

Kewanee Up-draft Boiler, Nos. 1 to 20, with Stack Connection at Rear

Boiler No.	Ratings, sq. ft.		Grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																				*Number of common brick
					Breeching		Stack																											
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	H	J	K	L	M	N	O	P	Q	R	S	T	V	W	Z	
1	900	1500	4.4	113	12	18	12	45	40	45	4	2½	1¼	30	77	17	9	26	70	25	48	103	52	32	12	8	30	44	6	30	38	60	111	1450
2	1050	1700	5.4	131	14	20	12	45	40	45	4	2½	1¼	30	90	17	9	32	70	25	56	116	52	32	14	8	30	44	6	38	46	60	111	1600
3	1200	2000	6.4	147	16	22	14	45	40	45	5	3	1¼	30	102	17	9	38	70	25	66	128	52	32	16	8	30	44	6	44	57	60	111	1750
4	1400	2300	6.8	180	16	22	14	45	40	45	5	3	1½	36	90	17	9	32	77	31	59	116	55	36	16	8	36	47	7	36	49	66	123	1900
5	1700	2800	8.0	215	18	24	16	45	40	45	6	3	1½	36	108	17	9	38	77	31	71	135	55	36	18	8	36	47	7	42	61	66	123	2150
6	2000	3300	9.3	250	18	24	16	45	45	45	6	3	2	36	126	17	9	44	77	31	83	152	55	36	18	8	36	47	7	54	73	66	123	2400
8	2600	4300	11.1	305	20	28	18	50	45	50	6	4	2	42	120	22	9	44	83	37	80	151	58½	39	20	8	42	50	7	48	75	72	135	2650
9	3000	5000	12.6	350	22	32	20	50	45	50	6	4	2	42	138	22	9	50	83	37	86	169	58½	39	22	8	42	50	7	60	81	72	135	2900
10	3500	5800	12.9	368	22	32	20	50	45	50	6	4	2	48	126	22	9	44	90	43	84	157	61	42	22	8	48	53	8	54	75	78	135	3000
11	4000	6600	14.7	420	24	32	22	50	50	50	6	4	2½	48	144	22	9	50	90	43	94	175	61	42	24	8	48	53	8	66	87	78	135	3300
12	4500	7400	16.5	472	24	34	22	50	50	50	7	5	2½	48	162	22	9	56	90	43	102	193	61	42	24	8	48	53	8	80	93	78	135	3600
13	5500	9100	18.8	560	28	36	26	55	50	55	7	5	2½	54	167	24	13	56	96	49	110	204	66	48	28	8	54	56	8	84	97	92	171	5300
14	6500	10700	20.8	673	28	36	26	60	50	60	7	5	3	54	197	24	13	62	96	49	116	234	66	48	28	8	54	56	8	102	103	92	171	5900
15	7500	12400	22.9	743	32	40	30	60	55	60	7	5	3	60	186	24	13	62	108	54	114	223	75	51	32	11	60	63	10	90	101	98	183	6500
16	8700	14400	25.1	873	32	40	30	70	55	70	7	5	3½	60	216	24	13	68	108	54	128	253	75	51	32	11	60	63	10	108	115	98	183	7200
17	10000	16500	25.5	954	32	40	30	70	60	70	8	6	3½	66	192	24	13	62	114	60	116	229	80	58	32	11	66	66	10	90	103	104	195	7200
18	11000	18200	28.0	1080	32	42	30	70	60	70	8	6	3½	66	216	24	13	68	114	60	128	253	80	58	32	11	66	66	10	108	116	104	195	7700
19	12000	19800	30.8	1167	36	44	34	70	60	70	8	6	4	72	192	28	13	68	120	66	117	233	85½	63	36	11	72	69	10	84	105	110	207	7700
20	14000	23100	33.5	1329	36	46	34	70	60	70	8	6.	4	72	216	28	13	74	120	66	129	257	85½	63	36	11	72	69	10	102	117	110	207	8200

*Foundations not included.

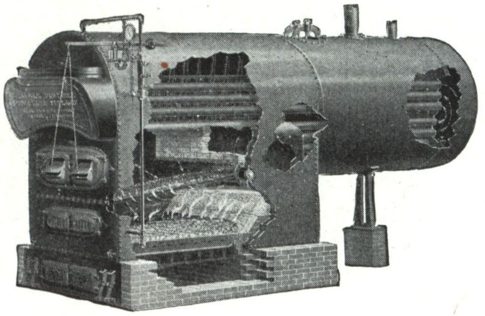
Continued on next page

PLATE NO. 3. KEWANEE SMOKELESS PORTABLE BOILERS

This boiler is intended for use in apartment houses, hotels, office buildings and factories, where the chimney heights are 50 or more feet, depending on the capacity required.

It generally requires less floor space than the brick-set type, and is easier to clean. For this reason it is frequently selected.

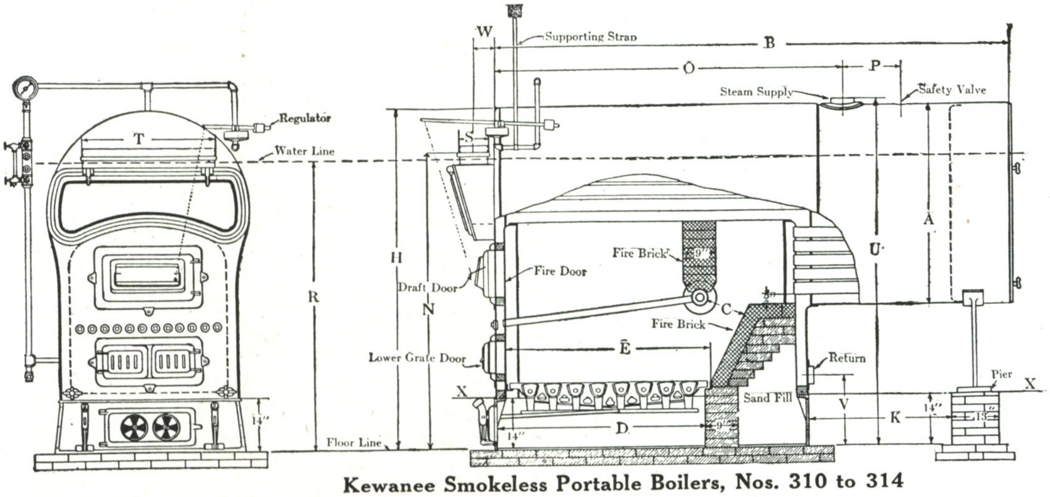
This boiler is designed primarily for soft coal operation, but is also suitable for oil, sawdust, refuse, or hard coal.



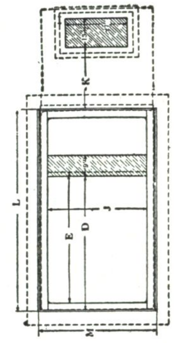
The extreme heat of burning oil is developed and absorbed with high efficiency by the large water content kept in rapid circulation by the water grate.

Boiler No. 314 (and smaller) constructed with enlarged cylinder. Iron ash pit furnished with Boiler No. 309 (and smaller). Boiler No. 310 (and larger) set on brick foundation as shown.

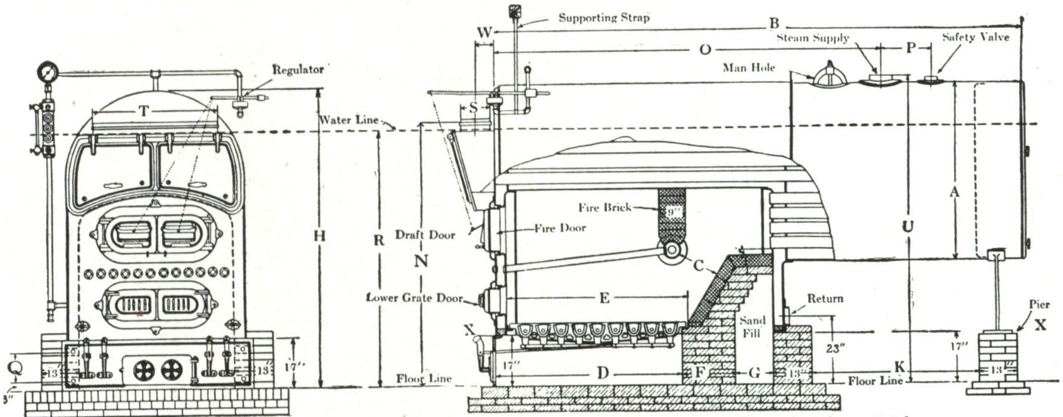
Note: Boilers Nos. 310, 311, 312, 313, and 314 are constructed with bell top, but are set on brick foundation instead of cast iron base as shown.



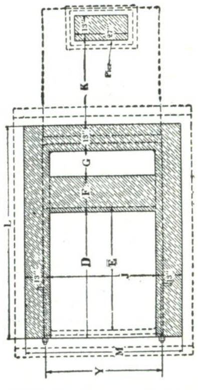
Kewanee Smokeless Portable Boilers, Nos. 310 to 314



Foundation and Setting Plan at XX, Boilers, Nos. 310 to 314



Kewanee Smokeless Portable Boilers, Nos. 315 to 324



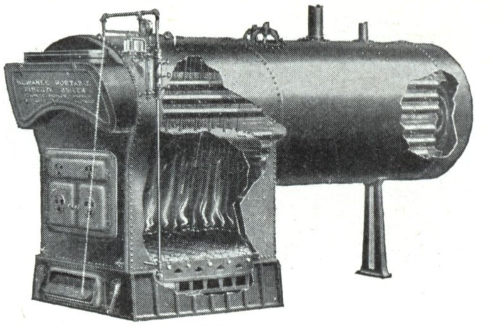
Foundation and Setting Plan at XX, Boilers, Nos. 315 to 324

Boiler No.	Ratings, sq. ft.		Upper grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																							Space required to open rear flue doors, in.	*Number of brick		Outside surface to be covered, sq. ft.
					Breeching		Stack																																	
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y		Common	Fire	
307	3000	5000	8.8	297	22	30	20	28	50	60	6	4	2	48	109	9	38	37	9	..	84	37	29	61	46	76	71	12	..	71	10	36	85	19	8	..	26	200	115	148
308	3500	5800	10.1	352	22	30	20	28	55	65	6	4	2	48	125	10	44	43	9	..	84	37	39	67	46	76	80	14	..	71	10	36	85	19	8	..	26	200	115	157
309	4000	6600	11.4	391	22	30	20	28	55	65	6	4	2½	48	137	11½	50	49	9	..	84	37	45	73	46	76	87	14	..	71	10	36	85	19	8	..	26	200	115	173
310	4500	7400	12.9	446	24	34	22	31	55	65	6	4	2½	54	131	11	50	49	13	12	89	43	27	84	60	80	90	13	8	76	10	42	90	19	8	48	28	800	155	184
311	5000	8300	14.7	496	24	34	22	31	55	65	6	4	3	54	143	12½	56	55	13	12	89	43	33	90	60	80	98	13	8	76	10	42	90	19	8	48	28	825	155	212
312	5500	9100	16.5	546	24	34	22	31	60	70	6	4	3	54	155	14	62	61	13	12	89	43	39	96	60	80	105	15	8	76	10	42	90	19	8	48	28	850	155	221
313	6000	9900	17.1	592	26	38	24	34	60	70	7	5	3	60	155	12½	56	55	13	12	98	49	45	90	66	88	105	15	8	83	12½	46	99	20	9¼	54	32	1075	195	255
314	6500	10700	18.5	623	26	38	24	34	60	70	7	5	3½	60	167	14	62	61	13	12	98	49	51	96	66	88	111	18	8	83	12½	46	99	20	9¼	54	32	1050	195	265
315	7500	12400	20.0	721	28	40	26	36	65	75	7	5	3½	60	183	14	63	61	18	13	101	53	57	107	79	90	131	16	11	87	12½	46	103	23	9¼	60	32	1300	210	266
316	8500	14000	21.4	773	28	40	26	36	65	75	7	5	4	60	192	15	69	67	18	13	101	53	63	113	79	90	138	18	11	87	12½	46	103	23	9¼	60	32	1350	215	280
317	10000	16500	23.5	912	30	44	28	40	65	75	8	6	4	66	189	15	63	61	18	13	107	59	62	107	85	93	132	16	11	90	15	50	109	23	10½	66	35	1300	240	290
318	12000	19800	25.9	1053	32	46	30	42	70	80	8	6	4	66	213	16	69	67	18	13	107	59	80	113	85	93	141	18	11	90	15	50	109	23	10½	66	35	1350	241	330
319	14000	23100	28.5	1204	34	50	32	46	70	80	8	6	2–2½	72	199	16	69	67	18	13	113	65	63	113	91	100	139	15	11	96	17	54	115	23	11½	72	37	1375	255	335
320	16000	26400	29.9	1316	34	50	32	46	70	80	8	6	2–3	72	215	17	75	73	18	13	113	65	74	119	91	100	146	18	11	96	17	54	115	23	11½	72	37	1450	255	360
321	18000	29700	32.6	1458	36	52	34	48	80	90	8	6	2–3	78	214	17	75	73	18	13	115	71	72	119	97	101	146	15	11	97	17	60	117	23	11½	78	40	1400	290	370
322	20000	33000	34.6	1549	36	52	34	48	90	100	8	6	2–3	78	226	18	75	73	18	19	115	71	79	125	97	101	153	16	11	97	17	60	117	23	11½	78	40	1475	315	400
323	25000	40000	41.7	2074	40	56	38	54	90	100	10	6	2–3½	84	241	18	81	79	18	19	121	77	84	131	103	109	164	18	11	105	20	60	123	23	13	84	43	1575	425	455
324	30000	48000	44.8	2629	42	56	40	54	100	110	10	6	3–3½	84	289	19	87	85	18	19	121	77	126	137	103	109	180	20	11	105	20	64	123	23	13	84	43	1600	425	545

*Foundations not included.

Continued on next page

PLATE NO. 4. KEWANEE UP-DRAFT PORTABLE BOILERS FOR HEATING



Designed for hard coal, oil, coke or gas firing.

This boiler now being used extensively in the East with buckwheat coal under natural or forced draft and is found to be very efficient in this kind of service.

Can be used for soft coal where not prevented by stringent smoke laws.

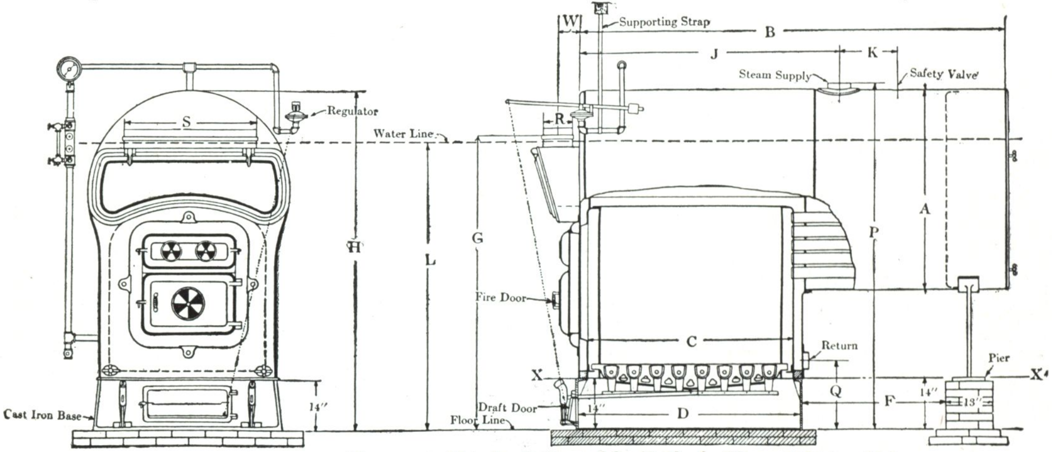
Requires a stack 50 ft. or higher, depending on capacity.

Boiler No. 414 (and smaller) is made with enlarged cylinder as shown.

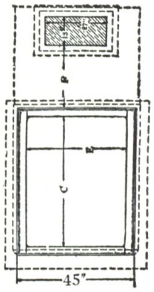
Iron ash pits, as illustrated, furnished with No. 409 and smaller.

No. 410 (and larger) set on brick foundation.

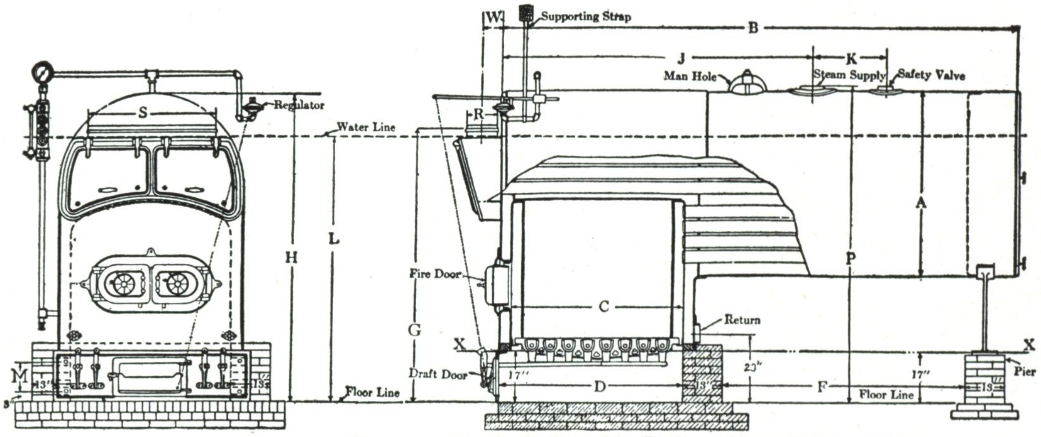
No. 415 and larger made with firebox same width as cylinder.


S
Regulator
Water Line
H
L
G
Cast Iron Base
14"
W
Supporting Strap
B
J
K
Steam Supply
Safety Valve
R
A
P
Fire Door
C
Return
X
X'
Draft Door
Floor Line
14"
D
Q
F
14"
13"
Pier

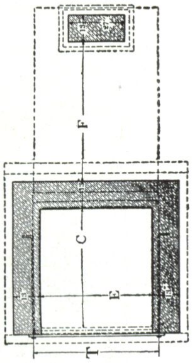
Kewanee Up-draft Portable Boilers, Nos. 407 to 410



Foundation and Setting Plan at XX, Boilers Nos. 407 to 410


S
Regulator
Water Line
H
L
M
13"
13"
Floor Line
W
Supporting Strap
B
J
K
Man Hole
Steam Supply
Safety Valve
R
A
P
Fire Door
C
Return
G
X
X
Draft Door
17"
D
23"
F
17"
Floor Line
13"
Pier

Kewanee Up-draft Portable Boilers, Nos. 415 to 424



Foundation and Setting Plan at XX, Boilers Nos. 415 to 424

Boiler No.	Ratings, sq. ft.		Grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																	*Number of common brick	Outside surface to be covered, sq. ft.
					Breeching		Stack																									
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R	S	T		
407	2500	4100	9.6	278	22	30	20	28	50	60	6	4	2	48	103	38	45	36	39	76	84	56	13	71	....	85	19	10	36	...	70	115
408	2900	4800	11.1	310	22	30	20	28	50	60	6	4	2	48	114	44	51	36	44	76	84	63	14	71	....	85	19	10	36	...	70	130
409	3500	5800	12.6	373	22	30	20	28	55	65	6	4	2	48	132	50	57	36	57	76	84	75	18	71	....	85	19	10	36	...	70	150
410	4000	6600	12.9	416	24	34	22	21	55	65	6	4	2	54	120	44	47	43	45	80	89	66	16	76	8	90	19	10	42	48	450	155
411	4500	7400	14.7	465	24	34	22	21	55	65	6	4	2½	54	132	50	53	43	52	80	89	76	18	76	8	90	19	10	42	48	480	175
412	5000	8300	16.5	515	24	34	22	21	60	70	6	4	2½	54	145	56	59	43	58	80	89	96	13	76	8	90	19	10	42	48	510	185
413	5500	9100	18.8	565	26	38	24	34	60	70	7	5	2½	60	149	56	59	49	62	88	98	99	16	83	8	99	20	12½	46	54	530	190
414	6000	9900	20.8	626	26	38	24	34	60	70	7	5	3	60	163	62	65	49	70	88	98	104	18	83	8	99	20	12½	46	54	560	220
415	7000	11600	20.7	676	28	40	26	36	65	75	7	5	3	60	172	56	60	53	79	90	101	101	21	87	11	103	23	12½	46	60	680	250
416	8000	13200	22.9	778	28	40	26	36	65	75	7	5	3	60	194	62	66	53	95	90	101	113	27	87	11	103	23	12½	46	60	710	280
417	9500	15700	25.5	929	30	44	28	40	65	75	8	6	3½	66	189	62	66	59	89	93	107	112	18	90	11	109	23	15	50	66	740	290
418	11000	18200	28.0	1040	32	46	30	42	70	80	8	6	3½	66	208	68	72	59	101	93	107	122	30	90	11	109	23	15	50	66	760	310
419	13000	21500	30.8	1168	34	50	32	46	70	80	8	6	4	72	191	68	72	65	83	100	113	116	18	96	11	115	23	17	54	72	790	315
420	15000	24800	33.5	1303	34	50	32	46	70	80	8	6	4	72	210	74	78	65	95	100	113	133	24	96	11	115	23	17	54	72	820	345
421	17500	28500	36.6	1514	36	52	34	48	80	90	8	6	2–2½	78	215	74	78	71	100	101	115	135	24	97	11	117	23	17	60	78	840	385
422	20000	32000	39.6	1711	36	52	34	48	90	100	8	6	2–3	78	239	80	84	71	118	101	115	144	30	97	11	117	23	17	60	78	885	425
423	25000	40000	42.9	2209	40	56	38	54	90	100	10	6	2–3	84	241	80	84	77	118	109	121	150	24	105	11	123	23	20	64	84	900	455
424	28000	45000	46.1	2427	42	56	40	54	100	100	10	6	2–3	84	265	86	90	77	136	109	121	150	21	105	11	123	23	20	64	84	935	505

*Foundations not included.

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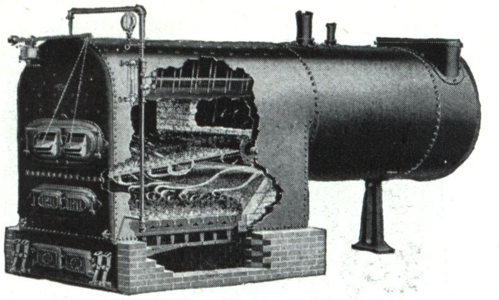
PLATE NO. 5. KEWANEE SMOKELESS PORTABLE TYPE K BOILERS FOR HEATING

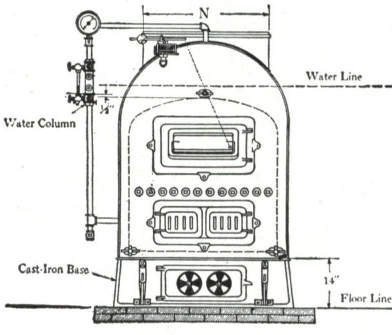


Portable Type K Boiler for smaller buildings is constructed along the same lines that the larger Kewanee Boilers are built.

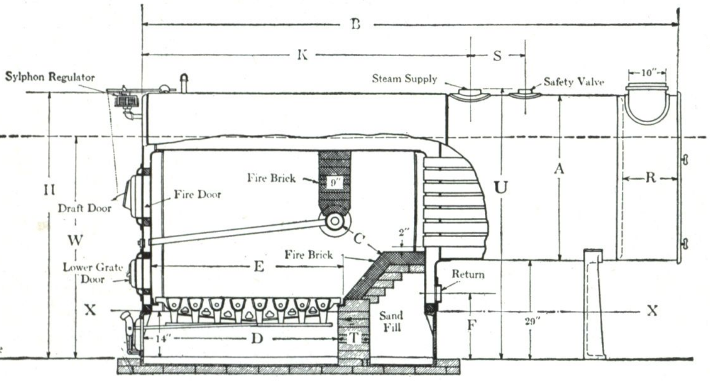
This type of boiler was designed for conditions where very *limited* headroom and chimney height are available, as in factory or garage work, though it is suitable in any other type of building where either or both of these limitations exist.

This boiler, although designed primarily for soft coal operation, is suitable for any of the varieties of fuel mentioned for the other portable or brick-set types.

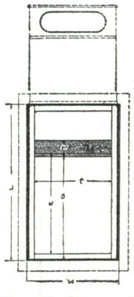
The illustration shows the Nos. 113K to 120K boilers; 104K to 112K have cast iron base.


N
½"
Water Column
Cast-Iron Base
14"
Floor Line

Front Elevation

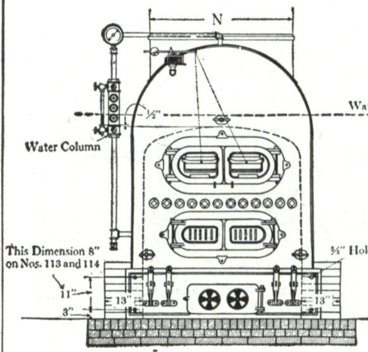

B
K
S
Sylphon Regulator
Steam Supply
Safety Valve
10"
Water Line
H
Draft Door
Fire Door
Fire Brick
9"
W
Lower Grate Door
C
2"
Fire Brick
E
A
U
R
Return
X
Sand Fill
F
X
14"
D
T
29"

Longitudinal Section

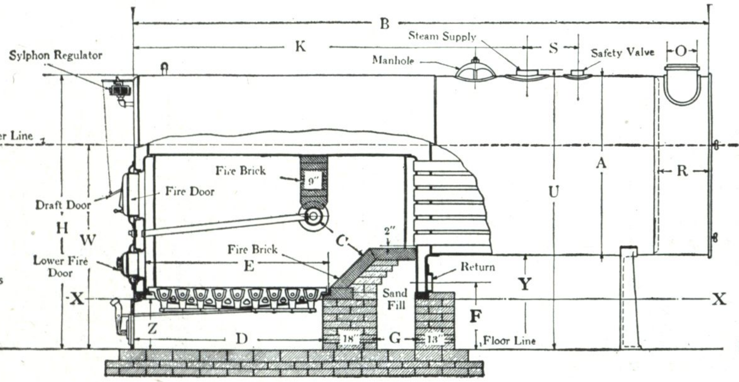


Foundation and Setting Plan at XX, Boilers Nos. 104K to 112K

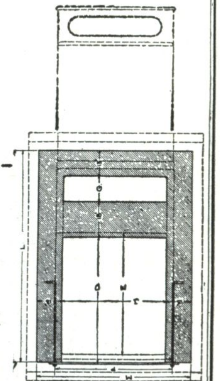
Kewanee Smokeless Portable Boilers, Nos. 104K to 112K


N
½"
Water Column
This Dimension 8" on Nos. 113 and 114
¾" Holes
11"
3"
13"
13"

Front Elevation


B
K
Steam Supply
S
Safety Valve
O
Sylphon Regulator
Manhole
Water Line
Fire Brick
9"
Fire Door
Draft Door
H
W
C
2"
Fire Brick
E
Lower Fire Door
A
U
R
Return
Sand Fill
Y
X
X
F
Z
D
18"
G
13"
Floor Line

Longitudinal Section



Foundation and Setting Plan at XX, Boilers Nos. 113K to 120K

Kewanee Smokeless Portable Boilers, Nos. 113K to 120K

Boiler No.	Ratings, sq. ft.		Upper grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																							Space required to open rear flue doors, in.	Outside surface to be covered, sq. ft.	*Number of brick	
					Breeching		Stack																																	
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	W	Y	Z			Common	Fire
104K	1500	2450	5.9	157	20	26	18	24	40	50	5	3	1½	36	119	7	32	31	19	..	65	31	72	51	40	24	10	..	..	16	15	9	67	55	29	14	21	93	....	85
105K	1900	3100	7.2	185	20	26	18	24	40	50	6	3	2	36	137	8	32	37	19	..	65	31	84	57	40	24	10	..	..	16	18	9	67	55	29	14	21	102	....	85
106K	2200	3600	8.4	220	22	28	20	26	40	50	6	3	2	36	155	9	44	43	19	..	65	31	96	63	40	24	10	..	..	16	18	9	67	55	29	14	21	115	....	85
107K	2500	4100	8.6	234	22	28	20	26	45	55	6	4	2	42	134	9	38	37	19	..	71	37	90	60	46	30	10	..	..	16	13	9	73	58½	29	14	24	131	....	115
108K	2900	4800	10.1	271	22	30	20	28	45	55	6	4	2	42	152	10	44	43	19	..	71	37	96	66	46	30	10	..	..	16	12	9	73	58½	29	14	24	148	....	115
109K	3400	5600	11.4	308	24	32	22	30	45	55	6	4	2½	42	170	12	50	49	19	..	71	37	105	72	46	30	10	..	..	16	13	9	73	58½	29	14	24	164	....	115
110K	3800	6300	11.8	338	24	32	22	30	45	55	6	4	2½	48	164	10	44	43	19	..	77	43	106	72	54	36	10	..	..	16	16	13	79	61	29	14	27	180	....	155
111K	4400	7400	13.2	381	27	34	24	32	50	55	6	4	2½	48	182	11	50	49	19	..	77	43	116	78	54	36	10	..	..	16	18	13	79	61	29	14	27	199	....	155
112K	5200	8600	15.0	425	27	34	24	32	50	55	7	5	3	48	200	12½	56	55	19	..	77	43	124	84	54	36	10	..	..	16	18	13	79	61	29	14	27	218	....	155
113K	6200	10100	17.1	500	30	36	28	34	55	65	7	5	3	54	205	13	57	55	19	6	83	49	132	94	75	46	10	54	..	16	21	18	85	66	29	14	30	243	955	195
114K	7100	11800	19.1	590	30	38	28	36	55	65	7	5	3½	54	235	14	63	61	19	6	83	49	138	100	75	46	10	54	..	16	30	18	85	66	29	14	30	278	980	195
115K	8100	13300	21.1	677	34	42	32	38	55	65	7	5	3½	60	232	14	63	61	23	12	93	54	142	106	80	50	12	60	..	18	26	18	95	75	33	17	33	311	1300	210
116K	9500	15700	23.3	787	34	42	32	38	55	70	7	5	4	60	262	15½	69	67	23	12	93	54	156	112	80	50	12	60	..	18	30	18	95	75	33	17	33	350	1350	215
117K	10900	18000	23.5	879	36	44	34	40	65	70	8	6	4	66	238	14	63	61	23	12	99	60	144	106	86	54	12	66	..	18	30	18	101	80	33	17	36	350	1300	240
118K	12300	20400	25.9	987	36	45	34	42	65	75	8	6	4	66	262	15½	69	67	23	12	99	60	156	112	86	54	12	66	..	18	30	18	101	80	33	17	36	384	1350	240
119K	13300	21900	28.5	1090	38	48	36	44	65	75	8	6	2–2½	72	238	16	69	67	23	12	105	66	145	112	92	68	13	72	..	18	20	18	107	85½	33	17	39	380	1375	255
120K	15200	25000	31.3	1230	38	50	36	46	65	75	8	6	2–3	72	262	17	75	73	23	12	105	66	157	118	92	68	13	72	..	18	34	18	107	85½	33	17	39	407	1450	255

*Foundations not included.

Continued on next page

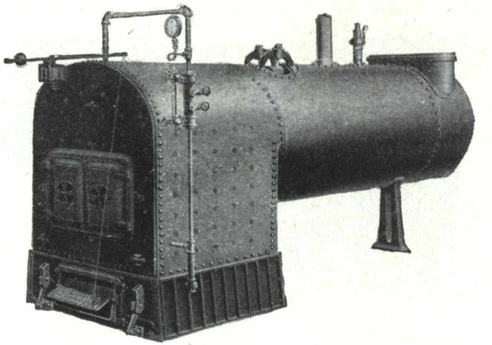
PLATE NO. 6. KEWANEE UP-DRAFT PORTABLE TYPE K BOILERS FOR HEATING

The Type K Boiler for smaller buildings is constructed along the same lines as the larger Kewanee Boilers.

Nos. 1K to 12K have cast iron base; 13K and larger have brick base.

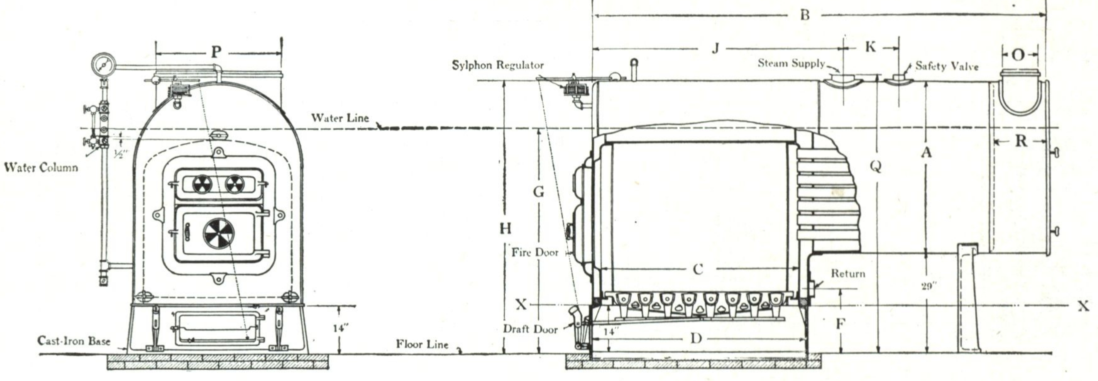
Type K Boilers will carry all their rated capacity.

Designed for conditions where very limited headroom and chimney height are available, as in factory or garage work, though it is suitable in any other type of building where either or both of these limitations exist.



Will burn any kind of fuel with the maximum efficiency, but where soft coal is to be used in territories where there are stringent smoke laws, specify the Type K Smokeless.

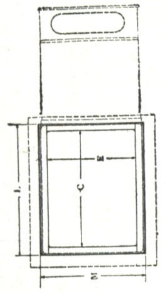
The illustration shows the Nos. 0K to 12K boilers; 13K to 20K have brick base.



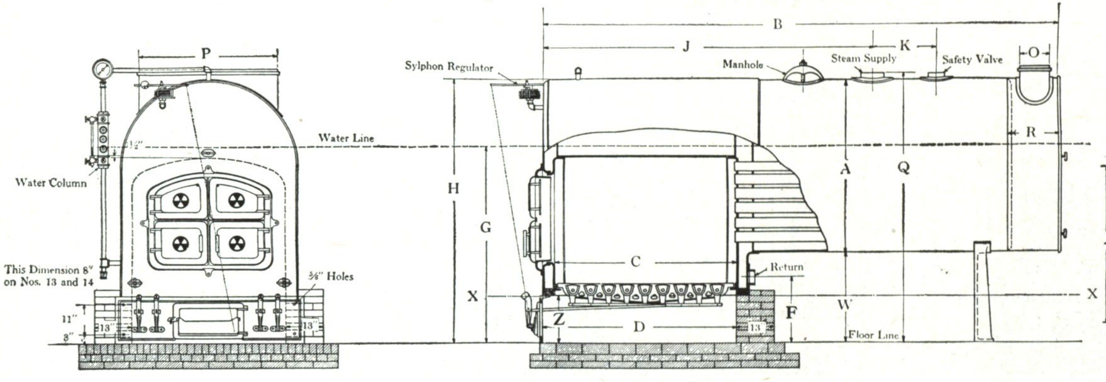
Front Elevation

Longitudinal Section

Kewanee Up-draft Portable Boilers, Nos. 0K to 12K



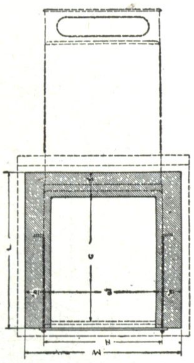
Foundation and Setting Plan at XX, Boilers Nos. 0K to 12K



Front Elevation

Longitudinal Section

Kewanee Up-draft Portable Boilers, Nos. 13K to 20K



Foundation and Setting Plan at XX, Boilers Nos. 13K to 20K

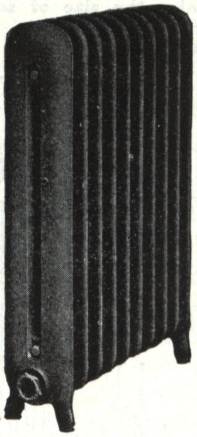
Boiler No.	Ratings, sq. ft.		Grate area, sq. ft.	Heating surface, sq. ft.	Diameter, in.				Min. height of stack, ft.		Size of openings, in.			Measurements shown on dimension diagrams, in inches																			Space required to open rear flue doors, in.	*Number of Common brick	Outside surface to be covered, sq. ft.
					Breeching		Stack																												
	Steam	Water			One boiler	Two boilers	One boiler	Two boilers	One boiler	Two boilers	Steam	Return	Safety valve	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	W	Z			
0K	600	1000	3.5	47	10	16	10	16	35	40	3	2	1	24	93	26	31	19	18	45	51	48	12	32	27	..	10	10	53	12	29	14	24	....	55
1K	850	1400	4.4	83	12	18	12	18	35	40	4	2½	1¼	30	94	26	33	24	18	52	59	48	12	34	34	..	8	16	61	16	29	14	18	....	68
2K	1000	1600	5.4	93	14	20	12	18	35	40	4	2½	1¼	30	106	32	39	24	18	52	59	56	15	40	34	..	8	16	61	16	29	14	18	....	77
3K	1150	1900	6.4	104	16	22	14	20	35	40	5	3	1¼	30	118	38	45	24	18	52	59	66	16	46	34	..	8	16	61	16	29	14	18	....	85
4K	1300	2200	6.8	139	16	22	14	20	35	40	5	3	1½	36	106	32	39	30	19	55	65	59	15	40	40	..	10	24	67	16	29	14	21	....	91
5K	1600	2600	8.0	164	18	24	16	22	35	40	6	3	1½	36	124	38	45	30	19	55	65	71	18	46	40	..	10	24	67	16	29	14	21	....	106
6K	1900	3100	9.3	190	18	24	16	22	40	40	6	3	2	36	142	44	51	30	19	55	65	83	18	52	40	..	10	24	67	16	29	14	21	....	120
8K	2450	4100	11.1	241	20	28	18	26	40	45	6	4	2	42	136	44	51	36	19	58½	71	80	13	52	46	..	10	30	73	16	29	14	24	....	133
9K	2850	4700	12.6	275	22	32	20	28	40	45	6	4	2	42	154	50	57	36	19	58½	71	86	13	58	46	..	10	30	73	16	29	14	24	....	149
10K	3300	5500	12.9	298	22	32	20	28	40	45	6	4	2	48	142	44	51	42	19	61	77	84	16	52	52	..	10	36	79	16	29	14	27	....	157
11K	3800	6300	14.7	338	24	32	22	30	45	45	6	4	2½	48	160	50	57	42	19	61	77	94	18	58	52	..	10	36	79	16	29	14	27	....	177
12K	4300	7000	16.5	378	24	34	22	32	45	45	7	5	2½	48	178	56	63	42	19	61	77	102	18	64	52	..	10	36	79	16	29	14	27	....	197
13K	5200	8600	18.8	447	28	36	26	34	45	50	7	5	2½	54	184	56	59	49	19	66	83	110	21	72	75	54	10	46	85	16	29	14	30	460	200
14K	6200	10100	20.8	537	28	36	26	34	45	55	7	5	3	54	214	62	65	49	19	66	83	116	30	78	75	54	10	46	85	16	29	14	30	490	235
15K	7100	11800	22.9	603	32	40	30	36	50	55	7	5	3	60	204	62	65	54	23	75	93	114	26	78	80	60	12	50	95	18	33	17	33	710	275
16K	8200	13700	25.1	708	32	40	30	36	50	65	7	5	3½	60	234	68	71	54	23	75	93	128	30	84	80	60	12	50	95	18	33	17	33	740	314
17K	9500	15700	25.5	791	32	40	30	36	55	65	8	6	3½	66	210	62	65	60	23	80	99	116	26¾	78	86	66	12	54	101	18	33	17	36	740	311
18K	10400	17300	28.0	896	32	42	30	38	55	65	8	6	3½	66	234	68	71	60	23	80	99	128	30	84	86	66	12	54	101	18	33	17	36	760	345
19K	11400	18800	30.8	992	36	44	34	40	55	65	8	6	4	72	210	68	71	66	23	85½	105	117	20	84	92	72	13	68	107	18	33	17	39	790	338
20K	13300	21900	33.5	1129	36	46	34	42	55	65	8	6	4	72	234	74	77	66	23	85½	105	129	34	90	92	72	13	68	107	18	33	17	39	820	366

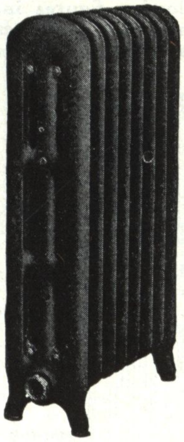
*Foundations not included.

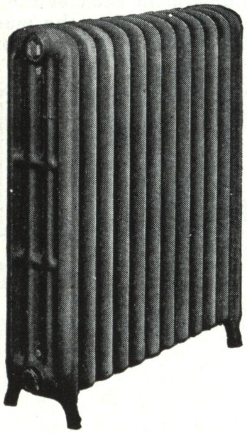
Continued on next page

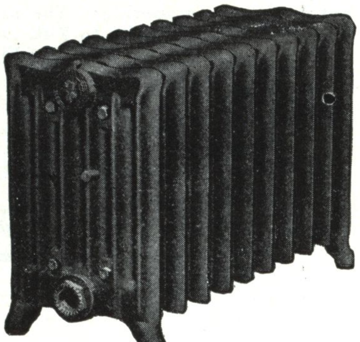
PLATE NO. 7. KEWANEE DIRECT RADIATORS—FLOOR TYPE

One-column


Two-column


Three-column


Four-column


Window Type

Sections	Length, in.	One-column					Length, in.	Two-column						Length, in.	Three-column						Length, in.	Four-column					
		Height, in.						Height, in.							Height, in.							Height, in.					
		38	32	26	23	20		45	38	32	26	23	20		45	38	32	26	22	18		45	38	32	26	22	18
		Rad., sq. ft. per section						Rad., sq. ft. per section							Rad., sq. ft. per section							Rad., sq. ft. per section					
		3	2½	2	1⅔	1½		5	4	3⅓	2⅔	2⅓	2		6	5	4½	3¾	3	2¼		10	8	6½	5	4	3
2	5	6	5	4	3⅓	3	5	10	8	6⅔	5⅓	4⅔	4	5	12	10	9	7½	6	4½	6	20	16	13	10	8	6
3	7½	9	7½	6	5	4½	7½	15	12	10	8	7	6	7½	18	15	13½	11¼	9	6¾	9	30	24	19½	15	12	9
4	10	12	10	8	6⅔	6	10	20	16	13⅓	10⅔	9⅓	8	10	24	20	18	15	12	9	12	40	32	26	20	16	12
5	12½	15	12½	10	8⅓	7½	12½	25	20	16⅔	13⅓	11⅓	10	12½	30	25	22½	18¾	15	11¼	15	50	40	32½	25	20	15
6	15	18	15	12	10	9	15	30	24	20	16	14	12	15	36	30	27	22½	18	13½	18	60	48	39	30	24	18
7	17½	21	17½	14	11⅔	10½	17½	35	28	23⅓	18⅔	16⅓	14	17½	42	35	31½	26½	21	15¾	21	70	56	45½	35	28	21
8	20	24	20	16	13⅓	12	20	40	32	26⅔	21⅓	18⅔	16	20	48	40	36	30	24	18	24	80	64	52	40	32	24
9	22½	27	22½	18	15	13½	22½	45	36	30	24	21	18	22½	54	45	40½	33¾	27	20¼	27	90	72	58½	45	36	27
10	25	30	25	20	16⅔	15	25	50	40	33⅓	26⅔	23⅓	20	25	60	50	45	37½	30	22½	30	100	80	65	50	40	30
11	27½	33	27½	22	18⅓	16½	27½	55	44	36⅔	29⅓	25⅔	22	27½	66	55	49½	41¼	33	24¾	33	110	88	71½	55	44	33
12	30	36	30	24	20	18	30	60	48	40	32	28	24	30	72	60	54	45	36	27	36	120	96	78	60	48	36
13	32½	39	32½	26	21⅔	19½	32½	65	52	43⅓	34⅔	30⅓	26	32½	78	65	58½	48¾	39	29¼	39	130	104	84½	65	52	39
14	35	42	35	28	23⅓	21	35	70	56	46⅔	37⅓	32⅔	28	35	84	70	63	52½	42	31½	42	140	112	91	70	56	42
15	37½	45	37½	30	25	22½	37½	75	60	50	40	35	30	37½	90	75	67½	56¼	45	33¾	45	150	120	97½	75	60	45
16	40	48	40	32	26⅔	24	40	80	64	53⅓	42⅔	37⅓	32	40	96	80	72	60	48	36	48	160	128	104	80	64	48
17	42½	51	42½	34	28⅓	25½	42½	85	68	56⅔	45⅓	39⅔	34	42½	102	85	76½	63¾	51	38¼	51	170	136	110½	85	68	51
18	45	54	45	36	30	27	45	90	72	60	48	42	36	45	108	90	81	67½	54	40½	54	180	144	117	90	72	54
19	47½	57	47½	38	31⅔	28½	47½	95	76	63⅓	50⅔	44⅓	38	47½	114	95	85½	71¼	57	42¾	57	190	152	123½	95	76	57
20	50	60	50	40	33⅓	30	50	100	80	66⅔	53⅓	46⅔	40	50	120	100	90	75	60	45	60	200	160	130	100	80	60
21	52½	63	52½	42	35	31½	52½	105	84	70	56	49	42	52½	126	105	94½	78¾	63	47½	63	210	168	136½	105	84	63
22	55	66	55	44	36⅔	33	55	110	88	73⅓	58⅔	51⅓	44	55	132	110	99	82½	66	49½	66	220	176	143	110	88	66
23	57½	69	57½	46	38⅓	34½	57½	115	92	76⅔	61⅓	53⅔	46	57½	138	115	103½	86¼	69	51¾	69	230	184	149½	115	92	69
24	60	72	60	48	40	36	60	120	96	80	64	56	48	60	144	120	108	90	72	54	72	240	192	156	120	96	72

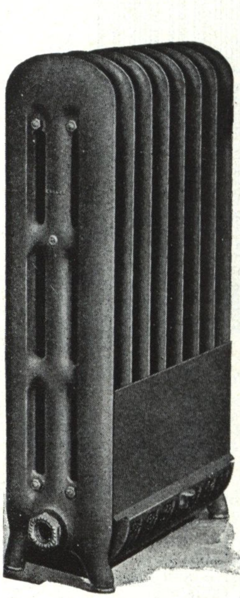
For roughing-in measurements see page 2172.

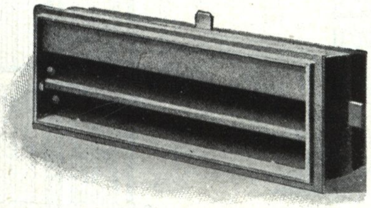
All single column radiators regularly tapped 1½ in. right hand and bushed according to tapping list. Top tapping 1½ in. and smaller if required. Two, three and four-column radiators regularly tapped 2 in. right hand and bushed according to tapping list. Top tapping can be furnished 2 in. and bushed, or tapped solid any size smaller than 2 in. Air vent tappings regularly made ⅛ in. Add ½ in. for each bushing or plug to get total length of radiator.

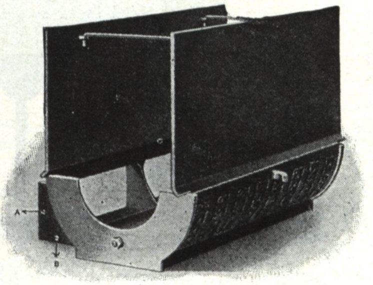
Sections	Length, in.	Window Radiators				
		Height, in.				
		20	18	16	14	13
		Rad., sq. ft. per section				
		5	4⅓	3¾	3	3
2	6	10	8⅔	7½	6	6
3	9	15	13	11¼	9	9
4	12	20	17⅓	15	12	12
5	15	25	21⅔	18¾	15	15
6	18	30	26	22½	18	18
7	21	35	30⅓	26¼	21	21
8	24	40	34⅔	30	24	24
9	27	45	39	33¾	27	27
10	30	50	43⅓	37½	30	30
11	33	55	47⅔	41¼	33	33
12	36	60	52	45	36	36
13	39	65	56⅓	48¾	39	39
14	42	70	60⅔	52½	42	42
15	45	75	65	56¼	45	45
16	48	80	70⅓	60	48	48
17	51	85	73⅔	63¾	51	51
18	54	90	78	67½	54	54
19	57	95	82⅓	71¼	57	57
20	60	100	86⅔	75	60	60
21	63	105	91	78¾	63	63
22	66	110	95⅓	82½	66	66
23	69	115	99⅔	86¼	69	69
24	72	120	104	90	72	72
25	75	125	108⅓	93¾	75	75
26	78	130	112⅔	97½	78	78
27	81	135	117	101¼	81	81
28	84	140	121⅓	105	84	84
29	87	145	125⅔	108¾	87	87
30	90	150	130	112½	90	90
31	93	155	134⅓	116¼	93	93
32	96	160	138⅔	120	96	96

All window radiators tapped 2 in. and bushed according to the list, unless solid tapping is expressly ordered. When top tapping is desired it can be furnished, tapping 2 in. and bushed or tapped solid.

All openings right hand threaded, unless otherwise ordered. Air valve tappings regularly made ⅛ in. Add ½ in. for each bushing to get total length measurement of radiator.




Wall Box



Box Base for Kewanee Radiators for Either Bottom or Back Inlet

Kewanee Direct-Indirect Radiator

Consists of a Kewanee box base that fits three-column steam or water radiators. The box base has a sliding damper. By pressing down knob shown at top of fretwork fresh air inlet is closed off and air from room circulates through radiator. By raising knob to position shown, air from room is shut off and fresh air inlet opened. Fresh air must pass through radiator before being delivered into room. Box base changed from back to bottom inlet by removal of a few bolts. Wall box is made to fit openings in walls through which fresh air is brought to direct-indirect radiators. Metal pipes, thickness of wall, connect wall box with box base. Wall boxes made in one size only.

MEASUREMENT OF BOX BASE

Number of Sections									
3	4	5	6	7	8	9	10	11	12
Length of outside opening for fresh air inlet, in.									
2¾	5¼	7¾	10¼	12¾	15¼	17¾	20¼	22¾	25¼

Height of outside opening for fresh air inlet, 3$\frac{5}{16}$ in. Distance from floor to top of base, 15 in.

Pin Direct Radiator

For steam or water.

For use in Vento or blast heating.

Air valve tappings regularly made ⅛ in.

Pin Direct Radiator

Continued on next page

PLATE NO. 8. KEWANEE DIRECT RADIATORS—WALL TYPE

Key to figure numbering: The first numeral in each of the following figures indicates the size of section. Fig. 717 refers to 7-ft. sections arranged in the manner shown in sketch above the number. Fig. 917 refers to 9-ft. sections and to same assemblage.

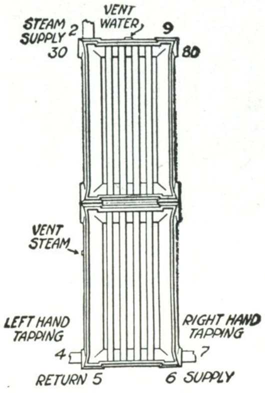

VENT WATER
STEAM SUPPLY 2
9
30
80
VENT STEAM
LEFT HAND TAPPING
RIGHT HAND TAPPING
4
7
RETURN 5
6 SUPPLY

Figure 713 or 913
2 sections in 2 tiers—water and 2-pipe steam

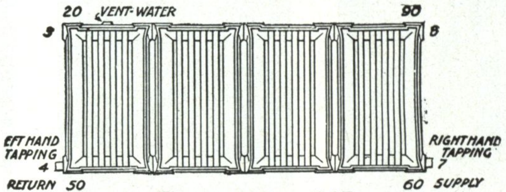

20
VENT-WATER
90
3
8
LEFT HAND TAPPING
4
RIGHT HAND TAPPING
7
RETURN 50
60 SUPPLY

Figure 717 or 917
Assembled 4 sections in single tier—water

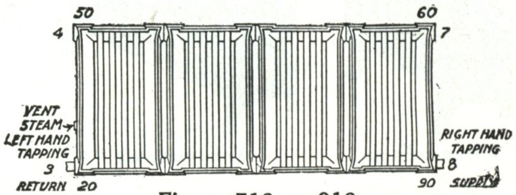
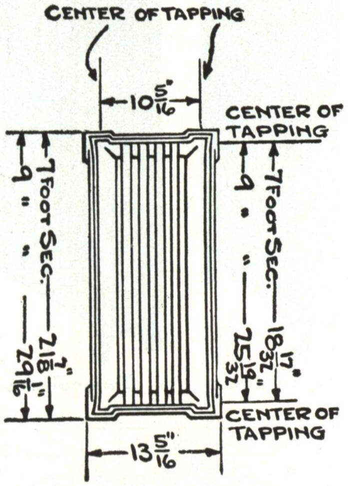

50
60
4
7
VENT STEAM
LEFT HAND TAPPING
3
RETURN 20
RIGHT HAND TAPPING
8
90 SUPPLY

Figure 718 or 918
Sections in single tier—1- and 2-pipe steam


CENTER OF TAPPING
10 5/16"
CENTER OF TAPPING
9 " " 29 1/16"
7 FOOT SEC. 21 7/18"
9 " " 25 19/32"
7 FOOT SEC. 18 17/32"
CENTER OF TAPPING
13 5/16"

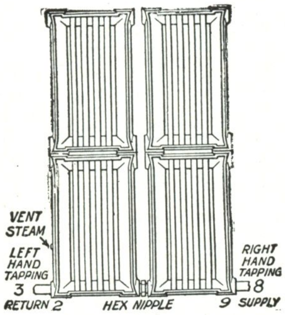

VENT STEAM
LEFT HAND TAPPING
3
RETURN 2
HEX NIPPLE
RIGHT HAND TAPPING
8
9 SUPPLY

Figure 720 or 920
Assembled 4 sections in 2 tiers —1- and 2-pipe steam

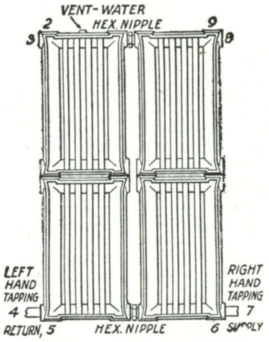

VENT-WATER
HEX NIPPLE
2
9
3
8
LEFT HAND TAPPING
4
RETURN 5
HEX NIPPLE
RIGHT HAND TAPPING
7
6 SUPPLY

Figure 719 or 919
Assembled 4 sections in 2 tiers—water

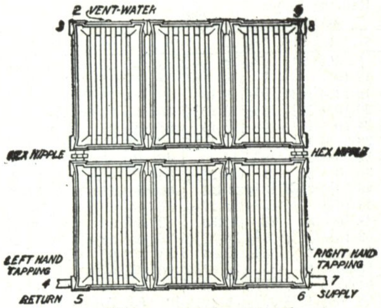

2 VENT-WATER
9
3
8
HEX NIPPLE
HEX NIPPLE
LEFT HAND TAPPING
4
RETURN 5
RIGHT HAND TAPPING
7
6 SUPPLY

Figure 725 or 925
Assembled 6 sections in 2 tiers—water

Note: The regular tappings of wall radiators are indicated by Nos. 2, 3, 4, 5, 6, 7, 8 and 9. Nos. 20, 30, 40, 50, 60, 70, 80 and 90 indicate special tappings which can be furnished, if desired, and for which an extra charge will be made. Tappings are 1½ in., supply and return, and bushed as desired. Add 1⅛ in. to length measurement for each hexagonal nipple used in assembling.

Wall radiators are tapped 1½ in. flow, 1½ in. return, and bushed to size required. Wall radiators are assembled with malleable iron screw nipples threaded right and left

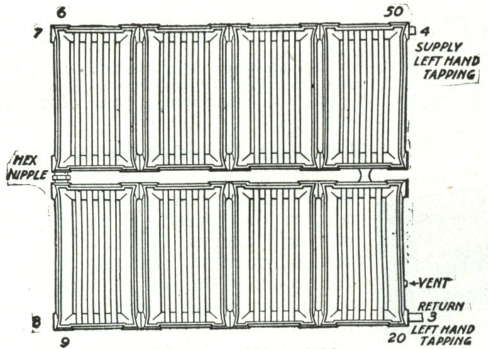

6
50
7
4
SUPPLY LEFT HAND TAPPING
HEX NIPPLE
VENT
RETURN
3
LEFT HAND TAPPING
8
9
20

Figure 740 or 940
Assembled in 8 sections in 2 tiers—For 2-pipe steam

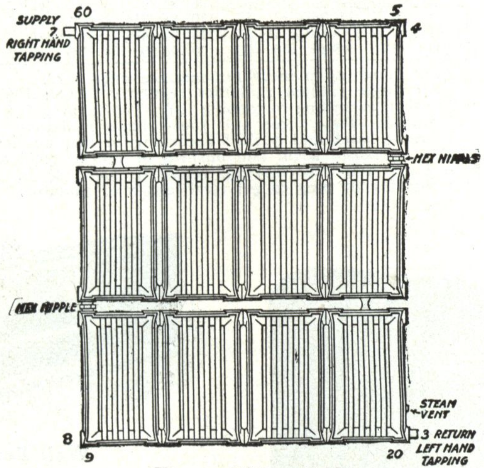
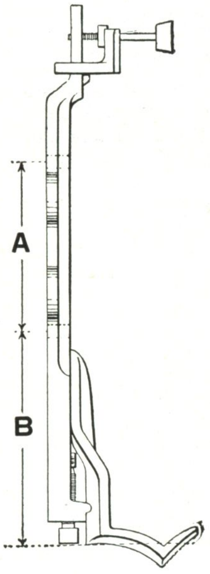

SUPPLY
60
5
4
7
RIGHT HAND TAPPING
HEX NIPPLE
HEX NIPPLE
STEAM VENT
3 RETURN
LEFT HAND TAPPING
8
9
20

Figure 742 or 942
Assembled in 12 sections in 3 tiers, using spacing saddles



Kewanee Adjustable Radiator Bracket

Made in various lengths to support any Kewanee Wall or Column Radiator of any height. Easily attached to concrete, brick, tile or frame walls. Can be adjusted from 1/16 to 1½ in. after bracket is on wall. No wood strips or backing required

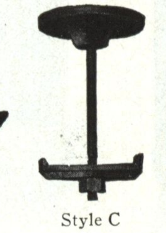
ROUGHING-IN MEASUREMENTS FOR KEWANEE ADJUSTABLE RADIATOR BRACKETS

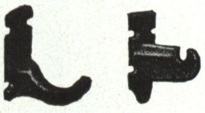
Height of radiator	Number of columns	Dimension A, in.
22 in.	3 and 4	5¼
For 5-ft. wall bracket,		5¼
26 in.	2, 3 and 4	8⅛
For 7 and 9-ft. wall bracket		12½
32 and 38 in.	1, 2, 3 and 4	12½
45 in.	2, 3 and 4	24

Dimension B is the distance from center of lower wall bolt hole to bottom of radiator and is adjustable from 6¼ to 7¾ in. on all brackets.

Style A

Style B

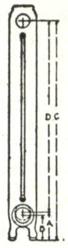

Style C


Style D

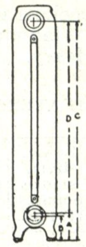
Kewanee Radiator Brackets
The brackets illustrated are inexpensive and commonly used. Style D is concealed brackets for column radiators

Continued on next page

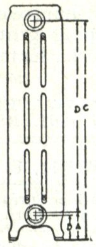
PLATE NO. 9. ROUGHING-IN MEASUREMENTS FOR KEWANEE RADIATORS



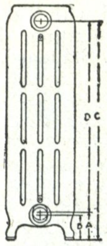
Single-column



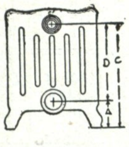
2-column



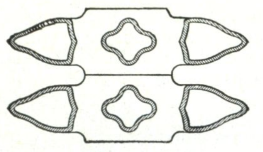
3-column



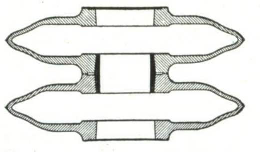
4-column



Window Type



Section Through Center



Section Through Hub

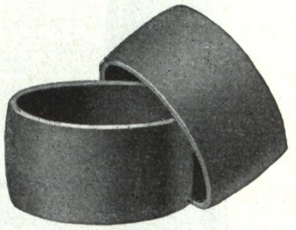
Two cross sections of Kewanee 3-column radiators are shown. Section through hub shows the slip nipple making a perfect iron-to-iron joint with no chance of leaking. Other section shows the concave columns and distribution of surface. When specially ordered, we furnish solid legs, 6 or 8 in. high. Can also furnish radiator pedestals of any height

		Single-column			2-column				3-column					4-column						Window type			
		Width of section, 4½ in. Length of section in stack, 2½ in.			Width of section, 7½ in. Length of section in stack, 2½ in.				Width of section, 9 in. Length of section in stack, 2½ in.					Width of section, 11⅛ in. Length of section in stack, 3 in.						Width of legs, 13 in. Width of section, 12 in. Width of top, 12¼ in. Length of section in stack, 3 in.			
		Height, in.			Height, in.				Height, in.					Height, in.						Height, in.			
		26	32	38	26	32	38	45	22	26	32	38	45	18	22	26	32	38	45	14	16	18	20
A	Floor to center of lower tapping, straight hub, for hot water and supply on 2-pipe steam	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	3⅝	3⅝	3⅝	3⅝
B	Floor to center of lower tapping, drop-hub 1-pipe steam or return on 2-pipe steam	Not dr	made op-hu	with b	4	4	4	4	4	4	4	4	4	Not	made	with	drop-	hub	Not	made	with	drop-	hub
C	Floor to center of upper tapping	23½	29½	35½	23½	29½	35½	42½	19½	23½	29½	35½	42½	15½						11$^{15}/_{16}$	13$^{15}/_{16}$	15$^{15}/_{16}$	17$^{15}/_{16}$
D	Center to center of straight-hub hot water	19	25	31	19	25	31	38	15	19	25	31	38	11	15	19	25	31	38	8$^{5}/_{16}$	10$^{5}/_{16}$	12$^{5}/_{16}$	14$^{5}/_{16}$

Kewanee Extra Heavy Malleable Nipples

We call particular attention to our extra heavy malleable iron push nipple for connecting radiator sections.

Makes a perfect iron-to-iron joint which water can not get through.



Tapping Instructions

1-Pipe Steam System—

Tapping, in.	1	1¼	1½	2
Radiation, sq. ft.	0-24	24-60	60-100	Above 100

2-Pipe Steam System—

Tapping, in.	1x¾	1¼x1	1½x1¼
Radiation, sq. ft.	0-48	48-96	Above 96

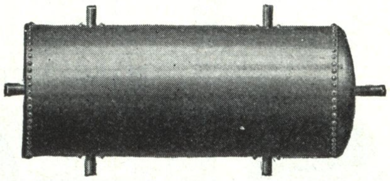
Hot Water System—

Tapping, in.	1	1¼	1½
Radiation, sq. ft.	0-40	40-72	Above 72

KEWANEE STEEL TANKS

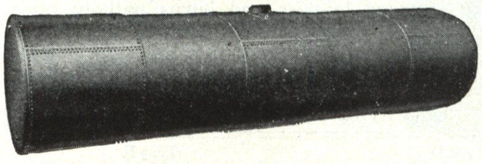
CAPACITIES AND DIMENSIONS OF KEWANEE WATER STORAGE TANKS

Standard and Extra Heavy				Shipping weight, lb		Standard and Extra Heavy				Shipping weight, lb.	
Cap., gal.	Size, in.	Openings, in.	Size Coil (4 pipes) in.	Standard	Extra heavy	Cap., gal.	Size, in.	Openings, in.	Size coil, (4 pipes) in.	Standard	Extra heavy
66	20x4	1½	1	270	....	315	36x6	2	1½	700	920
85	20x5	1½	1	310	....	365	36x7	2	1½	780	1030
100	24x4	1½	1¼	330	....	420	36x8	2	1½	870	1160
120	24x5	1½	1¼	380	390	525	36x10	2	1½	1030	1380
140	24x6	1½	1¼	440	450	430	42x6	2	1½	890	1140
150	30x4	2	1¼	430	440	500	42x7	2	1½	980	1260
180	30x5	2	1¼	500	520	575	42x8	2	1½	1070	1400
220	30x6	2	1¼	560	590	720	42x10	2	1½	1250	1660
250	30x7	2	1¼	630	660	865	42x12	2	1½	1430	1910
295	30x8	2	1¼	700	720	1000	42x14	2	1½	1620	2180



Standard Water Storage Tank

Tested to 100 lb. hydrostatic pressure. For use where water working pressure does not exceed 65 lb. Can be used either horizontally or vertically. Manholes, handholes, and coils furnished only when ordered. Extra heavy tanks are tested to 150 lb. hydrostatic pressure; working pressure not to exceed 100 lb. Tanks both plain and galvanized.



Kewanee Pressure and Storage Tank

Built for all purposes and pressures, and of any size. In making inquiry for prices and specifications, always give pressure to be carried, purpose for which tank is to be used, and number of gallons capacity. Tanks listed in table are for pressures up to 100 lb.

SPECIFICATIONS OF KEWANEE PRESSURE AND STORAGE TANKS

Size tank, ft.	Thickness, in.		Weight, lb.	Cap., gal.	Size tank, ft.	Thickness, in.		Weight, lb.	Cap., gal.	Size tank, ft.	Thickness, in.		Weight, lb.	Cap., gal.
	Shell	Head				Shell	Head				Shell	Head		
4 x 8	¼	7/16	1700	750	4½x16	5/16	7/16	4300	1890	6x28	5/16	½	9700	5940
4 x10	¼	7/16	2000	940	4½x18	5/16	7/16	4700	2130	6x32	5/16	½	10800	6780
4 x12	¼	7/16	2300	1130	4½x20	5/16	7/16	5200	2360	6x36	5/16	½	11900	7630
4 x14	¼	7/16	2600	1300	4½x24	5/16	7/16	6000	2840	7x20	5/16	½	9200	5760
4 x16	¼	7/16	2900	1500	5 x20	5/16	7/16	5900	2920	7x24	5/16	½	10500	6910
4 x18	¼	7/16	3200	1700	5 x24	5/16	7/16	6900	3470	7x28	5/16	½	11800	8070
4 x20	¼	7/16	3500	1880	5 x28	5/16	7/16	7800	4090	7x32	5/16	½	13200	9220
4 x24	¼	7/16	4100	2260	5 x32	5/16	7/16	8700	4670	7x36	5/16	½	14500	10370
4½x12	5/16	7/16	3500	1420	5 x36	5/16	7/16	9800	5260	8x24	⅜	⅝	14600	9000
4½x14	5/16	7/16	3900	1660	6 x20	5/16	7/16	7400	4240	8x30	⅜	⅝	17200	11250
					6 x24	5/16	7/16	8500	5090	8x36	⅜	⅝	20000	13500

Manholes and flanges can be located where desired.

Kewanee Gravel Basins and Blow-off Receivers—Made in diameters from 20 to 36 in.; capacities from 34 to 210 gal. Thickness of shell, ¼ in. Thickness of heads, 5/16 in. Flanges of any size located to suit purchaser.

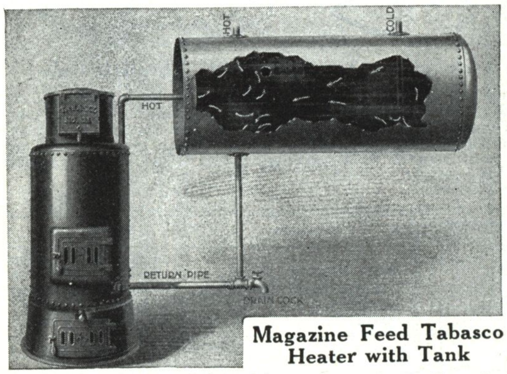
Kewanee Pneumatic Tanks—Built for 75 lb. water working pressure. Horizontal seam is lap joint, double riveted, all rivet holes reamed to full size. Openings in shell reinforced and threaded. Any size, plain or galvanized.

Kewanee Air Receivers—Shell seams are lap joints, double riveted; circular seams single riveted. Heads dished to a radius equal to diameter of shell. Tested to 165 lb. hydrostatic pressure. Safe under 110 lb. working pressure.

Continued on next page

PLATE NO. 10. TABASCO WATER HEATERS AND HOT WATER HEATING BOILERS

Economical and simple to operate with any kind of fuel. Safe for city high water pressures. Riveted steel construction insures against repairs from cracking or breaking. Brass clean-out plugs or handholes furnished on all Tabasco Heaters. Equipped with Tabasco improved rocking grate—a sectional, clinker-cutting, dumping grate. Maximum working pressure 60 lb. Standard, 110 lb. Extra Heavy.



Magazine Feed Tabasco Heater with Tank

SPECIFICATIONS FOR STANDARD TYPE WATER HEATERS AND HOT WATER HEATING BOILERS

Heater No.	Water heating Cap., gal. per hr.	Size of heater, in.	Total height, in.	Sizes, flow and return, in.	Weight, lb.		Equiv. diam. smoke connection, in.	Diam. grate, in.	Water rad., cap. sq. ft.
					Magazine feed	Surface burner			
17	130	17x30	52	2–1½	455	400	6	12½	200
18	150	17x36	57	2–1½	480	420	6	12½	250
21	200	21x30	52	2–1½	590	520	7	15	300
22	250	21x36	59	2–1½	625	550	7	15	350
25	300	25x36	59	2–2	900	780	8¼	19	430
26	350	25x42	65	2–2	935	810	8¼	19	500
27	400	25x48	71	2–2	965	840	8¼	19	550
30	500	30x42	65	2–2½	1625	1500	8¼	24	600
31	600	30x48	75	2–2½	1700	1600	8¼	24	700
32	700	30x54	81	2–2½	1780	1650	8¼	24	800

All above ratings are based on raising temperature of water 50° an hour. Heaters No. 21 and above have four 2-in. brass clean-out plugs. Maximum working pressure 60 lb.

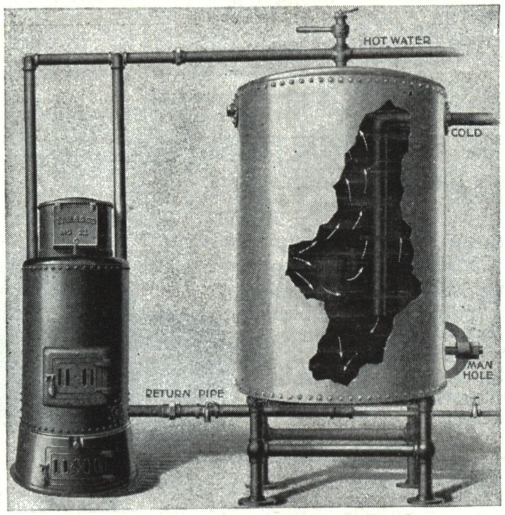
Extra Heavy Type—Built same as Standard Tabasco Water Heater. Serves its full rated capacity in bungalow, cottage, garage, or other building requiring a small heating plant.

EXTRA HEAVY HEATERS, TYPE R

No.	Cap., gal.	Total height, ft.	in.	Diam. fire pot, in.	Sizes, flow and return, in.	Approx. shipping weight, lb.	
						Surface burner	Magazine feed
150	150	5	3	12	2–1½	600	660
200	200	4	10	16	2–1½	700	775
300	300	5	4	20	2–2	950	1075
400	400	6	6	20	2–2	1130	1275
500	500	5	10	25	2–2½	1500	1625
600	600	6	10	25	2–2½	1600	1700
700	700	7	2	25	2–2½	1650	1780

TYPE R HEATERS WITH TYPE S TANKS AND STANDS

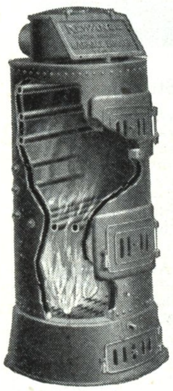
Size, in. ft.	Cap., gal.	Total height tank and stand, ft.	in.	Weight of tank, lb.	Weight of tank stands, lb.
36 x 5	265	7	2	1000	160
42 x 5	360	7	3	1300	180
48 x 5	470	7	4	1500	200
54 x 5	590	7	5	2000	220
60 x 5	730	7	6	2400	250
60 x 5′ 6″	800	8	0	2500	250
60 x 6	875	8	6	2600	250



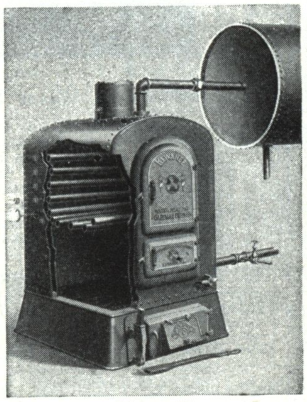
Type R Heater **Type S Tank**

KEWANEE WATER HEATING GARBAGE BURNERS

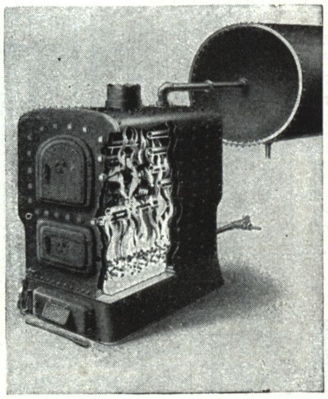
Built of riveted steel for a working pressure of 125 lb. per sq. in. to withstand any city water pressure without cracking or bursting. They eliminate unpleasant features of accumulated garbage in such buildings as apartments, clubs, sanitariums, hotels, restaurants, and in producing hot water by incineration cut the fuel bill of an ordinary heater in half. The operation is very simple. A small fire is started on the lower grates, and the garbage thrown into the upper chamber in any quantity; even when filled, the garbage is dried to a combustible condition in a short time by means of the patented by-pass and burns without odor, leaving only a small amount of ash. These burners will produce the best results when hot water storage tank attached has a capacity 50% greater than the hourly heating capacity of the burner.



Type A



Type D



Type H

	Type A				Type D					Type H				
No.	30	31	32	33	36	37	38	39	40	41	42	43	44	45
Capacity, gal. per hr. 50° raise	200	300	400	600	800	1000	1200	1500	1800	1200	1500	1800	2200	2600
Capacity, garbage chamber, one charge bu.	1	2	3	4	4	5	7	9	12	6	8	9	11	12
Height, over all in.	58	64	64	68	56	56	56	56	66	69	69	69	71	71
Floor space required in.	22	25	30	36	35x35	35x41	35x47	41x53	41x59	38x36	38x42	38x48	38x54	38x60
Dimensions over all in.	...	...	...	...	32x32	32x38	32x44	38x50	38x56	38x32	38x38	38x44	38x50	38x56
Height to bottom of garbage door in.	33	37	37	39	31	31	31	31	31	37	37	37	37	37
Garbage door in.	7x8	7x8	7x8	9x12	16x16	16x16	16x16	16x16	16x16	16x16	16x16	16x16	16x16	16x16
Coal or fire door in.	7x8	7x8	7x8	9x12	16x10	16x10	16x10	16x10	15x10	16x8	16x8	16x8	16x8	16x8
Lower or coal grates, in.	12	16	20	24	24x24	24x30	24x36	30x42	30x48	24x24	24x30	24x36	24x42	24x48
Size, flow and return flanges, one each in.	1½	2	2	2	2½	2½	2½	3	3	3	3	4	4	4
Diameter of smoke pipe in.	6½	7½	8¼	8¼	10	10	10	12	12	10	10	10	12	12
Approx. shipping weight lb.	600	800	1000	1500	2100	2300	2500	3000	3300	2800	3100	3400	3700	4000

Above ratings all based on raising temperature of water in storage tank 50° an hour.

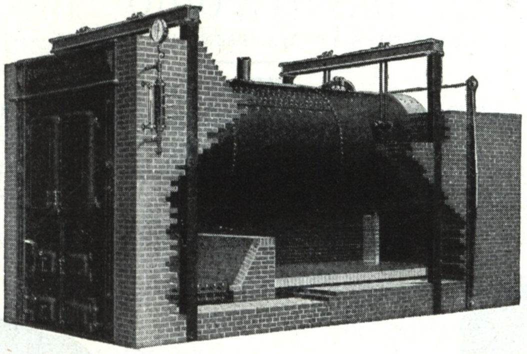
Continued on next page

PLATE NO. 11. KEWANEE UP-DRAFT HORIZONTAL RETURN TUBULAR POWER BOILERS

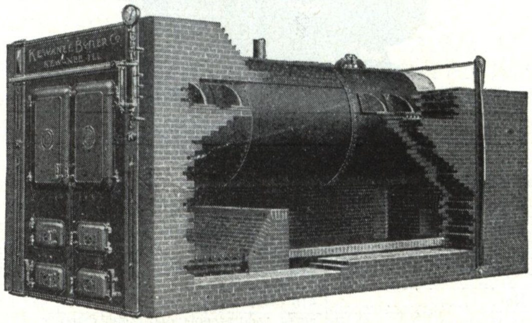
Built in accordance with A. S. M. E. code in capacities from 80 to 200 hp. Built for wall support or suspended independent of masonry. May be used singly or in batteries.

The material used in construction of Kewanee Power Boilers must conform to strict specifications as to strength and quality. Shell plates and heads are of firebox quality steel with minimum tensile strength of 55,000 lb. per sq. in.

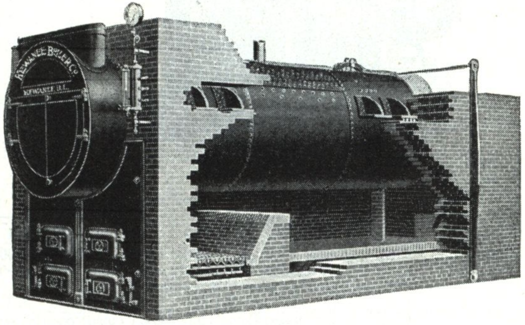
All rivet holes are reamed to size, and calking edges of all plates are bevel-planed to remove material stressed in shearing. This eliminates danger of fire cracks. Each boiler has a manhole in the shell and one in front below the tubes, each complete with plate, yoke, bolts and gaskets. Opening in shell is reinforced by a heavy, pressed steel saddle riveted to inside of shell. Each boiler is provided with eight lugs or brackets for supporting boiler on wall of setting. If desired, steel hanger loops may be substituted for the suspended type of setting. The system of suspension is amply strong in every part, and is properly arranged to allow free expansion and contraction without injury to brickwork.



Suspended Independent of Masonry



Full-front Setting Supported on Walls



Half-front Setting Supported on Walls

SPECIFICATIONS OF UP-DRAFT HORIZONTAL RETURN TUBULAR POWER BOILERS

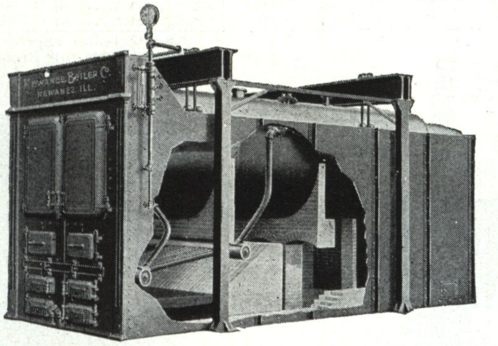
Rated hp.	Diam. boiler, in.	Length tubes, ft.	Number of tubes		Grate area, sq. ft.	Stack sizes		Steam opening, in.	Weights complete, lb.				Dimensions and weights of suspension system			
									*125 lb. working pressure		‡150 lb. working pressure		A		B	
									Setting		Setting					
			3½-in.	4-in.		Diam., in.	Height, ft.		Full-front	Half-front	Full-front	Half-front	Column height, ft. in.	Weight of outfit, lb.	Column height, ft. in.	Weight of outfit, lb.
80	60	16	54	44	22.5	28	60	4	18205	17425	18915	18135	9–9	1200	9–9	3300
90	60	18	54	44	25.0	28	60	5	19815	19035	20645	19865	9–9	1200	9–9	3300
100	66	16	66	54	24.75	30	60	5	21020	20300	22105	21385	10–3	1500	10–3	4000
110	66	18	66	54	27.5	30	60	6	22910	22190	24140	23420	10–3	1500	10–3	4000
125	72	16	86	70	27.0	34	60	6	25310	24675	26750	26115	11–3	1800	11–3	4400
150	72	18	86	70	30.0	34	60	6	27600	26965	29135	28500	11–3	1800	11–3	4400
165	72	20	86	70	33.0	34	70	6	30100	29465	31860	31225	11–3	1800	11–3	4400
180	78	18	110	88	32.5	38	60	6	34215	33770	35520	35075	11–9	2100	11–9	5000
200	78	20	110	88	35.75	38	70	6	37495	37050	38940	38495	11–9	2100	11–9	5000

*Longitudinal seams, all butt-jointed, triple riveted.
‡Longitudinal seams, all butt-jointed, quadruple riveted.
A—Based on using 4 columns for one boiler and 2 additional columns for each additional boiler in the battery.
B—Based on using suspension equipment without center columns for battery setting of boilers.

KEWANEE DOWN-DRAFT SMOKELESS TUBULAR POWER BOILERS

Built in accordance with the A. S. M. E. code in capacities from 115 to 275 hp. Particular attention is directed to our smokeless tubular boilers. These boilers are designed for continuous overloads with bituminous coal with an economical consumption of fuel. The proportions of the boiler enable it to carry these overloads without frequent cleaning periods. The connection between the upper grates produces a forced circulation which gives the boiler a high steaming capacity. We recommend the use of a steel casing insulated by an asbestos lining 1 in. thick to eliminate air leakage through setting.

The measurements shown below for setting are for one boiler. For battery setting make the center wall back of bridge wall 30 in. We include as part of the equipment: fire door arches and dead plates for both upper and lower grates. We also furnish special fire brick tile to fit header at rear end of water tube grate.



SPECIFICATIONS OF DOWN-DRAFT SMOKELESS HORIZONTAL RETURN TUBULAR POWER BOILERS

Rated hp.	Diam. boiler, in.	Length tubes, ft.	Number of tubes		Upper grate area, sq. ft.	Stack size		Weights complete, lb.		Setting specifications		
			3½-in.	4-in.		Diam., in.	Height, ft.	125 lb. working pressure	150 lb. working pressure	Common brick	Fire brick	Asbestos for casing, sq. ft.
115	60	16	54	44	?	30	100	25710	26420	8700	4850	435
130	60	18	54	44	?	30	100	27430	28260	9000	5000	450
145	66	16	66	54	?	32	110	29240	30325	9800	5500	470
160	66	18	66	54	?	32	110	31145	32375	10300	5575	505
180	72	16	86	70	?	36	115	33980	35420	10800	6220	500
200	72	18	86	70	?	36	120	36325	37860	11700	6480	525
225	72	20	86	70	?	36	125	38495	40255	12100	6730	565
250	78	18	110	88	?	40	125	42720	44025	13600	6930	565
275	78	20	110	88	?	40	125	45370	46815	14500	7420	600

ESTABLISHED 1885

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DAYTON, OHIO

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Brownell Steel Heating and Power Boilers.

Steam Engines, Feed Water Heaters, Tanks, Breechings, Stacks, Boiler Castings and Steel Plate Construction.

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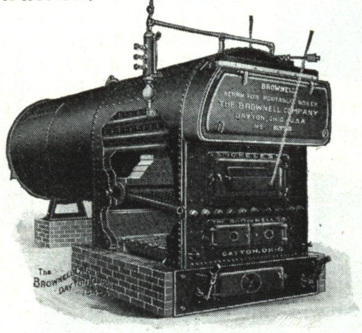
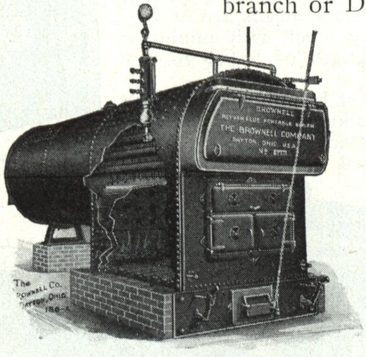

The Brownell Co. Dayton, Ohio

Brownell Portable Boiler—Smokeless

Boiler No.	307	308	309	310	311	312	313	314	315
Capacity, steam.............sq. ft.	3000	3500	4000	4500	5000	5500	6000	6500	7500
Capacity, water.............sq. ft.	5000	5800	6600	7400	8300	9100	9900	10700	12400
Boiler No.	316	317	318	319	320	321	322	323	324
Capacity, steam.............sq. ft.	8500	10000	12000	14000	16000	18000	20000	25000	30000
Capacity, water.............sq. ft.	14000	16500	19800	23100	26400	29700	33000	40000	48000

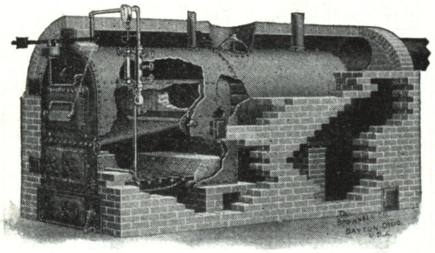
Note: Ask for Bulletin B-6A.


The Brownell Co. Dayton, Ohio

Brownell Portable Boiler—Direct Draft

Boiler No.	407	408	409	410	411	412	413	414	415
Capacity, steam.............sq. ft.	2500	2900	3500	4000	4500	5000	5500	6000	7000
Capacity, water.............sq. ft.	4100	4800	5800	6600	7400	8300	9100	9900	11600
Boiler No.	416	417	418	419	420	421	422	423	424
Capacity, steam.............sq. ft.	8000	9500	11000	13000	15000	17500	20000	25000	28000
Capacity, water.............sq. ft.	13200	15700	18200	21500	24800	28500	32000	40000	45000

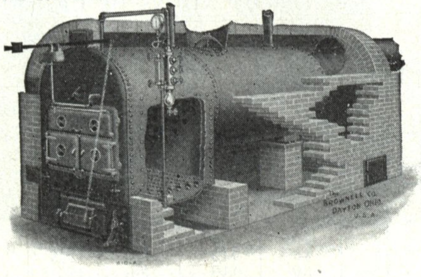
Note: Ask for Bulletin B-6A.


The Brownell Co. Dayton, Ohio U.S.A.

Brownell Brickset Boiler—Smokeless

Boiler No.	107	108	109	110	111	112	113
Capacity, steam..........sq. ft.	2600	3100	3600	4000	4700	5500	6500
Capacity, water..........sq. ft.	4300	5100	5900	6600	7800	9100	10700
Boiler No.	114	115	116	117	118	119	120
Capacity, steam..........sq. ft.	7500	8500	10000	11500	13000	14000	16000
Capacity, water..........sq. ft.	12400	14000	16500	19000	21500	23100	26400

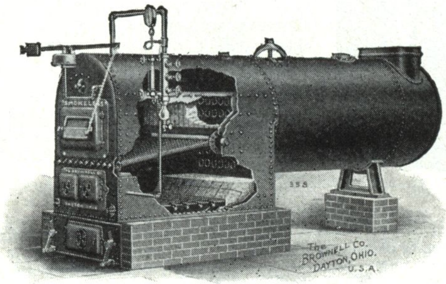
Note: Ask for Bulletin B-6.


The Brownell Co. Dayton, Ohio U.S.A.

Brownell Brickset Boiler—Direct Draft

Boiler No.	1	2	3	4	5	6	7*	8	9	10
Capacity, steam......sq. ft.	900	1050	1200	1400	1700	2000	2000	2600	3000	3500
Capacity, water......sq. ft.	1500	1700	2000	2300	2800	3300	3300	4300	5000	5800
Boiler No.	11	12	13	14	15	16	17	18	19	20
Capacity, steam......sq. ft.	4000	4500	5500	6500	7500	8700	10000	11000	12000	14000
Capacity, water......sq. ft.	6600	7400	9100	10700	12400	14400	16500	18200	19800	23100

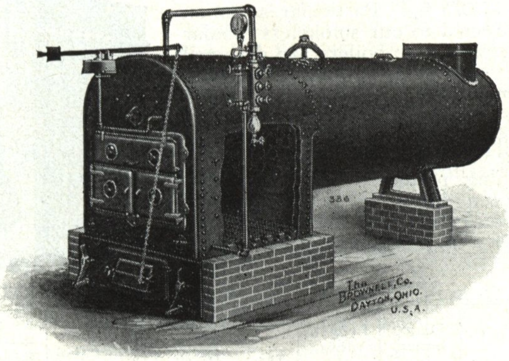
*No. 7 boiler shorter and larger diameter than No. 6.
Note: Ask for Bulletin B-6.


The Brownell Co. Dayton, Ohio. U.S.A.

Brownell Economy Setting—Smokeless

Boiler No.	107	108	109	110	111	112	113
Capacity, steam..........sq. ft.	2500	2950	3400	3800	4450	5225	6200
Capacity, water..........sq. ft.	4100	4850	5600	6300	7400	8650	10150
Boiler No.	114	115	116	117	118	119	120
Capacity, steam..........sq. ft.	7125	8100	9500	10925	12350	13300	15200
Capacity, water..........sq. ft.	11800	13300	15700	18050	20425	21950	25075

Note: Ask for Bulletin B-6E.


The Brownell Co. Dayton, Ohio. U.S.A.

Brownell Economy Setting—Direct Draft

Boiler No.	1	2	3	4	5	6	7*	8	9	10
Capacity, steam......sq. ft.	850	1000	1150	1325	1600	1900	1900	2475	2850	3325
Capacity, water......sq. ft.	1425	1600	1900	2200	2650	3125	3125	4100	4750	5500
Boiler No.	11	12	13	14	15	16	17	18	19	20
Capacity, steam......sq. ft.	3800	4300	5225	6200	7125	8250	9500	10450	11400	13300
Capacity, water......sq. ft.	6300	7025	8650	10150	11800	13700	15700	17300	18800	21950

*No. 7 boiler shorter and larger diameter than No. 6.
Note: Ask for Bulletin B-6E.

RICHARDSON & BOYNTON CO.

SINCE 1837

Manufacturers of "Richardson" "Perfect" Heating and Cooking Apparatus

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Products

Richardson Low Pressure Boilers for Steam, Vapor and Hot Water; Domestic Hot Water Supply, Tank and Laundry Heaters.

For Warm Air Heaters, see pages 2128-2129; for Richardson Vapor-Vacuum-Pressure System of Heating, see pages 2254-2256; for Coal and Gas Cooking Ranges, see pages 2762-2764.

Richardson Low Pressure Boilers for Steam, Vapor and Hot Water

Richardson low pressure cast iron boilers are made in *three* distinct types and many sizes. The three types are:

(1) Smokeless square sectional boilers.
(2) Round sectional boilers.
(3) End feed square sectional boilers.

Ratings—Richardson boilers are rated according to accurate standards and on the assumption that sufficient radiation will be used, the piping system properly arranged and the boiler connected to a flue of ample capacity and good draft, with steam at 2 lbs. boiler pressure and with hot water at a temperature of 180° Fahr.

Richardson ratings provide that all piping (mains, risers and returns), in addition to the direct radiation to be used, shall be figured as radiating surface in estimating the size of boiler necessary. One size larger boiler for reserve power is best used.

For indirect radiation add 75% to surface for such radiation, and where pipe radiation surface is used, add 25% for same to equal the usual amount direct radiation.

When a pipe coil or cast iron section is placed in the firebox for heating water for domestic uses, additional capacity must be figured at the rate of 1½ sq. ft. of direct radiation for a steam boiler and 2½ sq. ft. of direct radiation for a hot water boiler, for each gallon of water to be heated per hour.

Richardson boilers are tapped for coils to be placed in the firebox for heating water.

Do not bush outlets on boilers; connect all of them full size to mains.

To secure best results boilers should be covered with asbestos cement.

Guarantee—Every Richardson boiler is sold under a guarantee as to its perfection in manufacture, and its ability to carry the rating shown in our printed matter.

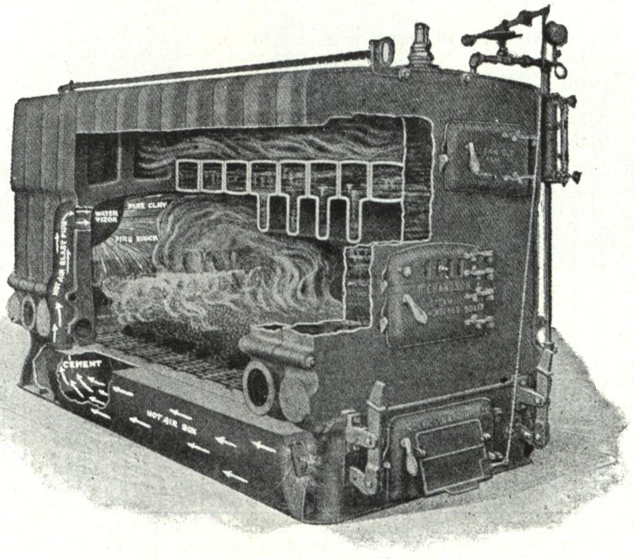
Coal—Richardson boilers can be furnished with grates to burn the small sizes of coal when so ordered.

When soft coal is used for fuel, increase boiler one size.

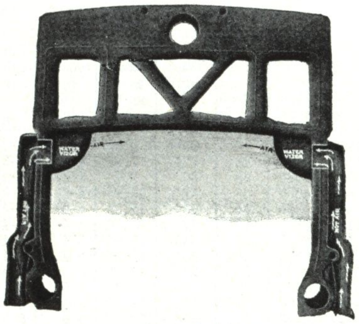
Boiler Trimmings—All Richardson steam boilers are equipped with all necessary trimmings, consisting of automatic damper regulator, steam gauge, water column, with water gauge and gauge cocks, safety valve and fusible plug when called for.

Hot water boilers are furnished with firing tools only.

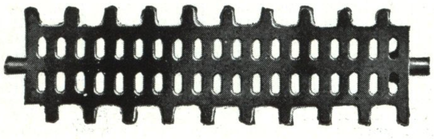
Firing Tools—All Richardson boilers are furnished with a complete set of firing tools consisting of flue brush, hoe and slice bar.



Side Sectional View



Front Sectional View of Air Blast Section



Ribbed Grate Bar

Richardson Smokeless Boilers

Continued on next page

Richardson Smokeless Boilers

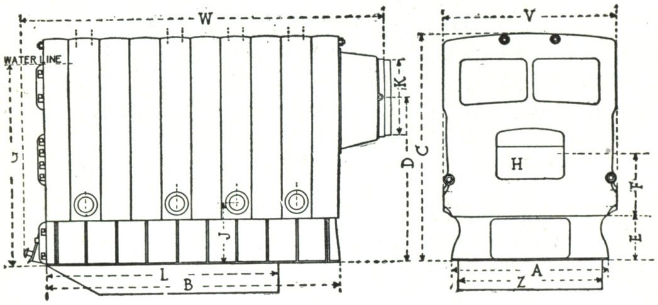
Richardson smokeless boilers, based on an entirely new principle, are designed to provide *perfect and complete* combustion of the cheaper grades of bituminous coal.

The result is the entire elimination of smoke (which the ordinary boiler pours out of the stack), and an enormous economy in fuel, since the volatile gases wasted in the ordinary system of combustion are converted into active heat units and used.

Principle of Operation—Perfect combustion of soft coals is accomplished by supplying the proper amount of oxygen at the right place and the right temperature.

In order to effect a complete chemical union, the air supplying the oxygen must reach the fire *at a high temperature.* The air is taken from outside the boiler for both sides—openings being provided with dampers for graduating the supplies (see illustration). The rear of the firebox is heated to a high temperature and the air, in turn, is pre-heated and is pulled down by the vacuum created over the bridgewall section. The hot gases distilled from the coking coal in the front of the boiler meet the hot blast of air, producing an intimate mixture of gases and oxygen perfectly united, therefore giving intense combustion. The flame produced from this action is intensely hot and travels with such a motion as to throw its full heating force against the whole length of the boiler's heating surface.

Special Features—Sectional construction permits erection at any time. Can be put through any standard width of doors. Can be installed any time. Handling expense on job at a minimum.



Natural Fire Travel and Draft—Eliminate excessive heights in chimneys.

Long Smoke Travel—No obstruction to flames, which aids combustion to perfection point and utilizes maximum heat from the fuel.

"Y" Flue Construction—Equalizes circulation, assures steady water line.

Overhanging Prime Heating Surface—At the maximum, assuring highest evaporative power.

Combustion Chamber—During process of coking gases are drawn back into a large chamber in front of bridgewall, which has two portholes at the top, making it impossible for gases to accumulate and explode.

Base—Is made in sections, permitting enlargement of boiler if ever necessary.

Fire Door—Carelessness or neglect in cleaning ash pit of ashes destroys grates. Replacing of grates through fire door (big enough for man to enter, 15x20 in.) means saving in time. The size of this door permits even distribution of fuel over fire.

Twin or Battery Jobs — Provide extra large range of capacities, are economical in fuel consumption in mild weather and never necessitate absence of steam in case of the plant's being shut down for re pairs.

APPROXIMATE CHIMNEY FLUE SIZES

When the Full Rated Capacity of Boiler is Operating

Boiler No.	Number of boilers in battery or connected to one chimney					
	1		2		3	
	Flue, in.	Chimney height, ft.	Flue, in.	Chimney height, ft.	Flue, in.	Chimney height, ft.
C-2075	12x16	40	16x16	50	20x20	60
C-2085	16x16	45	16x16	55	20x20	65
C-2095	16x20	50	24x24	60	24x24	70
C-2105	16x20	50	24x24	60	28x28	70
C-3075	16x16	50	20x24	60	24x24	70
C-3085	16x20	55	20x24	65	24x24	75
C-3095	20x20	55	20x24	65	28x28	75
C-3105	20x20	60	20x24	70	28x28	80
E- 742	20x20	50	24x24	60	28x28	70
E- 842	20x20	55	24x24	65	28x28	75
E- 942	20x20	60	24x28	70	30x30	80
E-1042	20x20	65	24x28	75	30x30	85
E-1142	20x24	65	28x28	75	30x36	85
E-1242	20x24	70	24x28	80	30x36	90
E-1342	20x24	70	28x28	80	30x36	90
E-1442	24x28	75	30x30	85	30x36	95
E-1542	24x28	75	30x30	85	30x36	95
E-1642	28x28	80	30x36	90	36x36	100
E-1742	28x28	85	30x36	95	36x36	105
E-1842	30x30	90	36x36	100	42x42	110
E-1942	30x30	95	36x36	105	42x42	115
E-2042	30x30	100	36x36	110	42x42	120

RATINGS AND DIMENSIONS OF RICHARDSON SMOKELESS BOILERS

Boiler No.		Rating, sq. ft.		Water line, (steam boilers) in.	Total length, in.	Grate area, sq. ft.	Number outlets and size, in.	Number inlets and size, in.	Ashpit (inside), in.	Chimney		Smoke pipe, in.	A	B	C	D	E	F	G	H	J	K	L	V	W	Z
steam	water	steam	water							Flue, in.	Hght., ft.															
C-2075	C-2075	1850	3000	48	65½	6.83	3-3½	6-3½	27½x50	12x16	40	14	32¾	50¼	55	42¼	11½	12	48	13 x16	15½	14	50	39⅜	65½	23
C-2085	C-2085	2150	3550	48	72¾	7.97	4-3½	8-3½	27½x57¼	16x16	45	14	32¾	57½	55	42¼	11½	12	48	13 x16	15½	14	57¼	39⅜	72¾	23
C-2095	C-2095	2500	4100	48	80	9.11	4-3½	8-3½	27½x64½	16x20	50	14	32¾	64¾	55	42¼	11½	12	48	13 x16	15½	14	64½	39⅜	80	23
C-2105	C-2105	2800	4600	48	87¼	10.25	4-3½	8-3½	27x71¾	16x20	50	14	32¾	72	55	42¼	11½	12	48	13 x16	15½	14	71¾	39⅜	87¼	23
C-3075	C-3075	3800	6200	56	68¾	11.75	4-4	8-4	39⅜x50½	16x16	50	16	44	57	63	49½	13	15⅛	56	14½x18	17	16	50½	48	68¾	35
C-3085	C-3085	4450	7300	56	77	13.70	4-4	8-4	39⅜x59	16x20	55	16	44	65½	63	49½	13	15⅛	56	14½x18	17	16	59	48	77	35
C-3095	C-3095	5100	8400	56	85¼	15.65	5-4	10-4	39⅜x67½	20x20	55	16	44	74	63	49½	13	15⅛	56	14½x18	17	16	67½	48	85¼	35
C-3105	C-3105	5750	9500	56	93½	17.60	5-4	10-4	39⅜x76	20x20	60	16	44	82½	63	49½	13	15⅛	56	14½x18	17	16	76	48	93½	35
E- 742	E- 742	5100	8400	59	64	13.82	3-5	6-5	45x50	20x20	50	20	50	57	68	47¾	13	17	59	16 x22	17	20	48⅛	54	68	41
E- 842	E- 842	5950	9600	59	72¼	16.11	3-5	6-5	45x58¼	20x20	55	20	50	65¼	68	47¾	13	17	59	16 x22	17	20	56 7/16	54	76¼	41
E- 942	E- 942	6800	11200	59	80½	18.40	3-5	6-5	45x66½	20x20	60	20	50	73¾	68	47¾	13	17	59	16 x22	17	20	64¾	54	84¾	41
E-1042	E-1042	7650	12600	59	88¾	*20.69	4-5	8-5	45x74¾	20x20	65	20	50	82	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	93	41
E-1142	E-1142	8500	14000	59	97	*20.69	4-5	8-5	45x74¾	20x24	65	20	50	90¼	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	101¼	41
E-1242	E-1242	9350	15400	59	105¼	*20.69	4-5	8-5	45x74¾	20x24	70	20	50	98½	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	109½	41
E-1342	E-1342	10200	16800	59	113½	*20.69	4-5	8-5	45x74¾	20x24	70	20	50	107	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	118	41
E-1442	E-1442	11050	18200	59	121¾	*20.69	5-5	10-5	45x74¾	24x28	75	20	50	115¼	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	126¼	41
E-1542	E-1542	11900	19600	59	130	*20.69	5-5	10-5	45x74¾	24x28	75	20	50	123½	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	134½	41
E-1642	E-1642	12750	21000	59	138¼	*20.69	5-5	10-5	45x74¾	28x28	80	20	50	131¾	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	142¾	41
E-1742	E-1742	13600	22400	59	146½	*20.69	5-5	10-5	45x74¾	28x28	85	20	50	140¼	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	151¼	41
E-1842	E-1842	14450	23800	59	154¾	*20.69	6-5	12-5	45x74¾	30x30	90	20	50	148½	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	159½	41
E-1942	E-1942	15300	25200	59	163	*20.69	6-5	12-5	45x74¾	30x30	95	20	50	156¾	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	167¾	41
E-2042	E-2042	16150	26600	59	171¼	*20.69	6-5	12-5	45x74¾	30x30	100	20	50	165	68	47¾	13	17	59	16 x22	17	20	*73 1/16	54	176	41

Height of boilers: 25-in. Series, 55 in.; 35-in. Series, 63 in.; 42-in. Series, 68 in. Pop safety valves as per A.S.M.E. code.

*Maximum grate area shown above is based on limiting the depth of grate to 72 in. Larger grate areas can be furnished in "C" Type boilers, as follows: No. 1142, 22.98 sq. ft.; Nos. 1242 to 1342, 25.27 sq. ft.; Nos. 1442 to 2042, 27.56 sq. ft.

The above limit of pit dimensions, as shown under column "L," applies to "E" Series boilers only. Where special "C" Type boilers are ordered with larger grate areas, use pit dimensions as follows: No. 1142, 81⅜ in.; Nos. 1242 to 1342, 89 11/16 in.; Nos. 1442 to 2042, 98 in.

Continued on next page

Richardson Round Sectional Boilers for Steam, Vapor and Water

Richardson round sectional boilers were designed to furnish a boiler suitable for small buildings and private residences, one that would be simple and easy to operate, powerful, yet economical. Their operation is most simple and requires no practical knowledge. They have large feed doors for supplying fuel to the fire, and ample clean-out and ash pit doors, and will carry sufficient fire all night to insure a warm house in early mornings. The water boilers have a special dome section for water heating and all the waterways throughout the boiler are small, producing a rapid circulation of water over the heating surfaces and absorbing the heat units as they are given off from the fire and heated gases. All the heating surfaces are within the boiler and surrounded by water passages.

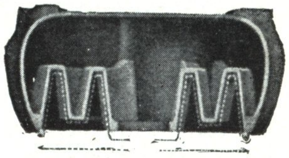
Construction—Richardson round boilers for steam and hot water are made up of several parts. The lower, or base section, is fitted with "Perfect" revolving triangular grate bars, as shown, the most effective and durable clinker-clearing grates possible to make. The ash pits are fitted with large doors for the easy removal of the ashes, and an air inlet butterfly draft door for supplying oxygen to the fuel, this draft door being operated from the automatic damper regulator of steam boilers, and with a ratchet on water boilers.

Above the ash pit comes the fire pot section, heavily corrugated on the inside and with overhanging surfaces or arms over the fire. The fire pot is deep, so that the fire can be run at a low rate of combustion and require attention at long intervals. These sections are also fitted with two openings at the rear so water can be heated for domestic purposes from a coil in the fire box.

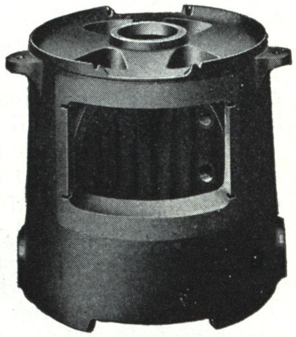
The flue openings in the intermediate sections are arranged so the fire travel is staggered, the opening in one section going below the heating surfaces in the section above; consequently, there is no waste heat, the products of combustion being constantly in contact with heating surfaces backed by water.

The connections between all sections in Richardson boilers are made with extra heavy machine cut tapered cast iron nipples fitted into tapered openings in the section, *making an iron to iron joint,* without the use of any lead or packing, and absolutely tight.

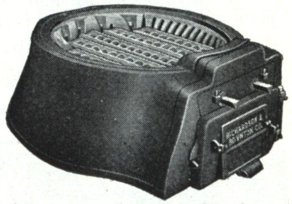
The top section of all is the dome. The illustration shows fully the large amount of heating surface contained in the Richardson boiler dome. *Heating surface* is *necessary* to *produce heat* with *economy* of fuel. Richardson boilers have the necessary surface to benefit by all the heat produced by the fuel.



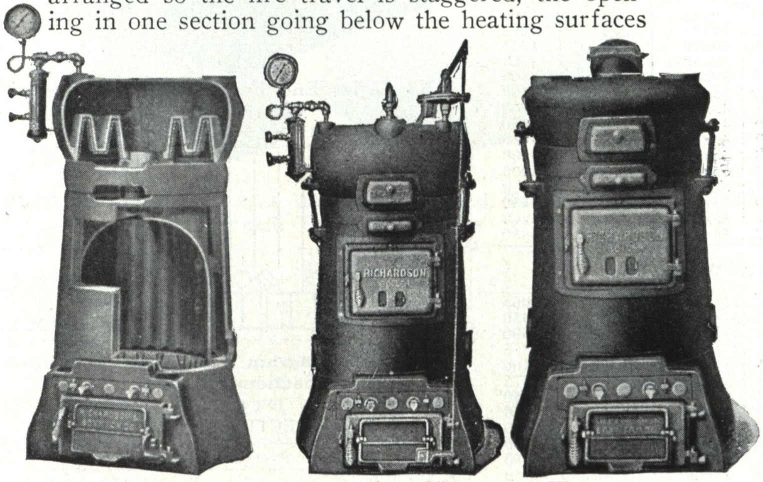
Dome Section



Fire Pot Section

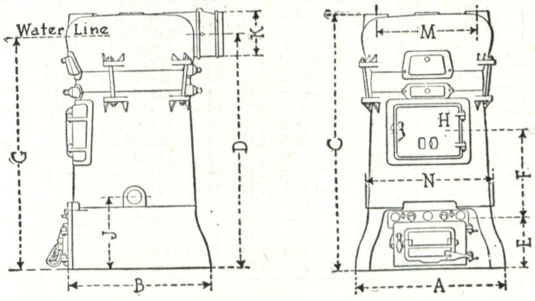


Base and Grate Section



Steam—Sectional View Steam—Front View Water—Front View

Richardson Round Sectional Boilers



RICHARDSON ROUND SECTIONAL BOILERS

Boiler No.	8-hour rating, sq. ft.	Nom. diam. grate, in.	Grate area, sq. ft.	Number outlets and size, in.	Number inlets and size, in.	*Direct rad. boiler will supply
			STEAM			
190	300	19	1.97	2–2½	2–2½	200
191	350	19	1.97	2–2½	2–2½	235
192	375	19	1.97	2–2½	2–2½	250
221	450	22	2.64	2–2½	2–2½	300
222	500	22	2.64	2–2½	2–2½	335
223	550	22	2.64	2–2½	2–2½	375
251	625	25	3.41	2–3	2–3	410
252	675	25	3.41	2–3	2–3	450
253	725	25	3.41	2–3	2–3	480
281	875	28	4.28	2–3½	2–3½	600
282	950	28	4.28	2–3½	2–3½	650
283	1025	28	4 28	2–3½	2–3½	700
			WATER			
190	500	19	1.97	2–2½	2–2½	330
191	575	19	1.97	2–2½	2–2½	385
192	625	19	1.97	2–2½	2–2½	410
221	750	22	2.64	2–2½	2–2½	500
222	825	22	2.64	2–2½	2–2½	550
223	900	22	2.64	2–2½	2–2½	600
251	1025	25	3.41	2–3	2–3	700
252	1100	25	3.41	2–3	2–3	750
253	1200	25	3.41	2–3	2–3	800
281	1350	28	4.28	2–3½	2–3½	900
282	1550	28	4.28	2–3½	2–3½	1025
283	1675	28	4.28	2–3½	2–3½	1125

*Based on use of cast iron radiation in a 70° F. temperature and assuming that boiler and piping system are thoroughly covered in usual manner. For churches, garages, schools, or where pipe coils, wall or indirect radiation is used, tax on boiler must be figured on a basis equivalent to cast iron radiation as above. When coils or indirect water heaters are used in connection with steam and water boilers for heating water for domestic purposes, additional capacity must be figured at the rate of 1½ sq. ft. of direct radiation for steam boilers and 2½ sq. ft. for hot water boilers for each gallon of water to be heated per hour.

DIMENSIONS IN INCHES, RICHARDSON ROUND SECTIONAL BOILERS—(See diagram at left)

Boiler No.	Steam and Water										Steam only		Water only
	A	B	D	E	F	H	J	K	M	N	C	G	C
190	30¼	28¼	45⅜	10	17½	10 x12½	14⅜	8	20⅛	25½	47½	42½	45¼
191	30¼	28¼	49⅝	10	17½	10 x12½	14⅜	8	20⅛	25½	51½	46½	49¼
192	30¼	28¼	53⅝	10	17½	10 x12½	14⅜	8	20⅛	25½	55½	50½	53¼
221	33¼	32	50⅝	10½	18	10 x13¾	15½	9	22	28	53	48¼	50½
222	33¼	32	55¼	10½	18	10 x13¾	15½	9	22	28	57	52¼	54½
223	33¼	32	59¼	10½	18	10 x13¾	15½	9	22	28	61	56¼	58½
251	36	34½	52¼	11¼	18	10 x15½	16¼	10	24⅞	31⅜	54¼	49½	52
252	36	34½	56¼	11¼	18	10 x15½	16¼	10	24⅞	31⅜	58¼	53½	56
253	36	34½	60⅜	11¼	18	10 x15½	16¼	10	24⅞	31⅜	62¼	57½	60
281	40	38¼	53¾	11¼	18	10½x16	16⅞	10	28	34¾	55¾	51	53¼
282	40	38¼	57¾	11¼	18	10½x16	16⅞	10	28	34¾	59¾	55	57¼
283	40	38¼	62	11¼	18	10½x16	16⅞	10	28	34¾	63¾	59	61¼

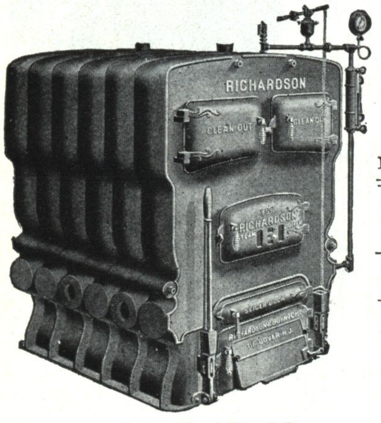
Continued on next page

Richardson End Feed Square Sectional Boilers for Steam, Vapor and Water

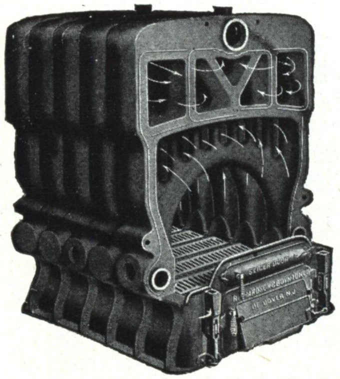
These boilers are made in sizes to meet practically any steam, hot water or vapor heating requirement for dwellings of moderate or large size, apartment house, office and commercial buildings, hospitals, schoolhouses, etc. The prime features are the ease with which they can be operated, their ability to carry their ratings for long periods, and an economical operating expense. This is accomplished by securing the proper proportion and arrangement of the heating surface to the grate area with large flues, admitting of a low rate of combustion.

Heating Surface—Richardson boilers are so constructed as to present to the fire a large amount of correctly proportioned direct heating surface. This surface being entirely backed by water in thin, shallow bodies causes rapid circulation and a quick absorption of the heat units given off by the fire. The flames pass three times the full length of the boiler and are constantly in contact with the water heating surfaces, thus securing an effective and positive transfer of heat from the products of combustion to all parts of the boiler.

Grates—The grate bars are extra heavy sectional shaking and dumping pattern, operated in sections from the front of the boiler and controlled by a lock plate permitting the bars to be shaken, dumped, or locked in position, as desired, and are made for burning a large or small size coal.



25-35-42 Series End Feed Steam and Hot Water Boilers



Sectional View of End Feed Steam and Hot Water Boilers

Ash Pit—The ash pit is high and wide and is fitted with a large door, making the removal of the ashes a simple operation. The ash pit door is provided with an air inlet, butterfly draft door for supplying oxygen to the fuel, this draft door being operated from the automatic damper regulator of steam boilers, and with a ratchet on water boilers.

The slicer door in the ash pit front permits cleaning the grate of clinkers and ashes without disturbing the top of the fire.

Firing and Clean-out Doors—Firing doors are large, permitting easy firing. Large double doors are provided for wood fuel. Two large clean-out doors furnish access to flue surfaces for cleaning.

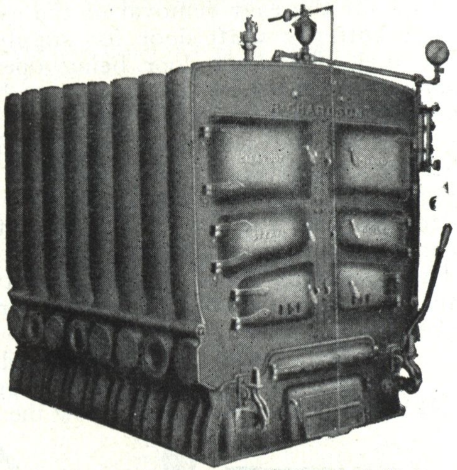
Smoke Box—At the rear of boiler is the smoke box, fitted with sliding throttle damper for controlling draft, and an air inlet check draft door at bottom operated with a ratchet on the water boilers and with weighted lever handle connected by chain to the automatic damper regulator on steam boilers.

Connections—All connections between the sections are made with extra heavy cast iron machine cut tapered slip nipples, fitting into tapered openings in the section, and making up absolutely tight.

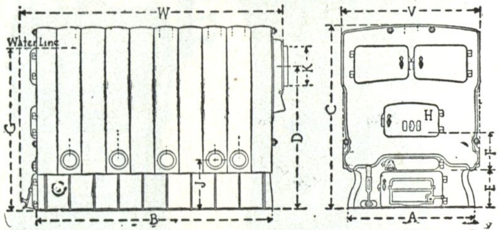
END FEED STEAM AND HOT WATER BOILERS

Boiler No.	8-hour rating, sq. ft.	Grate area, sq. ft.	Ash pit inside, in.	Number outlets and size, in.	*Direct rad. boiler will supply
		STEAM			
255	1000	4.57	27½x35½	2–3½	665
256	1250	5.70	27½x42¾	2–3½	830
257	1500	6.83	27½x50	2–3½	1000
258	1700	7.97	27½x57¼	2–3½	1125
355	1950	7.85	39x33¼	2–4	1300
356	2400	9.81	39x41½	2–4	1600
357	2850	11.75	39x50	3–4	1900
358	3300	13.70	39x58¼	3–4	2200
359	3750	15.65	39x66½	3–4	2500
427	3500	13.82	45x50	2–5	2300
428	4050	16.11	45x58¼	2–5	2700
429	4600	18.40	45x66½	2–5	3050
4210	5150	20.69	45x74¾	3–5	3450
4211	5700	22.98	45x83	3–5	3800
536	6300	18.94	55x55	2–6	4200
537	7300	22.68	55x65¾	2–6	4850
538	8300	26.40	55x76½	3–6	5550
539	9300	30.12	55x87¼	3–6	6200
5310	10300	33.88	55x98	3–6	6850
		HOT WATER			
255	1600	4.57	27½x35½	2–3½	1065
256	2000	5.70	27½x42¾	3–3½	1350
257	2400	6.83	27½x50	3–3½	1600
258	2800	7.97	27½x57¼	3–3½	1875
355	3125	7.85	39x33¼	3–4	2100
356	3850	9.81	39x41½	3–4	2575
357	4575	11.75	39x50	4–4	3050
358	5300	13.70	39x58¼	4–4	3550
359	6025	15.65	39x66½	5–4	4000
427	5600	13.82	45x50	3–5	3750
428	6500	16.11	45x58¼	3–5	4350
429	7400	18.40	45x66½	3–5	4950
4210	8300	20.69	45x74¾	4–5	5550
4211	9200	22.98	45x83	4–5	6150
536	10000	18.94	55x55	2–6	6650
537	11600	22.68	55x65¾	2–6	6750
538	13200	26.40	55x76½	3–6	8800
539	14800	30.12	55x87¼	3–6	9850
5310	16400	33.88	55x98	3–6	10950

*Based on use of cast iron radiation in a 70° F. temperature and assuming that boiler and piping system are thoroughly covered in usual manner. For churches, garages, schools, or where pipe coils, wall or indirect radiation is used, tax on boiler must be figured on a basis equivalent to cast iron radiation as above. When coils or indirect water heaters are used in connection with steam and water boilers for heating water for domestic purposes, additional capacity must be figured at the rate of 1½ sq. ft. of direct radiation for steam boilers and 2½ sq. ft. for hot water boilers for each gallon of water to be heated per hour.



53 Series End Feed Steam and Hot Water Boilers



Dimension Diagram Richardson End Feed Sectional Boilers

DIMENSIONS IN INCHES, RICHARDSON END FEED SECTIONAL BOILERS

Boiler No.	Steam and Water											St'm
	A	B	C	D	E	F	H	J	K	V	W	G
255	32¾	35¾	55	43	11½	14½	10¼x17¾	15½	12	39⅜	48¾	48¼
256	32¾	43	55	43	11½	14½	10¼x17¾	15½	12	39⅜	56	48¼
257	32¾	50¼	55	43	11½	14½	10¼x17¾	15½	12	39⅜	63¼	48¼
258	32¾	57½	55	43	11½	14½	10¼x17¾	15½	12	39⅜	70½	48¼
355	44	40½	63	49½	13	13	11x18	17	14	48	47¼	56
356	44	48¾	63	49½	13	13	11x18	17	14	48	55½	56
357	44	57	63	49½	13	13	11x18	17	14	48	64	56
358	44	65½	63	49½	13	13	11x18	17	14	48	72¾	56
359	44	73¾	63	49½	13	13	11x18	17	14	48	80½	56
427	50	57	68	50½	13	14	11x20	17	16	54	64	59
428	50	65½	68	50½	13	14	11x20	17	16	54	72¼	59
429	50	73¼	68	50½	13	14	11x20	17	16	54	80½	59
4210	50	82	68	50½	13	14	11x20	17	16	54	88¾	59
4211	50	90¼	68	50½	13	14	11x20	17	16	54	97	59
536	61¾	61¼	82	60⅞	14⅞	17	13x21	20⅝	17	69½	78¼	70½
537	61¾	72	82	60⅞	14⅞	17	13x21	20⅝	17	69½	89	70½
538	61¾	82¾	82	60⅞	14⅞	17	13x21	20⅝	19	69½	99¾	70½
539	61¾	93½	82	60⅞	14⅞	17	13x21	20⅝	21	69½	110½	70½
5310	61¾	104¼	82	60⅞	14⅞	17	13x21	20⅝	21	69½	121¼	70½

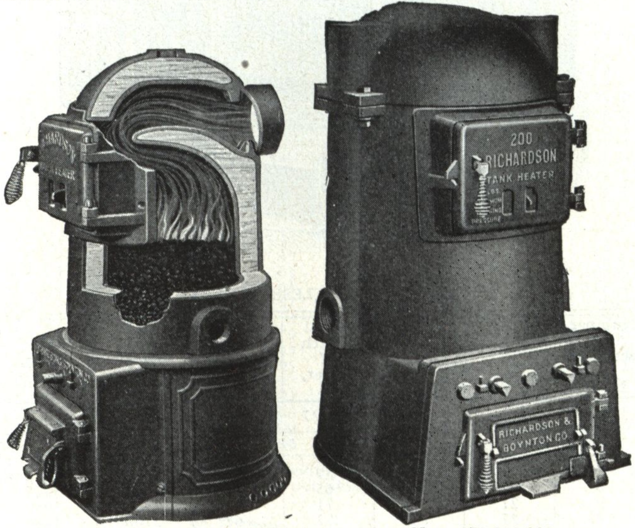
Continued on next page

Richardson Domestic Hot Water Supply and Tank Heaters

Furnish an abundant supply of hot water for residences, apartments, clubs, restaurants, hotels, laundries, garages, or wherever hot water is required. Made with two types of water section: cast iron and galvoxide.

Richardson Galvoxide Process—In many sections the chemical composition of the water makes it impossible to obtain clean hot water free from rust or discoloration, except by using brass sections in the tank and laundry heaters. Seven years ago the Richardson & Boynton Co. perfected a new type of heater with a galvoxide water section so treated by a special process that it is not affected by the chemical properties in the water in any way whatsoever. The result is that clean hot water is available at all times.

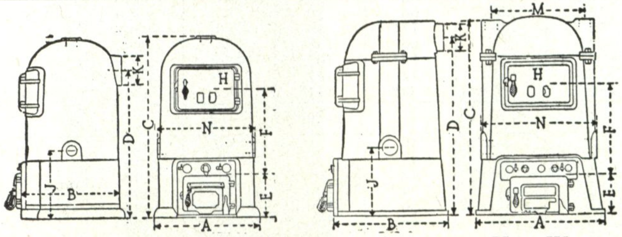
Thousands of successful installations in the past seven years have so established the Richardson galvoxide heater as a solution for the clean water problem that Richardson & Boynton Co. now guarantee their galvoxide water heaters to keep water free from rust or discoloration. Architects and plumbers find the guaranteed galvoxide water section so satisfactory in all ways that they do not hesitate to recommend it without reservation to clients.



Nos. 110-T, 112-T, 114-T Nos. 170-200-230

Richardson Domestic Hot Water Supply and Tank Heaters Fitted with Triangular Grates

No.	List price		Capacity gal. of water	Capacity sq. ft. of radiation	Height, in.	Diam. grates, in.	Tappings, flow and return, in.	Smoke pipe, in.	No.	List price, all cast iron	Capacity, gal. of water	Capacity, sq. ft. of radiation	Height, in.	Diam. grates, in.	Tappings, flow and return, in.	Smoke pipe, in.
	All cast iron	With galvoxide water section														
110-T	$80.00	$98.00	150	115	34	10	1¼	6	170	$170.00	475	380	42	17	2-2½	7
112-T	98.00	126.00	250	200	36⅜	12	2	6	200	220.00	600	480	42⅞	20	2-3	8
114-T	115.00	143.00	350	280	37⅞	14	2½	6	230	260.00	800	600	46	23	2-3	9



Dimension Diagrams Richardson Domestic Hot Water Supply and Tank Heaters

Dimensions in Inches

No.	A	B	C	D		K	N	No.	A	B	C	D	J	K	M	N
110	17	16½	34¼	28	13¾	6	15½	170	24	25¼	43¼	38	14½	7	16	23½
112	20	19½	36½	30¼	15	6	17¾	200	27	28½	43¼	39¼	15½	8	18¾	26¾
114	22½	22	38	31¼	15½	6	20	230	30	31½	48¾	41¾	16½	9	21¾	29¾

Richardson Domestic Hot Water Supply and Laundry Heaters

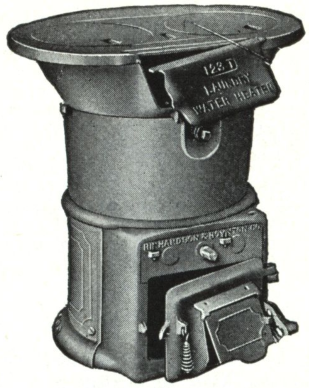
No. 123T and No. 124 Laundry and Tank Heaters—

No. 123T, 23 in. high.
No. 124, 26 in. high.
Top, 24x16 in.
Grate, 10½ in.
Smoke pipe, 4½ in.
1-in. flow and return tapping.

Fitted with high ash pit and "Perfect" revolving grate bars.

No. 123T for 80 gal.
No. 124 for 150 gal.

Can be furnished with cast iron or galvoxide water section.



No. 123T and No. 124 Laundry and Tank Heater

No. 4 Union Laundry and Tank Heater—

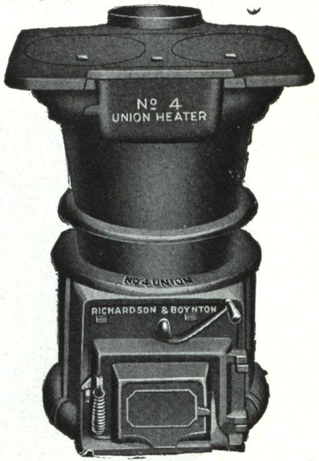
Height, 27½ in.
Top, 21x14¼ in.
Grate, 8 in.
Smoke pipe, 6 in.
1-in. flow and return tapping.

Fitted with high ash pit and "Perfect" revolving grate bars.

A course of firebrick under water section prevents ashes and dead coal from coming in contact with heating surface, insuring maximum efficiency.

No. 4 for 50 gal.

Can be furnished with cast iron or galvoxide water section.



No. 4 Union Laundry and Tank Heater

No. 123B Laundry and Tank Heater—

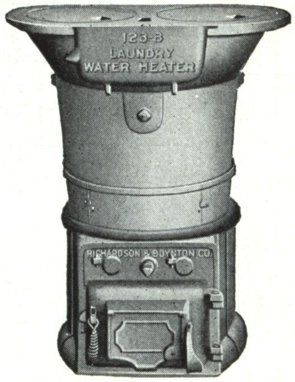
No. 123B, 28¾ in. high.
Top, 24x16 in.
Grate, 10½ in.
Smoke pipe, 5 in.
1-in. flow and return tapping.

Fitted with high ash pit and "Perfect" revolving grate bars.

Brick ring prevents accumulation of dead ashes at bottom of water section.

No. 123B for 100 gal.

Can be furnished with cast iron or galvoxide water section.



No. 123B Laundry and Tank Heater

No. 225 Richardson Domestic Hot Water Supply and Laundry Heater—

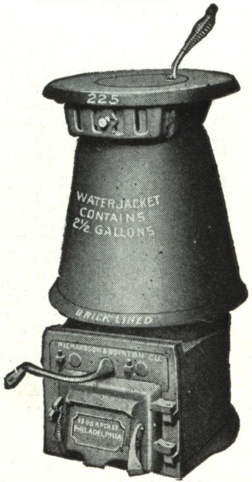
Capacity, 125 gal.
Height, 30⅞ in.
Grate, 12 in.
Smoke pipe, 6 in.
1¼-in. flow and return tappings.

A course of firebrick under water section prevents ashes and dead coal from coming in contact with heating surface, insuring maximum efficiency.

Fitted with high ash pit and "Perfect" revolving grate bars.

430 sq. in. direct heating surface.

Can be furnished with cast iron or galvoxide water section.



No. 225 Laundry Heater

THE H. B. SMITH CO.

Manufacturers of Boilers and Radiators

WESTFIELD, MASS.

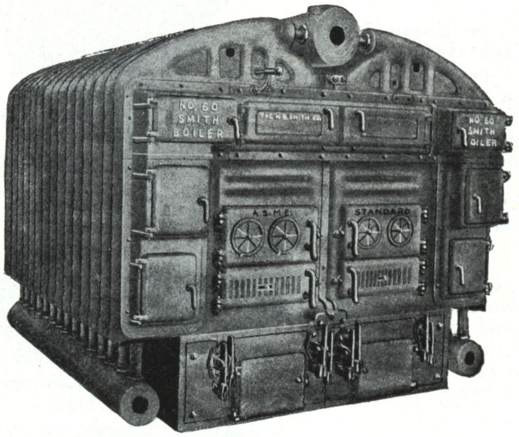
BRANCH OFFICES AND WAREHOUSES

BOSTON, 640 Main Street, Cambridge, Mass.
NEW YORK, N. Y., 10 East 39th Street
PHILADELPHIA, PA., 49th Street and Gray's Avenue
CLEVELAND, OHIO, 1108-10 Webster Avenue, S. E.
PACIFIC COAST REPRESENTATIVES: Holbrook, Merrill & Stetson, SAN FRANCISCO AND LOS ANGELES, CAL.

Products

Smith Smokeless Boilers, Steam and Water; Mills Water Tube Steam and Water Boilers; H-B Steam and Water Boilers; Menlo and Hy-Test Boilers for Hot Water Supply; Princess Direct and Wall Radiators.

Also Princess Direct-Indirect and Indirect Radiators.



Smith Smokeless Boiler with Oxygen Torch

Number of sections in boiler	Nominal size of fire pot, in.		Total length of boiler, in.	Length at foundation, in.	Steam rating, ft.	Water rating, ft.
	Width	Length				
			No. 27			
10	27	36	77	62	2700	4450
11	27	42	83	68	3000	4950
12	27	48	89	74	3300	5450
13	27	54	95	80	3600	5950
14	27	60	101	86	3900	6425
15	27	66	107	92	4200	6925
16	27	72	113	98	4500	7425
			No. 36			
11	36	42	87	68	4300	7100
12	36	48	93	74	4800	7925
13	36	54	99	80	5300	8750
14	36	60	105	86	5800	9575
15	36	66	111	92	6300	10400
16	36	72	117	98	6800	11225
17	36	78	123	104	7300	12050
18	36	84	129	110	7800	12875
			No. 60			
12	60	42	110	73	10800	17800
13	60	48	116	79	12000	19800
14	60	54	122	85	13200	21800
15	60	60	128	91	14400	23750
16	60	66	134	97	15600	25750
17	60	66	140	103	16800	27700
18	60	72	146	109	18000	29700
19	60	78	152	115	19200	31700
20	60	78	158	121	20400	33650

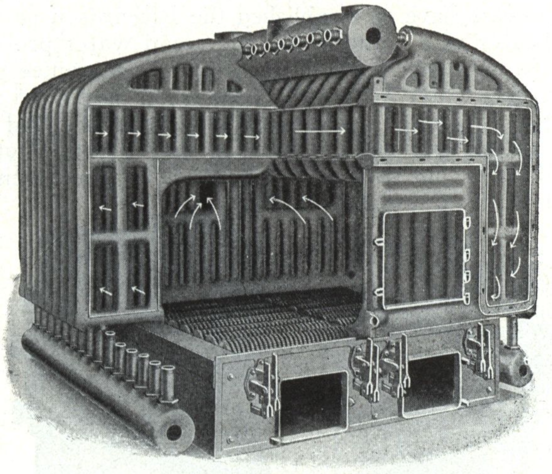
ADDITIONAL DATA APPLYING TO SMITH SMOKELESS BOILERS

Boiler No.	27	36	60
Width at foundation ......in.	35	48¼	72
Width of boiler, steam ......in.	56	72	98
Width of boiler, water ......in.	59	76	98
Height of boiler ......in.	80	83	87
Height of water line ......in.	57	59	66
Smoke pipe opening	13½ in. round	15½ in. round	*16 x 37 in. oval

*Equals 26-in. round.

Smith Steam and Water Boilers

Smith steam and hot water boilers are of the cast iron sectional type for use in low pressure heating systems.



Smith Smokeless Boiler

Number of sections in boiler	Nominal size of fire pot, in.		Total length of boiler, in.	Length at foundation, in.	Steam rating, ft.	Water rating, ft.
	Width	Length				
			No. 27			
5	27	24	47	32	1200	1975
6	27	30	53	38	1500	2475
7	27	36	59	44	1800	2975
8	27	42	65	50	2100	3475
9	27	48	71	56	2400	3950
10	27	54	77	62	2700	4450
11	27	60	83	68	3000	4950
12	27	60	89	74	3300	5450
12	27	66*	89*	74	3300	5450
13	27	66	95	80	3600	5950
13	27	72*	95*	80	3600	5950
14	27	66	101	86	3900	6425
14	27	78*	101*	86	3900	6425
			No. 36			
7	36	36	63	44	2300	3800
8	36	42	69	50	2800	4625
9	36	48	75	56	3300	5450
10	36	54	81	62	3800	6275
11	36	60	87	68	4300	7100
12	36	60	93	74	4800	7925
12	36	66*	93	74	4800	7925
13	36	66	99	80	5300	8750
13	36	72*	99	80	5300	8750
14	36	66	105	86	5800	9575
14	36	78*	105	86	5800	9575
15	36	72	111	92	6300	10400
15	36	84*	111	92	6300	10400
			No. 60			
8	60	36	86	49	6000	9900
9	60	42	92	55	7200	11900
10	60	48	98	61	8400	13850
11	60	54	104	67	9600	15850
12	60	60	110	73	10800	17800
13	60	66	116	79	12000	19800
14	60	72	122	85	13200	21800
15	60	78	128	91	14400	23750
16	60	84	134	97	15600	25750
17	60	78*	140	103	16800	27700
18	60	84*	146	109	18000	29700
19	60	84*	152	115	19200	31700
20	60	84*	158	121	20400	33650

Note: For additional data pertaining to these boilers, see table at bottom of first column, this page.

Continued on next page

Mills Water Tube Steam and Water Boilers

Sectional cast iron boilers which are moderate in first cost, low maintenance and extremely economical in fuel. Sectional view shows large combustion chamber and vertical waterways of small area. The latter absorb heat quickly, circulate water rapidly and make dry steam. Fired with anthracite coal, wood, coke or fuel gas.

MILLS WATER TUBE STEAM AND WATER BOILERS

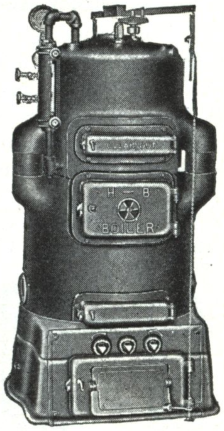
Number of sections	Nominal size of fire pot, in. Width	Nominal size of fire pot, in. Length	Total length of boiler, in.	Length at foundation, in.	Smoke pipe opening equals, in. round	Fire (heating) surface, sq. ft.	Steam rating, ft.	Water rating, ft.
No. 24								
5	24	24	48	32	9	75.5	900	1500
6	24	30	54	38	9	91.0	1125	1875
7	24	36	60	44	10	106.5	1350	2250
8	24	42	66	50	10	122.0	1575	2600
9	24	48	72	56	12	137.5	1800	2975
10	24	54	78	62	12	153.0	2025	3350
Total height, 66 in. Total widths—steam, 45 in.; water, 48 in. Height of water line, 47 in.								
No. 34								
6	34	30	60	37	12	165.0	2000	3300
7	34	36	66	43	12	192.5	2400	3950
8	34	42	72	49	12	220.0	2800	4625
9	34	48	78	55	14	247.5	3200	5275
10	34	54	84	61	14	275.0	3600	5950
11	34	60	90	67	14	302.5	4000	6600
12	34	66	96	73	16	330.0	4400	7250
13	34	72	102	79	16	357.5	4800	7925
14	34	78	108	85	16	385.0	5200	8575
Total height, 78 in. Total width, 51 in. Height of water line, 54 in.								
No. 44								
7	44	36	72	43	15	287	3600	5950
8	44	42	78	49	15	328	4200	6925
9	44	48	84	55	15	369	4800	7925
10	44	54	90	61	18	410	5400	8900
11	44	60	96	67	18	451	6000	9900
12	44	66	102	73	18	492	6600	10900
13	44	72	108	79	20	533	7200	11875
14	44	78	114	85	20	574	7800	12875
15	44	84	120	91	20	615	8400	13850
16	44	90	126	97	20	656	9000	14850
Total height, 75 in. Total width, 64 in. Height of water line, 58 in.								
No. 48								
7	48	30	74	43	16	360	4800	7925
8	48	36	80	49	16	420	5600	9250
9	48	42	86	55	16	480	6400	10550
10	48	48	92	61	16	540	7200	11875
11	48	54	98	67	20	500	8000	13200
12	48	60	104	73	20	660	8800	14625
13	48	66	110	79	20	720	9600	15850
14	48	72	116	85	20	780	10400	17150
15	48	78	122	91	20	840	11200	18475
16	48	84	128	97	24	900	12000	19800
17	48	72	134	103	24	960	12800	21125
17	48	*90	134	103	24	960	12800	21125
18	48	78	140	109	24	1020	13600	22450
18	48	*96	140	109	24	1020	13600	22450

Total height, 103 in. Total width, 84 in. Height of water line, 84 in.
*Maximum size of fire pot, not shipped as regular.

H-B Steam and Water Boilers

H-B boilers have three waterways between sections. They are the only boilers in which ascending and descending currents of water are circulated through separate connections, giving a steady water line and rapid circulation without back pressure.

Outside connections assist in the ease of erection, remove joints from intense heat and are accessible, allowing full diameter of fire box.



No. 224 H-B Steam Boiler

H-B STEAM AND WATER BOILERS

No. of boiler	Nominal diam. fire pot, in.	Total height boiler, in.	Height of dome, in	Height of water line, in.	Diam. smoke pipe opening, in.	Outside diam. fire pot, in.	Steam rating, ft.	Water rating, ft.
115	15	46	34	39½	6	19	250	425
217	17	55¼	20¾	49¾	7	20½	325	550
317	17	62¼	20¾	56¾	7	20½	375	625
219	19	55¼	20¾	49¾	7	22⅜	425	700
319	19	62¼	20¾	56¾	7	22⅜	475	775
221	21	56½	22	49¾	8	24⅝	500	825
321	21	63½	22	56¾	8	24⅝	550	900
223	23	56½	22	49¾	8	26⅝	600	1000
323*	23	63½	22	56¾	8	26⅝	700	1150
224	24	58	22	51	8	28¼	650	1075
324	24	65½	22	58½	8	28¼	800	1325
227	27	58	22	51	8	31¼	900	1500
327	27	65½	22	58½	8	31¼	1000	1650

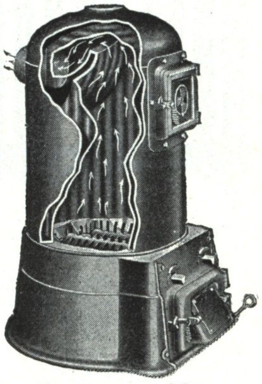
*Note that No. 323 is larger than No. 224.

Fire tools furnished: poker and flue brush with handle.

Trimmings furnished with steam boilers: steam gage with cock; water column complete; two ⅜-in. gage cocks; one pair water gage cocks with glass; damper regulator complete with chain; pipe and fittings for connecting steam trimmings.

Menlo Hot Water Supply Boilers

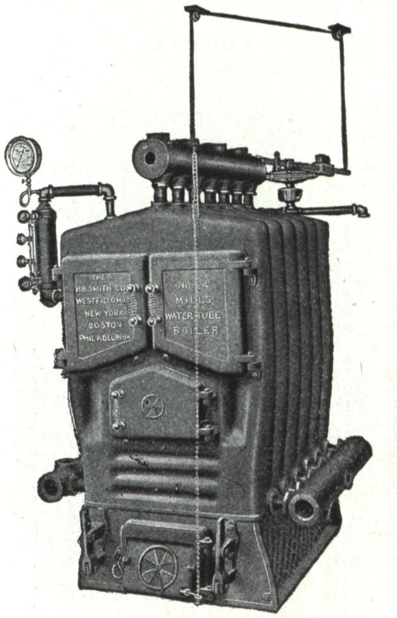
The sizes listed below will be found extremely economical for domestic hot water supply.



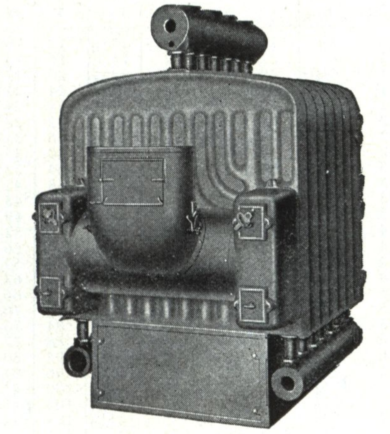
Interior of Menlo Boiler Showing Fire Travel

MENLO HOT WATER SUPPLY BOILERS

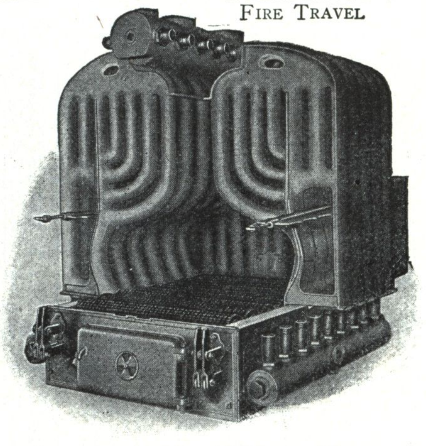
No. of boiler	10	12	14	16	18	20
Diam. fire pot, in.	10	12	14	16	18	20
Water rating, ft.	200	300	400	500	600	800
Hot water supply rating, gal.	125	175	250	.....	.....	.....
Total height of boiler, in.	33½	35	39	50	50	51
Outside diam. dome, in.	15	17½	20	22	24	26
Diam. smoke pipe opening, in.	5	5	6	7	7	8



No. 24 Mills Water Tube Steam Boiler



No. 34 Mills Water Tube Water Boiler



Interior of No. 44 Mills Water Tube Boiler

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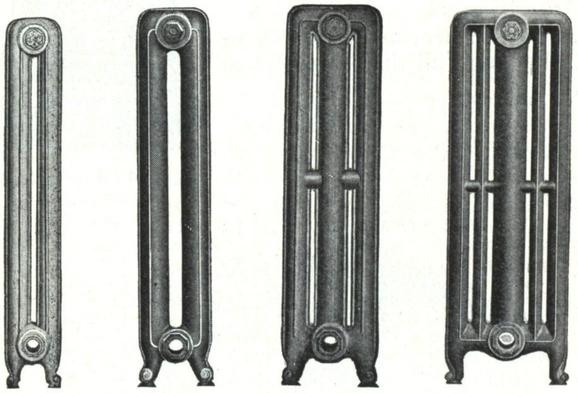
Princess Direct Radiators

For sanitary reasons, radiators with wide spacing should be demanded.

If ordinary radiators are not sanitary enough for hospitals, they are not sanitary for the home. To meet hospital specifications, some manufacturers make special radiators with wide spacing and charge an increased price.

Princess radiators are the standard radiators of The H. B. Smith Co. and are sold at regular list prices.



Single Column Two-column Three-column Five-column

Princess Direct Radiators

Princess Direct Radiator Tappings

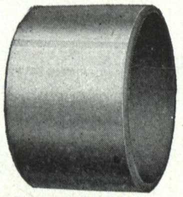
Steam, One-pipe Work	Inches
Radiators of 30 ft. and smaller	1
Radiators larger than 30 ft. and smaller than 60 ft.	1¼
Radiators of 60 ft. and larger and smaller than 120 ft.	1½
Radiators of 120 ft. and larger	2
Air valve	⅛

Steam, Two-pipe Work	
Radiators of 50 ft. and smaller	1 x ¾
Radiators larger than 50 ft. and smaller than 120 ft.	1¼ x 1
Radiators of 120 ft. and larger	1½ x 1¼
Air valve	⅛

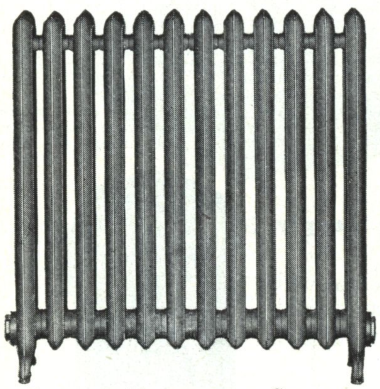
Water	
Radiators of 50 ft. and smaller	1 x 1
Radiators larger than 50 ft. and smaller than 120 ft.	1¼ x 1¼
Radiators of 120 ft. and larger	1½ x 1½
Air valve	⅛ at top

Special Note—Radiators will be tapped for two-pipe work unless otherwise specified. If radiators are required tapped top and bottom same end, or top and bottom opposite ends, so specify on order. All tappings will be made right hand unless otherwise specified.

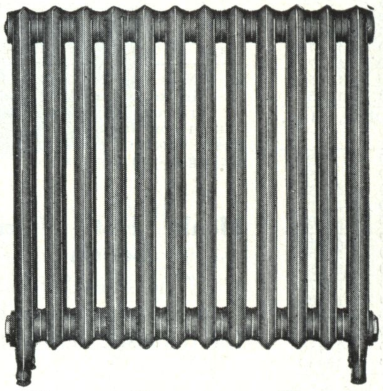
Tappings other than regular can be made special to order.



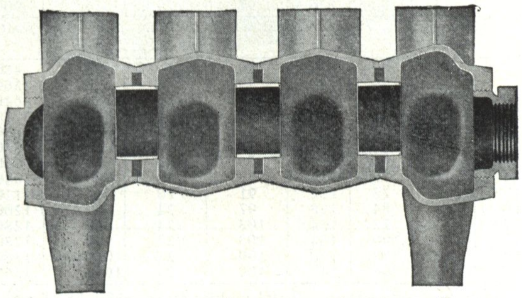
Push Nipple



Princess Two-column Steam Radiator



Princess Two-column Water Radiator



Section Through Radiator Showing Push Nipple Construction for Direct Radiators

LIST OF SIZES SHOWING RADIATING SURFACE IN SQUARE FEET OF PRINCESS DIRECT RADIATORS

Number of sections	Two-column								Three-column								Five-column						
	Total length (sections 3 in. each)		Height, in.						Total length (sections 3¼ in. each)		Height, in.						Total length (sections 3¼ in. each)		Height, in.				
			45	37	31	25	22	19			45	37	31	25	22	19			37	25	16	14	12
			Radiation in sq. ft. per section								Radiation in sq. ft. per section								Radiation in sq. ft. per section				
	ft.	in.	5	4	3½	3	2⅝	2¼	ft.	in.	8	6½	5½	4½	4	3½	ft.	in.	10	7	4⅔	4	3⅓
3	0	10	15	12	10½	9	7⅞	6¾	0	10¾	24	19½	16½	13½	12	10½	0	10¾	30	21	14	12	10
4	1	1	20	16	14	12	10½	9	1	2	32	26	22	18	16	14	1	2	40	28	18⅔	16	13⅓
5	1	4	25	20	17½	15	13⅛	11¼	1	5¼	40	32½	27½	22½	20	17½	1	5¼	50	35	23⅓	20	16⅔
6	1	7	30	24	21	18	15¾	13½	1	8½	48	39	33	27	24	21	1	8½	60	42	28	24	20
7	1	10	35	28	24½	21	18⅜	15¾	1	11¾	56	45½	38½	31½	28	24½	1	11¾	70	49	32⅔	28	23⅓
8	2	1	40	32	28	24	21	18	2	3	64	52	44	36	32	28	2	3	80	56	37⅓	32	26⅔
9	2	4	45	36	31½	27	23⅝	20¼	2	6¼	72	58½	39½	40½	36	31½	2	6¼	90	63	42	36	30
10	2	7	50	40	35	30	26¼	22½	2	9½	80	65	55	45	40	35	2	9½	100	70	46⅔	40	33⅓
11	2	10	55	44	38½	33	28⅞	24¾	3	¾	88	71½	60½	49½	44	38½	3	¾	110	77	51⅓	44	36⅔
12	3	1	60	48	42	36	31½	27	3	4	96	78	66	54	48	42	3	4	120	84	56	48	40
13	3	4	65	52	45½	39	34⅛	29¼	3	7¼	104	84½	71½	58½	52	45½	3	7¼	130	91	60⅔	52	43⅓
14	3	7	70	56	49	42	36¾	31½	3	10½	112	91	77	63	56	49	3	10½	140	98	65⅓	56	46⅔
15	3	10	75	60	52½	45	39⅜	33¾	4	1¾	120	97½	82½	67½	60	52½	4	1¾	150	105	70	60	50
16	4	1	80	64	56	48	42	36	4	5	128	104	88	72	64	56	4	5	160	112	74⅔	64	53⅓
17	4	4	85	68	59½	51	44⅝	38¼	4	8¼	136	110½	93½	76½	68	59½	4	8¼	170	119	79⅓	68	56⅔
18	4	7	90	72	63	54	47¼	40½	4	11½	144	117	99	81	72	63	4	11½	180	126	84	72	60
19	4	10	95	76	66½	57	49⅞	42¾	5	2¾	152	123½	104½	85½	76	66½	5	2¾	190	133	88⅔	76	63⅓
20	5	1	100	80	70	60	52½	45	5	6	160	130	110	90	80	70	5	6	200	140	93⅓	80	66⅔
21	5	4	105	84	73½	63	55⅛	47¼	5	9¼	168	136½	115½	94½	84	73½	5	9¼	210	147	98	84	70
22	5	7	110	88	77	66	57¾	49½	6	½	176	143	121	99	88	77	6	½	220	154	102⅔	88	73⅓
23	5	10	115	92	80½	69	60⅜	51¾	6	3¾	184	149½	126½	103½	92	80½	6	3¾	230	161	107⅓	92	76⅔
24	6	1	120	96	84	72	63	54	6	7	192	156	132	108	96	84	6	7	240	168	112	96	80
25	6	4	125	100	87½	75	65⅝	56¼	6	10¼	200	162½	137½	112½	100	87½	6	10¼	250	175	116⅔	100	83⅓
26	6	7	130	104	91	78	68¼	58½	7	1½	208	169	143	117	104	91	7	1½	260	182	121⅓	104	86⅔
27	6	10	135	108	94½	81	70⅞	60¾	7	4¾	216	175½	148½	121½	108	94½	7	4¾	270	189	126	108	90
28	7	1	140	112	98	84	73½	63	7	8	224	182	154	126	112	98	7	8	280	196	130⅔	112	93⅓
29	7	4	145	116	101½	87	76⅛	65¼	7	11¼	232	188½	159½	130½	116	101½	7	11¼	290	203	135⅓	116	96⅔
30	7	7	150	120	105	90	78¾	67½	8	2½	240	195	165	135	120	105	8	2½	300	210	140	120	100

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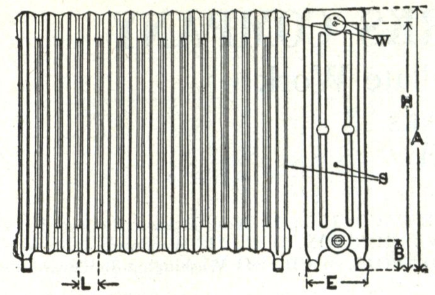


DIMENSION DIAGRAM, PRINCESS DIRECT RADIATORS

	Single-column	2-column	3-column	5-column Heights 37 and 25	5-column Heights 16, 14 and 12
E—Width of section..........in.	5¼	7	9	12	12
L—Length of section..........in.	3	3	3¼	3¼	3¼
B—Hgt. to center on reg. tapping in.	4⅝	4⅝	4⅝	4⅝	3

SINGLE, 2 AND 3-COLUMN

A—Total height............in.	45	37	31	25	22	19
H—Height of top tapping:						
Single-column...........in.	43⅛	34 9/16	28 15/16	23	20	17
2-column................in.	43	35	29	23	20	17
3-column................in.	43	35	29 1/16	23 3/16	20	17 3/16

5-COLUMN

A—Total height..............in.	37	25	*16	*14	*12
H—Height of top tapping.....in.	35	23	14	12	10

S Location of air vent tapping (steam)
W Location of air vent tapping (water)

*Window heights.

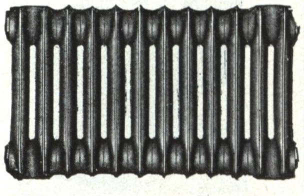
Princess Wall Radiators

Suited for all places where direct radiators or pipe coils can not be used. Especially desirable in locations where floor space is valuable and where wall, column or ceiling space is more available. They possess extreme flexibility of size and arrangement.

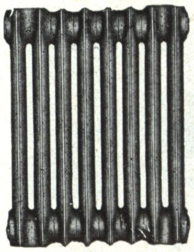
Made in two heights: 15 and 22 in. Can be furnished with heating surfaces from 5 sq. ft. up, in multiples of 2½ sq. ft. Corresponding lengths in 22-in. radiator are from 9 in. up, in multiples of 4 in. (1 in. allowed in over-all length for plugs and bushings). In the 15-in. radiator, corresponding lengths are from 13 in. up in multiples of 6 in.

By combinations of the two heights, these radiators can be arranged in tiers, either for horizontal runs or for column work. Hung horizontally, they make excellent ceiling radiators.

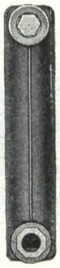
For water, Princess wall radiators have nipple connections between groups. For steam, the top connection at intervals is a plug instead of a nipple.



15-IN. PRINCESS RADIATOR
10 sq. ft. of radiation



22-IN. PRINCESS RADIATOR
10 sq. ft. of radiation

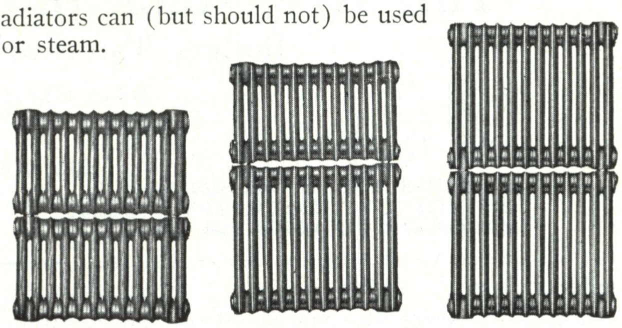


END VIEW

RADIATING SURFACE

15-in. radiator Length, ft. in.	15-in. radiator Sq. ft. of surface	22-in. radiator Length, ft. in.	22-in. radiator Sq. ft. of surface
1—1	5	0—9	5
1—7	7½	1—1	7½
2—1	10	1—5	10
2—7	12½	1—9	12½
3—1	15	2—1	15
3—7	17½	2—5	17½
4—1	20	2—9	20
4—7	22½	3—1	22½
5—1	25	3—5	25
5—7	27½	3—9	27½
6—1	30	4—1	30
6—7	32½	4—5	32½
7—1	35	4—9	35
7—7	37½	5—1	37½
8—1	40	5—5	40
8—7	42½	5—9	42½
9—1	45	6—1	45
9—7	47½	6—5	47½
10—1	50	6—9	50
10—7	52½	7—1	52½
11—1	55	7—5	55
11—7	57½	7—9	57½
12—1	60	8—1	60
12—7	62½	8—5	62½
13—1	65	8—9	65
13—7	67½	9—1	67½
14—1	70, 72½	9—5	70
14—7	72½	9—9	72½
15—1	75	10—1	75

Steam radiators can not be used for water; water radiators can (but should not) be used for steam.

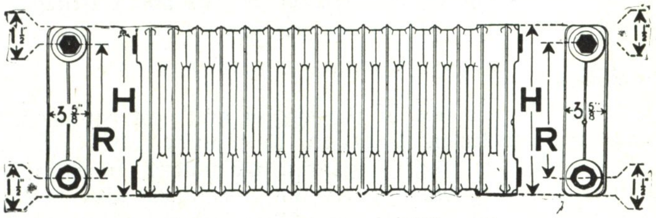


20-ft. Radiator
2 Tiers High

25-ft. Radiator
2 Tiers High

30-ft. Radiator
2 Tiers High

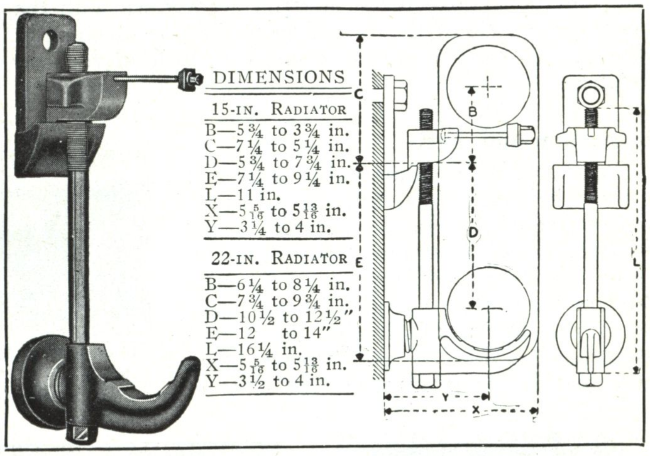
PRINCESS WALL RADIATOR COMBINATIONS



DIMENSION DIAGRAM, PRINCESS WALL RADIATORS

	15-in. radiator	22-in. radiator
H—Total height......................in.	14 9/16 in.	21 11/16 in.
R—Center to center of tapping.........in.	11 9/16 in.	18 11/16 in.

Width of radiator 3⅝ in.
Radiator 15 in. high—6 in. in length = 2½ ft. surface.
Radiator 22 in. high—4 in. in length = 2½ ft. surface.
Plugs and bushings (1 in.) included in total length of radiator.



DIMENSIONS

15-IN. RADIATOR
B—5¾ to 3¾ in.
C—7¼ to 5¼ in.
D—5¾ to 7¾ in.
E—7¼ to 9¼ in.
L—11 in.
X—5 5/16 to 5 13/16 in.
Y—3¼ to 4 in.

22-IN. RADIATOR
B—6¼ to 8¼ in.
C—7¾ to 9¾ in.
D—10½ to 12½"
E—12 to 14"
L—16¼ in.
X—5 5/16 to 5 13/16 in.
Y—3½ to 4 in.

No. 10 PRINCESS ADJUSTABLE WALL BRACKET

Princess Wall Radiator Tappings

STEAM, TWO-PIPE WORK	Inches
Radiators of 50 ft. and smaller....................	1 x ¾
Radiators larger than 50 ft. and smaller than 120 ft..	1¼ x 1
Radiators of 120 ft. and larger....................	1½ x 1¼
Air valves	⅛

STEAM, ONE-PIPE WORK	
Radiators of 30 ft. and smaller....................	1
Radiators larger than 30 ft. and smaller than 60 ft..	1¼
Radiators of 60 ft. and larger.....................	1½
Air valve	⅛

WATER	
Radiators of 50 ft. and smaller....................	1 x 1
Radiators larger than 50 ft. and smaller than 120 ft..	1¼ x 1¼
Radiators of 120 ft. and larger....................	1½ x 1½
Air valve	⅛ in. top plug

Special Note—Radiators will be tapped for two-pipe work unless otherwise specified.

For water, and for two-pipe steam work, radiators 2, 4, or 6 units high are tapped top and bottom same end. Radiators 3, 5, or 7 units high are tapped top and bottom opposite ends.

THE TITUSVILLE IRON WORKS COMPANY

Boilers, Tanks and Steel Plate Work

MAIN OFFICE AND WORKS
TITUSVILLE, PA.

BRANCH OFFICES

NEW YORK, N. Y., 152 West 42nd Street
BUFFALO, N. Y., 1124-26 Marine Trust Building
PITTSBURGH, PA., Farmers Bank Building

CHICAGO, ILL., 53 West Jackson Boulevard
WASHINGTON, D. C., 732 Woodward Building
DETROIT, MICH., 833 Washington Boulevard Building

Products

Firetube Steel Boilers for Power and Heating.
Tubeless Steel Water Heaters.

Also manufacturers of Steel Plate Work, including Tanks, Smokestacks, etc.; Boiler Fronts and Castings, Grates, etc.

Facilities

Our shop is one of the largest and best equipped boiler manufacturing plants in the country. It is provided with the latest improved machinery, including hydraulic and pneumatic riveting machines, also best hydraulic flanging equipment. Electric overhead cranes insure careful and rapid handling of material.

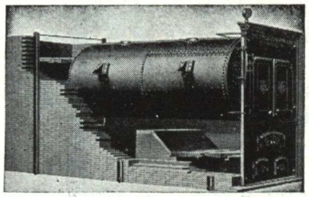
A large stock of plates and tubes is carried and shipment can be made with reasonable promptness. Also a large stock of completed Tico and Acme firebox boilers ready for immediate shipment.

A.S.M.E. Code

Our boilers are made in strict accordance with the latest boiler code of the American Society of Mechanical Engineers, or can be made to conform to local requirements.

Inspection and Test

All boilers are thoroughly inspected during their entire construction by a representative of the Hartford Steam Boiler Inspection and Insurance Company, who is in continual attendance at our works. Boilers are tested to required hydrostatic pressure, made absolutely tight and stamped "ASME." All workmanship and material are guaranteed first class in every respect. The insurance company's test certificate is furnished free of charge, if desired.


Horizontal Tubular Boiler for Power and Heating
See tables Nos. 1 and 2

Working Pressures

All boilers when used for high pressure or power service are made for 100 to 150 lb. working pressure, A.S.M.E. code, and are tested with hydrostatic pressure 50% in excess of the working pressure.

Standard heating boilers are made for 15 lb. working pressure A.S.M.E. Code and tested to 60 lb. hydrostatic pressure.

Steam Radiation Ratings

Firebox heating boilers are all rated very conservatively. Boilers up to about 4000-sq. ft. capacity are rated 10 sq. ft. of radiation per square foot of fire surface and larger boilers 11 to 1. Horizontal tubular heating boilers are all rated 10 to 1.

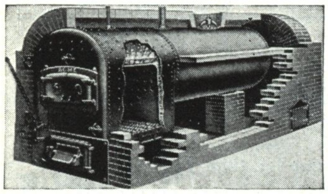
In determining the size of a boiler, take the actual amount of cast iron radiation or equivalent, plus the piping, and add about 5 to 10% and select a boiler with the next highest rating.

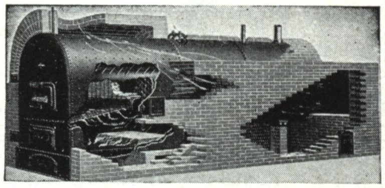
Equipment

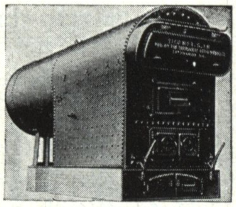
All our boilers are provided with complete castings, as illustrated below. Stationary grates are standard equipment on all horizontal tubular boilers. Shaking grates are standard with all firebox boilers. Special grates can be furnished on all types when desired.

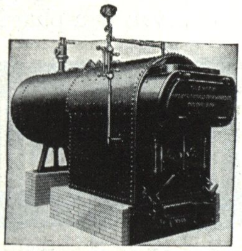
Catalogues

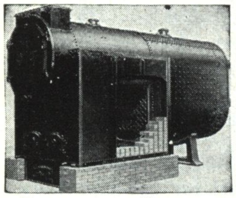
Send for new catalogues Nos. 81 and 85-A describing Titusville boilers and machinery.

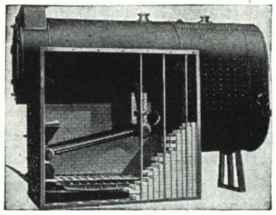

Acme Brickset Firebox Heating Boiler
See table No. 5

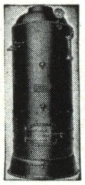

Acme Brickset Smokeless Firebox Heating Boiler

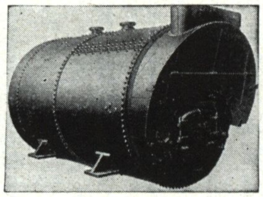

Tico Smokeless Portable Firebox Heating Boiler
See table No. 4

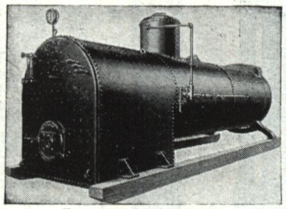

Tico Portable Firebox Heating Boiler
See table No. 3

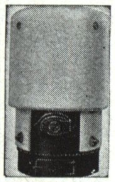

Perfection Return Tubular Portable Boiler
See table No. 6


Perfection Smokeless Return Tubular Portable Boiler


Vertical Boiler
See table No. 7


Scotch Boiler


Locomotive Boiler


Jacketed Tubeless Water Heater
See table No. 8

Continued on next page

TABLE NO. 1. SPECIFICATIONS FOR TITUSVILLE "A. S. M. E." HORIZONTAL TUBULAR POWER BOILERS

Working pressures, 100 to 150 lbs. Form 2500

Boiler No	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519
Horsepower at 10 sq. ft.	34	40	48	50	59	60	69	73	78	83	100	112	125	150	165	180	200	225	250
Diameter ... in.	42	44	44	48	48	54	54	60	60	60	66	66	72	72	72	78	78	84	84
Length of shell ... ft.	10	10	12	12	14	14	16	14	15	16	16	18	16	18	20	18	20	18	20
Heating surface ... sq. ft.	338	398	476	504	592	603	687	727	777	828	1000	1121	1263	1419	1575	1751	1942	2117	2353
Area of grates ... sq. ft.	12.25	12.83	14.6	16	18	20.25	22.5	22.5	25	27.5	30.25	33	33	36	39	39	42.25	42	45.5
Tubes Number	38	46	46	48	48	36	36	44	44	44	54	54	70	70	70	88	88	108	108
Tubes Size ... in.	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Diameter of stack ... in.	20	22	22	24	24	26	26	28	28	28	30	30	34	34	34	40	40	44	44

TABLE NO. 2. SPECIFICATIONS FOR TITUSVILLE "A. S. M. E." HORIZONTAL TUBULAR HEATING BOILERS

Working pressure, 15 lbs. Form 2600

Boiler No	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623
Horsepower at 10 sq. ft.	26	31	34	40	52	61	69	66	76	82	87	83	96	103	110	123	122	129	145	156	176	209	232
Capacity radiation ... sq. ft.	2500	3000	3300	4000	5000	6000	7000	6500	7600	8000	8700	8200	9600	10000	11000	12000	12000	13000	14500	15000	17000	21000	23000
Heating surface ... sq. ft.	258	309	338	405	523	608	693	656	762	815	868	827	961	1028	1095	1229	1215	1294	1452	1560	1755	2090	2319
Area of grates ... sq. ft.	10½	12	12¼	14	16	18	20	20¼	20¼	22½	22½	22½	25	25	27½	30	27½	30¼	33	33	36	39	42¼
Diameter ... in.	36	36	42	42	48	48	48	54	54	54	54	60	60	60	60	60	66	66	66	72	72	78	78
Length shell ... ft	10	12	10	12	12	14	16	12	14	15	16	12	14	15	16	18	15	16	18	16	18	18	20
Number 3-in. tubes	28	28	38	38	50	50	50	64	64	64	64	82	82	82	82	82	98	98	98	120	120	144	144
Diameter of stack ... in.	18	18	20	20	24	24	24	26	26	26	26	28	28	28	28	28	30	30	30	34	34	38	38

TABLE NO. 3. SPECIFICATIONS FOR TICO "A. S. M. E." PORTABLE FIREBOX HEATING BOILERS

Working pressure, 15 lbs. Form 2700

Boiler No.	T20	T22	T25	T31	T34	T38	T41	T46	T51	T55	T65	T72	T80	T81	T86	T90	T97	T98	T105	T113	T125	T135	T150	T161	T186	T220	T250
Capacity radiation ... sq. ft.	2000	2200	2500	3100	3400	3800	4600	5100	5600	6100	7200	8000	9000	8800	9600	10000	10800	10800	11600	12500	14000	15000	16500	18000	21000	25000	28000
Heating surface ... sq. ft.	202	222	250	311	341	379	415	464	509	555	654	721	812	800	865	902	973	975	1052	1149	1249	1345	1492	1610	1862	2194	2504
Grate area ... sq. ft.	6.7	7.9	9.2	9.5	11	12.5	12.8	14.6	16.3	18.7	20.7	20.7	22.7	23.3	25.5	25.5	27.7	28.3	30.8	30.8	31.1	33.9	36.7	37	40	43.3	45.5
Diameter of shell ... in.	36	36	36	42	42	42	48	48	48	54	54	54	54	60	60	60	60	66	66	66	72	72	72	78	78	84	84
Length of shell ... ft. and in.	8-10	9-10	10-10	9-10	10-10	11-10	10-0	11-0	12-0	11-0	12-6	13-6	15-0	13-2	14-2	14-8	15-8	13-8	14-8	15-8	14-8	15-8	17-2	15-10	17-10	18-0	20-0
Height of water line ... in.	61	61	61	64	64	64	72	72	72	77	77	77	77	81	81	81	81	85	85	85	88	88	88	100	100	104	104
Diameter of breeching ... in.	14	14	14	18	18	18	20	20	20	20	22	22	22	26	26	26	26	30	30	30	30	30	30	36	36	36	36

TABLE NO. 4. SPECIFICATIONS FOR TICO "A. S. M. E." SMOKELESS PORTABLE FIREBOX HEATING BOILERS

Working pressure, 15 lbs. Form 2800

Boiler No.	TS7	TS8	TS9	TS10	TS11	TS12	TS13	TS14	TS15	TS16	TS17	TS18	TS19	TS20	TS21	TS22	TS23	TS24
Capacity direct radiation ... sq. ft.	3000	3500	4000	4500	5000	5500	6000	7000	8000	9000	10000	12000	14000	16000	18000	20000	26000	28000
Heating surface ... sq. ft.	307	360	400	466	517	568	630	697	780	863	920	1050	1274	1373	1582	1694	2093	2284
Grate area A.S.M.E. rating . sq. ft.	11.25	13.1	15	17.5	19.6	21.8	22.5	25	28.1	30.9	31.25	34.4	37.8	41.25	45	45	48.8	52.8
Diameter of shell ... in.	42	42	42	48	48	48	54	54	60	60	66	66	72	72	78	78	84	84
Length of shell ... ft. and in.	9-8	11-1	12-1	11-0	12-0	13-0	12-0	13-0	13-2	14-2	13-2	14-8	15-2	16-2	15-10	16-10	17-6	18-6
Height of water line ... ft. and in.	6-2	6-2	6-2	6-10	6-10	6-10	7-1	7-1	7-10	7-10	8-3	8-3	8-8	8-8	9-5	9-5	10-4	10-4
Diameter of breeching ... in.	18	18	18	20	20	20	22	22	26	26	30	30	30	30	36	36	36	36

TABLE NO. 5. SPECIFICATIONS FOR TITUSVILLE "A. S. M. E." ACME BRICKSET FIREBOX BOILERS FOR HEATING

Working pressure, 15 lbs. Form 2800

Boiler No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Capacity, steam ... sq. ft.	900	1050	1200	1400	1700	2000	2200	2600	3000	3500	4000	4500	5500	6500	7500	8700	10000	11000	12000	14000
Capacity, water ... sq. ft.	1500	1700	2000	2300	2800	3300	3600	4300	5000	5800	6600	7400	9100	10700	12400	14400	16500	18200	19800	23100
Diameter of shell ... in.	30	30	30	36	36	36	42	42	42	48	48	48	54	54	60	60	66	66	72	72
Length of shell ... ft.	6½	7½	8½	7½	9	10½	8½	10	11½	10½	12	13½	14	16½	15½	18	16	18	16	18
Diameter of breeching required ... in.	16	16	16	18	18	18	20	20	20	22	22	22	24	24	30	30	34	34	40	40
Length of brickwork over all. ft. and in.	8-7	9-7	10-7	9-7	11-1	12-7	10-7	12-1	13-7	12-7	14-1	15-7	16-1	18-7	18-1	20-7	18-7	20-7	18-7	20-7
Width of brickwork over all. ft. and in.	5-8	5-8	5-8	6-2	6-2	6-2	6-8	6-8	6-8	7-2	7-2	7-2	7-8	7-8	8-2	8-2	8-8	8-8	9-2	9-2
Height of brickwork over all. ft. and in.	6	6	6	6-11	6-11	6-11	7-3	7-3	7-3	7-11	7-11	7-11	8-8	8-8	9-1	9-1	9-11	9-11	10-9	10-9
Height of water line ... in.	51	51	51	56	56	56	61	61	61	65	65	65	66	66	72	72	78	78	84	84

TABLE NO. 6. SPECIFICATIONS FOR PERFECTION "A. S. M. E." RETURN TUBULAR PORTABLE BOILERS

Working pressures, 15 to 150 lbs. Form 2400 For power and heating

Boiler No.	P-25	P-30	P-35	P-40	P-50	P-60	P-70	P-80	P-90	P-100	P-125	P-150	P-175	P-200
Horsepower at 10 sq. ft.	25	30	35	40	50	60	70	80	90	100	125	150	175	200
Capacity direct radiation ... sq. ft.	2600	3100	3700	4200	5600	7000	8000	9000	10000	12000	14000	17000	20000	24000
Heating surface ... sq. ft.	258	308	364	418	503	616	716	814	900	1031	1256	1535	1750	2017
Area of grates ... sq. ft.	10½	10½	14	14	16	20	22½	22½	25	27½	30	35¾	38½	39
Diameter of shell ... in.	36	36	42	42	48	48	54	54	60	60	60	66	66	72
Length over all ... in.	132	147	144	156	142	160	155	167	168	183	207	210	228	228
Width casing ... in.	60	60	66	66	72	72	79	79	85	85	85	91	91	97
Diameter of stack ... in.	20	20	24	24	28	28	32	32	34	34	34	38	38	42

TABLE NO. 7. SPECIFICATIONS FOR TITUSVILLE "A. S. M. E." VERTICAL BOILERS WITH FULL LENGTH TUBES

Working pressure, 100 lbs. Form 3000

Boiler No.	V4	V5	V6	V8	V10	V12	V15	V18	V20	V25	V30	V35	V40	V45	V50	V60	V70	V80	V90	V100	V125
Horsepower	4	5	6	8	10	12	15	18	20	25	30	35	40	45	50	60	70	80	90	100	125
Diameter ... in.	24	24	24	30	30	30	36	36	36	42	42	42	48	48	48	54	54	60	60	66	66
Height of shell ... ft.	4	5	6	5	6	7	6½	7	8	7¼	8¼	9¼	8½	9	10	9	10	10	11	10½	12
Height over all ... in.	67	79	91	82	94	106	103	109	121	115	127	139	132	138	150	142	154	157	169	166	184

TABLE NO. 8. TITUSVILLE TUBELESS WATER HEATERS

Steel plate construction, 150 lbs. pressure

No.	5	10	15	20	No.	5	10	15	20
Capacity ... gals per hour, 50° raise	500	1000	1500	2000	Grate area ... sq. ft.	3.5	4.9	7.0	10
Diameter shell ... in.	30	36	42	48	Thickness shell ... in.	¼	¼	5/16	5/16
Height shell ... in.	78	78	78	78	Thickness firebox ... in.	⅜	⅜	7/16	7/16
Diameter jacket ... in.	38	44	50	56	Diameter smoke outlet ... in.	12	12	12	14
Height over all ... in.	90	90	90	90	Asbestos covering required ... sq. ft.	70	85	100	115
Diameter grate and firebox ... in.	25	31	37	43	Shipping weight ... lbs.	2200	2750	3700	4300

*Standard equipment includes stationary grates. Shaking grates can be furnished at additional cost.
For further information on any of the above boilers or heaters, send for our complete new Catalogues Nos. 81 and 81-A.

ESTABLISHED 1864

E. KEELER COMPANY

Manufacturers of Water Tube and Return Tubular Boilers

WILLIAMSPORT, PA.

BRANCH OFFICES

NEW YORK, N. Y. PHILADELPHIA, PA. CHICAGO, ILL. PITTSBURGH, PA. DALLAS, TEX.
SYRACUSE, N. Y. BOSTON, MASS. PORTLAND, ORE. TOLEDO, OHIO

Products

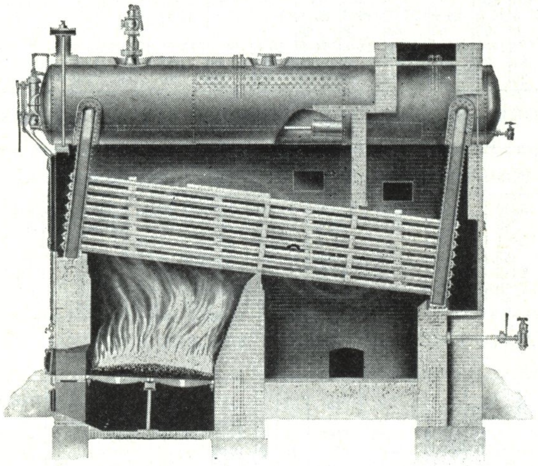
Horizontal Return Tubular, Double Duty, Longitudinal Drum and Cross Drum Water Tube Boilers.

Also Steel Stacks and Breechings.

"Sixty-one years building boilers, never an explosion."

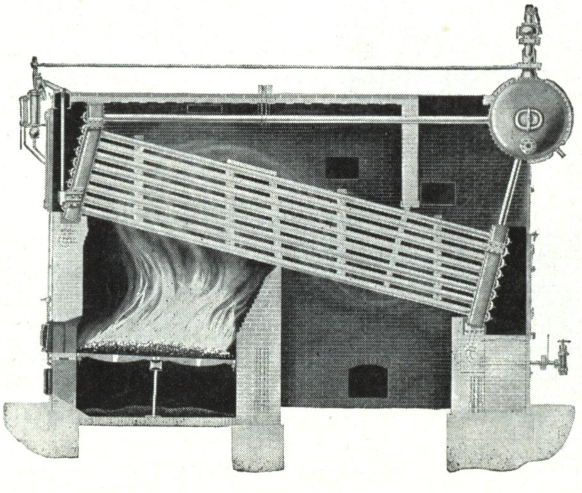
Keeler Water Tube Boilers

Longitudinal Drum Water Tube Boilers—A type used where high efficiency and great overload are desired.



The construction and design is such that there is a pronounced circulation; the arrangement of tubes in straight rows horizontally and staggered vertically and the arrangement of baffling insure the maximum absorption of heat by the boiler (Keeler flue gas temperatures are phenomenally low); the drum being in a horizontal position permits taking the steam from top center line which is the driest point in the boiler.

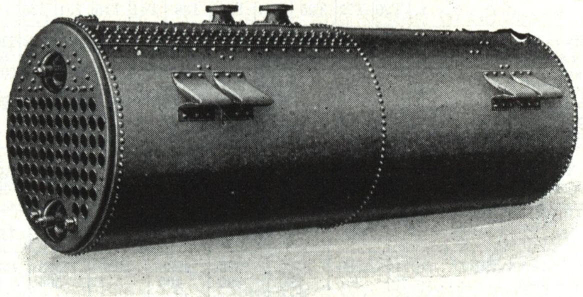
All Keeler water tube boilers are suspended at the front end from overhead steel girders resting on I-beam columns placed at the outside corners of the boiler setting.



Keeler Cross Drum Water Tube Boilers—A modification of the construction of the longitudinal drum boiler only in the method of attaching the drum to the boiler headers.

Keeler Horizontal Return Tubular Boilers

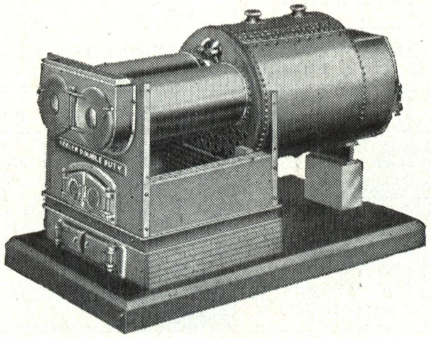
Keeler horizontal return tubular boilers are the product of sixty-one years' experience in building boilers.



They are built to meet the requirements of various State codes and contain many refinements in construction which have merited the approval and commendation of highest inspection authorities.

Keeler Double Duty Boilers

Keeler double duty boilers are an improved design of self-contained tubular boilers. Their design is such that no side bracing, objectionable crown sheets, waterbacks or other pockets which require constant attention, are used.



More and better facilities for cleaning and inspection are found in the Keeler double duty boiler than in any other self-contained boiler. The furnace design is such that with slight modification it can be arranged to accommodate the burning of any fuel successfully.

Few fire brick are required to line the furnace casing and the boiler can be installed ready for operation in a very short time. Fire brick are required in all boiler furnaces where efficiency is desired.

Catalogues

Catalogues describing these boilers and giving architects' and engineers' setting dimensions of all standard sizes will be sent free on request.

ESTABLISHED 1850

THE THATCHER COMPANY

Steam and Hot Water Boilers

39-41 St. Francis Street
NEWARK, N. J.

TELEPHONES
Mulberry 4480 (Newark)
Murray Hill 4072 (New York)

PLANTS
NEWARK, N. J.
GARWOOD, N. J.

NEW YORK SALES OFFICE: 21 West 44th Street

WESTERN OFFICE: CHICAGO, 341 North Clark Street

Products

Thatcher Round, Progress, and Sectional Steam and Hot Water Boilers; Thatcher Garage Heaters; Geyser Hot Water Supply Boilers.

For Warm Air Furnaces, see pages 2130-2131; for Coal and Gas Ranges, see page 2765.

Thatcher Round Boiler Series

For steam or hot water heating for all size buildings (tapped for hot water supply heaters). Many years' experience have produced this boiler which combines the best relation between volume of water, flue area and grate surface, insuring highest efficiencies.

Dome—Provides unusually large space to insure dry steam. This means increased efficiency of the boiler. The heavy corrugations double the heating surface.

Being very low and having thin waterways and deeply corrugated undersurface, the amount of water circulated is reduced and steam is produced quicker and more economically.

Boiler Body—The 3 ports extending into the fire pot greatly increase the heating efficiency of the boiler.

Boiler Sections—The design of these sections by forcing a staggered fire travel, causes the flames and hot gases to "mushroom" between the sections and pass over every part of each section.

Base—High with ample space under grates for easy cleaning of ash pit. The efficient, easily operated, revolving, triangular type grates may be removed by simply withdrawing two cotter pins in the base.

Butterfly Damper Door—In the base and directly connected with damper door in smoke hood by a chain through regulator arm, eliminating usual chain and pulleys fastened to ceiling; does not interfere with doors.

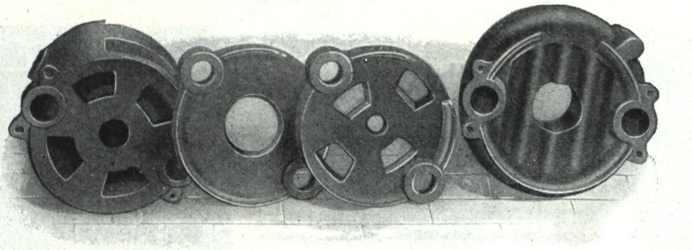
Regulator—Of the disc type, made of rustproof phosphor bronze. It is extremely sensitive, causing regulator to respond to the slightest pressure.

Clean-out Door—Unusually large and permits all surfaces to be reached with a wire brush. This is an important feature since ⅛ in. of soot reduces the heating efficiency of a surface about 60%.

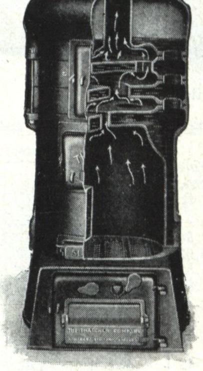
Push Nipples—Located one on each side of the sections, permitting unobstructed sweep of fire and making interior easier to clean.

Rating—For seventy-five years the unchanged ratings of the round boilers have been most conservative. Consequently the boilers have more prime heating surface than most any other boiler on the market.

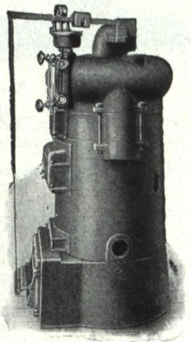
Base and Grates



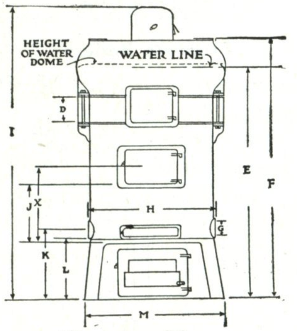
Sections Showing Staggered Fire Travel Openings



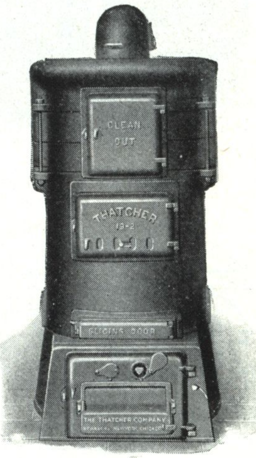
No. 19-2S Steam Boiler



Steam Boiler with Butterfly Check Draft Damper Control



Dimension Diagram (See table below)



No. 19-2W Hot Water Boiler

Thatcher Round Boilers

Steam boiler		Water boiler		Dimensions covering both steam and water boilers, in.																
No.	Radiation, sq. ft.	No.	Radiation, sq. ft.	Grate diam., in.	Grate area, sq. ft.	* A	B	C	D	** E	F		* G	H	I		J	K	L	M
											st'm	water			st'm	water				
17-0S	235	17-0W	400	17	1.58	2½	6	15¼	0	36	41½	37½	2½	21	49½	44½	14½	14½	11½	23
17-1S	275	17-1W	450	17	1.58	2½	6	15¼	4½	40½	46½	42½	2½	21	54½	49½	14½	14½	11½	23
19-0S	300	19-0W	500	19	2.04	3	7	18¼	0	40	46¾	42½	3	24½	56	51¾	14½	14⅝	11¾	27
19-1S	350	19-1W	575	19	2.04	3	7	18¼	4½	44½	51¼	47	3	24½	60½	56¼	14½	14⅝	11¾	27
19-2S	400	19-2W	650	19	2.04	3	7	18¼	9	49	55¾	51½	3	24½	65	60¾	14½	14⅝	11¾	27
22-0S	450	22-0W	750	22	2.64	3	8	21¼	0	42⅜	49¾	44¾	3	28¼	60	55	15	14½	12	30½
22-1S	525	22-1W	875	22	2.64	3	8	21¼	4⅝	47	54⅜	49⅜	3	28¼	64⅝	59⅝	15	14½	12	30½
22-2S	575	22-2W	950	22	2.64	3	8	21¼	9¼	51⅝	59	54	3	28¼	69¼	64¼	15	14½	12	30½
25-0S	600	25-0W	1000	25	3.41	4	9	22	0	42¾	50¼	44½	4	31	61½	55¾	15½	14½	11¾	33½
25-1S	675	25-1W	1150	25	3.41	4	9	22	5	47¾	55¼	49½	4	31	66½	60¾	15½	14½	11¾	33½
25-2S	750	25-2W	1225	25	3.41	4	9	22	10	52¾	60¼	54½	4	31	71½	66¾	15½	14½	11¾	33½
28-0S	800	28-0W	1325	28	4.28	4	9	25	0	43¾	51⅛	45½	4	35½	62⅜	56¾	16	15	12	37
28-1S	900	28-1W	1500	28	4.28	4	9	25	5⅛	48⅞	56¼	50⅝	4	35½	67½	61⅞	16	15	12	37
28-2S	1000	28-2W	1650	28	4.28	4	9	25	10¼	54	61⅜	55¾	4	35½	72⅝	67	16	15	12	37

* 2 each flow and return.

** Steam boilers only.

Note: Ratings on these boilers have never been increased.

Continued on next page

Progress Boilers, Single and Twin

The basic principle of triangular shaped sections, embodied in the design of all Progress boilers, is primarily responsible for their remarkable efficiency during their many years of manufacture. This design provides: (1) the lowest practical water line on the market; (2) perfect water circulation; (3) triple fire travel.

Triple Fire Travel—The construction of the sections causes the flames and hot gases to pass three times through the entire length of the boiler, and to completely surround the water tubes, before escaping into the smoke flue. This gives unusually long fire travel and increases the amount of surface that comes in direct contact with the hot gases.

Water Circulation—The triangular sections force the heated water up over the hottest part of the fire and down over back of boiler where the fire is less intense, on the thermo-siphon principle. This provides a rapid, unobstructed circulation.

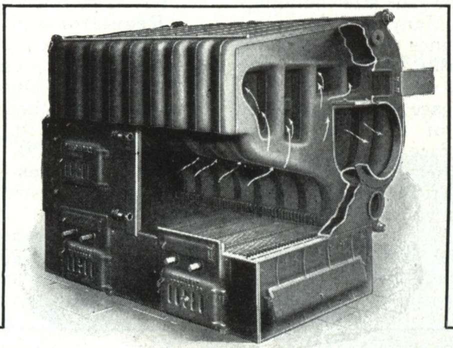
Ease of Firing and Cleaning—Side feed construction, with its consequent short depth of grate, and the several feed doors insure easy firing and cleaning and economy of fuel. Damper is on side away from doors.

Low Water Line—The water line being only 48 in. in the smaller and 55 in. in the largest boilers makes them suitable for cellars with little headroom, greenhouses, etc., and eliminates the objectionable boiler pit.

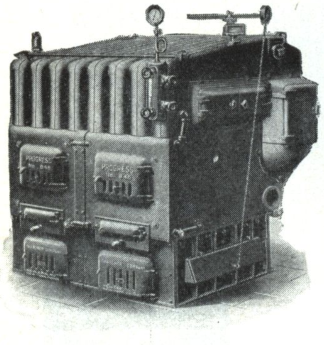
Grate—The deeply corrugated base lining around outer edge admits a free passage of air through sides of fire and insures perfect combustion of fuel. Grate bars are of the heavy power boiler type. All shaker connections are in the rear outside of the ash pit, thus avoiding clogging and consequent warping of grate bars.

Economy of Twin Boilers—For large heat requirements in churches, public buildings, apartment houses and large residences, twin boilers possess the following advantages: One twin boiler costs less to install than two single boilers; radiation losses are less; considerable floor space is saved; either half may be used independently, meeting the varying demands of temperature changes. For very large capacities, twin boilers give excellent results erected in battery or in connection with a fan or ventilating system.

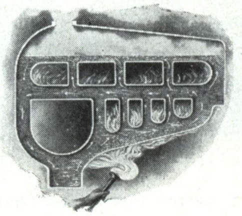
Ratings—The ratings of Progress boilers are very conservative. These ratings require that the following conditions be maintained at the boiler: steam boiler, 2-lb. pressure; water boiler, 180°.



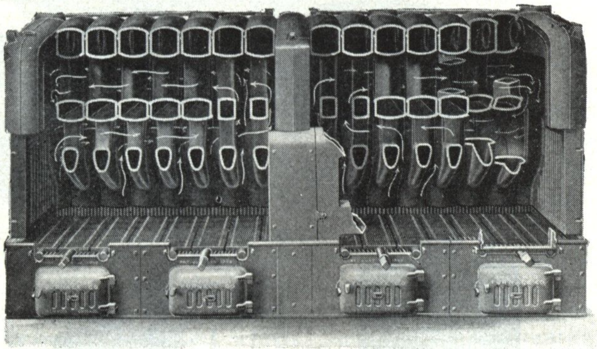
Single Hot Water Boiler



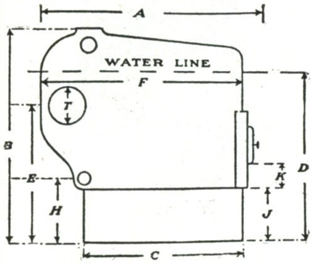
Single Steam Boiler



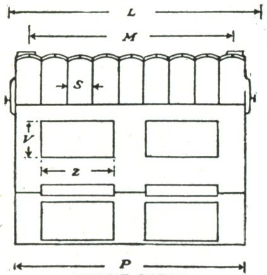
Triangular Shaped Section and Triple Fire Travel



Twin Steam Boiler



END VIEW



FRONT VIEW

Progress Boilers

S—Steam W—Water T—Twin

Steam boiler		Flow and returns, in. (2 each)	Grate area, sq. ft.	Number of feed doors	Water boiler		Steam boiler		Flow and returns, in. (2 each)	Grate area, sq. ft.	Number of feed doors	Water boiler	
No.	Radiation, sq. ft.				No.	Radiation, sq. ft.	No.	Radiation, sq. ft.				No.	Radiation, sq. ft.
528-S	1150	4	6.81	1	528-W	1925	1628T-S	5350	3 and 4	22.54	4	1628T-W	8950
628-S	1550	4	8.30	2	628-W	2600	1728T-S	5800		24.02	4	1728T-W	9700
728-S	2000	4	9.78	2	728-W	3350	1828T-S	6400		25.51	4	1828T-W	10700
828-S	2450	4	11.27	2	828-W	4100	1928T-S	7000		26.89	4	1928T-W	11700
928-S	2900	4	12.75	2	928-W	4850	1540T-S	7600		29.24	4	1540T-W	12650
1028-S	3350	4	14.24	2	1028-W	5650	1640T-S	8300	4 and 5	31.30	4	1640T-W	13800
640-S	2600	5	11.53	2	640-W	4350	1740T-S	9000		33.36	4	1740T-W	16175
740-S	3200	5	13.59	2	740-W	5275	1840T-S	9700		35.42	4	1840T-W	17350
840-S	3800	5	15.65	2	840-W	6325	1940T-S	10400		37.48	4	1940T-W	18525
940-S	4500	5	17.71	2	940-W	7500	2040T-S	11100		39.54	4	2040T-W	19700
1040-S	5200	5	19.77	2	1040-W	8675	2140T-S	11800		41.60	5	2140T-W	21025
1140-S	5900	5	21.83	3	1140-W	9850	2240T-S	12600		43.66	6	2240T-W	22350
1240-S	6700	5	23.89	4	1240-W	11175	2340T-S	13400		45.72	7	2340T-W	23675
1340-S	7500	5	25.95	4	1340-W	12500	2440T-S	14200		47.78	8	2440T-W	25000
1440-S	8300	5	28.01	4	1440-W	13850	2540T-S	15000		49.84	8	2540T-W	26350
1128T-S	3100	4	15.11	2	1128T-W	5125	2640T-S	15800		51.90	8	2640T-W	27700
1228T-S	3550	4	16.60	2	1228T-W	5950	2740T-S	16600		53.96	8	2740T-W	29050
1328T-S	4000	4	18.08	3	1328T-W	6700	2840T-S	17300		56.02	8	2840T-W	30400
1428T-S	4450	4	19.57	4	1428T-W	7450	2940T-S	18000		58.08	8	2940T-W	31750
1528T-S	4900	3 and 4	21.05	4	1528T-W	8200							

DIMENSIONS, SINGLE SERIES BOILERS*

No.	A	B	C	D	E	F	H	J	K	L	M	P	S	T	V	Z
28 Series	46	55	30	48	35	42	19¾	16	11	See table below			7¼	12	10¾	16¼
40 Series	64	64	42	55	35	60	19¾	16	11				7¼	18	10¾	16¼

No.	528	628	728	828	928	1028	1128	640	740	840	940	1040	1140	1240	1340	1440
L	54½	61¾	69	76¼	83½	90¾	98	65¾	73	80¼	87½	94¾	102¼	109¼	116½	124¾
M	30¼	37¾	45	52¼	59½	66¾	74	37¾	45	52¼	59½	66¾	74	81¼	88½	95¾
P	36¼	43½	50¾	58	65¼	72½	79¾	43½	50¾	58	65¼	72½	79¾	87	94¼	101½

*All measurements for Twin series boilers are same as above except height of smoke pipe which is on back of boiler. Length can be determined by adding 7¼ in. for each additional section.

Example: Length of a No. 2040T-S boiler is twice that of a No. 1040-S, plus 7¼ in. for dividing wall.

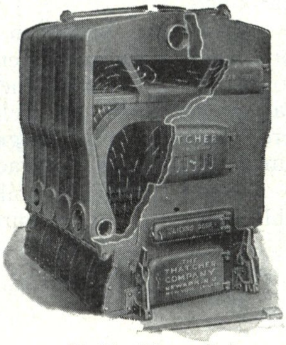
Continued on next page

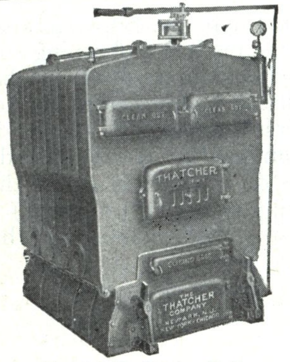
Thatcher Sectional Boilers

Thatcher sectional boilers are made in sizes to meet all ordinary steam and hot water heating requirements for residences, apartment houses, commercial and public buildings, hospitals, churches, etc.

Triple Fire Travel and Perfect Circulation—The same principle of triangular shaped sections, described under Progress boilers, is used in the sectional boiler. This feature insures perfect circulation and efficient transmission of heat.

Sectional Type Construction—The Thatcher sectional is of the end feed type of square sectional boiler with an unusual amount of prime heating surface. Waterways and flues are carefully proportioned to secure the best results. Castings are accurately machined and fitted and all sections are tested to 80-lb. hydrostatic pressure at the factory. All sections are joined by a heavy, lathe turned, cast iron nipple, making a permanently secure and watertight joint.


No. 26-6W Hot Water Boiler


No. 26-6S Steam Boiler

Firing Door—The extra wide feed door affords easy access to the interior of the boiler and permits the use of a large shovel, greatly facilitating firing. Being placed high above the grates it allows a large amount of coal to be fired at one time, resulting in fuel economy.

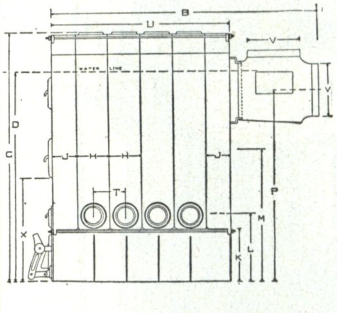
Grates—These are of the heavy, crown top pattern, very durable, easily operated and suitable for all sizes of anthracite coal, or soft or pea coal.

Regulation—The regulation of these boilers is extremely sensitive and is so set as to operate the drafts on a very small steam pressure.

Ratings—The ratings of all Thatcher boilers, as shown on these pages, are very conservative. They have been established only after successive tests under the most exacting conditions. These ratings contemplate the following conditions be maintained at the boiler: steam boiler, 2-lb. pressure; water boiler, 180°.

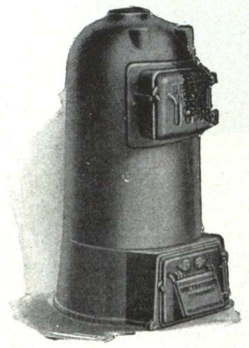
Where soft coal is to be used a boiler one size larger should be specified.

Thatcher Sectional Boilers



Radiation, sq. ft.				Number of sections	Grate area, sq. in.	Flows and returns, in. (2 each)	Dimensions, in.																	
Steam boiler		Water boiler																						
No.	Rat'g	No.	Rat'g				A	B	C	D	E	H	J	K	L	M	P	S	T	U	V	X	Y	Z
18- 4S	450	18- 4W	750	4	2.75	3	31	37	50	44	26½	6	5⅝	11½	14½	27	39	12¼	6	22¾	9	22¼	15	9
18- 5S	600	18- 5W	1000	5	3.47	3	31	43	50	44	26½	6	5⅝	11½	14½	27	39	12¼	6	28¾	9	22¼	15	9
18- 6S	750	18- 6W	1250	6	4.19	3	31	49	50	44	26½	6	5⅝	11½	14½	27	39	12¼	6	35¼	9	22¼	15	9
18- 7S	900	18- 7W	1500	7	4.91	3	31	55	50	44	26½	6	5⅝	11½	14½	27	39	12¼	6	41¼	9	22¼	15	9
26- 5S	1175	26- 5W	1950	5	6.12	4	41	58	59½	50½	32	7½	5½	13½	18	30	50	24½	7½	34½	12	26	18	10
26- 6S	1450	26- 6W	2400	6	7.47	4	41	65½	59½	50½	32	7½	5½	13½	18	30	50	24½	7½	42	12	26	18	10
26- 7S	1725	26- 7W	2875	7	8.82	4	41	73	59½	50½	32	7½	5½	13½	18	30	50	24½	7½	49½	12	26	18	10
26- 8S	2000	26- 8W	3350	8	10.20	4	41	80½	59½	50½	32	7½	5½	13½	18	30	50	24½	7½	57	12	26	18	10

"Geyser" Round Top Hot Water Supply Boilers


"Geyser" Boiler

"Geyser" boilers are equally suitable for domestic and business installations.

They are adapted to all kinds of fuel, including hard and soft coal, coke, wood or gas. The exceptionally deep fire pot permits of a sufficient charge of fuel to last from 12 to 15 hours.

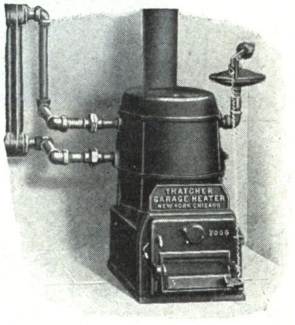
In the larger sizes the capacity is ample for supplying all the hot water for apartment houses, institutions, etc. All boilers are furnished with patented revolving triangular grates.

RATINGS AND DIMENSIONS OF GEYSER ROUND TOP BOILERS

No.	Capacity, gal. per hour	Radiation, sq. ft.	Dimensions in inches				
			Inside diameter fire pot	Total height	Height to center of return	Flows and returns, tapped	Smoke pipe
1	150	120	10	31½	9	2	6
2	300	240	12	38¼	12¼	2½	7
4	400	320	14	40¼	12¼	(2) 2½	7
7	550	440	17	42	15	(2) 2½	8

"Thatcher" Garage Heating Systems

The "Thatcher" garage heating system is practically automatic, the fire being controlled by an efficient thermostatic regulator which opens and closes draft with changes of temperature. These systems include the heater, radiation, tank, fittings and regulator, being the outfit complete except for smoke pipe.



Garage Heater

The heater has a square base, provided with large door for easy removal of ashes, set flush with the floor. Fire pot is of ample depth. Water jacket is cast in one piece and so constructed as to transmit maximum heat to the water. The flat top affords ample space for heating water.

"THATCHER" GARAGE HEATERS FOR VARIOUS SIZE INSTALLATIONS

No. of heater	Size system	Top	Wall radiation, sq. ft.	Number of radiators
200	1-car	Flat	28	1
200	2-car	Flat	56	2
1	3-car	Round	84	3
1	4-car	Round	112	4

UTICA HEATER COMPANY

UTICA, N. Y.

CHICAGO OFFICE, 365 E. Illinois Street
CLEVELAND OFFICE, 628 Union Building
NEW YORK OFFICE, 1843 Grand Central Terminal

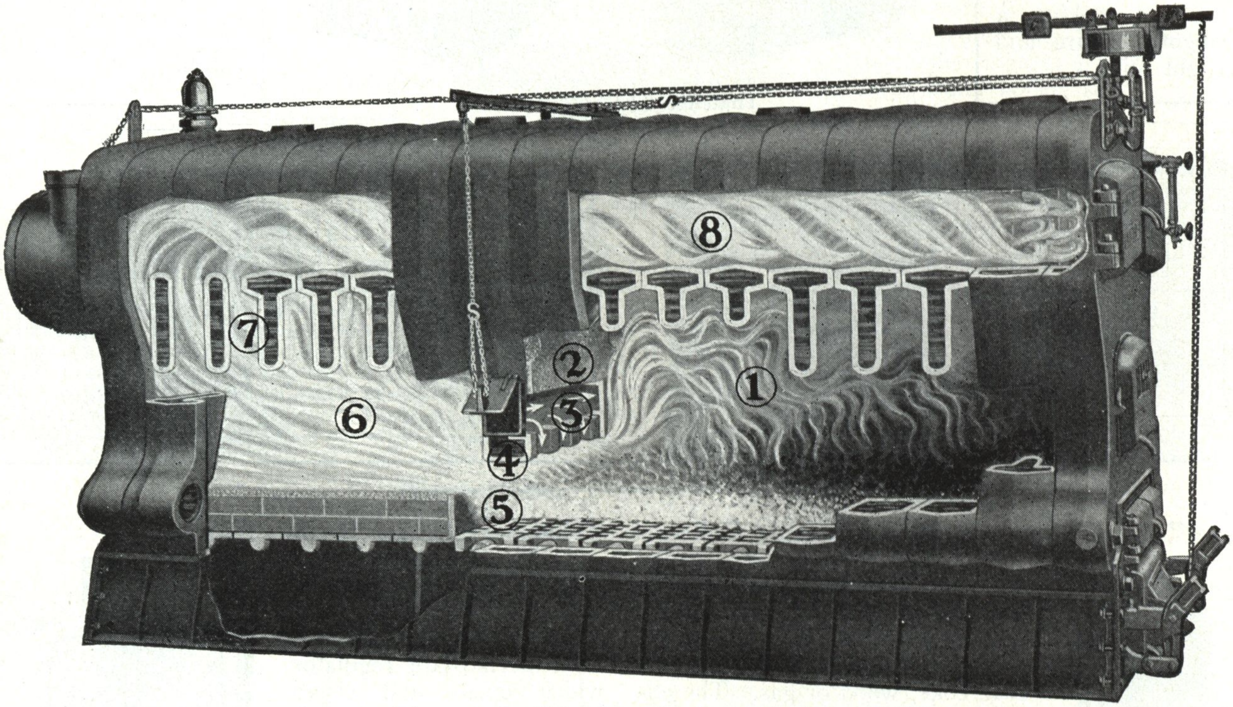
REPRESENTATIVES IN THE PRINCIPAL JOBBING CENTERS OF THE UNITED STATES

Utica-Imperial Super-Smokeless Boiler

Since invented seven years ago, the Super-Smokeless boiler has revolutionized the method of burning soft coal, and has attained a predominant position in that field. The principle of admitting highly heated air for secondary combustion was first successfully applied in this boiler. Although widely imitated in partial detail, the Super-Smokeless remains the only boiler in which this vitally necessary principle (fully protected by patent) is successfully used. It is to soft coal combustion what the Bunsen burner is to gas and the carburetor to gasoline.

No other boiler so completely solves the smoke problem. High in efficiency, easy to operate, elastic as to quality and type of fuel requirements, conservative in ratings, the Super-Smokeless stands in a class by itself—pre-eminent in the recognition of architects, engineers, smoke inspectors, contractors and users.

Super-Smokeless boilers have also proved remarkably successful in oil burning installations.



Cutaway View of the Utica-Imperial Super-Smokeless Boiler

Special Features of Utica-Imperial Super-Smokeless Boilers

The numbers listed below refer to corresponding figures in the above illustration.

(1) Hot blast chamber through the adjustable inlets at each end of which the additional air (oxygen) is admitted, superheated, and injected into the fire, producing the Bunsen burner effect and resulting in as perfect combustion as has ever been obtained.

(2) Water curtain which divides the primary and secondary combustion chambers and prevents the hot blast passage from burning out, and assists in maintaining the incoming air at just the proper temperature.

(3) High fire test fire resistant for protection of water curtain and to aid in breaking the carbon into fine particles to render them more easily consumed upon contact with the air blast.

(4) The primary combustion chamber—the fresh coal is supplied to front of this chamber and upon coking is pushed toward the rear. Simplicity of operation is a strong Super-Smokeless feature.

(5) The secondary combustion chamber—in which the unburned gases, which ordinarily are carried away as smoke, are burned. In this part of the firebox a gas temperature is obtained higher than has ever been possible before in a low pressure boiler.

(6) Here combustion passes from the primary into the secondary combustion chambers and the additional oxygen is supplied for perfect consumption of the gases.

(7) Note the great amount of overhanging fire surface extending downward into the hottest part of the fire, a most valuable heating surface—another reason for the Super-Smokeless boiler's efficiency and economy.

(8) The flue surface of the Super-Smokeless is swept clean by the spirally traveling gases and this flue surface, ordinarily classed as indirect, becomes direct heating surface. The Super-Smokeless is self-cleaning.

Continued on next page

BOILER CAPACITIES AND DIMENSIONS

Steam Boiler No.	Ratings*, sq. ft.	Water Boiler No.	Ratings*, sq. ft.	Grate area, sq. ft.	Diam. smoke collar, in.	Length of sections only, in.	Length of sections and smoke box, in.
S- 245	1200	W- 245	1920	4.96	12	37¼	59
S- 246	1500	W- 246	2400	6.16	12	45½	67¼
S- 247	1800	W- 247	2880	6.16	14	53¾	73¾
S- 248	2100	W- 248	3360	7.36	14	62	82
S- 249	2400	W- 249	3840	7.36	14	70¼	90¼
S- 335	2000	W- 335	3200	7.32	15	37¼	60¼
S- 336	2500	W- 336	4000	9.10	15	45½	68½
S- 337	3000	W- 337	4800	10.87	15	53¾	76¾
S- 338	3500	W- 338	5600	12.65	16	62	83½
S- 339	4000	W- 339	6400	14.42	16	70¼	91¾
S-3310	4700	W-3310	7520	16.20	16	78½	100
S- 405	2750	W- 405	4400	9.68	18	37¼	64¾
S- 406	3500	W- 406	5600	12.03	18	45½	73
S- 407	4250	W- 407	6800	14.38	18	53¾	81¼
S- 408	5000	W- 408	8000	16.73	18	62	89½
S- 409	5750	W- 409	9200	19.08	18	70¼	97¾
S-4010	6500	W-4010	10400	21.43	18	78½	106
S-4011	7250	W-4011	11600	23.77	20	86¾	112¾
S-4012	8000	W-4012	12800	23.77	20	95	121
S-4013	8750	W-4013	14000	23.77	20	103¼	129¼
S-4014	9500	W-4014	15200	23.77	20	111½	137½
S-4015	10250	W-4015	16400	23.77	20	119¾	145¾
S-4016	11000	W-4016	17600	23.77	20	128	154
S-4017	11750	W-4017	18800	23.77	20	136¼	162¼
S-4018	12500	W-4018	20000	23.77	20	144½	170½
S-4019	13250	W-4019	21200	23.77	20	152¾	178¾
S-4020	14000	W-4020	22400	23.77	20	161	187
S-4021	14750	W-4021	23600	23.77	20	169¼	195¼
S-4022	15500	W-4022	24800	23.77	20	177½	203½
S-4023	16250	W-4023	26000	23.77	20	185¾	211¾
S-4024	17000	W-4024	27200	23.77	20	194	220

*Ratings—Height of water line: Nos. 245-249, 45½ in.; Nos. 335-3310, 53 in.; Nos. 405-4024, 57 in.

RECOMMENDED CHIMNEY SIZES

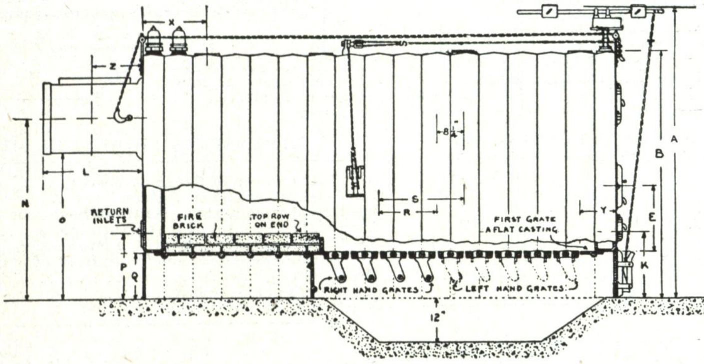
Boiler No.	One boiler		Two boilers		Three boilers		Four boilers	
	*Square, in.	Hgt., ft.	*Square, in.	Hgt., ft.	*Square, in.	Hgt., ft.	*Square, in.	Hgt., ft.
245	12x12	40	....	....	....	....	....	....
246	13x13	40	....	....	....	....	....	....
247	13x13	45	....	....	....	....	....	....
248	14x14	50	....	....	....	....	....	....
249	14x14	55	....	....	....	....	....	....
335	14x14	40	....	....	....	....	....	....
336	15x15	40	19x19	50	....	....	....	....
337	16x16	40	20x20	50	23x23	60	25x25	70
338	16x16	50	21x21	60	24x24	70	26x26	80
339	18x18	50	22x22	60	25x25	70	28x28	80
3310	18x18	55	23x23	65	27x27	75	29x29	85
405	15x15	50	....	....	....	....	....	....
406	16x16	50	....	....	....	....	....	....
407	18x18	50	23x23	60	26x26	70	29x29	80
408	18x18	55	24x24	65	27x27	75	30x30	85
409	20x20	55	25x25	65	29x29	75	32x32	85
4010	20x20	60	26x26	70	30x30	80	33x33	90
4011	21x21	60	27x27	70	32x32	80	35x35	90
4012	22x22	65	28x28	75	32x32	85	36x36	95
4013	22x22	70	29x29	80	33x33	90	37x37	100
4014	23x23	75	29x29	85	34x34	95	38x38	105
4015	23x23	75	30x30	85	36x36	95	40x40	105
4016	24x24	80	31x31	90	36x36	100	40x40	110
4017	24x24	80	32x32	90	37x37	100	41x41	110
4018	25x25	80	32x32	90	38x38	100	43x43	110
4019	25x25	85	33x33	95	39x39	105	43x43	115
4020	25x25	90	34x34	100	40x40	110	44x44	120
4021	25x25	100	34x34	110	40x40	120	44x44	130
4022	26x26	100	34x34	110	40x40	120	45x45	130
4023	27x27	100	35x35	110	41x41	120	46x46	130
4024	27x27	100	36x36	110	43x43	120	47x47	130

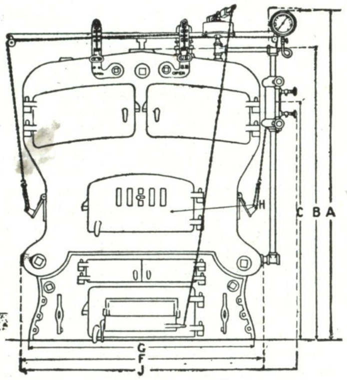
*If round or rectangular chimney is used, effective area should be equivalent to that of the square chimney. Long side of rectangular chimney should not be more than one and one-half times the short side.

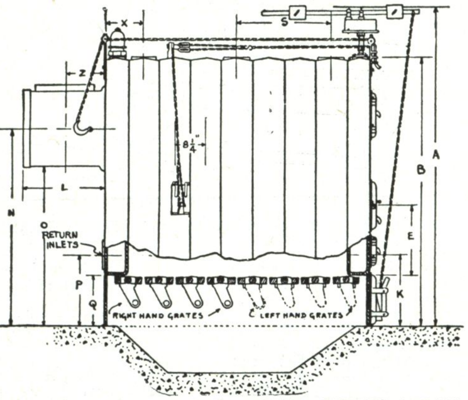
NUMBER OF FIRE BRICK REQUIRED

Boiler No.	No. of Bricks	Boiler No.	No. of Bricks
4012	25	4019	188
4013	50	4020	213
4014	75	4021	225
4015	100	4022	250
4016	125	4023	275
4017	138	4024	300
4018	163		

The longer boilers are assembled as shown at the right, with blank grates and two rows of fire brick, the top row laid on edge. Boilers under 12 sections in length do not require bricks.







DIMENSIONS AS SHOWN ON BOILER DIAGRAMS

			24 Series	33 Series	40 Series
A	Height to top of steam trimmings	in.	65	75	82
B	Height to top of outlets	in.	54	64½	69
C	Height of waterline	in.	45½	53	57
E	Height from grate to center of feed door	in.	14	17½	18
F	Width of sections	in.	35½	47	57½
G	Width of base	in.	29½	38½	51
H	Size of feed door	in.	9¼x16	9½x17½	12x23½
J	Width of boiler with trimmings	in.	47	59	66
K	Height to center of side return inlets	in.	16½	17½	18½
L	Length of smoke box	in.	21¾-20	23-21½	27½-26
N	Height to center of rear outlet of smoke collar	in.	40	46½	51
O	Height to bottom of smoke box	in.	32	37½	40
	Height to top outlet of smoke box	in.	50½	57	63½
	Distance between centers of inlet tappings of rear section	in.	28	38	48¼
P	Height to center of rear return inlets	in.	16½	17½	18½
Q	Height of base	in.	10	10	11
R	Distance center to center of three sections	in.	16½	16½	16½
S	Distance center to center of four sections	in.	24¾	24¾	24¾
T	Distance center to center of two sections	in.	8¼	8¼	8¼
X	Distance center 3d section from rear to rear of boiler	in.	18½	18½	18½
Y	Distance center 2d section to front of boiler	in.	10¼	10¼	10¼
Z	Distance center of top outlet of smoke box to rear of boiler	in.	10	10	13

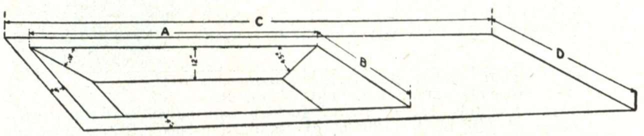


Diagram of Ash Pit and Foundation
(Dimensions shown in table on the right)

We recommend that every Super-Smokeless boiler be provided with a pit under the grates, as shown by lines A and B above. This pit should be constructed with sloping front and rear and should be at least 12 in. in depth. In the case of boilers of six sections and less the depth may be reduced to 6 in.

DIMENSIONS OF ASH PIT AND FOUNDATION

Boiler No.	Pit under ash pit, in. A B	Foundations, in. C D	Boiler No.	Pit under ash pit, in. A B	Foundations, in. C D
245	35 x24	43 x32	4010	76¼x46	84¼x54
246	43¼x24	51¼x32	4011	84½x46	92½x54
247	43¼x24	59½x32	4012	84½x46	100¾x54
248	51½x24	67¾x32	4013	84½x46	109 x54
249	51½x24	76 x32	4014	84½x46	117¼x54
335	35 x33½	43 x41½	4015	84½x46	125½x54
336	43¼x33½	51¼x41½	4016	84½x46	133¾x54
337	51½x33½	59½x41½	4017	84½x46	142 x54
338	59¾x33½	67¾x41½	4018	84½x46	150¼x54
339	68 x33½	76 x41½	4019	84½x46	158½x54
3310	76¼x33½	84¼x41½	4020	84½x46	166¾x54
405	35 x46	43 x54	4021	84½x46	175 x54
406	43¼x46	51¼x54	4022	84½x46	183¼x54
407	51½x46	59½x54	4023	84½x46	191½x54
408	59¾x46	67¾x54	4024	84½x46	199¾x54
409	68 x46	76 x54			

Capacities and Dimensions of Utica-Imperial Super-Smokeless Boilers

Continued on next page

BOILER CAPACITIES AND DIMENSIONS

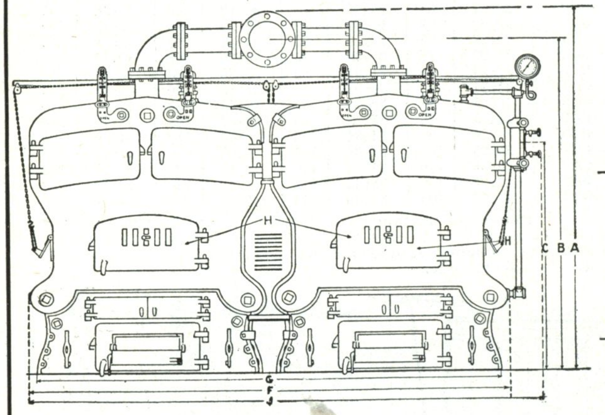
Steam Boiler No.	Ratings, sq. ft.	Water Boiler No.	Ratings, sq. ft.	Grate area, sq. ft.	Diam. smoke collar, in.	Length of sections only, in.	Length of sections and smoke box, in.
S- 827	8500	W- 827	13600	28.76	28	53¾	70¾
S- 828	10000	W- 828	16000	28.76	28	62	79
S- 829	11500	W- 829	18400	33.46	28	70¼	87¼
S-8210	13000	W-8210	20800	33.46	28	78½	95½
S-8211	14500	W-8211	23200	38.16	28	86¾	103¾
S-8212	16000	W-8212	25600	38.16	28	95	112
S-8213	17500	W-8213	28000	42.86	28	103¼	120¼
S-8214	19000	W-8214	30400	42.86	28	111½	128½
S-8215	20500	W-8215	32800	42.86	28	119¾	136¾
S-8216	22000	W-8216	35200	47.54	28	128	145
S-8217	23500	W-8217	37600	47.54	28	136¼	153¼
S-8218	25000	W-8218	40000	47.54	28	144½	161½

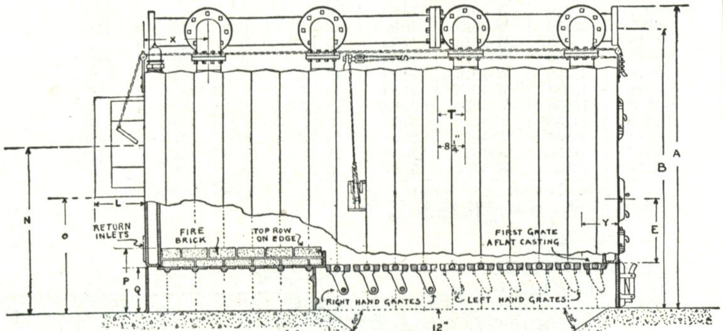
Height of water line, 57 in.
Length of smoke box, 17 in.

RECOMMENDED CHIMNEY SIZES

Boiler No.	One boiler		Two boilers		Three boilers		Four boilers	
	*Square, in.	Height, ft.	*Square, in.	Height, ft.	*Square, in.	Height, ft.	*Square, in.	Height, ft.
827	23x23	60	29x29	70	34x34	80	38x38	90
828	24x24	65	31x31	75	36x36	85	40x40	95
829	25x25	65	33x33	75	38x38	85	42x42	95
8210	26x26	70	34x34	80	40x40	90	44x44	100
8211	27x27	70	36x36	80	42x42	90	47x47	100
8212	28x28	75	37x37	85	43x43	95	48x48	105
8213	29x29	80	38x38	90	45x45	100	50x50	110
8214	29x29	85	39x39	95	46x46	105	51x51	115
8215	30x30	85	40x40	95	47x47	105	53x53	115
8216	31x31	90	41x41	100	48x48	110	54x54	120
8217	32x32	90	42x42	100	50x50	110	56x56	120
8218	32x32	90	44x44	100	51x51	110	57x57	120

*If round or rectangular chimney is used, effective area should be equivalent to that of the square chimney. Long side of rectangular chimney should not be more than one and one-half times the short side.





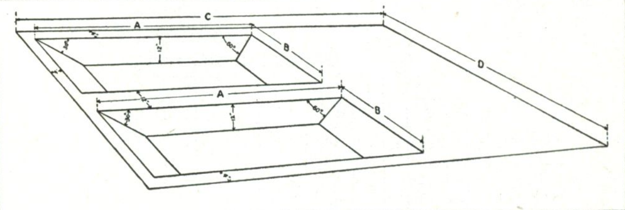
Note: This grate assembly applies to boilers numbered 4912 to 4924 inclusive

DIMENSIONS SHOWN ON FRONT ELEVATION

A—Height to top of flange on heater	in.	88¼
B—Height to center of outlets	in.	81½
C—Height of water line	in.	57
G—Width of base	in.	109
H—Size of feed door	in.	12 x 23½
F—Width of boiler	in.	115¼
J—Width of steam boiler with trimmings	in.	124
Height of base	in.	11

DIMENSIONS SHOWN ON SIDE ELEVATION

A—Height to top of flange on header	in.	88¼
B—Height to center of outlets	in.	81½
E—Height from grate to center of feed door	in.	18
P—Height to center of rear return inlets	in.	18½
T—Distance center to center of two sections	in.	8¼
Y—Distance center 2d section to front of boiler	in.	10¼
Q—Height of base	in.	11
L—Length of smoke box	in.	17
N—Height to center of smoke collar	in.	50



ASH PIT AND FOUNDATION MEASUREMENTS

Boiler No.	Pit under ash pit, in.	Foundations, in.	Boiler No.	Pit under ash pit, in.	Foundations, in.
	A B	C D		A B	C D
827	51½ x 46	59½ x 112	8213	76¼ x 46	109 x 112
828	51½ x 46	67¾ x 112	8214	76¼ x 46	117¼ x 112
829	59¾ x 46	76 x 112	8215	76¼ x 46	125½ x 112
8210	59¾ x 46	84¼ x 112	8216	84½ x 46	133¾ x 112
8211	68 x 46	92½ x 112	8217	84½ x 46	142 x 112
8212	68 x 46	100¾ x 112	8218	84½ x 46	150¼ x 112

We recommend that every Super-Smokeless boiler be provided with pit under ash pit, as shown by lines A and B above. This pit should be constructed with sloping front and rear and should be at least 12 in. in depth. (In the case of boilers of six sections and less the depth may be reduced to 6 in.)

NUMBER OF FIRE BRICK REQUIRED

Boiler No.	Number of bricks	Boiler No.	Number of bricks
8212	50	8216	250
8213	100	8217	280
8214	150	8218	330
8215	200	....	...

The longer boilers are assembled as shown above, with blank grates and two rows of fire brick, the top row laid on edge.

Boilers under twelve sections in length require no bricks.

Outlets and Inlets

Utica-Duplex Super-Smokeless steam boilers are equipped with a flanged header, which is shipped as an integral part of the boiler. Steam boilers have an *8-in. flanged outlet, from either front or rear of header.* All boilers are equipped with return yoke having two *4-in. inlets and equalizer,* fitted with Hartford connection, which may be used or not as desired.

Utica-Duplex Super-Smokeless water boilers are provided with one 8-in. flanged outlet at front or rear of header, and four 4-in. inlets on back of rear section.

ASBESTOS BOILER COVERING REQUIRED

Boiler No.	Surface, sq. ft.	Boiler No.	Surface, sq. ft.
827	90	8213	174
828	104	8214	188
829	118	8215	202
8210	132	8216	216
8211	146	8217	230
8212	160	8218	244

If back of rear section is to be covered add 22 sq. ft.

For covering smobe box, add 27 sq. ft.

Approximately 15 sq. ft. of surface can be covered to average thickness of 1½ in. by 100 lb. of standard asbestos boiler covering. Therefore, for ready estimates allow 94 lb. for each section.

Capacities and Dimensions of Utica-Duplex Super-Smokeless Boilers

UNITED STATES RADIATOR CORPORATION

GENERAL OFFICES
DETROIT, MICH.

BRANCH AND SALES OFFICES

*BOSTON, MASS., 136 Federal Street
*PORTLAND, ME., 2 Matyr Street
*SPRINGFIELD, MASS., North Main Street
*PROVIDENCE, R. I., Allen's Avenue foot of Oxford Street
*NEW HAVEN, CONN., New Street and Railroad Avenue
*TROY, N. Y., Center Street, Green Island, N. Y.
NEW YORK, N. Y., 301 Architects Building
*BROOKLYN, N. Y., 65 Forty-fifth Street
*HARRISON, N. J., Davis and Central Avenues
*PHILADELPHIA, PA., 220 South 16th Street
*BALTIMORE, MD., 1147 Wicomico Street
BUFFALO, N. Y., 303 Crosby Building
*ROCHESTER, N. Y., 64 Chester Street
PITTSBURGH, PA., 1008 Union Bank Building
*CLEVELAND, OHIO, 523 Guarantee Title Building
*COLUMBUS, OHIO, 174 West Naghten Street
*CINCINNATI, OHIO, 1212 Exeter Street
*DETROIT, MICH., 517 Dime Bank Building
*CHICAGO, ILL., 500 North Dearborn Street
*MILWAUKEE, WIS., 168 Corcoran Avenue
*INDIANAPOLIS, IND., 908 North Senate Avenue
*LOUISVILLE, KY., 1631 West High Street
*ST. PAUL, MINN., 688 Hampden Avenue
*KANSAS CITY, MO., 1412 West Twelfth Street
*ST. LOUIS, MO., 4004 Duncan Avenue
*DES MOINES, IOWA, 400 Southwest Ninth Street
*OMAHA, NEB., 1017 North 21st Street
*DENVER, COLO., 2439 Blake Street
*PORTLAND, ORE., 16th North and Thurman Streets
*SEATTLE, WASH., 1248 First Avenue, South

*Warehouse stocks carried at points indicated by asterisk

Products

Page
CAPITOL HEATING BOILERS 2195–2203
HOT WATER SUPPLY BOILERS 2203
COLUMN RADIATORS 2204
WALL RADIATORS 2205
RADIATOR BRACKETS 2205–2206
RADIATOR TAPPING LIST 2206

Capitol Boilers Are Designed to Meet Every Condition of Installation

The three types of Capitol Boilers described and illustrated in this catalogue are divided into separate groups according to the following conditions of installation applying to each building:

(1) Size of boiler required to take care of present requirements and maximum size boiler that will take care of any future demands on account of additions to the building.

Any size Capitol Boiler, less than the maximum, in each group may be increased at any time to the maximum capacity for that group by the addition of extra sections.

(2) Draft pressure, chimney height and size of flue.

Boilers of approximately the same capacity are available in two groups but with different limitations as to chimney heights and flue dimension.

(3) Height available for boiler and water line.

Capitol Boilers of approximately the same rating are available for either low cellars and low water line or for average height of cellar and water line

General Data on Capitol Round and Square Boilers

Trimmings—Steam boilers include safety valve, low pressure steam gauge, water column, water gauge, gauge cocks and metal automatic regulator. No trimmings furnished with water boilers.

Regulator tapping, ¾-in.; water column tappings, 1-in.; safety valve tappings comply with A. S. M. E. Code.

Grates—All boilers are provided with grates suitable for burning different grades of fuel.

Tools—Firing tools furnished with all boilers, except the hot water supply boilers (listed on page 2203).

Coil Openings—We do not recommend installation of coils or auxiliary heaters in the firebox of Capitol Boilers. Openings are provided in all boilers, except the 40″ and 4100 Series, for the insertion of such coils should the installation not justify the use of a separate hot water supply boiler or a circulating coil heater. These openings are spaced on 6-in. centers on round boilers and 5-in. centers on square boilers.

On steam jobs we particularly recommend the use of circulating coil heaters in which hot water from the boiler circulates about a copper coil connected to the supply tank. All Capitol Boilers are tapped especially for the connection of these heaters.

Nipples—All boilers are assembled with cast iron push nipples manufactured in our own factories. These nipples are machine turned to the thousandth of an inch and make a permanent iron to iron joint. No gaskets or packing are used in assembling Capitol Boilers.

Working Pressures—Boilers are built in accordance with the A. S. M. E. Standard, and are tested under water pressure of 60 lb. per sq. in. The maximum working pressure should not exceed 15 lb. per sq. in. on steam boilers or 30 lb. per sq. in. on water boilers, unless boiler has been specially tested at the factory at two and one-half times the proposed working pressure.

Boilers specially tested for working pressures in excess of 15 lb. on steam and 30 lb. on water should be equipped with high grade relief valve set to open at a reasonable, predetermined pressure. If requested, affidavit as to test pressure will be supplied, but no responsibility against fracture is accepted by this company.

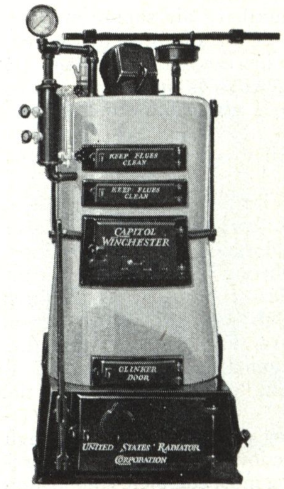
Water Relief Valves—The following table gives allowable sizes of water relief valve for water heating and water supply boilers:

Diam. of valve, in.	Rated capacity, sq. ft. water radiation	Rated capacity in gal. per hour		
		25° rise	50° rise	100° rise
½	750	540	270	135
¾	2000	1440	720	360
1	3500	2520	1260	630
1¼	7500	5400	2700	1350
1½	15000	10800	5400	2700
2	30000	21600	10800	5400

Basis of Boiler Ratings—Rating of steam boilers is based upon a gauge pressure of 2 lb., at the boiler, and a condensation of 0.25 lb. of steam per sq. ft. of radiating surface standing in still air at 70°.

Guarantee

We absolutely guarantee the published capacities of Capitol Boilers in pounds of steam at the boiler outlet, provided that the area of the vertical smoke flue and its height shall be great enough to provide a sufficient draft to consume with proper combustion the required amount of fuel per hour, and the best grades of anthracite coal are used.

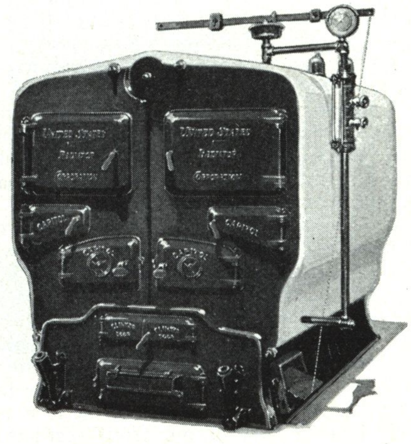


Capitol Winchester Boiler

INDEX TO DATA ON CAPITOL SQUARE AND ROUND BOILERS

Type of boiler	*Capacity, sq. ft. radiation		For low cellars	For draft conditions			Described on page
	Steam	Water		Poor	Average	Good	
SQUARE SECTIONAL:							
180 Series	400– 850	650– 1430	X		X	X	2197
200 Series	600– 1200	1000– 2000	X		X	X	2197
250 Series	1100– 1850	1825– 3050	X		X	X	2197
G 270 Series	1350– 2250	2230– 3700	X		X	X	2198
230 Series	1900– 4150	3150– 6900			X	X	2198
4100 Series	3700– 7575	6050–12550	X		X	X	2199
WN270 Series	4550–11950	7575–19600			X	X	2199
Smokeless:							
27″ Series	1800– 4200	2975– 6875	X			X	2200
40″ Series	4475– 9125	7350–15150	X			X	2200
50″ Series	7800–14100	12875–23225				X	2200
ROUND:							
Group "A"	325– 1300	535– 2145	X	X			2203
Group "B"	350– 1400	580– 2310			X		2203
Group "C"	430– 1500	710– 2475				X	2203

*Any boiler below maximum capacity in each series can be increased to the maximum capacity shown for the series by the addition of extension bases and extra sections. Capacity based on 8-hour firing period. When fuel is consumed in a shorter or longer period, capacities are proportionately increased or decreased.


UNITED STATES RADIATOR CORPORATION
UNITED STATES RADIATOR CORPORATION
CAPITOL
CAPITOL

Capitol Square Sectional Boiler

Continued on next page

General Data on Capitol Square Type Boilers

Easily Operated Grates—Grates are of the flat top shaking and dumping pattern. Lying widthwise of the base they permit of a double shaking movement, thereby more evenly distributing the rocking strain. A small ratchet, located on front of base where connecting bar attaches to shaker handle, permits the rocking of bars sufficient for ordinary attention. Should freer action be desired, the release of this ratchet allows bars to turn nearly on edge, dumping fire quickly and completely. An improved system of joining grate bars to connecting rods is used on all Capitol Boilers. Grate lugs are furnished that bolt snugly on to underside of grate bar, which can be easily repaired and adjusted. All Capitol Boilers shake from the front, and grate bars are so constructed and reinforced as to insure their durability and satisfactory operation with either hard or soft coal, wood or coke.

Grate bars can be easily dropped into place through fire door.

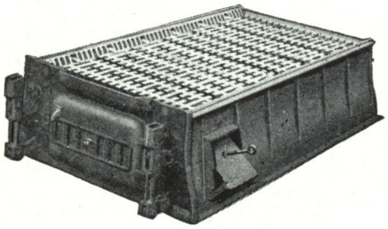
Maximum Heating Surface—The arrangement of heating surface in Capitol Boilers is the outcome of a long series of tests under actual working conditions, burning all grades of fuel. Your attention is directed to the long fire travel. The heated gases pass from the fire bed up into the combustion space, back to the rear of the boiler and into the side flues, then forward through side flues to the front, thence into the return flue and out through the smoke hood at the rear. The distance which gases are forced to travel permits the surfaces upon which they impinge to absorb the maximum amount of heat.

Rapid Heating—The overhanging arches of sections directly over the fire bed contain flue openings extending from front to rear. These flue openings below the crown sheet break up the waterways in the interior of the boiler into small units, and the play of burning gases through these flue openings bringing the hot gases into contact with smaller bodies of water increase the rapidity with which steam is generated.

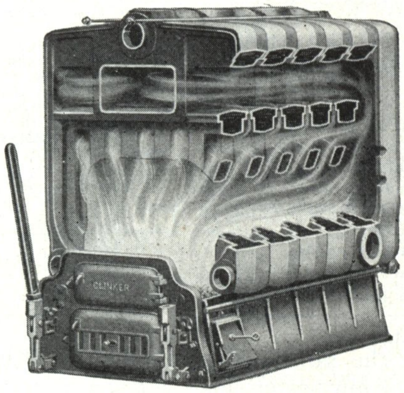
Free Circulation in Sections—Boilers are composed of three different types of sections: front, intermediate and back. The intermediates vary in number according to size of the boiler, and flow and return tappings are so arranged as to give the best results for allowing steam and water free and easy circulation into piping.

Properly Designed Smoke Hood—The smoke hood is designed to aid proper combustion and regulation of the fire and is provided with a heavy cast iron damper which can be operated from front of boiler and set at any desired point, together with a hanging check door which is operated by the damper regulating device.

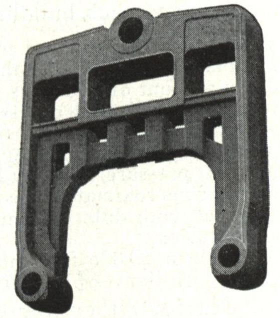
Ease of Operation—The large, roomy side and center flues are provided with large cleanout doors at the front, opening one to either side, allowing full inspection of all places where soot can lodge. Tool equipment furnished with all sizes of Capitol Boilers is especially adapted for quick and efficient cleaning. Flues and fire doors do not depend upon an extra frame to fit evenly in front of boiler, each individual door being ground to fit section, thereby insuring a tight and snug joint.



Grate



Interior View



Intermediate Section

General Data on Capitol Smokeless Boilers

The Capitol Testing Laboratory has developed three new series of the Capitol Smokeless line of bituminous burning boilers—the 27″ series, 40″ series and 50″ series. These boilers are of the regular up-draft type so designed that they may be operated smokelessly with proper attention.

27″ Series—The important smokeless feature of these boilers is the inverted bridgewall or curtain section, through which heated auxiliary air filters over the fire for complete combustion. Additional auxiliary air is admitted to the firebox through properly proportioned fixed openings in the fire door.

When firing these boilers, the coking method should be applied—that is, a portion of the coked fuel should be pushed to the rear of the grate and new fuel added at the front. The gases distilled from the green coal pass under the curtain where they mix with the auxiliary air. This mixture of combustible gases and air is forced to pass close to the surface of the incandescent coke fire at the rear, where combustion takes place.

The low water line, 45½ in., is of distinct advantage. A considerable saving in construction costs can be effected through the use of low ceiling basements or boiler rooms.

40″ Series—The auxiliary air supply in these boilers which is a contributing factor to their high efficiency, is taken from the ash pit and carried to the level of the fuel bed through passageways cast in the front section of the boiler. These passageways extend across the entire front of the firebox and as the air is discharged from them it sweeps across the fuel bed from front to rear, mixing with the volatile gases from the fuel bed, thus insuring complete combustion.

This method of admitting the auxiliary air supply provides automatic regulation of the amount of air admitted to the firebox. As the rate of combustion is increased or decreased the velocity of air through the passageways is increased or decreased, insuring the right quantity of air at all rates of combustion.

A distinctive feature of this boiler is its low water line—49 in.

50″ Series—These boilers, the largest of the new series developed by the Capitol Testing Laboratory, contain a large furnace where bituminous coal undergoes rapid combustion. The main air supply is admitted through the grates and the fuel bed. Auxiliary air for smokeless combustion is admitted at the front of the furnace through passages leading from the ash pit to a point just above the level of the fuel bed. This air is properly proportioned for best results. It is preheated and mixes with the volatile gases distilled from the fuel.

An additional supply of auxiliary air is furnished through an inverted bridgewall or curtain section. This air is also preheated and filters over the fire, assuring most complete combustion and highest efficiency.

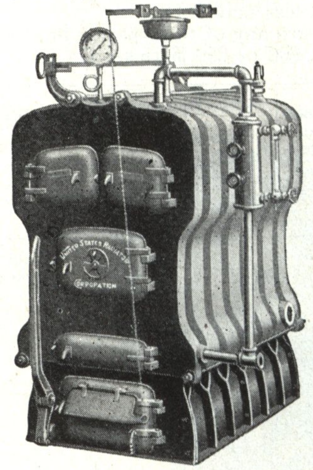
Continued on next page

*180 Series Square Sectional Boilers for Minimum Heights and Widths

Where Boiler Capacities of Not More Than 850 sq. ft. (Steam) or 1430 sq. ft. (Water) Will Ever Be Required

The 180 Series is designed for basements with low ceilings where minimum height of water line is desirable.

Will burn any kind of fuel—hard or soft coal, wood, coke, gas or oil, with the maximum efficiency for this type of boiler.



187 Steam

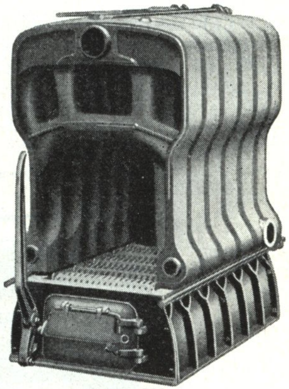
Boilers in this series should be selected:

Where the required boiler capacity, at time of installation, is less than 850 sq. ft. (steam) or 1430 sq. ft. (water) and future demands of the building will not require a boiler capacity of more than 850 sq. ft. (steam) or 1430 sq. ft. (water). By the addition of extra sections to the Nos. 184, 185 or 186 their boiler capacity can be increased, at any future time, to a maximum of 850 sq. ft. (steam) or 1430 sq. ft. (water).

Where a boiler capacity of between 600 and 800 sq. ft. (steam) or 900 and 1400 sq. ft. (water) will amply care for the installation requirements, but future demands may require a boiler capacity up to 1200 sq. ft. (steam) or 2000 sq. ft. (water), specify a boiler from the 200 Series described below.

No.	8-hr. rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
184	400	650	1.88	2.33	35	8 x 8	2-3″
185	550	910	2.63	3.17	35	8 x 12	2-3″
186	700	1170	3.38	4.01	35	8 x 12	2-3″
187	850	1430	4.13	4.84	40	8 x 12	2-3″

Height, 61½ in.; width, 36¾ in.—inclusive of trimmings. Height of water line, 40½ in. Specify whether top or back outlet smoke hood is required.

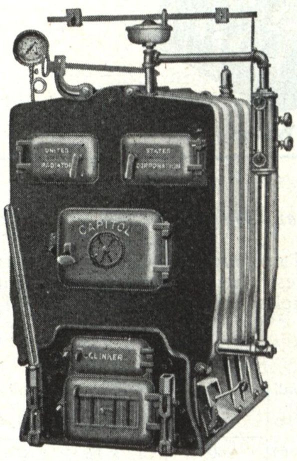


187 Water

*200 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 1200 sq. ft. (Steam) or 2000 sq. ft. (Water) Will Ever Be Required

A larger boiler than the 180 Series. Will burn the same kind and grades of fuel as the 180 Series.



207 Steam

Boilers in this series should be selected:

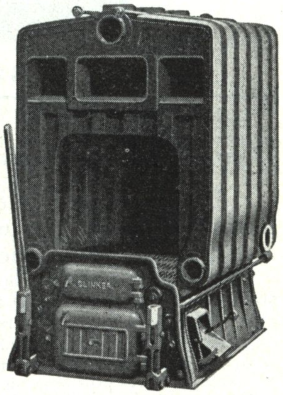
(1) Where the required boiler capacity, at the time of installation, is between 600 and 1200 sq. ft. (steam) or 1000 and 2000 sq. ft. (water) and where a maximum boiler capacity of 1000 sq. ft. (steam) or 2000 sq. ft. (water) will take care of all future demands.

Any boiler in this series can be increased at any future time to the maximum boiler capacity for this series by the addition of extra sections.

(2) Where the height from finished floor in cellar to the bottom of first floor beams is not less than 6 ft. 8 in. (unless an exceptionally long run of pipe prevents proper grading of the water line and dry return).

No.	8-hr. rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
204	600	1000	2.59	4.36	35	8 x 12	2-3″
205	800	1300	3.48	5.85	35	8 x 12	2-3″
206	1000	1650	4.37	7.34	35	12 x 12	2-3″
207	1200	2000	5.26	8.83	40	12 x 12	3-3″

Height, 66½ in.; width, 45 in.—inclusive of trimmings. Height of water line, 46½ in. Specify whether top or back outlet smoke hood is required.

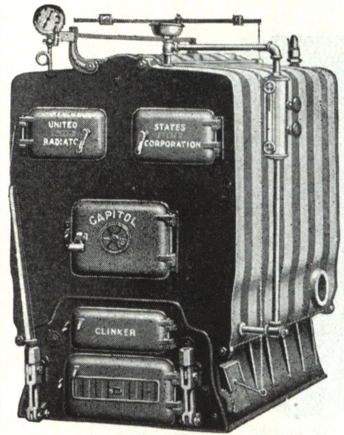


207 Water

*250 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 1850 sq. ft. (Steam) or 3050 sq. ft. (Water) Will Ever Be Required

Boilers in this series will burn any of the grades or kinds of fuel mentioned for the 180 or 200 Series.



257 Steam

Boilers in this series should be selected:

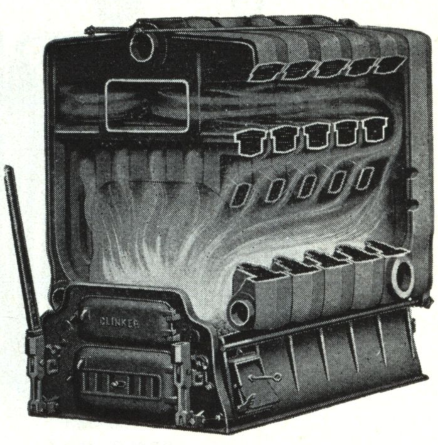
(1) Where the required boiler capacity, at the time of installation, is between 1100 and 1850 sq. ft. (steam) or 1825 and 3050 sq. ft. (water) and where a maximum boiler capacity of 1850 sq. ft. (steam) or 3050 sq. ft. (water) will take care of all future demands.

Any boilers in this series can be increased at any future time to the maximum boiler capacity for this series by the addition of extra sections.

(2) When the height from the finished cellar floor to bottom of first floor beams is not less than 7 ft.

No.	8-hr. rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
255	1100	1825	5.66	8.37	40	8 x 12	2-4″
256	1350	2225	7.08	10.45	40	8 x 12	2-4″
257	1600	2650	8.50	12.53	40	12 x 12	3-4″
258	1850	3050	9.92	14.62	45	12 x 12	3-4″

Height, 70½ in.; width, 51 in.—inclusive of trimmings. Height of water line, 49 in. Specify whether top or back outlet smoke hood is required.



257 Water

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*For smoke pipe, base dimensions and complete measurements, see fourth page following.

Continued on next page

*G 270 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 2250 sq. ft. (Steam) or 3700 sq. ft. (Water) Will Ever Be Required

Designed with a lower water line than the 250 Series. The G 276 and G 277 in this series have an approximate corresponding rating as the Nos. 256 and 257 boilers in the 250 Series.

G 270 boilers should be selected for these capacities:

(1) Where the required boiler capacity, at the time of installation, is between 1350 and 2250 sq. ft. (steam) or 2720 and 3700 sq. ft. (water) and where a maximum boiler capacity of 2250 sq. ft. (steam) or 3700 sq. ft. (water) will take care of all future demands.

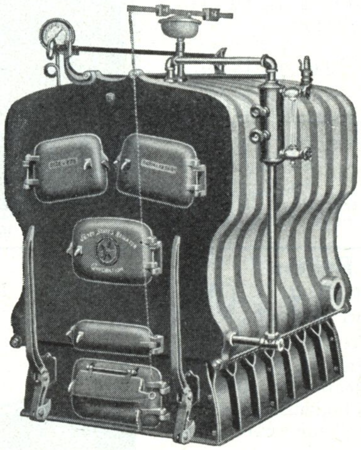
Note: If a maximum boiler capacity of 1850 sq. ft. (steam) or 3050 sq. ft. (water) will take care of all future requirements and between 1350 and 1850 sq. ft. (steam) or 2225 and 3050 sq. ft. (water) are the present requirements, select a boiler from the 250 Series.

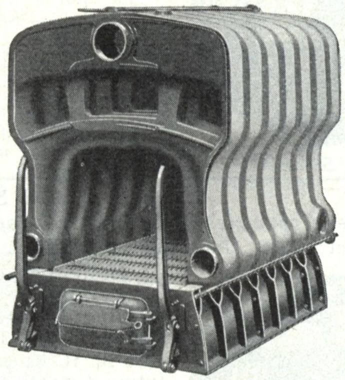
(2) When the height from finished cellar floor to bottom of first floor beams is not less than 7 ft.

Boilers in this series will burn any of the types or grades of fuel mentioned for the 180, 200 or 250 Series.

No.	8-hr. rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
G 276	1350	2230	5.32	7.93	40	12 x 12	2-4″
G 277	1650	2720	6.55	9.65	40	12 x 12	2-4″
G 278	1950	3200	7.78	11.37	45	12 x 12	3-4″
G 279	2250	3700	9.01	13.09	45	12 x 12	3-4″

Height, 68½ in.; width, 50¾ in.—inclusive of trimmings. Height of water line, 45½ in. Specify whether top or back outlet smoke hood is required.


G 278 Steam


G 278 Water

*230 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 4150 sq. ft. (Steam) or 6900 sq. ft. (Water) Will Ever Be Required

Boilers in this series are constructed with additional heating surface in arches of the sections.

Boilers in this series should be selected:

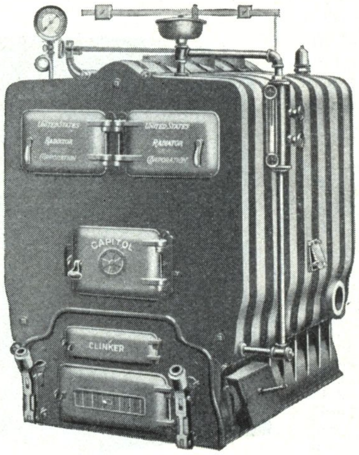
Where the required boiler capacity, at the time of installation, is between 1900 and 4150 sq. ft. (steam) or 3150 and 6900 sq. ft. (water) and where a maximum boiler capacity of 4150 sq. ft. (steam) or 6900 sq. ft. (water) may be required at some future time.

Note: Boilers Nos. 235 and 236, in this series, have an approximate corresponding boiler capacity as the G 278 and G 279 in the G 270 Series (described above). Where the height of the water line and boiler and flue dimensions of the 230 Series are a limitation and the future heating demands of the building will not require a boiler capacity of more than 2250 sq. ft. (steam) or 3700 sq. ft. (water) use the G 270 Series for these two capacities.

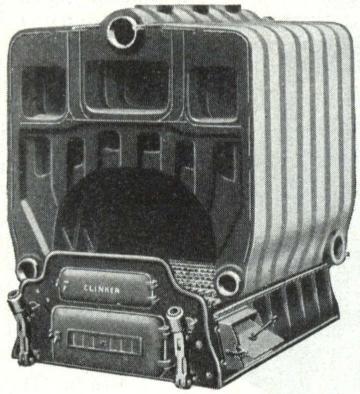
Will burn any kind of fuel economically, but where soft coal is to be used in territories where there are stringent smoke laws, specify the smokeless type described on following pages.

No.	8-hr. rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
235	1900	3150	7.28	11.01	40	12 x 16	2-4″
236	2350	3900	9.11	13.75	45	12 x 16	2-4″
237	2800	4650	10.94	16.49	45	16 x 16	3-4″
238	3250	5450	12.77	19.22	50	16 x 16	3-4″
239	3700	6150	14.61	21.96	50	16 x 16	3-4″
240	4150	6900	16.44	24.70	60	16 x 16	4-4″

Height, 78 in.; width, 58¼ in.—inclusive of trimmings. Height of water line, 55 in.



238 Steam



238 Water

*For smoke pipe, base dimensions and complete measurements, see third page following

Continued on next page

*4100 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 7575 sq. ft. (Steam) or 12550 sq. ft. (Water) Will Ever Be Required

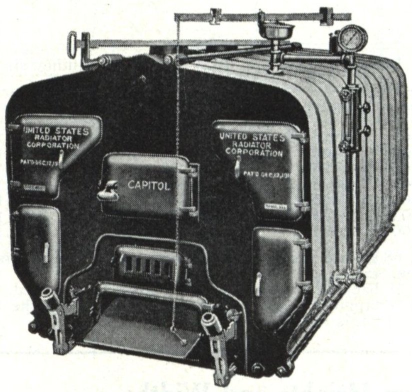
Designed for low cellars and low water line.

Boilers in this series should be selected:

Where the required boiler capacity, at the time of installation, is between 3700 and 7575 sq. ft. (steam) or 6050 and 12550 sq. ft. (water) and where a maximum boiler capacity of 7575 sq. ft. (steam) or 12550 sq. ft. (water) may be required at some future time.

Note: Boilers Nos. 4106 and 4107 in this series have an approximate corresponding boiler capacity as the Nos. 239 and 240 in the 230 Series (previously described). Where the height of the water line and boiler *are not a* limitation and the future heating demands of the building will never require a boiler capacity of more than 4150 sq. ft. (steam) or 6900 sq. ft. (water) 230 Series boilers of corresponding capacities may be used.

Will burn any kind of fuel economically, but where soft coal is to be used in territories where there are stringent smoke laws, specify the smokeless type described on following pages.


UNITED STATES RADIATOR CORPORATION
UNITED STATES RADIATOR CORPORATION
CAPITOL

No. 4111 Steam

No.	Rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		*Tappings	
	Steam	Water			Height, ft.	Flue, in.	Flow	Return
4106	3700	6050	10.31	13.30	45	18 x 18	2-5″	2-6″
4107	4475	7350	12.47	16.30	50	18 x 18	2-5″	2-6″
4108	5250	8650	14.63	19.25	55	18 x 20	2-5″	2-6″
4109	6025	9950	16.79	22.25	60	20 x 20	3-5″	2-6″
4110	6800	11250	18.95	25.20	65	20 x 24	3-5″	2-6″
4111	7575	12550	21.11	28.15	70	24 x 24	3-5″	2-6″

Height, 71 in.; width, 75 in.—inclusive of trimmings. Height of water line, 49 in.

*Return tappings located on rear of back section. A 3-in. flow and return tapping is provided in the side of boiler for hot water supply heater.

*WN270 Series Square Sectional Boilers

Where Boiler Capacities of Not More Than 11950 sq. ft. (Steam) or 19600 sq. ft. (Water) Will Ever Be Required

The right and left halves of assembled boiler in this Series must be joined at the rear by 3-in. pipe connection, insuring free circulation through both sides of boiler.

Boilers in this Series have two firing doors for the one set of grates, permitting easy firing and attention.

Will burn any kind of fuel economically, but where soft coal is to be used in territories where there are stringent smoke laws, specify the smokeless type described on following page.

Boilers in this series should be selected:

Where required boiler capacity, at time of installation, is between 4550 and 11950 sq. ft. (steam) or 7475 and 19600 sq. ft. (water) and where this maximum boiler capacity may be required, at some future time, to meet the demands of additions to the present building.

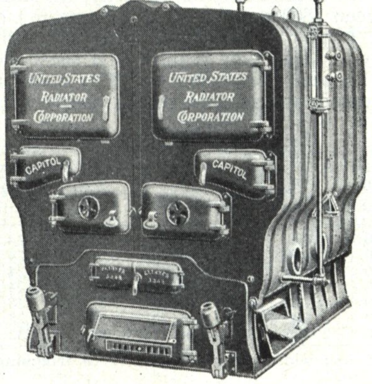
Note: Boilers WN277, 278, 279 and 280, in this series, have approximate corresponding boiler capacity as the Nos. 4107, 4108, 4109, 4110 and 4111 in the 4100 Series (described above). Where height of water line and boiler and flue dimensions of this (WN) Series would be a limitation and the future heating demands would never require a boiler capacity of more than 7575 sq. ft. (steam) or 12,550 sq. ft. (water) use the corresponding 4100 Series Boilers.

No.	Rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
WN276	4550	7475	15.25	24.66	50	20 x 24	3-5″
WN277	5475	9000	18.29	29.67	55	24 x 24	3-5″
WN278	6400	10525	21.33	34.68	60	24 x 24	3-5″
WN279	7325	12050	24.37	39.69	60	24 x 24	4-5″
WN280	8250	13575	27.41	44.71	65	24 x 28	4-5″
WN281	9175	15100	30.45	45.96	70	28 x 28	4-5″
WN282	10100	16625	*30.45	47.21	70	28 x 28	4-5″
WN283	11025	18100	*30.45	48.46	75	28 x 32	5-5″
WN284	11950	19600	*30.45	49.72	80	32 x 32	5-5″

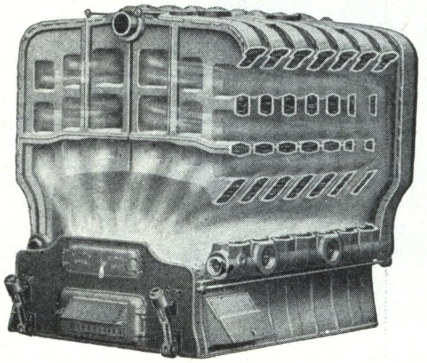
Height, 92 in.; width, 82 in.—inclusive of trimmings. Height of water line, 66 in.

*Bridgewall provided reduces grate area to proper dimension.

Specify whether top or back outlet smoke hood is required.


UNITED STATES RADIATOR CORPORATION
UNITED STATES RADIATOR CORPORATION
CAPITOL
CAPITOL

WN278 Steam



WN279 Water

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*For smoke pipe, base dimensions and complete measurements, see second page following.

Continued on next page

*27″ Series Smokeless Boilers for Minimum Heights and Widths

Where Boiler Capacities of Not More Than 4200 sq. ft. (Steam) or 6875 sq. ft. (Water) Will Ever Be Required

UNITED
RADIATOR
STATES
CORPORATION
CAPITOL

No. 827 Smokeless (Steam)

This series is so designed that, with proper attention, it will burn bituminous coal smokelessly.

May be used with equal satisfaction with any other kind of fuel.

The important smokeless feature of this boiler is the inverted bridgewall or curtain section through which heated auxiliary air filters over the fire for complete and smokeless combustion (see page 2196 for General Data).

Boilers in this series have a low water line and should be selected:

(1) Where the required boiler capacity, at time of installation, is between 1800 and 4200 sq. ft. (steam) or 2975 and 6875 sq. ft. (water) and where this maximum boiler capacity is all that will ever be required to meet any increased demands of the building.

(2) Where a considerable saving in construction costs can be effected through the use of low ceiling basements or boiler rooms.

No.	Rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		*Outlets,
	Steam	Water			Height, ft.	Flue, in.	
627	1800	2975	5.32	7.93	40	12 x 12	2-4″
727	2200	3625	6.55	9.65	40	12 x 12	2-4″
827	2600	4275	7.78	11.37	45	12 x 12	3-4″
927	3000	4925	9.01	13.09	45	12 x 16	3-4″
1027	3400	5575	10.24	14.81	45	12 x 16	3-4″
1127	3800	6225	11.47	16.53	50	12 x 16	3-4″
1227	4200	6875	12.70	18.25	50	12 x 16	4-4″

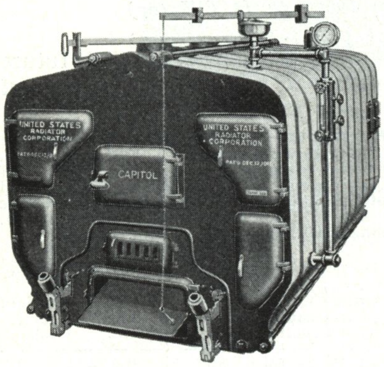
Height, 68½ in.; width, 50¾ in.—inclusive of trimmings. Height of water line, 45½ in.

Specify if back or top outlet smoke hood is required.

*2 return tappings 4 in. in diam. are located in the back section of every size of this series.

*40″ Series Smokeless Boilers for Minimum Heights and Widths

Where Boiler Capacities of Not More Than 9125 sq. ft. (Steam) or 15150 sq. ft. (Water) Will Ever Be Required



No. 1140 Smokeless (Steam)

The operation of the 40″ Series is similar to that of the 27″, except that auxiliary air enters through patented air passages in the front section. Admission of air at the front permits combustion of a large part of the gases before they pass under the curtain.

This method of admitting auxiliary air supply provides automatic regulation of the amount of air admitted to the firebox—as the rate of combustion is increased or decreased the velocity of air through the passageways is correspondingly increased or decreased. Boilers in this series should be selected:

(1) Where the required boiler capacity, at time of installation, is between 4475 and 9125 sq. ft. (steam) or 7350 and 15150 sq. ft. (water) and where this maximum boiler capacity is all that will ever be required to meet any increased demands of the building.

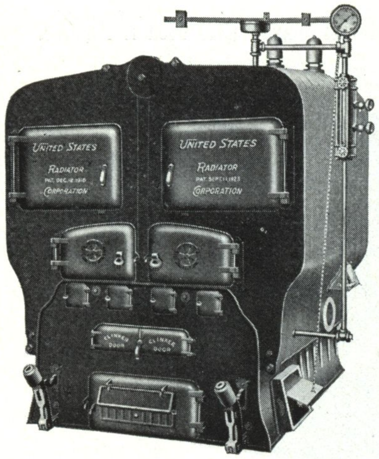
(2) Where a considerable saving in construction costs can be effected through the use of low ceiling basements or boiler rooms.

No.	Rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets,
	Steam	Water			Height, ft.	Flue, in.	
740	4475	7350	8.15	10.40	50	18 x 18	2-5″
840	5250	8650	10.31	13.30	55	18 x 20	2-5″
940	6025	9950	10.31	13.30	60	20 x 20	2-5″
1040	6800	11250	12.47	16.30	65	20 x 24	3-5″
1140	7575	12550	14.63	19.25	70	24 x 24	3-5″
1240	8350	13850	14.63	19.25	70	24 x 28	3-5″
1340	9125	15150	16.79	22.20	75	24 x 28	3-5″

Height, 71 in.; width, 75 in.—inclusive of trimmings. Height of water line, 49 in.

*50″ Series Smokeless Boilers

Where Boiler Capacities of Not More Than 14100 sq. ft. (Steam) or 23225 sq. ft. (Water) Will Ever Be Required



No. 1150 Smokeless (Steam)

This is the largest and latest development of the Capitol Testing Laboratory. These boilers are assembled with divided sections, right and left.

They contain a large furnace where bituminous coal undergoes rapid combustion. The main air supply is admitted through the grates and the fuel bed.

Auxiliary air for smokeless combustion is admitted at the front of the furnace through passages leading from the ash pit to a point at the front of the fuel bed. The curtain wall (see General Data, page 2196), acts as a secondary auxiliary air supply.

Assuming a good grade of bituminous coal is available, boilers in this Series should be selected:

Where the required boiler capacity, at time of installation, is between 7800 and 14100 sq. ft. (steam) or 12875 and 23225 sq. ft. (water) and where the future demands of the building may at some time require that the boilers of lower capacity in this series be increased. Any boiler in this series may be increased, at any time, to the maximum capacity for this series.

No.	Rating, sq. ft.		Grate area, sq. ft.	Coal cap., cu. ft.	Min. chimney sizes		Outlets and inlets
	Steam	Water			Height, ft.	Flue, in.	
750	7800	12875	18.29	29.67	55	24 x 24	3-5″
850	8850	14600	21.33	34.68	60	24 x 24	4-5″
950	9900	16325	21.33	34.68	65	24 x 28	4-5″
1050	10950	18050	24.37	39.69	70	24 x 28	5-5″
1150	12000	19775	24.37	39.69	80	28 x 28	6-5″
1250	13050	21500	27.41	44.71	90	28 x 32	6-5″
1350	14100	23225	27.41	44.71	95	32 x 32	6-5″

Height, 92 in.; width, 82 in.—inclusive of trimmings. Height of water line, 66 in.

Specify if top or back outlet smoke hood is desired.

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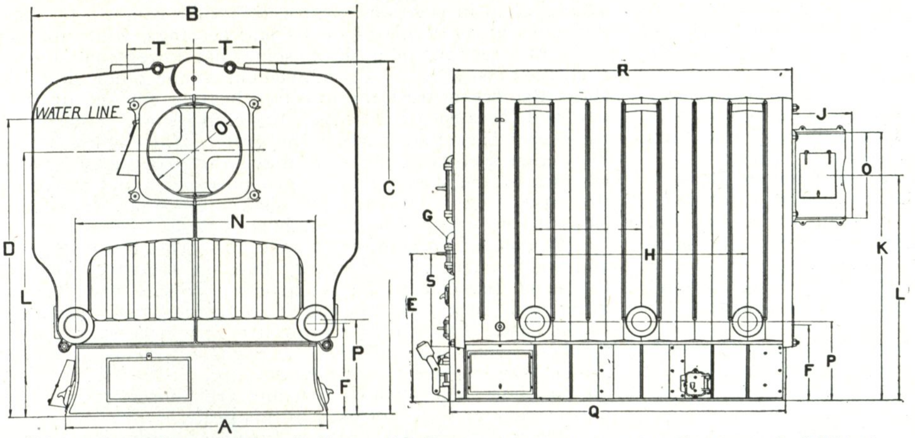
*For smoke pipe, base dimensions and complete measurements, see next page following

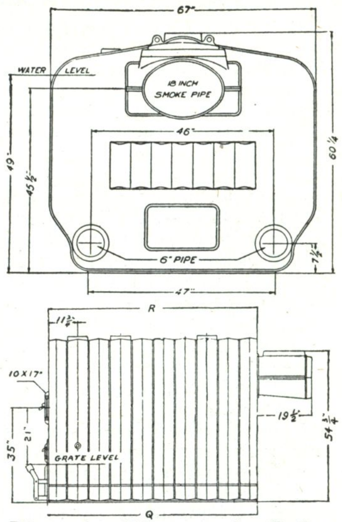
Continued on next page

Measurements for All Series Square Boilers



Dimension Diagrams for Boilers with Bases. 180, 200, 250, G270, 230, WN270, 27″ and 50″ Series

Note: Assembly of 4100 Series varies from 40″ soft coal assembly. See assembly chart in all cases.



Dimension Diagrams for Boilers Without Bases, 4100 and 40″ Series

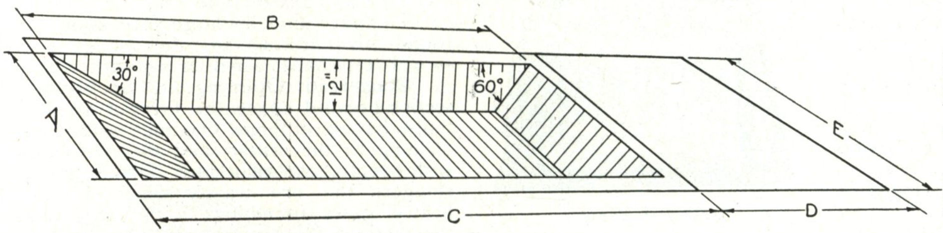
	180	200	250	G270	230	4100	WN270	27″	40″	50″
A	25½″	28¾″	34¼″	36 ″	41¼″	47 ″	57¾″	36 ″	47 ″	57¾″
B	28½″	32½″	39 1/16″	43½″	48½″	67 ″	71¾″	43½″	67 ″	71¾″
C	48 ″	54 ″	58⅝″	55¾″	67 ″	60¼″	77¾″	55¾″	60¼″	77¾″
D	40½″	46½″	49 ″	45½″	55 ″	49 ″	66 ″	45½″	49 ″	66 ″
E	25½″	29 11/16″	28 15/16″	27½″	31 ″	35 ″	33¾″	27½″	35 ″	38 ″
F	....	....	....	....	....	7½″	20⅛″	16⅛″	7½″	20⅛″
G	7½″x11½″	9¾″x14½″	9¾″x14½″	8″x13″	9¾″x15¼″	10″x17″	10″x17″	8″x13″	10″x17″	10″x17″
J	12 ″	11½″	11½″	16 ″	14 ″	19½″	22½″ top outlet 15″ back outlet	16 ″	19½″	22½″ top outlet 15 ″ back outlet
†K	44½″	50 11/16″	52 5/32″	50 ″	59 ″	53¾″	72 ″	50 ″	54¾″	72 ″
†L	37 ″	43 3/16″	45 5/32″	41½″	52 ″	45½″	58¾″	41½″	45½″	58¾″
§N	....	....	....	....	....	46 ″	53¼″	....	46 ″	53¼″
O	10 ″	10 ″	12 ″	14 ″	14 ″	18 ″	21 ″	14 ″	18 ″	21 ″
P	14¼″	16¾″	17¼″	16 ″	19 ″	....	20⅞″	....	....	20⅞″
Q	184–20″	204–23½″	255–37¼″	G276–35¾″	235–37⅞″	4106–46⅞″	WN276–49¼″	627–35¾″	740–54⅞″	750–59″
	Above values of Q are based on minimum size boilers in each series. For each additional section, add as follows:									
	6⅛″	6¼″	8 ″	6 11/16″	8 ″	8 ″	9 ″	6 11/16″	8 ″	9 ″
R	184–20¾″	204–22¾″	255–36½″	G276–35¾″	235–37¼″	4106–46 ″	WN276–50⅞″	627–35¾″	740–54″	750–60 ″
	Above values of R are based on minimum size boilers in each series. For each additional section, add as follows:									
	6¼″	6¼″	8 ″	6¾″	8⅛″	8 ″	9⅛″	6¾″	8 ″	9⅛″
*S	14¼″	18 ″	17 ″	15½″	18 ″	....	19¼″	....	21 ″	23½″
T	....	....	....	....	....	....	14 13/16″	....	....	14 13/16″

*Center of fire door above grate level. †Dimension K is for top outlet smoke hood which can be furnished on all square boilers. §Back openings must be connected across back of boiler with a pipe not less than 3 inches in diameter on WN270.

Pit Dimensions for All Series Square Boilers (inches)

We recommend the construction of a pit similar to the sketch below with all Capitol square boilers, as 95% of burned grates are directly traceable to the accumulation of ashes under grates.

Complete dimensions are found above. Measurement "D" pertains to Smokeless boilers and sizes 282, 283 and 284 of the WN270 Series, as these heaters employ bridgewall which shortens pit dimensions.



A—Width of pit.
B—Length of pit.
C—Length of base of boilers not employing bridgewall, also distance from front base plate to bridgewall on all smokeless boilers and sizes 282, 283, 284 of the WN270 Series.
D—Distance from bridgewall to rear base plate.
E—Width of boiler base.

To provide proper foundation for boiler when basement floor is not laid, add 6 to 8 in. to dimensions C, D and E.

No.	A	B	C	D	E
184	19½	14¼	20¼	....	25½
185	19½	20½	26½	....	25½
186	19½	26¾	32¾	....	25½
187	19½	33	39	....	25½
204	22¾	17½	23½	....	28¾
205	22¾	23¾	29¾	....	28¾
206	22¾	30	36	....	28¾
207	22¾	36¼	42¼	....	28¾
255	28¼	31¼	37¼	....	34¼
256	28¼	39¼	45¼	....	34¼
257	28¼	47¼	53¼	....	34¼
258	28¼	55¼	61¼	....	34¼
G276	30	30	36	....	36

No.	A	B	C	D	E
G277	30	36¾	42¾	....	36
G278	30	43½	49½	....	36
G279	30	50¼	56¼	....	36
235	35¼	30½	38⅛	....	41¼
236	35¼	38¾	46⅛	....	41¼
237	35¼	47	54⅛	....	41¼
238	35¼	55¼	62⅛	....	41¼
239	35¼	63½	70⅛	....	41¼
240	35¼	71¾	78⅛	....	41¼
4106	41	38	47⅛	....	47
4107	41	46	55⅛	....	47
4108	41	54	63⅛	....	47
4109	41	62	71⅛	....	47
4110	41	70	79⅛	....	47
4111	41	78	87⅛	....	47

No.	A	B	C	D	E
WN276	51	43⅝	49⅝	....	57¾
WN277	51	52¾	58¾	....	57¾
WN278	51	61⅞	67⅞	....	57¾
WN279	51	71	77	....	57¾
WN280	51	80⅛	86⅛	....	57¾
WN281	51	89¼	95¼	....	57¾
WN282	51	89¼	95¼	9⅛	57¾
WN283	51	89¼	95¼	18¼	57¾
WN284	51	89¼	95¼	27⅜	57¾
627	30	30	36	....	36
727	30	36¾	42¾	....	36
827	30	43½	49½	....	36
927	30	50¼	56¼	....	36
1027	30	57	63	....	36
1127	30	63¾	69¾	....	36

No.	A	B	C	D	E
1227	30	70	76½	....	36
740	41	30	36¼	18⅞	47
840	41	38	44¼	18⅞	47
940	41	38	44¼	26⅞	47
1040	41	46	52¼	26⅞	47
1140	41	54	60¼	26⅞	47
1240	41	54	60¼	34⅞	47
1340	41	62	68¼	34⅞	47
750	51	52½	59¼	....	57¾
850	51	61½	68¼	....	57¾
950	51	70½	77¼	....	57¾
1050	51	79½	86¼	....	57¾
1150	51	70	76½	18⅛	57¾
1250	51	79	85½	18⅛	57¾
1350	51	79	85½	27⅛	57¾

Continued on next page

General Data on Capitol Winchester (Round) Boilers

Capitol Winchester boilers are manufactured for both steam and hot water heating systems.

The Winchester is of the round type and its design is based upon facts well established by both theory and practice.

Conditions of installation differ, however, and much depends on draft pressure and the size, height and nature of the flue.

Therefore, to enable architects, engineers and heating contractors to select a boiler that will operate most efficiently under the given conditions, the Winchester type is divided into three groups in which the indirect heating surfaces vary.

How to Select the Proper Capitol Winchester Boiler—Proper draft pressure is indispensable to perfect combustion, and high evaporative power requires adequate indirect heating surface. When the draft is insufficient, surface must be sacrificed to suit operating conditions. In such cases, the removal of indirect heating surface with reduced draft losses through the boiler will permit operation under the draft available, but at a lower efficiency.

Obversely, where draft is ample, boilers with large amounts of heating surface may be used and higher evaporation may be obtained in pounds of water per pound of coal burned.

On installations where the flue is small or of insufficient height, or is improperly constructed and therefore leaky, the building may be comfortably heated by selecting a boiler having less indirect heating surface, thereby requiring less draft pressure, but this must be accomplished at some loss of evaporative power due to absence of indirect heating surface. On the other hand, where flues are perfect in construction a higher evaporative power may be obtained.

Consequently, in the three groups of Winchester boilers there are the same four main divisions of the boiler—ash pit base, combustion chamber fire pot, intermediate sections and dome—but the number of intermediate sections varies in each group. Thus a boiler can be selected with indirect heating surface that best meets the conditions of each particular installation. Group A boilers should be selected where poor draft conditions prevail; that is, where a low chimney or undersized chimney is available. Group B should be used where average draft is available, and group C where conditions are ideal.

Other conditions will also affect the choice of boiler group; for instance, draft will be reduced with sharp bends in the smoke pipe or where the distance from boiler to chimney is excessive.

In general, the chimney sizes given for the various boilers will give satisfaction with boilers properly selected for the heating load

Features of Construction

Unusually Deep Base—The base of the Capitol Winchester Boiler is unusually deep to accommodate the rotary duplex grate. Its increased depth, together with its large ash door, facilitates the removal of ashes.

The draft door is placed on the side of the base. This draft door is equipped with a butterfly damper hung from the center, very sensitive for operation by an automatic regulator. Its position on the side of the base leaves the regulator chain free from the swing of the fire door.

Rotary Duplex Grates—The Capitol Winchester Boiler is the first boiler built with a rotary duplex grate. This is a step in advance of anything heretofore developed in the construction of round boilers.

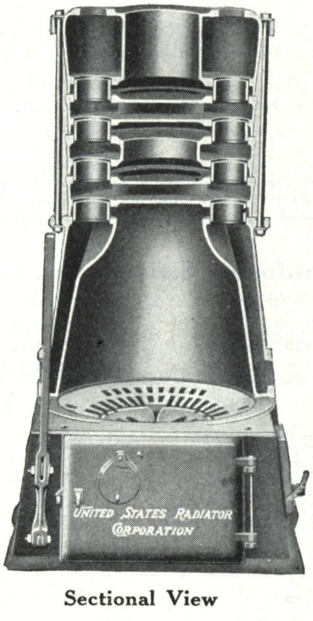
The rotary duplex grate consists of two parts—an outer ring section having a slight pitch toward the center and rotating on steel ball bearings, and an inner section made of two parts, which, when in position, form a basketlike center. In shaking, the outer grate occillates on its ball bearings, while the center basketlike section, in position somewhat lower than the outer ring, remains at rest. The movement of the outer ring section slices the fire nearest the effective heating surface of the fire pot, and, because of its bevel, the clinkers are moved toward the center basketlike part of the grate. The duplex or basket like center section of the grate is separately operated by a quarter turn of the shaker handle, dropping ashes and clinkers into the base. These two simple shaking movements effectually clean the fire without loss of unburned fuel.

Because of its concave surface, this grate has a larger area and a larger amount of air space than the ordinary flat grate of the same diameter. The construction is such that the entire grate rests on a slide running from front to rear on each side of the base. To repair the grate it is only necessary to remove the base front and pull the entire grate forward, remove the broken part, replace with a new one, and push back into position on the slide. Bolts which rust and are difficult to remove are unnecessary and are not used in this grate.

The rotary duplex grate is furnished with all sizes of the Capitol Winchester Boiler except Nos. 85, 86 and 87, which are provided with a flat rocking grate. This flat rocking grate can be furnished with all sizes of these boilers when preferred.

Deep, Smooth Surface—Fire Pot—The Capitol Winchester *fire pot is not corrugated, but presents a smooth surface to the fire.* Ashes and clinkers frequently accumulate in the corrugations found in the fire pots of earlier types of boilers. This condition can not exist in the Winchester fire pot. Furthermore, numerous tests have proven conclusively that there is no merit of increased efficiency in the slightly corrugated fire pot ordinarily used.

The unusually deep fire pot provides an abundant fuel capacity, easily sufficient to carry the fire overnight, together with an ample combustion chamber above the fuel bed, and with increased amount of direct fire surface. Experience has shown that to obtain the highest efficiency, a large combustion space is essential for thoroughly burning the gases generated by the coal before their escape into the upper flues.



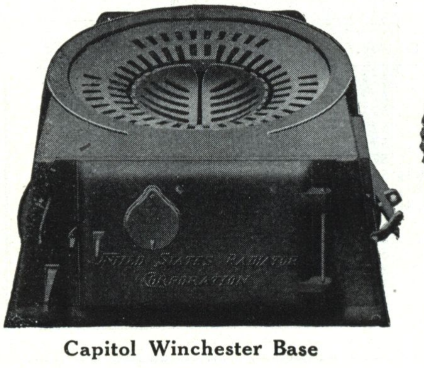
Sectional View

The oxygen in the air and the carbon in the coal can not unite to produce heat unless a chamber is provided for their proper mixture before they are cooled below the ignition temperature by contact with cool water-backed heating surfaces.

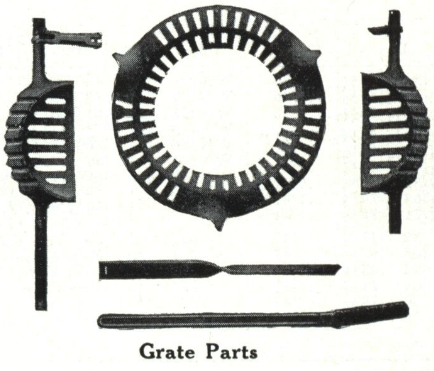
To obtain this large combustion chamber, the fire pot has been increased somewhat beyond the usual height, and the customary overhanging arms have been omitted. The heating surface of the overhanging arms has been added to the fire pot through its increased height. The Capitol Winchester *was the pioneer in this type of construction.*

The exceptionally large feed door will be found advantageous for the use of a large shovel, especially when firing with soft coal.

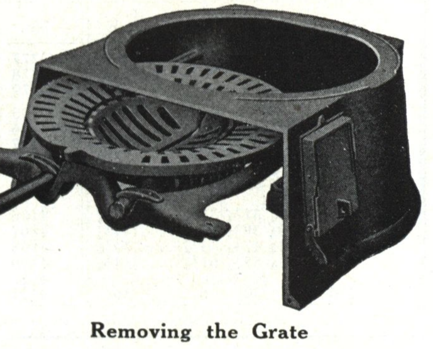
Staggered Opening in Sections—The sections placed above the fire pot are of two types, having different openings—one with the opening in the center, and the alternate one with openings at each side. This arrangement staggers the fire travel, which brings the heated gases in contact with every part of the sections.



Capitol Winchester Base



Grate Parts



Removing the Grate

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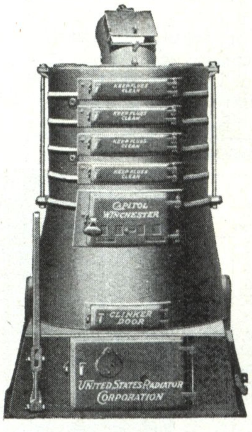
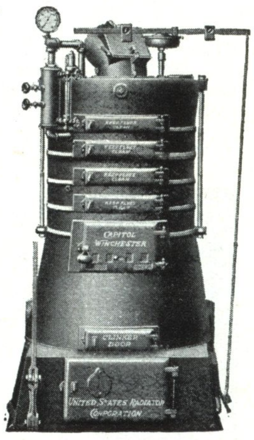
Capacities and Dimensions of All Groups of Capitol Winchester (Round) Boilers



Boiler No. 87 Water



Boiler No. 87 Steam

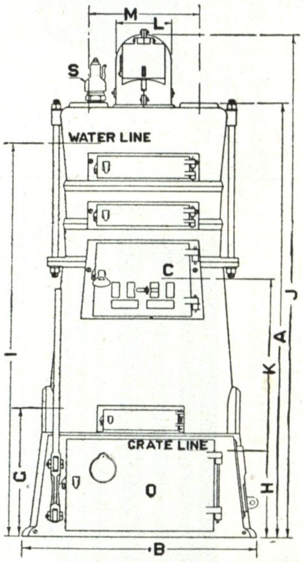
No.	*8-hr. rating, sq. ft.		Nominal grate diam., in.	Grate area, sq. ft.	Coal cap., lb.	Height of water line, in.	Min. chimney sizes		Outlets and inlets
	Steam	Water					Height, ft.	Flue, in.	
GROUP A									
24	325	535	17	1.58	113	45	30	8 x 8	2-2½″
31	385	635	19	1.87	153	46	30	8 x 12	2-2½″
34	450	740	20	2.18	165	46	35	8 x 12	2-2½″
45	575	950	23	2.76	234	51	40	8 x 12	2-3″
55	700	1155	25	3.27	255	52½	40	8 x 12	2-3″
65	900	1485	27	3.97	305	52½	45	12 x 12	2-4″
75	1050	1735	29	4.59	335	53½	45	12 x 12	2-4″
85	1300	2145	33	5.94	465	51	45	12 x 12	2-4″
GROUP B									
25	350	580	17	1.58	113	49 9/16	35	8 x 8	2-2½″
32	410	675	19	1.87	153	51	35	8 x 12	2-2½″
35	475	785	20	2.18	165	51	40	8 x 12	2-2½″
46	600	990	23	2.76	234	56	45	8 x 12	2-3″
56	750	1240	25	3.27	255	57½	45	8 x 12	2-3″
66	1000	1650	27	3.97	305	57½	50	12 x 12	2-4″
76	1150	1900	29	4.59	335	58½	50	12 x 12	2-4″
86	1400	2310	33	5.94	465	56	50	12 x 12	2-4″
GROUP C									
33	430	710	19	1.87	153	56	40	8 x 12	2-2½″
36	500	825	20	2.18	165	56	45	8 x 12	2-2½″
47	650	1075	23	2.76	235	61	50	8 x 12	2-3″
57	800	1320	25	3.27	255	62½	50	8 x 12	2-3″
67	1050	1735	27	3.97	305	62½	55	12 x 12	2-4″
77	1250	2065	29	4.59	335	63½	55	12 x 12	2-4″
87	1500	2475	33	5.94	465	61	55	12 x 12	2-4″

Note: In groups A, B, C boilers of 23, 25, 27, 29 and 33-in. grate diameter are assembled with four intermediate sections between fire pot and dome.

*For basis of boiler ratings and guarantee, see page 2195.

A larger size of fire pot is recommended when soft coal is used.

Boilers Nos. 85, 86 and 87 are equipped with rocking grates only.



CAPITOL WINCHESTER BOILER MEASUREMENTS (INCHES)

Group	Size No.	Steam			Water		Steam and Water							
		A	I	J	A	J	B	C	G	*H	*K	L	M	O
A	24	49½	45	56 11/16	44¼	51 3/16	26¼	8x 9	15 5/16	8⅞	23½	7	13 11/16	10½ x14 11/16
	31	50¾	46	59	45½	53¾	26¾	9x11	15 5/16	8⅞	23½	7	13 11/16	10½ x14 11/16
	34	50¾	46	59	45½	53¾	29 5/16	9x11	15 5/16	8⅞	23½	7	13 11/16	10 11/16x17¾
	45	55¾	51	64⅝	50½	59⅜	31	9x12	16¼	8⅞	24⅛	8	16 5/16	10 11/16x17¾
	55	57¼	52½	66⅛	52	60⅞	35	9x12	17¾	9⅞	24⅛	8	16 5/16	11 15/16x18⅜
	65	57¼	52½	67⅜	52	62⅛	35¾	9x13	17¾	10⅜	24⅞	9	17 13/16	11 13/16x18⅜
	75	58¼	53½	68⅜	53	63⅛	40	9x13	18¾	10 9/16	24 11/16	9	17 13/16	13⅜ x20⅝
	85	55¾	51	66⅞	50½	61⅝	41⅞	9x14	16¼	12¼	20¼	10	21 7/16	10 11/16x17¾
B	25	54 1/16	49 9/16	61¼	48 13/16	56	26¼	8x 9	16¼	8⅞	23½	7	13 11/16	10½ x14 11/16
	32	55¾	51	64	50½	58¾	26¾	9x11	15⅜	8⅞	23½	7	13 11/16	10½ x14 11/16
	35	55¾	51	64	50½	58¾	29 5/16	9x11	16¼	8⅞	23½	7	13 11/16	10 11/16x17¾
	46	60¾	56	69⅝	55½	64⅜	31	9x12	16¼	8⅞	24⅛	8	16 5/16	10 11/16x17¾
	56	62¼	57½	71⅛	57	65⅞	35	9x12	17¾	9⅞	24⅛	8	16 5/16	11 15/16x18⅜
	66	62¼	57½	72⅜	57	67⅛	35¾	9x13	17¾	10⅜	24⅞	9	17 13/16	11 15/16x18⅜
	76	63¼	58½	73⅜	58	68⅛	40	9x13	18¾	10 9/16	24 11/16	9	17 13/16	13⅜ x20⅝
	86	60¾	56	71⅞	55½	66⅝	41⅞	9x14	16¼	12¼	20¼	10	21 7/16	10 11/16x17¾
C	33	60¾	56	69	55½	63¾	26¾	9x11	15⅜	8⅞	23½	7	13 11/16	10½ x14 11/16
	36	60¾	56	69	55½	63¾	29 5/16	9x11	16¼	8⅞	23½	7	13 11/16	10 11/16x17¾
	47	65¾	61	74⅝	60½	69⅜	31	9x12	16¼	8⅞	24⅛	8	16 5/16	10 11/16x17¾
	57	67¼	62½	76⅛	62	70⅞	25	9x12	17¾	9⅞	24⅛	8	16 5/16	11 15/16x18⅜
	67	67¼	62½	77⅜	62	72⅛	35¾	9x13	17¾	10⅜	24⅞	9	17 13/16	11 15/16x18⅜
	77	68¼	63½	78⅜	63	73⅛	40	9x13	18¾	10 9/16	24 11/16	9	17 13/16	13⅜ x20⅝
	87	65¾	61	76⅞	60½	71⅝	41⅞	9x14	16¼	12¼	20¼	10	21 7/16	10 11/16x17¾

*With standard grate equipment.

United States Hot Water Supply Boilers

Built to A. S. M. E. standards. Maximum allowable working pressure 40 lb. per sq. in.

If required to work under high pressure, boilers should be specially tested at two and one-half times required pressure.

Boilers Nos. 610, 620 and 630 may be furnished with cast iron base plate, as on 119, with legs 2½ in. high. Butterfly draft door furnished on 610, 620 and 630.

Grates—No. 2 X equipped with a draw center grate. All others have triangular grates.

Hot Water Supply Ratings of Boilers—To heat a storage tank for an 8-hr. firing period.

For Square Boilers—Multiply the number of U. S. gallons of water to be heated by the degrees to be heated per hour and multiply product by .00018. The result is the proper coal capacity in cubic feet of a square boiler using hard coal.

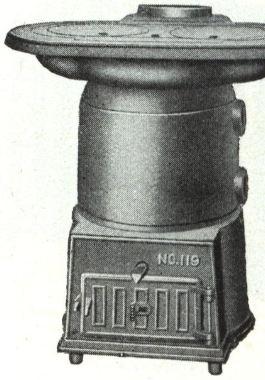
Example: To raise temperature of 800 gal. of water 40° per hour; 800 × 40 × .00018 = 5.76 cu. ft. of coal capacity necessary. Use boiler No. 205 of 5.85 cu. ft. of coal capacity.

For Round Boilers Using Hard Coal—Multiply number of U. S. gallons to be heated by the degrees water is to be heated per hour to obtain factor shown in table. This factor designates proper size Capitol Winchester Boiler to use.

Example: To raise temperature of 350 gal. of water 25° per hour; 350 × 25 = 8750 (factor).

The next higher factor in table is 10500. Hence use boiler No. 24.

No.	Factor	No.	Factor	No.	Factor
24	10500	45	23100	67	33100
25	11200	46	24200	74	31200
31	14200	47	25200	75	33000
32	15000	54	23700	76	34700
33	15800	55	25200	77	36300
34	15300	56	26400	84	43300
35	16300	57	27500	85	46100
36	17100	64	28400	86	48100
37	17800	65	30100	87	50100
44	21800	66	31600		



No. 119

CAPACITIES AND DIMENSIONS OF HOT WATER SUPPLY BOILERS

*Nominal capacity, gal.	Nominal diam., in.	Grate area, sq. ft.	Height overall, in.	Tappings				Smoke collar, in.
				No.	Size, in.	Height, in.		
						Upper	Lower	
60	9	.40	23¾	2	1	17½	12⅝	6
90	10	.42	26½	2	1¼	19½	13¾	6
150	13	.89	30	2	2	30	11⅞	6
200	13	.89	33	2	2	33	11¾	6
250	13	.89	36	2	2	36	11⅞	6

*Gal. per hr. per 25° rise on 8-hr. firing period with hard coal.

UNITED STATES RADIATOR CORPORATION
CLINKER DOOR
NO.610

Nos. 610, 620, 630

Continued on next page

*Triton Plain Column United States Radiators

Scientific radiating surface and mechanical perfection are the first considerations in the manufacture of Triton Radiators. Triton Radiators must satisfy the user or they can not possibly satisfy us. Their simple, plain design and harmonious lines blend unobtrusively with the furniture and decorations.

There are Triton patterns for all kinds of buildings, various sizes and characters of rooms and for many special purposes, such as the sanitary requirements of hospitals, hotels, restaurants, etc.

Sidewall for concealed brackets, steam and water.

Legs extra high, solid (except 45-in. height) for steam or water.

Direct—indirect for steam or water and hospital pattern (not listed in this catalogue).

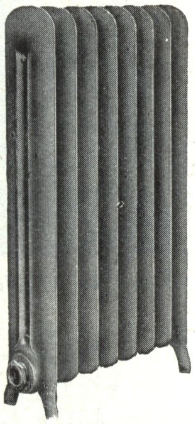
Corner, curved and circular for steam or water and pantry radiators (not listed in this catalogue).

Specify Triton Radiators and the United States Radiator Company will assume its full share of responsibility for their satisfactory service.

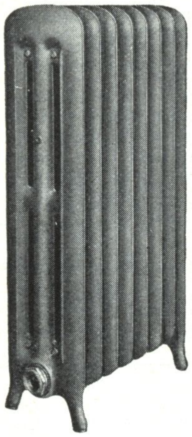
One-column

Sections	Length, in.	One-column				
		Height, in.				
		38	32	26	22	20
		Rad., sq. ft. per section				
		3	2½	2	1⅔	1½
2	5	6	5	4	3	3⅓
3	7½	9	7½	6	4½	5
4	10	12	10	8	6	6⅔
5	12½	15	12½	10	7½	8⅓
6	15	18	15	12	9	10
7	17½	21	17½	14	10½	11⅔
8	20	24	20	16	12	13⅓
9	22½	27	22½	18	13½	15
10	25	30	25	20	15	16⅔
11	27½	33	27½	22	16½	18⅓
12	30	36	30	24	18	20
13	32½	39	32½	26	19½	21⅔
14	35	42	35	28	21	23⅓
15	37½	45	37½	30	22½	25
16	40	48	40	32	24	26⅔
17	42½	51	42½	34	25½	28⅓
18	45	54	45	36	27	30
19	47½	57	47½	38	28½	31⅔
20	50	60	50	40	30	33⅓
21	52½	63	52½	42	31½	35
22	55	66	55	44	33	36⅔
23	57½	69	57½	46	34½	38⅓
24	60	72	60	48	36	40
25	62½	75	62½	50	37½	41⅔

Sections	Length, in.	Two-column						
		Height, in.						
		45	38	32	26	22	20	15
		Rad., sq. ft. per section						
		5	4	3⅓	2⅔	2¼	2	1½
2	5	10	8	6⅔	5⅓	4½	4	3
3	7½	15	12	10	8	6¾	6	4½
4	10	20	16	13⅓	10⅔	9	8	6
5	12½	25	20	16⅔	13⅓	11¼	10	7½
6	15	30	24	20	16	13½	12	9
7	17½	35	28	23⅓	18⅔	15¾	14	10½
8	20	40	32	26⅔	21⅓	18	16	12
9	22½	45	36	30	24	20¼	18	13½
10	25	50	40	33⅓	26⅔	22½	20	15
11	27½	55	44	36⅔	29⅓	24¾	22	16½
12	30	60	48	40	32	27	24	18
13	32½	65	52	43⅓	34⅔	29¼	26	19½
14	35	70	56	46⅔	37⅓	31½	28	21
15	37½	75	60	50	40	33¾	30	22½
16	40	80	64	53⅓	42⅔	36	32	24
17	42½	85	68	56⅔	45⅓	38¼	34	25½
18	45	90	72	60	48	40½	36	27
19	47½	95	76	63⅓	50⅔	42¾	38	28½
20	50	100	80	66⅔	53⅓	45	40	30
21	52½	105	84	70	56	47¼	42	31½
22	55	110	88	73⅓	58⅔	49½	44	33
23	57½	115	92	76⅔	61⅓	51¾	46	34½
24	60	120	96	80	64	54	48	36
25	62½	125	100	83⅓	66⅔	56¼	50	37½



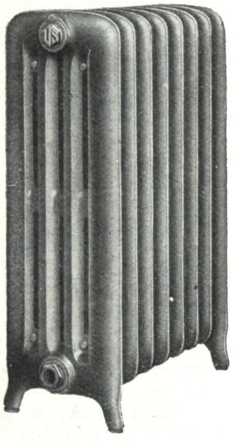
Two-column



Three-column

Sections	Length, in.	Three-column					
		Height, in.					
		45	38	32	26	22	18
		Rad., sq. ft. per section					
		6	5	4½	3¾	3	2¼
2	5	12	10	9	7½	6	4½
3	7½	18	15	13½	11¼	9	6¾
4	10	24	20	18	15	12	9
5	12½	30	25	22½	18¾	15	11¼
6	15	36	30	27	22½	18	13½
7	17½	42	35	31½	26¼	21	15¾
8	20	48	40	36	30	24	18
9	22½	54	45	40½	33¾	27	20¼
10	25	60	50	45	37½	30	22½
11	27½	66	55	49½	41¼	33	24¾
12	30	72	60	54	45	36	27
13	32½	78	65	58½	48¾	39	29¼
14	35	84	70	63	52½	42	31½
15	37½	90	75	67½	56¼	45	33¾
16	40	96	80	72	60	48	36
17	42½	102	85	76½	63¾	51	38¼
18	45	108	90	81	67½	54	40½
19	47½	114	95	85½	71¼	57	42¾
20	50	120	100	90	75	60	45
21	52½	126	105	94½	78¾	63	47¼
22	55	132	110	99	82½	66	49½
23	57½	138	115	103½	86¼	69	51¾
24	60	144	120	108	90	72	54
25	62½	150	125	112½	93¾	75	56¼

Sections	Length, in.	Four-column					
		Height, in.					
		44	38	32	26	22	18
		Rad., sq. ft. per section					
		10	8	6½	5	4	3
2	6	20	16	13	10	8	6
3	9	30	24	19½	15	12	9
4	12	40	32	26	20	16	12
5	15	50	40	32½	25	20	15
6	18	60	48	39	30	24	18
7	21	70	56	45½	35	28	21
8	24	80	64	52	40	32	24
9	27	90	72	58½	45	36	27
10	30	100	80	65	50	40	30
11	33	110	88	71½	55	44	33
12	36	120	96	78	60	48	36
13	39	130	104	84½	65	52	39
14	42	140	112	91	70	56	42
15	45	150	120	97½	75	60	45
16	48	160	128	104	80	64	48
17	51	170	136	110½	85	68	51
18	54	180	144	117	90	72	54
19	57	190	152	123½	95	76	57
20	60	200	160	130	100	80	60
21	63	210	168	136½	105	84	63
22	66	220	176	143	110	88	66
23	69	230	184	149½	115	92	69
24	72	240	192	156	120	96	72
25	75	250	200	162½	125	100	75



Four-column

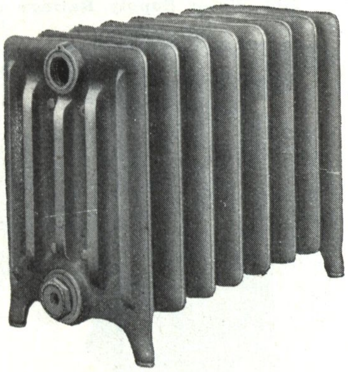
Column Wall

Column Wall Radiator

Made in one, two, three and four-column in all heights.

General data is the same as standard radiation of corresponding sizes.

Sections	Length, in.	Five-column, window type		
		Height, in.		
		20	17	14
		Rad., sq. ft. per section		
		5	4	3
2	6	10	8	6
3	9	15	12	9
4	12	20	16	12
5	15	25	20	15
6	18	30	24	18
7	21	35	28	21
8	24	40	32	24
9	27	45	36	27
10	30	50	40	30
11	33	55	44	33
12	36	60	48	36
13	39	65	52	39
14	42	70	56	42
15	45	75	60	45
16	48	80	64	48
17	51	85	68	51
18	54	90	72	54
19	57	95	76	57
20	60	100	80	60
21	63	105	84	63
22	66	110	88	66
23	69	115	92	69
24	72	120	96	72
25	75	125	100	75



Window

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*For radiator tapping list, see second page following.

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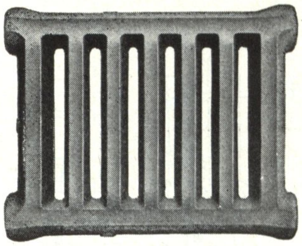
Triton Wall Radiators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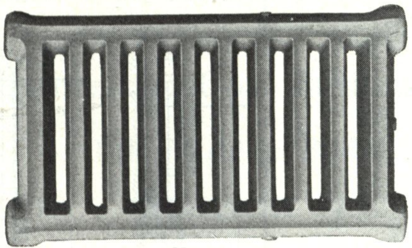
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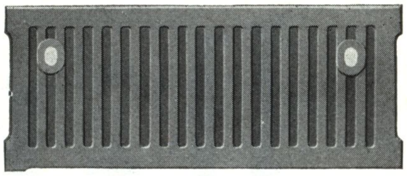
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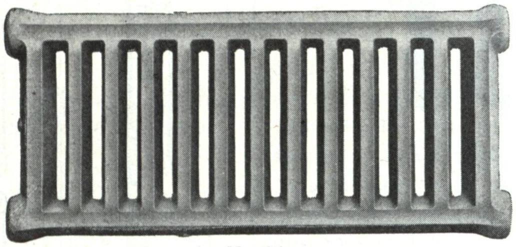
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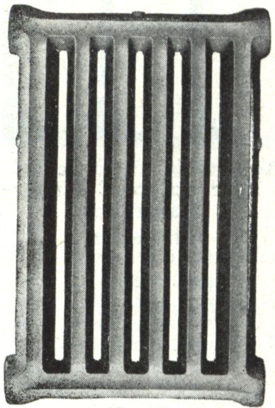
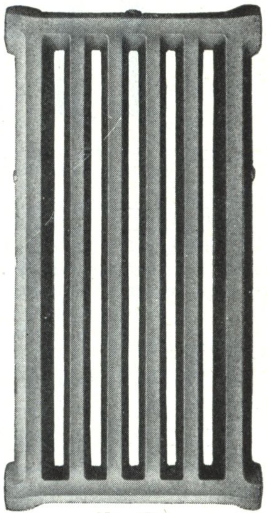
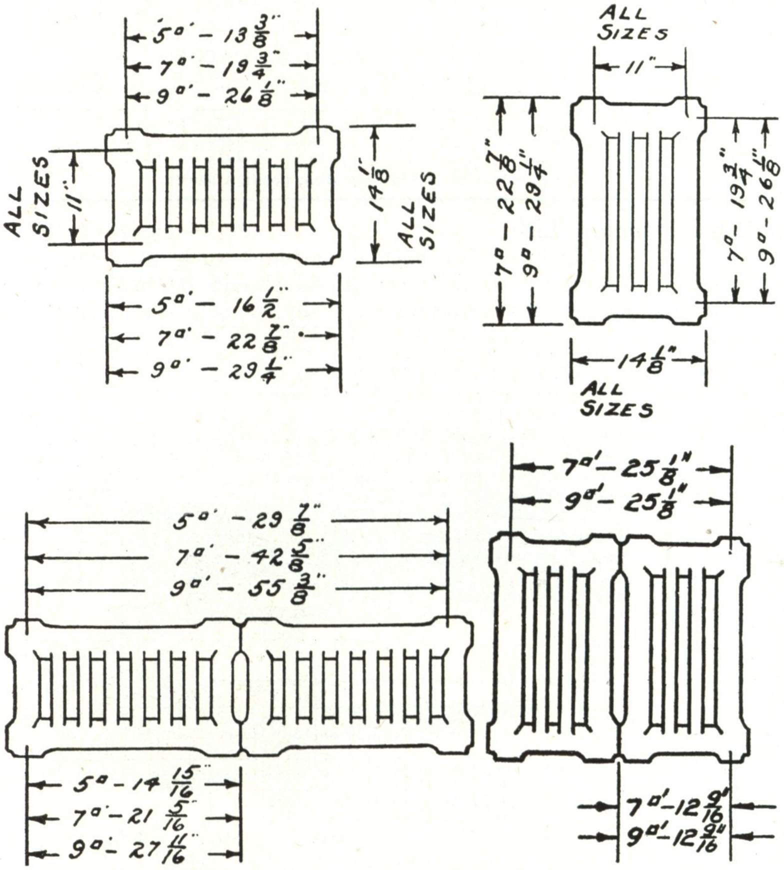

No. 7B


No. 9B

Section No.	Height, in.	Length or width, in.	Thickness, in.	Thickness with brackets, in.	Heating surface, sq. ft.
3½A	8	20½	1½	...	3½
5A	14⅛	16½	3	3½	5
7A	14⅛	22⅞	3	3½	7
9A	14⅛	29¼	3	3½	9
7B	22⅞	14⅛	3	3½	7
9B	29¼	14⅛	3	3½	9

Above radiators tapped 1½-in. except 3½A tapped ½-in.

Triton Wall Radiators should always be assembled with bars vertical, whether sections are built in stacks or tiers. Nos. 5A, 7A and 9A are used when sections are to be assembled end to end, and Nos. 7B and 9B when assembled side by side. No. 3½A wall bathroom radiator installed in single units only.



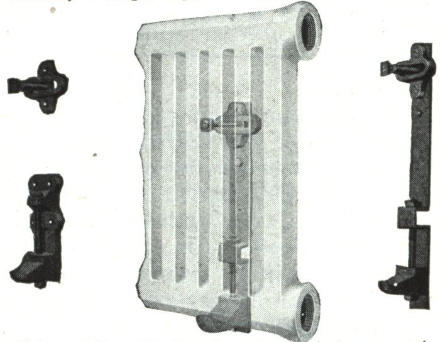
Assembly and Dimensions of Triton Wall Radiators

Above measurements apply to A and B styles

Triton Adjustable Wall Brackets

Triton Adjustable Brackets are made to support wall radiators in large or small tiers or stacks in buildings of any character where wall radiation is installed.

They are strong and substantial, and hold radiators securely in place. They are adjusted after attachment to walls by a single expansion bolt.



Triton Adjustable Brackets are made in two styles.

"N" brackets can be screwed to the wall to support any arrangement of wall radiation.

"O" bracket, with bearing plate, is attached to wall with ½-inch expansion bolts, materially reducing the cost of construction and guaranteeing a safe and secure attachment.

Vertical movement of the seat of "N" and "O" bracket is 2 in., permitting adjustment for pitch after radiators are erected. The brackets set the outer face of the radiator 4⅞ in. from the wall.

Screw sizes suitable for use on "N" bracket:

- Top bracket—size of hole, ¼ in.—use No. 14 wood screw.
- Bottom bracket—size of hole, 9/16 in.—use ½-in. lag screw.
- "N" brackets mounted on steel plates.
- Top bracket, ⅜ in.—flat head machine screw to fasten to plate.
- Bottom hole, 9/16 in.—for ½-in. lag screw to wall.
- Bottom brackets, ⅜ in.—machine screw to fasten to plate.
- Bottom hole—for ½-in. lag screw to fasten to wall.

For additional measurements and chart showing number and location of brackets on assemblages, see following page.

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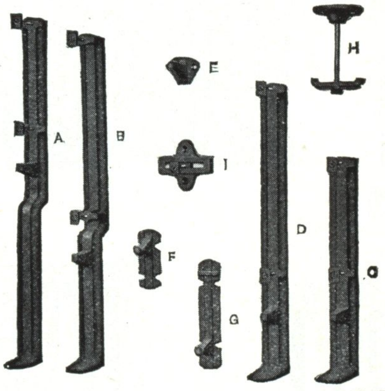
Wall Radiator Brackets



BRACKETS "B" TO FIT OVER A 9½-IN. HIGH BASEBOARD
For Supporting Wall Radiators Nos. 7-B and 9-B

Bracket No.	B5½	B7½	B9½
Height from floor to center of tapping, in.	5½	7½	9½

Brackets "D" are straight right angle brackets without offset for supporting Nos. 7-B and 9-B. Distance from floor to center of tapping 5½ in.

BRACKETS "A" TO FIT OVER BASEBOARD
For Supporting Nos. 5-A, 7-A and 9-A

Bracket No.	A6	A8	A10	A12	A14	A16
Height from floor to center of tapping, in.	1½	3½	5½	7½	9½	11½
Will fit over baseboard, in.	6	8	10	12	14	16

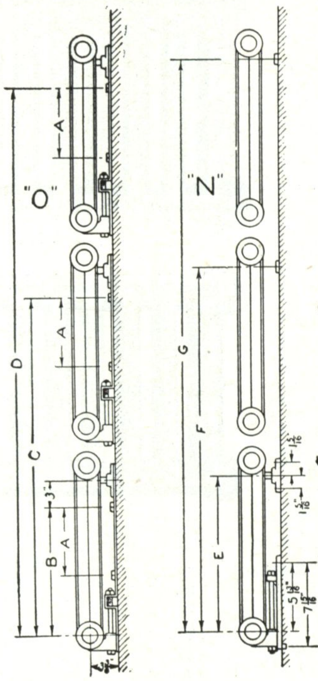
Brackets "C" are straight right angle brackets without offset for supporting Nos. 5-A, 7-A and 9-A. Distance from floor to center of tapping, 5½ in.

Brackets "F," "G," "E" and "I" are screwed to wall, baseboard and wainscoting. "F" and "G" are bottom supports for all sizes; "E" and "I" top guides to hold radiator in place should always be used with "F" and "G" brackets. "F" and "G" brackets are slotted for four wood screws not furnished by us, and "E" and "I" are for two wood screws.

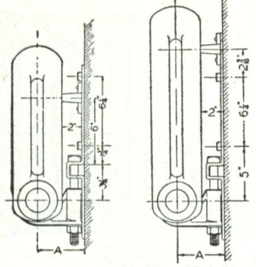
Ceiling brackets "H" for supporting radiator from ceilings, made of cast plate 3⅜-in. in diameter to be screwed to ceiling joist by four screws. Bolt furnished gives a distance of from 3½ to 5 in. from bottom of radiator to ceiling. Other lengths on special order.

With brackets "A," "B," "D" and "C" we furnish two ¼x2¼-in. F. H. stove bolts with button, and with bracket "I" one 2¼-in. stove bolt with button.

Radiator Brackets

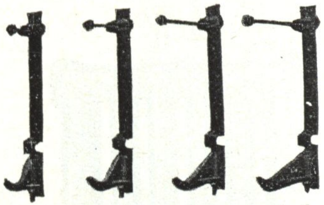


Triton Adjustable Brackets for Wall Radiation



For 18, 20 and 22-in. Heights

For Heights Above 22 in.



Adjustable Concealed Brackets for Column Radiation

All Heights
(In cuts above)

1-column..A equals 4¼ in.
2-column..A equals 5½ in.
3-column..A equals 6½ in.
4-column..A equals 8¼ in.

Adjustable concealed brackets for column radiators can safely stand 350 lb. each.

"O" TYPE DIMENSIONS (INCHES)

Kind of section	A	B	C	D
All horizontal	0	6 15/16	20 13/16	34 11/16
9 ft. vertical	8 1/16	15	44¼	73½
7 ft. vertical	8 1/16	15	37⅞	60¾

"N" TYPE DIMENSIONS (INCHES)

Kind of section	E	F	G	
All horizontal	9½	23⅜	37¼	
9 ft. vertical	24⅜	53⅝	82⅞	
7 ft. vertical	18	40⅞	63¾	

Adjustments 1 in. either way from position shown.

Radiator Tapping List

All column steam radiators are tapped 2 in., and bushed as per list below, unless otherwise ordered.

All column water radiators are tapped 2 in. at bottom, and 1½ in. at top. Tappings are bushed as per list below, unless otherwise ordered. Water radiators are tapped 1½ in. at top on one end. Smaller top tapping can be furnished on special order.

All wall radiators are tapped 1½ in.

All column radiators have right-hand threads at both supply and return, and all wall rediators have right-hand threads at one end, and left-hand threads at the other end.

All air valve tappings are ⅛-in. When radiators are ordered for special systems, such as vapor or vacuum, specific instructions should be given as to the method of tapping for supply, return and vent.

STEAM, ONE-PIPE WORK

Radiators containing 24 sq. ft. and under	1 in.
Above 24, but not exceeding 60 sq. ft.	1¼ in.
Above 60, but not exceeding 100 sq. ft.	1½ in.
Above 100 sq. ft.	2 in.

STEAM, TWO-PIPE WORK

Radiators containing 48 sq. ft. and under	1 x ¾ in.
Above 48, but not exceeding 96 sq. ft.	1¼x1 in.
Above 96 sq. ft.	1½x1¼ in.

WATER, TAPPED FOR SUPPLY AND RETURN

Radiators containing 40 sq. ft. and under	1 in.
Above 40, but not exceeding 72 sq. ft.	1¼ in.
Above 72 sq. ft.	1½ in.

MEASUREMENTS OF SECTIONS AND TAPPINGS OF UNITED STATES RADIATORS
Push Nipple

Style	Dimensions of sections			Distance from floor to center of lower tappings on water and steam radiators, supply and return, in.		Distance from floor to center of upper tappings											Distance from floor to bottom of section
	Width, in.	Width of legs, in.	Thickness, in.	Water	Steam	45-in.	44-in.	38-in.	32-in.	26-in.	22-in.	20-in.	18-in.	17-in.	15-in.	14-in.	
Triton 1-col.	4½	5 1/32	2½	4½	4	....	....	35 9/16	29 9/16	23⅝	19⅝	17 47/64	....	....	....	....	2⅛
Triton 2-col.	7⅛	7 13/32	2½	4½	4	42⅜	....	35 9/16	29 9/16	23⅝	19⅝	17 47/64	....	....	12 11/16	....	2⅛
Triton 3-col.	9	9 5/16	2½	4½	4	42⅜	....	35 9/16	29 9/16	23⅝	19⅝	....	15¾	....	....	....	2⅛
Triton 4-col.	12½	12 13/16	3	4½	4½	....	41 7/16	35 9/16	29 19/32	23⅝		....	15¾	....	....	....	2½
Triton Window	13	13	3	3½	3½	....	....	....	....	....	....	18 1/16	....	15 1/16	....	12 1/16	1¾
Standard 6-in. high legs	....	....	....	6	6	....	....	....	....	....	....	....	....	....	....	....	....

Radiators of 19 section to 35 section, 1 center leg
Radiators of 36 section to 52 section, 2 center legs
To determine height of column wall radiation deduct dimension given in last column from nominal height of radiator.

COKAL STOKER CORPORATION

COMBUSTIKATOR DIVISION

Manufacturers of Coal Burning Equipment

1014 Wrigley Building

CHICAGO, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

The CombustiKator—the Stoking and Firing Machine for the efficient burning of coal in low pressure boilers.

How the CombustiKator Works

The fireman throws the coal against the arch wall and it lands in the right place. The heat drives off the gas which passes through the passage in the arch and burns in the combustion chamber. The coke that is left is fed down the grate and the ash is dumped at the end of the grate by an occasional pull of the lever by the janitor or fireman.

The Natural Way to Burn Coal

The CombustiKator burns gas and coke instead of burning the green coal. The result is a smokeless fire with an efficiency impossible to equal with the most expert hand firing.

Adaptable to All Low Pressure Boilers

Either locomotive firebox or return tubular boilers work perfectly when equipped with the CombustiKator. No boiler can smoke that is CombustiKator equipped. CombustiKator is neither expensive to buy or to apply to any standard boiler.

Eliminates All Cleaning Periods

There is no rush of cold air through the boiler during firing and cleaning periods. There are no holes in the fire as the coke is always spread evenly over the grate from the internal hopper. This is another coal saving feature of CombustiKator. Burns all sizes of coal.

Owners Like CombustiKator

Building maintenance is cut down both by using cheap bituminous coal burned efficiently and by employing cheaper help in the boiler room.

Architects Like CombustiKator

Architects like the assurance of well and cheaply heated buildings no matter what class of help is employed.

Consulting Engineers Like CombustiKator

Consulting engineers realize that CombustiKator gives scientific combustion in low pressure boilers for the first time.

Firemen Like CombustiKator

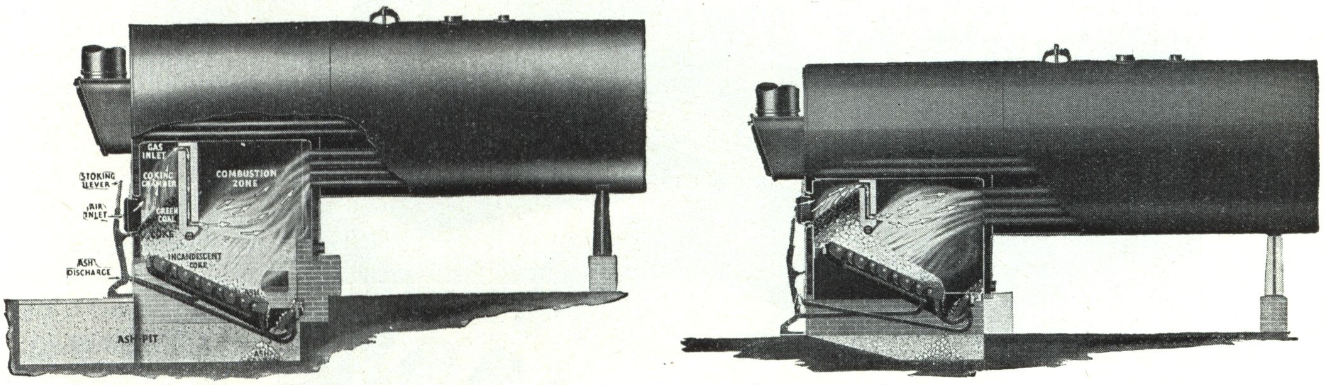
CombustiKator cuts out the drudgery of cleaning fires—eliminates criticism of smoking chimneys and makes the fireman proud of saving the coal pile. He likes the quick pick up that follows a pull of the lever.

Boiler Manufacturers Like CombustiKator

The man who makes the boiler welcomes the assurance of sure performance of boiler ratings plus, under any conditions.

Responsibility of CombustiKator

CombustiKator is manufactured, engineered and guaranteed by a corporation with nation-wide organization and undoubted financial standing.



Application of CombustiKator to Kewanee Boilers

Typical Method of Installing CombustiKator to 400 Series Kewanee Boilers That Are Already Installed

In most cases CombustiKator can be set in boiler above bottom of firebox, without necessity of fire brick at sides to protect bottom of firebox

CombustiKator Installed in New Kewanee of 400 Series

On all sizes, CombustiKator can be set above bottom of firebox. Only change necessary is location of door, which should be raised to suit CombustiKator. On all other types of boilers, boiler builder will build firebox to suit CombustiKator

ECONOMY GRATE & EQUIPMENT CO., INC.

TELEPHONE
VANDERBILT 3397

410-412 East 34th Street
NEW YORK, N. Y.

Where Economy Grates Can Be Installed

The Economy grate can be installed in any steam or hot water boiler. It is so constructed that it becomes a part of the present boiler.

Savings Effected by Economy Grates

The Economy grate saves about nine dollars per ton of coal by burning No. 3 buckwheat coal or other small sizes of anthracite coal—which can be purchased for about five dollars per ton—and yet gets the same heating efficiency as is now obtained with domestic sizes costing about three times as much.

Economy Grate and Equipment System

The Economy Grate and Equipment System consists of a fixed, water cooled grate, domed air distributors, air blower and motor, airtight base (ash pit), and automatic control.

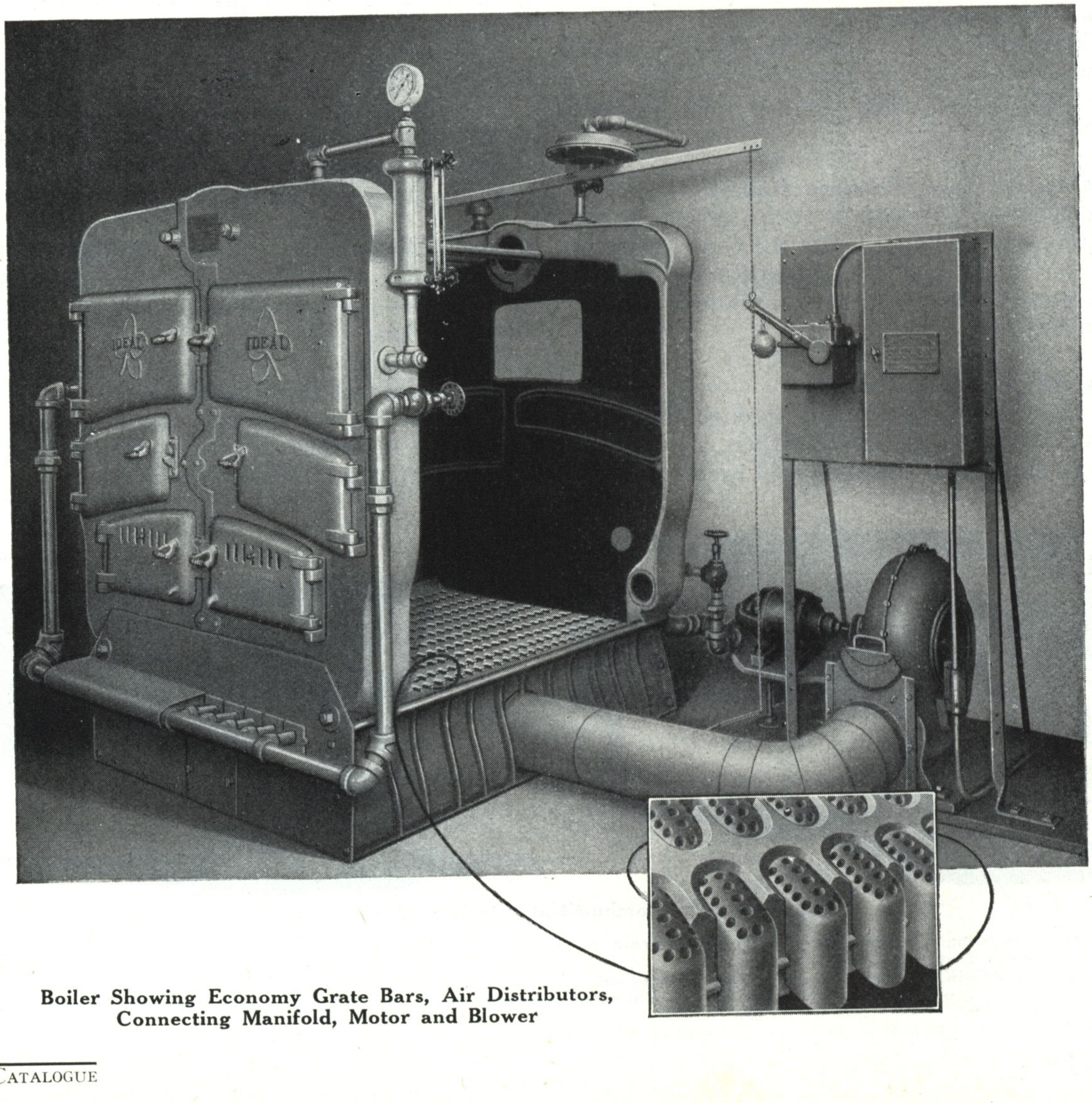
The Economy grate bar is hollow (for water cooling), 4 in. wide and 3 in. deep, and has vertical semicircular grooves its entire length, into which are fitted the air distributors. Adjoining bars fit entirely around these air distributors making the grate absolutely airtight. The water used for cooling is taken directly from and returned to the boiler—the heat absorbed by the cooling water is thus applied directly to the generating of steam and not wasted as would be the case with a separate cooling system. Both ends of each grate bar extend through the outer section of the boiler where they are connected to a manifold. As all pipe connections are outside the boiler, there is no expansion or contraction and they can not possibly burn out or leak.

The base is sealed airtight and connected to an external air blower. The blower, driven by a direct connected motor, forces air into the base under the grate where it is fed to the fire bed through the air distributors, the holes of which are bored at various angles. The air striking at all angles, allows no dead spots, the fire burning evenly over the entire grate area.

Automatic control of steam pressure is provided in our standard equipment. Any desired pressure can be maintained.

Guarantee

If at any time within a period of ten years from date of installation, the Economy grate bars shall prove defective or faulty in workmanship, they are to be replaced without charge to the purchaser.



Boiler Showing Economy Grate Bars, Air Distributors, Connecting Manifold, Motor and Blower

IDEAL GAS BOILERS

MANUFACTURED BY THE AMERICAN RADIATOR COMPANY

DISTRIBUTORS
THE A. H. WOLFF GAS RADIATOR CO.

376 Lafayette Street, NEW YORK, N. Y.

Ideal Gas Boilers

The modern, clean, convenient and efficient method of heating homes and other buildings. Designed for steam or hot water heating. Capacities: steam, 200 to 2450 sq. ft.; water, 350 to 4200 sq. ft. Burns natural or manufactured gas. Tested and rated according to standards of the American Gas Association.

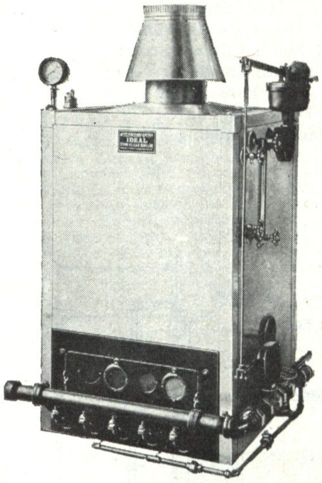


Fig. 1. Ideal Type 1-G Gas Boiler

Made in two models: Type 1-G for medium sized and large homes (Fig. 1); and Junior (JG) for smaller homes (Fig. 3). Equipped with attractive insulated aluminum jacket. Special design of heating section, each studded with protruding pins, absorbs approximately 87% of all heat available in the gas, giving maximum results with a minimum of fuel consumption.

Each boiler is equipped with thermostatic pilot control and low water gas cutout (Fig. 2). This water control means that; (1) gas can not be turned on until pilot light is burning; (2) gas is automatically cut off if pilot light goes out or if breakage occurs; (3) gas is automatically cut off if water (in steam boilers) falls below a certain level.

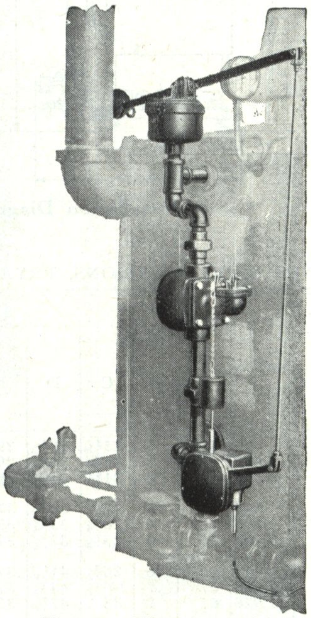


Fig. 2. Thermostatic Master Control

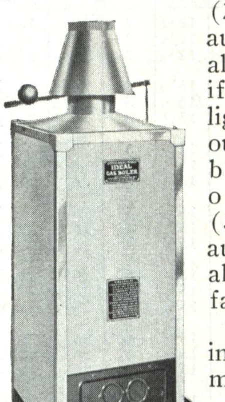
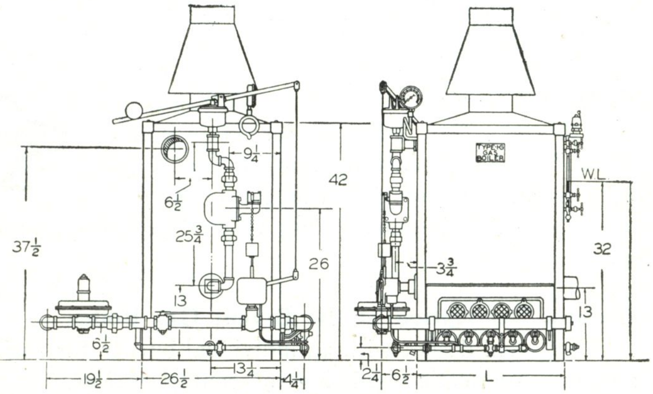


Fig. 3. Ideal Junior Gas Boiler

Efficient burner and Venturi mixing tube designed according to recommendations of United States Bureau of Standards, give proper combustion. No odor or noise. Connected with thermostat in rooms above assuring positive and absolute control of temperature according to requirements.

These boilers, covering a wide range, reflect the best engineering practice in gas fired heating equipment and are up to the high standard set by the American Radiator Company for coal fired boilers.

Literature and data sent on request to distributor listed above.



Figs. 4 and 5. Dimensional Drawing Type 1-G Gas Boiler

RATINGS AND DIMENSIONS

Boiler No.		Ratings		Dimension "L," in.	Diam. flue pipe, in.	Gas supply pipe, in.	Number of sections	Number of burners
Steam	Water	Steam	Water					
Ideal Junior Gas Boiler								
JG-4	JG-40	200	350	15	5	¾	4	3
JG-5	JG-50	300	500	18	5	1	5	3
JG-6	JG-60	400	650	21	6	1	6	3
JG-7	JG-70	500	800	24	6	1¼	7	3
Ideal Type 1 G Gas Boiler								
1-G-3	1-G-30	350	600	14	6	1	3	2
1-G-4	1-G-40	525	900	18	6	1¼	4	3
1-G-5	1-G-50	700	1200	22	7	1¼	5	4
1-G-6	1-G-60	875	1500	26	8	1½	6	5
1-G-7	1-G-70	1050	1800	30	8	1½	7	6
1-G-8	1-G-80	1225	2100	34	8	1½	8	7
1-G-9	1-G-90	1400	2400	38	9	1½	9	8
1-G-10	1-G-100	1575	2700	42	9	2	10	9
1-G-11	1-G-110	1750	3000	46	10	2	11	10
1-G-13	1-G-130	2100	3600	54	12	2	13	12
1-G-15	1-G-150	2450	4200	62	14	2	15	13

Ideal Gas Boilers are rated according to the specifications contained in the code of the American Gas Association for testing and rating gas fired boilers. Ideal Gas Boilers will deliver 240 B.t.u. per hour per sq. ft. of *steam* rating and 150 B.t.u. per hour per sq. ft. of *water* rating at boiler outlets.

DIMENSIONS

	Ideal Junior	Type 1-G
Supply tappings	One—2½ in.	Two—4 in.
Return tappings	One—2½ in.	Two—4 in.
Height of water line	32 in.	32 in.
Height of boiler	45 in.	42 in.
Height of boiler (including draft diverter)	60 in.	54 in.
Width of boiler	19 in.	Dimen. "L"
Depth of boiler	Dimen. "L"	24 in.

REGULAR EQUIPMENT SUPPLIED WITH ALL IDEAL GAS BOILERS

Steam Boilers: Gas pressure governor; gas shut-off valve; three-function snap valve with thermostatic pilot control; Arco steam regulator with lever, weight and connecting rod; pilot gas cock; water gauge; tri-cocks; steam gauge; draw-off cocks; pop safety valve; aluminum back draft diverter; Ideal aluminum jacket.

Water Boilers: Gas pressure governor; gas shut-off valve; three-function snap valve with thermostatic pilot control; Arco water regulator with lever, weight and connecting rod; pilot gas cock; altitude gauge thermometer; draw-off cocks; aluminum back draft diverter; Ideal aluminum jacket.

THE BRYANT HEATER & MFG. COMPANY

Bryant Tubular Gas Boilers

FACTORY
952 East 72nd Street
CLEVELAND, OHIO

BRANCHES

BALTIMORE, MD., 1116 Lexington Building
BIRMINGHAM, ALA., American Trust Building
BOSTON, MASS., 126 High Street
BUFFALO, N. Y., 610 Erie County Bank Building
CANTON, OHIO, 415 Daily News Building
CHICAGO, ILL., 218 South Wabash Avenue
CINCINNATI, OHIO, 421 Union Trust Building
CLEVELAND, OHIO (Sales Service), 1454 East 17th Street
DENVER, COLO., 1425 Sixteenth Street
DETROIT, MICH., 7644 Woodward Avenue
KANSAS CITY, MO., 207 Davidson Building
MUSKOGEE, OKLA., 110 South Fourth Street
NEW YORK, N. Y., 353 Atlantic Avenue, Brooklyn
PHILADELPHIA, PA., 1518 Vine Street
PITTSBURGH, PA., East End Trust Building
ROCHESTER, N. Y., 112 South Clinton Street
ST. LOUIS, MO., 840 Planters Building
SAN FRANCISCO, CAL., 710 Polk Street
TOLEDO, OHIO, 405 Nicholas Building
WICHITA, KAN., 421 Sedgwick Building

Product

TUBULAR TRADE MARK REGISTERED

Bryant Gas Boilers for Hot Water, Steam and Vapor Heating, and for Low Pressure Steam for manufacturing purposes.

For Bryant Automatic Hot Water Storage Systems, see page 1869.

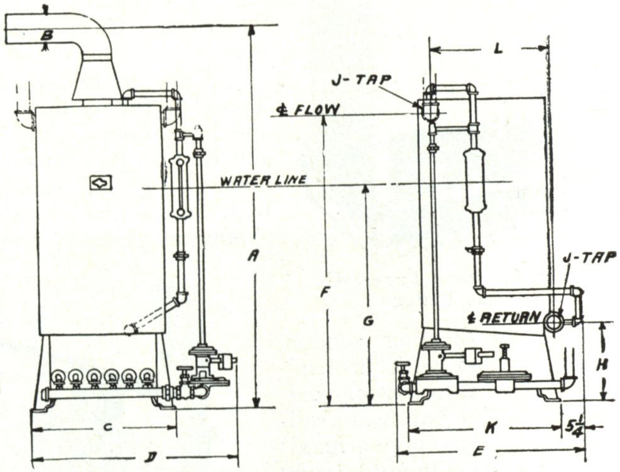
General Description of the Bryant Gas Boiler

Sectional design with an individual burner for each section. Automatic regulating and control devices.

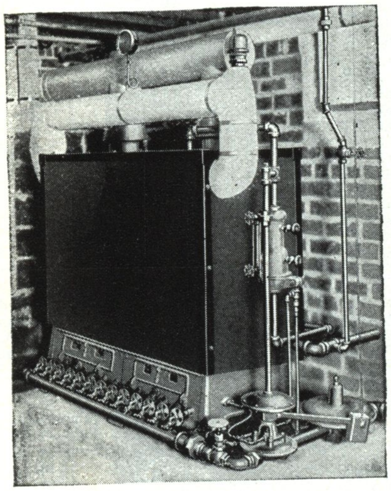
Cast iron construction with heavy base which serves as foundation.

Liberally proportioned tubes—staggered for long gas travel. Tubes are easily accessible for cleaning.

Large steam liberating space, which insures a steady water line.



Installation Diagram, Bryant Gas Boilers



Bryant Engineers

Bryant representatives travel the entire country in an endeavor to give wholehearted co-operation and service.

Complete information can be secured from any of the offices listed above.

RATINGS AND DIMENSIONS, BRYANT GAS BOILERS

Steam Boiler No.	Rating	Water Boiler No.	Rating	Dimensions, inches A	B	C	D	E	F	G	H	J	K	L
3-S-2	200	3-C-2	320	47	5	15 3/16	28 1/2	29	29 5/16	22	12 1/8	2	18	13 7/8
4-S-2	265	4-C-2	425	47	5	18 3/8	31 1/16	29	29 5/16	22	12 1/8	2	18	13 7/8
5-S-2	335	5-C-2	535	47	5	21 9/16	34 7/8	29	29 5/16	22	12 1/8	2	18	13 7/8
3-S-3	400	3-C-3	640	65	5	17 1/16	30 1/2	37	46	36	15 1/16	3	26 7/8	21 1/8
4-S-3	560	4-C-3	895	66	6	20 1/4	33 3/4	37	46	36	15 1/16	3	26 7/8	21 1/8
5-S-3	720	5-C-3	1,150	66	6	23 7/16	37 7/8	37	46	36	15 1/16	3	26 7/8	21 1/8
6-S-3	880	6-C-3	1,410	66	6	26 5/8	41 1/16	37	46	36	15 1/16	3	26 7/8	21 1/8
7-S-3	1,040	7-C-3	1,665	67	7	29 13/16	44 1/4	37	46	36	15 1/16	3	26 7/8	21 1/8
8-S-3	1,200	8-C-3	1,920	67	7	33	47 7/16	37	46	36	15 1/16	3	26 7/8	21 1/8
9-S-4	1,500	9-C-4	2,400	66 1/2	8	40 1/8	54 9/16	37	47 3/4	37	15 3/4	4	26 7/8	21 1/8
11-S-4	1,880	11-C-4	3,010	67	8	47 3/8	63 3/8	37 1/4	47 3/4	37	15 3/4	4	26 7/8	21 1/8
13-S-4	2,260	13-C-4	3,620	67	8	54 5/8	70 5/8	37 1/4	47 3/4	37	15 3/4	4	26 7/8	21 1/8
15-S-4	2,640	15-C-4	4,220	67 1/2	9	61 7/8	77 7/8	37 1/4	47 3/4	37	15 3/4	4	26 7/8	21 1/8
17-S-4	3,020	17-C-4	4,830	67 1/2	9	69 1/8	86	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
19-S-4	3,400	19-C-4	5,440	67 1/2	9	76 3/8	93 1/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
21-S-4	3,780	21-C-4	6,050	67 1/2	9	83 5/8	100 1/2	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
23-S-4	4,160	23-C-4	6,660	68	10	90 7/8	107 3/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
25-S-4	4,540	25-C-4	7,260	68	10	98 1/8	115	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
27-S-4	4,920	27-C-4	7,870	68 1/2	11	105 3/8	122 1/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
29-S-4	5,300	29-C-4	8,480	68 1/2	11	112 5/8	129 1/2	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
31-S-4	5,680	31-C-4	9,090	68 1/2	11	119 7/8	136 3/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
33-S-4	6,060	33-C-4	9,700	68 1/2	11	127 1/8	144	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
35-S-4	6,440	35-C-4	10,300	68 1/2	11	134 3/8	151 1/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
37-S-4	6,820	37-C-4	10,910	69	12	141 5/8	158 1/2	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
39-S-4	7,200	39-C-4	11,520	69	12	148 7/8	165 3/4	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8
41-S-4	7,580	41-C-4	12,330	69	12	156 1/8	173	37 3/8	47 3/4	37	15 3/4	4	26 7/8	21 1/8

MEARS-KANE-OFELDT, INC.

SUCCEEDING WILLIAM KANE MFG. CO. and THE OFELDT GAS-FIRED BOILER CO.

Manufacturers of Gas Fired Boilers and Water Heaters Since 1871

1903-15 East Hagert Street, PHILADELPHIA, PA.

Products

Vertical Steel Tubular Boilers, for high or low pressure, either Steam or Hot Water.

Cast Iron Sectional Boilers, for low pressure steam, vapor or hot water heating.

Heaters, Water, Automatic Storage.

Heaters, Water, Cast Brass, Sectional.

Heaters, Water, Copper Coil.

Also, High Powered Gas Burners (Industrial), and Automatic Water Feed.

Kane Vertical Steel Tubular Boiler

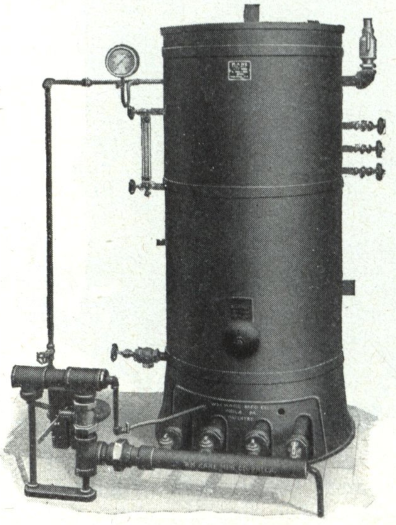
For industrial purposes is used for both high and low pressure work. It is enclosed in a jacket of sheet steel and asbestos. This jacket is spaced one-half inch from the shell of boiler, permitting the hot gases to pass around boiler as well as through tubes, increasing efficiency and economy.

Kane Boilers are built in two types, Kane Standard and Kane Low Water Level. The standard boiler is for general use, but there are places where it is necessary to have a boiler of special low water level. To meet this requirement we have designed the Kane Low Water Level type.

Kane Boilers comply with the requirements of the A.S.M.E. and Massachusetts State standard boiler codes. Every boiler is tested for 100 pounds working pressure by a licensed inspector. Special boilers built for pressures higher than 100 pounds.

Kane Boilers are equipped with an automatic gas regulator which maintains any desired steam pressure. This regulator is really a fuel economizer. When the desired steam pressure is reached, the fuel supply is automatically decreased to the minimum necessary to meet demands on the boiler. In ordering boilers, the approximate steam pressure to be carried should be mentioned, so that the proper equipment may be furnished.

Trimmings included are burners, automatic gas regulator, try cocks, steam and water gauges, blow-off and safety valves.

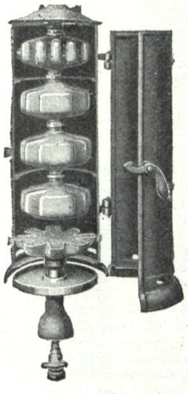


Kane Vertical Steel Tubular Boiler

KANE VERTICAL STEEL TUBULAR BOILERS

Horsepower	Floor space, in. (width by depth)	Total height, in.	Height to water line, in.	Approx. shipping weight, lb. (including crating)
Standard Boilers				
1	28x28	33	21	460
2	28x28	45	29	560
3	29x35	45	29	700
4	34x39	53	34	980
5	34x39	61	39	1035
6	34x39	61	39	1050
7	41x44	59	40	1500
8	41x44	59	40	1525
10	44x44	65	44	1625
12	44x44	73	49	1700
15	52x52	65	43	2600
18	52x52	65	43	2740
20	53x57	65	43	3040
22	53x57	65	43	3135
25	53x57	65	45	3280
30	63x57	65	45	4000
Low Water Level Boilers				
3	34x39	33	22	700
5	41x44	33	22	1050
7	47x63	33	22	1450

Gas Fired Tank Water Heaters



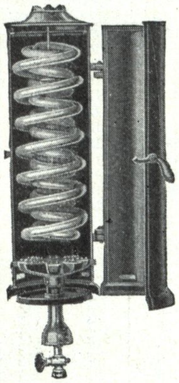
Las-Ten Water Heater

Las-Ten Heaters—Are guaranteed for 10 years against defects in workmanship and material. They will not burn out as the heating element is of patented cast brass sections.

Size	Cap., gal.	Diam., in.,	Ht., in.	Wt., lb.
No. 4	30	8	20	40
No. 5	75	9	27	84

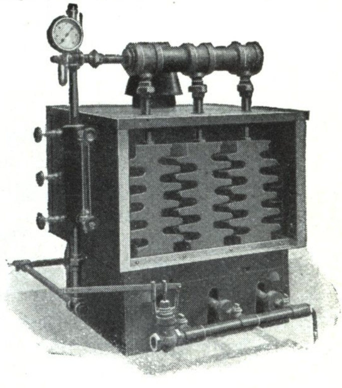
Golden Eagle Heaters—Golden Eagle heaters have a double copper coil. Standard finish—black japan.

Size	Cap., gal.	Diam., in.	Ht., in.	Wt., lb.
No. 5	30	8	24	33½



Golden Eagle Water Heater

Kane Cast Iron Sectional Boiler



Cast Iron Sectional Boiler

For low pressure steam, vapor or hot water is designed to give maximum travel to the hot gases. Construction permits sediment or scale to fall readily to bottom of each section, where it is easily removed through blow-off valve on mud-drum. This keeps sections clean and reduces fuel cost; also, maintains high efficiency. These features combine to make the Kane House Heating Boiler most economical to operate. The Kane method of connecting sections eliminates breakage from expansion and contraction while operating. Complete fittings for either hot water or steam are supplied, including a temperature control regulator. The boiler proper is completely insulated with a jacket of asbestos and sheet metal.

RATINGS BASED ON CAST IRON RADIATION

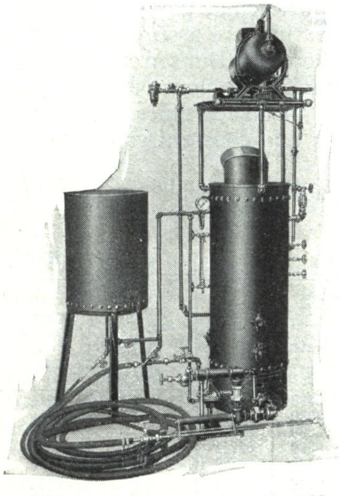
No. of boiler	1	2	3	4	5
Ratings, sq. ft.:					
Steam boilers	200	400	600	800	1000
Water boilers	280	560	840	1120	1400

Larger boilers supplied, increasing in size at the rate of 200 sq. ft. of steam or 280 sq. ft. of hot water radiation per size.

Kane Auto-cleaning Outfit

For cleaning the underbodies, running gear, chassis and motors of automobiles and trucks by combining high pressure steam with a cleaning solution—it provides an effective method of removing paint, and, after either, or both, of these processes is completed, it will furnish warm water (at City pressure) for rinsing.

The Kane Outfit is completely automatic and is attractively priced. Garages, service stations and auto painting shops will find it a most profitable investment.



Kane Auto-cleaning Outfit

Kamanco Automatic Storage Water Heater

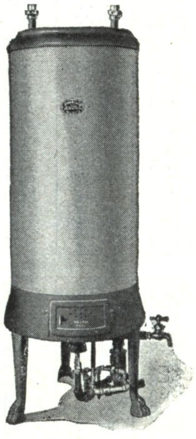
The heating element is placed in the center of the storage tank. This element is made up of special Kane patented cast brass sections which will not burn out. Easily removed by disconnecting two unions.

Storage tank best grade tank plate, riveted and galvanized, both inside and out. Capacity, 22 gallons.

Insulation is a specially prepared hair-felt, covered with a gray enameled metal jacket.

All water fittings of best grade brass.

Maximum burner consumption 45 cubic feet of manufactured gas per hour.



Kamanco

PEERLESS HEATER CO.

Manufacturers of Gas Fired Heating Boilers

PITTSBURGH, PA.

AGENCIES

BALTIMORE, MD., H. B. Aldrich, 2702 East Erdman Avenue
BIRMINGHAM, ALA., Birmingham Hardware & Gas Supply Co., 2014 Morris Avenue
BOSTON, MASS., Eastern Service Co., 131 State Street
BROOKLYN, N. Y., Griffiths Sales Co., 351 Atlantic Avenue
CHICAGO, ILL., Chicago Gas Appliance Co., 200 North Jefferson Street
CINCINNATI, OHIO, O. J. Allonier, 1231 Union Trust Building
CLEVELAND, OHIO, D. S. Bray, 1237 St. Clair Avenue
COLUMBUS, OHIO, J. T. Seiders, 5 State Street
DENVER, COLO., Steiner Bros., 1708 Broadway
DETROIT, MICH., W. H. Kratzer Co., 5195 Loraine Avenue
DULUTH, MINN., Marshall-Wells Co.
LOS ANGELES, CAL., Paul E. Haugh, 414 Insurance Exchange Building
LOUISVILLE, KY., Ives Engineering Co., 554 South Fifth Street
PHILADELPHIA, PA., C. E. Barlett & Co., 1938 Market Street
ST. LOUIS, MO., Louis J. Cuneo, 1009 Pine Street

Peerless Gas Fired Heating Boilers

For steam, vapor and hot water heating systems, hot water storage systems, and industrial steam generation up to 15 lb. pressure.

Marketed since 1912. Designed and built for high efficiency, sturdiness, simplicity, reliability and long life.

They burn natural and artificial gas and are of the true water tube type. Made up in any number of sections to suit any heating demand and conform to the A.S.M.E. code. Furnished with complete accessories and especially suitable for automatic control.

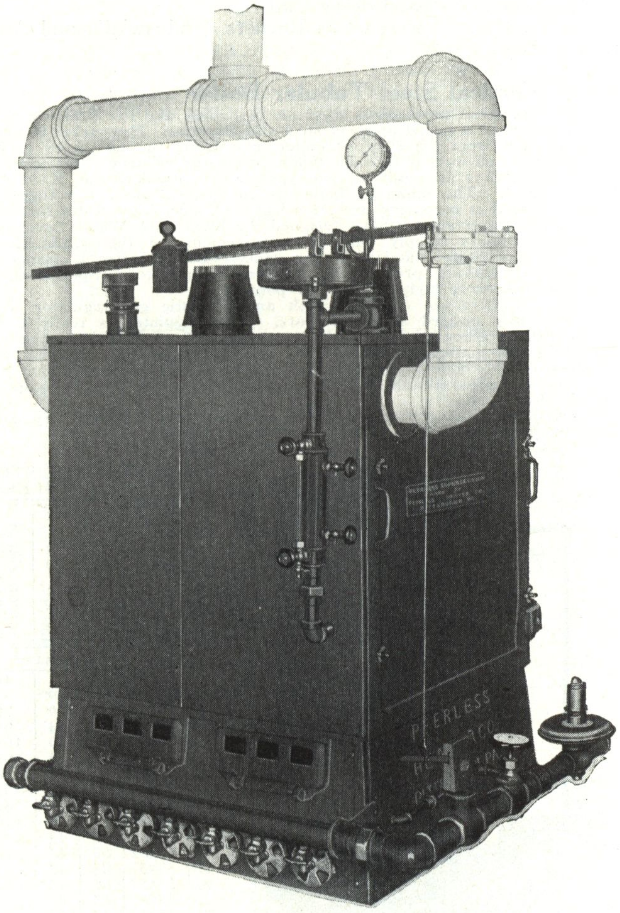
Each section is a single cored iron casting consisting of 6 horizontal water tubes connected at the ends by vertical headers and at intermediate points by tubes. The intermediate tubes insure a rapid and even circulation of water over the whole section and easy paths for steam to rise and free itself from the water. A large top tube provides a steam dome from which steam is drawn to the outlets. These exclusive features give Peerless steam boilers remarkable ability to hold a steady water level under all conditions and cause them to deliver exceptionally dry steam.

Burners are of cast iron with raised air ports and air slot in center, and are easily removed if necessary. Air mixers have venturi throat mixing tube and adjustable air shutter, therefore maximum entrainment of primary air, freedom from backfiring, perfect combustion and a high flame temperature are assured.

Pilot burners are of the semi-Bunsen type, with lava tips; they will not carbonize or blow out.

Gas pressure regulators (furnished unless otherwise specified) maintain the proper and constant gas pressure on burners at all times.

The entire interior is readily accessible for cleaning through the large end doors.



PEERLESS GAS BOILERS

*Boiler No.		Guaranteed ratings, B.t.u. per hour	Commercial rating, sq. ft.		Floor space, in.	Flow and §return tappings, number and size, in.	Distance between tappings, in.	Flue outlets, number and size, in.	Minimum size flue, in.	Gas valves and regulator, in.	
Steam or vapor	Hot water		Steam or vapor	Water						Nat. gas	Art. gas
Super Section Gas Boilers											
4–S	4–W	308,000	1680	2690	51x25	2–4	20⅜	1–8	8	1½	2
5–S	5–W	410,000	2300	3680	51x31	2–4	25½	2–7	10	1½	2
6–S	6–W	510,000	2880	4600	51x36	2–4	30⅝	2–7	10	1½	2
7–S	7–W	595,000	3350	5350	51x41	2–4	35¾	2–7	10	2	2½
8–S	8–W	680,000	3820	6100	51x46	2–4	40⅞	3–7	12	2	2½
9–S	9–W	765,000	4300	6870	51x51	2–5	46	3–7	12	2	2½
10–S	10–W	850,000	4780	7640	51x56	2–5	51⅛	4–7	12	2	2½
11–S	11–W	935.000	5250	8400	51x61	2–5	56¼	4–7	12	2	2½
12–S	12–W	1,020,000	5730	9160	51x66	2–5	61⅜	4–7	14	2	2½
13–S	13–W	1,106,000	6210	9930	51x72	2–5	66½	4–7	14	2½	3
14–S	14–W	1,190,000	6690	10700	51x77	2–5	71⅝	5–7	16	2½	3
15–S	15–W	1,275,000	7160	11460	51x82	2–5	76¾	5–7	16	2½	3
3-in. Gas Boilers											
23–S	23–W	69,300	360	620	29x16	2–3	12	1–6	6	1¼	1¼
24–S	24–W	99,000	510	860	29x20	2–3	16	1–6	6	1¼	1¼
25–S	25–W	132,000	660	1120	29x24	2–3	20	1–6	6	1¼	1¼
26–S	26–W	158,400	820	1400	29x28	2–3	24	1–6	6	1¼	1¼
27–S	27–W	184,800	980	1670	29x32	2–3	28	1–6	6	1¼	1½
28–S	28–W	210,200	1140	1940	29x36	2–3	32	2–6	7	1¼	1½
29–S	29–W	238,000	1300	2200	29x40	2–3	36	2–6	7	1½	1½
30–S	30–W	264,000	1460	2480	29x44	3–3	40	2–6	7	1½	1½
31–S	31–W	290,400	1620	2750	29x48	3–3	44	2–6	7	1½	1½
32–S	32–W	316,800	1780	3010	29x52	3–3	48	2–6	7	1½	1½
33–S	33–W	343,200	1940	3290	29x56	3–3	52	2–6	7	1½	1½
34–S	34–W	369,600	2100	3560	29x60	3–3	56	2–6	8	1½	1½

Over-all height without draft hood:
  Super Section boilers........................54 in.
  3-inch boilers........................41 in.
Over-all height to top of draft hood:
  Super Section boilers........................62½ in.
  3-inch boilers........................48 in.
Height of water line in steam boilers:
  Super Section boilers........................41 in.
  3-inch boilers........................32 in.
Height to center of flow outlets:
  Super Section boilers........................48 9/16 in.
  3-inch boilers........................37⅞ in.
Height to center of return outlets:
  Super Section boilers........................20 3/16 in.
  3-inch boilers........................16½ in.

Steam boiler trimmings include:

Safety valve; steam gauge; drain cock; draft hood; pilot lights with cocks and piping; automatic steam pressure control (all-metal steam diaphragm lever and snap action gas cut-off valve); water column with gauge and tri-cocks; labeled globe valve; clean-out brush; gas pressure regulator.

Water boiler trimmings include:

Drain cock; draft hood; pilot lights with cocks and piping; altitude gauge; thermometer; snap action gas cut-off valve for thermostatic control; labeled globe valve; clean-out brush and gas pressure regulator.

*Designates number of sections and burners.

§All Super Section boilers can be furnished with 5-in. flow and return tappings if desired.

THE ANTHONY COMPANY

Liquid Fuel Engineers

136 West Avenue
LONG ISLAND CITY, N. Y.

Products

ANTHONY NEBULYTE OIL BURNING and GAS BURNING SYSTEMS for steam boilers, hot water heaters, hot air furnaces, cooking ranges, etc.

MECHANICAL SPRAYS for all liquids.

Engineering Service

Anthony engineers are prepared to discuss all heating problems and design special oil, tar or gas fired apparatus for specific needs.

Having designed a great variety of successful industrial heat treating systems, they have wide experience in this field to place at a client's disposal.

THE ANTHONY COMPANY since its organization has dealt with every application as an individual combustion problem, appreciating, as no others have, its many sensitive and variable conditions and accurately meeting these by correctly utilizing essential principles.

They are pioneers in the development of mechanical nebulization as applied to the combustion of liquid fuel, as well as in the application of those combustion principles which effect the accurate control of heat quality.

Employment of their services leads to conservation of fuel, speeding up of heat cycles and better quality of results as 4000 clients will testify.

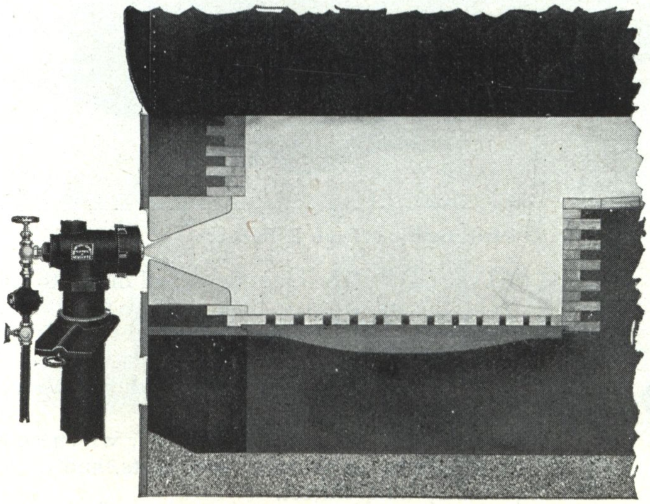
Nearly 20 years of record-smashing success.

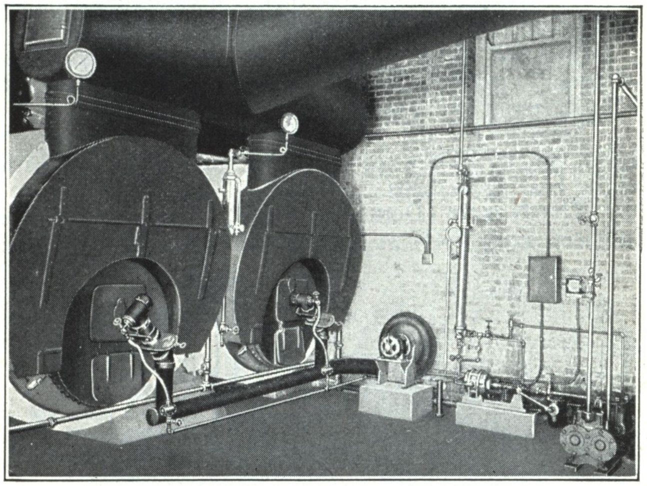
Anthony Nebulyte System for Boilers

The Anthony is a mechanical nebulizing system for liquid fuel, which actually attains the perfection of radiant gas firing and normally produces 80% to 85% evaporating efficiency.

In this highly developed system of gas firing with oil fuel, an instantaneous conversion of liquid to gas is effected by correct combination of essential elements.

Performance—Every item of Anthony equipment has been selected and developed to meet exacting requirements, and is fully guaranteed to be free from defects in materials and workmanship. In spite of the severest operating conditions, the annual operating costs have averaged no more than 2% over a period of 10 years.





Typical Installation of an Anthony Mechanical System

A completely installed Anthony Nebulyte system is 100% assurance of satisfaction.

Equipment—This includes storage tanks and fittings, suction and discharge strainers, heaters, pumps, blowers, burner sets, valves, piping, gauges and thermometers, together with firing chambers and attachments.

Anthony oil heaters, for use with heavy gravity oils, are supplied to give the required temperature to the particular grade of oil specified. Complete with safety relief valve, thermometer and, where desired, with automatic temperature control.

Anthony main line strainers, either single or duplex, are supplied for both suction and discharge lines; of ample capacity to obviate frequency of cleaning.

Control—Usually by hand, but automatic controls of proven reliability can be furnished, where specified, to maintain definite boiler pressure, room temperature, or both.

Application—The Anthony Nebulyte system is adapted for burning oil or gas under heating and power boilers in apartment houses, hotels, clubs, public buildings, etc.

Anthony Nebulyte Sprays for All Liquids

Sprays supplied of definite capacity and throw which can be utilized for many purposes, such as cooling, aerating, atomizing, gasifying, mixing, absorbing gases and vapors, and for all purposes where it is desired to distribute a liquid in finely divided form over a large area, or through a large volume. Scientific distributors. Free acting. Conical and flat types.

COMBUSTION FUEL OIL BURNER CO.

8 Keefe Avenue
MILWAUKEE, WIS.

Product
Combustion Fuel Oil Burners.

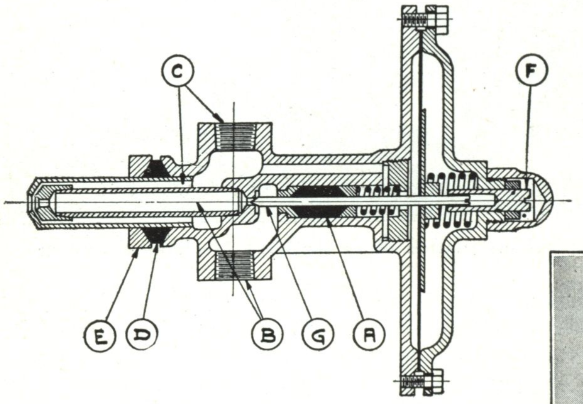
Combustion Fuel Oil Burners

They are of the nozzle type, insuring economical heat for homes, hotels, apartment buildings and industrial plants.

Over six years of satisfactory service to thousands of users in city and country, wherever electric current from a power line is available.

Suitable for use in hot air furnace, hot water or steam boilers. They are especially suitable for use with vapor heating systems.

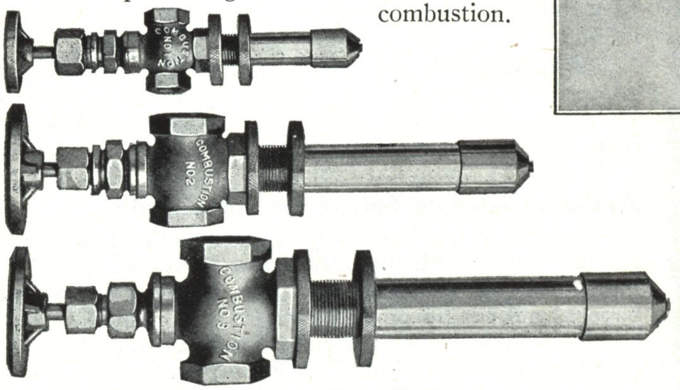
The Nozzle (Domestic Type)—The nozzle, made in three sizes, operates precisely like the ordinary nose or throat spray, that is, it has a central tube through which the oil flows, surrounded by a larger tube, through which the air is forced. The air jet impinges on the central oil stream from all sides at a sharp angle and atomizes it so finely that no drops are left large enough to be visible without a microscope.



Section Through Standard Nozzle

A—Needle valve packing
B—Oil intake and passage
C—Air intake and passage
D—Air tube packing
E—Air tube lock nut
F—Oil adjusting screw
G—Oil needle valve

The nozzle is mounted so that its tip projects only a half inch through the furnace doors and is pointed slightly downwards to give as long a flame as the size and shape of the boiler will permit. The oil is sprayed across the pilot or ignition flame which starts combustion.



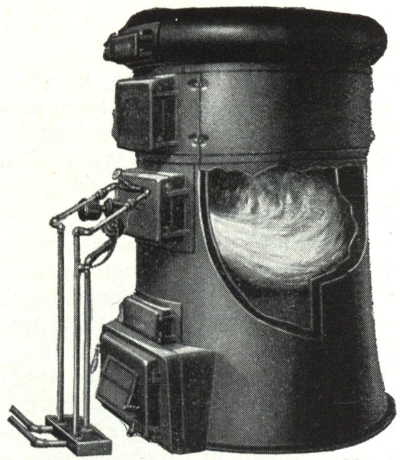
Industrial Type Nozzle

Types—Combustion Fuel Burners are made in three types. Type "D," "P," and "E."

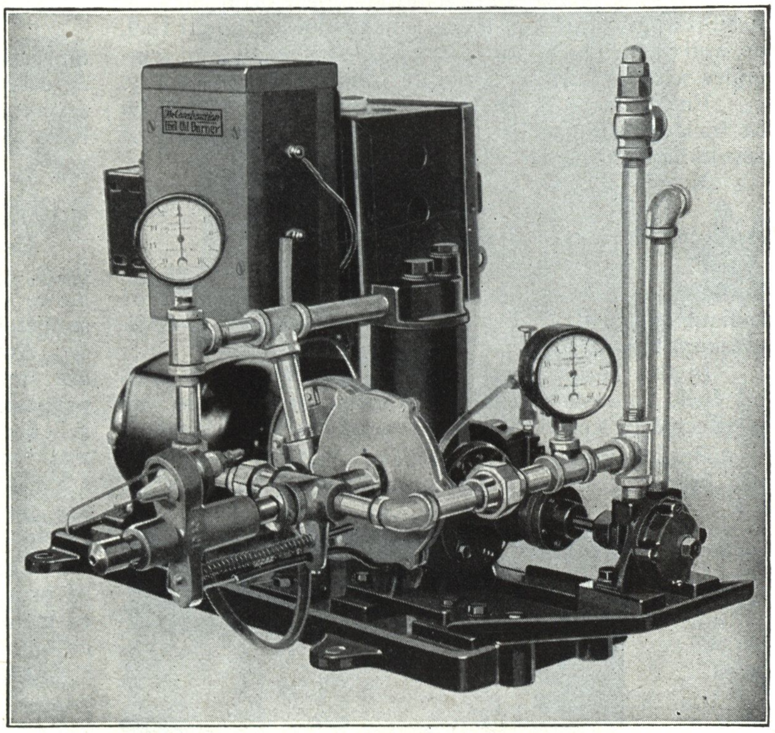
Type "D" burner is furnished with a 60-gallon inside service tank in sizes Nos. 0, 1, 2, and 3, and listed as "Standard" by the Underwriters' Laboratories, Inc.

The first Combustion Burner of this type was installed in a home near Chicago in 1919, and is still giving satisfactory service to the owner.

Type "P," with oil pump instead of service tank, is otherwise similar in all respects to Type "D." The oil is delivered direct to the nozzle from the oil storage tank. A by-pass valve permits the oil not used to be returned to the storage tank.



Round Boiler Fired by No. 0 or No. 1 Equipment



Electric Ignition Type E Burner

Type "E," for electric ignition as shown above, is also furnished with an oil pump.

Bulletin—Ask for Bulletin No. 33, which contains specifications, comparative fuel costs, and other data required by an architect.

Continued on next page

Advantages of the Combustion System

Fully Flexible and Applicable to All Types of Heating Plants—One nozzle or a dozen may be operated from a single air pump unit. It is only necessary to select a unit of proper capacity to operate the desired number of nozzles. Thus, a single unit is often used to fire two or more boilers at the same time and in mild weather part of the boilers may be shut down, permitting the operation of the required boilers at their maximum economy.

Sizes—The nozzles, of which there are three sizes, are fully adjustable for both air and oil so that the proper number and size of nozzles may be used with any given boiler. This permits firing each type of boiler with a flame of the best shape and size for that particular boiler rather than to attempt to fire all boilers having widely varying sizes and shapes of fire pots and heating surfaces with a single stereotyped form of burner which at best is a compromise design for some boilers. A wide range of sizes of units have been designed, built and applied to various sizes and types of boilers so that any heating plant may be equipped for fuel oil whether it be for a small domestic hot water supply, an isolated garage heater or the boiler plant for a great hotel or office building.

No. 0 is used for small houses, bungalows, private garages and domestic hot water supply.

No. 1 is the size used in the great majority of homes of from 8 to 12 rooms. It is also used for hot water supply for hotels and large apartments.

No. 2 unit is suitable for houses of 14 rooms and larger and for 3 to 6 apartments also for moderate sized stores, churches, etc.

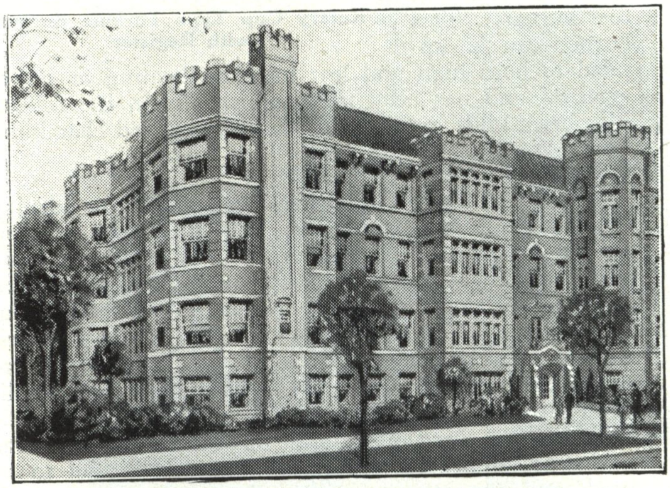
The larger sizes are selected to suit the boiler ratings or connected radiation of any building or boiler plant either low or high pressure.

STANDARD SIZES
Connected Radiation, Square Feet

No.	Steam	Hot Water	No.	Steam	Hot Water
0	500	750	4	4,000	6,400
1	1,000	1,600	5	6,000	9,600
2	1,600	2,600	6	8,000	13,000
3	2,400	3,800			

Sizes No. 8, 10, 12, 14, 16—data on application.

Automatic in Operation—The Combustion System is truly automatic, delivering heat when and as required in accordance with the setting of the room thermostat.



48 Apartments Heated by Combustion Burner No. 6

The amount of heat delivered is regulated by the length of time the machine runs: this varies from perhaps a half hour mornings and evenings in the Spring and Fall to possibly twelve hours out of twenty-four in sub-zero weather, but always under control of the room thermostat.

This Seven-room Bungalow Has Been Most Satisfactorily Heated by a No. 0 Unit for Six Successive Winters at Much Less Than the Cost of Coal

Large Kewanee Boiler in the Garage Fired by a No. 3 Unit Heats This Mansion as Well as the Four-car Garage and a Four-room Apartment Over Same

The owner says the heat is O.K. and the cost less than soft coal. Four years service

There is no change necessary in the adjustment of the air and oil when the weather changes, for the machine is adjusted to fire the boiler at its best and most efficient rate and this adjustment should be maintained. This feature is distinctly different from many so-called automatic heating systems which really alter the adjustment of the burner to maintain a constant steam pressure. Such systems are far from automatic, requiring attention and resetting at every weather change—in fact, they save physical labor of shoveling coal and ashes but require as much of the janitor's time as a coal fire.

More Economical—The Combustion System uses less fuel for a given boiler plant than other oil burning equipments because of its adaptability to each type of boiler, and because it may be adjusted to the most economical operating condition for the boiler in use and so left that whenever the boiler is fired the same economical conditions persist, no matter how frequently or infrequently the boiler is called upon for more heat.

Every boiler plant is provided with a chimney or stack designed to remove burned gases and to draw in the necessary air for combustion. Thus, every building has in its boiler and stack a heat engine operating without expense of any kind to supply the combustion air. Why then disregard this free supply and buy electric power or a motor driven fan to force combustion air into a furnace? The Combustion System utilizes this natural and free supply of oxygen by chimney draft and wastes no electrical power on needless fans.

PETROLEUM HEAT AND POWER COMPANY

Engineers, Manufacturers and Contractors of Oil Burning Equipment and Distributers of Fuel Oil

OFFICES

NEW YORK, N. Y. BOSTON, MASS. PROVIDENCE, R. I. STAMFORD, CONN.

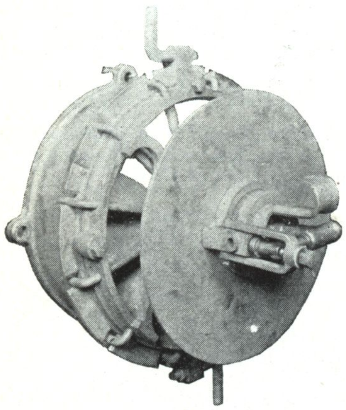
Products

- Mechanical Atomizing Burner.
- Steam Atomizing Burner.
- Rotary Cup Type Turbine Burner.

Mechanical Atomizing Burner

The P. H. & P. Co. mechanical burner is of the well-known centrifugal atomizing type and is similar in many respects to the general type of this burner, excepting that air is admitted through a specially designed type of register which distributes the air past the flame cone with a rotary action, insuring thorough mixing.

This type of burner is well suited for use in boiler furnaces where extreme ratings are desired, and may be installed in such a manner that the oil supply to the burner, the air supply to the register, and the furnace draft can be adjusted simultaneously, depending upon the load on the boiler. This makes for extreme economy under all load conditions.



Mechanical Atomizing Burner

Steam Atomizing Burner

The P. H. & P. Co. steam atomizing burner is radical in design, and is different from all other types of steam atomizing burners in its theory of operation. The steam is fed to the burner tip proper through a mixing device called an atomizer. This device has vanes so arranged that the axial direction of the steam is changed to tangential. The ports through which the steam flows when making this change in direction are gradually convergent at the outlet, being, in fact, very much like a steam turbine nozzle.

The oil is admitted to the steam jet at the point where its velocity is highest, and is not only thoroughly mixed with the steam, but is carried with the steam in its tangential path so that part of the velocity of the steam is imparted to the oil.

This gives both the steam and the oil a potential centrifugal action which causes it after emission from the orifice to be thrown outward, thus breaking up the particles of oil into the finest mist.

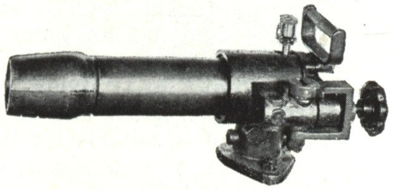
The air supply for this type of burner is taken through openings in a fire brick floor generally termed "checker work." This checker work is so designed that the proper air supply for the burner will be obtained for the maximum load conditions, and the area of the openings depends upon the available draft in the furnace. This burner can be applied to high pressure steam boilers operating at 30 pounds or more, and it has been applied to Duhrkop bake ovens, char kilns, and various other industrial uses.

Steam Atomizing Burner

Our steam atomizing burner is very flexible and readily suited for automatic regulation of steam, oil and draft, and when installed in this manner it is possible to obtain a maximum combustion economy under extreme variations of load.

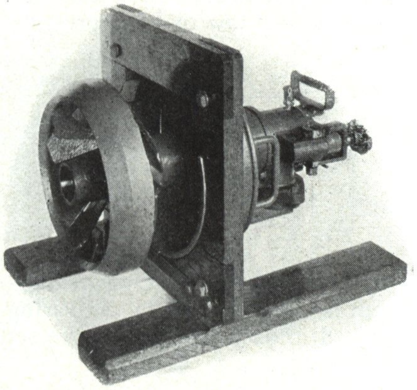
Rotary Cup Type Turbine Burner

The P. H. & P. Co. rotary cup type turbine burner is capable of almost universal application. The theory of operation is as follows: A horizontal cup is driven at high velocity by a low pressure air jet which impinges on the vanes of a so-called turbine wheel. The oil is fed to the center of the cup, and due to the cup's rotation it is carried around the interior surface of the cup until it reaches the edge, from which point it is thrown out tangentially under the centrifugal action thus developed. At this point, the spray is blown forward by the air which has passed through the turbine wheel and imparted some of its energy thereto.



Rotary Cup Type Turbine Burner

This burner requires air at 8 ounces per square inch pressure to properly spin the cup, the quantity being dependent upon the size of the burner. This burner can be applied to both high and low pressure heating or power systems, and has been used industrially in the following: brick kilns, rotary kilns, fish driers, and char kilns.



Rotary Cup Type Turbine Burner with Register

General

All P. H. & P. Co. burners are suitable for burning oil of 12° Baumé gravity up to 40° Baumé gravity, and the low pressure turbine type can be made to operate automatically in most of its various applications when oil of 28° Baumé or lighter is used. We are particularly interested in various applications of our burners, and our engineering department is always ready to co-operate with the trade in working out new applications.

When writing us, kindly submit sketches of the device to be fired, together with amount of oil to be used, and any other pertinent data as to type of oil available in your district.

WILLIAMS OIL-O-MATIC HEATING CORPORATION

Manufacturers of Automatic Oil Burners

BLOOMINGTON, ILL.

AUTHORIZED DEALERS IN ALL PRINCIPAL CITIES AND TOWNS IN THE UNITED STATES AND CANADA

WILLIAMS OIL-O-MATIC HEATING

Oil-O-Matic Oil Burner

As the name implies, it is a fully automatic oil burner for use in any type of good steam, vapor or hot water heating boiler or warm air furnace.

Its principles have been proven for over 6 years and installations have been made in over 30,000 buildings, including homes, apartment buildings, theaters, churches, schools, hotels, garages, etc.

A typical installation, as shown below, consists of the Oil-O-Matic, an automatic switch mounted as an integral part on the fan housing, a room thermostat, a steam vapor or hot water boiler control of the mercoid type, a fuel tank either inside the building or buried underground, and all necessary piping and wiring. No gravity feed is required.

Motor and wiring, 110-220-volt, 60-cycle, direct or alternating current. Listed as standard by the National Board of Fire Underwriters. All parts guaranteed for one year by factory. Installation and service guaranteed by dealer.

Installation

Grates and ashpit door are removed from heating boiler, fire brick setting is installed in combustion chamber, and ashpit door is bricked up after draft pipe of the Oil-O-Matic is inserted as shown.

Two Models

Model 1200 rpm is designed for steam radiation up to 1500 sq. ft., hot water radiation up to 2400 sq. ft., and hot air up to 9000 cu. ft.

Model 1800 rpm is designed for steam radiation up to 4500 sq. ft., hot water radiation up to 7200 sq. ft.

Additional radiation can be provided for by installing more burners.

Advantages

Oil-O-Matic operates according to the four natural laws of oil combustion as outlined in Kent's Handbook on Engineering and in Admiral Dyson's "Naval Engineering."

Oil is so perfectly atomized that fuel oil as low as 28 degrees Baumé may be used without forming soot or carbon deposit. After atomizing, the oil is intimately mixed with air and burned in suspension. No part of the Oil-O-Matic is inside the firebox. No hot plates, pots or chambers are used.

There is no continuous gas pilot. Either the Williams automatic gas valve or straight spark ignition is used. The gas valve lights automatically each time the burner starts and remains lighted only about 10 seconds.

There is no drip bucket shut-off. The Williams thermal safety control stops the entire mechanism if for any reason the oil fails to ignite or if the flame is extinguished.

Oil-O-Matic does not run continuously. Depending upon outside temperature, it operates approximately 3 to 9 hours out of 24. The room thermostat actuates the motor as the room temperature drops below the point predetermined.

Oil-O-Matic operates on any grade of fuel oil from 28 degrees Baumé and up. No adjustment is necessary when changing from a heavier to a lighter grade of oil. The metering pump regulates the flow automatically. Low gravity fuel oil contains more heat units per gallon and costs less than kerosene or distillates.

All moving parts run in oil and what little wear takes place is taken up automatically. No adjustments are necessary.

Information for Use When Specifying

To determine the size of Oil-O-Matic to use:

$$\frac{\text{Hot water radiation} \times K}{100 \times 7.5} = \text{gallons of oil per hour}$$

$$\frac{\text{Steam radiation} \times 1.67 \times K}{100 \times 7.5} = \text{gallons of oil per hour}$$

In round boiler, K equals 2; sectional boiler, 1.75; special oil burning boiler, 1.5.

100 sq. ft. of radiation requires 1.7 to 1.8 lb. of oil per hour.

1 gal. of oil weighs 7.5 lb.

1 lb. of oil will evaporate 15 to 16 lb. of water per hour.

Oil-O-Matic 1200 rpm delivers 1 to 7 gal. of oil per hour; 1800 rpm delivers 2 to 12 gal. per hour.

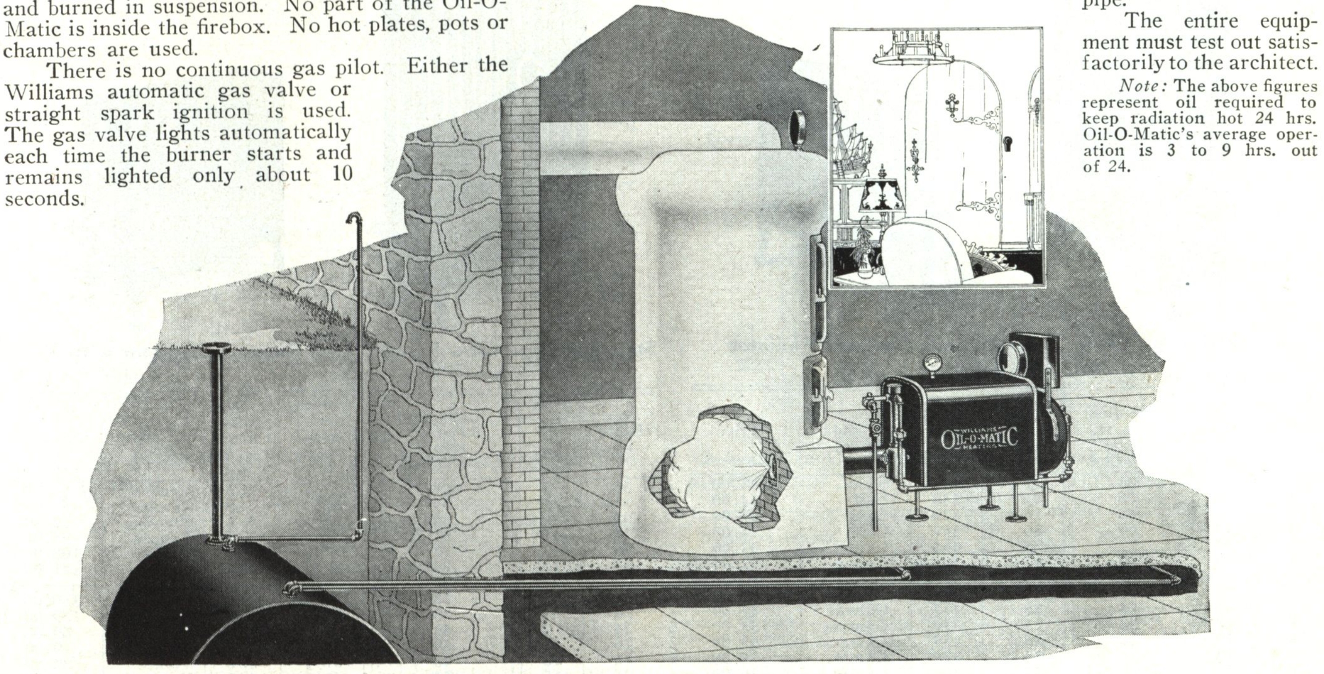
Use 2000 ft. of radiation for 1200 rpm and 5000 sq. ft. for 1800 rpm as a limit to allow for overload capacity.

All installations are to be made in accordance with the Fire Underwriters' rules, local city ordinances and fire department regulations.

In addition to the burner and its necessary equipment, as shown in manufacturers' catalogue, the Oil-O-Matic contractor shall also figure on an inside tank of 50 gal. capacity or up according to local ordinances, or a 1000 or 2000-gal. outside tank buried in the yard. Tank shall be connected properly with an automatic pump to burner and by-pass circulating pipe back to storage tank. Provide tank with gooseneck vent pipe.

The entire equipment must test out satisfactorily to the architect.

Note: The above figures represent oil required to keep radiation hot 24 hrs. Oil-O-Matic's average operation is 3 to 9 hrs. out of 24.



Typical Installation of Oil-O-Matic Oil Burner

JAMES B. CLOW & SONS

Manufacturers of Gasteam and Gaswater Radiators

534-546 South Franklin Street, CHICAGO, ILL.

SALES OFFICES

NEW YORK BALTIMORE NEW ORLEANS LEXINGTON LOS ANGELES SAN ANTONIO SAN FRANCISCO
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WORKS

CHICAGO, ILL. NEWCOMERSTOWN, OHIO COSHOCTON, OHIO

Products

Clow Gasteam Radiators.
Clow Gaswater Radiators.

Catalogues

For Pipe and Fittings, R-U-V Water Sterilizers, Plumbing Supplies (including Drinking Fountains, Automatic Water Closets, Lavatories, Sinks, etc.), Steam Supplies, Waterworks Supplies, Marble Products and Cast Iron Specialties, send for our catalogues as follows:

Plumbing Supplies, Catalogue M; the R-U-V Catalogue on Water Sterilization; Drinking Fountain Catalogue; Pipe Economy; Catalogue on Lamp Posts.

Clow Gasteam Radiators

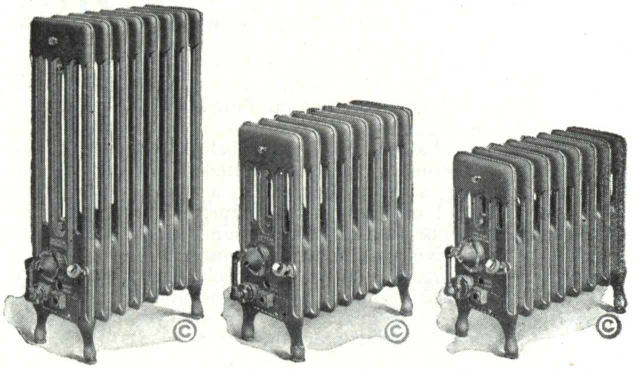
Clow Gasteam radiators offer a complete heating system for residences, stores, apartments, offices, theaters, churches, detached factory buildings, etc. Each radiator is an independent heating unit, enabling as many or as few as desired to be used at any time. They require no water connections and eliminate a central heating plant, fuel storage, furnace tending, smoke and ashes. They can also be used in connection with a standard steam heating plant.

Clow Gaswater Radiators

Clow Gaswater radiators are similar to Gasteam radiators in appearance and may be used in connection with standard hot water heating systems as well as independently.

Operation

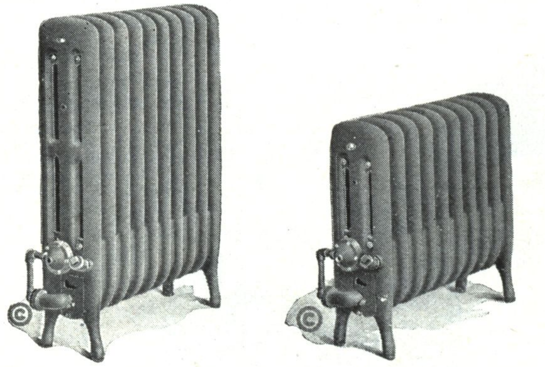
Water chamber is filled with water and the burner adjusted correctly, ready for lighting. A match is struck and applied to burner through the lighting opening in the end door, the gas cock then being turned on full. The heat will at once start generating steam until the steam pressure reaches 5 or 6 lb The automatic regulator takes care of the gas consumption. The gas cock is left fully opened.



Standard Type Clow Colonial Four-column Gasteam Radiator

10 in. wide

Height, in.	Number of sections	Equivalent in sq. ft. steam radiation	Length, incl. trimmings, in.	Approx. shipping weight, lb.	Code word	*Price
38	4	28	15	173	Gumby	$ 46.00
38	6	42	20	255	Gunner	60.00
38	8	56	25	333	Gurdle	72.00
38	10	70	30	412	Gurlet	84.00
38	12	84	35	500	Gurton	96.00
38	15	105	42½	610	Gusset	115.00
26	4	20	15	139	Guilty	$ 40.00
26	6	30	20	194	Guitar	49.00
26	8	40	25	248	Gulch	58.00
26	10	50	30	307	Gulf	67.00
26	12	60	35	364	Gullet	76.00
26	15	75	42½	457	Gulp	93.00
22	4	14	15	118	Guard	$ 38.00
22	6	21	20	160	Guardian	47.00
22	8	28	25	210	Guava	56.00
22	10	35	30	257	Guest	65.00
22	12	42	35	303	Guide	74.00
22	15	52	42½	368	Guild	86.00

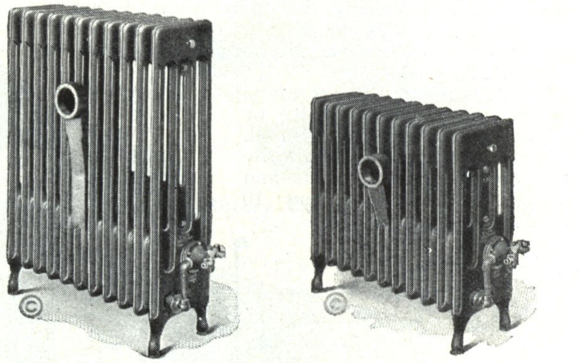


Standard Type Clow Three-column Gasteam Radiator

9 in. wide

Height, in.	Number of sections	Equivalent in sq. ft. steam radiation	Length, incl. trimmings, in.	Approx. shipping weight, lb.	Code word	*Price
38	4	24	15	175	Gain	$ 43.00
38	6	36	20	248	Gait	54.00
38	8	48	25	324	Gala	65.00
38	10	60	30	397	Gale	76.00
38	12	72	35	461	Gall	87.00
38	15	90	42½	592	Gallop	102.00
26	4	16	15	126	Gallows	$ 39.00
26	6	24	20	177	Galway	47.00
26	8	32	25	219	Gamble	55.00
26	10	40	30	279	Game	63.00
26	12	48	35	326	Gamin	71.00
26	15	60	42½	398	Gamut	86.00

*Prices effective May 1, 1925.



Standard Type Clow Four-column Gasteam Radiator with Vent

10 in. wide. Vent opening tapped for 3-in. iron pipe

Height, in.	Number of sections	Equivalent in sq. ft. steam radiation	Length, incl. trimmings, in.	Approx. shipping weight, lb.	Code word	*Price
38	5	28	17½	237	Venal	$ 56.00
38	7	39	22½	315	Vendor	69.00
38	9	50	27½	393	Veneer	82.00
38	11	61	32½	470	Venom	95.00
38	13	72	37½	550	Venture	108.00
38	15	83	42½	617	Venus	121.00
26	5	18	17½	166	Volar	$50.00
26	7	25	22½	220	Voley	59.00
26	9	32	27½	275	Volga	69.00
26	11	39	32½	329	Volt	79.00
26	13	46	37½	384	Volute	89.00
26	15	53	42½	435	Volume	97.00

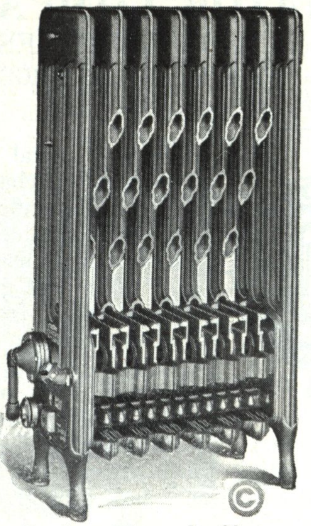
See next page for roughing-in dimensions.

Continued on next page

Construction

Clow "Gasteam" radiators are constructed of cast iron sections fitted with malleable slip nipples. The sections are made so that the upper part forms a steam radiating surface of 2, 3 or 4 columns. Directly beneath the radiating surface is a water chamber made to hold a body of water 1 in. deep. This requires filling about every 2 weeks when in use. Beneath, and an integral part of the section, is a chamber for holding a Bunsen gas burner which we term the combustion chamber (see sectional view).

Each radiator is equipped with a gas burner, steam pressure regulator, water filling cup, air vent valve and safety valve. All sections and all parts are metal, making a permanent and practically indestructible appliance.



Section Through Clow Gasteam Radiator

Automatic Control

The volume of gas supplied to the burner is controlled by an automatic regulator actuated by the pressure of the steam in such a manner that when steam has been generated in the radiator to from 5 to 8 lb. pressure, the volume of the gas is automatically reduced so as to allow only sufficient gas to be supplied to maintain the 5 to 8 lb. pressure.

This insures a minimum amount of gas being used to keep the radiator hot and the maintenance of an even room temperature. It prevents the wasting of the gas and the overheating of the radiator and room.

Gas Piping Specifications

(1) All gas piping to be run as shown on plans.

(2) The main distributing gas lines shown shall be of not less than .... in. standard iron pipe and shall be connected so as to form an unbroken loop.

(3) The main gas distributing loop line must be run close to the basement ceiling and not concealed.

(4) All risers and drops are to be concealed.

(5) Run a .... in. gas line from gas meter location to and connected with main gas distributing loop line.

(6) All gas risers supplying 3 outlets shall be not less than 1-in. standard iron pipe; all gas risers supplying 2 outlets shall be not less than ¾-in. standard iron pipe; all gas risers supplying 1 outlet shall be not less than ½-in. standard iron pipe.

(7) All gas drops supplying 2 outlets shall be not less than ¾-in. standard iron pipe; all gas drops supplying 1 outlet shall be not less than ½-in. standard iron pipe.

(8) All gas outlets for radiators shall be not less than ½-in. standard iron pipe.

(9) All piping must be free from burrs and other obstructions.

(10) Split pipe or fittings repaired with cement or lead must not be used. Calked fittings must not be used.

(11) Unions or bushings must not be used in work that is to be concealed, and cast iron fittings are prohibited in either exposed or concealed work.

(12) All outlets must be securely closed with iron caps until fixtures or appliances are installed.

(13) When it is absolutely necessary to run pipe on an outside wall a furring strip must be placed between the pipe and the wall.

(14) All piping run on masonry walls must be securely fastened thereto by strapping it to wooden plugs driven into the wall.

(15) When pipe is to be embedded in concrete or cement, it must be covered with tar paper or other suitable covering, or laid in a conduit pipe.

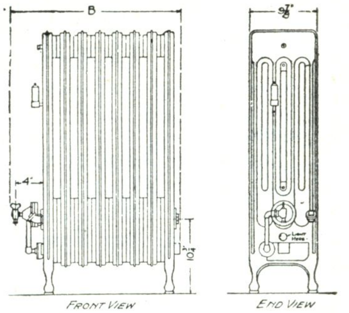
(16) To avoid trapping pipe, gas fitters must grade it to riser or to drops.

(17) Before fixtures are installed, the piping must stand a pressure of six (6) inches on a column of mercury without showing any drop in the column for a period of ten minutes.

After fixtures are installed, piping must stand a pressure of six (6) inches on a column of mercury without showing any drop for the same period of time.

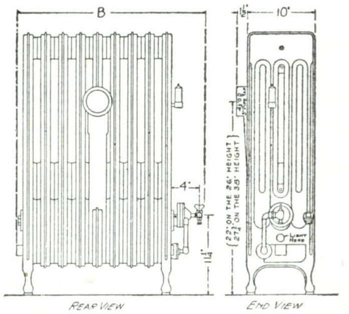
Note: Where natural gas or manufactured gas of fluctuating pressure is to be used include Paragraph 18.

(18) Contractor must have installed between the gas meter and the main gas distributing line one ...... inch Emco adjustable gas pressure regulator, to be adjusted for an outlet pressure of $1\frac{8}{10}$ ounces for natural gas, or for an outlet pressure of 2½ inches for manufactured gas.



ROUGHING-IN DIMENSIONS OF FOUR-COLUMN, NON-VENTED GASTEAM RADIATORS
22, 26 and 38 in. High

Number of sections	Length over all (B), in.
4	15
6	20
8	25
10	30
12	35
15	42½



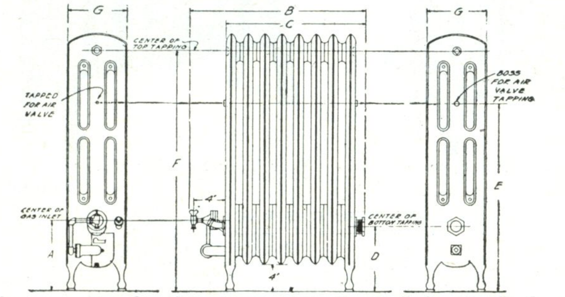
ROUGHING-IN DIMENSIONS OF FOUR-COLUMN, VENTED GASTEAM RADIATORS
38 in. High

Number of sections	Length over all (B), in.
5	17½
7	22½
9	27½
11	32½
13	37½
15	41½

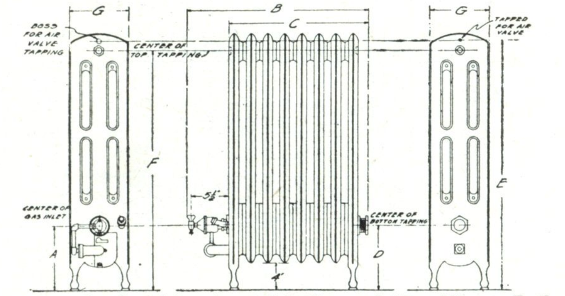
Two Heating Systems in One

By connecting Clow "Gasteam" or "Gaswater" radiators to a central steam, vapor, or hot water boiler in place of the standard steam or water radiators, the Clow "Gasteam" or "Gaswater" radiators become a part of the standard heating system. When the boiler is in use, they act as ordinary radiators. When the boiler is not in use the Clow "Gasteam" or "Gaswater" radiators supply quick, healthful and economical heat, when and where it is wanted.

The gas system combined with the central system permits starting the boiler a month or two later in the fall and shutting it down a month or two earlier in the spring. In apartments and flats when the boiler is shut down at night it permits continued heat through the night where and when it is wanted.



Gasteam in Combination with Central Steam Boiler



Gaswater in Combination with Central Hot Water Boiler

ROUGHING-IN DIMENSIONS OF COMBINATION SYSTEMS (INCHES)

Number of sections	Gasteam 4	6	8	10	12	15	Gaswater 4	6	8	10	12	15
Dimension "B"	15	20	25	30	35	42½	16½	21½	26½	31½	36½	44
Dimension "C"	10	15	20	25	30	37½	10	15	20	25	30	37½

Dimensions	Gasteam A	D	E	F	G	Gaswater A	D	E	F	G
3-column 38" high	11¼	10¾	28¼	35¼	8⅞	10¾	10¾	36¾	35¼	8⅞
3-column 26" high	11½	10⅞	16	23½	8⅞	10⅞	10⅞	24¼	23½	8⅞
4-column 38" high	11¼	10¾	27¼	35⅝	9⅞	10¾	10¾	37	35⅜	9⅞
4-column 26" high	11¼	10¾	17	23½	9⅞	10¾	10¾	24¾	23½	9⅞
4-column 22" high	11⅛	10¾	16½	19½	9⅞	10¾	10¾	21	19½	9⅞

PACIFIC GAS RADIATOR COMPANY

1732-1740 West Washington Street, LOS ANGELES, CAL.
FACTORY AND FOUNDRY: Roseberry and Walter Streets, LOS ANGELES, CAL.
For List of Sales Agents, see page 2116

Products

Gas Fired Radiators.
Gas Fired Steam Radiators.
Gas Fired Fireplace Heaters.
For Warm Air Furnaces, see pages 2116-2117.

Over 200,000 Pacific Radiators in Use

Pacific radiators have been made by us since 1913 and over 200,000 have been installed in residences, apartment houses, hospitals, schools, churches, libraries, theaters, office buildings, etc.

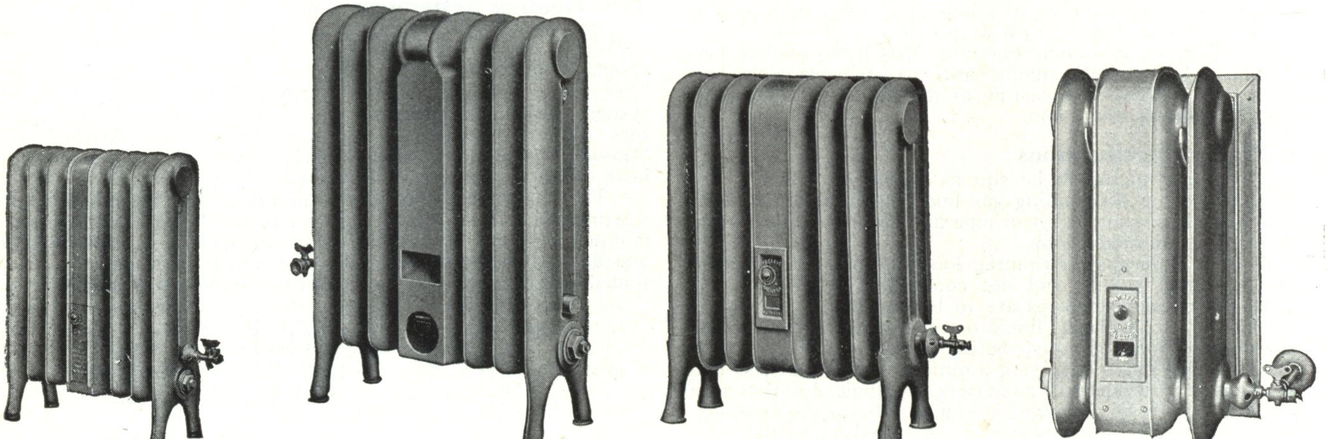
Pacific Gas Radiators

These efficient and economically operated radiators are made in the cast iron type (27 and 33-in. heights) and in the pressed metal type (26-in. height), both types being made in leg and wall models. The sections of the pressed metal type are made of No. 20 gauge Toncan metal and the legs, burners and combustion chambers of cast iron.

All Pacific gas radiators are equipped with adjustable air mixers, gas valves and cast iron Bunsen type burners.

The hot gases in Pacific radiators, as they travel from the burner to the vent outlet, come in contact with an exceptionally large amount of radiating surface, every square inch of which absorbs heat and radiates it into the room. (See illustration.) In this manner the maximum number of heating units are absorbed by the entire surface of the sections and are given up in practical heating service.

Results of tests show that Pacific gas radiators have a large amount of heating surface with a low temperature of discharged gas fumes at the vent and a small consumption of gas for the amount of radiating surface and room contents heated.



Cast Iron Type — Rear View Showing Vent Outlet — Pressed Metal Type — Wall Type

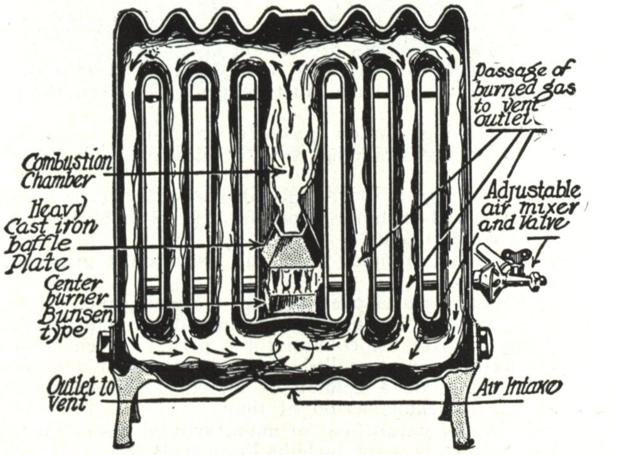
Pacific Gas Radiators

PACIFIC GAS RADIATORS

Number of sections	Equivalent sq. ft. of steam radiation	Length (including trimmings), in.	*Roughing-in dimensions for gas outlets, in.		Code word
			Height from finished floor	Distance from center of vent, right or left	
PRESSED METAL GAS RADIATORS (VENTED TYPE) Height, 26 in. Width, 8 in.					
4	30	16	6	7	Pressor
6	40	21	6	9½	Pressex
8	50	26	6	12	Pressate
10	60	34	6	14½	Preston
12	80	39	6	17	Pressel
14	90	44	6	19½	Pressorto
16	100	49	6	22	Pressecto
CAST IRON GAS RADIATORS (VENTED TYPE) Height, 27 in. Width, 8 in.					
4	32	14½	7	7	Castor
6	42	19½	7	9½	Casten
8	52	24½	7	12	Castate
10	74	29½	7	14½	Casteen
12	84	34½	7	17	Castelve
14	94	39½	7	19½	Castfort
16	104	44½	7	22	Castall
Height, 33 in. Width, 8 in.					
4	36	14½	7	7	Foster
6	50	19½	7	9½	Fostex
8	64	24½	7	12	Fostate
10	86	29½	7	14½	Fosteen
12	100	34½	7	17	Fostelve
14	114	39½	7	19½	Fostfort
16	124	44½	7	22	Fostall

*Roughing-in dimensions for vent:
Leg type, 3-in. round hole; center, 15 in. from finished floor.
Wall type, 3-in. round hole; center, 25 in. from finished floor.
Inside area of vent to be at least 12 sq. in.
Size of gas connection for all radiators, ½ in.

Radiators larger than 8 sections, that is, those having 10 to 16 sections, have two burners, each burner having a separate valve control and each being equipped with a tee-connection using one vent outlet.

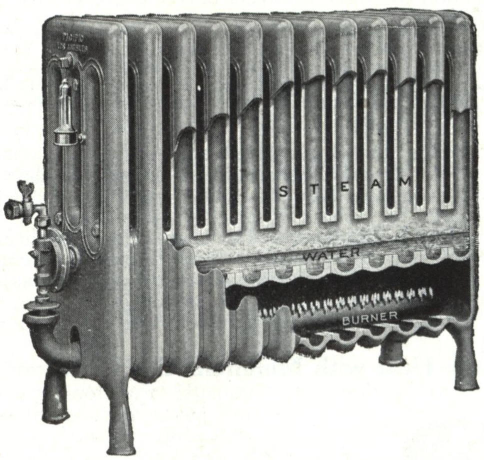

Passage of burned gas to vent outlet
Combustion Chamber
Adjustable air mixer and valve
Heavy Cast iron baffle Plate
Center burner Bunsen type
Outlet to Vent
Air Intake

Sectional View of Pacific Gas Radiator Showing Long Heat Travel

Continued on next page

Pacific Gas Steam Radiators

These gas fired, cast iron, steam radiators are of the four-column pattern having an extremely large amount of heating surface for the floor space occupied. They are made in vented and unvented types, in 26, 32 and 38-in. heights, and in sizes to meet all requirements.



Sectional View of Pacific Cast Iron Gas Steam Radiator

PACIFIC CAST IRON GAS STEAM RADIATORS
(FOUR-COLUMN VENTED TYPE)

Number of sections	Equivalent sq. ft. of steam radiation	Length (including trimmings), in.	*Roughing-in dimensions for gas outlets, in.		Code word
			Height from finished floor, in.	Distance from center of vent, right or left, in.	
		Height, 26 in.	Width, 9 in.		
4	12	14	14½	6½	Prove
6	18	19	14½	11½	Provide
8	24	24	14½	16½	Provision
10	30	29	14½	21½	Professor
12	36	34	14½	26½	Procure
14	42	39	14½	31½	Procede
		Height, 32 in.	Width, 9 in.		
4	16	14	14½	6½	Produce
6	24	19	14½	11½	Procession
8	32	24	14½	16½	Proverb
10	40	29	14½	21½	Province
12	48	34	14½	26½	Prosecute
14	56	39	14½	31½	Prosper
		Height, 38 in.	Width, 9 in.		
4	20	14	14½	6½	Prorate
6	30	19	14½	11½	Propel
8	40	24	14½	16½	Product
10	50	29	14½	21½	Pronoun
12	60	34	14½	26½	Profess
14	70	39	14½	31½	Propellor

*Roughing-in dimensions for vent: 3-in. round hole; center, 13½ in. from finished floor. Inside area of vent to be at least 12 sq. in.

PACIFIC CAST IRON GAS STEAM RADIATORS
(FOUR-COLUMN UNVENTED TYPE)

Number of sections	Equivalent sq. ft. of steam radiation	Length, including trimmings, in.	Code word
	Height, 26 in.	Width, 9 in.	
4	18	14	Forco
5	22½	16½	Forum
6	27	19	Forsex
8	36	24	Forate
10	45	29	Fortem
12	54	34	Forearm
14	63	39	Forteen
15	67½	44	Foreswear
	Height, 32 in.	Width, 9 in.	
4	23	14	Force
5	28¾	16½	Forceful
6	34¼	19	Forever
8	46	24	Forget
10	57½	29	Foretell
12	69	34	Foretold
14	80½	39	Forbid
15	86¼	44	Fortune
	Height, 38 in.	Width, 9 in.	
4	28	14	Forge
5	35	16½	Forgery
6	42	19	Foreman
8	56	24	Foresight
10	70	29	Forcep
12	84	34	Foreign
14	98	39	Foresee
15	105	44	Forego

Size of gas connection for all radiators ½ in. Gas outlet, 13 in. **Prices furnished on application.**

Their attractive design and pleasing proportions make them suitable for any type of building where steam heat is required without the installation and upkeep of a central heating plant.

These radiators are independent heating units requiring no water connections. They generate steam in from 10 to 15 minutes after the gas burner is lighted. Burner is automatically controlled by the diaphragm valve, consequently a steady, even heat and economical operation is assured.

The sections are made of high grade cast iron. Combustion chamber is an integral part of each radiator section and standard steam push nipple assembly is used throughout.

Burners are of cast iron throughout. They are of the raised tip Bunsen type with extra large air mixing chamber. A sufficient clearance between flame and bottom of water chamber prevents impingement of the flame and assures odorless and smokeless combustion.

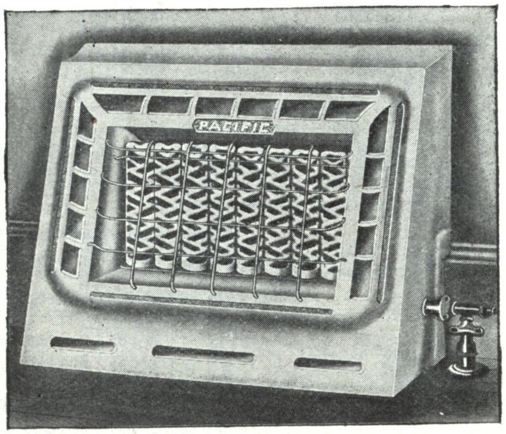
Automatic regulator valves are of the diaphragm type, having cast iron shells and nickel silver diaphragms. The diaphragms are 3½ in. in diameter and operate with a spud gas orifice, which allows a fine adjustment under all working conditions. When steam reaches a predetermined pressure, it actuates the automatic regulator, which in turn reduces the flow of gas and maintains the pressure mentioned. In this manner, safe and economical operation is obtained.

Gas valves are of brass throughout and have fixed orifices. Air mixers are of cast iron and have cone adjustment and lock nut. Filler receptacle is of brass, and has thumb screw filler cap conveniently located for filling. Standard Hoffman siphon air valves are used. Safety valves are of brass throughout, standard pattern, pressure spring type and are adjusted to 15 lb. steam pressure.

Pacific Gas Fired Recess Radiant Heater

A specially constructed unit having 8 heating elements and a Bunsen burner. Has a 1½-in. cold air chamber between radiant section and outer casing. Provision is made for supplying air to chamber through a cold air duct connected to the boot and box at bottom of heater. This duct is continuous from the heater to a point under the floor, terminating near the louvers, which insures a constant supply of cold air. If installed in a building two stories or more in height, duct can be terminated at outer wall in a convenient location, with an ornamental grille or lattice covering.

This unique construction makes an ideal, quick heating unit of pleasing appearance. Keeps casing cool at all times. Supplies fresh air to room constantly. Furnished in white enamel, buffed aluminum or plated finishes.



Pacific Recess Radiant Heater

Number of heating elements, 8. Approximate heating capacity, 3000 cu. ft. Gas connection, ½ in. Frame, 17½x17½ in. Cold air box, 16 in. high, 17 in. wide, 5½ in. deep. Telegraph code, Recess. Rough-in gas stub through floor, 3 in. to right of heater frame and 2 in. from wall

AUTOMATIC GAS-STEAM RADIATOR CO.

Manufacturers of Automatic Self-generating Steam or Hot Water Radiators

6945 Lynn Way, PITTSBURGH, PA.

REPRESENTATIVES IN PRINCIPAL CITIES

NEW YORK, N. Y., Eastern Gas Appliance Co., 47 West 42nd Street
PHILADELPHIA, PA., Automatic Radiation Co., 249 So. Twelfth Street
NEWARK, N. J., H. K. Barrett & Co., Inc., 15 West Park Street
BOSTON, MASS., The Eastern Service Co., 131 State Street
ST. LOUIS, MO., Louis J. Cuneo, 1009 Pine Street
NEW ORLEANS, LA., James H. Aitken & Sons, Inc., 816-18 Lafayette Street
TAMPA, FLA., American Plumbing Supply Co., Commerce Street and Carew Avenue
DALLAS, TEX., Southwest Heating Co., 301 Melba Building
LOS ANGELES AND SAN FRANCISCO, CAL., Payne Furnace and Supply Co., 154-62 No. Los Angeles Street, Los Angeles
CLEVELAND, OHIO, The Liberty Sanitary Supply Co., 3521 King Avenue
TOLEDO, OHIO, The Liberty Sanitary Supply Co., 127 Tecumseh Street

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Steam or Hot Water Heat—No Boiler, No Waste, No Labor

The automatic self-generating steam or hot water radiator is an economical and certainly the most convenient method of heating any type of building. It consists of a cast iron radiator of standard construction. Steam is generated in each radiator by gas (automatically controlled) making each radiator a complete low cost steam heating plant.

There are no water supply pipes, boiler or other inconveniences and expenses associated with a boiler heating plant.

While Automatic radiators can be and often are used in connection with other methods of heating, either as an adjunct to or as a booster for other heating plants, they are in themselves a complete heating system.

As Much Heat as Wanted, Wherever Wanted

For House Heating—A radiator for each room in the usual way, but the Automatic self-generating unit can be operated separately either on hot water or steam. This provides for minimum or maximum requirements, assuring uniform comfort throughout the day or night.

For Apartment Heating—An entire building can be heated as successfully as a small house. Each tenant can control heat in his apartment—no complaints—no janitor with Automatic installations.

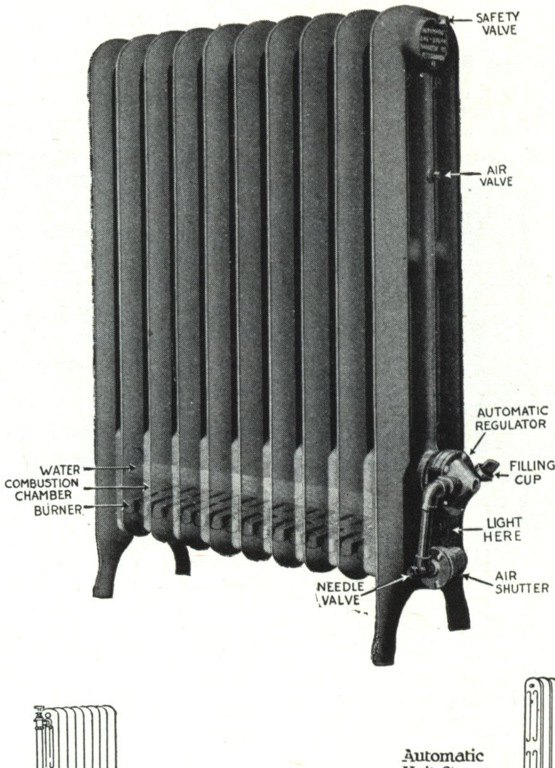
For Office and Store Heating—Automatic radiators can be located to suit stock and fixtures—No dirt or danger from fire. (Approved by National Board of Fire Underwriters.) Use basement for salesroom or storage.

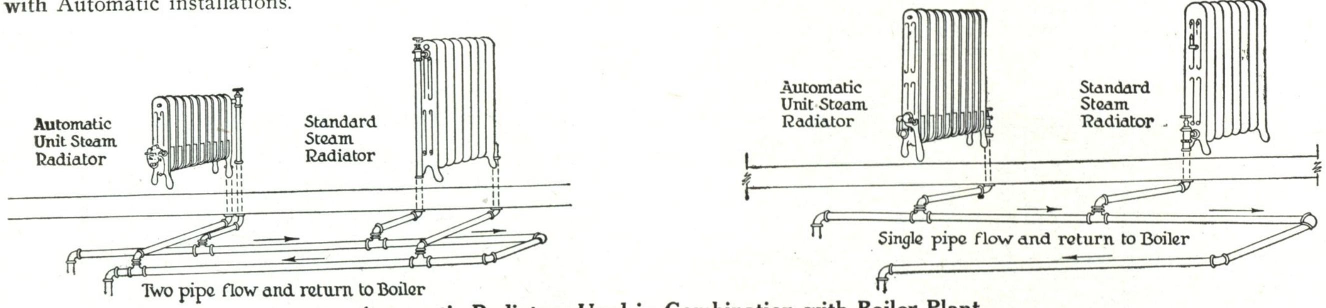
For Church and School Heating—The usual heating season is 181 days, ranging from nothing to extreme then back to nothing in Spring. The flexible automatic unit radiator system adapts itself economically to the demands of ever changing weather conditions. Heating can be limited to rooms in use.

Maximum Heat with Minimum Gas Consumption

The construction of Automatic radiators gives maximum heat with minimum gas consumption. Directly beneath the radiating surface of the standard cast iron radiator is a water chamber into which a small quantity of water is poured through a filling cup. This is sufficient for from 2 to 4 weeks operation. Just below the water in the radiator is the combustion chamber with a Bunsen gas burner of improved type. This burner is so designed that it will give a blue, sootless flame that will not vitiate the air or cause odors. It takes only a few minutes for this burner to generate 5 to 8 lb. of steam in the radiator, at which time the automatic regulator (through which the gas must pass) reduces the gas supply to maintain the amount of heat desired.

Absolute Safety—Automatic radiators are tested to a cold water pressure of 100 lb. to the square inch before leaving the factory. As an additional factor of safety, each steam radiator is equipped with a safety valve to automatically release any pressure higher than 20 lb. No part of the system can become overheated either through accident or carelessness.




Automatic Unit Steam Radiator
Standard Steam Radiator
Two pipe flow and return to Boiler
Automatic Unit Steam Radiator
Standard Steam Radiator
Single pipe flow and return to Boiler

Automatic-Radiators Used in Combination with Boiler Plant

Connected with central plant or boiler supplying regular steam radiators and operated in the usual way. When boiler is not fired the automatic can be used separately under its own steam generated within the radiator

SPECIFICATIONS OF ALL SIZES OF AUTOMATIC GAS-FIRED RADIATORS

Height, in	38	38	38	38	38	*38	*38	*38	*38	*38	*38	28	28	28	28	28	28	28	28	24	24	24	24	24	24	24	24
Catalogue No.	H	H	H	H	H	HV	HV	HV	HV	HV	HV	L	L	L	L	L	L	L	L	LL	LL	LL	LL	LL	LL	LL	LL
Number of sections	6	8	10	12	15	4	6	8	10	12	15	4	6	8	10	12	15	18	20	4	6	8	10	12	15	18	20
Capacity, sq. ft	42	56	70	84	105	24	36	48	60	72	90	20	30	40	50	60	75	90	100	18	27	36	45	54	68	82	90
Length over all, in	20	25	30	35	42½	15	20	25	30	35	42½	15	20	25	30	35	42½	50	55	15	20	25	30	35	42½	50	55
Approx. weight, lbs	222	290	360	430	530	210	258	307	385	465	594	140	192	239	296	350	430	489	544	100	144	188	232	276	320	380	420

Communicate with nearest dealer for prices and estimates at addresses shown above.
*Flue type Automatic Gas-Steam Radiators; take air from the floor through the radiator into chimney or flue outlet.

COLUMBIA METAL BOX CO.

Manufacturers of Radiator Enclosure Cabinets

226 East 144th Street
NEW YORK, N. Y.

TELEPHONE
Mott Haven 1282, 1283, 1284

For List of Sales Representatives, see page 2094

Products

Columbia Radiator Enclosure Cabinets.

For Steel Bathroom Cabinets, see pages 2094-2095.

Columbia Radiator Enclosure Cabinets

Architects know that the uncovered radiator has the bad habit of picking up and depositing dust and soot upon wall paper, pictures, and draperies on the wall against which it stands, making frequent redecorating necessary.

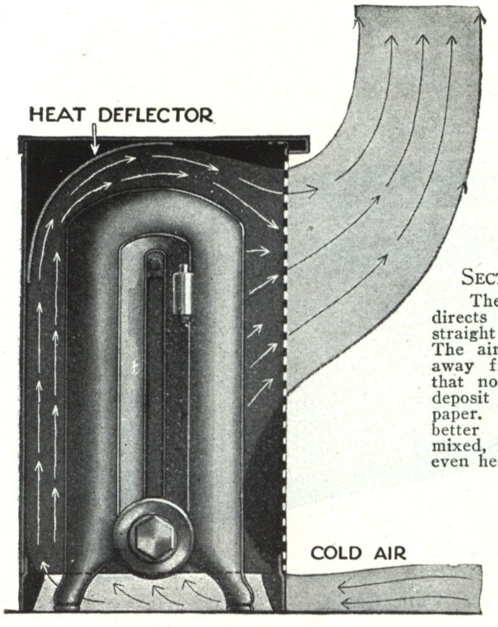
The radiator enclosure cabinet is an artistically designed and beautifully finished all-steel cover which fits over any radiator so as to hide it entirely from view without interfering with its heating efficiency. It protects the wall paper and hangings from the radiator smudge, thereby saving its cost in a short time.

One-piece Construction

The radiator enclosure cabinets are built throughout of the finest grade of furniture steel, $\frac{1}{16}$ in. thick. The same material is used for the "heat deflector" and the feet. All the parts are *electrically welded* together so as to form in effect *one solid piece of steel.* There is not a screw, bolt or rivet in the entire cabinet—nothing to shake loose, rust apart, crack asunder or warp out of shape.

Excellently Finished

The beautiful finish is as lasting in quality as the cabinet itself. It consists of oven-baked enamel in five layers, which are *sprayed* on the steel to insure a thick and even coating. The surface is skillfully treated to imitate *mahogany* or *American walnut* or may be finished in *ivory, cream, gray* or *white,* as desired.

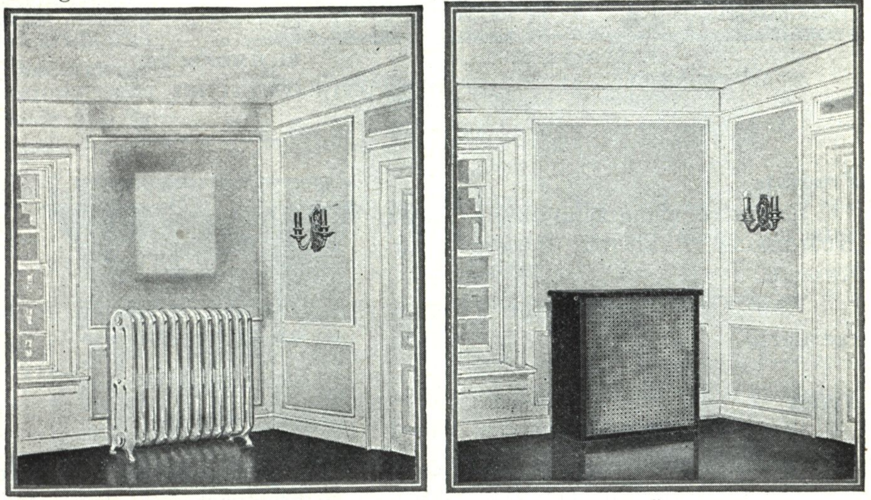


Sectional View

The heat deflector directs the heated air straight into the room. The air is kept entirely away from the wall so that no smudge or soot deposit can mar the wall paper. The hot air is better distributed and mixed, resulting in more even heat, at less cost

Columbia Cabinets are Low Priced

In spite of their beautiful finish and lasting qualities, the cabinets are surprisingly low in cost. There is no installation cost as the cabinet is not fastened to the radiator—it simply slips over it.



A Columbia Radiator Cabinet Keeps Walls Clean

The illustrations show the effectiveness of the radiator cabinet. Note how disfigured wall and ceiling have become in the picture at the left. Compare it with the picture at the right where a radiator cabinet has protected the wall

When to Order

The cabinets should be ordered when the steam contract is let and the easiest way to order them is to submit the radiator specifications to the Columbia Metal Box Co., at the same time specifying the finish desired for each cabinet.

In all other cases give (1) the height, (2) length, (3) width of each radiator to be covered, (4) the height from floor to top of valve, and (5) if valve is on right or left side of radiator. Finally indicate (6) the finish desired.

The diagram indicates clearly what to measure.

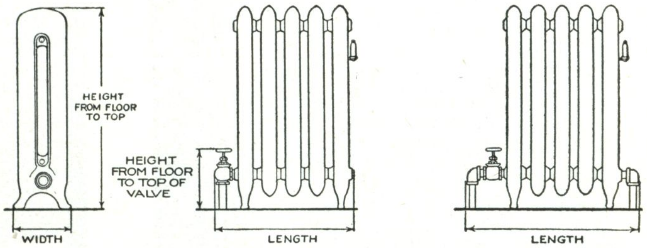


Diagram to Follow When Ordering

Catalogue

Every architect should have a copy of the large, beautifully illustrated catalogue, "Radiator Enclosure Cabinets for Modern Homes." It should be filed under *radiators.* Send for it today.

ART METAL RADIATOR COVER CO.

GENERAL OFFICES AND FACTORY
Kolmar and Grand Avenues
(Department A)
CHICAGO, ILL.

BRANCH OFFICES

NEW YORK, N. Y.
PITTSBURGH, PA.
CLEVELAND, OHIO
CINCINNATI, OHIO
DETROIT, MICH.
INDIANAPOLIS, IND.
PEORIA, ILL.
MOLINE, ILL.
MILWAUKEE, WIS.
KANSAS CITY, MO.
MINNEAPOLIS, MINN.
LOUISVILLE, KY.
ST. LOUIS, MO.
MEMPHIS, TENN.
DES MOINES, IOWA
CEDAR RAPIDS, IOWA
OMAHA, NEB.
SCRANTON, PA.
SAN FRANCISCO, CAL.
BOSTON, MASS.
PHILADELPHIA, PA.
GRAND RAPIDS, MICH.
WASHINGTON, D. C.
BUFFALO, N. Y.
LANCASTER, PA.
BALTIMORE, MD.
SYRACUSE, N. Y.
KNOXVILLE, TENN.
CHARLOTTE, N. C.
RICHMOND, VA.
CHARLESTON, W. VA.
AND OTHER PRINCIPAL CITIES THROUGHOUT THE U. S.

Products

Exclusive manufacturers of Trico Humidifier Radiator Covers or Shields.

Also Grille Fronts for recessed radiators.

TRICO
ART METAL
RADIATOR COVERS
SHIELD—HUMIDIFIER—SEAT
TRADE-MARK

Types

Standard and Grille.

Grilles in two designs, rod and cane.

The top, water container and back shield are the same on all types.

Specifications for "Rod Grille" Type Trico Humidifying Radiator Cover

Top and back same as Standard with front and ends covered with quarter-inch steel channel rods, with quarter-inch ornaments between rods.

Top is No. 14 gauge, and border No. 16 gauge furniture steel with six-coat baked enamel finish to closely match any samples selected.

Humidifiers of No. 24 gauge galvanized iron.

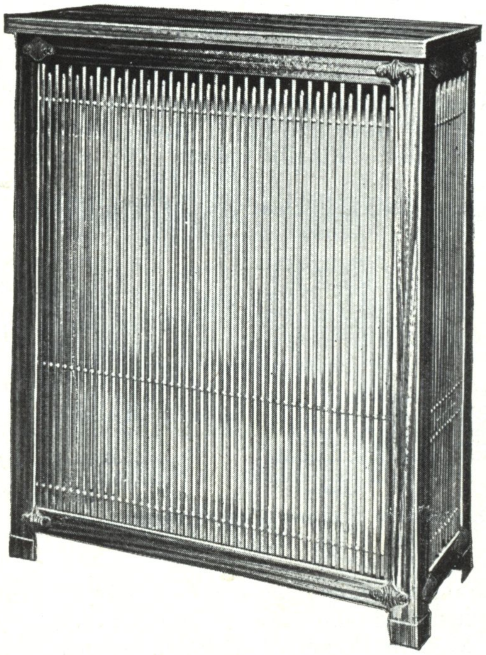
Specifications for "Cane Grille" Type Trico Humidifying Radiator Cover

Top and back same as Standard with front and ends covered with steel imitation cane.

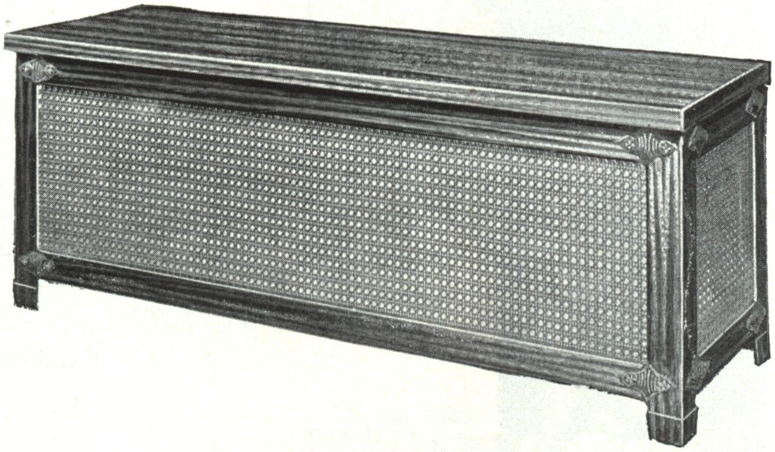
Top is No. 14 gauge and border is No. 16 gauge furniture steel with baked enamel finish to closely match any sample selected.

Humidifiers of No. 24 gauge galvanized iron.

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK N.Y. EST 1913



Trico Square "Rod Grille"



Trico "Cane Grille"

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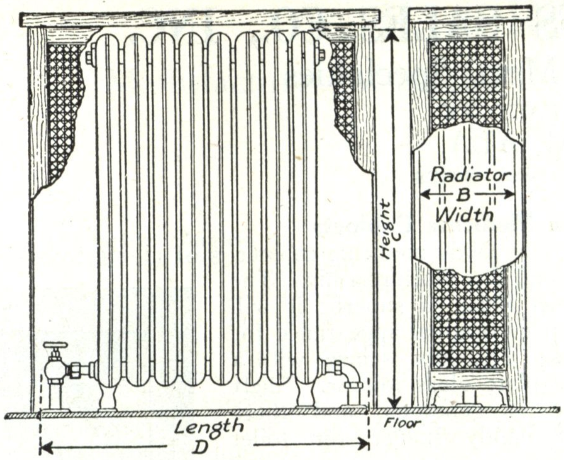
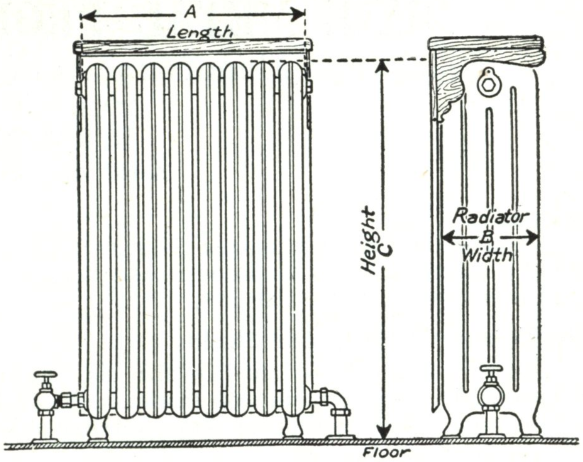

Radiator
B
Width
Height
C
Length
D
Floor

Detail of Dimensions Required, Trico Humidifying Radiator Cover (Rod or Cane)

D—length, B—width, and C—height. State dimensions in inches. Give control valves upper or lower, right or left. Indicate type of grille as follows: C—cane. R—square rod


A
Length
Height
C
Radiator
B
Width
Floor

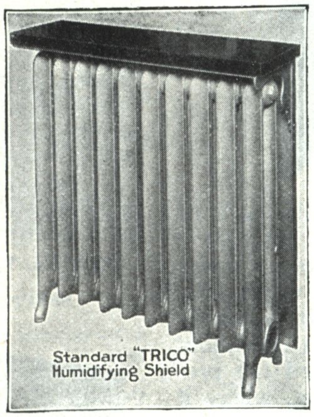
Detail of Dimensions Required, Trico Humidifying Radiator Shield (Standard)

A—length, B—width, and C—height. State dimensions in inches. In measuring length do not include nut (bushings) if any

Our regular equipment rests 2¼ inches above the top of the radiator, but special equipment can be used where there is less than a 2¼-inch clearance. ¼-inch clearance behind the radiator is sufficient to make installation.

For radiators partly recessed, an offset can be made in the back so as to throw the top forward.

Curved and angle shaped radiators can be covered with either Standard or Grille types.


Standard "TRICO"
Humidifying Shield

Standard Trico Humidifying Shield

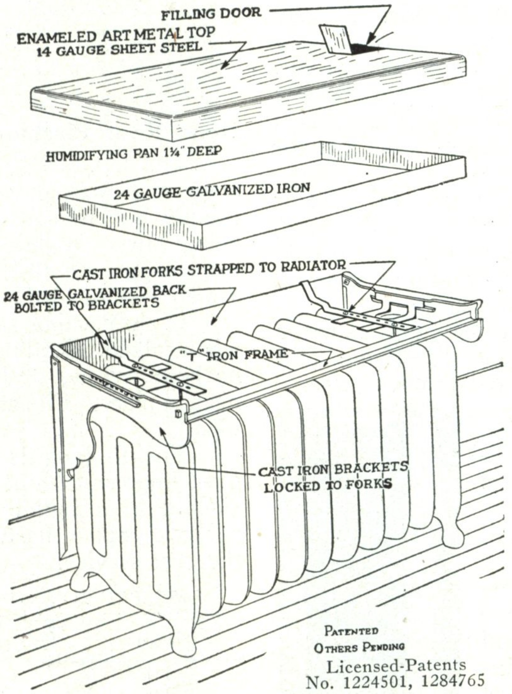
Specifications for "Standard" Type Trico Humidifying Radiator Cover

Front and ends of radiator exposed.

Top is of No. 14 gauge furniture steel with baked enamel finish to closely match any samples selected.

Humidifier and back is of No. 24 gauge galvanized iron.

Brackets, connecting rods, forks and castings are included.


FILLING DOOR
ENAMELED ART METAL TOP
14 GAUGE SHEET STEEL
HUMIDIFYING PAN 1¼" DEEP
24 GAUGE GALVANIZED IRON
CAST IRON FORKS STRAPPED TO RADIATOR
24 GAUGE GALVANIZED BACK
BOLTED TO BRACKETS
"T" IRON FRAME
CAST IRON BRACKETS
LOCKED TO FORKS

Patented
Others Pending
Licensed-Patents
No. 1224501, 1284765

Construction Details of Trico Standard Shield

The evaporating capacity of Trico humidifiers each 24 hours per lin. ft. of radiator, is as follows: 1-column and wall radiator, 1 qt.; 2 and 3-column radiator, 1½ qt.; 4-column radiator, 2 qt.; 6-column radiator, 2¾ qt.

DIXIE METAL PRODUCTS SALES CO., INC.

Manufacturers of Sheet Metal Specialties

MAIN OFFICE AND FACTORY
BIRMINGHAM, ALA.
SALES OFFICES IN PRINCIPAL CITIES

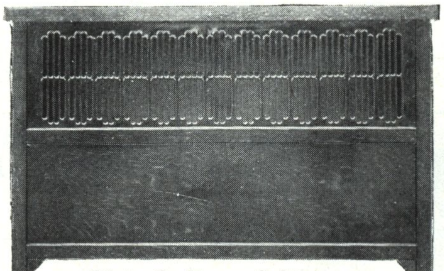
Products

Radiator Cabinets; Radiator Shields; Shower Baths; Medicine Cabinets; Roof Flashings.

Also Hot Air Register Cabinets.

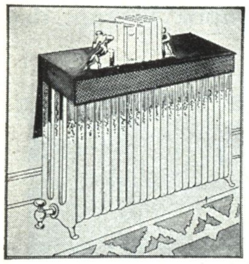
Dixie Radiator Cabinets and Shields

Radiator Cabinets—Humidify the air, prevent injury to wall paper, furniture or fabrics, and, at the same time, transform the radiator into a substantial and decorative article of furniture.



Dixie Radiator Cabinet

Dixie radiator cabinets are substantially built of high grade furniture steel. Each cabinet contains a vapor pan of solid sheet copper, placed directly under the hinged cover so that it can easily be filled with water. The top can be used as a shelf or table. It is heavily insulated, so that anything can be placed on it without danger of damage from heat. The insulated top prevents heat from rising directly to the ceiling, where it would be wasted. Dixie radiator cabinets are finished with baked-on enamel, in colors and grained finishes to harmonize with any decorative scheme.



Dixie Radiator Shield

Radiator Shields—Prevent hot draft and dust from blowing upwards to injure decorations and woodwork. They are heavily insulated and can be used as a shelf. Furnished without a vapor pan.

Regular finishes are gold or aluminum bronze; black, gray, ivory or white enamel; also oak, walnut or mahogany grained. Special finishes extra.

When Writing for Information—For radiator cabinets, give number of radiators and columns and sections in each. Give finish preferred in every case.

Dixie Shower Bath

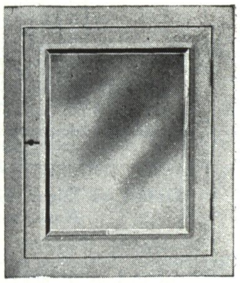
The Dixie shower has been designed for installation where space is limited. It can be set up in the corner of any bedroom or other suitable small space. Each stall is separately packed, ready for installation. They are made of steel 1/8 in. thick, all welded in one solid piece. The entire shower stall after being made, is galvanized or finished in any color of baked enamel desired. They can be drilled to meet the requirements or are sold with all fittings complete.

Dixie Shower Bath

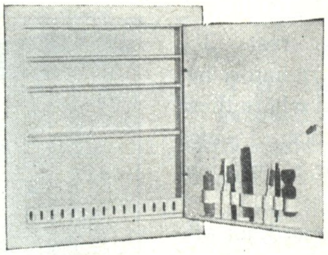
Dixie Medicine Cabinets

The Dixie medicine cabinet is of all-steel construction and fine workmanship. The enamel finish is superb; it will retain its original appearance for years. The door is inset with a large plate glass mirror. Shelf space is generous, and there is a handy holder for toilet articles.

Unless otherwise specified, all cabinets are finished in white enamel baked on.



Dixie Medicine Cabinet



Style No. 1, Dixie Cabinet

Four Styles—No. 1 Dixie cabinet is recessed with adjustable shelves. No. 2 recessed with fixed shelves. No. 3 is an outside wall cabinet. No. 4 is recessed type with an open recessed shelf below.

SPECIFICATIONS AND LIST PRICES OF DIXIE MEDICINE CABINETS

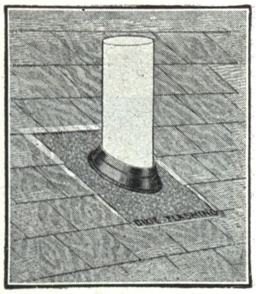
No.	1	2	3	4
Outside, in.	21½x25½	17½x22½	14½x19½	21½x25½
Opening, in.	19 x22	15 x19½	...	19 x22
Depth, in.	4¼	4¼	...	4½
Size mirror, in.	14 x18	10 x14	10 x14	12 x14
Weight, lb.	42	32	22	40
List Prices				
With plain mirror	$25.00	$18.00	$15.00	$24.00
With bevel mirror	26.50	19.00	16.00	25.00
Add for nickelplated towel bar	...	...	1.50	...

Dixie Roof Flashings

The Dixie flashing is perfectly adjustable for any angle of a peaked roof as well as for a flat roof. The calking hub is made to do for either standard or extra heavy pipe. Made of galvanized iron, copper or all-lead. Collars are entirely of lead.

Dixie flashing stays in place when calked. Will not leak. Has no bolts, screws or lugs. Looks neat in place. Fits any weight of pipe.

The flashing is one of the most important things to be considered in a building. Specify a Dixie copper flashing and get the best service.



Dixie Roof Flashing

LIST PRICE PER DOZEN OF DIXIE ROOF FLASHINGS

Size, in.	Galvanized iron	Copper	All-lead
1¼	$ 8.00	$15.00	$16.00
1½	8.00	15.00	16.00
2	10.00	17.00	18.00
3	11.00	19.00	21.00
4	12.00	20.00	23.00
5	17.00	27.00	30.00

Note: All flashings packed 1 doz. to the box.

W. H. JOHNSON & SON CO.

Manufacturers of Shields for Radiators and Warm Air Registers

330 East St. Joe Street
INDIANAPOLIS, IND.

Acme Radiator Shields

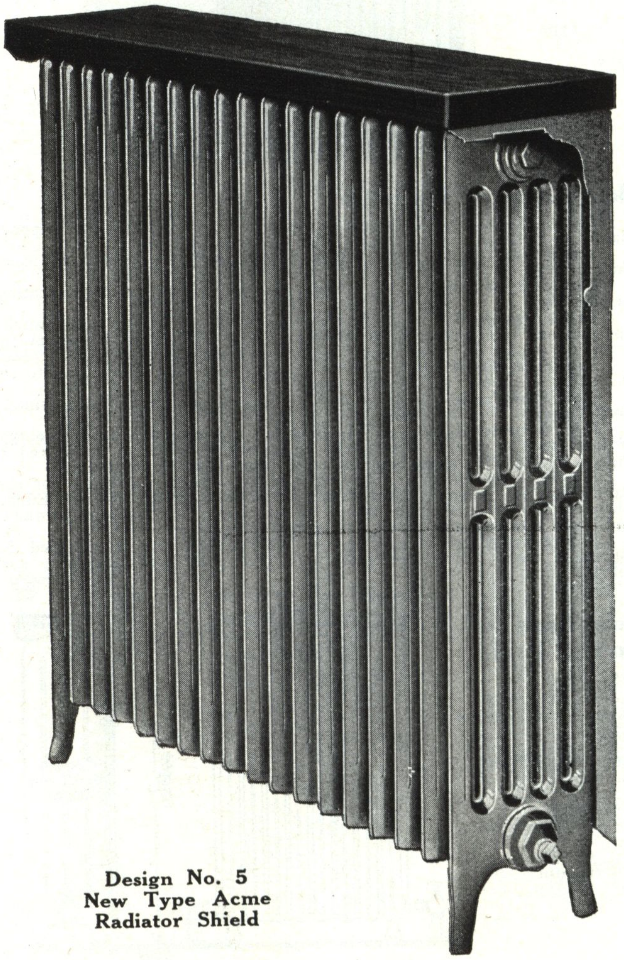
Acme radiator shields prevent the wall discoloration which appears above unshielded radiators. They stop the damage done to fine draperies by collecting in a special dust gutter, the minute particles of dirt.

As an investment, Acme radiator shields will pay for themselves in a single year. The moderate cost of an Acme is easily saved over and over by eliminating the necessity of cleaning and redecorating.

The Acme shields are distinctly attractive and will harmonize with any radiator and with any room.

Acme shields are so shaped that they do not retard radiation of heat—instead, they throw the heat out into the room. They collect particles of dust in the special dust gutter which is an important feature of construction. No dust-carrying air is circulated where radiators are equipped with Acme shields. Dust gutter is easily cleaned with a damp cloth. Acme shields are made either with or without water pans. Water pan maintains the proper degree of humidity, giving a more healthful heat and preventing cracking and warping of furniture.

In ordering Acme shields use our regular order form No. 10, filling out completely and listing each radiator separately.



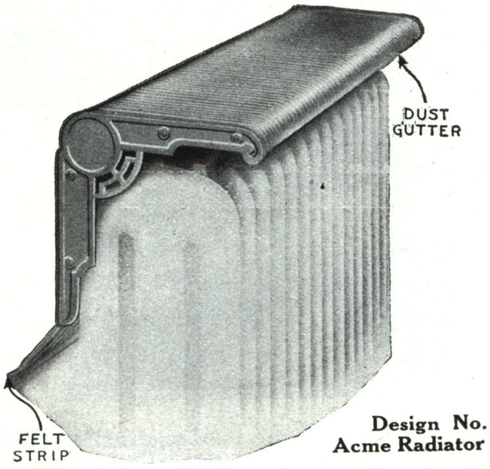
Design No. 5
New Type Acme
Radiator Shield

Design No. 5—The New Acme shield is built of heavy gauge metal. The body is of galvanized iron, the end pieces of heavy gauge stampings, the top of heavy gauge furniture steel with 1½-in. flange all the way around. The top is finished in *baked enamel, grained* walnut, mahogany or golden oak, plain gray, ivory or white, or special colors by submitting sample with order. The back and ends should be finished to match radiator finish.

The shield extends to bottom of radiator coil and is attached to the radiator by heavy steel supports, bolted to end pieces of shield and clamped to radiator by U-bolts.

Care has been exercised in designing this shield that it be made to fit the contour of the radiator. The depth of the top and the finish give it the appearance of a heavy wooden slab.

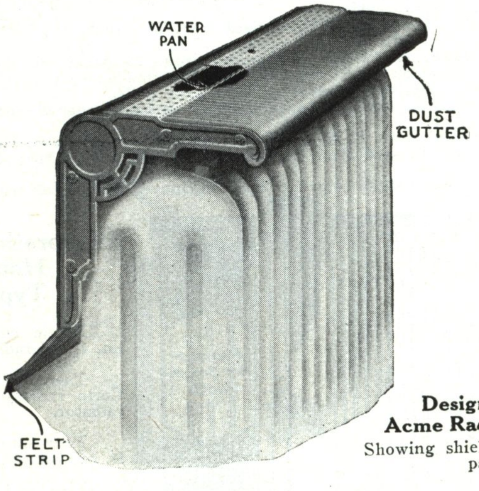
Beneath the top panel of the shield, resting on the radiator, is a galvanized water pan running the full length of the radiator, to maintain the proper humidity of the room. If water pan is not desired, the top panel is lined with asbestos to prevent overheating.



Design No. 3
Acme Radiator Shield

Designs No. 2 and No. 3—Made of crimped, galvanized iron, well reinforced with cast iron ends. Plain iron used if required. Supported on radiator by hook and bolt on each standard, easily removable. The back has a felt strip which fits tightly against wall or the back may continue to floor.

Aluminum or gold bronze are standard colors, others on request. Furnished unfinished if desired.



Design No. 2
Acme Radiator Shield
Showing shield with water pan

Acme Warm Air Register Shields

Constructed similar to the radiator shields, and are equally effective for the protection of walls.

SCHLEICHER, INC.

Manufacturers of Slyker Metal Radiator Furniture

EXECUTIVE OFFICES AND FACTORY
GARY, IND.
DISTRICT REPRESENTATIVES IN ALL IMPORTANT CITIES

Slyker Radiator Furniture Has National Field

During the past year Slyker Metal Radiator Furniture has appeared before the American public in national magazines, and a large and constantly growing demand has been well established.

The artistic, protective and hygienic features of Slyker Radiator Furniture are the principle reasons why architects are freely specifying it as necessary equipment for heating systems in the better homes, hotels and other buildings.

Features of Slyker Radiator Furniture

Slyker Radiator Furniture will appeal particularly to the architect who includes a scheme for interior decoration, or it will provide the interior decorator with finished radiator cabinets that do not present any obstacle to harmonious arrangement or color effects.

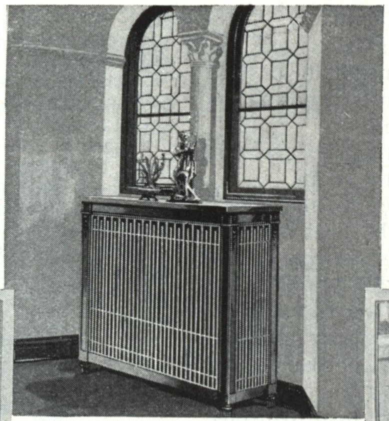
They provide an advantage over special recessed provision for radiators in the fact that when placed normally in any room and equipped with Slyker Radiator Furniture, the radiators are readily accessible and no loss of heating efficiency is sustained.

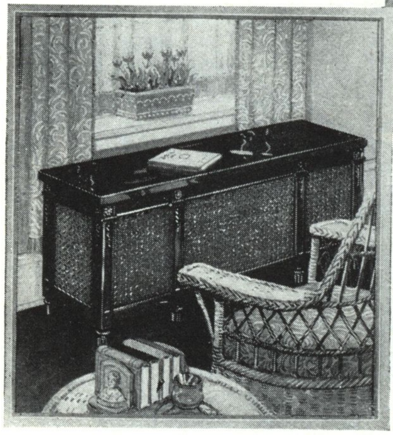
Aside from the primary advantage of fine appearance and workmanship, Slyker equipment prevents soiling of delicate draperies and exposed surfaces in the vicinity of radiators, brought about by the deflection of air currents and moistened air.

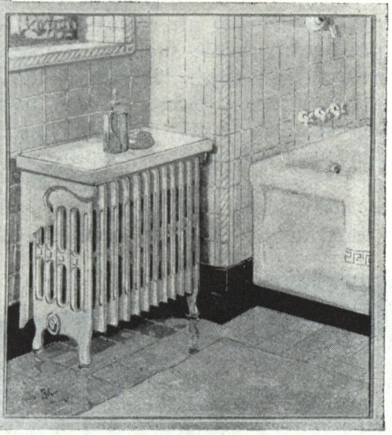
The humidifier is a separate unit contained beneath the top and filled without removing any parts. This hygienic feature is recognized as necessary by leading physicians as well as owners.

Prompt Execution of all Orders

Although there is a great variety in size and type of radiators, we carry a sufficient quantity of all sizes in stock to permit prompt fulfillment of any sized order.







Slyker
Radiator Furniture

Above: Rod Grille Type

Left: Cane Grille Type

Right: Plain Type

Construction Details of Slyker Radiator Furniture

Water pans rest on pan supports and are ⅝ in. above top of radiator. Shields are separated from back flange of water pan ¾ in. and the top, or cover, rests on the brackets and is $\frac{5}{16}$ in. above highest point of water pans. This allows for perfect circulation and prevents heat loss. All heated air from the radiator passes directly over water surface and is moistened and deflected into the room. The shields form a perfect protection against the rising dust from radiators accumulating on walls or hangings.

Plain Type—*Tops or Covers*—No. 1 grade furniture steel, 14 gauge; flanged all around 1¼ in.; corners acetelyne-welded, ground, buffed and filled before finishing. Finished in six-coat baked enamel. Filling doors 3x3½ in. hinged, spot-welded.

Water Pans (Humidifiers)—Galvanized iron, 24 gauge, 1¼ in. deep; corners lapped and soldered.

Deflector Backs or Shields—Galvanized iron, 24 gauge, finished in baked enamel to match radiator finish. Shield extends beyond each end of radiator and extends to lower edge of heating coils.

Brackets—Pressed steel, 12 gauge, finished in baked enamel to match shield and radiator.

Forks—Pressed steel, 12 gauge, black japanned. Special construction.

Pan Supports—Pressed steel, 14 gauge, black japanned. Special construction.

Stirrups—Pressed steel, 14 gauge, black japanned. Special construction.

Bolts—¼ in., special threaded, for fastening forks and pan supports rigidly to radiator.

Angle Iron—⅛ in., for connecting end brackets, finished to match radiators.

Grille Type—*Grille*—Tops, backs and water pans, same specifications as plain type.

Grille Frame—No. 1 grade furniture steel, 18 gauge, with paneled uprights and rails delicately ornamented. The feet are of aluminum and gracefully modeled. The general design is conventional.

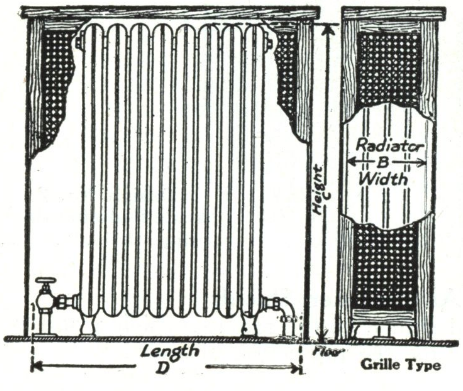
Rod Panel Insets—18 gauge, ¼-in. channels with each alternate rod shaped at the top.

Cane Panel Insets—20 gauge with hexagonal openings in perfect simulation of cane.

Interchangeable Insets—All paneling is interchangeable from one type of inset to the other. Prices will be submitted where it is desired to change from a cane panel inset to a rod panel inset or vice versa.

Finishes—On the rods are baked and are usually finished in bronze. Cane insets are regularly finished in what may be termed a "Cane Effect" where the top is finished in walnut or mahogany, being skillfully combed and toned down to slightly lighter shades for contrast.

Where ivory and white or any solid light color is specified for tops and frame, it is customary to finish the inset to match such colors.



Grille Type

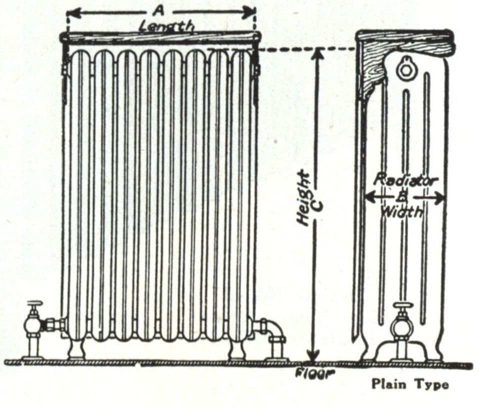
Evaporating Capacity Each 24 Hours, Plain and Grille Type

Single column radiators—1 qt. per lin. ft. of radiator.

Two and three-column radiators and Corto radiators—1½ qts. per lin. ft. of radiator.

Four-column radiators—2 qts. per lin. ft. of radiator.

Five and six-column radiators—2¾ qts. per lin. ft. of radiator.



Plain Type

HEALY-RUFF COMPANY

Manufacturers of E-Z Radiator Hangers

776 Hampden Avenue
ST. PAUL, MINN.

REPRESENTATIVES

AMSTERDAM, N. Y., F. E. Dwyer, 447 Guy Park Avenue
ATLANTA, GA., W. K. Andrews, 804 Forsyth Building
*BALTIMORE, MD., Vance & Vance, 510 Garrett Building
BIRMINGHAM, ALA., C. P. Lichty, 1633 2nd Avenue, No.
*BOSTON, MASS., H. C. Perkins Co., 30 Oliver Street
BUTTE, MONT., Sullivan Valve & Engineering Co., 223 N. Main Street
CHARLOTTE, N. C., J. C. Lydon, 208 Latonia Building
*CHICAGO, ILL., Macy S. Good, 230 E. Ohio Street
CINCINNATI, OHIO, W. C. Green Specialty Co., 310 Provident Bank Building
CLEVELAND, OHIO, H. Porter, 3030 Euclid Avenue
*COLUMBUS, OHIO, W. C. Green Specialty Co., 404 Clinton Building
DALLAS, TEX., John H. Van Zandt, 1903 Santa Fe Building
*NEW YORK, N. Y., L. L. Broughton, 16 Park Avenue
*DENVER, COLO., M. J. O'Fallon Supply Co., 1621 15th Street
DES MOINES, IOWA, Preston Daniels, Hubbel Building
*DETROIT, MICH., C. W. Locker, 2847 Grand River Avenue
*INDIANAPOLIS, IND., L. K. Ascher & Son, 516 Board of Trade Building
IRONWOOD, MICH., R. K. Springer, Glassner Building
KANSAS CITY, MO., H. H. Wright, 207 Davidson Building
LACROSSE, WIS., H. M. Davidson, 210 Newburg Building
*LOS ANGELES, CAL., R. M. Gunzel, 306 Crocker Street
MILWAUKEE, WIS., H. M. Miller, 6089 Plankinton Building
NASHVILLE, TENN., Southern Sales Co., 117 5th Avenue, No.
*NEW YORK, N. Y., L. L. Broughton, 16 Park Avenue
*OMAHA, NEB., Natkin Engineering Co., 706 World-Herald Building
*PHILADELPHIA, PA., L. G. Paine, 806 Otis Building
*PITTSBURGH, PA., Arthur Service Co., 409 Empire Building
RICHMOND, VA., W. Wallace Neale, 302 Carneal Building
ST. LOUIS, MO., B. H. Mueller, 1223 Syndicate Trust Building
*SAN FRANCISCO, CAL., Paul W. Beggs, Sharon Building
*SEATTLE, WASH., Steam Appliance Co., 2021 L. C. Smith Building
SPOKANE, WASH., Heating Assurance, 614 Empire State Building
*TOLEDO, OHIO, Colby-Merrill Co., 1121 Nicholas Building
WASHINGTON, D. C., Vance & Vance, 616 Lenox Building
WICHITA, KAN., J. M. O'Conner, 421 Sedgwick Building

*Indicates where stock is carried

Product

E-Z One-bolt Radiator Hanger or Bracket, adapted to hanging all makes and sizes of radiators on the wall, including Corto and Aero.

Styles

Style "R" places radiator 1½ in. from wall, but is not adjustable for baseboard.

Style "H" places radiator 2½ in. from wall and provides for baseboard adjustment.

All style "R" hangers convertible, with parts No. 5 and No. 8, into style "H."

Both styles are made for wall, 1, 2, 3, 4 or 5-column, window and Corto radiation. All parts made of pressed steel except bottom hook support.

All column radiation is held in at the top with an invisible washer.

Advantages

Easy to clean under the radiator.

Floors and carpets can be laid without disturbing radiator or connections.

No carrying of radiators over new floors.

Anchor bolts can be placed in walls during construction. No accurate measurements required since hangers have both horizontal and vertical adjustments. (Vertical adjustments made with ½-in. pipe.)

Only one bolt in the wall for each hanger.

Expansion can not affect anchor bolts in wall.

Entire hanger invisible.

Adjustable for any height of baseboard.

Saves time and labor.

Can be used with any make or style of radiator.

Radiators can be hung and permanent connections made before floors are laid.

Applicable to wood, brick, tile or walls of any material.

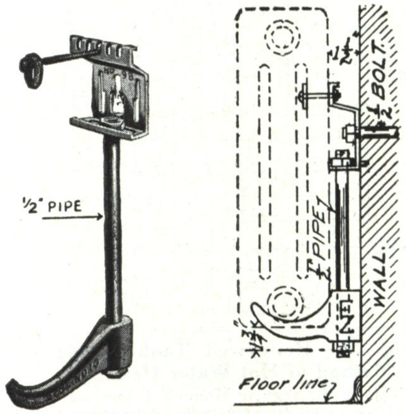
Desirable where vacuum cleaners are used.

Desirable where temperature control is used.

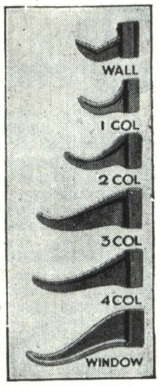
Typical Specifications

Where Baseboards Are Used—All radiation, unless otherwise noted, shall be supported on wall by means of E-Z Radiator Hangers, Style "H," or equal, and approved in writing by the architect; arranged to support the radiator 2½ in. from the wall and with baseboard adjustment.

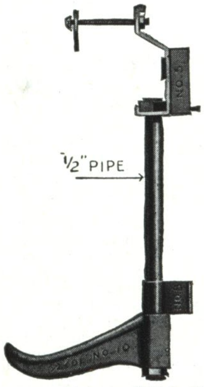
Where Baseboard Adjustment Is Not Desired—All radiation, unless otherwise noted, shall be supported on wall by means of E-Z Radiator Hangers, Style "R," or equal, and approved in writing by the architect; arranged to support the radiator 1½ in. from the wall.



Style "R," Radiator Hanger, without Baseboard Adjustment

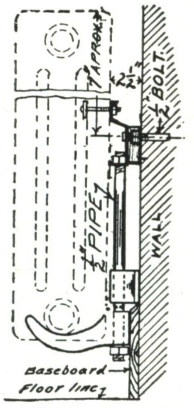


E-Z Radiator Hangers



Part No. 5

Part No. 8



Style "H," Radiator Hanger, with Baseboard Adjustment

THE HONEYWELL COMPANIES

WABASH, IND.

CANADIAN TRADE SUPPLIED FROM MONTREAL

Products

Honeywell Heat Generators; Water Regulators; Temperature Regulators.

Piping Plans Prepared for Architects

We prepare plans only for architects and the legitimate trade or those entitled to buy heating materials. Under no circumstances will we knowingly make plans for house owners or others not entitled to trade protection. If architects will send us plans of the building in which they wish to install the Honeywell method, showing locations of boiler and radiators, also their capacities, we will prepare complete guaranteed piping plans for our method at the following rates: for plans of 500 sq. ft. or less, $2.00; 500 to 750 sq. ft., $2.50; 750 to 1000 sq. ft., $3.00; $1.00 for every 500 sq. ft. of radiation over 1000 sq. ft.

Honeywell Method of Heating

In this method, are utilized:

(1) The Honeywell heat generator (Fig. 1) which increases the rapidity of water circulation in hot water heating systems, thereby increasing water temperatures.

(2) The Honeywell system of temperature regulation consisting of:

(a) The Honeywell water regulator (Fig. 4) which maintains constant predetermined water temperature in hot water heating systems, or,

(b) Honeywell room temperature regulators, consisting of a thermostat (Fig. 5) and an electric motor (Fig. 7) for hot water, warm air or steam heating systems.

Honeywell Heat Generator

An automatic and absolutely safe mercury device for sealing hot water heating systems and producing a slight pressure on the water. This causes the water to circulate more rapidly over the heating surfaces of the boiler, making possible a positive and uniform circulation throughout the entire piping and radiation, and a higher water temperature.

It can be used on any hot water heating system and is suitable for all classes of buildings.

It is the only device providing a positive, interior circulation, making it possible to produce and maintain a pressure of 10 lb. and permitting all water of expansion in excess of 10 lb. to pass readily and freely to the expansion tank. Has no mechanical parts to rust, stick, leak, become useless or cause dangerous pressure.

HONEYWELL HEAT GENERATORS

*Special generators for tank-in-basement method for plants containing 2500 sq. ft. or less of radiation	§Regular generators for tank-in-attic method
No. 11 for 1-story buildings	No. 1 carries up to 1200 sq. ft. of radiation
No. 12 for 2-story buildings	No. 2 carries up to 2500 sq. ft. of radiation
No. 13 for 3-story buildings	No. 3 carries up to 4500 sq. ft. of radiation
	No. 4 carries up to 10,000 sq. ft. of radiation

*Generators can be furnished for plants containing more than 2500 sq. ft. of radiation or for buildings having more than 3 stories.

§For buildings of any height.

Honeywell No. 30 Water Regulator

Furnished in connection with Honeywell tank-in-basement method for preventing boiling of the water.

The weights on the regulator lever can be adjusted to close the drafts at any desired water temperature below 240° F., the boiling point of the Honeywell method. It operates the drafts by means of the water temperature, a more dependable way than regulation by pressure. Desirable house temperatures are assured by installing a regulator of the room control type (described on following page) in connection with the Honeywell water regulator, with which it functions perfectly.

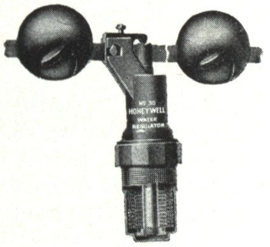


Fig. 4. Honeywell No. 30 Water Regulator

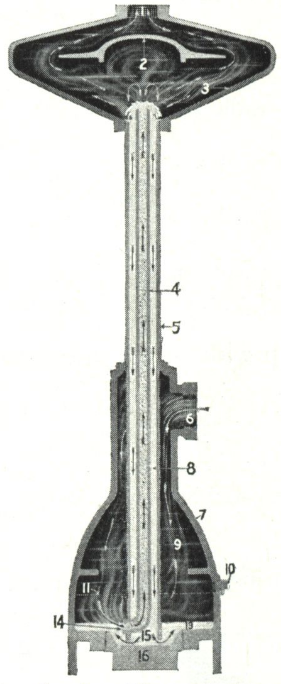


Fig. 1. Section Through Honeywell Heat Generator

When water in plant is cold, mercury (13) lies on bottom of mercury pot (7), all other parts of generator being filled with water. When water begins to expand, it flows into generator at (6), thus exerting a pressure on the mercury and forcing it up through the circulating tube (4). As the mercury rises in the circulating tube, it will lower to a corresponding extent in the mercury pot. When the water has forced the mercury down slightly below the top of inlet (14), it will pass over the mercury and into the circulating tube, constantly carrying a quantity of mercury with it. When water and mercury reach the top of the circulating tube, the water will pass up and around the deflector (2) and out to the opening (1) to the expansion tank. The mercury which is driven upward with the water will return through space (8) thus raising mercury level in mercury pot, and operates in a manner similar to a balanced valve

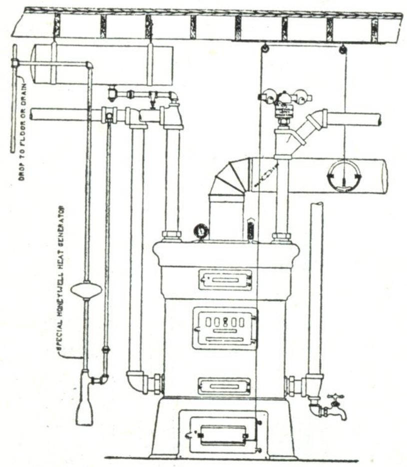


Fig. 2. Honeywell Tank-in-basement Method of Hot Water Heating

This method is employed in bungalows, one-story or flat roof buildings or any building where it is difficult or unsightly to place expansion tank above radiators or where water in tank is liable to freeze

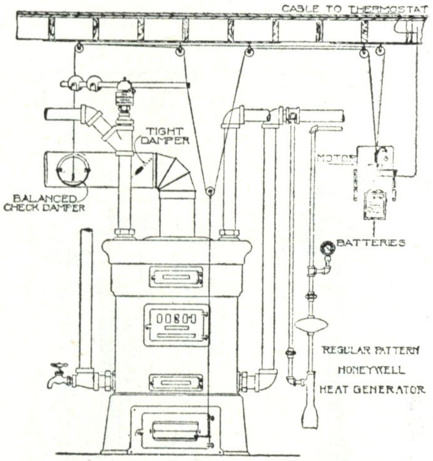


Fig. 3. Honeywell Tank-in-attic Method of Hot Water Heating

This is the regular Honeywell method employed whenever convenient to place expansion tank above the radiators or where there is no danger of water in tank freezing

Continued on next page

Honeywell Room Temperature Regulators

A Honeywell room temperature regulator consists of two units: a thermostat located in the living room and a motor located in the basement and connected to the heater damper.

The thermostat controls the operation of the motor, being extremely sensitive to temperature changes.

Thermostats are furnished in two types—15 to 20-day Type R automatic (Fig. 5), and Plain pattern.

Motors are also furnished in two types—Electric (Fig. 7) and Spring. Any thermostat can be used with any motor, consequently nine different complete combinations are available.

Honeywell temperature regulators may be used in connection with any type of heating plant—warm air, steam, oil or gas.

All wire, chain, brackets, etc. necessary for installation are furnished.

Honeywell Type R Thermostat—

(1) It has a jeweled balanced clock of improved mechanical construction, especially developed for thermostatic control.

- (a) Is a dependable time piece.
- (b) Is not removed for winding.
- (c) Has only one spring to wind.
- (d) Little more than one-half the size of other thermostat clocks.
- (e) Has a day and night indicator on dial.
- (f) Has an improved bezel fastening.
- (g) Is silent in operation.

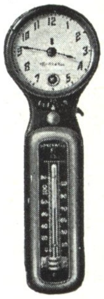


Fig. 5. Honeywell Type R Thermostat

(2) It is beautiful in appearance and simple in design.

(3) A change in temperature of one degree will cause it to function.

(4) It will insure uniform temperature throughout the day and night.

(5) Any change in temperature settings can be made quickly by the owner for either day or night period.

(6) Will automatically raise the temperature to any degree in the morning.

(7) Will automatically lower the temperature to any degree at night.

(8) Any desired time for the morning raising or night lowering of the temperature can be had.

(9) Can be furnished with night cut-out for mild climate.

(10) It has only one moving actuating member.

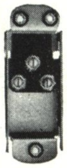


Fig. 6. Wall Plate

(11) The well known Honeywell principle of actuation by gradual cam movement is employed.

(12) Is easily installed, the Honeywell detachable wall plate (Fig. 6) being used.

(13) Ease of adjustment is notable.

(14) An accurate red liquid thermometer is standard equipment.

Honeywell Type Q Plain Pattern Thermostat—This is like the other thermostat types except it has no clock. It is used where clock control is unnecessary.

The indicator is set at all times by hand.

Honeywell Type 6 One-day Thermostat—This is a most dependable instrument. It is equipped with a one-day clock which automatically sets the temperature indicator up in the morning at any predetermined time. It is necessary to wind the clock once every 24 hours and set the indicator back each evening before retiring.

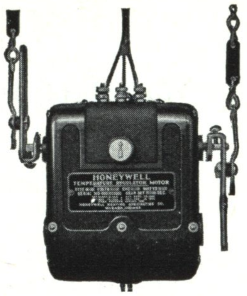


Fig. 7. Honeywell Electric Motor

Honeywell Electric Motor—This is a part of the regulator installed in the basement (Fig. 7).

Its function is to open or close the heater dampers or to control steam, water or gas valves. It is suitable for every residential condition where automatic control is desired.

The new Honeywell Type D Motor is a marvel of simplicity, silent in operation, efficient and neat appearing.

The new motor has no armature, armature windings, commutator, brushes, brush holders, brush holder springs or brush holder bearings to cause expensive servicing and annoyance. Danger from over-oiling has been eliminated entirely—yet sufficient oiling capacity is provided to last for years under normal conditions.

(1) Line voltage is taken into the motor and is automatically reduced to low voltage for the thermostatic circuit.

(2) It lifts 60 pounds.

(3) Gears are packed in pure vaseline.

(4) Remarkably simple and accessible, having only one primary moving part, the rotor.

(5) Noiseless and completely enclosed.

(6) There are no parts to wear out or cause trouble.

(7) The unit weighs approximately 7 pounds.

Honeywell Spring Motor—This type of motor is fitted with a spring of sufficient size to operate the motor from 60 to 75 times on one winding (enough to control the average heating plant from 1 to 2 weeks).

The motor is easily wound from the front and a winding indicator on the front of the motor shows at a glance when the motor needs winding or just how much reserve power the spring contains.

Two ordinary dry cells are required, or city lighting current reduced to 12 volts through our special transformer may be used to trip it.

Honeywell Gravity Motor—In operation, this type is similar to the spring motor, except that the motive power is supplied by a 10-lb. weight. Gives 20 to 25 operations in the average basement on one winding.

Honeywell Electric Motor Switch—Fig. 8 shows one of the many special controlling devices available from the Honeywell line.

The motor switch is fitted with a specially designed snap break switch which controls auxiliary circuits such as fans, motors, etc.

Designed for oil burning apparatus, forced air heating systems or similar fields where a single unit control of dependable design and principle is to be employed.

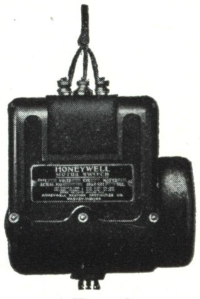


Fig. 8. Honeywell Electric Motor Switch

H. A. THRUSH & CO.

Manufacturers of Hot Water Heating Specialties

PERU, IND.

Products

THRUSH TANK-IN-BASEMENT HOT WATER HEATING SYSTEM, consisting of the following Heating Specialties: THRUSH DAMPER REGULATOR, DIFFERENTIAL PRESSURE RELIEF VALVE, AIRTIGHT PRESSURE TANK, SPECIAL GAUGE and THERMOMETER.

Efficient Hot Water Heating Demands Thrush Heating Specialties

Thrush Hot Water Heating System is a controlled hot water heating system operating under a slight pressure. The expansion or pressure tank and all expansion line equipment are placed close to the boiler in the basement, making installation quick and economical and eliminating all danger of freezing. The saving in labor and material will almost neutralize the added cost of Thrush equipment.

The increased efficiency derived from operating the heating system under a constant pressure with drafts automatically controlled results in hotter radiators, quicker and better circulation and a great saving in fuel.

Thrush Automatic Damper Regulator

This device provides a thoroughly reliable means of automatically closing and opening the draft and check damper to maintain any desired degree of temperature in the water in the system.

It is installed where shown in Figs. 2 and 3.

It operates at a slight change in the temperature of the water *regardless of the pressure in the system*—a more logical and reliable method than regulation by pressure.

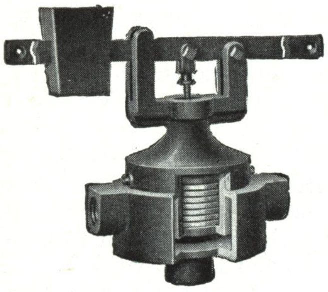


FIG. 1. THRUSH AUTOMATIC DAMPER REGULATOR

The Thrush Regulator consists of a 3-in. multiple disc thermostat which sets in an inner shell surrounded by the hot water leaving the boiler which is contained in an outer shell. The water circulates in this chamber between the inner and outer shells and any change of temperature causes the thermostat to operate the weighted lever which in turn opens or closes the draft door and check damper through the medium of chains.

Since the thermostat consists of six separate units, a defect in one of the units does not destroy the operation of the regulator. Therefore, the thermostat is never out of commission and its action is positive.

Different water temperatures are maintained simply by adjusting the weight on the lever.

The Thrush damper regulator requires no personal attention to insure proper operation, no winding of a motor or clock and no adjustment of a thermostat. There are no electrical connections to get out of order. It insures uniform heating of all radiation in the building and saves fuel.

Tapping is for ¾-in. iron pipe connections, extending from pressure-tank supply pipe down to the return main close to the boiler.

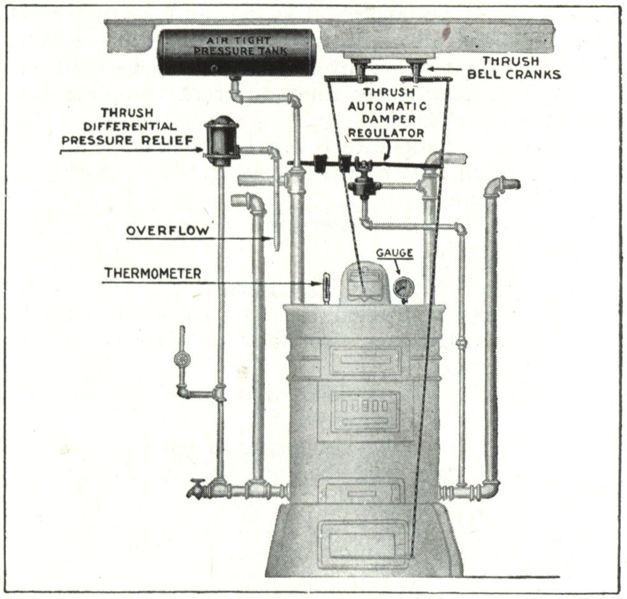

AIR TIGHT PRESSURE TANK
THRUSH BELL CRANKS
THRUSH AUTOMATIC DAMPER REGULATOR
THRUSH DIFFERENTIAL PRESSURE RELIEF
OVERFLOW
GAUGE
THERMOMETER

FIG. 2. PROPER METHOD OF INSTALLING THRUSH HOT WATER HEATING SPECIALTIES WHERE ROUND CAST IRON BOILER IS USED

Thrush Damper Cranks—Furnished with the Thrush damper regulator and take the place of pulleys. With these damper cranks, dampers are always perfectly balanced and the most sensitive operation is had from the regulator (see Figs. 2 and 3).

Thrush Differential Pressure Relief Valve

The function of this device is to maintain a constant predetermined pressure on any make of hot water

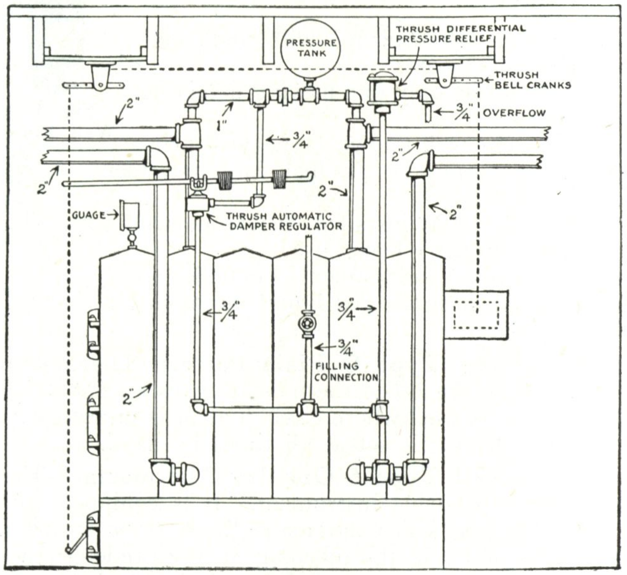


FIG. 3. PROPER METHOD OF INSTALLING THRUSH .HOT WATER HEATING SPECIALTIES WHERE SECTIONAL CAST IRON BOILER IS USED

Continued on next page

heating system and to relieve excess pressure with absolute safety. It is connected to the return near the boiler as shown in Figs. 2 and 3, and operates as explained in Fig. 5.

It is set at our factory to open (or relieve) at various pressures, depending upon the height of the building, and is non-adjustable. It can not fail to operate when the pressure has reached the maximum for which it is set, since the differential ratio between the disc and diaphragm which operates it is 10 to 1, thereby insuring positive overflow (or relief) of excess water in the heating system.

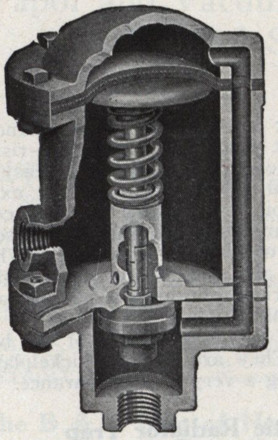


Fig. 4. Thrush Differential Pressure Relief Valve

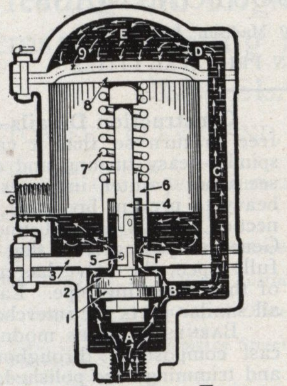


Fig. 5. How the Thrush Differential Pressure Relief Valve Operates

Water enters at "A," passes through opening "B" into by-pass "C" to opening "D" and into top chamber "E." Valve seat is closed tight when not under pressure of the tension of coil spring "7." As pressure accumulates from the system, diaphragm "9" is forced against adjustable plate "8," which pushes down upon valve stem "4." When pressure has become sufficient to counteract the tension of coil spring "7," valve unseats and allows water from chamber "A" to pass out through middle chamber at "G." As pressure recedes, coil spring pulls valve disc back against its seat, when overflow ceases

Dirt or sediment can not accumulate around the valve seat, therefore the latter will always close tight against the water when the pressure in the system has been reduced to the working pressure for which the relief valve is adjusted.

Thrush Pressure Tank

Made of copper bearing steel and tested to withstand not less than 75 lb. of cold water pressure per square inch. There is one 1-in. opening which is for the expansion pipe connection and one ¾-in. opening for drain. Tank is located at any convenient point near boiler. Where possible, it should be connected to the flow mains or out of flow risers from boiler (see Figs. 2 and 3).

Thrush Special Gauge

Indicates the height of the water in the heating system. Has indicators to correspond to height of building heated and is placed on the boiler as shown in Figs. 2 and 3. Has special simplified dial.

Specification

Furnish and install in accordance with diagrams and instructions furnished by the manufacturer, Thrush Hot Water Heating Specialties complete with Pressure Tank, Automatic Damper Regulator, Differential Pressure Relief Valve, Special Gauge and Thermometer. The above equipment to be suitable for the total amount of radiation herein specified and in accordance with the rated capacities as listed by manufacturer.

Radiator Valve and Piping Notes

The following sizes of radiator valves are recommended for the Thrush hot water heating system:

First Floor	
Up to 70 sq. ft. of radiation	¾-in. valve
Up to 125 sq. ft. of radiation	1 -in. valve
Over 125 sq. ft. of radiation	1¼-in. valve
Second Floor	
Up to 25 sq. ft. or radiation	½-in. valve
Up to 90 sq. ft. of radiation	¾-in. valve
Over 90 sq. ft. of radiation	1 -in. valve
Third Floor	
Up to 40 sq. ft. of radiation	½-in. valve
Up to 120 sq. ft. of radiation	¾-in. valve
Over 120 sq. ft. of radiation	1 -in. valve

Radiators in which mains terminate should have one size larger valves. This serves as a distinct aid in circulation because the radiators in which mains terminate serve as a link to joint together the flow and return mains.

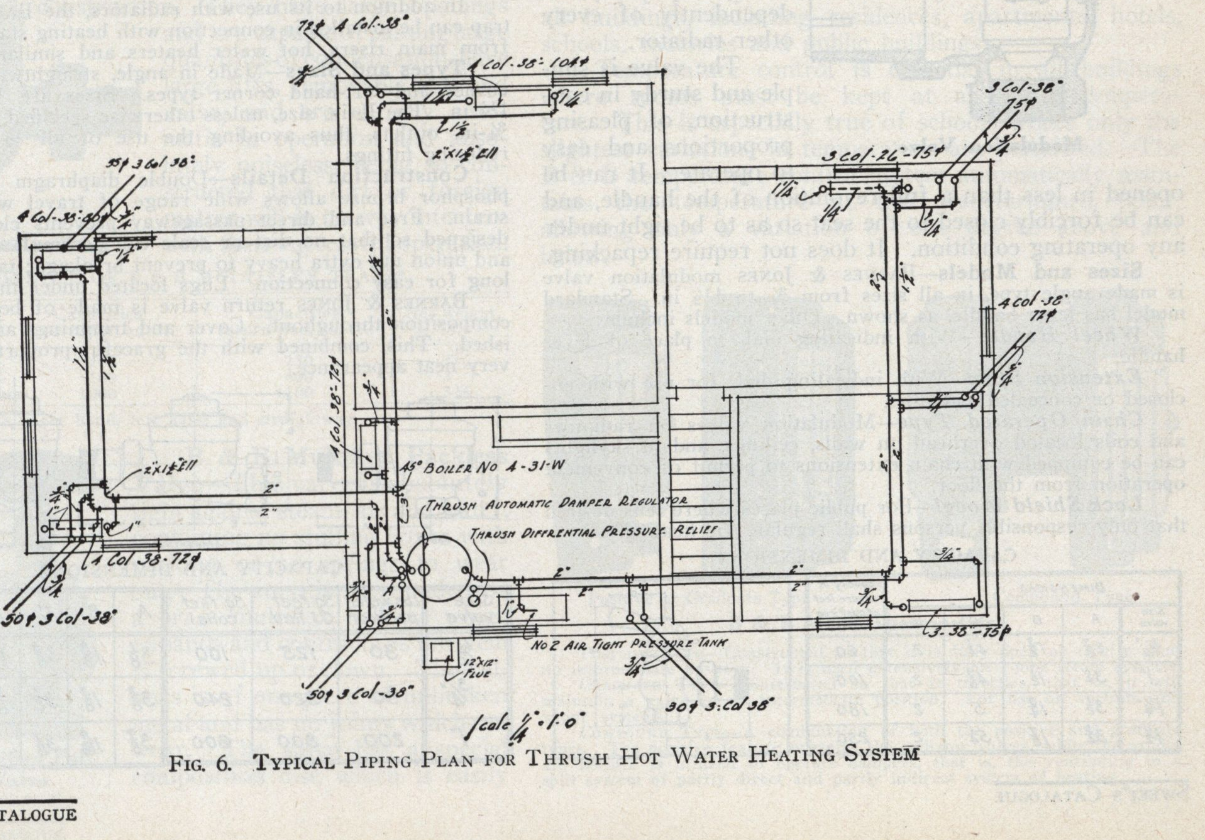


Fig. 6. Typical Piping Plan for Thrush Hot Water Heating System

BARNES & JONES

Modulation, Vapor and Vacuum Heating Specialties

5 Melrose Street, BOSTON, MASS.
New York Office, 300 Madison Avenue
REPRESENTATIVES IN PRINCIPAL CITIES

Products

Barnes & Jones Modulation Systems of Steam Heating, either Vapor or Vacuum, including the following specialties:

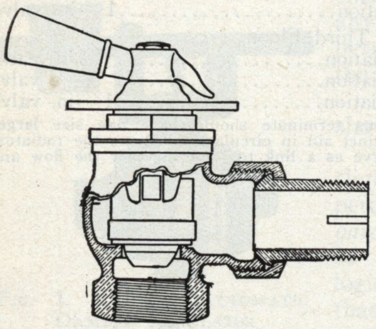
Modulating Radiator Valves.
Thermostatic Radiator Traps.
Condensators (Return Steam Traps).
Blast Traps.
Vent Traps.

Improved Vapor and Vacuum Systems

Barnes & Jones modulation systems, either pressure or vacuum, are applicable to every architectural heating problem from the smallest house to the largest office building. They embody all the general advantages of vapor and vacuum systems with which architects are already familiar. In addition, they have many special advantages in construction and design which have been developed as a result of our 25 years of experience with steam heating problems.

Barnes & Jones Modulation Valve

Designed for use with all Barnes & Jones heating systems, being equally satisfactory with open return line vapor systems or vacuum systems. Barnes & Jones modulation valve completely controls the heat of each radiator, allowing it to be heated wholly or partially, independently of every other radiator.


Modulation Valve

The valve is simple and sturdy in construction, of pleasing proportions and easy to operate. It can be opened in less than a full revolution of the handle, and can be forcibly closed to the seat so as to be tight under any operating condition. It does not require repacking.

Sizes and Models—Barnes & Jones modulation valve is made angle type, in all sizes from ¾ to 1½ in. Standard model has lever handle, as shown. Other models include:

Wheel Handle—With indicating dial, in place of lever handle.

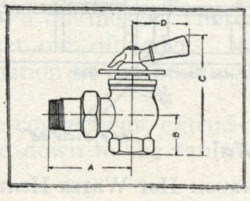
Extension Stem—With indicating dial, for use with enclosed or concealed radiators.

Chain Operated Type—Modulation valves on radiators and coils located overhead on walls, ceilings, and in skylights can be equipped with chain extensions to permit of convenient operation from the floor.

Lock Shield Model—For public places where it is desired that only responsible persons shall regulate the heating.

CAPACITY AND DIMENSIONS

Dimensions					Capacity in square feet of cast iron radiation
Size valve	A	B	C	D	
¾"	2⅞	1⅜	4¼	2	60
1"	3¼	1½	4⅜	2	100
1¼"	3½	1¾	5	2	180
1½"	3¾	1⅞	5¼	2	250

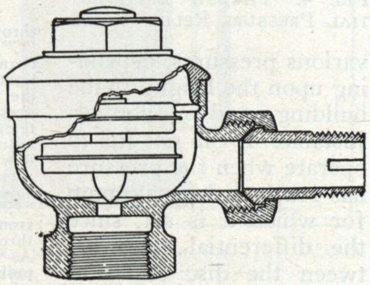


Construction Details—Dark finish coco-bolo wood handle, free to turn so that it can not bind and split. Non-rising spindle—easy turning and quick opening. Large dial—easy to see what pointer indicates. Tail piece and union nut extra heavy to prevent breakage; tail piece made long for easy connection. Lugs located under threads. Renewable disc seat. Generous passages, so that scale or dirt can not lodge. When fully open, the valve has a free area practically equal to that of the connecting pipe. Each part is accurately machined, and all similar parts are interchangeable.

Barnes & Jones modulation valves are made of the best cast composition throughout. They are heavily nickelplated and trimmings are polished, giving a very neat appearance.

Barnes & Jones Thermostatic Radiator Trap

The successful operation of open return line vapor systems and vacuum systems depends in large measure on the efficiency of the radiator traps. These must be sensitive, so as to close in the presence of steam and open as soon as air or water of condensation begins to accumulate. Their action must be independent of pressure conditions.


Thermostatic Trap

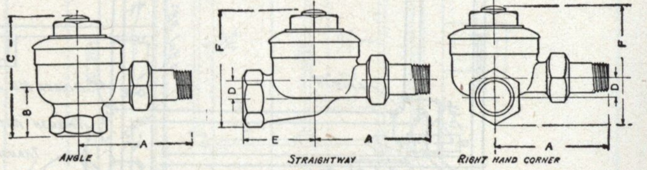
Barnes & Jones radiator trap was designed to meet these requirements. It is of the thermostatic diaphragm type, its moving power being obtained by the expansion and contraction of a volatile liquid enclosed in a hermetically sealed diaphragm. Features of design are the elimination of every unnecessary part; the design and construction of the diaphragm; the free passageway, which prevents clogging; and the liberal proportions of the whole. Each trap is factory adjusted and tested to rigid standards.

In addition to its use with radiators, the Barnes & Jones trap can be installed in connection with heating stacks and drips from main risers, hot water heaters and similar connections.

Types and Sizes—Made in angle, straightway, right-hand corner and left-hand corner types. Sizes are ½, ¾, 1 and 1¼ in. The ½-in. size, unless otherwise specified, is made with ¾-in. outlets, thus avoiding the use of all ½-in. pipe and reducing fittings.

Construction Details—Double diaphragm of tempered phosphor bronze allows wide range of travel with minimum strain. Free and direct passageway prevents clogging. Seat designed so that no dirt or scale can accumulate. Tail piece and union nut extra heavy to prevent breakage; tail piece made long for easy connection. Lugs located under threads.

Barnes & Jones return valve is made of best grade cast composition throughout. Cover and trimmings are highly polished. This, combined with the graceful proportions, gives a very neat appearance.



Angle Straightway Right hand corner

CAPACITY AND DIMENSIONS

Size valve	Lbs. water per hour	Sq. feet C.I Rad.	Sq. feet coils	A	B	C	D	E	F
½"	30	125	100	3⅛	1⅜	3⅜	½	2	3¼
¾"	80	320	240	3⅜	1⅜	3½	⅝	2⅛	3½
1"	200	800	600	3⅞	1 11/16	3⅞			

THE BISHOP & BABCOCK MFG. CO.

MASSACHUSETTS BLOWER COMPANY—SUBSIDIARY

Vapor and Vacuum Heating and High Pressure Steam Specialties; Temperature Control Systems; Ventilating and Exhaust Fans; Air Washers

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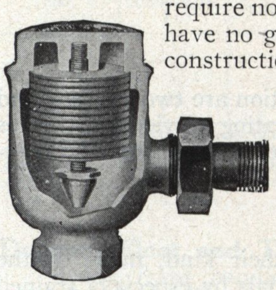
The B & B Line of Heating, Ventilating and Temperature Control Specialties

The Bishop & Babcock Mfg. Co. manufactures the most complete line of heating specialties in the world. Its products comprise all devices and apparatus used in up-to-date vacuum and vapor heating systems and ventilating systems. It is entirely practical for an architect to standardize with B & B heating specialties—every device for the entire system can be a B & B product.

B & B Multiflex Radiator Trap—At the return end of each unit of radiation, drip points, hot water generator and hot blast heaters, there should be installed a Bishop & Babcock water and air relief trap, which is designed to freely permit the water of condensation and air accumulated in the radiation to enter the return line but to always prevent the passage of steam, thereby maintaining the radiation at an efficiency of 100%. These traps are factory adjusted and require no adjustments on the installation, have no gaskets and are of heavy bronze construction. They have large openings and are capable of passing large quantities of condensation, have large lifts, removable seat and valve, and are entirely automatic in operation and absolutely noiseless, being so constructed that dirt or foreign matter will in no way interfere with their successful operation.

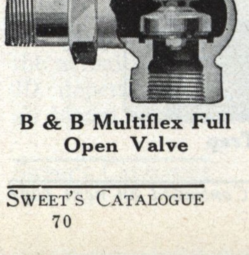


B & B Multiflex Trap

SCHEDULE OF B & B MULTIFLEX TRAPS*

Size	Capacities vacu-vapor, sq. ft.	Capacities return line, sq. ft.	Net weight, lb.
½″ angle	200	250	2½
¾″ angle	500	600	3
1″ angle	1000	1100	3½

*Made angle, right hand, left hand and straightway.



B & B Multiflex Full Open Valve

B & B Multiflex Packless Valve—This valve is absolutely tight against steam, air and water, containing no stuffing boxes with packing or no springs to wear out. The stem is surrounded by a brass multiflex bellows which expands and contracts as the stem is screwed up or down. The bellows is of one piece of unbroken metal and has no joints which can wear. The valve has a special composition disc which is easily removable for repairs. The handle is made of hard rubber composition.

SCHEDULE OF B & B MULTIFLEX FULL OPEN VALVE

Size	Vacu-vapor system, sq. ft.	Return line system, sq. ft.	One-pipe system, sq. ft.	Net weight, lb.
½″ angle	0 to 20	0 to 25	....	2
¾″ angle	21 to 60	26 to 75	....	2½
1″ angle	61 to 120	76 to 150	0 to 30	3
1¼″ angle	121 to 200	151 to 300	31 to 60	6
1½″ angle	201 to 350	301 to 500	61 to 80	7
2″ angle	351 to 450	501 to 650	81 to 130	10

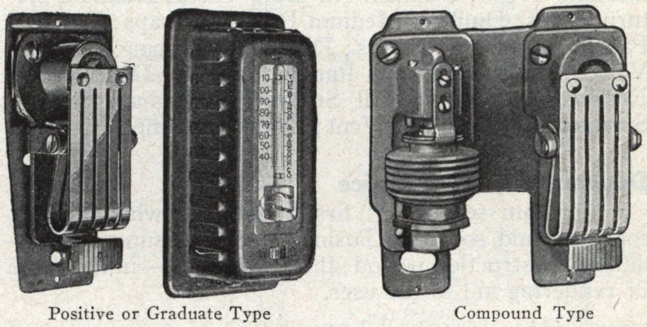
The B & B Multiflex valves are made in all patterns except 1½ and 2 in.

B & B Temperature Control System—Designed for automatically controlling hot air, steam or hot water heating apparatus.

This is accomplished by means of the B & B thermostat which operates the Multiflex supply valves, Multiflex damper motor and dampers with compressed air. The compressed air is furnished by a B & B air compressor and distributed to the various units through the piping.

Adaptability—The B & B system is adapted for all buildings, including residences, apartments, hotels, schools, factories and public buildings.

Temperature control is essential in all buildings where rooms must be kept at an exact temperature. This is especially true of schools where only the slightest variations in temperature are permitted. The B & B temperature control system automatically maintains the temperature at the predetermined point, allowing only a variation of one degree above and below.



Positive or Graduate Type

Compound Type

B & B Metal Thermostats

Positive Type—Constructed so that it is fully open or tightly shut, no intermediate position. It is used extensively on 1-pipe steam systems.

Graduate Type—Constructed so that it throttles, that is, it will maintain a valve in an intermediate position. For use on vacuum and vapor systems.

Compound Type—A combination of both the positive and graduate types. The positive feature operates the radiator valves, while the graduate feature is utilized to operate dampers, that is, the ventilating in a split system of partly direct and partly indirect system of heating

C. A. DUNHAM COMPANY

Makers of the Dunham Radiator Trap and Other Heating Equipment

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Products

Specialties for use in connection with the DUNHAM SYSTEM OF HEATING, known according to its several adaptable forms as the Dunham Home Heating System, the Dunham Return System, the Dunham Vacuum System—all two-pipe systems; and the Dunham Air Line System.

These specialties are:

Dunham Radiator Traps, Dunham Float and Thermostatic Traps; Dunham Air Line Valve; Dunham Return Traps; Dunham Medium Pressure Traps; Dunham Packless Radiator Valves; Dunham Reducing Pressure Valve; Dunham Vacuum Pump Governor; Dunham Air Eliminator; Dunham Oil Separator; Dunham Suction Strainer; Dunham Air Vent; Dunham Damper Control.

Dunham Heating Service

Dunham service is: first, advisory—when making contracts and soliciting business; second, supervisory—during construction period; third, adjustive—in the sense of rendering aid to the user.

The DUNHAM
REG. TRADE-MARK
HEATING SERVICE

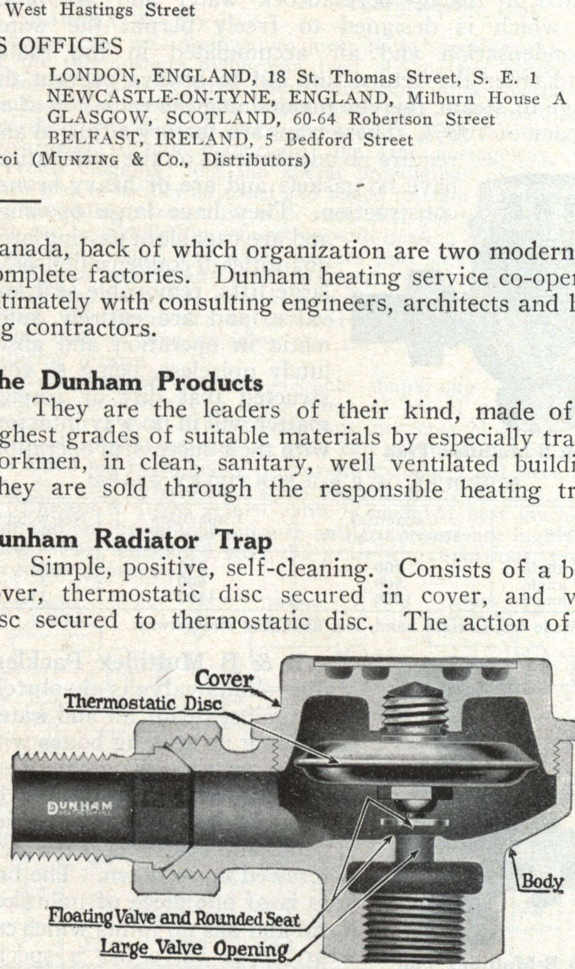
This service is delivered through over 60 branch and local sales offices throughout the United States and Canada, back of which organization are two modern and complete factories. Dunham heating service co-operates intimately with consulting engineers, architects and heating contractors.

The Dunham Products

They are the leaders of their kind, made of the highest grades of suitable materials by especially trained workmen, in clean, sanitary, well ventilated buildings. They are sold through the responsible heating trade.

Dunham Radiator Trap

Simple, positive, self-cleaning. Consists of a body, cover, thermostatic disc secured in cover, and valve disc secured to thermostatic disc. The action of the



Dunham Radiator Trap

Continued on next page

thermostatic disc is positive, and the valve seats squarely, like a globe valve (the tightest of all types), and presents little opportunity for uneven wear. There are no loose parts, no sliding contacts, nothing to gum up or obstruct the liberal valve opening. Standardized throughout, parts are always interchangeable.

The roughing-in dimensions (3¼ in.) from center of trap to end of nipple conform to the standard adopted by the Heating and Piping Contractors National Association.

The function of the Dunham Radiator Trap is to conserve heat, and thus fuel, by keeping radiation and piping at the point of maximum efficiency. To do this, the working part of the trap, *the thermostatic disc,* must be and always is fully exposed to the actual conditions within the radiator, and it therefore responds instantly to any change taking place therein, automatically releasing air and water of condensation and closing to prevent waste of unused steam. It not only saves steam, but clears the space, which should be occupied by steam, from air and water—enemies of high efficiency.

This trap was the first of its kind to be a commercial success, and it has maintained its leadership since 1903. It has therefore stood the test of time.

It is made in 5 sizes, and for steam pressures not to exceed 10 lb. gage.

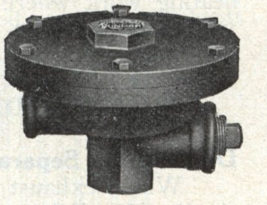
The No. 1 and No. 2 traps are for use principally on radiators; No. 3 for large radiators, for pipe coils and dripping piping; No. 4 and No. 5 for large pipe coils, and dripping small steam mains.

To determine trap capacity for pipe coils reduce actual surface of coil to equivalent square feet of direct cast iron radiation, the unit in which all traps are rated, by multiplying by 1¼.

TABLE A—DUNHAM RADIATOR TRAPS

Size	Pipe connection, in.	Capacity, direct radiation, sq. ft.
No. 1	½	100
No. 2	½	350
No. 3	¾	800
No. 4	¾	1500
No. 5	1	3000

Nos. 1, 2, and 3 traps made in angle, straightway, right-hand, and left-hand pattern—all made in brass and bronze; Nos. 4 and 5 in angle and straightway pattern only and made of iron.



Trap No. 5

Dunham Float and Thermostatic Trap

These traps handle large volumes of water and sudden calls for maximum duty.

They open automatically for water and air and close for steam, and are suitable on either gravity or vacuum heating systems.

They combine the Dunham thermostatic principle with the float. The water is handled by the float operated valve which is so constructed that the opening is always sealed with water with no opportunity for steam leakage. The air is handled by the thermostatic valve.

They may be applied to any type or make of cast iron or pipe coil blast heater. They are unsurpassed for dripping large low pressure steam mains and risers, domestic hot water heaters, dry kilns, milk condensers, evaporators, paper machines, and on any industrial work in which low pressure steam is used as a heating medium.

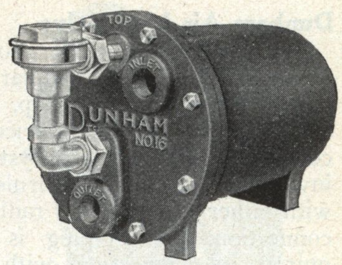
In selecting capacities, be sure to reduce blast coil radiation to equivalent direct radiation by multiplying the actual surface of coil by a factor ranging from 6 to 10, depending on temperature, velocity and volume of air blown over coils.

TABLE B—DUNHAM FLOAT AND THERMOSTATIC TRAPS

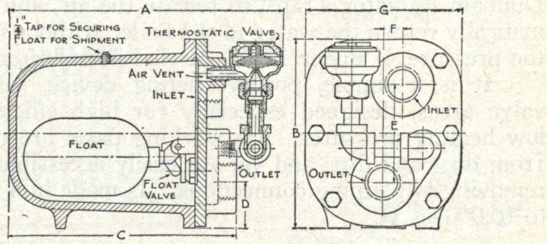
Made only for pressures up to 10 lb. gage

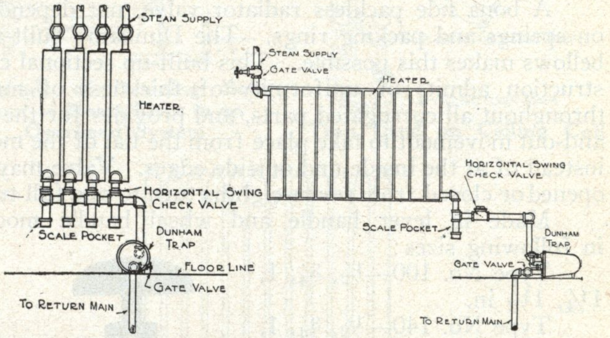
No.	Size of tappings, in.	Capacity rad'n, sq. ft.	Net wt., lb.
22	¾	3,000	14
23	1	4,000	15
16	¾	6,000	25
17	1	7,000	25
18	1¼	9,000	35
19	1½	11,000	35
20	2	16,000	45

Capacities given are based upon a condensation rate of ¼ lb. per sq. ft of cast iron direct radiation per hour at a pressure differential of 1 lb. per sq. in.


TOP
INLET
DUNHAM
NO.16
OUTLET

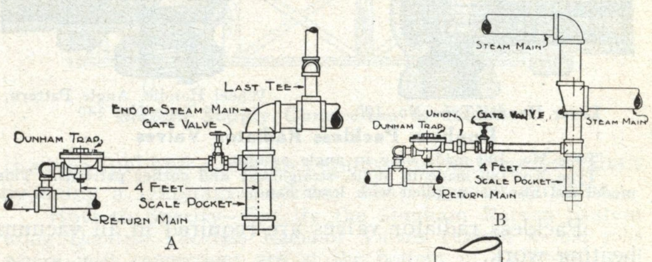
Dunham Float and Thermostatic Trap


A
¼" Tap for Securing Float for Shipment
Thermostatic Valve
Air Vent
Inlet
Float
Float Valve
Outlet
D
C
G
F
Inlet
B
E
Outlet

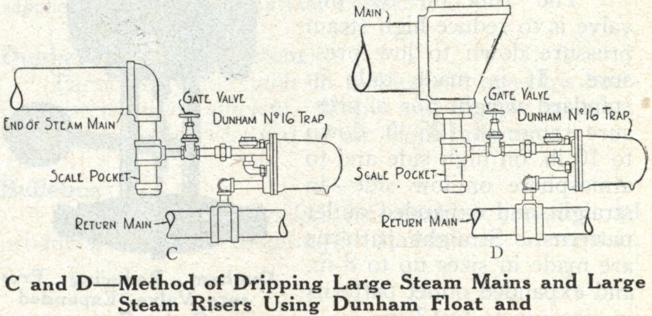

Steam Supply
Heater
Horizontal Swing Check Valve
Scale Pocket
Dunham Trap
Floor Line
Gate Valve
To Return Main
Steam Supply
Gate Valve
Heater
Horizontal Swing Check Valve
Scale Pocket
Dunham Trap
Gate Valve
To Return Main

Method of Connecting These Traps to a Group of Vento Units

On heaters having more than 16 sections in each stack install an additional vent, taking it out of the middle section in each stack connecting each line to a Dunham ¼x¼-in. air line valve. Connect the discharge line from these air line valves into the outlet pipe from the float trap


Last Tee
End of Steam Main
Gate Valve
Dunham Trap
4 Feet
Scale Pocket
Return Main
A
Steam Main
Union
Gate Valve
Dunham Trap
Steam Main
4 Feet
Scale Pocket
Return Main
B

A and B—Method of Dripping End of Steam Main and Rise in Steam Main Using Dunham Thermostatic Trap

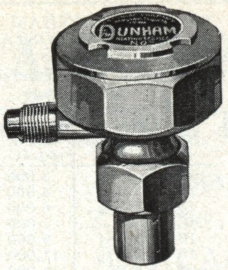

Rise in Steam Main
Steam Main
End of Steam Main
Gate Valve
Dunham No. 16 Trap
Scale Pocket
Return Main
C
Gate Valve
Dunham No. 16 Trap
Scale Pocket
Return Main
D

C and D—Method of Dripping Large Steam Mains and Large Steam Risers Using Dunham Float and Thermostatic Trap

Continued on next page

Dunham Air Line Valve

The principle of operation is identical, and design similar, to the Dunham Radiator Trap. Its efficiency is high and service in connection with air line systems invaluable. Can be furnished with either ⅛ or ¼-in. radiator connection. Air piping is required in connection with its use.



Dunham Air Line Valve

Dunham Return Trap

The Dunham Return Trap is used to separate the air and water discharged into the dry return piping by the Dunham Radiator Traps, to release the air, and to automatically return the water to the boiler without regard to the pressure, if under 10 lb., carried in boiler or system.

It is a simple, positive acting device, with large valve areas, designed especially for high efficiencies at low heating pressures. Its working parts are protected from dust and dirt, and yet are easily accessible without removing any piping connections. Is made in 4 sizes, up to 16,000 sq. ft.

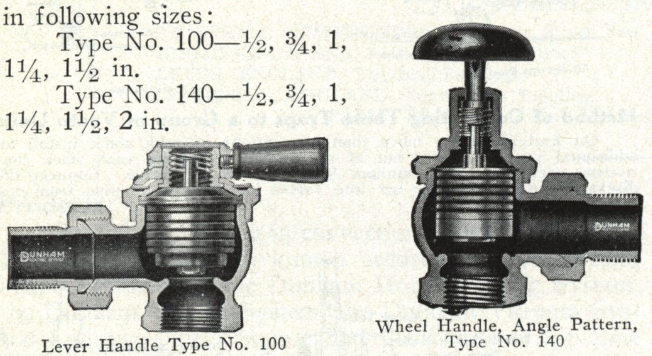
Dunham Packless Radiator Valve

A bona fide packless radiator valve, not dependent on springs and packing rings. The Dunham "built-up" bellows makes this possible. This built-up sectional construction admits of uniformity of thickness of metal throughout all corrugated parts, and provides for the in-and-out movement to take place from the flat of the metal instead of at the inside and outside edges. Valve may be opened or closed from seven-eighths turn to one full turn.

Made in lever handle and wheel handle models in following sizes:

Type No. 100—½, ¾, 1, 1¼, 1½ in.

Type No. 140—½, ¾, 1, 1¼, 1½, 2 in.



Lever Handle Type No. 100

Wheel Handle, Angle Pattern, Type No. 140

Dunham Packless Radiator Valves

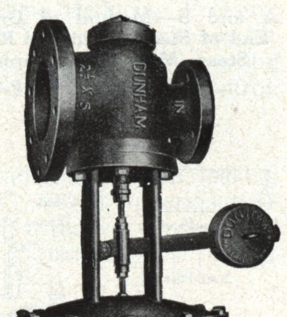
Type No. 100 made only in angle pattern.

Type No. 140 made in angle, straightway and corner patterns. This model can also be supplied with lever handle.

Packless radiator valves are required in all vacuum heating work.

Dunham Reducing Pressure Valve

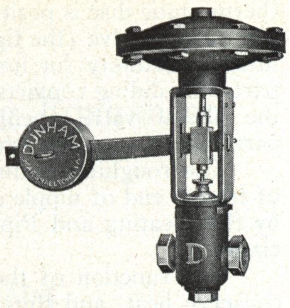
The function of this valve is to reduce high steam pressure down to low pressure. It is made only in standard weight for a pressure range of 125 lb. down to 10 lb. on high side and to atmosphere on low side—in straight and expanded outlet patterns. Straight patterns are made in sizes up to 8 in. and expanded outlet patterns in sizes up to 6x12 in.



Dunham Reducing Pressure Valve, Expanded Outlet Pattern

Dunham Vacuum Pump Governor

Function of this governor is to control steam to a steam driven vacuum pump to operate same so as to maintain a certain vacuum in the suction piping. It is used in maintaining a predetermined amount of vacuum in the return piping of a vacuum heating system. All pipe sizes from ½ to 2 in., inclusive.

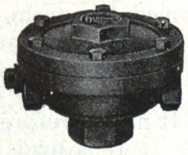


Dunham Vacuum Pump Governor

Dunham Medium Pressure Trap

This embodies the principle so successfully used in the Dunham Radiator Trap and is just as simple and satisfactory. It is used almost exclusively in hospitals and kitchens for dripping sterilizers and steam cooking apparatus, and also in laundries where steam is used at a pressure from zero to 60 lb. gage.

Install at least 4 ft. of connecting piping between the point to be dripped and the trap.



Trap No. 14

TABLE C—DUNHAM MEDIUM PRESSURE TRAPS

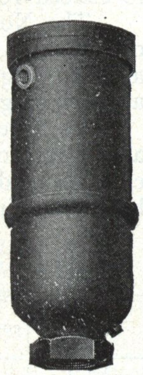
Size	Pipe connection, in.	Capacity, water per hour, lb.	Weight, lb.
No. 13	½	100	4
No. 14	¾	200	15
No. 15	1	400	25

Always state operating pressure when ordering.

Dunham Air Vent

This device is for the purpose of venting air from water that is under pressure. It is particularly adapted to heating work where the steam operated vacuum pump is discharging water of condensation directly back to the boiler.

Capacity for 5000 sq. ft. of radiation.



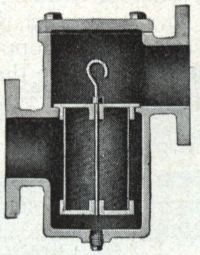
Dunham Air Vent

Dunham Oil Separator

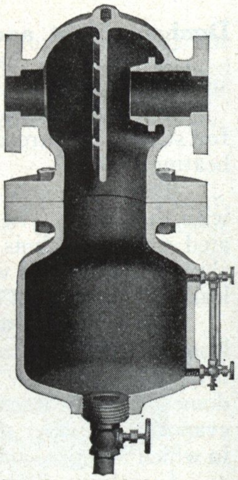
Where exhaust steam is used for heating purposes the heating efficiency of the steam is materially increased by the use of a good oil separator. In fact, with exhaust steam, the use of an oil separator is imperative in best practice. The Dunham Separator is made in all sizes from 1½ to 6 in., horizontal pattern only, with flanged ends.

Dunham Strainer

A strainer is a necessity in protecting the vacuum pump from dirt and scale which otherwise might get into it and cause considerable damage.



Dunham Strainer



Dunham Oil Separator

The Dunham Strainer with its large brass screen basket for catching and holding the dirt, and easily accessible for cleaning, at once commends itself for

Continued on next page

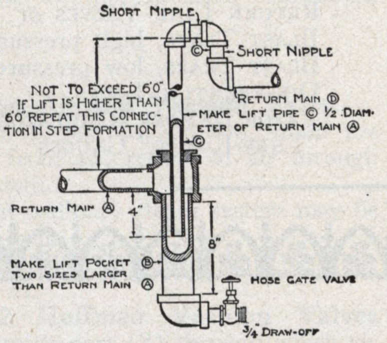
this purpose. It is made in all sizes from ¾ to 6 in.

The Dunham Vacuum System

Since 1903 the Dunham Vacuum System has been a leader and it still stands at the front, easily maintaining its position because of the remarkable success as well as the high efficiency of the Dunham Radiator Trap and allied Dunham specialties.

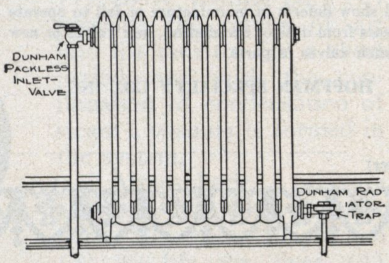
Simplicity is the leading note of Dunham design. There is the system of steam mains and piping to supply all radiation, and the return piping to carry away the air and water of condensation. Steam may be supplied direct from boiler plant or through reducing valve where boiler pressure is too high (over 10 lb. gage) for direct service, or exhaust steam may be used supplemented by live steam through a reducing valve.

The returns all converge and grade to the suction inlet of a vacuum pump, which may be either steam or motor driven, automatically controlled, and which may also act as a boiler feed pump.


SHORT NIPPLE
SHORT NIPPLE
NOT TO EXCEED 6'0" IF LIFT IS HIGHER THAN 6'0" REPEAT THIS CONNECTION IN STEP FORMATION
RETURN MAIN Ⓓ
MAKE LIFT PIPE Ⓒ ½ DIAMETER OF RETURN MAIN Ⓐ
Ⓒ
RETURN MAIN Ⓐ
4"
8"
MAKE LIFT POCKET Ⓑ TWO SIZES LARGER THAN RETURN MAIN Ⓐ
HOSE GATE VALVE
¾" DRAW-OFF

Typical Lift Connection in Return Main

How to Specify—Specify the Dunham Vacuum System using Dunham Packless Radiator Valves and Dunham Radiator Traps in the supply and return connection to and from each radiator (use hot water type radiation, preferably), Dunham Float and Thermostatic Traps for dripping mains and for all blast coils, Dunham Reducing Pressure Valve for reducing steam pressure, or automatically supplementing exhaust steam, Dunham Oil Separator for removing oil and making exhaust steam suitable for efficient heating, Dunham Strainer for keeping dirt and scale from vacuum pump, Dunham Vacuum Pump Governor for automatically starting and stopping the steam driven vacuum pump to maintain desired amount of vacuum in return piping, and Dunham Air Vent for releasing air from the system; each and all to be installed in accordance with instructions to be supplied by C. A. DUNHAM COMPANY.


DUNHAM PACKLESS INLET VALVE
DUNHAM RADIATOR TRAP

Hot Water Type Radiator Equipped with Dunham Trap and Dunham Packless Radiator Valve, Type 100

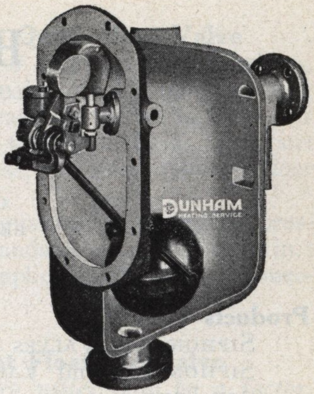
Type 140 valve may be used if desired

The Dunham Return System

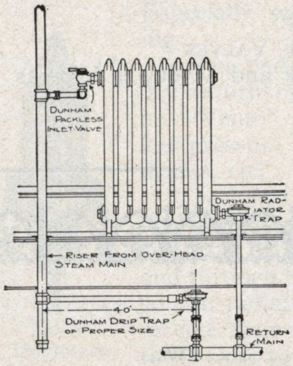
Combines simplicity and ease of operation with high efficiency. Steam is conducted through one system of piping from the boiler to the radiator, where it is retained by Dunham Radiator Traps until it has given off its heat. Then, as water, it passes through the traps, together with the air, and both water and air are conducted through another set of piping back to the Dunham Return Trap, which, independent of the boiler pressure, automatically releases the air out of the system and returns the water to the boiler.

The feature of a positive return under varying steam pressures makes this Dunham System particularly adaptable to apartment houses, small hotels and medium sized commercial buildings, schools and churches.

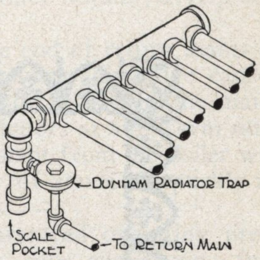
This system now makes it convenient to modernize old heating jobs of the one and two-pipe gravity flow types, increasing their efficiency and insuring positive circulation without the loss of steam.



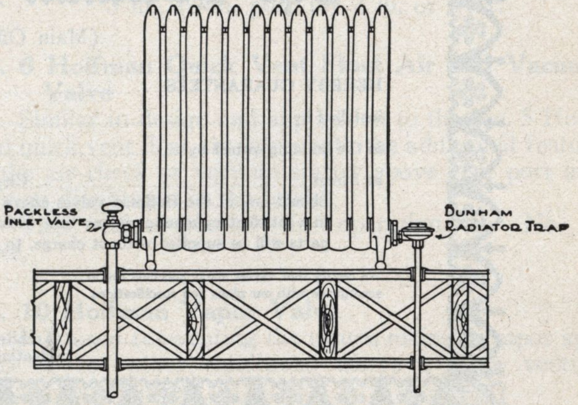
Mechanism of Dunham Return Trap


DUNHAM PACKLESS INLET VALVE
DUNHAM RADIATOR TRAP
RISER FROM OVER-HEAD STEAM MAIN
4'0"
DUNHAM DRIP TRAP OF PROPER SIZE
RETURN MAIN

Methods of Draining Bottom of Steam Riser in an Overhead System


DUNHAM RADIATOR TRAP
SCALE POCKET
TO RETURN MAIN

Trap Used on Ceiling Coil


PACKLESS INLET VALVE
DUNHAM RADIATOR TRAP

Bottom Supply Connection to Radiator

It saves fuel and eliminates sputtering leaking air valves by using a Dunham Radiator Trap at each radiator.

How to Specify—Specify the Dunham Return System using Dunham Packless Radiator Valves (except in old jobs where inlet connections are at the bottom of radiators) and Dunham Radiator Traps in supply and return connections to and from each radiator, and Dunham Return Trap for releasing air and returning water to the boiler; each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. DUNHAM COMPANY.

Dunham Air Line System

Particularly adaptable in making old one-pipe heating systems more efficient. Easily and cheaply installed, and insures quick removal of air from radiators.

Bulletins

Bulletins with detailed information covering all products, including roughing-in dimensions, on request.

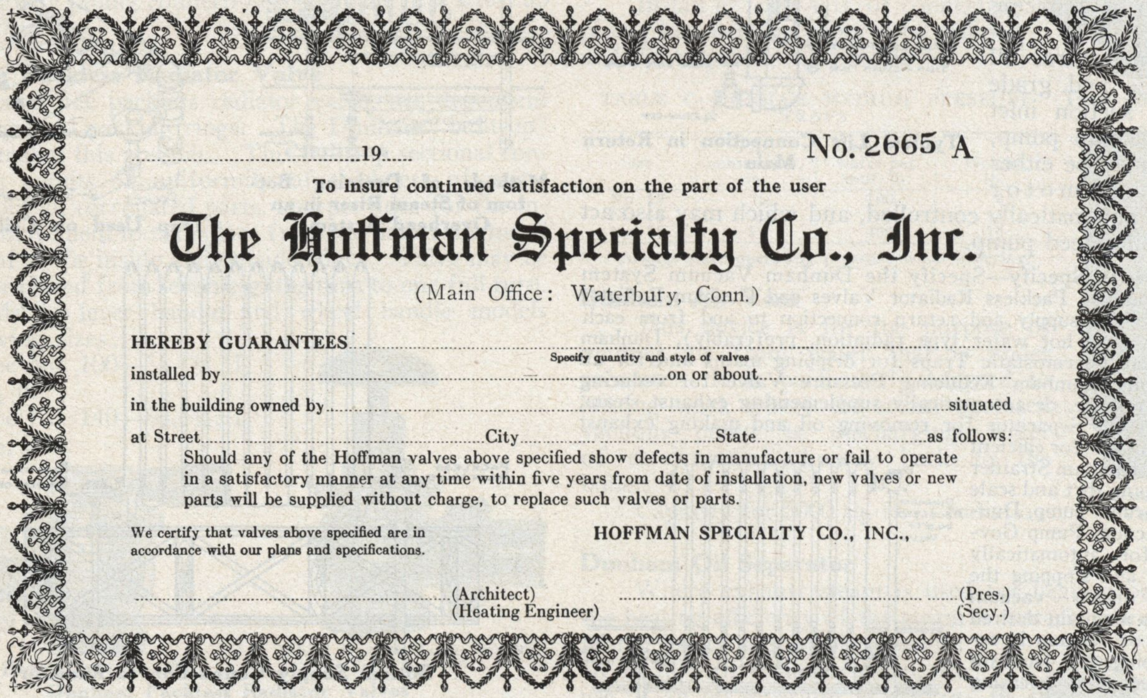
HOFFMAN SPECIALTY CO., INC.

MAIN OFFICE AND FACTORY
WATERBURY, CONN.

GENERAL SALES DEPARTMENT: 25 West 45th Street, NEW YORK, N. Y.
BRANCH OFFICES AND SALES REPRESENTATIVES IN PRINCIPAL CITIES

Products

- Siphon Air Valves
- Siphon Air and Vacuum Valves
- Air Line Valves
- Quick Venting Valves
- Quick Vent Float Air Valves
- Quick Vent Float Air and Vacuum Valves
- Vapor Valves
- Vapor Vacuum Valves
- Adjustable Modulating Valves
- Quick Opening Valves, low pressure
- Return Line Valves or Traps, high pressure
- Return Line Valves or Traps, low pressure
- Blast Traps, high pressure
- Blast Traps, low pressure
- Differential Loops
- Vapor Damper Regulators
- "Ther-Kompo" Gauges



....19......

No. 2665 A

To insure continued satisfaction on the part of the user

The Hoffman Specialty Co., Inc.

(Main Office: Waterbury, Conn.)

HEREBY GUARANTEES ....
Specify quantity and style of valves
installed by .... on or about ....
in the building owned by .... situated
at Street .... City .... State .... as follows:

Should any of the Hoffman valves above specified show defects in manufacture or fail to operate in a satisfactory manner at any time within five years from date of installation, new valves or new parts will be supplied without charge, to replace such valves or parts.

We certify that valves above specified are in accordance with our plans and specifications.

HOFFMAN SPECIALTY CO., INC.,

....(Architect)
(Heating Engineer)

....(Pres.)
(Secy.)

What the Hoffman Guarantee Means

In making the above guarantee the company is obliged to exercise the utmost care in manufacture, testing every individual valve while in process and before shipment, allowing such a factor of safety that the architect has every reason to expect that the life of Hoffman valves which are installed for his client will greatly exceed the period covered by the guarantee.

Stocks Carried Throughout the Country

Hoffman Valves and Controlled Heat Equipment are carried in stock throughout the country by jobbers of heating and plumbing supplies. They are sold at prices which insure the architect and his client the economies that accrue in buying standard merchandise.

Hoffman Valves

Hoffman valves are so designed and constructed that without thought or attention by the user they automatically insure flexibility and economy of operation.

The venting and thermostatic valves are automatic, non-adjustable, and are made entirely of metal, each part of a special alloy best adapted for its particular purpose.

The basic principle used in the design is an all-metal thermostatic member, with one or more flexible diaphrams containing a volatile or heat-sensitive fluid, which causes the valve to act upon slight temperature changes.

The internal fluid pressure in the thermostatic member maintains a constant relationship with the steam pressure throughout the wide pressure range in which they operate.

Air "bottled up" in a heating system has a very important bearing on the effectiveness of the system. By the proper venting of air (including that released by condensation of steam), without steam loss, Hoffman valves greatly increase the thermal efficiency.

Hoffman venting valves are automatic, non-adjustable and guaranteed to properly function for a period of five years from date of installation when installed and operated under conditions for which designed.

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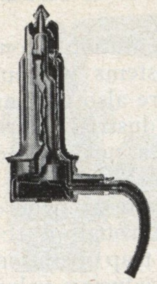


No. 1 Hoffman Siphon Air Valve

No. 1 Hoffman Siphon Air Valve

"The Watchman of the Coal Pile" is designed for low pressure gravity systems. Through its use all air is vented from the radiator without loss of steam, heating efficiency is assured, and leakage from water-logged radiators prevented.

The siphon drains all water from the valve and venting occurs without the slightest "split" even if the radiator is under pressure.

Maximum guaranteed operating pressure, 10 lb.; radiator connection, ⅛ in.

No. 2 Hoffman Siphon Air and Vacuum Valve

Similar to the No. 1, but, in addition, when the radiator is once freed from air, return of air through the vent port is prevented.

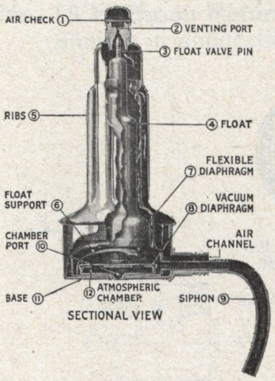
Through its use, an ordinary steam system may be changed into a vacuum type.

Maximum guaranteed operating pressure, 10 lb.; radiator connection, ⅛ in.

How the No. 2 Hoffman Vacuum Valves Operate—Normally venting port (2) through which air escapes from radiator is wide open until steam comes in contact with the float (4). Then the heat sensitive fluid in the float, *the thermostatic member,* is changed to gaseous state expanding the flexible diaphragm (7), raising the float and closing vent port.

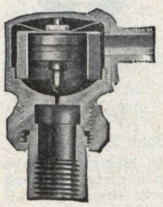
If the radiator is shut off or for any reason steam contact ceases, the diaphragm contracts, and the float drops. The air check (1) above venting port (2) prevents the return of air into the radiator for a short period, and with the continuation of condensation of steam a *vacuum* is formed in the system.

Atmospheric pressure exerted through chamber port (10) causes diaphragm (8) to lift the float (4) causing float valve pin (3) to seal and effectively close venting port (2).



No. 2 Hoffman Vacuum Valve

In other words the air check (1) acts as a vacuum starter preventing the return of air for a short period until sufficient vacuum is formed in the valve to permit the atmospheric pressure acting in chamber (12) to force diaphragm (8) upward, raising the float (4) and doubly closing the vent port.

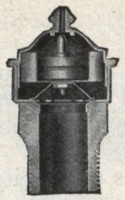


No. 3 Hoffman Air Line Valve

No. 3 Hoffman Air Line Valves

A compact, well constructed valve for air line, or as they are frequently termed, "Paul" systems. It is sensitive in action and closes the instant steam fills the radiator. No adjustment is necessary either before or after installation.

Maximum guaranteed operating pressure, 10 lb.; radiator connection, ⅛ in.; air line connection, ¼ in.



No. 4 Hoffman Quick Vent Valve

No. 4 Hoffman Quick Vent Valve

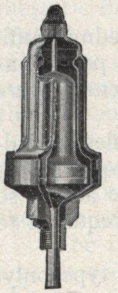
Designed for use in venting risers, ends of steam mains, or for quick venting service where water is *not* a factor. Air is freely vented through a ⅛-in. vent port without steam loss, *but valve does not close against water.*

Maximum guaranteed operating pressure, 10 lb.; standard connection, ¾ in.; can also be supplied with ¼-in. connection.

No. 5 Hoffman Quick Vent Float Air Valve

For quick venting *where water may be a factor.* Especially well adapted for use in venting:

The ends of steam mains; the ends of dry return mains; indirect radiators; blast or "Vento" stacks; hot water generators; low pressure feed water heaters; dryers and drums, etc.



No. 5 Hoffman Quick Vent Float Air Valve

Installed on the end of return mains in one-pipe gravity systems this valve causes steam to first flow to the end of the main, and through the radiators at a uniform rate, so that radiators distant from the boiler will receive their supply of steam as quickly as those close to boiler.

Maximum guaranteed operating pressure, 10 lb.; ⅜-in. pipe connection; furnished with 3/16-in. port for pressures below 3 lb., 1/16-in. port for 3 lb. or over.

No. 6 Hoffman Quick Vent Float Air and Vacuum Valve

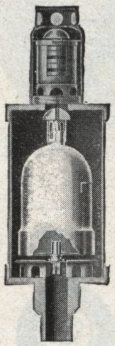
Similar in design and application to the No. 5 Hoffman quick vent float air valve, with the additional feature of the air check or vacuum starter above vent port and vacuum diaphragm in the base.

This valve similar in operation to No. 2 valve.

No. 10 Hoffman Vapor Valve

It is used for venting the return mains in vapor systems or for other conditions where a large venting capacity is required.

The vent port is ¾ in. in diameter.



No. 10 Hoffman Vapor Valve

For preventing the escape of water, the valve has a large buoyant float which has a double valve, one disc controlling a ¾-in. port and the other an auxiliary port 3/16-in. diameter.

When water recedes from the valve and pressure is maintained, the 3/16-in. port is first opened and as the air pressure is relieved, the ¾-in. port opens and full venting area is obtained.

The thermostat is located above the float chamber and controls the vent port upon contact with steam.

The valve is of rugged construction, nickelplated all over.

Maximum guaranteed operating pressure, 15 lb.; ¾-in. pipe connection.

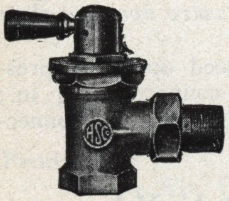
No. 11 Hoffman Vapor Vacuum Valve

Similar in design and application to the No. 10 Hoffman vapor valve, with the additional feature of the air check or vacuum starter above vent port.

Continued on next page

No. 7 Hoffman Adjustable Modulating Valve

This valve is designed for use in vapor or vacuum systems of heating and is usually connected to the top tapping on the end section of a hot water type of radiator.



No. 7 Hoffman Adjustable Modulating Valve

The No. 7 valve has a capacity up to 200 sq. ft. of direct cast iron radiation.

It is so constructed that it may be easily adjusted, after it is installed, so as to limit the flow of steam into the radiator for the size of the radiator to which it is connected, and thus meet any required conditions.

The valve handle may then be turned to admit sufficient steam to heat all of the radiator, or such portion as may be necessary to maintain the desired temperature in the room.

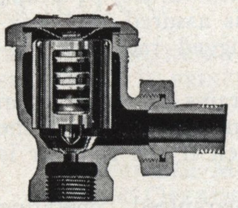
The valve stem stuffing box has a frictionless metallic fiber packing that will last indefinitely requiring no attention, but giving at the same time a valve action so free that the pressure of only one finger is required to open or close the valve.

The No. 7 valve is made in ¾-in. angle type only. Lever handle is standard equipment.

On special orders, wood wheel handles, lock shields, closed tops, extended stems, or chain pull can be furnished.

Nos. 8 and 9 Hoffman Return Line Valves or Radiator Traps

These freely relieve air and condensation from radiators in vapor or vapor vacuum systems without steam loss. They are also used as steam traps in industrial work where pressure does not exceed 50 lb.



Nos. 8 and 9 Hoffman Return Line Valves

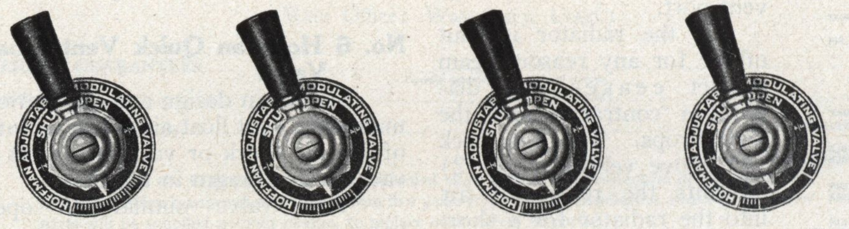
Installed in systems where steam is supplied through a reducing valve, proper trap operation is assured even if reducing valve fails to function and admits high pressure steam to the system, for within its working range, the trap operates with the same degree of sensitiveness.

Hoffman return line valves are absolutely non-adjustable and thermostats can be instantly changed from one body to another; likewise the valve may be used under either high or low pressure without adjusting.

The No. 8 valve is made in ½-in. size only, and is furnished in angle, straightway, right and left-hand offset patterns. The maximum capacity is 200 sq. ft. of direct cast iron radiation. Port diameter, ¼ in. all styles.

The No. 9 valve is made in ¾-in. size *angle pattern only*, and has a maximum capacity of 600 sq. ft. of direct cast iron radiation. ⅜-in. port for pressures under 15 lb.; $\frac{3}{16}$-in. port for higher pressures.

Maximum guaranteed operating pressure, 50 lb.



All Graduations Exposed—200 sq. ft.

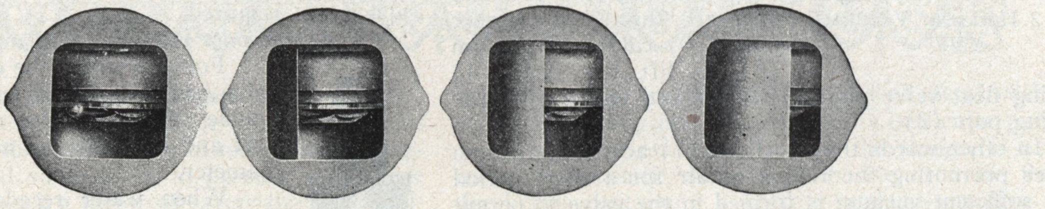
15 Graduations Exposed—150 sq. ft.

10 Graduations Exposed—100 sq. ft.

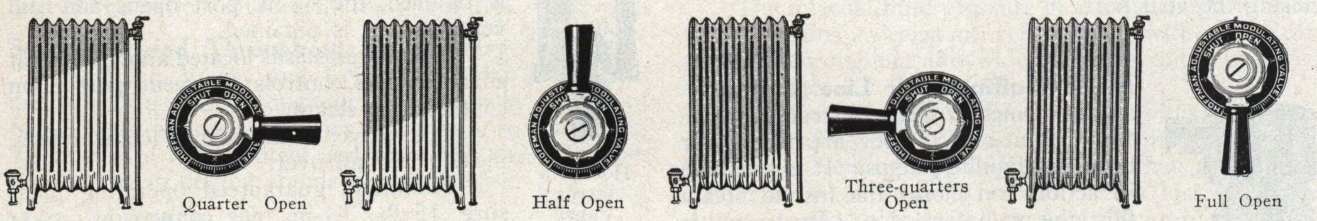
5 Graduations Exposed—50 sq. ft.

Positions of Top Dial Plate on No. 7 Hoffman Adjustable Modulating Valve

For sizes of radiators as indicated



Corresponding Positions of Rotary Sleeve Showing Port Areas for Above Graduations



Quarter Open

Half Open

Three-quarters Open

Full Open

Mild Days

Open the valve so that the pointer is at the ¼ mark. Then there will be just enough heat in the radiator to take the chill off

Average Days

If the valve is opened to the ½ mark the radiator will give plenty of heat for the ordinary winter days

Cold Days

On a really cold day you will need more heat. Turn the valve to the ¾ mark and be perfectly comfortable

Bitter Cold Days

On those raw, biting cold days when the thermometer hangs around zero, open the valve all the way and be snug and warm in spite of all outdoors

Illustrating Complete Range of Modulation Possible with No. 7 Hoffman Adjustable Modulating Valve

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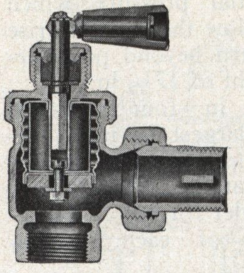
No. 17 Hoffman Lever Handle Supply Valve



No. 17 Hoffman Lever Handle Supply Valve

For vapor or vacuum installations where modulation is not required.

This valve is made in ¾-in. size only; suitable for radiators up to 200 sq. ft.

The valve may be turned from open to shut position or vice versa, with one turn of the lever handle. The valve action is very free, with little friction, due to the novel construction of the disc holder and its extension or lead screw for raising and lowering the disc.

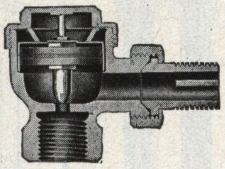
In the No. 17 valve, the stem is not threaded, but is squared on the end, fitting into a square sleeve in the lead screw, the latter being approximately 1⅛ in. in diameter. By turning the stem, the lead screw is rotated and the disc advanced toward its seat or withdrawn from it. The lead screw is a hard drawn brass shell with quadruple rolled threads that engage in the valve body. With this construction, it is possible to make the threads fit closely, thus keeping the surfaces free from dirt and at the same time permitting smooth and easy valve operation.

The packing used in stem stuffing box is metallic fiber.

The No. 17 valve is supplied in lever handle type only. On special orders, wood wheel handles, lock shields, closed tops, extended stems, or chain pull can be furnished.

No. 18 Hoffman Return Line Valve or Radiator Trap

Similar in application to the No. 8 Hoffman return line valve where radiator units are not over 100 sq. ft. direct cast iron radiation and the pressure at the trap does not exceed 15 lb.



No. 18 Hoffman Return Line Valve or Trap

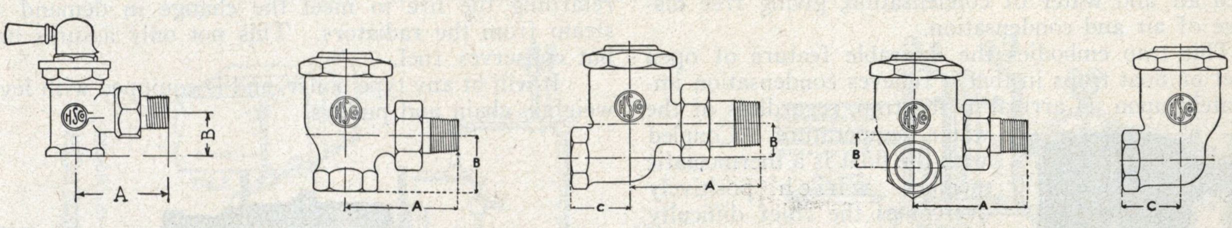
The thermostat consists of one chamber made by two diaphragms separated by a space ring to which they are fastened. In the center of the bottom diaphragm, the valve pin is attached, the joint being expanded and made absolutely tight. The thermostat is held in its cage by a pin expanded and attached to the top diaphragm, this pin extending through the cage and engaging with the boss on the cap.

The thermostat contains a small quantity of thermostatic fluid, sealed under vacuum, insuring extremely sensitive valve action. The fluid is such that its pressure maintains constant relationship with steam pressure, and consistency of valve operation under varying pressure is thus obtained.

The thermostat is made of special Hoffman diaphragm metal that will not soften under repeated action. It will not stretch, causing permanent elongation of the thermostat and resultant closing of the valve port.

The thermostat is held in a cage, the feet of which rest on a shoulder in the valve body. The distance from shoulder to valve seat is very accurately controlled in machining the body and also the distance from the feet of the cage to the seating surface in the valve pin, thus making all thermostats have uniform valve travel. The thermostats are interchangeable without requiring adjustment and will operate with the same degree of sensitiveness.

Maximum guaranteed operating pressure, 15 lb.



Hoffman Valve Measurements

DIMENSIONS OF NOS. 7, 8, 9, 17 AND 18 VALVES

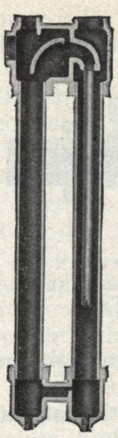
Style	Size, in.	Diameter valve port, in.	Maximum capacity, sq. ft.	Dimensions, in.		
				A	B	C
No. 7 Angle	¾	....	200	2⅞	1⅜	...
No. 17 Angle	¾	....	200	2¾	1½	...
No. 8 Angle	½	¼	200	2 23/32	1 9/32	...
No. 8 Straightway	½	¼	200	2 23/32	25/32	1 13/32
No. 8 Offset	½	¼	200	2 23/32	25/32	1 5/16
No. 18 Angle	½	¼	100	2¾	1¼	...
No. 18 Straightway	½	¼	100	2¾	⅞	1⅜
No. 18 Offset	½	¼	100	2¾	⅞	1⅜
No. 9 Angle	¾	⅜*	600	3 3/32	1 11/32	...

*No. 9 Valve furnished with 3/16-in. port for pressure above 15 lb.

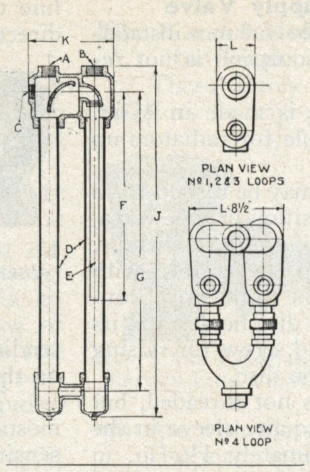
Continued on next page

Hoffman Differential Loop

The "Watchman of the Water Line." An extremely simple, yet efficient device, which prevents water from backing up in the return main, and at the same time maintains a constant differential pressure, between steam and return mains whenever pressure exceeds a predetermined amount. In standard Nos. 1 and 2 loops, usual pressure at which the loop operates is 10 ounces. With 10-ounce loops there will be no loop action until boiler pressure exceeds 10 ounces. The pressure causes the water to rise in vertical part of return main 17½ in. above boiler water line. Further rise is not permitted, for the water column in the loop which normally seals connection between steam and return main permits a small quantity of steam to "blow over" into return main, closing a thermostatic vent, compressing the air in return main and building up a differential pressure which does not allow the water to rise in the return beyond predetermined height of 17½ in.



Hoffman Differential Loop



Hoffman Differential Loop.

Made in four standard sizes, the largest having a capacity up to 15,000 sq. ft. of direct radiation. Larger sizes made to order for individual requirements of each installation.

Hoffman differential loops are sold as a part of "Controlled Heat" equipment.

Nos. 1 and 2 loops should not be used where low point in dry return is less than 24 in. above boiler water line; with Nos. 3 and 4 loops, at least 30 in.

DIMENSIONS AND CAPACITIES OF LOOPS (INCHES)

Loop No.	A	B	C	D	E	F	G	J	K	L	Capacity sq. ft. rad.
1	¾	1¼	1¼	1½	½	18¼	26	30⅝	7⅝	3	2000
2	¾	1¼	1¼	1½	¾	18¼	26	30⅝	7⅝	3	3500
3	¾	1½	1½	2	1	25	32	37¾	10	3¾	7500
4	¾	2	2	2	1	25	32	37¾	10	8½	15000

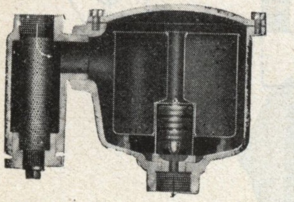
No. 12 Hoffman Blast Trap

Especially well adapted for draining condensation from: Indirect radiators; blast or "Vento" stacks; ends of steam mains and risers; dryers and drums; hot water generators; laundry machinery; unit heaters, etc.

This valve will take care of large amounts of condensation.

In functioning, it distinguishes between steam heated air and water of condensation, giving free discharge of air and condensation.

This trap embodies the desirable feature of open bucket or float traps in that it relieves condensation immediately upon its arrival at the trap, regardless of the water temperature. Coupled with the float is a thermostatic member, which positively overcomes the chief difficulty with float traps by automatically relieving air as well as condensation from the system.



No. 12 Hoffman Blast Trap

Normal position of valve is open, and this is held until steam reaches it, when closure takes place. If small quantities of condensation flow to trap, the thermostat functions and relieves the water, but if larger amounts of condensation, beyond the capacity of the thermostat reach trap, the float lifts thermostat from its seat and maximum capacity is obtained.

NOMINAL CAPACITIES NO. 12 HOFFMAN BLAST TRAPS

Pressure, lb. per sq. in.	½	1	2	3	4	5
Capacity, lb. per hour	800	1,000	1,500	1,800	2,000	2,500
Capacity in sq. ft. of radiation on the basis of ¼ lb. of condensation per hr. per sq. ft.	3,200	4,000	6,000	7,200	8,000	10,000

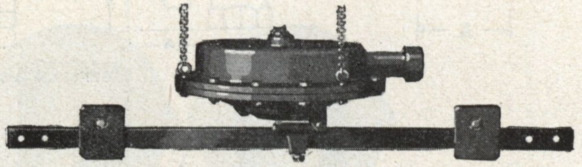
Maximum guaranteed operating pressure, 30 lb.
Capacities for over 5-lb. pressure furnished on application.

Hoffman Damper Regulator

The new Hoffman damper regulator, with its compensating or balancing plate, is like a pair of scales. It is practically frictionless, remarkably sensitive and operates on slight changes in pressure.

It is automatic in operation and after it has once been set at the desired pressure requires no attention. It controls the dampers, and responds immediately when any radiator valve is turned on or off, accelerating or retarding the fire to meet the change in demand for steam from the radiators. This not only assures heat, but conserves fuel.

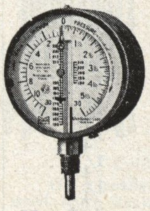
It will fit any type boiler, and is equipped with lever, weights, chain and pulleys.



Hoffman Damper Regulator

Hoffman Ther-Kompo-Gage

Measures pressure up to 30 lb., vacuum to 30 in., and temperature to 225°. Pressure is registered in ounces up to 5 lb. Vacuum is shown in half inches up to 10 in.

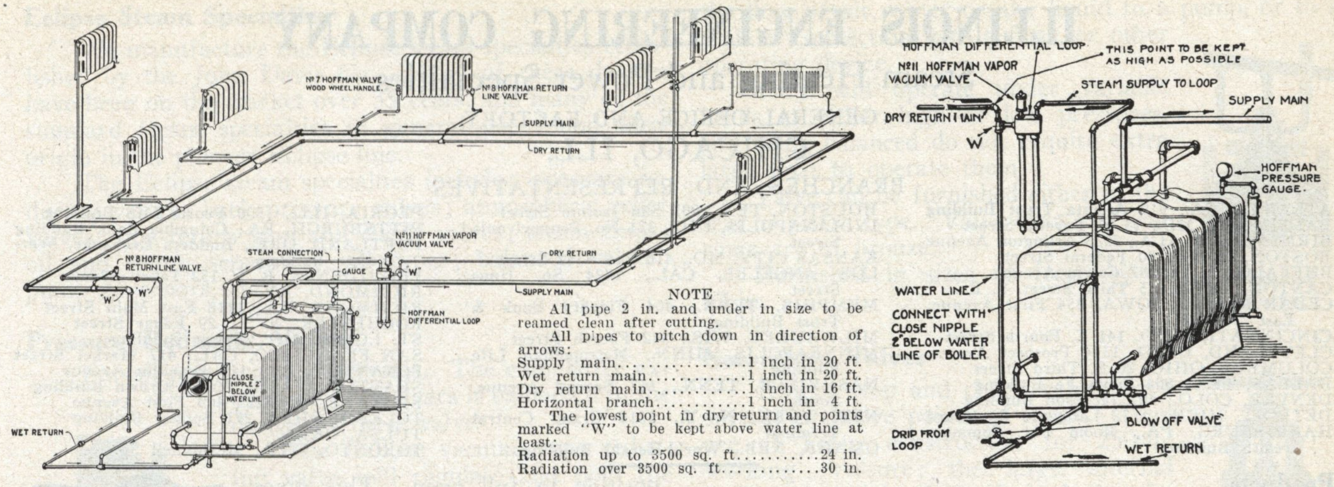


Hoffman Ther-Kompo-Gage

Temperature of steam or vapor being generated in the boiler is indicated on the thermometer.

Used in Hoffman "Controlled Heat" installations or in one-pipe gravity vacuum systems equipped with No. 2 valves; indicates efficiency of the apparatus when a warm house is maintained with vapor at a temperature considerably below 212°.

Continued on next page


Nº 7 HOFFMAN VALVE WOOD WHEEL HANDLE.
Nº 8 HOFFMAN RETURN LINE VALVE
SUPPLY MAIN
DRY RETURN
Nº11 HOFFMAN VAPOR VACUUM VALVE
STEAM CONNECTION
GAUGE
"W"
Nº 8 HOFFMAN RETURN LINE VALVE
"W"
"W"
DRY RETURN
SUPPLY MAIN
HOFFMAN DIFFERENTIAL LOOP
CLOSE NIPPLE 2" BELOW WATER LINE
WET RETURN
HOFFMAN DIFFERENTIAL LOOP
THIS POINT TO BE KEPT AS HIGH AS POSSIBLE
Nº11 HOFFMAN VAPOR VACUUM VALVE
STEAM SUPPLY TO LOOP
DRY RETURN MAIN
W
SUPPLY MAIN
HOFFMAN PRESSURE GAUGE.
WATER LINE
CONNECT WITH CLOSE NIPPLE 2" BELOW WATER LINE OF BOILER
BLOW OFF VALVE
DRIP FROM LOOP
WET RETURN

NOTE

All pipe 2 in. and under in size to be reamed clean after cutting.

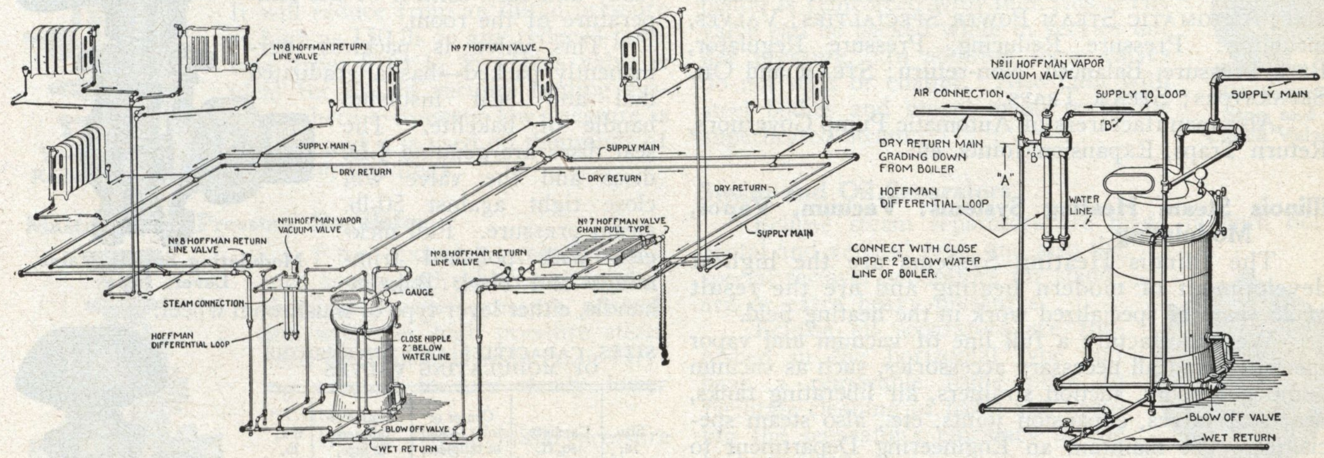
All pipes to pitch down in direction of arrows:

Supply main..................1 inch in 20 ft.
Wet return main..............1 inch in 20 ft.
Dry return main..............1 inch in 16 ft.
Horizontal branch............1 inch in 4 ft.

The lowest point in dry return and points marked "W" to be kept above water line at least:

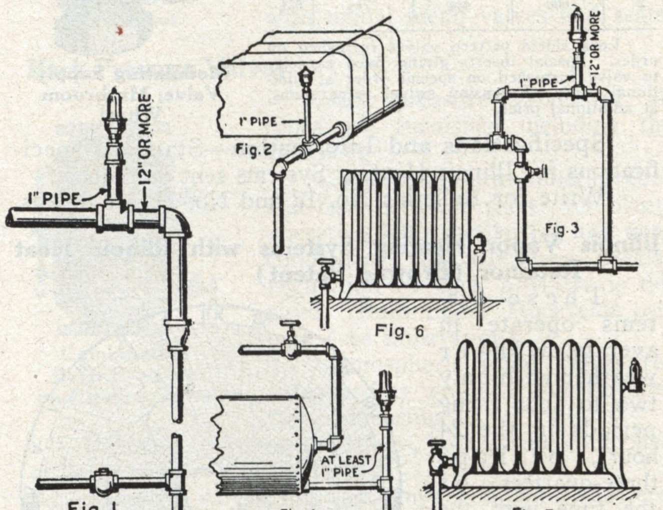
Radiation up to 3500 sq. ft..........24 in.
Radiation over 3500 sq. ft...........30 in.

Typical Method of Installing Hoffman Equipment on Sectional Boilers


Nº 8 HOFFMAN RETURN LINE VALVE
Nº 7 HOFFMAN VALVE
SUPPLY MAIN
DRY RETURN
SUPPLY MAIN
DRY RETURN
Nº11 HOFFMAN VAPOR VACUUM VALVE
Nº 8 HOFFMAN RETURN LINE VALVE
Nº 7 HOFFMAN VALVE CHAIN PULL TYPE
Nº 8 HOFFMAN RETURN LINE VALVE
STEAM CONNECTION
GAUGE
HOFFMAN DIFFERENTIAL LOOP
CLOSE NIPPLE 2" BELOW WATER LINE
BLOW OFF VALVE
WET RETURN
Nº11 HOFFMAN VAPOR VACUUM VALVE
AIR CONNECTION
SUPPLY TO LOOP
SUPPLY MAIN
"B"
"B"
DRY RETURN MAIN GRADING DOWN FROM BOILER
"A"
HOFFMAN DIFFERENTIAL LOOP
WATER LINE
CONNECT WITH CLOSE NIPPLE 2" BELOW WATER LINE OF BOILER.
BLOW OFF VALVE
WET RETURN

Typical Method of Installing Hoffman Equipment on Round Boilers

HOFFMAN "CONTROLLED HEAT" EQUIPMENT—TYPICAL INSTALLATIONS


1" PIPE
12" OR MORE
Fig. 1
1" PIPE
Fig. 2
1" PIPE
12" OR MORE
Fig. 3
AT LEAST 1" PIPE
Fig. 4
Fig. 5
Fig. 6

SOME METHODS OF APPLICATION OF HOFFMAN QUICK VENT VALVES

Fig. 1 shows correct application of Nos. 4 or 5 Hoffman valves for venting end of steam or return main.

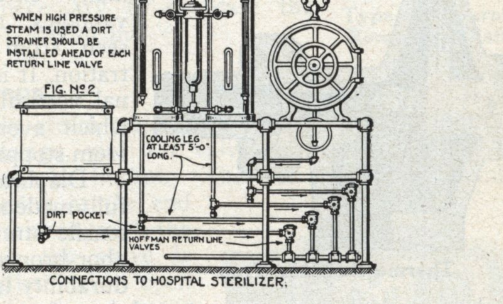
Fig. 2 shows correct application of Nos. 4 or 5 Hoffman valves for venting indirect radiator.

Fig. 3 shows correct application of No. 5 Hoffman valve for venting false waterline loop providing by-pass for draining or cleaning.

Fig. 4 shows correct application of Nos. 4 or 5 Hoffman valves for venting steam coil in storage tank.

Fig. 5 shows a No. 1 Hoffman valve on steam radiator in one-pipe gravity system.

Fig. 6 shows a No. 3 Hoffman air line valve installed on air line system of either gravity or vacuum type


WHEN HIGH PRESSURE STEAM IS USED A DIRT STRAINER SHOULD BE INSTALLED AHEAD OF EACH RETURN LINE VALVE
FIG. Nº 2
COOLING LEG AT LEAST 5'-0" LONG.
DIRT POCKET
HOFFMAN RETURN LINE VALVES

CONNECTIONS TO HOSPITAL STERILIZER.

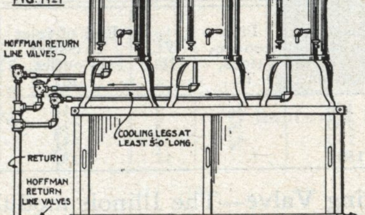


FIG. Nº 1
HOFFMAN RETURN LINE VALVES
COOLING LEGS AT LEAST 5'-0" LONG.
RETURN
HOFFMAN RETURN LINE VALVES

CONNECTIONS TO KITCHEN & RESTAURANT FIXTURES.

ILLINOIS ENGINEERING COMPANY

Steam Heating and Power Specialties

GENERAL OFFICE AND FACTORY
CHICAGO, ILL.

BRANCHES AND REPRESENTATIVES

ATLANTA, GA., 919 Atlanta Trust Building
BALTIMORE, MD., 15 E. Fayette Street
BIRMINGHAM, ALA., 2233 Arlington Avenue
BOSTON, MASS., 80 Federal Street
BUFFALO, N. Y., 287 Colvin Avenue
CANTON, OHIO, 915 Third Street, S. E.
CEDAR RAPIDS, IOWA, 854 First Avenue, East
CINCINNATI, OHIO, 141 E. Fourth Street
CLEVELAND, OHIO, 1514 Prospect Avenue
COLUMBUS, OHIO, 20 S. Third Street
DALLAS, TEX., 804 Santa Fe Building
DENVER, COLO., 401 Jacobson Building
DETROIT, MICH., 1772 Lafayette Boulevard
HARRISBURG, PA., Room 311 Commonwealth Building
HOUSTON, TEX., 905 San Jacinto Street
INDIANAPOLIS, IND., 321 No. Pennsylvania Street
KANSAS CITY, MO., 410 East 43rd Street
LOS ANGELES, CAL., 1824 So. Hope Street
MEMPHIS, TENN., 404 Fidelity Bank & Trust Building
MILWAUKEE, WIS., 342 Fourth Street
MINNEAPOLIS, MINN., Metropolitan Life Building
NASHVILLE, TENN., 167 Second Avenue, South
NEW YORK, N. Y., 3514 Grand Central Terminal
OMAHA, NEB., World-Herald Building
PEORIA, ILL., 1500 Peoria Life Building
PITTSBURGH, PA., Columbia Bank Building
PORTLAND, ORE., Builders Exchange, Worcester Building
PROVIDENCE, R. I., 152 Taber Avenue
RICHMOND, KY.
RICHMOND, VA., 1118 East Main Street
ROCHESTER, N. Y., 29 Edgar Street
ST. LOUIS, MO., Tower Building
SAN FRANCISCO, CAL., 417 Market Street
SCRANTON, PA., 119 Franklin Avenue
SEATTLE, WASH., 309-10 Crown Building
SPOKANE, WASH., 409 First Avenue
TOLEDO, OHIO, 271 Spitzer Building
TULSA, OKLA.
TORONTO, ONT., McDonnell Square

Products

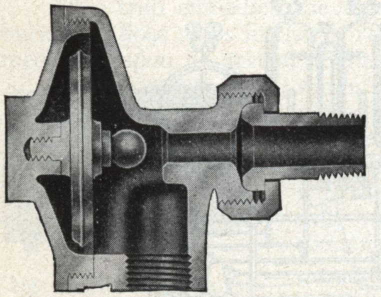
Vacuum and Vapor Heating System Specialties; Automatic Steam Power Specialties; Valves, including: Pressure Reducing, Pressure Regulator, Back Pressure, Balanced, Non-return; Steam and Oil Separators; Steam Traps.

Also manufacturers of Automatic Pump Governors, Return Traps, Expansion Joints, etc.

Illinois Steam Heating Systems: Vacuum, Vapor, Modulating

The Illinois Heating Systems are the highest development of modern heating and are the result of 25 years of specialized work in the heating field.

We manufacture a full line of vacuum and vapor specialties and all necessary accessories, such as vacuum pump governors, suction strainers, air liberating tanks, vent seal valves, expansion joints, etc., also steam specialties. We maintain an Engineering Department to assist engineers and users in the proper installation and operation of our devices.



Thermo Radiator Trap

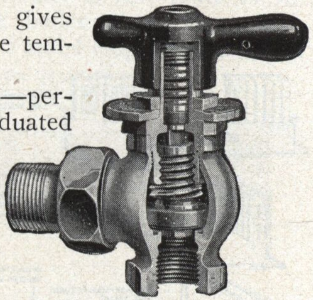
Thermo Radiator Trap—All Illinois systems, whether vacuum or vapor, use our Thermo trap on all radiators. It has many exclusive advantages, as can be seen from the illustration. It is the original vertical seat trap, which avoids trouble from stoppage by dirt.

Diaphragm is carefully made of 90,000-lb. tensile strength phosphor-bronze and the durability is such that, under our three-year guarantee, the number of renewals is practically nil. The margin of strength is such that the Thermo trap will operate on 75-lb. steam pressure. The Thermo trap is sensitive and positive in operation.

SIZES, CAPACITIES AND DIMENSIONS OF THERMO TRAPS

No.	Size, in.	Capacity, sq. ft., direct radiation	Pipe connections, in.	Wt., lb.	End of inlet to center of outlet, in.	Center of inlet to face of outlet, in.
1	½	100	½	2	2½	1¾
2	½	200	½	3	2½	1¾
3	¾	750	¾	4	2¾	2½
4	1	1500	1	17	1¾	3¼

Modulating Valve—The Illinois modulating supply valve controls the supply of steam to the radiator by only a half turn of the handle from the closed position to full open. This gives ready and easy control of the temperature of the room.



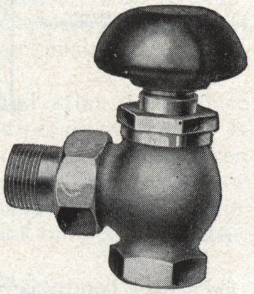
Modulating Supply Valve, Lever Type

This valve is packless—permanently packed—has a graduated dial and heat insulated handle of bakelite. The seat discs are genuine J.D. discs and the valve will close tight against 50-lb. steam pressure. Full nickeled with polished trimmings and black Bakelite handle, either lever type or mushroom wheel.

SIZES, CAPACITIES AND DIMENSIONS OF MODULATING VALVES

Size, in.	Capacity, sq. ft.	Center of inlet to end of tailpiece, in.	Center of tailpiece to face, in.	Wt., lb.
¾	100	2⅝	1⅜	2
1	200	3⅛	1 9/16	2¾
1¼	300	3½	1¾	4½
1½	400	4	2	5
2	600	4¾	2⅜	6½

Lock shield pattern valves furnished on order. Special inserts giving fixed capacity to valve furnished on special order at additional price. Extension swivel valve stems, at additional price.



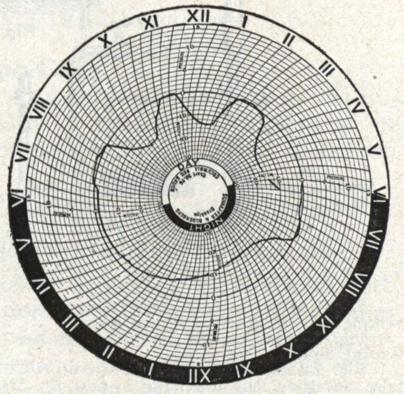
Modulating Supply Valve, Mushroom Wheel

Specifications and Information—Standard specifications for Illinois Heating Systems sent on request.

Write for Bulletins No. 12 and No. 21 for details.

Illinois Vapor Heating Systems with Illinois Heat Retainor (Browne Patent)

These systems operate in average winter weather with only two to four firing periods in the 24 hours, perhaps three-quarters of the time with the boiler under vacuum. The radiators remain warm during long intervals between firing periods. This results in a marked fuel economy, exclusive to Illinois Systems.



Recording Chart

Shows records of operating conditions of pressure and vacuum for 24 hours on an Illinois system. It shows that system was under vacuum for 20 hours out of 24

Continued on next page

Eclipse Steam Specialties

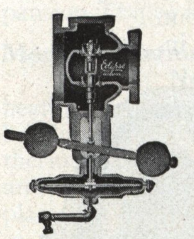
We manufacture the Eclipse steam specialties established by the John Davis Co. Many of these devices have been on the market over 35 years, and many of the standard steam specialties in general use found their origin in the pioneer Eclipse line.

The Eclipse steam specialties include: pressure reducing valves; back pressure valves; atmospheric relief valves; non-return stop and check valves; steam traps; oil and steam separators, all types; balanced valves; pump governors, etc.

Pressure Reducing Valves

For all pressures and services. The cumulative experience of 35 years is embodied in the design of these valves.

The Eclipse vacuum type reducing valve will regulate and hold the reduced pressure within a 4-oz. limit. It will reduce from an initial pressure as high as 150 lb. to any reduced pressure from 5 to ¼ lb. This valve is ideal for use in vacuum heating systems where a constant low pressure is desired, and it is used on thousands of important buildings.

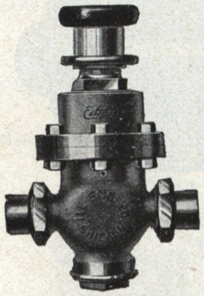


Vacuum Type Reducing Valve

Master Type Pressure Regulator

For exacting requirements, such as tire and rubber vulcanizing, chemical process pressure control, and wherever high pressure steam must be accurately reduced in varying amount to any steady lower pressure.

It will reduce initial pressure up to 300 lb. down to any lower pressure greater than 5 lb., and does not build up pressure on a closed or dead end line. Made of bronze with monel metal valves and seats.



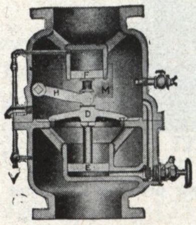
Pressure Regulator

Back Pressure Valves

Back pressure valves of all types are furnished including the following:

Combination atmospheric relief and back pressure valves for plants operating both condensing and non-condensing, or wherever precise regulation of back pressure is desired. Built under Hockfeldt patents (see illustration).

Atmospheric relief valves for safeguarding engines and turbines run condensing.



Combination Back Pressure and Relief Valve

Balanced, bevel-seated valves, both spring controlled or lever and weight controlled.

Balanced valves for float control in tanks, heaters, etc.

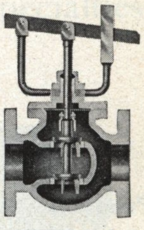
Balanced Valves

Eclipse balanced valves are used for automatically controlling the water supplied to tank, or for controlling the flow of air, water or any liquid to a pump, or to a tank in connection with a float, or other operating device.

They will operate under variable heads at either high or low pressures, and being balanced do not require extra large float to operate them.

Valve can be furnished either in the seat or piston type. Valve discs and seat rings are of bronze.

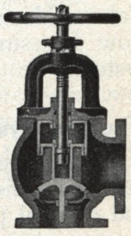
Furnished in sizes of from ½ to 12 in.



Balanced Valve

Non-return Valves

Eclipse stop and check valves have several exclusive points of merit. They are of heavy construction for 250-lb. working pressure; the large internal dashpot is independent of the body; the piston is reinforced with four ribs. The valve can be packed while in service under pressure. In addition these valves do not stick or chatter. Also built with steel bodies and monel metal parts for superheated steam.



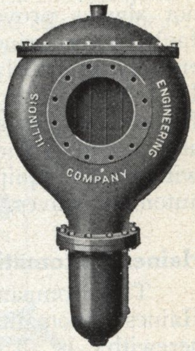
Non-return Stop and Check Valve

Steam and Oil Separators

Eclipse steam separators are made in both horizontal and vertical type, and also the special receiver separators for standard or extra heavy pressures.

Eclipse oil separators are furnished in the horizontal type and have a removable baffle plate to facilitate cleaning of baffle and keeping the separator's efficiency at the highest point.

These separators have been in use for a number of years and are giving complete satisfaction. They are designed with view to obtaining as large a baffle surface and internal area as necessary to decrease the velocity of the steam.



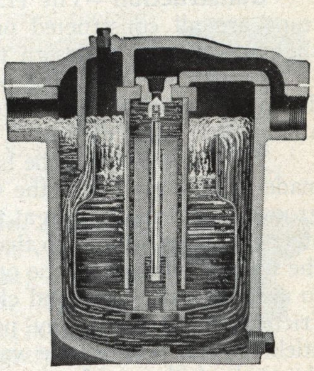
Type O Separator Removable Baffle

Steam Traps

Eclipse steam traps embody an important improvement in design, viz.: the valve and valve stem are not attached to the bucket. The valve is only operated by the bucket at the end of its movement, with the result that the valve is always either wide open or tight closed and never cracked on the seat, no intermediate position.

In addition to insuring positive action, this eliminates wire drawing.

This trap automatically vents air, and does not require a pet cock for air removal.



Improved Steam Trap

WILLIAM S. HAINES & COMPANY

Manufacturers of Steam Heating Specialties

Twelfth and Buttonwood Streets
PHILADELPHIA, PA.

Products

Haines Vacuum Heating Systems and Automatic Vapor Systems, consisting of Haines Automatic Valves and Traps, Automatic Air Traps, Graduated Supply Valves, Suction Strainers, Safety Valves, Vacuum Pump Governors, Damper Regulators, Low Pressure Gages, and all Specialties used in the systems.

Vacuum Systems of Steam Heating

This company believes that the architect and engineer are sufficiently familiar with the principle, operation and general piping arrangement of this system to make it unnecessary to detail them here.

It is generally conceded that the vacuum system of steam heating, properly installed and equipped, is the most efficient and economical heating system that can be used in connection with large buildings of any description.

Vacuum systems of heating, however, have not always proved successful, due not to any fault in the principle of the system, but almost entirely to poorly constructed automatic valves. In fact, the automatic valve is so important a feature that, regardless of all other perfections, any system of vacuum heating would be a failure without an equipment of positive and reliable automatic valves.

Haines Automatic Valves and Traps

This company is the sole manufacturer of the Haines automatic valves and traps (four illustrated herewith), in all of which the operating power consists of the Haines specially designed thermostatic tube. This member is not new or untried, as the company has been using it in connection with its automatic valves and traps for 25 years, and during this entire period the principle of the thermostatic tube has not been changed a particle.

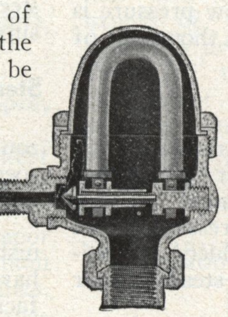
Construction—The Haines automatic valves and traps are all constructed on one principle, with some slight difference in design to meet different conditions. In all cases the operating power consists of a specially designed Haines thermostatic tube mounted vertically on a horizontal valve motion.

The thermostatic tube has forked or bifurcated ends made to fit a groove in the valve head at one end and a groove in the guide stem at the opposite end. The guide stem is set permanent so that the movement or travel of the tube is confined to the opposite end in such a way as to automatically open and close the valve. To eliminate friction and remove any possible chance of the valve sticking, the hole in the valve stem is round, whereas the end of the guide stem on which it is mounted is square, which insures a free and perfect movement.

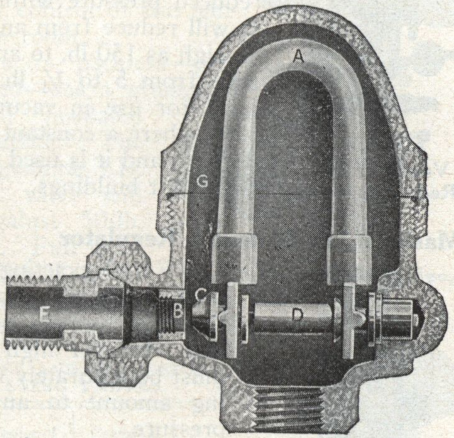
The valve mechanism in all the Haines automatic valves and traps is mounted horizontally. This permits scale and foreign matter to drop clear of the valve and seat at each operation; and as the construction of the thermostatic tube is such as permits a long range of movement, the chances of the valve fouling with scale or foreign matter is reduced to a minimum.

Advantages—They open quickly and close just as quickly.

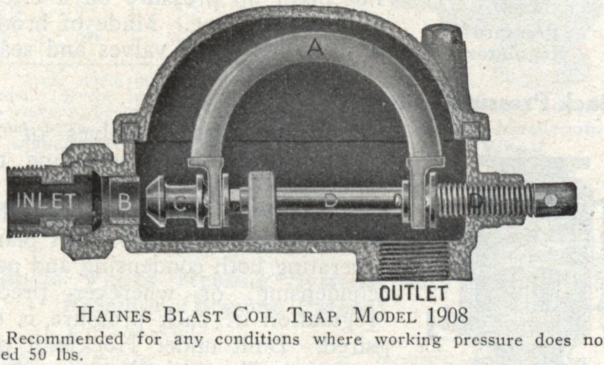
They are made right—to stay tight.
Not a particle of steam gets away.
Nothing that ought to stay in gets out.
Nothing that ought to get out stays in.



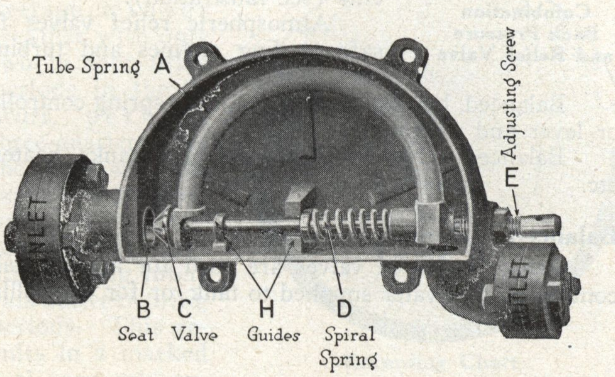
Haines Automatic Air Line Valve



Haines Vento Trap
Recommended for vacuum, vapor and low pressure heating systems



Haines Blast Coil Trap, Model 1908
Recommended for any conditions where working pressure does not exceed 50 lbs.



Haines High Pressure Trap
Recommended for any conditions where working pressure does not exceed 200 lbs.

MONASH-YOUNKER CO.

High Grade Thermostatic Radiator Traps, Air Relief Valves and Steam Specialties

553 West Monroe Street
CHICAGO, ILL.

TRADE MONASH MARK
TRADE-MARK

Products

Monash Thermostatic Radiator Traps for vapor and vacuum heating; Thermostatic Heavy Duty or Drip Traps; Automatic Air Valves, adjustable and non-adjustable; Quick Venting Valves; Air Line Valves.

Also manufacturers of Drip Line Automatic Air Valves; Valve Holders; Packless Supply Valves and Auxiliary Traps; Automatic Steam Main Vents; Expansion Traps; Radiator Covers.

Monash Thermostatic Radiator Traps

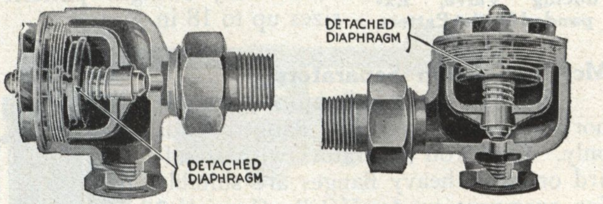
Monash No. 35 Traps—For vapor and vacuum heating in homes, apartments, schools, churches, office buildings, etc. The distinctive feature of the Monash thermostatic line of traps is the *diaphragm,* a separate and independent unit, so constructed and so held in place that friction and strain on the diaphragm is reduced to a minimum, overcoming the hazard of fracture and rupture of the diaphragm.

Monash radiator traps Nos. 35-A and 35-B are of virgin cast brass, nickelplated; ½-in. pipe size; capacity, 200 sq. ft.; 65 lb. of water per hour.

List price, f.o.b. Chicago—$5.50 each.

No. 35-A—Has a *vertical* seat with the diaphragm *out* of the steam chamber.

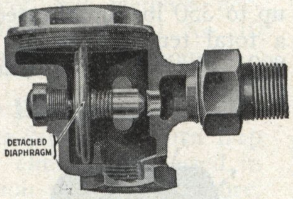
No. 35-B—Is built with a *horizontal* seat and the diaphragm *in* the steam chamber.



No. 35-A No. 35-B
Monash No. 35 Radiator Traps

Monash No. 37 Radiator Trap—Made only with *vertical* seat, and diaphragm *out* of the steam chamber. Body is made of close grained, gray iron, nickelplated; brass coupling nut, nipple and cover, nickelplated.

Pipe size, ¾ in.; capacity, 420 sq. ft.; 135 lb. of water per hour. List price, f.o.b. Chicago—$8.00.



No. 37 Radiator Trap

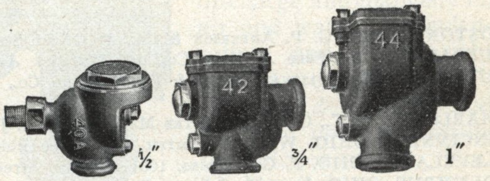
Monash Thermostatic Heavy Duty or Drip Traps

These are made with *dirt-pocket, clean-out* and *by-pass.* Vertical seat and diaphragm outside the steam chamber. They are especially suitable for blast coils, dry kiln coils, main drips, dryers and all points where large quantities of condensation are to be handled.

Guaranteed on pressures up to 25 lb.

MONASH THERMOSTATIC HEAVY DUTY OR DRIP TRAPS

No.	Size, in.	Radiation, sq. ft.	Water per hour, lb.	Net weight, lb.	List price, f.o.b. Chicago
40	½	350	108	3.25	$ 9.00
42	¾	1500	475	5.00	12.00
44	1	5000	1560	7.50	18.00



No. 40 No. 42 No. 44
Monash Thermostatic Heavy Duty or Drip Traps

Monash Automatic Air Valves

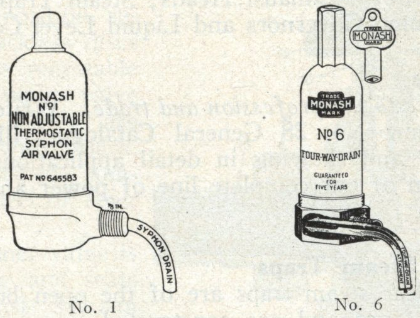
Monash No. 1—All-metal, *non-adjustable* automatic air valve in which the base and nipple are in one casting—no soldered or sweated joints to come apart.

The siphon extending from the bottom of the valve into the radiator drains off the water of condensation and is removable for cleaning.

List price, f.o.b. Chicago—$1.56.

Monash No. 6—Four-way-drain, lock-shield, automatic air valve equipped with a *special air tube* extending above the top of the float conducting the air from the radiator and permitting it to escape through the opening in the screw. Adjustment of the valve made with *special key only.* Has the four-way-drain attachment which clears valve of sediment and water condensation; is self-cleaning, no flooding of floors and other damage. *On the market for more than twenty-five years.*

List price, f.o.b. Chicago—$2.30.



No. 1 No. 6
Monash Automatic Air Valves

Monash Quick Venting Valves

For mains and risers the Monash No. 27 thermostatic quick venting valve is desirable. This has heavy brass body and cover, phosphor bronze thermostatic diaphragm. It operates automatically at all pressures up to 10 lb. and insures rapid steam circulation. It closes against steam, but does not close against water.

Connections are ⅜ in., 1 lb. net weight.

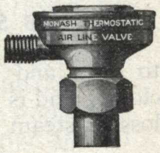
List price, f.o.b. Chicago—$3.25.

MONASH Nº27
QUICK VENT VALVE

No. 27

Monash Air Line Valves (No. 2 and 3)

These thermostatic air line valves are for drip or air line systems; also for venting stacks and blast coils. They are rapid in action and positive in results, passing all air, but closing tightly against steam. Made of brass, white plated.



Nos. 2 and 3

Monash Air Line Valve, No. 2—⅛x¼ in., 1 lb. net weight. List price, f.o.b. Chicago—$3.50.

Monash Air Line Valve, No. 3—½x⅜ in., 1 lb. net weight. List price, f.o.b. Chicago—$3.75.

THE McALEAR MFG. CO.

Power, Heating, Water, Gas and Oil Specialties

1901-1907 So. Western Avenue
CHICAGO, ILL.

SALES REPRESENTATIVES

BOSTON, MASS., G. P. Anderson & Co., 36 Oliver Street
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CLEVELAND, OHIO, F. G. Bridges, 1001 E. 143rd Street
COLUMBUS, OHIO, John T. Seiders, Room 203, 5 W. State Street
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HARTFORD, CONN., Arthur J. Purcell, 631 New Britain Avenue
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PHILADELPHIA, PA., Brogan & Co., 810 Race Street
PITTSBURGH, PA., P. F. Maginn & Co., 207 Fulton Bldg.
SAGINAW, MICH., H. W. Sullivan, 1622 No. Michigan Avenue
ST. LOUIS, MO., Engineering & Equipment Co., 408 Granite Building
SALT LAKE CITY, UTAH, C. A. Stilphen, 803 McIntyre Bldg.
SAN FRANCISCO, CAL., C. H. Cobb, 211 Sharon Bldg.
SEATTLE, WASH., C. L. Williamson, 318 Alaska Bldg.
SYRACUSE, N. Y., Chas. F. Wayte, 406 So. Franklin Street
TORONTO, ONT., Arthur S. Leitch Co., Ltd., 1123 Bay Street
TULSA, OKLA., W. L. Sullivan, Machinery, P. O. Box 1224
WASHINGTON, D. C., L. C. Holmes, 918 Buchanan Street, N. W.

Products

Low Pressure, Vapor and Vacuum Heating System Specialties: Including Pressure Reducing Valves; Radiator Valves; Radiator Traps; Air Line Valves; Return Traps and Air Eliminators; Air Traps; Steam Traps; Damper Regulators; Vacuum Regulators; Air Line Vacuum Pumps; and Direct-to-boiler Water Feeders.

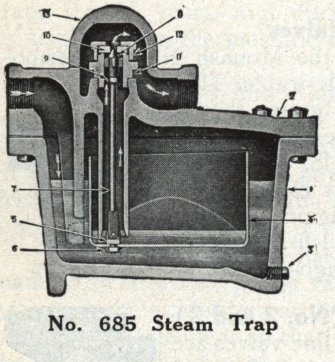
Power Plant Specialties: Including Pressure Reducing Valves for steam, water, air, gas and oil; Altitude and Altitude Relief Valves; Float Valves and Balanced Lever Valves; Stop and Check Valves; Back Pressure and Atmospheric Relief Valves; Steam and Oil Separators; Exhaust Heads; Steam Traps; Grease Traps; Pump Governors and Liquid Level Controllers.

Catalogue

Notice to the profession and trade: Write for copy of our new No. 28 General Catalogue, illustrating, describing and showing in detail applications in blue print form of our complete line of power and heating specialties.

McAlear Steam Traps

McAlear steam traps are of the open bucket and ball float types and are constructed in a number of different styles to meet any given service conditions.



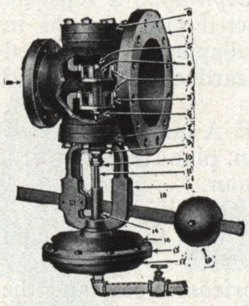
No. 685 Steam Trap

The No. 685, as illustrated, is equipped with a reversible seat. By removing the cap, the disc and seat can be quickly renewed, or other sizes for higher or lower pressures substituted without breaking pipe connections. The non-collapsible open bucket float has ample power to open and close a large valve. The valve is tight closing and is provided with a deep water seal to prevent loss of steam when trap is discharging.

McAlear Air Traps

We manufacture air traps for use in connection with low pressure, vapor and vacuum heating systems, or any other service requiring the discharge of air without loss of steam and water.

Pressure Reducing Valves



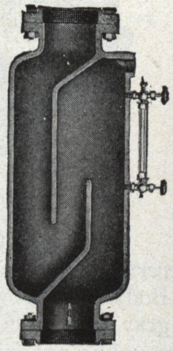
No. 155 Pressure Reducing Valve, Expanded Outlet Pattern

McAlear reducing valves, both lever weighted and spring weighted, are used to reduce steam pressures from 5 to 250 lb. to any desired service pressure from a partial vacuum to 10 lb. or from 5 to 150 lb., depending upon the style valve used.

Made in expanded outlet and straight patterns, standard and extra heavy. Expanded outlet pattern is made in sizes up to 12x24 in.; straight pattern in sizes up to 18 in.

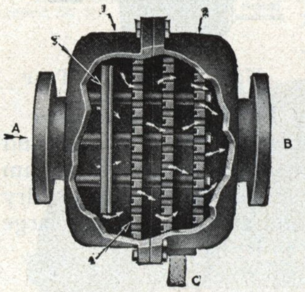
McAlear Steam Separators

No. 655 steam separators are made horizontal and vertical flanged ends only. Cast iron separators with standard or extra heavy flanges are suitable for pressures up to 150 lb.; semisteel with extra heavy flanges, up to 250 lb. saturated or superheated steam having a total temperature of not to exceed 500° F.; steel with extra heavy flanges, up to 350 lb. superheated steam having a total temperature of not to exceed 800° F. Made in sizes from 2 to 12 in.



No. 655 Vertical Steam Separator

Oil Separators



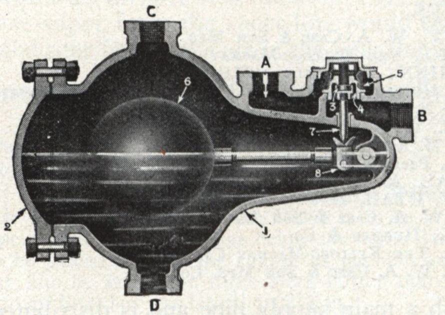
No. 675 Horizontal Oil Separator

No. 675 oil separators are made both horizontal and vertical for pressures up to 25 lb. They have large internal areas which allow the steam to expand quickly and reduce in velocity so that all oil and grease can be completely separated without causing back pressure. Every particle of steam flowing through the separator comes in contact with the large baffle surfaces. Consequently, all oil and other foreign elements are completely removed. Made in sizes from ¾ to 18 in.

Continued on next page

McAlear Direct-to-boiler Water Feeders

The engineering profession, the trade, insurance companies, state and municipal governments are now recognizing the necessity of boiler protection through automatically controlled water levels. McAlear automatic water feeders not only give this protection, but, in addition, decrease fuel consumption and reduce maintenance expense.



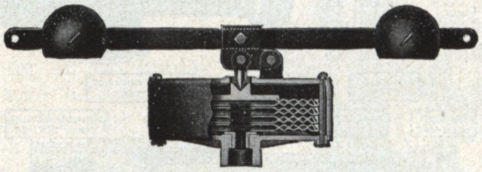
McAlear Simplex Water Feeders

The Simplex water feeder is used for automatically controlling the make-up water necessary to maintain a constant water level in steam boilers, evaporators, steam generators, receiving tanks, accumulators, and feed water storage tanks.

The Duplex water feeder (not illustrated) is constructed the same as the Simplex, except that it has a flanged head containing an overflow float trap. The Duplex not only supplies make-up water as needed to maintain a constant water level, but also discharges any surplus to the sewer through the overflow trap, if for any reason, water of condensation is held up in the piping system or is siphoned out of the boiler.

McAlear Damper Regulators

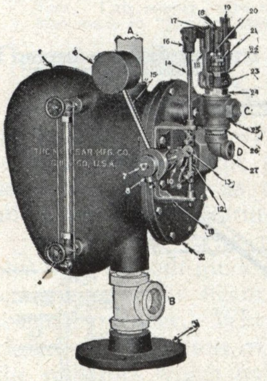
McAlear damper regulators are sensitive, positive, and reliable in operation. The No. 56 vapor damper regulator will control in ounces, boiler pressure from atmosphere to 3 lb. The No. 58 steam pressure damper regulator will control boiler pressures from 1 to 15 lb.



No. 56 Vapor Damper Regulator

Furnished complete with lever, two weights, necessary S hooks, two ceiling pulleys, 12 ft. of No. 10 tinned chain tapped for 1-in. steam pipe connection.

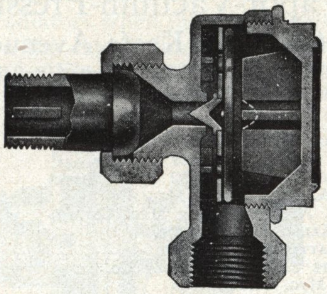
McAlear Return Traps and Air Eliminators



No. 781 Return Trap and Air Eliminator

The No. 781 return trap and air eliminator is used in connection with low pressure, vapor, and vacuum heating systems. It is designed especially for returning the water of condensation direct to boiler at high temperature, irrespective of pressure or vacuum in boiler or system, and discharging the air to atmosphere as fast as it accumulates. Suitable for pressure up to 15 lb.

McAlear Radiator Traps



No. 28 Radiator Trap

McAlear radiator traps are suitable for pressures up to 15 lb., are simple in construction and positive, self-cleaning, and noiseless in operation. They discharge automatically all air and water of condensation and close tight against steam.

Nos. 28, 28A, 29 and 29A are used principally for radiator service. Nos. 33, 34 and 36 are used for draining water of condensation from drip point in risers, steam mains, and large radiators or pipe coils. All traps are permanently and properly adjusted at the factory and require no readjustment on the job.

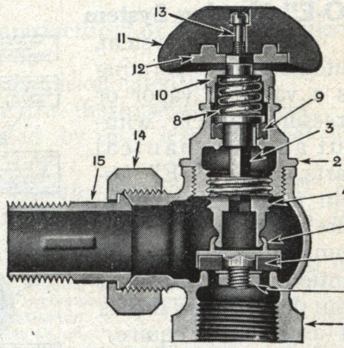
TABULATION OF McALEAR RADIATOR TRAPS

No.	Pipe connections, in.	Capacity direct radiation, sq. ft.	Net weight each, lb.	No.	Pipe connections, in.	Capacity direct radiation, sq. ft.	Net weight each, lb.
28	½	150	1½	33	¾	400	2¾
28A	½	150	1½	34	¾	600	5¼
29	½	300	2⅝	36	1	800	5
29A	½	300	2½				

McAlear Quick Opening Packless Radiator Valves

McAlear quick opening packless radiator valves are suitable for pressures up to 100 lb. and are constructed of the best bronze with special composition, renewable, packless discs and Jenkins renewable discs for main valve opening. They are equipped with black, highly polished composition wheel or lever handles.

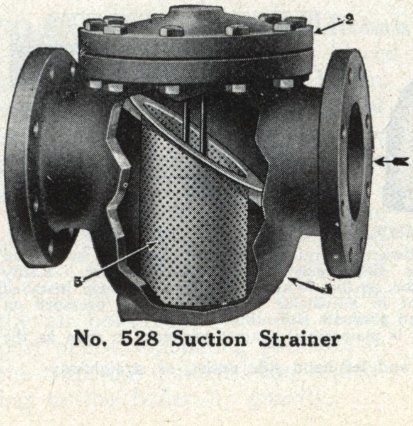
The inner valve is self-aligning and seats tight against steam water, or air. The packless disc is held tight against any possible leakage. The valve is opened to full pipe capacity with slightly more than one turn of the handle. Made in angle, right-hand corner, and left-hand corner patterns in sizes from ½ to 2 in.



Wheel Handle Radiator Valve

McAlear Suction Strainers

No. 528 suction strainers with bolted covers, as illustrated, are suitable for pressures up to 125 lb.; with clamped covers, for pressures up to 50 lb. They are especially suitable for use in connection with water and oil service mains, pump suctions, etc. Made flanged ends only in sizes from 2 to 10 in.



No. 528 Suction Strainer

O-E SPECIALTY MANUFACTURING CO.

Vapor-Vacuum-Pressure Heating Specialties

6-8-10-12 Keefe Avenue, MILWAUKEE, WIS.
PITTSBURGH OFFICE: Fulton Building. SEATTLE OFFICE: Colman Building
LOS ANGELES OFFICE, 244 I. W. Hellman Building SAN FRANCISCO OFFICE, 379 Monadnock Building

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MINNEAPOLIS, MINN., The Kellogg-Mackay Co.
NEWARK, OHIO, Universal Supply Co.
NIAGARA FALLS, N. Y., W. A. Case & Son Mfg. Co.
NEW YORK, N. Y., W. A. Case & Son Mfg. Co.
OAKLAND, CAL., M. Stulsaft Co.
PORTLAND, ORE., Peerless Pacific Co.
SACRAMENTO, CAL., M. Stulsaft Co.
SALT LAKE CITY, UTAH, Mountain State Supply Co.
SCRANTON, PA., W. A. Case & Son Mfg. Co.
SPOKANE, WASH., Hughes & Co.
ST. PAUL, MINN., The Kellogg-Mackay Co.
SYRACUSE, N. Y., W. A. Case & Son Mfg. Co.

Products

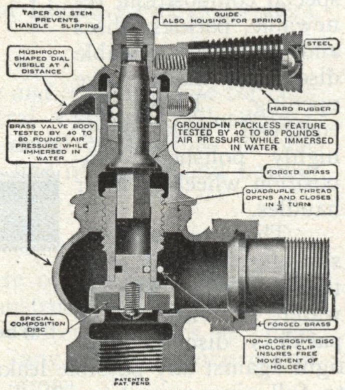
"O-E" Perfect Vapor-Vacuum-Pressure Heating System; "O-E" Packless Graduated Radiator Supply Valves; "O-E" Combination Return Elbow, with Vent, Water-Seal Ball-check and Cleanout; "O-E" Air Exhauster and Vacuum Valve; "O-E" Thermo-nickel Return Line Radiator Trap; "O-E" Direct Differential Return Trap.

Also manufacturers of "O-E" Rouse Type Balanced Swing Check Valves; "O-E" Compound Vacuum Pressure Gauges; "O-E" Combination Damper Regulator; Pressure Reducing Valves; High Grade Brass Castings; Float Drip Traps; Quick Vents, Vacu Float Vents.

"O-E" Heating System

A 2-pipe system, automatically operating as a vacuum, vapor or pressure system without any mechanical parts. The "O-E" system passes from pressure to vapor or to vacuum without other attention or adjustments than the ordinary drafts of any boiler require.

The "O-E" system is so simple and reliable that it is distributed and given service and sponsored by the heating departments of leading jobbers in all parts of the country. For engineering service and quotations, write the nearest distributer from the list at the top of this page.

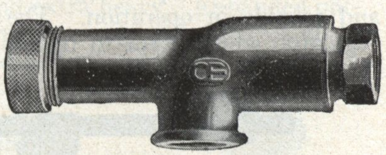

TAPER ON STEM PREVENTS HANDLE SLIPPING
GUIDE ALSO HOUSING FOR SPRING
STEEL
MUSHROOM SHAPED DIAL VISIBLE AT A DISTANCE
HARD RUBBER
BRASS VALVE BODY TESTED BY 40 TO 80 POUNDS AIR PRESSURE WHILE IMMERSED IN WATER
GROUND-IN PACKLESS FEATURE TESTED BY 40 TO 80 POUNDS AIR PRESSURE WHILE IMMERSED IN WATER
FORGED BRASS
QUADRUPLE THREAD OPENS AND CLOSES IN ½ TURN
SPECIAL COMPOSITION DISC
FORGED BRASS
NON-CORROSIVE DISC HOLDER CLIP INSURES FREE MOVEMENT OF HOLDER
PATENTED PAT. PEND.

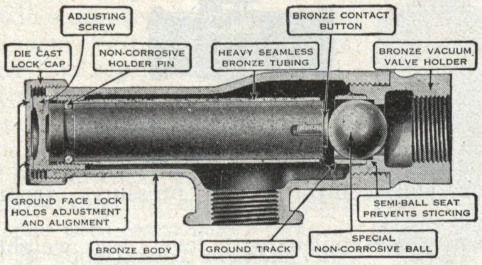
Interior View "O-E" Packless Graduated Supply Valve

Operation—Vapor generated at the boiler passes up through a main supply pipe and is distributed to the several radiators through small individual supply pipes, the amount being governed by an "O-E" packless graduated valve. Air and condensation are discharged through a ½-in. or ¾-in. "O-E" elbow into the main return pipe, where the air is separated out and discharged through an "O-E" patent air exhauster and vacuum valve. The water is returned to the boiler for re-use.

Both the elbows and air exhausters act as vacuum valves so that, after the air has once been discharged, the system operates under vacuum, most of the time producing vapor at temperatures considerably under 212° F., with resultant saving in fuel consumption.

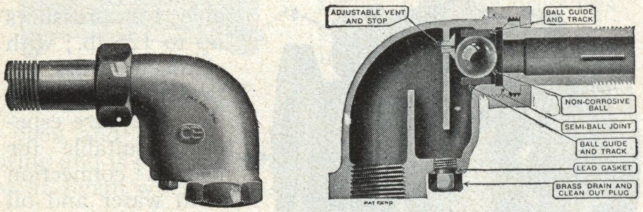
"O-E" Air Exhauster and Vacuum Valve—Most simple; can not buckle, very sensitive. Remains open as long as there is any air in the system, but closes as




ADJUSTING SCREW
BRONZE CONTACT BUTTON
DIE CAST LOCK CAP
NON-CORROSIVE HOLDER PIN
HEAVY SEAMLESS BRONZE TUBING
BRONZE VACUUM VALVE HOLDER
GROUND FACE LOCK HOLDS ADJUSTMENT AND ALIGNMENT
SEMI-BALL SEAT PREVENTS STICKING
BRONZE BODY
GROUND TRACK
SPECIAL NON-CORROSIVE BALL

"O-E" Air Exhauster and Vacuum Valve

Freely vents air from return line, closes as soon as vapor reaches return line and holds vacuum tight when operating below atmospheric pressure

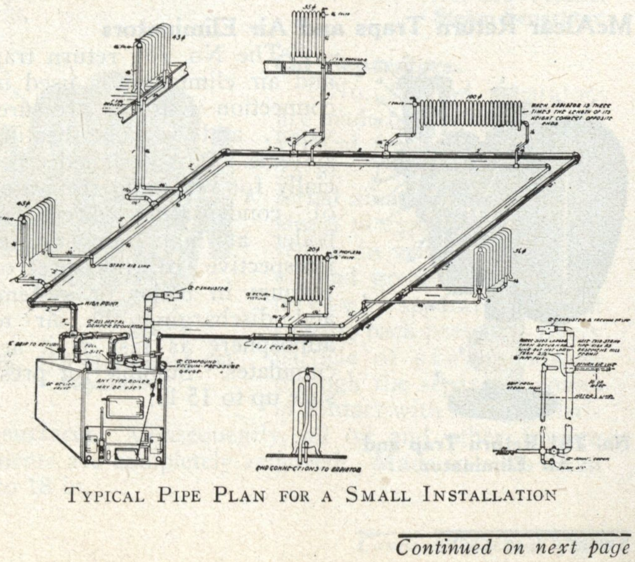

ADJUSTABLE VENT AND STOP
BALL GUIDE AND TRACK
NON-CORROSIVE BALL
SEMI-BALL JOINT
BALL GUIDE AND TRACK
LEAD GASKET
BRASS DRAIN AND CLEAN OUT PLUG
PAT. PEND.

"O-E" Ball-check Water-seal Union Elbow

Entirely automatic; always operates perfectly; can not stick and there are no thermostatic diaphragms to get out of order. Easily cleaned—an important factor, as dirt is always present in newly installed heating systems. Air vent in adjustable screws equalizes pressure on both sides of water seal and prevents siphoning.

Note: The water seal is maintained against pressure as soon as the exhauster closes.

Also made right-hand and left-hand side outlet, or straightway


35#
43#
100#
WHEN RADIATOR IS THREE TIMES THE LENGTH OF ITS HEIGHT CONNECT OPPOSITE ENDS
43#
START AIR LINE
20#
56#
HIGH POINT
ANY TYPE BOILER MAY BE USED
END CONNECTIONS TO RADIATOR

Typical Pipe Plan for a Small Installation

Continued on next page

soon as heat reaches the thermostatic control, a specially made composition post. After the air in the system has been exhausted the ball seal is held to its seat by the vacuum created by condensation. A separate exhauster is recommended for each air and water return line, as one line may be shorter or have less radiation than the other, in which case vapor from the short line would be apt to close the exhauster before the air in the long line has been expelled.

Specifications for "O-E" Heating System

By incorporating in regular 2-pipe specification form the following paragraphs, you will have a perfect "O-E" system specification.

"O-E" Exhauster and Vacuum Valve—A 1-in. "O-E" Air Exhauster and Vacuum Valve is to be provided on each air line return, where it drops below the water line. This exhauster to be placed as near the ceiling as possible and connected to the air line by standpipe three sizes larger than the air and water return line, but not less than 2½ in.

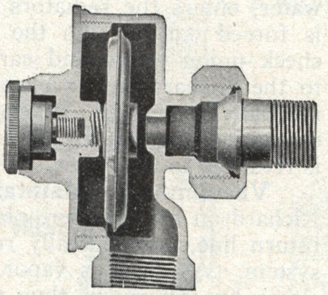
Valves and Return Fittings—Vapor to be supplied to the radiators through the "O-E" Improved Packless Graduated Valve, care being taken to use the proper size valve for each radiator.

All valves are to be placed at top of radiator. The return end of each radiator to be provided with an "O-E" Ball-check Water-seal Union Elbow, with an adjustable air vent. Radiators of 20 sq. ft. capacity and less, to have ½-in. valves; 20 to 75 sq. ft., ¾-in. valves; 75 to 126 ft., 1-in. valves; and larger, 1¼-in. valves.

Thermo-nickel Return Line Radiator Trap

No. 1 "O-E" trap is a return line radiator trap suitable for vapor, vacuum, or pressure, and all kinds of return line heating systems.

Construction and Operation—The "O-E" diaphragm is manufactured of high grade cross-rolled non-corrosive metal heavily corrugated, reinforced at point of heaviest duty, and is plated all over. The thermostatic member closes against the steam or vapor and not in it. As the discharge of condensation is continuous, it does not depend on an accumulation to cool before opening. The flat disc closes against a semi-ball seat. The vertical seat is practically self-cleaning. This trap is readily visualized in the accompanying illustration.



Thermo-nickel Return Line Radiator Trap

THERMO-NICKEL RETURN LINE RADIATOR TRAP

Size	Center of outlet to face of inlet	Center of inlet to face of outlet	Capacity
½ in.	2 in.	$1\frac{13}{16}$ in.	200 sq. ft.
¾ in.	2½ in.	$2\frac{9}{16}$ in.	500 sq. ft.

Note: Can supply traps to rough-in 3¼ in. if desired. Also made in "Junior" size.

Thermo-nickel Return Trap with Non-corrosive Ball-check

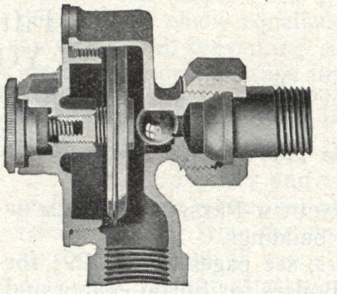
No. 2 "O-E" trap, is a high grade combination thermostatic return trap with a non-corrosive ball-check and is used for the same purpose and has practically the same construction as the No. 1 trap, only with the added ball-check feature shown in the illustration.

Operation—The non-corrosive ball-check operates on a smooth guide or track, and is rolled to its seat against vapor or steam by the expansion of gas in the thermal member. When the radiator supply valves are closed, condensation of the steam forms a vacuum in the radiators which holds the balls to their seats, permitting all water in the return lines to flow freely back to the boiler, thereby eliminating the danger of broken boiler sections and preventing steam or vapor short-circuiting into radiators through return risers.

(Numerous heating boilers have been damaged on account of the vacuum, formed by condensation in the radiators when the supply valves are closed, holding water in the return lines, preventing its return to the boiler.)

When supply valves are opened, the balls are released from their seats permitting air and condensation to freely enter the return lines without pressure.

Exhaustive tests have demonstrated that "O-E" Thermo-nickel traps will hold tight on a vacuum pump installation, as well as on a vapor or pressure job, and that the non-corrosive balls in the traps with checks will not "chatter." (See Test Bulletin, No. 570A.)



Return Trap with Non-corrosive Ball-check

Roughing-in dimensions same as No. 1

Engineers, architects and others should familiarize themselves with No. 2 "O-E" Thermo-nickel traps with ball-checks. The insurance against boiler damage is alone worth more than the reasonable price asked.

Points of Superiority of Thermo-nickel Traps

(1) They will not deteriorate as other traps do.

(2) They will not collapse from abnormal pressure nor will they freeze and become damaged.

(3) The diaphragm valve will not stick or bind.

(4) They can be easily and quickly adjusted.

(5) The vertical seat prevents foreign matter from adhering.

(6) The body is manufactured of best government bronze and not of cast iron.

(7) They are heavily nickelplated all over.

(8) Locking device for thermostatic member.

(9) Each trap tested by not less than 90 lb. pressure.

(10) Guaranteed to remain closed at about 200° F. when vacuum pump on return line is pulling 10 in. of vacuum.

Note: The above guarantee is conservative, since in actual test the traps remained closed when the vacuum pump was pulling 18 in. of vacuum on the return lines. We recommend a maximum of 5 to 10-in. vacuum be maintained by the installation of an "O-E" automatic pump governor, a low vacuum being just as effective as a higher vacuum, and means less duty on the pump and other heating apparatus. The special metal and liquid used in "O-E" thermal members account for the unusual test mentioned, and also assure maximum action.

The above points hold good for both No. 1 and No. 2 traps.

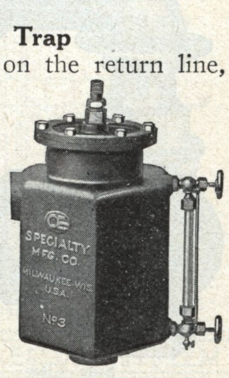
Thermo-nickel Trap Guarantee

We guarantee that each and every "O-E" trap is thoroughly tested and carefully adjusted before being packed for shipment, and will cheerfully supply new parts without charge to replace any that may prove defective within five years from date of installation.

"O-E" Direct Differential Return Trap

A simple, sturdy trap, placed on the return line, above the water line of the boiler, assuring the complete draining of condensation from the return line protecting the water line of the boiler.

As trap fills with water, the steam port remains closed and the air port is open. When trap is full, by a positive snap action, the air port closes and the steam port opens, equalizing pressure in the trap, the condensation returning to the boiler by gravity.



"O-E" Differential Return Trap

RICHARDSON & BOYNTON CO.

SINCE 1837

Manufacturers of "Richardson" "Perfect" Heating and Cooking Apparatus

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ROCHESTER, N. Y. ST. LOUIS, MO. SPRINGFIELD, MASS.

Products

Richardson Vapor-Vacuum-Pressure System of Heating for all classes of buildings.

For Warm Air Heaters, see pages 2128-2129; for Richardson Low Pressure Boilers for Steam, Vapor and Hot Water, also Domestic Hot Water Supply, Tank and Laundry Heaters, see pages 2177-2181; for Coal and Gas Cooking Ranges, see pages 2762-2764.

Richardson Vapor-Vacuum-Pressure System

This system is simple in operation and easy to control. The essential features consist of only five simple parts or fittings (see illustrations).

The amount of radiation is the same as for steam systems, but it must be of the hot water type.

The *five* Richardson parts are: (1) Richardson graduated supply valve and (2) the Richardson water seal ball check union elbow at the radiator; (3) the Richardson air expeller and vacuum trap; (4) horizontal swing check valve and (5) compound pressure and vacuum gauge at the boiler, and a Richardson special vacuum-vapor-pressure damper regulator is supplied with the Richardson boiler. No pumps, floats or receivers are required.

Conspicuous Advantages—The Richardson vapor-vacuum-pressure system has all the advantages and none of the disadvantages of both steam and hot water heating. Properly installed the following results will be experienced from the Richardson system:

A material saving in fuel; a far better distribution of heat because each radiator can be regulated to give varying amounts of heat; quicker heat in the morning; closer regulation to suit temperature changes; no overheating in moderate weather or underheating in severe weather; a system easier to operate than either steam or hot water; longer life; fewer repairs; nothing to get out of order; no frozen radiators; no leaky air valves; no pounding in pipes or radiators; it is so simple and so automatic that any one can operate it successfully.

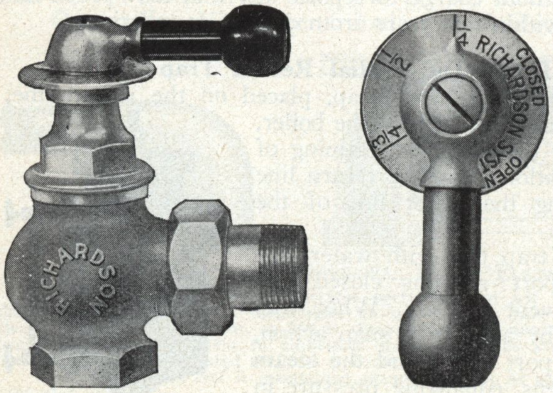
Underlying Principle of the Richardson System—This underlying principle is to remove the atmospheric pressure from the system, and to automatically maintain a partial vacuum for the purpose of permitting a quick and positive circulation of vapor throughout the entire system.

Water will give off vapor long before the water begins to boil. Under normal atmospheric pressure water boils at 212°. Remove this pressure by creating an absolute vacuum and water would boil at 98°, thus requiring only one-half the fuel. While it is impractical to produce an absolute vacuum, nevertheless the Richardson system, by automatically removing the air and closing the system against its return, does produce a partial vacuum which makes it possible to produce vapor and to boil water at much lower temperatures, and, consequently, with much less fuel than would be required in a steam system of corresponding size.

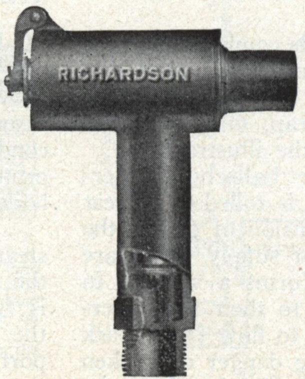
Simple Operation—The operation of the Richardson system is simple and easily understood. When the fire is started in the boiler vapor rises from the water, enters the radiators and replaces the air which is forced out through the Richardson water seal ball check union elbow and carried by the air return line to the Richardson air expeller, where the air is automatically expelled. When the vapor in the radiator condenses, the water passes through the water seal and is returned to the boiler.

Vacuum Is Maintained Automatically—The Richardson air expeller, placed at the end of each air return line, automatically releases all the air from the system. As soon as vapor reaches it, the air expeller closes by expansion, thus preventing air from getting back into the system. It is this air expeller, located at the boiler, which creates and maintains the vacuum in the system. The compound pressure and vacuum gauge, supplied with this system, indicates at a glance the amount of vapor pressure being carried, or the vacuum in inches.

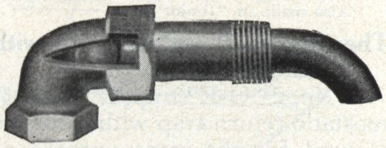
Heat Controlled at Each Radiator — Each radiator is independently controlled by the Richard-



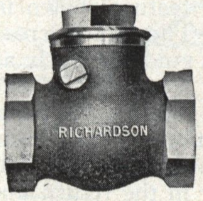
Side View Top View
Part 1. Richardson Graduated Supply Valve



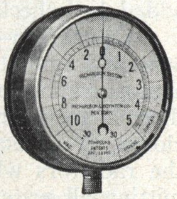
Part 3. Richardson Air Expeller



Part 2. Richardson Water Seal Ball Check Union Elbow



Part 4. Richardson Horizontal Swing Check Valve

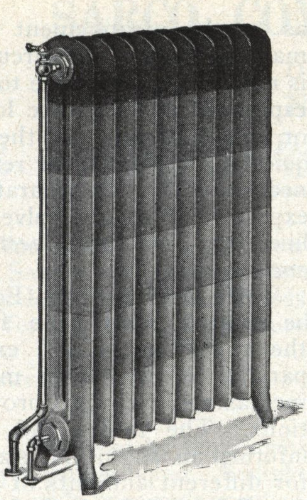


Part 5. Richardson Vacuum and Pressure Gauge

The Five Parts of the Richardson Vapor-Vacuum-Pressure System

Continued on next page

son packless graduated valve, conveniently placed on the supply pipe at the top of one end of the radiator, so that it can be easily operated without stooping over. A three-quarter turn opens or closes the valve, which is graduated for adjustment to any degree of temperature desired. The valve is of packless construction and never leaks or requires attention.



Radiator Control By Richardson Packless Supply Valve

Richardson Packless Graduated Supply Valve

This valve is of heavy pattern, best steam metal, heavily nickelplated and furnished with hard rubber handle. A three-quarter turn opens or closes the valve, graduated for partial openings. Made in four sizes:

½ in. "A" type for radiators 30 sq. ft. and under; ½ in. "B" type for radiators over 30 sq. ft. and up to 50 sq. ft.; ¾ in. for radiators over 50 sq. ft. and up to 110 sq. ft.; 1 in. for radiators over 110 sq. ft.

Richardson Water Seal Ball Check Union Elbow

This fitting is made in only one size, ½ in., which is ample for all radiators. It is placed at bottom of radiator and operates as follows: when supply valve is opened, the ball check opens and allows the condensation to pass freely into the return. If the supply valve closes tight, the ball check closes to prevent water or vapor backing into the radiator. This return valve is entirely automatic. The air vent opening in the tail piece of the elbow equalizes the pressure on both sides of water seal, preventing siphoning. It also allows the air in radiator to escape into return, as soon as supply valve is open.

Richardson Air Expeller and Vacuum Trap

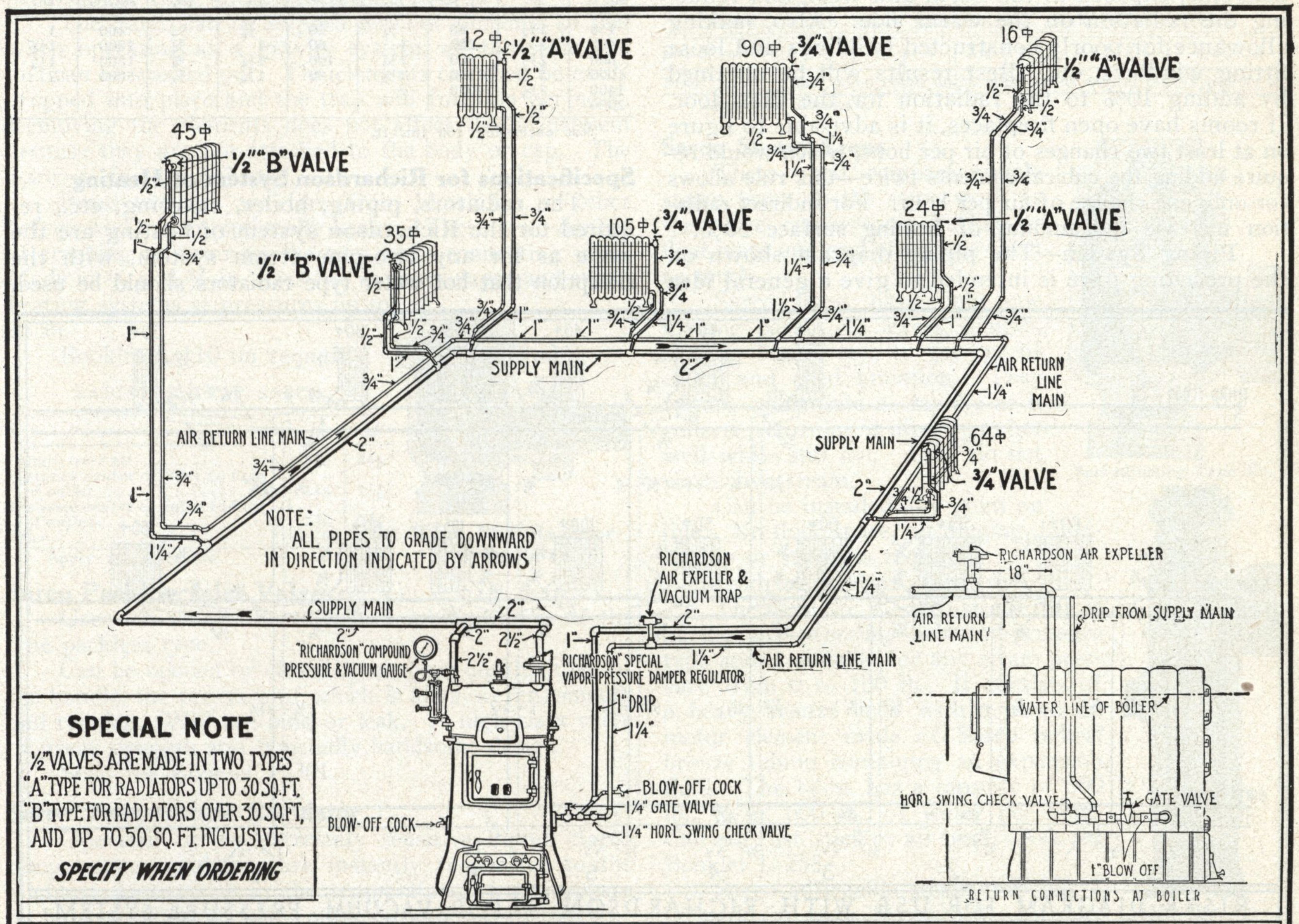
The air expeller and vacuum trap is placed at the end of each air return line at the boiler. It automatically releases the air from the system, but closes by expansion as soon as steam or vapor reaches it, preventing waste heat. The vacuum attachment prevents air from re-entering the system through the air expeller, when it cools off.

Richardson Horizontal Swing Check Valves

These check valves are made of heavy pattern brass and designed especially for use with Richardson vapor-vacuum-pressure system and for all heating installations where quick acting, dependable check valves are required. Made in four sizes: ¾ in., 1 in., 1¼ in. and 1½ in.

Richardson Compound Pressure and Vacuum Gauge

The compound pressure and vacuum gauge supplied with the Richardson system indicates at a glance the vapor pressure in ounces or the vacuum being carried in inches.


12⌽ ½" "A" VALVE
45⌽ ½" "B" VALVE
35⌽ ½" "B" VALVE
105⌽ ¾" VALVE
90⌽ ¾" VALVE
16⌽ ½" "A" VALVE
24⌽ ½" "A" VALVE
64⌽ ¾" VALVE
SUPPLY MAIN
2"
AIR RETURN LINE MAIN
1¼"
AIR RETURN LINE MAIN
SUPPLY MAIN
RICHARDSON AIR EXPELLER & VACUUM TRAP
"RICHARDSON" COMPOUND PRESSURE & VACUUM GAUGE
2½"
RICHARDSON" SPECIAL VAPOR-PRESSURE DAMPER REGULATOR
1" DRIP
BLOW-OFF COCK
1¼" GATE VALVE
1¼" HOR'L SWING CHECK VALVE
BLOW-OFF COCK
RICHARDSON AIR EXPELLER
18"
AIR RETURN LINE MAIN
DRIP FROM SUPPLY MAIN
WATER LINE OF BOILER
HOR'L SWING CHECK VALVE
GATE VALVE
1" BLOW OFF
RETURN CONNECTIONS AT BOILER

NOTE: ALL PIPES TO GRADE DOWNWARD IN DIRECTION INDICATED BY ARROWS

SPECIAL NOTE

½" VALVES ARE MADE IN TWO TYPES
"A" TYPE FOR RADIATORS UP TO 30 SQ. FT.
"B" TYPE FOR RADIATORS OVER 30 SQ. FT. AND UP TO 50 SQ. FT. INCLUSIVE

SPECIFY WHEN ORDERING

TYPICAL LAYOUT OF SINGLE CIRCUIT FOR RICHARDSON VAPOR VACUUM PRESSURE SYSTEM

Note: Layout for moderate size job shows sizes of air return line main, also branches and risers. Note that the air line begins at radiator first supplied with steam. Side elevation of boiler shows proper method of connecting the air line and drip from supply main back into the boiler

Continued on next page

Directions for Figuring and Installing the Richardson Vapor-Vacuum-Pressure System

We recommend, in connection with the Richardson system, the use of exactly the same amount of radiation as would be required for a gravity steam job; using hot water pattern radiators.

Rule for Figuring Radiation—First, find the total square feet of glass surface in windows and outside doors, taking the full opening. Then measure the surface in exposed outside walls, from which subtract the glass surface. The wall surface must then be reduced to equivalent glass surface by dividing the net amount of wall surface by:

10 if wall is 8 to 10 in. thick.
15 if wall is 12 to 26 in. thick.
20 if wall is 28 to 38 in. thick.

To this result add the actual glass surface, which gives the glass equivalent of wall and glass exposures. Multiply this total by 75, as 1 sq. ft. of glass surface cools 75 cu. ft. of air per hour. The result will give the total cubic feet of air to be heated to offset the loss from glass and wall exposures. To this total must be added the cubical contents of the room to be heated, and the grand total multiplied by .0055 for a temperature of 70° Fahr. in zero weather. The result will be the square feet of radiation required. For each degree below zero, for which the heating is required, add 1% to the radiation.

It is necessary in using this or any rule, to use good judgment in increasing the amount of radiation on the first floor and also in the rooms on the cold side, exposed to the north and west, and reducing the radiation on the warm side. Also, making allowance for poorly constructed buildings and loose fitting windows, etc. Best results will be obtained by adding 10% to the radiation for the first floor. If rooms have open fireplaces, it is advisable to figure on at least two changes of air per hour, which would require adding the cubical contents twice—this rule allows for only one change of air per hour. For indirect radiation increase the amount of heating surface 50%.

Piping System—The piping diagram shown on the preceding page is intended to give a general idea as to the arrangement of the supply and return mains, showing one circuit for a small building. It is not always advisable to use a single circuit system especially if mains are long, but rather to run two or more circuits, as the radiators will heat more quickly. A separate air return line must be run in connection with each separate supply main, with an air expeller and vacuum valve for each separate air return line main. *Do not connect two air return line mains to one expeller.*

Air Return Line—Each air return line main must be started where the first radiator is taken off the supply main and extended through with and parallel to the steam main, graded the same and increasing in size to provide for the added connections. The tables and illustrations will give full information as to the size air return line necessary for different amounts of radiation.

Grade of Piping—All lateral pipes or branches in cellars and all horizontal pipes under floors (both supply and return) should have a grade of at least 1 in. in 2 ft. The supply mains and air return line mains should have a grade of 1 in. in 20 ft., and more if conditions will permit.

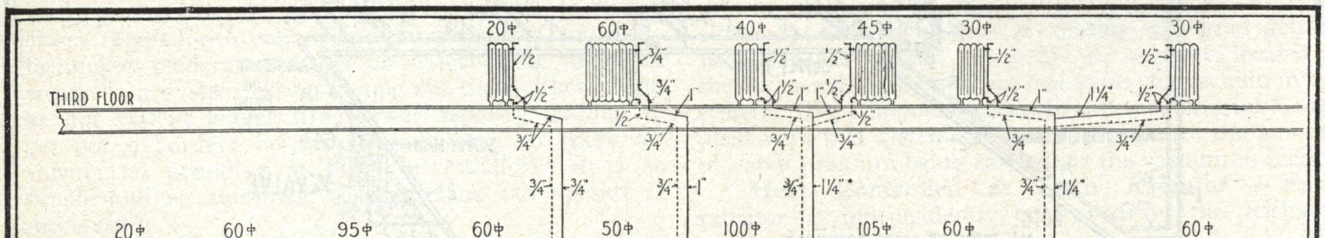
Pipe Sizes—The following table together with the diagram at bottom of the page are suggested pipe sizes for the Richardson system:

Supply mains*		Air return line mains		Risers up to 30 lin. ft. high			Wet return mains	
Radiation, sq. ft.	Pipe size, in.	Radiation, sq. ft.	Pipe size, in.	Radiation, sq. ft.	Supply risers, in.	Return risers, in.	Radiation, sq. ft.	Pipe size, in.
150	1½	80	¾	20	¾	¾	400	1
400	2	200	1	60	1	¾	1000	1¼
600	2½	800	1¼	100	1¼	¾	1800	1½
1000	3	1500	1½	180	1½	¾	5000	2
1400	3½	4000	2					
2000	4							

*Not exceeding 100 lin. ft.

Specifications for Richardson System of Heating

The radiators, piping, boiler, covering, etc., required for the Richardson system of heating are the same as for any two-pipe steam system, with the exception that hot water type radiators should be used.



RISER DIAGRAM FOR USE WITH RICHARDSON VAPOR VACUUM PRESSURE SYSTEM

Note: This diagram shows in general the amount of radiation which can be carried on risers of various sizes. Also where the pipe sizes reduce to size of valve, and the sizes of branches from mains to foot of risers. No. 7 shows condition where branches of unusual length are necessary. Note the larger size of lateral

SARCO COMPANY, INC.

Manufacturers of Steam Specialties

18 Park Place, NEW YORK, N. Y.

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PHILADELPHIA, PA., Drexel Building
DETROIT, MICH., Ford Building
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Products

SARCO RADIATOR TRAPS for vapor, vacuum or low pressure heating systems; SARCO PACKLESS INLET VALVE; SARCO TEMPERATURE REGULATORS for liquids or air; SARCO STEAM TRAPS for low and high pressure service.

Also manufacturers of Sarco Strainers.

Radiator Trap Sarco

The Sarco radiator trap is operated by the expansion and contraction of a very sensitive liquid. A slight change of temperature causes a wide open movement of the valve. Its positive action keeps radiators thoroughly drained, preventing waterhammer and air binding, and increasing the heating value of every pound of coal burned.

The life of the helical corrugated expansion motor element in the Sarco exceeds many times that of annularly corrugated tubes because its movement at any point of the tube is so slight that it is hardly perceptible, due to the stress in expansion and contraction being distributed evenly over the entire surface.

If scale does reach the seat, it is practically impossible for it to collect there, for line contact is had only between the cone and seat of the valve.

The Sarco can be shipped without elements so that when operating as a gravity system, all the scale and dirt can be washed out. The elements can then be easily dropped into place and the trap will function perfectly. Removing the elements does not affect the adjustment because they are not attached to the body or cap. The Sarco is factory adjusted.

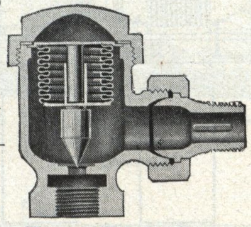
Brass castings are free from blowholes or other defects and are exceptionally heavy. There is no danger of cracking or straining the trap when connecting same. Made in ½ and ¾-in. sizes for vacuum, vapor and steam heating systems at pressures up to 25 lb.

Booklet L-110 on request.

RADIATOR TRAP SARCO

Size in.	½	¾
Length over all . . . . . in.	3⅝	3⅝
Distance center of inlet to face of outlet . . . . . in.	1½	1½
Distance center of valve to face of outlet . . . . . in.	2¾	2¾
Price	$6.00	8.00

Apply for discounts.



Type "E" Radiator Trap Sarco

Sarco Packless Inlet Valve

Uses the unique Sarco helical tubing and is of the true packless type.

Can be opened or closed by a three-quarter turn of the handle, the pressure of which is always even, smooth and regular. Will not bind or leak. A high class valve of great strength and unusually handsome design.

Send for Booklet P-301.

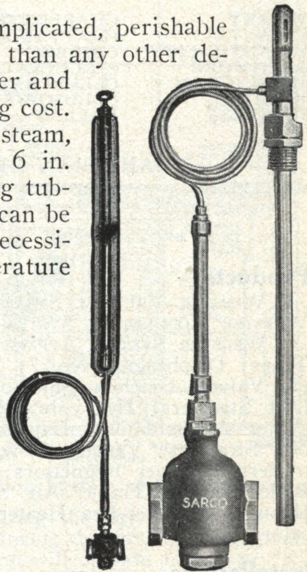
Sarco Temperature Regulator

Operated by an extremely sensitive liquid, Sarco temperature regulators are instantly responsive to the slightest fluctuations in the temperature of atmosphere or liquids. Entirely self-contained and self-operated.

No electricity, compressed air or other outside attachments are required for their operation. No rubber or leather diaphragms or complicated, perishable parts. The Sarco costs less than any other dependable control and is cheaper and easier to install. No operating cost.

Sarco regulators operate steam, water and gas valves ½ to 6 in. They have 6 ft. of connecting tubing between elements, which can be increased where conditions necessitate. Supplied for any temperature between 30 and 300° F.

Ask for Booklet L-75.



Type KR-14 for Rooms

Type TR-21 for Tanks, etc.

Sarco Temperature Regulators

SARCO TYPE TR-21 REGULATOR, FOR LIQUIDS

Size, in.	Weight, lb.	Face to face of valve, in.	Price
½	8	2¾	$ 75.00
¾	8	3⅜	80.00
1	9	3 11/16	85.00
1¼	13	4½	90.00
1½	22	5	95.00
2	28	6	100.00
2½	37	7¼	115.00
3	51	8¾	130.00
4	81	13¾	170.00
5	132	15¾	225.00
6	158	18	275.00

SARCO TYPE KR-14 REGULATOR, FOR ATMOSPHERE

Size of valve, in.	½	¾	1	1¼	1½	2	2½	3	4
Price	$60.00	65.00	70.00	75.00	85.00	95.00	110.00	125.00	170.00

Apply for discounts.

Sarco Steam Traps

These small, compact, simple steam traps do the same work as the more cumbersome bucket or float traps and cost about one-third as much.

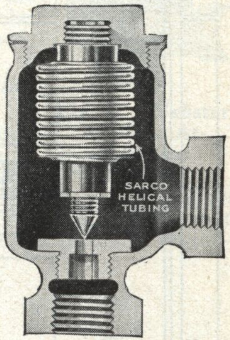
Sarco traps have only one moving part. No levers, gauges, stuffing boxes, etc., to get out of order and need attention. They release condensate as rapidly as it collects, returning it directly to hot well while still hot. They do not waste live steam.

Can be installed any point on line. No floor space, pit digging, building up or supports required.

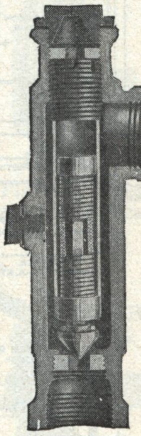
Sold on 30 days' free trial.

The new No. 9 Sarco steam trap is of the *self-adjusting* balanced-pressure type and is suitable for any steam pressure from 0 to 100 lb. It consists of a heavy bronze body with a powerful motor element made of Sarco helical bronze tubing containing an expansion fluid. The ½-in. has a capacity of 500 lb., ¾-in. 600 lb., of water per hour. Can not rust, stick or air bind. Ask for Booklet L-255.

Sarco adjustable steam trap No. 7 is made in sizes ⅜ to 3-in. for any given pressure up to 200 lb. Write for Booklet L-157.



Self-adjusting Type No. 9



Adjustable Type No. 7

Sarco Steam Traps

ESTABLISHED 1888

WARREN WEBSTER & COMPANY

Steam Heating Systems and Steam Specialties

CAMDEN, NEW JERSEY

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LONDON, ENGLAND: The Atmospheric Steam Heating Co., Ltd.

Products

Webster Vacuum Systems of Steam Heating; Webster Modulation Systems of Steam Heating.

Webster System Apparatus: Including Sylphon Traps; Diaphragm (No. 7) Traps; Modulation Supply Valves; Sylphon Quick-opening Packless Valves; Dirt Strainers; Heavy-duty Traps; Double Service Valves; Water Accumulators; Expansion Joints; Lift Fittings; Suction Strainers; Vacuum Governors; Hy-Lo Traps and Controllers; Damper Regulators; Vent Traps and Vent Valves; Boiler Return Traps; Air Separating Tanks; Feed Water Heaters; Webster-Lea Heater-Meters; Steam and Oil Separators.

Installations

More than 34,000 Webster Systems have been installed since 1888.

Webster ESTABLISHED 1888

TRADE-MARK

Webster Service

Is an integral part of every Webster System, delivered through 50 branch offices. Webster Service places the accurate, comprehensive information resulting from the extensive experience of this organization at the disposal of architects, engineers and heating contractors.

"Steam Heating" is a manual of practical data prepared by the Webster organization. It has been adopted as text in several universities. Extremely useful to those having *steam heating design problems.* It is cloth bound, has 368 pages, 8x10½ in., 162 tables of useful data and 493 typical layouts and illustrations. Architects and engineers are invited to request a copy on their letterheads.

Service Details—Are provided showing accepted standard practice to be followed in installing Webster System apparatus and in making connections. Over 160 separate service details are available in loose-leaf form. These are supplied, as needed, to users of Webster Systems.

The use of Webster Service Details saves a substantial amount of the designer's time in laying out a system and helps to assure correct installation of each system.

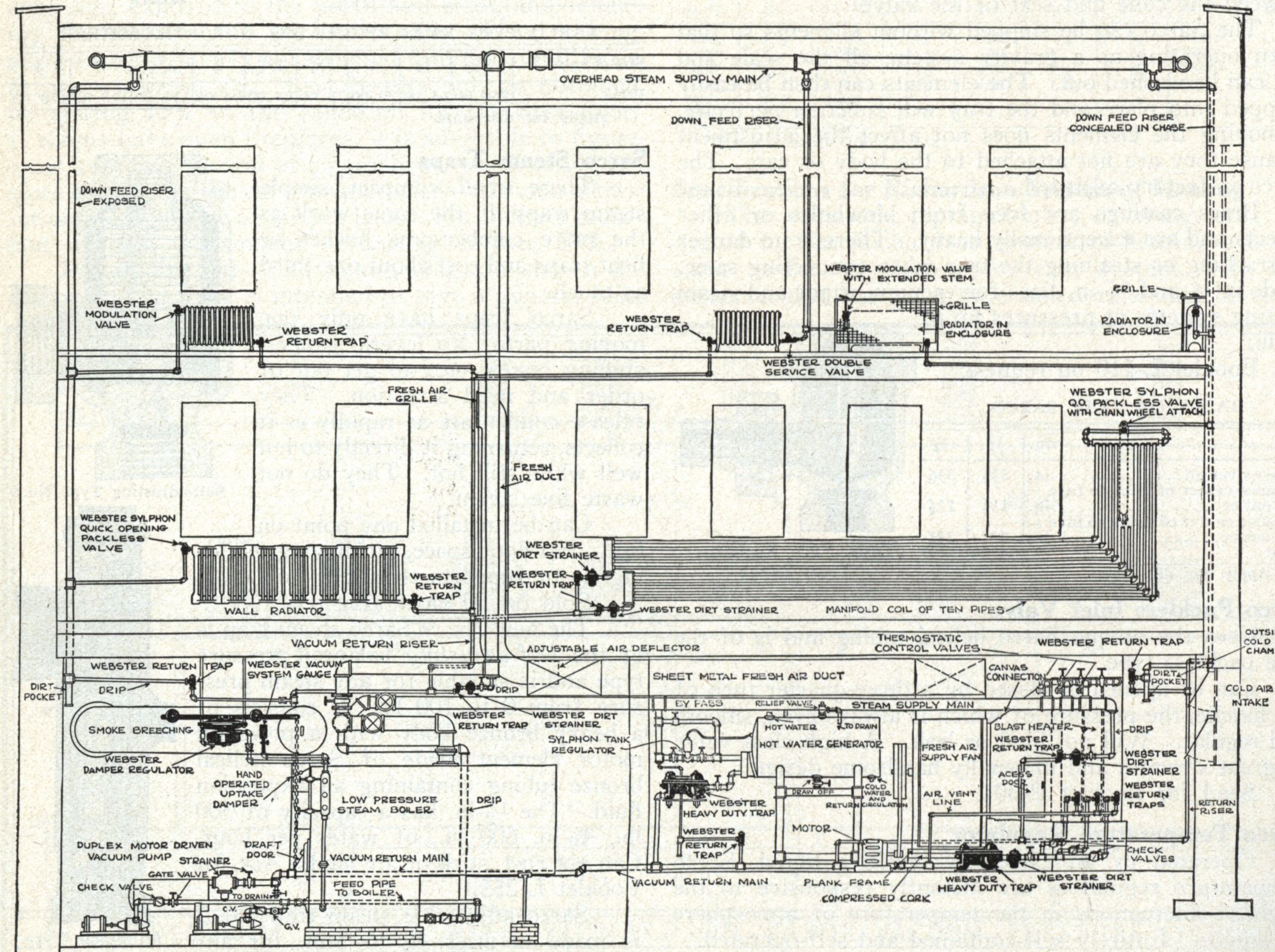
OVERHEAD STEAM SUPPLY MAIN
DOWN FEED RISER EXPOSED
DOWN FEED RISER
DOWN FEED RISER CONCEALED IN CHASE
WEBSTER MODULATION VALVE
WEBSTER RETURN TRAP
WEBSTER RETURN TRAP
WEBSTER MODULATION VALVE WITH EXTENDED STEM
GRILLE
RADIATOR IN ENCLOSURE
GRILLE
RADIATOR IN ENCLOSURE
WEBSTER DOUBLE SERVICE VALVE
FRESH AIR GRILLE
FRESH AIR DUCT
WEBSTER SYLPHON Q.O. PACKLESS VALVE WITH CHAIN WHEEL ATTACH.
WEBSTER SYLPHON QUICK OPENING PACKLESS VALVE
WALL RADIATOR
WEBSTER RETURN TRAP
WEBSTER DIRT STRAINER
WEBSTER RETURN TRAP
WEBSTER DIRT STRAINER
MANIFOLD COIL OF TEN PIPES
VACUUM RETURN RISER
ADJUSTABLE AIR DEFLECTOR
THERMOSTATIC CONTROL VALVES
WEBSTER RETURN TRAP
OUTSIDE COLD AIR CHAMBER
WEBSTER RETURN TRAP
WEBSTER VACUUM SYSTEM GAUGE
DIRT POCKET
DRIP
DRIP
SHEET METAL FRESH AIR DUCT
CANVAS CONNECTION
DIRT POCKET
COLD AIR INTAKE
SMOKE BREECHING
WEBSTER RETURN TRAP
WEBSTER DIRT STRAINER
BY PASS
RELIEF VALVE
STEAM SUPPLY MAIN
SYLPHON TANK REGULATOR
HOT WATER
TO DRAIN
HOT WATER GENERATOR
BLAST HEATER
DRIP
WEBSTER DAMPER REGULATOR
FRESH AIR SUPPLY FAN
WEBSTER RETURN TRAP
WEBSTER DIRT STRAINER
HAND OPERATED UPTAKE DAMPER
ACESS DOOR
LOW PRESSURE STEAM BOILER
DRIP
DRAW OFF
COLD WATER AND CIRCULATION
RETURN
WEBSTER HEAVY DUTY TRAP
AIR VENT LINE
WEBSTER RETURN TRAPS
RETURN RISER
DUPLEX MOTOR DRIVEN VACUUM PUMP
DRAFT DOOR
VACUUM RETURN MAIN
WEBSTER RETURN TRAP
MOTOR
STRAINER
GATE VALVE
CHECK VALVES
CHECK VALVE
TO DRAIN
C.V.
G.V.
FEED PIPE TO BOILER
VACUUM RETURN MAIN
PLANK FRAME
COMPRESSED CORK
WEBSTER HEAVY DUTY TRAP
WEBSTER DIRT STRAINER

Fig. 1. General Arrangement of the Webster System of Steam Heating Using Low Pressure Steam Boiler and Motor Driven Vacuum Pump

Continued on next page

Catalogue Bulletins—Describe Webster apparatus from the standpoint of the engineer, providing complete tables, drawings and other technical data. Issued in loose-leaf catalogue size for convenient reference.

Industrial Plant Heating

Different types of Webster Systems of Steam Heating are obtainable to meet the requirements of literally every type of building. The principal types used are briefly described in the paragraphs that follow. Correspondence is invited regarding your particular heating problem.

Webster Vacuum Systems

Operate on exhaust or live steam at very low pressure and return practically pure distilled water to the boilers. Used with direct radiation or in combination with blast coils or unit heaters. Particularly suited for large buildings or where process steam is used.

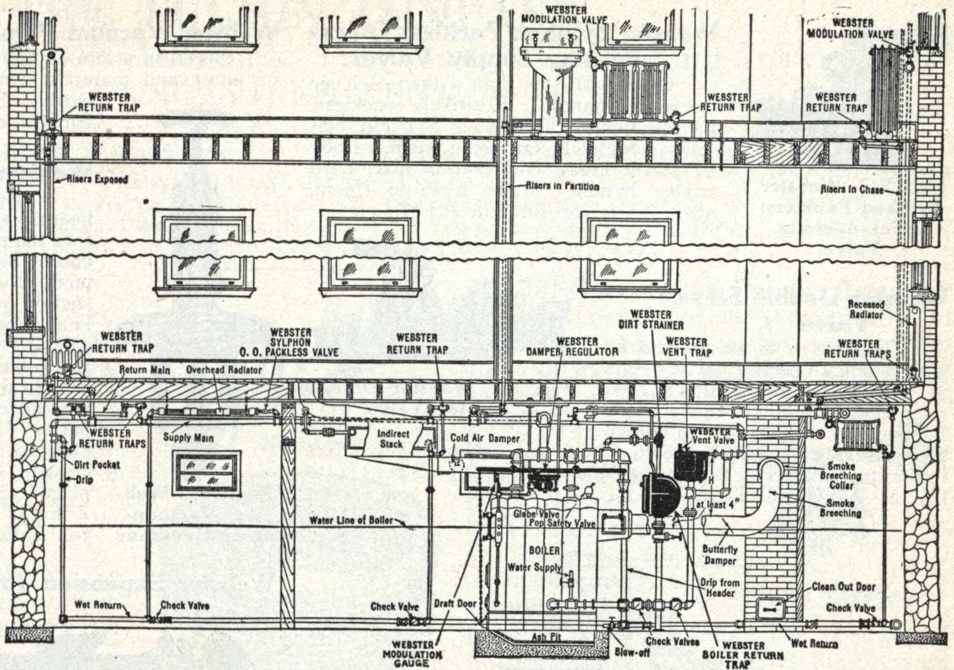
WEBSTER MODULATION VALVE
WEBSTER MODULATION VALVE
WEBSTER RETURN TRAP
WEBSTER RETURN TRAP
WEBSTER RETURN TRAP
Risers Exposed
Risers in Partition
Risers in Chase
Recessed Radiator
WEBSTER RETURN TRAP
WEBSTER SYLPHON O. O. PACKLESS VALVE
WEBSTER RETURN TRAP
WEBSTER DIRT STRAINER
WEBSTER DAMPER REGULATOR
WEBSTER VENT TRAP
WEBSTER RETURN TRAPS
Return Main
Overhead Radiator
WEBSTER RETURN TRAPS
Supply Main
Indirect Stack
Cold Air Damper
WEBSTER Vent Valve
Dirt Pocket
Drip
Smoke Breeching Collar
H
at least 4"
Smoke Breeching
Water Line of Boiler
Globe Valve
Pop Safety Valve
BOILER
Water Supply
Butterfly Damper
Drip from Header
Clean Out Door
Wet Return
Check Valve
Check Valve
Draft Door
Check Valve
Ash Pit
WEBSTER MODULATION GAUGE
Blow-off
Check Valves
WEBSTER BOILER RETURN TRAP
Wet Return

Fig. 3. Typical Arrangement of Webster Type "R" Modulation System of Steam Heating

Operation—A partial vacuum is created and maintained by a steam or power driven vacuum pump. Steam is admitted to radiators or other heating units through Webster Sylphon Quick-opening Packless Valves, or Webster Modulation Valves. Condensation and air are discharged from each heating unit through Webster Return Traps, which close to prevent the passage of steam, thus preventing waste.

Water of condensation and air are removed from the system through the return piping by the vacuum pump. The air is discharged to the atmosphere, the water is returned to the boiler, by means suited to particular conditions. An elevation of a typical Webster Vacuum System installation using low pressure steam boiler and motor driven vacuum pump, is shown in Fig. 1.

Ask for Bulletin B-500.

Webster Hy-Lo Vacuum System

Where a group of buildings, at varying distances from the source of steam or at different levels, is to be heated by the same vacuum system, uneven distribution often results. This can be overcome by using Webster Hy-Lo Vacuum controlling units (Fig. 2) on the return mains from those units having the highest vacuum. They automatically control the degree of vacuum so that substantially equal circulation is obtained in each unit of the group.

Operation—Dirt strainer at right protects apparatus. Hy-Lo Trap in center below passes condensation. Hy-Lo Controller in center above regulates vacuum. Webster Lift Fittings at left raise condensation to higher level.

Ask for Bulletin 710-A.

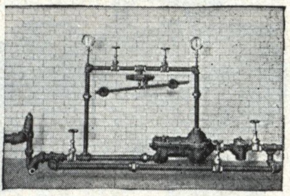

Fig. 2. Typical Installation of Hy-Lo Vacuum Control System

Webster Type "R" Modulation System

A desirable type of low pressure steam heating system suitable for all types of buildings having little or no demand for process steam and a basement or other means for placing low pressure boiler *below* the lowest radiator. For installations from 500 to 32,000 sq. ft. of equivalent direct cast iron radiation. Can be operated safely and satisfactorily by unskilled labor.

Operation—Initial steam pressure is closely controlled by an extremely sensitive Webster Damper Regulator. Steam is admitted to radiators through Webster Modulation Valves which permit close regulation of room temperature through an effective throttling control. Condensation and air are discharged from radiators by Webster Return Traps, which prevent discharge of steam, thus avoiding waste. Condensation and air are carried to a Webster Vent Trap, which automatically vents air from the system through a vent valve, permitting operation under partial vacuum for long periods.

Return of water to boiler is assured by the Webster Boiler Return Trap. A typical Webster Type "R" Modulation System installation is shown in Fig. 3.

Ask for Bulletins 726 and S-650.

Combination Modulation and Vacuum Systems

In many instances, combinations of vacuum and Type "R" Systems provide the most desirable heating system, particularly for industrial installations. When heat is required continually and process steam used only during the day, the system can be operated with vacuum pump during the day, assuring greatest economy. At night, the system will operate as a Type "R" System, with the pump shut down.

Webster engineers will point out the system best suited for your operating conditions, without obligation.

Modernizing Existing Systems

Webster Sylphon Attachments (Fig. 4) provide a means of bringing old, inefficient 2-pipe systems up to economical operating standards.

They are made to fit practically all makes of traps and valves and can be installed without disturbing piping connections.

For complete information describe the present equipment.

With the instructions furnished and the tools which are loaned for the purpose, the work of modernizing by means of Webster Sylphon Attachments is so simple that it can be done in a few minutes for each radiator, and so cleanly that there is no disturbance or damage to the surroundings or furnishings. Ask for Bulletin 851.

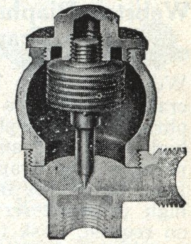

Fig. 4. Webster Sylphon Attachment

Webster System Apparatus

Has been developed especially for use with Webster Systems and tested by years of service.

Webster Sylphon Traps

The original and most highly perfected type of bellows trap. Effectively discharge all condensation and entrained air from radiators or coils without permitting passage of steam. Operation is by means of a sensitive volatile liquid contained in a rugged Sylphon bellows. Factory adjusted, and made in sizes from ½ to 1¼ in. Ask for Bulletin 701.

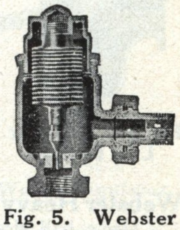

Fig. 5. Webster Sylphon Trap

Webster Modulation Supply Valves

Provide by means of the tapered modulating plug, accurate heat control of each radiator. Particularly well suited for residence heating systems, as it permits heating any desired portion of radiator. Sizes, ½ to 1¼ in. Ask for Bulletin 705-3.

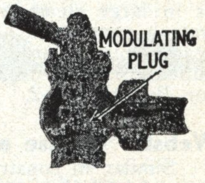
MODULATING PLUG

Fig. 6. Webster Modulation Supply Valve

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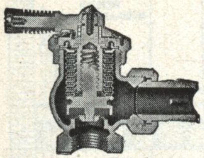


Fig. 7. Webster Sylphon Packless Quick-opening Valve

Webster Sylphon Packless Quick-opening Supply Valves

Open with less than a turn of lever or wheel handle. Positively packless, having flexible laminated Sylphon bellows completely enclosing stem. Body of steam brass, composition disc, hard rubber handle. Made in ½ to 1½-in. sizes. Ask for Bulletin 705-51.

Webster Double Service Valve

Combines a thermostatic trap with a quick-opening valve. Acts as trap for draining down feed riser and as radiator supply valve. Particularly applicable in down feed risers as used in one-story buildings where they effect important savings in pipefitting labor. (Fig. 9.) Sizes, ¾ to 1½ in. Ask for Bulletin 722.

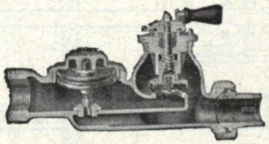


Fig. 8. Webster Double Service Valve

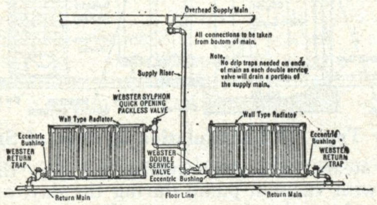

Overhead Supply Main
All connections to be taken from bottom of main.
Note. No drip traps needed on ends of main as each double service valve will drain a portion of the supply main.
Supply Riser
WEBSTER SYLPHON QUICK OPENING PACKLESS VALVE
Wall Type Radiator
Wall Type Radiator
Eccentric Bushing
WEBSTER RETURN TRAP
WEBSTER DOUBLE SERVICE VALVE
Eccentric Bushing
Eccentric Bushing
WEBSTER RETURN TRAP
Return Main
Floor Line
Return Main

Fig. 9. Connections of Double Service Valve to Two Wall Radiators

Additional sections or long pipe coils may be used

Webster Diaphragm Type Return Trap (No. 7)

Performs the same functions as Webster Sylphon Trap. Has as operating member a multiple flat diaphragm made of phosphor bronze. A highly efficient and serviceable diaphragm type trap. Made in sizes from ½ to 1¼ in. Also made for high pressure service. Information on request. Ask for Bulletin 702.

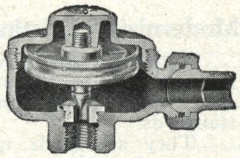


Fig. 10. Webster No. 7 Trap

Webster Dirt Strainers

Placed in return lines of steam heating systems to catch dirt, rust, scale and other particles, preventing them from impairing the tightness of traps. More dependable than pockets made of pipe and fittings, cost less to install, and are more readily cleaned. Sizes from ½ to 2 in. Ask for Bulletin 709.

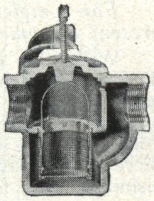


Fig. 11. Webster Dirt Strainer

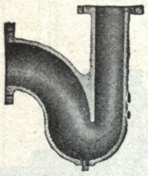


Fig. 12. Webster Lift Fitting

Webster Lift Fittings

For use in vacuum systems where condensation is to be lifted to a higher level. More efficient than "lifting pockets" made of standard fittings, require less time, and cost less to install. Sizes, ¾ to 12 in. Ask for Bulletin 713.

Webster Heavy Duty Traps

Have ball floats actuating valve mechanism. Used to remove condensation where it accumulates in large quantities, as in large steam mains, hot water generators and fan heater coils. Large discharge outlet. Sizes, ¾ to 2 in. Ask for Bulletin 706-2.

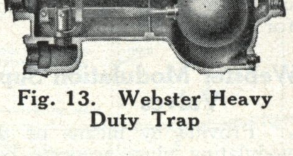


Fig. 13. Webster Heavy Duty Trap

Webster Grease and Oil Traps

Similar in construction to heavy duty traps shown above. For use in draining oil separators on steam lines or feed water heaters. For pressures up to 15 lb. Sizes, ¾ to 2 in. Ask for Bulletin 401-A.

Webster Vacuum Pump Governors

Placed in steam supply lines to automatically control speed of pump and maintain constant vacuum. Very sensitive and easily adjusted. Sizes up to 3½ in. Ask for Bulletin 708.

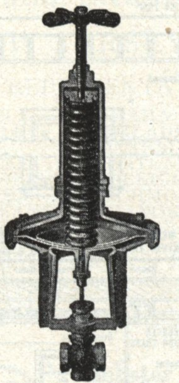


Fig. 14. Webster Vacuum-pump Governor

Webster Suction Strainer

Placed in the return line of a vacuum heating system before the return line enters the vacuum pump, they protect suction valves and linings of the pump cylinders from damage.

Strainer baskets have large capacity and are easily removed, cleaned and replaced. Sizes from 2 to 12 in. Ask for Bulletin 707.

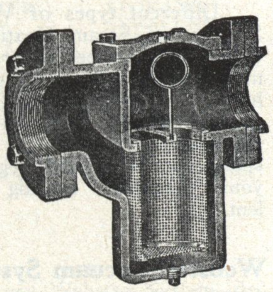


Fig. 15. Webster Suction Strainer

Webster Expansion Joints

Made in single and double slip sliding types. Classes D and G for pressures up to 15 lb. Classes DH and GH for 125 lb. and 150 lb., respectively. Have anchor footings. Sizes, 2 to 24 in. Ask for Bulletin 1100.

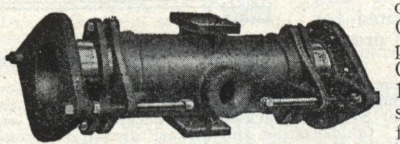


Fig. 16. Webster Expansion Joint

Webster Air Separating Tanks

Made in two standard sizes, 18-in. diam. by 48 in. long and 24-in. diam. by 72 in. long.

They receive and store returns from heating systems, affording space for liberation of entrained air and provide a suitable place for introducing "make-up" feed water.

Made in three styles: *Plain* with only the essential openings and provision for adding make-up water by hand; *water control type* with automatic regulating valve for admitting make-up water during periods when the heating system returns may fall off temporarily; *steam control type* with cold water admission, hand controlled, but with automatic regulating valve governing the operation of the feed pump and controlling the discharge of water from tank.

Shell construction of 3/16-in. steel and heads of ½ in., unless otherwise specified. Ask for Bulletin 714.

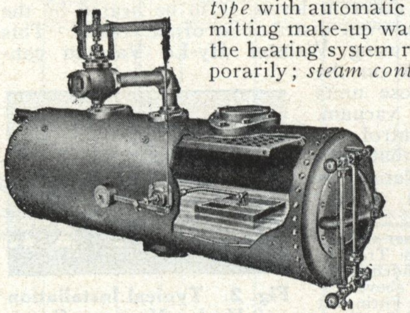


Fig. 17. Webster Air Separating Tank

Webster Feed Water Heaters

Save from 10 to 17% of fuel and from 10 to 14% of water as compared with closed type of heater, or with no heater. Reduce boiler repairs by eliminating strain incident to injecting cold water, and reduce boiler cleaning expense by their action as water purifiers. Ask for Bulletin 102-A.

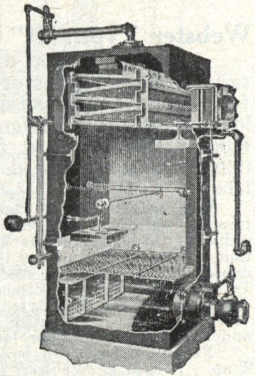


Fig. 18. Webster Feed-water Heater

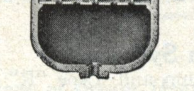


Fig. 19. Webster Oil Separator

Webster Oil Separators

For horizontal or vertical flow, low pressure. Sizes from 1½ to 16 in. Ask for Bulletin 401-A.

THE FULTON COMPANY

Manufacturers of Sylphon Automatic Temperature Controlling Instruments

KNOXVILLE, TENN.

SALES OFFICES

NEW YORK, N. Y., Hudson Terminal Building, 50 Church Street
DETROIT, MICH., Book Building, Washington Boulevard
CHICAGO, ILL., Wrigley Building, Michigan Boulevard
PHILADELPHIA, PA., Drexel Building, 4th and Chestnut Streets
BOSTON, MASS., 136 Federal Street

EUROPEAN REPRESENTATIVES: Crosby Valve & Engineering Co., Ltd., 41-42 Foley Street, LONDON, W. 1, ENGLAND
CANADIAN REPRESENTATIVES: Darling Bros., Ltd., 120 Prince Street, MONTREAL, QUE.
REPRESENTATIVES IN ALL PRINCIPAL CENTERS IN UNITED STATES

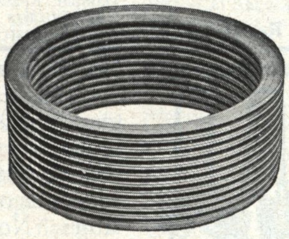
Products

Patentees and manufacturers of Sylphon Products: Sylphon Automatic Air and Vent Valves; Thermostats for regulating temperatures of homes heated by warm air furnaces, steam or hot water boilers; Temperature and Pressure Regulators, Temperature Regulating Radiator Covers; and other Heating Specialties.

Advantages

All Sylphon devices embody the seamless, one-piece bellows of drawn metal shown at right. There is not a bit of solder throughout its length—no chance for leaks or breaks. It is a feature found exclusively in Sylphon products. Sylphons are made in sizes ranging from 1⅛ to 12 in. outside diameter.

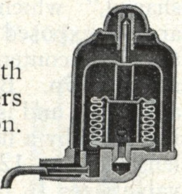
Sylphon TRADE MARK
For Constant Temperatures



Sylphon Bellows
The heart of all Sylphon products

No. 536 Sylphon Radiator Air Valve

An improved radiator air valve with large thermostat and float which renders it extremely powerful and positive in action.



No. 536
Radiator Air Valve

The active principle is the Sylphon bellows, which is filled with a thermo-sensitive liquid whose volatilization, when steam comes in contact with it, expands the bellows and closes the port.

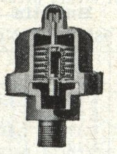
It will not buckle or distort, and will never lose its efficiency. Has ample movement, thus insuring free venting.

Ask for Bulletin TAV-1.

Specification—All radiators shall be equipped with No. 536 Sylphon Radiator Air Valves, as manufactured by The Fulton Company, Knoxville, Tenn., to be installed according to standard practice governing the venting of radiators.

No. 527 Sylphon Quick Vent Valve

For venting mains and risers. Same in principle as No. 536, but does not have float because always installed above water line. The venting orifice is $\frac{3}{32}$-in. diameter. Substantially built of heavy brass castings so that it is not easily damaged.



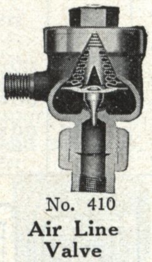
No. 527
Quick Vent Valve

Ask for Bulletin TAV-1.

Specification—The ends of long runs of pipe, risers or loops shall be vented with a No. 527 Sylphon Quick Vent Valve as manufactured by The Fulton Company, Knoxville, Tenn.

No. 410 Sylphon Air Line Valve

An automatic non-adjustable air line valve that will positively and silently expel air and condensation, but close against steam. The Sylphon air line valve has as its basic principle the Sylphon thermostat, which will quickly and effectively distinguish between steam and air, freely allowing the air and condensation to pass but preventing the passage of steam. This means that every inch of radiating surface becomes 100% efficient.



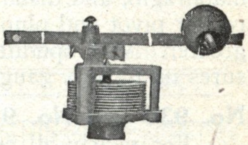
No. 410
Air Line Valve

Ask for Bulletin TAV-1.

Specification—All radiators to be equipped with Sylphon Air Line Valves, known as (either No. 410 or No. 410-A) as manufactured by The Fulton Company, Knoxville, Tenn.

No. 22 Sylphon Steam Damper Regulator

This instrument, for the regulation of dampers on steam boilers, is composed entirely of metal, has no rubber diaphragms to wear out and become inoperative; is frictionless, sensitive, positive and invariable in its action. It operates with a slight change in pressure, thus closing the dampers at a very low steam pressure when desired. The position of the counterweight determines the pressure to be maintained.



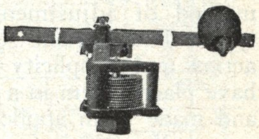
No. 22
Damper Regulator

Ask for Bulletin TD-4.

Specification—The boiler shall be equipped with a No. 22 Sylphon Steam Damper Regulator, as manufactured by The Fulton Company, Knoxville, Tenn., and installed in accordance with instructions of the manufacturer.

No. 22 Junior Sylphon Steam Damper Regulator

This regulator is identical in construction with No. 22 except that it contains a smaller Sylphon bellows as its diaphragm and is, therefore, suitable for small steam boilers or those having light dampers which do not require much power for their operation.



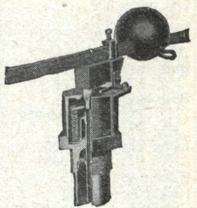
No. 22
Junior Damper Regulator

Ask for Bulletin TD-4.

Specification—The boiler shall be equipped with a No. 22 Junior Sylphon Steam Damper Regulator, as manufactured by The Fulton Company, Knoxville, Tenn., and installed in accordance with instructions of the manufacturer.

No. 45-A Sylphon Hot Water Damper Regulator

Used to control the dampers on hot water heating boilers. Simple, accurate regulators which will control the draft so as to maintain a constant temperature of the water at any point between 120° and 220° F. They prevent the temperature of the water from rising higher than necessary, insuring faucet water of even temperature every hour of the day. They prevent the generating of steam in the system, thus eliminating the disagreeable sputtering and blowing off when the faucet is opened.



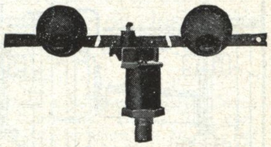
No. 45-A
Water Regulator

Ask for Bulletin TD-4.

Specification—(Boiler, heater, or tank heater) shall be equipped with a No. 45-A Sylphon Hot Water Damper Regulator as manufactured by The Fulton Company, Knoxville, Tenn.; the regulator to have a temperature range of (specify temperature range. No. 45-A has temperature range of 120-200°, No. 45-B has temperature range of 100-200° Fahr.), and to be installed in accordance with instructions furnished by the manufacturer.

No. 46 Sylphon Hot Water Damper Regulator

This regulator is designed especially for domestic hot water supply heaters and is identical in construction with No. 45, except that it contains



No. 46
Damper Regulator

Continued on next page

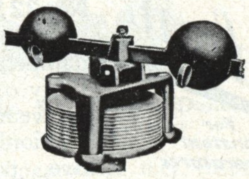
a smaller Sylphon bellows as its diaphragm, as it requires less power to operate the light dampers of such heaters. Also suitable for laundry heaters, garbage burners, etc.

Ask for Bulletin TD-4.

Specification—(Boiler, heater, or tank heater) shall be equipped with a No. 46 Sylphon Hot Water Damper Regulator, as manufactured by The Fulton Company, Knoxville, Tenn.; the regulator to have a temperature range of (specify temperature range. No. 46 has temperature range of 130-200° F.), and to be installed in accordance with instructions furnished by the manufacturer.

No. 924 Sylphon Steam Damper Regulator

For low pressure steam boilers where extra sensitiveness and greater power are required to operate the damper. Is identical in construction with No. 22 except that it contains a larger Sylphon bellows as its diaphragm, and distance between rocker pivot and plunger pivot is greater. Will operate with pressures up to 3-lb. gauge.



No. 924

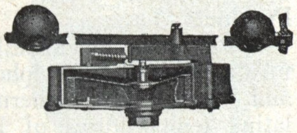
Damper Regulator

Ask for Bulletin TD-4.

Specification—Boiler shall be equipped with a No. 924 Sylphon Steam Damper Regulator as manufactured by The Fulton Company, Knoxville, Tenn., and installed in accordance with the instructions of the manufacturer.

No. 925 Sylphon Vapor Damper Regulator

Specially designed to control dampers on boilers used with vapor heating systems. Extremely powerful and sensitive. Has extra large flexible Sylphon bellows as diaphragm. One ounce change in vapor pressure produces a 6¼-lb. force to open or close dampers. Operates from 2 oz. to 1-lb. gauge, perfectly, smoothly and will not "flutter" under any condition.



No. 925

Vapor Damper Regulator

Ask for Bulletin TD-4.

Specification—The boiler shall be equipped with a No. 925 Sylphon Vapor Damper Regulator, as manufactured by The Fulton Company, Knoxville, Tenn., and installed in accordance with the instructions of the manufacturer.

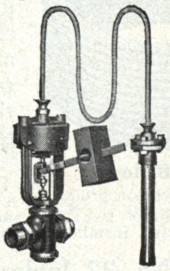
No. 930 and No. 931 Temperature Regulators

For nearly all requirements where liquids are heated by steam, and especially for hot water supply tanks in apartments, hotels, clubs, etc., and for industrial uses. Regularly furnished with a temperature range of 140° to 180° F. Special regulators can be furnished with adjustment for 20° above or below the operating point for temperatures not lower than 20° nor higher than 310° F. No. 930 Regulator is the same as No. 931, except that it has lever and weight method of adjustment instead of spring type. The extreme sensitiveness, positive action and simplicity of these regulators have placed them in a class by themselves, and made them applicable in hundreds of ways. No. 930 is furnished in valve sizes from ½ to 8 in., inclusive. No. 931 in sizes from ½ to 2½ in., inclusive.

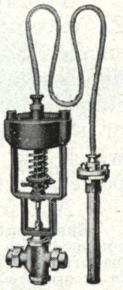
Valves—Double seated balanced type, bronze discs and seats. Bronze bodies fitted with bronze unions in sizes ½ to 1½ in., inclusive.

Size 2 in. and above have iron bodies, bodies flanged and drilled standard. Companion flanges furnished at extra cost.

Flexible Metal Tube—8 ft. long; supplied longer on order.



No. 930



No. 931

Temperature Regulators

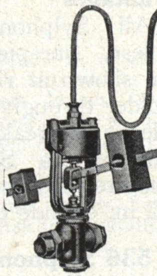
No. 980 and No. 981 Temperature Regulators

These regulators are used to automatically control temperature of air in dry rooms, etc., and can be furnished with the same temperature ranges as our Nos. 930 and 931 Regulators. No. 980 is lever type, No. 981 spring type. The thermostatic bulb, of our own special design is "star-shaped," which gives the greatest area of exposed surface in proportion to cubical content and mass of any design known. Bulb may be placed at any point, and is connected with the operating valve by a flexible tube of any required length up to 125 ft. No. 980 is made in valve sizes ½ to 5 in., inclusive; No. 981 in sizes ½ to 2½ in., inclusive.

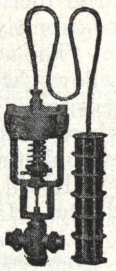
Chart—On application, a chart will be furnished showing size of regulator needed for any given condition.

Specification—Install where shown on plans a Sylphon Temperature Regulator (No. 930, No. 931 or No. 980 or No. 981) as manufactured by The Fulton Company, Knoxville, Tenn.; the regulator to have a temperature range of (specify the temperature range) and be of the following size (specify the size of valve), for steam pressure of .... lb., with tubing .... ft. long.

Bulletin—Ask for Bulletin TT-105.



No. 980

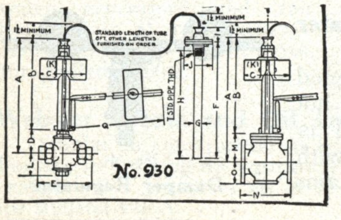


No. 981

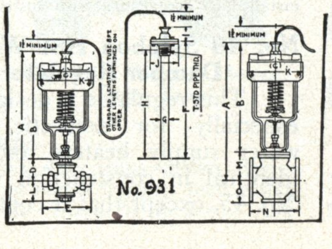
Temperature Regulators

PRINCIPAL DIMENSIONS, PRICES, ETC. OF NO. 930, NO. 931, NO. 980 AND NO. 981 SYLPHON TEMPERATURE REGULATORS

Valve sizes, inches	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
List prices 930	$60	$65	$70	$75	$80	$ 90	$ 95	$100	$110	$120	$200	$225	$275
" " 931	$60	$65	$70	$75	$80	$ 90	$ 95	...	...	...	...	...	...
" " 980	$70	$75	$80	$85	$90	$100	$110	$125	$140	$150	$225	...	...
" " 981	$70	$75	$80	$85	$90	$100	$110	...	...	...	...	...	...
Bulb thread IPS 930	1″	1″	1″	1″	1″	1¼″	1¼″	1¼″	1¼″	1¼″	1¼″	2½″	2½″
" " " 931	1″	1″	1″	1″	1″	1¼″	1¼″	...	...	...	...	...	...
Bulb length 930	16″	16″	16″	16″	16″	16″	16″	24″	24″	24″	24″	24″	24″
" " 931 and 981	16″	16″	16″	16″	16″	16″	16″	...	...	...	...	...	...
" " 980	16″	16″	16″	16″	16″	16″	16″	16″	16″	16″	16″	...	...
Lever bar length 930	24″	24″	24″	24″	24″	24″	24″	36″	36″	36″	36″	36″	36″
" " " 980	41″	41″	41″	41″	41″	41″	41″	43″	43″	43″	43″	...	...
Height A + L 930	14⅞″	15¼″	16⅛″	17 1/16″	17 9/16″	...	...	...	...	...	...	...	...
Height A + O 930	...	...	...	...	...	19⅜″	20⅜″	23½″	24 15/32″	25 13/32″	27 15/32″	29 15/32″	31 9/16″
Height A + L 931 and 981	18½″	18⅞″	19¾″	20¼″	20¾″	...	...	...	...	...	...	...	...
Height A + O 931 and 981	...	...	...	...	...	21⅛″	22⅛″	...	...	...	...	...	...
Height A + L 980	14⅞	15¼″	16⅛″	17 1/16″	17 9/16″	...	...	...	...	...	...	...	...
Height A + O 980	...	...	...	...	...	19⅜″	20⅜″	23½″	24 15/32″	25 13/32″	27 15/32″	...	...
Face to face 930	(E) 5⅜″	(E) 5⅞″	(E) 6½″	(E) 7¾″	(E) 8⅜″	(N) 7″	(N) 7¾″	(N) 8⅝″	(N) 9½″	(N) 10¼″	(N) 12¼″	(N) 14¼″	(N) 18½″
" " " 931 and 981	(E) 5⅜″	(E) 5⅞″	(E) 6½″	(E) 7¾″	(E) 8⅜″	(N) 7″	(N) 7¾″	...	...	...	...	...	...
" " " 980	(E) 5⅜″	(E) 5⅞″	(E) 6½″	(E) 7¾″	(E) 8⅜″	(N) 7″	(N) 7¾″	(N) 8⅝″	(N) 9½″	(N) 10¼″	(N) 12¼″	...	...
Width incl. Q 980	26″	26″	26″	26″	26″	26″	26″	27¼″	27¼″	27¼″	27¼″	...	...
Lever bar R 980	14⅝″	14⅝″	14⅝″	14⅝″	14⅝″	14⅝″	14⅝″	15¾″	15¾″	15¾″	15¾″	...	...


1½ MINIMUM
STANDARD LENGTH OF TUBE 8FT. OTHER LENGTHS FURNISHED ON ORDER.
1½ MINIMUM
1 STD PIPE THD
A
B
C
(K)
J
H
F
D
G
L
E
O
N

No. 930


1½ MINIMUM
1½ MINIMUM
1½ MINIMUM
STANDARD LENGTH OF TUBE 8FT. OTHER LENGTHS FURNISHED ON ORDER.
1 STD PIPE THD
K
J
H
A
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M
O
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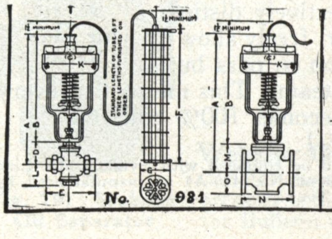
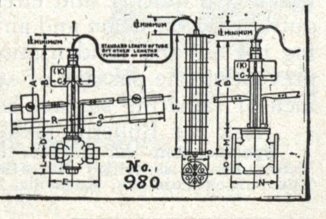
No. 931


1½ MINIMUM
1½ MINIMUM
1½ MINIMUM
STANDARD LENGTH OF TUBE 8FT. OTHER LENGTHS FURNISHED ON ORDER.
K
A
B
D
F
L
E
M
O
N

No. 981


1½ MINIMUM
1½ MINIMUM
1½ MINIMUM
STANDARD LENGTH OF TUBE 8FT. OTHER LENGTHS FURNISHED ON ORDER.
(K)
C
A
B
F
D
G
Q
R
L
E
O
N

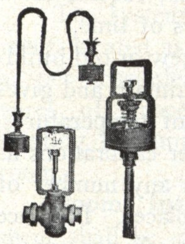
No. 980

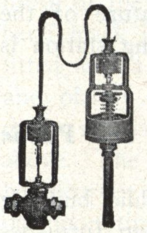
Continued on next page

No. 932 Sylphon Temperature Regulator

Detachable Tube Type—This regulator for controlling temperature of liquids, is composed of three distinct and separable units—the valve, the thermostatic bulb and the transmission tube. Each may be separately installed, removed or replaced as the case may be. If the flexible tubing should become damaged or broken, the power transmitting unit may readily be replaced by loosening two lock nuts, and the repair part slipped into place. Movement is transmitted by liquid pressure acting between two small Sylphon bellows and is frictionless. Liquid is non-freezing. These features are patented and possessed by no other regulator on the market.

This regulator, on account of its flexibility of installation, is very popular with the heating trade. If steam line is quite a distance from point of control and interferences lie in between, each unit is easily installed because separate. One transmission unit fits all regulators having valve sizes ½ to 1¼ in. Another unit, valve sizes 1½ to 4 in.

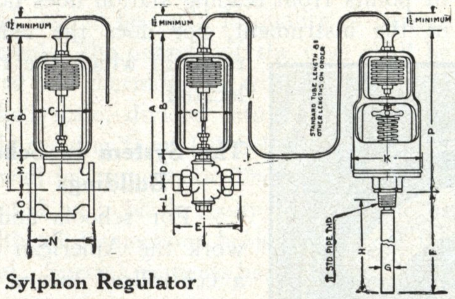

Unassembled


Assembled

Valves—Double seated balanced type, with bronze discs and seats. Bronze bodies fitted with bronze unions in sizes ½ to 1½ in., inclusive. Sizes 2 in. and above have iron bodies, bodies flanged and drilled standard. Companion flanges furnished at extra cost.

Flexible Metal Tube—8 ft. long; supplied longer on order.

Ask for Bulletin TT-105.



No. 932 Sylphon Regulator

PRINCIPAL DIMENSIONS, PRICES, SHIPPING WEIGHTS, ETC.

Valve size, inches	½	¾	1	1¼	1½	2	2½	3	3½	4
Bulb thread IPS . . . in.	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼
Bulb length . . . in.	16	16	16	16	16	16	16	16	16	16
Height A+L . . . in.	13	13⅜	14¼	14¾	15¼	.....	.....	.....	.....	.....
" A+O . . . in.	.....	.....	.....	.....	.....	18⅝	19⅝	20¹¹⁄₁₆	21²¹⁄₃₂	22¹⁹⁄₃₂
Face to face . . . in.	E5⅜	E5⅞	E6½	E7¾	E8⅜	N7	N7¾	N8⅝	N9½	N10¼
Height P . . . in.	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆	16⁵⁄₁₆
Shipping wt . . . lb.	35	35	40	45	45	70	80	95	115	140
List price	$75	$80	$85	$90	$95	$110	$120	$130	$140	$150

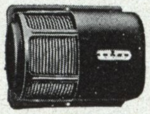
Specification—Install where shown on plans for control of water temperature No. 932 Sylphon Temperature Regulator as manufactured by The Fulton Company, Knoxville, Tenn.; the regulator to have a temperature range of (specify temperature range), and to be of the following size (specify the size of valve), with steam pressure of ...... lb.; and tubing ...... ft. long.

Sylphon Regitherm

The most powerful heating thermostat on the market. Requires no electricity, compressed air or clockwork. Responds to slight changes in temperature of air and is used to control valves, dampers and shutters. Works smoothly and is noiseless in operation. Requires no attention.

Standard range 60° to 80° F. Small and neat in appearance, being 6 in. wide by 7½ in. long.

Ask for Bulletin TT-4.


Regitherm

Specification—Install as shown on plans for the control of room temperature Sylphon Regitherm as manufactured by The Fulton Company, Knoxville, Tenn.; the Regitherm to have a temperature range of (specify temperature range—60-80° Fahr. is standard), same to be installed in accordance with instructions furnished by the manufacturer.

No. 952 Sylphon Pressure Regulator

This regulator has as its operating medium a Sylphon bellows which permits extreme sensitiveness and makes it possible to reduce the pressure to as low as 2 lb. With this regulator it is possible to take the controlling pressure from any desired point.

By employing springs of different resilience and Sylphons of different strength, varying initial pressures can be handled, therefore, specify your condition carefully.

No. 952 gives excellent results as a pump governor where there is no excessive pulsation in line. Made in sizes ½ to 4 in.

No. 952
Pressure Regulator

Valves—Double seated balanced type, ground tight against steam pressure up to 150 lb. Sizes 2 in. and above have iron bodies with all other parts bronze including seats and discs; ends flanged and drilled standard.

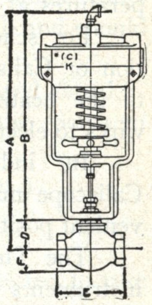
Ask for Bulletin TT-105.

PRINCIPAL DIMENSIONS, PRICES, SHIPPING WEIGHT, ETC.

Valve sizes, inches	½	¾	1	1¼	1½	2	2½	3	3½	4
REGULATOR 952										
A+F . . . in.	16²³⁄₃₂	17	17⅜	17⅞	18¹⁄₆₄	21³⁄₁₆	22³⁄₁₆	23¹¹⁄₁₆	25⁹⁄₃₂	26⁷⁄₃₂
E . . . in.	2½	2⅝	2⅞	3¼	3⅞	7	7¾	8⅝	9½	10¼
Shipping wt . . . lb.	37	40	40	45	45	65	75	92	130	160
List price	$35	$36	$40	$45	$50	$60	$75	$90	$100	$120
REGULATORS 952A AND 952B										
A+F . . . in.	16²³⁄₃₂	17	17⅜	17⅞	18¹⁄₆₄	21³⁄₁₆	22³⁄₁₆			
E . . . in.	2½	2⅝	2⅞	3¼	3⅞	7	7¾			
Shipping wt . . . lb.	37	40	40	45	45	65	75			
List price	$35	$36	$40	$45	$50	$60	$75			
REGULATOR 952C										
A+F . . . in.	13²⁵⁄₃₂	14¹⁄₁₆	14⁷⁄₁₆	14¹⁵⁄₁₆	15³¹⁄₆₄					
E . . . in.	2½	2⅝	2⅞	3¼	3⅞					
Shipping wt . . . lb.	15	15	20	20	25					
List price	$35	$36	$40	$45	$50					

RANGE OF OPERATION

Regulator	Initial pressure, lb.	Reduced pressure, lb.
No. 952	50	25
No. 952A	150	25
No. 952B	150	40
No. 952C	150	100



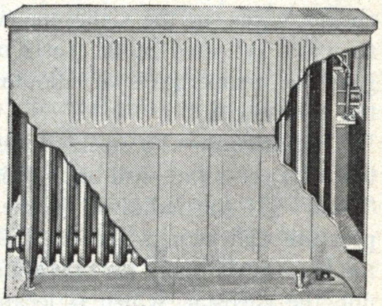
Specification—Install where shown on plans a Sylphon Pressure Regulator as manufactured by The Fulton Company, Knoxville, Tenn., known as No. 952. Size (state size) to reduce from ...... lb. steam (or water) pressure to ...... lb.

Ja-Nar Radiator Cover

Made of fine furniture steel, lined with heat insulating material. Completely covers hot water and steam radiators, either high or low. Furnished in 7 standard finishes or to match any interior woodwork. Light or dark oak, mahogany, walnut and various tinted enamels. Conserves fuel and transforms an unsightly radiator into a beautiful and harmonious article of furniture.

Furnished in three types: automatic temperature control; manually operated temperature control; uncontrolled type.

The illustration shows radiator coils (either hot water or steam) covered with Ja-Nar which is cut away to show how it fits over radiator.


The Ja-Nar
Cut away to show radiator

On the right is the Sylphon regitherm which maintains an even temperature in the room by automatically opening or closing the openings or louvers shown on upper part of Ja-Nar.

Ask for pamphlet on the Ja-Nar.

Specification—Install where shown on plans a Ja-Nar Radiator Cover as manufactured by The Fulton Company, Knoxville, Tenn. The contractor will furnish to The Fulton Company information as to size of radiator and other measurements necessary to build the Ja-Nars. (Specify finish for each room. State whether Ja-Nar Radiator Covers are to be of automatic control type, hand control type or uncontrolled type.)

THE AMERICAN TEMPERATURE INDICATING COMPANY

Manufacturers of Electric Temperature Indicators

MAIN OFFICE AND FACTORY
1017-1019 Summit Street
TOLEDO, OHIO

BRANCH OFFICES

CLEVELAND, OHIO, The American Temperature Indicating Co., 402 Advance Building
CHICAGO, ILL., D. B. Noyes, 900 Garrick Building, 64 West Randolph Street
PHILADELPHIA, PA., The American Temperature Indicating Co., 601 Schaff Building, 1505 Race Street
DETROIT, MICH., James E. Degan Company, 622-24 First Street

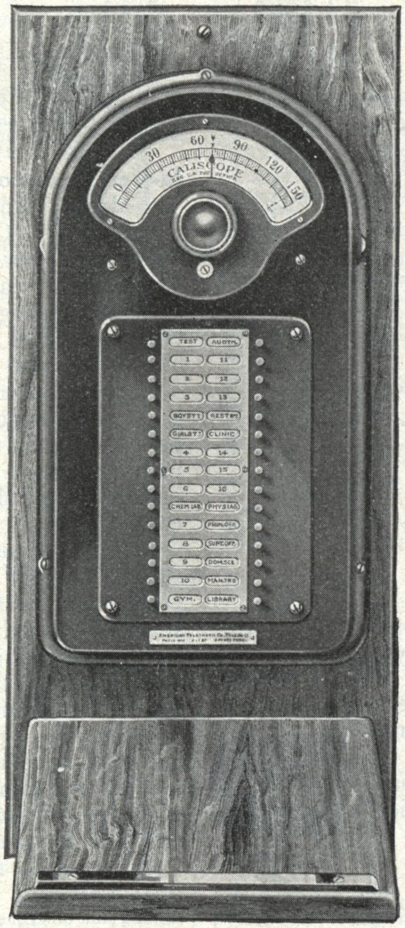
Products

The Caliscope and Thermoscope, comprising the American System of Electric Temperature Indication for schools, churches and public buildings, and for industrial purposes.

American System of Electric Temperature Indication

Description—This system provides an efficient means of indicating the temperature in the rooms of a building, of grain in storage bins and of desired places in cold storage plants, etc., by giving the various temperatures at one central reading station.

For school building work, this central reading station or Caliscope is placed in the basement convenient to the heating apparatus and connected by means of wires to electric thermoscopes located in the schoolrooms.



The Caliscope

In industrial installations the Caliscope may be placed in any convenient position.

The Thermoscopes are the small instruments which are located at the various places where the temperatures are to be taken. They are so constructed that their ohmic resistance is increased when the temperature surrounding them is increased and decreased when the temperature is decreased. These resistance differences are transmitted, by means of copper wires, to the Caliscope, where they are indicated in the form of degrees of temperature on the face of the instrument.

Operation—To operate the system first press the push button marked "Test." If the indicator on the temperature dial swings free to 150° F., the machine is ready for operation. If not, the rheostat, which is located on the face of the meter and directly below the indicator, is turned to the right or to the left, whichever is necessary, to give the instrument the proper current to swing the indicator to 150°.

To determine the temperature at the various points simply press the push button which corresponds with the room as scheduled on the face of the instrument, and the exact temperature of each room will be instantly indicated on the dial. The temperatures can be taken as fast as the push buttons can be pressed. The entire operation of setting the machine, whenever necessary, and making readings of a 30-room building need not require more than a minute and a half to two minutes of time.

Advantages—Easily installed in new or old buildings. Easy to operate, economical to maintain and gives accurate readings. Has a wide range of temperatures, from 10° below zero to 160° F., or other calibrations as required. Indicates temperatures from any number of points and from otherwise inaccessible places. Distance of points from reading station does not affect accuracy of the instrument, nor does the temperature of the room in which the reading station is located.

The System in Schools and Public Buildings

For schools and public building work the American system furnishes a centralized means for conveniently supplying the custodian, janitor or engineer with exact knowledge of the temperature of all rooms in the building. This permits intelligent control of the heating of a large building so that every room will be kept at the proper temperature with a minimum of effort and fuel consumption.

The school building equipped with the American system of electric temperature indication is assured of correct and constantly maintained classroom temperatures, because: the regulation of heat is placed where it belongs—in the basement; it furnishes the man responsible for the heat with the information he needs to intelligently fire his apparatus at all times. In addition the system saves wear and tear on furnaces and boilers by preventing overheating; saves fuel; and insures the comfort, health and safety of the occupants of the room.

Continued on next page

Industrial Installations

The American system of electric temperature indication will also be found extremely valuable in many industrial installations for the reason that it can take the temperature of inaccessible places and indicate the temperature of any number of distant points at one conveniently placed reading station. It is thus possible to determine at the reading station the temperature of any desired number of places in cold storage plants, ice plants, packing plants, creameries, etc.

General Specifications

The contractor to furnish and install an electrical indicating device, called the Caliscope, as manufactured by The American Temperature Indicating Company, 1017 Summit Street, Toledo, Ohio. The system to be complete with all apparatus, conduit, wire outlet boxes and all other necessary parts.

The system shall consist of a thermo-sensitive element, located as directed in the various rooms or places as per schedule attached, and connected by means of wires of proper gauge run in conduit to the indicating instrument, located in or near the custodian's room.

Room Instrument—The thermo-sensitive element shall be encased in a neat pressed steel case, the finish of the metal case to be equal in quality to bower-barff black japanned. The outside of the case shall be fitted with a guard and thermometer with an accurately and plainly marked scale, divided into Fahrenheit degrees, with a scale ranging from 10° below zero to 120° above. The sidewall instruments or Thermoscopes shall be securely mounted on a black ebony finish maple or oak mounting with all connections brought in from the back and concealed. Special elements hermetically sealed in glass tubing encased in brass or iron pipes with suitable fittings for tanks and air ducts.

Indicating Instrument—The reading instrument shall be the Type "C" Caliscope, illustrated in catalogue on page 8 of The American Temperature Indicating Company.

The front of the Caliscope shall be made of black bakelite and mounted on steel cabinet in "frostine" or mahogany finish. Desk to be of the same finish.

The instrument shall be calibrated to read from 10° below zero to 160° F. (or other calibrations as required).

This indicating instrument shall be located as directed, and shall be complete with all necessary apparatus, including batteries, and shall indicate the temperature for actual work within one degree.

The instrument to have accommodations for as many or more circuits or connections as per schedule attached (see Note "A").

Insulation of Circuits—Conduits shall be run from the indicating instrument to the outside of the room instrument. At each room outlet place an approved box flush with plaster line. In the box place a knot or spring in conductor to take strain off of wiring in conduit.

Wiring—From the indicating instrument to each room instrument outlet box, run a duplex rubber covered fixture or telephone wire in two colors, determining first the length of the longest run and then install in accordance with the following schedule of wire gauges:

Gauge No.	Distance from Caliscope to Thermoscope, ft.
19	150
18	189
17	238
16	300
15	378
14	378
14	476
13	600
12	756

There should be, after the wires are run, 2.4 ohms of resistance in each circuit. This is an equivalent of 300 lin. ft. of No. 19 wire or 150 ft. in duplex. And the same thing holds true in the other sizes and lengths. In other words, if there is more than 2.4 ohms resistance in a run, the gauge of wire is too small and should be changed.

All joints must be properly soldered and taped.

Note A: Following is a schedule of the rooms to be wired and connected:

Basement .... (Number of rooms.)
First floor ....
Second floor ....

If the reading instrument is to be connected to take care of extra rooms in the future, state how many.

Note B: While this specification covers the wiring placed in conduits, it is by no means always necessary; the voltage in the entire system being only 4.5, open wiring is permissible, and usually run in ventilating flues, etc. The ordinary common rubber covered fixture wire is used for all installations excepting, greenhouses, ice plants, packing plants and creameries. In these we use any wire that is moistureproof and weatherproof.

Note C: A size larger wire can be used than the one required, but a size smaller must never be used.

Note D: If wet bulb temperatures are desirable for obtaining the relative humidity, specify the combination wet and dry bulb room instruments called humidiscopes. One humidiscope is one wet bulb and one dry bulb station. The reading instrument to be properly marked for any number of dry stations and dry and wet stations.

Note E: We also furnish where desirable, in addition to the wet and dry bulb readings, a comfort scale designed for us by Dr. E. Vernon Hill. This added comfort scale instantly indicates the proper dry bulb temperature for every wet bulb reading which will give the maximum of comfort. It also indicates the proper wet bulb temperature for every dry bulb reading which will give the maximum of comfort.

ESTABLISHED 1885

JOHNSON SERVICE COMPANY

Manufacturers of Heat Regulating Apparatus

MILWAUKEE, WIS.

BRANCHES

ALBANY, N. Y., 4 Ramsey Place
ATLANTA, GA., 206 Bona Allen Building
BOSTON 18, MASS., 31 Waltham Street
BUFFALO, N. Y., 503 Franklin Street
CHICAGO, ILL., 1355 Washington Boulevard
CINCINNATI, OHIO, 1113 Race Street
CLEVELAND, OHIO, 2028 East 22nd Street
DALLAS, TEX., 333 Western Indemnity Building
DENVER, COLO., 1230 California Street
DES MOINES, IOWA, 441 Insurance Exchange Building
DETROIT, MICH., 427 Brainard Street
GREENSBORO, N. C., Daily News Building (P. O. Box 617)
INDIANAPOLIS, IND., 312 East Ohio Street
KANSAS CITY, MO., 411 East 10th Street
LOS ANGELES, CAL., 607 Van Nuys Building
MINNEAPOLIS, MINN., 922 Second Avenue, South
NEW YORK, N. Y., 118 East 28th Street
PHILADELPHIA, PA., 258 South Van Pelt Street
PITTSBURGH, PA., 10 E. No. Diamond Street, N. S.
PORTLAND, ORE., 404 Failing Building
ST. LOUIS, MO., 14 North 12th Street
SALT LAKE CITY, UTAH, 610 McIntyre Building
SAN FRANCISCO, CAL., 417 Rialto Building
SEATTLE, WASH., 452 Colman Building

JOHNSON TEMPERATURE REGULATING COMPANY OF CANADA, LIMITED

CALGARY, ALTA., 605 Second Street, West
MONTREAL, QUE., 615 Drummond Building
TORONTO, ONT., 147 Church Street
WINNIPEG, MAN., 259 Stanley Street
VANCOUVER, B. C., 550 Sixth Avenue, West

Products

Johnson System of Automatic Temperature Regulation and Humidity Control, for regulating and controlling the temperature and the humidity of all kinds of buildings, particularly schools and other public buildings, offices, residences and factories. Equally efficient on any form of heating and ventilating, steam, air or water.

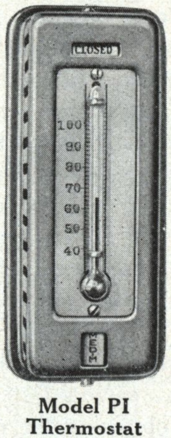
Thermostats, Humidostats, Metal Diaphragm Valves, Dampers, Switches, and all kinds of apparatus for automatically controlling temperature and humidity in dry kilns, bake ovens, cold storage rooms, and similar places where uniformity of temperature is required to produce the best results.

Johnson Positive Thermostat

Has a snap action for closing and opening valves quickly, positively and fully, thereby assuring their durable and satisfactory operation. Has an indicator showing at a glance whether the heat is "On" or "Off." Has a convenient means for shutting off the heat when desired.

Johnson Intermediate Thermostat

Has all-metal movement, giving true graduated motion to mixing dampers for blast heating systems and, where desirable, can be used to operate steam valves on a vacuum heating system.



Model PI Thermostat
4¾ in. high, 2 in. wide, 1 in. deep

Johnson Compound Thermostat

The Johnson All-metal Compound Thermostat combines the features of both the Positive and Intermediate, and is applicable for control of valves or dampers where certain units are to be operated positively and others intermediately at an interval of a few degrees in temperature.

Johnson Dual Thermostat

The Dual, or two-temperature, thermostat provides for a daytime temperature (usually 70°) and a nighttime temperature (35° to 50°), as desired, for all or some of the rooms in a building, simply by the manipulation of a single push button by the engineer or other person in authority. It is a factor for the greatest economy in school buildings, a number of rooms of which are occupied at night as well as day and for any buildings in which some of the rooms are occupied only at certain times, such as churches, auditoriums, masonic temples and lodges.

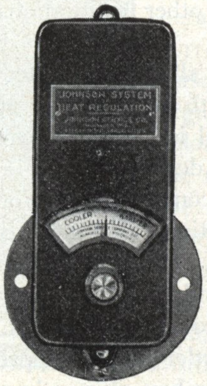
Every Johnson Thermostat is all-metal throughout, having no soft or hard rubber parts to deteriorate and become inoperative.

Insertion Thermostats

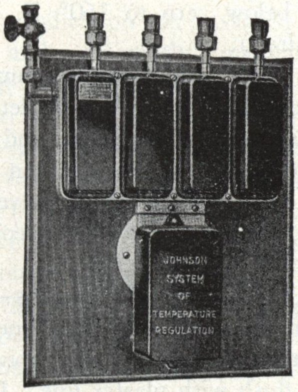
These thermostats are for the purpose of controlling the temperature of water and liquids in a tank or other similar apparatus, or the temperature of air in ducts or plenum chambers.

These thermostats are identical in principle, quality and construction with the room thermostats above described, but are constructed in such form that the sensitive element is inserted in a tank, duct or plenum chamber and exposed to the temperature therein, but the mechanism is outside in an accessible place.

These thermostats are made either to control a single individual valve or damper at any desired temperature, positively or intermediately, and are termed unit duct thermostats; or to control a series of valves such as are usually located on a bank of steam coils, one after the other at predetermined, desired temperatures, and are known as multiple thermostats.



Single Point Insertion Thermostat



Multiple Insertion Thermostat

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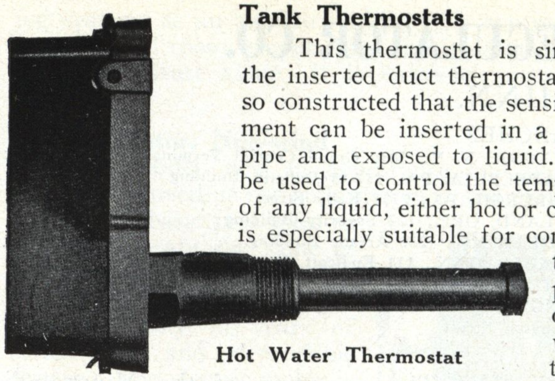
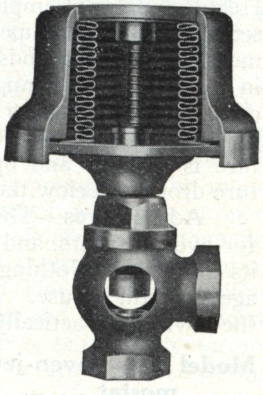


Hot Water Thermostat

Tank Thermostats

This thermostat is similar to the inserted duct thermostat, but is so constructed that the sensitive element can be inserted in a tank or pipe and exposed to liquid. It can be used to control the temperature of any liquid, either hot or cold, and is especially suitable for controlling the temperature of hot water tanks.

"Sylphon" Valves



"Sylphon" Metal Diaphragm Valve

Diaphragm valves are obviously of equal necessity and importance to the thermostat in a complete system of temperature regulation. Because for many years no other suitable material was obtainable, rubber formed the diaphragms for these valves, but in the production of the "Sylphon," a metal diaphragm valve equal in efficiency to the rubber but permanently durable and absolutely indestructible was made possible, removing entirely the one great objection to automatic heat regulation, which is the perishable characteristic of rubber. The "Sylphon" seamless metal diaphragm valve is furnished by the Johnson Service Company for radiators, blast coils, hot water tanks, and, in fact, for any place where a steam valve is required, and in any sizes and commercial shapes. The "Sylphon" is also used in the construction of pneumatic motors for the operation of dampers.

Humidity Control

The supplying of moisture to the heated air in buildings and the automatic control of the percentage of moisture in this air are recognized by authorities to be as important as maintaining proper temperatures.

Humidity is indispensable for museums and fine residences to protect valuable pictures, furniture, wood carvings, etc. It is even more valuable for the protection of life in homes, schools, hospitals, etc.

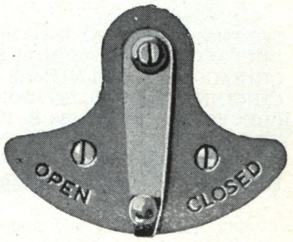
Humidostats and Humidifiers

The humidostat automatically controls the supply of moisture delivered to the air by a humidifier and maintains a constant percentage of relative humidity. It operates a diaphragm valve on the steam coils in the pan humidifier. The pan is provided with float box to maintain constant water level and is located in the ventilating air duct leading throughout the building. Steam jet and water spray types of humidifiers are also furnished.

Air Compressors

Electric, hydraulic, steam or belt driven compressors of all sizes are furnished and installed by this Company to supply the small amount of compressed air necessary to operate Johnson thermostats, diaphragm valves, switches and other apparatus. They are entirely automatic in operation and require only the usual, ordinary care given to this class of apparatus.

Pneumatic Switch Control



Pneumatic Switch Control

Remote valve and damper control plays, by means of our pneumatic switches, a very important part in the economical operation of the modern heating plant, especially in schools.

It saves the janitor's time for other duties, and makes it possible to accomplish results in the operation of the heating plant which can not be obtained in any other way.

It makes it easy to operate the fresh air and vent dampers, with the corresponding assurance that these dampers be economically operated as intended by the heating engineer.

How to Specify

Furnish and install the Johnson All-metal system of automatic temperature regulation and humidity control, furnishing all necessary thermostats, valves, dampers, humidifiers, special devices, air compressors, piping and fittings, and labor of installing system, except setting valves and dampers in position—all in accordance with the following schedule and detailed specification:

Schedule—State the rooms to be controlled and number of thermostats in each; the manner in which the tempered air, if there is any, is to be controlled; the manner in which the drafts of the boiler are to be controlled; and specify the manner of the control of any fresh air, vent or return air dampers, stating the location and number of switches.

Thermostats—Specify Johnson Model Thermostat, size, 4½x2x1 in.; and state whether it is to have residence or school cover, indicating device, positive shutoff, and whether it is to be positive or intermediate motion. Specify the number and kind of inserted thermostats.

Dual Thermostats—Specify as follows: The thermostats for ...... rooms shall be the Johnson Dual or Two-temperature Thermostat [Intermediate] [Positive] [Compound] type. These instruments shall be so constructed as to operate at two distinct temperatures, one for day and one for night, the change from day to night operation and vice versa being accomplished by means of one push button switch placed in the engineer's room. The instrument shall operate at 15-lb. air pressure for both day and night operation and shall be further provided with an indicator showing whether set for day or night operation.

Valves—Specify the "Sylphon" Metal Diaphragm Valve, and state whether it is to be plain or nickelplated, with or without unions, adding that these valves will be placed in position by the heating contractor.

Air Compressors—Specify kind of air compressor (steam, hydraulic, electric or power driven), requiring that the air compressor shall be of sufficient size to operate the system, with a factor of safety not less than 3, and requiring that it be provided with all necessary governing devices, fittings, gage, etc.

Humidostats—Specify Johnson Humidostat and Humidifier, stating the kind of humidifier, whether perforated steam or copper evaporating pan.

Dampers—Specify that dampers shall be made by the heat regulating contractor, but installed by the galvanized iron contractor, and that dampers shall consist of wrought iron frames, sheet steel blades, strongly cleated, with brass bearings.

Guarantee—Require that system be complete in every respect, and that all necessary material and special fittings shall be furnished whether specifically mentioned or not.

Require that entire system be guaranteed free from all original defects in material and workmanship, and that any parts proving defective or wearing out within 2 years from the date of completion shall be replaced free of charge.

Require that thermostats shall operate the valves or dampers to which they are attached, at a variation of not to exceed 1° above or below any given point.

Require that both thermostats and valves shall be constructed entirely of metal.

ESTABLISHED 1885

MINNEAPOLIS HEAT REGULATOR CO.

MINNEAPOLIS, MINN.

FACTORY SERVICE BRANCHES

BOSTON, MASS., 162 Boylston Street
BUFFALO, N. Y., 1505 Main Street
CHICAGO, ILL., 672-74 North Section Wrigley Building
CINCINNATI, OHIO, 207 Bell Block
CLEVELAND, OHIO, 738 B. F. Keith Building
DENVER, COLO., 1425 16th Street
DETROIT, MICH., 8025 Woodward Avenue
MILWAUKEE, WIS., 228 Third Street
NEW YORK, N. Y., 5036 Grand Central Terminal Office Building
PHILADELPHIA, PA., 317-18 Bulletin Building
PITTSBURGH, PA., 7732 Kelly Street
PORTLAND, ORE., 122 Security Building
ST. LOUIS, MO., 1230 Arcade Building
ST. PAUL, MINN., 111 Endicott Arcade
SEATTLE, WASH., 722 Fourth Avenue
SPRINGFIELD, MASS., 45 Crystal Avenue
SYRACUSE, N. Y., 218 East Washington Street

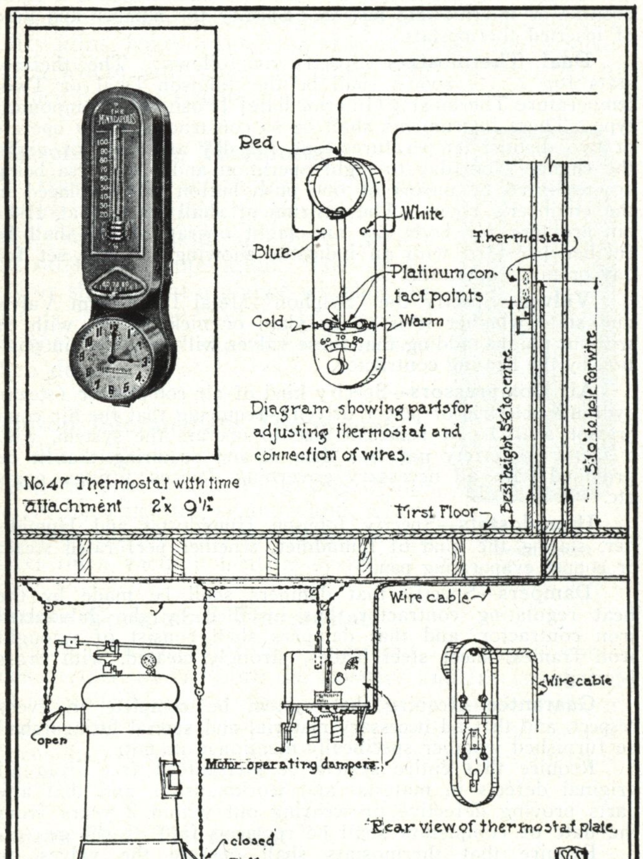
Products and Services

MINNEAPOLIS HEAT REGULATORS; THERMOSTATS; MOTORS; PRESSURE REGULATORS.

This company manufactures exclusively AUTOMATIC HEAT REGULATORS for warm air furnaces; for steam, vacuum, vapor and hot water boilers; for gas and district steam service. In large cities the factory branches install heat regulators and maintain a staff of trained service salesmen to advise as to new installations, and to insure the most efficient service from the regulators already in use.

Minneapolis Heat Regulator

Made in various models as to style of both thermostats and motors. The application is simple. The thermostat (mechanical thermometer) is placed at an average temperature point in the living room, and is connected by concealed 3-wire cable to motor located in basement. The thermostat is adjustable on 1° or more temperature range.


No.47 Thermostat with time attachment 2x 9½
Red
White
Blue
Thermostat
Platinum contact points
Cold
Warm
Diagram showing parts for adjusting thermostat and connection of wires.
Best height 5'6" to centre
5'10" to hole for wire
First Floor
Wire cable
open
Motor operating dampers
Wire cable
Rear view of thermostat plate.
closed
Cellar

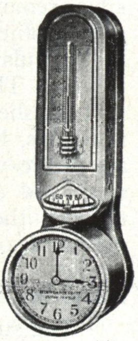
SHOWING MODEL 47 REGULATOR IN CONTROL OF STEAM HEATER

Operation—The operation of the Minneapolis Heat Regulator is simple. The pointer on the thermostat is set at any desired temperature, usually 70°. A coil of thermostatic metal expands and contracts with every change in temperature, making an electrical contact closing the circuit. This operates the motor connected to the drafts of the heater, closing drafts when the desired temperature is reached and opening drafts when the temperature drops 1° below the point set on the thermostat.

Advantages—This regulator has been on the market for over 40 years, and is the most widely used device of its character. Nothing to wear out. Many sold 40 years ago are still in use. No special dampers required, and the device is practically noiseless in operation.

Model 77, Seven-jeweled Eight-day Duplex Thermostat

This model is equipped with a seven-jeweled eight-day clock manufactured in our new modern clock factory. This thermostat is as simple in operation as a one-day clock thermostat, yet has all the advantages of the eight-day duplex model, as it will move the indicator twice daily to change night and day temperatures. Adjustment of the time "set" can be made almost instantly. Automatic throw of the pointer is adjustable either forwards or backwards. Clock movement is jeweled, with bi-metallic balance. Adjusted to isochronism and to heat and cold. All pinions and pivots are polished. Every part is extra heavy, insuring rigidity to the movement, long life and excellent time keeping qualities. The Model 77 is finished in brushed silver.



MODEL 77 DUPLEX THERMOSTAT
2¼x9½ in.

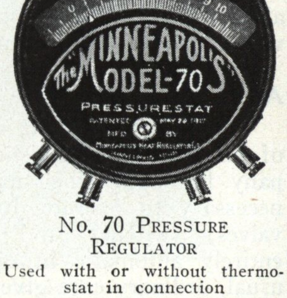
Model 47 Thermostat

The Model 47 has a dependable 24-hour clock, which, when set, will change the indicator at any predetermined hour in the morning to any day temperature desired. The clock is easily removed for winding. This thermostat is finished in a sand-blast bronze.

No. 70 Pressure Regulator

This model works on same principle as our regular thermostats but is actuated by pressure instead of temperature. It is furnished to operate on a range from 0 to 10 lb. pressure.

It can be used in combination with room thermostat on vapor and steam heat-



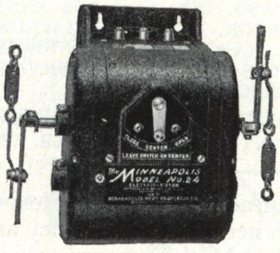
NO. 70 PRESSURE REGULATOR
Used with or without thermostat in connection

Continued on next page

ing systems as an auxiliary and double control of both pressure and room temperature, or with a motor to control by pressure alone. It is extremely accurate and durable.

Electric Motor, Non-wind

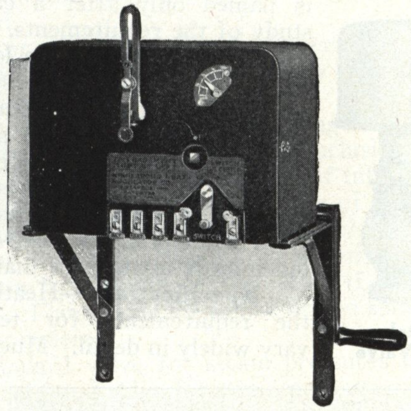
This model, new in appearance and design and greatly improved, is not built on a new and untried principle. The basic principles of construction are the same as employed in the old type electric motor that have proven their reliability in years of actual use and dependable service. The electric motor is connected directly to the house lighting circuit and never requires winding. The cost of operation will never exceed ten cents per annum. It is completely enclosed in a dustproof die cast aluminum housing, richly finished in baked enamel. A small transformer is used serving two purposes: first, preventing the motor from needlessly using valuable current when not in operation, and second, supplying a secondary low voltage circuit of only 8 volts through the thermostat, preventing injury to the platinum contacts. The electric non-wind motor has been tested and approved by the National Board of Fire Underwriters and is particularly recommended for use with gas, oil, or central station heating.



No. 24 A-c. Motor

Spring Motor

Runs from a week to 10 days with one winding. Easily re-wound with crank key. Wind indicator shows when rewinding is necessary. Enclosed in solid pressed steel dustproof cover. All "Minneapolis" motors provided with patented switch which eliminates possibility of motor running down when drafts are open. Obviates danger of fire from overheating.



Motor Enclosed in Steel Cover

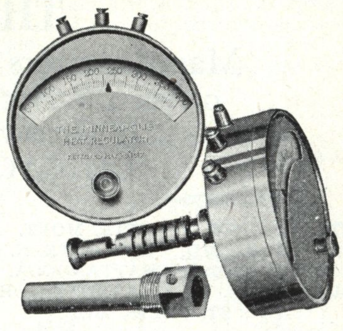
Minneapolis Regulator Applied to District Steam and Gas

Especially serviceable in controlling temperature of buildings heated by gas or street steam, because it governs the supply of gas or steam to heater and admits only enough to maintain the desired temperature. Can be connected to any heating plant (warm air, hot water or steam), whether a straight gas heater or a coal heater with gas burners in it.

Motor connected to gas valve (usually a balanced disk) by chain and pulley. By-pass and pilot light are installed in connection with it.

Model 65 Hot Water Thermostat

This instrument is built with adjustable scale, giving an approximate range of temperature control from 100° to 240° Fahr. It is suitable for use on any kind of hot water supply control and assures absolutely dependable reliable control on any kind of heat—coal, gas or oil. Being moderate in cost, it is a practical installation on even small jobs. Note particularly its adaptability and range. It can be used during the winter months for controlling a steam valve and during the summer months can handle the draft control on the auxiliary heater, giving during the whole year evenly heated water at a minimum cost in fuel.

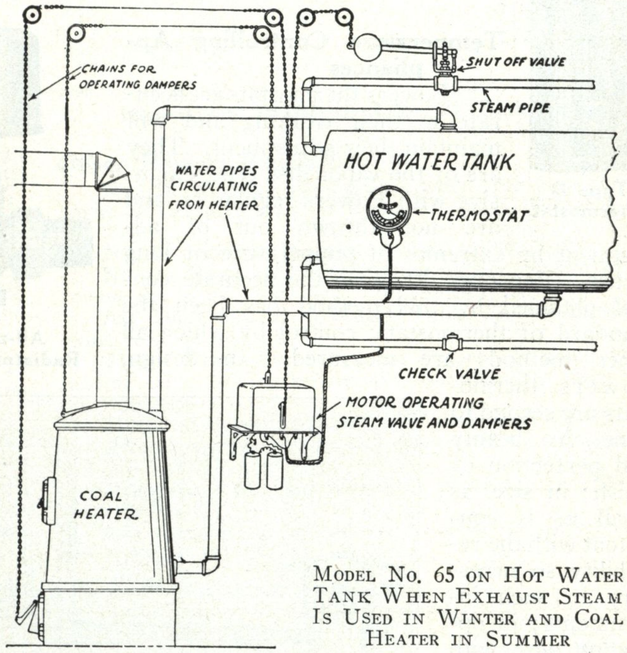


Model No. 65 Hot Water Thermostat

We also manufacture the No. 65 thermostat with fully graduated scales in different ranges for temperatures from 0 to 490° F.

Dual Control—The No. 65 thermostat on hot water heating plants is a valuable aid in connection with the standard Minneapolis regulator, as its use on the boiler gives a dual control in the temperature of the job, that is, room temperature and temperature of the water in the heating plant itself. This dual installation, particularly on gas and oil heated plants, absolutely prevents racing of boiler, overheating of the rooms when the temperature is raised from the lower night temperatures. The addition of the No. 65 regulator means absolutely even temperature, even and steady fire at the boiler and a still further saving in coal.

Standard extension is 2 in. Extensions up to 24 in. to order.


CHAINS FOR OPERATING DAMPERS
SHUT OFF VALVE
STEAM PIPE
HOT WATER TANK
WATER PIPES CIRCULATING FROM HEATER
THERMOSTAT
CHECK VALVE
MOTOR OPERATING STEAM VALVE AND DAMPERS
COAL HEATER

Model No. 65 on Hot Water Tank When Exhaust Steam Is Used in Winter and Coal Heater in Summer

Specifications

Install in ...... room Model ...... Minneapolis Thermostat and connect by concealed 3-wire cable to ....Model Motor in heater room. (Designate thermostat by number and motor by letter—as Model 77, 110-volt a-c., etc.)

Contracting

In the cities where this company maintains factory service branches as listed, specifications should call for installation by Factory Service Branch, the Minneapolis Heat Regulator Co.; in other cities by the heating contractor.

THE POWERS REGULATOR CO.

Manufacturers of Automatic Temperature Controlling Apparatus

GENERAL OFFICES AND FACTORY
2722 Greenview Avenue
CHICAGO, ILL.

GENERAL EASTERN OFFICES
144 East 44th Street
NEW YORK, N. Y.

BRANCHES AND SERVICE STATIONS

ATLANTA, GA. BUTTE, MONT. CLEVELAND, OHIO EL PASO, TEX. LOS ANGELES, CAL. NEW ORLEANS, LA.
BALTIMORE, MD. CHARLOTTE, N. C. DENVER, COLO. HOUSTON, TEX. MILWAUKEE, WIS. PHILADELPHIA, PA.
BOSTON, MASS. CHATTANOOGA, TENN. DES MOINES, IOWA INDIANAPOLIS, IND. MINNEAPOLIS, MINN. PITTSBURGH, PA.
BUFFALO, N. Y. CINCINNATI, OHIO DETROIT, MICH. KANSAS CITY, MO. NASHVILLE, TENN. ROCHESTER, N. Y.
ST. LOUIS, MO. SAN FRANCISCO, CAL. SEATTLE, WASH.

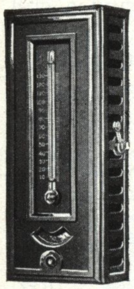
THE CANADIAN POWERS REGULATOR CO., LTD., TORONTO, ONT.
BRANCHES AT: CALGARY, HALIFAX, MONTREAL, VANCOUVER, WINNIPEG

Products and Services

AUTOMATIC TEMPERATURE CONTROLLING SYSTEMS, applied, under the supervision of Powers engineers, to heating plants, new or old, in residences, offices, factories, schools, institutions, and to any other condition of artificial heating where uniform temperature is desired.

Also Regulators to control temperature of liquids, gases and air in industrial processes. Thermostatic Regulators to control the mixing of hot and cold water, steam and cold water, and hot and cold air, to deliver a mixture at any temperature desired. Pressure Reducing Valves, High Pressure Steam Traps, Dial Indicating Thermometers, Humidity Control Devices, and the Powers Shower Mixer.

For Thermostatic Water Controllers and Shower Bath Mixing Valves, see pages 2046-2047.



Type D Thermostat

Temperature Controlling Appliances

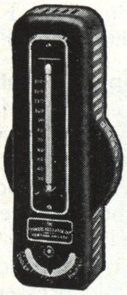
Powers thermostats are accurate in their working and will maintain their adjustment. They are of the vapor disc type, exclusive with Powers regulators, and are not thrown out of adjustment by extremes of temperature or long disuse. For over 30 years the accurate control obtained by this method has been the standard of thermostatic control by which all other methods are measured. In design, Powers thermostats are second to none in beauty and perfection of finish; in size, as small as is consistent with the reliability so necessary in such instruments; in operation, sure, with gradual or positive action, as conditions require.

Diaphragm radiator valves, diaphragm motors, mixing dampers and other equipment are especially rugged in construction, dependable, and durable; built regardless of expense whenever strength is needed for efficiency and long service.

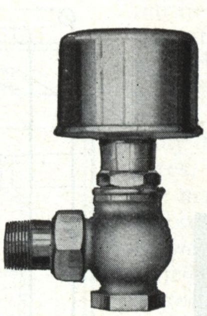
Motive power used in these systems is compressed air. The company builds its own air compressors, operated by steam, electricity or water, and characterized by their reliability, noiseless operation, perfect control and long life.

Installations—Installations of Powers systems are invariably made by this company. At each branch office is maintained a competent engineering and erecting force, sparing no expense to maintain the highest efficiency.

Power special devices, however, are easily installed by any engineer or contractor.



Type K Thermostat



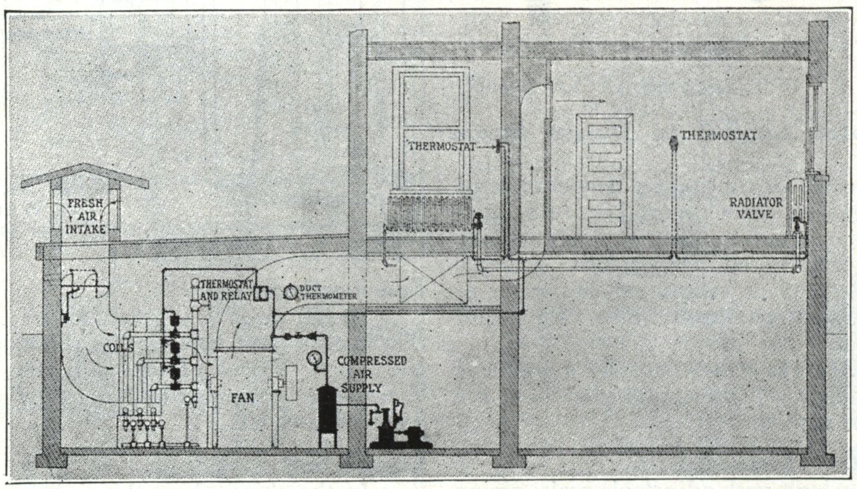
All-metal Radiator Valve

Prices—Price for Powers Regulation covers the system installed complete, and is named only after a careful study of the requirements.

Our price is not the lowest, but we believe no other system will be found so efficient and economical. Customers are served with the sole aim of getting results for them; and experience shows that satisfactory service from a temperature controlling system is of much more importance than its first cost.

Specifications—Heating systems, and the requirements for temperature control, vary widely in detail. Much of the dissatisfaction experienced with some systems of temperature regulation is due to the attempt to force a ready-made inflexible system or device to meet special requirements, taking no account of the conditions peculiar to the situation to be treated.

For these reasons, we believe special study should be given each case. We shall be glad to submit to any architect or engineer a detailed specifi-



Application of Powers Temperature Control to Combination (Split) System of Heating

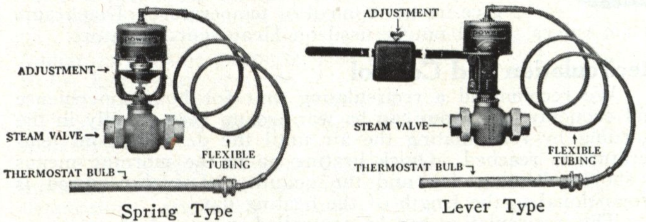
Direct radiation supplies the heat; fan supplies warm air for ventilation. Thermostats control valves on radiators to maintain proper room temperature. Ventilating coils are controlled by a thermostat placed in the fan discharge duct

Continued on next page

cation, accompanied by a guaranteed price, to cover complete system of temperature control installed, the price to hold if specification is used. This guarantees full protection to the client against advantage being taken of a close specification. This company will gladly collaborate with architect or engineer in preliminary plans. As specialists in temperature control, The Powers Regulator Company has unusual facilities for solving problems in this particular field.

Powers No. 11 Tank Regulator

Used on steam heated hot water service in hotels, apartment buildings, offices, schools, shops, hospitals, factories, laundries, etc. Because this regulator prevents overheated water, it saves fuel and prolongs the life of valves and packings. Self-operating; easily installed. Of great durability, guaranteed accurate and positive in action.



Spring Type Lever Type

No. 11 Tank Regulator

In ordering, always give size of tank, steam pipe size, steam pressure, and temperature wanted.

The spring type regulator is commonly used for this work except in sizes larger than 4-in., when the lever type is used. Smaller sizes will be furnished in lever type if preferred.

The regulator will be furnished to operate at 160° F., with adjustability 20° above and below that point, unless otherwise specified.

Flexible connection tube is 6 ft. long for sizes 1½-in. and smaller; 8 ft. for 2 to 4-in. inclusive, and 10 ft. for larger sizes. Additional lengths of tubing will be furnished at $1.00 per ft. A net charge of $2.00 is made for flexible tubing shorter than standard.

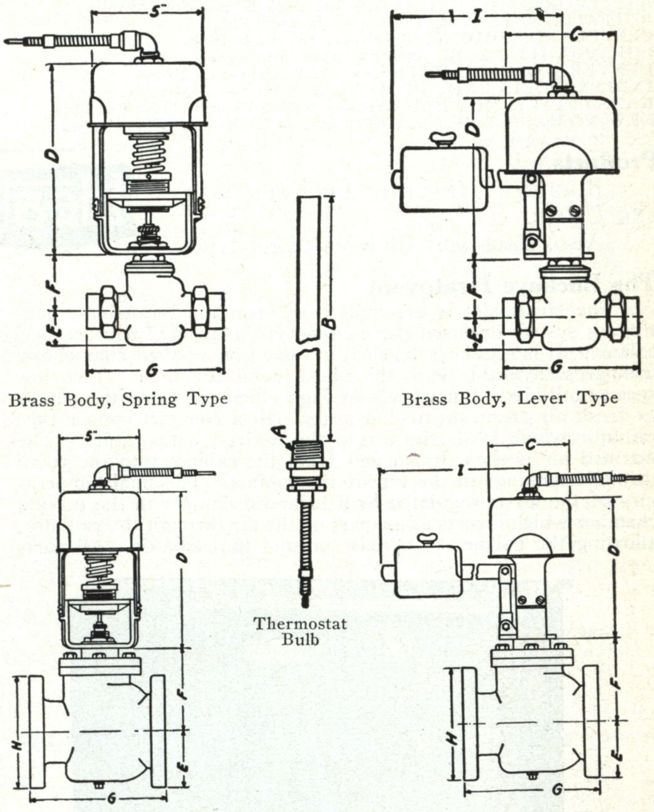
The valve in all sizes is of the double seated balanced type. Companion flanges will be furnished, if desired, at market prices. Flanged valves will be drilled standard unless otherwise ordered.

Specify standard valve for steam pressures up to 100 lbs. and monel fitted valve for steam pressures above 100 lbs.

Specification—In connection with the (steam heated) hot water storage tank, furnish and install Powers No. 11 Tank Regulator with .... inch [standard] [monel fitted] valve with standard length of flexible tubing. Regulator shall maintain the temperature of the water at .... degrees with steam pressure at .... lb.

Note: Where installation is to control steam coil and auxiliary coal burning heater, specify Powers No. 12 Regulator with chains, pulleys, etc., for the control of dampers on auxiliary heater (see Bulletin No. 129).

For coal burning heaters without steam coils, use Powers No. 13 Regulator (see Bulletin No. 136).



Brass Body, Spring Type

Brass Body, Lever Type

Thermostat Bulb

Iron Body, Spring Type

Iron Body, Lever Type

Dimensional Drawings of No. 11 Tank Regulator

Other Powers Specialties

No. 18 Regulators—Self-contained, for control of compartment temperatures between 60° and 100° F.—Bulletin No. 145.

No. 10 Damper Regulator—Bulletin No. 119.

No. 15 Regulator—Self-contained, for control of drying rooms, dry kilns, ovens, etc. Bulletin No. 138.

Air Duct and Hot Water Tank Thermometers—Bulletins No. 140 and 155.

Steam Trap—For restaurant fixtures, hospital sterilizers, heating coils, cooking kettles, etc., for pressures from 5 to 100 lbs. Bulletin No. 115.

Hospital Sterilizer Control Valve—Bulletin No. 122.

Thermostatic Steam and Water Mixer—Bulletins No. 137 and No. 137-A.

Pressure Reducing Valve—For steam, air and water—Bulletin No. 118.

Note: Complete set of bulletins describing the entire Powers line will be sent on request.

PRICES AND PRINCIPAL DIMENSIONS OF NO. 11 TANK REGULATOR

Valve size . . . . in.	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
List price: Stand. valve	$60.00	65.00	70.00	75.00	80.00	90.00	95.00	100.00	110.00	120.00	175.00	225.00	275.00
Monel valve	$70.00	76.00	82.00	90.00	98.00	113.00	122.00	130.00	145.00	160.00	....	....	....
Style of body	Union	Union	Union	Union	Union	Screwed	Screwed	Screwed	Flanged	Flanged	Flanged	Flanged	Flanged
Material of body	Brass	Brass	Brass	Brass	Brass	Iron	Iron	Iron	Iron	Iron	Iron	Iron	Iron
Dimension A . . . . in.	1	1	1	1	1	1	1	1	1	1	1¼	1¼	1¼
B . . . . in.	10	10	12	14	14	16	16	18	20	20	20	20	24
C . . . . in.	5	5	5	5	5	5	5	5	5	5	5⅞	5⅞	5⅞
D . . . . in.	7¼	7¼	7¼	7¼	7¼	8¼	8¼	8¼	8¼	8¼	13⅜	13⅜	13⅜
E . . . . in.	2	2⅛	1 7/16	1¾	2	2 15/16	3½	3⅝	4¼	4½	5	5½	6¾
F . . . . in.	2⅛	2 3/16	2⅝	2 15/16	3¼	3 13/16	5⅜	5⅜	5½	5½	6⅛	8	9
G . . . . in.	5½	5¾	6 11/16	6⅞	7⅞	8	9	9	10¾	10¾	12	13⅛	16⅞
H . . . . in.	....	....	....	....	....	....	....	....	8½	9	10	11	13½
I . . . . in.	29	29	29	29	29	29	29	29	29	29	29	29	29

BUCKEYE BLOWER COMPANY

COLUMBUS, OHIO

BRANCH OFFICES

ATLANTA, GA., R. L. Hicks, 372 Whitehall Street
BALTIMORE, MD., C. Linhardt Jr., 2126 Edmondson Avenue
BUFFALO, N. Y., F. H. Field, 333 Jackson Bldg.
CLEVELAND, OHIO, C. A. Pavey, 301 Rose Bldg.
CHICAGO, ILL., A. W. Amstein, 372 Transportation Bldg.
DENVER, COLO., H. H. Fiedling, 1226 California Street
INDIANAPOLIS, IND., H. M. Arzet, 3115 No. Central Avenue
KANSAS CITY, MO., J. H. Kitchen & Co., Pioneer Trust Co. Bldg.
NEW YORK, N. Y., E. C. Hinkle and A. T. Holl, 1400 Broadway
PHILADELPHIA, PA., R. S. Howell, 321 Bulletin Bldg.
PITTSBURGH, PA., Schley & Nash, 709 Columbia Bank Bldg.
SALT LAKE CITY, UTAH, Hawley-Richardson-Williams Co., Dooly Bldg.
SAN FRANCISCO, CAL., P. W. Beggs, 405 Sharon Bldg.
SEATTLE, WASH., Heating & Ventilating Equipment Co., Fales Bldg.
SYRACUSE, N. Y., W. M. Bolton, 206 Comstock Avenue
YOUNGSTOWN, OHIO, Schley & Nash, 1101 Realty Bldg.

Products

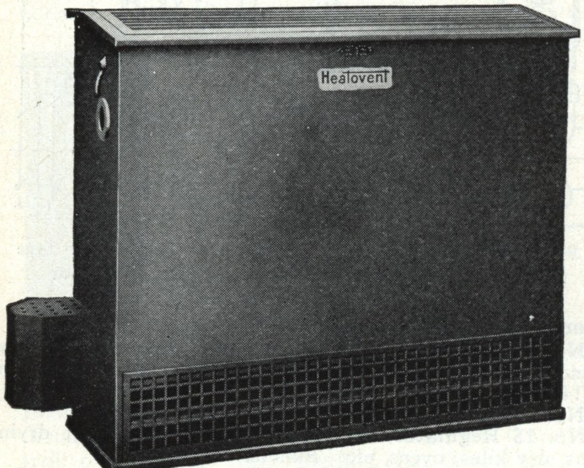
Buckeye Heating and Ventilating Units.

Also, Fans and Blowers of all types.

Heatovent (REG · U · S · PAT · OFF ·)

The Buckeye Heatovent

The Heatovent is a complete self-contained fan blast ventilating system enclosed in a compact No. 14 gauge furniture steel cabinet. It is regularly finished in olive green baked enamel and compares favorably with the finest metal furniture. Two low speed multiblade fan wheels of high efficiency draw the supply of fresh air from out-of-doors, through a compact copper tube radiator which heats the air to the desired temperature. The warmed air is then discharged from the cabinet into the room through openings in the top of the cabinet. The final temperature of the air is regulated by a balanced damper in the mixing chamber which directs all or part of the air through the radiator, allowing the balance to by-pass around the radiator. All parts of the unit are easily accessible through the front of the cabinet, which, although provided with a lock and key to prevent tampering by unauthorized persons, can be readily removed from all types of Heatovent units.



The Heatovent

In design the Heatovent combines the standard elements of a modern ventilating plant into a compact and simple unit.

The Heatovent is low enough to fit under the window sill, being 37 in. high. The unit is only 13 in. in width and represents no more aisle obstruction than a standard three-column radiator. It can be recessed 5 in., making the aisle obstruction negligible.

More Flexible and Economical Than Central Fan System

The Heatovent System is more economical to operate than any central fan system of ventilation. Long horizontal ducts and vertical flues offer so much frictional resistance to the air flow, that the electric power requirements of a central fan system range from two to four times as much as those of the Heatovent System. In general, the larger the building, the greater the saving from this source.

The greatest economy in the operation of the Heatovent System lies in the elimination of ventilation in unoccupied rooms, thereby saving both electrical power and steam. As it costs as much to ventilate a building as it does to heat it, why not save this expense by ventilating only the occupied rooms?

Automatic Temperature Control

Any standard system of automatic temperature control can be used with the Heatovent. The diaphragm motor furnished by the regulation company is installed inside the cabinet at our factory and connected to the mixing damper. Mixing dampers are balanced and mounted in brass bearings. They move easily and give instant control of temperature. Diaphragm steam valves should not be used on Heatovent Radiators.

Recirculation and Control

We recommend a recirculating unit for both convenience and economy. A room can be warmed up very rapidly in the morning by recirculating the air until the desired room temperature is reached. Quick heating up in the morning means a shorter heating day and the quantity of fuel required is proportional to the length of the heating day.

This recirculation can be controlled in one of three ways:

(1) By hand, by means of a neat handle on the end of the cabinet.

(2) By automatic temperature control. When this is specified a second diaphragm motor is installed in the Heatovent cabinet and connected to the recirculating damper. All the recirculating damper motors are connected to a three-way pneumatic switch, generally located in the boiler room, which controls all recirculating dampers simultaneously.

(3) By a Buckeye Thermal Damper Control. This installed on a Heatovent will hold the damper in a recirculating position as long as the room temperature is below 60° F., but as the room temperature rises above 60°, the recirculating damper automatically reverses and the unit takes outside air.

This device gives the advantage of automatically recirculating during the warming up period and insures a supply of fresh outside air whenever the room is occupied, as a room will not be comfortable at temperatures around 60° F.

Wiring

All wiring is properly protected, the motor is fused, and no live contact points are exposed. Each unit is provided with a locking switch requiring a key to start and stop the motor. Where the unit will not be subjected to tampering instant push button control can be furnished if desired.

ENGINEERING DATA ON TYPES C AND D HEATOVENTS
Room temperature 70° F. Steam at 5 lbs. gauge pressure

Unit	Cu. ft. air per min.	Entering air —10°			Entering air zero F			Entering air +10°			Entering air +20°		
		Final temp.	Cond. lbs. per hour	Omit sq. Ft. rad.	Final temp.	Cond. lbs. per hour	Omit sq. ft. rad.	Final temp.	Cond. lbs. per hour	Omit sq. ft. rad.	Final temp.	Cond. lbs. per hour	Omit sq. ft. rad.
136	750	74	71	13	80	68	31	85	64	47	90	60	63
137	750	90	85	63	95	80	78	99	76	92	104	71	106
138	750	104	97	106	107	91	117	111	86	132	115	80	142
139	750	115	107	142	118	101	151	121	95	161	125	90	173
146	1000	74	95	17	80	90	42	85	85	63	90	79	84
147	1000	90	113	84	95	107	104	99	100	122	104	95	142
148	1000	104	129	142	107	121	156	111	114	176	115	107	190
149	1000	115	142	189	118	134	202	121	126	214	125	120	231
156	1250	74	119	21	80	113	52	85	106	78	90	99	105
157	1250	90	141	105	95	134	130	99	126	152	104	119	177
158	1250	104	163	177	107	152	195	111	143	220	115	135	237
159	1250	115	178	236	118	168	252	121	158	268	125	150	288
166	1500	74	143	25	80	136	63	85	128	94	90	119	126
167	1500	90	170	126	95	161	156	99	152	182	104	143	198
168	1500	104	194	213	107	182	234	111	172	264	115	162	285
169	1500	115	214	283	118	202	303	121	189	322	125	180	346

Specifications

(1) The ventilating contractor shall furnish and install complete and ready for use, Buckeye Heatovents of number, size and type shown on plans and specified herein.

(2) Heatovents shall be guaranteed to deliver the full volume of air shown on plans and to raise temperature from ..°F. to ..°F. with steam at 5 lbs. pressure at radiator for a continuous run of 72 hours without undue noise or overheating of motor.

Continued on next page

(3) Unit fans shall be of slow speed multiblade type and shall operate at a tip speed not greater than 1500 ft. per minute when delivering their full rating against the resistance of the unit.

(4) Motors. *(Use only one of the following paragraphs—depending on electric service available.)*

(4-A) Motors shall be 115 volts direct current, shunt wound of ample power to drive fans with a temperature rise not to exceed 40° C. above the surrounding air.

(4-B) Unit motors shall be designed to operate on .... phase, ... cycles, ... volt circuit provided under the electrical contract and shall have ample power to drive fans continuously with a temperature rise not to exceed 40° C.

(5) Each unit shall be provided with by-pass damper for controlling temperature of discharge air without affecting the volume. When all the air is by-passed the rise in temperature shall not exceed 3° with 5 lbs. steam pressure on the radiator. Radiators shall be guaranteed to withstand 50 lbs. hydrostatic pressure.

Use either 5-A or 5-B as desired

(5-A) Mixing damper shall be hand controlled.

(5-B) Mixing damper shall be automatically controlled as specified under the temperature regulation. Damper motors furnished under regulation contract shall be mounted by the unit manufacturer.

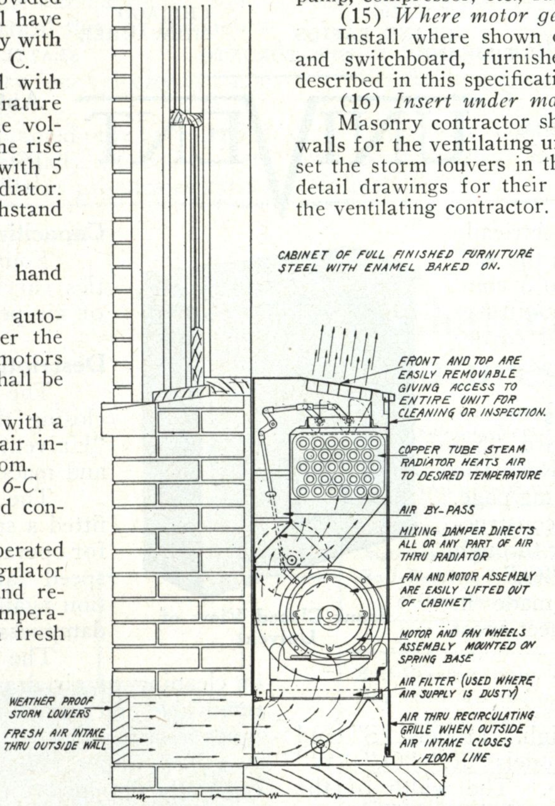
(6) Every unit shall be provided with a damper which shall close the fresh air intake and recirculate the air in the room.

Use only one, either 6-A, 6-B or 6-C.

(6-A) This damper shall be hand controlled.

(6-B) This damper shall be operated by a Buckeye Thermal Damper Regulator designed to close fresh air intake and recirculate room air whenever room temperature falls below 60° F. and to open fresh air intake automatically when room temperature rises above 60° F.

(6-C) This damper shall be operated by a damper motor furnished under the automatic temperature regulation and all unit intake dampers shall be operated by a three-way switch in the basement.


CABINET OF FULL FINISHED FURNITURE STEEL WITH ENAMEL BAKED ON.
FRONT AND TOP ARE EASILY REMOVABLE GIVING ACCESS TO ENTIRE UNIT FOR CLEANING OR INSPECTION.
COPPER TUBE STEAM RADIATOR HEATS AIR TO DESIRED TEMPERATURE
AIR BY-PASS
MIXING DAMPER DIRECTS ALL OR ANY PART OF AIR THRU RADIATOR
FAN AND MOTOR ASSEMBLY ARE EASILY LIFTED OUT OF CABINET
MOTOR AND FAN WHEELS ASSEMBLY MOUNTED ON SPRING BASE
AIR FILTER (USED WHERE AIR SUPPLY IS DUSTY)
AIR THRU RECIRCULATING GRILLE WHEN OUTSIDE AIR INTAKE CLOSES
FLOOR LINE
WEATHER PROOF STORM LOUVERS
FRESH AIR INTAKE THRU OUTSIDE WALL

Cross Section View of Type C Heatovent

(7) Each unit shall be constructed so that radiator will heat by gravity recirculation of air within the room when fresh air intake is closed and fans are not running.

(8) The unit cabinet shall be constructed of full finished, furniture steel of not less than No. 14 gauge with olive green enamel baked on and rubbed to a dull finish. The unit shall be provided with suitable lock and locking type motor switch and 20% extra keys shall be furnished. All parts of the cabinet shall be easily accessible for cleaning.

(9) The masonry contractor will leave fresh air intake openings and set all fresh air louvers in place as the work progresses, but ventilating contractor will be responsible for the proper size and location of all openings. Fresh air louvers shall be 32-oz. copper with ½-in. square mesh wire screen behind louvers.

(10) (Type D on Wall Brackets) Units supported on walls shall be mounted on cast iron wall brackets which shall be furnished by the unit manufacturer. The masonry contractor will set brackets in wall as directed by the ventilating contractor.

(11) *Use only where air supply is dusty.*

Units located in rooms ...... shall be provided with air filters so placed as to be easily accessible and removable for cleaning. Filters shall be of the adhesive type and the installation must be complete with necessary cleaning and oiling vats.

(12) The ventilating contractor shall furnish to the electrical contractor, one ...... kw. motor generator set consisting of a .... hp., ... phase, ... cycles, ... volt, ... r.p.m. motor connected by a flexible coupling to a .... kw. 110-volt flat compound wound direct-current generator as manufactured by the .... Co.

Use 12-A or 12-B—depends on size motor required.

(12-A) (3-kw. and smaller) motor shall be provided with a .... pole, double throw, enclosed, fused starting switch.

(12-B) (5-kw. and larger) motor shall be furnished with starting compensator complete with low voltage release and overload relays.

(13) The ventilating contractor shall furnish to the electrical contractor, one 1¼-in. slate switchboard with back of board field rheostat, one 135-volt d-c. voltmeter; one ....ampere d-c. ammeter; one switchboard light; one 2-pole .... ampere fused cut-out switch and .... two-pole 30-ampere fused circuit switches. Furnish a structural steel supporting frame.

(14) *Insert Under Electrical Work:*

Electrical contractor shall furnish and install, a complete system of wiring to all of the ventilating units shown on the plans, providing for each unit a 150-watt outlet. The electrical contractor will make all electrical connections and do all wiring necessary for the operation of the ventilating units, fans, vacuum pump, compressor, etc., furnished by heating contractor.

(15) *Where motor generator set is used:*

Install where shown on the plans, one motor generator set and switchboard, furnished by the ventilating contractor and described in this specification under Heating and Ventilating.

(16) *Insert under masonry contract:*

Masonry contractor shall provide fresh air openings through walls for the ventilating units, furnish lintels for same, and shall set the storm louvers in these openings. The storm louvers and detail drawings for their proper location shall be furnished by the ventilating contractor.

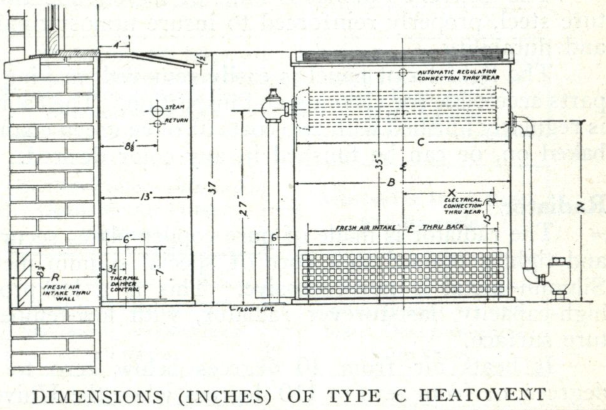
(17) *Insert under automatic temperature regulation:*

In all rooms having ventilating units and direct radiation, a compound thermostat shall be installed, the direct radiation being controlled by the positive acting thermostat and the mixing damper in the unit controlled by the gradual acting thermostat through a damper motor in the cabinet. In all rooms having ventilating units only, install a gradual acting thermostat controlling the mixing damper in the unit.

(18) *Use with paragraph 6-C only, for closing fresh air intakes:*

All fresh air intakes to ventilating units shall be controlled by a three-way switch located in the boiler room and operating damper motors in the units.

(19) Damper motors shall be furnished to the unit manufacturer who will install the same at his factory. The unit manufacturer shall furnish dimension prints locating pneumatic outlets for connection to damper motors in the units.


4"
½"
STEAM
RETURN
8⅛"
13"
37
27"
6"
6"
3½"
7"
8¾"
R
FRESH AIR INTAKE THRU WALL
THERMAL DAMPER CONTROL
FLOOR LINE
AUTOMATIC REGULATION CONNECTION THRU REAR
C
35"
B
X
ELECTRICAL CONNECTION THRU REAR
15"
FRESH AIR INTAKE E THRU BACK
N

DIMENSIONS (INCHES) OF TYPE C HEATOVENT

Unit No.	C.f.m.	B	C	E	X	Steam	Return
136 C	750	32	31⅝	28	13½	1½	1
137 C	750	32	31⅝	28	13½	1½	1
138 C	750	32	31⅝	28	13½	1½	1
139 C	750	32	31⅝	28	13½	1½	1
146 C	1000	40	39⅝	36	17½	1½	1
147 C	1000	40	39⅝	36	17½	1½	1
148 C	1000	40	39⅝	36	17½	1½	1
149 C	1000	40	39⅝	36	17½	1½	1
156 C	1250	50	49⅝	46	22½	2	1¼
157 C	1250	50	49⅝	46	22½	2	1¼
158 C	1250	50	49⅝	46	22½	2	1¼
159 C	1250	50	49⅝	46	22½	2	1¼
166 C	1500	60	59⅝	56	27½	2	1¼
167 C	1500	60	59⅝	56	27½	2	1¼
168 C	1500	60	59⅝	56	27½	2	1¼
169 C	1500	60	59⅝	56	27½	2	1¼

THE HERMAN NELSON CORPORATION

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UNIVENT
(TRADE MARK)

Product

Univent System of Ventilation.

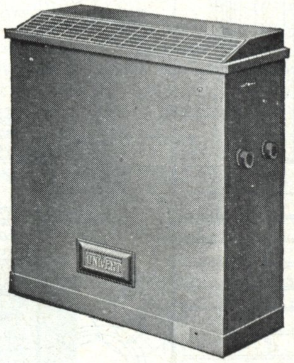
Univent

The Univent, which is electrically operated, draws fresh air through the wall or window, cleans it, warms it to a comfortable temperature and perfectly diffuses this fresh air to every nook and corner of the room.

There Are Six Univent Models

The six Univent models are "S," "S-D," "R," "O," "W," and "W-R." The first four are shown on the following page. "W" and "W-R" are similar in construction to Model "O" and take the air through the window as shown by Model "O."

Each of these models is made in various sizes and capacities to meet most problems in ventilation.



Front Closed View of Univent

Cabinet

All models are 38 inches high. Models "S" and "S-D" are 12½ inches deep; Models "R," "O," "W" and "W-R" are 16 inches deep. The width of the various models varies according to their capacity.

The Univent Cabinet is built of high grade furniture steel, properly reinforced to insure utmost rigidity and durability.

The light front panel is easily removed, making all parts accessible for cleaning and inspection. The cabinet is regularly finished with two coats of olive green enamel, baked on, or can be finished in any color desired.

Radiator

The radiator is made of pure copper plates securely and tightly pressed to a core of special silumin metal. Silumin metal is non-corrosive. This is a leakproof, high-capacity, last-forever radiator, with low-temperature surface.

It heats air from 40 degrees below zero to 70 degrees, or from zero to 110 degrees when the Univent is in operation.

Univent Fan and Motor

A single aluminum low-speed fan is used. No housing is necessary for this fan.

All Univent models can be equipped with direct or 60-cycle alternating-current motors, and are recommended in the following order: direct-current; polyphase alternating-current; single-phase alternating-current.

Filter

Filters for removing dirt, dust, soot and sand from the air can be installed in the Univent if desired. No nuts, bolts or screws are necessary for installation.

Automatic Temperature Control

Any well-known system of temperature control may be used with the Univent System.

Capacities

Four sizes of each model with capacities varying from 500 to 1500 cubic feet of air per minute can be furnished.

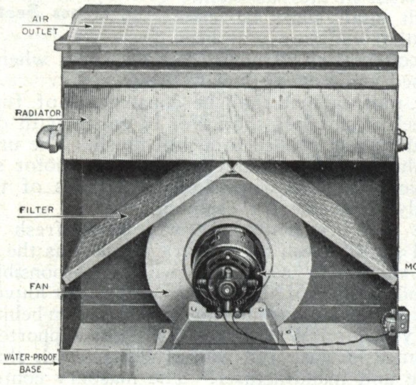
Description

The cabinet illustrated herewith enclosing the mechanical equipment of the "Univent" is built of pleasing proportions, and made of high grade furniture steel.

The base of this cabinet, to which is fitted a small fractional horsepower motor for operating an especially constructed slow speed fan, is waterproofed as a protection against short circuiting the motor by dampness.

The screens provided for the filtering or cleaning of air drawn in for ventilation are readily removable and always renewable, thereby assuring at all times an unobstructed clean air passageway.

The copper radiator installed above the screen is especially designed for use in the "Univent" and is so arranged that it may be connected easily to any steam heating plant.



Front Open View of Univent

The warm air damper, and the automatic compensating damper, occupy the upper section of the cabinet and control the temperature of the air as it leaves the Univent.

Operation

The suction of the fan draws the fresh air from outdoors into the lower compartment of the Univent, from which it is forced through the air filters where all particles of dirt and dust are thoroughly removed, then up through the radiator, where it is properly warmed, and finally through to a specially designed deflector at the top of the Univent, from which it is driven toward the ceiling of the room, instead of horizontally across it.

Continued on next page

The fresh, warm air leaving the Univent almost vertically at a velocity of approximately 1000 feet per minute strikes the ceiling with sufficient force to deflect and diffuse it through the entire room, breaking up all air pockets and reaching every nook and corner of the room in a most complete manner.

Then the air leaves the room through a vent outlet which is placed near the floor, generally on the opposite side of the room, and passed to the outside of the building, either directly through a vertical flue, or through a corridor or attic.

Air entering a room at a very low velocity is liable to go through the room in strata.

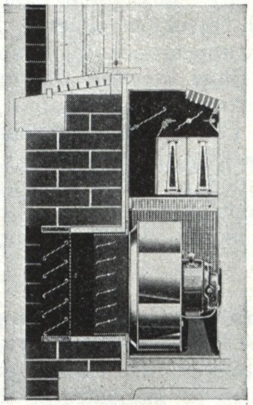
A good air mixture can be obtained only by agitation but if the air is discharged horizontally, instead of vertically, at high velocity, in an effort to produce agitation and proper mixture, it will cause both dangerous drafts and discomfort to the occupants of the room.

The principle of the Univent System is to discharge the air towards the ceiling at high velocity, causing the air as it strikes the ceiling to spread rapidly over the entire ceiling area. This agitates the air contents of the room and mixes fresh air with it, causing a perceptible motion of clean pure air which produces the desired healthful and invigorating result.

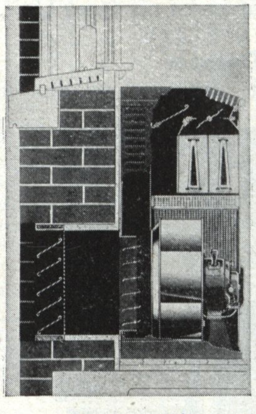
Service Stations and Information

Representatives and service men are located in each of the cities listed.

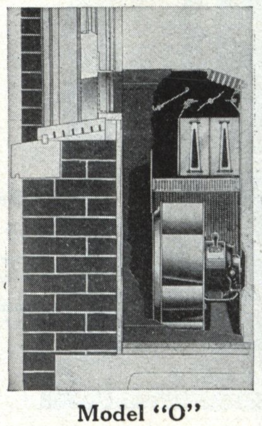
Catalogues containing complete engineering data can be furnished on request to our main office at Moline, Ill.



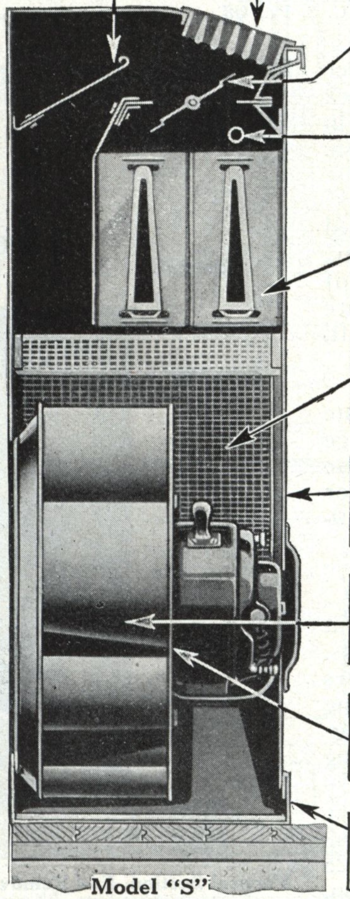
Model "SD"



Model "R"



Model "O"



Model "S"

Mechanical Features	Results
High Velocity Vertical Jet Discharge. Special guide veins to control direction.	Proper Diffusion and adequate air motion without drafts.
Automatic Aluminum Ball-Bearing Compensating damper.	Perfect temperature control, without change in air volume.
Ball-Bearing, tight fitting warm air and mixing damper.	Positive temperature control, by hand or automatically.
Humidifier (optional).	The Univent insures proper diffusion of humidity in room.
Radiator with large amount of low temperature surface, heavy cast non-corrosive core.	Ample heating capacity with no scorching of air. Leak-proof – lasts forever
Sanitary removable and cleanable Air Filter. (Optional)	Removal of Dust, Soot and Bacteria.
Neat substantial Cabinet, easily accessible to all parts.	Perfectly sanitary and clean. Occupies minimum space.
Large low-speed Aluminum Fan.	Silent Operation. Large Capacity, Low Power cost.
Motor recessed in Fan with one place to oil.	Makes possible very narrow ventilator.
Heavy Base, Rust-Proof inside and out.	Long life, clean and sanitary.

A Summary of Distinct Univent Features

Univent is manufactured only by The Herman Nelson Corporation, Moline, Ill.

ESTABLISHED 1894

JOHN J. NESBITT, INC.

Manufacturers of Universal Unit Ventilation System

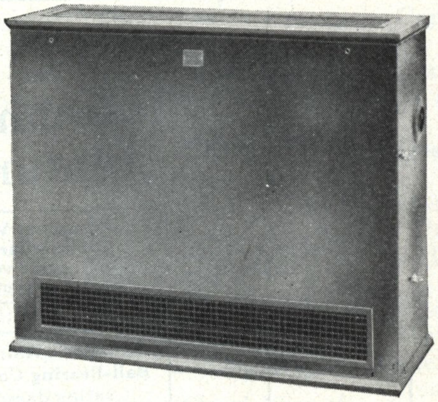
EXECUTIVE OFFICE AND FACTORY
213 North Vermont Avenue
ATLANTIC CITY, N. J.

BRANCH OFFICE, 405 Lexington Avenue, NEW YORK, N. Y.

REPRESENTATIVES

ST. PAUL, MINN.
PORTLAND, ORE.
SEATTLE, WASH.

DENVER, COLO.
MINNEAPOLIS, MINN.
DULUTH, MINN.



The Universal Unit
The Standard by Which All Other Makes Are Measured
TRADE-MARK
Reg. U. S. Pat. Off.

Products

Manufacturers of the Universal Combined Heating and Ventilating Units (Portable Unit Ventilators); Universal Exhaust Fans and Universal Air Filters.

Universal Unit System of Heating and Ventilating

A mechanical system of ventilation for supplying fresh warm air directly from outdoors for use wherever good ventilation is required and particularly suitable for schoolhouse ventilation.

Universal Combined Heating and Ventilating Unit Cabinet

The cabinet of the Universal Unit is constructed of No. 14 gauge cold rolled, stretcher leveled, pickled and oiled first quality furniture stock steel. All parts of the Universal Unit are finished in olive green, sprayed and baked to a smooth hard finish.

Fans

Universal Fans are of the multiblade low speed double inlet type, designed to operate at 800 r. p. m., plus or minus 5%. The fans are rigidly constructed of aluminum with special care given to balance. Fans are mounted on double extended ends of the motor shaft.

Motor

Motor of Universal Unit can be supplied to operate on any voltage of direct current or any cycle or voltage of polyphase alternating current. Where single-phase current is available, it is necessary to install a motor generator set to convert that character of current to 110-volt direct current.

Three-point Lead Mounting

The motor and fan assembly of the Universal Unit is mounted in the cabinet on three steel ball points. These points rest on lead liners, supported by angles from side of the casing. This three-point lead mounting has made possible the use of polyphase alternating-current motors with a permanent and rigid supporting device.

Universal Unit Radiator

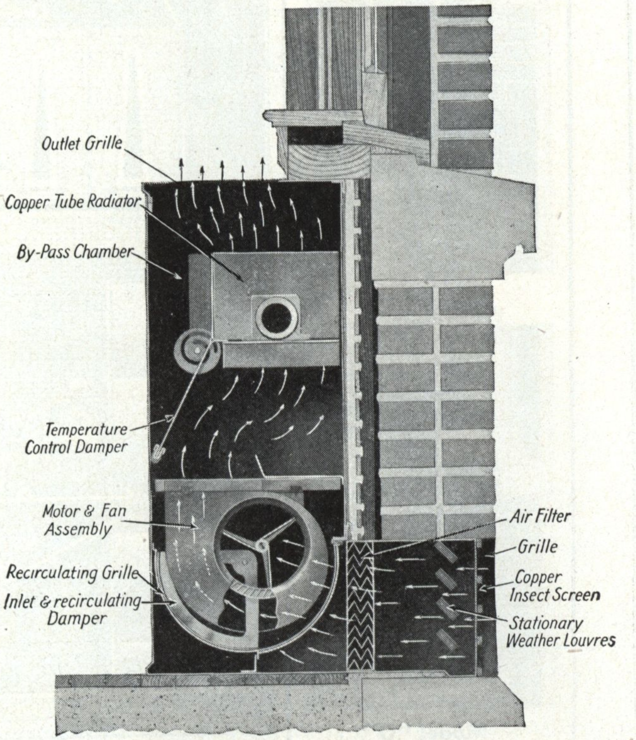
Standard Universal Units are provided with 106.25 sq. ft. of prime surface extruded copper tube radiation. The radiator weighs only 61 lb. complete. This radiator is composed of a plurality of individual, thin walled, seamless copper tubes, the ends of which are hexagonal and, assembled, resemble a true honeycomb in appearance. The steam is free to flow between the tubes in both vertical and horizontal directions. The air flows through the tubes, so that the tubes are entirely surrounded by steam on one side and swept by air on the other side, which means 100% prime surface.

Temperature Control Damper

The Universal Unit is provided with a temperature control damper, which can be manually or thermostatically operated to regulate the temperature of air from Unit.

Inlet and Recirculating Damper

Each Universal Unit is arranged so that air can



Vertical Section, End Removed, Universal Unit, Series 14-3643
Fresh air intake through wall box and grille near bottom of Unit. This Unit can be recessed to depth of 4 in. as shown. Recess must be 60 in. long by 36 in. high, or can be recessed 2 in. in 43-in. long recess 36 in. high. Standard practice places the Unit flush with the inside wall

Continued on next page

be brought from outdoors, warmed, if desired, and circulated in the room, or can be recirculated and reheated within the room, as desired.

This is accomplished by means of a circular roll damper of aluminum. This damper can be manually controlled at the cabinet, or pneumatically controlled from some remote point.

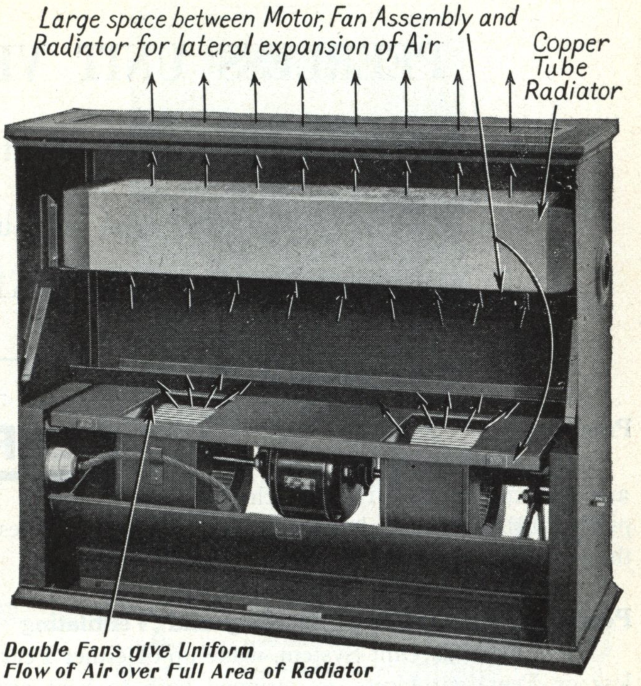
Universal Air Filter

The use of air filters is especially recommended for buildings located in congested manufacturing districts, or where the air is heavily laden with dust or soot.

Universal Air Filters are of the adhesive impingement type, designed to fit in the fresh air intake of the Universal Unit. In this location the velocity of the air over the entire surface of the filter is uniform, with the result that an equal amount of work is imposed throughout its entire area. Combined with this ideal location is a set arrangement, which provides ease and simplicity of removal and replacement, when cleaning is necessary.

Catalogue and Engineers' Data Book

A copy of our "Catalogue & Engineers' Data Book," containing complete engineering data, specifications, etc., on Universal Unit Ventilation System, will be furnished on request to our executive office.


Large space between Motor, Fan Assembly and Radiator for lateral expansion of Air
Copper Tube Radiator
Double Fans give Uniform Flow of Air over Full Area of Radiator

Universal Unit, Series 14-3643

One-piece front and by-pass division plates removed, showing radiator and motor fan assembly in place. Entire operation of removing and replacing front and by-pass division requires less than three minutes

TABLE OF CAPACITIES—FINAL TEMPERATURES AND CONDENSATIONS

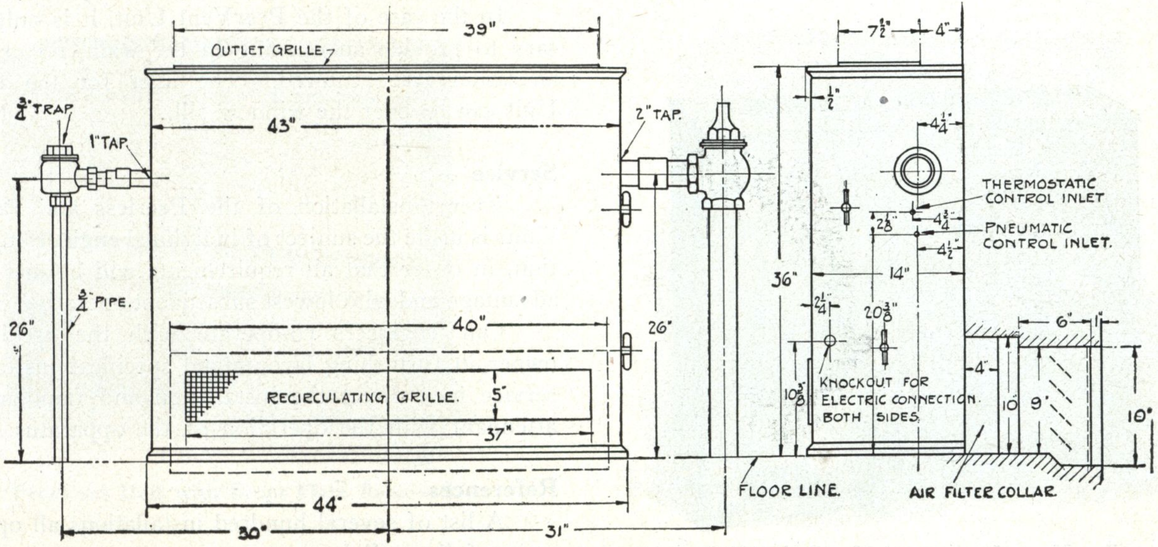
Steam—218° 2 lbs. Gauge

	1500 Cu. Ft. of Air per Minute or 90,000 Cu. Ft. of Air per Hour Universal Unit Series 14-3643-15 and 18-3643-15					1200 Cu. Ft. of Air per Minute or 72,000 Cu. Ft. of Air per Hour Universal Unit Series 14-3643-12 and 18-3643-12					900 Cu. Ft. of Air per Minute or 54,000 Cu. Ft. of Air per Hour Universal Unit Series 14-3643-9 and 18-3643-9					600 Cu. Ft. of Air per Minute or 36,000 Cu. Ft. of Air per Hour Universal Unit Series 14-3643-6 and 18-3643-6				
Temp. entering, deg. F.	Final temp. of air	B. t. u.	Sq. ft. surface in rad.	Condensation per sq. ft. in rad.	Total condensation in rad.	Final temp. of air deg. F.	B. t. u.	Sq. ft. surface in rad.	Condensation per sq. ft. in rad.	Total condensation in rad.	Final temp. of air	B. t. u.	Sq. ft. surface in rad.	Condensation per sq. ft. in rad.	Total condensation in rad.	Final temp. of air	B. t. u.	Sq. ft. surface in rad.	Condensation per sq. ft. in rad.	Total condensation in rad.
—10	100.31	210115	106.25	2.06	218.87	103.1	175440	106.25	1.72	182.75	112.96	139737	106.25	1.37	145.56	123.18	103017	106.25	1.01	107.31
0	106.63	201955	106.25	1.98	210.37	109.4	168297	106.25	1.65	175.31	119.3	133612	106.25	1.31	139.18	130.6	98937	106.25	0.97	103.06
10	112.65	192777	106.25	1.89	200.81	115.73	161155	106.25	1.58	167.87	125.64	128515	106.25	1.26	133.87	137.02	93840	106.25	0.92	97.75
20	119.28	183600	106.25	1.80	191.25	122.04	154012	106.25	1.51	160.43	131.98	122400	106.25	1.20	127.5	143.42	89760	106.25	0.88	93.50
30	125.63	175440	106.25	1.72	182.75	128.35	145852	106.25	1.43	151.93	138.28	116275	106.25	1.14	121.12	149.79	85680	106.25	0.84	89.25
40	131.93	166252	106.25	1.63	173.18	134.67	138720	106.25	1.36	144.50	144.68	110160	106.25	1.08	114.75	156.29	83635	106.25	0.82	87.12
50	138.23	157075	106.25	1.54	163.62	140.97	131577	106.25	1.29	137.06	150.98	105052	106.25	1.03	109.43					
60	144.43	148915	106.25	1.46	155.12	147.37	123417	106.25	1.21	128.56										
70	150.83	139737	106.25	1.37	145.56	153.67	116275	106.25	1.14	121.12										
Current consumed watts hr.	A-C. 146 watts			D-C. 143 watts		A-C. 118 watts			D-C. 102 watts		A-C. 90 watts			D-C. 90 watts		A-C. 80 watts			D-C. 83 watts	

When a fine adjustment is desired for obtaining either a smaller or larger volume of air than a given set of fans discharge from a given line voltage, air volume regulators will be furnished.

The air volume regulators consist of curved plates, which may be readily adjusted to further open or close the fan discharge opening.

The adjustment of these plates for a smaller air delivery reduces the amount of current consumed.



Roughing-in Dimensions, Series 14-3643

PEERLESS UNIT VENTILATION CO., INC.

Manufacturers of Heating and Ventilating Units

Skillman Avenue and Hulst Street

LONG ISLAND CITY, N. Y.

Products

Peerless and PeerVent Heating and Ventilating Units, for schools, hospitals, offices, banks, clubrooms, churches, dormitories, theaters, factories, etc.

PEERVENT

Peerless Unit System of Heating and Ventilating

The Peerless Unit System, made up of either Peerless or PeerVent Units, is designed both to heat and to ventilate, with the utmost efficiency and economy, the rooms in which it is installed.

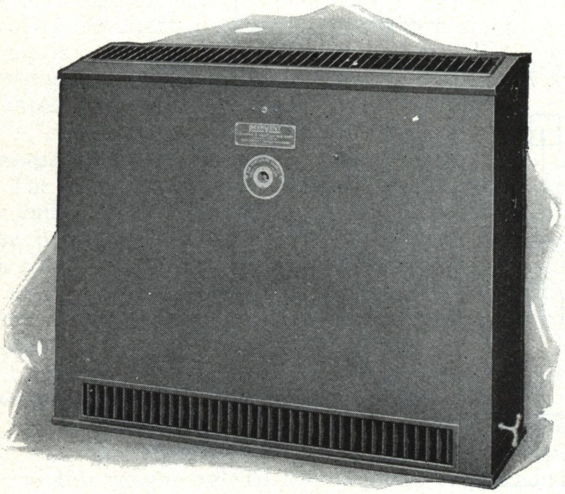
Each Peerless or PeerVent Unit is self-contained within a handsome cabinet, and so designed that fresh air can be brought in from out of doors, warmed if desired, and circulated throughout the room; or part or all of the air in the room can be recirculated and reheated, as the conditions demand.

Operation

Fresh air is drawn through an inlet and forced through a radiator by means of twin multiblade fans driven by a direct-connected slow-speed noiseless motor.

Temperature control is obtained by a mixing damper which by-passes any part or all of the air around the radiator.

This mixing damper can be arranged for hand or automatic operation.



PeerVent Heating and Ventilating Unit

Advantages of Peerless Unit Systems

Independent Service for Each Room at a Cost Proportioned Exactly to the Useful Work Done—The cost of current is far less than for operating a single large fan and duct system. All expense for ventilating and heating unoccupied rooms is eliminated.

Adaptable to All Steam Conditions—Work equally well with high or low pressure steam and with exhaust vacuum or modulation heating systems.

Thorough Ventilation Without Drafts—Only gentle harmless air currents are created. No discomfort or risk to occupants.

Noiseless Operation—Direct current motors eliminate all magnetic motor noises.

Always in Working Order—Nothing subject to much wear. Motor bearings are practically frictionless.

Big Space and Cost Savings—The units occupy little more space than radiators and require no large apparatus or space in basement, no long ducts, and no special provision in building design.

No heating losses between basement and rooms ventilated. The absence of long ducts also eliminates an objectionable place for dirt to lodge and lessens fire risk.

No Remodeling in Old Buildings—The Peerless and PeerVent Unit System can be added to or may entirely replace any heating and ventilating system to improve heating and ventilating efficiency.

In the case of the PeerVent Unit, it is only necessary to provide an opening in the wall—no expensive alterations are required. The inlet for the Peerless Unit can be over the window sill.

Service

Every installation of the Peerless and PeerVent Units is made the subject of individual engineering attention, in order that all requirements will be met to best advantage and with lowest subsequent operating expense.

Our engineers co-operate with the architect or owner in furnishing layouts and specifications, and our service men direct the installation and familiarize the attendant with the operation of the apparatus.

References

A list of several hundred installations all operating successfully, will be sent on request.

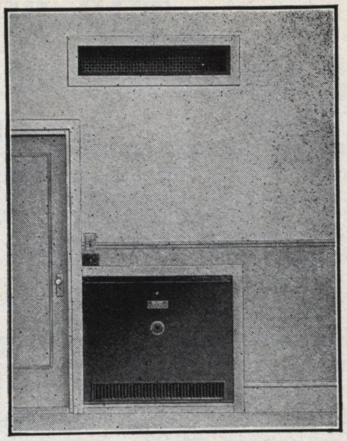
Continued on next page

*PEERVENT HEATING AND VENTILATING UNITS

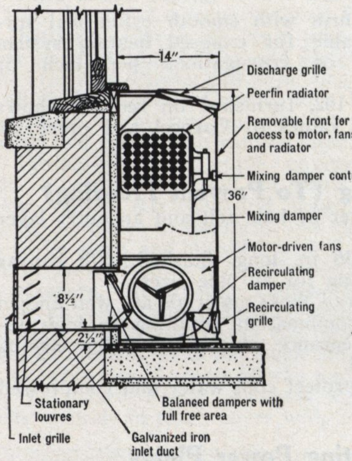
For dimensions "B" and "L," see drawings below

Unit No.	Max. cu. ft. per min.	Number of pupils	Length (L), in.	Height, in.	Depth, in.	Inlet duct, in. (8½xB)
46271	600	20	33	36	14	8½x27½
46272	700	23	33	36	14	8½x27½
46273	800	26	33	36	14	8½x27½
46274	900	30	33	36	14	8½x27½
46275	1000	33	33	36	14	8½x27½
46276	1050	35	33	36	14	8½x27½
46361	1100	36	42	36	14	8½x36½
46362	1150	38	42	36	14	8½x36½
46363	1200	40	42	36	14	8½x36½
46364	1250	41	42	36	14	8½x36½
46365	1300	43	42	36	14	8½x36½
46366	1350	45	42	36	14	8½x36½
46451	1400	46	51	36	14	8½x45½
46452	1450	48	51	36	14	8½x45½
46453	1500	50	51	36	14	8½x45½
46454	1550	51	51	36	14	8½x45½
46455	1600	53	51	36	14	8½x45½
46456	1750	58	51	36	14	8½x45½

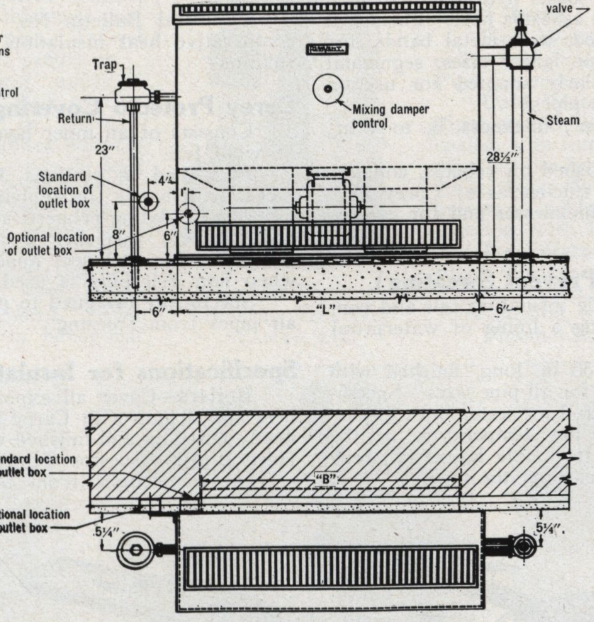
**Booklet with complete data on Peerless Units will be sent on request.*



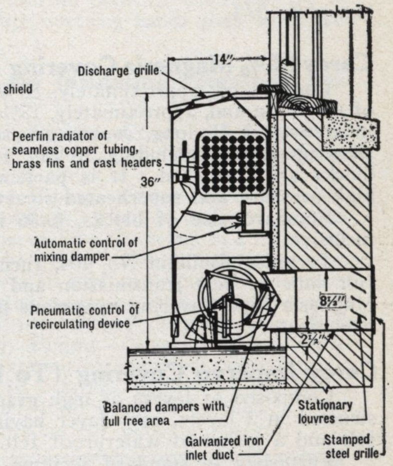
Concealed Type of PeerVent Heating and Ventilating Unit


14″
Discharge grille
Peerfin radiator
Removable front for access to motor, fans and radiator
Mixing damper control
36″
Mixing damper
Motor-driven fans
Recirculating damper
Recirculating grille
8½″
2½″
Stationary louvres
Inlet grille
Balanced dampers with full free area
Galvanized iron inlet duct

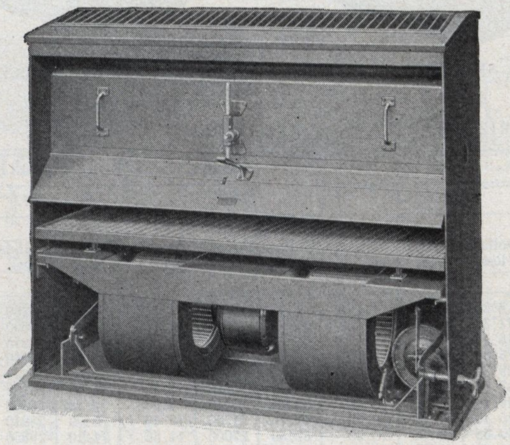
Cross Section, Showing Mixing Damper Under Hand Control


Lock and shield valve
Trap
Return
23″
Standard location of outlet box
4¼″
1″
8″
6″
Optional location of outlet box
Mixing damper control
Steam
28½″
6″
"L"
6″
Standard location of outlet box
"B"
Optional location of outlet box
5¼″
5¼″

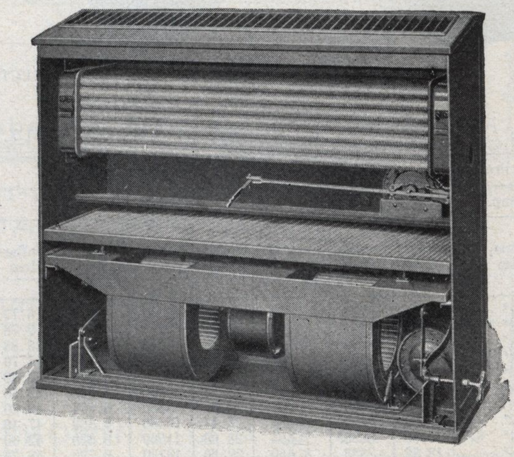
Front Elevation and Plan of PeerVent Heating and Ventilating Unit


14″
Discharge grille
Peerfin radiator of seamless copper tubing, brass fins and cast headers
36″
Automatic control of mixing damper
Pneumatic control of recirculating device
8½″
2½″
Balanced dampers with full free area
Stationary louvres
Galvanized iron inlet duct
Stamped steel grille

Cross Section, Showing Mixing Damper Under Automatic Control and Pneumatic Control of Recirculating Device



PeerVent Unit with Front Plate Removed



PeerVent Unit with Front Plate and Mixing Damper Removed

THE PHILIP CAREY COMPANY

Manufacturers of Heat Insulation

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

Carey PRODUCTS REG. U.S. PAT. OFF.

TRADE-MARK

Products

Pipe Coverings and Insulation.

Also Insulating and Refractory Cements, and Miscellaneous Asbestos Products of all kinds.

For Waterproofing and Dampproofing Materials, see pages 96-97; for Built-up Roofing, see pages 1042-1045; for Asphalt Shingles, see page 1101; for Expansion Joints, see page 571.

Carey 85% Magnesia Covering (High Pressure Steam)

Consists of, approximately, 85% basis hydrated carbonate of magnesia and, approximately, 15% asbestos fiber. Furnished in sections 3 ft. long, canvas covered, with metal bands, for sizes up to and including 10 in.; for larger sizes, segmental blocks are furnished. It is particularly adapted for use on high pressure and superheated steam pipes.

Standard size of blocks, 6x36 in.; thickness ⅞ to 4 in., inclusive.

Technical Bulletin No. 104, furnished on request, contains full data on heat transmission and efficiencies of Carey 85% Magnesia Pipe Covering in various thicknesses and for various pipe sizes.

Carey Impervo Covering (To Prevent Sweating)

Composed of layers of high grade insulating felt and constructed in 2 layers, each layer having a lining of waterproof felt and a jacket of waterproof felt.

Furnished in standard sections 36 in. long, finished with canvas jacket and bands for applying for all pipe sizes. Specifically designed for use on cold water and ice water lines to prevent sweating and to maintain the low temperature of the liquid. It should always be applied in double layers to break all seams and joints to prevent air reaching the pipe.

Carey Carocel Covering (Heating Systems)

Consists of alternate layers of fine corrugated and flat sheets of asbestos paper. Furnished in standard 36-in. long sections, canvas jacketed with bands for applying for all pipe sizes. Specifically designed to give maximum insulating value on low and medium temperature steam pipes. Better adapted than any other type of covering for temperatures ranging from hot water up to 35 lb. steam pressure.

This covering is very firm with smooth cylindrical surface, making it very desirable for exposed heating system pipes. It has *8 layers* of corrugations per inch of thickness.

Technical Bulletin No. 102, furnished on request, shows comparative heat insulation values of Carocel and other insulations.

Carey Protecto Covering (To Prevent Freezing)

Consists of an inner layer of hair felt and an outer layer of wool felt.

Furnished in sections 36 in. long, finished with canvas jacket with bands for applying for all pipe sizes.

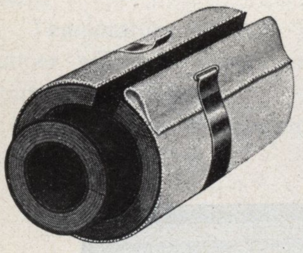
The insulating properties of these materials are well known and Protecto furnishes a combination resulting in high insulating value and neat appearance which is so often lacking when hair felt only is used.

Specifically designed to protect cold water and compressed air pipes from freezing.

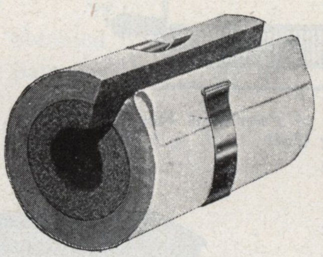
Specifications for Insulating Power Plants

Boilers—Cover all exposed boiler tops, combustion chambers and drums with Carey 85% Magnesia Blocks 2 in. thick, firmly wired on and finished with a ½-in. coat of Carey No. 100 Hard Finish Asbestos Cement, troweled smooth.

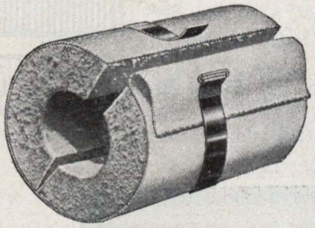
On connections from boiler to smokestack, apply V-rib



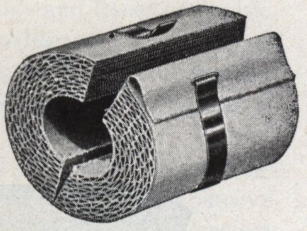
Carey Impervo



Carey Protecto



Carey 85% Magnesia



Carey Carocel

MONETARY LOSSES RESULTING FROM HORIZONTAL BARE STEAM PIPE

Gage Press.	Hot Water			10 Lbs.			80 Lbs.			120 Lbs.			160 Lbs.			200 Lbs.		
Temp.	180° F			239.4° F			324.0° F			350.0° F			370.7° F			387.9° F		
Pipe size	Dollars loss	Pounds coal	B.T.U. per lineal ft. per ° F. diff. per hr.	Dollars loss	Pounds coal	B.T.U. per lineal ft. per ° F. diff. per hr.	Dollars loss	Pounds coal	B.T.U. per lineal ft. per ° F. diff. per hr.	Dollars loss	Pounds coal	B.T.U. per lineal ft. per ° F. diff. per hr.	Dollars loss	Pounds coal	B.T.U. per lineal ft. per ° F. diff. per hr.	Dollars loss	Pounds coal	B.T.U. per lineal ft per ° F. diff. per hr.
1″	1.91	763	.878	3.26	1305	.973	5.72	2290	1.138	6.25	2601	1.178	7.27	2910	1.242	8.07	3230	1.280
2″	3.24	1297	1.491	5.36	2142	1.600	9.78	3910	1.943	11.37	4549	2.052	12.75	5100	2.145	14.00	5600	2.220
3″	4.56	1824	2.100	8.24	3292	2.460	13.88	5550	2.760	16.14	6450	2.910	18.04	7210	3.030	19.84	7945	3.150
4″	5.78	2305	2.650	9.87	3950	2.950	17.70	7075	3.520	25.50	8200	3.700	22.85	9145	3.842	25.15	10060	3.981
6″	8.20	3280	3.775	14.21	5680	4.240	25.30	10110	5.024	29.30	11720	5.295	32 80	13120	5.522	36.00	14420	5.715
8″	11.00	4398	5.050	18.25	7300	5.450	32.60	13030	6.455	37.65	15050	6.840	42.40	16940	7.125	46.05	18420	7.300
10″	12.68	5065	5.925	22.05	8820	6.584	40.20	16100	8.010	46.70	18690	8.440	52.30	20910	8.805	57.75	23100	9.150
12″	15.00	6000	6.995	26.44	10580	7.890	47.40	18950	9.425	55.40	22120	10.00	61.76	24700	10.40	70.00	28010	11.14
14″	16.60	6635	7.625	28.90	11560	8.620	52.00	20800	10.34	60.50	24200	10.92	67.50	27000	11.36	74.10	29650	11.76
16″	18.82	7525	8.650	32.80	13120	9.790	58.76	23500	11.70	68.40	27320	12.34	76.10	30410	12.80	84.25	33700	13.35

Note: In these tables, coal has been figured at $4.00 per ton of 2000 lb.; 13,000 B.t.u. per lb. of coal; labor, boiler room expense, etc., taken at $1.00 per ton, making total value of coal fired at $5.00 per ton. Boiler efficiency taken at 70%. Air temperature 70° F. Experimental data obtained at the Mellon Institute.

Continued on next page

expanded metal lath to provide an air space of, approximately, ¾ in. Then apply Carey 85% Magnesia Blocks, 2 in. thick firmly laced in place and covered with hexagonal wire mesh, stretched tight and finished with a ½-in. coat of Carey No. 100 Hard Finish Asbestos Cement.

Apply a thin coating of Carey B. T. U. Cement over entire exposed brick boiler wall surface. Use from 45 to 50 lb. of cement per 100 sq. ft. of surface. Then apply a 2-in. coat of Carey 85% Magnesia Cement reinforced with wire mesh fastened to brickwork and finish with a coat of Carey No. 100 Hard Finish Asbestos Cement.

High Pressure Steam Piping—Cover all high pressure saturated steam pipes, 4-in. diam. and larger, with double standard thick 85% Magnesia Pipe Covering. Cover all high pressure steam pipes under 4-in. diam. and all high pressure drip pipes with 2-in. Carey 85% Magnesia Pipe Covering.

For superheated steam pipes use combination of the first layer Carey Hi-Temp Covering and outer layer Carey 85% Magnesia Covering as recommended in detail in Bulletin 101—High Temperature Heat Insulation.

Exhaust Steam Piping—Cover all exhaust pipes and mains within buildings with 1 layer of 1½-in. Carocel Asbestos Sectional Pipe Covering.

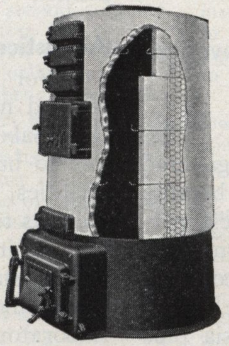
Feed Water Piping—Cover all feed water pipes with 1 layer of 1-in. Carocel Asbestos Sectional Pipe Covering.

Fittings—Cover all high pressure and exhaust steam fittings, valves and flanges with Carey 85% Magnesia Blocks and 85% Magnesia Cement, or all 85% Magnesia Cement, to a thickness corresponding to covering on adjacent pipe. Trowel smooth and finish with canvas jacket pasted on.

Finish—Over all pipe covering, apply a 16-lb. asbestos paper and an extra 8-oz. canvas jacket, tightly stretched and sewed on, approximately, 3 stitches to the inch. All canvas surfaces are to be sized and finished with 2 coats of lead and oil paint of color to be selected by architect.

Heaters, Receivers, Tanks, Traps, etc.—Cover all such appurtenances with Carey 85% Magnesia Blocks and Carey No. 100 Hard Finish Asbestos Cement to a minimum thickness of 1½ in., or with 1-in. Carocel Blocks and ½-in. Carey No. 100 Hard Finish Asbestos Cement. Wire blocks securely in place, cover with 2-in. hexagonal wire mesh, stretched tight, and apply Carey No. 100 Hard Finish Asbestos Cement, troweled smooth.

Finish with canvas jacket smoothly pasted on. Canvas jacket shall be of same weight as used on 85% Magnesia Pipe Coverings.



Method of Insulating Boilers, Heaters, Tanks, etc.

Specifications for Insulating Heating Systems

Boilers, Heaters, etc.—Cover all such appurtenances with Carey 85% Magnesia Blocks and Carey No. 100 Hard Finish Asbestos Cement to a minimum thickness of 1½ in., or with 1-in. thick Carocel Blocks and ½ in. thickness of Carey No. 100 Hard Finish Asbestos Cement. Wire blocks securely in place, cover with 2-in. hexagonal wire mesh, stretched tight, and finish with Carey No. 100 Hard Finish Asbestos Cement, troweled smooth.

Heating Pipes—Cover all mains, risers and returns (except horizontal radiator connections) with 1-in. thick Carocel Asbestos Sectional Pipe Covering.

Fittings—Cover all fittings and valves (except radiator valves) with asbestos cement approximately 1 in. thick, troweled smooth, and finish with canvas jacket smoothly pasted on. The canvas shall be the same weight as that used on the pipe covering.

Finish—All exposed canvas jackets shall be sized and painted with 2 coats of lead and oil paint of color selected by the architect. Pipe covering bands shall be applied on 18-in. centers.

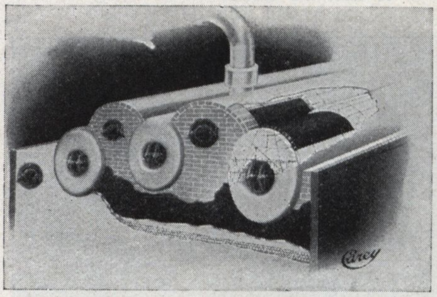
Specifications for Insulating Plumbing Systems

Hot Water Piping—Cover all hot water mains and piping with Carocel Asbestos Sectional Pipe Covering 1 in. thick.

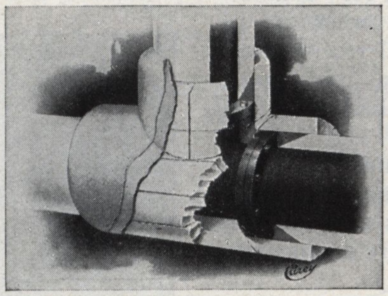
Cold Water Piping—Cover all cold water pipes within buildings, whether exposed or concealed, with Impervo Pipe Covering, in 2 layers, applied by the broken joint method, each layer being ½ in. thick. Cover all cold water pipes in entrances, areaways, unheated rooms or otherwise exposed to freezing, with Protecto Pipe Covering 1 in. thick.

Ice Water Piping—Cover all ice water pipes, whether exposed or concealed, with Impervo Pipe Covering, in 2 layers, applied by the broken joint method, each layer being ¾ in. thick.

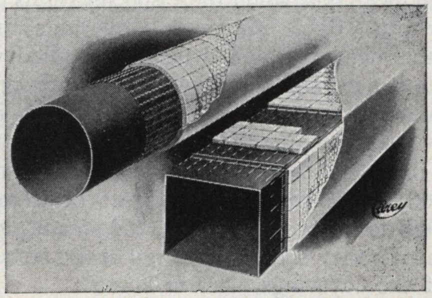
Finish—Same as for heating system.



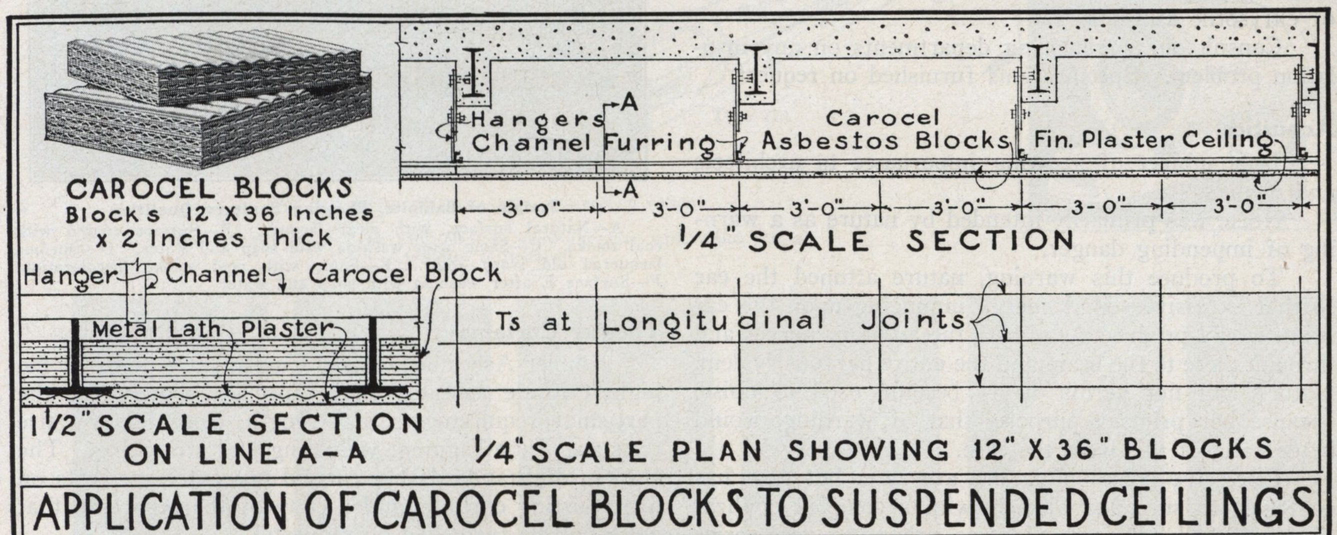
Method of Insulating Boiler Tops, Ends and Walls



Method of Insulating Fittings, Flanges, etc.



Methods of Insulating Boiler Breechings



APPLICATION OF CAROCEL BLOCKS TO SUSPENDED CEILINGS

KEASBEY & MATTISON COMPANY

AMBLER, PA.

Miners of Chrysotile Asbestos and Manufacturers of Asbestos and Magnesia Products

BRANCHES AND ENGINEERING DEPARTMENTS

BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
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PITTSBURGH, PA.
WASHINGTON, D. C.

Products

"Featherweight" 85% Magnesia Pipe and Boiler Insulation.

Acoustical Treatment: Felt and Membrane Method.

Sabinite Sound-absorbing Plaster.

Ambler Asbestos Theater Curtains.

Also manufacturers of Asbestos Air Cell Coverings and Blocks and Asbestos Textiles in variety.

"Featherweight" 85% Magnesia Coverings

"Featherweight" 85% Magnesia is the registered name of the product. It saves the most coal because being the lightest covering it contains the largest percentage of air cells, making it the best non-conductor of heat and most economical 85% Magnesia covering manufactured in the United States or elsewhere.

As the original producers of 85% magnesia pipe and boiler coverings, our long experience and our selective methods of manufacture assure both architect and engineer that when their specifications call for "Featherweight" 85% Magnesia Coverings the owner of the building for which they are specified will receive thoroughly durable coverings; most efficient as coal savers, because by their use the best results in heat conservation are obtained.

85% Magnesia Coverings of our manufacture have been in service for a quarter of a century upon very high temperature superheated steam pipes and, upon removal, they show no change in the structure or character of the coverings.

We also manufacture the highest grade of air cell coverings, which are built of corrugated laminated sheets of chrysotile asbestos.

Consult our engineering departments on any insulation problem. Specifications furnished on request.

Acoustics

Is a subject of growing importance to architects and owners.

Noise was primarily intended by nature as a warning of impending danger.

To produce this warning, nature attuned the ear so that excessive sound energy impinging upon the ear drum would produce a shock to the auditory nerves and through these to the brain and the entire nervous system. Nature will not permit us to become used to noise, because her primary purpose, that of warning, would be defeated if this were the case.

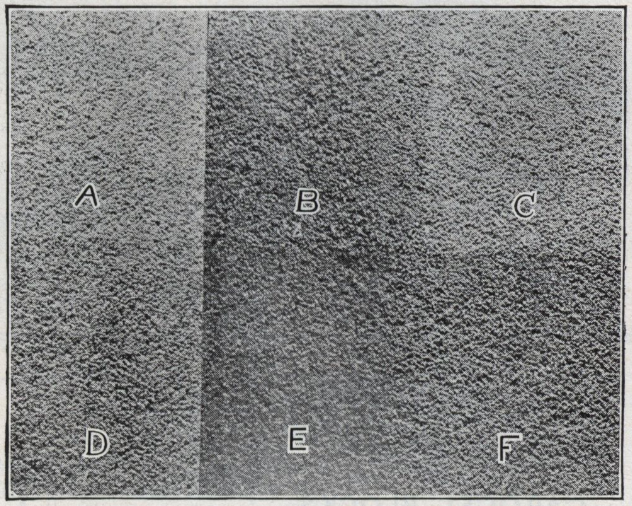
Excessive noises in nature are rare, but man has contrived to surround himself with a complex civilization, in which all sorts of noise producing accessories constantly give shock to the nervous system, which, great or small, drain physical energy and produce fatigue. This problem has been scientifically solved at last and actual savings in dollars and cents have been effected, due to the increased efficiency of the working personnel.

Acoustical Treatment

For *correcting* acoustics, the felt and membrane method may be best in some cases. In new construction, Sabinite sound-absorbing plaster enables the architect to build with permanent, predetermined acoustical qualities, and not be hampered in architectural treatment as to design, shape, size or finish.

Sabinite is a new commodity, but not in the experimental stage; it has been tried and proved. It is the development of several years' work at the Riverbank Laboratories, by Dr. Paul E. Sabine, the best informed physicist in the world today on the science of acoustics.

Let our engineering department tell you the story of Sabinite and how it can be used.



Sample of Sabinite, Showing Sanitary Qualities

A—Natural surface, with clear lacquer. B—Surface coated with coal smoke. C—Same after washing with soap and water. D—Surface lacquered old ivory color. E—Same with coal smoke discoloration. F—Surface E after washing with soap and water

Theater Curtains

Ambler Asbestos Theater Curtains are made of the highest grade asbestos cloth, specially woven for the particular requirements of strength, close texture, fire resistance, non-bagging, wrinkling and stretching. The Bureau of Standards has carried out extensive tests on fire resisting curtains and a copy of the report on that work will be furnished on request.

ESTABLISHED 1910

THE RIC-WIL COMPANY

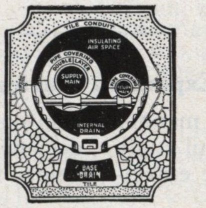
Underground Conduit Systems for Heating Pipes

Union Trust Building, CLEVELAND, OHIO

AGENTS IN PRINCIPAL CITIES

Products

Ric-wiL Interlocking Conduit, Interlocking Base Drain, Pipe Supports and Ric-wiL Underground Pipe Covering used in the "Ric-wiL Method" of Insulating Underground Steam, Hot Water and Fuel Oil Pipes.



Ric-wiL Interlocking Conduit

Ric-wiL Conduit is first quality, standard weight, vitrified salt glazed tile of the bell and spigot type.

It is shipped on the job in full round sections and split into top and bottom halves as used. When installed, bell and special Loc-liP side joints are sealed with portland cement. Loc-liP joint (illustrated at foot of second column) is shaped so that cement locks top and bottom halves permanently together in all directions, giving conduit even greater strength than before splitting. Leakage is practically impossible. Top and bottom halves are interchangeable (foolproof) and numbered in pairs so that companion pieces may be kept together.

Sections are all in 2-ft. lengths, sizes from 4 to 24-in. inside diameter. Every sixth section of conduit has an opening in the bottom half through which a pipe support of the roller type projects to carry the steam, hot water or oil pipes, thus making the pipe supports independent of the conduit itself, a desirable feature for this class of work.

Ric-wiL Interlocking Base Drain

Ric-wiL Base Drain is first quality vitrified salt glazed tile of such design that it is both a base for supporting and lining up the conduit and drain for carrying away any water which might otherwise accumulate around the conduit. The base drain also provides two points of support for conduit, adding 35% to the ground load which the conduit will carry safely, as compared to the same conduit placed on flat ground or broken stone.

The top of the base drain has a slot in it into which the bell of conduit fits, making sections of conduit and base drain stagger with each other so that a strong interlocking construction results.

No concrete foundation is necessary in solid ground. Free drainage area of the base drain is large and ample for every practical condition. Three sizes are made: No. 1 for 4 and 6-in. conduit, No. 2 for 8 to 15-in. conduit, inclusive, and No. 3 for larger sizes. We will furnish ordinary drain tile instead of base drain, if desired, but the base drain will save more than its extra cost in labor, and makes a far better job.

Ric-wiL Pipe Supports

The pipe supports are planned to carry from one to five or more pipes and are ordinarily spaced 12 ft. apart. They are strong, made of cast iron, rustproofed, and interlock with the base drain, imposing no load on the conduit itself. Once in place, no movement of the pipes can disturb them.

Ric-wiL Conduit Systems for All Uses

Ric-wiL Conduit for underground pipe is of four types to meet varying service requirements.

Type SPC System—For steam heating and power pipes and for superheated steam. The tile itself is not lined with insulation as in Types DA and DF but the insulation is applied to pipes direct and consists of any standard make of sectional pipe covering, the kind and thickness depending upon the service to be rendered. Double drainage is provided in this type.

Type F System—For steam heating and power pipes. A lower priced type than the others, consisting of unlined Ric-wiL conduit with filler packed around the pipes. Filler is the same as described in Type DF System.

Type DA System—For hot water, fuel oil and condensation returns. Tile and insulation in one, the latter moulded inside the tile and keyed in. Consists of a diatomaceous earth (Sil-O-Cel) mixture, light in weight and of high insulating quality; will not deteriorate. This type insulates the pipes from surrounding ground but not from each other, making it specially adapted to house oil and steam pipes together for fuel oil transmission. Exceptionally easy to install.

Type DF System—For steam heating and power pipes. This is Type DA with the addition of Ric-wiL Conduit Filler to be packed around the pipes at approximately 20 lb. per cu. ft. The filler is a good non-conductor which will not corrode the pipes nor shrink.

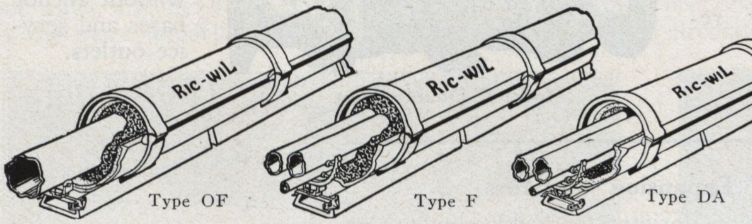
Inquiries

Inquiries should state the size of pipe or pipes to be covered and the services to be carried by them—whether steam, condensation return, hot water or fuel oil. If steam, give pressure.

Catalogue and price list on request.

Engineering

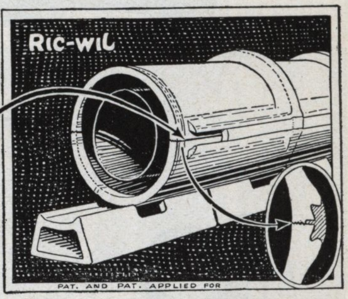
An engineering service is maintained for the convenience of customers.



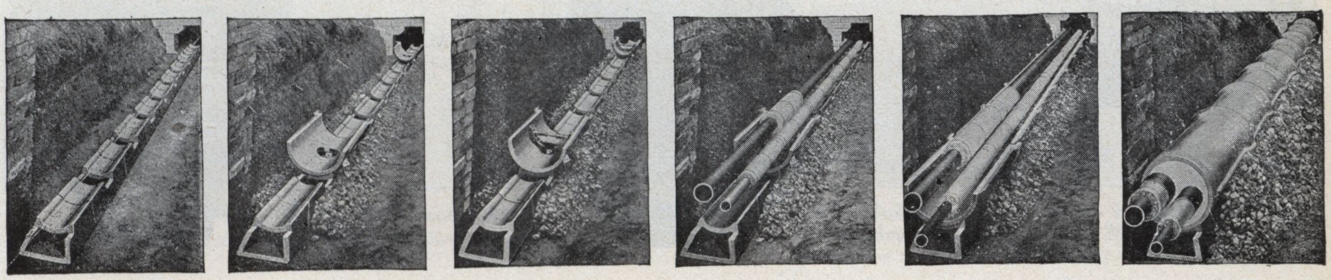
Type OF Type F Type DA

Ric-wiL Conduit Systems

For description of these types, see second column



The illustrations of Type SPC (below) show the ease with which Ric-wil Conduit is installed



AMERICAN DISTRICT STEAM COMPANY

GENERAL OFFICES AND WORKS
NORTH TONAWANDA, N. Y.

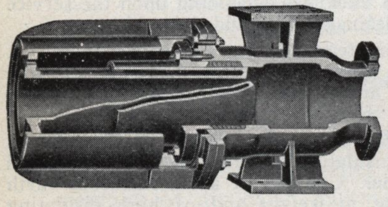
BRANCH OFFICES

NEW YORK, N. Y. CHICAGO, ILL. SEATTLE, WASH.

Expansion Devices

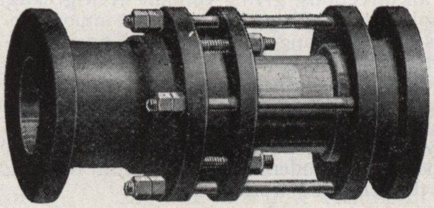
Caring for expansion and contraction in all manner of steam and hot water piping has had the careful study of this Company since 1877. In addition to the expansion devices shown, there are "Adsco" Joints especially designed for every class of service. Specify "Adsco" Joints for satisfaction to your clients.

For High Pressure



Duplex Sleeve Guided Type

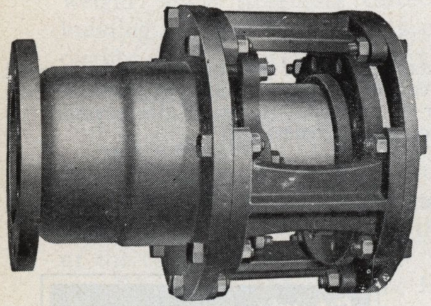
Duplex Sleeve Guided Type for continued service under high pressures and superheat. The duplex feature of the slip preserves the packing and assures a tight joint under most severe conditions.



Tie Rod Type

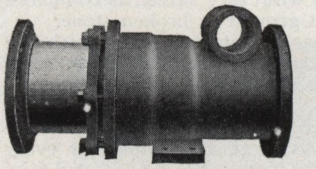
This semi-guided high pressure joint serves well where no unusual demands occur.

For Low Pressure

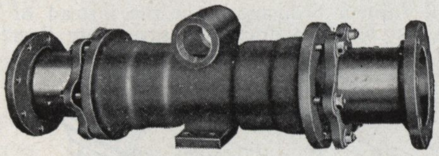


Model M Guided Joint

Model M Guided Joint for 125 lb. pressure, with or without anchor base, supplies the need for a standard pressure guided joint easily examined and quickly repacked.



Model D Single Joint



Model D Double Joint

"Adsco" Model D is our special underground standard pressure joint. Thousands of these are used by district heating plants.

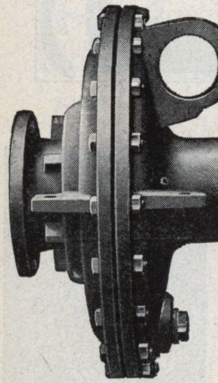
Supplied either with or without anchor bases and service outlets.

"Adsco" Expansion Variators

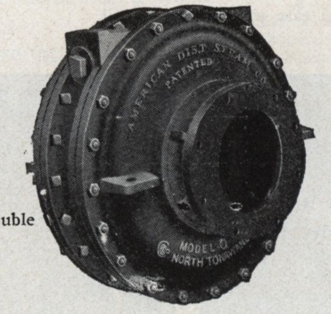
"Adsco" Expansion Variators or packless expansion joints will outlive the line itself and render uninterrupted service. Install them and forget them.

Model O

For 50 lb. pressure with anchor and service outlets



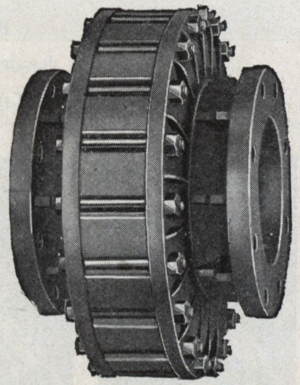
Single



Double

Model P

For 100 lb. pressure. No anchor nor service outlets



GRINNELL COMPANY, INC.

Heating, Industrial and Power Plant Piping

EXECUTIVE OFFICES

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Products and Services

Complete CONSTRUCTION SERVICE on POWER PLANT, HEATING, and INDUSTRIAL PIPING, including Estimates, Materials and Installations.

GRINNELL PIPE HANGERS and FITTINGS.

TEXTILE DRYING MACHINERY.

Also Humidifying Systems; Constant Level Size Circulating Systems; Piping for acids and other special materials; Pipe Fabricating, Bending and Threading; Welding.

Brass, Bronze and other Castings; Valves: Air Relief, Globe, Angle, Cross, Check, Quick Opening and Closing, Non-return, Tank, Pressure Reducing and Regulating, Safety and Y.

Pipe Bends and Coils; Unions, Tees, Ells and Nipples; Cast Iron, Steel and Wrought Iron Pipe; Pipe Rolls; Steam Traps.

For Automatic Sprinkler Systems, see page 1955.

Grinnell Piping Systems

High grade machinery does not produce the expected results if served by poorly designed and indifferently installed piping. The installation of modern piping systems and appliances enables good machinery to perform satisfactorily, jumps production figures and produces immediate savings in coal consumption. Correct pipe sizes, elimination of overloads, utilization of waste hot water and flexibility and simplicity are only a few of the more important factors that create savings and cut costs of production. In many cases, such savings have paid the entire cost of the improved installations in a few years.

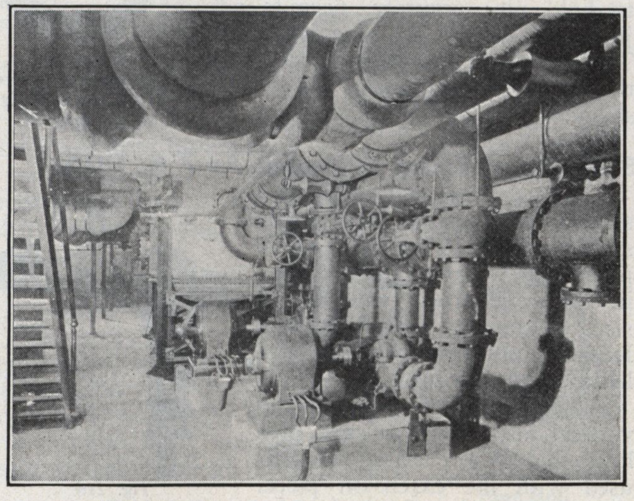
Seventy years of practical experience in designing and erecting proper piping systems is back of every Grinnell Piping System. To architects and consulting engineers Grinnell offers a construction service that insures proper carrying out of plans.

Grinnell Heating Systems

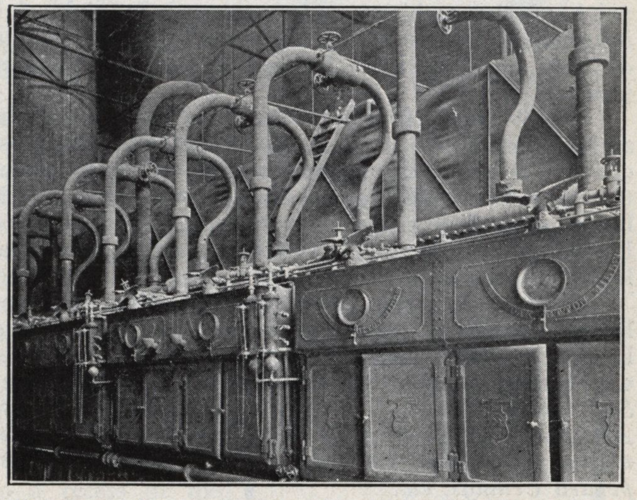
By careful pre-consideration of all factors, GRINNELL COMPANY, INC. is able to install systems that not only produce the required degrees of heat, but do so on a minimum coal consumption.

For instance, for many mills and other industrial plants the Grinnell forced circulation hot water system will provide ample heat which can be easily graduated to meet internal conditions regardless of outdoor temperatures, at a far lower cost per unit than any other system.

Again, when it is decided that hot water will effect the most efficient solution to the heating problem, it must be remembered that the degree of efficiency and economy depends on the skill with which the system is planned and installed. In any Grinnell hot water system radiating surfaces are calculated accurately, needless complexities are avoided, and materials and installation costs are kept down to the lowest figure compatible with the best results. Details of the Grinnell guarantee on forced-circulation hot water heating will be furnished on request.



Welded Heating Mains and Branch Tees
Experienced Grinnell men welded these lines on the job



Pipe Bends from Boilers to Main Steam Header and Bend from Header to One Prime Mover
Illustrative of Grinnell pipe bending service

Continued on next page

Textile Drying Machinery

Grinnell Company, Inc., also manufactures a complete line of textile drying machinery, including package yarn dryers, truck yarn dryers, looping dryers, wool and cotton stock dryers, etc.

Each is guaranteed to do efficiently and economically the work for which it is designed. They are backed by the reputation of this company, established for seventy years.

Grinnell Adjustable Pipe Hangers

Our complete line of adjustable pipe hangers—the only complete line on the market—is the result of years of experience in solving pipe hanging problems in our contract work. The wide and easy adjustability of these hangers both before and *after* installation is a sure corrective for the troubles brought about by the sagging of pipe lines.

Every pipe line, no matter how carefully installed, eventually gets out of alignment, due to the settling of a building's foundations, vibration, heavy or uneven loading of floors. Unless the line is immediately straightened out, efficiency and safety decrease, and maintenance costs increase.

These troubles are quickly corrected where Grinnell Adjustable Hangers are used. A few turns of a nut of the patented swivel-shank, according to the type of Grinnell Hanger that supports the pipe, raises or lowers the pipe, bringing it back into perfect alignment.

Moreover, any architect or engineer who specifies the Grinnell Line will escape the troubles and delays caused by the necessity of having to order special hangers, pipe stands, etc. It was to avoid these very difficulties that we had our designers work up a variety of stock models sufficient to care for all manner of installations—from the simplest to the most complex. Hangers and stands suitable for all types and sizes of piping; unique adjustable radiator brackets; and a wide assortment of ceiling flanges and expansion cases are provided to take care of varying conditions.

Send for the Hanger Data and Specification Book—Architects who have copies of "Safeguarding Heating and Service Pipe Lines" find it greatly simplifies and shortens the work of specifying the correct hanging of pipe lines and radiators. This handbook was planned and written strictly from the standpoint of the architect and engineer. It gives full information for the correct and economical installation of all types of radiation, heating, service and sprinkler pipes.

Its 39 pages, profusely illustrated by photographs and graphic charts, contain specific data on the most effective means of insuring the rigidity of piping, maintaining proper alignment during and *after* installation, safeguarding against costly repairs, stoppage, or loss of piping efficiency through sagging or accidental leverage.

Not only are the correct types of adjustable pipe hangers described, but the proper methods for attaching hangers to every form of structural anchorage are likewise treated. Among the many subjects dealt with are: *Supporting Heating Circulation Systems on Walls; Attaching Pipe Lines to Hollow Tile Floor Slabs; Attaching Pipe Lines to Roofs (Flat or Pitched), Suspended Ceilings, etc.*

We will be glad to supply you with a free copy of this comprehensive and authoritative data book. Write our nearest office.

Grinnell Standard Pipe Fittings

We use more fittings than any company in the country. During the growth of our contracting business we have produced a special line of fittings that meet the exacting requirements of our heating, power and sprinkler work. Made of the best material, carefully tested and rigidly inspected, these fittings make better jobs with less labor.

You can use hundreds upon hundreds of Grinnell Flat Band Fittings without finding a single sandhole; even in the small sizes, sandholes are infrequent. Tapping is clean and accurate; threads taper slightly so that they "make on" easily; cores are clean and smooth. No pains are spared to live up to the reputation of the "most reliable fitting on the market."

In addition to adjustable hangers and fittings we can also furnish bends and lap joints to your blue prints.

Adjustable Swivel Ring, Solid Ring Type (Patented October 4, 1921)

This malleable iron adjustable swivel ring can be used with coach screw rod or machine threaded rod in connection with practically any type of ceiling flange, expansion case, insert, etc.

The usual feature of this ring is the swivel shank. An adjustment of at least 1½ in. is secured by simply turning the nut on the shank. No temporary support of the pipe line is necessary while making adjustments.

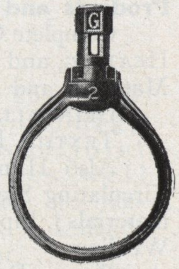


Fig. 101
Adjustable Swivel Ring, Solid Ring Type

By means of a unique locking device the swivel shank can be locked to prevent loosening due to vibration in the pipe line.

Adjustable Swivel Ring, Split Ring Type (Patented October 4, 1921)

The split ring type of the adjustable swivel ring also was designed for use with coach screw rod or with machine threaded rod. The swivel shank feature allows the same adjustment as in Fig. 101, and the off-center hinging of the ring, by providing sufficient seating to hold pipe securely, permits adjustments before the ring is closed. The closing of the hinged section of this ring securely locks the swivel shank.

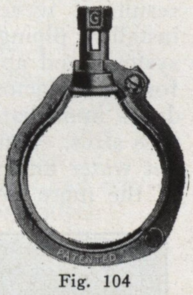


Fig. 104
Adjustable Swivel Ring, Split Ring Type

Side I-Beam Clamp (Patented April 6, 1915)

Adaptable to many uses, this side I-beam clamp has ample strength for hanging ¾ to 12-in. pipe from I-beams. This clamp, in different sizes, will fit all sizes of standard and Bethlehem I-beams, and most sizes of Bethlehem girder beams.

Under conditions requiring vertical adjustment of the pipe line, this side I-beam clamp is used with the extension piece. This extension piece allows 1-in. adjustment at the top of the hanger rod, and a full swing of the rod itself.

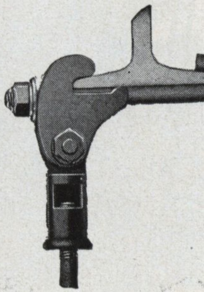


Fig. 216
Side I-Beam Clamps

Continued on next page

Channel Iron Clamp

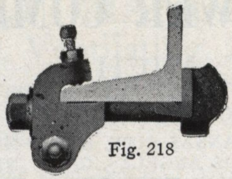


Fig. 218
Channel Iron Clamp

Due to the adjustability of the Grinnell Channel Iron Clamp, four sizes of these clamps, with varying lengths of clamp rods, each with a simple hex-nut, will meet most of the conditions encountered in practical installation work in connection with channels. We know of nothing else on the market which will obviate the necessity for the making of specials for channel iron work.

Adjustable Wall Coil Hangers (Patented May 20, 1923)

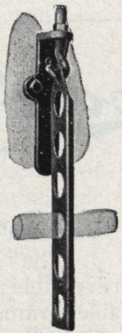


Fig. 160
Adjustable Wall Coil Hanger

The adjustable wall coil hanger can be furnished with four separate brackets—two for single coils and two for double coils. The brackets locate the center of the coils 2¼ or 6¼ in. from back of bracket. Where double coils are used the second hangs 3½ in. in front of the first. Besides the adjustable advantages of these hangers, which permit the hanger plate to be raised or lowered to secure perfect pipe alignment, it is only necessary to fasten the individual bracket in place by two bolts. This saves labor.

Adjustable Wall Radiator Brackets

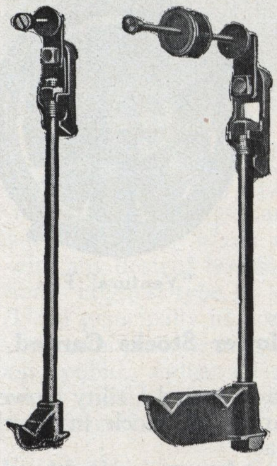


Fig. 190
Single Foot Type
Fig. 191
Double Foot Type
Adjustable Wall Radiator Brackets

The Grinnell Adjustable Wall Radiator Brackets shown here were designed to support either a single section of radiation or two sections—one in front of the other. Fig. 190 shows bracket with single foot for supporting one section; Fig. 191 shows bracket with double foot, long screw and double collar, for holding two sections in place.

Only one bolt is necessary to securely fasten these brackets to the wall. This means low installation cost and it cuts drilling holes down to a minimum. Cost of installation can be further reduced by spacing these hangers farther apart than ordinary type of weaker construction, especially where hook bolts are set in the wall.

When hook bolt is used, it can be set without extremely accurate measurements, due to the liberal range of vertical adjustment, and as only three points of the bracket touch the wall, the difficulty so often experienced with rough brickwork is practically eliminated.

Adjustable Swivel Pipe Roll (Patented Oct. 4, 1921)

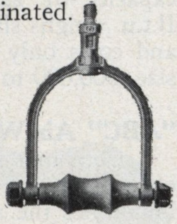


Fig. 174
Adjustable Swivel Pipe Roll

The adjustable swivel pipe roll supplies the need for any adjustable type of pipe roll hanger with single hanger rod. It is unique, inasmuch as vertical adjustment can be made by use of swivel shank at top of hanger.

Saddle Hangers, Standard Type

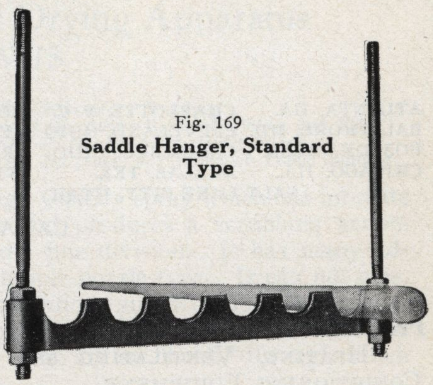


Fig. 169
Saddle Hanger, Standard Type

Grinnell Saddle Hangers are unique, inasmuch as the hanger bar is of steel instead of cast iron. This feature not only reduces the weight of the hanger but also reduces its cost. Hex-nuts at bottom of rods support the hanger and allow almost unlimited adjustment. These saddle hangers are exceptionally strong and will not sag. Labor cost of installation is considerably less than with branch rolls and rods. The saddle hanger is used in connection with 1½-in. rods and hex-nuts on 2 to 8-branch hangers, ⅝-in. rods and hex-nuts on 9 to 12-branch hangers and with expansion cases, Grinnell hanger flanges, or with side I-beam clamps to steel work for supporting overhead coils.

Adjustable Pipe Stand, Anchor Chair, Pipe Seat

Used with welded steel brackets. Welded steel bracket, Fig. 199, is light in weight as compared with the usual cast iron brackets. It was designed primarily for use with the Grinnell adjustable pipe stand Fig. 196, anchor chair Fig. 197 and pipe seat Fig. 198, here illustrated. These combine the strongest type of brackets and pipe supports procurable. The adjustable pipe stand as used with the steel bracket has excellent adjustment features, it being possible to obtain vertical adjustment by simply adjusting bolts on the roll stand. A lateral adjustment or movement is possible with the adjustable pipe stand and pipe seat by sliding the stand or seat on the bracket. With the anchor chair, lateral adjustment is also possible, if chair is moved before the nuts on the anchor yoke are tightened.

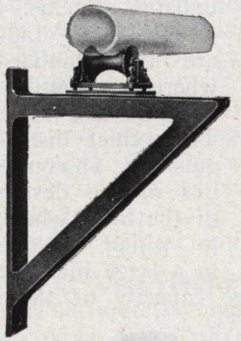


Fig. 199
Welded Steel Bracket with Fig. No. 196 Adjustable Pipe Stand

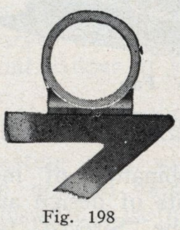


Fig. 198
Pipe Seat

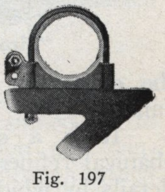


Fig. 197
Anchor Chair

Branch Pipe Rolls

Grinnell Pipe Rolls are especially designed to take care of expansion and contraction. The rolls are made hollow so that only a small surface is in contact with the rod, whereas the surface in contact with the pipe is made as large as possible. This results in the "roll" actually rolling when expansion or contraction of piping takes place. Through a specially designed socket, vertical adjustment is allowed at the bottom of each vertical rod as well as at the ceiling flange. Furthermore, the nut at the bottom of the hanger rod fits into a recess of the socket preventing loosening or turning from vibration.

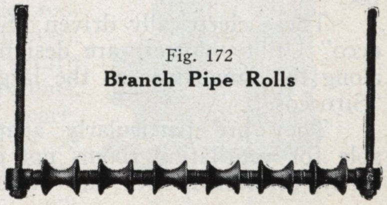


Fig. 172
Branch Pipe Rolls

AMERICAN BLOWER COMPANY

DETROIT, MICH.

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BOSTON, MASS.
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CANADIAN SIROCCO CO., LTD., WINDSOR, ONT.

"Sirocco"
TRADE MARK.

Products

Heating, Ventilating and Air Conditioning Equipment.

Also Exhaust Systems, Air Blast Apparatus, Drying Systems, Steam Engines, Steam Traps.

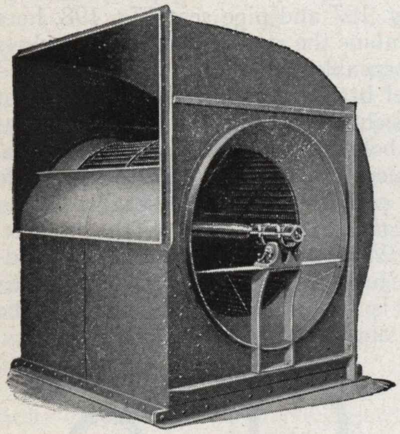
General

The following gives only a general idea of the line of heating, ventilating and air conditioning equipment bearing the "Sirocco" trade mark. Detailed bulletins or special catalogues gladly sent to those interested.

"Sirocco" Fans

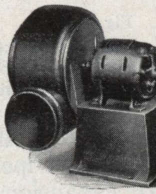
Made in various types to meet the varying requirements of a great number of classes of installations in heating, ventilating, air conditioning, mechanical draft, drying, mining and exhaust systems.

"Sirocco" fans are the standard wherever ventilating fans are used. Their chief distinguishing feature lies in the design of the blast wheel, to which is due in a large measure the efficiency, durability and large capacity of these fans.



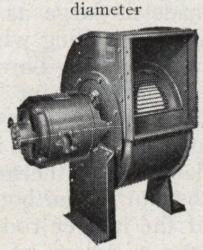
"Sirocco" Fan

It is a combination of mechanical refinements of design and details by which the "Sirocco" fan produces such high volumetric and mechanical efficiencies.



"Sirocco" Utility Blower

Wheels 3 to 9-in. diameter



"Sirocco" Utility Blower

Wheels 12 to 24-in. diameter

"Sirocco" Utility Blowers

"Sirocco" fans with wheels 3 to 24 in. in diameter, capable of handling from 40 to 10,000 cu. ft. per min., are regularly equipped with motors of latest designs and highest efficiencies, wound for currents in most general use.

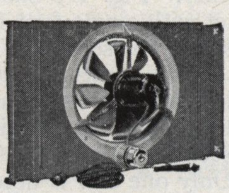
These electrically driven "Sirocco" Utility blowers are designed along the same lines as the larger "Siroccos."

They are particularly adaptable for ventilating rooms not directly connected with the out-of-doors, where ducts are required in the ventilating system; and are also valuable in numerous other applications for ventilating, cooling and drying purposes.

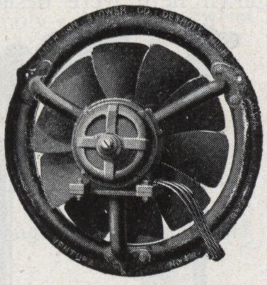
"Ventura" Fans

The No. 2⅓ "Ventura" fan, 12½-in. wheel, is reversible; used with or without the portable, adjustable frame illustrated. Ideal for use in homes and offices.

Larger "Venturas," 16 to 48-in. wheels, handle from 1000 to 17,500 cu. ft. per min. Pulley or motor driven, economical and efficient for many public buildings and industrial applications.



"Ventura" Fan



"Ventura" Fan

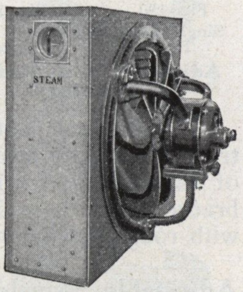
Ventura Fan and Utility Blower Stocks Carried in Principal Cities

American Blower Ventura fans and Utility blowers in all types and sizes are carried in stock in all the principal cities and at the factory.

"Venturafin" Unit Heaters

"Venturafin" unit heaters are the lightest, most compact and economical heating units of equal capacity yet developed.

The No. 4 illustrated with capacity of 125,000 to 162,500 B.t.u. weighs slightly over 300 lb. and costs only $178.00. Larger size, 500,000 to 650,000 B.t.u.



No. 4 "Venturafin"

"ABC" Air Washing and Cooling Fan

Combines fan and air washer in one unit, occupying only floor space required by fan. Washes, cools and humidifies the air.

"Sirocco" Air Washer

Used in public and industrial buildings where conditioned air is necessary for improved working or manufacturing conditions.

BAYLEY MANUFACTURING CO.

Builders of Heating, Ventilating, Exhausting and Drying Apparatus

752 Greenbush Street, MILWAUKEE, WIS.

SALES OFFICES

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SALT LAKE CITY, UTAH, P. W. Belcher, Dooly Block
INDIANAPOLIS, IND., Geo. H. Jerge, 425 Board of Trade Building

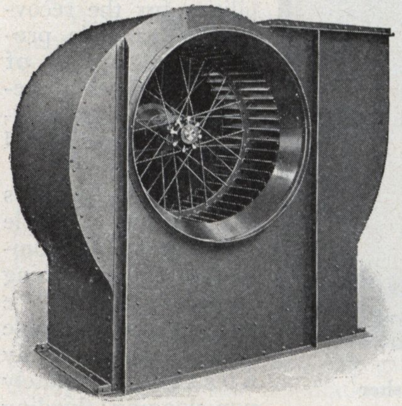
Products

Fans and Blowers for all purposes; Air Washers and Atomizers; Chinook Heaters; Unit Heaters.

Also manufacturers of Air and Gas Scrubbers, Blast Gates, Leather Dryers and Steam Traps.

Plexiform Fan

A ventilating unit which is suitable for handling cool or warm air, high or low temperature gasses, or for all applications where a maximum of air at low or medium pressure is required. Especially adaptable where space is limited and where power economy is an important factor.



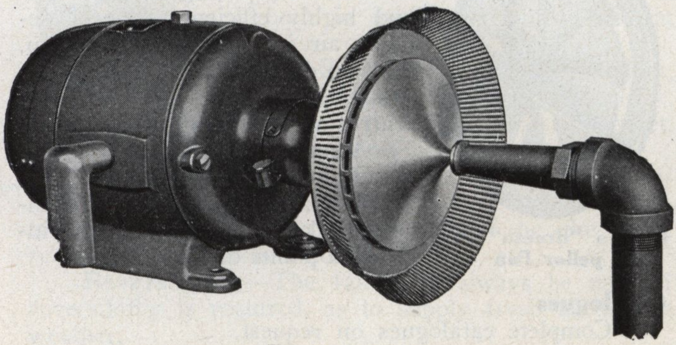
Plexiform Fan Housing

The blast wheel is of distinct Bayley design, and secures very great strength without excess weight. Due to their reinforced construction and the consequent equal distribution of all strains, Plexiform blast wheels are much less subject to crystallization due to the constant vibration in continued use. Free and noiseless in delivery of air because arbitrary cut-offs are eliminated. Large and practically unobstructed inlets and outlets. Made with single or double wheel and with any desired housing construction and discharge position. Highest type of bearings.

Used principally as component part of heating systems or combined heating and ventilating systems for schools, public, industrial and office buildings, or for forced or induced draft systems, drying systems, or to supply process air.

Turbo Air Washer and Conditioner

The Bayley Air Washing System is built around the Turbo Atomizer, which forms an evenly distributed spray by means of the centrifugal force set up by the rapidly revolving wheel. Water is admitted at the center of the wheel through a large fire type nozzle. It is then thrown from the center and against the pins which are set around the periphery of the wheel and thence radially in an even high velocity spray which has intimate contact with the air and produces a scrubbing action, due to its velocity and fine division. It has many advantages over the multiple nozzle type. It can not clog, requires very little attention, and will operate successfully under much lower water pressure. The spray is always uniform, and there are no "holes" through which impure air may pass.

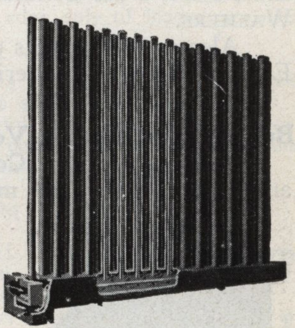


Turbo Atomizer

It can be used for washing, cooling, humidifying or dehumidifying, as required.

Chinook Heating Sections

The Chinook Heating Section is a staggered tube indirect radiator for hot blast heating systems. There are no return bends, elbows, nipples or left-hand threads. Consequently the whole unit is always free from unequal expansion or contraction, each tube being a complete radiator in itself. Each tube consists of a pipe within a pipe; the inside one leading from the live steam chamber of the header is open at the top, and the outside pipe, being open at the bottom, discharges into the condensation chamber of the header. In this way the full length of each tube is evenly heated and the highest efficiency is obtained.



Chinook Heating Section

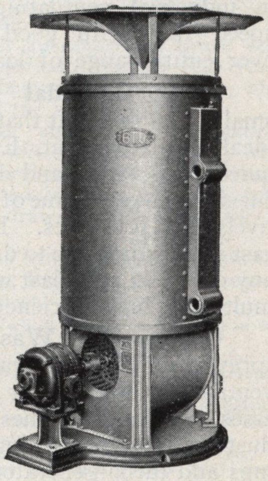
Used principally with Plexiform Fans for heating, ventilating and drying. Also for direct radiation and the cooling of water and condensing of steam.

Is shipped assembled in the smaller sizes and knocked down in the larger units. Can be assembled by any steamfitter without danger of leaky joints.

B. T. U. Unit Heater

This unit is complete and self-contained. It consists of a series of heating coils so designed as to prevent leakage due to unequal expansion and contraction. They are enclosed in a casing through which air is forced by a standard Plexiform Fan placed at the bottom. The warm air passes out at the top through any desired type of breaching and warms the room with a steady current of warm (not hot) air. It operates with greater efficiency than a direct radiation system and forms a combined heating and ventilating unit, taking part of the circulating air from the outside if desired.

Easily installed or moved. Requires only steam, return pipe and wiring connections. Occupies small floor space. Made in sizes from 30 to 60 inches. Can be shipped from stock.



B. T. U. Heater

BUFFALO FORGE COMPANY

CARRIER AIR CONDITIONING CO. OF AMERICA

Heating, Ventilating, Drying, Exhausting and Mechanical Draft Equipment

BUFFALO, N. Y.

BRANCH OFFICES

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PHILADELPHIA, PA., 1303 Land Title Building
PITTSBURGH, PA., 917 Union Trust Building
ST. LOUIS, MO., 515 Chemical Building
BOSTON, MASS., 177 State Street
CLEVELAND, OHIO, 368 Rockefeller Building
MINNEAPOLIS, MINN., 120-122 So. Ninth Street
ATLANTA, GA., Earl F. Scott Co., Candler Building
INDIANAPOLIS, IND., W. C. Fletcher, 1016 Fletcher Trust Building
WASHINGTON, D. C., 9th and F Streets, N. W.
LOS ANGELES, CAL., 636 W. H. Hellman Building
CINCINNATI, OHIO, 607 Mercantile Library Building
DETROIT, MICH., Coon DeVisser Co., 1772 W. Lafayette Boulevard

COMPLETE LINE MANUFACTURED IN CANADA BY CANADIAN BLOWER & FORGE CO., KITCHENER, ONT.

Products

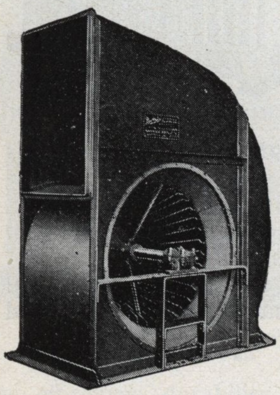
Heating and Ventilating Equipment, including Centrifugal Fans, Heaters (pipe coil and cast iron), Blowers, Disc Fans; Exhaust Systems, including Exhaust Fans, Dust Collectors, Blast Gates; Carrier Air Washers.

Also manufacturers of Forced Draft Fans, Drying Equipment for all materials, etc.

Buffalo Heating and Ventilating Equipment

Buffalo Duplex Conoidal Fans—Even pressure and good efficiency are maintained by these fans over a greater range of air demand than is possible with any other construction. Buffalo Duplex Conoidal Fans can not overload motors and may be directly connected to high speed, relatively low cost motors. They run well within the reasonable limits required for quiet operation by the most particular ventilating systems.

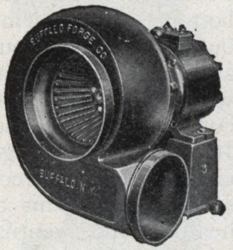
Engineers find this fan best adapted to the needs of all supply or exhaust ventilation in schools, public buildings, etc.



Buffalo Duplex Conoidal Fan

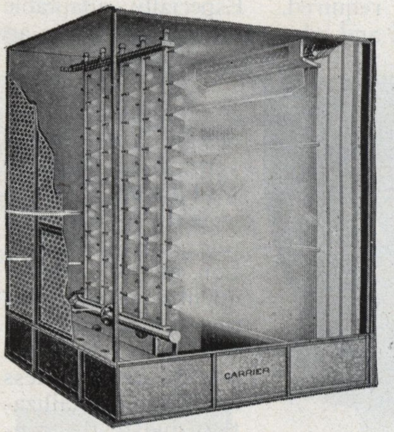
Niagara Conoidal Fans—Without equal for handling large quantities of air with high efficiency at the big overloads and high outlet velocities permissible in industrial ventilating applications. They are low speed fans with good efficiency over entire range of loads.

Baby Conoidal Fans—A small portable outfit that makes an ideal ventilating unit. Exceedingly quiet in operation and designed to furnish a large volume of air at relatively low pressures. Housing is cast iron, adjustable to discharge in any direction and blast wheel is the multiblade high efficiency type.



Baby Conoidal Fan

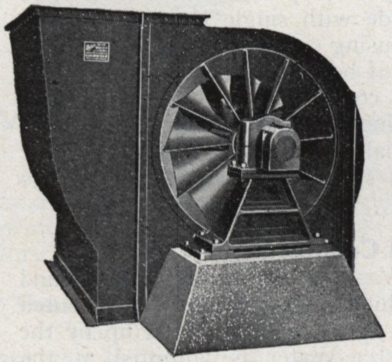
Carrier Air Washers—Highly developed water spray machines for washing and humidifying air for ventilation, elimination of dust in manufacturing processes, removal of fumes and odors, recovery of valuable dust and vapors, cooling of overheated rooms or buildings and turbo-generator cooling.



Carrier Air Washer

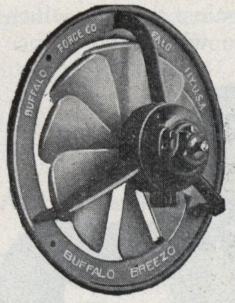
Engineers should investigate the possibilities for the recovery of valuable products, absorption of vapors and other special uses. Our engineers have specialized along these lines.

Carrier washers are extremely simple in construction; eliminators and scrubbing surfaces are of the one-piece demountable plate design; spray nozzles, absolutely non-clogging; flooding nozzles insure constantly wet surfaces on scrubbing portion of eliminators; suction screen extends entire width of tank under washer.



Buffalo Stoker Fan

Stoker Fans—Highest efficiency at normal load where it counts most; utmost proven reliability and high speed for direct connection to relatively low cost motors. They afford absolute protection to motor. Many of America's leading power plants have adopted these fans as standard equipment.



Buffalo "Breezo" Propellor Fan

Propellor Fans—Buffalo "Breezo" Propellor Fans are new and highly efficient. Wheel delivers air in concentrated stream, with no dead spot. Made in sizes from 12 to 30 inches and also with straight blades in larger sizes. For ventilating restaurants, hotels, theaters, garages, billiard halls, bowling alleys, stores, offices, laundries, bakeries, creameries and industrial plants of all kinds.

Catalogues

Complete catalogues on request.

ESTABLISHED 1852

HOWARD & MORSE, INC.

Manufacturers of and Engineers and Contractors for Ventilating Equipment

GENERAL OFFICE AND FACTORY
1199 De Kalb Avenue, BROOKLYN, N. Y.
Howard & Morse Ventilating Engineers Quickly Available by Writing or Wiring to Brooklyn

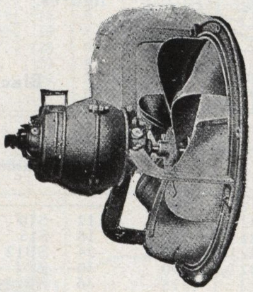
Products

The Original Blackman Fan (Year 1882):

Type D.H. (double hub) for open mounting or for duct work where the maximum static pressure is less than ½ inch; Type S.H. (single hub) to operate under free circulation.

H & M Duplex Cone Fans for feeding directly into a duct where static pressures are in excess of ½ inch and less than 2½ inches.

Also High Pressure Blowers; Motors, Supports and Shafting, and Sheet Metal Duct Work.



Type D.H. Fan

Our Position—a Reputation of 43 Years of Successful Installations

We are the pioneers in the application of mechanical ventilation to buildings. The Blackman Fan, brought out by us in 1882, has stood for 43 years the pre-eminent design.

Our installations are in the three tallest buildings in the world, and in most of the finest buildings in and around New York.

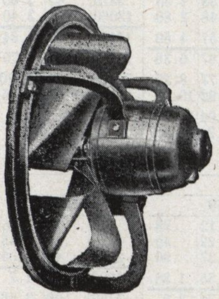
20-year Guarantee—We guarantee all our ventilating equipment and installations for satisfactory operation through twenty years.

Constructive Engineering Assistance Readily Available

Our engineers are "on the road" continually. Any architect or engineer east of the Rockies may, within a few days, have the benefit of our experience in ventilation presented in person by wiring or writing us.

Fans vs. Blowers—Factors That Determine Selection

Howard & Morse Fans are used for mechanical ventilation where large volumes of air are to be moved economically either under free circulation or against maximum static pressures of 2½ inch.



Type S.H. Fan

Economy—Where space is not a limitation, the fan ought to be specified rather than the blower, for the reason that its cost, to move a given volume of air, is less by half, both in initial investment and in operation.

Silence—The fan, being silent, ought always to be specified where, with surroundings especially quiet, noise would be accentuated.

The fan ought always to be used where the apparatus is near the people to be taken care of by the ventilation—especially where noise would be the more serious, as in churches, hospitals, clubs, etc.

Reversibility—The fan must always be used if reversibility is required, as to supply fresh air in hot weather.

General Data on Howard & Morse Fans

Life of Howard & Morse Fans Practically Indefinite—No departure has ever been made from the fine original design that insures that Howard & Morse Fans will practically last forever—installations 40 years old are still running.

General Construction—Howard & Morse Fans are usually designed for either horizontal or vertical operation. They consist essentially of an enclosed, dustproof motor, speed regulator, cast iron wall ring, for bolting either to the wall or other discharge opening, a tripod supporting the motor or bearing and a fan and arms.

Special Features of Superiority—Reinforcing ribs are used on both edges of the fan blades (applied on the surface away from the air movement, of course). On any other fan, the spokes, on one edge only of blades, are used for the reinforcement.

Blades overlap, giving greater "scoop."

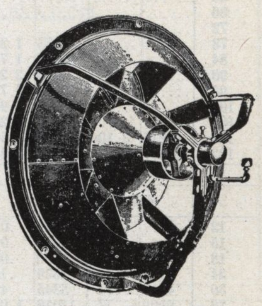
Spokes are recessed into slots in hub-flanges, and bolted. Other fans have spokes riveted to surface of hub-fingers.

Spokes are tenoned at outer ends and extend through mortises in outer ring, countersunk on outer face, the ends of tenons being hammered down flush with outer face. In other fans the practice is to rivet the ends of spokes to inner face of ring.

Two hubs used in Type D.H. give three times the "balance control" possible with usual single hub.

Many details, such as larger drive shaft, 3 setscrews on shaft instead of one, outer ring and spokes of more than double sectional area, 16 rivets per blade as against 4, greater area of blades, etc., reflect the superiority of Howard & Morse fans.

Putting a Howard & Morse Fan on the weighing scale, it will be found to be from 125% to 255% heavier than others according to make—a consequence of the substantial construction.



Duplex Cone Fan

True Balance Guaranteed—All Howard & Morse Fans are guaranteed for true balance. This means a great deal. It is in part responsible for the fact that Howard & Morse installations are the lowest in cost over any period from five to forty years.

Architects' Specifications

It is well to specify Howard & Morse outright as follows:

The contractor shall provide and install a complete ventilating system, as indicated in the drawings and called for in the specifications. The entire equipment shall be as manufactured by Howard & Morse, Inc., 1197 De Kalb Avenue, Brooklyn, N. Y.

Guarantee—The contractor shall guarantee the entire ventilating system and equipment for a period of twenty (20) years against all structural defects and improper workmanship, also for the satisfactory operation of all the mechanical units.

Alternative Specification—An alternative specification, upon which Howard & Morse prices will compare favorably with any that may be presented to the general contractor, is as follows:

The contractor shall provide and install a complete ventilating system as indicated in the drawings and called for in the specifications.

The entire equipment shall be as manufactured by Howard & Morse, Inc., 1197 De Kalb Avenue, Brooklyn, N. Y., or equal, subject to the approval of the architect.

Note: The following are vital points which should be included in the details of the specification:

Tests and Guarantee Requirements—After installation each fan or blower must be tested in the presence of the architect or his representative to prove that it will move .... cu. ft. per min. of air.

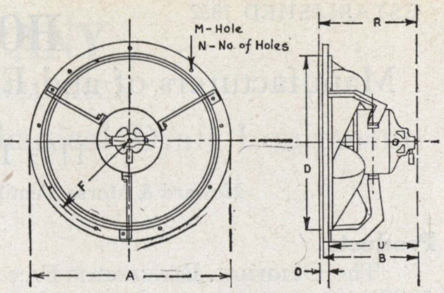
Every fan shall be guaranteed, by its manufacturer, for true balance and against all vibration. Fans shall be further guaranteed to hold their balance through at least twenty (20) years.

Finally, the entire installation shall be guaranteed, in writing, to operate satisfactorily for a period of not less than twenty (20) years after the date of installation.

Continued on next page

Type S. H. Blackman Exhaust Fan

This is the original Blackman Fan mounted on a single instead of two hubs. It is built especially to operate under free circulation with standard motors and on such installations, where price is a limitation, this (S. H. Type) fan should be specified. The same high grade workmanship and material is built into this fan but the Type D.H. is the more powerful. The air volumes shown midway on this page for Type D.H. fans are conservatively stated, with plenty of reserve, for engineers' adoption outright, and we *guarantee* them. The air volumes appearing here for Type S.H. may be obtained as readily as with any competitive fan presented with such figures.



CAPACITIES BASED ON FREE INTAKE AND DELIVERY

Fan diam., in.	Approx. air delivery, cu. ft. per min.	Motor rating					Approx. shipping weight, lb.
		Approx. hp.	Volts	Approx. full load, amp.	Speed, r.p.m.	Frame No.	
12	850	1/12	115	.65	1200	F17	40
12	1050	1/10	230	.8	1150	S16	40
18	3100	1/6	115	1.75	1050	S15	65
18	3100	1/6	230	1.75	1050	S15	65
24	5250	⅓	115	3.0	755	SB12	160
24	5250	⅓	230	3.0	755	SB12	160
30	9300	½	115	2.25	600	SB2	240
30	9300	½	230	2.25	600	SB2	240
36	14000	¾	115	3.3	500	SB2½	290
36	14000	¾	230	3.3	500	SB2½	290
42	18500	1	115	4.5	475	SBF3	375
42	18500	1	230	4.5	475	SBF3	375

Blackman Fans Type S. H. Direct-current Outfits

Size, in.	Frame	Weight, lb.	Dimensions in inches								
			A	B	D	F	M	N	O	R	U
12	S16	40	15½	9 11/16	13¼	7⅛	9/32	6	13/16	10⅛	9 5/16
18	S15	65	22	10 1/16	19½	10⅜	7/16	6	⅞	10 7/16	9½
24	SB12	160	29	14 13/16	26	13⅝	7/16	6	1	15 5/16	14⅛
30	SB2	240	35	17 15/32	32¼	16⅞	9/16	6	1 1/16	17 17/32	16 25/32
36	SB2½	290	43	19 7/16	38¼	20⅛	9/16	9	1⅛	19 13/16	18 11/16
42	SBF3	375	48	20¾	43½	22 13/16	11/16	9	1⅛	21⅛	19⅞

VOLUME AND POWER TABLE OF TYPE D. H. BLACKMAN FANS
Showing the Amount of Air Moved in Cubic Feet per Minute and Power Required at the Speeds Given, Under Free Circulation

Size, in.	Revolutions per minute																							
	75		100		125		150		175		200		225		250		275		300		350		400	
Diam.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.	Cu. ft.	Hp.
30	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	3741	.18	4276	.25
36	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	6606	.23	7707	.36	8808	.54
42	......	......	......	......	......	......	......	......	......	......	......	......	......	......	7515	.28	8235	.38	9018	.49	10521	.78	12024	1.25
48	......	......	......	......	......	......	......	......	......	......	8592	.95	9666	1.10	10740	1.25	11814	1.40	12888	1.60	15036	1.90	17184	2.15
54	......	......	......	......	......	......	......	......	10819	.94	12365	1.25	13911	1.50	15456	1.80	17002	2.05	18548	2.35	21639	2.95	24730	3.75
60	......	......	......	......	9827	.75	11793	1.15	13758	1.50	15724	1.75	17689	2.05	19655	2.35	21620	2.80	23586	3.15	27517	4.25	31448	5.65
66	......	......	......	......	17145	1.07	20574	1.55	24003	2.12	27432	2.50	30861	2.65	34290	3.22	37719	3.82	41148	4.50	48006	5.42	54864	7.20
72	......	......	......	......	21135	1.38	25362	2.00	29589	2.75	33816	3.25	38043	3.75	42270	4.50	46497	5.25	54724	6.25	59178	7.00	67632	9.15
78	......	......	18873	1.20	23591	1.90	28309	2.72	33028	3.25	37746	3.95	42464	4.75	47182	5.85	51265	6.57	56619	8.00	61873	9.15	......	......
84	......	......	25227	1.75	31659	3.25	37990	3.85	44322	4.50	50654	5.05	56986	6.15	63317	7.65	69649	8.50	......	......	......	......	......	......
90	......	......	28600	2.25	35750	3.30	42900	4.40	50050	5.50	57200	6.60	64350	7.87	71500	9.00	......	......	......	......	......	......	......	......
96	......	......	33388	2.75	41735	4.80	50082	6.75	58429	7.75	66776	8.65	75123	10.00	83470	12.50	......	......	......	......	......	......	......	......
102	......	......	42220	2.95	52775	5.00	63331	6.85	73886	8.40	84441	10.40	94996	12.80	105551	14.80	......	......	......	......	......	......	......	......
108	......	......	45226	3.25	56532	5.75	67839	7.02	79145	9.56	90452	12.50	101758	15.60	113065	18.75	......	......	......	......	......	......	......	......
120	44217	3.10	58957	5.50	73696	6.20	88435	8.90	103174	12.10	117914	15.75	......	......	......	......	......	......	......	......	......	......	......	......
132	56077	4.40	74770	8.05	93462	11.00	112155	15.00	130847	20.90	149540	26.00	......	......	......	......	......	......	......	......	......	......	......	......

	Revolutions per minute																							
	450		500		550		600		650		700		800		900		1000		1100		1200		1300	
12	......	......	349	.012	383	.018	418	.024	453	.030	488	.036	557	.042	627	.050	697	.056	767	.062	838	.068	909	.076
15	......	......	523	.018	574	.022	627	.027	678	.031	727	.036	780	.048	831	.059	882	.074	933	.089	984	.106	1035	.125
18	900	.028	1000	.033	1100	.044	1200	.057	1300	.072	1400	.090	1600	.135	1800	.192	2000	.264	2200	.351	2400	.456	2600	.579
24	2102	.10	2336	.14	2569	.18	2803	.24	3037	.30	3270	.38	3738	.57	4205	.81	4672	1.11	5139	1.48	5606	1.92	6073	2.44
30	4810	.31	5345	.42	5879	.56	6414	.73	6948	.93	7483	1.16	8552	1.74	9621	2.25	10690	2.85	......	......	......	......	......	......
36	9909	.77	11010	1.05	12111	1.40	13212	1.82	14313	2.31	15414	2.82	16515	4.32	......	......	......	......	......	......	......	......	......	......
42	13527	1.66	15030	2.28	16533	3.04	18036	3.94	19539	5.00	21042	6.25	......	......	......	......	......	......	......	......	......	......	......	......
48	19332	2.90	21480	3.50	23628	4.25	25776	5.00	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
54	27822	4.85	30913	6.00	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
60	35379	7.25	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

VOLUME AND POWER TABLE OF DUPLEX CONE FAN No. 2 TYPE
Capacities (Cubic Feet per Minute) and Pressures (Ounces) Also Horsepower Rating

Size, in.		Revo utions per minute																							
		100			125			150			175			200			225			250			275		
Diam.	Width Blade	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.	Cu. ft.	Oz.	Hp.
36	6	......	......	......	......	......	......	......	......	......	......	......	......	1710	.11	.25	1925	.43	.35	2140	.17	.42	2350	.21	.50
42	8	......	......	......	......	......	......	......	......	......	......	......	......	3105	.15	.56	3495	.19	.70	3880	.23	.90	4268	.28	1.07
48	9	......	......	......	......	......	......	......	......	......	......	......	......	4560	.19	1.00	5130	.24	1.25	5700	.30	1.56	6270	.36	1.9
54	10⅝	......	......	......	......	......	......	......	......	......	5965	.18	1.12	6820	.24	1.48	7665	.31	1.90	8520	.38	2.30	9370	.45	2.80
60	12	......	......	......	......	......	......	......	......	......	8315	.22	1.37	9500	.30	1.80	10690	.38	2.26	11880	.46	2.80	13060	.57	3.40
66	13	......	......	......	......	......	......	9345	.20	1.64	10900	.27	2.24	12460	.36	2.90	14015	.46	3.70	15570	.57	4.60	17130	.69	5.54
72	14	......	......	......	......	......	......	11975	.24	2.28	13970	.33	3.10	15965	.43	4.00	17960	.55	5.15	19955	.67	6.36	21955	.84	7.70
78	15½	......	......	......	12965	.19	2.10	15570	.28	3.00	18155	.38	4.00	20750	.50	5.30	23345	.63	6.75	25930	.77	8.25	28525	.94	10.00
84	17	......	......	......	16465	.23	2.55	19760	.33	3.70	23055	.45	5.00	26355	.59	6.54	29645	.74	8.25	32940	.92	10.25	36235	1.09	12.36
90	18	16040	.17	2.30	20050	.26	3.60	24060	.38	5.16	28070	.52	7.00	32080	.67	9.16	36090	.84	11.60	40100	1.04	14.35	......	......	......
96	19	19260	.19	2.95	24075	.30	4.60	28890	.42	6.60	33705	.59	9.00	38520	.76	11.80	43340	.96	14.90	48150	1.2	18.45	......	......	......
102	19¾	22602	.21	3.60	28253	.33	5.60	33904	.45	8.12	39555	.65	11.00	45206	.86	14.45	50857	1.09	18.25	......	......	......	......	......	......
108	20½	26292	.25	4.27	32865	.37	6.60	59432	.53	9.60	46011	.77	13.00	52584	.96	17.00	......	......	......	......	......	......	......	......	......

		Revolutions per minute																							
		300			325			350			375			400			425			450			500		
18	3⅜	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	540	.12	.28	600	.16	.35
24	4½	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1282	.22	.40	1425	.27	.45
30	5¾	......	......	......	......	......	......	1947	.21	.50	2088	.27	.60	2227	.30	.70	2367	.32	.80	2506	.37	.90	2784	.46	1.05
36	6	......	......	......	......	......	......	3000	.32	.82	3205	.38	.94	3420	.43	1.08	3635	.49	1.25	3850	.55	1.38	4280	.67	1.7
42	8	4656	.32	1.25	5044	.39	1.50	5432	.45	1.75	5820	.51	2.00	6208	.59	2.25	6596	.66	2.60	6984	.74	2.9	7760	.90	3.56
48	9	6840	.43	2.25	7410	.51	2.60	7980	.59	3.00	8550	.67	3.50	9120	.76	4.00	9690	.86	4.50	10260	.94	5.00	11400	1.17	6.25
54	10⅝	10223	.55	3.30	11076	.63	3.90	11929	.75	4.40	12782	.85	5.50	13635	.96	5.95	......	......	......	......	......	......	......	......	......
60	12	14250	.67	4.00	15440	.78	4.75	16630	.94	5.50	17820	1.06	6.25	19010	1.17	7.25	......	......	......	......	......	......	......	......	......
66	13	18685	.82	6.60	20245	.96	7.75	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
72	14	23950	.97	9.10	25945	......	10.14	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

		Revolutions per minute																							
		550			600			650			700			750			800			850			900		
18	3⅜	661	.200	.43	721	.235	.50	781	.270	.56	841	.321	.66	901	.375	.76	951	.416	.86	1021	.482	.96	1082	.531	1.15
24	4½	1567	.36	.56	1707	.48	.70	1851	.48	.95	1993	.57	1.25	2135	.65	1.40	2277	.76	1.60	2419	.84	1.80	2561	.95	1.09
30	5¾	3062	.56	1.30	3340	.65	1.60	3618	.77	1.82	3896	.86	2.10	4174	1.05	2.41	4452	1.19	2.75	4730	1.36	3.10	5008	1.78	3.48

For a heating system use figures below the heavy line, and select a fan according to volume and pressure required. It is not necessary to discount the capacities below the heavy line. The figures above the heavy line may be relied on only in exhaust systems or where ducts are very ample in size

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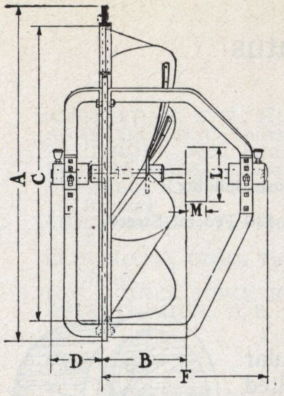
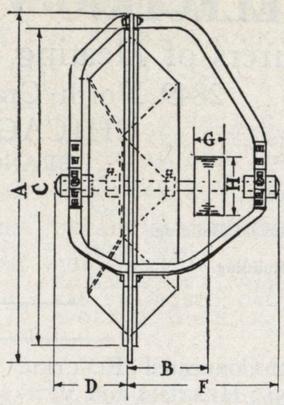


PRINCIPAL DIMENSIONS OF TYPE D. H. BLACKMAN FANS (Inches)

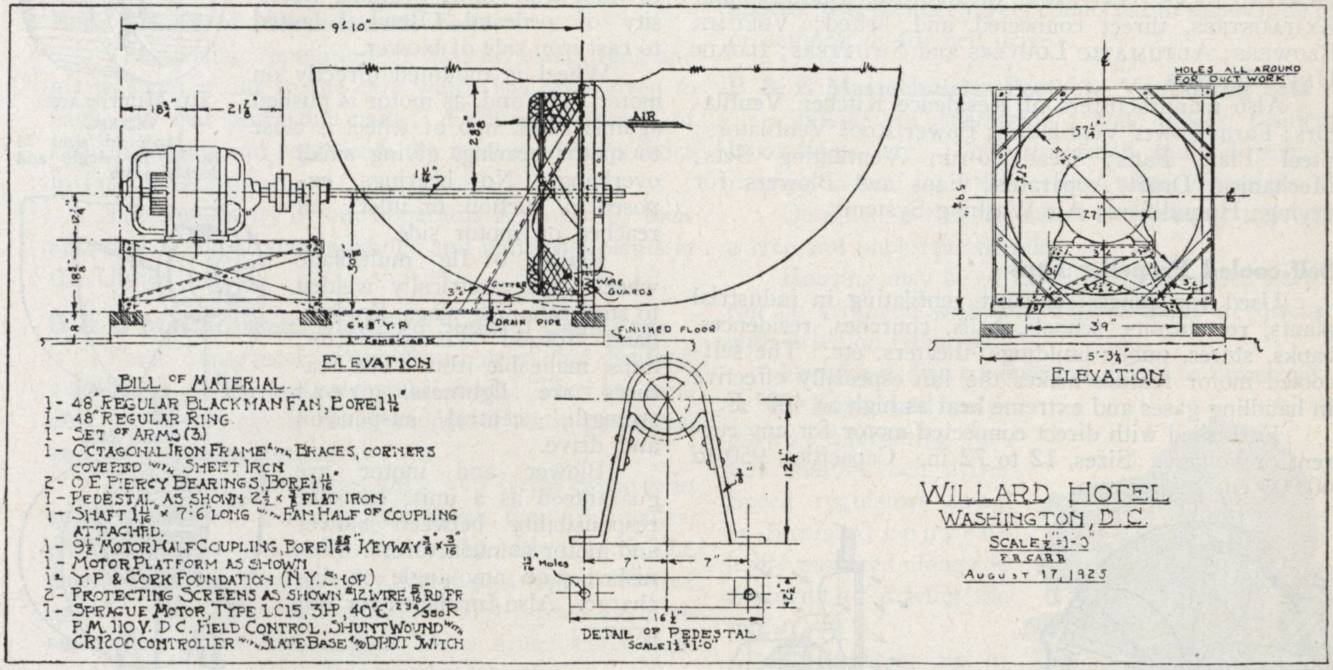
Size	A	B	C	D	F	L	M
12	15½	......	12⅞	.....	......	3	*
15	18⅞	6½	15⅞	3⅝	12⅜	3½	1½
18	12	7$\frac{1}{16}$	18⅞	3⅝	13$\frac{13}{16}$	4	1½
24	29	8$\frac{11}{16}$	25¼	4$\frac{11}{16}$	18	5	2
30	35	11$\frac{3}{16}$	31½	5½	19¾	6	2½
36	43	12¼	37⅝	6½	23	7	3
42	48	12⅜	43	7½	23¼	8	3
48	56¼	14⅛	40	8⅛	29$\frac{9}{16}$	9	4
54	63⅛	17⅝	56	9	34½	10	5
60	69⅛	16$\frac{7}{16}$	62½	9	33⅝	12	6
66	74¾	16⅜	68¾	9¾	35⅞	14	6
72	80¾	17⅞	74¾	9¾	41¾	15	6
78	87	18⅞	81	10½	44⅛	16	6
84	93¼	19⅞	87¼	10½	47⅛	18	6
90	99¼	......	93¼	.....	......	20	8
96	106¼	......	99¼	.....	......	20	8
102	112¼	......	105¼	.....	......	20	8
108	118¼	......	111¼	.....	......	22	8
120	130½	......	123½	.....	......	24	10
132	141½	......	135½	.....	......	26	12

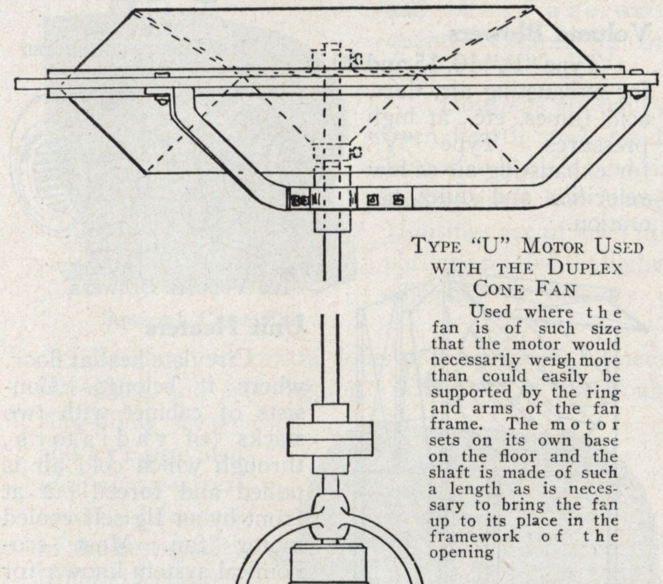
* 12-in. fans provided with grooved pulleys.



PRINCIPAL DIMENSIONS OF DUPLEX CONE FANS (Inches)

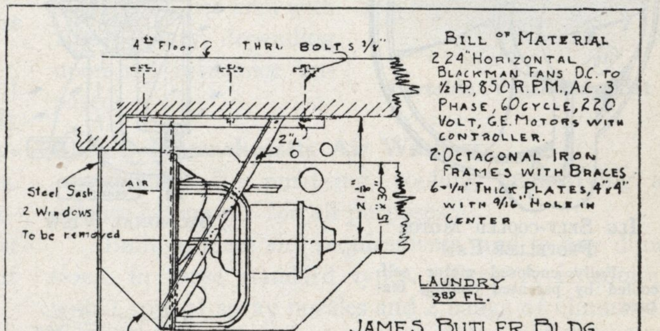
Size	A	B	C	D	F	G	H
12	8⅜	3½	13¼	7⅜	7½	1½	3
18	13⅜	4 1/6	19½	6¼	12½	2	4
24	17½	6 1/24	26	7⅜	13⅝	2½	5
30	22	7	32¼	8¾	15	3	6
36	27½	7 7/12	38¼	10	16½	3½	7
42	30¾	8 ⅔	43½	11¼	19½	4	8
48	35¼	11 1/6	50¾	12¾	23$\frac{11}{16}$	4½	9
54	39	12⅔	57½	14⅝	26	5	10
60	43	13⅓	63$\frac{3}{16}$	16	28¾	6	12
66	47⅝	14¼	69¾	16$\frac{3}{16}$	29½	6	14
72	52¼	15¼	75¾	17	30½	6	15
78	56	16¼	82	18¾	31½	6	15
84	60	17 1/12	88¼	20¼	33	6	18
90	65	18¾	94¼	21½	36¼	8	20
96	69⅛	20 1/6	100¼	22	39	8	20
102	76	....	106¼	.....	......	8	20
108	80	....	112¼	.....	......	8	22
120	88	....	124½	.....	......	10	24
132	98	....	136½	.....	......	12	26

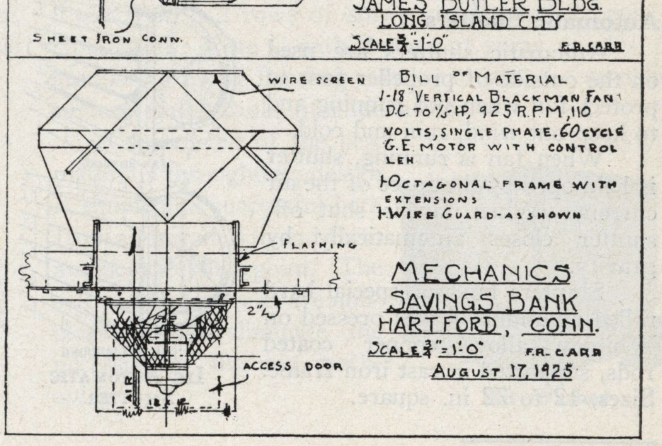

9'-10"
18⅜"
21⅞"
AIR
29⅝"
12¼"
18⅜"
30⅝"
3½"
GUTTER
WIRE GUARDS
6"x8" Y.P.
DRAIN PIPE
FINISHED FLOOR
2" COMP. CORK
ELEVATION
HOLES ALL AROUND FOR DUCT WORK
57¼"
27"
39"
5'-3¼"
ELEVATION
BILL OF MATERIAL
1- 48" REGULAR BLACKMAN FAN, BORE 1$\frac{11}{16}$"
1- 48" REGULAR RING
1- SET OF ARMS (3)
1- OCTAGONAL IRON FRAME WITH BRACES, CORNERS COVERED WITH SHEET IRON
2- O E PIERCY BEARINGS, BORE 1$\frac{11}{16}$"
1- PEDESTAL AS SHOWN 2½ x ⅜ FLAT IRON
1- SHAFT 1$\frac{11}{16}$" x 7'-6" LONG WITH FAN HALF OF COUPLING ATTACHED.
1- 9½" MOTOR HALF COUPLING, BORE 1$\frac{55}{64}$" KEYWAY ⅜" x $\frac{3}{16}$"
1- MOTOR PLATFORM AS SHOWN
1- Y.P & CORK FOUNDATION (N.Y. SHOP)
2- PROTECTING SCREENS AS SHOWN #12 WIRE $\frac{5}{16}$" RD FR
1- SPRAGUE MOTOR, TYPE LC15, 3HP, 40°C 234/350 R.P.M. 110 V. D.C. FIELD CONTROL, SHUNT WOUND WITH CR1200 CONTROLLER WITH SLATE BASE AND DPDT SWITCH
12¼"
$\frac{13}{16}$" Holes
7"
7"
16½"
DETAIL OF PEDESTAL
SCALE 1½"=1'-0"
WILLARD HOTEL
WASHINGTON, D.C.
SCALE ½"=1'-0"
F.R. CARR
AUGUST 17, 1925



TYPE "U" MOTOR USED WITH THE DUPLEX CONE FAN

Used where the fan is of such size that the motor would necessarily weigh more than could easily be supported by the ring and arms of the fan frame. The motor sets on its own base on the floor and the shaft is made of such a length as is necessary to bring the fan up to its place in the framework of the opening


4th Floor
THRU BOLTS ⅜"
2"
AIR
Steel Sash
2 Windows
To be removed
21"
15"x30"
SHEET IRON CONN.
BILL OF MATERIAL
2 24" HORIZONTAL BLACKMAN FANS D.C. TO ½ HP, 850 R.P.M., A.C. 3 PHASE, 60 CYCLE, 220 VOLT, G.E. MOTORS WITH CONTROLLER.
2 OCTAGONAL IRON FRAMES WITH BRACES
6 - ¼" THICK PLATES, 4"x4" WITH 9/16" HOLE IN CENTER
LAUNDRY
3RD FL.
JAMES BUTLER BLDG.
LONG ISLAND CITY
SCALE ¾"=1'-0"
F.R. CARR


WIRE SCREEN
FLASHING
2"
ACCESS DOOR
AIR
BILL OF MATERIAL
1-18" VERTICAL BLACKMAN FAN D.C. TO ⅕ HP, 925 R.P.M, 110 VOLTS, SINGLE PHASE, 60 CYCLE G.E. MOTOR WITH CONTROLLER
1-OCTAGONAL FRAME WITH EXTENSIONS
1-WIRE GUARD-AS SHOWN
MECHANICS
SAVINGS BANK
HARTFORD, CONN.
SCALE ¾"=1'-0"
F.R. CARR
AUGUST 17, 1925

ILG ELECTRIC VENTILATING CO.

Manufacturers of Heating and Ventilating Apparatus
2849 North Crawford Avenue
CHICAGO, ILL.

BRANCHES

NEW YORK, N. Y., 13 Park Row
Telephone, Barclay 8787
CLEVELAND, OHIO, 1314 Schofield Building
Telephone, Main 776
PITTSBURGH, PA., Bessemer Building
Telephone, Smithfield 1213

PHILADELPHIA, PA., 327 Commercial Trust Building
Telephone, Spruce 2099
BOSTON, MASS., Tompkins-Stoddard Co., 136 Federal Street
Telephone, Fort Hill 6454
DETROIT, MICH., 203 Owen Building
Telephone, Cherry 5231

Products

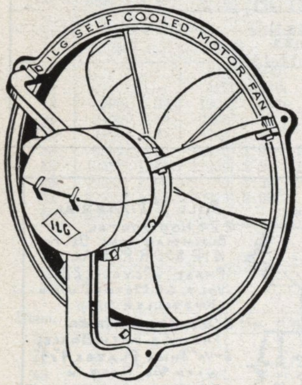
A complete line of Direct Connected Electric Propeller Fans; Exhaust Fans; Heating and Ventilating Fans; Universal Multiblade Blowers and Exhausters, direct connected and belted; Volume Blowers; Automatic Louvers and Shutters; Ilgair Unit Heaters.

Also manufacturers of Residence Kitchen Ventilators; Farm Power Ventilators; Power Roof Ventilators; Steel Plate Fans; Ready-to-run Ventilating Sets; Mechanical Draft Apparatus; Fans and Blowers for drying; Humidifiers; Air Washing Systems.

Self-cooled Propeller Fans

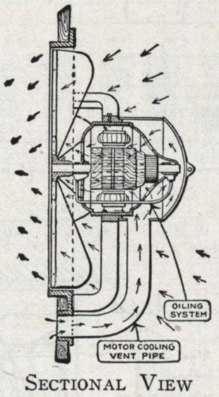
Used for general exhaust ventilating in industrial plants, restaurants, schools, halls, churches, residences, banks, stores, public buildings, theaters, etc. The self-cooled motor feature makes the fan especially effective in handling gases and extreme heat as high as 400° F.

Furnished with direct connected motor for any current or voltage. Sizes, 12 to 72 in. Capacities, 950 to 40,000 cu. ft. per min.


ILG SELF COOLED MOTOR FAN
ILG

Ilg Self-cooled Motor Propeller Fan

Fully enclosed motor self-cooled by patented cooling feature



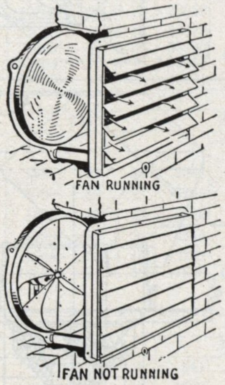
Sectional View

Automatic Shutters

Automatic shutters are used on the outside of propeller fans to protect fan when not running and to keep out wind, rain and cold.

When fan is running, shutter is held open by the force of the air current. When fan is shut off, shutter closes automatically by gravity.

Shutters built of special hard rolled aluminum leaves pressed on Whitney alloy, copper coated rods, supported in cast iron frame. Sizes, 12 to 72 in. square.



Ilg Automatic Shutter

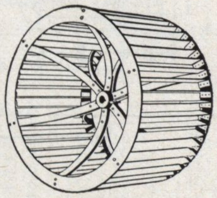
Universal Multiblade Blowers

Motor is machined circular and held in cast iron ring bolted to cast iron bowl avoiding necessity of pedestal. Bowl is bolted to cast iron side of blower.

Wheel is mounted directly on motor shaft and, as motor is pushed against bowl, hub of wheel is close to motor bearing, giving small overhang. No bearings exposed in suction or inlet; all reached on motor side.

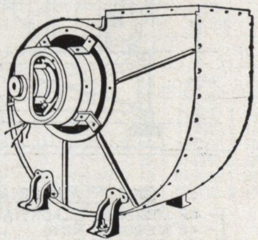
Blades of Ilg multiblade wheels are electrically welded to steel retaining rings. Spiders, hand forged wrought iron; hubs, malleable iron. The features are lightness, great strength, central suspension and drive.

Blower and motor are guaranteed as a unit; no split responsibility between blower and motor manufacturers. Furnished with any angle or discharge. Also furnished for belt drive.

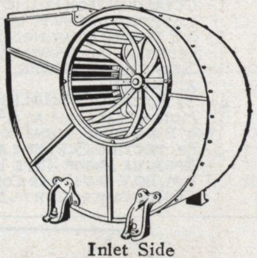


Ilg Multiblade Wheel

Made in sizes 25 to 80 in. single and double width



Motor Side

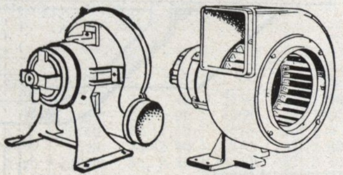


Inlet Side

Ilg Direct-connected Blower

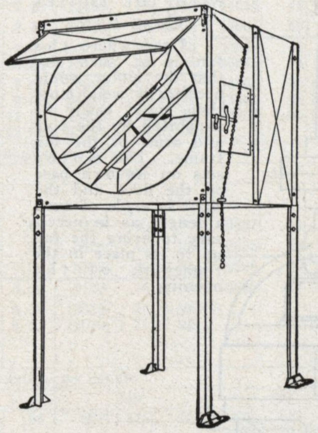
Volume Blowers

Type "P," 10, 15 and 20 in., for exhausting air, dust, acid fumes, etc., at high pressures. Type "V" for exhausting air at low velocities and quiet operation.



Type "P" Type "V"

Ilg Volume Blowers



Ilgair Floor Type Heater

Also made for ceiling suspension

Unit Heaters

Circulate heat at floor, where it belongs. Consists of cabinet with two stacks of radiators, through which cold air is pulled and forced out at front by an Ilg self-cooled motor fan. Most economical system known for large open spaces.

Literature

Descriptive literature on all Ilg apparatus furnished on request.

MASSACHUSETTS BLOWER COMPANY

OWNED AND CONTROLLED BY THE BISHOP & BABCOCK MFG. CO.

WATERTOWN, MASS.

REPRESENTATIVES

AMSTERDAM, N. Y., F. E. Dwyer, 447 Guy Park Avenue
ASHEVILLE, N. C., Southern Industrial Sales Co., 216 Drhumor Street
BALTIMORE, MD., Building Service Co., 404 St. Paul Street
BOSTON, MASS., Tierney-Wilson Co., 201 Devonshire Street
BUFFALO, N. Y., C. H. Freeman & E. W. Abrahamson, 333 Jackson Building
CHICAGO, ILL., The Bishop & Babcock Mfg. Co., 112 West Austin Avenue
CLEVELAND, OHIO, The Bishop & Babcock Mfg. Co., 1200 E. 55th Street
DES MOINES, IOWA, H. F. Willis, 520 Security Building
DETROIT, MICH., T. R. Woolley, Donovan Building
DULUTH, MINN., C. C. Ferguson, 412 Builders Exchange
MILWAUKEE, WIS., Riley & Fredericks Co., Security Building
MONTREAL, QUE., Linde Canadian Refrigerating Co., 37 St. Peter Street
NEW YORK, N. Y., The Bishop & Babcock Mfg. Co., 444 Lafayette Street
OKLAHOMA CITY, OKLA., Federal Steam Specialty Co., 120 East Main Street
PHILADELPHIA, PA., Alexander & McDevitt, 1725 Sansom Street
RICHMOND, VA., Virginia Equipment & Supply Co.
SAN FRANCISCO, CAL., Walter S. Leland, 660 Howard Street
SPOKANE, WASH., R. L. Nelson, 507 Empire State Building

Products

Ventilating and Exhaust Fans; Air Washers.

B & B Line of Massachusetts Fans

The sterling reputation of Massachusetts fans and air washers is due to the care which has been given to each one that bears our name. Each is the result of careful testing and represents the most modern practice in fan building.

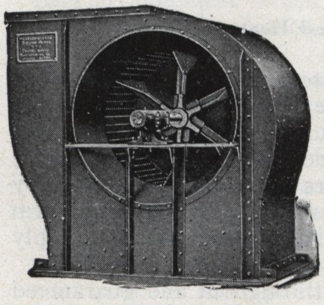
The superiority of our apparatus is proven by their adoption in the largest buildings and industrial plants in the United States.

B & B Massachusetts Modified Squirrel Cage Fans

These fans meet every requirement for heating, ventilating, drying and mechanical draft. They are suitable for supplying air under moderate static pressures, and for removing foul air.

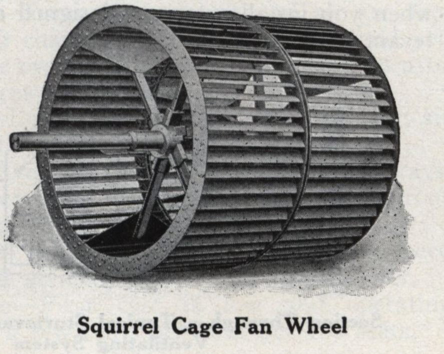
Their chief advantages are: (1) Great capacity in small space. (2) For a given volume, they are smaller, cheaper in first cost and in cost of operation. (3) The smaller wheel is economically driven at a higher rotative speed. (4) The small wheel at high speed requires a smaller motor and engine when direct connected, and these are consequently cheaper in first cost.

Housings are built of open hearth steel, rigidly braced and bolted, and riveted to angle iron frames. Housings are of such proportions to give the highest efficiency in delivery of



Squirrel Cage Fan

Bearings are extra long and of large diameter, self-oiling and self-aligning. They are of the double ring-oiling type and are provided with a large oil reservoir. Linings are of the best quality babbitt accurately bored and reamed to size; and, under special conditions, water cooling is provided.



Squirrel Cage Fan Wheel

Built in standard arrangements as to hand and discharge, in full housed, and seven-eighths housed types, and furnished either direct connected to motors, turbines or engines, or for belt drive.

B & B Massachusetts Portable Ventilating Sets

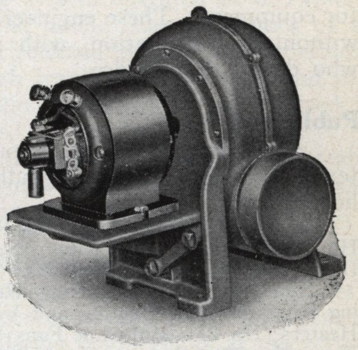
Suitable for ventilating toilets, offices, residences, laboratories, etc. They are small squirrel cage fans ranging in size from 6 to 15-in. wheel diameters.

Designed so that the wheel is overhung, thus giving a free and unobstructed inlet.

Housing may be of cast iron or of sheet steel, and can be arranged with any desired angle of discharge, with drive on either side.

Furnished direct connected either to direct current or to single and polyphase alternating current motors, belt drive. Speed regulators may be furnished conveniently mounted alongside the motor driving the fan.

Capacities up to 4000 cu. ft. per min. with free delivery, depending upon the resistance imposed.



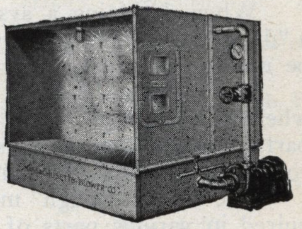
Portable Ventilating Set

B & B Massachusetts Air Washers

Suitable for purifying, cooling, humidifying and dehumidifying air for all purposes.

Built to meet any requirements, and to any dimensions, in three standard types. Type A is equipped with 1 row of spray nozzles and 2 banks of eliminators; Type B with 2 rows of spray nozzles and 2 banks of eliminators; Type C with 2 rows of spray nozzles, one auxiliary row of flooding nozzles to wet the scrubbing surface and 2 banks of eliminators.

Constructed of the best materials throughout; design is simple and successful both from an installation and from an operation viewpoint. The self-cleaning nozzles are nonclogable and eliminate the necessity of flushing mechanism.



Air Washer

B. F. STURTEVANT COMPANY

Heating and Ventilating Apparatus

HYDE PARK, BOSTON, MASS.

PLANTS LOCATED AT

HYDE PARK, MASS. STURTEVANT, WIS. BERKELEY, CAL. FRAMINGHAM, MASS. CAMDEN, N. J. GALT, ONT.

SALES ENGINEERING OFFICES

ATLANTA, GA.
BOSTON, MASS.
BUFFALO, N. Y.
CAMDEN, N. J.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DALLAS, TEX.
DENVER, COLO.
DETROIT, MICH.
HARTFORD, CONN.
INDIANAPOLIS, IND.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PITTSBURGH, PA.
PORTLAND, ORE.
ROCHESTER, N. Y.
ST. LOUIS, MO.
SALT LAKE CITY, UTAH
SAN FRANCISCO, CAL.
SEATTLE, WASH.
WASHINGTON, D. C.
MONTREAL, QUE.
TORONTO, ONT.

FOREIGN REPRESENTATIVES

BOGOTA, COLOMBIA, Wesselhoeft & Poor
BUENOS AIRES, Compania Italo-Americana de Importacion
CARACAS, VENEZUELA, Wesselhoeft & Poor
HONOLULU, T. H., Honolulu Iron Works Co.
JOHANNESBURG, TRANSVAAL, A. E. Barker
LIMA, PERU, Pedro Martinto, Inc.
MANILA, P. I., Catton Neill Engineering & Machine Co.
SHANGHAI, American Trading Co.
SYDNEY, N. S. W., H. P. Gregory & Co., Ltd.
TAMPICO, MEXICO, General Machinery Co.
TOKIO, American Trading Co.
WELLINGTON, N. Z., Blair, Reed & Co., Ltd.

Products

Heating, Ventilating and Power Plant Equipment: Fans; Blowers; Exhausters, Heaters; Air Washers; Portable Ventilating Sets; Galvanized Iron Duct Work; Vertical Steam Engines; Steam Turbines; Electric Motors and Generators; Gasoline Engine Generating Sets; Fuel Economizers.

Sturtevant
PUTS AIR TO WORK

Engineering Service

Sturtevant engineers will analyze the conditions of any prospective installation and make recommendations for equipment. These engineers are ready to co-operate, without any obligation, with architects and engineers who desire this service.

Publications

A special catalogue is published for each Sturtevant product. We shall gladly send any of these publications on request.

Drying Apparatus—No. 243, Paper Drying; No. 314, High Humidity Lumber Dry Kilns; No. 298, Sturtevant-Brownell Dryer; No. 299, Drying Systems.

Heating and Ventilating—No. 201, Electric Dust Blowing Sets; No. 227, Heating and Ventilating Layouts; No. 230, Heaters; No. 271, Multivane Fans; No. 279, Disc and Propeller Fans; No. 290, Silentvane Fans; No. 306, Hot Blast Heaters.

Mechanical Draft—No. 236, Forced Draft Fans; No. 276, Turbo Undergrate Blowers: Design 3; No. 301, Cindervane Fans; No. 304, Turboblowers: Design 1.

Planing Mill Fans and Dust Conveying Systems—No. 185, Slow Speed Low Power Planing Mill Exhausters; No. 252, Steel Plate Fan Performance Chart; No. 291, Pneumatic Dust Collecting and Conveying Systems; No. 302, Planing Mill Exhausters: Design 1; No. 303, Planing Mill Exhausters: Design 2.

Power Apparatus—No. 255, Gasoline Electric Generating Sets; No. 284, Polyphase Motors; No. 309 Turbo Transmissions; No. 311, Type 12 Turbines; Stoker Bulletin.

Pressure Apparatus—No. 257, Positive Pressure Blowers; No. 258, Design 4 and 5 Pressure Blowers; No. 292 Monogram Blowers and Exhausters; No. 297, Steel Pressure Blowers.

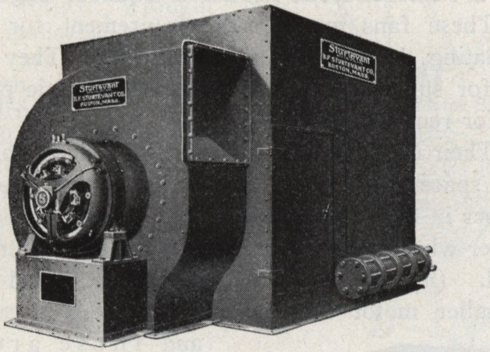
Fan Blast Heating Systems

When designing a system for heating only, either a "draw-through" or a "blow-through" arrangement may be used.

The "draw-through" arrangement is furnished where the warm air is to be circulated throughout all parts of a building. The air is drawn through heating coils to a fan and is distributed by ducts.

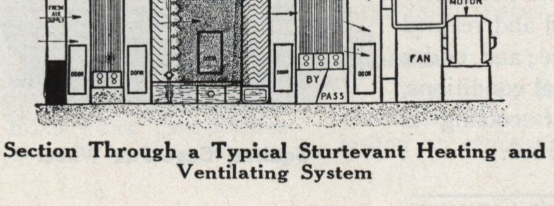
The "blow-through" method is used where air is required in various parts of a building at different temperatures. The air enters a fan, is blown through heating coils, and is distributed by means of ducts for one temperature; for another, a by-pass is built from the fan, around the heater, through a cold air duct and is distributed in the same way.

When both heat and ventilation are required a "draw-through" arrangement is used. The air enters the heating coils and is drawn through a chamber where it is washed by a sheet of water. The cleansed air then strikes plates which eliminate all surplus moisture; the air then passes through coils for reheating, and is distributed by ducts; or, if more than one temperature is required, some air may be drawn around the heater by means of a by-pass and then distributed. During warm weather, cool, clean, washed air is obtained by simply shutting off the heat.



Sturtevant Fan and Heater Unit

These systems are built throughout and guaranteed by Sturtevant. The responsibility for the manufacture of the apparatus as well as for its performance is borne by the largest heating and ventilating concern in the world. You are sure of obtaining the finest equipment when you install a system designed and built by Sturtevant.



Section Through a Typical Sturtevant Heating and Ventilating System

ERNST GLANTZBERG, President

TYPHOON FAN COMPANY

Cooling and Ventilating Systems

345 West 39th Street
NEW YORK, N. Y.

TELEPHONE
Longacre 9260

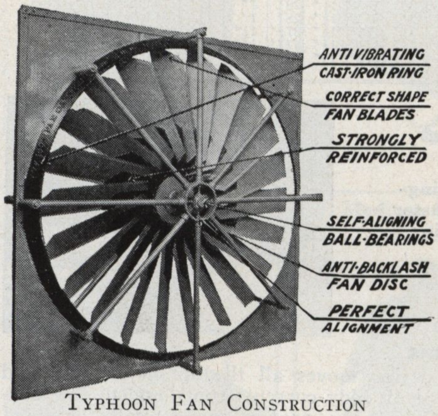
BRANCH OFFICES IN LARGE CITIES

Typhoon System—What It Does

Typhoon is a system for the cooling and ventilating of theaters, auditoriums, hotels, workrooms or large roofed-in spaces of any sort. It consists of an arrangement of low-speed, noiseless multiblade fans, creating a refreshing breeze which makes the house comfortable on the hottest days of summer. Part of the same apparatus, with the addition of steam heating coils, will serve in winter, if desired, as a complete and efficient heating system. Typhoon at all times is a complete system of ventilation.

Fans—Made for long life, large air capacities, and low-speed, silent operation. Protected by special patents.

Frame is of heavy angle steel, securely fastened to cast iron cone ring. Blades are strongly reinforced, and a heavy steel disk prevents backlash. The self-aligning ball bearings run in dustproof cases.



Typhoon Fan Construction

Typhoon Twin Set—A unit composed of two Typhoon single fans operated by one motor. A compact arrangement which saves headroom and provides a more even distribution of air.

Typhoon for Cooling and Ventilating Theaters

In principle, Typhoon is simply a big breeze-making machine. It requires no refrigerating coils or water sprays which saturate the air with moisture. Clean dry air from the roof sweeps through the house and out the doors in a uniform current, making the most crowded theater comfortable on the hottest day.

The Typhoon equipment is usually housed on the roof in one or more penthouses, but can also be located on side or back walls and on side of stage. The inlet grilles, usually placed in the ceiling or the proscenium arch, afford an opportunity for pleasing architectural treatment.

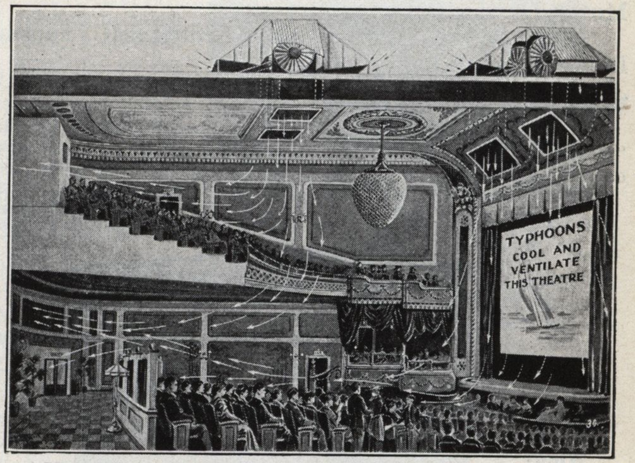
No Drafts—Tremendous volumes of air are supplied (usually 60 changes an hour or more), and yet, on account of the even distribution, there are no drafts. The audience faces the air currents.

No Noise—Large fans running at low speed; air passing through large openings at low velocity.

No Expensive Equipment—No coils; no sprays. Since the air is comparatively free of dust at the roof level, the use of air washers is unnecessary.

Reversible—Typhoon fans can be run at low speed in the reverse and used to exhaust foul air in winter.

Inexpensive—First cost is low and operating charges are only a few cents per hour per 100 seats.


TYPHOONS COOL AND VENTILATE THIS THEATRE

How Typhoon Cools and Ventilates a Theater
Arrows show direction of air currents

Typhoon for Cooling and Ventilating Hotels

A patented cooling system operated by a Typhoon fan on each floor of the hotel. Large volumes of air at low velocities are circulated through the corridors, enter the rooms through transoms or louvers, and pass out the windows, or the air flow may be reversed by reversing the Typhoons.

The Typhoon system makes any hotel comfortable in summer, gives uniform ventilation to every room, and makes inside rooms more valuable.

Typhoon Service to Architects

Typhoon Fan Company has a wide and successful experience in solving problems in cooling and ventilation. A corps of ventilating engineers is at the service of the architect.

On receipt of blue prints the Typhoon engineers will advise as to the necessary equipment. They will furnish complete working drawings on receipt of order, and when desired will write the necessary specifications, which vary with each installation. This service is free to architects.

Typhoon systems can be installed by the local contractor, or, if desired, we will furnish our own skilled mechanics.

Some Typhoon Installations

Among the large theatrical enterprises which have installed Typhoon systems are:

Saenger Amusement Co. (35 theaters)
Southern Enterprises (51 theaters)
Marcus Loew (20 theaters)
Stanley Amusement Co. (15 theaters)
Harry M. Crandall (12 theaters)

Also the following individual houses:

Colony, New York, N. Y.
Belmont, New York, N. Y.
Metropolitan, Brooklyn, N. Y.
Empress, Omaha, Neb.
Princess, Hot Springs, Ark.
Victoria, Los Angeles, Cal.
Lyric, Indianapolis, Ind.
Jest-a-Mere, St. Louis, Mo.
Kettler, West Palm Beach, Fla.
Rivoli, Baltimore, Md.
Howard, Atlanta, Ga.
Visalia, Visalia, Cal.
Metropolitan, Washington, D. C.
Riviera, Chicago, Ill.
Stratford, Chicago, Ill.

L. J. WING MFG. CO.

Manufacturers of Exhausters, Fans and Heaters

TELEPHONE
CHELSEA 0027-8-9-30

350-364 West 13th Street NEW YORK, N. Y.
BRANCH OFFICES IN PRINCIPAL CITIES

WORKS
NEWARK, N. J.

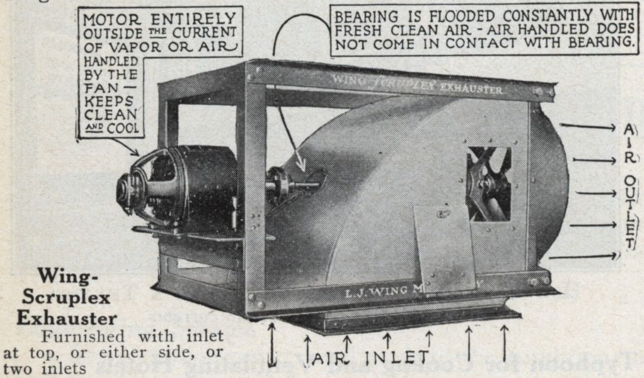
Products

WING-SCRUPLEX PROPELLER FANS and EXHAUSTERS; WING FEATHERWEIGHT UNIT HEATERS; TYPE EM MOTOR DRIVEN BLOWERS.

Also Wing Turbine and Centrifugal Turbine Blowers, and Wing Steam Turbines.

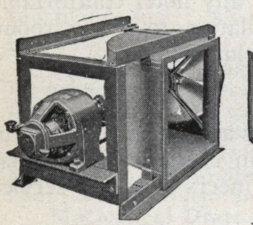
Wing-Scruplex Exhauster

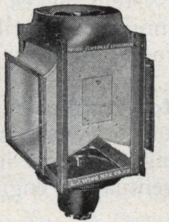
The Wing-Scruplex Exhauster consists of the highly efficient "screw-propeller" fan, combined with a casing of convenient design with the motor on the outside, where it will keep clean and cool and be easy of access. Because of these features, it is used for duct work where the resistance is low, instead of propeller fans with motors directly attached, where, heretofore, to obtain these features it has been necessary to use encased fans of the multivane type.

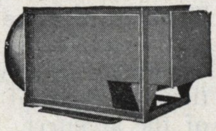

MOTOR ENTIRELY OUTSIDE THE CURRENT OF VAPOR OR AIR
HANDLED BY THE FAN — KEEPS CLEAN AND COOL
BEARING IS FLOODED CONSTANTLY WITH FRESH CLEAN AIR - AIR HANDLED DOES NOT COME IN CONTACT WITH BEARING.
WING SCRUPLEX EXHAUSTER
L. J. WING M
AIR OUTLET
AIR INLET

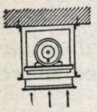
Wing-Scruplex Exhauster
Furnished with inlet at top, or either side, or two inlets

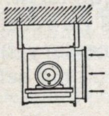
Being designed in the form of an elbow, it fits very well into any run of duct. Its rectangular frame greatly simplifies installation as can be seen.

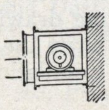

Right Side Inlet

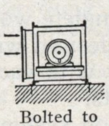

Vertical Double Inlet

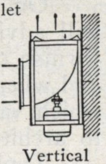

Weatherproof Bottom Inlet


Bolted Directly to Ceiling


Hung from Ceiling


Bolted Directly to Side Wall


Bolted to Floor or Foundation

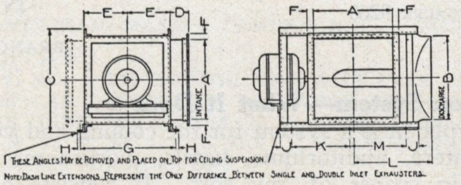

Vertical Bolted to Side Wall

Wing-Scruplex Exhausters

Size	Inlet square, in.	Out-let round, in.	Speed, r. p.m.	Free air		.15 in.		.25 in.		.40 in.		.50 in.	
				C. f.m.	Hp.	C. f.m.	Hp.	C. f.m.	Hp.	C. f.m.	Hp.	C. f.m.	Hp.
1-A	10	10½	1750	850	.052	630	.054	330	.060				
2-A	13½	14⅛	1150	1440	.060	950	.069	395	.090				
2-B	13½	14⅛	1750	2050	.195	1895	.208	1695	.216	1155	.248	750	.285
3-S	16¾	17⅜	850	2130	.090	1250	.110						
3-A	16¾	17⅜	1150	2700	.180	2150	.195	1550	.221				
3-C	16¾	17⅜	1750	4000	.600	3720	.635	3510	.655	3150	.700	2810	.720
4-S	21	21¾	850	2850	.100	2200	.125	1610	.150				
4-A	21	21¾	1150	3575	.170	3150	.200	2775	.220	1950	.245	1550	.280
4-C	21	21¾	1750	5400	.540	5160	.600	4990	.650	4670	.710	4440	.750
5-A	25	25	1150	5200	.330	4720	.380	4250	.440	3300	.530	2610	.600
5-B	25	25	1750	8000	1.330	7740	1.360	7540	1.400	7175	1.480	6900	1.540
6-A	30	30	600	5500	.210	3725	.250	2375	.330				
6-B	30	30	850	7400	.550	6280	.600	5450	.740	4000	.830	3400	.960
6-C	30	30	1150	10250	1.500	9520	1.550	8950	1.570	8000	1.620	7340	1.760

Where particularly quiet operation is desired, as in offices, residences, hospital wards, churches, laboratories, etc., use lowest speeds in all sizes. For toilet rooms, laboratories, motion picture booths, stockrooms, etc., use any speed in sizes 1 and 2; low and medium speeds in all other sizes. In industrial plants, hotel and restaurant kitchens, engine rooms, workshops, etc., use any speed.

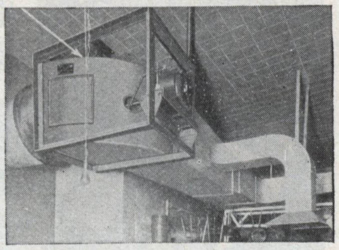
Complete table for pressures up to 1-in. static sent on request.


E
E
D
F
F
A
F
C
A
INTAKE
H
G
H
B
DISCHARGE
J
K
M
J
L
These Angles May be Removed and Placed on Top for Ceiling Suspension
Note: Dash Line Extensions Represent the Only Difference Between Single and Double Inlet Exhausters

Dimension Diagram of Wing Exhauster

Diagram shows side inlet exhausters. Top and bottom dimensions are the same. The side elevation shown, becoming a plan view of top inlet type

Size	Intake	Dch.	Dimensions of Single or Double Side Inlet Exhausters									
	A&A	B	C	D	E	F	G	H	J	K	L	M
1-A	10"	10½"	14⅜"	2⅝"	5½"	1"	13"	¾"	1½"	7½"	12⅞"	10½"
2-A	13½"	14⅛"	17¾"	2⅞"	7⅛"	1"	16⅜"	¾"	1½"	9½"	15"	12½"
2-B	13½"	14⅛"	17¾"	2⅞"	7⅛"	1"	16⅜"	¾"	1½"	9½"	15"	12½"
3-A&S	16¾"	17⅜"	22¼"	2¾"	8¾"	1"	20¼"	1"	1½"	11¼"	18"	14¼"
3-C	16¾"	17⅜"	22¼"	2¾"	8¾"	1"	20¼"	1"	1½"	12¼"	18"	15¼"
4-A&S	21"	21¾"	26½"	2¾"	11"	1"	24½"	1"	1½"	13"	19½"	16"
4-C	21"	21¾"	26½"	2¾"	11"	1"	24½"	1"	1½"	15"	19½"	18"
5-A	25"	25"	30"	3"	15"	1¼"	28"	1"	1½"	17½"	28"	20½"
5-B	25"	25"	30"	3"	15"	1¼"	28"	1"	1½"	17½"	28"	20½"
6-A	30"	30"	40"	3¼"	17¾"	1¼"	37¾"	1⅛"	1½"	21½"	31"	24½"
6-B	30"	30"	40"	3¼"	17¾"	1¼"	37¾"	1⅛"	1½"	21½"	31"	24½"
6-C	30"	30"	40"	3¼"	17¾"	1¼"	37¾"	1⅛"	1½"	21½"	31"	24½"

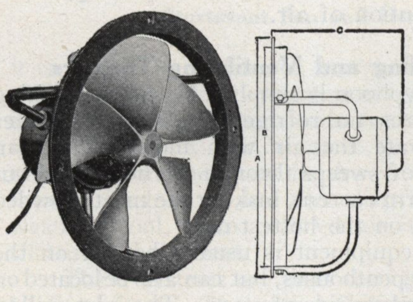


A Typical Wing-Scruplex Exhauster Installation in a Kitchen

Wing-Scruplex Fans

The true screw design moves all the air in straight and parallel lines. Absence of eddy currents contribute to low current consumption. Generously proportioned, totally enclosed motors require no artificial ventilation, and accessibility insures long life with minimum of attention.

Also furnished for pulley or turbine drive.



DIMENSIONS OF "WING-SCRUPLEX" FANS (IN INCHES)

Size, in.	A	B	C
10	12½	10	10⅝
13	16	13	12
17	20	17	13¾
22	24½	22	13¾
25	29⅜	25	15
30	34½	30	18⅝
36	41½	36	20½
42	46½	42	28
48	53	48	29
54	59	54	33
60	66	60	39

SIZES AND CAPACITIES OF "WING-SCRUPLEX" FAN

Size, in.	Speed, r.p.m.	Free air capacity, c.f.m.	Motor, h.p.	Size, in.	Speed, r.p.m.	Free air capacity, c.f.m.	Motor, h.p.
10 H-18	1750	950	1/20	30 L- 9	850	6000	¼
10 H-20	*2000	1100	1/10	30 L-95	950	6300	3/10
13 L-18	1750	1400	1/10	30 H-60	600	7000	⅓
13 H-12	1150	1550	⅛	30 H-70	700	7600	4/10
13 H-15	*1500	2080	⅙	36 L-60	600	8000	⅓
13 H-18	1750	2400	¼	36 L-70	700	8800	4/10
17 L-15	*1500	2700	⅙	36 H-60	600	11000	6/10
17 L-12	1150	2100	⅛	42 L-60	600	12700	6/10
17 H-12	1150	3150	¼	42 H-45	450	14700	¾
17 H-18	1750	4800	¾	42 H-50	500	14700	¾
22 H- 9	850	3450	⅙	48 L-45	450	17500	¾
22 H-12	1150	4150	¼	48 L-50	500	17500	¾
22 H-18	1750	6300	¾	48 H-45	450	19500	1
25 H- 9	850	4500	¼	54 L-45	450	21000	1
25 H-10	1000	5200	3/10	54 H-45	450	24000	1¼
25 H-12	1150	6000	½	60 L-45	450	26000	1¼
25 H-18	1750	9100	1½	60 H-40	400	33000	2

Table of capacities at various static pressures on request.

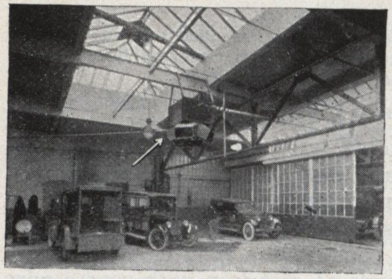
Note: The 13, 17, 22 and 25-in. sizes in speeds above 1150 r.p.m. are designed for industrial plants and locations where a little noise is not objectionable. All other speeds given are "quiet speeds."

*D-c. only—all other a-c. and d-c.

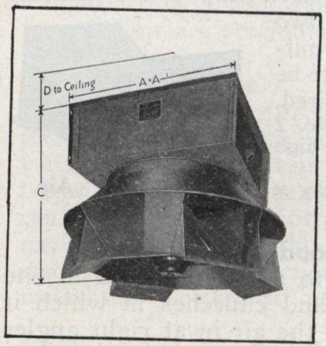
Continued on next page

Wing Featherweight Unit Heaters

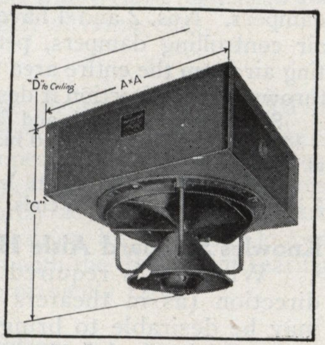
The outstanding features of Wing Featherweight unit heaters are their extreme light weight (about one-tenth that of the old style) and small dimensions, combined with the fact that driving motors are direct connected, no belts, and are out of the path of heated air.


A Difficult Garage Problem Solved

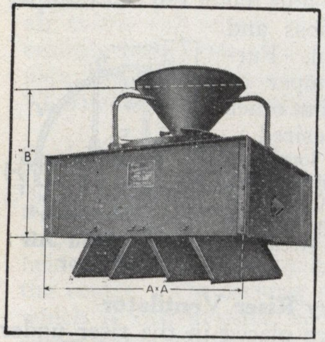
These features open a much broader field of application for this system of heating — in effect, the hot blast system which is generally accepted by engineers and architects as the best system for industrial plants and other buildings of large open areas such as garages, armories, etc.



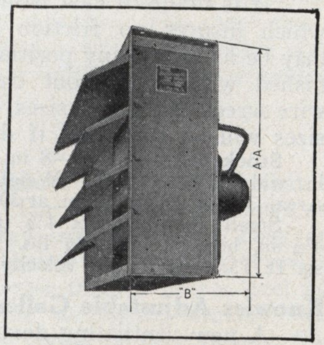
Low Ceiling Type



Medium Ceiling Type



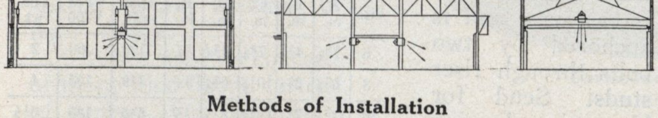
High Ceiling Type



Horizontal Type

CONDENSED TABLE OF ENGINEERING DATA

Unit size	AxA, in.	B, in.	C, in.	D, in.	Air, c.f.m.	Motor, hp.	Temperature		B.t.u. per hr. available	Approx. ship. wt., lb.
							Room	Leav.		
13-4-12	19¾	25	25	6	1150	⅛	65	113	67,000	185
17-3-12	22¾	27½	27½	6	1950	⅓	65	113	92,500	212
22-3-12	27¾	27¼	27¼	6	3200	⅓	65	115	157,000	270
22-4-12	27¾	27¼	27¼	6	2800	⅓	65	125	162,600	280
22-5-12	27¾	27¼	27¼	6	2600	⅓	65	135	173,200	288
25-4-12	32¾	28¾	28¾	7	4800	½	65	125	279,000	320
25-5-12	32¾	28¾	28¾	7	4500	½	65	135	300,000	332
30-4-85	40⅛	37¼	37¼	8	6900	1	65	125	401,000	400
30-5-85	40⅛	37¼	37¼	8	6500	1	65	135	433,000	376
36-4-85	46⅛	39⅞	39⅞	8	9600	2	65	125	558,000	504
36-5-85	46⅛	39⅞	39⅞	8	9000	2	65	135	599,400	528

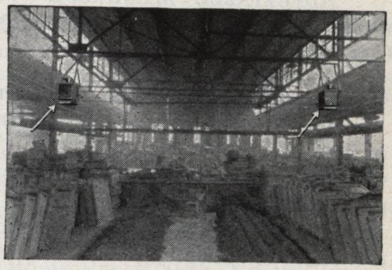

Methods of Installation

The above shows three different methods of installation, the units in each case being located well above the head line, out of the way. The third illustration shows the high ceiling type heater installed 30 ft. from the floor above a traveling crane. The column of heated air leaves the heater with sufficient velocity to strike the floor with considerable force from this point, but by the aid of adjustable diffusers the column is divided and directed so that no objectionable velocity is felt at the head line.

The best and most economical installation of Wing Featherweight unit heaters is when they are placed close to the roof or ceiling.

The Wing Featherweight unit heater employs a heating element of seamless copper tubing. The air passes through the tubes, and steam surrounds them, as contrasted with heavy weight iron pipe coils, in which the steam passes through the pipes and the air around the outside of the pipes. Attention is directed to the extremely light weight and small dimensions of the unit obtained by this construction (see tables).

The well-known Wing-Scruplex fan is employed to direct the air through the heating element and through the air outlets, since it must be delivered at sufficient velocity to reach the working level even from a great ceiling height. Motors on these fans are completely ball bearing in all of the vertical types.


Typical High Ceiling Type Heaters in a New Modern Foundry

The units are designed to require no attention from the beginning to the end of the heating season.

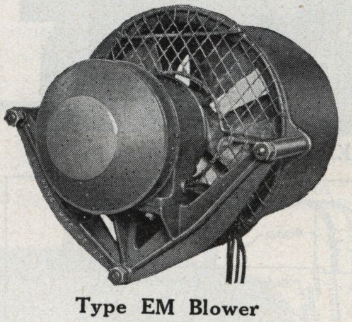
The features emphasized make possible suspending the units from ceiling or roof of any building, old or new, without necessitating additional strengthening of the structure; and the overhead installation makes it possible to run all steam and return lines overhead out of the way.

Wing Featherweight unit heaters heat the floor or working level first. Being placed near the roof or ceiling, they withdraw the heated air which tends to accumulate there and return it to the working level where it is needed. Considerable economy is effected by reducing the temperature directly under the roof where heat transmission is always the greatest.

Motor Driven Blower for Low Pressure Boilers

These Type E M Motor Driven Forced Draft Blowers similar in design to the Wing turbine blowers, offer a small, convenient unit for providing forced draft for low pressure boilers. Since the fan is mounted right on the motor shaft, there results a most simple outfit—merely a motor, in effect, with but two bearings to lubricate.

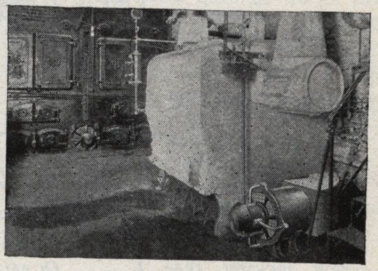
In the case of brickset boilers, Type E M blowers are cemented directly into the ash pit wall. With cast iron boilers, the blowers are usually mounted by feet to the floor, near the boiler, connecting by means of a short duct into the ash pit. The smaller sizes of blowers are often secured directly to the boiler base.


Type EM Blower

The lower illustration shows an installation in an apartment house. The blower in the background operates two return tubular heating boilers, while the blower in the foreground is connected with a short duct to a hot water supply heater.

Type E M blowers are made with specially designed enclosed motors, the covers enclosing the bearings as well as the motor proper. The blowers are furnished in either single phase, polyphase, or direct current, all three types with speed regulation; and in the polyphase type with squirrel cage motors and built-in dampers for air control. Since for most capacities E M blowers operate at 1750 r.p.m., they are pleasantly quiet in operation.

These blowers have been extensively used in schools, apartment houses, loft buildings, hotels, etc., not only providing the ability to burn the low priced anthracites—thereby effecting astonishing savings—but also giving a more rapid generation of steam, therefore assuring efficient heat in the early morning hours.


A Typical Installation

In soft coal localities, E M blowers permit of the combustion of low priced, low volatile coals, thereby eliminating the smoke question.

KNOWLES MUSHROOM VENTILATOR CO.

TELEPHONE
Walker 6967

202-204 Franklin Street
NEW YORK, N. Y.

Products

Adjustable Mushroom Ventilators; Camelback Air Diffusers; Aisle Hood Air Deflectors; Gallery Riser Ventilators.

Uses and Operation of Air Controlling Heads

For use in connection with mechanical systems of air purifying or ventilation, for controlling the distribution of the supply of fresh air or the exhaust of vitiated air.

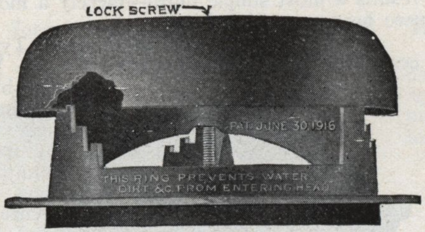
Particularly valuable in the ventilation of auditoriums of theaters, schools, public buildings and large rooms in manufacturing establishments.

Equally effective in up-draft or down-draft methods; the heads are usually located on the floor under seats and connected with the plenum chamber or ducts supplying tempered fresh air forced by a blower fan, or exhausting vitiated air by suction.

They are individually adjusted for their relative distances from the fan so that each will distribute an equal quantity of air, or so that the distributing is regulated for different parts of the room as desired.

Knowles "Notch" Mushroom

Construction—This air controlling head has three outer bearings and is absolutely rigid. Four recessed notches at each bearing point furnish sufficient adjustments. The head is positively locked in each position by tightening the head screw. It can not possibly collapse. There are no set-screws to become loosened. The cap is free from any dirt collecting depressions.

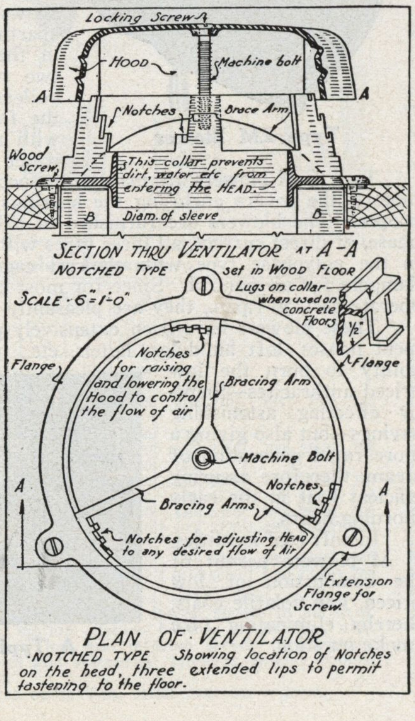

LOCK SCREW
PAT. JUNE 30 1916
THIS RING PREVENTS WATER DIRT &C FROM ENTERING HEAD

Knowles "Notch" Mushroom

Three extended lips from flange permit fastening to wood floor, or three drop L-shape lugs permit setting in concrete floor.

STOCK SIZES

Dia. at B-B	Area sq. ft.	C.f.m. at 300 vel.	Wt. lb.
4″	.087	27	2¾
5″	.136	42	3½
6″	.196	60	4¼
7″	.267	81	5¾
8″	.349	105	8½
10″	.545	165	12


Locking Screw-A
Hood
Machine bolt
A
Notches
Brace Arm
Wood Screw
This collar prevents dirt, water etc from entering the HEAD.
B
Diam. of sleeve
B
SECTION THRU VENTILATOR AT A-A
NOTCHED TYPE set in WOOD FLOOR
SCALE - 6"=1'-0"
Lugs on collar when used on concrete Floors
½"
Flange
Flange
Notches for raising and lowering the Hood to control the flow of air
Bracing Arm
Machine Bolt
Notches
Bracing Arms
A
A
Notches for adjusting Head to any desired flow of Air
Extension Flange for Screw
PLAN OF VENTILATOR
NOTCHED TYPE Showing location of Notches on the head, three extended lips to permit fastening to the floor.

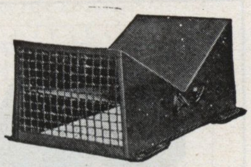
Specification Data—*For Concrete Floors*—Furnish and place 6-in. cast iron mushroom air diffusers with recessed notches for permanent adjustment of mushroom caps at any desired opening; to have center screw locking feature, and L-shape lugs as manufactured by Knowles Mushroom Ventilator Co. Provide for each opening No. 20 galvanized iron sleeve extending through concrete floor; to be set when slab is laid. (See booklet, page 6.)

Knowles "Camelback" Air Diffuser

A device constructed with two-way air delivery at the ends, permitting discharge of the maximum volume of air with minimum number of diffusers, thereby requiring less duct work, saving a great expense in masonry. Its construction reduces friction loss to a minimum. It is made of cast iron with coarse wire screens over the ends. Nos. 1 and 3 are without dampers. Nos. 2 and 4 have two air controlling dampers, permitting air from the entire area to be thrown in one direction if desired.

Stock Sizes—No. 1 and No. 2—14 in. long x 7 in. wide x 6 in. high at ends.

No. 3 and No. 4—14 in. long x 7 in. wide x 5 in. high at ends.



"Camelback" Air Diffuser

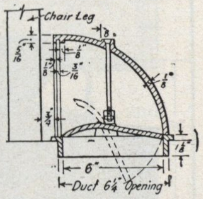
Knowles Standard Aisle Hood Air Deflector

Where it is required to admit fresh air in one direction (as in theaters and churches in which it may be desirable to bring the air in at right angles to the aisle) this deflector gives positive results.

It is made of cast iron and has a curved damper which insures no friction loss and may be locked in any position. Furnished with or without damper or wire screen and in two sizes, but other sizes will be furnished if desired.

Stock Sizes—Large—8 in. long x 6 in. wide x 6 in. high. Weight, 13 lbs. Area, .333 sq. ft. 100 c.f.m. at 300 velocity.

Small—8 in. long x 4½ in. wide x 4½ in. high, weight 9½ lbs. Area, .25 sq. ft. 75 c.f.m. at 300 velocity.

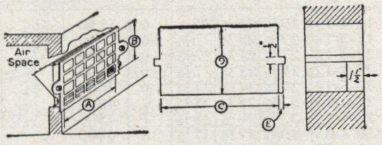

Chair Leg
6"
Duct 6¼" Opening

Aisle Hood Air Deflector

Knowles Adjustable Gallery Riser Ventilator

A new ventilating device placed in the riser under seats in the balconies of theater, church and school auditorium. The unit is built small to provide a uniform distribution of fresh air without draughts. The areas of these ventilators are equal to the 6-in. 8-in. 10-in. and 12-in. Mushroom ventilators.

The damper controlling the supply of air is adjustable at any angle and is held in place by a simple locking device on the damper rod. Can not be tampered with. The ventilator is cast iron and is anchored by two bolts through riser studs. Send for blue print showing details.


Air Space
A
B
C
D
E
1½"

Section Showing ventilator   Elevation Section Hole in riser for vent

Gallery Riser Ventilator

Size	A, in.	B, in.	C, in.	D, in.	E, in.	Area, sq.ft.	CFM V300	Lbs. wt.
6	7$\frac{5}{16}$	4⅞	7¾	4¾	¼	.196	60	2
8	9⅞	6⅜	10¼	6¾	¼	.349	105	4
10	11⅞	7⅝	12⅜	8⅛	½	.545	165	6½
12	16⅜	10¾	17	11⅞	½	.785	235	9½

Other Types

The following types can also be furnished:
Single damper air diffuser
Double damper air diffuser.
"Lever Lock" (center screw revolving type).
See booklet for details.

VENTILATING PRODUCTS CO.

Manufacturers and Distributers

2451 Cottage Grove Avenue
CHICAGO, ILL.

TURTLEBACK

TRADE-MARK

"Turtleback" Air Diffusers

The "Turtleback" is an improved adjustable floor ventilator of the mushroom type, used wherever a uniformly diffused air supply at the floor line is desired. "Turtlebacks" are specially recommended in connection with the indirect method of heating and ventilating theaters, schools, churches, auditoriums and large workrooms where close regulation and free air flow are preeminently advantageous.

Adjustable Feature

Close regulation of the air supply is provided by three supporting webs, which are graduated to $\frac{1}{16}$-in. variations in the height of opening. (See cut-away view below.) By turning the cap, the height and outflow area can be instantly and accurately adjusted. After adjustment, the cap is held in position by a central locking screw which, in conjunction with the three-point bearing, makes the "Turtleback" permanently rigid.

Unobstructed Air Distribution

Each size of "Turtleback" is designed to distribute air to the full supply pipe capacity. The outer rim is entirely free from obstructions, which guarantees complete uniformity of air distribution. The operation of "Turtlebacks" is noiseless.

Design and Materials

The design of "Turtlebacks" throughout is that of a strictly quality product. The cap and floor flange are smooth, selected, tough gray iron castings. They are held rigidly together by a heavy steel locking screw at the center. The locking screw threads into a steel nut which is cast-in-place in the supporting bracket. An ample water stop is provided above the floor flange. The finish throughout is the highest grade of baked gloss black.

Installation

"Turtlebacks" are readily installed. An accurately sized collar fits snugly into the air supply pipe, and a floor flange rests evenly upon the finished floor. Attachment to the finished floor is made by three flat head screws through holes in three lugs spaced equally around the floor flange.

When used on concrete or monolithic floors, instead of screws, flat head bolts and lead expansion shells—such as are customarily used for attaching theater seats—have been found to furnish the most practical and serviceable method of attachment.

Use and Location of "Turtlebacks"

"Turtlebacks" are widely used with the duct or plenum chamber system of indirect heating and ventilation. They serve as inlets for the fresh air, whether cold or tempered, but when connected to suction fans will serve equally well to exhaust the vitiated air at the floor line. A favorite plan with architects and heating and ventilating engineers is to arrange duct systems so as to use the "Turtlebacks" as inlets in summer and as outlets in winter.

"Turtlebacks" should preferably be placed under seats, desks, pews or other fixed furniture, where they take up no floor space. The upward system of indirect heating requires a wide distribution of the air. This is most effectively served by "Turtleback" air diffusers and the most favored disposition in theaters is to place a "Turtleback" under alternate seats.

During the heating season the air supply, before passing through the "Turtlebacks" should be suitably tempered. Supply pipe air velocities under 150 ft. per minute are recommended.

Specification

Furnish and install, where indicated on drawings or as hereinafter specified, 6-in. [8-in.] [10-in.] [8x12-in. oval] "Turtleback" Air Diffusers with close regulation by finely graduated supporting webs, as manufactured by Ventilating Products Co., Chicago, Ill.

On finished wood floors, attach by means of flat head wood screws not smaller than ⅞ in. by No. 10.

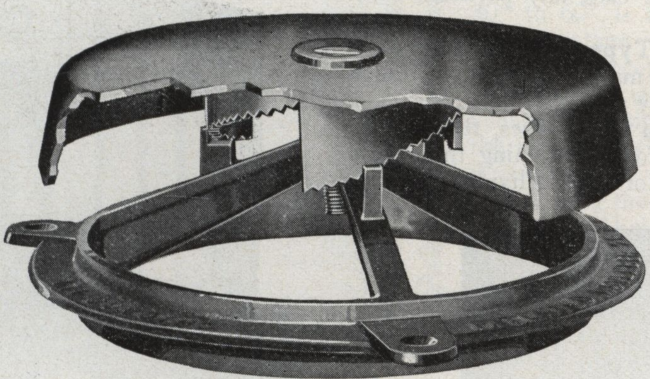
On cement or monolithic finished floors, attach by means of flat head bolts not less than $\frac{3}{16}$x1 in. in size, in approved lead expansion shells fitted into holes neatly drilled in floor to template locations.

Provide under each air diffuser one No. 20 gauge galvanized iron sleeve, to be set by heating contractor in conjunction with the general contractor at the time the floor is laid.

In concrete floors when sleeves are located on forms fill sleeves with sand before concrete is placed, to prevent distortion of sleeves.

Service

Our engineering service department is at the command of architects upon request. Mail inquiry for bulletins, service data and advice covering special or unusual applications and installations. Ask for the address of our nearest representative.



"Turtleback" Air Diffuser

Patented Nov. 28, 1922

PROMPT DELIVERY FROM STOCK OF SIZES LISTED BELOW

Pipe size, in.	Cap diameter, in.	Max. height (raised), in.	Min. height, (lowered), in.	Weight, lb.	Pipe area, sq. ft.	*Capacity in c. f. m. at velocity of		
						150 f. p.m.	125 f. p. m.	100 f. p. m.
6	7	2⅞	1⅞	4¾	.196	30	25	20
8	9	3½	2¼	7½	.349	52	43	35
10	11½	3⅞	2¾	10	.545	82	68	55
8x 12 oval	9½ x 13½	4	2¾	12	.571	86	71	58

*Capacities given are equal to full supply pipe capacities. The amply proportioned design of the "Turtlebacks" allows unequalled free air flow throughout an unusually wide range of adjustment.

ATMOSPHERIC CONDITIONING CORPORATION

443 Chestnut Street
PHILADELPHIA, PA.

CHICAGO, ILL., 1030 Monadnock Block
NEW YORK, N. Y., 623 Singer Building

Representatives in the Principal Cities of the United States, Dominion of Canada and in London, England

Products

Air Washers for Cleansing or Cooling Air for the ventilation of public buildings.

Air Conditioning Apparatus for Humidifying, Dehumidifying, Cooling, Drying and for Automatic Control of Air Conditions in industrial plants; Spray Nozzles.

Also Generator and Transformer Ventilation.

Webster Air Washers

Efficiency—Webster air washers and air conditioning apparatus have been on the market since 1907, and have been installed in hundreds of buildings throughout the United States and Canada.

They are suitable for practically every type of building for cleansing and cooling the air for the comfort of the occupants, or to maintain high effiiciency among employees or students.

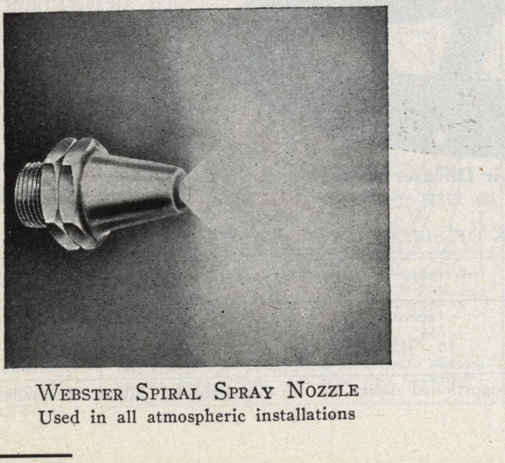
From 95% to 98% of all foreign matter is effectively removed from the incoming air, and after the passing air has been brought into intimate contact with the finely atomized water, it passes the eliminators free of all entrained moisture.

The Webster spiral spray nozzle is generally recognized for its high efficiency; it is simple in construction and less liable to clog than any other nozzle on the market.

In the process of recirculating the spray water, the water is drawn through a double brass box strainer with an area twenty times that of the suction pipe, and openings of such size as to hold back any particles which might clog the nozzle.

Sizes, Capacities and Types—Webster air washers for public building use are made in many sizes, dimensions and capacities to suit any requirements.

They are constructed in three types, the Webster Type "A," "B," and "C," for maintaining the various degrees of cooling required for each individual problem.



Webster Spiral Spray Nozzle
Used in all atmospheric installations

AIR CONDITIONING
TRADE MARK

All three types are based upon the recirculation of the spray water.

Webster Type "A" Air Washer

This type is made with one bank of sprays in addition to flooding nozzles, has an over-all length of 7 ft. and is guaranteed to cool the passing air 70% of the wet bulb depression.

Webster Type "B" Air Washer

This type is made with two banks of sprays in addition to the flooding nozzles, has an over-all length of 9 ft. and the water volume is such as to cool the passing air to the saturation point.

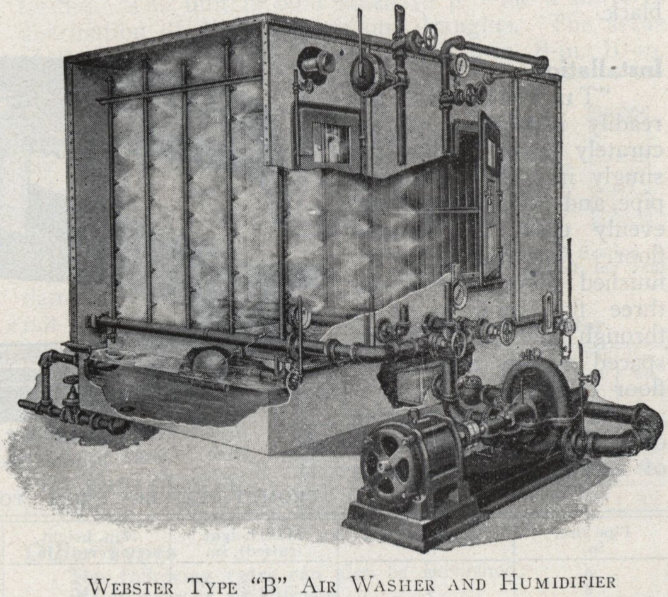
Webster Type "C" Air Washer

This type has but one bank of sprays in addition to the flooding nozzles, has an over-all length of 4 ft. 10 in. and, while primarily for cleansing, has a cooling effect of 60% of the wet bulb depression.

Webster System of Humidity Control

Suitable to any of the three types of air washers.

By this system we can guarantee to maintain the temperature of the passing air within 1° F. and the relative humidity within 2% of the point for which control is set.



Webster Type "B" Air Washer and Humidifier

The highly efficient spray nozzles in operation. Note the eliminators for removing free moisture from passing air, the strainer on suction pipe, and the steam and water mixers in tank.

Water temperature regulator and diaphragm valve forming part of the automatic control system are also indicated

Continued on next page

Atmospheric Conditioning Apparatus for Industrial Plants

The Atmospheric Conditioning Corporation is equipped to design, manufacture and install apparatus for maintaining artificial atmospheric conditions in industrial plants.

Such apparatus becomes essential where it is desired to safeguard the health and increase the efficiency of employees by maintaining normal temperature, removing all dangerous dust particles, fumes, etc., or to protect food products, delicate fabrics, sensitive photographic materials or films, paints, enamels and all goods which undergo deterioration through injurious contact with atmospheric impurities.

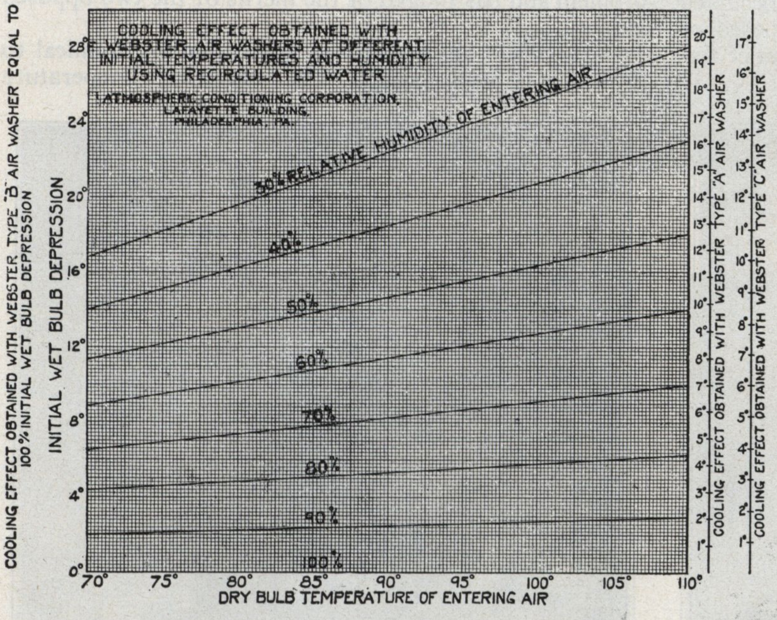
The nature of each problem dictates the type and construction of equipment to be installed.

The introduction of moisture and the maintenance of the proper relative humidity are often essential to the perfect working of certain products, and with a Webster humidifier, ideal conditions can be maintained day in and day out, the year around.

Where excessive humidity conditions are dangerous to the success of a given process or objectionable in packing or storage rooms, the Webster dehumidifier will be found equal to any climatic variation.

Webster system of automatic humidity control may be applied to the various types of Webster air washers, humidifiers and dehumidifiers. Perfect in principle and accurate in operation—the chief controlling thermostat subject to water, a medium with four times the specific heat of air.

Humidifiers—The Webster humidifier is designed for use in connection with industrial plants, such as textile mills, where it is essential to the success and economy of production to add moisture to the air entering through the ventilating system and maintain automatically a uniform relative humidity.



Cooling Chart

The above chart shows cooling effected by the recirculation of spray water in the Webster types A, B and C Air Washers.

Where artesian well water is available at proper temperature, or where refrigeration is resorted to for cooling the spray water, and where brine is the spraying medium, a much better cooling can be effected

Among the advantages gained by the use of the Webster humidifying system, may be mentioned:

(1) Central location and control of entire humidifying plant.

(2) Uniform humidity obtainable without the application of direct spray in rooms.

(3) Humidity may be maintained automatically at any desired point.

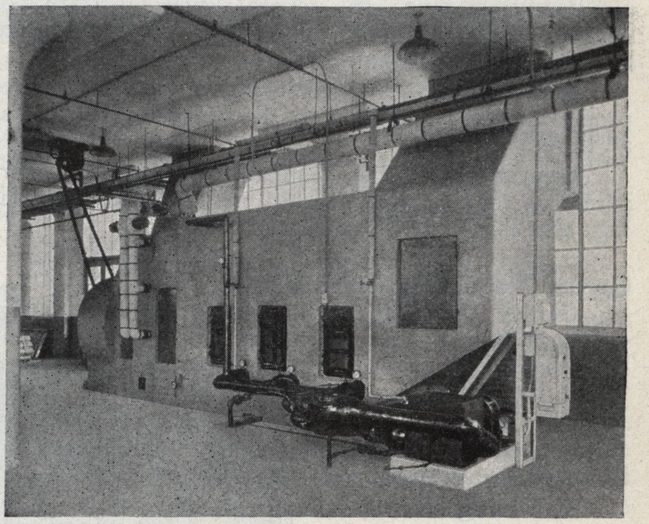
(4) Entering air freed from dust and dirt by washing.

(5) Lowering of temperature in summer by evaporation, using recirculated water in humidifier.

(6) Regain may be kept practically constant, assuring uniformity of product.

(7) Elimination of static electricity.

(8) Ample ventilation without opening of windows.



Dehumidifier for Refrigeration

(9) Great economy may be effected during heating season by partial recirculation of air.

Dehumidifier—Various types of Webster dehumidifiers are constructed to meet individual conditions.

If well water at a temperature of from 50° to 60° is available in sufficient quantity, a single stage or multistage well water dehumidifier is recommended.

If well water is not available, an ingeniously designed dehumidifier embodying the use of mechanical refrigerating apparatus is used.

Among the advantages to be gained by the use of the Webster dehumidifying system, as compared with earlier methods of cooling and dehumidifying, are:

(1) Saving in power.

(2) Economy in space.

(3) More effective heat transfer.

(4) Elimination of frosting.

(5) Elimination of dirt and dust from air by washing.

(6) Greater accuracy of control possible.

(7) Automatic regulation can readily be secured by a simple scientific control system.

THEODORE R. N. GERDES, M. E.

Engineer and Manufacturer

105-107 Bank Street
NEW YORK, N. Y.

GERDES
METHOD
REGISTERED TRADE-MARK

Products

VENTILATING SYSTEMS.

Service

Engineering—Excepting for the solution of complex ventilating problems, no charge is made for engineering service.

Manufacturing—In general, we fabricate all parts at our shop. The best grade of material is used and skilled labor is employed.

Maintenance—Our maintenance service insures proper care and operation of the ventilating system at all times.

Guarantee—Gerdes Ventilation Systems are guaranteed as regards workmanship, material and functioning; that is, the result is guaranteed.

Gerdes Ventilating Systems

Gerdes Systems diffuse healthful and invigorating *unheated* fresh air without causing draft or chill. The method is further explained under the heading "Scientific Basis."

Air Filters—Dust, soot and smoke are separated from the air in its passage through processed fiber, which is renewed when necessary—usually about once a month.

Diffusing Nozzles—Gerdes swivel nozzles are designed to diffuse perfectly the *unheated* fresh air, and they allow the air streams to be deflected during the warm season to cause agitation in the air of the occupied zone. These nozzles can be installed along exposed or furred-in ducts, and can be placed in ceiling outlet fixtures of appropriate architectural design.

Electric Window Ventilators

Gerdes electric window ventilators are detached ventilating units complete with motor, air filter, air blower, Gerdes nozzle, and electrical control apparatus. These units are mounted on a panel for installation in a window, usually under the lower sash. Their operation is based on the underlying principles of the Gerdes Method of Ventilation, and they are backed by the Gerdes guarantee.

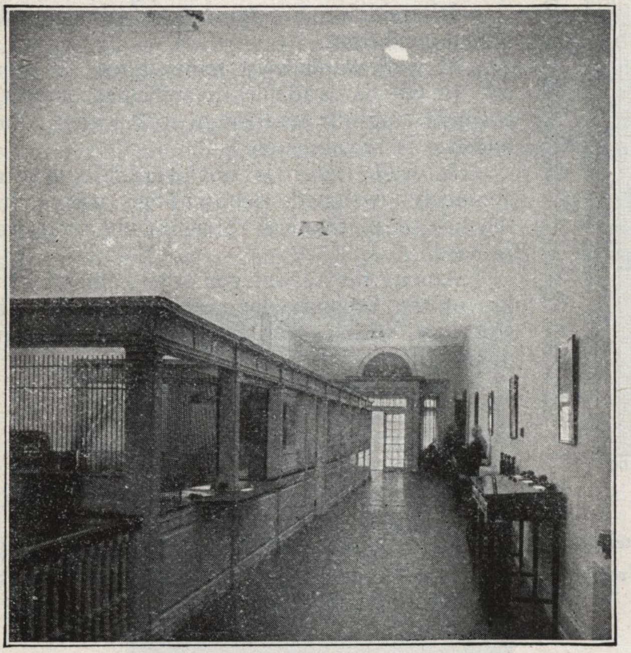
Heating

In general, direct heating, as installed according to good practice, serves its purpose even to better advantage if the space is also ventilated by the Gerdes Method. If a room can be maintained comfortably warm by its heating means when no cold air is being introduced, then diffusion of *unheated* fresh air by the Gerdes Method will increase the comfort of the occupants no matter how cold the outdoor air may be.

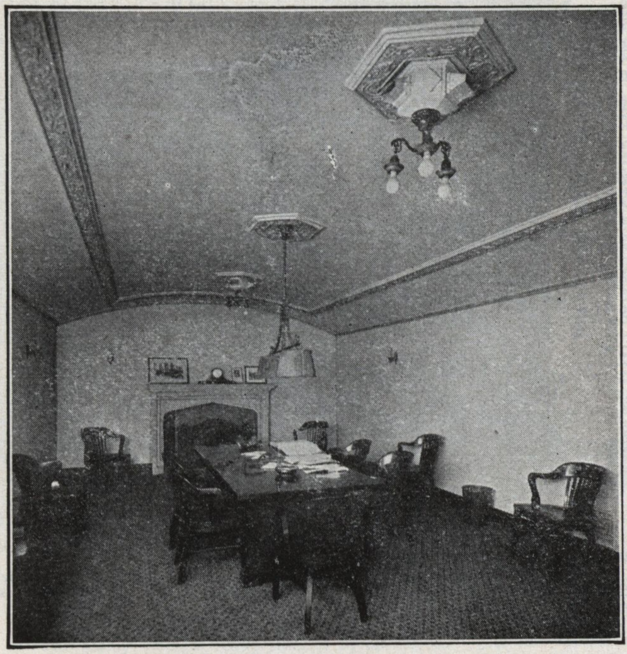
Scientific Basis

Architects should realize that there are two totally opposed and opposite methods of ventilation. The "cooked" air method is based on a science now recognized to be fallacious and the trend of ventilation engineering is towards the modern method which employs *unheated* fresh air. Clients are justified in assuming that the architect has given due thought to the ventilation problem and has judged of the merits of the two opposed systems.

"Cooked" air systems of ventilation are inimical to health and well being. The excessive temperature



Ceiling Outlets, Swivel Nozzles, Provident Trust Co., Philadelphia, Pa.
CARL A. ZIEGLER, Architect



Ceiling Outlets Combined with Lighting Fixtures, Federation Bank, New York, N. Y.
EUGENE A. OHMER COMPANY, INC., Builders

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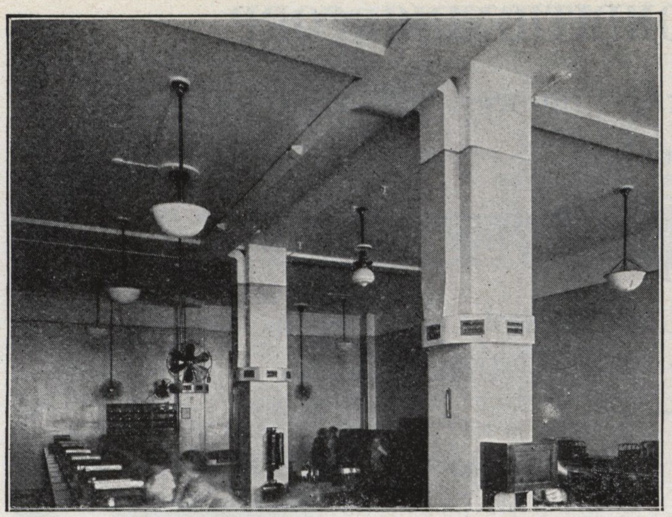


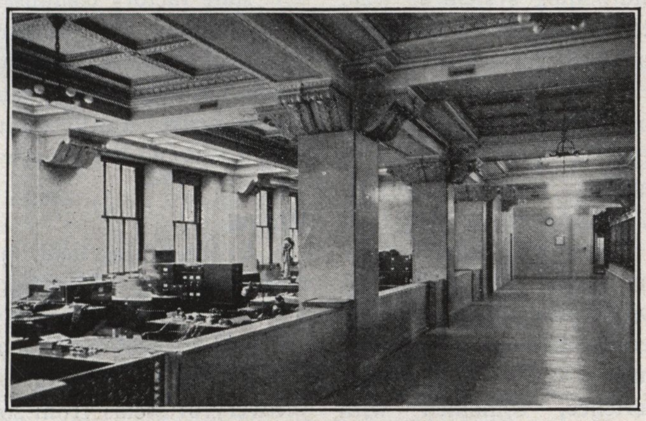
Swivel Nozzles in Ceiling Duct and Around Columns, New York Telephone Co., New York, N. Y.

Outlet Boxes on Columns, Boston Safe Deposit & Trust Co., Boston, Mass.

and the sterilized condition of the air, together with the drafts occasioned by the incoming air streams, are defects in the heated air method which are obviated by the use of the modern method. The Smithsonian Institution has stated that one-third of the deaths in the United States are due to poor ventilation and poor heating. This statement by the Government Scientific Authority should be carefully weighed by the architect before deciding which method of ventilation is to be used.

The Gerdes Method of Ventilation consists in the continuous diffusion of *unheated* fresh air into the over-warm stratum at the ceiling, and maintains in all parts of the room a pure and invigorating atmosphere of uniform temperature from floor to ceiling. The freshness of the air is clearly appreciable to the senses and the success of a building is not jeopardized by the discomfort of its occupants.

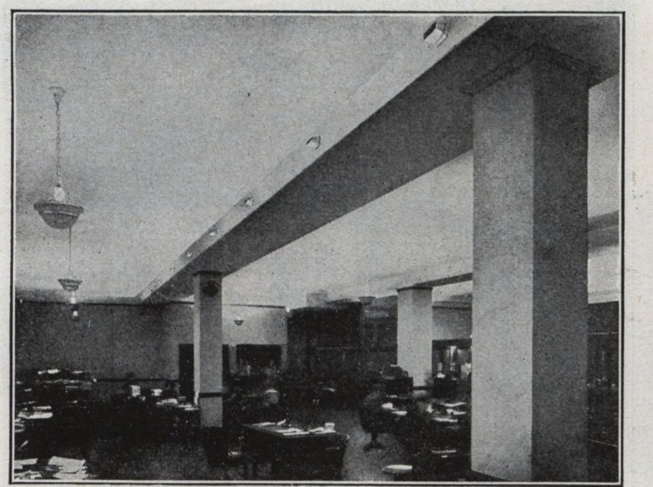
An investigation of the results obtained by the Gerdes Method will prove conclusively that this method is the true solution of the ventilation problem.



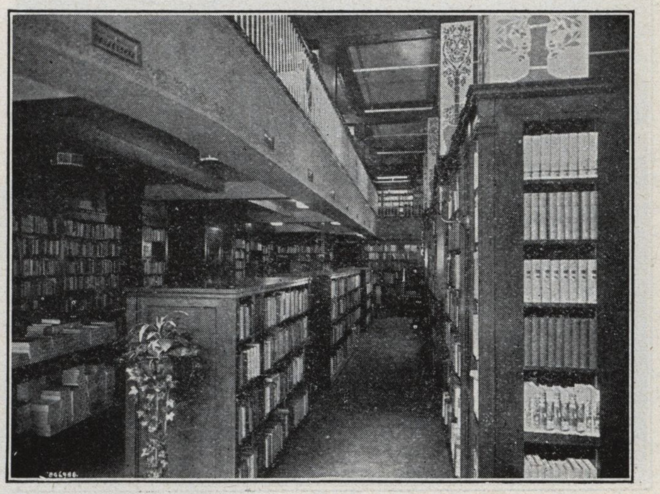
Distributing Duct in False Beam Swivel Nozzles, The Pennsylvania Co., Philadelphia, Pa.
Ritter & Shay, Architects

References

The names of architects, management engineers, banks and commercial firms to whom we can refer, will be given on application.



Furred-in Distributing Duct, Swivel Nozzles, International Acceptance Bank, New York, N. Y.
Walker & Gillette, Architects



Swivel Nozzles on Both Sides of Mezzanine Fascia, Brentano's, New York, N. Y.
Oswald C. Hering, Architect

COOLING & AIR CONDITIONING CORP.

Consulting and Contracting Industrial Engineers for Air Conditioning and Cooling

31 Union Square, West
NEW YORK, N. Y.

BRANCH OFFICES: BOSTON, MASS., CHICAGO, ILL., PITTSBURGH, PA., and ATLANTA, GA.
ALSO B. F. STURTEVANT CO., INC. OFFICES

Products

Air Conditioning and Cooling Systems.

Dryers.

Industrial and Process Piping.

Also Power Plant Piping and Recirculated Air Systems for new and old blast heating installations.

Air Conditioning System

General—There was a time when air conditioning was a luxury. The time has come, however, when modern building is demanding that the installation of a heating system be an air conditioning system as well. The comfort of tenants and the protection of merchandise demands the more modern and efficient equipment of today.

Fields of Use—Air conditioning for the school, the home, the apartment house, the office building, for places of public gatherings, such as museums, convention halls, railroad terminals, manufacturing plants, in fact, any building where the control and regulation of water vapor is essential to the comfort and welfare of the occupants; further, the conditioning of air in buildings housing perishable materials that are affected by moisture is of inestimable value.

Our engineering experience, combined with Sturtevant apparatus, has solved the problem of economical combination of moisture, heat and control.

Bulletins—A series of bulletins covering several fields of air conditioning are in print and copies will be sent on request. Each of these contains a full description of the apparatus and method, and outlines the information required for an estimation of cost.

Industrial and Process Piping

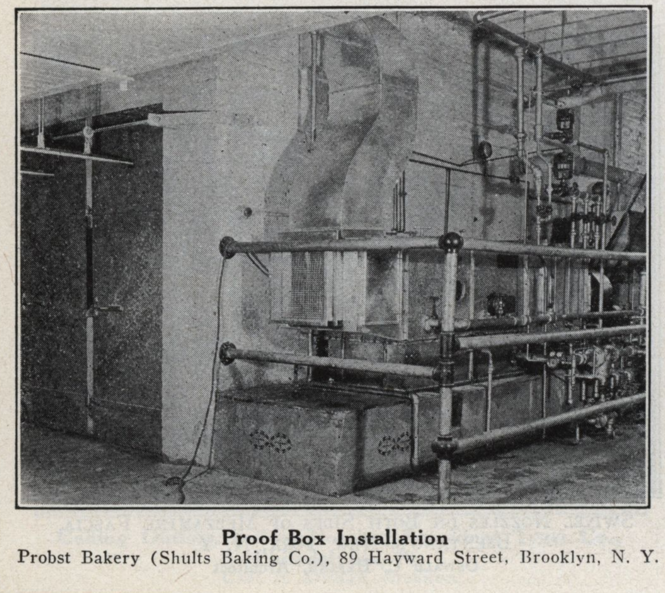
Vapor Removal—We were almost the first company to install modern vapor and fume removal systems. The state factory commissions of some of the principal states illustrate our installations as the best.

Low Pressure Dyeing—Our study of low pressure steam for dyeing has enabled many plants to generate power for practically nothing. Our dyehouse installations of piping are everywhere.

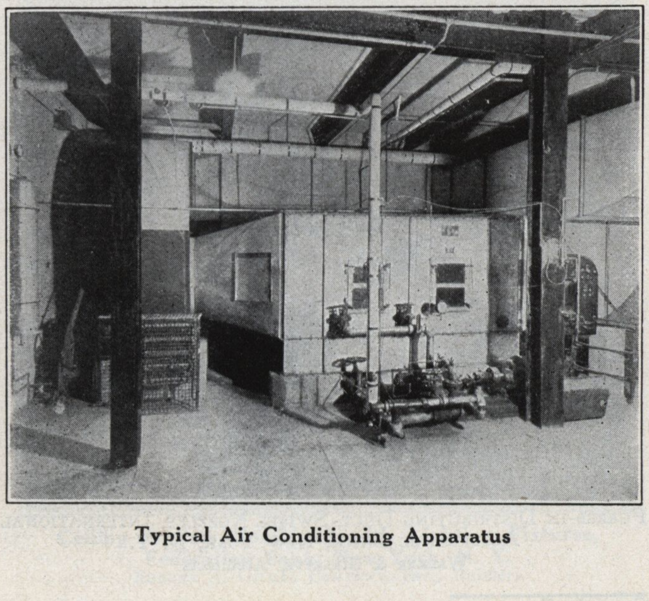
Drying

In the drying field, our "moist air" dryers revolutionized drying. This led to our spray dryer development, in which five years of research, experimentation and field installations have made us pre-eminent.

We would be glad to have your inquiries on the recovery of solids from solutions, suspensions or emulsions.



Proof Box Installation
Probst Bakery (Shults Baking Co.), 89 Hayward Street, Brooklyn, N. Y.



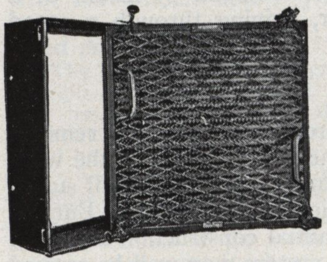
Typical Air Conditioning Apparatus

MIDWEST AIR FILTERS, INC.

GRAND CENTRAL TERMINAL BUILDING
100 East 45th Street, NEW YORK, N. Y.
MIDWEST AIR FILTERS PACIFIC, INC., 953 Monadnock Building, SAN FRANCISCO, CAL.
MIDWEST CANADA, LTD., 83 Craig Street West, MONTREAL, CANADA
BRANCHES IN PRINCIPAL CITIES

Midwest Unit Air Filters

Principle—Midwest Air Filters operate on the baffle impingement principle. Each filter cell (Fig. 1) contains a series of specially perforated and shaped filter sheets of steel, so designed that dusty air in passing through the cell is forced to change its direction many times. These sheets are coated with a viscous sticky fluid, "Viscosine." Dust particles are impinged against the sticky surfaces of the filter sheets at each change of direction of the air stream, where they are caught and held.


Midwest Filter Unit (Cell and Frame) New Model Type U2

At the back of each cell a secondary filtering effect is provided, consisting of a series of knitted mats of flat copper wire, also coated with Viscosine. Fine particles of dust which may pass by the filter sheets, are impinged and caught here.

Openings in the filter sheets and the spaces between them are so large as to prevent clogging, and provide for ample dust capacity. Cleaning is easily accomplished, since there is no obstruction to the free flow of washing water through the cell.

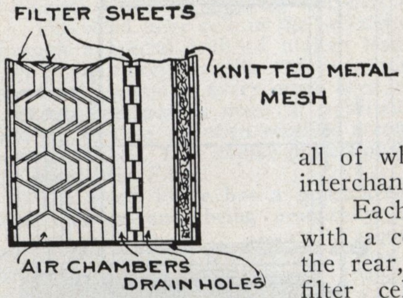


Fig. 1

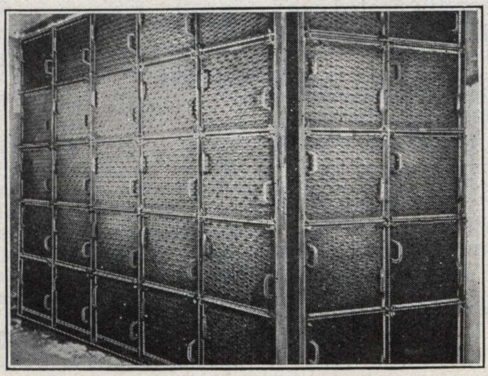
Special Features—Each filter unit consists of a frame and a cell, all of which are completely interchangeable.

Each frame is provided with a continuous flange in the rear, against which the filter cells are forced by thumbscrews set in removable plate clips which fit into slits at the four corners of the frame. Thus airtight joints are provided between all cells and frames (Fig. 2).

Each frame is further provided with projecting turned-over lips, at one side and at the bottom. These lips grip and interlock with the adjoining side and top of adjacent frames. The frames themselves are bolted together at the rear. In this way, a double air seal is formed on all frames, and an absolutely airtight installation assured (Fig. 3).

Installation—An installation consists of the proper number of units, assembled in an angle iron frame. Any limitations of space are easily and economically met.

Operation and Maintenance—There being no moving parts, practically no operating supervision is required. Maintenance consists in periodical cleaning and recharging of cells in Viscosine.


Typical Midwest Air Filter Installation

Cleaning is systematically carried out by removing the cell next to the one last cleaned, and replacing at once by a clean, charged reserve cell. The dirty cell is washed in hot water and soda in a special tank provided with the installation. It is then drained and allowed to dry. When dry it is dipped in Viscosine and set aside to drain, when it serves as the next reserve cell.

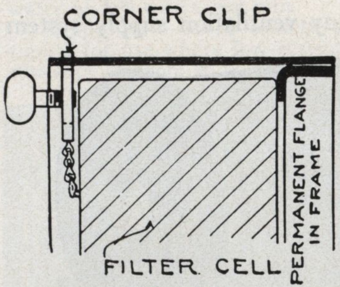


Fig. 2

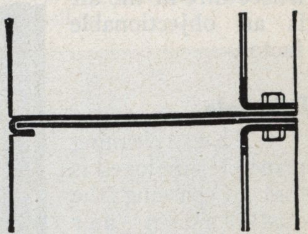


Fig. 3

The entire filter being constantly covered with Viscosine, does not corrode or rust. An installation is practically everlasting.

DATA AND SPECIFICATIONS

Size of unit (over all)	20x20x6½ in.
Size of cell	19½x19½x4 in.
Net weight of cell	28 lb.
Weight of unit	40 lb.
Capacity per cell	At ⅜-in. operating resistance, 800 cu. ft. per min.
Efficiency	Maximum dust content in cleaned air, under normal operating conditions will not exceed 0.05 grain of dust per 1000 cu. ft.
Resistance	Maintained at ⅜-in. water gauge by routine cleaning
Cleaning	Depends on dust conditions. In average installation, each cell is cleaned once every 6 to 8 weeks. Time required: 3 to 5 minutes per cell
Viscosine consumption	1 gal. per unit per year

Application—*General Ventilation*—Art galleries, museums, libraries, banks, office buildings, churches, auditoriums, theaters, telephone exchanges, hotels, hospitals, department stores, restaurants, clubs, schools and other buildings.

Industrial Plants—Protection of equipment against dust damage—such as turbo and hydro-electric generators, mill motors, air compressors, internal combustion engines, etc. Improving working conditions; saving heat by recirculation of cleaned air; improving quality of products; recovery of valuable dusts and other special purposes.

Other Types and Humidifiers

Special types of Midwest Air Filters, another special type, are purposes. These include Midwest Window Ventilators, self-contained units with fan, motor and filter for individual offices and smaller rooms. Midwest Range Filters, another special type, are used in hotels, restaurants, clubs, etc., to collect grease from kitchen ranges before it enters the flues.

Wherever required, we can furnish a unique and simple, automatically controlled humidifier free from the weaknesses of existing types.

NATIONAL AIR FILTER COMPANY

TELEPHONE
Franklin 4126

9 South Clinton Street
CHICAGO, ILL.

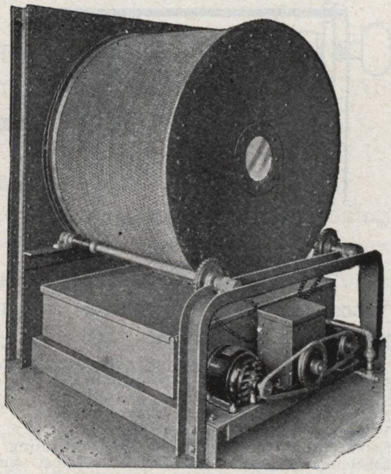
OFFICES FOR SALES AND SERVICE IN ALL PRINCIPAL CITIES

Products

The "National Rotary" Air Filter.

Applications

Designed for use in any ventilation supply system where dirt in the air is an objectionable factor.



National Rotary Air Filter

Principle

The cleaning principle employed is that of passing the dust laden air through a maze of metal surfaces coated with a viscous liquid, a method rapidly becoming accepted as the most satisfactory means of filtering air.

Advantages

The "National Rotary" not only provides a highly efficient filtering medium but makes the process of filtration continuous and automatic. This is made possible by requiring the liquid used to perform the double duty of washing off the dust as it accumulates and re-oiling the filtering medium for further service. The "human element" involved in the servicing of other types of filters is thus practically eliminated.

Uniform air flow and unchanging resistance are insured by the continuous feature of our process.

Construction and Operation

The filtering medium is a fabric composed of fine ribbons of solid copper woven into a mesh of close texture, and is wound around a cylindrical screen to the thickness required for efficient cleaning. A medium of uniform texture is thus secured that can not become displaced by usage. Being kept constantly coated with oil, it is practically impossible for dirt—even soot—to penetrate its mazes.

The air is drawn from the surrounding space through the filtering medium to the inside of the drum, and thence out through its open end in the direction of the fan. The joint between the movable neck of the drum and the stationary outlet head is provided with an effective felt seal.

The oil is sprayed across the inner surface of the drum at its lowest point by means of a distributing element, and flows through the filtering medium *counter current* to *the flow of air*.

In its circuit of travel the oil is passed through an oil cleaner, which retains all the accumulated dirt, so that the oil used in washing is always clean. This cleaner is simple in construction and can be installed in whatever location may be found most convenient.

The drum is kept in slow rotation by means of a fractional horsepower motor, driving through a speed reducing gear.

Maintenance

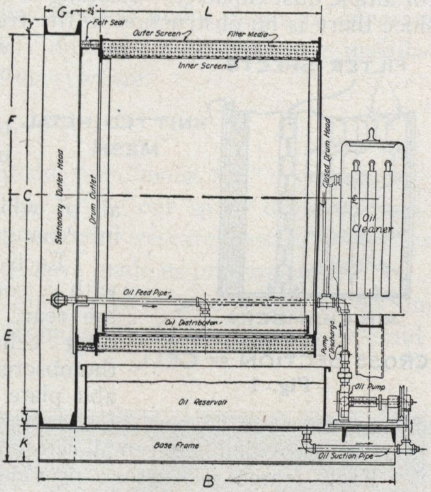
The only attention required is the periodical removal of the dirt from the oil cleaner, thus localizing the work to such extent that a few minutes each week will suffice to keep the system functioning perfectly. Further economy is assured by substantial construction and such simplicity of design that the system may well be termed "troubleproof."

Installation

The "National Rotary" may be located practically any place in the ventilating system. The use of preheating coils is optional, as the filter can be installed in any partitioned-off room, or even on the outside in a compartment protected from the weather. It comes to the job as a finished "machine," and the contractor's work is simply that of connecting our outlet head to the duct work of the system.

Abbreviated Specification Guide

"Furnish and install one 'National Rotary' Air Filter, having capacity of ——— c.f.m. Filter to be a complete unit ready for service, including oil cleaner, supply of oil, and all accessories furnished by manufacturer."



LONGITUDINAL SECTION

CAPACITIES AND DIMENSIONS

Total Resistance to Air Flow always less than 0.35″ Water Gauge.

Size No.	Capacity, c. f. m.	Approx. space required, in.		
		Length	Width	Height
24	4,000	48	48	60
30	6,000	54	54	60
36	9,000	60	60	66
42	12,000	64	72	72
48	16,000	72	78	80
54	20,000	76	84	86
60	25,000	82	90	96
66	30,000	86	100	102
72	36,000	92	108	108
78	42,000	98	114	120
84	50,000	106	126	126
90	56,000	112	136	132
96	64,000	116	148	138
108	80,000	130	164	150

Note: The above space dimensions are liberal, and allow room for access to apparatus and free flow of air to filter. Considerable variation is permissible to fit special space conditions.

REED AIR FILTER CO., INC.

Air Cleaning, Humidifying and Drying Apparatus

FACTORY AND ENGINEERING DEPARTMENTS
201 Central Avenue
LOUISVILLE, KY.

ENGINEERING AND SALES OFFICES

NEW YORK, N. Y.
BOSTON, MASS.
SPRINGFIELD, MASS.
PHILADELPHIA, PA.
BALTIMORE, MD.
ROCHESTER, N. Y.
BUFFALO, N. Y.
TROY, N. Y.
PITTSBURGH, PA.
CLEVELAND, OHIO
TOLEDO, OHIO
SEATTLE, WASH.
DETROIT, MICH.
CHICAGO, ILL.
MINNEAPOLIS, MINN.
ST. PAUL, MINN.
MILWAUKEE, WIS.
SAN FRANCISCO, CAL.
CINCINNATI, OHIO
KANSAS CITY, MO.
ST. LOUIS, MO.
DALLAS, TEX.
INDIANAPOLIS, IND.
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BIRMINGHAM, ALA.
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MEMPHIS, TENN.
CHARLOTTE, N. C.
PORTLAND, ORE.
WASHINGTON, D. C.
UTICA, N. Y.
COLUMBUS, OHIO
HOUSTON, TEX.

Reed Air filters ALL METAL

Products

The Reed Air Filter.

Also Dry Air Washers, Dust Collecting Systems, Air Compressor Filters, High Pressure Filters, Unit Humidifiers and Drying Apparatus.

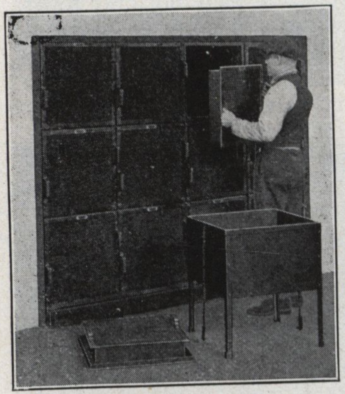
Reed Air Filter

The Reed Air Filter operates on the same fundamental principle as the human nostril. The air in passing through the filter impinges upon a finely divided filter media coated with "Adhesine," a special odorless, tasteless, non-volatile, adhesive liquid having a strong affinity for dust, dirt and, particularly, soot. As successive layers of dust are deposited and bound in the filter, additional "Adhesine" is supplied by capillary action from the minute droplets or reservoirs of the liquid held at the intersections of the media, thus binding and keeping the entire system moist for long periods.

The filtering media of split wire (similar to steel wool but of much coarser texture and made from special wire producing unusually long resilient segments) divides the air into innumerable fine streams and brings it into intimate contact with the adhesive coated surfaces to which the dust and dirt adhere. Because of its small cross section, the Reed filtering media offers minimum resistance to the air flow, at the same time presenting the maximum amount of adhesive coated surface for trapping the dust and dirt, thus securing a most desirable combination of high cleaning efficiency and low resistance.

The Reed filter cell, in the process of manufacture, passes through a special bath of molten lead alloy, in which each fibre of the filtering media receives a non-corrosive coating and is securely bound to every other fibre it touches, thus forming a permanent, porous mass of approximately 1500 sq. ft. of filtering surface. It then receives a coat of black enamel and is oven baked. This double protection insures the long life of the Reed Air Filter.

The Reed Filter has a guaranteed efficiency of 97% in dust removal and, being practically automatic in operation, requires no attention other than an occasional cleaning. When dirty, the cells are washed in hot water and washing soda, in tanks supplied for this purpose, recharged with "Adhesine" and put back into service.



Removing Cell for Cleaning

A Reed Air Filter Unit—Comprises a filter cell and its frame. Each unit has a rated capacity of 800 cu. ft. per min. and an installation consists of proper number of units bolted together to give desired capacity. The unit principle makes it possible to arrange filter to meet practically any space requirements.

Different Types of Reed Air Filters

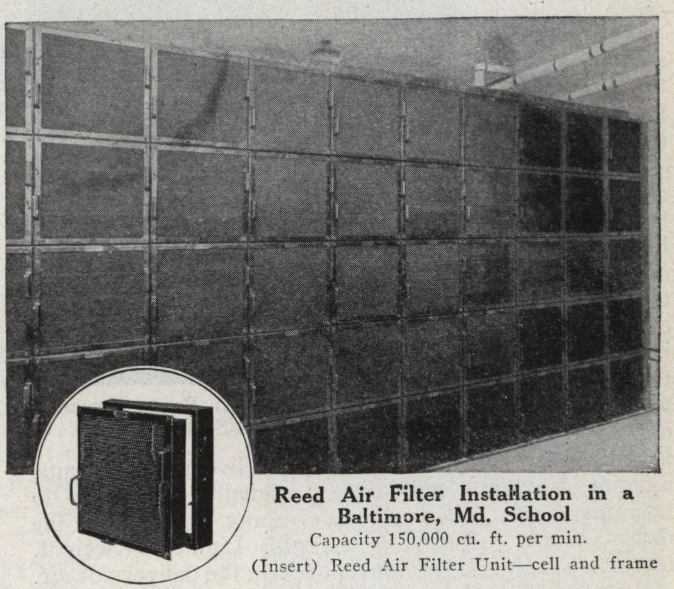
Another exclusive advantage of the Reed System is the ability to secure almost any degree of cleaning efficiency or resistance by varying the density of the filtering media.

To meet the different requirements usually found in ventilation problems the Reed Filter is made in three standard types—A, B and C—all identical in construction, but with different characteristics as to resistance and cleaning efficiency.

Type "A"—A tightly packed unit having a high cleaning efficiency and recommended for bacteria elimination and other applications where a high degree of air cleanliness is required.

Type "B"—The standard Reed Filter designed to secure the best balance of cleaning efficiency and resistance and recommended for general ventilation, electrical ventilation, air compressors, etc. A cleaning efficiency of 97% is guaranteed with a resistance of $\frac{3}{16}$-in. of water at 800 cu. ft. per min.

Type "C"—More loosely packed than the "B" and designed for use where low resistance is essential and a cleaning efficiency of from 90 to 95% is permissible.



Reed Air Filter Installation in a Baltimore, Md. School

Capacity 150,000 cu. ft. per min.

(Insert) Reed Air Filter Unit—cell and frame

Data and Specifications of Reed Air Filters

Size of filter, over all	20x20x4 in.
Effective opening	18x18 in. (2¼ sq. ft.)
Capacity of each unit	800 cu. ft. per min.
Efficiency of filter (Standard Type "B")	97%
Surface area of filter media	1500 sq. ft.
Linear velocity of air through filter	365 ft. per min.
Resistance of clean filter to flow of air	$\frac{3}{16}$-in. water gauge

Frequency of cleaning depends upon amount of solids to be removed from air. For the average city air, cleaning periods may be estimated roughly as once in 6 to 10 weeks. Time required for cleaning operation 5 to 8 min.

Weight of filter cell	20 lb.
Weight of cleaning tank	45 lb.
Weight of filter frame	10 lb.
Weight of "Adhesine" per gal.	7.5 lb.

Applications of the Reed Air Filter

For general ventilation work: schools, clubs, restaurants, department stores, varnishing, enameling and painting rooms, manufacturing plants, museums, etc.

For cooling turbo-generators, air blast transformers, etc. For air compressors, pneumatic tools, mining and manufacturing operations. For drying milk, gelatin, sensitized paper, photographic films, butter, eggs, fruits, starch, laundry work, cereals, glue, paper, paints, wool, yarn, sugar, chemicals, cotton, etc.

For bacteria control: photographic gelatin, glue, butter, milk, cheese, removing air bacteria, mould and other such minute fungi; hospital operating rooms and contagious wards. For recovery of valuable dusts: gold, silver, sugar, starch. For control of injurious dusts: lead dust, abrasives, chemicals, etc. For control of explosive dusts: flour, starch, aluminum, etc. For control of injurious gases: ammonia, chlorine, etc.

THE AMERICAN WARMING & VENTILATING CO.

Manufacturers of Sheet Metal Products for Public Buildings

MAIN OFFICE AND FACTORY
1017-1019 Summit Street
TOLEDO, OHIO

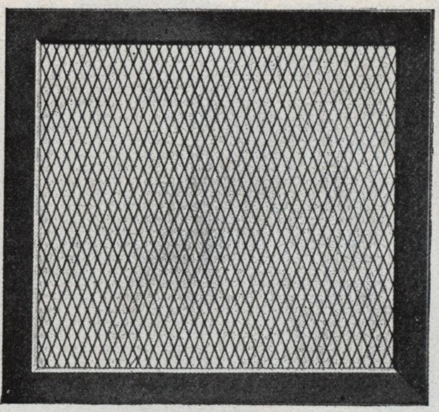
BRANCH OFFICE: 1869 East 55th Street, CLEVELAND, OHIO

Products

- Warm Air and Ventilating Sidewall Registers.
- Aluminum Back Pressure Dampers.
- Fresh Air Screens and Louvers.
- Also Mixing, Louver and By-pass Dampers.

"American" Warm Air and Ventilating Sidewall Registers

These registers fit into the warm air and vent openings in the sidewall, and are made of heavy pressed steel frames and expanded metal centers. Furnished in any color and any size.

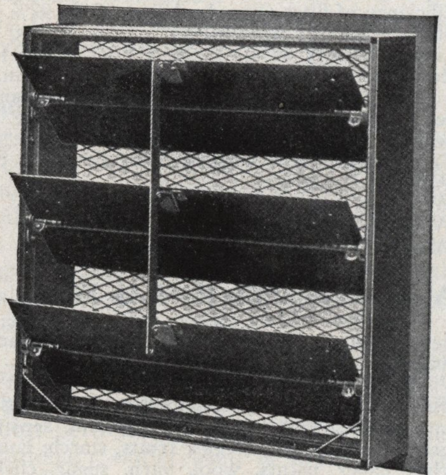


"American" Warm Air Black Enamel Register for Sidewall

Advantages of the "American" Register over Cast and Steel—Our warm air and ventilating registers have an open air space inside the framework of 85%, which is much greater than any type of wrought or cast metal registers. It means smaller openings for the delivery of the same amount of air, and consequently a smaller register to do the same work. They are made in any size without the delay and cost of making patterns. Lighter in weight, more air space, and less horsepower in the delivery of air.

"American" Fresh Air Louver and Screen Combined

This combination screen and louver takes the place of the regular fresh air screen with a window. The frame and screen are constructed the same as our regular "American" warm air register with the exception that it is of heavier material. The dampers are of the ball-bearing type and are constructed to be used either with automatic control or hand control. They are finished in standard black enamel unless otherwise ordered. We make them in any size. If another type of fresh air screen is contemplated, these louvers and frames can be fitted for the use of the same.

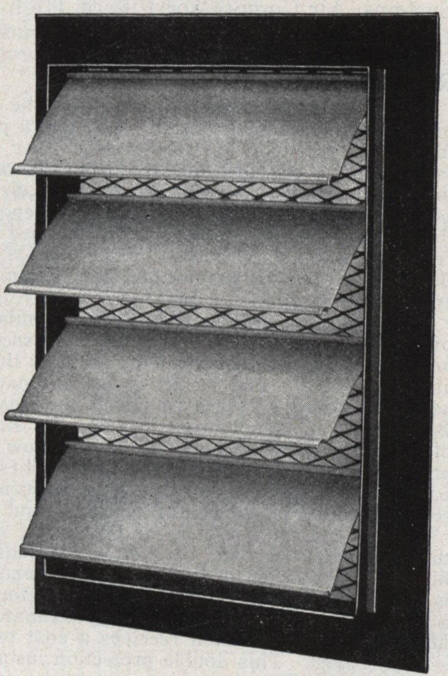


"American" Fresh Air Louver and Screen Combined

"American" Back Pressure Damper and Ventilating Register Combined

These back pressure dampers and registers fit into the vent openings at the base of the ventilating flues in the sidewall. The frames and centers are the same as the warm air registers. The louvers which are simply an addition to the registers are made of aluminum and are so constructed both as to shape and weight, that they automatically close when the fan is not in operation and when ventilation is not required.

The louvers as above stated are made of aluminum and are arranged in such a manner that they are noiseless in operation. The felt padding which is securely placed on the edge of each louver, makes it noiseless in its operation. These are made in any size.



"American" Back Pressure Damper and Ventilating Register Combined

The back pressure dampers are made not only to fit in our own make of registers but can be fitted into the vent openings at the base of the ventilating flues and any type of register used in connection with it.

The construction of this louver is somewhat different from any other manufactured. In most all other makes of back pressure dampers the combined weight of all of the upper louvers are resting upon the lowest one in the frame.

This means that the upper louvers must all open before the lowest one in the frame opens which is the essential one to open, for the reason that the lowest louver is located at a point where the foulest air of the room is located. Hence, it naturally should open first. It does, the way we make them.

References

We have hundreds of schools, churches, and theaters throughout the United States equipped with our product. Many leading architects and engineers are specifying our goods.

Catalogues and Prices

Illustrated catalogues showing our complete line of sheet metal products, with designs and prices, will be sent on request.

THE AUER REGISTER CO.

Wrought Metal Registers, Grilles, Ventilators and Radiator Enclosures

CLEVELAND, OHIO

Wrought Metal Grilles

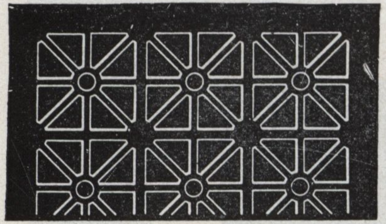
Advantages—Wrought metal grilles can be made in odd sizes and shapes without the expense and delay of pattern making. Wrought grilles are also lighter in weight and more easily fastened to walls and ceilings. They can neither be broken in transit nor after installation. The lodging surface for dust is reduced to a minimum.

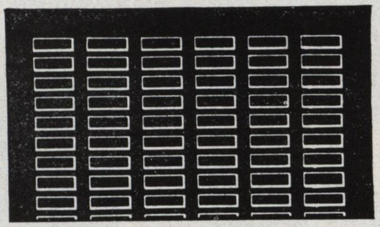
Installation—Grilles can be screwed or hinged to woodwork or metal frames. Invisible doors for access to radiator valves can be incorporated. All grilles can be made into registers by the addition of operating or stationary louvers.

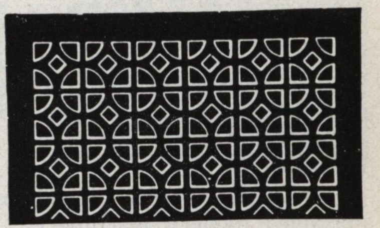
Sizes—3 to 60 inches wide and up to 120 inches long. Larger sizes in sections appropriately joined.

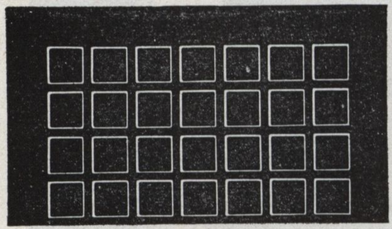
Metals and Finishes—Solid bronze, brass, copper or steel. Prime coat, black or white japanned, or electroplated in bronze, brass or copper.

Designs—As shown and many other combinations.


No. 7A—50% Air Opening
Multiples of 3, 3⅜ and 3½ in.

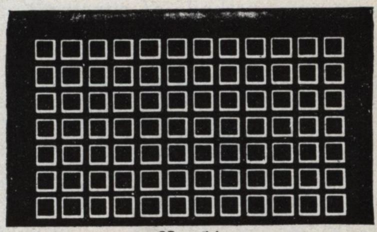

No. 2A—50% Air Opening
Openings 1½x½ in.; bars ¼ and ½ in.


No. 4A—51% Air Opening
Openings 1¾ in.; bars ¼ in.

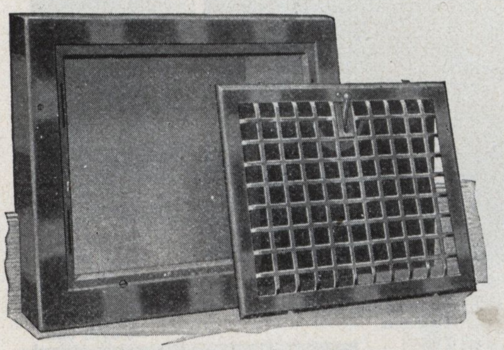

No. 10A

MESH SIZES OF PLAIN LATTICE DESIGN

No.	Openings, in. square	Bars, in.	Air openings
5A	¾	¼	64%
8A	½	¼	50%
9A	1	¼	75%
10A	1¾	¼	85%


No. 5A

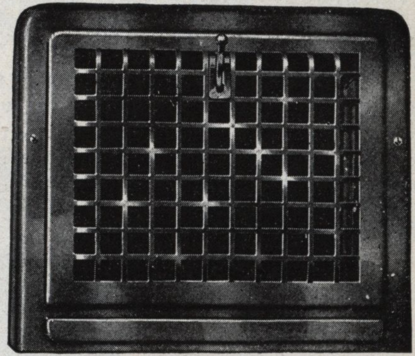
A Few Standard Designs of Wrought Metal Grilles

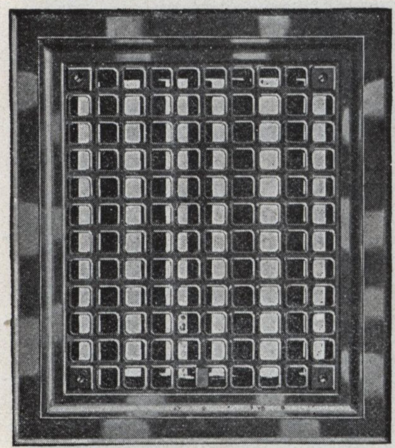

Baseboard Register; Grille Detached

Baseboard Registers

The Auer baseboard registers have many advantages over floor registers.

They are made in sizes to accommodate standard heating pipes.


Baseboard Register—Closed


Steel and Semisteel Registers with Louvers
For floor, wall or ceiling. Also in keylock types

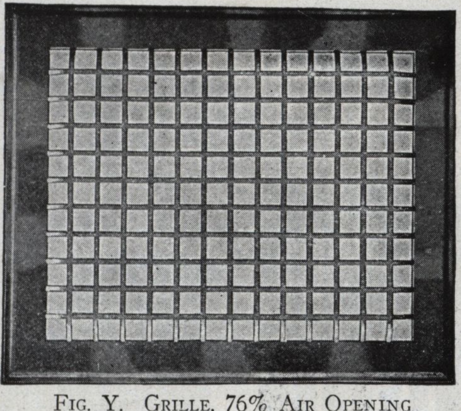
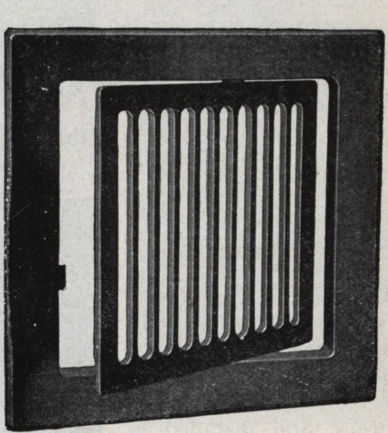


Fig. Y. Grille, 76% Air Opening
Specially suited for heating and ventilating flues and ducts. Mounted on angle frame to extend into flue or duct opening, dispensing with wall frames. Costs less and better suited than wire and other types of grilles


Sanitary Design Grille and Frame
With catch and hinged for opening. Also made as register with louvers

THE BEST REGISTER COMPANY

Registers, Ventilators, Grilles and Screens

1500 Oklahoma Avenue
MILWAUKEE, WIS.

Products

Registers, Ventilators, Grilles and Screens, of stock or special designs and finishes, in Bronze, Brass, Copper, White Porcelain Enamel, White or Black Japan, etc., made in Cast Iron, Semisteel, Brass or Bronze Metal, and Steel; Mushroom Ventilators.

Specialists in Semisteel Registers.

Also manufacturers of Gratings, Wall Frames, Sheet Steel Boxes, Floor Borders, Double Slide Dampers, Perforated Steel Grilles, Wire Screens, etc.

Facilities

The factory is equipped throughout with the most improved modern machinery. The capacity is unlimited; and the efficiency of the entire equipment, together with new methods of construction, insure a high quality of workmanship and finish.

"Best" Semisteel Register

Patented July 14, 1908; August 9, 1910.

The faces are made of cast iron; the boxes, valves, operator, etc., of sheet steel. Each register is coated with heavy rustproof metal coating, and carefully inspected.

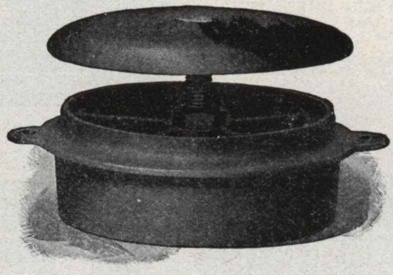
Manufactured regularly in two designs.

Special Designs

Special design goods are made to order only. In all cases, pattern work is necessary to produce. Any design can be produced from architect's drawings or sketches, and can be made to conform to any conditions and be supplied in any finish.

"Best" Mushroom Ventilator

Made in 5 sizes to fit ducts or flues of the following diameters (dimensions being the size of the flue opening of duct): 4, 5, 6, 8 and 10 in



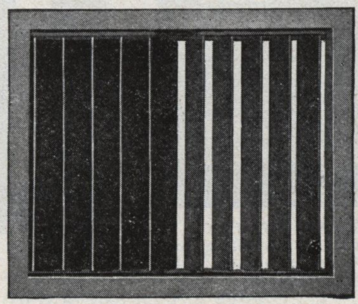
"Best" Mushroom Ventilator

Adjustable Diffuser

Eliminates friction. Diffuses air in any horizontal direction.

References

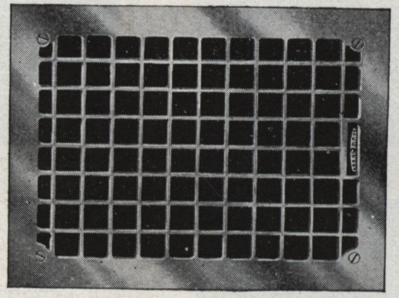
Goods are sold solely on merit. Used and accepted by leading architects and engineers, and installed in many hotels, hospitals, postoffices, and other public buildings.



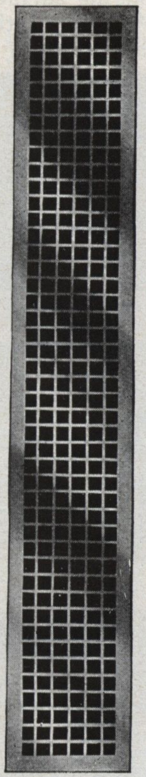
Adjustable Diffuser

Catalogues and Prices

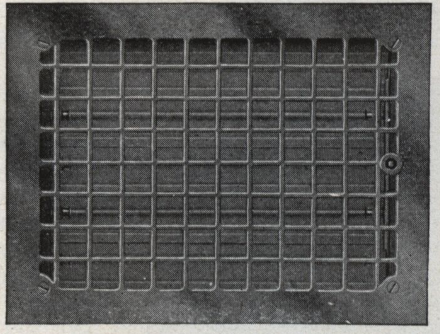
Illustrated catalogues, showing a large variety of register designs and prices, sizes and finishes, as well as further information concerning "Best" deflecting wall and baseboard registers and other products, will be sent on request.



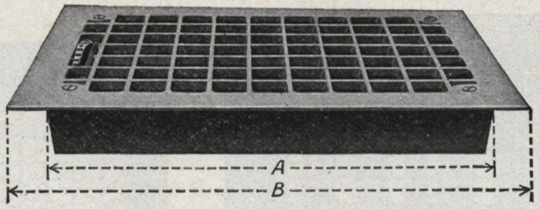
Plain Lattice Design
Made in any style



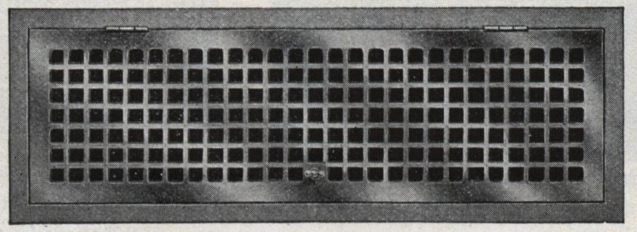
Plain Lattice Ventilating Face
This design made to order only in any length and width desired



Key-operated Register
Phosphor bronze operator parts. Can not wear or rust out



Method of Measuring Registers
A—Flue or opening size
B—Extreme measurement



Grille Hinged in Angle Iron Frame

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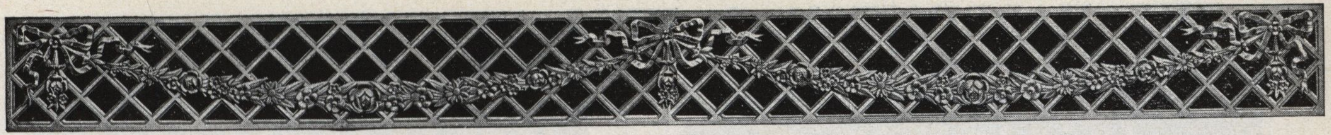

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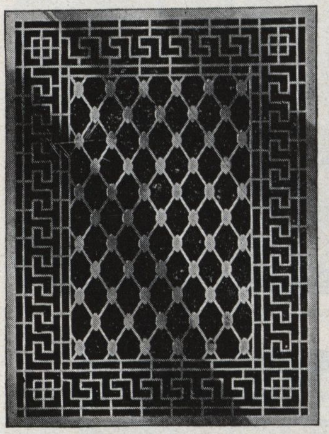

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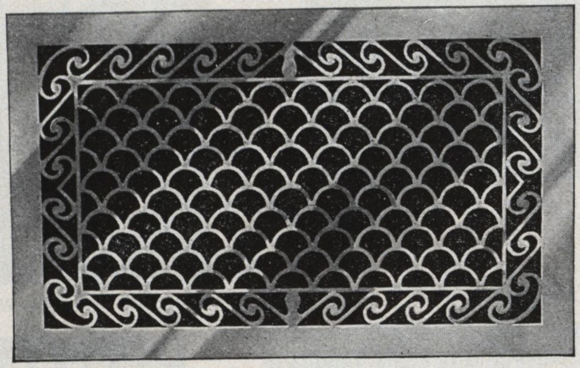

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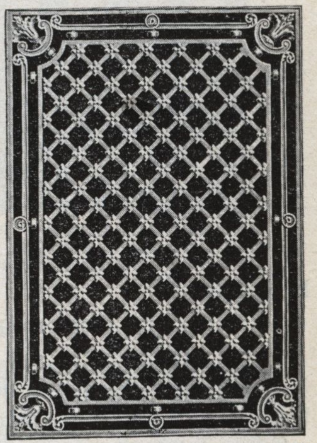

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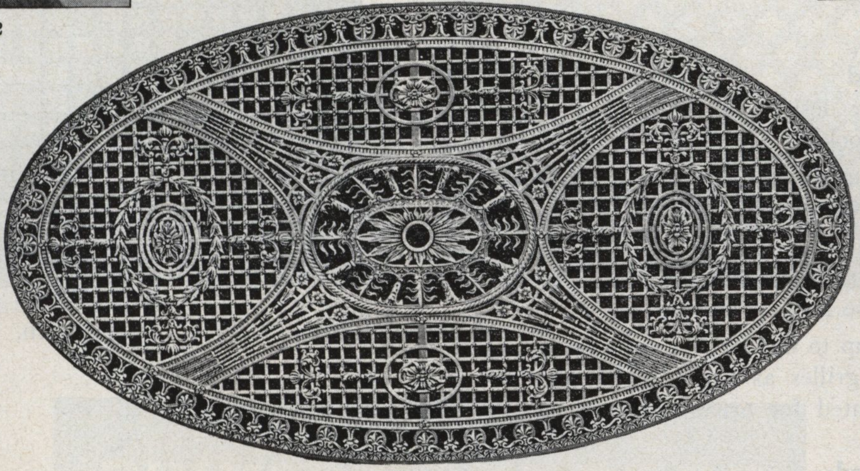
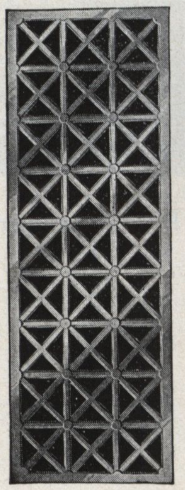
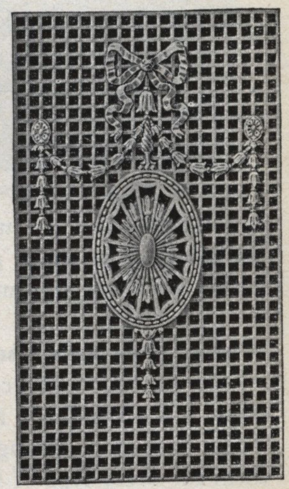


No. 504-A



No. 11



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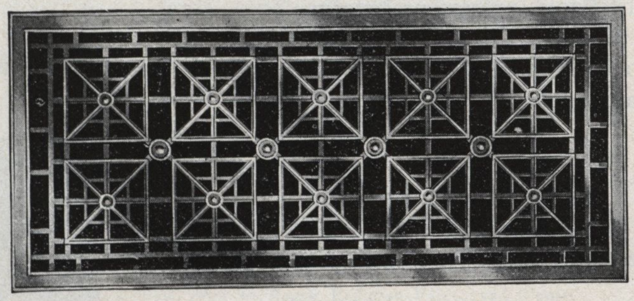
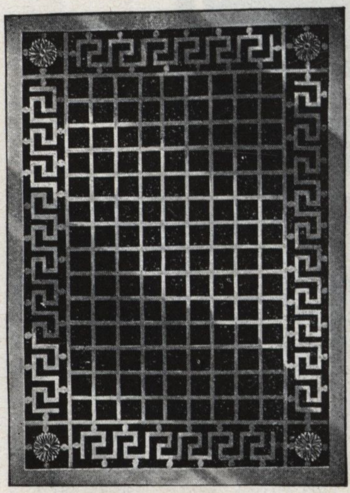


No. 119



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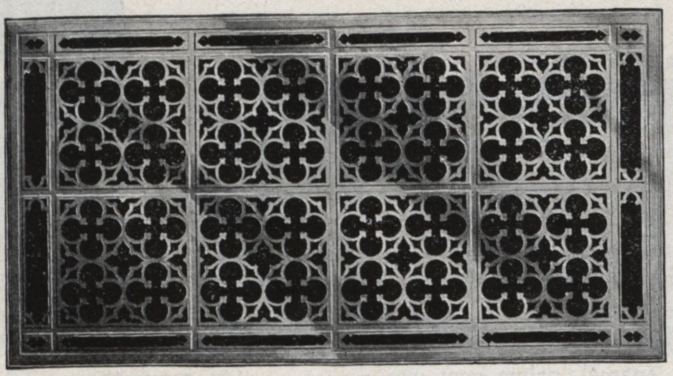

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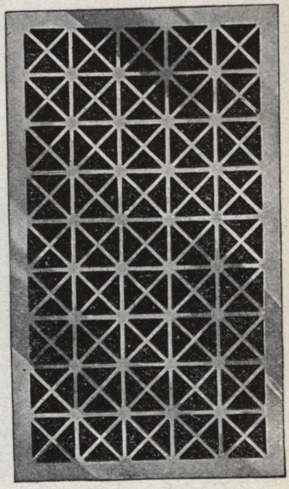


No. 110

Some of Many Special Designs Produced

This company will make any register. Nothing too small, too large or too complicated

THE HARRINGTON & KING PERFORATING CO.

Grilles and Ventilators of Perforated Metal

MAIN OFFICE AND FACTORY
5647 Fillmore Street
CHICAGO, ILL.

TELEPHONE
Mansfield 1800

BRANCH OFFICE: NEW YORK, N. Y., 110 Liberty Street—Telephone, Rector 1733

Products

Grilles of Perforated Metals.

We specialize in the manufacture of Grilles and Register Faces of special sizes, shapes and designs, made by perforating plates of wrought steel, bronze, brass, and other metals.

Why They Are Used

Appearance—Our designs are handsome and the grilles are substantial looking.

Strength—Every grille is made of wrought metal which is rugged and strong. It *can not break* as it is not brittle.

Economy—Only a fraction of the cost of other kinds of grilles, because no patterns are necessary.

Sizes—Any size up to 6x12 ft. in any design, any thickness. We make grilles as heavy as ⅜ in. thick where thickness is wanted for ornamental effect.

Where They Are Used

In hotels, residences, hospitals, apartments, steamships, office buildings, and wherever grilles are needed. Their economy, strength and appearance recommend them for every type of installation.

Designs

A few of our designs are shown here. Send for our new catalogue, *Grilles of Perforated Metal,* which illustrates with actual size cuts, all of our standard designs.

Finishes

Finished in electroplate to match any hardware or enameled any color. Also prime coat, and shop finish.

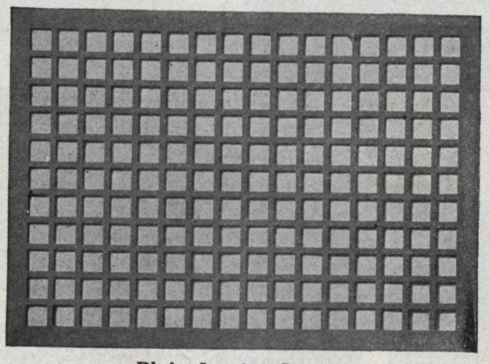
Specifications

When writing specifications be sure to give this information:

Size—opening or over all.
Margins—indicate minimum width of blank.
Design—indicate style letter.
Metal—kind and thickness.
Finish—electroplated, enamel, prime coat, etc.
Screw holes—plain or countersunk.
Special features—handholes, frames, etc.

Standard Plain Lattice Designs

Made in the following sizes:

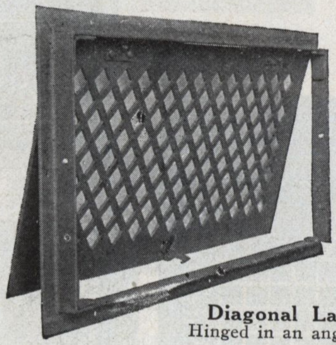


Plain Lattice Design

Size of hole, in.	Width of bridge, in.	Percentage open
5/16	⅛	51%
½	¼	45%
11/16	3/16	62%
¾	¼	57%
⅞	¼	60%
1	3/16	71%
1¾	5/16	72%

Standard Diagonal Lattice Designs

Made in following sizes:



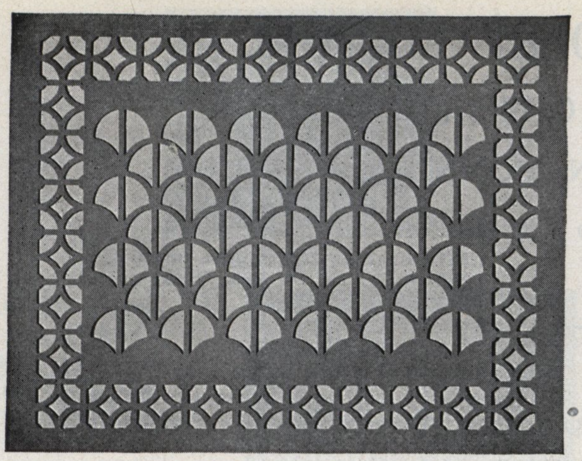
Diagonal Lattice Grill
Hinged in an angle iron frame

Size of hole, in.	Width of bridge, in.	Percentage open
⅜	3/16	45%
½	3/16	53%
11/16	3/16	62%
⅞	¼	60%
1	¼	64%

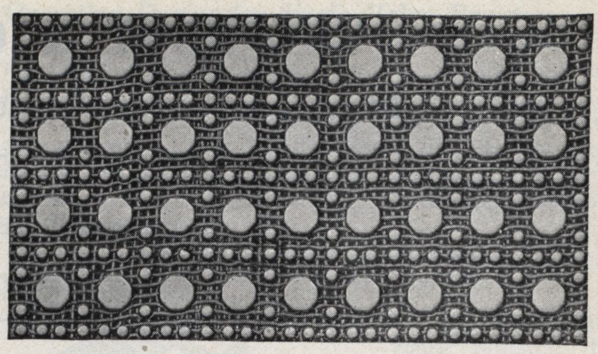
Catalogues

On request, we will send you copies of our new catalogue, *Grilles of Perforated Metal,* which shows actual size of every design.

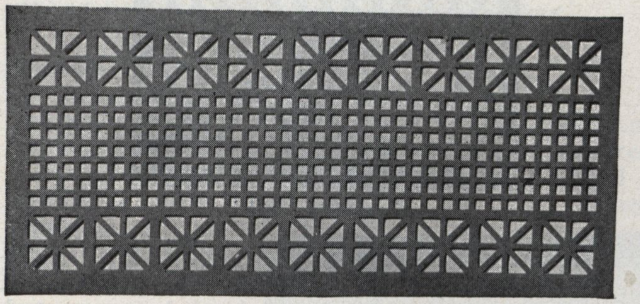
Continued on next page



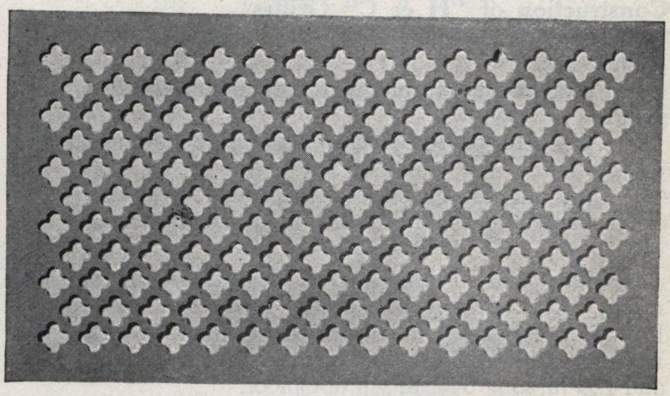
Style MQ, 60% Open



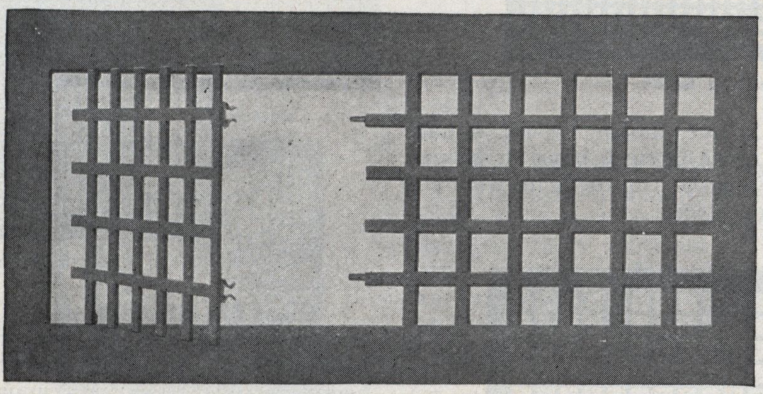
Style P (Metal Cane) ⅝ Actual Size
Cut shows this design finished in imitation cane enamel. Used extensively for radiator enclosures



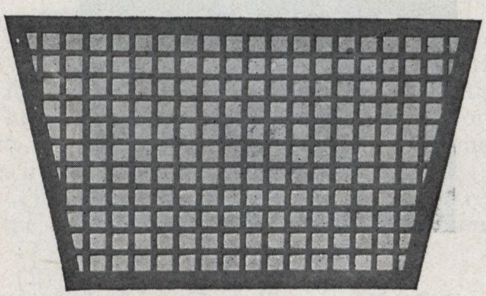
Style LK, 45% Open



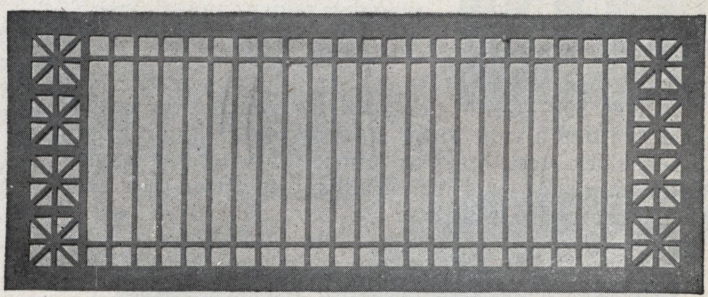
Style F 45% Open



Grille Fitted with Handhole Door to Reach Radiator Valves and Vents
Strong and rugged; absolutely invisible when closed



Odd Shapes: Ovals, Circles and Tapered Edges a Specialty
Grilles can be curved to fit any shape wall



Style LT, 71% Open

A Few Grille Designs

THE HART & COOLEY CO., INC.

Manufacturers of Registers, Grilles and Ventilators

NEW BRITAIN, CONN.

BRANCH OFFICES AND WAREHOUSES
NEW YORK, N. Y., 501 Fifth Avenue
PHILADELPHIA, PA., Real Estate Trust Building
CHICAGO, ILL., 73 East Lake Street
BOSTON, MASS., 141 Milk Street

Products

GRILLES, STEEL REGISTERS, FACES, and VENTILATORS.

Construction of "H & C" Grilles

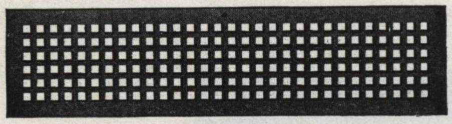
Some of the points of superiority of "H & C" grilles are:

Frets line up throughout the entire length of the grille.

They are perfectly flat, making installation very easy.

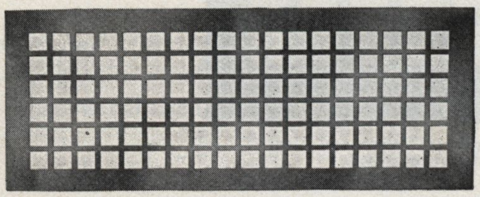
Only highest grade of cold rolled steel used for electroplated grilles. Made also in bronze or brass.

Class 570—Plain lattice design ½-in. square mesh, ¼-in. fretwork. Made from steel, brass or bronze .109 or .134 in. thick. Best suited to grilles of narrow widths but can be furnished up to 30 in. wide and 120 in. long over all, in one piece.



Class 570 Grille

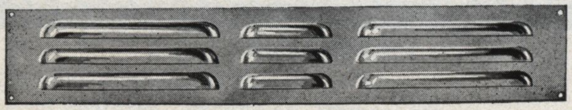
Class 575—Plain lattice design ¾-in. square mesh, ¼-in. fretwork. Made in steel, brass or bronze. .109 or .134 in. thick. Furnished up to 50 in. wide and 120 in. long over all, in one piece.



Class 575 Grille

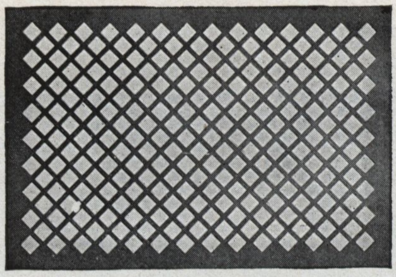
Class 576—Plain lattice design similar to 575 except that mesh is 1 in., ¼-in. fretwork.

Class 590—Grille designed for ventilation without permitting a view to the space beyond. Made from .065-in. thick steel, brass or bronze. Louvers or hoods can be either 7½ or 4 in. Widths, 6 to 30 in. over all. Any height up to 120 in. over all.



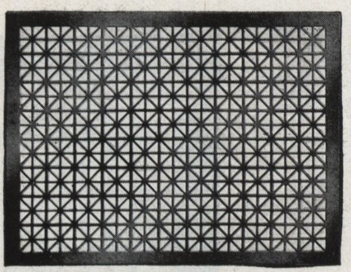
Class 590 Grille

Class 572—Diagonal lattice pattern, ¾-in. mesh, ¼-in. fretwork. In steel, brass or bronze. .109 or .134 in. thick. Over-all sizes up to 48 in. wide and 120 in. long in one piece.



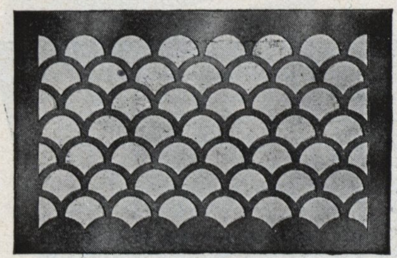
Class 572 Grille

Class 573—Greek or Union Jack design. Artistic square 3-in. opening. Frets between squares ⅜ in. Furnished in .109 or .134-in. thick brass, bronze or steel. Over-all sizes up to 48 in. wide, 120 in. long.



Class 573 Grille

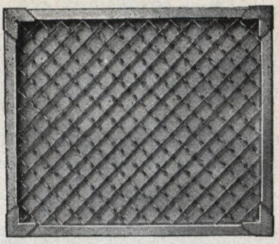
Class 578—Shell design. Openings are based on a circle of ⅞-in. radius, 2 in. from center to center in width, 2¼ in. center to center in height. Maximum height possible, 50 in. Maximum width possible, 120 in. Specify dimensions by width and height. Detail drawing furnished on request.



Class 578 Grille

Class 127—Wire grille. Furnished from No. 10, 12 or 14 B. gauge wire, either 1 or 1½-in. diagonal mesh, 1x1x⅛-in. angle frame, cast corners or 1-in. channel frame.

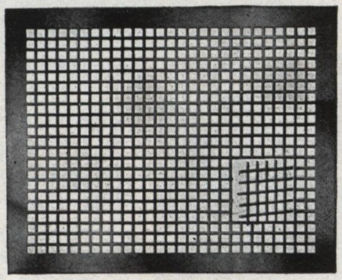
Continued on next page



Class 127 Grille

Invisible Doors

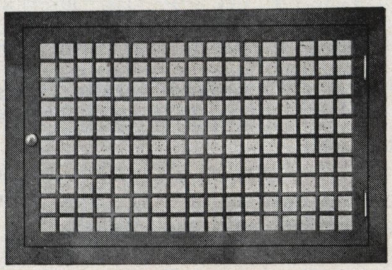
Any grille of classes 570, 572, 573, 575, 576 or 578 can be equipped with invisible door for access to radiator valves as shown. These doors furnished in two sizes, 4x5 or 6x6 in.



Invisible Grille Door

Outside Frames

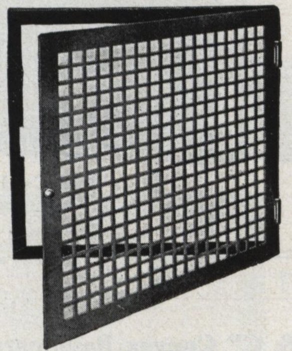
Any grille of classes 570, 572, 573, 575, 576 or 578 can be furnished hinged to outside angle frame complete with knob, spring catch and stops or, if desired, with lock in place of catch. Standard angle used is 1x1x⅛ in., but size of angle may be varied to meet conditions.



Outside Grille Frame

Concealed Frame

Any grille of classes 570, 572, 573, 575, 576, or 578 may be furnished hinged or screwed to concealed frame as shown, complete with knob and spring catch. Standard frame made from 1x1x⅛-in. angle but size of angle may be varied to meet conditions.



Concealed Grille Frame

Rigid Construction of "H & C" Steel Registers

The superior claims of the "H & C" line of registers embrace the finely rounded pinched-up fretwork of the face, which adds strength and beauty to the register; the heavy braces reinforce the face and afford strength much in excess of any possible requirements. The capacity of free flow of warm air reaches the maximum.

Throughout the entire "H & C" line are combined all the best features in register construction:

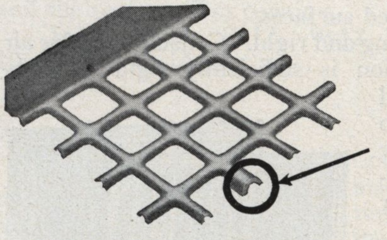
(1) Strength
(2) Durability of finish
(3) Maximum free air capacity
(4) Simple construction
(5) Effectiveness of design
(6) Ease of installation

Operating Device for Single Valve Registers

All "H & C" single valve baseboard and sidewall registers are equipped with standard "H & C" operating mechanism.

This includes an operating handle of neat design, operated with either hand or foot. It does not project to catch clothing. Action is positive. Screws for adjusting tension take up all play and increase or diminish friction as desired.

Floor Registers

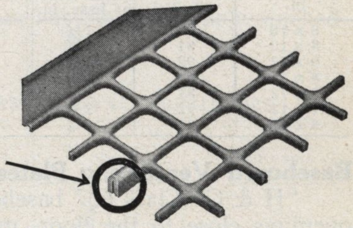


The Old Way

For a great many years registers have been made with an area of fretwork nearly equal to the free air area. This is still true of practically all makes of registers. In Hart & Cooley registers is found the correct construction and maximum air capacity.

The illustrations show how the "H & C" register has been perfected from the old type (although even in the old type "H & C" registers had the largest per cent of air capacity) to the present form of fretwork. The old type arches have been pressed together, increasing the air capacity and the strength of the register without decreasing the amount of steel used. This means you can use smaller sizes than heretofore with equal efficiency, at a considerable saving in cost.

"A Register is as good as its Air Capacity!"

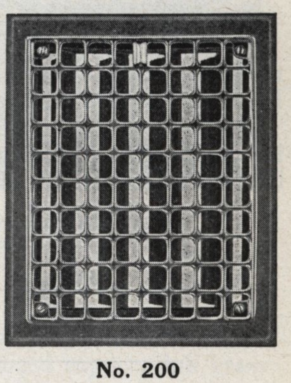


The New Way
(Patented)

"H & C" Wrought Steel Floor Registers (Class 200)

The steel in these registers is of sufficiently heavy gauge to make them rigid and durable, features which have not been sacrificed to obtain light weight. The louvers have solid trunnions securely riveted to each end, insuring free and easy operation. The braces are securely riveted to the box, distributing the strain when in use.

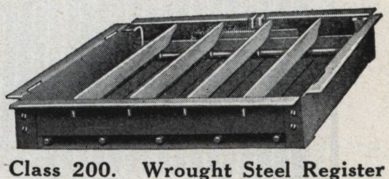
Heavy angles at the corners, insure against stripping threads when attaching face.



No. 200

Following are the actual free air capacities of a few leading sizes in our class 200:

8x10—55 sq. in. of free opening
8x12—67 sq. in. of free opening
9x12—76 sq. in. of free opening
10x12—85 sq. in. of free opening
12x14—119 sq. in. of free opening.



Class 200. Wrought Steel Register Body Showing Heavy Reinforcing Braces

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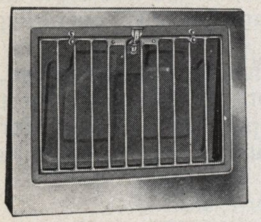
"H & C" Baseboard Registers (Class 170 Series) Quick Detachable Face

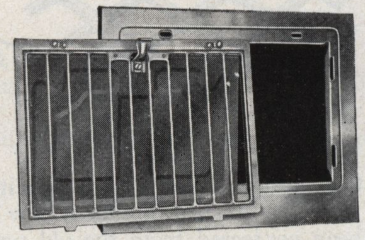


Class 170
(Patent applied for)

This register with quick detachable face of vertical bar design has an increase of about 40% in free air capacity, permitting the use of smaller sizes of register than heretofore, and giving greater efficiency. The frame is pressed from a solid piece of steel giving strength and the vertical bars, integral with margin of face, present rounded surfaces.

They are very strong and rigid. Consult table for air capacities. Construction is sufficiently rigid to withstand hard usage and lends itself superbly to finishes to match any hardware. Easily attached to tin box or stackhead.

As tension is exerted at center of face, one screw regulates the tension. Wood screws are furnished to attach register to studding.



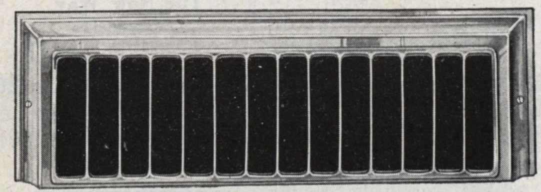
Class 170 Register
(Patent applied for)

SIZES AND AIR CAPACITY CLASS 170

Size, in.	Air cap., sq. in	Projection from wall at base, in.	Size, in.	Air cap., sq. in.	Projection from wall at base, in.
8 x 10	66	1¼	10 x 12	102	3¼
8 x 12	81	1¼	10 x 13	110	3¼
9 x 12	92	1¼	11 x 13	127	3¼
8 x 10	66	2¼	10 x 13	110	4¾
8 x 12	81	2¼	11 x 13	127	5⅝
9 x 12	92	2¼	12 x 14	149	5⅝
8 x 12	81	3¼	12 x 14	149	7½

Baseboard Ventilating Plates

"H & C" Class 657 baseboard ventilating plate has openings close to the floor, making it very efficient in removing cold air. The edges fit tight to the baseboard. Matches No. 170 baseboard register.

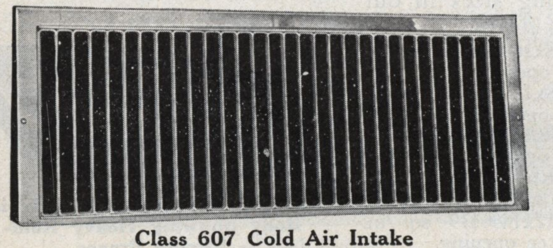


Class 657

"H & C" Class 655 baseboard ventilating plate is identical with No. 657 except that face is of the oblong hole type for use with "H & C" No. 150 registers.

SIZES AND CAPACITY CLASSES 657 AND 655

Size, in.	Air cap., sq. in.
5 x 14	657–46 655–35
5 x 30	657–98 655–75



Class 607 Cold Air Intake

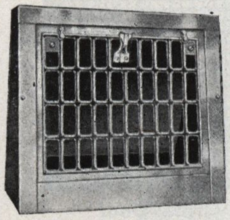
Cold Air Intake (Class 607)

The "H & C" Class 607 is made with projections from wall varying from 3 to 6½ in. and has the vertical bar face affording greater air capacity.

SIZES AND CAPACITY CLASS 607

Size, in.		Air cap., sq. in.	Projection from wall, in.
Opening	Over all		
10 x 14	11 x 16	115	5½
12 x 14	13⅜ x 16	138	7½
10 x 30	11 x 32	245	6
12 x 31	13⅜ x 32	305	7½

Quick Detachable Face (Class 150)



Class 150

This is a two-piece register with face that is detachable. The frame is provided with integral flanges having holes for tin loops. The face with valve attached is fastened by means of lugs at bottom and two locking clips at top, a quarter turn of which releases face from frame.

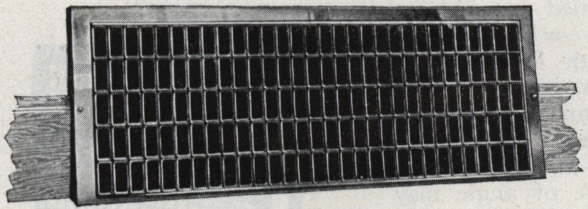
SIZES AND AIR CAPACITY CLASS 150

Size, in.	Air cap., sq. in.	Projection from wall at base, in.	Size, in.	Air cap., sq. in.	Projection from wall at base, in.
8 x 10	50	1¼	10 x 12	75	3¼
8 x 12	60	1¼	11 x 13	96	3¼
9 x 12	71	1¼	11 x 13	96	5⅝
8 x 10	50	2¼	12 x 14	105	5⅝
9 x 12	71	2¼			

"H & C" Cold Air Intake (Class 605)

This intake is made to project 3 to 6½ in. from the wall.

The sizes on all intakes are so arranged that joists do not have to be cut. Two round head wood screws are packed with each intake.



Class 605 Cold Air Intake

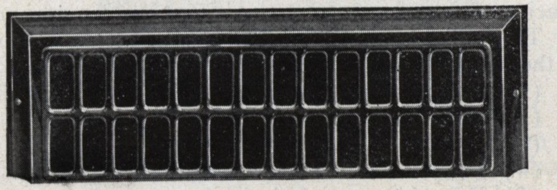
CLASS 605 COLD AIR INTAKE

Opening . . . . in.	10 x 14	10 x 30
Over all . . . . in.	11½ x 16	11½ x 32

"H & C" Convex Baseboard Ventilating Plates

The openings in these plates come close to the floor, making them very efficient in removing foul air and creating a thorough circulation.

The edges fit tight to the baseboard, another important feature.



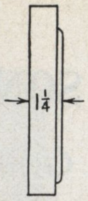
Class 655 Convex Ventilating Plate
Sizes 5x14 and 5x30 in.

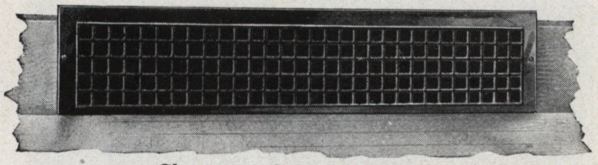
Continued on next page

"H & C" Cold Air Intake (Class 625)

This intake is the sidewall type which can be installed without cutting floor and does not interfere with the use of rugs or carpets. Sets flush with baseboard.

All intakes have square holes with rounded fretwork, which is a distinctive feature of the "H & C" line.



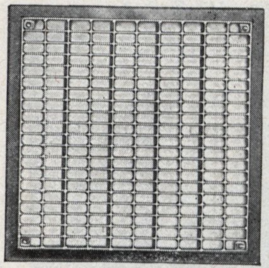


Class 625 Cold Air Intake

CLASS 625 COLD AIR INTAKE

Opening.........in.	4 x 14	4 x 30	5 x 14	5 x 30
Over all.........in.	5½ x 16	5½ x 32	6½ x 16	6½ x 32

Cold Air Face (Class 250)



Class 250 Cold Air Face

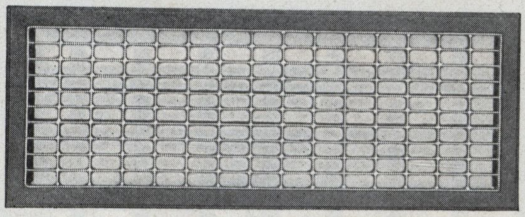
The "H & C" No. 250 cold air face has the same superior fretwork braced underneath with steel bars which in turn are supported by a heavy angle frame that is removable. The overlap of the face on the floor provides ample support and in this way eliminates the necessity of accurate fitting in the floor. Smaller faces than in the case of wood may be used with equal efficiency.

AIR CAPACITIES CLASS 250

Pipe		"H. & C." No. 250	
Size, in.	Air cap., sq. in.	Size, in.	Free area, sq. in.
12	114	12 x 14	118
14	154	14 x 16	157
16	201	14 x 20	196
18	254	18 x 20	267
20	314	18 x 24	319
22	380	20 x 26	385
24	452	20 x 30	445
26	530	24 x 30	532
28	615	28 x 30	630

Cold Air Face (Class 255)

The "H & C" Class 255 face is somewhat lighter than Class 250, yet of ample strength in the sizes made.



Class 255 Cold Air Face

The braces are riveted to heavy angle plates, which are welded to the face and are not detachable. This face has the same economical features as the Class 250. The "H & C" oak finish is a good match in color to the average oak floor.

AIR CAPACITIES CLASS 255

Size, in.	Air cap., sq. in.	Size, in.	Air cap., sq. in.
10 x 24	180	12 x 30	270
10 x 30	225	14 x 30	313
12 x 14	126	18 x 30	405
12 x 24	216	20 x 30	450

"H & C" Single Valve Sidewall Registers (Class 350)

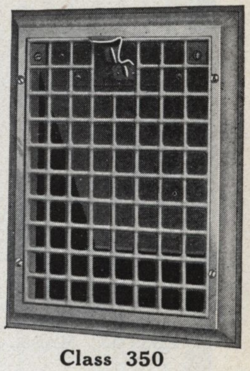
Very easily installed.

Class 340 is for horizontal setting; Class 350 for vertical setting.

Face and valve shipped assembled and need not be taken apart.

A small frame is the third member, which can be fastened to the tin box by loops; to this the face and valve are screwed and the register is in position.

Sizes 8x10, 8x12, 9x12, 10x12 and 10x14 in.

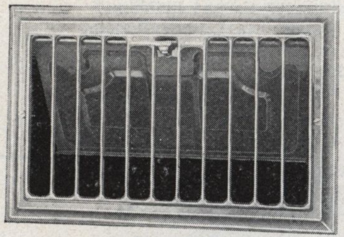


Class 350

Sidewall Registers

The Class 370, because of its large air capacity, is made for horizontal setting. In design, being of the vertical bar type, it matches the "H & C" Class 170 and 190 series baseboard registers.

The single valve is operated in the same manner as all "H & C" baseboard registers and is positive in action.



No. 370

Class 340 "H & C" sidewall register is the same as Class 370 except that the face has the square hole pinched fretwork.

SIZES AND CAPACITIES SIDEWALL REGISTERS

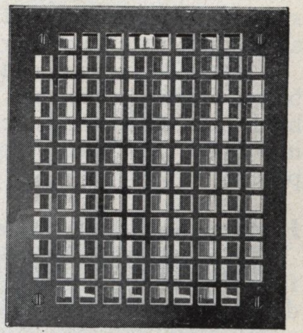
No. 370		No. 340	
Size, in.	Air cap., sq. in.	Size, in.	Air cap., sq. in.
8 x 10	64	8 x 10	44
8 x 12	79	8 x 12	53
		9 x 12	60

No. 800 Register

Made for use in connection with plain lattice grilles, and to match our Class 575.

Face from No. 12 to 16 gauge steel, ¾-in. hole, ¼-in. bar.

Has same body as our Class 200 line of registers.



No. 800 Register

Standard Finishes

This company is equipped to furnish any electroplated finish desired to match hardware. The following finishes are standard, and complete details for types of registers, grilles, etc., to which they apply will be sent on request.

Electroplated light bronze, statuary bronze, polished brass, copper (not shaded), oxidized copper, dull brass (brushed), dead black, nickel.

Black japanned, white japanned, white porcelain enamel, gold bronze paint, silver bronze paint, copper bronze paint.

Air Capacity

The value of a register is largely a question of the amount of warm air it will deliver. "H & C" registers excel in free air capacity—i. e., warm air.

ESTABLISHED 1854 INCORPORATED 1909

WM. HIGHTON & SONS COMPANY

Registers, Ventilators, Grilles and Screens

HOME OFFICE AND WORKS

NASHUA, N. H.

BRANCH OFFICES AND WAREHOUSES

BOSTON, MASS., 80 Portland Street—Telephone, Haymarket 3848

PHILADELPHIA, PA., 129 Bread Street

REPRESENTATIVES

NEW YORK, N. Y., E. H. Page & W. T. Reynolds, 25 West 43rd Street—Telephone, Vanderbilt 2521
BALTIMORE, MD., Vance & Vance, 1207 Garrett Building
WASHINGTON, D. C., Vance & Vance, 616 Lennox Building
CLEVELAND, OHIO, H. F. Thomas, 328 Union Building
OAKLAND, CAL., Nelle Read, 5300 Genoa Street
DETROIT, MICH., Louis T. Ollesheimer, Inc., 606 Marquette Building
ROANOKE, VA., Vance & Vance, 506 Boxley Building
RICHMOND, VA., Vance & Vance, 302 Corneal Building
DALLAS, TEX., W. A. Sedwick Co., 2916 Maple Avenue
PITTSBURGH, PA., Geo. V. Hamilton Co., 132 First Avenue

Products

Manufacturers of a complete line of stock Registers, Grilles, etc., in cast iron, cast bronze, cast brass, also stamped steel, bronze and brass Grilles and Registers.

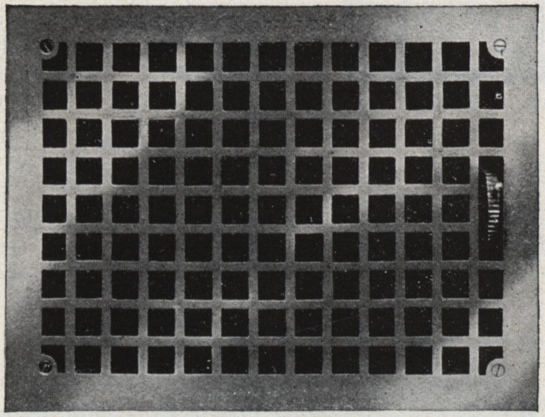
Highton Quality

71 years making registers, grilles, etc., is in itself ample proof that we know how.

Registers and Ventilators Style 100

The Highton All-cast Register is among the best made. Will last as long as the building itself. No cheap steel stampings to rust out. Presents a more substantial appearance than any other type.

Faces being cast can be made of soft gray iron, brass, bronze, nickel and any desired finish to match hardware. Cast in practically any design. This is important. 1925 annual catalogue now ready, see page 8.



All-cast Register Style 100, Plain Lattice Design

Highton Semisteel, Style 200

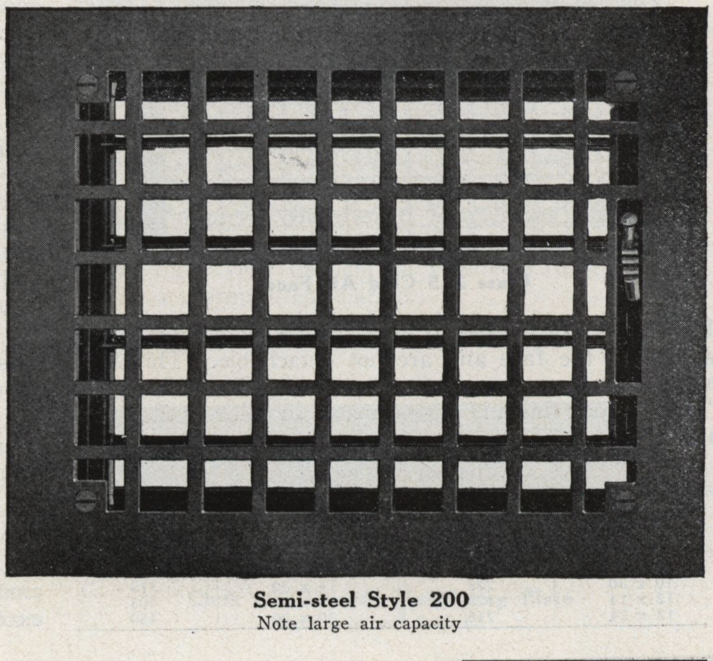
The aristocrat of semisteel registers, made in four designs: plain lattice, Highton design, Maltese design, Indian lattice. (See pages 9-11-12 of Catalogue 1925.)

Cast face. Iron, brass, bronze or nickel, all finished.

Body, heavy sheet iron, all finished. It embodies all the latest achievements in register making, and displaces the impractical slide center movement with the reliable vertical wheel. All parts electric welded together, solid steel journals are used on the valves. Strongest steel body made.

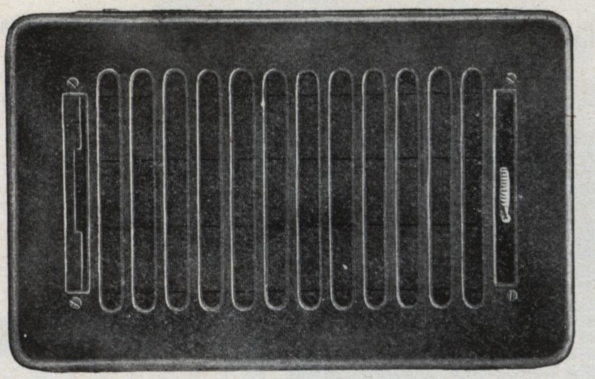
Especial Attention: This register is made both with the valves running either the short way or the long way; for example, a 10x30 can be furnished or a 30x10 if so desired. (See page 9 of Catalogue 1925.)

Highton all-steel stamped plain lattice face using our semisteel body, a good steel register. (See page 10 of Catalogue 1925.)

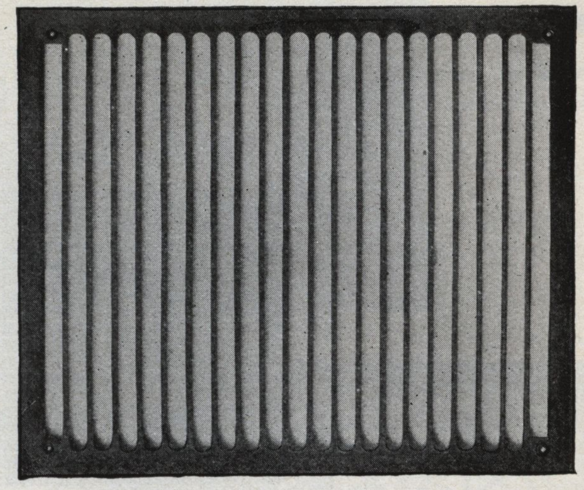


Semi-steel Style 200
Note large air capacity

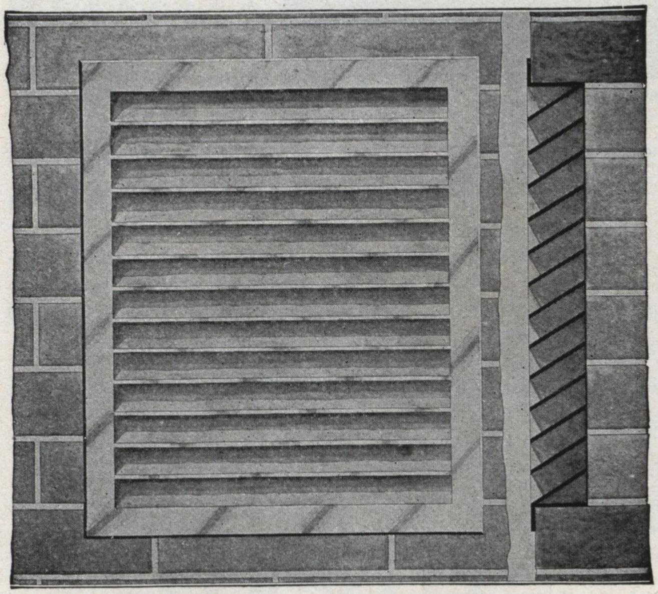
Continued on next page



Sanitary Register and Grille
Beveled edges. Made in all sizes



Sanitary Type with Square Edges and Corners

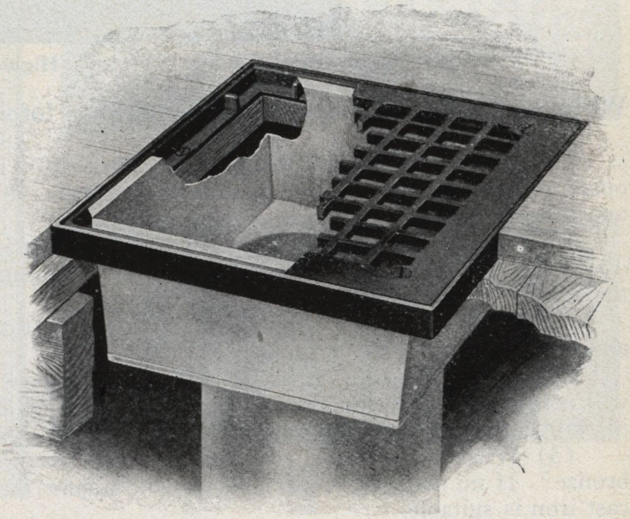


Sidewall Air Inlet Ventilator, 12 in. Wide, 18 in. High

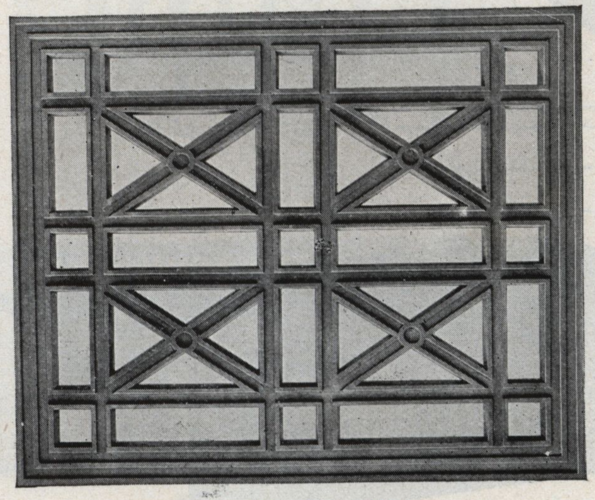
With stationary louvers for use on outside of building as a fresh air inlet. Extra heavy and constructed so as to exclude rain or snow. Cast iron, brass or bronze metal

Made in any size and to order only. When ordering give horizontal first and mark "wide" and "high" after the dimensions.

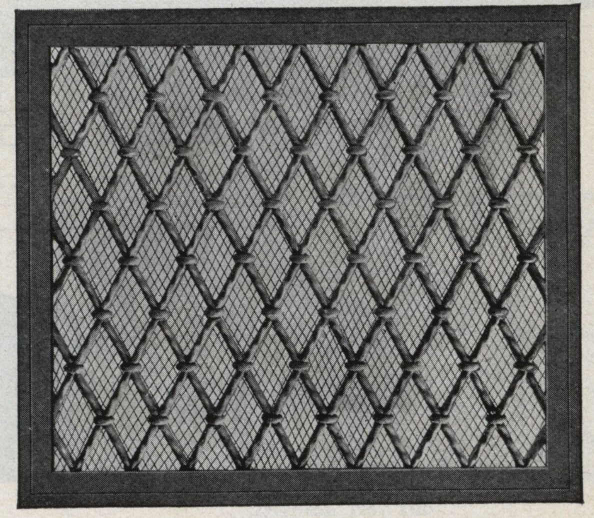
Write for further information



Highton Concealed Border for Registers or Grilles
Patented October 18, 1921



Highton No. 272



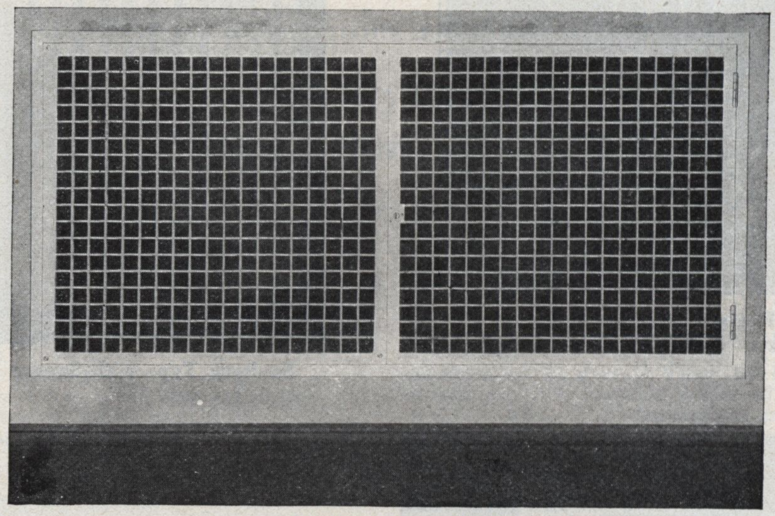
Highton No. 460

Continued on next page

Highton No. 101

Grilles Style 101 are used where large air capacity is required, such as schoolhouses, public halls, etc. Style 101 is 1½-in. mesh plain lattice design, and has an air capacity of 85%, made in cast iron, brass or bronze metal and in any finish desired.

Illustration shows grilles hinged to angle iron and with sub treasure lock.



Highton No. 101

When Specifying Please Give the Following Information

(1) If dimensions are opening or over-all? If opening size is given we will assume that margins are approximately 1 in. greater all around.

By opening size, we mean the rib opening; that is, dimension "A" as shown below. Dimension "B" means the over-all measurement.

(2) What design is required? If plain lattice, advise what mesh is to be required.

If no mesh is given on orders for plain lattice we will assure that our standard mesh, which is about ¾ in. with ¼-in. bars, will be suitable.

(3) What material is required? Steel, iron or bronze? If no material is specified we will assume that cast iron is suitable.

(4) Finish desired? We can furnish most any finish desired in enamel or electroplated. On orders for cast iron and steel, unless the finish is given, we will assume that a priming coat finish is desired.

On orders for cast bronze material, unless instructed otherwise, we will finish them in bright bronze.

(5) If to be drilled and countersunk, kindly give the location of holes and size of screw. When holes are ordered, we furnish a sufficient amount of 1-in. No. 10 wood screws.

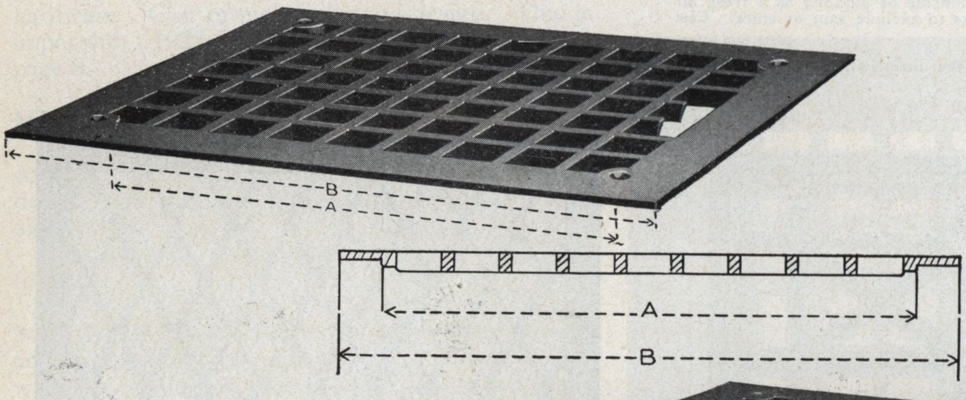
Unless drilling is specified we do not drill them.

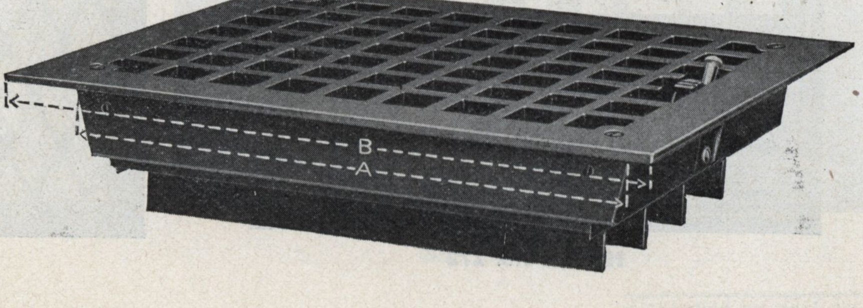
(6) If to be supplied with handhole doors, specify the location of doors and size.

If size is not given, we will make them approximately 6x6 in.

Handhole doors are placed in all designs at additional cost.

(7) If to be equipped with angle frames, kindly submit a small sketch showing size of frame and method of attaching grille to same.





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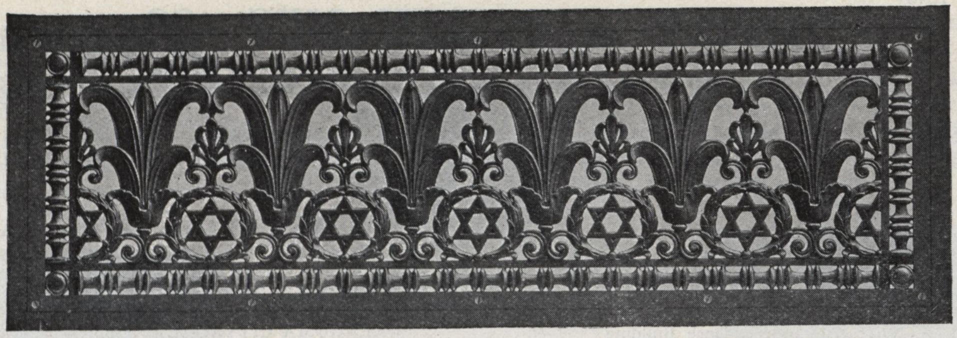
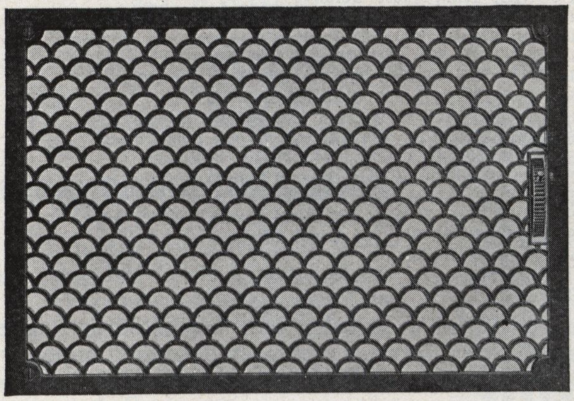
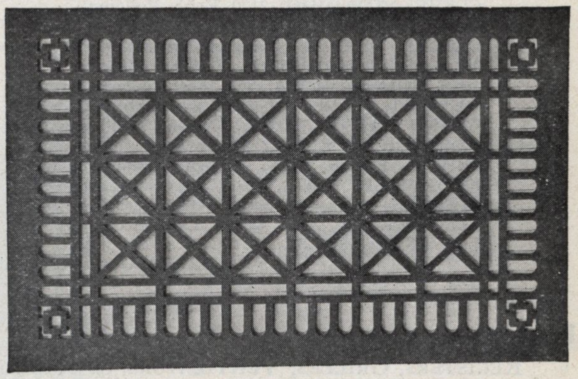
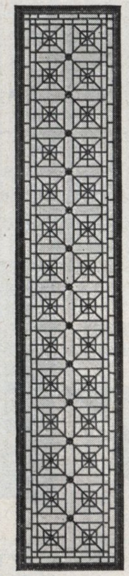
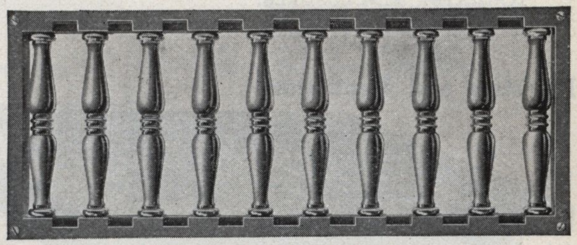
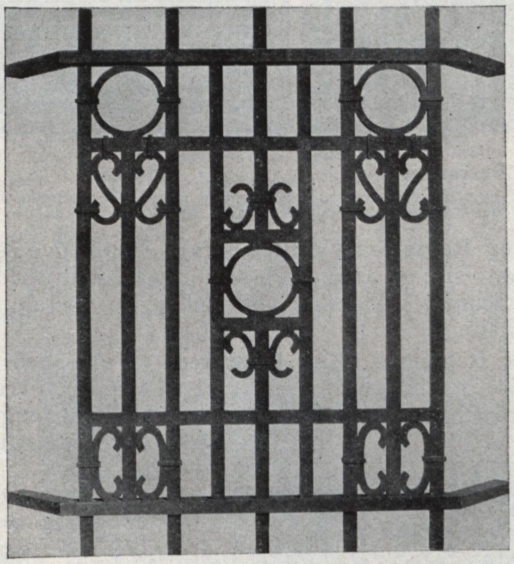

Special Modeled Grille

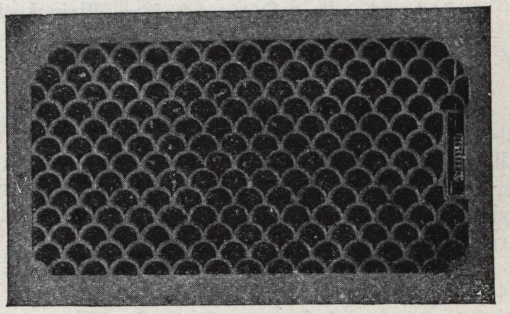

Highton No. 130-B

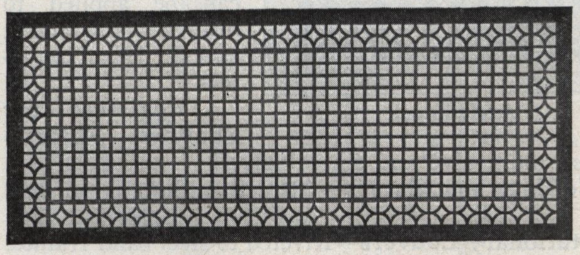

Highton No. 1982

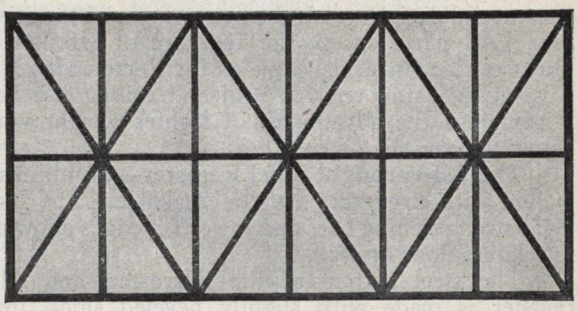

Highton No. 619


Highton No. 100-Y


Highton No. 1002


Highton Shell No. 2


Highton No. 484


Highton No. 106

ESTABLISHED 1846

TUTTLE & BAILEY MFG. CO.

Registers, Ventilators and Grilles

FACTORIES
BROOKLYN, N. Y.
BRIDGEBURG, ONT.

1123 West 37th Street
CHICAGO, ILL.

441 Lexington Avenue
NEW YORK, N. Y.

36 Portland Street
BOSTON, MASS.

704 East 18th Street
KANSAS CITY, MO.

SALES OFFICES

ALBANY, N. Y., 80 South Allen Street
ATLANTA, GA., 608 Walton Building
BALTIMORE, MD., 1107 American Building
BIRMINGHAM, ALA., 2315 Avenue E, South
BUFFALO, N. Y., 409 Parkdale Avenue
CHARLOTTE, N. C., 709 Independence Building
CINCINNATI, OHIO, 401 Mercantile Library Building
CLEVELAND, OHIO, 2120 Keith Building
COLUMBUS, OHIO, 416 Dublin Street
DALLAS, TEX., 616 Slaughter Building
DAYTON, OHIO, 1250 U. B. Office Building
DES MOINES, IOWA, 900 West Douglas Avenue
DETROIT, MICH., 517 East Larned Street
GRAND RAPIDS, MICH., Perkins Building
HOUSTON, TEX., 1612 Miller Street
INDIANAPOLIS, IND., Merchants Bank Building
KNOXVILLE, TENN., 209 West Clinch Avenue
LINCOLN, NEB., 205 South 10th Street
LITTLE ROCK, ARK, 206½ Louisiana Street
LOS ANGELES, CAL., 721 Central Building
LOUISVILLE, KY., Main and 15th Streets
LYNCHBURG, VA., Peoples Bank Building
MEMPHIS, TENN., 216 Madison Avenue
NASHVILLE, TENN., 41 Arcade
NEW ORLEANS, LA., 819 Julia Street
OKLAHOMA CITY, OKLA., Empress Theater Building
OMAHA, NEB., 658 Brandeis Theater Building
PEORIA, ILL., Jobst Building
PHILADELPHIA, PA., 9th and Jefferson Streets
PITTSBURGH, PA., 507 Larimer Avenue
RICHMOND, VA., 119 Mutual Building
ROCHESTER, N. Y., 21-23 South Ford Street
ST. LOUIS, MO., 825 Chemical Building
ST. PAUL, MINN., Jackson and Second Streets
SALT LAKE CITY, UTAH, 605 W. 4th South Street
SAN FRANCISCO, CAL., 942 Phalen Building
SCRANTON, PA., Cedar Avenue Station
SEATTLE, WASH., 501 First Avenue South
SIOUX CITY, IOWA, 609 Pearl Street
SYRACUSE, N. Y., 904 Canal Street
WILKES-BARRE, PA., 904 Second National Bank Building

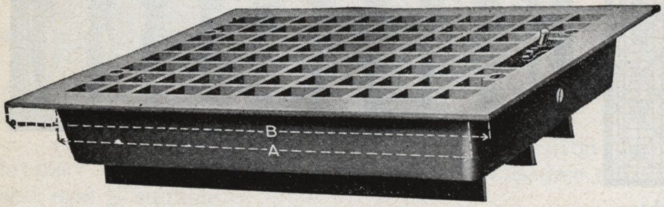
Products

Registers, Grilles, Ventilators, of stock or special design, cast in Ferrocraft iron, bronze and brass, stamped in sheet steel, bronze and brass.

Radiator Enclosures.

78th Annual Catalogue now ready.

Registers and Ventilators



Style 30. Cast Ferrocraft Iron, Plain Lattice

"A," size of opening in floor or wall; "B," extreme size of register face. Registers are catalogued by dimension "A"

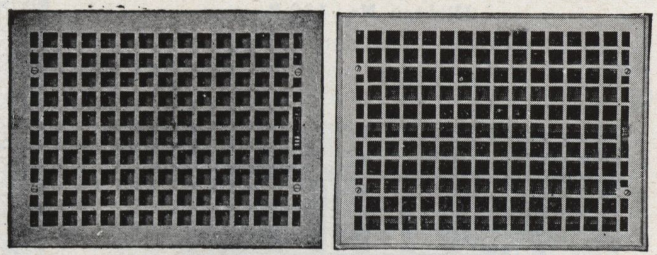
Ferrocraft Registers—The best that can be made. All-cast, with no steel stampings to bend or rust, they will last as long as the building. Faces can be of cast Ferrocraft iron, bronze or brass, and in practically any design, thus making it possible to bring the registers into harmony with the decorative scheme.

The vertical wheel movement, patented by us in 1846, is positive and quiet, and remains today the most satisfactory device for operating the valves.

Ferrosteel Registers (Semi-steel)—Have all the advantages of the cast top—strength, durability and ornamental design—with the light weight of the steel bottom. All parts except the face are of wrought steel. Faces can be furnished same as for Ferrocraft registers. This style is favored for wall and ceiling use because it combines the advantages of lighter weight with the better appearance of cast tops.

The All Wrought Steel Register—Combines light weight with strength. It is unbreakable. The face has rigid strengthening bars and the offset edges allow a close fit against floor or wall.

The steel bottom of the Ferrosteel and All-steel register is made with slightly beveled sides, insuring easy setting, and is shallower than the cast bottom, all sizes up to 12 in. wide being only 2¼ in. deep. The automatic locking device is especially desirable in blower systems; the draught will not open the valves.



Style 60
Ferrosteel

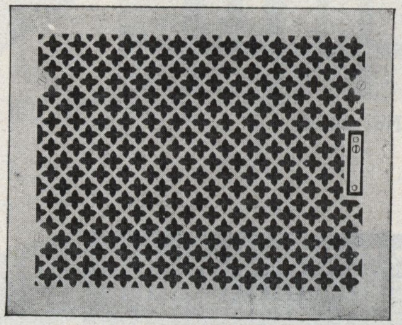
Style 70
All-steel

"T & B" standard registers are designed to allow the maximum flow of warm air without sacrificing appearance or safety

Pulley Registers (Ventilators)—Multivalve registers of any size or design can be equipped with special pulley attachments for wall and ceiling, to operate by cord or chain.

Lock Registers (Key Operated)—Furnished in plain lattice in all sizes of Ferrocraft (Style 31), Ferrosteel (Style 61) and All Wrought Steel (Style 71) registers. Also in Asylum design.

The Asylum design is made with fretwork so small that inmates can not put their fingers in openings. The key operating lock device can be applied to many Ferrocraft special design registers.



Asylum-lock

Registers for Shallow Flues—Convex, multivalve and single valve.

Ceiling Ventilators—Attractive designs in cast iron.

Stationary Louvers—Riveted to steel band frames.

Wire Grilles—Many styles. See catalogue No. 78.

Continued on next page

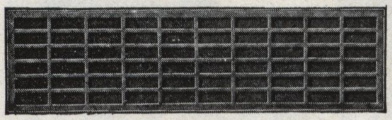
Cold Air Faces—A new cast iron cold air face which meets the requirements of the engineer and will appeal to the house owner.

Floor registers of this cobble design can be supplied in standard sizes.

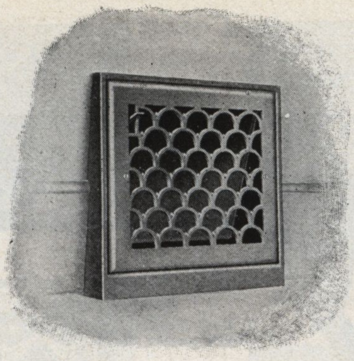
Catalogue page on application.

Baseboard Registers—Intakes—A baseboard register (single valve) with cast face matching in design the baseboard intake for return air.

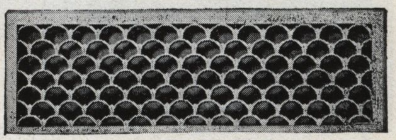
See catalogue No. 78, pages 20 to 23 for standard sizes and designs available.



Style C Cobble



Style 100



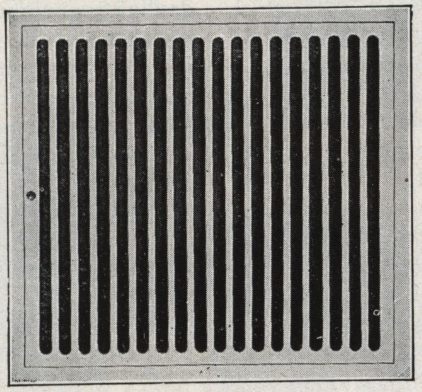
Style N100

Sanitary Registers and Grilles for Hospitals

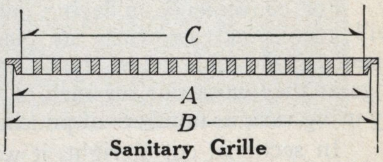
Sanitary registers and grilles are furnished in all standard sizes.

There are no corners where dirt or germs can lodge.

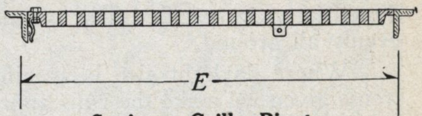
Specifications should state which is the vertical and which the horizontal dimension.



Sanitary Grille
Pivot hinged to angle iron frame



Sanitary Grille
(A) Opening size; (B) extreme size; (C) daylight opening
Note: Opening size "A" runs to even inches

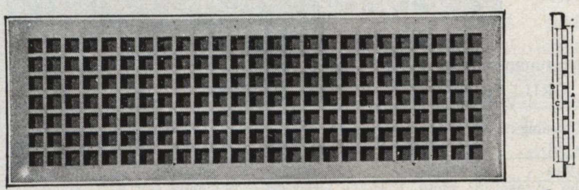


Sanitary Grille Pivot
Hinged to Angle Iron Frame
(E) Extreme of angle return
Note: "E" runs to even inches

Ferrocraft Products

Ferrocraft products mean more than "ornamental iron" and should not be confounded with ordinary foundry work. Made for fine interiors, they are modeled by artists and finished by craftsmen, and if cast in special design to conform to the decorative plan they become objects of beauty as well as utility.

They comprise registers and grilles suitable for all heating and ventilating systems and radiator enclosures, and are made in cast Ferrocraft iron, bronze and brass.



Style 1. Cast Ferrocraft Iron Grille, Plain Lattice, Standard ⅞-in. Mesh

Specify—"Tuttle & Bailey's *Ferrocraft*" for the best in registers and grilles.

How to Specify Ferrocraft Grilles

Floor Grilles—*Grilles for floor use must be so specified.*

Material—Can be cast Ferrocraft iron, bronze or brass.

Sizes—Unless otherwise stated, sizes given will be understood to be "A" (size of opening to be covered). Style No. 1 is carried in semifinished stock in many regular register sizes.

Rims—Are ¾ to 1¼ in. wide according to size of grille; if extreme dimension "B" must be exact it should be so specified. Thickness of rims is always less than fretwork and varies with size of grille. Widths of rims are taken from *back* of grille. They are the difference between dimensions "A" and "B." Dimension "C" is daylight opening.

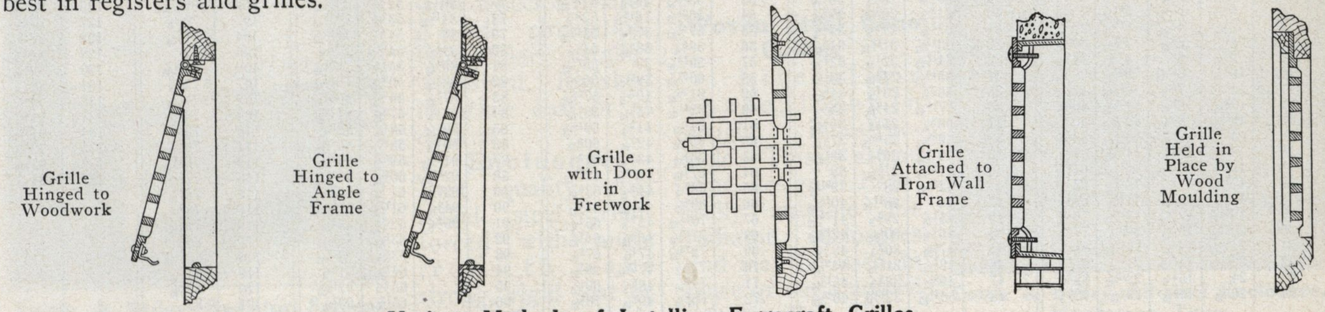
Special Designs—The standard design is Plain Lattice, but some 500 special designs are available, a few of which are shown on second page following. Many are the creations of famous artists and architects and each decorative period is represented. Made to order only, and in any sizes desired.

Finishes—Prime coat, japans, tanbos and electroplates.

Drilling—Rims will not be drilled unless so ordered. If required, state if for machine screws or countersunk for wood screws; if important, indicate location of holes.

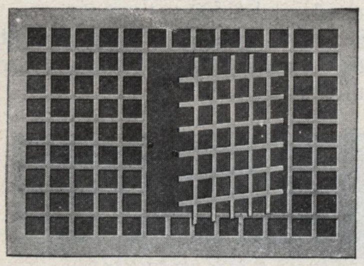
Hinges and Handhole Doors—Location must be given.

Curving—State radius, whether face of grille is curved convex or concave, whether the long way or short way, and if dimensions given are along the chord or the arc.

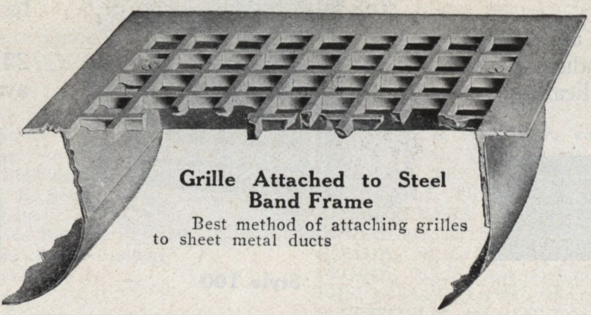

Grille Hinged to Woodwork
Grille Hinged to Angle Frame
Grille with Door in Fretwork
Grille Attached to Iron Wall Frame
Grille Held in Place by Wood Moulding

Various Methods of Installing Ferrocraft Grilles

Continued on next page

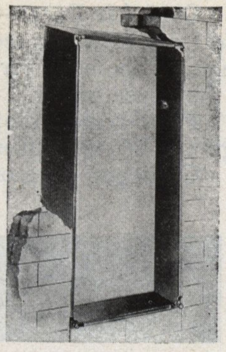


Steel Grille with Handhole Door



Grille Attached to Steel Band Frame

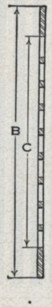
Best method of attaching grilles to sheet metal ducts



Reverse Beveled Cast Iron Wall Frame

Steel Grilles

For convenience in laying out opening sizes which will correspond as nearly as possible to the daylight openings, the table below shows the daylight openings as they work out for each of the four designs by using various numbers of punched holes or units.



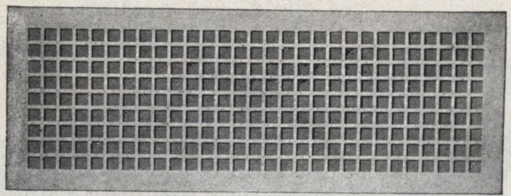
In sectional cut at right, it will be noted that "C" is the daylight opening and "B" the extreme dimension of the grille. The latter can be any size desired except that if both daylight and extreme dimensions are specified the rims may not work out evenly all around.

Where daylight size is specified with no extreme given we make the rims approximately 5/8 to 1 in. all around over daylight size. Where opening in wall and extreme size of grille is given we make the daylight opening the closest approximation to wall opening that will allow a slight overlap of material over opening. It is desirable, however, that daylight opening should be specified so that it will work out to the dimensions indicated in the table.

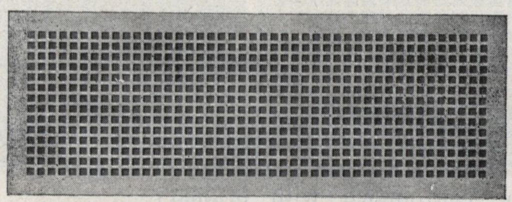
Steel grilles can be furnished in prime coat ready for painting, black or white japanned, in any tanbo finish, or electroplated any standard finish or to match sample.

If so specified, holes can be drilled in the rims, in which case state whether the grilles are to be attached to woodwork, iron framing or marble. The rims will not be drilled unless so ordered.

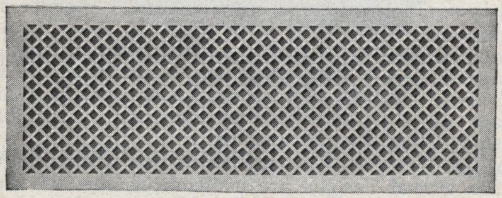
The 78th Annual Catalogue of 76 pages is now ready.



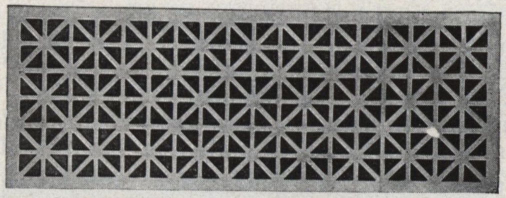
Style "01" Standard 7/8-in. Square Mesh Grille



Style "02" 1/2-in. Square Mesh Grille



Style "03" 1/2-in. Diagonal Mesh Grille



Style "04" 4-in. Grecian Mesh Grille

Note: Any of the designs above can also be stamped from sheet brass or bronze.

DAYLIGHT OPENINGS "C" FOR STEEL GRILLES OF THE ABOVE DESIGNS

Number of punch holes or units	Size of opening "C," in.				Number of punch holes or units	Size of opening "C," in.			Number of punch holes or units	Size of opening "C," in.			Number of punch holes or units	Size of opening "C," in.			Number of punch holes or units	Size opening "C," in.	Number of punch holes or units	Size opening "C," in
	Styles					Styles				Styles				Styles				Style		Style
	01	02	03	04		01	02	03		01	02	03		01	02	03		02		02
1	27/32	1/2	1 3/32	3 1/2	25	26 1/8	17	24 7/16	49	51 3/8	33 1/2	47 3/4	73	76 21/32	50	71 3/32	98	67 3/16	122	83 11/16
2	1 29/32	1 3/16	2 1/16	7 3/8	26	27 5/32	17 11/16	25 13/32	50	52 7/16	34 3/16	48 23/32	74	77 23/32	50 11/16	72 1/16	99	67 7/8	123	84 3/8
3	2 15/16	1 7/8	3 1/32	11 1/4	27	28 7/32	18 3/8	26 3/8	51	53 1/2	34 7/8	49 11/16	75	78 25/32	51 3/8	73 1/32	100	68 9/16	124	85 1/16
4	4	2 9/16	4	15 1/8	28	29 9/32	19 1/16	27 11/32	52	54 17/32	35 9/16	50 21/32	76	79 27/32	52 1/16	74	101	69 1/4	125	85 3/4
5	5 1/16	3 1/4	5	19	29	30 5/16	19 3/4	28 5/16	53	55 19/32	36 1/4	51 21/32	77	80 7/8	52 3/4	74 31/32	102	69 15/16	126	86 7/16
6	6 3/32	3 15/16	5 31/32	22 7/8	30	31 3/8	20 7/16	29 9/32	54	56 21/32	36 15/16	52 5/8	78	81 15/16	53 7/16	75 15/16	103	70 5/8	127	87 1/8
7	7 5/32	4 5/8	6 15/16	26 3/4	31	32 7/16	21 1/8	30 1/4	55	57 23/32	37 5/8	53 19/32	79	83	54 1/8	76 29/32	104	71 5/16	128	87 13/16
8	8 7/32	5 5/16	7 29/32	30 5/8	32	33 15/32	21 13/16	31 7/32	56	58 3/4	38 5/16	54 9/16	80	84 1/32	54 13/16	77 7/8	105	72	129	88 1/2
9	9 9/32	6	8 7/8	34 1/2	33	34 17/32	22 1/2	32 3/16	57	59 13/16	39	55 17/32	81	85 3/32	55 1/2	78 27/32	106	72 11/16	130	89 3/16
10	10 5/16	6 11/16	9 27/32	38 3/8	34	35 19/32	23 3/16	33 3/16	58	60 27/32	39 11/16	56 1/2	82	86 5/32	56 3/16	79 13/16	107	73 3/8	131	89 7/8
11	11 3/8	7 3/8	10 13/16	42 1/4	35	36 5/8	23 7/8	34 5/32	59	61 29/32	40 3/8	57 15/32	83	87 7/32	56 7/8	80 13/16	108	74 1/16	132	90 9/16
12	12 7/16	8 1/16	11 25/32	46 1/8	36	37 11/16	24 9/16	35 1/8	60	62 31/32	41 1/16	58 7/16	84	88 1/4	57 9/16	81 25/32	109	74 3/4	133	91 1/4
13	13 15/32	8 3/4	12 25/32	50	37	38 3/4	25 1/4	36 3/32	61	64 1/32	41 3/4	59 13/32	85	89 5/16	58 1/4	82 3/4	110	75 7/16	134	91 15/16
14	14 17/32	9 7/16	13 23/32	53 7/8	38	39 25/32	25 15/16	37 1/16	62	65 3/32	42 7/16	60 3/8	86	90 3/8	58 15/16	83 23/32	111	76 1/8	135	92 5/8
15	15 19/32	10 1/8	14 23/32	57 3/4	39	40 27/32	26 5/8	38 1/32	63	66 5/32	43 1/8	61 3/8	87	91 13/32	59 5/8	84 11/16	112	76 13/16	136	93 5/16
16	16 5/8	10 13/16	15 11/16	61 5/8	40	41 29/32	27 5/16	39	64	67 3/16	43 13/16	62 11/32	88	92 15/32	60 5/16	85 21/32	113	77 1/2	137	94
17	17 11/16	11 1/2	16 21/32	65 1/2	41	42 31/32	28	39 31/32	65	68 1/4	44 1/2	63 5/16	89	93 17/32	61	86 5/8	114	78 3/16		
18	18 3/4	12 3/16	17 5/8	69 3/8	42	44	28 11/16	40 15/16	66	69 9/32	45 3/16	64 9/32	90	94 9/16	61 11/16	87 19/32	115	78 7/8		
19	19 25/32	12 7/8	18 19/32	73 1/4	43	45 1/16	29 3/8	41 29/32	67	70 11/32	45 7/8	65 1/4	91	95 5/8	62 3/8	88 9/16	116	79 9/16		
20	20 27/32	13 9/16	19 9/16	77 1/8	44	46 1/8	30 1/16	42 29/32	68	71 13/32	46 9/16	66 7/32	92	......	63 1/16	89 17/32	117	80 1/4		
21	21 29/32	14 1/4	20 17/32	81	45	47 5/32	30 3/4	43 7/8	69	72 15/32	47 1/4	67 3/16	93	......	63 3/4	90 17/32	118	80 15/16		
22	22 31/32	14 15/16	21 1/2	84 7/8	46	48 7/32	31 7/16	44 27/32	70	73 1/2	47 15/16	68 5/32	94	......	64 7/16	91 1/2	119	81 5/8		
23	24	15 5/8	22 15/32	88 3/4	47	49 9/32	32 1/8	45 13/16	71	74 9/16	48 5/8	69 1/8	95	......	65 1/8	92 15/32	120	82 5/16		
24	25 1/16	16 5/16	23 7/16	92 5/8	48	50 11/32	32 13/16	46 25/32	72	75 5/8	49 5/16	70 3/32	96	......	65 13/16	93 7/16	121	83		
													97	......	66 1/2	94 13/16				

Note: Gauge for sheet steel, U. S. Standard; for sheet bronze and brass, Browne & Sharpe Standard.

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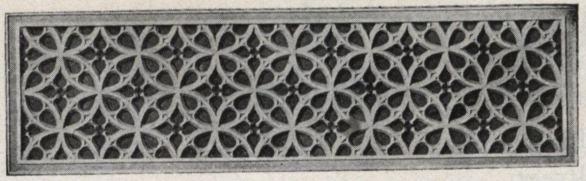
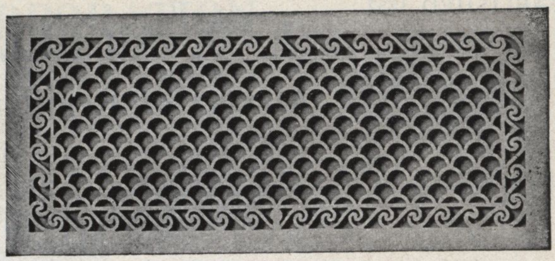
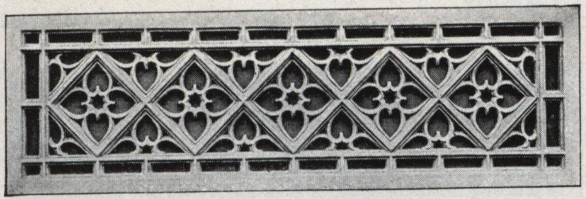


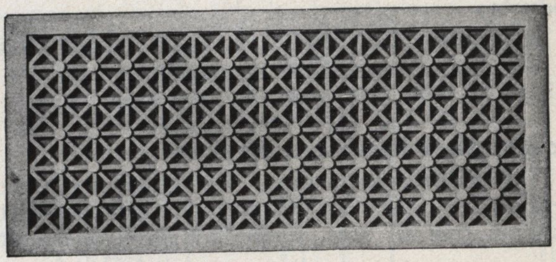
Design No. 257



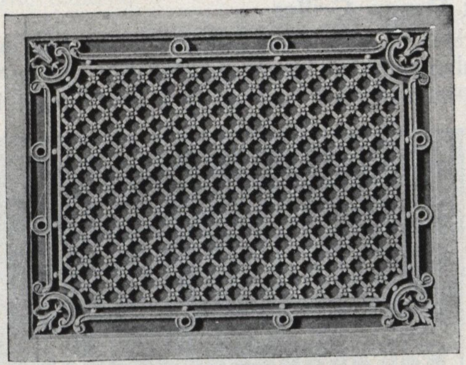
Design No. 118
Scale Design without Scroll Border is Design No. 153



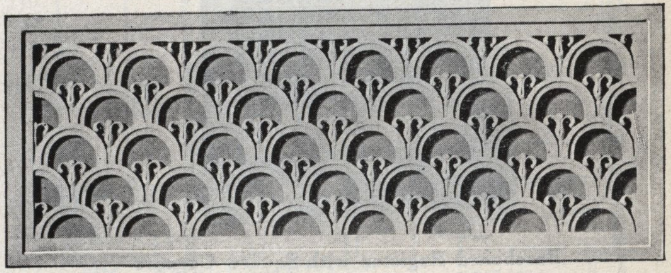
Design No. 371



Design No. 42
Same Design, Flat Face without Buttons is Design No. 43



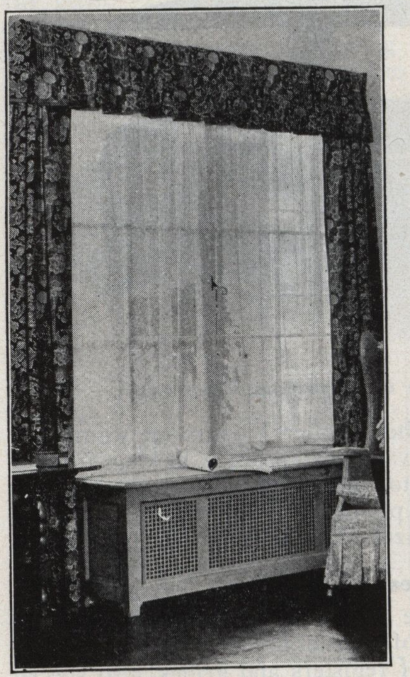
Design No. 83
Same Fretwork, without Ornamental Border is Design No. 84



Design No. 50

Examples of Cast Ferrocraft Grilles in Special Designs

Our unique collection contains 500 special designs, many being shown in our Catalogue No. 78



Tuttle & Bailey Radiator Screens, Lexington Type

Radiator Enclosures

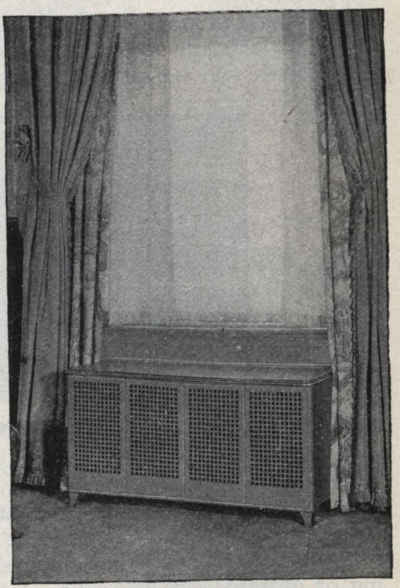
Screens—Strong wooden frames and solid paneled tops and sides, well insulated from heat. Paneled front grilles are stamped steel in ½-in. square mesh. Cast Ferrocraft or woven steel Cane Grilles can be used in place of steel. A steel deflector insures good circulation. Humidifier installed if desired. Finished in prime coat or as desired.

Enclosures—Best quality cold rolled steel, reinforced with angle irons to make strong, rigid seat or shelf. Front panels have ½-in. square mesh openings. We recommend our Tanbo finishes or can be shipped ready for painting. Deflector and humidifier if desired.

Specify—Height, length, depth of radiator (include valve and fittings). Give distance from finished wall to center of radiator, and height of sill, if in window location.

Woven Steel Cane Grilles

Liberal air space, light in weight, indestructible. This is a true cane design. Especially suitable for radiator enclosures and may be used in place of our stamped metal grilles.



Tuttle & Bailey All-steel Enclosure, Henderson Type

ESTABLISHED 1857

L. J. MUELLER FURNACE CO.

Makers of Registers, Grilles and Ventilators

GENERAL OFFICES
230 Reed Street
MILWAUKEE, WIS.

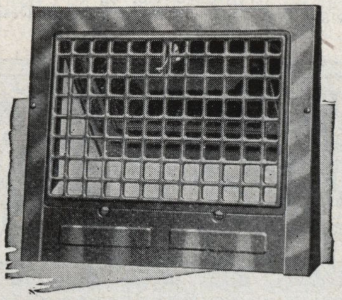
For Branch Offices, see Page 1887

Products

Registers; Grilles; Mushroom Ventilators.
For Combination Hot Water Supply Boilers and Garbage Burners, see page 1887.

Wrought Steel Baseboard Registers

The distinctive features of Mueller Baseboard Registers are: neat appearance, durable construction, maximum free air area, simple and positive operation.



Baseboard Register with Square Corners

Both square and round corner registers are made with a solid one-piece frame, with a removable grille.

These are carried in stock in 6 standard sizes and in a large variety of finishes. Descriptive folder on request, describing popular new "Colonial" finish.

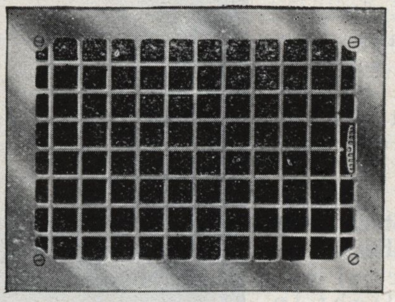
Floor Registers

Plain lattice design—semi-steel construction—boxes and valves of sheet steel, faces cast of semi-steel. These registers have great strength and are unusually neat in appearance.

Carried in stock in all standard sizes and finishes.

Can be made to special order in any size.

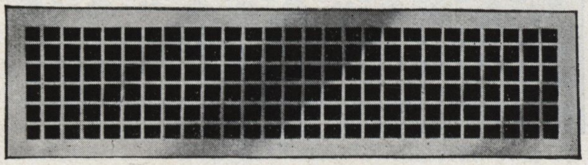
Prices will be quoted on application.



Floor Register

Cast Iron and Steel Grilles

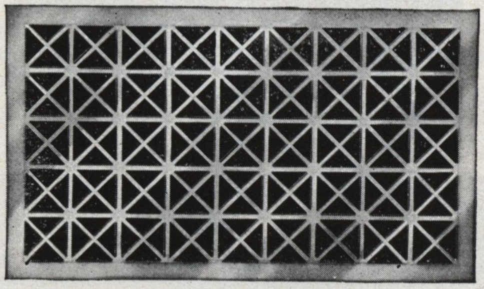
Can be made in any size and finish. Some sizes carried in stock. Any size can be made to order. When ordering, specify whether dimensions are size of opening or extreme size of grille. Can be furnished curved if desired.



Cast Iron or Steel Grille

Special Design Grilles

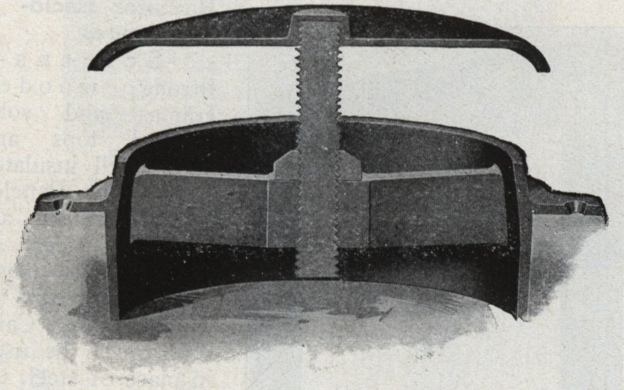
Below is shown one of the many special design grilles that we manufacture, in cast iron, brass or bronze. Send specifications for any grilles desired, for prices.



Special Grille

Mushroom Ventilators

For use in schools, theaters, churches, and public buildings. Easily adjusted to distribute an equal volume of air.



Perspective of Mushroom Ventilator

Advantages—The Mueller Mushroom Ventilator has the following advantages: positive locking feature, no depression in cap to collect dirt, no setscrew projecting; easy, quick and permanent adjustment.

Carried in five sizes: 4, 5, 6, 8 and 10-in. diam.

Catalogue and Prices

Upon request we will furnish illustrated catalogue of our complete line of registers, ventilators and grilles. Prices on odd sizes of registers and grilles, also special design grilles will be submitted on application.

KELVINATOR CORPORATION

Electric Refrigeration for the Home

DETROIT, MICH.

Product

KELVINATOR, an electric Motor Driven Domestic Refrigerating Unit for installation in any standard refrigerator—the oldest product of its kind on the market.

Description

Kelvinator eliminates ice for home refrigeration by substituting a more sanitary and economical means of temperature reduction. It does this by utilizing, in a practical way, the well-known principle of alternately expanding and condensing a gas (sulphur dioxide).

Kelvinator consists of three elements: a refrigerating element that goes in the ice chamber, an air-cooled condensing element placed at any convenient spot within a certain distance of the refrigerator, and an automatic thermostatic control.

The relative positions, design and appearance of these elements are illustrated in the diagrams at the right. The function of each parallels the function of similar elements found in larger refrigeration plants, familiar to all architects and engineers.

Installation

A single hole is drilled through the floor, side or back of the refrigerator for the gas tubes supplying the refrigerating element inside the ice compartment.

The condensing element can be located anywhere within the limits of distance indicated in the diagram. It is commonly placed at the side or on top of the refrigerator or in the basement. Electrical connections are standard. No water is used.

Operation

Operation is entirely automatic. The thermostatic control automatically starts and stops the motor with a quick-make and quick-break switch as the temperature fluctuates within predetermined limits.

There is absolutely no leakage of the refrigerant at any point. All points are permanently gastight. The compressor is equally so, as a "gas-seal" of antifriction metal is used in place of stuffing boxes. The KELVINATOR CORPORATION is prepared to cite instances where Kelvinator has been in service many years without leakage.

DIMENSIONS AND DATA FOR DIFFERENT KELVINATOR UNITS

Size unit icer	Over-all dimensions of freezing tank and *attachments, in.			Minimum recommended dimensions of cooling compartment			Maximum Cubic contents of refrigerator	Average maximum connected load in watts	Ice cube capacity	10-lb. cake of ice	Over-all dimensions of condensing unit, in.		
	Width	Depth (front to rear)	Height	Width	Depth	Height					Width	Length	**Height with legs
05 Side	10	11	16½	11½	12½	17	5	200	15	0	17	30¼	24⅝
510 Side	10	12	19½	11½	14½	20	10	200	42	0	17	30¼	24⅝
1015 Side	10	12½	21½	12	15	22	15	200	63	0	17	30¼	24⅝
1520 Jr. Side	12	13	23½	14	16	24	20	200	63	0	17	30¼	24⅝
1520 Sr. Side	12	13	25½	14	16	26	20	300	42	1	17	30¼	26½
2028 N. Side	12	13	28½	15	17	29	28	300	42	1	17	30¼	26½
2028 W. Side	14	14	24½	17	18	25	28	300	42	1	17	30¼	26½
2836 N. Side	12	13	32½	16	18	33	36	300	42	1	17	30¼	26½
2836 W. Side	14	14	27½	18	19	28	36	300	42	1	17	30¼	26½
3645 N. Side	12	15	34½	18	21	35	45	300	63	1	17	30¼	26½
3645 W. Side	16	14	29½	22	20	30	45	300	63	1	17	30¼	26½
05 Top	16	11	10⅛	17	13	11½	5	200	15	0	17	30¼	24⅝
510 Top	19	12	12⅛	20	14	13½	10	200	42	0	17	30¼	24⅝
1015 Top	22	12½	12⅛	23½	14½	13½	15	200	63	0	17	30¼	24⅝
1520 Top	26	12	13⅛	27½	14	14½	20	200	63	0	17	30¼	24⅝
2028 Top	29	12½	13⅛	31	15	15	28	300	42	1	17	30¼	26½
2836 Top	31	13	13⅛	33	15½	15	36	300	42	1	17	30¼	26½
3645 Top	33	13	15⅛	35	16	17	45	300	63	1	17	30¼	26½

*Includes thermostat and expansion valve mounting for which 8½ in. are allowed.

**Height of legs with rubber tip 6⅜ in.

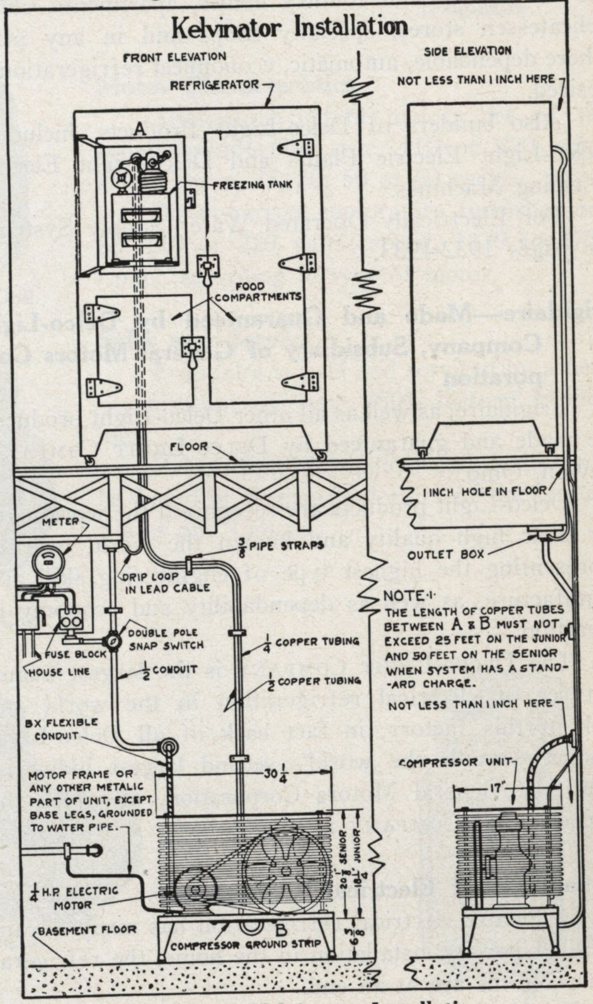
Special sizes from 45 to 150 cu. ft.

Specifications

For architects, special data, of size to fit architect's files, has been prepared. Copies on request.

Indorsements

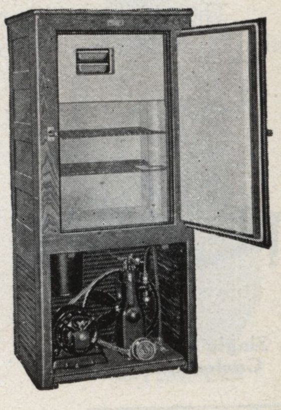
Kelvinator has been tested and indorsed by the: New York Tribune Institute; Good Housekeeping Institute; Modern Priscilla Proving Plant; Hydro Electric Power Commission of Ontario, Canada; Investigating Committee of Architects and Engineers, 7 E. 42nd Street, New York, N. Y.


Kelvinator Installation
FRONT ELEVATION
SIDE ELEVATION
REFRIGERATOR
NOT LESS THAN 1 INCH HERE
A
FREEZING TANK
FOOD COMPARTMENTS
FLOOR
1 INCH HOLE IN FLOOR
METER
3/8 PIPE STRAPS
OUTLET BOX
DRIP LOOP IN LEAD CABLE
NOTE·1·
THE LENGTH OF COPPER TUBES BETWEEN A & B MUST NOT EXCEED 25 FEET ON THE JUNIOR AND 50 FEET ON THE SENIOR WHEN SYSTEM HAS A STANDARD CHARGE.
DOUBLE POLE SNAP SWITCH
1/4 COPPER TUBING
FUSE BLOCK
HOUSE LINE
1/2 CONDUIT
1/2 COPPER TUBING
NOT LESS THAN 1 INCH HERE
BX FLEXIBLE CONDUIT
COMPRESSOR UNIT
30 1/4
17"
MOTOR FRAME OR ANY OTHER METALIC PART OF UNIT, EXCEPT BASE LEGS, GROUNDED TO WATER PIPE.
20 1/8" SENIOR
18 1/4" JUNIOR
1/4 H.P. ELECTRIC MOTOR
6 3/8
BASEMENT FLOOR
B
COMPRESSOR GROUND STRIP

A Typical Kelvinator Installation

The Kelvin.et

The Kelvin.et is a self-contained unit, especially suited for apartment houses and smaller homes. Cabinet is finished in white enamel, golden oak varnished, or with a prime coat in white for finishing to harmonize with woodwork.



Exterior dimensions: 60¼ in. high; 27 in. wide, over all; 25½ in. deep, over all.

The only installation necessary is "plugging-in" on the electric circuit. Complete specifications in catalogue sent on request.

FRIGIDAIRE ELECTRIC REFRIGERATION

Made and Guaranteed by

DELCO-LIGHT COMPANY

SUBSIDIARY OF GENERAL MOTORS CORPORATION

DAYTON, OHIO

DELCO-LIGHT CO. OF CANADA, LTD., 245 Carlow Avenue, TORONTO, ONT.

Products

Frigidaire Automatic Electric Refrigeration for use in city and country homes, apartments, clubs, delicatessen stores, specialty shops and in any place where dependable, automatic, economical refrigeration is desired.

Also builders of Delco-Light Products, including Delco-Light Electric Plants and Delco-Light Electric Washing Machines.

For Electrically Operated Water Supply Systems, see pages 1932-1933.

Frigidaire—Made and Guaranteed by Delco-Light Company, Subsidiary of General Motors Corporation

Frigidaire, as well as all other Delco-Light products, are made and guaranteed by Delco-Light Company, Dayton, Ohio.

Delco-Light products are recognized the world over for their high quality and known the world over as representing the highest type of engineering skill and manufacture, as well as dependability and economy in operation.

The Delco-Light Company is the largest manufacturer of electrical refrigeration in the world and back of this factory, in fact back of all Delco-Light products, stands the world's second largest industrial plant, the General Motors Corporation, of which the Delco-Light Company is a subsidiary.

Advantages of Electrical Refrigeration

Frigidaire electrical refrigeration has many advantages. Upon its installation in the home, the refrigeration problems are at an end.

Frigidaire not only solves refrigeration problems but it gives clean, dry, sanitary refrigeration that is better in every way than any other method known.

The safeguarding of the health of the family is alone sufficient reason for the installation of Frigidaire. Government experts require for the safe keeping of food a temperature in the warmest part of the refrigerator ranging between 40° and 50° F., never higher than 50° F.

Frigidaire maintains a temperature in the food compartment that is well within these limits.

Model B-5-2 Frigidaire

This is a complete cabinet model of Frigidaire in which a single cylinder, air cooled mechanism is built into a specially designed and constructed cabinet.

Model B-5-2 fills the need for dependable refrigeration at a very low price. It has over 4½ cu. ft. of food storage capacity, stands 59¼ in. high, is 26¼ in. wide and 22 in. deep.

Model B-9 Frigidaire

Model B-9 Frigidaire is the size ordinarily installed in the home where a complete unit with cabinet and mechanism combined is desired.

Attractive in design and pleasing in appearance, Frigidaire is a highly prized article of kitchen equipment.

This model has 9 cu. ft. of food storage capacity, stands 67¼ in. high, is 39 in. wide and 24¾ in. deep.

Model B-15 Frigidaire

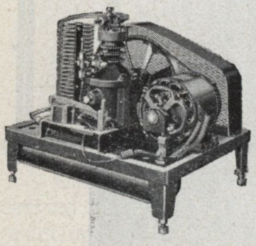
Because of its greater food storage capacity, this model Frigidaire is well adapted to the needs of the large home, restaurant, delicatessen or small specialty shop.

This model has 15½ cu. ft. of food storage capacity, stands 67¼ in. high, is 59 in. wide and 24¾ in. deep.

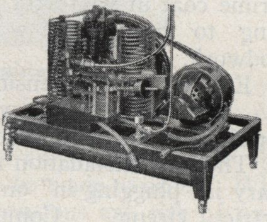
Frigidaire Can Be Installed in Any Ice Box

The wide range of Frigidaire models makes it adaptable to any requirement, large or small.

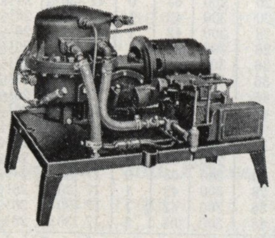
It can be installed in any good ice box. The Frigidaire "Frost Coil" is placed in the ice compart-



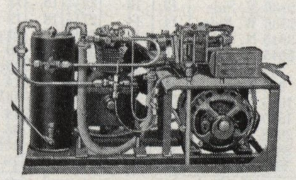
Single Cylinder Air Cooled Compressor



Twin Cylinder Air Cooled Compressor



Water Cooled Household Compressor



Commercial Compresser for Large Installations

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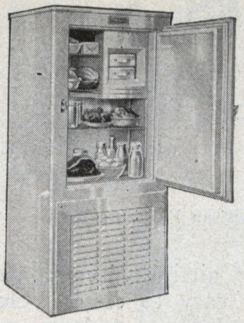
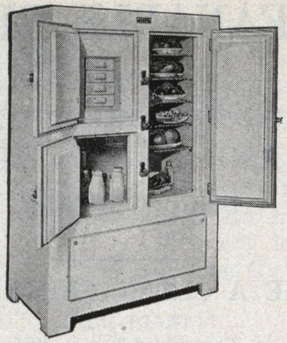
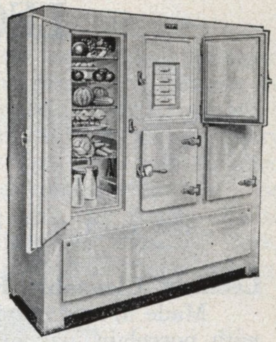

Model B-5-2 Frigidaire


Model B-9 Frigidaire

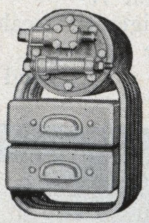

Model B-15 Frigidaire

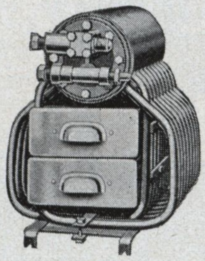
ment of the refrigerator, the mechanism is placed in the basement, the two are connected by two small copper tubes, and an electrical connection is made. This is all that is necessary to equip any ice box with Frigidaire.

Frigidaire for Commercial Purposes

With the addition of the Model 500 Frigidaire compressor to the line, Frigidaire is available for use in meat markets, restaurants, schools, hospitals and in fact every place where ice is now used for refrigeration.

Frigidaire not only gives better refrigeration, but it brings complete freedom from the possible annoyance and uncertainty of an outside ice supply.


V-8 Frost Coil


V-10 Frost Coil

Motor Characteristics

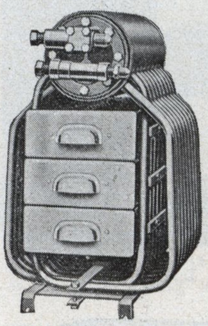
Alternating-current motors are of the repulsion-induction type, 110 or 220 volts, single phase, 25, 30, 50 or 60 cycles.

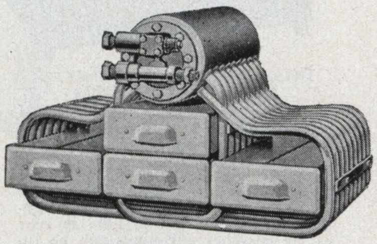
Direct-current motors are furnished for 32, 110 or 220 volts; speed, 1420 to 1750 r.p.m., according to type of motor.

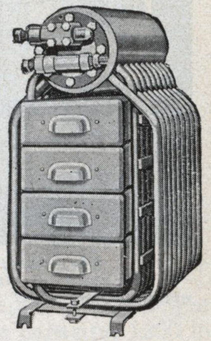
Sales and Service

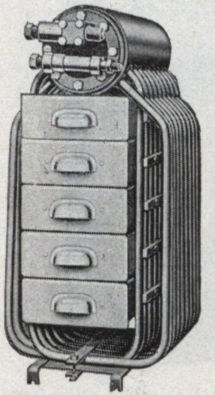
Frigidaire is sold and serviced by a field organization of over 3500 factory trained men.

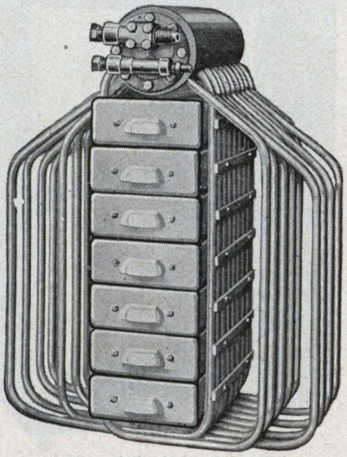
Delco-Light distributors and dealers will be found in all principal cities of the United States and Canada.

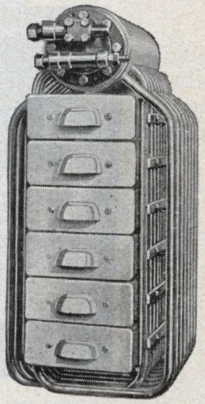

V-20 Frost Coil


H-25 Frost Coil


V-25 Frost Coil


V-35 Frost Coil


V-75 Frost Coil


V-50 Frost Coil

LEONARD CLEANABLE REFRIGERATORS

Made by

GRAND RAPIDS REFRIGERATOR COMPANY

GRAND RAPIDS, MICH.

BRANCH OFFICES

NEW YORK, N. Y., Worlds Tower Building

CHICAGO, ILL., American Furniture Mart

"LIKE A CLEAN CHINA DISH"

TRADE-MARK
Copyrighted May 11, 1915

Leonard Cleanable Refrigerators

Made in many styles and sizes, with porcelain, oak and ash cases, lined with white or gray porcelain or white enamel.

Especially constructed for use with electrical refrigerating machines. Detachable bases for refrigerating machines can be supplied when required (see illustration below).

Our one-piece porcelain linings consist of three coats of porcelain fused on heavy Armco iron. This porcelain will not crack nor craze, and is non-porous. Linings are slightly depressed at the bottom to prevent spilled materials from running out, and have full rounded corners to facilitate cleaning. Compartments are connected by airtight joints, also rounded and easy to clean. Our all-porcelain refrigerators have casings made of the same material as the one-piece lining.

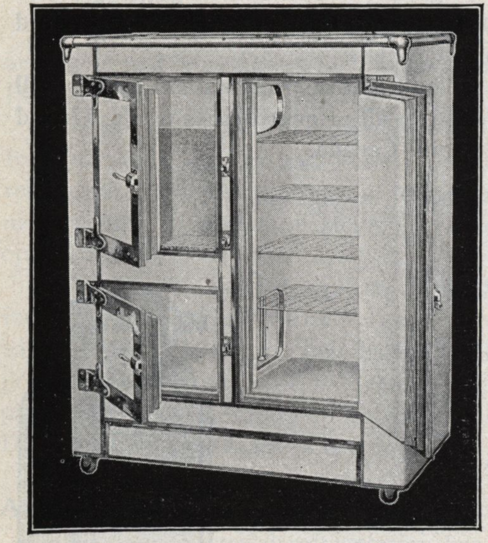
The insulation consists of 1½-*in. pressed corkboard* sealed with wool felt and asphalt felt.

Locks and hinges are of the most approved design and made of heavily nickelplated brass.

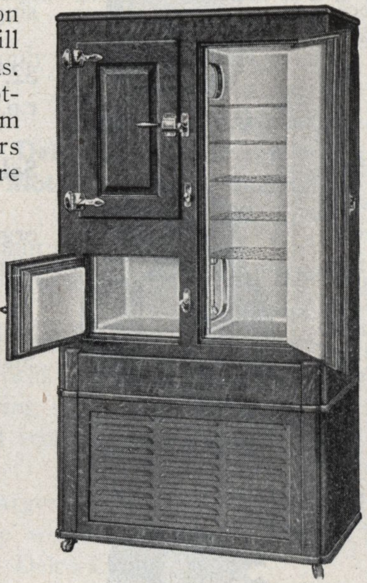
Any of our refrigerators can be furnished with rear or end icing doors, or water coolers, if desired.

Catalogue

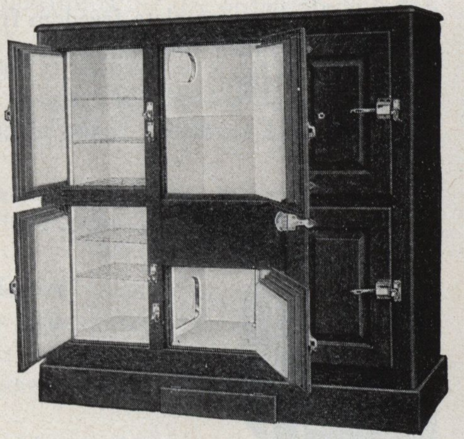
Complete catalogue illustrating and describing 80 styles and sizes will be mailed on request.



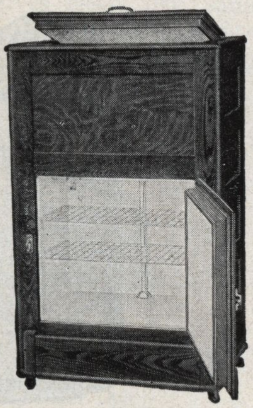
Three-door, All-porcelain Style
We make 10 sizes in all-porcelain, including overhead and center icing types



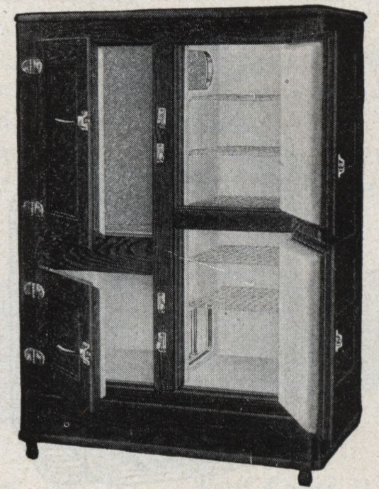
Detachable Bases for Electrical Refrigerating Machines
These bases raise the height of refrigerator 18 in. Finished to harmonize with refrigerator. Louvered for ventilation. Back is open and front is removable for installation of refrigerating machine. Stud bolts in ceiling of ice chamber for support of brine tank and hole in rear of ice chamber for pipes can be installed at slight extra cost



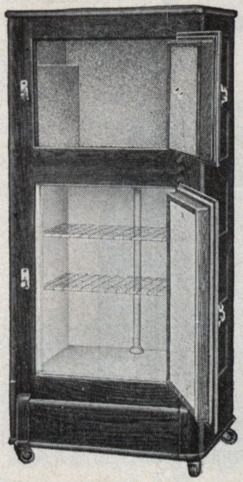
Six-door Center Icing Style



Lift Lid, Top Icing Style



Four-door Side Icing Style



Apartment House Overhead Icing Style

Leonard Cleanable Refrigerators

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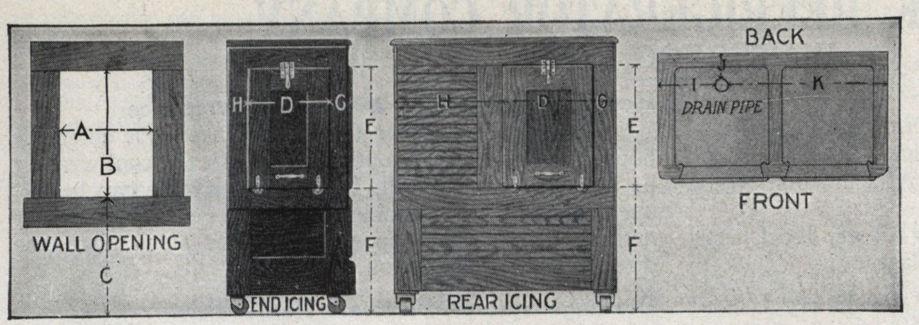

Explanation of Lettering

§A—Width of opening in wall
§B—Height of opening in wall
C—Distance from floor to bottom of opening
D—Width of rear icing door
E—Height of rear icing door
*F—Distance from floor to bottom of door
G—Distance from right end of refrigerator to door
H—Distance from left end of refrigerator to door
I—Distance from center of drain to right end of refrigerator
J—Distance from center of drain to back of refrigerator
K—Distance from center of drain to left end of refrigerator

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*Deduct 2 in. if no casters are wanted.

§Allow 2 in. top and bottom and 1½ in. on each side for door in exterior wall. Allow more for a very thick brick or stone wall

Measurements for Locating Wall Openings for Outside Icing in Side Icing Refrigerators

Taken when facing the back of the refrigerator

Side Ice Chambers with Rear Doors

Ref. No.	Locating door in outside wall			Locating door in back of refrigerator					Locating drain pipe		
	§A	§B	C	D	E	*F	G	H	I	J	K
012**	15⅝	20½	22⅜	12⅝	16½	24⅜	3¼	17⅝	14¾	4	18¾
12**	16¾	23	21⅞	13¾	19	23⅞	3	17½	9⅞	4¼	24½
14**	16⅝	23⅛	24	13⅝	19⅛	26	3⅞	19¼	16⅛	4	20⅝
15**	17¾	28⅜	23¼	14¾	24⅜	25¼	3⅞	20⅜	17⅜	4	21⅝
16**	18½	27¾	26⅞	15½	23¾	28⅞	3⅞	21¼	18¼	4	22⅜
17**	18⅝	28¼	30⅞	16⅝	24¼	32⅞	3⅞	22½	19½	4¼	23½
18**	21⅜	28¼	32⅞	18⅜	24¼	34⅞	3⅞	24	21⅛	4¼	25⅛
20	21⅜	28⅛	31	18⅜	24⅛	33	21⅛	21⅛	30⅜	4¼	30⅜
4	16⅞	23	23¼	13⅞	19	25¼	3¼	18⅝	15½	4¼	20
5	18	27⅞	24	15	23⅞	26	3⅛	19⅝	16⅝	4¼	21⅛
6	19	28¾	26	16	24¾	28	3⅛	20½	17⅝	4¼	22
7	20	28⅜	28¾	17	24⅜	30¾	3⅛	21⅝	18⅝	4¼	23⅛
8	21⅞	28½	33⅝	18⅞	24½	35⅝	3⅛	23½	20½	4¾	25
10	21⅞	28½	31⅞	18⅞	24½	33⅞	20½	20½	30¾	4¼	30¾
4403	15⅞	21	21⅜	12⅞	17	23⅜	3	16⅞	9¼	4⅛	23⅜
4404	16⅛	22⅛	22¾	13⅛	18⅛	24¾	3	17⅛	9⅜	4⅛	24
4405	16½	22½	23⅝	13½	18½	25⅝	3¼	18⅛	15⅜	4⅛	19½
4406	16¾	27⅞	22½	13¾	23⅞	24½	3¼	18⅝	15¾	4⅛	19⅞
4407	16¾	28¼	23¼	13¾	24¼	25¼	3¼	18⅝	15¾	4⅛	19⅞
4412	18⅛	28⅜	24	15⅛	24⅜	26	3¼	19¾	17	4⅛	21⅛
4413	18¾	27½	29⅛	15¾	23½	31⅛	3¼	20½	17½	4⅛	22
4415	21⅞	28½	33⅝	18⅞	24½	35⅝	3⅛	23½	20½	4¾	25
973	15¾	21	22⅜	12¾	17	24⅜	2⅜	16¼	8¾	4⅛	22¾
974	16¼	22⅛	22¾	13¼	18⅛	24¾	2⅜	16¾	9	3⅞	23¼
975	16¾	27⅞	23½	13¾	23⅞	25½	2¾	18¼	15⅛	3¾	19⅝
1073	15¾	21	22⅜	12¾	17	24⅜	2⅜	16¼	8¾	4⅛	22¾
1074	16¼	22⅛	22¾	13¼	18⅛	24¾	2⅜	16¾	9	3⅞	23¼
1075	16¾	27⅞	23½	13¾	23⅞	25½	2¾	18¼	15⅛	3¾	19⅝
1173	16	21⅜	21	13	17⅜	23	2⅞	16¾	14¼	4¼	18¼
1174	16⅜	22½	22¼	13⅜	18½	24¼	2⅞	17¼	9½	4⅛	24⅛
1175	17¼	27¾	23¼	14¼	23¾	25¼	3⅛	18¼	15½	4⅛	20¼
1273	16	21⅜	21	13	17⅜	23	2⅞	16¾	14¼	4¼	18¼
1274	16⅜	22½	22¼	13⅜	18½	24¼	2⅞	17¼	9½	4⅛	24⅛
1275	17¼	27¾	23¼	14¼	23¾	25¼	3⅛	18¼	15½	4⅛	20¼
7130	13¼	19⅞	19¼	10¼	15⅞	21¼	2⅜	13⅞	7¼	3⅜	19¼
7131	13¾	21⅛	20	10¾	16⅞	22	2⅜	14⅜	7¾	3⅜	19¾
7132	15⅝	22¼	20⅝	12⅝	18¼	22⅝	2⅜	16	8⅞	3½	22⅛
7133	15⅝	23¼	21⅝	12⅝	19¼	23⅝	2⅜	16	8⅞	3½	22⅛
7134	15¾	27¼	20	12¾	23¼	22	2⅜	16¼	9	3½	22¼
8134	16⅛	23¼	20⅝	13⅛	19¼	22⅝	2¾	17⅜	9⅜	3½	23⅞
8135	17	27¾	21⅜	14	23¾	23⅜	2¾	18¼	9¾	3½	25¼
8107	17½	27¾	25⅛	14½	23¾	27⅛	3⅛	19⅜	10⅜	3⅞	26⅝

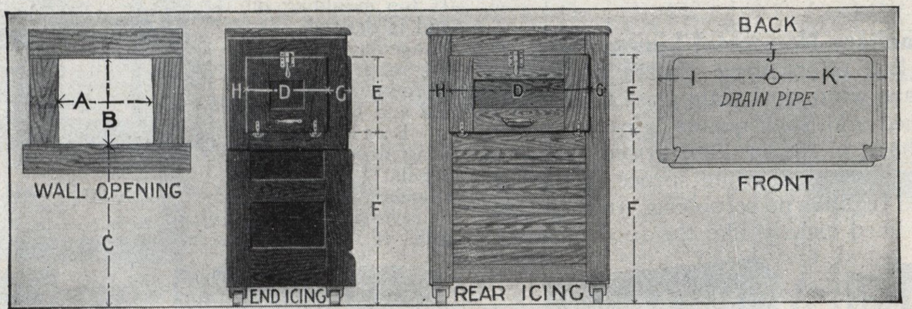
*Deduct 2 in. if no casters are wanted.

§Allow 2 in. top and bottom and 1½ in. on each side for door in exterior wall. Allow more for a very thick brick or stone wall.

Side Ice Chambers with End Doors

Ref. No.	Locating door in outside wall			Locating door in end of refrigerator					Locating drain pipe		
	§A	§B	C	D	E	*F	G	H	I	J	K
012**	15⅝	20½	22⅜	12⅝	16½	24⅜	3⅝	4⅛	14¾	4	18¾
12**	16¾	23	21⅞	13¾	19	23⅞	3¾	4⅛	9⅞	4¼	24½
14**	16⅝	23⅛	24	13⅝	19⅛	26	3⅞	4¼	16⅛	4	20⅝
15**	17¾	28⅜	23¼	14¾	24⅜	25¼	3½	3⅞	17⅜	4	21⅝
16**	18½	27¾	26⅞	15½	23¾	28⅞	4¼	4¼	18¼	4	22⅜
17**	18⅝	28¼	30⅞	16⅝	24¼	32⅞	3¾	4	19½	4¼	23½
18**	21⅜	28¼	32⅞	18⅜	24¼	34⅞	3¾	4	21⅛	4¼	25⅛
4	18¼	23	23¼	15¼	19	25¼	2¾	3⅛	15½	4¼	20
5	18	27⅞	24	15	23⅞	26	3	3⅜	16⅝	4¼	21⅛
6	20¼	28¾	26	17¼	24¾	28	2¾	3⅛	17⅝	4¼	22
7	20	28⅜	28¾	17	24⅜	30¾	3	3⅜	18⅝	4¼	23⅛
8	21⅞	28½	33⅝	18⅞	24½	35⅝	3¼	3⅛	20½	4¾	25
4403	15¼	21	21⅜	12¼	17	23⅜	2¾	3⅛	9¼	4⅛	23⅜
4404	17⅝	22⅛	22¾	14⅝	18⅛	24¾	2⅜	2¾	9⅜	4⅛	24
4405	18½	22½	23⅝	15½	18½	25⅝	2⅜	2¾	15⅜	4⅛	19½
4406	18⅝	27⅞	22½	15⅝	23⅞	24½	2½	2⅞	15¾	4⅛	19⅞
4407	18¾	28¼	23¼	15¾	24¼	25¼	2⅜	2¾	15¾	4⅛	19⅞
4412	18½	28⅜	24	15½	24⅜	26	3	2⅞	17	4⅛	21⅛
4413	20½	27½	29⅛	17½	23½	31⅛	2⅞	2¾	17½	4⅛	22
4415	21⅞	28½	33⅝	18⅞	24½	35⅝	3¼	3⅛	20½	4¾	25
973	14¼	21	22⅜	11¼	17	24⅜	2¾	2¾	8¾	4⅛	22¾
974	16½	18⅛	22¾	13½	18⅛	24¾	2¾	2¾	9	3⅞	23¼
975	17½	27⅞	23½	14½	23⅞	25½	2¾	2¾	15⅛	3¾	19⅝
1073	14¼	21	22⅜	11¼	17	24⅜	2¾	2¾	8¾	4⅛	22¾
1074	16½	18⅛	22¾	13½	18⅛	24¾	2¾	2¾	9	3⅞	23¼
1075	17½	27⅞	23½	14½	23⅞	25½	2¾	2¾	15⅛	3¾	19⅝
1173	16	21⅜	21	13	17⅜	23	2¾	2¾	14¼	4¼	18¼
1174	16⅜	22½	22¼	13⅜	18½	24¼	3½	3½	9½	4⅛	24⅛
1175	17¼	27¾	23¼	14¼	23¾	25¼	3¼	3¼	15½	4⅛	20¼
1273	16	21⅜	21	13	17⅜	23	2¾	2¾	14¼	4¼	18¼
1274	16⅜	22½	22¼	13⅜	18½	24¼	3½	3½	9½	4⅛	24⅛
1275	17¼	27¾	23¼	14¼	23¾	25¼	3¼	3¼	15½	4⅛	20¼
7130	13⅜	19⅞	19¼	10⅝	15⅞	21¼	2½	2¼	7¼	3⅜	19¼
7131	14⅜	21⅛	20	11⅜	16⅞	22	2½	2¼	7¾	3⅜	19¾
7132	14	22¼	20⅝	11	18¼	22⅝	2¾	2¾	8⅞	3½	22⅛
7133	15¼	23¼	21⅝	12¼	19¼	23⅝	2¾	2¾	8⅞	3½	22⅛
7134	15¼	27¼	20	12¼	23¼	22	2¾	2¾	9	3½	22¼
8134	17	23¼	20⅝	14	19¼	22⅝	2¾	2¾	9⅜	3½	23⅞
8135	16¾	27¾	21⅜	13¾	23¾	23⅜	3	3	9¾	3½	25¼
8107	18¼	27¾	25⅛	15¼	23¾	27⅛	3⅜	3⅛	10⅜	3⅞	26⅝

**End icing doors on Nos. 012, 12, 14, 15, 16, 17 and 18 swing on hinges and are not detachable.



Measurements for Locating Wall Openings for Outside Icing in Overhead Icing Refrigerators

Taken when facing the back of the refrigerator

Overhead Ice Chambers with Rear Doors

Ref. No.	Locating door in outside wall			Locating door in back of refrigerator					Locating drain pipe		
	§A	§B	C	D	E	*F	G	H	I	J	K
011**	21¼	16½	26½	18¼	12½	28½	3½	3½	13	4	13
11**	22	17¾	34¼	19	13¾	36¼	3⅞	3⅞	13⅜	4	13⅜
4409	27⅛	16⅞	32¼	24⅛	12⅞	34¼	3	3	15⅛	4⅛	15⅛
7109	18¾	16½	30⅝	15¾	12½	32⅝	2⅜	2⅜	10¼	3⅜	10¼
7110	22¾	17½	31⅝	19¾	13½	33⅝	2⅜	2⅜	12¼	2¾	12¼
7111	21¾	16¾	34⅜	18¾	12¾	36⅜	2⅜	2⅜	11¾	2¾	11¾
7112	26½	16¾	30⅜	23½	12¾	32⅜	2⅜	2⅜	14⅛	2¾	14⅛

*Deduct 2 in. if no casters are wanted.

§Allow 2 in. top and bottom and 1½ in. on each side for door in exterior wall. Allow more for a very thick brick or stone wall.

Overhead Ice Chambers with End Doors

Ref. No.	Locating door in outside wall			Locating door in end of refrigerator					Locating drain pipe		
	§A	§B	C	D	E	*F	G	H	I	J	K
011**	13¾	16½	26½	10¾	12½	28½	3⅝	4½	13	4	13
11**	13⅛	17¾	34¼	10⅛	13¾	36¼	4¼	4⅝	13⅜	4	13⅜
4409	16⅜	16⅞	32¼	13⅜	12⅞	34¼	2⅜	2¾	15⅛	4⅛	15⅛
7109	12¼	16½	30⅝	9¼	12½	32⅝	2¾	2¾	10¼	3⅜	10¼
7110	14½	17½	31⅝	11½	13½	33⅝	2¾	2¾	12¼	2¾	12¼
7111	14½	16¾	34⅜	11½	12¾	36⅜	2¾	2¾	11¾	2¾	11¾
7112	14¾	16¾	30⅜	11¾	12¾	32⅜	2¾	2¾	14⅛	2¾	14⅛

**End icing doors on Nos. 011 and 11 swing on hinges and are not detachable.

HERRICK REFRIGERATOR COMPANY

WATERLOO, IOWA

Products

Herrick Refrigerators; Special Built-in Residence Refrigerators with Herrick Outside Icing Convenience. Water Cooler Attachments when specified.

Also manufacturers of Display Cases, Ice Chests, Ice Cream Cases, Soda Fountain Bases.

The "Aristocrat of Refrigerators" for Every Use

Every refinement known to refrigerator specialists is found in the Herrick. Material and workmanship are the best, based on a refrigerator building experience of thirty years.

The line includes models specially designed for homes, hotels, clubs, cafes, stores, dining cars, hospitals, etc. Government buildings, state institutions, and United States battleships are Herrick equipped. Hundreds of architects specify this refrigerator.

The Herrick 22 quality features assure the highest degree of serviceability, durability, beauty and economy.

A Feature of Many Exclusive Apartment Buildings

A growing number of high class apartment buildings are equipped with Herrick refrigerators. They thoroughly match the magnificence and refinement of the finest apartments. Names and locations of such buildings may be obtained by writing to the manufacturer.

Mineral Wool Insulation, Proved Best by Test

Every wall and panel door is packed heavily and absolutely tight with genuine mineral wool, sterilized by melting, then blown to small particles.

No form of animal life can exist in this material. Hence the walls are always dry, cold and absolutely clean. We advertise an open offer to bore clear through the walls of any Herrick, exposing the inside construction and insulation in competition with any other refrigerator made.

Correct Dry Air Circulation System

Scientifically correct interior design guarantees perfect circulation of air, giving a dryness, frigidity and purity that keeps food free indefinitely from mould, taint, decay, and interchange of odors and flavors.

Three Kinds of Sanitary Non-metal Linings

The Herrick line offers three classes of linings. The finest styles have white opal plate glass throughout. Some styles are lined with high quality, glossy, durable white enamel. Others, in the medium priced class, are lined with a sanitary, odorless white spruce lining that never gets damp and requires no scrubbing. In each class the ice chamber is lined exactly like the food chamber.

Herrick Outside Icing a Great Convenience

During the summer the iceman need not enter the house to fill a Herrick outside icer. In the cool weather he need not come at all, for the outer door can be left open, allowing the outside air to enter the ice chamber and circulate. See opposite page for stock sizes and directions for installation.

Drainage System, Parts are Removable

Lower end of drain pipe in a Herrick has a patented trap. This prevents entrance of warm air through the tube and yet allows easy exit of water from the ice. It is heavily galvanized, will not rust, and every part of this drainage system is easily removable for cleaning without taking the ice from the chamber.

Lifetime Cases, Superbly Finished

Stock sizes are built of solid oak. Quarter sawed oak is used in opal plate glass lined cases. Special sizes, solid mahogany, oak, birch, etc. Special treatment renders the Herrick impervious to climatic extremes or changes.

Trimmings, Better than Average

All trimmings are nickelplated on heavy brass. Hinges have long bearings. Improved lever fasteners keep the doors practically airtight.

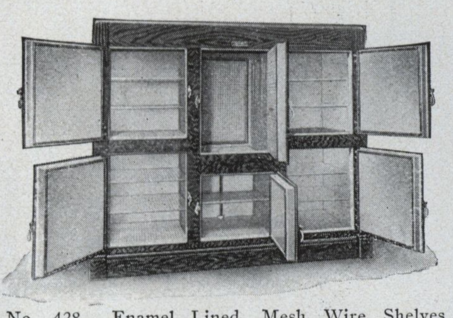
Specification Data

Dimensions given are the sizes of the framed finished opening to be cut in the wall of the house. The casing on refrigerator around the outside icing door just fits into this opening.

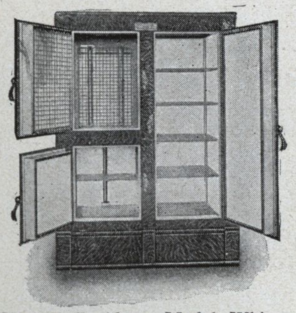
"G" in table of dimensions represents height from floor to bottom of opening in wall, which is computed without the casters under the refrigerator, except where marked; "E," the height of the opening; "A," the width of the opening; "K," the distance from the flush right end of refrigerator (facing the front) to edge of finished opening in wall of house.

For sizes up to and including second 4-door size (No. 411), if the refrigerator sets against left wall, finished edge of opening in wall of house for back icing is 1⅝ in. from corner of room or from left end of refrigerator. In all sizes above this allow 3⅞ in. from corner of refrigerator to edge of opening, which does not include moulding on top, but does allow for ⅞-in. base block and casing on lower part of refrigerator. If top moulding on end is desired, edge of opening should be 5⅜ in. from corner of room on sizes No. 212 and larger.

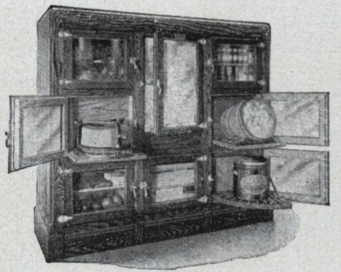
Back outside icing door is made regularly in back ice chamber. This can be reversed to other side if necessary,



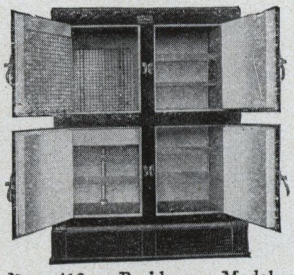
No. 428. Enamel Lined, Mesh Wire Shelves
Latest Design
Width, 86 in.; depth, 31 in.; height, 72½ in.; weight, 1050 lbs.



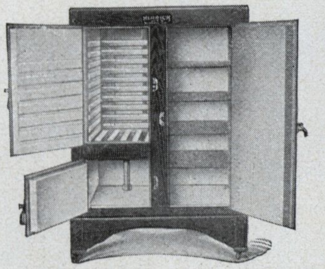
No. 55. Residence Model, White Opal Plate Glass Lined, Mesh Wire Shelves
Width, 38 in.; depth, 22¾ in.; height, 54¼ in.; weight, 550 lbs.



No. 766. Display Model, All Storage Doors Glass, French Plate Mirror on Ice Door
Width, 86 in.; depth, 31 in.; height, 77¾ in.; weight, 1200 lbs.
List price, $199.50



No. 412. Residence Model, Enamel Lined, Mesh Wire Shelves
No. 512. Opal Glass Lined
Width, 52 in.; depth, 30½ in.; height, 66½ in.; weight, 525 lbs.



No. 220. Residence Model, Spruce Lined, Mesh Wire Shelves
Nos. 42 to 45 are same style as above, but all enamel lined
Width, 36 in.; depth, 20¾ in.; height, 48 in.; weight, 220 lbs.

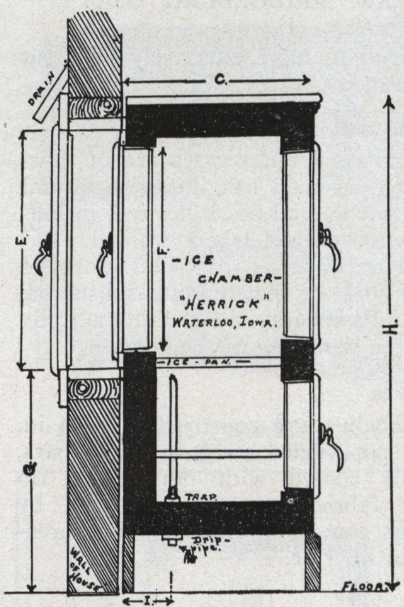
A Few Types of Herrick Refrigerators

Continued on next page

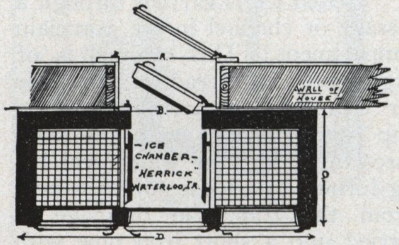
or refrigerator can be iced from left-hand end (facing the front) if desired, and right-hand end if found necessary to conform to space.

The outside icing door on back or end refrigerator swings through opening in wall.

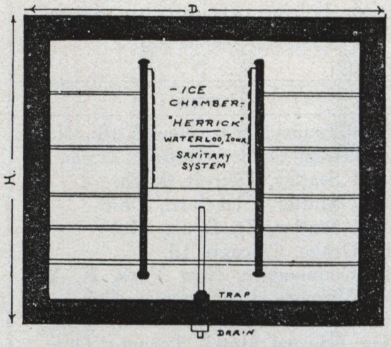
The outside of the opening in the wall, as shown in the plan, should be finished with a small batten door.


DRAIN
C.
E.
ICE CHAMBER
"HERRICK"
WATERLOO, IOWA.
H.
ICE - PAN.
G.
TRAP.
DRIP-PIPE.
WALL OF HOUSE
I.
FLOOR

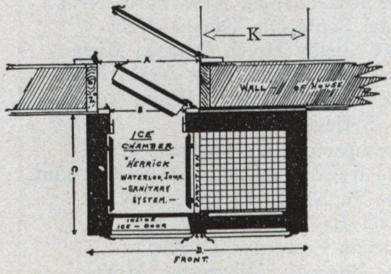
Elevation—Back Outside Icing 3- and 4-door Refrigerator


A.
B.
WALL OF HOUSE
ICE CHAMBER
"HERRICK"
WATERLOO, IA.
C.
D.

Plan—Back Outside Icing Refrigerator


D.
H.
ICE CHAMBER
"HERRICK"
WATERLOO, IOWA
SANITARY SYSTEM
TRAP
DRAIN

Elevation—Back Outside Icing 6-Door Refrigerator


K
A.
B.
WALL OF HOUSE
ICE CHAMBER
"HERRICK"
WATERLOO, IOWA
SANITARY SYSTEM
INSIDE ICE-DOOR
C.
D.
FRONT.

Plan—Back Outside Icing 3- or 4-door Refrigerator

BACK ICING STYLE, DIMENSIONS IN INCHES

Refrigerator No.	*Size of refrigerators, outside, without moulding or casters			Opening in wall of house for outside icing			Refrigerator back icing door		Location of drain pipe under refrigerator, from end of refrigerator to center of hole		Edge of refrigerator to edge of opening in wall, not including moulding
	Width	Depth	Height	Height from floor	Opening Width	Opening Height	Width	Height	From back	From end	
	D	C	H	G	A	E	B	F	I	J	K
200, 300	34	18	41	20¼	16½	19½	13	15¾	3¾	9	16
210, 41	34	19	44	22¼	16½	20½	13	16¾	3¾	9	16
42, 220	36	19	46	20	18½	23¼	14	19½	4¼	9⅝	16
43, 230	36	20	48	20¾	18½	24½	14	20¼	4¼	9⅝	16
44, 54, 240	36	20	50	20½	18	27¾	13¼	23	4¼	9⅝	16⅞
45, 55, 250	38	22	52	22½	18½	27¾	13¼	23	4½	10⅜	18⅜
43T, 230T, Texas	36	20	48	18½	18	27¾	13¼	23	4¼	9⅝	16⅞
215, 415	32	19	48	18½	18	27¾	13¼	23	3¾	7¾	12½
9, 29, 39, 49, 59, 290	42	24	56	26¾	21¼	27¾	15¾	21⅜	4½	11	20⅛
†11, 211, 311, 411, 511	46	24	59	29	22½	27¾	17¾	22⅜	4½	13	22⅛
†212, 312, 412, 512, 612	50	28	64½	30	23¾	32¼	19¾	28¼	4¾	14½	24¾
†214, 314, 414, 514, 614, 714	54½	28	70	33	25¾	35	21¾	31	5	14½	26½
†216, 316, 416, 516, 616, 716	60½	30¼	73	34	28	36	24	32	5	15½	29¾
†Chef, 228, 328, 428, 528 also 628, 628P, 628E, 619, 319	85¾	30¼	71	32½	27	36¼	23	32¼	4¾	42⅞	28
†766, 466	85¾	30¼	78	36	27	37½	23	33½	4¾	42⅞	28
580½	66	26¼	68	27	22	38½	16¼	33	5½	33	21
HERRICK GRAND WITH CORNER BLOCKS											
50, Herrick Grand	44½	26½	55	24	19	28½	15	24½	5½	13½	20¼
90, Herrick Grand	47	28	62	27¼	21	28¼	15½	24	5½	14	23

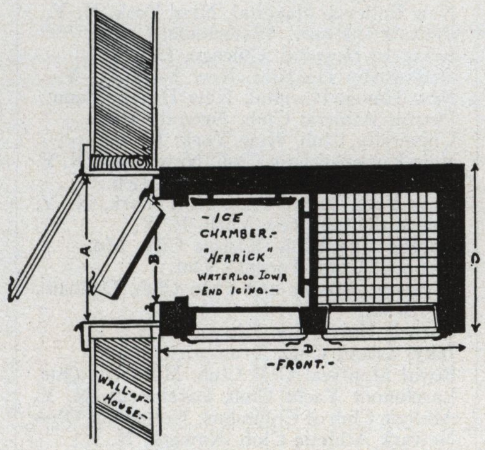
*For "over-all" dimensions, including mouldings, refer to catalogue. †With casters (2 in. high) (Chef casters 1 in.). Texas style has long ice chamber for 22-in. artificial ice.

END ICING STYLE, DIMENSIONS IN INCHES

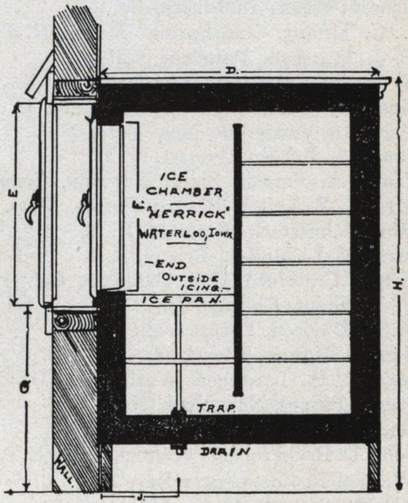
Refrigerator No.	*Size of refrigerators, outside, without moulding			Opening in wall of house for outside icing			Refrigerator end icing door		Location of drain pipe under refrigerator, from end of refrigerator to center of hole		Edge of refrigerator to edge of opening in wall, not including moulding
	Width	Depth	Height	Height from floor	Opening Width	Opening Height	Width	Height	From back	From end	
	D	C	H	G	A	E	B	F	I	J	L
200, 300	34	18	41	20¼	16½	19½	13	15¾	3¾	9	½
41, 210	34	19	44	22¼	16½	20½	13	16¾	3¾	9	⅞
42, 220	36	20	46	20	18½	23¼	14	19½	4¼	9⅝	¾
43, 230	36	20	48	20¾	18½	24½	14	20½	4¼	9⅝	¾
44, 54, 240	36	20	50	20½	18	27¾	13¼	23	4¼	9⅝	¾
45, 55, 250	38	22	52	22½	18½	27¾	13¼	23	4½	10⅜	1⅜
43T, 230T, Texas	36	20	48	18½	18	27¾	13¼	23	4¼	9⅝	¾
215, 415	32	19	48	18½	18	27¾	13¼	23	3¾	7¾	½
29, 39, 49, 59, 290	42	24	55	26¾	21¼	27¾	15¾	19	4½	11	1⅜
211, 311, 411, 511	46	24	59	29½	22½	27¾	16¾	20	4½	13	⅞
†212, 312, 412, 512, 612	50	28	64½	29½	23¾	32¼	19¾	28¼	4¾	14½	2⅛
†214,314,414,514,614,714	54½	28	70	33	25¾	35	21¾	31	5	14½	1
216,316,416,516,616,716	60½	30¼	73	34	28	36	24	32	5	15½	1¼
HERRICK GRAND WITH CORNER BLOCKS											
†50, White House	44½	26½	55	24	19	28½	15	24½	5¼	12¼	2¾
†90, America	47	28	62	27¼	21	28¼	14¾	23¼	5¼	13¼	3

*For "over-all" dimensions, including mouldings, refer to catalogue. †With casters (1⅝ in. high). Texas style has long ice chamber for 22-in. artificial ice.

Specify if back or end icing, and if regular left-hand ice chamber, as in illustrations, or the opposite, right-hand facing front of refrigerator.


A.
B.
ICE CHAMBER
"HERRICK"
WATERLOO IOWA
END ICING.
C.
D.
FRONT.
WALL OF HOUSE.

Plan—End Outside Icing Refrigerator


D.
E.
ICE CHAMBER
"HERRICK"
WATERLOO, IOWA
END OUTSIDE ICING.
ICE PAN.
H.
G.
TRAP
DRAIN
WALL.
J.

Elevation—End Outside Icing 3- and 4-door Refrigerator

Specifications and Dimension Diagrams for Herrick Outside Icing Refrigerators

ESTABLISHED 1849

THE JEWETT REFRIGERATOR CO.

GENERAL OFFICE AND FACTORY
BUFFALO, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., 16 East 40th Street
CHICAGO, ILL., 38 South Dearborn Street
BOSTON, MASS., 80 Boylston Street
CLEVELAND, OHIO, 347 Leader News Building
LOS ANGELES, CAL., 722 Story Building
MONTREAL, QUE., 603 New Birks Building

PORCELAIN WORKS: LACKAWANNA, N. Y. CANADIAN WORKS: BRIDGEBURG, ONT.

Products

Builders of REFRIGERATORS for residences, hotels, hospitals, clubs, industrial restaurants, institutions, steamships, etc.

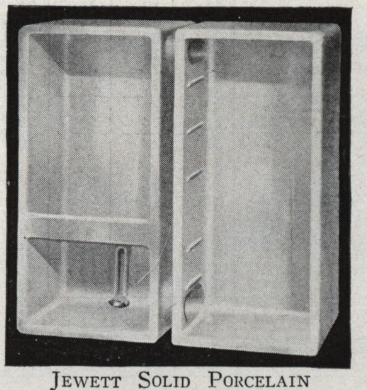
Also Mortuary Refrigerators for hospitals.

Jewett Solid Porcelain Lined Refrigerators

The interior linings in both food and ice compartments are of one piece of solid porcelain ware 1¼ in. thick, having all corners fully rounded. There is not a seam, joint, crack or square corner. They assure absolute cleanliness and eliminate the trouble with leaky ice chambers and the consequent dampness so often encountered on refrigerators with metal lined ice chambers.

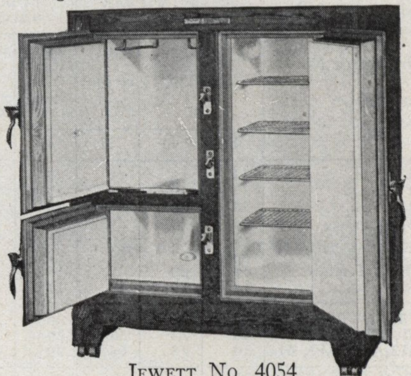
Insulation

Consists of the exterior case of ⅞-in. tongued and grooved ash, two courses of heavy waterproof insulating paper, 1-in. thickness of sheet cork, two courses of heavy waterproof insulating paper, ⅞-in. tongued and grooved lumber, 1¼-in. thickness of pure cork, 1¼-in. thickness of solid porcelain ware—a total thickness of over 5⅜ in., all arranged to most effectively lock out the heat.



JEWETT SOLID PORCELAIN REFRIGERATOR LINING

The one-piece compartments of immaculate, snowy white solid porcelain ware with full rounded corners do not provide a single lurking place for the slightest contamination



JEWETT NO. 4054

The Jewett is the only refrigerator with solid porcelain lining

Finish and Hardware

Exposed outer cases are of thoroughly seasoned ash, finished natural or in any special finish desired, including white enamel where wanted.

Hardware is of solid polished brass and of heavy and substantial type. Fasteners close automatically with the slamming of the door.

Shelves

Shelves are constructed of ¼-in. rod, spot-welded to 5⁄16-in. cross bars, heavily coated with pure block tin after fabrication and supported by lugs cast integrally with the porcelain interior.

Drainage

Melted ice is carried through a passage or channel in the porcelain compartment. This channel is of large bore and readily accessible for cleaning and terminates in a trap cast integrally with the solid porcelain lining, the water seal being formed by a loose porcelain bell. From the trap, the drainage is carried into a short iron pipe with threaded end, 1½-in. diam., projecting below refrigerator floor.

PROMINENT INSTALLATIONS OF JEWETT REFRIGERATORS

RESIDENCES

Arthur Curtiss James, Newport, R. I.
Vincent Astor, Rhinebeck, N. Y.
L. C. Tiffany, Cold Spring Harbor, N. Y.
E. J. Marshall, Pasadena, Cal.
S. Reading Bertron, New York, N. Y.
Guernsey Curran, East Norwich, N. Y.
Cornelius Vanderbilt, New York, N. Y.
James A. Burden, Syosset, N. Y.
James A. Farrell, South Norwalk, Conn.
Mrs. L. Z. Leiter, Beverly Farms, Mass.
Wm. Fahnestock, Katonah, N. Y.
Mrs. W. L. McKee, Bristol, R. I.
Ernest Crawford May, Pasadena, Cal.
F. D. Stout, Chicago, Ill.
H. P. Davison, Locust Valley, N. Y.
Samuel Mather, Cleveland, Ohio
Mrs. R. H. Townsend, Washington, D. C.
Henry Phipps, New York, N. Y.
George Eastman, Rochester, N. Y.
John D. Rockefeller, Pocantico Hills, N.Y.
William R. Coe, Oyster Bay, N. Y.
Sir Mortimer B. Davis, Montreal, Que.
John D. Rockefeller, Jr., New York, N. Y.

HOSPITALS, CLUBS AND INSTITUTIONS

Rockefeller Institute, New York, N. Y.
Post Graduate Hospital, New York, N. Y.
Municipal Contagious Disease Hospital, Chicago, Ill.
New Bellevue Hospital, New York, N. Y.
Perkins Institute, Watertown, Conn.
Lying-In Hospital, Chicago, Ill.
Orthopædic Hospital, New York, N. Y.
New Haven Hospital, New Haven, Conn.
Detroit Athletic Club, Detroit, Mich.
University Club, New York, N. Y.
New York Athletic Club, New York, N. Y.
Michigan Union, Ann Arbor, Mich.
New York Yacht Club, New York, N. Y.
Harvard Club, New York, N. Y.
Kansas City Club, Kansas City, Mo.
National Club, Toronto, Ont.
Dedham Country and Polo Club, Dedham, Mass.
Cornell University, Ithaca, N. Y.
Jekyl Island Club, Brunswick, Ga.
Royal Montreal Golf Club, Montreal, Que.
Larchmont Yacht Club, Larchmont, N. Y.
Athletic Club of Columbus, Columbus, Ohio
Newark Athletic Club, Newark, N. J.
Hamilton Club, Chicago, Ill.
Buffalo Athletic Club, Buffalo, N. Y.

HOTELS

Hotel Pennsylvania, New York, N. Y.
New Hotel Statler, Buffalo, N. Y.
Hotel Statler, Detroit, Mich.
Hotel Statler, Cleveland, Ohio
Hotel Statler, St. Louis, Mo.
The Drake, Chicago, Ill.
The Commodore, New York, N. Y.
The Biltmore, Los Angeles, Cal.
The Mount Royal, Montreal, Que.
King Edward Hotel, Toronto, Ont.
Sheridan Plaza Hotel, Chicago, Ill.
The Ritz-Carlton, New York, N. Y.
Hotel Fontenelle, Omaha, Neb.
Fort Shelby Hotel, Detroit, Mich.
Vanderbilt Hotel, New York, N. Y.
The Green Brier, White Sulphur Springs, W. Va.
Davenport Hotel, Spokane, Wash.
The Royal Connaught, Hamilton, Ont.
The St. Regis, New York, N. Y.
Hotel Palliser, Calgary, Alta.
Chateau Frontenac, Quebec
The Bancroft, Worcester, Mass.
The Ten Eyck, Albany, N. Y.

Continued on next page

Outside Icing Door

Refrigerators can be provided with extra icing door in the rear or end. See data below.

Mechanical Refrigeration

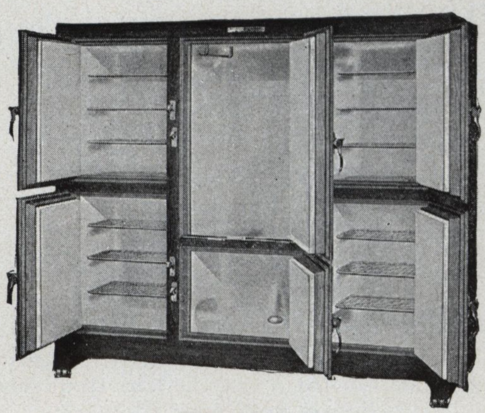
Jewett solid porcelain refrigerators are especially suited for use with mechanical refrigeration.

If to be used for such purpose we can provide the necessary holes at the factory for machine piping.

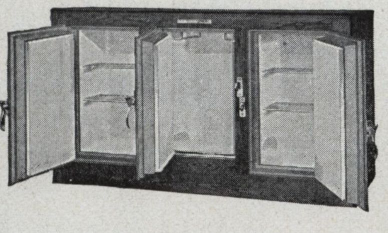
Service to Architects

A catalogue of solid porcelain residence refrigerators and data on hotel, hospital, club and institution refrigerators is at the service of architects on request. Inquiries are given detailed attention.

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORPORATION NEW YORK, N.Y.



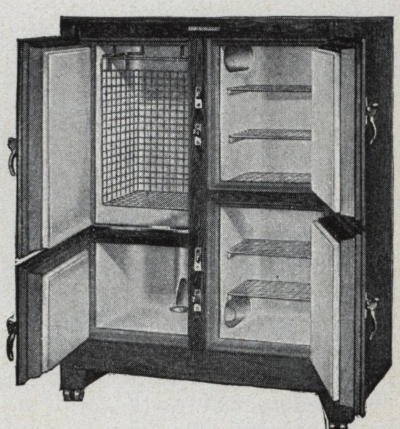
Jewett Solid Porcelain Refrigerator
Nos. 6672, 7072, 7472 and 7872



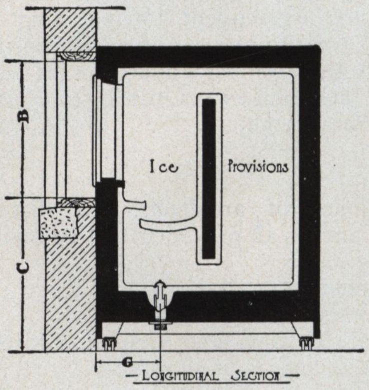
Nos. 6432 and 4432

Especially Adapted for Butler's Pantry

Designed to stand under counter shelf, and furnished without casters and with fronts built down to floor. Can be furnished in woodwork and finished to match adjacent trim of building. Above illustration shows No. 6432. No. 4432 has only two doors, one opening into ice chamber and one into storage compartment



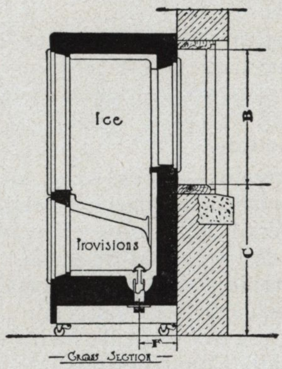
Jewett Solid Porcelain Refrigerator
Nos. 4460, 4860, 5260, 4472, 4872 and 5272

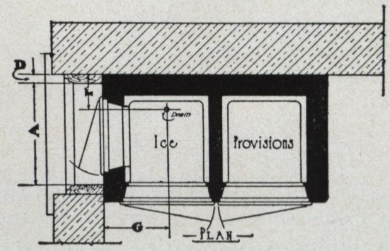


The architect can make provision in building plans and the builder can arrange the proper wall openings from these tables.

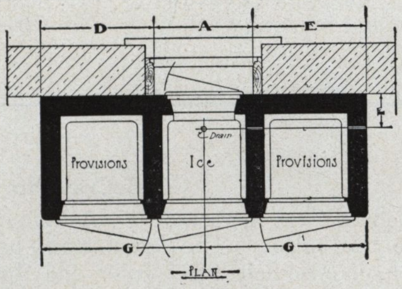
Floor plan shows side ice compartment refrigerators with ice at the left. Refrigerators can be furnished with ice at the right without extra charge, in which event dimensions "D" and "G" will show distance from the right end.

Drain is properly trapped and projects through floor of refrigerator, being finished with 1½-in. standard pipe thread

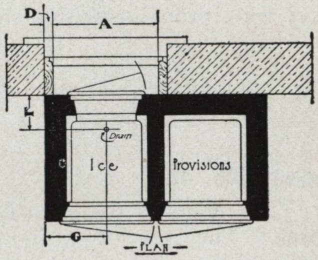




End Icing Doors



Rear Icing Doors with Center Ice Compartment



Rear Icing Doors with Left Hand Ice Compartment

JEWETT SOLID PORCELAIN LINED REFRIGERATORS

Model No.	Over-all dimensions, inches			Number of doors	Ice capacity, lbs.	Ship'g weight, lbs.	Dimensions, inches									
							*With rear (outside) icing doors				*With end icing doors				F	G
	Width	Depth	Height				A	B	C	D	A	B	C	D		
4054	40	25	54	3	90	950	18	27	24	1¾	20	27	24	1¾	7	11½
4460	44	25	60	4	150	1100	20	27	30	1¾	20	27	30	1¾	7	12½
4860	48	25	60	4	180	1200	24	27	30	1¾	20	27	30	1¾	7	14½
5260	52	25	60	4	180	1300	24	27	30	1¾	20	27	30	1¾	7	14½
4472	44	25	72	4	190	1300	20	31	38	1¾	20	31	38	1¾	7	12½
4872	48	25	72	4	190	1400	20	31	38	1¾	20	31	38	1¾	7	12½
5272	52	25	72	4	240	1500	24	31	38	1¾	20	31	38	1¾	7	14½
6672	66	25	72	6	190	1900	20	31	38	23	.....	.....	.....	.....	7	33
7072	70	25	72	6	240	2100	24	31	38	23	.....	.....	.....	.....	7	35
7472	74	25	72	6	240	2200	24	31	38	23	.....	.....	.....	.....	7	35
7872	78	25	72	6	240	2300	24	31	38	27	.....	.....	.....	.....	7	39
4432	44	25	32	2	75	775	20	25	6	1¾	.....	.....	.....	.....	13½	12½
6432	64	25	32	3	90	950	20	25	6	22	.....	.....	.....	.....	13½	32
3072	30	25	72	2	100	950	24	28	43	3	.....	.....	.....	.....	7	15

*"A" is the width in the clear of opening in building wall.
"B" is the height in the clear of opening in building wall.
"C" is the distance from finished floor to sill of opening.
"D" is the distance from left end of refrigerator (with rear icing door) to opening in building wall. For end icing door, "D" is distance from back of refrigerator to opening in building wall.
"F" is the distance from back of refrigerator to center of drain.
"G" is the distance from left end of refrigerator to center of drain.

McCRAY REFRIGERATOR CO.

GENERAL OFFICE AND FACTORY

2455 Lake Street

KENDALLVILLE, IND.

SALESROOMS IN ALL PRINCIPAL CITIES

Product

McCray Refrigerators for all purposes.

Facilities

The McCray Refrigerator Co. build refrigerators and coolers and carry them in stock for residences, hotels, restaurants, clubs, hospitals, institutions, florists, grocery stores, meat markets, steamships and dining cars.

They also build mortuary coolers for morgues and hospitals.

McCray refrigerators may be arranged for either ice or mechanical refrigeration. The refrigerators listed on this page are carried in stock, ready for shipment.

Construction

Exterior—Stock sizes of McCray refrigerators are furnished in quarter sawed or furniture oak.

Special built-to-order refrigerators are furnished in any desired wood or finish.

Interior—Lining for residence models may be of white opal glass or porcelain; for commercial models, of odorless wood, shellacked.

Wall Construction—Walls are insulated with heavy waterproof insulating sheathing and mineral wool.

The McCray opal glass lined refrigerators are insulated with 2 in. of corkboard.

Special Features

Any McCray refrigerator can be arranged with rear or left end icing door, so that it may be iced from side or rear porch. See tables on next page.

Special Built-to-order Refrigerators

A special designing department for planning refrigerators and coolers for all purposes, to fit any desired space, is maintained by this company, and is at the service of every architect and builder. Orders for special refrigerators are executed promptly.

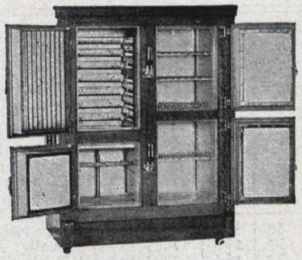
Catalogues

For the convenience of architects, five distinct catalogues are issued, any or all of which will be mailed on request, as follows:

No. 96—for Residences.
No. 74—for Grocers.
No. 65—for Meat Markets and General Stores.
No. 55—for Hotels and Restaurants.
No. 76—for Florists.

McCray No. 460

This model is particularly adapted for use in residences. The interior is snow white opal glass. The exterior of sturdy quarter sawed oak, handsomely finished. An efficient and thoroughly sanitary refrigerator.

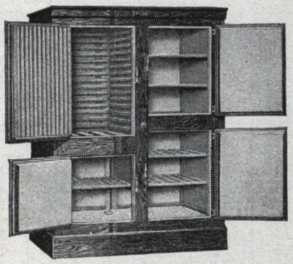


McCray No. 460
For residences

Dimensions—Width, 3 ft. 10½ in.; depth, 2 ft. 2¾ in.; height, 5 ft. 2 in. Shipping weight, 980 lb. Ice capacity, 200 lb.

McCray No. 75

A staunch and efficient refrigerator for hotel and restaurant use. The exterior is of solid oak, antique color and the interior lining is of odorless wood, shellacked, the floor being of galvanized sheet steel.



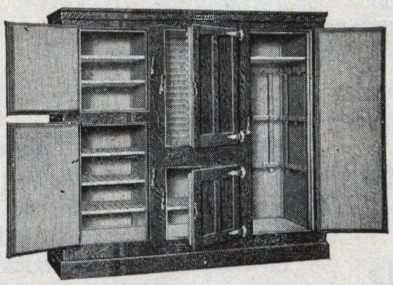
McCray No. 75
For hotels and restaurants

Dimensions—Width, 4 ft. 8½ in.; depth, 2 ft. 3¼ in.; height, 6 ft. Shipping weight, 780 lb. Ice capacity, 340 lb.

Continued on next page

McCray No. 1135

One of the most popular and serviceable models for hotels and institutions. It is especially recommended for conditions requiring a small meat stock with considerable storage of butter, eggs, berries, fruits, etc. The circulation of cold air being in two distinct currents, avoids carrying of odors to the meat compartment.

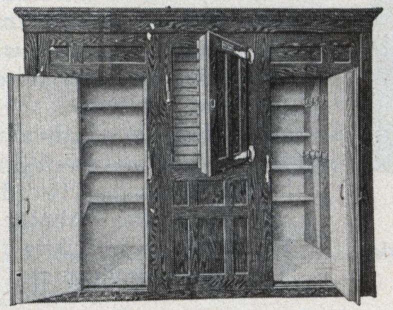


McCray No. 1135
For hotels and institutions

Dimensions—Width, 7 ft. 9½ in.; depth, 2 ft. 10¾ in.; height, 7 ft. Shipping weight, 2025 lb. Ice capacity, 665 lb.

McCray No. 171

This popular cooler is used in many hotels and institutions throughout the country. The front and both ends of the exterior case are of solid oak; the interior lining is of odorless wood, shellacked. Both compartments are finished with shelving except the two sides of the right-hand compartment, which is equipped with meat racks.

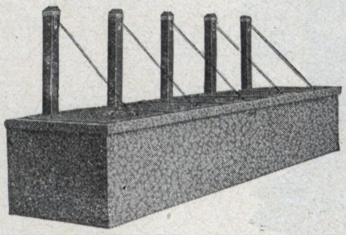


McCray No. 171
For hotels and institutions

Dimensions—Width, 10 ft.; depth, 5 ft.; height, 8 ft. Shipping weight, 5000 lb. Ice capacity, 2500 lb.

McCray No. 1230

The front, end and top of this special ironclad service pantry refrigerator are covered with galvanized iron. The interior is also covered with galvanized iron and is equipped with shelves. There are five lids on top attached to counterweights which greatly facilitate the use of the refrigerator.

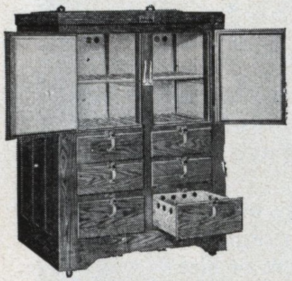


McCray No. 1230

Dimensions—Width, 14 ft. 9 in.; depth, 3 ft.; height, 2 ft. 6 in. Weight, 2500 lb.

McCray No. 525

This short order box is very popular in hotels and restaurants. It is designed for preserving sea foods, game and other foods which require a lower temperature than can be developed economically in the ordinary refrigerator. The exterior is of solid oak finished antique. The lining is odorless wood shellacked. The drawers are of galvanized iron with oak front. These drawers lock automatically when the drawers close. Across the back there are freezer tanks for crushed ice.

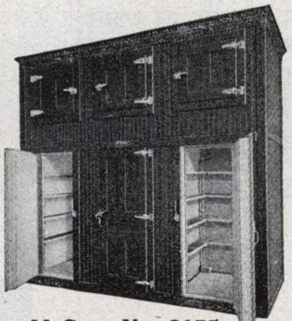


McCray No. 525
Restaurant short order box

Dimensions—The size of the model is 3 ft. 5½ in. wide; 2 ft. 6¾ in. deep; 4 ft. 7 in. high. Shipping weight is 700 lb.

McCray No. 3175

This large cooler is really three distinct coolers, as it has two solid partitions extending from floor to top, dividing it into three storage compartments and ice chambers. The center compartment is fitted with meat racks, the others being equipped with shelving. The 5-in. walls, highest grade materials, and staunch construction, insure efficient service.

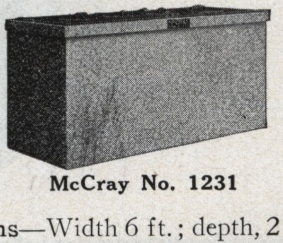


McCray No. 3175
For hotels and institutions

Dimensions—Width, 12 ft.; depth, 5 ft.; height, 11 ft. Shipping weight, 7500 lb. Ice capacity, 1200 lb. each compartment, 3600 lb. total.

McCray No. 1231

The front and two ends of this special milk cabinet are covered with galvanized iron. The interior is also covered with galvanized iron, and top consists of Monel metal which is rustproof. The cabinet contains four 20-quart porcelain lined receptacles.



McCray No. 1231

Dimensions—Width 6 ft.; depth, 2 ft. 6 in.; height, 3 ft. Shipping weight, 1000 lb.

SEEGER REFRIGERATOR COMPANY

GENERAL OFFICES AND MAIN FACTORIES

ST. PAUL, MINN.

BRANCH OFFICES

NEW YORK, N. Y., 399 Madison Avenue
BOSTON, MASS., 80 Washington Street
LOS ANGELES, CAL., 2433 Hunter Street
CHICAGO, ILL., 705 Burnham Building

Products

Seeger Original Siphon Refrigerators for residences, apartment houses, hospitals, clubs, hotels, restaurants, etc.

Also builders of Refrigerators to order, to conform to specifications of any design or size.

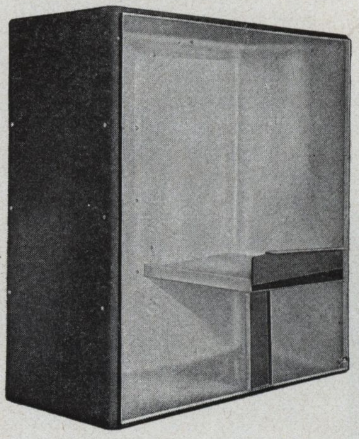
Seeger Quality and Guarantee

The Seeger line of refrigerators is a development of twenty years of progress and improvement, and is in greater demand now than ever before. Due to the superior materials and workmanship employed, Seeger products have successfully stood the test of time and continuous use and are so recommended.

The Seeger refrigerators are guaranteed to be exactly as represented. If found otherwise, we will refund the purchase price and all freight charges. This guarantee is binding on us whether refrigerators are bought direct from us or from one of our representatives.

Seeger
ORIGINAL SIPHON
REFRIGERATOR
TRADE-MARK

Tested and Approved by the Good Housekeeping Institute Conducted by Good Housekeeping Magazine



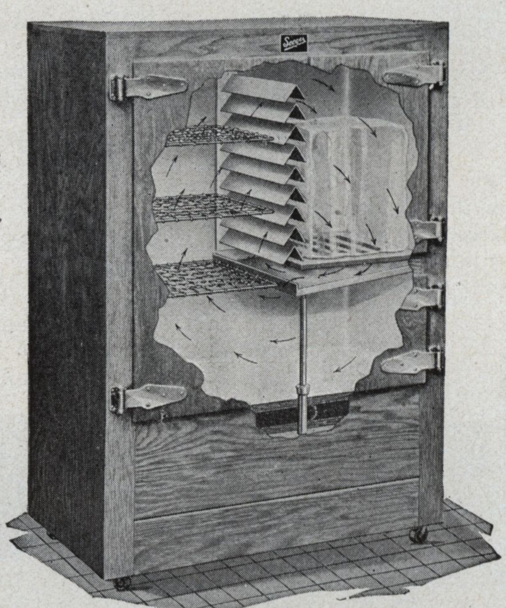
Seeger One-piece Porcelain Interior
(Patents Pending)

Seeger Original Siphon System of Refrigeration

A major feature of efficiency in Seeger refrigerators (whether ice or electrical refrigeration is used) is our original siphon system of air circulation, which accomplishes the successful preservation of foods and the necessarily low temperature with a minimum consumption of ice and power.

The illustration presented on this page shows the way in which the warmer air is siphoned from the food chambers, carried over and around the ice and returned, perfectly pure and dry, at a very low temperature. All odors, moisture and impurities are carried off with the water from the melting ice through the drain pipe, where a special trap prevents their return.

The purity of the dry cold atmosphere thus maintained enables food to be preserved for a much longer period than is ordinarily the case, and makes it almost impossible for germs and bacteria to develop. The siphon system also keeps the



Seeger Siphon System of Refrigeration

Continued on next page

ice on duty to the last ounce, being therefore doubly economical. All of the models illustrated are carried in stock at our factory and at all of our branches, ready for immediate shipment.

Seeger Flush Panel Refrigerators

These are our entirely new models, and represent the latest Seeger contribution to the requirements of refrigerator appearance and hygiene. There being no paneling or projections, the outside is as easily cleaned as the inside, while the beautiful appearance of the fine, smooth, exterior finish makes it a worthy adjunct to the finest of homes.

One-piece Porcelain Interior—The new seamless, one-piece porcelain interior is a feature of great importance. It is made in our own factories, of vitreous porcelain on Armco iron, and is in one piece, including food chambers, ice chamber and drip pan—without a seam.

The corners are round and the surface is guaranteed non-chippable.

Insulation—These models are insulated with pure sheet corkboard, 2 in. thick, laid between four sheets of waterproof paper. This method of insulation is approved as absolutely the best by all refrigeration experts.

Exterior—The attractive outer casing is of 5-ply laminated waterproof white oak, finished to bring out the natural beauty of the wood. The panels are flush and perfectly smooth, offering no irregular surfaces to catch the dust and dirt.

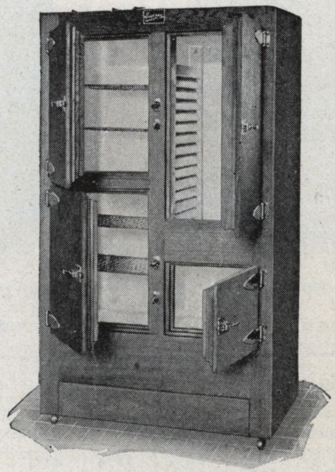
The hardware is of solid brass, double nickelplated, and of exceptional wearing quality. All doors are equipped with self-locking rollers and rubber compression gaskets.

All models are suitable for either ice or electrical refrigeration, without any change in the construction.

Seeger All-porcelain Refrigerators

These refrigerators embody all of the advantageous features of our flush panel line. The exterior, however, is of the same vitreous porcelain as the interior, guaranteed non-chippable, and finished with nickel silver (german silver) trimmings.

All models are equipped for either ice or electrical refrigeration.



Standard Model Seeger Flush Panel Refrigerator

Seeger System of Warmth and Coldproof Walls and Doors

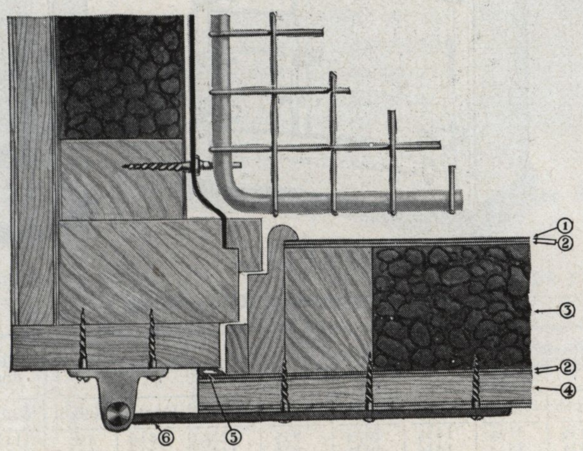
A second major efficiency feature of the Seeger refrigerator — which contributes importantly to the Seeger pre-eminence as a maximum preserver of foods and a minimum consumer of ice and power—is the system of wall and door construction shown in detail at the bottom of this page.

It is needless to go into detail as to the wonderful insulating value of pure corkboard, but we say here there never has been an insulating material found that surpasses it for refrigeration purposes.

No. 1. Interior porcelain lining

No. 2. Two sheets of water-proof insulating paper

No. 3. 2 in. of pure sheet corkboard



No. 4. White oak—5-ply laminated exterior or vitreous porcelain on Armco iron

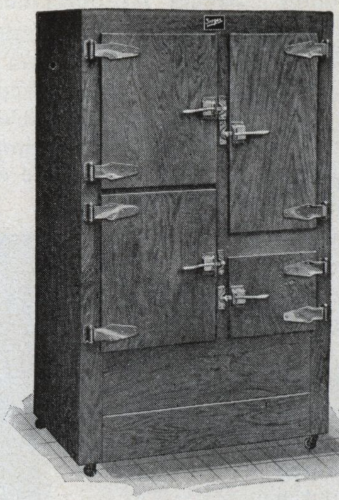
No. 5. Compression gasket

No. 6. Spring brass strap hinge

Reduced Size Detail of 3-in. Wall Construction
One-third actual size
Showing cross section of walls and doors, top and bottom

Continued on next page

Nos. 200, 250 and 300

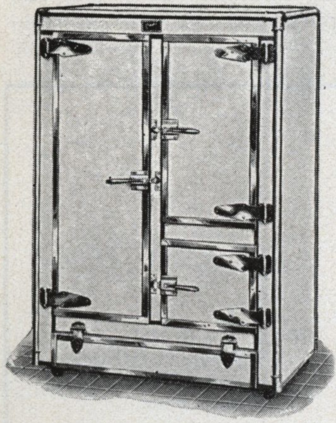


Nos. 350, 370, 380, 400, 500 and 550

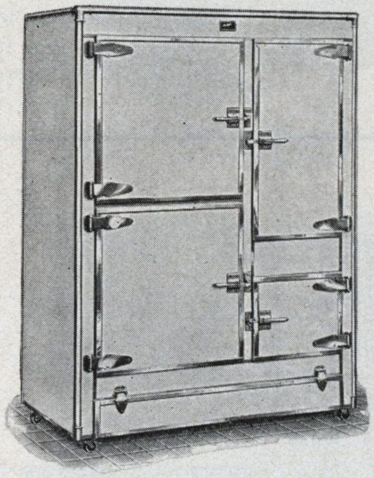
Nos. 700 and 800

Seeger Flush Panel Refrigerators

No.	Outside, in.			Large provision chamber, in.			Small provision chamber, in.			Ice chamber, in.			Ice door opening, in.		Ice capacity, lb.	Shipping weight, lb.	Storage space, sq. ft.
	Width	Depth	Height	Width	Depth	Height	Width	Depth	Height	Width	Depth	Height	Width	Height			
200	37½	21¼	52½	16⅛	15½	32¾	14⅞	15½	10¾	12¼	15½	19	11½	18	90	340	8½
250	34	20	56½	13	14¼	36½	14½	14¼	10¾	11½	14¼	23¼	10¾	22	100	322	7
300	40	21¾	56½	18½	16	36½	15	16	10¾	12¾	16	23¼	12	22	125	370	9¾
350	37½	21¼	60½	16⅛	15½	41¾	14⅞	15½	10¾	12¼	15½	26¼	11½	25	150	400	10¼
370	42	21¼	60½	19⅜	15½	41¾	16⅛	15½	10¾	13½	15½	26¼	12¾	25	160	420	13¾
380	40	21¾	69⅛	16¾	16	50½	16¾	16	12¾	14	16	31½	13⅜	29¼	175	450	14
400	48	25	60½	24	19¼	41¾	17½	19¼	11¾	15	19¼	25	14¼	24	175	520	18¼
500	48	25	69⅜	24	19¼	50½	17½	19¼	12¾	15	19¼	31½	14¼	29¼	250	617	22¾
550	55	27	68⅞	28	21¼	54½	20½	21¼	13½	17½	21¼	35½	17¼	31¼	325	680	27¾
700	60¾	28	71¼	16½	22¼	57½	21	22¼	12¾	15	22¼	38	15	34	400	800	31¾
800	66	29	76⅞	18¼	23¼	63	23	23¼	14¼	16¼	23¼	42¼	16⅝	38	540	980	39



Nos. 208, 258 and 308



Nos. 358, 378, 388, 408, 508 and 558

Nos. 708 and 808

Seeger All-porcelain Refrigerators

No.	Outside, in.			Large provision chamber, in.			Small provision chamber, in.			Ice chamber, in.			Ice door opening, in.		Ice capacity, lb.		Shipping weight, lb.	Storage space, sq. ft.
	Width	Depth	Height	Width	Depth	Height	Width	Depth	Height	Width	Depth	Height	Width	Height	Nat. ice	Mfd ice		
208	37½	21¾	45½	16⅛	15½	31¼	14⅞	15½	9½	12¼	15½	19	11½	18	90	75	414	8½
258	34	20½	49½	13	14¼	35	14½	14¼	9½	11½	14¼	23¼	10¾	22	100	100	405	7
308	40	22	49½	18	16	35	15½	16	9½	12¾	16	23¼	12	22	125	100	467	9¾
358	37½	21¾	56	16⅛	15½	41¾	14⅞	15½	10½	12¼	15½	27	11½	25	150		493	10¼
378	42	21¾	56	19⅜	15½	41¾	16⅛	15½	10½	13½	15½	27	12¾	25	160		520	13¾
388	40	22¼	65	16¾	16⅛	50	16¾	16⅛	12½	14	16	33½	13¼	29¼	175		610	14
408	48	25⅜	56	24	19¼	41¾	17½	19¼	11½	15	19¼	25	14¼	24	175		627	18¼
508	48	25⅜	65	24	19¼	50½	17½	19¼	12	15	19¼	34	14¼	29¼	250		730	22¾
558	55	27⅜	69	28	21¼	54½	20½	21¼	14½	17½	21¼	35½	17¼	31¼	325		870	27¾
708	61	28½	72¼	16½	22¼	57½	21	22¼	12½	15	22¼	38	15	34	400		1000	31¾
808	67	30	78¼	18¼	23¼	63	23	23¼	14	16¼	23¼	41¼	16⅝	38⅛	540		1250	39

Continued on next page

Electrical Refrigeration Installed in Seeger Refrigerators

Electrical refrigeration is now being installed in so many modern homes that outside icing is very rarely used. For these latter, we will gladly furnish the architect full information, on request.

Even in the smaller homes it is now possible to obtain refrigeration by installing small electrical units. These are usually self-contained and require only electrical connections to operate the motor. These machines are all of the type known and designated as *low pressure system* and are hermetically sealed and use their refrigerant over and over without the necessity of renewal.

In using electrical refrigeration in connection with a refrigerator it must be borne in mind that these units are the refrigeration agent taking the place of ice, and that when they are used the insulating qualities of the refrigerator are just as important as when ice is used. Obviously, the better the refrigerator the better the results.

General Description—Refrigerating units for residences, motor driven, designed for installations in refrigerators.

In general, these units consist of a refrigerating element, a condensing element and automatic thermostatic or low pressure control.

The refrigerating element consists of the freezing tank, the expansion coils either inside or outside the freezing tank, and the expansion system and thermo coil. This element is suspended in the cooling compartment of the refrigerator.

The condensing element consists of a motor, compressor, and the condensing coils, mounted on a single base. This is installed in the basement or other out-of-the-way-place—below the refrigerator, or in base of refrigerator—in fact, anywhere where it is most convenient.

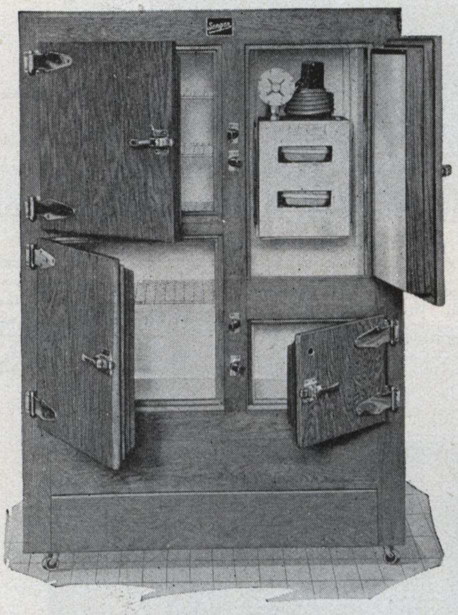
Electrical refrigeration can be installed any place in the house—the most practical and convenient place may be selected. The architect and home builder do not have to plan an impractical arrangement merely to place the refrigerator where it will be convenient for the ice man. *As one architect states in a letter, "We find it no longer necessary to provide a special room accessible from the outside, as in the case when an ice box is installed, and the saving in the cost of construction of such a room is equal to the cost of electrical refrigeration."*

Motors, as regularly furnished, are alternating or direct current, 110 or 220 volts, and 60-cycle for alternating current lines. Some odd frequency motors cause a slight extra charge. One-fourth horsepower special refrigerating type motors are regular for all models.

The actual time which the compressor runs will vary, of course, with the room temperature, the quality and degree of refrigerator insulation, the size of the refrigerator, the frequency with which the refrigerator doors are open, the tightness with which they close, etc.

Temperatures vary so with the conditions under which the machine works that it is impossible to quote accurately. The best that can be done, therefore, is to say that electrical refrigeration keeps the refrigerator at least several degrees colder than ice can keep the same refrigerator, when the ice compartment is kept constantly filled with ice to its capacity. As this is, of course, impossible, the advantage which electrical refrigeration shows over ice is considerably greater under actual conditions when ice melts between fillings.

The Seeger Refrigerator Company does not make or sell any make of electrical refrigeration machine, but is whole hearted in its recommendation of the use of a standard make of electrical refrigeration in connection with Seeger refrigerators.

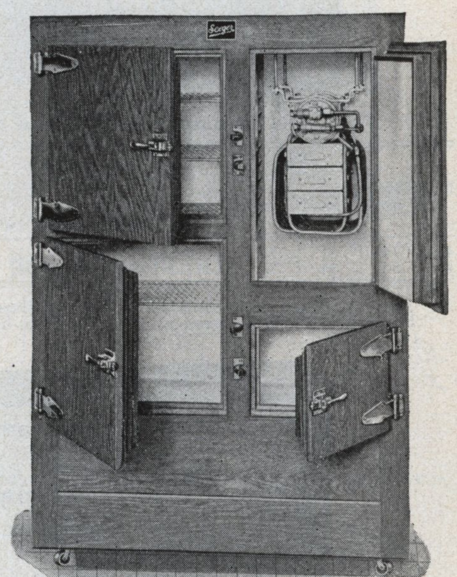


Seeger Refrigerator with Kelvinator Unit

Low Temperature Insulation

Every Seeger refrigerator is insulated for the low temperatures possible with artificial refrigeration—2 in. of high grade corkboard are necessary to maintain the 50% greater difference of temperature which artificial refrigeration can give compared with ice cooling.

Where ice is used in a Seeger refrigerator this cold storage type of insulation gives both lower temperature and great ice economy. Where artificial refrigeration is installed in a Seeger refrigerator this remarkable insulation results in ideal low temperatures and great economy in the maintenance by the refrigerating machine.



Seeger Refrigerator with Frigidaire Unit

SEEGER KELVINATOR DATA

Seeger No. Flush, no panel	Seeger No. All-porcelain	Cubical capacity	Brine tank unit	Compressor unit
200	208	9.1	510 S	Jr.
250	258	8.3	510 S	Jr.
300	308	11.5	1015 S	Jr.
350	358	11.4	1015 S	Jr.
370	378	13.1	1015 S	Jr.
380	388	15.3	1520-Jr.S	Jr.
380	388	15.3	1520-Sr.S	Sr.
400	408	19.1	1520-Jr.S	Jr.
400	408	19.1	1520-Sr.S	Sr.
500	508	25.1	2028-NS	Sr.
550	558	32.5	2836-NS	Sr.
700	708	40.3	3645-NS	Sr.
800	808	49.5	4554	Sr.

SEEGER FRIGIDAIRE DATA

Seeger No. Flush, no panel	Seeger No. All-porcelain	Cubical capacity	Frigidaire	
			Coil	Compressor
200	208	9.1	V-8	1 Cyl.
200	208	9.1	V-10	H H A-WC
250	258	8.3	V-8	1 Cyl.
250	258	8.3	V-10	H H A-WC
300	308	11.5	V-20	H H A-WC
350	358	11.4	V-20	H H A-WC
370	378	13.1	V-20	H H A-WC
380	388	15.3	V-20	H H A-WC
400	408	19.1	V-20	H H A-WC
500	508	25.1	V-25	H H A-WC
550	558	32.5	V-35	H H A-WC
700	708	40.3	V-50	Com W.C.
800	808	49.5	V-50	Com W.C.

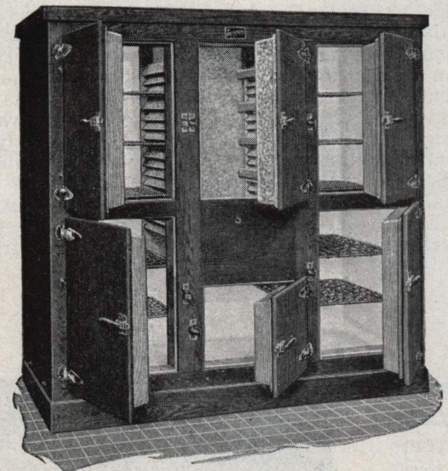
Note: Data on other machines is not available at the time of going to press. Write Seeger Refrigerating Company for this information.

Continued on next page

Seeger Hotel and Restaurant Kitchen Refrigerators

These models are especially designed for heavy duty service and have extra heavy insulation consisting of a 3-in. sheet of pure corkboard and 4 layers of heavy waterproofed paper.

The interior is of vitreous porcelain on Armco iron, in three sections with rounded corners, providing a surface that is germproof and easily cleaned. The ice chamber is heavily galvanized. The exterior is of solid oak, golden finish. The heavy overlapping doors are equipped with rubber compression gaskets, specially designed spring brass triple nickelplated strap hinges, and self-acting roller locks. All shelves are woven wire, tinned, extra heavy in construction and removable for cleaning.



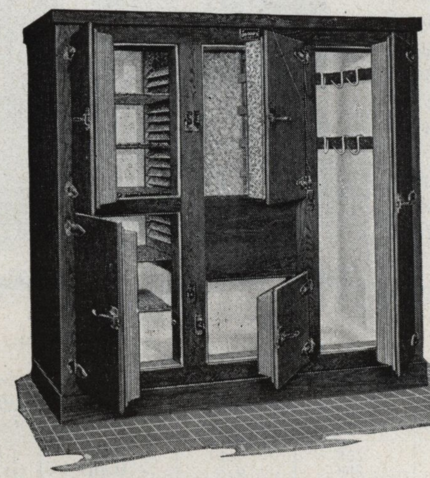
Refrigerator Nos. 413 and 418

No.	Width, in.	Depth, in.	Height, in.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening, in.		Ice bunker, in.		
						Width	Height	Width	Depth	Height
413	74	31	72	1180	500	16¾	27¼	17½	22½	37
418	86	34	77	1475	625	20¾	29¾	21½	25¼	38¼

Drain location

No. 413. From right-hand wall, 25¾ in.; from back wall, 25 in.

No. 418. From right-hand wall, 29 in.; from back wall, 28 in.



Refrigerator Nos. 421 and 426

No.	Width, in.	Depth, in.	Height, in.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening, in.		Ice bunker, in.		
						Width	Height	Width	Depth	Height
421	86	34	77	1475	625	20¾	29¾	21½	25¼	38¼
426	74	31	72	1180	500	16¾	27¼	17½	22½	37

Drain location

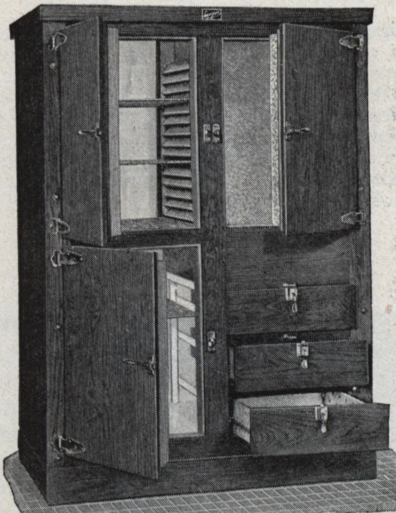
No. 421. From right-hand wall, 29½ in.; from back wall, 28 in.

No. 426. From right-hand wall, 25¾ in.; from back wall, 25 in.

Seeger Short Order Refrigerators

No. 422—Meets the requirements of small hotels and restaurants. Insulated with a 3-in. sheet of pure corkboard and 4 layers of waterproofed paper, and lined with porcelain. Has perforated galvanized steel drawers with insulated fronts, and Seeger "slide-easy" slides. Removable shelves of heavy woven wire, tinned; ice bunker of galvanized steel. Exterior finished in golden oak.

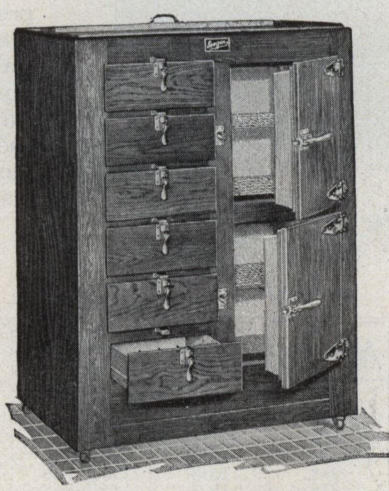
No. 433—Equipped with a rear ice tank for salt and crushed ice, with drain at bottom, permitting holding of intensely cold salt water. Tank is removable and so arranged that it permits free circulation of air. Entire refrigerator lined with galvanized iron. Absolutely watertight, and insulated like Model 422. All doors, drawers and lids to the cracked ice compartment are fitted with rubber compression gaskets. Shelves are of woven wire, retinned after weaving.



Refrigerator No. 422

No.	Width, in.	Depth, in.	Height, in.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening, in.		Ice bunker, in.		
						Width	Height	Width	Depth	Height
422	56	33	77	1280	400	18¾	29¾	20½	24¼	33½

Drain location: 28 in. from right-hand wall and 27 in. from rear wall



Refrigerator No. 433

No.	Width, in.	Depth, in.	Height, in.	Shipping weight, lb.	Ice cap., lb.
433	41	31	57½	650	250

Drain location: 21 in. from right-hand wall; 6 in. from back wall.

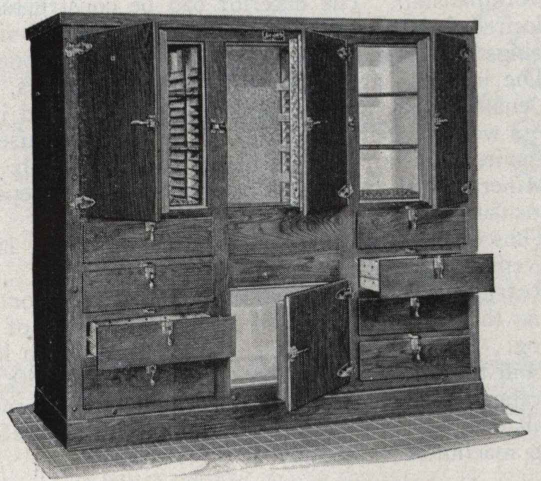
Continued on next page

Seeger Combination Hotel Kitchen, Pantry, and Short Order Refrigerators

This style is designed particularly for pantry or cooks' service, where it is desired to keep the various foods separate. The drawers for chops, cuts and small meats are made of perforated galvanized iron with fully insulated fronts and special locks. They are fitted with Seeger "slide-easy" slides and operate perfectly.

The interior is lined with vitreous porcelain. The refrigerator is insulated with a 3-in. sheet of pure corkboard and 4 sheets of waterproofed paper. The ice bunker is lined with galvanized iron.

The exterior is of selected oak, varnished with golden finish.

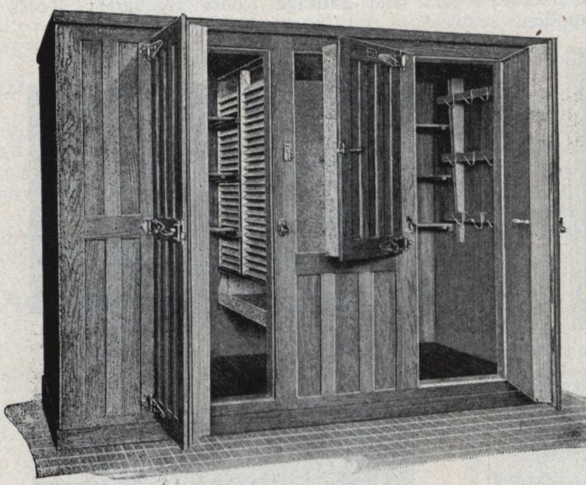


Refrigerator Nos. 412 and 429

No.	Width, in.	Depth, in.	Ht., in.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening, in.		Ice bunker, in.		
						Width	Ht.	Width	Depth	Ht.
412	74	31	72	1200	500	16¾	27¼	17½	22½	37
429	86	34	77	1500	625	20¾	29¾	21½	25¼	38¼

Drain location

No. 412. From right-hand wall, 25¾ in.; from back wall, 25 in.
No. 429. From right-hand wall, 29½ in.; from back wall, 28 in.



Refrigerator No. 431

No.	Width, ft.	Depth, ft.	Ht., ft.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening, in.		Ice bunker, in.		
						Width	Ht.	Width	Depth	Ht.
431	10	5	7	3500	2000	23½	42¼	28	50	48

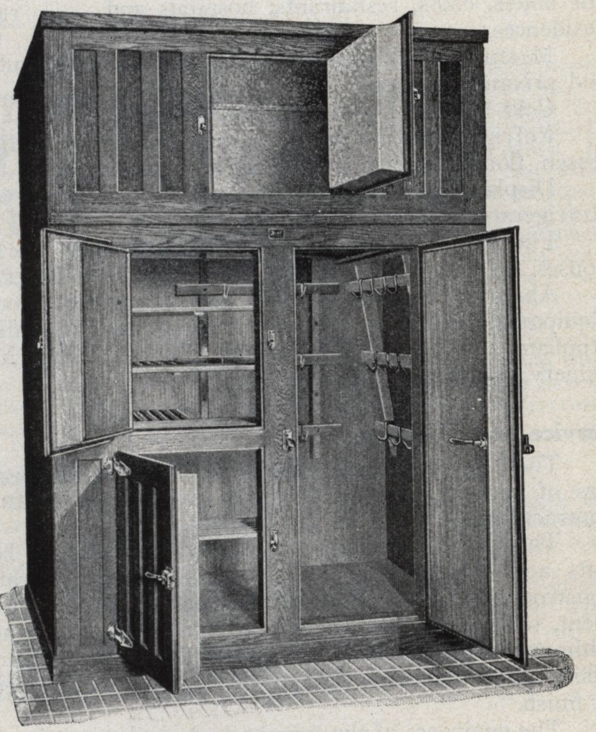
Drain location

From right-hand wall, 41 in.; from back wall, 53 in.

Seeger Combination Service and Storage Refrigerator

This refrigerator has no equal as a combination service and storage cooler for hotels, restaurants and institutions. It has an overhead ice or coil compartment and a full size walk-in door which leads to the meat hanging racks and the shelves behind the service compartment.

The insulation throughout is of 3-in. pure sheet corkboard and 4 sheets of waterproofed paper. All shelves are of hardwood and removable. The hardwood racks are fitted with removable wrought iron retinned meat hooks. Storage compartments are lined with odorless wood, and the ice or coil compartment with heavily galvanized sheet steel. The exterior is of oak, with golden oak varnish finish.



Refrigerator No. 432

No.	Width, ft.	Depth, ft.	Ht., ft.	Ship'g weight, lb.	Ice cap., lb.	Ice door opening in.		Ice bunker, in.		
						Width	Ht.	Width	Depth	Ht.
432	7	5	10	3750	2700	23½	25½	64	50½	27½

Drain location

From right-hand wall, 15 in.; from back wall, 8 in.

Prominent Installations

Following are a few of the large hotels and restaurants equipped with Seeger refrigerators:

Hotel des Artistes, New York, N. Y.
Victoria Hotel, Boston, Mass.
Hotel Wellington, Philadelphia, Pa.
Bristol Ferry Inn, Bristol Ferry, R. I.
The Marshall House, York Harbor, Me.
277 Park Avenue Apartment, New York, N. Y.
Quincy House, Boston, Mass.
Narragansett Pier Hotel, Narragansett, R. I.
Suntaug Lake Inn, Lynnfield, Mass.
Iroquois Hotel, New York, N. Y.
Saint Paul Hotel, St. Paul, Minn.
Cheshire House, Keene, N. H.
Breen Hotel, St. Cloud, Minn.
Hotel Nicollet, Minneapolis, Minn.
Congress Hotel, Chicago, Ill.
Leggat Hotel, Butte, Mont.
Riggens Hotel, Waco, Tex.
Hotel Florida, Havana, Cuba
Congress Square Hotel, Portland, Me.
Glacier National Park Hotel, Glacier, Mont.
Mason Hotel, Jacksonville, Fla.
Hotel Kahler, Rochester, Minn.
Hotel Windsor, Wheeling, W. Va.

Note: The SEEGER REFRIGERATOR COMPANY also will be glad to furnish the names and addresses of other prominent restaurants, clubs, hospitals and residences equipped with Seeger refrigerators.

THE C. SCHMIDT CO.

Designers and Manufacturers of "Thesco" Refrigerators and Store Fixtures

John and Livingston Streets
CINCINNATI, OHIO
REPRESENTATIVES IN EVERY STATE

THE HOME OF THESCO PRODUCTS
TRADE-MARK
(Registered)

Products

Refrigerators and Store Fixtures which include:

Refrigerators and Cold Storage Rooms for hotels, clubs, restaurants, hospitals and residences.

Mortuary Refrigerators for hospitals and for public and private morgues.

Cold Storage Doors and Insulation.

Refrigerators for meat markets, groceries, delicatessen, florists' shops, creameries and commissaries.

Display Cases, Ice Chests, Ice Cream Cabinets and Refrigerator Display Counters.

Fixtures and Equipment for municipal market houses, meat markets, grocery and delicatessen stores.

Abattoir, Packing House and Slaughter House Equipment including Hoists, Tracking and Operating Appliances, Packing House and Sausage Room Machinery, Tools and Supplies.

Service and Facilities

The long experience (since 1870) and ample facilities of this company enable it to execute successfully contracts in all parts of the country.

This company makes a specialty of preparing layouts and specifications for all classes of refrigerator construction and store, market, and packing house equipment, which it is always ready to furnish promptly and without charge together with detailed drawings, specifications and estimates covering any size, style, arrangement, or finish.

The engineers of the company are ready to assist the architect at all times in laying out the equipment or refrigerators best suited to his particular requirements. Their experience and knowledge is offered without obligation. Inquiries are invited.

Construction

Thesco refrigerators and fixtures are famous for their high grade cabinet finish and workmanship. The exterior can be constructed in any desired finished wood, white opal with nickel silver trimmings or plaster to match the finish of the room.

The interiors are lined with white opal glass, tile, white enamel steel, white enamel paint, galvanized iron, odorless wood or cement plaster. The hardware used is the heaviest substantial type in any desired finish.

Mineral wool, pure sheet cork or any other dependable insulation can be furnished.

Thesco fixtures and equipment feature the latest improvements and are modern in design.

Refrigerators can be arranged with a rear or end door so that they can be iced from the outside of the building. Plans showing wall openings and drain locations will be sent on request. Thesco refrigerators can be arranged for either ice or mechanical refrigeration and this company works in co-operation with any refrigerating machine contractor.

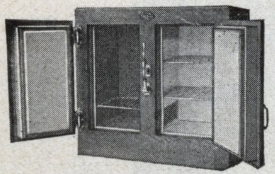
Literature

Any or all of the following catalogues, illustrating and describing the complete Thesco line of stock sizes, will be mailed on request:

No. S-88—Refrigerators and Fixtures for the Meat Market and Grocer.

No. S-84—Refrigerators for Hotels, Clubs, Institutions and Residences.

No. S-72—Packers' and Sausage Room Machinery, Tools and Supplies.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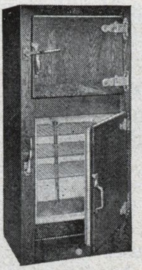
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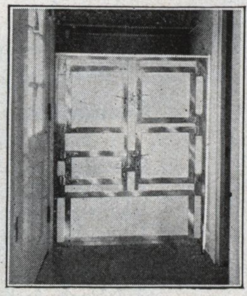
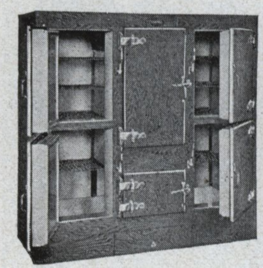

A Thesco Built-to-order Installation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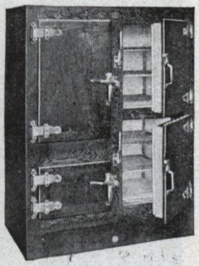
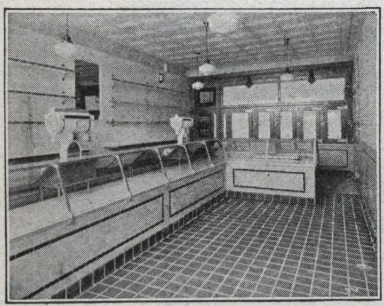
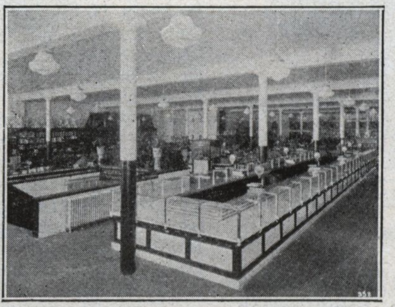
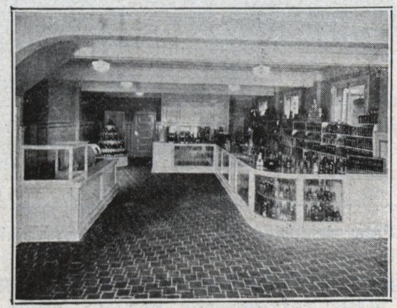

Style No. 5439

Thesco Residence Refrigerators


Meat Market


Public Market


Grocery

Equipped with Thesco Refrigerators and Store Fixtures

AMERICAN CARBONIC MACHINERY CO.

Carbonic Safety System of Refrigeration and Ice Making

WISCONSIN RAPIDS, WIS.

BRANCH OFFICES

CHICAGO, ILL., 720 Cass Street
ST. PAUL, MINN., 43 West Fourth Street
CLEVELAND, OHIO, Plymouth Building
ST. LOUIS, MO., Title Guaranty Building
NEW YORK, N. Y., 30 Church Street
PITTSBURGH, PA., Keenan Building
DETROIT, MICH., 833 Washington Boulevard Building
KANSAS CITY, MO., 723 Dwight Building

Carbonic Safety System
TRADE-MARK

Product

CARBONIC SAFETY SYSTEM OF REFRIGERATION and ICE MAKING INSTALLATIONS (Manual and Automatic Control).

When the Carbonic Safety System of Refrigeration Is Used

This system is manufactured for use wherever cooling of any degree is necessary and also for the manufacture of ice.

It is used in hospitals, hotels, department stores, fur storage, industrial plants, candy and ice cream factories, dairies, packing plants, drinking water cooling plants, bottling plants, also for marine refrigeration, air conditioning, chemical plants, etc.

Operation of Carbonic Safety System of Refrigeration

The accompanying drawing shows a complete refrigerating plant and the functions of the three primary parts: compressor, condensing coil and expansion coils. The medium employed in producing refrigeration in this system is carbon dioxide (CO_2). This gas is introduced into the system by connecting the drum containing the carbon dioxide at the point "H." By compressing this gas it becomes heated and enters the condenser "B" at a high temperature and a corresponding pressure. Cold water is then supplied to the tubes of the condenser, cooling, condensing and liquifying the gas. The gas is then collected in the liquid receiver from which it flows through the expansion valve "D" into the expansion coils "C" where the pressure is reduced by the expansion or regulating valve. In expanding, the gas is reduced to a very low degree of temperature, which in turn reduces the temperature of the substance in contact with the outer surface of the coils. This coil may be installed directly in a refrigerator, in a brine tank when brine is used as a transfer medium, or in a drinking water tank, etc.

After the gas passes from the expansion coil it returns to the compressor where the processes are repeated.

Gauge board "R" indicates the condition of the gas in the various parts of the system and the various pressures at all parts of the system, permitting the operator to keep the system under control at all times. The system is started or stopped by the simple manipulation of the condensing water valve.

Any excessive oil supplied to the compressor for lubricating the cylinder is collected by oil traps "F" and "G" and drawn off through drain cocks.

Advantages in the Use of Carbon Dioxide as a Refrigerating Medium

Carbon dioxide (CO_2) derives its name from its constituents, carbon and oxygen. It is absolutely harmless and non-inflammable and can be made odoriferous by charging a small quantity of peppermint, or any harmless highly odoriferous chemical into the system. It has an unusual range of refrigerating temperatures (to 110° below zero). It is by a large margin the cheapest and most readily procurable refrigerant now in use, costing a few cents per pound. It requires a very small compressor cylinder, one-sixth as much as other systems. Unlike other mediums, carbon dioxide does not deteriorate, because it has no affinity for water, oils or other matter. The compressor operates above atmospheric pressure, and for this reason other gases, such as air, do not enter the system and cause inefficiency, or disturbance in the operating conditions, a fault common with other types of refrigerating equipments. It is neutral, having no deteriorating or corroding effect on materials such as brass, bronze, etc.

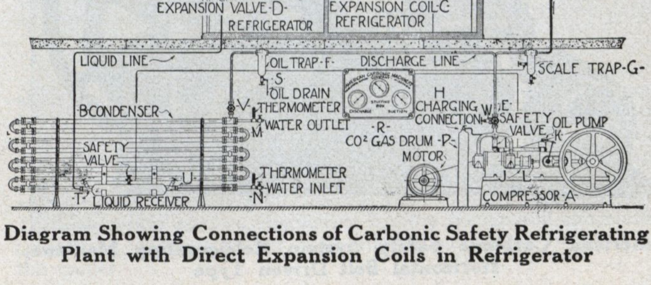


Diagram Showing Connections of Carbonic Safety Refrigerating Plant with Direct Expansion Coils in Refrigerator

Compressor

The compressors are adaptable to any steam engine or motor drive. Engine drives are arranged with the main shaft in one piece, attached to the crank discs of the engine and compressor.

The heavy duty design of the compressor is ideal for direct connection to girder frame or the heavy duty rolling mill type engines.

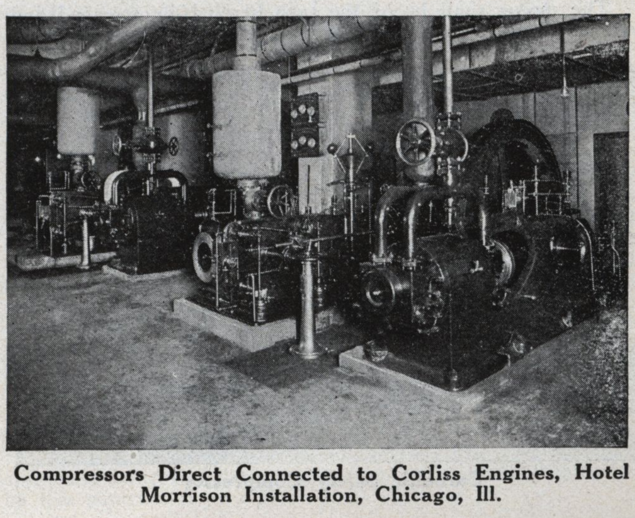
There will be furnished on application our General Catalogue containing full description of compressor and appurtenances, and useful data on refrigeration.

Automatic Carbonic Safety System

The Automatic Carbonic Safety System is a patented combination of our standard equipment with automatic operation and temperature controlling devices.

This equipment is recommended where the highest degree of economy in operation is desired and where uniform temperatures are essential. The advantages of the standard Carbonic Safety System, combined with the additional advantages of automatic temperature control, result in an equipment unsurpassed in economy and reliability.

Complete information, together with plans and specifications for this system to suit the requirements, will be furnished on request.



Compressors Direct Connected to Corliss Engines, Hotel Morrison Installation, Chicago, Ill.

Continued on next page

Standard Specifications

Introductory Clauses

Work to Be Furnished by Other Contractors Under Separate Specifications for the Respective Trades—

Foundation Work
Electric Wiring and Connections to Motor
All necessary Chases
Refrigerators.
Insulation.
Ventilating ducts and fixtures.

Work Included in This Contract—This contractor shall supply and install all equipment excepting that specified to be done by others. The plant shall be turned over to owner in condition for immediate and perfect operation.

Installation in Existing Buildings—This contractor shall do all cutting and patching necessary for the installation of this work; same shall be done in a skillful and workmanlike manner.

Foundations—All foundation work shall be done by another contractor. This contractor shall furnish drawings showing the exact location of all equipment together with templates, bolts, sleeves and washers.

Refrigerating Equipment

Compressor—This contractor shall furnish, install and connect..........compressors to be of the horizontal or vertical Carbonic Safety type of ....tons daily refrigerating capacity under proper operating conditions with the temperature of the condenser water at or below 70°. The oiling system on these compressors shall be of the positive oiling type.

Compressor Drive—This contractor shall furnish, install and connect such devices as are necessary to drive the compressor from the engine shaft or motor pulley. If belt drive, the belt shall be of regular weight double leather strictly center stock, oak tanned, and shall be made endless. Where there is a possibility of dampness or wet floors, this belt shall be of the waterproof type.

Condensor—The contractor shall furnish, install and connect double pipe condensers, countercurrent type, made of 1¼-in. extra heavy inside pipe and 2-in. extra heavy outside pipe, with all CO_2 connections welded and with removable water return bends to allow for cleaning the water tubes. If space does not permit the installation of a double pipe condenser, then the triple pass shell type condenser as manufactured by the American Carbonic Machinery Co. shall be installed. There shall be provided a liquid receiver of ample capacity together with the necessary valves and fittings as required for a complete installation.

Brine Storage Tank—This contractor shall furnish and install..........brine storage tank..........long,.......... wide,..........high, made of..........material of the riveted or welded type, painted inside and outside and guaranteed watertight. The necessary flanges shall be provided as required for the complete installation.

Brine Cooler—This contractor shall furnish and install brine cooling apparatus of the double pipe countercurrent type of......tons capacity, or of the triple-pass shell type, as manufactured by the American Carbonic Machinery Co.

Brine Circulating Pump and Motor—This contractor shall furnish and install the necessary brine circulating pumps of the ....type of proper capacity, designed to operate against the total head of the system. Pump will be mounted on cast iron subbase with extension for mounting motor and the base shall have raised lip around edge to catch all drip.

The motor shall be of the type hereinafter specified and shall be of proper size to operate the pump continuously without overheating and shall be supplied with the necessary starting switch.

Coils and Piping for Brine Circulating System—This contractor shall furnish and install a complete brine circulating system for the proper cooling of the refrigerators, etc., as herein specified. Contractor shall furnish and install the brine mains of standard galvanized pipe and fittings, of ample size to insure proper circulation for each cooling coil. All valves will be of the gate type. Brine mains shall be erected in first class and approved manner with all horizontal and vertical lines installed parallel to the building walls.

Hangers, valves and fittings for the complete installation shall be provided.

The brine lines shall be thoroughy tested before covering is applied.

The brine coils shall be made of gavanized iron pipe with galvanized return bends, or shall be continuous welded galvanized coils. Each coil shall be of ample surface to attain proper temperatures in each respective refrigerator as herein specified.

Snowmounds—There shall be furnished for each apartment refrigerator, or refrigerators requiring similar service, the American Carbonic Machinery Co.'s Snowmound, thoroughly galvanized after fabrication, each properly fitted with brine inlet and outlet connection, separately valved to allow for cutting out individual refrigerator service.

Each Snowmound shall be arranged with ice freezing compartment and there shall be provided a hinged cover over this ice freezing compartment. Each Snowmound shall be provided with proper legs or supports to allow for uniform air circulation.

There shall be furnished with each of the Snowmounds, ice making trays made of No. 14 gauge copper, tinned after fabrication. These trays to be provided with separate dividing partitions to make cubes 1¼ in. square. The dividing partitions shall be made of copper, heavily tinned after fabrication. Ice cube trays shall be designed to allow for rapid freezing of ice and also facilitate the removal of the ice from the cube trays.

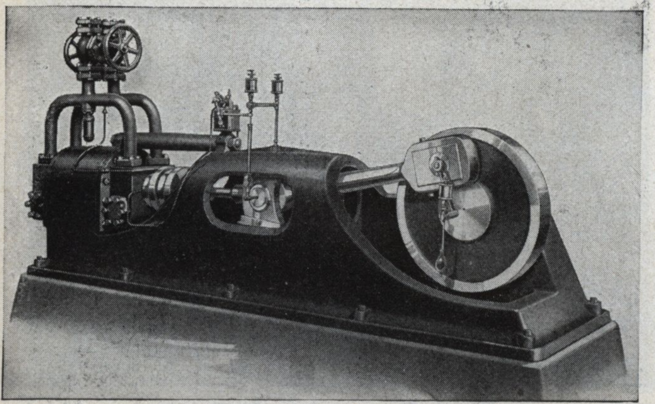
Pipe Covering—This contractor shall furnish and apply to all exposed cold gas and brine pipe cork sectional [hair felt] pipe covering of brine thickness, applied in a first class and approved manner. Covering to be applied in accordance with usual manufacturers' specifications.

Pipe and Coils for Direct Expansion System—For all refrigerators, freezing rooms and requirements where direct expansion cooling coils are desired, these coils shall be made of 1¼-in. genuine extra heavy coiling pipe bent into coils of continuous length. Such coils shall be provided with the necessary straps and supports as required for the proper installation in working order in the rooms in which they are to be used.

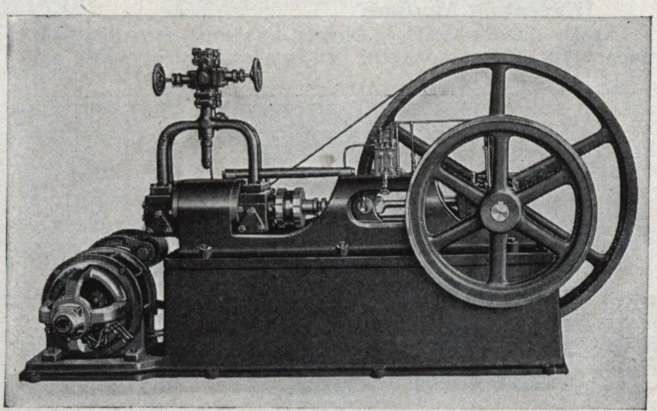
These coils for the respective rooms shall have proper exposed cooling surface to maintain uniform temperature in the refrigerators in amount as required for the continuous or intermittent refrigerating unit to maintain the required temperatures.

These coils are to be galvanized or black. (If galvanized it shall be of the "hot process" and all surfaces of coils, straps and supports shall be entirely coated.)

Brine Holdover Tanks—With the specified direct expansion cooling coils there shall be furnished the necessary brine holdover tanks. These tanks to be made of galvanized material of proper size or capacity for maintaining a uniform temperature in the refrigerators during the shutdown period of the compressor. These holdover tanks to be properly proportioned to suit each respective refrigerator so that the correct space for air circulation on all sides of the tanks shall be allowed.



Carbonic Safety Compressor



American Carbonic Safety System Refrigerating Machine, Horizontal Belt Driven Type

Continued on next page

Ice Making Equipment

Ice Making Tank—There will be furnished one ice making tank..........long,..........wide,..........high, made of ....material thoroughly welded or riveted and caulked, painted inside and outside and guaranteed watertight. This tank shall be well reinforced around the top with angle iron and otherwise braced to make this tank of rigid construction.

There shall also be supplied in this tank the necessary openings and connections to the brine system. The ice making tank shall be arranged with the necessary provisions for the circulation of the brine and to maintain proper level of brine in the tank at all times. Provision shall also be made to accommodate the brine agitator as hereinafter specified.

Ice Can Covers and Framework—This contractor shall furnish individual ice can covers for each ice can. These covers shall be made of three layers of ⅞-in. T. & G. lumber with waterproof insulating paper between each layer, and the cover shall be fitted with galvanized lifting hook flush with the top. The framework shall be arranged to accommodate the ice cans and covers and shall be rigidly constructed of cypress lumber. The portion of the top not used for ice cans shall be insulated with not less than 4 in. of corkboard confined between the framework by means of two layers of ⅞-in. T. & G. lumber with two layers of waterproof insulating paper.

Insulation—The ice tank shall be insulated as follows: the floor space where the tank is to be erected shall be heavily mopped with hot asphalt and one layer of 3-in. pure corkboard shall be laid directly on this asphalt with all joints well sealed with asphalt. The top of this layer of corkboard shall then be mopped with hot asphalt and a second layer of 2-in. pure corkboard shall be laid directly on the first course with the joints of the second course broken with respect to the joints in the first course. This second course of corkboard shall then be heavily mopped with asphalt and the tank shall be set in place on this cork insulation.

The sides of the tank shall be insulated with not less than 12 in. of granulated cork or two layers of 2-in. pure corkboard erected with hot asphalt similar to the insulation for the bottom of the tank and with a space of approximately 2 in. left between the corkboard insulation and the sides of the tank. This space shall be well filled and packed with granulated cork. The exposed surface of the insulation shall be finished and made rigid by means of two layers of ⅞-in. T. & G. lumber with two layers of waterproof insulating paper between.

Ice Cans—This contractor shall furnish........standard ....lb. ice cans..........deep, made of No. 16 gauge heavily galvanized material well riveted and soldered. The top shall be reinforced with galvanized iron band drilled for lifting device.

Raw Water Systems—The ice making system shall be of the type commonly known as the raw water system and shall manufacture clear ice from raw water by means of air agitation. This system shall include the necessary blower together with belt and motor. There shall also be furnished all necessary air agitating piping, automatic air valves, drop tubes and thawing needles as required for this installation and for accomplishing results above specified.

On large installations a core sucker pump and motor will also be furnished.

Ice Can Hoist—This contractor shall furnish and install complete ice can hoist of the crane or hand type. (If the crane type hoist is furnished, it will be furnished complete with tracks, hangers, and trolleys.)

Brine Agitator—There shall be furnished one brine agitator and motor complete.

Coils for Freezing Tank—Coils for the freezing tank shall be made of 1¼-in. genuine extra heavy pipe and shall be made to fit the ice making cans and equipment, and will be so made that no joints shall appear below the level of the brine in the tank.

Ice Can Filler—This contractor shall furnish one filler to be of the automatic type complete with three-ply rubber hose and connections.

Thawing Device—This contractor shall furnish one ice can dump and thawing well or one automatic sprinkling dump as manufactured by the American Carbonic Machinery Co.

Drinking Water Cooling Equipment

Drinking Water Circulating System—Other contractors shall furnish and install the complete system of piping, fountains, faucets, etc., for circulating the water through the building and including the connections to the water cooling tank and water circulating pump. Water pipe covering for this system shall be furnished and installed by other contractors. The refrigerating machinery contractor shall furnish and erect the drinking water coolers, insulation for the cooler and the water circulating pump, together with all refrigerant connections to the cooler.

General and Miscellaneous Clauses

Accessories—This contractor shall furnish and install a complete set of tools, lubricating devices, gauge board and gauges, together with oil traps, and thermometers. All lubricating pumps and accessories to be nickelplated.

Initial Charge of Chemicals—This contractor shall furnish the initial charge of calcium chloride brine to test not less than 1.25 specific gravity, and carbon dioxide gas necessary for the complete installation and testing out of system, and for its successful operation.

Connections—This contractor shall furnish and install all the required carbon-dioxide connections. All pipes shall be of extra heavy wrought iron pipe, and all fittings, valves and flanges shall be of the best of their respective kind. Water connections to and from the condenser shall be made within 10 ft. of the respective condenser water inlet and outlet.

Electric Motors—This contractor shall furnish the necessary motors for operating the equipment as herein specified. These motors shall be of the 40° C. rated type and shall be of the proper type to operate the equipment successfully.

Each motor, up to and including 5 hp., shall be furnished with the necessary starting switch and all motors 7½ hp., and above, shall be provided with compensator providing overload protection and undervoltage release features.

The power characteristic of all motors shall be volts, d-c. [..........volts, a-c.,..........cycle,..........phase].

The compressor motor shall be..........hp.; other motors shall be..........(include schedule).

Note: For other conditions see electric wiring specifications.

Electrical Connections—This contractor shall furnish and deliver to the owner, or electric wiring contractor at the building, motors and control apparatus to be furnished under this contract. All electric wiring to be handled in accordance with building trade conditions existing during the installation of this apparatus.

Delivery—The complete equipment as specified above shall be shipped from its place of construction in Wisconsin Rapids, Wis., to the building of the.................................... in........days after acceptance of this contract.

Installation—Immediately upon the arrival of said machinery and appurtenances at the said destination, this contractor shall furnish all the necessary material and labor, and immediately proceed to install the equipment unless delayed by strikes, fires, accidents, or other causes beyond the reasonable control of the contractor.

Purchaser shall notify contractor when building is ready to receive material and installation can proceed, upon which notice contractor shall furnish competent erecting engineer to install the entire equipment.

Permits—Contractors shall provide for all permits and inspection fees as required for the installation and operation of the entire apparatus herein specified.

Test—Immediately after the completion of the installation, a test shall be made during which the plant shall demonstrate that it fulfills the conditions of this contract, and if it is shown during the test that the plant performs the service for which it has been installed, it shall then be accepted by the purchaser in writing.

Guarantee—Contractor guarantees that the machinery and appurtenances herein provided to be furnished shall be free from injurious flaws and defects and shall be constructed throughout of the best material and workmanship and carefully designed to operate without undue friction, wear, or breakage of parts, and any part which proves defective within one year from the date of installation, due to improper material or workmanship, shall be replaced free of charge to the purchaser. Contractor further guarantees that when properly operated the said compressor shall have a capacity equal to the melting of........ tons of ice in twenty-four (24) hours, with the temperature of the condensing water at or below 70° F.

Contractor shall further guarantee that the complete equipment shall be installed with provisions for all safety appliances in accordance with Safety Code, and also shall guarantee that the complete charge of refrigerant shall not cause any damage or injury to persons or property in the event the entire charge escapes from the refrigerating system, and it shall be understood that the refrigerating plant shall be installed under such conditions.

Patents—Contractor shall guarantee no infringement upon the patent rights of others. In case of patent litigation brought against purchaser for alleged infringements, the contractor shall defend such litigation and keep purchaser entirely free from and unharmed by all dangers and expense of all kinds which might arise in connection with patent litigation.

Alternate—All equipment necessary for the complete automatic control of the refrigerating system shall be furnished by this contractor.

THE AUDIFFREN REFRIGERATING MACHINE CO.

TELEPHONE
Rector 2777

140 Cedar Street, NEW YORK, N. Y.

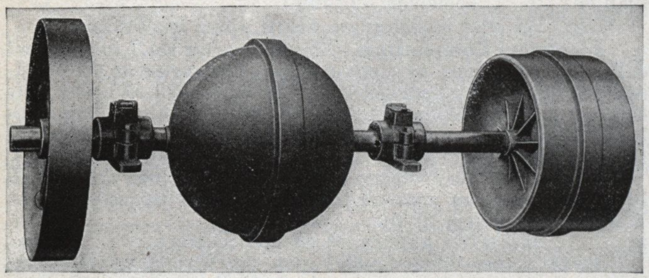
CABLE ADDRESS
"Audrefmaco"

Products

Audiffren-Singrun Ice Machine.
Audiffren Drinking Water System.
Audiffren Refrigerating Systems.

Description of the Audiffren Machine

The Audiffren machine is so designed that the mechanism, the refrigerant—sulphur dioxide—and the lubricating oil are permanently and hermetically sealed inside the dumbbell shaped rotor. This cast bronze rotor thus combines the functions of compressor, condenser and evaporator. There are no external glands, valves or gauges. There is nothing to adjust or to set, nothing can leak and no replacement of refrigerant is ever needed. To produce refrigeration, the dumbbell must only be rotated, with the condenser end dipping in a tank of cooling water, the evaporator end in the liquid to be cooled.



Audiffren Rotor or Dumbbell

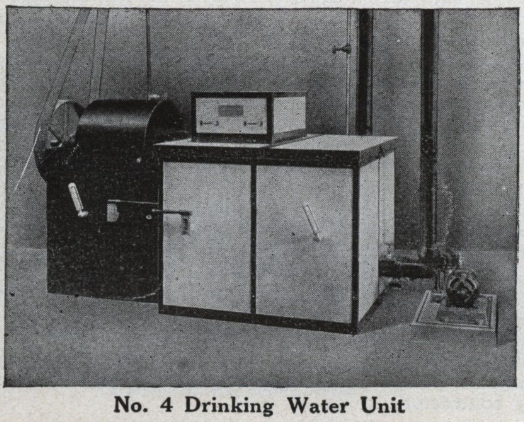
Sizes

Built in five sizes, with nominal ratings of $\frac{1}{10}$, ⅕, ½, 1 and 2 tons capacity, these machines provide ideal refrigerating service with a minimum of expense, absolute safety, and without skilled supervision.

No. of machine	Hp. required	Condensing water per hour, gal.	Refrigerat'n ice equivalent, lbs. per 24 hr.	Drinking water		
				Water cooled 77°-50° per hr.	Average length pipe line, ft.	Population served, persons
1	⅓	10	125- 250	7	20	10- 50
2	½	20	300- 600	15 gals.	200	50- 100
3	1½	50	750-1500	35 gals.	400	100- 500
4	2½	100	1500-3000	75 gals.	900	500-1000
6	5	200	3000-6000	150 gals.	1400	1000-3000

Application

The Audiffren machine is peculiarly adapted to direct cooling of drinking water in factories, public buildings and hotels; to ice making up to 2500 lbs. daily, to cooling refrigerators in residences, stores, florist shops, restaurants, cafeterias, and factories; and to various industrial processes.



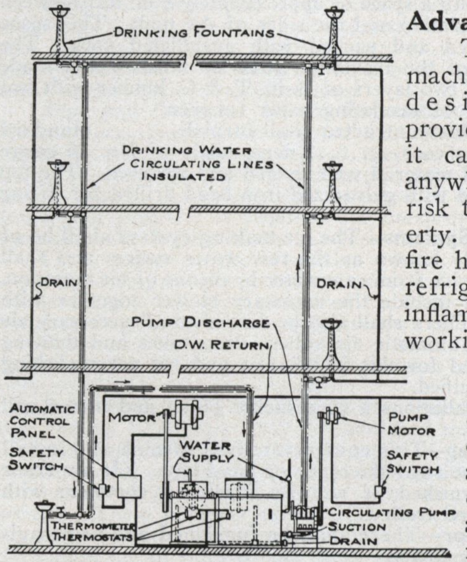
No. 4 Drinking Water Unit

Performance

The Audiffren machine may be operated by belt drive from any available source of power—electric motor, steam engine, gas engine or water power. With electric power it lends itself readily to automatic control and requires only routine attention. When used for refrigeration of storage boxes and cold rooms, brine is maintained at low temperature in the insulated brine tank (in which ice may be made if desired) and circulated through the cooling coils of the refrigerator.

Applied to the refrigeration of drinking water, brine is eliminated and the rotor, turning directly in the water, cools and aerates it. From the cooling and storage tank, the chilled water is continuously circulated through the "loop" pipe system to all the fountains and back to tank. The machine operation is automatically controlled from a thermostat in drinking water tank, which thus maintains the water throughout the system within any desired limits and at any desired temperature. There is no fluctuation. The Audiffren system provides drinking water service of unequalled quality.

Net capacities of machine vary with maximum external air and condensing water temperatures and required temperatures in refrigerator, or liquid being cooled. In preparing estimates we should also have data as to refrigerator size and insulation, lengths of piping for brine or drinking water and electric current characteristics.



Audiffren Drinking Water System

Advantages

The Audiffren machine is safe. Its design inherently provides for that, and it can be installed anywhere without risk to life or property. There is no fire hazard since the refrigerant is not inflammable. The working pressure is low and excessive pressures can not be generated under any condition of operation or abuse. Machine refrigerates by simply *rotating the rotor*. It is economical to operate, simple, durable. The first cost is higher than ordinary machines and it is worth the difference. Satisfaction is permanent.

Facilities

The rotors are completely standardized and have been built for us since 1911 by the General Electric Company at the Fort Wayne Works. A stock of all sizes is maintained. The tanks, cabinets and accessory equipment are made and assembled at the Audiffren factory in Jersey City. We furnish the complete unit erected and in operation, or will advise with the architect when part of the system is to be installed by others.

Catalogue

Send for descriptive literature and name of local agent near your office.

BAKER ICE MACHINE CO., INC.

Manufacturers of Small and Medium Sized Ice Making and Refrigerating Plants

OMAHA, NEB.

BRANCHES AND AGENTS

BIRMINGHAM, ALA., 447 Brown-Marx Building
BOSTON (29), MASS., 142 Cambridge Street
CHICAGO, ILL., 218 North Jefferson Street
DENVER, COLO., 1517 Blake Street
DES MOINES, IOWA, 512 S. & L. Building
FORT WORTH, TEX., 207 East Front Street
JACKSON, MISS., 110 South Roach Street
KANSAS CITY, MO., 1107 Wyandotte Street
LITTLE ROCK, ARK., 612 A. O. U. W. Building
LOS ANGELES, CAL., 351 South Anderson Street
MEMPHIS, TENN., 354 South Main Street
MIAMI, FLA., 9-11 Southeast Sixth Street
MINNEAPOLIS, MINN., 304 Lumber Exchange Building
ORLANDO, FLA., 1014 State Bank Building
PHILADELPHIA, PA., 1215 Filbert Street
SEATTLE, WASH., 1310 Seattle Boulevard
VALDOSTA, GA., Room 3, Dalton Building

BAKER SYSTEM
REFRIGERATION

Service Department

An ice making or refrigerating plant is so technical in construction that each plant must be individually designed according to client's requirements. It is practically impossible to give any set rules or specifications that would apply on all jobs. Rarely are two installations exactly alike.

It is absolutely necessary that a client's requirements be first properly analyzed before a plant can be designed.

We urge you to consult our engineering service department. Our engineers will gladly assist you in analyzing refrigerating problems and aid you in designing a well balanced plant that will operate at a low cost. You are not obligated to specify Baker equipment.

Baker Ice Making and Refrigerating Plants

They are quality plants throughout. Our records in February, 1924, showed 81% of plants installed 15 years before were still in operation. Nearly 5500 plants have been sold during the past 19 years. A Baker is not sold on a price basis, but rather on a basis of honest performance of duty.

Baker Compressors

Furnished in standard valve-in-head, slow-speed compressor or safety-head type operating at medium speed. All are vertical, single-acting compressors. Made of semi-steel, not cast iron. slow and medium speed at which Baker compressors operate insures longer life.

All compressors are equipped with automatic relief valves. Plants can be equipped with automatic water valves and extension valves. When advisable, plant can be operated by means of automatic thermostatic control. Baker plants are furnished in sizes up to 75 tons capacity each 24 hours.

Baker Self-contained Unit

A compact plant having compressor, condenser, oil trap and liquid receiver, all mounted on one base. Furnished in sizes up to 2½ tons refrigerating capacity.

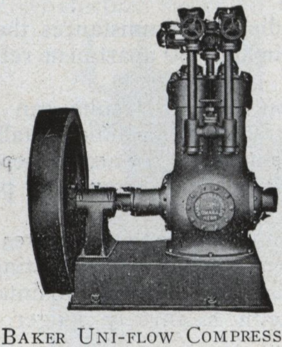
Some of the Uses for Baker Plants

Installed in hotels, apartments, clubs, hospitals, restaurants, public buildings, creameries, dairies, bakeries, fur storage houses, produce companies, confectioneries, and cold storage, fish, and ice plants. Used wherever foodstuffs must be kept at low temperature in order to prevent spoilage. Ideal for water cooling and adaptable for cooling air in large rooms.

Prominent Installations of Baker Refrigerating Plants

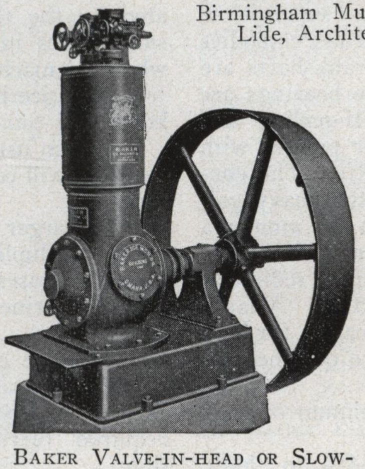
Baker refrigerating and ice making systems are performing satisfactory service throughout the United States in the largest hotels, restaurants, hospitals, institutions, clubs, public buildings and apartment houses, and in the finest residences. A few of the many Baker installations follow:

Kemp Hotel, Wichita Falls, Tex., Richards, McCarty and Bulford, Columbus, Ohio, Architects
Hotel Fontenelle, Omaha, Neb., Thomas R. Kimball, Architect
Hotel Radisson, Minneapolis, Minn., Charles L. Pillsbury, Consulting Engineer
New Washington Hotel, Seattle, Wash., Eames & Young, St. Louis, Mo., Architects
Hotel Fort Des Moines, Des Moines, Iowa, Proudfoot, Bird & Rawson, Architects and Consulting Engineers
Hotel Powhatan, Washington, D. C., Milbourn, Heister & Co., Architects
Tri-State Hotel, Memphis, Tenn., Jones & Furbinger, Architects
Kansas City Athletic Club, Kansas City, Mo., Hoit, Price & Barnes, Architects
Y. M. C. A., Minneapolis, Minn., Long, Lamoreaux & Long, Architects; Shattuck & Hussie, Chicago, Ill., Associate Architects and Engineers
National Lepers' Home, Carville, La., Joseph A. Wetmore, Washington, D. C., Acting Supervising Architect
U. S. Marine Hospital, Savannah, Ga., Joseph A. Wetmore, Washington, D. C., Acting Supervising Architect
University Hospital, Omaha, Neb., John Latenzer & Sons, Architects
Institution for Defective Delinquents, Napanoch, N. Y., Franklin B. Ware, State Architect
Crane Co. Building, Chicago, Ill., Holabird & Roche, Architects
First National Bank Building, Montgomery, Ala., Carpenter, Blair & Gould, New York, N. Y., Architects
Birmingham Municipal Market, Birmingham, Ala., Martin J. Lide, Architect and Engineer



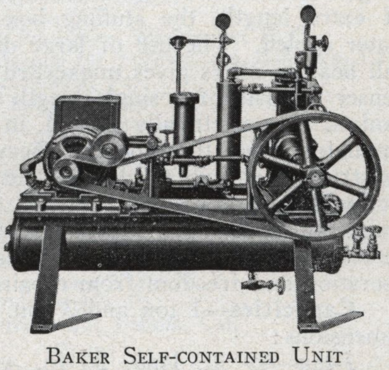
BAKER UNI-FLOW COMPRESSOR EQUIPPED WITH DOUBLE SUCTION MANIFOLD

Each cylinder can operate independently of the other. For combination of low and medium temperature work



BAKER VALVE-IN-HEAD OR SLOW-SPEED COMPRESSOR

Heavy cylindrical construction. Noted for its long wearing qualities. A quality machine that can be safely recommended



BAKER SELF-CONTAINED UNIT

Furnished with uni-flow compressor. Takes up little floor space. Low operating cost because of high efficiency. Automatic or hand control

PEERLESS ICE MACHINE COMPANY

Manufacturers of Automatic Refrigerating Machinery

503-531 South Jefferson Street
CHICAGO, ILL.

CABLE ADDRESS
"Kritzer"

Products

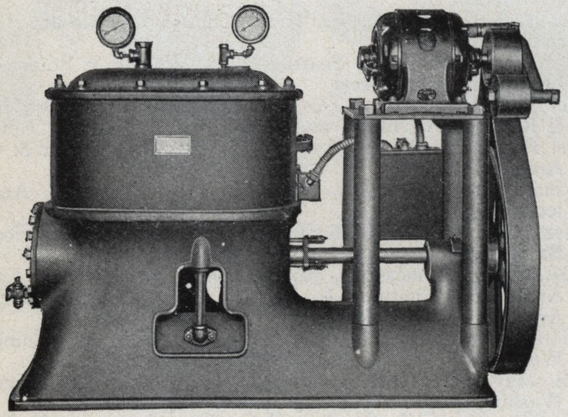
Peerless Automatic Refrigerating Machines of "Commercial" capacities.

Automatic Expansion Valves, Automatic Water Regulators, Pressure Control Valves.

Also Thermostats for all purposes.

Peerless Automatic Refrigerating Machines

Description—The Peerless is a self-contained, full automatic refrigerating machine in which the entire high pressure side, consisting of compressor, condenser, oil trap, and receiver, is assembled in one unit, compact in design and attractive in appearance. The Peerless is essentially a unit machine, replacing the old-fashioned equipment in which the different processes of mechanical refrigeration were brought together in one room and called an ice machine.



The Peerless—Complete High Pressure Side on One Base

Equipped with automatic controls embodying our own control devices the Peerless eliminates the necessity of skilled attention, a monthly oiling being all required.

Unit construction permits of standardized parts with complete assembly taking place under factory supervision.

Details of The Peerless—The Peerless embodies the best construction throughout. The crankshafts are of generous diameters, the die cast sleeve bearings are of extra length, the stuffing box is self-sealing and water cooled. The use of large diameter pulleys with ball bearing idlers gives unexcelled belt life. The condenser consists of a single length of extra heavy galvanized pipe electrically welded, in which the ammonia circulates *inside* the pipe and the water *outside*. This construction permits of cleaning out dirt, mud, sediment, etc., without breaking an ammonia connection. A large crankcase capacity provides sufficient lubrication for long periods. Plate and semiplate valves insure quietness of operation and freedom from repairs.

Capacities—1 ton and 3 ton. Maximum over-all dimensions:

1-ton—49 in. long, 26 in. wide, 44½ in. high. Weight, 1480 lbs.

3-ton—72 in. long, 29 in. wide, 53 in. high. Weight, 2650 lbs.

The Peerless in Apartment Buildings

The increasing number of apartment buildings requiring up-to-date features has opened a wide field for mechanical refrigeration.

The Peerless, more than any other type of machine now offered, meets the requirements of this particular work.

Its compact construction requires a minmium of room in the basement for installation. Its automatic operation eliminates the necessity of skilled engineering attention.

The entire equipment can be placed in a separate room under lock, it being only necessary to open up once a month to oil the motors. Any janitor without previous experience on ice machinery can operate the Peerless.

The extremely quiet operation and the absence of the compressor "pound" found in most ice machines allows full use of the automatic features.

It is not necessary to pull the switch at night as the starting and stopping of the plant at any hour does not create any noise whatever in the apartments.

The Peerless can be located directly under sleeping rooms or immediately adjacent without disturbing tenants.

In "central plant" refrigeration, the ice machinery is connected to a double-pipe brine cooler, located on the wall of the room and insulated with cork.

A small centrifugal pump circulates the cold brine to galvanized iron tanks located in the ice compartment of the refrigerators.

These tanks are equipped with recesses for the freezing of table ice.

The ice machine maintains the brine at a constant temperature the year around, automatically increasing its operation in the warm months to take care of the increased load.

The ice machine motor and pump motor are operated by the thermostat located in the brine line, the small tanks in the ice boxes maintaining temperatures when the machinery is shut down.

Cube ice is frozen in approximately one and a half hours.

Under usual and ordinary circumstances the 3-ton Peerless will cool approximately 30 apartment refrigerators.

In larger installation perfect results can be secured by duplicate and triplicate machine installations, in which cases the machines are connected separately with one brine cooler and only one circulating pump is used.

The use of more than one machine insures 100% refrigeration at all times regardless of the contingencies arising, as the remaining machines will maintain the required refrigeration with a slightly longer operation.

The Peerless organization will gladly co-operate in laying out refrigerating systems. Our experience is at your service.

YORK MANUFACTURING CO.

Ice Making and Refrigerating Machinery Exclusively

MAIN OFFICE AND WORKS

YORK, PA.

BRANCH OFFICES

BOSTON, MASS., 98 Friend Street
BROOKLYN, N. Y., 42nd Street and Second Avenue
PHILADELPHIA, PA., 2222-28 Arch Street
PITTSBURGH, PA., South 24th and Carson Streets
CLEVELAND, OHIO, 2700 Washington Avenue, N. W.
ATLANTA, GA., Houston and Jackson Streets
CHICAGO, ILL., 1113-23 Cornelia Avenue
CINCINNATI, OHIO, 1110 Race Street
ST. LOUIS, MO., 115-21 South 11th Street
OMAHA, NEB., 1213-17 Jackson Street
DENVER, COLO., 2121-31 Market Street
HOUSTON, TEX., 2201-11 Texas Avenue
NEW ORLEANS, LA., 609 Tchoupitoulas Street
LOS ANGELES, CAL., 5051 Santa Fe Avenue
SAN FRANCISCO, CAL., 832-38 Folsom Street
SEATTLE, WASH., 500-10 Terry Avenue, N.
TORONTO, CAN., CANADIAN ICE MACHINE CO., LTD., Villiers and Munition Streets

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Products

ICE MAKING and REFRIGERATING MACHINERY which includes: Compression Refrigerating Machines, Absorption Refrigerating Machines, Ice Making Plants, Refrigerating Plants, Ammonia Valves, Ammonia Fittings, Ammonia Condensers, Brine Coolers, Aqua Ammonia Pumps, Ice Cans, and all parts needed to equip a complete ice making or refrigerating plant.

Description

We build all the machinery and apparatus used in ice making and for general refrigeration, both compression and absorption systems. Compression machines may be actuated by any available power.

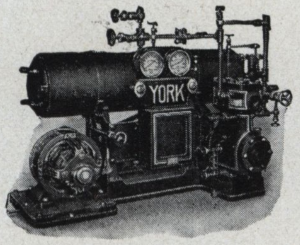
Sizes

The enclosed machine is built in sizes from ¼-ton refrigerating capacity upwards; the vertical single-acting machines from 20 to 600 tons; the horizontal double-acting machines from 10 to 600 tons. Ammonia absorption and carbon dioxide (CO_2) machinery of any capacity required by the trade.

Application

York machines can be used wherever ice making or refrigeration is required, the style of machine being determined, to a great extent, by local conditions.

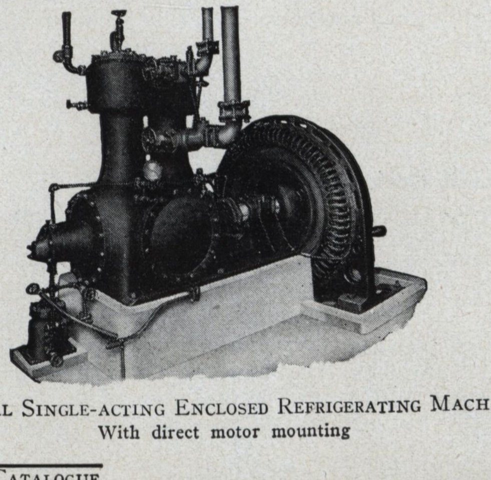
The self-contained and enclosed machines are particularly adapted for residences, apartment houses, small hotels, creameries, ice cream factories, etc.



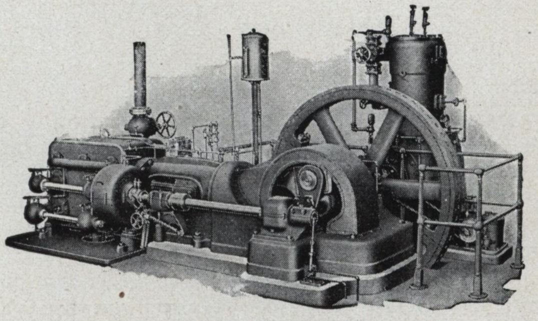
SELF-CONTAINED REFRIGERATING MACHINE

Valves and Fittings

York ammonia valves and fittings are guaranteed to give satisfaction under all usual working pressures.



VERTICAL SINGLE-ACTING ENCLOSED REFRIGERATING MACHINE
With direct motor mounting



ENCLOSED SINGLE-ACTING REFRIGERATING MACHINE
Direct connected to uniflow engine

Service

All York branches carry in stock a complete line of ammonia valves and fittings, also a line of enclosed machines. What a service department is to the owner of an automobile, the York Sales Organization is to the user of ice making and refrigerating machinery. Both *quality* and *service* can be secured by patronizing the York Organization.

References

A few installations are given below:

HOTELS

Hotel Adelphia, Philadelphia, Pa.
Pennsylvania Hotel, New York, N. Y.
Statler Hotel, Buffalo, N. Y.
Hotel Sherman, Chicago, Ill.
Copley-Plaza Hotel, Boston, Mass.
Hotel Traymore, Atlantic City, N. J.

STORES

Rosenbaum & Co., Pittsburgh, Pa.
Lord & Taylor, New York, N. Y.
B. Altman & Co., New York, N. Y.

HOSPITALS

Homeopathic Hospital, Pittsburgh, Pa.
Bellevue Hospital, New York, N. Y.
Government Hospital for the Insane, Washington, D. C.
Pennsylvania State Sanitarium for Tuberculosis, Hamburg, Pa.
Jefferson Hospital, Philadelphia, Pa.
United States Veterans Hospital, New York, N. Y.

SCHOOLS

Cornell University, Ithaca, N. Y.
University of Illinois, Urbana, Ill.
University of Missouri, Columbia, Mo.

OFFICE BUILDINGS

Singer Building, New York, N. Y.
Tribune Building, Tampa, Fla.
New York Stock Exchange, New York, N. Y.
Curtis Publishing Co., Philadelphia, Pa.
San Joaquin Light & Power Co., Fresno, Cal.

CLUBS

New York Yacht Club, New York, N. Y.
Players' Club, New York, N. Y.
Army and Navy Club, Washington, D. C.
Union League Club, Philadelphia, Pa.
Chevy Chase Club, Chevy Chase, Md.

ARMSTRONG CORK & INSULATION COMPANY

Manufacturers of and Contractors for Cold Storage and Cold Pipe Insulation

135 Twenty-fourth Street, PITTSBURGH, PA.

BRANCHES AND AGENTS

ALBANY, N. Y.
ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHARLOTTE, N. C.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DALLAS, TEX.
DENVER, COLO.
DETROIT, MICH.
GRAND RAPIDS, MICH.
HARTFORD, CONN.
HOUSTON, TEX.
INDIANAPOLIS, IND.
JACKSONVILLE, FLA.
KANSAS CITY, MO.
LOS ANGELES, CAL.
LOUISVILLE, KY.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEW YORK, N. Y.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
ROCHESTER, N. Y.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
SPOKANE, WASH.
TACOMA, WASH.
TULSA, OKLA.
MONTREAL, QUE.
TORONTO, ONT.

Products

ARMSTRONG'S CORKBOARD for the insulation of cold storage, freezing and constant temperature rooms, tanks, roofs, residences, etc.

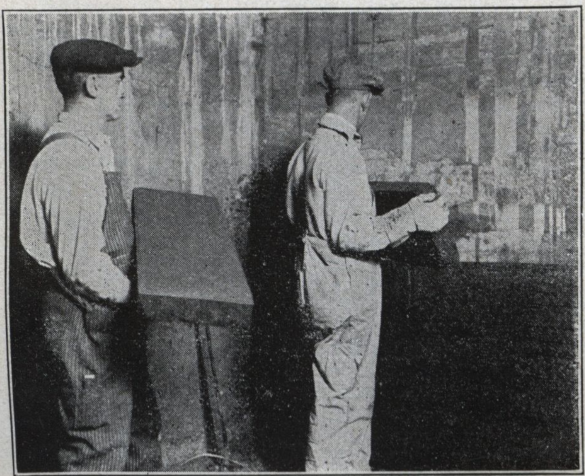
NONPAREIL CORK COVERING for brine, ammonia, refrigerated drinking water and all other low temperature pipe lines.

For Linotile and Armstrong's Cork Tile, see pages 560-561; for House and Roof Insulation, see pages 1350-1351; for Cork Bulletin Boards, see page 2828.

Armstrong's Corkboard

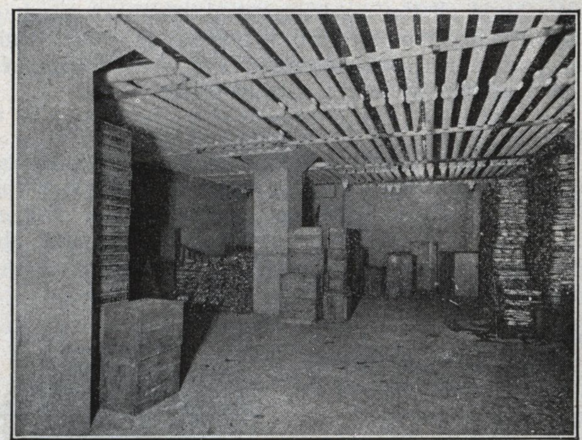
Armstrong's Corkboard is generally recognized as the standard insulation for cold storage and constant temperature rooms of all kinds. It is made of clean granulated cork, slightly compressed in sheets and baked in metal moulds at a moderate temperature. This process liquefies the natural waterproof gum or resin of the cork, which binds the mass firmly together and protects it against moisture.

Advantages—Containing no foreign substances and consisting only of pure cork, the heat conductivity of Armstrong's Corkboard is as low as any of the commercial insulating materials. Being cellular in structure, not fibrous, it is free from capillary attraction and will not absorb moisture. It is easy to install, and when erected properly, Armstrong's Corkboard is proof against mold, rot and vermin, and will not absorb or give off offensive odors or deteriorate in any way. Furthermore, Armstrong's Corkboard is slow burning and does not smolder or carry fire. It has been tested and approved by the National Board of Fire Underwriters.



Erecting Armstrong's Corkboard Against Concrete Walls in Portland Cement Mortar

Armstrong's Corkboard is giving excellent satisfaction in thousands of plants employing refrigeration, situated throughout the civilized world.



Cold Storage Room Insulated with 6 in. of Armstrong's Corkboard, Fisherman's Cooperative Sales & Cold Storage Co., Detroit, Mich.

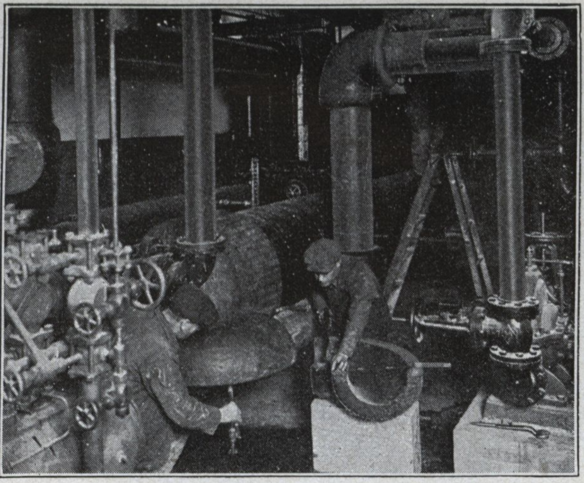
Finish—Ordinarily Armstrong's Corkboard on walls and ceilings is finished with portland cement plaster applied directly to the exposed surface, but where moisture conditions are severe, Armstrong's Mastic Finish Corkboard should be used. This is standard Armstrong's Corkboard with a ⅛-in. coating of asphalt mastic ironed on at the factory.

Catalogues and Samples—The Company publishes a number of booklets on the various applications of Armstrong's Corkboard containing complete information, specifications, etc. Any of these publications will be cheerfully supplied on request together with samples.

Nonpareil Cork Covering

Nonpareil Cork Covering is a most efficient, durable and economical insulation for brine, ammonia and ice water lines and for cold pipes and tanks generally. Its efficiency is due in a large measure to the peculiar characteristics of its sole ingredient, cork. Like Armstrong's Corkboard, Nonpareil Cork Covering consists of granules of pure cork compressed and baked in moulds at a moderate temperature. The natural gum of the cork, liquefied by the heat, cements the particles firmly together and,

Continued on next page



Applying Nonpareil Cork Covering and Lagging at the Plant of J. Butler & Co., Long Island City, N. Y.

coating each granule with a shellac-like film, renders it practically impervious to moisture. The covering is then coated, inside and out, with a mineral rubber finish ironed on. As a result Nonpareil Cork Covering is protected internally and externally against deterioration due to moisture absorption and the penetration of frost. When properly applied and the joints sealed with waterproof cement, Nonpareil Cork Covering will last for years—longer than the pipes in many recorded instances.

Insulating Efficiency—The insulating efficiency of Nonpareil Cork Covering is due to the thousands of tiny sealed dead air cells which make up the structure of natural cork. This cellular construction so retards the transmission of heat that Nonpareil Cork Covering effects a saving of approximately 85% of the refrigeration which would be lost from bare pipes.

Forms and Sizes—Nonpareil Cork Covering is supplied in moulded covers for practically all standard, screwed and flanged fittings and in 36-in. split sections for straight pipe runs of the sizes ordinarily used. Nonpareil Cork Covering is made in three thicknesses:

(1) Special Thick Brine—From 3 to 4 in. in thickness for lines carrying refrigerant below 0° F.

(2) Brine Thickness—From 2 to 3 in. in thickness for lines carrying refrigerant between 0° F. and 25° F.

(3) Ice Water Thickness—Approximately 1½ in. in thickness for refrigerated drinking water lines and others where temperatures are above 25° F.

Nonpareil Cork Covering is also furnished in the form of lagging for the larger sizes of pipes and fittings, beveled to the proper radius; and in any thickness up to 6 in. for the insulation of tanks and other cylindrical cold surfaces.

Samples and Literature—A 48-page book, "Nonpareil Cork Covering," contains complete information and specifications of inestimable value to all users of refrigeration. A copy of this book and a sample of the covering will be sent on request without charge or obligation.

Drinking Water Systems

The refrigerated drinking water system has, in recent years, become firmly established not only as a modern convenience, but as a requisite of economy and efficiency in mills and factories, hotels, office buildings, and other public and semipublic buildings. Such a system delivers properly cooled water in exactly the quantity required, when and where wanted. It occupies little space, saves time and money, and is clean and sanitary, eliminating the waste and mussiness of the ordinary ice water tank or the bucket-and-dipper method. In manufacturing plants, particularly, the excellent results of the refrigerated drinking water system contribute in a very positive way to improve morale and efficiency, and to reduce labor turnover and time lost by sickness.

Nonpareil Cork Covering in ice water thickness is especially adapted for the insulation of the distributing lines and apparatus. It is neat in appearance, moistureproof and fire retardant. Its high insulating efficiency insures a minimum use of refrigeration, and its durability is a guarantee of long life in service.

This Company is in possession of valuable data on drinking water system installations, not available elsewhere, which will be cheerfully furnished on request. This information concerning water, power and refrigeration requirements, approximate costs, etc., will be found of unusual assistance in designing drinking water systems.

Drinking Water Lines Insulated with Nonpareil Cork Covering, Canvas Finish, United Drug Co., St. Louis, Mo.

Contracting Service

With a thoroughly trained construction force, the Armstrong Cork & Insulation Company is prepared to handle complete contracts of any size for the erection of its products. Branch offices will co-operate with architects and engineers in solving insulation problems, entirely without charge or obligation.

ESTABLISHED 1865

L. MUNDET & SON, INC.

Manufacturers of Jointite Cork Products

461 Eighth Avenue
NEW YORK, N. Y.

FACTORY
HILLSIDE, N. J.

BRANCH OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES

Jointite TRADE MARK

Products

Pure Baked Cork Board; Pure Cork Pipe Covering and Moulded Fittings.

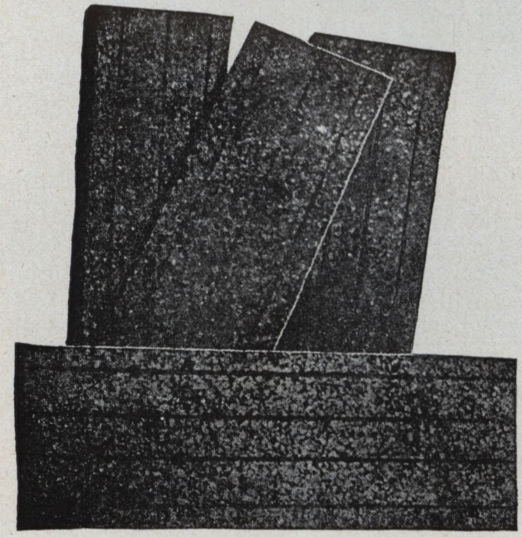
Also Jointite Mastic Coated Cork Board, Jointite Machinery Isolation Cork, Regranulated Cork Fine, Regranulated Cork Coarse, Jointite Cork Tile Flooring, Jointite Cork Bulletin Board, Granulated Cork Screened, Granulated Cork Unscreened.

"Everything Made of Cork."

Pure Baked Cork Board for:

Cold Storage Construction—Packing plants, ice plants, breweries, creameries, dairies, ice cream factories, refrigeration, fur storage vaults and all other requirements where maintenance of uniform temperatures and conservation of refrigeration are important.

House Insulation—The successful use of pure cork board for refrigeration insulation is ample proof of perfection in insulating material. Refrigeration experience points the way to this proven insulator for the modern home.



Jointite Pure Baked Cork Board

Jointite Cork Board Meets United States Government Specifications—The insulation requirements of the United States Government are without a doubt the most severe, as witness the following test specifications:

"The weight of the cork board shall not be less than 8 pounds nor more than 12 pounds per cubic foot.

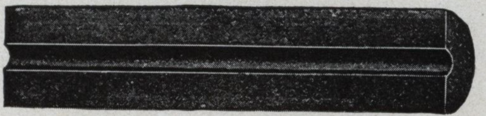
"Representative samples of the cork board shall be submerged in boiling water at atmospheric pressure for three hours without disintegrating. Immediately upon removal from the boiling water the samples shall be measured for linear expansion which shall not exceed two per cent in any direction."

To this rigorous test requirement, Jointite Cork Board conforms in every particular.

Pure Cork Sectional Pipe Covering and Moulded Cork Fitting Covers

For ammonia, cold water, ice water, brine and special cold lines.

Pure cork covering is the only thoroughly satisfactory covering for cold pipes of all kinds. Jointite cork covering and Jointite moulded fitting covers are made from pure granulated cork, compressed and moulded to fit various sizes of pipe and fittings in ordinary use.



Pure Cork Sectional Pipe Covering

Moulded Cork Fitting Covers

They are coated with Jointite mineral rubber compound, ironed on at the factory. And, being applied to the lines with waterproof cement on the joints, they produce a positive Jointite insulation not affected by moisture.

Jointite pipe coverings and moulded covers for fittings possess maximum insulating efficiency, durability, neat appearance and ease of application.

Suggested Thickness for Sectional Pipe Covering and Moulded Fitting Covers—

(1) Approximately 1½-inch thickness for ice-water and cold lines where temperature of 30° Fahrenheit and higher are carried.

(2) Standard brine covering, from 2 to 3-inch thickness, is designed for ammonia and brine lines where temperature ranges from 0° to 30° Fahrenheit.

(3) Special thick covering from 3 to 4-inch thickness for temperature below 0° Fahrenheit.

Mundet Service

Satisfaction is a big word with a big meaning. To our customers, both prospective and actual, we give an all inclusive service which combines quality products, engineering knowledge and construction skill.

The construction department maintained by us is in keeping with our high quality product. All insulation work is therefore performed in the most approved and workmanlike manner. To contractors or owners who prefer to install the insulation themselves, we extend the privilege of drawing on our knowledge and experience, all in the interests of profitable insulation.

Write for samples, prices, information or construction estimate to the Home Office.

UNITED CORK COMPANIES

Insulation Against Heat and Cold—Isolation Against Noise and Vibration

LYNDHURST, N. J.

SALES OFFICES

NEW YORK, N. Y., 50 Church Street
CHICAGO, ILL., 1151 Eddy Street
PHILADELPHIA, PA., 1042 Ridge Avenue
CINCINNATI, OHIO, Terminal Warehouse Building
BOSTON, MASS., 45 Commercial Wharf
CLEVELAND, OHIO, 1200 W. Ninth Street
PITTSBURGH, PA., 1331 Penn Avenue
BALTIMORE, MD., 503 Munsey Building
ST. LOUIS, MO., The Brecht Co.
MILWAUKEE, WIS., Federal Asbestos Co.
SEATTLE, WASH., Seattle Asbestos Factory

Products and Services

Crescent Pure Corkboard, Granulated and Regranulated Cork, for Heat and Cold Insulation, and Noise and Vibration Isolation.

Designing, furnishing and installing Cork Insulation and Isolation is our specialty. We have a staff of expert engineers and field erectors at every one of our Sales Offices.

For Cork Brick and Tile, and Cork Bulletin Boards, see page 562.

Crescent Pure Corkboard

Crescent pure corkboard is 100% pure, screened, granulated cork compressed into moulds to the thickness desired, and then baked for several hours at a moderate temperature. No foreign binder is used.

Crescent corkboard has the highest non-conductive value of any commercial insulator, its heat transmission being equal to 7 B.t.u. per sq. ft. per degree difference of temperature per 24 hours.

It has great structural strength and is adaptable to all kinds of construction. Is less absorbent and more waterproof than the natural cork itself.

Size of boards: 12x36 in. from 1 to 4 in. thick.

Weight of insulation boards: 9 lb. per cu. ft. (.75 lb. per ft. board measure).

Weight of isolation boards: 12 to 30 lb. per cu. ft., according to density required.

Natural Granulated Cork

Natural granulated cork is furnished in two sizes known as 8/20 C. S. and 12/20 C. S. meaning that they are sifted through screens of 8 or 12 meshes and over screens of 20 meshes to the inch.

Natural granulated cork is much superior to other fillings because the cork is odorless, non-absorbent, does not support combustion, is not subject to decay and has a very low heat conductivity.

Regranulated Cork

This is a by-product obtained in the manufacture of corkboard. It is more waterproof and its insulation value is higher than that of granulated natural cork.

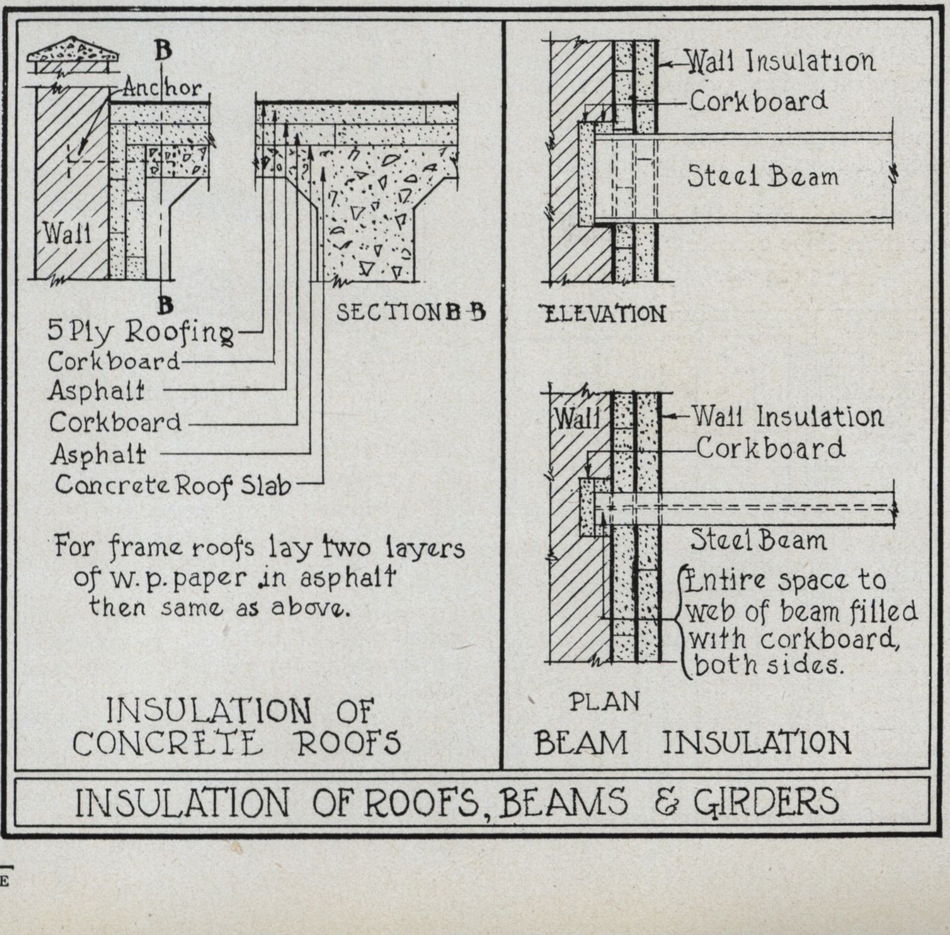
The grades generally used are known as "Fine," from dust up to 3/32-in. granules; "Coarse," from ⅛ to ⅝-in. granules; and "Mixed," a combination of both.

For general use the Fine or Mixed is recommended, but where dust would prove objectionable the Coarse is preferable.

It is mostly used for filling around tanks or where cork in board form would be unsuitable.

APPROXIMATE WEIGHT PER CUBIC FOOT OF GRANULATED AND REGRANULATED CORK

Granulated Cork		Regranulated Cork	
8/20 C.S. 13 lb.	12/20 C.S. 15 lb.	Fine and Mixed 7 lb.	Coarse 6½ lb.


B
Anchor
Wall
B
SECTION B-B
5 Ply Roofing
Corkboard
Asphalt
Corkboard
Asphalt
Concrete Roof Slab
For frame roofs lay two layers of W. p. paper in asphalt then same as above.
INSULATION OF CONCRETE ROOFS
Wall Insulation
Corkboard
Steel Beam
ELEVATION
Wall
Wall Insulation
Corkboard
Steel Beam
Entire space to web of beam filled with corkboard, both sides.
PLAN
BEAM INSULATION

INSULATION OF ROOFS, BEAMS & GIRDERS

ESTABLISHED 1897

MARKET FORGE COMPANY

Manufacturers of Steel Sanitary Interior Refrigerator Equipment

EVERETT, MASS.

AGENCIES

ATLANTA, GA., J. P. Lyons, 615 Citizens Southern Bank Building
BALTIMORE, MD., Edw. J. Seager, Gunther Building
CHICAGO, ILL., F. A. Boettcher, 500 Diversey Parkway
CINCINNATI, OHIO, Wm. P. Ridgway, 927 Provident Bank Building
CLEVELAND, OHIO, Seidel & Sprigade, 2120 Keith Building
DETROIT, MICH., Reindel & Reindel, Kresge Building
LOS ANGELES, CAL., Williams & Hess, 2316 South Figueroa Street
NEW YORK, N. Y., L. W. Tracy, 1121 Knickerbocker Building
OMAHA, NEB., Industrial Sales Co., 627 Grain Exchange Building
PHILADELPHIA, PA., E. F. Johnson, 1619 Sansom Street
PITTSBURGH, PA., J. R. Wells, 202 Ferguson Building
PORTLAND, ORE., Gillen-Cole Co., 60 Front Street
ST. LOUIS, MO., Herbert Golterman, 722 Wainwright Building
SAN FRANCISCO, CAL., Halloran & Golcher, Sharon Building
SEATTLE, WASH., D. E. Fryer & Co., Paulsen Building
LONDON, ENGLAND, York Shipley, Ltd., British Columbia House

Products

Galvanized Steel Refrigerator Shelving, including Hook Rails, Reach-in Shelving, Steel Cork Insulated Baffle Boards, Drawers with Insulated Fronts, Garde Manger Equipment and Insulated Bunker and Drip Pans.

Fur Storage Racks; Rug Storage Racks.

Mortuary Units Complete.

Also manufacturers of Florists' Shelving, Fixtures and Equipment.

Distinctive "Maforco" Shelving and Rail Features

Rigid and self-supporting, eliminating anchorage to refrigeration construction. This avoids puncturing of insulation and resulting disintegration.

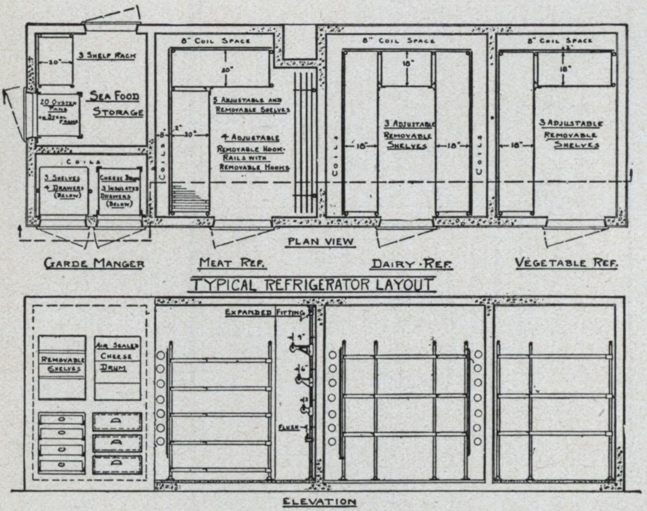
Racks assembled without bolts, permitting ready removal of shelves for cleansing; there is no complicated bracing or framework to retain dirt.

Vertical adjustment of post brackets to meet user's shelf spacing requirements.

Shelves are continuous angle-bound units of strong construction. Straps are 1 in. wide, 1 in. apart, flush riveted to frame with edges well rounded and chamfered. This construction permits a free circulation of air. Shelves are also furnished perforated or solid as desired. Standard finish, hot galvanized; also furnished in monel metal or german silver.

Posts are round, eliminating all dirt crevices, set on liberal diameter floor flanges and neatly finished with acorns.

Shimming under posts is avoided by vertical adjustment of brackets to meet slope of floor.


3 Shelf Rack
20"
Sea Food Storage
20 Oyster Pans on Steel Frame
Coils
3 Shelves 4 Drawers (Below)
Cheese Drum 3 Insulated Drawers (Below)
8" Coil Space
20"
5 Adjustable and Removable Shelves
8
2"
4 Adjustable Removable Hook-Rails with Removable Hooks
3 Adjustable Removable Shelves
18"
Plan View
Garde Manger
Meat Ref.
Dairy · Ref.
Vegetable Ref.
Typical Refrigerator Layout
Expanded Fitting
9"
6"
Flush
Removable Shelves
Air Sealed Cheese Drum
Elevation

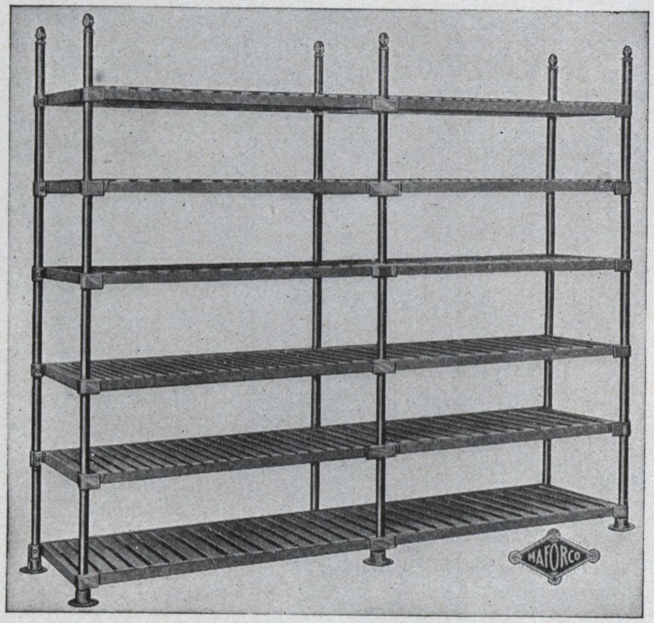
Plan and Elevation of Refrigerator Layout

Valuable refrigeration space is conserved because the equipment fits snugly into all corners and every inch of space is available.

Rail rack uprights are expanded between floor and ceiling. Indestructible rail brackets of stamped steel are vertically adjustable, also removable without disturbing uprights.

Hooks are removable or rigid, as desired, on removable rails held firmly into place by these stamped steel brackets.

With wall coil refrigerator, "Maforco" cork insulated galvanized steel baffle boards attached to shelving are recommended. These shields create a circulation of cold air—making the refrigerator more efficient, protecting products from the coil frosting and at the same time providing a stop at the rear of the rack.



Typical Shelf Rack

Shelves are furnished any number of sections long, wide or high. Maximum shelf size, 7 ft. by 2 ft. 6 in.

Galvanized steel does not retain odors and lasts indefinitely. "Maforco" equipment is all heavily hot galvanized after assembly, except meat hooks, which are tinned.

The importance of proper handling and storage of food can not be overemphasized; "Maforco" equipment in every detail lends itself to all requirements.

Specify—"Maforco" Refrigerator Equipment as made by the Market Forge Company, Everett, Mass., U. S. A.

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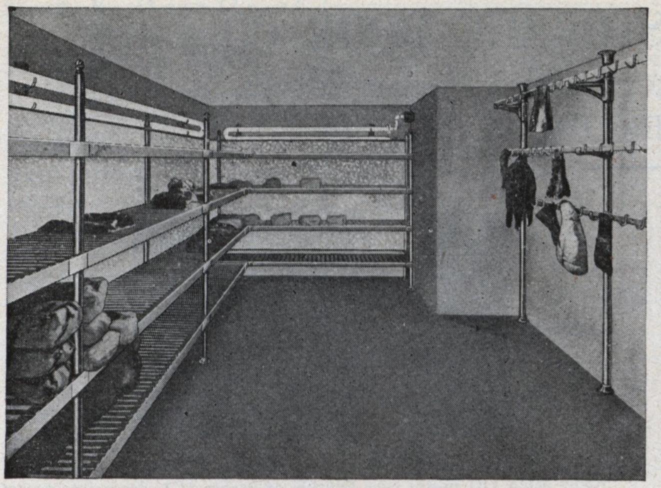


Typical Installation of Shelves, Rails and Baffles, John Hancock Insurance Building, Boston, Mass.

Fur Storage Racks

The single post construction, made possible by the use of "Maforco" fur fixtures, makes for the utmost in simplicity, economy of construction and low cost of erection.

Expensive pipe fittings are entirely eliminated; single posts also allow greater trucking space.

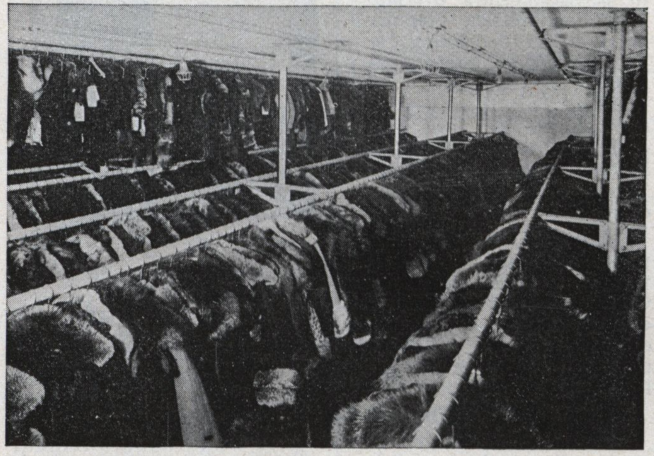
Brackets are vertically adjustable for any desired spacing. Brackets added or removed without disturbing uprights.

Centers of robe rails made from 20 to 36 in. for double brackets and from 10 to 18 in. for single brackets.

Posts expanded between floor and ceiling eliminate puncturing of insulation. Posts are 1½-in. iron pipe size. Robe rails, 1⅝ in. outside diameter.

We suggest uprights on 6-ft. centers and robe rails on 24-in. centers for the most satisfactory results.

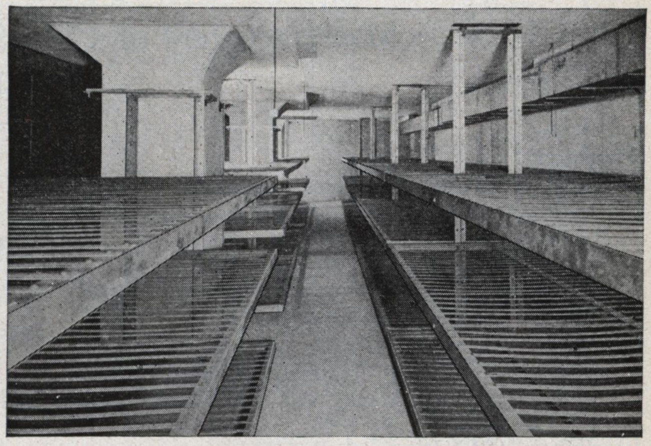
Furnished one, two or three tiers high with gratings, ladders and hand rails where desired; or where required, with fur storage truck No. 492, eliminating the overhead runways.



Installation of Fur Storage Racks, Strawbridge and Clothier's, Philadelphia, Pa.

Rug Storage Racks

All shelving is vertically adjustable and of slatted construction which allows a free circulation of air. Uprights are of pipe with adjustable brackets or of special steel shapes punched to permit adjustment of shelves.



Installation of Rug Storage Racks, Eldredge Storage Warehouse, Atlantic City, N. J.

For all practical purposes we suggest shelves not over 5 ft. wide.

Mortuary Slides and Trays

Each compartment is equipped with removable telescoping tray carriage, operating on bronze rollers in substantial steel frame. Framework is rigidly secured into place without puncturing of insulation.

Tray of one-piece galvanized sheet steel or monel metal bent over continuous galvanized pipe frame with a handle formed at each end. No rivets pass through the body of the tray, thus eliminating all crevices leading to the accumulation of acids; tray rides on roller at end of the carriage.

Slide and tray are all heavily hot galvanized. This is a most vital feature to consider where the cadavers handled are mutilated or where death has occurred from an infectious disease.

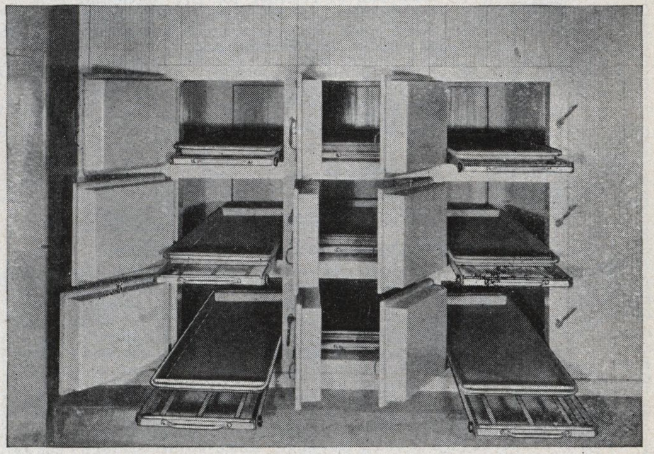
Tray operates on carriage which may be withdrawn two-thirds of its length and will remain in horizontal position without sagging. Tray is also removable and is provided with handles at both ends, for use as a stretcher.

Units are furnished to slide one way, two ways, or sideways.

Minimum clear inside depth required is 7 ft. 5 in.

Minimum clear door width required is 2 ft.

Specify—"Maforco" Mortuary Racks as made by the MARKET FORGE COMPANY, Everett, Mass., U. S. A.



"Maforco" Nine-compartment Installation, Presbyterian Hospital, Philadelphia, Pa.

STEVENSON COLD STORAGE DOOR CO.

Manufacturers of Cold Storage and Freezer Doors

CHESTER, PA.

Products

Cold Storage and Freezer Doors:

Stevenson's Standard Cold Storage Door.

Stevenson's "Door that cannot stand open"—an unequalled fire stop.

Overhead Track Door—positive port shutter.

Fireproof Cold Storage Doors.

Special Freezer Doors for icy doorways.

Vertical Sliding Counterbalanced Doors.

Combined Self-acting Air Cushioned Doors and Chutes.

Little 1912 Platform Ice Doors.

Revolving Ice Cream Doors—metal, non-swelling.

Passing Vestibules to pass ice cream.

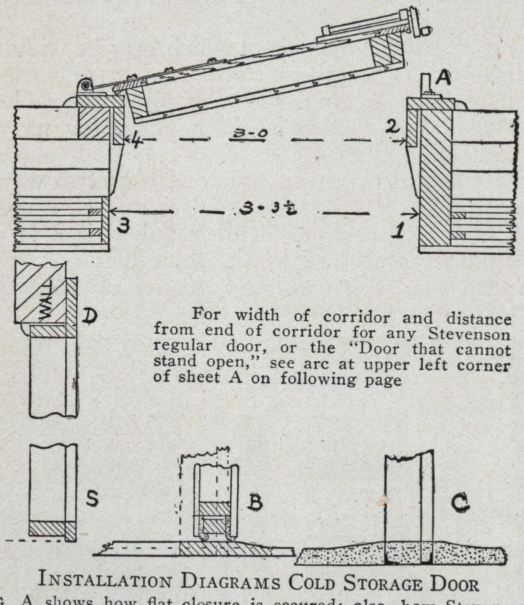
Cold Storage Windows.

1922 Stevenson Door Closer—for doors of any kind.

Doors and windows made either plain or fireproof.

Advantages

Straight, clean, sanitary jambs. No frail rabbet strips in doorway. Adjustable, flexible door frames, set to conform to door, not to wall. Hinges are self-adjusting, spring tempered steel, galvanized; with big generous bearings, three times their former size. A powerful hinge guard on lower hinge protects the hinge from excessive strains, and insures tight sealing at that point. Door swings off to one side entirely out of the way of injury, hence doorway can be 6 in. less in width than with other doors, economizing in refrigeration.



For width of corridor and distance from end of corridor for any Stevenson regular door, or the "Door that cannot stand open," see arc at upper left corner of sheet A on following page

Installation Diagrams Cold Storage Door

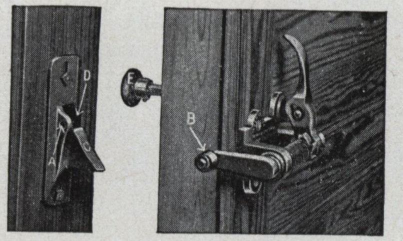
Fig. A shows how flat closure is secured; also, how Stevenson door frame sets in wall. Opening in wall should be 3½ in. wider and 4½ in. higher than clear size of doorway. (Follow construction Nos. 1 and 2.) Overhead track doors require rough opening extending 11 in. above upper edge of track; the overhead track "Door that cannot stand open," 12½ in. above. Door frames are secured with lag screws ⅜x4 in., inserted through front casing at A. Set door frame to conform to door, not to conform to wall.

Fig. D shows head of door frame used on all sizes of Stevenson regular doors, and indicates method of setting in wall.

Fig. S shows door frame with full standard sill; not suited for trucking.

Fig. B shows wooden beveled threshold, which connects lower ends of door frame and forms part of it. Let down into floor. No featheredge, no splinters, no jolt; ideal for trucking or sliding ice.

Fig. C shows Stevenson patented construction for concrete floors. Lower ends of door frame connected by angle irons extending across doorway and embedded in floor 3 in. below surface.



Stevenson's Automatic Roller Fastener

Roller latch (B) passes over knuckle of keeper (C), drops into pocket (D) before door strikes face of door frame, and reaches its locked position at the instant gasket is most tightly compressed. No bending of latch. No lost motion to be taken up. No slackening as it latches. No walking around edge of door to enter. A padlock shackle, through hole (A), prevents roller from lifting out.

Door can be unlatched from front or back—opened, closed and latched again 40 times per minute

STOCK SIZES, STEVENSON'S STANDARD COLD STORAGE DOORS

List number	Size of doorway in clear, ft. in. x ft. in.	Size of wall opening to receive door frames, ft. in. x ft. in.	Estimated weight, crated, lbs.
Ice doors	2 3 x 2 0	2 6½ x 2 4½	100
2	2 0 x 4 0	2 3½ x 4 4½	140
3	2 0 x 5 0	2 3½ x 5 4½	170
4	2 0 x 5 6	2 3½ x 5 10½	185
5	2 0 x 6 0	2 3½ x 6 4½	200
6	2 6 x 6 0	2 9½ x 6 4½	250
7	3 0 x 6 0	3 3½ x 6 4½	300
8	3 6 x 6 0	3 9½ x 6 4½	350
9	4 0 x 6 0	4 3½ x 6 4½	400
10	3 0 x 6 6	3 3½ x 6 10½	325
11	3 6 x 6 6	3 9½ x 6 10½	380
12	4 0 x 6 6	4 3½ x 6 10½	440

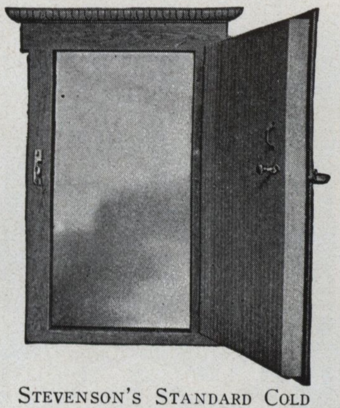
Regular overhead track doors require openings in wall to extend 11 in. above upper edge of track bar (see sheet "A," next page, left end).

Overhead track "Door that cannot stand open," to extend 12½ in. above.

Form of Specification for Architects

Doors for refrigerators, cold storage and ice rooms to be Stevenson's overlapping, non-binding regular doors. For hardening or freezing rooms, Stevenson's special freezer doors. All vestibule air locks—high temperatures or low, frequent use or infrequent—to be replaced with Stevenson's "Door that cannot stand open."

For Trucking—On wood floors, use Stevenson's wooden beveled threshold. On concrete floors, lower ends of door frame to be connected by angle irons extending across doorway below surface of floor.



Stevenson's Standard Cold Storage Door

Door frame with sill

Most users prefer the patented beveled threshold or patent angle iron arrangement for concrete floors. See following page, Figs. 0, 1-2, 3.

For Walking Through—Use Stevenson's sill.

Hardware—All doors to be fitted with Stevenson's automatic roller fastener, and hung with Stevenson's elastic clamping hinges, as manufactured by the Stevenson Cold Storage Door Co., Chester, Pa.

To prevent overstraining of hinge use Stevenson's 1911 hinge guard on every door sealing against floor.

To avoid regular doors standing open, use Stevenson's 1922 Door Closer. (See second page following.)

Shipping Note

All Stevenson doors and windows are shipped ready to set in the wall. Adjustable door frame, hinges and fastener included.

Continued on next page

Sheet A—Details of Stevenson's Cold Storage Doors

At this end of the sheet is shown the plan, elevation and section of track doors for beef houses.

Arc on plan shows least width of corridor and distance from doorway to end of corridor.

Note the seven methods, shown by numerals enclosed in circles, of forming jambs or bucks to provide for regular Stevenson door frames.

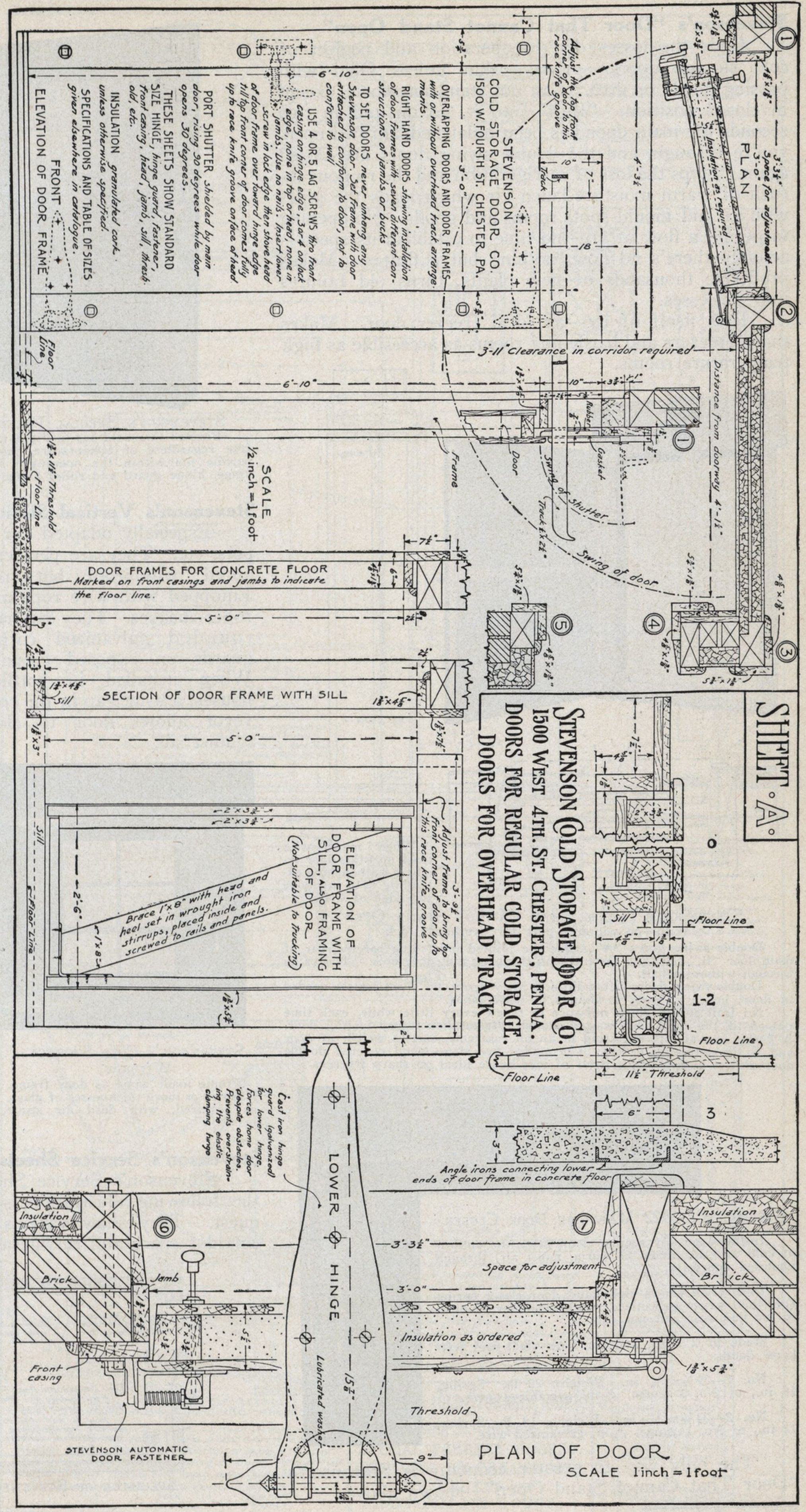
In the center of the sheet are shown the details of regular door:

Section of head and sill, 0;

Threshold, 1-2;

Concrete floor arrangement, 3.

At this end of the sheet are shown an enlarged section of regular door, and details of fastener, hinge and hinge guard. The only yokeless elastic clamping hinge free from impeding frictional resistance—assuring tight joint.

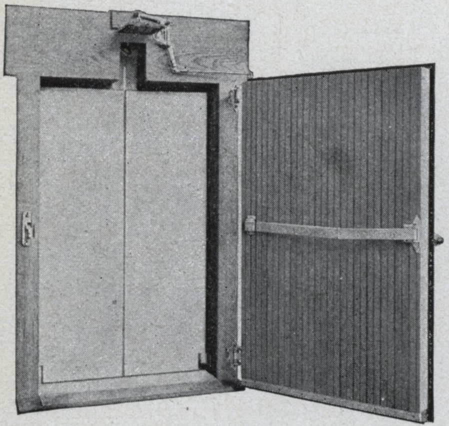

SHEET A
STEVENSON COLD STORAGE DOOR CO.
1500 WEST 4TH. ST. CHESTER, PENNA.
DOORS FOR REGULAR COLD STORAGE.
DOORS FOR OVERHEAD TRACK
STEVENSON COLD STORAGE DOOR CO. 1500 W. FOURTH ST. CHESTER, PA.
OVERLAPPING DOORS AND DOOR FRAMES with or without overhead track arrangements.
RIGHT HAND DOORS showing installation of door frames with seven different constructions of jambs or bucks
TO SET DOORS never unhang any Stevenson door. Set frame with door attached to conform to door, not to conform to wall
USE 4 OR 5 LAG SCREWS thro front casing on hinge edge, 3 or 4 on lock edge, none in top or head, none in jambs. Use no nails. Insert lower screw in lock edge then shove head till top front corner of door comes fully up to race knife groove on face of head
PORT SHUTTER shielded by main door, rising 30 degrees while door opens 30 degrees.
THESE SHEETS SHOW STANDARD SIZE HINGE, hinge guard, fastener, front casing, head, jamb, sill, threshold, etc.
INSULATION granulated cork unless otherwise specified.
SPECIFICATIONS AND TABLE OF SIZES given elsewhere in catalogue.
FRONT ELEVATION OF DOOR FRAME
SCALE 1/2 inch = 1 foot
PLAN
Space for adjustment
Insulation as required
Adjust the top front corner of door to this race knife groove
3'-11 Clearance in corridor required
Distance from doorway 4'-1 1/2"
Swing of shutter
Swing of door
Track
Gasket
Rubber
Door
Frame
Floor Line
1 1/2 x 11 1/2 Threshold
DOOR FRAMES FOR CONCRETE FLOOR Marked on front casings and jambs to indicate the floor line.
SECTION OF DOOR FRAME WITH SILL
Sill
ELEVATION OF DOOR FRAME WITH SILL, ALSO FRAMING OF DOOR (Not suitable to trucking)
Brace 1"x8" with head and heel set in wrought iron stirrups, placed inside and screwed to rails and panels.
Adjust frame to bring top front corner of door up to this race knife groove.
6'-10"
5'-0"
① ② ③ ④ ⑤ ⑥ ⑦
0
1-2
3
11 1/2" Threshold
Angle irons connecting lower ends of door frame in concrete floor
Cast iron hinge guard (galvanized) for lower hinge. Forces home door. Repels obstacles. Prevents over-straining the elastic clamping hinge
LOWER HINGE
Lubricated washer
15 7/8"
9"
3'-3 1/2"
3'-0"
Insulation
Brick
Jamb
Front casing
Insulation as ordered
Space for adjustment
Threshold
STEVENSON AUTOMATIC DOOR FASTENER
PLAN OF DOOR
SCALE 1 inch = 1 foot

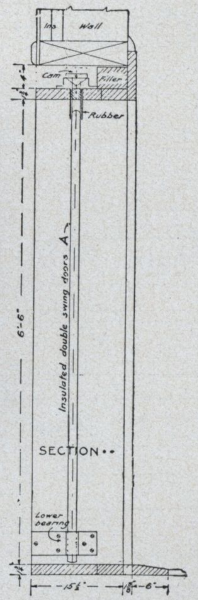
Continued on next page

Stevenson's "Door That Cannot Stand Open"

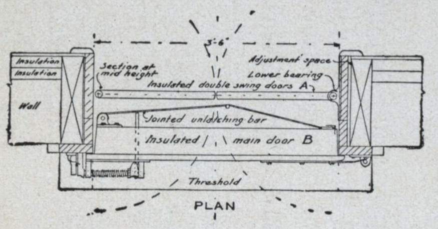
Ends the losses due to operation and neglect of cold storage doors. Always shut unless filled with passing goods or man. Can not stand anywhere except in closed position. "Butt" into it, go on and in two seconds the main door has been unlatched, thrown open, you're through, and the double swing doors are closed again. Stops the loss of refrigeration and the ruinous inrush of warm moisture-laden air which loads the pipes with ice and mould-spots rooms and goods. No opening to permit a flow of air—no time to establish its speed—actually there's no flow, nothing but a flutter. Makes profitable thousands of new plants, turns old failures into successes.

Rids itself of ice—an ideal freezer door. Makes sharp freezers and hardening rooms as accessible as high temperature rooms.




Ins
Wall
Cam
Filler
Rubber
6'-6"
Insulated double swing doors A
SECTION
Lower bearing
15½"
6"

When made with track port this door requires wall opening extending 12½ in. above top edge of track

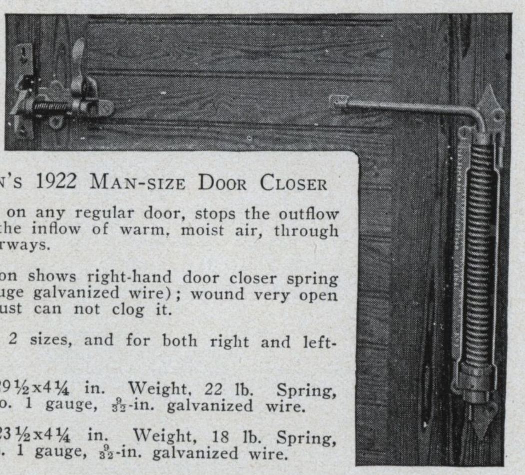

3'-6"
Insulation
Insulation
Wall
Section at mid height
Adjustment space
Lower bearing
Insulated double swing doors A
Jointed unlatching bar
Insulated main door B
Threshold
PLAN

Stevenson's "Door That Cannot Stand Open"
With—or without—port for overhead track

Double swing doors "A" strike the jointed unlatching bar on rear of main door "B," releasing fastener and throwing that door open. Trucks go through without a halt.

Double-swing doors lift a little as they open; no short bevels needed in floor, hence no jolts to liquids in wheel-tanks.

No frail spring hinge nuisance to renew every little while, each time put off till the old set has wasted enough refrigeration to pay for this door. A 2-way cam at top, operating in an oil reservoir, carries weight of door and is the actuating device. Unequalled fire stop—metal covered double door always closed. Rids itself of ice; hence ideal on sharp freezers



Stevenson's 1922 Man-size Door Closer

Installed on any regular door, stops the outflow of cold air, the inflow of warm, moist air, through unclosed doorways.

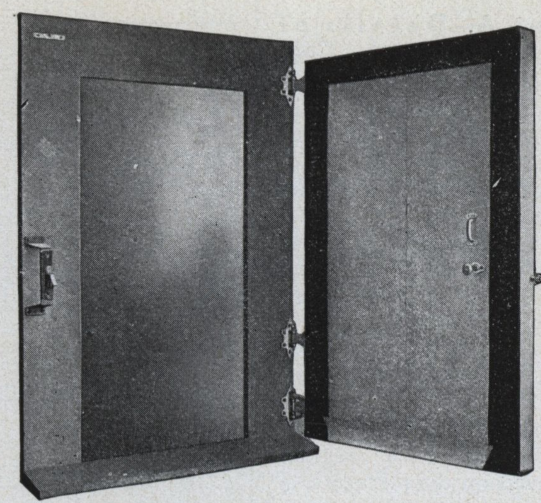
Illustration shows right-hand door closer spring (of No. 1 gauge galvanized wire); wound very open so ice and rust can not clog it.

Made in 2 sizes, and for both right and left-hand doors:

No. 1—29½x4¼ in. Weight, 22 lb. Spring, 18 in., of No. 1 gauge, $\frac{9}{32}$-in. galvanized wire.

No. 2—23½x4¼ in. Weight, 18 lb. Spring, 12 in., of No. 1 gauge, $\frac{9}{32}$-in. galvanized wire.

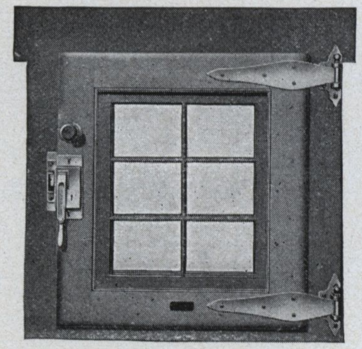
The only way to greater economy is Stevenson's "Door That Cannot Stand Open"—shown above.



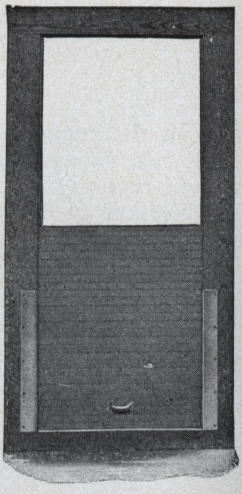
Stevenson's Special Freezer Door for Icy Doorways
Beveled threshold (as in Fig 3, sheet B). Perfectly tight and perfectly free regardless of temperature, moisture, or accumulation of ice. No portion fits within the opening. Fastens itself. Has latest Stevenson hinge, hinge guard and roller fastener.

Stevenson's Vertical Sliding Doors

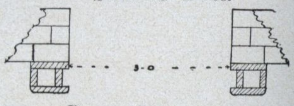
Especially adapted for use in breweries, milk depots, etc. They are perfectly insulated and counterbalanced; windproof, but free. Equipped with wire rope and roller sheaves. They can have rounded galvanized corner guards on exposed corners. When installed in bottling houses, a 4-in. gap in the conveyor allows door to close against sill.



Stevenson's Cold Storage Window
Frame made same as door frame. Has two or more thicknesses of glass, as required, with dead air space between



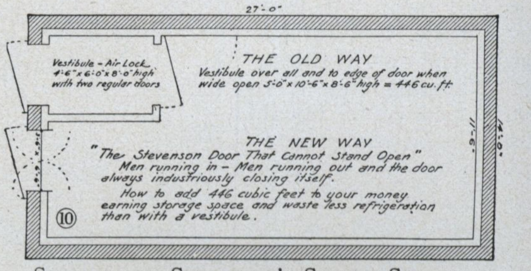
Stevenson's Vertical Sliding Door



Cross Section of Vertical Sliding Door

Stevenson's Service Sheets

Stevenson's Service Sheets, four times the size of the following illustration, sent to any architect on request. They show various arrangements to minimize corridor space and refrigeration loss, to cut labor costs.


27'-0"
Vestibule - Air Lock
4'-6" x 6'-0" x 8'-0" high
with two regular doors
THE OLD WAY
Vestibule over all and to edge of door when wide open 5'-0" x 10'-6" x 8'-6" high = 446 cu. ft.
THE NEW WAY
"The Stevenson Door That Cannot Stand Open"
Men running in - Men running out and the door always industriously closing itself.
How to add 446 cubic feet to your money earning storage space and waste less refrigeration than with a vestibule.
11'-6"
14'-0"
⑩

Specimen of Stevenson's Service Sheets

Continued on next page

Sheet B—Details of Stevenson's Special Freezer Doors, etc.

At the top of the illustration are shown the details of the special freezer door for icy doorways, made with threshold for trucking, also with sill to step over.

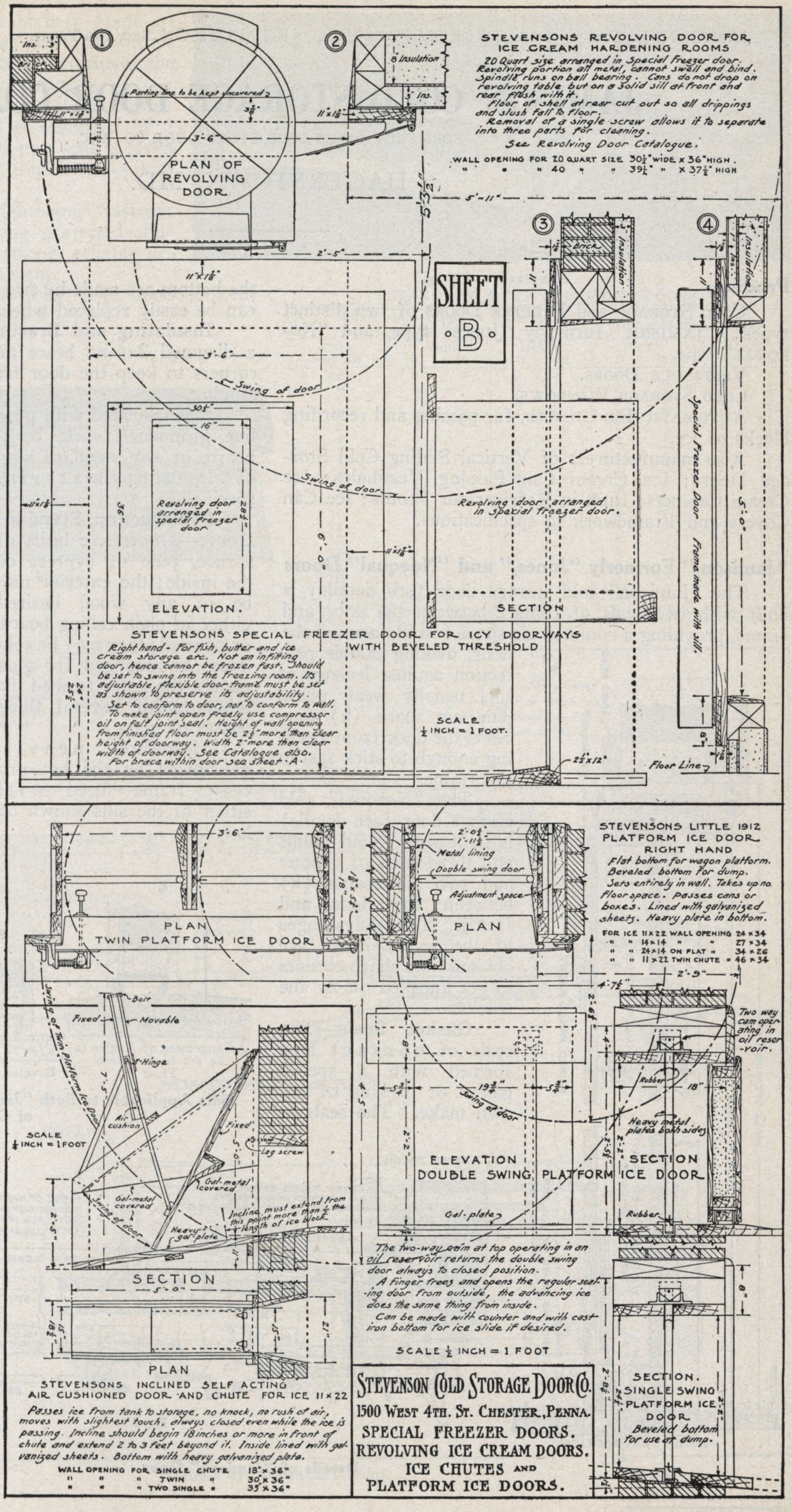
Arcs on plan show least width of corridor, and distance from doorway to end of corridor.

On plan, elevation and section is shown revolving door as installed in special freezer door.

Note the four methods, shown by numerals enclosed in circles, of forming jambs or bucks to provide for the door frames of Stevenson special freezer doors for icy doorways.

In the center, and at the lower right of the illustration are shown the details of the little platform ice door, single or twin, both flat bottom and inclined.

At the lower left of the illustration are shown the details of the inclined self-acting air cushioned door and chute for use at dump. Single or twin.


SHEET B
①
②
③
④
Ins.
Insulation
3" Ins.
Brick
11"×1⅞"
Parting line to be kept uncovered
3'-6"
PLAN OF REVOLVING DOOR
5'-3½"
5'-11"
2'-5"
Swing of door
30½"
16"
36"
28½"
Revolving door arranged in special freezer door
6'-0"
ELEVATION.
SECTION
Special Freezer Door Frame made with sill.
5'-0"
2½"×12"
Floor Line
24"
25½"
PLAN
TWIN PLATFORM ICE DOOR
2'-0½"
1'-11½"
Metal lining
Double swing door
Adjustment space
18"
Bolt
Fixed
Movable
Hinge
Swing of Twin platform Ice Door
Air cushion
Lag screw
Gal-metal covered
Swing of door
Heavy gal-plate
Incline must extend from this point more than ½ the length of ice block
2'-5"
SECTION
5'-0"
18¾"
15"
21"
PLAN
19¾"
ELEVATION DOUBLE SWING PLATFORM ICE DOOR
Gal-plate
2'-9"
4'-7½"
2'-6¾"
Two way cam operating in oil reservoir.
Rubber
Heavy metal plates both sides
SECTION ICE DOOR
SECTION. SINGLE SWING PLATFORM ICE DOOR
Beveled bottom for use at dump.
2'-8¾"
SCALE ¼ INCH = 1 FOOT

STEVENSONS REVOLVING DOOR FOR ICE CREAM HARDENING ROOMS

20 Quart size arranged in Special Freezer door. Revolving portion all metal, cannot swell and bind. Spindle runs on ball bearing. Cans do not drop on revolving table but on a solid sill at front and rear flush with it.

Floor of shell at rear cut out so all drippings and slush fall to floor.

Removal of a single screw allows it to separate into three parts for cleaning.

See Revolving Door Catalogue.

WALL OPENING FOR 20 QUART SIZE 30½" WIDE x 36" HIGH.
" " " 40 " " 39¼" " x 37½" HIGH

STEVENSONS SPECIAL FREEZER DOOR FOR ICY DOORWAYS WITH BEVELED THRESHOLD

Right hand - For fish, butter and ice cream storage etc. Not an infitting door, hence cannot be frozen fast. Should be set to swing into the freezing room. Its adjustable, flexible door frame must be set as shown to preserve its adjustability.

Set to conform to door, not to conform to wall.

To make joint open freely use compressor oil on felt joint seal. Height of wall opening from finished floor must be 2½" more than clear height of doorway. Width 2" more than clear width of doorway. See Catalogue also.

For brace within door see sheet ·A·

SCALE ½ INCH = 1 FOOT.

STEVENSONS LITTLE 1912 PLATFORM ICE DOOR RIGHT HAND

Flat bottom for wagon platform. Beveled bottom for dump. Sets entirely in wall. Takes up no floor space. Passes cans or boxes. Lined with galvanized sheets. Heavy plate in bottom.

FOR ICE 11×22 WALL OPENING 24×34
" " 14×14 " " 27×34
" " 24×14 ON FLAT " 34×26
" " 11×22 TWIN CHUTE " 46×34

The two-way cam at top operating in an oil reservoir returns the double swing door always to closed position.

A finger frees and opens the regular seating door from outside, the advancing ice does the same thing from inside.

Can be made with counter and with cast iron bottom for ice slide if desired.

SCALE ½ INCH = 1 FOOT

STEVENSONS INCLINED SELF ACTING AIR CUSHIONED DOOR AND CHUTE FOR ICE 11×22

Passes ice from tank to storage, no knock, no rush of air, moves with slightest touch, always closed even while the ice is passing. Incline should begin 18 inches or more in front of chute and extend 2 to 3 feet beyond it. Inside lined with galvanized sheets. Bottom with heavy galvanized plate.

WALL OPENING FOR SINGLE CHUTE 18"×36"
" " " TWIN " 30"×36"
" " " TWO SINGLE " 35"×36"

STEVENSON COLD STORAGE DOOR CO.
1500 WEST 4TH. ST. CHESTER, PENNA.
SPECIAL FREEZER DOORS.
REVOLVING ICE CREAM DOORS.
ICE CHUTES AND
PLATFORM ICE DOORS.

J. V. JAMISON, Jr., Pres.   D. A. STICKELL, Vice-Pres.   R. L. JAMISON, Sec. and Treas.   C. J. HADEN, Asst. Gen. Mgr.

JAMISON COLD STORAGE DOOR CO., INC.

FORMERLY JONES COLD STORE DOOR CO., INC.

HAGERSTOWN, MD.

Products

Cold Storage and Freezer Doors of two distinct types: "Jamison" formerly "Jones" type, and "Noequal" type.

Vestibule Doors.

Cold Storage Windows.

Automatic Ice Chutes, for passing and recording blocks of ice.

Also manufacturers of Vertical Sliding Cold Storage Doors; Ice Cream Can Passing Vestibules; Ice Cream Cabinets; Built-in Refrigerator Fronts; Ice Can Covers and Framework to specifications.

"Jamison," Formerly "Jones," and "Noequal" Doors

The "Jamison" cold storage door (see details) is built with two seals of contact between the door and frame, providing a confined air space entirely around the door, making double protection against leakage at this usually weak point. The air space (k) prevents the door from swelling enough to stick fast in the frame.

The "Noequal" cold storage door (see details) is built with round jambs and three seals of contact and two air spaces (k) between the door and frame. The advantages of the round jambs are obvious—no sharp corners to get knocked off by the trucks.

Gasket Seals—The seals of contact are formed with a special gasket or packing of our own make. The seals at the bottom are made by two rows of heavy hair felt and can be easily replaced when worn out.

Insulating and Bracing—The door has inserted a diagonal 2x4-in. brace and heavy steel angle in the corners to keep the door true and rigid and free from sagging.

It is insulated with pure live granulated cork, corkboard, or any standard kind of insulating material specified.

Construction, Standard Doors—Doors are built of spruce, pine or cypress on the inside; the exterior may be of any wood desired, either in plain ceiling boards or paneled; they may be solid doors or arranged for glass panels, the latter formed like windows, of several thicknesses of glass.

Hardware, heavily galvanized by the hot process; frame fitted with either of the sills shown below.

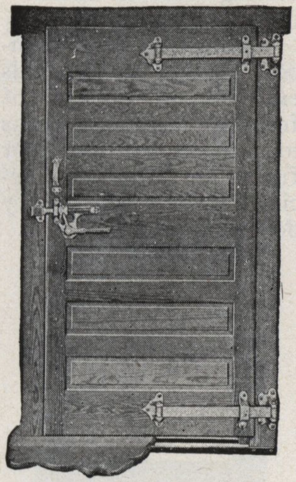
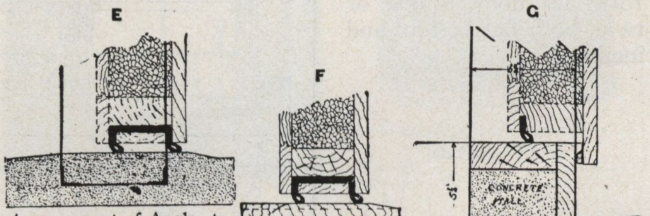


Fig. 1. "Jamison," Formerly "Jones," Standard Door

Right hand, raised panel front


E
F
G
CONCRETE FILL
FLOOR
FLOOR

Arrangement of Angles to be set in Concrete Floor

Beveled Oak Sill

High Sill

Sills Applicable to Both "Jamison" and "Noequal" Types of Doors

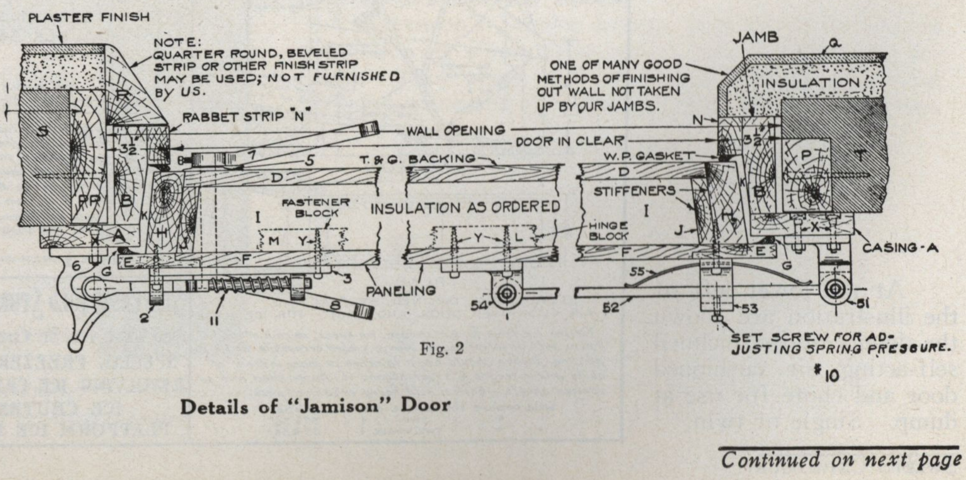

PLASTER FINISH
NOTE: QUARTER ROUND, BEVELED STRIP OR OTHER FINISH STRIP MAY BE USED; NOT FURNISHED BY US.
RABBET STRIP "N"
WALL OPENING
DOOR IN CLEAR
T. & G. BACKING
W.P. GASKET
JAMB
ONE OF MANY GOOD METHODS OF FINISHING OUT WALL NOT TAKEN UP BY OUR JAMBS.
INSULATION
STIFFENERS
FASTENER BLOCK
INSULATION AS ORDERED
HINGE BLOCK
CASING-A
PANELING
SET SCREW FOR ADJUSTING SPRING PRESSURE.
#10

Fig. 2

Details of "Jamison" Door

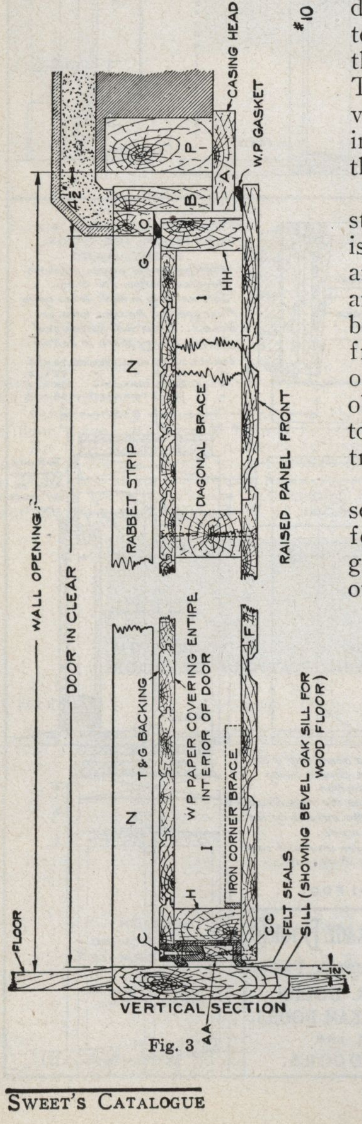

#10
CASING HEAD
W.P GASKET
RABBET STRIP
DIAGONAL BRACE
RAISED PANEL FRONT
WALL OPENING
DOOR IN CLEAR
T&G BACKING
W P PAPER COVERING ENTIRE INTERIOR OF DOOR
IRON CORNER BRACE
FELT SEALS
SILL (SHOWING BEVEL OAK SILL FOR WOOD FLOOR)
FLOOR
VERTICAL SECTION
AA

Fig. 3

Continued on next page

Nothing used but the highest grade of lumber and other materials; workmanship is of the best; and this company guarantees the doors satisfactory to the purchaser.

Hardware—The pressure of the powerful adjustable spring hinge is regulated by a setscrew, by turning which a new seat is given the door from time to time, thus keeping it as tight as when new.

The automatic self-tightening fastener (Fig. 11) is a forged spring projected slide bolt worked by a lever; a strong, reliable device that draws the door up tight.

The same kind of hardware is used upon both the "Jamison" and "Noequal" types.

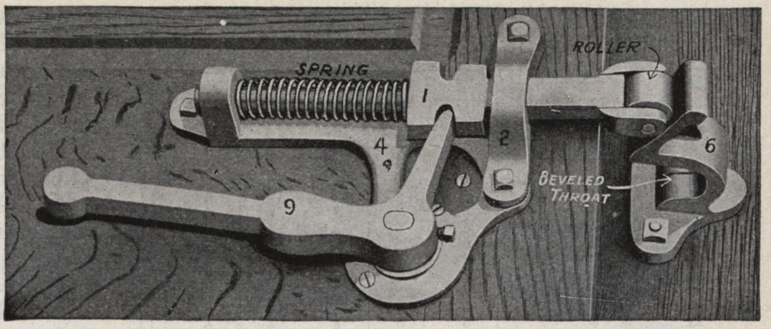

SPRING
ROLLER
1
2
4
6
9
BEVELED THROAT

Fig. 11. Fastener

STANDARD SIZES, "JAMISON" DOORS

	Dimensions inside of frames (Door in the clear)				Size of wall opening			
Stock door No.	Width		Height		Width		Height	
	ft.	in.	ft.	in.	ft.	in.	ft.	in.
00	2	6	2		3	1	2	5
0	2		3		2	7	3	5
1	2		6		2	7	6	5
2	2	6	6		3	1	6	5
3	2	6	6	6	3	1	6	11
4	3		6		3	7	6	5
5	3		6	6	3	7	6	11
6	3	6	6		4	1	6	5
7	3	6	6	6	4	1	6	11
8	3		7		3	7	7	5
9	3	6	7		4	1	7	5
10	4		6		4	7	6	5
11	4		6	6	4	7	6	11
13	4	6	6	6	5	1	6	11
14	4		7		4	7	7	5
15	4	6	7		5	1	7	5
16	5		6	6	5	7	6	11
17	5		7		5	7	7	5

In ordering doors use stock numbers in first column of table and add "Jamison." Bold face type denotes most popular sizes. Large stocks of standard sizes always on hand.

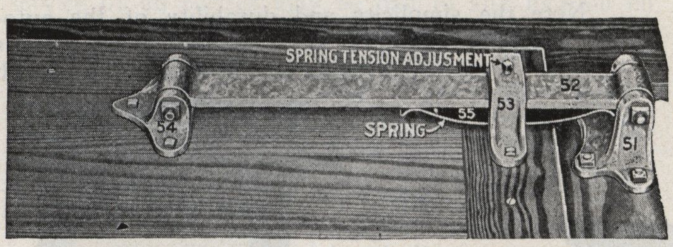
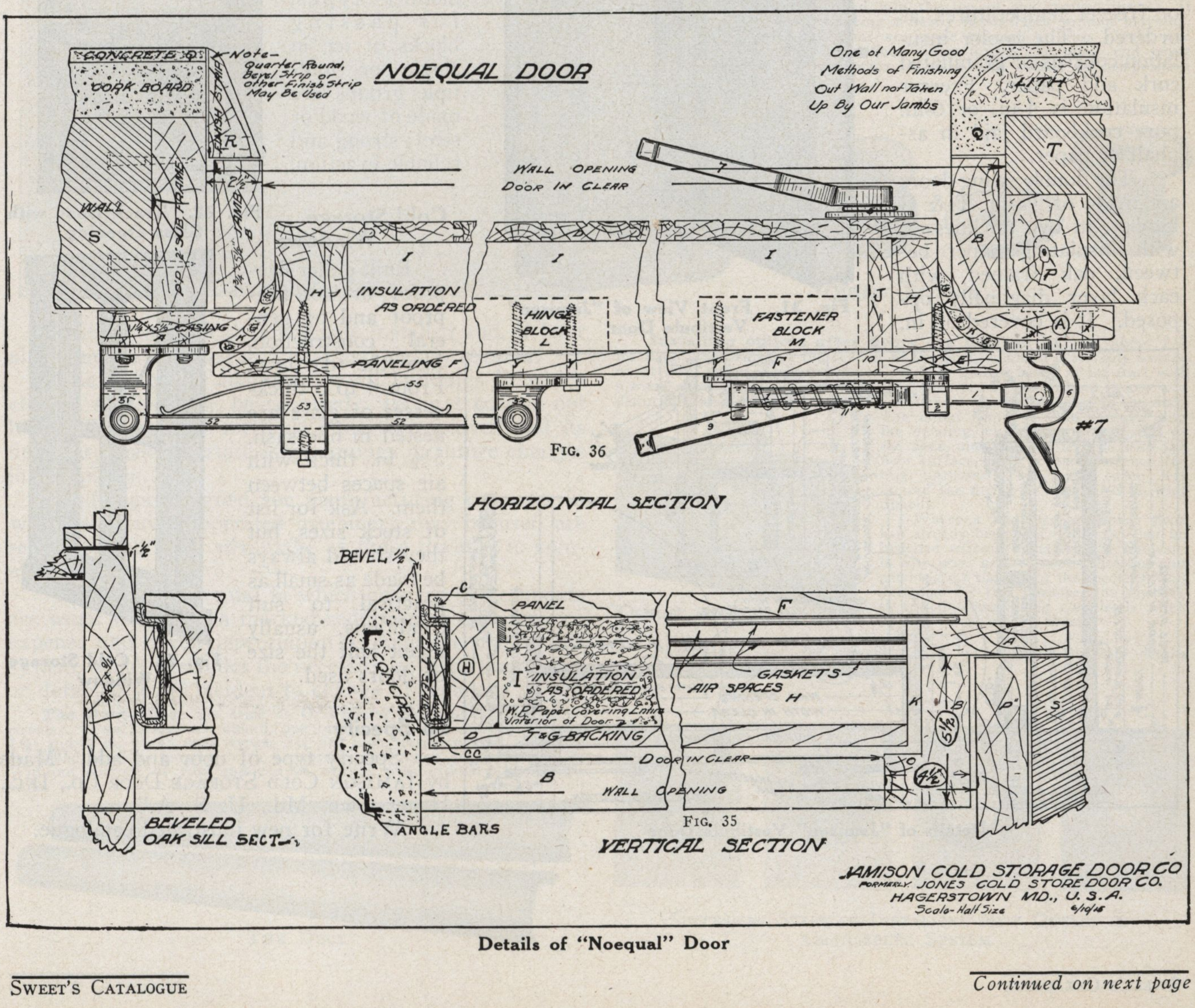

SPRING TENSION ADJUSMENT
52
53
54
55
51
SPRING

Fig. 10. Hinge


NOEQUAL DOOR
CONCRETE
CORK BOARD
Note- Quarter Round, Bevel Strip or other Finish Strip May Be Used
WALL
S
R
SUB FRAME
JAMB B
CASING A
INSULATION AS ORDERED
HINGE BLOCK L
FASTENER BLOCK M
PANELING F
WALL OPENING
DOOR IN CLEAR
One of Many Good Methods of Finishing Out Wall not Taken Up By Our Jambs
LITH
T
P
Q
I
H
J
E
K
G
A
51
52
53
55
9
#7
FIG. 36
HORIZONTAL SECTION
BEVEL ½
PANEL
CONCRETE
ANGLE BARS
INSULATION AS ORDERED
W.P. Paper Covering Entire Interior of Door
T&G BACKING
GASKETS
AIR SPACES
DOOR IN CLEAR
WALL OPENING
BEVELED OAK SILL SECT.
C
CC
D
5½
4½
FIG. 35
VERTICAL SECTION
JAMISON COLD STORAGE DOOR CO
FORMERLY JONES COLD STORE DOOR CO.
HAGERSTOWN MD., U. S. A.
Scale - Half Size

Details of "Noequal" Door

Continued on next page

STANDARD SIZES, "NOEQUAL" DOORS

Dimensions inside of frames (Door in the clear)					Size of wall opening			
Stock door No.	Width ft.	Width in.	Height ft.	Height in.	Width ft.	Width in.	Height ft.	Height in.
00	2	6	2		2	10	2	5
0	2		3		2	4	3	5
1	2		6		2	4	6	5
2	2	6	6		2	10	6	5
3	2	6	6	6	2	10	6	11
4	3		6		3	4	6	5
5	3		6	6	3	4	6	11
6	3	6	6		3	10	6	5
7	3	6	6	6	3	10	6	11
8	3		7		3	4	7	5
9	3	6	7		3	10	7	5
10	4		6		4	4	6	5
11	4		6	6	4	4	6	11
13	4	6	6	6	4	10	6	11
14	4		7		4	4	7	5
15	4	6	7		4	10	7	5
16	5		6	6	5	4	6	11
17	5		7		5	4	7	5

In ordering doors use stock numbers in first column of table and add "Noequal." Bold face denotes most popular sizes.

"Jamison" Vestibule Door

The "Jamison" vestibule door combines a "Jamison" type cold storage door with a pair of double swing, metal clad, batten doors, in the same frame, forming a vestibule, or air check, as shown below.

The standard door has a pine front and spruce, pine or cypress back and jambs.

The cold storage door is insulated for either cooler or freezer temperatures, as ordered. The cooler insulation consists of granulated cork and paper. Freezer insulation is 4-in. or 6-in. pure corkboard laid in asphalt or paper.

The double swing doors are made of 7/8-in. T & G lumber, in two thicknesses, with insulating paper between, oak framed, with each layer diagonally opposed. It is covered 30 in. high with No. 16 galvanized steel, in a single sheet. The remaining height is covered with lighter sheet.

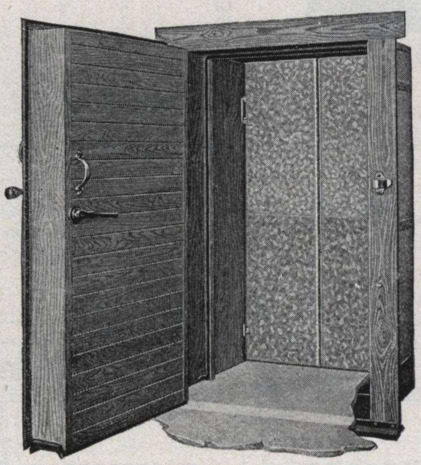
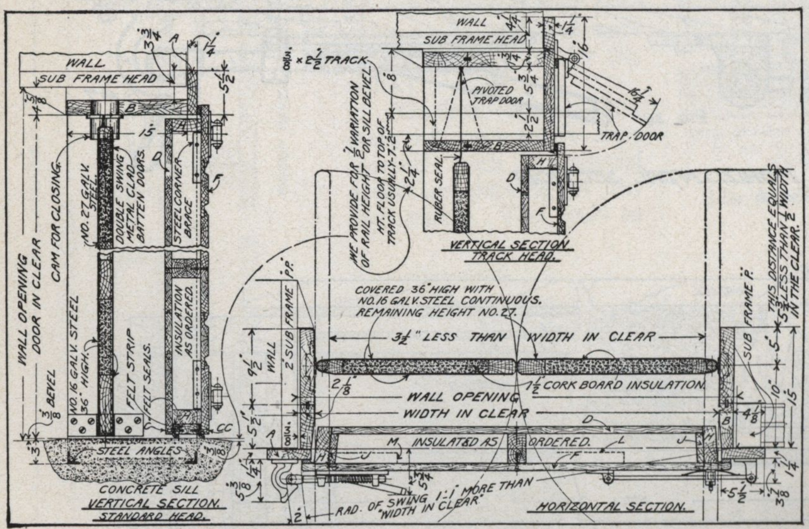


Fig. 31. Front View of "Jamison" Vestibule Door


WALL
SUB FRAME HEAD
3¾
A
1¼
5½
5/8
4⅜
B
15
CAM FOR CLOSING.
NO. 27 GALV. STEEL.
DOUBLE SWING METAL CLAD BATTEN DOORS.
D
STEEL CORNER BRACE
F
WALL OPENING
DOOR IN CLEAR
NO. 16 GALV. STEEL 36" HIGH.
FELT STRIP
FELT SEALS.
INSULATION AS ORDERED.
H
CC
⅜ BEVEL
3
STEEL ANGLES
CONCRETE SILL
VERTICAL SECTION.
STANDARD HEAD.
⅝ × 2½ TRACK
WE PROVIDE FOR ½ VARIATION OF RAIL HEIGHT OR SILL BEVEL.
HT. FLOOR TO TOP OF TRACK USUALLY-7.2
8
2¼
PIVOTED TRAP DOOR
5¾
2½
16
16¼
TRAP. DOOR
RUBER SEAL.
VERTICAL SECTION TRACK HEAD.
COVERED 36" HIGH WITH NO. 16 GALV. STEEL CONTINUOUS. REMAINING HEIGHT NO. 27.
3½" LESS THAN WIDTH IN CLEAR
WALL
2" SUB FRAME
P.P.
9½
2⅛
1½" CORK BOARD INSULATION.
WALL OPENING
WIDTH IN CLEAR
M
INSULATED AS ORDERED.
J
L
5⅜
RAD. OF SWING 1'-1" MORE THAN WIDTH IN CLEAR
HORIZONTAL SECTION.
SUB FRAME P.
THIS DISTANCE EQUALS 5¾ LESS THAN ½ WIDTH IN THE CLEAR.
4⅛
10
15
5½
3⅞

Details of "Jamison" Vestibule Door

Furnished either right or left hand. The frame is cross connected with angles to be set in concrete floor; also furnished with beveled oak sill.

The track frame head is furnished when an overhead rail passes through the opening.

The hardware used on this door is this company's standard type and design. The double swing doors are hinged with gravity closing device that insures its coming back to closed position instantly.

The Jamison Cold Storage Door Co., Inc., will be pleased to advise those who contemplate the installation of vestibule doors, if they will write before making their plans.

Track, Freezer, Fireproof Ice Chutes

Note the simplicity and durability of the automatic trap lift device for track doors. Freezer doors are of the same construction as the standard, but with heavier insulation. Fireproof cold storage doors are of Jamison regular wood construction, metal covered; carrying the same temperature as the standard door. Ice chutes of two distinct types, for passing blocks of ice in single or multiple groups are made of wood or steel; strong and reliable in action.

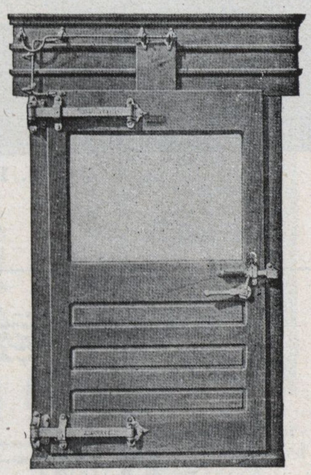


Fig. 22. Track Door with Glass Opening

Cold Storage Windows

Built either fireproof or non-fireproof and of general construction, like the doors. From 4 to 6 thicknesses of glass are nested in one sash, 5½ in. thick with air spaces between them. Ask for list of stock sizes, but they should always be made as small as practical to suit conditions, usually about half the size of doors used.

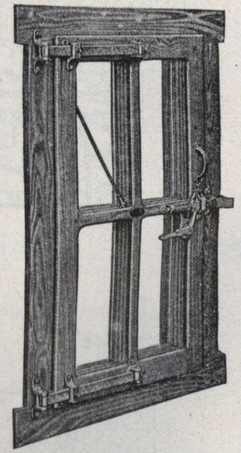


Fig. 54. Cold Storage Window

To Specify

Specify type of door and add, "Made by Jamison Cold Storage Door Co., Inc., Hagerstown, Md., U. S. A."

Write for new illustrated catalogue.

JOHNS-MANVILLE INC.

Sole Selling Agent for The Fibre Conduit Company, Orangeburg, N. Y.

292 Madison Avenue, at 41st Street, NEW YORK, N. Y.

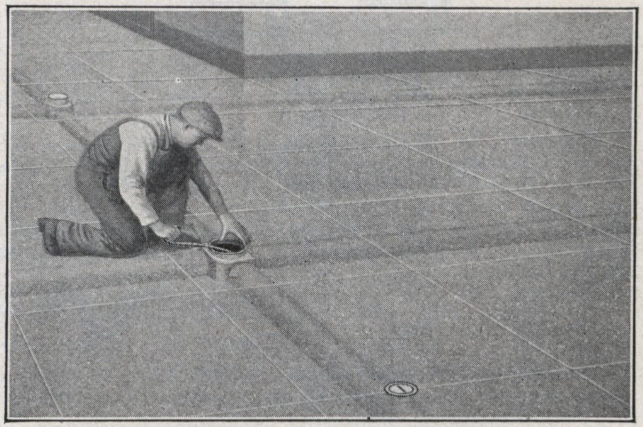
Products

ORANGEBURG UNDERFLOOR DUCT SYSTEM, a non-metallic rigid duct with fittings. (Patented March 17, 1925.)

For Asbestos Roofing, Insulation, etc., see pages 1046-1047.

Orangeburg Underfloor Duct System

A universal wire-way incorporated in the finished floor of modern buildings through which electric wire service of all classes may be had to any location on the floor. Consists of parallel lines of fiber duct laid on centers which give a comprehensive grid over the entire floor area. Access is had through cast iron junction boxes with brass tops, and wires are brought out through brass fittings at locations determined by the occupation of the floor space. All classes of electric service are available, as electric light and power, telephone, call bells, telegraph, etc.



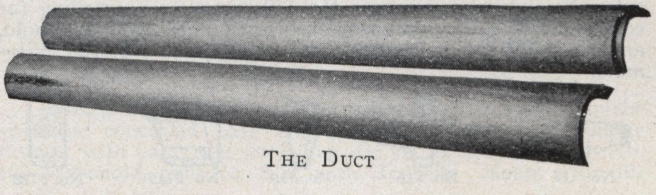
Outlets are quickly and easily installed and, if later abandoned, are closed in a neat and sightly manner.

The system is adaptable to all buildings in which electric service may be required. Its first cost is not higher than that of methods hitherto employed and its flexibility makes certain large savings in future changes in occupation.

Buildings designed for manufacturing purposes in which electrically operated machinery may be used are served to the same advantage as those devoted to commercial offices.

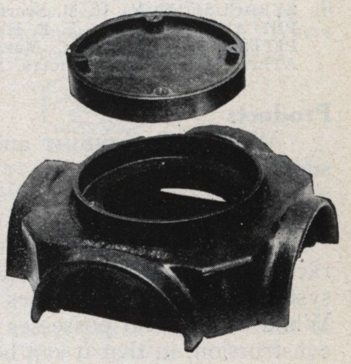
Buildings for rental in which changes of occupants are usual will show a marked reduction in maintenance expense and lower depreciation through the use of this system, which precludes the necessity of disturbing floors or defacing walls incident to change of tenancy.

The Duct—Made the same as Orangeburg fiber conduit, but semi-circular. Two styles: one closed, one open on the bottom; closed types, 1⅝ and 2 in. high; open types, 2¼ in. high, respectively. Regularly furnished in 5-ft. lengths, with a mortise and tenon joint connection. Will not corrode or rust and can be worked with ordinary carpenter's tools.



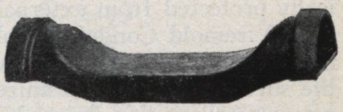
THE DUCT

Junction Box—Made with cast iron body and adjustable brass cover which may be brought exactly flush with the floor surface. Cover is recessed and is to be filled in with cement, linoleum or whatever floor surfacing is used, leaving only a narrow rim visible when work is completed. Boxes are furnished with 4 outlets or less for the duct, and will be drilled and tapped for metallic conduit as required.



JUNCTION BOX

Crossunder Fitting—Made of cast iron with the ends shaped for suitable connection with the fiber duct. Serves to offset the duct down to allow water or other piping present in the floor fill to cross the duct line. May also be used to permit the crossing of 2 ducts at intersections where junction boxes are not required.

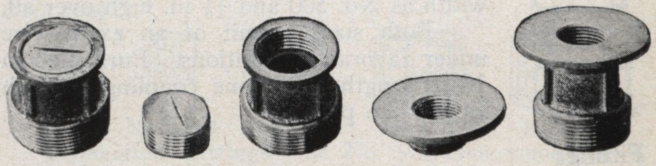


CROSSUNDER FITTING

Floor Outlets—The regular outlet fitting, used for cement surfaced floors, is made of brass, 1¾ in. diam. by 1¾ in. long over all with a 1-in. inside thread. The outside thread is sharply cut and cuts its own thread in the fiber as it is screwed into the duct. A plug can be supplied for use where an outlet is not in service.

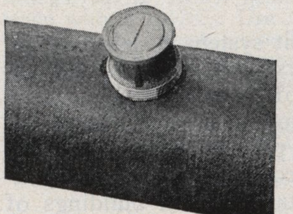
A special fitting is made for use with linoleum or other composition floor coverings, and is screwed into the top of the regular insert. It has a 2⅝-in. diam. flange, making a neatly finished job without patching.

Connections above the floor are made through a brass nipple, one end of which screws into the floor outlet fitting, the other end being provided with a suitable connector or plain hard rubber or composition bushing.



OUTLET FITTINGS

Installing outlets after floors are finished—A hole about 2¼ in. diam. is cut through the cement to the duct, which is preferably located about 1 in. below the floor surface. A hole is then bored in the duct with a wood auger bit or a metal drill. This hole can be cut without in any way disturbing or injuring any wire which may be already installed in the duct.

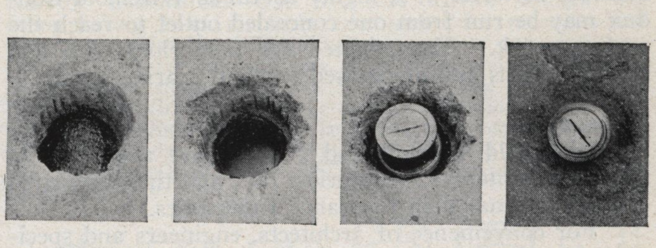


OUTLET IN DUCT

The outlet fitting is then screwed into the opening, cutting its own thread in the fiber, until the top is flush with the floor surface, using a special wrench for this purpose. The small space left around the fitting is then filled in with cement.

Where a linoleum or similar floor has already been laid, an outlet can be installed without damaging the linoleum in any way, and without requiring any patching, by the use of the special fitting designed for this purpose, the opening in the linoleum being completely filled by the flange of the fitting.

Pamphlet—Send for pamphlet E-30, which gives complete details of the system.



SUCCESSIVE STEPS IN INSTALLING NEW OUTLET IN ORANGEBURG SYSTEM

WIREMOLD CONDUIT SYSTEMS FOR SURFACE WIRING

MANFACTURED BY
THE AMERICAN WIREMOLD COMPANY
HARTFORD, CONN.

SALES REPRESENTATIVES

BOSTON, MASS., Edward Rigby, 10 High Street
NEW YORK, N. Y., American Wiremold Co,. 58 W. 15th Street
SYRACUSE, N. Y., H. M. Scofield, 405 South Avenue
PHILADELPHIA, PA., E. E. Hedler, 250 No. 11th Street
PITTSBURGH, PA., H. C. Moran, 1112 Keystone Building
ATLANTA, GA., H. C. Biglin, 138 Marietta Street
NEW ORLEANS, LA., H. C. Biglin, 509 Conti Street
CHICAGO, ILL., M. B. Austin & Co., 108-16 So. Desplaines Street
DETROIT, MICH., R. J. Thorne, 4325 Commonwealth Avenue
DALLAS, TEX., O. T. Jenkins, Santa Fe Building
SAN FRANCISCO, CAL., Geo. A. Gray Co., 910 Howard Street
LOS ANGELES, CAL., Geo. A. Gray Co., 236 So. San Pedro Street

Products

Wiremold Conduit and Wiremold Fittings for surface wiring.

Description

Wiremold Conduit is a scientifically designed metal raceway permitting the installation of interior wiring systems on exterior surfaces in sturdy and neat manner. While this system possesses all the advantages of open construction, in that it can be easily extended or moved about, the wires are at all times enclosed and mechanically protected from external injury.

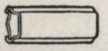
Wiremold Conduit is rolled from high grade sheet steel and is so finished that the portion which lays against the surface wired is galvanized, while the section visible after installation is finished in a neutral tone of heavy high grade enamel that will blend with any color scheme and act as a ground for graining or staining. Also covers with one coat of flat white.

Sizes

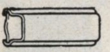
No. 500 for two-wire circuits, scant ¾ in. wide and $\frac{9}{16}$ in. high over all.

No. 700 for four-wire circuits, same width as No. 500 and $1\frac{1}{16}$ in. high over all.

Both sizes permit of an extra wire under favorable conditions. Furnished in 10-ft. lengths with one coupling to each length like pipe.



2WIRE CONDUIT



4WIRE CONDUIT

Fittings

Wiremold Fittings are also furnished in two sizes corresponding to Wiremold Conduit. The large size fittings are equipped with double twistouts making it possible to use them interchangeably with No. 500 or No. 700 Wiremold Conduit.

Where Used

No. 500 Wiremold Conduit system is designed for all surface work, including extensions from existing outlets of two and short runs of three wires.

No. 700 Wiremold Conduit is recommended for large installations where two parallel circuits may be conveniently enclosed in one conduit. Its use is general, as it may be readily installed in all buildings of frame, mill or concrete construction. It affords an easy means of wiring existing buildings of lath and plaster construction as the floors need not be disturbed. For concrete factories, it is highly useful as Wiremold Conduit may be run from one concealed outlet to reach the surface work. Also adapted for time clock, call and signal systems and unexposed parts of marine work.

Approvals

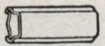
Wiremold Conduit and Fittings are approved by the Underwriters' Laboratories, Inc., and the Associated Factory Mutual Fire Insurance Companies.

For convenience of architects, engineers and specification writers, detailed specifications covering fittings required for specific plans are given as follows.

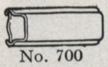
Specifications for Wiremold Conduit Systems

Circuit wiring between control panels and all light, plug, and switch outlets shall be run exposed in Wiremold Conduit. The circuits shall be run in the most direct and best mechanical manner possible, care being taken in placing vertical runs so that same will stand straight and plumb. Horizontal runs shall be neatly fitted around all beams and other projections at the ceiling. Wiremold Fittings shall be used at all outlets, and at all points where a change of direction occurs, or connection with other work. The entire installation shall be made in accordance with National Electrical Code, and local requirements, using the manufacturers' catalogue as a guide for installation suggestions.

Wiremold—No. 500 or No. 700 Wiremold shall be used throughout. Use No. 5701 couplings to couple adjacent ends, and where necessary to cover joints, use No. 506 for No. 500 Wiremold, or No. 706 for No. 700 Wiremold. No. 502 bushings for No. 500 Wiremold, or No. 702 for No. 700 Wiremold shall be used at all fittings.



No. 500



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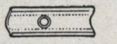
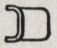


No. 5701



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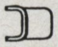

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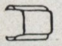

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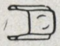
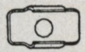
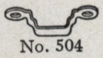


No. 706

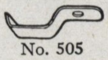
Support—No. 5703 shall be used for lining up runs of No. 500 or No. 700 Wiremold and for supports in middle of lengths. Use No. 504 with No. 500, and No. 704 with No. 700 Wiremold for securely fastening the conduit against uneven surfaces. All runs located on concrete or tile surfaces shall be supported with No. 505 for No. 500 Wiremold, or No. 704 with one leg removed for No. 700 Wiremold.



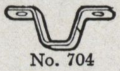
No. 5703



No. 504

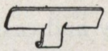


No. 505



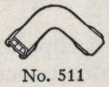
No. 704

Grounding—Ground Wiremold through No. 5709 standard screwless ground coupling, which must be placed in conduit before piece is installed.



No. 570

Offsets—All 45° and 90° flat turns shall be made with No. 512 and No. 511 flat elbows with No. 500 Wiremold, and No. 5712 and No. 5711 flat elbows with No. 700 Wiremold. Internal and external offsets shall be made with No. 517 internal and No. 518 external with No. 500 Wiremold, and No. 5717 internal and No. 5718 external with No. 700 Wiremold. For twisted elbows, use No. 5781 and No. 5784, or No. 5782 and No. 5783 in combination. For all internal and external offsets other than 90° use Wiremold Bender No. 600.



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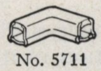

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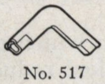

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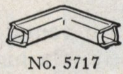

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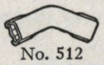
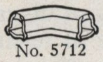


No. 512



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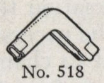

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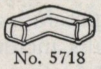

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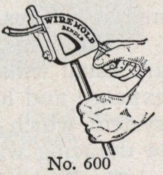
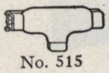


No. 600

Branches—Use No. 515 plain tee and No. 516 plain cross for single and double branch connections with No. 500 Wiremold and No. 5728 for either single or double branch connections with No. 700 Wiremold. When Wiremold is located on sidewalls and in corners, use No. 519 corner box at ceiling for connection of horizontal and vertical runs of No. 500 Wiremold, and No. 5719 for all corner combinations with No. 700 Wiremold.



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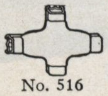

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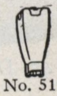

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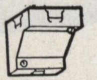
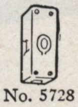


No. 5719

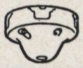


No. 5728

Continued on next page

Note: Under the following headings when both sizes of fittings are specified, all fittings shall be No. 5700 type where both No. 500 and No. 700 Wiremold is used. 500 type fittings may be used where only No. 500 Wiremold is used.

Cord and Chain Pendants—All cord pendants shall be supported from No. 521 with No. 500 Wiremold, and No. 5721 with No. 500 and No. 700 Wiremold, except in places of narrow dimensions use No. 5728. For chain pendants use ⅛-in. male loop.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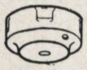
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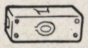
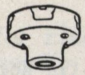

No. 5728

Reinforced Cord Pendants—All cord pendants up to No. 12 reinforced, shall be supported from all steel combination rosettes, No. 524 with No. 500 Wiremold, and No. 5724 with No. 500 and No. 700 Wiremold, both rosettes fitted with fiber insulating washer.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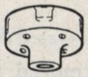
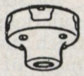

No. 5724

Fixtures—Support fixtures from No. 524 with No. 500 Wiremold, and No. 5724 with No. 500 and No. 700 Wiremold. Both rosettes are fitted with special chase nipple and locknut tapped inside and outside for making ⅜ or ½-in. connections. For pendant drops use ⅜-in. male loop.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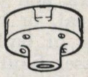
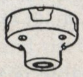

No. 5724

R. L. M. Reflectors—Use No. 524 with No. 500 Wiremold, No. 5724 with No. 700 Wiremold and ⅜ or ½-in. pipe nipple for hanging R. L. M. reflectors close up. Use No. 5739 with shock absorber for ½-in. pipe drop.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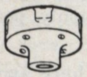
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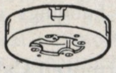
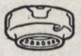

No. 5739

Receptacle Base—Use all steel receptacle base with base plate fitted with ready to wire tap block, and a standard fluted or wrinkled ring adapted for any standard socket body. No. 525 with No. 500 Wiremold, and No. 5725 with No. 500 and No. 700 Wiremold.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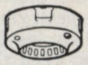
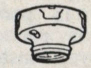

No. 5725

Keyless Receptacles—All keyless receptacles shall be of the standard Edison type, with keyless socket interior, standard thread on shell to take standard forms of shadeholders and base plates. Use No. 526 with No. 500 Wiremold, and No. 5726 with No. 500 and No. 700 Wiremold.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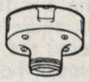
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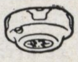
Plug Receptacles—All attachment plugs shall be made up of a steel housing with standard 10-ampere plug base with double "T" slots and standard base plate. Use No. 527 with No. 500 Wiremold, and No. 5727 with No. 500 and No. 700 Wiremold. For double "T" slot attachment plugs, use No. 5748-S surface type, and No. 5749 for flush type.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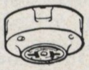
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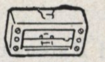
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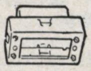
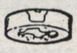

No. 5749

Ceiling Pull Switches—Mount 5-ampere ceiling pull switches with bases not exceeding 2½ in. on No. 532 with No. 500 Wiremold and No. 5732 with No. 700 Wiremold. Mount 5 or 10-ampere switches with bases not exceeding 3 in. on No. 533 with No. 500 Wiremold and No. 5733 with No. 700 Wiremold.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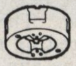
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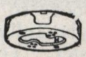
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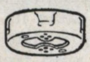
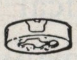

No. 5733

Switch Bases—Mount all 5-ampere snap or toggle surface switches, concealed base wall sockets, rosettes and similar fittings, with bases not exceeding 2½ in. on No. 532 with No. 500 Wiremold, and No. 5732 with No. 700. Mount 5 or 10-ampere switches and fittings with bases not exceeding 3 in. on No. 533 with No. 500 Wiremold, and on No. 5733 with No. 700 Wiremold. Use these fittings with No. 5731 blank cover for junction and pull boxes.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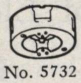
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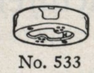
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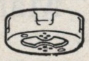
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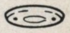
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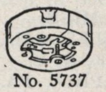
Fixture Extensions—Use No. 5737 extension box at all present fixture locations where extensions are required. Where a larger fitting for this purpose is required, use No. 5739-A.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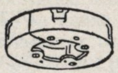
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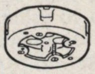
Hanging Fixtures—Support all hanging fixtures from 4¾-in. fixture box No. 5738, and all canopies which exceed 4½-in. diameter, use No. 5739.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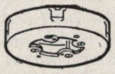
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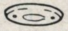
Cover Plates—All blank outlet boxes installed shall be fitted with either 2¼ or 4-in. blank covers as required, No. 5731 and No. 5736 respectively.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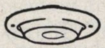
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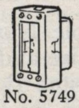
Flush Type Switches—Mount all shallow type flush switches and receptacles in No. 5749 switch case with cover, and No. 5750 switch case with cover having standard openings for push buttons and mounting screws.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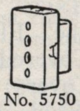
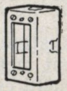

No. 5750

Switches—Surface Type—Mount all surface type switches in No. 5748, and all receptacles in No. 5748 or No. 5748-S. For connection with existing switch or receptacle outlets, use No. 5751 for single gang, No. 5752 for two gang, and No. 5753 for three gang.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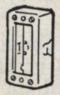
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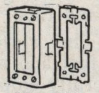
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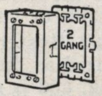
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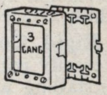
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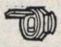
Connection Fittings—Use No. 5781 for connecting to standard panel and outlet boxes with ½-in. pipe knockout and Wiremold, and No. 5781-A with ¾-in. pipe knockout. Use No. 5782 to connect Wiremold to ½-in. rigid conduit, and No. 5782-A to connect to ¾-in. rigid conduit. Use No. 5783 for elbow box connection with Wiremold, and No. 5784 elbow connection with ½-in. rigid conduit. Connections with ½-in. steel conduit, BX flexible conduit, conduit boxes, condulet type fittings, safety switch cabinets and similar devices, shall be made with No. 5785. Use No. 588 fitting for bringing tap to two-wire open work. Use No. 5729 with condulet type cover for bringing tap to open work with more than two wires. Use No. 5786 adjustable offset connector for connections with surface type cabinets.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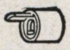
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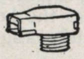
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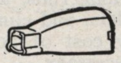
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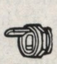
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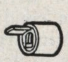
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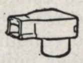
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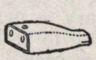
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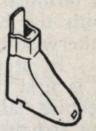
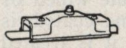

No. 5786

Store Windows, Show Cases, Wall Cases and Places of Narrow Dimensions—Use No. 5720 narrow straight line fitting having ⅛-in. nipple to take socket for reflectors and receptacles. Use No. 5728 utility box at all tee and cross connections, also for junction box, cord drops and fixtures with ⅜ and ½-in. stems. Use No. 5729 utility box condulet type, having both Wiremold and pipe or BX connections for mounting cord and fixture rosettes, lamp and plug receptacles. No. 5721 for cord drops or with nipple for standard reflectors, No. 5725 receptacle base and No. 5725 keyless receptacle may also be used.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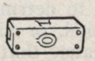
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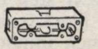
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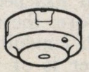
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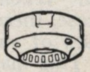
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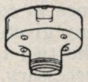
No. 5726

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General Information on Electric Wiring

Electric wiring is ordinarily installed in buildings under construction by the use of one of three general systems: Rigid conduit, armored cable or knob and tube.

Rigid Conduit System—The rigid conduit system is universally recognized as the safest and most permanent method of installing wiring, and is generally employed for structures of size and importance. In certain sections of the country, particularly in cities on the Pacific Coast, it is likewise employed to a large extent even for individual residences and other buildings of small size. In other cases, rigid conduit is employed for certain parts of buildings, or for certain parts of the wiring, as in basements, or for service entrances, etc., and one of the other systems is then used for the remainder of the work.

Rigid conduit is largely employed in factories and other industrial establishments where the wiring is exposed, as well as where it is concealed. When rigid conduit is used for exposed work in factories, it is often supplemented by lengths of flexible metallic conduit at the ends of runs where final connection is made to motors, or other current consuming machines. This arrangement combines the fundamental advantages of the rigid conduit on the long runs, with flexibility and ease of installation at terminal outlets, and eliminates the bends, elbows and fittings, with the heavy cost of accurately aligning them which would otherwise be necessary.

In preparing to specify rigid conduit for wiring, therefore, it is first necessary to determine whether the conditions at hand require "all wiring to be in rigid conduit," as in large and important structures (or even for smaller buildings in accordance with local regulations in certain sections), or whether the rigid conduit may be supplemented by other materials.

Two Grades of Rigid Conduit—In the manufacture of rigid conduit for electric wiring, the most important consideration, from the standpoint of the purchaser, is proper protection from rust. All manufacturers of rigid conduit supply two different grades of this material. One of these depends for protection from rust, on a coating of *black enamel,* and the other is protected by a coating of *zinc*. The difference in the lasting qualities of these two types of conduits, under conditions tending to produce corrosion, is of much more importance than the difference in cost. When it has been decided to use rigid conduit in any given case, therefore, the next step is to detrmine which of the two types of such conduit, black enamel, or zinc coated, is necessary. This matter is of such importance that it is treated at some length in later paragraphs.

Armored Cable—On account of the relatively high cost of wiring the smaller types of buildings with rigid conduit, it is common practice in many cities, particularly in the Eastern section of the country, to employ armored cable for this purpose. This includes not only residences, stores and small apartments, but often such buildings as churches and schools. In some cases, however, municipal, or other regulations, limit the size or location of buildings which may be wired in this way, and in other cases limit the number of outlets which may be installed.

For the wiring of existing buildings, either without modification, or in connection with alterations, armored cable, owing to its flexibility, offers particular advantages. On this account, even in districts where the use of armored cable in new buildings under construction is more or less limited, its use for the wiring of existing buildings is commonly permitted on a much more liberal basis.

Flat Armored Cable—Where armored cable is to be run on brick or tile walls or ceilings, and "plastered in," the *flat type* of cable, known by the trade name of "Ovalflex," has many advantages over the ordinary round type. If round armored cable is used under these circumstances, it is commonly necessary to groove the brick, or cut through the tile, in order that the cable may be covered by the plaster. To avoid the expense of this, it is customary, in specifying outlets in dwellings and similar buildings, to locate them, as far as possible, on hollow partitions instead of solid walls, even though this may not give the maximum of convenience. The depth of "Ovalflex" is such, however, that it may be run directly on the surface of brick or tile walls or ceilings, and fully covered by the thickness of plaster commonly used. If "Ovalflex" is employed for the wiring, therefore, outlets can be located wherever convenience may dictate, regardless of the type of wall or partition on which this may bring them. In calling for the wiring of buildings to be done with armored cable, therefore, it is particularly desirable to specify that where the cable is run on brick or tile walls the *flat type* must be employed, instead of the round type.

Knob and Tube System—If rigid conduit or armored cable is not called for by the specifications, or required by municipal regulations, contractors will ordinarily install the wiring by the knob and tube system, since usually this gives the minimum cost. To secure this type of wiring, therefore, it is not necessary to specify it, but merely to refrain from specifying any other type.

Alterations and Extensions—On account of re-arrangement of partitions, or other minor alterations, which are frequently necessary in fireproof buildings, for the proper accommodations of tenants, extensions or changes in wiring are frequently required. As a rule, such changes can best be cared for by the use of "Ovalflex" flat armored cable. When this is employed, it is merely necessary to groove the plaster, from the nearest point on the existing circuits to the desired new location, and to lay the flat cable in the groove so formed. The depth of the cable is so slight that it can be fully covered by merely filling in the grooves with fresh plaster. To employ any other approved material for such extensions, it would usually be necessary to groove not merely the plaster but also the tile or other material beneath it.

Where it is desired to make extensions, or alterations, in wiring of the above type, with a minimum of cost and without

Continued on next page

the necessity of grooving the plaster, this can be done by the use of "National" metal molding, laid on the surface. This material consists of a small trough of thin steel for covering and protecting the wires. It is of such a shape and color that it can be run on the walls or ceilings of offices or buildings of similar character without being conspicuous, or detracting from their appearance. "National" metal molding, therefore, constitutes a very desirable method of making extensions or changes in the wiring of business buildings of all classes at a minimum expense.

Further Information

The National Metal Molding Company, Pittsburgh, Pa., manufacturers of the above materials, as well as of a wide variety of electric cables, conduits, and fittings, will be glad to supply further information in regard to any of the above subjects.

Rigid Conduit for Electric Wires—What, Why and How to Specify

Electrical Conduits Should Be Permanent—Owing to the ever increasing use of electricity, the provision for distributing this force is an important factor in the planning of large buildings. In all structures of size or importance, the fundamental element in such distribution is a system of steel pipes, or conduits, placed in the walls, floors and ceilings during construction, into which the wires are afterwards drawn.

It is particularly important that this conduit system be properly designed, not only with reference to initial requirements, but also with a view to the future. Should the *wires* in a building prove inadequate or defective, they can be drawn out and replaced with comparative ease. A fault in the *conduit* system, however, is almost as serious as a flaw in the main framework of the building itself.

Important structures are put up with a view of *permanence.* In fifty years or more, the fundamental parts of any high grade hotel, office building or public edifice now being planned should be sound and useful. It is thus obvious that in important buildings, the conduits for electrical conductors (without which the usefulness of the building would be so seriously impaired) should be installed with the same view to permanence as the main structure.

Rust Protection the Important Feature—Iron and its offspring, steel, which afford such wonderful resistance to physical forces, are peculiarly subject to the chemical attacks of oxygen. Each year the blast furnaces of the world are said to release nearly seventy-five million tons of iron from its oxides, and each year a large portion, estimated as nearly one-quarter of this tonnage, returns to its primeval forms through the action of rust. Electrical conduits are made of steel, and to secure permanance, therefore, the fundamental problem of the architect and engineer is to select conduits in which the steel is properly protected against rust.

Methods of Rust Protection—There is only one way of protecting steel from oxygen, and that is by keeping them apart. This keeping apart, however, may be accomplished by several different processes.

One method is to convert the surface of the steel into some less corrodible compound, as in the familiar process of bluing screws. Another is to coat the steel with organic material, such as paint or enamel. A third is to cover the steel with a coating of some less corrodible metal, such as zinc.

Black Enameled Conduit—A very thin wall of organic material affords effective protection, provided it is continuous, and certain types of conduits are protected by an enamel which oxidizes to a hard elastic and adhesive coating. If applied over perfectly clean surfaces this coating functions satisfactorily, as long as it is unbroken. But let the coating wear off or crack, so that moisture can get at the steel, and rust will form, and spread beneath the enamel. If the enamel is applied to surfaces on which corrosion has already started, even in small spots, the corrosion may still spread underneath, even though the coating itself is unbroken.

Coating with enamel was one of the first means devised for protecting electrical conduits from corrosion, and "black enameled" or simply "black pipe," as it is commonly called, is used to a considerable extent in buildings designed for a limited life, in places where the conditions tending to cause corrosion are not severe, or in structures of such a character that the replacement of the conduit, if necessary, would not involve prohibitive expense.

Zinc Coated Conduit—When conduit is coated with zinc, another principle comes into play. As long as it is continuous, the zinc protects the steel merely by covering it, just as enamel would do. The affinity of oxygen for zinc, however, is so much greater than its affinity for steel, that when the two metals are in contact, it will always attack the former rather than the latter. If a zinc coating is scratched or abraded, therefore, the area of steel thus exposed will remain bright(instead of rusting as with an enamel coating) unless, of course, it is so large that its central portion is beyond the protective influence of the surrounding zinc. A coating of zinc thus affords protection for the steel, not only when continuous, but also when bruised or broken, if the damage is not too great. If the zinc is removed from larger areas, the exposed steel will, of course, rust, but even in such cases, the rust will be confined to the portions actually exposed and will not spread underneath the coating, as with enamel.

On account of the above feature, zinc coated, rather than black enameled conduit is commonly specified for conditions where moisture or other corrosive conditions are likely to be met. Zinc coated conduit is also commonly specified for large and important buildings, even when corrosive conditions are not severe, on account of the greater amount of handling necessary in such buildings and the greater liklihood of scratching or abrading the protective coating.

How Zinc Should Be Applied—The best method of coating conduit with zinc is by *Sherardizing.* The conduit is placed in retorts with finely divided zinc and maintained at a high temperature for several hours. This first changes the surfaces inside—outside—and threads, into a zinc-steel alloy, and then covers this alloy with a zinc coating. It is the only method by which all three of these portions can be protected simultaneously. Incidentally, the process anneals the conduit so it can be easily bent when desired during installation. Owing to the alloy, also, the zinc is securely attached to the steel, and a minimum amount flakes off when bends are made.

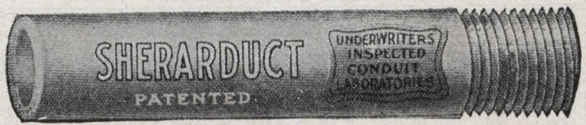
How to Specify—There is only one Sherardized conduit, and this is known as *"Sherarduct."* In addition to its zinc covering, it is given a coating of baked-on enamel, extra heavy on the inside, so that it is doubly protected against corrosion. This gives it an important advantage.

"Sherarduct" may be specified by name, or by the phrase—"All conduit used in this work must be sherardized inside and out and must be further protected by a coating of transparent acidproof enamel over the sherardized surfaces."

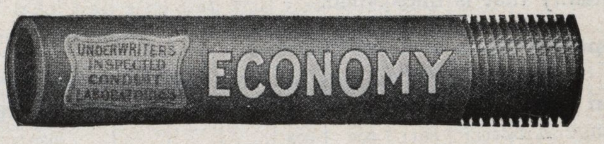
To obtain the best grade of black enameled conduit, it is common to specify it by trade name—"Economy."

Additional Data

The National Metal Molding Company, Pittsburgh, Pa., manufacturers of "Sherarduct" and "Economy" conduits, as well as of a wide variety of other wiring materials, will be glad to supply further information on this matter, if desired.



Sherardized Rigid Steel Conduit



Black Enameled Rigid Conduit

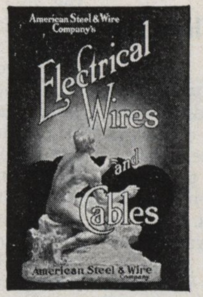
AMERICAN STEEL & WIRE COMPANY

Manufacturers of Electrical Wires and Cables

SALES OFFICES

CHICAGO, 208 South La Salle Street
NEW YORK, 30 Church Street
WORCESTER, 94 Grove Street
BOSTON, 185 Franklin Street
PHILADELPHIA, Widener Building
PITTSBURGH, Frick Building
BUFFALO, 670 Ellicott Street
DETROIT, Foot of First Street
CINCINNATI, Union Trust Building
CLEVELAND, Rockefeller Building
BALTIMORE, 32 South Charles Street
WILKES-BARRE, PA., Miners Bank Building
ST. LOUIS, MO., Liberty Central Trust Co. Building
DALLAS, Praetorian Building
ST. PAUL, Merchants National Bank Building
KANSAS CITY, MO., 417 Grand Avenue
OKLAHOMA CITY, First National Bank Building
BIRMINGHAM, ALA., Brown-Marx Building
MEMPHIS, TENN., Union and Planters Bank Building
DENVER, First National Bank Building
SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, United States Steel Products Co., 30 Church Street, New York
PACIFIC COAST REPRESENTATIVES, United States Steel Products Co., San Francisco, Los Angeles, Portland, Seattle


American Steel & Wire Company's
Electrical Wires and Cables
American Steel & Wire Company

TRADE-MARK

Products Page

Electric Wires and Cables:
Rubber Covered Wires and Cables 2372
Americore Rubber Covered Wires and Cables 2372
Amparak Rubber Covered Wires and Cables 2373
Amerite Rubber Covered Signal Wires 2373
Americore Lamp and Portable Cord 2374
Annunciator and Office Wire 2375
Americore Brewery, Packing House, and Canvasite Cord 2376
Americore Theater or Stage Cable 2376
Border Light and Elevator Lighting and Control Cables 2376
Rubber Covered Telephone Wire 2376
Weatherproof and Slow Burning Wires and Cables 2377
Flat Steel Taped Park or Suburban Cables 2379
Bare Wires and Cables, Copper, Iron and Steel 2380

For Wire Rope, see pages 29-33; for Concrete Reinforcement, see pages 40-44; for Triangle Mesh for Stucco Base, see page 424.

Facilities

The company's extensive factory facilities are well equipped with chemical, physical, and electrical laboratories, wherein the problems incident to the solution of every difficulty encountered are handled by thoroughly reliable experts and up-to-date methods. All steel and copper used is rolled and drawn in our mills and is under the company's supervision throughout every operation. All raw materials are tested and inspected before being used, the manufacturing processes are constantly checked, and finally the finished material is subjected to an exhaustive series of tests that determine beyond question whether or not it is of proper quality. With such facilities, this company is enabled to manufacture electrical conductors of all kinds to the severest specifications and to give the users of the product a standard of quality that is unexcelled.

Specifications and Instructions

General specifications for dwelling houses are given on page 2381; instructions concerning industrial plants, page 2382.

Rubber Covered Wires and Cables

Used for general interior light and power wiring.

The conductor consists of uniformly soft annealed, commercially pure copper wire, insulated with code thickness of high grade vulcanized rubber protected with closely woven, strong, and elastic cotton braids saturated in waterproof compound.

All conductors are thoroughly and evenly coated with tin to protect the copper from any injurious effect from the sulphur in the rubber insulation.

Grades of Rubber Insulation—Three standard grades of rubber compound are made for rubber covered conductors. In addition, the company insulates wire to any specifications covering particular requirements, such as 20 or 40% rubber compounds.

Americore Rubber Covered Wire—This grade meets all requirements of the National Electrical Code. It is recommended for all service conditions in which the working pressure is 7000 volts or under.

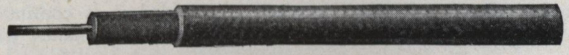
Amparak Rubber Covered Wire—An "intermediate" grade commonly known as *engineers'* wire. The insulation is of high grade compound made to suit the demand of engineers and architects desiring a better wire than Americore but not so high a quality as Amerite. Recommended especially for open wiring (knob and tube system) in dwellings, industrial plants, etc.

Amerite Rubber Covered Wire—This is the highest grade of rubber covered wire. It answers all requirements of the 30% Para rubber grade. It is used for high voltage circuits. It has great strength and elasticity, high insulating qualities, and long life.

Identification—Every wire insulated with the company's standard compounds has a distinguishing woolen tracer thread placed lengthwise of the conductor between the rubber and the braid as follows: Americore, *uncolored* thread; Amparak, *dark green*; Amerite, *crimson*.

Americore Rubber Covered Wires and Cables

This wire is made to comply with the National Electrical Code requirements and every coil is regularly examined and labeled under the supervision of the Underwriters' Laboratories, Inc. A strictly high grade wire for interior light and power wiring.



Americore Wire

Solid tinned copper conductor

Gauge, B. & S., or cir. mils	Thickness of insulation, in., for					
	0 to 600 volts Type R. S.	600 to 1500 volts Type R. S.-15	1500 to 2500 volts Type R. S.-25	2500 to 3500 volts Type R. S.-35	3500 to 5000 volts Type R. S.-50	5000 to 7000 volts Type R. S.-70
14–8	3/64	6/64	8/64	10/64	12/64	16/64
7–2	4/64	7/64	9/64	10/64	12/64	16/64
1–4/0	5/64	8/64	10/64	10/64	12/64	16/64
225,000 to 500,000	6/64	9/64	10/64	11/64	12/64	16/64
525,000 to 1,000,000	7/64	10/64	10/64	12/64	12/64	16/64
Over 1,000,000	8/64	10/64	10/64	12/64	14/64	18/64

Note: Type R. S. as given above signifies single braid rubber covered wire. Double braid or tape and braid would be designated as Type R. D.

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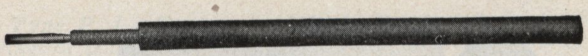
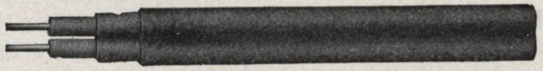


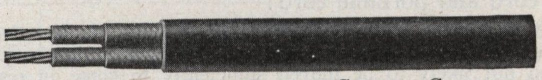
Americore Light Insulation Fixture Wire

Solid tinned copper conductor, rubber insulation, single braid, black finish

Size, B. & S. gauge	Thickness of rubber, in.	Diameter over braid, in.	List No.	Standard coils, ft.
12	1/64	9/64	....	500
14	1/64	8/64	8004	500
16	1/64	6/64	8006	1000
18	1/64	5/64	8008	1000
19	1/64	5/64	....	1000
20	1/64	5/64	....	1000



Americore Twin Rubber Covered Wire

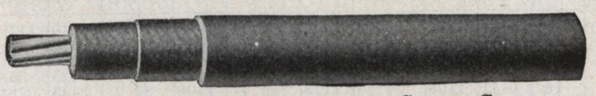


Americore Twin Rubber Covered Cable

AMERICORE TWIN RUBBER COVERED WIRES AND CABLES

Size, B. & S. gauge	Thickness of rubber, in.	Solid Conductor		Stranded Conductor			Shipped on reel No.
		List No.	Weight per 1000 ft., lbs.	Number of wires	List No.	Weight per 1000 ft., lbs.	
4/0	5/64	917	1653	19	687	1762	1020
3 0	5/64	918	1328	19	688	1444	1013
2/0	5/64	919	1091	19	689	1176	1013
0	5/64	920	896	19	690	966	1013
1	5/64	921	743	19	691	796	1002
2	4/64	922	576	7	692	622	1002
3	4/64	923	479	7	693	513	1002
4	4/64	924	399	7	694	431	335
5	4/64	925	334	7	695	362	335
6	4/64	926	280	7	696	301	335
8	3/64	928	181	7	698	195	1004
10	3/64	930	123	7	700	141	Coils
12	3/64	932	92	7	702	107	Coils
14	3/64	934	71	7	704	83	Coils
16	2/64	936	....	....	....	....	Coils
18	2/64	938	....	....	....	....	Coils

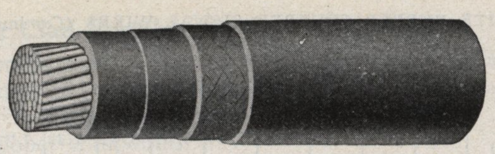
Underwriters' rules permit use of above in sizes No. 14 and larger. No. 6 and larger shipped on reels containing 1000-ft. lengths; smaller sizes shipped in coils containing 500-ft. lengths.



Americore Cable, Stranded Tinned Copper Conductor

AMERICORE RUBBER COVERED WIRES AND CABLES

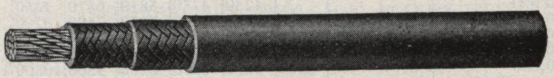
Size, B. & S. gauge	Thickness of rubber, in.	Solid		Stranded			Standard packages, amounts, ft.
		List No.	Weight per 1000 ft., lbs.	Number of wires in strand	List No.	Weight per 1000 ft., lbs.	
Single Braid							
4/0	5/64	810C	784	19	557	832	1000 Reels
3/0	5/64	810B	633	19	558	678	1000 Reels
2/0	5/64	810A	517	19	559	550	1000 Reels
1/0	5/64	810	423	19	560	454	1000 Reels
1	5/64	811	348	19	561	372	1000 Reels
2	4/64	812	268	7	562	289	1000 Reels
3	4/64	813	221	7	563	237	1000 Reels
4	4/64	814	183	7	564	197	1000 Reels
5	4/64	815	152	7	......	....	1000 Reels
6	4/64	816	127	7	566	137	1000 Reels
8	3/64	818	80	7	568	86	500 Coils
10	3/64	820	57	7	570	61	500 Coils
12	3/64	822	42	7	572	45	500 Coils
14	3/64	824	32	7	574	34	500 Coils
16	2/64	826	19	....	......	....	500 Coils
18	2/64	828	15	....	......	....	500 Coils
Double Braid							
4/0	5/64	850C	820	19	867	871	1000 Reels
3/0	5/64	850B	666	19	868A	715	1000 Reels
2/0	5/64	850A	547	19	869	583	1000 Reels
1/0	5/64	850	450	19	870	485	1000 Reels
1	5/64	851	374	19	871	400	1000 Reels
2	4/64	852	291	7	872	314	1000 Reels
3	4/64	853	242	7	873	260	1000 Reels
4	4/64	854	201	7	874	218	1000 Reels
5	4/64	855	169	7	......	....	1000 Reels
6	4/64	856	144	7	876	155	1000 Reels
8	3/64	858	94	7	878	101	500 Coils
10	3/64	860	69	7	880	74	500 Coils
12	3/64	862	53	7	882	57	500 Coils
14	3/64	864	42.2	7	884	44.8	500 Coils
16	2/64	866	25	....	......	....	500 Coils
18	2/64	868	20	....	......	....	500 Coils



Americore Feeder Cable

Capacity in cir. mils	Number and diameter of wires in strand, in.	Thickness of rubber, in.	Diameter over tape and braid, in.	List No. single braid	Weight per 1000 ft., lbs.	Shipped on reel No.
250,000	37 x .0822	3/32	56/64	340	1018	1013
300,000	37 x .0901	3/32	59/64	341	1194	1013
350,000	37 x .0973	3/32	62/64	342	1368	1013
400,000	37 x .1040	3/32	65/64	343	1541	1013
450,000	37 x .1103	3/32	68/64	344	1714	1020
500,000	37 x .1162	3/32	72/64	345	1894	1020
600,000	61 x .0992	7/64	79/64	346	2282	1020
750,000	61 x .1109	7/64	86/64	347	2795	1020
1,000,000	61 x .1280	7/64	96/64	348	3640	1021
1,250,000	91 x .1172	8/64	107/64	348A	4534	1021
1,500,000	91 x .1284	8/64	115/64	349	5406	1015
2,000,000	127 x .1255	8/64	129/64	349 A	7062	....

Shipped in reels containing 1000-ft. lengths.



Americore Rubber Covered Switchboard Cable

National Electrical Code Standard; low potential, 0-600 volts; Class A

Size, B. & S. gauge	Number of wires in strand	Thickness of rubber, in.	Diameter over single braid, in.	Diameter over double braid, in.	List No.		Weight per 1000 ft., lbs.		Standard packages, amounts, ft.
					Single braid	Double braid	Single braid	Double braid	
1	259	5/64	37/64	40/64	221	271	376	406	1000
2	210	4/64	33/64	36/64	222	272	302	329	1000
3	151	4/64	30/64	33/64	223	273	231	255	1000
4	133	4/64	27/64	30/64	224	274	210	231	1000
5	82	4/64	23/64	26/64	226	276	144	163	1000
6	49	4/64	23/64	26/64	226	276	145	164	1000
8	49	3/64	19/64	22/64	228	278	87	101	500
9	40	3/64	18/64	21/64	229	279	73	87	500
10	19	3/64	17/64	20/64	230	280	61	74	500
12	19	3/64	15/64	18/64	232	282	45	57	500
14	19	3/64	14/64	17/64	234	284	34	45	500

Amparak Rubber Covered Wires and Cables

Made in sizes and styles as above described for Americore covering.

Amerite Rubber Covered Signal Wires

These rubber covered wires and cables are made to meet the rigid specifications of the Railway Signal Association. Insulation contains only highest grade of pure dry Para rubber and other necessary preservative ingredients. Exact composition of the rubber compound used and thickness of the rubber insulation is in every case determined by working voltage and by nature of service. Furnished in any size and finish and for all services and voltages.

AMERITE RUBBER COVERED SIGNAL WIRES

30% Fine Para Rubber Compounded

Size, cir. mils or A. W. gauge (B. & S.)	Thickness of insulation, in.									
	3/64	2/32	5/64	3/32	7/64	4/32	5/32	6/32	7/32	8/32
Megohms per Mile After a One-minute Electrification at 60° Fahr.										
1,000,000	.....	.....	.....	.....	650	725	900	1025	1150	1350
900,000	.....	.....	.....	.....	675	750	925	1100	1250	1400
800,000	.....	.....	.....	.....	700	800	950	1150	1300	1450
700,000	.....	.....	.....	.....	750	850	1000	1200	1400	1550
600,000	.....	.....	.....	.....	800	900	1100	1300	1450	1650
500,000	.....	.....	.....	750	850	950	1150	1400	1550	1700
400,000	.....	.....	.....	850	950	1100	1300	1500	1700	1850
300,000	.....	.....	.....	950	1100	1200	1400	1700	1900	2150
250,000	.....	.....	.....	1000	1150	1300	1550	1800	2050	2250
4/0	.....	.....	1000	1200	1300	1450	1750	2000	2250	2600
3/0	.....	.....	1050	1300	1450	1600	1850	2250	2500	2800
2/0	.....	.....	1200	1450	1600	1750	2100	2350	2700	3050
1/0	.....	.....	1300	1550	1750	1950	2250	2600	2950	3250

Continued on next page

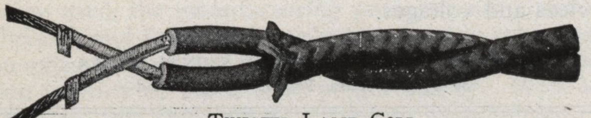
AMERITE RUBBER COVERED SIGNAL WIRES (Continued)
30% Fine Para Rubber Compounded

Size, cir mils or A. W. gauge (B. & S.)	Thickness of insulation, in.									
	3/64	2/32	5/64	3/32	7/64	4/32	5/32	6/32	7/32	8/32
Megohms per Mile After a One-minute Electrification at 60° F., Solid Wire										
1	....	....	1600	1850	2100	2350	2750	3100	3500	3825
2	....	1500	1750	2000	2300	2550	3000	3350	3750	4150
3	....	1600	1850	2250	2500	2750	3250	3700	4050	4500
4	....	1750	2100	2500	2750	3000	3500	3950	4300	4700
5	....	1950	2300	2700	3000	3250	3750	4250	4600	5050
6	....	2100	2500	2850	3250	3500	4050	4500	4950	5400
8	1800	2500	3000	3350	3750	4100	4700	5200	5600	5950
9	2000	2750	3250	3600	4050	4350	5000	5500	6000	6400
10	2400	3000	3500	3900	4350	4700	5300	5850	6300	6800
12	2700	3500	4000	4500	4950	5300	6000	6550	7000	7550
14	3000	4050	4600	5100	5600	6000	6750	7300	7800	8300
Megohms per 1000 ft. After a One-minute Electrification at 60° F., Standard Wire										
1,000,000	....	....	....	....	3430	3830	4750	5420	6080	7140
900,000	....	....	....	....	3560	3960	4880	5810	6600	7400
800,000	....	....	....	....	3700	4230	5020	6070	6870	7650
700,000	....	....	....	....	3960	4480	5280	6350	7400	8200
600,000	....	....	....	....	4230	4750	5810	6870	7650	8720
500,000	....	....	....	3960	4480	5020	6070	7400	8200	9000
400,000	....	....	....	4480	5020	5810	6870	7920	9000	9770
300,000	....	....	....	5020	5810	6350	7400	9000	10000	11350
250,000	....	....	....	5280	6070	6870	8200	9500	10800	11900
4/0	....	....	5280	6350	6870	7650	9250	10550	11900	13750
3/0	....	....	5550	6870	7650	8450	9770	11900	13200	14800
2/0	....	....	6350	7650	8450	9250	11100	12400	14250	16100
1/0	....	....	6870	8200	9250	10300	11900	13750	15600	17200
Megohms per 1000 ft. After a One-minute Electrification at 60° F., Solid Wire										
1	....	....	8450	9770	11100	12400	14520	16400	18500	20200
2	....	7920	9250	10550	12150	13500	15900	17700	19800	21900
3	....	8450	9770	11900	13200	14520	17200	19600	21400	23800
4	....	9250	11100	13200	14520	15900	18500	20805	22700	24800
5	....	10300	12150	14250	15900	17200	19800	22450	24300	26700
6	....	11100	13200	15050	17200	18500	21400	23800	26150	28500
8	9500	13200	15900	17700	19800	21650	24800	27500	29600	31450
9	10560	14520	17200	19000	21400	23000	26400	29050	31700	33800
10	12700	15900	18500	20600	23000	24800	28000	30900	33300	35900
12	14250	18500	21100	23800	26150	28000	31700	34600	37000	39900
14	15900	21400	24300	27000	29600	31700	35650	38600	41200	43800
Voltage Tests for a Five-minute Period										
14 to 2	3000	4500	6000	7500	9000	10500	13500	16300	19200	22100
1 and larger	....	....	3800	5200	6800	8250	11250	14250	17250	20250

Americore Lamp and Portable Cord

For exposed wiring to connect concealed wiring with drop lights, brackets, and portables. Also used for bell and annunciator wiring, and for other purposes where a short flexible connecting conductor is desired.

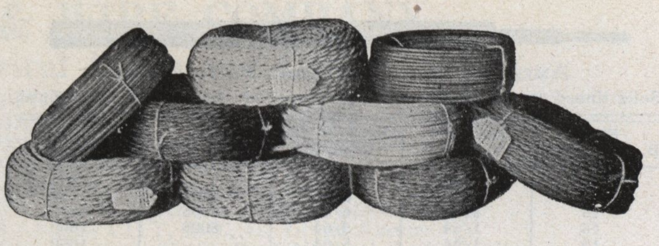
The conductor consists of a number of small untinned annealed copper wires each No. 30 American Wire gauge (B. & S.), having a diameter of .01 in., twisted into a cable of the required carrying capacity. This conductor is then covered with a tight, close wind of fine cotton, after which it is insulated with seamless rubber and then covered with an ornamental braid of silk or cotton. Two of these are finished and braided all over with silk or cotton, in each case forming the two branches of a circuit.



Twisted Lamp Cord

All sizes put up in coils of 250 ft. each. Sizes Nos. 16 and 18 have the largest sale, and are put up in packages containing 1000 and 3000 ft. each, as desired. Coils will be packed in specially prepared paper cartons on request.

A combination of green and yellow is the color usually furnished for cotton covered lamp cords; portable cords generally furnished with dry black cotton braid.



Lamp Cord of All Kinds and Sizes

Types—The following is an extract from the National Board of Underwriters' specifications dated 1911, and covers this company's Americore (new code) lamp cord and portable cord:

Type C for Pendant Lamps—In this class is included all flexible cord, which, under usual conditions, hangs freely in the air and not likely to be moved sufficiently to come in contact with surrounding objects. Pendant lamps provided with long cords, so that they can be carried about or hung over nails or on machinery, etc., are not included in this class, even though they are usually allowed to hang freely. Each conductor must have an approved braided covering, so put on and sealed in place that when cut it will not fray out.

This type is insulated with $\frac{3}{64}$-in. rubber on sizes 8 to 14 and $\frac{1}{32}$-in. on 16 to 22.

Type C. W. P. for Pendant Lamps—Same as above, except must have saturated braid and $\frac{3}{64}$-in. rubber. For use in damp places.

Type P. O. for Pendant Lamps—Parallel cord—each conductor Type C, two such conductors laid parallel and covered with one silk or cotton braid.

AMERICORE LAMP CORD, TYPES C. AND P. O.

Size, AW. gage B. & S.	Number of wires in strand	Rubber, in.	Twisted Pair (Type C)				Duplex Parallel (Type P.O.			
			Cotton covered		Silk covered		Cotton covered		Silk covered	
			List No.	Weight per 1000 ft., lbs.	List No.	Weight per 1000 ft., lbs.	List No.	Weight per 1000 ft., lbs.	List No.	Weight per 1000 ft., lbs.
10	104	3–64	1100	122.00	1120	116.71	1400	120.0	1420	117.0
12	65	3–64	1102	89.36	1122	84.77	1402	88.99	1422	86.1
14	41	3–64	1104	65.49	1124	61.53	1404	66.1	1424	63.6
16	26	1–32	1106	37.70	1126	34.61	1406	38.7	1426	36.8
18	16	1–32	1108	29.33	1128	26.47	1408	30.2	1428	28.5
20	10	1–32	1110	23.44	1130	20.83	1410	24.5	1430	22.9
22	6	1–32	1112	20.15	1132	17.50	1412	20.9	1432	19.3

Type P. for Portables—Flexible cord for portable use, except in offices, dwellings or similar places where cord is not liable to rough usage and where good appearance is an essential feature, must meet all the requirements for flexible cord for pendants, and in addition must have a tough braided cover over the whole. There must also be an extra layer of rubber between the outer cover and the flexible cord. All sizes (except No. 14 and larger) are insulated with $\frac{1}{32}$-in. rubber; No. 14 and larger have $\frac{3}{64}$-in. rubber.

Portable Cord

Type P. W. P. for Portables in Damp Places—(Same as Type P except must be furnished with a saturated braid.) For use in damp places, the insulation must be $\frac{3}{64}$-in. thick on sizes No. 14 and larger, and $\frac{1}{32}$-in. on sizes No. 16 and smaller, and the cord must have an outer covering saturated with a moistureproof preservative compound thoroughly slicked down, or must have a filler of approved material instead of an extra layer of rubber, and have two outer braids saturated with a moistureproof compound with an exterior surface thoroughly slicked down.

Types P. O., P. and P. W. P.—These types will be made with $\frac{3}{64}$-in. rubber on size 18 B. & S. gauge only, per new underwriters' ruling, and should be specified as types P. O. 64, P. 64 and P. W. P. 64.

If old styles are required, specify types as P. O. 32, P. 32 and P. W. P. 32.

Continued on next page

Type P. L.—Trade name: Light Reinforced Cord. For pendant or portable use in dry places and where not subject to hard usage. Construction: twisted pair with no braid on each conductor; jacket of Americore Rubber not less than 1/64 in. thick around the twisted pair; outer covering of glazed cotton or silk. Insulation on conductors same as Type C. Replaces Type P. S. which is not approved now.

Type P. D.—Trade name: Twisted Portable. For pendant or portable use in offices, dwellings, or similar dry places where not likely to be subjected to rough usage and where appearance is essential. Construction: twisted pair, with soft cotton braid on each conductor; outer covering of glazed cotton or silk. Insulation same as Type C.

Also used in place of Type P. S. which is not approved now.

REINFORCED PORTABLE CORD, TYPES P. AND P. W. P.

Size	Number of wires in strand	Rubber, in.	Dry Cotton Braid (Type P.)		Silk Braid (Type P.)		Saturated Braid (Type P. W. P.)	
			List No.	Weight per 1000 ft., lb.	List No.	Weight per 1000 ft., lb.	List No.	Weight per 1000 ft., lbs.
10	104	3/64x1/64	....	214.7	....	204.0	....	222.4
12	65	3/64x1/64	1162	169.2	1172	159.8	1182	175.6
14	41	3/64x1/64	1164	131.2	1174	125.9	1184	135.9
16	26	1/32x1/64	1166	77.9	1176	73.9	1186	81.4
18	16	1/32x1/64	1168	67.4	1178	62.7	1188	69.9
20	10	1/32x1/64	1170	58.2	1180	53.3	1190	59.8
22	6	1/32x1/64	....	53.2	....	48.5	....	54.3

Construction of Cord for Portables—Made with regular National Electrical Code cotton covered lamp cord, over which is placed a supplementary insulation of vulcanized rubber.

This is then covered with one strong braid of cotton, thoroughly saturated with a preservative compound, waxed and polished.

Reinforced portable cord is sometimes called for with the outside braid of dry, glazed cotton, either black or colored, and sometimes with a colored silk braid.

Show window cord and cord for portables are the same as reinforced portable cord. Orders should specify the kind of braid desired, *i. e.,* whether weatherproof, dry cotton or silk, and the color.

1909 Code: This grade, also known as grade A, is insulated with 1/32-in. thickness of rubber, and was formerly the National Code Standard.

Commercial: Known as "old code," or grade C, is insulated with 1/64-in. thickness of rubber.

Both these grades are still in demand and can be furnished upon request in lamp cord or portable cord constructions.

The braiding can be either dry cotton or silk in any color or weatherproof saturated cotton.

Amcord Woven Braid

This is a braided weave in which fillers are woven diagonally about a warp placed lengthwise of the conductor.

It is usually made of hard twisted cotton cord saturated with a weatherproof compound. It is very flexible and possesses extreme durability under hard service conditions.

It can be furnished on any size cable and is especially adapted for portable cords and mining machine cable.

Tubular Weave Loom

This is a loom weave, similar to that on fire hose, made up of hard twisted cotton saturated with a weatherproof compound. It is very durable and offers an excellent protection to the insulation for portable cords.

Rubber Clad Portable Cords

Conductors are insulated with high grade 30% rubber compound to required thicknesses, over which is placed a supplementary insulation consisting of a 60% rubber compound.

This outer rubber belt is very tough and elastic; it will withstand the hardest kind of service. Used for wiring portable garage lights, trouble lights and electric drills, etc. Furnished in 2 or 3 conductors.

Rubber Clad Portable Cord

Annunciator and Office Wire

Annunciator Wire—Used in primary battery circuits for call bell or annunciator wiring in hotels, offices or houses. Commercially pure, soft copper wire from No. 14 to No. 22 B. & S. is used. This is insulated with two firm winds of cotton applied in opposite directions and saturated with specially prepared paraffin wax compound. The outside wrap is made of any color or combination of colors—the most common being bright and fast red or blue with white. Put up on spools weighing about 7 lbs. net.

Annunciator Wire

Size, B. & S. gauge	List No.	Length in 1 lb., ft.	Size, B. & S. gauge	List No.	Length in 1 lb., ft.
14	3114	67	20	3120	221
16	3116	101	22	3122	311
18	3118	155			

"Black Core" or "Dampproof" Annunciator Wire—Finished in colors as above, shipped on spools of about 7 lbs. net. Made with the inside wind saturated with our weatherproof compound. This permits its use in damp places. Outside wind of cotton, which is made in colors, is saturated with special paraffin wax compound, and finished so as to present a smooth and highly polished surface that will not catch dust.

"BLACK CORE" OR "DAMPPROOF" ANNUNCIATOR WIRE

Size, B. & S. gauge	List No.	Length in 1 lb., ft.	Size, B. & S. gauge	List No.	Length in 1 lb., ft.
14	3214	60	20	3220	200
16	3216	90	22	3222	280
18	3218	130			

Office Wire—Standard grade consists of a copper conductor, varying in size from No. 14 to No. 20 B. & S., insulated with one wind and one braid of cotton, both of which are applied tight and even.

These two cotton covers are thoroughly saturated with our special paraffin wax compound. The outer braid is given a high polish and is made in any color or combination of colors specified. The standard colors are red and white or blue and white.

This wire is put up in coils of about 20 lbs.

Used largely by telephone and telegraph companies for inside wiring, extending from the instruments to the junction where they connect with outside wires and cables as they enter building. Also used as high grade bell and annunciator wire.

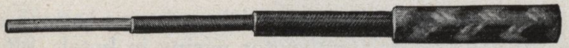
Continued on next page

Office Wire

Size, B. & S. gauge	List No.	Length in 1 lb., ft.	Size, B. & S. gauge	List No.	Length in 1 lb., ft.
14	3314	56	18	3318	115
16	3316	80	20	3320	154

"Black Core" or "Dampproof" Office Wire—Has two inside cotton winds applied in opposite directions which are thoroughly impregnated with black weatherproofed compound. The outside braid is finished same as regular office wire.

Used where higher grade of insulation is required. Packed same as regular office wire.



"Black Core" or "Dampproof" Office Wire

Size, B. & S. gauge	List No.	Length in 1 lb., ft.	Size, B. & S. gauge	List No.	Length in 1 lb., ft.
14	3414	53	18	3418	98
16	3416	72	20	3420	135

Special Annunciator and Office Wire—Special kinds furnished as specified. Also conductors of other than standard sizes, either solid or stranded. Untinned copper wire is used in the regular product, but tinned wire will be furnished if required.

Multiple Conductors—Any of these insulated wires supplied, two in parallel or twisted in pairs, in 3-conductor cables or in cables having any number of conductors. Same can be covered with one or more braids or with tape and braid and finished in any manner specified.

Americore Brewery, Packing House and Canvasite Cords

Brewery Cord (Type C. B., Class A)—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a weatherproof braid; two such conductors twisted together (no braid over all).

Brewery Cord

List No.	Construction of conductor	Thickness of rubber insulation, in.	Size B. & S. gauge	Weight per 1000 ft., lbs.
8930L	104-30 B. & S. wires	3/64	10	125
8932L	65-30 B. & S. wires	3/64	12	95
8934L	41-30 B. & S. wires	3/64	14	70
8936L	26-30 B. & S. wires	1/32	16	40
8938L	16-30 B. & S. wires	1/32	18	32
8940L	10-30 B. & S. wires	1/32	20	25

Canvasite Cord (Type C. C.)—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a weatherproof braid; two such conductors twisted together with one weatherproof braid over all.

Canvasite Cord

List No.	Construction of conductor	Thickness of rubber insulation, in.	Equal in capacity to	Weight per 1000 ft., lbs.
8910	104-30 B. & S. wires	3/64	10 B. & S.	140
8912	65-30 B. & S. wires	3/64	12 B. & S.	105
8914	41-30 B. & S. wires	3/64	14 B. & S.	85
8916	26-30 B. & S. wires	1/32	16 B. & S.	48
8918	16-30 B. & S. wires	1/32	18 B. & S.	39
8920	10-30 B. & S. wires	1/32	20 B. & S.	32

Packing House Cord (Type P. K. W. P.)—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a dry braid; 2 such conductors twisted together, jute filled, and covered with 2 weatherproof braids.

Packing House Cord

List No.	Construction of conductor	Thickness of rubber insulation, in.	Size, B. & S. gauge	Weight per 1000 ft., lbs.
8950L	104-30 B. & S. wires	3/64	10	142
8952L	65-30 B. & S. wires	3/64	12	107
8954L	41-30 B. & S. wires	3/64	14	84
8956L	26-30 B. & S. wires	1/32	16	52
8958L	16-30 B. & S. wires	1/32	18	41
8960L	10-30 B. & S. wires	1/32	20	33

Americore Theater or Stage Cable

Sizes No. 10 to No. 16, Type T—Each conductor regular lamp cord strand, cotton wrapped, insulated with code thickness of rubber and covered with single weatherproof braid; two or three such conductors twisted together with jute fillers and covered with two weatherproof braids.

Sizes No. 2 to No. 8—Same as above, except have standard rubber covered tinned copper concentric strand and are not covered by type T.

Theater or Stage Cable

Size, B. & S. gauge	Number of wires in strand	Thickness of rubber insulation, in.	List No.	Weight per 1000 ft., lbs.
2	210	4/64	8972	...
3	151	4/64	8973	...
4	133	4/64	8974	654
6	49	4/64	8976	468
8	49	3/64	8978	286
10	104	3/64	8980L	196
12	65	3/64	8982L	153
14	41	3/64	8984L	118
16	26	3/64	8986L	70

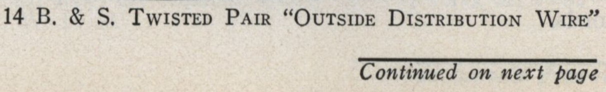
Border Light and Elevator Lighting and Control Cables

Furnished to National Code specifications.

Rubber Covered Copper Telephone Wire

Specifications—The following are considered standard by the larger telephone companies:

No. 14 B. & S. Twisted Pair "Outside Distribution Wire"—Each conductor hard drawn tinned copper wire, insulated to a diameter of 5/32 in. over rubber and covered with cotton braid, saturated with black weatherproof compound, wax finish, one conductor having a raised tracer to distinguish it from the other.



No. 14 B. & S. Twisted Pair "Outside Distribution Wire"

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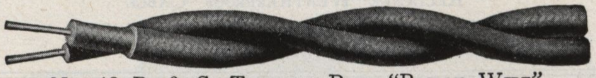
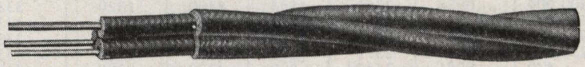
No. 18 B. & S. Twisted Pair "Bridle Wire"—Each conductor soft drawn tinned copper wire, insulated to a diameter of $\frac{7}{64}$ in. over rubber and covered with cotton braid, saturated with black weatherproof compound, wax finish, one conductor having a raised tracer to distinguish it from the other.



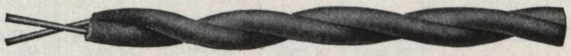
No. 18 B. & S. Twisted Pair "Bridle Wire"

No. 19 B. & S. Single Conductor Twisted Pair and Triple Conductor "Inside" or "Substation" Wire—Conductors soft drawn tinned copper insulated to a diameter of $\frac{3}{32}$ in. over rubber, covered with single hard glazed cotton braid. Single conductors are braided with plain colored cotton, while in the twisted pair one conductor contains a differently colored tracer thread, and in triple conductor two of the three wires contain different colors or different design of tracer threads, thus making no two of conductor braids alike. Sometimes a differently colored cotton braid is used, one for each conductor, for purposes of distinction.



No. 19 B. & S. Single Conductor Twisted Pair, and Triple Conductor "Inside" or "Substation" Wire

"Pot Head" Wires, Plain Telephone Conductors—Furnished in the smaller sizes, Nos. 18, 19, 20 or 22 B. & S., either single conductor or twisted pair. Soft tinned copper conductors insulated to a diameter of $\frac{3}{32}$ in. over rubber without any outer braid or protection. In case of twisted pairs, one conductor is sometimes made of a differently colored rubber than the other to discriminate between them.



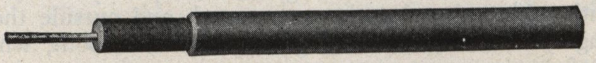
"Pot Head" Wire, Plain Telephone Conductor

TELEPHONE WIRES, TWISTED PAIRS

Size, B. & S. gauge	Finish	Diam. over rubber, in.	List No.			Weight per 1000 ft., lbs.
			No test	100 megohms	Over 100 megohms	
14	Braided	11/64	9141	9040	9040A	75
14	Braided	5/32	9145	9045	9045A	68
16	Braided	5/32	9165	9065	9065A	72
16	Braided	9/64	9169	9069	9069A	55
16	Braided	4/32	9164	9064	9064A	40
18	Braided	4/32	9184	9084	9084A	35
18	Braided	7/64	9187	9087	9087A	32
19	Braided	7/64	9197	9097	9097A	30
19	Braided	3/32	9193	9093	9093A	28
20 or 22	Braided	3/32	9120 9122	9020 9022	9020A 9022A	26
19	Plain	3/32	9193P	9093P	9093B	20
20 or 22	Plain	3/22	9120P 9122P	9020P 9022P	9020B 9022B	24

Telephone Cables—Made to include any number of single conductors or twisted pairs of telephone wires either plain or braided, bunched together or laid up concentrically, with a tape or cotton braid or other fibrous covering over all. Frequently incased in lead sheath, or armored. These cables vary greatly in construction and are furnished to buyers' requirements and specifications.

Rubber Covered Iron Telephone Wire, Single Conductor—These conductors are generally No. 12 or 14 B. W. G. galvanized iron wire insulated with code thickness of vulcanized rubber, either single or double cotton braid, weatherproof, saturated and wax polished.



Rubber Covered Iron Telephone Wire, Single Conductor

RUBBER COVERED IRON TELEPHONE WIRE, SINGLE CONDUCTOR

Size, B. W. G.	Thickness rubber, in.	Single Braid		Double Braid	
		List No.	Weight per 1000 ft., lbs.	List No.	Weight per 1000 ft., lbs.
12	3/64	1512	100	1512A	140
14	3/64	1514	75	1514A	100

When furnished in twisted pairs, one conductor contains a raised tracer thread to distinguish it from the other conductor.

Other Styles of Telephone Wire—***Spider Wire***—The accepted interpretation of this term is synonymous with "bridle wire," except that it is used singly instead of in pairs. Braids and finish are the same.

Drop Wire—No. 14 B. & S. twisted pair, $\frac{5}{32}$ in. over insulation, with black saturated weatherproof braid, and raised marker in one conductor. Hard drawn copper. This service involves the drop from the pole terminal to the house bracket. No. 16 B. & S. insulated to 4/32 in. is extensively used, but on account of the severe service to which this type of wire is put, necessitating great resistance to climatic conditions, No. 14 B. & S. is considered the standard, because of increased tensile strength.

Jumper Wire—This is often confused with spider and "bridle wire" in outside construction, but by the more general acceptance of the term, it applies to the wire used for cross connecting service on the main distributing frame. It is usually a No. 20 or No. 22 B. & S. wire insulated to $\frac{3}{32}$ in. with flameproof braids; if twisted pair, one is red and one is white.

Weatherproof and Slow Burning Wires and Cables

These have moderate degree of insulation and are less expensive than rubber insulated conductors. Double and triple braid.

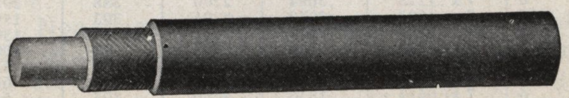
Reliance weatherproof wire meets every requirement for outdoor service, while Reliance slow burning wire is superior for indoor uses.

Wires and cables are made in strict accordance with all requirements of the National Board of Fire Underwriters, sizes varying from No. 20 B. & S. to the largest feeder cables used. Sizes No. 4/0 B. & S. and smaller are usually made of solid wires, while larger sizes have stranded conductors.

Unless hard drawn copper be specified, wires of purest grade of annealed copper, uniform in softness and having minimum conductivity of 98% Matthiessen's standard, will be used.

Reliance Weatherproof Insulation—For use outdoors where moisture is certain and where fireproof qualities are not necessary; also where, on account of small separation, bare wires would be liable to swing into contact with each other or with other low tension cables.

The wires are first covered by two or three closely and evenly woven braids of strong fibrous material, which is then completely saturated with weatherproof insulating compound. After drying thoroughly, the wire receives dressing of mineral wax, when the surface is thoroughly burnished and polished, reducing to a minimum trouble from sleet and ice.



Reliance Weatherproof Wire

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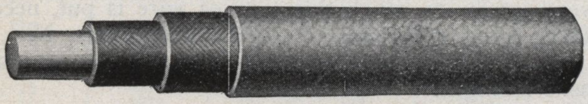
RELIANCE WEATHERPROOF WIRE
Solid copper wire, double braid, black finish
National Electrical Code Wire

Size, B. & S. gauge	Diameter, in., bare wire	Area, cir. mils	List No.	Weights		Standard packages, amounts, ft.	Shipped on reel No.
				Lbs. per 1000 ft.	Lbs. per mile		
4/0	.4600	211600	2040	723	3817	2400	315
3/0	.4096	167772	2030	587	3098	2500	315
2/0	.3648	133079	2020	467	2467	3200	315
0	.3250	105625	2000	377	1989	4300	315
1	.2893	83694	2001	294	1553	1000	302
2	.2576	66358	2002	239	1264	1300	302
3	.2294	52624	2003	185	977	1600	302
4	.2043	41738	2004	151	795	2100	302
5	.1819	33088	2005	122	646	2500	322
6	.1620	26244	2006	100	529	3400	322
8	.1285	16512	2008	66	349	5000	322
9	.1144	13087	2009	54	283	6000	322
10	.1019	10384	2010	46	241	35 to 50	Coils
12	.0808	6528.6	2012	30	158	25 to 40	Coils
14	.0641	4108.8	2014	20	107	25 to 40	Coils
16	.0508	2580.6	2016	16	83	20 to 30	Coils
18	.0403	1624.1	2018	12	64	20 to 30	Coils

The insulation will withstand all ordinary climatic conditions.

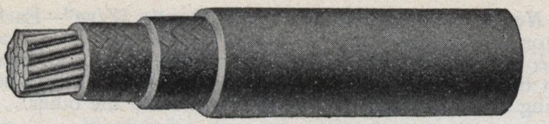


RELIANCE WEATHERPROOF WIRE
Solid copper wire, triple braid, black finish
National Electrical Code Wire

Size, B. & S. gauge	Minimum thickness of insulation, in.	List No.	Weights		Standard packages, amounts, ft.	Shipped on reel No.
			Lbs. per 1000 ft.	Lbs. per mile		
4/0	.0781	2140	767	4050	2400	315
3/0	.0781	2130	629	3320	2500	315
2/0	.0781	2120	502	2650	3200	315
0	.0781	2100	407	2150	4300	315
1	.0781	2101	316	1670	1000	302
2	.0625	2102	260	1370	1300	302
3	.0625	2103	199	1050	1600	302
4	.0625	2104	164	865	2100	302
5	.0625	2105	135	710	2500	322
6	.0625	2106	112	590	3400	322
8	.0469	2108	75	395	5000	322
9	.0469	2109	62	325	6000	322
10	.0469	2110	53	280	35 to 50	Coils
12	.0469	2112	35	185	25 to 40	Coils
14	.0469	2114	25	130	25 to 40	Coils
16	.0469	2116	20	105	20 to 30	Coils
18	.0469	2118	16	85	20 to 30	Coils

RELIANCE WEATHERPROOF CABLE
Stranded copper conductors, double braid, black finish
National Electrical Code Wire

Size	No. and diam. of wires in strand, in.	Diam. bare strand, in.	List number	Weights	
				Lbs. per 1000 ft.	Lbs. per mile
2,000,000	91 x .1482	1.6302	2250	6690	35323
1,750,000	91 x .1386	1.5246	2251	5894	31119
1,500,000	91 x .1284	1.4124	2252	5098	26915
1,250,000	91 x .1172	1.2892	2253	4264	22516
1,000,000	61 x .1280	1.1520	2254	3456	18246
900,000	61 x .1215	1.0935	2257	3137	16513
800,000	61 x .1145	1.0305	2259	2799	14779
750,000	61 x .1109	.9981	2260	2635	13913
700,000	61 x .1071	.9639	2261	2471	13046
600,000	61 x .0992	.8928	2263	2093	11052
500,000	37 x .1162	.8134	2265	1765	9318
450,000	37 x .1103	.7721	2267	1601	8452
400,000	37 x .1040	.7280	2268	1436	7584
350,000	37 x .0973	.6811	2269	1248	6589
300,000	19 x .1257	.6285	2270	1083	5721
250,000	19 x .1147	.5735	2271	907	4788
4/0	19 x .1055	.5275	2240	745	3935
3/0	19 x .0940	.4700	2230	604	3190
2/0	7 x .1378	.4134	2220	482	2544
0	7 x .1228	.3684	2200	388	2051
1	7 x .1093	.3279	2201	303	1599
2	7 x .0973	.2919	2202	246	1301
3	7 x .0867	.2601	2203	190	1004
4	7 x .0772	.2316	2204	155	820
5	7 x .0687	.2061	2205	126	668
6	7 x .0612	.1836	2206	103	544
8	7 x .0485	.1455	2208	68	359



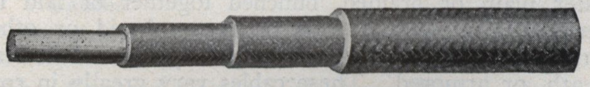
RELIANCE WEATHERPROOF CABLE
Stranded copper conductors, triple braid, black finish
National Electrical Code Wire

Size	Minimum thickness of insulation, in.	List No.	Weights		Standard packages, amounts, ft.	Shipped on reel No.
			Lbs. per 1000 ft.	Lbs. per mile		
2,000,000	.1250	2350	7008	37000	600	324
1,750,000	.1250	2351	6193	32700	700	324
1,500,000	.1250	2352	5380	28400	850	324
1,250,000	.1250	2353	4508	23800	1000	324
1,000,000	.1250	2354	3674	19400	1320	324
900,000	.1094	2357	3332	17600	1320	324
800,000	.1094	2359	2992	15800	1320	324
750,000	.1094	2360	2822	14900	1320	333
700,000	.1094	2361	2650	14000	1320	333
600,000	.1094	2363	2235	11800	1320	333
500,000	.1094	2365	1894	10000	1320	333
450,000	.0938	2367	1724	9100	1320	333
400,000	.0938	2368	1553	8200	1320	333
350,000	.0938	2369	1345	7100	2640	333
300,000	.0938	2370	1174	6200	2640	333
250,000	.0938	2371	985	5200	2640	333
4/0	.0781	2340	800	4220	2000	315
3/0	.0781	2330	653	3450	2000	315
2/0	.0781	2320	522	2760	2640	315
0	.0781	2300	424	2240	2640	315
1	.0781	2301	328	1735	1000	302
2	.0625	2302	270	1425	1300	302
3	.0625	2303	206	1090	1600	302
4	.0625	2304	170	900	2100	302
5	.0625	2305	140	740	3000	322
6	.0625	2306	115	610	3400	322
8	.0469	2308	78	410	4000	322

SOLID COPPER WEATHERPROOF COILS

Size, B. & S. gauge	Weights per coil, lbs.		Outside diameter of coil, in.	Diameter of eye of coil, in.	Thickness of coil, in.	Covering of coil	How shipped
	2 braids	3 braids					
4/0	360	383	30 to 34	19	7½	Paper and burlap	Loose coils
3/0	352	377	30 to 34	19	7½		
2/0	326	350	30 to 34	19	7½		
0	301	325	30 to 34	19	7½		
1	294	316	30 to 34	19	7½		
2	310	338	30 to 34	19	7½		
3	305	330	30 to 34	19	7½		
4	317	344	30 to 34	19	7½		
5	317	350	30 to 34	19	7½		
6	320	180	30 to 34	19	6		
8	171	195	30 to 34	19	6		
10	50	50	18 to 20	12	5	Paper	Coils packed in barrels
12	40	40	18 to 20	12	5		
14	40	40	18 to 20	12	5		
16	30	30	18 to 20	12	5		
18	30	30	18 to 20	12	5		

RELIANCE WEATHERPROOF IRON WIRE, DOUBLE BRAID



RELIANCE WEATHERPROOF IRON WIRE, TRIPLE BRAID

For fire alarm, telephone, telegraph and burglar alarm construction where danger of short circuits with other wires or trees exists

Reliance Slow Burning Wires and Cables—Have insulation that will not carry flame. Especially useful in hot, dry places, and where wires are brought together, as on the back of a large switchboard or in a wire tower. Each insulating braid completely saturated with white, slow burning compound, and outside thoroughly slicked down and given a hard, smooth, white surface.

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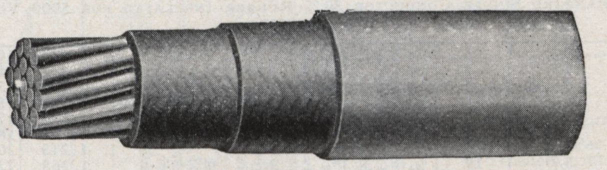
Reliance Slow Burning Wire, National Code Standard
Solid conductor, triple braid, white finish



Reliance Slow Burning Cable
Stranded copper conductor, three white braids

RELIANCE SLOW BURNING WIRE, NATIONAL CODE STANDARD
Solid conductor, triple braid, white finish

*Size B. & S. guage.	Stranded			Solid			Standard packages, amounts, ft.	Shipped on reel number
	List No.	Weight, lb.		List No.	Weight, lb.			
		Per 1000 ft.	Per mile		Per 1000 ft.	Per mile		
2,000,000	2400A	7540	39800	......	......	......	600	...
1,750,000	2401A	6700	35400	......	......	......	700	...
1,500,000	2402A	5830	30800	......	......	......	850	...
1,250,000	2403A	4940	26100	......	......	......	1000	...
1,000,000	2404A	3980	21000	......	......	......	1320	324
900,000	2406A	3640	19200	......	......	......	1320	324
800,000	2408A	3280	17300	......	......	......	1320	324
700,000	2410A	2920	15400	......	......	......	1320	333
600,000	2412A	2460	13000	......	......	......	1320	333
500,000	2414A	2080	11000	......	......	......	1320	333
450,000	2415A	1900	10000	......	......	......	1320	333
400,000	2416A	1700	9000	......	......	......	1320	333
350,000	2417A	1500	7900	......	......	......	2640	333
300,000	2418A	1310	6900	......	......	......	2640	333
250,000	2419A	1120	5900	......	......	......	2640	333
0000	2640	960	5070	2440	925	4890	2000	315
000	2630	785	4150	2430	760	4020	2000	315
00	2620	625	3300	2420	600	3170	2640	315
0	2600	510	2700	2400	495	2610	2640	315
1	2601	380	2000	2401	365	1930	1000	302
2	2602	335	1770	2402	320	1690	1300	302
3	2603	280	1480	2403	270	1425	1600	302
4	2604	230	1220	2404	220	1160	2100	302
5	2605	195	1030	2405	190	1000	2500	322
6	2606	165	870	2406	160	845	3400	322
8	2608	105	555	2408	100	530	40–60 lb.	Coils
10	......	......	......	2410	80	420	35–50 lb.	Coils
12	......	......	......	2412	55	290	25–50 lb.	Coils
14	......	......	......	2414	40	210	25–40 lb.	Coils
16	......	......	......	2416	30	160	25–40 lb.	Coils
18	......	......	......	2418	24	130	20–30 lb.	Coils

*Size and number of wires in strands same as in weatherproof cables.

Special Weatherproof and Slow Burning Wires—A combined insulation of black weatherproof and white slow burning coverings is often required. The wires may have a single coating of each kind or three coatings, two of slow burning and one of weatherproof, or conversely. When weatherproof covering is inside, the conductor is known as "white finish weatherproof," and when flameproof covering is inside, it is called "black finish slow burning." Outside surfaces are finished smooth and hard. The white finish weatherproof wire only is approved by the National Electrical Code.

Park and Suburban Cables

These cables have been designed for use without conduit or other protection, and offer all the advantages of a cable in conduit at but a small part of the cost of such a system.

They are usually laid in the ground in a shallow trench from 12 to 24 in. below the surface, the depth depending upon the location, no other protection being necessary, due to their construction. An example is explained on following page.

These cables are made with any number of conductors, or any size, either solid or stranded, and for any voltage, and may be insulated with rubber, with paper, or with cambric, as desired. The method of construction is practically the same in every case.

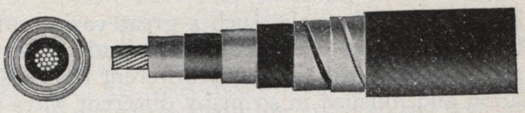
Construction—Standard construction is illustrated. The wires making up the copper conductor are tinned to prevent corrosion of copper by sulphur in rubber insulation, and then the conductor is given an insulation of rubber of required thickness and quality. Then a rubber filled tape is applied.

In the case of Three-conductor and Two-conductor or Duplex (round), each conductor is insulated with rubber, taped, and the conductors are then twisted together with jute fillers. Tape is then wrapped around the group. In the case of the Twin (flat) there are no jute fillers or tape over all. Twin cable is furnished when two conductors are required, unless Two-conductor round cable is specified.

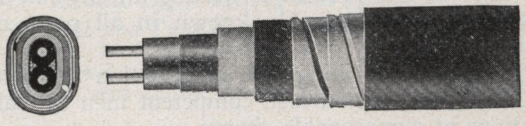
A lead sheath is placed over the tape to exclude moisture. An asphalt saturated jute covering is applied over the lead sheath, acting as a cushion between the armor and lead, thus protecting the lead from mechanical injury by the steel tapes and preventing an accumulation of moisture between the lead and armor.

A steel tape armor consisting of two flat steel tapes is then applied. The tapes are wound in the same direction, the outer tape overlapping the line of separation between the spirals of the inner tape, thus giving flexibility, while preventing any opening in the armor when the cable is bent, which might possibly allow an injury to the lead sheath and insulation below. These cables are furnished with ungalvanized steel tapes unless otherwise specified. Electro-galvanized tapes can be furnished, if desired.

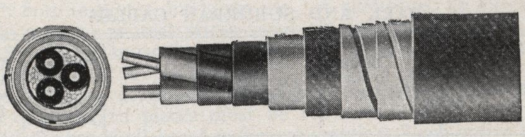
An asphalt saturated jute covering is placed outside of the steel tape armor to protect it from corrosive action of moisture or any chemicals which may be in the soil, and from electrolysis.



Single Conductor



Twin Conductor



Three Conductors

Flat Steel Taped Park or Suburban Cables
Rubber, cambric, or paper insulated

Uses—

- Street lighting
- Railroad yard lighting
- In coal mines
- Industrial plants
- Park and ground lighting
- Submarine service under lakes and rivers where tensile strength is not looked for
- Railway signal service
- And many others

Non-magnetic Metal Tape Armored Cables—For several years past there has been a large demand for an armored cable suitable for street lighting and similar uses in which faults could be located without

Continued on next page

removing the cable from the ground. This long felt want is found in our non-magnetic metal tape armored cables (patent applied for).

Heretofore it has been customary to make armored street lighting cables and similar cables with flat steel tapes over the lead sheath. In attempting to localize such a cable with an inductance coil and telephone receiver one can readily see that due to the permeability of the steel tape, the lines of force, due to current flowing in conductors, would be confined to the armor and would not be permitted to stray into surrounding air and pass through the inductance coil.

In our non-magnetic armored cables non-magnetic flat metallic tapes are used for the armor. The permeability of such material being no greater than that of air, the lines of force set up by the testing current are permitted to stray into the surrounding air and pass through the exploring coil, the terminals of the winding of this coil being connected to a telephone receiver.

It will readily be seen that such a cable has many advantages in that its position in the ground can be easily located by the exploring coil without doing any excavating, and in the case of a short circuit in the cable the fault is easily located, and excavation is only necessary at the point of burn-out in order to make repairs. These cables are constructed the same as our steel taped cables.

These cables are not an experiment; they have been installed and tested and found to be what is claimed, i. e., the construction is such as to enable any trouble to be localized, a function not possible with a steel taped cable, and yet the non-magnetic armored cables are fully as strong with regard to mechanical protection.

The cost of these cables is but slightly more than the regular steel taped armored cables.

Inquiries—We make such a great variety of electric light and power cables, they are made in so many different sizes and with so many different thicknesses of insulation and finished in so many different ways that it would be impracticable to attempt to tabulate them all. This class of our product is making an enviable record and is well and favorably known in all parts of the country.

Inquiries containing full information are solicited.

If desired, can furnish competent men to make installations at a reasonable charge.

PARK AND SUBURBAN CABLES

SINGLE CONDUCTOR AMERICORE RUBBER INSULATED FOR 600 VOLTS SERVICE

Size of conductor, B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. outside diam. over jute, in.	Approx. weight per 1000 ft., lb.
8	1	3/64 One covering of .012 in. rubber filled tape	3/64 Covered with one serving of saturated jute .075 in. thick, two coverings of .020 in. metal tapes and one serving of .068 in. thickness saturated jute with compound finish	.705	601
6	1	4/64	4/64	.801	881
4	7	4/64	4/64	.871	1060
2	7	4/64	4/64	.930	1222
1	19	5/64	4/64	1.002	1439
1/0	19	5/64	4/64	1.043	1583
2/0	19	5/64	4/64	1.088	1753
3/0	19	5/64	4/64	1.140	1957
4/0	19	5/64	4/64	1.198	2134

SINGLE CONDUCTOR 30% RUBBER INSULATED FOR 2500 VOLTS SERVICE

Size of conductor, B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. outside diam. over jute, in.	Approx. weight per 1000 ft., lb.
8	1	6/64 One covering of .012 in. rubber filled tape	4/64 Covered with one serving of saturated jute .075 in. thick, two coverings of .020 in. metal tapes and one serving .068 in. thickness of saturated jute and compound finish	.830	896
6	1	6/64	4/64	.864	988
4	7	6/64	4/64	.933	1169
2	7	6/64	4/64	.993	1357
1	19	6/64	4/64	1.033	1482
1/0	19	6/64	4/64	1.078	1629
2/0	19	6/64	4/64	1.120	1802
3/0	19	6/64	4/64	1.172	2008
4/0	19	6/64	4/64	1.229	2254

PARK AND SUBURBAN CABLES—(CONTINUED)

STANDARD SINGLE CONDUCTOR 30% RUBBER INSULATED FOR 5000 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	9/64 One covering of .012 in. rubber filled tape	4/64 Covered with one serving .075 in. thickness of saturated jute, two coverings of .020 in. metal tapes and one serving .068 in. thickness of saturated jute and compound finish	.924		1088
6	1	9/64	4/64	.957		1183
4	7	9/64	4/64	1.027		1373
2	7	9/64	4/64	1.087		1570
1	19	9/64	4/64	1.127		1704
1/0	19	9/64	4/64	1.168		1851
2/0	19	9/64	4/64	1.213		2026
3/0	19	9/64	4/64	1.265		2237
4/0	19	9/64	5/64	1.354		2742

STANDARD FLAT TWIN OR TWO-CONDUCTOR AMERICORE RUBBER INSULATED FOR 600 VOLTS

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	3/64 Each conductor covered with one .012 in. rubber filled tape. Laid parallel	3/64 Covered with one serving of saturated jute, .076 in. thick, two coverings of .020 in. metal tapes, and one serving of .068 in. thickness of saturated jute, with compound finish	.952	.707	833
6	1	4/64	4/64	1.113	.802	1283
4	7	4/64	4/64	1.252	.871	1595
2	7	4/64	4/64	1.373	.932	1929
1	19	5/64	5/64	1.545	1.033	2575
1/0	19	5/64	5/64	1.629	1.075	2821
2/0	19	5/64	5/64	1.719	1.120	3122
3/0	19	5/64	5/64	1.822	1.172	3553
4/0	19	5/64	5/64	1.936	1.229	4029

STANDARD TWIN CONDUCTOR 30% RUBBER INSULATED FOR 2500 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	6/64 Each conductor covered with one .012 in. rubber filled tape. Laid parallel	4/64 Covered with one serving .075 in. thickness of saturated jute, two coverings of .020 in. metal tapes, and one serving .068 in. thickness of saturated jute, compound finish	1.170	.830	1256
6	1	6/64	4/64	1.238	.864	1509
4	7	6/64	4/64	1.378	.934	1835
2	7	6/64	5/64	1.529	1.025	2430
1	19	6/64	5/64	1.607	1.064	2683
1/0	19	6/64	5/64	1.691	1.106	2964
2/0	19	6/64	5/64	1.781	1.151	3298
3/0	19	6/64	5/64	1.885	1.203	3705
4/0	19	6/64	5/64	1.999	1.260	4179

STANDARD TWIN CONDUCTOR 30% RUBBER INSULATED FOR 5000 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	9/64 Each conductor covered with one .012 in. rubber filled tape. Laid parallel	4/64 Covered with one serving .075 in. thickness of saturated jute, two coverings of .020 in. metal tapes, and one serving .068 in. thickness of saturated jute, compound finish	1.356	.923	1678
6	1	9/64	4/64	1.424	.957	1849
4	7	9/64	5/64	1.595	1.058	2456
2	7	9/64	5/64	1.715	1.118	2839
1	19	9/64	5/64	1.793	1.157	2963
1/0	19	9/64	5/64	1.877	1.199	3239
2/0	19	9/64	5/64	1.967	1.244	3726
3/0	19	9/64	5/64	2.071	1.296	4139
4/0	19	9/64	5/64	2.185	1.353	4629

STANDARD THREE-CONDUCTOR AMERICORE RUBBER INSULATED FOR 600 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	3/64 Each conductor covered with one .012 in. rubber filled tape. Three conductors twisted together with saturated jute fillers and one .012 in. thick rubber filled tape over all	4/64 Covered with one serving of saturated jute, .075 in. thick, two coverings of .020 in. metal tapes, and one serving .068 in. thickness of saturated jute, compound finish	1.045		1293
6	1	4/64	4/64	1.184		1754
4	7	4/64	5/64	1.365		2463
2	7	4/64	5/64	1.495		2991
1	19	5/64	6/64	1.681		4011
1/0	19	5/64	6/64	1.769		4465
2/0	19	5/64	6/64	1.865		5004
3/0	19	5/64	6/64	1.982		5398
4/0	19	5/64	7/64	2.133		6684

STANDARD THREE-CONDUCTOR 30% RUBBER INSULATED FOR 2500 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	6/64 Each conductor covered with one .012 in. rubber filled tape. Three conductors twisted together with saturated jute fillers and one .012 in. rubber filled tape over all	5/64 Covered with one serving .075 in. thickness of saturated jute, two coverings of .020 in. metal tapes, and one serving .068 in. thickness of saturated jute, compound finish	1.278		1977
6	1	6/64	6/64	1.381		2583
4	7	6/64	6/64	1.530		3086
2	7	6/64	6/64	1.660		3698
1	19	6/64	6/64	1.747		4101
1/0	19	6/64	6/64	1.836		4527
2/0	19	6/64	6/64	1.933		4966
3/0	19	6/64	7/64	2.076		6102
4/0	19	6/64	7/64	2.121		6872

STANDARD THREE-CONDUCTOR 30% RUBBER INSULATED FOR 5000 VOLTS SERVICE

Size of conductor. B. & S.	Number of wires	Thickness insulation, in.	Thickness lead covering, in.	Approx. o. d. over jute, in. Max.	Approx. o. d. over jute, in. Min.	Approx. weight per 1000 ft., lb.
8	1	9/64 Each conductor covered with one .012 in. rubber filled tape. Three conductors twisted together with saturated jute fillers and one .012 in. rubber filled tape over all	6/64 Covered with one serving .075 in. thickness of saturated jute (and on sizes No. 8 to 2/0 inclusive, two coverings of .020 in. metal tapes; sizes No. 3/0 and 4/0, two coverings of .030 in. metal tapes) and one serving .068 in. thickness saturated jute, compound finish	1.512		2888
6	1	9/64	6/64	1.583		3171
4	7	9/64	6/64	1.734		3750
2	7	9/64	6/64	1.864		4348
1	19	9/64	6/64	1.949		4750
1/0	19	9/64	7/64	2.069		5618
2/0	19	9/64	7/64	2.166		6178
3/0	19	9/64	7/64	2.318		6867
4/0	19	9/64	7/64	.443		7668

STANDARD SHIPPING LENGTHS OF CABLE AND OUTSIDE DIAMETERS

Outside diam . . in.	.75	1.00	1.25	1.50	1.75	2.00	2.25 and over
Length . . . . ft.	2000	1750	1500	1200	1000	800	700

Bare Wires and Cables—Copper, Iron and Steel

Copper wire for all purposes in any required shape or size; for telephone and telegraph, high voltage long distance transmission, and industrial purposes in general.

Continued on next page

Copper cables of all capacities and degrees of flexibility, hard drawn or annealed, bare or insulated.

HARD DRAWN COPPER TELEGRAPH AND TELEPHONE WIRE

Size, B. & S. gauge	Diameter, in.	Weight per mile in lbs.	Size, B. & S. gauge	Diameter, in.	Weight per mile in lbs.
8	.1285	264	12	.0808	104
9	.1144	209	14	.0641	66
10	.1019	166			

PROPERTIES OF HARD DRAWN COPPER WIRE
(Adopted by the A. S. T. M.)

Size, B. & S.	Diameter, in.	Area, cir. mils	Tensile strength, lbs. per sq. in.	Per cent elongation in 10 in.	Size, B. & S.	Diameter, in.	Area, cir. mils	Tensile strength, lbs. per sq. in.	Per cent elongation in 10 in.
0000	0.460	211,600	49,000	3.75	8	0.128	16,380	63,400	1.4
000	0.410	168,100	51,000	3.20	9	0.114	12,996	64,200	1.3
00	0.365	133,200	52,800	2.70	10	0.102	10,404	64,800	1.2
0	0.325	105,600	54,500	2.4	11	0.091	8,281	65,400	1.1
1	0.289	83,520	56,000	2.1	12	0.081	6,561	65,700	1.0
2	0.258	66,560	57,500	2.0	13	0.072	5,184	66,000	0.9
3	0.229	52,440	58,500	1.9	14	0.064	4,096	66,200	0.9
4	0.204	41,620	59,500	1.8	15	0.057	3,249	66,400	0.8
5	0.182	33,120	60,500	1.7	16	0.051	2,601	66,600	0.8
6	0.162	26,240	61,500	1.6	17	0.045	2,025	66,800	0.7
7	0.144	20,740	62,500	1.5	18	0.040	1,600	67,000	0.7

Galvanized iron and steel wire is also made in all shapes and sizes, bare or insulated, and for all purposes; telephone and telegraph wires, armor wires, strand and wire rope of all kinds.

W. & M. Telephone and Telegraph Wire

There are three standards of extra galvanized telephone wire in general commercial use:

"Extra Best Best" (E.B.B.)—Made by improved continuous process and stands highest in conductivity of any telegraph wire with a weight per mile ohm under 5000 lbs. Uniform in quality, pure, tough and pliable. It is largely used by telegraph companies and in railway telegraph service.

"Best Best" (B.B.)—Superior to E.B.B. in mechanical qualities and equal in galvanizing, but of somewhat lower electrical value. Weight per mile ohm, 5600 to 6000 lbs. Used very largely by telephone companies.

"Steel" (or homogeneous metal)—Designed for short-line telephone service, where a measure of conductivity can be exchanged for high tensile strength in a light wire. Weight per mile ohm, 6500 to 7000 lbs.

RESISTANCE AND WEIGHTS OF TELEGRAPH AND TELEPHONE WIRES

Size, B.W.G.	Diam. in.	Weight per 1000 ft., lbs.	Weight per mile, lbs.	Bundles per mile	Approximate breaking strain, (lbs.)			Average resistance per mile at 68° F (International ohms)		
					E. B. B.	B. B.	Steel	E. B. B.	B. B.	Steel
4	.238	153	811	¼	2,028	2,271	2,433	5.98	7.15	8.32
6	.203	112	590	⅓	1,475	1,652	1,770	8.22	9.83	11.44
8	.165	74	390	½	975	1,092	1,170	12.43	14.87	17.31
9	.148	60	314	½	785	897	942	15.44	18.47	21.50
10	.134	49	258	½	645	722	774	18.79	22.48	26.16
11	.120	39	206	½	515	577	618	23.54	28.16	32.77
12	.109	32	170	½	425	476	510	28.52	34.12	39.71
14	.083	19	99	½	247	277	297	48.98	58.59	68.18

The resistance per mile in any case is obtained by dividing the weight per mile ohm by the weight per mile.

Electrical Specifications for Residential Work

(1) **Scope**—These specifications are intended to provide for a complete electric light wiring equipment and power wiring to motors and other apparatus requiring electric current from point where illuminating company's service terminates to each and every light, switch, receptacle outlet, power outlet, etc., shown on the drawings; all call bell and telephone conduits; together with such other labor and material as may be directed hereinafter, or which may be clearly indicated on the drawings as electrical work.

(2) **Code Rules**—All work shall be done in strict accordance with the latest rules and regulations of the National Board of Fire Underwriters, the local ordinances, and the rules of the local lighting and power company. Certificates of inspection shall be obtained by the contractor at his expense from the local department of the National Board of Fire Underwriters or from the city inspector and turned over to the architect before final payment is made.

(3) **Test**—On completion of the work the installation shall be entirely free from ground and short circuits.

(4) A thorough test shall be made with a magneto in the presence of the architect or his representative.

(5) **Symbols**—The various electric symbols on the plans are those adopted and recommended by the National Electric Contractors' Association and the American Institute of Architects, except that instead of the number of sockets being indicated at each outlet the number of watts is indicated.

(6) **Permits**—The contractor for electric work shall obtain and pay for all permits required in connection with his work.

(7) **Current Supply**—Supply for lighting and power shall be taken from the local lighting and power company, and their rules, as well as those of the National Board of Fire Underwriters, shall govern in all installation work and meter connections.

(8) **Service**—The lighting company will bring their current supply to the point indicated on drawings (or, ... name point of entrance). The contractor for electrical work shall provide and install his work from that point.

(9) **Wiring System**—The circuit wiring shall be installed as a (include one of the following systems):

9a. 2-wire 110-volt d-c. system.
9b. 2-wire 110-volt—phase—cycle a-c. system.
9c. 3-wire 110-220-volt d-c. system.
9d. 3-wire 110-220-volt—phase—cycle a-c. system.

(10) Not more than 16 outlets or a maximum of 660 watts shall be placed on any one circuit.

(11) **Distribution**—The mains are to run from the point of entrance to main fuse and switch, thence to the meter and thence to the various panelboards forming the various centers of distribution. Branch mains and circuits to be run from the centers of distribution as needed.

(12) **Service Switch and Cut-out**—Provide and set near point of entrance an approved service switch and cut-out mounted on porcelain base with connections for plug fuses [mounted on slate base with connections for cartridge fuses] [enclosed in an approved iron box].

(13) **Meter Service**—Provide and set complete in position meter service panel, said panel and connections to be in accordance with the requirements of the local lighting company, as well as to the satisfaction of the architect, and shall have all provisions for light and power service.

(14) **Electric Light Wiring and Conduits—**

(15) ***Knob and Tube System***—All wiring shall be installed as a concealed knob and tube system.

(16) All wires shall be rigidly supported on porcelain insulators which separate the wire at least 1 in. from the surface wired over.

(17) Wires passing through floors, studding, etc., shall be protected with porcelain tubes, and where wires pass vertically through bottom plates, bridging, etc., of partitions, an extra tube shall be used to protect wires from plaster droppings.

(18) Wires must be supported at least every 4 ft. and where near gas or water pipes extra supports shall be used.

(19) All porcelain material shall be non-absorptive and broken or damaged pieces must be replaced.

(20) Tubes shall be of sufficient length to bush entire length of hole.

(21) At outlets, wires shall be protected by flexible tubing, the same to be continuous from nearest wire support to inside of outlet box.

(22) Wires installed in masonry work shall be protected by approved rigid iron conduit which shall be continuous from outlet to outlet.

(23) ***BX Cable***—All wiring shall be installed with flexible steel armored cable (BX cable).

(24) All runs must be rigidly secured in place with pipe straps and where same terminate in outlet box or panel box, an approved box connector with lock nut and bushing shall be used if the box is not designed with this feature.

(25) Care should be taken that the rubber insulation is not damaged or rough cutting edges remain when armor is stripped, this operation being performed with an approved armor stripper.

(26) No bends shall be made with an inside radius of less than 4 in., and conductors must be securely fastened out of contact with gas, water or other pipes.

Continued on next page

(27) If necessary, each and every run of conductor must be thoroughly grounded with a mechanically and electrically perfect connection to the water system on the street side of meter. At least one point of the system shall be grounded in this way.

(28) ***Rigid Iron Conduit***—All wiring shall be installed in rigid enameled (galvanized) iron conduit.

(29) All conduit runs, except where buried in cement or concrete, must be rigidly held in place with pipe straps. All bends and offsets shall be avoided where possible and when same are made, an approved hickey, similar to the "Lakin" or a conduit bending machine shall be used. The use of a pipe tee or a vise will not be permitted. All conduit deformed or crushed in any way shall not be installed and must be removed from the building without delay.

(30) All conduit must have an inside diameter of at least ⅝ in. and no bend shall have less than a 3½-in. inside radius.

(31) Conduit shall be cut with a hack saw. The ends must be square after cutting and conduit shall be reamed after threading.

(32) Conduits must be securely fastened to all outlet boxes with lock nuts and bushings of approved make, care being exercised that the full number of threads project through the bushings. Conduits shall be jointed with approved conduit couplings or right and left couplings. No running threads will be permitted.

(33) All joints in conduit must be leaded and made watertight.

(34) No wires shall be installed until all work which might cause damage to the conduits or wires has been completed.

(35) Conduits must be kept away from hot water pipes, steam pipes, and flues at least 6 in.

(36) A ground connection of approved size shall be extended from water service at street side of meter to panel box, and each home run and feeder conduit must be thoroughly and effectively grounded at both points.

(37) Conduits shall be plugged and kept clean and dry during installation.

(38) **Outlet Boxes**—At each light and switch outlet, furnish and install a standard pressed steel outlet, junction or terminal box of form to suit each individual requirement, arranged to set flush with the adjoining finish and have sufficient room left in box for fixture studs. Outlet boxes to be enameled [sherardized] [hot dipped galvanized].

(39) All outlet boxes shall be rigidly secured in place and those intended for fixtures shall be provided with a fixture stud, or, in case of large fixtures, a hanger to furnish support independent of the outlet box.

(40) ***Position of Outlets***—The exact location of all outlets shall be obtained from the architect before same are placed in position, and any moving of outlets necessary to bring same out in proper place in trim, decoration, etc., shall be done by the contractor at the contractor's expense, provided outlets are not located in accordance with these instructions.

(41) **Wires**—The wire shall be solid, tinned annealed copper wire of highest conductivity, insulated with code thickness of high grade vulcanized rubber, protected with closely woven, elastic cotton braids saturated with waterproofing compound.

(42) ***Lighting Wires***—All lighting wires shall be "Americore" brand, made by the American Steel & Wire Company.

(43) ***Underground Cables***—Underground cables, shall be "Americore" rubber insulated, lead sheathed, suburban cable.

(44) ***For Heating and Cooking Devices***—"Americore" electric heater cord, rubber insulated, and covered with asbestos braid and hard glazed cotton braid.

(45) ***For Fans, Lamps, etc.***—Type P.S. incandescent lamp cord.

(46) ***For Motor Equipment***—No. 4814, "Americore" portable cord.

(47) ***Sizes of Wires***—No wire smaller than No. 14 B. & S. gauge shall be used, and for all circuits 100 ft. or longer, No. 12 B. & S. gauge shall be used. All conductors of No. 8 B. & S. gauge or larger shall be stranded.

(48) Wires shall be of sufficient length at outlets to make connection to apparatus without straining connections.

(49) Splices shall be made both mechanically and electrically perfect, and the proper thickness of rubber and friction tape shall then be applied.

(50) **Panelboards**—Panelboards to be of the best quality of black marbleized slate, guaranteed free from all imperfections, and of proper dimensions to accommodate all circuits, as required in strict accordance with the "National Code"; thickness of slate, 1 in. All slate exposed to view shall be carefully finished.

(51) They are to be mounted on the double box system, the outer box being made of steel, the inner box and panelboard to be of marbleized slate. The sides of said inner box being bored, and then bushed, with turned polished hard rubber bushings where conductors enter. Doors of boards shall be lined with ½-in. thick marbleized slate and trim shall be lined with sheet steel. Door and trim shall be of same material and finish as adjoining woodwork, and provided under this specification.

(52) For the door of each panel box provide and set cylinder lock and two flat keys, and hang with butts; all hardware to be of the same type and finish as surrounding hardware.

(53) Panels for lighting circuits to be equipped with 3-wire mains with fuses and switches, and 2-wire branches with knife switches and N. E. cartridge fuses. Extension on lugs must be furnished as required.

(54) Panels for power circuits shall be equipped with 3-wire mains with fuses and switches, and 2-wire branches each controlled by knife blade and N. E. cartridge fuses.

(55) The panelboard shall be of (mention manufacturer). Each panel shall have 2 extra or spare circuits.

(56) On the inside of door to each panelboard, provide printed directions clearly indicating the location of lights controlled by each circuit and protect same by polished plate glass with ground and polished edges. Secure same to door by copper corner pieces. Also install key socket on a gooseneck in side of panel, on side near top, to light each board.

(57) **Local Switches**—Local wall switches shall be made by (mention manufacturer. See Switches, Electric, in index of Sweet's Architectural Catalogue).

(58) All switches shall be of ample capacity to carry their loads.

(59) All switches shall have face plates to match color and finish of hardware.

(60) Where more than one switch occurs in same location, furnish an approved lettered gang plate to cover all fixtures.

(61) Where indicated on the plan, closets shall be equipped with automatic door switches to connect light when door is open.

(62) ***Pilot Lights***—Switches controlling cellar, attic, and porch lights shall have pilot lamp in parallel on load side of switch.

(63) **Base and Wall Receptacles**—Base and wall receptacles shall be made by (mention manufacturer. See Receptacles, Electric, in index of Sweet's Architectural Catalogue).

(64) ***Floor Receptacles***—All floor receptacles shall be made by (mention manufacturer. See Receptacles, Electric, in index of Sweet's Architectural Catalogue).

(65) **Power Circuits**—A set of feeders, with switch and fuse, shall be run from street connection to switchboard for power in the same manner as specified for light.

(66) A set of feeders shall be run from switchboard to each power outlet indicated on the drawings.

(67) At each motor shall be placed a double pole knife switch and proper fuse for control of motor.

(68) **Call Bells**—Provide and install a complete system of call bells with all necessary wiring, buttons, bells, buzzers, and annunciators, as shown on plans and herein described.

(69) ***Wiring***—All wiring shall be installed in metal conduit similar to electric light wires.

(70) (Alternative) All wiring shall be cleated in joists, studs, etc., with insulated staples. Damp places, metal pipes of all description, flues, etc., must be avoided and wire fastenings must be applied in such a way that insulation is not damaged. No splices shall be made where same will not be accessible at any time after completion of building.

(71) ***Wires***—Wires shall not be smaller than No. 18 B. & S. gauge. They shall be "Americore" rubber covered wires as manufactured by the American Steel & Wire Company (or, American Steel & Wire Company's dampproof annunciator wire).

(72) ***Bells, Buzzers, Annunciators, etc.***—Shall be of approved make (mention type and manufacture. See specific headings in index of Sweet's Architectural Catalogue).

(73) ***Batteries***—Furnish and install where directed [three] cells of carbon cylinder battery in a substantial cabinet.

(74) ***Schedule of Bells***—Give schedule of bells (as, front door push to ring bell in hall; dining room push to ring buzzer in pantry; etc.)

Industrial Plant Wiring

Two Requirements—(1) The primary requirement of factory wiring is to serve as the reliable means of furnishing energy to motors, lamps, heating devices,

Continued on next page

etc. (2) It must be safe and free from fire or accident hazards.

Two Principal Wiring Systems Used in Factory Buildings—(1) Open wiring, in which the insulated wires are supported on porcelain knobs or cleats and are not enclosed in any protection except where exposed to probable injury. (2) Conduit wiring in which the wires are run in metal ducts that are either exposed on ceilings, walls or columns, or concealed in walls and floors, or partly exposed and partly concealed. Because of its superior safety, conduit wiring is insisted on for factory buildings in the largest cities, and is coming more and more into use everywhere.

Selection of System—In general, it may be said that the less expensive open wiring system may be used in any factory building where no special effort at fireproofing has been made and in which no hazardous materials or processes are used, and further, where wires may be so arranged that they will not be readily disturbed. If building is of substantially fireproof construction, open wiring is entirely out of place because every feature of the wiring also should be practically fireproof. If so-called mill construction is used, open wiring may be used with slow burning insulation on wires. Conduit wiring may be used in almost any type of building; but is especially desirable in concrete or other fireproof buildings.

Economy Precautions—In concealed conduit systems, circuits should be run as direct and as free of bends as possible. All wires for a circuit should be run in the same conduit, especially if alternating current is used.

Distribution, junction, cut-out and switch boxes or cabinets should be of ample size to accommodate additional feeders and branch circuits that it may be anticipated to add later, even if these are not installed for some time. This may be easily done by having these boxes of ample size, and provided with blank knockouts to permit ready addition of other feeders or branches without interfering with existing service.

In the case of concealed conduit in a concrete building it pays to install ample conduit runs for any possible future demands.

Separate Feeders for Lighting and Power—Separate feeders should always be installed for lighting and power. Starting and stopping of motors causes serious fluctuation of the circuit voltage; large changes of load also produce such fluctuations, which are very noticeable in the light emitted by lamps. The second reason is that motor circuits are more often overloaded or short circuited, and therefore interrupted by blowing of fuses, than lighting circuits.

Illumination Requirements Must Be Determined—In laying out lighting circuits, illumination requirements of different rooms must first be known. These depend on kind of work done, size and light absorbing conditions of room and on nature of the lighting equipment selected. On account of these variables, power consumption for lighting ranges from 0.5 to 2.5 watts per sq. ft. in different departments of different plants.

For any chosen lighting intensity and related conditions it is possible to find corresponding unit watt consumption. Assume it to be 1.2 watts per sq. ft., the floor area in square feet multiplied by 1.2 will then give total wattage to be provided for the room in question. Not more than 660 watts is allowed on any ordinary lighting circuit. From these facts it is possible to lay out the requisite circuits, arrangement of which in a large room should usually permit switching on the lamps in rows parallel to windows, so those furthest from windows may be turned on first.

The table shows capacity of different sizes of wires as lighting feeders. Second column gives capacity of the wire in amperes, third column gives it in watts based on 220 volts between the outer wires. Last six columns give number of 25, 40, 50, 60, 75 and 100-watt lamps, respectively, that can be supplied by the particular size of wire. The neutral wire is not taken into account, serving chiefly as a means for overcoming unbalance. These capacities have nothing to do with the branch circuits, which are normally limited to 660 watts.

CAPACITY OF WIRES FOR LIGHTING FEEDERS

B. & S. wire gauge	Ampere capacity	3-Wire System, 220-110-220						
		Feeder wattage	Lamp wattage					
			25	40	50	60	75	100
1,250,000	750	165000	6600	4125	3300	2750	2200	1650
1,000,000	650	143000	5720	3575	2960	2383	1906	1430
900,000	600	132000	5280	3300	2640	2200	1760	1320
800,000	550	121000	4840	3025	2420	2016	1613	1210
750,000	525	115500	4620	2887	2310	1925	1540	1155
700,000	500	110000	4400	2750	2200	1833	1466	1100
650,000	475	104500	4180	2612	2090	1741	1393	1045
600,000	450	99000	3960	2475	1980	1650	1320	990
550,000	425	93500	3740	2337	1870	1558	1246	935
500,000	400	88000	3520	2200	1760	1466	1173	880
450,000	372	81840	3272	2040	1636	1364	1090	818
400,000	325	71500	2860	1787	1430	1191	953	715
350,000	300	66000	2640	1650	1320	1100	880	660
300,000	275	60500	2420	1512	1210	1008	806	605
250,000	240	52800	2112	1320	1056	880	704	528
4/0	225	49500	1980	1237	990	825	660	495
3/0	175	38500	1540	962	770	641	516	385
2/0	150	35000	1320	825	660	550	440	330
0	125	27500	1100	687	550	458	366	275
1	100	22000	880	550	440	366	293	220
2	90	19800	792	495	396	330	264	198
3	80	17600	704	440	352	293	234	176
4	70	15400	616	385	308	256	205	154
6	50	11000	440	275	220	183	146	110
8	35	7700	308	192	154	128	102	77
10	25	5500	220	137	110	91	73	55
12	20	4400	176	110	88	73	58	44
14	15	3300	132	82	66	55	44	33

Independent System for Emergency Lighting—Since failure of light at a critical time, as at the outbreak of a fire, might easily contribute to serious loss of life in a factory with many employes, because of the great difficulty in finding exits in a dark, smoke filled room, a number of communities require installation of an independent system for emergency lighting. This is an excellent provision in any medium size or large plant. Such a system should have separate circuits and be fed from a source separate from that normally supplying the lighting.

Installation of Open Wiring System—Installation of an open wiring system is relatively simple. The wires must have either a rubber, slow burning, or slow burning weatherproof insulation; rubber covered wires smaller than No. 6 may have a single outer braid but No. 6 or larger must have a double braid.

In very moist rooms rubber insulation is required. In places where there are corrosive vapors, insulation may be either rubber or weatherproof; in the latter case, a coating of shellac or varnish is sometimes applied over the wires after they have been put up.

In all cases wires must be properly supported and spaced. Where exposed to mechanical injury they must be protected by conduit, running boards or guard strips.

Installation of Conduit Wiring System—Rubber covered wiring is used almost exclusively in installations of conduit wiring unless temperature of room is quite high when slow burning insulation is required. In places where there is liability of condensation inside the conduits due to changes of temperature, as in cold storage or refrigerating rooms, conduit must be well drained or open wiring with suitable guard strips where necessary must be used.

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Manufacturers of Electrical Wires and Cables

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Rubber Insulated and Lead Encased Cables.

Lamp, Heater and Pendant Cords.

Special constructions to specifications. This enables us to place before the architectural profession a complete line of electrical conductors for almost every need.

Trade Names

The three trade-marked brands:

Neptune, 30% Para (Hevea)

Triton, Intermediate Grade, 25% Para (Hevea)

Dolphin, National Electrical Code,

are recognized by architects generally as a standard for the comparison of similar guides.

Specifications

The specifications which follow are those which every Atlantic wire and cable must meet with the necessary variations for the grades of insulation. They are submitted here in such form that they may be written into any general specification to cover the rubber insulated wires and cables.

Copper Conductors

The copper wire used must be true to gauge, free from all surface defects and dead soft; the tensile strength to be not greater than, nor the elongation less than, the values stated in the following table:

Size of wire American wire gauge (B & S)	Tensile strength lb. per square inch	Per cent elongation in 10 inches
4/0 to 1/0 inclusive	36,000	35
1 to 9 "	37,000	30
10 to 18 "	38,500	25

Electric Resistivity

The resistivity must not exceed 891.58 lb. per mile ohm. This is based on 98% conductivity and is equivalent to

.15614 ohms per meter gram
1.7564 microhms per centimeter-cube
.69150 microhms per inch cube
10.565 ohms per mile-foot

Tinning

The wire must be covered with a uniform continuous coating of pure tin to properly protect and preserve the copper conductors

Stranding

Unless otherwise specified, sizes No. 6 and larger are to be stranded. The individual wires entering into the construction of stranded cables shall meet all the requirements and specifications for soft drawn copper wire. The number and diameters of wires in stranded cables and the cross-sectional areas shall be as specified in the tables.

Application of Insulation

The rubber insulation must be homogeneous, free from weak spots, and concentric with the wire.

The braids must be of high grade long staple cotton. Tape may be furnished in place of an inner braid and must be of high quality and helically applied with sufficient overlap to insure proper adhesion and smoothness of surface. In the final operation of saturating and polishing, the wire is to be treated with a wax mixture which acts as a preservative and makes the completed wire impervious to moisture. The polishing wax is to be non-sticking and give the wire a smooth, slippery surface.

Neptune Grade—30% Hevea Rubber

A sample of vulcanized compound, 4 in. in length, shall be cut from the wire and marks placed on it 2 in. apart; stretched until the marks are 6 in. apart and immediately released; 1 minute after such release the marks shall be not more than 2¼ in. apart; then stretched until the marks are 12 in. apart before breaking.

Tensile strength, 1200 lb. per sq. in.

Insulation resistance at 60° F., 2000 megohms per mile for No. 14 B & S; other sizes in proportion.

Triton Grade—25% Hevea (Intermediate)

A sample of vulcanized compound, 4 in. in length shall be cut from the wire and marks placed on it 2 in. apart; stretched until the marks are 6 in. apart and then immediately released; 1 minute after such release the marks shall be not more than 2¼ in. apart; then stretched until the marks are 10 in. apart before breaking.

Tensile strength 900 lb. per sq. in.

Insulation resistance at 60° F., 1500 megohms per mile for No. 14 B & S, other sizes in proportion.

Dolphin National Electrical Code Grade

Dolphin, a dependable high grade code wire passing all the latest rules of the National Board of Fire Underwriters by a wide margin.

The same care in its manufacture is guaranteed as in our higher grade products.

Continued on next page

STANDARDS FOR ATLANTIC STRANDED, SOLID, SINGLE AND DOUBLE BRAID RUBBER INSULATED WIRE

American wire gauge (B. & S.)	Style of conductor	Diameter over conductor, mils	Number of strands in conductor	Diameter each strand in mils	Thickness of rubber insulation, inch	Diameter over rubber insuation, inches	Outside overall diameter, inches	Current carrying capacity
Single Braid Rubber Covered Wire..								
14	Solid	64.1	....	....	3/64	.158	.190	15
14	Stranded	72.6	7	24.2	3/64	.66	.198	15
12	Solid	80.8	....	....	3/64	.174	.206	20
12	Stranded	91.8	7	30.6	3/64	.185	.217	20
10	Solid	101.9	....	....	3/64	.196	.229	25
10	Stranded	115.5	7	38.5	3/64	.209	.242	25
8	Solid	128.5	....	....	3/64	.222	.256	35
8	Stranded	145.2	7	48.4	3/64	.239	.273	35
Double Braid Rubber Covered Wire								
6	Stranded	183.6	7	61.2	4/64	.308	.382	50
5	Stranded	206.1	7	68.8	4/64	.331	.420	55
4	Stranded	231.6	7	77.2	4/64	.356	.445	70
3	Stranded	260.1	7	86.7	4/64	.385	.475	80
2	Stranded	292.2	7	97.4	4/64	.416	.505	90
1	Stranded	331.5	19	66.3	5/64	.488	.559	100

STANDARDS FOR ATLANTIC RUBBER COVERED, TAPED, AND BRAIDED CABLE

American wire gauge No.	Circular mils	Number of wires	Diameter of wires, mils	Diameter over copper mils	Thickness of rubber insulation, inches	Diameter over rubber insulation, inches	Outside overall diameter, inches	Current carrying capacity
1	83,695	19	66.3	331.5	5/64	.4878	.5778	100
0	105,593	19	74.6	373.0	5/64	.5293	.6193	125
00	133,079	19	83.7	418.5	5/64	.5748	.6648	150
000	167,805	19	94.2	471.0	5/64	.6273	.7173	175
0000	211,600	19	105.5	527.5	5/64	.6838	.7738	225
	250,000	37	82.3	576.1	6/64	.7636	.8536	250
	300,000	37	90.0	630.0	6/64	.8175	.9075	275
	350,000	37	97.2	680.4	6/64	.8679	.9579	300
	400,000	37	104.0	728.0	6/64	.9155	1.0055	325
	450,000	37	110.3	772.1	6/64	.9596	1.0496	360
	500,000	37	116.2	813.4	6/64	1.0009	1.0909	400
	550,000	61	95.0	855.0	7/64	1.0738	1.1638	425
	600,000	61	99.3	893.7	7/64	1.1125	1.2025	450
	650,000	61	103.2	928.8	7/64	1.1476	1.2376	475
	700,000	61	107.0	963.0	7/64	1.1818	1.2718	500
	750,000	61	111.0	999.0	7/64	1.2178	1.3078	525
	800,000	61	114.0	1026.0	7/64	1.2448	1.3348	550
	850,000	61	118.0	1062.0	7/64	1.2808	1.3708	575
	900,000	61	121.4	1092.6	7/64	1.3114	1.4014	600
	950,000	61	125.0	1125.0	7/64	1.3438	1.4338	625
	1,000,000	61	128.0	1152.0	7/64	1.3708	1.4608	650
	1,250,000	91	117.2	1289.2	8/64	1.5392	1.6392	675
	1,500,000	91	128.4	1412.4	8/64	1.6624	1.7624	850
	1,750,000	127	117.0	1521.0	8/64	1.7710	1.8710	950
	2.000.000	127	125.5	1631.5	8/64	1.8815	1.9815	1050

List of Architects Who Specify or Approve Atlantic Insulated Wires and Cables

Limited space prevents listing of many other notable references

Ahlschlager, Inc., Walter, Chicago, Ill.
Armstrong, J. A., Chicago, Ill.
Ashely, E. E., New York, N. Y.
Bonsack & Pearce, St. Louis, Mo.
Brunner, Arnold W., New York, N. Y.
Carrère & Hastings, New York, N. Y.
Clark, MacMullen & Riley, New York, N. Y.
Clinton, Russell, Wells, Holton & George, New York, N. Y.
Coolridge and Hodgdon, Chicago, Ill.
Cory, Russell G., New York, N. Y.
Crow, Lewis & Wick, New York, N. Y.
Delano & Aldrich, New York, N. Y.
Esenwein & Johnson, Buffalo, N. Y.
French & Hubbard, Boston, Mass.
Gilbert, Cass, New York, N. Y.
Gilbert, C. P. H., New York, N. Y.
Goldschmidt, Otto, New York, N. Y.
Gompert, W. H., Board of Education, New York, N. Y.
Goodhue Associates, New York, N. Y.
Hall, Lawrence, Ripple & Radcliffe, Inc., Chicago, Ill.
Herrbostle, Henry, Harrisburg, Pa.
Hoffman, A. J., State Architect Illinois, Chicago, Ill.
Hyland, Paul V., Chicago, Ill.
Ittner, W. B., Buffalo, N. Y.
Jallade, L. E., New York, N. Y.
Jensen, Mundy & Jensen, Chicago, Ill.
Kahn, Albert, Detroit, Mich.
Kaiser, Muller & Davies, New York, N. Y.
Kimball Co., R. D., New York, N. Y.
Lamb, Thomas W., New York, N. Y.
Lang & Witchell, Dallas, Tex.
Lappley, Clayton G., Harrisburg, Pa.
Link, T. C., St. Louis, Mo.
Lockwood, Greene & Co., Boston, Mass.
Lowell, Guy, New York, N. Y.
McKenzie, Voorhees & Gmelin, New York, N. Y.
McKim, Mead, White & Lucas, New York, N. Y.
Marshall & Fox, Chicago, Ill.
Maynicke & Franke, New York, N. Y.
Meyer, Strong & Jones, New York, N. Y.
Murchison, Kenneth, New York, N. Y.
Pattison Brothers, New York, N. Y.
Place, Clyde, New York, N. Y.
Post & Sons, George B., New York, N. Y.
Rapp, C. W. and George L., Chicago, Ill.
Riley, Robert E., New York, N. Y.
Rissiman & Kirschfeld, New York, N. Y.
Rogers, James G., New York, N. Y.
Rouse & Goldstone, New York, N. Y.
Schmidt, Garden & Martin, Chicago, Ill.
Severance, H. Craig, New York, N. Y.
Shattuck & Hussey, Chicago, Ill.
Shepard & Weiser, St. Louis, Mo.
Starrett & Van Vleck, New York, N. Y.
Taylor, Isaac, St. Louis, Mo.
Tenney & Ohmes, New York, N. Y.
Thomas, J. H., Louisville, Ky.
Timmis & Chapman, New York, N. Y.
Trowbridge & Livingston, New York, N. Y.
Walker & Weeks, Cleveland, Ohio
Warren & Wetmore, New York, N. Y.
Wells, G., Oklahoma City, Okla.
York & Sawyer, New York, N. Y.

Atlantic Insulated Wires and Cables Have Been Approved for Use in the Following Buildings, Which Have Been Constructed in the Recent Past, or Are in the Process of Construction

Alvernia High School, Chicago, Ill.
American News Company Building, New York, N. Y.
Baptist Theological Seminary, Louisville, Ky.
Bronx Municipal Market, New York, N. Y.
Brown Theatre, Louisville, Ky.
Buick Motor Company Plant, Flint, Mich.
Capitol Theatre, New York, N. Y.
Cathedral of St. John the Divine (Parts), New York, N. Y.
Central Exchange Office Building, Chicago, Ill.
Chemical Laboratory, Brown University, Providence, R. I.
Chicago Theatre, Chicago, Ill.
Connecticut General Life Insurance Building, Hartford, Conn.
A. I. du Pont Residence, Roslyn, Long Island, N. Y.
Edgewater Beach Hotel, Chicago, Ill.
Elizabeth General Hospital, Elizabeth, N. J.
Elks National Memorial Building, Chicago, Ill.
Engineering Societies' Building (Addition), New York, N. Y.
A. H. Grebe Company Factory, Jamaica, Long Island, N. Y.
Harkness Memorial Group, Yale University, New Haven, Conn.
Hudson Motor Car Company (Installation), Detroit, Mich.
Illinois Bell Telephone Building, Chicago, Ill.
Illinois State Hospital, Chicago, Ill.
John Harris Senior High School, Harrisburg, Pa.
Kansan Hotel, Topeka, Kan.
Knickerbocker Telephone Building, New York, N. Y.
Lake View Apartments, Chicago, Ill.
Madison-Belmont Building, New York, N. Y.
Municipal Pier, Chicago, Ill.
Oak Park Hospital, Chicago, Ill.
Olympic Hotel, Seattle, Wash.
Public School Group, Board of Education, Chicago, Ill.
Public School Group, Board of Education, New York, N. Y.
St. Bartholomew's Church, New York, N. Y.
Sheridan-Brompton Hotel, Chicago, Ill.
Southmoor Hotel, Chicago, Ill.
South Dakota Cement Plant, Rapid City, S. D.
E. R. Squibb & Sons Factory, Brooklyn, N. Y.
Standard Oil Company Building (Section), New York, N. Y.
Sterling Chemical Laboratory, Yale University, New Haven, Conn.
Swedish Covenant Hospital, Chicago, Ill.
Travelers Insurance Company Building, Hartford, Conn.
United States Veterans Hospital, Great Lakes, Ill.
University of Chicago, Medical College Buildings, Chicago, Ill.
World Theatre, Omaha, Neb.

FRANK ADAM ELECTRIC CO.

GENERAL OFFICE AND FACTORY

3650 Windsor Place
(Mail Address, 3649 Bell Avenue)

ST. LOUIS, MO.

DISTRICT OFFICES

CHICAGO, ILL., Major Equipment Co., 360 North Michigan Avenue
CINCINNATI, OHIO, E. F. Schurig, 213 East Third Street
DALLAS, TEX., R. S. Wakefield, 324 Interurban Building
DENVER, COLO., Alex. Hibbard, Inc., 1940 Blake Street
DETROIT, MICH., H. H. Norton, 627 Wayne Street
INDIANAPOLIS, IND., Scott-Jacqua Co., Inc., 707 Roosevelt Building
KANSAS CITY, MO., Robert Baker, 828 New York Life Building
LOS ANGELES, CAL., H. B. Squires Co., 229 Boyd Street
MINNEAPOLIS, MINN., L. H. Cooper, 442 Builders Exchange
NEW ORLEANS, LA., W. J. Keller, 509 Conti Street
NEW YORK, N. Y., 197 Seventh Avenue
PHILADELPHIA, PA., Herbert Bryan, The Bourse
PITTSBURGH, PA., Coffin-Perry Co., 501 Ferguson Building
SAN FRANCISCO, CAL., H. B. Squires Co., 583 Howard Street
SEATTLE, WASH., H. B. Squires Co., 552 First Avenue, South
WINNIPEG, CANADA, Langley Elec. Mfg. Co., 677-79 Notre Dame Avenue

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Products

Panelboards and Cabinets: Live and Dead Face (Safety Type).

Switchboards for light and power: Major System Remote Control for theaters and auditoriums; Manually Operated Live and Dead Face for industrial and business buildings.

Fan Hanger Outlets.

Adjustable Floor Boxes.

Also Knife Switches; Safety Type Brush Switches.

Foreword

Frank Adam Electric Co. are pioneers in the design and manufacture of panelboards and cabinets and are recognized by the most prominent architects and engineers as leaders in this particular field.

Facilities

Main office and works located in St. Louis (near center of population). District offices in nearly all large cities.

We erected and designed our factory buildings for our own use and equipped them with the latest modern machinery for the exclusive manufacture of the above products.

Experience

We have been manufacturing this class of material for over 30 years, and, having graduated from the School of Electric Contractors, understand the practical side of this business.

Construction

All F-A products are approved by the National Board of Fire Underwriters and bear the Underwriters' Laboratories, Inc., label.

Due to lack of space it is impossible to adequately describe and illustrate more fully the construction of our products, but we will be glad to send one of our descriptive catalogues on request.

Advantages

You are dealing with a reliable firm, having a national reputation for quality and fairness and who have the means and ability to supply your requirements in quick time and in accordance with your specifications.

Service

With our warehouse stocks of standard material in St. Louis, Detroit, Dallas, Cincinnati, New Orleans, New York, Denver, Minneapolis, Los Angeles and San Francisco, and Associated Frank Adam Factories in Canada, we are able to give unexcelled service.

Engineering

Our engineering department is always at your service for engineering, design and construction information pertaining to our product.

Specifications

On the following pages we show a few illustrations with descriptive matter covering some of our material. We also give a few suggestive specifications that are not exclusive and will permit of other manufacturers' material of equal quality (in the opinion of the architect) to be installed. This, we believe, is in keeping with the architect's wishes.

We invite fair competition, and although having a reputation for high prices, we know you will be surprised how small the difference really is between our prices and those quoted by less careful switchboard manufacturers.

Catalogue

Our 1925 No. 35 Catalogue will be gladly sent on request.

Continued on next page

F-A Standardized Panelboards and Cabinets

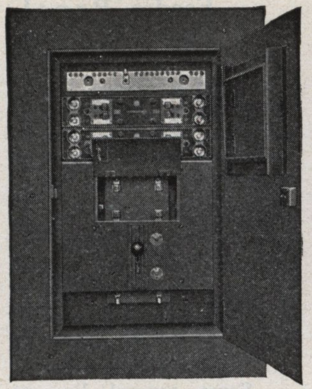
F-A Safety Types TP and NTP Panelboards and Improved Type Cabinets—

Two-fuse Type TP—Branches controlled by 30-amp., double pole, 250-volt, heavy duty type tumbler switches with N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire, with or without switches.

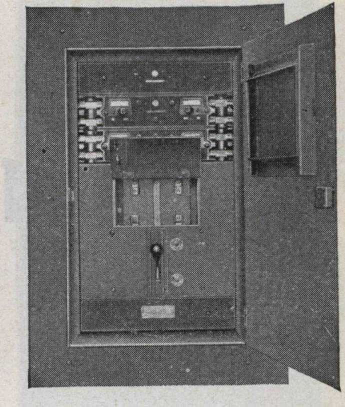
One-fuse Type NTP—Branches controlled by 30-amp., single pole, 250-volt, heavy duty type tumbler switches with N.E.C Edison plug fuse connections. Mains, 2 or 3-wire, with or without switches.

F-A Safety Type TCD Panelboards and Improved Type Cabinets—

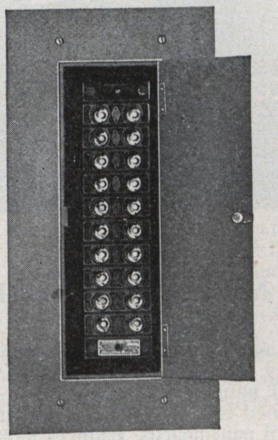
Two-fuse Type TCD—Branches controlled by 30-amp., 250-volt, double pole, heavy duty type tumbler switches with N.E.C cartridge enclosed fuse connections. Mains, 2 or 3-wire, with or without switches.



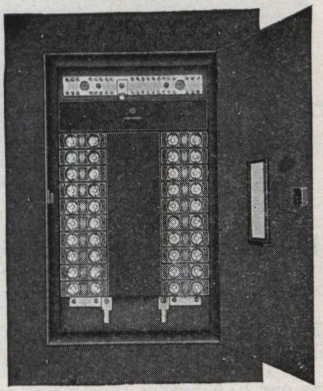
Type NTP Safety Panelboard and Cabinet



Type TCD Safety Panelboard and Cabinet



Type R3G Safety Panelboard and Cabinet



Type N2R3G Safety Panelboard and Cabinet

F-A Safety Types R3G and NR3G Narrow Panelboards with 3-in Gutter Improved Type Cabinets—

Two-fuse Type R3G—Branches have double pole, N.E.C. plug fuse connections. Mains, 2 or 3-wire, with lugs only.

One-fuse Type NR3G—Branches have single pole, N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire, with lugs only.

F-A Safety Tpes 2R3G and N2R3G Panelboards and Improved Type Cabinets—

Two-fuse Type 2R3G—Branches have double pole, N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire, with or without switches.

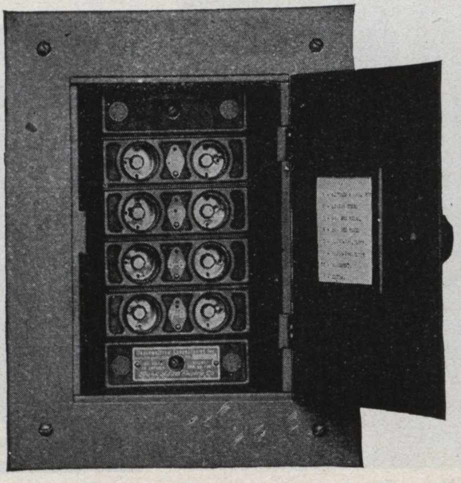
One-fuse Type N2R3G—Branches have single pole, N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire, with or without switches.

Residence Types

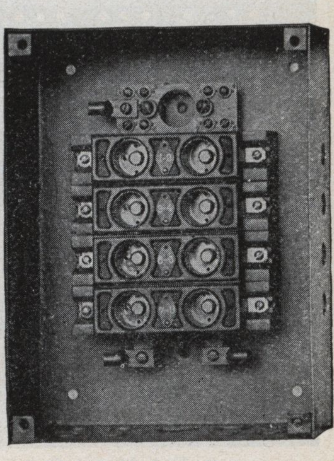
F-A Safety Types R and NR Panelboards and 2-in. Gutter Improved Type Cabinets Up to 12 Circuits—

Two-fuse Type R—Branches have double pole, N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire, with lugs only.

One-fuse Type NR—Branches have single pole, N.E.C. Edison plug fuse connections. Mains, 2 or 3-wire; with lugs only.



Type R Safety Panelboard and Cabinet



Type NR Safety Panelboard

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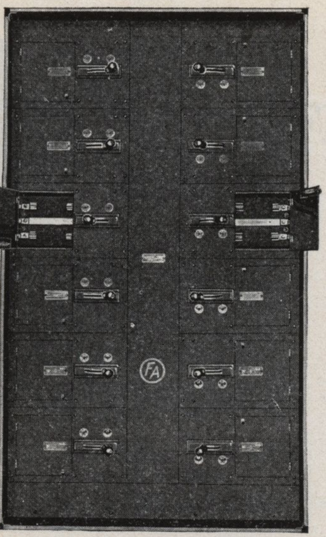


F-A Safety Type Feeder Panelboard

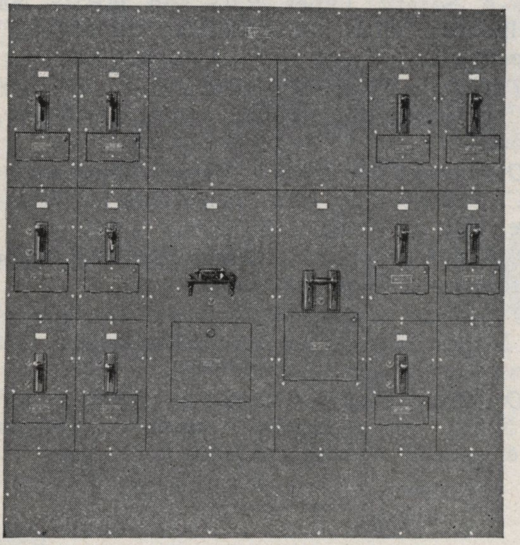
F-A Safety Type Feeder Panelboards and Cabinets

Absolute safety at all times, for it is impossible to open the door to replace blown fuses unless the switch is disconnected.

Constructed of F-A standardized safety switch units, which are easily replaced.

F-A Safety Type Dead Front Switchboards

Same general line of construction as our safety type feeder panelboards. Switch units are mounted on angle iron frame and are removable from face of board.

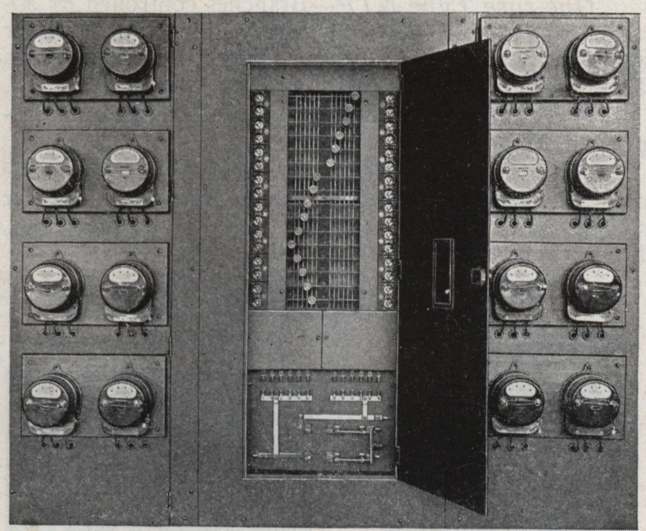


F-A Safety Type Dead Front Switchboard

F-A Meter Control Panelboards and Cabinets

The illustration below shows an ideal installation where the panel is in one cabinet and the meters are mounted on the fronts of two separate cabinets. This will permit mounting the meters away from the panel when wall space is limited.

F-A busbar types of panelboards are recommended where strictly high class jobs are desired, for with the latter types, all changes in meter connections are made with our busbar connecting device.



F-A Meter Control Panelboard and Cabinet

F-A Wire-connecting Type Meter Control Panelboards

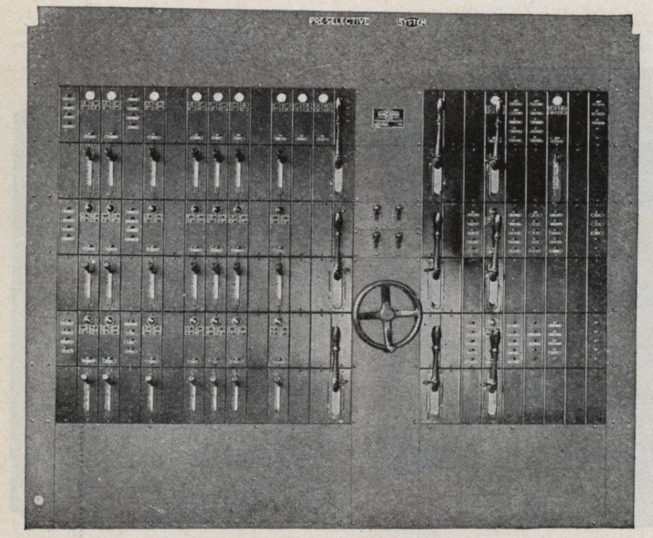
For your less particular clients and where first cost is given preference over quality and simplicity, we have designed our F-A wire-connecting type meter control panelboard.

The latter type, although designed to give the same results as our F-A busbar type meter control panelboards, requires more time to make meter changes and these changes can not be made readily without disconnecting the entire panel, and, in some types, it is also necessary to remove the front so that the meter wire can be brought down from the meter fuses through the gutter to the branch circuit connections.

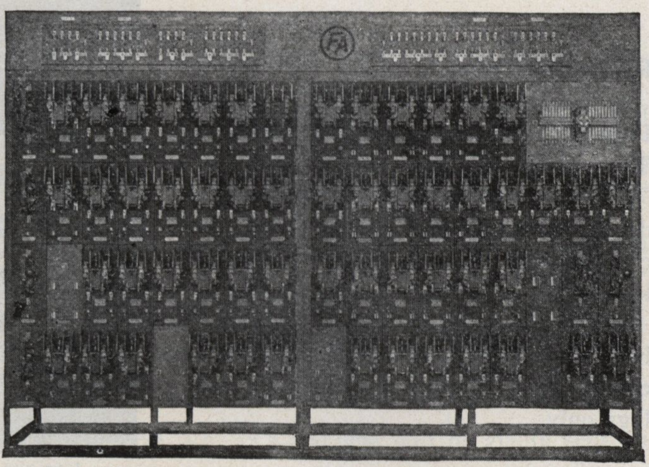
For more complete information on meter control panelboards, write for our 1924-1925 bulletin No. 34 which will be gladly mailed on request.

F-A All-master System Pilot and Remote Control Switchboards

For theaters, auditoriums, fraternal buildings and schools. Sectional unit construction. Contains the most flexible and simplest method of grouping controls. Capable of fulfilling every lighting control needed in the smallest school auditorium, as well as in the largest and most luxuriously equipped theater. Its cost is below that of inferior equipment and its safety factors make it unquestionably the selection of far-seeing architects and engineers. List of buildings and our book "The Control of Lighting in Theaters" gladly sent on request.



F-A Major System Pilot Board



F-A Major System Remote Control Switchboard

Continued on next page

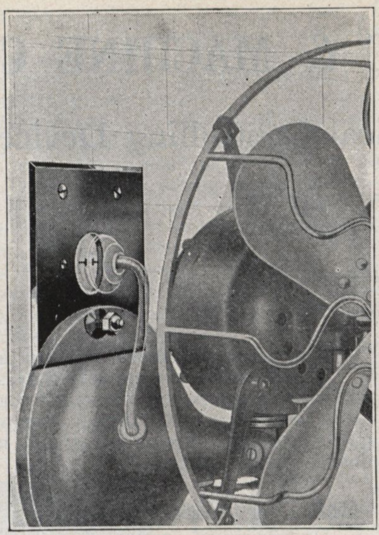
F-A Fan Hanger Outlets (Patented)

F-A hanger outlets were designed and made especially for fan service, but readily lend themselves as a utility outlet for heaters, floodlights and various electrical appliances.

They are adaptable to all classes of modern buildings, where safety as well as efficiency is desired in fan or other hanger outlet service.

They eliminate wall brackets, standards and all temporary installations that are dangerous and unsightly.

They are permanent for they are built in at the same time as the rest of the service equipment.

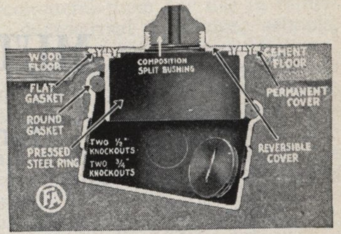


F-A Fan Hanger Outlet

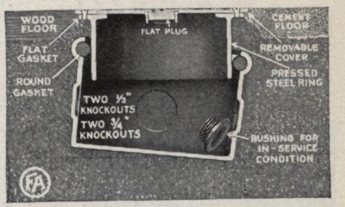
F-A Adjustable Floor Boxes

Type FB-345 Floor Boxes—Adjustable, roomy, substantial and watertight. The floor plate is in two parts—a permanent rim and the reversible cover which leaves the floor undisturbed when changes are made. This permanent rim is always supplied with this type of floor box, a feature not found in other ordinary floor boxes.

Type FB-5 Floor Boxes—Similar to our Type FB-345 except the floor plate is made in one piece, is not reversible and receptacle plugs can not be disconnected without removing the plate. They were designed primarily to meet the demand for a less expensive box, for use with telephone, bell and electric light wires that are permanently connected.



Type FB-345 Floor Box



Type FB-5 Floor Box

Suggested Specifications for a Modern Panelboard Installation

Branch Circuit Lighting Panelboards and Cabinets— Install at each distributing center for lighting branch circuits, as located on plans, a safety type panelboard and cabinet of standard make, and finished in black marine finish, equal in the opinion of the architect, to those manufactured by the Frank Adam Electric Co. as follows:

Main feeder connections to have lugs only for 125-250 volt, 3-wire service with busbar (as per 1923 code) per branch circuit.

Branches are to be controlled by 30-amp., 250-volt, double pole tumbler switches, equipped with N. E. C. plug type fuse connections. Each switch to have a card holder.

Cabinet box to be code gauge steel gutter type with adjustable panelboard supports, that will permit the panelboard to be centered and plumbed and also to be adjusted outwardly at least ¾ in. Box must be painted with two coats of rustproof paint.

The cabinet front must be made of one piece of smooth code gauge sheet steel and to be of the same size as the box for surface installation, and ¾ in. larger all around than the box for flush work.

If the panelboard is protected only over the switches, the front must be made with one main door over the entire panelboard equipped with a lock, and an inside door fitted with latch, over the protected section of the panelboard, to operate the switches. If the panelboard is of the full protected type, the inner door can be omitted.

All doors shall have flush hinges placed not over 2 ft. apart, and fitted with spring catches and Yale locks.

The inside of the fronts must be given two coats of dead black paint, and the outside two coats of lead and oil, dead black finish.

Feeder Distributing Panelboards— All feeder panelboards and cabinets must be of the safety type, equal in the opinion of the architect to those manufactured by the Frank Adam Electric Co.

Each panelboard must be equipped with a safety type main switch, main fuse connections and busbars of the total capacity of the branch feeders, each branch feeder to be controlled by a safety type switch with fuse connections of the capacity of the branch feeders specified.

The main and branch feeder switches must be self-contained, fitted with individual covers, with interlocking mechanism between switch handle and door to the fuse compartment, so that door over fuses can not be opened unless switch is discontinued. Each switch to have card holder.

The cabinet boxes shall be made of code gauge steel having a gutter space for wire all around panelboard, as follows:

Mains of 100 to 200 amp	4-in. gutter
Mains of 200 to 400 amp	6-in. gutter
Mains of 400 to 600 amp	8-in. gutter
Mains of 600 to 800 amp	10-in. gutter
Mains of 800 to 1200 amp	12-in. gutter

The cabinet fronts shall be made of code gauge steel. The doors must have flush hinges riveted to front and fitted with spring catch and lock. All doors over 48 in. long, and all double doors, must be equipped with vault handles and shoot-bolts with lock. Boxes and fronts must be painted with two coats of rustproof paint.

Meter Control Panelboards— Where located on plans, a complete safety busbar type meter control panelboard and cabinet, equal in the opinion of the architect to F-A type MBSFC, manufactured by the Frank Adam Electric Co., St. Louis, Mo., must be installed as described below.

Mains shall be controlled by a knife switch with cartridge enclosed fuse connections.

All branches are to have double pole Edison plug fuse connections and shall each be equipped with a sliding busbar connecting device, so that it is possible to connect any branch circuit or a combination of branch circuits to any one of the meter busbars by simply changing the location of the branch circuit busbar connecting device to the desired meter bars.

Each meter control panelboard, unless otherwise specified, must have at least one-half as many meter bars and meter fuse connections as there are branch circuits.

Cabinet boxes are to be furnished for the meter control panelboards and for meters. All boxes must be of same height and construction.

Door over panelboard shall be fitted with combination lock and catch. Meter cabinets must have hinged steel doors properly bushed and wide enough to accommodate one meter for each meter bar specified, and, in addition, wood meter boards must be furnished and mounted above bushed holes on face of the steel doors, so that meters can be properly installed.

These meter doors must be equipped with a meter sealing device, so that they can not be opened unless seal is broken.

All steel fronts and wood meter boards are to be given at least two coats of paint, finished dead black.

MUTUAL ELECTRIC & MACHINE CO.

Manufacturers of Electrical Controlling Devices

DETROIT, MICH.

Products

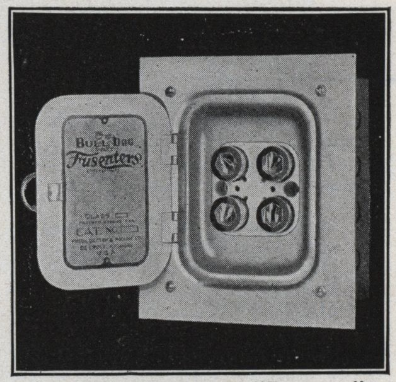
"Bull Dog" Switchboards; Fusenters (Panelboard and Cabinets) and Safety Switches.

Also manufacturers of Knife Switches, Fuse Clips, Cable Terminal Lugs, etc.

Underwriters' Approval

"Bull Dog" Electrical Apparatus is approved and listed by the Underwriters' Laboratories, Inc., under rules and requirements of the National Board of Fire Underwriters.

"Bull Dog" Safety "Fusenters"



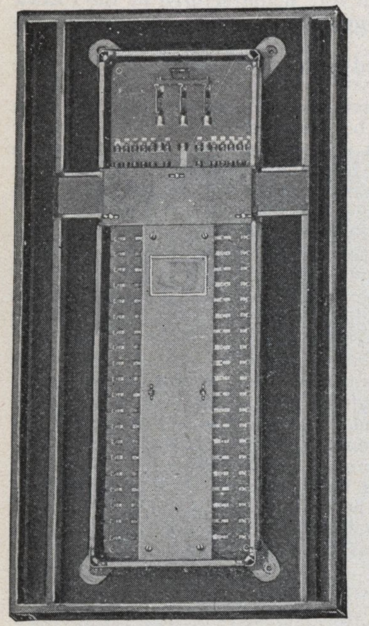
"Bull Dog" Safety "Fusenter"

Fusenters (pronounced fuse centers) a new and significant term to describe electrical controlling and distributing apparatus, heretofore known as Panelboards — which name has been meaningless in that it is not descriptive.

The "Bull Dog" Safety Fusenter line is complete from 4 circuits to 100 circuits and represents the latest development in design and construction.

Numerous joints have been eliminated and the possibilities of failure of the apparatus thereby reduced. With "Bull Dog" Safety Fusenters any one can replace fuses without liability of shock or accident.

Cabinets are of "Luminized" Finish, making them ornamental objects so that they may be installed in kitchens, hallways or any prominent place in homes or other buildings, thus avoiding the necessity of going into dark basements and inaccessible places for fuse replacements. "Bull Dog" Safety Fusenters harmonize with the finest surroundings.


Panel in Box with Front Removed

Specifications—Contractors shall furnish "Bull Dog" Safety Fusenters with "Luminized" finish at various points throughout the buildings, as designated by the architect, for the number of circuits prescribed by the National Electrical Code.

"Bull Dog" Super-sealed Type Metering Panels

These represent the latest development and most advanced ideas in metering systems, are designed to meet the most exacting conditions, and are adaptable for almost any condition where metering panels are required.

The basic principles of design are:

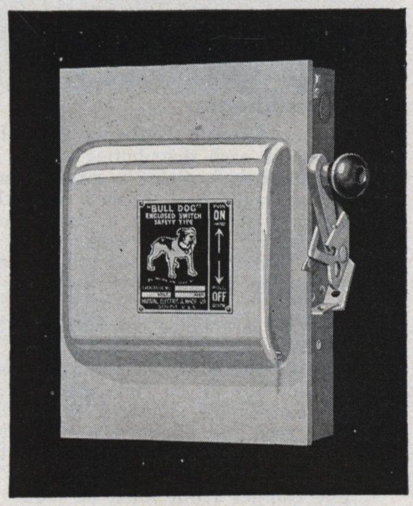
(1) Positive sealing of the compartment enclosing the meter connections, to prevent tampering; (2) additional meters, after the initial installation is completed; (3) separate wiring gutters for the circuit wires and meter wires, with a sealed door over the latter.

"Bull Dog" Safety Switches

Underwriters' approval, Classification "A." Also approval of the Associated Factory Mutual Fire Insurance Companies. Manufactured in all types and ratings from 30 to 200-ampere capacities, 125, 250 and 600 volts.

Luminized Finish—An exclusive "Bull Dog" aluminum deposit process, producing a permanent lustrous, aluminum finish, gives to "Bull Dog" Safety Switches the following definite points of superiority.

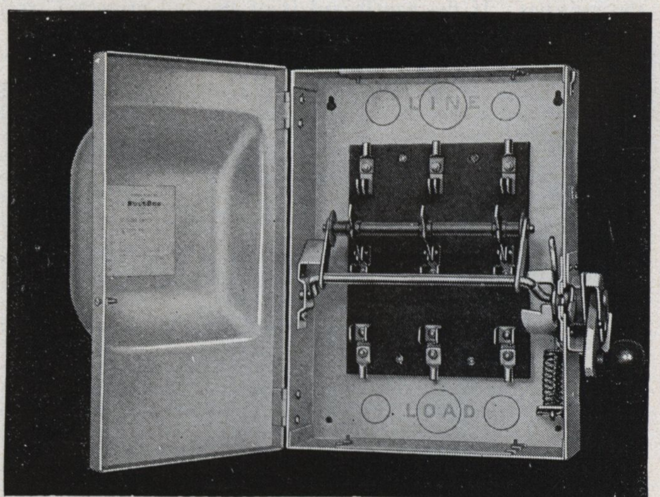
(1) Greater visibility—luminous in the dimmest light. (2) Resists rust, acids and alkalis. (3) Harmonizes with wall coatings; also makes a perfect base for tint paints where other color finishes are desired. (4) Enhances the brightness and cleanliness of surroundings, thus conducing to efficiency in the industrial plant and cheerfulness in the home. (5) Easily grounded. (6) Gives an air of quality and value to the installation.



"Bull Dog" Safety Switch Cabinet, Closed

Design and Construction—The switch in the cabinet is "Bull Dog" Type "A."

The parts are made of heavy copper bars—milled, pinned and soldered together.



"Bull Dog" Safety Switch Cabinet, Open

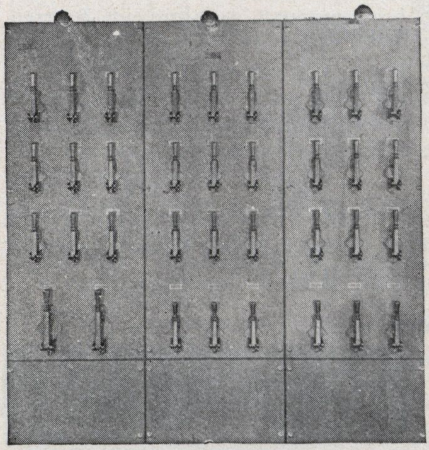
Continued on next page

Full safety mechanism makes it impossible to open door of cabinet without first throwing "off" the switch, and door must first be closed before switch can be thrown "on." This mechanism can be momentarily neutralized by qualified persons to permit inspection of the switch in any position.

Quick-make and Quick-break—A feature of this line. This effect is produced by a rugged spring, but the operation of the switch is not dependent upon this spring, for the switch could be thrown "on" or "off" even if spring broke or were removed. Quick-make is just as important as, if not more than, quick-break, because the intentional pressure required to operate it prevents accidental closing of the switch.

Blade Construction—Blade construction precludes any possibility of one blade staying in contact when handle is pulled to "off" position. This is due to the fact that the blades and cross bar are practically a unit.

Endorsements—"Bull Dog" Safety Switches are standard equipment of many of the largest industrial plants, including steel mills and automobile factories and are used whenever severe conditions are to be met.



Front of Model DF-5

Specifications—All safety switches shall be "Bull Dog" Quick-make and Quick-break and bear Underwriters' Classification "A" for fire and safety.

"Bull Dog" Super-safety Dead Front Switchboards Model DF-5

These switchboards are designed to supersede the live face type of switchboards. Their simplicity of design and ruggedness of construction, as well as the safety features, recommend them for use in industrial plants, central stations, commercial buildings, schools, etc.

Standard Specification Data—"Bull Dog" Super-safety Dead Front Switchboards Model DF-5, consist of panels 1½ in. thick, clear black electrical slate, oil finish, complete with subbases of the same material.

Controlling levers only are mounted on the face of the panel, with all switches, operating mechanism, fuse holders and busbars, mounted at the rear.

The following features are incorporated in these boards:

(1) No copper in the switches is less than 100-ampere capacity for mechanical strength, with fuse gaps provided for the size of fuse desired.

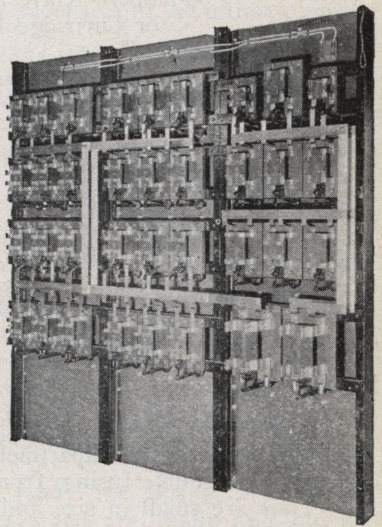
(2) Switches are of the double break type so that all parts, except those directly connected to the busbars are "dead" when the switch is open.

(3) Fuses are "dead" when switches are open and readily accessible for renewal or replacements.

(4) Switches are of standardized unit construction, so they may be readily replaced at any time without the necessity of having switches made to order.

(5) Switchboards are so designed that it is possible to remove individual switch units and replace same with larger units and reinforce the busbars to take care of these additions.

Engineering Co-operation—Our Engineering Department will gladly assist in layouts. Bulletin describing this switchboard will be sent on request.



Rear of Model DF-5

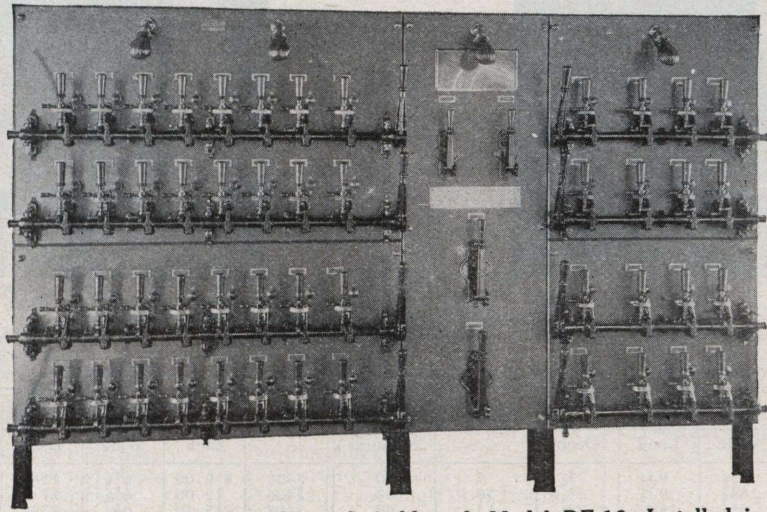
"Bull Dog" Pre-set Super-safety Stage Switchboards, Model DF-10

They represent the highest development in theater and auditorium lighting control, are designed to anticipate and meet requirements of the largest stages and auditoriums and include all elements necessary to secure these results. For smaller enterprises our Model DF-7 Plain Interlocking Board will answer the purpose economically and efficiently.

Standard Specification Data—The general principles of design and construction are similar to those of our Model DF-5 Industrial Type Dead Front Switch-board described above, inasmuch as there are no live parts on the front of the board, all these being mounted at the rear. To secure the rapid and varied lighting effects required in theater lighting, the following features are incorporated:

The operating levers on the front of the board are designed to make it possible to *pre-set* the lights for two or three scenes ahead without interfering with the scene in progress. This makes it possible for one man to operate both the switchboard and dimmers and have sufficient time to supervise other electrical apparatus on the stage.

Each switch is regularly provided with a telltale colored bullseye indicating lamp. These, together with the position of the operating levers, designate whether the switch is in the "on" or "off" position. Each position of the switch is further designated by an indicating color name plate and each switch and master lever is provided with a cast, copper finish, card holder.



"Bull-Dog" Super-safety Stage Switchboard, Model DF-10, Installed in the James Theater, Columbus, Ohio

On the Model DF-7 Plain Interlocking Board, the operating handles are colored to conform to the circuits which they control.

We particularly recommend that all dimmers, switches and fuses which may be operated in connection with stage and auditorium lighting should be on the stage where they are readily accessible and where the operator can see the results of the operation and have quick access to all parts. Where any of these parts are removed from the stage, assistant stage electricians are required in order to assist the switchboard operator in case of failure of parts to function.

Upon receipt of information advising the number of stage borders and whether or not proscenium strips are used, number of stage pockets and number of colors used in foots and borders, also the different colors of lights used in the auditorium with the capacity thereof, we will give the approximate space which should be allowed for "Bull Dog" Switchboards on the stage.

Write for bulletin giving illustrations and detailed descriptions.

THE TRUMBULL ELECTRIC MFG. CO.

PLAINVILLE, CONN.

SALES OFFICES

NEW YORK, N. Y., 114 Liberty Street
PHILADELPHIA, PA.

CHICAGO, ILL., 2001 West Pershing Road
BOSTON, MASS.

SAN FRANCISCO, CAL., 595 Mission Street
JACKSONVILLE, FLA.

TRADE-MARK

Products

- PANELBOARDS WITH CABINETS:
  - Sectional; Bases of Moulded Composition;
    - Safety Type (Dead Front):
      - 30-ampere Tumbler Switches, Plug Fuses Only
    - Live Front:
      - 30-ampere Knife Switches, Plug or Cartridge Fuses Only
    - Residence Type:
  - Slate Base, or Bases of Similar Material;
    - Metering Type:
      - Loose Wire
      - Interchangeable Meter Bars
    - Special:
      - Live Front
      - Safety Type (Dead Front)
- SWITCHBOARDS:
  - Distribution, Power and Light:
    - Live Front
    - Safety Type (Dead Front)
- SWITCHBOARDS (continued):
  - Theater:
    - Safety Type (Dead Front):
      - Manual Non-Interlocking
      - Manual Interlocking
      - Electrical, Remote Control
      - "Controlite," a Simplified Dimmer Control Board
- ENCLOSED SWITCHES:
  - Safety Switches
  - Meter Service Switches
  - Entrance Switches
  - Motor Starting Switches
- KNIFE SWITCHES
- WIRING DEVICES

Literature

Write for Catalogue 13, which contains a complete description of Trumbull electrical safety devices; also for a monthly copy of "Trumbull Cheer."

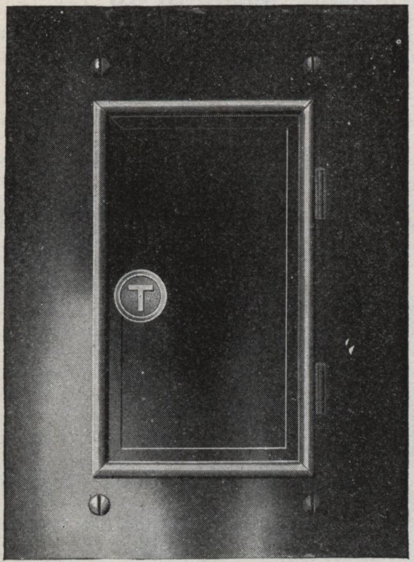
Trumbull "Circle T" Residence Panelboards

"Circle T" residence panelboards are designed for use with residence and apartment house wiring systems for single or double fusing, from 4 to 14 circuits.

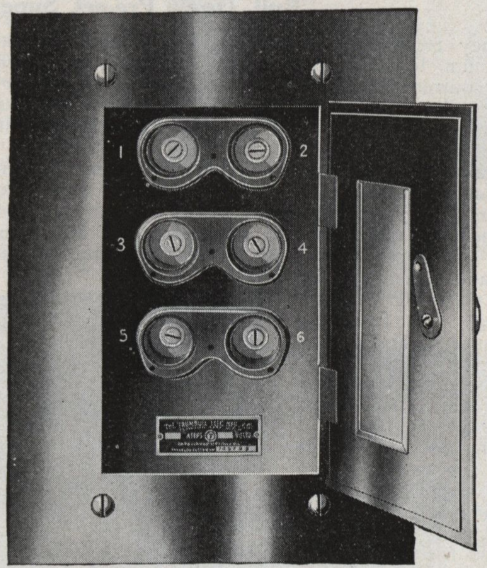
They are small in size and of the safety type for flush mounting, having removable front with baked black enamel finish. Removable shield encloses all live parts leaving only the fuses accessible to the user.

"Circle T" panelboards are of great convenience to the user, who is enabled to renew fuses without visiting the cellar meter board.

Low price, appearance and ease in installation, added to the above features make the "Circle T" panelboards an essential part of every residence and apartment house wiring installation.



Cat. No. 3206. 6 Circuits, Single Fusing



Cat. No. 3206. Door Open

Trumbull "Circle T" Residence Panelboards

Single Fusing 3 or 2-wire Mains—2-wire Branches								Double Fusing 2-wire Mains—2-wire Branches						
Number of circuits	Cat. No.	List price, each	Outside dimensions of box, in.			Shipping wt., lb.	Ampere capacity of mains	Cat. No.	List price, each	Outside dimensions of box, in.			Shipping wt., lb.	Ampere capacity of mains
			Wide	Long	Deep					Wide	Long	Deep		
4	3204-A	$ 7.50	6⅝	9⅞	2¾	9	30	3404	$ 9.00	6⅝	11 15/16	2¾	13	60
6	3206	8.00	6⅝	9⅞	2¾	10	60	3406	12.00	6⅝	17	3⅜	16	100
8	3208	9.00	6⅝	11 15/16	2¾	13	60	3408	15.50	6⅝	23⅝	3⅞	30	100
10	3210	10.50	6⅝	14	3⅜	16	60	3410	21.50	6⅝	27¾	3⅞	37	100
12	3212	12.00	6⅝	17	3⅜	20	60	3412	24.50	6⅝	31⅞	3⅞	44	132
14	3214	14.00	6⅝	20	3⅜	25	100	3414	26.00	6⅝	36	3⅞	50	132

Discounts—Trumbull schedule L-1.

Continued on next page

"Circle T" Unit Panelboards

Simplification and standardization in design and listings make it possible to offer the trade an exceptionally high grade line of standard panelboards with their enclosing steel cabinets.

In the realization of this design we have given serious consideration to the fact that a panelboard with its enclosing steel cabinet installed in a modern building should give continuous service over a considerable period of time; that is, at least twenty to twenty-five years.

Panel boxes are often set flush in concrete, terra cotta or brick walls. The panelboard equipment thus completely installed represents a considerable investment, much of the value being in the cost of installation. When a building is turned over to the owners, the electrical distribution system becomes an integral part of the building structure and is depreciated therefore proportional to the life of that structure.

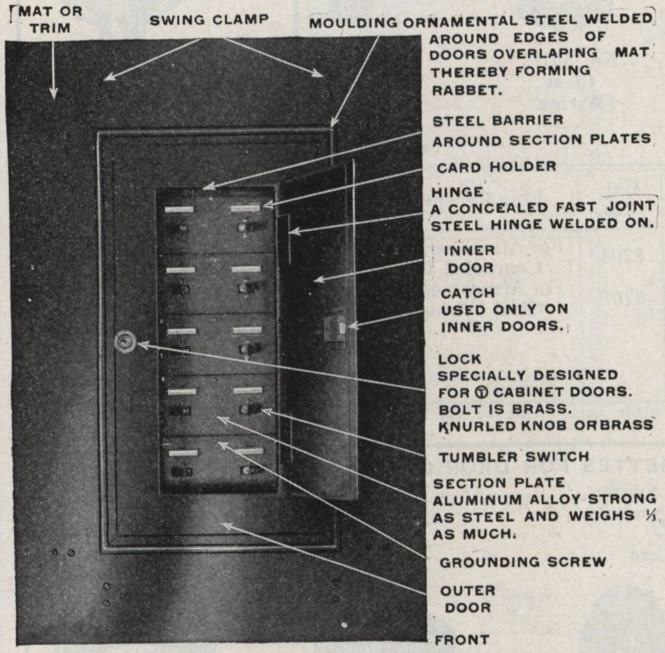
With the many changes in the electrical system and wiring codes along with the advance of the art, flexibility of distribution equipment is increasingly important.

For instance, it may be desirable at some future time to change the panel:

From 2-wire to 3-wire distribution in the panel board mains.

From single phase to 3-phase.

From cartridge fuses to plug fuse receptacles.


MAT OR TRIM
SWING CLAMP
MOULDING ORNAMENTAL STEEL WELDED AROUND EDGES OF DOORS OVERLAPING MAT THEREBY FORMING RABBET.
STEEL BARRIER AROUND SECTION PLATES
CARD HOLDER
HINGE A CONCEALED FAST JOINT STEEL HINGE WELDED ON.
INNER DOOR
CATCH USED ONLY ON INNER DOORS.
LOCK SPECIALLY DESIGNED FOR Ⓣ CABINET DOORS. BOLT IS BRASS. KNURLED KNOB OR BRASS
TUMBLER SWITCH
SECTION PLATE ALUMINUM ALLOY STRONG AS STEEL AND WEIGHS ⅓ AS MUCH.
GROUNDING SCREW
OUTER DOOR
FRONT

CAT. No. TP310LD
PAGE 161
SAFETY TYPE
DOOR WITHIN-A-DOOR
LUGS IN MAINS
30 AMPERE TUMBLER SWITCHES

MATERIAL—CODE GAGE STEEL.

ARRANGED—FOR FLUSH OR SURFACE MOUNTING. SURFACE MATS ¼" LARGER ON ALL SIDES THAN INSIDE DIMENSION OF BOX. FLUSH MATS 1" LARGER ON ALL SIDES.

FINISH—FLUSH—DULL BLACK LACQUER SURFACE—BAKED BLACK ENAMEL.

TYPES—SAFETY PANELS, DOOR WITHIN A DOOR. ALL OTHERS SINGLE DOOR ONLY.

From open knife switches in branch circuits to safety type.

To omit the neutral fuse in the branch circuits.

To increase the carrying capacity of mains.

All of the changes listed above could be made on "Circle T" Unit panelboards without in any way disturbing the panel box.

To install "Circle T" Unit panelboards is to insure the electrical distribution system against undue financial depreciation.

The cost of an electrical distribution system is interest on first cost, plus maintenance, plus depreciation. It takes a tremendous saving in first cost to offset increases in maintenance and depreciation. Cheap panelboard equipment is very expensive to the ultimate owner of any building.

The Following Features Are of Particular Importance

Tumbler Switch for Branch Circuits—A superior snap switch for tumbler operation is designed and manufactured by us especially for panelboard use.

The switch has a 30-ampere rating and will operate and stand up under this load continuously.

Push or rotary snap switches are not recommended or listed.

Ease of Installation—With "Circle T" Unit panelboards, any size panel can be set in the box by one man. No tools are necessary, not even a screwdriver.

The supporting channels hang on four studs extending from the back of the box. It is simply necessary to hang the panels in place and screw down the four wing nuts.

The panel is then ready for wiring, after which the barriers and corner irons are easily and quickly installed.

Removal from the Front—

(a) Every circuit part, including circuit switches, switch plates and fuse holders can be removed from the panel without taking off the steel front or barriers.

(b) Any section or switch base can be removed from the panel without disturbing adjacent sections.

(c) A section having circuits of one type may be changed to any other standard type without removing the section.

Standardization and Simplification

Size—All standard panels in any regular combination of "Circle T" circuits and mains which fit in boxes not over 61½ in. high, require only 15 different stock sizes, as follows:

Cat. No.	Inside dimensions, inches			Side wiring gutter, in.	Cat. No.	Inside dimensions, inches			Side wiring gutter, in.
	Width	Height	Depth			Width	Height	Depth	
50101	18	17½	5⅜	3	50109	18	41½	5⅜	3
50102	18	20½	5⅜	3	50110	18	44½	5⅜	3
50103	18	23½	5⅜	3	50111	20	49½	5⅜	4
50104	18	26½	5⅜	3	50112	20	52½	5⅜	4
50105	18	29½	5⅜	3	50113	20	55½	5⅜	4
50106	18	32½	5⅜	3	50114	20	58½	5⅜	4
50107	18	35½	5⅜	3	50115	20	61½	5⅜	4
50108	18	38½	5⅜	3					

"CIRCLE T" UNIT PANELBOARDS ARE REGULARLY FURNISHED IN 9 DIFFERENT TYPES

Type	Explanation of Symbols		
TPD	T—30-ampere tumbler switches	P—Plug fuses	D—Safety type, door-within-a-door fronts
TCD	T—30-ampere tumbler switches	C—Cartridge fuses	D—Safety type, door-within-a-door fronts
TP	T—30-ampere tumbler switches	P—Plug fuses	
TC	T—30-ampere tumbler switches	C—Cartridge fuses	
KP	K—30-ampere knife switches	P—Plug fuses single door fronts	
KC	K—30-ampere knife switches	C—Cartridge fuses	
PD	P—Plug fuses only	D—Protecting plate over live parts, single door fronts	
P	P—Plug fuses only		
C	C—Cartridge fuses only		

THE ARROW ELECTRIC COMPANY

Manufacturers of Electrical Wiring Devices

PRINCIPAL OFFICE AND FACTORY
HARTFORD, CONN.

BRANCH OFFICES

NEW YORK, N. Y., 350 Madison Avenue
SYRACUSE, N. Y., Seitz Building
PITTSBURGH, PA., Chamber of Commerce Building
ST. LOUIS, MO., Syndicate Trust Building
DETROIT, MICH., Guaranty Trust Building
CINCINNATI, OHIO, First National Bank Building
BOSTON, MASS., 10 High Street
BALTIMORE, MD., Continental Building

WESTERN OFFICE AND WAREHOUSE: CHICAGO, ILL., 560 West Monroe Street
PACIFIC COAST OFFICE AND WAREHOUSE: SAN FRANCISCO, CAL., 617 Howard Street

Products

SWITCHES: Surface Snap, Push Button, Rotary, Door, Pendant, Heater, Lock, Wall Pull, Ceiling Pull, Toggle.

RECEPTACLES: Flush, Ceiling, Standard Plug, Outlet Box, Porcelain, Weatherproof, Sign, Bullseye.

SOCKETS: Mogul and Medium Base, Candelabra, Miniature, Brass Shell, Porcelain (with all types of fittings for various uses).

LUMINOUS PENDANTS.

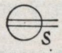
ROSETTES.

Also, Attachment Plugs; Brass Plates for outlet boxes, flush receptacles, flush switches, and special combinations; Current Taps; Fuse Plugs; Plug Cut-outs; Shade Holders; Switch Blocks.

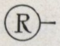
TRADE-MARK

TABLE NO. 1. ARROW PORCELAIN SURFACE PLUG AND LAMP RECEPTACLES

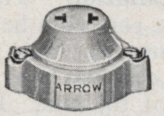
STANDARD SYMBOLS


Surface Convenience Outlet

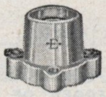
Ceiling Lamp Receptacle


Wall Lamp Receptacle

No. 8204
Concealed Wiring


No. 8205
Cleat Wiring

No. 4000
Concealed Wiring


No. 50715
Cleat Wiring

No. 829
For Outlet Box

No. 860
For Outlet Box

SURFACE PLUG RECEPTACLES

SURFACE LAMP RECEPTACLES

Recommended Uses	Cat. No.	Plug Receptacles	Cat. No.	Lamp Receptacles
These types of devices are used for surface work where finished appearance is unimportant or where the question of expense is involved. Especially useful for garage, cellar, laundry and attic. The choice of proper receptacle depending on style of wiring and type desired.	8204	For Attachment Plug; Concealed Wiring.	4000	Concealed Wiring.
	8205	For Attachment Plug; Cleat Wiring.	50715	Cleat Wiring.
			829	Pull for outlet box.
			860	Keyless for outlet box.

NOTE: The above Plug Receptacles take all parallel and tandem blade caps. One of the parallel slots is elongated to fit polarized parallel caps.

TABLE NO. 2. ARROW ROSETTES FOR DROP CORDS

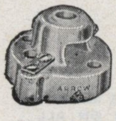
STANDARD SYMBOL

Drop Cord

No. 297
Cleat Base

Cap for 297 and 298

No. 298
Concealed Base


No. 1999
Open or Concealed

No. 301
Keyless

No. 310
Pull

TWO PIECE PORCELAIN ROSETTES

ONE PIECE PORCELAIN ROSETTE

METAL COVERED ROSETTES

Recommended Uses	Cat. No.	Porcelain Rosettes	Cat. No.	Metal Covered Rosettes
Rosettes are used where lights on drop cords are desired. Porcelain Rosettes are useful for attic, cellar or garage where appearance is not important.	297	For Open Cleat Wiring; Two Pieces.	301	Keyless for Outlet Box.
Metal Covered Rosettes are suggested for ceilings, hallways, pantries and bedrooms where drop light and finished appearance is wanted.	298	For Concealed Wiring; Two Pieces.	T 310	Pull Switch for Outlet Box.
	1999	For Cleat or Concealed Wiring; One Piece.		Rosettes fit 3¼-in. and 4-in. Outlet box. Diameter of base, 4$^{11}/_{16}$-in.

NOTE: The Metal Covered Rosettes can be used with chain or silk cord in colors to make attractive fixtures. The brass covers can be finished to match the woodwork or hardware. Brush Brass is the standard finish.

The No. 310 is equipped with a short chain and 6 ft. of cord.

Continued on next page

CEILING OUTLET Table No. 1, 2 & 7.
WALL BRACKET Table No 1 & 6.
SINGLE CONVENIENCE OUTLET Table No 1 & 5.
(E) WALL OUTLET FOR EXTENSION. Table No 1 & 5.
SPECIAL PURPOSE OUTLET Table No. 1 & 5.
SPECIAL PURPOSE OUTLET Table No. 1 & 5
SPECIAL PURPOSE OUTLET Table No 1 & 5.

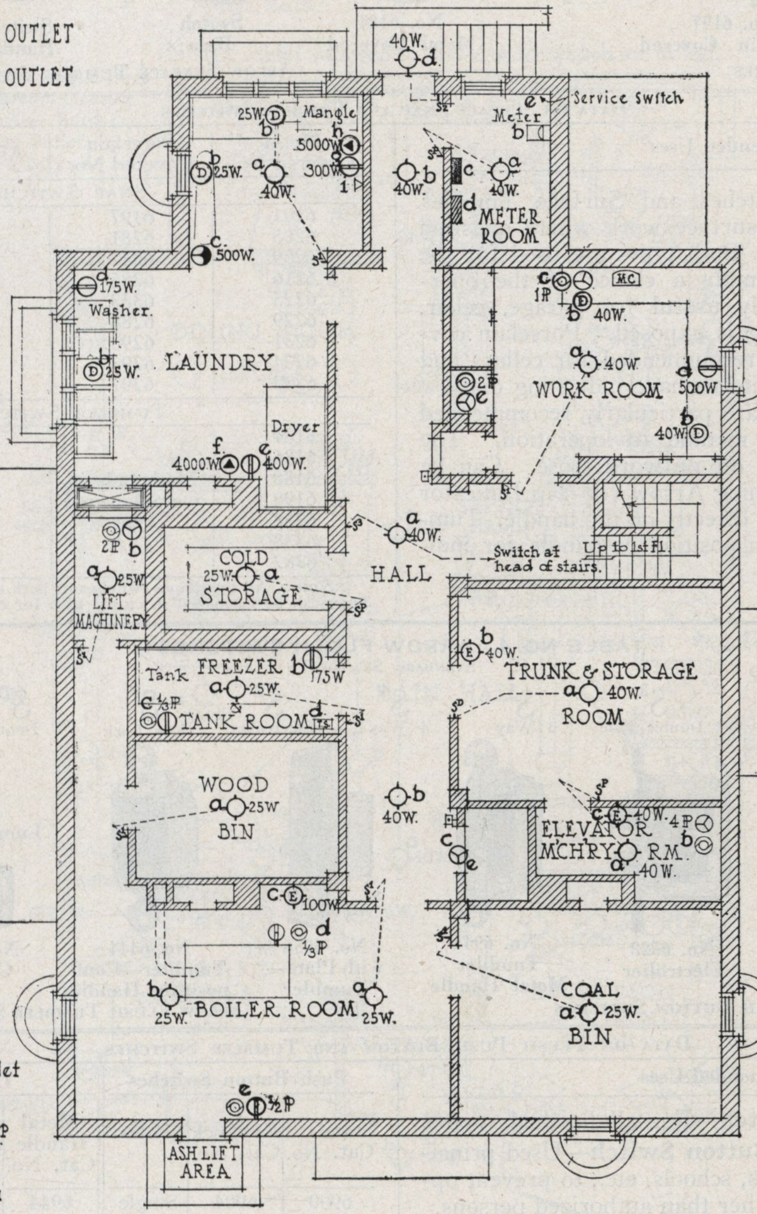
(D) DROP CORD Table No. 2.
S^1 LOCAL SWITCH-SINGLE POLE Table No. 3 & 4.
S^2 LOCAL SWITCH-DOUBLE POLE Table No 3 & 4.

S^3 LOCAL SWITCH-3 WAY Table No. 3 & 4.
S^P PUSH BUTTON SWITCH & PILOT Table No. 5.
TS TANK SWITCH

MOTOR
MC MOTOR CONTROL
METER
LIGHTING PANEL
POWER PANEL
PUSH BOTTON
INTERIOR TELEPHONE

NOTE: Tables referred to above under symbols are in text.

LAUNDRY
a Ceiling Outlet on S^1
b Drop Lights
c Electric Iron
d Electric Washer
e { Electric Clothes Dryer - Fan,
f { Heat elements
g { Mangle Motor Outlet,
h { Mangle Heater Outlet
i Interior Phone.


40W.
d
Service Switch
e
Meter
b
25W.
D
Mangle
b
h
5000W
g
300W
i
D
25W.
a
40W.
b
40W.
c
a
40W.
d
METER ROOM
c
500W.
d
175W.
Washer.
MC
1P
D
40W.
LAUNDRY
b
D
25W.
a
40W.
WORK ROOM
500W
2P
b
40W
D
Dryer
f
e
4000W
400W.
a
40W.
2P
b
COLD
25W.
a
STORAGE
HALL
Switch at head of stairs.
Up to 1st Fl.
a
25W.
LIFT MACHINERY
FREEZER
b
175W
b
E
40W.
TRUNK & STORAGE ROOM
Tank
a
25W.
40W.
c
1/2P
TANK ROOM
TS
WOOD
a
25W
BIN
b
40W.
E
40W.
4P
b
ELEVATOR MCHRY. RM.
a
40W.
c
e
c
E
100W
d
1/3P
b
25W.
BOILER ROOM
a
25W.
COAL
a
25W.
BIN
1/2P
ASH LIFT AREA

METER ROOM
a Ceiling Outlet on S^P
b Meter
c Lighting Panel
d Power Panel
e Service Switch.

WORK ROOM
a Ceiling Outlet on S^1
b Drop Light - Ceiling Outlets
c Motor Outlet (Utility.)
d Polisher, Buffer Soldering Iron or Drill.
e Dumbwaiter Motor.

TRUNK & STORAGE
a Ceiling Outlet on S^P
b Porcelain Wall Receptacle for Extension Light.

HALL
a Ceiling Outlet on S^3
b Ceiling Outlet.
c Operator for Elevator
d Exterior Wall Bracket
e Threshold Light.

ELEVATOR M'CHRY R'M
a Ceiling Outlet on S^P
b Elevator Motor.
c Porcelain Wall Outlet for Extension.

FREEZER & TANK R'M
a Ceiling Outlet on S^1
b Outlet for Freezer.
c Outlet for Tank pump
d Tank Switch.

BOILER R'M.
a Ceiling Outlet on S^1
b Ceiling Outlet.
c Porcelain Wall Receptacle for Extension.
d Oil-feed Motor.
e Motor Outlet for Ash Lift.

LIFT MACHINERY R.M.
a Ceiling Outlet on S^1
b Wood Lift Motor with Special Purpose Outlet

COLD STORAGE
a Ceiling Outlet on S^P

WOOD BIN
a Ceiling Outlet on S^1

COAL BIN
a Ceiling Outlet on S^1

THE
ARROW ELECTRIC
COMPANY

BASEMENT PLAN
THE HOME ELECTRICALLY CONVENIENT
Suggesting Electrical Outlets for Ideal Illuminating and the use of Labor Saving Devices.

NOT DRAWN
TO SCALE
DATE AUG. '23.

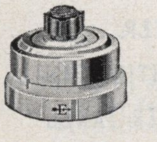
DRWG
1

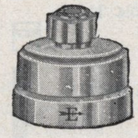
Continued on next page

TABLE NO. 3. ARROW SURFACE SNAP AND TUMBLER SWITCHES

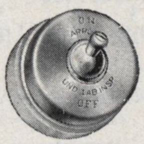
STANDARD SYMBOLS

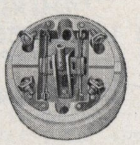
S^1	S^2	S^3	S^4	S^E
Single Pole	Double Pole	3 Way	4 Way	Electrolier


No. 6101
Metal Covered


No. 6197
Porcelain Covered

ARROW SNAP SWITCHES


No. 6184
Metal Covered


Switch
Base

Switch
Handle

Switch
Cover

ARROW SURFACE TUMBLER SWITCHES

DATA ON SURFACE SNAP AND TUMBLER SWITCHES

Recommended Uses

Surface Snap Switches and Surface Tumbler Switches are used for surface work where question of expense is involved. Both types are used for the same purpose; it is simply a choice of the operating means. Especially useful for garage, cellar, attic or wherever wiring is exposed. Porcelain covered snap switches are recommended for cellars and damp places. Snap Switches have indicating dials.

Tumbler Switches are particularly recommended owing to their handy method of operation. The handles can not vibrate off or work loose. Can be made luminous by attaching Arrow Glo-Tip Indicator No. 1870, which threads directly on the handle. Tumbler Switches depend on position of handle for indication.

Metal Covered No.	Porcelain Covered No.	Amperes	Poles
SNAP SWITCHES			
6101	6197	5	Single
6205	6281	10	Single
6209	6641	5	Double
6216	6285	10	Double
6225	6333	5	3-Way
6229	6288	10	3-Way
6231	6290	5	4-Way
6234	6293	10	2-Circuit
6238	6297	10	3-Circuit
TUMBLER SWITCHES			
6184	Made only in metal covered type	5	Single
6186		10	Single
6188		5	Double
6190		10	Double
6258		5	3-Way
6338		10	3-Way
6382		5	4-Way

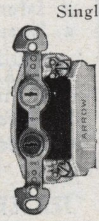
Note: All the above switches of both types are listed in open base. They can be furnished in closed base for concealed wiring.

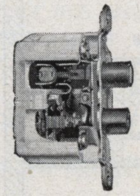
TABLE NO. 4. ARROW FLUSH SWITCHES

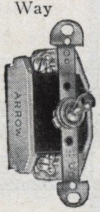
STANDARD SYMBOLS

S^1	S^2	S^3	S^4	S^E	S^K	S^D
Single Pole	Double Pole	3 Way	4 Way	Electrolier	Key Lock	Door

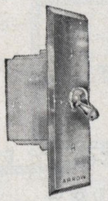
No. 6900
Standard

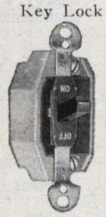

No. 6904
Key Lock

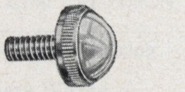

No. 6528
Electrolier


No. 6944
Tumbler
Metal Handle

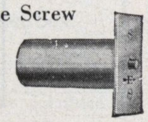
ARROW FLUSH PUSH BUTTON SWITCHES


No. 6056
with Plate—
Tumbler


No. 6444
Tumbler—Composition Handle


No. 1880
Luminous Plate Screw

No. 1870
Glo-Tip


No. 6950
Flush
Door Switch

ARROW FLUSH TUMBLER SWITCHES

DATA ON FLUSH PUSH BUTTON AND TUMBLER SWITCHES

Recommended Uses

Push Button Switch—For all finished rooms.

Key Lock Push Button Switch—Used principally for public buildings, schools, etc., to prevent operation of switches by other than authorized persons.

Tumbler Switches—For all finished rooms. Metal handle type lends itself to decorative finish and is threaded for No. 1870 Glo-Tip. Composition handle type interchangeable with other standard makes.

These Arrow Flush Switches, except the electrolier push button, are the shallow (1 in. deep) type recommended for all installations. Well suited to 2-in. partitions using the shallow 1½-in. box. Can be used with standard 2½-in. boxes. Made in one high grade quality only.

Push Button Switches			Tumbler Switches		
Standard Cat. No.	KeyLock Cat. No.	Poles	Metal Handle Cat. No.	Composition Handle Cat. No.	Poles
6900	6904	Single	6944	6444	Single
6901	6905	Double	6945	6445	Double
6902	6906	3-Way	6946	6446	3-Way
6903	6907	4-Way	6947	6447	4-Way
6530	6533	2-Circuits	*6056		2-Circuits: 1-2-1 & 2-off
6526	6513	3-Circuits	*6057		3-Circuits: 1-1 & 2-1 & 2 & 3, off

**Note:* Electrolier switch operates with a rotary motion but has same appearance as standard tumbler switches and fits same plates.

General Note: Single pole switches are ordinarily used. Where it is desirable to control a light or lights at two points a combination of 3-way switches is used. To control from a third point, 4-way switches are used. Double pole switches are used in the same place as single pole switches where it is desired to break both sides of the line as on a 220-volt circuit. Electrolier switches permit of selective lighting.

(Continued on second page following)

Continued on next page

⊕ CEILING OUTLET. Table No. 6 & 7.
⊣○ WALL BRACKET Table No. 6.
⊖ SINGLE CONVENIENCE OUTLET Table No. 5.
⊖₂ DOUBLE CONVENIENCE OUTLET Table No 5.
◉ FLOOR OUTLET. Table No. 5.

▲ SPECIAL PURPOSE OUTLET. Table No. 5.
S^1 LOCAL SWITCH-SINGLE POLE. Table No. 4.
S^2 LOCAL SWITCH-DOUBLE POLE Table No. 4.
S^3 LOCAL SWITCH-3 WAY. Table No. 4.
$^PS^3$ LOCAL SWITCH-3 WAY, with warning light in series. Table No. 5.

S^4 LOCAL SWITCH-4 WAY. Table No. 4.
S^E ELECTROLIER SWITCH Table No. 4.
S^D AUTOMATIC DOOR SWITCH Table No. 4.
8| WALL FAN OUTLET Table No. 5.

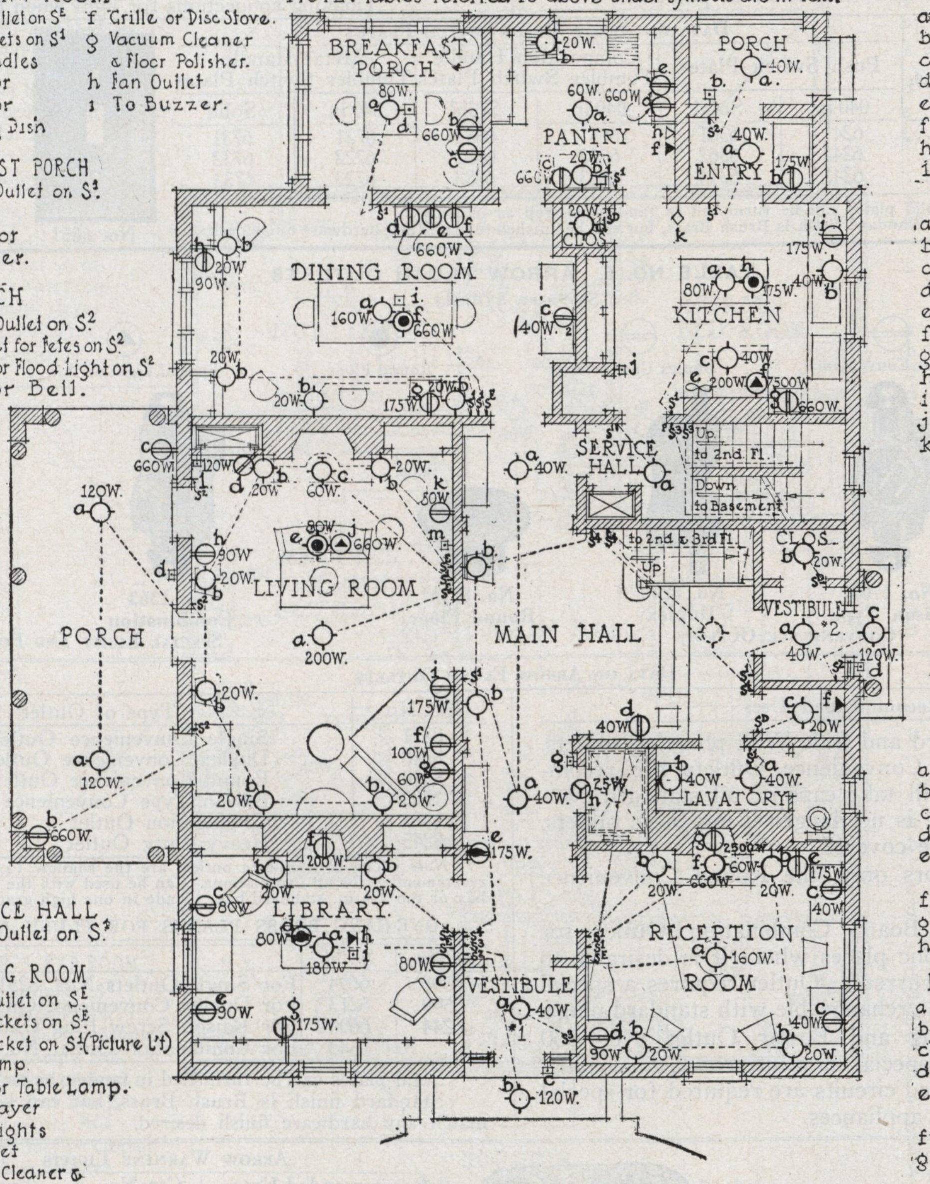
⊡ PUSH BUTTON
▱ BUZZER
◇ ANNUNCIATOR
▷ INTERIOR TELEPHONE
▶ PUPLIC TELEPHONE

NOTE: Tables referred to above under symbols are in text.

DINING ROOM
a Ceiling Outlet on S^E
b Wall Brackets on S^1
c Table Candles
d Percolator
e Toaster or Chafing Dish
f Grille or Disc Stove.
g Vacuum Cleaner & Floor Polisher.
h Fan Outlet
i To Buzzer.

BREAKFAST PORCH
a Ceiling Outlet on S^1.
b Toaster
c Percolator
d To Buzzer.

PORCH
a Ceiling Outlet on S^2
b Box Outlet for Fetes on S^2.
c Outlet for Flood Light on S^2
d To Door Bell.



PANTRY
a Ceiling Outlet on S^1.
b Wall Brackets.
c Plate Warmer.
d Percolator
e Toaster or Waffle Iron.
f Public Telephone
h Interior Telephone
i From Dining Room.

KITCHEN
a Ceiling Outlet on S^1.
b Wall Bracket
c Ceiling Outlet under Hood.
d Closet Ceiling Outlet on S^D
e Outlet for Exhaust
f Electric Range
g Fireless or Pressure Cooker
h Mixer or Beater
i Outlet for Dishwasher
j fot Dumbwaiter
k Annunciator for 1st Floor signals

REAR PORCH
a Ceiling Outlet on S^2.
b To Door Bell

ENTRY
a Ceiling Outlet on S^1
b Electric Refrigerator

LAVATORY
a Ceiling Outlet on S^1
b Wall Bracket

MAIN HALL
a Ceiling Outlets on S^4
b Wall Brackets on S^4
c Ceiling Outlet on S^P
d Table Lamp
e Vacuum Cleaner & Floor Polisher.
f Public Telephone
g Elevator Operator
h Threshold Light

RECEPTION ROOM
a Ceiling Outlet on S^E
b Wall Brackets on S^1
c Table Lamp Outlets
d Outlet for Fan or Lamp.
e Vacuum Cleaner & Floor Polisher.
f Bracket Outlet on S^1 (Picture Light)
g Electric Coal Fire.

SERVICE HALL
a Ceiling Outlet on S^4.

LIVING ROOM
a Ceiling Outlet on S^E.
b Wall Brackets on S^E.
c Wall Bracket on S^1 (Picture L't)
d Floor Lamp.
e Outlet for Table Lamp.
f Piano Player
g Piano Lights
h Fan Outlet
i Vacuum Cleaner & Floor Polisher
j Stereopticon or Cinema Outlet.
k for Electric Wood Lift.
l Electric Phonograph.
m To Annunciator

VESTIBULE NO. 1.
a Ceiling Outlet on S^3
b Exterior Ceiling Outlet on S^2.
c To Door Bell.

VESTIBULE NO. 2.
a Ceiling Outlet on S^1
b Closet Ceiling Outlet on S^D
c Exterior Ceiling Outlet on S^2
d To Door Bell.

LIBRARY
a Ceiling Outlet on S^E
b Wall Brackets on S^1
c Floor Lamp.
d Outlet for Desk Lamp
e Wall Fan
f Electric Coal Fire
g Vacuum Cleaner & Floor Polisher.
h Public Telephone
i To Annunciator.

Note:-
Elexits may be used where ceiling or wall outlets have been indicated. (See Table No. 6.)

THE ARROW ELECTRIC COMPANY

FIRST FLOOR PLAN
THE HOME ELECTRICALLY CONVENIENT
Suggesting Electrical Outlets for Ideal Illuminating and the use of Labor Saving Devices.

NOT DRAWN TO SCALE
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DRWG 2

Continued on next page

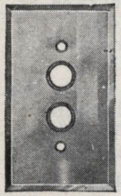
(Continued from second page preceding)

Data on Arrow Luminous Attachments

Recommended Uses	Cat. No.	Description
Glo-Tip: For all Arrow Metal Handle Tumbler Switches and Pull devices.	1870	Made to thread on to the end of handle of all Arrow Tumbler Switches.
Luminous Screws for all Flush Plates.	1880	Takes the place of a holding screw in any Flush Plate.

Data on Arrow Door Switch

Recommended Uses	Cat. No.	Control
Suited for dark closets, linen closets, etc. The switch is automatic and its action is positive.	6950	Plunger is pushed in when door is closed and light is off. Plunger is released and pushed out, making connections for light when door is open.

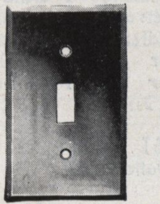


No. 6312

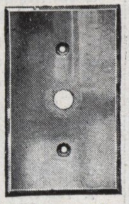
Data on Arrow Brass Switch Plates

No. of Switches	Push Switch Plates		Composition Handle Tumbler Switch Plates		Metal Handle Tumbler Switch Plates	
	.040 in.	Solid	.040 in.	Solid	.040 in.	Solid
One	6241	6361	6851	6881	6721	6731
Two	6242	6362	6852	6882	6722	6732
Three	6243	6314	6853	6883	6723	6733

Note: Solid plates can be furnished in tandem as well as in gangs.
Finishes—Standard finish is Brush Brass, but can be finished to match any hardware finish desired.



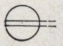
No. 6851



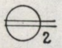
No. 6741

TABLE NO. 5. ARROW FLUSH OUTLETS

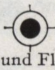
Standard Symbols



Single Convenience



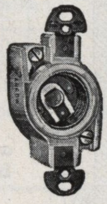
Duplex Convenience



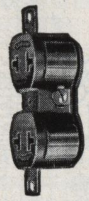
Round Floor

Special Light or Power

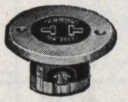
No. 8251
Single



No. 1708
Edison Type

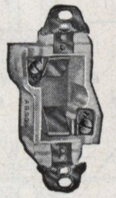


No. 8248
Duplex

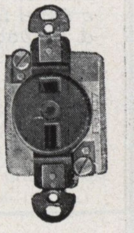


No. 8230
Round Floor

Convenience Outlets



No. 1363
Combination



No. 8245
Heavy Duty

Special Light and Power Outlets

Data on Arrow Flush Outlets

Recommended Uses

For Base Board and Side Wall plugging outlets, Single or Duplex Convenience Outlets are recommended, as they will take caps of all standard two-piece plugs. There is no danger using these outlets, as all live parts are covered.

For wood floors only, the Round Convenience Outlet is used.

Special Base Board Combination Outlet for hotels or other public places where it is desirable to restrict the use of current. Outlet requires a special plug which is not interchangeable with standard plugs.

Special Heating and Power Outlet over 660 watts, requires a special non-interchangeable plug. Used where polarized circuits are required for special heating and power appliances.

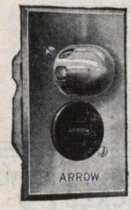
Cat. No.	Type of Outlet
8251	Single Convenience Outlet
8248	Duplex Convenience Outlet
8230	Round Convenience Outlet
1708	Edison Type Convenience Outlet
1363	Combination Outlet
8245	Heavy Duty Outlet

Note: The convenience outlets are the shallow (1 in. deep) type recommended for all installations. Can be used with the 1½-in. shallow box or the 2½-in. standard box. Made in one high grade quality only.

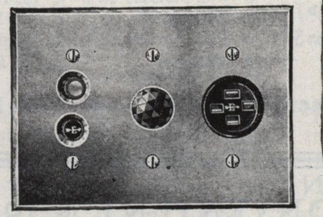
ONE-GANG BRASS PLATES FOR FLUSH OUTFITS

.040 in.	Solid	
6598	6694	For Single Outlets Nos. 8251 and 8245.
6599	8213	For Duplex Convenience Outlet No. 8248.
6244	6690	For Edison Screw Plug Outlet No. 1708.
....	543	For Combination Outlet No. 1363.

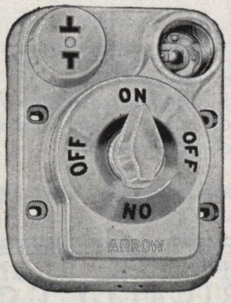
Solid plates can be furnished in tandem as well as in gangs.
Standard finish is Brush Brass, but can be finished to match any hardware finish desired.



No. 8321
Pilot Light
Receptacle



Bull's Eye Receptacle in Series with Push Switch and Single Convenience Outlet



No. 466
Surface Heater Control

Arrow Warning Lights

Recommended Uses	Cat. No.	Description
Warning lights indicate a closed circuit. The most frequent use is in kitchens, bathrooms and hallways.	1711	Bull's eye receptacle
	6786	.040 in. plate for No. 1711
	1712	Solid plate for No. 1711
	466	Surface Heater Control with Medium Lamp Base
	*467	Surface Heater Control with Candelabra Lamp Base
	8321	Flush Pilot Light

*No. 467 is not made by inserting an adapter in the lamp base of No. 466. It is a permanently assembled unit necessitating the use of a candelabra base lamp as pilot light, and prevents overloading by using this as a current outlet.

Continued on next page

CEILING OUTLET Table No. 6&7.
WALL BRACKET Table No 6.
SINGLE CONVENIENCE OUTLET Table No. 5.
DOUBLE CONVENIENCE OUTLET Table No. 5.
SPECIAL PURPOSE OUTLET.

S^1 LOCAL SWITCH - SINGLE POLE Table No. 4.
S^2 LOCAL SWITCH - DOUBLE POLE Table No. 4
S^3 LOCAL SWITCH - 3 WAY Table No 4.

S^4 LOCAL SWITCH - 4 WAY Table No. 4.
S^D AUTOMATIC DOOR SWITCH Table No. 4.
S^E ELECTROLIER SWITCH Table No. 4.

PUSH BUTTON
INTERIOR TELEPHONE
PUBLIC TELEPHONE
ANNUNCIATOR
BELL

B.A.M.S. Burglar Alarm Master Switch giving simultaneous control for selected switch controlled lights. Lights when on are independent of local switches.

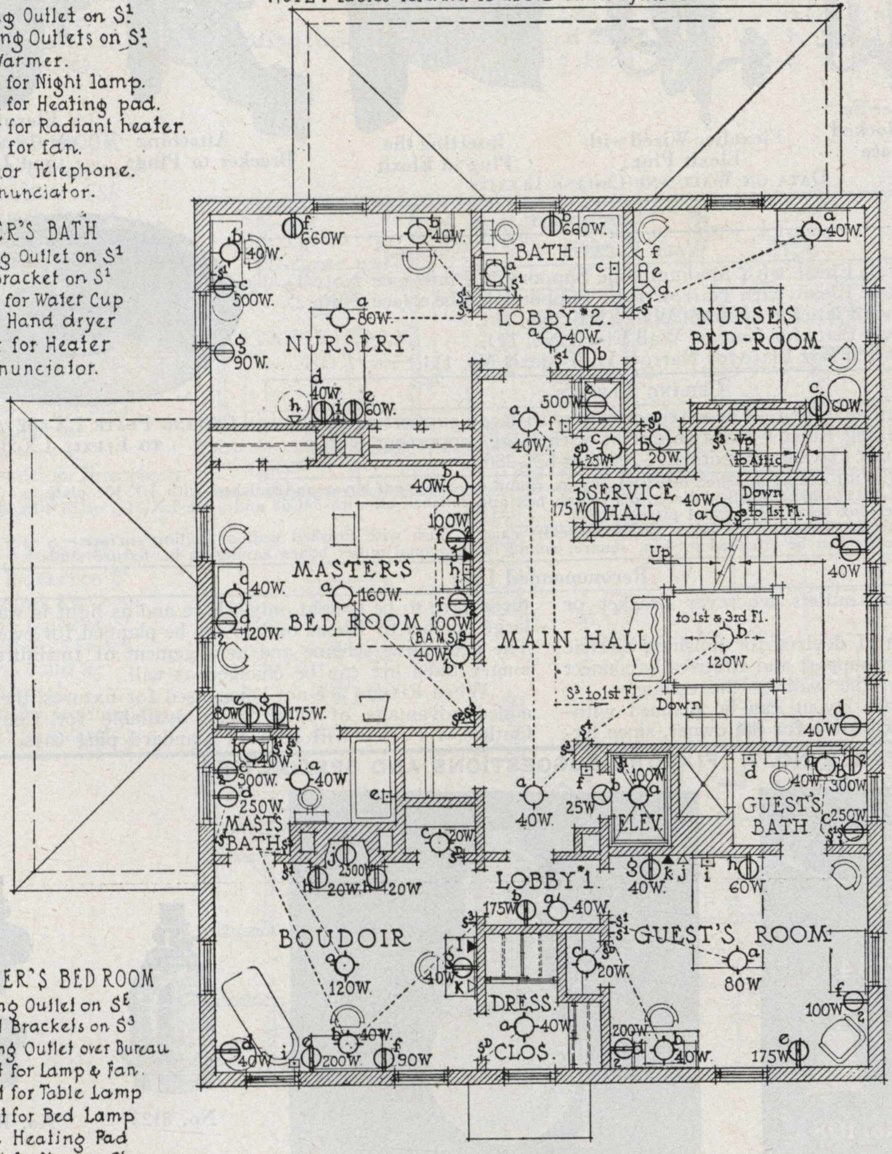
NOTE: Tables referred to above under symbols are in text.

NURSERY

a Ceiling Outlet on S^1
b 2 Ceiling Outlets on S^1
c Milk Warmer.
d Outlet for Night lamp.
e Outlet for Heating pad.
f Outlet for Radiant heater.
g Outlet for fan.
h Interior Telephone.
i To annunciator.

MASTER'S BATH

a Ceiling Outlet on S^1
b Wall bracket on S^1
c Outlet for Water Cup & Hand dryer
d Outlet for Heater
e to Annunciator.



BATH
NURSERY
LOBBY #2.
NURSE'S BED-ROOM
SERVICE HALL
to Attic
Up
Down
to 1st Fl.
MASTER'S BED ROOM
(B.A.M.S.)
MAIN HALL
to 1st & 3rd Fl.
S^3 to 1st Fl.
Down
MAST'S BATH
ELEV.
GUEST'S BATH
LOBBY 1
BOUDOIR
GUEST'S ROOM
DRESS. CLOS.
660W
40W.
660W.
40W.
500W.
80W.
90W.
40W
60W.
40W.
500W
40W.
25W.
20W.
60W.
175W
40W
40W.
100W
40W
40W.
160W.
120W.
100W
40W
120W.
80W
175W.
40W.
300W.
40W
250W.
100W
25W
40W.
40W.
300W
250W
20W.
2500W
20W.
20W
40W.
60W.
175W
40W.
120W.
40W
20W.
80W
100W.
40W.
40W
200W.
90W
200W.
40W.
175W

NURSE'S BED ROOM

a. Ceiling Outlet on S^1
b Ceiling Outlet on S^D
c Outlet for table, Bed lamp or Heating pad
d. for 2nd Floor.
e from Nursery.
f Interior Telephone.

NURSE'S BATH

a Wall Bracket on S^1
b Outlet for Radiant Heater.
c to Annunciator.

MAIN HALL

a 2 Ceiling Outlets on S^3
b Ceiling Outlet on S^4
c Wall Brackets on S^D
d 2 Outlets for lamps.
e Outlet for D.W. Heater.
f Operator for Elevator

SERVICE HALL

a Wall Bracket on S^3
b Outlet for Vacuum Cleaner & Floor Polisher.

LOBBY NO. 1

a Wall Bracket
b Outlet for Vacuum Cleaner & Floor Polisher.

LOBBY NO 2.

a Ceiling Outlet on S^1.
b Outlet for Vacuum Cleaner & Floor Polisher.

GUEST'S BATH

a Wall Bracket on S^1.
b Electric Hand Dryer & Immersion Heater.
c Electric Bath Room Heater.
d to Annunciator.

GUEST'S BED ROOM

a Ceiling Outlet on S^1.
b Ceiling Outlet on S^1
c Ceiling Outlet on S^D
d Outlet for Curling Iron, etc.
e Outlet for Vacuum Cleaner & Floor Polisher.
f Outlet for Table Lamp & Fan
g Outlet for Heating Pad.
h Outlet for Bed Lamp
i to Annunciator
j Interior Telephone.
k Public Telephone

ELEVATOR

a Ceiling Outlet on S^1
b Threshold Light.

MASTER'S BED ROOM

a Ceiling Outlet on S^E
b 2 Wall Brackets on S^3
c Ceiling Outlet over Bureau
d Outlet for Lamp & Fan.
e Outlet for Table Lamp
f Outlet for Bed Lamp & Heating Pad
g Outlet for Vacuum Cleaner & Floor Polisher.
h to Annunciator
i Interior Telephone
j Public Telephone.
k Burglar Alarm Master Switch.

DRESS CLOSET

a Ceiling Outlet on S^D.

BOUDOIR

a Ceiling Outlet on S^1
b Ceiling Outlet on S^3
c Ceiling Outlet on S^D
d Outlet for Table Lamp
e Hair Dryer & Fan.
f Curling Iron or Vibrator
g Outlet for Desk Lamp.
h 2 Candles.
i to Annunciator.
j Electric Coal Fire
K Interior Telephone
1 Public Telephone.

THE
ARROW ELECTRIC
COMPANY

SECOND FLOOR PLAN
THE HOME ELECTRICALLY CONVENIENT

Suggesting Electrical Outlets for Ideal Illuminating and the use of Labor Saving Devices.

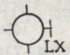
NOT DRAWN TO SCALE
DATE AUG. '23.

DRWG 3

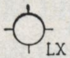
Continued on next page

TABLE NO. 6. ELEXITS

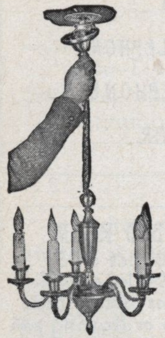
STANDARD SYMBOLS



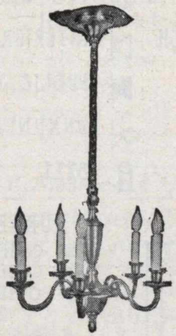
Wall Bracket Outlet



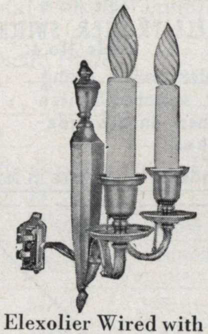
Ceiling Outlet



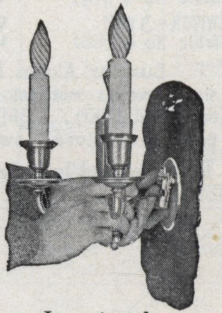
Inserting Plug in Ceiling Elexit



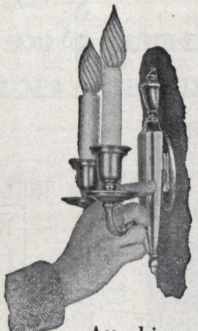
Elexolier Securely locked in Place



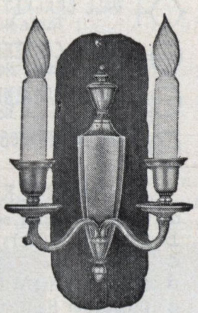
Elexolier Wired with Elexit Plug



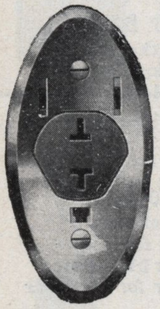
Inserting the Plug in Elexit



Attaching Bracket to Plug



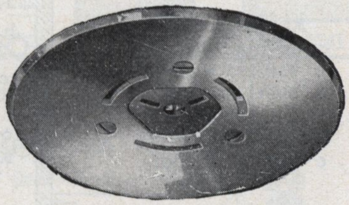
Elexolier Securely Attached and Locked



WALL PLATE LX-311 WITH ELEXIT LX-111

DATA ON WALL AND CEILING ELEXITS

Cat. No.	Description
	WALL ELEXITS
LX-101	Wall Elexit with Medium type Supporting Plate (see Note 1).
LX-111	Wall Elexit with Narrow type Supporting Plate (see Note 2).
LX-301	Oval Plate for Medium Wall Elexit No. 101.
LX-311	Oval Plate for Narrow Wall Elexit No. 111.
LX-307	Switch Box Plate for Narrow Wall Elexit No. 111.
	CEILING ELEXITS
LX-200	Ceiling Elexit—For single circuit with large supporting plate.
LX-230	Ceiling Elexit—For two circuit with large supporting plate.
LX-400	Flush Plate for Elexits LX-200 and LX-230.



CEILING PLATE LX-462 ATTACHED TO ELEXIT LX-202

Note 1: LX-101 can be attached direct to 3¼-in. round or octagonal boxes and finished with LX-301 plate.

Note 2: LX-111 can be attached direct to a switch box and finished off with 54C63 and plate LX-311, or to 4-in. square boxes by special outlet box cover 52C63 and plate LX-311.

Note: Extreme care must be taken to have Elexits exactly flush with finished wall or ceiling surface. Ceiling Elexits can be attached to 4-in. square, round or octagonal outlet boxes having ⅜-in. fixture studs.

Recommended Uses

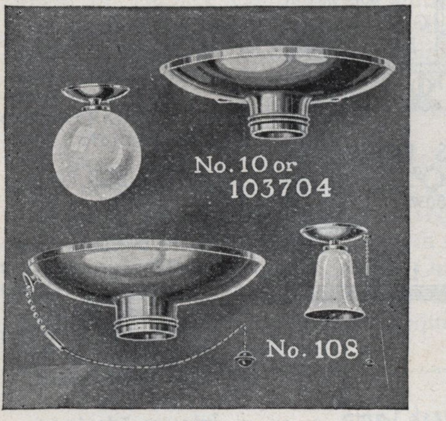
For all wall or lighting outlets wherever bracket or ceiling lights are required:

Elexits provide a system of devices for finishing electric outlets, designed to detachably support and electrically connect lighting fixtures, whether on the wall or the ceiling.

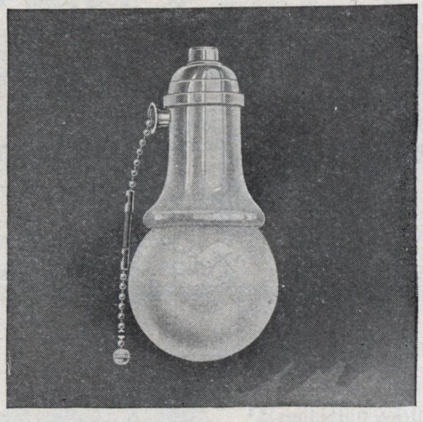
With Elexits an adequate layout can be planned without making it prohibitively expensive for the owner, since fixtures have to be bought only where and as light is wanted. A large number of Elexit outlets can be planned for every room. The decorative scheme and arrangement of furniture are no longer fixed but can be changed at will.

When Elexits are not being used for fixtures, there is the added advantage of their being available for Convenience Outlets, for they will take all standard plug caps.

TABLE NO. 7. FIXTURE SUGGESTIONS AND SPECIALTIES



Standard Receptacles



Arrobell Socket, Key, Keyless and Pull with Round Frosted Lamp

No. 8125

ARROW
ARROW

No. RH-8200

DATA

Recommended Uses	Cat. No.	Description
No. 108 for hallway, pantry, bedroom and service portion of house. No switch required.	108	Metal Covered Pull Receptacles
No. 10 for hallway, pantry, bedroom and service portion of house. Switch required.	10	Metal Covered Keyless Receptacles
Arrobel Sockets for bathroom, kitchen, etc.	APD-901	Arrobell Pull Socket, ⅛-in. cap
No switch required with pull or key types.	APA-901	Arrobell Key Socket, ⅛-in. cap
	APC-901	Arrobell Keyless Socket, ⅛-in. cap.
No. 8125 Cord Grip Aluminum Socket for industrial work. Takes direct threading reflector or shade holder.	8125	Aluminum Socket
No. RH-8200 Armored Cord Grip Attachment Plug for industrial work.	RH-8200	Armored Attachment Plug

Continued on next page

- ○ CEILING OUTLET Table No 1-6-7
- ○| WALL BRACKET Table No. 6.
- ⊖ SINGLE CONVENIENCE OUTLET Table No 5
- ⊖₂ DOUBLE CONVENIENCE OUTLET Table No 5
- ● FLOOR OUTLET Table No. 5.
- ⊗ SPECIAL PURPOSE OUTLET Table No. 5.
- ✦ PULL SWITCH
- S^1 LOCAL SWITCH-SINGLE POLE Table No. 4
- S^2 LOCAL SWITCH-DOUBLE POLE Table No. 4.
- S^D AUTOMATIC DOOR SWITCH Table No 4.
- S^3 LOCAL SWITCH-3 WAY. Table No. 4.
- S^4 LOCAL SWITCH-4 WAY. Table No. 5.
- 8 CEILING FAN OUTLET Table No. 5.
- 8| WALL FAN OUTLET Table No. 5.

NOTE: Tables referred to above under symbols are in text.

SERVANT'S BED ROOM NO. 1
- a Ceiling Outlet on S^1
- b Outlet for Bed Lamp or Heating Pad.
- c Wall Bracket.

SERVANT'S BED ROOM NO. 2
- a Ceiling Outlet on S^1
- b Outlet for Bed Lamp or Heating Pad.

HOUSEKEEPER'S ROOM
- a Ceiling Outlet on S^1
- b Outlet for Bed Lamp or Heating Pad.
- c Outlet for Desk Lamp and Curling Iron.

BILLIARD ROOM
- a Ceiling Outlets on S^1
- b Wall Brackets on S^1
- c Wall Bracket
- d Closet Ceiling Outlet on S^D
- e Outlet for Vacuum Cleaner & Floor Polisher.
- f Outlet for Drink Mixer & Fan.

PLAY ROOM
- a Ceiling Outlet on S^1
- b Floor Outlet for Transformer
- c Wall Outlet for Stereopticon
- d Outlet for Fan.

DARK ROOM
- a Wall Bracket on S^1 for Dark R'm. Lamp
- b Ceiling Outlet on S^1 with Pull Switch
- c Ceiling Outlet for Exhaust.
- d Outlet for printing lamp.
- e Outlet for enlarging.

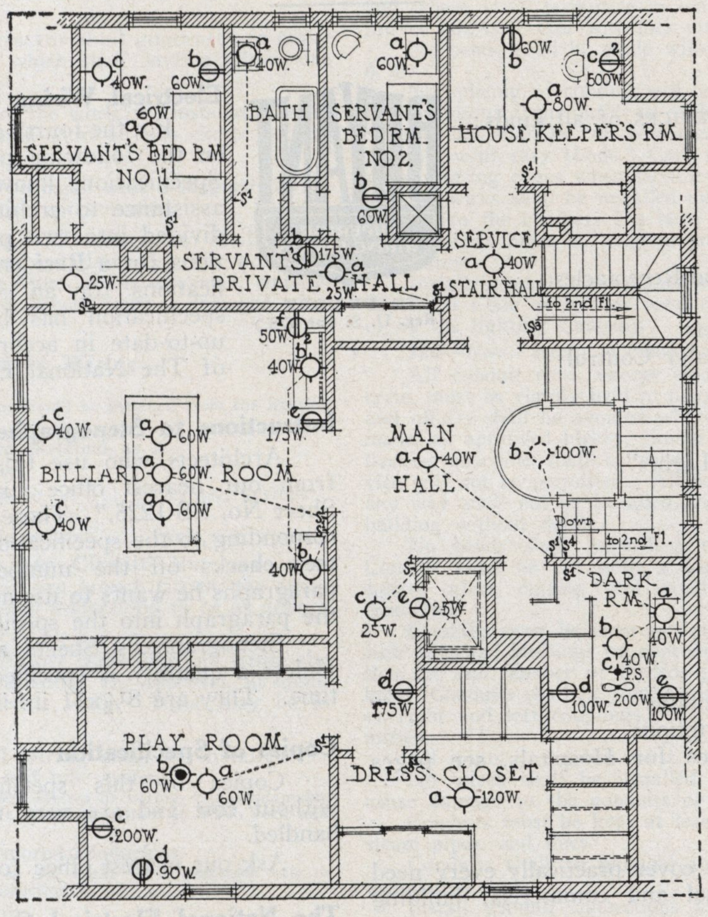
MAIN HALL
- a Ceiling Outlet on S^1
- b Ceiling Outlet on S^4
- c Ceiling Outlet on S^1
- d Outlet for Vacuum Cleaner & Floor Polisher
- e Threshold Light.

SERVANT'S PRIVATE HALL
- a Ceiling Outlet on S^1
- b Outlet for Vacuum Cleaner & Floor Polisher

SERVICE STAIR HALL
- a Ceiling Outlet on S^3

DRESSING CLOSET
- a Ceiling Outlet on S^1

BATH
- a Wall Bracket on S^1


SERVANT'S BED RM. NO 1.
BATH
SERVANT'S BED RM. NO 2.
HOUSE KEEPER'S RM.
SERVANT'S PRIVATE HALL
SERVICE STAIR HALL
to 2nd Fl.
MAIN HALL
Down
to 2nd Fl.
BILLIARD ROOM
DARK RM.
PLAY ROOM
DRESS CLOSET
40W.
60W.
60W.
40W.
60W.
500W.
80W.
60W.
175W.
25W.
40W.
25W.
50W.
40W.
175W.
100W.
60W
60W
60W
40W
40W
40W.
25W.
25W
40W
40W.
P.S.
200W.
175W.
100W.
100W.
60W
60W.
200W.
90W.
120W.

THE ARROW ELECTRIC COMPANY

THIRD FLOOR PLAN
THE HOME ELECTRICALLY CONVENIENT
Suggesting Electrical Outlets for Ideal Illuminating and the use of Labor Saving Devices.

NOT DRAWN TO SCALE
DATE AUG. '23.

DRW'G 4

THE BRYANT ELECTRIC COMPANY

Manufacturers of Electric Wiring Devices

BRIDGEPORT, CONN.

BRANCHES

SAN FRANCISCO, CAL., 149 New Montgomery Street (Office and Warehouse)

CHICAGO, ILL., 844 West Adams Street (Office and Warehouse)

NEW YORK, N. Y., 342 Madison Avenue

Products

ELECTRIC WIRING DEVICES of all kinds:

- Adapters
- Appliance Plugs
- Attachment Plugs
- Bell Push Buttons
- Bullseye Receptacles
- Candelabra Sockets and Receptacles
- Candle Sockets
- Chain for Pull Sockets
- Combinations for Heater Control
- Conduit Box Bodies
- Cut-outs
- Door Switches
- Elexits—"Places for Lights"
- Entrance Switches
- Fan Switches
- Fixture Specialties
- Fuses
- Panelboard Switches
- Receptacles
- Rosettes
- Shade Holders
- Sockets of all Descriptions
- Switches of all Descriptions

For Signaling Systems for Hospitals, see pages 2498-2499.

General

Bryant wiring devices cover practically every need for residential, institutional and commercial building wiring.

Our new catalogue lists such a large number of designs for particular uses that it would be impractical to list them here. If you have no copy of this catalogue, we want to send you one. You will find it very useful.

Hospital Signaling System

The Bryant Silent Call Hospital Signal System is a simplified nurses' call which has been in successful use for 13 years and is installed in over 500 institutions in America and foreign countries.

Recent improvements and simplifications have allowed substantial reductions in the cost of this equipment, and all architects who are interested in hospital work should ask for our hospital bulletins, which describe this system fully.

BRYANT
SUPERIOR WIRING DEVICES

TRADE-MARK
(Reg. U. S. Pat. Off.)

Electrical Wiring Specification

For the fourth consecutive year, we publish on the following pages an Electrical Wiring Specification, knowing that it has been of assistance to architects in their work. It is divided into two parts, "Electrical Specifications for a Residence" and "Electrical Specifications for an Apartment House." This specification has been revised and brought up-to-date in accordance with all new rules of The National Electrical Code.

Instructions to Stenographer

Architects who use this specification may obtain from our nearest office supplies of "Stenographer's Sheet No. SS-1225." These sheets have numbers corresponding to the specification paragraphs. The architect checks off the numbers corresponding to the paragraphs he wants to use and the stenographer copies the paragraph into the specification.

Stenographer's Sheets are supplied without cost. Unless a quantity is specified five are supplied at one time. They are 8½x11 in. in size.

Copies of Specification

Copies of this specification will be supplied without cost and are very useful, as they are easily handled.

Ask our nearest office for as many as you want.

The National Electrical Code

THE BRYANT ELECTRIC COMPANY heartily supports the efforts of The National Board of Fire Underwriters in its endeavor to reduce losses by fire.

For many years all Bryant and Perkins wiring devices have received careful, periodical inspection and test by The Underwriters' Laboratories, Inc. and, with a very few exceptions every Bryant and Perkins product has the approval of The Underwriters' Laboratories. The "N.E.C.S." marking on a device is evidence that it conforms to the rigid requirements of The National Electrical Code.

Indorsing, as we do, The National Electrical Code, it is only consistent that this Electrical Wiring Specification should be written to specify electrical wiring that will be strictly in accordance with The National Electrical Code.

Continued on next page

Electrical Specifications for a Residence

General

(1) Scope—The aim and object of these specifications are to include all that is necessary for a complete wiring system from the local light company's service to each and every outlet throughout the house *(1a*—and garage), including *(1b*—service feeder), service switch, feeders, distributing panel, circuit wiring, plug receptacles, local switches, bells, etc., as hereinafter specified.

(2) All of the above to be done in accordance with these specifications and plans and in a manner satisfactory to the architect.

(3) Code Rules, etc.—The work shall in all ways be in accordance with the rules of The National Electrical Code *and any local department having jurisdiction.* All necessary certificates shall be obtained by the contractor at his expense and delivered to the architect before work is accepted. All work shall also be in accordance with the rules of the lighting company.

Note: Be sure to consult with the local authorities before drawing your specifications.

(4) Guarantee—The contractor shall guarantee to make good any defects in his work which shall develop within one year from date of acceptance.

(5) Test—On completion of the work, the installation shall be entirely free from grounds and short circuits except for the required ground connection.

(6) A thorough test shall be made with a magneto in the presence of the architect or his representative.

(7) Cutting and Repairing—The contractor shall do all cutting necessary to the proper installation of his work and shall repair any damage done by him or his workmen, employing the services of the contractor whose work is damaged when so directed by the architect.

Electric Light Wiring

(8) System—

Note: The following information should be obtained from the lighting company in each instance.

The circuit wiring shall be installed as a

8a—2-wire 110-v., d-c. system.
8b—2-wire 110-v., single phase, ... cycle, a-c. system.
8c—3-wire 110- 220-v., d-c. system.
8d—3-wire 110- 220-v., single phase, ... cycle, a-c. system.

(9) Number of Outlets per Circuit—Not more than 10 outlets shall be wired on any one branch circuit, the terms "outlet" and "branch circuit" being understood to be as defined by the National Electrical Code.

(10) Wiring Diagrams—Before installing any work, the contractor shall submit to the architect for approval, in duplicate, drawings showing all circuit work. These may be in colored crayon on blue prints.

(11) Wiring System—All wiring shall be installed:

11a—As a concealed knob and tube system.

Note: This is the most economical system of wiring, but is adaptable only to wood frame construction. It is not permitted in New York and other large cities.

11b—With flexible steel armored conductors.

Note: This is generally known as BX work. It is adaptable only to non-fireproof and semi-fireproof construction.

11c—In flexible steel conduit.

Note: This system consists of a raceway of conduits whereby the wires can be replaced at any time without damage to woodwork, plaster, etc. Not adaptable to fireproof construction.

11d—In rigid iron conduit.

Note: This is the only system adaptable to fireproof construction. It is also adaptable to non-fireproof work, but is more expensive than 11a, 11b and 11c.

General Note: It is possible that a wire may become overheated through excessive load, short circuit, or ground, and the resulting heat or arc from wires parting may cause a destructive fire. With a metal protection over conductors, as in 11b, 11c and 11d, the hazard is greatly minimized, as the metal confines the fire and acts as a conductor or return path to ground for the current. The metal covered conductors are also verminproof.

11d possesses the advantage of 11c besides being entirely moistureproof and waterproof if installed properly.

(12) Installation of Wires, etc.—

12a—Note: Specify in connection with 11a.

All wires shall be rigidly supported on porcelain insulators. Wires passing through floors, studding, etc., shall be protected with porcelain tubes, and where wires pass vertically through bottom plates, bridging, etc., of partitions, an extra tube shall be used to protect wires from plaster droppings.

Broken or damaged porcelain pieces must be replaced.

Wires installed in masonry work shall be protected by approved rigid iron conduit which shall be continuous from outlet to outlet.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction, or by the lighting company.

12b—Note: Specify in connection with 11b.

All runs must be rigidly secured in place with pipe straps and where same terminate in outlet box or panel box, an approved box connector with lock nut and bushing shall be used.

Care should be taken that the rubber insulation is not damaged or rough cutting edges remain when armor is stripped.

No bends shall be made with an inside radius of less than 4 in. and conductors must be securely fastened out of contact with gas, water or other pipes.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction or by the lighting company.

12c—Note: Specify in connection with 11c.

All runs must be rigidly secured in place with pipe straps and where same terminate in outlet box or panel box, an approved box connector with lock nut and bushing shall be used.

No bends shall be made with an inside radius of less than 6 in.

No splicing of conduit will be permitted; the conduit must be continuous from outlet to outlet.

Conduit shall be cut to proper length to make shortest run possible with easy bends. Care must be taken to remove all rough cutting edges when flexible conduit is cut.

No wires shall be installed until all work which may cause damage to the conduits has been completed.

Conduits must be plugged and kept clean and dry during installation.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction or by the lighting company.

12d—Note: Specify in connection with 11d.

All conduit runs, except where buried in cement or concrete, must be rigidly held in place with pipe straps. All bends and offsets shall be avoided where possible and when same are made, an approved hickey, similar to the "Lakin," or a conduit bending machine shall be used. The use of a pipe tee or a vise will not be permitted. All conduit deformed or crushed in any way shall not be installed and must be removed from the building without delay.

No bends shall have less than a 3½-in. inside radius. Conduit shall be cut with a hack saw. The ends must be square after cutting and conduit shall be reamed after threading.

Conduits must be securely fastened to all outlet boxes with lock nuts and bushings of approved make, care being exercised that the full number of threads project through for the bushings. Conduits shall be joined with approved conduit couplings or right and left couplings. No running threads will be permitted.

All joints in conduit must be leaded and made watertight.

No wires shall be installed until all work which might cause damage to the conduits or wires has been completed.

Conduits must be kept at least 6 in. from hot water pipes, steam pipes, and flues.

Conduits shall be plugged and kept clean and dry during installation.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction or by the lighting company.

(13) Conductors—Conductors shall be continuous from outlet to outlet and no splices shall be made except in outlet boxes.

(14) For all circuits of 100 ft. or longer, No. 12 B & S gauge shall be used.

All conductors of No. 8 B & S gauge or larger shall be stranded.

Outer braid of one wire of each branch circuit shall be white. This shall be connected to the grounded side of the system and the "shell" terminal of all sockets and shall not be broken by single-pole switches.

(15) Wires shall be of sufficient length at outlets to make connection to apparatus without straining connections.

(16) Splices shall be made both mechanically and electrically perfect, soldered, and the proper thickness of rubber and friction tape shall be then applied.

(17) Materials—All materials used in carrying out these specifications shall be acceptable to the National Board of Fire

Continued on next page

Underwriters and to any local departments having jurisdiction.

Where no make or brand is specified or where the expression "equal to" is used, the contractor must notify the architect of the make or brand to be used and receive his approval before any of said material is installed. Where a particular brand or make is definitely specified, no substitution will be permitted.

(18) Conduit—

Note: This paragraph is to be included only where paragraph 11d is specified.

18a—All rigid iron conduit shall be enameled.

18b—All rigid iron conduit shall be galvanized.

(19) Wire—The insulation of all conductors shall be rubber, with protecting braids. Insulation shall

19a—Be N. E. C. Standard.

19b—Be "Intermediate" grade.

19c—Have a rubber compound containing not less than 30% by weight of Para rubber.

Note: 19c is the highest grade.

(20) Service Connection—Install service feeder from the lighting company's line to the service switch and make all connections complete to the satisfaction of the lighting company and the architect.

Service feeder shall be same size as house feeder.

Feeder shall be installed:

20a—Overhead with weatherproof wire.

20b—Underground in galvanized iron pipe conduit with lead covered wires.

Conduit shall be painted with asphaltum.

Trenching and backfilling by this contractor.

Note: The architect should consult with the lighting company as to whether or not they will install the service feeder. Some companies require that this be installed by others, while some will not permit the electrical contractor to make the installation.

(21) Service Switch—The service switch shall be an externally operated fused knife switch of proper capacity and shall be installed in a moistureproof steel box.

No fuse or means for fusing shall be provided in the grounded wire.

21a—30-amp. porcelain base with connections for plug fuses.

21b—Of proper capacity mounted on a slate base with connections for cartridge fuses.

(22) Provision for Meter—Make all provision for installation of meter as required by the lighting company.

(23) House Feeder—The size of the feeder from the service switch to the distributing panel shall be figured in accordance with The National Code rules for carrying capacity, allowing for all circuits being fully loaded, unless the local rules permit an allowance for load factor; but in no case shall the load factor be taken as less than 75% of the total connected load. The feeder shall be of sufficient size, however, to confine the drop in voltage as figured with all circuits fully loaded to not more than 3% of the line voltage.

Feeder shall be rubber insulated.

Size of feeder must be submitted to the architect for approval.

(24) Connection for Range—At the point of service entry, install a fused switch of proper capacity in a moistureproof steel box with hinged cover and make provision for meter as required by the lighting company. From this point install a feeder as specified for lighting feeder to the location of range as indicated on drawings and connect to range.

Feeder shall be of proper size to carry the full load of range, which is ..... watts.

Feeder, switch, etc., shall be designed for the voltage and number of wires required by the lighting company for this class of service.

Note: Obtain capacity of range from the manufacturer. An average range with oven, broiler and with 4 "hot plates" requires about 9000 watts.

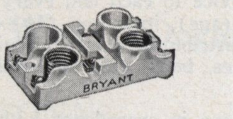
(25) Install a knife switch in the range feeder in an accessible location in sight of the range. This switch shall be an externally operated fused knife switch of proper capacity and shall be installed in a moistureproof steel box.

(26) Distributing Panel—

Note: The use of switches on distributing panel is to be recommended, particularly if cartridge type fuses are used, so that the circuit may be opened to replace fuses. The National Electrical Code now permits and recommends the use of fuses only on the ungrounded side of all branch circuits. Bryant cut-outs and panelboard units which provide for this type of fusing are called, for convenience, "single-fused" while the regular cut-outs and panelboard units providing for fuses on both sides of a circuit are called "double-fused."

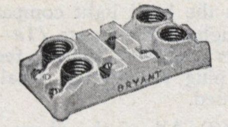
The distributing panel shall consist of:

26a—2-wire, 125-v. branch cut-outs (Single-fused, Bryant No. 62087; double-fused, Bryant No. 62587).



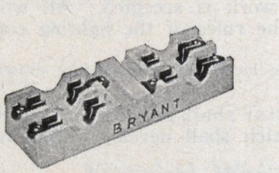
Catalogue No. 62087

26b—3-wire, 125-v. branch cut-outs (Single-fused, Bryant No. 62099; double-fused, Bryant No. 62199).



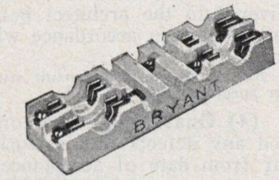
Catalogue No. 62199

26c—2-wire, 250-v. branch cut-outs (Single-fused, Bryant No. 19022; double-fused, Bryant No. 1922).



Catalogue No. 1922

26d—3-wire, 250-v. branch cut-outs (Single-fused, Bryant No. 19023; double-fused, Bryant No. 1923).



Catalogue No. 1923

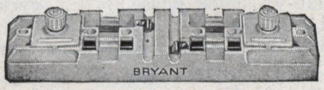
26e—2-wire, 125-v. porcelain base panelboard units (Single-fused, Perkins No. 23000; double-fused, Perkins No. 2300).

Catalogue No. 2300

26f—3-wire, 125-v. porcelain base panelboard units (Single-fused, Perkins No. 23060; double-fused, Perkins No. 2360).

Catalogue No. 23060

26g—2-wire, 250-v. porcelain base panelboard units (Single-fused, Perkins No. 25035; double-fused, Perkins No. 2535).



Catalogue No. 25035

26h—3-wire, 250-v. porcelain base panelboard units (Single-fused, Perkins No. 25036; double-fused, Perkins No. 2536).

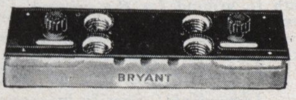
Catalogue No. 2535

26j—2-wire, 125-v. porcelain base dead front panelboard units (Single-fused, Perkins Nos. 25099, 26099, Bryant Nos. 72087, 72099; double-fused, Perkins Nos. 2599, 2699, Bryant Nos. 72587, 72199).

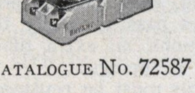
26k—3-wire, 125-v. porcelain base dead front panelboard units (Single-fused, Perkins Nos. 26000, 27000, Bryant Nos. 82087, 82099; double-fused, Perkins Nos. 2600, 2700, Bryant Nos. 82587, 82199).

Catalogue No. 27000

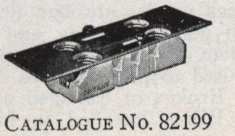
Catalogue No. 2599



Catalogue No. 2600



Catalogue No. 72587



Catalogue No. 82199

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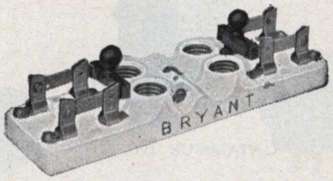
26l—2-wire, 250-v. porcelain base dead front panelboard units (Single-fused, Perkins Nos. 26085, 26088; double-fused, Perkins Nos. 2685, 2688).

Catalogue No. 2688

26m—2-wire, 125-v. porcelain base knife switch panelboard units (Single-fused, Bryant No. 18052; double-fused, Bryant No. 1852).



Catalogue No. 1852

26n—30-amp. fusible branch circuit switches, with ample size busbars and main fusible switches of proper capacity, all mounted on a black finished slate slab at least 1 in. thick. Jaws and hinges of all switches shall be milled and sweated construction.

(27) Fuses—Distributing panel shall be fully equipped with fuses and 25% in excess shall be furnished to the owner. All fuses for branch circuits shall be not more than 15-amp. capacity.

27a—125-v. plug type 3-15 amperes (Bryant "Pyrotite," Nos. 66327 to 66335).

Note: Specify 27a in connection with 26a, 26b, 26e, 26f, 26j, 26k, 26m.

27b—250-v. cartridge type 1-15 amp. (Bryant Nos. 1853 to 1862).

Note: Specify 27b in connection with 26c, 26d, 26g, 26h, 26l, 26n.

PYROTITE
125 V
BRYANT

Catalogue No. 66335

Catalogue No. 1853

27c—125-v. plug type 20-30 amp. (Bryant "Pyrotite" Nos. 66337 to 66341).

Note: Specify 27a or 27c in connection with 21a.

27d—250-v. cartridge type 20-60 amp. (Bryant Nos. 1863 to 1870).

Note: Specify 27b or 27d in connection with 21b.

(28) Panel Cabinet—The distributing panel cabinet shall be flush type of steel, not less than No. 12 gauge bent up or reinforced with angle iron frames which shall be securely riveted in place. Cabinet shall be larger than panel to give at least 4-in. wire space around panel and shall be given 2 coats of moisture repellent paint.

(29) The distributing panel shall be surrounded with an ebony asbestos or slate partition ½ in. thick which will form a wire space around panel.

(30) Panel Trim and Door—The panel trim and door shall be:

30a—Of steel, with brass cylinder lock and brass hinges, all furnished under this contract.

30b—Of paneled hardwood, finished as directed and lined with ⅜-in. asbestos wood, all furnished under this contract.

30c—Furnished under another contract, but ⅜-in. asbestos wood lining shall be installed by this contractor.

30x—A directory of circuits and outlets served by panel shall be enclosed in glass with metal frame, mounted on inside of panel door.

(31) Feeder, etc. to Garage—From a branch connection on the distributing panel, install a circuit to the garage. The portion of this circuit between the house and the garage shall be installed:

31a—Overhead, using weatherproof wires supported by approved insulators at each end.

31b—Underground, using lead covered wires installed in galvanized iron pipe conduit. Conduit shall be painted with asphaltum. Trenching and backfilling by this contractor.

Near the point at which the circuit enters the garage building, install an approved entrance switch and cut-out in steel box and extend circuits from this switch to the various outlets in garage.

(32) Outlets—At each and every switch, wall, ceiling, receptacle or other outlet shown on plans, install a standard deep type, stamped steel, knockout type, outlet box and cover of a style most suitable for the purpose of the outlet.

Where directed, wall bracket outlet covers shall be French fixture type. All outlet boxes and covers shall be suitable for the installation of Elexits of the proper type.

Outlet boxes shall be:

32a—Enameled.

32b—Galvanized.

(33) All outlet boxes must be rigidly secured in place by approved methods.

33a—Except where Elexits are specified, those intended for fixtures shall be provided with a fixture stud, or, in the case of large fixtures, hangers to furnish support independent of the outlet boxes.

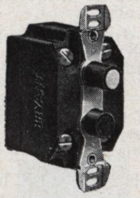
(34) Position of Outlets—Unless otherwise indicated or directed, plug receptacles shall be located just above baseboard; wall brackets, 5 ft. above finished floor in bedrooms, and 5 ft. 6 in. in all other rooms; wall switches, 4 ft. above finished floors.

(35) All outlets shall be centered with regard to paneling, furring, trim, etc., and any outlet which is improperly located on account of failure to take account of above conditions must be corrected at the contractor's expense.

(36) All outlets must be set plumb and extend to finish of wall, ceiling or floor, as the case may be, without projecting beyond same.

(37) Local Switches—Local wall switches, except where otherwise noted on drawings, shall be:

37a—Two-button flush type completely enclosed in a box of non-breakable insulating material with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 601 to 610).



Catalogue No. 602

Note: **This is the highest grade push switch made.**

It is standard 2-button type and the mechanism is completely enclosed in a 2-piece box made of indestructible insulating material, thereby eliminating breakage, excluding dirt and preventing electrical grounds.

The screws which attach the plate to the switch enter bushings that are under spring tension, which automatically aligns the plate on the wall.

Single pole (catalogue No. 601) for loads not in excess of 660 watts.

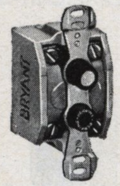
Double pole (catalogue No. 602) for loads greater than 660 watts or where it is desired to open both sides of the circuit.

Three-point (catalogue No. 603) to be used where a given light or group of lights is to be controlled from two places.

Four-point (catalogue No. 604) to be used in connection with two 3-point switches at each additional point where lights are to be controlled from any one of more than two places.

Double pole 20-amp. type (catalogue No. 609) to be used for heater or other heavy duty service.

37b—Two-button flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Nos. 2201 to 2204).



Catalogue No. 2202

Note: **This is the standard porcelain cup flush switch for residence work.**

Single pole (catalogue No. 2201) for loads not in excess of 660 watts.

Continued on next page

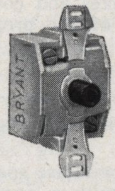
Double pole (catalogue No. 2202) for loads greater than 660 watts or where it is desired to open both sides of the circuit.

Three-point (catalogue No. 2203) to be used where a given light or group of lights is to be controlled from two places.

Four-point (catalogue No. 2204) to be used in connection with two 3-point switches at each additional point where lights are to be controlled from any one of more than two places.

Double pole 20-amp. (catalogue No. 2623) to be used for heater or other heavy duty service.

37c—Single button flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Type "O").



Catalogue No. 2457

Note: This is a type of flush switch which is preferred by many as standard for the reason that all combinations of connections are provided in the one style.

The operation is by means of successive pushes on a single button. They are furnished as follows

No. 2457, single pole.
No. 2491, single pole, indicating.
No. 2458, three-point.
No. 2459, four-point.
No. 2460, two-circuit elevator.
No. 2492, two-circuit elevator, indicating.
No. 2461, three-circuit electrolier.
No. 2493, three-circuit electrolier, indicating.
No. 2462, double pole.
No. 2494, double pole, indicating.

They may also be arranged to control the speed of fan motors and other small motors.

The indicating feature is by means of a dial which shows through a small hole in the end of the button.

The choice of single pole, double pole, three-point and four-point switches is determined in the same manner as under 37a.

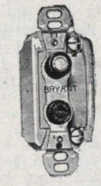
Electrolier switches are used to obtain varying degrees of illumination; as for instance, a 6-light fixture controlled by a 2-circuit switch might give on the first operation of the switch, 2 lights; on the second, 4 lights; on the third, 6 lights; on the fourth, all off.

The same fixture in connection with a 3-circuit switch might give on the first operation, 1 light; on the second, 3 lights; on the third, 6 lights; on the fourth, all off.

37d—Rotary flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Nos. 2205 to 2210).

Note: This is the oldest type of flush switch and has been largely discarded in favor of the styles specified in 37c and 37g. It may be furnished to provide the same variety of connections.

37e—Two-button flush type with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 2901 and 2903).



Catalogue No. 2901 Switch

Note: This "Yankee" switch is extensively used where the highest quality switch is not necessary.

It is supplied only in single pole (No. 2901) and 3-point (No. 2903) types.

37f—Tumbler, flush type, with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 2951-2955, 2961-2965, 2871-2875, 2881-2885).

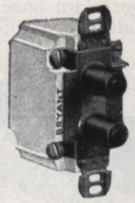
BRYANT
OFF
ON

Catalogue No. 2951

Note: Because of the simplicity of operation, the tumbler switch is gaining in popularity.

Supplied in single pole (Nos. 2951, 2961, 2871, 2881), double pole (Nos. 2952, 2955, 2962, 2965, 2872, 2875, 2882, 2885), three-point (Nos. 2953, 2963, 2873, 2883), and four-point (Nos. 2954, 2964, 2874, 2884); in lever types (Nos. 2951 and 2961 series) and lock types (Nos. 2871 and 2881 series); in both porcelain (Nos. 2851 and 2871 series) and composition (Nos. 2861 and 2881 series) cups.

37g—Duplex 2-button flush type with brass beveled edge cover plate finished to match surrounding hardware.



Catalogue No. 2709

Note: This switch consists of two Type "O" switch mechanisms (see note under 37c) mounted in a single porcelain cup of standard dimensions.

The variety of combinations of circuits offered by this arrangement of switches is too wide to be catalogued here. Full information may be found in our catalogue, copy of which will be furnished on request.

(38) Where noted on drawings, local switches shall be supplied with "Undark" genuine radium luminous buttons or handles.

The addition of a radium luminous button or handle to a switch makes it easy to find in the dark. It eliminates groping, stops the disfigurement of walls around switches and perfects electric lighting convenience.

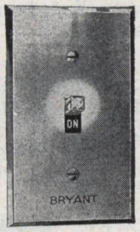
The switches described in paragraphs 37a, 37b, 37c and 37f can be supplied with genuine "Undark" radium luminous inserts in buttons or handles.

(39) Where noted on drawings, local switches shall be:

39a—3-point.

39b—4-point.

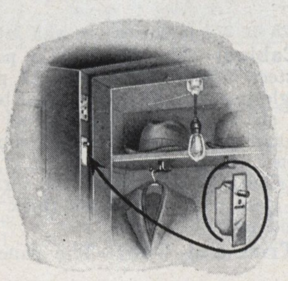
39c—Electrolier.



Catalogue
No. 2951-BH
Switch and
OS61 Plate

(40) Where more than one switch occurs in same location, furnish an approved lettered gang plate to cover all switches.

(41) Where indicated on the drawings, closets shall be equipped with automatic door switch to connect the light when the door is open (Perkins No. 2355).



Application of Catalogue No. 2355

(42) Three-point Control—Where noted on drawings, outlets shall be controlled by 3-point or 4-point switches.

(43) Electrolier Control—Wherever noted on drawings, three wires with distinctively colored braids shall be run between the switch box and the outlet box, and local switches shall be electrolier type.

(44) Outlets as noted on plans shall be connected to be operated by a master switch. Where such outlets are controlled from one local switch this switch shall be a 3-point switch with one point connected to the regular branch circuit and the other point of all such switches shall be connected to the master switch. Master switch shall be a single pole switch connected to a separate branch circuit cut-out on distributing panel. Where such outlets are controlled from two or more points a 4-point

Continued on next page

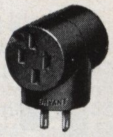
switch shall be installed in place of one of the usual 3-point switches and the extra point shall be connected to the master switch.

(*Note:* See wiring diagram Bryant 1924 Wiring Device Catalogue page 181.)

Master switch shall be located as indicated on plans.

(45) Dining Room Circuit—Furnish and install in dining room where indicated on plans an approved box containing an approved 10-amp. dead front plug receptacle (Bryant No. 120, 9020, 760, 115 or 116). Furnish 6 ft. of No. 14 B & S gauge silk covered flexible cord with plug (Bryant No. KA, KB, KC, KD or KN) for the 10-amp. receptacle on the end and with composition cord connector body (Bryant No. 103) with composition duplex adapter (Bryant No. KH) on the other end.

CATALOGUE No. 103



CATALOGUE No. KH

(46) Hardware—All hardware, including cover plates for switches and receptacles, metal covered attachment plugs, etc., furnished under this contract shall match in quality and finish other adjacent hardware.

(47) All flush plates shall be:

47a—.040 in. thick.

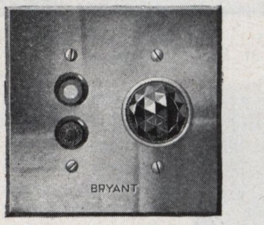
47b—.060 in. thick.

47c—Solid type, .110 in. thick.

(48) Pilot Lights—Switches as noted on drawings shall have:

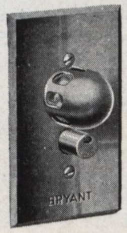
48a—Pilot lamp in plate with switch (Bryant No. 413).

48b—Pilot lamp in plate with switch (Bryant No. 465).



CATALOGUE No. 413

Note: This switch requires for its installation a 2-gang outlet box. The ruby bullseye which covers the lamp is practically flush, extending from the wall no further than the buttons of the switch.



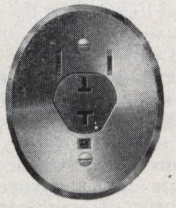
CATALOGUE No. 465

Note: This switch is installed in a single gang box. The lamp extends through the plate and is protected by a perforated cage which extends about 1 in. from the plate.

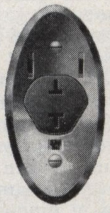
(49) Elexits—"Places for Lights"—All wall and ceiling fixture outlets as noted on drawings shall be equipped with Elexit receptacles of proper and approved type (Bryant).

LX101-301 is the standard wall Elexit receptacle with standard oval plate. Can be installed in standard outlet boxes by means of ⅜-in. fixture stud or by means of 8x32 screws which support it to the ears of the box.

LX111-311 is the narrow wall Elexit receptacle with narrow oval plate for use with wall brackets having narrow backs. It is the type to specify on new work. It can be installed only with types 52C63 and 54C63 outlet box covers. Such covers are made by a number of prominent box manufacturers.

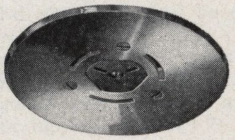


LX101 ELEXIT WALL RECEPTACLE WITH LX301 OVAL PLATE



LX111 ELEXIT WALL RECEPTACLE WITH LX311 NARROW OVAL PLATE

LX200-400 is the single circuit ceiling Elexit receptacle with flat plate. Two-circuit Elexit receptacles and raised plates are also available where needed. Can be installed in standard ceiling outlet boxes by means of ⅜-in. fixture stud or by means of screws which support it to the ears of the box.



LX200 ELEXIT CEILING RECEPTACLE WITH LX400 CEILING PLATE

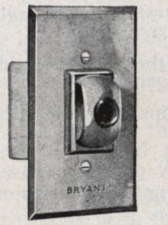
(50) Plug Receptacles—Plug receptacles shall be:

50a—Of the disappearing door type, with beveled edge brass cover plate finished to match surrounding hardware (Bryant D. D. No. 430).

Note: In this receptacle the doors are pushed inward by the insertion of the plug, and upon its withdrawal, close automatically, effectually excluding dirt and concealing the live terminals. It is the best plug receptacle obtainable. The plug is of Bakelite and is practically unbreakable, and there are no protruding contacts to become bent or loosened.

50b—Spartan type (single) (duplex).

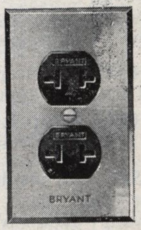
Note: This type of receptacle has been standardized by a number of manufacturers and its use is recommended for this reason. Most of the separable plugs furnished with heating devices will fit this receptacle. Duplex is preferable.



CATALOGUE NOS. 430 RECEPTACLE OD61 PLATE AND 432 PLUG

BRYANT
BRYANT

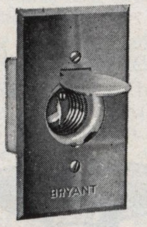
CATALOGUE No. 120 AND No. OF61 PLATE



CATALOGUE No. 122 AND No. OV61 PLATE

50c—Of the screw plug type, with beveled edge brass cover plate finish to match surrounding hardware (Bryant No. 1708).

Note: This type will receive any style of Edison screw base attachment plug. In many localities local rules require that this type of receptacle where used be installed at least 4 ft. above the floor.

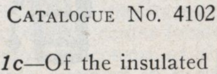


CATALOGUE No. 1708 RECEPTACLE AND No. OE61 PLATE

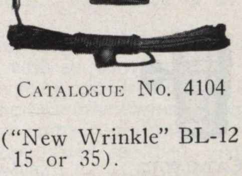
(51) Wall and Ceiling Sockets and Receptacles—One-light wall and ceiling receptacles shall be:

51a—Keyless, of a type to fit standard 3¼-in. or 4-in. outlet boxes (Bryant Nos. 4100, 4102).

51b—Pull chain of a type to fit standard 3¼-in. or 4-in. outlet boxes (Bryant No. 4104).



CATALOGUE No. 4102



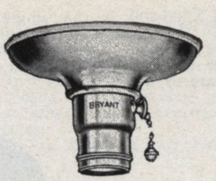
CATALOGUE No. 4104

51c—Of the insulated base type ("New Wrinkle" BL-12 or 13 or 15 or 35; or BM-12 or 13 or 15 or 35).

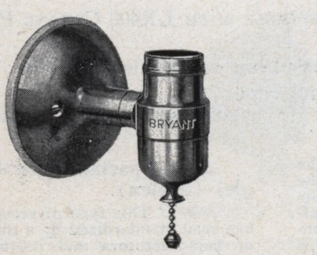
Note: If wall brackets are desired, Bryant Nos. 674, 675, 684 and 685 may be found suitable.

Continued on next page

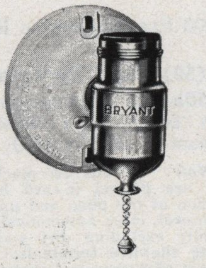
Catalogue No. BL-13



Catalogue No. BM-15



Catalogue No. 674



Catalogue No. 684

(52) Sockets in damp places, cellar and bathrooms shall be porcelain.

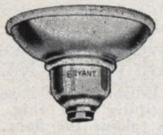
Note: Where outlets are controlled by local switches, specify keyless receptacles—otherwise specify key or pull chain type.

(53) All lamp sockets used in fulfilling these specifications shall have an approved rating of 660 watts, 250 volts.

(54) Drop Lights—Drop lights shall consist of the necessary length of reinforced cord supported by:

54a—An insulated rosette with brass base and cover (Bryant "New Wrinkle" BL or BM-26).

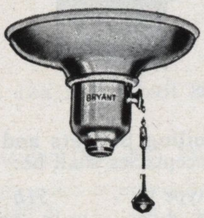
54b—A porcelain rosette with binding screw terminals (Bryant No. 572).



Catalogue No. BL-26

Catalogue No. 572

54c—A combination rosette and pull switch ("New Wrinkle" BL or BM-25).



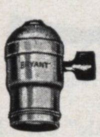
Catalogue No. BM-25

54X—And furnished with a:

54d—Keysocket ("New Wrinkle" AT-10, 11 or 12).

54e—Keyless socket ("New Wrinkle" AT-13).

54f—Pull socket ("New Wrinkle" AT-15 or AT-35).



Catalogue No. AT-12

Catalogue No. AT-13

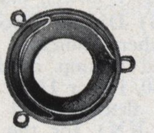
Catalogue No. AT-35

54Y—Complete with a:

54g—2¼-in. shade holder (Bryant "Uno" No. 501 or 532 with setscrews, or Bryant "Uno" No. 502 or 533 with spring grip).

Note: Specify for brass shell sockets.

Catalogue No. 501



Catalogue No. 533

54h—Sockets in damp places, cellar and bathrooms shall be porcelain (Bryant No. PT-71, 73, 70 or 76).

54k—And finished with 2¼-in. shade holder (Bryant No. 628).

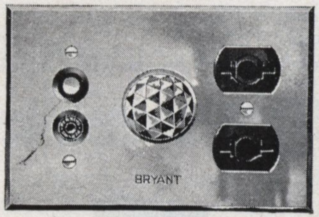
Note: Specify for porcelain sockets.

Catalogue No. PT-70

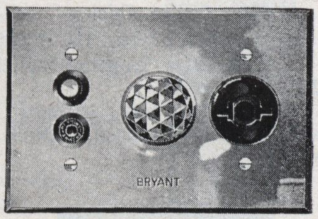
Catalogue No. 628

54Z—Each drop cord shall have an adjuster.

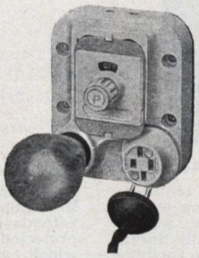
(55) Heater Switch, Pilot and Receptacle—Heating device outlets shall be equipped with combination of switch, pilot light and receptacle (Bryant).



Catalogue No. 558



Catalogue No. 467



Catalogue No. 466

Communication and Signaling Systems

(56) Call Bells, etc.—The contractor shall furnish, install and connect all push buttons, bells, buzzers and annunciators, etc., as shown on plans or herein described.

(57) All wiring shall be:

57a—Cleated on joists, studs, etc., with insulated staples. Damp places, metal pipes of all description, flues, etc., must be avoided and wire fastenings must be applied in such a way that insulation is not damaged.

No splices shall be made where same will not be accessible at any time after completion of building.

Note: 57a for wood construction only.

57b—Installed in metal conduit similar to electric light wires.

(58) Wires shall not be smaller than No. 18 B & S gauge and shall be:

58a—Dampproof insulated.

Note: 58a for wood frame construction only.

58b—Rubbed insulated, as specified for electric lighting.

(59) Bells, buzzers, buttons, etc. shall be of approved type and make (see paragraph 17) and shall be designed to operate on the current supply as hereinafter specified.

(60) Push button for main entrance door shall be provided with approved ornamental brass plate with approved finish. Push button in dining room shall consist of combination floor push, with necessary length of flexible cord and approved portable foot push.

Continued on next page

(61) Furnish and install where directed:

61a—Three approved dry battery cells in a substantial cabinet.

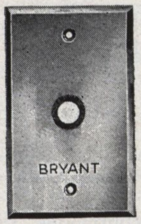
Note: Specify where electric light service is direct current.

61b—An approved bell transformer of ample capacity to operate the system connected to separate branch circuit from distributing panel.

Note: Use where service is alternating current, as bell transformer is economical and requires no attention.

(62)—Schedule of Bells—

Note: Give stenographer schedule of bells similar to following:
Front door push rings bell in hall.
Dining room push rings buzzer in kitchen.
Bedroom No. 1 push rings annunciator in first hall.
Bedroom No. 2 push rings annunciator in first hall.
Bedroom No. 3 push rings annunciator in first hall.



Catalogue No. 3649

(63) Conduit for Telephone Wires—From an approved point of entrance of telephone company, install ⅜ or ½-in. approved rigid iron conduit to telephone locations as shown on plans or where directed, providing an outlet box with plate having a bushed opening (Bryant Nos. 3649, 3651) at end of conduit.

Note: Specify the above where exposed telephone wire is objectionable.

(64) Speaking Tubes—Furnish and install a complete system of speaking tubes as shown on plans or herein described:

64a—Speaking tube to be heavily plated block tin pipe, 1-in. diameter. All seams and joints shall be perfectly soldered and tube must be properly supported with pipe straps. Tube shall not be twisted or bent, all changes in direction being made with the proper fittings.

Note: 64a is for wood frame construction only.

64b—Speaking tube to consist of 1-in. rigid enameled conduit securely fastened in place with pipe straps. All joints must be made with threaded couplings and leaded so as to be airtight.

Note: 64b can be used in both non-fireproof and fireproof construction.

(65) Mouthpieces shall be porcelain with indicating flaps and whistles, installed 4 ft. 10 in. above floor.

(66) Burglar Alarm—Furnish and install complete burglar alarm system consisting of the necessary wires, window springs, door springs, night latch cut-out for front door, bell, batteries, cabinet, interconnection strip, etc., and everything required for a complete open circuit system.

(67) Each window sash and outside door throughout the building shall be equipped with contact spring of approved make and all springs on same side of building on each floor shall be wired on one circuit and terminated on single pole knife switch on interconnection strip. One polarity shall be common throughout the system.

(68) The interconnection strip shall be located as directed and shall have single pole cut-out switches for each circuit as well as a double pole battery switch.

(69) The battery shall consist of at least three approved dry cells in suitable cabinet placed where directed. Both positive and negative leads shall be carried direct to battery switch on interconnection strip.

(70) The burglar alarm wires shall be not less than No. 18 B & S gauge, insulated and installed as specified for call bells.

(71) Intercommunicating Telephones—Furnish and install an intercommunicating telephone system complete with all telephone sets, wiring, batteries, etc. Locations of instruments are shown on drawings.

(72) All wires shall be cables containing the necessary number of No. 22 B & S gauge conductors for each station and a pair of No. 16 B & S gauge conductors each for talking and ringing battery, respectively. Each pair of wires shall be twisted and all pairs shall be twisted around each other.

(73) The wires shall be silk and cotton insulated, with a moisture repellant of beeswax or varnish and the whole covered with a lead sheath.

(74) Where cables terminate in outlet boxes, they shall be fanned out and laced in an orderly manner and secured to connecting terminals, one of which shall be provided for each wire.

(75) Install where directed in an approved cabinet at least four cells of approved dry battery each, for talking and ringing purposes.

(76) Installation of Interphone Cable—

76a—Intercommunicating cables shall be supported with pipe straps and liberal clearance shall be observed where near steam or other pipes.

Note: 76a for frame construction or exposed work only.

76b—Intercommunicating cables shall be installed in approved rigid iron conduit with necessary approved metal outlet boxes, as specified for lighting system.

Note: 76b for all types of construction.

(77) Cable to garage shall be installed underground in galvanized iron pipe conduit painted with asphaltum. Trenching and backfilling by this contractor.

(78) Instruments shall be of approved make, of wall or desk type, as noted on drawings. System shall be:

78a—Common talking, selective ringing type.

Note: Specify where it is not necessary for more than one conversation to be carried on at a time. This system is simpler and more reliable than the full automatic push button type.

78b—Full automatic push button type, so that as many conversations as desired may be carried on simultaneously.

Electrical Specifications for an Apartment House

General

(1) Scope—The aim and object of this specification is to include all that is necessary for a complete wiring system from the local light company's service to each and every outlet through the building, including (*1a*—service feeders), service switch, feeders, distributing panel, circuit wiring, plug receptacles, local switches, bells, etc., as hereinafter specified.

(2) All of the above to be done in accordance with this specification and plans and in a manner satisfactory to the architect.

(3) Code Rules, etc.—The work shall in all ways be in accordance with the rules of The National Electrical Code *and any local department having jurisdiction.* All necessary certificates shall be obtained by the contractor at his expense and delivered to the architect before work is accepted. All work shall be in accordance with the rules of the lighting company.

Note: Be sure to consult with the local authorities before drawing your specifications.

(4) Guarantee—The contractor shall guarantee to make good any defects in his work which shall develop within one year from date of acceptance.

(5) Test—On completion of the work, the installation shall be entirely free from grounds and short circuits, except for the required ground connection.

(6) A thorough test shall be made with a magneto in the presence of the architect or his representative.

(7) Cutting and Repairing—The contractor shall do all cutting necessary to the proper installation of his work, and shall repair any damage done by him or his workmen, employing the services of the contractor whose work is damaged when so directed by the architect.

Electric Light Wiring

(8) System—

Note: The following information should be obtained from the lighting company in each instance:

The circuit wiring shall be installed as a

8a—2-wire 110-v., d-c. system.

8b—2-wire 110-v., single phase, ... cycle, a-c. system.

8c—3-wire 110-220-v. d-c. system.

8d—3-wire 110-220-v. single phase, ... cycle, a-c. system.

(9) Number of Outlets per Circuit—Not more than 10 outlets shall be wired on any one branch circuit, the terms "outlet" and "branch circuit" being understood to be as defined by the National Electrical Code.

(10) Wiring Diagrams—Before installing any work, the contractor shall submit to the architect for approval, in duplicate, drawings showing all circuit work. These may be in colored crayon on blue prints.

(11) The owner's portion of building and each apartment shall be wired as a separate system with its own meter.

(12) Apartments requiring more than one circuit shall have a distributing center located within the apartment where directed. the same to consist of the necessary number of branch circuit cut-outs mounted in a cabinet as hereinafter specified. Apartments with not more than one circuit shall be wired direct from service board.

Continued on next page

(13) It is intended that all meters be placed:

13a—In basement, and this contractor shall extend a feeder of capacity as specified hereinafter under "Feeders" from distributing center in each apartment to the general meter board in basement.

13b—In apartments, approximately where shown on drawings. This contractor shall install a system of feeders extending from general service switchboard in basement to top floor, the same to loop through the various distributing centers. At distributing centers proper provision shall be made for meter connections, with meter protecting fuses, switch, meter loops, etc., all in accordance with the requirements of the lighting company. Provide for owner's meter where directed.

(14) All wiring shall be installed:

14a—As a concealed knob and tube system.

Note: This is the most economical system of wiring, but is adaptable only to wood frame construction. It is not permitted in New York and other large cities.

14b—With flexible steel armored conductors.

Note: This is generally known as BX work. It is adaptable only to non-fireproof and semi-fireproof construction.

14c—In flexible steel conduit.

Note: This system consists of a raceway of conduits whereby the wires can be replaced at any time without damage to woodwork, plaster, etc. Not adaptable to fireproof construction.

14d—In rigid iron conduit.

Note: This is the only system adaptable to fireproof construction. It is also adaptable to non-fireproof work, but is more expensive than 14a, 14b and 14c.

It is possible that a wire may become overheated through excessive load, short circuit, or ground, and the resulting heat or arc from wires parting may cause a destructive fire. With a metal protection over conductors, as in 14b, 14c and 14d, the hazard is greatly minimized, as the metal confines the fire and acts as a conductor or return path to ground for the current. The metal-covered conductors are also verminproof.

14d possesses the advantages of 14c besides being entirely moistureproof and waterproof if installed properly.

(15) Installation of Wires, etc.—

15a—Note: Specify in connection with 14a.

All wires shall be rigidly supported on porcelain insulators. Wires passing through floors, studding, etc., shall be protected with porcelain tubes, and where wires pass vertically through bottom plates, bridging, etc., of partitions, an extra tube shall be used to protect wires from plaster droppings.

Broken or damaged porcelain pieces must be replaced.

Wires installed in masonry work shall be protected by approved rigid iron conduit which shall be continuous from outlet to outlet.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction, or by the lighting company.

15b—Note: Specify in connection with 14b.

All runs must be rigidly secured in place with pipe straps and where same terminate in outlet box or panel box, an approved box connector with lock nut and bushing shall be used.

Care should be taken that the rubber insulation is not damaged or rough cutting edges remain when armor is stripped.

No bends shall be made with an inside radius of less than 4 in. and conductors must be securely fastened out of contact with gas, water or other pipes.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction or by the lighting company.

15c—Note: Specify in connection with 14c.

All runs must be rigidly secured in place with pipe straps and where same terminate in outlet box or panel box, an approved box connector with lock nut and bushing shall be used.

No bends shall be made with an inside radius of less than 6 in.

No splicing of conduit will be permitted; the conduit must be continuous from outlet to outlet.

Conduit shall be cut to proper length to make shortest run possible with easy bends. Care must be taken to remove all rough cutting edges when flexible conduit is cut.

No wires shall be installed until all work which may cause damage to the conduits has been completed.

Conduits must be plugged and kept clean and dry during installation.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction, or by the lighting company.

15d—Note: Specify in connection with 14d.

All conduit runs, except where buried in cement or concrete, must be rigidly held in place with pipe straps. All bends and offsets shall be avoided where possible and when same are made an approved hickey, similar to the "Lakin," or a conduit bending machine shall be used. The use of a pipe tee or a vise will not be permitted. All conduit deformed or crushed in any way shall not be installed and must be removed from the building without delay.

No bends shall have less than a 3½-in. inside radius. Conduit shall be cut with a hack saw. The ends must be square after cutting and conduit shall be reamed after threading.

Conduits must be securely fastened to all outlet boxes with lock nuts and bushings of approved make, care being exercised that the full number of threads project through for the bushings. Conduits shall be joined with approved conduit couplings or right and left couplings. No running threads will be permitted.

All joints in conduit must be leaded and made watertight.

No wires shall be installed until all work which might cause damage to the conduits or wires has been completed.

Conduits must be kept at least 6 in. from hot water pipes, steam pipes, and flues.

Conduits shall be plugged and kept clean and dry during installation.

Install ground connections as required by The National Electrical Code or by any local department having jurisdiction, or by the lighting company.

(16) Conductors—Conductors shall be continuous from outlet to outlet and no splices shall be made except in outlet boxes.

(17) For all circuits of 100 ft. or longer, No. 12 B & S gauge shall be used. All conductors of No. 8 B & S gauge or larger shall be stranded. Outer braid of one wire of each branch circuit shall be white. This shall be connected to the grounded side of the system and the "shell" terminal of all sockets and shall not be broken by single pole switches.

(18) Wires shall be of sufficient length at outlets to make connection to apparatus without straining connections.

(19) Splices shall be made both mechanically and electrically perfect, soldered, and the proper thickness of rubber and friction tape shall be then applied.

(20) Materials—All materials used in carrying out these specifications shall be acceptable to the National Board of Fire Underwriters and to any local departments having jurisdiction. Where no make or brand is specified, or where the expression "equal to" is used, the contractor must notify the architect of the make or brand to be used and receive his approval before any of said material is installed. Where a particular brand or make is definitely specified, no substitution will be permitted.

(21) Conduit—

Note: This paragraph is to be included only when paragraph 14d is specified.

21a—All rigid iron conduit shall be enameled.

21b—All rigid iron conduit shall be galvanized.

(22) Wire—The insulation of all conductors shall be rubber, with protecting braids. Insulation shall

22a—Be N. E. C. Standard.

22b—Be "Intermediate" grade.

22c—Have a rubber compound containing not less than 30% by weight of Para rubber.

Note: 22c is the highest grade.

(23) Service Connections—Install service feeders for light and power from the lighting company's line to the service entry and make all connections complete to the satisfaction of the lighting company and the architect. Lighting feeder shall be of sufficient size to carry the entire lighting load with all circuits fully loaded with a voltage drop not to exceed 2% of the line voltage or less if required by the lighting company. The power feeder shall be equal in capacity to the combined capacity of motor feeders. A "load factor" of not less than 75% may be used in figuring the size of these feeders if permitted by local rules and by the lighting company. Size of feeder must be submitted to the architect for approval. Feeders shall be installed:

23a—Overhead with weatherproof wire.

23b—Underground in galvanized iron pipe conduit with lead covered wires. Conduit shall be painted with asphaltum. Trenching and backfilling by this contractor.

Note: The architect should consult with the lighting company as to whether or not they will install the service feeder. Some companies require that this be installed by others, while some will not permit the electrical contractor to make the installation.

(24) Lighting Feeders—The size of feeders shall be figured in accordance with the National Code rules for carrying capacity, allowing for all circuits being fully loaded, unless the

Continued on next page

local rules permit an allowance for load factor, but in no case shall the load factor be taken as less than 75% of the total connected load. Feeders shall be of sufficient size, however, so that the drop in voltage as figured with all circuits fully loaded will not exceed 3% of the line voltage.

Feeder shall be rubber insulated.

Size of feeder must be submitted to the architect for approval.

(25) The contractor shall submit for the architect's approval a sketch of the arrangement of feeders, together with the size of each before such work is installed.

(26) Arrangement of meters, switches, cut-outs, meter loops, service feeder and feeders, etc., shall be installed in every particular in accordance with the requirements of the lighting company and subject to the approval of the architect. This contractor shall make all connections necessary to a complete installation from service to each and every outlet except those made by lighting company.

(27) Contractor shall install in hatchway, where directed by elevator contractor, an approved outlet box for lighting trail cable and extend circuit for same from owner's distributing panel where a separate circuit switch shall be provided for same.

(28) Motor Feeders—Provide a power distributing board at service entrance consisting of the necessary knife switches, cut-outs, fuses, space for meter, etc., and extend feeder from this board to each motor as indicated on plans. Power distributing board shall be installed in a cabinet with door and trim as specified for lighting distributing panel.

(29) Wiring shall be:

29a—2-wire, ...-v., d-c.

29b—2-wire, ...-v., single phase, ...cycle, a-c.

29c—....-wire, ...-v., 2-phase, ...cycle, a-c.

29d—3-wire, ...-v., 3-phase, ...cycle, a-c.

General Note—This information should be obtained from the lighting company in each instance.

(30) Feeder for elevator shall be based on 150% of full load current rating of motor.

(31) The size of other motor feeders shall be based on 125% of full load current rating of each motor.

(32) Provide and install in a steel box near each motor a fused knife switch of proper capacity and furnish and make all connections to starters and motors.

(33) Starters will be furnished by others but shall be erected by this contractor.

Note: **Paragraphs 27 to 33, inclusive, provide for power wiring entirely separate from lighting. This is desirable, as the fluctuation in voltage due to stopping and starting of motors will cause a disagreeable flicker in lamps if they are on same feeder.**

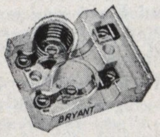
(34) Service Board—

34a—*Note:* Specify the following in connection with 13a.

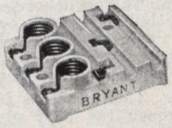
Where indicated in basement, install a meter and cut-out board, consisting of 1¼-in. hardwood, properly battened and securely mounted on wall. This board shall be of ample size to provide space for meters, etc., without crowding, and shall be given at least 2 coats of moisture repellant paint. Provide for meter for each apartment and one for the owner. The meters will be mounted in a horizontal row. Furnish and install a steel box extending the entire length of the board consisting of No. 12 gauge steel with self-closing door of same thickness, with hinges, catch and hasp for padlock. Porcelain bushings with clamp or lock attachment shall be provided for each and every wire entering box. Where required by local authorities or by the lighting company, provide metal enclosures for wires from box to meters. Install in above box the necessary number of branch circuit, plug fuse cut-out bases (Bryant No. 61035 if single-fused, 2 pole, Bryant No. 61935 if double-fused, 2 pole Bryant No. 80042 if single-fused, 3 pole, Bryant No. 8042 if double-fused, 3 pole).

Each feeder to an apartment having only one circuit without a distributing center in the apartment shall be protected with an additional cut-out on the house side of its meter.

Arrangement of meter board and cut-outs must be approved by the lighting company before work is installed.



Catalogue No. 61035



Catalogue No. 8042

From the above meter board, extend a feeder of size as specified under "Feeders" to the point of entrance of the service and provide all entrance fuses, switches, etc., required by the lighting company or the local inspection department having jurisdiction.

34b—*Note:* Specify the following in connection with 13b.

Where indicated in basement, install an approved service panel consisting of 1¼-in. black finished slate, mounted in a steel cabinet with steel door as specified for distributing panels.

Provide on this panel a fused knife switch of proper capacity for each and every feeder, together with an unfused main knife switch. All fuses shall be N. E. C. standard enclosed type. Extend from this service panel a lighting feeder of size as specified under "Feeders" to point of entrance of the service, and provide all entrance fuses, switches, etc., required by the lighting company or the local inspection department having jurisdiction.

(35) Connections for Ranges—Contractor shall install a feeder to the location of each range as indicated on drawings and shall connect to each range. Install a knife switch in feeder to each range in an accessible location adjacent to range. This switch shall be an externally operated fused knife switch of proper capacity and shall be installed in a moistureproof steel box. No fuse or means for fusing shall be provided for the grounded wire. Install service feeder, service fuses, switches, etc., branch cut-outs, provision for meters, etc., all of proper capacity and in general as specified for lighting system. Feeders shall be of proper size to carry the full load of each range, which is .... watts. Service feeder shall be of proper capacity to carry the full load of all ranges, unless the local rules permit an allowance for load factor, but in no case shall the load factor be taken as less than 75% of the total connected load. Feeders, switches, etc., shall be designed for the voltage and number of wires required by the lighting company for this class of service. Arrangements for meters and service connection must be approved by the lighting company before work is installed.

Note: **Obtain capacity of range from the manufacturer. An average range with oven, broiler and four "hot plates" requires about 9000 watts.**

(36) Distributing Panels—

Note: For description of panel units, see paragraph 26 of Electrical Specification for a Residence.

The distributing panels shall consist of:

36a—2-wire, 125-v. branch cut-outs
(Single-fused, Bryant No. 62087).
(Double-fused, Bryant No. 62587).

36b—3-wire, 125-v. branch cut-outs
(Single-fused, Bryant No. 62099).
(Double-fused, Bryant No. 62199).

36c—2-wire, 250-v. branch cut-outs
(Single-fused, Bryant No. 19022).
(Double-fused, Bryant No. 1922).

36d—3-wire, 250-v. branch cut-outs
(Single-fused, Bryant No. 19023).
(Double-fused, Bryant No. 1923).

36e—2-wire, 125-v. porcelain base panelboard units
(Single-fused, Perkins No. 23000).
(Double-fused, Perkins No. 2300).

36f—3-wire, 125-v. porcelain base panelboard units
(Single-fused, Perkins No. 23060).
(Double-fused, Perkins No. 2360).

36g—2-wire, 250-v. porcelain base panelboard units
(Single-fused, Perkins No. 25035).
(Double-fused, Perkins No. 2535).

36h—3-wire, 250-v. porcelain base panelboard units
(Single-fused, Perkins No. 25036).
(Double-fused, Perkins No. 2536).

36j—2-wire, 125-v. porcelain base dead front panelboard units
(Single-fused, Perkins Nos. 25099, 26099, Bryant Nos. 72087, 72099).
(Double-fused, Perkins Nos. 2599, 2699, Bryant Nos. 72587, 72199).

36k—3-wire, 125-v. porcelain base dead front panelboard units
(Single-fused, Perkins Nos. 26000, 27000, Bryant Nos. 82087, 82099).
(Double-fused, Perkins Nos. 2600, 2700, Bryant Nos. 82587, 82199).

36l—2-wire, 250-v. porcelain base dead front panelboard units
(Single-fused, Perkins Nos. 26085, 26088).
(Double-fused, Perkins Nos. 2685, 2688).

Continued on next page

36m—2-wire, 125-v. porcelain base knife switch panelboard units
(Single-fused, Bryant No. 18052).
(Double-fused, Bryant No. 1852).

36n—30-amp. fusible branch circuit switches, with ample size busbars and main fusible switch of proper capacity, all mounted on a black finish slate slab at least 1 in. thick. Jaws and hinges of all switches shall be milled and sweated construction.

(37) Fuses—Distributing panel shall be fully equipped with fuses and 25% in excess shall be furnished to the owner. All fuses for branch circuits shall be not more than 15-amp. capacity.

37a—125-v. plug type, 3-15 amp. (Bryant "Pyrotite," Nos. 66327 to 66335).

Note: Specify 37a in connection with 34a, 36a, 36b, 36e, 36f, 36j, 36k, 36m.

37b—250-v. cartridge type, 1-15 amp. (Bryant Nos. 1853 to 1862).

Note: Specify 37b in connection with 34b, 36c, 36d, 36g, 36h, 361, 36n.

37c—125-v. plug type, 20-30 amp. (Bryant "Pyrotite" Nos. 66337 to 66341).

Note: Specify 37a or 37c in connection with 34a.

37d—250-v. cartridge type, 20-60 amp. (Bryant Nos. 1863 to 1870).

Note: Specify 37b or 37d in connection with 34b.

(38) Panel Cabinets—The distributing panel cabinets shall be flush type of steel, not less than No. 12 gauge bent up or reinforced with angle iron frames which shall be securely riveted in place. Cabinets shall be larger than panel to give at least 4-in. wire space around panels and shall be given 2 coats of moisture repellent paint.

(39) The distributing panel shall be surrounded with an ebony asbestos or slate partition ½ in. thick which will form a wire space around panel.

(40) Panel Trims and Doors—The panel trims and doors shall be:

40a—Of steel, with brass cylinder lock and brass hinges, all furnished under this contract.

40b—Of paneled hardwood, finished as directed and lined with ⅜-in. asbestos wood, all furnished under this contract.

40c—Furnished under another contract, but ⅜-in. asbestos wood lining shall be installed by this contractor.

40x—A directory of circuits and outlets served by panel shall be enclosed in glass with metal frame, mounted on inside of panel door.

(41) Outlets—At each and every switch, wall or ceiling receptacle or other outlet shown on plans, install a standard deep type, stamped steel, knockout type, outlet box and cover of a style most suitable for the purpose of the outlet.

Where directed wall bracket outlet covers shall be French fixture type. All outlet boxes and covers shall be suited for the installation of Elexits of the proper type.

(42) Outlet boxes shall be:

42a—Enameled.

42b—Galvanized.

(43) All outlet boxes must be rigidly secured in place by approved methods.

43a—Except where Elexits are specified those intended for fixtures shall be provided with a fixture stud, or, in the case of large fixtures, hangers to furnish support independent of the outlet boxes.

(44) Position of Outlets—Unless otherwise indicated or directed, plug receptacles shall be located just above baseboards; wall brackets, 5 ft. above finished floor in bedrooms, and 5 ft. 6 in. in all other rooms; wall switches, 4 ft. above finished floors.

(45) All outlets shall be centered with regard to paneling, furring, trim, etc., and any outlet which is improperly located on account of failure to take account of above conditions must be corrected at the contractor's expense.

(46) All outlets must be set plumb and extend to finish of wall, ceiling or floor, as the case may be, without projecting beyond same.

(47) Hall Lighting—All outlets in halls, entrance, etc., are to have double switch control with two circuits carried through all outlets, and shall have lock type switches located as directed in entrance hall. All hall and stair lights shall be wired from owner's distributing panel.

Note: This scheme permits economizing in lighting current by extinguishing part of the lights at certain periods.

(48) Local Switches—

Note: For descriptions of local wall switches, see paragraphs 37 of Electrical Specifications for a Residence.

Local wall switches, except where otherwise noted on drawings, shall be:

48a—Two-button flush type completely enclosed in a box of non-breakable insulating material with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 601 to 610).

48b—Two-button flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Nos. 2201 to 2204).

48c—Single button flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Type O).

48d—Rotary flush type with brass beveled edge cover plate finished to match surrounding hardware (Perkins Nos. 2205 to 2210).

48e—Two-button flush type with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 2901 and 2903).

48f—Tumbler, flush type, with brass beveled edge cover plate finished to match surrounding hardware (Bryant Nos. 2951 to 2955, 2961 to 2965, 2871 to 2875, 2881 to 2885).

Note: Because of the simplicity of operation, the tumbler switch is gaining in popularity.

Supplied in single pole (Nos. 2951, 2961, 2871, 2881), double pole (Nos. 2952, 2955, 2962, 2965, 2872, 2875, 2882, 2885), three-point (Nos. 2953, 2963, 2873, 2883), and four-point (Nos. 2954, 2964, 2874, 2884); in lever types (Nos. 2951 and 2961 series) and lock types (Nos. 2871 and 2881 series); in both porcelain (Nos. 2851 and 2871 series) and composition (Nos. 2861 and 2881 series) cups.

48g—Duplex two-button flush type with brass beveled edge cover plate finished to match surrounding hardware.

(49) Where noted on drawings local switches shall be supplied with "Undark" genuine radium luminous buttons or handles.

(50) Where noted on drawings, local switches shall be:

50a—3-point.

50b—4-point.

50c—Electrolier.

(51) Where more than one switch occurs in same location, furnish an approved lettered gangplate to cover all switches.

(52) Where indicated on the drawings, closets shall be equipped with automatic door switch to connect the light when the door is open (Perkins No. 2355).

(53) Three-point Control—Where noted on drawings, outlets shall be controlled by 3-point or 4-point switches.

(54) Electrolier Control—Wherever noted on drawings, three wires with distinctively colored braids shall be run between the switch box and the outlet box, and local switches shall be electrolier type.

(55) Outlets as noted on plans shall be connected to be operated by a master switch. Where such outlets are controlled from one local switch this switch shall be a 3-point switch with one point connected to the regular branch circuit and the other point of all such switches shall be connected to the master switch. Master switch shall be a single pole switch connected to a separate branch circuit cut-out on distributing panel. Where such outlets are controlled from two or more points a 4-point switch shall be installed in place of one of the usual 3-point switches and the extra point shall be connected to the master switch.

(*Note:* See wiring diagram Bryant 1924 Wiring Device Catalogue page 181.)

Master switch shall be located as indicated on plans.

(56) Dining Room Circuits—Furnish and install in each dining room where indicated on plans an approved box containing an approved 10-amp. dead front plug receptacle (Bryant No. 120, 9020, 760, 115 or 116). Furnish 6 ft. of No. 14 B & S gauge silk covered flexible cord with plug (Bryant No. KA, KB, KC, KD or KN) for the 10-amp. receptacle on the end and with composition cord connector body (Bryant No. 103) with composition duplex adapter (Bryant No. KH) on the other end.

(57) Hardware—All hardware including cover plates for switches and receptacles, metal covered attachment plugs, etc., furnished under this contract shall match in quality and finish other adjacent hardware.

(58) All flush plates shall be:

58a—.040 in. thick.

58b—.060 in. thick.

58c—Solid type, .110 in. thick.

(59) Pilot Lights—Switches as noted on drawings shall have:

59a—Pilot lamp in plate with switch (Bryant No. 413).

Note: This switch requires for its installation a 2-gang outlet box. The ruby bullseye which covers the lamp is practically flush, extending from the wall no further than the buttons of the switch. See paragraph 48a of Electrical Specifications for a Residence.

59b—Pilot lamp in plate with switch (Bryant No. 465).

Note: This switch is installed in a single-gang box. The lamp extends through the plate and is protected by a perforated cage which extends about 1 in. from the plate. See paragraph 48b of Electrical Specifications for a Residence.

Continued on next page

(60) Elexits—"Places for Lights"—All wall and ceiling fixture outlets as noted on drawings shall be equipped with Flexit receptacles of proper and approved type (Bryant).

(61) Plug Receptacles—Plug receptacles shall be:

61a—Of the disappearing door type, with beveled edge brass cover plate finished to match surrounding hardware (Bryant "D.D." No. 430).

Note: See paragragh 50a of Electrical Specifications for a Residence.

61b—Spartan type [single] [duplex].

Note: See paragraph 50b of Electrical Specifications for a Residence.

61c—Of the screw plug type, with beveled edge brass cover plate finished to match surrounding hardware (Bryant No. 1708).

Note: See paragraph 50c of Electrical Specifications for a Residence. In many localities local rules require that this type of receptacle where used be installed at least 4 ft. above floor.

(62) Wall and Ceiling Sockets and Receptacles—

Note: For illustrations of devices mentioned in this paragraph, see paragraph 51 of Electrical Specifications for a Residence.

One-light wall and ceiling receptacles shall be:

62a—Keyless, of a type to fit standard 3¼ or 4-in. outlet boxes (Bryant Nos. 4100, 4102).

62b—Pull chain of a type to fit standard 3¼ or 4-in. outlet boxes (Bryant No. 4104).

62c—Of the insulated base type "New Wrinkle" BL-12 or 13 or 15 or 35; or BM-12 or 13 or 15 or 35.

(63) Sockets in cellar, bathrooms and damp locations shall be porcelain.

Note: Where outlets are controlled by local switches, specify keyless receptacle—otherwise specify key or pull chain type.

(64) All lamp sockets used in fulfilling these specifications shall have an approved rating of 660 watts, 250-v.

(65) Drop Lights—

Note: See illustrations in paragraph 54 of Electrical Specifications for a Residence.

Drop lights shall consist of the necessary length of reinforced cord supported by:

65a—An insulated rosette with brass base and cover (Bryant "New Wrinkle" BL or BM-26).

65b—A porcelain rosette with binding screw terminals (Bryant No. 572).

65c—A combination rosette and pull switch ("New Wrinkle" BL or BM-25).

65X—And furnished with a:

65d—Key socket ("New Wrinkle" AT-10, 11 or 12).

65e—Keyless socket ("New Wrinkle" AT-13).

65f—Pull socket ("New Wrinkle" AT-15), or, (AT-35).

65Y—Complete with a:

65g—2½-in. shade holder (Bryant "Uno," No. 501 or 532 with setscrews or Bryant "Uno" No. 502 or 533 with spring grip).

Note: Specify for brass shell sockets.

65h—Sockets in cellar, bathrooms and damp locations shall be porcelain (Bryant No. PT-73, 71, 70 or 76).

65k—And furnished with 2¼-in. shade holder (Bryant No. 628).

Note: Specify for porcelain sockets.

65Z—Each drop cord shall have an adjuster.

(66) Heater Switch, Pilot and Receptacle—Heating device outlets shall be equipped with combination of switch, pilot light and receptacle (Bryant). The switch and receptacle shall be as hereinbefore specified.

Note: See illustrations in paragraph 55 of Electrical Specifications for a Residence.

Communication and Signaling Systems

(67) Call Bells, etc.—The contractor shall furnish, install and connect all push buttons, bells, buzzers and annunciators, as shown on plans or herein described.

(68) All wiring shall be:

68a—Cleated in joists, studs, etc., with insulated staples. Damp places, metal pipes of all descriptions, flues, etc., must be avoided and wire fastenings must be applied in such a way that insulation is not damaged.

No splices shall be made where they will not be accessible at any time after completion of building.

Note: 68a for wood frame construction only.

68b—Installed in metal conduit with outlet boxes similar to electric light wires.

(69) Wires shall not be smaller than No. 18 B & S gauge and shall be:

69a—Dampproof insulated.

Note: 69a for wood frame construction only.

69b—Rubber insulated as specified for electric lighting.

(70) Install a 3-in. bell in each apartment where indicated on drawings, and wire it so it will be operated by separate push button in entrance vestibule.

(71) Install a buzzer in each apartment where directed and wire it so it will be operated by a button on hall side of apartment entrance door. Bells and buzzers shall be installed on approved hardwood mats installed to cover outlet boxes.

(72) Install a buzzer in the kitchen of each apartment where directed and wire it to a combination push located in dining room floor where directed. Also supply necessary length of flexible cord and approved portable foot-push.

(73) Install a push button in each apartment where indicated on drawings and wire it so it will operate door latch on main entrance door to building.

(74) Install in basement near dumbwaiter of each apartment section a bank of push buttons mounted on common plate of ⅛-in. brass with name card holders above each button and wire so each button will operate a buzzer located in each apartment near dumbwaiter opening. Button mechanisms shall be on back of plate and no parts shall be removable from the front.

(75) Battery feeders shall consist of riser feeders from basement to each vertical row of apartment entrance door push buttons and each vertical row of apartment door-opening push buttons with both battery leads accessible at all push buttons. Also install battery feeders to each of the dumbwaiter and entrance door push button banks.

(76) All battery feeders shall terminate on an approved interconnection strip with fuse for each feeder installed in battery cabinet which shall be located in basement where directed. The interconnection strip shall have a separate terminal for each wire.

(77) Furnish and install the necessary number of dry cells of approved make in an approved hardwood cabinet to make entire system work properly.

(78) Letter Boxes, etc.—In entrance hall where directed, furnish and install a bank of letter boxes consisting of a push button and letter box for each and every apartment, all to be mounted in an approved frame. The letter boxes shall be fitted with approved locks and keys, no two to be alike. Boxes shall be provided with master doors and shall be drilled for master locks to be installed by the Post Office Department and shall in all ways be constructed in accordance with the rules of the Post Office Department. A holder for name card must be provided on each section with glass to cover card. All exposed parts shall be of brass, finished as directed by architect.

(79) Telephone Conduits—Furnish and install an approved rigid iron conduit system for telephone wires, consisting of telephone service conduit from point where telephone company enters building to a main interconnection box located where shown on drawings.

(80) From this interconnection box extend the necessary number of riser conduits to provide a raceway of sufficient size to accommodate, without crowding, at least 2 pairs of telephone company's inside twisted pair wires for each apartment; also conduit to telephone switchboard.

(81) Furnish and install an outlet box with approved cover in above system in each apartment and provide conduit extension to this outlet box from baseboard or picture mould as directed.

(82) This contractor shall furnish all necessary interconnection boxes with approved doors, trims, hinges and locks, and shall obtain approval of telephone company on entire contemplated system before any work is installed.

(83) Vestibule Telephone—Install a wall telephone instrument in the vestibule as a part of the bank of letter boxes and a wall telephone instrument in each apartment near the entrance door as directed. Instruments shall be of approved type and manufacture. Instrument in vestibule shall have a button, with approved name card holder, to ring the instrument in any apartment and all connections shall be installed for the system which shall be common talking type. Mouthpiece in lobby shall be of metal and shall not be removable from the face. Receiver in lobby shall be attached in an approved manner to make malicious removal difficult. Wiring shall be No. 18 B & S gauge and shall be installed as specified for call bells. Install the necessary number of dry cells for the proper operation of this system in an approved cabinet located as directed.

Note: If telephones are specified, buttons in vestibules and bells in apartments operated by these buttons may be omitted.

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Products

Connecticut-Bakelite Wiring Devices: Switch plates (toggle and push button), Oversize Plates, Blank Plates, Radio Plates, Telephone Plates, Pilot Light Plates, Single and Duplex Convenience Outlets, Single and Double Gang Unit Combinations, Attachment Plug, Double Plug, Three-way Plug and Tap.

Complete Line

The only complete line of Bakelite wiring Devices—originated and developed by Connecticut.

Approved

Connecticut-Bakelite Wiring Devices have been approved by the "Underwriters' Laboratories, Inc.," and meet the National Electrical Code Standards.

Shockproof

The absence of all exposed metal parts makes Connecticut-Bakelite Wiring Devices absolutely shockproof.

TRADE-MARK

Color and Finish

The rich brown color of natural Bakelite is standard, but black can also be furnished. The distinctive eggshell finish blends well with the polished beveled borders.

Non-tarnishing

No cleaning or polishing is required as the color and finish are permanent.

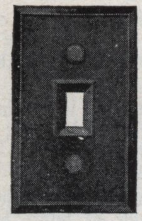
Installation Data

All Connecticut-Bakelite Wiring Devices are of shallow construction for installation in narrow partitions. For example: the unit receptacle (convenience outlet) has plate and switch moulded in one piece and extends only 5/8 inch into the wall box.

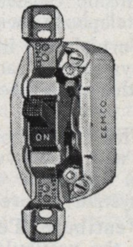
Local Switches

Local wall switch shall be: (1) Toggle flush type (Connecticut Nos. 6276-6279) with Connecticut-Bakelite Toggle Switch Plate (Nos. 7121-7132).

(2) Push button, flush type (Connecticut Nos. 6076-6078) with Connecticut-Bakelite Push Button Plate (Nos. 7101-7110).



Cat No. 7121



Cat. No. 6276

Cat. No.	Gangs	List
7121	1	.60
7122	2	1.00
7123	3	1.25
7124	4	1.60
7125	5	2.00
7126	6	3.60
7127	7	4.20
7128	8	4.80
7129	9	8.10
7130	10	9.00
7131	11	9.90
7132	12	10.80

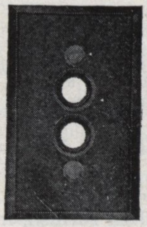
Cat. No.	Rating 125V	Rating 250V	Type	List
6276	10 Amp.	5 Amp.	S.P.	.35
6277	10 Amp.	10 Amp.	D.P.	.70
6278	10 Amp.	5 Amp.	3 Way	.70
6279	10 Amp.	5 Amp.	4 Way	2.00

Tandem Plates

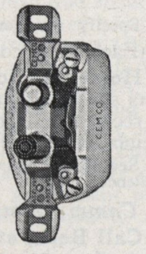
Cat. No.	Gang	List
7142	2	1.20
7143	3	1.56
7144	4	2.00

Oversize Plates

Cat. No.	Gang	List
7171	1	.72
7172	2	1.20



Cat. No. 7101



Cat. No. 6076

Cat. No.	Gangs	List
7101	1	.50
7102	2	.90
7103	3	1.10
7104	4	1.45
7105	5	1.85
7106	6	2.45
7107	7	4.05
7108	8	4.65
7109	9	7.95
7110	10	8.85

Cat. No.	Rating 125V	Rating 250V	Type	List
6076	10 Amp.	5 Amp.	S.P.	.35
6077	10 Amp.	10 Amp.	D.P.	.70
6078	10 Amp.	5 Amp.	3 Way	.70

Tandem Plates

Cat. No.	Gang	List
7152	2	1.00
7153	3	1.46
7154	4	1.85

Oversize Plates

Cat. No.	Gang	List
7161	1	.60
7162	2	1.08

Continued on next page

Pilot Light Plate

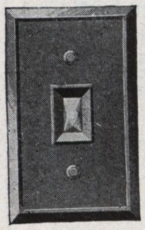
Pilot light plate shall be Connecticut-Bakelite Pilot Light Plate (No. 7141) with receptacle (No. 6185).

Telephone Plate

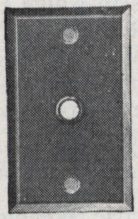
Telephone plate shall be Connecticut-Bakelite Telephone Plate (No. 7195-6).

Blank Plate

Blank plate shall be Connecticut-Bakelite Blank Plate (No. 7185-7). Oversize Blank Plates (No. 7181-2).



Pilot Light Plate
No. 7141
List $2.00



Telephone Plate
No. 7195
List $0.60

Blank Plate
No. 7185
List $0.60

Convenience Outlets

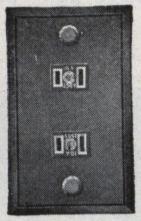
Convenience outlets shall be (1) Connecticut-Bakelite Single Unit Receptacle (No. 980).

(2) Connecticut-Bakelite Duplex Unit Receptacle (No. 990).

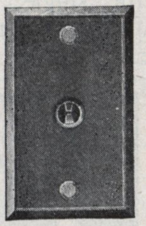
(3) Connecticut-Bakelite Radio Receptacle (No. 985).

These units have plate and receptacle moulded in one piece.

Single Unit Receptacle
No. 980
List $0.80



Duplex Unit Receptacle
No. 990
List $1.00



Radio Receptacle
No. 985
List $0.80

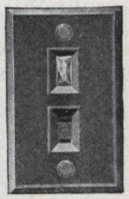
Plate and receptacle moulded in one piece

Pilot Light Combinations

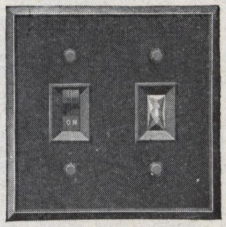
Where indicated on sketches the following pilot light combinations shall be furnished:

(1) Connecticut-Bakelite single gang unit combination complete with pilot light and single receptacle (No. 6170). Pilot light operates by inserting plug cap in receptacle.

(2) Connecticut-Bakelite two-gang unit combination complete with S. P. toggle switch and pilot light and 125-volt lamp (switch controls pilot light). Used for back stair or cellar control (No. 6145).



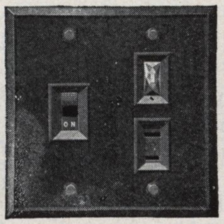
Single Gang Unit Combination
No. 6170
List $3.60



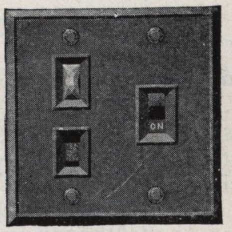
Two Gang Unit Combination
No. 6145
List $5.00

Where indicated on sketches the following two-gang unit combinations shall be furnished:

(1) Connecticut-Bakelite two-gang unit combination (heater switch) complete with D. P. toggle switch, single receptacle and pilot light and 125-volt lamp (No 6150). Switch controls pilot light and receptacle.



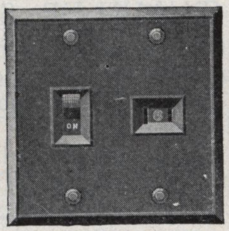
Two Gang Unit Combination
No. 6150
List $6.00



Two Gang Unit Combination

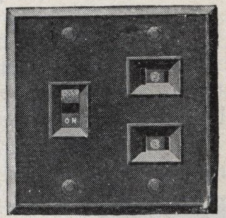
No.	Type	List
6161	S. P. switch	$4.80
6162	D. P. switch	5.00
6163	3-way switch	5.00

(2) Connecticut-Bakelite two-gang unit combination complete with toggle switch. Single receptacle, pilot light and 125-volt lamp (No. 6161) (No. 6162) (No. 6163). Switch operates independently of pilot light and receptacle. Pilot light operates by inserting plug cap in receptacle.



Two Gang Unit Combination

No.	Type	List
6111	S. P. switch	$3.45
6112	D. P. switch	3.80
6113	3-way switch	3.80



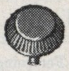
Two Gang Unit Combination

No.	Type	List
6101	S. P. switch	$3.65
6102	D. P. switch	4.00
6103	3-way switch	4.00

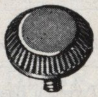
Can be wired either independently or as a switch controlled receptacle

(3) Connecticut-Bakelite two-gang unit combination complete with toggle switch and single receptacle. (No. 6111-6113).

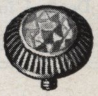
(4) Connecticut-Bakelite two-gang unit combination complete with toggle switch and duplex receptacle (No. 6101-6103).



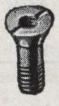
Button
No. 6193
Used only with switch plates, 2-gang unit combination and No. 7141
List $0.10



Button
No. 6190
Used with all numbers except switch plates, 2-gang unit combination and No. 7141
List $0.10

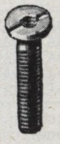


Luminous Button
No. 6191
for all numbers
List $0.40



Attaching Screw
No. 6195
Used only with switch plates, 2-gang unit combination and No. 7141
List $0.05

No. 6197, 1¾ in. screw, List $0.06
No. 6198, 3 in. screw, List .07



Attaching Screw
No. 6196
Used with all numbers except switch plates, 2-gang unit combination and No. 7141
List $0.05

Note: Price of all plates, receptacles and unit combinations includes finishing buttons and attaching screws. Luminous buttons are extra.

THE HART & HEGEMAN MFG. CO.

Electric Switches and Wiring Devices

342 Capitol Avenue
HARTFORD, CONN.

FACTORIES: HARTFORD, CONN.; PHILADELPHIA, PA.; TRENTON, N. J.

Products

"H&H" Flush Switches: Tumbler, Push and Rotary, in Shallow and Deep Bases; Automatic Door Switch, and Panelboard Switches.

Flush Receptacles: Shallow and Deep Bases, and "H&H" Floor Receptacles.

Warning Lights and Combinations.

Plates: Standard Plates for all devices and in gangs and combination, Round End and Oval Plates.

Also manufacturers of "H&H" Sockets, Rosettes, Attachment Plugs and Cut Outs, Pull Switches, Entrance Switches, Motor Control and Heater Switches; "H&H" Surface Switches, "H&H" Wall Cases, "H&H" Renewable Fuse Plugs and "H&H" Elexits.

H&H
TRADE-MARK

The Catalogue and the Material Included

This catalogue has been arranged to include only the devices in which the architect is directly interested. The switches, receptacles, etc., with the proper plates have been arranged so as to have all the information on each subject in a condensed form. The list prices have been included in order to give the relative cost of the various products. General Catalogue "R" sent on request.

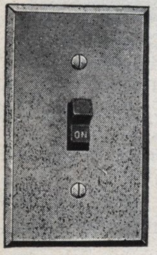
"H&H" Line of Electric Wiring Devices

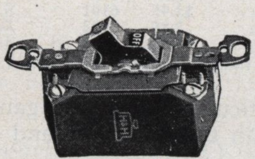
This Company was one of the pioneers of the trade and has always been known for the high quality of its products. Every effort is made to produce the best article possible. Each piece is accurately made of the best materials and can be depended on to give the very best in service and satisfaction to the user.

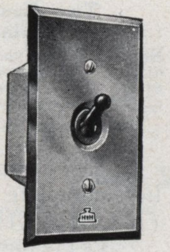
"H&H" TUMBLER SWITCHES AND PLATES

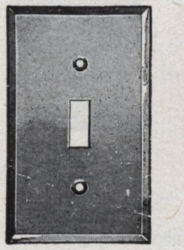
The "H&H" Tumbler Switch is being used more extensively on account of its practicability. The operating lever arm moves up and down and indications clearly show whether current is "on" or "off."

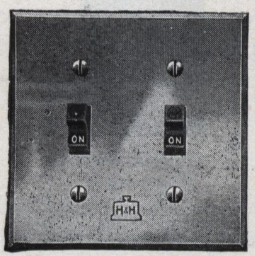
The mechanism is of the highest quality and is smooth, positive and quick acting in operation. The switch blades are well insulated from the operating mechanism. The bases are made in both the porcelain and composition types. They are made for single, double, three-way and four-way control.

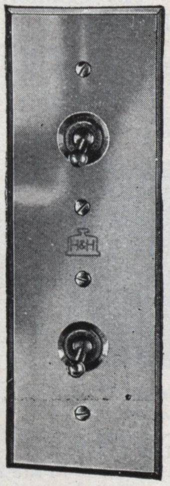

No. 8601 Sqr. with No. 8841 Plate
Flush Type Shallow Porcelain Base
Depth 1 in.


No. 8902
Flush Type Shallow Composition Base
Depth 1 in.


No. 8401
Flush Type Porcelain Base
Depth 1⅝ in.


No. 8841 Plate
Single-gang


No. 8601 Sqr. Switch
No. 8842 Plate
Two-gang


No. 8401 Switch
No. 8462 Plate
Tandem Two-gang

"H&H" Tumbler Switches, Flush Type

Number of poles	Switches with Porcelain Base								Both Foregoing Types with Composition Bases, Bakelite Insulation, etc.		
	Sqr. handle, shallow base 1 in. deep				Round handle, deep base 1⅝ in. deep				List No.		List price
	Rating		** List No.	List price	Rating		List No.	List price			
	125 V	250 V			125 V	250 V			Sqr. handle, shallow	Round handle, deep	
*Single..	10A	5A	8601	$0.45	10A	5A	8401	$0.45	8901	8491	$0.72
Double..	10A	10A	8602	.70	10A	10A	8402	.70	8902	8492	.88
*3-way..	10A	5A	8603	.70	10A	5A	8403	.70	8903	8493	.88
4-way...	10A	5A	8604	2.00	10A	5A	8404	2 00	8904	......	2 00
Double..	20A	20A	8642	80	20A	20A	8432	.80	8909	8495	1.40

All tumbler switches may be supplied with radio luminous levers (at additional cost of 25¢ each).

Plates for tumbler switches listed in the plate section (at the right).

*Extra discounts bring 8601 and 8603 to same low net prices as "Nutmeg" Push Switches on following page.

**Add Sqr. after each number to indicate square handles.

Shallow switches with round handles supplied when specified without extra charge.

"H&H" Plates for Tumbler Switches

Number of switches	Horizontal for Round Handle Switches								Tandem for Round Handle Switches			
	Ht., in.	W'th, in.	Struck-up plates				Solid brass		Solid brass (only)			
			.040 in. brass		.060 in. brass							
			List No.	List price	List No.	List price	List No.	List price	Ht., in.	W'th, in.	List No.	List price
One.....	4½	2¾	8441	$0.14	8591	$0.18	8451	$0.34	.....	.....	.....	.....
Two....	4½	4$\frac{9}{16}$	8442	.28	8592	.36	8452	.68	8⅛	2¾	8462	$0.80
Three...	4½	6⅜	8443	.42	8593	.54	8453	1.02	11¾	2¾	8463	1.20
Four....	4½	8$\frac{3}{16}$	8444	.88	8594	1.04	8454	1.36	15⅜	2¾	8464	1.60
	Horizontal for Square Handle Switches								Tandem for Square Handle Switches			
One.....	4½	2¾	8841	$0.14	8861	$0.18	8851	$0.34	8⅛	2¾	8872	$0.80
Two....	4½	4$\frac{9}{16}$	8842	.28	8862	.36	8852	.68	11¾	2¾	8873	1.20
Three...	4½	6⅜	8843	.42	8863	.54	8853	1.02	15⅜	2¾	8874	1.60
Four....	4½	8$\frac{3}{16}$	8844	88	8864	1 04	8854	1.36	..		....	..

Also made for 5, 6, 7 and 8 switches. Prices are for "Old Brass" finish. For other finishes see page 60, Catalogue R.

Bakelite plates furnished up to 3 gangs.

"H&H" FLUSH TUMBLER SWITCHES AND PLATES

Continued on next page

HART & HEGEMAN PUSH BUTTON SWITCHES

We manufacture push button switches in three price classes for use in work of the very finest grade or where less expensive material is required. The switches made by this Company have been used in the leading hotels, office and public buildings, institutions and residences of this country for the past thirty years and are generally regarded as the most desirable for such use.

In specifying, be sure to name the standard desired and see that the standard called for is used at the job. The switch installed should be not only of Hart & Hegeman make but should correspond to your specifications of the particular standard or brand of "H&H" Switch.

Where light is controlled from two points, use a 3-way switch.

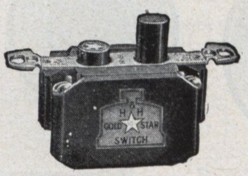
For each additional point of control use a 4-way switch.

Electrolier switches are made for controlling two or three circuits separately or at the same time.

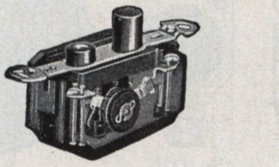
All switches except lock type can be obtained with radio luminous buttons.

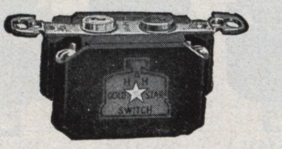
"GOLD STAR" AND "SILVER STAR" PUSH BUTTON SWITCHES (Highest Standard)

"Gold Star" is the very finest grade "H&H" push button switch made. It is especially noted for its smoothness and quietness of action. It is made to the most exacting specification as to quality of material, accuracy of parts and of action. The base is made of a high grade composition. The 14-karat gold star button insert will not tarnish and is a definite means of identification. The "Silver Star" Switch is the same as the "Gold Star" except that it has a radio luminous star in the button. Lock Type "Gold Star" Switch has the "Gold Star" mechanism but can only be operated with a key. Useful in public buildings, hospitals and asylums.

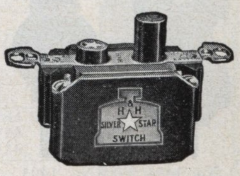


No. 8421


No. 8421 Showing Mechanism



No. 8421L (Lock)



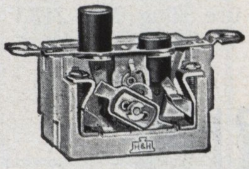
No. 8426

"Gold Star" and "Silver Star" Switches Have Composition Bases 1½ in. Deep

Number of poles	"Gold Star"				"Silver Star"—(Luminous)				"Gold Star"—Lock type			
	Rating		List No.	List price	Rating		List No.	List price	Rating		List No.	List price
	125 V	250 V			125 V	250 V			125 V	250 V		
Single	10A	5A	8421	$0.72	10A	5A	8426	$0.97	10A	5A	8421L	$1.17
Double	10A	10A	8422	.88	10A	10A	8427	1.13	10A	10A	8422L	1.33
3-way	10A	5A	8423	.88	10A	5A	8428	1.38	10A	5A	8423L	1.33
4-way	10A	5A	8424	2.00	10A	5A	8429	2.50	10A	5A	8424L	2.45
Double	20A	20A	8425	1.40	20A	20A	8430	1.65	20A	20A	8425L	1.85

"H&H" 2081 TYPE PUSH BUTTON SWITCH ("The Old Reliable")

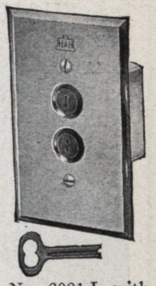
This "H&H" Switch has been specified for years by architects as being the standard, high quality switch. All parts are of the best material, accurately made and although not as expensive as the "Gold Star" Switch, it will give the best of service for years. It can be identified by the "H&H" on the black button.


"H&H" Type No. 2081

With Porcelain Base 1$\frac{11}{16}$ in. Deep

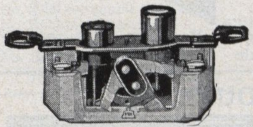
Number of poles	Standard type				*Lock type				Electrolier type				
	Rating		List No.	List price	Rating		List No.	List price	10 amp. 125 V 5 amp. 250 V	Indicating		Non-ind.	
	125 V	250 V			125 V	250 V			Circuits	List No.	List price	List No.	List price
Single...	10A	5A	2081	$0.45	10A	5A	2081L	$0.90	1, off, 1 and 2, off, 1 and 2 and 3, off...	2967	$1.15	3511	$1.05
Double..	10A	10A	2082	.70	10A	10A	2082L	1.15					
Double..	20A	20A	3778	.80	20A	20A	3778L	1.25	1, off, 1 and 2, off...	2968	1.15	3512	1.05
3-way...	10A	5A	2083	.70	10A	5A	2083L	1.15	1, off, 2, off, 1 and 2, off............	3264	1.15	3513	1.05
4-way...	10A	5A	2084	2.00	10A	5A	2084L	2.45					

*One key is furnished with each lock switch.



No. 2081-L with No. 4077 Plate

"NUTMEG" PUSH BUTTON SWITCH


No. 4401-S

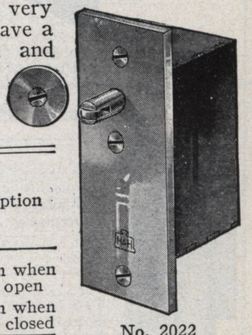
The "Nutmeg" is a good quality switch designed for use where cost is a factor. Shallow type is especially designed for use in 2-inch wall partitions. The standard base is porcelain but it can be supplied with composition base on special order at an advance in price.

Inexpensive Type with Porcelain Base

Number of poles	Shallow base 1 in. deep				Standard base 1⅝ in. deep			
	Rating		List No.	List price	Rating		List No.	List price
	125 V	250 V			125 V	250 V		
Single......	10A	5A	4401S	$0.35	10A	5A	4401	$0.35
Double.....	10A	10A	4402S	.70	......	......	......	......
3-way......	10A	5A	4403S	.50	10A	5A	4403	.50
4-way......	10A	5A	4404S	2.00	......	......	......	......

"H&H" DOOR SWITCH

The "H&H" door switch is very durable and efficient. All plungers have a roller tip which prevents friction and strain on the switch. It also adjusts itself automatically to the shrinking or swelling of the door.


No. 2022

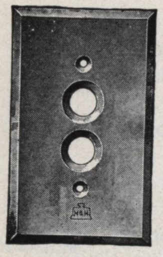
Number of poles	Rating		List No.	List price	Description
	125 V	250 V			
Single...	6A	3A	2022	$2.25	Light on when door is open
Single...	6A	3A	2023	2.25	Light on when door is closed

Dimensions of plate, 3¾x1¼ in. Mortise, 2⅝x1$\frac{1}{16}$x1¾ in. deep.

No. 3047 iron box for door switch 2⅞x1¼x2¾ in.

"H&H" PUSH BUTTON AND AUTOMATIC DOOR SWITCHES

Continued on next page

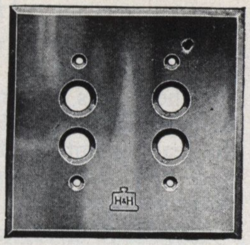

No. 4077

"H&H" PLATES FOR PUSH BUTTON SWITCHES

Number of switches	Horizontal								Tandem			
			Struck-up plates				Solid brass		Solid brass (only)			
			.040 in. brass		.060 in. brass							
	Height, in.	Width, in.	List No.	List price	List No.	List price	List No.	List price	Height, in.	Width, in.	List No.	List price
One	4½	2¾	4077	$0.14	2301	$0.18	4051	$0.34	......	......	......	......
Two	4½	4 9/16	4078	.28	2302	.36	4052	.68	8⅛	2¾	4072	$0.80
Three	4½	6⅜	4079	.42	8613	.54	4053	1.02	11¾	2¾	4073	1.20
Four	4½	8 3/16	1154	.88	8614	1.04	4054	1.36	15⅜	2¾	4074	1.60

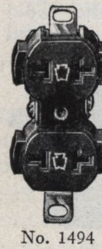
Note: Also made for 5, 6, 7 and 8 switches. Prices are for "Old Brass" finish. For other finishes see page 60 of our Catalogue R.

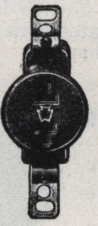
Also made for 5 and 6 switches.

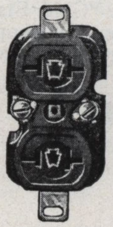

No. 4078

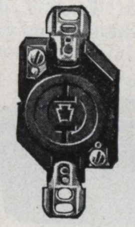
"H&H" CONVENIENCE OUTLETS (Shallow Type)

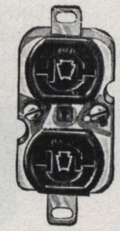
These outlets are made in the shallow type with the T-slot which takes all standard plug caps. Bases are of composition or porcelain as indicated below. These outlets may be used in 2-in. wall partitions as well as in standard construction. The bases, except 1454 and 1455, are the same depth as shallow switches, 1 in. deep.


No. 1494


No. 1493


No. 1437


No. 1435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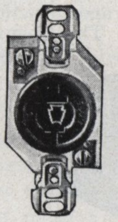
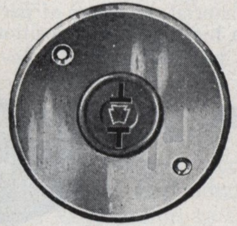
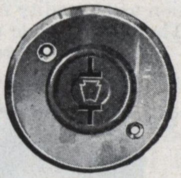

No. 1430


No. 1455


No. 1454

Single Convenience Outlets
10 amperes, 250 volts

Description	List No.	List price
Composition side wire for plate without lid	1493	$0.30
Composition for plate without lid	1435	.33
Porcelain for plate without lid	1430	.30
Porcelain for plate with lid	1440	.35

Duplex Convenience Outlets
10 amperes, 250 volts

Description	List No.	List price
Composition side wired	1494	$0.48
Composition	1437	.51
Porcelain	1482	.48

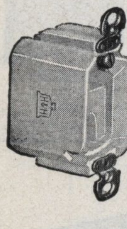
Round Convenience Outlets
10 amperes, 250 volts

Description	List No.	List price
Receptacle with 2¾-in. round plate	1454	$0.85
Plate for No. 1454	1471	.50
Base for No. 1454	1472	.35
Receptacle with 3⅝-in. round plate	1455	.95
Plate for No. 1455	1452	.60
Base for No. 1455	1453	.35

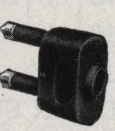
"H&H" FLUSH RECEPTACLES WITH CLOSING SHUTTERS

"H&H" Flush Receptacles with closing shutters are used where a special non-interchangeable plug is desired, as in hotels, etc. Also used in wood floors, where there is no danger from water, especially for dining rooms.

The prongs of the plug can be inserted through two small holes in a rug or at a seam. As the plugs are insulated to the points there is no danger of short circuiting. For extra thick rug use Plug No. 2133 with long prongs.


No. 2001
Receptacle

No. 2033
Plate


No. 2002
Plug

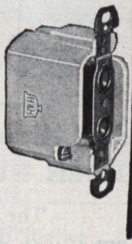
With Shutters on Plate
10 amperes, 125 volts

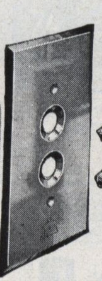
Description	List No.	List price
Receptacle No. 2001, Plug No. 2002 and No. 2033 plate	2034	$1.40
Plug with extra long fingers for No. 2001 or No. 2850 receptacles	2133	.50
Single plate for No. 2001 receptacle	2033	.65
Two-gang plate for 2 No. 2001	2233	1.30

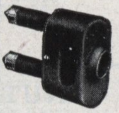
With Shutters on Receptacle
10 amperes, 250 volts

Description	List No.	List price
Receptacle No. 2850, Plug No. 2002 and No. 2301 switch plate	3087	$1.23
Plug only	2002	.25
Single brass switch plate	2301	.18
Two-gang brass switch plate	2302	.36

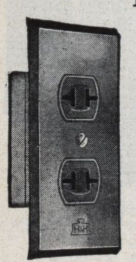
Plates for these receptacles are same size as for single and duplex convenience outlets.


No. 2850
Receptacle


No. 2301
Plate

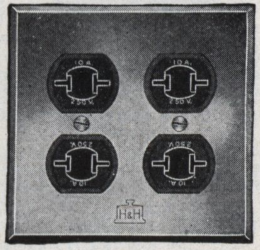

No. 2002
Plug

"H&H" PLATES FOR SINGLE AND DUPLEX CONVENIENCE OUTLETS


No. 1482 with
No. 1485 Plate

Number of receptacles	Height, in.	Width, in.	For Single Convenience Outlets						For Duplex Convenience Outlets					
			Struck-up plates				Solid brass		Struck-up plates				Solid brass	
			.040 in. brass		.060 in. brass				.040 in. brass		.060 in. brass			
			List No.	List price	List No.	List price	List No.	List price	List No.	List price	List No.	List price	List No.	List price
One	4½	2¾	8631	$0.14	1710	$0.18	1431	$0.34	1485	$0.14	8661	$0.18	8671	$0.34
Two	4½	4 9/16	8632	.28	1712	.36	1432	.68	1486	.28	8662	.36	8672	.68
Three	4½	6⅜	8633	.42	1107	.54	1433	1.02	8643	.42	8663	.54	8673	1.02
Four	4½	8 3/16	......	......	......	......	1434	1.60	......	......	......	......	......	......

Note: Prices are for "Old Brass" finish. For other finishes see page 60, Catalogue R.


No. 1482 with
No. 8662 Plate

"H&H" SWITCH PLATES—"H&H" CONVENIENCE OUTLETS AND PLATES

Continued on next page

"H&H" BULLSEYE RECEPTACLES (Warning Lights)

This receptacle consists of a small lamp contained in a suitable porcelain base with wiring contacts. When mounted underneath a plate having a colored glass lens, it becomes a signal or warning light. Used in connection with electrical appliances, it indicates when the current is on.

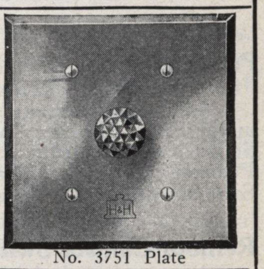
A patented feature is hinging of the lamp socket, enabling lamps to be more easily renewed and thus reduce breakage. (Pages 42-44, Catalogue R.) The light shines directly through the cut glass bullseye and serves as a reminder to turn current off when not needed.

"H&H" SINGLE WARNING LIGHTS

No. 2999

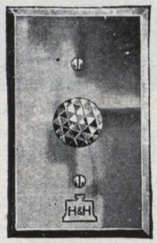
For 125-volt and 32-volt Circuits			For 250-volt Circuit		
Description	List No.	List price	Description	List No.	List price
Receptacle with 2 c.p., 125-volt candelabra base with lamp	2999	$1.00	Plate only for two No. 2999 receptacles wired in series 4½ in. high x 4⁹⁄₁₆ in. wide for 2-gang wall case	3751	$1.60
Receptacle with 2 c.p., 32-volt candelabra base with lamp	3099	1.50			
Single plate with bullseye 4½ in. high x 2¾ in. wide	3000	1.00			

Red is standard color for bullseye. Other colors supplied, if wanted.



No. 3751 Plate

"H&H" PLATES FOR BULLSEYE RECEPTACLES



No. 3000

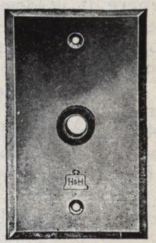
Number of receptacles	Height, in.	Width, in.	Struck-up plates				Solid brass	
			.040 in. brass		.060 in. brass			
			List No.	List price	List No.	List price	List No.	List price
One	4½	2¾	8691	$0.80	8701	$0.84	3000	$1.00
Two	4½	4⁹⁄₁₆	8692	1.60	8702	1.68	8677	2.00
Three	4½	6⅜	8693	2.40	8703	2.52	8678	3.00

"H&H" PLATES FOR SINGLE TELEPHONE OUTLETS

Number of gang	Struck-up plates				Solid brass	
	.040 in. brass		.060 in. brass			
	List No.	List price	List No.	List price	List No.	List price
One	3144	$0.20	3739	$0.24	3246	$0.40
Two	8682	.40	8727	.48	8725	.80
Three	8683	.60	8728	.72	8726	1.20

Note: Prices are for "Old Brass" finish. For other finishes, see page 60, Catalogue R.

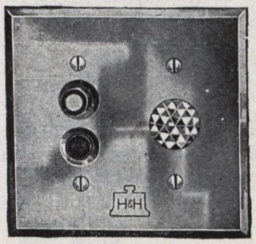
"H&H" blank plates are made in the same quality and size as other "H&H" plates. Double Telephone Outlet plates may also be furnished.



No. 3144

"H&H" COMBINATIONS

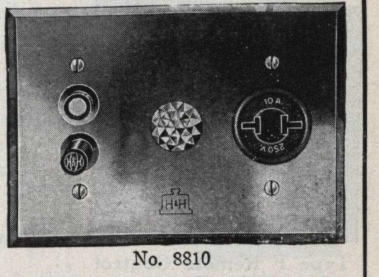
BULLSEYE AND SWITCH



No. 3752

With Double Pole "H&H" Push Switch 10 amperes, 125 volts			With Double Pole "H&H" Tumbler Switch 10 amperes, 125 volts		
Description	List No.	List price	Description	List No.	List price
No. 2082 D.P. "H&H" switch No. 2999 Receptacle with lamp No. PB Plate with bullseye	3752	$3.24	No. 8602 Sqr. D.P. tumbler switch No. 2999 Receptacle with lamp No. IB Plate with bullseye	8690	$3.24

Note: Two-gang standard wall case required for these combinations.

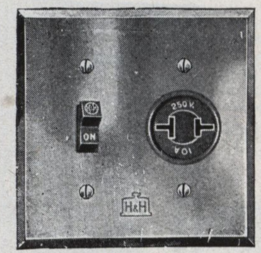


No. 8810

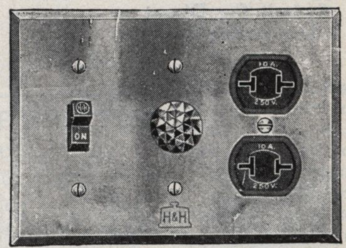
SWITCH AND CONVENIENCE OUTLET

With Single Convenience Outlet			With Single Convenience Outlet		
No. 2082 D.P. "H&H" push switch No. 2999 Receptacle with lamp No. 1430 Convenience outlet No. PBF Plate with bullseye	8810	$3.98	No. 8602 Sqr. D.P. tumbler switch No. 2999 Receptacle with lamp No. 1493 Convenience outlet No. IBF Plate with bullseye	8729	$3.98
With Duplex Convenience Outlet			**With Duplex Convenience Outlet**		
No. 2082 D.P. "H&H" push switch No. 2999 Receptacle with lamp No. 1482 Plug receptacle No. PBD Plate with bullseye	3759	$4.16	No. 8602 Sqr. D.P. tumbler switch No. 2999 Receptacle with lamp No. 1494 Duplex plug receptacle No. IBD Plate with bullseye	8730	$4.16

Many other styles and combinations of warning lights are listed in our General Catalogue "R."



No. 8690



No. 8730

BULLSEYE, SWITCH AND SHUTTER RECEPTACLE

With D.P. Push Switch Shutter receptacle						With D.P. Tumbler Switch Shutter receptacle					
Description 10 amperes, 125 volts	List No.	List price	Description 10 amperes, 250 volts	List No.	List price	Description 10 amperes, 125 volts	List No.	List price	Description 10 amperes, 250 volts	List No.	List price
No. 2082 D.P. push switch No. 2999 receptacle with lamp No. 2850 plug receptacle No. 2002 plug No. PBP plate with bullseye	8724	$4.73	No. 2082 D.P. push switch Two No. 2999 receptacles No. 2850 plug receptacle No. 2002 plug No. PXP plate with bullseye	3760	$6.23	No. 8602 Sqr. D.P. tumbler switch. No. 2999 receptacle with lamp No. 2850 plug receptacle No. 2002 plug No. TBP plate with bullseye	8799	$4.73	No. 8402 D.P. tumbler switch. Two 2999 receptacles with lamp No. 2850 plug receptacle No. 2002 plug No. TXP plate with bullseye	8803	$6.23

Note: A four-gang wall case is needed for use with 250-volt combinations.

"H&H" PLATES FOR COMBINATIONS

TWO-GANG

Description	Push Switch					Tumbler Switch				
	Convenience outlet		List price	Bullseye receptacle		Convenience outlet		List price	Bullseye receptacle	
	Single	Duplex				Single	Duplex			
	List No.	List No.		List No.	List price	List No.	List No.		List No.	List price
.040 in. brass	PF 40	PD 40	$0.38	PB 40	$1.04	TF 40	TD 40	$0.38	TB 40	$1.04
.060 in. brass	PF 60	PD 60	.46	PB 60	1.12	TF 60	TD 60	.46	TB 60	1.12
Solid brass	PF	PD	.88	PB	1.54	TF	TD	.88	TB	1.54

THREE-GANG

Description	Push Switch and Bullseye					Tumbler Switch and Bullseye				
	Convenience outlet		List price	No. 2850 receptacle		Convenience outlet		List price	No. 2850 receptacle	
	Single	Duplex				Single	Duplex			
	List No.	List No.		List No.	List price	List No.	List No.		List No.	List price
.040 in. brass	PBF 40	PBD 40	$1.28	PBP 40	$1.28	TBF 40	TBD 40	$1.28	TBP 40	$1.28
.060 in. brass	PBF 60	PBD 60	1.40	PBP 60	1.40	TBF 60	TBD 60	1.40	TBP 60	1.40
Solid brass	PBF	PBD	1.98	PBP	1.98	TBF	TBD	1.98	TBP	1.98

Two-gang plates are 4½ in. high x 4⁹⁄₁₆ in. wide. Three-gang plates are 4½ in. high x 6⅜ in. wide.

Prices given are for "Old Brass" finish. "T" is the symbol plate letter for round handle tumbler switch. If square handle tumbler switch plate is desired substitute "I" at same price.

"H&H" WARNING LIGHTS, COMBINATIONS AND PLATES

THE HART MANUFACTURING CO.

Manufacturers of Switches, Receptacles and Appliances

HARTFORD, CONN.

BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street
BOSTON, MASS., 170 Summer Street
CHICAGO, ILL., 312 So. Green Street
DENVER, COLO., 13th Avenue and Broadway
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TORONTO, ONT., 331 King Street, West
LONDON, ENG., 76-77 Rochester Row, Westminster, S. W.

Products

"Diamond H" Remote Control Switches.

Also Push Button and Lever Switches, Automatic Door Switches, Automatic Flush Receptables, Series Parallel Heater Switches, Feed Through and Pendant Switches, Momentary Contact Switches, Surface Switches, Door Bolt Control Switches.

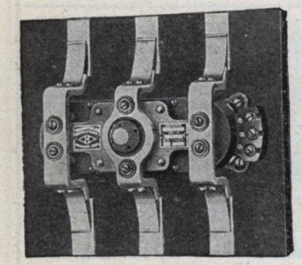
Remote Control Switches

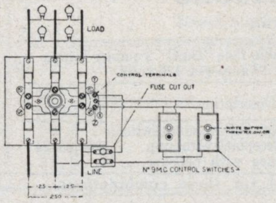
A remote control or magnetically operated switch is used where it is desired to control a certain load from a remote point, so remote that it would be inexpedient and expensive to run the heavy mains from the load to the point of control and return.

A remote control switch is installed as near the load as practicable and three small wires, for moderate distances No. 14, are run from this switch to the manual momentary contact switch located at the desired point of control. The points of control may be increased to any desired number.

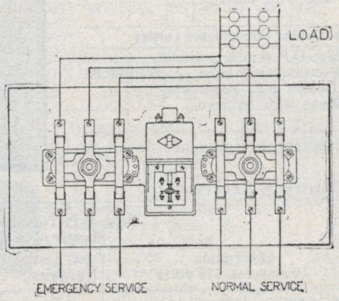
Type F—The two Type F remote control switches and relay illustrated are adapted for use as a double throw switch when two sources of current supply are available. Upon the failure of one source, the load is automatically transferred to the second source and automatically retransferred to the first upon its return to normal voltage.

The momentary contact switch is normally in an open position, and connects the common control wire alternately with the other two which are in series with the opening and closing coils respectively of a remote control switch.

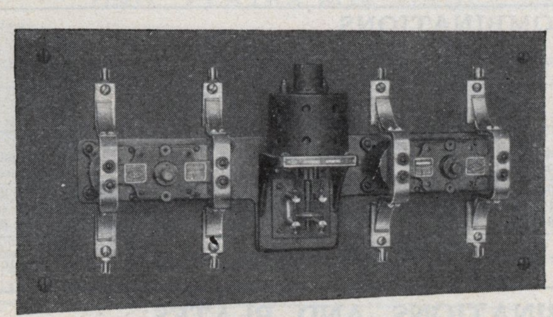

Type F Remote Control Switch for Direct or Alternating Current



Wiring Diagram and Connections for Type F Switch
Showing 2-point control



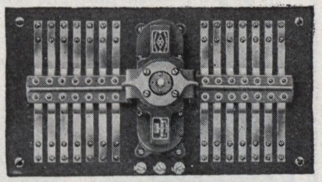
Wiring Diagram Two Type F Switches and Relay
Showing metal sub-base
(See illustration below)

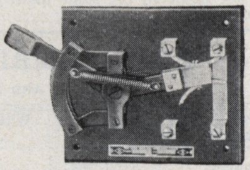

Double Throw Combination Remote Control Switch

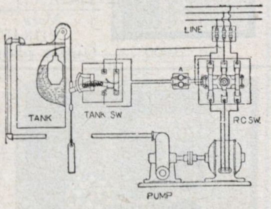
The principal use of the remote control switch is for the control of large groups of lights in public buildings, trainsheds, isolated sections of plants or docks, individual buildings, etc.

They are also used largely for the control of motors, such as motors for elevators, pumps, vacuum cleaners or individual machines or printing presses.

Remote control switches are also used in connection with automatic devices of many kinds, such as thermostats, pressure gages, clocks, tank floats, fire engine house relays, high and low voltage relays, or in any place where it is desired that a circuit shall be opened or closed upon the existence of a predetermined condition.


Multi-current Switch for Control of Emergency Lights or Burglar Alarm Systems


"Diamond H" Tank Switch without Float and Cable



Outline of the "Diamond H" Tank Switch
Showing operation by float and cable

The coils of remote control switches are wound to operate either at line potential or by an auxiliary circuit of lower voltage, such as a battery circuit.

Type F is built in 8 sizes, from 30 to 400 amp.

Type A—In Type A switch, the closing coil is of comparatively low resistance and requires current only while the switch is closing.

An interruption of the coil circuit, either from failure of current supply or by the opening of the control switch, allows the armature, which this high resistance coil holds suspended, to drop, releasing the ball-locking device of the main armature and allowing the switch to open by gravity.

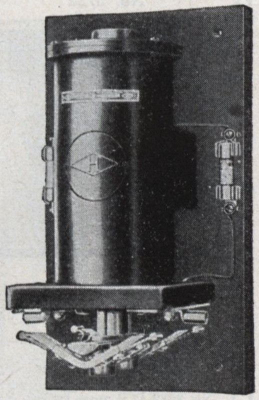
The manual control is effected by a single pole switch, or, when more than one point of control is desired, by three-way and four-way switches.

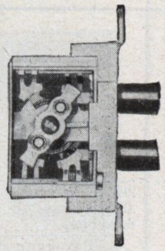
The switch is built for both alternating and direct current, but with different windings.

Type A switch is used principally on intermittent work.

Momentary Contact Switch—This is a special push button switch for use in connection with remote control switches.

The mechanism is similar to that of the regular "Diamond H" push button switch and is so arranged that a snap contact is made by pressing either of the buttons and a quick break is obtained when the button is released. Both buttons can not be pressed at the same time.


Type A Remote Control Switch
No voltage release


Mechanism of Momentary Contact Switch

HARVEY HUBBELL, INC.

Manufacturers of Electrical Specialties

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Products

Approved Wiring Devices, including Hubbell T-Slot Receptacles of all types, Brass Shell and Porcelain Sockets, Flush Door Receptacles, Toggle Switches, Plugs and Caps, etc.

TRADE-MARK

The Company and Its Products

This Company was one of the pioneers in the manufacturing of electrical specialties. Many of the special appliances and improvements introduced by us are now standard with all manufacturers, such as the well known Hubbell pull chain socket and T-Slot type of plug receptacle which accommodates all standard plugs. Hubbell products have a national distribution and can be secured through electrical supply houses throughout the country.

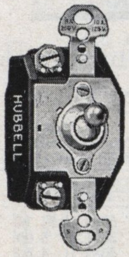
HUBBELL HIGHEST GRADE (DE LUXE) SHALLOW FLUSH TOGGLE SWITCH

This switch is designed for the highest class work in residences, clubs, office buildings, hotels, etc. It is the result of years of experimenting and improvement to obtain the very best mechanism and action possible to produce in a toggle switch. Being of the shallow type it can be used for 2-inch partitions. This switch is recommended where the utmost satisfaction is required in a toggle switch.

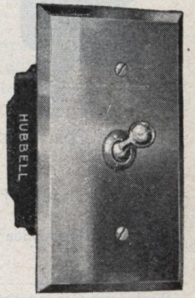
The toggle arm when operated winds up a strong spring and when wound to its full strength it is released by what is known as the lock and release movement. This we believe is the first time that this movement has ever been applied to the toggle switch action. The movement is extremely smooth and positive and there can be no binding or burned contacts by this type of mechanism which is exclusive with us. It requires only a slight pressure by the finger or elbow to operate the switch.

The body is made in black composition. It has the advantage of having a metal plate cover in addition to the fiber cover to protect the mechanism of the inside of the switch if installed before the plastering is completed.

The handle is of brass and can be furnished with a luminous tip of Undark when so ordered.



No. 8121



No. 8121 with No. 8291 Plate

WITH COMPOSITION BASE, BRASS HANDLE AND CLOSED TOP

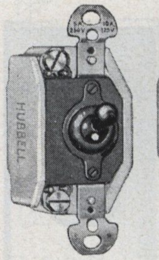
Number of poles	Amperes		List No.	List price
	125 v.	250 v.		
Single	10	5	8121	$0.72
Double	..	10	8122	.88
Double	..	20	8132	1.40
Three-way	10	5	8123	.88
Four-way	5	2	8124	2.00

Will fit 1½-in. switch boxes. No. 8121 Line can be furnished with luminous tip handle at extra cost of 25¢. Nickel handles furnished for white enamel plates unless otherwise specified.

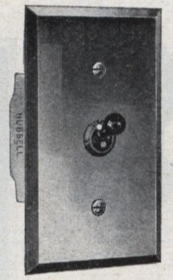
HUBBELL MEDIUM GRADE SHALLOW FLUSH TOGGLE SWITCHES

These switches are designed especially for use where a good serviceable switch is required for medium grade work and the question of cost is a consideration. The switches are similar in construction to the high grade switch. They do not have the extra metal plate over the fiber cover. The action is absolutely smooth and all parts are made to withstand long usage.

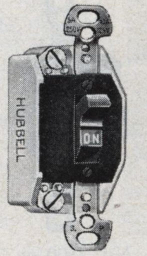
The switches are furnished in two types. The 8641 Line has a round tip bakelite handle. The 8791 Line has a square composition handle. The latter type of handle is being standardized to fit a standard size oblong hole face plate. Many features in its construction have been perfected after many years of experimentation.



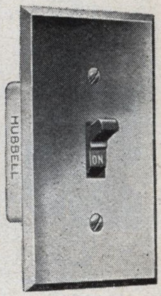
No. 8641



8641 with 8291 Plate



No. 8791



8791 with 8771 Plate

WITH BAKELITE HANDLE

Number of poles	Amperes		List No.	List price
	125 v.	250 v.		
Single	10	5	8641	$0.45
Double	....	10	8642	.70
Three-way	10	5	8643	.70
Four-way	5	2	8644	2.00

Will fit 1½-in. switch boxes. White dot on handles of single and double pole switches indicates when current is on or off.

WITH SQUARE COMPOSITION HANDLE

Number of poles	Amperes		List No.	List price
	125 v.	250 v.		
Single	10	5	8791	$0.45
Double	....	10	8792	.70
Three-way	10	5	8793	.70
Four-way	5	2	8794	2.00

Will fit 1½-in. switch boxes. On and off are lettered in white on the handles of the single and double pole switches.

These switches can not be furnished with luminous tips.

Continued on next page

HUBBELL SURFACE TOGGLE SWITCHES

These switches afford a full line of dependable switches for location where the extra cost of flush toggle switch and concealed wiring is not warranted or required. They are especially useful in basements, garages, factories, etc., where exposed wiring in BX or metal moulding is used. They are made with a black porcelain base and closed brass cap. The handle is of brass. The switch action is positive and is controlled by a strong spring which actuates the mechanism with a quick yet smooth action. They are made in both 5 and 10-ampere types.

No 8171

Number of poles	Amperes 125 v.	Amperes 250 v.	Black porcelain base Solid	Black porcelain base Slotted	List price
Single	5	3	No. 8171	No. 8191	$0.28
Three-way	5	3	No. 8173	No. 8193	.48
Single	10	5	No. 8421	No. 8431	.48
Double	10	5	No. 8112	No. 8162	.76
Three-way	10	5	No. 8153	No. 8233	.76

Outside diameter of base for 5-ampere switches and single pole 10-ampere bases is 2¼ in. Outside diameter of base of the double and three-way 10-ampere switches is 2⅝ in. Switches Nos. 8112, 8153, 8162 and 8233 may be furnished with luminous tipped handles at 25¢ additional to list price.

"Lacco" (lacquered brush brass) and Nickelplate are standard finishes. "Lacco" Brass furnished unless otherwise specified.

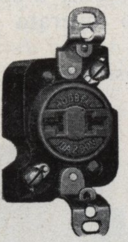
No. 8112

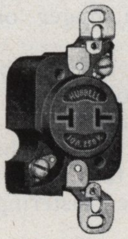
HUBBELL SHALLOW FLUSH CONVENIENCE OUTLETS FOR LIFT COVER PLATES

The T-Slots which are now standard for all convenience outlets were originated for convenience outlets by this company. The slots will accommodate any standard attachment plug caps having tandem or parallel blades. As none of the contacts are visible there is no danger of short circuiting.

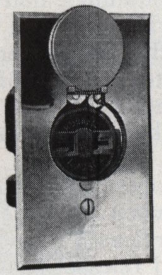
The body sets flush with the wall and is only 1 in. deep. The contact springs concealed in the T-Slots are double phosphor bronze and occupy individual contact chambers, which make poor contact or short circuit impossible. Only the cap blades can reach the contact springs.

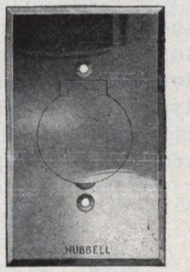
These outlets have the advantage of a cover in the plate for closing in the receptacle when not in use.


No. 5579
Black Porcelain


No. 6890
Composition

No. 5579 with
No. 6801 Plate


No. 5579 with
No. 5580 Plate


No. 5580
Double Hinge Plate

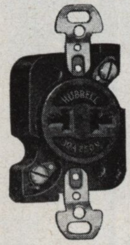
PLATES WITH LIFT COVERS FOR CONVENIENCE OUTLETS

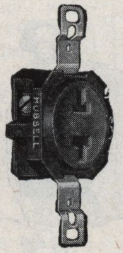
Description	Body	List No.	List Price	Description	Dimensions, in.	Single hinge type .060 in. metal List No.	Single hinge type .060 in. metal List price	Single hinge type .040 in. metal List No.	Single hinge type .040 in. metal List price	Self-closing spring cover .060 in. metal List No.	Self-closing spring cover .060 in. metal List price	Double hinge for Nos. 5579 and 6980 Solid brass .114 in. List No.	Double hinge for Nos. 5579 and 6980 Solid brass .114 in. List price
Single convenience outlet	Black porcelain	5579	$0.35	Single plate	4½x2¾	6801	$0.23	6866	$0.19	6897	$0.69	5580	$1.15
Single convenience outlet	Composition	6980	.35	Two-gang	4½x4 9/16	6871	.46	6867	.38	6898	1.20	5581	3.00
				Three-gang	4½x6⅜	6872	.69	6868	.57	6899	1.80	5582	4.50
				Four-gang	4½x8⅜							5600	6.00

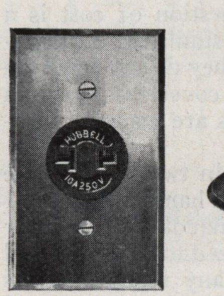
Standard finish, brush brass.

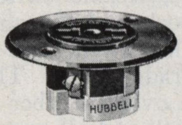
HUBBELL SINGLE AND DUPLEX STANDARD CONVENIENCE OUTLETS WITH COMPOSITION AND BLACK PORCELAIN BODIES

These are the standard T-Slot type of outlets and will accommodate all standard plug caps.

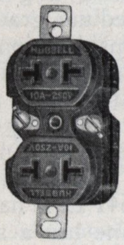

No. 5547 or
No. 5850

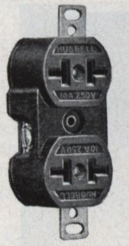

No. 7500 or
No. 7550

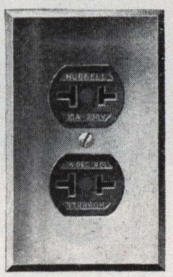



No. 6282

No. 6283


No. 6257 or
No. 5890


No. 7525 or
No. 7575



SINGLE CONVENIENCE OUTLETS (10-AMPERE 250-VOLT)

For Rectangular Plates

Description	List No.	List price
Black porcelain body, top wired	5547	$0.30
Composition body, top wired	5850	.30
Black porcelain body, side wired	7500	.30
Composition body, side wired	7550	.30

For Round Plates

Description	List No.	List price
Round porcelain body for 2¾-in plate	6282	$0.85
Round porcelain body for 3⅝-in. plate	6283	.95

DUPLEX CONVENIENCE OUTLETS (10-AMPERE 250-VOLT)

For Rectangular Plates

Description	List No.	List price
Black porcelain body, top wired	6257	$0.48
Composition body, top wired	5890	.48
Black porcelain body, side wired	7525	.48
Composition body, side wired	7575	.48

Note: Special attention is called to the fact that No. 7500 single convenience outlet has a perfectly plain face free of all markings.

Continued on next page

Main Entrance

Outside Light on S¹ Toggle Switch (Plate 1)
Illuminated Number on S¹ Toggle Switch (Plate 1)

Main Entrance Vestibule No. 1

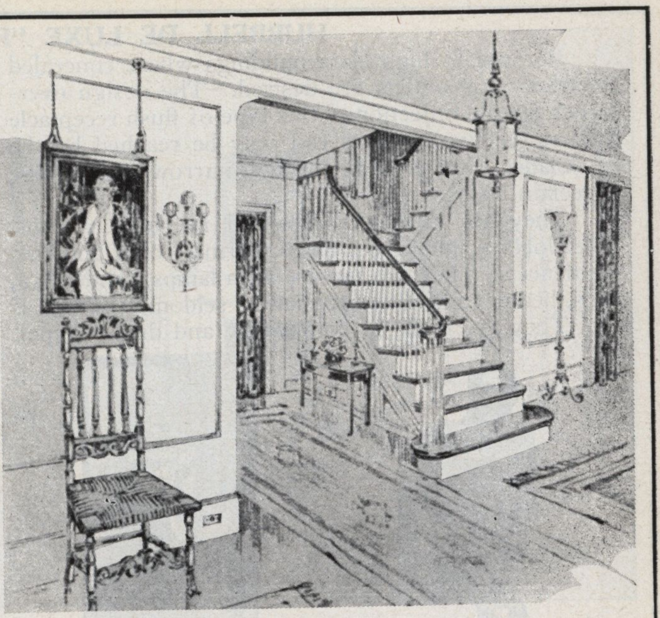
Ceiling Light on S³ Toggle Switch (Plate 1)

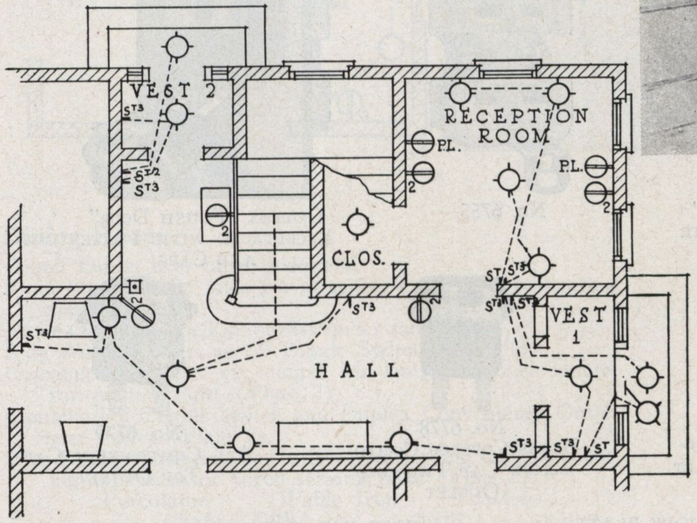
Main Hall

Ceiling Outlet on S³ Toggle Switch (Plate 1)
Wall Brackets on 2S³ Toggle Switches (Plate 1)
Semi Permanent Wrought Iron Floor Lamp—Flush Door Receptacle (Plate 3)
Double Convenience Outlets:
In base board for vacuum cleaner, floor polisher, etc.
Under side table for night lamp.

Side Vestibule No. 2

Ceiling Outlet on S³ Toggle Switch (Plate 1)




VEST 2
RECEPTION ROOM
P.L.
P.L.
CLOS.
VEST 1
HALL
ST3
ST2
ST

Side Entrance

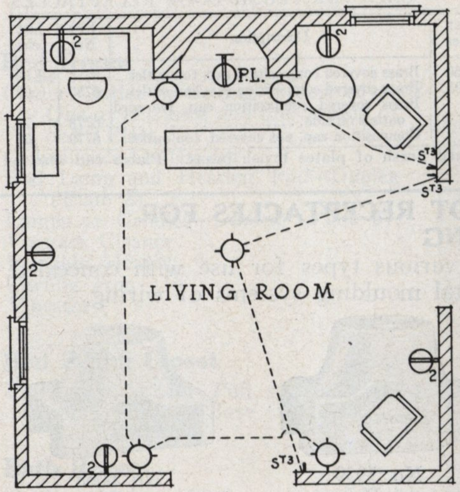
Side or Overhead Bracket Outlet on S¹ Toggle Switch (Plate 1)

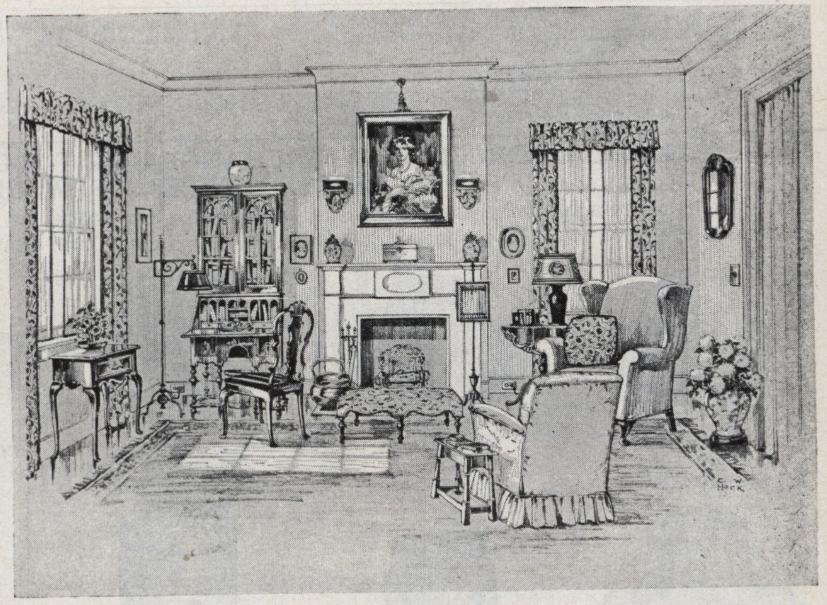
Reception Room

Ceiling Light on S² Toggle Switch (Plate 1)
Bracket Outlets on S² Toggle Switch (Plate 1)
Floor lamps, Double Convenience Outlets (Plate 2)
Picture Lights — Single Convenience Outlet (Plate 2)

Closet Off Reception Room

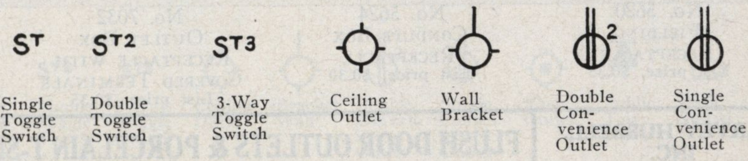
Ceiling Outlet on Pull Chain (Plate 4)


LIVING ROOM
P.L.
ST3
2



Living Room

Mantel Lights on 2S³ Toggle Switch (Plate 1)
Side Wall Brackets S² Toggle Switch (Plate 1)
Convenience Outlets for Picture Light Over Mantel on S² Toggle Switch (Plate 2)
Convenience Outlets for
- Table Lamps
- Floor Lamp
- Electric Cleaner
- Table Appliances
- Phonograph Motor
- Christmas Tree Outfit
- Electric Piano
- Portable Heater
- Electric Grate
- Moving Picture Machine


ST
Single Toggle Switch
ST2
Double Toggle Switch
ST3
3-Way Toggle Switch
Ceiling Outlet
Wall Bracket
2
Double Convenience Outlet
Single Convenience Outlet

Continued on next page

HUBBELL DE LUXE "FLUSH DOOR" OUTLETS

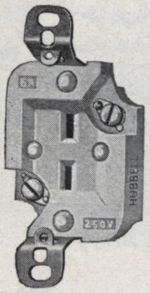
For use in high class buildings where concealed electrical plug outlets are desired. The design overcomes the old objection to this type of flush receptacle in that the live contacts can only be reached by the cap blades after passing through narrow slots in the porcelain body.

They are especially designed for use in clubs, hotel lobbies, public buildings, formal room and fine residences. They are for use with lamps, candelabra, fans, heaters and other appliances seldom removed.

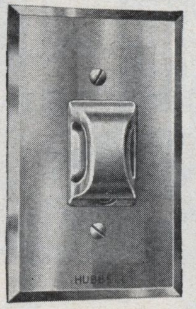
They are made in both single and duplex types, the duplex type occupying the same space as the single type.

Four different types of caps are made for use with these outlets to answer special conditions of use. They are made to take a cord at the top, at the end, or a double cord at the side. They are also made in plain composition and composition brass covered.

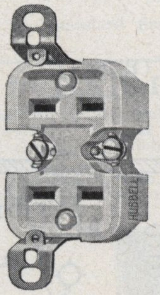
The outlets are sold with or without plugs. They are made for 10-amperes 250 volts for both single and double outlets. The brass covered caps can be finished to match the hardware.



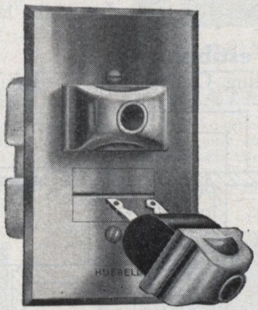
No. 6775



Single "Flush Door" Receptacle with Plate and Cap

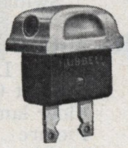


No. 6755

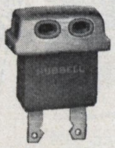


Duplex "Flush Door" Receptacle with Plate and Caps

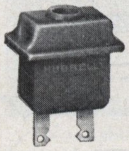
No. 6758
Brass Covered Composition Cap Top Outlet



No. 6759
Brass Covered Composition Cap End Outlet



No. 6778
Brass Covered Composition Cap Two-cord Outlet



No. 6779
All Composition Cap Top Outlet

"FLUSH DOOR" RECEPTACLES
6-AMPERE, 250-VOLT

Description	List No.	List price
Single receptacle, porcelain	6775	$0.50
Duplex receptacle, porcelain	6755	.75

"FLUSH DOOR" PLATES

Description	Size	List No.	List price
Single receptacle plate	2¾x4½ (.060 in. metal)	6776	$0.60
Duplex receptacle plate	2¾x4½ (.060 in. metal)	6756	.95

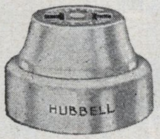
CAPS FOR FLUSH DOOR RECEPTACLES

Description	List No.	List price
Brass covered composition cap, top outlet	6758	$0.60
Brass covered composition cap, end outlet	6759	.60
Brass covered composition cap, two-cord outlets on side	6778	.70
Composition cap, not covered, top outlet	6779	.50

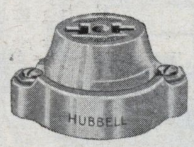
Receptacle is 1⅞ in. deep from face of plaster and requires standard outlet box. Standard finish of plates brush brass. Plates can also be obtained in solid brass on order and in special finishes.

HUBBELL PORCELAIN INTERCHANGEABLE T-SLOT RECEPTACLES FOR EXPOSED TYPES OF WIRING

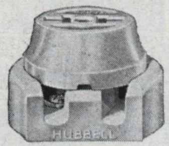
These receptacles have double T-Slot porcelain body and are used with 10 amperes, 250 volts. They are made in various types for use with concealed, cleat, and metal moulding systems of wiring.



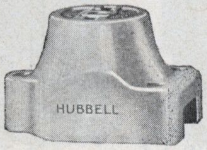
No. 5617
Concealed Receptacle
List price, $0.30



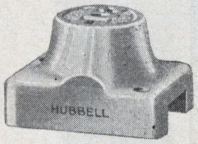
No. 5618
Cleat Receptacle
List price, $0.30



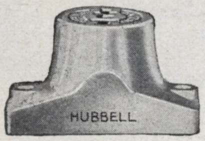
No. 5619
Moulding Receptacle
List price, $0.30



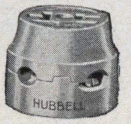
No. 5939
One-way Receptacle National Moulding
List price, $0.35



No. 6068
Two-way Receptacle National Moulding
List price, $0.35

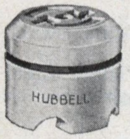


No. 5620
Fielding Receptacle
List price, $0.35



No. 5624
Conduit Box Receptacle
List price, $0.30

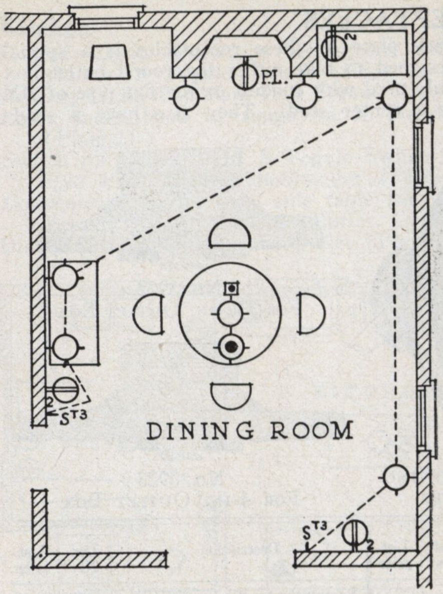
No. 7032
Outlet Box Receptacle with Covered Terminals
List price, $0.35

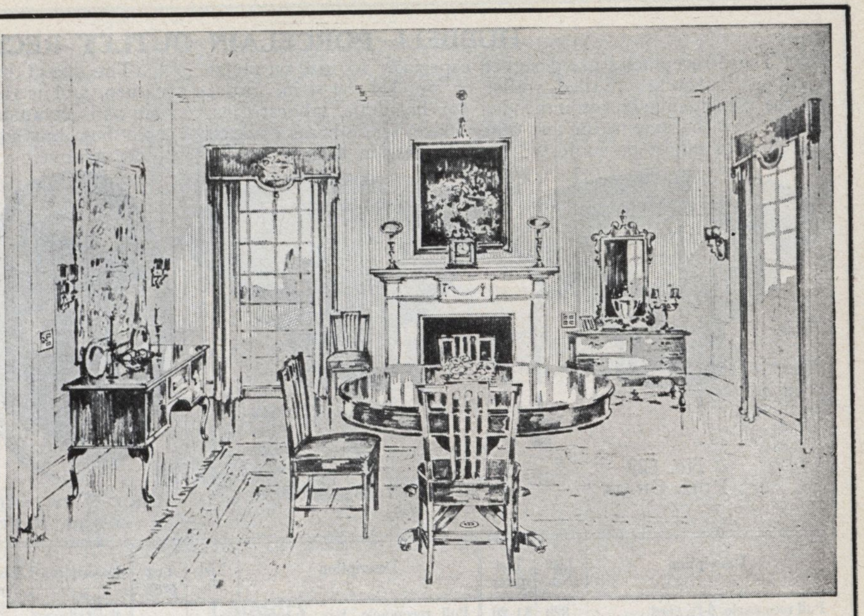


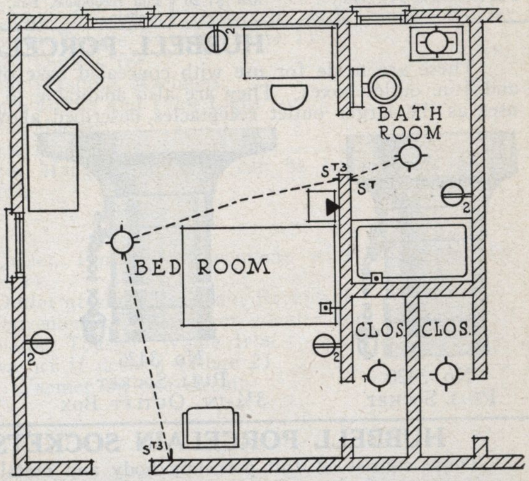
No. 7027
Outlet Box Receptacle
List price, $0.30

No. 6252
Fixture Receptacle
List price, $0.37

Continued on next page


P.L.
2
S^{T3}
DINING ROOM
S^{T3}
2




BATH ROOM
S^{T3}
S^{T}
2
BED ROOM
CLOS.
CLOS.
2
2
S^{T3}

Dining Room

Center Outlet over table if desired.

Floor Outlet under table for attaching candelabra or heating appliance.

Floor Outlet for bell or buzzer under table.

Side Wall Brackets on S^3 Toggle Switch (Plate 1).

Convenience Outlet on mantel for lamp and over mantel for picture light (Plate 2).

Combination Toggle switch and Duplex Convenience Outlet near buffet (Plate 2).

Two Duplex Convenience Outlets over serving table for heating appliances or wired serving table (Plate 2).

Percolator Waffle Iron Toaster
Chafing Dish Grill

Bed Room

Center Outlet in Ceiling if desired on 2-S^3 Toggle Switch One at entrance and one at side of bed (Plate 1).

Convenience Outlets for
Bed Lamp and Heating Pad—Duplex (Plate 2).
Lamps or Candles—Duplex (Plate 2).
Vacuum Cleaner
Portable Heater
Curling Iron
Vibrator

Bed Room Closet

Ceiling Outlet for Pull socket in Insulated Ceiling Base (Plate 4).

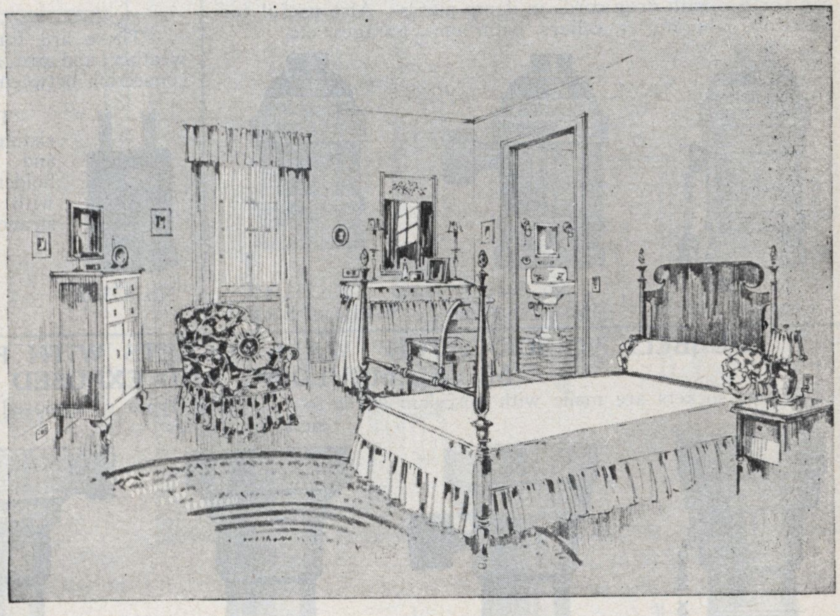
Bath Room

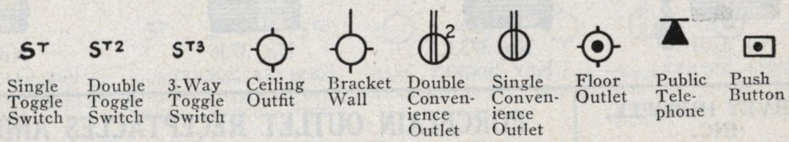
Ceiling Light with porcelain socket and base with shade holder on S^2. (Plate 1.)

Bracket Outlets with porcelain pull Sockets (Plate 4).

Duplex Convenience Outlets for use with

Water Heater
Portable Heater
Shaving Mug
Curling Iron
Hair Dryer
Sterilizer
Vibrator



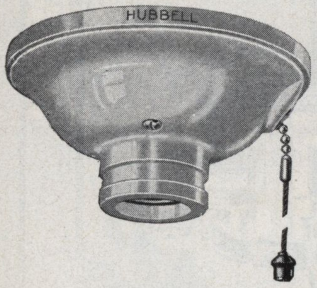

S^{T}
Single Toggle Switch
S^{T2}
Double Toggle Switch
S^{T3}
3-Way Toggle Switch
Ceiling Outfit
Bracket Wall
2
Double Convenience Outlet
Single Convenience Outlet
Floor Outlet
Public Telephone
Push Button

Continued on next page

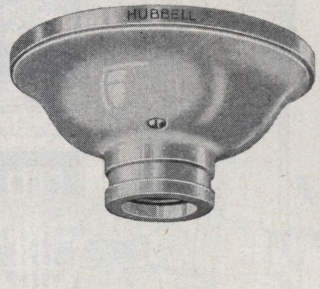
HUBBELL PORCELAIN OUTLET RECEPTACLES

These receptacles are designed especially for use on metal ceilings, concrete or tiled walls, or on 3¼ or 4-in. outlet boxes. Particularly recommended for hospitals, laboratories, bathrooms, basements, or any other place where brass covered receptacles might be subjected to dampness or fumes.

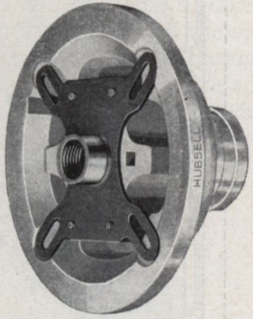
The metal back plate of these receptacles is a special feature, and is designed to take either the round outlet box such as is commonly used with conduit or the flat type of BX cable box having a center stud. They also have a shade holder groove.



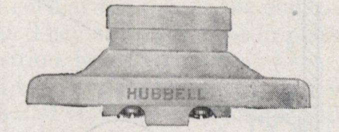
No. 829
Pull Chain



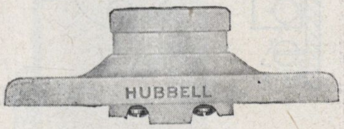
No. 860
Keyless Socket



Back View Showing
Metal Plates



No. 3922
For 3¼-in. Outlet Box

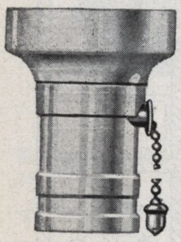


No. 3923
For 4-in. Outlet Box

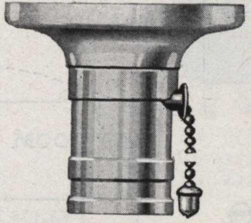
Description	List No.	List price	Description	List No.	List price	Description	List No.	List price	Description	List No.	List price
Pull receptacle, 6-ft. cord........	829	$1.20	Pull receptacle, 8-in. insulated chain......................	830	$1.20	Keyless receptacle..	860	$0.60	Receptacles for 3¼-in. outlet box.	3922	$0.40
									Receptacles for 4-in. outlet box...	3923	.50

HUBBELL PORCELAIN CEILING OR WALL SOCKETS

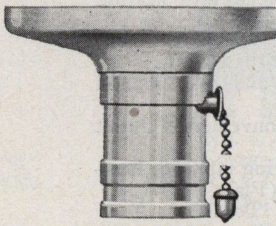
These are made for use with concealed base or for 3¼ and 4-in. outlet boxes. They are also adaptable to the same uses as the larger outlet receptacles described above. They are used where a shade holder is required to fit close against the ceiling.



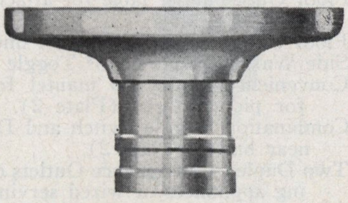
No. 3420
Pull Socket



No. 3426
Pull Socket
3¼-in. Outlet Box



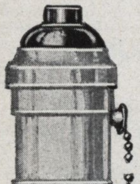
No. 3429
Pull Socket
4-in. Outlet Box



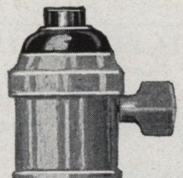
No. 3431
Keyless Socket
4-in. Outlet Box

HUBBELL PORCELAIN SOCKETS

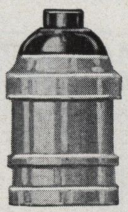
These consist of full porcelain body and metal covered cap for use with drop cords in damp places. Also useful for hospitals, laboratories, cellars, bathrooms, garages, etc.



No. 3330
Pull Socket



No. 3332
Key Socket

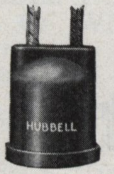


No. 3334
Keyless Socket

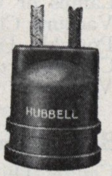
HUBBELL WEATHERPROOF SOCKETS

These are for use where sockets are exposed to the weather and are so made that water can not leak at the connection between the wire and the sockets.

They are made of a heat resisting black composition and with and without groove for shade holder. Each socket furnished with 6 in. of No. 14 B & S stranded rubber covered wire.



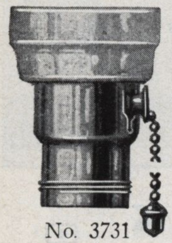
No. 43310



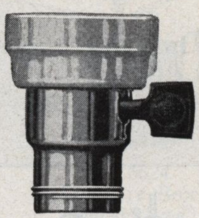
No. 60666

HUBBELL "QUICK-CATCH" WALL SOCKETS WITH PORCELAIN BASES FOR METAL MOULDING AND EXPOSED WORK

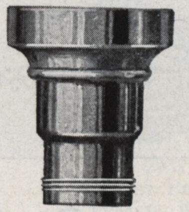
These sockets are made with porcelain bases to fit various types of exposed wiring systems, including cleat and metal mouldings



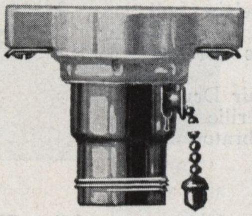
No. 3731
Pull Socket



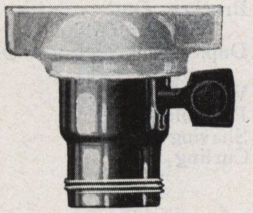
No. 3732
Key Socket



No. 3736
Keyless Socket



No. 3885
For Cleat Wiring



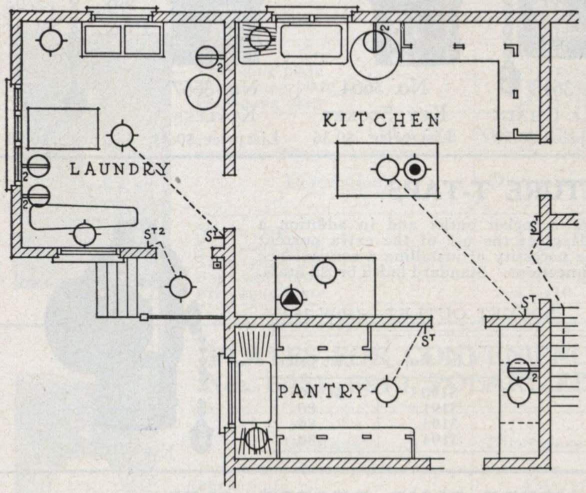
No. 3886
For Wood Moulding

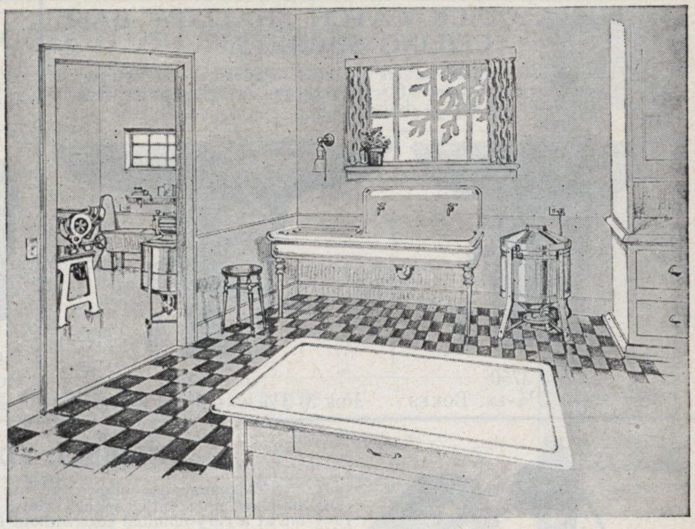
HARVEY HUBBELL, INC. | **PORCELAIN OUTLET RECEPTACLES AND SOCKETS** | **PLATE 4**

Continued on next page

Kitchen

Ceiling Light, Porcelain Receptacle with Shade Holder, S Toggle Switch (Plate 2)
Bracket Light, Porcelain Pull Socket (Plate 4)
Light under hood of range on S Toggle Switch (Plate 1)
Switch for Cellar Light, S Toggle Switch and Bulls Eye Pilot Light Combination (Plate 6)
Convenience Outlet over side table for Beater, Mincer, Toaster, Buffer, Grinder, etc.
Dishwasher on Convenience Outlet (Plate 2)


KITCHEN
LAUNDRY
PANTRY
ST2
ST
2

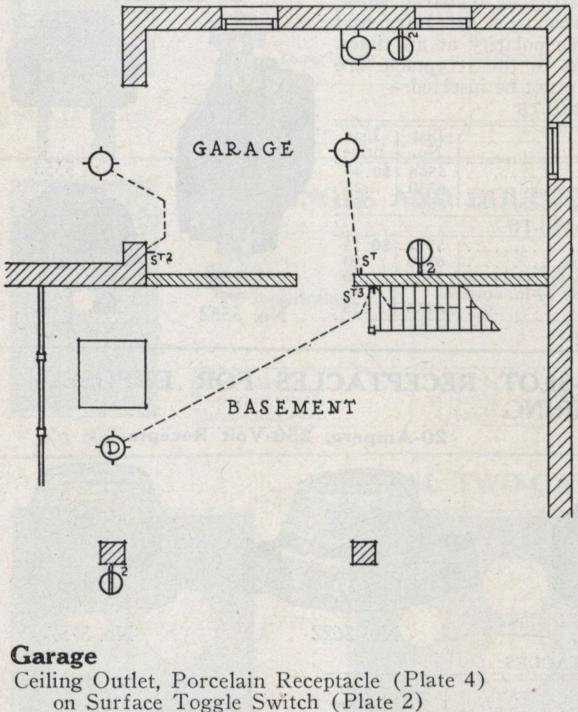


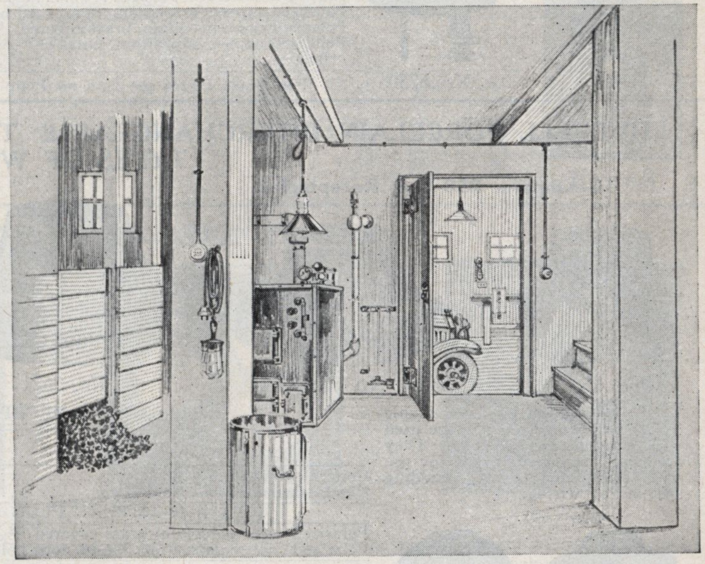
Laundry

Ceiling Light, Porcelain Receptacle with Shade Holder (Plate 4) Toggle Switch (Plate 1)
Convenience Outlets for
Electric Washing Machines
Convenience Outlet and Pilot Light for
Electric Mangle
Electric Iron
Electric Mangle and Iron can be on separate power circuit.

Pantry

Ceiling Outlet, Porcelain Receptacle with Shade Holder (Plate 4)
Bracket Outlet at sink, Porcelain Receptacle
Duplex Convenience Outlets over counter for
Percolator, Toaster, Waffle Iron
Dishwasher if desired (Plate 2)
Plate Warmer on one circuit.


GARAGE
BASEMENT
ST2
ST
ST3
D
2



Garage

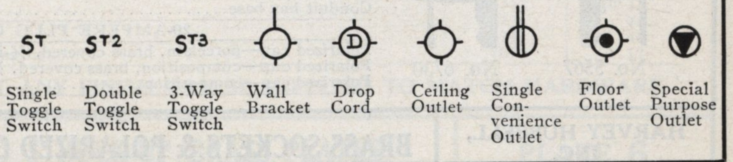
Ceiling Outlet, Porcelain Receptacle (Plate 4) on Surface Toggle Switch (Plate 2)
Wall Outlet, Porcelain Receptacle (Plate 2)
Porcelain Wall Receptacle for (Plate 5)

Portable Lamp Motor for	
Portable Heater, Drill, Lathe	
Soldering Iron	Battery Charger
Grindstone	Vacuum Cleaner

Exterior Outlet, Porcelain Receptacle (Plate 4) on Surface Toggle Switch (Plate 2)

Cellar

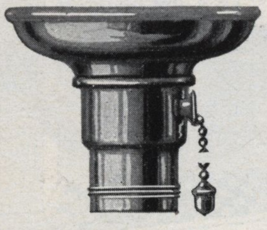
Drop Light with Porcelain Receptacle or Ceiling Light with Porcelain Receptacle (Plate 4)
Porcelain Wall Receptacle, for Portable Lamp (Plate 4)
Surface Toggle Switch for garage (Plate 2)


ST
Single Toggle Switch
ST2
Double Toggle Switch
ST3
3-Way Toggle Switch
Wall Bracket
D
Drop Cord
Ceiling Outlet
Single Convenience Outlet
Floor Outlet
Special Purpose Outlet

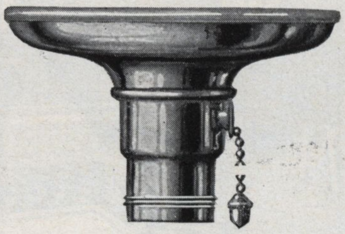
Continued on next page

HUBBELL QUICK CATCH SHALLOW BASE CEILING SOCKETS

These insulated brass sockets are used to advantage as fixtures in closets and service portions of residences and other places where an inexpensive ceiling fixture is desired.



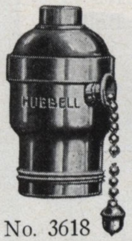
No. 3750
For 3 and 3¼-in. Boxes



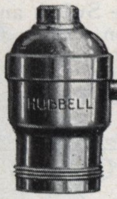
No. 3880
For 3, 3¼ and 4-in. Boxes

HUBBELL QUICK CATCH SOCKETS

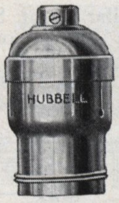
These sockets offer a full line of high grade brass sockets for general use. They are assembled complete. The pull switches tie up in character with the regular sockets.



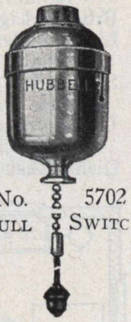
No. 3618
Pull Chain
List price, $0.50



No. 3664
Key Socket
List price, $0.36

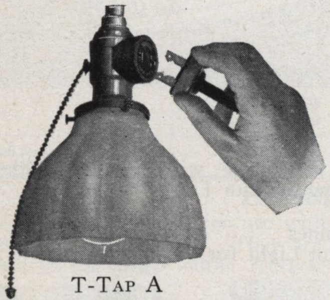


No. 3667
Keyless
List price, $0.33



No. 5702
Pull Switch
List price, $0.60

HUBBELL FIXTURE T-TAPS

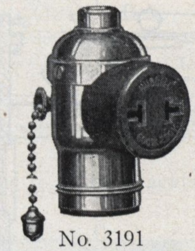


T-Tap A

This appliance allows the use of a socket outlet and in addition a standard plug outlet with T-Slots. It gives the use of the extra current tap at a very nominal cost without the necessity of installing a convenience outlet and the necessary wiring and connections. Standard finish brush brass.

PLUG OUTLET—660W-250 V. SOCKET OUTLET—250W-250 V.

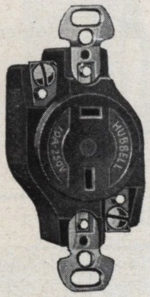
Description	List No.	List price
Medium screw base	3190	$1.00
With ⅛-in. cap	3191	.80
With ⅜-in. cap	3193	.86
With pendant cap	3194	.80



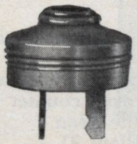
No. 3191

HUBBELL POLARIZED 10 AND 20 AMPERE PLUG RECEPTACLES

10 Amperes



No. 5566



No. 5567

No. 6730

These outlets are for use principally in industrial work. They are used on motors, etc., where it is necessary that the current be delivered in the same polarity at all times. The blades in the cap and openings in the receptacle are arranged so that an ordinary cap can not be inserted.

10 AMPERES—250 VOLTS

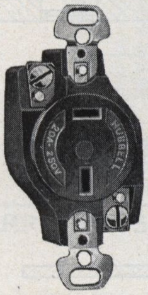
Description	List No.	List price
Black porcelain receptacle	5566	$0.40
Polarized cap—composition, $\frac{13}{32}$-in. cord hole	6730	.25
Polarized cap—porcelain, brass covered, $\frac{13}{32}$-in. cord hole	5567	.50

20 AMPERES—250 VOLTS

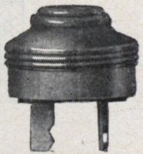
Description	List No.	List price
Black porcelain receptacle	5552	$0.75
Polarized cap—composition, ½-in. cord hole	6720	.30
Polarized cap—porcelain, brass covered, ½-in. cord hole	5553	.50
Polarized cap—composition, brass covered, ½-in. cord hole	6156	.55

For Brass Plates see data on Plate 6.

20 Amperes



No. 5552

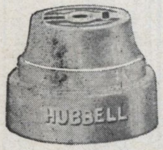


No. 5553

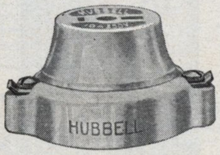
No. 6720

HUBBELL PORCELAIN INTERCHANGEABLE T-SLOT RECEPTACLES FOR EXPOSED TYPES OF WIRING

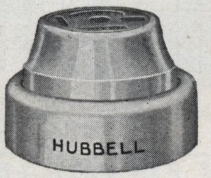
10-Ampere, 250-Volt Receptacles



No. 5885

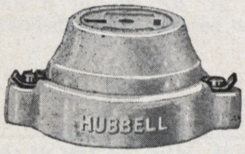


No. 5886

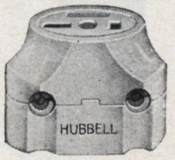


No. 5621

20-Ampere, 250-Volt Receptacles

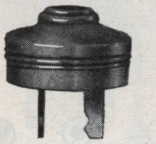


No. 5622



No. 5757

These receptacles have double T-Slot porcelain body and are used with 10 amperes, 250 volts. They are made in various types for use with cleat, and metal moulding systems of wiring.



No. 5567

No. 6730

10-AMPERE RECEPTACLES

Description	List No.	List price
Concealed base	5885	$0.40
Cleat base	5886	.40

10-AMPERE PLUG CAPS

Description	List No.	List price
Polarized cap—porcelain, brass covered, $\frac{13}{32}$-in. cord hole	5567	.50
Polarized cap—composition, $\frac{13}{32}$-in. cord hole	6730	.25

20-AMPERE RECEPTACLES

Description	List No.	List price
Concealed base	5621	.50
Cleat base	5622	.50
Conduit box base	5757	.50

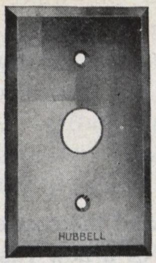
20-AMPERE PLUG CAPS

Description	List No.	List price
Polarized cap—porcelain, brass covered, ½-in. cord hole	5553	.50
Polarized cap—composition, brass covered, ½-in. cord hole	6156	.55
Polarized cap—composition	6720	.30

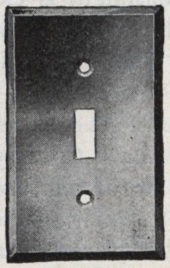
No. 5553

No. 6720

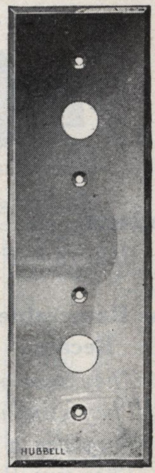
Continued on next page



No. 8301



No. 8751



No. 8672
TANDEM PLATE

PLATES FOR TOGGLE FLUSH SWITCHES

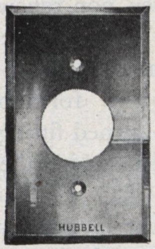
Description	Dimensions, in.	Solid brass, .100 in.		.060-in. metal	
		List No.	List price	List No.	List price
Single plate	4½x 2¾	8301	$0.34	8291	$0.18
Two-gang plate	4½x 4 9/16	8302	.68	8292	.36
Three-gang plate	4½x 6⅜	8303	1.02	8293	.54
Four-gang plate	4½x 8 3/16	8304	1.36	8294	1.04
Five-gang plate	4½x10	8305	2.00	....	....
Six-gang plate	4½x11 13/16	8306	2.40	....	....
Seven-gang plate	4½x13⅝	8307	2.80	....	....
Eight-gang plate	4½x15 7/16	8308	3.20	....	....

TANDEN PLATES, SOLID BRASS, .100 IN.

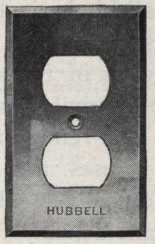
Description	Dimensions, in.	List No.	List price	List No.	List price
Two-gang plate	8⅛x2¾	8672	$0.80	....	....
Three-gang plate	11¾x2¾	8673	1.20	....	....
Four-gang plate	15⅜x2¾	8674	1.60	....	....

PLATES FOR SQUARE HANDLE TOGGLE SWITCHES

Description	Dimensions, in.	Solid brass, .100 in.		.060-in. metal	
		List No.	List price	List No.	List price
Single plate	4½x 2¾	8761	$0.34	8751	$0.18
Two-gang plate	4½x 4 9/16	8762	.68	8752	.36
Three-gang plate	4½x 6⅜	8763	1.02	8753	.54
Four-gang plate	4½x 8 3/16	8764	1.36	8754	1.04
Five-gang plate	4½x10	8765	2.00	....	....



No. 5548
SINGLE PLATE



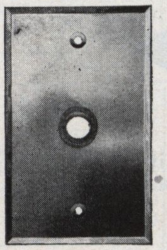
No. 6258
SINGLE PLATE

PLATES FOR CONVENIENCE OUTLETS, 3-WIRE RECEPTACLES Nos. 6051, 6810, POLARIZED RECEPTACLES Nos. 5566 AND 5552

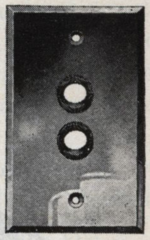
Description	Dimensions, in.	Solid brass, .100 in.		.060-in. metal	
		List No.	List price	List No.	List price
Single plate	4½x2¾	6585	$0.34	5548	$0.18
Two-gang plate	4½x4 9/16	6586	.68	5549	.36
Three-gang plate	4½x6⅜	5550	1.02	6840	.54

PLATES FOR DUPLEX CONVENIENCE OUTLETS

Description	Dimensions, in.	Solid brass		.060-in. metal	
		List No.	List price	List No.	List price
Single plate	4½x2¾	6587	$0.34	6258	$0.18
Two-gang plate	4½x4 9/16	6588	.68	6259	.36
Three-gang plate	4½x6⅜	6260	1.02	6859	.54



No. 6923

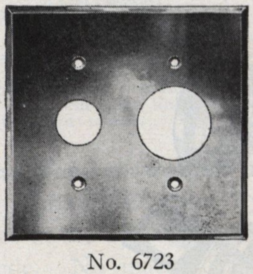


No. 6924

SINGLE AND DOUBLE OUTLET TELEPHONE PLATES

Description	Dimensions, in.	Single outlet plates				Double outlet plates			
		Solid brass, .100 in.		.060-in. metal		Solid brass, .100 in.		.060-in. metal	
		List No.	List price	List No.	List price	List No.	List price	List No.	List price
Single plate	4½x2¾	6923	$0.40	6910	$0.24	6947	$0.44	6941	$0.28
Two-gang plate	4½x4 9/16	6924	.80	6911	.48	6948	.88	6942	.56
Three-gang plate	4½x6⅜	6925	1.20	6912	.72	6949	1.32	6943	.84

SPECIAL TWO-GANG COMBINATION PLATES



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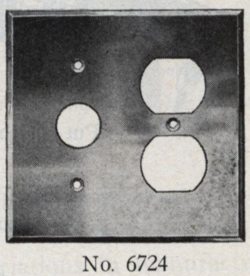

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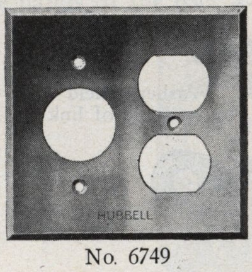
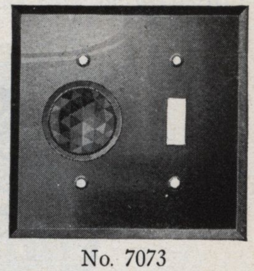


No. 6749



No. 7073

Description	Struck-up .060 in.	
	List No.	List price
For single convenience outlet and round handle toggle switch	6723	$0.46
For duplex convenience outlet and round handle toggle switch	6724	.46
For one duplex and one single convenience outlet	6749	.46
For one double pole toggle switch and fitted with red jewel for warning light	7073	1.12

NOTE: BRUSH BRASS IS STANDARD FINISH BUT ANY FINISH CAN BE SUPPLIED TO MATCH HARDWARE

HARVEY HUBBELL, INC.	HUBBELL SOLID AND STRUCK-UP BRASS PLATES	PLATE 6

BUSSMANN MANUFACTURING CO.

Manufacturers of Electric Fuses

ST. LOUIS, MO.

DEALERS AND DISTRIBUTERS IN EVERY PRINCIPAL CITY

BUSS FUSES
ELECTRICITY'S SAFETY VALVE

TRADE-MARK

Products

Electric Fuses, all types.

Buss Renewable Fuses Should Be Specified Because

They save money on fuse replacements.

They eliminate need for an extra set of fuses.

They are a permanent investment.

They are the simplest and most practical renewable fuse yet devised.

They give the greatest protection at the lowest obtainable cost.

The ever increasing use of electricity in buildings of all kinds, including hotels, hospitals and office buildings, as well as industrial plants, causes more frequent blowing of fuses than was formerly the case and makes the renewable cartridge fuse far more economical than the non-renewable cartridge fuse.

Fuses are made to blow—they are electricity's safety valve. The use of a non-renewable cartridge fuse means actually throwing money away every time a fuse blows.

With Buss renewable fuses, a new link puts the fuse back into service quickly and the cost of the link is but 5% of the cost of a new fuse.

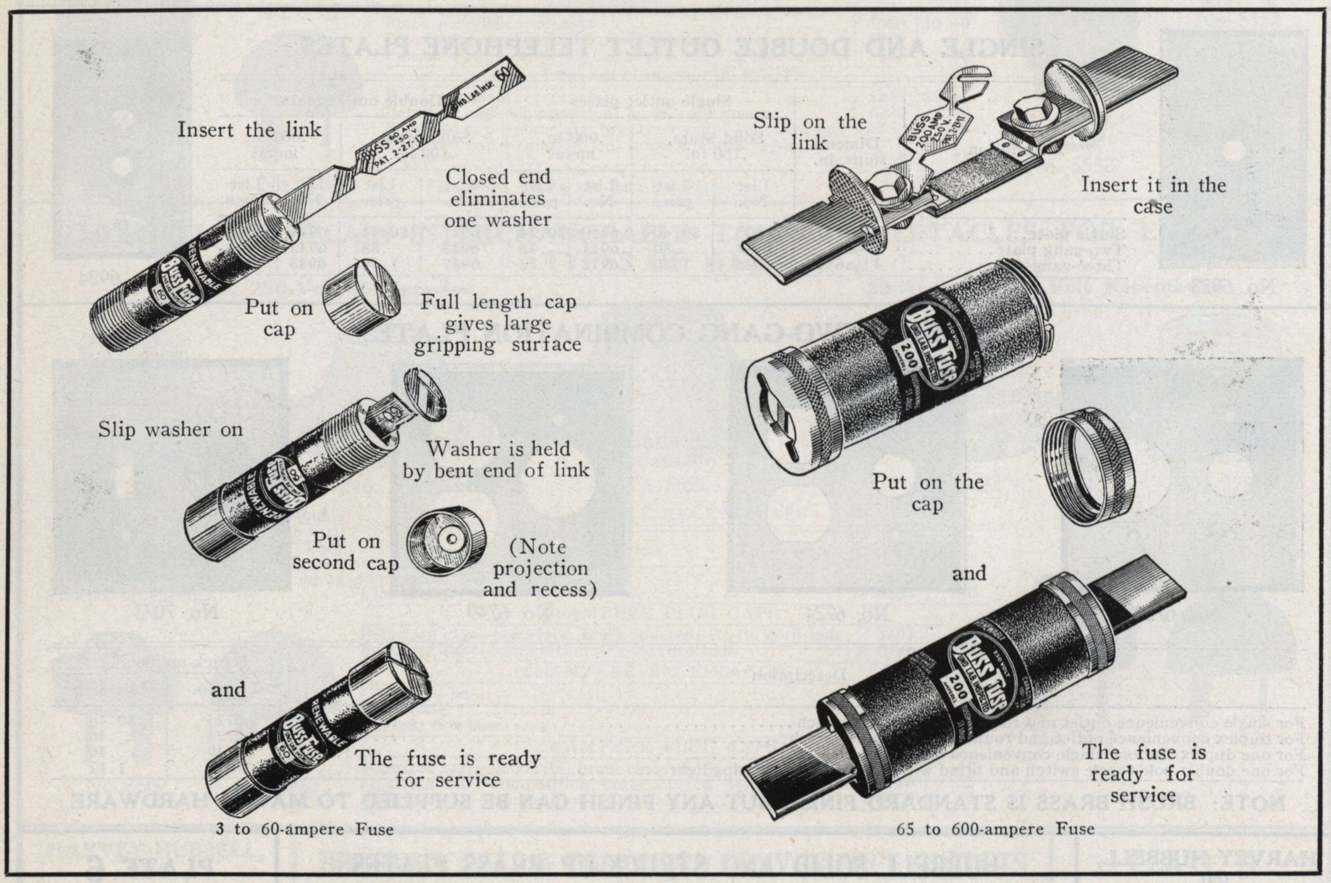
When the battery in a flashlight is exhausted, the flashlight is not thrown away, but a new battery is put in. The same logic should be applied to fuses.

With renewable fuses installed, a double set of fuses is not necessary, nor does the electrician have to carry in his pockets or in his tool kit a bulky lot of material to replace blown fuses. All he needs is a supply of the inexpensive light weight renewal links to replace blown links.

Modern electrical maintenance men clearly show their preference for renewal fuses. Often non-renewable fuses installed in new buildings have been scrapped by the electrician and replaced by renewable fuses.

Renewable fuses are the most modern form of fuse protection. They are made of heavy turned fittings and improve the appearance of any board in which they are installed.

Buss renewable fuses are a permanent investment. They are simple in design, exceptionally sturdy in construction, and are quick, easy and positive in renewal.


Insert the link
Closed end eliminates one washer
Put on cap
Full length cap gives large gripping surface
Slip washer on
Washer is held by bent end of link
Put on second cap
(Note projection and recess)
and
The fuse is ready for service
3 to 60-ampere Fuse
Slip on the link
Insert it in the case
Put on the cap
and
The fuse is ready for service
65 to 600-ampere Fuse

Details Showing Ease of Assembling Buss Renewable Cartridge Fuses

Continued on next page

Blow-outs do not injure the fiber tube or metal parts of Buss renewable fuses because of the simplicity of design and use of the highest quality of materials throughout.

The Buss renewable fuse is as much of a permanent investment as the fuse board itself. A board equipped with Buss fuses can be maintained for the life of the board at a much less cost than if equipped with non-renewable cartridge fuses.

How to Specify—Specify outright by name *"Buss,"* and be protected, or specify:

"Fuses shall be renewable, approved by Underwriters' Laboratories, Inc., and equipped with multinotch links of standard dimensions. The 3 to 60-ampere sizes shall have not more than 5 parts, to be renewable without tools and to have the closure and ferrule in one piece. The 65-ampere and larger sizes to have not more than 4 separate parts to be handled in renewing."

BUSS RENEWABLE FUSES

	Amperes	Length over all, in.	Diam. tube, in.	Lb. per 100	Standard package	List price
250 Volt Fuses and Links						
Complete fuses	3 to 30	2	½	5.5	100	$0.50
	35 to 60	3	¾	14.0	100	1.00
	65 to 100	5⅞	1	43.0	50	2.00
	110 to 200	7⅛	1½	109.0	25	4.00
	225 to 400	8⅝	2	204.0	10	7.50
	450 to 600	10⅜	2½	337.0	5	11.00
Renewal links	3 to 30	....	....	.17	100	$0.03
	35 to 60	....	....	.67	100	.05
	65 to 100	....	....	.78	50	.10
	110 to 200	....	....	2.21	25	.15
	225 to 400	....	....	4.42	25	.30
	450 to 600	....	....	8.84	10	.60
600 Volt Fuses and Links						
Complete fuses	3 to 30	5	¾	18.	100	$1.10
	35 to 60	5½	1	36.	100	1.25
	65 to 100	7⅞	1¼	77.	50	3.00
	110 to 200	9⅝	1¾	173.	25	5.00
	225 to 400	11⅝	2½	331.	10	11.00
	450 to 600	13⅜	3	535.	5	16.00
Renewal links	3 to 30	....	....	.5	100	$0.05
	35 to 60	....	....	1.7	100	.06
	65 to 100	....	....	2.1	50	.10
	110 to 200	....	....	6.2	25	.15
	225 to 400	....	....	12.4	25	.30
	450 to 600	....	....	24.8	10	.60

Buss fuses and links are approved in all sizes and are labeled "Underwriters' Laboratories Inspected."

Buss renewable links are identical in size and interchangeable with all standard makes.

Buss Non-renewable Fuses

Ferrule Contact Type, 1 to 60 Amperes—These sizes in the 250-volt range have no soldered joint on the inside. No inaccuracies or variations in manufacture are possible.

1 to 60-ampere Buss Non-renewable Fuse

Knife Blade Type, 65 to 1000 Amperes—Blades always in positive alignment. All parts riveted; fusible element riveted and soldered. The strip used makes our fuses cool operating, and we guarantee it not to burn or char the fiber tube at any overload.

65 to 1000-ampere Buss Non-renewable Fuse

BUSS NON-RENEWABLE FUSES

	Amperes	Length over all, in.	Diam. tube, in.	Lb. per 100	Standard package	List price
250-volt	1 to 30	2	½	3.8	100	$0.15
	35 to 60	3	¾	10.0	100	.30
	65 to 100	5⅞	1	32.0	50	.90
	110 to 200	7⅛	1½	79.0	25	2.00
	225 to 400	8⅝	2	165.0	10	3.60
	450 to 600	10⅜	2½	276.0	5	5.50
	650 to 800	11½	3	430.0	5	12.00
	850 to 1000	12⅝	3½	540.0	5	15.00
600-volt	1 to 30	5	¾	14.5	100	.40
	35 to 60	5½	1	26.0	100	.60
	65 to 100	7⅞	1¼	56.0	50	1.50
	110 to 200	9⅝	1¾	124.0	25	2.50
	225 to 400	11⅝	2½	303.0	10	5.50
	450 to 600	13⅜	3	463.0	5	8.00
	650 to 800	14½	3½	600.0	5	15.00
	850 to 1000	15⅝	4	775.0	5	18.00

Approved and labeled "Underwriters' Laboratories Inspected," except sizes larger than 600 amperes which are not tested by the Underwriters' Laboratories, Inc.

Buss Clear Window Plug Fuses

You can instantly see which fuse is blown, because every Buss fuse

Has an all-white interior

Has the blowing point right up near to the window

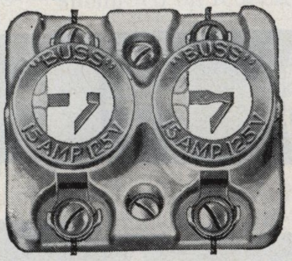
Has the entire strip visible through the window

Has a window guaranteed to be clear

No other plug fuse on the market combines all of these advantages and, therefore, no other fuse can possibly indicate when it is blown, as quickly, easily and surely as the Buss clear window fuse.

Buss-Five-in-a-Box-Package—Is particularly well suited to needs of home, industrial plants, railroads, hotels, hospitals, office buildings, institutions, etc.

Educational Information on the Carton—As to why fuses blow and what to do when they blow, is in the hands of the user at the exact time he needs it.



Buss Plug Fuses

Amperes	Cat. No.	List, each	Amperes	Cat. No.	List, each
3	803	$0.07	15	815	$0.07
6	806	.07	20	820	.07
10	810	.07	25	825	.07
12	812	.07	30	830	.07

Approved by Underwriters. Every plug tested at full amperage. Each standard package contains 40 cartons, 200 fuses. Weight, 75 lb. per 1000.

ECONOMY FUSE & MFG. CO.

Greenview Avenue at Diversey Parkway
CHICAGO, ILL.

ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CINCINNATI, OHIO
CLEVELAND, OHIO
DETROIT, MICH.
DENVER, COLO.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SEATTLE, WASH.

ECONOMY FUSE & MFG. CO. OF CANADA, LTD., MONTREAL, QUE.
Complete Stocks Carried by All Leading Electrical Jobbers and Dealers

Products

"CLEARSITE" NON-RENEWABLE PLUG FUSES; IMPROVED "ECONOMY" RENEWABLE CARTRIDGE and PLUG FUSES; "DROP OUT" RENEWAL LINKS; "ARKLESS" NON-RENEWABLE INDICATING FUSES; "ECO" NON-RENEWABLE, NON-INDICATING, ENCLOSED FUSES.

Licensed manufacturers of "ELEXIT" RECEPTACLES and PLUGS.

Also manufacturers of Moulded Insulation, Screws for Electrical Work, and S. & C. High Potential Fuses (in Canada).

"Clearsite" Non-renewable Plug Fuses

Clearsite fuses are the only non-renewable plug fuses using the famous Economy "Drop Out" link. This link, with amperage stamped upon it, is mounted with the operative section of the element directly under a window of unusual design. Clearsite fuses never fail to indicate. When blown on an overload a gap at the operative section is clearly visible; when blown on short circuit the window is blackened and vision of link is made impossible. Clearsite fuses, in capacities of from 3 to 30 amp., are sold in cartons of 500 and of 50, and in retail packages of 4 for 25¢. (Write for Catalogue 19-C.)

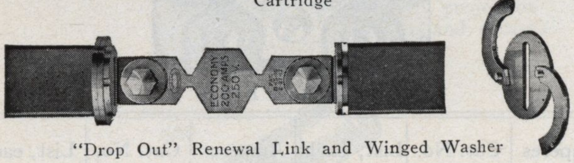
ECONOMY FUSE & MFG. CO.
CHICAGO
U.S.A.
15 AMP
125 V.
125 V.
REG. U.S. PAT. OFF.
"CLEARSITE"
CLEARSITE

"CLEARSITE" NON-RENEWABLE PLUG FUSE
Listed as Standard by Underwriters' Laboratories, Inc.

Improved "Economy" Renewable Fuses

"Economy" fuses are made in three general types (ferrule, knife blade and plug) with a full line of capacity ranges for all commercial voltages. They are the first line of fuses using an inexpensive bare link for restoring a blown fuse to its original efficiency to be listed as standard *in all capacities* by Underwriters' Laboratories, Inc.

Cartridge



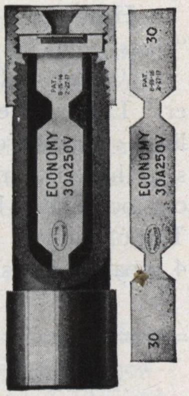
"Drop Out" Renewal Link and Winged Washer

"ECONOMY" KNIFE BLADE TYPE FUSE DISASSEMBLED

The fusible elements are of the "Drop Out" renewal type, accurately rated and of definite design. Study this renewable link. Note the two narrow bridges of metal holding the drop-out portion in place. In operation on short circuits, the entire fuse metal does not volatilize, only these two narrow bridges fuse. The internal pressure is much less than when an entire strip of fusible metal is instantly converted into gas. There is no powdered filler to deteriorate or solidify. The winged washer in knife blade type and the end plug in ferrule type make replacement of links quick and easy. (Write for Catalogue 19-E.)

Economy Fuse Savings—Since only the inexpensive link needs to be renewed and the rest of the fuse is good for years of service, a great annual saving in fuse maintenance costs may be obtained as compared with the use of "one-time" fuses.

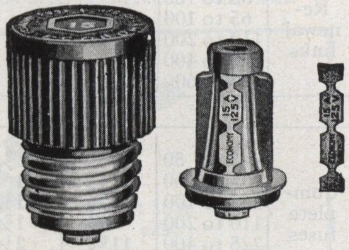
"Drop Out" Renewal Link—The heart of an "Economy" fuse. Instantly restores a blown "Economy" fuse to its original efficiency at the absolute minimum of cost. A stock of "Drop Out" links, always on hand, represents a very small investment.



FERRULE TYPE FUSE AND "DROP OUT" RENEWAL LINK

"Economy" Renewable Plug Fuses

Use of the "Drop Out" renewal link in this plug type fuse results in similar operation and saving as in the "Economy" cartridge type fuses. No tools are required to replace the blown link and restore the plug to its original efficiency. (Catalogue 19-RP.)



PLUG TYPE FUSE AND "DROP OUT" RENEWAL LINK

"Arkless" Non-renewable Indicating Fuses

Equipped with a positive mechanical indicator; famous for consistent performance. (Catalogue 19-A.)

"Eco" Non-renewable Non-indicating Fuses

Our latest fuse of this type for electrical protection of circuits not subject to frequent overloaded conditions. (Catalogue 19-K.)

"Economy" Inlet, Outlet and Switch Boxes

Manufacturers of a new style inlet box making for convenience in installation and reducing costs on old wiring jobs. In addition, various standard forms of outlet and switch boxes, together with covers for various uses.

Economy "Elexits"

Under license agreement, Elexit Receptacles and Plugs are produced and marketed by this company, enlarging our service to the architect, fixture manufacturer and dealer, and electrical dealers and contractors, in developing the universal standardization and use of this modern method of installing lighting fixtures. Catalogue LX-19 will bring full details of this device.

BEARDSLEE CHANDELIER MANUFACTURING CO.

216 South Jefferson Street, CHICAGO, ILL.

TRADE-MARK

Products and Services

Beardslee designs and manufactures ELECTRIC LIGHTING EQUIPMENT for all types of buildings.

The architect will find here skilled artists and artisans capable of carrying out any suggestions he may give them, or of originating designs that will result in the lighting equipment being in perfect harmony with the architectural features of the edifice in which it is installed.

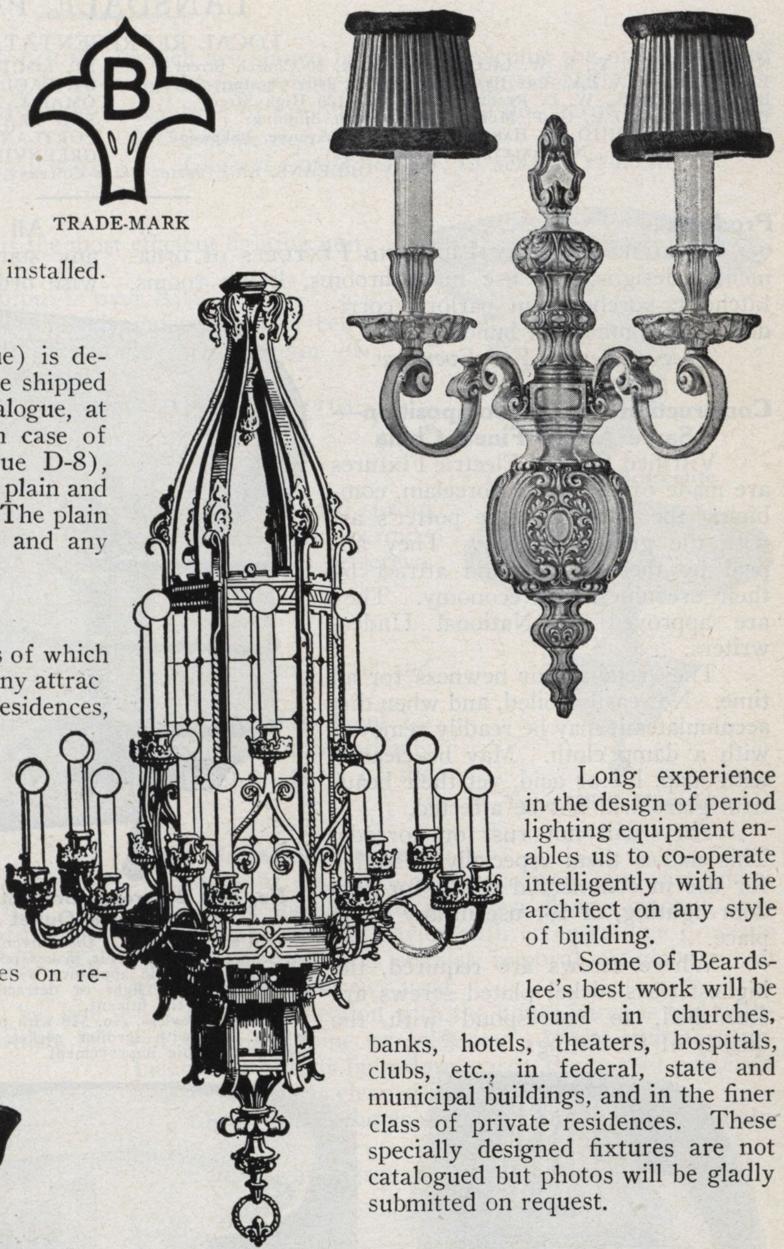
Shipments at 24 Hours Notice

One of our catalogues (the S-7 Catalogue) is devoted entirely to lighting equipment that can be shipped in 24 hours after receipt of order. This catalogue, at least, should be in your file for reference in case of emergency. The Denzar catalogue (Catalogue D-8), covering the Denzar commercial lighting unit in plain and ornamental forms, should also be in your file. The plain types of Denzar can be shipped in 24 hours and any of the ornamental types in a few days.

Standard Designs

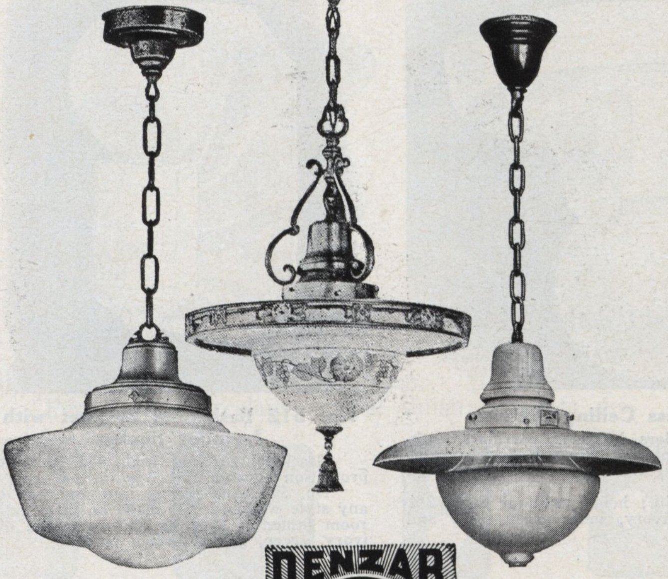
In the various Beardslee catalogues (copies of which will be gladly sent on request) will be found many attractive standard designs suitable for private residences, apartment houses, office buildings, schools, churches, banks, hotels, hospitals, theaters and public buildings.

For the lighting of schools, stores, offices, club rooms, railroad stations and other large areas Beardslee can furnish from stock a number of plain and ornamental units. These are described and illustrated in the Denzar Catalogue and in a pamphlet entitled Commercial Lighting—copies on request.



Long experience in the design of period lighting equipment enables us to co-operate intelligently with the architect on any style of building.

Some of Beardslee's best work will be found in churches, banks, hotels, theaters, hospitals, clubs, etc., in federal, state and municipal buildings, and in the finer class of private residences. These specially designed fixtures are not catalogued but photos will be gladly submitted on request.



DENZAR

TRADE-MARK

Special Designs

From a huge file of photographs, sketches and blue prints we can select helpful data that will assist the architect in formulating lighting plans and specifications for any type of building.

For the building that requires lighting equipment of special design we have complete facilities for producing new and original designs, and the patterns when required.

Intelligent Co-operation

In the design and execution of lighting equipment Beardslee artists and artisans co-operate with the architect with a degree of intelligence that, we have been told, is unusual. We number among our staunchest friends the creators of many of the finest public buildings and private residences in the country.

FRANKLIN POTTERY

A CORPORATION

Lighting Fixtures

LANSDALE, PA.

TELEPHONE
LANSDALE 600, 601

LOCAL REPRESENTATIVES

NEW YORK, N. Y., R. W. LILLIE CORPORATION, 50 Church Street
PHILADELPHIA, PA., THE BRADLEY COMPANY, 2401 Chestnut Street
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PORTLAND, ORE., JOHN PILLMAN, 45 Union Avenue
GREENVILLE, S. C., MANUFACTURERS SALES CO., 109 E. Coffee Street
NEW ORLEANS, LA., JUSTICE SALES COMPANY, 307 Magazine Street

Products

VITRIFIED POTTERY LIGHTING FIXTURES of ornamental designs, for use in bathrooms, living rooms, kitchens, porches, sun parlors, corridors and commercial buildings.

"Never Renew Yet Evernew."

Construction and Composition—Same As the Finest China

Vitrified Pottery Electric Fixtures are made of the finest porcelain, combining the beauty of the potter's art with the greatest utility. They appeal by their beauty and attract by their usefulness and economy. They are approved by National Underwriters.

They retain their newness for all time. Not easily soiled, and when dirt accumulates it may be readily removed with a damp cloth. May be cleaned with soap, lye or acid, yet their beautiful glaze will not be affected.

They will not rust or corrode. This makes them especially desirable for use in commercial work, for outdoor lighting, or for use in any damp place.

Where screws are required, the highest class nickel plated screws are furnished, to correspond with the quality of the fittings.

All fixtures have fixture straps adjustable to fit any standard outlet box. All fixtures unless otherwise ordered are regularly furnished with 14-in. pigtails of No. 18 standard fixture wire.

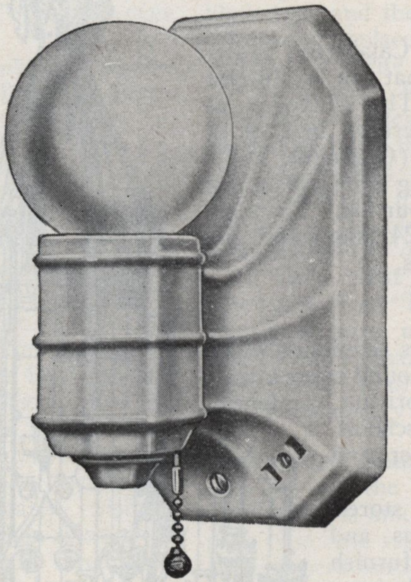
Designs and Colors—Fixtures are made in various designs suited for special purposes. They may be had in colors to harmonize with other fittings and furnishings.

Economy—No Expense But the First Cost

Even were Vitrified Pottery Electric Fixtures higher in price than others, they would be economical. Their everlasting quality makes them especially desirable. "Never Renew, Yet Evernew," aptly describes them. They retain their beauty and freshness through years of hard usage. Their use entails no expense but the first cost, as they are virtually indestructible.

For Apartment Houses and Hotels

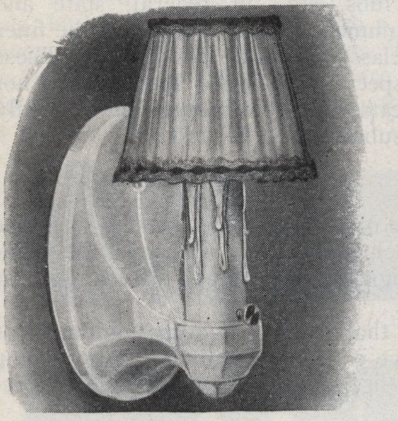
Vitrified Pottery Lighting Fixtures are especially desirable in apartment houses and hotels. Their durability and the fact that they retain their newness makes re-furnishing unnecessary. As they agree in design, uniformity may be had throughout the structure.



No. 510 Bathroom Bracket with Convenience Outlet

An added feature is the convenience outlet, where desired. This makes possible the use of any electric appliance without interference with the light or detracting from the beauty of the fitment.

No. 511 keyless, No. 510 with pull chain, or No. 512 with levolier socket, are furnished with this improvement

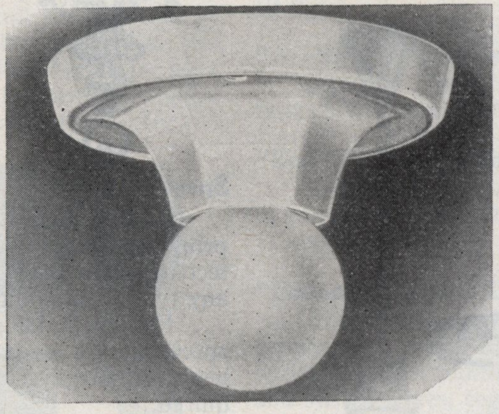


Living, Dining and Bed Room Brackets

Furnished in either key or keyless type sockets.

Bracket bases, 7 in. high, 4¼ in. wide; over-all height from bottom of base to top of shade, 9 in.; projection beyond wall, 6 in.

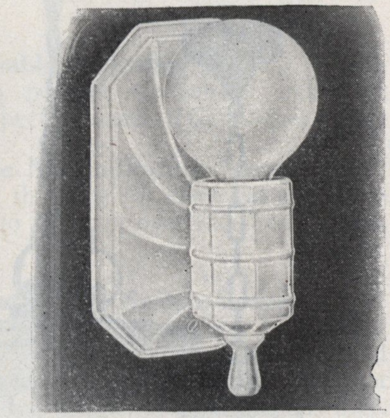
Brackets may be had in blue, ivory, green or golden brown. Silk shades supplied in the following color combinations: old rose outside, lined with old rose; blue outside, lined with old rose; old gold outside, lined with old gold



No. 505 Keyless Ceiling Fixture

For porches, sun parlors, hallways, corridors, bathroom ceilings or outdoor places. Furnished with waterproof sign socket with pigtails or screw terminal sign socket.

Base diameter, 6¼ in.; height without bulb, 2¾ in. Colors: white, old ivory, moss green, blue and golden brown



No. 512 Bathroom Bracket with Levolier Socket

Bracket base, 7 in. high, 4¼ in. wide; projection beyond wall, 3¾ in.

No. 505 as a ceiling unit and two of any style wall brackets make an ideal bathroom fitment. May be had in white, old ivory, green, golden brown or blue

THE EDWIN F. GUTH COMPANY

Designers and Manufacturers of Lighting Equipment

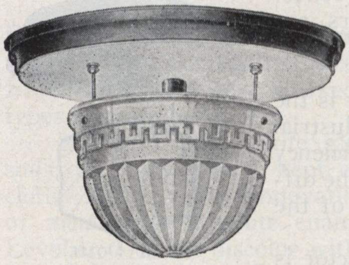
ST. LOUIS, MO.

Products and Services

Designers and manufacturers of Lighting Equipment of all kinds and for all purposes, including Brascolite, Aglite, Maze-Lite, E-Lite, Industrolite and Magic-Lite.

In addition to our large line of stock items, a few of which are shown below, we welcome the opportunity of furnishing architects with Designs specially prepared for any type of building. There is no charge or obligation for this service.

General Catalogue No. 15 sent on request.



Type W680 Brascolite

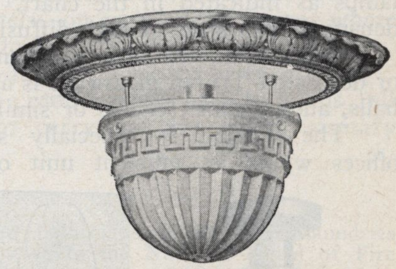
Brascolite

Brascolite is the most efficient lighting unit manufactured.

Its total output is over 83%.

Brascolite is entirely independent of ceiling height as it carries its own reflector of white porcelain enamel.

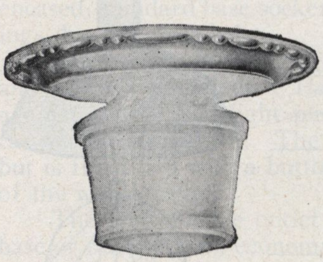
Also made in pendant types, both ornamental and plain.



Type W660 Brascolite

Magic-Lite

A neat, efficient, dustproof unit. Patented spring holding device holds the globe securely and permits instant removal of glass for cleaning. No setscrews are used.

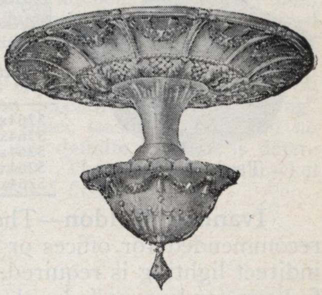


Type K782 Magic-Lite

Maze-Lite

The dainty luminaire for living rooms, hotel and home bedrooms.

The delicately polychromed ivory glass bowl reflects most of the light upward where the beautifully ornamental reflector refracts rays to all parts of the room in a flood of soft light.



Type M517 Maze-Lite

Aglite

For bathrooms, kitchens, hospitals, laboratories, etc., Aglites are being rapidly recognized as standard.

Made of Armco iron on which three coats of permanent porcelain enamel have been fused at 1600° F. No metal parts are visible. No setscrews are used.

Its perfectly smooth surface is cleaned by one rub of a damp cloth. It will not rust, tarnish or discolor.

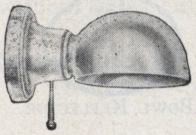
Guth Reflector Flange

Made of one piece of Armco iron, porcelain enameled. The neatest and strongest flange made. New spring globe holding device with eccentric key prevents rattling of glass and enables removal of globe in an instant. No setscrews used.

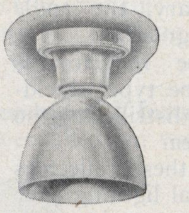
Direct connection with the house wires is had without splicing, taping or soldering. White reflector surface inside reflects light downward. Permanent porcelain enamel surface is cleaned in an instant.

Ideal for schools, public buildings, hospitals, stores, etc.

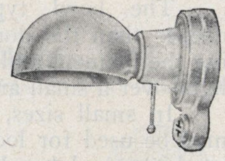
Colors, white, gray and ivory.



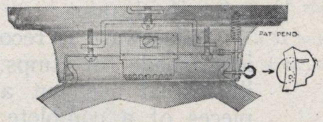
Type A725
Aglite



Type A722
Aglite



Type A730
Aglite



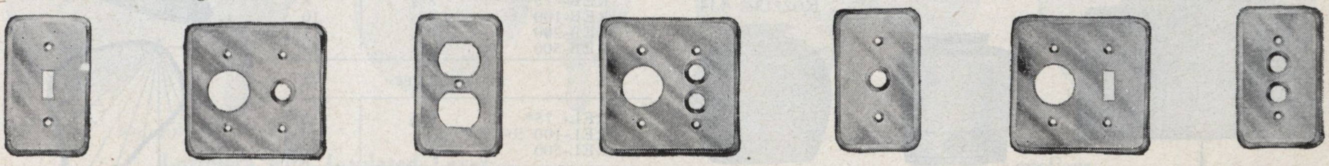
Type K791 Guth Reflector Flange
Made of one piece of Armco iron, porcelain enameled

Porcelain Enameled Switch Plates for All Types of Switches

Made in white, gray and ivory. May also be furnished in pink, blue, brown and green.

Permanent porcelain enamel finish prevents discoloration, rusting and tarnishing.

They will outlast the building in which they are installed.



K831 K840 K829 K830 K811 K820 K823

Porcelain Enameled Switch Plates

IVANHOE DIVISION OF THE MILLER CO.

CLEVELAND, OHIO

Products

Ivanhoe manufactures a complete line of lighting equipment.

METAL REFLECTORS and FITTINGS for Industrial Lighting; COMMERCIAL UNITS for Offices and Stores and ROZELLE GLASSWARE for Home Lighting.

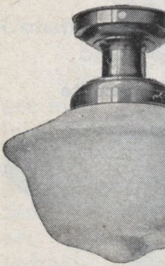
New catalogues covering this complete line are now available.

Commercial Units for Offices and Drafting Rooms

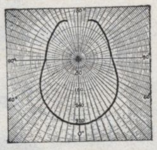
Ivanhoe Trojan—Supplied in five sizes to serve lamps as indicated in the chart. It is made of light density Genco glass of high diffusing properties.

When combined with ornamental hangers, the plain or decorated Trojan glassware is appropriate for stores, halls, auditoriums, schools or similar locations.

The Trojan is especially suited for industrial offices where an efficient unit of simple but pleasing design is required. The unit is also very well adapted for light manufacturing operations.

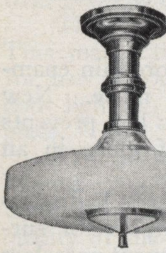


TROJAN UNIT

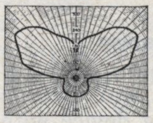


Catalogue No.	Diam., in.	Wattage recommended
5264x 9 Genco	9	75
5264x12 Genco	12	100-150
5264x14 Genco	14	150-200
5264x16 Genco	16	200-300
5264x18 Genco	18	300-500-750

Ivanhoe Keldon—The Keldon unit is especially recommended for offices or drafting rooms where semi-indirect lighting is required. Ceiling or suspension type fixtures can be supplied with glass or metal bottom cap. By removing the bottom cap, the lamp may be changed without removing the glassware.



KELDON UNIT



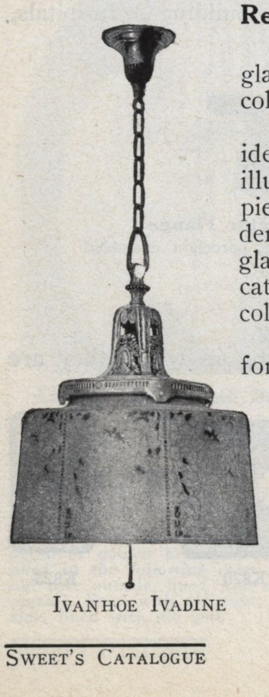
Catalogue No.	Diam., in.	Wattage recommended
5363x14 C E	14	100-150
5363x16 C E	16	200
5363x18 C E	18	300-500

Residential Lighting Glassware

Ivanhoe Rozelle decorated glassware will not fade or turn color in cleaning.

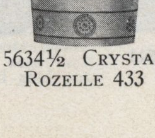
Glassware is recognized as the ideal shade for lamps. The shades illustrated are but a few typical pieces of a complete line of residential lighting glassware which is catalogued in actual color.

Write for information.

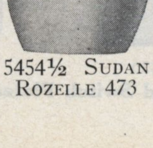


IVANHOE IVADINE

5502 VELURIA
ROZELLE 434



5634½ CRYSTAL
ROZELLE 433



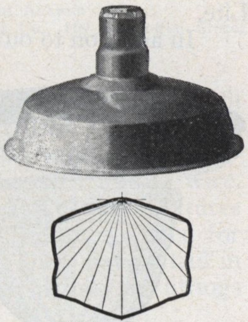
5454½ SUDAN
ROZELLE 473

RLM Dome Reflectors and Glassteel Diffusers

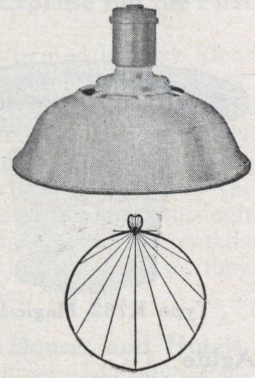
Either RLM dome reflectors or Glassteel diffusers are recommended for general overhead lighting.

The Glassteel diffuser is the latest development for industrial lighting, combining the efficiency of the metal reflector and the diffusion and low brightness of the enclosing globe.

The RLM dome reflector is supplied with solid top as illustrated, or with B heel for use with separable holder.



RLM DOME



GLASSTEEL DIFFUSER

Catalogue No.	Depth, in.	Diam., in.
RLM DOME REFLECTORS		
REDD- 50*	7¾	12⅛
REDD- 75	8¼	12⅛
REDD- 100	9⅜	14⅛
REDD- 200	10½	16⅜
REDD- 500	12½	18⅛
REDD-1000	15½	21
GLASSTEEL DIFFUSERS		
952	9	18
953	10	21

Nos. 952 and 953 are complete unit numbers.

No. 952 should be used with 200-watt lamp and holder 908.

No. 953 should be used with 300 to 500-watt lamp and holder 909.

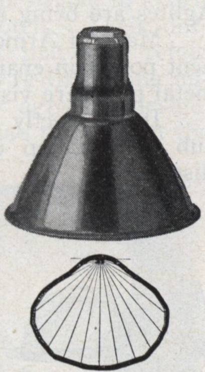
*Numerals shown represent wattage recommended. Holder is illustrated but is supplied separately.

Angle and Bowl Type Reflectors

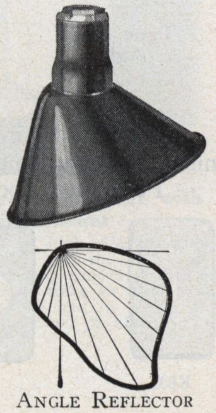
For lighting where sidewall mounting is necessary, the angle type reflector is designed.

The bowl type reflector is deeper than the dome type, shielding the filament and distributing the light over a small area.

In small sizes, these reflectors may be used for local lighting over machines and benches, or in other locations.



BOWL REFLECTOR



ANGLE REFLECTOR

Catalogue No.	Depth, in.	Diam., in.
BOWL TYPE		
REB- 75*	8¾	8½
REB-100	9½	10
REB-200	10½	11⅛
REB-500	12½	13
ANGLE TYPE		
REL- 75*	9½	8¼
REL-100	12	10½
REL-500	16	12½

*Numerals shown represent lamp wattage recommended.

McGILL MANUFACTURING COMPANY

Manufacturers of Electrical Specialties

VALPARAISO, IND.

Products

Levolier White Glazed Porcelain Sanitary Wall Brackets.

Levolier
TRADE-MARK

Porcelain Sanitary Wall Brackets

The Levolier White Glazed Porcelain Sanitary Wall Brackets offer a very marked improvement over other types now on the market.

Made of pure white glazed porcelain that never soils, they are always kept clean merely with a damp cloth. This is a great innovation over the old styles made of metal with a white enamel sprayed finish, as the Levolier does not discolor with age and does not have to be refinished when soiled.

The canopy is connected with the glazed porcelain-encased, standard base socket with brass tubing and bushings, heavily nickeled.

The lever control at the bottom of the socket is new and most convenient. Heavily insulated for safety against shock. A slight push with the finger will turn the switch on and off. The keyless socket has no lever, but is furnished with a button that adds to the symmetry of the wall bracket.

The convenience outlet or receptacle built into the base or canopy is an economy feature. It saves the price of an extra circuit run to a baseboard receptacle.

The socket and convenience outlet are easily wired and attached to wall. Made to fit any standard outlet box—all wiring connections are made to a plate with proper terminals. No soldering or taping.

Suggestions for Home Installations

Bathrooms—on each side of mirror—eliminating extra circuit to baseboard receptacle.

Kitchens—directly over sink or either side of window over sink, auxiliary to regular ceiling kitchen lighting unit.

Pantries—convenient place on wall to light cupboard.

Laundries—directly over tubs or to one side. Convenience outlet handy for washing machine connection without extra outlet box.

Suggestions for Commercial Installations

Hospitals—between beds in wards or over beds in private rooms. Four and a half feet above floor to give light and furnish current for heating pads, immersion heaters, etc.

Hotels—on each side of mirror where space allows.

Office buildings—in each lavatory in each office.

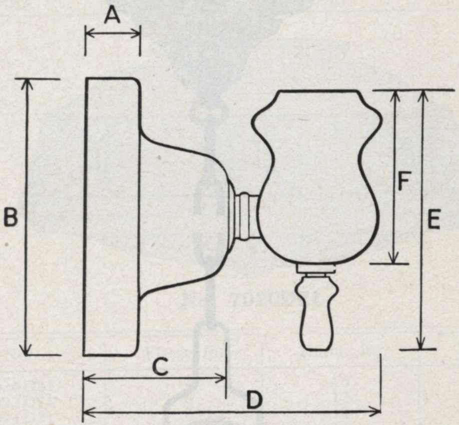
Restaurants and candy kitchens—on walls all around the rooms to carry out the white sanitary effect.

Specifications

Lighting brackets for bathrooms, kitchens and laundries shall be porcelain acceptable to the National Board of Fire Underwriters or to any local department of jurisdiction.

Lighting brackets for bathrooms, kitchens and laundry shall be of the Levolier White Glazed porcelain type as manufactured by the McGill Manufacturing Company, Valparaiso, Ind. Type to be herein specified.

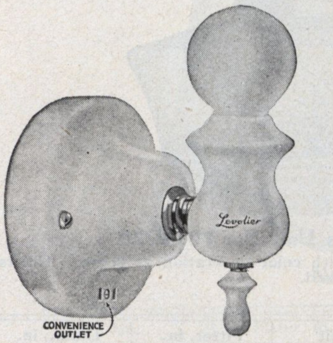
Location of Bracket—The location of brackets shown on drawing is subject to modification depending upon the "swing" of doors or placing of mirrors, sinks, washtubs, etc., and no brackets shall be installed until the definite location is determined and approved by the architect. The center of the bracket shall be 5 ft. 6 in. above the finished floor.



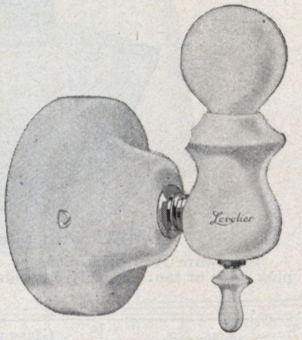
Dimension Diagram

A—Depth of flange	1 in.	D—Over all length	5¼ in.
B—Diameter of base or canopy	5 in.	E—Length of socket, including lever	4½ in.
C—Depth of canopy	3 in.	F—Length of keyless socket	3⅜ in.

Note: All dimensions for keyless bracket same as lever type.

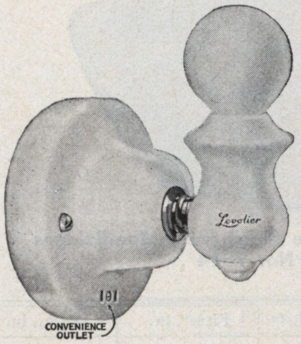


No. 107

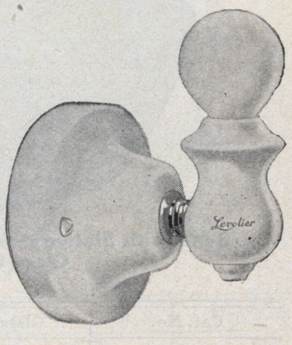


No. 105

Levoliers with Insulated Lever



No. 108



No. 106

Keyless Levoliers

No. 105—Lever control with plain canopy........................each	$4.00
No. 107—Lever control with convenience outlet in canopy......each	5.00
No. 106—Keyless with plain canopy...........................each	$4.00
No. 108—Keyless with convenience outlet in canopy...........each	5.00

MOE-BRIDGES COMPANY

Residential and Commercial Lighting Equipment

FACTORY AND MAIN OFFICES
MILWAUKEE, WIS.

BRANCHES
NEW YORK, N. Y., 588-90 Broadway
MINNEAPOLIS, MINN., 308 South Third Street
LOS ANGELES, CAL., 1026 Wall Street
DETROIT, MICH, 438 West Jefferson Avenue
SAN FRANCISCO, CAL., 933-35 Mission Street

EXCLUSIVE EASTERN AND PACIFIC COAST DISTRIBUTERS OF INLAND GLASSWARE

Products

A complete line of Residential and Commercial Lighting Equipment manufactured on a standardized production basis.

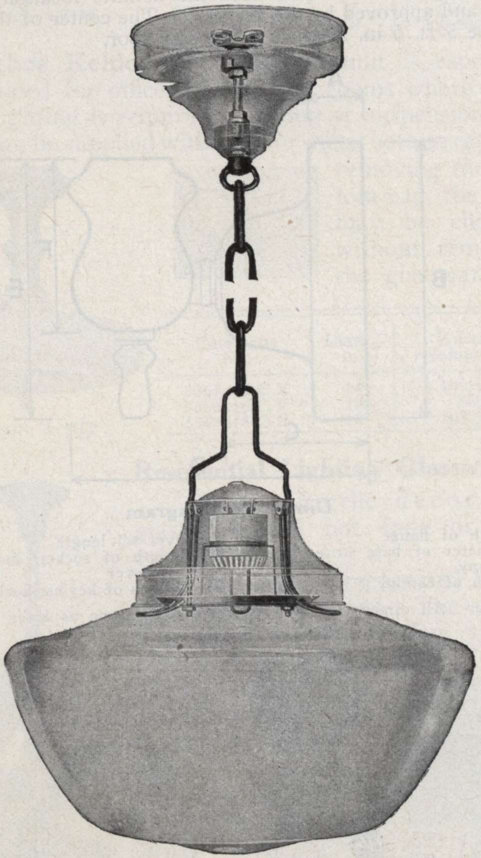
M-B Screwless Safety Holder (Patents Applied for)

The distinctive features of this holder are a stemless canopy and the fact that the glassware is held without screws, clamps, or unsightly slots. The MB screwless holder is perfectly safe. Hugs glassware tightly and resists all vibration. Simple in construction and operation. No complicated parts to get out of order. Locks itself from the inside. Glassware can be removed or replaced in one second. Reduced maintenance cost of changing lamps or cleaning glassware. Surface is perfectly smooth, which enhances its appearance. Will take any standard type of glassware. Both ceiling and pendant types are finished with either a 4-in. or a 6-in. fitter. Standard overall length, exclusive of glassware, 24 in. Additional links may be had at a nominal charge.

The pendant type does away with the unsightly stem type of canopy; also permits canopy to be freely lowered, insuring ease of accessibility for installation and inspection.

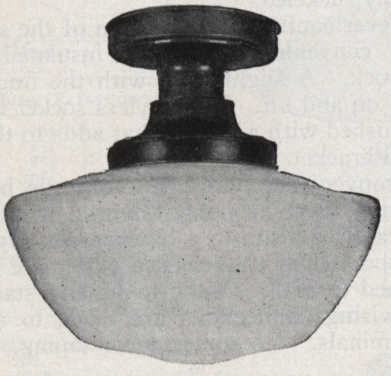
M-B Ceiling Holder (Patent Applied for)

In White Enamel and Statuary Bronze finishes.



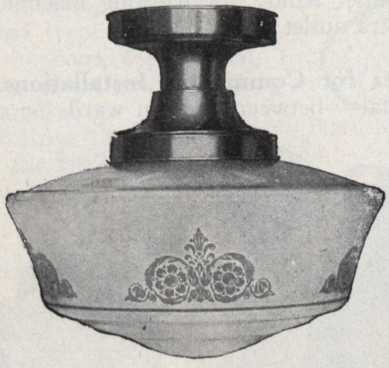
6-MB with Statuary Bronze Finish with Moe-Bridges Glass Unit No. 7614

Cat. No.	Glass unit	Fitter, in.	Diam., in.
4-MB-7608	7608	4	8
4-B-B-7610	7610	4	10
6-MB-7612	7612	6	12
6-MB-7614	7614	6	14
6-MB-7616	7616	6	16



4-MBC with Glass Unit No. 7614

Cat. No.	Glass unit	Fitter, in.	Diam., in.
4-MBC-7608	7608	4	8
4-MBC-7610	7610	4	10
6-MBC-7612	7612	6	12
6-MBC-7614	7614	6	14
6-MBC-7616	7616	6	16



6-MBC with Glass Unit No. 7014D20

Glassware furnished plain or with color decoration as shown. Colors: pink, blue or tan. Specify color desired.

Cat. No.	Glass unit	Fitter, in.	Diam., in.
4-MBC-7010D20	7010D20	4	10
6-MBC-7012D20	7012D20	6	12
6-MBC-7014D20	7014D20	6	14
6-MBC-7016D20	7016D20	6	16

INLAND GLASS COMPANY

Residential and Commercial Illuminating Glassware

FACTORY AND MAIN OFFICES

CHICAGO, ILL.

MOE-BRIDGES COMPANY, EXCLUSIVE EASTERN AND PACIFIC COAST DISTRIBUTERS

NEW YORK, N. Y., 588-90 Broadway

SAN FRANCISCO, CAL., 933-35 Mission St.

Product

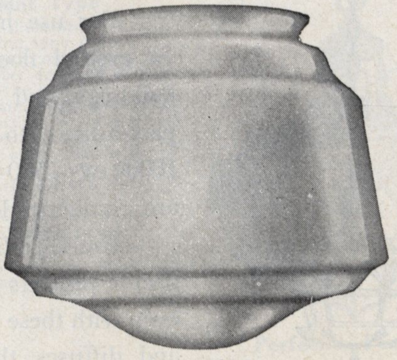
A complete line of Residential, Commercial and Street Lighting Glassware.

"Inland Snow-White" Glass

The representative commercial units shown on this page are made of "Inland Snow-White" Glass—a most efficient light-density white glass. Our exclusive formula and improved methods of manufacture make this glassware the best for use in commercial lighting installations where the maximum efficiency of the lamp is demanded with the absorption percentage of light rays reduced to the minimum.

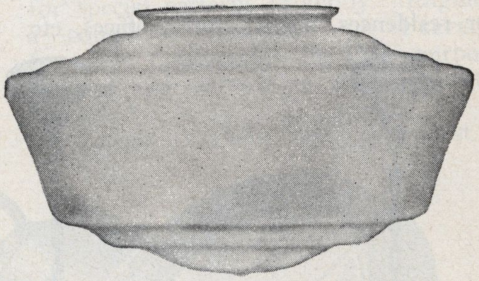
As a diffusing medium for the modern high intensity lamps now in use, this glass is unsurpassed and the usual glare is entirely eliminated. When unlighted, the fine, soft white texture of this glass is a beautiful addition to the appearance of any commercial establishment.

A Few Recent Inland Installations	Number of Units
Boston Chamber of Commerce, Boston, Mass.	3600
Park Square Building, Boston, Mass.	4800
Central Life Building, Chicago, Ill.	450
U. S. Post Office, Washington, D. C.	600
Furniture Market, Chicago, Ill.	8000
Bell Building, Chicago, Ill.	1500
Wrigley Building, Chicago, Ill.	1000
Broadway Arcade Building, Los Angeles, Cal.	1000
Insurance Building, Los Angeles, Cal.	600
Commercial Exchange Building, Los Angeles, Cal.	400
Burnham Building, Chicago, Ill.	2000



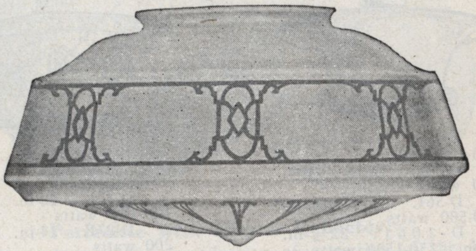
No. 7514

No.	Fitter, in.	Diam., in.	Depth, in.
7514	6	10	9
7525	4	8	7½
7526	6	12	10



No. 7010

No.	Fitter, in.	Diam., in.	Depth, in.
7010	4	10	6
7012	6	12	6⅞
7014	6	14	8
7016	6	16	10

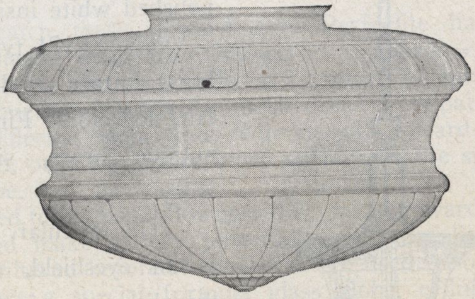


No. 7020D21

No.	Fitter, in.	Diam., in.	Depth, in.
7020D21	4	10	6
7022D21	6	12	6¼
7024D21	6	14	7⅛
7026D21	6	16	8⅞
7028D21	8	18	9

Color decorations: pink, blue, tan.

Above unit may also be had plain. If so desired, omit "D21" from above numbers.



No. 7001

No.	Fitter, in.	Diam., in.	Depth, in.
7001	4	9	6½
7003	6	12	8¼
7005	6	15	9⅜

THE MILLER COMPANY

Manufacturers of Lighting Fixtures

MERIDEN, CONN.

BRANCHES

NEW YORK, N. Y., 68-70 Park Place
PHILADELPHIA, PA., 16th and Chestnut Streets
CHICAGO, ILL., 190 North State Street
LONDON, ENG., 30-35 Drury Lane, Kingsway, W. C. 2

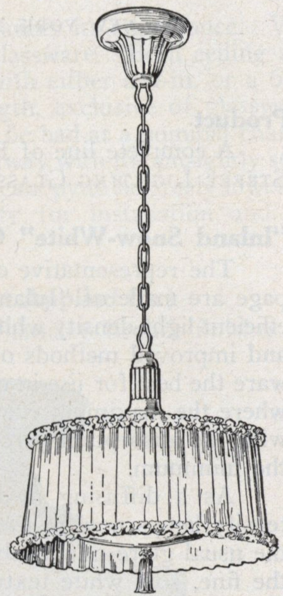
The Duplex-a-lite

The Duplex-a-lite is scientifically designed to provide ideal illumination. The various types illustrated are for residences, hotels, stores, offices, etc.

At the lower left of the page is a new Duplex-a-lite with Spanish influence. Finished in antique hammered gold and red or antique hammered silver and blue.

Shades of silk, parchment, fringe or cretonne may be used on the Duplex-a-lite without affecting the illumination.

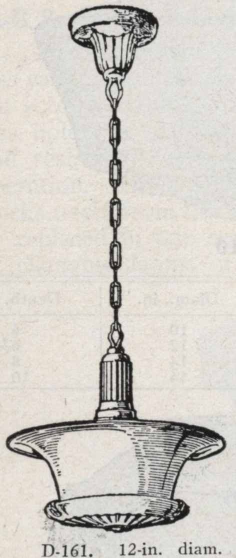
Wire frames may be supplied so that decorators may make special shades to suit interiors, or complete shades may be had to fit the several sizes of Duplex-a-lites.



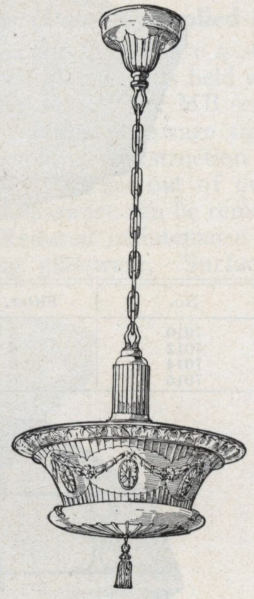
Silk Shade S-5010

Specify the size of Duplex-a-lite the shade is to fit. Ecru silk screens with tassels may also be had to cover the glass bottom disc

The shade illustrated is No. S-5010. Furnished in old gold, old rose, ecru, delft blue or French gray.



D-161. 12-in. diam. 100-150 watts
D-261. 14-in. diam. 200 watts
D-561. 16-in. diam. 300-500 watts
D-1061. 22½-in. diam. 750-1500 watts

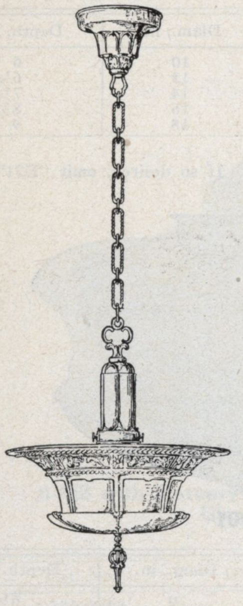


D-171. 12-in. diam. 100-150 watts
D-271. 14-in. diam. 200 watts
D-571. 16-in. diam. 300-500 watts

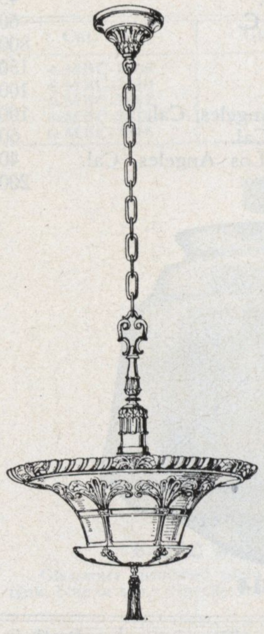
Above is shown D-161 type, the plain Duplex-a-lite with porcelain enameled deflector, mat ivory outside, polished white inside.

The D-171 type has a brass cuirass on the porcelain deflector. Finished in antique brass, silver or ivory.

The circular deflector is an eyeshield, changing the direction of the horizontal rays from the glare angle and diffusing them through the bottom disc and from the ceiling.



D-281. 14-in. diam. 100-200 watts
D-581. 16-in. diam. 300-500 watts



D-1052. 26-in. diam., 60 in. long. For 750 to 1500-watt lamps
No. D-1051. Made without the applied ornament on the deflector

For use in large bays on ground floors of office buildings and stores, Duplex-a-lites to take 750, 1000 or 1500-watt lamps are recommended.

The eyeshielding deflector protects from glare, even with these large lamps, and diffuses the illumination from the entire area of the ceiling, practically as evenly as if from the sky.

THE PERFECLITE COMPANY

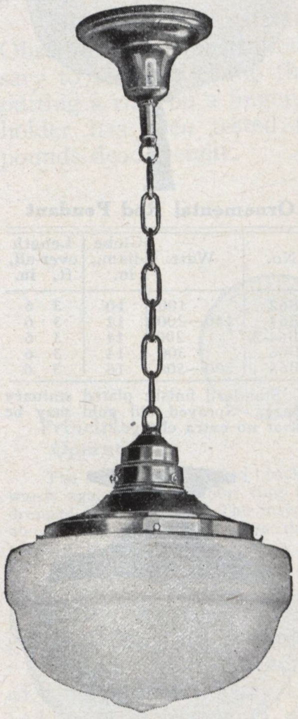
1451-1457 East 40th Street
CLEVELAND, OHIO

DISTRIBUTORS

BALTIMORE, MD., Baltimore Gas Light Co.
BIRMINGHAM, ALA., Matthews Electric Supply Co.
BUFFALO, N. Y., Bison Electric Co.
CHICAGO, ILL., B. J. Mockenhaupt & Co.
DES MOINES, IOWA, Collins Electric Co.
DETROIT, MICH., Crescent Electric Co.
DULUTH, MINN., Duluth Electrical Supplies Co.
HARRISBURG, PA., Harrisburg Electric Supply Co.
HUNTINGTON, W. VA., Emmons-Hawkins Hardware Co.
MINNEAPOLIS, MINN., Sterling Electric Co.
SIOUX FALLS, S. D., Tri State Electric Co.
TRENTON, N. J., Trenton Electric Supply Co.
WHEELING, W. VA., Gee Electric Co.
WILKES-BARRE, PA., Shepherd-Rust Electric Co.

Products

Perfeclite offers a complete line of commercial lighting units embodying the patented Perfeclite Mirror Reflector and Special Formula Glass Globe, the entire unit made of the finest materials throughout. Perfeclites are made with plain and decorated globes, pendant and ceiling types. A Perfeclite Gym Unit is also made.

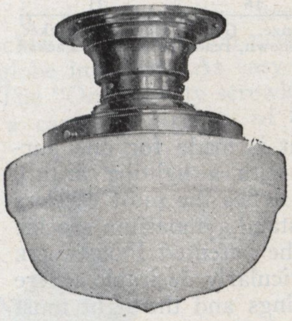


Plain Pendant Type

Above are illustrated the pendant and ceiling type Perfeclites, provided with our special formula glass globe, designed expressly by us for the unit.

This glassware, cellular-like in structure, literally filters the light from an incandescent lamp. It is the most highly efficient globe we know and was developed particularly for the Perfeclite.

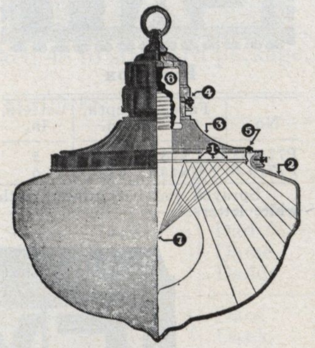
These plain Perfeclite units are most commonly used in office buildings, schools, auditoriums and public buildings of all kinds where no decorative effects are required



Plain Ceiling Type

No.	Watts	Bowl diam., in.
61	100	10
63	150–200	12
63A	200	14
65	300	14
67	300–500	16
Plain Pendant Type		
62	100	10
64	150–200	12
64A	200	14
66	300	14
68	300–500	16

Standard finish: plated statuary bronze. Sprayed finishes may be had at no extra charge.



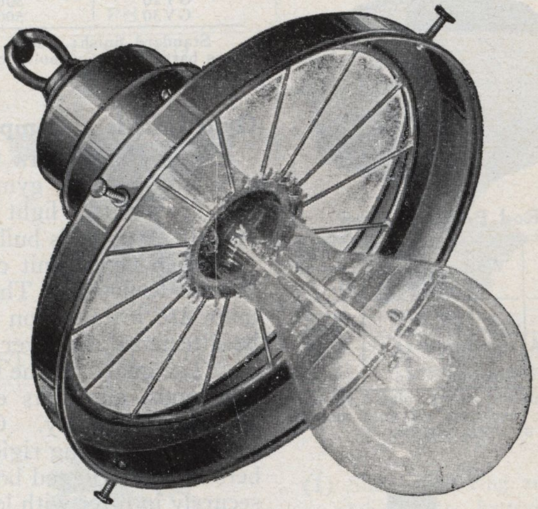
Perfeclite Features

(1) Patented mirror reflector
(2) Perfeclite glass
(3) Interchangeable holder
(4) Special ventilation spacing bushing
(5) Reflector clips
(6) Porcelain mogul receptacle
(7) Filament of nitrogen lamp, showing redirection of upward rays

Exclusive Design—Our Service

Perfeclite maintains an exclusive designing service and can meet requirements for special patterns promptly. Engineering a complete installation of Perfeclites for any commercial lighting purpose is part of our service to the architect and builder.

Literature gladly sent on request.



Perfeclite with Mirror Reflector

Above is a photographic reproduction of a section of the Pendant Type Perfeclite, showing the patented Perfeclite mirror reflector in its relative position to the lamp filament, as contained in all Perfeclite units

Perfeclite Principle

Half the rays from a modern gas-filled incandescent lamp go up—half go down. Usually the upward rays are entirely wasted against the fitter and discolored ceiling. Yet these upward rays—just as strong, just as many—represent half the illuminating power of the lamp.

To catch these upward rays Perfeclite has an extraordinarily wide fitter, shown in the large reproduction above, and this encloses a battery of mirrors, set in segments on a circular metal disc. This patented mirror reflector stops and redirects all upward rays downward, over the entire inner surface of the special glass globe.

Added to the usual downward rays, the upward rays re-directed make a very powerful light, that literally must be filtered before it can be safely used. So Perfeclite uses a special formula glass globe, cellular in fibre, which filters the powerful glare into a soft mellow light that is kind to the eyes.

The Perfeclite mirror reflector is made of a special glass, produced under a secret process, and is unconditionally guaranteed not to peel, check or crack under any heat generated by the lamp.

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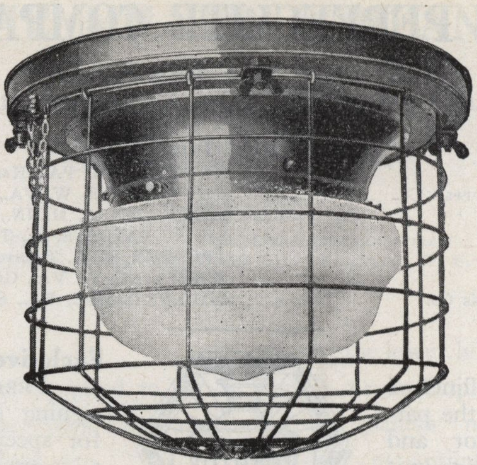


Perfeclite Gym Unit

No.	Watt	Globe, in.	Ceiling diam., in.
GY75	100—150	10	14
GY85	200	12	17
GY20	300	14	21
GY30	500	16	21

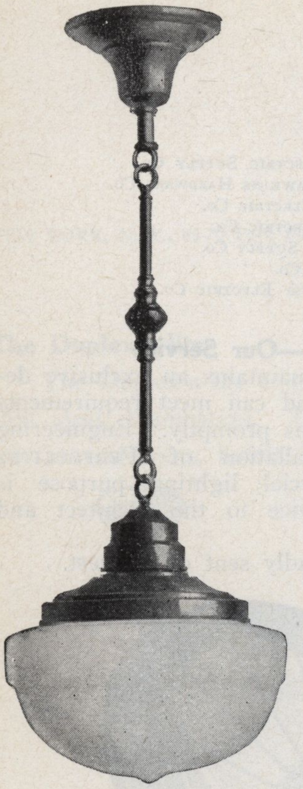
Standard finish: plated statuary bronze. Guard, glassware, socket, cross bars, expansion bolts, complete as shown, ready to install. Packed in individual cartons.

Gym Unit Is a Complete Unit

The Perfeclite Gym Unit is made for one purpose—to provide gymnasiums with a lighting fixture that gives better light and that defies the most careless athletic play. It is built to withstand gymnasium shocks.

Each Gym Unit contains the patented Perfeclite Mirror Reflector. This is particularly desirable where units are installed on high ceilings and the light must be directed down over a broad playing area.

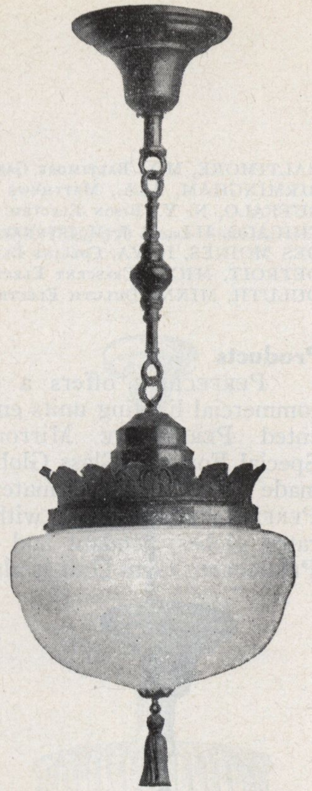
The guard on the Gym Unit is made of extra heavy wire rods, all joints electro-welded, then soldered for additional security. Guard is attached independently of globe, fastening rigidly to four heavy iron cross members by four rugged bolts and wing nuts. Globe is held securely in fitter with locking nuts or thumb screws. No jolts received by guard can be transmitted to globe or lamp.



Rod Pendant Type

No.	Watt	Globe diam., in.	Length over-all, ft. in.
R62	100	10	3 6
R64	150—200	12	3 6
R64-A	200	14	3 6
R66	300	14	3 6
R68	300—500	16	3 6

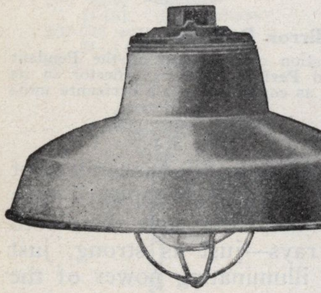
Standard finish: plated statuary bronze. Sprayed old gold may be had at no extra charge.



Ornamental Rod Pendant

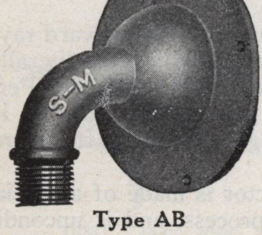
No.	Watt	Globe diam., in.	Length over-all, ft. in.
FB62	100	10	3 6
FB64	150—200	12	3 6
FB64-A	200	14	3 6
FB66	300	14	3 6
FB68	300—500	16	3 6

Standard finish: plated statuary bronze. Sprayed old gold may be had at no extra charge.



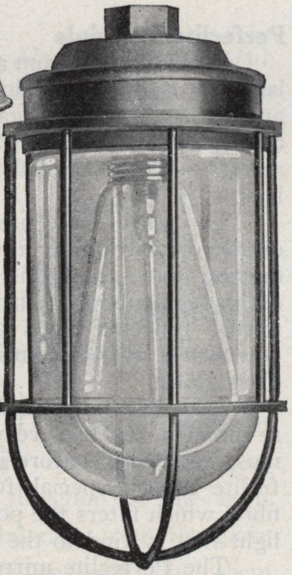
Type SC1

Same as type C1 but equipped with special 12-in. RLM dome reflector



Type AB

Type AB angle bracket may be used in conjunction with Type C1 unit, where bracket type fixture is desired



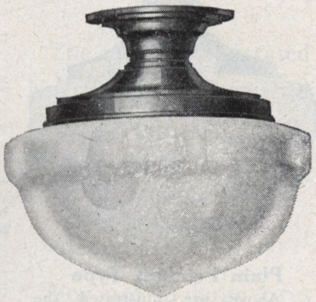
Type C1

Designed for exposed conduit installations. Fitter is regularly tapped for ½-in. conduit at the top

Exit Box

No.	Face, in.	Depth, in.	Letters, in.
P7719-5	7 x13	4½	5
P7719-6	8¾x13	4½	6

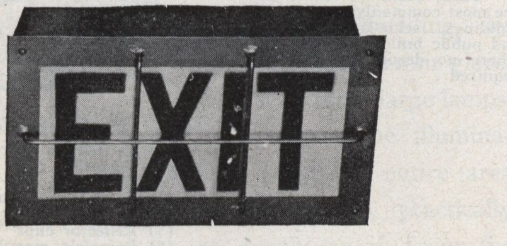
Sprayed red background with white letters.



Two-Circuit Auxiliary Unit

No.	Main watt	Auxil. watt	Globe, diam., in.
2L-61	75	25	10
2L-63	150	25	12

Complete with sockets. Finish: white enamel or statuary bronze.



P7700—Flush Exit Box

Front 8x14 in.; insert box 6½x12½ in.; depth 4 in.; red letters 5 in. high. Front is attached with screws, and has wire guard protection

Continued on next page

"Onli" Safety Screwless Holder

For commercial lighting units. Manufactured especially for use in schools and office buildings. These holders will accommodate any globe of standard fitter size.

ONLI
ONLY
SAFETY SCREWLESS HOLDER
ONLI
ONLY

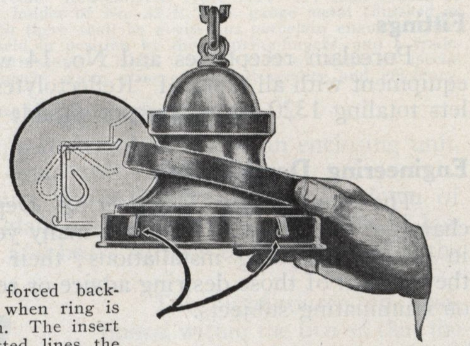
TRADE-MARK

Functions—Safety screwless holders will expedite installation, cleaning and re-lamping of globes, insuring safety and avoidance of the breakage common to screw type holders.

Demand—For years the lighting industry as well as the public has wanted a strong, dependable, safe screwless holder—one that would be simple in use, yet absolutely secure in holding the globe.

Original Safety Screwless Holder—In response to this need, the "Onli" safety screwless holder was devised. It is now an outstanding achievement among the many improvements made in the lighting industry. It is the original screwless holder, made of No. 22 B&S gauge brass, and it is favorably known to the trade.

Simplicity—Certainly it is simplicity itself. Observe in the illustration below the one motion necessary to securely clamp the globe in place. As easy as putting a ring on a finger. The "Onli" safety screwless holder has been tested to a carrying capacity of 78 pounds dead weight.



Principle of Operation

The clips are forced backwards against globe when ring is dropped into position. The insert above shows by dotted lines the position of clips before ring is placed over them, while the solid lines show position when locked.

How Furnished—All spun metal, No. 22 B&S gauge brass. All ornaments solid cast brass.

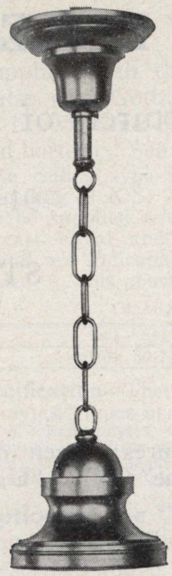
Holder complete with pendant equipment consists of canopy, stem, hickey, chain and safety holder. Standard length of pendants, 42 inches over all.

All holders are packed 24 to standard package, except No. PH4, which is packed 48 to standard package.

SIZES AND FINISHES

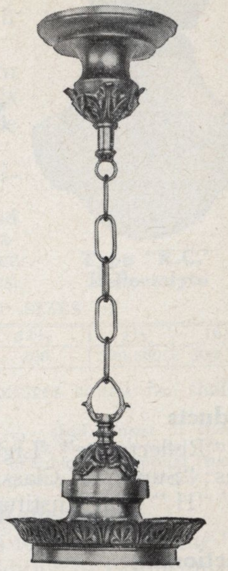
No.	Size, in.	Ceiling diameter, in.	Finish *	Code
PH4	4	...	Statuary bronze or brushed brass	Dad
PH5	5	...		Dame
PH6	6	...		Daddy
104C	4	6½	Statuary bronze or brushed brass	Dare
105C	5	8¼		Dank
106C	6	8¼		Darky
FP4	4	...	Statuary bronze and gold on ornaments	Durk
FP6	6	...		Duroy
FC104	4	6½	Statuary bronze and gold on ornaments	Dory
FC106	6	8¼		Durpit

*Special plated or enameled finishes may be had.



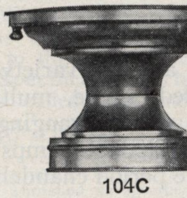
PH

STANDARD PENDANT



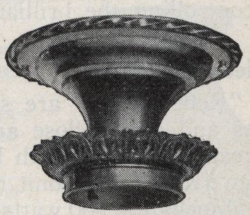
FP

ORNAMENTAL PENDANT



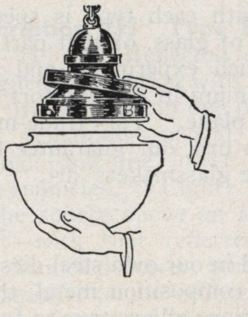
104C

STANDARD CEILING

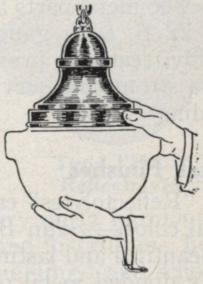


FC

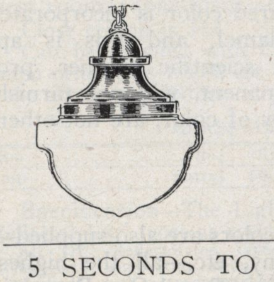
ORNAMENTAL CEILING



(1) Simply lift ring and insert globe. No battered screw threads to wrestle; no jagged screw heads to hurt fingers. No screws to lose.



(2) Drop ring and press it into place. No twisting to reach screws on opposite side from where you stand; no doubt about security of globe.



(3) Locked tight. No guessing if screws are not tight enough. Safe, secure, sightly.

5 SECONDS TO INSERT OR REMOVE ANY GLOBE

THE REFLECTOLYTE COMPANY

Manufacturers of Reflectolyte Lighting Fixtures

914-K Pine Street

ST. LOUIS, MO.

Products

"Reflectolyte" Lighting Fixtures; seven distinct types: "Supreme" Classic, "Supreme" Gothic, "U," "K," "L," "H," and "Institutional."

Functioning

The functioning of each type is based on the "Reflectolyte System" of light-control and diffusion—the subject matter of over eighty patents; a scientific method of controlling the brilliant rays of Mazda "C" lamps.

Styles and Sizes

"Reflectolytes" are supplied in a large variety of styles and sizes—close and suspended, single, multiple and candle models, with brackets to match—ranging in design from simple unit types (for Mazda C lamps up to and including 500 watts) to massive period chandeliers for large interiors.

Glassware

The glassware supplied with each type is special, both as to outline and formula of glass, of that particular form and composition which experiment and test have proven provides the maximum in eye comfort and illumination on the working plane. The trade-mark "Reflectolyte" is blown in each urn, our guarantee that it is the choicest product of the glassmakers' art.

Metal Parts

The metal parts are formed in our own steel dies, of No. 22 B. & S. gauge special composition metal, thoroughly treated to prevent corrosion; all are true to form, extra strong and serviceable, and will last as long as the building.

Metal Finishes

"Reflectolytes" can be finished in a large variety of metal colors—Satin Brass, Antique Gold, Bronze, etc.—all beautiful and lasting. To produce these finishes, very finely divided metal of the desired color is incorporated with transparent Pyralin Enamel, and this is applied, layer upon layer, in a scientific manner, providing finishes which are permanent, will not tarnish, and which, in variety and beauty of color, are not otherwise obtainable.

Enamel Finishes

Enamel finishes in various colors are also supplied—White, Ivory, Black, Mahogany, etc.—all the highest grade Pyralin Enamels. White Fused-On Porcelain Enamel can also be supplied.

Metal Ornaments

The cast metal ornaments are of Alba metal, cast in our own bronze moulds; they are beautifully modeled and are free from fins and flaws.

Compo Ornaments

The ornamental compo parts are cast of a secret compound of highly refined gypsum and other ingredients, providing an unusually hard, tough, strong material. When finished by our process, it has the appearance of cast metal, and will last for many years unimpaired in strength and color.

Fittings

Porcelain receptacles and No. 14 wire are regular equipment with all types of "Reflectolytes," hence 13 outlets totaling 1320 watts, are permissible on each circuit.

Engineering Department

The Reflectolyte Engineering Department is in charge of experts who have had many years' experience in planning lighting installations; their services are at the disposal of those desiring advice or recommendations on illuminating subjects.

Distribution

"Reflectolytes" are obtainable through all dealers in first class electrical merchandise throughout the United States, Canada, and Foreign Countries.

Conclusion

Reflectolytes were placed on the market in 1914, when Mazda "C" lamps came into general commercial use. Our entire time, since then, has been devoted to the task of designing artistic and original ideas in lighting fixtures.

That we have been fairly successful, is testified to by over eighty mechanical and design patents, issued to date. Were our ideas and designs not new and original, we could not have secured these patents.

The illustrations of base types on the following page do not represent our full line. For complete representation, we refer to our catalogue containing almost one hundred and fifty illustrations.

Your favorable consideration of "Reflectolytes" for public and office buildings, department and retail stores, banks, churches, schools, hotels, theaters and hospitals, will insure your clients receiving lighting equipment of the highest order, developed artistically, scientifically and mechanically, to the highest degree of perfection.

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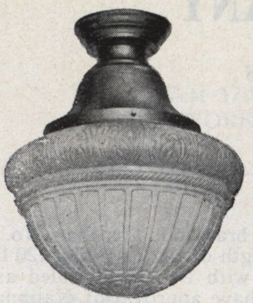


Type “S.C.”
Reflectolyte

Description of “S” or “Supreme” Reflectolyte

The “S” or “Supreme” Reflectolyte is an enclosing unit provided with a detachable reflector concealed within the body.

The reflector is of steel with a fused-on porcelain enameled white reflecting surface, and is designed to re-direct the horizontal and upwardly inclined light rays, downwardly and outwardly.

The glass urn, of distinctive shape and special formula diffusing glass, intercepts the rays from the lamp and reflector, and diffuses them over a wide area beneath the fixture; and also illuminates the ceiling.

Made in two period designs, Classic and Gothic.

Plain metal parts with Classic urns: close ceiling type is S.C.; suspended ceiling type is S.I.

Plain metal parts with Gothic urns: close ceiling type is S.G.; suspended ceiling type is S.G.I.

The ornamental types are supplied with Classic and Gothic cast metal and compo ornaments, and are indicated by the letter “O” suffixed to the above type letters.

GLASS AND LAMP SIZES

Diam..............in.	8½	10½	12½	14½	16½
Lamp...........watts	50-75	100-150	200	300-500	300-500

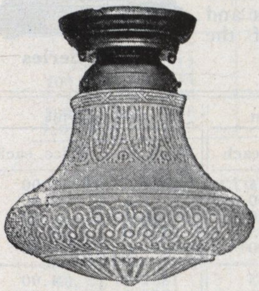
Specification—The Lighting Fixtures called for shall be “Reflectolytes,” types as specified:

All “S” or “Supreme” Reflectolytes, types .... shall consist of a bell-shaped body or holder of No. 22 B. & S. gauge metal (finished as specified) within which there shall be a vitreous porcelain enameled steel reflector detachably held in position by three spring-fingers, and a trade-marked, one-piece, acorn-shaped Classic urn (or Gothic), made of special (formula “S”) translucent white glass of highest quality and efficiency.

Description of “U” Type Reflectolyte

The “U” type Reflectolyte is also an enclosing unit, but without the detachable reflector.

The glass urn, of distinctive design, is blown of special formula glass of high diffusing quality and low light absorption, and bears surface ornamentation in the Classic period.



Type “U.C.”
Reflectolyte

The light-source is positioned within the urn so that the bell shaped upper portion functions as a reflector, directing the rays from the source downwardly, to be diffused over a wide area by the bowl shaped bottom.

Made in Classic ornamentation only.

Close ceiling type is U.C. Suspended ceiling type is U.I.

When cast metal and compo ornaments are required, add the letter “O” to the above type letters.

GLASS AND LAMP SIZES

Diam. ....in.	8½	10½	12½	15½
Lamp ....watts	50-75	100-150	200	300-500

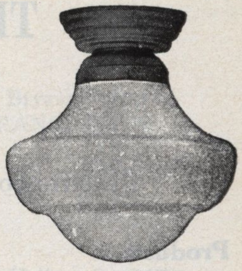
Specification—The Lighting Fixtures called for shall be “Reflectolytes,” types as specified:

All “U” Reflectolytes, types .... shall consist of standard “Reflectolyte” supporting means of No. 22 B. & S. gauge metal (finished as specified), with a trade-marked, one-piece, bell-shaped urn, bearing surface ornamentation in the Classic period, and blown of special (formula “U”) translucent white glass of highest quality and efficiency.

Description of “K” Type Reflectolyte

The “K” type Reflectolyte is also an enclosing unit, with urn of simple outline, designed to re-direct the horizontally and upwardly inclined rays downwardly.

The urn is blown of a new light-density white glass, of high diffusing quality and low light absorption. Its outline, and the position of the light-source, provide the maximum of well diffused illumination over a wide area beneath the fixture.



Type “K.C.’
Reflectolyte

Supplied with the glass urn plain, also with Gothic quatrefoils in rich brown tone etched on the side and bottom. See “L” type.

Close ceiling type is K.C. Suspended ceiling is K.S.

Can be supplied with Classic and Gothic cast metal and compo ornaments, and are indicated by the letter “O” added to the above type letters.

GLASS AND LAMP SIZES

Diam..............in.	8½	10½	12½	14½	16½
Lamp.............watts	50-75	100-150	200	300-500	300-500

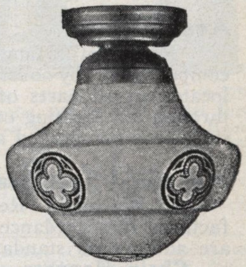
Specification—The Lighting Fixtures called for shall be “Reflectolytes,” types as specified:

All “K” Reflectolytes, types .... shall consist of standard “Reflectolytes” supporting means of No. 22 B. & S. gauge metal (finished as specified), with a trade-marked, one-piece urn, blown of special (formula “K”) translucent white glass of highest quality and efficiency.

Description of the “L” Type Reflectolyte

The “L” type Reflectolyte is identical with the “K” type, described above, with the addition of Gothic quatrefoils, in rich brown tone, etched on the sides and bottom.

The close ceiling type is L.C.; suspended ceiling type is L.S.



Type “L.C.”
Reflectolyte

Glass and lamp sizes are the same as specified for the “K” type.

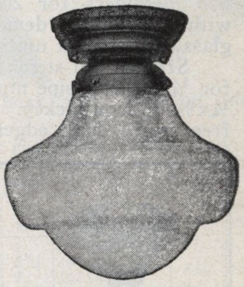
When cast metal and compo ornaments are required, add the letter “O” to the above type letters.

Specification—The lighting fixtures called for shall be “Reflectolytes,” types as specified:

All “L” Reflectolytes, types .... shall consist of standard “Reflectolyte” supporting means of No. 22 B. & S. gauge metal (finished as specified), with a trade-marked, one-piece urn, blown of special (formula “K”) translucent white glass of highest quality and efficiency, having Gothic “Quatrefoils” in rich brown tone, etched on the sides and bottom.

Description “H” Type Reflectolyte

“H” type Reflectolyte Diffusers are enclosing units designed to function with the ceiling in distributing light. The urn is blown in one piece of crystal glass, the top or neck remaining crystal, lightly frosted, and the lower portion opal-enameled. Light emitted by the source above an angle of 100°—with that reflected from the enameled lower portion—is transmitted to the ceiling practically unobstructed, there reflected and widely diffused. Rays emitted below this angle are diffused through enameled lower portion.



Type “H.C.”
Reflectolyte

Supplied in close and suspended types, with plain and ornamental metal parts, sufficient to carry out a harmonious scheme of illumination in hospitals and institutions, hotel guest rooms, apartment and office buildings, and schools.

Close ceiling is H.C. Suspended ceiling is H.S.

Can be supplied with Classic and Gothic cast metal and compo ornaments which are indicated by adding the letter “O” to the above type letters.

GLASS AND LAMP SIZES

Diam.................in.	8½	10½	12½	14½
Lamp...............watts	50-75	100-150	200	300-500

Specification—The Lighting Fixtures called for shall be “Reflectolytes,” types as specified:

All “H” Reflectolytes, types .... shall consist of standard “Reflectolyte” supporting means of No. 22 B. & S. gauge metal (finished as specified), with a trade-marked, one-piece urn, blown of crystal glass, the upper neck portion lightly frosted, and the lower hemispherical dish shaped portion, opal-enameled; designed to function with the ceiling in distributing the light.

THE F. W. WAKEFIELD BRASS COMPANY

Manufacturers of "Red Spot" Lighting Specialties

VERMILION, OHIO

PACIFIC COAST REPRESENTATIVES: THE GEO. A. GRAY COMPANY, LOS ANGELES AND SAN FRANCISCO, CAL.

Products

"RED SPOT" HANGERS in pendant and ceiling types, for all commercial lighting service.

"RED SPOT" SAFETY SCREWLESS "JIFFY" HOLDER.

"RED SPOT" PORCELAIN ENAMEL CEILING FIXTURE for kitchens, bathrooms and hospital service.

Advantages

"Red Spot" Hangers are made to rigid specifications which insure durability in service and permanence of finish.

Structural features facilitate the work of installation, so that fixture hanging cost is substantially reduced on jobs where "Red Spot" Hangers are used.

The Wakefield method of forming solid brass chain in "Absotite" links gives a safe tensile strength in excess of 120 lb. and provides the best base for permanent plated finish.

Mechanical design relieves canopies from all strain where individual pull chain control is employed, thus preventing loosening by repeated switch action.

Availability

"Red Spot" Hangers and lighting specialties are handled competitively by over 130 leading electrical supply jobbers located in all parts of the United States, and are procurable through any lighting or fixture contractor whatsoever. Factory stocks are maintained at Vermilion, O., and San Francisco, Cal.

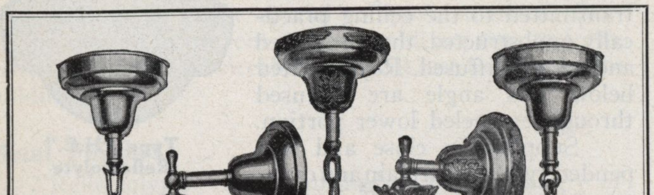
Wakefield Specification

All Wakefield "Red Spot" Hangers here listed, are manufactured in accordance with the following specifications, which are adopted as standard by discriminating architects:

Chain Hangers—*Canopies*—All canopies for single light pendants to be not less than 5¾-in. diameter, 3½ in. deep, and of No. 22 B&S gauge brass, with adequate slip ring and setscrew.

Holders—All holders for single light pendants to be of No. 22 B&S gauge brass and equipped with three holder screws having beveled ends or other approved safe holding device. Sockets must be located at, or adjusted to, the position required to bring lamp in proper relation to the glassware specified. Holders for 200-watt units or larger to be equipped with a means or device to compensate for lack of balance in glassware so that units shall hang even.

Stems—All stems to consist of solid cast brass loop tapped for ¼-in. iron pipe nipple, No. 24 B&S gauge brass casing and ¼x⅜-in. iron hickey. All wireways to be properly reamed and free from rough edges.



Chain—All chain to be of solid brass not less than No. 5 B&S gauge, and having a tensile strength of not less than 120 lb.

General—All units to be wired with No. 14 stranded asbestos covered wire. All units must have approval of National Board of Underwriters. No sprayed-on finish shall be used on any unit.

Ceiling Units—*Canopies*—All canopies for 200-watt units or larger to be not less than 8-in. diameter and made of No. 22 B&S gauge brass. Canopies to be mounted on a steel strap suitable for attaching to lugs of outlet box or fixture stud by means of locknut.

Holders—All holders for ceiling units to be of No. 22 B&S gauge brass and equipped with three holder screws having beveled ends or other approved safe holding device. Sockets must be located at, or adjusted to, position required to bring lamp in proper relation to the glassware specified.

General—All units to be wired with No. 14 stranded asbestos covered wire. All units must have approval of National Board of Underwriters. No sprayed-on finish shall be used on any unit.

Accessories

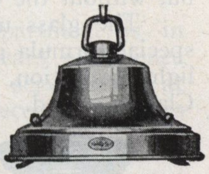
To insure uniformity in complete installations, there are available a variety of accessory "Red Spot" Hangers and sidewall fixtures suitable for small space lighting such as restrooms, anterooms, narrow halls, etc. Accessory units are in all respects similar and equal to the commercial hangers here shown.

Data Sheets

Complete illustrated data on all "Red Spot" material is available to architects in letter size sheets, complete with folder for filing.

Safety Screwless Holder

Jiffy Holder "Red Spot" Hangers (series 1700 in table below) are timesavers for the maintenance man, enabling him to almost instantaneously remove or replace glassware for lamp renewal or for cleaning. We believe that the Wakefield Jiffy Holders are the simplest, safest and most easily manipulated holders of the "safety" or "screwless" type.



1700 Series

For lamps of wattage	Size fitter, in.	Chain Suspension		Ceiling Unit	
		Stock No.	Price, each	Stock No.	Price, each
75	3¼	1330-A	2.75	1331-A	2.00
100–150	4	1370-A	3.00	1371-A	2.00
200	6	1350-A	3.50	1351-A	3.00
300–500	6	1350-B	4.25	1351-B	3.75
500	8	1380-B	7.00	1381-B	6.00
75	3¼	1830-A	6.75	1831-A	4.00
100–150	4	1870-A	7.00	1871-A	4.00
200	6	1850-A	9.00	1851-A	6.50
300–500	6	1850-B	9.75	1851-B	7.25
500	8	1880-B	15.00	1881-B	10.00
100–150	4	1770-A	4.53	1771-A	3.24
200	6	1750-A	5.28	1751-A	4.65
300–500	6	1750-B	6.27	1751-B	5.61

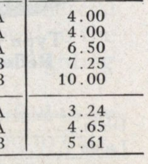
*Standard brackets: 2¼-in. fitter, $2.42; 3¼-in. fitter, $2.25; 4-in. fitter, $2.45.

**Ornamental brackets: 2¼-in. fitter, $3.57; 3¼-in. fitter, $5.00; 4-in. fitter, $5.25.

***Stem construction: Above listed "Red Spot" Hangers supplied in stem construction, as illustrated, at 50 cents extra each list.

Porcelain Enamel Ceiling Unit

For kitchens, bathrooms, lavatories, and for all hospital service, the "Red Spot" vitrified porcelain enamel ceiling unit illustrated has given the greatest satisfaction. Structural features permit it to be hung quickly at low cost and it is easily removable for washing. Pull chain or sidewall switch control, 4-in., fitter, 5¼-in. over-all length, list price, $2.75. Identified as "Red Spot" No. 1171-Com.



1171-Com.

BENJAMIN ELECTRIC MFG. CO.

SALES AND DISTRIBUTING OFFICES

247 West 17th Street
NEW YORK, N. Y.

120-128 South Sangamon Street
CHICAGO, ILL.

448 Bryant Street
SAN FRANCISCO, CAL.

BRANCH OFFICES

MONTREAL, TORONTO AND WINNIPEG, BENJAMIN ELECTRIC MFG. CO. OF CANADA, LTD.
LONDON, ENGLAND, THE BENJAMIN ELECTRIC, LTD.

FACTORIES: CHICAGO AND DES PLAINES, ILL.

BENJAMIN
TRADE-MARK

Products

BENJAMIN INDUSTRIAL LIGHTING EQUIPMENT including Porcelain Enameled Reflectors and Specialties, Acidproof, Gasproof, Vaporproof and Weatherproof Fixtures, Showcase Lighting Units, Show Window Lighting Equipment; PANEL BOARDS and CABINETS.

Also manufacturers of Wiring Devices, Industrial Signals and other Electrical Specialties.

Benjamin Reflector-Sockets (One Piece Units for General Service)

Designed to provide the best lighting through the correct positioning of proper lamps.

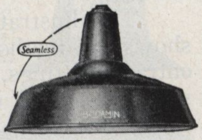
They are made for medium and mogul base lamps as listed.

Sockets are regularly equipped with Benjamin lamp grip and the medium base socket can be furnished, at slight advance in price, with Benjamin self-locking device or in pull chain type.

Construction—One-piece porcelain enameled steel reflector, Benjamin green outside, white inside. Heavy porcelain two-piece keyless socket; strong supporting fitting tapped ½ or ¾ in. or bushed for drop cord, as specified.

Dome RLM Reflector-Socket—

Lamp, watts	Diam., in.	Height., in.	Cat. No.
50	12	7¼	5640
75	12	8⅛	5641
100, 150	14	9¼	5642
200	16	10½	5643
300, 500	18	12⅛	5644
750, 1000	20	15⅛	5645



DOME RLM REFLECTOR-SOCKET

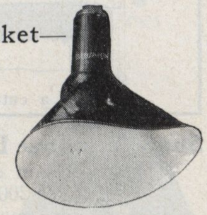
Bowl Reflector-Socket—

Lamp, watts	Diam., in.	Height, in.	Cat. No.
40, 50, 60	7	7½	6166
75	8¼	8¾	6161
100, 150	9	9½	6189
200	10	10⅝	6169
300, 500	12	12	6173

BOWL REFLECTOR-SOCKET

Elliptical Angle Reflector-Socket—

Lamp, watts	Diam., in.	Height, in.	Cat. No.
60, 75	8⅞x13¼	12⅜	5522
100, 150	8⅞x13¼	14	5525
200	11⅛x16⅜	16½	5526
300, 500	13⅞x19⅞	19⅝	5537
750, 1000	13⅞x19⅞	21⅜	5538



ELLIPTICAL ANGLE REFLECTOR-SOCKET

Parabolite—

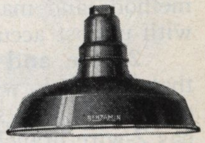
Lamp, watts	Length, in.	Height, in.	Cat. No.
60, 75	21	8½	1234
100, 150	21	9¼	1235
200	21	10⅛	1236

PARABOLITE

Type RR Threaded Fixtures (Heavy Duty)

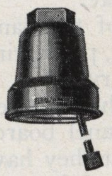
For conditions requiring a heavy duty unit where easy removal, for cleaning reflector surface, is essential.

Finish—Steel hoods are green porcelain enameled; cast hoods are green paint enameled. Reflectors are green porcelain enameled outside; white inside. Pendent hoods tapped ½ or ¾ in.



TYPE RR DOME FIXTURE
Nos. 26001 and 26014

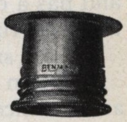
Type RR Hoods—



No. 26003
Pendent Cast Hood
Showing key for lamp lock

No. 26030
Pendent Steel Hood

No. 26002
Outlet Box Cast Hood
For 4-in. std. box



No. 26025
Outlet Box Steel Hood
For 4-in. std. box

TYPE RR THREADED HOODS FOR THREADED REFLECTORS

Kind of socket	Pendent Type		Outlet Box Type	
	Cast, Cat. No.	Por. enam. steel, Cat. No.	Cast, Cat. No.	Por. enam. steel, Cat. No.
Med. base keyless	26001	26030	26002	26025
Med. base locking	26003	26033	26004	26027
Med. base pull chain	26007	26037	26010	26031
Mogul base keyless	26005	26035	26008	26029

Type RR Reflectors—

Type RR Dome RLM Standard

Type RR Bowl

Type RR Angle

TYPE RR THREADED REFLECTORS FOR THREADED HOODS

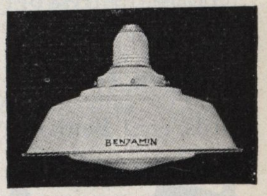
Lamp, watts	Dome			Bowl			Angle		
	Diam., in.	Ht., in.	Cat. No.	Diam., in.	Ht., in.	Cat. No.	Diam., in.	Ht., in.	Cat. No.
75	12	4⅜	26012	8¼	5	26108	.....	.....	.....
100, 150	14	5½	26014	9	5⅞	26109	10	8¼	26210
200	16	6⅝	26016	10	7	26110			
300, 500	18	8	26018	12	7¾	26112	12	12	26212
750, 1000	20	11	26020	.....	.....	.....	14	15⅜	26214

Glassteel Diffuser

The most notable results of this unit are: softening of shadows and reduction of direct and reflected glare because 7% of light output reaches ceiling; directs light at higher angles than other similar equipment.

Construction—White porcelain enameled steel reflector with Type RR threaded hood (tapped ½ in.) and glass diffusing globe. Two-piece porcelain socket.

Special base allows interchange of mogul or medium socket.



CATALOGUE No. 26300

Lamp, watts	Diam., in.	Ht., in.	Pendent type Cat. No.	Ceiling type Cat. No.
200	18	11¾	26300	26304
300, 500	20	13⅜	26302	26306

Continued on next page

Benjamin-Starrett Panel Boards and Cabinets

National Electrical Code Standard.

Durability, strength and fine appearance with safe insulation, traceable distribution and convenient accessibility are features of Benjamin-Starrett Panel Boards and Cabinets.

The bases are of molded composition which is impervious to moisture, oil or acid. Because of its strength—both mechanical and dielectric—engineers have recognized this material as most satisfactory for panel boards. Fine appearance is a result of modern methods and machinery. Every part is machine made with utmost accuracy.

2-fuse and 1-fuse Panels—The 2-fuse panels—that is, panels with two fuses in each wire branch circuit—have been standard in the past. The 1-fuse panel has 2-wire branch circuits with one fuse per circuit. It is used only with 3-wire grounded neutral. The unfused side of each branch circuit is connected directly to the neutral bus bar at the top of the panel.

Dead Front Panel Boards—The Benjamin-Starrett dead front type of panel board is as nearly accident and foolproof as is possible to make.

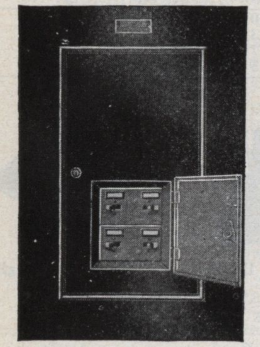
The large door exposes the full face of the panel and has a combined Yale lock, latch and knob, preventing theft of fuses, tampering, or accidental injury.

The smaller door gives access only to the switches.

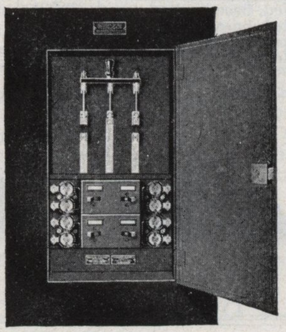
Open Front Panel Boards—These panel boards are identical with the dead front except that they have a single door giving access to all switches and fuses.

Features of Construction—Composition base is fireproof, has high dielectric strength, and is lighter and mechanically stronger than other materials commonly used, resulting in neatness and accuracy of mounting.

Catalogue S-4, containing complete listings, will be sent upon request.



DEAD FRONT TYPE
Range—4 to 30 circuits



OPEN FRONT TYPE
Range—4 to 30 circuits

TYPE SYMBOLS FOR 2-FUSE PANELS

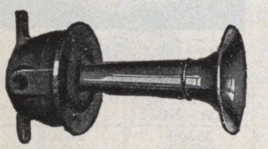
Switches in branches	Dead Front		Open Front	
	Branches arranged for Edison plug fuses	Branches arranged for cartridge fuses	Branches arranged for Edison plug fuses	Branches arranged for cartridge fuses
None	....	....	Type OP	Type OC
Knife	....	....	Type OPK	Type OCK
Tumbler	Type DPT	Type DCT	Type OPT	Type OCT

1-fuse panel type symbols are same as above with prefix "S": for example, SDPT.

Industrial Howlers

For calls and warnings in factories, warehouses, yards, etc. Benjamin Howlers have a peculiar and penetrating pitch which makes them most satisfactory and effective. They are ruggedly made for either outdoor or indoor use on d-c. or a-c.

Complete information in Bulletin 53—on request.



WEATHERPROOF HOWLER

Enclosed Lighting Units (Dustproof, Gasproof, Vaporproof)

Safety, durability and effectiveness are combined in this line of equipment. Full listings are shown in Catalogue 24, which we will gladly send you. Three representative types are illustrated here.

GASPROOF FIXTURE WITH DOME REFLECTOR
Catalogue No. 1545

VAPORPROOF FIXTURE
Catalogue No. 1565

DUSTPROOF FIXTURE
Catalogue No. 665

Lamp, watts	Gasproof and vaporproof fixture with dome reflector			Gasproof and vaporproof fixture less dome reflector			Moistureproof and dustproof fixture		
	Diam., in.	Height, in.	Cat. No.	Diam., in.	Height, in.	Cat. No.	Diam., in.	Height, in.	Cat. No.
25—60	......	......	......	3½	8¼	1563	3½	7⅜	663
60—75	12	8¼	1543	3½	8¼	1563	......	......	......
75	......	......	......	......	......	......	......	......	......
75—100	......	......	......	......	......	......	5⅛	9½	665
100—150	14	9⅞	1544	5⅛	9⅞	1565	......	......	......
150—200	......	......	......	......	......	......	......	......	......
200	16	13⅜	1545	8	13½	1568	......	......	......
300—500	18	13⅜	1546	8	13½	1570	......	......	......

Show Case Lighting Fixtures

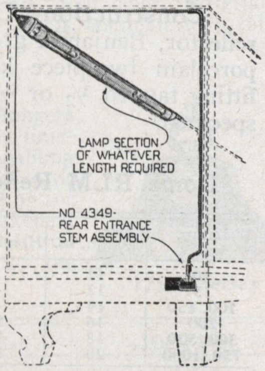
These fixtures use standard tubular lamps, and can be installed in any type of show case.

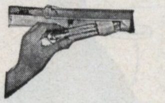
Lamp sections are made in a variety of lengths so that a combination is obtainable to fit any length of case.

The standard finish for parts is dark bronze outside. Lamp sections are aluminized inside.

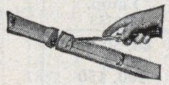
The illustration at the right shows the method of installing entrance fittings. Tubing is of soft brass and easily cut and bent.

Complete information and listings given in A D 1159 will be sent upon request.

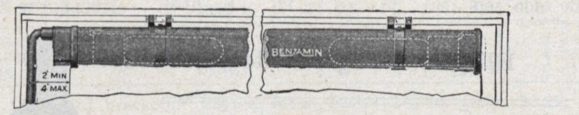

LAMP SECTION OF WHATEVER LENGTH REQUIRED
NO 4349-REAR ENTRANCE STEM ASSEMBLY



At the left is shown the socket which separates like a standard attachment plug, so that lamps can be changed outside of case.



At the right is shown the method of joining sections both mechanically and electrically by tightening up two screws.

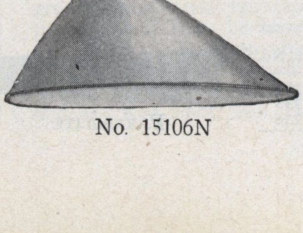


Above is a cut-away plan, showing lamp section installed

Show Window Lighting Equipment

This porcelain enameled steel reflector, for use with 75 to 200-watt lamps, is especially suitable for flush mounting with false ceilings and where intense illumination is wanted in a window of usual dimensions. Its unbreakable surface is easily cleaned, and it will not discolor, stain or tarnish. Finish is buff outside, white inside. Suitable for color lighting.

Catalogue No. 15106N. Diameter, 12¼x8¾ in. Height, 7⅝ in.



No. 15106N

Continued on next page

Ben-ox Interchangeable Devices for Factories, Warehouses and General Industrial Use

The economy of a Ben-ox installation is indisputably apparent to any one who sees demonstrated its extreme simplicity of assembly.

Ben-ox represents a new idea not only for meeting obvious present-day requirements, but also providing for any unforeseen future development in industrial illumination.

Ben-ox is an easier, quicker and better way of installing lighting equipment. Its principal advantages are:

(1) Ceiling unit is easily attached to any standard outlet box without soldering and taping joints.

(2) Changes in lighting equipment may be made at any time as easily as changing lamps, and without disturbing any original wiring of ceiling outlets.

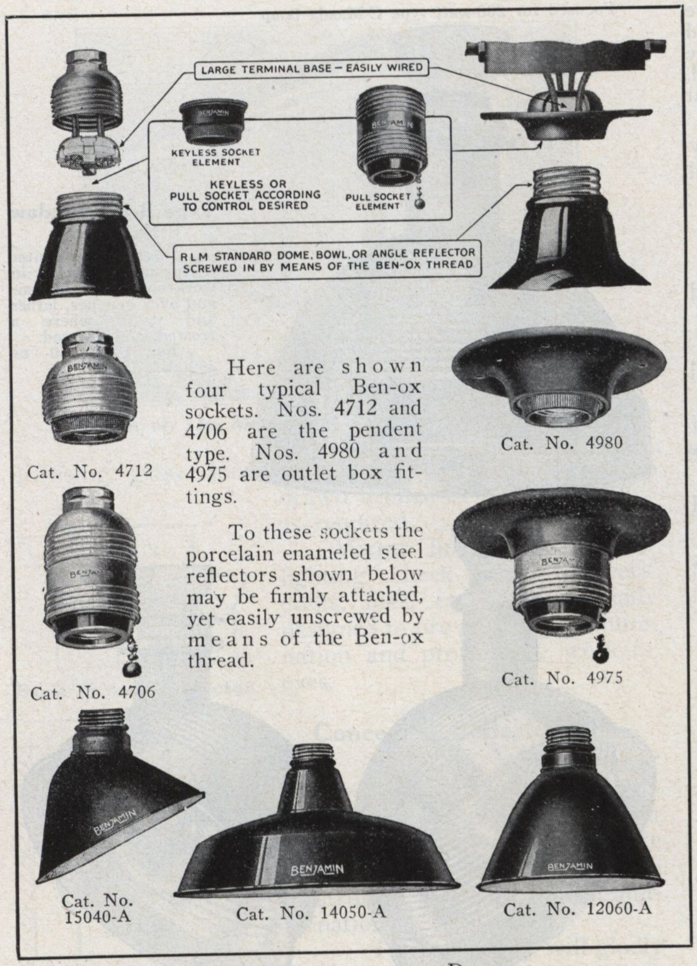
(3) Wiring may be completed so that inspection approval may be obtained before installation of fixtures.

(4) Provides a place for temporary light.

(5) Pull socket, screwed into stem or ceiling unit, provides local control.

(6) Easy removal is a Ben-ox feature. Lighting equipment may be easily removed for cleaning, or stored out of the way while redecorating or making structural changes in the building.

Complete listings of all Ben-ox parts and equipment are given in Catalogue No. 24. We will gladly furnish further information.

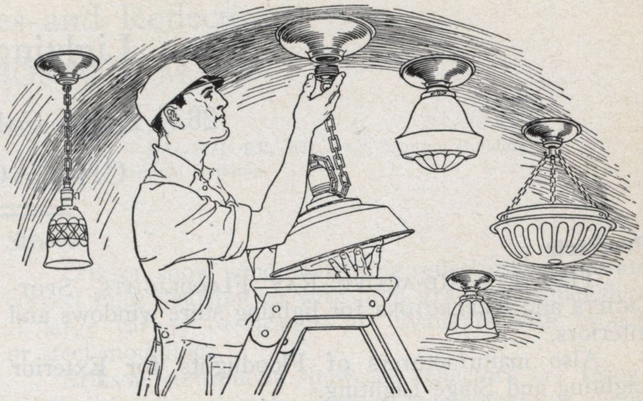

LARGE TERMINAL BASE – EASILY WIRED
KEYLESS SOCKET ELEMENT
KEYLESS OR PULL SOCKET ACCORDING TO CONTROL DESIRED
PULL SOCKET ELEMENT
RLM STANDARD DOME, BOWL, OR ANGLE REFLECTOR SCREWED IN BY MEANS OF THE BEN-OX THREAD
Cat. No. 4712
Cat. No. 4980
Cat. No. 4706
Cat. No. 4975
Cat. No. 15040-A
Cat. No. 14050-A
Cat. No. 12060-A

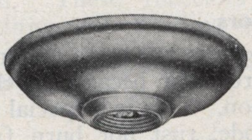
Here are shown four typical Ben-ox sockets. Nos. 4712 and 4706 are the pendent type. Nos. 4980 and 4975 are outlet box fittings.

To these sockets the porcelain enameled steel reflectors shown below may be firmly attached, yet easily unscrewed by means of the Ben-ox thread.

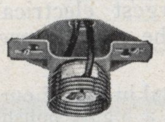
Ben-ox Interchangeable Devices

Ben-ox Devices for Offices, Hotels, Stores, Hospitals and Public Buildings

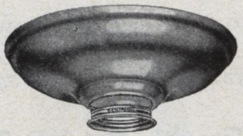




The Ben-ox Basic Ceiling Unit Consists of a Simple



Mounting Element with Ben-ox Thread and a



Canopy with Supporting Ring

Ben-ox Ceiling Unit

With the above elements installed, the electrician completes his wiring job by screwing in a keyless or pull socket and everything is ready for inspection approval. Reflectors, connectors or shade holders for any style of glassware may be interchangeably screwed in, by means of the Ben-ox thread, without disturbing the original wiring.

Where Ben-ox is installed, lighting equipment can be changed as easily as a lamp bulb.

Stores—Need Ben-ox because changes in the arrangement of the interior make changes in lighting equipment necessary.

Office Buildings—Need Ben-ox because changes in tenancy make changes imperative in lighting equipment to suit various occupations and individual tastes.

Hotels—Need Ben-ox because changes in vogue of interior decoration and frequent remodeling make changes in lighting equipment a routine part of hotel maintenance.

Catalogue—Complete listings of the specific connectors and devices used for making all Ben-ox installations are given in Catalogue 24.

TINAULT'S RE-ACTIVE RAY

Lighting Experts

2824 North California Avenue

CHICAGO, ILL.

Products

Tinault's Re-active Ray Floodlights, Spotlights and Reflectors for lighting store windows and interiors.

Also manufacturers of Floodlights for Exterior Lighting and Stage Lighting.

Tinault's Reflectors

Tinault's reflectors are more enduring and efficient than any known reflector because of the material used in their construction. This is a special metal which will not tarnish, corrode, rust nor burn from any of the usual causes such as dampness, sulphur or gas fumes, creosote, salt water or air, or excessive heat.

One of the largest electrical companies in this country says of the metal used in Tinault's reflectors:

> "We tested this metal in one of our electric furnaces where we wanted to use it in a highly polished condition and found that, after holding the furnace temperature of 700° F. for three weeks, the polish of the plates had not been affected at all. We have never found any other metal stand *such a terrific* heat for so long a time."

In contrast to glass reflectors, which are usually guaranteed for a period of 5 years, Tinault's metal reflectors are guaranteed for *20 years.*

Advantages of Tinault's Metal Reflectors

They are made of an ever-brilliant metal and will not corrode or tarnish under any condition.

They are unbreakable.

They are not plated, but polished on solid metal surface.

They will withstand fire, heat, sulphur fumes, salt water and chemical fluid. Gas fumes do not impair their efficiency.

They are light and therefore ship much safer and cheaper than glass.

Tinault's spotlight is safe to use in featuring a wax figure because the heat is not projected with the light.

The color medium used is far superior to the customary gelatine.

The color screens give more light and more color. They eliminate all filament shadows and give a perfect diffusion of light and color.

The white screen does not reduce the light but increases it by reason of its prismatic quality.

The sunlight screen, used in connection with either the flood or spotlight gives a true-to-nature glow that has never been achieved before.

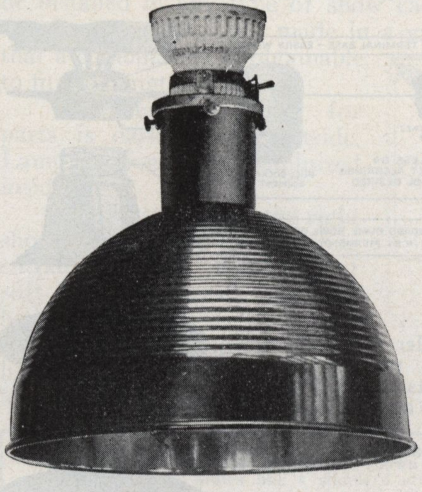
Each floodlight and spotlight is equipped with 6 color screens.

Exterior Flood Lighting

Tinault's floodlights are approved and adopted by the Board of Education, Chicago, Ill. *Exterior flood- and stage-lighting is our specialty.* Send for bulletin.

Type A—Spotlight

Designed for featuring a particular item in window. Has 36-in. brilliant center beam.
Focused for 200-watt type C-Mazda lamp



Type B-2—Window Reflector

Designed for center wiring in windows or in workroom, stockrooms and over benches, lathes and desks where a frosted lamp is used.
For 100-, 150- or 200-watt lamp

For 100 and 150-watt Lamps
Type Y-2

For 200-watt Lamp
Type Y-1

These window reflectors are suitable for windows 8 to 14 ft. high by 6 to 8 ft. deep—correct for standard wiring

L. ERIKSON ELECTRIC COMPANY

Lighting Specialties and Reflectors

6 Portland Street, BOSTON, MASS.

BRANCH OFFICES

PHILADELPHIA, PA., 1723 Sansom Street
NEW YORK, N. Y., 4037 Grand Central Terminal Building
BALTIMORE, MD., 1428 Munsey Building

Products

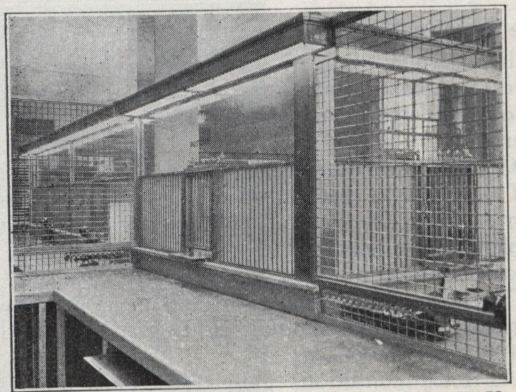
Designer and manufacturer of LIGHTING EQUIPMENT for:

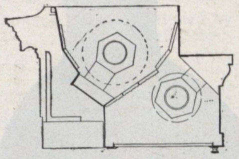
Bank Screen Counters
Bulletin Boards
Cabinets
Chancel Arches
Cove Lighting
Desks
Director Boards
Files
Fitting Rooms
Galleries
Operating Rooms
Pictures
Poster Boards
Pulpits
Showcases
Show Windows
Rug Racks
Signs
Stages
Temples

Banks

Erikson indirect bank screen reflectors are of synthetic construction which provides for fulfilling the individual requirements of each installation.

Downward reflectors for counter illumination afford evenly diffused light without glare by means of hinged diffusing glass doors. Reflectors are constructed of drawn bronze or steel mouldings as required.


Bank of The Manhattan Co., New York, N. Y.

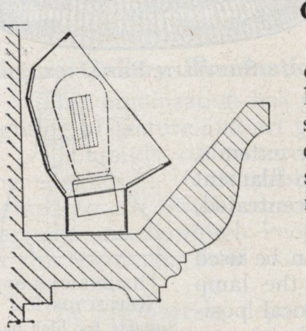

Bank Screen Reflector

Mirror lined reflectors for lighting check desks, officers' desks, files, etc., are especially designed to provide proper illumination and protect the workers' eyes.

Concealed Reflectors

Erikson reflectors for cove, chancel arch, and skylight lighting in which the light sources are concealed are carefully designed and constructed to afford even illumination.

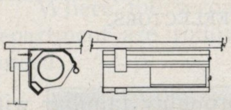
This Company will gladly furnish engineering recommendations with full sized details for any project without obligation.

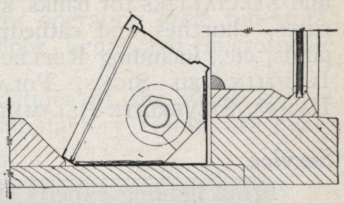

Cove Reflector

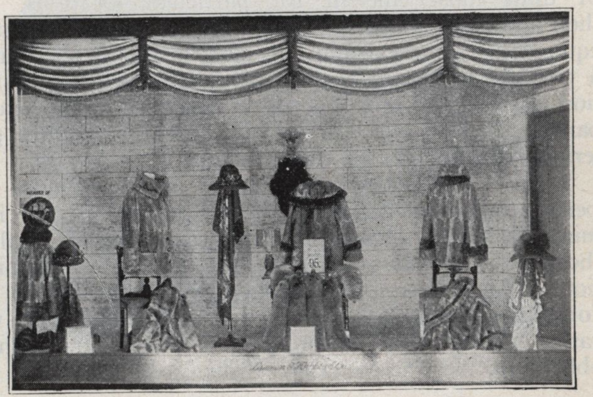
Stores

Erikson show window lighting reflectors incorporate correct light distribution with high grade workmanship. A large variety of designs are available with bronze or steel mouldings.

Erikson continuous showcase reflectors are recognized as representing the highest development in showcase illumination. These reflectors are inconspicuous, and in addition to affording even illumination, shield the eyes of both the customer and the clerk.

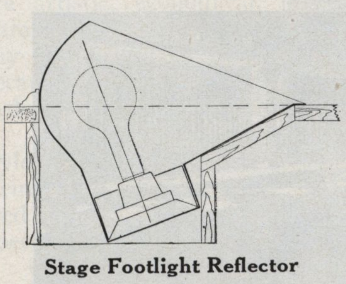

Showcase Reflector

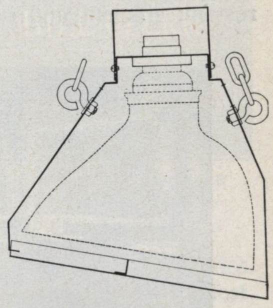

Window Footlight Reflector


Lamson & Hubbard Co., Boston, Mass.

Stage Reflectors

A wide range of types of footlight and border light reflectors are manufactured by this Company to meet the diversified requirements of stage lighting, from the small portable types used in schools to the large individual unit type used in commercial theaters.


Stage Footlight Reflector


Border Light

Catalogue

Descriptive catalogue on Lighting Equipment on request.

I. P. FRINK, INC.

Reflectors, Scientific and Artistic Lighting Specialties

TELEPHONE
Chickering 8760

Twenty-fourth Street and Tenth Avenue
NEW YORK, N. Y.

CABLE ADDRESS
"Frinklet, New York"

BRANCH OFFICES

CHICAGO, ILL., 1309 Monadnock Building
BOSTON, MASS., 161 Summer Street
BUFFALO, N. Y., 310 Mutual Life Building
DETROIT, MICH., 325 State Street
ATLANTA, GA., 148 Marietta Street
SAN FRANCISCO, CAL., 77 O'Farrell Street
CLEVELAND, OHIO, 992 The Arcade
BIRMINGHAM, ALA., 426 Age-Herald Building
SEATTLE, WASH., 609 Seaboard Building
PHILADELPHIA, PA., Franklin Trust Building
CINCINNATI, OHIO, 601 Second National Bank Building
LOUISVILLE, KY., 415 West Main Street
ST. LOUIS, MO., 1415 Pine Street
CANADA: Associated with The Robert Mitchell Co., Ltd., 64 Belair Avenue, MONTREAL

Products

Designers and manufacturers of Lighting Systems and Specialties for banks, stores, show windows, showcases, churches and cathedrals, picture galleries, hospitals, etc., including Reflectors, Lighting Fixtures, Illuminated Signs, Polaralite Signs, Linolite Lamps, Silverlite All-metal Reflectors.

Service

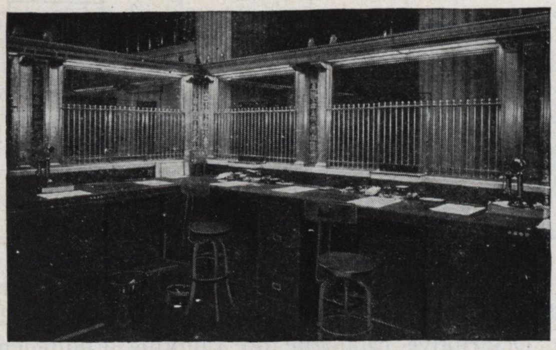
Frink lighting experts are thoroughly familiar with modern illumination. Their development of those types of units most efficient for particular locations, and their ability to recommend and install the proper lighting equipment for any condition, place this organization in a position to obtain for its clientele complete satisfaction in illuminating stores, show windows, display cases, banks, offices, churches, hospitals, hotels, picture galleries, public buildings, etc.

The Frink service department is in charge of experts who have had many years experience in illumination work. Their services are at the disposal of those desiring advice or recommendations on illumination of any description. They will furnish full information, submit sketches and estimates, and will carry out the ideas of prospective purchasers without obligation.

Bank Illumination

The Frink system of bank illumination adapts itself ideally to solid, substantial bank architecture.

The principle on which Frink reflectors are built allows for any working condition, whether it be an isolated desk lamp, a long bank screen or concealed cornice lighting, and affords a perfect light distribution all along the working plane, approaching the ideal as to restful, efficient and well diffused illumination.



Guaranty Trust Co., New York, N. Y.
Showing perfect illumination of counters by Frink screen reflectors

It is possible to design Frink reflectors in detail to any motif in bank architecture. Shadows or glare are eliminated where the Frink system is employed, because all rays are thoroughly broken up and the reflected light is so diffused as to approach daylight in quality.

In view of the great number of banking installations where the Frink system has been employed, it can reasonably be said that it has proved in competition to be the most perfect localized bank lighting system in existence.

Designs and recommendations for this class of lighting will be made without obligation.

Store Illumination

Effective lighting of show windows, counter cases, wall display cases and interiors increases the attractiveness of retail stores, contributing largely to their selling power.

Correctly diffused light *of the proper intensity* displays materials to the best advantage and is the foremost factor in sales promotion. Quality and tonal values are the prime requisites for efficient store lighting, rather than the volume of light heretofore demanded.

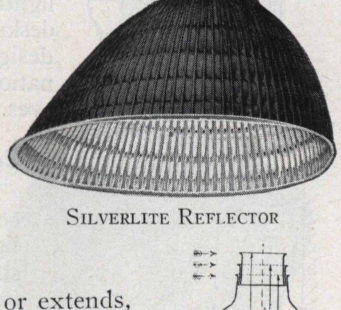
The Frink system of store lighting is known and recognized to be based upon lighting principles that are scientifically correct.

As local conditions govern the size and type of reflectors, the engineering department will recommend the correct type of reflector for any condition upon receipt of proper data.

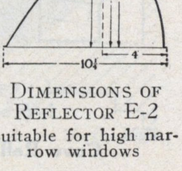
Silverlite Reflectors — Silverlite reflectors are *all-metal* reflectors—pure copper electrolytically deposited on pure silver. As glass is entirely eliminated, absorption is reduced to a minimum. The silver lining is guaranteed not to crack nor peel.

Each Silverlite reflector has an adjustable neck. The collar collapses or extends, raising or lowering the lamp filament to three positions, for a concentrated, medium or wide spread light.

75 to 150-watt lamps can be used in same reflector, retaining the lamp filament in predetermined focal position.



Silverlite Reflector



Dimensions of Reflector E-2
Suitable for high narrow windows

Continued on next page

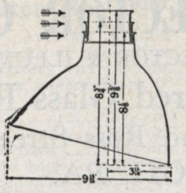
The collar fits regular 3¼-in. holder, and can be adjusted for any special holder already installed.

No screws, clamps or springs are used. No special fittings necessary.

Silverlite reflectors come in shapes and sizes suitable for most conditions.

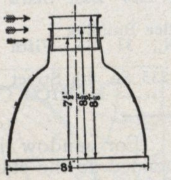
Stock always on hand for immediate shipment.

Light in weight, and unbreakable, for express delivery.



E-4 FOR USE IN LOW DEEP WINDOWS

Adjustable neck makes possible use of 75, 100 or 150-watt type C lamps

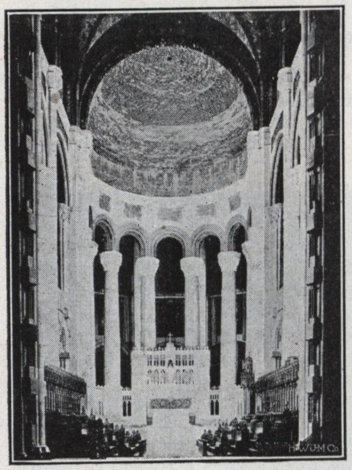


E-5 FOR FACTORY LIGHTING, LIGHTING THROUGH GLASS CEILINGS AND OTHER SPECIAL PURPOSES

Church Illumination

For over 60 years I. P. FRINK, INC., has been manufacturing church reflectors and chandeliers for lighting auditoriums, pulpits, chancels, classrooms, and every other place in a church or cathedral where light is necessary. During this time, it has successfully lighted over 25,000 churches and cathedrals, among them being the finest buildings of this kind in the country.

This organization has originated and developed the following successful methods of church illumination:



CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK, N. Y.
Showing effects produced by concealed Frink reflector

Frink ventilated ceiling diffuser system, Frink indirect and direct-indirect systems, Frink concealed lighting from coves and Frink concealed system either from specially placed Frink reflectors or through skylights or glass ceilings. These four systems and modifications are applicable to every style of architecture.

By application of these methods, a revolution in church and cathedral lighting has been brought about, supplanting the dim and gloomy light of the past with a light that is soft, cheerful and yet which is powerful enough to bring out architectural effects to the best advantage.

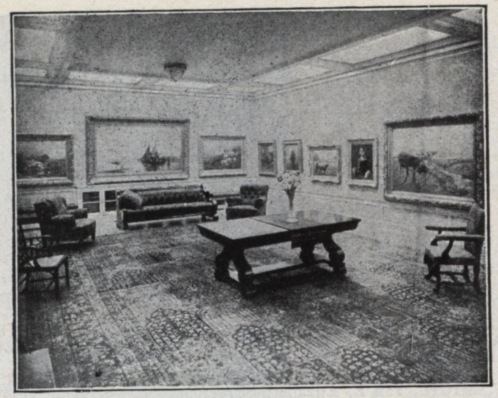
The services of the engineering department of this organization are at the disposal of those desiring advice or recommendations on church or cathedral illumination of any description.

Picture Gallery Illumination

This organization has made a careful study of the lighting of picture and art galleries.

Thousands of pictures and most of the prominent galleries, both public and private, have been lighted by the Frink organization, whose extended experience and thorough knowledge of the requirements in this particular field is an assurance of satisfactory results.

The engineering department will make recommendations for this class of lighting without obligation.

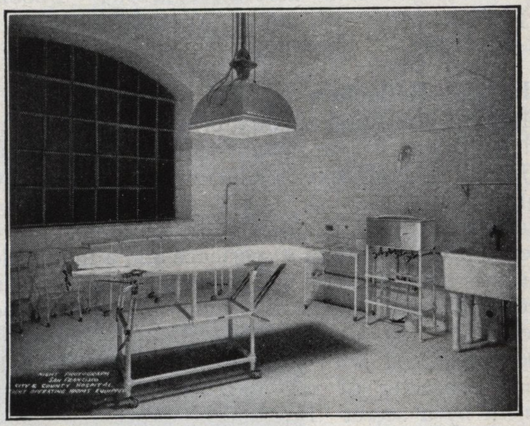


SCHEME OF PICTURE GALLERY LIGHTING THROUGH STAINED GLASS CEILING PANELS

Hospital Illumination

The Frink system of hospital lighting has been installed in the majority of the first class hospitals in this country. The line embraces operating table reflectors, ward lights, bed lights, floor lights and microscopic reflectors.

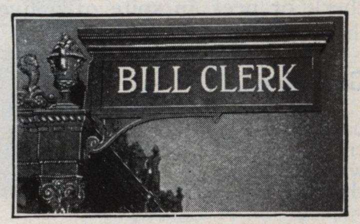
Where the recommendations of the Frink service department are followed, satisfactory results are guaranteed.



FRINK SYSTEM OF LIGHTING IN AN OPERATING ROOM

Illuminated Signs

For all purposes where an ornate and effective sign is required and for all permanent positions in theaters, hotels, banks and public buildings, the Frink polaralite sign has no equal. The source of illumination is entirely hidden and the light is reflected up or down edgeways through the glass, giving a strikingly beautiful and original effect.



FRINK POLARALITE SIGN IN HOTEL COMMODORE, NEW YORK, N. Y.

Frink polaralite signs are artistic, economical, durable and will outlast any other kind of sign, because there is nothing to deteriorate or wear out.

Furnished in any style of wording or lettering with white or colored ground, and made to read from one or both sides. Special designs and sketches furnished upon request.

Linolite Lamps

A tubular lamp with double contact and single filament; ideal for bank, showcase and cove lighting. Write for full details.

PITTSBURGH REFLECTOR COMPANY

FORMERLY PITTSBURGH REFLECTOR & ILLUMINATING CO.

Manufacturers of Silvered Glass Reflectors

Third Avenue and Ross Street
PITTSBURGH, PA.

BRANCHES

NEW YORK, N. Y., 145 West 41st Street (at Broadway)
KANSAS CITY, MO., 1320 Main Street
CHICAGO, ILL., Machinery Hall, Clinton and West Washington Streets

REPRESENTATIVES

BALTIMORE, MD., 506 St. Paul Place
CLEVELAND, OHIO, Builders Exchange, Rose Building
DALLAS, TEX., 2002½ Live Oak Street
DETROIT, MICH., 159 E. Elizabeth Street at John R
INDIANAPOLIS, IND., 707 Roosevelt Building
LITTLE ROCK, ARK., 607 Main Street
LOS ANGELES, CAL., 1207 East Sixth Street
LOUISVILLE, KY., Keller Building
MINNEAPOLIS, MINN., 31 So. Fifth Street
PHILADELPHIA, PA., 235 So. 8th Street
SALT LAKE CITY, UTAH, 212 S. W. Temple Street
SAN FRANCISCO, CAL., 90 New Montgomery Street
SEATTLE, WASH., 70 Marion Street
SYRACUSE, N. Y., 569 South Clinton Street
TORONTO, ONT., 83 York Street
HAVANA, CUBA, Industria 34
MEXICO CITY, Apdo 2724, D. F. Mexico

Products

Silvered Glass Reflectors of special design for the lighting of show windows, showcases, wall cases and other displays; Cove and other forms of Concealed Lighting for theaters, churches, public buildings; Industrial Lighting Reflectors; Reflectors for indirect fixtures; Reflectors and Fixtures for bank counters, stock quotation boards and picture lighting; "Color-Lite" for show windows, theaters and decorative work; "Flood-O-Lite"; "Windo-Spot" and "Windo-Flood"; and "Easy-To-Install" Conduit.

"Pittsburgh" Reflectors

Made of the finest quality crystal glass, clear and sparkling; blown in our own factory—where glass is made for no other purpose—that we may control every step of the glass making.

Each reflector is a single piece of glass. Careful skill developed by years of experience and a multitude of experiments make possible the accurate design that properly controls and directs the light for the purposes required.

Double plated with pure grain silver. The high reflecting character of this mirrored surface is made permanent by a secret "Pittsburgh" process which lays a thin sheet of copper over the silver; the silver is protected on one side by glass and on the other by copper. Silver color satin finish.

Nine-year Record—Not a single "Pittsburgh" reflector made since August 1, 1916—the date we began using this process, now more than nine years ago—has ever been reported to us as having the silvered reflecting surface tarnish or discolor, or the backing crack, check or peel, in spite of a five-year guarantee against these defects.

Guarantee

"We absolutely and unconditionally guarantee that the backing on "Pittsburgh" silver plated glass reflectors will not crack, check nor peel and that the silvered reflecting surface will not tarnish for a period of five years from date of purchase."

Show Window Lighting

For nearly twenty years we have specialized in the lighting of show windows and other sales displays as well as in such special fields as cove lighting.

For show window lighting a one-piece silvered glass reflector of proper design is today the recognized standard. "Pittsburgh" show window reflectors give maximum efficiency. Easily installed by any electrical worker, either with or without the use of the "Pittsburgh" "Easy-To-Install" conduit. Installed at the top of the window close to the glass line where, by reason of their shape, they gather up and redirect practically all of the light downward and forward; the reflector design controls the field of light to give even illumination over the entire trim.

For window lighting, 100-watt or 150-watt lamps are recommended as the standard, with the proper reflector spaced about 12 in. on centers along the glass line. In the smaller cities or on the side streets a wider spacing may be used, and in some locations a higher intensity is desired. This can be accomplished either by closer spacings or by the use of the 200-watt lamp.

Indirect Lighting

The "Pittsburgh" line includes the needed variety of reflectors for indirect fixtures, for use in coves, pedestals, wall boxes; for lighting theaters, churches and public buildings from concealed sources. Following pages illustrate some of the "Pittsburgh" reflectors used in window, cove and other lighting.

Color-Lite

"Pittsburgh" Color-Lite consists of two stamped steel retainer rings with retainer wires which hold the colored gelatine sheets. Attaches to the "Windo-Spot" or "Windo-Flood" or show window reflectors No. 51, No. 52 and No. 100. Easy to attach—simply hook the two springs to the holder adapter; to remove, unhook. Four colors furnished: red, amber, blue and green.

We can also furnish glass color caps which are particularly useful with No. 25 and similar reflectors for color lighting in theatres, etc.

"Easy-To-Install" Conduit

Consists of No. 20 gauge steel channel with receptacles not wired. Made to order to fit each job. No. 1 for show window reflectors and in cove lighting with reflectors No. 100, 71 and 25. Size, $1\frac{5}{16}$ in. high by 1¾ in. wide. BX connectors furnished at ends, top or bottom as required.

Conduit No. 2, with "Pittsburgh" angle sockets for use with reflectors No. P 100, P 40, P 76, P 75 and P 150. Size $\frac{13}{16}$x$1\frac{13}{16}$ in. BX connectors furnished at top or bottom as required.

Catalogues

With engineering and other data showing application of the various reflectors furnished on request.

Example of "Pittsburgh" Window Lighting, Marshall Field & Co., Chicago

Continued on next page

Reflector No. 100

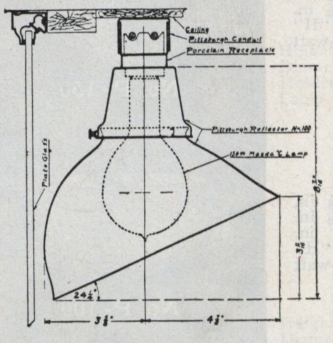
For average window with a depth of one-half to three-quarters its height. Light flux covers from 0° to 90°.

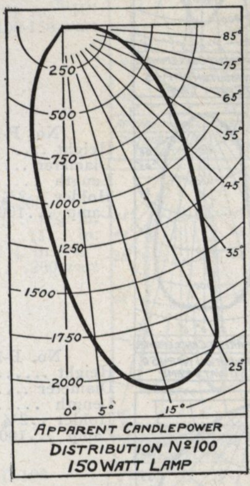
Height ....8$\frac{7}{16}$ in.
Width ....9⅛ in.
Front to back .....8½ in.
Center to back.....3⅝ in.

Receptacles should be 5½ in. O.C. from glass—minimum 3¾ in.

For 100 or 150-watt lamp use holder 2¼ in. Form "O." With 200-watt lamp use Form "H," or special holder furnished without extra charge for use with Form "O" holder.

No. 100


Ceiling
Pittsburgh Conduit
Porcelain Receptacle
Pittsburgh Reflector No. 100
150W Mazda "C" Lamp
Plate Glass
8 7/16"
3 5/16
24¼°
3⅝"
4⅞"



APPARENT CANDLEPOWER DISTRIBUTION No 100 150 WATT LAMP

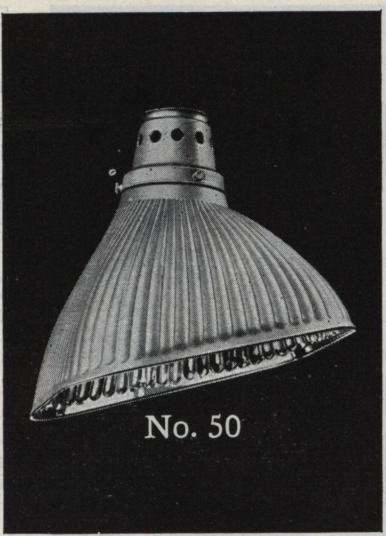
Reflector No. 50

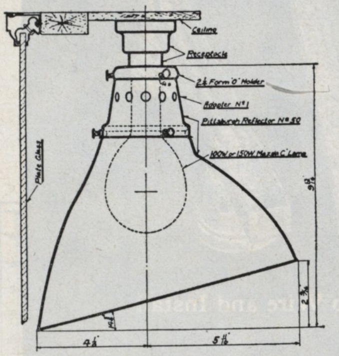
Same general class of windows as No. 51. Light cuts off sharply on the 55° line.

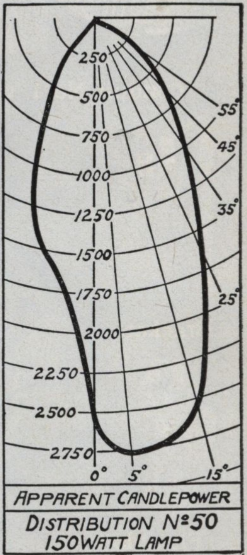
Height ....9⅝ in.
Width ....10¼ in.
Front to back.....9$\frac{13}{16}$ in.
Center to back....4⅛ in.

Receptacles should be 5½ in. O.C. from glass—minimum 4¼ in.

For 100 or 150-watt lamp use holder 2¼ in. Form "O." With 200-watt lamp use Form "H," or special holder furnished without extra charge for use with Form "O" holder.


No. 50


Ceiling
Receptacle
2¼ Form "O" Holder
Adapter No 1
Pittsburgh Reflector No 50
100W or 150W Mazda "C" Lamp
Plate Glass
9⅝
2 3/16
14¼
4⅛"
5 11/16"



APPARENT CANDLEPOWER DISTRIBUTION No 50 150 WATT LAMP

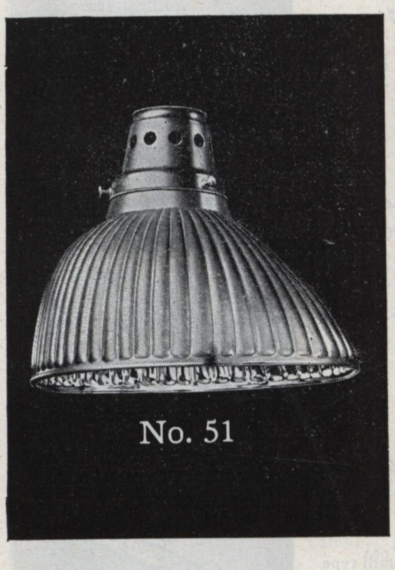
Reflector No. 51

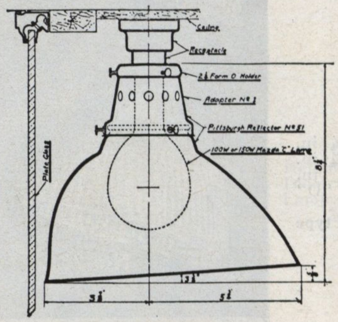
For high, shallow windows, medium high trim, island windows or windows with the upper part of the background of glass. Concentrating. Light cuts off sharply on the 55° line.

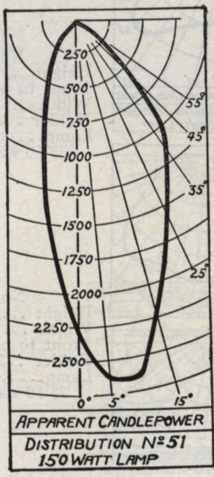
Height ....8⅛ in.
Width ....9⅞ in.
Front to back......9⅝ in.
Center to back.....3⅞ in.

Receptacles should be 5½ in. O.C. from glass—minimum 4 in.

For 100 or 150-watt lamp use holder 2¼ in. Form "O." With 200-watt lamp use Form "H," or special holder furnished without extra charge for use with Form "O" holder.


No. 51


Ceiling
Receptacle
2¼ Form O Holder
Adapter No 1
Pittsburgh Reflector No 51
100W or 150W Mazda "C" Lamp
Plate Glass
8⅛"
13½°
3⅞"
5¾



APPARENT CANDLEPOWER DISTRIBUTION No 51 150 WATT LAMP

Reflector No. 52

Designed especially for those windows where it is necessary or desirable to insert the reflector in the ceiling, with bottom of reflector flush with the ceiling.

Same general class of windows as No. 51. Concentrating. Line cuts off sharply on the 55° line.

Height ....8$\frac{13}{16}$ in.
Width ....9 in.
Front to back......9½ in.
Center to back.....3½ in.

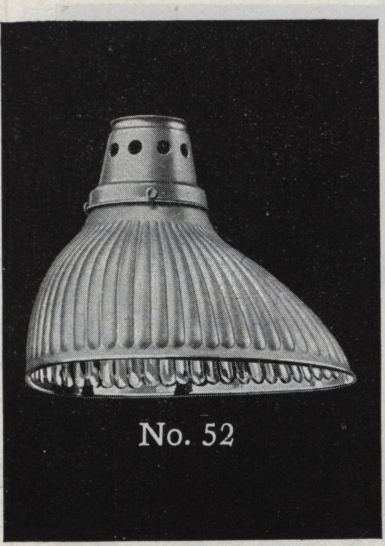
Receptacle should be 5½ in. O.C. from glass—minimum 4 in.

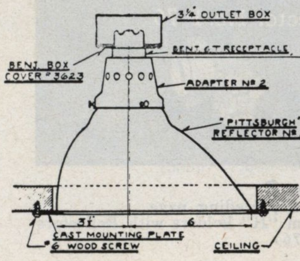
For 100 or 150-watt lamp use holder 2¼ in. Form "O." With 200-watt lamp use Form "H," or special holder furnished without extra charge for use with Form "O" holder.

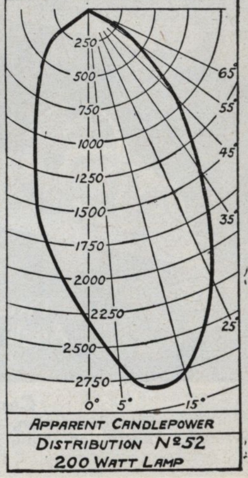
Flush Mounting Plate—(For Reflector No. 52.)

Diameter ...10⅜x11½ in.
Thickness ....⅛ in.

Color-Lite attaches to thumb screws.

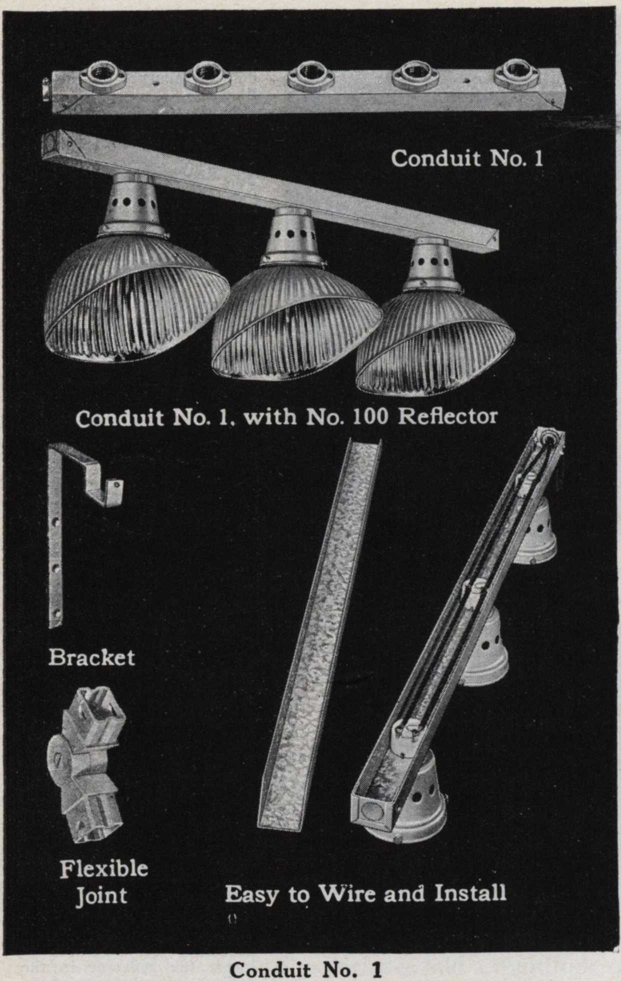

No. 52


3¼" OUTLET BOX
BENJ. G.T RECEPTACLE
BENJ. BOX COVER #3623
ADAPTER No 2
"PITTSBURGH" REFLECTOR No 52
7 13/32"
3½"
6
CAST MOUNTING PLATE
#6 WOOD SCREW
CEILING

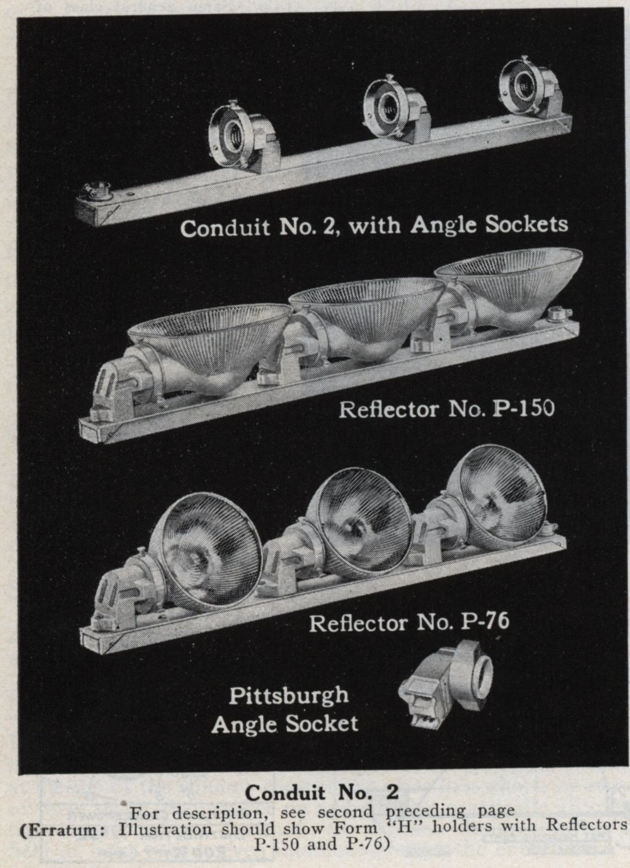


APPARENT CANDLEPOWER DISTRIBUTION No 52 200 WATT LAMP

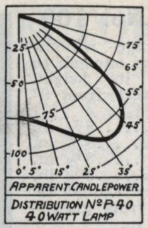
Continued on next page


Conduit No. 1
Conduit No. 1, with No. 100 Reflector
Bracket
Flexible Joint
Easy to Wire and Install

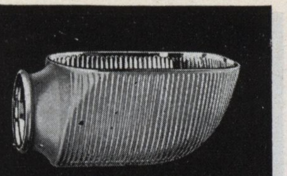
Conduit No. 1
For description, see second preceding page


Conduit No. 2, with Angle Sockets
Reflector No. P-150
Reflector No. P-76
Pittsburgh Angle Socket

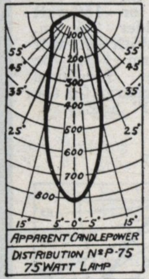
Conduit No. 2
For description, see second preceding page
(**Erratum:** Illustration should show Form "H" holders with Reflectors P-150 and P-76)



No. P-40
Height ....2¾ in.
Width ....4¼ in.
Length ....5½ in.
Holder ..2¼ in. "O"
Lamp 25-50-watt

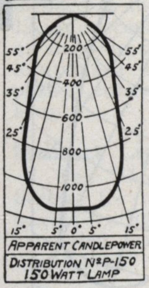


No. P-40



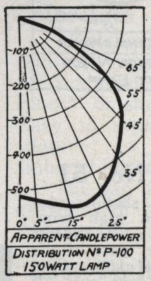
No. P-75
Height ....3 in.
Diameter .....6¾ in.
Holder ..2¼ in. "O"
Lamp 75-watt

No. P-75

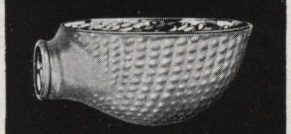


No. P-150
Height ....3⅞ in.
Diameter .....7½ in.
Length ......7½ in.
Holder ..2¼ in. "H"
Lamp ...100-150-watt

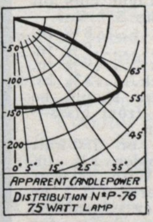
No. P-150



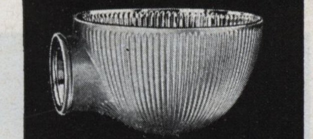
No. P-100
Height ....3⅜ in.
Diameter .....6½ in.
Length ......7 in.
Holder ..2¼ in. "H"
Lamp ...100-150-watt



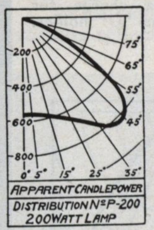
No. P-100



No. P-76
Height ....3 in.
Diameter .....4¾ in.
Holder ..2¼ in. "H"
Lamp 75-watt

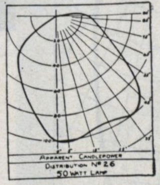


No. P-76

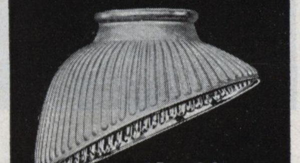


No. P-200
Height ....4¼ in.
Diameter .....7½ in.
Length ......8 in.
Holder ..2¼ in. "O"
Lamp 100-150-watt
Holder ..2¼ in. "H"
Lamp 200-watt

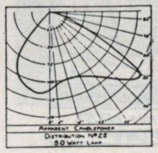
No. P-200



No. 26
Height ......3½ in.
Front to back.4$\frac{11}{16}$ in.
Width ....4⅛ in.
Holder ..2¼ in. "O"
Lamp...........
25-50 watt, mill type



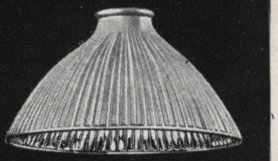
No. 26



No. 25
Height ....4¼ in.
Width ....4¼ in.
Front to back.5 in.
Holder ..2¼ in. "O"
Lamp...........
25-50 watt, mill type

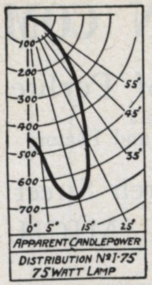
No. 25

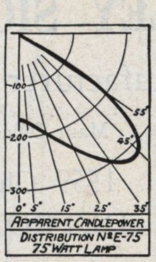
Continued on next page



No. I-75

No. I-75
Height ....4¾ in.
Diameter .....8¼ in.
Holder ..2¼ in. "H"
Lamp 75-watt



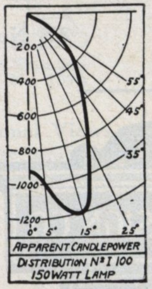


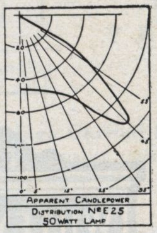
No. E-75
Height ....4¾ in.
Diameter. ....6½ in.
Holder ..2½ in. "H"
Lamp 75-watt

No. E-75

No. I-100

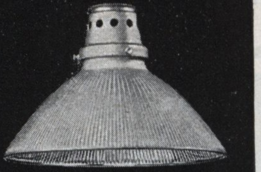
No. I-100
Height ....5⅞ in.
Diameter .....9¾ in.
Holder ..2¼ in. "H"
Lamp ...100-150-watt





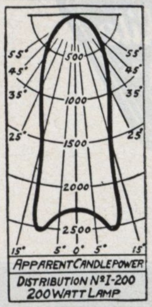
No. E-25
Height ....3½ in.
Diameter .....4¼ in.
Holder ..2¼ in. "O"
Lamp..........
25-50 watt, mill type

No. E-25

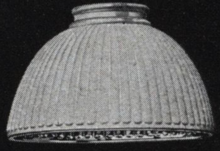


No. I-200

No. I-200
Height ...... 7⅜ in.
Diameter ....11 in.
Holder ..2¼ in. "O"
Lamp 200-watt



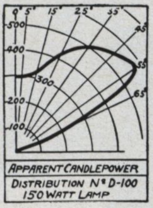
No. E-26
The distribution of light of Reflector No. E-26 is similar to, but more concentrated than Reflector No. E-25.
Height ....3 7/16 in.
Diameter .....5⅝ in.
Holder ..2¼ in. "O"
Lamp..........
25-50 watt, mill type

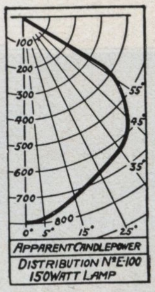


No. E-26

No. D-100

No. D-100
Height ....4½ in.
Diameter .....7 in.
Holder ..2¼ in. "H"
Lamp ...100-150-watt



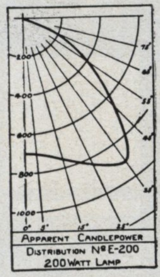


No. E-100
Height ....6⅛ in.
Diameter .....8 in.
Holder ..2¼ in. "H"
Lamp ...100-150-watt

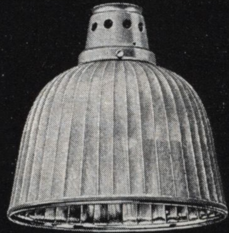
No. E-100

No. D-200

No. D-200
The distribution of light of reflector D-200 is wider than that of D-100.
Height ....5¾ in.
Diameter .....9½ in.
Holder ..3¼ in. "O"
Lamp 200-watt



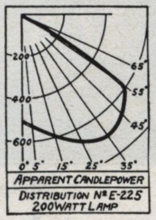
No. E-200
Height ....9 in.
Diameter .....8⅞ in.
Holder ..2¼ in. "O"
Lamp 200-watt



No. E-200

No. B-100

No. B-100
Distribution of light is similar to reflector No. B-500.
Height ....5 in.
Diameter .....8⅞ in.
Lamp..........
100-150-200-watt

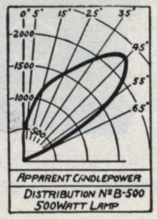


No. E-225
Height ....7¾ in.
Diameter .....9½ in.
Holder ..2¼ in. "O"
Lamp 200-watt

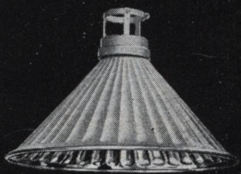
No. E-225

No. B-500

No. B-500
Height ...... 6¼ in.
Diameter ....11½ in.
Lamp..........
300-500-1000-watt



No. I-500
Distribution concentrating.
Height ....9⅝ in.
(including holder)
Diameter ....14⅞ in.
Lamp ...300-500-watt



No. I-500

WILLEY SIGN COMPANY

Manufacturer of Perlite Signs

Main Offices and Factory

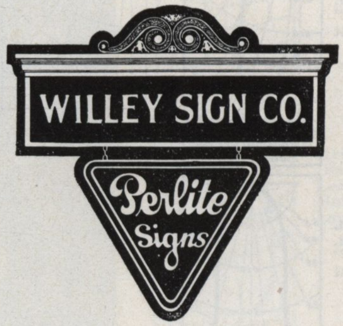
1559 Church Street
DETROIT, MICH.

TELEPHONE
GLENDALE 8540

CABLE ADDRESS
"WILLEYCO"

EASTERN WILLEY CORP.
452 Lexington Avenue, NEW YORK, N. Y.
Telephone: Murray Hill 7584

MID-WEST WILLEY CO.
225 North Michigan Avenue, CHICAGO, ILL.
Telephone: State 8393



Facing (Background)

The Perlite sign consists of a drawn or cast metal casing or frame which holds the facing or background. The facing consists of any one of the three following types.

(1) Heavy sheet of plate glass into which letters are etched, lighted through edge of glass.

(2) Embossed opal letters with sprayed metallic finished background.

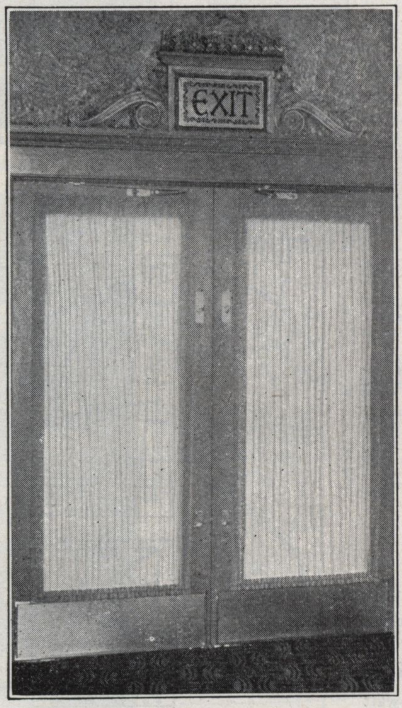
(3) Metal and glass facing which consists of a sheet of metal (having the lettering or design etched out) firmly veneered over a sheet of milk white opal glass, with background finished copper as listed below. Treatment given (2) and (3) facing makes it non-reflective, therefore there is no glare of reflected light upon background, lettering stands out in brilliant contrast and sign can be read from any angle.

Colors

The copper facing or background of Perlite signs may be had in a wide range of finishes, including natural copper, statuary bronze, gunmetal and a variety of verde antique effects, or, through the use of Duco finishes, any desired color such as red, blue, green, gray, etc., may be obtained.

Perlite signs are made in various attractive designs for both indoor and outdoor use and they may bear any inscription. Widely used for all purposes where ornate and attractive signs are demanded as in banking rooms, hotel and office building corridors and lobbies, department stores, theaters, etc.

Glass stock sizes are 4″, 6″, 8″, 10″, 12″, 14″, 16″ and 18″ in height, and 14″, 18″, 26″, 38″, 50″, 62″ and 74″ in length.



Style No. 250

Lettering

All lettering for Perlite signs is made to order. We duplicate trade-marks, signatures or slogans in any style required, or we design special lettering to meet requirements. Lettering may be on one or both sides of the sign.

Casings or Frames

Standard stock casings are made of cold drawn sheet bronze or sheet steel or of cast iron or cast bronze. The bronze casings are furnished either in natural finish or oxidized in various shades. The steel casings are furnished in either sprayed or strippled finishes.

Special cast or drawn casings may be made to order. Special ornamentatations may be applied on casings or frames in any period design.

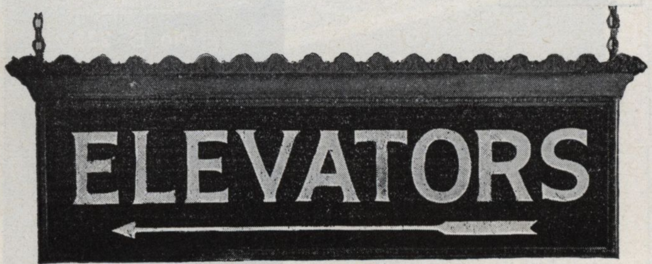
In computing over-all sizes, add 1¼″ to both height and length of glass. For example, a 4″x14″ glass would require a single lamp compartment casing 5¼″x15¼″. Casings with double lamp compartment measure 2½″ higher and 1¼″ longer, over all, than the glass sizes. For example, a 10″x26″ glass would require a casing 12½″x27¼″ over all.

Illumination

Perlite signs are illuminated by standard Mazda lamps either 6-inch 25 watt, 12-inch 25 watt or 12-inch 40 watt.

For glass heights of 4″, 6″ and 8″, there is one lamp compartment, with light source either at top or bottom.

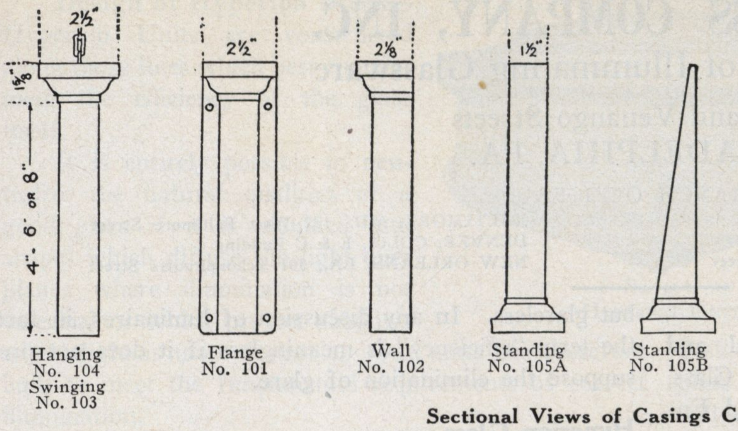
For glass heights of 10″, 12″ 14″, 16″ and 18″ there are two lamp compartments, with light source at both top and bottom.

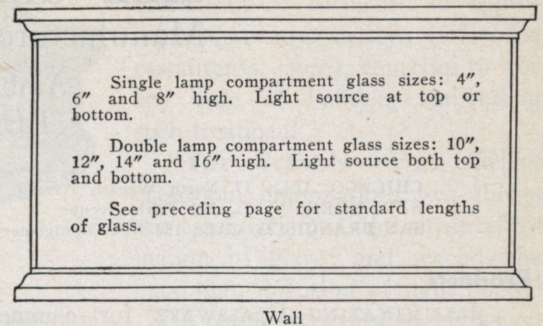


Style No. 252

Style No. 254

Continued on next page


2½"
1⅝"
4', 6' or 8'
Hanging
No. 104
Swinging
No. 103
2½"
Flange
No. 101
2⅛"
Wall
No. 102
1½"
Standing
No. 105A
Standing
No. 105B



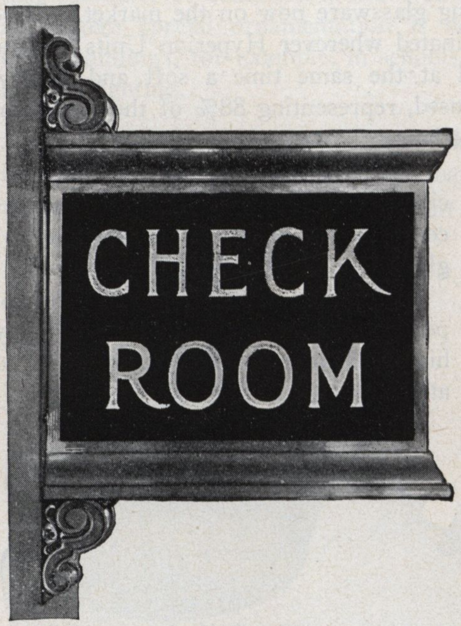
Single lamp compartment glass sizes: 4", 6" and 8" high. Light source at top or bottom.

Double lamp compartment glass sizes: 10", 12", 14" and 16" high. Light source both top and bottom.

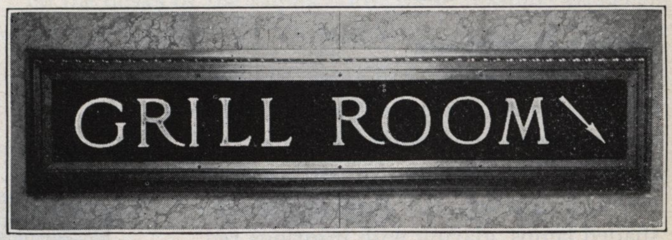
See preceding page for standard lengths of glass.

Wall
No. 102 Double Compartment

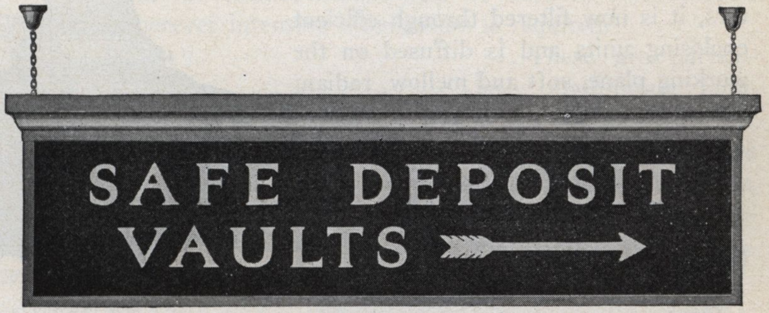
Sectional Views of Casings Carried in Stock
Dimensions are minimum. Larger or smaller casings built to order



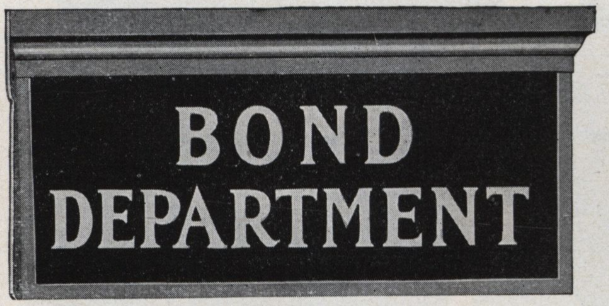
Style No. 253



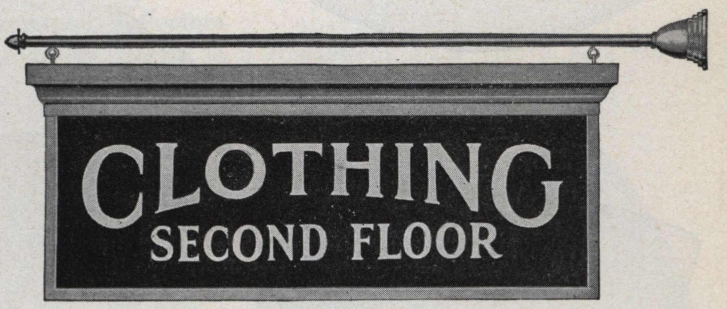
Style No. 251


SAFE DEPOSIT VAULTS

Style No. 104


BOND DEPARTMENT

Style No. 101


CLOTHING
SECOND FLOOR

Style No. 103

When Ordering or Specifying Perlite Signs

State which facing is desired, whether plate glass (No. 1 on preceding page), embossed opal letters (No. 2) or metal and glass (No. 3).

Specify style number (if stock design is required); size; whether lettering is to appear on one or both sides; finish desired on casing (frame); finish desired on facing (background); size and style of lettering; how sign is to be erected (by means of flange so as to project from wall, suspended by chains or rods, flat against wall, or to stand on a ledge, counter or desk).

Service

Our service department is in charge of experts having many years experience. We will be glad to furnish full information or sketches and estimates to help carry out your ideas without any obligation on your part.

Folders sent on request.

GILL GLASS COMPANY, INC.

Manufacturers of Illuminating Glassware

Amber and Venango Streets
PHILADELPHIA, PA.

BRANCH OFFICES

CHICAGO, ILL., 17 North Wabash Avenue
NEW YORK, N. Y., 200 Fifth Avenue
SAN FRANCISCO, CAL., 180 New Montgomery Street
BALTIMORE, MD., 122 West Baltimore Street
DENVER, COLO., E & C Building
NEW ORLEANS, LA., 301 Tchoupitoulas Street

Products

Illuminating Glassware for commercial and residential lighting in Hyperion, Nova and Velva Glass, including Bowls, Electric Shades, Reflectors and Enclosing Units, plain and decorated.

Also Street Lighting Bowls and Globes in Hyperion, Nova and Velva Glass.

Correct Illumination

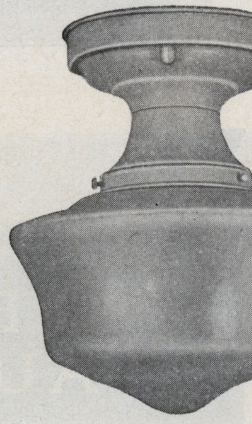
As every architect knows, the practice and theory of illumination have, within the last few years, been clarified and standardized. Illumination is still the prime requisite, but whereas formerly it was obtained through the medium of unshaded lamps, glaring with injurious red and yellow rays and intensified by inefficient auxiliaries such as crystal reflectors, it is now filtered through efficient enclosing units and is diffused on the working plane, soft and mellow, radiant but glareless. In any discussion of luminaires, in fact, the term "efficiency" is meaningless if it does not presuppose the elimination of glare.

Hyperion Glass

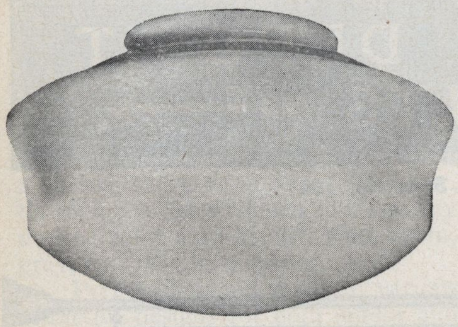
It was with these facts in mind, that we finally developed and perfected Hyperion Glass, the most efficient illuminating glassware now on the market. Glare is entirely eliminated wherever Hyperion Units are the luminaires, and at the same time a soft and mellow radiance is diffused, representing 88% of the total light generated by the lamp.

This is the highest average efficiency ever attained by any glass accompanied by the elimination of glare.

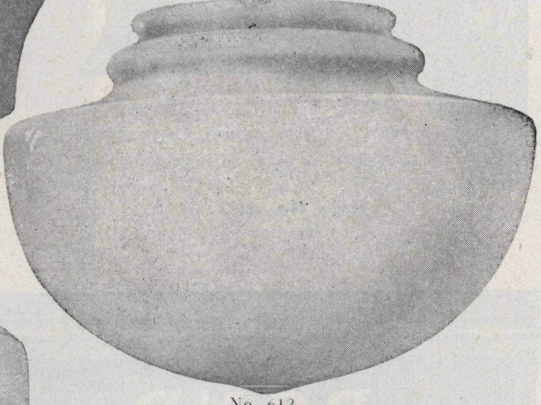
Hyperion Glass is pleasing in appearance and texture, and is not only highly efficient but also ornamental and attractive.



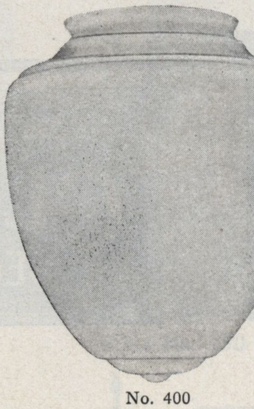
No. 618½
Kitchen
Unit



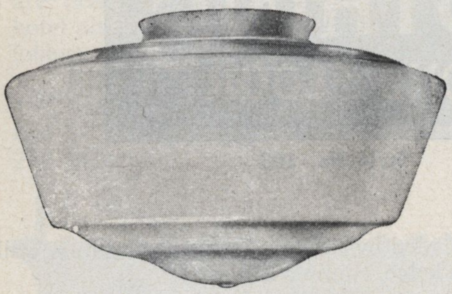
No. 606



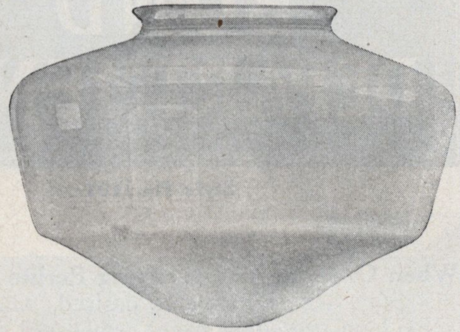
No. 612



No. 400



No. 621



No. 8614

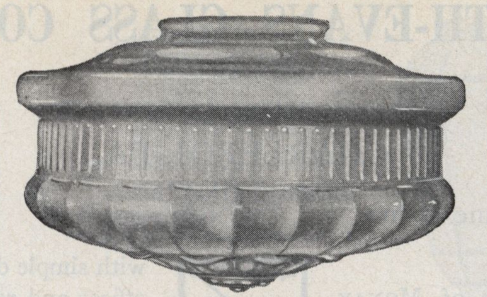
Hyperion Commercial Units

Size, in.	Fitters, in.	Recommended wattage	Size, in.	Fitters, in.	Recommended wattage
8	4	60-75	14	6	200-300
9	4	75-100	16	6	300
10	4-6	100	18	8	300-500
12	4-6	150-200			

Continued on next page

Design of Hyperion Units—Hyperion Units are constructed along those lines which best complement the efficiency of the glass itself.

It is entirely possible to neutralize the natural qualities of a good glass if it is moulded into shapes which diffuse the light over planes where illumination is not essential or which project shadows where light is most desirable. Our units are therefore *built to meet the fundamental requirements of correct illumination.*



No. 664
Hyperion Unit

Plain and Decorated Units—Hyperion Units can be furnished, of course, in plain glass, not decorated, for that character of commercial and even residential lighting where special ornamentation is not desirable: in office buildings, for example, in schools, in stores, or in kitchen lighting.

On the other hand, Hyperion Units can be furnished in appropriate decorative designs for banks, restaurants, stores, churches or for any type of building demanding such treatment.

For Schools—For efficient classroom illumination, two things are essential: first, the entire elimination of glare; and second, the maximum diffusion of light on the desks of the pupils. *If a photometric test of Hyperion glass be examined (one will be sent at your request) it will be found that the light generated by the lamp is* diverted from its usual horizontal projection, is bent downwards and most of it diffused, glareless but radiant, on the desks of the pupils. For these reasons, Hyperion glass is specified by the Boards of Education in many of the largest cities of the country.

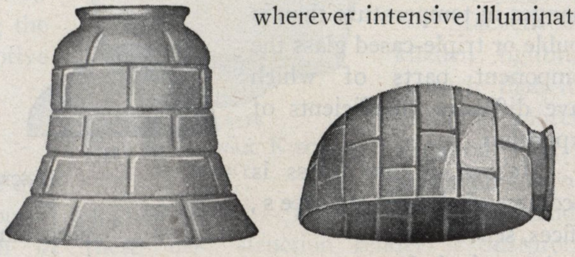
Bathroom Unit and Electric Shades

We show an illustration of our bathroom unit and electric shades in which *the tile design is moulded into the glass,* thus enabling these luminaires to harmonize and blend with the furnishings of most modern bathrooms.

The unit is intended to provide general illumination and the electric shades may be used in side brackets wherever intensive illumination is required.

These are particularly appropriate luminaires for the bathroom, and inasmuch as they are made in Hyperion Glass, are unequalled in efficiency and appearance.

No. 682
Bathroom Unit



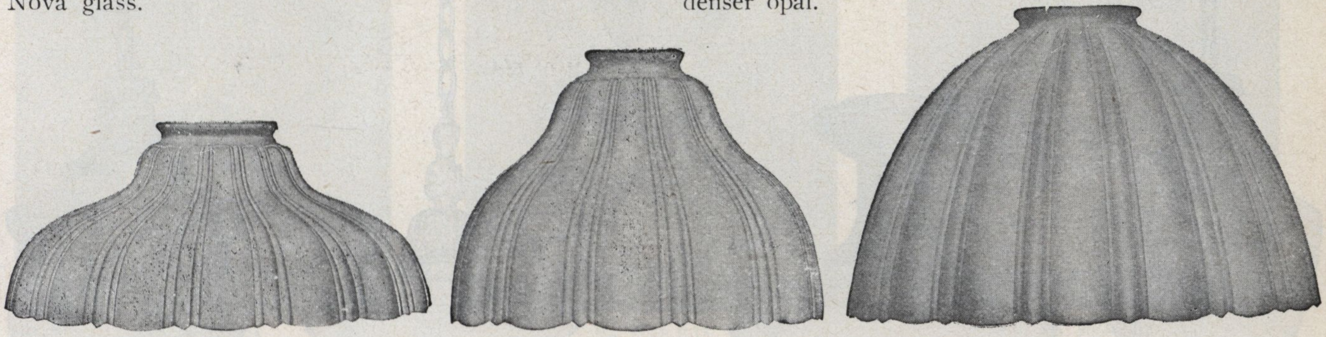
No. 301 No. 302

Appropriate Bathroom Luminaires
The tile is moulded into the glass, thus enabling these luminaires to harmonize with the furnishings of most modern bathrooms

Gill Commercial Reflectors

These reflectors are manufactured in Velva and Nova glass.

Velva is a translucent glass; Nova is a slightly denser opal.



No. 7006 No. 7002 No. 7004

Gill Commercial Reflectors

Flat Type		Deep Type		Bowl Type	
Nova	Velva	Nova	Velva	Nova	Velva
7006— 25-watt	3006— 25-watt	7000— 25-watt	3000— 25-watt	7004—150-watt	3004—150-watt
7007— 40-watt	3007— 40-watt	7001— 40-watt	3001— 40-watt		3005—250-watt
7008— 60-watt	3008— 60-watt	7002— 60-watt	3002— 60-watt		
7009—100-watt	3009—100-watt	7003—100-watt	3003—100-watt		
7010—150-watt	3010—150-watt				
	3011—250-watt				

MACBETH-EVANS GLASS COMPANY

EASTERN DIVISION

Illuminating Glassware

CHARLEROI, PA.

BRANCH OFFICES

BOSTON, MASS. CHICAGO, ILL. NEW YORK, N. Y. SAN FRANCISCO, CAL.

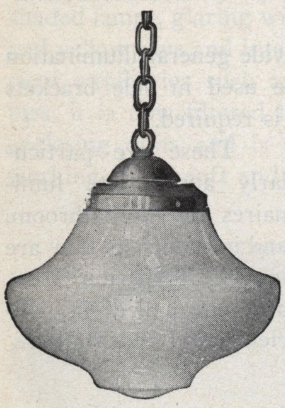
TRADE-MARK

Products

Commercial Lighting Ware of Monax and Alba Glass; Residential Lighting Ware principally of Monax Glass decorated by Artian and Thebian processes; Decorative Lighting Ware for restaurants and hotels; Monax Globes and Alba Shades for industrial illumination.

Commercial Lighting

Macbeth-Monax enclosing globes, both plain and ornamental, are supplied in upwards of 25 distinct designs, in diameters ranging from 6 inches to 18 inches inclusive. Monax is one-piece glass of from 84% to 86% efficiency, transforming the harsh brilliancy of modern high-powered lamps into perfectly diffused, soft illumination, with small loss by absorption.



No. 3756
Macbeth Monax School Lighting Unit

Monax is less susceptible to breakage from sudden changes in temperature than is double or triple-cased glass the component parts of which have different co-efficients of expansion.

Macbeth-Monax glass is recommended for stores, offices, schools, hospitals and industrial plants—particularly textile mills. It is also supplied with simple decoration suitable for lobbies, private offices and retail stores where decorative effect is desirable—also in Gothic and Adam design for church illumination.

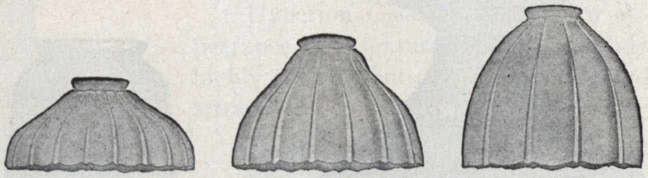
Write for descriptive literature.

School Lighting

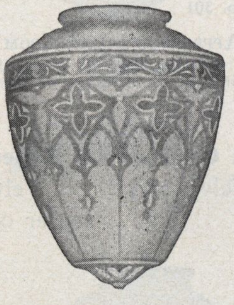
Macbeth-Monax enclosing globes of our No. 3756 line are supplied in 10, 12, 14 and 16-inch sizes. This particular shape is found through exhaustive tests to be particularly desirable for schoolroom illumination, and is now considered as standard in several of the larger cities and in many small ones.

Macbeth-Evans Alba Shades

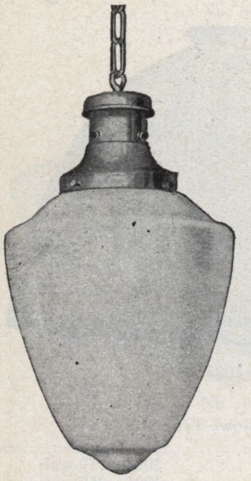
Alba is the original white diffusing glass. Translucent and of recognized quality, it is supplied for use with lamps of from 15 to 200 watts. Made in a great variety of shapes and designs, Alba embodies the requisites necessary to meet the lighting and architectural requirements of almost every interior.



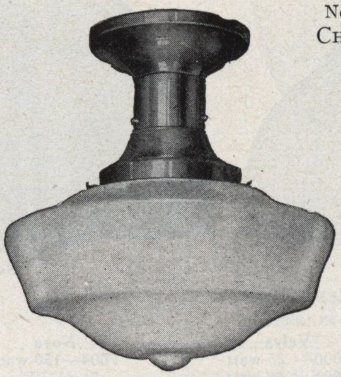
No. 3431 No. 3424 No. 3443
Macbeth-Evans Alba Shades



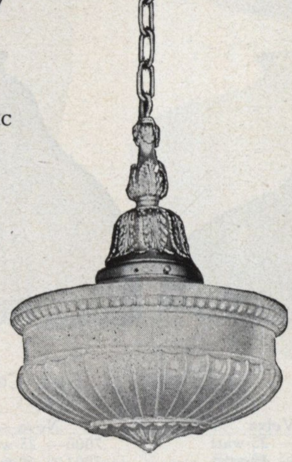
No. 3866-AK-235
Church Gothic



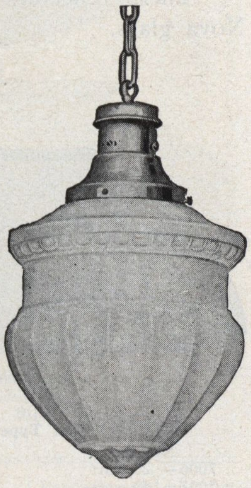
No. 3869



No. 4138



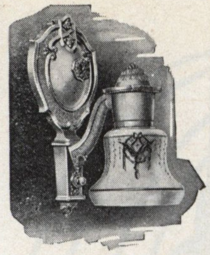
No. 2475A



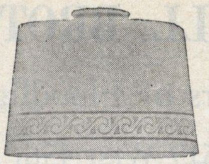
No. 4426

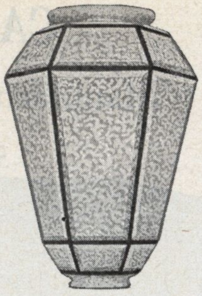
Macbeth-Monax Commercial Lighting Globes
Practical designs supplied for plain and ornamental pendant or ceiling type luminaires

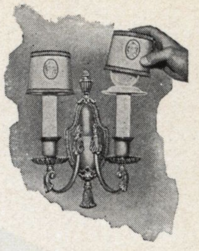
Continued on next page


No. 5114-J-5
Ball Lamp Shade

No. 1444-J-37
Shade


No. 4257-P-13
Oval Shade


No. 4253
Colonial Lantern


Practical Application
of Candle Shade

Macbeth Decorative Lighting Glassware for Residential Illumination

Residential Illumination

Lighting glassware for residences, comprising decorated bowls, small electric shades, boudoir shades, kitchen lights and dining room luminaires are supplied principally in Monax glass decorated by the Artian and Thebian processes.

Candle and ball lamp shades are furnished in various shapes and designs, individually decorated in rich colors. Each shade is equipped with a Macbeth-Evans adaptable holder for attaching it to the fixture.

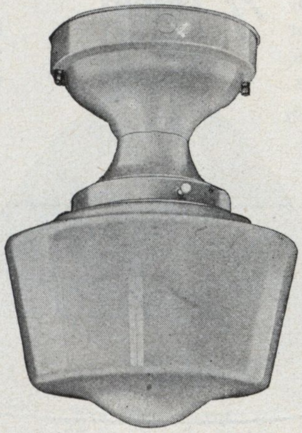
Ball lamp fixtures equipped with Macbeth-Evans shades diffuse a mellow light throughout the room, eliminating the glare of bare lamps. Write for descriptive literature.

The Aurora Luminaire

The Aurora Luminaire, the latest development in dining room illumination, is supplied in three designs as illustrated. Each of these designs furnishes an attractive combination of diffused light and soft color tints so welcome in the dining room.

Luminaires should be hung so that bottom of globe is 30 inches above plane of dining table, with either a 150 or 200-watt frosted lamp 1¼ inch above opening in bottom of globe. Adherence to these directions insures a cone of direct light 66 inches in diameter being thrown upon the table at an angle below the line of vision of those seated about the table.

Candle shades harmonious with the luminaire are available for auxiliary bracket lighting.

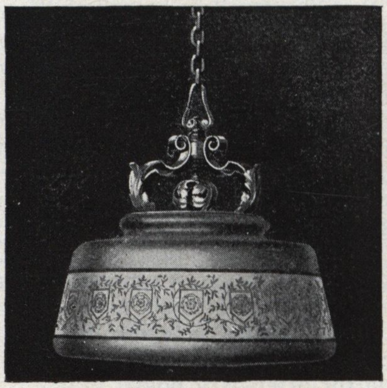

No. 5179
Macbeth-Monax Kitchen Light

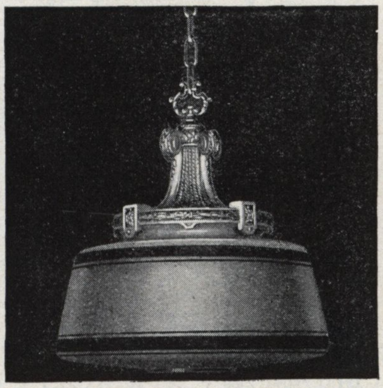
Kitchen Lighting

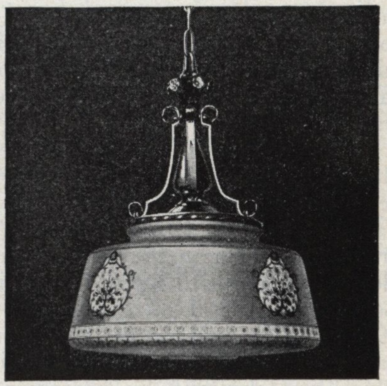
Macbeth-Monax glass is ideal for kitchen lighting, since its composition is such that it reduces harsh brilliancy of light sources into comfortable illumination and eliminates eyestrain with minimum loss of light.

The smooth surface and completely enclosed construction render it dustproof and practical to clean without removing the globe.

A suggested shape is illustrated; many others are available. Write for descriptive literature.


No. 5068-J-53
The Tudor


No. 5068-P-15
The Classic


No. 5068-J-52
The Ming

The Aurora Luminaire
The latest development in dining room illumination

CAHILL BROTHERS

Manufacturers of Floodlight Projectors

517-519 West 45th Street
NEW YORK, N. Y.

Products

Especially large and powerful FLOODLIGHT PROJECTORS for outdoor illuminations and for large and high interiors, combining freedom from glare, large output of light, beautiful quality and fine diffusion.

Horizontal-throw Projectors

In 500, 1000 and 2000-watt sizes for floodlighting large and high interiors, for stadiums, race tracks, fronts of buildings, areas before grandstands, open air seats, pageants, rodeos, military tournaments, swimming pools, football fields, tennis courts, auto parking spaces, etc.

Pendant Projectors

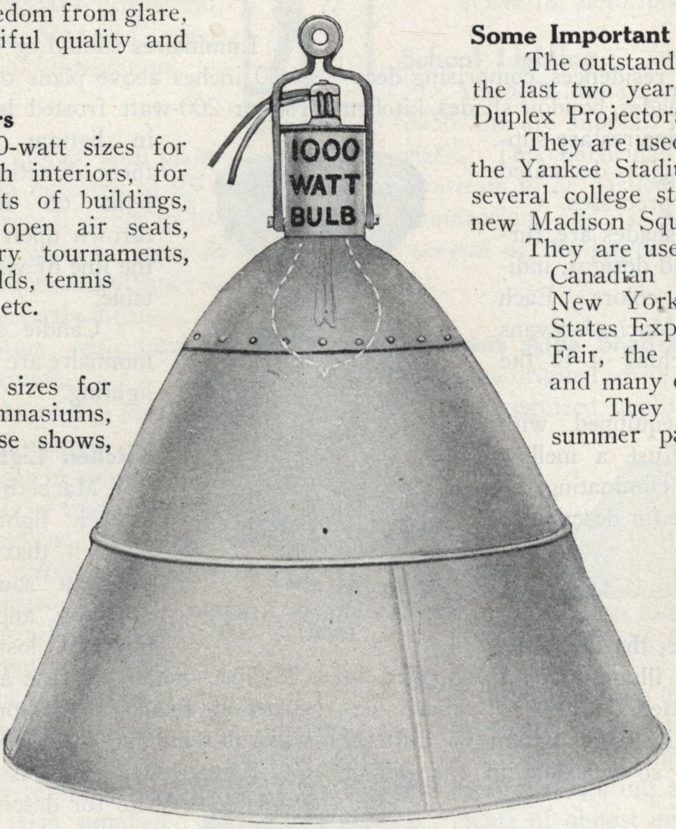
In 500 and 1000-watt sizes for illuminating coliseums, gymnasiums, armories, field houses, horse shows, exhibitions, conventions, trade shows, indoor polo, indoor swimming pools, basketball courts, tennis courts, ice rinks, rings for boxing matches, etc.

Service

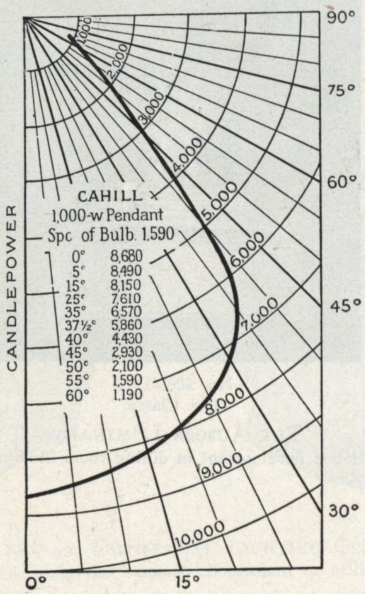
CAHILL BROTHERS specialize in the illumination of large and high interiors for exhibition, industrial, commercial and sporting purposes. Also in great outdoor illuminations for industrial and commercial purposes and for swimming pools, pageants, exhibitions, fairs, summer parks, football, soccer, tennis, etc.

Our George F. Cahill laid out the illuminations now used on the playing fields of the Polo Grounds and of the Yankee Stadium in New York; of the greatest stadium in the world, Wembley, at the British Empire Exposition, London; at several college stadiums for after-dark football; in the coliseum at the great Eastern States Exposition, which was declared by horsemen to be the best lighted horse show in the world.

He has also laid out illuminations in high machine shops, foundries, gymnasiums, armories, etc., and at the greatest summer parks and the great state and national expositions in America. He is glad to assist architects and owners in determining what is needed for any illumination outdoors or in any large interior.



Cahill Pendant Type Projector
Size of projector shell: diameter, 32½ in.; depth, 25 in.



Some Important Installations

The outstanding flood lighting honors of the last two years have fallen to our Giant Duplex Projectors.

They are used to light the Polo Grounds, the Yankee Stadium, the Wembley Stadium, several college stadiums and the wonderful new Madison Square Garden in New York.

They are used for flood lighting at the Canadian National Exposition, the New York State Fair, the Eastern States Exposition, the Michigan State Fair, the Central States Exposition and many others.

They are used at the greatest summer parks in America, such as Riverview, Euclid Beach, Kennywood, Luna Park, Steeplechase, Dominion Park, etc.

They are used at Yale, Harvard, Cornell, Pennsylvania, Annapolis, West Point, Illinois, Chicago, Wisconsin, Minnesota, Iowa, and Missouri Universities, etc., for after-dark football, soccer, hockey, winter sports and for Greek Plays and graduation exercises.

They are used at many commercial swimming pools, such as Kennywood, Providence, Rochester, Youngstown, Wilmington, Camden, etc.

As few as two projectors for each tennis court, are used at commercial and club courts for night tennis where play, at $3.00 per hour, often runs past midnight.

Besides illuminations in unusually large and high interiors by our regular pendant projectors:

Our special pendant projectors are used for lighting the armory at Yale for after-dark polo.

Other special pendants are used for lighting the rings at the Polo Grounds, the Yankee Stadium and other arenas for the greatest boxing matches.

Names of users in any of the above fields gladly furnished.

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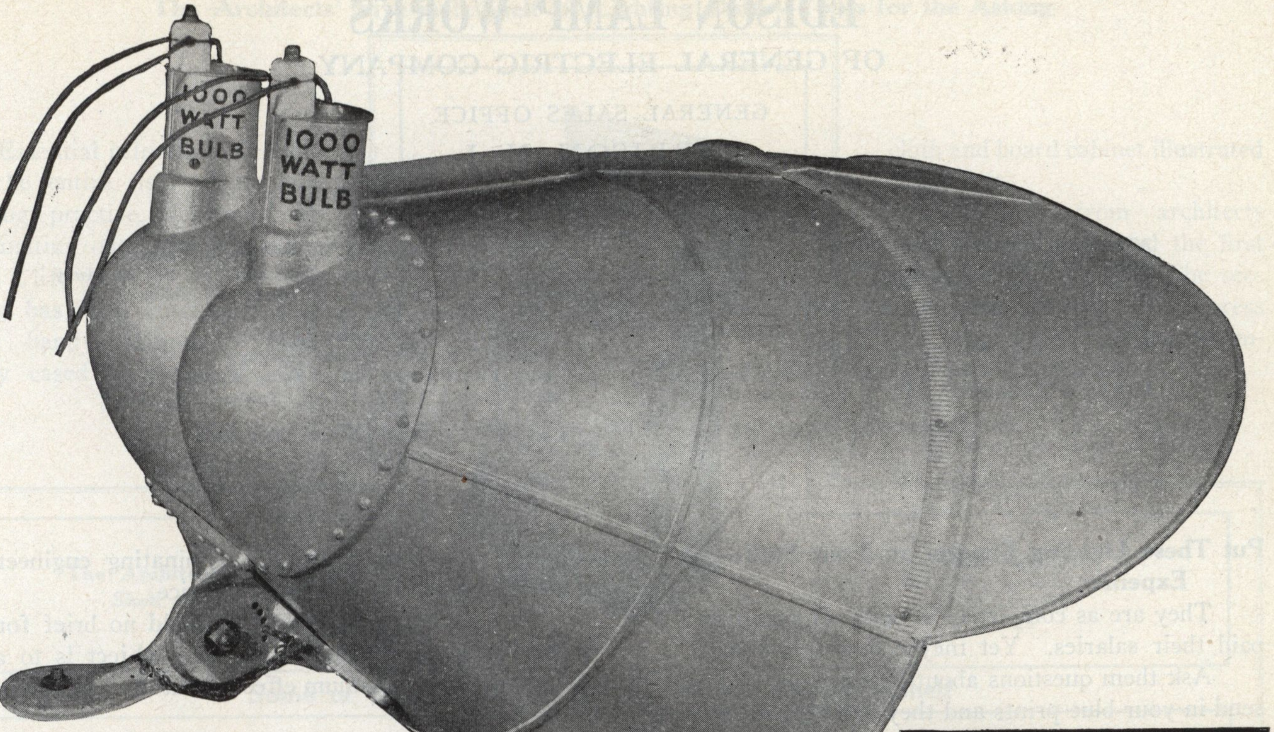
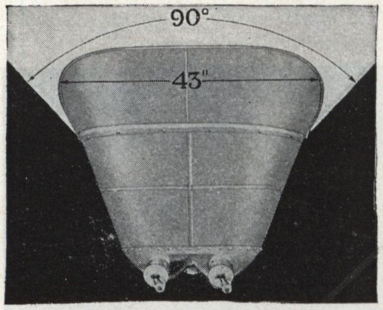
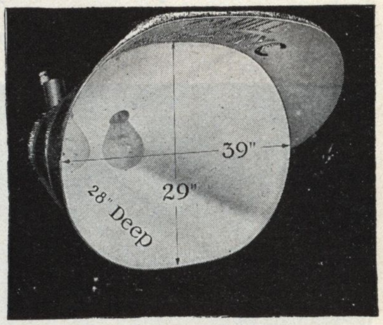
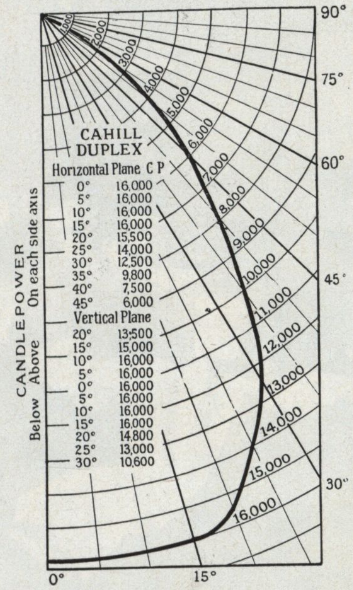


The New Giant
Cahill Duplex Projector







Characteristics of Cahill Projectors

Great Size—Front opening of duplex projector is 29x39 in.; of 1000-watt projector, 32-in. diameter. Light chambers, 25 in. deep, not including peak.

Large Light Output—A very large output of light for the current consumed.

Wide Spread of Beam—70° to 90°, and strikingly fine diffusion throughout the beam, as will be seen in the distribution curves.

Fine Light Quality—A remarkably fine quality of light, soft and beautiful, which brings out colors and complexions very well.

Low Glare—Remarkably low glare or dazzling effect—so low in fact, that one can look straight into even our duplex projector or drive an automobile directly toward it without being dazzled, although it is giving as much light as 3 or 4 of the largest floodlights of other makes.

The outer surface is covered with a fine grade of aluminum paint and the inner is treated with a white, granular chemical compound, which has an exceedingly high light reflecting value. This serves to break down the dazzling effect and does not discolor under heat or light.

In all Cahill projectors, the lamp is far back in the light chamber—well within the cast part. More than half of all the light produced by the filament impinges on the casting alone.

Our outward throw projectors are adjustable up and down on one center and round about on another. They should never be tilted above the horizontal.

Construction

Cahill projectors are all made with a cast iron or aluminum "cap," to which a heavy galvanized "skirt" of toncan iron is securely bolted. All projectors for horizontal throw have also a peak or vizor over the upper half to throw into the useful field some of the rays which would be otherwise wasted, and to act as a weather guard.

Output of Light

A report of the Electrical Testing Laboratories on our 1000-watt projector shows that it delivers 78% of all the light produced by the bulb. Before the test was made the expert, who was constantly making similar tests, did not consider it possible for a floodlight projector to exceed 55%. The highest efficiency of other projectors was reliably said to be but 52½%.

EDISON LAMP WORKS

OF GENERAL ELECTRIC COMPANY

GENERAL SALES OFFICE
HARRISON, N. J.

DISTRICT SALES OFFICES

ATLANTA, GA., Red Rock Building
BOSTON, MASS., 84 State Street
CHICAGO, ILL., Illinois Merchants Bank Building
CINCINNATI, OHIO, Provident Bank Building
DENVER, COLO., U. S. National Bank Building
KANSAS CITY, MO., Dwight Building
LOS ANGELES, CAL., 724 South Spring Street
MINNEAPOLIS, MINN., 410 Third Avenue, North
NEW ORLEANS, LA., Maison-Blanche Building
NEW YORK, N. Y., Equitable Building, 120 Broadway
PHILADLEPHIA, PA., Witherspoon Building
PITTSBURGH, PA., Oliver Building
PORTLAND, ORE., Electric Building
ST. LOUIS, MO., Pierce Building
SAN FRANCISCO, CAL., Rialto Building
SALT LAKE CITY, UTAH, Newhouse Building

For Other Sales Offices, see General Electric Company's Sales Offices, page 2475

Put These Lighting Experts on Your Staff—At Our Expense

They are as completely at your command as if you paid their salaries. Yet they cost you nothing.

Ask them questions about lighting, or, if you wish, send in your blue prints and they will lay out the proper system. The experience of illuminating engineers of national reputation is at your service.

The obligation is ours. We hold no brief for any particular kind of equipment. Our object is to assist you to give the maximum effects in utility and decoration from light.

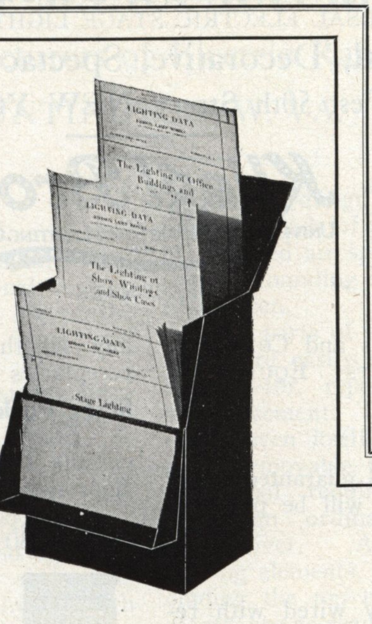
A Section of the Lighting Service Department
A staff of twenty-five specialists will plan your lighting for you without charge

Continued on next page

The Architects' Five-inch Shelf of Lighting Data—Yours for the Asking

Essential information covering the entire field of modern lighting practice, developed by illuminating engineers who have made a life study of their chosen fields, has been condensed into these handy pamphlets, compactly cased in the convenient cloth and board cabinet illustrated at the left.

Demands from architects have already exhausted the first edition of this series. The second edition is just off the press and your set will be mailed immediately on request.


LIGHTING DATA
The Lighting of Office Buildings and
LIGHTING DATA
The Lighting of Show Windows and Show Cases
LIGHTING DATA
Stage Lighting

The Architects' Five-inch Shelf of Lighting Data

This attractive dark green case is but 6½ in. wide, 4½ in. deep and 9½ in. high

Some of the Bulletins in the Architects' Five-inch Shelf

Lighting of Office Buildings and Drafting Rooms
Covering the lighting of office spaces, comparisons of systems of lighting, spacing of outlets, etc.

Residence Lighting
General systems of lighting, specific recommendations for lighting the various rooms of the house, the grounds and the garage

Lighting of Theaters and Auditoriums
Lighting the entrance, foyer, lounge and auditorium of the theater, motion picture auditorium, concert hall, lodge room and building exterior

Hotel and Restaurant Lighting
Covering the lighting requirements in hotels and restaurants of the lobby, dining rooms, kitchens, guest rooms, exteriors, etc.

Church Lighting
Feasible arrangements in ritualistic and evangelical churches with special requirements of the chancel, choir loft, windows, tower and exterior

Calculation of the Lighting Installation
A simplified and time saving method for calculating and laying out the lighting requirements

Lighting of Public Buildings
The special lighting requirements of art galleries, museums, libraries and executive buildings

Medical Lighting, Including Hospitals and Dental Offices
A helpful discussion of these problems with recommendations for solving same

Lighting of Large Dry Goods and Department Stores
The intensity, color and diffusion of light required, and arrangement of lighting the equipment

Lighting of Small Stores
Increasing the effectiveness of the display window as well as the interior of the small shop

Lighting of Show Windows and Show Cases
Intensity of illumination, color and spotlight effects, overcoming daylight reflections

Lighting of Textile Mills
Including general lighting schemes and recommendations, cotton, woolen and silk mills, and bleacheries

Lighting of Metal Working Plants and Steel Mills
Methods of lighting with detailed recommendations for the various departments and yards

Lighting of Woodworking Plants
Illuminating interior and outdoor operations, size of lighting units, and reflecting equipment

Lighting of Clothing and Shoe Industries
General and special lighting requirements of the individual operations

Automobile, Garage and Display Room Lighting
More effective lighting both inside and outside with specific recommendations and layouts

Lighting for Indoor Recreations
These include pool and billiard parlors, bowling alleys, tennis and squash courts, and skating rinks

Artificial Daylight for Merchandising and Industry
Modifying artificial light, color matching, with specific applications of modified light

Illumination and Production
Proper lighting, production tests, factors affecting the result, a lighting survey.

Lighting of Schools and Gymnasiums
Classroom and gymnasium lighting requirements with recommendations and typical layouts

Light and Safety
The relation of lighting to the safety problem

Lighting of Printing Plants
Planning proper lighting for type making and composing room, press room and bindery

Lighting of Signs and Billboards
Cove lighting and other methods of illuminating signs and billboards discussed

Electric Light on the Farm
Covering all phases of farm lighting requirements including wiring and equipment

Effect of Maintenance and Color of Surroundings on Illumination

KLIEGL BROS.

UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.

Theatrical, Decorative, Spectacular Lighting

321 West 50th Street, NEW YORK, N. Y.

TELEPHONE
Circle 0094, 0095

ESTABLISHED 1897

TRADE-MARK

Products

Equipment for Stage, Theatre and Motion Picture Studio Lighting; Decorative and Display Lighting; Pageant and Outdoor Theatrical Lighting; Lighting Effects; Electro-mechanical Stage Effects; Special Lighting Designs and Construction; Complete Lighting Plants; Equipment, Apparatus and Supplies.

Guarantee

All products are sold with a full guarantee. Any defects in material or workmanship will be promptly rectified.

Footlights

Completely wired with receptacles and cable splicing box; any desired length; any specified curvature. All standard designs for 60-watt to 150-watt Mazda lamps.

Detachable color globe type (No. 632) is equipped with a spring catch color globe holder on each receptacle, eliminating use of lamp coloring and color screens in color lighting.

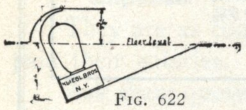


Fig. 622

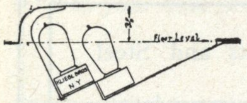


Fig. 624

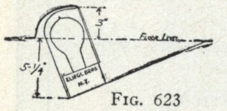


Fig. 623

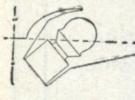
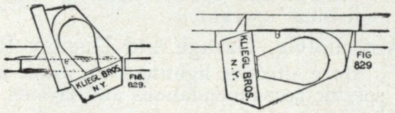


Fig. 632

Standard Footlights



Open Closed

Fig. 829. Disappearing Footlights

Disappearing type footlight (No. 829) furnished complete in 5-ft. sections ready for installation. When closed they are flush with the stage floor.

Border Lights

Furnished in any desired length; completely wired with receptacles and cable splicing box; also pipe and chains for hanging. All standard designs for 60-watt to 500-watt Mazda lamps.

Universal type (No. 600) for 60-watt lamps, four lamps to the foot.

Nitrogen type (No. 612) for 100-watt to 500-watt Mazda lamps; provided with metal frame and slide groove for color mediums.

Detachable color globe type (No. 616) for 150-watt Mazda lamps; equipped with spring catch holder for glass color globes.

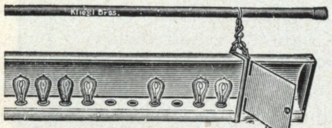

Kliegl Bros.

Fig. 600. Universal Type

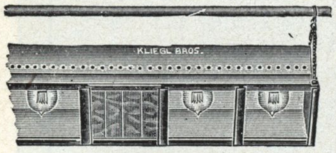

KLIEGL BROS.

Fig. 612. Nitrogen Type

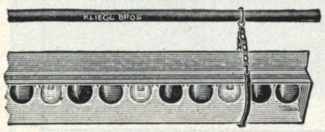


Fig. 616. Color Globe Type

Border Lights

Proscenium Lights

Any desired lengths; completely wired with receptacles and cable splicing box; strap hinges for fastening.

Strip Lights

For cove and concealed lighting; any length or curvature; furnished complete with receptacles and fully enclosed wiring.

Stage Pockets, Plugs and Receptacles

Stage pockets: flush floor types any number of circuits from 1 to 4; self-closing cover. Waterproof floor type, single circuit.

Wall pockets; flush or surface types; 2, 3 and 4-wire circuits; 30 to 200 amperes; suitable plugs.

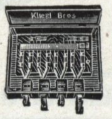


Fig. 374
Pocket Panel

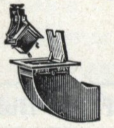


Fig. 350
Stage Pocket

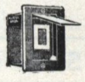


Fig. 310
Wall Pocket

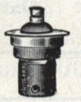


Fig. 300
Waterproof Floor Pocket

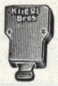


Fig. 307
Wall Pocket

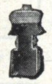


Fig. 301
Fiber Plug

Exit Signs and Illuminated Glass Signs

Variety of styles in exit signs; ornamental and plain designs; clear, frosted, ruby or leaded glass; surface or flush mounting; single faced and double faced; rectangular and triangular shaped; 3-in. to 8-in. letters. Illuminated glass signs of all descriptions.

Aisle and Step Lights

Louver construction, directs light to floor, set in step or wall flush with surface, complete with lamp receptacle. Aisle spotlight for end-chair mounting.

Theater Dimmers and Switchboards

Single unit dimmer plates to multiple unit dimmer banks; hand operated or automatic; 2 or 3-wire circuits; any desired control from single lamps to complete theater installation.

Switchboards for theaters, auditoriums, and the like.

Act Announcers

For mounting in proscenium arch, controlled by keyboard back stage, ten compartments completely wired with opal glass front.

Monogram type, 16 letters complete with keyboard.

Carriage Calls

Three-unit call, any number 0 to 999, visible day or night, call switch self-contained, no cards or other contrivances required, furnished complete.

Connectors

Single and multiple circuit connectors; cable connectors, pin connectors, branch-off connectors; 5 to 200 amperes; 2, 3 and 4-wire; indestructible, made of solid fiber to withstand hard service.

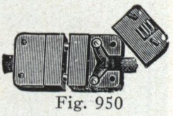


Fig. 950

Catalogue

Catalogue M *(completely revised edition)* describes equipment and service in detail. Contains much of interest to architects, engineers and contractors. Copy forwarded on request.

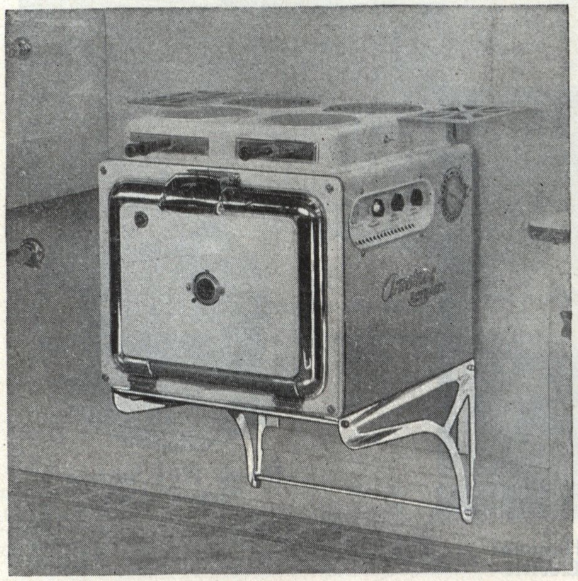
THE ARMSTRONG MANUFACTURING COMPANY

Manufacturers of Electric Ranges
HUNTINGTON, W. VA.

Armstrong Automatic Electric Range

The Armstrong automatic is an entirely new conception in electric ranges. Its design is similar to no other, departing widely from the conventional coal or gas range type of construction and making use of the flexibility of electric energy as has never been done before.

Its compact arrangement makes the Armstrong automatic especially adapted for installation in apartments where conservation of space is essential. Saving in space is effected by careful design, without in any way reducing the capacity of the range. It has a full size oven and four top heating units, giving ample capacity for large family use. In addition to oven and top heating units, the Armstrong includes a family size waffle mould, and a large capacity toaster drawer heated both sides at once by means of the divided heating element so successfully used in the familiar Armstrong table stove.



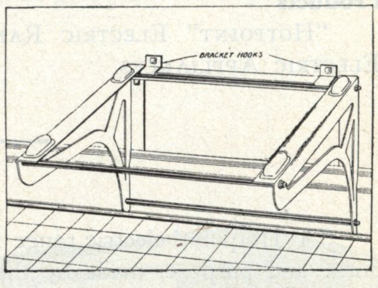
Armstrong Automatic Electric Range Installed

The oven is fully automatic; controlled for both time and temperature. Temperature control may be set to maintain any desired degree of heat and time control to turn on the current at any predetermined time and to turn it off at any later time, the temperature being maintained at an even degree of heat during the entire cooking time.

Construction

Made entirely of stamped metal parts, the weight of the Armstrong has been reduced to about half that of the ordinary styles of ranges in which cast iron and steel angles are so freely used. The die-pressed method of manufacture insures a uniformity and exactness impossible with other methods of construction. The material used is principally sheet steel of substantial gauge, finished in vitreous white enamel and nickel over a heavy copper plate.

In the design of the range unusually generous use has been made of the excellent heat insulating properties of confined air spaces, not less than two of which are used surrounding each heating element and the accurately fitted oven.



Brackets for Installing Range

All parts of the range are easily removed for repairs or replacement. The entire oven itself is easily removable, the only tool required being an ordinary screwdriver. All heating elements, including the top elements, are as readily replaced as changing a light bulb, no tools being needed for this operation.

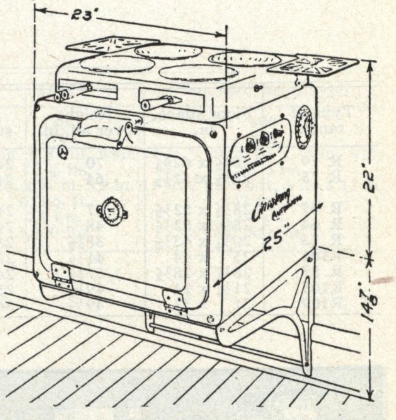
Easy Installation

The range rests on a nickel bracket easily installed against any type of wall. This method of support requires no special provision in wall construction nor any recesses in the wall into which the range must be set, and eliminates entirely any obstruction on the floor beneath.

Wiring Requirements

The Armstrong automatic range is adapted for use on either two or three-wire circuits and can be supplied for any standard current or voltage. A conduit terminal box located on the bottom of the range body gives proper provision for installation where conduit is required, and in any case, the wiring may be brought through the wall at the back or up through the baseboard, leaving the floor free from any obstruction.

Size and Weight



Over-all Dimensions of Range

The accompanying line drawing shows the principal dimensions of the range. The swinging shelf brackets add 5½ in. on each side to make up the over-all width. The oven measurements are 14 in. wide, 14 in. high and 19½ in. deep. The four cooking surfaces on top each measure 8¼ in. in diameter. The weight of the range alone is 149 lb.; supporting brackets, 12 lb.; total weight, 161 lb.

Further Information

Requests for more detailed information are invited.

EDISON ELECTRIC APPLIANCE CO., INC.

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Products

"HOTPOINT" ELECTRIC RANGES and HOUSEHOLD ELECTRIC APPLIANCES.

"EDISON" HOTEL, HOSPITAL, BAKERY, RESTAURANT and ELECTRIC COOKING EQUIPMENT.

"Hotpoint" Electric Ranges

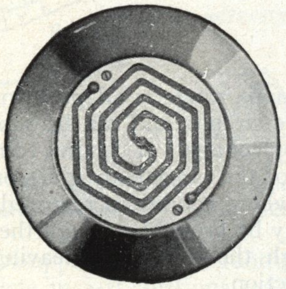
"A 'Hotpoint' electric range for every purse and purpose, made by the world's largest manufacturer of electric cooking equipment."

Made in a variety of types and sizes representing the most complete line of electric cooking apparatus in the world.

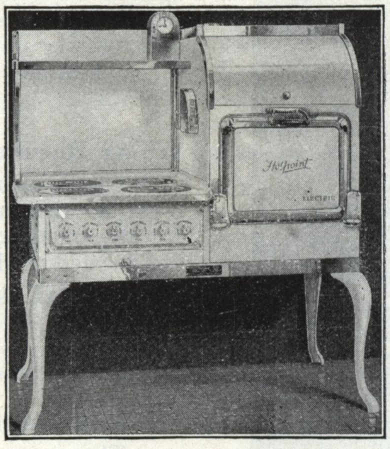
Hotpoint

Tested and approved by the National Board of Fire Underwriters. Furnished with either left or right-hand ovens.

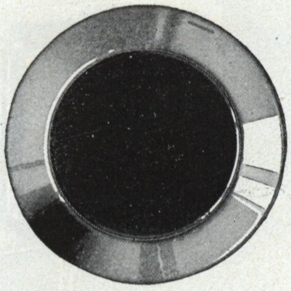
For wiring specifications, catalogue and other information, telephone or write our nearest sales office.



Open Coil Surface "Speed" Unit



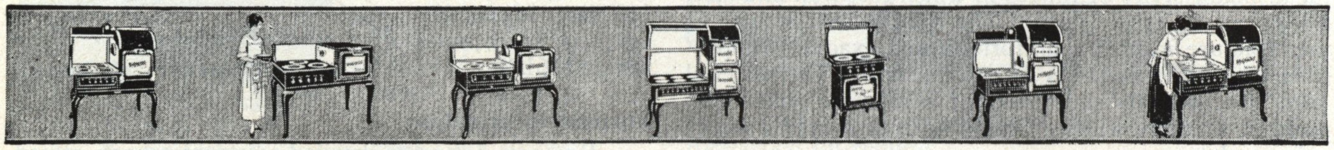
Model 181 RS67 "Hotpoint" Super-automatic Electric Range



Sheath Wire Surface "Speed" Unit

SPECIFICATIONS

Type of range	Floor space, in.	Height over all, in.	Cooking surface, in.	Number of surface units	Oven size, in.	Position of oven	Kw. connected load	Automatic equipment
R 79	28½ x 62¾	70	24½ x 37	6	18 x 18 x 14	R or L	14.7	Temperature and time control
R 75	28½ x 52½	64	24½ x 26½	4	18 x 18 x 14 18 x 18 x 8	R or L	10.4	Temperature and time control
R 67	28½ x 52½	57	24½ x 26½	4	18 x 18 x 14	R or L	8.9	Temperature and time control
R 64	28½ x 52½	48	24½ x 26½	4	18 x 18 x 14	R only	8.9	Temperature and time control
R 73	20¾ x 43½	38½	23 x 22	3	16 x 19 x 14	R & L	7.9	Temperature and time control
R101	25 x 44	41½	23 x 22	3	16 x 18 x 12	R only	6.8	None
R 87	28¼ x 28½	57½	24½ x 27½	4	18 x 18 x 14	Low	8.9	None
R105	21¼ x 24	49½	25 x 17½	2	16 x 15 x 12	Low	4.2	None
R109	21 x 37	49½	36 x 17½	3	16 x 15 x 12	Low	6.0	None



RS67 R101 RS63 RA79 R105 RA75 R67

Continued on next page

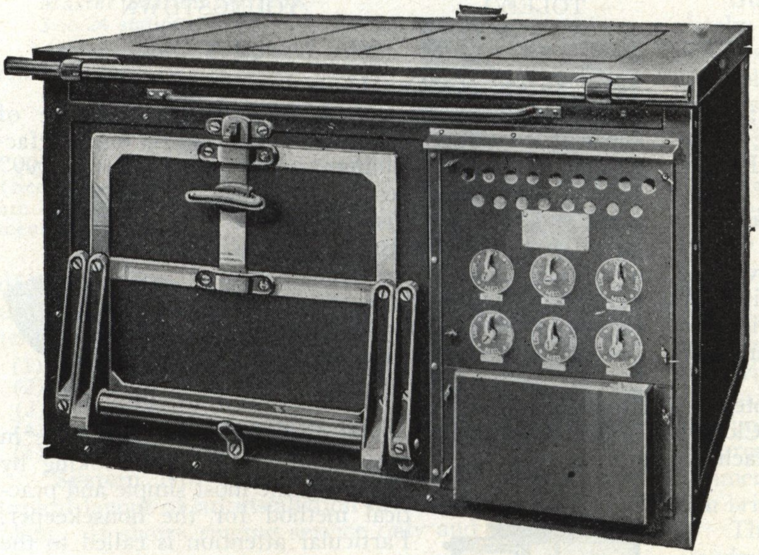
Edison Hotel, Hospital and Restaurant Electric Equipment

The "Edison" line of heavy duty equipment covering every need in the hotel, hospital and restaurant kitchen and bake shop is the result of years of intensive study and experimental work by electrical heating engineers and bake oven and kitchen equipment designers.

"Edison" heavy duty equipment includes, stationary brick type bake ovens; multiple deck type bake ovens; two-deck bake ovens; single-deck bake ovens; multiple deck baking and roasting ovens; hotel type heavy duty ranges and cooking tops; frying griddles; service broilers; coffee urns; steam tables; plate and food warmers; toasters; waffle bakers; doughnut stoves; egg boilers.

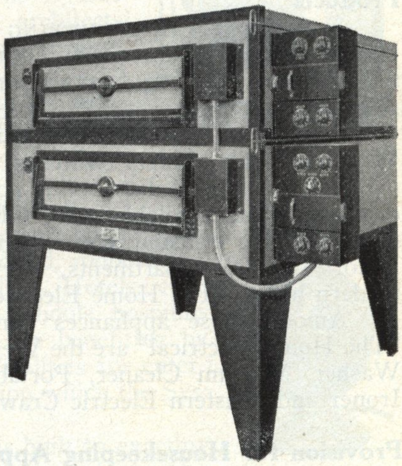
Service—The advice and service of our heavy duty cooking equipment engineers is available for your counsel in planning kitchen installations. Telephone or write our nearest sales office.

Catalogues, photographs, detail drawings, wiring specifications, etc., will be gladly sent on request.



Catalogue No. 432 R111

"Edison" Electric Heavy Duty Range



Catalogue No. SA166

Edison Electric Bake Oven

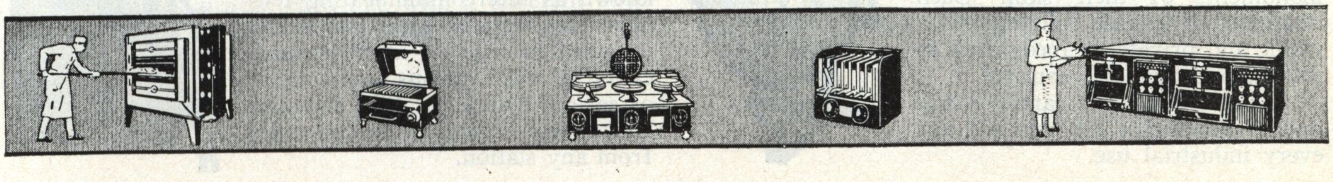
RANGE SPECIFICATIONS

Catalogue No.	Floor space	Height over all	Cooking Top	Oven dimensions	Rated wattage	Installed weight
432R111	39 in. x 48 in.	31 in.	24 in. x 36 in.	18 in. x 21 in. x 26½ in.	22 kw.	1,250 lbs.
432R116	39 in. x 48 in.	31 in.	24 in. x 36 in.	Furnished less oven	16 kw.	1,150 lbs.

BAKE OVEN SPECIFICATIONS

Catalogue No.	*434N38	*434N43	439N22	SA166	SA175	No. 400, Brick type
1-lb. loaf capacity	20	40	60	120	180	400
Hourly capacity	30	60	90	180	270	600
Floor space	36 in. x 58 in. wide	36 in. x 58 in. wide	39 in. x 58 in. wide	72 in. x 81 in. wide	72 in. x 81 in. wide	14 ft. 7 in. x 10 ft. 3 in. wide
Over-all height	54 in.	67 in.	72 in.	75¼ in.	75¼ in.	7 ft. 3 in.
Compartment dimensions	30 in. x 38 in. x 8 in.	30 in. x 38 in. x 8 in.	27 in. x 38 in. x 8 in.	56 in. x 57 in. x 9 in.	56 in. x 57 in. x 9 in.	11 ft. 2 in. x 6 ft. 5 in. x 11 in.
Total baking surface	7 sq. ft.	14 sq. ft.	21 sq. ft.	40 sq. ft.	61 sq. ft.	142 sq. ft.
Rated wattage	4.2 kw.	8.4 kw.	9 kw.	16 kw.	24 kw.	54 kw.
Installed weight	650 lbs.	1,400 lbs.	1,800 lbs.	3,600 lbs.	5,000 lbs.	60,000 lbs.

*Furnished with automatic temperature control.



WESTERN ELECTRIC COMPANY

INCORPORATED

Electrical Equipment for Home and Industry

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YOUNGSTOWN

Products

Electrical Housekeeping Appliances; Enclosed and Semi-enclosed Lighting Units; Sunbeam Mazda Lamps; Inter-phone Systems; Public Address Systems.

Also Fans, Motors, Generators, Wiring Materials, Wire and Cable; Safety Switches.

Through the 54 distributing points listed above, this company makes available every thing electrical; in fact, every thing to transmit, control and apply electricity in factories, hotels, apartments, stores, theaters and the modern home, "The Home Electrical."

Among those appliances particularly adapted to "The Home Electrical" are the Western Electric Clothes Washer, Vacuum Cleaner, Portable Sewing Machine, Ironer and Western Electric Crawford Range.

Provision for Housekeeping Appliances

In homes, the popular demand for electrical housekeeping appliances suggests ample provision for installation space and convenience outlets.

The Western Electric clothes washer is 24 in. wide and 33 in. long. The ironer is 24 in. wide and 37½ in. long.

Alternating or direct-current motors are supplied according to local conditions.

The Western Electric sewing machines and vacuum cleaners, being portable, need be considered only when locating the convenience outlets. They are equipped with universal motors operating on either direct or alternating-current.

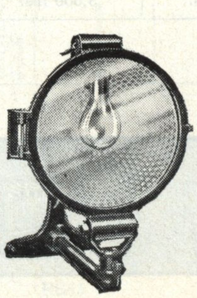
Sunbeam Mazda Lamps

These famous lamps are standard for practically every use in home and industry, all over the country. They are available in all sizes and types wherever Western Electric supplies are sold.

Floodlights

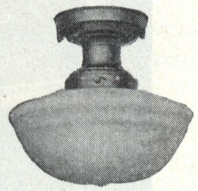
Architects are using Western Electric floodlights, lit by Sunbeam Mazda lamps, to illuminate the monuments of their skill. Such treatment of notable buildings, both public and private, is recognized as protective as well as beautiful.

Western Electric carries a full line of floodlights for this and for every industrial use.



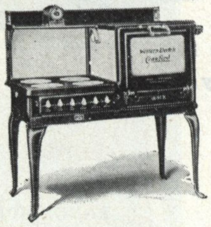
"99" Safety Lighting Units

Western Electric enclosed lighting units are of superior construction, suitable for homes, offices, factories and public buildings. The globes of the "99" Safety units are of best grade cased glass, and the fixture is correctly designed for proper diffusion and distribution. Removal of the globe is controlled by a single knob, a quick and simple operation. No danger of loosening or cracking the glass.



Electric Range

The Western Electric Crawford range is made in several sizes and types, designed to make cooking by electricity the most simple and practical method for the housekeeper. Particular attention is called to the new models 18—91 and 16—81, equipped with Time and Temperature Control. In these models, cooking may be started and stopped at the desired hours, with the oven temperature definitely regulated, entirely in the absence of housewife or maid.



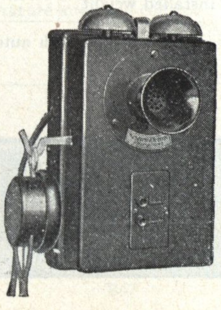
Quality Supplies

The name Western Electric is a guarantee of quality covering the great variety of electrical supplies for building requirements. Everything for wiring installations, from wire and conduit to switch and fixture, is stocked in quantity and variety at all the Western Electric offices. Our national distribution makes Western Electric supplies obtainable everywhere.

FRICTION
VICTOR
TAPE
VICTOR TAPE

Inter-Phones

"Inter-Phone" is the trade name adopted by the Western Electric Company for what is commonly known as intercommunicating telephone apparatus. Inter-phones are intended to provide intercommunication between various points in one or several buildings. The signaling and talking circuits can be controlled from any station.



Continued on next page

This is an ideal system for apartment houses, hotels, offices, manufacturing establishments, schools, hospitals.

In the larger residences, and where there is a garage or servants' quarters, Inter-Phones constitute a convenience not to be overlooked. They are being built into new homes in increasing numbers.

Systems—Various systems are available to cover various service requirements. A few of these follow:

Selective Talking and Selective Ringing: 3 to 24 stations. (See description of System No. 1.)

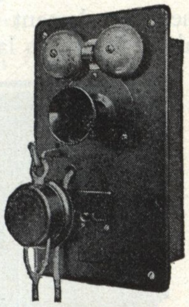
Common Talking and Selective Ringing: 3 to 8 stations.

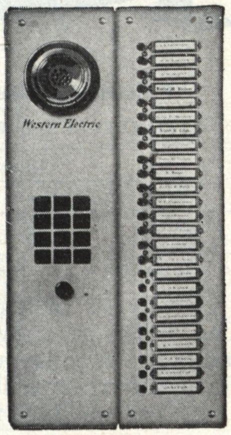
Common Talking and Code Ringing: 2 to 6 stations. (See description of System 15-C.)

Master Station Systems—3 to 24 stations.

Annunciator Telephone Systems—6 to 70 stations.

Apartment House Systems—Selective Ringing and Talking or Common Talking: 3 to 70 stations. (See description of System 10. There are several systems suitable for apartment house use.)

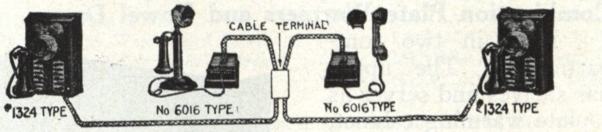




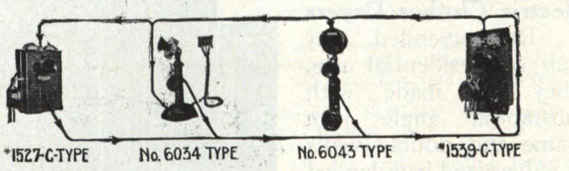
Types—The following types of Inter-Phones are available for use in the various kinds of systems:

(1) Wall Sets, Surface Mounting.
(2) Wall Sets, Flush Mounting.
(3) Desk Sets.
(4) Hand Sets, Surface Mounting.
(5) Hand Sets, Flush Mounting.

System No. 1—System No. 1 illustrated is a typical layout of an installation in an office or industrial plant. It shows ringing service only and should not be considered a wiring diagram. Selective ringing, selective talking service, 3 up to 24 stations. (1) Any station can ring selectively any other station. (2) More than one conversation can take place simultaneously.



System No. 15-C—Code ringing, common talking service, 2 up to 6 stations. A simple private line system (requires only 3 line wires between stations). When a button is pressed at any station the bells of all other stations will ring simultaneously. The various stations are called by signaling each one with a different code. Only one conversation can be carried on at a time.

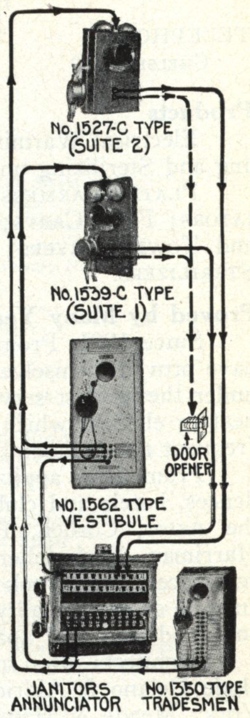


System No. 10—System No. 10 is a typical apartment home layout. It shows the ringing service only and should not be considered a wiring diagram.

The non-interfering service connecting one janitor's switchboard, two or more vestibule and tradesmen's Inter-Phones and any number of suite Inter-Phones up to 70. It is intended for use where several vestibules in the same or adjoining apartments are to be served by one janitor. A maximum of 24 suite Inter-Phones can be connected to each vestibule set.

Bulletins—Bulletins completely describing Inter-Phones and installation instructions are available, also a volume of illustrations and typical architects' specifications on Inter-Phones may be had for the asking.

Communicate with the nearest Western Electric Distributing House.



Public Address Systems

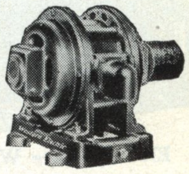
The Western Electric public address Systems amplify and distribute sound, indoors and out, with great fidelity. Hotels, civic auditoriums, theaters, schools, hospitals and public buildings are benefiting by the greatly enlarged facilities for entertainment and instruction which the System brings.

This equipment is built to exacting standards of design and workmanship. Complex in structure, it is wonderfully simple to use. It has the Western Electric guarantee.

Motors and Control

For general power service Western Electric offers alternating and direct-current motors of rugged construction to meet every requirement. Adequate stocks are maintained at most of our offices, and architects engaged in the design of industrial plants are invited to consult our experts about power layouts.

Industrial users of power endorse the practice of installing individual motors and control for the operation of each machine. In many cases the resulting elimination of loss over shafting will result in greater economy.



Other Western Electric Quality Products

Our 54 offices are centers for electrical supplies of every description. Western Electric distributes the products of nationally known makers. The Western Electric Year Book lists over 60,000 items, everything electrical.

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PROMETHEUS
TRADE-MARK

Products

Electrical Warming, Heating, Drying and Sterilizing units, including:

PLATE WARMERS; ELECTRIC RADIATORS; FOOD CARTS; COMBINATION PLATE WARMERS and TOWEL DRYERS; CLOTHES DRYERS; INSTRUMENT STERILIZERS.

Proved by Many Years of Service

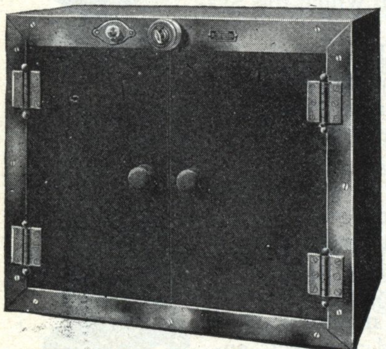
Since 1901, Prometheus electric heating appliances have proved themselves efficient, durable and substantial under the hardest service. They are distinguished by a heating element which does not get red hot, eliminating frequent renewals and fire hazard.

Prometheus appliances are widely installed in residences, hotels and clubs of the highest class, including the Astor, Cosden, Patterson, Deering, Ford, Frick, Harriman, Rockefeller, Schiff, Speyer and Vanderbilt residences, the Brook Club and the Waldorf Astoria. In spite of their quality, their price makes them available for residences and apartments of moderate cost.

Architects who specify Prometheus specialties include Delano & Aldrich and Charles A. Platt of New York; Meade & Hamilton of Cleveland; and Keen & Wallace of Philadelphia.

Prometheus Electric Plate Warmers

Used in the butler's pantry, kitchen or hospital ward for warming dishes and food without cracking the china or drying out the food. They operate by a turn of the switch—no fire, smoke, steam or odor. Approved by the National Board of Fire Underwriters.



Electric Plate Warmer

Construction—Substantial welded angle iron frame. Double walls thoroughly lagged. Shelves and frames on heavy iron rod and supported on angle iron brackets. All interior fittings removable.

Can be furnished, if desired, with enamel doors and with Monel metal top, which can be used as a hot plate.

Heating Element—By a patented arrangement, the heating units are contained in shallow flues, attached to the side walls of the interior, so that water or gravy which may be spilled can not short circuit them. Heating elements never reach a red hot temperature. The dishes are warmed by means of a uniform circulation of warm air.

Plate warmers are usually designed with two degrees of heat. A patented thermostatic cut-off can be furnished.

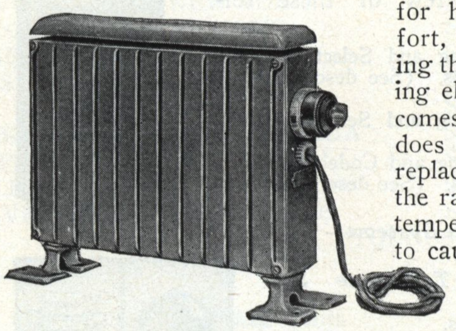
Built to Order—Generally the plate warmers are built to architects' specifications. When ordering, give over-all dimensions, and state whether appliance is to be built into a recess or stand free. Stock sizes are:

Type	Outside diam., in.			Current consumed watts	List price
	Wide	High	Deep		
800	18	18	18	400	$ 45.00
801	18	18	18	400	51.00
802	25	24	18	600	125.00
804	36	30	20	800	150.00

Outside finished in Russia iron. All types except No. 800 have nickel-plated trimmings.

Prometheus Electric Radiators

These are not radiant heaters, but true electric radiators which architects can specify for permanent service. The heating element is a series of flat surfaces by which air is heated in large volumes to the proper temperature for health and comfort, without scorching the air. The heating element never becomes red hot and does not have to be replaced. No part of the radiator reaches a temperature sufficient to cause fire. Three-heat switch insures economy of operation.



Prometheus Electric Radiator

PROMETHEUS ELECTRIC RADIATORS—STOCK SIZES

Type	Dimensions, in.			Maximum wattage	List price
	Long	High	Deep		
331	16	14½	4	1000	$40.00
332	16	14½	4	2000	50.00

110 or 220 volts. Special voltage at slight additional charge.

Body of radiator is cast iron aluminum finished. Can either be screwed to floor or else employed as utility heater to be moved about at will. Also furnished for mounting on wall brackets.

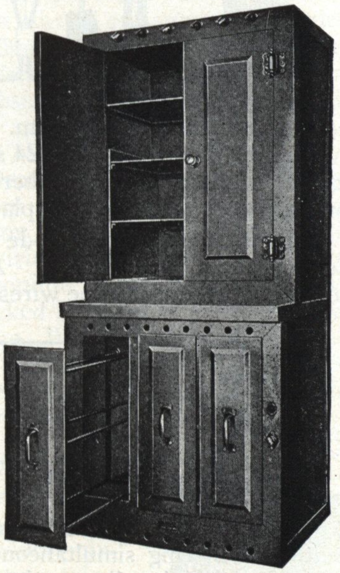
Flush wall type radiators built to order.

Prometheus Electrically Heated Food Carts

For keeping food warm during distribution from a central kitchen; recommended for hospitals. Principle of operation similar to plate warmers. Built to order.

Combination Plate Warmers and Towel Dryers

Built in two compartments. The upper has shelves and serves as a plate warming cabinet, while the lower, fitted with racks, serves for drying towels. This is a convenient arrangement for kitchens and serving pantries in residences and clubs. Built to specifications.



Combination Plate Warmer and Towel Dryer

Electric Clothes Dryers

Recommended for club or residential use. They are made with substantial angle iron frame and double walls of galvanized iron lagged with mineral wool. Outer wall can be mirror finish if desired. Built to specifications.

Instrument Sterilizers

Made in three stock sizes: No. 520, 11x5x3½ in.; No. 523, 13¾x5x3½ in.; No. 526, 16½x6x3½ in. Special sizes will be furnished to order.

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SCHENECTADY, N. Y.

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Continued on next page

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The General Electric Company has established various means of marketing its products: direct sales to purchasers; sales through distributing jobbers; sales through contractors and dealers; sales to manufacturers of machinery and appliances; manufacture and sale by associated companies through any one of these channels. It is possible to obtain through these channels every kind of apparatus, machinery, device, or material necessary for the generation, transmission and distribution of electrical energy with the exception of telephone and similar equipment.

General Electric and Associated Companies

The General Electric Company, and the various companies associated with it, manufacture many products of direct service to architects and builders. The products of the associated companies are so noted where they appear in the classification that follows. Inquiries about these products should be directed to the companies at their addresses given below:

Cooper-Hewitt Electric Company, 95 River St., Hoboken, N. J.
Edison Electric Appliance Co., 5660 W. Taylor St., Chicago, Ill.
Edison Lamp Works of General Electric Company, Harrison, N. J.
National Lamp Works of General Electric Company, Cleveland, Ohio
Trumbull Electric Mfg. Co., Plainville, Conn.
Victor X-Ray Corp., 236 Robey St., Chicago, Ill.
Warren Clock Company, Ashland, Mass.

The General Electric Company's Service to Architects

Because of their convenience and logical arrangement, the headings of the "Standard Construction Classification," Document No. 172, issued by the American Institute of Architects, have been used by the General Electric Company as an outline for the description of some of its products which serve architect, contractor, and owner.

The extent to which electricity may be applied in all building operations, from preparation of site to the eventual comfort and convenience of the occupant, is practically unlimited.

The G-E products are dependable servants, as economical power drive for excavation, construction, and transportation, as power installations for operation of buildings and industries, as convenient comforts that bring light, heat, fresh air, and the services of innumerable labor-saving appliances within the reach of a simple switch.

Data

There is a marked difference between general and specific data in the building industry, so much so that those planning or building structures should confer with General Electric and associated companies' representatives before proceeding too far with their work, that the latest and best practices in regard to electrical usages may be known, and that only the latest and most approved equipment may be selected.

G-E Products for Architects and Contractors

Grouped according to the "Standard Construction Classification," Document No. 172 issued by the American Institute of Architects

(1) Preparation of Site

In the preparation of site electric power is most economical when available. G-E motors and controls are extensively used for derrick and drum hoists, electric shovels, air compressors, electric drills, etc.

1a. Demolition of Structures—

G-E motors and controls for electric trucks, industrial haulage, electric hoists, etc.

1a3. ***Sprinkling—***

Where local water pressure is insufficient forced pressure by pumps G-E electrically equipped should be provided.

1c. Top Soil Removal—

G-E motors and controls applied to the operation of electric shovels, hoists, derricks, conveyors, trucks, and industrial haulage are available.

(2) Excavation

G-E floodlighting projectors provide the best illumination for night construction work, bringing brilliant but diffused daylight to large areas. Their use makes night work possible and safe. Any area can be lighted by G-E projectors, with any desired intensity. Their installation means uninterrupted work, maximum safety, and economical installation and operation.

2a2. ***Borings—***

G-E motors and controls for rock drills are built for heavy continuous duty. Electric drive is convenient, economical, and above all reliable.

2b. Excavated Material, Disposal of—

G-E motors and controls play a large part in excavation and the disposal of excavated material. Their application to electric shovels, conveyors, electric hoists, trucks, locomotives for large excavating jobs, cranes and derricks means that power is used only when the machines are actually working; control is simple, with corresponding decrease in labor cost; and because of G-E dependability work is accomplished with a minimum of time for maintenance.

2c. Blasting—

G-E insulated enameled wire is the best obtainable for blasting circuits. Great quantities of it were used to carry the charges that blasted open the cuts at Panama. For large jobs or small jobs it unfailingly delivers the spark that sets off the blast.

2d. Open Caisson—

G-E motors and controls for pumps, conveyors, and hoists make excavations for open caisson work rapidly.

2j. Dredging—

G-E motors and controls for dredges increase the yardage per day. They perform rapidly and economically on all jobs, large or small.

G-E motors and controls for pumps and conveyors are available to make dredging a labor-saving electrified operation.

(4) Concrete and Concrete Work

4b. Proportioning and Mixing—

4b3. ***Mixing—***

4b31. *Machine—*

G-E motors and controls applied to concrete mixing, where provisions have been made for electric power supply, perform economically. They are well adapted to the requirements for flexible control.

Continued on next page

(6) Foundations

6b. Caissons, Air—

G-E compressors and blowers supply air automatically to pneumatic caissons at the pressure required. Because of their absolute dependability there are no setbacks in the work from failing air pressure.

G-E motors and controls applied to ventilating fans keep the air circulating to safeguard the workers' health.

G-E motors and controls for mud pumps, hoists, and conveyors dispose of the excavated material with ease and rapidity.

(11) Paving

11a. Concrete—

G-E motors and controls for concrete mixing and paving machinery are adapted to the requirements for flexible control. Electric drive saves time, labor, and fuel costs on jobs where electric supply is available.

(13) Structural Steel and Iron

13c. Fabrication—

Electric arc welding of trusses, tie-beams, floor joists, tanks, etc., costs less than riveting, and the finished products carry as much weight per square inch safely, without causing fatigue in the metal. G-E arc welding equipment for this work is simple, economical, and is designed to knit metals with arcs of varying heat and intensity, depending upon the properties of the metals and the requirements of strength and safety. To train competent welders, this company maintains a free arc welding school at its Schenectady Works.

13d. Erection—

G-E motors and control equipment for cranes, derricks and hoists are especially adapted to these machines. The motors have high starting torque, low flywheel effect, varying speeds, and are capable of close regulation. They are very simple in construction and are designed for heavy duty. Furnished in either 3 or 2-phase a-c. capacity, 1 to 600 hp.; d-c. 2 to 130 hp.

(14) Miscellaneous—Steel and Iron

14b. Door and Window Fittings—

14b5. *Doors and Shutters—*

G-E fractional horsepower motors and controls are supplied for door, window and shutter opening and closing. Simply constructed, they are positive and reliable in operation. Control may be either adjacent or remote.

(18) Vaults and Safes

18a. Built-In Vaults—

Mazda lamps, G-E wires and cables, and G-E wiring devices bring daylight illumination into the vault, without the eye strain caused by old type glaring lamps. The wiring is simply installed.

Outlets make the addition of extra fixtures, when needed, a simple matter.

(25) Paint, Painting and Finishing

25b. Finished Products—

25b2. *Paints and Enamels—*

25b28. *Miscellaneous and Special—*

G-E insulating and finishing paints are designed to give a protective coating and finished appearance to electrical machines, to fill cables to render them flame-proof, and to give a protective coating for apparatus against the action of certain oils.

25f. Reflecting Surfaces—

Care should be used in specifying paints or enamels for reflecting surfaces used in electric lighting. Provision should be made to keep the reflecting factor as permanent as possible.

(29) Plumbing

29c. Drainage—

29c1. *Ejectors and Pumps—*

G-E motors and controls designed especially for pump service and sump pumps are available. G-E motors for centrifugal pumps are high speed motors, both a-c. and d-c., with high efficiency and power-factor, self-ventilating to assure cool operation. Suitable control is furnished, the type depending upon the particular job. Automatic speed regulators are available which automatically regulate the speed of pumps within close limits over a range of 50 per cent. G-E vertical motors and controls are provided for pumps in confined spaces or where the motor must be located directly above the pump.

29c2. *Sewage Disposal—*

G-E motors and controls for sewage disposal pumping and sump pumps are designed especially for pump drive, with high speed, efficiency and power-factor.

G-E motors and controls for air compressors used to assist in sewage disposal are specially adapted to the requirements of compressor drive.

29d. Water Supply—

29d1. *Meters—*

By the use of G-E electrically operated flow meters electrical instruments for a variety of suitable records are available. They may be used to measure and record water supply in feed pipes and to any particular consumption point, or to detect leaks and waste. These flow meters provide uniform, accurate electric measuring instruments for water, steam, air, or gas flow.

29d2. *Heaters and Boilers—*

G-E electrically and mechanically operated flow meters for the accurate measurement of steam, gases, and water supply to boilers and pumps. They are especially adapted to measuring flow of water in feed pipes, total amount of steam generated, discovering internal boiler leaks, detecting steam losses between boiler and points of consumption, etc. G-E motors and controls for boiler feed pumps, hot well pumps, condenser pumps, etc.

29d4. *Storage and Tanks—*

G-E motors and controls for pumps used for water storage and pumping to tanks are adapted by design to such service. G-E duplex pump controls provide for combination of manual and automatic control, or the transfer of controls from one motor to another, to insure continuity of service under any possible contingencies. Adjacent or remote control, as conditions require.

G-E high speed motors for centrifugal pumps are specially designed to be in perfect balance, free from vibration, high in efficiency, and quiet in operation.

29d5. *Pumps—*

G-E motors and controls, a-c. or d-c., are designed especially for direct connection to pumps. Type KT or KQ squirrel cage rotor a-c. motors, type MT or MQ slip ring a-c. motors, or type RCP d-c. motors are ideal for pump drive, the type depending upon conditions of each application. Vertical motors, a-c. or d-c., are suitable for driving sump pumps, or pumps in confined spaces, or where the motor must be located above the pump.

29d51. *Hydraulic Rams—*

G-E motors and controls for pumps for hydraulic ram feed pipes insure a continuous supply of water at the required pressure.

Continued on next page

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There is a marked difference between general and specific data in the building industry, so much so that those planning or building structures should confer with General Electric and associated companies' representatives before proceeding too far with their work, that the latest and best practices in regard to electrical usages may be known, and that only the latest and most approved equipment may be selected.

G-E Products for Architects and Contractors

Grouped according to the "Standard Construction Classification," Document No. 172 issued by the American Institute of Architects

(1) Preparation of Site

In the preparation of site electric power is most economical when available. G-E motors and controls are extensively used for derrick and drum hoists, electric shovels, air compressors, electric drills, etc.

1a. Demolition of Structures—

G-E motors and controls for electric trucks, industrial haulage, electric hoists, etc.

1a3. ***Sprinkling—***

Where local water pressure is insufficient forced pressure by pumps G-E electrically equipped should be provided.

1c. Top Soil Removal—

G-E motors and controls applied to the operation of electric shovels, hoists, derricks, conveyors, trucks, and industrial haulage are available.

(2) Excavation

G-E floodlighting projectors provide the best illumination for night construction work, bringing brilliant but diffused daylight to large areas. Their use makes night work possible and safe. Any area can be lighted by G-E projectors, with any desired intensity. Their installation means uninterrupted work, maximum safety, and economical installation and operation.

2a2. ***Borings—***

G-E motors and controls for rock drills are built for heavy continuous duty. Electric drive is convenient, economical, and above all reliable.

2b. Excavated Material, Disposal of—

G-E motors and controls play a large part in excavation and the disposal of excavated material. Their application to electric shovels, conveyors, electric hoists, trucks, locomotives for large excavating jobs, cranes and derricks means that power is used only when the machines are actually working; control is simple, with corresponding decrease in labor cost; and because of G-E dependability work is accomplished with a minimum of time for maintenance.

2c. Blasting—

G-E insulated enameled wire is the best obtainable for blasting circuits. Great quantities of it were used to carry the charges that blasted open the cuts at Panama. For large jobs or small jobs it unfailingly delivers the spark that sets off the blast.

2d. Open Caisson—

G-E motors and controls for pumps, conveyors, and hoists make excavations for open caisson work rapidly.

2j. Dredging—

G-E motors and controls for dredges increase the yardage per day. They perform rapidly and economically on all jobs, large or small.

G-E motors and controls for pumps and conveyors are available to make dredging a labor-saving electrified operation.

(4) Concrete and Concrete Work

4b. Proportioning and Mixing—

4b3. ***Mixing—***

4b31. *Machine—*

G-E motors and controls applied to concrete mixing, where provisions have been made for electric power supply, perform economically. They are well adapted to the requirements for flexible control.

Continued on next page

(6) Foundations

6b. Caissons, Air—

G-E compressors and blowers supply air automatically to pneumatic caissons at the pressure required. Because of their absolute dependability there are no setbacks in the work from failing air pressure.

G-E motors and controls applied to ventilating fans keep the air circulating to safeguard the workers' health.

G-E motors and controls for mud pumps, hoists, and conveyors dispose of the excavated material with ease and rapidity.

(11) Paving

11a. Concrete—

G-E motors and controls for concrete mixing and paving machinery are adapted to the requirements for flexible control. Electric drive saves time, labor, and fuel costs on jobs where electric supply is available.

(13) Structural Steel and Iron

13c. Fabrication—

Electric arc welding of trusses, tie-beams, floor joists, tanks, etc., costs less than riveting, and the finished products carry as much weight per square inch safely, without causing fatigue in the metal. G-E arc welding equipment for this work is simple, economical, and is designed to knit metals with arcs of varying heat and intensity, depending upon the properties of the metals and the requirements of strength and safety. To train competent welders, this company maintains a free arc welding school at its Schenectady Works.

13d. Erection—

G-E motors and control equipment for cranes, derricks and hoists are especially adapted to these machines. The motors have high starting torque, low flywheel effect, varying speeds, and are capable of close regulation. They are very simple in construction and are designed for heavy duty. Furnished in either 3 or 2-phase a-c. capacity, 1 to 600 hp.; d-c. 2 to 130 hp.

(14) Miscellaneous—Steel and Iron

14b. Door and Window Fittings—

14b5. *Doors and Shutters*—

G-E fractional horsepower motors and controls are supplied for door, window and shutter opening and closing. Simply constructed, they are positive and reliable in operation. Control may be either adjacent or remote.

(18) Vaults and Safes

18a. Built-In Vaults—

Mazda lamps, G-E wires and cables, and G-E wiring devices bring daylight illumination into the vault, without the eye strain caused by old type glaring lamps. The wiring is simply installed.

Outlets make the addition of extra fixtures, when needed, a simple matter.

(25) Paint, Painting and Finishing

25b. Finished Products—

25b2. *Paints and Enamels*—

25b28. *Miscellaneous and Special*—

G-E insulating and finishing paints are designed to give a protective coating and finished appearance to electrical machines, to fill cables to render them flame-proof, and to give a protective coating for apparatus against the action of certain oils.

25f. Reflecting Surfaces—

Care should be used in specifying paints or enamels for reflecting surfaces used in electric lighting. Provision should be made to keep the reflecting factor as permanent as possible.

(29) Plumbing

29c. Drainage—

29c1. *Ejectors and Pumps*—

G-E motors and controls designed especially for pump service and sump pumps are available. G-E motors for centrifugal pumps are high speed motors, both a-c. and d-c., with high efficiency and power-factor, self-ventilating to assure cool operation. Suitable control is furnished, the type depending upon the particular job. Automatic speed regulators are available which automatically regulate the speed of pumps within close limits over a range of 50 per cent. G-E vertical motors and controls are provided for pumps in confined spaces or where the motor must be located directly above the pump.

29c2. *Sewage Disposal*—

G-E motors and controls for sewage disposal pumping and sump pumps are designed especially for pump drive, with high speed, efficiency and power-factor.

G-E motors and controls for air compressors used to assist in sewage disposal are specially adapted to the requirements of compressor drive.

29d. Water Supply—

29d1. *Meters*—

By the use of G-E electrically operated flow meters electrical instruments for a variety of suitable records are available. They may be used to measure and record water supply in feed pipes and to any particular consumption point, or to detect leaks and waste. These flow meters provide uniform, accurate electric measuring instruments for water, steam, air, or gas flow.

29d2. *Heaters and Boilers*—

G-E electrically and mechanically operated flow meters for the accurate measurement of steam, gases, and water supply to boilers and pumps. They are especially adapted to measuring flow of water in feed pipes, total amount of steam generated, discovering internal boiler leaks, detecting steam losses between boiler and points of consumption, etc. G-E motors and controls for boiler feed pumps, hot well pumps, condenser pumps, etc.

29d4. *Storage and Tanks*—

G-E motors and controls for pumps used for water storage and pumping to tanks are adapted by design to such service. G-E duplex pump controls provide for combination of manual and automatic control, or the transfer of controls from one motor to another, to insure continuity of service under any possible contingencies. Adjacent or remote control, as conditions require.

G-E high speed motors for centrifugal pumps are specially designed to be in perfect balance, free from vibration, high in efficiency, and quiet in operation.

29d5. *Pumps*—

G-E motors and controls, a-c. or d-c., are designed especially for direct connection to pumps. Type KT or KQ squirrel cage rotor a-c. motors, type MT or MQ slip ring a-c. motors, or type RCP d-c. motors are ideal for pump drive, the type depending upon conditions of each application. Vertical motors, a-c. or d-c., are suitable for driving sump pumps, or pumps in confined spaces, or where the motor must be located above the pump.

29d51. *Hydraulic Rams*—

G-E motors and controls for pumps for hydraulic ram feed pipes insure a continuous supply of water at the required pressure.

Continued on next page

29e. Fire Protection—

G-E motors and controls, a-c. or d-c., for special fire pumps of any desired capacity are absolutely dependable for emergency use. Automatic or manual control, or both, as required. Equipments can be furnished to meet special Underwriters' specifications.

29e1. *Sprinklers—*

G-E high speed motors and controls, a-c. or d-c., are adapted to sprinkler pump drive.

29f. Gas—

29f1. *Generators and Producers—*

G-E centrifugal blowers and compressors are designed for furnishing air for gas producers and for boosting the gas generated in the producers. For pressures ¾ lb. and up, any capacity up to 50,000 cu. ft. per minute against 5 lb. pressure.

29g. Air—

G-E centrifugal air blowers and compressors, driven by either a-c. or d-c. motors or small steam turbines, are small, high speed, efficient and simple, and require no belting and gears. Automatic or manual control provides close speed regulation. Also portable or stationary compressor sets for use where compressed air is required.

(30) Heating and Ventilating

30c. Steam and Water—

30c1. *Boilers—*

G-E flow meters are used to measure supply on lines to consumption points, to discover leakages, to measure consumption, etc. They are extremely accurate, simple and positive in operation.

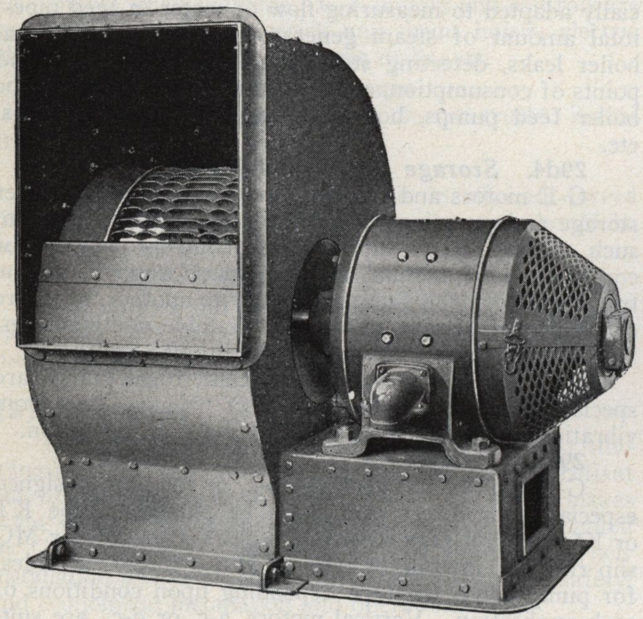
30c5. *Pumps—*

G-E motors and controls, a-c. or d-c., are specially adapted for boiler feed pumps.

30d. Ventilating—

30d1. *Blowers and Fans—*

G-E motors and controls, a-c. or d-c., constant or variable speed, are adapted for use on supply and exhaust fans. They are furnished with enclosed control of the manual, remote pre-set, or remote speed-indicating type.



D-C Motor Arranged for Direct Drive of Centrifugal Fan

30d2. *Air Washers—*

G-E motors and starters for recirculating pumps give the best service for air washing units.

30f. Temperature Regulation—

30f2. *Thermostatic Control—*

G-E thermostats may be accurately adjusted for a wide variation in temperature, between —20° F. and 212° F. Minimum range 4°, maximum 10°. The thermostat is not affected by excessive vibration or dampness. It is small in size, and all parts are accessible and substantial.

30g. Fuel and Fuel Feeds—

G-E motor drive for mechanical stokers may be regulated to feed the exact amount of fuel desired. They may be equipped with special automatic speed regulators for regulation within close limits over a fifty per cent range.

(31) Electrical Work

31a. Generating Apparatus—

The GENERAL ELECTRIC COMPANY manufactures generators of four types for both alternating and direct current.

Alternating Current:

Curtis steam turbine-driven a-c. generators (10 to 50,000 kw.) are built in all standard voltages, 3- or 2-phase, self-excited and separately excited. Steam pressure, superheat and power pressure, and condensing or non-condensing operation should be specified.

G-E horizontal and vertical water wheel-driven a-c. generators (30 to 50,000 kw.) for separate excitation and for a wide range of speeds and voltages.

Engine-driven a-c. generators, 240-480-600-2300 volts, 60 cycles, 3- or 2-phase, built for full range of steam and gas engine speeds (30 to 5000 kw.).

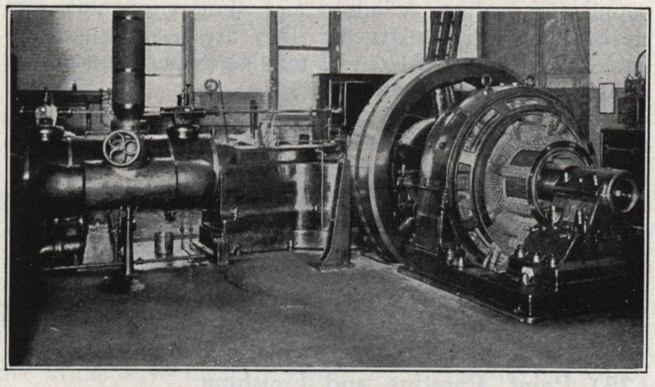
Belted a-c. generators, self-excited or separately excited, with voltage range from 120 to 2300 volts (9 to 600 kw.).

Direct Current:

Curtis steam turbine-driven d-c. generators, direct and gear connected, are manufactured by General Electric Company. Generators 125 to 250 volts 2-wire, and 3-wire 125/250 volts. Turbines condensing and non-condensing for various steam pressures (10 to 2000 kw.).

Water wheel-driven d-c. generators in many sizes and various speeds for vertical and horizontal operation.

G-E engine-driven d-c. generators, with commutating poles, compound wound for all modern steam and gas engine speeds, 125 volts, up to 250 kw.; 250 volts, 2-wire, 35 to 2000 kw. 3-wire systems may be supplied with G-E 2-wire generators equipped with balancer sets, or with G-E 3-wire generators with self-contained compensators.



Engine Driven D-C Generator for Isolated Plant Service

Belted d-c. generators, shunt or compound wound with commutating poles for voltages 120-125, 240-250, 550-575, 2-wire; and 125-250 volts, 3-wire (265 watts to 175 kw.).

Small direct-connected steam engine-driven gener-

Continued on next page

ating sets, of marine type, are manufactured in sizes from 2½ to 60 kw. to supply power and lighting in isolated plants and to be used as exciters for alternating-current generators. Built for severe service, they are light, compact, automatic, vibrationless in operation, and permit of close regulation.

31b. Transformers and Lightning Arresters—

G-E transformers are made in all ratings between 1½ kv-a. to 10,000 kv-a., for all uses from high voltage transmission lines to ordinary household distribution. These transformers are built to withstand adverse weather and transportation conditions. They are carefully designed to withstand short circuit forces under sustained primary voltage without external reactance.

Special G-E transformers are built for low voltages to take the place of batteries and magneto generators, saving maintenance and replacement costs. A pipe-thawing transformer for use in residences and buildings is manufactured.

G-E lightning arresters of several types are supplied for transmission and distribution systems.

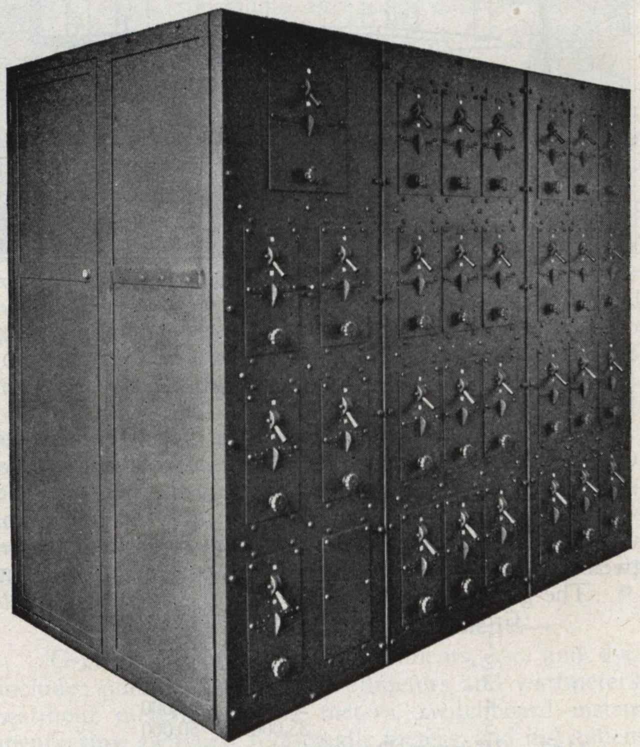
31c. Distribution System—

31c1. *Engineering Data—*

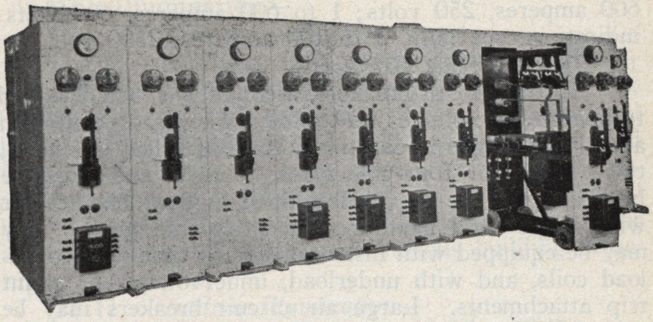
The General Electric Company offers to holders of Sweet's Architectural Catalogue much data obtained from thousands of installations on the subject of distribution systems, especially in relation to the proper devices or materials for use in such systems, both exterior and interior.

31c2. *Switchboards—*

G-E switchboards and switchboard appliances are manufactured to meet all generating, distributing or receiving station switchboard requirements. Standard switchboards have uniform arrangement of devices and uniform appearance. They are carefully constructed of the best materials, and the operator is protected from all "live" parts. Safety removable truck type panels are also available. In order to specify correct type of switchboard panels and instruments for each installation, the architect and contractor should communicate with the switchboard specialist in the nearest G-E sales office.



Dead Front Safety Enclosed Switchboard for A-C Incoming Line and Feeder Circuits



A-C Incoming Line and Feeder Switching and Protective Equipment, with Oil Circuit Breakers in Safety Enclosed Truck Panels

31c3. *Panel Boards—*

G-E and Trumbull panel boards are manufactured in many standard sizes and varieties or built to specification of architect or engineer. For lighting panels they may be "live" or "dead" front; equipped with knife, tumbler or push button switches in the branches, plug fuses or N. E. C. cartridge fuses in branches; knife, brush contact, or tumbler switches with or without fuses in mains.

Provision is made to meet all codes that may be specified.

31c31. *Cabinets—*

G-E or Trumbull cabinets are manufactured in standard sizes or will be manufactured to meet the requirements of the panel board. Gutter allowances should be specified.

31c33. *Trims—*

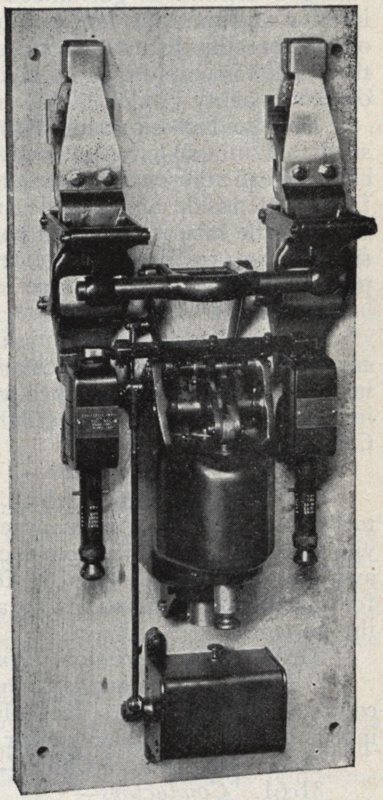
G-E and Trumbull switches, both knife and externally operated safety types, are manufactured for panel board use.

31c4. ***Circuit Rupturing Devices—***

Many means are provided for closing and rupturing an electrical circuit both automatically or manually. The General Electric Company manufactures practically every variety and their selection therefore should be with caution sufficient to insure the very best operation both for the device and the imposition placed upon it.

31c41. *Fuses—*

G-E indicating, non-indicating and renewable type fuses are manufactured to accord with National Electric Code standards. Both types, 1 to



Direct-Current Air Circuit Breaker, Solenoid Operated, for Remote Control of Feeder Circuits, Type CP-7

Continued on next page

600 amperes, 250 volts; 1 to 600 amperes, 600 volts; indicating type only, 3 to 100 amperes, 2500 volts.

31c42. *Circuit Breakers*—

G-E air circuit breakers, a-c. and d-c., are designed to operate on voltages up to 750. They are positive in action and simple in construction. Furnished in single-, two-, three-, or four-pole types. Single- and two-pole breakers may be supplied with individual handles, or with single rigid handles of the trip-free type. They may be equipped with instantaneous or time-delay overload coils, and with underload, undervoltage, or shunt trip attachments. Large air circuit breakers may be solenoid or motor operated.

The line includes varnishes, finishing varnishes, sealing and filling compounds, oils, stickers and shellacs, insulating enamels and paints, varnish-treated cloths, fibers and papers, varnished cloth tapes, friction and splicing tapes, cotton, prepared paper and asbestos tapes, cords and twines, flexible varnished tubing, and soldering paste.

31c43. *Relays*—

G-E relays, a-c. and d-c., for protection against overload and underload, reverse current, reverse power, reverse phase and reverse polarity, under-voltage and over-voltage are manufactured for motor, synchronous converter, generator, storage battery, and all alternating current circuits and connected apparatus installations. They are simple, durable, accurate and unusually dependable.

31c5. *Conduit Systems*—

The General Electric Company manufactures cable, special junction boxes and subway transformers for underground conduit systems. G-E conduit and fittings are available for interior conduit systems.

31c51. *Conduit*—

Greenfieldduct—a hot-dipped galvanized conduit insuring a continuous galvanized coating throughout the interior and exterior length of the conduits regardless of whether the diameter is large or small; enameled on the inside to comply with N. E. C.; elbows and couplings of same quality available.

Spragueduct—is manufactured from the best mild steel and in two circular sections to permit cutting a clean thread; thoroughly cleaned to remove dust and dirt from both inside and outside surfaces; after thorough washing the tube is enameled both on inside and outside surfaces to provide for an even coating free from air pockets throughout the entire length.

31c52. *Outlet Boxes*—

Spraguelets will keep in, shallow with a variety of covers together with four inch and three and one-quarter inch octagon and round boxes with covers accommodating all devices manufactured by the General Electric Company.

31c53. *Junction Boxes*—

G-E junction boxes, which have operated satisfactorily and dependably in many conduit installations, are vital links in any underground cable system. They are available for several sizes of feeder and main cables, for installation in manholes or any convenient point in the system.

31c54. *Miscellaneous Fittings*—

G-E tapes, compounds, jointing material, cast iron coupling and tee boxes for cables, and end bells for indoor use are recommended for conduit installations.

31c6. *Wires and Cables*—

31c61. *Conductors*—

G-E wires and cables are supplied for practically every wiring need. They comply strictly with N.E.C. regulations. The Company manufactures many types of wires and cables, some of which are: paper-insulated cables for power circuits up to 33,000 volts working pressure, rubber or varnish cambric-insulated, braided, leaded or armored cables to meet specifications for interior, aerial, underground or submarine, lighting and power circuits of any commercial voltage, National Electric Code, Marine Code and United States Government standard wires and cables, lamp cords and portables, rubber-insulated telephone, telegraph, fire alarm and signal cables, triple-braid weather-proof and triple-braid flame-proof wires and cables, asbestos insulated wires, magnet wires, enamel-, cotton-, silk-, and asbestos-covered.

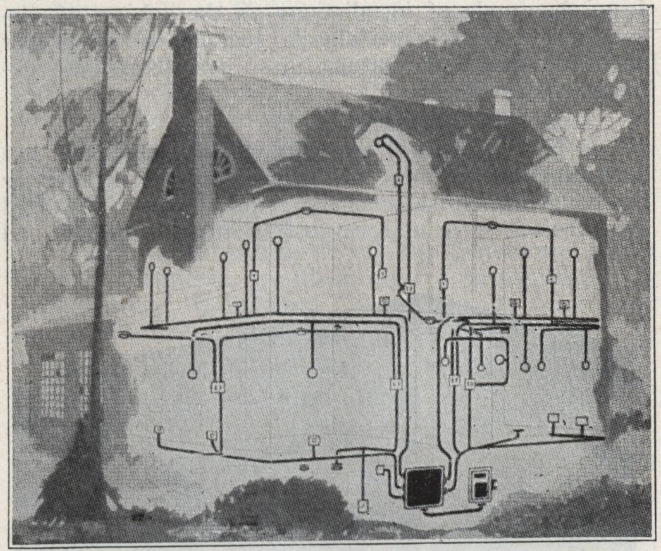
31c62. *Insulations*—

G-E insulations are the same as those used in the manufacture of all G-E products; consequently they are the best available, made to meet all the exacting requirements for high grade insulations.

G-E a-c. oil circuit breakers are designed for all capacities and for any voltage in a great variety of forms. The selection of the proper oil circuit breaker will depend upon the voltage, current, and power capacity of the system to which it is connected, short-circuit rupturing capacity required, and on the automatic features necessary.

Wiring Specification Data for Architects—

Realizing the necessity for the simplification of electrical specifications so that architects may be assured of quality materials throughout, without the necessity for detailed specifications covering a wide variety of products, General Electric has introduced the G-E Wiring System.



Typical Wiring Diagram for a Residence

The G-E Wiring System is a selected group of G-E Wiring materials, which includes all of the essential elements from the service entrance to the point of use.

Specific groups have been selected for houses of varying values, thus maintaining a proper relation betwen the cost of the home and the cost of the wiring.

The groups are as follows:

Group	Residence Valuation
1	$ 6,000 to $12,000
2	12,000 to 18,000
3	18,000 to 25,000
4	25,000 to 35,000
5	35,000 to 50,000

31c7. *Wiring Devices*—

G-E dependable wiring devices are manufactured to meet the requirements of practically every wiring installation. They are built to National Electric Code standards and have given complete satisfaction in thousands of homes and buildings.

Continued on next page

31c71. *Sockets*—

All varieties of sockets are made: Fluted catch sockets, threaded catch, locking, electrolier, candle, candelabra, miniature, heavy duty, brass shell, porcelain, weather-proof, and fixture cap for pendants.

31c72. *Receptacles* (and Convenience Outlets)—

G-E receptacles should be specified because of their compactness, simplicity of wiring, and all-around, dependable use. G-E convenience outlets and standard elexits represent the highest development in attractive, useful outlets, simple, and sturdily built. The line includes: metal shell and porcelain socket receptacles for cleat and moulding work, conduit boxes and signs, candelabra and miniature socket receptacles, polarity plug receptacles, three-wire receptacles, pilot lamp receptacles, industrial plug receptacles, disappearing door receptacles, rosettes, standard and pony size convenience outlets, and standard elexits, including wall elexit and ceiling elexit.

31c73. *Switches*—

G-E switches are built for unfailing service, in several types to meet various building requirements, and to accord with the tastes of the users. Single pole, double pole, three-way, four-way, two-circuit, three-circuit switches in flush tumbler, pony flush tumbler, and flush push-button types; tumbler and rotary surface switches, ceiling and surface pull, fluted catch pull, pendant push-through, through cord, automatic door, heavy duty tumbler, heater, small motor control switches, tumbler switches for panel or box mounting and switches for appliances are all manufactured by the General Electric Company.

31c74. *Miscellaneous Appliances*—

G-E miscellaneous wiring appliances include copper cable terminals, enclosed fuse cutouts, fuse plug cutouts, standard and renewable fuse plugs, enclosed fuses, renewable fuses, renewable fuse plug casings, and fuse wire. They are manufactured to give the dependable service characteristic of all G-E apparatus.

31d. Motors and Control—

G-E motors are manufactured for every rating between 1/200 hp. to 6000 hp., and in every type for alternating current and direct current on any commercial voltage. They may be installed for direct, belt, chain, or gear drive. Depending upon requirements of each job, motors are furnished in open, semi-closed, or totally enclosed frames, moisture-proof, drip-proof or water-proof. Where necessary they can be provided with special insulations to resist heat, fumes, or acids.

G-E motor control equipment for starting, accelerating, speed regulating, predetermined starting and stopping, braking and other control functions, is supplied. Rheostats, compensators, switches, starting panels, relays, push-button stations, thermostats, resistors, automatic starters, magnetic controllers and switches, automatic speed regulators, solenoids and solenoid brakes are manufactured to fill every operating need, in all the ratings required. This control equipment is absolutely dependable.

31e. Electric Measuring Instruments—

G-E electric measuring instruments, a-c. and d-c., include: portable ammeters, voltmeters and wattmeters, watthour meters, demand meters, switchboard instruments, time switches, foot-candle meters, and instrument transformers for use on high voltage or on circuits carrying high currents. The unusual accuracy of these instruments, the simplicity of their construction and reliability of operation, mark them as ideal measuring instruments.

31f. Illumination—

31f1. *Engineering Data*—

The General Electric Company maintains Illuminating Engineering Laboratories at Schenectady, N. Y., Edison Lamp Works, Harrison, N. J., and National Lamp Works, Cleveland, Ohio. There have been issued from these laboratories many bulletins which are available for architects and engineers desiring either a general knowledge of the best practices of illumination or specific information on the lighting of various building structures.

31f11. *Outdoor Illumination*—

G-E Novalux fixtures are supplied for all illumination for the outside of buildings, parks, and grounds, with the exception of public park lighting, for which G-E flood-lighting projectors should be specified. The General Electric Company manufactures a number of devices for the illumination of streets, highways, etc. For outdoor lighting see Bulletin L.D. 126.

31f12. *Residential*—
See Bulletin L.D. 137.

31f13. *Industrial* (Factories)—
See Bulletins L.D. 108-A, 123, 135.

31f14. *Commercial*—
See Bulletins L.D. 132, 132-A.

31f15. *Business*—
See Bulletin L.D. 108-A.

31f16. *Educational*—
See Bulletin L.D. 109.

31f17. *Public Buildings and Auditoriums*—
See Bulletins L. D. 135, 136.

31f18. *Indoor Recreations and Sports*—
See Bulletin L.D. 129.

31f19. *Miscellaneous* (Hospitals and Medical Lighting)—
See Bulletin L.D. 121.

31f24. *Searchlights and Floodlighting Projectors*—

G-E direct current searchlights for industrial illumination and yard protection at night are made in sizes from 9 to 60 inches, with beam intensity from 1,500,000 candle-power to 500,000,000 candle-power, and with several types of control. Searchlights supplied to the U. S. army and navy have demonstrated the dependability and high lighting efficiency of this G-E product.

G-E floodlighting projectors are provided in several types, of different intensities, for the lighting of buildings, signs, store fronts, and displays. Their installation emphasizes the architectural beauty of the lighted building at night, making it stand out commandingly from the surrounding darkness. Communicate with the nearest sales office for information regarding number and position of floodlighting projectors needed for particular installations.

31g. Heating—

31g1. *Engineering Data*—

Engineering data upon industrial electric heating should be obtained from the General Electric Company, Schenectady, N. Y., and upon electric heating devices for household, apartment, hotel, office, school, or hospital equipment from the Edison Electric Appliance Company, Chicago, Ill.

31g2. *Heating Elements*—

G-E industrial electric heaters with control panels for automatically maintaining temperatures are manufactured. Also small heating units, such as tempering pots, melting pots, cartridge and helicoil heating units, water and oil immersion heaters, air heating units, electric soldering irons, industrial kettles, glue pots, arc welding sets, etc.

Continued on next page

31g3. ***Heaters—***

31g31. *Air—*

The Edison Electric Appliance Company manufactures electric air heaters in sizes between 15x9x17½ inches and 23x9x22¼ inches, wattage range between 1000 and 5000. Furnished in 110, 120, 220, 240 volts.

Radiant heaters of the glowing coil, reflector type for use in small rooms, offices, and bathrooms are also manufactured in capacities from 600 to 3000 watts.

Portable "Hedlite" heaters are made in several sizes for warming small rooms, etc.

31g32. *Water—*

The Edison Electric Appliance Company manufactures electric water heaters which are rapidly supplanting gas water heaters, and which are necessary where an electric range is installed. The circulating type is adapted to storage or intermittent water heating, and the clamp-on type to heating water for continuous service. A thermostat switch for heat regulation is available.

31g33. *Plate Warmers—*

The Edison Electric Appliance Company manufactures large size plate and food warmers for hotel service.

31g4. *Cooking—*

All varieties of electric cooking devices are made by the Edison Electric Appliance Company. For domestic use the Hotpoint-Hughes electric range is unexcelled. Kitchenette ranges, portable ovens, grills, table and disc stoves, percolators, toasters, waffle irons, electric teakettles and ovenettes are also manufactured. For hotel service the company makes heavy duty electric ranges, bake ovens, steam tables, broilers, plate and food warmers, platter warmers, cooking tops, coffee urn heaters, toasters, frying griddles, waffle bakers, doughnut stoves, and egg boilers.

31h. Small Power Appliances—

G-E fractional horsepower motors and controls are sold to innumerable manufacturers of small power appliances. They are manufactured in sizes from 1/200 hp. up, for both a-c. and d-c. service.

31h1. ***Laundry Equipment—***

G-E electric motors and controls should be specified for operating washing machines and ironers.

31h2. ***Kitchen Equipment—***

G-E motors and controls are applied to dish washing machines, ice cream freezers, meat choppers, vegetable peelers, coffee grinders, buffing wheels, dough mixers, and all other types of power-operated kitchen equipment.

The Edison Electric Appliance Company manufactures electric ranges, plate warmers, disc stoves, tables, stoves, toasters, waffle irons, egg boilers, grills, coffee percolators, irons, etc.

31h3. ***Pumps—***

31h31. *Water—*

G-E motors and controls, both a-c. and d-c., for water pumps.

31h32. *Gasoline—*

G-E motors and controls, both a-c. and d-c., for gasoline pumps are safe for operation in highly inflammatory surroundings.

31h33. *Oil—*

G-E motors and controls, both a-c. and d-c., for oil pumps.

31h34. *Air and Gas—*

G-E motors and controls, both a-c. and d-c., for air and gas pumps. G-E blowers and compressors with close regulating controls for blowing air and gas.

31h4. ***Miscellaneous—***

31h41. *Portable Vacuum Cleaners—*

G-E fractional horsepower motors for portable vacuum cleaners.

31h42. *Portable Fans—*

G-E portable fans, motors for fans, and disc fans provide fresh, live air.

31h43. *Sewing Machines—*

G-E fractional horsepower motors for household sewing machines, and other sizes for factory sewing machines.

31h44. *Adding Machines—*

G-E fractional horsepower motors for adding machines, equipped with special switches and controls.

31i. Signaling and Communicating Systems—

G-E wiring devices especially made for hospital and other signal and call systems are available.

31i1. ***Call Systems—***

31i11. *Generators and Batteries—*

G-E generators and control panels are manufactured for battery charging or direct supply to line.

31i12. *Bell Ringing Transformers—*

G.E Wayne bell ringing transformers take the place of expensive magnetos and batteries for signaling and communicating systems.

31i2. ***Time Systems—***

The Warren synchronous time system is operated from independent or utility company supply. Secondary clocks are kept in exact time with master clock by synchronous motors.

31i21. *Time Clocks and Stamps—*

The Warren synchronous motor which operates Warren time clocks is adaptable to use with time stamps and indicators.

31j. Electro-Medical and Therapeutic Apparatus—

The Victor X-Ray Corporation manufactures complete roentgen, X-ray, and high frequency apparatus for medical, therapeutic, and dental use.

31k. Ultra-Violet and X-Ray Apparatus—

The Victor X-Ray Corporation manufactures X-ray tubes of the Coolidge Type.

The Cooper-Hewitt Company manufactures ultraviolet apparatus.

(32) Refrigeration

G-E switchboards, transformers, motors and controls are used throughout modern refrigerating plants. Electric operation should be provided for brine, agitators, water agitators, ammonia compressors, condensor pumps, brine pumps, conveyors, hoists, ice crushers, cubers and shavers.

Specially designed and constructed slow speed synchronous a-c. motors, and d-c. motors, with automatic controls, are furnished for direct drive of ice machines.

32d. Small Domestic Units—

G-E motors and devices are supplied to many manufacturers of household refrigerators.

(33) Elevators

33b. Passenger, Power—

33b1. *Electric—*

G-E motor and control equipment for geared and gearless passenger elevators ranges from single speed motors through several types and sizes of varying speed equipments with rheostatic control, alternating outfits with two distinct speeds, to generator-voltage control equipments for medium and high-speed elevators. Gen-

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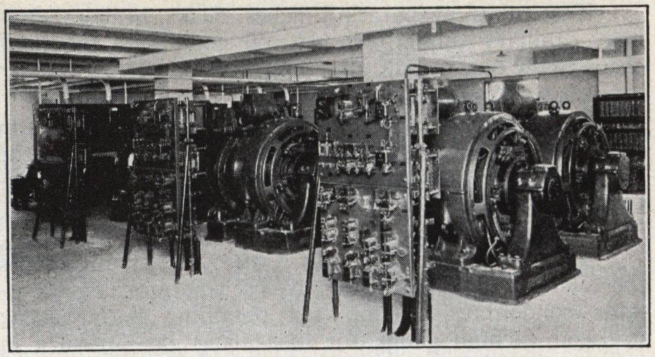

Bank of Gearless Elevator Motors with Variable Voltage Control

erator-voltage equipments are built for either a-c. or d-c. operation. This equipment is supplied to leading elevator manufacturers.

G-E elevator control is noteworthy for its smoothness in acceleration and retardation, and the accuracy with which landings can be made.

33c. Freight—

33c1. ***Electric—***

G-E motors and controls, a-c. and d-c., for geared freight elevators are of three types to meet different conditions of service: single speed, varying speed with rheostatic control, and alternating equipment with two distinct speeds. Many installations on elevators manufactured by leading companies have demonstrated their dependability.

33d. Dumbwaiters—

G-E motors and controls, a-c. and d-c., are supplied for dumbwaiter operation.

33h. Signals and Indicators—

G-E wiring devices for signal and indicator systems are manufactured for elevator installations.

(34) Power Plant

34a. Design—

The General Electric Company has available for architects and engineers much information upon power plant design. Address the nearest sales office.

34b. Boiler Room Equipment—

34b1. ***Boilers and Accessories—***

G-E electric steam generators supply sufficient steam for night and holiday demands without operating the main boiler plant. In capacities up to 30,000 kw.

G-E electrically operated flow meters for accurately measuring and recording feed water supply, steam supplied to consumption points, total steam generated, etc.

34b2. ***Condensers—***

G-E motors and controls are supplied for condenser pumps. Either a-c. or d-c. operation.

34b4. ***Super-Heaters and Mechanical Draft—***

G-E mechanical drive turbine-operated centrifugal blowers for super-heaters and mechanical draft.

34b6. ***Stokers—***

G-E adjustable speed motor drive for mechanical stokers may be regulated to feed the exact amount of fuel desired. They are equipped with special speed-regulating control which permits speed regulation within close limits over a 50 per cent range.

34b8. ***Fuel Oil and Powdered Coal Equipment—***

G-E motors and controls, a-c. and d-c., for pumps used in fuel oil boiler room equipment.

G-E blowers for powdered coal equipment.

34c. Coal and Ash Handling—

34c1. ***Conveyors—***

G-E motors and controls, a-c. and d-c., are built to operate conveyors.

34c2. ***Pulverizers—***

G-E motors and controls, a-c. and d-c., may be used with economy on coal pulverizers.

34d. Cranes and Trolleys—

G-E crane type motors and controls, a-c. and d-c., built especially for crane service, have high overload capacity. Special controls for close regulation.

G-E Sprague hoists, ½ ton to 6 ton capacity, for power plant service are adapted to top hook suspension or to be hung from plain, hand-geared or motor-driven trolleys.

G-E motors and controls for trolleys.

34e. Valves and Operators

G-E solenoid-operated valves can be used for handling water, air, steam and light oils under pressure not to exceed 175 lbs. and at temperatures not to exceed 250° F. G-E motors and controls, a-c. and d-c., for large valve operation, have high starting torque, and are totally enclosed. Furnished with control for automatic shutoff when valve closes.

34f. Pumps—

G-E motors and controls, a-c. and d-c., are supplied for centrifugal, rotary, and positive displacement pumps. Vertical motors are designed for sump pump drive.

34g. Regulators—

34g2. ***Feed Water—***

G-E electrically operated flow meters to measure and record feed water supply.

G-E automatic speed regulators for induction pump motors maintain fluid pressures within close limits. They provide for automatically reducing the speed over a 50 per cent range.

34g3. ***Pressure, Water, Steam, Gas—***

G-E automatic speed regulators for induction pump motors and blowers, maintain fluid pressures within close limits. They provide for automatically reducing the speed over a 50 per cent range.

34h. Engine Room Equipment—

34h3. ***Turbines—***

G-E mechanical drive turbines, types D52 and D51, condensing and non-condensing, are small Curtis steam turbines which use excess steam for driving compressors, blowers, etc.

34h4. ***Compressors—***

G-E motors and controls are furnished for direct connection, belt drive, or chain drive of positive displacement compressors.

G-E centrifugal compressors are manufactured in capacities up to 50,000 cu. ft. per minute against 5 lb. pressure. They may be closely regulated by special G-E control equipment.

34i. Miscellaneous—

34i1. ***Gas Producers—***

G-E electric apparatus for gas producers.

34i2. ***Oiling Systems, Storage and Filters—***

G-E motors and control, a-c. and d-c., for oil pumps.

34i3. ***Water Cooling, Heating and Treating—***

G-E blowers and motors and controls, a-c. and d-c., are supplied for water treating, recirculating pumps, etc. G-E electric heating units for water heating.

Continued on next page

(35) Equipment, Stationary

35a. Stage and Theatrical—

Mazda lamps used in footlights, border, strip and proscenium lights provide the best stage lighting. All effects may be obtained by use of color-dipped lamps, gelatin films, partial illumination, and arrangement in banks as desired. Mazda lamps for flood lights, spot lights, "baby spots," and hanging spot lights provide intense light where needed. Unusual effects may be produced by using the sciopticon, or effect machine, with either arc or incandescent lamp equipment.

G-E switchboards and panel boards other than those containing dimmers, wire and cable, stage cable and wiring devices are supplied for installation in stages and theaters.

35b. Educational—

The lighting of schools must be carefully and thoughtfully planned to save the pupils from eye-strain, annoyance and fatigue due to glaring or improperly placed lamps. Mazda lamps, white or frosted for direct illumination, or placed in indirect lighting fixtures wherever possible, should be specified for the best lighting results.

G-E switchboards, wires and cables, and wiring supplies complete the lighting installation.

35c. Cooking—

35c2. *Bakery—*

G-E motors and controls for all baking machines can be obtained by specifying G-E equipment when ordering the machinery.

35c21. *Ovens—*

The Edison Electric Appliance Company manufactures electric bake ovens to meet the needs of the modern baker. Electric heat is clean, smokeless, and may be so closely regulated that perfect baking is easily accomplished.

35d. Laundry—

G-E constant and adjustable speed a-c. and d-c. motors with manual or automatic control are furnished for all types of laundry equipment, both for the small private laundries attached to hotels, hospitals and similar buildings, and for large industrial laundry plants. These include the proper motors and controls for washers, extractors, mangles, ironing machines and other miscellaneous equipment.

Motors are designed for mounting directly on the machines and form a part thereof. Controls are totally enclosed and insure safety to the operators and protection to the motors and machinery. Motors and controls are both adapted to working in the moist atmosphere of laundries.

35d1. *Washing Machines—*

G-E motors and controls are supplied the leading laundry machinery manufacturers for application on washing machines and clothes tumblers. Specify G-E equipment.

35d2. *Ironing Machines—*

G-E motors and controls are supplied for ironers, dampeners, starchers, shirt finishers, presses and prim presses.

35d3. *Clothes Dryers—*

G-E motors and controls are furnished for drying tumblers and conveyors for dry rooms.

35e. Laboratory—

G-E clear fused quartz is an ideal substitute for glass for laboratory equipment, as it can be heated to 1000° C. and immediately cooled without breaking, has negligible co-efficient of expansion, is the most transparent substance known, and transmits all light rays with very little loss of energy.

Test tubes, evaporating dishes, flasks, beakers, funnels, capillary tubing, lenses, and containers made of clear fused quartz will give long service.

35e1. *Chemical—*

G-E chemical laboratory products include aluminum crucibles, materials such as silicon tetrachloride, and the X-ray diffraction apparatus for measuring crystal structures.

35e2. *Physical—*

The General Electric Company manufactures the following apparatus for physical laboratories: Langmuir condensation pump for obtaining high vacua; McLeod vacuum gauge for measuring gas pressure in a vacuum; a high voltage d-c. laboratory set; and portable electric measuring instruments, voltmeters, ammeters, milliammeters, potentiometers, etc.

35f. Athletic, Sports and Games—

G-E floodlighting projectors have been used to light athletic fields for night football, tennis and hockey. They are also used to light athletic pageants and night spectacles.

35f1. *Gymnasium—*

Mazda lamps in the gymnasium give the best illumination for night play. Glare is avoided, saving the eyes of spectators and participants.

35f2. *Pools and Natatoriums—*

G-E motors and controls for pumping water to swimming pools give long, dependable service. The pump motors may be regulated from any convenient spot by means of remote control equipment.

Mazda lamps bring daylight and daylight safety to indoor pools.

35f3. *Bowling Alleys—*

Mazda lamps in proper fixtures give the best possible light for bowling alleys.

35f4. *Pool and Billiard Rooms—*

Mazda lamps supply brilliant light, without glare, to pool and billiard tables, and make playing a pleasure.

35g. Musical—

35g1. *Organs—*

G-E blowers and compressors for pipe organs give quiet, uninterrupted service. Compared to other methods of pumping they are very economical, and they supply a steady supply of air at the desired pressure.

35h. Commercial—

35h2. *Carriers—*

35h21. *Pneumatic—*

G-E blowers are well adapted to pneumatic systems because of their high efficiency, noiseless operation, and characteristics resulting in power consumption proportional to volume of air used. In sizes: 1 lb., 800 to 14,000 cu. ft. per min., 2 lb. 750 to 8000 cu. ft. per min., and 3 lb., 1200 to 3800 cu. ft. per min. Other sizes can be built to order.

35i. Industrial—

35i1. *Material Handling Machinery—*

G-E motors and controls for cranes, derricks, hoists and conveyors, and G-E electric locomotives handle material rapidly and economically.

35i2. *Machinery and Appliances—*

35i21. *Ovens, Kilns, Furnaces, Converters, Dryers—*

G-E electric furnaces for heating, heat treatment, baking and finishing are manufactured by the company in several styles and sizes. They are equipped with controls to maintain temperatures, as required by the work.

35i25. *Machine Tools—*

G-E electric arc welding equipment, a-c. or d-c., is supplied in three types of sets: automatic, semi-automatic,

Continued on next page

and portable. These sets are invaluable repair tools for shop use. The new G-E arc welding electrode is especially recommended for the welding of cast iron and galvanized iron.

G-E constant- and adjustable-speed motors and controls for all electrically operated machine tools, planers, wood and metal working machinery, wheel-lathes, drills, etc., are manufactured. The General Electric Company is prepared to recommend the proper motor and control equipment for every machine tool.

35j. Dust, Ash and Waste Material Collection—

35j1. *Stationary Vacuum Cleaners—*

G-E motors and controls, a-c. and d-c., for stationary vacuum cleaners are built for long, dependable service. Specify G-E when ordering cleaner equipment.

35j2. *Ash Collection and Removal—*

35j21. *Pneumatic—*

G-E blowers and compressors for pneumatic removal of ashes are built for heavy duty. Adjacent or remote control.

35j22. *Ash Hoists—*

G-E motors and controls, a-c. and d-c., are used to operate ash hoists and conveyors.

35k. Surgical and Medical—

35k1. *Bacteriological Laboratory—*

G-E clear fused quartz is ideal for laboratory equipment such as test tubes, tubing, evaporating dishes, flasks, beakers, etc.

35k2. *Operating Room—*

The Victor X-ray Corporation manufactures X-ray equipment of every variety for surgical and medical use.

Mazda lamps, properly installed, light the operating room perfectly and do away with glare and shadows.

35k3. *Diet Kitchen—*

The Edison Electric Appliance Company manufactures electric ranges, broilers, disc stoves, egg boilers, warming ovens, and hot plates which modernize the diet kitchen and provide clean, smokeless heat.

35l. Agricultural—

G-E engine-driven generator sets are built for farms not supplied with electricity from power company lines, in several capacities from 700 watts to 75 kw. Small water wheel-driven generators are also available for use on farms having ready water power supply.

From these sources G-E motors are operated on pumps for water supply, washing machines, vacuum cleaners, sewing machines, electric fans, refrigerators in the home, and on milkers, churns, separators, clippers, hay hoists, feed grinders, ensilage cutters, saws, and threshing machines in the barns.

With G-E wiring and wiring devices, house and barns are electrically lighted by Mazda lamps, electric ranges and kitchen appliances may be installed, and electric drills, soldering irons, water heating units and electric incubators used.

G-E motors and controls for irrigation pumping are used extensively where irrigation is necessary.

35m. Automobile—

35m1. *Turn Tables—*

G-E motors and controls for automobile turntables save labor.

35m2. *Gasoline Tanks and Pumps—*

G-E motors and controls for pumps are easily installed, economical and safe in operation.

(36) Construction Plant

G-E floodlighting projectors provide the best illumination for night construction work, bringing brilliant but diffused daylight to large areas. Their use makes night work possible and safe. Any area can be lighted by G-E projectors, with any desired intensity. Their installation means uninterrupted work, maximum safety, and economical installation and operation.

36b. Concrete Mixing and Handling Machinery—

G-E motors and controls, a-c. and d-c., for concrete mixing and handling machinery are more economical than any other power application where electric supply is available.

36c. Hoisting—

36c1. *Platform Lifts—*

G-E motors and controls, a-c. and d-c., are available for heavy platform lift operation.

36c3. *Derricks—*

G-E crane-type motors and controls, a-c. and d-c., provide the best, economical, close-regulated drive for cranes and derricks.

36c4. *Engines, Steam, Electric—*

G-E motors and controls, a-c. and d-c., are manufactured for all construction plant installations. Consult G-E engineers at the nearest sales office.

36g. Trucks—

G-E automotive type motors and controls are manufactured for electric truck service. Many G-E equipments in operation testify to their dependability.

36h. Small Tools—

G-E fractional horsepower motors and controls are supplied to the manufacturers of small tools for direct electric drive. Specify G-E motors.

36i. Industrial Railroads—

G-E electric locomotives, trolley or storage-battery type, give economical, dependable service for industrial plant railroads.

They may be operated inside buildings which steam locomotives could not enter because of fire risks. They use power only when in actual operation, are compact, simple in construction, powerful and reliable.

36j. Pumps—

G-E motors and controls, a-c. and d-c., are built especially for pump drive. Enclosed frames for operation in excessive moisture or heat. Vertical type motors for direct above pump installation. Automatic speed regulation for closely regulating speeds over a 50% range.

(38) Landscape

38d. Paths—

G-E Novalux lighting units are the best lighting equipment for paths, drives and grounds, as they direct a powerful beam in both directions along the path.

38f. Greenhouses—

G-E motors and controls for pumps supply water to greenhouses and hothouses. They operate dependably and economically.

G-E wires and cables, conduits and conduit fittings, wiring devices, and panel boards are available for greenhouse installations.

(40) Regulations

40b. Codes—

40b2. *National Electrical Code—*

The General Electric Company heartily endorses the regulations of the National Electrical Code. All its products are manufactured to comply with N.E.C. standards.

40c. Underwriters—

See underwriters' lists of approved appliances for G-E products.

WESTINGHOUSE ELECTRIC & MFG. COMPANY

Apparatus for the Generation, Application and Control of Electric Power

EAST PITTSBURGH, PA.

WESTINGHOUSE SALES OFFICES

ALBANY, N. Y., Journal Building
ATLANTA, GA., Westinghouse Electric Building, 426 Marietta Street
BAKERSFIELD, CAL., 2224 San Emedio Street
BALTIMORE, MD., Westinghouse Electric Bldg., 121 East Baltimore St.
BIRMINGHAM, ALA., Age-Herald Building, 2030 2nd Street
BLUEFIELD, W. VA., Rooms 601-2-3 Peery Building, Corner Bland and Federal Streets
BOSTON, MASS., Rice Building, 10 High Street
BRIDGEPORT, CONN., Bruce and Seymour Streets
BUFFALO, N. Y., Ellicott Square Building, Ellicott Square
BURLINGTON, IOWA, 315 North Third Street
BUTTE, MONT., Montana Electric Co. Building, 52 East Broadway
CANTON, OHIO, (Box 292—Mail and Telegrams)
CASPER, WYO., Turner-Coffman Building, 124 West 2nd Street
CEDAR RAPIDS, IOWA, 1616 Fifth Avenue (Mail—P. O. Box 1067)
CHARLESTON, W. VA., Kanawha National Bank Building, Capitol and Virginia Streets
CHARLOTTE, N. C., 210 East Sixth Street
CHATTANOOGA, TENN., Tennessee Electric Power Co. Building, Market and 6th Streets
CHICAGO, ILL., Conway Building, 111 West Washington Street
CINCINNATI, OHIO, Westinghouse Electric Bldg., Third and Elm Sts.
CLEVELAND, OHIO, Station "B," Westinghouse Electric Building, 2209 Ashland Road, S. E.
COLUMBUS, OHIO, Interurban Terminal Building, Third and Rich Streets
DALLAS, TEX., Magnolia Building, Akard and Commerce Streets
DAVENPORT, IOWA, Central Office Building
DAYTON, OHIO, Reibold Building, 14 West Fourth Street
DENVER, COLO., Gas & Electric Building, 910 Fifteenth Street
DES MOINES, IOWA, Equitable Building, West 6th and Locust Streets
DETROIT, MICH., Westinghouse Electric Building, 1535 Sixth Street
DULUTH, MINN., Rooms 408-9-10 Bradley Building, Lake Avenue and Superior Street
ELMIRA, N. Y., Hulett Building, 338-342 East Water Street
EL PASO, TEX., Mills Building, Oregon and Mills Streets
ERIE, PA., 1013 State Street
FORT WAYNE, IND., 1010 Packard Avenue
FRESNO, CAL., Griffith-McKenzie Building, J and Mariposa Streets
GRAND RAPIDS, MICH., 422 Kelsey Building, Pearl and Ottawa Streets
HAMMOND, IND., (Mail—P. O. Box 238; Telegrams—1238 Jackson Street)
HARTFORD, CONN., 220 Market Street
HOUSTON, TEX., Union National Bank Building, Main Street and Congress Avenue
HUNTINGTON, W. VA., Westinghouse Electric Building, Corner Second Avenue and Ninth Street
INDIANAPOLIS, IND., Westinghouse Electric Building, 820 North Senate Avenue
ISHPEMING, MICH., 507 North 5th Street
JACKSON, MICH., 704 Peoples National Bank Building
JACKSONVILLE, FLA., Union Terminal Building, East Union and Ionia Streets
KANSAS CITY, MO., 2026 Wyandotte Street, Gateway Station
KNOXVILLE, TENN., 413 Bankers Trust Building
LITTLE ROCK, ARK., 2311 State Street
LOS ANGELES, CAL., Westinghouse Electric Building, 420 South San Pedro Street
LOUISVILLE, KY., Marion E. Taylor Building, 312 Fourth Avenue
MADISON, WIS., 315 First Central Building
MEMPHIS, TENN., Exchange Building, 130 Madison Avenue
MIDDLESBORO, KY., (P. O. Box 518)
MILWAUKEE, WIS., First National Bank Building, 425 East Water Street
MINNEAPOLIS, MINN., Northwestern Terminal, 2303 Kennedy St., N. E.
NEWARK, N. J., 38-40 Clinton Street
NEW HAVEN, CONN., Liberty Building, 152 Temple Street
NEW ORLEANS, LA., Maison Blanche Building, 921 Canal Street
NEW YORK, N. Y., 150 Broadway
NIAGARA FALLS, N. Y., Gluck Building, 205 Falls Street
NORFOLK, VA., 1122 National Bank of Commerce Bldg., 300 Main St.
OKLAHOMA CITY, OKLA., Tradesman's National Bank Building, Main and Broadway Streets
OMAHA, NEB., 1102 Woodman of the World Building, 1319 Farnam Street
PEORIA, ILL., 417 Peoria Life Building, 214 Cooper Street
PHILADELPHIA, PA., Westinghouse Electric & Mfg. Building, 30th and Walnut Streets
PHOENIX, ARIZ., 412 Luhrs Building
PITTSBURGH, PA., Chamber of Commerce Bldg., 7th and Smithfield Sts.
PORTLAND, ME., 61 Deering Street
PORTLAND, ORE., Porter Building, Sixth and Oak Streets
POUGHKEEPSIE, N. Y., Bardavon Building, Room 48, 35 Market Street
PROVIDENCE, R. I., 393 Harris Avenue
RALEIGH, N. C., 803 North Person Street
RICHMOND, VA., Room 912 Virginia Rwy. and Pr. Building, Seventh and Franklin Streets
ROCHESTER, N. Y., Chamber of Commerce Building, 119 East Main Street
ROCK ISLAND, ILL., 2319 Third Avenue
SACO, ME., R. F. D. No. 2
ST. LOUIS, MO., Westinghouse Electric Building, 717 South Twelfth Street
SALT LAKE CITY, UTAH, Interurban Terminal Building, corner West Temple and South Temple Streets
SAN ANTONIO, TEX., 1105 Denver Boulevard
SAN DIEGO, CAL., 2415 El Capitan Avenue
SAN FRANCISCO, CAL., First National Bank Bldg., 1 Montgomery St.
SEATTLE, WASH., Westinghouse Electric Bldg., 3451 East Marginal Way
SHREVEPORT, LA., 432 Robinson Place
SPOKANE, WASH., 1322 Old National Bank Building, Riverside and Stevens Streets
SPRINGFIELD, ILL., Public Service Building, 130 South Sixth Street
SPRINGFIELD, MASS., Hotel Kimball
SYRACUSE, N. Y., University Building, South Warren and East Washington Streets
TACOMA, WASH., W. R. Rust Building, South 11th and Commerce Streets
TERRE HAUTE, IND., 320 Terre Haute Trust Building, 735 Maple Avenue
TOLEDO, OHIO, Ohio Building, Madison Avenue and Superior Street
TULSA, OKLA., Mid-Continent Building, 5th Street and Boston Avenue
UTICA, N. Y., 408 Pine Street
WASHINGTON, D. C., Hibbs Building, 723 Fifteenth Street, N. W.
WATERTOWN, N. Y., 245 Woolworth Building, Public Square
WICHITA, KAN., 3809 East English Street
WILKES-BARRE, PA., Miner's Bank Bldg., West Market and Franklin Sts.
WORCESTER, MASS., Park Building, 507 Main Street
YOUNGSTOWN, OHIO, Home Savings and Loan Building, Federal and Chestnut Streets
Hunt-Mirk & Company, San Francisco, Cal., 141 Second Street, Marine Dept., Special Pacific Coast Representatives
The Hawaiian Electric Company, Ltd., Honolulu, T. H.—Agent

WESTINGHOUSE AGENT-JOBBERS

ABILENE, KAN., Union Electric Co.
ALBANY, N. Y., H. C. Roberts Electric Supply Co.
ATLANTA, GA., Gilham-Schoen Electric Co.
BALTIMORE, MD., H. C. Roberts Electric Supply Co.
BIRMINGHAM, ALA., Moore-Handley Hardware Co.
BLUEFIELD, W. VA., Superior Supply Co.
BOSTON, MASS., Wetmore-Savage Electric Supply Co.
BUFFALO, N. Y., McCarthy Bros. & Ford
BUTTE, MONT., The Montana Electric Co.
CHICAGO, ILL., Illinois Electric Co.
CHARLOTTE, N. C., Carolina States Electric Co.
CLEVELAND, OHIO, The Erner Electric Co.
COLUMBIA, S. C., Mann Electric Supply Co., Inc.
DENVER, COLO., The Mine & Smelter Supply Co.
DETROIT, MICH., Commercial Electric Supply Co.
DULUTH, MINN., Duluth Electrical Supplies Co.
EL PASO, TEX., The Mine & Smelter Supply Co.
ERIE, PA., Star Electrical Co.
EVANSVILLE, IND., The Varney Electrical Supply Co.
HOUSTON, TEX., Tel-Electric Co.
HUNTINGTON, W. VA., Banks-Miller Supply Co.
INDIANAPOLIS, IND., The Varney Electrical Supply Co.
JACKSONVILLE, FLA., Pierce Electric Co.
KANSAS CITY, MO., Columbian Electrical Co.
LOS ANGELES, CAL., Illinois Electric Co.
LOUISVILLE, KY., Tafel Electric Co.
MEMPHIS, TENN., The Riechman-Crosby Co.
MILWAUKEE, WIS., Julius Andrae & Sons Co.
MINNEAPOLIS, MINN., R. M. Laird Electric Co.
NEW HAVEN, CONN., The Hessel & Hoppen Co.
NEW ORLEANS, LA., Electrical Supply Co.
NEW YORK, N. Y., Alpha Electric Co.
OMAHA, NEB., The McGraw Co.
PHILADELPHIA, PA., H. C. Roberts Electric Supply Co.
PITTSBURGH, PA., Robbins Electric Co.
PORTLAND, ORE., Fobes Supply Co.
RICHMOND, VA., Tower-Binford Electric & Mfg. Co.
ROCHESTER, N. Y., Rochester Electrical Supply Co.
ST. LOUIS, MO., The McGraw Company
ST. PAUL, MINN., St. Paul Electric Co.
SALT LAKE CITY, UTAH, Inter-Mountain Electric Co.
SAN FRANCISCO, CAL., Fobes Supply Co.
SCRANTON, PA., Penn Electrical Engineering Co.
SEATTLE, WASH., Fobes Supply Co.
SIOUX CITY, IOWA, The McGraw Co.
SPOKANE, WASH., The Washington Electric Supply Co.
SPRINGFIELD, MASS., Wetmore-Savage Electric Supply Co.
SYRACUSE, N. Y., H. C. Roberts Electric Supply Co.
TAMPA, FLA., Pierce Electric Co.
WASHINGTON, D. C., H. C. Roberts Electric Supply Co.

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  For Driving Vacuum Cleaner Systems.........................2488
  For Operating Pumps.........................2489
  For Driving Fans and Blowers.........................2489
Panel Boards.........................2492
Generator Sets 2495
Switchboard Instruments.........................2494
Switchboards 2493
Water Heaters 2491

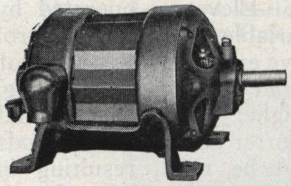
Continued on next page

Westinghouse Motors and Control

Westinghouse motors and control are supplied for practically all machines within the architect's field of activity. Special motors have been developed for certain specialized service. Others, for more general service where no special characteristics are required, can be applied to a wide variety of machines.

They can be mounted directly on the machine or on the floor, wall or ceiling, and may be belted, geared or direct connected to the driven machine.

If the architect states in his specification the exact service under which the motor is to be operated, a Westinghouse motor and controller will be furnished, which will perfectly fit the conditions.

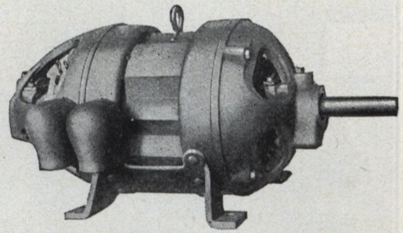


Westinghouse Type CS Squirrel-Cage Induction Motor

Westinghouse type CS squirrel-cage motors are designed for general constant speed service, and are suited for driving machines in practically all industries. These motors are made in all standard sizes of 2 hp. and larger.

The design and construction are very simple, the number of parts being few, and interchangeable wherever possible. Thus, when necessary, renewals may be quickly and easily made. The rotors are practically indestructible; the bearings have very liberal areas, giving them long life. They are non-leaking and are protected from dust. The type CS motor is furnished equipped with the sealed-sleeve bearing in order to secure long life and freedom from troubles incident to dust or dirt getting into the bearings and to oil or oily vapor getting into the motor and its windings.

Type CW wound-rotor motors are employed for constant-speed work where starting conditions are too severe for squirrel-cage motors or where speed regulation is required.



Type CW Wound-rotor Motor

Westinghouse type CW wound-rotor induction motors are designed for both constant- and varying-speed, continuous-duty service. Heavy starting torque with low starting current is obtained by inserting resistance in the rotor circuit when starting the motor. For constant speed service, this resistance is cut out by means of a starter furnished with the motor. Like the type CS motor, the type CW motors are equipped with the new sealed-sleeve bearings.

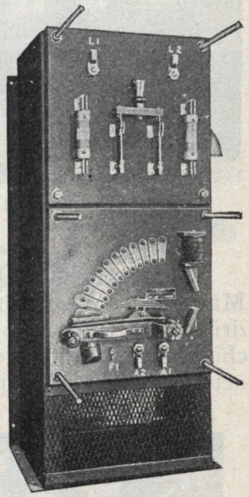
The Westinghouse, type SK direct-current, commutating-pole motors represent the accummulation of years of experience in the design and manufacture of motors. The initial installations of these motors proved so satisfactory that their good reputation has spread tremendously and now there are more type SK motors in use than any other make of direct-current machine.

These motors will give long and uninterrupted service in constant-, adjustable-, and varying-speed applications, in continuous or intermittent service for such drives as machine tools, pumps, including those for mine service, printing presses, rubber and paper calendars, cold rolls, paper machines, fans, blowers, etc.

Type SK motors have the following outstanding characteristics that make for satisfactory and trouble-proof operation:

(1) Close speed regulation.
(2) Perfect commutation.
(3) Reversibility without changing brush position.
(4) Economical in operation and maintenance.
(5) Sealed-sleeve bearings.
(6) Mica-insulation motor coils.

Motor Control—Westinghouse Electric manufactures hand and automatic starters and speed controllers to control motors in all applications. By specifying Westinghouse starters and controllers to operate Westinghouse motors, the responsibility for the successful operation of the installation is placed upon one manufacturer.

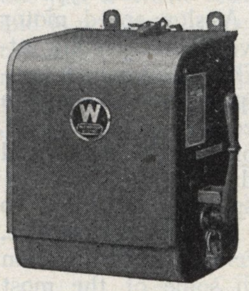


Class 7010 Starter for D-C Motors

Starting and speed regulating rheostats and rheostat panels are designed for starting and regulating the speed of series-, shunt- and compound-wound, direct-current motors. These starters are supplied with safety enclosing covers arranged for external operation.

Manual starters for squirrel-cage induction motors are designed with the "quick-make and break" feature insuring positive action at all times. All current-carrying parts are enclosed in dustproof cases. Rolling contacts are used, thereby localizing burning of contact tips and insuring a clean surface where the final contact is made.

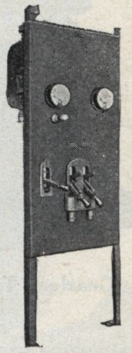
Manual controllers for wound-rotor motors are cam-contactor-type drum controllers. All controllers have a reset contact which prevents starting until the handle has been turned to the starting position. These drum controllers, together with a primary oil switch and resistance, are arranged for panel mounting.



Class 10-700 Auto-starter for Squirrel-cage Motors

Class 10-700 auto-starters are used for polyphase, squirrel-cage induction motors where the size of the motor, or restrictions imposed by the local power company, require starting on reduced potential. These starters are extensively used wherever squirrel-cage motors larger than 5 hp. are employed in non-reversing service. They are self-contained and provide low voltage and overload protection by means of relays mounted inside the case with the auto-transformer and switching mechanism.

The Westinghouse dead-front, fire pump controllers are manually operated and are for use with squirrel-cage and wound-rotor motors that drive fire pumps installed as water suppliers to automatic sprinkler systems and other private, fire protective devices. This type of panel was designed to insure safety to the occupants of buildings, offices and factories, and for the purpose of securing lower insurance rates. The outstanding feature of the Westinghouse fire-pump controller is that the front of the panel is entirely free of all current-carrying parts, thus making it, in fact, a "dead-front" panel. It is approved by the National Board of Fire Underwriters.

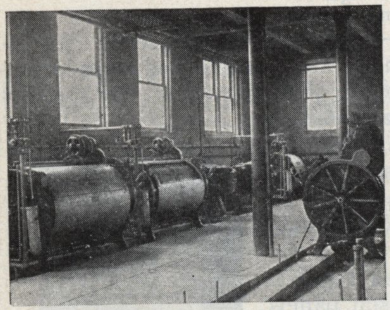


Dead-front Fire-pump Controller for Squirrel-cage Motors

Continued on next page

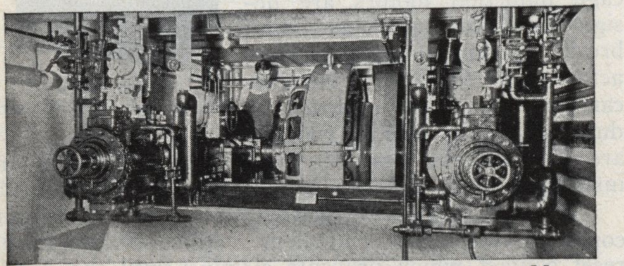
Motors for Driving Laundry Equipments—The moist atmosphere of the laundry, the presence of dripping water, and the lack of technical knowledge on the part of the operators make laundry service especially severe for electric motors.

Westinghouse laundry machine motors are adapted in every respect for their purpose, as is proven by the fact that the leading laundry machine manufacturers have standardized on their use.



Laundry Equipment Driven by Westinghouse Type CS Motors

Motors for Driving Ice and Refrigerating Machines—Westinghouse motors can be supplied for driving all types and sizes of ice and refrigerating machines from any power circuit. These motors are characterized by high efficiency and great reliability.

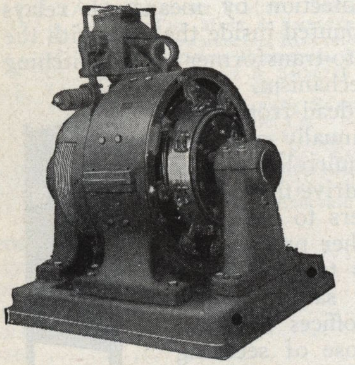


Refrigerating Equipment Driven by Westinghouse Motor, Kuhn-Loeb Building, New York, N. Y.

Gearless Traction Elevator Equipment—The gearless-traction elevator is the most modern type of elevator for high-speed service. A slow-speed motor is used having a grooved sheave wheel rigidly attached to the motor armature. The cables which support the car and counterweights pass over the sheave wheel. This equipment is best suited for high car speeds, since it is economical in operation and all wear and vibration of gearing are eliminated.

Westinghouse Electric is especially qualified to produce a high quality of motor for elevator service. The elevator motors have been developed in conjunction with some of the most prominent elevator manufacturers and the result of this co-operation is shown by the satisfactory results obtained in actual service and under all conditions.

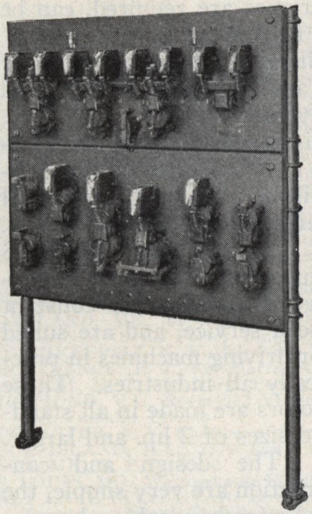
Some of the special features of these motors are quietness in operation, heavy shaft bearings designed to carry the suspended load with a large factor of safety, and that the whole motor is built as far as possible to permit mounting in small penthouses. A well-balanced electrical design is used giving performance, commutation, efficiency and regulation, to meet all the requirements of fine elevator service.



Gearless Traction Elevator Motor

Variable-voltage control is a system introduced by Westinghouse that utilizes a small motor generator and control panel whereby the speed and direction of rotation of the elevator motor is controlled by changes in voltage of the generator. This system is now being widely used where the service requirements covering acceleration, high speed, fast car schedule, quietness and power consumption are most exacting. The results are superior to those obtained with any other type of elevator drive.

Elevators operated by variable voltage control give extreme smoothness of starting and stopping. Higher car speeds and shorter accelerating periods can be used, resulting in faster car schedules. Landings are easily and accurately made.

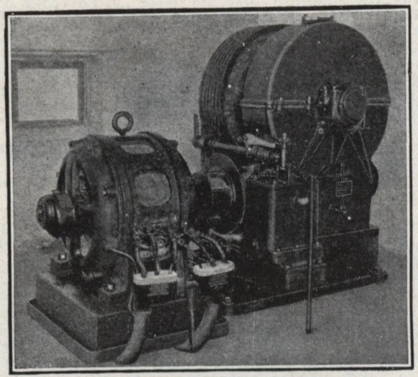


Automatic Elevator Control Board

Alternating-current can be used for high speed elevators with the assurance of service as good as if direct-current were used. All power losses in armature resistance are eliminated.

Motors for Operating Geared Elevators—Westinghouse elevator motors and controllers have been specially designed and built for elevators of all types, high- and moderate-speed passenger and low-speed freight elevators. The Westinghouse elevator motors and controllers are quiet in operation, start the car quickly but smoothly, and can be stopped quickly without jolts.

Alternating-current motors can be furnished in both squirrel-cage and wound-rotor types, single- and two-speed. The selection of the type is determined by the service. Low-speed elevators can use single-speed motors, while high-speed elevators, with the necessity of making accurate car stops, require the two-speed motor.

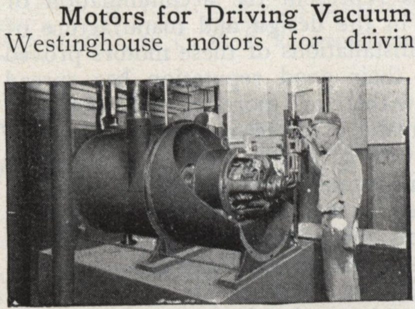


Type CS Motor Driving Elevator

Direct-current motors are available in several classes in order to suit the different kinds of service.

Motors for Driving Vacuum Cleaner Systems—Westinghouse motors for driving vacuum cleaners can be operated successfully by unskilled operators.

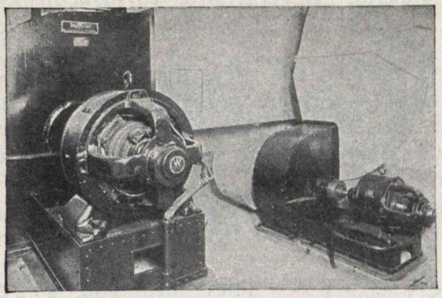
It is customary for most of the manufacturers of vacuum cleaners to supply their machines complete with the motors attached.



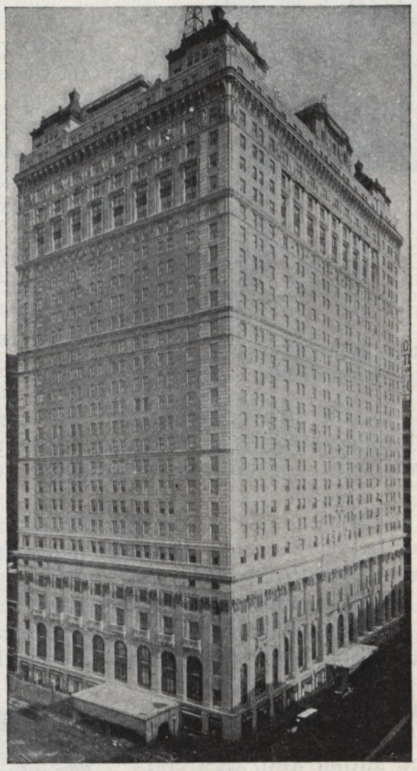
Vacuum Cleaner, Hotel Ambassador, New York, N. Y., Driven by Westinghouse Motor

Continued on next page

Motors for Driving Fans and Blowers—A line of Westinghouse motors has been specially designed for ventilating fans and blowers of any type and size. Some of their features are close speed regulation, quiet operation, cleanliness, economy in the use of current, and reliability.

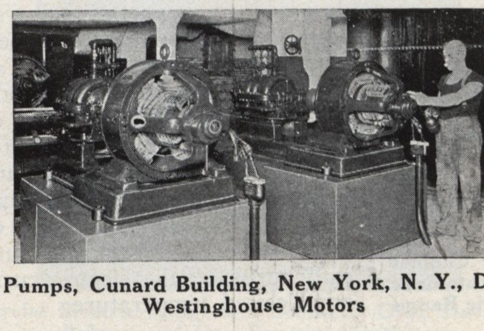


Ventilating Fan Driven by Westinghouse Motor, Seaboard National Bank Building, New York, N. Y.



Book-Cadillac Hotel, Detroit, Mich.
Heating and ventilating system equipped with Westinghouse Motors

Motors for Operating Pumps—Westinghouse motors and control are supplied for all types of pumps and all classes of pumping service, including centrifugal, triplex, duplex, single-acting, deep-well and fire pumps. Special protection from moisture may be given where conditions require it. Automatic control permits operation to be controlled from a distance or, if desired, entirely automatically. A full line of motors is available for small house pumps.



House Pumps, Cunard Building, New York, N. Y., Driven by Westinghouse Motors

Ceiling, Bracket and Desk Fans

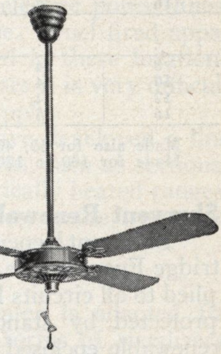
Oscillating Fans—The oscillating mechanism lets the oscillation stop when the fan strikes an obstruction. Can not drop oil. Oscillates over 45° to 90°, as desired. Fan can be tilted 20° forward when arranged either for upright or for bracket mounting. Oscillation can be stopped or started with the fan running.

Ceiling Fans—56 in. for stores and other large interiors. Where ceiling fans can not be used, 56-in. column fans of similar type are available, for both counter and floor mounting.

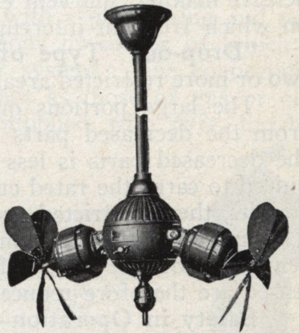
CEILING FANS

Diam., in.	Watts	Speeds
60-CYCLE A-C. 4-BLADE TYPE		
56	150	2
D-C. 4-BLADE TYPE		
56	110	3
60-CYCLE A-C. GYRATING TYPE		
2 x 12	88	3
D-C. GYRATING TYPE		
2 x 12	64	1

Made also for 50, 40 and 25 to 30-cycle alternating current. Made for 110 and 220 volts. All fans black enamel.

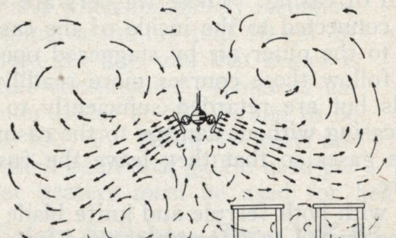


Ceiling Fan



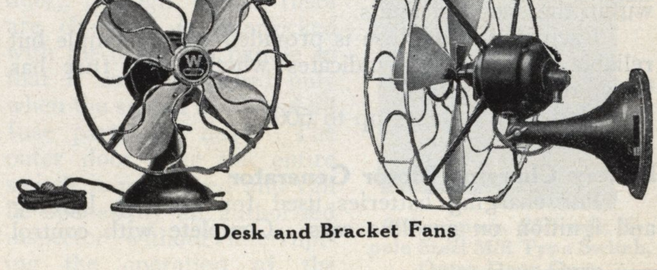
Ceiling Type Gyrating Fan

Gyrating Fans—These have been called the "Scientific Breeze Makers." They keep all the air stirring, not just a draft. Moving part rests on a ball bearing, and is revolved by mechanical drive, not by air reaction; can not run too fast. Made in ceiling, counter-column and floor-column types. Special bearing arrangement prevents the escape of oil.



Currents of Air Started by a Gyrating Fan
Wide zone of moving air. Two columns of air constantly revolving

Stationary Fans—The stationary fans can be tilted forward 15°, backward 90° (for bracket mounting), and the 12 and 16-in. rotated 240°. A wing nut clamps all adjustments.



Desk and Bracket Fans

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DESK AND BRACKET FANS

Diam., in.	Blades	Non-oscillating		Oscillating	
		Watts	Weight, lb.	Watts	Weight, lb.
60-cycle Alternating-current Fans					
8	4	30	6	....	....
10	4	35	7	34	9
12	4	42	15	44	17
16	4	86	19	85	21
16	6	....	....	85	21½
Direct-current Fans					
8	4	33	5	....	....
10	4	35	7	36	9
12	4	27	13	32	15
16	4	63	16	65	18

Made also for 50, 40, and 25 to 30-cycle alternating-current.
Made for 100 to 120, and for 200 to 230 volts.

Shurvent Renewable Cartridge Fuses

Renewable Fuse

Shurvent Renewable Cartridge Fuses can be safely applied to all circuits heretofore protected by standard non-renewable enclosed cartridge fuses. Renewals are inexpensive making Shurvent especially adaptable on circuits on which frequent interruptions occur.

"Drop-out" Type of Link—The drop link with two or more restricted areas is used exclusively.

The large portions quickly radiate the heat away from the decreased parts so that the cross section of the decreased parts is less than otherwise would be required to carry the rated current. In operation on short circuits, these restricted areas, only, melt and volatilize. The intermediate parts immediately drop away from the remainder of the link without melting. The gases released are therefore reduced to a minimum.

Safety in Operation—The distinctive feature of design is the positive method of venting and cooling the hot gases generated when the fuse volatilizes. The usual method for emitting these gases is along the threads between the ferrule and the casing. This tends to cause the ferrule to freeze on the casing and to burn the threads of the casing and thus to decrease the life of the fuse.

"Shurvent" fuses have a series of fixed washers at each end of casing. These washers are separated by chambers, connected to the inside of the casing, to each other and to the outer air by staggered openings. The hot gases follow these courses more readily than along the threads but are retarded sufficiently to quench the arc in the casing without damage to the casing itself and to cool the gases so that they leave the fuse at a safe temperature.

Made with both ferrule and knife blade connections in capacities from 1 to 600 amperes and for voltage up to 600.

Non-renewable Indicating and Non-indicating Fuses

For use on circuits where interruptions are very infrequent.

These fuses meet the demand for reliable and accurate devices that will carry their rated current and can be depended upon to open circuits where overloads are within the specified limits.

Each indicating fuse is provided with a simple but reliable device which indicates whether the fuse has blown or is still intact.

Made for voltages up to 600.

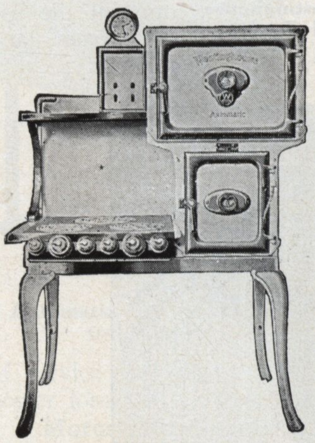
Battery Charging Motor Generator

For charging batteries used for starting, lighting and ignition on gasoline cars. Complete with control panel mounted directly on frame. Provides most convenient means of control. Several sizes furnished.

Electric Ranges

Electric ranges furnish the ideal means for cooking meals automatically—without personal supervision. Can be kept clean and sanitary, as all equipment can be easily removed. Absolutely no dirt, dust, soot or disagreeable odors.

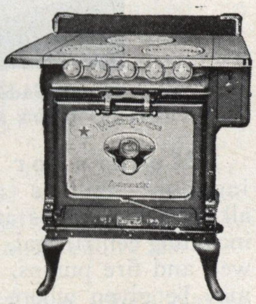
Westinghouse ranges are approved by the National Board of Fire Underwriters and by the Good Housekeeping Institute.



Type 3-19 B Automatic Range Nickel Finish

They are full size family cooking ranges for domestic use, and have reached their high perfection in convenience and economy through many years of experience. In addition to the cleanliness, safety, saving in food—both in weight and in flavor—they have the further advantage of saving a great deal of care, trouble and expense. The Westinghouse ranges are furnished with automatic features. In the automatic ranges the current for the ovens is either turned on by hand or automatically turned on by the proper setting of the clock, and is turned off automatically by the thermostat and circuit breaker when the predetermined temperature has been reached.

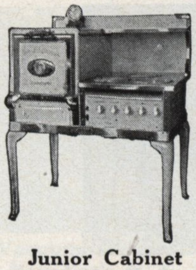
All the ranges operate on the heat storage principle; that is, they require electric current only for raising the temperature to the proper cooking point, after which no further current is required, as the food continues to cook on *stored heat,* as the heat insulation of the oven retains and utilizes this stored heat for hours.



Type 2-19 B Automatic Range with High Back (Extra)

Ovens are properly ventilated. They have special aluminized finish and all oven burners are removable. The ovens are heat-insulated with the highest grade of mineral wool.

Type 5-15 is a medium priced non-automatic electric range, similar to type 2-19 B. To be used where space is a consideration and especially adaptable for apartment houses.



Junior Cabinet Full Automatic Electric Range

The Junior range with its single oven has been designed to meet the universal demand for a small cabinet type range where economy of space is one of the controlling factors. Although it is very compact, it is large enough to prepare sufficient food for the average family. It is full automatic in operation—the clock automatically starts the cooking at any desired time, while the thermostat automatically turns off the electric current at any desired temperature.

Continued on next page

Combination Gas and Electric Ranges—Electric ovens and gas stove tops are also furnished for localities where the cost of electricity is high. For oven cooking, owing to the fireless cooker principle and the automatic features, electricity is as cheap as gas.

Economy—The average monthly current consumption of 24 families, of from 4 to 6 persons each, and having widely varying requirements, is between 75 and 100 kilowatt hours. The table shows the current used by these consumers over a 6-months' period.

ELECTRIC RANGES

Type	Total watts	Length, in.	Height, in.	Depth, in.
5-15 Non-automatic	5000	24½	31	16½
2-19 B. Automatic	7000	32	34	24½
2-19 B. Combination, automatic	3000	32	34	24½
3-19 B. Automatic	8000	43	59	25
3-19 B. Combination, automatic	4000	43	59	25

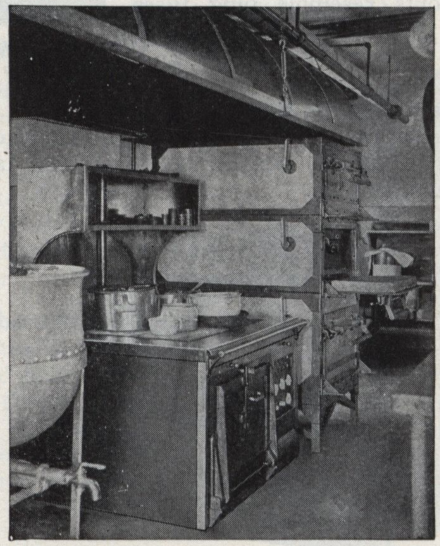
Ask for catalogue 8-10-1.

TABULATION OF CURRENT CONSUMPTION

Consumer	June	July	Aug.	Sept.	Oct.	Nov.	Total	Average per month
1	174	10	10	119	32	197	542	90
2	100	108	95	87	107	100	597	99
3	88	105	77	88	85	100	543	90
4	100	91	100	100	99	100	590	98
5	...	114	106	138	143	175	676	135
6	82	100	105	100	159	126	672	112
7	184	78	97	100	96	100	655	109
8	60	71	82	89	74	113	489	82
9	97	97	100	97	74	100	565	94
10	...	...	...	...	43	91	134	67
11	102	96	96	77	85	98	554	92
12	...	...	...	...	...	91	91	91
13	129	125	122	126	129	144	775	129
14	95	91	100	97	73	75	531	89
15	128	95	118	98	101	107	647	108
16	96	89	100	97	93	105	580	97
17	...	100	141	179	155	170	745	149
18	114	128	104	35	100	49	530	88
19	100	100	98	77	86	97	558	93
20	72	83	77	104	53	138	527	88
21	100	100	70	71	82	98	521	87
22	98	93	100	62	58	...	411	82
23	65	101	...	...	...	...	165	83
24	...	...	...	...	...	68	68	68

Total, 24 consumers 1 month 2320
Average, 1 consumer 1 month 97

Commercial Cooking—Electrically heated commercial cooking apparatus has advantages which are becoming recognized by modern bakers, stewards and chefs. The cleanliness and convenience of electric heating is self-evident. There are no products of combustion to cause dirt and grime in the kitchen. The accurate control of temperature and heat distribution insures the highest quality of products, and inasmuch as it is possible to retain a large portion of heat in the equipment, the apparatus does not unduly heat the room, consequently, the kitchen staff works under very comfortable conditions. Another very important item is the freedom from fire hazard. This in itself is very important, but also in some cases there is a saving in the insurance rate for the building. It is very frequently desirable to have the kitchen on the upper floors of a building, and on account of the ease of running electric power lines, electric heat is ideal for this purpose. Fuel fired apparatus in many cases can not be used in these locations due to local regulations. In other cases it is very difficult to arrange for the necessary fuel supply.


Commercial Electric Range and Sectional Oven Having Two Baking and One Roasting Sections

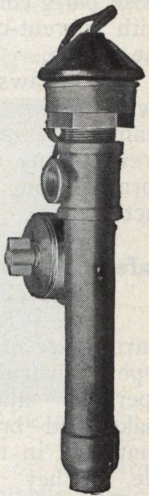
The Westinghouse Company have developed a line of electrically heated kitchen apparatus, such as sectional ovens for baking and roasting; electrically heated ranges, broilers, coffee urn heaters, hot tables, waffle irons and bayonet immersion heaters.

Water Heaters

The bayonet or circulation heater is adapted for hot water storage systems, various forms of sterilizers, steam generators, and other uses of this nature. The complete heater is provided with a pipe casing and tees arranged for ¾-in. connections by means of which it may be attached to a water system. The connections are made in the same manner as those of gas or circulation type of heater. Supplied with 6-ft. flexible cord and control switch.

WATER HEATERS

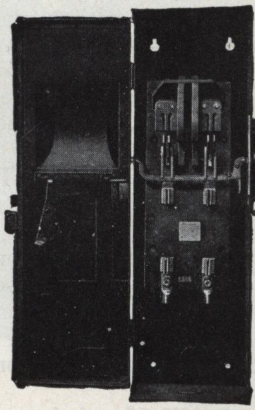
Capacity of boiler, gal.	Watts	
	Uninsulated galvanized boiler and piping	Boiler insulated with 2-in. covering and piping with 1-in. cover
12	550	220
18	600	240
21	650	260
24	700	280
27	775	300
30	850	320
35	900	340
40	950	360
63	1450	500


Type C Water Heater, 1000 to 2000 watts

The above table suggests size of heater required for various sizes of boilers, when uninsulated and when completely insulated, including piping, assuming that 10 gal. of water are used per day, and that heater is on the circuit continually. Water is assumed to enter boiler at 60° F. and to be drawn off at 160° F. Allow 10 watts additional for each additional gallon used per day. Larger heaters must be used for heavy service.

Industrial Safety Switches—Type WK-55

Westinghouse Type WK-55 switches are full safety switches designed to withstand the most severe service in buildings and industrial plants. The exclusive double door design is the principal safeguard to the operator, in that the inner door, through which fuses are changed, is interlocked with the operating handle so that it can be opened only when the switch is off and all fuse parts are dead. The outer door over the entire switch is padlocked and can be opened by an authorized inspector without interrupting the operation of the


200-ampere, 250-volt, 2-pole Steel Mill Type Switch, Outer Door Open

Continued on next page

switch or the motors it controls. The WK-55 has a "quick make" and "quick break" mechanism which is enclosed in the external operating handle, thus removing from the switch enclosure all parts that are extraneous to the actual current-carrying functions of the switch.

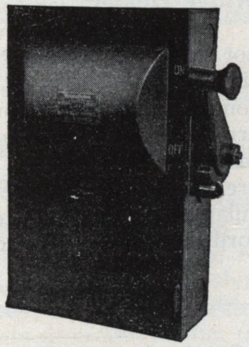
The switch jaws are designed with the diamond pointed feature that prevents the arc that may be formed on opening an overloaded circuit from burning or pitting the contact surface. WK-55 switches in the 600-volt and 250-volt steel mill sizes are equipped with an arc quencher that absorbs the energy of the arc so rapidly that it is extinguished instantaneously.

Enclosed Safety Switch WK-60

The WK-60 line of safety enclosed switches supplements the WK-55 line of full safety switches and is designed for applications where switches with full safety features are not absolutely necessary.

The switches are entirely enclosed and externally operated and have the "quick make and break" mechanism enclosed in the handle so that there are no parts within the switch enclosure to offer a possibility of loose parts coming into contact with current-carrying parts of the switch.

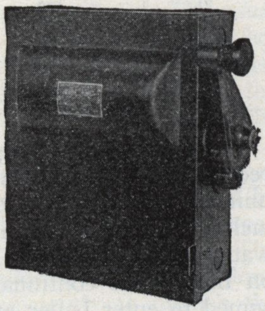
The jaws in the WK-60 switches are designed on the diamond pointed principle that prevents any arcs that may be formed from burning the contact areas.



WK-60 Safety Switch, 60-ampere, 3-pole, 250-volt, Closed View

Safety Motor Starter—Type WK-22

Type WK-22 safety motor starters are of the knife switch type construction, externally operated, and with "quick make and break" mechanism contained in the external handle. They are particularly designed for heavy duty service and for use where there are heavy momentary overloads.



WK-22 Motor Starter, Closed View

Motor protection in the WK-22 is provided by cartridge type thermal cutouts that open the circuit when subject to overloads heavy enough to damage the motor.

The switch blades and cutouts in the WK-22 starters are dead when the switch is off and the switch may be padlocked in the off position to prevent tampering and assure safety for the operator.

WK-22 motor starters for 600-volt circuits are equipped with arc quenchers.

Meter Service Switch—Type WK-65

The Westinghouse meter service switch, type WK-65, is constructed in the standardized sizes, 30, 60 and 100-ampere dimensions. It is designed for single phase and direct-current service.

The WK-65 is tamperproof, eliminating the possibility of theft of current. At the same time, it is constructed so that the customer may renew fuses in perfect safety.

All WK-65 switches are equipped with testing facilities.

Universal Meter Service Switch WK-57

The Type WK-57 universal service switch has been designed to meet the requirements of central stations and power companies and embodies the principle of safety, convenience and economy.

It combines in one enclosed unit all the functions of a service entrance switch and cutout block with facilities for meter connections and testing, and complete enclosure of all elements of the service entrance installation.

It embodies everything that may be had with a standardized meter service switch, namely, external operation which prevents theft of current, service cutout, meter connection block, lock off for service suspension, meter testing device and other features, making it a switch which is ideal for central stations.

The switch is externally operated by means of a conveniently located operating handle, there being no possibility of contact with live parts as they are enclosed in the steel cabinet and can not be reached by the customer.

The handle is on the right-hand side and may be locked "on" or "off" on the outside of the cabinet, by seal or padlock, through the medium of the "on" and "off" stop projections secured to the sidewall of the cabinet.

This switch is made in the 30-ampere size and for plug fuses only. There are several arrangements providing the different main and branch circuit combinations, including two or three-wire branch circuits.

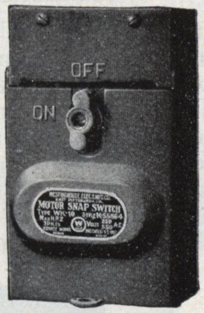
Some of the arrangements provide for up to two branch circuits, single fused or double fused, others provide for up to four branch circuits, single fused.

For 60 and 100-ampere capacities the Type WK-54 standardized switch is recommended.

Safety Motor Starters—Type WK-10 and WK-20

WK-10 and WK-20 motor starters are used to furnish protection to operator and motor on single and three-phase motors, using 125, 250, 440 and 550-volt service. The WK-10 is suitable for motors up to 2 hp., 550 volts, and the WK-20 is suitable for motors up to 5 hp., 550 volts.

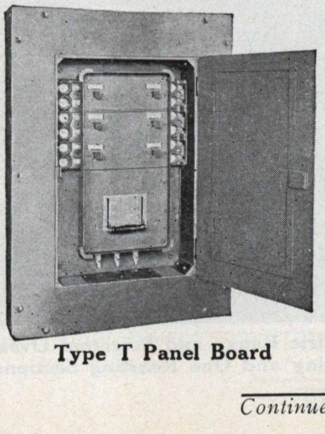
Motor protection in these starters is provided by thermal cutouts that open the circuit when subject to overloads that endanger the motor. These cutouts resemble plug fuses but are provided with left-hand threads.



Type WK-10

Type T Safety Panel Boards

Application—For control of lighting circuits in residences, apartment houses, hotels, stores, factories, schools, churches, etc.



Type T Panel Board

Continued on next page

Distinctive Features—These panel boards are the result of the combined experience and efforts of the best engineers. No details have been omitted and no expense spared in their development, so as to make them complete from an engineering standpoint.

These panel boards have the approval of the National Board of Fire Underwriters. Since a very large proportion of panel boards sold are the result of architects' specifications, the Type T panel board has been designed with the idea of combining good appearance with maximum quality and durability, resulting in a finished product which the best architects will appreciate.

Construction—As a result of the combined efforts of engineers and tool designers, details of the Type T panel boards have been so carefully worked out that the medium factory cost of all parts is secured, and by assembling in the service shops large stocks of completed panels are avoided.

This assures to the user a maximum quality product at a minimum price.

Type W Panel Boards

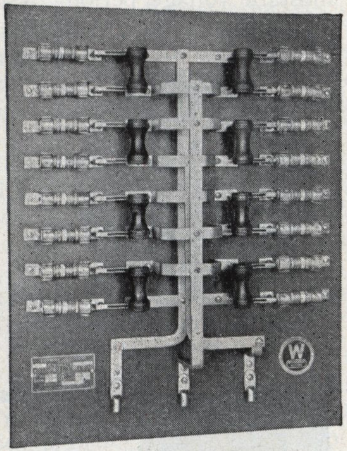
Application—The type W panel board has been very carefully developed to meet the most exacting needs for the control of light circuits in industrial plants and small factories.

Distinctive Features—All parts are interchangeable so that a plug fuse connection may be replaced with clips for enclosing cartridge fuses and all parts can be removed from the front of the panel board.

Busbars superimposed, affording protection from accidental contact with and short circuiting of live busbars.

No screws to carry current as all contacts are clamped.

Mounting holes are drilled only half way through the slate. This method provides a stronger panel board and reduces the danger of breakage in transit and installing. There are no screwholes on the back of the panel to be insulated. The undrilled slate acts as an insulation much superior to the usual method of filling countersunk mounting holes with insulated cement.

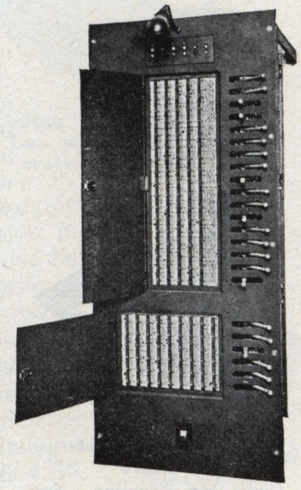


Type W Panel Board

Construction — Practically the same constructional features apply to Type W as to Type T, and consequently the user is assured of a quality product at a minimum price.

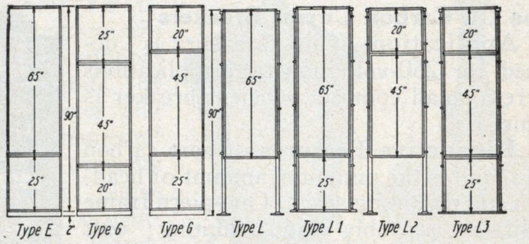
Switchboards

Theater Switchboards—Switchboards, for the control of theater stage and auditorium lighting, are made for any size of building, and may be either manually or electrically operated. A small, tumbler type board is built for school auditoriums and similar applications, while the multi-preset board, a recent Westinghouse development, is designed for large theaters and public auditoriums.



Theater Switchboard

Between these two extremes there is a board for every application.



Over-all Dimensions of Switchboard Frames

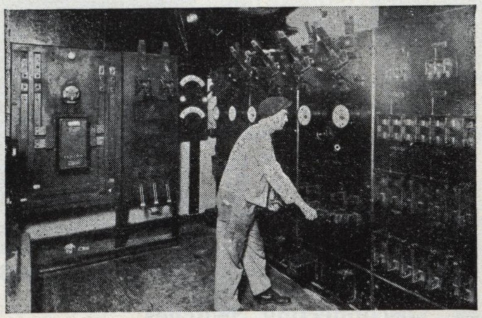
The type does not cover width, thickness or material of slabs

All Requirements Covered—Switchboards are built by the WESTINGHOUSE ELECTRIC & MFG. COMPANY to cover all requirements from the smallest plant to the largest.

They are built to conform to the specifications of the architect or engineer where necessary; but in order to save the time of the designer, a complete assortment of switchboard panels has been standardized.

To make up a switchboard for any desired installation, all that is necessary is to select the panels for the required purposes.

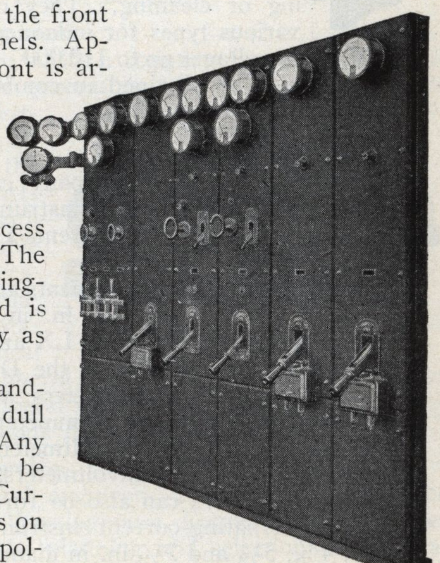
All panels bearing the same type designation match up in appearance and in the alignment of apparatus, and can be combined to form a complete switchboard.



Switchboard, Hotel Ambassador, New York, N. Y.

Special care is taken with the arrangement of apparatus on both the front and the rear of panels. Apparatus on the front is arranged with special reference to the convenience of operation, and apparatus on the rear, to provide access to all connections. The rear of a Westinghouse switchboard is arranged as neatly as the front.

Finish — Standard finish is a dull velvety black. Any special finish can be had on order. Current-carrying parts on front of panel are polished copper.

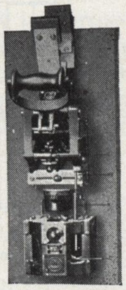


Type EA Switchboard

Continued on next page

Delivery—The standard panels can usually be delivered within a very short time. Delivery in each case, however, should be obtained from the nearest Westinghouse district sales office, especially so in the case of changes or substitution from standard listed panels.

Type CL Carbon Circuit Breakers

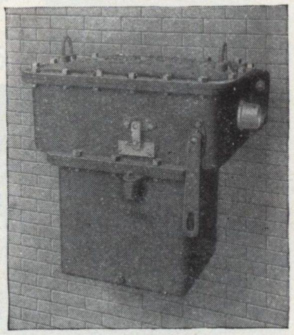

Type CL Carbon Circuit Breaker

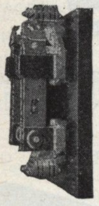
Application—This breaker is designed for 250-volt industrial applications where a small compact, efficient breaker is required.

Distinctive Features—Short carbon arm requires the minimum amount of headroom and mounting space. One-piece frame facilitates assembly and mounting; unit construction permits the addition of other units for multiple service. Attachments are easily added. The closing device is adjustable to make perfect contact under all operating conditions. The main brush makes perfect butt contact with the stud block, assuring high contact pressure and self-cleaning contacts. Copper parts are of ample capacity to carry the rated current. The operating mechanism makes closing of the breaker easy and positive. It is equipped with a latching device which prevents opening of the breaker under ordinary shocks. All copper parts have a satin finish.

Type F Oil Circuit Breakers

Comprise a complete line of moderate capacity, non-automatic and automatic, manually and electrically operated breakers. For indoor service, the breakers are made in the panel mounting and remote control wall or pipe mounting forms and for outdoor service in pole or subway mounting forms.


Type F Circuit Breaker


Type S Disconnecting Switch

Disconnecting Switches

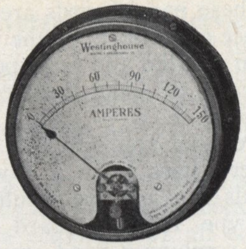
These switches are used primarily for isolating apparatus from the circuit for purpose of inspection or repair, for sectionalizing feeders, also in connection with lightning arresters for isolating arrester when inspecting or cleaning. They can be supplied in various types for indoor and outdoor service in voltages up to 110,000. These switches can also be obtained in combination with choke coils and fuses.

Switchboard Instruments

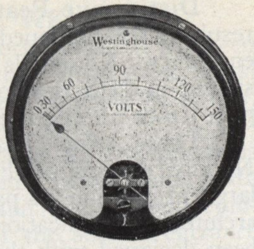
The Westinghouse Company can now furnish a complete line of switchboard instruments, which, when mounted on a switchboard, presents a uniform and pleasing appearance.

The direct-current instruments are made in five sizes, $2\frac{9}{16}$, 3½, 4⅜, 5½, and 7½ in. in diameter, and are known as types BX, CX, DX, LX and SX, respectively. These instruments operate on the D'Arsonval principle and can be supplied as ammeters, voltmeters, milliammeters and radio-frequency ammeters. Special instruments such as differential voltmeters, ground detector voltmeters, pyrometer millivoltmeters, temperature speed or frequency meters can also be furnished.

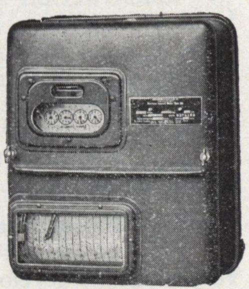
The alternating-current instruments are made in 3 sizes, 4⅜, 5½ and 7½ in. in diameter and are known as types DY, LY and SY, respectively. The types DY, LY and SY instruments match the direct-current types DX, LX and SX instruments in size and appearance. Except for the ammeter which operates on the moving iron vane principle, these instruments have the dynamometer movement and may be supplied as ammeters, voltmeters, wattmeters, frequency meters and power factor meters.



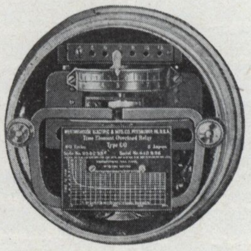
Type SX, 7½-in. Diam. Ammeter, Direct Current

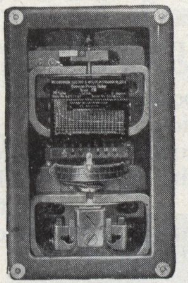


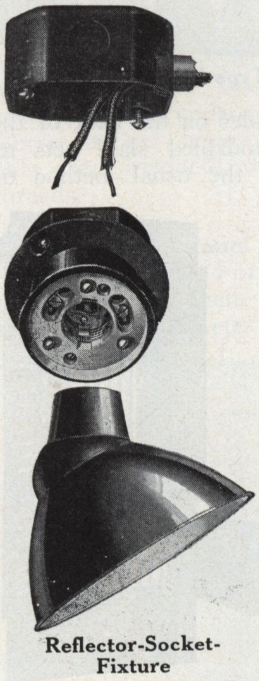
Type SY, 7½-in. Diam. Voltmeter, Alternating Current


Type RA Recording Demand Watt-hour-Meter

The following are some of the most important kinds of the Westinghouse relays: Over-current, directional, selective-differential current, impedance (distance), overload, temperature, reverse-power, thermostatic voltage, periodic re-closing and multiple contact.


Type CO Overcurrent Relay


Type CR Directional Relay


Reflector-Socket-Fixture

Outlet box mounting. Two operations

Industrial Lighting Equipment

Good illumination on an average saves 30 minutes of each man's time per day. It gives increased production for the same labor costs and overhead, reduces the amount of spoilage and seconds, decreases eye strain and creates better sanitary and more cheerful conditions for employees.

The Illuminating Engineering Bureau will assist in making plans and estimates. When submitting sketches, give class of work to be performed, dimensions of rooms, height of ceilings, location of work benches, color of walls and whether conduit or open wiring is used.

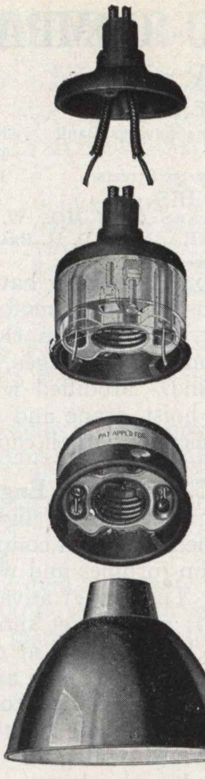
Reflector-Socket-Fixtures—Consist of one-piece porcelain enameled steel reflectors fastened securely to a porcelain body holder-socket. Gaskets between the porcelain sockets and reflectors make the fixtures weatherproof.

Continued on next page

These reflector-socket-fixtures are easy to wire (see illustrations). One complete fixture can be installed by one man in two minutes. The wires are pulled through the vertical openings in the porcelain socket and connected to the terminals; the reflector is then fastened to the socket by three screws which engage in bayonet slots in the top of the reflector. There are no loose wires to stuff back or washers and lock nuts to adjust.

Reflector-socket-fixtures are held rigidly, level, and in correct position with reference to the lamp filament. They insure permanent high efficiency. They are well protected from dust accumulations and are easily cleaned.

Reflector-holder-sockets are interchangeable. Reflectors of different types may be substituted at any time; reflectors for medium base and mogul base lamps may be interchanged, respectively, with medium screw and mogul screw sockets.



Reflector-Socket-Fixture

Conduit mounting. Three operations

Methods of Attachment—Reflector-socket-fixtures are used on any type of installation and for either interior or exterior lighting purposes. They may be suspended:

(1) On ½ or ¾-in. conduit.
(2) Directly from the outlet box.
(3) On chain or cord by using suspension eyes.
(4) On reinforced drop cord by using porcelain bushings.

Approved Construction—Reflector-sockets are approved by the National Board of Fire Underwriters.

Sol-Lux Luminaires

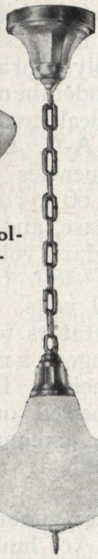
For the lighting of stores, offices, schools, banks and other such structures where beauty and effective light distribution are prime requisites, the Sol-Lux luminaire is recommended.

This luminaire is made in two forms, the suspension type and the ceiling type. Both types are easily installed. Maintenance costs are cut to a minimum as the luminaires are dustproof and the construction is such as to almost entirely eliminate globe breakage.

The Sol-Lux luminaire with the plain Sol-Lux globe provides ample decorative effects for most installations by its simple dignity, but where still further beautification is desired, the decorated globe is recommended. Silk and parchment shades can also be furnished for use with the suspension type luminaire.

Write for Circular 1712, Better Light for Better Buildings; Catalogue 47-B, Sol-Lux Lighting; Folder 4519, Sol-Lux Commercial Lighting.

Ceiling Type Sol-Lux with Decorated Globe



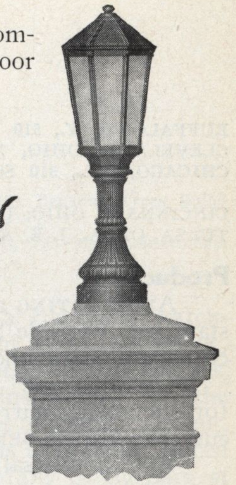
Suspension Type Sol-Lux with Plain Globe

Street Lighting Equipment

Westinghouse manufactures a complete line of equipment for outdoor lighting. Newels and standards of either cast iron or hollowspun reinforced concrete are designed to support lighting units of different sizes and styles. Ornamental cast iron brackets or ceiling plates with chain suspension are also manufactured to support pendent lanterns.

Write for Catalogue 8-B.

Octagon Lighting Unit

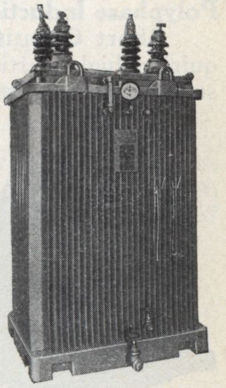


Jefferson Newel

Transformers

Westinghouse builds an extensive and complete line of transformers in any size or voltage of either single or three-phase construction, for all power and distribution purposes or for filling any given specific requirement.

The Westinghouse transformer design is the result of many years of experience and painstaking study. Problems of insulation, ventilation and mechanical strength have been given attention that guarantees long transformer life, efficient performance and security from breakdowns.

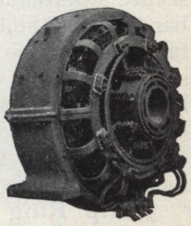


1000 Kv-a OISC Transformer

Type Q Generator

The Westinghouse type Q generator is characterized by its ability to withstand heavy overloads with sparkless commutation from no load to heavy overloads.

The machine has been designed with an open coil and spider construction which gives especially liberal ventilating performance. Good ventilation assures cool operation, longer life and more efficient use of copper. Ask for Leaflet 2371-B.

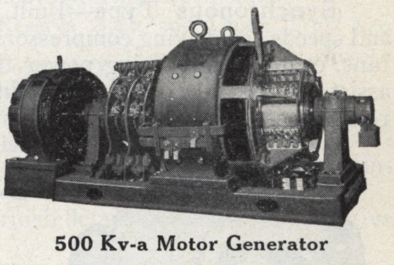


Type Q Generator

Conversion Equipment

Westinghouse builds a complete line of rotary converters and motor generators. Many years experience has refined the Westinghouse conversion equipment to the minimum of parts consistent with sturdy and reliable construction. Accessibility, good ventilation, good commutation and mechanical strength give it a liberal performance factor which allows the handling of liberal overloads on occasion.

Ask for Leaflets 3746-C and 3823-D.



500 Kv-a Motor Generator

Co-operative Service

Architects and engineers are invited to use the facilities of the Westinghouse Engineering and Sales Departments in the planning and selection of material and electrical equipment to solve special problems.

BURKE ELECTRIC COMPANY

ERIE, PA.

WORKS
ERIE, PA.
CONNEAUTVILLE, PA.

SALES AND SERVICE OFFICES

BUFFALO, N. Y., 510 Morgan Building
CLEVELAND, OHIO, 7829 Euclid Avenue
CHICAGO, ILL., 310 So. Michigan Avenue
DETROIT, MICH., 1904 Dime Savings Bank Building
ERIE, PA., 12th and Cranberry Streets
NEW YORK, N. Y., 156 East 42nd Street
PHILADELPHIA, PA., 1507 Arch Street
PITTSBURGH, PA., 539 Oliver Building

SALES AGENCIES

CINCINNATI, OHIO, Underwood Electric Co., 252 Butler Street
TULSA, OKLA., J. E. Arnold, 116 West 3rd Street
KANSAS CITY MO., W. T. Osborn, 1002 Commerce Building
OMAHA, NEB., D. H. Braymer Equipment Co., 727 W. O. W. Building

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Products

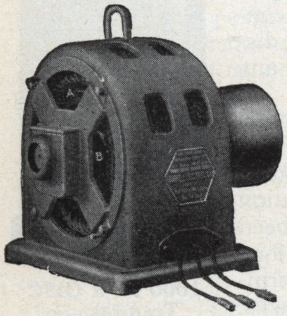
Alternating and Direct-current Motors: Constant and Variable Speed, Fractional Horsepower, Synchronous, Crane and Hoist, Elevator, Mill, etc.

Generators: Direct Connected and Belted Types for alternating current and 2- and 3-wire supply direct current; Motor-generator Sets: Any combination.

Also Universal Motors, operating on both alternating and direct current; Electric Arc Welding Equipment.

Polyphase Induction Motors

Short Circuit Type—Built for severe service requiring high starting torque with low starting current, such as driving machine tools, elevators, cranes, hoists, pumps, fans, etc. Their outstanding features are rugged construction throughout, correct mechanical design, high grade materials and workmanship, conservative ratings, high average power factor with low starting current.

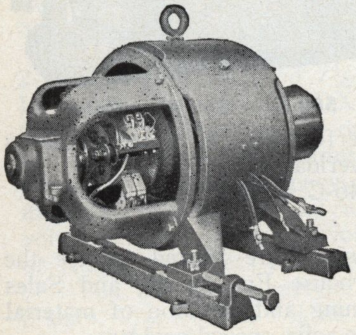

Type EM Induction Motor

Rotor windings are formed from solid bar copper, eliminating all the screws, rivets, solder, connectors, welds and other devices and methods commonly used to secure a permanent short circuit to the rotor. The solid bar construction leaves nothing to rust out, lose contact, become loose, or fly off; thus, from an investment standpoint, the value of the motors is considerably enhanced. The absence of end rings and joints eliminates leakage and gives high starting torque.

Furnished for floor, wall, or ceiling mounting, for usual frequencies, for all voltages and speeds.

Slip Ring Type—For every requirement where reliable constant or variable speed slip ring motors are needed. For crane and elevator service they have been developed with a view to being superior in operating characteristics and with special attention to strong mechanical construction in moving parts and bearings.

Synchronous Type—Built in all sizes, voltages and speeds for driving compressors, ice machines, pumps, fans, etc., and improving power factor. We will gladly assist prospective customers in power factor correction problems and make engineering recommendations.


Type WA D-C. Motor

D-C. Motors and Generators

These high grade machines are well known for their rugged and simple design. For reliability under severe service, quiet running, long life, high average efficiency, and low temperature rise under continuous full load they can not be surpassed. They have been applied in practically every industry, where motors and generators are required.

Made in open, closed and semi-enclosed types for all commercial voltages, either shunt, series or compound wound. Modified windings and designs are furnished for hoist, crane and elevator service and variable speed applications in all capacities and desirable speed ranges.

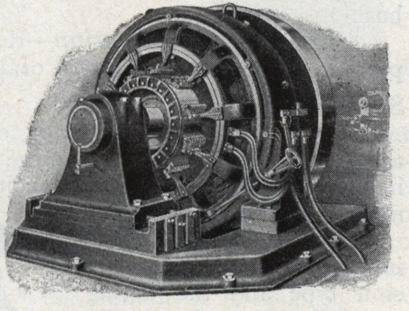
A-C. and D-C. Engine Type Generators

For general lighting and power purposes. Furnished for direct connection to steam, oil and gas engines, steam turbines and water wheels.

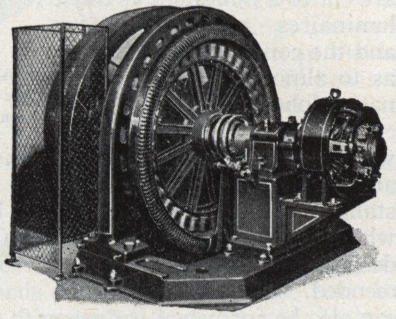
Their chief advantages are correct and compact design; rugged yet simple construction; ability to operate for long periods at continuous full load with low temperature rise; high average efficiency; noiseless running.

D-C. Generators for Two and Three-wire—Regularly built for the usual engine speeds and for the standard voltages. Special generators built for other speeds and voltages. The 3-wire generator, which is covered by the Company's broad patents, is self-contained and requires no balance coils or transformers, thus eliminating losses occurring in other systems requiring such apparatus. It resembles the regular 2-wire generator, but has, in addition, a single collector ring mounted in front of the commutator. For deriving the neutral of the 3-wire system, a special auxiliary winding is provided on the armature which is connected to collector ring and also into the main armature winding at commutator.

These 3-wire generators are installed in numerous hotels, office buildings, apartment houses, hospitals, etc., in New York, Philadelphia, and other principal cities wherever it is desirable to supply light and power under the most economical conditions.


D-C. Engine Type Generator

A-C. Generators- -Regularly built for standard frequencies of 25 and 60 cycles, 2 or 3-phase, and for the standard voltages of 240, 480, 600 and 2400 volts. Special generators for other voltages and frequencies. Direct connected or belted type exciters furnished, if required.


A-C. Engine Type Generator

Motor-generator Sets

Are built in any combination of a-c. and d-c. machines coupled together on mutual cast iron bedplates, thus making compact, self-contained units for all services for which such machines are required.

THE HOLTZER-CABOT ELECTRIC CO.

Electric Signaling Systems

HOME OFFICE AND FACTORY
125 Amory Street, BOSTON MASS.

BRANCH OFICES

CHICAGO, ILL., 6161-65 South State Street
NEW YORK, N. Y., 101 Park Avenue
DETROIT, MICH., 407 Lincoln Building
CLEVELAND, OHIO, 517 Union Building
BALTIMORE, MD., 1104 Union Trust Building
PHILADELPHIA, PA., 807 Otis Building
KANSAS CITY, MO., Pioneer Trust Building
PITTSBURGH, PA., 1101 Benedum-Trees Building
MINNEAPOLIS, MINN., 726 Metropolitan Life Building

Products

Hospital Calling Systems; Fire Alarm Systems; Fire and Watch Systems; Bank Signaling Systems.

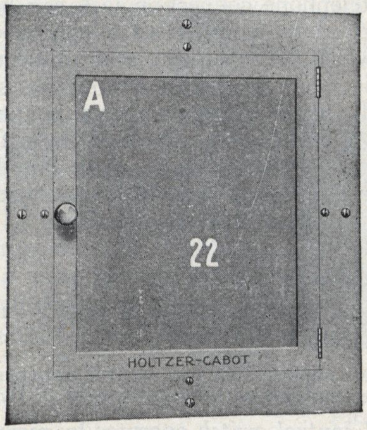
Also Factory Signaling Systems; Watchman's Recording Systems; Indicating Systems; Factory Calling Systems; School Signal Systems; Fractional Horsepower Motors; Motor Generators and Dynamotors.

Nurse Call System for Hospitals

The original locking button system. Patented in 1916. Now installed and giving 100% service in more than 1000 hospitals. Representative installations include:

Boston City Hospital, Boston, Mass.
Civic Hospital, Ottawa, Canada
Reading Hospital, Reading, Pa.
Buffalo City Hospital, Buffalo, N. Y.
Roosevelt Hospital, New York, N. Y.
Ohio Masonic Home, Springfield, Ohio

Full description and diagrams in our brochure, "Signaling Systems for Hospitals." A copy on request.



Nurses' Station Annunciator

Doctors' Paging System for Hospitals

An entirely new adaptation of the silent call system for paging doctors. Number codes are flashed on and off at annunciators in corridors and doctors' rooms. More effective than an audible system and less expensive than the annunciator system. Annunciators having 10 indications and requiring only 11 wires give a maximum of 175 doctors' codes.

Booklet, "Doctors' Silent Code Call System" on request.

Fire Alarm Systems

Today the question of fire prevention is recognized as one of the most serious problems confronting the people of the United States and Canada. The possibility of fire is always present and in all buildings or institutions where there is usually a large number of persons, there should be a high grade dependable fire alarm system.

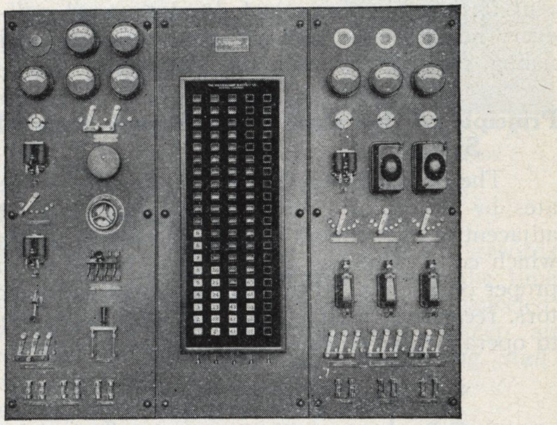
In schools, this can be incorporated with the exit drill system. In industrial plants, a combined watchman's report and fire alarm system is of advantage. Hospitals and hotels require a system giving two alarms, the first to the personnel of the institution, and the second, in case of necessity, a general alarm throughout.

Holtzer-Cabot fire alarm systems are manufactured for practically any requirements. Many of the largest buildings in this country and Canada are Holtzer-Cabot equipped. Included in our list are:

City of Boston Public Schools
United States Naval Air Base, San Diego, Cal.
The Drake Hotel, Chicago, Ill.
Bureau of Engraving and Printing, Washington, D. C.
Mount Royal Hotel, Montreal, Que.
Federal Reserve Bank, Cleveland, Ohio

And a great many public and Government buildings.

We have literature on various types of fire alarm systems. In writing, please mention size and type of building being planned.



Fire and Watch System Switchboard

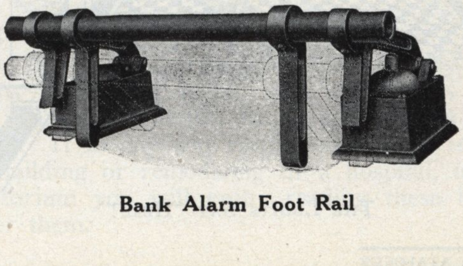
Bank Signaling Systems

We have designed and built complete signaling systems for some of the largest banking institutions on this continent. Holtzer-Cabot systems are installed in:

United States Federal Reserve Bank and Union Trust Co., Cleveland, Ohio
Bank of America, New York, N. Y.
Mellon National Bank, Pittsburgh, Pa.
First National Bank, Boston, Mass.

The systems required vary considerably in accordance with the layout and operating methods of the institution.

We will gladly furnish details or send representative on request.



Bank Alarm Foot Rail

THE BRYANT ELECTRIC COMPANY

Hospital Signaling Systems

BRIDGEPORT, CONN.

BRANCHES

SAN FRANCISCO, CAL., 149 New Montgomery Street (Office and Warehouse)
CHICAGO, ILL., 844 West Adams Street (Office and Warehouse)
NEW YORK, N. Y., 342 Madison Avenue

Product

The BRYANT SILENT CALL HOSPITAL SIGNAL SYSTEM.

For Wiring Devices, see pages 2402-2413.

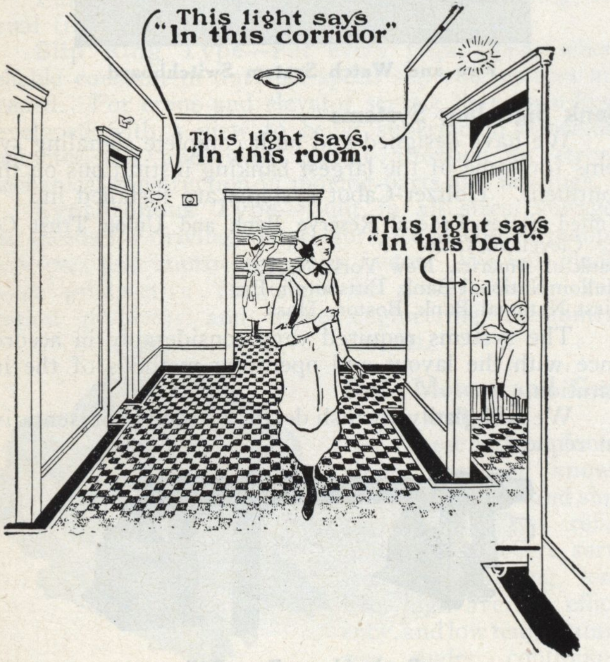
Hospital Signaling

In every hospital there must be provided a means for patients to summon nurses. Such means range from a simple table bell, which the patient taps, to the most complete electric system of signal lights, signal bells, annunciators, recorders, etc.

Silence is an aim of every hospital. The quiet hospital offers its patients better opportunity to get well than does the noisy one. Call bells can be dispensed with as unnecessary if an adequate silent signaling system be substituted, and the Bryant System—*a system that improves nursing and develops good will*—fulfills every hospital need with respect to silence, efficient signaling, positive operation and low cost.

Principle of Operation of the Bryant Hospital Signal System

The Bryant Silent Call Hospital Signal System operates by means of colored light signals. In the wall, adjacent to each patient's bed, is installed a *calling station* which consists always of a *control switch* to make the proper connections to the various signal lights, annunciators, recorders, audible calls, etc., means for the patient to operate this control switch, and certain other devices which may or may not be made part of the calling station but which do improve service and add to the comforts of the patients.


This light says "In this corridor"
This light says "In this room"
This light says "In this bed"

THE LIGHTS SAY "HERE!"

When the patient wants a nurse, he either pulls a linen cord or presses the button at the end of an electric cord. Instantly signal lamps light in various parts of the hospital.

There should always be a signal lamp in the corridor over the patient's room door. There will be other signal lamps placed at selected points to notify nurses and guide them to the proper patients. The lights continue to burn until a nurse visits the patient and cancels the call at his bedside. The signals can not be erased except at the calling patient's station.

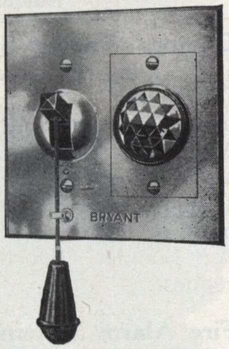
In addition to the control switch, each calling station can be equipped with means for summoning a doctor for emergency assistance. In wards, a red light is used in each calling station to indicate the location of the calling patient. A telephone connection jack can be added and the patient given the comfort of telephone contact with the outside world. Very often, too, an electric convenience outlet is made a part of the station so that fans, warming pads, water heaters and examination lights can be readily connected. Any or all of these features may be made a part of any calling station, but they must be anticipated in advance of installation because they necessitate wiring to permit them to function.

Calling Stations

The calling stations of the Bryant Silent Call Hospital Signal Systems are of two general classes, namely:

(1) Those equipped with pull control switches
(2) Those equipped with magnetic control switches

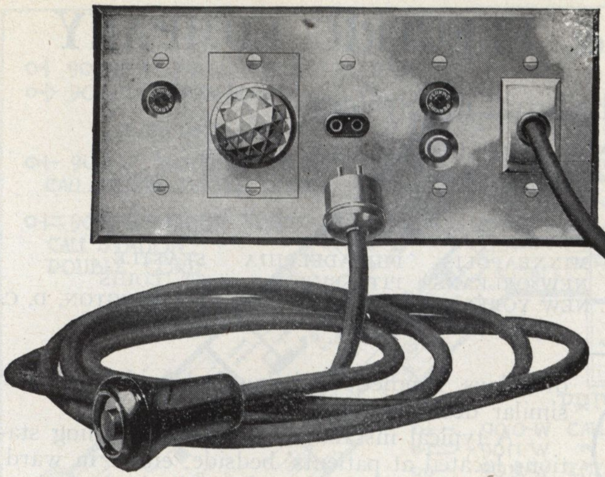
The *pull control switch* operates by means of a cord which the patient pulls. It is simple, inexpensive, occupies small space and, where used in conjunction with an audible signal, permits the patient to sound the audible signal as many times as desired. To offset the abuse of the audible signal privilege, calling stations can be locked so that the patient may operate the signal lights, but can not use the signal bell.



No. 142. CALLING STATION WITH PULL CONTROL SWITCH AND BULLSEYE

The *magnetic control switch* operates by means of a push button on the end of an electric cord. It is very easy to operate because the effort required is so slight, but it will not operate without intent on the part of the patient. The patient can sound an audible signal once only. It requires more space in the wall than does the station with pull control switch and costs a little more to install.

Continued on next page



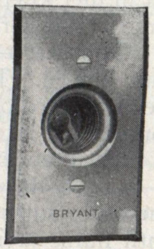
No. 17. Calling Station with Magnetic Control Switch, Bullseye, Emergency Call and Convenience Outlet

Signal Lights

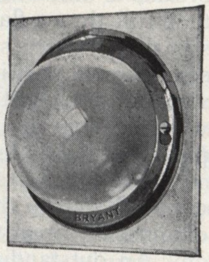
There should be installed in the corridor over or by the door of each room or ward a *door light* to indicate when calls have been registered from these rooms or wards.

Where corridors meet, *pilot lights* should be placed to indicate to attendants that patients in adjacent corridors need service. A call originating in any room opening on a corridor, lights the pilot lamp in that corridor. Pilot lights should be placed in diet kitchens, linen rooms, service rooms, etc. In small hospitals, pilot lights carefully placed make the use of annunciators unnecessary. In large hospitals, they save many steps by eliminating frequent visits to annunciators.

Where a more finished appearance is desired than presented by the No. 1708 receptacle with No. OF61 plate illustrated above, dome lights can be furnished.



No. 1708. Receptacle with No. OF61 Plate for Door Light or Pilot Light

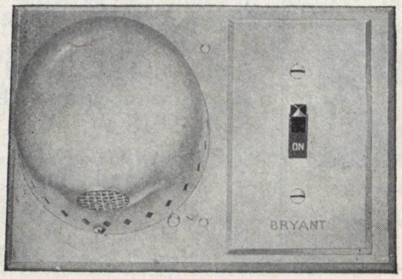


No. HS-50. Dome Light for Door and Pilot Lights

Audible Call Signals

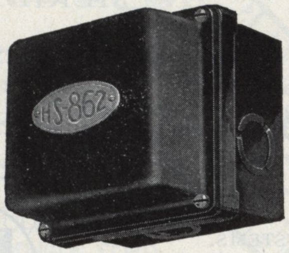
At night, when few nurses are on duty, it is an advantage to supplement the signal lights with an *audible signal*. For this purpose a bell or buzzer may be used and it is best to install it in connection with a switch so it can be connected or disconnected at will.

A single stroke bell sounds 1 tap for each time the patient operates it. The tone may be regulated loud or soft.

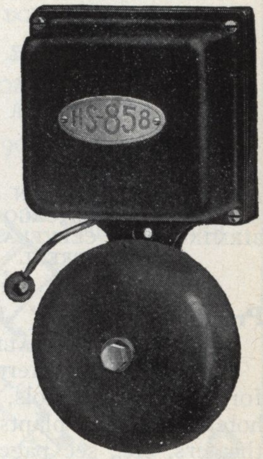


Single Stroke Bell with Switch

Vibrating bells and buzzers sound as long as the cord of the pull control switch is held taut. They can not be used in connection with the magnetic control switch.



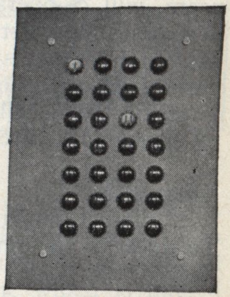
No. HS-862. Buzzer



No. HS-858. Vibrating Bell

Annunciators

The annunciator indicates the call by a light corresponding to the number of the room or calling station. The lamp remains lighted until the call has been answered and canceled. Signals in any desired number of annunciators can be registered from the same calling station.

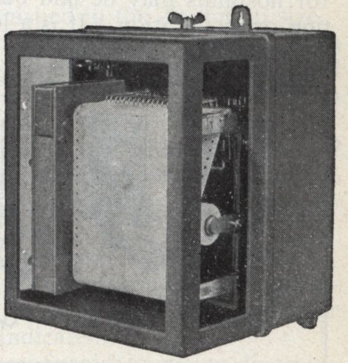


No. HSA-28. Annunciator

Elapsed Time Recorders

Elapsed time recorders make graphic records showing the time each call is registered and the time elapsing before the call is answered and canceled. This record enables the superintendent to keep an accurate check on the service of the nursing staff. It is always valuable in case of claims by patients that call signals are not promptly answered.

Recorders are made only in sizes of 5, 10, 15 and 20 pens. One pen is required for each station connected. The paper chart rolls need be changed only once in two weeks. They are easily inserted and are inexpensive. The instruments are substantially built, efficient and durable.



No. HS-70. Elapsed Time Recorder

Catalogue

The Bryant system is described minutely and instructions for laying it out and instructions for installing it are given in two handsome bulletins recently published. If in any way connected with or interested in the building or remodeling of a hospital, infirmary or sanatorium you will enjoy reading these bulletins. Send for them.

CONNECTICUT TELEPHONE & ELECTRIC COMPANY

Manufacturers of Hospital Signaling Systems

MERIDEN, CONN.

REPRESENTED IN:

ALBANY
ATLANTA
BIRMINGHAM
BOSTON
CHICAGO
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MONTREAL
DENVER
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LOUISVILLE
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PHILADELPHIA
PITTSBURGH
SAN FRANCISCO
SEATTLE
ST. LOUIS
WASHINGTON, D. C.
WINNIPEG

Products

Hospital Signaling Systems.

For Private Intercommunicating Telephones for hospitals, schools, apartment houses, banks, hotels, industrial plants, offices, residences, stores, theaters, etc., see pages 2507-2509.

Co-operative Service

This Company, directly or through its sales engineers, will co-operate with architects and engineers to determine the most practical installation for any of the above requirements, and will furnish without cost specifications, layouts, and estimates based on conditions and covering the installation of any service within the scope of its manufacture.

Guarantee

This Company guarantees all its apparatus to be free from inherent electrical and mechanical defects.

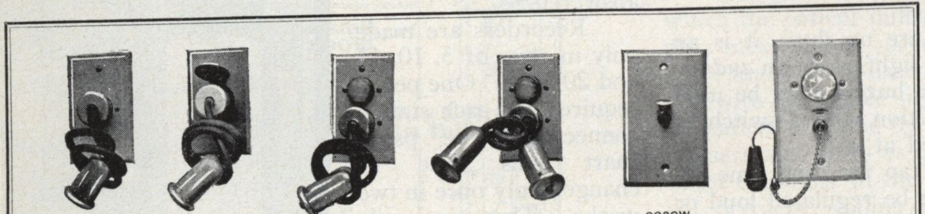
Hospital Signaling Systems

For ten-volt alternating or direct-current lamp signals.

Nurses' Signal Systems.
Emergency Signal Systems.
Doctors' Paging Systems.
Staff In and Out Systems.

Nurses' Signal Systems

The Connecticut Automatic Nurses' Signal System for hospitals may be laid out to any degree of elaboration or moderation. It is a low voltage system in which a mechanical circuit closing switch eliminates the need of relays, magnetic switches, solenoids, or other similar devices.



Connecticut Hospital Calling System Apparatus

A typical installation consists of calling stations located at patients' bedside, either in ward, or private room; dome type corridor lamp stations above ward or private room doors; a pilot lamp annunciator and buzzer station at nurses' duty station, and in diet kitchen; and a lamp annunciator in the head nurse's or superintendent's office.

Operation—Patient requiring nurse presses automatic button. This lights lamp at ward bedside station, over the ward or private room door, at nurses' duty station, in diet kitchen, and in annunciator in head nurse's or superintendent's office. It also gives momentary buzz at nurse's duty station, in diet kitchen, and in head nurse's or superintendent's office. Lamps remain lighted until nurse arrives at patient's bedside and cancels call.

Calling Stations—These stations consist of the conventional single gang brass switch plate containing plug receptacle, detachable aluminum plug with 8 ft. of washable rubber covered cord and an automatic nonbreakable aluminum button. The button is arranged so that full thrust flashes station lamps, then gives audible signal at buzzer stations after which button returns to semi-normal position where only lamp circuits are closed, remaining so until released by nurse answering call, which is done by a pointed key or similar device or, if preferred, a trip lever.

The plugs are designed so that undue strain on the cord will detach them from receptacle in wall plate, thus eliminating breakage.

An outstanding feature is the safeguard receptacle which immediately throws on all signals if the plug is accidentally detached, insuring against interruption of service to the patient. No nurse's call can become inoperative without giving warning of that condition.

The "fifth contact" station, an added feature, making possible a considerable reduction in wiring where a single pilot common to a group of private rooms and wards, meets the service requirement.

Style 9010-W, Private Room Calling Station
Style 9014-W, Ward Calling Station with bullseye lamp
Style 9018-W, Weatherproof Balcony Station with 15-ft. cord and hinged cover over plug receptacle
Style 9020-W, Wall Type Station, for toilets, baths, operating room, etc.

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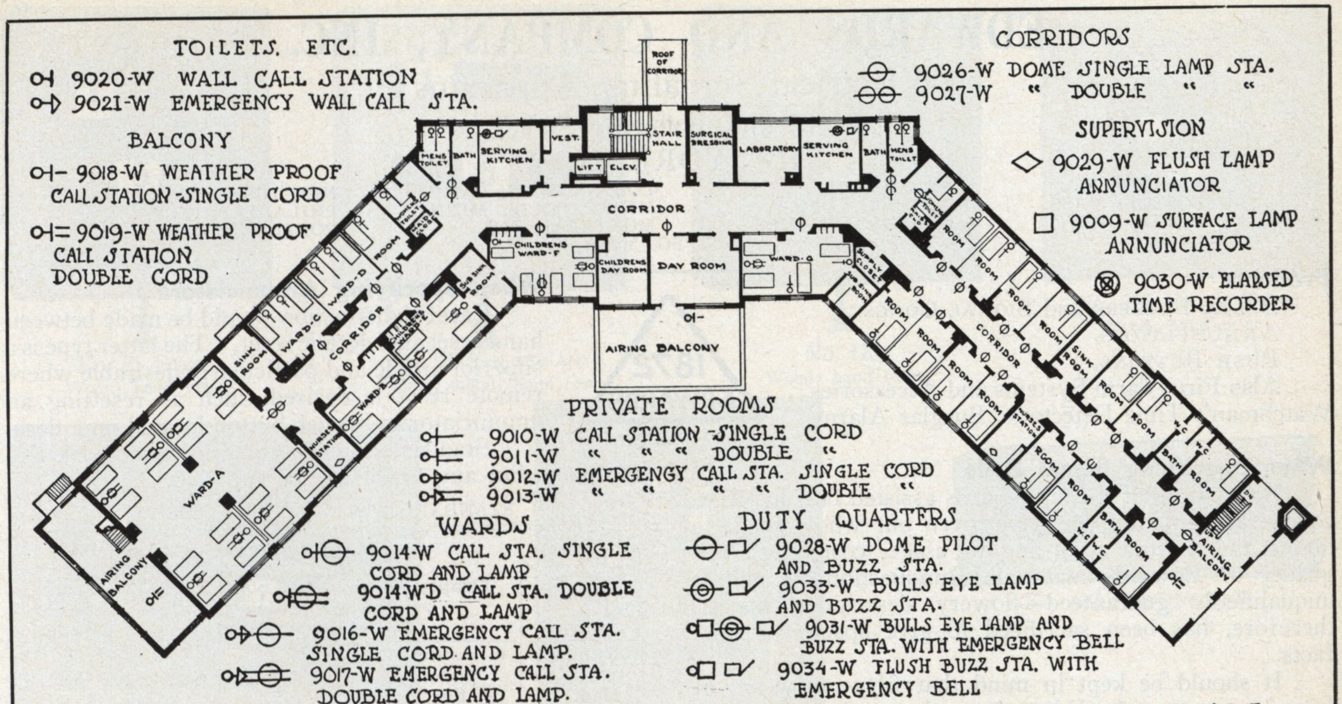

TOILETS, ETC.
9020-W WALL CALL STATION
9021-W EMERGENCY WALL CALL STA.
BALCONY
9018-W WEATHER PROOF CALL STATION-SINGLE CORD
9019-W WEATHER PROOF CALL STATION DOUBLE CORD
CORRIDORS
9026-W DOME SINGLE LAMP STA.
9027-W " DOUBLE " "
SUPERVISION
9029-W FLUSH LAMP ANNUNCIATOR
9009-W SURFACE LAMP ANNUNCIATOR
9030-W ELAPSED TIME RECORDER
PRIVATE ROOMS
9010-W CALL STATION-SINGLE CORD
9011-W " " " DOUBLE "
9012-W EMERGENCY CALL STA. SINGLE CORD
9013-W " " " " DOUBLE "
WARDS
9014-W CALL STA. SINGLE CORD AND LAMP
9014-WD CALL STA. DOUBLE CORD AND LAMP
9016-W EMERGENCY CALL STA. SINGLE CORD AND LAMP.
9017-W EMERGENCY CALL STA. DOUBLE CORD AND LAMP.
DUTY QUARTERS
9028-W DOME PILOT AND BUZZ STA.
9033-W BULLS EYE LAMP AND BUZZ STA.
9031-W BULLS EYE LAMP AND BUZZ STA. WITH EMERGENCY BELL
9034-W FLUSH BUZZ STA. WITH EMERGENCY BELL
ROOF OF CORRIDOR
MENS TOILET
BATH
SERVING KITCHEN
VEST.
LIFT
ELEV.
STAIR HALL
SURGICAL DRESSING
LABORATORY
SERVING KITCHEN
BATH
MENS TOILET
CORRIDOR
CHILDRENS WARD-F
CHILDRENS DAY ROOM
DAY ROOM
WARD-G
AIRING BALCONY
WARD-D
WARD-C
CORRIDOR
SINK ROOM
WARD-B
NURSES STATION
WARD-A
AIRING BALCONY
ROOM
CORRIDOR
SINK ROOM
BATH
AIRING BALCONY

TYPICAL HOSPITAL LAYOUT AND EQUIPMENT DIAGRAM

Note: See Symbols under apparatus illustrations

Style 9038-W, Contagious Ward Station (pull chain)
Style 9059-W, Serving Light Station

For emergency button add E to style number
Example: 9010-W-E

For double cords from same outlet add D to style number
Example: 9010-W-D

For any of the above, use standard single gang switch box or outlet box cover, except 9014-W-E (emergency button) and 9059-W which takes two-gang size.

Dome Type Corridor Lamp Station—*Style 9026-W*—For mounting above ward or private room door, is a brass plate mounting equipped with a hinge door to facilitate replacement of burned out lamps, provided with an opalescent glass dome which permits light to be seen from any direction.

Fitted with a red lamp additional when emergency call is included. Fits standard two-gang switch box or outlet box cover.

Pilot Lamp Annunciator and Buzzer Station—*Style 9033-W*—Is a brass plate provided with two or more bullseye pilot lamps and a low tone buzzer. Equipped with cutout switch for silencing buzzer as desired. Usual practice calls for each lamp cap lettered to indicate respective group of private rooms or ward. The two and four-lamp stations fit deep type three-gang switch box or three-gang outlet box cover.

***Style 9028-W*—**Similar to 9026-W but with the addition of a buzzer and silencing switch; for pilot station at duty quarters. Will accommodate up to four lamps. Lamps may be colored to indicate section calling. Fits standard three-gang switch box or outlet box cover.

Flush Lamp Annunciator—*Style 9029-W*—Consists of a glass door hinged to a metal frame mounted on a heavy all metal outlet box of a size determined by the number of lamps required. Indications are etched on the glass and are visible when illuminated. Can be lined off to show sections. As all equipment is an integral part of the front frame, outlet boxes can be set in advance. Lamp sockets, removable individually, are mounted in banks of five. The lamp mounting strips, to the required number, are attached to a sub-frame which is hinged at the bottom for easy access to incoming wires. On listed sizes connections to line terminals are made after hinged frame is swung permanently in place, thus avoiding disturbing other wiring when concerned with a particular line connection. When so specified, outlet boxes will contain a sufficient number of two or four-way connectors to act as a distributing center for branch circuits.

Elapsed Time Recorder—*Cat. No. 9030-W*, an automatic instrument for recording mechanically on a strip chart the number of calls and exact time elapsing before answer. Chart feeds continuously for a period of 15 days. Regularly furnished in the 20-station size.

Lamps—(10-volt Mazda Tungsten Filament) with standard candelabra base, and receptacles are used throughout. The apparatus comes equipped with lamps.

Finish—Standard finish is washable white for all calling station face plates, corridor lamp stations and annunciators, except weatherproof balcony station, which is black enamel.

Buttons and plugs are polished aluminum.

Outlet Boxes—Face plates are multiples of standard switch plate sizes and fit standard switch boxes or outlet box covers of size indicated.

Wiring—This Company furnishes wiring diagrams showing layout of system and details of installation with its proposals.

Current—This system operates from the regular alternating current lighting circuits reduced to 10-12 volts by transformer: where alternating current is not available, storage batteries charged by a motor-generator set may be used.

Catalogue

Catalogue sent on request.

EDWARDS AND COMPANY, INC.

Electrical Signaling Apparatus

140th and Exterior Streets
NEW YORK, N. Y.

ATLANTA, GA. · BOSTON, MASS. · BUTTE, MONT. · CHICAGO, ILL. · DENVER, COLO. · KANSAS CITY, MO. · LOS ANGELES, CAL. · MINNEAPOLIS, MINN. · MONTREAL, QUE. · NEW ORLEANS, LA. · PHILADELPHIA, PA. · PORTLAND, ORE. · WINNIPEG, MAN.

1872
EDWARDS

TRADE-MARK

Products

BELLS, BUZZERS and SIGNAL GONGS.
ANNUNCIATORS.
PUSH BUTTONS.
Also Fire Alarm Systems and Accessories; Watchman's Time Detectors; Burglar Alarms.

When Specifying Signal Bells

Believing that the architect is assisted best by clear, concise information, we have given our whole space to listing the devices according to usage, cost, etc. The quality of Edwards material is unquestionable and is unqualifiedly guaranteed—flowery descriptive matter, therefore, has been sacrificed to give space for pure facts.

It should be kept in mind that fifty-two years of experience enter into Edwards products; that shipments can be made quickly and that our engineering department is available for consultation without charge.

When Specifying Annunciators

Careful distinction should be made between hand reset and electric reset. The latter type is a superior article and particularly desirable where remote reset is desired, such as resetting an annunciator by a push button located on a desk. Standard annunciator finishes are oak and mahogany, but any finish can be supplied.

STANDARD WALL ANNUNCIATORS

Type of Reset	Quality	Type of Case			
		Wood		Metal	
		Flush type	Surface type	Flush type	Surface type
Hand reset	(1) Lowest price	. . . .	No. 81	. . . .	91
Hand reset	(2) Best quality	No. 215	No. 125	No. 215M	No. 125M
Electric reset	(1) Best quality	No. 406	No. 401	No. 405	No. 407

STANDARD VIBRATING BELLS AND BUZZERS‡

Operating current	Quality	Use	
		Interior	Exterior§
For battery or motor generator...	(1) Lowest price; light duty; up to 8 V. only; 2½ to 4 in. only............ (2) Better quality; longer life; 2½ to 6 in.......... (3) Best quality; longest life; 3 to 18 in..........	"Cadet" "Lungen" "Recti"*	.... "Recti"§
For transformer....	(1) Lowest price; light duty; up to 6 V. only; 2½ to 4 in. only.......... (2) Best quality; longest life; 3 to 12 in..........	"Cadet" "Five-Ten"*	.... "Five-Ten"§
For 110-V.D.C.....	(1) Best quality; 3 to 18 in..........	"Recti"*	"Recti"§
For 220-V.D.C.....	(1) Best quality; 3 to 18 in..........	"Recti"*	"Recti"§
For 250 to 600 V.D.C...........	(1) Best quality; 3 to 18 in..........	"Recti"*	"Recti"§
For 110 V.A.C.....	(1) Best quality; 4 to 12 in..........	"Recti"*	"Recti"§
For 220 V.A.C.....	(1) Best quality; 4 to 12 in..........	"Recti"*	"Recti"§

‡Buzzers are bell movements without gong or hammer—there is a corresponding buzzer for every bell listed above. Lungen buzzers are made in 5 sizes, all illustrated on the next page. *Made for use with conduit if specified "conduit type." §Bells for exterior use should be specified "weatherproof type."

PUSH BUTTONS, ETC.

Type	Description	Cat. No.
Standard Flush....	Fits ⅝-in. hole for low D.C. or A.C. voltages. Pearl center—any finish..............	620
Three-circuit......	Fits ¾-in. hole. For low D.C. or A.C. voltages, has 4 contacts, to close 3 separate circuits at once. Black center. Any finish..	260
Return call......	Fits ¾-in. hole. To allow 3 wires instead of 4 in return call systems. For low voltages D.C. or A.C. Black center. Any finish...	265
Water-tight.....	For conduit; surface mounting; for all A.C. or D.C. voltages up to 110..............	1785
Water-tight.....	Non-conduit; surface mounting; for low A.C. or D.C. voltages..............	1786
Floor tread	For under dining room rug..............	290
Desk push.	Self-contained with card racks. Any finish. Any size..............	190

SPECIAL BELLS

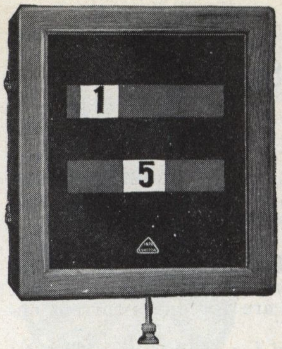
Operating Current	Sizes	Cat. No.
SINGLE STROKE (FOR CODE SIGNALS)		
All D.C. Voltages	4 to 12 in.	No. 21
All A.C. Voltages	4 to 12 in.	No. 22
LOUD ALARM, MOTOR DRIVEN		
For 110-V.A.C. or D.C. and battery	10 to 18 in.	"Riot"

SPECIAL TYPE ANNUNCIATORS

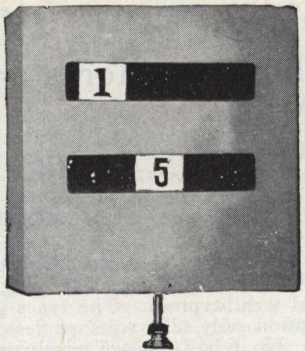
Type	Reset	Case	Cat. No.	Voltages
Desk type.....	Electric	Wood	No. 412	Battery or Transformer
High voltage...	Hand	Metal	No. 807	110 to 250 D.C. or A.C.
Return call, for hotels, etc...	Hand	Wood	No. 10	Battery or Transformer

Note: No. 116 *flush* return call push and buzzer is used at each station with the above annunciator, or No. 137 *surface* return call push and bell is used at each station with above annunciator.

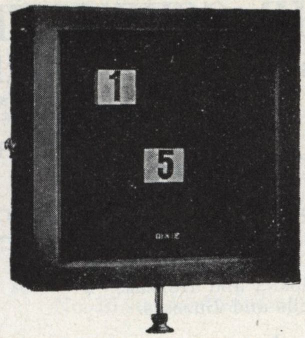
Continued on next page



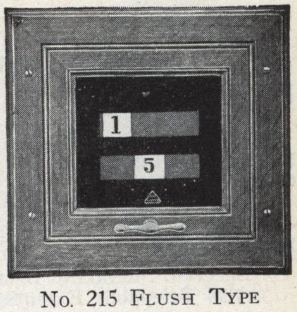
No. 81 Dixie
Wood; hand reset



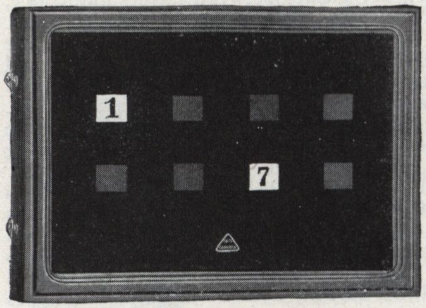
No. 91 San-fer-an
White; metal; hand reset



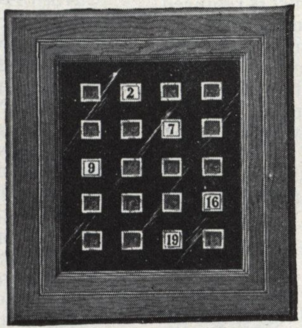
No. 125
Wood; hand reset



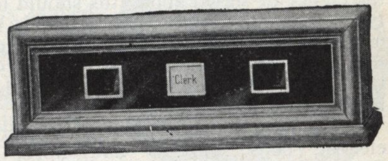
No. 215 Flush Type
Wood; hand reset



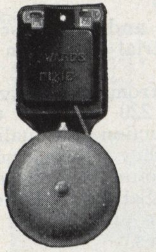
No. 401
Wood; electric reset. Metal is No. 407



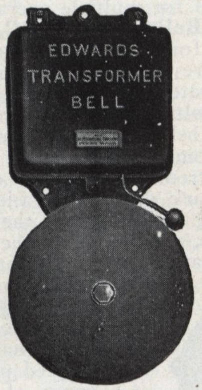
No. 406 Flush Type
Metal case is No. 405



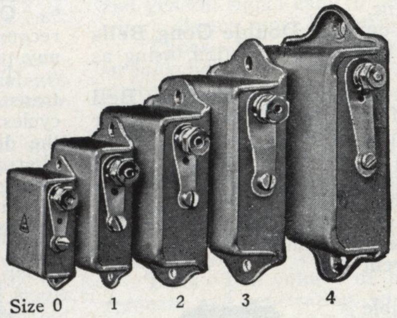
No. 412 Annunciator



Cadet



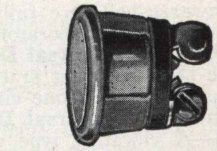
No. 510



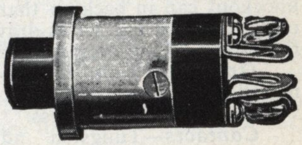
Lungen Buzzers

Size 0	1⅝x1⅛ in.
Size 1	2⅛x1 5/16 in.
Size 2	2 9/16x1¾ in.
Size 3	3 x2 in.
Size 4	3½x2¼ in.

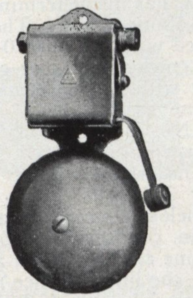
Tone and volume varies according to size



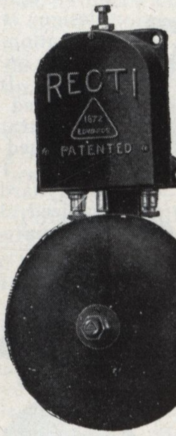
No. 620 Push



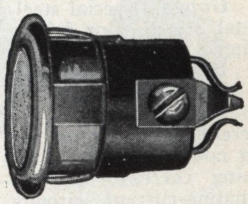
No. 85—110 V. Push
No. 85A—220 V. Push



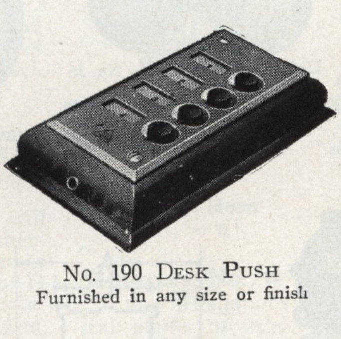
No. 13 Lungen Bell



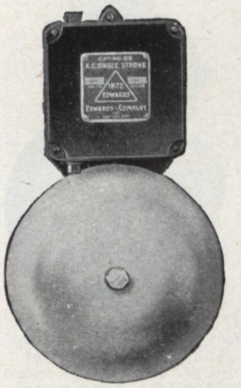
No. 100 Recti Bell



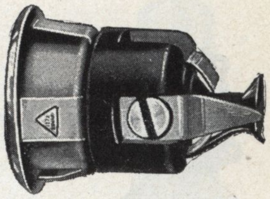
No. 260—4 Contact Push



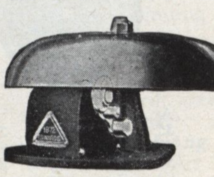
No. 190 Desk Push
Furnished in any size or finish



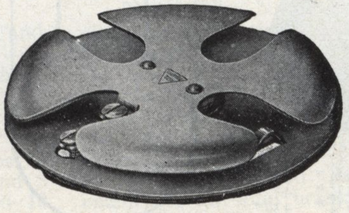
Single Stroke Bell
No. 21 for d-c. current
No. 22 for a-c. current



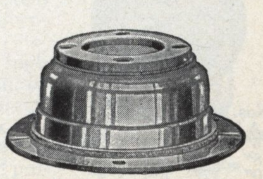
No. 265 Return Call Push



No. 300 Riot
A loud ringing bell



No. 290 Floor Tread



No. 1786 Watertight Push

THE SCHWARZE ELECTRIC CO.

Manufacturers of Electrical Bells, Buzzers, Horns and Specialties

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Products

Electric Signaling Bells, Horns and Buzzers.
Also Telephone Extension Bells and Buzzers.

Schwarze Electric Signal Devices

There is a Schwarze electric signaling device designed for practically every purpose where a high grade product is required.

When an audible signal is required, a few considerations in the choice of signal apparatus should be borne in mind. (1) The type of signal, whether the sound is to be continuous or intermittent. (2) The loudness of the signal. (3) The quality of the sound and sweetness of tone. (4) Conditions of installation, indoor or outdoor. (5) Available current, whether alternating or direct.

All these considerations are covered in the large variety of electric bells, buzzers and horns manufactured by The Schwarze Electric Co.

Schwarze Electric Bells

Schwarze bells are particularly adapted to use for fire alarm signals in schoolhouses, public buildings and industrial plants.

They are a fit and dependable signal for sprinkler systems, telephone systems, etc.

Schwarze bells are fully guaranteed and are approved by the Underwriters' Laboratories, Inc.

Schwarze Universal Direct-current Double Gong Bells—These bells are most practical for series operation, using as many as 20 bells on one circuit.

Schwarze Universal Direct-current Double Gong Bell No. 35—A vibrating type with frame drilled and tapped for ½-in. conduit connection. Has porcelain bushed holes in top of frame for entrance of line wires for exposed wiring circuits; knockout cap in back so that it can be mounted over standard outlet box and line wires drawn through to bell terminals inside the frame. Line entrance not in use may be securely closed.

Operating Conditions—In series or multiple directly connected to any specified direct-current voltage of 40 volts or less.

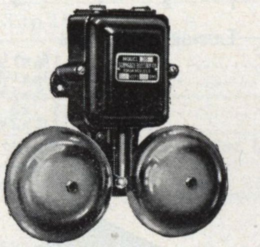
Contacts—Tungsten adjustable screw type.

Frame—Cast iron, finished in black or red enamel as desired.

Gongs—Special steel or cast bell metal 2½, 3, 4 or 5 in. Also fancy gongs—Tea, Dome and Cow.

Weight—2½ to 4 lb. depending on size of gongs specified.

Note: This bell is for direct-current circuits only and can not be used on alternating current. For alternating-current circuits, see bells Nos. 9, 9A and 75.



Universal Double Gong No. 35

A	B	C	D	
6″	7½″	4⅞″	2⅛″—2½″	gongs
7″	8″	4⅞″	2⅛″—3″	gongs
9″	9″	4⅞″	2½″—4″	gongs
11″	9½″	4⅞″	2⅞″—5″	gongs

Schwarze Cyclone Vibrating Bells Nos. 6, 6C, 6E and 6F—These bells are of the single gong plunger type, dustproof and weatherproof. The types given are for direct-current operation only, 250 volts or less.

No. 6 has exposed terminals, only for operation on 30 volts direct current or less.

No. 6E has the general appearance of No. 6C, except that it is equipped with a rubber gasket between cover and frame, making it waterproof; circuit application, 30 volts or less. No. 6C is for direct operation on 110 volts or less and the casting is tapped for ½-in. conduit, making it weatherproof and dustproof. No. 6F is for direct operation on 110 to 250 volts and has rubber gasket between cover and frame; it is waterproof.

All Schwarze Direct-current Cyclone Bells mentioned above can be used on higher voltages than those stated by using external resistance in series with the bell.

Gongs can be hard steel or cast bell metals, as required, in the following sizes: hard steel gongs furnished in nickel, brass or galvanized plate, 6, 8, 10 and 12 in. Galvanized hard steel gongs are recommended for outdoor installations or in damp places on account of their rust resisting qualities. Standard winding of the No. 6 direct-current Cyclone in its various types is 10 ohms.

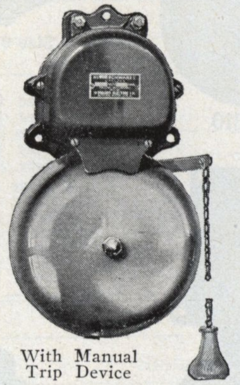
The mechanisms are entirely insulated from the frame and are constructed for multiple operation only.

Cyclone Bells Nos. 7, 7C, 75, 76 and 77—Especially recommended for schoolhouses and industrial plants; in fact, any place where signals are required.

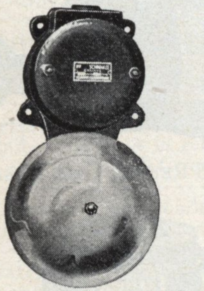
They operate on alternating current from any secondary transformer voltage or direct on 110 or 220 volts, 25 to 60 cycles. These bells are of the same construction and quality as the direct-current Cyclone Bells, except they are wound for alternating current and have no contact points, thereby eliminating any spark during operation. All Schwarze Bells are instant starting and stopping; therefore are practical for code calling systems, which require these features.

The alternating-current Cyclone Bell No. 7 has outside terminals, and No. 7C has inside terminals and is tapped for ½-in. conduit. These types are furnished with 6, 8 and 10-in. gongs, hard steel, nickel, brass or galvanized plate; or with cast bell metal gongs of the same sizes.

Cyclone Bell No. 75 is of the latest design; is weatherproof, dustproof, for operation on transformer voltage or direct on 110 or 220 volts, 25 to 60 cycles. It has enclosed terminals and is tapped for ½-in. conduit, also holes for entrance of line wires. Plugs are furnished to close the line entrance not in use. It is equipped with 3, 4 and 5-in. hard steel nickel, brass or galvanized plate or cast bell metal gongs, as required.

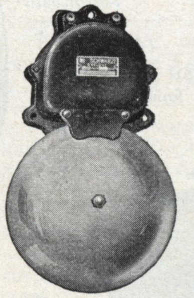


With Manual Trip Device



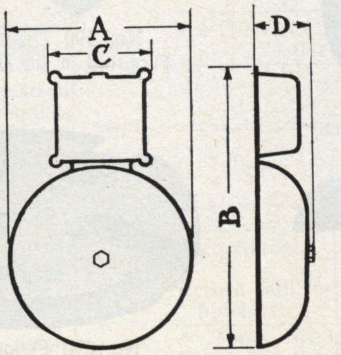
Nos. 6C, 6E, 6F, 7C

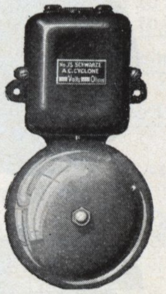
A	B	C	D
6″	13″	6¾″	3½″
8″	15″	6¾″	4″
10″	17″	6¾″	4″
12″	19″	6¾″	4¾″



Nos. 6 and 7

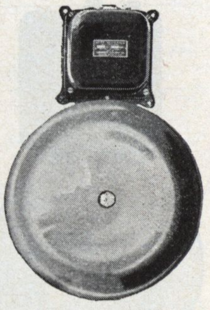
A	B	C	D
6″	12″	6¼″	3¼″
8″	14″	6¼″	4″
10″	16″	6¼″	4½″





No. 75

A	B	C	D
3″	5″	4⅞″	2″
4″	6″	4⅞″	2″
5″	7″	4⅞″	2½″



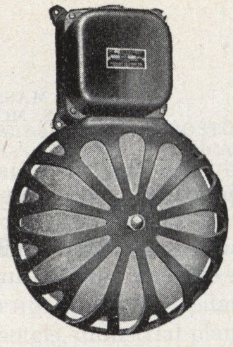
Nos. 76 and 77

A	B	C	D
6″	11½″	5¾″	3″
8″	13½″	5¾″	3½″
10″	15½″	5¾″	4″
10″	16¼″	6″	4″
12″	18¼″	6″	4½″
14″	20¼″	6″	5″

Cyclone Vibrating Bells—Styles and Dimensions

Continued on next page

Cyclone Bells Nos. 76 and 77 are of the same construction as No. 75, and have the same fundamental principles as all the other alternating-current Cyclone Bells, except that the mechanism and frame of the bell is much heavier to produce the greatest volume of tone from gongs 6 to 14-in. diam. All terminals are enclosed, same as No. 75, and plugs are furnished for closing the entrance not in use.

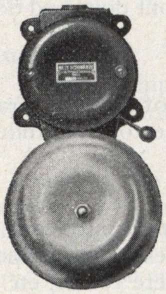


Cyclone Vibrating Bell with Full Grid

Special Equipment—Manual trip device with pull knob and chain which provides that bell be operated manually while current is shut off. Can be supplied on Cyclone Bells Nos. 6, 6C, 6E, 6F, 7, 7C, 7E, 76 and 77.

Full Grids—Can be furnished for 6 to 12-in. gongs on Cyclone Bells Nos. 6, 6C, 6E, 6F, 7, 7C, 7E, 62, 72, 76 and 77. Grid is recommended for use with Cyclone Bells installed in places where pedestrians are apt to stone bell, thereby inflicting injuries to the gongs.

These grids furnish the necessary protection to the gong, as they are ruggedly built.



No. 21, D-C.

A	B	C	D
6″	13″	7″	3½″
8″	15″	7″	3⅞″
10″	17″	7″	4¼″
12″	19″	7″	4¾″

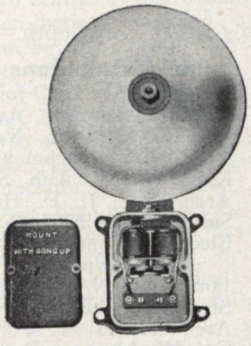
Schwarze Direct-current Single Stroke No. 21—A single gong bell, direct current only; standard winding, 3 ohms.

Construction—The bell mechanism is entirely insulated from the frame. Made with inside terminals only and tapped for ½-in. conduit; operating in multiple or series. Furnished with back boxes if required.

Uses—Designed for fire alarm service, factory signaling, superintendent's calls, etc., and an excellent bell for code signaling work.

Gong Equipment—Hard steel or cast bell metal. Hard steel gongs are furnished with nickel, brass or galvanized plate.

Gong Size—6, 8, 10, 12 and 14 in.



No. 24, A-C.

A	B	C	D
6″	12½″	6″	3½″
8″	14½″	6″	4″
10″	16½″	6″	4⅜″

Schwarze Single Stroke Bells

Schwarze Alternating-current Single Stroke No. 24—A single gong type for alternating current only, not exceeding 60 cycles. No. 24 standard winding is 3 ohms.

Construction—Made with inside terminals only and tapped for ½-in. conduit. It is designed for multiple or series operation, and should be mounted with gong up.

Gong Equipment—Hard steel or cast bell metal. Hard steel gongs are furnished with nickel, brass or galvanized plate.

Gong Size—6, 8 and 10 in.

Polarized Bells Nos. 9, 9A and 11—These are of the double gong type for use with alternating current only, not exceeding 60-cycle frequency.

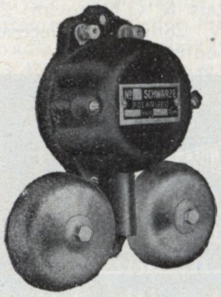
Construction—Nos. 9 and 11 will operate direct on 110 to 220-volt alternating current or from transformer secondary circuit. No. 9 and No. 11 have outside terminals; No. 9A has inside terminals and is tapped for ½-in. conduit. These bells can be operated in multiple or in series.

Standard winding of Nos. 9 and 9A is 8 ohms.

No. 11 standard winding is 5 ohms.

Gong Equipment—Hard steel or cast bell metal.

Gong Sizes—Nos. 9 and 9A: 2½, 3, 4 and 5 in.; No. 11: 6, 8 and 10 in.



Nos. 9 and 11

Polarized Bell

A	B	C	D	
6″	5½″	4″	2⅜″—2½″	gongs
7″	6½″	4″	2⅜″—3″	gongs
9″	7½″	4″	2⅜″—4″	gongs
11″	8½″	4″	2½″—5″	gongs
13″	12½″	6″	4″ —6″	gongs
17″	13½″	6″	4½″—8″	gongs
21″	15″	6″	5″ —10″	gongs

Buzzers

This type is for alternating-current circuits only, not to exceed 60-cycle frequency.

Construction—No. 16 polarized or magneto buzzers are absolutely dust-proof and weatherproof. Mechanism in this buzzer is entirely insulated from the frame, and has no contact points to arc or spark, the action of the working parts being absolutely controlled by magnets. This buzzer can be operated either in multiple or in series.

No. 16 standard winding is 8 ohms.

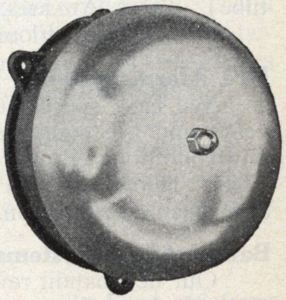
Nº16 SCHWARZE
A.C. BUZZER

Polarized Buzzer

Monitor Type Cyclone Vibrating Bells

No. 72—Alternating current. Mechanism is entirely enclosed in cast iron frame which is tapped for ½-in. conduit and entrance for line wires. Furnished with 8-in. gong only.

No. 62—Same as No. 72, except that bell can be built for battery current of any voltage or direct connection to 110 to 250-volt power circuit without use of extra resistance in series with bell.



Nos. 62 and 72

Monitor Type Bell

A	B	D
8″	8½″	4¼″

Schwarze No. 3 Vibrating Horns

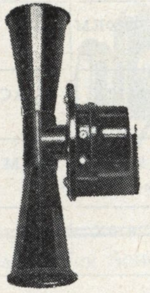
Uses—For use as fire alarm and general signal calls in public buildings and industrial plants where alarms must be thrown in different directions.

Types—No. 3 vibrating horns are made in three types: *megaphone, 2-way and 3-way.* They can be used with either alternating or direct current.

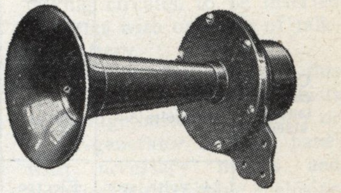
Construction—No. 3 horns have two binding posts for open wire circuit or can be constructed for use with conduits. Supplied for operation by battery, standard lighting voltages direct or alternating current, or transformer. Recommended for operation in multiple only.

Finish—Standard finish for all No. 3 horns is black enamel with nickeled screws. Will be furnished with red enamel finish at no extra cost.

Tone—The volume of tone produced is very great—deep, resonant and penetrating, which are the qualifications necessary for a reliable warning signal.



2-way Horn
13½″x6⅜″



Megaphone
11″x5½″

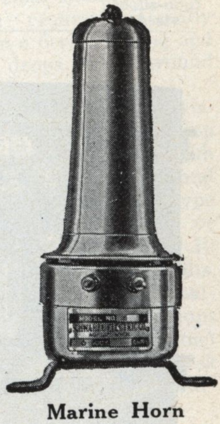
Schwarze No. 6 Marine Horn

For installations in mills and chemical plants or wherever dampness or dust prevails.

Type—The No. 6 horn is of the vibrating type with a 3½-in. special steel diaphragm which produces a loud piercing tone.

For use on transformer and high voltage 60-cycle alternating current, or for battery and high voltage direct-current circuits.

Finish—Finished in all black enamel or all solid brass. Highly polished.



Marine Horn
10″x5½″

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We have specialized in this line for a great many years and are equipped to manufacture systems to fit any condition. By referring to the "Ready Reference Chart" below, one can choose the complete system for any specific installation.

Bandit Alarm Systems

Our new bandit rail is the latest development of this type of alarm for protection against holdup in banks, jewelry stores, ticket offices, etc.

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Our strap key boards represent equipment designed to meet rigid school specifications and are the standard of many boards of education throughout the country.

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For over 35 years we have been manufacturing this line, in house and elevator style, made in gravity, needle, target drops or lamp type.

Bells and Buzzers

This company is prepared to furnish bells and buzzers for any particular need such as fire alarm, school signaling and bandit alarm for any standard voltage, alternating and direct current.

Push Buttons

Our cast and wrought metal push buttons are the product of many years' experience, in high grade elevator, directory, vestibule, letter box, front door and desk pushes.

Shades and Reflectors

We manufacture a complete line of tin and brass shades, and porcelain enameled steel reflectors for industrial use.

Tubes and Fittings

We specialize on speaking tubes for all purposes. Concrete Work Tin Tube—Tubes used for providing holes for pipes, conduit, in concrete forms, etc.

Sockets

Pull, key and keyless brass shell sockets for pendant, 1/8 in., 3/8-in. pipe fittings, in standard and special finishes.

Tank Alarms

For indication of high and low water, any depth.

READY REFERENCE CHART—OSTRANDER FIRE ALARM SYSTEMS

Circuit	Operated by	Gongs		Type of System						
				Regular			Maximum gongs per circuit	Pre-signal		
		Kind	Catalogue No.	Type	Page No.	Boxes used		Type	Page No.	Boxes used
Closed circuit (supervised)	110 volts D-C.	Single stroke	9816X to 9820X	SSDC	B7-B8	5395 5396 5397 5397½	14	DSSDC	B 9	5398 5398½
		Electro-mechanical	9922EM to 9929EM	EM	B13	5395 5396 5397 5397½	14	....	....	.....
	110 volts A-C.	Single stroke	6108X to 6112X	SSAC	B10-B11	5395 5396 5397 5397½	9	DSSAC	B 12	5398 5398½
	24 volts storage battery.	Electro-mechanical	9922EM to 9929EM	SBEM	B14-B15	5395 5396 5397 5397½	12	....	......	......
Open circuit (non-supervised)	Battery......	Vibrating	2816X to 2820X	VB	B17	168	......	......	......	......

Some Installations

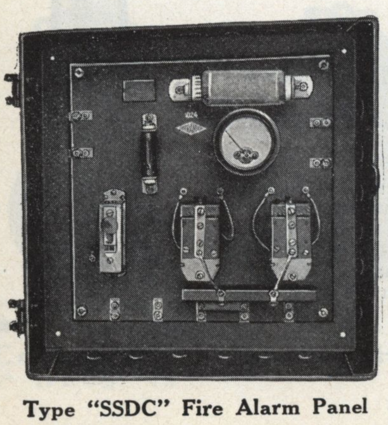
Hospital for Joint Diseases, Madison Ave. 123d to 124th St., New York, N. Y.; Buchman & Kahn, 49 W. 45th St., Architects; J. P. Hall Smith Co., 320 Fifth Ave., Electrical Contractor.

Jamestown Hotel, Jamestown, N. Y.; W. L. Stoddart, 50 E. 41st St., Architect; H. P. Foley Co., Washington, D. C., Electrical Contractor.

The Olcott, 72nd St. and Central Park West, New York, N. Y.; Geo. Fred. Pelham, Inc., 200 W. 72nd St., Architect; Reis & O'Donovan, 253 W. 28th St., Electrical Contractors.

Catalogues

For complete details write for 16th and 17th Edition Catalogues.

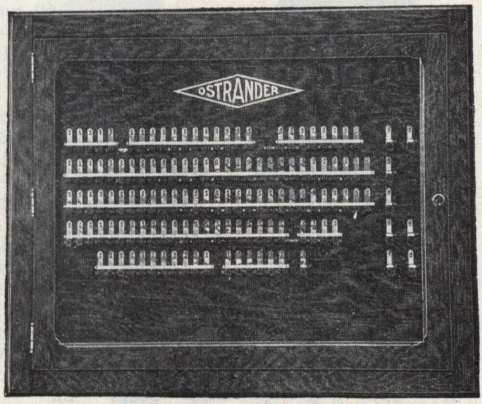


Type "SSDC" Fire Alarm Panel

Single Stroke D-C. Gong No. 9816X

IN CASE OF FIRE
4
BREAK GLASS
OPEN DOOR
PULL HOOK
DOWN

Fire Alarm Box No. 5397½



Strap Key Board, Style A

CONNECTICUT TELEPHONE & ELECTRIC COMPANY

Manufacturers of Intercommunicating Telephones

MERIDEN, CONN.

REPRESENTED IN

ALBANY
ATLANTA
BIRMINGHAM
BOSTON
CHICAGO
CLEVELAND
MONTREAL
DENVER
DETROIT
INDIANAPOLIS
TORONTO
KANSAS CITY, MO.
LOS ANGELES
LOUISVILLE
MINNEAPOLIS
NEW ORLEANS
NEW YORK
VANCOUVER
PHILADELPHIA
PITTSBURGH
ST. LOUIS
WINNIPEG
SAN FRANCISCO
SEATTLE
WASHINGTON, D. C.

Products.

PRIVATE INTERCOMMUNICATING TELEPHONES for hospitals, apartment houses, banks, hotels, industrial plants, offices, residences, schools, stores, theaters, etc.

For Hospital Signaling Systems, see pages 2500-2501.

Guarantee

This Company guarantees all its apparatus to be free from inherent electrical and mechanical defects.

Co-operative Service

This Company, either directly or through its sales engineers, will co-operate with architects and engineers to determine the most practical installation of Private Intercommunicating telephones in banks, schools, residences, institutions and industrial plants.

They will also furnish without cost specifications, layouts and estimates based on requirements and covering the installation of any service within the scope of its manufacture.

Telephone Systems for Schools

Centerphone Systems—Can be laid out to any degree of elaboration or moderation. An ideal installation consists of a centerphone calling station and annunciator located in the principal's office, together with as many outlying stations as necessary. Up to 50 outlying stations the above system meets every requirement perfectly. Above that number it is advisable to install a telephone switchboard.

Service—With this system, central phone can call outlying stations selectively by means of push buttons in a portable pad, or a flush wall plate. Outlying stations can call central by depressing button on telephone. Intercommunication between outlying stations can be accomplished only through central phone.

Central Phone and Button Pad—Style 5200-W, desk type and 2202-W portable button pad, to also contain annunciator reset button; with brass top, nickel finish, wood block with weighted base, felt covered, connected by 6-ft. cord, makes an ideal outfit. Cradle type desk telephone Style 5000-W can be substituted for the conventional desk type instrument. No. 5200-W desk telephone with portable button pad, wood top, weighted base, green felt covered, and card holders, will also meet the service requirements. Special attention is called to the 3904-W cradle type telephone with up to 16 buttons in base, combining the telephone and button pad.

Annunciator—Type "S" or "O" with wood cabinet, is of the electric reset surface type with as many signal drops, each designated by a number, as there are outlying stations; equipped with bell or buzzer. When specified, this annunciator is mounted on the door of a terminal cabinet with wood trim, having metal outlet box set flush in wall, containing a sufficient number of connectors for telephones, and if desired, clocks, bells and other low voltage systems, and to act as a central distributing point for branch circuits. Can be finished to match surrounding trim.

Outlying Stations—(Choice of following types.) Style 128-W, is semi-flush with all metal case, hinged front, apparatus cabled to four-way terminals in metal outlet box, and four spare terminals as local distributing center for other low voltage circuits in same conduit; equipped with an adjustable transmitter, dustproof hook, metal watch case receiver and cord, push button, buzzer and induction coil. Front and frame finish is baked black enamel, other exposed parts black oxidized.

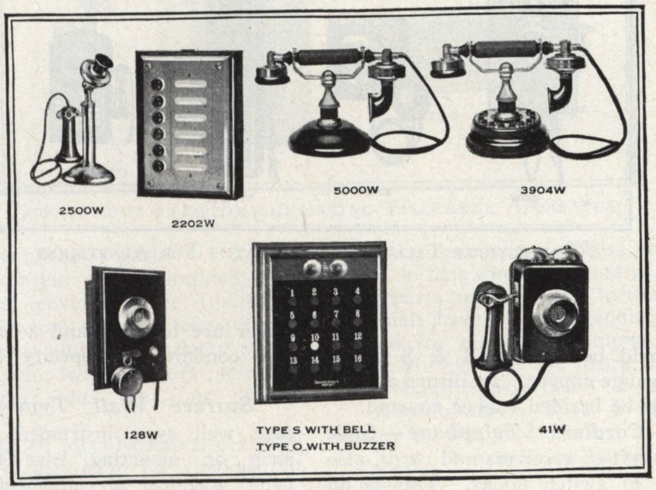
Style 2500-W, a desk type instrument equipped with single button and buzzer.

Style 41-W, a wall type telephone with a hinged metal case, standard long distance transmitter and receiver, double gong bell, and one button for calling central. Phone front connections are wired to a terminal strip on base. Terminal screws are threaded into brass bushings.

Boiler Room Telephone—Style 129-W, is of the watertight surface type with a malleable iron case tapped for ½ in. conduit having a hinged gasketed door, the transmitter and receiver being mounted on a swivel arm located inside and when required, an extension bell of the enclosed iron box type with 3-in. gong is furnished for janitor's room.

Impedance Coil—Style 100-W, as used for multiple talking circuits, to be inserted in series with one side of talking battery.

Current Supply—For this system, supply usually consists of storage batteries, rectifier or motor-generator set, and panel with necessary meters and switches, with suitable enclosing cabinet and rack. Special detailed specifications written to meet individual situations. Diagrams on request. Usually operated on a 6-volt talking and a 16-volt ringing battery—bells, buzzers, drops to be wound accordingly.



CONNECTICUT TELEPHONE APPARATUS FOR SCHOOLS

Switchboard System—For 50 rooms or more it is advisable to install a central switchboard preferably of the flat top desk type with a double set of drawers, turret cabinet with lamp signals, a cord circuit with ringing and listening keys and supervisory signal, for each 20 lines. Our non-relay type of board gives perfect satisfaction on lines of 1600 ft. or less (of No. 19 gauge copper wire). For lines of over 1600 ft. the relay equipped board is necessary for proper results. Systems No. T.C. 494 operates on a single set of storage batteries of 20 volts for ringing and talking. For outlying stations our 41-W surface type metal case telephone (less push button) is recommended, but any of our single point wall or desk telephones may be used. Details and specifications will be furnished upon request.

Catalogue—Sent on request.

Continued on next page

Apartment House Systems

Under this heading are described systems in more general use—common talking selective ringing—but we are prepared to furnish selective ringing, selective talking systems covering the same range of service; also apartment hotel equipment which can consist of a telephone annunciator with outlying stations or a telephone switchboard with lamp signals.

Common Talking Selective Ringing Systems—*System No. 27*—For specifications calling for cordless type vestibule unit and janitor's telephone annunciator.

Service—Vestibule to suites and janitor, suites to janitor and door opener, janitor to suites and door opener. Annunciator in janitor's quarters indicates suite calling and records calls during his absence.

System No. 24—For specifications calling for cordless vestibule unit, and no janitor's or tradesman's equipment.

Service—Vestibule to suites, suites to door opener.

System No. 25A—For specifications calling for swivel arm, armored cable or cord type vestibule units, janitor's telephone annunciator and trade phones.

Service—Vestibule to suites and janitor, suites to janitor and door opener, janitor to suites and door opener, tradesmen to suites and janitor. Annunciator in janitor's quarters indicates suite calling and records calls during his absence.

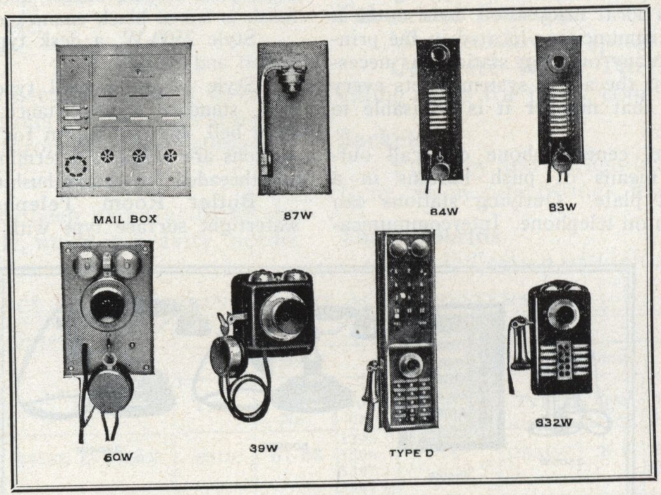
System No. 21A—For specifications calling for swivel arm, armored cable or cord type vestibule units, janitor's telephone (without annunciator) and trade phone.

Service—Vestibule to suites and janitor, suites to janitor and door opener, janitor to suites and door opener. Tradesmen to suites and janitor.

System No. 22—For specifications calling for no janitor's telephone annunciator or tradesman's equipment.

Service—Vestibule to suites, suites to door opener.

Batteries—Two separate sets of dry batteries, centrally located—three dry cells for talking, three or more cells for ringing, according to distance and size of wire.



Connecticut Telephone Apparatus For Apartment Houses

Wires—Battery wires should be No. 16 B & S gauge and direct wires No. 18 B & S gauge copper. To insure against maintenance trouble they should be braided rubber covered.

Vestibule Equipment—*Cordless Telephone*—Style 86-W, is designed to eliminate theft of receivers and cords, also possible bending and breaking of switch hooks. This is an absolutely flush telephone, the only fittings on face of plate being the card holders and buttons, making a very neat appearing instrument. It is modern in every respect and gives perfect service. To operate, push button of suite wanted; answer will be received through perforated sound openings and conversation carried on just as if party were present.

Swivel Arm Type—Style 87-W, answers similar requirement to 86-W in that receiver is attached to a swivel arm to prevent theft. Raising arm automatically cuts in talking battery.

Armored Cable Type—Style 84-W, also designed to prevent theft of receivers. The receiver cord is encased in a flexible armored conductor attached to face plate by a concealed fastening.

Cord Type—Style 83-W, a standard flush telephone with flush transmitter, metal watch case receiver and calling buttons.

Finish—All fronts are brass, standard finish is mat gold. Other finishes at additional cost.

Mail Boxes, Government Approved—These boxes in combined units with heavy gauge solid brass fronts are furnished in gangs of 3, 4, 5 and 6 and are plenty large enough to take mail matter and magazines. The counterbalanced master door opens to a horizontal position, forming a shelf for the mail man to sort the mail. A calling card slot is provided. The lower or tenants' doors are perforated to disclose mail and when fully opened remain stationary in an upward position and give plenty of clearance. They are fitted with individual locks.

Boxes are screwed to the wall by concealed fastenings, no bolts or screws are exposed. This box with its plain front in panel effect is designed to match architectural surroundings. The finish is mat gold.

Cat. No. 1503-W for 3-unit Gang—width, 13 in.; height, 19½ in.

Cat. No. 1504-W for 4-unit Gang—width, 17 in.; height, 19½ in.

Cat. No. 1505-W for 5-unit Gang—width, 21 in.; height, 19½ in.

Cat. No. 1506-W for 6-unit Gang—width, 25 in.; height, 19½ in.

Combined Mail Boxes and Telephone—We are also prepared to furnish any of the previously described types of vestibule telephones "built in" the mail box frame. Telephone will occupy the space of one or more boxes, depending on number of buttons specified.

Suite Telephones—*Flush Wall Types*—Style 60-W, regularly furnished with double gong bell, flush transmitter, composition mouthpiece, metal case bi-polar receiver and cord, induction coil, door opener button, and janitor's button when called for, wood frame mounting with metal housing for operating parts.

When so specified, metal mouthpiece will be supplied. On cordless vestibule systems, to meet wiring conditions, induction coil and bi-polar receiver are left out and a battery type receiver is substituted. For conduit jobs specify Style 1598-A heavy metal outlet box.

Surface Wall Type—Style 39-W, a compact metal case wall type instrument with wires hinged to terminal strip on mounting base to facilitate inspection and repair. Identical in equipment to No. 60-W next above except that the regular mounting frame and outlet box are not required.

Janitor's Equipment—*Telephone Annunciator*—Type "D"—a surface wall instrument complete with a call button for each suite, annunciator drops to indicate and register calls made during janitor's absence. Equipped with extra button for electrically resetting drops and button for operating door opener. This annunciator may be sectionalized where apartment buildings are divided into groups.

Janitor's Telephone—Style 332-W—a surface wall type telephone equipped with double gong bell, buttons for calling suites and operating door opener.

Tradesmen's Telephone—Style 330-W—same as No. 332-W without bell, usually located at dumbwaiter or rear entrance and provided with buttons for calling suites and janitor.

Catalogue—Sent on request.

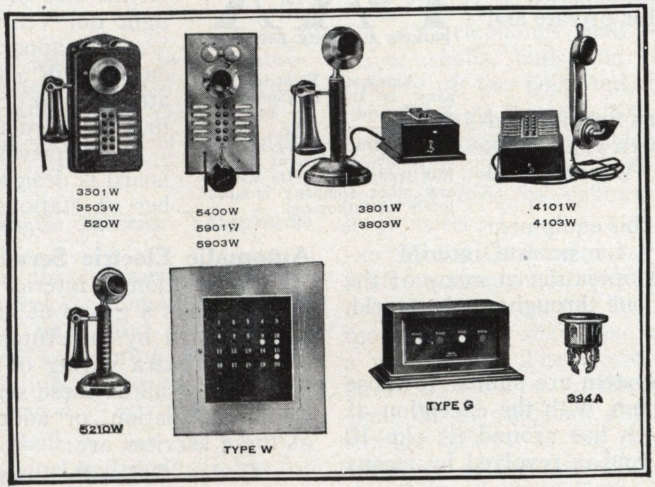
Continued on next page

Intercommunicating Telephones, Annunciators and Button Pads for Banks, Hospitals, Industrial Plants, Offices, Residences, and Theaters

Telephones, Automatic Selective Ringing, Selective Talking Systems—Made for intercommunication between two or more points where installation of a private telephone switchboard is not practical. These systems are of two kinds, common return and metallic circuit, and consist of a push button automatic telephone of the wall or desk type located at each point to be served, each equipped with as many calling buttons as there are other phones. Number of buttons standard in multiples of four, from eight to twenty buttons.

As an insurance against cross-talk or induction, the metallic circuit system is sometimes selected. It is what might be termed a "double-pole" system. The connections at the instrument are made by a set of circuit closing springs for each side of the line.

Cable specifications call for a twisted pair of conductors for each instrument, thus giving a transposition effect. It will be found, however, that common return systems will meet all ordinary requirements.



Connecticut Intercommunicating Telephone Apparatus

Operation—To call and talk with a certain station, press corresponding button. As many sets of conversation can be carried on simultaneously as there are pairs of telephones. Depressing another button automatically resets a previous button; hanging up receiver restores system to normal.

Junction Boxes—Style 107-W (surface type). Looping from one telephone to another is satisfactory except at distributing points, where a suitable junction box should be installed. Our junction box, with proper number of connectors, is especially adapted to this purpose.

Wires can be fastened to terminals either by screw or solder connection. Terminal strips are in multiples of seven connectors each.

Cable—For common return—Style 415-W braided telephone cable for dry places, lead covered cable for damp places, with as many single line wires to each telephone as there are telephones on the system, plus four battery wires. Metallic circuit—Style 425-W with twisted pairs to each telephone instead of single wires; plus the four battery wires.

Batteries—Two separate sets of dry batteries centrally located, one for talking (6 volts), the other for ringing (10 volts) depending on length of lines.

Telephones—In types and finishes as listed below:

	Common return	Metallic circuit	Finish
Surface type	Style 3501-W	Style 3503-W	Golden oak
Flush type	Style 5901-W	Style 5903-W	Mat gold
Desk type	Style 3801-W	Style 3803-W	Black and nickel—golden oak box
Desk type (with flush wall button plate)	Style 4001-W	Style 4003-W	Black and nickel mat gold plate
Hand type	Style 4101-W	Style 4103-W	Aluminum — golden oak box
Hand type (with flush wall button plate)	Style 4201-W	Style 4203-W	Mat gold

Special finishes extra.

Telephones—Common Talking, Selective Ringing—For use only where no more than one conversation is to be carried on simultaneously. The ringing of these telephones is selective, and any instrument may be called by pressing the corresponding button.

The equipment may be selected from the following types:

Flush Telephone—Style 5400-W, mat gold.

Surface Telephone—Style 520-W, golden oak.

Desk Telephones—Style 5210-W (with buttons in base and card holder), black and nickel.

Style 5200-W (with button block), black and nickel; mahogany block.

Style 3904-W (cradle phone with buttons in base), ebony and nickel.

Style 5270-W (hand type with button block), polished aluminum and mahogany block.

Standard in four, eight, and twelve-button sizes. Special finishes extra.

Junction Boxes, Cable and Batteries—Described above under common return, selective talking systems.

Annunciators and Button Pads—Connecticut annunciators are equipped with a style of drop which is simplicity itself. It consists of an operating and resetting coil. No permanent magnets are involved. The actuation of the operating coil closes knife contacts which put the reset coil in circuit with the reset button. Only the drops which have been operated are in circuit with the reset wire, thereby materially reducing the amount of current required for this operation. But one reset button is needed regardless of size; (series multiple combinations with a reset button for each limited group of drops on a large size annunciator is not necessary). Each drop is a self-contained unit and can be easily removed from the annunciator by disconnecting the wires and removing a single machine screw. All are mounted on a vertical metal mounting strip, giving a rigid and substantial construction. These strips are integral with the back board so that when the front of the cabinet is removed all operating parts are accessible in their working condition. The line terminals have machine binding screws. Annunciators are arranged for electric or automatic reset singly or in multiple. When so specified the drops are adjusted for operation on a low voltage transformer.

Annunciators—Type S—double-gong bell—Style 760-W surface cabinet, golden oak.

Type O—concealed buzzer—Style 780-W surface cabinet, golden oak.

Type W—flush—Style 790-W with concealed buzzer. Metal trim, mat gold.

Type G—portable desk—Style 770-W cabinet, mahogany—felt base, 6-ft. flexible cable and terminal strip.

Special finishes extra.

Button Pads—Style 2200-W, portable type with 6-ft. flexible cable; polished nickel top, mahogany weighted felt covered base.

Style 2201-W, flush type with card holders—polished nickel.

Style 2110-W, surface wall type, mahogany finish top.

Style 2150-W, same, with 6-ft. flexible cable and weighted felt covered base.

Style 394-A, push buttons. Light or dark, composition or pearl center, nickel or brush brass rim—wiping contacts—convenient screw connecting terminals, fit ⅝-in. hole.

Special finishes extra.

Catalogue—Sent on request.

AUTOMATIC ELECTRIC COMPANY

Automatic Telephone Equipments

FACTORY AND HOME OFFICE
Corner Morgan and Van Buren Streets
CHICAGO, ILL.

BRANCH OFFICES
NEW YORK, N. Y., 21 East 40th Street
CLEVELAND, OHIO, Cuyahoga Building
LOS ANGELES, CAL., 238 San Fernando Building

ASSOCIATED COMPANIES

INTERNATIONAL TELEPHONE SALES AND ENGINEERING CORPORATION, 21 East 40th Street, New York, N. Y.

INTERNATIONAL AUTOMATIC TELEPHONE CO., LTD., Norfolk House, Norfolk Street, Strand, London, W. C. 2, England

AUTOMATIC TELEPHONE MANUFACTURING CO., LTD., Milton Road, Edge Lane, Liverpool, England

COMPAGNIE FRANÇAISE POUR L'EXPLOITATION DES PROCÉDÉS THOMSON-HOUSTON, 13 Passage des Favorites, Paris, France

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Products and Services

Manufacturers and installers of AUTOMATIC TELEPHONE SYSTEMS for private and public service.

History and Adoption

The Automatic system was first utilized for city exchanges and has been thus serving in numerous cities in America and abroad for over 30 years.

During the past 20 years, this equipment has been adopted extensively for private interior exchange service, and is now in operation in many of the most representative organizations throughout the world.

Instruments

The instruments in this system are similar to those of the ordinary telephone system, with the exception of raised dial 2¾-in. diam., which has around its rim 10 holes numbered from 1 to 0, and is revolved by means of the finger.

Of the instruments there are various types: wall, desk, hand, mine, and others specially designed for particular purposes.

Automatic Exchange

This apparatus takes the place of the manual switchboard and the operator, and is placed in any convenient or available space, the size of which depends on the size of the system. Neither natural light nor ventilation is essential.

The apparatus is entirely self-contained, enclosed in a glass cabinet, and sufficiently attractive in design and finish to be installed in a conspicuous place.

The private automatic exchange switchboard is designed to serve any desired number of stations.

P-A-X TRADE MARK
PRIVATE AUTOMATIC EXCHANGE

Automatic Electric Company is the originator of P-A-X and is the only organization in the United States manufacturing interior telephone equipment under this trade-mark. Its use by any other company is absolutely unauthorized.

Automatic Electric Services

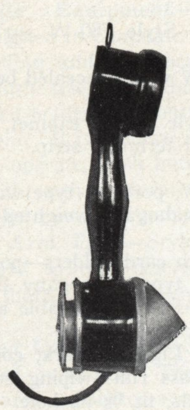
In addition to interior telephone service this equipment renders a group of affiliated services all controlled and operated by the Automatic exchange and involving but slight extra wiring or expense.

Any or all of these services may be included in the initial installation, or added later, as required. Some of these services are:

Code Call—By which code signals can be sent out to horns, bells, lights, etc., in all parts of the establishment, to locate a person not at his desk.

Conference Wire—By which three or more persons can meet and confer telephonically.

Emergency Alarm—For fire or other emergencies. This may be a general alarm, or may give both "still" and general alarms.



Hand Telephone
Light, compact, handy; 9 in. long. When not in use hangs from hook under desk

Automatic Wall Telephone
Compactly arranged, black enamel steel cabinet

Automatic Desk Telephone
No larger and no heavier than the manual

Continued on next page

Method of Operation

The person who is calling lifts the receiver in the customary manner, and connection is then made by rotating the dial.

If station 65 is wanted the finger is placed on the dial hole over 6 and drawn around to the finger stop. Then the finger is removed, and the dial revolves back to its original position. The operation is repeated for the number 5. This completes the connection and rings the bell at station 65. It requires but two seconds to make such a call.

The ring is heard in the receiver of the calling station, and is repeated at intervals until the called station answers or the receiver is hung up at the calling station.

If the station wanted is engaged, a distinct buzz is heard by the persons calling. The hanging of the receiver on the hook breaks the connection, and another call can be made immediately.

The system is so flexible that those who do not wish to make their own calls can have their telephones so arranged that a clerk or stenographer can dial the connections for them.

Guarantee

The Automatic system is warranted to give absolutely satisfactory service and is guaranteed against defects of material or workmanship for one year.

Full and precise data and specifications gladly furnished on request.

Specifications for an Automatic Interior Telephone System

Under these specifications the contractor shall furnish and install a complete interior automatic telephone exchange, including all cable, wire, and runways for inter-connecting switches, and connecting switches to power plant, to main distributing frame and all other equipment as hereinafter described.

General—The system shall be of Automatic Electric Company's type or equal and shall provide for the following features:

(1) All stations shall be able to communicate with each other, the connections being established by means of switching apparatus controlled by a calling dial mounted on each telephone.

(2) Any two stations shall be able to communicate without the possibility of being overheard or interfered with by a third station.

(3) Access to any station already in use shall be automatically prevented and, when attempted, a distinctive tone shall be automatically transmitted to such station making the attempt.

(4) Ringing the bell shall be intermittent and controlled automatically from the central switchboard, without the necessity of a ringing key or button at any telephone.

(5) The ringing of the bell at the called station shall be indicated to the station calling by a distinctive audible tone in the receiver of the calling station.

(6) Equipment shall be of such a design that only a single pair of wires are required between each station and the switchboard.

Switchboard—The Switchboard shall have a capacity of......individual lines and.......connecting units; regular connecting units shall be arranged for on the first.......spaces, and the.......space shall be arranged for an executive right-of-way service unit as required.

For economy and to facilitate additions, the switchboard shall be furnished with the positions reserved for the ultimate equipment, completely wired and equipped with switch jacks, multiple cable and apparatus for multiplying the station lines and trunks so that a station or trunking apparatus can be added by simply placing the required apparatus in the jack.

Telephones—The telephones shall be of the following types:

.... Wall Telephones
.... Desk Telephones
.... Hand Telephones
.... Mine Telephones
.... Flush Telephones

All telephones shall be of the highest quality and, in design, construction and performance, the equal of telephones used by public telephone companies.

Each telephone shall be equipped with a standard calling dial, consisting of a revolving disc, having ten finger holes, under which shall be mounted a stationary enameled number plate marked with figures, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, in black on a white background.

All telephones shall be equipped with bakelite receiver shells, cups and mouthpieces, and shall have ringers of the polarized, double-gong type.

Storage Battery—An approved storage battery of proper voltage and capacity shall be furnished; such battery shall have glass jars and shall be installed in an enclosed type of cabinet with sand trays, lugs and hydrometer.

Motor Generator—A charging motor generator set shall be furnished, consisting of a motor directly connected to a generator by means of a flexible coupling mounted on a slate base which in turn is mounted on a wood pier. The motor shall be designed to operate on......volts......cycle......phase; the generator shall be of sufficient capacity properly to charge the storage battery at the normal charging rate; the field regulator of the generator also shall be mounted on the slate base of the charging set.

Miscellaneous—A powerboard of black electrical slate, mounted upon a steel upright, shall be furnished. This powerboard shall include Weston Electrical Instrument Co.'s voltmeter and ammeter of the proper calibrations for use with the operation of the switchboard. The ammeter shall be of such a type that the reading will show the rate of charge or discharge. The powerboard shall also include the necessary automatic type of reverse current circuit breaker, charging switch, voltage control relays and supervisory signals and relays for indicating unstandard conditions of the switchboard or power equipment. The switchboard shall also include carbon arrester and heat coil type of protection, together with terminal blocks for the cross connection of the station lines with the switchboard line equipment.

The switchboard and powerboard shall be enclosed in a substantial steel and glass cabinet designed to be as dustproof as practical, also each line selecting unit shall be covered with an individual metal dustproof cover of a slip-on type.

A suitable set of wrenches, pliers and other tools including a hand test telephone for testing shall be furnished, together with a set of circuit and wiring diagram blue prints, and also a complete set of adjustment specifications covering the relay and mechanical equipment.

S. H. COUCH COMPANY, INC.

Private Telephone Systems

GENERAL OFFICE AND FACTORY
NORFOLK DOWNS, MASS.

BRANCH SALES OFFICES
NEW YORK, N. Y., 76 Varick Street
CHICAGO, ILL., 337 West Madison Street
BOSTON, MASS., 170 Purchase Street

SALES AGENCIES
PHILADELPHIA, PA., John R. Hollingsworth
SAN FRANCISCO, CAL., Sierra Electric Co.
SEATTLE, WASH., Sierra Electric Co.
LOS ANGELES, CAL., Sierra Electric Co.
MONTREAL, QUE., G. L. MacGillivray & Co., Ltd.

DEALERS AND INSTALLERS IN ALL PRINCIPAL CITIES

Products

Intercommunicating Telephone Systems, ranging from a simple Private Line for from house to garage to the Couch Autophone System, an Automatic Private Exchange for service between many stations.

Also Annunciators for any service, including elevator, return call, telephone, etc.; Push Buttons for desks, elevators, etc.; Government Approved Mail Boxes for apartments for use with telephone or speaking tube systems; complete line Apartment House Telephone Systems.

Experience

Since 1894 when our business was started, we have been constantly engaged in the design and production of private telephone systems.

Systems B-33B and S-438

Application—For schools. Simple, efficient and reliable systems, easily operated and maintained.

Service and Operation—Master station can call and talk with any substation and vice versa.

Any substation can talk with any other substation by first calling through master station.

All stations common to one talking circuit.

All calls from substations register on annunciator at master station, allowing person at master station to answer calls made during absence.

Master Call for S-438 Only—The call board of the master station is equipped with a master button for ringing all stations simultaneously for conference or general call by means of code ringing. The house wiring for the two systems is the same.

Specifications—(1) Furnish all necessary telephones, wiring, labor, battery and other accessories for a complete telephone installation of............substations, equipped for an ultimate expansion to............substations.

(2) The service to be such that a master station may call and talk with any substation by first pressing the proper button on a call board; that any substation may call and talk with the master station by first pressing a button on their telephone; that any substation may talk with any other substation by first calling the master station and requesting that the desired substation be called. All incoming calls at the master station are to be registered on an annunciator so that calls received when the master station is unattended may receive the proper attention later. This annunciator is to be electrically re-set from a special button on the call board of the master station.

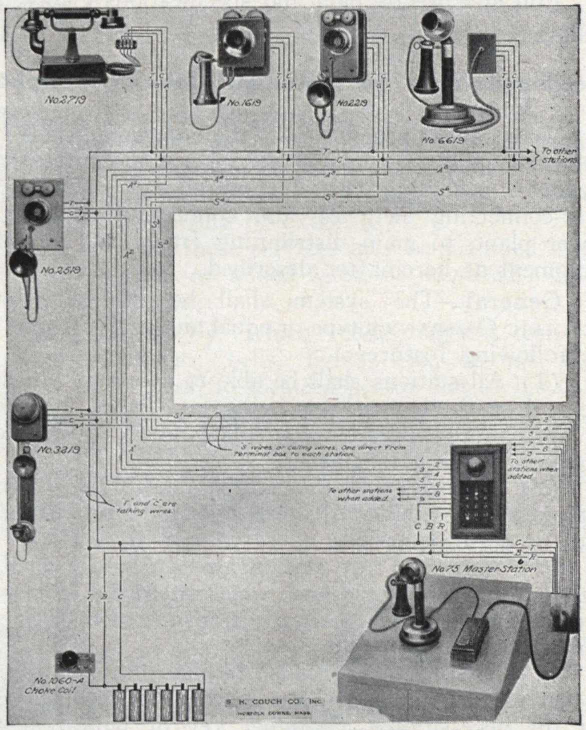
System S-438 Only—The master station to be equipped with a master call button to call all substations simultaneously for conference or for general calling of manager or superintendent by means of code ringing.

(3) All telephone apparatus to be of the manufacture of S. H. Couch Company, Inc., as follows:

One (1) No. 75 Master Station of .... station capacity.
.... No. 6619 Substation Desk Sets.
.... No. 2219 Substation Metal Box Wall Sets.
.... No. 1619 Substation Wood Box Wall Sets.
.... No. 2719 Substation Hand Microphone Table Sets.
.... No. 2519 Substation Flush Wall Sets.
.... No. 3219 Substation Hand Microphone Wall Sets.
One (1) No. 1060A Choke Coil for Talking Circuit.

Note: Add M.C. to above code numbers if used in System S-438.

All to be located in accordance with plans or instructions of owner or architect.



Graphic Layout of Systems B-33B and S-438

(4) Wiring to consist of No. 19 B. & S. gauge copper, excepting battery wires which are to be No. 16 B. & S. gauge, suitably insulated to meet the installation conditions and concealed as much as possible in partitions, under floors or behind picture mouldings and to be properly protected against dampness, extreme heat and mechanical injury.

(5) The necessary battery shall consist of an approved make of dry cells, located in a cool, clean and dry, easily accessible place not over 20 ft. distant from the master station and enclosed together with the choke coil in a neat wood or metal box.

(6) The entire installation shall be subject to the approval of the owner or architect. Any defect in the system arising within one year after its acceptance shall be corrected free from expense to the owner, provided such defect is due to faulty construction of the apparatus or installation.

Continued on next page

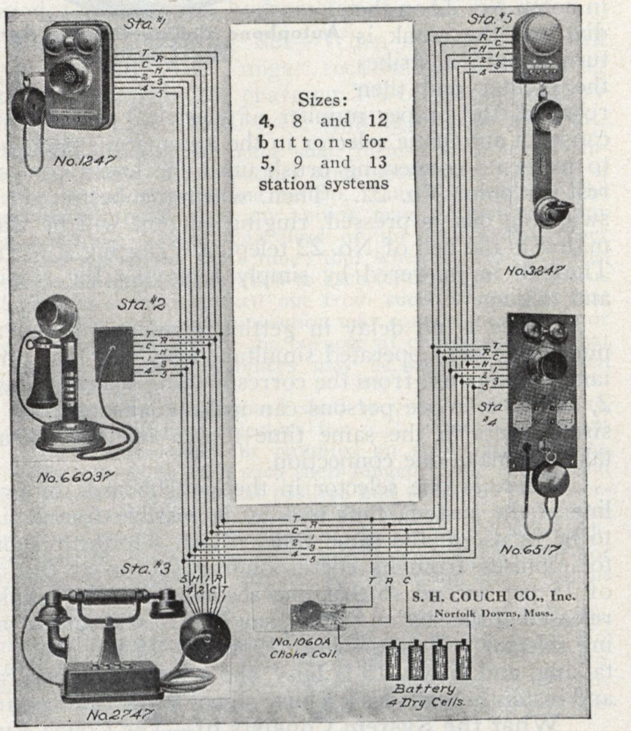
System B-2A

Application—For residences, offices, small factories, etc., where use of no more than 2 stations at a time is required.

Service and Operation—Any station may call any other station direct by pressing the proper button.

All stations are connected to one talking circuit so that conversations are limited to 2 stations at a time, except that any station may ring in order to several others, and the group may then hold conference.

Sizes—4, 8 and 12 buttons for 5, 9 and 13-station capacity system.



Graphic Layout of System B-2A

Specifications—(1) Furnish all instruments, wiring materials, and labor for the installation of a complete system of telephone stations to be located as shown on plans.

(2) The service is to be such that any station in the system may call any other station by pressing the proper button and only the desired station will ring. All stations are to be bridged to one common talking circuit limiting conversation to 2 stations at a time except that any station, if desired, can ring in order several others so that such stations may hold a conference.

(3) All telephones are to be of the manufacture of S. H. Couch Company, Inc., as made for their System B-2A. The number and types of telephones to be installed are as follows:

(Insert here quantity, type and call button capacity of each telephone desired)

(4) All cables shall have sufficient number of conductors to take care of the full number of buttons on the telephones so that the full station capacity by the telephones may be utilized. Cables must be neatly installed, properly supported, and suitably protected by piping, moulding, or porcelain bushings wherever necessary to guard against mechanical injury.

(5) Inside construction: Couch Type B braided cable may be used in dry places. Couch Type L lead incased cable must be used in damp places. Cables may be fastened with wood, metal, or porcelain cleats at the option of the contractor.

(6) Outside construction: Type L lead incased cable must be used for overhead and underground runs between buildings. If placed underground it must be installed in pipe the entire length of such run; if carried overhead it must be supported to a No. 12 galvanized iron wire by cable hangers placed not over 3 ft. apart, the iron wire to be securely fastened at both ends and not to span a distance greater than 125 ft. without an intermediate fastening. Overhead cables must enter buildings through a porcelain bushing and slightly looped to form a drip to prevent water following the cable and entering the building.

(7) The battery consisting of the proper number of dry cells for satisfactorily operating the system must be located in a dry, clean and accessible place enclosed in a wood or metal box.

(8) The entire installation shall be subject to the approval of the architect.

System B-12A

Application—For banks, offices, factories, etc., where conversation between any number of stations at a time is needed.

Service and Operation—Any station may call any other station direct by pressing the proper button.

Call connects automatically when receiver is removed at called station and conversation may proceed. Any number of pairs of stations in system may converse at a time.

Sizes—10, 12, 16 and 20 buttons for 11, 13, 17 and 21-station capacity systems.

Specifications—(1) Furnish all instruments, wiring materials, and labor for the installation of a complete system of ....telephone stations to be located as shown on plans.

(2) The service is to be such that any station in the system may call any other station by pressing the proper button and only the desired station will ring, and that any number of pairs of stations may converse at the same time without interference between pairs.

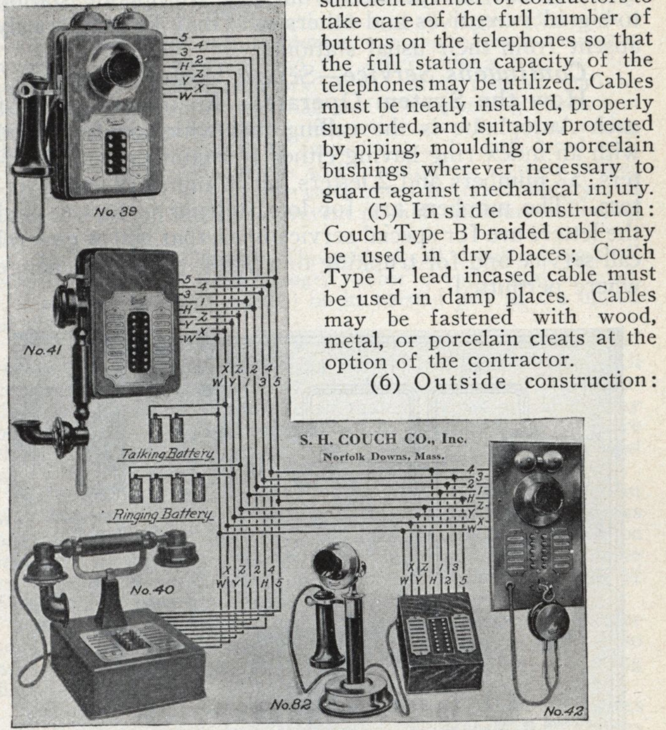
(3) All telephones are to be of the manufacture of S. H. Couch Company, Inc., as made for their System B-12A. The number and types of telephones to be installed are as follows:

(Insert here quantity, type and call button capacity of each telephone desired)

(4) All cables shall have a sufficient number of conductors to take care of the full number of buttons on the telephones so that the full station capacity of the telephones may be utilized. Cables must be neatly installed, properly supported, and suitably protected by piping, moulding or porcelain bushings wherever necessary to guard against mechanical injury.

(5) Inside construction: Couch Type B braided cable may be used in dry places; Couch Type L lead incased cable must be used in damp places. Cables may be fastened with wood, metal, or porcelain cleats at the option of the contractor.

(6) Outside construction: Type L lead incased cable must be used for overhead and underground runs between buildings. If placed underground it must be installed in pipe the entire length of such run; if carried overhead it must be supported to a No. 12 galvanized iron wire by cable hangers placed not over 4 ft. apart, the iron wire to be securely fastened at both ends and not to span a distance greater than 125 ft. without an intermediate fastening. Overhead cable must enter building through a porcelain bushing and slightly looped to form a drip to prevent water following the cable and entering the building.



Graphic Layout of System B-12A

(7) The battery consisting of the proper number of dry cells for satisfactorily operating the system must be located in a dry, clean and accessible place enclosed in a wood or metal box.

(8) The entire installation shall be subject to the approval of the architect.

Continued on next page

Couch Autophone System—Patented Private Automatic Telephone Exchange

Suitable for banks, offices, schools, residences, industrial plants, etc., where the capacity of the system exceeds 20 stations and where full intercommunication between stations is desired *without the services of a central operator*.

The Couch Autophone system combines all the best features of centrally operated systems with those of full intercommunicating systems, and eliminates the objectionable features of manual operation.

Advantages of the System—Incorporated in the Couch Autophone system are the following unique service features, all obtained with the use of one central storage battery over 3 wires from each telephone instrument to the automatic switchboard.

Instantaneous Operation—Any station can call any other non-busy station by operating the Autophone dial once. *No central operator is required.*

Secrecy of Conversation—Access to a busy line is impossible. The calling party gets a busy signal.

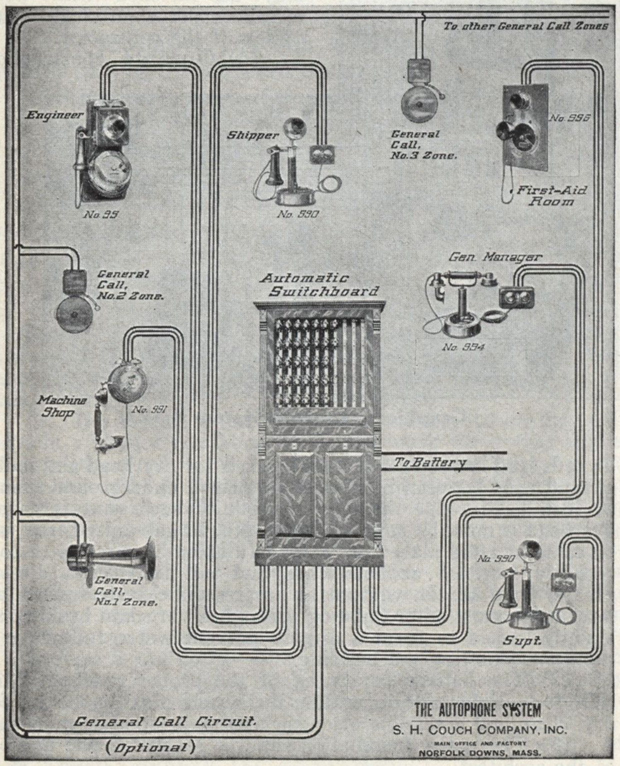
100% Capacity of Conversation—Any station can connect to any other non-busy station regardless of the number of lines in use.

Conference Service—Several stations can interconnect for private conference and several of such conferences can be carried on simultaneously.

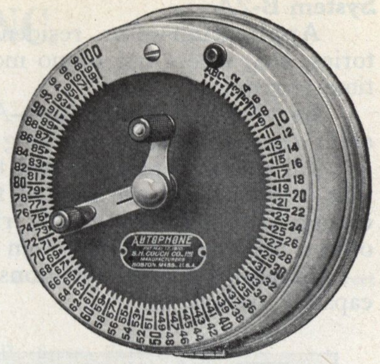
General Call Service—Any number of horns, bells, or both, can be operated from any Autophone station to signal executives and others who may be temporarily absent from their usual stations.

Continuous Service—Service always available.

How the System Operates—An integral part of each Autophone is the calling dial which is furnished with an index ring having either 103 numbers and 3 letters, 52 numbers and 2 letters, or 30 numbers and 3 letters. The numbers are for local telephone service and the letters are for special service lines, that is, for general call service and for trunking to a public service exchange where permitted.



Graphic Layout of Autophone System



Autophone Calling Dial—a Part of the Telephone

The Autophone dial is a simple, sturdy device which is positive in operation. Its function is to send a series of impulses to the automatic switchboard, the number of impulses sent being governed by the travel of the crank on the dial. If, for instance, the dial pointer is set in notch No. 22 on the dial and the crank is turned until it strikes the pointer and then released, the proper number of electrical impulses will cause an automatic selector in the automatic switchboard to move its connecting brush until the brush comes to rest on point No. 22. Then, when the button on the switching dial is pressed, ringing current will be transmitted to the bell of No. 22 telephone, causing it to ring. The call is answered by simply removing the receiver and talking.

There is no delay in getting connections and any number of dials operated simultaneously will find simultaneous response from the corresponding selectors, hence 2, 10, 20 or more persons can make connections to desired points in the same time that a manual operator takes to make one connection.

There is one selector in the switchboard for every line in the system, thus making it possible for all lines to be in use at the same time. Each selector responds to impulses from its corresponding station at the rate of 15 per second so that one second after the crank is released at the station calling, say No. 15, the corresponding selector will land its brush on No. 15 line ready for talking, and if No. 15 is busy, the selector automatically and instantly sends back a busy signal to the calling party.

What the System Consists of—The Couch Autophone system consists of an automatic switchboard, telephones, a 24-volt storage battery, a battery charging set, and necessary wiring. General call bells and horns are optional equipment and may be added to the system if desired.

Autophone systems are available in 3 sizes, 30, 50 and 100 lines, but the actual station capacity may exceed the line capacity by connecting two or even three Autophone stations to one line. It is possible for 40, 50 or even more stations to be served to advantage by a 30-line Autophone switchboard.

Autophone Automatic Switchboards—Made of oak in the following sizes, and either partially or fully equipped with selectors according to requirements:

No.	Selector capacity	Cabinet dimensions, in.			Type
		Width	Height	Depth	
F	30	24½	61½	12	Wall mounting
G	50	38	85	12	Floor
H	100	68	85	12	Floor

Telephone Sets—Six types of telephones (as illustrated), each equipped with the Autophone calling dial, are available for the Autophone system, namely:

No. 99 wall set with ordinary receiver
No. 991 wall set with hand microphone
No. 995 flush wall set for residences and hospitals
No. 990 desk set with ordinary receiver
No. 994 table set with hand microphone
No. 996 weatherproof box set for outdoor service

Combinations of these 6 types can be used in the same system.

Continued on next page

General Call Horns and Bells—The following equipment, operating on 24-volt storage battery, is supplied only when specified:

No. S-1, 4-in. cow bell
No. S-2, 6-in. weatherproof bell
No. S-3, 3½-in. horn

General Call Unit—All Autophone switchboards are regularly wired for one general call unit for operating bells and horns. This unit can be added at any time and is not installed in the switchboard unless otherwise specified.

Storage Battery—When specified, we will supply our No. YG-60 storage battery, 24-volt sealed type, fully charged, together with hydrometer.

Battery Charging Set—When specified, we will supply our No. A-1 Tungar rectifier with regulating switch and ammeter for charging YG-60 storage battery from 110 or 115 volt, 60-cycle lighting or power circuit.

Specifications—Contractor shall furnish all necessary instruments, wiring, labor, battery and other accessories for a complete automatic telephone system, ready for service. The system shall provide that any station may connect with any other non-busy station regardless of the number of other stations in use at the same time; that when any two stations are connected in talking relation to each other, all other stations shall be automatically locked out from such connection; that one of the parties to any connection may connect to any one or more non-busy stations for the purpose of conference and that one or more such conferences may be established between stations at will.

The automatic switchboard shall be ...... lines capacity, equipped with sufficient selectors for ...... lines for present use. The selectors shall be mounted on steel angle shelves, 5 selectors to a shelf, with each shelf hinged to the cabinet and resting normally in a vertical position and arranged for lowering to a horizontal position without disturbing any connections or interfering with the operation of the system. The switchboard shall be further equipped with a general call unit for controlling the necessary circuits for operating ...... horns and ...... bells.

Telephones shall have dials for ...... lines capacity. The number and types to be installed shall be as follows: ...... No. 990 desk telephones, ... No. 991 hand telephones, ... No. 99 wall telephones, ... No. 94 table telephones, ... No. 995 flush telephones and ...... No. 996 weatherproof telephones.

There shall be ...... 3½-in. horns and ...... 4-in. cow bells installed for general call signals. Horns and bells are not to be used on the same circuit. No more than 6 horns and not more than 20 bells shall be connected to any circuit.

Location of switchboard, telephones and general call horns and bells shall be designated by the architect or owner's representative.

Wire—Each single station circuit shall consist of 3 conductors from the telephone to the automatic switchboard.

Each party line circuit shall consist of 3 conductors from the automatic switchboard to the first station on the circuit and 5 conductors from the first to the second station. The 3 conductors of each circuit shall be twisted throughout after the manner of regular triple conductor telephone wire. Wires and cables shall be in accordance with the following specifications:

(a) Individual Circuits—Each conductor shall be of No. 19 B.&S. gauge copper insulated with 3/32-in. rubber and then braided, the 3 conductors then twisted together. For damp places or where exposed to the weather, each conductor shall be treated with a weatherproof compound before twisting.

(b) Cables—Where 10 or more circuits parallel each other for a distance of 100 ft. or more, such circuits shall be carried in cable form from a suitable junction box to the automatic switchboard. The conductors of all cables shall not be smaller than No. 20 B.&S. gauge copper, tinned and insulated with one silk and two cotton coverings wound in reverse direction. The 3 conductors for each circuit shall be twisted together after the manner of regular triple conductor telephone wire, and each conductor of a circuit shall be of different color to permit of identification.

(c) Interior Cable in Dry Places—Where used in perfectly dry places, the covering of the cable core shall consist of a winding of cotton, then 2 reverse wrappings of paraffined paper, then a cotton braid treated with a slate colored moistureproof and flameproof compound.

(d) Interior Cable in Damp Places—Core of cable shall be made as specified under section "b" and have an outer sheathing of lead and not less than 1/16-in. wall.

(e) Aerial Cable—Cable for aerial use shall be of the same construction as that under section "d" and shall be supported by a steel messenger wire and secured to the same by clips or hangers at intervals of not more than 2 ft. The messenger wire shall be supported in a substantial manner at proper intervals.

(f) Underground Cable—Underground cables shall be of the same construction as called for under section "d" and shall be laid in suitable conduit as a safeguard against mechanical injury, or, if conduit can not be provided, then a standard park cable shall be used. This park cable shall be made as follows: the requisite number of triple conductors for the telephone service and one extra set of triple conductors for each 10 sets of triple conductors, each conductor to be of No. 19 B.&S. gauge, with rubber insulation. Over the conductors shall be a binding of tape; next, suitable lead sheathing; next, jute and tar; next, 2 steel tapes applied in reverse direction, finally, jute and tar and finish coat. Such cables should be thoroughly saturated with tar. Park cables must be laid at least 18 in. below the surface.

Erection of Wires and Cables—All interior individual circuits shall be supported at intervals of not more than 3 ft. with insulated saddle staples or wood cleats. Where several individual circuits run parallel, they shall be supported by either porcelain cleats or enameled open screw rings at intervals or not more than 3 ft. All interior cable shall be supported by snugly fitting pipe clips or straps of not more than 3 ft., shall be run as straight as possible and all sharp bends avoided.

Junction Boxes—Whenever individual circuits are extended by a cable, a junction box located in a perfectly dry place shall be used. The junction box shall be provided with a brass connector for each conductor, one side of each connector having a screw terminal and the other side a terminal for soldering to. The conductors of individual circuits shall be connected to the screw terminals and corresponding conductors of the cable soldered to the solder terminals. Before attaching the cable wires, they shall be fanned out and neatly laced with twine so that the conductors will be adjacent to their proper connectors. The end of the cable must be taped tightly and given 2 coats of shellac to prevent possible moisture following the core of the cable.

General Call Circuit—The general call circuit wiring shall consist of No. 14 B.&S. gauge, rubber covered and braided. Conductors shall run parallel or in twisted pair at the option of the installer.

Conduits—Any necessary conduits shall be provided and installed in the same manner as for electric light service. All conduits shall terminate in standard switch boxes. This conduit shall be of sufficient size so that all wires or cables may be readily inserted. Contractor will be permitted to pull more than one circuit through a single conduit or insert cable and wires through same conduit if convenient.

Outlets for desk sets where such desks are away from wall are to be made in standard floor boxes. Where desks are placed against the wall, standard outlet boxes shall be installed 12 in. above the finished floor line. Wall telephone outlets shall have standard outlets brought out at a height of 5 ft. 3 in. from finished floor line.

All conduit shall be installed so as not to form water pockets and all ends and joints shall be properly reamed so as to prevent tearing of insulation while wires are being fished in.

Should conduit lengths exceed a distance where the wires may be readily drawn from outlet to outlet, necessary pull boxes shall be provided.

Battery and Power Wires—The 2 conductors leading from the storage battery to the automatic switchboard shall be rubber covered and shall have a weatherproof braid. The resistance of each conductor shall not exceed .01 of an ohm. Battery wires shall be supported by porcelain cleats. Wiring between battery charging switchboard and charging service mains shall be done in strict accordance with Fire Underwriters' rules.

Battery Charging Outfit—Suitable battery charging equipment shall be furnished for charging the battery from (insert here voltage and kind of current available for charging).

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INTER-COMMUNICATING TELEPHONE SYSTEMS for use in banks, hospitals, schools, stores, offices, factories, and residences.

APARTMENT HOUSE TELEPHONE SYSTEMS, including Flush and Surface Type Telephones, Mail Boxes, Annunciators, Switchboards, and theftproof, loud speaking "Cordless" Vestibule Equipment.

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A General Discussion of Federal Telephone Systems

The Federal Inter-communicating and Apartment House Telephone Systems are, in general, inter-communicating systems operated without a central station and from a common battery. By changing the wiring and using different instruments and accessories practically any type of service may be obtained.

The normal apartment house installation consists of one or more calling or master stations, together with necessary apartment phones or other special stations either with or without buzzer, annunciator, or door opening devices operated from the individual stations. Individual apartment stations are not, as a rule, so wired as to be able to call each other, although this service can be furnished where necessary, the system then becoming practically the standard completely inter-communicating system, wherein any station can call any other station.

The following are the more important parts of Federal Telephone systems:

(1) **Talking Circuits**—

(a) Common—wherein use of any part of the system renders the entire system "busy," and "listening-in" is possible.

(b) Non-interfering—wherein no part of the system is in use except that connecting the two stations talking; conversations are absolutely secret except in so far as concerns any other master station on the system which might desire to "listen in." At the option of any calling station (master station) any number of the individual phones may be brought into the conversation. Also, as many individual conversations may be carried on at one time as there are master or calling stations.

(c) Inter-communicating—wherein any station may talk to any other station on the system without having to go through a third (master) station. Such systems may be either common talking or non-interfering, and one or more stations may be "master stations."

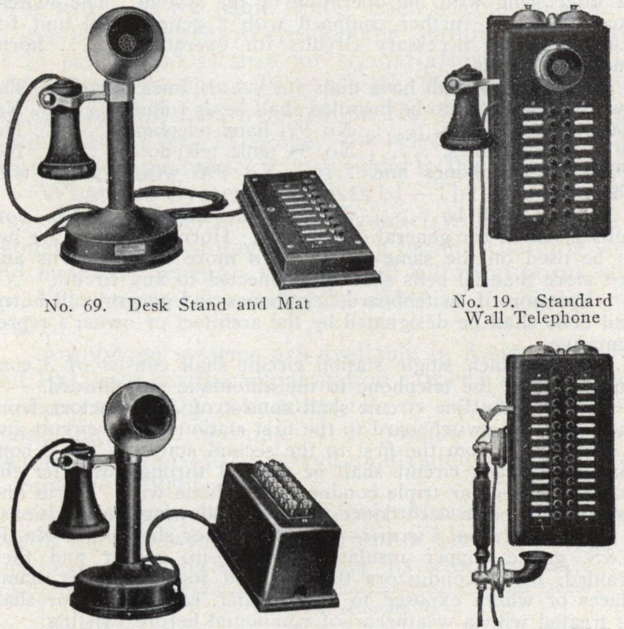
(2) **Auxiliary Circuits**—

(a) Signaling or calling. Any desired arrangement of common or selective signaling or calling can be furnished. When more than one station can call any other station, annunciators can be provided to indicate the calling station. Where desired, master ringing keys can be provided.

(b) Door opening. In apartment house systems each apartment, and where desired, master stations, other than the vestibule stations, can be equipped with door opening button or key.

(3) **Telephone Instruments**—

Practically any standard type. Bells may be internal or external. Calling and door opening keys may be integral or on separate boards. Keys may be numbered or name plates may be provided. For vestibule service, an audible or "cordless" type instrument is recommended, as with this type of phone the receiver and mouthpiece can not be stolen or accidentally damaged. If such instruments are used at any point in the system it is necessary that all other instruments in the system be specially wired; with this one exception, all instruments are interchangeable.


No. 69. Desk Stand and Mat

No. 19. Standard Wall Telephone

No. 1001. Standard Desk Set with Key Box

No. 39. Wall Microphone Set

Types of Federal Telephone Instruments

For selective and secret talking, push button key gangs are used which operate by spring combination. The spring groups are mounted on a steel frame which is rigidly attached to the face plate of the telephone or mounted in a separate box, as desired. The key of selected number when depressed full length closes the ringing circuit and rings the calling bell; when released the key opens the ringing circuit and closes the talking circuit; when the called number answers a "home" button with red head must be depressed.

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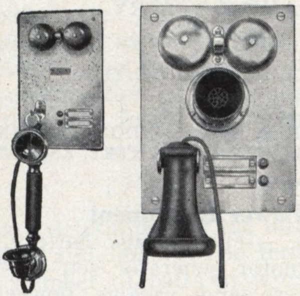
Federal Apartment House Telephone Systems

Standard—The Standard Telephone System is of the common talking and selective calling type.


No. 22H No. 22
Flush Type Telephone

System No. 16 and 16-P—Vestibule to apartments, with door opening button in apartments.

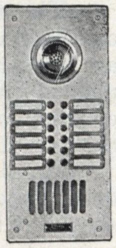
System No. 21 and 21-P—Vestibule and janitor to each apartment, door opening and janitor calling buttons in each apartment, but not in vestibule.

System No. 19 and 19-P—Vestibule, janitor and tradesmen's entrance to each apartment, door opening and janitor calling button in each apartment. Vestibule and tradesmen's entrance can call janitor, but janitor can not open vestibule door. Annunciator added to janitor's phone.

System No. 31 and 31-P—Vestibule, janitor and tradesmen's entrance to each apartment, vestibule to janitor, door opening and janitor button in each apartment, janitor can open vestibule door.

System No. 46—Vestibule, janitor, tradesmen's entrance and laundry to each apartment. All can call janitor, apartment and janitor have door opening button, apartments and janitor can call laundry.

Cordless or Audible—A common talking, selective calling system which derives its name from the fact the vestibule telephone is of the flush type and carries no externally removable receiver or mouthpiece, thus eliminating the possibility of tampering or theft. The receiver is a horn with loud speaking amplifier, built in behind the face plate. The mouthpiece is of the standard capsule type, set in a specially designed depression in the face plate. In a standard telephone system the circuit is broken at each instrument when its receiver is on the hook. In the cordless type there is no hook or other movable part in the vestibule phone—the circuit is only broken at the apartment phones and the removal of any receiver in the system from its hook places the vestibule phone in circuit. For this reason, all phones used at any point in this system must be specially wired—the internal wiring of the standard set will not provide current for the phone at the other end of the circuit.


Cordless Type No. 50 Telephone

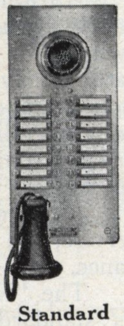
System No. 9 and 9-P—Vestibule to apartments. Door opening buttons in apartments.

System No. 10 and 10-P—Vestibule and janitor to each apartment, door and janitor calling buttons in apartments, janitor can open door.

System No. 13 and 13-P—Same as No. 10 and 10-P with addition of janitor's annunciator.

System No. 47—Same as No. 10 and 10-P with addition of vestibule to janitor, janitor has door opening button. Janitor's annunciator can be added, if desired.

Non-interfering—A selective calling and selective and secret talking telephone. Provides the highest class of telephone service for apartment houses. This system provides absolute secrecy in talking by use of the push button keys. All or as many stations as desired can be master stations. The maximum of 24 buttons is allowed on vestibule telephone—if more are required it is advisable to use additional instruments, sectionalizing the apartment house.


Standard Type No. 40 Telephone

System No. 35—Vestibule to apartments only, door opening button in each apartment.

System No. 32 and No. 33—Vestibule and janitor to each apartment, annunciator in janitor's apartment, janitor can not open door. In No. 32 janitor's station is key operated, in No. 33 janitor's station is jack and plug operated.

System No. 43—Vestibule, janitor and tradesmen's entrance to apartments, vestibule and tradesmen's to janitor, janitor has annunciator, door opening button in each apartment and janitor can open door.

Federal Inter-communicating Telephone

Inter-communicating telephone systems for installation in schools, factories, suites of offices, public buildings, residences, stores, etc.

Either the common talking or the non-interfering with selective calling systems can be used. Because secrecy in talking is nearly always desired the non-interfering system is the one most frequently used with a master station in the chief executive's office. As many stations as desired can be master stations.

As in the apartment house systems described above, by changing the wiring and use of accessories, a variety of services may be obtained.

Following are the most important systems:

Non-interfering System No. 2—This system provides selective calling and absolute secrecy. On this system as many conversations may be carried on as there are pairs of instruments, each absolutely secret from the others.

Calls are made and talking circuits completed by means of the push button, key gang described above. Master ringing keys can also be provided.

Master Station System No. 7—This system is for use where all calls must originate or go through the master station. This feature is desirable, in many cases, as it eliminates the indiscriminate use of the telephone. To this system may be added a master ringing key for the ringing of all or special groups of stations simultaneously. In school installations, these master ringing keys can be used for a program signaling system.

Common Talking Code Signaling System No. 5—A common talking, common signaling, code ringing system, where only one conversation at a time can be carried on.

Call and Return System No. 4—For use where only two stations are necessary, as from office to warehouse, etc. This is the simplest system that can be installed.

Federal Private Exchanges (PX)

For inter-communication requirements in mercantile establishments, offices, public buildings, schools, etc., large enough to call for a central station. PX can have all the features of the regular commercial system with certain additions, such as simultaneous ringing of all stations for conference, fire, etc. In many instances, PX stations can be connected to commercial exchanges allowing distribution to all connections of PX of calls originating from outside sources or calling through PX of outside numbers. There is no limit to the number of telephones that can be placed in this system.

Federal PB Boards—Furnished in either regulation jack and plug or monitor (cordless) types. Jack and plug boards are made in three general types: the regular floor type, a wall hung type of similar appearance, and a desk type where the lower portion of the floor boards is replaced by any type of office or stenographer's desk.

Federal Switchboard No. 221

THE NORTH ELECTRIC MANUFACTURING COMPANY

Automatic Telephone Equipment

GENERAL OFFICE AND FACTORY
GALION, OHIO
REPRESENTATIVES IN ALL PRINCIPAL CITIES

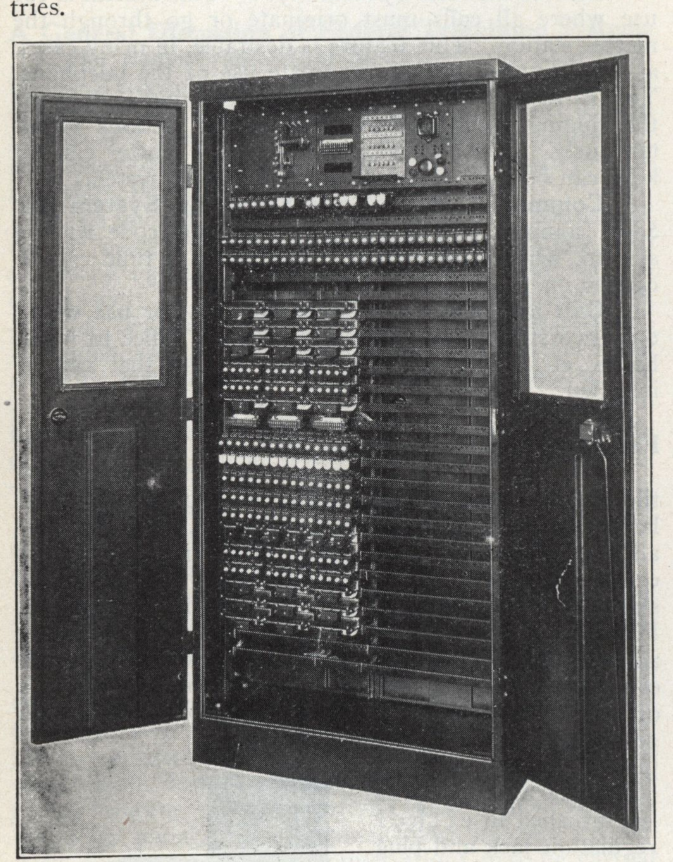
ASSOCIATED COMPANIES
COVENTRY AUTOMATIC TELEPHONES, LTD., LONDON, ENGLAND
PEEL-CONNER TELEPHONE WORKS, STOKE, COVENTRY, ENGLAND

Product

North Private Automatic Telephone Exchanges.

Experience and Development

The North Electric Manufacturing Company was originally established as a partnership in 1884 and during all of the intervening period has been engaged in the manufacture of telephone equipment. In addition to its complete line of private automatic telephone exchanges it also manufactures two varieties of machine switching equipments for city exchanges. The product of the Company is in service all over the United States and also in Canada, Mexico and in many foreign countries.



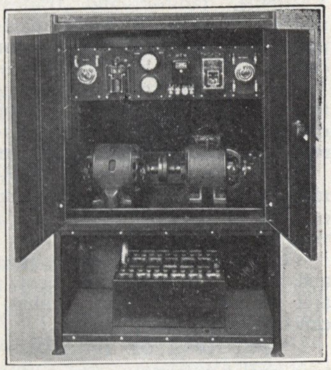
North All-Relay Automatic Exchange
Capacity, 50 lines and 6 links. Equipped, 30 lines and 3 links

Exchange Equipment

As the exchange equipment proper is extremely quiet in operation and suitable for installation in an office or other similar location, the cabinet used is a piece of standard steel office furniture finished in olive green, and equipped with glass doors as indicated by photograph. The apparatus shown is equipped for one-half the capacity of the cabinet so as to illustrate the arrangements for readily taking care of future growth.

Power Equipment

The storage battery, motor generator set, meters and various power control apparatus are also housed in a steel cabinet finished in green. Due to the nature of this equipment this cabinet is of a type suitable for installation in such places as engine room or basement. Illustration of this cabinet appears at the right.



North Power Cabinet

Telephone Instruments

The telephones used are the same as utilized in connection with city automatic telephone systems and are similar to those used in manual city systems of the common battery type, with the exception of the dial.

An illustration of the desk type instrument is shown at the right.

Automatic Desk Phone

The North Dial

All telephones are equipped with the North dial which drives and controls the entire mechanism. The finger wheel is of solid rustproof Monel metal and all delicate moving parts are housed in a dustproof case.

All-Relay Apparatus

The exchange apparatus is furnished in two separate and distinct types.

All-Relay equipment, as the name implies, is built of relays exclusively, using no rotary switches, step-by-step switches or any other form of electro-mechanical apparatus involving rotary friction, sliding or scraping friction or any other form of wear and tear with the accompanying oiling, cleaning, repairing and other maintenance. This type of construction gives the user the advantages of: (1) much greater durability or longer life, (2) freedom from interruption or more reliable service, and (3) cash saving through economy in maintenance.

The "North All-Relay Automatic Exchange" with its standardized power plant and the "North Dial" constitute the most finished and modern development of the automatic exchange art. The North Company is the sole American manufacturer of All-Relay exchanges.

Continued on next page

Switch Apparatus

The older type of equipment employing standard step-by-step switch mechanism is also built utilizing the same switches that the Company has used for two decades in the manufacture of city exchanges. These switches are used, however, for the connector mechanism only, the preselection equipment, even in the switch type of exchange, being of All-Relay construction. This equipment complies in detail with the older forms of private automatic exchange specifications.

Exchange Capacity

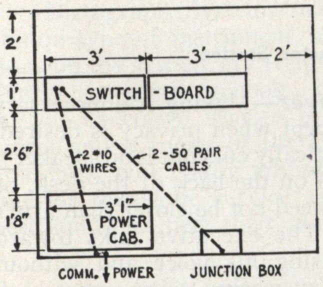
The sizes manufactured are determined by the ultimate capacity in terms of lines and links. The term lines refers to the maximum number of pairs of wires which can be used to connect telephones or services to the exchange. The term links refers to the maximum number of connectors with which the exchange can be equipped. Each link or connector will handle one conversation at a time and the number of links or connectors determines the maximum possible simultaneous conversations.

RELAY TYPE EXCHANGES

Type	Lines	Links	Exchange cabinet	Power cabinet
1	100	1	wall cabinet	none
3	30	3	1	none
5	50	6	1	1
10	100	4	1	1
11	100	10	2	1
30	100 to 1000	10 per 100 lines	2 or more	1 or more

SWITCH TYPE EXCHANGES

Type	Lines	Links	Exchange cabinet	Power cabinet
15	100	4	1	1
16	100	10	2	1
35	100 to 1000	10 per 100 lines	2 or more	1 or more



Typical Floor Plan, Type 11 North All-Relay Automatic Exchange
Capacity, 100 lines and 10 links

Code Call

When a desired party can not be reached by calling his telephone number, but is within reach of the telephone system, he can be located immediately and surely by dialing the same number through the code call apparatus. This equipment is housed in a small wall cabinet and uses two of the telephone numbers included in the capacity of the exchange, one for calling and the other for answering. This feature is highly recommended.

Other Features

If desired, the following features can also be furnished: Watchman's Service, Emergency Alarm, Conference Service, Executive Right-of-way, Departmental Selection, Pick-up Service, Annunciator Service.

Standard Specifications

Any manufacturer of automatic interior telephone equipment of the types used in automatic city exchanges can comply with the following condensed and simplified specifications, unless "North All-Relay" equipment is decided upon. As hereinbefore stated "All-Relay" is the latest completed development of the automatic telephone art, and the North Company is the sole American manufacturer.

Specifications

The contractor shall furnish and install ready for service one automatic interior telephone system with all conduits, wiring, telephones, battery, power equipment and other apparatus as hereinafter described.

Exchange Type—The telephone switching equipment shall be of the "All-Relay" automatic selective type or equal, having terminals for calling and for called lines, and connecting links, with automatic connection of the calling line to the link upon lifting the receiver, and automatic connection of the link to the called line by impulses transmitted over a single pair of wires from the calling station and produced by a ten-digit finger-hole dial mounted on the telephone set, the same as in automatic city exchanges. The switching mechanism shall be composed of relays exclusively.

Alternate Paragraph

Exchange Type—The telephone switching equipment shall be of the automatic selective type, having terminals for calling and for called lines, and connecting links, with automatic connection of the calling line to the link upon lifting the receiver, and automatic connection of the link to the called line by impulses transmitted over a single pair of wires from the calling station and produced by a ten-digit finger-hole dial mounted on the telephone set the same as in automatic city exchanges.

General—The exchange shall be so designed as to provide the following features:

(1) Each station shall be able to communicate with every other station.

(2) Any two stations shall be able to communicate without the possibility of being overheard or interfered with by a third station.

(3) Access to any station already in use shall be automatically prevented and, when attempted, a distinctive signal shall be automatically transmitted to such station attempting.

(4) All connections shall be controlled by the operation of finger hole dials carrying the digits 1 to 0 and mounted on the telephones.

(5) Ringing of the bells shall be intermittent and controlled automatically from the exchange without the necessity of a ringing key or button at the telephone.

(6) The ringing of the bell at the called station shall be indicated to the person calling by a distinctive audible signal in the receiver of the calling station.

Exchange Size—The exchange shall have a capacity of ...... lines and ...... links (trunks or connectors) and the initial installation shall be ...... lines and ...... links. Provision is to be made for adding lines and links without altering the original equipment.

Telephones—Telephone instruments shall be of the highest quality and in design, construction and performance the equal of telephones used by public telephone companies. All telephones shall be equipped with ringers of the polarized double gong type. The telephones shall be of the following quantities and types:

.... desk telephones; .... flush telephones;
.... wall telephones; .... hand telephones.

Power Equipment—The power equipment shall include a 48-volt storage battery of sufficient ampere-hour capacity to run the exchange for 24 hours under normal load without receiving charge; also a motor generator designed to operate from the local commercial current supply and of a sufficient watt capacity to keep the battery fully charged; and shall also include a voltmeter and ammeter, and apparatus for automatically starting, stopping and controlling the charging of the storage battery. There shall also be provided a device for generating alternating current suitable for operating the telephone bells and furnishing the busy signal. All of this equipment shall be of the standard design as furnished by the manufacturer for the size and type of exchange covered by these specifications.

Housing—The exchange proper shall be contained in a steel and glass cabinet. The power equipment may be included with the exchange, contained in a separate steel cabinet or mounted separately in accordance with the standard practice of the manufacturer.

Wiring—Telephone wiring shall be of No. 19 B & S gauge twisted pair braided, rubber covered interior telephone wire for dry locations, and No. 18 B & S gauge saturated braided rubber covered wire where dampness may be encountered.

A single pair of wires shall be used from each telephone directly to the automatic switchboard, or to the nearest distributing cable terminal.

Where found more convenient, standard No. 22 silk and cotton insulated lead covered switchboard cable may be used from local distribution points to the switchboard.

Cable wires and telephone distribution wires shall be terminated on approved terminal blocks mounted in suitable cabinets.

Conduits—Conduits shall be run in the switchboard room between the various pieces of apparatus according to the manufacturer's blue print layout.

Installation—This contractor shall install all apparatus, connect all telephones, and turn the entire system over to the owner in first class operating condition.

Switchboard installation shall be made according to specifications furnished by the manufacturer.

DICTOGRAPH PRODUCTS CORPORATION

Dictograph System of Interior Telephones—"The Highest Development of the Telephone for Interior Use"

GENERAL OFFICE AND FACTORY
NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS., 729 Colonial Building
CHICAGO, ILL., 1830 Lytton Building
CLEVELAND, OHIO, 717 Guarantee Title Building
DETROIT, MICH., 2011 Park Avenue
KANSAS CITY, MO., 405 Sharp Building
MINNEAPOLIS, MINN., 640 Lumber Exchange Building
PHILADELPHIA, PA., 20 So. 15th Street
ST. LOUIS, MO., 208 Security Building

AGENCIES

CINCINNATI, OHIO, J. M. Dolbey, 406 Southern Ohio Bank Building
INDIANAPOLIS, IND., O. K. Van Ausdall, 19 Pembroke Arcade
LOS ANGELES, CAL., L. C. Bishop, 1241 Pacific Mutual Building
MONTREAL, QUE., J. A. Anderson & Co., 357 St. Catherine Street, West
SAN FRANCISCO, CAL., R. A. Fanto, 554 Monadnock Building
SEATTLE, WASH., The Converse Co., Inc., 510 Union Street
MIAMI, FLA., H. D. Greenstein, 25½ Washington Avenue

Products

Dictograph System of Interior Telephones, for banks, offices, factories, stores, hospitals, schools, residences, etc.

Dictograph Apartment House Telephone Systems.

Also Dictograph Paging and Announcing Systems, and other Electrical Sound Transmitting Products.

Preliminary Service to Architects, Engineers and Owners

Our service includes practical demonstration of the operation of the system, for architect or owner, or both; study of the individual problem by competent sales engineer, followed by written recommendation covering the type of system best suited to render the service desired; complete co-operation with architect in the laying out of conduit, writing of specifications, and other details connected with the installation of the system.

Designation forms for charting the telephone service required may be had upon application. By filling out this form, it is easy to visualize the intercommunication problem, making it possible to specify the type of equipment that will cover the individual requirements in the most efficient manner.

Guarantee

The Dictograph System is guaranteed for a period of two years against all mechanical and electrical defects, assuring the user of satisfactory and uninterrupted results.

Provision for Service to Users

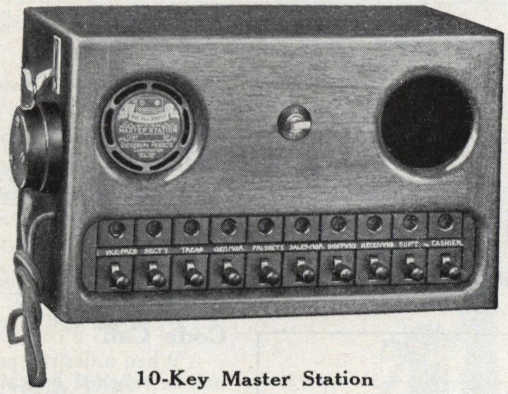
In addition to the branch offices and sales agencies above listed, the company also maintains service stations at fifteen other small cities, with competent service men in charge of the maintenance of the Dictograph Systems in their districts, assuring users of prompt service at all times.

Dictograph System

The Dictograph System is a highly developed interior telephone service, especially designed for executive use. Two types of instruments are provided—the Dictograph master station for executive use, and the Dictograph substation for general use (see illustrations). A system is made up of any desired combination of master stations and substations and operates equally well in large or small units, meeting the requirements of every business. Instruments are made standard with 4, 10, 15, 20, 30, 40 or more connections, and are furnished in solid mahogany, oak or walnut.

Special Executive Service—While providing a complete intercommunication service for all departments of an organization, the Dictograph System furnishes a specialized executive service for one or more executive points (through the use of the master station), including the following features:

Ease of Operation—"Just press a key and talk." Incoming calls are indicated by a buzz signal and a visual shows over the key of the party calling. This white shutter signal, or visual, always notifies the executive, in advance, who is calling, enabling him to answer or to disregard the call, at his discretion.



10-Key Master Station

Loud Speaking Receiver—Making it unnecessary to use earpiece receiver, except when privacy is desired. (Taking up earpiece automatically cuts out loud speaker). The master station is placed on the back of the desk, or on a stand at one side, and need not be closer than arm's length from the speaker. The executive talks toward the instrument without raising his voice and without using the earpiece, and the answering voice comes back through the loud speaker as clearly and distinctly as if the party talking were in the same room.

Executive Right of Way—By means of a lamp signal which notifies the party called that the executive is calling, even though that station may be busy at the moment. This "right of way" feature precludes the possibility of the executive being held up by busy wires.

Conference Feature—Making it possible to communicate with three or more departments simultaneously. To hold a conference or make a general announcement, it is only necessary to press the proper keys and communication is immediately established with the several points desired.

Absolute Privacy—Making it impossible for any one to cut in on a master line unless the executive so desires.

Exceptional Clarity of Sound Transmission—Through the use of the Dictograph sensitive flush type transmitter, the old-fashioned unsanitary mouthpiece is eliminated. Confidential information may be transmitted in a very low tone of voice or even a whisper, if desired.

Continued on next page

Automatic Memorandum of Calls—Received when the executive is away from his desk. Shutter visual indicates who has called. If more than one party has called, visual will show for each of these calls, enabling the executive to "call back" if he wishes.

General Interior Telephone Service—The Dictograph substation is recommended for general use, or at points where the special executive service of the master station is not required.

Although substations are ordinarily used in combination with one or more master stations, yet a very satisfactory intercommunication service may be obtained through the installation of a system consisting entirely of substations, no loud speaking master stations being used. Such a system would provide complete intercommunication service, with selective talking and selective ringing.

The substation does not provide a loud speaking receiver, but retains many of the other master station features including: ability to hold conferences easily; sanitary flush type transmitter; direct automatic connections instantly with the pressure of a key; small watchcase receiver, weight only 4 ounces; ability to talk 12 to 18 inches distance from transmitter.

12-Call Substation

As many conversations may be held simultaneously as there are pairs of instruments on the system. Two stations in use do not tie up the system as is the case with the old-fashioned "house telephone".

Dictograph Systems made up entirely of the substation type of instrument, and without any master stations on the system, are frequently used in factories, residences, hospitals, schools, or other institutions where special executive service is not required. All branch offices and agencies of the Dictograph Products Corporation will gladly advise with prospective users of interior telephone service as to the type of equipment best suited to meet their individual requirements.

Flexibility—Dictograph Systems are so laid out as to provide for expansion of system or changing location of stations with a minimum of trouble and expense.

Specifications—*Service*—The contractor shall furnish and install a system of interior telephones, of the manufacture of Dictograph Products Corporation, or equal, selective ringing and selective talking type, with all conduits, wiring, instruments and batteries necessary for the installation of the system complete and ready for use. Executives are to receive preferred executive service, by means of master station, including: loud speaking receiver; executive right of way; ability to hold conferences, with three or more parties on the line at once; privacy of lines. System to be so arranged as to permit as many conversations being held simultaneously as there are pairs of instruments on the system.

Stations Required—Instruments to be located as indicated by symbols on plans. The sizes of the various instruments and the connections given to each shall be in accordance with designation form approved by architect.

Symbols—
M◁ Master Station
S◁ Substation
|ı|ı| Batteries

Cable—Cable to be standard braid or lead covered cable carrying five No. 14 B. & S. gauge battery wires and a sufficient number of No. 22 B. & S. gauge twisted pairs to provide the complete service specified. Lead covered cable must be used in damp places; braid covered cable may be used in dry places. All interconnections of cables to be accomplished by means of junction blocks, each connection being soldered. Junction blocks to be provided with hardwood covers to match finish.

Conduit and Outlets—Conduit shall be best grade black enameled or galvanized steel conduit, terminating in standard wall or floor outlet boxes as indicated on plans.

Batteries—Battery consisting of a sufficient number of standard dry cells for the satisfactory operation of the system shall be provided and encased in hardwood battery box, located in a dry accessible place.

Representative Users—

General Electric Co., New York, N. Y.; Chicago, Ill.; Syracuse, N. Y.; etc.
Timken Detroit Axel Co., Detroit, Mich.
Southern Railway, Washington, D. C.
Union Oil Co., Los Angeles, Cal.
Bethlehem Steel Co., Pittsburgh, Bethlehem and Johnstown, Pa.
Elevated Railroads, Chicago, Ill.
Thomas Cusack Co., New York, N. Y.
E. I. du Pont de Nemours Co., New York, N. Y.; Pittsburgh and Scranton, Pa.; Arlington and Parlin, N. J.
Pacific Gas & Electric Co., San Francisco, Cal.
Johns-Manville Co., New York, N. Y.
National City Bank, New York, N. Y.

Dictograph Apartment House Telephone

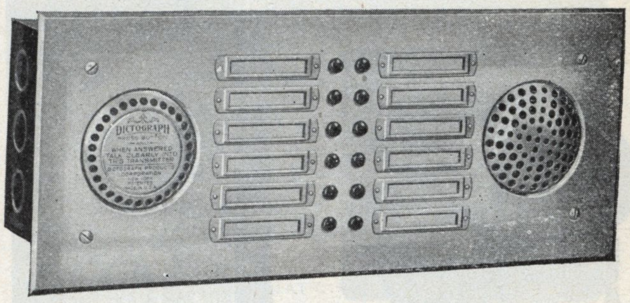
The Dictograph Apartment House Telephone System has been designed after a careful study of the requirements of the modern apartment building.

It provides adequate communication between entrance hall or vestibule and the various apartments within a building and in addition, if required, with janitor or superintendent or other special points.

Co-operation with Architects and Contractors—The Dictograph Products Corporation, while maintaining its own Construction and Installation Departments in all large cities, does not usually undertake installation of the Dictograph Apartment House Telephone Systems, inasmuch as it is our policy to merchandise this equipment through the electrical trade. However, our Engineering Department will be glad to co-operate with architects and contractors in all engineering details.

Guarantee—The Dictograph apartment telephone, when installed in accordance with our instructions, is unconditionally guaranteed for *two years* against all mechanical and electrical defects.

Loud Speaking Vestibule Master Station—The loud speaker employed in the vestibule station is of the same type used in the regular Dictograph System of Interior Telephones described on preceding page. No receiver or cord is required, thus eliminating damage through carelessness, improper usage or malicious mischief.



12-Button Vestibule Station

To Operate—The button connecting with the proper apartment is pressed, whereupon the station in the apartment rings. When the receiver at the apartment telephone is taken off the hook, communication is established between the apartment and the entrance hall, and the voice of the person answering the apartment telephone is transmitted through the loud speaker in the vestibule master station, loudly, clearly and distinctly.

Continued on next page

The person talking into the vestibule master station talks toward the flush type Dictograph transmitter, and the answering voice comes through the loud speaker on the opposite side of the station (see illustration).

It is not necessary to hold the push button during the conversation, the full operation requiring only the signaling of the desired apartment. When the receiver is taken from the hook on the apartment telephone the circuit is completed.

Dimensions—The Dictograph master vestibule telephone is furnished complete with metal wall box ready to install. The dimensions of standard face plate and metal wall box are as follows:

	Face Plate		Box		
Buttons	Width	Height	Width	Depth	Height
12	13¾ in.	5¾ in.	12¾ in.	4¾ in.	4¾ in.
24	13¾ in.	8½ in.	12¾ in.	4¾ in.	7¼ in.
36	13¾ in.	10¾ in.	12¾ in.	4¾ in.	9½ in.
48	13¾ in.	13 in.	12¾ in.	4¾ in.	11¾ in.
60	13¾ in.	15¼ in.	12¾ in.	4¾ in.	14¼ in.
72	13¾ in.	17½ in.	12¾ in.	4¾ in.	16½ in.

Intermediate sizes take next larger face plate and box.

Note: Loud speaking master stations of non-flush type can be furnished in hardware cabinet, as required, at small extra charge.

Construction—The construction is unusually simple and sturdy. There are no moving parts or flexible cords to get out of order. Installation is extremely simple and can be made by any electrician.

Dictograph Apartment Substation—The Dictograph apartment Substation for surface mounting is enclosed in a strong hinged hardwood ebony finished cabinet, 6 in. high by 5¼ in. wide by 3⅛ in. deep; weight, thirty ounces, is equipped with sanitary flush type Dictograph transmitter and small watchcase receiver. Every contact and connection is easily accessible. The design of this station marks a definite forward step in moderate price apartment house telephones. Substations can be furnished for flush mounting where required.

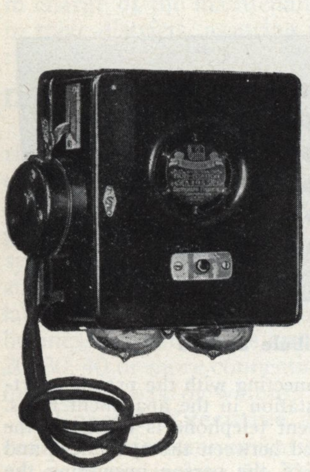
To Operate—To answer a call from the vestibule station, take receiver from hook and talk towards the transmitter.

To call janitor or other station, take receiver from hook, and press corresponding button to signal desired station. When through talking, replace receiver on hook.

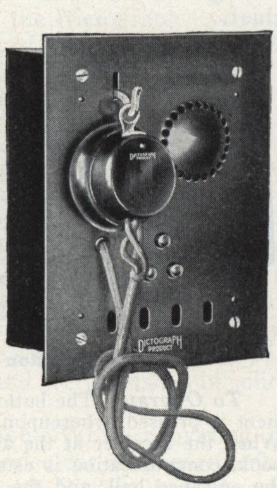
The use of the sensitive Dictograph transmitter makes it unusually convenient to operate as it is possible to talk to the telephone a distance the full length of the cord. The receiver is of standard Dictograph watchcase design and finish.

Push button plates are attached to cover any requirement. These push buttons, when depressed, will operate door opener, elevator, call janitor, laundry or other combination desired.

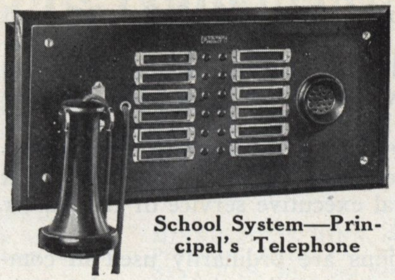
In addition to apartment house use, for which it is especially designed, the Dictograph Apartment Telephone System is adapted wherever communication is desired from a central point to various rooms or outlying points, such as residences, hotels, hospitals, schools, prisons, asylums, etc.



Surface Type Suite Telephone



Flush Type Suite Telephone



School System—Principal's Telephone

Letter Boxes—Letter boxes are furnished to match face plate of vestibule master station. All Dictograph letter boxes are especially designed to comply with United States Post Office order No. 9596, which prescribes that where more than two mail receptacles are installed in vestibule, that the same must be so arranged as to permit mail matter being deposited by the carrier in the various boxes, the doors of which shall open as one, obviating the necessity for opening each door individually. This carrier's door must cover at least six boxes, and is secured by a lock, approved by the Post Office Department. The individual boxes are accessible by means of separate locks which control each box, respectively.

School System—Classroom Telephone

Circuits—Careful consideration of the telephone requirements of the modern apartment building has led us to concentrate our standard production on what is commonly called selective ringing and common talking service. This system permits each individual apartment to be called separately without ringing or signaling other apartments at the same time. Three wires are required between each substation and the vestibule station. The talking line is common throughout the system.

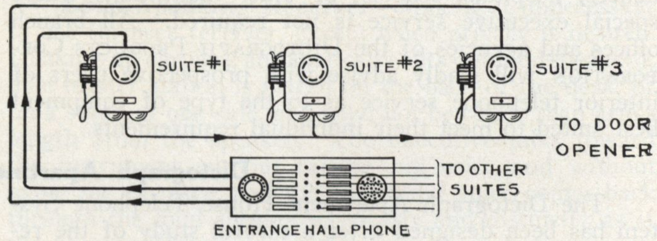


Diagram for System A-10

There are a large number of combinations available with the Dictograph System. A few of the more common systems have been listed below. The diagram is intended to show possible ringing and talking circuits, and should not be confused with the wiring diagram.

System A-10 Service: Vestibule can call apartments, apartments can open door.

System A-11 Service: Vestibule can call apartments, apartments can open door and call janitor.

System A-12 Service: Vestibule can call apartments and janitor, apartments can open door and call janitor, janitor can open door.

System A-13 Service: Vestibule can call apartments and janitor, apartments can open door and call janitor, janitor can open door and call apartments.

System A-14 Service: Vestibule can call apartments and janitor, apartments can open door and call janitor, janitor can open door and call apartments. Tradesmen's telephone can call apartments and janitor.

If special conditions require selective ringing not specified above, our Engineering Department is prepared to submit circuits and prices to meet all such requirements and will be pleased to co-operate with architects, engineers, builders and contractors in working out any special ideas.

THE SCREW MACHINE PRODUCTS CORPORATION

Manufacturers of the Select-O-Phone, an Automatic Telephone and "Paging" System

PROVIDENCE, R. I.

Product

The SELECT-O-PHONE, an Automatic Central Station Interior Telephone System which eliminates both operator and complicated cables.

Adaptability

The Select-O-Phone is adaptable to the varying service requirements of such institutions as industrial plants, administration buildings, state institutions, offices, mines, private estates and residences, both large and small.

Description

The Standard Select-O-Phone system is made in 12, 36 and 55-line capacity and the Junior system in 12 and 36-line capacity. The station capacity may be doubled or tripled by party lines. The system is built on the unit plan, permitting as few stations as are needed to be installed initially, and stations added one by one up to the ultimate capacity. The line wiring is exceedingly simple, consisting merely of a single strand of triple conductor wire from each station to the switchboard.

Service Features

The general call, or "paging," feature (optional) provides a ready means for quickly finding a party who may be away from his regular station.

Secret conversation between any two stations without cut-off or interruption.

Secret conference, or general conversation between three or more stations.

Select-O-Phone handles separately and simultaneously as many calls as may be initiated.

Executive right-of-way for the chief to all telephones whether busy or not.

Provides watchman's call and auxiliary fire alarm service.

The Select-O-Phone for the Home

The Junior type Select-O-Phone is particularly for residences and estates where more than 12 stations and secret service are not needed; the standard system is more adaptable for larger homes.

The advantages of using either the standard or the Junior type Select-O-Phone will be evident to both architect and owner when it is realized that because of the simple wiring, and the flexibility of the Select-O-Phone system itself, it is not necessary to definitely and carefully plan the exact locations when the plans are drawn. If all the probable locations are planned for by a run of inexpensive triple wire from a baseboard outlet in each room to a central point where a switchboard may be placed, the owner's requirements can always be cared for readily whether his ideas change before the completion of the building, or several years later.

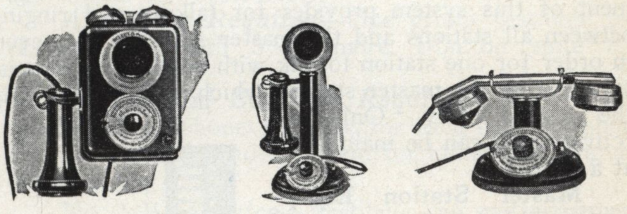
Because the wiring is a single strand of triple wire instead of a cable, a change of location in a room can easily be accomplished; therefore it is not necessary to restrict the owner's plans for furnishings by telephones located before his ultimate ideas have been formulated.

In new buildings where conduit is to be installed, use the ¾-in. size. The single strand of triple wire may be run without conduit, and in old buildings or during alterations may readily be pulled into the walls from attic or cellar.

The Junior system has all the features of the standard system except secrecy and paging features, and may usually be operated from a battery of dry cells.

Select-O-Phone Instruments

The three types of Select-O-Phones most generally used are shown below. Other types are shown in our catalogue. All instruments are finished in dull black enamel and polished nickel. Similar to standard city service instruments, with addition of numbered dial.



Wall Desk
STANDARD SELECT-O-PHONES

HAND MICRO-PHONE DESK SET

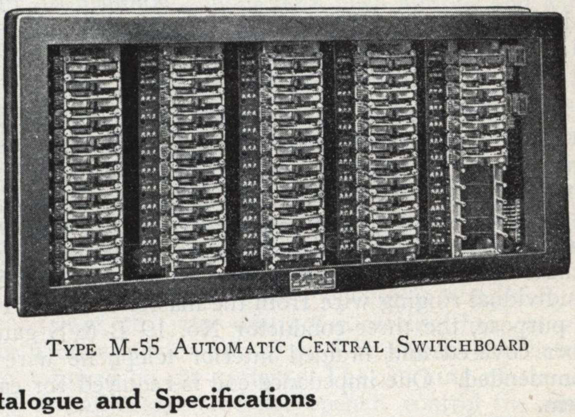
Automatic Central Switchboards

Switchboards are made in three capacities: 12, 36 and 55 lines.

Type M-55—Capacity, 55 lines. Dimensions, 45x24x9 in.

Type M-36 and Junior 36—Capacity, 36 lines. Dimensions, 30x24x9 in.

Type M-12 and Junior 12—Capacity, 12 lines. Dimensions, 15x24x9 in.



TYPE M-55 AUTOMATIC CENTRAL SWITCHBOARD

Catalogue and Specifications

Our catalogue, descriptive of Select-O-Phone apparatus and service, and our standard specifications, which should be in the files of every architect and engineer, will be sent on request. Ask for No. 186 and No. 203 respectively.

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY

GENERAL OFFICES AND FACTORIES
1056 University Avenue
ROCHESTER, N. Y.
BRANCH SALES OFFICES
CHICAGO, ILL., 17 South Jefferson Street
TORONTO, CAN., 211-219 Geary Avenue
KANSAS CITY, MO., Coca-Cola Building
DEALERS AND INSTALLERS IN ALL PRINCIPAL CITIES

Products

Manufacturers of Inter-communicating Telephone Systems and Telephone Apparatus.

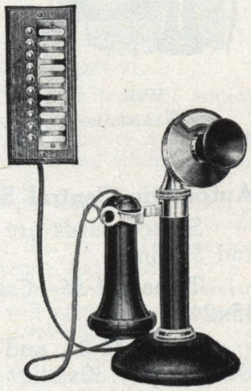
Also manufacturers of Telephone Cables and Supplies.

Master Station Telephone System No. 3

System No. 3 meets the needs of schools, small hotels, institutions, etc., where it is desirable that the master station have a check on all calls. The arrangement of this system provides for talking and ringing between all stations and the master station. However, in order for one station to talk with another it is necessary to ring the master station, which will in turn, ring the desired party. Only one conversation can be maintained at a time.

Master Station Equipment—This equipment consists of a desk stand with a buzzer concealed in the base and a push button block with a button for each outlying station. When desired an annunciator may be provided at the master station.

No. 1118 Type—Standard telephone with buzzer concealed in base, 5 or 10-button push button block attached. Additional blocks may be added to bring the number up to the required capacity.



No. 1118 Type Master Station Telephone

Code No.	Use	Number of Push Buttons
1118-A	Master Station	5
1118-B	Master Station	10

Outlying Station Equipment—Each outlying station is equipped with either a wall telephone provided with a single push button, or a combination telephone with a push button in the hook switch box.

Wiring of the System—Three wires are required between each outlying station and a master station. Two of these wires are common talking wires and the third an individual ringing wire from the master station. For this purpose, the three-conductor No. 19 B & S gauge rubber covered and braided interior telephone wire is recommended. One impedance coil is required for each system.

Battery—One set of dry cell batteries is the only battery required to supply both ringing and talking current for this system. Systems using less than a thousand feet of cable will receive ample current from 7 cells. Where more cable is used there should be a corresponding increase in the number of cells used.

Specification Data, System No. 3—*Service*—Master station can call all outlying stations and make connections between them. Outlying stations can call master station.

Apparatus Required—One master station outfit and any number, up to thirty, of one-button outlying station telephones.

Wiring and Batteries Required—Two common talking wires and individual ringing wire for each station. One set of dry batteries to furnish both talking and ringing current.

Apartment House Telephone System No. 5

System No. 5 covers what is known as an apartment house telephone system, offering to architects, contractors and owners a standardized line of apartment house telephones which are equipped with commercial standard transmitters and receivers, thus insuring greater talking efficiency and much clearer articulation of speech than that obtained through the use of telephones equipped with transmitters and receivers designed for short distance service only.

In other words, this apartment house line of inter-communicating telephone apparatus is equipped with the same standard transmitters and receivers as used on Stromberg-Carlson public exchange telephone apparatus.

The No. 5 inter-communicating telephone system provides communication between the vestibule, apartments, janitor's quarters, laundry and tradesmen's entrances. There are different combinations of the No. 5 system, differing from each other in the way that they are connected for inter-communicating service. The operation, however, is the same with any combination, as the system is wired on a common-talking basis.

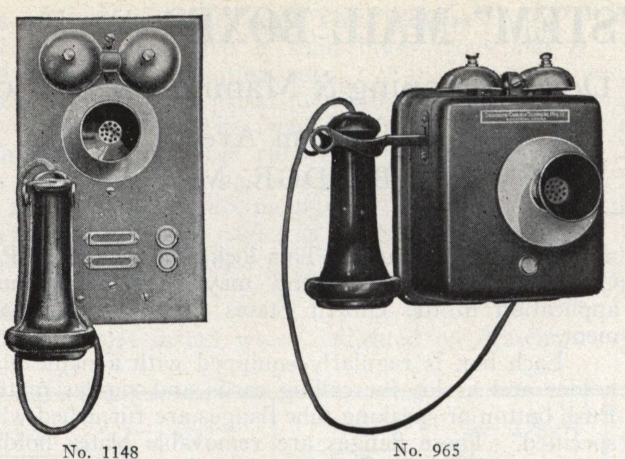
Vestibule Telephone Outfits—The vestibule outfit consists of a vestibule telephone and a call unit which is equipped with push buttons for signalling the suite telephones.

Suite Telephones—Suite telephones are furnished in 3 types—non-flush wall, flush brush brass wall and micro-phone type, equipped with 1 or 2 buttons, depending upon the type of service selected. These push buttons, when depressed, will operate the door opener, call the janitor or any other combination selected—such as the laundry or the tradesmen's entrance telephone.

No. 1148 Flush Type—Standard suite telephone set for flush wall installation. Furnished with brush brass finished face plate and metal outlet box. Carries 2 push buttons—one for calling janitor's telephone and the other for electric door opener.

Mounting space 5x9 in. Wall opening required $4\frac{11}{16}$x$8\frac{7}{16}$ in.

Continued on next page


No. 1148
Flush Type

No. 965
Non-flush Type

Wall Type Suite or Outlying Station Telephones

No. 965 Non-flush Type—Standard suite telephone set for non-flush wall installations. Furnished in metal, finished with a semiglossy black finish. Carries 1 or 2 push buttons as per list below. Mounting space 5⅞x7⅜ in.

Code No.	Use	System	Number of push buttons
965-B	Outlying Station	No. 3	1
965-G	Suites	No. 5	1
965-F	Suites	No. 5	2
965-H	Janitor's set	No. 5	1

No. 10 Micro-phone Type—A suite telephone that may be installed as either a wall or desk telephone to any vertical surface. Always within convenient reach yet never in the way. Furnished in semiglossy black enamel.

Code No.	Use	System	Number of push buttons
10-PC	Outlying Station	No. 3	1
10-D	Suites	No. 5	1
10-J-D	Suites	No. 5	2

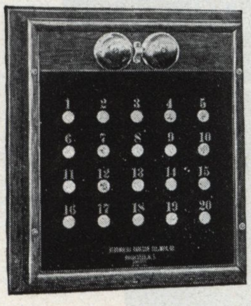
No. 10

Combination Type Suite or Outlying Station Telephone

Janitor's Telephone, etc.—The janitor's and laundry telephones can be arranged for either receiving calls from the other stations without being able to signal back, or for receiving calls and signaling and talking back to the suite telephones. They can also be equipped with an annunciator which records all calls during the absence of the janitor or laundress, permitting them to get in touch with any desired suite upon their return, should some one have called during their absence.

For less than 15 suites it will be necessary to use a No. 965-H janitor's telephone in conjunction with a push button block and the annunciator as shown.

For 15 suites or more it is at the customer's option to use this type of set or a janitor's annunciator switchboard.



Janitor's Annunciator

The tradesmen's set consists of a No. 965-H wall telephone and a push button block equipped with a sufficient number of push buttons to call each and every suite.

Wiring of the System—The following data will provide information covering the number of wires to be run for any of the systems listed.

For connections between the various stations either cable or loose wires can be used, depending largely upon the layout of the building. Naturally where there is a long run of a large number of wires, as in the case of the various vertical risers from floor to floor, it is recommended to use cable and to install terminal blocks at the various distributing points.

For connecting the suite telephones to the various distributing points twisted pair wires are generally run and these should be No. 19 gauge B. & S. rubber covered and braided telephone wire.

Specification Data System No. 5

The following is a list of the different combinations of System No. 5, the service given; apparatus required; wiring and battery requirements.

No. 5-A—*Service*—Vestibule can call apartments, apartments can open door.

Apparatus Required—One group vestibule telephone outfit with 3 or more 1-button suite telephones.

Wiring and Batteries Required—3 wires common to all telephones; 1 wire for each suite telephone. Dry batteries to furnish current for talking, ringing and door opening.

No. 5-B—*Service*—Vestibule can call apartments and janitor, apartments can open door and call janitor.

Apparatus Required—One group vestibule telephone outfit with 3 or more 2-button suite telephones and a single janitor's telephone of the No. 965 type.

Wiring and Batteries Required—4 wires common to all telephones; 1 wire for each suite telephone. Dry batteries to furnish current for talking, ringing and door opening.

No. 5-C—*Service*—Vestibule can call apartments and janitor, apartments can open door and call janitor, janitor can call apartments.

Apparatus Required—One group vestibule telephone outfit with 3 or more 2-button suite telephones and a janitor's telephone with push buttons and with or without annunciator or janitor's annunciator switchboard.

Wiring and Batteries Required—5 wires common to all telephones; 1 wire for each suite telephone. Dry batteries to furnish current for talking, ringing and door opening.

Note: Where common wires are spoken of it means that these 3 wires run throughout the entire system and terminate at each and every telephone, but one wire refers to an individual wire, the number depending upon the number of suites in the system. For example, 6 suites under system No. 5-A would require 3 common wires and 6 individual wires in the system.

Door Opener—A door opener is not listed, as it is assumed that the contractor carries them in stock. For a door opener only 2 or 3 additional dry batteries are required on the system. The working of the door, and the adjustment of the opener, control the amount of extra batteries required.

THE CHISM "UNIT SYSTEM" MAIL BOXES

The Chism Mail Box Company

339 Star Building
WASHINGTON, D. C.

Dover Stamping & Manufacturing Co.

385 Putnam Avenue
CAMBRIDGE, MASS.

Product

The Chism "Unit System" Mail Box.

Chism "Unit System" Mail Boxes

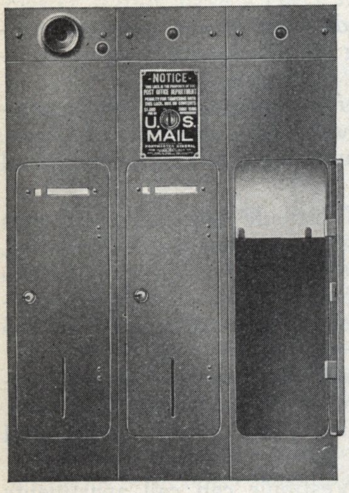
These boxes are designed for use as required by the Post Office Department Order Number 9596. "To prevent the theft of mail from apartment houses."

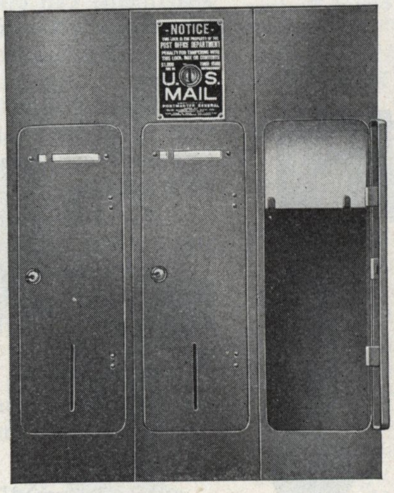
They are installed in gangs or groups, securely fastened in place from inside the box. The entire group, through a single operation, is made accessible to the post man for filling. Individual boxes are accessible only to the tenant holding that particular key.

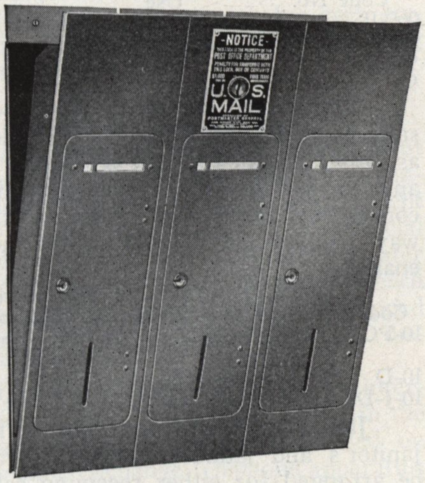
Box fronts are free from hinges and screws of any kind and swing forward in groups for filling when, and only when, the single control lock located in the master box is operated. This lock is a regulation Post Office Department lock and may be obtained upon application to the United States Post Office Department.

Each box is regularly equipped with a name plate holder and a slot for calling cards and similar matter. Push button or speaking tube flanges are furnished when specified. These flanges are removable plates holding the mouth piece or push button and give access to the electrical wiring.

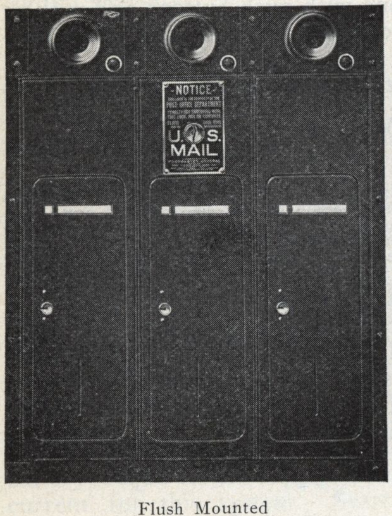
Assembling—These boxes are so designed that single units can be quickly and easily assembled into groups in the shop or on the job, thereby avoiding delays caused by waiting for delivery of a special size groups or gangs.

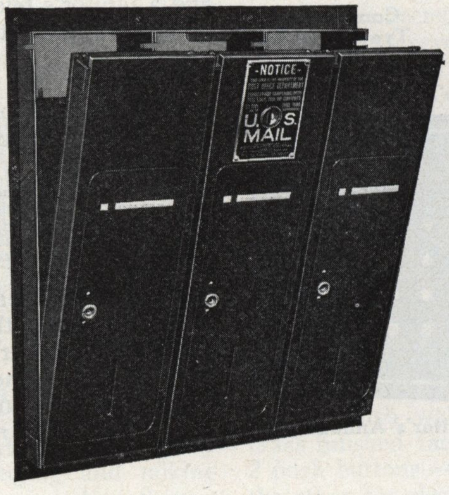

With Speaking Tube and Push Button Flanges

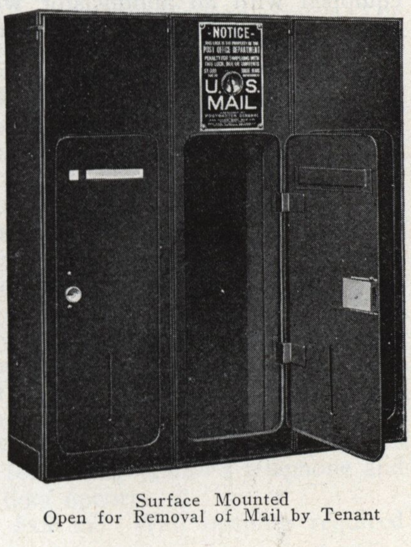

With Door Open for Removal of Mail by Tenant


Open for Insertion of Mail by Carrier

The "Autocrat"


Flush Mounted with Speaking Tube Flanges


Semi-Flush Mounted Open for Insertion of Mail by Carrier


Surface Mounted Open for Removal of Mail by Tenant

The "Eclipse"

Continued on next page

Styles—The "Autocrat" and The "Eclipse"

The "Autocrat" has a solid brass front and is intended for flush mounting only.

The "Eclipse" is made to fill the demand for a roomy durable box. The front is constructed of steel and finished in dull black rubberized telephone enamel which resists both wear and moisture. It may be either flush, semiflush, or surface mounted.

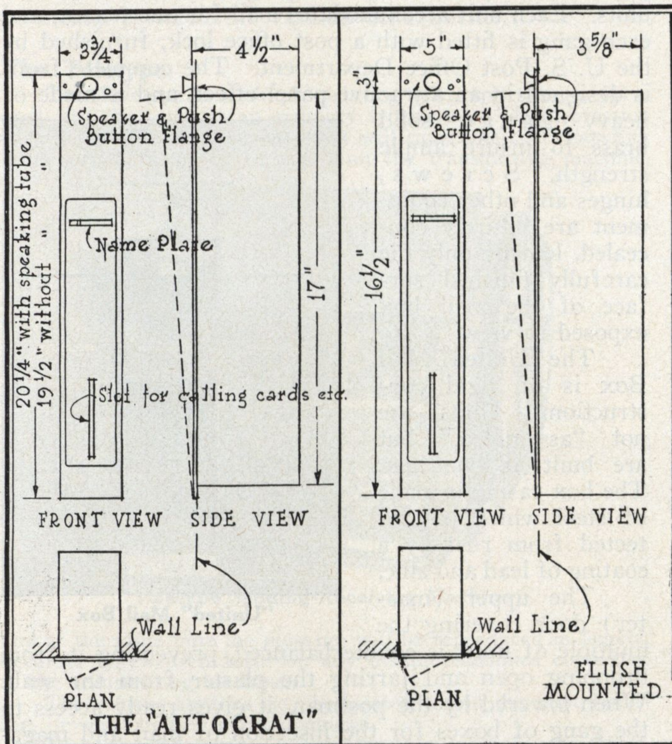
The body of both styles is made of steel with a durable rustproof coating.

Specification

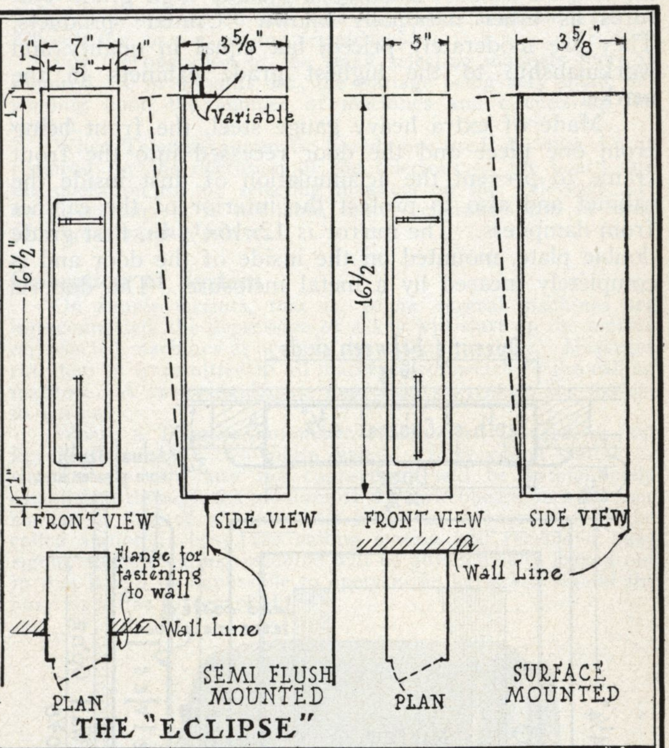
Furnish and install where indicated on drawings, Chism "Unit System" Mail Boxes (specify whether "Autocrat" or Eclipse" and whether speaking tube or push button are desired. If "Eclipse" is used specify whether it is to be flush, semiflush or surface mounted) as manufactured by THE CHISM MAIL BOX COMPANY, 339 Star Building, Washington, D. C., or the Dover Stamping & Manufacturing Co., 385 Putnam Avenue, Cambridge, Mass.

All work to be done in accordance with the regulations of the Post Office Department and satisfactory to the architect.

Guarantee in writing all material and workmanship for a period of one year.


3¾"
4½"
5"
3⅝"
3"
Speaker & Push Button Flange
Name Plate
20¼" with speaking tube
19½" without "
17"
16½"
Slot for calling cards etc.
FRONT VIEW
SIDE VIEW
PLAN
Wall Line
FLUSH MOUNTED

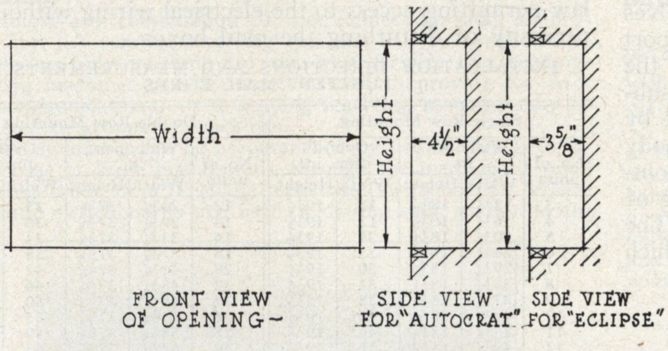
THE "AUTOCRAT"


1"
7"
1"
5"
3⅝"
Variable
16½"
FRONT VIEW
SIDE VIEW
Flange for fastening to wall
Wall Line
PLAN
SEMI FLUSH MOUNTED
Wall Line
SURFACE MOUNTED

THE "ECLIPSE"

~ WALL OPENINGS REQUIRED FOR "AUTOCRAT" & "ECLIPSE" MAIL BOXES ~

GROUP	"AUTOCRAT"													"ECLIPSE"								
No. of Boxes Horizontally	3	4	5	6	7	8	9	10	11	12	13	14	15	3	4	5	6	7	8	9	10	11
Width of Opening	10¾"	14½"	18¼"	22"	25¾"	29½"	33¼"	37"	40¾"	44½"	48¼"	52"	55¾	15"	20"	25"	30"	35"	40"	45"	50"	55"
No. of Boxes Vertically	1	2	3											1	2	3						
Height of Opening without Speaking Tube	17"	36½"	56"											16½"	33"	49½"						
Height of Opening with Speaking Tube	17"	37½"	57½"											16½"	36"	55½"						


Width
Height
4½"
Height
3⅝"
FRONT VIEW OF OPENING
SIDE VIEW FOR "AUTOCRAT"
SIDE VIEW FOR "ECLIPSE"

~ NOTE ~
In all cases top of wall opening not to exceed 60½ inches above floor

DETAILS OF CHISM "UNIT SYSTEM" MAIL BOXES

UNITED METAL BOX CO., INC.

Manufacturers of Sheet Steel and Brass Products
77-79 Sunswick Street, LONG ISLAND CITY, N. Y.

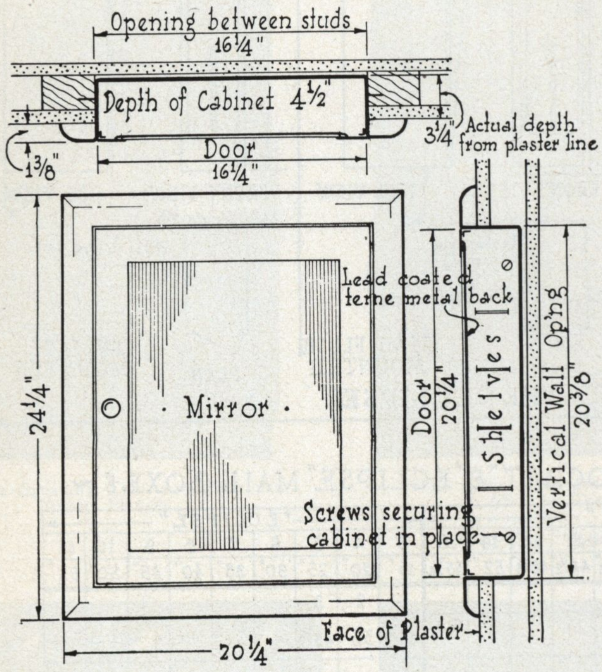
Products

Bathroom Cabinets.
Apartment House Mail Boxes.
Also Wall Safes, Cut-out Boxes, Panel Cabinets and Garbage Closets.

"United" Recessed Medicine Cabinets

These cabinets embody the same high grade features as other nationally known "United" products. They are moderately priced, but equal in quality and workmanship to the highest grade cabinets in the market.

Made of extra heavy gauge steel, the front being from one piece and the door recessed into the front frame to prevent the accumulation of dust inside the cabinet and also to protect the interior of the cabinet from dampness. The mirror is 12x16x¼-in. first grade double plate, mounted on the inside of the door and is completely incased by a metal inclosure. The door is hinged on concealed hinges with brass pins and may be opened almost parallel to the wall. The glass shelves are mounted on shelf clips so constructed as to support the glass shelf whether the cabinet is mounted with the hinge on the right or left side. The door knob is substantial, ornamental glass and the door is fastened by means of a solid brass concealed bullet catch. The body of the cabinet is constructed of rustproof steel (commercially known as long terne) with a special coating of lead and zinc to insure the life of the cabinet. The finish is exceptionally high grade white enamel which does not chip or flake.



"United" Recessed Cabinet

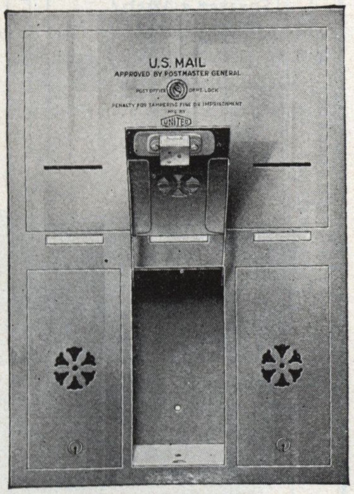
"United" Wall Type Cabinets

The same size as United Recessed cabinets, already described, and made of the same material and of the same high grade workmanship and construction.

"United" Mail Box

The "United" Mail Box was designed to meet all requirements of the Post Office Department; also the critical requirements of the architect, electrical jobber, contractor, apartment house owner and tenant.

They are made in a standard over-all height of 19½ in. to match up with standard vestibule telephones. They are made in gangs of 3, 4, 5 and 6 units. Each unit accommodates mail for one tenant, and each gang is fitted with a post office lock, furnished by the U. S. Post Office Department. The complete front is designed in an attractive panel effect, and is made of heavy gauge solid brass to insure ample strength. Screws, hinges and other equipment are entirely concealed, leaving only the carefully finished surface of the mail box exposed to view.



"United" Mail Box

The "United" Mail Box is of rigid construction. Units are not "assembled," but are built as one box. The box casing is made of steel which is protected from rust by a coating of lead and zinc.

The upper (master) door covering the multiple of units is counterbalanced, preventing it from dropping open and jarring the plaster from the wall. When lowered by the postman, it gives ready access to the gang of boxes for the insertion of mail and magazines, serving as a shelf for the sorting of mail. When locked, this one-piece solid brass door fits so snugly that it offers extreme resistance against prying open.

The lower (tenants') doors open upward to a stationary position which leaves both hands free for the removal of mail or magazines. The tenant's name is clearly visible when either door is in the open position. An additional nameplate for sub-tenants is provided on the inside of each unit.

The "United" Mail Boxes are also made with standard mouthpieces and push buttons. Push buttons are mounted on a removable plate to comply with the law permitting access to the electrical wiring without the necessity of disturbing the mail boxes.

INSTALLATION DIRECTIONS AND MEASUREMENTS OF "UNITED" MAIL BOXES

Single Row Mounting					Double Row Mounting				
No. of units	Wall open., in.		Over-all dim., in.		No. of units	Wall open., in.		Over-all dim., in.	
	Width	Height	Width	Height		Width	Height	Width	Height
3	12¼	18⅛	13	19½	12	24¼	37⅝	25	39
4	16¼	18⅛	17	19½	14	29¼	37⅝	30	39
5	20¼	18⅛	21	19½	16	33¼	37⅝	34	39
6	24¼	18⅛	25	19½	18	37¼	37⅝	38	39
7	29¼	18⅛	30	19½	20	41¼	37⅝	42	39
8	33¼	18⅛	34	19½	22	45¼	37⅝	46	39
9	37¼	18⅛	38	19½	24	49¼	37⅝	50	39
10	41¼	18⅛	42	19½	26	54¼	37⅝	55	39
11	45¼	18⅛	46	19½	28	58¼	37⅝	59	39
12	49¼	18⅛	50	19½	30	62¼	37⅝	63	39
13	54¼	18⅛	55	19½	32	66¼	37⅝	67	39
14	58¼	18⅛	59	19½	34	70¼	37⅝	71	39
15	62¼	18⅛	63	19½	36	74¼	37⅝	75	39
16	66¼	18⅛	67	19½	38	78¼	37⅝	80	39

MORKRUM-KLEINSCHMIDT CORPORATION

Printing Telegraph Equipments

FACTORY AND HOME OFFICE
1410 Wrightwood Avenue, CHICAGO, ILL.
NEW YORK, N. Y., *726 World Building* DETROIT, MICH., *304 Ford Building*
LOS ANGELES, CAL., *6371 Hollywood Boulevard*
ASSOCIATED COMPANY FOR CANADA: NORTHERN ELECTRIC CO., LTD., 121 Shearer Street, MONTREAL, QUE.

Products and Services

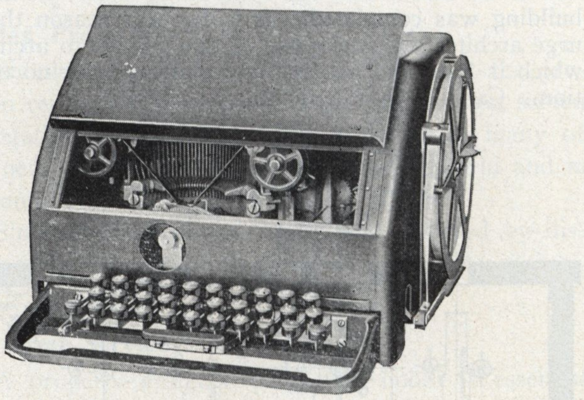
Manufacturers of the TELETYPE PRINTING TELEGRAPH EQUIPMENTS for Communication Purposes in hotels, banks, offices, industrial plants, etc., where accurate, recorded messages are necessary between the various departments.

TELETYPE

TRADE-MARK

The Teletype

The Teletype is a simple printing telegraph system, operated just the same as an ordinary typewriter. The depression of a key at the transmitting point will cause the corresponding letter or character to be typed on the transmitting machine, and at the same time the message will be reproduced in legible, accurate typewritten form on any distant machines connected to the transmitting machine.



Teletype Sending-Receiving Machine

The various stations may be located within the same building, or separated by great distances.

Two general types of Teletypes are now in use (both operating in practically the same manner); one, the Tape Teletype, typewriting on a narrow paper tape, and the other, the Page Teletype, which typewrites on a standard 8½-in. sheet. The Tape Teletype is best adapted for general use, the illustrations shown here being of this type.

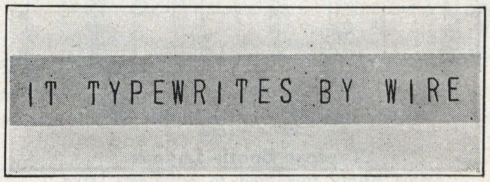
Wiring

Teletypes are interconnected by a system of wires, the kind and number of wires depending upon the voltage used and the circuits desired. The MORKRUM-KLEINSCHMIDT CORPORATION will furnish free of charge, all necessary specifications and wiring diagrams for specific installations.

Switching

Almost any combination of interconnections may be provided for. A sending-receiving machine can be connected to a receiving only machine for one-way service, two sending-receiving machines can be interconnected to provide for two-way communications; or a sending-receiving machine may be connected to groups of machines.

The switching can be accomplished by use of cam keys, or in the case of large installations, through the medium of small switching units, or a Teletype automatic switchboard. Where automatic switchboards are used, a dialing unit similar to the dial used on automatic telephones is provided at each transmitting point.



Sample of Printed Tape

Power

Small electric motors, $\frac{1}{30}$ hp., are used for driving the Teletype transmitting and printing mechanisms. Motors are provided which will operate on the kind of power available (110 or 220-volt d-c. or a-c. of any frequency).

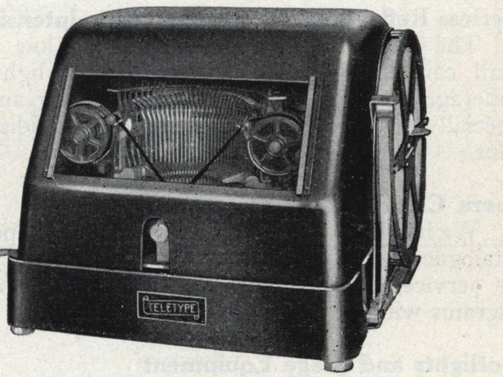
For the operation of the small selecting magnets there is required 110 or 48 volts d-c., the wattage being very small, depending upon the number of machines and circuits on the system.

When Teletype automatic boards are used, 48 volts d-c. is required for the operation of the selectors on the board and the operation of the selecting magnets on the Teletypes. If no direct current is available, motor-generators can be used for supplying this power.

Operation of System

On simple circuits, that is, where several machines are interconnected, the depression of a key will start up the motors on selected machines as well as the calling machine. Messages can then be transmitted to all machines connected to the calling machine. A restoring key is depressed to restore the system to normal.

Where a Teletype automatic switchboard is used, a cam key is thrown and two digits dialed. If the called station or stations are not busy the connections will be automatically established through the medium of the switchboard in a manner similar to that of an automatic telephone connection. If the called station is busy, the calling station will receive a busy signal, and the calling machine will be automatically locked out in that it will be impossible to operate the keyboard should the busy signal be disregarded.



Teletype Receiving Only Machine

Information Required for Specifications

Specifications will be furnished on request for any particular installation. The MORKRUM-KLEINSCHMIDT CORPORATION should be furnished with the following information:

(1) Name of customer. (2) Address of customer. (3) Kind of business. (4) What means of communication is now used (if any). (5) A definite, detailed description of the services to be handled. (6) Kind of apparatus—Tape or Page. (7) Number of transmitting-receiving machines. (8) Number of receiving only machines. (9) Ultimate requirements. (10) Location of machines—architect's drawings showing these positions, if possible.

(11) Power available at Teletype position and switchboard: 48-volt d-c., 110-volt d-c., 220-volt d-c., 110-volt a-c. ? cycle, 220-volt a-c. ? cycle.

(12) Present wire facilities (if any). (13) If external circuit, what wires are available. If telephone wires, what is maximum allowable voltage between pairs and the ground, and between adjacent wires? What is maximum permissible current?

EXHIBITORS SUPPLY COMPANY

Motion Picture Theater Equipment and Supplies

825 South Wabash Avenue
CHICAGO, ILL.

BRANCHES
MILWAUKEE, WIS. — MINNEAPOLIS, MINN. — ST. LOUIS, MO. — OMAHA, NEB.
CLEVELAND, OHIO — DES MOINES, IOWA — DENVER, COLO.

Products

Exclusive distributers in the Middle West for MOTION PICTURE EQUIPMENT: Simplex Motion Picture Projectors, Transverter Motor Generators, Minusa Picture Screens, Reflecting Arc Lamps, Opera Chairs, Spotlights and Stage Equipment, Aislelites, Lobby Display Frames; Complete Theater Equipments.

Simplex Motion Picture Projector

The Simplex projector with double bearing intermittent movement, enclosed mechanism, triple support pedestal, has a record, under actual operating conditions, for the highest efficiency in speed, steadiness and long wear. Complete details gladly furnished.

Hertner Transverter (Motor Generator)

The transverter is the most electrically efficient motor generator, built specifically for motion picture work. Is made in vertical or horizontal types, either in series wound, or multiple. Blue prints and details can be had on request.

Minusa Screens

Over 9000 of America's moving picture theaters are equipped with this metallic surface screen. Can be had in flat white if desired. Is the only seamless screen in the country. Comes complete with stretcher frame.

Peerless Reflecting Arc Lamps (Low Intensity)

The latest type of arc lamp using low amperage, small carbons, but delivering as much light as high amperage arc lamps. Ideal equipment for any theater, especially efficient for emergency with individual lighting plant.

Opera Chairs and Seating Service

We handle over 100 different models of opera chairs. Catalogues and prices on request. Through our seating service, we will furnish blue prints and seating diagrams without cost to architect or builders.

Spotlights and Stage Equipment

Spotlights, flood lights, border lights, dimmers and all stage lighting equipment are specialties of ours. In all of our offices we have men with years of experience, who know what is necessary for proper stage lighting. The services of these men are at the architect's command any time for consultation.

Aislelites

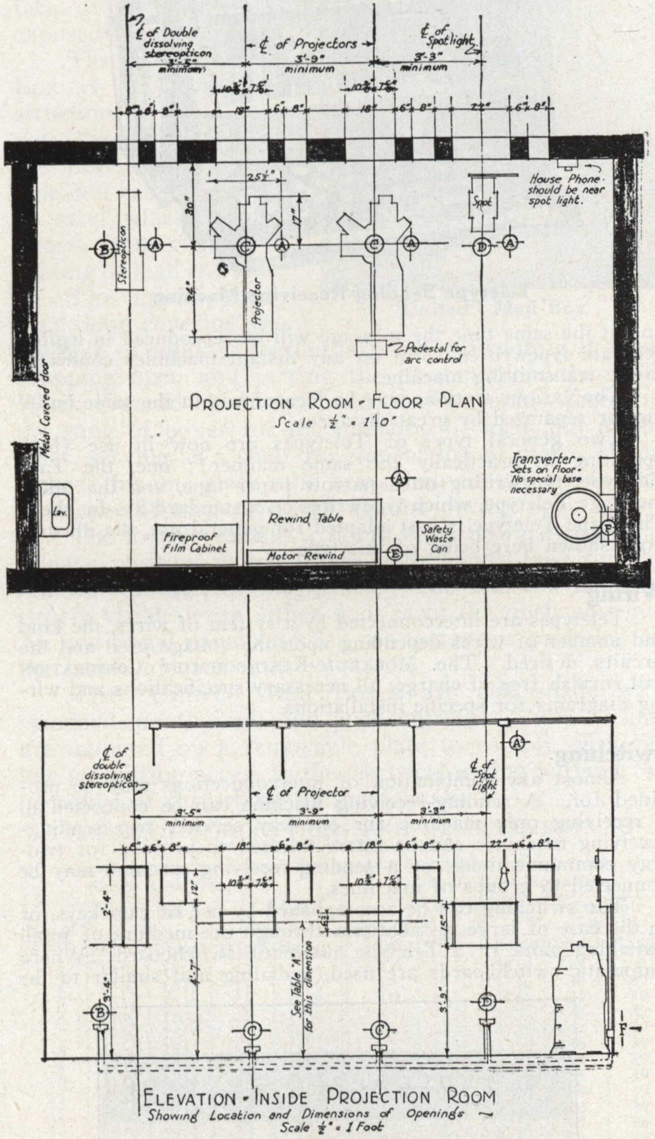
We are the owners of the patent on the original aislelite. Will furnish specifications for any theater, free of charge.

Lobby Display Frames

We are equipped to build to specifications, display frames for lobby and theater front. Sketches and design submitted on request. Representatives in all branches thoroughly equipped to submit details on lobby equipment.

Service to Architects

Our service to architects comprises furnishing blue prints, wiring diagrams, specifications, and personal consultation on the part of men who have been trained over a period of years in the practical projection of motion pictures. They know what is necessary to produce a perfect picture on the screen in the most efficient manner. There are many problems in connection with picture projection which are not known to the average individual. In a great many cases these problems have had to be solved through remodeling after the theater building was completed. It is for this reason that we urge architects to make use of our service to architects, which is free, and places the architect under no obligation. Call on us at any time.


℄ of Double dissolving stereopticon
℄ of Projectors
℄ of Spotlight
3'-5" minimum
3'-9" minimum
3'-3" minimum
10⅜" 7⅝"
8" 6" 8" 18" 6" 8" 18" 6" 8" 22" 6" 8"
25½"
30"
17"
34"
Stereopticon
Projector
Spot
House Phone should be near spot light.
Pedestal for arc control
Metal Covered door
PROJECTION ROOM - FLOOR PLAN
Scale ½" = 1'0"
Transverter - Sets on Floor - No special base necessary
Lav.
Fireproof Film Cabinet
Rewind Table
Motor Rewind
Safety Waste Can
A
B
C
D
E
F
℄ of double dissolving stereopticon
℄ of Projector
℄ of Spot Light
12"
2'-4"
6½"
15"
3'-4"
4'-7"
See Table "A" for this dimension
3'-9"
ELEVATION - INSIDE PROJECTION ROOM
Showing Location and Dimensions of Openings
Scale ½" = 1 Foot

Typical Booth Layout

Blue prints furnished to architects, free

THE PRECISION MACHINE COMPANY, INC.

Manufacturers of Various Types of Motion Picture Projectors

317 East 34th Street

NEW YORK, N. Y.

Products

Simplex Motion Picture Projectors:

Reflector Arc, High Intensity.

Regular Arc, Incandescent.

Simplex
TRADE MARK REG.

Simplex Projectors

Simplex projectors are designed to meet the projection requirements of theaters desiring the best screen presentation of pictures. They are used in many of the finest theaters in all countries of the world and in thousands of theaters in the United States.

Simplex projectors are sold and serviced by distributors in 28 centers of the country.

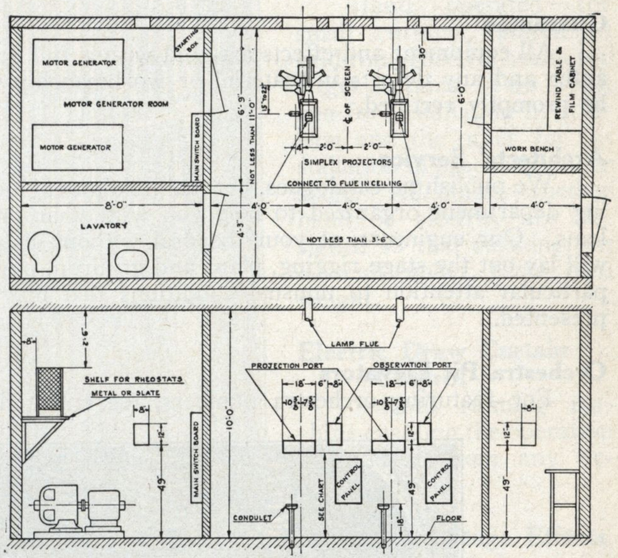
Blue Print Service

A properly designed projection booth is essential to the efficient operation of any motion picture projector. To be sure the proper provisions are made for projection rooms where Simplex projectors are to be installed, the manufacturers of these machines have established a free blue print service which is available to any exhibitor or architect.

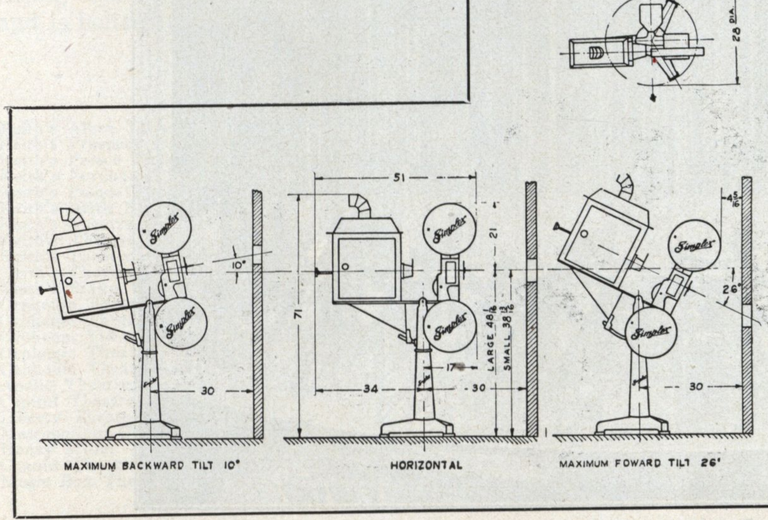
The blue prints offer a choice of layouts for booths of various dimensions and are endorsed by the manufacturers of Simplex machines as adequate and practical in every way.

Architects can save much time and trouble and avoid all possibility of overlooking any detail of the projection room requirements by using this service.

Blue prints are supplied free of charge and entail no obligation.


MOTOR GENERATOR
MOTOR GENERATOR ROOM
MOTOR GENERATOR
STARTING BOX
MAIN SWITCH BOARD
NOT LESS THAN 11'-0"
6'-9"
15" TO 22"
℄ OF SCREEN
30"
6'-0"
REWIND TABLE & FILM CABINET
WORK BENCH
4" 2'-0" 2'-0"
SIMPLEX PROJECTORS
CONNECT TO FLUE IN CEILING
8'-0"
4'-0"
4'-0"
4'-0"
4'-0"
4'-3"
LAVATORY
NOT LESS THAN 3'-6"
2'-6"
8"
SHELF FOR RHEOSTATS
METAL OR SLATE
8"
12"
49"
MAIN SWITCH BOARD
10'-0"
LAMP FLUE
PROJECTION PORT
OBSERVATION PORT
18" 6" 8"
10 5/8" 7 5/8"
18" 6" 8"
10 5/8" 7 5/8"
12"
CONTROL PANEL
CONTROL PANEL
SEE CHART
49"
18"
CONDULET
FLOOR
8"
12"
49"

A Simplex Booth Design


28 DIA.
51
21
71
LARGE 48 1/16
SMALL 38 13/16
17
34
30
30
30
10°
26°
4 5/16
Simplex
MAXIMUM BACKWARD TILT 10°
HORIZONTAL
MAXIMUM FOWARD TILT 26°

INCLINATION OF PROJECTOR	PROJECTION PORT SMALL PEDESTAL	PROJECTION PORT LARGE PEDESTAL
-10°	41	50 1/4
-8°	39 3/4	49
-6°	38 3/4	48
-4°	37 11/16	46 15/16
-2°	36 5/8	45 7/8
0°	35 9/16	44 13/16
2°	34 1/2	43 3/4
4°	33 7/16	42 11/16
6°	32 7/16	41 11/16
8°	31 3/8	40 5/8
10°	30 7/16	39 11/16
12°	29 3/8	38 5/8
14°	28 3/8	37 5/8
16°	27 5/16	36 9/16
18°	26 1/4	35 1/2
20°	25 1/4	34 1/2
22°	24 3/16	33 7/16
24°	23 1/8	32 3/8
26°	22	31 1/4

BACK TILT (-10° to -2°)

HORIZONTAL → 0°

FOWARD TILT (2° to 26°)

SPECIAL QUADRANT (20° to 26°)

Location of Projection and Observation Ports for Simplex Projector

PETER CLARK, INC.

Manufacturers of Stage Equipment
534-538 West 30th Street
NEW YORK, Y. Y.

WESTERN REPRESENTATIVE: Frank R. Eastman, 1773 No. El Molino Avenue, PASADENA, CAL.
CHICAGO REPRESENTATIVE: Irwin Goodrich, 3323 Belden Avenue, CHICAGO, ILL.

Products

Stage Rigging; Orchestra Pit Elevators; Organ Console Elevators; Counterweight Systems; Draw Curtain Tracks; Asbestos, Steel and Soundproof Curtains; Mechanical Stage Effects; Hand and Electric Curtain Hoists; Electric Draw Curtain Equipment.

Also Theatrical Iron Work, Stage Floors and Portable Ballroom Floors.

Guarantee

All equipment and effects are sold with a full guarantee and any defects in material or workmanship will be promptly rectified.

Architects' Service

We publish no catalogues, but maintain an engineering department organized to help you with your problems. Our engineers, at your disposal without charge, will lay out the stage rigging, plans and gridiron, paying particular attention to unusual conditions that may be presented.

Orchestra Pit Elevators

For featuring orchestra numbers, the entire floor of the orchestra pit is made the platform of a multiple screw elevator. The platform is lowered to the basement level where musicians enter or leave through a convenient door without annoyance to the patrons. While playing, the platform is brought to stage level for the overture.

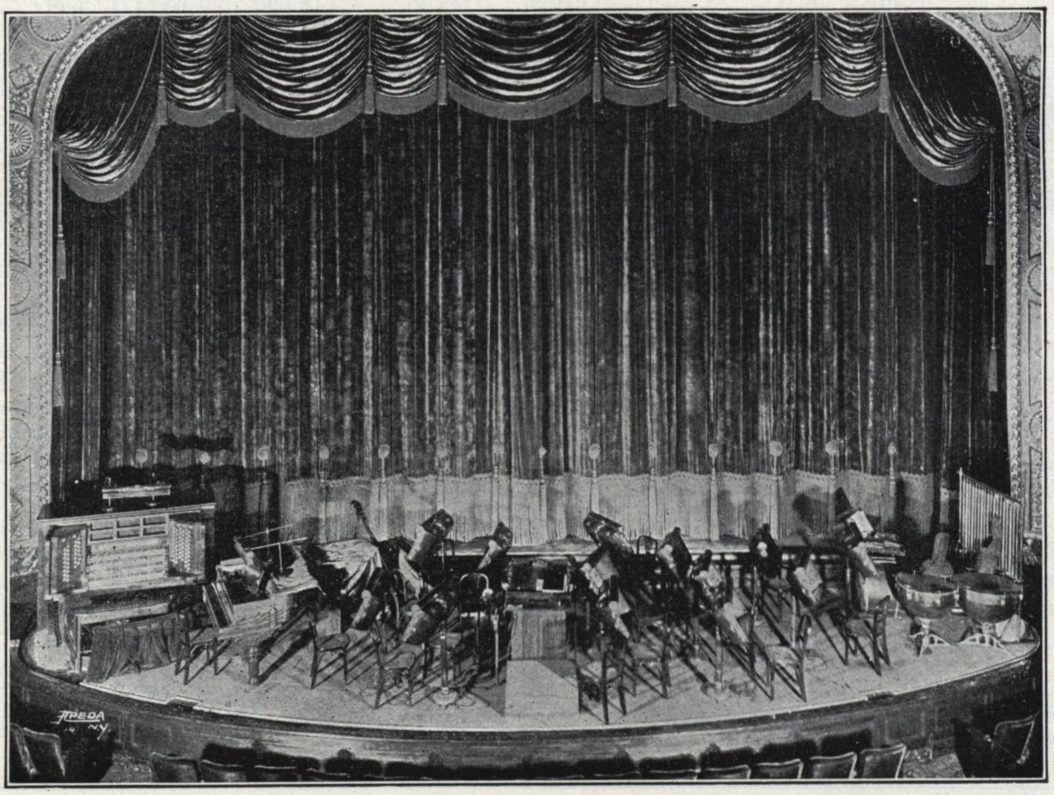
The platform can be lowered to an intermediate level, out of the sight lines of the audience, for accompanying the production.

The orchestra lift is electric driven and automatically controlled by push buttons. The leader, by pushing proper button for any of the levels, can bring platform to desired position where it will automatically stop.

The machinery is operated by one motor; it is worm gear driven and is ball bearing throughout. Operation can be arranged from two points.

Organ Console Elevators

Similar to orchestra pit elevators except that the platform is only large enough to hold console and usually are single screw. They are automatically controlled and operated in the same manner. Console lifts can also be made to revolve so organist presents a better view to the audience when playing a solo.



Orchestra Pit Elevator Installed in Colony Theatre, New York, N. Y.

Continued on next page

Counterweight System

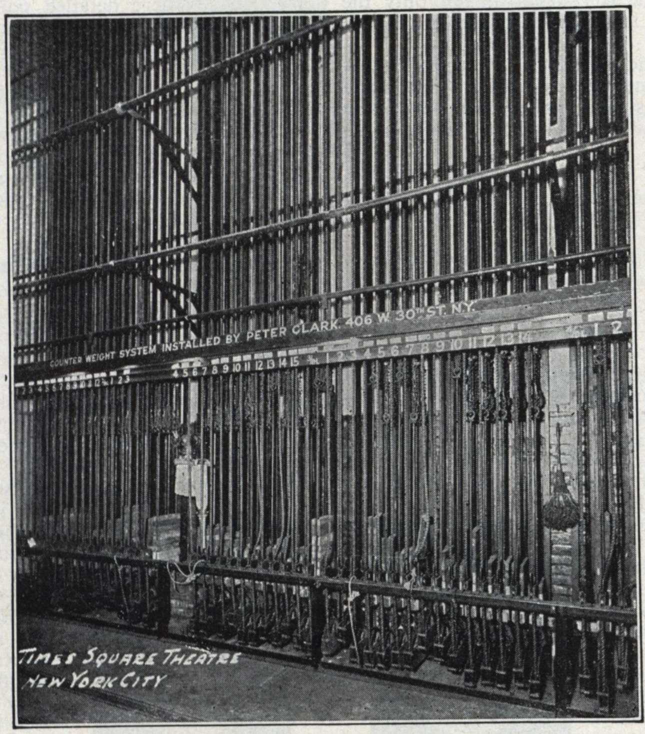
This system does away with fly galleries and operating of scenery from the flies, as all drops are handled from the stage floor.

Each set consists of a pipe batten long enough for width of opening—batten equipped with quick acting clamps or chains with snap hooks for attaching scenery to batten. Batten is hung by steel cables which run over loft blocks which have self-lubricating bearing, to roller bearing head block, and cables are attached to counterweight frame with trimming chains. Counterweight frame is equipped with fiber guides which run on tee-iron tracks. Tracks are placed on side wall of stage house. Counterweight frames are open on end so weight can be easily added or taken off frame.

The set is operated by a manila rope hand line which is attached to top of counterweight frame and run over head lock through locking clamp, thence over tension pulley and up to bottom of frame.

There is a loading platform at the upper travel of frame where frame is loaded or unloaded when scenery is put on or taken off of pipe batten. Across the entire front of the system, on the stage floor, is a locking rail which has rope locks and also card index for marking sets. Also across entire front of system there is an illuminated strip for lighting, with subdued light, the locking rail. On this strip the sets are numbered consecutively.

During a production the system is operated from the stage floor. The ease and quickness with which scenes can be handled, make it worth while to install this system, to say nothing of the labor saved.


COUNTER WEIGHT SYSTEM INSTALLED BY PETER CLARK. 406 W. 30TH ST. N.Y.
TIMES SQUARE THEATRE
NEW YORK CITY

Counterweight System Installed in The Times Square Theatre, New York, N. Y.

Draw Curtain Tracks

Steel encased maple tracks fitted with lignum-vitae ball slides. Each slide has welded metal eye for fastening curtain. The steel casing has welded joints and is bolted to a pipe batten. Track sheaves are ball bearing in iron frames and guarded to prevent rope from getting off sheave. Tracks are noiseless and dustproof. Highly recommended for productions that travel. Easily hung by tying rope to batten.

Asbestos Curtains

Flexible asbestos fire curtain of plain or woven wire cloth. Asbestos cloth curtain with rigid steel frame, has a layer of cloth on both auditorium and stage side of curtain. Curtains rigged so that they descend under their own weight.

Steel Curtains

Fire curtains with sheet steel face and vitrified asbestos back on structural iron frame.

Soundproof Curtains

Used in schools to separate gymnasiums from auditoriums. Have a sheet steel center covered on both sides with sound resisting material. Have a structural iron frame covered on both sides with asbestos cloth.

Curtain Hoists

Hand operated for small curtains, placed in gridiron. Electric hoists for larger curtains. Two types, one for installation in gridiron and the other for installation in basement under stage. All hoists, whether hand or electric, are designed so that curtains can descend under their own weight.

Electric Draw Curtain Control

Smooth running machine enabling the operation of curtain from any desired points.

Mechanical Stage Effects

Our knowledge of this highly special line has been gained through 25 years of experience, backed by technical knowledge. We accomplish results that are practical and mechanically correct.

Installations

Keith's Albee Theatre, Brooklyn, N. Y.
Keith's Prospect Theatre, Brooklyn, N. Y.
Keith's Palace Theatre, New York, N. Y.
Keith's Fordham Theatre, New York, N. Y.
Keith's Palace Theatre, Cleveland, Ohio
Keith's 105th Street Theatre, Cleveland, Ohio
Keith's Theatre, Syracuse, N. Y.
Keith's Theatre, Dayton, Ohio
Keith's Theatre, Providence, R. I.
Keith's Theatre, Boston, Mass.
Keith's Rialto Theatre, Louisville, Ky.
Orpheum Theatre, Kansas City, Mo.
Orpheum Theatre, Minneapolis, Minn.
Orpheum Theatre, South Bend, Ind.
Orpheum Theatre, Los Angeles, Cal.
Orpheum Theatre, San Francisco, Cal.
Apollo Theatre, New York, N. Y.
Capitol Theatre, New York, N. Y.
Liberty Theatre, New York, N. Y.
Metropolitan Opera House, New York, N. Y.
Henry Miller Theatre, New York, N. Y.
Chanin Theatre, New York, N. Y.
Music Box Theatre, New York, N. Y.
New Amsterdam Theatre, New York, N. Y.
New York Hippodrome, New York, N. Y.
Selwyn Theatre, New York, N. Y.
Times Square Theatre, New York, N. Y.
Winter Garden Theatre, New York, N. Y.
Apollo Theatre, Chicago, Ill.
Chicago Theatre, Chicago, Ill.
Harris Theatre, Chicago, Ill.
McVicker Theatre, Chicago, Ill.
Selwyn Theatre, Chicago, Ill.
State Theatre, Chicago, Ill.
Tivoli Theatre, Chicago, Ill.
Ambassador Theatre, New York, N. Y.
Franklin Theatre, New York, N. Y.
Guild Theatre, New York, N. Y.
Shubert Theatre, New York, N. Y.
Uptown Theatre, Chicago, Ill.
Diversey Theatre, Chicago, Ill.
Pantheon Theatre, Chicago, Ill.
Stratford Theatre, Chicago, Ill.
Senate Theatre, Chicago, Ill.
Wood Theatre, Chicago, Ill.
Goodman Hall Theatre, Chicago, Ill.
National Cash Register Auditorium, Dayton, Ohio
Public Auditorium, Cleveland, Ohio
James Theatre, Columbus, Ohio
National Opera House, Havana, Cuba
Albiso Theatre, Havana, Cuba
Academy of Music, Philadelphia, Pa.
Fox Theatre, Philadelphia, Pa.
Logan Theatre, Philadelphia, Pa.
American Theatre, Philadelphia, Pa.
Shawnee Theatre, Philadelphia, Pa.
Earle Theatre, Washington, D. C.
Mayflower Hotel, Washington, D. C.
Tivoli Theatre, Washington, D. C.
Wardman Theatre, Washington, D. C.
Biltmore Theatre, San Francisco, Cal.
Orpheum Theatre, Oakland, Cal.
Granada Theatre, Santa Barbara, Cal.
Balboa Theatre, San Diego, Cal.
Mecca Temple, New York, N. Y.
Akdar Temple, Tulsa, Okla.
East High School, Columbus, Ohio
Forshay High School, Los Angeles, Cal.
Washington Irving High School, New York, N. Y.

INTERNATIONAL TIME RECORDING CO. OF NEW YORK

GENERAL OFFICES
50 Broad Street
NEW YORK, N. Y.

FACTORIES: ENDICOTT, N. Y., DAYTON, OHIO, WASHINGTON, D. C. and TORONTO, ONT.

BRANCH OFFICES, SERVICE STATIONS AND DISPLAY ROOMS IN ALL THE PRINCIPAL CITIES OF THE WORLD

Products

ELECTRIC TIME SYSTEMS: Master Clocks; Secondary Clocks; Program Devices; Time Stamps; Attendance Time Recorders (Dial, Card and Autograph); Elapsed Time Recorders; Job Time Recorders; Door Recorders; Cost Recorders; Watchman's Systems, etc., for schools, banks, hotels, hospitals, public buildings, railroad terminals, manufacturing plants, etc.

International Experience and Reputation

The INTERNATIONAL TIME RECORDING CO. is not only the pioneer in its line but is also the largest manufacturer of time systems in the world.

International products are the result of 36 years' experience in the manufacture of time systems. They are made in a variety of models and sizes that makes it possible for this company to satisfy every time recording and time indicating demand.

International products embody the best materials obtainable. They are scrupulously inspected at various stages of manufacture and must measure up to a rigid standard before they reach and pass final inspection.

International products are guaranteed against defective materials and workmanship for a period of one year from date of installation.

International Service

This company will furnish, without cost, specifications, layouts of conduit, wiring diagrams and estimates covering installations of electric clock and program systems on receipt of necessary information, plans, etc.

Special designs and styles of clocks can be secured in any model to suit the architect's specifications.

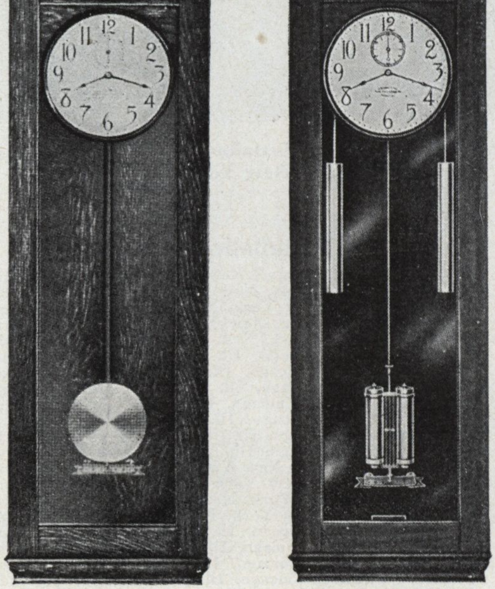
This company will contract for the installation of its products where necessary, but the apparatus is so simple and substantial that the average electrical contractor, by following the company's specifications, can easily install it and render perfect satisfaction.

This company employs a large force of skilled engineers and factory trained mechanics, and is able to give prompt, expert advice and service at all times through its branch offices and service stations located in all principal cities of the world.

Architect's and Engineer's Specification Manual

We publish an Architects' and Engineers' Specification Manual on Electric Time and Signal Systems. It contains general recommendations covering some of the best modern practice in low tension engineering and much valuable data on clock, fire alarm and telephone systems for schools of various sizes. It also includes the four model specifications which are given herein on pages 2538 to 2542.

We believe this manual to be the most comprehensive and valuable treatise ever published on this subject. It will be sent to architects and engineers upon their request without charge.



Series 240
Magnet Driven

Series 260
Weight Driven

International Self-winding Hanging Type Master Clocks

Model Specifications for School Clock and Signal Systems

On pages 2538 to 2542 are given four sets of model specifications for complete low tension clock and signal systems for schools. These specifications and other technical information are given in the following pages with the idea that they will not only be of practical service to architects and engineers, but that they will bring to the minds of those who use them an impression of the manufacturing and engineering ideals which this company maintains.

No attempt is made to commit those who avail themselves of the information given, to the exclusive use of International products. Where detailed points of construction are specified, they refer to features of International design which are based on the best electrical and mechanical practice and the most advanced ideas in time system engineering. Exclusive or patented features are thoroughly explained as such, and full information is given so that their merit be properly weighed.

We believe that a specification should admit of competition between manufacturers of good repute and comparable service facilities, therefore features that are sole developments of this company are suggested as addenda or alternatives to regular specifications.

International Self-regulating Feature for Impulse Time Systems

This feature, the latest International contribution to time system engineering, has been developed after careful research and exhaustive tests. A frank and uncolored discussion of the need for this device and why it was developed, will enable the reader to form an opinion of its value based on technical facts.

It should be borne in mind, considering ordinary electric impulse time systems as a whole, that the minute electric impulses are fundamentally a *means of drive* or propulsion. Secondary clocks or other secondary units *can not keep time of themselves,* and if the electric propelling or driving impulse fails to reach any unit for any reason, or if the unit is hindered in any way from responding to the impulse, *it has no means whatever, of itself, to continue to operate or to recover.*

A master clock controlling an electric impulse time system (outside of its time keeping requirements) has only one other duty to perform, and that is, to make a relatively short contact once every minute, with as nearly perfect regularity as possible, for *the sole purpose of establishing a circuit between some source of electric power and the secondary units that such power propels.* This is all the master clock does in an ordinary minute impulse time system. The matter of sounding signals has no bearing on the master clock's primary function and need not be considered.

It is assuredly a fact that if secondary units depended on the closing of master clock contacts alone, they would by all means, be absolute and positive reflections of the master clock's condition at all times. But such is not the case and, without the necessity for any experience with such systems on the reader's part or any particular engineering knowledge, a mere consideration of the components of an electric time system demonstrates one fact, which is: *there are always several variables present between the master clock contact and the*

Continued on next page

time indication on the secondary clock which its action is designed to affect.

The elements interposed, and required of necessity, between the master clock's minute contacts and the time indication on the secondary dials are: master relay, batteries, circuit relays, circuit wiring and secondary mechanism. All of these elements have individual limitations and are subject to disturbances that tend to interfere with their uninterrupted operation as a part of a clock system.

Batteries—Batteries have inherent limitations within their particular ratings and are sensitive to neglect, sudden drains and to irregularities in the charging current. These things tend to decrease the life of the cells and to hinder their best performance. Manufacturers of clock systems have done much to reduce the effect of these weaknesses by means of automatic charging boards with indicating meters, reliable rectifying apparatus, etc., thus proving that these weaknesses are a vital problem in time system design.

Relays—These simple devices give little or no trouble, but a little dust may get between the contacts and take an additional minute or two before the wiping or rolling action will work the dust out and restore normal contact. Undue and accidental vibration at the time of impulse may make the relay chatter, sending extra short impulses out over the secondary circuit. There are a number of abnormal conditions affecting relays in any clock system.

List No. 272 List No. 276

International Self-winding Ornamental Foor Type Master Clocks

Circuit Wiring and Connections—The danger of temporary grounds, partial short circuits or open circuits where wiring repairs or changes are being made to adjacent systems or to some part of the clock or bell system during operation, also the effect of moisture, mechanical abrasions, poorly made joints, etc., are well-known disturbances to any wiring system.

Secondary Mechanism—The greatest dangers to the retarding or undue advancing of secondary mechanisms are dust, improper connections at the terminals, and the fact that, having no means of driving themselves, they inherently respond to all impulses, regular or irregular, supplied to them.

Hourly Supervision Provided in the International System—That all clock manufacturers have long recognized the contingencies mentioned above is evidenced in the universal use of stepping keys and cut-out switches on each circuit of secondary units, and the providing of setting levers, or, at least ready access to each secondary unit so that either the whole circuit or the individual clock might be set by hand when necessary.

It must not be taken from the above that a well designed, constructed and installed plain impulse system has no merit. The continued demand for electric time systems holds a real endorsement of the worth of the idea, but experienced and unbiased opinion will admit that in times past a certain allowance has been made for variable factors by clock manufacturers and the public, and that the effect of such disturbances in occasionally throwing clocks out of step (synchronism) should not be taken as a reflection on the quality of the material or equipment so affected.

It does, however, emphasize the real need for some simple device to regularly supervise the system as a whole and make each secondary, on its own account, regularly self-comparing with the master clock's time. *This need is supplied by the hourly supervision provided in the International self-regulating impulse time system.*

A full description of the operation and construction of this feature may be found in our Architect's and Engineers' Specification Manual.

Practical Synchronizing—The International self-regulating impulse time system provides practical synchronizing. In its true meaning, the word "synchronizing" implies the ability of one unit to regularly compare itself with a controlling unit.

The International self-regulating system typifies synchronism even more perfectly than the synchronous motor, because it has the power of automatic and speedy recovery to exact comparison with the master clock.

No claims for individual synchronism in any secondary unit can be made unless it has, within itself, the necessary device by which it can be regularly compared with the controlling source of time. This is not only a technical conclusion but it is also a very practical conclusion.

The International self-regulating impulse time system automatically corrects disturbances or interruptions due to the irregularity in the electric impulse supply up to 29 minutes lead of the master clock or 30 minutes lag. Experience has proven that such variations for secondary units are so unusual that 15 minutes fast or slow, in any one hour, is more than ample supervising range for secondary units not actually defective. Consequently, should a secondary unit be in error up to the wider limits given above, compensation will take place at the rate of 15 minutes per hour until the total error is corrected.

Should a protracted shutdown of the power supply occur, no stepping key or manual resetting is necessary, as a switch is provided in the master clock which releases impulses every two seconds to the whole system, automatically stepping it up until the units are in any position within their own synchronizing range, when the switch is returned to the "running" side and the system proceeds normally.

The master clock has the well-known International 8-day movement, weight driven and automatically wound once a day by a small electric motor from the lighting service. With this 8-day power reserve, the uninterrupted operation of the master clock is practically guaranteed.

Electric Clock and Program Bell Control

The general principles adopted in the early days of electric clock systems are still followed to a large degree in the minute impulse method of operation. The widely spreading uses of electric energy have, in the years just past, demanded almost the entire efforts of electrical engineering ability to keep pace with required improvements, and the development of electric time systems has been rather neglected. Even today, mechanisms are being offered which bear but little change from those marketed 20 to 25 years ago.

This fact, coupled to the growing desire on the part of architects and engineers to specify certain makes of systems outright, offers to the conscientious and progressive manufacturer of electric time systems a splendid opportunity for new ideas and improved practice.

International Practice—International engineers have designed and developed electric time systems, both indicating and recording, for over 25 years, improving the product and extending the scope of its application.

International electric time systems are constructed in accordance with the recommendations of the National Board of Fire Underwriters Laboratories for 250 volts and below.

Master Clocks—These instruments are not so much timepieces as they are governing mechanisms—they are the controlling element for all secondary units. In English systems, the master regulator rarely performs any ornamental function, but is secluded and under the sole observation of the person responsible for the system. In order to have this governing element most efficiently perform its part, which is to deliver short electric impulses to the system with as near perfect regularity as possible, it should be kept closed. For this reason, no relays, switches, program devices or other instruments should be mounted inside the case. This insures more uniform regulation and better performance of the master clock.

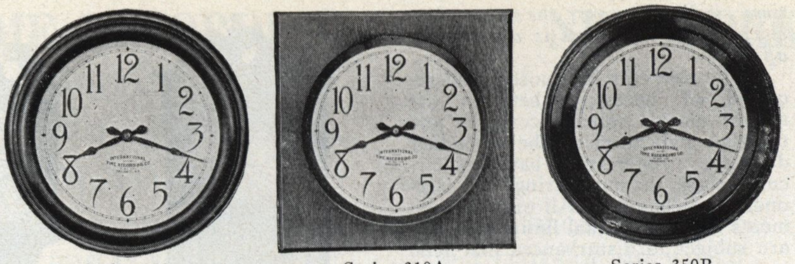
Winding of Master Clocks—Master clocks should be self-wound. The method of winding used for many years is the ratchet and pawl method which, through the minute impulse from the master clock itself, winds a small spring on a toothed wheel once each minute, recovering the tension lost in the preceding minute. With a dependable current source, this type of movement operates very well—should the current fail, it will run almost an hour.

The best and most reliable type of self-winding movement, and the most accurate, is obtained in the use of an 8-day, weight-driven design. The weights insure uniform driving power regardless of temperature, giving better time keeping qualities than the previous type described, and if the weight

Continued on next page

driven movement is provided with a small electric motor for automatically rewinding once a day, the arrangement becomes an ideal and absolutely dependable system governor.

All current-carrying parts should be insulated from the movement entirely and no current should pass through any part of the movement itself, for, if grounds exist on the system, a person touching the metal pendulum at the moment of impulse, may receive a very heavy inductive shock.



Series 320
Wood Case, Surface Type

Series 310A
Wood Case, Surface Type

Series 350B
Metal Case, Surface and Semiflush Type

International Secondary Clocks

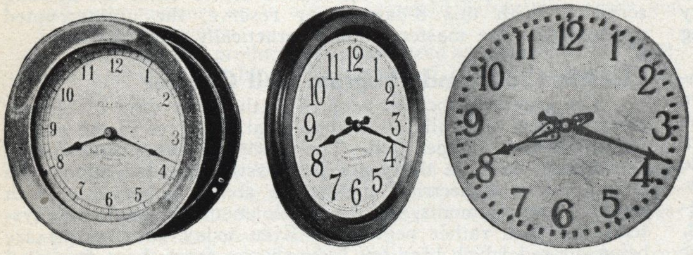
Location of Master Clocks—Places that are excessively damp or where sudden and wide variations of temperatures occur, should never be selected as locations for master clocks. The ideal location is one where the master clock will have the benefit of responsible supervision. A 60-beat regulator should be suspended with its top about 10 ft. from the floor in the principal's or superintendent's office.

In regulating master clocks, the accuracy obtainable depends largely on surrounding conditions. As a rule, the slower the beat the more accurate the movement. A master clock may be rated at 60 beats, but it may be so affected by temperature changes, vibration, etc., as to vary considerably from its normal performance.

Rigid and secure mounting of bases on solid, substantial partitions will greatly aid in obtaining accurate regulation. It is much better to locate a master clock as low in the building as possible and out of the path of building vibrations, rather than on an upper floor.

Secondary Clocks—These are very simple mechanisms, but due to their extreme simplicity and the fact that the general principle of impulse-operated secondary clocks has been so long on the market, too little importance has been attached to certain correct features of design.

Secondary movements of the ratchet and pawl type must have certain basic features in order to meet the requirements of service—they must be rustproofed; they must have machine cut gears and wheels and moistureproof coils; the hand gears must be self-locking both before and during the driving impulse; they must be properly assembled with a heavy front plate and rear bearings so that perfect alignment of parts is maintained. These points impose no special features on a high grade movement, and with them the best possible results may be expected.



Series 360
Metal Case Gauge Type for Boiler Room Service

Series 350C
Metal Case, Semiflush, Hinged Type

Series 370B
Ornamental Marble Dial Type

International Secondary Clocks

To decrease the load on the movement, all clock minute hands should have counterbalance weights and it is good practice to also counterbalance the hour hand (although it is the smaller one, and the counter torque produced by its weight is reduced to one-twelfth at the minute hand or driving shaft).

Secondary clock cases of the surface type are furnished in wood and in metal.

Wood Case Secondary Clocks—The wood case clocks should have 5-ply, cross veneered wood backs in order to permit rigid attachment to wall. The case should have a hinged door front of well-enough fitting construction so as to be dustproof when closed. The movement should be mounted on an enameled steel or brass mounting plate rather than wood, as a wood mounting plate increases the danger of misalignment. The dial should be white enameled metal.

Roman or Arabic numerals may be specified, but for legibility the Arabic dial seems to have the greatest demand. Roman numerals have better application for ornamental units where bronze numerals are employed.

Metal Case Secondary Clocks—These should be made preferably of copper, especially if any excess moisture is to be present. A steel case takes a slightly better enamel finish and is somewhat cheaper to manufacture, but it must be copper plated to take any of the popular statuary bronze finishes so often specified. Metal case secondary clocks should be of the two-section type, in order to avoid having to either hang them loosely on a wall hook or to have outside lugs and mounting screws visible.

This two-section body construction permits of a metal base which is hollow and can be lagged to the wall directly over the outlet box. In most cases (12-in. dial and up), this base could admit a program buzzer or a 2½-in. bell. The top part or bezel contains the dial, protection glass and movement and can be attached to the base by two round head clamping studs on which the bezel is slipped through two yoke holes. This bezel permits the unit being used as a semiflush clock by omitting the base part, installing a larger outlet box and by inserting the round head clamping studs in the wall.

Another form of semiflush metal case secondary clock uses a hinged mounting plate which is attached directly to the outlet box.

The semiflush type is without doubt the neatest form of installation. The outlet boxes should be installed when the partitions are being built.

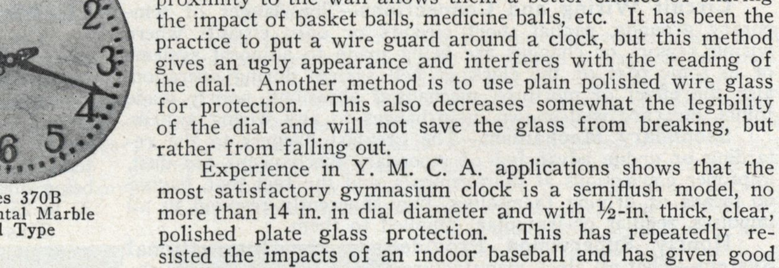
Secondary Clocks for Gymnasiums—Gymnasium clocks should always be of the semiflush type, as their close proximity to the wall allows them a better chance of sharing the impact of basket balls, medicine balls, etc. It has been the practice to put a wire guard around a clock, but this method gives an ugly appearance and interferes with the reading of the dial. Another method is to use plain polished wire glass for protection. This also decreases somewhat the legibility of the dial and will not save the glass from breaking, but rather from falling out.

Experience in Y. M. C. A. applications shows that the most satisfactory gymnasium clock is a semiflush model, no more than 14 in. in dial diameter and with ½-in. thick, clear, polished plate glass protection. This has repeatedly resisted the impacts of an indoor baseball and has given good results.

Secondary Clocks for Boiler Rooms—The accepted type of clock for this location is a cast metal case of the gauge type. They are mounted on switchboards or instrument boards and are steamproof and fumeproof.

Ornamental Secondary Clocks—This type of unit yields entirely to the architectural scheme in mind. Regular units having marble dials, skeleton bronze dials, and silver or bronze metal dials, all with raised numerals have been developed. Some general mechanical limitations should be borne in mind when writing specifications as follows:

Marble Dials—May be square or round and have either incised (cut) numerals filled with gold or black enamel, or raised bronze numerals. For 24-in. dials and above, they should be furnished with a removable center, which is a marble disc with a bronze ring and bayonet slip joint holding the movement and hands, and is used when access to the movement can only be had or is particularly desired from the front. For rear



Series 380A
Ornamental Skeleton Dial Type

List No. 912
Ornamental Metal Dial and Case Type

List No. 986
Ornamental Cast Bronze Semiflush Case Type

International Secondary Clocks

Continued on next page

access, the wall or outlet box should be open on the dial side of the wall and furnished with a regular panel box steel trim with hinged door on the opposite side.

Skeleton Dials—Skeleton dials below 48 in. in diameter may have plain rings and if strong shadow relief is desired behind the numerals, there may be inserted ½-in. spacers between the wall and the rings. Above the 48-in. dial, it is usually necessary to relieve the plain lines of the skeleton ring by a cast ring with a simple conventional ornamentation such as a bead and ball, or egg and dart. Instead of sheet metal hands, cast bronze hands are used. The latter type of unit requires a slow motion, motor drive secondary movement with concealed hand counterbalances. For front access, a rosette and plate are used to cover the wall box opening. For rear access there may be the same opening or a small sleeve through the wall surface to the box for the hand shaft to pass through.

Program and Clock Control—This very important element in the electric time system has the most intimate bearing on the administration of a school and deserves appropriate care in its selection. It must be borne in mind that the program device is to accomplish a definite result, and that it is more a part of the school organization than it is of the building. Also, in the growing demand for school buildings, it is easy to realize the need for forethought on the architect's part in planning future requirements for handling an increased number of pupils and extension courses.

Program Schedules in Large Schools—In the larger communities, especially in co-educational centers, the need for successive (alternate) lunch periods, short class periods on chapel days, and night school classes, imposes on program equipment the requirement of extreme flexibility. This must be obtained without complex or bulky mechanism.

The best plan for the architect is to obtain from the local school authorities an idea of the general requirements in the above respects. It is, of course, impossible in most cases to obtain a definite program schedule for a school that is just being planned, but a general scheme of operation is always available and that plan should be part of every specification for a program control equipment.

In the design of a proper program control, the results to be obtained govern the layout of the equipment as much as the quantity and groups of signal apparatus to be operated.

Method of Layout—The first step is to divide the signal apparatus (bells, buzzers, gongs, etc.) into program groups. These groups should then be considered as circuits. By the use of a cross-connecting plug board, any room can be included in whatever group or circuit is desired. Then each circuit is given a schedule of its own for regular school day classes, evening classes, if any, and any probable odd schedule during any day in the week.

For instance, in a large boys' and girls' high school using 8 circuits, 5 circuits have the same schedule every day except Friday, but they are released for lunch each day at different times. On Friday the whole school has chapel or auditorium and all groups have the same short periods for the rest of the day. The three other circuits are the cafeteria circuit, gymnasium and outside yard gongs, each having its own regular daily schedule with a different one on Friday. In addition, evening classes are to be provided in the 5 circuits first mentioned. This information allows a very accurate estimate of the equipment required.

Such conditions as the above are met efficiently with minimum cabinet or wall space by the International metal disc program machine. Being designed with disc units of 6 hours, the machine can be divided into either 6, 12, 18 or 24-hour programs and distributed as required over the circuits laid out for the school. The machine is positive in operation and of rugged mechanical assembly. Changes can be made with utmost ease and dispatch. The electrical contacts are thoroughly insulated from the drum and, being connected in but one leg of the control circuit, can not short or cause trouble in the system. A calendar drum is provided, allowing the program schedule, set up in each disc, to be repeated during any 6-hour period desired in the week or cut out altogether on Saturdays, Sundays, holidays, nights, etc.

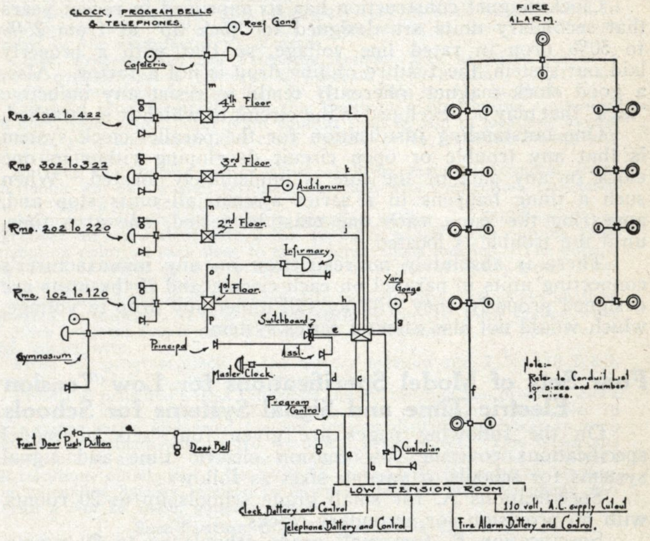
Bell circuit relays have a general service rating of 10 amps. each, with a duty cycle of 15 times an hour on 24 volts and below, and 5 amps. at 110 volts.

Program Requirements in Small Schools—The treatment of the requirements of a small school yields to the matter of cost more than in the larger institutions. Where the installation of secondary clocks, in addition to program control is desired, the disadvantages of placing equipment within a master clock case are often accepted in the interests of economy of cost and wall space.

A combination of a 60 or 72-beat master clock with clock control relays and program equipment mounted inside, produces satisfactory results for these smaller schools, the secondary clock circuits being distributed directly from the master clock location. In small school buildings for which secondary clocks are not desired, but only automatic program control, the cheapest and most reliable method is the use of a 60 or 72-beat mechanically driven program clock equipped with a 6 or 8-day spring driven movement, wound once a day by a small electric motor from the 110-volt lighting service. Being a 6 or 8-day movement, any temporary lapse of current supply has no effect in the system except as to ringing the bells. Current to ring the bells is usually taken through a small transformer and since signals are irregular and at comparatively long intervals, occasional interruptions in the current supply are not as disturbing as they would be if the clock operation itself were affected. However, in a great many cases, dry or wet primary cells have been used to good effect for the bell circuits.

Wiring—Rules for electric wiring are dictated rather closely by certain recognized authorities. Generally speaking, conformity with the recommendations of the National Board of Fire Underwriters Laboratories will satisfy most local boards or bureaus having jurisdiction over such matters. The safest and most accepted position to take is that the same construction employed for the lighting and power circuits should be used in the low voltage circuits. In modern building construction, conduit wiring is the only proper method of handling such circuits. A common conduit for all low tension (except fire alarm) connections to any particular point is good practice and economical. Little or nothing is gained by separating the components of a low tension system into separate conduit lines, except for large telephone cables.

The use of distributing centers is much to be desired and the best practice is the generous use of intermediate connection or terminal blocks, so that localized tests may be made and a faulty circuit isolated at as near the seat of trouble as possible. The size of these distributing centers depends on the extent of the system. A general plan for a layout of a low tension circuit distribution is given in the accompanying riser diagram.



Low Tension Riser Diagram

The location of the units in each room may be made by the usual symbols directly on the plans and the location of the distributing centers likewise.

All wire used should be rubber covered with double braid, under the National Electrical Code Standards. All joints should be properly soldered, rubber covered and taped.

The use of galvanized, loricated or sherardized conduits and fittings is recommended for all wiring.

Clock and Program Bell System Connections—Clock manufacturers widely differ as to the relative merits of series or parallel clock circuits. When electric clock systems were first manufactured, the requirements were, as a rule, for plain time indicating clocks and not until later were printing mechanisms operated. In addition, systems were not as large and extensive as they are now and did not, of course, involve the present diversified types of secondary units.

Mainly, however, due to the fact that very little engineering research has been devoted to clock magnet development, clock manufacturers knew no other simple means of controlling

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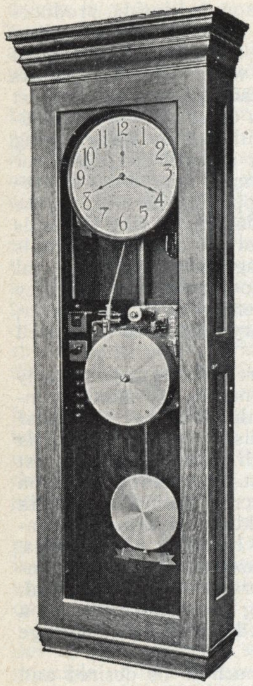


Series 460
Program Clock

inductive discharge impulses than by the use of series operation, and of necessity accepted its disadvantages. These inductive discharges tend to deliver an additional impulse each time the system operates.

Due also to the fact that these systems were operated at from 10 to 20 volts, much line drop could not be afforded and the use of a series circuit also permitted the smallest possible size of wire connections. Systems were seldom added to or changed, and, under highly competitive conditions, the series method of operation was cheaper commercially.

Why Series Operation Is Not Best Practice—Today, where systems are subject to extensions and additions, when they involve (such as in hotels, hospitals and industries) many administrative devices for printing time (that is, when all units on one circuit may not be uniform in character) the parallel system is unquestionably the most flexible and satisfactory.

When additions are made to a series circuit, the voltage of the system must be increased. If there is more than one circuit in a series system, the circuits are connected in parallel and unless adjustment of all the circuits is made with resistances, the voltage can not well be increased. Additional circuits must, therefore, be added for new equipment and placed parallel to the remaining series circuits, proving the superiority of the parallel or multiple principle.

Clock magnet construction has so improved in recent years that secondary units are designed to "pick up" at from 25% to 50% drop in rated line voltage, so that with a properly laid out system, the feature of line drop is not a factor. Also, a good clock magnet inherently tends to resist any inductive "kick" that may be developed in the circuit to which it is attached.

One outstanding justification for the parallel clock system is that any trouble or open circuit developing either in one clock or any part of the line is immediately located. When such a thing happens in a series system, all units stop and, appearing the same, each one must be tested, one at a time, until the trouble is located.

There is absolutely no restriction on any manufacturer's connecting units in parallel on each circuit, and if the units are designed properly, they will not fail under any drop in voltage, which would not also affect a series system.

Four Sets of Model Specifications for Low Tension Electric Time and Signal Systems for Schools

On the following pages are given four sets of model specifications covering low tension electric time and signal systems for schools of various sizes as follows:

Specifications A, for small grade schools up to 20 rooms, with no provision for secondary clocks.

Specification B, for small grade schools up to 20 rooms, providing secondary clocks.

Specification C, for medium sized schools up to 50 rooms.

Specification D, for large schools having 50 rooms or more.

Specification A

Fire Alarm and Signal System for Small Grade Schools
Up to 20 Rooms
(No Provision for Secondary Clocks)

Note: This specification is for a system very reasonable in cost and suitable for a small school, or perhaps a medium sized school where appropriations are limited. Secondary clocks are omitted and only automatic program control is provided.

The fire alarm equipment is of the best grade and produces maximum protection consistent with economy of first cost.

General—Furnish and install a complete fire alarm, program bell and telephone system as hereinafter specified, doing everything necessary to make a thoroughly satisfactory and working system.

This contractor shall submit, before shipment of any equipment, and as required by the work, complete system wiring diagrams for the program bell, fire alarm and telephone equipment together with detailed, descriptive data and dimension drawings for the architect's approval.

The entire equipment shall be warranted free from any defect for a period of one year from date of acceptance of the installation by the architect.

Fire Alarm System—Furnish and install as indicated on plans, a closed circuit, electrically supervised fire alarm system similar to ETS-Form DG manufactured by the Holtzer-Cabot Electric Co.

System shall consist of control center to be located in principal's office, having necessary indicating instruments, disarrangement bells and master code box. Panel shall be of the flush type and shall be provided with steel trim and plate glass door finished as directed by the architect.

There shall be a total of four 6-in. double gong, alternating-current fire bells having cast metal cow gongs, located in corridors where shown on plans. Below each gong and at other locations as directed, install a total of 5 semiflush, break-glass stations for closed circuit duty.

The system shall be tested out and left in approved operating order.

Telephone System—Furnish and install a complete, common-talking, selective-ringing telephone system, similar and equal to intercommunicating system No. 4, manufactured by the Holtzer-Cabot Electric Co.

The system shall be separately wired for, and connected, and shall operate independently of any element used for any other purpose than telephone service.

The system shall consist of one desk type central telephone to be located on the principal's desk at outlet location shown on plans. Principal's telephone shall have wall mounted buzzer, terminal block and a combined push button plate and directory providing signal connection with each station specified. Push button plate shall be mounted on principal's desk and connected to terminal block at outlet by a flexible, silk covered cable having sufficient number of conductors to connect the stations specified.

Furnish and install in each classroom and boiler room where shown on plans one surface type, wall telephone similar to List No. 148965 B, manufactured by the Holtzer-Cabot Electric Co.

Furnish and install in boiler room, in surface type, metal cabinet, 8 Burgess "Super-Six" or "Everready" dry cells, with proper impedance coil for operating current for the telephone system.

Program Bell System—Furnish and install in principal's office, where shown on plans, one 60-beat, self-winding, self-contained program clock similar to International Time Recording Co. Series No. 460 *(see illustration on this page)* with 12-in. dial metal ball pendulum and hardwood case with glass paneled door, case to be of oak and finished as directed by the architect.

Clock shall be capable of regulation within 30 seconds a month of perfect time; and shall have 6 days' reserve operating power, over and above the period between regular, automatic rewindings. Program clock shall be electric motor wound automatically every 24 hours from the 110-volt lighting current supply, and, should current fail, will fully rewind any time current is restored. Clocks shall be equipped with Graham dead-beat escapement and signal duration contacts, providing 4 seconds' ring for inside bells and 15 seconds' ring for outside gongs.

Program machine shall be mechanically driven by the clock movement and to be of the minute interval type to assure positive operation of signals.

Program machine shall control 2 circuits of alternating-current bells and shall provide one 12-hour schedule for each circuit and an additional 12-hour automatically transferred schedule for each circuit on assembly days. Bell circuit relays shall be of the double break type and all equipment shall be mounted on polished, bakelite back panel with necessary switches, push buttons and brass acorn nuts.

Program Bells—Furnish and install in each classroom, as indicated on plans, one metal case buzzer similar and equal to List No. 151040; in "Gymnatorium" one List No. 151017 Type AD 6-in. steel gong; at both ends of building, where shown on plans, 2 List No. 151036 10-in. Type A school yard gongs with mats and housings, all as manufactured by the Holtzer-Cabot Electric Co.

Transformer—For power supply to program bell system, etc., furnish and install one bell ringing transformer having 12-volt secondary and of sufficient capacity to operate the equipment to be connected to it. Transformer shall be mounted on marine finish Penrhyn slate with enclosed switch and cutout, and shall be provided with terminal posts for secondary connections.

Door Bell—Furnish and install at front door one watertight push button, black oxidized finish, and connected to operate two 4-in. cow gongs, one installed in front corridor and the other in boiler room, from bell ringing transformer.

Wiring—All wiring shall conform to National Electrical Code standards, shall be installed in conduit and all joints shall be soldered, rubber covered and taped as required for all other wiring in the building.

Fire Alarm System—Fire alarm system shall be fed from a cut-out between the electric power meter and the main distribution panel with 3 No. 14 B.&S. gauge wires to the control panel in the principal's office. All double gong bells and break-glass stations shall be connected in closed circuit, with 4 No. 14 B.&S. gauge wires, in ¾-in. conduit as required by the manufacturer's diagram.

Clock, Program Bell and Telephone System—Telephone system and program bell system may be wired for in a common conduit system centered at program clock location. This main box to be approximately 8 in. long x 10 in. wide x 4¼ in. deep. Conduits should extend from this to a distributing center on each floor, from which latter point conduits shall be run to locations having both telephone and buzzer or to locations having either telephone and buzzer.

All program bells and buzzers installed within the building are to be grouped in one circuit with 2 No. 12 B.&S. gauge wires running from distribution point on each floor to the program clock location. The outside gongs shall be wired on a separate circuit of 2 No. 14 B.&S. gauge wires to the program clock location. Each buzzer may be wired to its distribution box with 2 No. 16 B.&S. gauge wires. These wires may be run in the same conduit with telephone wires and the conduit to each buzzer outlet may be led out from the nearest telephone outlet. Each distribution box is to be furnished with a complete set of terminal posts with double binding nuts and washers, providing a terminal for each telephone, buzzer or bell. All leads shall be tagged for identification.

From the program clock to the bell ringing transformer run 2 No. 10 B.&S. gauge wires in ¾-in. conduit. From the program clock to the nearest lighting panel run 2 No. 14 B.&S. gauge wires in ½-in. conduit for winding current supply.

From the principal's desk telephone outlet, through the program clock center to the distributing boxes on each floor, run 2 No. 16 B.&S. gauge wires and from the distributing boxes to each telephone a common pair of No. 16 B.&S. gauge wires for the common talking circuit. From each telephone outlet to the principal's desk telephone outlet, run one No. 16 B.&S. gauge wire for selective ringing. From telephone battery location in basement to principal's telephone outlet, run 3 No. 16 B.&S. gauge wires.

Specification B

Clock, Fire Alarm and Signal System for Small Grade
Schools Up to 20 Rooms
(Providing Secondary Clocks)

Note: The following is a model specification laid out for a small school where a complete time system is desired, but of reasonable cost. The scheme is carefully laid out to meet every requirement of good engineering, and conforms to all modern ideas of school administration.

Continued on next page

General—Furnish and install a complete clock, fire alarm, program bell and telephone system as hereinafter specified, doing everything necessary to make a thoroughly satisfactory and working system.

This contractor shall submit, before shipment of any equipment and as required by the work, complete system wiring diagrams for the clock, program bell, fire alarm and telephone equipment together with detailed, descriptive data and dimension drawings for the architect's approval.

The entire equipment shall be warranted free from any defect for a period of one year from date of acceptance of the installation by the architect.

Fire Alarm System—Furnish and install as indicated on plans a closed circuit, electrically supervised fire alarm system similar to the Type E.T.S. Form E.M. system, manufactured by the Holtzer-Cabot Electric Co.

System shall consist of control center to be located in principal's office, having necessary indicating instruments, disarrangement bells and master code box. Panel shall be of the flush type, and shall be provided with steel trim and plate glass door finished as directed by the architect.

There shall be a total of four 10-in. single stroke, electro-mechanical fire gongs located in corridors where shown on plans. Below each gong and at other locations where indicated, install a total of 5 semiflush, break-glass stations for closed circuit duty.

The system shall be arranged for storage battery operation from storage battery hereinafter specified.

The system shall be tested out and left in approved operating order.

Telephone System—Furnish and install a complete common talking, selective ringing telephone system similar and equal to inter-communicating system No. 4, manufactured by the Holtzer-Cabot Electric Co.

The system shall be separately wired for, and connected, and shall operate independent of any element used for any other purpose than telephone service.

The system shall consist of one desk type central telephone to be located on the principal's desk, at outlet location shown on plans. The principal's telephone shall have wall mounted buzzer and concealed terminal connecting block. A combined push button plate and directory, providing signal connection with each telephone station specified, shall be mounted on the principal's desk and connected to terminal block in wall by flexible, silk covered cable having sufficient number of conductors to provide for the stations specified.

Furnish and install in each classroom and in boiler room, where shown on plans, one surface type wall telephone similar to List No. 148965B, manufactured by the Holtzer-Cabot Electric Co.

Furnish and install in boiler room in surface type metal cabinet, 8 Burgess "Super-Six" or Eveready dry cells with proper impedance coil for operating current for telephone system.

Clock and Program Bell System—Clock contractor shall furnish expert supervision of the installation of the equipment called for under this part of the specifications, and shall set and regulate the time system as required, leaving same in approved operating order.

Program Clock—Furnish and install in principal's office, where shown on plans, one 60-beat, self-winding master regulator with self-contained program machine, similar to International Time Recording Co. List No. 492B *(see illustration on this page)*, in selected oak case finished to match surrounding trim. Clock shall have magnet wound movement with Graham dead-beat escapement and metal ball pendulum capable of regulation within 30 seconds per month of perfect time. Movement shall have base casting and hard brass plates, machine cut gears and minute impulse contact of the drop-finger-and-cam type, operated from separate gear train and not from the escapement shaft. Movement shall be insulated from all current carrying parts. Case shall have 5-ply, cross veneered back panel. Master clock shall be provided with a signal operating contact, so timed that signals shall sound following after the regular minute impulse.

Program machine shall be of the minute-interval type and arranged to control 2 circuits of bells, providing one 12-hour daily schedule for each circuit and an additional 12-hour schedule for each circuit, automatically transferred, for assembly days.

Bell circuit relays shall be of the heavy duty type and shall be provided with cut-out switches. Two flush type push buttons shall be provided on the lower moulding of the clock case with one "all-ring" button. There shall also be one timing relay provided to operate outside gongs with a signal duration adjustable up to 20 seconds.

Clock circuit control shall consist of one master controlling relay with setting key and switch. Master relay shall wind the master clock, drive the program machine and control two clock circuit relays with stepping keys and cut-out snap switches, all mounted inside master clock case.

Secondary Clocks—All secondary clocks shall be provided with ratchet and pawl movements of the self-locking type, with white enameled, Arabic dials and counterbalanced hands. Except as otherwise noted, cases shall be of selected oak, finished as directed by the architect and shall have solid, 5-ply backs and hinged door fronts with approved, heavy snap catch. All clocks shall be installed rigidly and secured to the wall at the locations shown on plans.

In each classroom, as indicated, furnish and install, one International Time Recording Co. square case secondary clock with 12-in. dial *(see illustration on page 2536)*.

In "Gymnatorium," as indicated, furnish and install one International Time Recording Co. 14-in. dial square case secondary with hinged front only, and brass wire guard (2-in. mesh). Case to be of the semiflush type *(see illustration on page 2536)*.

In boiler room, as indicated, furnish one International Time Recording Co. 8-in. dial, cast metal gauge type, moisture proof and fumeproof secondary clock with dull black finish *(see illustration on page 2536)*.

Program Bells—Furnish and install in each classroom, as indicated on plans, within the secondary clock case, one metal case buzzer similar and equal to List No. 151052P; in "Gymnatorium," one Type S List No. 151020, 6-in. gong; at both ends of building, where shown on plans, 2 List No. 151033, 10-in. Type D school yard gongs with mats and housings, all as manufactured by the Holtzer-Cabot Electric Co.

Battery Plant—In basement, where shown on plans, furnish and install one low tension power plant consisting of the following units. All batteries shall be of the Electric Storage Battery Co. manufacture, or approved equal, with sealed-in elements in heat resisting glass jars. Batteries shall be installed on white pine shelves 1¼ in. thick, treated with three coats of black asphaltum, and of proper dimensions.

Fire Alarm Battery—This shall consist of one operating battery of sufficient size and capacity to operate the single stroke, electro-mechanical gongs called for, and one supervisory battery of 6 volts.

Clock and Program Bell Battery—This shall consist of one 12-cell, 24-volt Type C.T.M. unit of 12 ampere-hour capacity.

Charging—Furnish and install the following charging equipment.

Fire alarm battery shall be charged by two continuous charging Tungar rectifiers of the full wave type, with insulated primaries, controlled through a charging panel, furnished in steel cabinet and mounted on the wall. Panel to have necessary double throw switch to transfer the battery from one Tungar to the other. One spare Tungar bulb shall be provided and equipment shall include variable charging resistance to satisfactorily regulate the constant, low rate charge and with charge ammeter, voltmeter and two indicating line switches.

Clock and program bell battery shall be charged by a separate Form B Tungar rectifier provided and installed on battery shelf. The adjustment of the charge shall be accomplished by the use of one automatic charging panel similar to International Time Recording Co. List No. 437C *(see illustration on page 2542)*, having hourly operating time switch controlled from clock system, charge ammeter, voltmeter, controlling relay, switches, etc., furnished and installed in steel cabinet on wall adjacent to batteries.

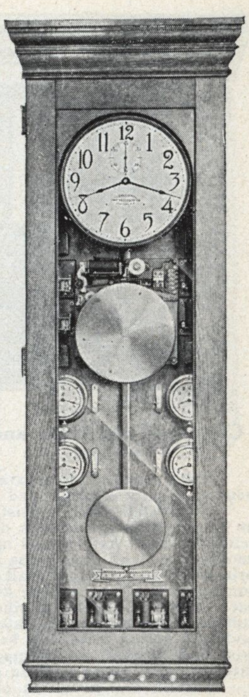
All charging rates shall be adjusted and the system left performing in all respects suitable to the needs of the low tension system.

Door Bell—Furnish and install at front door one watertight push button, black oxidized finish, and connected to operate two 4-in. cow gongs, one installed in front corridor and the other in boiler room, from the clock battery.

Wiring—All wiring shall conform to National Electrical Code standards and shall be installed in conduit, and all joints shall be soldered, rubber covered and taped as required for all other wiring in the building.

110-volt a-c. supply to the rectifiers for clock and signal systems and for the fire alarm system shall be taken from a cut-out ahead of the main light and power distribution point.

Fire Alarm System—From fire alarm battery location to control center in principal's office, 4 No. 14 B.&S. gauge wires. One ground line No. 12 B.&S. gauge from control center to ground clamp at nearest cold water pipe in basement.



List No. 492B
Combined Master Clock and Program Control

All single stroke gongs and break-glass stations shall be connected in closed circuit with 4 No. 14 B.&S. gauge wires in ¾-in. conduit as required by the manufacturer's diagram.

Clock, Program Bell and Telephone System—May be wired for in a common conduit system centered at program clock location. This main box to be approximately 8 in. high by 10 in. wide by 4¼ in. deep.

Conduits should extend from this point to a distributing center on each floor, from which latter point conduit shall be run to locations having telephone, program buzzer and clock outlets, or to locations having any one of the three.

At each distributing center there shall be installed terminal strips with double nut and washer terminals for each wire connection. All leads shall be tagged for identification.

All program bells and buzzers installed within the building are to be grouped on one circuit with 2 No. 12 B.&S. gauge wires running from distribution point on each floor to the program clock location. The outside gongs shall be wired on a separate circuit of 2 No. 14 B.&S. gauge wires to the program clock location.

Secondary clocks shall be grouped in two circuits. All clocks shall be connected in multiple. Clock circuits shall be No. 16 B.&S. gauge wire.

Each program buzzer shall be wired to its distribution box with No. 16 B.&S. gauge wire.

From the program clock to the battery location run 2 No. 10 B.&S. gauge wires and 2 No. 16 B.&S. gauge wires.

From the principal's desk telephone outlet, through the program clock center to the low tension distributing boxes on each floor, run 2 No. 16 B.&S. gauge wires, and from the low tension distributing boxes to each telephone, a common pair of No. 16 B.&S. gauge wires. This is for the common talking circuit. From each room telephone outlet to the principal's desk telephone outlet, run 1 No. 16 B.&S. gauge wire for selective ringing. From telephone battery location in basement to principal's telephone outlet, run 3 No. 16 B.&S. gauge wires.

Specification C and Alternative C1

Low Tension Clock, Signal and Fire Alarm System for Medium Sized Schools Up to 50 Rooms

Note: This set of specifications has been built with a view to both economy of cost and the best engineering practice in handling the circuits required in a 30 to 50-room installation. The features of the entire system guarantee prompt and easy maintenance. No point is omitted to produce results highly desired in the operation of a school.

General—Furnish and install a complete low tension system including clock, program bell, telephone and fire alarm systems as hereinafter specified, doing everything necessary to make a thoroughly satisfactory and working system. This contractor shall furnish all additional items that may be required to complete the work in an approved manner, whether specifically called for or not.

The contractor shall submit, before shipment of any equipment and as required by the work, complete system wiring diagrams for the clock, program bell, fire alarm and telephone systems, together with detailed descriptive data and dimension drawings for the architect's approval.

The manufacturers of equipment furnished shall be required to provide expert supervision of the installation of equipment specified and shall adjust, regulate and place in operation the several systems, leaving same in approved working order.

All quantities specified shall be checked with plans and the quantities required for a complete system shall not be decreased due to any unit being shown on plans but not specifically mentioned in the specifications or vice versa.

The entire equipment shall be warranted free from electrical or mechanical defect of material or workmanship for a period of one year from the date of acceptance of the installation by the architect.

Fire Alarm System—Furnish and install as indicated on plans a closed circuit, electrically supervised fire alarm system similar to the type CI—Form E.M. system manufactured by the Holtzer Cabot Electric Co.

The system shall consist of control center to be located in administration office, having necessary indicating lamps, instruments, disarrangement bells, relays and switches mounted in flush type cabinet, with glass doors

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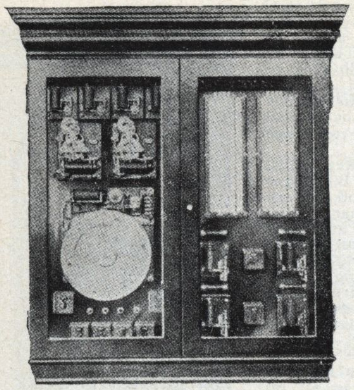


Series 490

Combined Program and Clock Control

and trim finished as directed by the architect.

There shall be a total of eight 10-in. single stroke, electro-mechanical fire gongs located in corridors where shown on plans. Below each gong and at other locations where indicated, furnish and install a fire signal station of the "break-glass-pull-lever" type, similar to Type H, Form F.G. station manufactured by the Holtzer-Cabot Electric Co. Stations to be arranged for closed circuit operation.

The system shall be arranged for storage battery operation from the storage battery hereinafter specified.

The system shall be tested out and left in approved operating order.

Telephone System — Furnish and install a complete common talking, selective ringing telephone system similar and equal to intercommunicating System No. 4 manufactured by the Holtzer-Cabot Electric Co.

The system shall be separately wired for, and connected, and shall be independent of any element used for any other purpose than telephone service.

The system shall consist of one desk type central telephone located on the assistant principal's desk at outlet shown on plans. This central telephone shall have a wall mounted buzzer for incoming calls from classrooms, etc., and one extra buzzer of distinctive sound operated from principal's desk. There shall also be mounted on wall over this outlet, one combined push button plate and directory providing signal connection with each telephone station specified. Central telephone outlet box shall be of sufficient size to accommodate a set of terminal blocks for all connections and push button plate shall be mounted on a door with trim covering outlet box, and finished as directed by the architect. Push button plate and directory shall be as small in size as possible and approved by the architect.

Furnish and install in each classroom, in janitor's room, and where shown on plans, one surface type, wall telephone similar to list No. 148965 as manufactured by the Holtzer-Cabot Electric Co.

Furnish and install from base outlets where indicated on plans, desk type telephone on principal's desk and physical director's desk.

This system to be arranged for operation from storage battery hereinafter specified.

Clock and Program Bell System—All clock and program control equipment shall be similar and equal in quality and workmanship to that manufactured by the International Time Recording Co., to whose list numbers reference is made.

Master Clock—Furnish and install in principal's office, where shown on plans, one 60-beat master regulator in hardwood case of material and finish as directed by the architect. Case to be similar to International Time Recording Co. Series 240 *(see illustration on page 2534)* with French plate glass door, paneled sides and 5-ply back panel. Movement to have cast iron base, hard brass plates, Graham dead-beat escapement with micrometer adjustment, machine cut gears, cut and polished pinions and mercurial compensating pendulum warranted capable of regulation within 10 seconds per month of perfect time.

Minute impulse contact is to be of the drop-finger-and-cam-type, operated on its own gear train and not from the escapement shaft. Movement shall be insulated completely from all current carrying parts, and shall be magnet wound through the master controlling relay. There shall be signal operating contact on the master clock movement so arranged that signals shall occur only following after the minute impulse. No auxiliary equipment of any kind shall be mounted in the master clock case.

Program and Clock Control—Furnish and install in administration office, one program and clock control cabinet similar to International Time Recording Co. Series 490 *(see illustration on this page)*. Cabinet shall be of hardwood material and finish as directed by architect, and shall have plate glass door, separate terminal compartment at top of case and polished bakelite back panel with grained brass acorn nuts.

Cabinet shall contain one master controlling relay with stepping key and cut-out switch, and 4 clock circuit relays, each with its circuit cut-out switch and stepping key.

For the control of program schedules there shall be provided a minute interval program machine equipment to provide the following automatically operated signal schedules for four circuits of buzzers, bells and gongs: one 18-hour daily schedule for each of the three circuits of buzzers and bells, providing for day and evening classes; one 12-hour daily schedule for outside gongs and one additional 12-hour schedule, automatically transferred, for assembly days, on each of the four circuits. Each bell circuit shall be provided with a heavy duty, double break relay with cut-out snap switch. A timing relay, adjustable up to 20 seconds duration, shall be furnished for the control of the outside gong circuit.

Adjacent to the program control cabinet, there shall be installed one cross connecting section mounted on hardwood base over outlet box and enclosed by a glass paneled door. Grained brass, cross connecting strips with screw plugs shall be provided so that any bell or buzzer may be transferred manually to any of the four circuits without disturbing wire connections. Each cross connecting strip shall be marked for identification and furnished with a push button or strap key for the manual ringing of any single buzzer or bell. There shall also be mounted a push button for each circuit.

List No. 498

Combined Program and Clock Control

Secondary Clocks—Secondary clocks shall be of the best quality construction, approved by the architect. They shall have white enameled Arabic dials, counterbalanced spade hands and provided with ratchet and pawl movements of the self-locking type. All gears and wheels shall be machine cut and coils shall be moistureproof. Except as otherwise specified, cases shall be of selected hardwood, of material and finish to match surrounding trim, shall have solid, 5-ply backs and hinged door fronts with approved heavy snap catch making dustproof closure. All clocks shall be installed rigidly and securely to the wall at the location shown on plans.

In each classroom, in administration office and physical director's room and library, as indicated, furnish and install one 12-in. dial, round moulded wood case secondary clock similar to International Time Recording Co. Series 320 *(see illustration on page 2536)*. Clock in physical director's room shall be finished in white enamel.

In gymnasium, as indicated, furnish and install one International Time Recording Co. 14-in. dial, metal case, semiflush secondary clock with dust cover, arranged for rigid clamping to wall. Clock shall be provided with special ½-in. thick, polished plate, protection glass.

In auditorium balcony rail, as indicated, furnish and install one International Time Recording Co. 18-in. dial, semiflush, round moulded wood rim secondary clock wth polished wire, plate protection glass, dust cover and hinged front.

In boiler room, as indicated, furnish and install on instrument board with steam pressure gauge, one International Time Recording Co. gauge type, cast metal case, 10-in. dial secondary clock, with setting trigger and screwed-on, gasketed bezel. Clock shall be fumeproof and moistureproof and shall have dull black finish.

Program Bells—Furnish and install in each classroom, as indicated, within the secondary clock case, one metal case buzzer similar to Type H.D. List No. 1511052P; in gymnasium, as indicated, furnish one 8-in. Type S steel gong, with brass, wire mesh guard; in auditorium, as indicated, furnish one Type S 6-in. steel gong; at both ends and at rear of building, where shown on plans, furnish three 12-in. watertight school yard gongs with mats and screen housings; all as manufactured by the Holtzer-Cabot Electric Co.

Battery Plant—In basement, where shown on plans, furnish and install a low tension power plant, consisting of the following units.

All batteries shall be of the Electric Storage Battery Co.'s manufacture, or approved equal, and shall have sealed-in elements within heat resisting glass jars. Batteries shall be installed on 1¼-in. thick white pine shelves of approved design, treated with three coats of black asphaltum.

Fire alarm battery shall consist of one operating battery of sufficient size and capacity to operate the single stroke, electro-mechanical gongs called for, and one supervisory battery of 6 volts.

Telephone battery shall consist of one 6-cell, 12-volt, Type C.T.M. battery of 12 ampere-hour capacity.

Clock and program bell battery shall consist of one 12-cell, 24-volt, Type P.T.M. battery of 24 ampere-hour capacity.

Charging—Fire alarm battery and telephone battery shall be charged by two duplicate, continuous charging, Form B Tungar rectifiers of the full wave type, with insulated primaries, controlled through a charging panel furnished in a steel cabinet with glass door and mounted in wall adjacent to the batteries controlled. Panel to have necessary double throw switches to transfer the charging line from one Tungar to the other. One spare Tungar bulb shall be furnished and equipment shall include variable charging resistances, battery line switches, alternating-current line switches, charge ammeters and voltmeter with transfer switch for testing all batteries.

Clock and program bell battery shall be charged by a separate Form B Tungar rectifier, mounted in sheet steel cabinet and self-contained within an automatic charging panel, similar to International Time Recording Co. List No. 436C *(see illustration on page 2542)*, having hourly operating time switch controlled from the clock system, line relay, charge ammeter, voltmeter, switches, fuses, etc., furnished and installed on wall adjacent to the batteries controlled.

All charging shall be adjustable for ampere rate and time cycle and left performing in all respects suitable to the needs of low tension equipment.

Door Bell—Furnish and install at front door one watertight push button, black oxidized finish, and connected to operate two 4-in. cow gongs, one installed in front corridor and the other in boiler room, from the clock battery.

Wiring—All wiring shall conform to National Electrical Code standards, shall be installed in conduits, and all joints shall be soldered, rubber covered and taped as required for all other wiring in the building.

Separate 110-volt a-c. supply lines in No. 14 B.&S. gauge wires, one to the rectifier for clock and bell systems and two to the rectifier for the fire alarm and telephone system, shall be taken from a cut-out ahead of the main light and power distribution point in the building.

Fire Alarm System—From the fire alarm battery location to the control center in administration office 4 No. 14 B.&S. gauge wires.

One ground wire No. 12 B.&S. gauge from fire alarm control center to ground clamp at nearest cold water pipe in basement.

All fire gongs and station boxes shall be connected in closed circuit with 4 No. 14 B.&S. gauge wires in ¾-in. conduit as required by the manufacturer's diagram.

Clock, Program Bell and Telephone System—May be wired for in a common conduit system centered at outlet box located at cross connecting and push button board, hereinbefore specified, in administration office. This outlet box shall be of size as recommended by the manufacturer of push button board.

From this box conduits of proper size to carry the wires specified shall lead to the program control cabinet, to the telephone push button and directory board at the assistant principal's desk, and to the distributing center on each floor, from which points conduits shall be run to the desired locations of clocks, bells and telephones. At each distributing center there shall be installed terminal strips with double nut and washer terminals, for each wire connection. All leads shall be tagged for identification.

From the telephone battery location to the telephone push button and directory board, 2 No. 14 B.&S. gauge wires.

From the telephone push button and directory board to all telephones indicated, a common pair of No. 6 B.&S. gauge wires for common talking circuit.

From the telephone push button and directory board to each telephone station indicated, a separate, single No. 16 B.&S. gauge wire for selective ringing circuit.

From the telephone push button and directory board to principal's telephone outlet, 2 extra No. 16 B.&S. gauge wires for separate signal buzzer.

All secondary clocks shall be wired in multiple on the circuits specified; No. 16 B.&S. gauge wire shall be used for individual clock connections and No. 14 B.&S. gauge for circuit mains to program control cabinet.

Program bells and buzzers shall be wired individually through their respective distributing boxes on each floor to the cross connecting board in the administration office with common returns of No. 12 B.&S. gauge, to the distributing points, and a single No. 8 B.&S. gauge common return to the cross connecting board. All connec-

Continued on next page

tions behind this board shall be made in a neat and approved manner and leads shall be tagged for identification.

Alternative C1-Bidders will state amount to be added for furnishing and installing (instead of the plain, impulse driven type of clock and program control specified) the "International self-regulating impulse system," which provides automatic hourly supervision of the entire secondary system *(see description on page 2534)* and does away with manual stepping keys on clock circuits and provides hourly, self-comparison of each secondary unit with the master clock, with the ability of each unit, should it be disturbed from synchronism, to compensate for at least 15 minutes either fast or slow in any one hour. System shall include one International Time Recording Co. Series 260 master clock in hardwood case, as hereinbefore specified, with an 8-day, weight driven movement and mercurial pendulum, wound automatically once each day from the 110-volt lighting service. Should 110-volt power fail, it shall be capable of fully rewinding any time power returns.

Additional wiring required consists of 2 No. 14 B.&S. gauge wires from master clock to the nearest lighting panel (¼-ampere 110-volts) for winding current supply, and one additional wire common to all units on each secondary circuit and one extra No. 16 B.&S. gauge wire from program control cabinet to master clock outlet.

Specification D with Alternatives C1 and C2

Low Tension Clock, Signal and Fire Alarm System for a Large School Having 50 Rooms or More

Note: This specification is intended to cover the most up-to-date requirements for a large, well equipped educational institution. The following features are provided in addition to a well engineered, general layout. These particular specifications were drawn for a 120-room senior high school.

(1) Fire alarm connection with municipal system.
(2) Private exchange telephone system.
(3) Full toned tower bell instead of yard gongs.
(4) Flexible program control for broad requirements of class and grade administration.

General—Furnish and install a complete low tension system, including clock, program bell, telephone and fire alarm systems as hereinafter specified, doing everything necessary to make a thoroughly satisfactory and working system. This contractor shall furnish all additional items that may be required to complete the work in an approved manner, whether specifically called for or not.

The contractor shall submit before shipment of any equipment and as required by the work, complete system wiring diagrams for the clock, program bell, fire alarm and telephone systems, together with detailed descriptive data and dimension drawings for the architect's approval.

The manufacturers of equipment furnished shall be required to provide expert supervision of the installation of specified equipment and shall adjust, regulate and place in operation the several systems, leaving same in approved working order.

All quantities specified shall be checked with the plans and the quantities required for a complete system shall not be decreased due to any unit being shown on plans but not specifically mentioned in the specifications or vice versa.

The entire equipment shall be warranted free from electrical or mechanical defects of material or workmanship for a period of one year from date of acceptance of the installation by the architect.

Fire Alarm System—Furnish and install, as indicated on plans, a closed circuit, electrically supervised fire alarm system similar to the Type SA Form EM dual system manufactured by the Holtzer-Cabot Electric Co.

The system shall consist of a control center to be located in the building superintendent's office in the basement, having necessary indicating lamps, instruments, relays, switches and disarrangement bells. There shall be an indicating panel mounted on the wall in the administration office having 2 green and 2 red indicating lamps so arranged as to provide visible indication of disarrangement in any part of the system, whether evidenced by the disarrangement bells or the auxiliary indicating lamps in the control center.

Control center is to be of the flush type with steel trim finished in dull ebony black, and glass door.

System shall provide automatic and simultaneous connection, when alarm of fire is sounded, with the municipal fire department system. Connection shall be made with an approved, auxiliary, street type station box located at intersection of ....

This box shall be furnished by this contractor and mounted as directed by the .... Fire Department, Engineering Division, on present street lighting standard, to which point the municipal department will bring its circuit and connect after installation by this contractor. Auxiliary station box shall not be installed until full specifications have been submitted to the municipal department as to code number, timing, type of mechanism and other required details, and a copy of their approval thereof has been forwarded to the architect for acceptance accordingly.

There shall be a total of sixteen 10-in. single stroke, electromechanical fire gongs located in corridors where shown on plans. Below each gong and at other locations where indicated, furnish and install 18 fire alarm stations of the break-glass, pull lever type, set semiflush in wall, similar to Type SA Form F, as manufactured by the Holtzer-Cabot Electric Co. Stations shall be arranged for closed circuit operation.

The system shall be arranged for storage battery operation from the storage batteries hereinafter specified.

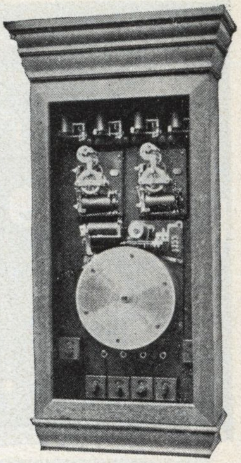
The system shall be tested out and left in approved running order.

Telephone System—Furnish and install a complete private exchange telephone system similar and equal to Holtzer-Cabot Electric Co.'s manufacture.

The system shall consist of one 125-line capacity, desk type switchboard providing 12 trunk lines for simultaneous conversation. Switchboard shall be equipped with lamp signals for each jack to indicate the proper line and a lamp signal at each plug to indicate end of conversation. Switchboard cabinet shall be of selected oak finished to match surrounding trim and shall be readily accessible for adjustment of contacts, leads, etc. Switchboard shall be located in administration office where indicated on plans and system shall be operated from telephone storage battery hereinafter specified. There shall be supplied a suitable vibrating converter for producing low frequency ringing current to the system. This unit shall also be operated from the telephone battery and shall be located in the low tension room in basement.

The following desk type telephones shall be furnished and installed at outlets as indicated on plans:

(1) Principal's office.
(1) Administration office (assistant principal).
(1) Physical director's office and infirmary.
(1) Building superintendent's office in basement.
(2) Department offices, first floor, rooms A and B.
(2) Department offices, second floor, rooms A and B.
(2) Department offices, third floor, rooms A and B.
(2) Department offices, fourth floor, rooms A and B.
(1) Department office, fifth floor, in library.



Series 450

Program Control Cabinet

The following semiflush, wall type telephones, similar and equal to List No. 148015M, as manufactured by the Holtzer-Cabot Electric Co., shall be installed at outlets as indicated on plans:

102 stations in all classrooms and laboratories.

Furnish and install in boiler room one cast metal case, dustproof and moistureproof telephone unit similar to List No. 148120M as manufactured by the Holtzer-Cabot Electric Co.

Clock and Program Bell System—All clock and program control equipment shall be similar and equal in quality and workmanship to that manufactured by the International Time Recording Co. to whose list numbers reference is made.

Master Clock—Furnish and install in principal's office, where shown on plans, one 60-beat master regulator in hardwood case of material and finish as directed by the architect. Case shall be similar to Series 240 *(see illustration on page 2534)*, with French plate glass door, paneled sides and 5-ply cross veneered back panel. Movement shall have cast iron base, hard brass plates, machine cut gears and wheels, and cut and polished steel pinions, Graham dead-beat escapement with micrometer adjustment and mercurial compensating pendulum, warranted capable of regulation within 10 seconds per month of perfect time.

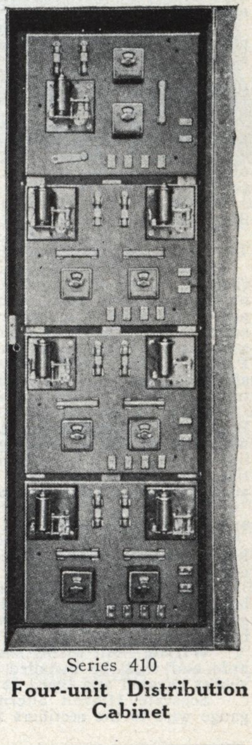
Minute impulse contact shall be of the drop-finger-and-cam type, operated on its own shaft through separate gear train and not from the escapement shaft. Movement shall be insulated completely from all current carrying parts and shall be magnet wound once each minute through the master controlling relay. There shall be a signal operating contact on the master clock movement so aranged that signals will occur only following after the minute impulse. No controlling equipment of any kind shall be mounted in the master clock case.

Program and Clock Control—Furnish and install in administration office, where indicated on plans, one flush type program control cabinet similar to List No. 498 combined program control and push button board *(see illustration on page 2540)*. Equipment shall be mounted in wall cabinets equal in size and built of No. 12 gauge steel with ⅛-in. brush finish sheet brass trims. Program control section shall have plate glass paneled, hinged door, and push button section shall have hinged door of brush finish brass on which all buttons are to be mounted. Both cabinets shall be carefully set and aligned, doors provided with locks and keys and the trim put in place as directed by the architect. Program section to have ⅜-in. bakelite (dull finish) back panel with 2-in. wiring gutter all around and with bakelite terminal cover. Program section to be arranged to control six circuits of bells, buzzers and tower bell. All relays shall be of the auxiliary "make and break" type with approved indicating, circuit cut-out snap switches.

For the control of program schedules, there shall be provided necessary minute interval program machine equipment to provide the following automatically operated signal schedules for the six circuits of buzzers, bells and tower bell.

(1) An 18-hour daily schedule providing day and evening classes and different noon cafeteria periods on each of four separate circuit groups.
(2) A 12-hour special schedule for all circuits, automatically transferred by the program mechanism, for assembly day.
(3) A 12-hour daily schedule for cafeteria and roof bell circuit.
(4) A 12-hour daily schedule for the tower bell.

Program machine shall be composed of 6-hour control units. Program contacts and signal relay coils shall be connected through brass, cross connecting strips and thumb screws, mounted within the control cabinet so that if necessary, the circuit schedule grouping may be changed or added to any time in the future, for which provide an additional 6-hour program control unit for each of the six circuits.



Series 410

Four-unit Distribution Cabinet

The push button section shall contain semiflush, navy type, push buttons of the phosphor bronze, leaf spring type, all mounted on the brass door of this section. There shall be a push button for each buzzer, bell or gong and each button shall be plainly marked with name or number of room or location. There shall be a push button of distinctive color for each circuit specified and one "all ring" button.

Concealed and mounted within the cabinet behind the push button section shall be one cross connecting board of selected hardwood, so arranged that any bell, gong or buzzer may be transferred from one circuit to another by means of a thumb screw plug without disturbing wire connections. All connections between the push buttons and cross connecting board shall be made by the manufacturer with neatly cabled and fanned flexible leads, properly tied and shellacked.

In low tension room in basement, where shown on plans, furnish and install one clock circuit control center in surface type sheet steel cabinet with plate glass door, lock and keys; cabinet to be finished in dull black enamel. The cabinet to consist of approved insulating panels with master controlling relay, with stepping key and indicating, cut-out snap switch, and six circuit relays with stepping keys and cut-out switches. Cabinet to contain automatic charging panel hereinafter specified. All panels shall have necessary fuses and terminals.

Secondary Clocks—Shall be of the best quality construction, approved by the architect. They shall have white enameled, Arabic dials, counterbalanced spade hands and provided with ratchet and pawl movements of the self-locking type. All gears and wheels shall be machine cut and coils shall be moistureproofed. Cases shall be of spun copper and with

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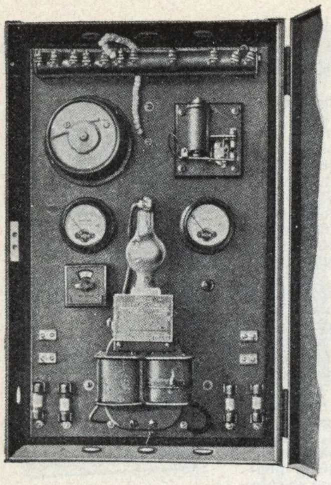


List Nos. 436 and 437

Alternating-current Charging Panel

approved, dark statuary bronze finish except as otherwise noted, and all semiflush units shall be of the hinged type with adjustable steel, back plate and dust cover mounted on outlet box and not on wall.

In each classroom, teachers' rooms, administration office, physical director's office, and offices of department heads on first, second, third, fourth and fifth floors, furnish and install a total of 114 twelve-inch dial, semiflush, metal case secondary clocks similar to Series 350C *(see illustration on page 2536)*. Clock in physical director's office shall be finished in white enamel.

In gymnasium, as indicated on plans, furnish and install one 14-in. dial, semiflush secondary clock with dustproof cover arranged for rigid clamping to wall, similar to Series 350B *(see illustration on page 2536)*. This clock shall be provided with a special ½-in. thick polished plate glass protection and a circular back mat of $\frac{3}{16}$-in. rubber sheeting applied to wall as directed.

In center panel of auditorium balcony rail, as indicated, furnish and install one 18-in. natural, satin finish, bronze skeleton dial secondary clock similar to Series 380A *(see illustration on page 2536)* with approved ornamental hands and ornamental center rosette, arranged for rear access, for which there shall be an 8x8-in. square outlet box to be opened at the rear, and furnished with steel trim and door with lock and keys.

In library, as indicated, furnish and install one 14-in. white Italian marble dial secondary clock *(see illustration on page 2536)* with raised bronze Arabic numerals and minute marks, spun dark statuary bronze moulded rim and approved ornamental hands finished to match rim, numerals and minute marks to be natural satin finish bronze.

In cafeteria, as indicated, furnish and install two 14-in. dial, hinged type, semiflush secondary clocks *(see illustration on page 2536)*.

In boiler room, as indicated, furnish and install on instrument board with steam pressure gauges, one gauge type cast metal case secondary clock with 10-in. dial *(see illustration on page 2536)*, setting trigger and screwed on gasketed bezel. Clock shall be fumeproof and moistureproof and shall have polished brass case.

Program Bells—Shall be of Holtzer-Cabot (or equal) manufacture to whose list numbers reference is made.

Furnish and install in each classroom and library, as indicated, one Type S, List No. 151045 heavy duty buzzer on ash mat, finished to match surrounding trim.

In gymnasium, as indicated, furnish and install one Type S, List No. 151020, 10-in. gong, with brass wire mesh guard and ash mat.

In auditorium and cafeteria, as indicated, furnish and install one Type S, List No. 151020, 6-in. gong.

On roof, as indicated, furnish and install one 10-in. List No. 151035 waterproof school yard gong.

In basement, as indicated, furnish and install one 8-in. gong, Type S, List No. 151020.

Tower Bell—Furnish and install in tower one 600-lb. cast Meneely bell with tongue for hand tolling and lever type striker. Bell shall be mounted in place on oak beam provided.

To operate above striker, furnish and install in tower room, below bell platform, one Seth Thomas striking movement of proper size for striking the above specified bell. Movement to be electrically released by the program control of the clock system and to be driven by weights kept wound by an electric motor. Movement shall strike 15 slow blows on the bell whenever the program control releases same.

Battery Plant—In low tension room in basement, as shown on plans, furnish and install a low tension power plant consisting of the following units.

All batteries shall be of the Electric Storage Battery Co.'s manufacture, or approved equal, and shall have sealed-in elements within heat resisting glass jars.

Batteries shall be installed on 1¼-in. thick white pine shelves of approved design, treated with three coats of black asphaltum.

Fire Alarm Battery—Shall consist of one Type PTM operating battery of sufficient number of cells to operate the single stroke, electro-mechanical gongs called for, and one 6-volt Type PTM supervisory battery.

Telephone Battery—Shall consist of one 11-cell, 22-volt, Type PTM 24-ampere-hour battery.

Clock and Program Bell Battery—Shall consist of one 12-cell, 24-volt Type PTM 24-ampere-hour battery.

Charging—Both fire alarm battery and telephone battery shall be charged by two duplicate, continuous charging Form B Tungar rectifiers of the full wave type, with extra bulbs, controlled through a charging panel, furnished in a steel cabinet with glass door and mounted on wall adjacent to the batteries controlled. Panel to have necessary double throw switches to transfer the charging line from one Tungar to the other. Panel shall also have variable charging resistances, battery line switches, alternating-current line switches, charge ammeters and voltmeter with transfer switch for testing all batteries.

Clock and program bell battery shall be charged by a separate Form B Tungar rectifier mounted in clock control cabinet and self-contained within an automatic charging panel, similar to International Time Recording Co. List 436D *(see illustration on this page)* having hourly operating time switch controlled from the clock system, line relay, charge ammeter, voltmeter, switches, fuses, etc. Extra Tungar bulb shall be provided.

The telephone ringing frequency converter and door bells may be operated from the clock and bell system battery.

All charging shall be adjusted for ampere rate and time cycle, and left performing in all respects suitable to the needs of the low tension equipment.

Door Bell—Furnish and install at front door one watertight push button, black oxidized finish, and connected to operate three 4-in. cow gongs, one each installed in first and fifth floor corridors and one in boiler room.

Wiring—All wiring shall conform to National Electrical Code standards and shall be installed in conduit and all joints shall be soldered, rubber covered and taped as required for all other wiring in the building.

Separate 110-volt alternating-current supply lines in No. 14 B.&S. gauge wire to the rectifiers for clock and program bell system and to the rectifiers for the fire alarm and telephone system, shall be taken from a cut-out ahead of the main lighting and power distribution point in the building.

Delivery of secondary clock special outlet boxes and all other special boxes shall be made as required by the building contractor so as not to delay any part of the work. All boxes shall be carefully set and aligned with reference to wall surface.

Fire Alarm System—From the fire alarm battery location in low tension room to the control center in building superintendent's office, install 4 No. 14 B.&S. gauge wires.

From fire alarm control center to ground clamp at nearest cold water pipe in basement, install 1 No. 12 B.&S. gauge ground wire.

From control center in building superintendent's office to location of auxiliary municipal fire alarm station box, in approved duct construction, install 2 No. 12 B.&S. gauge wires in duplex lead covered cable. Duct shall terminate in sidewalk connection box, of construction as approved by municipal fire department, at base of post standard, providing entry for fire department's circuit lines. From this connection box shall run one 1-in. conduit to the auxiliary fire alarm station installed on post.

From control center to locations shown on plans, all fire gongs and alarm boxes shall be connected in closed circuit with 6 No. 14 B.&S. gauge wires in 1-in. conduit as required by the manufacturer's diagram.

Clock and Program Bell System—May be wired for, where convenient, in a common conduit system centered at main connection box in first floor corridor, as shown on plans.

From this main connection box, conduits of proper size to carry the wires specified, shall lead to the program control cabinet in administration office, clock circuit control cabinet in low tension room, and to distribution boxes in the building, as shown on plans and riser diagram.

In main connection box and in each distribution box, there shall be provided and installed terminal strips for each wire connection. All leads shall be tagged for identification and wires shall be neatly cabled and placed with respect to the terminal strips. From each local distribution box to outlets, as indicated, proper conduit wiring shall be installed as specified.

From the master clock to clock circuit control panel in low tension room, install 5 No. 16 B.&S. gauge wires.

From the program control board to the clock circuit control panel install the following wires: 2 No. 8 B.&S. gauge and 5 No. 16 B.&S. gauge.

From the program control board to the main connection box install the following wires: 136 No. 16 B.&S. gauge and 2 No. 8 B.&S. gauge; 6 No. 14 B.&S. gauge.

From the clock circuit control panel to the main connection box install the following wires: one No. 8 B.&S. gauge; 8 No. 14 B.&S. gauge.

All secondary clocks shall be wired in multiple on the circuits specified. No. 16 B.&S. gauge wire shall be used for individual clock connection and No. 14 B.&S. gauge wire for circuit mains to main connection box.

Program bells and buzzers shall be wired individually with No. 16 B.&S. gauge wires through their respective local distribution points to the main connection box with common returns of No. 12 B.&S. gauge wire from the distribution points to the main connection box.

Telephone System—All conduits for telephone wires shall terminate in main connection box used for the clock and bell systems and distribution shall also be made through the same distribution points for the clock and bell systems. Terminal connection strips shall be also furnished at all junction points as required for the rest of the system.

From the telephone switchboard, through approved floor outlets, install 240 No. 22 B.&S. gauge, tinned copper wires, double silk and single cotton covered with identifying marks or colors, wax treated, in braided or wrapped and lead covered cables, to the main connection box.

From the main connection box to each distributing point, as indicated, the proper number of wires plus four spares shall be run in braided or wrapped and lead covered cable.

From the distributing centers to the telephone outlets the common clock and bell conduits may be used, running 2 No. 18 B.&S. gauge wires to each telephone outlet box.

From the telephone switchboard floor outlet, as indicated, to the telephone battery location in low tension room, 2 No. 10 B.&S. gauge wires and 4 No. 14 B.&S. gauge wires for alternating current ringing control.

All low tension main connection box and distribution boxes shall be of No. 12 gauge steel and provided with steel trim and hinged doors with approved locks and keys.

Alternative C1—Bidders will state amount to be added for furnishing and installing (instead of plain, impulse driven type of clock and program control specified) the International Self-Regulating Impulse System *(see description on page 2534)* which provides automatic, hourly supervision of the entire secondary system and does away with manual stepping-keys on clock circuits and provides hourly self-comparison of each secondary unit with the master clock, with the ability of each unit, should it be disturbed from synchronism, to compensate for at least 15 minutes either fast or slow in any one hour. System shall include a Series 260 master clock *(see illustration on page 2534)* as manufactured by the International Time Recording Co., in hardwood case as hereinbefore specified, with an 8-day, weight driven movement and mercurial pendulum, wound automatically once each day from 110-volt service. Should 110-volt power fail, it shall be capable of fully rewinding at any time power returns.

Additional wiring required consists of 2 No. 14 B.&S. gauge wires from master clock to nearest 110-volt lighting panel (¼ ampere, 110 volts) for winding current supply; one additional No. 16 B.&S. gauge wire common to all units on each secondary circuit; one additional No. 14 B.&S. gauge wire for each secondary circuit main feeder; one additional No. 16 B.&S. gauge wire from program control board to low tension room.

Alternative C2—Bidders will state amount to be added for furnishing and installing in administration office, where indicated on plans, one fully automatic, monthly record, two-color registration, teacher's register similar and equal to International Time Recording Co. Series 1316 (see accompanying illustration) in metal case with Yale lock, keys, pilot indicating dial and provision for conduit wiring, and to be controlled from the clock system. Case, to be finished as directed by the architect, shall have rigidly mounted metal back plate with detachable mechanism and equipment to be furnished with suitable enclosing racks with locks and keys for holding 200 registration cards.

International

Series 1316

Teacher's Register or Metal Case Card Recorder

A valuable accessory in school administration on which teachers may check in and out without the inconvenience of signing a book register

LANDIS ENGINEERING & MFG. CO.

Manufacturers of Electric Time and Program Clock Systems

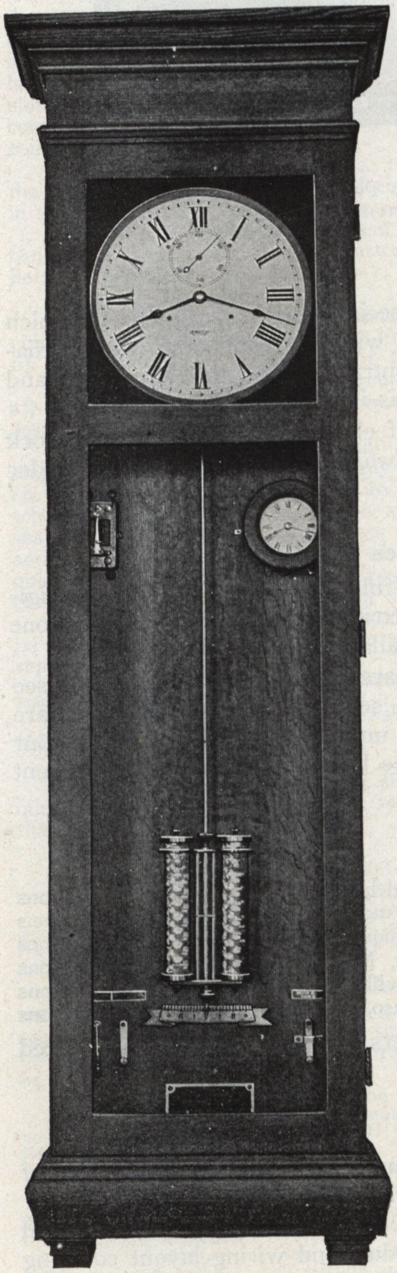
WAYNESBORO, PA.

Products

Electric Time and Program Clock Systems, complete with all accessories for use in schools, colleges, public buildings, banks and all other places where accurate time and signal work is desired.

QUALITY ECONOMY
LANDIS
SERVICE
TRADE-MARK

Our styles A and B cases are standard designs, but special designs and finishes to match can be furnished.


Master Clock Style A60TD

The Landis Line

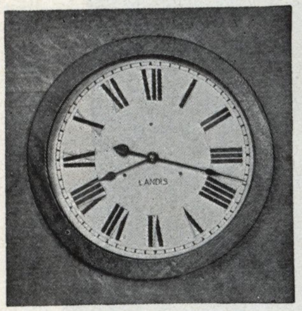
The Landis line is the result of many years development work in this field. Our equipment is the simplest, most rugged and most economical electric time and program clock system used today.

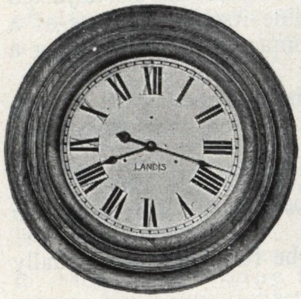
Master Clocks

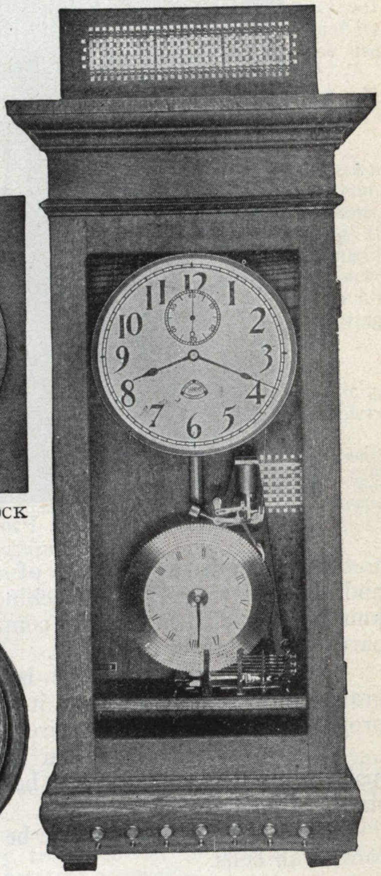
Our master clock, the controlling unit of any system, is an *electrically wound weight driven unit.* There is but one circuit closer used for the control of all secondarily operated equipment. Other master regulators use as many as 4 circuit closers. This movement requires but half of one per cent of the electrical energy necessary to wind the average self-winding regulator.

All details of the movement are accurately made in accordance with the most modern manufacturing methods.

Either 60, 80 or 120-beat movements can be furnished.


Style 1S Secondary Clock


Style 2 Secondary Clock


B80F Master Clock with 6-Program 5-Minute Program Machine

Secondary Clocks

Our secondary clocks are controlled automatically through the master clock. Once each minute an impulse is sent out from the master clock to operate the secondary clocks. This insures uniform time to all points throughout a building.

The Landis secondary clock is weight driven, positively non-racing in its action. The movements require no oiling for their successful operation. The rugged construction of the movement, with all accurately made details, makes it a most desirable secondary clock.

Secondary clocks can be furnished in a variety of case designs and finishes, with dial sizes from 8-in. diameter up to 36-in. diameter.

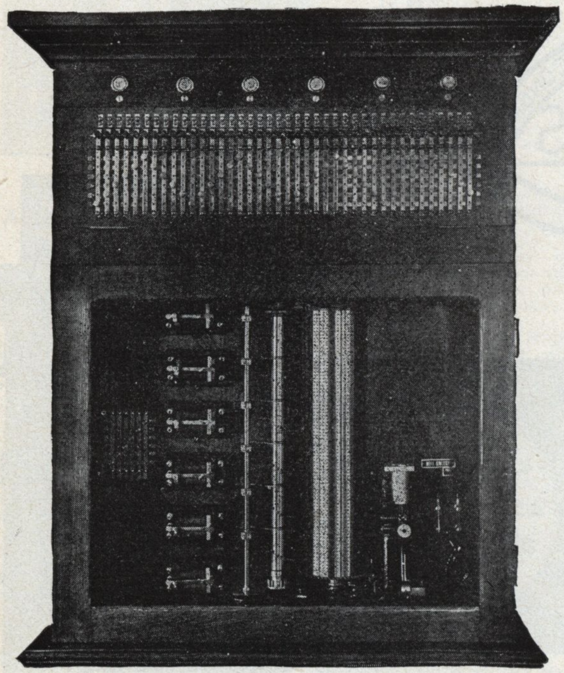
Continued on next page

Program Machines

We manufacture two types of program machines; 1-minute interval and 5-minute interval, for controlling series of signals according to a predetermined schedule.

The 1-minute interval program machine is made in 3 sizes, 2, 4 and 6-program sizes. The 5-minute interval program machine is made in 6-program size only.

Any program or schedule can be changed throughout or in part by changing the position of pins in cylinders and dial, without the use of special tools.



One-minute Interval Program Machine

The length or duration of signal can be adjusted and changed in program machine itself by means of a knurled nut, all bell ringing contact mechanism being a part of the program machine.

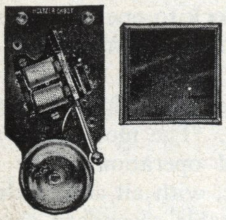
Each program machine is equipped with a program-circuit selector to make it possible to cross-connect programs and circuits as desired.

A distributing board can be likewise furnished to make it possible to place any bell on any circuit as desired, without changing wiring.

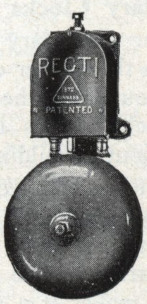
Push buttons can likewise be furnished to manually control all bells.

Bells

Any number of bells, gongs, buzzers and horns can be used in connection with the program machines.



2½-inch Wood Box Gong



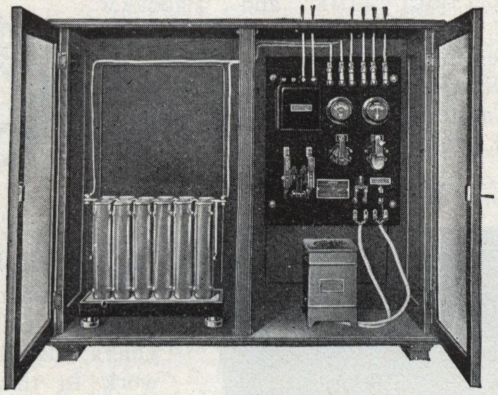
Watertight Gong

The size and type of the bells, buzzers, etc. depend on the location and service desired.

Battery Equipment

On small installations, primary battery equipment such as Edison BSCO or Columbia caustic soda cells is recommended. On small bell signaling systems, bell ringing transformers can also be used.

On larger systems we recommend the use of the Landis automatic battery charging panel, for charging a storage battery of proper capacity to handle the system. The storage battery to be charged either through a Tungar rectifier or motor-generator set from 110-volt 60-cycle alternating current.



Battery Charging Panel and Storage Battery with Rectifier

Installation

With detailed specifications (specimen of which follows) conduit and wiring layouts and wiring diagrams, the electrical contractor can install all conduit and wiring while building is in course of erection.

The installation of electric time and program clock systems to wiring is always made by ourselves or under our supervision.

Guarantee and Service

Our equipment is fully guaranteed against all original mechanical and electrical defects for a period of one year from date of installation.

Our service men are available at all times to see that our systems give service. Service contracts are made to keep systems under constant supervision, our charges for such service being very nominal, dependent upon our actual cost.

Some Users

Board of Education, Philadelphia, Pa.	125 installations
Board of Education, Los Angeles, Cal..........	20 installations
Board of Education, Baltimore, Md.	15 installations
Board of Education, Butte, Mont.	7 installations
Board of Education, Louisville, Ky.	6 installations
Board of Education, El Paso, Texas...........	5 installations

Thousands of others in every state in the United States.

Information

Send for our complete catalogue. It is full of data of interest to all architects. With an outline of requirements and a set of plans we can prepare detailed specifications and a conduit and wiring layout covering each particular installation.

Continued on next page

Specifications for Electric Time and Program Clock System

(1) Furnish and install a Landis electric clock system in accordance with the following specifications, as manufactured by the LANDIS ENGINEERING & MFG. CO., Waynesboro, Pa.

(2) The installation of the conduit and wiring shall be made by the electrical contractor in accordance with detailed conduit and wiring layout as provided by the manufacturer. The connection of the electric clock system to wiring shall be made by the manufacturers or under their direction.

Master Clock or Regulator—

(3) Provide one Landis self-winding regulator 60 (or 80) beat with 12-in. white enameled dial, with wooden rod and metal bob pendulum (or mercurial compensating pendulum) with Graham dead beat escapement, accurately cut gearing, steel pinions, hardened burnished pivots, and hard brass pivot bushings, capable of regulation to within 30 seconds per month (if mercurial compensating pendulum 10 seconds per month).

(4) Movement shall be weight driven, with maintaining power spring, to provide constant driving power at all times.

(5) Winding contacts shall be non-adjustable and quick breaking, so designed that magnets of winding mechanism are only energized the exact length of time necessary to wind the clock. Winding contact shall not be made more than once every 5 minutes and of not more than 1/10-second duration.

(6) Movement shall be provided with platinum tipped circuit closer for the operation of all secondarily operated equipment. Circuit closer shall be so designed that length of contact is independent of swing of pendulum. Making point of circuit closer shall be at a different point than breaking point with contact made by positive wiping motion across platinum contacts.

(7) All switches, pilot clocks, relays, etc., necessary for the control of secondarily operated equipment shall be mounted in same case with master regulator movement.

(8) Master regulator movement shall be mounted in a hanging wall type case, golden quartered oak cabinet finish (or finish to match adjacent wood trim).

Program Machine—

(9) Provide one Landis Automatic Universal program machine to operate at 1 (or 5) minute intervals, capable of control of (give number of programs) of 12 hours each.

(10) Provide one program-circuit selector, so that any or all programs of circuits be tied together or cross-connected as desired.

(11) The program machine shall be provided with an automatic calendar switch to automatically cut in or out any program on any day or night of the week, according to a predetermined schedule. The time of signals on any day, hour and minute shall be quickly changed by positions of pins in dial or cylinder and calendar switch. The length of signal shall be capable of quick regulation of bell ringing circuit closer on program machine without the use of tools or instruments.

(12) The 1- (or 5-) minute interval program machine shall be mounted either in same case with master regulator or separate wall case.

Note: 1-min. interval program machines are generally mounted in separate wall cases.

(13) Program machine case shall be finished to match finish of master clock case.

Time Element Relay—

(14) Provide one Landis time element relay for control of outside gongs where it is desirable to have a longer signal than that of inside bells or gongs.

Bells, Buzzers and Gongs—

(15) Provide bells, buzzers and gongs for various rooms, corridors and outside locations (as per schedule).

Note: Buzzers and 2½-in. bells used in general for classrooms, 6-in. gongs for corridors, 8-in. and 10-in. weatherproof gongs for outside. All bells, buzzers and gongs shall have a high resistance winding.

Distributing Board—

(16) Provide one distributing board with ...... points, as many points as there are bells and gongs, with busbars, one for each bell or gong circuit. Means shall be provided to put any bell or gong on any circuit as desired without the use of tools or instruments.

(17) Distributing board shall be mounted on ....

Note: If used with a 1-minute program machine, distributing board is mounted on program machine case. If used with a 5-minute program machine, on master clock case.

Push Button Board—

(18) Provide a push button board of .... points, by means of which any or all bells can be controlled, dependent upon the following schedule:

Note: If individual bells are to be manually controlled, one individual button for each bell. If bell circuits are to be controlled, one circuit button for each bell circuit. If all bells are to be controlled simultaneously, one simultaneous button.

(19) The push button board shall be mounted on.........

Note: If used with 1-minute interval program machine, to be mounted on program machine case. If used with 5-minute interval program machine, on master regulator case, when only circuit buttons and simultaneous buttons are used. If individual buttons are used with circuit and simultaneous buttons, distributing board and push button board are mounted in separate wall case, or on 1-minute interval program machine case.

Secondary Clocks—

(20) Provide secondary clocks, Landis electric type, of style, size of dial and at locations as follows:

Note: Here indicate number of clocks, size of dial (8-in., 10-in., 12-in., 14-in. or 18-in.), Style (1S-square, 2-round, 2F-round flush).

(21) All secondary clocks shall be equipped with movements constructed without springs, gravity actuated, magnetically controlled. The movement shall be positively locked at all times, before, during and after impulse from master regulator. All gearing of movement shall be accurately cut from hard rolled brass, all parts of steel and brass shall be either copperplated or nickelplated, movement shall be rustless, shall not require oiling and shall be mounted on an enameled base.

(22) Each secondary clock dial with its movement shall represent a complete unit, same to be mounted in dustproof case by means of bayonet lock switch, so that any dial and its movement can be quickly removed from wall without the use of any tools.

(23) Secondary clock cases shall be made of quartered oak, golden oak, cabinet finish (or finish to match wood trim).

Fire Alarm System—

(24) Provide a complete fire alarm system in connection with above system of bells and gongs, to be operated and controlled by means of .... break glass fire alarm stations, with test keys which shall be located throughout building at stations as directed. Break glass fire alarm stations to control Landis electric self-winding code ringing fire alarm movement which shall sound 4 distinct fire signals, such as a 3-2 on all bells and gongs, differing from program signal, yet permitting use of same bells and gongs used for program purposes.

Battery—

(25) Provide a complete storage battery of ample capacity to operate entire equipment, consisting of .... cells chloride accumulator type ....

Note: For systems up to and including 25 clocks and bells, specify 6 cells Type CT; up to and including 60 clocks and bells, specify 6 cells Type PT; above 60 clocks and bells, specify 12 cells Type PT. For systems covering a number of buildings as over a campus, consult manufacturer.

Battery Charging Equipment—

(26) Provide one Landis automatic battery charging panel, of slate, with following equipment mounted on same:

1 Landis automatic time switch
1 Reverse current relay
1 Voltmeter, 0-50
1 2-pole magnetic switch
1 High voltage relay
1 Ammeter, 15-0-15
Necessary knife switches, fuses and terminals.

(27) Automatic charging panel to keep battery fully charged at all times. Constant charge by floating battery across line not acceptable.

(28) Provide one tungar rectifier (or motor-generator set) to charge storage battery from 110-volt 60-cycle single-phase supply. Electrolytic rectifiers not acceptable.

(29) Provide a hardwood cabinet for housing storage battery and charging equipment complete. Cabinet to have glass paneled doors, lock and key, to be finished cabinet finish exterior, acidproof paint interior. Cabinet to have two separate compartments, storage battery to be placed in one compartment which is to be ventilated, with charging equipment to be placed in the other compartment.

Wiring—

(30) All wiring shall be rubber covered and braided fixture wire not smaller than No. 16 B & S gauge for all interior wiring and shall be installed in strict accordance with rules of National Board of Fire Underwriters.

(31) All conduit and wiring to be installed as per conduit and wiring layout and specifications as furnished by manufacturer.

Guarantee—

(32) All materials provided as above specified shall be guaranteed against all original mechanical and electrical defects for a period of one year from date of completion of said installation. The condition of this guarantee is such that if at any time within the term of guaranty any part of the mechanism is altered or repaired by any other than the manufacturers or their duly authorized representatives, their liability under this guarantee shall cease.

ESTABLISHED 1884 INCORPORATED 1888

THE STANDARD ELECTRIC TIME CO.

SPRINGFIELD, MASS.

SALES OFFICES AND SERVICE STATIONS

CHICAGO, 1361 Monadnock Building
BOSTON, 93 Federal Street
NEW YORK, 50 Church Street
BUFFALO, 901 Mutual Life Building
PHILADELPHIA, 1723 Sansom Street
BALTIMORE, 1428 Munsey Building
DALLAS, 717 Mercantile Bank Building
DENVER, 562 Penn Street
COLUMBUS, 407 First National Bank Building
BIRMINGHAM, 448 Brown-Marx Building
SAN FRANCISCO, 690 Market Street
LOS ANGELES, 616 Hiberian Building
MINNEAPOLIS, 801 Eighth Street, S. E.
SCRANTON, 148 Adams Street
MONTREAL, QUE., 94 St. Felix Street

Products

"Standard" Electric Time and Program Systems.

"Standard" Electric Telephone and Fire Alarm Systems.

"Standard" Electric Tower and Street Clocks. Industrial Equipment.

"Standard Service"

Having had a long experience in the manufacture and installation of electric time equipment, we can furnish architects, engineers and school boards with valuable, useful information. This information we gladly furnish gratis.

"Standard" Master Clock

"Standard" master clocks are self-wound every minute and are fitted with dead beat escapement and platinum contacts throughout. They are furnished with metal ball or mercurial compensating pendulums.

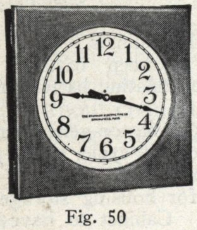


Fig. 50
Square Wood Secondary Clock

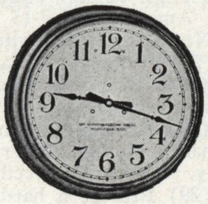


Fig. 51
Round Metal Secondary Clock Spun Case

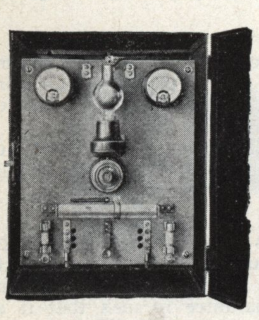


Fig. 823
Tungar Rectifier with Panel in Steel Case

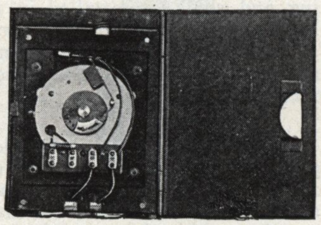


Fig. 807
Automatic Charging Device

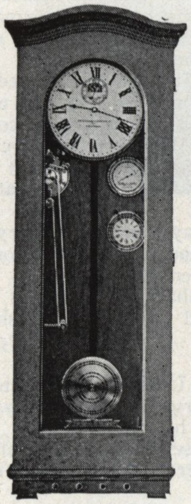


Fig. 580
60-Beat Master Clock
Equipped with metal ball pendulum, program clock, pilot dial and battery gauge

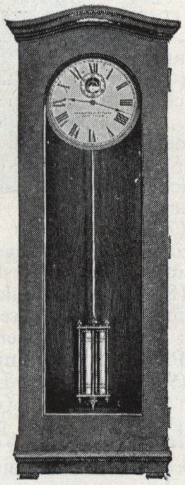


Fig. 10
60-Beat Master Clock, Mercurial Pendulum
Extreme dimensions: dial, 12 in.; height, 65 in.; width, 22¾ in.; depth, 9¾ in.

Master clocks are arranged to operate secondary clocks on either series or multiple circuits; also program clock, time recorders, time stamps and other time-keeping apparatus.

Automatic Program Clock

This device automatically rings signals.

It may be located either in a master clock case or separately, and is fitted with program relays and automatic calendar device for silencing the signals nights, Saturday afternoons, Sundays, etc., or for shifting from one schedule to another automatically. It will ring at minute intervals on 12 or 24-hour schedule.

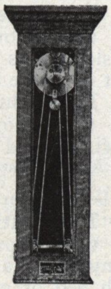


Fig. 721
Program Clock

Secondary Clocks

"Standard" secondary clocks are furnished in regular models with square wood cases, also round wood or metal cases with 8, 10, 12, 14, 18 or 24-inch dials.

Special watertight cases furnished for boiler rooms. Marble or fancy metal clocks for banks, etc.

Continued on next page

Fire Alarm

Standard fire alarm consists of master code box operated by break glass stations or push buttons.

Signals consist of either single stroke bells, vibrating bells or horns.

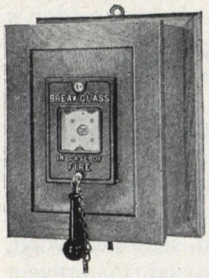


Fig. 814
Master Code Fire Alarm Box

"Standard" fire alarm system can be operated from the clock battery, thus making its operation much more reliable because this battery is always kept in good condition and is usually automatically charged.

A daily test can be automatically sounded on the fire alarm through the program clock before beginning school if desired.

Automatic Calling System

The "Standard" calling instrument uses telephone type ringing keys, familiar to all switchboard operators, furnishes 45 different code numbers operating either single stroke or vibrating bells, horns and buzzers; operates from storage battery or 110-volt current.

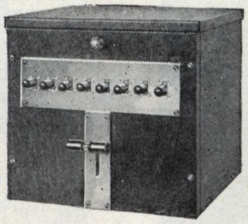


Fig. 710
"Standard" Calling Instrument

Industrial Equipment

This equipment consists of master clock, secondaries, program clock, automatic calling system, time recorders, time stamps and possibly an outdoor or tower clock.

The calling system can be combined with program clock, utilizing the same signals and wiring, if desired.

Old time recorders can be fitted wtih electric drive or synchronizers.

Time stamps can be operated either from the battery voltage or from 110-volt a-c. current.

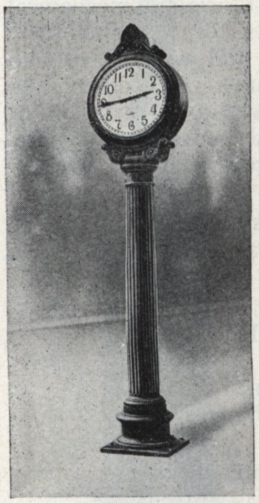


Fig. 820
Post Clock

Outside Clocks

Outside clocks are furnished in weatherproof cases, for attaching to outside of a building on brackets or as post clocks.

Dials, plain or arranged for illumination,

Combination Bell Control Board and Telephone System

With this device any room signal can be shifted from one program circuit to another without changing wiring connections. When equipped with hand microphone, switch and buzzer, this makes a simple effective telephone system, utilizing regular wall type phones.

The same room signals can be used for both program and telephone system. No confusion results because two quick rings can be given for the telephone signal whereas the program signal is a long ring of about 5 seconds. A "Standard" telephone system arranged in this manner can be operated from the clock battery, making it exceedingly reliable and saving cost of installation.

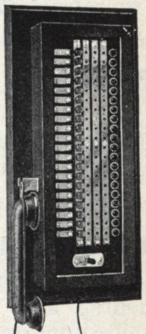


Fig. 818
Combination Bell Control Board and Central Telephone Station

Program Signals

Standard wood box bells are made in sizes 3, 4, 6 and 8 in. Cow gongs, 2½, 4 and 6 in. Outside weatherproof gongs furnished with or without housing and screen, 8, 10 and 12 in. Long duration contact furnished for ringing outside gongs.

Program Signaling Devices

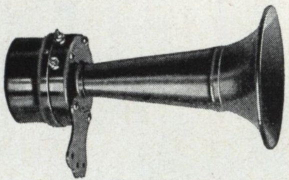


Fig. 816
Horn

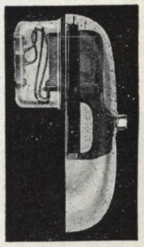


Fig. 708
Single Stroke Bell

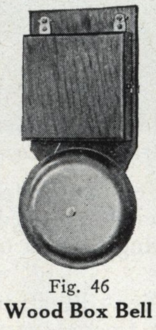


Fig. 46
Wood Box Bell

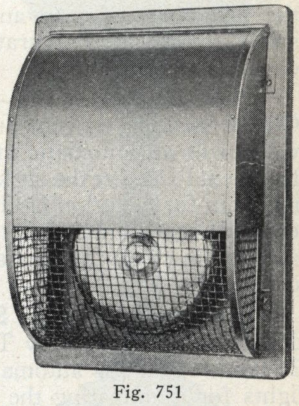


Fig. 751
Outside Gong with Housing and Screen

Battery Equipment

Standard electric time systems operate best from storage battery, automatically charged by the master clock.

Electrolytic, tungar or motor generator sets may be used for charging, with panel having instruments and necessary switches.

SETH THOMAS CLOCK CO.

19 West 44th Street

NEW YORK, N. Y.

CHICAGO, ILL., 215 W. Randolph Street

SAN FRANCISCO, CAL., 278 Post Street

Products

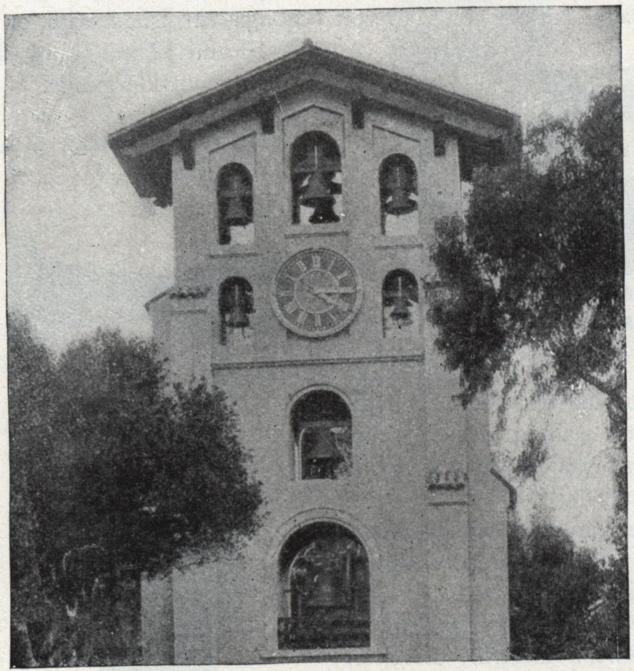
TOWER CLOCKS of every description for public buildings, churches, factories, schools, private estates, etc.; SELF-WINDING CLOCKS; STREET CLOCKS; BRACKET CLOCKS.

Tower Clocks

Both time and strike. Strike hours and half-hours; also Westminster chimes, angelus and ship-bells; quarter-hours on any number of bells up to eleven.

Description — Movements are substantially constructed. The wheels are of cast bronze, machine cut, pinions of steel (heat treated) all steel parts heavily copper plated. The mechanism mounted on a heavy cast iron bed frame. On the clock is a small dial to indicate the position of the hands on the outside dial; also a seconds dial for close regulation; a safety catch to prevent the fall and breakage of the pendulum rod should the suspension spring break. Escapement either Graham's dead beat, mahogany pendulum rod, or Dennison's double 3-legged gravity escapement, the pendulum of zinc and steel to insure accurate compensation.

Silencing Devices — On all striking movements we can fit an automatic attachment to silence the striking train for whatever hours desired; or a hand switch to silence the clock for special occasions.



BELL AND CLOCK TOWER, MILLS COLLEGE, CAL.

Automatic Light Switch—We can attach a double pole single throw Trumbull switch operated by a 24-hour wheel for automatically turning on and off the lights for illuminating the dials.

Self-winding Movements — (See illustration). We can equip movements with motors to operate on any current with automatic double pole single throwing Trumbull switches in weatherproof iron boxes automatically operated by the rise and fall of weight for automatic winding.

Size of Dials—As a guide in planning dials, we suggest that a good proportion is 1-ft. diam. for every 10 ft. in elevation.

Glass Dials—For illumination, dials may be safely used in whole plate not exceeding 4 ft. 6-in. diam.

For large sizes we advocate sectional glass and iron dials. The frame of the dial is cast in 6 sections with numerals and minute dots a part of the casting. The frame has rabbeted back to secure the glass which is installed in sections and fastened with brass clamps. All glass is 3/8 in. thick and ground on both sides.

Wood Dials—Two layers of 7/8-in. seasoned wood, tongued and grooved with grain crossed to prevent shrinking or warping, the two layers bolted together, the surface painted and smalted; metal numerals and minute dots painted black or gold leaf.

Iron Dials—Heavy galvanized iron with a wood backing 1½ in. thick. Numerals and finish same as for wood dials.

Skeleton Metal—Cast Roman or Arabic (no minute dots) mounted on 2 rings placed 2 or 3 in. from face of the wall. Finish to be in contrast to color of wall.

Estimate — On account of the various arrangements and individual requirements, each clock is made to order and in order to make an estimate it is necessary for us to know whether it is a time or strike movement, the number, diameter and style of dials. On request we will gladly send a question sheet which, when properly filled in, will enable us to quote intelligently.

Guarantee—Our tower clocks are of first class material and workmanship and guaranteed against original mechanical defects for a period of 5 years, and, when fitted with Graham's escapement, to run within a variation of 30 seconds per month, or with Dennison's double 3-legged gravity, 10 seconds per month if given proper attention.

Information Required for Estimates—When asking for estimates the following facts will be of much assistance to us:

Size and number of dials.
Wood, glass, metal, or stone dial wanted.
Is clock to strike hours?
Is clock to strike quarter-hours?
Do you wish Westminster Chimes?
Weight of bells.

Mammoth Clock Installations—

Colgate & Co., Jersey City, N. J.—1 dial, 50-ft. diam.
Emerson Drug Co., Baltimore, Md.—4 dials, 24-ft. diam.
Maryland Casualty Co., Baltimore, Md.—4 dials, 17-ft. diam.
C. Schmidt Sons, Philadelphia, Pa.—4 dials, 23-ft. diam.
Daniels & Fisher Stores Co., Denver, Colo.—4 dials, 15 ft. 7-in. diam.

Continued on next page

Seth Thomas Street Clocks

Of bracket or post type with 30 and 40-in. dials operated mechanically by the smallest size tower clock movement. These movements can be furnished in the 8-day weight driven, hand wind type or with automatic electric power wind, as illustrated. Movement measures 2 ft. square and 5 ft. high, and may be enclosed in wood cabinet of neat design to match surrounding trim. In case of post clocks, movement is mounted in base or, if ornamental column is required without base, movement may be installed under sidewalk or in basement.

Four dials of 3 ft. each in diameter, 3 dials of 3½ ft. each, 2 dials of 4 ft. or 1 dial of 5 ft. may be satisfactorily operated by this movement which carries a 5-year guarantee, and will last a lifetime.

These movements may be equipped with automatic lighting switch for turning on and off the lights used for illuminating the dials. Clock may be equipped with illuminated sign ornaments.

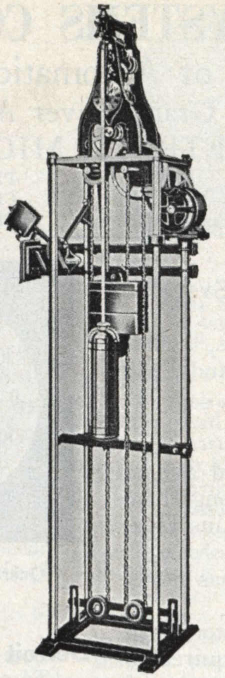
Self-winding Clocks for Indoor Use

Operated by a self-winding movement, weight driven; pendulum regulated; electrically wound by 2 dry cells requiring renewal once a year. These clocks are very satisfactory time keepers.

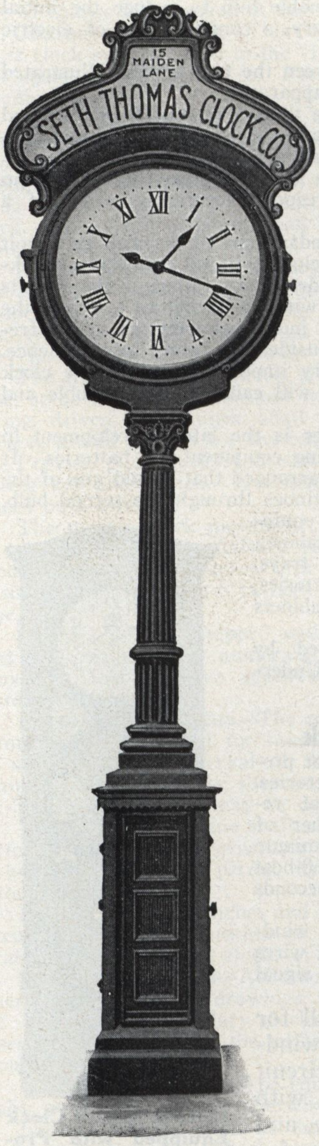
Styles—Plain office patterns, in oak, mahogany, or enamel of desired color, 18 in. square; approximately 5 in. deep; with 14-in. dial.

Same clock in bracket or ceiling type with double dials.

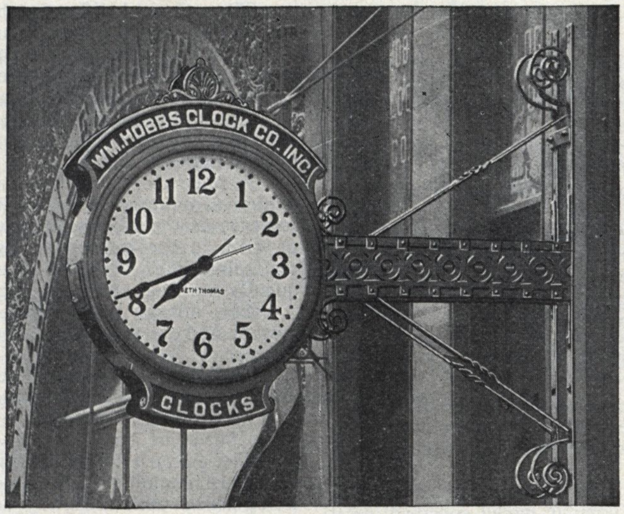
This movement can be supplied with special ornamental dials—up to 24 in. diam.—marble dials with raised bronze numerals and bronze hands; or skeleton type of either bronze or iron with gold leafed numerals and hands.



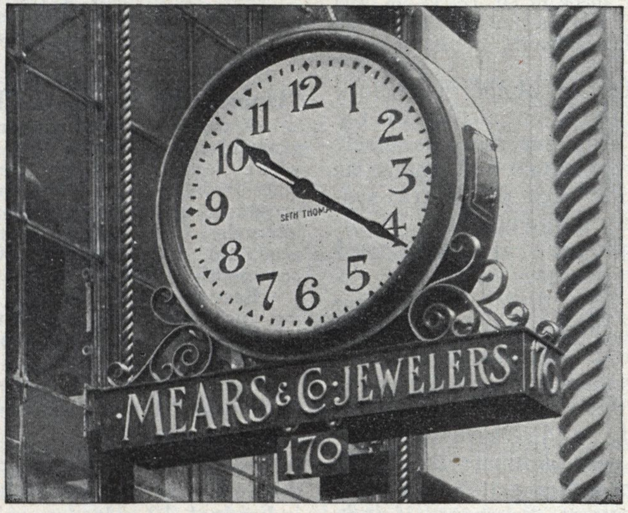
Electrically Wound Movement
For post or bracket type clocks



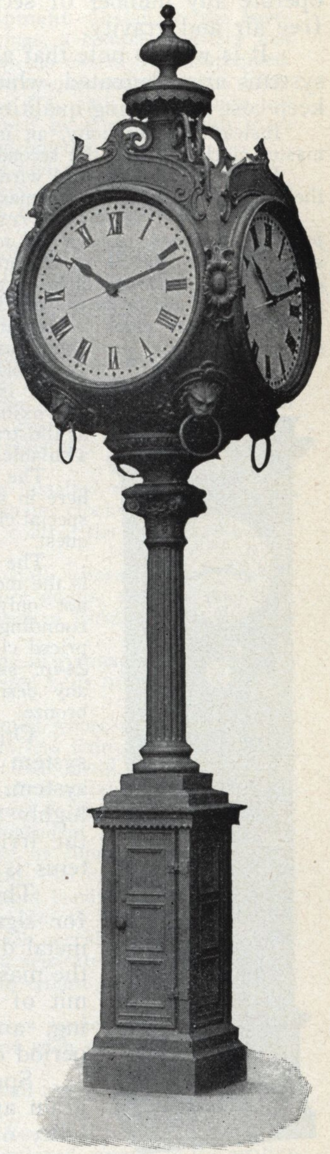
Two-dial Post Clock
With illuminated sign ornaments



Bracket Clock
Many different designs



Bracket Clock
Harmonious with architecture of building



Four-dial Post Clock
With shields above dials for lettering

TIME SYSTEMS COMPANY

Manufacturers of Automatic Clock Systems

7700 Grand River Avenue
DETROIT, MICH.

CHICAGO OFFICE, 9 South Clinton Street
BUFFALO OFFICE, 257 Washington Street
WASHINGTON OFFICE, 504 Peoples Life Insurance Building
PITTSBURGH OFFICE, 601 Century Building
CLEVELAND OFFICE, 530 Leader-News Building
CINCINNATI OFFICE, 605 Mercantile Library Building

Products

AUTOMATIC CLOCK, BELL and PROGRAM SYSTEMS.
ELECTRIC CLOCK and PROGRAM SYSTEMS.
Also manufacturers of Electrical Apparatus, including Bells, Transformers, Fire Alarm Stations, and Push Button Boards.

Hahl Automatic Clock Systems

The Hahl clock system was first installed almost fifty years ago in many eastern buildings, among them the United States Supreme Court, Johns Hopkins Hospital, and Marshall Field's store.

After fifty years, the Hahl clock system has never worn out or required replacement.

This system is distinctive in that the master clock contains and furnishes all the motive power required to operate any number of secondary clocks by means of free air and gravity.

It is well to note that all batteries common to other systems are eliminated, which accounts for the low upkeep cost and lasting qualities.

Instead of electricity, an impulse of air generated by the master clock controls the secondary clocks.

Instead of conduit and wire, small ⅛-in. iron pipe connects the secondary clocks to the master.

Note: This is not a pressure system, and no air compressors are used. Leaks and scattered secondaries are unheard of, as the pipe line is open to atmospheric pressure, at all times except the moment of impulse, which acts like a sound wave or ripple on the water in the pipes at a rate of 1000 ft. a second.

The master clock is weight driven and is equipped with a self-compensating pendulum guaranteed to vary not to exceed 10 seconds per month.

It is mounted in a floor type case, approximately 8 ft. high and 24 in. wide, as illustrated. Several styles of cases are available.

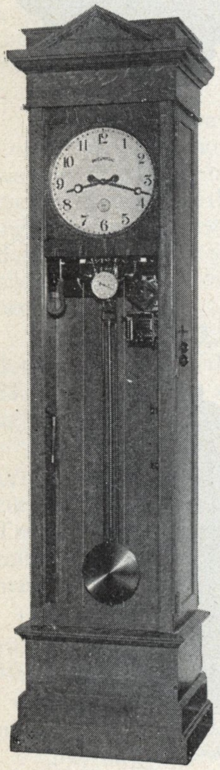
The secondary clocks are illustrated here in several styles. Other styles and special clocks are made to order upon request.

The style 010 round spun metal clock is the most popular model specified, as it not only easily harmonizes with surrounding details, but is a reasonably priced clock, made in 10, 12, 15, 18, and 24-in. sizes, and is finished to match any desired woodwork, or in statuary bronze.

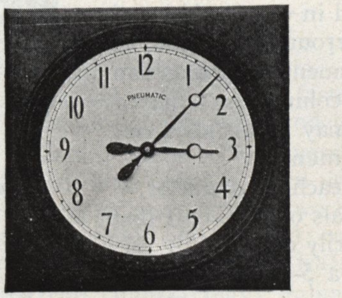
One feature of the Hahl clock system is the silent action of the system. This recommends itself highly for hospitals and hotels, as the irritating click of electric systems is very annoying.

The program apparatus used for signal purposes is of the all-metal disc type, direct driven from the master clock. It is built to permit of one-minute interval signaling, and silencing any two-hour period of day or night.

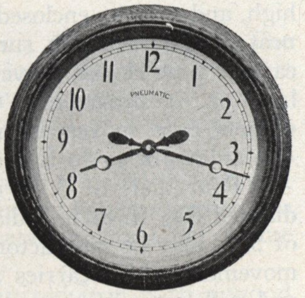
Specify a direct driven program and you eliminate the possibility of program getting off-time, a very frequent occurrence if it is simply a secondary movement.



Master Clock Case, Style 1



Style 01
Quartered Oak or Birch Mahogany



Style 010
Sanitary Spun Steel Case Furnished in Any Shade

Secondary Clocks

Detroit Electric Clock System

To provide the architect and engineer with a varied line of clock equipment as well as to enable him to reduce the initial cost of installation, when necessary, a complete line of electric clocks is offered.

The principal difference between the two systems illustrated lies in the control of secondary apparatus.

In order to maintain accurate time, a mercurial or all-metal compensating pendulum is necessary. A cheaper substitute, consisting of a wooden rod, metal ball pendulum, is also used.

The circuit closers and relays are all equipped with platinum points, as these contacts must respond accurately over half a million times a year.

A pilot clock for each secondary circuit, as well as a volt ammeter, mounted in the master clock, will aid materially in taking care of the system, as it will detect any failure in the circuits or drop in the battery voltage, without having to go over the entire building. For the sake of initial economy, these are frequently omitted, often causing considerable future inconvenience.

The storage battery is a very important part of the clock system and its neglect or abuse will cause endless trouble and expense.

The Duplex Tungar Rectifier is the latest development in moderate priced automatic charging equipment for batteries. It is provided with duplex bulbs, so arranged that should one of the bulbs burn out the charging continues through the second bulb.

The batteries and charging equipment are contained in a steel cabinet, doing away with unsightly sand trays, disagreeable fumes from the batteries, and dangerous wooden battery cabinets that take up valuable space.

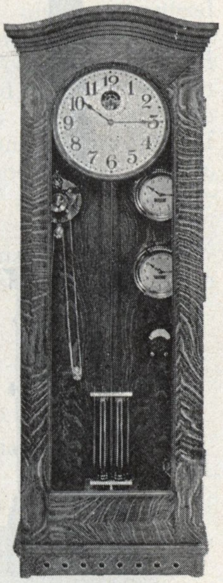
This equipment is approved by the National Board of Fire Underwriters.

"Universal" Program Clock

A motor wound direct driven program clock for schools and factories, where secondary clocks are not required. Will control any number of programs up to eight on one-minute intervals. Clock equipped with 60-beat pendulum, and guaranteed 30 seconds per month accuracy.

Easy to install, requires no winding, just bring a pair of 110-volt wires to top of clock and connect up to signal system.

When Specifying—Call for a 60-beat "Universal" self-winding, motor wound .... circuit program clock, equipped with direct drive program machine, and individual 12-volt a-c. relays for each program circuit.



Electric Master Clock Equipped with Program and Mercurial Pendulum

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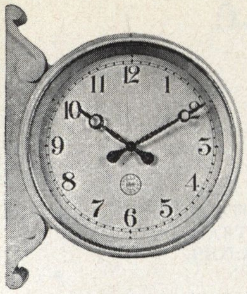
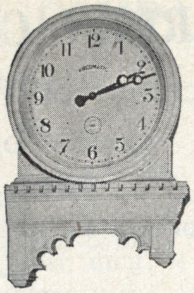
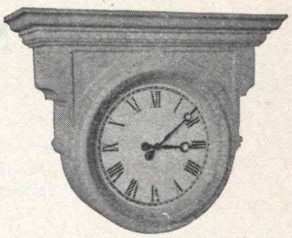


Style 023. Bracket or ceiling mounted, double face. Made in 12, 15 and 18-in. sizes

Style 017. Composition double face bracket type. Made in 18-in. size



Style 022. Composition bracket type. Made in 18-in. size



Style 016. Ceiling mounted, carved wooden double face. Made in 12, 15 and 18-in. sizes

Typical Specifications Covering a Master Clock and Program Bell System for a Modern School Building

Nature of Installation and Guarantee—These specifications and accompanying drawings contemplate the furnishing of all labor and material necessary for the installation of a clock and program system, consisting of master, program, secondary clocks and signal system, with all the necessary accessories to make it a complete and finished piece of work.

All materials used and workmanship shall be subject to the approval of the architects and engineers.

The entire system shall be guaranteed by the manufacturers against all mechanical and electrical defects, and maintained free of charge for a period of two years from date of acceptance.

Character of Work—This contractor shall furnish an automatic clock system, equal to the "Hahl," or an electric clock system equal to the Detroit or Pacific, subject to the foregoing specifications.

All wiring for the electric clock system shall be run in approved rigid metallic conduit, and all wires shall be No. 14 rubber covered. All piping for automatic system shall be strictly wrought iron with galvanized fittings, and tested under a pressure of 25 lbs. and found to be absolutely airtight after completion of work. All conduit or piping shall be run concealed, and all wires shall be carefully soldered and taped.

Master Clock—This contractor shall install, where directed, one high grade master clock, equipped with Graham dead beat escapement and self-compensating or mercurial pendulum, of the best type obtainable. Pendulum shall beat seconds, and shall vary not to exceed ten seconds per month after regulation.

The master clock shall be preferably of the weight driven type, so as to insure a constant tension upon the time train. If spring driven, mechanism shall automatically rewind to full tension, should springs for any reason become partially unwound.

Provide pilot clocks for each secondary clock circuit, with setting key and switch. Not more than fifteen clocks shall be placed on a circuit.

The master clock movement is to be mounted in a cabinet of quarter sawed oak, finished to match the woodwork in the room. The case shall meet with the approval of the architect. It shall not be less than 6 ft. high, either of the wall or standing type.

Clocks shall be equipped with 14-in. or 15-in. white enameled dial, with arabic numerals, indicating both minutes and seconds. Door to have approved lock and be provided with plate glass front.

Program Apparatus—The program machine shall be fully automatic and arranged for four program circuits, to ring bells on any one-minute interval of the day or night, and shall be equipped with automatic silencing device to cut out any daily six-hour period which may be desired.

The program machine shall also control a separate circuit to battery charging motor generator set, stopping and starting same at any pre-determined period, by means of a selector type of cutout relay.

Furnish suitable switches and push buttons for each program circuit, for manual operation of the signal system, same to be located on the program clock, or adjacent to it.

Secondary Clocks—All secondary clocks shall be installed where indicated on the drawings, or in the accompanying schedule. In general, secondary clocks shall have round spun metal cases finished to match the adjacent woodwork, or in statuary bronze, as directed.

Secondary clocks shall be equipped with 12-in. dials having arabic numerals, unless otherwise indicated.

Secondary cases shall be dustproof and mounted securely on the wall by means of back boards, hinged at the top to permit of easy access to the secondary movement.

Secondary Clocks

The secondary clocks in the corridors, auditorium and gymnasium shall be 18-in. diameter, and of similar construction. The gymnasium clock shall be equipped with a suitable wire guard with hinged front to permit of easy access.

Alternate—(Should double face corridor clocks be required.)

The secondary clocks in the corridors, where indicated on the drawings, shall be of the double face bracket type, with round wooden frames, on the face of which are to be mounted 18-in. white enameled dials, on hinged doors, so as to permit of easy access. Clocks shall be supported to the sidewall by means of a carved wooden bracket of neat design and subject to the approval of the architect. Both clock case and bracket shall be painted three coats of flat color, and two coats of enamel, as selected.

Battery and Charging Equipment—Install in the basement, where indicated on the drawings, a complete battery and automatic charging device to control the clocks herein specified.

Batteries shall be equal to those manufactured by the Electric Storage Battery Co., their type PT, and shall contain not less than 12 cells complete, contained in a cabinet with glass door, complete with sand trays, hydrometer, etc.

Cabinets shall be finished inside and out in baked enamel.

There is to be furnished a battery charging motor generator set with ample capacity, of not less than 150 watts, to maintain the batteries heretofore specified.

The motor generator set shall be controlled through a panelboard of slate, mounted in the battery cabinet or in a separate cabinet, to provide for charging and protecting the battery against improper discharge and reversal through generators.

The charging panel shall be complete in every respect to automatically charge the batteries at regular pre-determined periods, as controlled by the program machine, and which shall consist of an automatic battery relay, voltmeter, ammeter, switches, test keys, and necessary resistance for regulating the rate of charge.

Should an automatic system be installed, the battery equipment will not be required, but the master clock shall be equipped with all the necessary apparatus to control the secondary clocks, by means of air impulse.

Bells—This contractor shall install, where indicated on the drawings, 6-in. polarized transformer gongs, such as manufactured by the Holtzer-Cabot or Schwarze Electric Co. wound to operate on 12 volt a-c. current.

Where indicated on the drawings, in gymnasium, locker room and boiler room, install 4-in. polarized bells of the same manufacture.

Entrance gongs are to be mounted where indicated, shall be weatherproof and equipped with not less than 8-in. double gong or 10-in. single gong shells of cast bell metal.

Adjacent to the main panelboard, a suitable transformer of not less than 150-watt capacity, equal to the Dongan or Thordarson, shall be installed with independent fused safety switch between the transformer and source of supply.

Wiring for the Signal System—All wiring for the signal system shall be run in approved rigid conduit, and wired back to the master clock location, using No. 14 common return and No. 16 individual control, placing each corridor floor on an independent circuit, entrance gongs on a separate circuit, gymnasium and locker room bells on a separate circuit and boiler room on an individual circuit.

Provide push buttons and a cross connecting control device in the master clock, to take care of each circuit of bells, with independent push buttons.

Wiring for the signal system shall not be installed in conduit to be used for any other purpose.

Alternate Proposal—Bids may be submitted on other makes of clock systems, not specifically mentioned, subject to the written approval of the architects and engineers in advance.

WARREN CLOCK COMPANY

Manufacturers of Telechron Time Equipment

GENERAL OFFICE AND FACTORY
ASHLAND, MASS.
BRANCH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES

Telechron
TRADE-MARK

Products

Master Clocks, Secondary Clocks, Program Systems, Time Stamps, Employees' Recorders.

Also Tower Clocks, Automatic Time Switches, Synchronous Motors, and Instrument Movements of all kinds.

Description of Telechron Service

By means of our master clocks, which are located at the power stations of electric light companies, we are now furnishing correct time to thousands of homes, offices, factories, schools, etc. This is done by means of impulses of electricity over the systems of the electric light companies.

Telechron master clocks are corrected daily at noon by wireless signals from the United States Naval Observatory. Any lamp socket or outlet will supply Telechron time.

Telechrons have been operating satisfactorily for over 8 years. Over 3000 cities and towns now have current regulated by our master clocks.

Advantages—

Correct time by wire to every home, office, factory, school, etc.

No batteries of any kind.

No winding, cleaning, or oiling.

Correct time through automatic regulation.

No expensive master clock.

Great saving in wiring expense—all Telechrons can be operated from the nearest light wires.

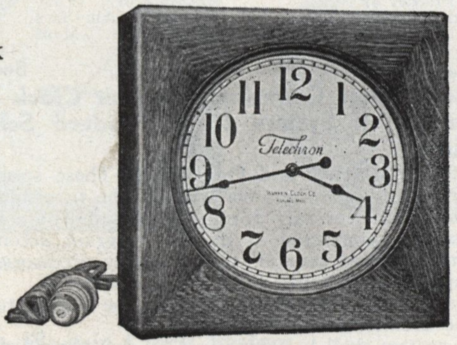
Telechrons are sold not rented—there is no service charge.

Telechron
ELECTRIC
TIME
SERVICE

Correct Time from a Lamp Socket

Employees' Recorders and Time Stamps

A Telechron movement is the only means by which synchronized time may be secured in employees' recorders, time stamps, etc., without a large expenditure for master clock, storage battery, charging equipment, etc.



No. 201. Oak

Standard recorders with Telechron movements cost practically the same as the same recorders with spring movements.

Program Clocks, Bells, etc.

Our program clock operates from the lighting current and has the standard Telechron movement. Our bells operate from the same current and have no contacts to wear out or get out of adjustment. They can be supplied for lower voltage if desired.

Guarantee

All Telechron apparatus is guaranteed against all defects of material and workmanship for 1 year from date of installation.

Specifications

Standard specifications and wiring diagrams will be sent on request.

We invite architects, engineers, etc., to communicate with us regarding any problem where time equipment is involved.

Representative Installations

General Electric Company, Schenectady, N. Y.
Hartford Hospital, Hartford, Conn.
Hood Rubber Co., Watertown, Mass.
Plaza Hotel, New York, N. Y.
Edison Electric Illuminating Co., Boston, Mass.
Brooklyn Edison Co., Brooklyn, N. Y.
Babson Statistical Organization, Wellesley Hills, Mass.
Mt. Pleasant School, New Bedford, Mass.
Chicago, Milwaukee & St. Paul R. R., Minneapolis Station
Ritz-Carlton Hotel, Atlantic City, N. J.
University of Michigan, Ann Arbor, Mich.
Bowery Savings Bank, New York, N. Y.
Phoenix Mutual Life Insurance Co., Hartford, Conn.
Phoenix National Bank, Hartford, Conn.
WLAG Radio Station, Minneapolis, Minn.
Book-Cadillac Hotel, Detroit, Mich.
Insurance Co. of North America, Philadelphia, Pa.
Otis Elevator Co., Yonkers, N. Y.
Waterbury Hospital, Waterbury, Conn.
Industrial Art School, Mt. Vernon, N. Y.
Life Savers, Inc., Portchester, N. Y.
Colonial Bank, New York, N. Y. (3 branches)
Hotel Astor, Milwaukee, Wis.
Fisher Body Corporation, Detroit, Mich. (3 plants)
Chevrolet Motor Car Co., Detroit, Mich.

A. B. SEE ELEVATOR COMPANY, INC.

52 Vesey Street

NEW YORK, N. Y.

Cable Address
"A. B. See, New York"

OFFICES

NEW YORK, N. Y., 52 Vesey Street
BOSTON, MASS., 82 Devonshire Street
HARTFORD, CONN., 36 Pearl Street
PHILADELPHIA, PA., 1018 Cherry Street
BALTIMORE, MD., Lexington and Liberty Streets
WASHINGTON, D. C., 14th and H Streets, N.W.
CLEVELAND, OHIO, 750 Prospect Avenue
DETROIT, MICH., 56 Henry Street

FACTORY: JERSEY CITY, N. J.

FOREIGN REPRESENTATIVES

TOKIO, JAPAN, Uchida Trading Company, Ltd.
MONTREAL, QUE., Darling Brothers, Ltd.
SYDNEY, AUSTRALIA, English Electric Co. of Australia, Ltd.

Products

Manufacturers of all types of Direct Connected Electric Passenger and Freight Elevators; Push Button Elevators; Sidewalk Type Elevators.

Design

The A. B. See electric elevators are designed and manufactured under the direction of the engineers of the A. B. See Elevator Company, Inc. and every part is designed for its specific work and is in no way an assembled product.

Gearless Traction Elevator

The gearless traction elevator was developed for high speed service where speeds of 450 to 700 f.p.m. are desirable.

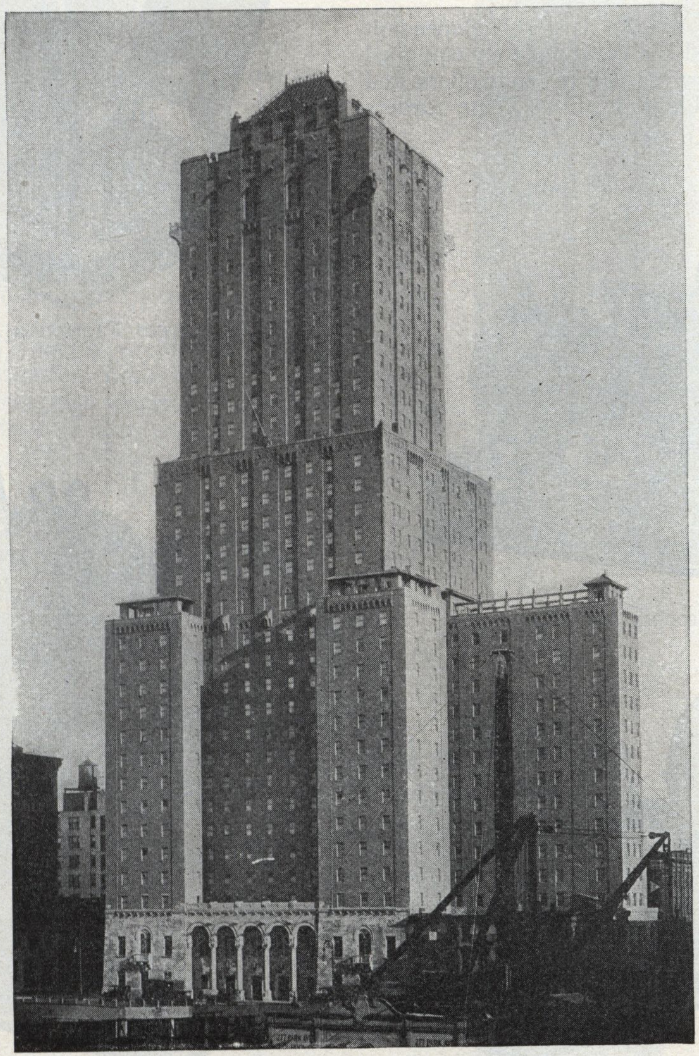
The gearless traction machine consists of a large slow speed multipole shunt wound motor, having the armature, brake wheel and drive sheave mounted on one sleeve. This sleeve is mounted on two sets of roller bearings and rotates around a stationary shaft, which in turn is keyed to two cast iron hangers that bolt direct to a heavy ribbed cast iron base. This rigid patented self-aligning design used in connection with roller bearings is an exclusive feature of A. B. See gearless traction machines.

Low operating cost and ease of control make this elevator desirable for high speed service.

Geared Traction Elevator

The geared traction elevator is the standard machine for buildings of moderate height requiring speeds of 150 to 450 f.p.m.

This machine has a high speed interpole motor of special design for elevator work, and a gear reduction to the drive sheave through steel worm and bronze gear which is directly connected to the drive sheave. The roping of this type machine is exactly the same as the gearless one-to-one machine. This type is made for both direct and alternating current and is suitable for one or two speed motors.



Hotel Shelton, New York, N. Y.
Arthur Loomis Harmon, Architect
Equipped with eleven A. B. See elevators

Freight Elevator

A. B. See freight machines are roped two to one with sheave on car crosshead and counterweight, or have a gear reduction obtained by driving the drum or traction sheave through internal gears, accurately cut. For extra heavy duty up to 30,000 lb. a combination of the two drives is used.

Push Button Elevator

The full-automatic push button control elevator has become very popular in the last few years, because this type eliminates the elevator operator. It is especially adapted for use in residences, hospitals and apartment houses.

This type of elevator can be operated on both direct and alternating current.

Sidewalk Machines

This company's sidewalk machines for both direct and alternating current are made in sizes 1000 to 6000 lb. and speeds 25 to 50 f.p.m.

Co-operation

Specifications, drawings and estimates for elevator installations will be furnished without obligation, to those who will communicate with our nearest office.

INCORPORATED 1898 PAID UP CAPITAL $250,000.00

AMERICAN ELEVATOR & MACHINE COMPANY

INCORPORATED

500-522 East Main Street
LOUISVILLE, KY.

REPRESENTATIVES

FLORIDA, Lev. G. Taylor, Tampa
HUNTINGTON, W. VA., E. L. Warnick
IOWA and NEBRASKA, Standard Engineering Co., Omaha
JACKSON, MISS., Oscar Carlisle
JACKSON, TENN., Parish Building Material Co.
KANSAS CITY and KANSAS, J. E. King, Kansas City, Mo.
NASHVILLE, TENN., J. Bouchard & Sons Co.
NEW ORLEANS, LA., American Elevator & Electric Co.
PEORIA, ILL., H. F. Kircher & Co.
PORTSMOUTH, OHIO, W. A. Bunch
PULASKI, VA., Robert Bunts Engineering Co.
SAVANNAH, GA., R. L. Gruver
SOUTH BEND, IND., Builders' Agency
SPRINGFIELD, ILL., Sangamo Equipment Co.
TEXAS and OKLAHOMA, J. Peyton Hunter, Dallas
CUBA, Thrall Electric Co., Havana

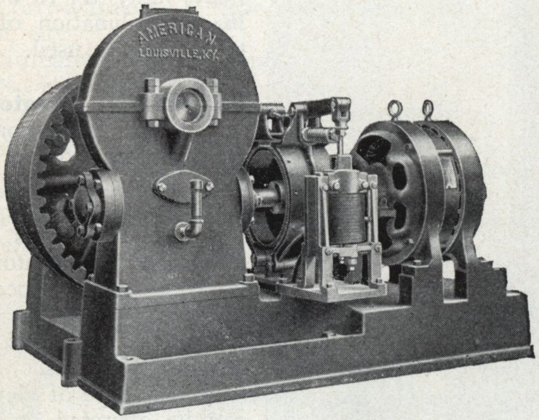
Products

A complete line of Gearless and Geared Electric Elevators for Direct and Alternating Current, including Variable Voltage Control.

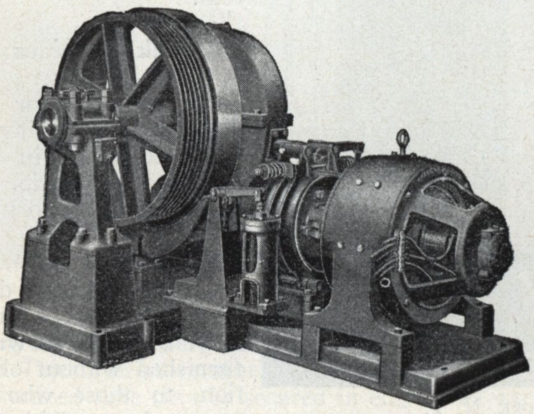
Also Automatic Push Button Passenger and Freight Elevators and Dumbwaiters; Automobile Elevators; Hand Elevators.

Facilities

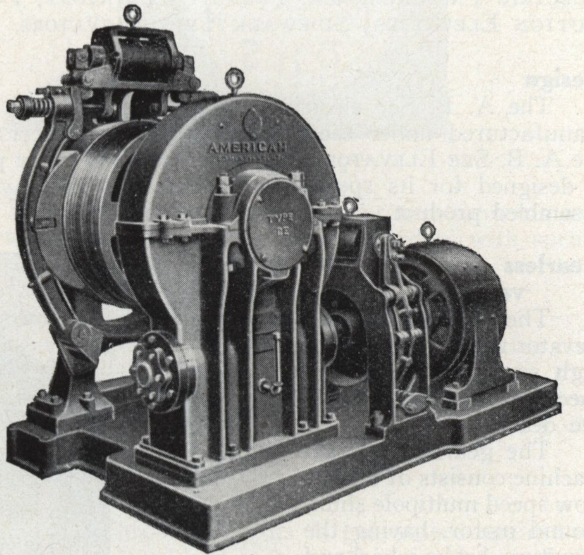
The company has one of the largest independent elevator plants in the United States, completely equipped for building elevators, elevator motors, controllers and other parts, thereby enabling it to execute orders promptly.



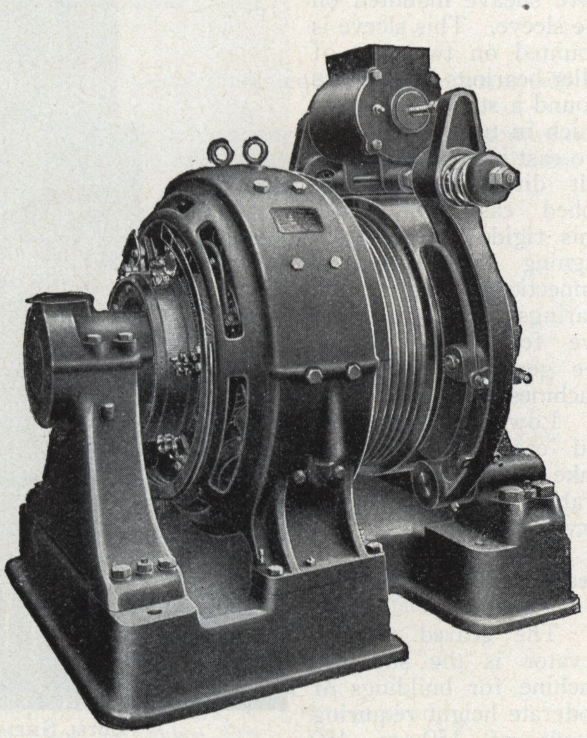
Slow Speed Freight Elevator



Medium Speed Passenger Elevator



High Speed Passenger Elevator, Geared Type



High Speed Passenger Elevator, Gearless Type
Variable voltage control for direct or alternating current

BAY STATE ELEVATOR CO., INC.

Manufacturers of Electric and Hydraulic Elevators

SPRINGFIELD, MASS.

HARTFORD, CONN. BOSTON, MASS. WORCESTER, MASS.

Products

ELEVATORS of all types for PASSENGER and FREIGHT SERVICE:

- Electric Elevators:
  - Car Switch, Push Button and Rope Control
- Plunger Hydraulic Elevators:
  - Rope and Lever Control
- Belt Power Elevators:
  - Ceiling and Floor Type and Rope Control
- Hand Power Elevators:
  - Freight and Invalid Lifts
- Also Dumbwaiters:
  - Electric: Push Button and Hand Rope Control.
  - Plunger Hydraulic: Hand Control.
  - Power: Automatic and Brake Rope Type.

Experience

This is an old established company with years of experience in the construction of elevators. During this time the company has had a steady growth and the quality and durability of its equipment is proven by the large number of repeat orders from architects, engineers and owners.

Estimates and Service

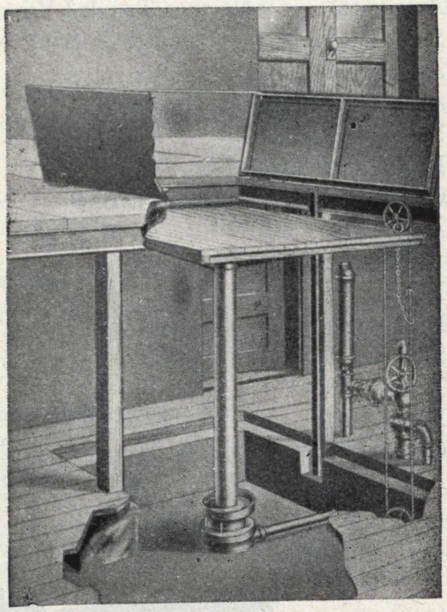
Our Engineering Department is at the service of architects and engineers in connection with the planning of elevator equipment.

We are very glad to furnish preliminary plans, estimates or any other information desired.

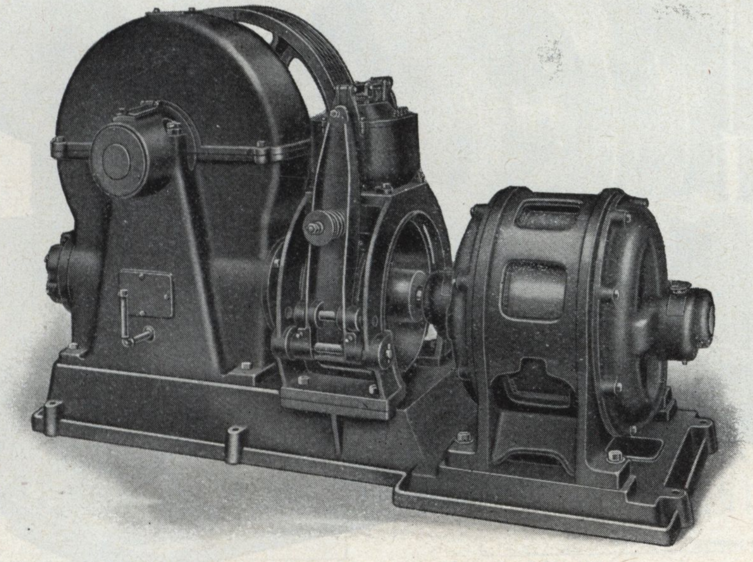
We are also equipped to furnish special lifting equipment, either electric or hydraulic, such as theater lifts, winches, etc.

A Few References

Cheney Bros. Silk Co.
Crofut & Knapp Co.
Diamond Match Co.
Eaton, Crane & Pike Co.
Fisk Rubber Co.
General Electric Co.
Gilbert & Barker Mfg. Co.
Gulf Refining Co.
Landers, Frary & Clark
Mount Holyoke College
The Norton Co.
Springfield Fire & Marine Insurance Co.
Springfield National Bank
State Mutual Life Assurance Co.
Albert Steiger Co.
U. S. Envelope Co.
West Boylston Mfg. Co.
Worthy Paper Co.



Bay State Hydraulic Elevator Installation



A Direct Connected Electric Traction Machine

THE CAPITAL LIFT & MANUFACTURING CO.

Town and Starling Streets
COLUMBUS, OHIO

Vertical Lifting Devices for Every Purpose

ELECTRIC POWER:

- Elevators
- Dumbwaiters
- Newspaper Lifts
- Form Lifts
- Stereotype Plate Lifts
- Roll Paper Lifts
- Abbattoir Lifts
- Ash Lifts
- Sidewalk Lifts
- Automobile Lifts
- Ice Lifts
- Fuel Lifts
- Mail Bag Lifts
- Loose Material Lifts
- Mine Lifts
- Warehouse Elevators
- Book Lifts
- Trunk Lifts
- Ice Tiering Machines

HYDRAULIC POWER:

- Sidewalk Lifts
- Roll Paper Lifts
- Counterbalanced Freight Lifts
- Ash Lifts

HAND POWER:

- Elevators
- Dumbwaiters
- Sidewalk Lifts
- Trunk Lifts
- Form Lifts
- Check Lifts
- Ash Lifts

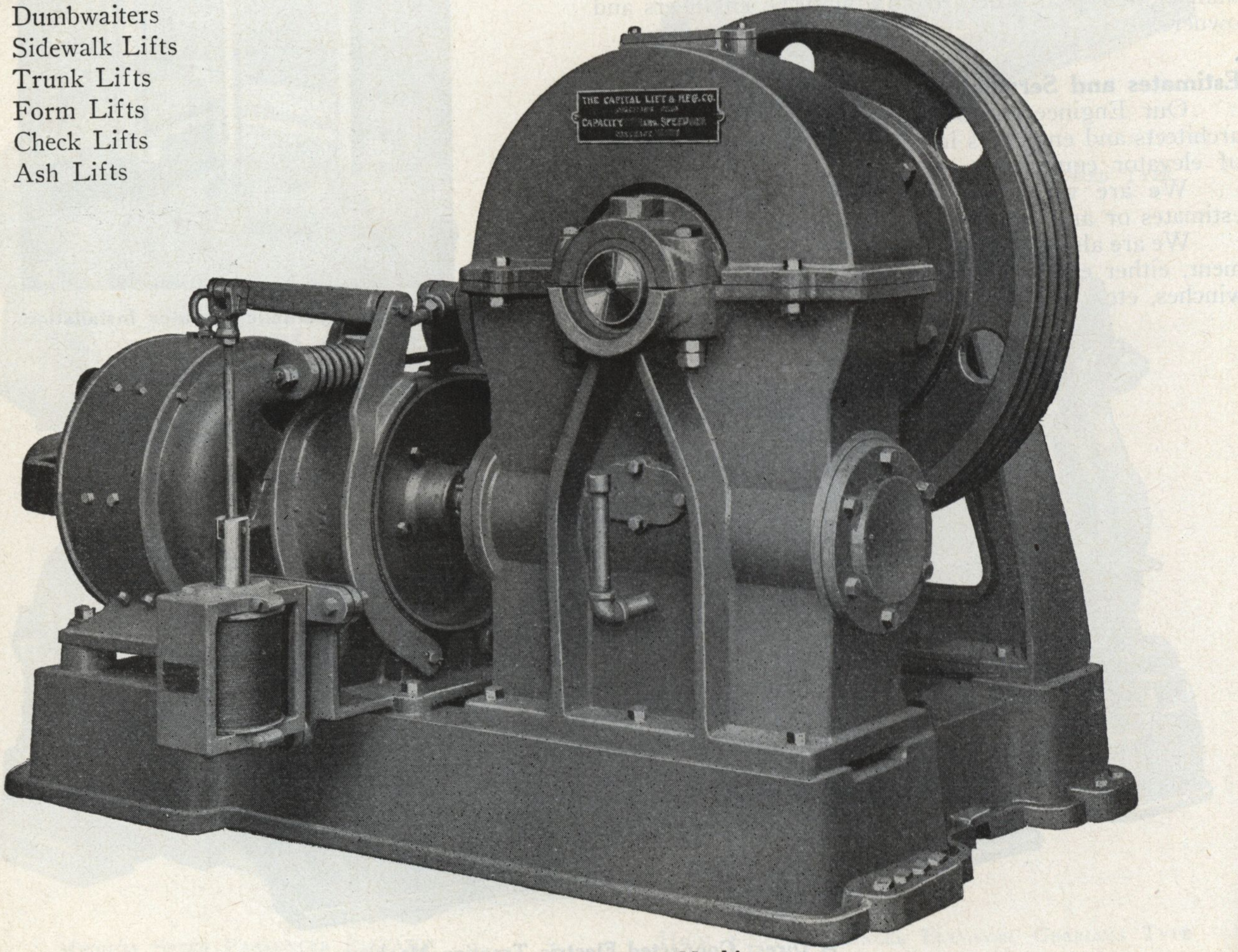
AUTOMATIC GRAVITY:

- Ice Droppers
- Stereotype Plate Droppers
- Roll Paper Droppers
- Milk Can Droppers
- Boxed Goods Droppers

Also Roll Paper Trucks, Stereotype Plate Trucks, Warehouse Trucks, Elevator Guide Lubricators, Electric Worm Gear Drives for conveyor manufacturers.

Services

Our engineering department is at the disposal of architects, engineers and owners in designing equipment for unusual conditions.



Capital Electric Elevator Machine

ESTABLISHED 1852

CHARLES E. DOWDALL, INC.

Manufacturers of Sidewalk Elevators

154 West Broadway
NEW YORK, N. Y.

Products

Sidewalk Freight Elevators, Platform Ash Hoists, Electric and Hand Power.

Also Stage Lifts.

Design

Dowdall Elevators are manufactured in accordance with our design in our factory. They are designed solely for the duties they serve and to meet the problems peculiar to freight elevator service.

Special Models

We can design special type elevators to meet unusual and difficult conditions.

Type

Both electric and hand power elevators are of the double drum type, the platform being raised at each of its four corners by chains or cables attached to lifting drums directly connected to the winding machine.

The electric machine is of the worm and gear type mounted on a one-piece, heavy, gray iron bed plate. The worm and gear are of a special size and mounting, having a high degree of efficiency.

The gearing of the machine is fitted accurately and is of extra heavy material. The drums are rigidly keyed on a steel shaft running in babbitted bearings. The machine is controlled by a powerful brake which holds the platform at the landing or at any point in its course of travel. It has automatic stop for top and bottom of hatchway.

The hand power winding machine is of the spur gear type mounted on a heavy steel frame, simple in operation and requiring a minimum of exertion in lifting loads.

All gearings and bearings are so installed as to be readily accessible for purposes of oiling and greasing.

The construction of these elevators is such that it insures both strength and simplicity of operation.

Control

The electric elevators are controlled and operated by either a hand cable with lifting ring on platform floor, overhead hand cable or push button switch on car. The service of the elevator is the chief determining factor.

Capacity

Capacities range from 1000 to 7000 pounds.

Speed

Electric, 20 to 40 feet per minute.
Hand power, 10 feet per minute.

Prices

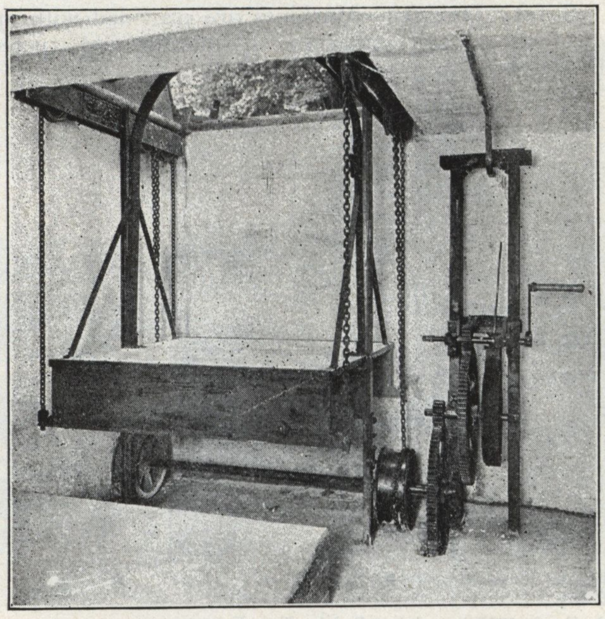
Based on: (a) Capacity. (b) Distance of travel. (c) Style of platform. (d) Type of electric current.

Specifications

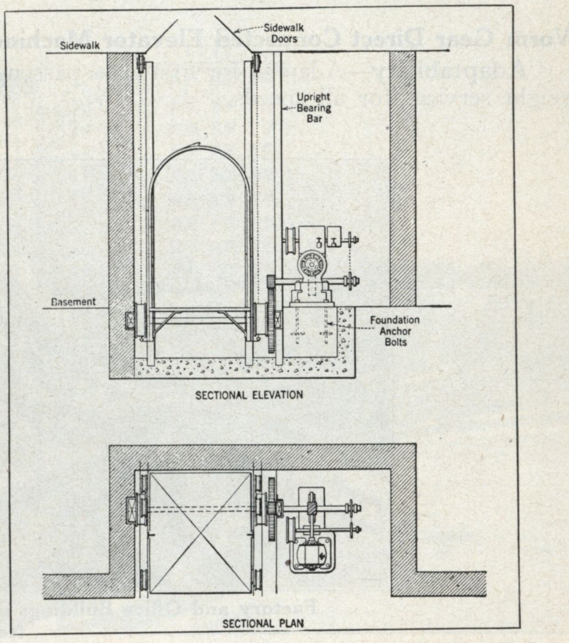
Furnish and install one Dowdall Sidewalk Elevator with necessary apparatus where indicated and in accordance with the manufacturer's drawings.

New York References

Childs Co., 200 Fifth Avenue
Corn Exchange Bank, 13 William Street
New York Telephone Co., 25 Dey Street
United Cigar Stores Co., 44 West 18th Street
F. W. Woolworth Co., 233 Broadway
Trowbridge & Livingston, 527 Fifth Avenue
McKenzie, Voorhees & Gmelin, 342 Madison Avenue



Typical Installation Dowdall Handpower Elevator



Sectional Detail Drawing of Typical Electric Installation

THE EASTERN MACHINERY CO.

Manufacturers of Electric Elevators

MAIN OFFICE AND FACTORY
250 Ashmun Street
NEW HAVEN, CONN.

BRIDGEPORT OFFICE, 65 Cannon Street

HARTFORD OFFICE, 183 Ann Street

Products

Electric Passenger and Freight Elevators; Elevator Equipment; Automatic Push Button Elevators and Dumbwaiters—50 to 20,000 lbs., 25 to 500 ft. per min.

Experience and Services

This company has had 30 years' experience in the elevator business.

Its exceptional manufacturing facilities enable it to produce machines that are designed on the most advanced mechanical ideas and which have proved practical and reliable for improved safety, speed, and ease and economy of operation.

The company maintains a corps of experienced engineers who will furnish layouts and detailed specifications for the proper installation of elevator equipment and give expert advice as to the necessary requirements for the building.

Architects and others having elevator problems to solve are invited to submit them to this company, and a satisfactory solution is assured, without obligation.

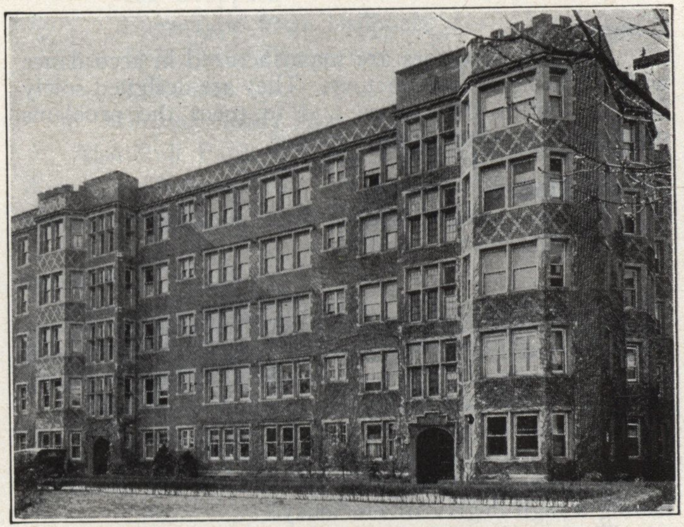
Electric Passenger and Freight Elevators

Electric Passenger Type—In use in office buildings, banks, hotels, hospitals, department stores, apartment houses, ships, and in private homes for the comfort and convenience of invalids.

Freight Type—Our many installations, of all capacities and for all requirements, have been thoroughly tried out by long and satisfactory use.

Worm Gear Direct Connected Elevator Machines

Adaptability—Adapted for first class passenger or freight service, for all speeds.



Apartment House in which two of our Electric Automatic, Push Button, Passenger Elevators have been serving continuously since 1915

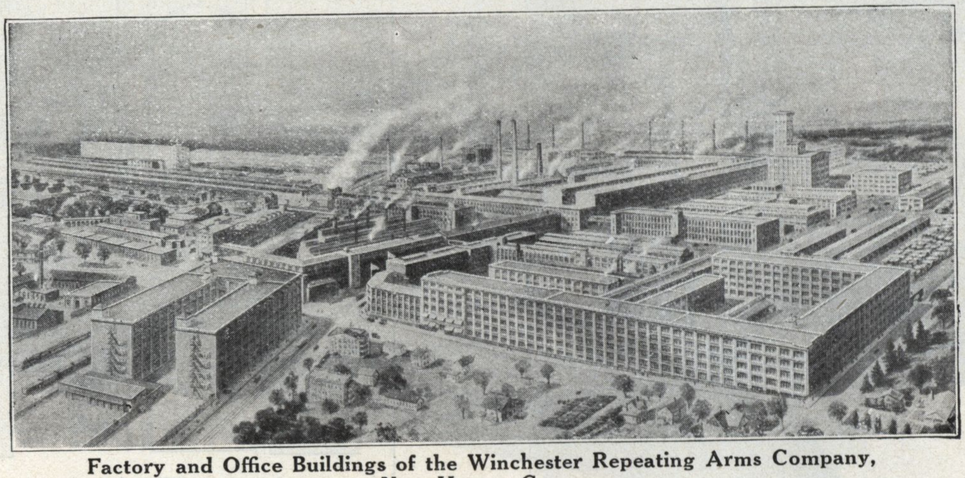
The owner reports that their operation has been thoroughly satisfactory, and that the only attention that has been found necessary in all this time has consisted of minor adjustments and replacements of a few small parts due to ordinary wear

Control—Operated by push buttons or by full magnet control from switch in car, with direct or alternating current.

Operation—Smooth, reliable and safe.

Construction—All parts are accurately machined, correctly assembled, and are interchangeable, insuring efficient and satisfactory service.

Safety Devices—Machines are provided with approved safety devices that are substantially constructed, and comply with every requirement.



Factory and Office Buildings of the Winchester Repeating Arms Company, New Haven, Conn.

This 80-acre plant is satisfactorily served by 35 electric elevators built and installed by The Eastern Machinery Co.

ELEVATOR COMPANY OF AMERICA

Manufacturers of Passenger and Freight Elevators

GENERAL OFFICES
190 North State Street, CHICAGO, ILL.

TELEPHONE
Central 0323

FACTORIES
CHICAGO, ILL.
CLEVELAND, OHIO

Products

Passenger and Freight Elevators of all types, speeds and capacities.

Also, Automatic Push Button Elevators, Electric and Hand Power Dumbwaiters, Sidewalk Lifts, Organ and Stage Lifts, etc.

Service and Supplies

We maintain a complete Service and Repair Department, and also carry a full line of elevator and motor supplies and accessories.

References

Chicago, Ill.

American Car & Foundry Co.
Balaban & Katz Corporation:
  Chicago Theater
  Tivoli Theater
  Uptown Theater
Belden Hotel
Broadmoor Hotel
Broadview Hotel
S. Birkenstein & Sons
E. J. Brach & Sons
Butler Building
Calumet National Bank
City of Chicago
Continental Can Co.
Corn Products Refining Co.
Covenant Club
David Fireproof Storage Co.
Denifer Apartments
E. Edelman & Co.
E. Eiger & Brothers
Fish Furniture Co.
Franklin Street Building and Garage
Furniture Exhibition Building
Garrick Theater Building
General Furniture Co.
Great Northern Office Building
Greene's Limited
Hurley Machine Co.
Illinois Smoked Meat Co.
Independence State Bank
Edw. Katzinger Co.
Library Bureau Building
Majestic Hotel
Northern Bank Note Co.
North Pier Terminal Co.
Albert Pick & Co.
Rusnak Brothers
Regensteiner Color Type Co.
Religeous Hospitalers of St. Joseph
Sherwin-Williams Co.
Standard Oil Co.
State-Lake Building
Stewart-Warner Speedometer Corp.
Thom Building
Union Vault Deposit Co.
Victor Adding Machine Co.
Webster Hotel
Western Shade Cloth Co.
Weyman-Bruton Co.

Other Localities

Abraham Lincoln Hotel, Springfield, Ill.
American Trust Bank, South Bend, Ind.
Arcade Building, Racine, Wis.
Ardmore Hotel, Milwaukee, Wis.
Benton Harbor Casting Co., Benton Harbor, Mich.
Commodore Apartments, Cleveland, Ohio
Cornhusker Hotel, Lincoln, Neb.
Edwardsville National Bank, Edwardsville, Ill.
Fox Theater, Oakland, Cal.
Globe Department Store, Waukegan, Ill.
Hotel La Salle, South Bend, Ind.
Illinois Power Company, Springfield, Ill.
Keith Theaters, Dayton & Akron, Ohio
Lauerman Bros., Marinette, Wis.
Metropolitan Theater, St. Louis, Mo.
Mid-Arcade Building, Cleveland, Ohio
Miller Amusement Co., Wichita, Kan.
National Lock Co., Rockland, Ill.
Old Second National Bank, Aurora, Ill.
Orpheum Circuit Theater Buildings:
  Main Street Theater, Kansas City, Mo.
  Junior Orpheum Theater, Minneapolis, Minn.
  New Palace Theater, Milwaukee, Wis.
  Oakland Amusement Co., Oakland, Cal.
  Hill Street, Los Angeles, Cal.
  San Francisco, Cal.
Park Lane Hotel, Kansas City, Mo.
Park Lane Villa, Cleveland, Ohio
Peterson & Anderson, Rockford, Ill.
Rockford National Bank, Rockford, Ill.
Roosevelt Building, Indianapolis, Ind.
Seidman Mortgage, Cleveland, Ohio
Shea Buffalo Theater, Buffalo, N. Y.
Joseph B. Spies, Elgin, Ill.
St. John's Hospital, Springfield, Ill.
St. Louis Ice Cream Co., St. Louis, Mo.
St. Nicholas Hospital, Sheboygan, Wis.
Valentine Transfer & Storage Co., Aurora, Ill.
Western Wheeled Scraper Co., Aurora, Ill.
Whittier Apartments, Detroit, Mich.
Worthington Apartment Building, St. Louis, Mo.

Shoreland Hotel, Chicago, Ill.

Fridstein & Company, Engineers and Architects — G. H. Gottschalk & Co., Builders

FOUNDED 1882

HOUSER ELEVATOR COMPANY

SYRACUSE, NEW YORK

ELEVATOR MANUFACTURERS ASSOCIATION
MEMBER

Products

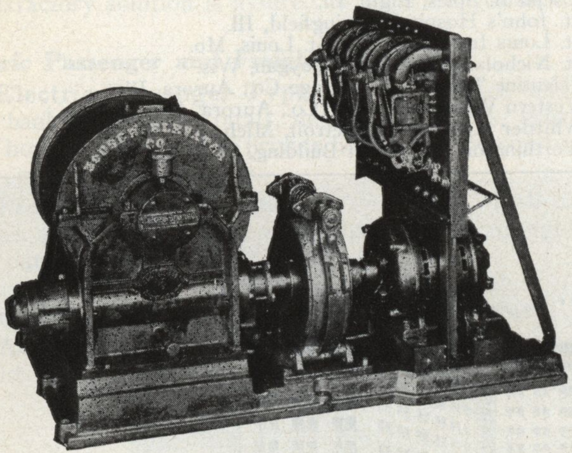
Electric Passenger and Freight Elevators.
Hydraulic Plunger Lifts.
Hand Power Elevators.
Dumbwaiters.
Hatchdoor Levers.

Experience and Services

The Houser Elevator Company was established over forty years ago, and has made a reputation for itself of producing high grade elevator equipment. In connection with the manufacture of elevators and other like equipment, it maintains a service department widely known as being both prompt and efficient.

Electric Elevators

The Houser Elevator Company manufactures geared traction, double belt and winding drum machines suitable for all conditions of passenger and freight elevators with speeds up to 400 feet per minute. Push button, car switch, or hand rope control will be provided as required.



Houser Electric Elevator Machine

Hand Power Elevators

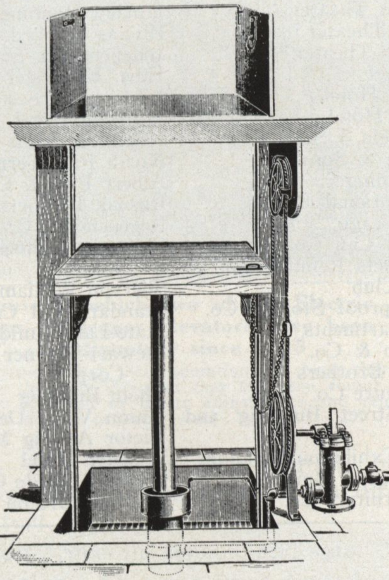
This Company has been installing its hand power elevators for over 40 years and offers a really substantial machine for all purposes.

Dumbwaiters

Electric or hand power dumbwaiters are built to suit any purpose or condition. Cars will be constructed to suit the customer.

Hydraulic Plunger Lifts

For sidewalk elevators and ash lifts the hydraulic plunger is economical in its installation and operation. It is simple and rugged in its construction, requiring very little service. Other short lifts of large or small capacities can be handled with these machines.



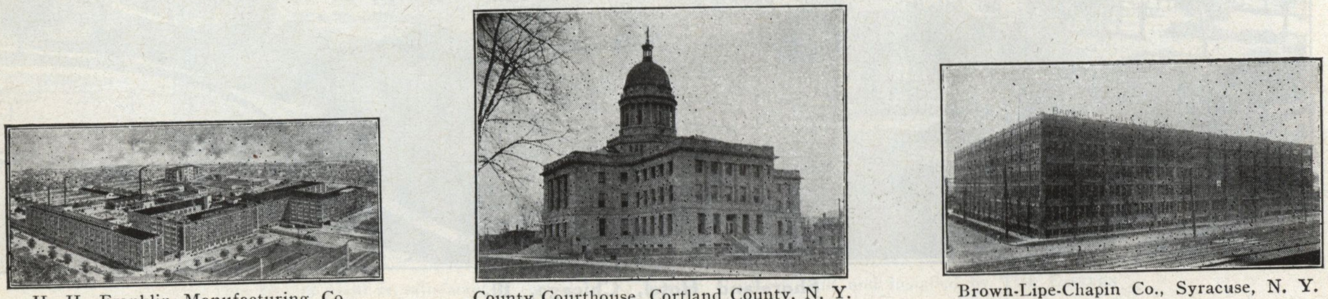
Houser Hydraulic Plunger Lift

Hatch Door Levers

The Houser hatch door lever has been in general use since 1894. The feature of our levers is that at no time during the operation does any part of the lever extend outside the hatchway.

Information

Architects and engineers may feel free to ask this Company for information and quotations at any time. Specimen elevator or dumbwaiter layouts and specifications will be furnished on request.



H. H. Franklin Manufacturing Co., Syracuse, N. Y.

County Courthouse, Cortland County, N. Y.

Brown-Lipe-Chapin Co., Syracuse, N. Y.

Some Users of Houser Elevators

ESTABLISHED 1883

KIMBALL BROTHERS COMPANY

Electric Elevators

TELEPHONE, 149

1000 Ninth Street
COUNCIL BLUFFS, IOWA

BRANCH OFFICES
MINNEAPOLIS, MINN. DENVER, COLO. SALT LAKE CITY, UTAH DALLAS, TEX. OKLAHOMA CITY, OKLA.
KANSAS CITY, MO. DETROIT, MICH. ST. LOUIS, MO. DES MOINES, IOWA

Products

Electric Passenger and Freight Elevators, including Push Button type for hospitals and apartment buildings.

Light Electric and Hand Power Machines; Sidewalk Elevators and Dumbwaiters.

Elevator Service

Expert specification and construction service is given by efficient engineers and mechanics. Prompt and efficient repair service is offered in the upkeep of elevator machinery after installation.

Experience and Establishment

Over forty years' successful construction and installation of electric elevators. Kimball Brothers Company is an old established firm with a high financial standing that can be relied upon.

You will find Kimball elevators backed by factory service of highest character.

Electric Passenger and Freight Elevators

All of Kimball Brothers elevators are built by experienced craftsmen in our own large, modern plant. Elevators varying in lifting capacity from a 100-lb. dumbwaiter to machines lifting up to 40,000 lbs. built and installed. High speed passenger elevators driven by straight line elevator machines are specialized in.

Gearless Traction

Kimball gearless traction elevators with speeds up to 600 ft. per min. are installed with many superior and exclusive features, including variable voltage control.

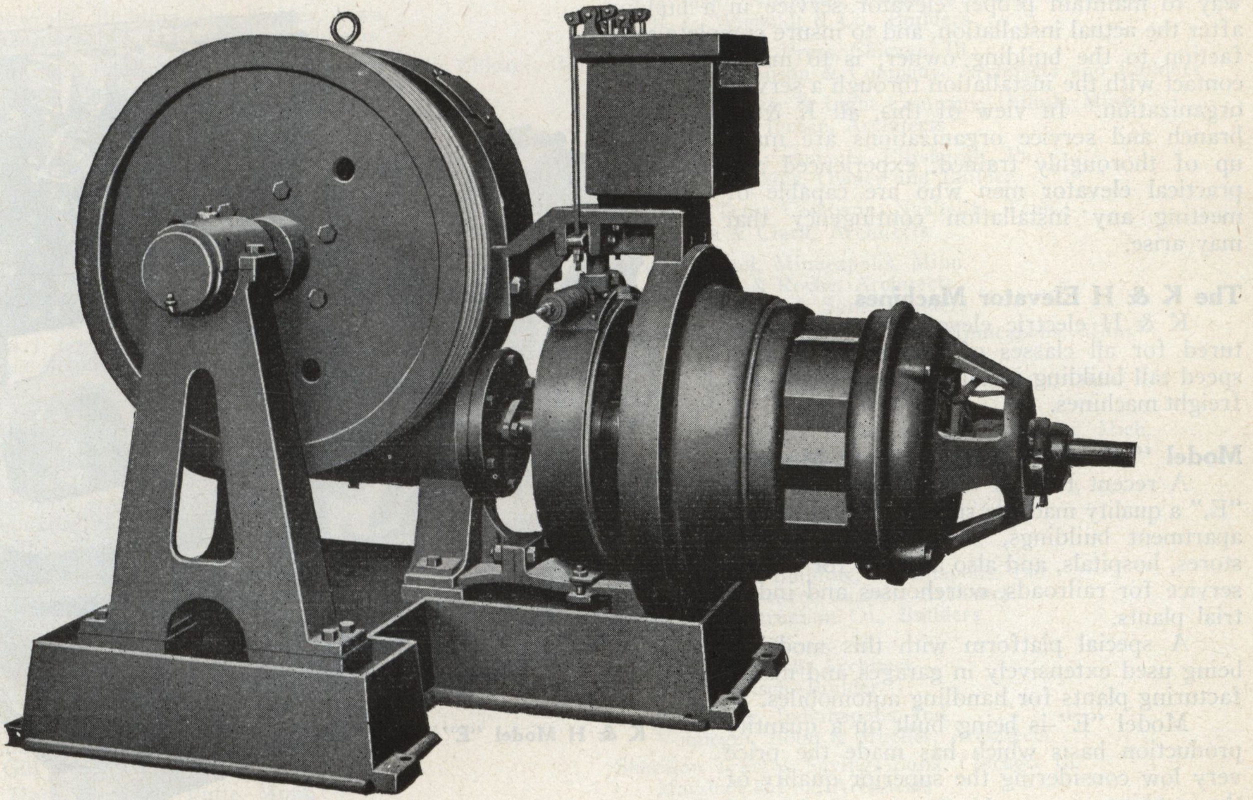
Straight Line Drive Machine

Demands for conservation of space and for a machine that will function uniformly and successfully at all times without getting out of alignment have led to the designing and adoption of a machine on which the motor and machine itself are assembled on to one integral frame "straight line drive." The combined unit is then fastened to the bed plate.

The illustration shows our heavy single geared "straight line drive" machine. This drive is used on all Kimball geared traction machines. It is an exclusive Kimball feature.

Catalogue

Send for complete illustrative catalogue.



Kimball 60 Hp. Extra Heavy Duty "Straight Line Drive" Machine

KAESTNER & HECHT CO.

Electric Elevator Builders

1500 North Branch Street
CHICAGO, ILL.

BRANCH OFFICES

CINCINNATI, OHIO, 605 Mercantile Library Building
CLEVELAND, OHIO, 1252 East Ninth Street
DALLAS, TEX., 218 Southwestern Life Building
DES MOINES, IOWA, 1211 Grand Avenue
DETROIT, MICH., 401 Insurance Exchange
INDIANAPOLIS, IND., 578 Century Building
MILWAUKEE, WIS., 27 Juneau Street
MINNEAPOLIS, MINN., 915 Metropolitan Life Building
NEW ORLEANS, LA., Carondolet Building
PITTSBURGH, PA., 605 Webster Avenue
ST. LOUIS, MO., 886 Arcade Building
SEATTLE, WASH., 709 Second Avenue
SPRINGFIELD, ILL., 607 Mine Workers Building

TRADE-MARK

Products

Every type of PASSENGER and FREIGHT ELEVATOR designed, manufactured, installed and serviced.

Engineering Co-operation

We offer to architects, engineers and builders intelligent engineering co-operation based on our many years of engineering, manufacturing and installation experience, to help them in solving their vertical transportation problems. Often our recommendations as to the type of equipment required, its design, placing and specifications have effected notable savings, not only in building costs, but in future operating costs. To include in the original plans elevators to suit the building, removes the necessity for future plan changes because of improper elevator design.

All recommendations, conferences and approval of plans are rendered without cost or obligations.

Service

The KAESTNER & HECHT CO. believes that the only way to maintain proper elevator service in a building after the actual installation, and to insure complete satisfaction to the building owner, is to maintain a close contact with the installation through a service organization. In view of this, all K & H branch and service organizations are made up of thoroughly trained, experienced and practical elevator men who are capable of meeting any installation contingency that may arise.

The K & H Elevator Machines

K & H electric elevators are manufactured for all classes of service, from high speed tall building installations to single unit freight machines.

Model "E"—The Many-Purpose Machine

A recent K & H development is Model "E," a quality machine suitable for hotels and apartment buildings, small office buildings, stores, hospitals, and also adapted for freight service for railroads, warehouses and industrial plants.

A special platform with this model is being used extensively in garages and manufacturing plants for handling automobiles.

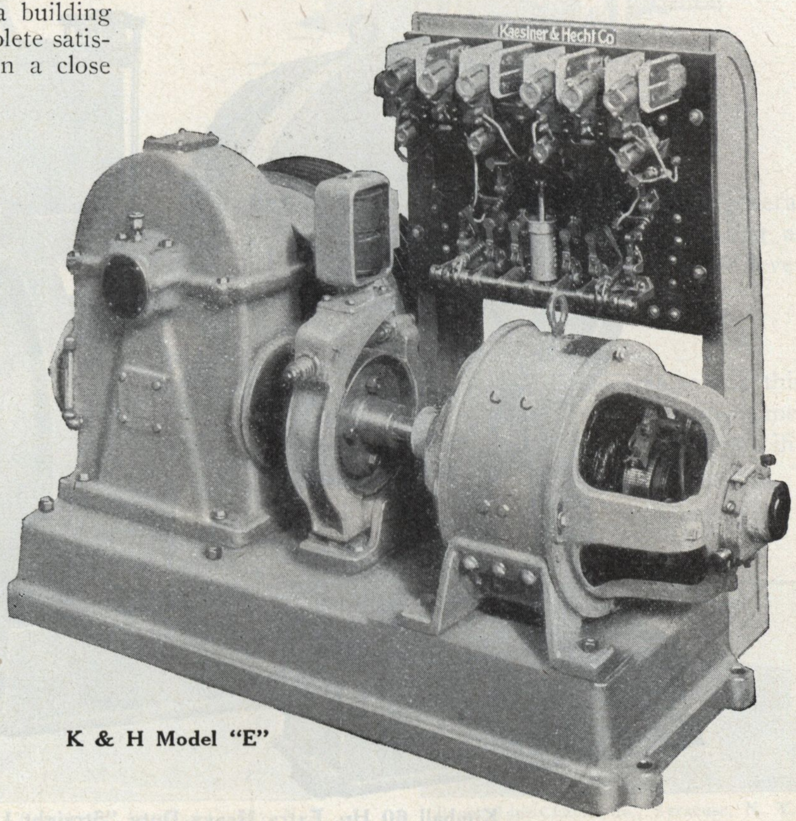
Model "E" is being built on a quantity production basis which has made the price very low considering the superior quality of the machine.

K & H Vari-Volt Control

Vari-Volt is the copyrighted name for the form of control originated by KAESTNER & HECHT CO., and first installed in the Chicago Athletic Association in February, 1921. It is a distinctive K & H development, the application of which has provided revolutionary betterments in vertical transportation.

With this type of control, the current is turned on gradually, proportionately to the load and speed of the car—just as the throttle of a steam engine governs the flow of steam. Old-fashioned rheostatic resistances, that step down a full voltage current to meet the need of the motor, are eliminated. The result is a smoother start and stop, with correspondingly smoother travel. The sudden jerks and bumps common to many elevators simply do not exist in a K & H *Vari-Volt Control* Elevator.

The swifter acceleration and deceleration made possible by Vari-Volt Control increases the elevator capacity by making possible a *higher average speed.*



K & H Model "E"

Continued on next page

In addition, the elimination of rheostatic resistances effects decided reductions in current consumption; and the smoother operation reduces the wear and tear which is unavoidable on ordinary elevators.

Users of K & H Vari-Volt Control

Following is a list of K & H Vari-Volt installations and contracts, indicating the judgment of many leading architects and builders on this superior type of elevator control:

American Furniture Mart, Chicago, Ill.
H. Raeder, Architect
Geo. C. Nimmons, N. Max Dunning, Associate Architects
Wells Brothers, Builders

Androy Hotel, Superior, Wis.
Roland C. Buck, Architect and Engineer

Aragon Hotel, Chicago, Ill.
J. A. Armstrong, Architect
A. Irving Jordan, Builder

B. Nugent Bros. Dry Goods Co., St. Louis, Mo.
Frank D. Snaman, Architect
(Mauran, Russell & Crowell, Architects)
Wismer Contracting Company, Builders

Bradley Building, Duluth, Minn.
German & Jensen, Architects

Brotherhood of Locomotive Engineers Bank Building, Cleveland, Ohio
Knox & Elliott, Architects
Geo. A. Fuller Company, Builders

Centennial Memorial Building, Springfield, Ill.
Department of Public Works, Owners
E. Martin, Architect

Central Union Trust Company, Wheeling, W. Va.
Chas. W. Bates, Architect

Chicago Athletic Association, Chicago, Ill.

Chicago Beach Hotel, Chicago, Ill.
A. C. King, Engineer

Citizens Title & Trust Company, Uniontown, Pa.
Albert Kahn, Architect
Mellon Stewart Company, Builders

Commonwealth Building, Des Moines, Iowa
Vorse, Kraetsch & Kraetsch, Architects

Commonwealth Edison Co., Crawford Ave. Station, Chicago, Ill.
Graham, Anderson, Probst & White, Architects
Geo. A. Fuller Company, Builders

Commonwealth Trust Building, Pittsburgh, Pa.
Commonwealth Real Estate Co., Owners

Co-operative Apartments, 2450 Lake View Avenue, Chicago, Ill.
H. Van Doren Shaw, Architect

Detroit Towers Building, East Detroit, Mich.
W. W. Ahlschlager, Architect
Walbridge Aldinger Company, Owners

Dexter Horton Building, Seattle, Wash.
John J. Graham, Architect
Puget Sound Bridge & Dredging Co., Builders

E. E. Atkinson Company, Minneapolis, Minn.

Eli Lilly & Company, Indianapolis, Ind.
R. F. Daggett, Architect
C. R. Ammerman, Engineer

Equitable Life Insurance Building, Des Moines, Iowa
Proudfoot, Bird & Rawson, Architects
Newman & Company, Builders

Exchange National Bank Building, Pittsburgh, Pa.
Weary & Alford, Architects

Ezra Thompson Building, Salt Lake City, Utah
Pope & Burton, Architects

Federal Bank & Trust Company, Dubuque, Iowa
J. W. Boyer, Architect

Federal Reserve Bank, Cleveland, Ohio
Walker & Weeks, Architects
J. Gill & Sons, Builders

Finlen Hotel Company, Butte, Mont.
Stanley & Baker, Architects

First National Bank Building, Hammond, Ind.
Weary & Alford, Architects

Giddens-Lane Building, Shreveport, Iowa
E. F. Neild, Architect

Grandview Hotel, La Crosse, Wis.
Norman & Skogstad, Architects

Hibbard, Spencer & Bartlett, Chicago, Ill.
Graham, Anderson, Probst & White, Architects

Highland Park General Hospital, Highland Park, Mich.
G. W. Graves, Architect

Indianapolis Athletic Club, Indianapolis, Ind.
R. F. Daggett, Architect

Insurance Exchange Building, Des Moines, Iowa
Boyd & Moore, Architects

I. O. O. F. Building, Pittsburgh, Pa.
Grand Lodge Association, Owners

Jackson Towers Building, Chicago, Ill.
W. W. Ahlschlager, Architect
Longacre Construction Co., Builders

J. B. Book Jr. Building, Detroit, Mich.
Louis Kemper, Architect
Otto Misch & Co., Builders

Joseph Horne Company, Pittsburgh, Pa.
Benno Jansen, Architect
Mellon Stewart Co., Builders

Kansas City Finance Company, Kansas City, Mo.
Keene & Simpson, Architects
Bickel Contracting Co., Builders

Keystone Grocery & Tea Company, Pittsburgh, Pa.
N. F. Arble, Architect

Lafayette Building, Detroit, Mich.
C. Howard Crane, Architect
Otto Misch & Co., Builders

Linz Building, Dallas, Tex.

Marlborough Apartments, Chicago, Ill.
Robert DeGolyer, Architect
Paschen Bros., Builders

Masonic Temple, New Orleans, La.

Midwest Store No. 3, Chicago, Ill.
W. A. Wieboldt & Co., Owners
Graham, Anderson, Probst & White, Architects
R. C. Wieboldt & Co., Builders

Miehle Printing Press, Chicago, Ill.
D. P. Robinson & Company, Architects and Builders

Minnesota Power & Light Company, Duluth, Minn.
German & Jensen, Architects

Morrowfield Apartments, Pittsburgh, Pa.
T. A. Watkins, Owner and Builder

Nashville Trust Company, Nashville, Tenn.
Asmus & Clark, Architects

Nicollet Hotel, Minneapolis, Minn.
Holabird & Roche, Architects
C. F. Haglin & Sons, Builders

100 North 7th Street Building, Minneapolis, Minn.
Hewitt & Brown, Architects

Peoples Bank & Trust Company, Marietta, Ohio
Weary & Alford, Architects

Pontiac Commercial & Savings Bank, Pontiac, Mich.
Smith, Hinchman & Grylls, Architects
Alverdo Building Company, Builders

Post of New Orleans, New Orleans, La.
Board of Commissioners, Owners
Samuel Young, Engineer

Postal Station Building, Indianapolis, Ind.
Fermor Spencer Cannon, Architect
Hall Construction Co., Builders

Rienzi Hotel, Chicago, Ill.
F. W. Janusch, Architect
J. L. Mensch, Builder

Selig Building, Indianapolis, Ind.
Vonnegut, Bohn & Mueller, Architects

Sheridan Trust & Savings Bank, Chicago, Ill.
Marshall & Fox, Architects
R. S. Wieboldt Company, Builders

Continued on next page

Sophian Plaza Apartment Hotel, Kansas City, Mo.
Shepard & Wiser, Architect
Manhattan Construction Co., Builders

South Shore Apartment Hotel, Chicago, Ill.
W. P. Doerr, Architect
Seipp & Lonergan, Builders

Southwestern Bell Telephone Company, San Antonio, Tex.
Sanguinet, Staats & Hedrick, Architects
I. R. Timlin, Architect

Sovereign Hotel Addition, Chicago, Ill.
W. W. Ahlschlager, Architect
B. W. Construction Company, Builders

Stevens Hotel, Chicago, Ill.
Holabird & Roche, Architects
George A. Fuller Co., Builders

Stoneleigh Apartments, Dallas, Tex.
F. J. Woerner, Architect
Gilsonite Contracting Company, Builders

Third National Bank, Dayton, Ohio
Schenck & Williams, Architects

Union Indemnity Company, New Orleans, La.
Favrot & Livaudais, Ltd., Architects
Morse M. Goldstein, Associate Architect
Guaranty Development Company, Owners

Union National Bank of Pittsburgh, Pittsburgh, Pa.

United Masonic Temple, Chicago, Ill.
United Masonic Temple Corp., Owners
C. W. & Geo. L. Rapp, Architects
Geo. A. Fuller Company, Builders

U. S. Postal Station, Detroit, Mich.
Fermor Spencer Cannon, Architect
Everett Winters Company, Builders

Westinghouse Electric & Mfg. Co., Chicago, Ill.
Scott Joy, Architect
E. W. Sprowl Company, Builders

Westinghouse Electric & Mfg. Co. Office Building, Pittsburgh, Pa.
Bernard H. Prach, Architect

Wild Bank Building, Indianapolis, Ind.
Fermor Spencer Cannon, Architect

Wille Apartments, Chicago, Ill.
W. W. Ahlschlager, Architect
J. L. Mensch, Builder

Wrigley Building, Chicago, Ill.
Graham, Anderson, Probst & White, Architects
Landquist & Illsley, Builders

Younker Bros. Department Store, Des Moines, Iowa
Proudfoot, Bird & Rawson, Architects

K & H Levelator

The K & H Levelator is another distinctive K & H development for electric elevators. It levels the elevator cab to the floor landing independently of operator control. All that the operator is required to do is to center the car switch for stop—the K & H Levelator stops the car exactly at the floor landing and holds it there. Unlike most of the floor leveling devices now on the market, the K & H Levelator is an integral part of the elevator—*not* an auxiliary elevator machine to handle the cab at low speeds for landings.

Push Button Control

Push button control is available on K & H elevators, thereby doing away with the constant attendance of an operator. It may also be applied in conjunction with a car switch—thus providing for the presence of an operator during the rush hours and for individual passenger control for slack periods and night service. Push button control is especially desirable for apartment house, hospital, family hotel and some industrial installations, where the elevator is used comparatively few times each day. K & H *Vari-Volt Control* lends itself favorably to push button application for any speed or capacity.

Interlocks and Door Closers

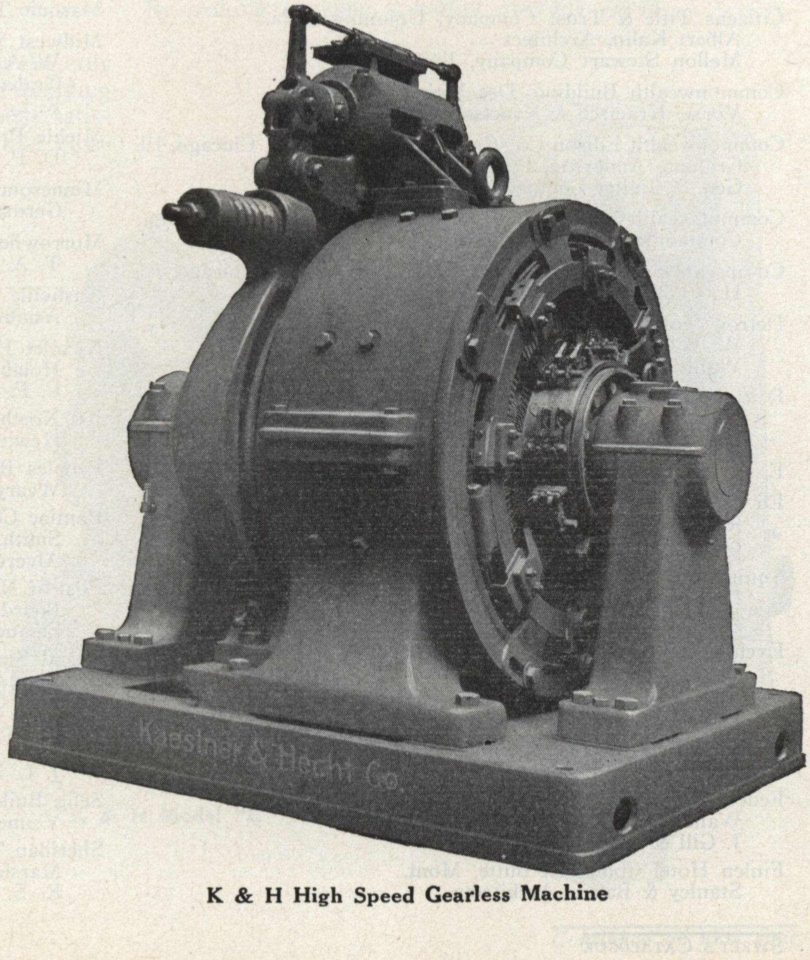
K & H elevators can be had equipped with interlocking devices and automatic door closers. An interlock prevents the movement of the car until the shaft door has been closed. The safety features of such a system are apparent.

Experience and Responsibility

Sixty years of quality manufacturing have given the Kaestner & Hecht Co. a traditional background of fine workmanship and high engineering standards. The constant application of these ideals to electric elevators has won for K & H elevators a national recognition and has coupled the K & H name with elevator quality and reliability. Such a reputation, when backed by a product that fulfills it, is of definite value to every elevator buyer.

Information Necessary for Bids

For information regarding bids, send the following:
Date information is wanted
Location of project
Name and address of owner......engineer...... architect......
Number of elevators
Kind of service and operation
Capacity....... speed....... travel in feet......
Travel in floors...... openings......
Location of machine...... current......
Size of hatch (P-W & F-B)
Number of cab sides enclosed



K & H High Speed Gearless Machine

ESTABLISHED 1882

GUST. LAGERQUIST & SONS

Manufacturers of Elevators

Seventh Street North and Bradford Avenue
MINNEAPOLIS, MINN.

Products

Direct connected Electric Elevators for Passenger and Freight Service built in both Drum and Traction designs.

Also manufacturers of Hydraulic and Electric Sidewalk Elevators; Hand Power Elevators; Hand Power and Electric Dumbwaiters.

Experience

During our years of manufacturing elevators (since 1882) we have gained an enviable reputation for producing equipments which give our customers the best in both quality and service. We are continually striving to give elevator purchasers the benefits of our varied and extensive experience and solicit inquiries from all prospective buyers, architects and engineers who might be interested in "elevating" problems.

Engineering Details

Frequently an architect, engineer or buyer desires advance data regarding elevator and hatchway construction details; and to all who inquire concerning such details we are pleased to give our engineering service gratis.

Geared Drum and Traction Type Elevator Hoisting Engines

Lagerquist electric passenger and freight elevators are provided with hoisting engines of rigid and heavy construction.

In neither the drum nor traction type do we rely upon keys for the drum or traction sheave drive. We use a heavy neck casting as a means of connecting the drum or sheave with the worm gear, thereby relieving the worm gear shaft from torsional stresses.

Worm shaft radial bearings are of bronze and of extra large dimensions. This type of bearing prevents the possibility of the worm dropping out of mesh with the worm gear because of a broken-down bearing.

We have also developed a compound geared traction engine employing an accurately machined external gear arrangement rather than an internal gear drive. Experience has taught us that the internal generated gear and pinion does not permit as smooth operation as that afforded by the external design.

Information Required for Estimates

Names and addresses of buyer and architect.

Location of building (street number, city and state).

Kind of elevator wanted (passenger or freight).

Kind of dumbwaiter wanted (hand power or automatic push button).

Operative power (electric, hydraulic, belted or hand power).

Capacity in pounds. Speed in feet per minute.

Platform size.

Total travel (in feet and inches) from lower to upper landings.

Type of hoisting engine (drum or traction).

Hatchway construction (enclosed, open, brick, tile, concrete, steel or wood).

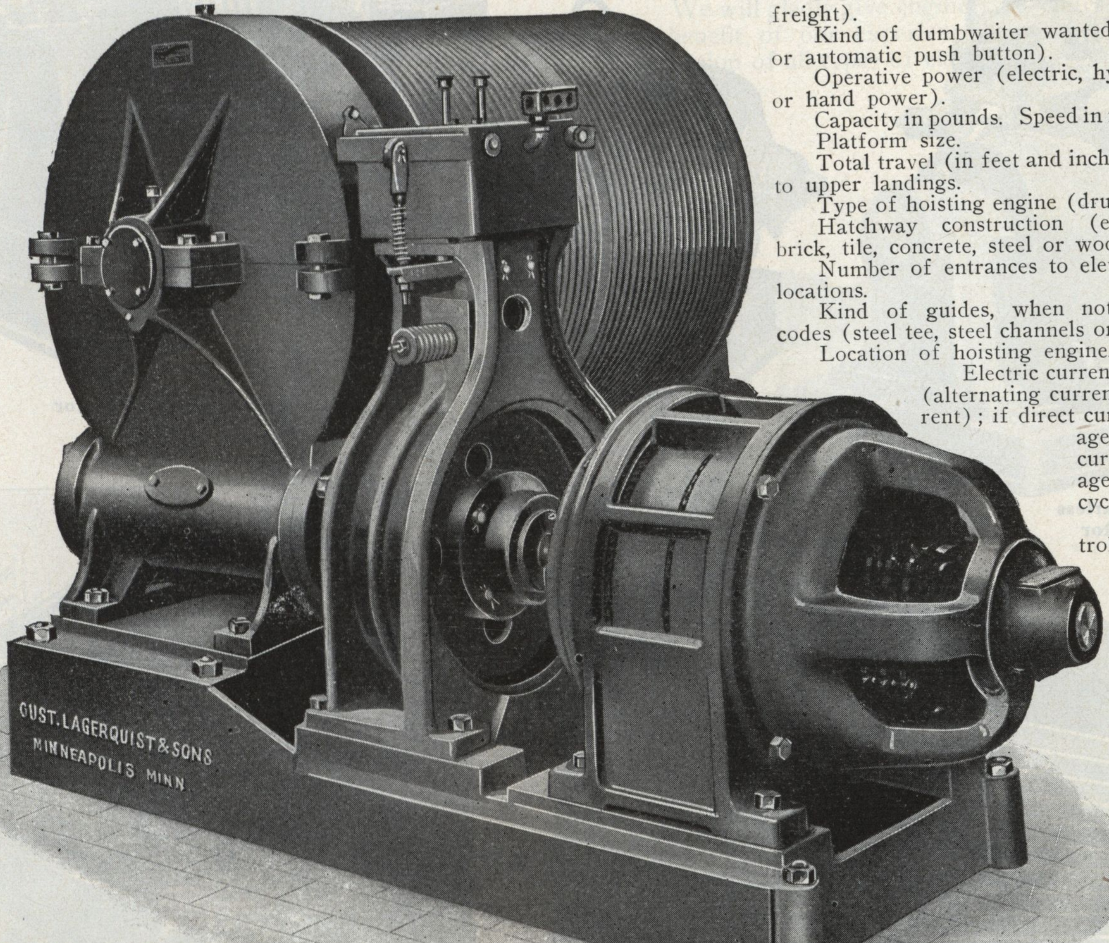
Number of entrances to elevator and their locations.

Kind of guides, when not restricted by codes (steel tee, steel channels or wood).

Location of hoisting engine.

Electric current characteristics (alternating current or direct current); if direct current, give voltage; if alternating current give voltage, phase and cycles.

Kind of control desired (hand cable, car switch, automatic or non-automatic push button).



Lagerquist Drum Type Elevator Hoisting Engine

LLEWELLYN IRON WORKS

Engineers, Manufacturers, Fabricators and Contractors for Elevators, Boilers, Structural Steel

LOS ANGELES, CAL.

Products

ELEVATORS: a complete line of Electric and Hydraulic Elevators of all kinds, including the Llewellyn Variable Voltage Gearless and Worm Geared types, Two-speed Worm Gear, Automatic Push Button Control, Hydro-electric, etc., for passenger and freight service—designed, manufactured and installed; Electric Dumbwaiters.

BOILERS: Vertical and Horizontal Return Tubular and Locomotive types, Llewellyn Water Tube, single and double drum; Connelly Bent Tube type.

PLATE WORK: Breechings, Stacks, Tanks, Elevated Tanks, Riveted and Welded Pipe and all classes of Plate Work.

STRUCTURAL STEEL: Buildings—office, theater, warehouse, industrial and portable; Bridges, Viaducts, Towers, Roof Trusses, etc.

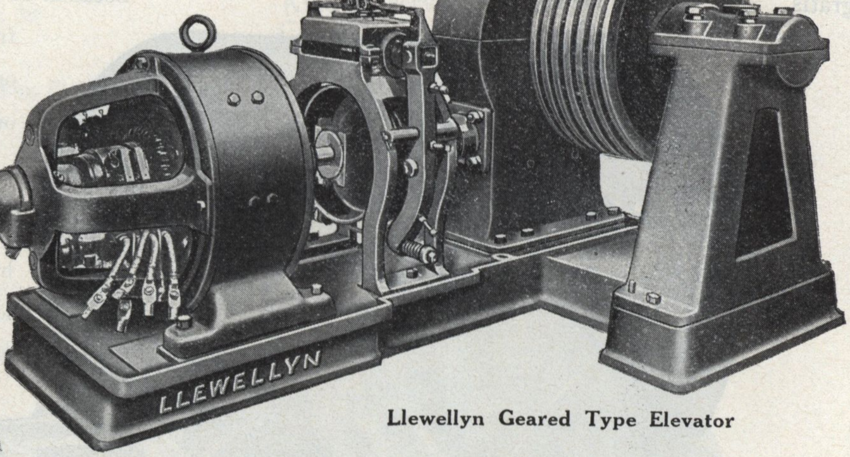
Also Traveling Cranes, Hoists and Derricks; Cast Iron Columns, and Special Castings.

Service

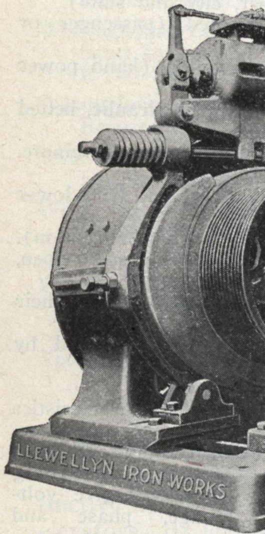
Operating a plant covering approximately eighteen acres and employing about twelve hundred men in structural, plate, boiler, elevator, electrical, machine, forge, foundry and pattern shops, and erecting crews; also having the largest Engineering and Technical Staff on the Pacific Coast, as well as carrying a very large stock of structural shapes and plates—we are prepared to give prompt and efficient service in all our products, as we control, within our plant, all branches of the designing, detailing, manufacturing, fabrication, installation and erection of our products.

Experience

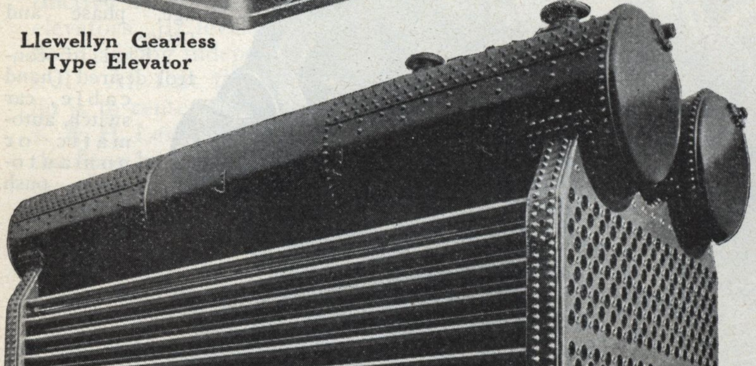
Established in 1886 and successfully operating ever since; increasing and improving the plant to meet modern requirements and always operating under competent management and supervision; and employing only skilled engineers and mechanics.



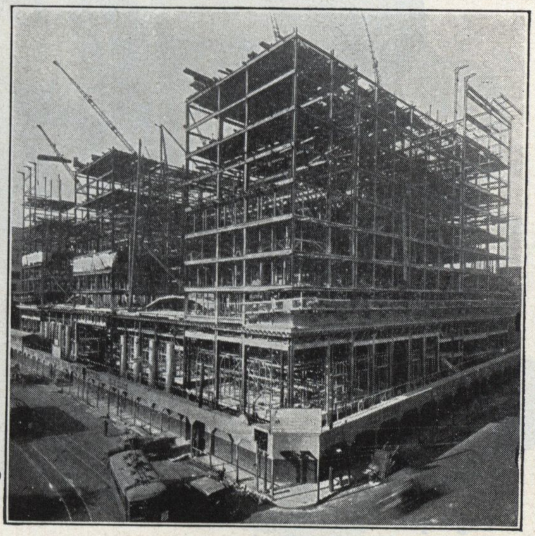
Llewellyn Geared Type Elevator



Llewellyn Gearless Type Elevator



Llewellyn Water Tube Boiler, Double Drum



Structural Steel, Biltmore Hotel, Los Angeles, Cal.

MARSHALL BROTHERS CO.

Freight and Passenger Elevators
21st and Mary Streets, South Side
PITTSBURGH, PA.

MARSHALL ELEVATORS
TRADE-NAME

Products

Passenger and Freight Elevators: Electric, Hydraulic, Belt and Hand Power; Dumbwaiters.

Also, Sidewalk Lifts, Invalid Elevators and Telescopic Ash Hoists: Electric, Hydraulic and Hand Power.

Electric Elevators

Passenger Elevators—Controlled by car switch or push button. Designed for office buildings, residences, factories, apartments, etc. Geared and gearless types.

Freight Elevators—Built in all sizes and capacities. Operated by car switch, push button or hand cable.

Our automobile electric elevators are specially designed for extra heavy duty.

Dumbwaiters—Electric dumbwaiters, operated by push button, made to suit any size hatchway.

Note: All of the above types of elevators are for alternating or direct current. Variable voltage control can be supplied for all types of equipment.

Hydraulic Plunger Elevators

For all water pressures and for freight purposes, as well as for dumbwaiter service.

Belt Power Elevators

Made for freight service where it is more desirable to use belts from main shaft or countershaft for driving power.

Hand Power Elevators

These are for use in stores, factories, residences, etc., where no electric or other power is available.

Special Types of Elevators

We also manufacture sidewalk lifts, invalid elevators and ash hoists, operated by electric, hydraulic or hand power.

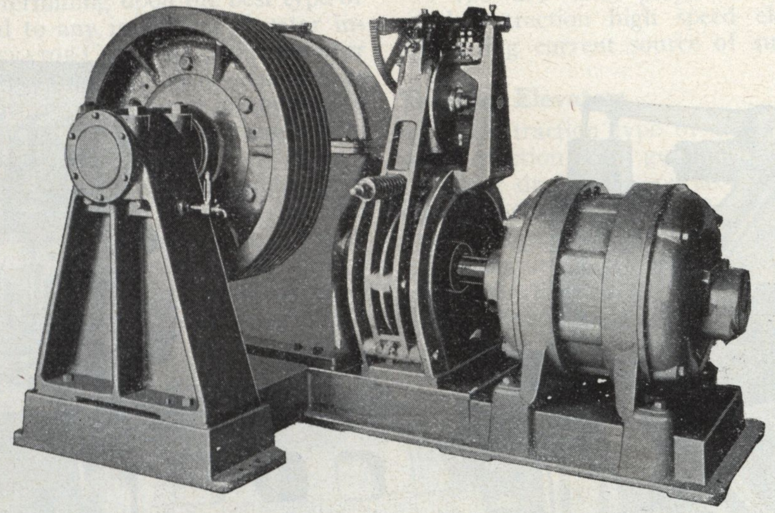
Data Required for Estimates

We will furnish on application, data sheets showing information required for making estimates.

Over a Century in the Engineering Field

We have been in business for many years and maintain a service department, enabling us to supply repair parts promptly.

We will gladly give engineers, architects and owners the benefit of our experience in connection with the installation of all types of elevators.



Direct Connected Heavy Duty Elevator Engine

Partial List of Marshall Elevator Installations

Company	Number
*Aluminum Company of America, Pittsburgh, Pa.	2
*American Sheet & Tin Plate Co., Pittsburgh, Pa.	8
*Carnegie Steel Co., Pittsburgh, Pa.	4
*Follansbee Brothers Company, Pittsburgh, Pa.	4
*Harbison-Walker Refractories Co., Pittsburgh, Pa.	24
*Hazel-Atlas Glass Co., Pittsburgh, Pa.	12
*Jones & Laughlin Steel Corp., Pittsburgh, Pa.	2
*Locomotive Stoker Company, Pittsburgh, Pa.	3
*Mesta Machine Company, Pittsburgh, Pa.	4
*National Lead & Oil Company, Pittsburgh, Pa.	2
*Oil Well Supply Company, Pittsburgh, Pa.	3
*Parcel Post Terminal, Pittsburgh, Pa.	3
*Pennsylvania Railroad Co., Pittsburgh, Pa.	10
*Pittsburgh Plate Glass Co., Pittsburgh, Pa.	23
*Pressed Steel Car Co., Pittsburgh, Pa.	3

Company	Number
*Standard Sanitary Mfg. Co., Pittsburgh, Pa.	15
*Standard Underground Cable Co., Pittsburgh, Pa.	4
*Union Supply Company, Pittsburgh, Pa.	7
Auto Body Company, Lansing, Mich.	2
Carborundum Company, Niagara Falls, N. Y.	19
W. S. George Pottery Co., East Palestine, Ohio	6
Ford Motor Car Company, Glassmere, Pa.	1
Homeopathic Hospital, Pittsburgh, Pa.	3
Keystone Driller Company, Beaver Falls, Pa.	2
Motroup Steel Products Co., Beaver Falls, Pa.	2
Mahoning Foundry & Machine Co., Youngstown, Ohio	6
New York & Pennsylvania Co., Johnsonburg, Pa.	2
Peoples Institute, Pittsburgh, Pa.	2
Phoenix Glass Company, Monaca, Pa.	9
Physicians Office Building, Pittsburgh, Pa.	1
U. S. Government Hospital, Dawson Springs, Ky.	2

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*We have installed elevators in various plants of these companies.

MONTGOMERY ELEVATOR COMPANY

MOLINE, ILL.

BRANCH OFFICES, SELLING AGENCIES AND SERVICE STATIONS

CHICAGO, ILL.
WICHITA, KAN.
KANSAS CITY, MO.
DES MOINES, IOWA
DETROIT, MICH.
CEDAR RAPIDS, IOWA
SCRANTON, PA.
DENVER, COLO.
HOUSTON, TEX.
PHOENIX, ARIZ.

Products

ELECTRIC ELEVATORS: Passenger Elevators; Freight Elevators in all capacities.

Also, Electric Power Dumbwaiters, and a complete line of Automatic Electric Passenger Elevators and Dumbwaiters for hospitals, apartment houses and residences.

Electric Passenger Elevator

Below is shown a typical traction type electric passenger elevator with two-speed motor, full magnet control, alternating current drive. Quiet operation, smooth and accurate control, and high efficiency are characteristics of this line of equipment.

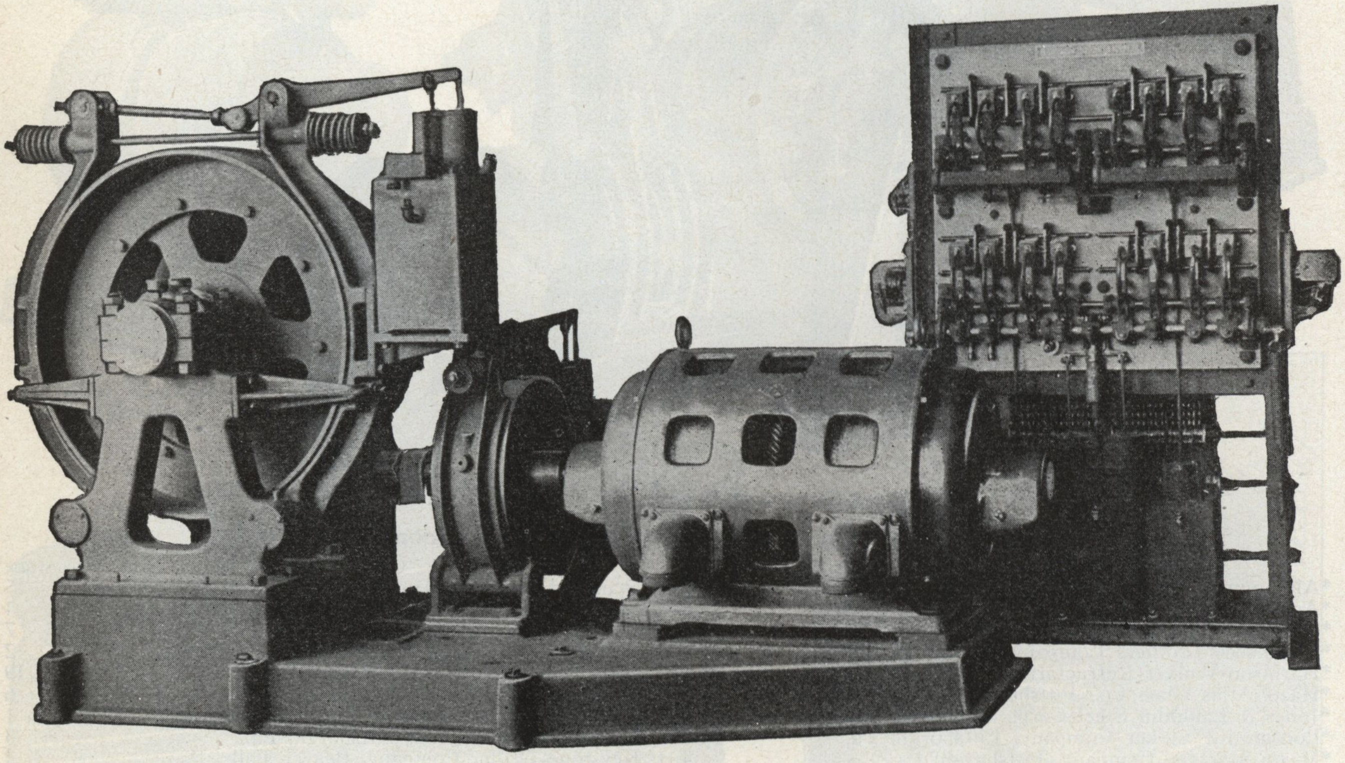
Illustrations and descriptive matter of machine or equipment for any service or duty, will be promptly and cheerfully furnished on request.

Facilities

A completely equipped plant enables this company to execute orders without delay and at reasonable prices.

Co-operative Services

Our engineering department is at the service of architects and engineers. Any required information concerning construction data relative to elevators and dumbwaiters, preliminary layout showing loading stresses, etc., also estimates, will be sent on request.



TRACTION TYPE, ELECTRIC PASSENGER ELEVATOR ENGINE WITH TWO-SPEED MOTOR, FULL MAGNET CONTROL FOR ALTERNATING CURRENT

OTIS ELEVATOR COMPANY

GENERAL OFFICES
Otis Building, 260 Eleventh Avenue
NEW YORK, N. Y.

OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD
For Addresses or Telephone Numbers, see Local Directories

FACTORIES
BUFFALO, N. Y. HARRISON, N. J. QUINCY, ILL. YONKERS, N. Y.

TRADE-MARK

Products

Elevators: Electric, of all kinds, including Operatorless, Micro-Drive (self-leveling) and with Multi-Voltage Control.
Elevators: Hydraulic, Steam, Belt, and Hand Power.
Escalators or Moving Stairways.
Conveyors: Gravity Spiral.
Hoists: Automatic Skip, Blast Furnace, Mine.
Incline Railways.
Also manufacturers of Inclined Elevators; Dock Elevators.

Planning Service

Elevator service is an engineering transportation problem, especially in the larger class of buildings housing thousands of tenants. The Otis Organization, with its nearly 70 years of experience in the elevator industry, is well qualified to co-operate with architects, owners and tenants in determining upon the best type of elevator equipment suited to any individual elevator installation. The Otis Elevator Company maintains over 178 offices in this country, and will gladly furnish at any of these offices information required in connection with elevators in planning a building of any kind, from the most simple to the most complex.

In the large office buildings where the number, size and speed of the elevators, as well as the details of control, must be carefully worked out so as to properly care for the tenants and give satisfactory service, the records available in the Otis offices are of valuable assistance in laying out the elevator plant. Drawings showing hatchway sizes, clearances, overhead supports, loads on beams, and all other details will be gladly furnished, as a means of assistance in preparing building plans.

Design and Manufacture

When an Otis elevator is purchased you do not buy an assembly of non-related manufactured articles, but an equipment which is designed in its entirety by Otis engineers with their years of experience; equipment which is entirely fabricated in Otis factories—machine, motor, controller, brake, gearing, safety devices of all kinds—they are all Otis manufactured, and especially designed for the work which they are to do.

All parts are standardized and can be obtained in stock at the many offices maintained for the purpose of taking care of the machines.

Electric Elevators

Practically all elevators installed at the present time are of the electric type. These range from the simple slow speed factory or store elevator, through the various duties of freight elevators, up to capacities of several tons at high speed, and with operatorless control. The passenger elevators range from the small automatic elevator for residences, through the range of duties required for department and other stores, apartment houses, hotels, office buildings of all types. The electric elevator is the most efficient and reliable type; it requires less space, is more easily operated, and costs less to install and operate.

The principal types in use are the single wrap traction and the gearless traction; both of these may also be furnished with Micro-Drive. Gearless machines may also be equipped with the latest development in the way of multi-voltage control.

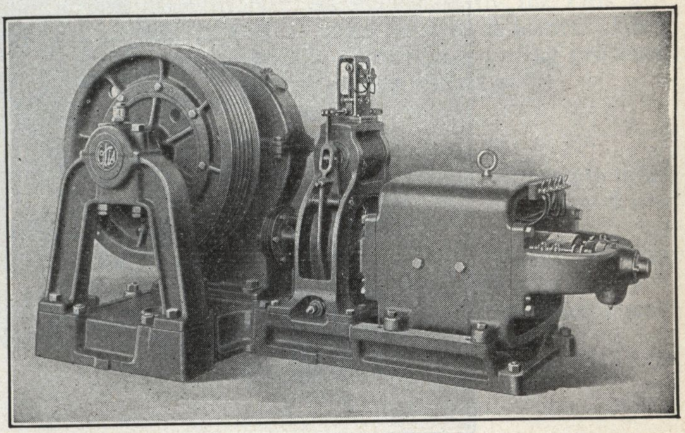
Current Characteristics—All single wrap traction elevators can be operated on direct or alternating current of commercial current characteristics. We are now prepared to offer alternating current passenger elevators for a car speed of 350 f.p.m. with two-speed motors and car switch control.

We are also prepared to offer Multi-Voltage gearless traction high speed elevators operated from alternating current source of supply.

Traction Elevators

The traction type of electric elevator, both single wrap traction and gearless traction, has superseded the older drum type, on account of saving in space required for the machine, efficiency and consequent economy of operation, ease of control, and the inherent safety feature of traction drive which prevents any possibility of the car or counterweight being drawn into the overhead work.

Single Wrap Geared Traction Elevators—On this type of elevator the car is driven through a driving sheave, operated through worm gearing by a motor of 700 to 900 r.p.m. Car speeds range up to 400 f.p.m.



Otis Single Wrap Geared Traction Elevator Machine

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This type of machine is generally used for freight work and for moderate passenger requirements where conditions of rise, load, speed, and required service would not warrant the use of the higher grade gearless elevator.

Gearless Traction Elevators—The gearless traction elevator is the highest development of the electric elevator, and provides car speeds up to the maximum allowable by local regulations, which at the present time is 800 f.p.m. in New York.

This type of elevator employs a slow speed high torque motor, with a driving sheave mounted on a spider which is integral with the armature shaft. All intermediate gearing is thus eliminated, as the slow speed motor enables the car to be driven directly from the sheave by means of ropes, which pass around the sheave and then to the car and the counterweight.

Easy and smooth operation, starting and stopping, and very high efficiency are features of this machine.

In cases where larger capacities at more moderate car speeds are required, this type of machine can still be utilized by roping up the car and counterweight on a 2:1 arrangement.

Control Systems for Electric Elevators

Hand Rope—This type of operation is fast becoming discarded for all except the small slow speed freight elevator, where the service is light and very intermittent.

This control subjects the equipment to greater wear and tear, and has the inherent danger of allowing the car to be started from any floor, with consequent possibility of accident. Insurance and public safety regulations have largely eliminated its use for these reasons.

Push Button—Automatic push button control meets, with full safety, the requirements of service without an operator. Call buttons at each floor and a full set of operating buttons in the car, provide for the operation. Safety and non-interference devices, together with gate and door locks and contacts, prevent confusion of service and provide safety for the passengers and the general public using the building.

This form of control is usually limited to use in private residences, private office buildings, hospitals, apartment houses, etc. It may, however, be used with heavy duty Micro-Drive elevators, as later described.

Car Switch Control—The most generally used form of control for freight work and practically all passenger work, is the switch in the car. The switch is arranged to return to stop position if released by the operator, and the entire control system is fitted with every safeguard to prevent accident.

Car Safety Devices

All elevators are provided with a steel car frame or sling, in which the platform is securely fastened and braced. Safety devices are mounted underneath the car platform and are operated by means of a centrifugal speed governor at the top of the hatchway.

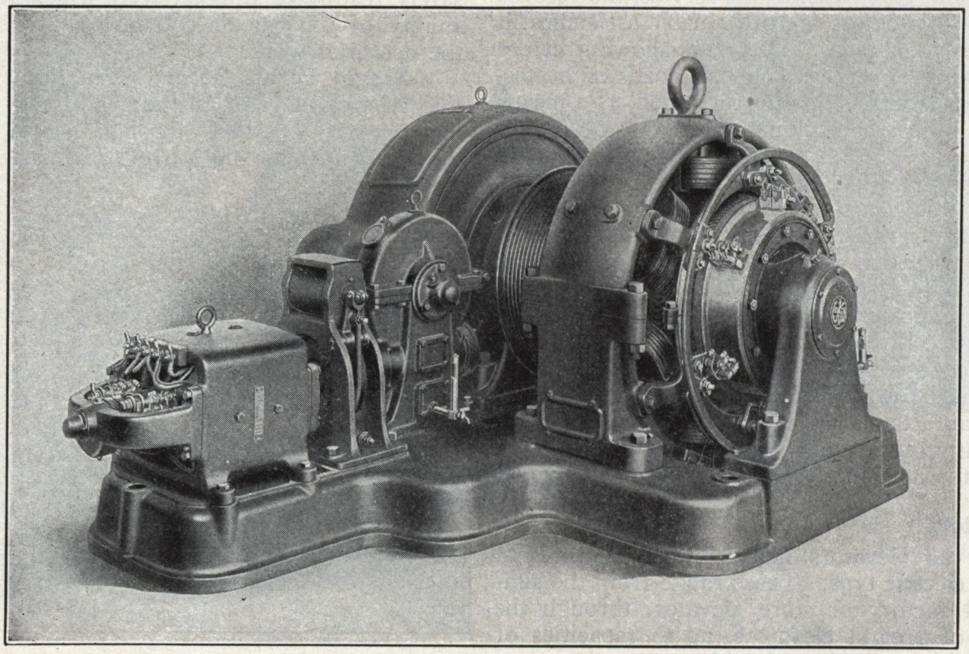
If the car attains excessive descending speed from any cause, the governor operates the safety device, so as to grip the guides and prevent further descent of the car. On the high speed elevators the governor acts to electrically slow down the speed of the elevator, if the car speed should become excessive, before the safety begins to operate.

Micro-Drive or Self-leveling Elevators

Increasing demands for higher efficiency in elevator service, for both high speed passenger and heavy duty freight elevators, have been met by the Otis Elevator Company in the Otis Micro-Drive (Self-leveling) electric elevator with either car switch or automatic control, and of either the gearless traction or geared traction type.

When the car reaches the micro zone at the floor where it is intended to stop, the Micro-Drive automatically brings the car exactly level with this landing, irrespective of load and speed, and also maintains the platform at that level regardless of changes in the load on the platform.

All this leveling operation is performed entirely automatically and independently of the operator. The elimination of all "inching" to the floor results in a



Otis Gearless Traction Micro-Drive Elevator Machine

Continued on next page

great saving in time, reduces maintainance to a minimum, saves wear and tear, increases life of equipment and saves power.

This control allows of much more rapid service, as it eliminates false stops at the floors, also permits of the use of less skilled operators, due to the automatic leveling at the landing.

There is greater safety on an elevator of this type, as the tripping hazard on passenger elevators is entirely eliminated, and on freight elevators the level stops do away with broken boxes and packages, which are often caused by trucks hitting the floor sills when the car is not exactly at the landing.

Operatorless Electric Freight Elevators

In large plants requiring a large number of elevators carrying industrial trucks, Micro-Drive elevators are essential to proper and efficient operation, and in some cases it has been found advantageous to group the elevators into banks of from six to ten, and control all of those in each bank by a central dispatcher working with an automatic telephone system and a conveniently located push button control board. Examples of such installations are the enormous Army Base warehouses and terminals at Brooklyn, N. Y., and Boston, Mass. Automatic door operating machines facilitate the service.

A single elevator arranged for the heaviest and most exacting freight service may be also equipped with push button control and Micro-Drive and thus eliminate the regular attendant.

Multi-Voltage Control

The latest development in the elevator art is Multi-Voltage control. This form of control can be applied to any number of elevators operated from either a direct current or an alternating current source of supply. This control produces the fastest rate of acceleration and retardation, and without discomfort to the passengers, resulting in the highest quality of operation; and in connection with gearless traction Micro-Drive elevators meets the most exacting demands of modern elevator service, permitting higher car speeds, and smoother operation than has heretofore been possible, handles more passengers per hour, consequently reduces the number of elevators required, and is very economical in power consumption.

Other Elevator Types

Hydraulic—Practically no geared hydraulic elevators are now being installed, as they are justified only in cases where electric power is not available. Direct lift plunger elevators can still be used advantageously for sidewalk, foundry, and other short rise service.

Belt Driven—This type is driven from a line shaft, and is used only for car speeds not exceeding 50 f.p.m.

Steam—Used only under exceptional circumstances.

Hand Power—Used only where service requirements are very light and infrequent, mostly in smaller towns where the conditions do not justify the expense of a power driven elevator.

Escalators or Moving Stairways

Used wherever it is desired to move people in great numbers continuously and rapidly—in subways, elevated railways, railroad terminals, theaters, department stores—and even in industrial buildings where many employes must be transported between levels quickly and with the maximum conservation of their working energy.

May be made reversible so as to conform to the changes in flow of traffic during the day, and can be installed for both up and down service. They operate continuously, with no waiting interval, and carry large numbers of people comfortably, quickly and without exertion. They require small motors on account of being constant running, hence the operating cost is very low.

Gravity Spiral Conveyors

The principal use for this equipment is in department stores and warehouses, where it facilitates the delivery of packages from the upper floors, and relieves the elevator system, as well as saving manual labor.

These conveyors are of the open or closed type, built of metal, and utilize gravity entirely, thus eliminating all operating expense. The diameter of the conveyor, and pitch of the delivery blades depend upon the size and character of packages to be handled, and which range from the smallest parcel to large packing cases. Several blades may be installed in one shell, and with the other features afford a selective service of considerable range.

Automatic Skip Hoists

The Otis automatic push button controlled skip hoist raises and delivers bulk material, such as coal, ashes, etc., and automatically returns to the loading position. The form of control may be varied to suit the conditions.

This machine has enabled plants using them to effect a considerable saving in operating expense, due to the reduction in manual labor required for this class of work. It is rugged in design and built to withstand the heaviest character of service.

Blast Furnace and Mine Hoists

Otis engineers have had broad experience in designing apparatus to meet the severe requirements for equipment of this character, as evidenced by the Otis apparatus in use in a large number of such plants. Each installation is usually an individual engineering problem, and carefully studied and worked out as such.

Incline Railways

These are also a case of selecting apparatus to meet the varying conditions of each individual case, and are studied accordingly.

They are used for a variety of purposes, such as handling passengers for sight-seeing purposes, or for ordinary business transportation, also for handling teams and motor trucks between separate levels.

THE OHIO ELEVATOR AND MACHINE CO.

Manufacturers of Elevators, Enclosures and Cabs

MAIN OFFICE AND FACTORY

COLUMBUS, OHIO

DISTRICT REPRESENTATIVES

BALTIMORE, MD., General Elevator Co.
HUNTINGTON, W. VA., O. S. Poyntz
PITTSBURGH, PA., Elevator Equipment & Repair Co.

RALEIGH, N. C., William Walker Jones
ST. LOUIS, MO., Klug Elevator Co.
WASHINGTON, D. C., Blake Palm & Bro.

TRADE-MARK

Products

Direct Connected Electric Elevators; Hydraulic Elevators; Elevator Enclosures and Cabs; Safety Gates, Cable Locks and Electric Door Switches.

Direct Connected Electric Elevators

The Ohio standard equipment in this line is capable of lifting a maximum load of 10,000 lbs. at a speed of 50 ft. per minute or a maximum speed of 300 ft. per minute with a load of 2,500 lbs.

The machine is direct connected, provided with a continuous cast iron bed plate under drum, gear and motor.

The car is provided with a steel sling and side sills, and is equipped with a positive safety device under the platform.

The guides may be either of steel, semisteel or wood construction.

Control may be either push button, car switch, pilot wheel, or hand cable.

For heavy load duty select the Ohio Tandem worm geared machine, which will lift a load of 40,000 lbs. at a slow speed.

For high speed duty, the Ohio V-Groove Traction machine is used. This type may be operated at any speed up to 400 ft. per minute.

Hydraulic Elevators

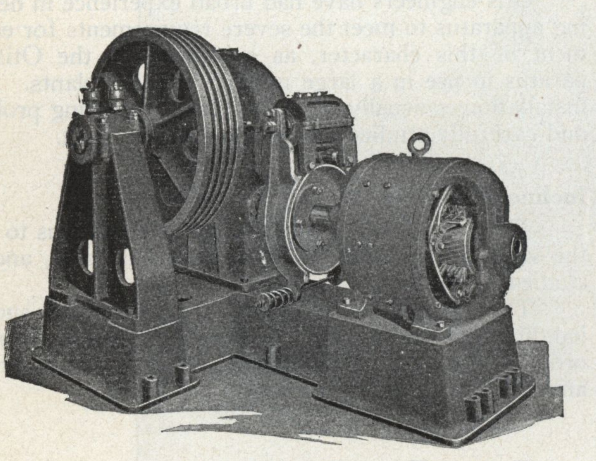
Vertical cylinder, direct plunger elevators are used for passenger or freight service, and are operated by means of hand cable, lever or pilot wheel in car.

Safety Gates

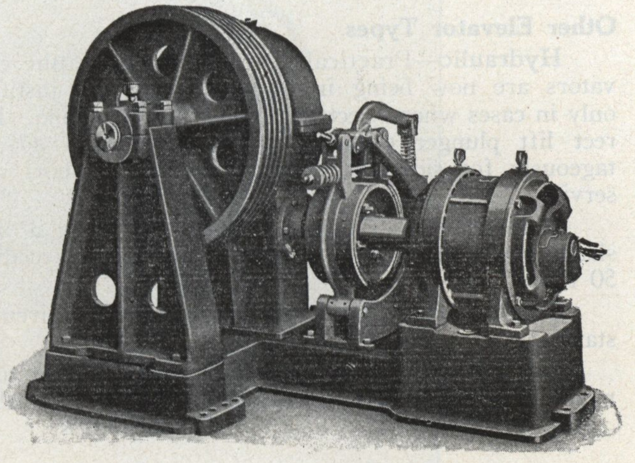
A complete line of safety gates is manufactured for both semi-automatic and full-automatic operation.

Cable Locking Devices

This company furnishes automatic locks for cable operated elevators, by means of which the operation of the elevator may be precluded unless the operator is on the car.



Direct Connected Single Worm Geared Elevator Engine, V-Groove Traction Type, Direct Current
For high speed or heavy duty



Direct Connected Single Worm Geared Elevator Engine, V-Groove Traction Type, Alternating Current
For high speed or heavy duty

Continued on next page

Electric Door Switches

Protection against possible accidents is one of the most desirable features of elevator service. This may be secured in a practical way by the use of Ohio electric door switches, which are so arranged that they may be installed on present or prospective equipment at small additional expense.

Enclosures and Cabs

A thoroughly equipped ornamental iron department is operated by this company, in which cabs and enclosures are made.

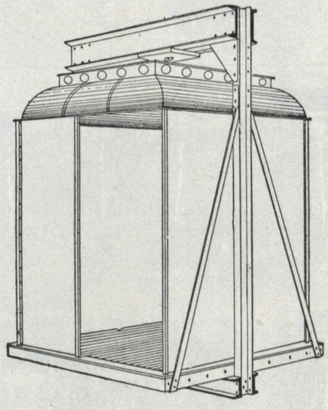
Architects, owners and builders will find it decidedly advantageous to have the elevator, cab and enclosures furnished and installed by a single contractor.

For passenger elevators, provide not less than 18 ft. of clearance from top landing to ceiling of penthouse, if machinery is in basement. If machinery is over hatchway, make this distance 24 ft. For freight elevators this can be reduced about 2 ft. At a point about 15 ft. above top landing make provision for supports for overhead beams or machinery.

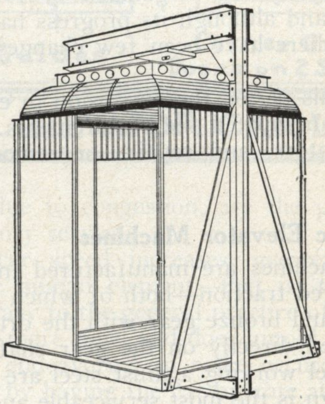
Make penthouse 2 ft. wider than hatch on post sides. If walls are of brick or concrete, fastenings for posts should be built in as the building is erected.

Co-operative Service

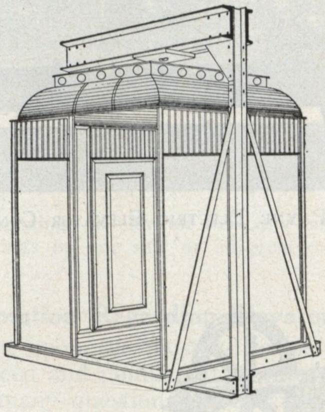
Many hours of tedious detail work for the architect are saved by this company's furnishing, without obligation, plans and specifications covering equipment suited to his needs.



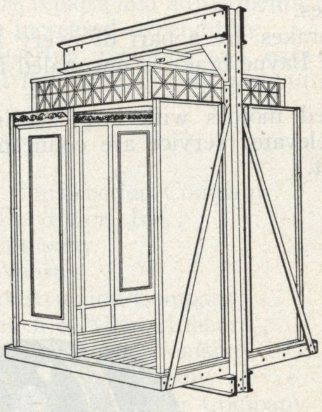
Ohio Design 254



Ohio Design 276



Ohio Design 277



Ohio Design 1363

Elevator Cabs Made by The Ohio Elevator and Machine Co.

Important to Architects

At bottom of elevator shaft provide a pit same size as shaft and not less than 3 ft. deep for freight elevators, or 5 ft. for passenger elevators.

For traction type elevators the pit should be at least 5 ft. deep; this allows space for oil buffers, which are placed both under car and counterweights.

Hatchways should be plumb over each other, and about 1 ft. wider than car on post sides and 2 in. longer than car from front to back.

A Few Nationally Known Users of Ohio Elevators

Allen Motor Company
American Sheet & Tin Plate Company
American Steel & Wire Company
G. & J. Tire Company
Hoover Suction Sweeper Company
Jeffrey Manufacturing Company
Jones & Laughlin Steel Company
Pierce-Arrow Motor Car Company
Pennsylvania R. R. Company
Quaker Oats Company
State Institutions of Ohio
United States Government

F. S. PAYNE CO.

Elevator Manufacturers

GENERAL OFFICE AND WORKS
CAMBRIDGE, MASS.

BRANCH OFFICES
BOSTON, MASS. LOWELL, MASS. NEW HAVEN, CONN.

PAYNE
TRADE-MARK

Products

Electric Passenger and Freight Elevators.

For Hydraulic Ash Hoists, see page 726; for Dumbwaiters, see pages 2606-2607.

Experience and Services

This company was organized in 1903 under the present name and although its progress has been almost unparalleled, there have been few changes in personnel or policy.

During this period the expansion in equipment and facilities has anticipated the requirements of customers for new elevators, and repairs or remodeling of old apparatus.

Payne Electric Elevator Machines

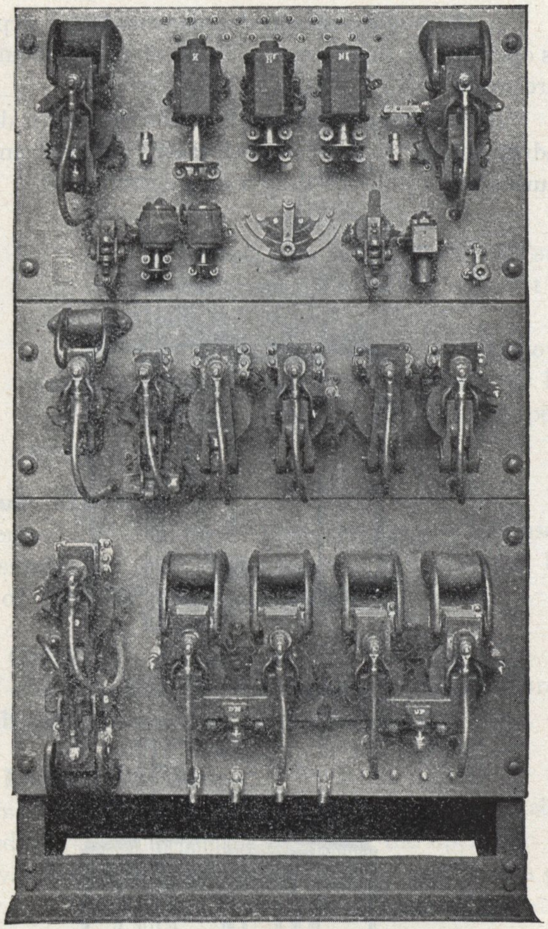
Payne machines are manufactured in two types—drum and geared traction—both of which are driven by a steel worm and bronze gear with the drum or driving sheave mounted directly on the gear shafts. No spur gears with steel working against steel are used.

This design is the most serviceable and efficient for all service.

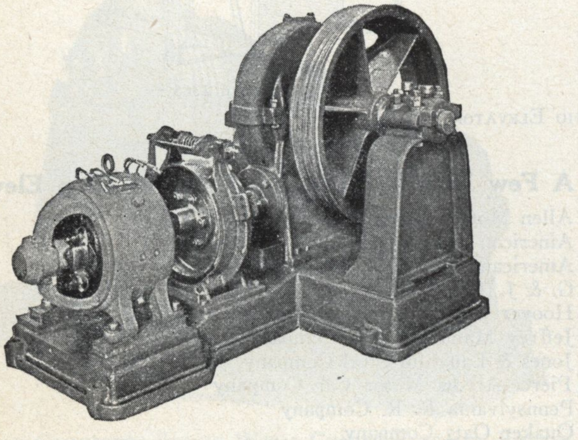
All machines with the exception of the smaller sizes have heavy continuous cast bed plates with an oil reservoir on all edges.

Electric brakes are a part of every Payne electric machine. The Payne brake is unequaled in the elevator industry.

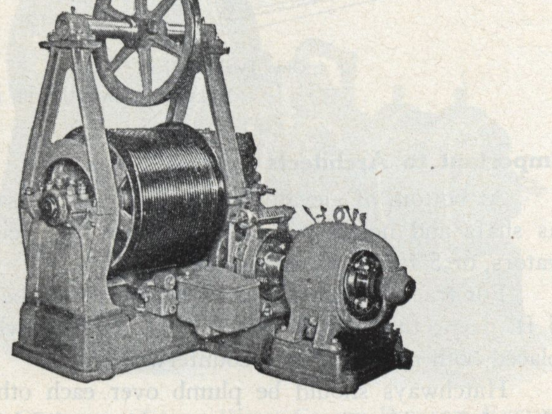
Slow speed motors with long bearings especially designed for elevator service are connected directly to the worm shaft.



Payne Electric Elevator Controller



Payne Direct Connected Electric Elevator Traction Machine



Payne Direct Connected Electric Elevator Drum Machine

Continued on next page

Payne Elevator Controllers

Payne controllers are the product of an engineering corps who have designed elevator controllers for 25 years. These controllers are manufactured for every service and method of operation and embody no mechanical or electrical compromise. (See illustration on previous page.)

Automatic Push Button Control—Particular attention is directed to automatically operated elevators as they can be adapted to every service and effect a great economy by eliminating the cost of an operator's services, reducing electric current consumption and lengthening the life of the entire apparatus as it is not subjected to carelessness and abuse as are manually operated elevators.

The speed of automatic elevators should be as slow as is consistent with service required, as the car will stop more accurately at slower speeds and there will be no necessity of adding any further complicated apparatus to the equipment in an effort to obtain more accurate stops.

Payne automatic control systems are a model of simplicity in design, which is the greatest assurance of continuous service.

Information Required for Estimates

Building ....
Address ....
Service (passenger or freight) ....
Water pressure available (for plunger elevator) .... lbs.
Size of car desired (....ft. .... in. by .... ft. .... in.)
Location of machine (in penthouse over hoistway or on basement floor adjacent to hoistway) ....
Construction of hoistway (brick, concrete, steel, tile or wood. If tile or wood, also advise floor construction) ....
Control desired (hand rope, car switch or automatic push button) ....
Load to be lifted .... lbs.
Electric current—
Direct: ...... volts.
Alternating: ..... phase; ..... cycles; ..... volts.
Travel: Number of floors to be served ....
Actual distance elevator is to travel, i. e.:
Floor heights from lowest to top landing .... ft. .... in.
Distance from top floor level to underside of roof over hoistway .... ft. .... in.
Gates required, number and type preferred (semiautomatic or full automatic) ....
Number of openings to elevator hoistway on each floor....
Are all openings on one side or adjacent or opposite sides of hoistway? ....

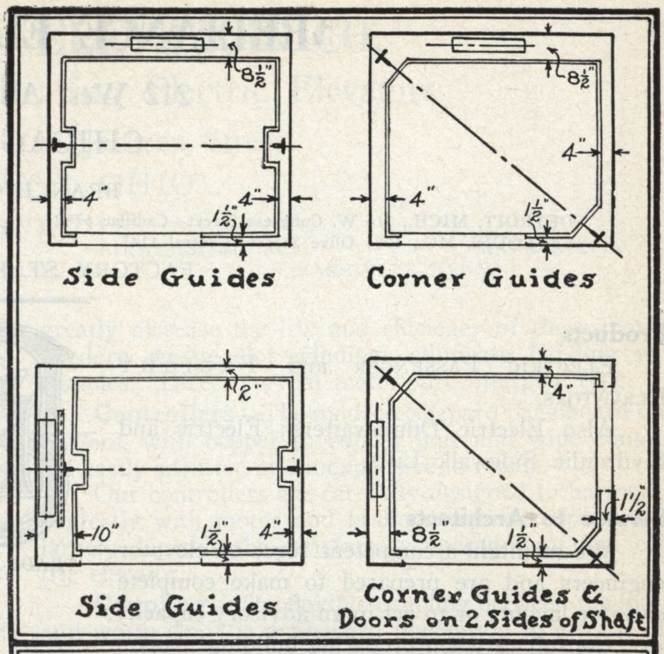
General Information Regarding Elevators

In deciding upon the most advisable capacity, car size and car speed and number of elevators for a building, there are many questions which arise in regard to the number of people or weight and area of freight to be carried in a given time. All these questions are usually disposed of by specifying a high car speed due to the false impression that increased speed necessarily expedites service proportionately.

High speed means high initial, operating and maintenance costs and not infrequently there is little or no return for these charges.

All elevators are stopped at various landings, more particularly freight elevators, the greater part of the time; and the actual time elevators are in motion is very small.

More consideration should be given to increasing the width of the entrance to the car and having liberal sized corridors or loading areas at each floor, as delays at landings, due to congestion, are the principal cause of unsatisfactory service.



TYPICAL ELEVATOR CAR LAYOUTS.

As the car speed increases, greater premium is placed on the human element—that is, the operator—which is contrary to the general practice of the day. An operator loses more time, and does untold damage to the apparatus, in endeavoring to make accurate stops than can be gained by having the car operate at a high speed.

If any apparatus is added to the equipment to assure accurate stopping, the operator will depend upon it entirely, which, with the additional complications involved requiring repairs and adjustments, will defeat the purpose of the increased expenditure.

The engineering facilities and experience of this company are at the service of all without any obligation being entailed.

References

Aberthaw Construction Company
Marc Eidlitz & Son, Inc.
Swift & Company
Stone & Webster
Turner Construction Company
Hollis French & Allen Hubbard
United States Rubber Company
American Woolen Company
General Fire Extinguisher Company
Colts Patent Fire Arms & Ammunition Co.
Manning, Maxwell & Moore
Boston and Albany Railroad
Boston and Maine Railroad
Central Vermont Railroad
U. S. War Department
U. S. Navy Department
U. S. Treasury Department
U. S. Emergency Fleet Corporation
Travelers Insurance Company
Hartford Fire Insurance Company
Harvard College
Wellesley College
Lockwood, Greene & Co.
York & Sawyer

RELIANCE ELEVATOR CO.

212 West Austin Avenue

CHICAGO, ILL.

BRANCH OFFICES

DETROIT, MICH., 316 W. Congress Street—Cadillac 6780
ST. LOUIS, MO., 1904 Olive Street—Central 1147

PITTSBURGH, PA., 5 Scott Place—Atlantic 3227
ATLANTA, GA., 371 Edgewood Avenue—Ivy 6222

FACTORY, ST. JOSEPH, MICH.

TRADE-MARK

Products

ELECTRIC PASSENGER and FREIGHT ELEVATORS.

Also Electric Dumbwaiters; Electric and Hydraulic Sidewalk Lifts.

Service to Architects

We maintain a competent force of elevator engineers and are prepared to make complete elevator layouts or to act in an advisory capacity.

Consult us when preparing building plans.

Reliance Traction Elevators

Reliance gearless and geared traction elevators are built for all classes of passenger and freight service.

Control Systems

Reliance controllers are built for every mode of operation. Reliance standardized variable voltage control permits high speed operation of elevators in alternating current districts.

Design and Manufacture of Reliance Elevators

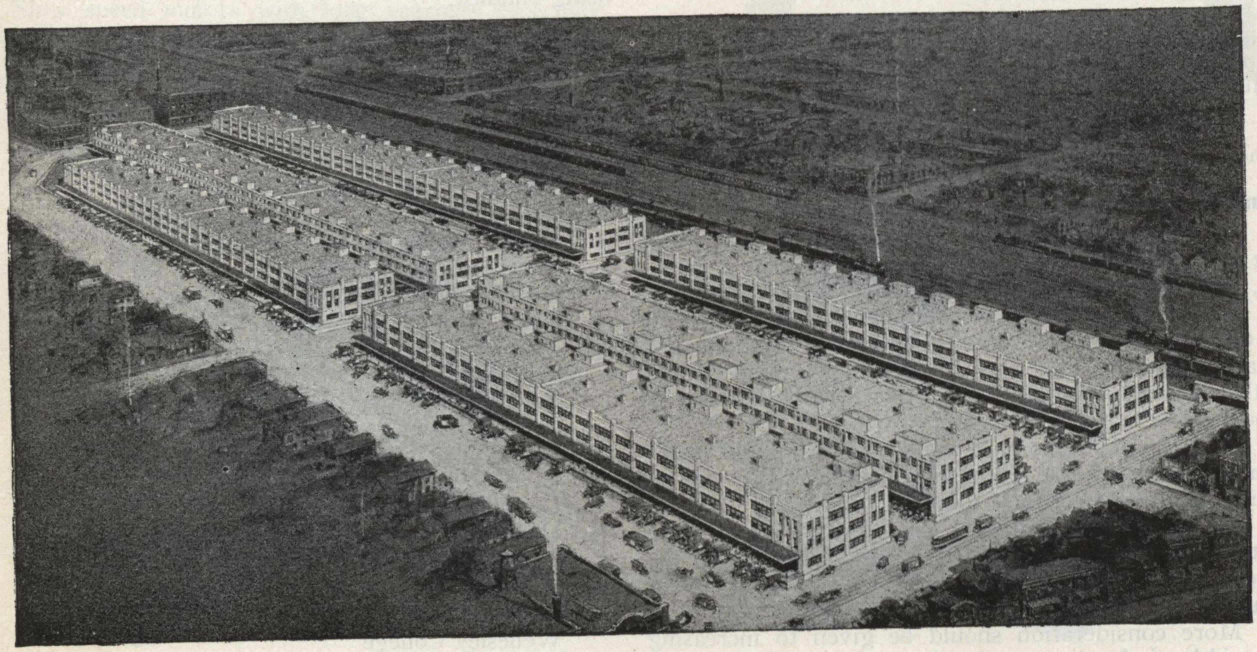
Reliance elevators are designed on the principles of simplicity, durability and safety. They are manufactured in our own plant by an organization with many years' experience in elevator manufacture and installation.

Materials used by us are of the highest grade and construction is based on a factor of safety far exceeding that used in ordinary practice.

Data Required for Quotations

When writing for estimates, please furnish us with the following information.

Name and location of building.
Name and address of owner.
Name and address of architect.
Capacity and speed of passenger elevator.
Capacity and speed of freight elevator.
Travel of elevator car in feet.
Location of winding machine.
Characteristics of electric current; state whether direct or alternating, voltage, phase and cycles.
Size of hatchway.
Value of passenger car.
Number of sides enclosed on freight car.
Type of control.
Steel or wood guides at sides or corner of hatchways.



The Chicago Produce District Trust

FUCARD & KNAPP, Architects

MCLENNAN CONSTRUCTION CO., Contractors

There are 166 Reliance freight elevators in these six units

THE SHEPARD ELEVATOR CO.

Manufacturers of Ball Bearing Electric Elevators

Central Parkway and Jackson Street
CINCINNATI, OHIO

REPRESENTATIVES

MEMPHIS, TENN. KNOXVILLE, TENN. BIRMINGHAM, ALA. KANSAS CITY, MO.
LITTLE ROCK, ARK. SAVANNAH, GA. NASHVILLE, TENN.

Products

Modern Full Ball Bearing Electric Passenger and Freight Elevators:

Latest designs in Unit Multivoltage Control Systems

Ball Bearing, Slow Speed, Compact and Noiseless Motor Generator Sets.

Squirrel Cage and Slip Ring Ball Bearing Alternating Current Elevator Motors.

Variable Speed Interpole Ball Bearing Direct Current Elevator Motors.

Automatic Elevators and Automatic Leveling Devices.

Panelboard Controllers; High Grade Safety Devices; Speed Governor and Door Switches.

Distinctive Features

We are pioneers in the building of *ball bearing electric* elevators and our products have gained the name of being the supreme achievement in modern elevator design. Shepard elevator apparatus, including electric motors, controllers, brakes, etc., is scientifically designed and accurately manufactured by our recognized elevator experts exclusively for elevator service. All equipment is the best that years of designing and experience can produce.

Ball Bearing Journals—Every journal on the Shepard elevator is supplied with high grade oversize ball bearings. They have proven a decided success because we know how to fit them. While they cost more to install, they save many times their first cost in reduced power, oil and repair bills.

Motors—Shepard motors, built by us for elevator service only, are made pedestal type to permit removal of armature or rotor without disturbing alignment of machine. Our alternating and direct current motors are interchangeable. Properly designed ball bearing journals greatly increase the life and efficiency of these motors. Modern wedge slot windings eliminate banding wire troubles. Direct current motors are interpole type.

Controllers—The modern Shepard panelboard controllers, with copper to copper butt and wipe contacts are easily adjusted and inexpensive to repair.

Our controllers are carefully designed to harmonize perfectly with motor and brake equipment upon which largely depends the satisfactory operation of any electric elevator.

Coupling—The flexible coupling between the motor and worm shaft is a Shepard innovation in electric elevator design. It eliminates many misalignment troubles and insures a smooth running unit.

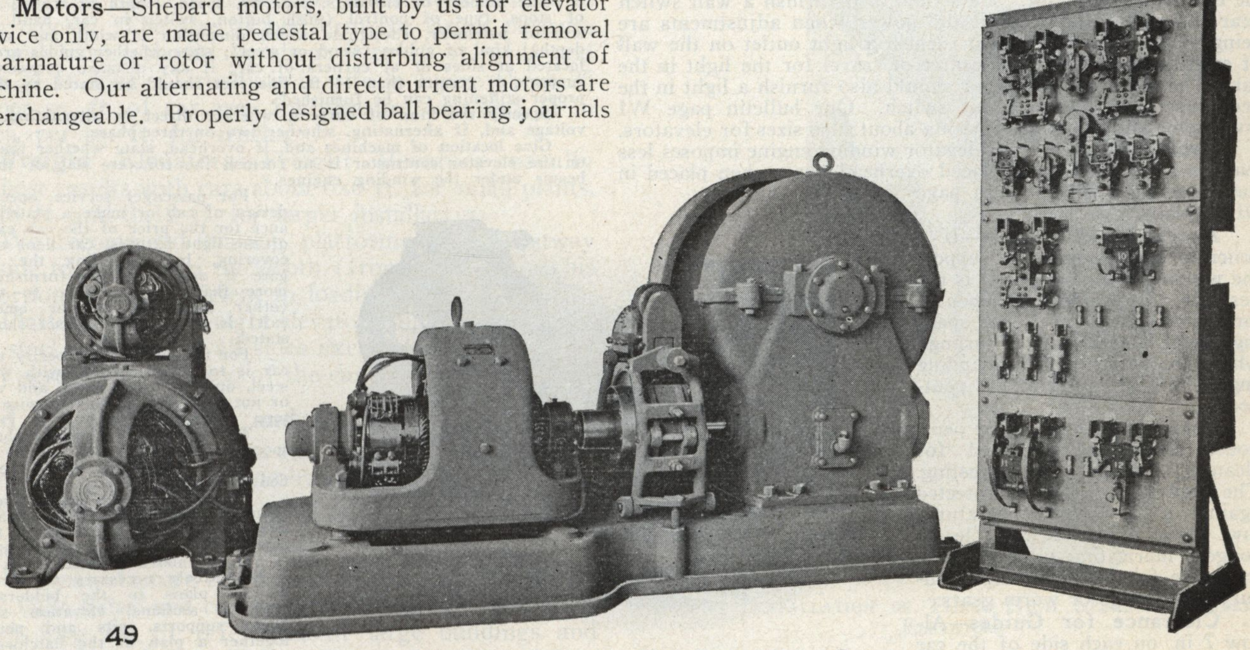
Brakes—The new Shepard brake is a simple magnet type, powerful, yet quiet in operation, and will not stick. No oil bath or dashpots are used. The self-aligning brake shoes accurately fit brake pulley.

Gearing—The driving spindle consists of one heavy casting with two accurately finished flanges, one for demountable bronze gear and one for demountable drive sheave. Gears and worms are designed and finished exactly right. The ball bearings on drive shaft are oversize standard design.

Safety Devices—All modern safety equipment is supplied with all our standard machines in addition to the above special features.

Expert Engineering Service

Our Engineering Department will gladly advise architects and engineers fully and promptly on their elevator problems.



Shepard Full Ball Bearing Unit Multivoltage System

THE WARNER ELEVATOR MFG. CO.

ESTABLISHED 1860

CINCINNATI, OHIO

DISTRICT OFFICES

ATLANTA, GA.
BIRMINGHAM, ALA.
CLEVELAND, OHIO
DAYTON, OHIO
DETROIT, MICH.
HUNTINGTON, W. VA.
INDIANAPOLIS, IND.
KNOXVILLE, TENN.
LEXINGTON, KY.
MEMPHIS, TENN.
MIAMI, FLA.
NASHVILLE, TENN.
NEW YORK, N. Y.
PITTSBURGH, PA.
SEATTLE, WASH.
TACOMA, WASH.
TAMPA, FLA.
WHEELING, W. VA.

SERVICE STATIONS IN MANY OTHER CITIES

Products

Electric Passenger and Freight Elevators.

Also manufacturers of Auto Lifts, Push Button Elevators, Electric Dumbwaiters, Electric Motors and Controllers, Electric Sidewalk Hoists.

Preliminary Information

Capacities—Elevator codes usually specify that passenger elevators have a capacity of 75 lb. per sq. ft. and hospital cars 50 lb. per sq. ft. of car floor area. Freight elevators should have a capacity sufficient to carry the heaviest load encountered in normal service. Special provision should be made for very exceptional loads.

Warner elevators are often given two capacity ratings with the higher capacity on the slow speed. This is accomplished with Warner's patented "speed selecting relay."

It is difficult to reach a hand rope in a fireproof hatchway. The "Warner Call Back" system of control with push buttons at each floor and a self-centering switch in the car, solves this problem completely.

Speeds—For heavy capacities and short lifts on intermittent service, 25 ft. per min. may be sufficient. For intermittent light freight service on short lifts, 50 ft. per min. is satisfactory.

For normal freight service where an operator is not used, 75 ft. per min. gives excellent service for medium lifts.

For constant freight service or light passenger service when the car is controlled by an operator, 200 ft. per min. is often used. This speed is not justified on short runs for freight service where the time required to load and unload and to open and close the doors is the predominant time-consuming factor.

The number of passenger elevators to be installed in a building depends upon the length of travel, the rentable area, the speed of the elevator, etc. Our 8-page article on "Passenger Elevator Service" covers this subject very completely.

Motor Horsepower Ratings—See our bulletin page WI for wiring information and elevator motor horsepower ratings.

Wiring—The wires should be brought to the controller by the electrical contractor. He should also furnish a wall switch near the machine to cut off the power when adjustments are being made. He should also furnish a light outlet on the wall of each hatchway near the center of travel for the light in the car. The electrical contractor should also furnish a light in the penthouse with a convenient switch. Our bulletin page WI gives some additional information about wire sizes for elevators.

Overhead Loads—An elevator winding engine imposes less load on a building, when placed overhead, than when placed in the basement. Our bulletin page OL explains this fully.

Access to Penthouse—If a concrete slab is used to support the winding engine and if it is not desirable to provide an opening through the slab, some other opening must be provided through which the parts of the winding engine can be raised to the penthouse.

Convenient access to the penthouse should be provided for cleaning, oiling and adjusting. The penthouse should be protected against a freezing temperature; low temperatures are liable to congeal lubricating oil and cause excessive friction, resulting in injury to bearings or worm gears.

Clearance for Guides—Allow 7 in. on each side of the car for guides. Car can travel within 1¼ in. of the tread and an allowance of about 10 in. should be made for the counterweight.

When two passenger elevators are placed in the same hatchway an 8-in. I-beam should be placed at each floor between the cars to support the guides.

Guides—Steel guides should be used on high speed elevators because they maintain accurate alignment and give smooth riding qualities. Wood guides give excellent service on slow and medium speed freight and passenger elevators. Wood guides are usually used when the hatchway is framed with wood.

Overtravel and Clearance—The A. S. M. E. Code provides for clearances at top and bottom of hatchway as follows:

Speed, ft. per min.		Overtravel at top, ft.	Clearance at top, ft.	Overtravel at bottom, ft.	Clearance at bottom, ft.
Above	to and including				
0	150	3	2	1½	2
150	350	4	2	2½	2
350	500	5	2	3½	2
500	600	5½	2	4½	2
600	800	6	2	5½	2

Top floor to underside of overhead beams = overtravel + clearance + height of car sling. (Car sling is usually 10 ft. high for passenger cars.)

Pit depth = overtravel + clearance + platform thickness. (Platform thickness is usually less than 1 ft.)

Buffers—Oil buffers should be used on speeds greater than 300 ft. per min. Spring buffers can be made to give satisfactory stops with speeds less than 300 ft. per min.

Electric Brakes—Required by most building codes, and should be used on all elevators.

Rope Drives—Warner bulletin page "CD" describes the types of rope drives used on elevators.

Specifications—Architects should specify results, rather than details of construction.

Each bidder should be required to include with his proposal a detailed description of his equipment together with illustrations.

Where other contractors come in contact with the elevator contractor, the line of separation should be clearly defined.

The following items should be specified:

The number of elevators, capacity, speed, length of travel, number of stops, type of control (push button, switch in car, hand cable); size of hatchway, (designate which dimension is width and which is depth); kind of guides (wood or steel); state whether guides are to be located at sides or at corners of car; if any distance between guide supports is greater than 14 ft. this fact should be stated so that the proper stiffening can be furnished.

Specify the kind of current, whether direct or alternating, giving voltage and, if alternating, whether two or three-phase.

Give location of machines and, if overhead, state whether the owner or the elevator contractor is to furnish the concrete slab or the steel beams under the winding engines.

For passenger service, specify the design of cab or make a stated allowance for the price of the cab exclusive of the light fixtures, car floor or floor covering, but including the folding gate if one is to be furnished. If more than one entrance to the car (other than the regular emergency exit) is required, this fact should be stated.

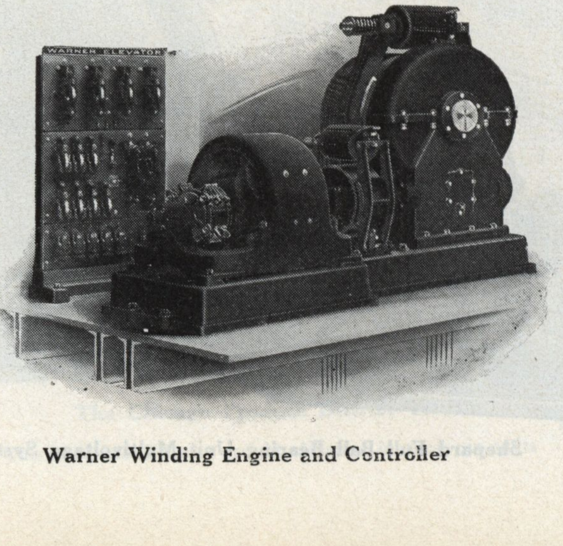
For freight service, specify whether car is to be wainscoted with wood or steel, on how many sides, and whether or not the car is to have a wire screen top.

The type of signal system should be specified.

Guide lubricators should be specified if required.

If door interlocks are required they should be specified. (It is usually desirable to include interlocks in the enclosure door contract.)

If the above information is given, it is scarcely necessary to furnish a set of plans to the bidders—however, a sectional elevation showing guide supports, pits and penthouse together a plan of the hatchway and penthouse will be of assistance to the bidder.



Warner Winding Engine and Controller

WARSAW ELEVATOR CO.

WARSAW, N. Y.

BALTIMORE, MD.
BUFFALO, N. Y.
JAMESTOWN, N. Y.
NEW YORK, N. Y.
PHILADELPHIA, PA.
ROCHESTER, N. Y.
SPRINGFIELD, MASS.
WILKES-BARRE, PA.

Products

Electric Passenger and Freight Elevators of all capacities and speeds.

Also manufacturers of Hydraulic Passenger and Freight Elevators; Belted and Hand Power Elevators; Push Button Dumbwaiters and Sidewalk Elevators.

Types of Machines and Facilities

We specialize on single and double wrap traction machines, also geared and 2:1 types, both overhead and basement installations; capacities range from 100 lbs. to 24,000 lbs. Any problem involving special construction by reason of peculiar conditions we can handle perfectly without extra cost. We have one of the finest and most efficient new plants with foundry in connection, which enables us to turn out work of this character to the entire satisfaction of customers.

Our engineering force is prepared at any and all times to discuss special problems with architects and engineers. With 30 years' experience in manufacturing elevators, we can guarantee customers efficient service.

Recommendations for Elevators

Passenger Elevators—In buildings 12 to 15 stories or more, we recommend car speeds ranging from 250 to 400 f. p. m. In smaller cities where the demands are not so great, we find speeds of 150 to 200 f. p. m. very satisfactory.

In estimating capacity, figure 75 lbs. per sq. ft. of cab area inside; with a cab which measures 5x5 ft. on the inside, estimate capacity at 1,875 lbs. Our experience shows an average allowance of 400 sq. in. per person is about correct, and the limit of comfortable capacity.

Steel guides should be used on all passenger elevators.

Automobile Elevators—For automobile elevators we recommend capacities of 5,000 to 6,000 lbs. for pleasure cars, and 8,000 to 10,000 lbs. where it is desired to carry trucks. The size of platform for larger pleasure cars and trucks should be about 9 to 10 ft. wide and 20 to 24 ft. long. Usually it is safe to figure about 25 lbs. per sq. ft. of car area for pleasure cars and 35 to 40 lbs. per sq. ft. for trucks.

Freight Elevators—Freight elevators usually give best results with cars about 6x6 ft. for small plants, to 6x8 ft. and 8x10 ft. for larger installations.

We recommend making platforms wider postway (or side to side) than the depth (front to back). This proportion is more efficient in loading and unloading.

Platforms of all freight elevators should be enclosed with steel or wood on all sides except the entrance. A heavy screen over the top of the car should be provided.

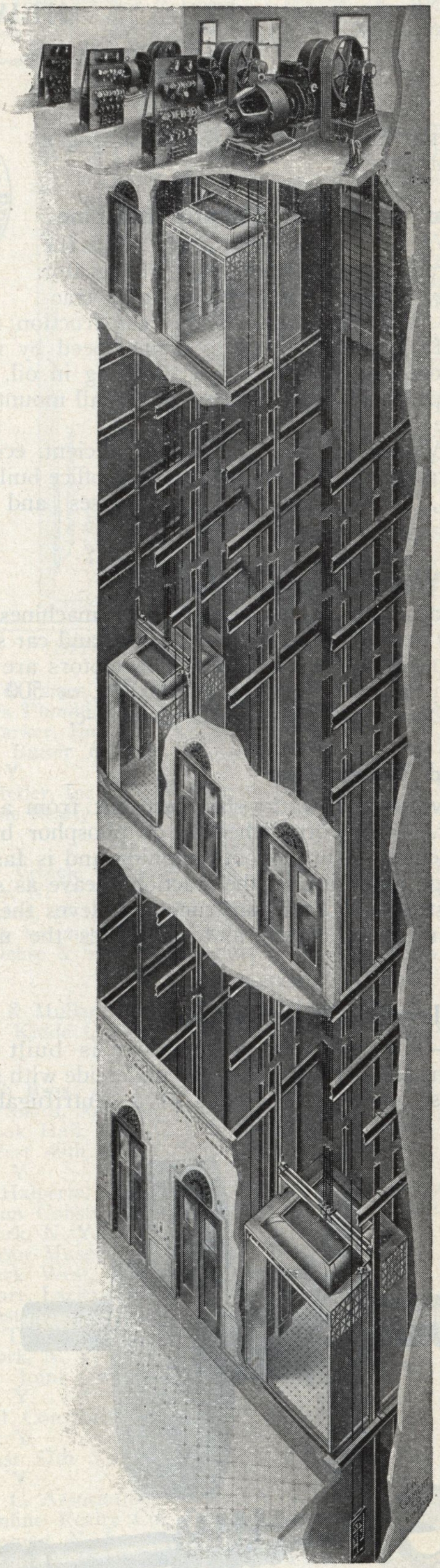
Hand Power Elevators and Dumbwaiters

We also manufacture a full line of hand power elevators and push button dumbwaiters of the latest improved type.

References

We manufacture the largest line of elevators of all kinds built today and can meet any existing conditions.

A long list of references of large buildings and manufacturing plants will be sent on request.



Recent Installation of Three High Speed Passenger Elevators

Installed in one of the largest office buildings in the East

WATSON ELEVATOR COMPANY, INC.

407 West 36th Street

NEW YORK, N. Y.

TELEPHONE
CHICKERING 8200

FACTORY
HOBOKEN, N. J.

Products

ELECTRIC ELEVATORS for both Passenger and Freight Service.

Description of Watson Elevator Machine

The Watson electric elevator machine is the finished product of over 25 years of elevator engineering. It is of the worm and gear traction type. The advantage of this construction is the reduction from motor speed to drum speed by means of an enclosed worm gear drive traveling in oil. The gear case, pedestal, brake and motor are all mounted on a one-piece bed plate.

The Watson machine is durable, efficient, economical in operation, and is adapted to use in office buildings, apartments, stores, factories, warehouses and residences.

Range of Watson Elevator Machines

The capacities of Watson elevator machines vary from 1,000 to 20,000 lbs. load in the car, and car speeds from 25 to 450 ft. per minute. The motors are from 5 to 40 hp. and are suited for 115, 230, or 500 volts, d-c., and 220 and 440 volts, 2 or 3-phase, a-c.

Worm and Worm Gear

The worm and worm shaft are cut from a solid steel blank. The worm wheel is of phosphor bronze, accurately cut to insure smooth running and is fastened to the flange extension of the traction sheave as shown in the illustration. This construction relieves the main shaft from torsion strain and eliminates the use of keys.

Watson Elevator Cars and Cabs

Cars—The Watson elevator car is built from steel sections and is provided on the underside with safety attachments, operated by means of a centrifugal governor placed at the top of the shaft, whereby, if the predetermined speed is exceeded, the car is gradually slowed down and finally locked to the guide rails.

Cabs—The cab is the enclosure forming the top and sides of car. In passenger elevators it is of steel or grill of desired finish, provided with folding gates having electric contact for all sides of the car where there are shaft doors. In some cases the cab is constructed of wood, or finished in imitation of wood, to correspond with the trim of the building.

On freight elevators, the cab is of sheet steel or grill reinforced to withstand rough use.

Specifications, Drawings and Inquiries

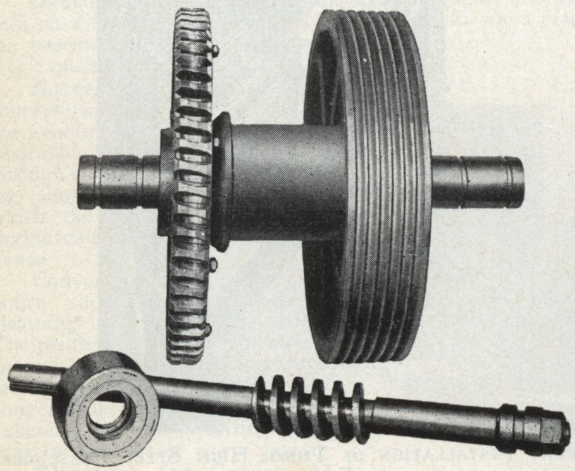
Specifications and drawings covering specific electric elevator equipment will be supplied to architects and engineers. A set of typical drawings (of which one is reproduced herein) will also be sent on request.

A general description should be given of the work the elevator is to be put to, including nature of the building, etc.; also the size of the shaft, the car speed in feet per minute, capacity in pounds, and the current available for operation—whether direct or alternating current—its voltage, and, if alternating current, its phase and cycles. A sketch locating doors to shaft and space available for elevator engine should accompany data.

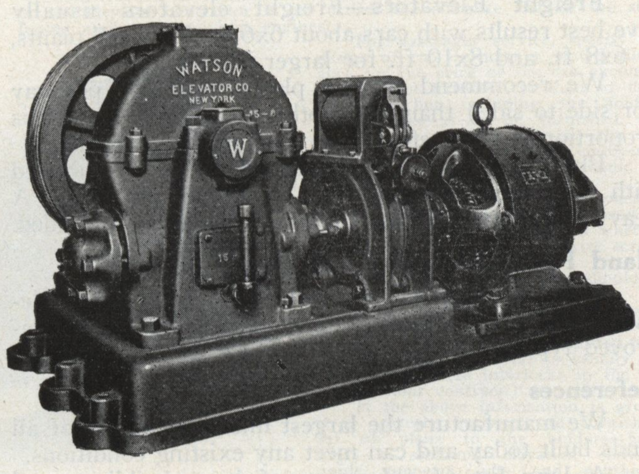
Watson Service

WATSON ELEVATOR COMPANY, INC. renders efficient service in connection with new installations, repairs or inspection; and places its many years' experience with elevators at the disposal of those interested.

There is no obligation incurred on the part of an architect, engineer or property owner who sends for "Watson" to assist in solving his elevator problems. An experienced elevator man is frequently able to save the owner an expensive mistake.



WORM, WORM GEAR ENDTHRUST AND TRACTION SHEAVE OF WATSON ELEVATOR MACHINE



WATSON ELEVATOR MACHINE

Continued on next page

Where an elevator is already installed, the Watson Company is prepared to enter into an inspection-repair contract (weekly, semi-monthly or monthly) whereby the actual repair bills may be kept at a minimum, or will contract to keep the elevator in perfect condition.

For a period of three months after installation, the Watson Elevator Company, Inc., will furnish, without charge, "Watson Service" consisting of a weekly examination of the elevator including oiling and cleaning machine, motor and controller, greasing overhead bearings and guides; necessary minor adjustments; "Call back" service and furnishing of the following specified supplies: all carbon and copper contacts, contact insulations and contact springs, motor brushes, oils, greases, and rope preservative.

Change of Motive Power from Existing Steam or Hydraulic Drives

It is real economy to change an existing steam or hydraulic elevator to electric drive by using the Watson electric elevator machine placed at the top of the shaft. A machine so placed does not increase the load on the building and may often be placed within the area now occupied by the overhead sheaves. This saves basement space which is often valuable to the owner.

The change of motive power does not necessarily imply that an entirely new elevator is required. The present car, guides, and other parts may be retained, if suitable. Watson will gladly go into these details in any specific case and will prepare drawings showing what material can be re-used.

References

This Company refers to owners or agents of any building where Watson electric elevators are in use. There are several hundred in New York City. Particular attention is called to the following:

Office Buildings

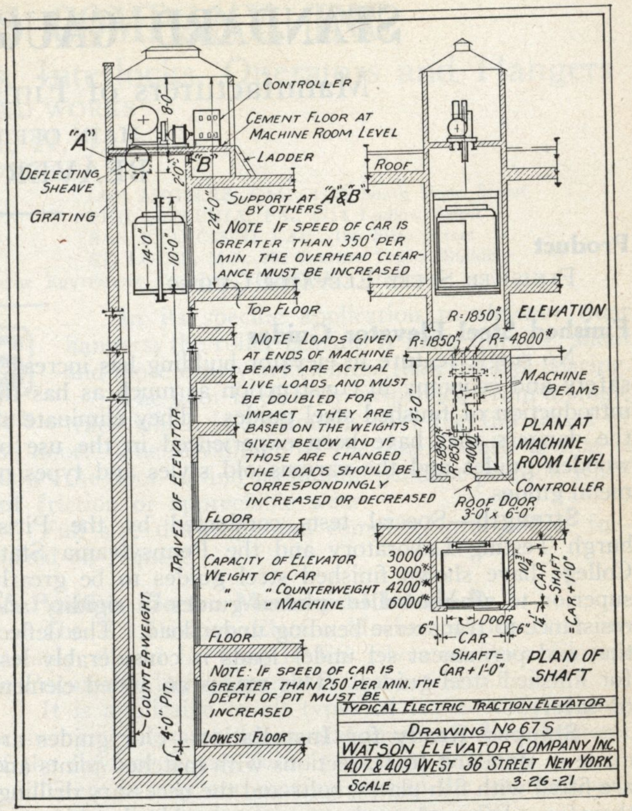
East 45th and 46th Street Realty Corp., 17 East 45th St., New York, N. Y.
Wurlitzer Building, 120 W. 42nd St., New York, N. Y.
Wood, Dolson Company, 2091 Broadway, New York, N. Y.
United Cigar Stores Co., 301 Madison Ave., New York, N. Y.
Grand Central Palace, 46th St. and Lexington Ave., New York, N. Y.

Factories

Kahn & Feldman, 360 Suydam St., Brooklyn, N. Y.
Atlantic Macaroni Co., Vernon Avenue and 14th St., Long Island City, N. Y.
Englander Spring Bed Co., Johnson and Stewart Aves., Brooklyn, N. Y.
MacCrellish & Quigley Co., Trenton, N. J.
William R. Noe & Sons, Willoughby Ave. and Raymond St., Brooklyn, N. Y.
Ault & Wiborg Co., 12th and Monmouth Sts., Jersey City, N. J.
Standard Oil Company, foot of 9th St., Long Island City, N. Y.
Reid Ice Cream Co., 141st St. and Fifth Ave., New York, N. Y.
Street & Smith, 147-51 W. 15th St., New York, N. Y.
E. R. Durkee, Elmhurst, L. I., N. Y.
P. M. & W. Schlichter, Inc., 644 First Ave., New York, N. Y.
David Weil's Sons, Berry and So. Third Sts., Brooklyn, N. Y.
Bingham Bros., 333-41 W. 16th St., New York, N. Y.
Schering & Glatz, Bloomfield, N. J.
Chas. Tisch, 161 Raymond St., Brooklyn, N. Y.
Eberhard Faber Company, Greenpoint, Brooklyn, N. Y.
Press Publishing Company, 13 Frankfort St., New York, N. Y.
M. M. Casey & Son Corp., 442 W. 49th St., New York, N. Y.
West Disinfecting Co., Barn St. and Jackson Ave., Long Island City, N. Y.

Warehouses

Fordham Fireproof Warehouse, 181st St. and Jerome Ave., New York, N. Y.
Long Island Storage Warehouse, Gates and Nostrand Aves., Brooklyn, N. Y.
J. A. Mahlstedt Lumber & Coal Company, New Rochelle, N. Y.
Joseph Kroeger, Newark, N. J.


CONTROLLER
CEMENT FLOOR AT MACHINE ROOM LEVEL
"A"
"B"
LADDER
DEFLECTING SHEAVE
GRATING
8'-0"
2'-0"
24'-0"
14'-0"
10'-0"
ROOF
SUPPORT AT "A"&"B" BY OTHERS
NOTE IF SPEED OF CAR IS GREATER THAN 350' PER MIN THE OVERHEAD CLEARANCE MUST BE INCREASED
TOP FLOOR
R=1850#
ELEVATION
NOTE: LOADS GIVEN AT ENDS OF MACHINE BEAMS ARE ACTUAL LIVE LOADS AND MUST BE DOUBLED FOR IMPACT THEY ARE BASED ON THE WEIGHTS GIVEN BELOW AND IF THOSE ARE CHANGED THE LOADS SHOULD BE CORRESPONDINGLY INCREASED OR DECREASED
R=1850#
R=4800#
MACHINE BEAMS
13'-0"
R-1850#
R-1850
R-4000
PLAN AT MACHINE ROOM LEVEL
CONTROLLER
ROOF DOOR 3'-0" x 6'-0"
TRAVEL OF ELEVATOR
FLOOR
CAPACITY OF ELEVATOR 3000#
WEIGHT OF CAR 3000#
" " COUNTERWEIGHT 4200#
" " MACHINE 6000#
10 3/4"
CAR
SHAFT
=CAR+1'-0"
1 1/4"
DOOR
6"
CAR
6"
SHAFT= CAR+1'-0"
PLAN OF SHAFT
FLOOR
NOTE: IF SPEED OF CAR IS GREATER THAN 250' PER MIN. THE DEPTH OF PIT MUST BE INCREASED
COUNTERWEIGHT
4'-0" PIT.
LOWEST FLOOR
TYPICAL ELECTRIC TRACTION ELEVATOR
DRAWING Nº 67S
WATSON ELEVATOR COMPANY INC.
407 & 409 WEST 36 STREET NEW YORK
SCALE
3-26-21

Details Electric Traction Elevator

Towns & James, 211-13 Duffield St., Brooklyn, N. Y.
Yonkers Plumbing & Supply Co., White Plains, N. Y.
King-Parker, Inc., 251 E. 55th St., New York, N. Y.
Koster Butter & Egg Co., 34 Gansevoort St., New York, N. Y.
H. I. Stetler, Inc., 527 Washington St., New York, N. Y.
Ten Jane Realty Corp., 227 W. 12th St., New York, N. Y.

Garages

Walker Vehicle Company, 13th St. and Ely Ave., Long Island City, N. Y.
J. Pittman, 13-17 Front St., New York, N. Y.
Reilly & Latimer, 185-87 Pacific St., Brooklyn, N. Y.
John Ochse & Son, 704 Greenwich St., New York, N. Y.

Loft Buildings

Sloane & Muller, 234 W. 39th St., New York, N. Y.
Walter Kidde Co., Inc., 128 Front St., New York, N. Y.

Miscellaneous

Wallach Bros., 265 Broadway, New York, N. Y.
Albert Smith, 56-58 W. 14th St., New York, N. Y.
Holbrook Hall, 145 W. 55th St., New York, N. Y.
109 West 49th Street Corp., 109 W. 49th St., New York, N. Y.
M. I. Halperin, Eighth Ave. and 4th St., Brooklyn, N. Y.
Coliseum Construction Co., 181st St. and Bennett Ave., New York, N. Y.
American Museum of Natural History, 77th St. and Central Park West, New York, N. Y.
Delaware, Lackawanna & Western R. R. Co., Brick Church and East Orange, N. J.
N. Y. Telephone Co., White Plains Road and 242nd St., New York, N. Y.
Culver Joint Ownership Corp., 424 E. 57th St., New York, N. Y.
Capitol Construction Co., 2315 University Ave., New York, N. Y.
37 East 57th Street Co., Inc., 37 E. 57th St., New York, N. Y.
Y. M. C. Association, Orange, N. J.
Bergenline Realty Co., Bergenline Ave. and 35th St., North Bergen, N. J.
Thos. Healy, 16 W. 74th St., New York, N. Y.
Art Aseptible Furniture Co., 16 W. 50th St., New York, N. Y.
Jas. A. Mears, Inc., 217 Lincoln Pl., Brooklyn, N. Y.
Geo. A. Fuller Building, 151 E. 79th St., New York, N. Y.

STANDARD GAUGE STEEL COMPANY

Manufacturers of Finished Steel Elevator Guides

MAIN OFFICE AND PLANT
BEAVER FALLS, PA.

Product

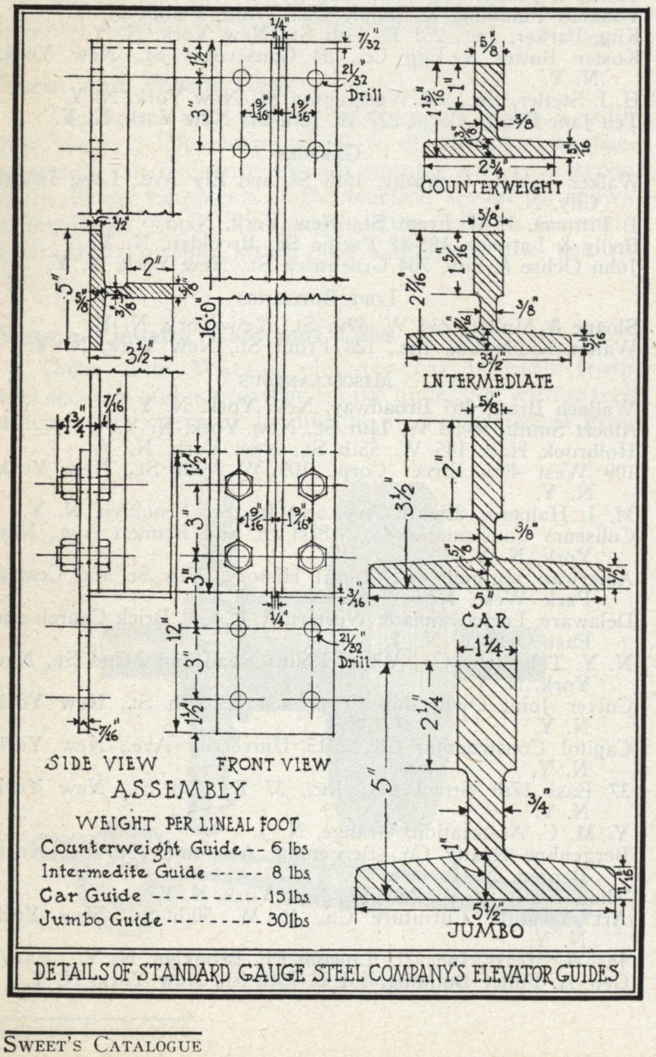
Finished Steel Elevator Guides.

Finished Steel Elevator Guides

No single feature in elevator building has increased safety and economy in construction as much as has the introduction of finished steel guides. They eliminate all the dangers that have been experienced in the use of wooden guides and the various old styles and types of metal guides.

Strength—Special tests conducted by the Pittsburgh Testing Laboratory and the Pennsylvania State College have shown finished steel guides to be greatly superior to all hot rolled, planed guides in rigidity and resistance to transverse bending under load. The deflection and permanent set under loads is considerably less for finished steel guides. This means an added element of safety.

Shipped Ready for Installation—Our guides are made in standard 16-ft. sections with matched joints and are fitted with fish plates, bolts and the necessary drilling, therefor. When desired, we can assemble them in runs of any required length without extra cost. They can then be easily and quickly erected as they are finished all over and do not require any filing or shimming on the part of the erector.


COUNTERWEIGHT
INTERMEDIATE
CAR
JUMBO
SIDE VIEW
FRONT VIEW
ASSEMBLY
WEIGHT PER LINEAL FOOT
Counterweight Guide -- 6 lbs
Intermedite Guide ------ 8 lbs
Car Guide ------------ 15 lbs
Jumbo Guide ----------- 30 lbs
16'0"
Drill

DETAILS OF STANDARD GAUGE STEEL COMPANY'S ELEVATOR GUIDES

Low Cost—Our methods of production permit us to offer finished steel guides at a price which makes them cost less than the ordinary hot rolled, planed guides, taking into consideration the cost of erection.

Type and Sizes—Our guides are made in one type, "Undercut," as illustrated. This type is made in three sizes: car, intermediate, and counterweight guides. All sizes are carried in stock for immediate shipment. We also manufacture the Jumbo "Undercut" guide which weighs 30 lb. to the foot.

Specifications

To specify finished steel elevator guides include the following:

All elevators to be equipped with Finished Steel Guides as manufactured by the Standard Gauge Steel Company.

References

During the last twenty years we have furnished finished steel elevator guides for over 5000 of the largest buildings constructed in all parts of the world without a single complaint being recorded.

A few prominent installations with the name of the elevator manufacturer are listed below:

Bellevue-Stratford Hotel, Philadelphia, Pa., Standard Plunger Elevator Co.
Wanamaker Store, Philadelphia, Pa., Standard Plunger Elevator Co.
Bureau Printing & Engraving, Washington, D. C., Blake Palm & Bro.
Interior Department Building, Washington, D. C., Blake Palm & Bro.
Aeronautical Tower, Pensacola, Fla., Blake Palm & Bro.
Masonic Temple, Columbus, Ohio, Ohio Elevator & Machine Co.
Commercial National Bank Building, Raleigh, N. C., Ohio Elevator & Machine Co.
Pittsburgh Athletic Club, Pittsburgh, Pa., Ohio Elevator & Machine Co.
The Avon Apartments, Cincinnati, Ohio, Shephard Elevator Co.
St. Elizabeth's Hospital, Dayton, Ohio, Shephard Elevator Co.
Kroger Grocery & Baking Co., Cincinnati, Ohio, Shephard Elevator Co.
Hotel Williams, Indianapolis, Ind., Home Elevator Co.
S. M. Bixby & Co., Indianapolis, Ind., Home Elevator Co.
Hotel Washington, Indianapolis, Ind., American Elevator & Machine Co.
K. M. & T. Office Building, Dallas, Tex., American Elevator & Machine Co.
Swift & Co. Branch, Havana, Cuba, American Elevator & Machine Co.
Roosevelt Building, Chicago, Ill., Reliance Elevator Co.
Mayo Bros. Clinic, Rochester, Minn., Kieckhefer Elevator Co.
Allis-Chalmers Mfg. Co., Milwaukee, Wis., Kieckhofer Elevator Co.
Minnesota Steel Co., Duluth, Minn., Kieckhefer Elevator Co.
Gross Building, Milwaukee, Wis., Rosenberg Elevator Co.
La Salle Building, Minneapolis, Minn., Rosenberg Elevator Co.
Gimbel Brothers, Milwaukee, Wis., S. Heller Elevator Co.
Caswell Block, Milwaukee, Wis., S. Heller Elevator Co.
Security Building, Milwaukee, Wis., S. Heller Elevator Co.
Capital National Bank Building, Lansing, Mich., Pitt Engineering Co.
Cerveceria Cuauhtemoe, S. A. Monterey, N. L. Mexico, Pitt Engineering Co.
United States Post Office Annex, Kansas City, Mo., Pitt Engineering Co.

ELEVATOR SUPPLIES COMPANY, INC.

Manufacturers of Elevator Door Closers, Interlocks, Operators and Hangers

MAIN OFFICE AND WORKS
HOBOKEN, N. J.
BRANCH OFFICES

ATLANTA, GA., 119 Spring Street
CHICAGO, ILL., 111 South Jefferson Street
CLEVELAND, OHIO, 1637 Superior Avenue
DALLAS, TEX., Santa Fe Building
LOS ANGELES, CAL., 1120 South Hope Street
PHILADELPHIA, PA., 1714 Ludlow Street
SAN FRANCISCO, CAL., 186 Fifth Street
ST. LOUIS, MO., 301 Leather Trades Building

CANADIAN REPRESENTATIVE: Canadian Elevator Equipment Co., Ltd., TORONTO, ONT.

ES
PRODUCTS

Products

ES Elevator Door Closers and Positive Electric Interlocks.

ES Heavy Duty Roller Bearing Hangers.

ES Positive Electro Mechanical Interlocks.

ES Pneumatic Door Operators.

ES Crowell Pneumatic Door Operators.

ES Electric Door Operators.

Also ES Guide Lubricators, etc.

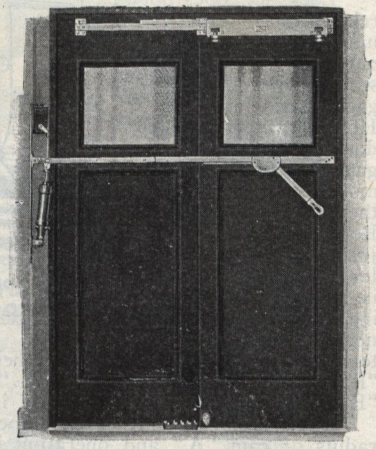
Complete catalogues furnished on request.

For Signals and Accessories, see page 2593.

ES Elevator Door Closer and Positive Electric Interlock

Specifications—ES Door Closers (Semi-automatic)—Each hatchway door shall be equipped with an ES Elevator Door Closer which shall comprise an operating cylinder containing springs and a liquid dash pot connected to the operating arms of the device. The door closer shall automatically close and lock the door and prevent slamming.

Each door shall be equipped with the *rack* and *pawl* device which shall effectively lock the door during the last 4 inches of its closing movement, thus permitting the advancement of the contact in the electric interlock and allowing the operating circuit of the elevator safely to be made a few inches in advance of the fully closed position of the door.



ES Elevator Door Closer and Positive Electric Interlock

On each elevator shall be installed a device to hold the door open while the elevator is at the ground floor, the door being released by pressure of a pedal in the car floor. A key or other means shall be provided to unlock the ground floor door from the corridor side.

There shall be installed in each elevator cab, an emergency switch of the break-glass type containing a normally open switch operated by a button requiring continuous pressure to maintain the contact. The switch shall be so connected that pressure of the button will short circuit and nullify the interlock system and permit temporary operation of the elevator.

ES Heavy Duty Roller Bearing Elevator Door Hanger

The exclusive feature of the ES Heavy Duty Roller Bearing Elevator Door Hanger, to which is largely due its superiority over other hangers, is the use of rollers instead of balls as a bearing medium.

In its specific application to elevator door hangers, the roller bearing is more durable, silent and more nearly frictionless than the ball bearing.

The door is directly suspended from a single track which is continuous over the full travel of the door. The advantage of the single track is that it allows the door to find its plumb, pendant position without friction or appreciable wear.

Full size drawings and complete information furnished on request.

ES Positive Electro Mechanical Interlock

The ES Positive Electro Mechanical Interlock invariably should be used if ES Elevator Door Closers or Pneumatic Door Operators are not installed.

It is applicable to all types of horizontally sliding or swinging elevator doors, and prevents the movement of the elevator if any door is open or unlocked.

There is only one moving part to the interlock and that part is actuated solely by gravity.

ES Pneumatic Door Operator (Overhead Type)

The ES Pneumatic Door Operator, overhead type, is a door opening and closing engine that is controlled by the elevator man with a small handle in the cab. The action of the pneumatic door operator is quicker and quieter than manual operation, and if desired it can be arranged to operate simultaneously both the corridor door and collapsible gate on the elevator.

These operations can be applied to any type of horizontal or vertical sliding doors or gates for either passenger or freight elevators, also for four fold doors, generally called butterfly type.

ES Crowell Pneumatic Door Operator

The ES Crowell Pneumatic Door Operator consists of an operating mechanism which is connected to the doors by means of arms similar to those used with the ES Elevator Door Closer.

The operating mechanism consists of a combined cylinder and liquid dash pot. The door is opened by compressed air and closed by spring pressure and is cushioned in both motions. The control is the same as for the ES Pneumatic Door Operator described above.

The operation of this equipment has been very successful when installed in connection with self-leveling elevators, to give automatic door opening as the elevator stops at the landings.

ES Electric Door Operator

ES Electric Door Operating Mechanism, for the operation of bi-parting, vertically sliding doors on freight elevators is especially valuable where the doors are too heavy to be operated quickly by hand on account of the size of the opening.

Experience and Consultation

Our organization with thirty-five years of experience is at your service and an experienced engineer will be glad to consult with you on any problem.

ELEVATOR LOCKS CO.

M-C-K Automatic and Purely Mechanical Elevator Safety Locks

119 No. Washington Street
PEORIA, ILL.

M·C·K
TRADE-MARK

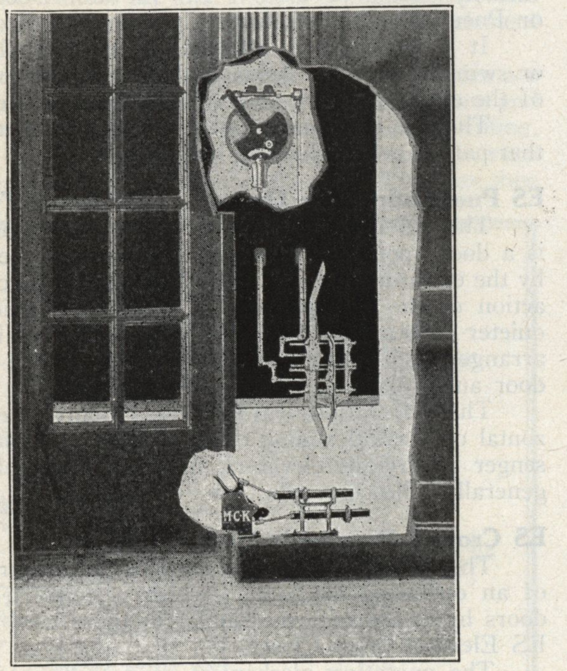
M-C-K Locks Can Be Installed on All Types of Controllers

M-C-K Elevator Safety Locks bear the endorsement of the Underwriters' Laboratories, Inc., and can be installed on both passenger and freight elevators. Any type of controller from the cable operated to the various types of electric controllers are easily equipped with M-C-K Safety Locks.

Elevators Made Safe without Interfering with Service

M-C-K Locks protect the elevator without attaching to or interfering with the motive power that runs the car. They are purely a mechanical device. One M-C-K lock, installed at each enclosure gate, is operated by the action of two cams attached to the elevator car.

The adjustment of these cams defines the limits within which the car must come before the shaft enclosure gate can be opened. The M-C-K locks *compel* the locking of the enclosure gates so that they can not be opened unless the car is at that particular landing.



Position of Complete Passenger Equipment, Car Approaching a Landing

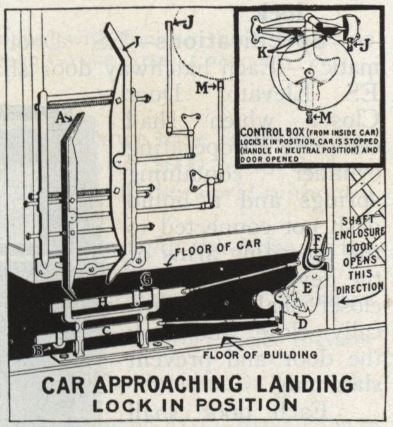
The interlocking system is so designed that (without being attached to or interfering with the motive power) the controller handle is locked in neutral position and the car can not be moved during the time the enclosure gate is open and unlocked. In short they *compel* the operator to follow the essential principles of safe operation and do not leave the burden of accident to his judgment.

Explanation of Operation

The drawing shows elevator approaching a landing, with the shaft enclosure gate shut and locked.

Roller "F" is attached to shaft enclosure gate and fits into rocker arm "E," which in turn is held by lock "D," thus preventing gate from being pulled back and opened.

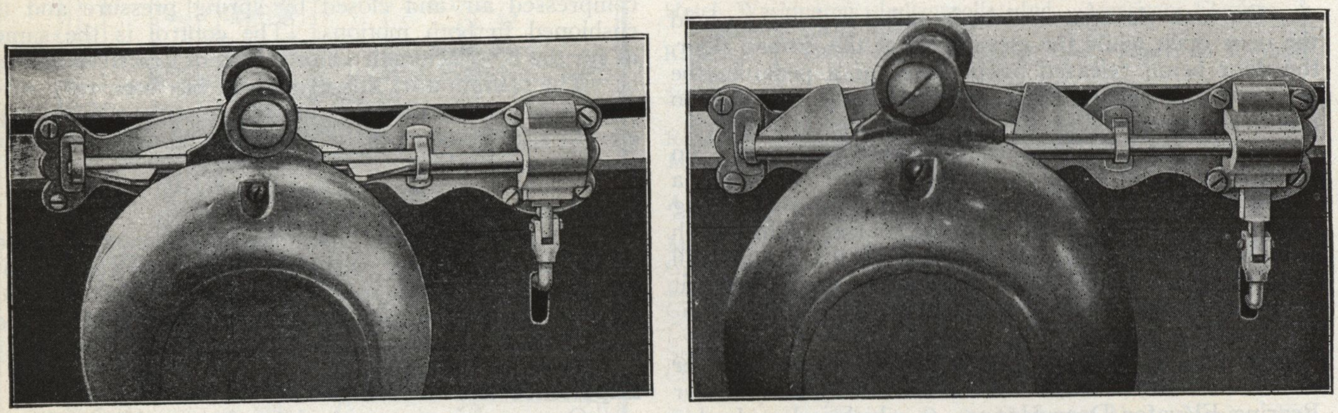
Lock "D" does not release rocker arm "E" until bar "C" pulls it out of engagement, when roller "B" engages with cam "A." However, cam "A" does not make this engagement until rod "M" moves, pushing it over the necessary distance. Rod "M" is so adjusted to the operating lever that when the car is stopped, the operating lever therefore in neutral position, it automatically makes an engagement between cam "A" and roller "B," which in turn releases lock "D," allowing rocker arm "E" to swing back when the gate is opened.


J
J
M
A
K
J
M
CONTROL BOX (FROM INSIDE CAR) LOCKS K IN POSITION, CAR IS STOPPED (HANDLE IN NEUTRAL POSITION) AND DOOR OPENED
FLOOR OF CAR
G
F
SHAFT ENCLOSURE DOOR OPENS THIS DIRECTION
H
E
C
D
B
FLOOR OF BUILDING

CAR APPROACHING LANDING
LOCK IN POSITION

Shaft enclosure gate is not unlocked until car is within the radius of cam "A," and operating lever is in the neutral or stop position.

When elevator is at a safe landing and operating lever in the neutral position necessary, when shaft enclosure gate is opened, rocker arm "E" is shoved back by roller "F" (which, as before mentioned, is attached to shaft enclosure gate). This shoves bar "H" to the left, bringing roller "G," which is attached to bar "H," into engagement with cam "I," thereby



Position of the Lever Device (the Controlling Lever Locked) When Enclosure Gate Is Open

Position of the Lever Locking Device (the Controlling Lever Free) When Gate Is Closed

The Controller Lever Locking Device

Continued on next page

shoving it to the left. This moves rod "J" upward, bringing the two arms, "K" (on inside of car), down on both sides of the operating lever so that it can not be moved from its neutral position.

Specifications for Elevator Locks

The bidder must name in proposal the separate amount for which they will equip the elevators and enclosure gates with inter-locks. The device to be strictly mechanical in construction and either semi or full automatic in its operation, and to have no connection with the electrical control circuit of the elevator.

The device shall prevent the car being moved until the hoistway door at which it is standing is closed and securely locked and must prevent the opening of any hoistway door, except in case of emergency until the car has come to rest within a prescribed distance of the floor level. (Landing limit being optional with the purchaser.)

The device must perform the functions of locking and unlocking the power, locking and unlocking the enclosure gates, and prevent same being done except when the control lever is in the neutral or stop position. It must bear the label of indorsement of the Underwriters' Laboratories, Inc., pass the Bureau of Standards tests and comply with the laws of the State of .... and the ordinances of the City of .... governing inter-locks for elevators.

Services to Architects and Owners

The Elevator Locks Co. are and have been for the past 15 years manufacturers exclusively of M-C-K Elevator Safety Locks.

The work of all installing is done by mechanics direct from the factory, with service stations in the principal cities.

No equipment sold outright to elevator companies, general contractors or builders' agents for installation by them.

Our Guarantee

(1) To mechanically lock the power and gate automatically.

(2) To lock the power while the gate is open to receive or discharge passengers.

(3) To keep the power locked until the gate is securely closed, by which the power is released.

(4) To securely lock the gate automatically before the power can be used to start the car.

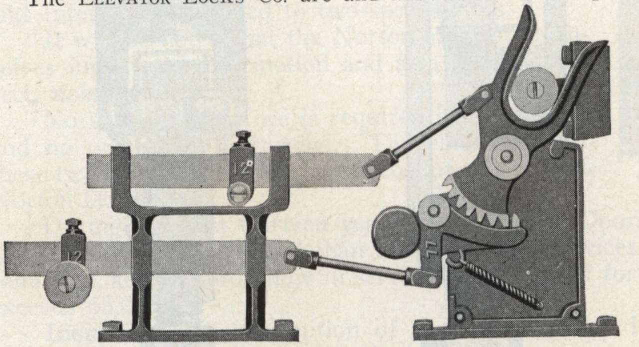
(5) To control the landing (limit of same being optional with purchaser).

(6) To give the above safety without attaching to the motive power, and furnish free of cost any defective material for one year from date of installation.

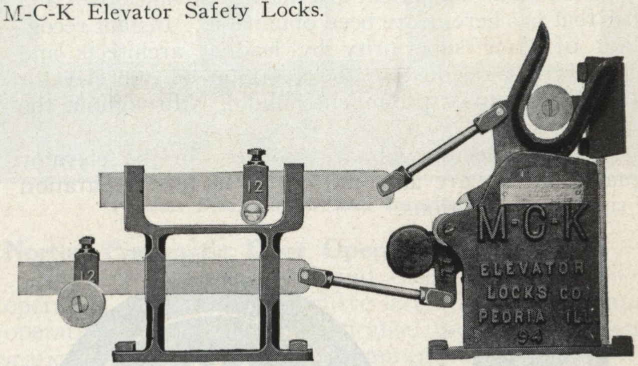
On the Elevators of America's Leading Buildings

We are proud of our record of installations in hundreds of important buildings in the large cities of the United States and Canada, including: the U. S. Capitol at Washington, D. C. and many State capitols, office buildings, theaters, department stores, banks, the Metropolitan Museum of Art, New York, etc.

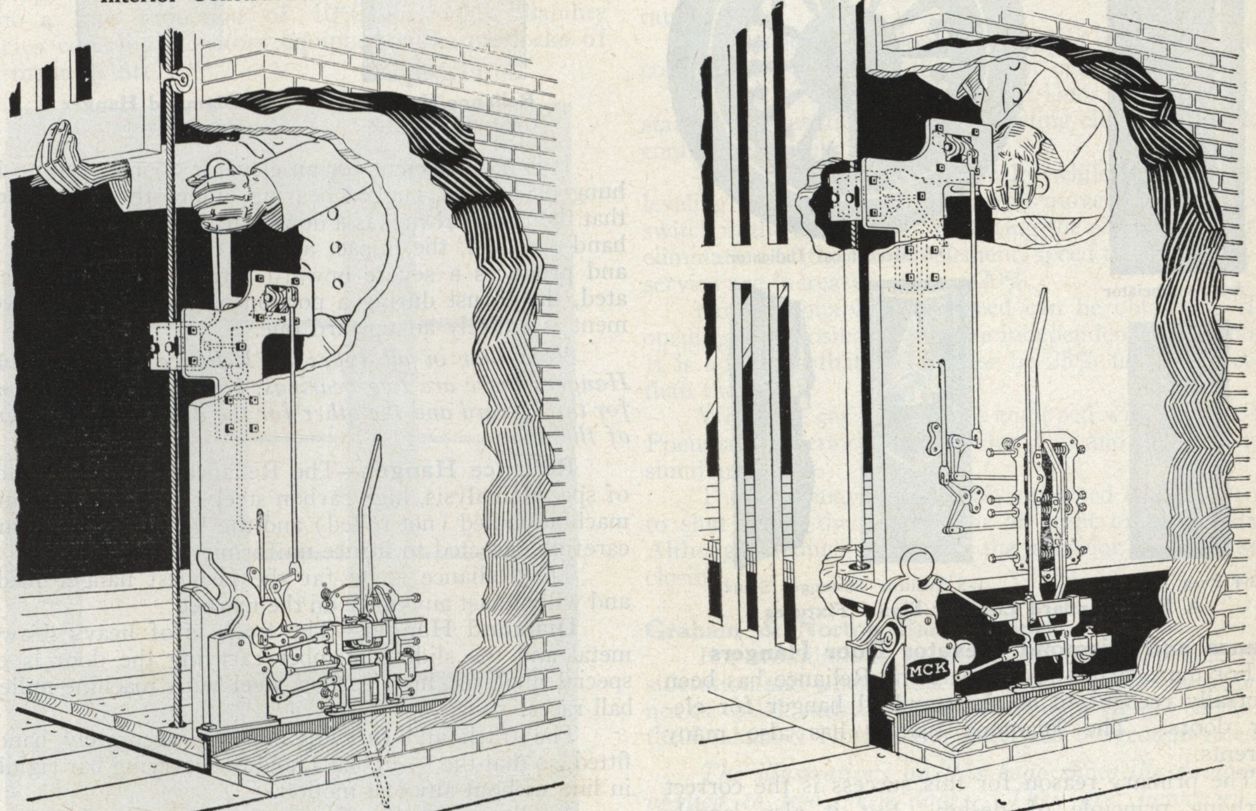
Write for list of buildings in your city equipped with M-C-K Elevator Safety Locks.



Interior Construction of the Lock



The Lock as Installed



Freight Car Gate Open—Cable Locked

Gate Closed and Locked—Cable Released

Complete M-C-K Equipment on Cable Operated Freight Car

GRAHAM & NORTON COMPANY

Flashlight Elevator Signals. Operating Devices, Interlocks and Hangers for Elevator Doors

126 Eleventh Avenue
NEW YORK, N. Y.

BRANCH OFFICES

CHICAGO, ILL., 19 South La Salle Street
SAN FRANCISCO, CAL., 213 Minna Street
CLEVELAND, OHIO, 750 Prospect Avenue

Products

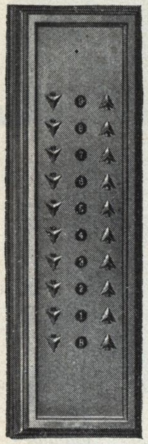
Graham & Norton Flashlight Elevator Signals.

Reliance and Diamond Ball Bearing Elevator Door Hangers; Norton Elevator Door Closer and Interlock; Norton Pneumatic Door Operator and Interlock; Graham & Norton Bar Interlock.

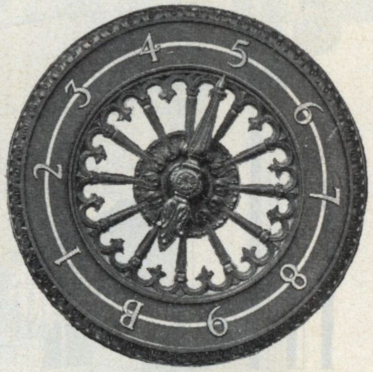
Flashlight Elevator Signals

We now offer a complete line of elevator signals and indicators. In refinement of design and high quality throughout, this equipment is a marked advance over any other that has heretofore been obtainable. Instant recognition of their superiority by leading architects and engineers has resulted in the adoption of our elevator signals in the most prominent buildings throughout the country.

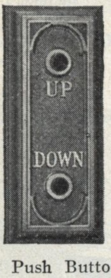
Our engineers, who are pioneers in the elevator signal industry, are at your service in the preparation of signal specifications.



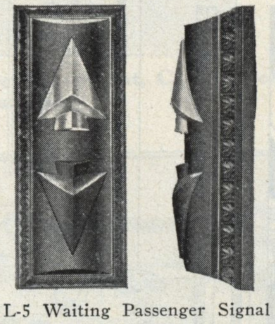
A-2 Annunciator



D-8 Mechanical Indicator



B-4 Push Button



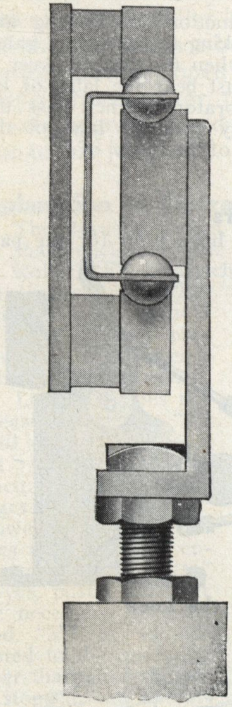
L-5 Waiting Passenger Signal

A Few Standard Elevator Signal Fixtures

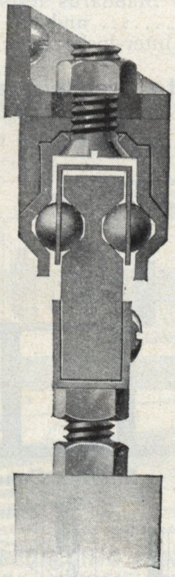
Reliance and Diamond Elevator Door Hangers

For more than twenty years the Reliance has been universally recognized as the standard hanger for elevator doors. The Diamond hanger has also many adherents.

The primary reason for this success is the correct underlying principle of design. But it also largely has been due to the fact that both hangers are manufactured by the only concern (the Reliance Ball Bearing Door Hanger Company) engaged exclusively in the production of hangers and locks for elevators doors.



Reliance Hanger
One-half actual size



Diamond Hanger
One-half actual size

It is not sufficient for an elevator door merely to be hung on a good, rugged bearing, under the assumption that the thrust always is a downward one. If the door is hand-operated, the impact against the bumpers cocks it and produces a severe upward thrust. If power-operated, the thrust during a portion of the opening movement is entirely an upward one.

Note that in all types of Reliance and Diamond Hangers there are two bearings, both exactly alike, one for the upward and the other for the downward pressure of the door.

Reliance Hanger—The Reliance Hanger is made of special analysis, high carbon steel. The ball races are machine-milled (not rolled) and the ½-in. steel balls are carefully selected to insure uniformity of diameter.

The Reliance is by far the heaviest hanger made and will outlast any other on the market.

Diamond Hanger—The track is of heavy drawn metal and the sliding member carrying the door is of special analysis, high carbon steel with machine-milled ball races.

The track and carrying bar are accurately hand-fitted, so that the ½-in. balls hold the carrying bar rigidly in line without any lost motion.

As illustrated, the Diamond Hanger requires very little space for its installation.

Continued on next page

General—Hangers should not be fastened by expansion bolts to brick, terra cotta, nor concrete, but should have a steel or wood backing. The doors should be equipped with rubber bumpers, as the hanger is not designed to act as a bumper.

Made for All Types of Doors—Reliance and Diamond Hangers are made for all types of doors.

Undivided Responsibility—As we are the sole distributers of Reliance and Diamond Hangers, architects will be sure of undivided responsibility for perfect door operation by specifying either of these hangers in connection with Norton Door Closers and Norton Pneumatic Door Operators.

Catalogues—Catalogues and full size details gladly furnished on request.

Norton Door Closer and Interlock

The Norton Door Closer automatically closes the door, silently locks it, and prevents all noise due to slamming.

The Norton Interlock prevents movement of the elevator while a door is open.

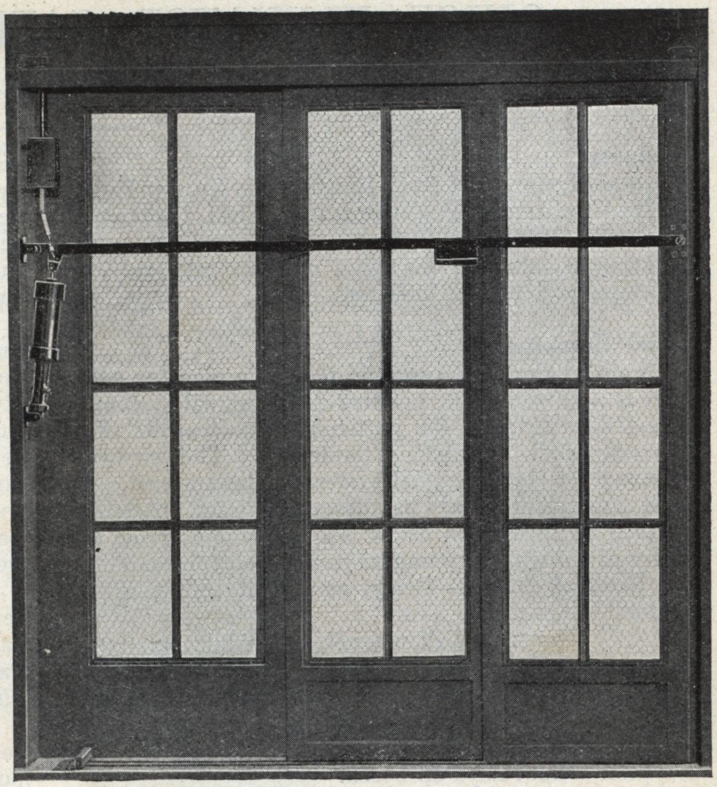
The illustration shows the Norton Door Closer and Interlock as applied to two-speed doors.

It will be noted that the Norton arms of themselves impart the 2:1 motion and also form a perfect, noiseless lock.

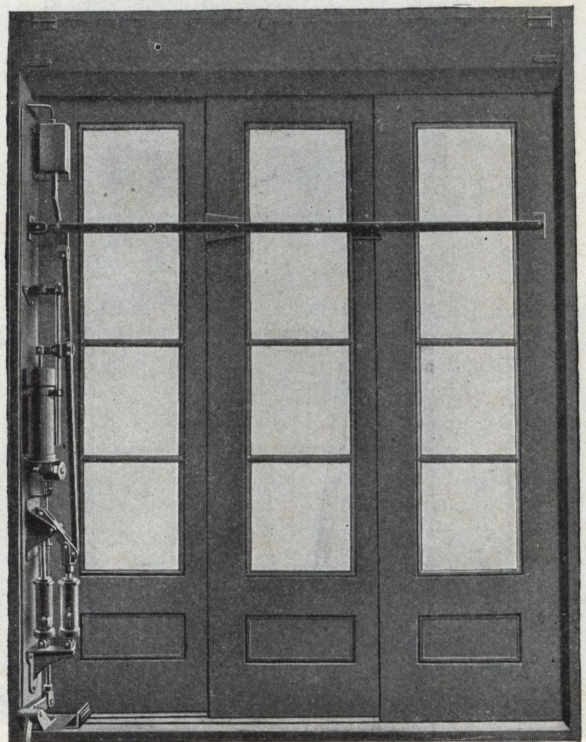
No gearing therefore is required in the hanger and no other lock is needed. The elimination of these two items largely offsets the cost of this type of Norton Door Closer.

During the past thirteen years more Norton Door Closers have been installed than all competitive devices combined, and the total now in service or contracted for exceeds 65,000.

Insurance—In recognition of the safety afforded by properly designed Interlocks the insurance companies grant a rate reduction of 10% on public liability policies covering elevators equipped with interlocks of our manufacture.



Norton Door Closer and Interlock



Norton Pneumatic Door Operator and Interlock

Norton Pneumatic Door Operator

Where extreme speed and ease of elevator door operation are desired, or where large doors make hand operation difficult or impracticable, the Norton Pneumatic Door Operator is recommended. This device embodies the utmost refinement of this type of apparatus.

Movement of the door is controlled by a small switch conveniently located in the elevator cab.

When the Norton Pneumatic Door Operator is installed in connection with self-leveling elevators, the door control is entirely automatic.

The door opens automatically while the elevator is leveling, and is closed by the first movement of the car switch in the normal act of starting the elevator. By this elimination of the human element, speed and efficiency of service are increased at least 20%.

Any reasonable door speed can be obtained. The opening and closing speeds are independently adjustable. It is advisable that the former be 25% to 50% greater than the latter.

When the car gate also is equipped with the Norton Pneumatic Operator, the corridor door and car gate move simultaneously.

The door may be manually operated if it is desired to shut down the compressor at night or on holidays. Although manually opened, the corridor door is self-closing.

Graham & Norton Bar Interlock

For installations in which safety is the sole consideration and where quiet automatic closing operation is not essential, such as in connection with freight elevators, the Graham & Norton Bar Interlock is recommended.

The illustrations on this page show the devices as applied to two-speed doors. They are, however, applicable to every other type of sliding door.

Catalogues furnished on request.

QUICK ELEVATOR SAFETY COMPANY, INC.

DALLAS, TEX.

Products

Manufacturers of FULL FLASHLIGHT SIGNAL EQUIPMENT; FLASHLIGHT ANNUNCIATORS, DIAL INDICATORS, STARTER'S CALL-BACK SYSTEM, etc.; DOOR CLOSERS and INTERLOCKS, also various types of Interlocks only, for passenger and freight elevators.

Signal Equipment

One of the most essential things in elevator equipment is a correct type, positive acting signal system, so arranged as to meet the particular requirements of all different kinds of business buildings. The important feature of a correct signal system is the automatic machine equipment which handles the system. Attention is called to illustration below, showing the extreme simplicity of design of commutator and control board.

Control Board—Relay, as shown below, acts as follows:

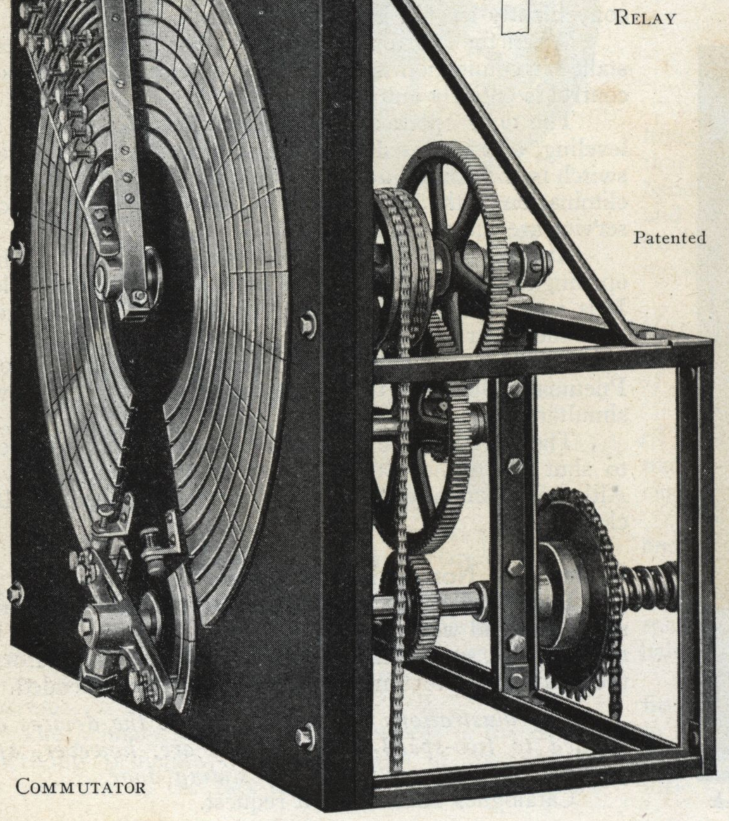
"A" represents hall magnet, and while hall button is being pushed, is energized, attracting lock arm "C" and dropping contact arm "D," forming contact at tungsten points "E" and "F," closing circuit for hall and pilot light for floor from which button has been pushed. This is typical of all relays on board.

An adjustable transformer, working off of lighting circuit, is used for reducing current to 18 volts for entire system, which entirely eliminates all burning across floor segments on commutator, making it possible for maintenance man to handle any part of system without cutting out signals, and reduces current consumption to a minimum.

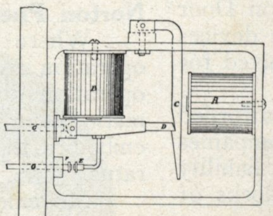
Commutator—This is the individual unit which automatically controls lighting for each elevator. Note rotary motion of both main switch and reversing switch. Regardless of years of service, any wear that might have taken place on contact segment can not in any way interfere with either main switch or reversing switch. A complete reverse of system can be had within twelve inches travel of car, thereby giving assurance of not passing up passengers on next to top and bottom floors.

Accessories—Mechanical dial indicators, hall lanterns, push button cases, pilot cases, flashlight annunciator cases and starters' call-back push button sets furnished in various designs and finishes to be selected by architects and owners.

We also manufacture a special flashlight mechanical reset annunciator for use in small buildings or in any size building where owner does not care to go to the expense of full automatic equipment.

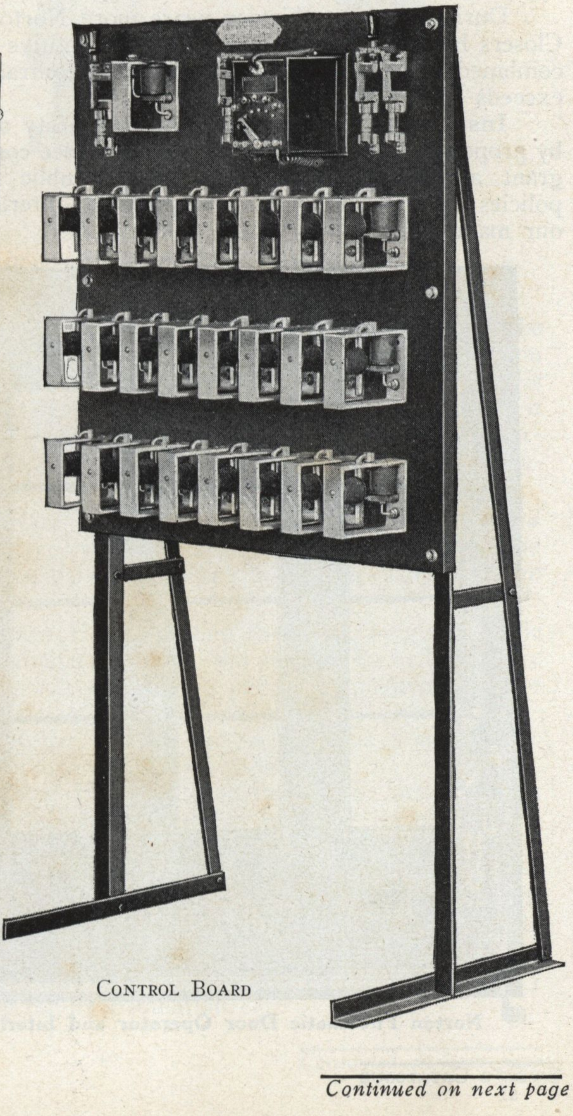


COMMUTATOR



RELAY

Patented



CONTROL BOARD

Continued on next page

Door Closers and Interlocks

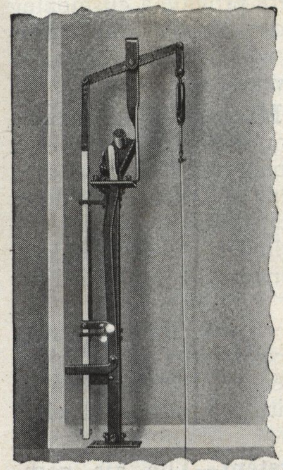
The Quick door closer and interlock is the last word in simplicity, because all doors in each hatchway are controlled by one master switch. This eliminates hundreds of working parts over types using switch at each door, thereby minimizing maintenance expense, and does away with annoyance resulting from bad contacts.

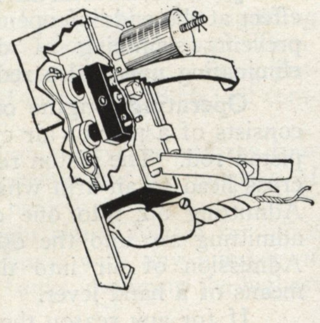
Safety—Every safety feature pertaining to door equipment is covered in this device. Door is always locked in emergency notch when master switch closes, forming contact. This automatically eliminates the two forms of accidents that commonly occur: that of falling into the open hatch, or being caught between car and door frame, due to car starting before door is closed, which, according to insurance statistics, constitute 84 per cent of the accidents on elevators.

Design—This equipment is designed with consideration for neatness of appearance, ease of operation and accuracy, and is not affected by door adjustment on pennant bolts.

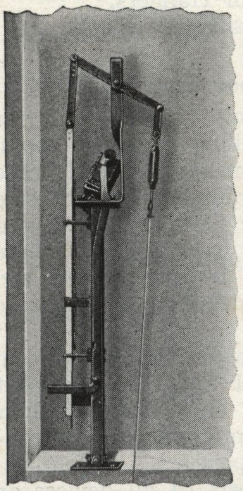
Less space is required for installation than other types, only 2½ inches back of door and 1¼ inch from face of door to sill nosing. Equipped with oil check, making it impossible for door to slam. Will close ordinary set of two-thirds type doors in 2½ to 3 seconds.

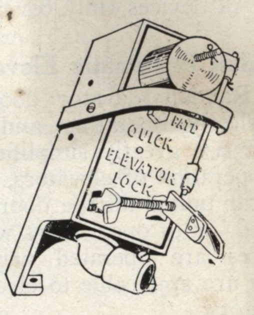
We manufacture special type of door closers and interlocks for push button control elevators, using master switch to handle all doors and doing away with ordinary contact and lock commonly used at each opening, thereby eliminating about 90 per cent of the trouble common to this type of elevator.



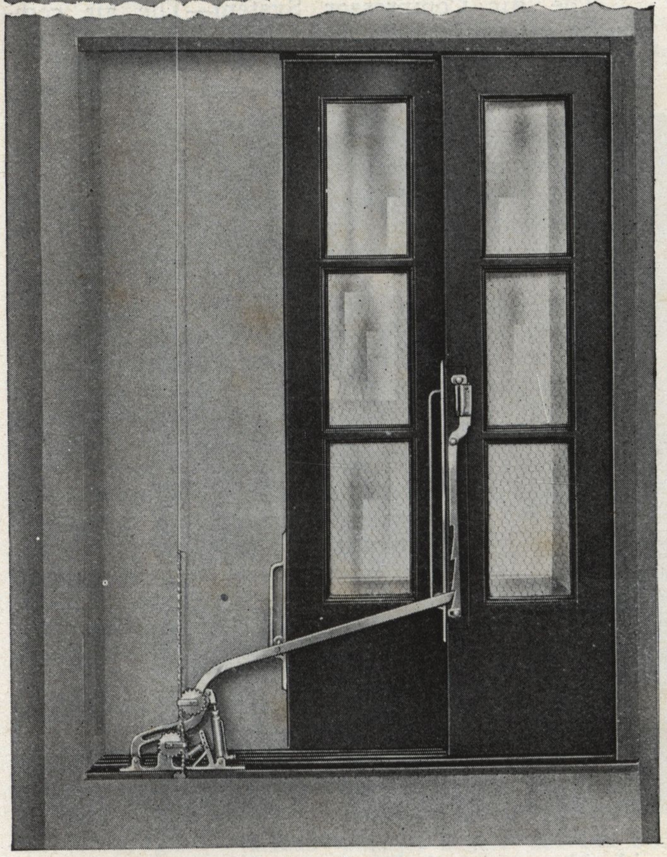


Breakaway Showing Detail Construction of "Master Switch"

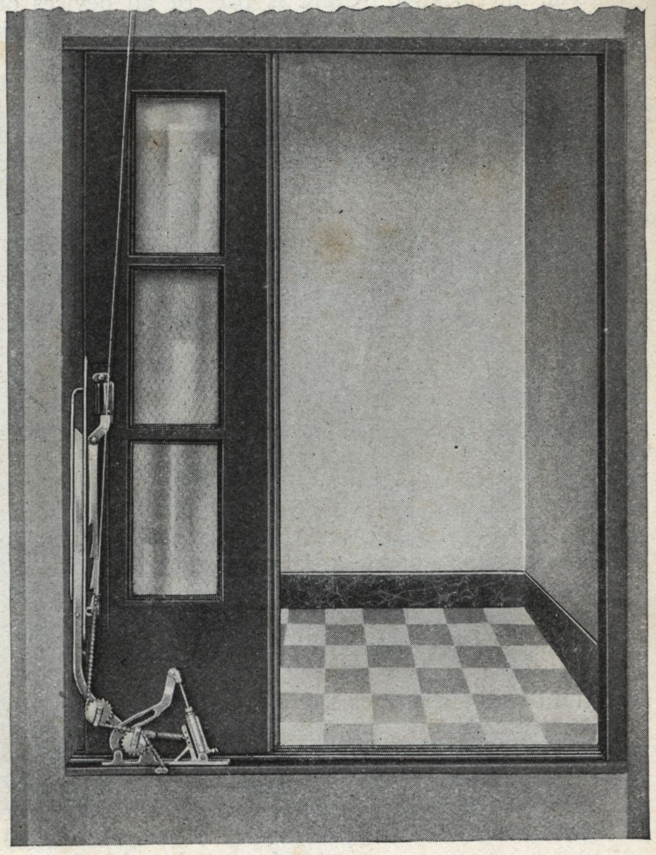




Enlarged Cut of "Master Switch" Showing Angle from Which It Operates, Assuring Perfect Contact



Door Closed



Door Open

QUICK DOOR CLOSER

RANDALL CONTROL & HYDROMETRIC CORPORATION

Manufacturers of Elevator Door Operators, Locks and Signal Systems

1014 East 9th Street
LOS ANGELES, CAL.

Products

Pneumatic Elevator Door Operators.

Automatic Door Locks for push button Electric Elevators.

A complete line of Elevator Signaling Equipments.

Also Manually Operated Elevator Door Locks; Ball Bearing Elevator Door Hangers.

All devices fully covered by patents.

WITH A TWIST OF THE WRIST
CONTROL & SAFETY
TRADE-MARK

Randall Pneumatic Elevator Door Controls

Randall elevator door controls are designed for completely operating and controlling elevator doors. Their use greatly simplifies and makes absolutely safe the operation of elevators, it being impossible to operate the car unless all the doors in the shaft are closed and locked, or to open doors while car is in motion. These devices are operated principally by compressed air. They are applicable to electric, hydraulic and automatic elevators.

The pneumatic control mechanism is mounted on top of the car or over each door and the equipment opens and closes both car gate and shaftway door simultaneously, and mechanically interlocks the car control while either gate or door is open.

The interlocking feature is part of all devices or systems manufactured by us and no other device, lock or interlock is required.

The control consists of three principal parts: A pair of air cylinders or an air machine for opening and closing the doors, a strap lock for locking the doors, and a master switch which breaks the operating circuit when any door is opened and closes circuit again when all doors are closed and locked.

These devices are all operated by a hand lever within the car, it being unnecessary for the operator to change position.

Controls are made for two types of installations: "Multiple Engine" type with one air machine for each door or set of doors, and "Single Engine" type with air machine on the elevator car.

Materials and Workmanship—All equipment is constructed of the best materials obtainable. All working parts are of case hardened steel. Tubing and valves are of the highest grade bronze. Durability has been secured in every detail, and high grade workmanship and construction insure satisfactory operation, actual and dependable safety.

Advantages—***Safety***—Randall controls give absolute elevator safety. Doors are securely locked from the shaft side. They can not be left open carelessly since all doors must be closed and locked before the car can be operated. This reduces accidents to a minimum.

Simplicity of Operation—A hand lever completely controls the operation of the door. At no time during the operation of the car is it necessary for the operator to reach in front of the passengers. This gives added convenience to passengers, and gives maximum passenger space.

Car gates are operated simultaneously with hatchway doors.

Speed of Operation—Randall controls open the doors to full opening and close them very rapidly. This saves time in starting and stopping and increases speed of operation. Efficiency of elevator service is increased by from 10% to 20% over hand operated doors.

Quietness—The air cylinders provide a cushioning effect at the ends of opening and closing strokes. This prevents slamming of doors, which in addition to eliminating noise, also reduces wear.

Operating Engine or Air Machine—This device consists of a pair of air cylinders, one at each end of a piston rod. The piston rod is connected by means of a cross head to an arm which opens and closes the door. Admitting air into one cylinder opens the door and admitting air into the other cylinder closes the door. Admission of air into the cylinders is controlled by means of a hand lever.

If for any reason the air is cut off, the doors may be operated by hand, without excessive friction, since the piston heads in each cylinder are of the loose or floating type and do not move with the piston rod when the doors are hand operated.

The Air Compressor System—The air compressor system furnished with Randall pneumatic elevator door controls includes standard electric air compressor of the proper size and latest improved type, together with air receivers or reservoirs for high and low pressure, piping, and all necessary devices for automatically controlling the compressor.

Strap Lock and Master Switch—The elevator door is locked by means of a latch attached to the inside of the shaft above the door. A lever in the car operates a cam or shoe which is mounted on the top of the car. This shoe engages an arm which lifts the latch. The same movement also breaks the circuit at the master switch which shuts off the car control circuit, thus holding the car in position. When the door is closed the latch drops back into place, locking the door and closing the circuit. The elevator car may then be operated.

Only one master switch is required for each elevator shaft instead of one switch at each door as in other systems. The master switch is operated by a spring steel tape running through each door lock and is counterbalanced. When any door latch is lifted the master switch is opened. Dropping the latch reverses the operation and throws the switch into contact position. The master switch may be located at any convenient place in the shaft.

An emergency switch is provided in car for bridging master switch in emergencies.

This equipment is exceptionally rigid. There are no springs in the lock, and it requires no lubrication nor attention.

This lock and master switch are designed for use with either pneumatically or manually controlled elevator doors.

Continued on next pag

Randall Pneumatic Elevator Door Control, "Multiple Engine" Type

In this type of control, an air machine is mounted over each door or set of doors. A master switch is fitted in each shaft.

With full pneumatic control, turning of the hand lever opens valve underneath car. This operates a lever at top of car, which admits air into opening cylinder, which opens door. Reversing hand lever closes and locks door.

This device is very compact, the space required above door for air machine being 17 in. high by 4 in. deep by about 5 ft. long; 1 in. is required between car and shaft for door opening levers.

Randall Flashlight Elevator Signal Systems

Designed to meet every requirement of building construction. The following special outlines suggest, in part, the completeness of the Randall elevator signaling devices, namely: Annunciators, both target and illuminating types; push button plates; up-down waiting passenger lanterns; electrical and mechanical dials; all complete in every detail.

The Randall elevator signaling system utilizes four classifications of these equipments for the purpose of estimating installation work, namely:

Class "A"—Full flashlight signal system for office and other heavy traffic buildings, with any number of elevators in single or several banks, requiring the highest type of equipment.

Class "B"—Hotel and apartment houses, requiring elevator flashlight annunciator systems.

Class "C"—Department store system, consisting of up-down waiting passenger lights and main floor electrical dials.

Class "D"—Loft buildings and miscellaneous low type structures, requiring annunciators and varied additional equipment.

References

Randall elevator appliances are in use in all parts of the country. A list of buildings in your vicinity, equipped with Randall devices, will be sent on request.

Amongst the many prominent buildings where they have been installed are the following:

Los Angeles, Cal.

National City Bank Building
Transportation Building
Pacific Electric Building
Pacific Finance Building
New Hall of Justice
Rosslyn Hotel
Petroleum Securities Building
Mercantile Arcade

Philadelphia, Pa.

Wanamaker Store
Drexel Building

Fresno, Cal.

Mattei Building
Patterson Building

New York, N. Y.

Blumstein Department Store
Pershing Square Building

Portland, Ore.

Corbett Building

Richmond, Va.

Miller-Rhodes Store

Long Beach, Cal.

Virginia Hotel
City Hall
Pacific-Southwest Trust & Savings Bank

Hollywood, Cal.

Taft Building
Guaranty Building

San Francisco, Cal.

St. Francis Hotel
New City Hall
Insurance Exchange
New Standard Oil Building

Sacramento, Cal.

State Capitol Buildings
Weinstock-Lubin Building

Oakland, Cal.

Oakland City Hall
H. C. Capwell Co.

Pasadena, Cal.

Citizens Savings Bank Building

Youngstown, Ohio

Stambaugh Building

San Diego, Cal.

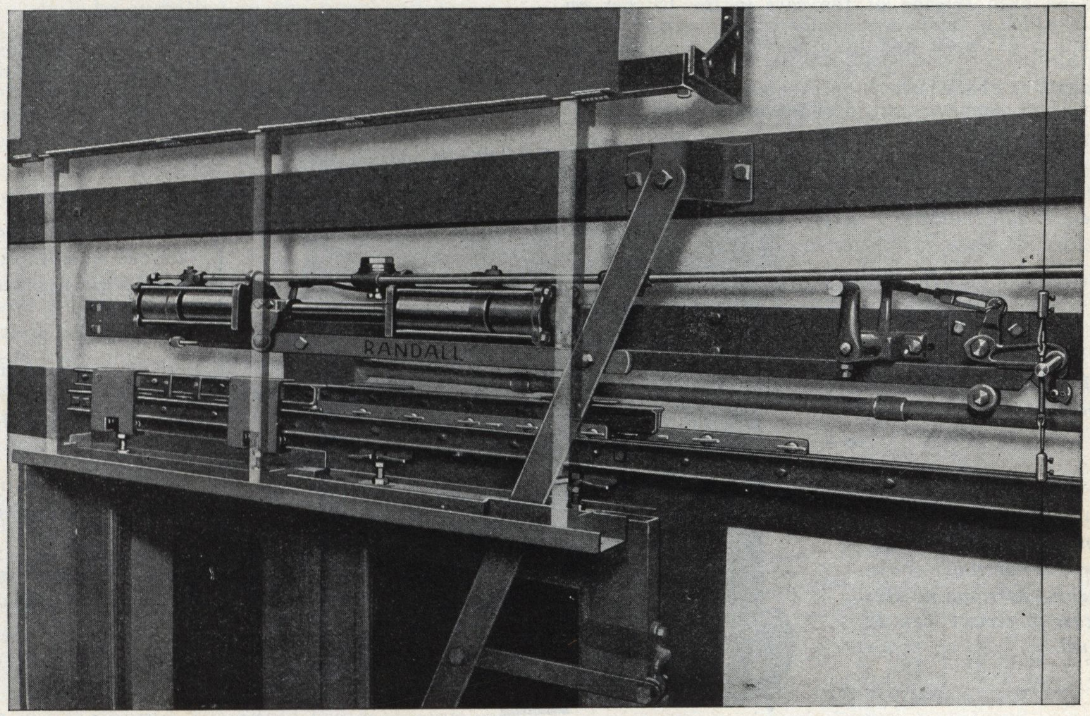
Commonwealth Building
Nathan Watts Building
Marston Company Department Store

Walla Walla, Wash.

Baker Bank Building

Kansas City, Mo.

Westport Junior High School



Randall "Multiple Engine" Elevator Door Control, Applied to Double Sliding Doors

BOARDMAN ELEVATOR CONTROL

TELEPHONE
RANDOLPH 3400

140 South Dearborn St.
CHICAGO, ILL.
BRANCH OFFICE, NEW YORK, N. Y.

Product

A SYSTEM for CONTROLLING the OPERATION of the ELEVATORS, providing a combination of (1) a Dispatching Light for each car at both terminals (within the car itself); (2) a Schedule Indicator for the Main Floor Terminal; (3) a Starter's Call Back System, and (4) a Signal at some predetermined point in mid-travel down (given to the operator within the car) which will indicate to him whether or not he is on schedule.

Description of Operation

The Boardman System is very flexible in operation. Provision is made in the master control unit, as shown in the illustration below, to meet the varying conditions of traffic. All operations are simple and are directly under the control of the starter or relief operator. This unit should be placed in the lobby or convenient thereto.

The diagram shows most of this clearly.

The plugs provided are each wired to a car and numbered according to the number of the car in the bank of elevators. The jacks are in order of dispatching cars. The rotary switch setting equally divides the interval for the number of cars in service. Thus any number of cars can be placed in service, in any order, still dispatching on equal intervals, keeping the system in operation.

The speed of the rotary switch can be varied by changing the position of its friction drive disc on the shaft drive wheel. Also, a quadrant is provided for allowing a longer time for up or down travel following the heaviest building traffic. Convenient scales are provided making this setting simple.

The fingers controlling the third light can be set to give the operator a signal at a predetermined point in mid-travel down to indicate to the operator whether or not he is on schedule. This point can be varied to suit the speed of the operation.

The two important features—(1) allowing for an unequal interval for up and down trips and (2) the warning or block light—insure an even spacing of the cars in the hatches on time intervals, which is fundamentally the correct way to insure even distribution of work and even service throughout the building.

The starter's call back buttons operate on top floor terminal light and give him complete control of elevators.

Material

The material used in the construction of the master control, car fixtures, installation, etc. is the best that can be obtained. Every part has been carefully studied and present manufacturing facilities have made it possible to make each one standard in every way. The motor is of special design and is constructed to allow continuous running for the periods necessary to operate a device of this type. All operations of service and care have been made as simple as possible.

Installation

The master control unit should be placed in the lobby or convenient thereto with an extension indicator, containing the schedule, indicator lights and the starter's call back buttons in the lobby.

Current for operating the system is taken from the lighting circuit of the building, provision being made for the voltage that obtains and for alternating or direct current. Lamps are generally 110-volt. Three-ampere fuses are used. The Boardman circuit is not connected with the circuits of the elevator equipment or floor signals.

The box containing the master control unit measures 23⅜x20¾ in. for single schedule and 23⅜x27¾ in. for double schedule (where express and local cars are handled from the same unit.) This box can be surface, semiflush or flush type. If flush type is ordered, 6½ in. must be available for setting the box in the wall. In all cases, the finish of the front and the part of the box showing is made to conform with the finish in the lobby.

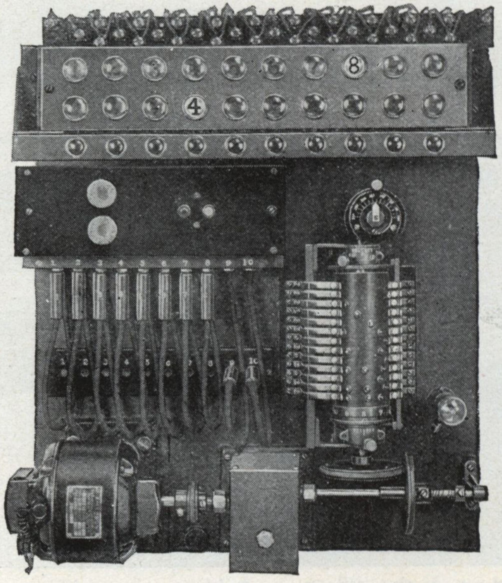
Car fixtures may also be surface, semiflush or flush type. Dimensions may vary here, but the usual type is 3½x5 in. For this size, 2-in. depth must be available to install flush type or 1½ in. for an excellent type of semiflush fixture. In all cases, covers conform with finish of cab.

Extension indicators will vary in size according to the number of cars in the building, but 4 in. should be allowed for depth if flush type is desired.

Stacks, wiring, conduit, clips, etc. all conform with existing laws and regulations. Blue prints on request.

Efficient, Schedule Operation

The manufacturers and distributers of this system supply all necessary material under contract, install the equipment, plot schedules of operation and place them in effect under the direction of competent service engineers.



2. The Schedule Indicator

4. Starter's Call Back Buttons

6. Jacks--numbered from 1 up in order of dispatching cars

8. Plugs---one for each car, numbered as cars are numbered. Thus order of dispatching cars and number of cars in service can be varied.

1. Graduated scale for varying interval. Numbers indicate round trip time in seconds.

3. Scale for varying time of Up and Down Trips---following heavy traffic.

5. Rotary Switch setting for number of cars in service.

7. Scale for setting position of Block Light Fingers.

The Master Control—Model 8 Single Schedule

DOUBLE SCHEDULE—For double schedule, necessary in building where both local and express service is used, another rotary switch is installed to the right of the one shown—operated from the same drive shaft—but with adjustments entirely independent. Thus each bank may be operated on the schedule suited to particular traffic conditions

ELEVATOR SUPPLIES COMPANY, INC.

Manufacturers of Elevator Accessories

MAIN OFFICE AND WORKS
HOBOKEN, N. J.

BRANCH OFFICES

ATLANTA, GA., 119 Spring Street
CHICAGO, ILL., 111 So. Jefferson Street
CLEVELAND, OHIO, 1637 Superior Avenue
DALLAS, TEX., Santa Fe Building
LOS ANGELES, CAL., 1120 South Hope Street
PHILADELPHIA, PA., 1714 Ludlow Street
SAN FRANCISCO, CAL., 186 Fifth Street
ST. LOUIS, MO., 301 Leather Trades Building

CANADIAN REPRESENTATIVE: Canadian Elevator Equipment Co., Ltd., TORONTO, ONT.

Products

ES Flashlight Signal Systems.
ES Locdrop Annunciators.
ES Dispatching Signal Systems.
ES Auxiliaries for Signal Systems.
ES Fireproof Steel Theater Curtains.
ES Electric Dumbwaiters.
Complete catalogues furnished on request.
For Door Equipment, see page 2583.

ES Flashlight Signal Systems

Specification Data—This signal system is recommended for buildings having groups of three or more elevators, for office buildings or other large buildings where the service is continuous and the elevators make complete trips.

The ES Full Flashlight Signal System shall consist of a single light operator's fixture in each elevator; an Up-Down Passenger Signal Lantern over each corridor door except at the terminal floors where single lanterns shall be installed; one Up-Down Push Button Box at each floor except at terminal floors where single push button boxes shall be installed, and controlling mechanism located overhead for automatic operation of signals. Duplicate transformers for low voltage current supply shall be installed in the overhead.

The operation shall be as follows: The pressure of an up or down button at any floor shall signal the operator of the first elevator approaching in the proper direction to stop. This signal shall be given by the illumination of the operator's fixture in the elevator, a floor and a half in advance of the elevator's arrival at the floor where the button is pressed. In addition to the signal given the operator, the pressure of the button shall also cause the proper globe of the passenger signal lantern to become illuminated, thus indicating to the waiting passenger which of the elevators will serve him. The signal lantern shall become illuminated approximately three floors in advance of the elevator's arrival. When the elevator leaves the floor at which the button was pressed both the passenger and operator's signal shall be automatically extinguished.

Provision for night and holiday service shall be made by placing a bell in the hatchway which by means of a switch may be put in circuit with the push buttons so that an audible signal is given when a passenger presses a button at any floor.

Each elevator shall be equipped with an ES Automatic Transfer Device to prevent cancellation of calls unless the elevator actually stops at the landing at which the signal was registered. (If an ES Automatic Transfer Device is not desired, substitute the following paragraph.)

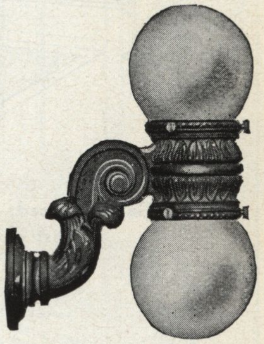
In each elevator shall be installed a transfer switch by means of which an operator may, if his car is fully loaded, transfer his signal to the next approaching elevator.

ES
PRODUCTS

Auxiliaries and Designs for Signal Systems

We manufacture many different types of designs for fixtures suitable to the character of the building for which it is to be used.

Our auxiliaries all have their particular duties to perform. Our experience covers a period of thirty-five years and our engineers will gladly consult with you to determine the best systems suited for the particular building you have in mind.



Up-Down Lantern

ES Steel Theater Curtains

ES Steel Theater Curtains are built to comply with all fire regulations. They are operated by hydraulic power.

ES Electric Dumbwaiters

ES Electric Dumbwaiters are installed to operate on any available commercial electric current. Different loads, speeds and types of push button controls are used, depending upon the class of building and the service desired. As we are one of the oldest and largest manufacturers of electric dumbwaiters in the world, the experience we have gained will be of use and will be gladly furnished you. No matter what requirements you may have in mind for a dumbwaiter, we are in a position to build it.

The increasing demand for a dependable, inexpensive dumbwaiter has resulted in the creation of the ES Type "F"-100 and Type "G"-200 dumbwaiters. These machines are built along the same lines as our larger machines but can be accommodated in very limited space.

In planning the building, if you can arrange to build the dumbwaiter hatch to conform to the sizes given below, there will be a considerable saving in the cost of the dumbwaiter.

STANDARD DUMBWAITERS TO SERVE TWO TO SIX FLOORS ONLY

Type	Load capacity, lb.	Speed, per minute	Inside hatch dimensions, inches (Must be guaranteed)	Inside car dimensions, inches			Type of car
				Width	Depth	Height	
F-100	100	100	30 x 30	21	22	30	Wood
G-200	200	100	34 x 34	25	26	36	Wood
CB-300	300	100	38 x 38	31	31	42	Steel
CB-500	500	100	43 x 43	36	36	48	Steel

Full Automatic Control furnished in each case.

Catalogue

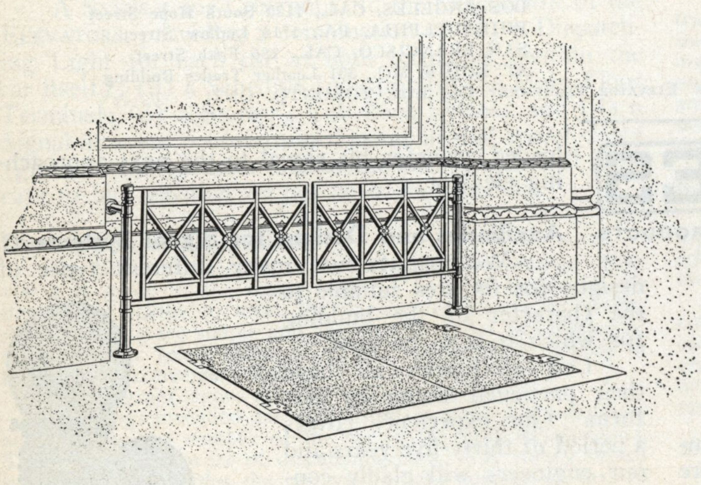
Catalogues and detailed information will be gladly furnished on request.

SHUR-LOC ELEVATOR SAFETY CO., INC.

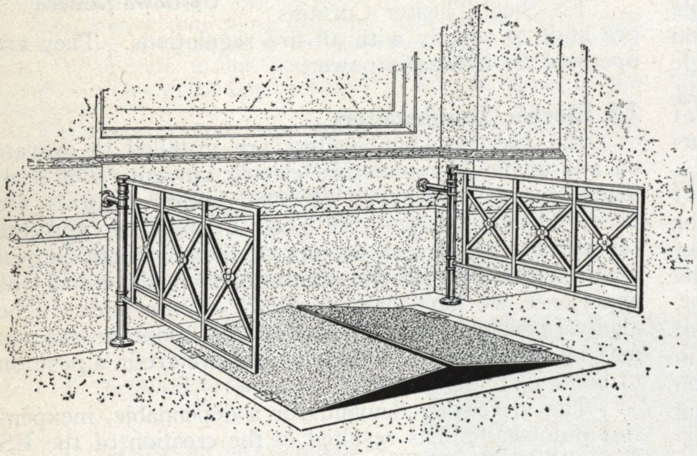
Automatic Sidewalk-Elevator Safety Gates

62 West 45th Street
NEW YORK, N. Y.

208 So. La Salle Street
CHICAGO, ILL.



Safety Gates Closed; the Covers Down; the Elevator Is at Rest at the Bottom of the Shaft



Safety Gates Swung Outward; the Covers Are Rising; the Elevator Has Started Upward

Automatic Sidewalk-Elevator Safety Gates

The gates prevent pedestrians from crossing the shaft covers while the elevator is rising. Accidents, often serious, are thus avoided. Full protection is assured without obstruction of the sidewalk.

Operation—The device consists of a pair of vertical gates which, lying flat against the building, slowly and automatically swing outward as the elevator starts to rise. Pedestrians are thus warned and restrained from walking over the covers which are later safely lifted to a vertical position by the arch-top of the elevator. After the covers are closed the safety gates slowly and automatically return to their out-of-the-way position against the building wall. The gates are operated by the motion and power of the elevator, and not by independent motor.

Complete Safety—If the gates, swinging outward, come in contact with a person standing on the covers, a slight pressure of the hand against them will prevent their further movement. The elevator will also be stopped and can not be started again until the pressure is removed.

Safety Gates for Use in Front of Low Show Windows—These gates when closed rest below the window line. As soon as the elevator starts to ascend they rise to a height of three feet and then swing outward. After the shaft covers again close they return to their former low level against the building.

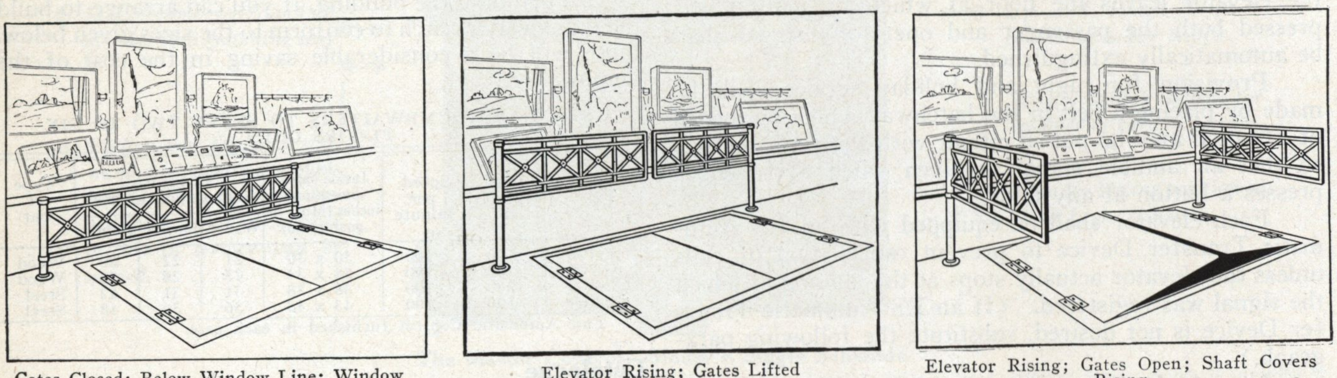
Gates of Special Design—Special gates in wrought iron or bronze furnished to conform to architects' drawings.

Estimates—Estimates and fuller information furnished on request.

Approval—These gates are approved by the Bureau of Highways, New York City, and by all accident insurance companies.

Some Late New York Installations

Equitable Trust Co.
Revillon Freres
Burroughs, Wellcome & Co.
Bank of America
Bowery Savings Bank
National Park Bank
Canadian Pacific Building
New York Daily News
Best & Co.
Berkeley Building
Metropolitan Life Insurance Co.



Gates Closed; Below Window Line; Window Unobstructed

Elevator Rising; Gates Lifted

Elevator Rising; Gates Open; Shaft Covers Rising

Safety Gates for Use in Front of Show Windows

SEDGWICK MACHINE WORKS

Manufacturers of Hand Power Dumbwaiters and Elevators

152 West 15th Street
NEW YORK, N. Y.

TELEPHONE
WATkins 9416

FACTORY
POUGHKEEPSIE, N. Y.

LOCAL DEALERS

BOSTON, MASS., The Geo. T. McLauthlin Co., 216 Fulton St.
CHICAGO, ILL., Standard Equipment Co., 549 W. Washington Blvd.
WASHINGTON, D. C., Barber & Ross, 11th & G Sts., N. W.
SAN FRANCISCO, CAL., Richard Spencer Company, 365 Market Street

Products

Hand Power Dumbwaiters and Elevators of all types and for every purpose:

Private House Dumbwaiters; Apartment House Dumbwaiters; Hospital Dumbwaiters and Elevators; Hotel and Restaurant Dumbwaiters; Library Book Lifts; Fuel Lifts; Brass Tube Dumbwaiters; High Speed, Automatic Brake, Band Brake, and Geared Dumbwaiters; Outdoor Dumbwaiters; Trunk Lifts, Invalid Elevators, Domestic Elevators, Freight Elevators, Sidewalk Elevators, Carriage Elevators, Automobile Elevators, Ash Hoists, Hatchway Hoists, Gravity Lifts, Iceless Refrigerators, etc.

Special Features

Long life, easy operation, freedom from trouble, low repair cost—all the result of superior design and principle, executed from the best of materials by skilled workmen in a factory devoted exclusively to the manufacture of hand power dumbwaiters and elevators, and equipped with special machinery for this purpose.

Quantity production on the interchangeable part system guarantees a uniformly high grade product.

Installation

Proper installation is essential to satisfactory operation. Blue prints and full directions for installing are furnished with each outfit, from which local labor may install. Or, experienced mechanics will be sent by the company, to install, on request. Customers will always secure better results by purchasing complete outfits from the company, rather than by securing part of the equipment from local sources.

Guarantee

"Sedgwick" dumbwaiter machines are guaranteed for 5 years from date of purchase and will be repaired free of charge at any time within that period if returned to the factory at Poughkeepsie, N. Y., charges prepaid.

Prices, Drawings, etc.

On the following pages are listed some of the standard Sedgwick types and sizes, the prices given being net to the consumer. Whenever further data is desired, drawings, estimates, and more complete descriptive matter will be gladly submitted.

Deliveries

Catalogue sizes are carried in stock, and shipment is made the day order is received. Special sizes require three to four days—principally to allow for proper finishing.

Sedgwick Service

Complete satisfaction depends upon the selection of dumbwaiters or elevator outfits exactly suited to the conditions and requirements of each case. Sedgwick service places at the disposal of architects and others, without charge, the benefit of specialized experience of more than 30 years. The Service Department will work with architects in deciding upon the proper dumbwaiter or elevator equipment to give specific results under specific conditions.

Special Outfits

Thousands of special drawings and designs have been developed, during a long experience for special purposes.

If these pages do not offer what is needed, consult Sedgwick service. Special constructions can be furnished on very short delivery, without sacrifice of quality and with the usual guarantee.

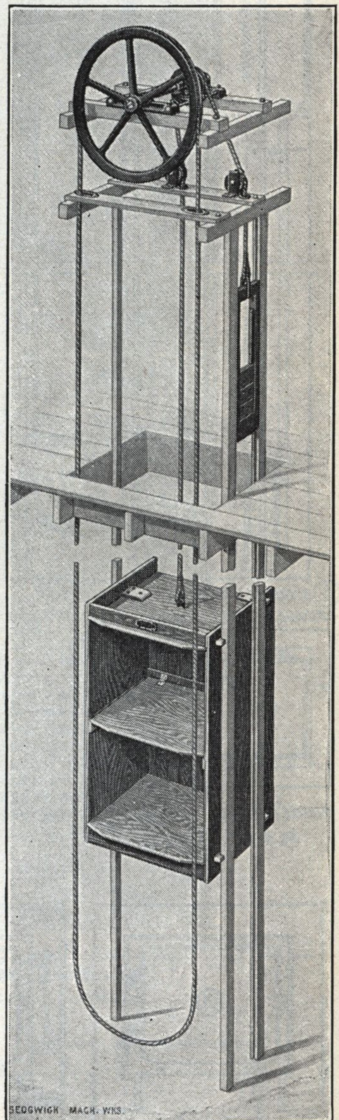

SEDGWICK MACH. WKS.

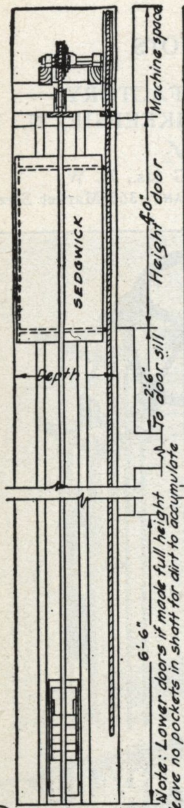
Fig. B. **"Sedgwick" Automatic Brake Dumbwaiter Erected**
Enclosure removed

Specifications

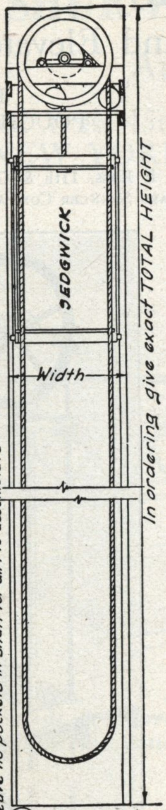
Specify as follows: "The Dumbwaiter [or Elevator] to be manufactured and installed by the Sedgwick Machine Works, 152 West 15th Street, New York, and to be suitable for average load of .... lb. and strong enough for occasional or test loads of .... lb.

Thus all contractors may figure on the same equipment, the owner gets maximum value, and the architect has the guarantee that the outfit will be satisfactory and the work properly done. If local mechanics are to install, simply omit the words "and installed."

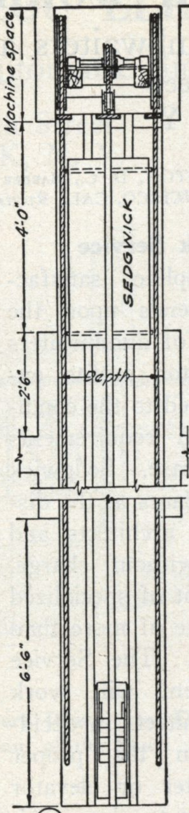
Continued on next page


Machine space
Height door 4'0"
SEDGWICK
Depth
To door sill 2'6"
6'6"
Note: Lower doors if made full height leave no pockets in shaft for dirt to accumulate

① SIDE ELEVATION. SINGLE FACE D.W.



② FRONT ELEVATION



③ SIDE ELEVATION. DOUBLE FACE D.W.

GENERAL NOTES

Always specify usual and heaviest load.

Doors for dumb waiter shafts should be as wide as the car desired and 4'0" high, located 2'6" above floor, making top of door 6'6" above floor thus permitting operator a long pull on the hand rope

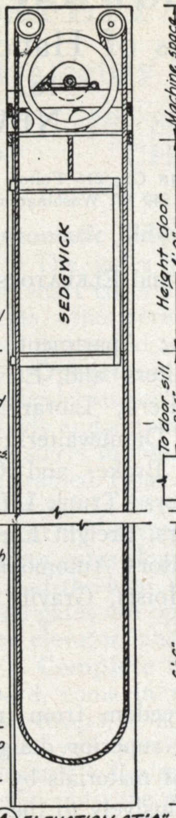
Machine space above top door should be 2'0" to 3'6" depending on size and type of outfit desired. A door or panel at top for access to the machine should be provided.

Single face dumb waiter cars are carried in stock in catalogue sizes with one hinged shelf or two solid shelves. Double face cars with two solid shelves

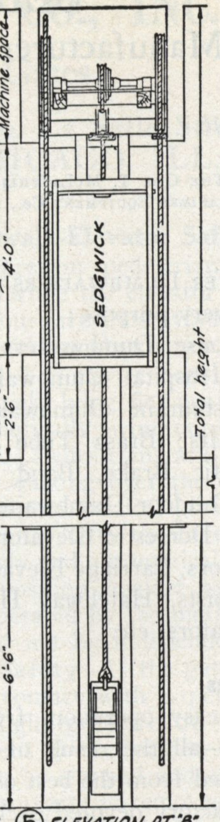
Unless otherwise ordered single face cars are furnished with one hinged shelf and double face cars with two solid shelves.

Dumb waiter guide runs both for car and weight are always fastened with wood screws: Never use nails for this purpose

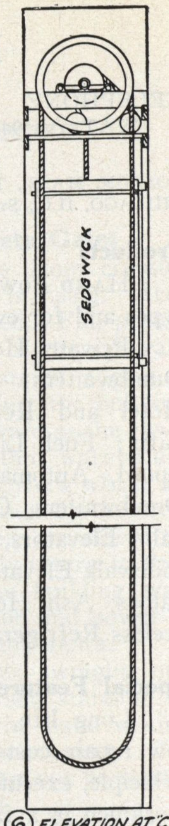
At least one door opening sufficiently large to admit car into well must always be provided until after outfit is installed



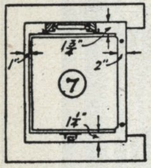
④ ELEVATION AT "A" CORNER POST D.W.



⑤ ELEVATION AT "B" CORNER POST D.W.



⑥ ELEVATION AT "C" CORNER POST D.W.

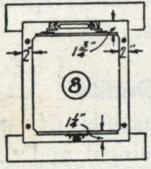


SINGLE FACE PLAN.

DESIGN NOTE:

Wherever possible dumb waiter shafts should be designed either single face as No. 1, 2 & 7 or double face as No. 2, 3 & 8 to insure the utmost satisfaction.

No. 2 above shows the front elevation of either single or double face shaft.



DOUBLE FACE PLAN.

DESIGN NOTE

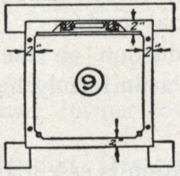
Where absolutely necessary to have door openings in adjacent sides of well, locate and identify each door and specify door chiefly used.

Corner post dumb-waiter, with double face machine can be operated in both directions from all doors by reversing one hand rope as shown in No. 4, 5, 6, & 9.

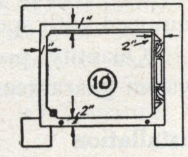
Corner post dumb waiter, single face machine shown No. 6 & 10 can be operated in both directions from front only.

Specify right or left for side door: Dumb waiter may be conveniently lowered from the side door.

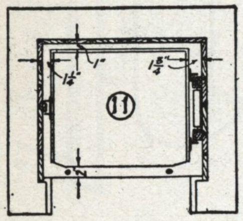
It is much better to arrange the outfit either single face as 1 & 7 or double face as 3 & 8 if possible



CORNER POST PLAN. OPERATED AT THREE SIDES



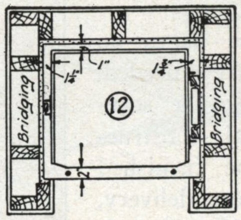
CORNER POST PLAN. OPERATED FROM ONE FRONT



PLAN. CEILED WELL

Where well is sheathed inside with boards the guide runs are fastened direct to this sheathing with wood screws.

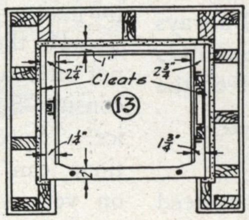
Clear inside dimensions of well are 3" larger than outside dimensions of car.



PLAN. PLASTERED WELL

Where well is plastered inside, the vertical studs are almost never located exactly where required for the guide runs; therefore it is advisable to have horizontal bridging or cats in both sides of the enclosure 30" on centers, to which guide runs are secured by long screws passing through lath and plaster.

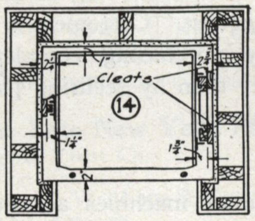
Clear inside dimensions of shaft are 3" larger than outside dimensions of the car.



PLAN. PLASTERED WELL

Where horizontal bridging as shown on plan No. 12 has not been provided it is necessary to put horizontal cleats on the face of the plaster 30" on centers to which guide runs are fastened by means of wood screws

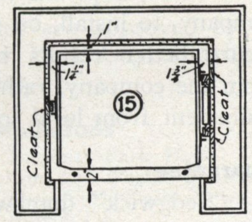
Allowing for 1" cleats on each side, the outside width of car will be 5" less than net inside width of the well 3" being allowed for the guide runs, counterweight, clearance etc



PLAN. PLASTERED WELL

Horizontal cleats as shown in plan No. 13 are frequently objectionable because they make little shelves on which dust collects This objection is overcome where it is possible to secure vertical cleating back of the guide runs as shown in plan No. 14.

Allowing for 1" cleats on each side, the outside width of car will be 5" less than net inside width of well: 3" being taken for the guide runs, weights, clearance etc



PLAN. FIRE PROOF WELL

In fire proof wells cleating may be put in horizontally as shown in plan No. 13 or vertically as shown in plan No. 14. The latter is preferable where the construction permits the firm fastening of the vertical cleating.

Where cleating is put in before well is plastered inside, the plaster may be brought flush with face of cleating as shown in plan No. 15 above.

The above show various Single Face Dumb Waiter enclosures, having all door openings in front. The car in a single face well is three inches less in depth than the depth of the well from the front to the rear. In Double Face wells, construction and arrangement are the same except that an extra inch is required between the fronts for the second hand rope. In Double Face wells therefore the car is four inches less in depth than the net inside measurement of the well from front to front

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Dumbwaiter Service Sheet

Continued on next page

Light Dumbwaiters (Figs. A and B)

The word "light" is used in contradistinction to the "geared" type described later. The two light dumbwaiter types here described are the ones most largely used for average service, where usual loads are less than 25 lbs.

The automatic brake dumbwaiter is for general work in private houses. The load can not run down, but is automatically held by the machine itself without any check or brake line.

The band brake dumbwaiter is for high wells, as in factories, apartments, stores, etc., where a harder service is imposed, or greater speed is desired.

Complete outfits include machine on platform, car, adjustable counterweight, guide runs for car and weight, and ropes for total height of 20 ft. over all, f. o. b. Poughkeepsie, N. Y. For extra height, see Table below.

"SEDGWICK" IMPROVED DUMBWAITER OUTFITS
(FIGS. A AND B)

No.	Size of car (outside), in.*	Size of ceiled well (inside), in.*	Shipping wt., lbs.	Prices of single face outfits			Prices of double face outfits*	
				"Automatic Brake"	"Band Brake"	Add for extra height, per ft.	Add for double face	Add for extra height, per ft.
	† ‡	† ‡						
1	20x16	23x19	350	$ 80.00	$100.00	$0.75	$15.00	$1.00
2	24x20	27x23	400	100.00	120.00	.80	15.00	1.05
3	28x24	31x27	450	120.00	140.00	.85	15.00	1.10
4	34x30	37x33	550	140.00	160.00	.90	15.00	1.15

*See note under table below; also under heading "Dumbwaiter Cars."
†Width from right to left. ‡Depth from front to rear.

Geared Dumbwaiters

These are intended particularly for locations where the service is heavier than in the average private house, such as hospitals, hotels, restaurants, factories and commercial establishments where the usual load will exceed 25 lbs.

They are built in two types—the automatic brake and the band brake—and carried in stock in the sizes listed.

Complete outfits include machine on platform, car, adjustable counterweight, guide runs for car and weight, and ropes and cable for total height of 20 ft. over all, f. o. b. Poughkeepsie, N. Y.

"SEDGWICK" GEARED DUMBWAITER OUTFITS

No.	Size of car (outside), in.*	Size of ceiled well (inside), in.*	Shipping wt., lb.	Price of single face outfits		Price of double face outfits*	
				"Automatic Brake" or "Band Brake"	Add for extra height, per ft.	Add for double face	Add for extra height, per ft.
	† ‡	† ‡					
1	20 x 16	23 x 19	400	$140.00	$ 1.00	$15.00	$1.40
2	24 x 20	27 x 23	450	160.00	1.10	15.00	1.45
3	28 x 24	31 x 27	500	180.00	1.20	15.00	1.50
4	34 x 30	37 x 33	550	200.00	1.30	15.00	1.55

*Double face outfits require an extra inch of space fron. front to front.
†Width from right to left. ‡Depth from front to rear.

No extra charge for outfits of different sizes and smaller dimensions. Price of special sizes is that of the regular size, out of which the special size could be made.

Inside dimensions of ceiled well are specified, as the guide runs may be screwed direct to the ceiling boards. If the shaft be fireproof or lathed and plastered inside, grounds or cleats must be provided, to which the guide runs may be screwed.

If these grounds or cleats are not provided in the walls and must be put on the face of the plaster, add 2 in. to the inside finished width of the well for this cleating.

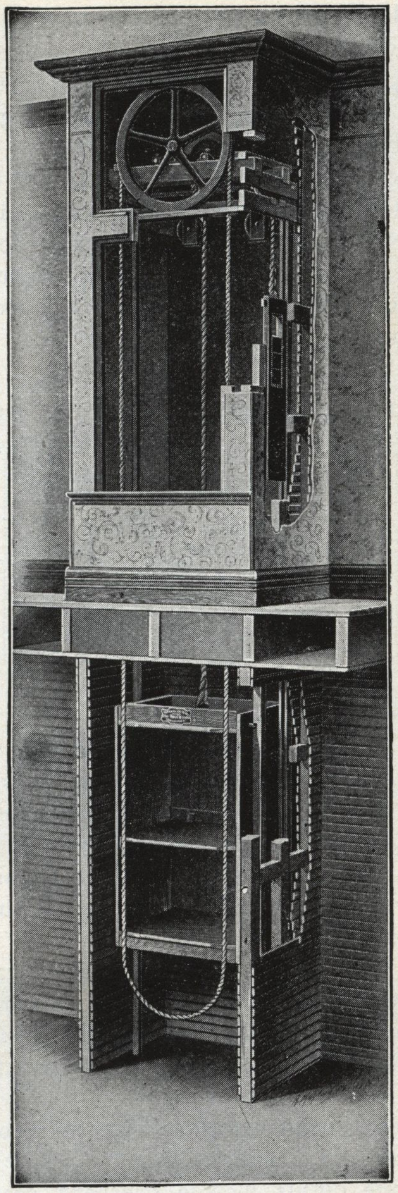
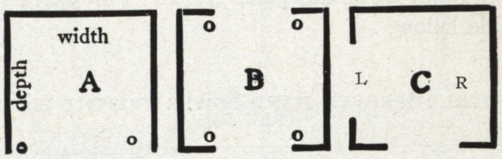


Fig. A. "Sedgwick" Automatic Brake Dumbwaiter Erected in Plastered Shaft



Floor Plans of Dumbwaiters

A—Open at front on all floors; the best arrangement where it can be used
B—Requires a double-face outfit to operate from both fronts
C—Open at front and right or left; say which. This arrangement is to be avoided, if possible

Dumbwaiter Cars

These are regularly built 3 ft. high inside, with one hinged shelf; or 3 ft. 6 in. high inside, with two fixed shelves in addition to top and bottom; except that No. 1 cars are usually 6 in. less in height.

In the tables, the first measurement given is the width from right to left; the second, the depth from front to rear. Thus, a No. 2 car is 24 in. wide, right to left, and 20 in. deep, front to rear.

Continued on next page

Automobile Elevators (Fig. C)

"Sedgwick" quality is here represented in high grade equipment for garages, paint shops, etc.

These elevators are simple, easy running, safe, and substantially built.

They can be furnished in any size and capacity.

Complete outfits include overhead gearing, platform, adjustable counterweight, guide runs for platform and weight, ropes and cables for total height of 20 ft. over all, f.o.b. Poughkeepsie, N. Y. For extra height, see Table below.

"SEDGWICK" AUTOMOBILE ELEVATORS (FIG. C)

Capacity, lbs.	Platform, ft.	Shipping weight, lbs.	Complete outfit	Add for extra height, per ft.
1,500	7½ x 12	2,000	$ 600.00	$4.00
2,000	7½ x 14	2,400	700.00	4.50
2,500	8 x 15	2,800	800.00	5.00
3,000	8 x 16	3,200	900.00	6.00
4,000	8 x 16	4,000	1000.00	7.00
5,000	8 x 16	5,000	1100.00	8.00
6,000	8 x 16	6,000	1200.00	9.00

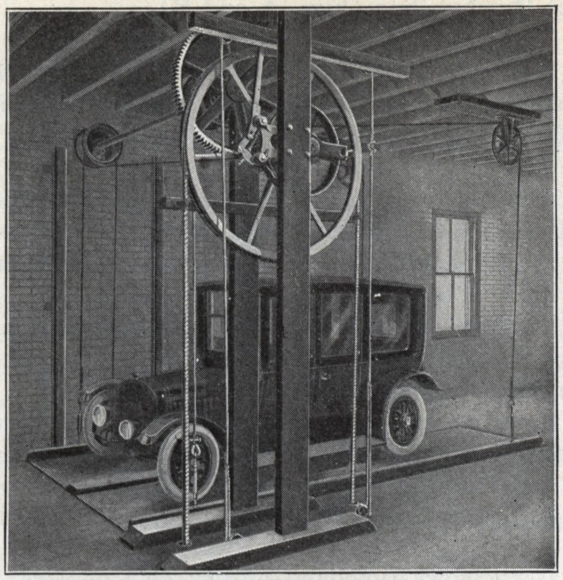


Fig. C. "Sedgwick" Automobile Elevator

Freight Elevators (Fig. D)

These equipments are built in the most substantial manner, designed for severe service and easy operation. In smaller sizes they are used in private homes as trunk lifts.

The larger sizes find application in factories, shops, stores, warehouses. schools and industrial buildings for all purposes.

They have steel antifriction roller bearings and rigidly braced iron frames, resulting in correct alignment and easy running. They are fitted with the improved "Sedgwick" self-locking indestructible band brake.

We recommend double cables independently attached to car and counterweight.

Complete outfits include overhead gearing, platform, adjustable counterweight, guide runs for platform and weight, ropes and cables for total height of 20 ft. over all, f.o.b. Poughkeepsie, N. Y. For extra height, see Table below.

"SEDGWICK" IMPROVED HAND POWER FREIGHT ELEVATORS (FIG. D)

Capacity, lbs.	Size of car, in.	Space required		Complete outfit	Add for extra height, per ft.	Shipping weight, lbs..
		Width, in.	Depth, in.			
	† ‡	†	‡			
500	36 x 36	40½	40	$225.00	$2.00	800
750	42 x 42	47¼	46	315.00	2.25	1,200
1000	48 x 48	53¼	52	350.00	2.50	1,300
1200	54 x 54	59¼	58	440.00	2.75	1,600
1500	60 x 60	66½	64	500.00	3.00	1,900
2000	72 x 72	79½	76	575.00	3.50	2,400
2500	72 x 72	79½	76	640.00	4.00	2,700

Price on outfits of greater size or capacity quoted on request.

Blue prints and full directions for erecting sent with each outfit.

† ‡See note foot of page 2597.

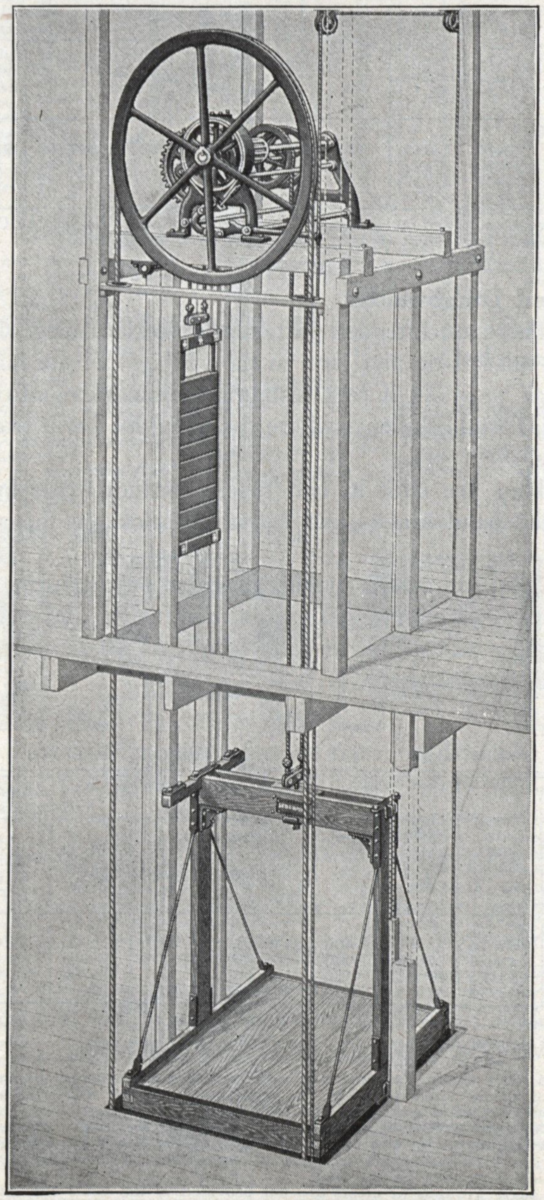


Fig. D. "Sedgwick" Freight Elevator

Continued on next page

Invalid or Residence Elevators (Fig. E)

The "Sedgwick" automatic brake hand power invalid elevator (Fig. E) is a practical outfit for the purpose intended.

The essential features of such an outfit are ease of operation, absolute safety, and simplicity of design, so that no interruption of service need be anticipated. These essentials are embodied in the Sedgwick outfits.

While the weakness which prevents the invalid climbing stairs would probably make it inadvisable for him to operate the elevator himself, the amount of power required is so small that even a child can safely operate the elevator either up or down with full load.

Complete outfits include machine, car 6 ft. 3 in. high in clear, counterweight, guide runs, ropes and cables for total height of 20 ft. or less over all, f.o.b. Poughkeepsie, N. Y. For extra height, see table below.

Special booklet on application.

"SEDGWICK" INVALID ELEVATORS (FIG. E)

Size of car, ft.	Size of well		Price of outfit	Add for extra height, per ft.	Shipping weight, lbs.
	Width, ft. in.	Depth, ft. in.			
† ‡	†	‡			
3 x 3	3 4½	3 3	$600.00	$2.00	950
3½ x 3½	3 11½	3 9	700.00	2.50	1,200
4 x 4	4 6	4 3	800.00	3.00	1,300
4½ x 4½	5 0	4 9	900.00	3.50	1,700
5 x 5	5 6	5 4	1000.00	4.00	1,800
6 x 6	6 8	6 4	1200.00	5.00	2,000

† ‡See note foot of page 2597.

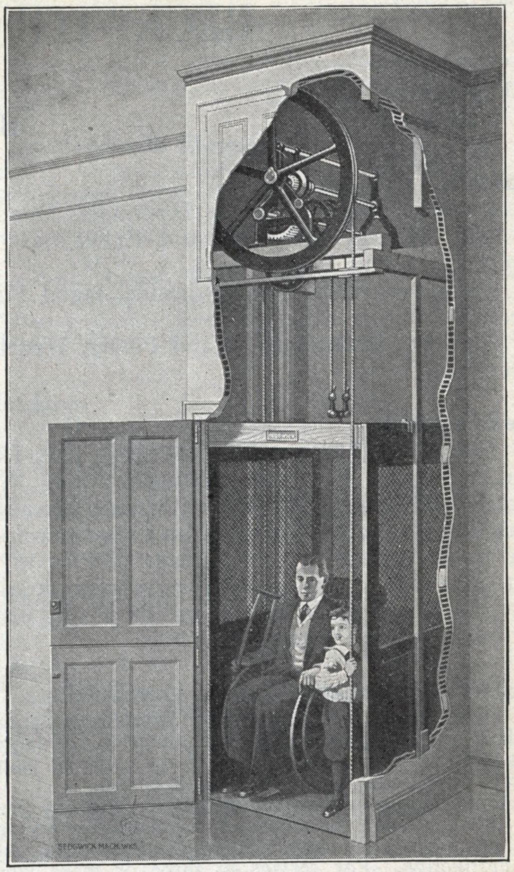


Fig. E. "Sedgwick" Invalid Elevator
"A child can run it"

Sidewalk Elevators (Fig. O)

Many improvements make the "Sedgwick" the simplest, strongest, safest, most durable, most easily operated sidewalk elevator that an architect can specify.

It is designed for heavy duty and stands up under the work.

Blue prints and full directions for erecting with each outfit.

"SEDGWICK" SIDEWALK ELEVATOR (FIG. O)

Capacity, lbs.	Size of platform, ft.	Price	Add for extra height, per ft.
500	3 x 3	$250.00	$5.00
1,000	3½ x 3½	275.00	6.00
1,500	4 x 4	350.00	7.00
2,000	5 x 5	375.00	7.50
2,500	5 x 5	450.00	8.00

Prices cover outfits complete f.o.b. Poughkeepsie, N. Y., for a total height of 10 ft. Extra for additional height as per table above.

Prices on heavier outfits on application.

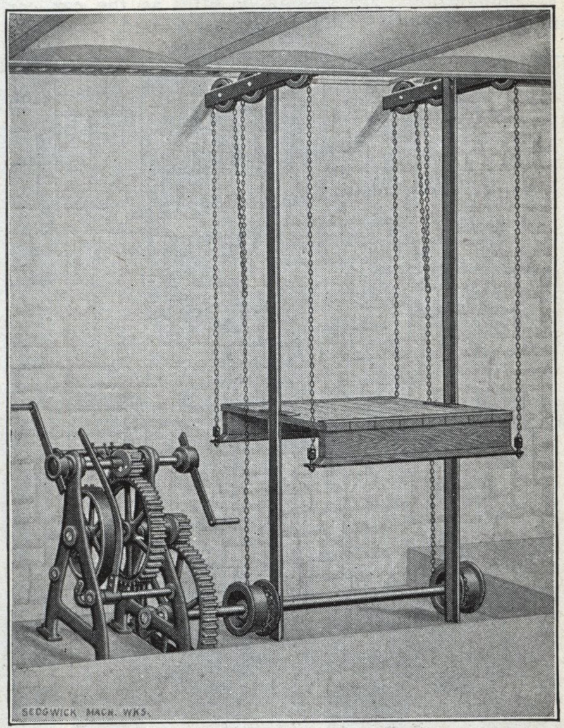

SEDGWICK MACH. WKS.

Fig. O. "Sedgwick" Sidewalk Elevator

ESTABLISHED 1889

BECKWITH ELEVATOR CO., INC.

INCORPORATED 1917

TELEPHONE
Liberty 8333

123 Pearl Street
BOSTON, MASS.

Products

Dumbwaiters: Electric, Hydraulic, Hand Power.

Ash Hoists and Sidewalk Elevators: Electric, Hydraulic, Hand Power.

Invalid Elevators: Hydraulic, Hand Power and Electric.

Freight Elevators: Hand Power, Hydraulic and Electric.

The Company

Since 1889, Beckwith Elevator Co., Inc., have been specialists in vertical transportation. Since the Beckwith line includes dumbwaiters and elevators of all three types—electric, hydraulic and hand power—we are able to advise the architect impartially as to the type best adapted to his particular service requirements. Material is sold f.o.b. Boston or completely installed by our own mechanical department.

Beckwith Automatic Electric Dumbwaiters

These are electric push button dumbwaiters of the most modern type, for use in apartment houses, residences, hotels, hospitals, stores, restaurants and manufacturing plants. Built in capacities of 50 to 500 lb. Speed to suit.

Operation—For two-landing service, there is one "up" and one "down" button for each landing. A momentary pressure on the button starts the car, which *stops automatically on reaching its destination.* For service to three or more landings, the various types of selective control are furnished, including (1) full automatic selective at every landing; (2) top or bottom only, stopping at intermediate floors by pressing a stop button.

Dumbwaiters are absolutely safe, as the car can not be started till all the landing doors are closed.

Machines—Of the best standard make. They are simple, durable, quiet and consume but little current. The worm gear in combination with our electric brake allows the car to make a quick, easy and smooth start or stop. Motors can be furnished to operate on any direct or alternating current lighting or power circuit up to 550 volts. Standard voltages are 110 and 220.

Cars—Made of ¾-in. hardwood or of steel with one or more removable shelves, as specified. Cars will be built to fit any shaftway—a good average car size being 24 in. wide by 20 in. deep by 30 in. high, inside measurements.

Standard Outfit—Fig. 1 shows standard outfit for capacities of 100 to 500 lb. It includes traction type machine with motor and control system; wire cable; car, hardwood or steel guide rails, and adjustable counterweight. Steel guide rails are advised for car speeds over 125 ft. per min.

Fig. 2 shows car double-hitched, for capacities up to 60 lb. at a speed of 50 ft. per minute, connected to ordinary lighting or power circuit.

Fig. 3 shows standard outfit for use where there is no headroom in shaft. Winding drum type machine is installed at bottom but preferably outside of the shaft, so that car may come up under the counter to extreme limit. No counterweights.

Beckwith Hydraulic Dumbwaiters

Compare for simplicity and low installation cost with the hand operated dumbwaiters, while they afford a rapid and silent power service. There is practically no mechanism to get out of order, and they are very reliable.

Beckwith hydraulic dumbwaiters are started by means of a handle or pull rope and stop automatically at top or bottom. They operate wherever 40 lb. or more water pressure is available from roof tank or city mains. Operating cost varies with the water rate, but is always low.

Standard Outfits—Fig. 4 shows standard piston type for rise of 20 ft. or less and capacities up to 500 lb. This type is very popular for under-the-counter service, as it requires no headroom in shaftway. Standard outfit includes car of ¾-in. hardwood or steel, cylinder and piston, steel guide rails, operating valve and rope.

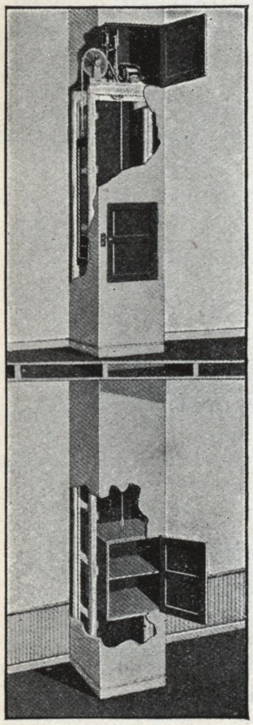


Fig. 1. Electric Dumbwaiter, Push Button Automatic Traction Type
100 to 500-lb. load, 75 to 150 ft. per min.

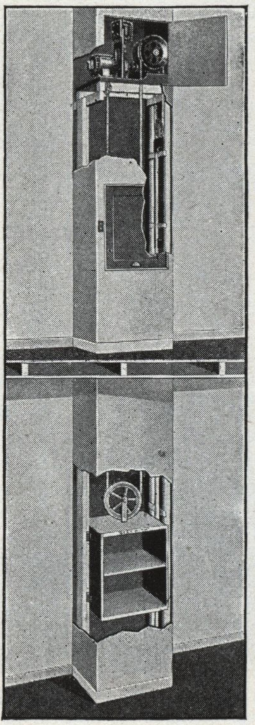


Fig. 2. Electric Double Hitch Dumbwaiter
Can operate on light circuit, 60 lb. load, 50 ft. per min. Heavier loads on separate power line

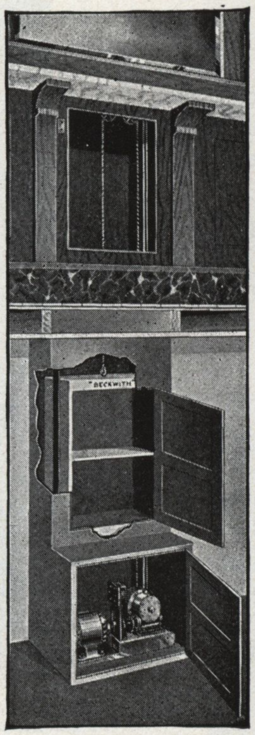


Fig. 3. Electric Dumbwaiter for Use Under Counters

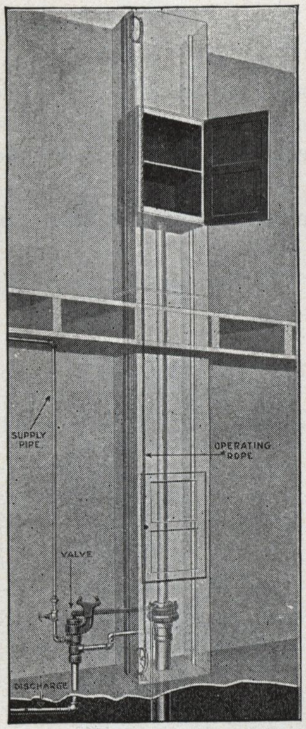


Fig. 4. Hydraulic Piston Type Dumbwaiter
Operates by shipper rope; stops automatically at top or bottom

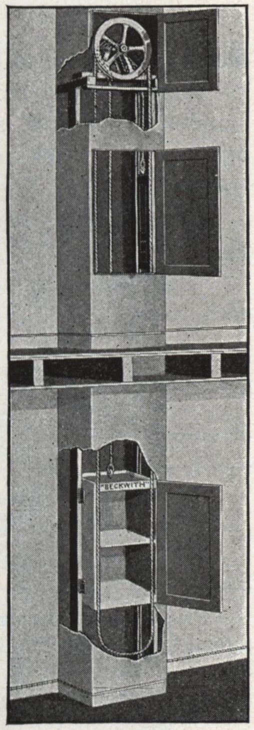


Fig. 5. Hand Power Automatic Brake Type Dumbwaiter
Capacities to suit

Continued on next page

Hand Power Dumbwaiters and Freight Elevators

Strong dependable outfits built for permanent service in types to meet every requirement.

Automatic Brake Type—For private houses and small apartments, where light loads are carried. The automatic brake is applied and regulated by the load on the car. A pull on the hand rope unlocks brake and moves car up or down. When the pull on the hand rope ceases, the car is held stationary. Capacities from 60 to 150 lb. Geared machines are furnished for capacities of 100 lb. and over.

Fig. 5 shows complete outfit 70-lb. capacity, automatic brake type. Includes machine, with idler stand, support timbers, and rope guard. Car of ¾-in. hardwood, guide runs of hard pine or maple, adjustable counterweight, hoisting cable, hand rope and check rope.

Band Brake Type—Gives the most satisfactory results, for all around work. Strong, easy running, rapid and especially adapted for hard service. Pulling hand rope raises or lowers car. Speed of car when being lowered is controlled by brake rope. Capacities from 60 to 500 lb. Geared machines furnished for capacities of 100 lb. and over. Standard outfit is the same as for automatic brake type.

Freight Elevators—For use where electricity or water power is not available, or circumstances do not justify expense of a power elevator. Smaller sizes can be used as trunk lifts in residences and apartments. Capacities from 500 to 1500 lb.

Standard outfit includes machine with two hoist wheels and idler stand (drum is extra); side post freight car of hardwood, adjustable counterweight, guide runs, two manila or steel hoisting cables, hand rope, brake rope, pulleys and rope guard. Safety devices under car extra.

When writing for information: *For all types of dumbwaiters,* state (1) type of car inside and over-all size, number of shelves; (2) plumb size of shaftway, total height, and height at top landing from floor to ceiling; (3) travel of car; (4) maximum and average loads; (5) number of landings served; (6) total number of openings and whether located at front only or front and back or front and side.

For electric type, besides the above information, state (7) available current—if direct current, give voltage, if alternating current, give voltage, phase and cycle; (8) speed of car in feet per minute; (9) type of control; (10) location of counterweight.

For hydraulic type, besides the above information, state (7) available water pressure and size of supply pipe.

For hand power type, besides the above information, state (7) type of machine—whether band brake, automatic brake or balanced dumbwaiter, and whether light or geared, (8) location of counterweight.

Ash Lifts and Sidewalk Elevators

Three types. Capacities to meet every requirement.

Hydraulic Piston Type—Standard sidewalk elevator for apartments, schools, office buildings, etc. Controlled by operating rope, lever or pull chain. Capacities up to 6000 lb. for rise of 20 ft. or less. Fig. 6.

Electric Push Button Type—For apartments and residences. Controlled from cellar to street level by one "up" and one "down" button at each level. Capacities to 500 lb.

Hand Power—Operates by crank or rope. Capacities to 2000 lb.

Invalid Elevators

Especial care is taken to make these machines simple, quiet, easy running and absolutely safe. They are furnished in hydraulic and hand power types, also electric.

Hydraulic—We recommend the hydraulic type for a rise up to 20 ft. on account of the simplicity, safety and absence of effort required to start car. It stops automatically at top or bottom. Collapsible gate at front of car as shown is extra. Fig. 7.

Hand Power—Operates by pulling hand rope. Speed of descent is controlled by separate brake rope. Car has safety devices to hold it in case of rope breakage. Standard size is 3 ft. square by 6 ft. 3 in. high. Size for wheel chairs 3 ft. 6 in. wide by 4 ft. 4 in. deep by 6 ft. 3 in. high. Fig. 8.

Installation Data for All Types

Shaftways should be strong and solid to avoid noise. Brick, concrete or terra cotta should be used if possible, as a wood or metal shaft transmits sound and vibration. Place wood cleats in shaft where guide runs are to be located. Space cleats about 3 ft. on centers and plaster flush. Allow an opening into the shaft of sufficient size to admit the assembled car, and an opening at top of shaft for access to machinery. Our engineering department will be glad to assist in the preparation of plans and specifications.

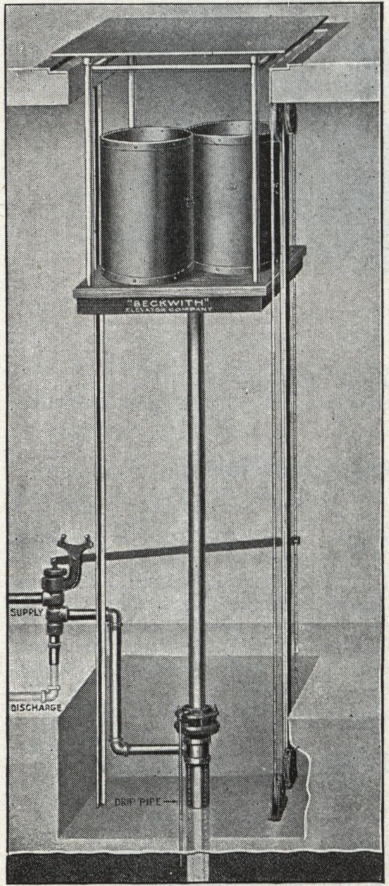


Fig. 6. Sidewalk Ash Lift, Hydraulic Piston Type
Capacities to suit

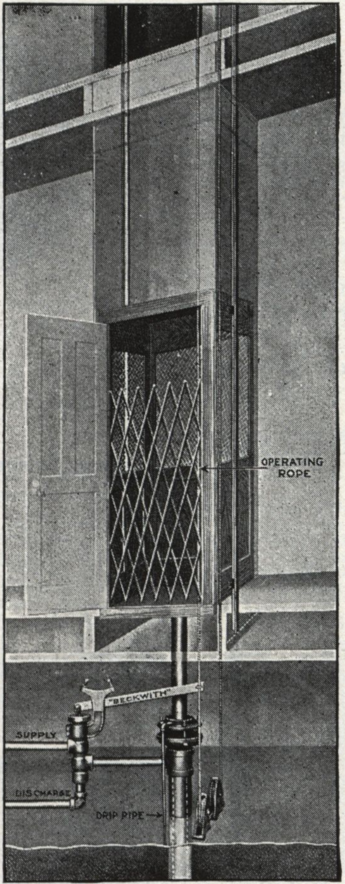


Fig. 7. Invalid Lift, Hydraulic Operated by Shipper Rope, Automatic Top to Bottom

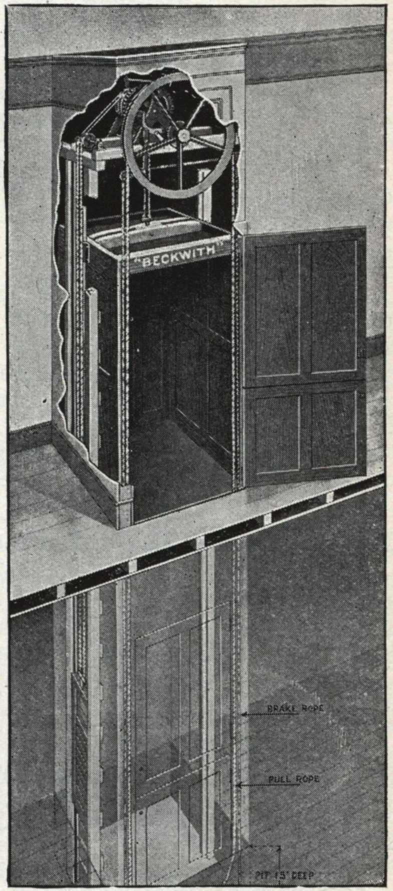


Fig. 8. Invalid Lift, Hand Power. Operates by Pull Rope
400-lb. capacity or larger to suit

ESTABLISHED 1876 INCORPORATED 1912

CHELSEA ELEVATOR CO.

Manufacturers of Electric Dumbwaiters and Elevators

OFFICE AND FACTORY
439-441 West 19th Street
NEW YORK, N. Y.

REPRESENTATIVES

ROCHESTER, N. Y. BUFFALO, N. Y. PITTSBURGH, PA. SPRINGFIELD, MO. ST. PAUL, MINN.
TOPEKA, KAN. DES MOINES, IOWA DETROIT, MICH. SEATTLE, WASH. OKLAHOMA CITY, OKLA.
SAN FRANCISCO, CAL. HELENA, MONT. SOUTH BEND, IND.

Products

Electrically Operated Dumbwaiters; Electrically Operated Sidewalk Elevators; small Push Button Passenger Elevators (specialists in Push Button Equipment).

For dumbwaiters and sidewalk type elevators a full line of Selective Boxes, Electric Door and Gate Contacts, Mechanical Door Locks, Slack Cable Switches, Machine Limit and Hatchway Limit Switches.

For Hand Operated Dumbwaiters and Elevators of every description, see pages 2608-2609.

Experience

Forty-nine years of manufacturing experience in one city assures reliability of products, and progressiveness in design and equipment assures highest quality in workmanship and materials.

Chelsea Electric Dumbwaiters

Combinations of capacities, speeds and sizes are obtainable to suit every requirement. Classes, hatchway sizes, car sizes, shipping weights, prices, outline specifications, etc., may be obtained from data tables on the following page.

Chelsea Electric Elevators

Our sidewalk elevators are rugged and compact and may be obtained with either push button or hand cable control.

Our electrically operated elevators are designed for capacities from 300 to 2500 lb. capacity and speeds from 20 to 200 ft. per minute.

Our small push button passenger elevators are substantially built and positive and reliable in action.

Chelsea Contacts, Locks, Switches

Simple and compact electric switches and mechanical locks for either hinged or sliding doors, hatchway limit and slack cable switches. Non-corrosive and built in proportion for service.

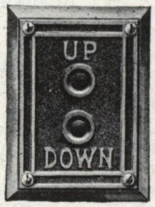
Guarantee

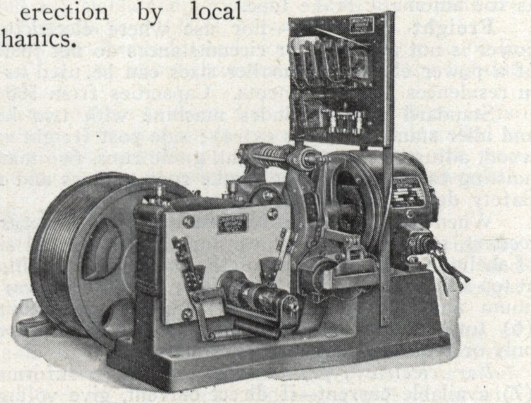
All parts are guaranteed for a period of one year free from defects in both workmanship and materials.

Shipment Orders

Our organization is prepared to furnish and also erect full equipment in any part of the United States. We are fully prepared, however, to furnish any portion or the full equipment with complete instruction for erection by local mechanics.

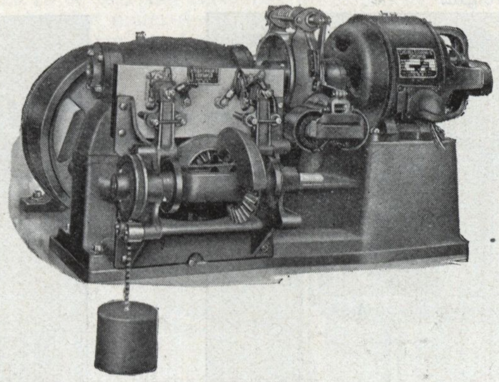
TRADE-MARK





Class "A" Engine

Designed for capacities varying from 1 to 400 lb. and speeds from 50 to 200 ft. per minute



Class "B" Engine

Designed for capacities varying from 300 to 800 lt. and speeds from 50 to 200 ft. per minute

Representative Dumbwaiter Installations

Federal Reserve Bank, New York, N. Y., York & Sawyer, Architects
Academy of Sciences, Washington, D. C., B. Goodhue, Architect
Elks Club, Elmhurst, N. Y., Ballinger Co., Architects
Post Office, San Francisco, Cal., U. S. Government Architects
Residences, Palm Beach, Fla., H. Mainzer, Architect
Hospital, Gary, Ind., Schmidt, Garden & Martin, Architects
Liggett & Co., New York, N. Y., Walter T. Williams, Architect
Bellevue Hospital, New York, N. Y., McKim, Mead & White, Architects
Title Co., White Plains, N. Y., Robt. Bruce Boyd, Architect

Representative Sidewalk Elevator Installations

Horn & Hardart, New York, N. Y., F. B. Platt, Architect
Post Office, New York, N. Y., H. A. Koelble, Architect
Roosevelt Hospital, New York, N. Y., York & Sawyer, Architect
Zion Hospital, Brooklyn, N. Y., L. A. Abramson, Architect
Colony Club, New York, N. Y., Delano & Aldrich, Architects
Leuchows Restaurant, New York, N. Y., H. Regelman, Architect
Bloom Building, New York, N. Y., David M. Ach, Architect

Continued on next page

Specify as follows:

Where shown on plans furnish and erect electrically driven dumbwaiters as made by Chelsea Elevator Co., New York, N. Y., with push buttons at each door opening. Capacity, ... lb.; speed, ... ft. per min.; travel from .... floor to .... floor to serve .... doors and to have .... stops; current supply will be ....; machine will be located .... *Shop Drawings Shall Be Submitted for Approval*—Include engine, motor, control, car, guides, rails, counterbalance, cables, sheaves, locks, contacts, and all conduit and wiring throughout hatchway. To make dumbwaiter complete.

Work by Other Contractors—Hatchway, enclosure, doors, pit, engine room, supports, power wiring to control, foundation, current for starting, testing and adjusting.

Engine—Bedplate, drum, back stand, gearing, motor and other parts constituting engine to be securely bolted to foundation.

Worm and Worm Shaft—Made of one steel forging accurately turned in lathe. Gear of bronze and accurately cut. Both worm and gear enclosed in heavy iron housing with suitable openings for inspection, and run in oil.

Drum—Cast iron, accurately turned and grooved for cables.

Brake—Engine has electric safety brake, that when service is interrupted, brake automatically applies to stop car and holds it at landings.

Limit Devices—Connected directly to drum shaft to interrupt main and brake circuits and automatically stop engine when car reaches limits of travel.

Electric Motor—Slow speed, long bearings, self-oiling, having high efficiency, great starting power and durability.

(*Note:* A-c. Multiphase motors, squirrel cage type.) Housing, brake and motor mounted on heavy cast iron bedplate. When engine is located at side of hatchway, this company furnishes templet, bolts, vibrator sheaves, shafts and hangers. Overhead, this company furnishes templet only; all beams and supports by others. This company includes rigid iron conduit, nuts, bushings, boxes and wiring between motor limit and controller; others to bring electric power mains to controller and connect to terminals, including line switches and reverse phase relays or cutouts to meet local requirements.

Control—*Type 2, for Two Floors Only*—Up and down buttons only. One for calling, 1 for sending at each landing. Control buttons inoperative if car is in motion.

Type 4, for Three Floors or More—Full automatic. A gang of buttons for each floor. To call or send the car to any floor, press the button corresponding to the floor to which car is sent or called; the car at once (unless already in use) starts for that floor. Floor stop device is connected to machine to perform the functions mentioned.

Sheaves—We furnish overhead sheaves, boxes, beams; supports by others.

Car—Ash, dovetailed, varnished and shelved with eyes for cable, and iron guides. Cars 3 ft. 6 in. in height.

Guide Runs—For car and counterbalance; hardwood, heavy double groove type.

Counterbalance—Cast iron, with guides for runs and eye for cable. Based on weight of car plus ⅓ live load.

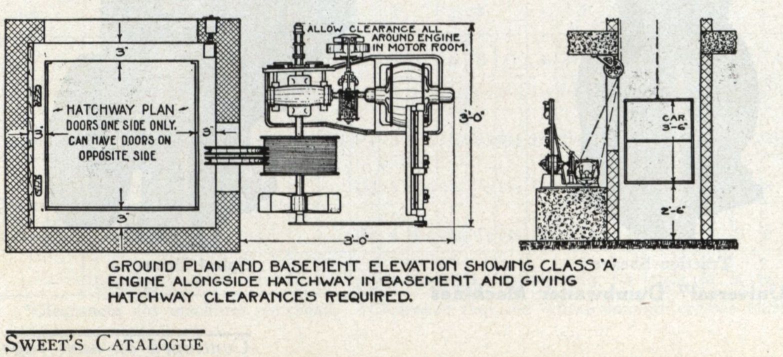
DATA AND PRICES OF SOME OF THE CHELSEA ELECTRIC DUMBWAITERS

Class engine	Type control	Car size, width and depth	Hatchway size, width and depth, doors 1 side only	Capacity, lb.	Speed per minute, ft.	Hp. motor, 110-220 volts, d-c.	Price of engine, motor and controller only		Shipping weight of engine, motor and controller, lb. (approx.)	Price complete equipment, 20-ft. height, 2 doors		Shipping weight, lb. (approx.)	Additional for each extra 10-ft. height		Additional for each extra door opening	Additional for any door opening on opposite side or at angle	For 220 volt a-c. multiphase, add or deduct as noted
							Machine above hatchway	Machine at side below		Machine above hatchway	Machine at side, below		Machine above hatchway	Machine at side, below			
A	2	22″x18″	28″x24″	100	190	1	$ 945.00	$1025.00	1050	$1115.00	$1275.00	1800	$36.00	$45.00	.....	$23.00	—$35.00
A	4	22″x18″	28″x24″	100	190	1	1260.00	1340.00	1300	*156.00	*1935.00	2200	45.00	56.00	$48.00	16.00	— 35.00
A	2	22″x18″	28″x24″	150	75	1	945.00	1025.00	1050	1115.00	1275.00	1800	36.00	45.00	......	23.00	— 35.00
A	4	22″x18″	28″x24″	150	75	1	1260.00	1340.00	1300	*1560.00	*1935.00	2200	45.00	56.00	48.00	16 00	— 35.00
A	2	22″x18″	28″x24″	175	115	1	1045.00	1090.00	1250	1230.00	1400.00	1900	36.00	45.00	......	23.00	— 35.00
A	4	22″x18″	28″x24″	175	115	1	1360.00	1440.00	1500	*1675.00	*1850.00	2300	45.00	56.00	48.00	16 00	— 35.00
A	2	22″x18″	28″x24″	200	100	1	1045 00	1090.00	1250	1230.00	1440.00	1900	36.00	45.00	.....	23.00	— 35.00
A	4	22″x18″	28″x24″	200	100	1	1360.00	1440.00	1500	*1675 00	*1850.00	2300	45.00	56.00	48.00	16.00	— 35.00
A	2	26″x22″	32″x28″	225	85	1	1050.00	1090.00	1250	1230.00	1400.00	1900	36.00	45.00	......	23.00	— 35.00
A	4	26″x22″	32″x28″	225	85	1	1360.00	1440.00	1500	*1675.00	*1850.00	2300	45.00	56.00	48.00	16.00	— 35.00
A	2	26″x22″	32″x28″	250	115	1½	1100.00	1145.00	1300	1285.00	1455.00	1950	36.00	45.00	......	23.00	— 35.00
A	4	26″x22″	32″x28″	250	115	1½	1415.00	1495.00	1550	1730.00	1905.00	2350	45.00	56.00	48.00	16.00	— 35.00
A	2	30″x24″	36″x30″	300	100	1½	1100.00	1145.00	1300	1285.00	1455.00	1950	36.00	36.00	......	23.00	— 35.00
A	4	30″x24″	36″x30″	300	100	1½	1415.00	1495.00	1550	1730.00	1905.00	2350	45.00	56.00	48.00	16.00	— 35.00
A	2	30″x24″	36″x30″	400	70	2	1060.00	1145.00	1500	1265.00	1425.00	2400	37.00	46.00	......	25.00	— 50.00
A	4	30″x24″	36″x30″	400	70	2	1375.00	1455.00	1800	*1710.00	*1885.00	2600	47.00	57.00	48.00	18.00	— 50.00
B	2	30″x24″	36″x30″	300	200	3	1330 00	1415.00	1600	1535.00	1700.00	2500	38.00	47.00	......	26.00	—100.00
B	4	30″x24″	36″x30″	300	200	3	1650.00	1735.00	1850	*1990.00	*2165.00	2800	47.00	57.00	63.00	22.00	—100.00
B	2	30″x24″	36″x30″	350	150	3	1330.00	1415.00	1600	1535.00	1700.00	2500	38.00	47.00	......	26.00	—100.00
B	4	30″x24″	36″x30″	350	150	3	1650.00	1735.00	1850	*2020.00	*2210.00	3200	54.00	64.00	63.00	21.00	—100.00
B	2	34″x28″	40″x34″	400	125	3	1330.00	1415.00	1600	1565.00	1745.00	2900	45.00	54.00	......	28.00	—100.00
B	4	34″x28″	40″x34″	400	125	3	1650.00	1735.00	1850	*2020.00	*2210.00	3200	54.00	64.00	63.00	21.00	—100.00
B	2	34″x28″	40″x34″	450	100	3	1330.00	1415.00	1600	1565.00	1745.00	2900	45.00	54.00	......	28.00	—100.00
B	4	34″x28″	40″x34″	450	100	3	1650.00	1735.00	1850	*2020.00	*2210.00	3200	54.00	64.00	63.00	21.00	—100.00
B	2	38″x32″	44″x38″	500	100	3	1400.00	1485.00	1700	*1640.00	1815.00	3400	46.00	55.00	......	29.00	—175.00
B	4	38″x32″	44″x38″	500	100	3	1725.00	1805.00	1950	*2095.00	*2275.00	3700	54.00	64.00	63.00	26.00	—175.00
B	2	38″x32″	44″x38″	550	70	3	1400.00	1485.00	1700	*1640.00	1815.00	3400	46.00	55.00	......	29.00	—175.00
B	4	38″x32″	44″x38″	550	70	3	1725.00	1805.00	1950	*2095.00	*2275.00	3700	54.00	64.00	63.00	26.00	—175.00
B	2	36″x36″	42″x42″	600	60	3	1400.00	1485.00	1700	1640.00	1815.00	3400	46.00	55.00	......	29.00	—175.00
B	4	36″x36″	42″x42″	600	60	3	1725.00	1805.00	1950	*2095.00	*2275.00	3700	54.00	64.00	63.00	26.00	—175.00
B	2	36″x36″	42″x42″	800	50	3	1420.00	1500.00	1700	1700.00	1900.00	3700	48.00	57.00	......	29.00	—190.00
B	4	36″x36″	42″x42″	800	50	3	1740.00	1825.00	1950	*2160.00	*2370.00	4000	56.00	66.00	63.00	26.00	—190.00

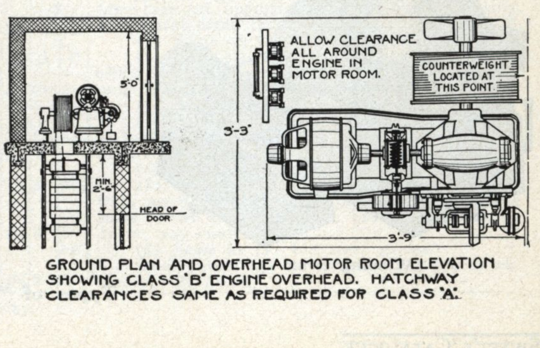
*Prices for complete equipment, 30 ft., 3 doors, one side only.

Note: This company furnishes 2 types of door contacts—mortised and exposed. Mortised type, $12.00 each; exposed type, $13.00 each. If door contacts are used, add $15.00 for conduit, wiring, etc., for each contact. When door locks are used, add for each door $8.00. When slack cable switch is used, add $22.00. For enclosed weight box, add $1.00 for each foot of height. Steel rails for car and counterbalance, including fishplates, screws, brackets, $3.00 per foot of height. Brass guides for steel rails, $9.00 per set. Steel cars are made special. Prices on request.

Above table gives stock sizes, speeds and capacities. Prices for variations given on request. No extra charge if car sizes vary slightly. Erection anywhere. All prices given are f.o.b. New York, N. Y. Sketches prepared on request. All parts are guaranteed free from defects for a period of 1 year. Detailed instructions for erection with each f.o.b. shipment.



GROUND PLAN AND BASEMENT ELEVATION SHOWING CLASS 'A' ENGINE ALONGSIDE HATCHWAY IN BASEMENT AND GIVING HATCHWAY CLEARANCES REQUIRED.



GROUND PLAN AND OVERHEAD MOTOR ROOM ELEVATION SHOWING CLASS 'B' ENGINE OVERHEAD. HATCHWAY CLEARANCES SAME AS REQUIRED FOR CLASS 'A'.

ESTABLISHED 1847

TELEPHONE
RICHMOND 3760

GEORGE T. McLAUTHLIN CO.

Manufacturers of Electric Dumbwaiters

120 Fulton Street, BOSTON, MASS.

INCORPORATED 1897

CABLE ADDRESS
"LAUTHLIN"
Western Union and
Lieber Codes

Products

McLAUTHLIN "UNIVERSAL" ELECTRIC DUMBWAITERS.

Also Passenger and Freight Elevators; Elevator Accessories; Fire Doors; Dumbwaiter Doors.

McLauthlin "Universal" Electric Dumbwaiters

Characterized by their reliable operation, compact design, ease of control and almost noiseless operation at high speeds. The machine requires little space. Preferably it is placed directly over the hoistway, but it may be set in the basement or on any floor. Current is obtained from any power or lighting circuit, 220 or 110 being the preferred voltages. There are six types of push button control.

Due to the speed of travel, the carrying capacity of "Universal" electric dumbwaiters is vastly greater than for hand power machines of the same ratings. They require but little power to operate. They have been in service over 17 years, and their exclusive features are covered by patents.

Distribution and Service

Information and estimates for the installation of "Universal" Electric Dumbwaiters may be obtained from elevator manufacturers throughout the United States and Canada, including:

AKRON, OHIO	HAUGHTON ELEVATOR & MACHINE CO., 9 North Canal Street
BUFFALO, N. Y.	HAUGHTON ELEVATOR & MACHINE CO., 405 Lincoln Building
CHICAGO, ILL.	KAESTNER & HECHT COMPANY, Blackhawk and Cherry Streets PITT ENGINEERING COMPANY, 120 West Kinzie Street WHEELER ELEVATOR COMPANY, 1102 Washington Boulevard
CLEVELAND, OHIO	HAUGHTON ELEVATOR & MACHINE CO., 1466 St. Clair Avenue
DETROIT, MICH.	HAUGHTON ELEVATOR & MACHINE CO., 531 East Larned Street
KANSAS CITY, MO.	KANSAS CITY ELEVATOR COMPANY, 26th and Madison Street
LIMA, OHIO	HAUGHTON ELEVATOR & MACHINE CO., Box 416
LOS ANGELES, CAL.	LLEWELLYN IRON WORKS, 120 North Main Street
NEW YORK, N. Y.	GURNEY ELEVATOR COMPANY, 300 Eighth Avenue HAUGHTON ELEVATOR & MACHINE CO., 250 West 54th Street
PITTSBURGH, PA.	McKENNA BRASS & MFG. COMPANY, 100 Wood Street at First Avenue
SAN FRANCISCO, CAL.	SPENCER ELEVATOR COMPANY, 166 Seventh Street
ST. LOUIS, MO.	HAUGHTON ELEVATOR & MACHINE CO., 2835 Washington Avenue
SEATTLE, WASH.	MONTGOMERY ELEVATOR CO., 709 Second Street (rear)
SIOUX CITY, IOWA	R. M. BAKER
SOUTH BEND, IND.	HAUGHTON ELEVATOR & MACHINE CO., Box 544
TOLEDO, OHIO	HAUGHTON ELEVATOR & MACHINE CO., 671 Spencer Street
WASHINGTON, D. C.	HAUGHTON ELEVATOR & MACHINE CO., Room 200, Vermont Building
YOUNGSTOWN, OHIO	HAUGHTON ELEVATOR & MACHINE CO., 26 North Walnut Street
CANADA	DARLING BROTHERS, LIMITED, 120 Prince Street, Montreal, Que.

Our engineering and drafting force is at the service of architects planning dumbwaiter installations. They will draw up plans and help to choose the outfit most suitable for your particular requirements. To take advantage of this service, the following information should be supplied:

(1) Available current, whether d-c. or a-c. If d-c., give voltage; if a-c., give voltage, phase and cycle. (2) Average and maximum loads in pounds. (3) Feet of travel and number of landings served. (4) Number of openings and position of each. (5) Speed in feet per minute. (6) Size of hoistway. (7) Construction if enclosed; whether brick, plastered or wood-sheathed. (8) Height in hoistway above top landing. (9) Depth below bottom landing. (10) Car construction, whether wood or steel, and for wood or steel guides. (11) Type of control. (12) Doors, whether slide-up, swing or special.

Types and Construction of Dumbwaiter Machines

"Universal" dumbwaiter machines are made in three types to meet the various conditions of service.

Spiral Drum Type—For terminal landing service only. Especially recommended because of the efficient method of operation. The car is started with the hoisting cable on the small diameter of the winding drum, so that the motor accelerates under relatively low torque. A second acceleration of car speed occurs when the cable climbs from the small to the large diameter of the drum. In stopping, car descends to small diameter of drum, reducing the speed by two-thirds. Current is then cut off and the brake applied.

Winding Drum Type—Recommended with selective control for service to three or more landings, except where length of travel requires too wide a drum face. (Rope stray should not exceed one-half the depth of car.)

Traction Sheave Type—For any type of service, but recommended only where weight of car makes spiral drum inadvisable, or length of travel makes winding drum impracticable.

Construction (All Types)—Machines are of the direct-connected type, with motor, brake and worm gearing mounted on one frame. They have few parts and efficiency is high. They are truly "universal," being suitable for widely varying conditions of service, current and position of installation.

Frame—Of soft gray iron, forming supports for motor and for worm and gear shafts. Designed to be installed with motor in either vertical or horizontal position. It is machined to form one head of the motor and to hold the ball bearings for the shafts. It completely encloses the worm and gear in an oil-tight casing.

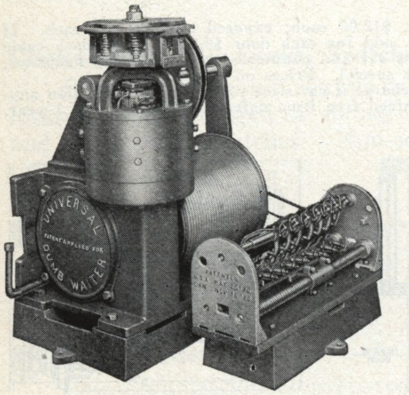
Motor—Runs either vertically or horizontally. It has ball bearings, high starting torque, and uses no current when car is not in motion. Motor shaft and worm shaft are one piece without coupling.

Worm Gear—Hobbed from solid bronze blank, and secured to its shaft by a large key and locked nut.

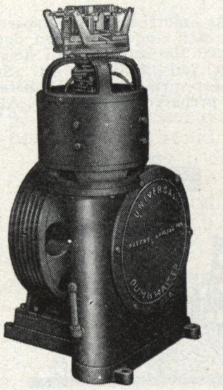
Worm—Accurately cut from special steel.

Main Shaft—Supported on two double row ball bearings fitted in frame, with additional ball bearing in an outboard stand for machines with winding drums or wide-faced spiral drums.

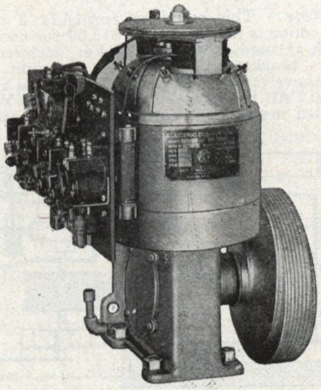
Brake—Unusually simple and effective. Very accessible, as it is at the outer end of the motor shaft. It is of the disc type applied by adjustable spring tension and released by magnets. The disc is secured to the motor shaft by a key and locked nut. The braking surface is cork to cast iron and is of liberal area.



Winding Drum



Traction Sheave



Spiral Drum

Types of "Universal" Dumbwaiter Machines

Continued on next page

Control Panel—For motor and brake, is of contactor type throughout and for simple installations is usually mounted on the motor. When selective button control is used, the panel being larger should be independently mounted.

Standard Control Systems

Control "A"—For two landing levels only, with "send" and "stop" buttons at each. No door switches required.

Control "B"—For two landing levels, with "call," "send" and "stop" buttons at landings. Control "B" can also be used for more than two floors, with "up," "down" and "stop" buttons at landings. Door switches are advised.

Control "C-1"—For more than two landing levels, with full automatic control at each landing.

Control "C-2"—For more than two landing levels, with full automatic control button box at one landing, and "call" and "send" buttons at the other landings.

Control "C-3"—For more than two landing levels, with full automatic control button box in the car and a call button at each landing. The car is dispatched by pressing the desired floor button and closing the landing door.

Note: In all the "C" type controls, operating button circuits are interlocked. No button except "stop" is operative while the car is in motion. Door switches are advised. Door locks are occasionally used with "C" type controls, but are not essential.

Control "D"—Constant pressure "up" and "down" buttons.

Special Controls—We supply control systems other than the above, obtained with various combinations of our standard control accessories.

Signaling Systems

Lights in cars, lights at floors, audible signals or combinations of the above can be provided if desired, so that users may quickly determine the location of the car.

How to Select the Proper Dumbwaiter

The first factors to be considered are type of control and type of machine. Four additional factors will aid in determining the choice of electric dumbwaiter outfit, viz.:

(1) Size and Weight of Car—Usually determined by nature of the materials to be handled or by size of an existing hoistway, but should be kept as small as possible, since car weight is a dead load on the machine. Where extra large cars are required, it is advisable to compound ("double hitch") the car and counterweight. This takes half the dead load from machine and suspends it from the building.

(2) Lifting Capacity—To secure highest operating efficiency, the maximum lifting capacity should be kept as near as possible to the average load.

(3) Speed—Except for loads exceeding 200 lb., dumbwaiters usually operate at speeds of 100 to 300 ft. per min., the higher speeds being adapted for longer travels and for dumbwaiters serving terminal landings only. 200 ft. per min. is the usual maximum for selective control dumbwaiters operated by a-c. motors. Where direct current is available, a higher car speed may be satisfactorily obtained with a slow-down selector. We recommend steel guide rails when the car speed exceeds 125 ft. per min.

(4) Service Requirements—Height of travel, number of landings, and number of trips per hour.

DUTY TABLES FOR "UNIVERSAL" DUMBWAITERS

TRACTION AND WINDING DRUM MACHINES

Live load cap., lb.	Avge. load speed, f.p.m.	*§Max. car travel drum type ft.	†Max. car wt., lb.	Max.std. car size (wood), in.	Max.std. car size (steel), in.	Machine No.	Direct or double hitch
60	200	50	20	12x18x20	12x12x24	34T or 36W	Direct
100	250	75	35	18x22x30	18x20x30	54T or 56W	Direct
100	100	50	35	18x22x30	18x20x30	33T or 35W	Direct
120	100	25	40	18x24x30	20x20x30	34T or 36W	Dbl. hitch
175	300	100	80	22x28x30	26x26x30	74T or 76W	Direct
200	50	25	50	20x26x30	22x22x30	33T or 35W	Dbl. hitch
200	125	75	50	20x26x30	22x22x30	53T or 55W	Direct
200	125	40	75	22x26x30	26x26x30	54T or 56W	Dbl. hitch
250	200	100	100	24x30x36	30x30x36	77T or 78W	Direct
250	300	100	80	22x28x30	26x26x30	94TDW or 96WDW	Direct
300	300	75	150	30x30x36	30x36x36	120T or W ADW1	Direct
350	150	100	100	24x30x36	30x30x36	73T or 75W	Direct
350	150	75	150	30x30x36	36x36x36	74T or 76W	Dbl. hitch
350	200	100	100	24x20x36	30x30x36	97T DW or 98W DW	Direct
375	60	40	100	24x30x36	30x30x36	53T or 55W	Dbl. hitch
400	300	75	175	30x36x36	36x36x36	120T or W BDW 2	Direct
500	100	100	200	36x36x48	36x36x48	77T or 78W	Direct
500	150	100	100	24x30x36	30x30x36	93T DW or 95W DW	Direct
500	150	75	150	30x30x36	30x36x36	94T DW or 96 WDW	Dbl. hitch
500	300	75	200	36x36x48	36x36x48	120T or W CDW3	Direct
500	200	75	200	36x36x48	36x36x48	120T or W ADW5	Direct
625	200	75	250	36x42x48	36x42x48	120T or W BDW6	Direct
700	75	75	200	36x36x48	36x36x48	73T or 75W	Dbl. hitch
700	100	100	150	30x30x36	30x36x36	97T DW or 98W DW	Direct
700	100	75	200	36x36x48	36x36x48	97T DW or 98W	Dbl. hitch
750	200	75	300	42x42x48	36x42x48	120T or W CDW7	Direct
800	125	75	300	42x42x48	36x42x48	120T or W ADW9	Direct
1000	75	75	200	36x36x48	36x36x48	93T or 95WD	Dbl. hitch
1000	125	75	400	42x48x54	42x42x48	120T or W BDW10	Direct
1250	125	75	500	48x54x54	48x48x48	120T or W CDW11	Direct

SPIRAL DRUM MACHINES

Live load cap., lb.	Avge. load speed, f.p.m.	*§Max. car travel, ft.	†Max. car wt., lb.	Max. std. car size (wood), in.	Max. std. car size (steel), in.	Machine No.	Direct or double hitch
50	250	75	20	12x18x20	12x12x24	32S	Direct
75	300	100	35	18x22x30	18x20x30	52S	Direct
100	125	75	25	12x18x30	16x18x30	31S	Direct
100	125	40	40	18x24x30	20x20x30	32S	Dbl. hitch
100	400	150	50	20x28x30	24x24x30	72S	Direct
150	150	100	50	20x28x30	24x24x30	51S	Direct
150	400	100	75	22x28x30	26x26x30	92S	Direct
175	150	50	45	20x24x30	22x22x30	52S	Dbl. hitch
200	60	20	50	20x26x30	22x24x30	31S	Dbl. hitch
225	200	150	80	22x28x30	26x26x30	71S	Direct
225	200	100	100	24x30x36	30x30x36	72S	Dbl. hitch
300	75	25	100	24x30x36	30x30x36	51S	Dbl. hitch
300	200	75	150	30x30x36	36x36x36	92S	Dbl. hitch
300	200	100	100	24x30x36	30x30x36	91S	Direct
450	100	100	150	26x30x48	30x30x48	71S	Dbl. hitch
600	100	75	200	36x36x48	36x36x48	91S	Dbl. hitch

Rated capacities (live load) are based on (1) *average duty*—loads seldom exceeding 50% of rated capacity. For usually heavy loads, reduce rated capacity 10 to 20%, depending on frequency of service and height of travel. (2) Machine over shaftway. If machine is located below, deduct 10% from listed capacity.

Listed speed is with average load, and for d-c. or 60-cycle a-c.

*Wider drums for longer travel at slight additional expense.

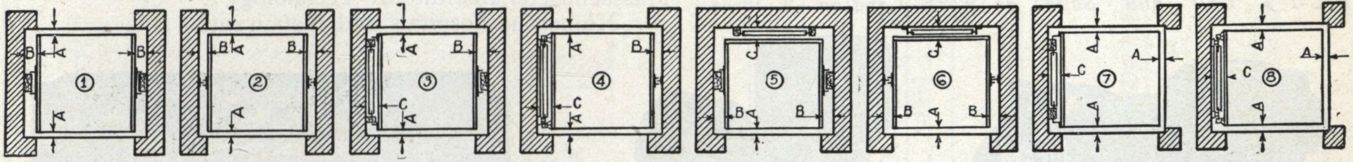
§Use compensating chains when height of travel exceeds 100 ft.

†To secure proper traction and relation of car-weight to load, car must weigh within 10% of listed weights.

Minimum permissible arc of rope contact on traction sheaves, 140°.

Machine should always be set so that pull of car hoist cable is away from the motor end of the worm shaft.

HOISTWAY CLEARANCES IN INCHES*



Sketch		1			2			3			4			5				6				7		8	
Letter		A	B	B†	A	B	B†	A	B	C	A	B	C	A	B	B†	C	A	B	B†	C	A	C	A	C
Control A send and stop		1¼	2½	2½	1¼	3½	3½	1¼	3	2½	1¼	3½	6½	1¼	2½	2½	4	1¼	3½	3½	5½	2½	3½	2½	5½
Control B call and send Control D up and down		1¼	2½	3	1¼	3½	3½	1¼	3	2½	1¼	3½	6½	1¼	2½	2½	4	1¼	3½	3½	5½	2½	3½	2½	5½
Control C Full Auto. Selective ..	3 Landings							1¼	3	3½	1¼	3½	6½	1¼	2½	3	4	1¼	3½	3½	5½	3	3½	3	5½
	4-7 Landings							1¼	4	4½	1¼	3½	6½	1¼	2½	3	4	1¼	4	4	6	3	4½	3	6
	8-12 Landings							1¼	4	4½	1¼	4	6½	1¼	2½	3	4	1¼	4	4	6	3	4½	3	6

(1) Side post, *wood* guides, no counterweight. Openings on opposite sides or one side only. For spiral drum dumbwaiters; Control A or B.

(2) Same as (1) but *steel* guides.

(3) Side post, *wood* guides, counterweight at either side. Openings on opposite sides or one side only. For traction or winding drum; any control.

(4) Same as (3) but *steel* guides.

(5) Side post, *wood* guides, counterweight at back. Single face only. Traction or winding drum; any control.

(6) Same as (5) but *steel* guides.

(7) Car and counterweight guides on same wall, *wood* guides. Only for openings on three sides or two adjacent sides. Traction or winding drum; any control.

(8) Same as (7) but *steel* guides.

Steel guides are advised for car speeds exceeding 125 f.p.m.

*Clearances for machines overhead. †Clearance required where conduit crosses hoistway.

F. S. PAYNE CO.

Dumbwaiter Manufacturers

CAMBRIDGE, MASS.

BRANCH OFFICES
BOSTON, MASS. LOWELL, MASS. NEW HAVEN, CONN.

TRADE-MARK

Product

Payne Electric Dumbwaiters.

For Hydraulic Ash Hoists, see page 726; for Passenger and Freight Elevators, see pages 2574-2575.

Payne Electric Dumbwaiter Construction

The Payne "AA" electric machine represents the very latest in dumbwaiter machine construction, several distinctive features of which are new in the dumbwaiter field.

(1) Its design is such that it may be easily assembled for duty either as a *drum winding* or *traction machine.*

(2) By the use of universally mounted motors and brake magnets, the machine may be readily modified for either alternating or direct current service.

(3) The location of motor and brake combines to give a very compact unit.

LIFTING CAPACITIES AND SPEEDS OF PAYNE ELECTRIC DUMBWAITERS
For both alternating and direct current

Load, lbs.	100	100	150	150	200	300	750
Speed, ft. per min.	75	150	75	150	100	75	*40

Loads and speeds are standard. Special machines furnished for any purpose. Lifting capacities are the maximum allowable loads on car when machine is overbalanced, an amount equal to one-third the rated capacity. Maximum load on drum or driving sheave shaft is not to exceed 800 lbs.

*With 2.1 hitch on car.

Control Systems for Payne Electric Dumbwaiters

The following standard control systems for Payne electric dumbwaiters will be found to meet the usual requirements. Special forms of control furnished where required.

System "A," Hand Rope Control—Starting, stopping and reversing of machine controlled by means of hand rope in hatchway near landing doors.

System "B," Two-landing Push Button Control—*("B-1") "Call" and "Send" at Each Landing*—A two-button station at each landing marked "up" and "down." Momentary pressure of either the "up" or "down" button will send the car in corresponding direction.

***("B-2") Single Button Control*—**A single button station at each landing, both being either "call" or "send."

System "C," Three-landing Push Button Control—*("C-1") "Call" and "Send" at Each Landing*—A three-button station at each landing marked "1—2—3" giving full selective control without a floor stop device.

***("C-2") Call and Car Control*—**A gang of sending buttons marked "1—2—3—Stop" is located in car while calling buttons only are at landings. Momentary pressure of sending button pre-sets control and car will proceed to selected floor as soon as landing door is closed.

System "D," Semiselective Push Button Control—A three-button station marked "up," "down," "stop" is provided at each landing. Momentary pressure of either "up" or "down" button will send car in corresponding direction and it will continue to either terminal unless stopped at an intermediate landing. Landing doors should be provided with glass windows to permit seeing car as it approaches an intermediate landing.

System "E," Full Selective Push Button Control—*("E-1") Multistation Control*—A control station is provided at each landing with a button for each floor served by the car, thus allowing complete control from any landing.

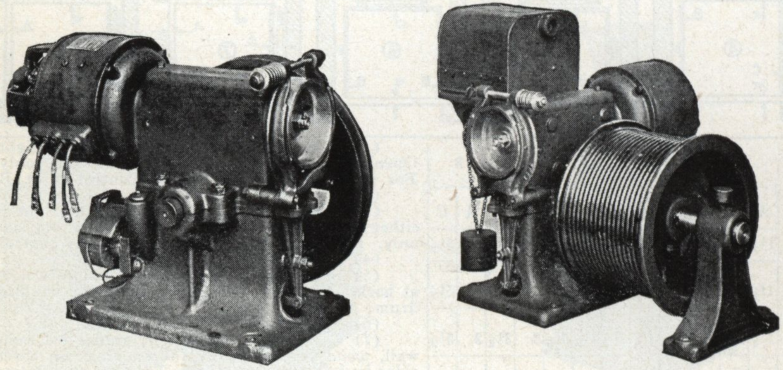
***("E-2") Call and Car Control*—**A gang of sending buttons marked to correspond with the floors served by the car is located in the car. Calling buttons only are at landings. Momentary pressure of sending button pre-sets control and car will proceed to selected floor as soon as landing door is closed.

System "F," Single Station Full Selective Push Button Control—A gang of buttons marked to correspond to the floors served by the car is located at one floor, giving complete control of car from this floor. Single button stations only are provided at other floors for returning car to controlling station.

System "G," Single Station Full Selective Push Button Control with Call and Return—A gang of buttons marked to correspond to the floors served by the car is located at one floor, giving complete control of car from this floor. A two-button station is located at all of the other floors, permitting car to be called to different floors and then returned to controlling station.

References

Childs Company
Federal Reserve Bank of Boston
First National Bank of Boston
Seth Thomas Clock Company
Vermont Marble Company
Cleveland Public Library
Providence Biltmore Hotel
Harvard College
Dartmouth College
Massachusetts Institute of Technology
Numerous hospitals and restaurants.

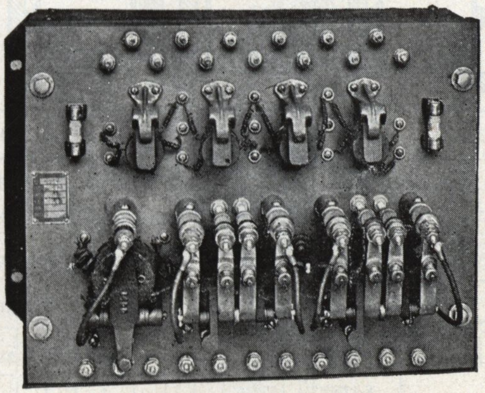


Traction Machine

Drum Winding Machine

Payne "AA" Electric Dumbwaiter Machine

Furnished for 115 and 230 volts d-c. and for 220, 440 and 550 volts, 2- or 3-phase, 60-cycle a-c. as standard units. Special machines made for 500 volts d-c. and 25 or 40 cycles a-c.



No. 12 D. C. Control Panel

With relays for push button operation

Continued on next page

Information Required for Estimates

Location of building.

Type of machine, whether drum or traction.

Live load capacity; car speed per minute; car travel.

Outside dimensions of car; whether side or corner post, wood or metal; number of shelves and whether stationary, removable or hinged; whether single face or double face.

Give current characteristics (whether A. C. or D. C.), also phase, cycles and voltage.

Type of control system desired (specify by symbol).

How gang switches are to be marked.

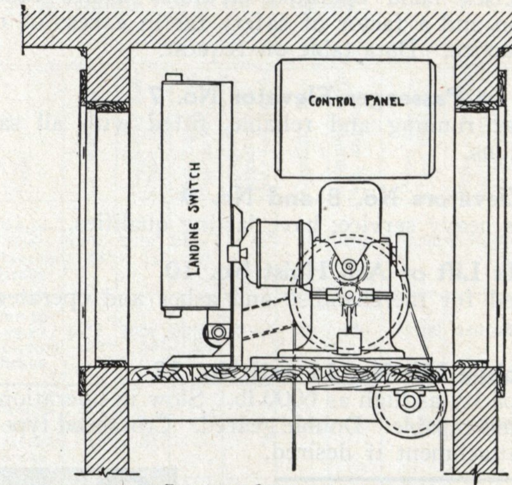
Number of landings and landing doors.

Style of door, whether swinging or vertical slide.

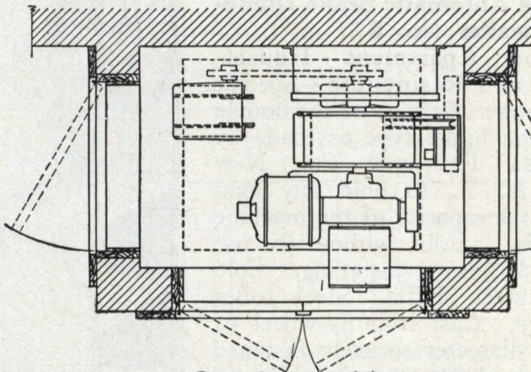
Location of machine, whether directly overhead, in basement, on shelf on top floor or intermediate floor.

Kind of guides, whether steel or wood.

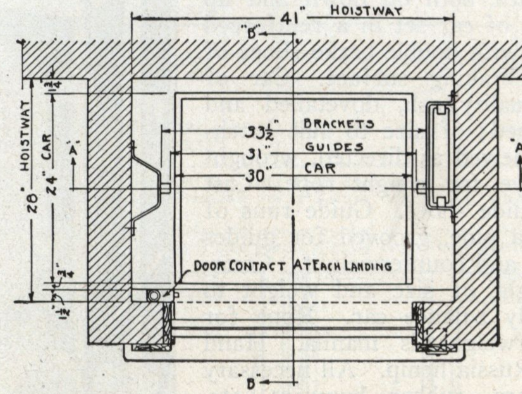
Number of door locks (if desired).


CONTROL PANEL
LANDING SWITCH

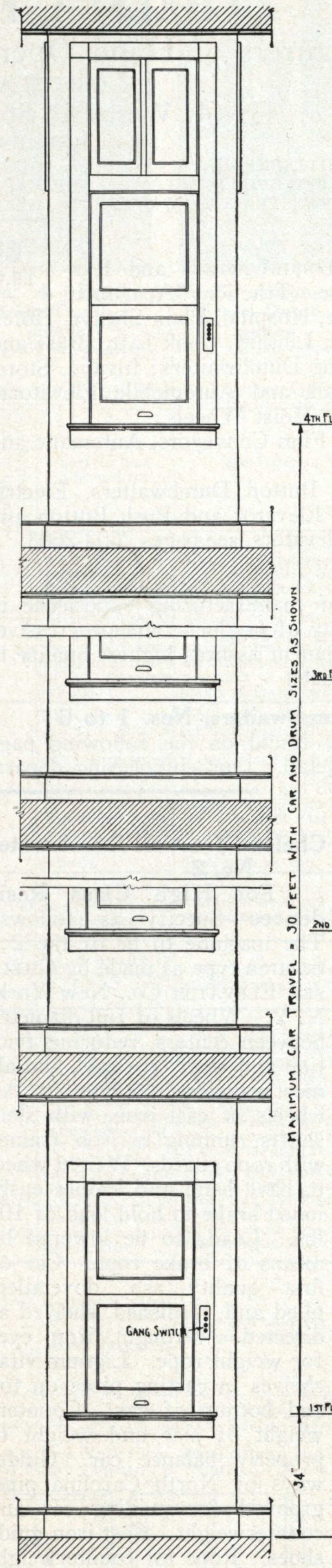
— Elevation Showing Arrangement —
— Of Machine Room —



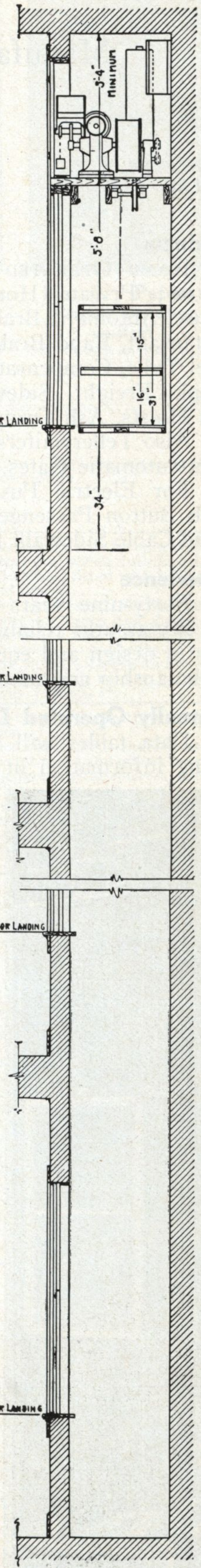
— Plan Showing Arrangement —
— Of Machine Room —


41"
HOISTWAY
"B"
33½" BRACKETS
31" GUIDES
30" CAR
28" HOISTWAY
24" CAR
"A"
DOOR CONTACT AT EACH LANDING
B

— Plan Of Hoistway —


4TH FLOOR LANDING
3RD FLOOR LANDING
2ND FLOOR LANDING
1ST FLOOR LANDING
GANG SWITCH
MAXIMUM CAR TRAVEL - 30 FEET WITH CAR AND DRUM SIZES AS SHOWN
34"

— Elevation Section A-A —


3'-4" MINIMUM
5'-0"
15"
16"
31"
34"

— Elevation Section B-B —

Note: Layout as shown is for four landings. Arrangement and dimensions can be modified to meet other conditions.

Type "AA" Dumbwaiter Machine Layout with Full Automatic Push Button Control

ESTABLISHED 1876 INCORPORATED 1912

CHELSEA ELEVATOR CO.

Manufacturers of Hand Operated Dumbwaiters and Elevators

OFFICE AND FACTORY
439-441 West 19th Street, NEW YORK, N. Y.

REPRESENTATIVES
ROCHESTER, N. Y.
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ST. PAUL, MINN.
TOPEKA, KAN.
HELENA, MONT.
DES MOINES, IOWA
DETROIT, MICH.
SOUTH BEND, IND.
SEATTLE, WASH.
OKLAHOMA CITY, OKLA.

CHELSEA
TRADE-MARK

Products

Hand Operated Dumbwaiters and Elevators; Private House, Traction, Apartment House, Automatic Brake, Hospital, Plain Sheave, Hotel, Restaurant, Band Brake, Library, Book Lift, Brass and Steel Tube, Compensating Dumbwaiters; Invalid, Store, Trunk, Freight, Sidewalk and Automobile Elevators; Ash Hoists, Ash Cranes, Hoist Wheels.

Also Tellerwaiters, Film Conveyors, Automatic and Semi-automatic Gates.

For Electric Push Button Dumbwaiters, Electric Push Button Passenger Elevator and Push Button and Hand Cable Sidewalk Elevators, see pages 2602-2603.

Experience

Forty-nine years of manufacturing experience in one city assures reliability of products, and progressiveness in design and equipment assures highest quality in workmanship and materials.

Manually Operated Dumbwaiters, Nos. 1 to 6

Data tables will be found on the following page giving information in detail. Our engineering department and our service sheets are at the disposal of prospective buyers.

Manually Operated Elevators, Nos. 7 to 12

Chelsea hand operated elevators insure ease of operation and a factor of safety far in excess of ordinary practice. Data table on request.

Invalid or Passenger Elevator No. 7

Easy running and reliable, fitted with all safety precautions.

Store Elevators No. 8 and No. 9

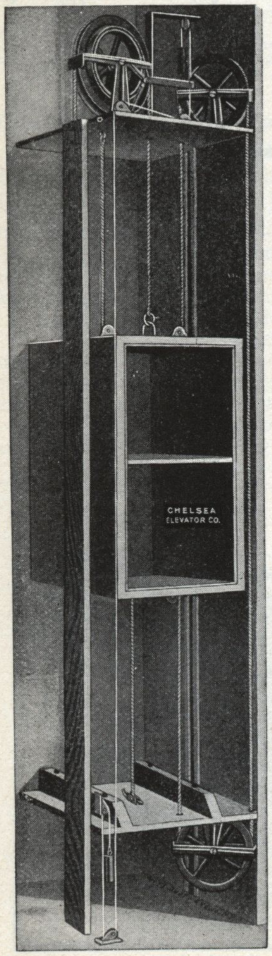
For heavy service, have lasting qualities.

Sidewalk Lift or Ash Hoist No. 10

Used for merchandise and ashes and operated by windlass.

Automobile Lift No. 11 and No. 12

Capacity as high as 6000 lb. Slow in operation but sturdy and capable. Double geared. Crosshead type and safety attachment if desired.



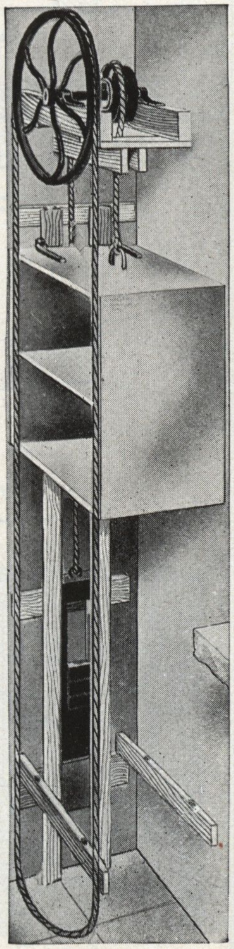
Dumbwaiter No. 2

Chelsea Traction Dumbwaiter No. 2

For High Class Residences—Specify as follows: The machine to be of the 2:1 traction type as made by Chelsea Elevator Co., New York, N. Y. Wheels of full diameter between centers, reducing friction and wear on ropes, and almost noiseless in operation. All wheels of cast iron, with steel shafts running in iron frames with rope guards. Weight wheel to have band and leather cushioned brake to hold load of 100 lbs. Loads to be lowered by means of brake rope. Car of first quality ash, dovetailed, filled and varnished, shelved as directed. Wrought iron eyes for weight rope. Lignum vitae shelves in casting piece on top and bottom of car. Counterweight of size and weight to properly balance car. Guideways of North Carolina pine, grooved for guiding car and counterweight. Cast iron guide shoes. Rope for counterweight is manila. Hand and check ropes, Russia hemp. All necessary hardware, rubber bumpers, etc. Guarantee 1 year.

Chelsea Automatic Brake Dumbwaiter No. 5

For Apartment Houses, Stores and Residences—Specify as follows: Machine of the double automatic brake type as made by Chelsea Elevator Co., New York, N. Y., to hold any load within the capacity of the machine which is .... lbs. without the use of check line or fastening. Cold rolled steel shafts. Steel roller bearings. Cast iron fly-wheel of proper diameter securely fastened to steel shaft, cast iron center wheel bored to fit shaft; lock full automatic both on down and up motion of car set in a reinforced casing with double brake shoes of ample braking surface. Car of first quality ash, dovetailed and varnished; of size to suit hatchway, shelved as directed, wrought iron eye for weight rope. Cast iron guide shoes. Guide runs of Georgia pine, grooved for guides on car and counterweight. Counterweight of size and weight to properly balance car. Rope for counterweight is manila. Hand rope, Russia hemp. All necessary hardware, rubber bumpers, etc. Machine timbers Georgia pine, sheaves cast iron. Guarantee 1 year.



Automatic Brake Dumbwaiter No. 5

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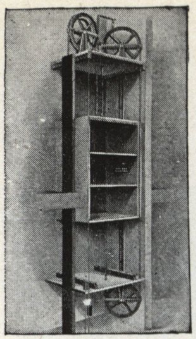
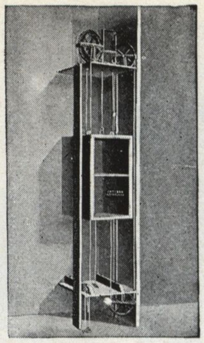
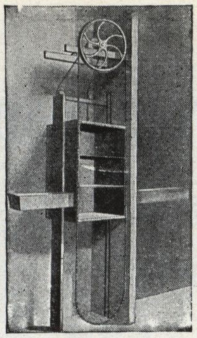


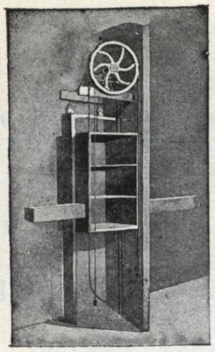
No. 1. One-to-one Traction Dumbwaiter
1 to 50 lb. capacity



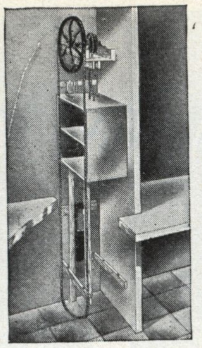
No. 2. Two-to-one Traction Dumbwaiter
50 to 100 lb. capacity



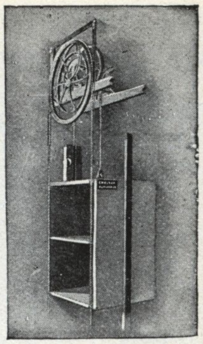
No. 3. Plain Sheave Dumbwaiter
50 to 150 lb. capacity



No. 4. Band Brake Dumbwaiter
50 to 150 lb. capacity



No. 5. Automatic Brake Dumbwaiter
75 to 250 lb. capacity



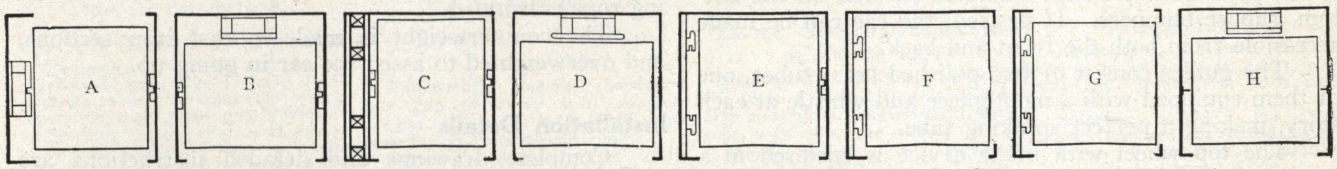
No. 6. Patent Frame Dumbwaiter
100 to 500 lb. capacity

DATA AND PRICES OF SOME OF THE CHELSEA HAND OPERATED DUMBWAITERS

No.	Type	Car size	Hatchway size, single face	Hatchway size, double face	Headroom required above door for mach.	Capacity, lb.	Complete ship. wt., approx., lb.	Price, machine only	Price, complete outfit, height 20 ft. or less	Price, machine, ex. double face	Add each extra ft., single face	Add each extra ft., double face	Service best adapted for	Specification Writers' Data and General Description
1A	One-to-one Traction Brake	22″x 18″	26″x 21″	26″x 22″	2′ 2″	50	400	$70.00	$150.00	$30.00	$0.60	$1.00	High class residence work. Pantry service. Quick service. Small packages. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Iron wheels set in iron frames, with oil holes, rope guards, etc. All wheels full diameters between centers; weight wheel fitted with band and leather cushioned band brake. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes for ropes and guides for runs; manila hemp hand and check ropes; manila weight rope; heavy double groove hardwood runs; cast iron counterweight fitted with eye and guides; platform at bottom fitted with rubber bumpers; check weights, bullseyes, pulleys, etc.
1B	One-to-one Traction Brake	26″x 22″	30″x 25″	30″x 26″	2′ 6″	50	450	75.00	160.00	40.00	.60	1.00		
2A	Two-to-one Traction Brake	22″x 18″	26″x 21″	.....	2′ 8″	100	430	65.00	170.00	......	.70	....	High class residence work where heavier duty is required than one-to-one. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Same as above with eye at top of shaft for hand rope fastening. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes for ropes and guides for runs and casting pieces with lignum vitae sheaves; manila hemp hand and check ropes; manila weight rope; heavy double groove hardwood runs; cast iron counterweight fitted with eye and guides; platform at bottom fitted with rubber bumpers and fastening for adjustment to hand rope; check weights, bullseyes, pulleys, etc.
2B	Two-to-one Traction Brake	26″x 22″	30″x 25″	.....	3′ 0″	100	475	70.00	175.00	......	.70	....		
3A	Plain Sheave Rig	22″x 18″	26″x 21″	26″x 22″	2′ 2″	75	240	24.00	62.00	16.00	.70	.90	A low priced general utility dumbwaiter.	MACHINE—Steel shaft, boxes, flywheels and weight wheel of iron. Car same as for No. 5 below.
4A	Brake Sheave Rig	22″x 18″	26″x 21″	26″x 22″	2′ 6″	75	290	45.00	100.00	18.00	.75	.95	Band brake to hold and lower loads.	MACHINE—Same as No. 3, only flywheel has band brake; car same as for No. 5 below.
5AA	Automatic Brake	20″x 16″	24″x 19″	24″x 20″	2′ 0″	50	250	45.00	80.00	14.00	.50	.85	Residence, apartment house, libraries, stores, restaurants, clubs, and public buildings and elsewhere, where a number of different people have the use of car. No check line required, as automatic brake holds loads within the capacity of machine.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel, and boxes for shaft. To back timber there is fastened an automatic brake of first class construction, so designed as to eliminate as much lost motion, noise and friction as possible; lock to automatically hold car at any point without the use of check lines or fastenings; car to remain stationary with load within capacity of machine until released by a pull on hand rope. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand and check ropes; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; cross pieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, check weights, etc.
5A	Automatic Brake	22″x 18″	26″x 21″	26″x 22″	2′ 2″	75	275	50.00	90.00	16.00	.60	.90		
5B	Automatic Brake	26″x 22″	30″x 25″	30″x 26″	2′ 6″	100	350	60.00	110.00	18.00	.75	.95		
5C	Automatic Brake	30″x 24″	34¼″ x27″	34¼″ x28″	2′10″	150	450	70.00	130.00	20.00	.80	1.00		
5E	Automatic Geared	30″x 24″	34¼″ x27″	34¼″ x28″	3′ 0″	150	600	80.00	155.00	20.00	.90	1.10	Hospitals, sanitariums, clubs, schools where heavy duty is required.	Car and machine same as above except machine has gears and iron frames.
5D	Automatic Brake	34″x 28″	38¼″ x31″	38¼″ x32″	3′ 2″	250	635	90.00	165.00	22.00	.90	1.10		

Notes: Enclosed weight box, add $1.00 each ft. of height. Steel guide rails for car, add $3.00 per ft. of height. Brass guides for steel rails, $9.00 a set. Automatic catch serviceable for a 2-story dumbwaiter where brake and automatic lock are omitted, $10.50. Rope clamps to fasten hand ropes, $1.75 each.

Steel cars are made special and prices quoted on request. All prices are f. o. b. New York City. Detailed plan and instructions are sent with each equipment. No extra charge if size varies slightly from these given. Ropes spliced before shipment, if requested. Prices quoted for erection anywhere.



Chelsea Dumbwaiter Hatchway Arrangements for Varying Conditions

In ordering, state preferable arrangement, and give clear inside measurements and total height of hatchway; also, door size in height and width

ESTABLISHED 1887

ENERGY ELEVATOR COMPANY

214 New Street

PHILADELPHIA, PA.

Products

Hand Power Dumbwaiters.
Hand Power Elevators.
Invalid Elevators.
Sidewalk Elevators.
Automobile Elevators.
Electric Dumbwaiters.
Electric Freight Elevators.

TRADE-MARK

"Energy" or Residence Dumbwaiter

Capacity—75 lbs. For high class residences, apartment houses, etc.

Description—The machine is of the automatic type, which securely sustains the car at any point without the use of lines or cords. The shaft is polished turned steel, revolving on roller bearings, and is mounted in an iron frame containing the entire mechanism, including the wheels for deflecting the hoist rope. All parts are accurately bored and carefully fitted, resulting in a perfect machine.

The car is constructed of well seasoned hardwood, finished with filler and varnish, and has adjustable guide shoes. The hoist rope is finest quality flexible wire cable, and the operating rope is hemp, free from splinters. The guides are so arranged that they guide both the car and the weight, thereby saving space in the shaft and insuring free and quiet operation. Quotations for double face and special types will be sent on request.

"Little Beauty" Dumbwaiter

Capacity—25 lbs. Suited for restaurants, stores, offices, etc., where noiseless, quick service is required.

Description—This installation stands open in the room, easily accessible. The operating gear consists of hemp rope passing over iron wheels, one at the top, the other at the bottom. These wheels are mounted in iron stands; they turn on roller bearings, and have guards to prevent the rope from jumping off. A self-holding brake, applied or released by one line from any floor, securely sustains the car, loaded or empty, at any point.

The car is made of highly finished hardwood trays, spaced with square brass tubes, and has re-inforced corners. It is fitted with adjustable brass guide shoes, polished brass rope connections, and, on the bottom, rubber bumpers. If desired, the car can be made accessible from both the front and back.

The guides consist of two polished brass tubes, one of them equipped with a mouthpiece and whistle at each story, making a perfect speaking tube.

The top wheel with brake device is enclosed in a hardwood paneled cabinet, which can be finished to match the surrounding woodwork, or the car, as preferred.

"Little Giant" Dumbwaiter or Trunk Lift

Capacity—300 lbs. Adapted for residence and apartment house work, hotels, stores, etc.

Description—The machine is entirely contained in an iron frame, with an automatic brake that securely sustains the car at any point without the use of lines or cords. It has spur gearing cast from machine cut patterns, and the shafts are turned steel revolving on antifriction bearings.

The car is well seasoned hardwood, with adjustable guide shoes, and it is well braced with irons and reinforced with angles where necessary to make it strong and rigid.

It is lined on the back and sides with yellow pine fencing.

The hoist rope is a strong, flexible cable, and the operating rope is hemp, free from splinters. The counterweight runs in a closed box.

If preferred, the car can be made the same as the "Energy," with the weight running in guides.

Invalid Elevator

Capacity—500 lbs. For residences.

Description — The hoisting mechanism has machine cut gearing and steel antifriction roller bearings, which eliminate noise, all enclosed in an iron frame.

The brake acts automatically and holds the car at any point in its travel, positively safe against excessive speed or a runaway.

The car is of artistic design, the sides and back having hardwood panel work 4 ft. high, and the upper parts enclosed with bronze grille work, with oak panels overhead.

It is equipped with a spring grip safety device that will prevent the car from falling more than an inch should both cables part. The woodwork is filled, and finished in golden oak. The guide runs are hard white maple.

The two steel hoist cables have an ultimate strength each of 13,000 lbs., and are attached to an equalizing bar that insures equal tension on each cable. The operating rope is hemp.

The counterweight is made in cast iron sections, and overweighted to assist the car in going up.

Installation Details

Complete drawings and detailed instructions are provided to direct the mechanic in setting up the dumbwaiters and elevators furnished by us.

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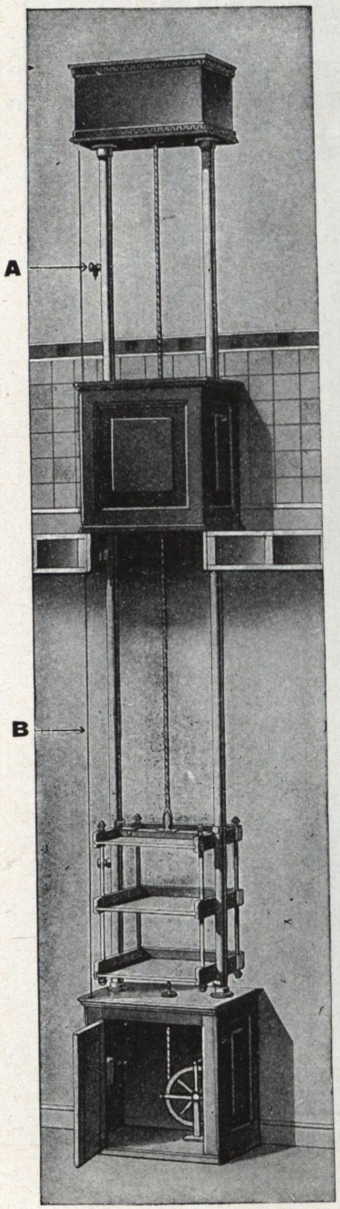
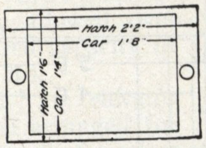


A—Speaker B—Brake line



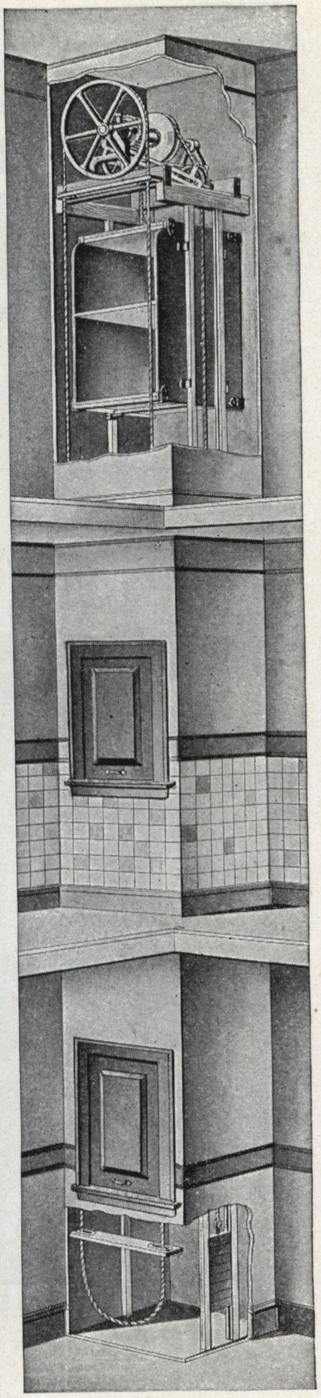
Plan for Car 20x16 in.

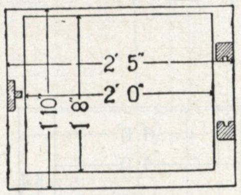
"Little Beauty" Dumbwaiter

Equipment: Wheels and brake, hardwood car (20x16 in.), leadweight, cabinet to cover top wheel, operating rope, brass tube guides.

Shipping weight: For 10-ft. travel (standard size), 275 lbs.; with bottom stand and guard for upper floor, 375 lbs.

Prices: For 10-ft. travel, $120.00; each extra foot travel, $2.00; each extra inch car area, $0.10





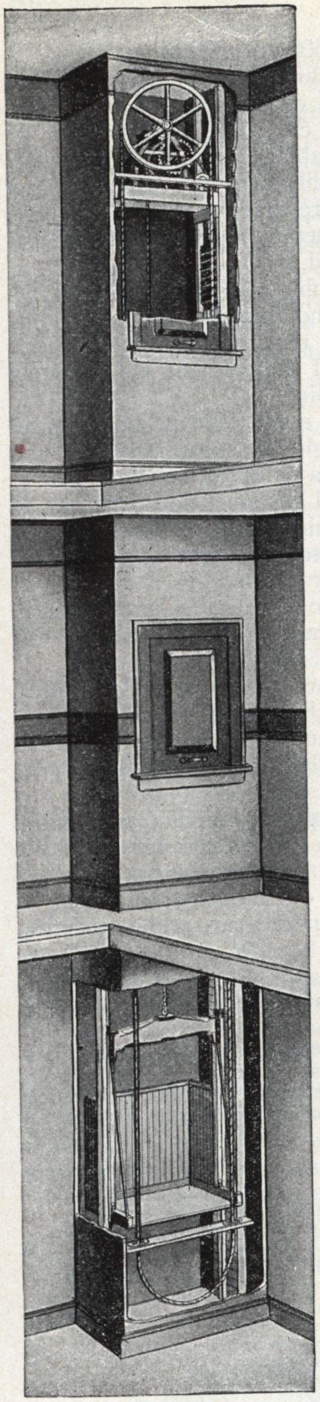
Plan for Car 24x20 in.

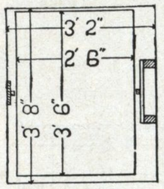
"Energy" or Residence Dumbwaiter

Equipment: Machine, hardwood car (up to 24x20 in.), counterweight, pull rope, hoist cable, rope guards, car runs, weight runs.

Shipping weight: For 10-ft. travel (standard size), 300 lbs.

Prices: For 10-ft. travel, $80.00; each extra foot travel, $0.80; each extra inch car area, $0.06





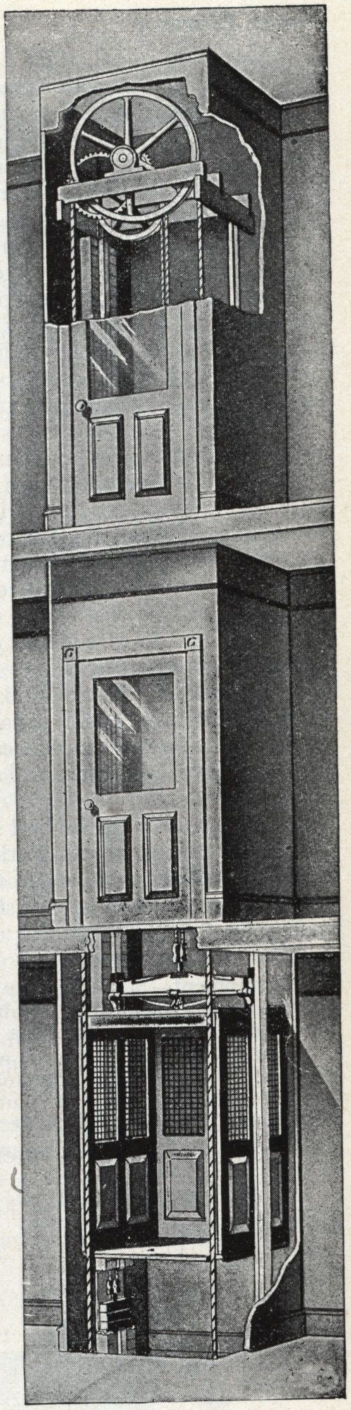
Plan for Car 2 ft. 6 in. x 3 ft. 6 in.

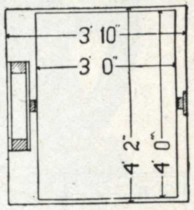
"Little Giant" Dumbwaiter or Trunk Lift

Equipment: Machine, hardwood car (2 ft. 6 in. x 3 ft. 6 in. x 4 ft. high maximum), counterweight, hand rope, hoist cable, car runs.

Shipping weight: For 10-ft. travel (standard size), 500 lbs.

Prices: For 10-ft. travel, $140.00; each extra foot travel, $0.50





Plan for Car 3x4 ft.

Invalid Elevator

Equipment: Machine, hardwood car (3 ft. wide x 4 ft. deep), counterweight, hand rope, hoist cable, car runs.

Shipping weight: For 10-ft. travel (standard size), 1600 lbs.

Prices: For 10-ft. travel, **$350.00**; each extra foot travel, $3.00

Continued on next page

Hand Elevator

Capacity—500, 1000, 1500 and 2000 lbs.

In the hand elevator machine the rope wheel is keyed to a steel shaft, which turns on steel antifriction roller bearings. The spur wheel is cast from a cut pattern, of extra strength to insure durability, and the cable wheel is doubly heavy and spoke ribbed for the same purpose. The main shaft, which also revolves on roller bearings, is turned steel of large diameter, to resist the torsional strain to which it is subjected.

The brake is of the double area self-holding type, consisting of a wide steel band compressing on the outside of the pull wheel. It is released or applied by one line from any floor, on or off the car, and will securely sustain a full load at any point.

The car is made of first quality hardwood, with all requisite iron braces and angles to secure strength and rigidity; it is equipped with a safety attachment that is sure in action, and that will instantly lock the car to the guides if the cables should break. The elevator is balanced by weights made in sections, so that the desired adjustment may be made or altered, if necessary, at any time. It is customary to have sufficient weight to cause the car to rise when empty, and we include this amount with our prices.

The cables are steel, and will sustain a load ten times greater than the rated capacity of the elevator; these cables are attached to the car by an equalizing bar so that both are kept taut, and the strain is equally apportioned.

The hand rope is best quality manila, and amply large and strong for its work. The check line is of the proper diameter and length to operate the brake.

The guide runs are first quality hard white maple, machined to fit the guides on the car, and bored and countersunk for screws.

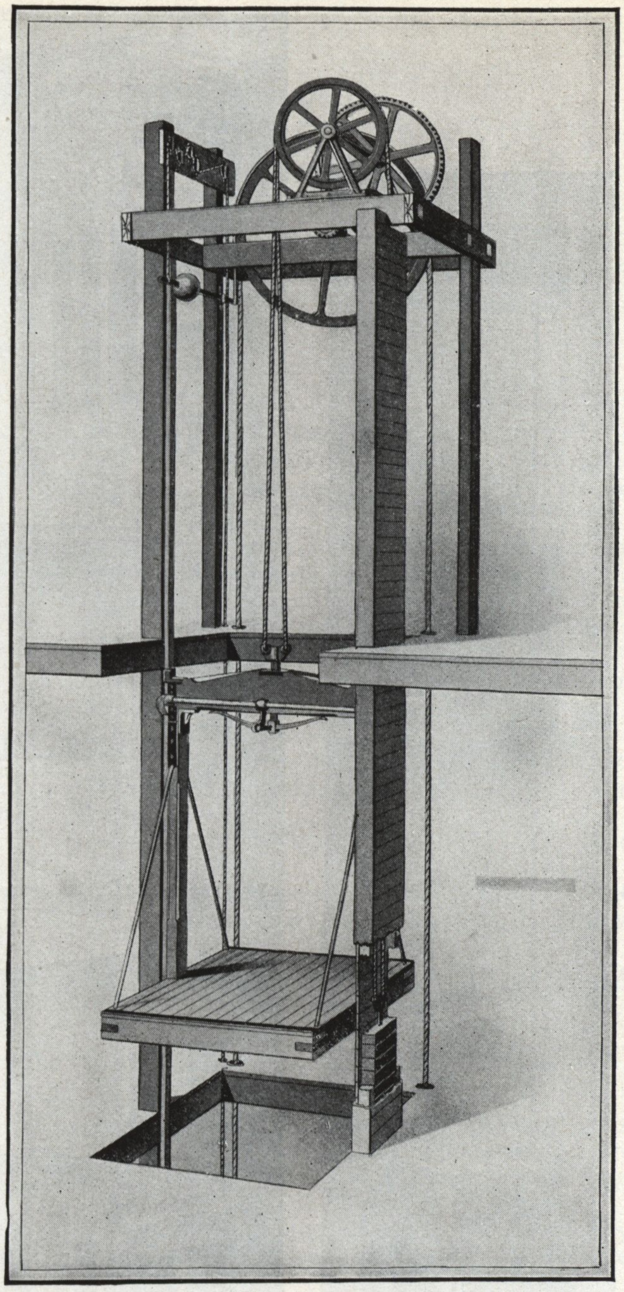
Equipment—Machine, car with safety catch, counterweights on a wrought iron bar, hand rope, two hoist cables and fastenings, check line, car runs.

Note: The guide posts, machine supports, weight box, and bolts for installing the elevator are not included in the shipment, as they can be purchased to better advantage locally, and with a considerable saving of freight charges.

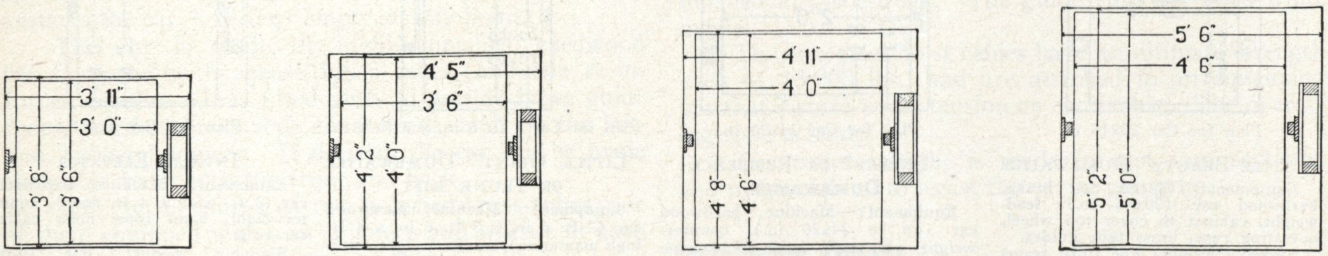
PRICES

Capacity, lbs.	Car size, outside measurement, ft.		Shipping weight, lbs.	Price for 10 ft. of travel	Price for each additional foot of travel	Price each additional sq. ft. of car area
	Width	Depth				
500	3	3½	1100	$180.00	$0.70	Maximum
1000	3½	4	1400	210.00	.80	Maximum
1500	4	4½	1700	240.00	.90	Maximum
2000	4½	5	2 0)	270.00	1.00	$5.00

Bow irons for top of car (to operate one set of doors), $30.00.
Irons to operate automatic hatch doors, each floor, $24.00.



Hand Elevator



500 lbs. 1000 lbs. 1500 lbs. 2000 lbs.

Shaft Plans for Hand Elevators

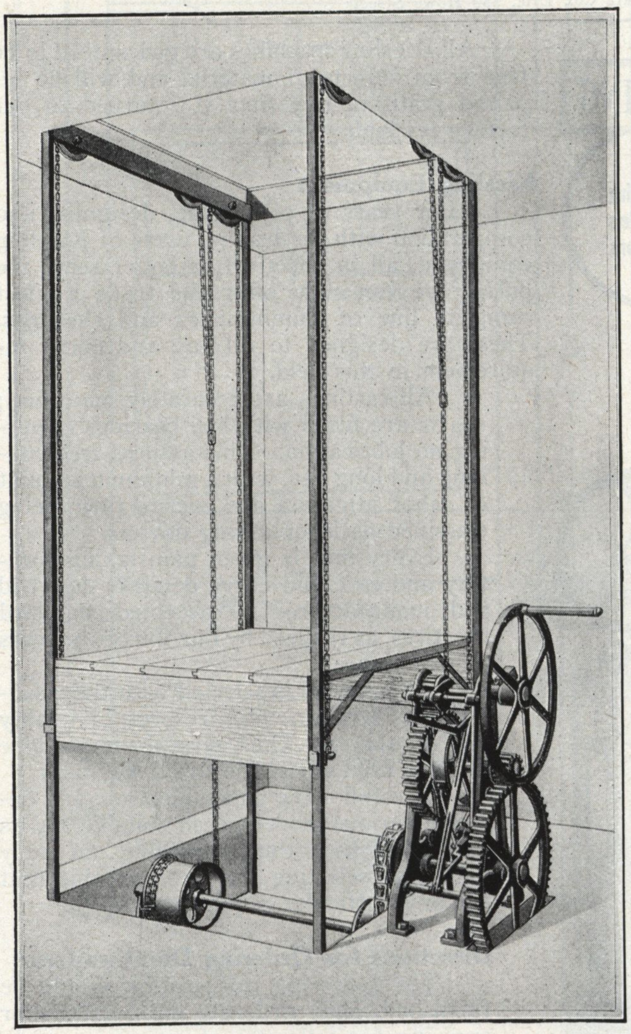
Continued on next page

Sidewalk Elevator, Type KD-24

Capacity—1500 lbs.

Description—Machine has compound gearing, steel shafts, iron drums and a powerful self-holding band brake, all set in an iron frame ready to bolt to the floor. Car is wood, braced with iron, and is suspended by four $\frac{5}{16}$-in. chains of 20,000 lbs. ultimate strength.

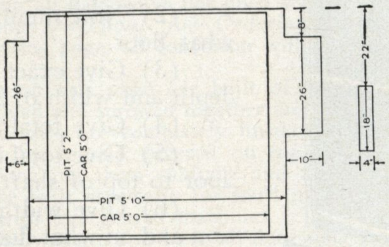
The gearing disengages for rapid lowering, thus eliminating the driving wheel, which does not revolve. The driving wheel is used instead of a crank to give momentum, and to provide greater safety for operator.



Sidewalk Elevator

The construction is strong throughout, with a good margin of safety allowed over its rated capacity of 1500 lbs.

This elevator can be arranged for hatches that project from the building line.



Plan of Pit

Equipment—Machine, car, top wheels in suspension irons, 4 chains, steel guide runs, all necessary connections.

Shipping weight, 2000 lbs.

Prices

For 10-ft. travel (with car not over 5 ft. square)	$300.00
Each additional foot of travel	3.00
Each additional square foot of car area	3.00

Automobile Elevator

Capacity—4000 lbs.

The automobile elevator has compound gearing of extra strength, bolted to heavy iron yokes, which keep the gearing in perfect alignment at all times.

The car is made of yellow pine sills, with a heavy plank floor, and is reinforced on the underside.

There are 4 cast steel cables, having an ultimate strength ten times greater than the elevator's capacity.

This elevator is further equipped with large machine grooved drums and heavy steel shafts. To equalize the strain on the hoisting gear, two counterweights are furnished, while the car has 4 guides, one at each corner, to insure steady travel and prevent floating.

Equipment—Machine, car, steel suspension connection for car, 2 counterweights, 4 hoist cables, 2 weight cables, pull rope, brake rope, maple guide runs.

Shipping weight, 5000 lbs.

Prices

For 10-ft. travel (car not over 8 ft. x 16 ft.)	$500.00
Each additional foot of travel	5.00
Each additional square foot of car area (not over 8 ft. x 18 ft.)	5.00

Electric Dumbwaiter

This electric lift is designed to carry loads up to 500 lb. at a speed of 50 ft. per minute. If the car travels one story it is controlled by push buttons. But if there are intermediate stops the controls are hand cables, passing down inside the hatch, accessible from each floor.

The steel shafts have phosphor bronze bearings and roller bearing thrusts. The hatchway terminal stops and the brake are both electric and automatic.

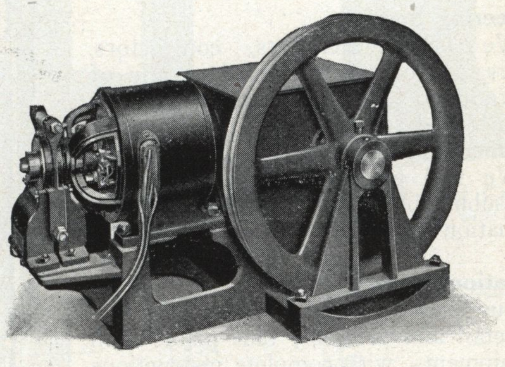
The car is made of hardwood, any size required, not over 3 ft. square or 4 ft. high, and can be made either platform or cabinet type as preferred. The two steel suspension cables have a combined strength of 20,000 lbs. The guides are wood.

The high grade of material and sound construction principles which are embodied in this outfit insure the longest possible period of efficient dumbwaiter service.

Equipment—Machine for alternating current, 2 or 3-phase, 220 volts, 60 cycles; car; controller; two hoist cables and connections; counterweight on an iron bar; guide runs; limit switches; push buttons.

Shipping Weight—900 lbs.

Prices—For 10-ft. travel, $500.00; each additional foot of travel, $2.00.



Electric Dumbwaiter Machine

Electric Freight Elevators

Energy electric freight elevators are made for a wide variety of uses, including sidewalk, automobile and warehouse work, and ranging in size from 1000 to 5000 lbs. Write for our quotations.

ESTABLISHED 1889

JOHN W. KIESLING & SON, INC.

Manufacturers of Dumbwaiters, Elevators and Lifts

1797-1799 Atlantic Avenue
BROOKLYN, N. Y.

AGENCIES

SAN FRANCISCO, CAL., Price-Teltz Co., Inc., 523 Market Street
CINCINNATI, OHIO, Ruhrwein Sales Co., 304 Sycamore Street
ST. LOUIS, MO., F. A. Camman Builders Service Co., 928 Century Building
LEXINGTON, KY., Clay Ingles Company, 347 E. Main Street
BIRMINGHAM, ALA., Beecroft & Mallory Sales Co., 2022 Fourth Avenue, No.
NEW ORLEANS, LA., J. T. Mann & Co., Inc., 319 Dryades Street
BALTIMORE, MD., Edwin Cugle & Co., 328 North Charles Street
ROANOKE, VA., C. Coady Cates, 505 Boxley Building
VANCOUVER, B. C., Wm. N. O'Neil Co., Ltd., 530 Howe Street

Products

Hand Power Dumbwaiters:

- Automatic Brake
- Brass Tube
- Jumper
- Steel
- Undercounter
- Band Brake
- High Speed
- Metal Lined
- Bakery
- Hospital

Elevators:

- Freight
- Hospital
- Passenger
- Sidewalk
- Automobile

Lifts:

- Invalid
- Ammunition
- Book
- Printer's Form
- Trunk
- Ash
- Coin
- Fuel

Policy

As pioneer manufacturers of high grade ball bearing hand power dumbwaiters, elevators and lifts we have endeavored during our business career to establish a high standing and appreciation for our equipment.

Thirty-six Years of Experience

Our thirty-six years of experience in the design, construction and manufacture of dumbwaiters and elevators have enabled us to incorporate in our equipment exclusive, inherent features, accruing only from highly specialized training and mechanical ability.

Engineering Service

We invite architects, contractors, builders and others interested in any of our products, to avail themselves of the assistance and co-operation of our service department, without cost.

We will gladly make recommendations, submit blue prints or give any other information desired.

Installation Service

Our service is most complete. We furnish detail and assembly blue prints with all equipments, with complete instructions for making Kiesling installations.

If so desired, we can furnish skilled erection crews for installation work.

Guarantee

Kiesling products are guaranteed to be first class in workmanship and material.

KIESLING

Ball Bearing Dumb Waiters & Elevators

All Kiesling machines are guaranteed to be free from defects of material and will be repaired gratis *at any time* if returned to our factory prepaid.

Kiesling Equipment

After years of pioneering, designing and co-operation with the leading users of Kiesling equipment, all in an effort to better serve the public, we can now offer the trade a most complete line of dumbwaiters and elevators. These are designed to fill any and every requirement in this field.

All castings are accurately machined; shafts are fitted with ball bearings requiring no lubrication. This assures free running and long life, with a minimum amount of labor attention and merits their being classified as labor saving devices.

Every unit is given painstaking scrutiny and care and every detail is designed and manufactured to accepted standard practices, as realized by our thirty-six years of experience.

All material is selected with the greatest consideration with respect to quality and durability. Thus, special unbreakable metal is used where the strain warrants.

The following pages illustrate and describe various models, each suitable for its particular use, thus affording an easy means of selecting the most suitable unit for any particular requirement.

Directions for Ordering Dumbwaiters

The following information should be furnished when ordering dumbwaiters or applying for estimates on same:

(1) Draw a rough sketch showing shaft and openings.

(2) Note number of openings and on what floor.

(3) Give exact finished dimensions of depth and width of shaft at tightest place.

(4) Give total height of shaft.

(5) Give total height from top of top floor to top of shaft.

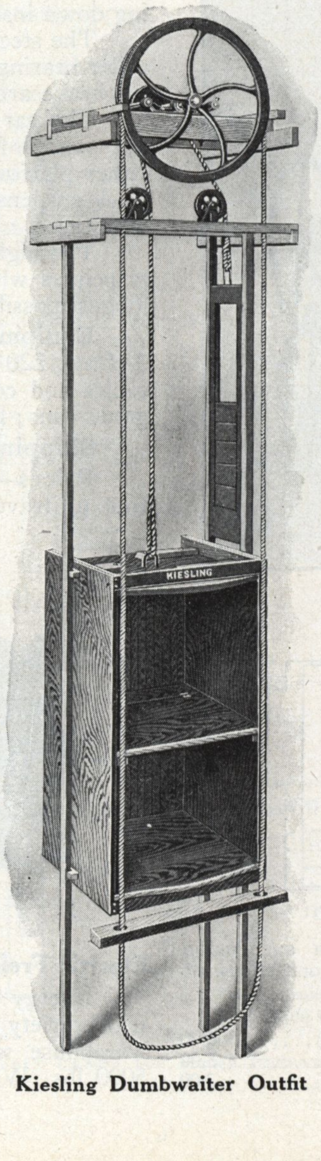
(6) Give width of widest door, position and on what floor.

(7) Show position of counterweight.

(8) State if well is of wood, lath and plaster, ash block, terra cotta, brick or metal.

(9) State what guides will be screwed to.

(10) State style of machine and car and of what capacity required.



Kiesling Dumbwaiter Outfit

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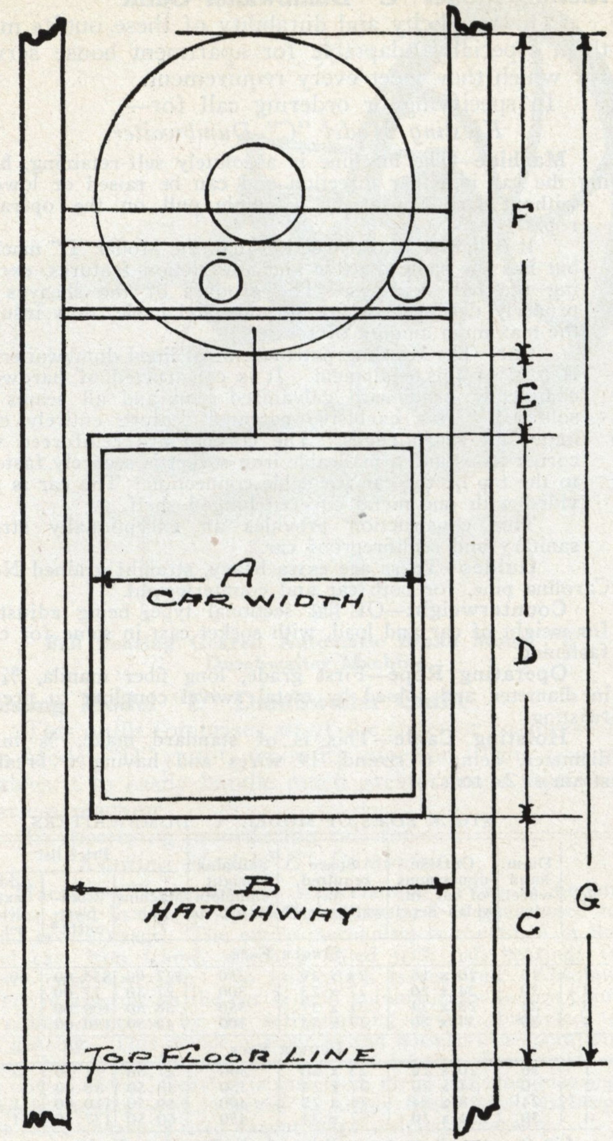


Elevation Showing Height at Top Floor

Dimensions in Inches

No.	A	B	C	D	E	F	G
1	20	23	36	36	10	16	98
2	24	27	36	40	10	20	102
3	28	31	36	44	10	24	106
4	34	37	36	48	10	30	110

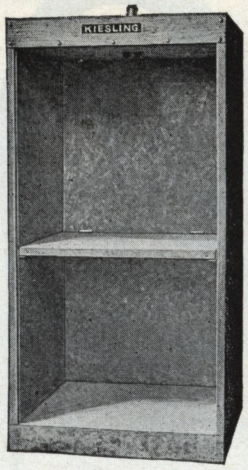
The above chart shows the space required for the various sizes of dumbwaiters and should be followed, if possible. These are minimum measurements, arranged according to sizes and models. Allowance should be made for guide fastening on all hatchways not lined with wood.

By following the *Directions for Ordering Dumbwaiters,* on the preceding page, all confusion will be eliminated.

The cars shown on this page are built of seasoned hardwood, dadoed, glued and screwed together and finished natural. Metal lined cars are completely lined with galvanized iron on the inside and covered on top, and all joints are soldered, making them sanitary and fireproof. The all-steel cars are built especially for hard usage and are generally used with our geared machines.

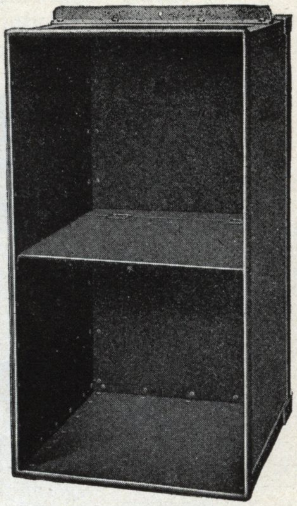
In laying out hatchways, try to have all door openings on the same or opposite sides, using the single or double face cars. Post waiters are used where door openings are at right angles, but this arrangement should be avoided if possible, as a special layout will usually have to be submitted with this style. Be sure to have one door opening wide enough to allow the car to pass through so as to avoid trouble when installing.

Any further information gladly furnished on request.



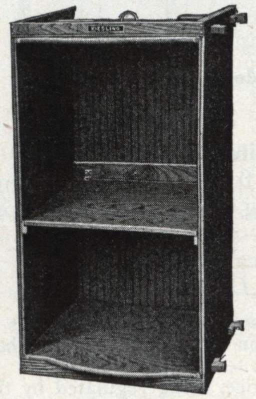
Metal Lined Car

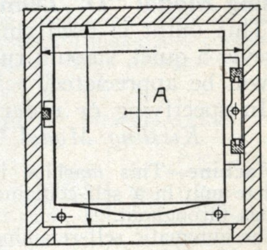
Patented October, 1924



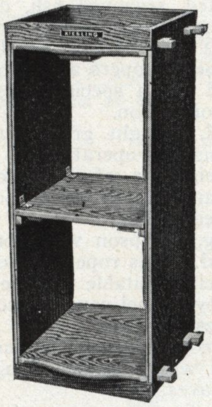
Heavy Steel Car

$\frac{1}{16}$-in. sheet steel with $\frac{1}{8}$-in. angle iron frame

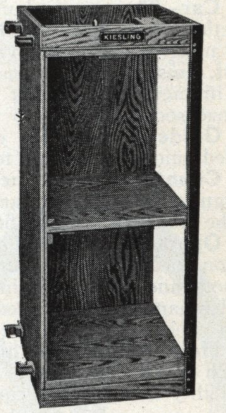




Standard Single Face Style with One Hinged Shelf

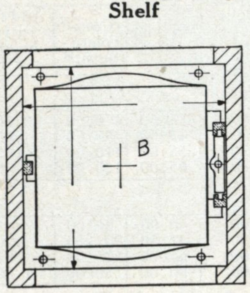


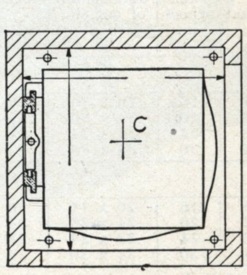
Standard Double Face Style with One Hinged Shelf



Corner Post Car

Steel post with one hinged shelf





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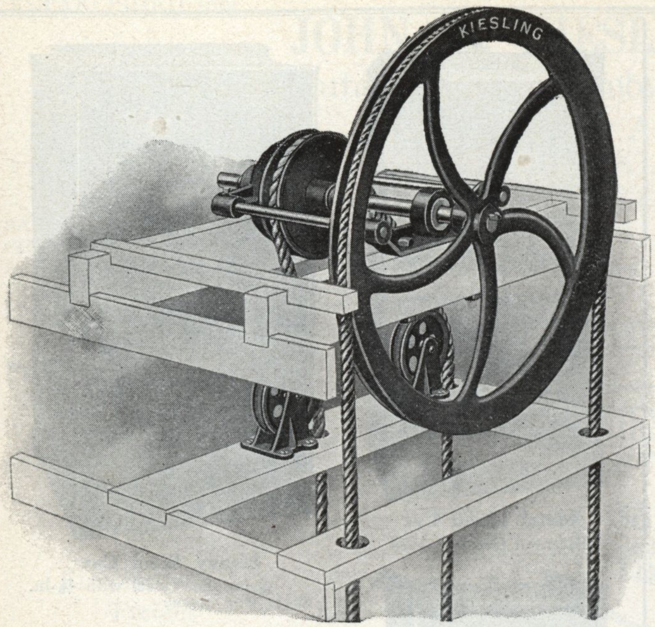


Automatic Brake Ball Bearing Model "D" Dumbwaiter Machine

Kiesling Model "D" Dumbwaiter Outfit

This outfit is used chiefly for fine residences and wherever a quiet, smooth running dumbwaiter is desired and will be appreciated.

In specifying or ordering call for—
Kiesling Model "D" Dumbwaiter.

Machine—This machine is assembled and set up as a complete unit in a self-contained iron frame and has full ball bearings throughout.

The automatic self-retaining device, being regulated by the load, holds without jar or jerk and can be released smoothly by a pull on the operating rope. The sheaves are properly designed for the respective sizes of rope and cable, which is a most desirable feature when considering the life of the ropes.

Car—The car is built of selected, seasoned ash, dadoed together, reinforced at the corners with our special brackets and nicely finished and varnished. It is fitted with one hinged shelf, finished iron guide shoes, rubber bumpers at the bottom set in metal sockets for impact and has a specially designed bronze socket at the top for cable connection.

Guides—These are of seasoned, straight grained maple, milled smooth and true to insure noiseless operation.

Counterweight—The counterweight is of flat sectional design, adjustable for car and load and having hardwood lugs at the sides to properly fit the grooved guides.

Operating Rope—For operating, Sampson white braided cotton cord, ¾ in. in diameter is used. This rope is absolutely smooth and can not splinter, thus being suitable for the most tender hands. It is joined together by a steel coupling covered with rubber tubing to prevent unnecessary noise.

Hoisting Cable—This is marlin covered, ⅜ in. in diameter, which gives a maximum amount of wear, insuring long life, flexibility and proper grip in the sheaves.

STOCK SIZES OF MODEL "D" DUMBWAITERS

No.	Diam. hand wheel, in.	Outside dimensions of car, in. width–depth	Space required, in. width–depth	Shipping weight complete outfit, lb.	Price list		
					Machine only	Complete outfit*	Add for extra height per ft.
			SINGLE FACE				
1	16	20 x 16	19 x 23	250	$35.00	$70.00	$0.50
2	20	24 x 20	23 x 20	300	45.00	90.00	.60
3	24	28 x 24	27 x 31	350	55.00	110.00	.65
4	30	34 x 30	33 x 37	450	65.00	130.00	.70
			DOUBLE FACE				
1	16	20 x 16	20 x 23	300	40.00	80.00	.85
2	20	24 x 20	24 x 27	350	52.50	102.50	.90
3	24	28 x 24	28 x 31	400	65.00	125.00	.95
4	30	34 x 30	34 x 37	500	80.00	150.00	1.00

*20 ft. over all or less. Prices f.o.b. Brooklyn, N. Y.

Kiesling Model "C" Dumbwaiter Outfit

The simplicity and durability of these outfits make them especially adaptable for apartment house service for which they meet every requirement.

In specifying or ordering call for—
Kiesling Model "C" Dumbwaiter.

Machine—The machine is absolutely self-retaining, holding the car in either direction and can be raised or lowered without jerk or jar by a gentle pull on the operating rope.

It is lighter in construction than the Model "D" machine but has the same durable and antifriction features, excluding the ball bearings. The grooves of the sheaves are properly designed to fit the rope and cable, thus insuring the maximum amount of service.

Car—The Kiesling patented metal lined dumbwaiter car is part of this equipment. It is constructed of hardwood, completely lined with galvanized iron and all seams are soldered. This exclusive patented feature entirely eliminates all sharp edges. The corners are reinforced with corner irons and a malleable iron socket is securely fastened to the top of the car for cable connection. The car is provided with one metal covered hinged shelf.

This construction provides an exceptionally strong, sanitary and semifireproof car.

Guides—These are extra heavy, straight grained North Carolina pine, for both car and counterweight.

Counterweight—Of flat sectional type, being adjustable for weight of car and load, with socket cast in same for cable fastening.

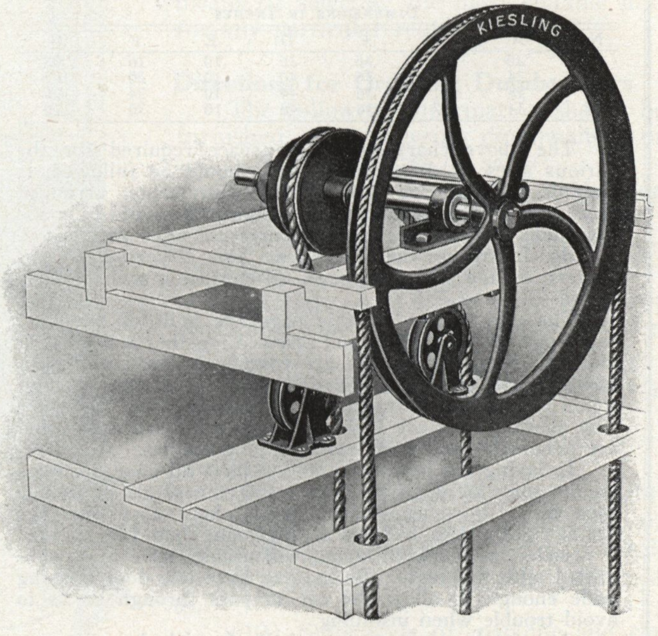
Operating Rope—First grade, long fiber manila, ¾ in. in diameter and joined by metal swivel coupling to prevent twisting.

Hoisting Cable—This is of standard make, ⅜ in. in diameter, being 6 strand, 19 wires and having a breaking strain of 2.4 tons.

STOCK SIZES OF MODEL "C" DUMBWAITERS

No.	Diam. hand wheel, in.	Outside dimensions of car, in. width–depth	Space required, in. width–depth	Shipping weight complete outfit, lb.	Price list		
					Machine only	Complete outfit*	Add for extra height per ft.
			SINGLE FACE				
1	16	20 x 16	23 x 19	250	$22.00	$55.00	$0.60
2	20	24 x 20	27 x 23	300	27.50	77.00	.65
3	24	28 x 24	31 x 27	350	38.50	100.00	.70
4	30	34 x 30	37 x 33	400	49.50	120.00	.75
			DOUBLE FACE				
1	16	20 x 16	23 x 20	300	27.50	71.50	.90
2	20	24 x 20	27 x 24	350	38.50	88.00	.95
3	24	28 x 24	31 x 28	400	49.50	110.00	1.00
4	30	34 x 30	37 x 34	450	60.50	137.50	1.10

*20 ft. over all or less. Prices f.o.b. Brooklyn, N. Y.



Automatic Brake Model "C" Dumbwaiter Machine

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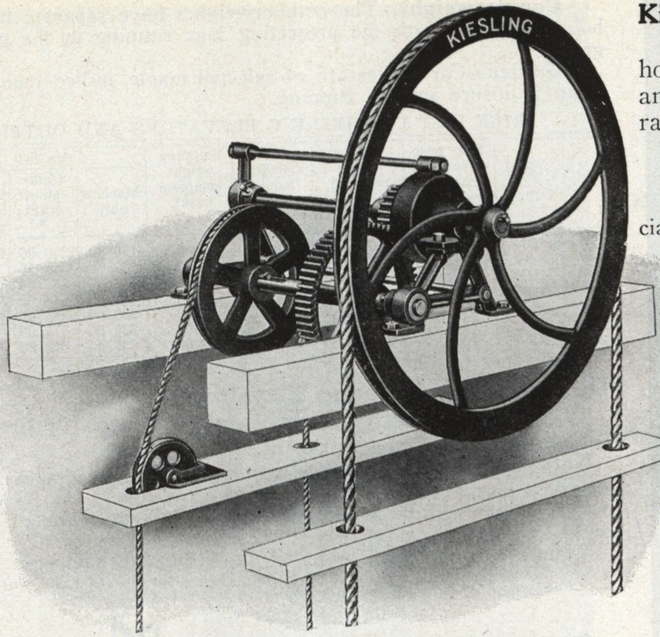


Ball Bearing Geared Automatic Brake Model "E" Dumbwaiter Machine

Kiesling Model "E" Dumbwaiter Outfit

This outfit comprises all of the superior features of our Model "D" outfit, while its superior lifting power enables it to easily handle much greater loads than the gearless machine.

In specifying or ordering call for—
Kiesling Model "E" Dumbwaiter.

Machine—The automatic self-retaining device is similar to that used in our Model "D" machine and is guaranteed to stand severe usage. The entire mechanism is contained in the rigid cast iron frame, which is fitted with ball bearings to insure easy operation. No lubrication is required. Absolute safety is assured, as the car is held automatically at any point in either direction by the self-retaining device connected to the gearing. This device is positive and noiseless in operation, being free from friction, and can not become disengaged or get out of order. Gearing is cast from metal patterns, insuring smooth running, and is keyed to amply heavy steel shafting. One cable sheave is used except when ordered otherwise.

STOCK SIZES OF MODEL "E" DUMBWAITERS

No.	Diam. hand wheel, in.	Outside dimensions of car, in. width–depth	Space required, in. width–depth	Shipping weight complete outfit, lb.	Price List		
					Machine only	Complete outfit*	Add for extra height per ft.
			Single Face				
1	16	20 x 16	19 x 23	350	$80.00	$130.00	$0.90
2	20	24 x 20	23 x 27	400	85.00	150.00	1.00
3	24	28 x 24	27 x 31	450	90.00	170.00	1.10
4	30	34 x 30	34 x 37	500	95.00	190.00	1.20
			Double Face				
1	16	20 x 16	20 x 23	400	90.00	145.00	1.30
2	20	24 x 20	24 x 27	450	95.00	165.00	1.35
3	24	28 x 24	28 x 31	500	100.00	185.00	1.40
4	30	34 x 30	34 x 37	550	105.00	205.00	1.45

*20 ft. over all or less. Prices f.o.b. Brooklyn, N. Y.

Car—Car is built of seasoned ash throughout, similar to that used with our Model "F" and for same purposes.

Guides—Guides for car and counterweight are of heavy straight grained North Carolina pine, milled true and smooth and bored and countersunk for bolts.

Counterweight—This is of flat design, made sectional and adjustable for car and load. Hard wood lugs are fitted at the sides to properly engage the grooved guides.

Operating Rope—Of best grade long fiber manila; ¾ in. for hand wheels up to 24 in. in diameter, and 1 in. for 30 in. and larger. Swivel couplings prevent twisting of ropes.

Hoisting Cable—Hoisting cable is ⅜ in. in diameter, of standard make, having a breaking strain of 2.4 tons and properly connected to car and counterweight.

Kiesling Model "F" Dumbwaiter Outfit

Designed for heavy duty in hospitals, commercial houses, bakeries, etc., for use as trunk hoists, coin lifts and all purposes where a light running equipment for raising heavy loads is required.

In specifying or ordering call for—
Kiesling Model "F" Dumbwaiter.

Machine—Very rugged and durable construction, especially considering its easy running qualities. A rigid cast iron frame contains the gearing and hoisting sheaves. The shafting runs in ball bearings and the load is controlled and held by the Kiesling self-locking, fiber lined circular band brake. Two cable sheaves are furnished, keyed to the shafting.

Car—The car furnished with this outfit is the type specially recommended for use in hospitals, bakeries and heavy kitchen service. It is of standard size, made of seasoned selected ash throughout and is fitted with two movable shelves, the bottoms being covered inside with heavy gauge galvanized iron. An equalizing bar is connected to the top of the car for cable sockets, thus allowing equal strain on both cables. Standard height is 48 in.

Guides—Guides for car and counterweight are of heavy, straight grained, clear North Carolina Pine, bored and countersunk for screws.

Counterweight—Counterweight is of flat design, having separate inlays to adjust for car and load.

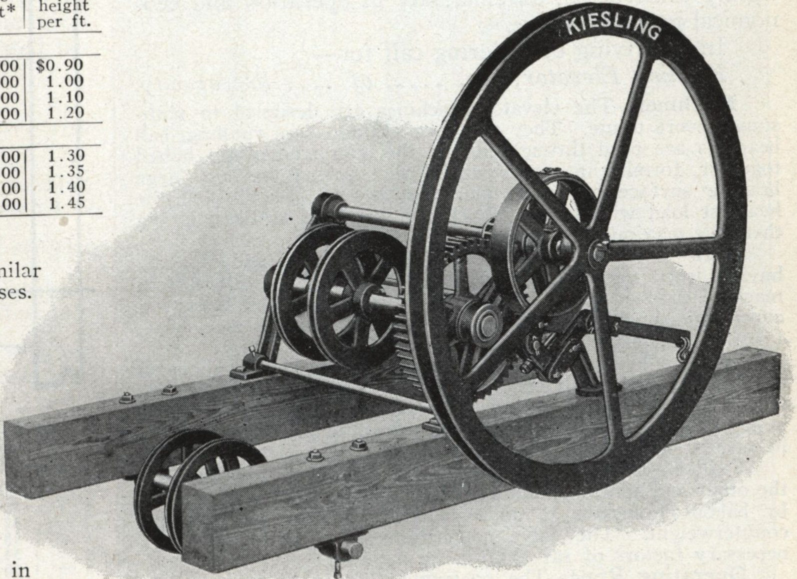
Operating Rope—Operating rope is of first grade long fiber manila; ¾ in. for hand wheels up to 24 in. in diameter, and 1 in. for 30 in. and larger. Swivel couplings are supplied for connecting.

Hoisting Cables—Hoisting cables are two in number, both ⅜ in. in diameter and of standard make, and connected to special sockets on car and weight. This arrangement allows each cable to act as a safety for the other.

STOCK SIZES OF MODEL "F" DUMBWAITERS

No.	Diam. hand wheel, in.	Outside dimensions of car, in. width–depth	Space required, in. width–depth	Shipping weight complete outfit, lb.	Price List		
					Machine only	Complete outfit*	Add for extra height per ft.
			Single Face				
1	16	20 x 16	19 x 23	350	$80.00	$130.00	$0.90
2	20	24 x 20	23 x 27	400	85.00	150.00	1.00
3	24	28 x 24	27 x 31	450	90.00	170.00	1.10
4	30	34 x 30	34 x 37	500	95.00	190.00	1.20
			Double Face				
1	16	20 x 16	20 x 23	400	90.00	145.00	1.30
2	20	24 x 20	24 x 27	450	95.00	165.00	1.35
3	24	28 x 24	28 x 31	500	100.00	185.00	1.40
4	30	34 x 30	34 x 37	550	105.00	205.00	1.45

*20 ft. over all or less. Prices f.o.b. Brooklyn, N. Y.



Ball Bearing Geared Band Brake Model "F" Dumbwaiter Machine

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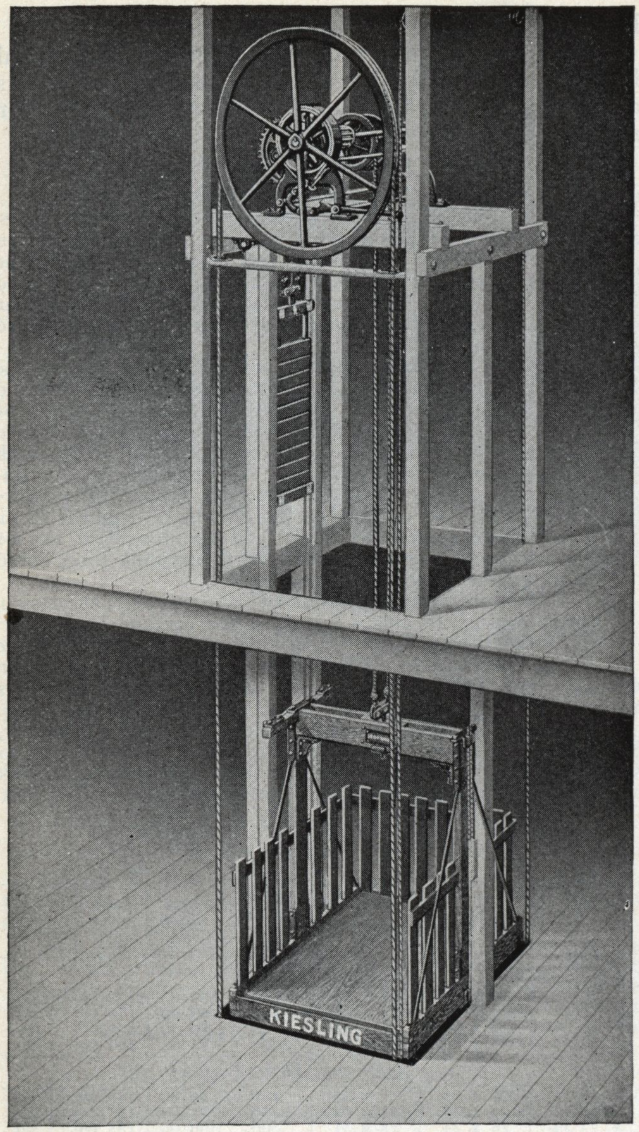


Kiesling Ball Bearing Elevator

Kiesling Ball Bearing Elevator Outfits

Kiesling elevators contain all of the modern improvements to facilitate ease in operation. They are rigidly constructed, durable, safe in operation and economical in maintenance.

In specifying or ordering call for—

Kiesling Elevator; No. ...., of .... lb. capacity.

Machines—The elevator machines are designed to withstand severe usage. They are noiseless and free running, ball bearings are used throughout and the iron frames are bolted together forming a single unit. The brakes have a large braking surface of ample diameter to control and hold the heaviest load without strain. The linings are of fiber, giving them the maximum of wear.

Cars—All cars are built in proportion to size and capacity, having iron braces, bolted where necessary, and fitted with machine finished guide shoes and furnished in the following constructions: hardwood entirely; hardwood with steel platform frame; all-steel.

All cars have side racks of hardwood, as shown above, 6 ft. high. Wire mesh can be used, if required. Where the travel is more than one story, they are fitted with our positive acting safety device, which engages the guide and holds the car in case of the breaking of the cables.

Cables—Two cables are used, each acting as a safety for the other and adding to the life of the outfit. Both are secured by babbitted sockets to an evener bar on the car and the counterweight. The cable connections have more than the necessary factors of safety to carry the load.

Operating Rope—The operating rope is of first quality four strand pure manila, 1¼ in. in diameter.

Counterweight—The counterweights have separate inlays bolted together with the projecting lugs running in the guide grooves.

Guides—Car guides are of selected maple, milled true and clean to insure smooth running.

PRICE LIST OF KIESLING ELEVATORS AND OUTFITS

No.	Capacity, lb.	Side post freight car not exceeding in.	Space required, in. width-depth	Diam. hand wheel, in.	Shipping weight complete outfit, lb.	Price list		
						Machine only	Complete outfit *	Add for extra hgt. per ft.
1	500	30 x 36	40½ x 40	24 or 30	800	$110.00	$250.00	$2.00
2	750	42 x 42	47¼ x 46	30 or 36	1200	165.00	330.00	2.25
3	1000	48 x 48	53¼ x 52	36 or 42	1300	180.00	345.00	2.50
4	1200	54 x 54	59¼ x 58	42 or 48	1600	235.00	440.00	2.75
5	1500	60 x 60	66½ x 64	48 or 54	1900	280.00	495.00	3.00
6	2000	72 x 72	79½ x 76	48 or 54	2400	320.00	575.00	3.25
7	2500	72 x 72	79½ x 76	48 or 54	2700	385.00	635.00	3.75

*20 ft. over all or less. Prices f.o.b. Brooklyn, N. Y.

Directions for Ordering Elevators

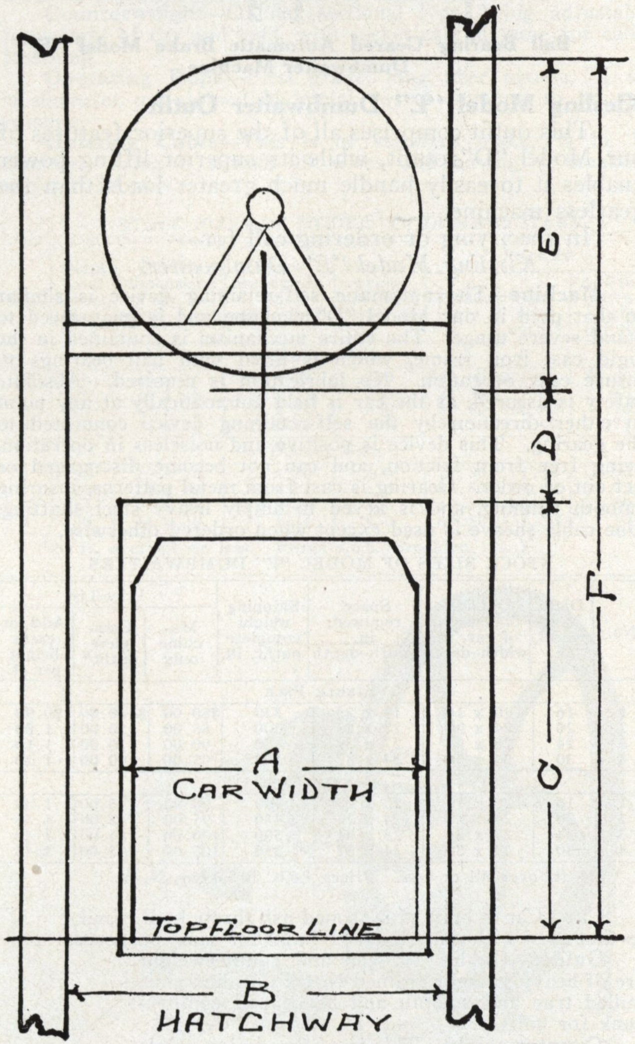
Follow generally the instructions given for ordering dumbwaiters on fourth preceding page.

State what kind of car is wanted and the maximum load that will be placed on same.

If a safety is to be furnished, 3 in. will be taken off the width of the platform.

State whether gates or hatch doors will be required.

Note: The rated capacity of a hand elevator is its safe working load; one man should raise about one-half the rated capacity.



Elevation Showing Height at Top Floor

Dimensions in Inches

No.	A	B	C	D	E	F
1	36	40	78	24	30	132
2	42	47¼	78	24	36	136
3	48	53¼	78	24	42	144
4	54	59¼	81	24	48	153
5	60	66½	81	24	54	159
6	72	79½	84	24	54	162
7	72	79½	84	24	54	162

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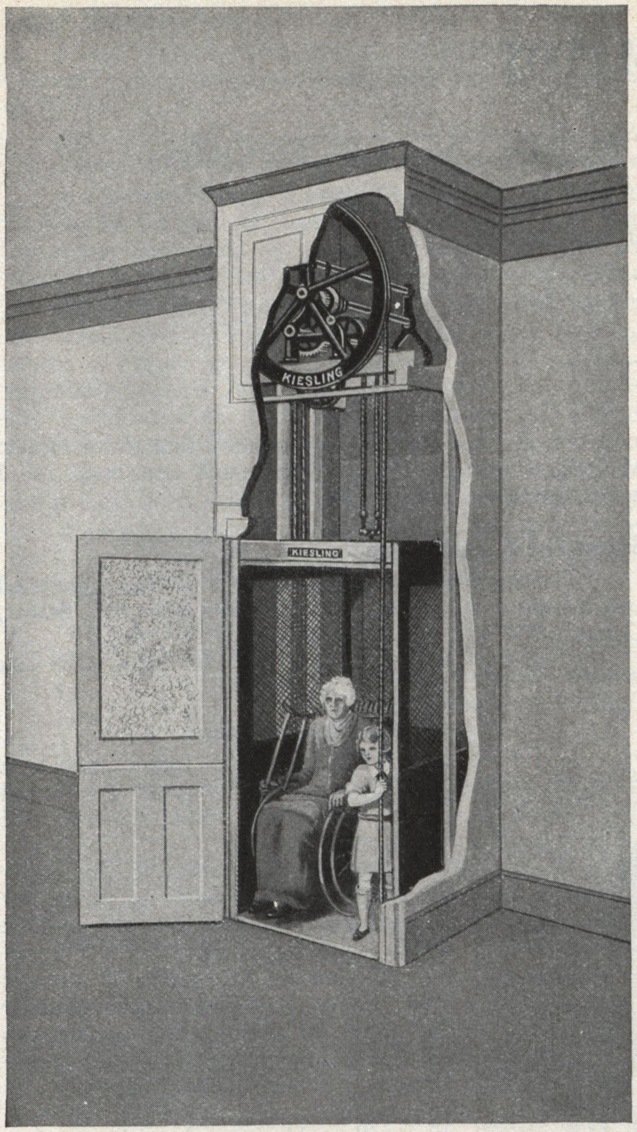


Kiesling Invalid Lift

Kiesling Invalid Lifts

Kiesling invalid lifts represent the last word in perfect production of hand power equipment, sparing neither labor ability nor material to make them the finest of the kind. Every invalid lift is thoroughly tested before leaving the factory.

When specifying or ordering call for—
Kiesling Invalid Lift, with ...... (give here size of car).

Machine—This is a counterpart of our Model "E" machine, described on second preceding page, plus special attention to detail.

Cars—The cars are built of selected hardwood, of superior workmanship, construction and finish.

Counterweight—The counterweight is arranged to balance the car and passenger, thus reducing the operating effort to a minimum.

Guides—Selected maple guides are used, milled true and smooth and allowing the bronze shoes of the car to slide without friction or noise.

Size of car, ft.	Size of well		Price of outfit	Add for extra height per ft.	Shipping weight, lb.
	Width, ft. in.	Depth, ft. in.			
3 x 3	3 4½	3 3	$600.00	$2.00	950
3½ x 3½	3 11½	3 9	700.00	2.50	1,200
4 x 4	4 6	4 3	800.00	3.00	1,300
4½ x 4½	5 0	4 9	900.00	3.50	1,700
5 x 5	5 6	5 4	1000.00	4.00	1,800
6 x 6	6 8	6 4	1200.00	5.00	2,000

Operating Rope—Braided Silver Lake white cotton cord is used for operating. This is the most desirable for the tenderest hands and is far more durable than any other make.

Cables—Two fiber covered steel cables, having a total breaking strain of 4.8 tons are used, securely fastened to the car and counterweight. This comprises a sufficient factor of safety to comply with all requirements, as each cable acts as a safety for the other in case of breakage.

Kiesling Sidewalk Elevators

We have made a specialty of the manufacture and installation of sidewalk elevators and our experience in this particular line enables us to design the proper outfit for any purpose.

When specifying or ordering call for—
Kiesling Sidewalk Elevator, of .... lb. capacity.

Machine—Consists of a heavy, rigid cast iron frame, containing proportioned gearing, keyed to heavy steel shafting which runs in antifriction metal bearings. Load is controlled in lowering by a powerful, self-locking, fiber lined band brake and is continually held on the up movement by a safety pawl, so designed as to eliminate the usual disagreeable noise, and cushioned to prevent breaking the gear teeth, if accidentally dropped while machine is in motion.

Lower or drum shaft is extra heavy, revolving in ball bearings contained in heavy iron housings, which need no lubricant and reduce friction to a minimum.

Sheaves—Upper carrying sheaves for chain are cast solid, having 1-in. diameter steel pins secured to heavy truss irons.

Chain—"B.B." quality, with end connections designed with careful consideration to insure safety.

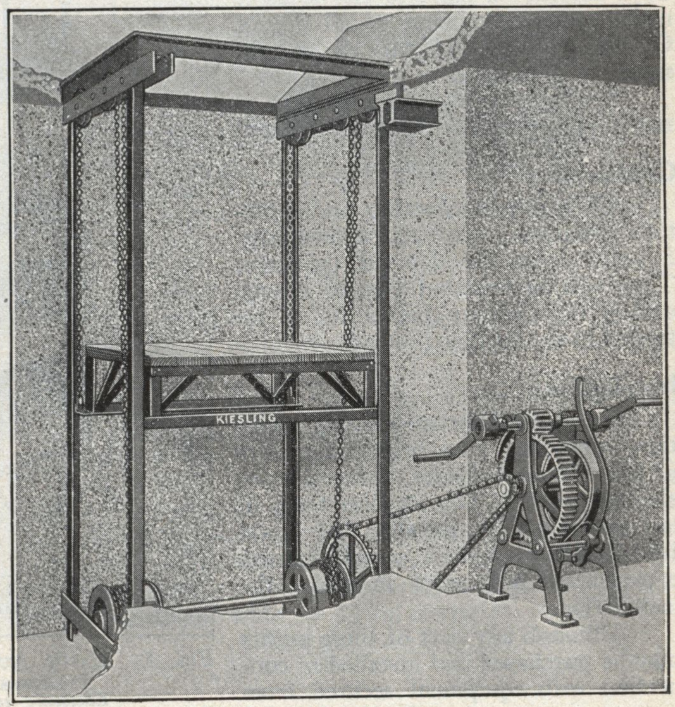
Platforms—These have hardwood flooring covered with wearing irons. Carrying frames of angle iron are well braced, bolted together and all is finished in first class workmanlike manner.

Guides—Various types of guide construction are used, each being the one most suitable for the required purpose. Heavy capacity elevators have guides of angle iron at each corner, lighter capacity elevators have "T" guides at the center of sides.

Where possible, the drum shaft bearings are so connected to the guides as to form one unit, reducing the inertia of the upper trusses.

Note: As it is not possible to specify all of our designs in this line, special drawings are furnished as required.

Capacity, lb.	Size of platform, ft.	Price	Add for extra height, per ft.
500	3 x 3	$250.00	$5.00
1000	3½ x 3½	275.00	6.00
1500	4 x 4	350.00	7.00
2000	5 x 5	375.00	7.50
2500	5 x 5	450.00	8.00



Kiesling Sidewalk Elevator

D. A. MATOT

Manufacturers of Hand Power Dumbwaiters and Elevators

1538-1546 Montana Street
CHICAGO, ILL.

TELEPHONE
Lincoln 0002, 0003

Products

All Types of Hand Power Dumbwaiters, including: Private House, Apartment House, Hospital, Hotel and Restaurant, Outdoor, Brass Tube, High Speed, Automatic Brake, Band Brake and Geared Types.

Hand Power Elevators, including Hospital, Invalid, Domestic, Sidewalk and Freight Types.

Lifts, including Library Book, Fuel, and Trunk.

Iceless Refrigerators.

Service

In order to assist the architects in selecting dumbwaiter and elevator outfits which will be best suited to the requirements of each installation, this company maintains a service or consultation department. By availing themselves of the services of this department architects may obtain, without charge, the benefit of our specialized experience of over 30 years in this field.

Shipping Facilities

A sufficient stock of regular sizes of dumbwaiters and elevators is always carried on hand to enable us to make prompt shipment of all orders. On regular sizes, goods are shipped the same day that order is received.

Special sizes can be furnished in not to exceed two or three days longer.

Guarantee

All Matot dumbwaiter and elevator machines are guaranteed for 5 years from the date of purchase. They will be repaired free of charge at any time within that period if returned to us, charges prepaid.

Installation

Complete instructions for erection, including blue prints, are furnished with each Matot dumbwaiter or elevator outfit. This enables them to be satisfactorily installed by local labor. Where desired, we will furnish experienced mechanics to make the installation.

Although any part of these outfits may be purchased and installed in connection with equipment secured from local sources, we strongly recommend that the complete outfit be specified. This will give the best results and insure complete satisfaction.

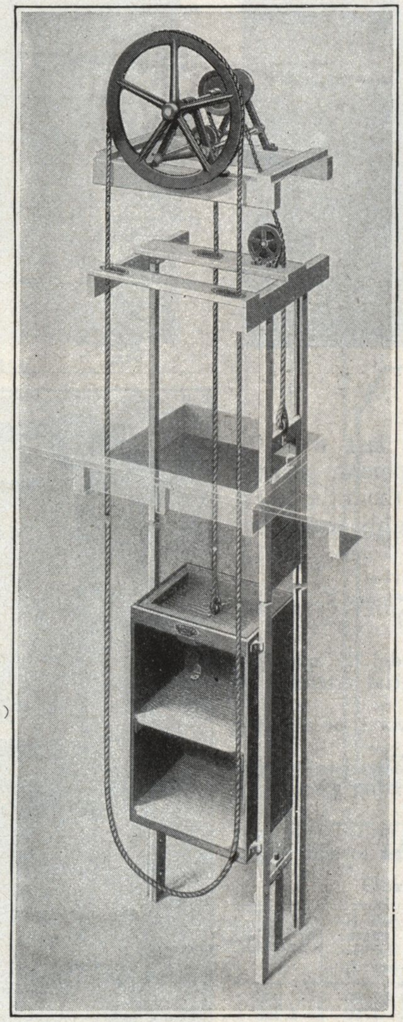


Fig. 1. Matot Automatic Brake Dumbwaiter
Enclosure removed

Suggested Specification

"The dumbwaiter (or elevator) to be manufactured and installed by D. A. Matot, 1546 Montana Street, Chicago, Ill."

Note: Where it is desired to have local labor install, simply omit the words, "and install."

Further Information

The pages that follow include a few of the many regular types and sizes of Matot dumbwaiters and elevators.

Complete information, including drawings and estimates on these or other regular or special types, will be gladly sent on request.

The many thousands of designs that have been developed during 30 years of dumbwaiter experience cover a vast number of special installations. Where special installations are required, the following information will enable us to furnish complete plans and estimates: (a) size and capacity of car; (b) number of stories of travel; (c) height of total travel; (d) use.

Matot Hand Power Dumbwaiters and Elevators

Design and Construction—Matot hand power dumbwaiters and elevators are correct in design and principle. They are manufactured from the best materials obtainable and are made and assembled by skilled workmen in a factory devoted exclusively to the manufacture of these products. The machinery used in their manufacture has been specially designed for this purpose.

Features—The result of correct design, good materials and careful construction has resulted in a product that is notable for length of life, ease of operation, freedom from trouble and the reduction of necessary repairs to the minimum.

Continued on next page

Light Dumbwaiters

These dumbwaiters are particularly suitable for average service where the usual loads are not in excess of 50 lbs.

Types—They are made in three general types and each type is furnished in 4 sizes, as shown in table below.

Automatic Brake Type—This type of dumbwaiter is designed for general work in private houses. The load is automatically held by the machine itself without any check or brake line and consequently can not run down.

Band Brake Type—For use in high wells, such as are found in factories, apartment houses and hospitals where a harder service is encountered. This type is more practical for lowering loads, as it does not require the operation of the hand rope. The speed and positive stops are regulated by the brake cord.

Economy Type—An inexpensive dumbwaiter for use in light work, having a spring check on the hand rope.

Complete Outfit—This includes the machine on platform, the car and weights and ropes for a total over-all height of 20 ft., all f.o.b. Chicago, Ill.

MATOT LIGHT DUMBWAITER OUTFITS

No.	Size of car (outside), in.*	Size of ceiled well (inside), in.*	Shipping wt., lbs.	List prices of complete single face outfits (subject to discount)				Prices of double face outfits	
				"Automatic"	"Economy"	"Band Brake"	Add for extra height per ft.	Add for double face	Add for extra height per ft.
1	20x16	23¼x19	215	$ 85.00	$ 65.00	$105.00	$0.75	$15.00	$0.95
2	24x20	27¼x23	285	105.00	85.00	125.00	.80	15.00	1.00
3	28x24	31¼x27	360	125.00	105.00	145.00	.85	15.00	1.05
4	34x30	37¼x33	470	145.00	125.00	165.00	.90	15.00	1.10

*See note to table below.

Geared Dumbwaiters

These dumbwaiters are designed for use where the service would be too severe for the lighter types described above.

They will be found ideal for installation in hospitals, restaurants, hotels and factories where the usual loads are between 50 and 500 lbs.

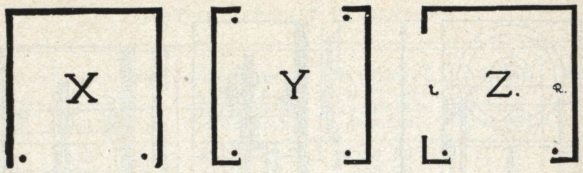
Types—Geared dumbwaiters are built in two types, the automatic and the band brake, and are furnished in the 4 sizes listed below.

Complete Outfit—This includes machine on platform, car, adjustable counterweight, guide runs for car and weight and ropes for a total over-all height of 20 ft., all f.o.b. Chicago, Ill.

MATOT GEARED DUMBWAITER OUTFITS

No.	Size of car (outside), in.*	Size of ceiled well (inside), in.*	Shipping weight, lbs.	List prices of complete single face outfits (subject to discount)		Prices of double face outfits	
				"Automatic" or "Band Brake"	Add for extra height per ft.	Add for double face	Add for extra height per ft.
1	20x16	23¼x19	350	$145.00	$1.00	$15.00	$1.40
2	24x20	27¼x23	400	165.00	1.10	15.00	1.50
3	28x24	31¼x27	450	185.00	1.20	15.00	1.60
4	34x30	37¼x33	500	205.00	1.30	15.00	1.70

*No extra charge for outfits of different sizes and smaller dimensions. Price of special sizes is that of the regular size, out of which the special size could be made.



Dumbwaiter Floor Plans

Fig. X. The best arrangement where possible to use
Fig. Y. Arrangement for operating from both fronts
Fig. Z. For operating at front and right or left or both

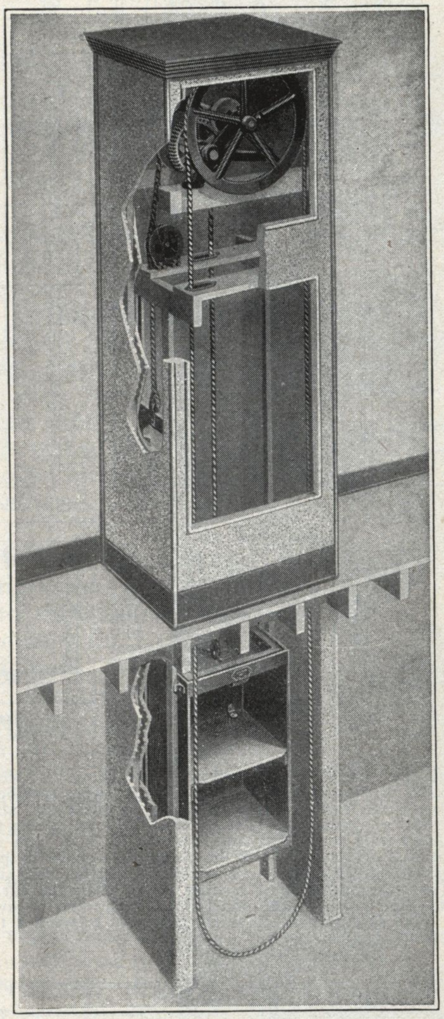


Fig. 2. Matot Automatic Brake, Geared Dumbwaiter
Typical installation in plastered shaft

Dumbwaiter Cars

These are regularly built in two different arrangements:

(1) 3 ft. high inside, with one hinged shelf; (2) 3 ft. 6 in. high inside, with two fixed shelves in addition to top and bottom.

The width and depth in which these two types of cars are furnished are shown in the second column of the preceding tables. The first number in this column refers to the width and the second to the depth. For example—a No. 3 car is made either 3 ft. or 3 ft. 6 in. high by 28 in. wide by 24 in. deep.

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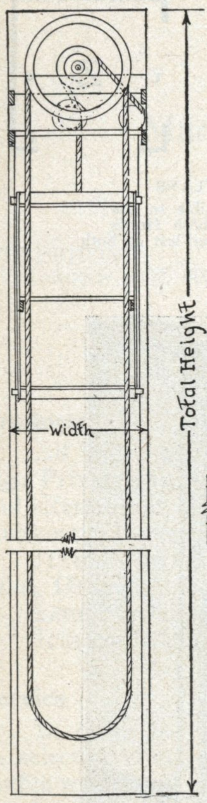
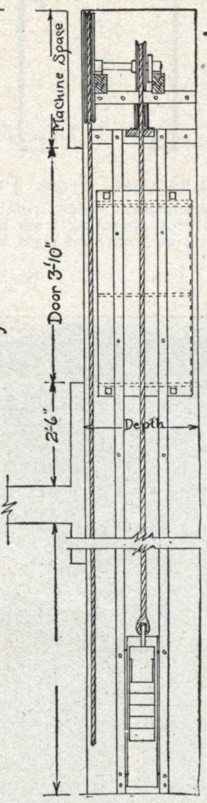
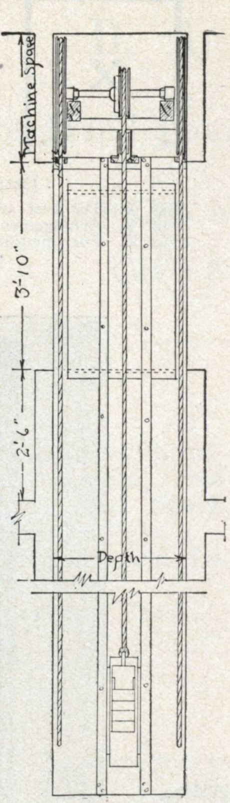
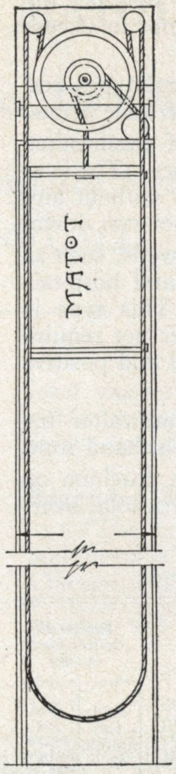




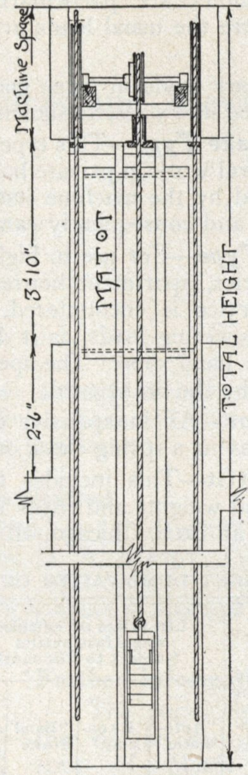
Front Elevation Side Elevation
Single and Double Face



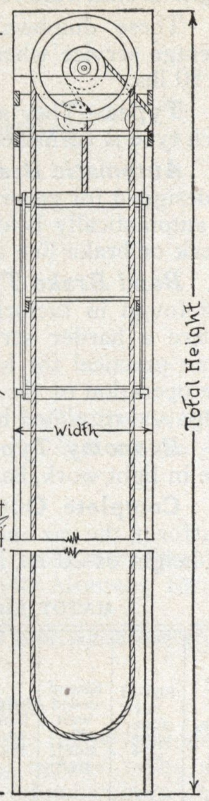
Side Elevation



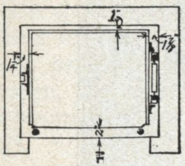
Front Elevation
Corner Post
Dumbwaiter
Operated from all sides



Side Elevation
Corner Post
Dumbwaiter
Operated from all sides

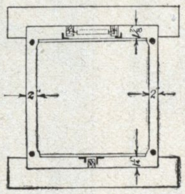


Front Elevation
Corner Post
Dumbwaiter
Operated from one **side only**

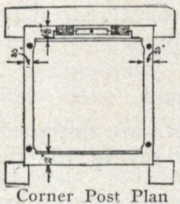


Plan
Single Face

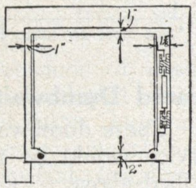
It is most practical to design single face or double face hatchways as shown, wherever the construction and layout of building permits



Plan
Double Face



Corner Post Plan
Operated from three sides



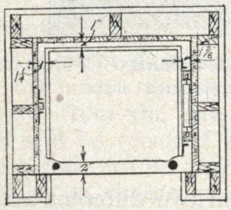
Plan
Operated from one side

Single face cars are equipped with one hinged shelf and double face cars with two solid shelves unless otherwise specified. Always specify the width and depth of hatchway in the clear, also the total height. State the usual and heaviest load. Doors leading to hatchway should be as wide as the car and 3 ft. 10 in. high, and should have sills located 2 ft. 6 in. above the floor. In order to place car in hatchway where the enclosure is already constructed, it is necessary to have at least one opening a little larger than the car. It is advisable to have a removable panel or door leading to overhead machinery. The space required for machinery is between 2 ft. and 3 ft. 6 in., depending upon type of equipment

In cases where it is necessary that openings leading to hatchway are on three sides, the corner post dumbwaiter can be operated in both directions from all sides by using a double face machine and reversing one hand rope as shown above.

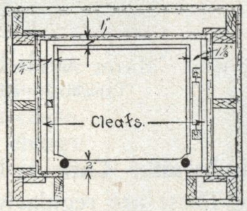
In a corner post dumbwaiter equipped with a single face machine as shown above, same can be operated in both directions from the front only.

Always specify on what side adjacent door openings are located. Such layouts as the foregoing are to be avoided, if possible



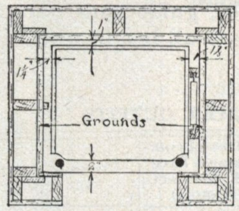
Plan
Ceiled Hatchway

Guide runs are screwed direct to the sheathing where hatchway is lined inside with lumber. This construction allows a car measuring outside 3¼ in. less in width and 3 in. less in depth than the clear inside measurements of the hatchway



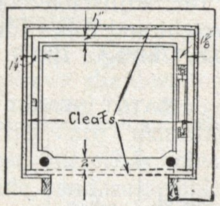
Plan
Plastered Hatchway

When hatchway is constructed of wood studding and plastered inside, cleats are placed on top of plaster horizontally spaced 30 in. on centers on both sides of hatchway and securely fastened in place, to which the guide runs are screwed. This construction allows a car measuring outside 5 in. less in width and 3 in. less in depth than the clear inside measurements of hatchway



Plan
Plastered Hatchway

When hatchway is constructed of wood studding, grounds can be placed horizontally on both sides of the hatchway and plaster brought flush with face of grounds. This construction allows a car measuring 3½ in. less in width and 3 in. less in depth than the clear inside measurements of the hatchway



Plan
Fireproof Hatchway

In these hatchways, cleating is placed horizontally all around hatchway 30 in. on centers, to which the guide runs are screwed. This construction allows a car measuring outside 5 in. less in width and 4¾ in. less in depth than the clear inside measurements of the hatchway

In single face outfits, the dumbwaiter cars always measure outside 3¼ in. less in width and 3 in. less in depth than the clear inside measurements of the hatchway after grounds or cleats are applied.

In double face outfits, the cars always measure outside 3¼ in. less in width and 4 in. less in depth than the clear inside measurements of the hatchway after the grounds or cleats are applied

Continued on next page

Freight Elevators

Sizes—Matot freight elevators are regularly made in seven sizes with capacities ranging from 500 to 2000 lb. (see table in opposite column).

Outfits of greater size or capacity are made up special.

Uses—These elevators are designed for severe service and easy operation.

The smaller sizes are suitable for use in private houses as trunk lifts. The larger sizes are suitable for all-round use in industrial buildings, warehouses, schools, etc.

Construction—Matot freight elevators are substantially built and contain many valuable features. These include the improved Matot self-locking indestructible band brake, steel friction roller bearings and rigidly braced frame.

Complete Outfit—Includes overhead gearing, platform, adjustable counterweight, guide runs for platform and weight, ropes and cables for an over-all height of 20 ft., all f.o.b. Chicago, Ill.

MATOT FREIGHT ELEVATORS

Capacity, lbs.	Size of car, in.		Space required, in.		List prices of complete outfits subject to discount	Add for extra height, per ft.	Shipping weight, lbs.
	Wdth.	Dpth.	Wdth.	Dpth.			
500	36	38	42	42	$220.00	$1.75	850
800	42	44	48	48	300.00	2.00	1225
1000	48	50	54	54	340.00	2.25	1350
1500	59	61	66	66	480.00	2.50	1700
2000	70	72	78	78	550.00	2.75	2500

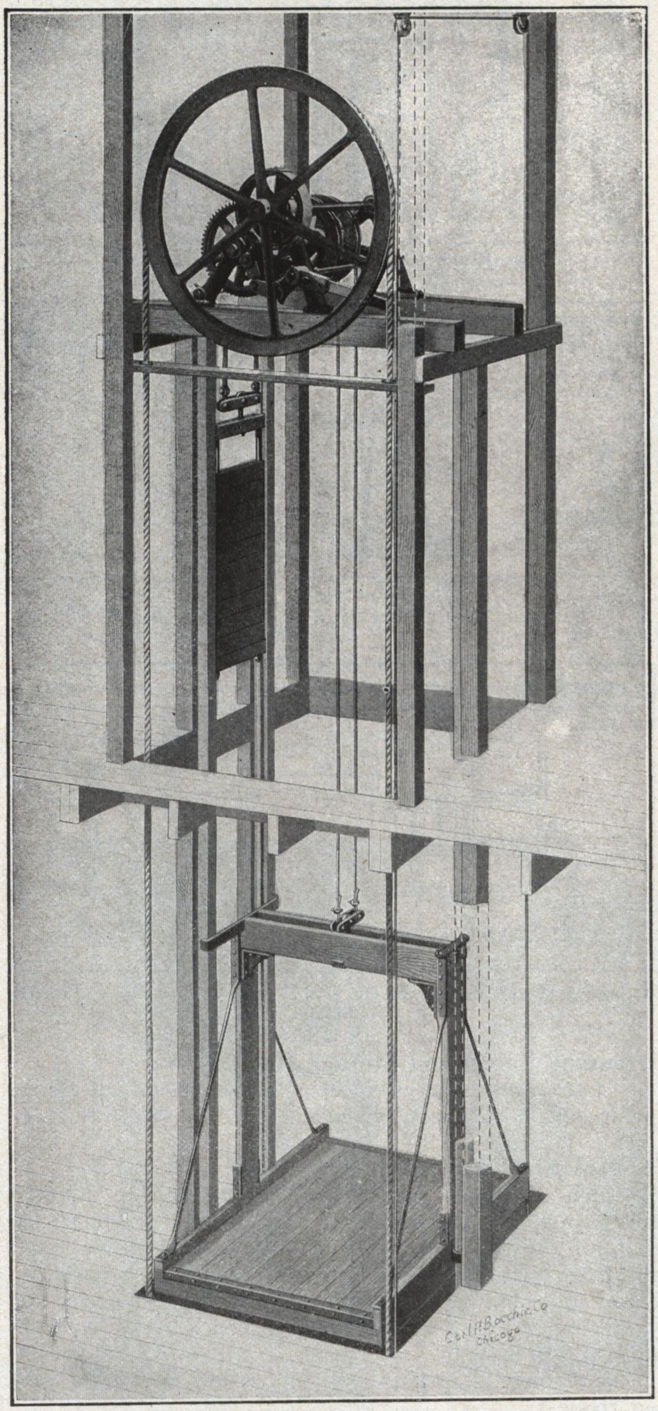


Fig. 3. Matot Freight Elevator

Matot Iceless Refrigerator

Matot automatic brake dumbwaiters equipped with galvanized steel cars are recommended for use as iceless refrigerators.

They preserve food without the expense and annoyance incident to the use of ice.

In most homes arrangements can easily be made to lower the dumbwaiter into the cellar, or, if the cellar is not cool enough, into a prepared well or pit beneath the cellar floor.

Prices, sizes, etc. are the same as those given for automatic brake dumbwaiter equipments.

Blue prints covering special layouts will be gladly submitted on request.

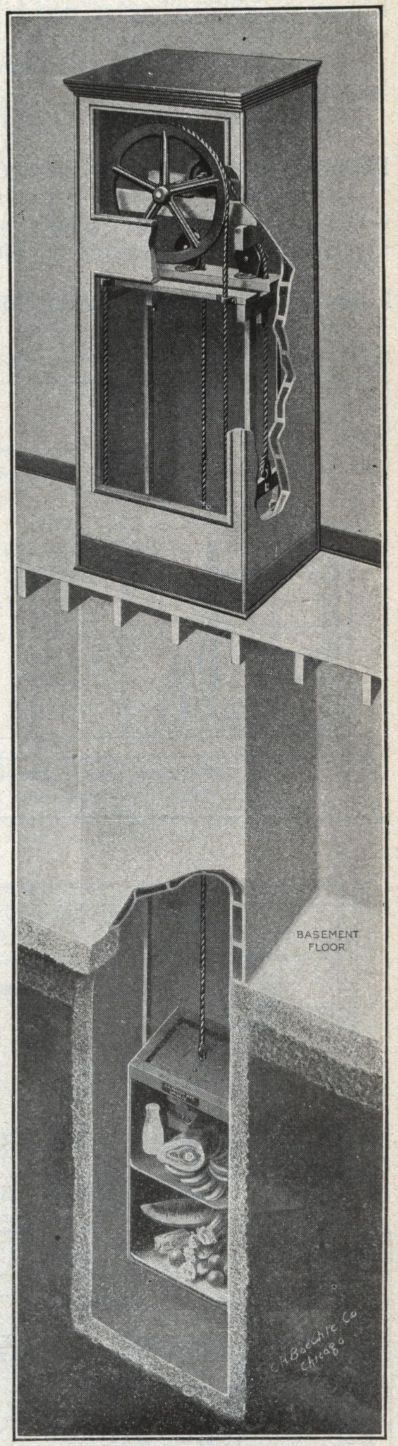


Fig. 4. Matot Iceless Refrigerator

ECONOMY ENGINEERING COMPANY

Manufacturers of Portable Lifters and Steel Storage Racks

2685 West Van Buren Street, CHICAGO, ILL.
NEW YORK, N. Y., 342 Madison Avenue
SALES REPRESENTATIVES LOCATED IN PRINCIPAL CITIES
(Name and address of nearest representative sent on request)

Products

Economy "Telescoper" Lifter and "Non-telescoping" Lifter (hand power or electric driven), for lifting, stacking, piling or tiering; portable and built in various sizes and capacities; Special Elevating Machinery; Economy Steel Storage Racks, for storing barrels, drums, etc.

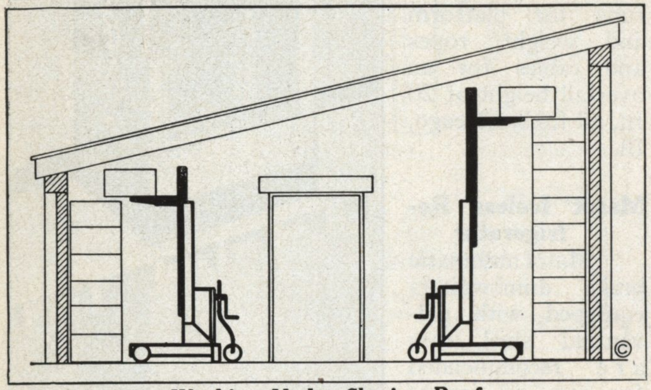
Also Special Racks built to fit requirements.

Economy Service to Architects

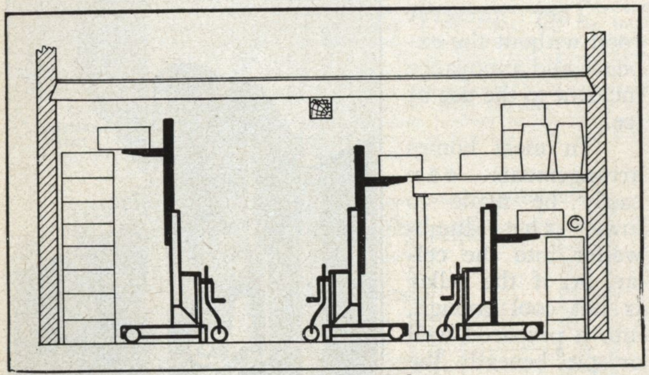
In addition to furnishing complete plans, our engineering department will gladly co-operate in designing special elevating or storing equipment and layouts.

Economy "Telescoper" and "Non-telescoping" Lifters

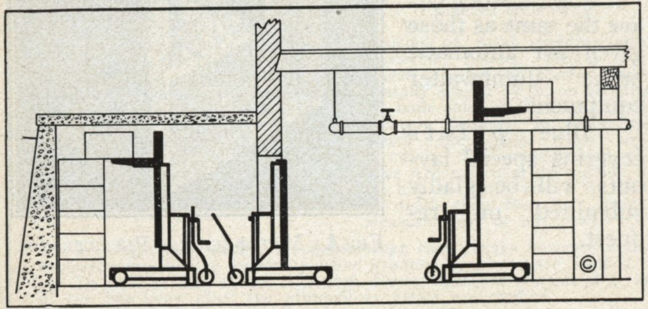
A study of the illustrations will indicate a few of many uses for the Economy lifting principle.



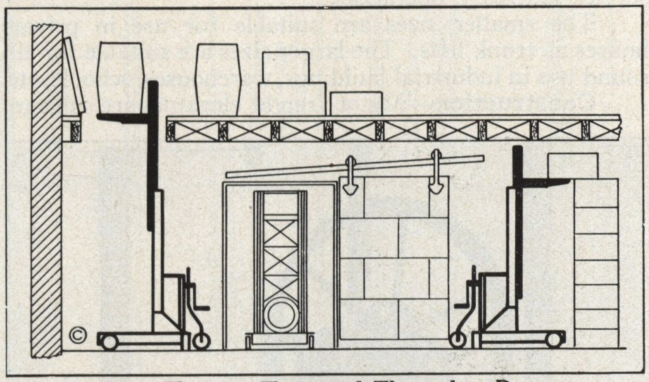
Working Under Sloping Roof
Note the "telescoping" action



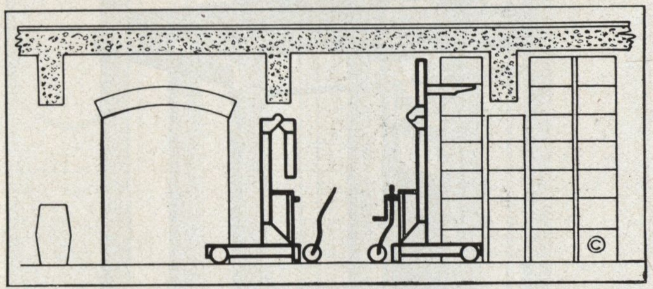
Above and Below Balcony
Note the extreme and minimum height of the "Telescoper"



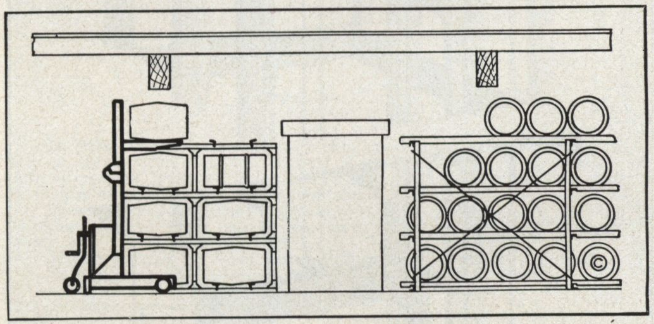
Under Pipes and Through Low Doorways
See how it "telescopes"



From Floor to Floor and Through a Door



"Non-telescoping" Lifter
The hinged top is lowered to clear obstructions



Economy Steel Barrel Rack and "Non-telescoping" Tiering Lifter

Economy Barrel and Storage Racks

Use our special engineering service—special equipment built to fit requirements.

Special Elevating Machinery

The Economy principle of lifting can be adapted to the lifting, stacking or tiering of any product. In addition to the two types of lifters shown we build special lifters of "4-post" design and are prepared to assist in designing special portable lifting machinery for operating on floor or track. If you have a lifting problem put it up to us.

Complete diagram book and other literature sent on request.

Working Model

This well designed model shows just how the "Telescoper" works. You should have one—write for it.

ESTABLISHED 1866

GILLIS & GEOGHEGAN

INCORPORATED

Manufacturers of Telescopic Hoists

542 West Broadway, NEW YORK, N. Y.

TELEPHONE
SPRing 7801

AGENCIES IN THE UNITED STATES

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ATLANTA, GA., Hill R. Huffman Co., Bona Allen Building
BALTIMORE, MD., Vincent D. Eastwood, 15 E. Fayette Street
BILLINGS, MONT., Frank W. Richardson, Inc., 307 Fratt Building
BIRMINGHAM, ALA., Beecroft & Mallory Sales Co., 2022 Fourth Avenue, No.
BOSTON, MASS., Allen & Drew, Inc., 80 Boylston Street
BUFFALO, N. Y., Jones Iron Works, 136 Efner Street
CHARLOTTE, N. C., R. Galloway Ross, 135 Brevard Court
CHATTANOOGA, TENN., T. G. P'Pool, 103 E. 6th Street
CHICAGO, ILL., S. I. Kaufman, 310 South Michigan Avenue
CINCINNATI, OHIO, A. W. Frank, 707 Gerke Building
CLEVELAND, OHIO, R. L. Queisser Co., Schofield Building
COLUMBIA, S. C., C. W. Turner, 58 Arcade
DALLAS, TEX., R. J. De Wees Company, 605 Slaughter Building
DENVER, COLO., Howard H. Fielding, 1226 California Street
DES MOINES, IOWA, Preston Daniels, Hubbell Building
DETROIT, MICH., Kennedy & Dawson, 2033 Park Boulevard
HUNTINGTON, W. VA., J. J. Weiler & Sons, 202-220 Elm Street
INDIANAPOLIS, IND., Hoover Brothers, Lombard Building
JACKSON, MISS., General Builders Supply Company, 211-214 Daniels Building
JACKSONVILLE, FLA., The Dawkins Supply Co., P. O. Box 2153
KANSAS CITY, MO., R. O. Smith, 2035 E. 19th Street
KNOXVILLE, TENN., C. M. Allen Co., Inc., 209 W. Clinch Avenue
LITTLE ROCK, ARK., Akers & Company, Inc.
LOS ANGELES, CAL., Frank R. Peck, 800 No. Spring Street
LOUISVILLE, KY., R. B. Tyler Co., 114 So. 4th Street
MANCHESTER, N. H., F. P. Lyons Iron Works
MEMPHIS, TENN., Akers & Co., Inc., 225 Madison Avenue
MIAMI, FLA., O. D. Brinson, 100 Bedford Building
MILWAUKEE, WIS., Philip Gross Hardware & Supply Co., 218 Third Street
MINNEAPOLIS, MINN., Morgan-Gerrish Co., 800-6 La Salle Avenue
NASHVILLE, TENN., E. T. Kirkpatrick & Co., 57 Arcade Building
NEW HAVEN, CONN., Warner-Miller Co., Railroad Avenue and St. John Street
NEW ORLEANS, LA., J. T. Mann & Co., 319 Dryades Street
NORFOLK, VA., J. S. Jones, 295 Arcade Building
OKLAHOMA CITY, OKLA., Lumbermen's Supply Co., American Bank Building
OMAHA, NEB., F. H. Turney & Co., 707 So. 27th Street
PHILADELPHIA, PA., Culbert-Whitby Co., Inc., 2019 Rittenhouse Street
PITTSBURGH, PA., J. R. Pitcairn, 132 Seventh Street
PORTLAND, ME., F. P. Lyons Iron Works, 406 Clapp Memorial Building
RICHMOND, VA., J. S. Archer, 22 No. 9th Street
ROANOKE, VA., Roanoke Engineering Sales Co., 522-23 MacBain Building
ROCHESTER, N. Y., Building Specialties Co., Inc., 61 Mill Street
ST. LOUIS, MO., McAnulty-Klein Co., 105 No. 7th Street
SALT LAKE CITY, UTAH, Hawley-Richardson-Williams Co., Dooley Building
SAN ANTONIO, TEX., Wm. S. Seng, 201 Maverick Building
SAN FRANCISCO, CAL., H. M. Holway, 1007 Hobart Building
SAVANNAH, GA., Charles M. Maclean & Co., 20 East Bay Street
SEATTLE, WASH., Crow-Matthews Co., 212 Douglas Building
SHREVEPORT, LA., Welsh Building Specialties, Inc., 310 Ricou-Brewster Building
SPRINGFIELD, MO., Lumbermen's Supply Co., Holland Building
SYRACUSE, N. Y., H. L. Waterman, Inc., 904 Canal Street
TOPEKA, KAN., Lumbermen's Supply Co., New England Building
UTICA, N. Y., American Hard Wall Plaster Co.
WASHINGTON, D. C.—See Baltimore
WICHITA, KAN., Lumbermen's Supply Co., Caldwell Murdock Building
WILKES-BARRE, PA., Robert M. Miller, 400 Coal Exchange Building

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Products

Equipment for handling ashes, rubbish and other materials between floors, consisting of several models of Hoists and other articles as follows:

Model E Hoist operated by Electric Motor, with Automatic Stop and Gravity Lowering Device.

Model D Overhead Crane Hoist, with Electric Motor in cellar.

Model C Hoist, with Electric Motor in cellar.

Model B Overhead Crane Hand Power Hoist, with automatic Gear Shifting Brake Device and Silencer.

the G&G ELECTRIC REG. U.S. PAT. OFF.
Telescopic Hoist
With Automatic Stop and Gravity Lowering Device

the G&G REG. U.S. PAT. OFF.
Telescopic Hoist
with Automatic Gear Shifting Brake Device and Silencer

Model A Hand Power Hoist, with Automatic Gear Shifting Brake Device and Silencer.

G&G Flush Watertight Sidewalk Doors (checkered steel or vault light).

G&G Automatic Sidewalk Door Opening and Closing Device.

G&G Spring Guard Gates.

G&G Swing Bail Ash Cans.

G&G Operator's Ladder.

G&G Electric Warning Bell.

G&G Ash Can Truck.

Note: It is recommended that *complete* G&G equipment be installed as a unit; but, if desired, any part or parts thereof can be furnished separately.

Where sidewalk opening is so located that the building wall does not afford protection when doors are opened, an additional set of spring guard gates can be installed to completely safeguard hoistway (Fig. 16).

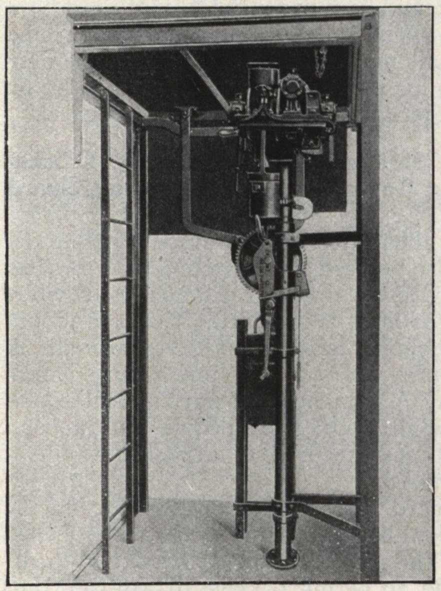

Fig. 1. Model E Hoist (Electric) When Not in Use

Hoist telescopes, and no part shows above street level. Sidewalk doors close down flush with pavement, and lock automatically

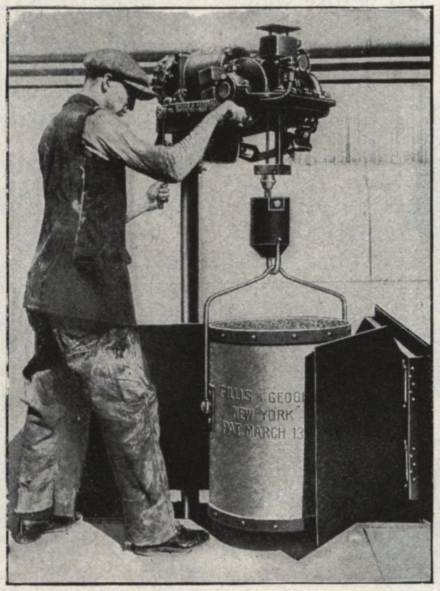

Fig. 2. Model E Hoist (Electric) at Julia Richman High School, New York

Wm. H. Gompert, Municipal Architect

G&G Sidewalk Doors, equipped with Automatic Door Opening and Closing Device. Spring Guard Gates automatically protect the hoistway on all sides

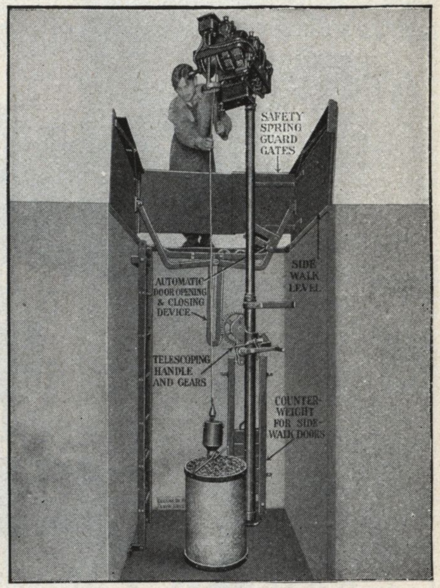
SAFETY SPRING GUARD GATES
SIDE WALK LEVEL
AUTOMATIC DOOR OPENING & CLOSING DEVICE
TELESCOPING HANDLE AND GEARS
COUNTER-WEIGHT FOR SIDE-WALK DOORS

Fig. 3. Model E Hoist (Electric) "Fishing" for Can

After placing swing bail cans in area, operator ascends ladder and completes removal from grade. He can then hook and raise filled cans electrically without leaving sidewalk

Continued on next page

Special Models

Special hoists other than our standard models can be designed and built to meet unusual and difficult conditions.—See page 2631.

Uses

G&G telescopic hoists with complete equipment are designed for lifting and lowering loads up to 500 lbs. in industrial plants, and for ash removal in office buildings, schools, factories, etc. G&G hoist equipment complies with all municipal ordinances. It has the approval of insurance and public building inspectors everywhere and often eliminates violations placed on grade openings. Can be operated in the coldest weather, as no parts are susceptible to freezing.

Model E Telescopic Hoist with Electric Motor

The G&G Model E telescopic hoist with complete equipment affords a simple, safe and economical method for hoisting and lowering between cellar and sidewalk or between floors, such loads as ashes, rubbish, bags, bales, barrels, coal, garbage, ice, auto tires, etc. Fig. 1 shows hoist equipment as installed for ash removal. When not in use no part of hoist shows above sidewalk. A few turns of telescoping handle raises hoisting head to proper position over hoistway (Fig. 6). Operator then ascends to sidewalk level by the iron ladder, and proceeds to raise the cans. Hoisting head revolves on ball bearings, depositing can, without lifting, on sidewalk. *Cans are lowered very rapidly by gravity,* thus saving electric current. Electric control lever has three positions. At one extreme, load is raised by electric power; at the other extreme, load is lowered by gravity; and in center position, load is brought to an instant stop.

Advantages—Hoist raises 500-lb. load electrically at a speed of 60 ft. per minute, and lowers much faster by gravity. The hoist equipment is compact and very easy to erect. We furnish all necessary clamps and bolts. and blue print showing, in detail, how to erect.

G&G sidewalk doors with guard gates make open hoistway absolutely safe for operator and pedestrians.

Construction—The strongest and most durable materials are used. Hoisting head is steel cast. Steel cable is non-rotating. All gears are machine cut. Every hoist is subjected to thorough working test before shipment, and is given factory coat of paint.

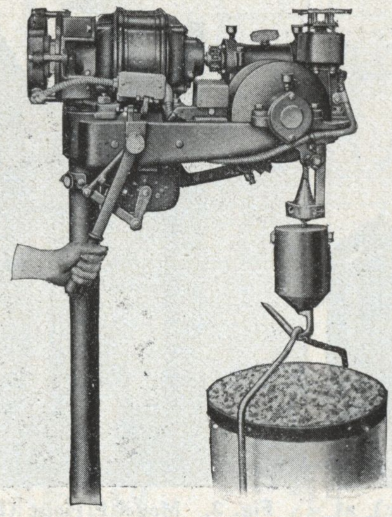

Fig. 4. Model E Hoisting Head

Close-up view of latest design hoisting head of Model E Hoist, showing lever in neutral position with brakes set. Operator pulls lever to raise load electrically. Pushes to lower load by gravity

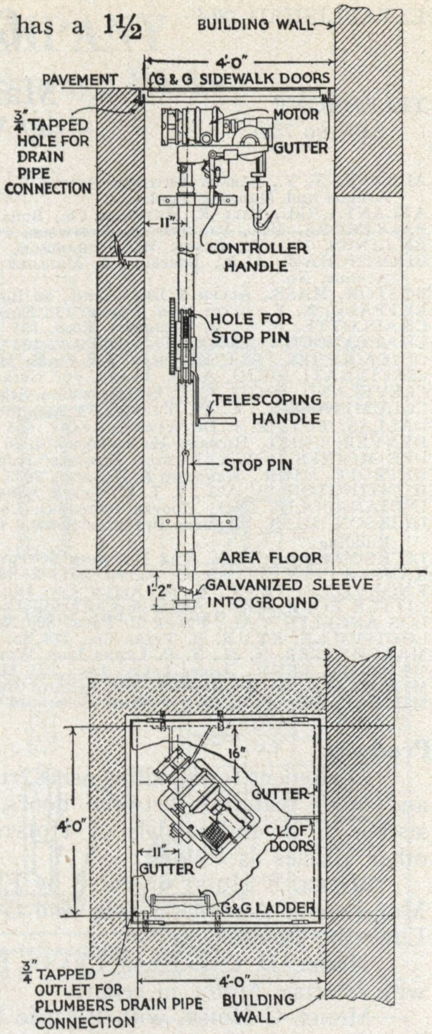

Fig. 5. Model E G&G Telescopic Hoist

Plan and elevation in standard 4x4-ft. area (large enough for all models). Scale, ¼ in. = 1 ft. Copy this on your tracing

Motor—Hoist has a 1½ hp. alternating or direct current totally enclosed motor with brake, automatic upper limit and single speed controller. Current is only consumed when hoisting. The hoist is equipped with Hyatt Roller Bearings. Motor is dustproof and moistureproof, lubrication being effected throughout by means of grease forced through compression cups.

Factor of Safety—No part has a factor of safety of less than 8, based on the ultimate strength of the materials when the maximum load of 500 lbs. is raised.

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered steel or vault light leaves; (*c*) location of doors with regard to building wall, see Fig. 12; (*d*) distance between boiler room floor and grade level; (*e*) kind of electric current available at building.

How to Specify—See page 2632.

Size of Area—We strongly recommend that area be made 4x4 ft. for all models. This gives the operator room enough to do his work. If necessary, a smaller or larger area may be provided, but it is not as practical.

G&G Automatic Sidewalk Door Opening, Closing and Locking Device with Safety Spring Guard Gates

This device is illustrated in connection with Model E hoist, but may also be used in connection with Models A, B, C and D. Device operates automatically when telescoping handle of hoist is revolved. Sidewalk doors open and close as hoisting head is raised or lowered. A counterweight is provided so that telescoping works smoothly and easily. A weatherproof warning bell is provided to operate while doors are opening and closing.

An important feature is the *self-locking doors, whether open or closed.*

The spring guard gates automatically close up the opening, at the sidewalk level, between the wide-opened sidewalk doors. The gates *cannot be swung inward; swing outward only,* to permit passage of ash can, thus protecting pedestrians and the operator.

G&G swing bail cans enable the operator to hook cans from the grade.

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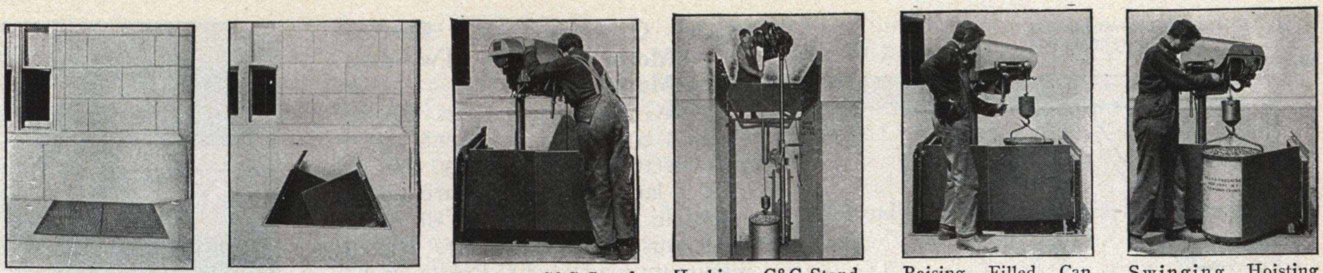


View with Watertight Doors Closed; Doors and Hinges Flush with Sidewalk

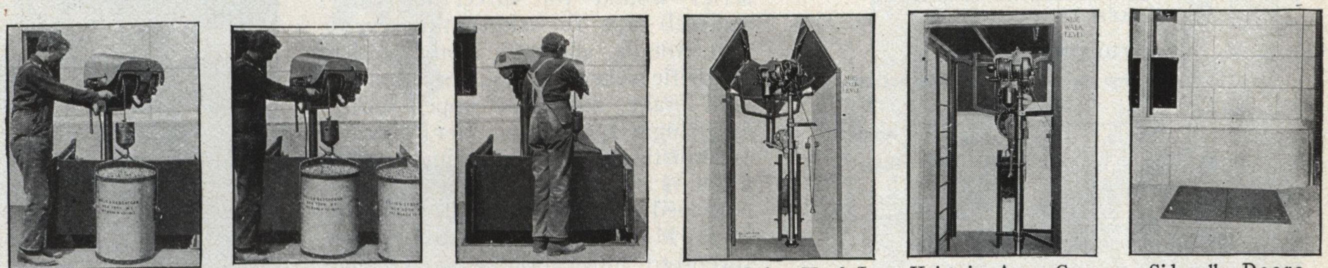
As Hoisting Head is Raised, Sidewalk Doors Automatically Open; Alarm Bell Rings

Hooking a G&G Standard Hoisting Can with Swing Bail After Operator Ascends Ladder

Hooking a G&G Standard Hoisting Can with Swing Bail (Inside view)

Raising Filled Can Without Leaving Sidewalk

Swinging Hoisting Head (on ball bearings) to Deposit Can on Sidewalk. Can Pushes Gate Open



Can Deposited on Sidewalk without Lifting. Gate Automatically Closes

Two Filled Cans Raised without Leaving Sidewalk

Lowering Empty Cans by Gravity

As Hoisting Head Is Lowered, Doors Automatically Close; Bell Rings

Hoist in Area, Compact, Out of the Way. Doors Locked

Sidewalk Doors Closed and Automatically Locked

Fig. 6. Operating Model E (Electric) G&G Telescopic Hoist in Connection with G&G Automatic Sidewalk Door Opening, Closing and Locking Device with Safety Spring Guard Gates at 145 West 55th Street, New York

Fred T. Ley & Co., Architects and Engineers

A complete ash removal equipment. Note that one man, unaided, performs entire operation. Watertight sidewalk doors are self-locking whether open or closed

Steel sidewalk doors, entire surface checkered or with vault lights, close flush with sidewalk. Equipped with flush bronze hinges, and wrought steel frame with extra deep gutter (see Fig. 9).

Automatic door opening, closing and locking device and sidewalk doors, with automatic spring guard gates, shipped with hoist to any part of the world. Blue print is furnished, showing how to erect. We subject each hoist, door opening, closing and locking device with spring guard gates, and sidewalk doors to a thorough working test before shipment. For this reason, and also because it makes for ease of installation at the building, *this Company prefers to furnish its own sidewalk doors with each hoist and opening and closing device.* (See Fig. 9.)

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered steel or vault light leaves; (*c*) location of doors with regard to building wall (see Fig. 5); (*d*) distance between boiler room floor and grade level; (*e*) kind of electric current available at building.

Model D Overhead Crane Hoist with Electric Motor in Cellar (Two-man Model)

G&G telescopic overhead crane hoist, Model D, with complete equipment, operates electrically (Fig. 7), and is for use in large buildings where the grade level approach permits wagons to drive up alongside of the hoistway leading to boiler room. When not in use, no part of hoist shows above sidewalk.

Raises maximum load of 300 lbs. at an actual speed of 60 ft. per minute. The can illustrated in Fig. 7, weighs about 175 lbs. when filled with ashes. This model can also be constructed for maximum working capacity of 500 lbs.

Motor—Hoist has a 1½ hp. series wound for direct current, squirrel cage for alternating current, totally enclosed motor with magnetic service brake, mechanical load brake, automatic upper limit and single speed controller, giving one hoisting and one lowering speed. Cable is non-rotating. The hoist is equipped with Hyatt Roller Bearings. Motor is dustproof and moistureproof, lubrication being effected throughout by means of grease forced through compression cups.

Hoist is so arranged that the operator may raise ash can from cellar into position 6 or 7 ft. above grade, and empty can directly into wagon or truck without rehandling at grade level. Because of the great saving in time and labor effected by the overhead crane types, architects should plan, if possible, for opening in sidewalk to be near curb or driveway, so as to permit the use of this type of hoist. (See also Model B, Fig. 12.)

Ash Cans—G&G standard 17x24-in. hoisting cans with swing bail may be emptied without unhooking. This cannot be done with ordinary cans.

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered steel or vault light leaves; (*c*) location of doors with regard to building wall (see Fig. 5); (*d*) distance between boiler room floor and grade level; (*e*) kind of electric current available at building.

How to Specify—See page 2632.

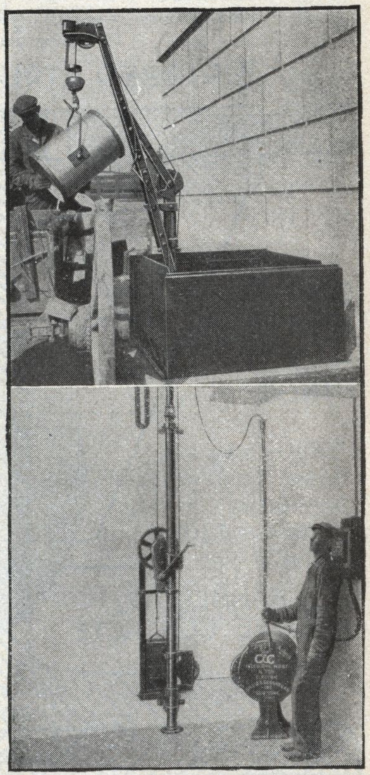


Fig. 7. G&G Model D Overhead Crane Electrically Operated Telescopic Hoist, Latest Model, Installed at the Central High School, Columbus, Ohio

William B. Ittner, Architect

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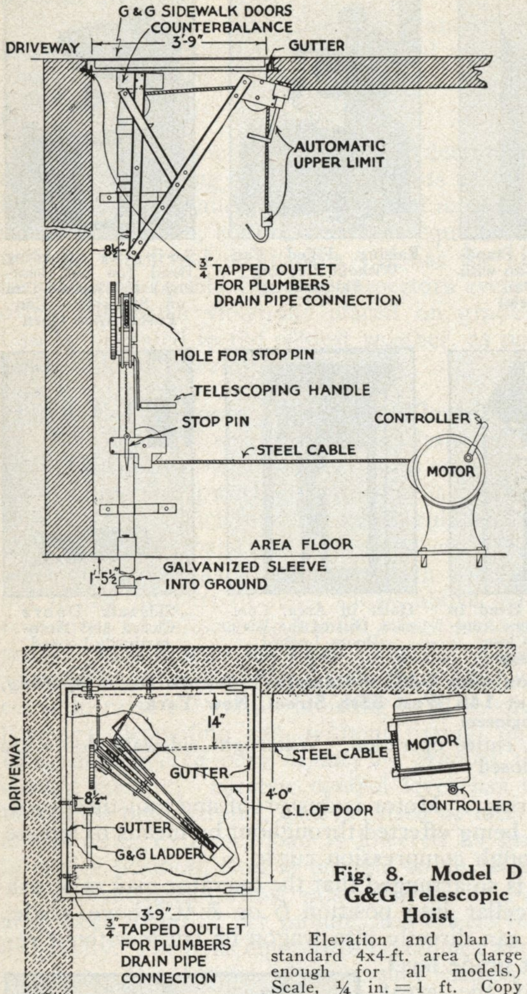

G & G SIDEWALK DOORS
COUNTERBALANCE
DRIVEWAY
3'-9"
GUTTER
AUTOMATIC UPPER LIMIT
8½"
¾" TAPPED OUTLET FOR PLUMBERS DRAIN PIPE CONNECTION
HOLE FOR STOP PIN
TELESCOPING HANDLE
STOP PIN
CONTROLLER
STEEL CABLE
MOTOR
AREA FLOOR
1'-5½"
GALVANIZED SLEEVE INTO GROUND
DRIVEWAY
14"
STEEL CABLE
MOTOR
GUTTER
4'-0"
8½"
C.L. OF DOOR
CONTROLLER
GUTTER
G&G LADDER
3'-9"
¾" TAPPED OUTLET FOR PLUMBERS DRAIN PIPE CONNECTION

Fig. 8. Model D G&G Telescopic Hoist
Elevation and plan in standard 4x4-ft. area (large enough for all models.) Scale, ¼ in. = 1 ft. Copy this on your tracing

Model C Hoist with Electric Motor in Cellar (Two-man Model)

G&G telescopic hoist Model C, with complete equipment, operates electrically (Fig. 10), and is used in large buildings where a considerable number of cans or other loads must be handled daily. Raises maximum load of 500 lbs. *to grade level* at speed of 60 ft. per min.

Motor—Hoist has a 1½ hp. series wound for direct current, squirrel cage for alternating current, totally enclosed motor with magnetic service brake, mechanical load brake, automatic upper limit and single speed controller, giving one hoisting and one lowering speed. Cable is non-rotating. The hoist is equipped with Hyatt Roller Bearings. Motor is dustproof and moistureproof, lubrication being effected throughout by means of grease forced through compression cups.

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered steel or vault light leaves; (*c*) location of doors with regard to building wall (see Fig. 16); (*d*) distance between boiler room floor and grade level; (*e*) kind of electric current available at building.

How to Specify—Same as for Model D, omitting words "overhead crane" (page 2632) and stating Model C.

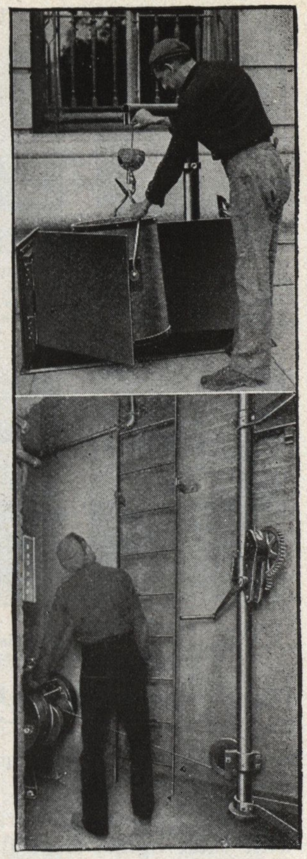


Fig. 10. G&G Electric Telescopic Hoist, Model C, Installation at American Academy Arts and Letters, New York.
McKim, Mead & White, Architects
Raises cans to grade level only

G&G Flush Watertight Sidewalk Doors

G&G sidewalk doors are much superior to ordinary ones. They are watertight, have a condensation gutter, tapped for plumber's drain pipe connection, assuring a perfectly dry area. Corners are welded.

Extra Heavy Doors

Our standard sidewalk door is designed to sustain a live load of 300 lbs. per sq. ft. If there is any danger of the ash wagon or heavily-loaded motor trucks running over the door, we recommend that the architect specify our extra heavy flush watertight sidewalk door. This door is designed to be installed in driveway or alley. Note special flush bronze hinges in Fig. 9.

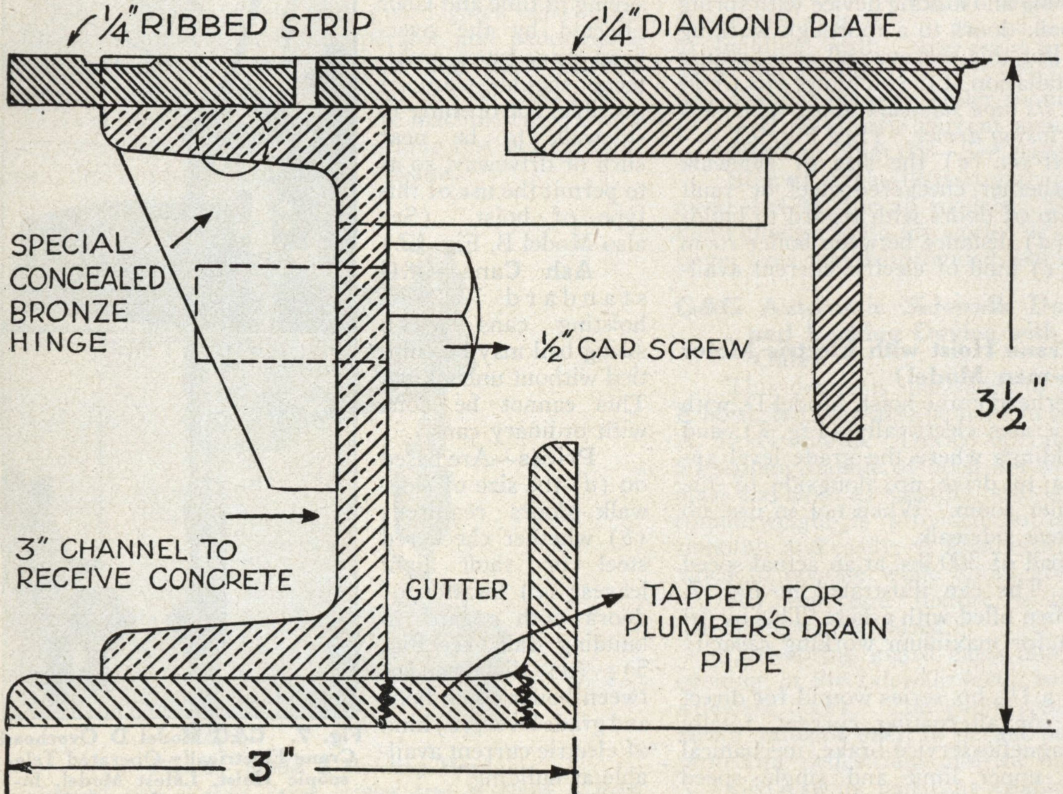

¼" RIBBED STRIP
¼" DIAMOND PLATE
SPECIAL CONCEALED BRONZE HINGE
½" CAP SCREW
3½"
3" CHANNEL TO RECEIVE CONCRETE
GUTTER
TAPPED FOR PLUMBER'S DRAIN PIPE
3"

Fig. 9. Construction of G&G Flush Watertight Sidewalk Door
Note special concealed bronze hinges which can be removed without breaking concrete work. Specifications pages 2632-2633

Continued on next page

Tests That Prove Operating Economy of G&G Electric Hoists

In order to substantiate claims that G&G electric hoists use only a negligible amount of current in their operation, a number of tests have been made for Gillis & Geoghegan by engineers of the Sprague Electric Works. The results of these tests show conclusively that in every instance the G&G electric hoist consumes so little current that it offers the most economical means available for removing ashes electrically.

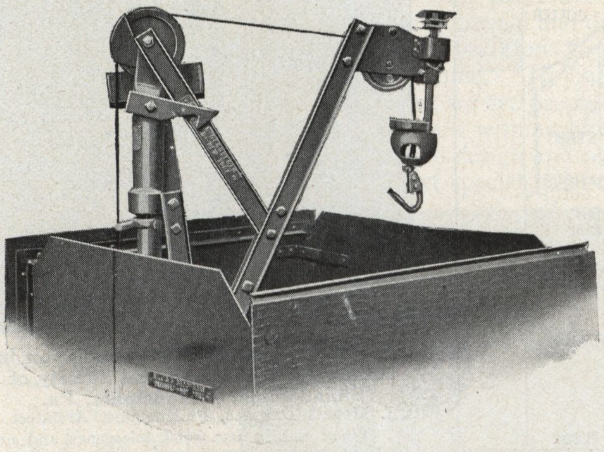


Fig. 11. Close-up View of Model D Overhead Crane—Latest Design

A pull on counterweighted lever raises crane to hoisting position. Note positive automatic upper limit

At the Mergenthaler Linotype Co., Brooklyn, N. Y., where a Model D hoist is installed, a total of 26 cans was raised, filled and lowered empty for 1¢ current consumption. Distance from grade to boiler room is 12 ft.; average raising time between cellar and top of wagon was 14.6 seconds, and average lowering time 13.8 seconds. 78 cans were raised and lowered in 1 kw-h. Current costs this operator 3¢ per kw-h.

At the Hotel Grand, New York City, where a model E (spur drive) hoist is installed, a total of 21 cans was raised, filled and lowered empty for 1¢ current consumption. Distance from grade to boiler room is 21 ft. 10 in.; average raising time was 11⅜ seconds, and average lowering time 17¾ seconds. 108 cans were raised and lowered in 1 kw-h. Current costs this operator 5¢ per kw-h. This is the same hoist that, after being in use for three years, raised 3500 cans of ashes in one continuous operation (the accumulation after a heavy snowstorm) without the slightest mechanical failure.

At the Hotel Navarre, New York City, where a Model E (spur drive) hoist is installed, a total of 45 cans was raised, filled and lowered empty for 1¢ current consumption. Distance from grade to boiler room is 9 ft.; average raising time was 6.6 seconds, and average lowering time 6.9 seconds. 227 cans were raised and lowered in 1 kw-h. Current costs this operator 5¢ per kw-h.

15.5 Net Tons Handled for $.0348—At the main Brooklyn, N. Y., building of the New York Telephone Company, where a Model E (worm drive) hoist is installed, a total of 85 cans was raised, filled and lowered empty for 1¢ current consumption. Distance from grade to boiler room is 16 ft. 8 in.; the average raising time was 12.33 seconds, and average lowering time was at the rate of about 200 ft. a minute by gravity. 296 cans were raised and lowered in 1 kw-h. The Bell Telephone System operates 131 G&G hoists in its buildings throughout the country.

The variation in consumption costs is due to difference in distance of lift, difference in the cost of current, and the benefit of gravity lowering device on the worm drive, Model E. Complete figures and details of any or all the above and other tests will be gladly furnished on request.

Model B Manually Operated Overhead Crane Hoist

Illustration (Fig. 12) shows how this hoist is arranged so that operator, standing at grade level, may raise ash can from cellar to position 6 or 7 ft. above grade, and empty can directly into wagon or truck, without rehandling at grade level. Because of the great saving in time and labor effected by the overhead crane model, architects should plan, if possible, for opening in sidewalk to be near curb or driveway so as to permit the use of this type of hoist. See also Model D, Fig. 11.

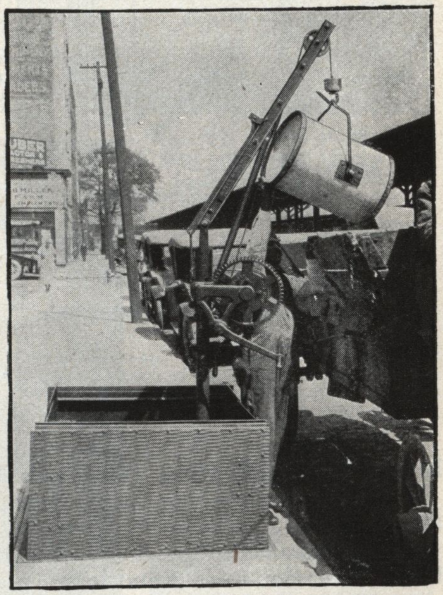


Fig. 12. Installation of Model B at Columbus Savings Bank, Columbus, Ohio

Frank L. Packard, Architect

Model B raises the can high enough so that the ashes may be dumped directly into a truck. When the opening is alongside of the curb, a double set of spring guard gates is used to give protection on all four sides

Also see Fig. 16

Advantages—Hoist is equipped with automatic gear shifting brake device and silencer (Fig. 13), and is so designed that it is practicable for one man to perform entire operation when complete equipment, including G&G swing bail cans, is used.

Raises maximum load of 300 lbs. at speed of 30 ft. per minute. This model can also be constructed for maximum working capacity of 500 lbs.

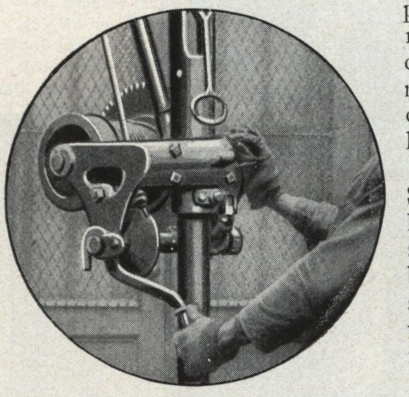


Fig. 13.—Automatic Gear Shifting Brake Device in Operation, Model B Hoist

A single movement of the brake lever automatically shifts gears and applies brake so that load is lowered by gravity. Hoisting handle does not revolve.

Applies to both Model A and Model B. G&G hand power Telescopic Hoists have certain exclusive and patented features, description of which will be found on page 2630

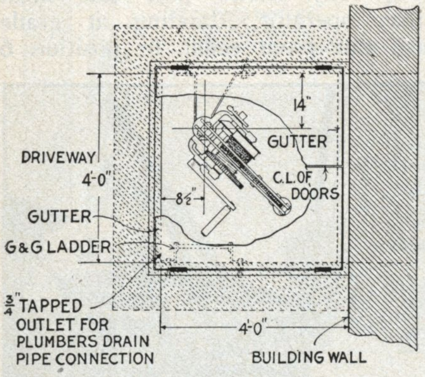
Factor of Safety—No part has a factor of safety of less than 8, based on ultimate strength of material when maximum load is raised.

Ash Cans—G&G standard 17x24-in. hoisting cans with swing bail empty the ashes into the truck without unhooking. This can not be done with ordinary cans.

Continued on next page

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered steel or vault light leaves; (*c*) location of doors with regard to building wall (see Fig. 16); (*d*) distance between boiler room floor and grade level.

How to Specify—See page 2632.


DRIVEWAY
4'-0"
14"
GUTTER
C.L. OF DOORS
8½"
GUTTER
G&G LADDER
¾" TAPPED OUTLET FOR PLUMBERS DRAIN PIPE CONNECTION
4'-0"
BUILDING WALL

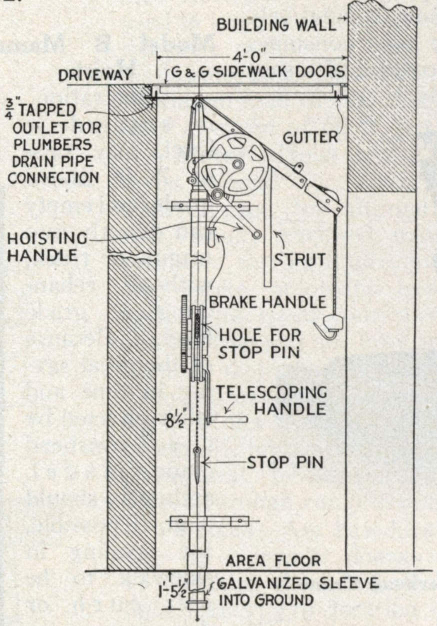

BUILDING WALL
4'-0"
DRIVEWAY
G & G SIDEWALK DOORS
¾" TAPPED OUTLET FOR PLUMBERS DRAIN PIPE CONNECTION
GUTTER
HOISTING HANDLE
STRUT
BRAKE HANDLE
HOLE FOR STOP PIN
TELESCOPING HANDLE
8½"
STOP PIN
AREA FLOOR
1'-5½"
GALVANIZED SLEEVE INTO GROUND

Fig. 14. Model B G&G Telescopic Hoist

Plan and elevation in standard 4x4-ft. area (large enough for all models).
Scale, ¼ in. = 1 ft. Copy this on your tracing

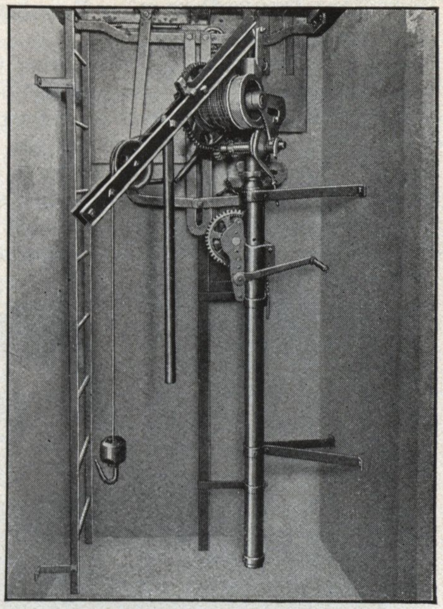


Fig. 15. Model B Hoist Installation in Mammal House Zoological Society of Philadelphia, Philadelphia, Pa.

J. Morris Daniels, Philadelphia, Architect

When not in use hoist telescopes and no part shows above grade level. Sidewalk doors closed down flush with pavement and locked

Model A Manual Hoist (One-man Model)

G&G telescopic hoist Model A with complete equipment is illustrated below (Fig. 16).

It is installed in buildings where it is desired to use hand power for raising and lowering loads, and where sidewalk opening is so situated that trucks can not drive alongside.

Advantages—One man, unaided, can operate the hoist.

Loads up to 500 lbs. are easily raised at a speed of 30 ft. per minute.

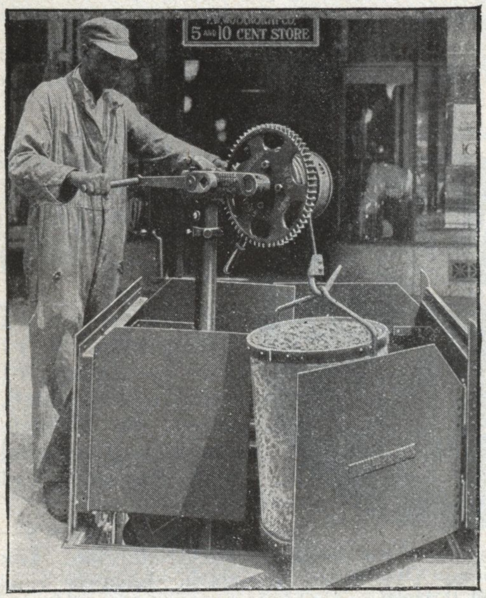

5 AND 10 CENT STORE

Fig. 16. G&G Hand Power Telescopic Hoist, Model A, as Installed for F. W. Woolworth & Co., 12th and F Streets, Washington, D. C.

B. S. Townsend, Architect

When the building wall does not form one protecting side, a double set of spring guard gates is used. (See Fig. 12.)

A pressure of only 7 lbs. for each 100 lbs. of load is required on hoisting handle to raise filled cans. Hoist is equipped with automatic gear shifting brake device. For lowering, a powerful band brake is provided. The load is always under perfect control. A single movement of brake lever shifts gears and applies brake, so that *load is lowered with no movement of hoisting handle*. This prevents possible injury to the operator. The cable drum is the only part that moves in lowering. The patented "Silencer" makes hoist extremely quiet in operation.

Prices—Are based on (*a*) the size of sidewalk doors required; (*b*) whether checkered, steel or vault light leaves; (*c*) location of doors with regard to building wall (see Fig. 16); (*d*) distance between boiler room floor and grade level.

How to Specify—See page 2632.

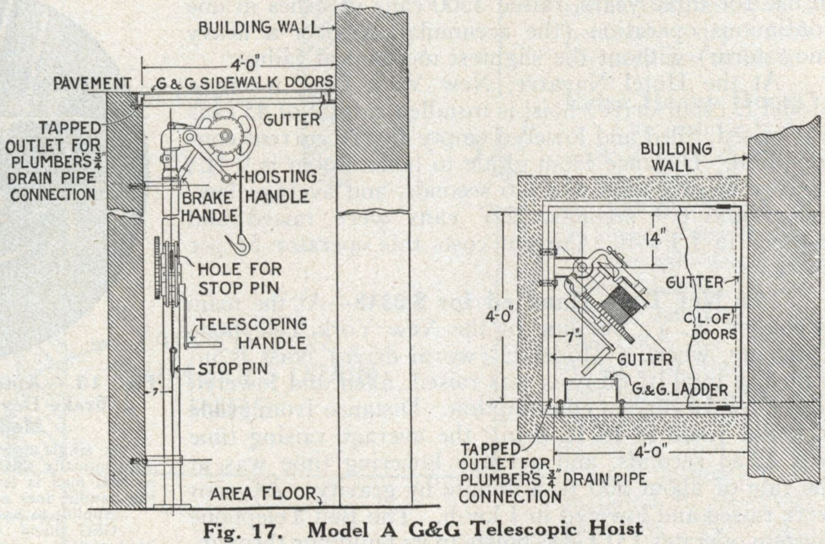

BUILDING WALL
4'-0"
PAVEMENT
G & G SIDEWALK DOORS
GUTTER
TAPPED OUTLET FOR PLUMBER'S ¾ DRAIN PIPE CONNECTION
HOISTING HANDLE
BRAKE HANDLE
HOLE FOR STOP PIN
TELESCOPING HANDLE
STOP PIN
7"
AREA FLOOR
BUILDING WALL
14"
GUTTER
4'-0"
C.L. OF DOORS
7"
GUTTER
G.&G. LADDER
TAPPED OUTLET FOR PLUMBER'S ¾" DRAIN PIPE CONNECTION
4'-0"

Fig. 17. Model A G&G Telescopic Hoist

Plan and elevation in standard 4x4-ft. area (large enough for all models)
Scale, ¼ in. = 1 ft. Copy this on your tracing

Continued on next page

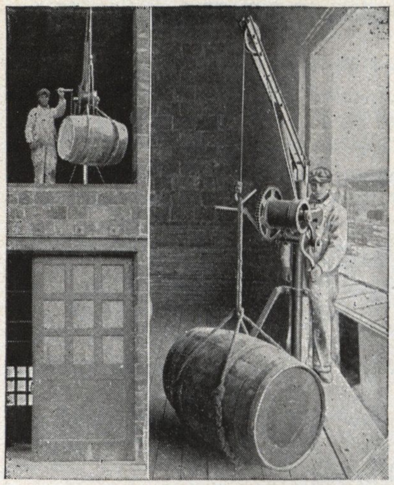


Fig. 18. Model B Non-Telescopic Hoist as Installed at Riches-Piver Co., Lyons Farms, N. J.

Loads are raised and lowered between shipping platform and upper floor of building

Special Models for Unusual Conditions

The standard G&G Telescopic Hoists, Models A, B, C, D and E will meet the requirements of the majority of buildings. On alteration jobs and on some new buildings there are at times unusual and difficult conditions to be overcome. In such cases, we are prepared to work with architect and to design and construct special hoists.

Models A, B, C, D and E can be furnished without the telescopic feature, and the standpipe can be mounted either in the usual position in the area or at the grade alongside the opening. For buildings which have been previously erected without the usual outside area, we particularly recommend Model A Non-telescopic Hoist to be mounted on the inside of the building and arranged to swing cans through the doorway (see Fig. 19). By using G&G Fixed Bail Cans, one man can "fish" for and raise as many as can be placed about the base of the hoist.

In buildings where a doorway is not available the G&G Basement Window Hoist can be installed so as to swing cans through a window (see Fig. 22).

G&G Telescopic Hoists are also used for handling various loads, such as barrels, bales, boxes, crates, trunks, etc., between floors, and can be furnished in capacities up to 1000 pounds, according to the requirements and the type of hoist used.

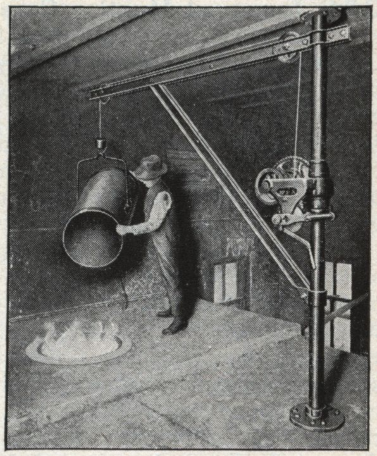


Fig. 21. Special Model B Non-telescopic Hoist as Installed at Ellis Island, New York Harbor, for U. S. Government Incinerator Plant

Garbage is raised in cans and dumped directly into fire opening on top of incinerator without rehandling. For convenience, two hoisting handles were provided—one on each side of standpipe

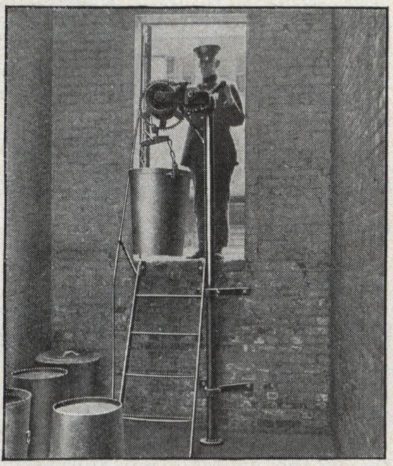


Fig. 19. G&G Model A Non-telescopic Hoist Installation at 91st Precinct Police Station, Brooklyn, N. Y.

Can be installed on the inside of the building so as to swing cans through a doorway

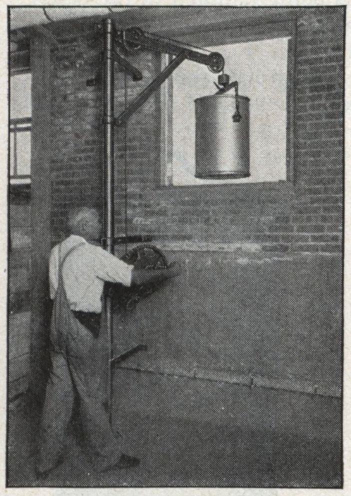


Fig. 22. G&G Basement Window Hoist Installed at P. S. No. 9, Allwood, N. J.

Designed for buildings without the usual outside area. If interested in inside hoists for ash removal, write for blue prints

Our Engineers will be glad to co-operate with the architect in the solution of all special hoisting problems, and we will furnish, where necessary and desired, special hooks, slings, grapples, etc.

It will facilitate matters, if when writing, you will inform us as to the following:

(1) For what purpose would you like to use a G&G Hoist?

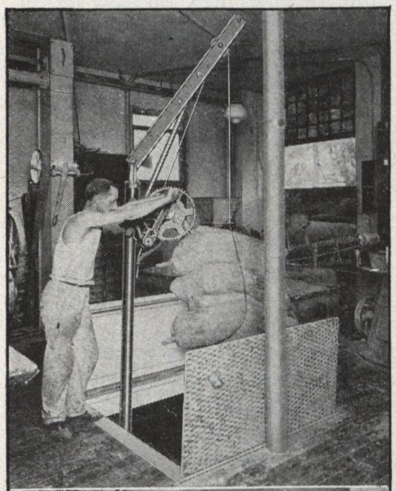
(2) Maximum weight of load?

(3) Distance of lift?

(4) Number of lifts daily?

(5) To be installed inside or outside of building?

(6) A sketch of conditions will help us to help you.



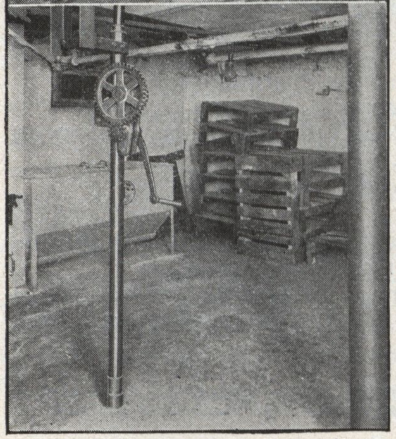


Fig. 20. Model B Non-telescopic Hoist Installed at Foerster Baking Co., Bergenfield, N. J.

Bags of flour and barrels of sugar are handled between floors quickly and easily

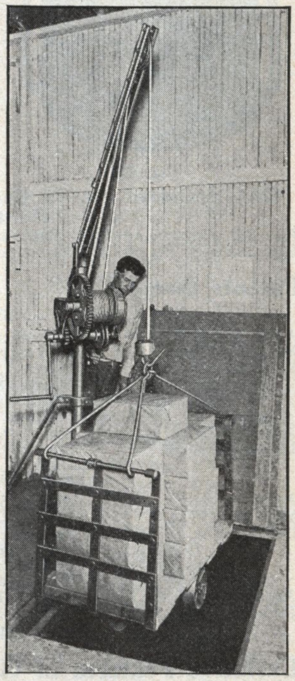


Fig. 23. (Above) Model B Non-telescopic Hoist as Installed at Great Western Paper Box Co., St. Louis, Mo.

Hand trucks and barrels are raised and lowered between floors quickly and easily

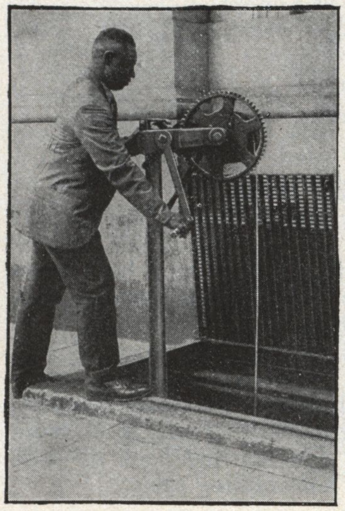


Fig. 24. Model A G&G Telescopic Hoist Installed in the United States Capitol, Washington, D. C.

Used for removing garbage from the House of Representatives cafeteria

Continued on next page

G&G Improved Hoisting Cans

These ash cans are manufactured in Gillis & Geoghegan's factory, especially for use with their hoists; are constructed throughout of No. 16 gauge galvanized iron, reinforced at top and bottom with ¼x1¼-in. steel bands. The thickness and weight of the No. 16 gauge iron (very much heavier than the material ordinarily used in making ash cans) makes for great strength and durability.

This company recommends the use of the G&G standard 17x24-in. hoisting can *with swing bail* in all cases with Model B hoist and Model D hoist. With Model A hoist, in buildings where *only one man* is employed to remove ashes, use our fixed bail can. The swing bail can is "balanced;" that is, the can may be easily emptied and will not spill the ashes when being raised. The swing bail is so arranged that it will not drag on the floor when can is being handled in the cellar, and will "stay put" when raised above can.

The fixed bail can shown in Fig. 26 is built for gruelling service. Like the swing bail can it will withstand rough treatment and outlast several ordinary ash-cans.

Prices—Furnished on request.

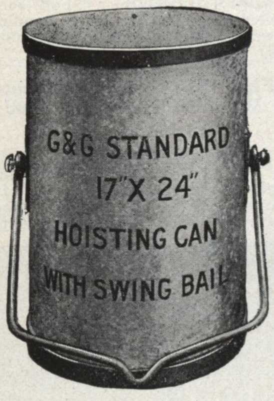


Fig. 25

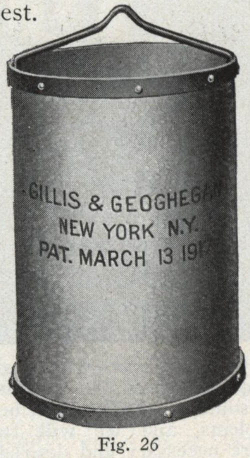


Fig. 26

G&G Standard No. 16 Gauge Galvanized Iron, 17x24-in. Hoisting Cans

Fig. 25, with *Swing* Bail, Recommended for Use with Models B and D
Fig. 26, with *Fixed* Bail, Recommended for Use with Models A, C and E

Patents Issued

United States

April 30, 1912
May 19, 1924
June 23, 1914
June 30, 1914
Reissued
October 19, 1915
August 17, 1915
December 7, 1915
December 7, 1915
February 1, 1916
March 7, 1916
March 28, 1916
March 13, 1917
October 8, 1918
March 9, 1920
March 9, 1921
March 9, 1922
September 19, 1922
April 24, 1923
January 3, 1925
January 6, 1925
January 6, 1925

Dominion of Canada

April 19, 1912
May 14, 1912
December 9, 1913
April 7, 1914
Reissued
November 14, 1916
April 27, 1915
June 22, 1915
August 3, 1915
May 9, 1916
July 25, 1916
September 5, 1916
October 10, 1916
November 21, 1916
June 1, 1920
August 31, 1920
March 9, 1922
May 30, 1922
May 30, 1922
November 28, 1922
April 24, 1923
January 12, 1925

Other patents pending. Also patented in foreign countries.

Exclusive Features of G&G Hoists

The automatic silencer; the automatic steady pin; hoisting head so arranged that it is impossible for the operator to accidentally detach the hoisting head from the standpipe; ball bearings with plates under the hoisting head; hoisting and telescoping handles provided with sliding grips; special woven brake band lining; gears keyed into position; pinions cut from bar steel; hoisting head, hoisting handle, telescoping handle, silencer, ash can grapple, gear shifting and brake lever of cast steel; ratchet pawl and hoisting hook of drop forged steel, a special steel non-rotating cable.

How to Specify Complete G&G Telescopic Hoist Equipment

Note:—Provide 4x4 ft. area to use standard size equipment. See ¼-in. scaled plan Model E, Fig. 5; Model D, Fig. 8; Model B, Fig. 14; Model A, Fig. 17. For data on how to specify this equipment without using manufacturer's name, see G&G Catalogue, 1924 edition, filed under A.I.A. Standard Class No. 30i1, or Hoist, G&G Telescopic.

Model E Electric Hoist—

(1) Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, one G&G Telescopic Hoist (with electric motor) Model E with Automatic Stop and Gravity Lowering Device.

(2) Include the following G&G equipment with the hoist, and set the same in the proper manner, all as shown on the manufacturer's drawings:

*Flush watertight sidewalk doors [checkered steel type] [vault light type] with condensation gutter tapped for plumber's ¾-in. drain pipe connection.

Automatic sidewalk door opening, closing and locking device.

Automatic safety spring guard gates.

Electric warning gong.

12 standard 17x24-in. No. 16-gauge galvanized fixed bail ash cans.

Rubber-tired ash can truck.

Heavy iron ladder.

(3) Leave the hoist completely and thoroughly installed, to the satisfaction of the architect.

(4) Above equipment to receive factory coat of paint before shipment and finishing coat of paint after erection.

(5) The necessary wiring and cut-out switch between the switchboard and service lugs on the motor are to be furnished and installed by the electrical contractor at the building.

(6) Before above apparatus is manufactured, this contractor is to submit to the architect for his approval, details and specifications of above equipment together with manufacturer's guarantee for 1 year against defective materials and workmanship.

Model D Electric Hoist—

(1) Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, one G&G Telescopic Overhead Crane Hoist Model D with electric motor.

(2) Include the following G&G equipment with the hoist, and set the same in the proper manner all as shown on the manufacturer's drawings:

*Flush watertight sidewalk doors [checkered steel type] [vault light type] with condensation gutter tapped for plumber's ¾-in. drain pipe connection.

Automatic sidewalk door opening, closing and locking device.

Automatic safety spring guard gates

Electric warning gong.

12 standard 17x24-in. 16-gauge galvanized swing bail ash cans.

Rubber-tired ash can truck.

Heavy iron ladder.

(3) Leave the hoist completely and thoroughly installed, to the satisfaction of the architect.

(4) Above equipment to receive factory coat of paint before shipment and finishing coat of paint after erection.

**If there will be any heavy traffic over the sidewalk doors specify "Extra Heavy Flush Watertight Sidewalk Doors," where indicated by this mark.*

Continued on next page

(5) The necessary wiring and cut-out switch between the switchboard and service lugs on the motor are to be furnished and installed by the electrical contractor at the building.

(6) Before above apparatus is manufactured, this contractor is to submit to the architect for his approval, details and specifications of above equipment together with manufacturer's guarantee for one year against defective materials and workmanship.

Model B Hand Power Hoist—

(1) Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, one G&G Telescopic Overhead Crane Hoist Model B with Automatic Gear Shifting Brake Device and Silencer.

(2) Include the following G&G equipment with the hoist, and set the same in the proper manner, all as shown on the manufacturer's drawings:

*Flush watertight sidewalk door [checkered steel type] [vault light type] with condensation gutter tapped for plumber's ¾-in. drain pipe connection.

Automatic sidewalk door opening, closing and locking device.

Automatic safety spring guard gates.

Electric warning gong.

12 standard 17x24-in. galvanized swing bail ash cans.

Rubber-tired ash can truck.

Heavy iron ladder.

(3) Leave the hoist completely and thoroughly installed, to the satisfaction of the architect.

(4) Above equipment to receive factory coat of paint before shipment and finishing coat of paint after erection.

(5) Before above apparatus is manufactured, the contractor is to submit to the architect for his approval, details and specifications of above equipment together with manufacturer's guarantee for one year against defective materials and workmanship.

Model A Hand Power Hoist—

(1) Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, one G&G Telescopic Hoist Model A with Automatic Gear Shifting Brake Device and Silencer.

(2) Include the following G&G equipment with the hoist, and set the same in the proper manner, all as shown on the manufacturer's drawings:

*Flush watertight sidewalk doors [checkered steel type] [vault light type] with condensation gutter tapped for plumber's ¾-in. drain pipe connection.

Automatic sidewalk door opening and closing device.

Automatic safety spring guard gates.

Electric warning gong.

12 standard 17x24-in. galvanized fixed bail ash cans.

Rubber-tired ash can truck.

Heavy iron ladder.

(3) Leave the hoist completely and thoroughly installed, to the satisfaction of the architect.

(4) Above equipment to receive factory coat of paint before shipment and finishing coat of paint after erection.

(5) Before above apparatus is manufactured, the contractor is to submit to the architect for his approval, details and specifications of above equipment together with manufacturer's guarantee for one year against defective materials and workmanship.

References

The following is a partial list of architects who have repeatedly specified the G&G Telescopic Hoist:

Office of the State Architect	Albany, N. Y.
Marye, Alger & Alger	Atlanta, Ga.
Wyatt & Nolting	Baltimore, Md.
Densmore & Le Clear	Boston, Mass.
Thomas M. James	Boston, Mass.
Monks & Johnston	Boston, Mass.
F. H. Berlenbach	Brooklyn, N. Y.
Schmidt, Garden & Martin	Chicago, Ill.
C. W. & G. L. Rapp	Chicago, Ill.
Graham, Anderson, Probst & White	Chicago, Ill.
Holabird & Roche	Chicago, Ill.
Perkins, Fellows & Hamilton	Chicago, Ill.
Weary & Alford	Chicago, Ill.
W. E. McCornack	Cleveland, Ohio
Hubbell & Benes	Cleveland, Ohio
Snyder, Babbitt & Matthews	Columbus, Ohio
Richards, McCarty & Bulford	Columbus, Ohio
William Gordon	Des Moines, Iowa
Proudfoot, Bird & Rawson	Des Moines, Iowa
C. Howard Crane	Detroit, Mich.
Albert Kahn & Ernest Wilby	Detroit, Mich.
Malcolmson & Higginbotham	Detroit, Mich.
Halstead & Sullivan	Duluth, Minn.
C. Howard Lloyd	Harrisburg, Pa.
Sanguinet & Staats	Houston, Tex.
W. E. Hulse & Co.	Hutchinson, Kan.
D. A. Bohlen & Son	Indianapolis, Ind.
Elmer E. Dunlap	Indianapolis, Ind.
John T. Rowland, Jr.	Jersey City, N. J.
J. H. Felt & Co.	Kansas City, Mo.
Joseph & Joseph	Louisville, Ky.
Van Ryn & De Gelleke	Milwaukee, Wis.
Croft & Boerner	Minneapolis, Minn.
Brown & Van Beren	New Haven, Conn.
Donn Barber	New York, N. Y.
Cross & Cross	New York, N. Y.
Carrere & Hastings	New York, N. Y.
Delano & Aldrich	New York, N. Y.
Cass Gilbert	New York, N. Y.
C. P. H. Gilbert	New York, N. Y.
Bertram G. Goodhue, Jr.	New York, N. Y.
Hunt & Hunt	New York, N. Y.
Louis E. Jallade	New York, N. Y.
Thomas W. Lamb	New York, N. Y.
McKim, Mead & White	New York, N. Y.
McKenzie, Voorhees & Gmelin	New York, N. Y.
Peabody, Wilson & Brown	New York, N. Y.
Charles A. Platt	New York, N. Y.
Starrett & Van Vleck	New York, N. Y.
C. B. J. Snyder	New York, N. Y.
Trowbridge & Livingston	New York, N. Y.
Warren & Wetmore	New York, N. Y.
John & Allan MacDonald	Omaha, Neb.
Hewitt & Emerson	Peoria, Ill.
Clyde S. Adams	Philadelphia, Pa.
The Ballinger Company	Philadelphia, Pa.
Paul A. Davis, 3rd	Philadelphia, Pa.
Horace Trumbauer	Philadelphia, Pa.
Comes, Perry & McMullen	Pittsburgh, Pa.
Claude Bragden	Rochester, N. Y.
Wm. B. Ittner	St. Louis, Mo.
Preston Bradshaw	St. Louis, Mo.
C. H. Johnston	St. Paul, Minn.
Edgar Blair	Seattle, Wash.
Edward M. Gee	Toledo, Ohio
Mills, Rhines, Bellman & Nordhoff	Toledo, Ohio
Milburn, Heister & Co.	Washington, D. C.
A. L. Harris, Municipal Architect	Washington, D. C.

OTHER REFERENCES

United States Government: Treasury Department, Washington, D. C., Department of Labor; Post Office Department—James A. Wetmore, Supervising Architect

Illinois Central Railroad, D. D. Jones, Co.'s Engineer, Chicago, Ill.

American Telephone & Telegraph Co., New York, N. Y.

Board of Education, Saginaw, Mich.

Board of Education, New York, N. Y.

See also page 2631

If there will be any heavy traffic over the sidewalk doors specify "Extra Heavy Flush Watertight Sidewalk Doors," where indicated by this mark.

G&G ATLAS SYSTEMS

INCORPORATED

Pneumatic Tube Apparatus

TELEPHONE
Spring 7801

542 West Broadway
NEW YORK, N. Y.

Products

Pneumatic Tube Systems. Complete installations. Alterations and supplies for any existing pneumatic tube system.

Power Saving Valves for application to any existing pneumatic tube system.

The G&G
REG. U.S. PAT. OFF.
ATLAS
PNEUMATIC
TUBE SYSTEM

TRADE-MARK

Uses

The G&G Atlas Pneumatic Tube System may be used wherever written messages, documents or other small articles must be sent from point to point, for example—department stores, banks, hotels, office buildings, hospitals and factories. The carriers may be round or oval, preferably round, in any of several standard sizes. There may be any number of stations located at strategic points.

Operation

The scale drawing at the bottom of this page shows how our engineers have made a saving of 196 sq. ft. floor space over the former space required by another pneumatic tube system. All carriers coming to the tube room are received by one operator, who relays them consecutively to the cashiers, seated at desks in groups of four.

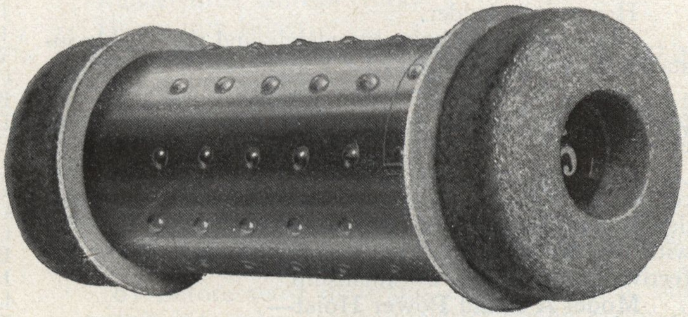
The G&G Atlas Pneumatic Ejector is so designed that the cashier must dispose of carriers in the order sent by the relay operator and can only receive them singly. Thus there is an equal distribution of work, saving the customer's time considerably. The cashier sends the carrier through another tube line back to the relay operator who returns it to the sales station from which it originally started.

Charge sales are recognized by the Relay through the use of the G&G Atlas Knobby Carrier, which is different to the eye and sense of touch. These are handled by authorizers.

Special Advantages

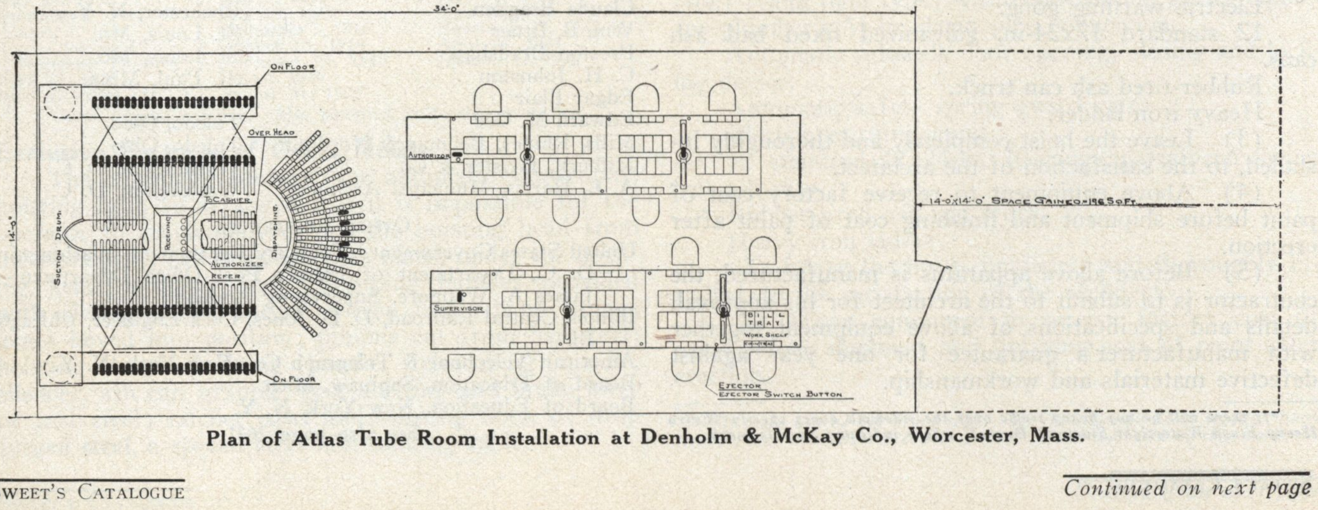
The G&G Atlas Power Saving Valve is self-regulating. It makes timing elements, electrical contacts and doors over bellmouth sends, unnecessary. The power in the pneumatic tube line, except for a small pilot flow of air, is shut off at all times when a carrier is not in transit in that particular line. Power is automatically shut off while carrier is dropping by force of gravity or when it attains excessive speed. This saves power and wear on tubes and carriers.

The G&G Atlas Power Saving Valve saves power because it cuts off the air at the exact time the carrier is delivered. Timing elements frequently shut off the power too late. When the carriers are traveling slower because several are in the same line, or are heavily loaded, or both, timers may shut off too early. In the first instance, it causes an unnecessary loss of power. In the second, it causes stoppage of tube lines with consequent delay and confusion. With the G&G Atlas Power Saving Valve, timing elements are unnecessary and are eliminated, which makes for simplicity, speed and economy of operation.



G&G Atlas Knobby Carrier for Charge Sales

This and many other styles of round and oval carriers can be furnished to fit all sizes of tubes



Plan of Atlas Tube Room Installation at Denholm & McKay Co., Worcester, Mass.

Continued on next page

Moving belts and mechanical separators cause delays, mechanical trouble and unequal distribution of carriers to the cashiers. These are not used in the G&G Atlas System which is simple, dependable and economical in operation. Substitution of the G&G Atlas Systems for competitive systems always leads to savings. The economies which may be expected are:

(1) Reduction in floor space (in some cases as much as 50%).

(2) Reduction in tube room personnel (frequently 50%).

(3) Reduction in number and size of blowers (from 25% to 66⅔%).

(4) Reduction in maintenance expenses.

Write for our interesting literature showing instances of the above savings.

To Specify

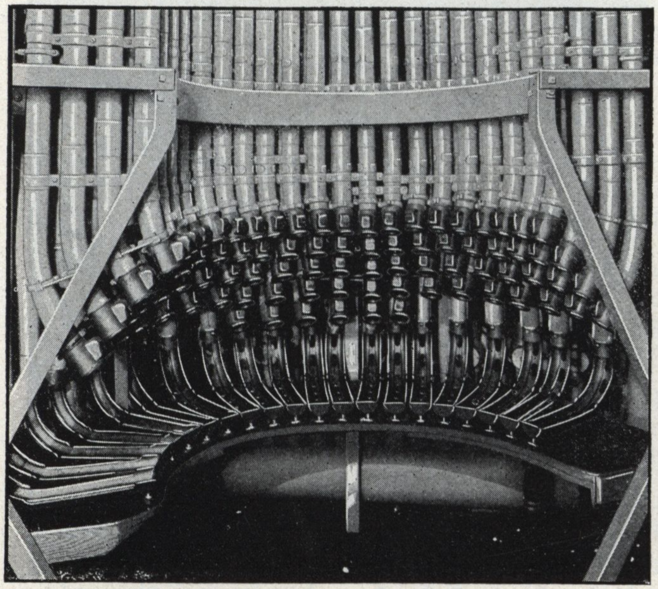
Though the requirements of each client differ our apparatus can be made to fit his needs. It is suggested that the architect or engineer consult us on proposed jobs, so that we can work together toward a satisfactory solution of the problem.

Much of our recent business has been the reconstruction of unsatisfactory tube lines into dependable and power saving G&G Atlas Systems.

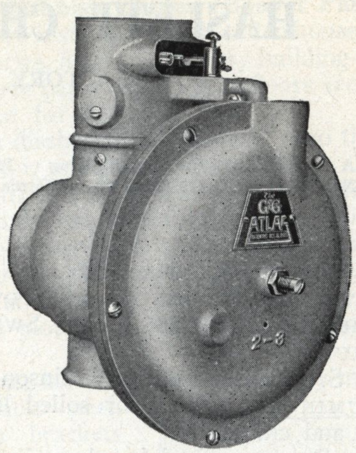
References

Complete G&G Atlas System Installations—

Oriole Department Store	Baltimore, Md.
E. T. Slattery Co.	Boston, Mass.
D. M. Read Co. (New Building)	Bridgeport, Conn.
Oppenheim Collins & Co.	Brooklyn, N. Y.
Hotel Bismarck	Chicago, Ill.
Stevens Hotel	Chicago, Ill.
L. S. Plaut & Co. (New Building)	Newark, N. J.
Bonwit Teller & Co.	New York, N. Y.
Eimer & Amend	New York, N. Y.
*R. H. Macy & Co. (New Building)	New York, N. Y.
Oppenheim Collins & Co.	New York, N. Y.
Central Union Trust Co.	New York, N. Y.
The Fleischmann Co.	New York, N. Y.
Farmers Loan & Trust Co.	New York, N. Y.
John David & Co. (3 stores)	New York, N. Y.
Joseph Horne Co. (New Building)	Pittsburgh, Pa.
Union National Bank	Pittsburgh, Pa.
Oppenheim Collins & Co.	Philadelphia, Pa.
Sultzer Packing Co.	Pottsville, Pa.
*McCurdy & Co.	Rochester, N. Y.
H. M. Voorhees & Bro.	Trenton, N. J.
R. Wallace & Sons Mfg. Co.	Wallingford, Conn.
Woodward & Lothrop, Inc.	Washington, D. C.
Wilmington & Philadelphia Traction Co.	Wilmington, Del.



G&G Atlas Central Dispatching Station at Bloomingdale Bros.
Half the cashiers—Half the power—Poor service converted to good service



G&G Atlas Power Saving Valve (Patented)
Used on all our new installations, or it can be installed on existing unsatisfactory tube lines

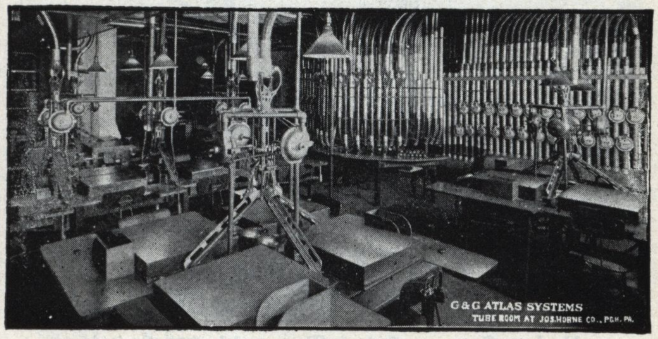
Competitive Systems Have Been Replaced by G&G Atlas Systems in the Following—

E. T. Slattery Co.	Boston, Mass.
Timothy Smith Co.	Boston, Mass.
C. Crawford Hollidge	Boston, Mass.
Frederick Loeser & Co., Inc.	Brooklyn, N. Y.
*R. H. Macy & Co. (Old Building)	New York, N. Y.
National City Bank of New York	New York, N. Y.
Franklin Simon & Co. Inc.	New York, N. Y.
*Bloomingdale Bros.	New York, N. Y.
A. De Pinna Co.	New York, N. Y.
Bonwit Teller & Co.	Philadelphia, Pa.
*Strawbridge & Clothier	Philadelphia, Pa.
Joseph Horne Co. (Old Building)	Pittsburgh, Pa.
*McCurdy & Co.	Rochester, N. Y.
*Denholm & McKay Co.	Worcester, Mass.

G&G Atlas Power Controls Have Been Substituted for Competitive Apparatus in the Following—

R. H. Stearns Co.	Boston, Mass.
Smith Patterson	Boston, Mass.
Timothy Smith	Boston, Mass.
D. M. Read Co. (Old Building)	Bridgeport, Conn.
Eberhard Faber Co.	Brooklyn, N. Y.
J. N. Adams Co.	Buffalo, N. Y.
Goddard Bros.	Lynn, Mass.
Charles A. Ditson & Co.	New York, N. Y.
National Cloak & Suit Co.	New York, N. Y.
The Goerke Co.	Paterson, N. J.
Penn Mutual Insurance Co.	Philadelphia, Pa.
Bonwit Teller Co.	Philadelphia, Pa.
*Sears Roebuck & Co.	Philadelphia, Pa.
Tepper Brothers	Plainfield, N. J.
Woodward & Lothrop, Inc.	Washington, D. C.

*Important savings were made for these concerns. Write for literature showing details.



G&G Atlas Systems Tube Room at Joseph Horne Co., Pittsburgh, Pa.

HASLETT CHUTE AND CONVEYOR CO.

FACTORY AND ENGINEERING DEPARTMENT

OAKS, PA.

PHILADELPHIA OFFICE, 811 Harrison Building
PITTSBURGH OFFICE, 411 State Building
BALTIMORE OFFICE, 523 Calvert Building
SAN FRANCISCO OFFICE, 60 California Street
CLEVELAND OFFICE, 1311 Union Mortgage Building

Products

Spiral Chutes; Gravity Roller Conveyors; Tray Elevators and Barrel Hoists; Power Driven Belt and Chain Conveyors; Paper, Sweepings and Rubbish Chutes.

Sole U. S. Licensee under Wilkinson patents for sanitary Aluminum Chutes for soiled linen in hospitals, hotels and clubs.

Also Fire Doors required for above installations.

Engineering and Architectural Co-operation

We invite correspondence with architects and engineers and are glad to furnish complete drawings showing floor openings, framing, supports, etc.

We employ experienced engineers to advise on layouts in factories, warehouses and distributing plants. Some of the best known architects and engineers in the country avail themselves of this service.

Spiral Chutes

The Haslett spiral chute with its patented concave bottom which governs the speed of all kinds of packages is recognized as the safest device of this kind made for lowering heavy or fragile merchandise.

STANDARD SIZES OF HASLETT PATENT CONCAVE CHUTES AND MAXIMUM SIZES OF PACKAGES HANDLED

Diameter	Trough width	Packages		
		Length	Width	Weight
3 ft.	12 in.	15 in.	9 in.	40 lbs.
4 ft.	19 in.	22 in.	14 in.	75 lbs.
6 ft.	24 in.	30 in.	18 in.	200 lbs.
*7 ft.	30 in.	36 in.	23 in.	350 lbs.
†9 ft.	36 in.	48 in.	28 in.	400 lbs.
9 ft. 10 in.	42 in.	52 in.	32 in.	600 lbs.
12 ft.	48 in.	60 in.	36 in.	1000 lbs.
15 ft.	60 in.	72 in.	46 in.	1400 lbs.

*Generally supplied to grocery jobbers.
†Generally supplied to hardware jobbers.
Special strength chutes can be built for especially heavy work in all sizes.

Write for our new booklet fully describing and illustrating spiral chutes.

This company also builds flat bed chutes, both enclosed and open, for department store, mail order and light factory work.

SIZES OF STANDARD FLAT BED CHUTES

Diameter	Trough width	Pipe column	Diameter	Trough width	Pipe column
2 ft. 4⅝ in.	12 in.	4 in. internal	6 ft. 6¾ in.	36 in.	6 in. internal
5 ft. 6¾ in.	30 in.	6 in. internal	7 ft. 8¾ in.	42 in.	8 in. internal

Gravity Roller Conveyors

Haslett ball bearing roller conveyor has shafts running entirely through, insuring perfect alignment. It is light, strong, clean and neat.

Made for various purposes, in four sizes, of steel tubing rollers: 13/16 in., 1½ in., 2¼ in. and 3 in.; also with maple rollers.

Tray Elevators

Haslett vertical and inclined elevators of all types for handling barrels, sacks, cases, baskets, dish trays, etc.

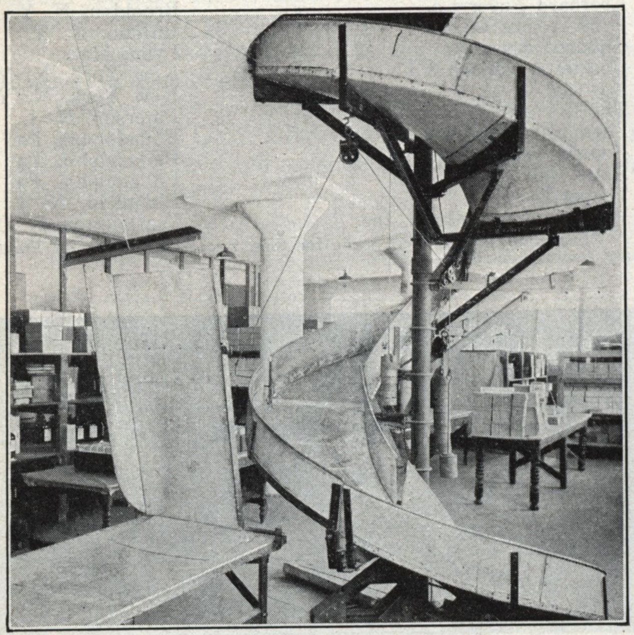
They are made in various sizes for handling anything from bobbin boards to bales of wool.

Designs made to meet requirements.

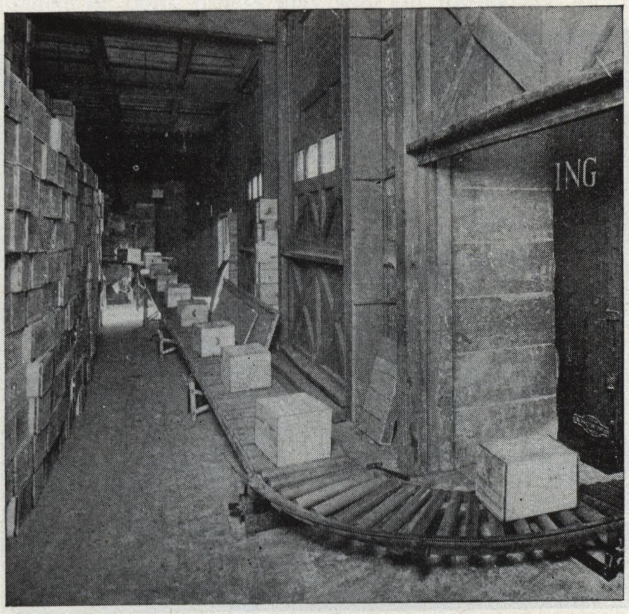
Power Driven Conveyors

For mail order houses, department stores, factories, etc.

A specialty is made of devising and laying out complete systems, including belt and chain conveyors, inclined elevators, etc., with noiseless transmission.



Haslett Concave Spiral Chute with 90° Switch



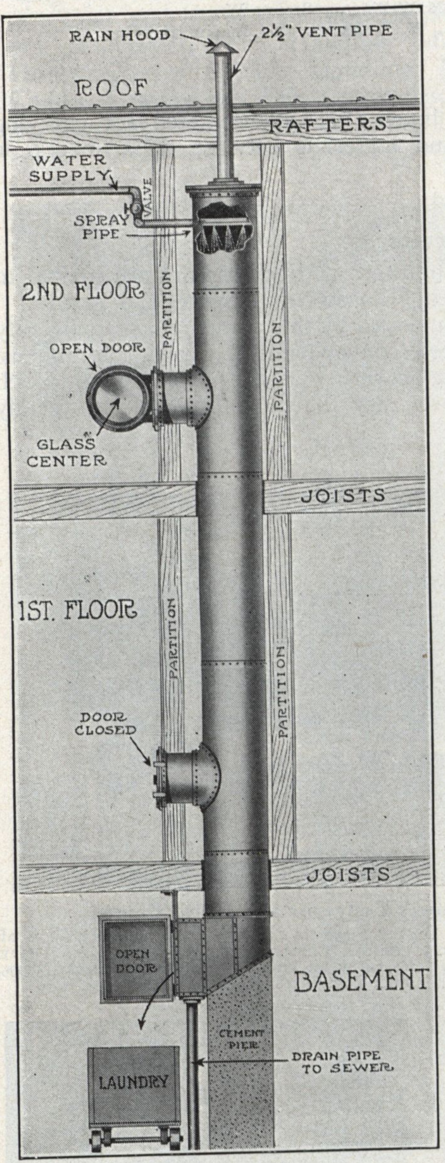
Haslett Gravity Roller Conveyor Delivering Direct from Spiral Chute to Freight Car

Continued on next page

Soiled Linen Chutes (Manufactured Under Wilkinson Patents)

Haslett chutes for delivering soiled linen from upper floors of hospitals, hotels, institutions and apartment houses are made of sheet aluminum $\frac{1}{16}$ in. thick. Rivet holes are countersunk and aluminum rivets driven flush on inside.

A cast aluminum throat is furnished for intake at each floor and is extended through partition wall with sheet aluminum pipe to door jamb casting outside of wall. Door consists of a cast aluminum ring, set with wire glass center, closing against a rubber gasket. The hinge is a heavy pin through strong lugs cast as part of door jamb and door casting, and door is forced tight against gasket by a refrigerator door clamp. This is of brass, nickel-plated. The door ring is buffed and polished, making a very handsome appearance.



Soiled Linen Chute

A spray ring is installed near the top, with connections for supply pipe and at bottom a drain pipe leads out for sewer connection.

At the bottom, very rigid construction, heavily reinforced, gives ample strength for deflection of bags of laundry by a slanting bottom to a side discharge.

We can provide structural steel legs for support of bottom, or chute can rest on a concrete pier. The chute is well supported and braced at intermediate points, so as to provide adequate rigidity.

The top has a flat plate with standard pipe flange from which 2½-in. pipe may be extended through the roof for vent if desired.

This sanitary method of handling soiled linen in institutions and hotels has become recognized as an essential feature in properly protecting patients, guests and especially employes.

The use of aluminum allows of cleansing with the flow from the spray pipe or with disinfectants applied with a long handled brush inserted at intake openings. Aluminum does not rust.

Paper and Rubbish Chutes (Beaver Patents)

These are installed in mail order houses, department stores, factories, hotels and in any building where sweepings and waste paper from upper floors are sent down to the basement for disposal.

Bottom discharge can be made onto the floor, or to the incinerator, or baling press.

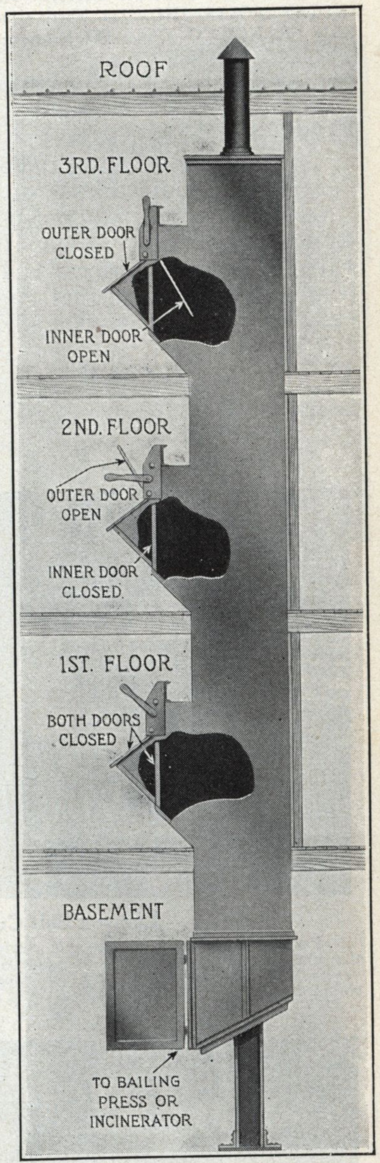
The bottom is made slanting and heavily reinforced, but owing to the shock of falling pieces of wood or other heavy waste material, it is best to have the bottom rest on a concrete pier, with grout poured in to fill the crack full so as to form an absolutely solid surface to take the blows. A heavy, hinged bottom door is provided.

The chute is rectangular and usually made of No. 16 gauge black steel. Angle iron brackets provide support at each floor and, if desired, an outlet can extend through the roof and a ventilator can be provided at the top.

Our double interlocking intake doors (patent applied for) provide positive check against back draught while refuse is being put in the chute, and are proof against the tendency to tie fire doors open. They can be opened only by the operating lever, and only one door can be opened at a time. It is impossible to open either door by pulling or pushing on the door and partial opening of both doors at the same time is impossible.

The operating lever controls both doors by a series of interrupted gears—a very simple and positive arrangement.

These doors make a vestibule of hopper shape so that the outer door may be opened while rubbish is swept in. Dirt slides down until it rests against the inner door. The lever then closes the outer door and a further stroke of the same lever opens the inner door allowing sweepings to fall into the main chute.



Paper and Rubbish Chute

Gears are protected with a sheet metal gear cover.

The utility of these chutes ranges from disposal of sweepings in hotels to waste paper removal in banks.

THE LAMSON COMPANY

Builders of Pneumatic, Electrical and Conveyor Apparatus

GENERAL OFFICE AND WORKS

SYRACUSE, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., 9-11 East 37th Street
PHILADELPHIA, PA., 210 North Broad Street
PITTSBURGH, PA., 319 Third Avenue
BALTIMORE, MD., Equitable Building
CHICAGO, ILL., 216 W. Monroe Street
DETROIT, MICH., 525 Woodward Avenue
MINNEAPOLIS, MINN., 229 Tribune Annex
CINCINNATI, OHIO, 119 East 5th Street
INDIANAPOLIS, IND., 711 North Gladstone Avenue
SAN FRANCISCO, CAL., 617 Mission Street
CLEVELAND, OHIO, Newman-Stein Building, Walnut and East 12th Streets
ST. LOUIS, MO., 709 Pine Street
ATLANTA, GA., 30 Wellhouse Building
SEATTLE, WASH., 720 Fourth Avenue
OMAHA, NEB., 309 Brandeis Theater Building
LOS ANGELES, CAL., 730 South Los Angeles Street
DALLAS, TEX., 905½ Elm Street
TORONTO, ONT., 126 Wellington Street, W.
VANCOUVER, B. C., W. L. BROWN, 104 Empire Building

Products

CONVEYORS; CHUTES; PNEUMATIC TUBES.

Also manufacturers of Selective Pick-up and Sweep-off Carriers; Automatic Tray Conveyors; Gravity Roller Conveyors; Light Hand Power Elevators and Lifts for carrying papers and materials in industrial plants; Wireline Cash and Parcel Carriers for carrying cash, as well as sales slips, and parcels; Sheet Writers' and Drivers' Bins.

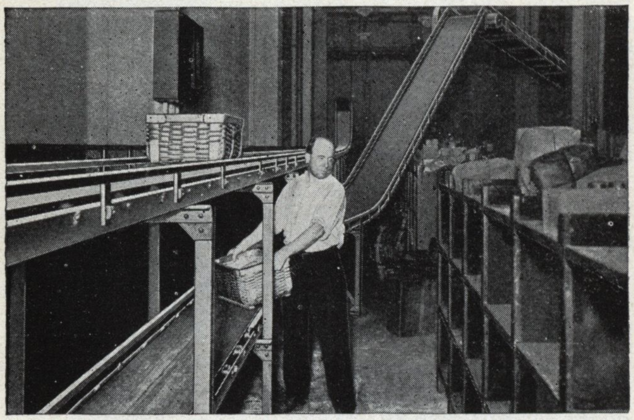
Scope of Use

Used in stores, offices, factories, mercantile plants, libraries, banks, hotels, post offices, etc., for carrying money, papers and materials between departments or buildings.

Co-operative Service

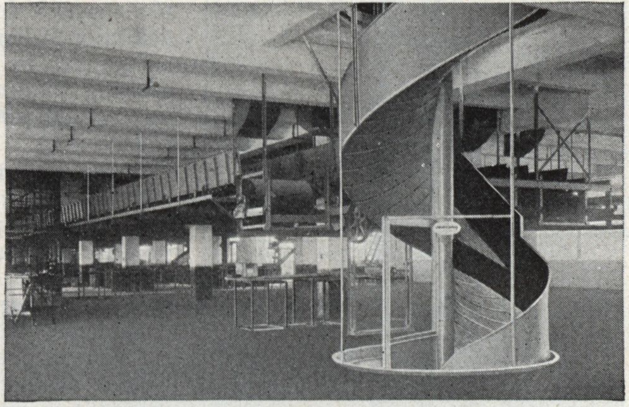
Architects, engineers and contractors are invited to avail themselves of Lamson experience and service.

Specialists employed by this company are constantly solving complicated conveying and carrying problems. Full information covering any problem to which Lamson conveyors may be adapted will be gladly furnished.



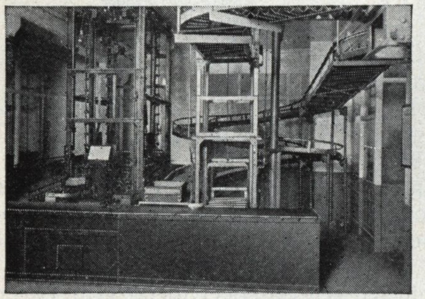
Lamson Belt Conveyor

Part of complete belt conveyor system for handling merchandise in the wholesale drug warehouse of Lehn & Fink, New York, N. Y. Conveyors simplify and speed up the work of classifying, sorting, and shipping



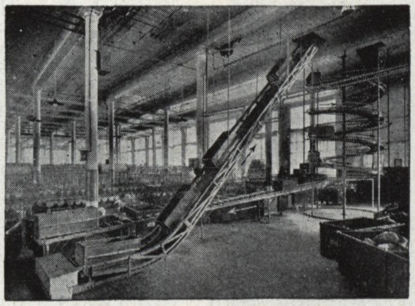
Lamson Power Conveyor and Spiral Chute

Combination power conveyor system and chute for handling sacks of mail in the Van Buren Terminal, Chicago Post Office. Lamson heavy duty power conveyor systems carry all kinds of materials in sacks, bags, boxes, crates, barrels, and other containers



Lamson Automatic Vertical Elevator

Part of an extensive system in the National Cash Register Plant, Dayton, Ohio. Delivers tote boxes to any department. This type of system is extensively used in industrial plants and warehouses



Lamson Inclined Power Conveyor

Inclined power conveyor raises boxes of empty bobbins between floors. The gravity spiral in background returns boxes of full bobbins furnishing a continuous operating system between floors

Lamson Pneumatic Tubes

Factory department station of pneumatic tube system for carrying orders, messages, etc. Lamson pneumatic tubes are used for ultra-quick carrying of all papers in practically every industry

SAMUEL OLSON & CO.

Conveying and Elevating Machinery

2418-2426 Bloomingdale Avenue
CHICAGO, ILL.

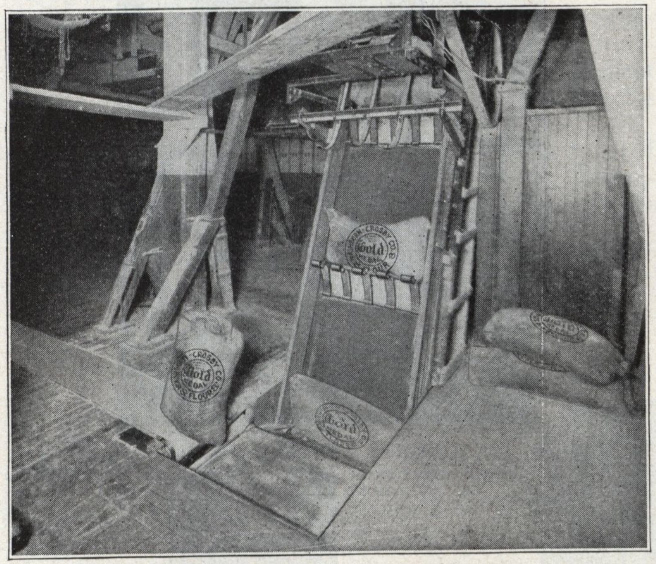
NEW YORK OFFICE, Fifth Avenue Building
LOS ANGELES OFFICE, Consolidated Building

Products

CONVEYING and ELEVATING MACHINERY for handling materials of every description:

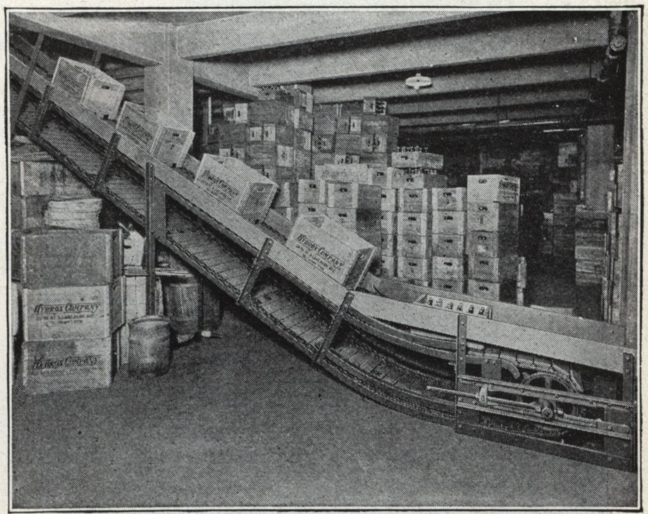
Coal and Ash Handling Elevators and Conveyors, Subveyors, Dish Handling Machinery, Packing House Conveyors, Ice Handling Machinery, Spiral Chutes, Gravity and Belt Conveyors, Store and Office Service Conveyors, Automatic and Pivoted Tray Elevators, Steel and Wood Apron Conveyors.

Power Transmission Machinery, Flour Blenders and Patented Automatic Proofers for Bakeries, Universal Pneumatic Tube Systems.



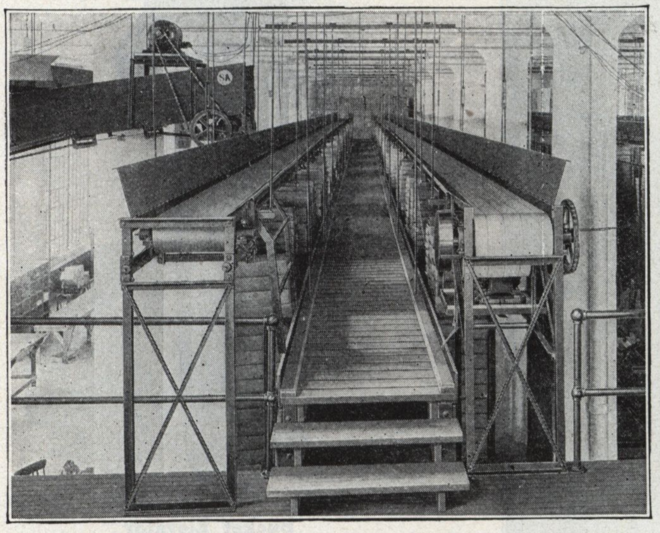
Washburn-Crosby Co. Installation

This system loads cars at the rate of seventeen hundred 196-lb. sacks per hour



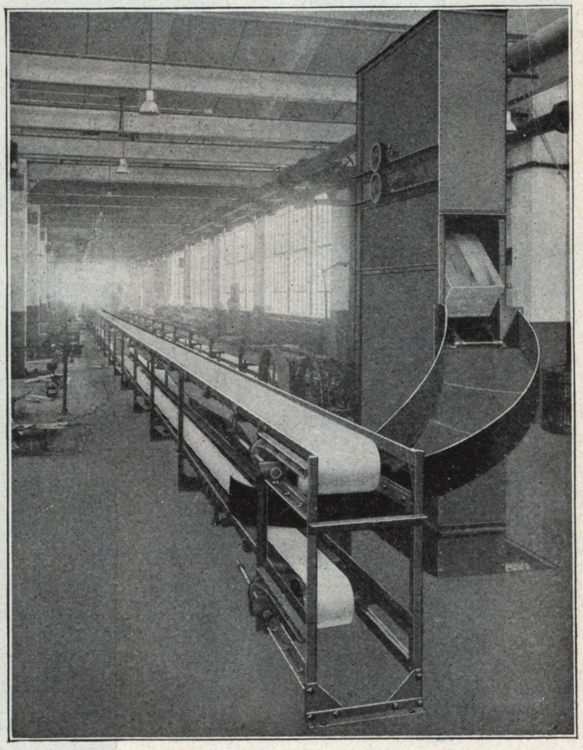
Hydrox Co. (Chicago, Ill.) Installation

The apron conveyor illustrated is but one of seven conveyor units installed in this plant



National Cloak & Suit Co. (Kansas City) Installation

SAMUEL OLSON & CO. completely equipped this plant with an elaborate conveying and elevating system



Patented Automatic Elevator

The dominating feature of this elevator is that it is possible to unload on the elevating side

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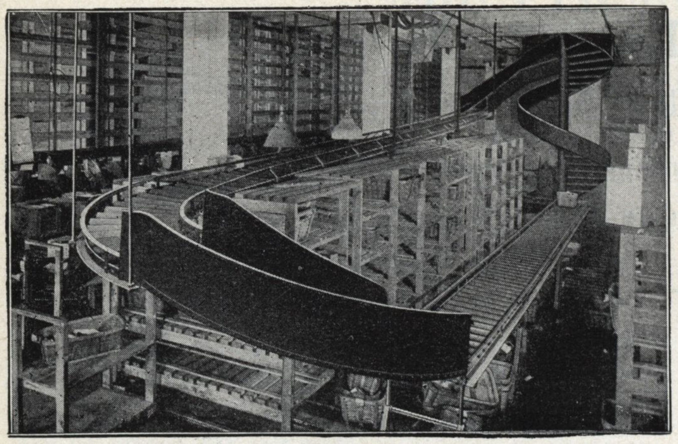
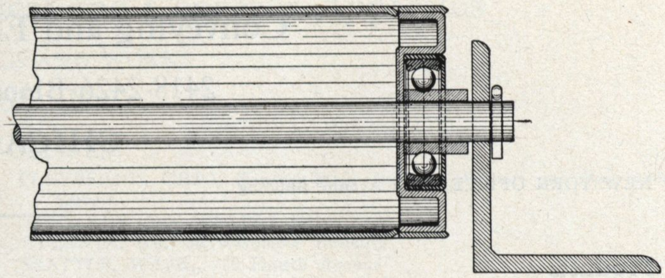
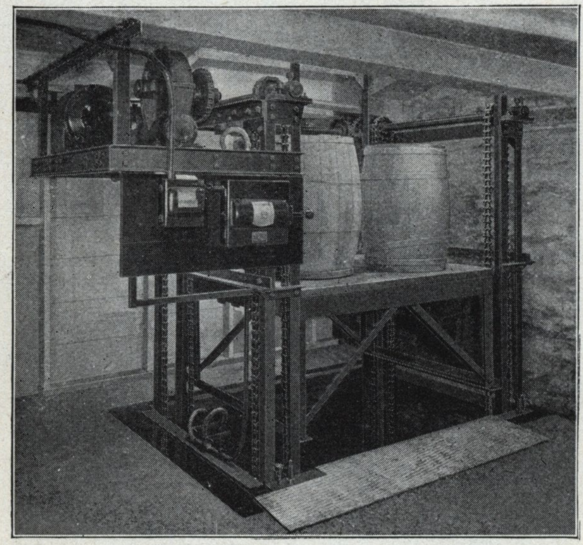


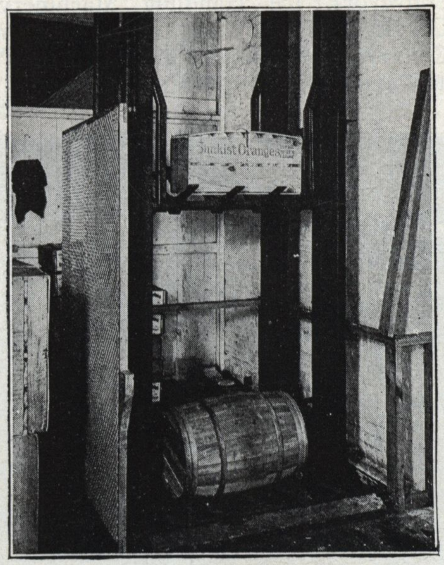
Gravity Conveyor System
Part of a conveying system installed in one of the largest wholesale drug houses



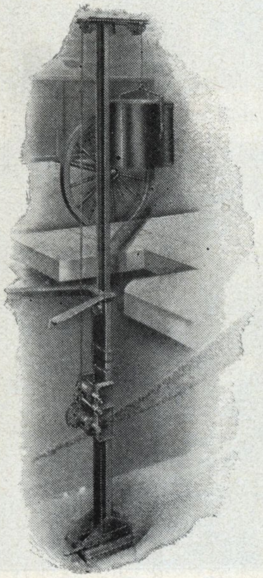
Section of Olson Gravity Conveyor Roller
Note ball bearing is a separate unit inserted in steel housing. Easily removed. Ball bearing has ground tempered steel race and bushing



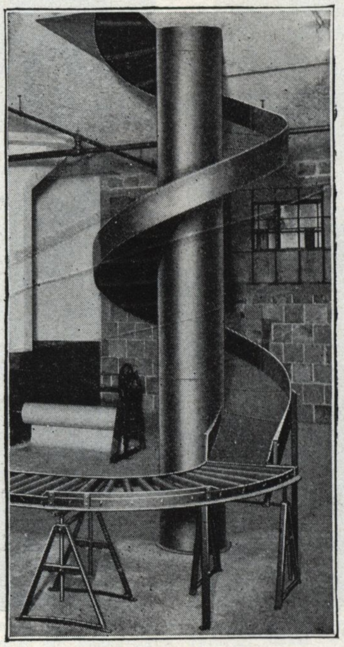
Platform Lift
A sturdy electrical operated lift. Note construction



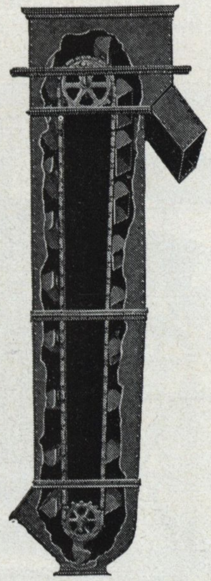
Pivoted Tray Elevator
The logical equipment where exceptionally heavy or bulky merchandise is to be handled



Disappearing Ash Lift
Designed for buildings such as apartments, stores, small banks, etc.



Spiral Chute
A complete line is manufactured



Bucket Elevator
A complete line of this type in either steel or wood for handling sand, gravel, cement, coal, ashes, grits, seed, grain, flour, crushed ice, lime, etc.

Continued on next page

Subveyors (Patented)

Subveyors solve dish and food handling problems in hospitals, hotels, clubs, restaurants, cafeterias and tearooms. Installations in leading institutions throughout the country. Subveyors have a distinct industrial and mercantile application where packing boxes, trays, crates, tote boxes or any standard container are to be elevated or distributed within a plant or building. We will be glad to furnish detail description of industrial applications.

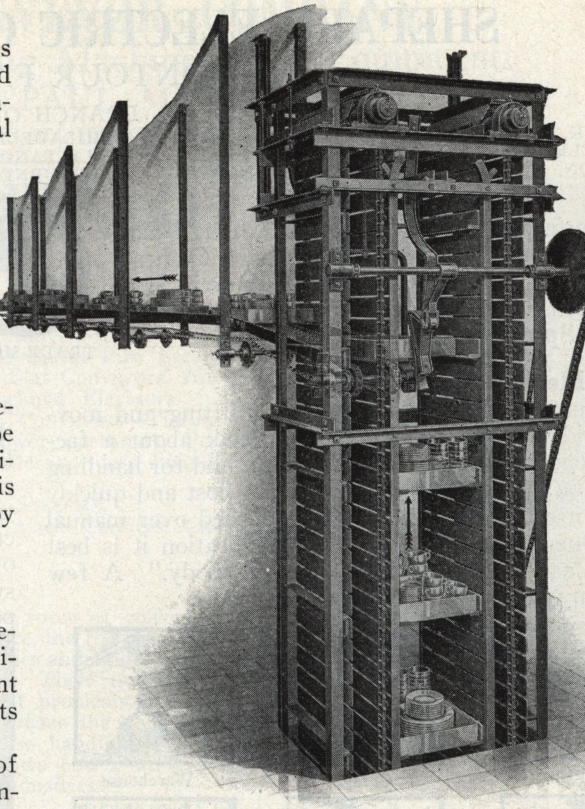
Olson Machinery Is Correctly Designed

Samuel Olson & Co. make a specialty of designing, manufacturing, and completely installing conveying and elevating systems for individual requirements. A conveying system to be efficient must be designed to conform with requirements. This necessitates a thorough analysis of the handling problem. This service is embodied in all equipment manufactured by this company.

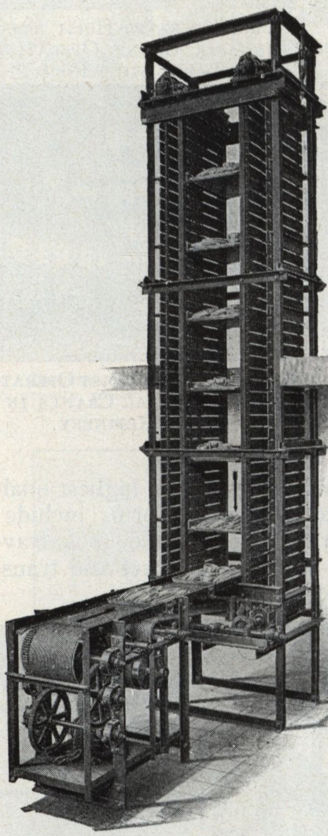
Co-operative Service

Architects and engineers should use the vast experience of Samuel Olson & Co. in the solving of intricate handling problems. The engineering department is ever ready to place at the architect's service experts in this line.

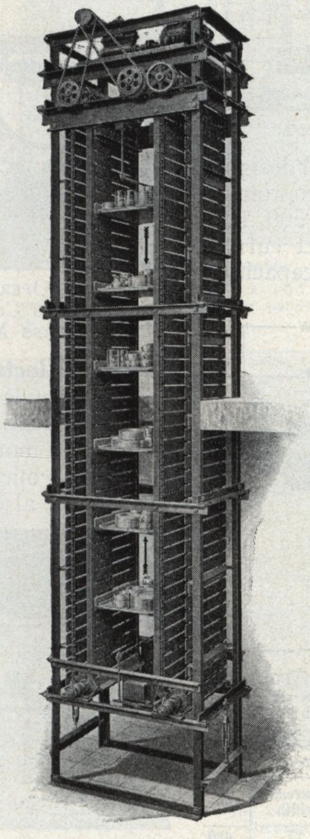
Previous to making final decision on any type of conveying machinery, consult this company. Recommendations particularly adapted for exact conditions will be supplied.



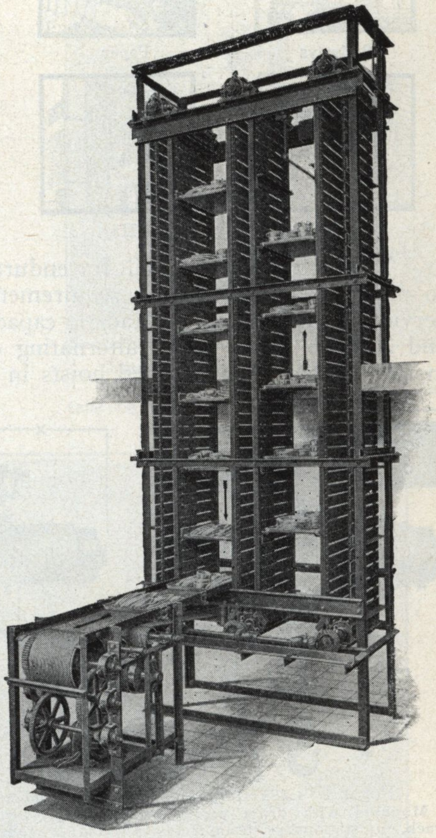
Model "J" Subveyor



Model "A" Subveyor



Model "F" Subveyor



Model "G" Subveyor

SHEPARD ELECTRIC CRANE & HOIST CO.

MONTOUR FALLS, N. Y.

BRANCH OFFICES

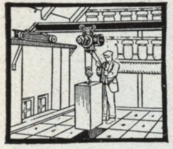
NEW YORK, N. Y.
LOS ANGELES, CAL.
LONDON, ENGLAND
CHICAGO, ILL.
SAN FRANCISCO, CAL.
CHRISTIANIA, NORWAY
PHILADELPHIA, PA.
CHATTANOOGA, TENN.
MELBOURNE, AUSTRALIA
PITTSBURGH, PA.
BUFFALO, N. Y.
BARCELONA, SPAIN
DETROIT, MICH.
BOSTON, MASS.
MONTREAL, QUE.

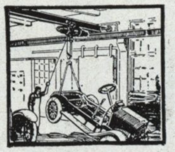
Products

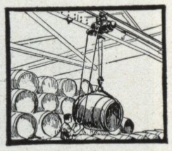
Manufacturers of ELECTRIC HOISTS and CRANES for every lifting service: Transfer Cranes; Single I-Beam Cranes; Complete Monorail Systems; Electric Winches; Cupola Charging Hoists. Also Speed Reducers.

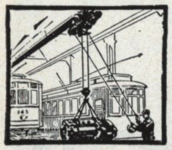
Shepard Electric "LiftAbout"

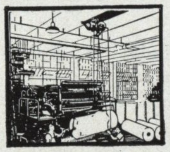
A sturdy little hoist designed for lifting and moving individual parts or materials in bulk about a factory, warehouse, store, building or yard, and for handling ashes. The "LiftAbout" is low in first cost and quickly pays for itself in the savings accomplished over manual labor. Due to its almost limitless application it is best described as "an electric hoist for everybody." A few of its many hundred uses are shown below.

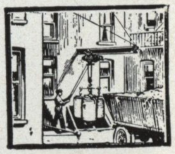

Ice Plant

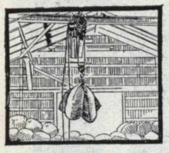

Garage

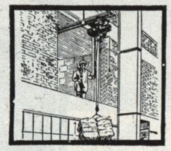

Warehouse

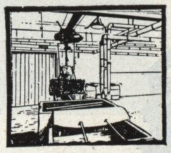

Railways


Paper

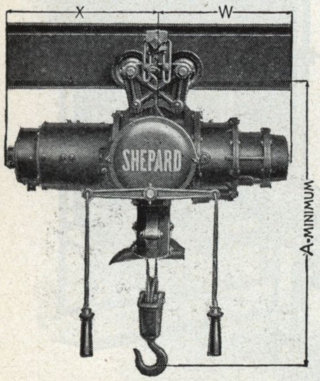

Ashes


Grain

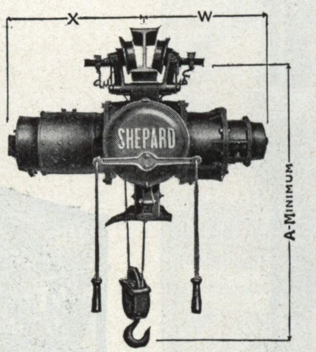

Hay


Foods

The "LiftAbout" is built for endurance and designed to meet the most exacting requirements of continuous service and rough usage. Made in capacities of 500, 1000 and 2000 lb., with either alternating or direct current motor. Other floor-operated hoists in larger capacities.



FORM 1 "LIFTABOUT"
Mounted with drum parallel to track, for stationary I-beam runways



FORM 1-X "LIFTABOUT"
Mounted with drum at right angle to track for single I-beam cranes and jib cranes

Capacity, lb.	Dimensions, in.				Net wt., lb.
	A	X	W	Extreme width	
1000	30	17½	19½	27	420
2000	34½	24	23½	29	660

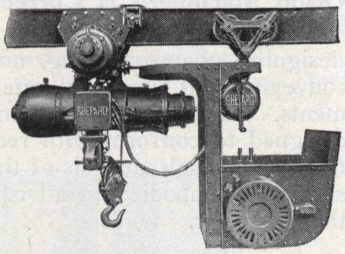
Capacity, lb.	Dimensions, in.				Net wt., lb.
	A	X	W	Extreme width	
1000	31	17½	19½	27	420
2000	35½	24	23½	29	660

Dimensions specified are for reference only.

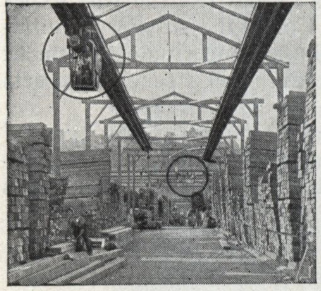
TRADE-MARK

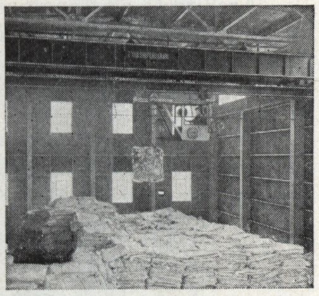
Shepard Cage-Operated Electric Hoist

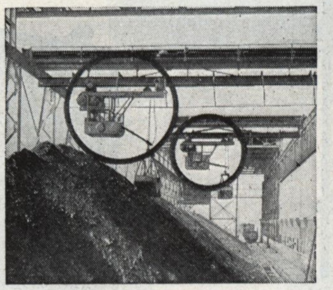
Built in capacities to 10 tons for efficient material handling. It consists of an electric hoist and cage suspended from trolleys traveling on a single I-beam. It runs in either direction, at a wide range of speeds, the entire operation of lifting, moving and lowering of the load controlled by the man in the cage. Through a system of I-beam trackway and switches its usefulness is practically limitless.

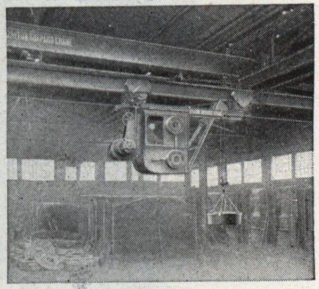


FORM 25 HOIST WITH TRAILER CAGE


CAGE-OPERATED HOIST AT WORK IN LUMBER YARD


CAGE-OPERATED HOIST AND TRANSFER CRANE OPERATING IN LARGE STORE ROOM

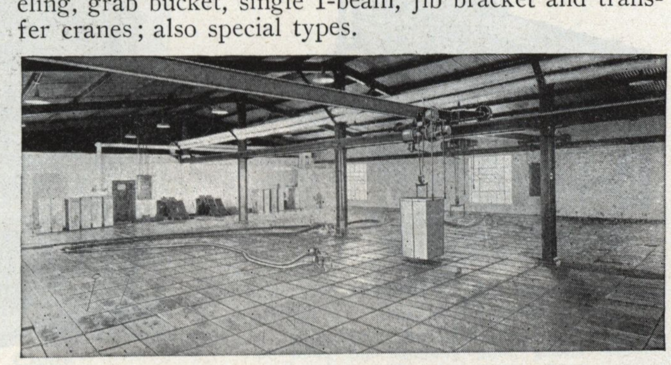

TWO CAGE-OPERATED HOISTS HANDLING COAL FOR A BRASS MILL



CAGE-OPERATED HOIST OPERATING ON SEVERAL CRANES IN METAL REFINERY

Shepard Electric Cranes

A fully developed line of cranes of the highest quality, in capacities from 1 to 30 tons. Forms include: standard 3-motor cage-operated and double hook traveling, grab bucket, single I-beam, jib bracket and transfer cranes; also special types.


SINGLE I-BEAM CRANE AND HOIST USED IN THE MAKING OF ARTIFICIAL ICE

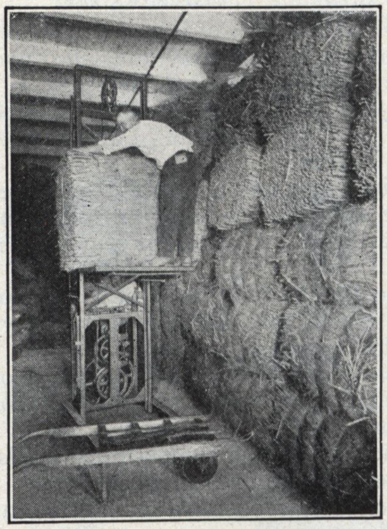
STANDARD CONVEYOR COMPANY

Manufacturers of Conveying Machinery and Equipment

NORTH ST. PAUL, MINN.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

STANDARD
CONVEYOR COMPANY



Tiering Machine

Operated either by hand or electric power. One man tiers bales, boxed and cased goods to a height that manual labor can not reach

Products

GRAVITY and POWER CONVEYING SYSTEMS:

Gravity—Spiral Chutes, Roller Conveyors, Wheel Conveyors and Spiral Fire Escapes.

Power—Belt and Slat Conveyors, Automatic Straight Lift and Inclined Elevators.

BROWN-PORTABLE CONVEYORS—Tiering Machines (hand and power operated), Portabelts (car loaders and unloaders), Pilers, Boat Loaders and Unloaders.

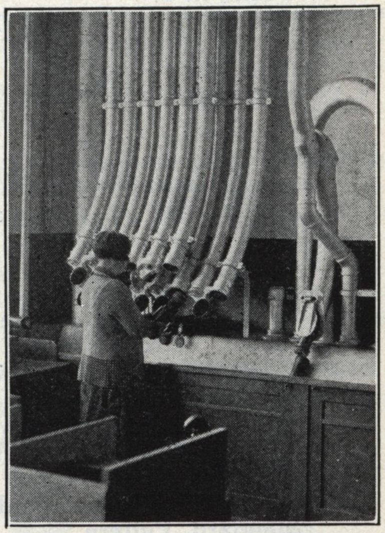
PNEUMATIC TUBE SYSTEMS.

Also, Wire Line Cash Carriers, Cash and Message Lifts.

Service

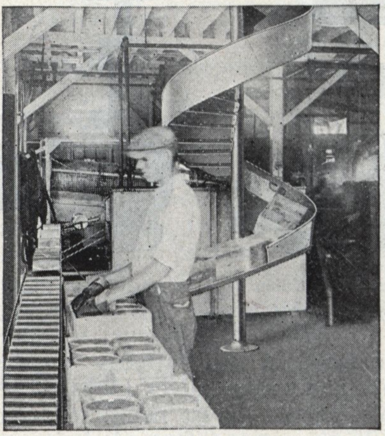
In addition to the force of conveying engineers at the Home Office, the STANDARD CONVEYOR COMPANY maintains Sales and Engineering Offices in all principal cities. Their time is spent in studying the individual problems of a business or industry that recognizes the need of cutting the cost of merchandise handling.

Catalogue "O" shows how Standard Equipment serves various industries.



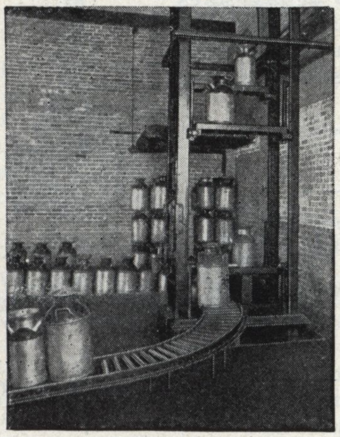
Standard Pneumatic Tube System

Receives and despatches messages, orders, and cash from various departments or offices to central desk



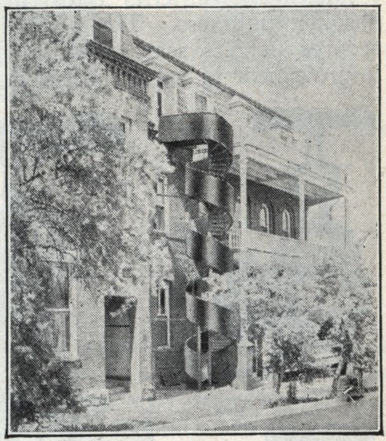
Standard Spiral Chute

Lowers merchandise from upper floors to gravity roller conveyors in basement



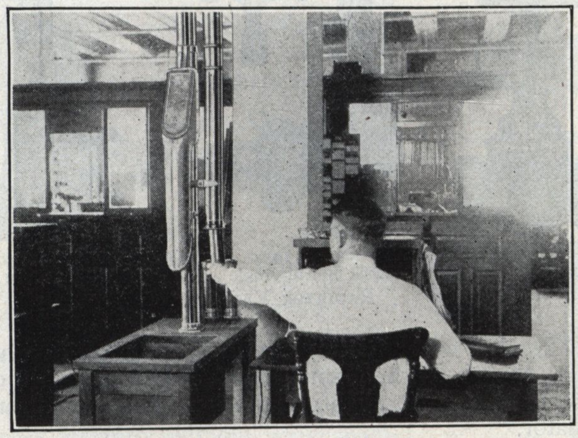
Straight Lift Elevator

Automatically receives and elevates milk cans from roller conveyors to upper floors



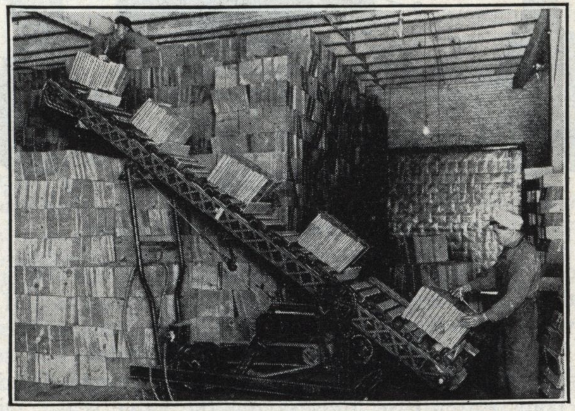
Standard Spiral Fire Escape

Is adaptable for schools, hospitals, insane asylums, and public buildings



Standard Pneumatic Tube System

Operates successfully in mail order houses, wholesale houses, banks, hotels, dry goods stores, department stores, laundries, etc.



Standard Piling Machine

With two men, stacks barrels, sacked goods, cases, bales, box shook, to the ceiling, saving labor costs and time.

Portable sections of conveyors are often connected with the piler which makes it possible to convey a product hundreds of feet from an unloading point to a piling point with a minimum number of men

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Manufacturers of Valves and Mechanical Rubber Goods

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Products

Jenkins Globe, Angle, Cross, Check, Hose, Blow-off, Safety and Gate Valves.

Radiator Valves.

Automatic Radiator Air Valves.

Also, Back Pressure or Exhaust Valves; Rapid Action Valves; Steam Traps; Gage Cocks; Needle Valves; Marine Valves.

Mechanical Rubber Goods: Jenkins '96 and Jenarco Sheet Packing, Gaskets, Pump Valves; Compressed Asbestos Jointing; Moncrieff Scotch Gauge Glasses.

Renewable Disc, Bronze and Iron Body Valves, Standard Pattern

Jenkins valves, standard pattern, all have the feature of renewable disc and disc-holder as shown in the sectional view of Fig. 106. The renewable disc, first introduced by Jenkins Bros. many years ago, assures absolute tightness. The flexibility of the Jenkins disc secures perfect seat contact and is a most important improvement in valve construction. For steam use, the discs are made of hard composition, which becomes pliable under the action of steam; for water, gas and air service, somewhat softer compounds are furnished.

If grit or scale lodges on the seat it does not seriously injure the valve body, but it becomes embedded in the composition disc, thus saving the valve seat. Discs worn out in service can be replaced easily and quickly at very little expense. All parts are standardized and perfectly interchangeable. Valves seldom wear out completely.

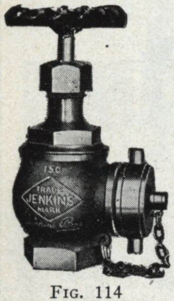

Fig. 114
Hose Angle Valve

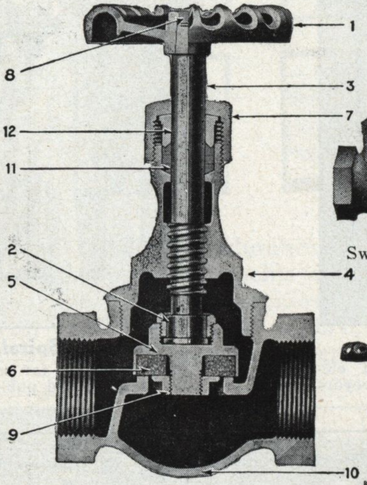

Fig. 106. Sectional View

(1) Wheel
(2) Locknut
(3) Spindle
(4) Bonnet
(5) Disc-holder
(6) Disc
(7) Packing nut
(8) Wheel nut
(9) Disc nut
(10) Body
(11) Stuffing box packing
(12) Gland or follower

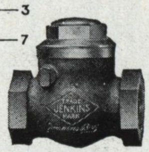

Fig. 352
Swing Check Valve

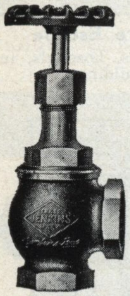

Fig. 108
Angle Valve

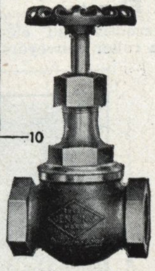

Fig. 106
Globe Valve

Bronze Valves, Standard Pattern

Radiator Valves

Jenkins globe and angle radiator valves are of the same pattern and construction as the standard pattern valves, previously described.

These are carefully made of a superior grade of metal, and are unusually heavy and durable.

Finished valves take a rich bronze color when polished, making them particularly desirable for the finer grades of work.

Regularly furnished with black composition wheels, or, if desired, with bronze, wire or iron wheels.

Lock shield valves, to be operated with key (as Figs. 170 and 171), designed to circumvent annoyance of tampering, can be supplied in all the different patterns.

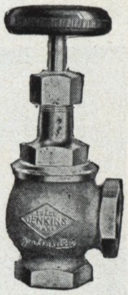

Fig. 166
Angle, Screwed

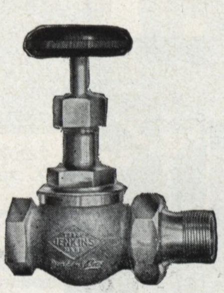

Fig. 167
Globe, with Union

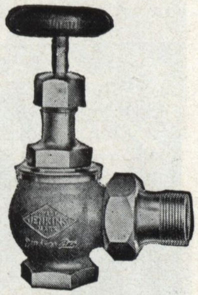

Fig. 168
Angle, with Union

Radiator Valves

Corner valves are made in two patterns—regular and offset. Offset globe and corner valves (Figs. 173A and 180) have the inlet at the lowest point, to avoid trapping of water and hammering on first admission of steam.

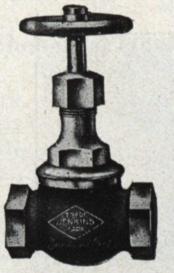

Fig. 310
Bronze Wheel Globe

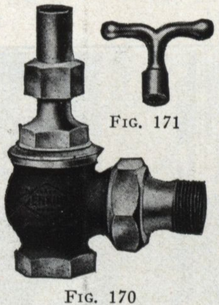

Fig. 170
Lock Shield Angle

Fig. 171

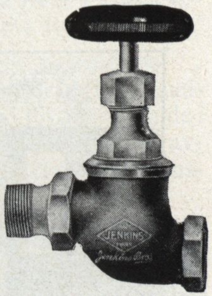

Fig. 173A
Offset Globe

Radiator Valves

For hot water heating, valves may be had, without extra charge, with a small hole drilled through diaphragm to permit slight circulation of water through radiator.

When specified for hot water heating systems *using forced circulation,* valves are specially fitted for the service.

Continued on next page

Regular styles of finish follow:

Rough body, finished trimmings, No. 1 screwed, No. 6 with union
Finished and polished all over, No. 2 screwed, No. 7 with union
Rough body, nickel plated trimmings, No. 3 screwed, No. 8 with union
Rough body, nickel plated all over, No. 4 screwed, No. 9 with union
Finished and nickel plated all over, No. 5 screwed, No. 10 with union

Jenkins improved automatic air valves (Figs. 190 to 193) are used to remove air from radiators and heating coils automatically. All finished and nickelplated.

Regular sizes, 1/8 and 1/4 in.; also, 3/8-in. size for long runs or large stacks, and the Jenkins Diamond traps, sizes 1/2 and 3/4 in.

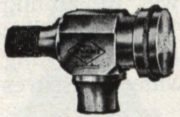
Fig. 190

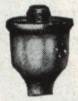
Fig. 191

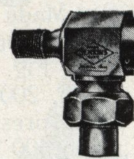
Fig. 193

Improved Automatic Air Valves

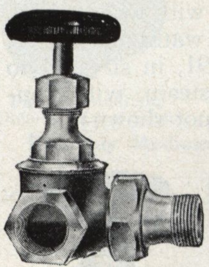
Fig. 176
Regular Corner

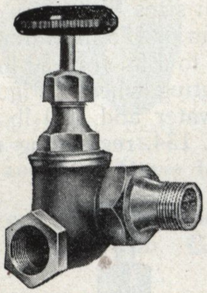
Fig. 180
Offset Corner

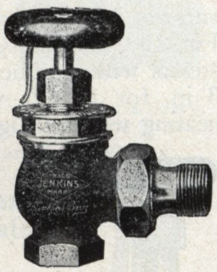
Fig. 300
Fractional

Radiator Valves

Recent developments in the manufacture of valves for steam heating apparatus have enabled us to perfect a line of devices suitable for all classes of steam circulation in connection with atmospheric, vacuum return line and vapor systems. This includes differential and automatic impulse check valves, also the Jenkins fractional radiator valves (as Fig. 300).

The fractional valve has dial indicator, and opens wide in five-sixths of a turn. The opening is correctly graduated and the amount of steam admitted to the radiator is easily controlled.

Fire Line Valves

Specially designed to meet the general demand for efficient, dependable hose valves and to fulfill the requirements of fire line service. Bronze, fitted with Jenkins composition disc. Large wheel enameled red.

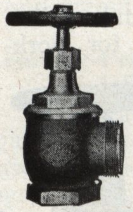
Fig. 715.
Bronze Fire Line Angle Valve

Quick Opening Globe and Angle Valves

Valves have quadruple threaded spindle and bonnets, and can be opened full with about a quarter usual number of turns.

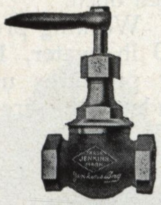
Fig. 241
Bronze Quick Opening Globe Valve

Rapid Action Valve

Opened wide by quarter pull of lever. Stays open automatically. Closes instantly without water hammer.

Made of bronze with malleable iron lever.

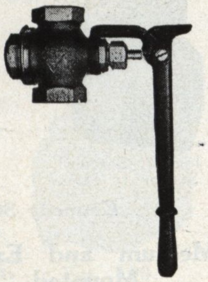
Fig. 720. Rapid Action Valve

Extra Heavy Bronze Valves

Globe, angle, cross, check and Y valves are designed for working steam pressures up to 300 lb., hydraulic or air up to 800 lb. Extra heavy iron body valves for pressures up to 250 lb.

Jenkins Automatic Equalizing Stop and Check Valves—Are especially adapted to prevent boiler room accidents and to equalize the pressure between the different boilers in a battery. This type is made in extra heavy globe or angle patterns, with iron or cast steel bodies.

Gate Valves

Jenkins gate valves are made in bronze or iron body in three patterns: standard, for 125 lb. working steam pressure or 175 lb. water; medium, for 175 lb. steam or 250 lb. water; extra heavy for 250 lb. steam or 400 lb. water.

They are of the solid wedge, double face type. One of the important features of these valves is the improved globe shaped body. This new design is used because it secures the greatest possible strength, good proportion, and neat appearance.

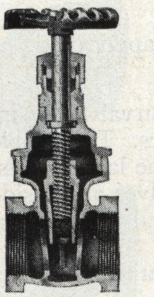
Fig. 370
Standard Bronze Gate with Inside Screw

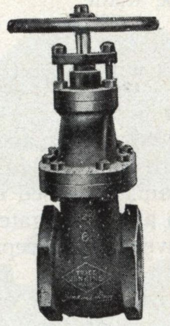
Fig. 325
Standard Iron Body Gate with Inside Screw

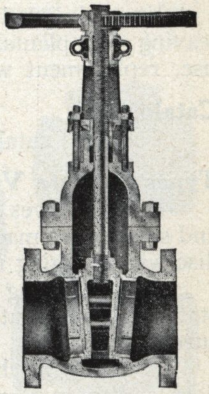
Fig. 245
Extra Heavy Iron Body Gate, with Outside Screw and Yoke

Gate Valves

They are made with inside screw, stationary spindle; or with outside screw and yoke, rising spindle.

Cast Steel Valves

Jenkins cast steel valves are made in globe, angle, gate, check, and automatic equalizing stop and check patterns. They are well adapted to the severe conditions incident to high pressure superheated steam service.

The valves are suitable for working steam pressures up to 350 lb., and 360° superheat, making a total temperature of 800° F.

Quality and Guarantee

Each Jenkins valve is made for the maximum service, not merely for the average. Behind the name and Diamond trade-mark on all *genuine* Jenkins valves stands the famous guarantee which has been adequately maintained for a period of over 60 years:

"If you will put a *genuine* Jenkins valve on the worst place you can find, where you can not keep other valves tight, and if it is not perfectly tight, or does not hold steam, acids, water or other fluids longer than any other valve, you may return it and your money will be refunded."

Specification

"All valves shall be genuine Jenkins bearing the name 'Jenkins' within a diamond mark." For convenience, and to avoid possible mistakes, it is suggested that figure numbers also be specified.

Catalogue

A catalogue of all the Jenkins valves, giving sizes, styles and list prices, mailed on request.

THE KENNEDY VALVE MFG. CO.

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TRADE-MARK

Products

Valves, for power, heating, fire protection, water supply, plumbing, etc., in Bronze and Iron Body, and in Gate, Globe, Angle and Check types; Fire Hydrants; Malleable Iron Screwed, and Standard Cast Iron Flanged Pipe Fittings, Standard Brass and Bronze Fittings, Kennedy-Pennie Back-water and Sewer Gas Valve.

Guarantee

Kennedy products are thoroughly inspected before leaving our plants. Should defects develop in proper use, replacement will be made.

Catalogues

Complete catalogues will be sent on application.

Types of Gate Valves

Bronze valves 3 in. and smaller, and iron valves 1½ in. and smaller are made with solid wedge discs. The double disc with wedging mechanism is used in the larger sizes.

Outside rising stem and yoke gate valves and inside stationary stem gate valves can be repacked under pressure when open.

Wedging mechanisms used for operating Kennedy double disc gate valves are of the "Cam," "Newtype" and "Lenticular" types.

The "Cam" type has the least possible number of working parts. In sizes 2 to 12 in., inclusive, it has been found to give the best service for standard pressures. Valves operate in any position.

The "Newtype" water-gate type meets the requirements of water works and similar installations. Wedges of solid bronze act on both discs equally and independently of stem. Discs can not stick because the flange of the bronze stem nut is thicker on one side than on the other; therefore, in opening the valve, one half-disc lifts before the other half.

The "Lenticular" type combines the flexible double disc principle with the wedge disc feature. Best for pressures greater than ordinary and particularly for steam.

Standard Bronze Gate Valves

Made with non-heating wheel. Solid wedge discs are used in sizes up to 3 in., and double disc parallel seats, 3½ in. and larger. Stem is stationary. Sizes ¼ to 3 in. are for working pressures up to 150 lb. water, or 125 lb. steam; 3½ to 6 in. for working pressures up to 125 lb. water, or 100 lb. steam, and made with bolted bonnet. Made with or without gland in stuffing box.

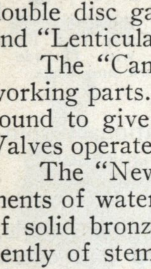


Fig. 27. Standard

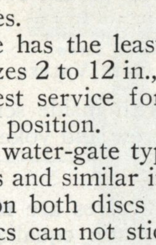


Fig. 37. Medium

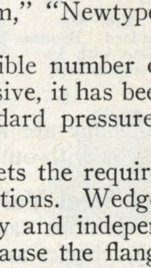


Fig. 40. Extra Heavy

Kennedy Bronze Gate Valves

Medium and Extra Heavy Bronze Gate Valves

Made with non-heating wheel, solid wedge disc and stationary stem. Gland follower in stuffing box. Fig. 37, medium pressure for water, 250 lb.; steam, 200 lb. Fig. 40, extra heavy for working steam pressures up to 250 lb. and water pressures up to 300 lb.

Bronze Globe and Angle Valves

Fig. 95 made in sizes ½ to 2 in. for working pressures of 150 lb. steam or 175 lb. water, with wood wheel. Fig. 150, in sizes ⅛ to 4 in. for 150 lb. water and 125 lb. steam, with non-heating wheel. Fig. 91, in sizes ¼ to 3 in. for 175 lb. water and 150 lb. steam, with non-heating wheel. Fig. 134, regrinding (not shown).

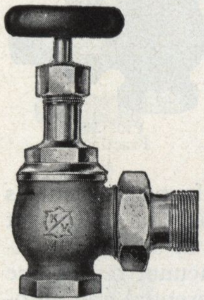


Fig. 95. Heavy Government Type Radiator

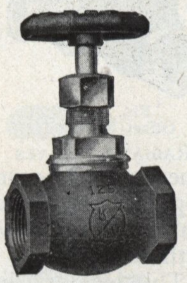


Fig. 150. Standard

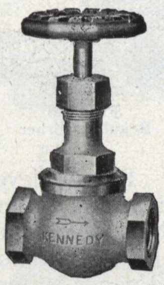


Fig. 91. Renewable Disc

Kennedy Bronze Globe Valves

Standard Iron Body Gate Valves

Double discs, parallel seats, inside or outside rising stem and yoke with steel or bronze stem. The outside rising stem is a positive indicator as to the extent the valve is open and permits it to be readily inspected, cleaned and oiled. Can be repacked under pressure when open.

Working pressures as follows: 14 in. and smaller, 150 lb. water, 125 lb. steam; larger sizes for working pressures up to 100 lb. water. Made with screwed, flanged or bell ends.

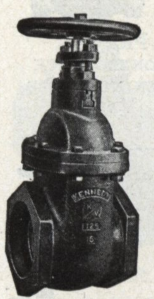


Fig. 57. Screwed, Stationary Stem

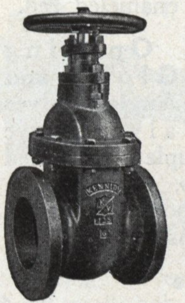


Fig. 58. Flanged, Stationary Stem

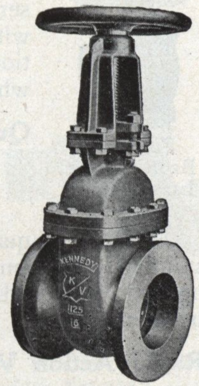


Fig. 61. Flanged, Outside Rising Stem

Kennedy Standard Iron Body Gate Valves

Medium and Extra Heavy Iron Body, Bronze Mounted "Lenticular" Gate Valves

Figs. 74 and 75 for working steam pressures up to

Continued on next page

175 lb.; Figs. 76 and 77, 250 lb. Stems of all sizes of Figs. 74 and 76, made of bronze; Figs. 75 and 77 made of steel.

Can be repacked under pressure when open. Made with screwed or flanged ends.

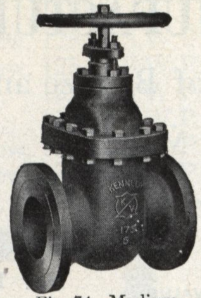


Fig. 74. Medium, Stationary Stem

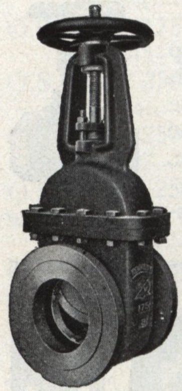


Fig. 75. Medium, Outside Rising Stem

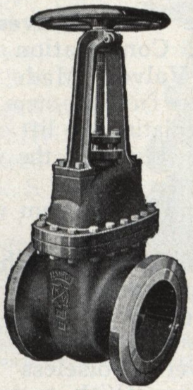


Fig. 77. Extra Heavy, Outside Rising Stem

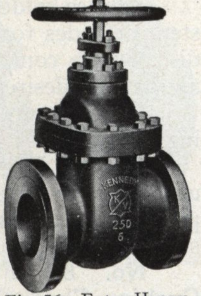


Fig. 76. Extra Heavy, Stationary Stem

Kennedy Medium and Extra Heavy Iron Body Valves

Low Pressure Iron Body Bronze Mounted or All-iron Gate Valves

Equipped with "Newtype" disc mechanism. Furnished with flanges of any practical diameter and drilling. Can be furnished to operate with chain instead of hand wheel. Sizes, 14, 16, 18, 20, 24, 30, 36, 42 and 48 in.

Can be furnished with clean-out pockets, if desired.

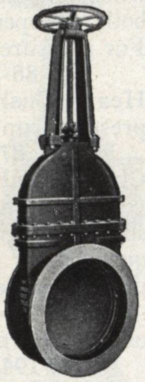


Fig. 48. Low Pressure Valve

Extra Heavy Steel Body Valves

Made with double discs and tapered seats. Specially designed for high pressures and superheat. Safe from high expansion and contraction stresses.

Fig. 80D inside stationary stem. Working water pressure, 500 lb. Sizes, 1½ to 12 in. flanged.

Fig. 81, outside rising stem and yoke. Working steam pressure, 350 lb. Sizes, 1½ to 16 in.

Kennedy-Pennie Back-water and Sewer Gas Valve

For sealing the waste pipe against back-water, vermin, and gases in residences, public buildings, factories, etc. Balanced disc, positive in action. Can be installed vertically, horizontally, or inclined and balanced to prevent resistance to outflow.

For standard or extra heavy soil pipe. Sizes, 2 to 12 in.

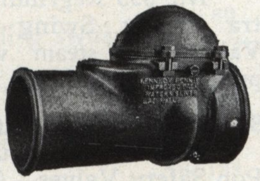


Fig. 55 Kennedy-Pennie Back-water and Sewer Gas Valve

Iron Body, Bronze Mounted Globe and Angle Valves with Renewable Composition Disc

For working pressures up to 125 lb. steam, and 150 lb. water. Renewable elastic composition disc and raised seats insure tightness. Can be repacked under pressure. Heavy design, with full size disc and area. Sizes, 2 to 10 in.

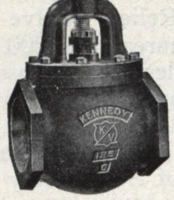


Fig. 100. Screwed Globe Valve

Swing Check Valves

Fig. 103, bronze, in sizes ⅜ to 3 in. and Fig. 105, iron body, for 125 lb. steam and 150 lb. water working pressures. Valves are straightway, with direct passageway of full pipe area; discs revolve and are self-adjusting. Sizes, 2 to 24 in. Made also with flanged and bell ends.

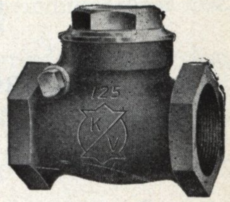


Fig. 103. Kennedy Bronze Swing Check Valves

Bronze Regrinding Check Valves

Have lift disc and extra strong bodies. Regrinding feature permits seat to be renewed without disturbing pipe line. Sizes, ⅛ to 3 in. for maximum pressure of 200 lb. steam or 225 lb. water.

Pipe Fittings

Malleable iron screwed fittings, galvanized or black, all desired types; standard cast iron flanged fittings and flanges in straight and reducing sizes; standard brass and bronze fittings.

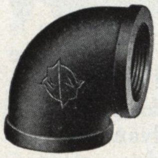


Fig 301

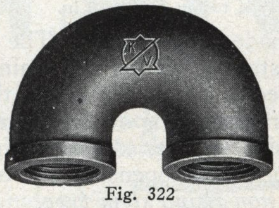


Fig. 322

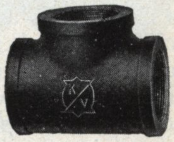


Fig. 312

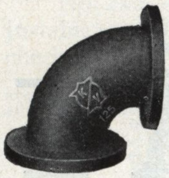


Fig. 200

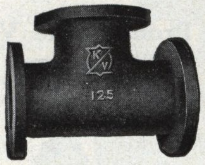


Fig. 210

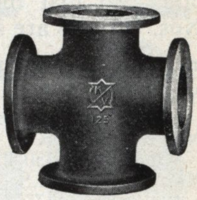


Fig. 220

Pipe Fittings

Indicator Post Gate Valves

National Standard Underwriters' type. Sizes, 4 to 12 in. and all depths of bury.

Kennedy "Newtype" Fire Hydrant

Compression type leather-disc inlet valve closing in direction of pressure. No flooding if top is broken. For 4 to 8-in. mains. One to four nozzles with any standard of threading. Test pressure, 300 lb. water.

Floor Stands

Inside stationary or outside rising stem, hand wheel, gear or electrically operated types. Inside stem types provided with indicator if desired.

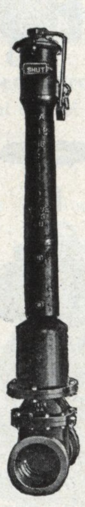


Fig. 54. Indicator Post Valve

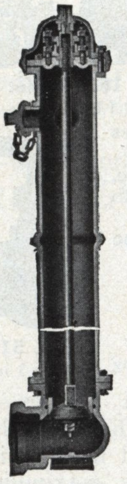


Fig. 108. "Newtype" Fire Hydrant

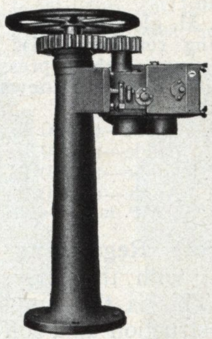


Fig. 118ag. Floor Stand

With automatic electric control

SCOTT VALVE MANUFACTURING CO.

Manufacturers of a Complete Line of Bronze and Iron Body Valves

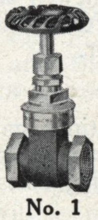
DETROIT, MICH.

SIGN OF VALUE

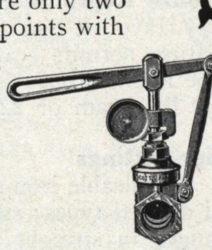
Scott Split Wedge Bronze Gate Valves

For steam working pressures up to 125 lb.

In the Scott Split Wedge there are only two parts to the disc, and these meet at all points with a full circular bearing which insures proper distribution of the wedging strains when closing the valve. When the Scott Split Wedge Disc is closed it is as solid as though made in one piece. The construction is such that at the instant of closing or opening the valve one side of the split wedge rotates slightly on the other. This accomplishes a perfect seating of the disc in closing; and, in opening, one side releases slightly in advance of the other, so that the valve opens easily under pressure. Nos. 1 and 8 are *non-rising stem type.*

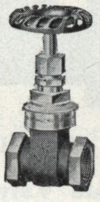

No. 1
¼ to 3 in.

No. 8
¾ to 3 in.


No. 22
½ to 3 in.

Scott Solid Wedge Bronze Gate Valves

No. 0 —N.R.S., S.W.P. to 125 lb.
No. 170 —N.R.S., S.W.P. to 150 lb.
No. 172 —N.R.S., S.W.P. to 175 lb.
No. 172-A—O.S.Y., S.W.P. to 175 lb.
No. 41 —N.R.S., S.W.P. to 250 lb.
No. 41-A—O.S.Y., S.W.P. to 250 lb.


No. 170
¼ to 3 in.

No. 41
¼ to 3 in.

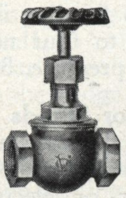
No. 41-A
¾ to 2½ in.

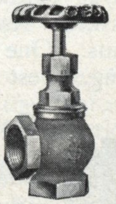
Note: N.R.S. indicates non-rising stem. S.W.P. indicates steam working pressure.

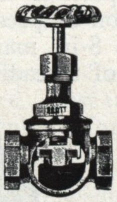
Scott Bronze Globe and Angle Valves

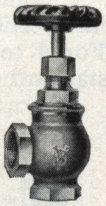
Nos. 192 and 193 are bronze disc type; for steam working pressures to 125 lb.

Nos. 70 and 71 are removable disc type and are furnished with Jenkins disc, or copper disc, as desired; for steam working pressures to 150 lb.


No. 192
⅛ to 3 in.


No. 193
⅛ to 3 in.


No. 70
⅛ to 3 in.

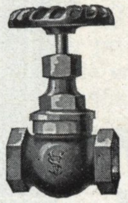

No. 71
⅛ to 3 in.

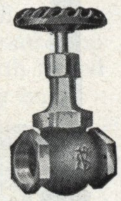
No. 51, globe, and No. 49, angle, regrinding renewable disc type; to 250 lb. steam working pressure.

Union Bonnet Renewable Disc Regrinding Type—

No. 200. Globe—to 200 lb. S.W.P.
No. 201. Angle—to 200 lb. S.W.P.
No. 251. Globe—to 250 lb. S.W.P.
No. 249. Angle—to 250 lb. S.W.P.

Note: S.W.P. indicates steam working pressure.


No. 51
½ to 3 in.

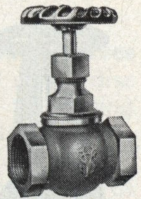

No. 200
¼ to 3 in.

Scott Regrinding Globe Valves—Have seats integral with the body, and discs which are renewable. This is the simplest and most satisfactory type of construction and offers the *maximum* in *over-all economy,* first cost and life of valve both considered.

Scott Bronze Check Valves

No. 112 Combination Stop and Check Valves—Made with disc holder free from the stem. The stem provides for regulating the lift of the disc, or the complete closing of the valve, as may be desired.

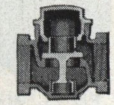
For pressures to 125 lb. steam working pressure.


No. 112
½ to 3 in.

No. 82 Regrinding Swing Check—Suitable for use in either horizontal or vertical position on pressures to 150 lb. steam working pressure.

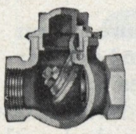
No. 86 Flower Noiseless Cushion Check Valve—With upper and lower internal dashpots which effectually cushion the valve both on opening and closing. For pressures up to 125 lb.

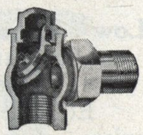
No. 82
¼ to 3 in.


No. 86
¼ to 3 in.

No. 86-E Flower Extra Heavy Cushion Check—For pressures up to 250 lb.

No. 87 Rouse Swing Check Valve—Made with vertical seat. An extremely sensitive check especially suited to vapor heating systems and similar exacting requirements. For pressures up to 125 lb. Leather faced disc when desired.

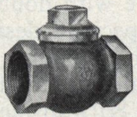

No. 87
¼ to 3 in.

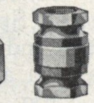

No. 90
½ to 1¼ in.

No. 90—Rouse Angle Check Valve—Made with union. Furnished with regrinding plug when desired.

No. 194 Horizontal Standard Check—For steam working pressure up to 125 lb.

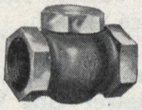
No. 195—Vertical Standard Check—For steam working pressure up to 125 lb.

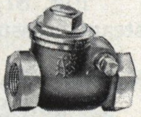

No. 194
⅛ to 3 in.


No. 195
⅛ to 3 in.

No. 253 Union Bonnet Regrinding Extra Heavy Check—For steam working pressure up to 250 lb.

No. 353 Regrinding Extra Heavy Swing Check Valve—For steam working pressure up to 350 lb.

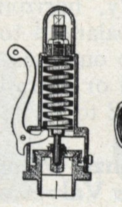

No. 253
¼ to 3 in.

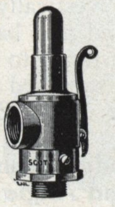

No. 353
½ to 3 in.

Scott Bronze Pop Safety and Relief Valves

No. 149 Top Outlet and No. 150 Side Outlet Pop Safety Valves—A.S.M.E. standard for pressures up to 200 lb. saturated steam. Suitable for use on small stationary boilers and all types of portable boilers.

No. 312 Side Outlet Relief Valve—For pressures up to 200 lb. Specially designed for use on cylinders and suitable for use wherever a positive relief is required.


No. 149
½ to 3 in.


No. 150
½ to 4 in.

No. 312
½ to 4 in.

Literature—On application showing complete lines of Scott safety and relief valves.

Note: All bronze safety and relief valves are standard with male base and bronze seat, but can be furnished when desired with female or flanged connections, and with nickel or Monel seat or disc.

Continued on next page

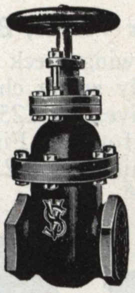
Scott Iron Body Gate Valves

No. 431—screwed ends, inside screw, 125 lb. S.W.P.
No. 432—flanged ends, inside screw, 125 lb. S.W.P.
No. 433—screwed ends, O.S. & Y., 125 lb. S.W.P.
No. 434—flanged ends, O.S. & Y., 125 lb. S.W.P.
No. 637—screwed ends, inside screw, 175 lb. S.W.P.
No. 638—flanged ends, inside screw, 175 lb. S.W.P.
No. 639—screwed ends, O.S. & Y., 175 lb. S.W.P.
No. 640—flanged ends, O.S. & Y., 175 lb. S.W.P.
No. 845—screwed ends, O.S. & Y., 250 lb. S.W.P.
No. 846—flanged ends, O.S. & Y., 250 lb. S.W.P.
No. 847—screwed ends, O.S. & Y., 250 lb. S.W.P., with by-pass.
No. 848—flanged ends, O.S. & Y., 250 lb. S.W.P., with by-pass.

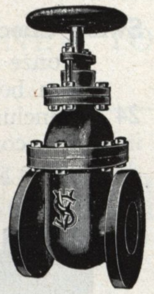
Note: Bodies of semisteel, bronze mounted. Steel or bronze stem as specified.

Note: S.W.P. indicates steam working pressure; O.S. & Y. indicates outside stem and yoke.

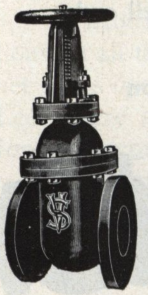
125 lb. S.W.P., flanged valves have standard flanges.
175 lb. S.W.P., flanged valves have extra heavy flanges.
250 lb. S.W.P., flanged valves have extra heavy flanges.



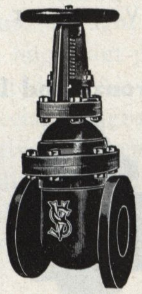
No. 431
2 to 12 in.



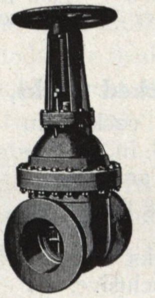
No. 432
2 to 16 in.



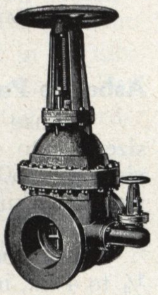
No. 434
2 to 16 in.



No. 640
2½ to 12 in.



No. 846
2½ to 12 in.



No. 848
2½ to 12 in.

Scott Iron Body Check Valves

No. 83—screwed end regrinding swing check, 125 lb. S.W.P.

No. 84—flanged end regrinding swing check, 125 lb. S.W.P.

No. 88—screwed end Rouse swing check, 125 lb. S.W.P.

No. 89—flanged end Rouse swing check, 125 lb. S.W.P.

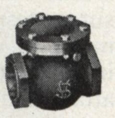
No. 59—screwed end regrinding swing check, 250 lb. S.W.P.

No. 60—flanged end regrinding swing check, 250 lb. S.W.P.

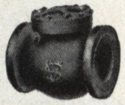
No. 198—screwed end Flower cushion check, 250 lb. S.W.P.

No. 199—flanged end Flower cushion check, 250 lb. S.W.P.

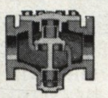
Note: S.W.P. indicates steam working pressure.



No. 83
2 to 12 in.



No. 60
2 to 12 in.



No. 199
2½ to 6 in.

Scott Iron Body Globe and Angle Valves

No. 76—screwed end globe, composition or copper disc, 125 lb. S.W.P.

No. 77—flanged end globe, composition or copper disc, 125 lb. S.W.P.

No. 80—screwed end angle, composition or copper disc, 125 lb. S.W.P.

No. 81—flanged end angle, composition or copper disc, 125 lb. S.W.P.

No. 208—screwed end globe, regrinding bronze disc, 175 lb. S.W.P.

No. 209—flanged end globe, regrinding bronze disc, 175 lb. S.W.P.

No. 210—screwed end angle, regrinding bronze disc, 175 lb. S.W.P.

No. 211—flanged end angle, regrinding bronze disc, 175 lb. S.W.P.

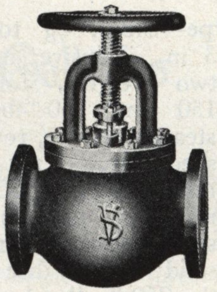
No. 55—screwed end angle, regrinding bronze disc, 250 lb. S.W.P.

No. 56—flanged end angle, regrinding bronze disc, 250 lb. S.W.P.

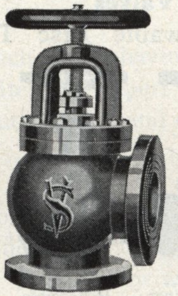
No. 57—screwed end globe, regrinding bronze disc, 250 lb. S.W.P.

No. 58—flanged end globe, regrinding bronze disc, 250 lb. S.W.P.

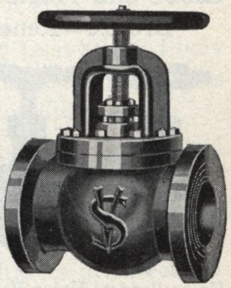
Note: S.W.P. indicates steam working pressure.



No. 77
2½ to 12 in.



No. 56
2 to 12 in.



No. 58
2 to 12 in.

Scott Stop-check and Back Pressure Valves

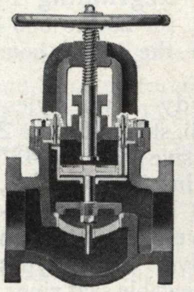
No. 213—globe adjustable cushion stop-check, 250 lb. S.W.P.

No. 215—angle adjustable cushion stop-check, 250 lb. S.W.P.

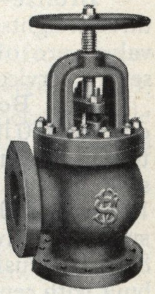
Note: The above valves are furnished also with screwed ends when specified.

S.W.P. indicates steam working pressure.

No. 96—flanged vertical water sealed back pressure valve. Furnished also in horizontal pattern. Screwed ends when desired.



No. 213
4 to 10 in.



No. 215
4 to 12 in.

Scott Iron Body Safety Valves

No. 143—flanged base top outlet, inside spring, 200 lb. S.W.P.

No. 144—flanged base side outlet, inside spring, 200 lb. S.W.P.

Note: Above two valves furnished also with hexagon female base when desired.

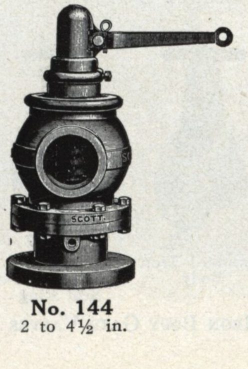
No. 330—flanged base side outlet, outside spring, 250 lb. S.W.P. Furnished also with steel body for higher pressures.

Scott Iron Body Relief Valves

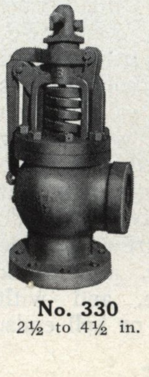
No. 148—water works type, inside spring, 250 lb. water.

No. 248—water works type, bolted top, 250 lb. water.

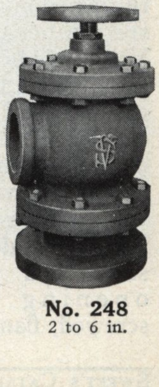
Note: Safety and relief valves regularly bronze fitted, but nickel or Monel seats and discs used when specified.



No. 144
2 to 4½ in.



No. 330
2½ to 4½ in.



No. 248
2 to 6 in.

READING STEEL CASTING CO., INC.

PRATT and CADY DIVISION

Manufacturers of Valves and Asbestos Packed Cocks

GENERAL SALES OFFICE
BRIDGEPORT, CONN.

Product

BRONZE and IRON VALVES for all services.

Globe and Angle Valves

Bronze—Renewable Disc Type—Sizes, 1/8 to 3 in., inclusive, in two weights, for 150 and 250 lb. steam pressure, respectively. Furnished with P&C renewable asbestos, special metal or solid bronze disc; the 250-lb. line has a renewable solid bronze disc and renewable seat ring.

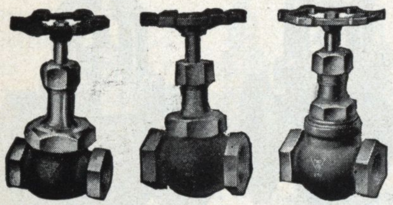


Fig. U-1 Union Bonnet, Renewable Ring Disc
Fig. 9 Union Bonnet, Regrinding
Fig. 31 Renewable Disc and Renewable Seat Rings

BRONZE GLOBE VALVES

Bronze—Regrinding Type—Sizes, 1/8 to 3 in., in three weights, for 200 to 300 lb. steam pressure. These valves are of the union bonnet type and suitable for severe service.

Iron Body—Two styles: with renewable asbestos disc for 150 lb. steam in sizes 2 to 8 in., inclusive; and the 45° seat valves in two weights, 150 and 250 lb. steam pressure respectively, in sizes 2 to 8 in., inclusive. Both types built with renewable seat rings.

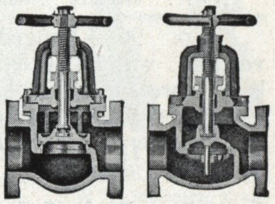


Fig. 41 Renewable Asbestos Disc, Bronze Seat Rings
Fig. 47 45° Seat, Renewable Bronze Seat Rings

IRON BODY GLOBE VALVES

Gate Valves

Bronze—All sizes, for steam pressures up to 250 lb. and 800 lb. water. The 150, 250 and 800-lb. lines have renewable seat rings. The 125-lb. outside screw and yoke line made to Underwriter specifications. All P&C gate valves have reversible wedges made to gauge.

Iron Body—Sizes, 2 to 24 in., inclusive, for 125 to 250 lb. steam working pressures. The 125-lb. line will be furnished built to Underwriter specifications, if desired. Valves are bronze trimmed and have bronze faced solid wedges except the 125-lb. valves which can be furnished with a new design of split wedge, made to have the advantages of a split wedge. These valves are made in the inside screw, outside screw and yoke, and quick opening type, and with screwed, flanged or bell ends.

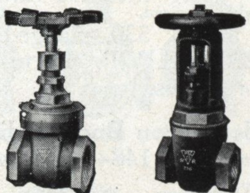


Fig. 86 Reversible Wedge
Fig. 118-A Renewable Seat Rings

BRONZE GATE VALVES

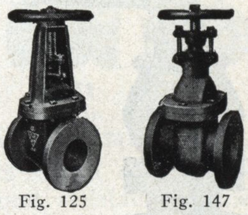


Fig. 125 Standard Iron Body
Fig. 147 Iron Body, Renewable Seat Ring

IRON BODY GATE VALVES

Swing Check Valves, Bronze and Iron

Bronze swing check valves made in sizes 1/8 to 3 in. Iron body swing check valves made in sizes 2 to 24 in., inclusive, for 125 lb. steam. Sizes, 3 to 12 in., inclusive, conform to Fire Underwriters' specifications. Also a line suitable for 250 lb. steam in sizes 2 to 12 in., inclusive.

Working parts for these valves can be renewed or the disc reground without removing valve from the line.

Made in screwed, flanged or bell ends.

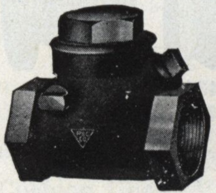


Fig. 201
BRONZE SWING CHECK VALVE

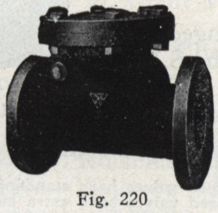


Fig. 220
IRON BODY SWING CHECK VALVE

Asbestos Packed Cocks, Bronze and Iron

Bronze cocks in sizes 1/4 to 4 in., inclusive, for 150 and 250 lb. steam working pressures, respectively.

Iron cocks in sizes 1/4 to 4 in., inclusive, for 100 to 125, and 250 lb. steam working pressures, respectively. Also made in sizes up to 10 in. for the various pressures with worm gear operating attachment.

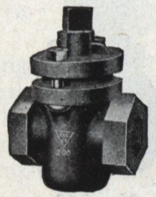


Fig. 233
BRONZE ASBESTOS PACKED COCK

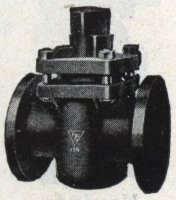


Fig. 250
IRON ASBESTOS PACKED COCK

Iron Body Low Pressure Gate Valves

Low pressure water gates, 10 to 24 in., inclusive, for pressures up to 75 lb., of the double disc, parallel seat type. For gas lines, up to 35 lb. pressure, all-iron, double disc, parallel seat. Valves with handhole for clean-out under the disc. Design of disc is particularly made to be tight at low water pressures.

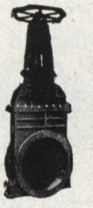


Fig. 189
LOW PRESSURE GATE VALVE FOR GAS, ALL-IRON

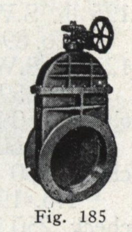


Fig. 185
LOW PRESSURE GATE VALVE, BRONZE TRIMMED

Automatic Stop and Check Valves

These P&C valves are a combination of simplicity and ruggedness. They operate freely as there are no stuffing boxes through which the reciprocating parts have to pass. The dashpot and piston walls are of equal metal thickness, have large steam volume on both the inside and outside and consequently expand equally, thus keeping the same relative clearances and preventing sticking.

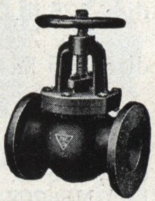


Fig. 328
AUTOMATIC CHECK VALVE

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INCORPORATED

Cabinet Makers and Decorators

417-421 Madison Avenue

NEW YORK CITY

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INCORPORATED
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Hand Wrought Furniture, Decorative Objects, Lighting Fixtures and Draperies; Paneled Rooms; Complete Interior Decorative Service for town and country houses and yachts.

Reproductions and Antiquities.

Furniture

Strictly hand-wrought and hand-finished reproductions, in all the important periods, are made in the cabinet shops operated by this establishment at nearby Fort Lee, where special designs are also executed to order for any decorative requirements.

For immediate or early delivery: In addition to a great variety of reproductions, the exhibits at the Galleries comprise an interesting collection of antiquities, each object having been selected only after an expert examination of its authenticity and condition.

Decorating Service

This organization maintains a staff of designers and decorators qualified by training and experience to complete an interior in harmony with its architectural treatment, in each detail of the decoration, furniture, lighting fixtures, floor coverings, draperies and other fabrics.

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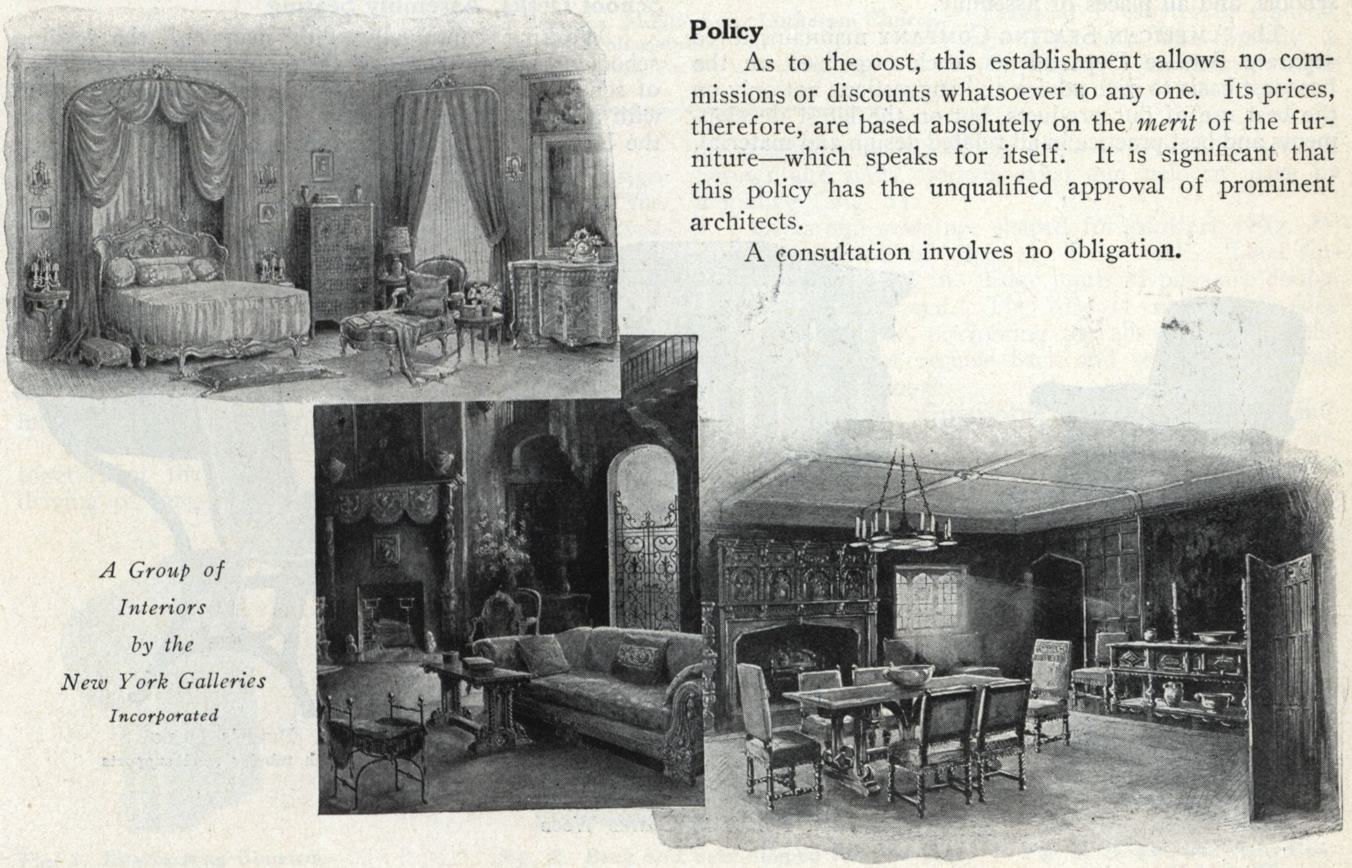
Decorative designs, entirely distinct from commercial products, in lamps and shades, torcheres, sconces, wall fixtures, candelabra, chandeliers—in stock and made to special order from designs prepared here or by the architect.

Policy

As to the cost, this establishment allows no commissions or discounts whatsoever to any one. Its prices, therefore, are based absolutely on the *merit* of the furniture—which speaks for itself. It is significant that this policy has the unqualified approval of prominent architects.

A consultation involves no obligation.



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AMERICAN SEATING COMPANY

Designers and Manufacturers of Seating and Furniture for Public Buildings

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CHURCH FURNITURE: Pews; Sanctuary and Chancel Furniture; Special Fitments in Carved Wood; THEATER and AUDITORIUM SEATING; SCHOOL DESKS and ASSEMBLY ROOM SEATING; LODGE FURNITURE.

Specialized Service Departments

Our organization, with over 50 years' experience in designing, building, and installing public seating and furniture in collaboration with architects and builders, cordially invites the profession to avail themselves of our service in interpreting and detailing their designs, furnishing technical information, such as dimensions and range of seating for given spaces, detailed layouts, estimates, etc.

Our experience justifies the assumption that we can be of definite service to the architect in any manner involving the designing, planning and installing of public seating and other furniture for churches, theaters, schools, and all places of assembly.

The AMERICAN SEATING COMPANY maintains three separate Service Departments, each organized on the broadest basis to give advice and suggestions not only on the best use of our products, but on the latest developments and best practice in all related design and material.

Separate catalogues and folders on all of the products contain illustrations and suggestions of value.

Church Furniture and Wood Carving

This department has collaborated in the design of the interior fitments and seating of many of the notable cathedrals and churches of the country. The data and experience cover so many structures over so long a period that the architect may call on us to advantage during the earliest stages of any project.

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As the successful handling of the seating often is influenced by the exits, floor slope, etc., the practical aid of this organization in even the preliminary sketch stage is apparent.

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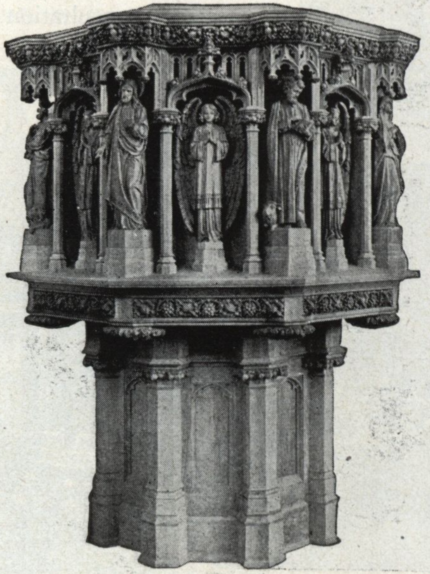
Working continually with many of the leading school architects over the entire country, all problems of school seating may be taken up with this department with assurance that suggestions submitted are based on the broadest practical experience.

THEATER CHAIR
One of our many varieties



HIGH PULPIT IN CARVED WOOD

PUPIL'S DESK
With tubular steel supports

ELLWOOD F. DE LONG VICTOR W. DE LONG HARRY D. LYNNE

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Furniture and Decoration for Religious, Fraternal, Commercial and Public Buildings

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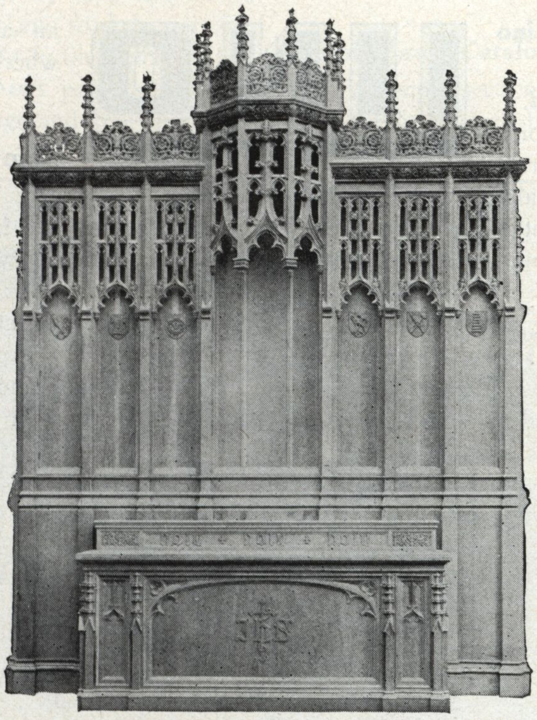
We manufacture a complete line of church furniture, including pews, pulpits, altars, fonts, lecturns, pedestals, reredos, etc., from our own as well as from architects' designs.

We have furnished many churches in the United States and it has been our constant aim to produce examples that have architectural merit and that are of the most approved construction.

Our facilities are peculiarly adapted to special work of this character and we are in a position to co-operate with architects in furnishing valuable authoritative data concerning designs, finishes, seating plans, etc.

The character and scope of our organization are exemplified by our installations, a few of which are listed opposite.



Altar and Reredos, Muhlenburg Lutheran Church, Philadelphia, Pa.
RICHTER & EILER, Architects, Reading, Pa.

A Few Architects and Representative Churches We Have Served

Third Church of Christ, Scientist, New York, N. Y.; Delano & Aldrich, 126 East 38th Street, New York, N. Y.

Union College Chapel, Schenectady, N. Y.; McKim, Mead & White, Architects, 101 Park Avenue, New York, N. Y.

Village Chapel, Pinehurst, N. C.; Hobart Upjohn, Architect, Grand Central Terminal, New York, N. Y.

Baptist Temple, Rochester, N. Y.; Gordon & Kaelber and Carl Traver, Architects, Sibley Building, Rochester, N. Y.

Central Park M. E. Church, Buffalo, N. Y.; Chas. W. Bolton & Son, Architects, Schaff Building, Philadelphia, Pa.

Tazewell Presbyterian Church, Tazewell, Va., Smithy & Tardy, Architects, Roanoke, Va.

Standard Specifications of Pews

Our pews are distinctive for excellence of design and finish, and for comfort. They are examples of the best workmanship throughout and of the latest improved methods of construction.

Backs—Five-ply construction. Face plies are of ⅛-in. sawed wood. Height, 21 in. Thickness, $\frac{13}{16}$ in.

Seats—Built up of 1¾-in. stock rift sawed strips, glued under heavy pressure. Depth, 15 in.

Top Rails—Tongued and grooved interlocking construction (Fig. 1).

Backs and Seats—Fitted and joined together at the factory by glueing, by driving of long screws every 6 in. and by cement coated finishing nails between the screws. Screws and nails are concealed and held in place by moulding (Fig. 3).

Backs and seats are shaped for comfort (Fig. 2).

Ends—Built of three-ply 1-in. stock. Total finished thickness, 2⅜ in. Edge joints of plies are double tongued and grooved. The base is made with edge grain on the floor, preventing the absorption of moisture. Routing to receive back and seat is a dovetail groove.

Guarantee—Wood, workmanship and finish are of the best and guaranteed against constructional and material defects.

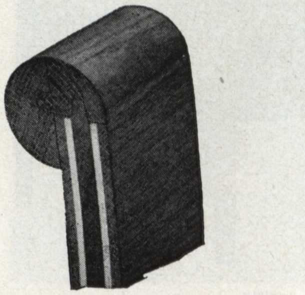


Fig. 1. Interlocking Construction of Top Rail of Pew

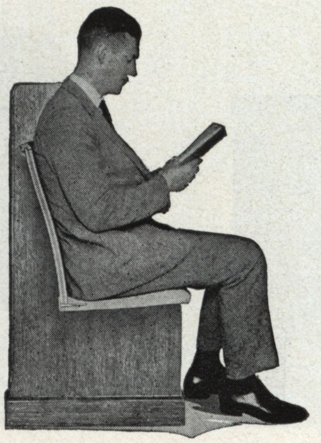


Fig. 2. Back and Seat Shaped for Comfort

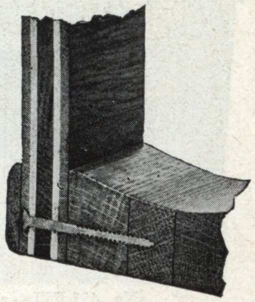


Fig. 3. Screws and Nails Concealed and Held in Place by Moulding

THE GUNN FURNITURE CO.

For Thirty Years Builders of Office Desks and Tables

GRAND RAPIDS, MICH.

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TRADEMARK REG.

Gunn Lino Desks with Inlaid Lino Tops and Lino Slides

Patented and fully guaranteed.

Gunn Lino desks, Grand Rapids made, excell in service, beauty and real desk comfort. Lino is our specially prepared fabric, scientifically treated to make it impervious to stains, to resist wear and to absorb harmful light reflections.

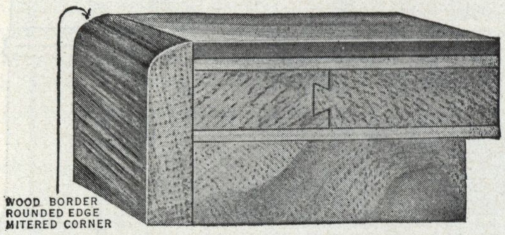
Lino provides the ideal writing surface, has ironlike wearing qualities, yet feels like kid to the touch. Necessity for glass tops or desk pads is eliminated. The wood border has comfortable rounded edges. There is an airtight and moistureproof joint where the border adjoins Lino.

"It isn't a Lino unless it's a Gunn."

Lino Eliminates Glare and Relieves Eyestrain

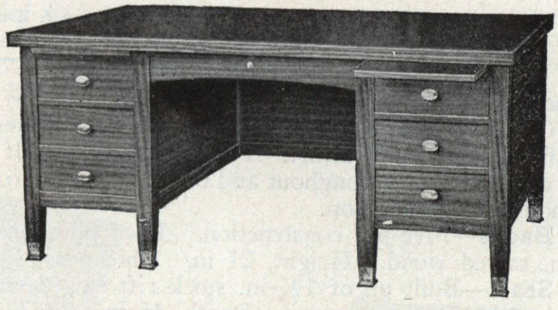
The human eye has no natural protection against light rays coming from below. The soft, dull shade of Lino is *restful to the eyes.* The quiet color prevents irritating light reflections common to any polished surface.

We furnish Lino tops separately, if desired, to replace worn tops on desks or tables in use.

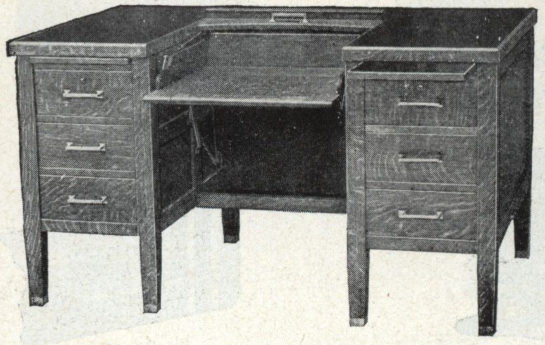


Sectional View of Gunn Lino Patented Top

No. 250½ SL-Lino—an ideal desk for Teachers' use



No. 866 SL-Lino—a High Class Desk for Executives



No. 455 FTL—a popular typist's desk
Lino top and Lino arm rests

No. 460 RL
Lino top and slides; cast brass pulls

Illustrating a Few of Our Many Styles of Lino Desks—All Finishes, Grades and Sizes

Continued on next page

Gunn Lino Tables with Inlaid Lino Tops for Offices, Libraries and Cafeterias

Patented and fully guaranteed.

Silence is dominantly desired in a library. Gunn Lino tops are practically noiseless and their new appearance is retained indefinitely.

Lino is an excellent dining table surface. Being slightly resilient, it saves breakage of tops and dishes and eliminates clatter and noise. Lino tops do not chip or break and are warm and pleasant to the touch. They are easily kept clean; stains do not penetrate. Lino Tops can be washed without damage and kept invitingly fresh and attractive at all times. They do not require covers; no varnish to mar, no periodical refinishing expense to pay.

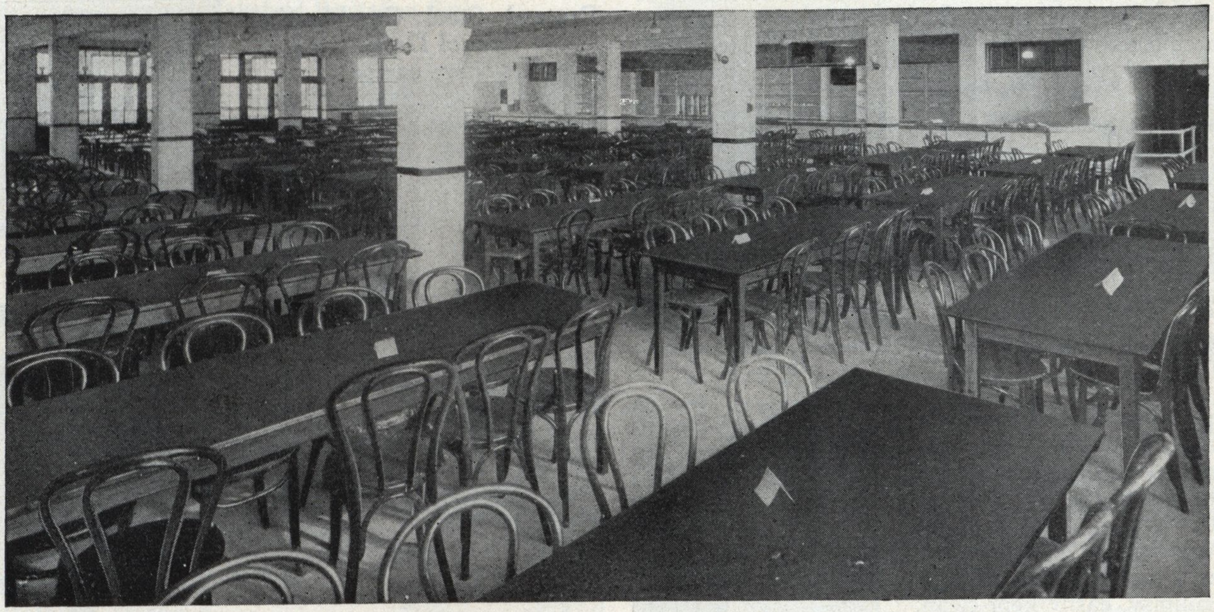
Separate Lino Tops

Let us quote on separate tops for counters, wrapping-tables and similar purposes.

Samples and Catalogue

A sample section of Lino patented top, also complete catalogue, will be mailed on request.

Library Equipped with Gunn Lino Tables
The soft dull shades of Lino are restful to the eyes



Cafeterias of New North and South High Schools, Columbus, Ohio, Equipped with Gunn Tables
Gunn Lino tables are fast becoming standard for cafeterias in our finest school buildings. The United States Government uses Gunn Linos in the dining rooms of the U. S. Veteran's Hospitals

HEYWOOD-WAKEFIELD COMPANY

Manufacturers of Theater and School Furniture

DISTRICT SALES OFFICES AND WAREHOUSES

BALTIMORE, MD., 113 West Conway Street
BOSTON, MASS., Warehouse, Winter Hill 45; Salesroom, 174 Portland Street
BUFFALO, N. Y., Wells and Carroll Streets
CHICAGO, ILL., Warehouse, 2653 Arthington Street; Salesroom, Third Floor Furniture Mart, 666 Lake Shore Drive
KANSAS CITY, MO., 1310 West Eighth Street
LOS ANGELES, CAL., 215 East Sixth Street
NEW YORK, N. Y., 516 West Thirty-fourth Street
PHILADELPHIA, PA., 244 South Fifth Street
PORTLAND, ORE., 148 North Tenth Street
ST. LOUIS, MO., Sixth and O'Fallon Streets
SAN FRANCISCO, CAL., 737 Howard Street

Products

CHAIRS: Theater, Portable, Grandstand, Bentwood, Wood, Bank and Office, Invalid and Steamer; SCHOOL FURNITURE; TABLES and CHAIRS for lunch rooms, etc.; REED and FIBRE FURNITURE for teachers' rooms, rest rooms, smoking rooms, theater and hotel lobbies; COCOA BRUSH DOOR MATS and MATTING, as well as many other products used in homes.

Manufacturing Facilities

Seven large factories are used in producing the various Heywood-Wakefield lines. Eleven warehouses located as given above assure architects and buyers of prompt and efficient service.

Special Service to Architects

Architects can secure special information from any of the above listed warehouses. In each of these warehouses there are men who specialize in furnishing theaters, schools, churches, assembly halls and public buildings. Architects will always find these men ready to serve them.

Important Note

Space does not permit showing more than representative illustrations from each line of merchandise. Full information concerning each variety of seating shown on this and the following page will gladly be sent you on request.

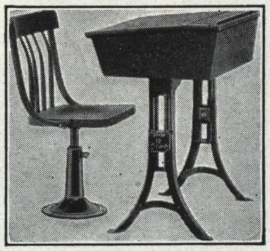
School Seating

The Heywood-Wakefield school seating line includes all types of seats required in school buildings, a few of which are shown here. The Heywood-Wakefield desk line, with its heavy gauge steel construction offers a guarantee against breakage. Architects will find it to their advantage to recommend Heywood-Wakefield pressed steel school furniture because of its improved and practical construction features.

All Heywood-Wakefield chair desk sets can be furnished with either steel-side desks, or all-wood desks. They can also be furnished with spindle-back chairs, or with cross-slat, steel-pillar chairs. Send for catalogue and architects' schedule of sizes for all Heywood-Wakefield school desks.

Adjustable Open Front Desk Sets

All metal parts of unbreakable heavy gauge pressed steel. The adjustment is simple, of exceptional range, and easily operated. Once the adjustment is correctly made, it will remain in position permanently.



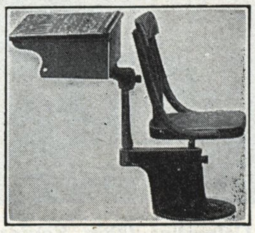
Eclipse Adjustable Chair Desk Set

Lifting Lid or Open Front Single Pedestal Desk Sets

Designed and constructed to prevent twisting or loosening of adjustment.

A well made desk that permits easy egress and ingress.

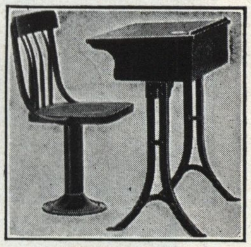
Sanitary, easily kept clean, simplifies sweeping and cleaning of floor.



Single Pedestal Chair Desk Set

Stationary Open Front or Lifting Lid Desk Sets

Pressed steel desk standards. Six standard sizes give all needed variation for grade schools. This is the highest type of non-adjustable desk. Single pedestal seat permits easy sweeping and cleaning under desks.

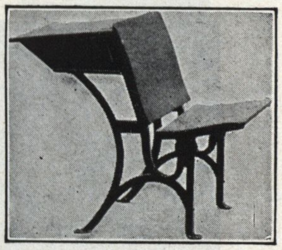


Stationary Desk Set

Pressed Steel Combination School Desks

A strong, compact, easily assembled seat, popular in all sections of the country.

Standard is of heavy gauge pressed steel instead of cast iron, insuring against breakage.



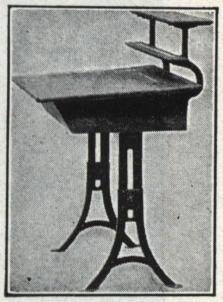
Combination School Desk

Adjustable Commercial Desks

Suitable for any commercial use. Made in several styles, in oak, cherry, or birch.

Metal parts finished in dull black enamel.

Supplied with either chair desk seats or movable chairs.



No. 1
Eclipse Commercial Desk

Continued on next page

Special School and Office Chairs

Line permits of choice of many types.

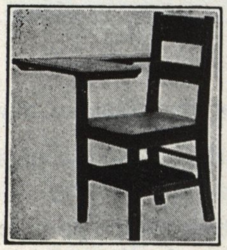
G 1113-1

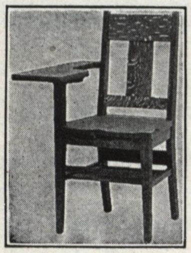
G 1113-5XY

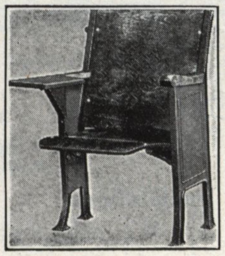
G 1113-2XY

Tablet Arm Chairs

Many types. Made of wood, cane and wood, or veneer and metal.

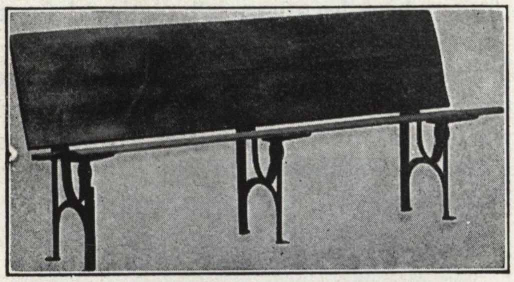

G 1203-1 TA


G 1285-1 TA


OC 406 TA

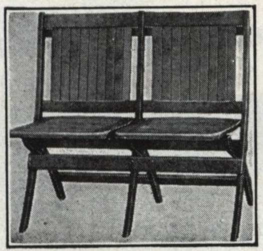
Recitation Seats

Come in 4 and 6-ft. lengths. Pressed steel standards. Six sizes.


Heywood-Wakefield Recitation Seat

Portable Chairs

Used where permanent seats are not required, in auditoriums, gymnasiums, public buildings, lodge halls, churches, etc. Fold easily to permit storage in limited space. Made singly, or in sections. Obtainable with kneeling rests, folding arms, or tablet arms.


T 274

Grandstand Chairs

Fifteen of the sixteen big league baseball parks, and many other parks, race tracks, etc., are furnished with Heywood-Wakefield grandstand chairs. Well built, long lasting. Complete line in theater chair catalogue.

OC 402

Theater Chairs

Owing to lack of space, illustrations are shown of only three typical Heywood-Wakefield theater chairs—full upholstered, half upholstered, and veneer. Our complete line is illustrated in our theater chair catalogue. Our seating specialists will gladly co-operate with architects, and will furnish any desired information.

All parts of these chairs are interchangeable, and any type of seat, back, end, or arm can be combined to suit the taste of the architect or owner. A wide range of materials, upholsteries, aisle ends, and finishes is available.

OC 417

OC 414

OC 412

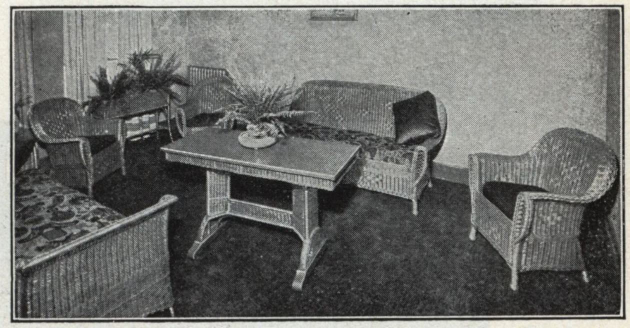
Loge and Box Chairs

Come singly, sections of two or multiples of two. Line offers a wide choice of styles in a variety of finishes and upholsteries. Sturdily made of reed, wood, or cane and wood.

W 534 CU 5

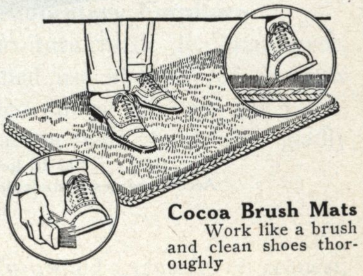
Furniture for Rest Rooms

Industrial, professional, and social rest rooms are now being furnished with reed and fibre furniture, because of its lightness, durability, and beauty. Heywood-Wakefield is one of the largest and oldest makers of reed and fibre furniture in America.


A Typical Heywood-Wakefield Rest Room Installation

Cocoa Brush Door Mats and Cocoa Floor Matting

Heywood-Wakefield cocoa brush door mats and cocoa floor matting are ideal for schools, theaters, hotel lobbies, office buildings, all public buildings, and residences. Names, addresses, or mottoes can be woven into mats. Made in regular or special sizes.


Cocoa Brush Mats Work like a brush and clean shoes thoroughly

WIESE LABORATORY FURNITURE CO.

Laboratory Furniture Engineers

MANITOWOC, WIS.

TRADE-MARK

Products

Furniture of Standard and Special Design for Chemistry, Physics, Biology, General Science, Agriculture, Sewing, Domestic Science, Drawing, Manual Training and Commercial, for schools, hospitals and industrial plants.

Special Service Rendered Architects

We make complete floor plan layouts showing accurate location of each piece of furniture and the floor outlets for water, waste, gas, electricity, air and any other service desired.

Architects are invited to consult with us in planning and detailing suitable furniture for all departments.

Our service is free.

Experience

The personnel of the Wiese Laboratory Furniture Co. is composed of experienced and specially trained representatives, who are prepared to relieve you of all details from the basic idea to the completely equipped laboratory.

Territory

We accept contracts for execution in any part of the world.

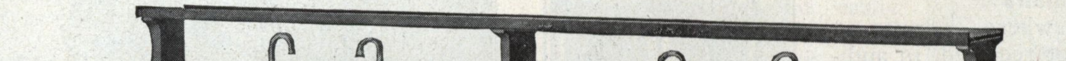
Installations

We maintain a force of trained men for the purpose of making complete installation of our furniture ready for use.

General Information

Contracts placed with us receive skilled detailing and expert factory supervision. All plumbing and electrical fittings have been especially designed for convenience in practical use.

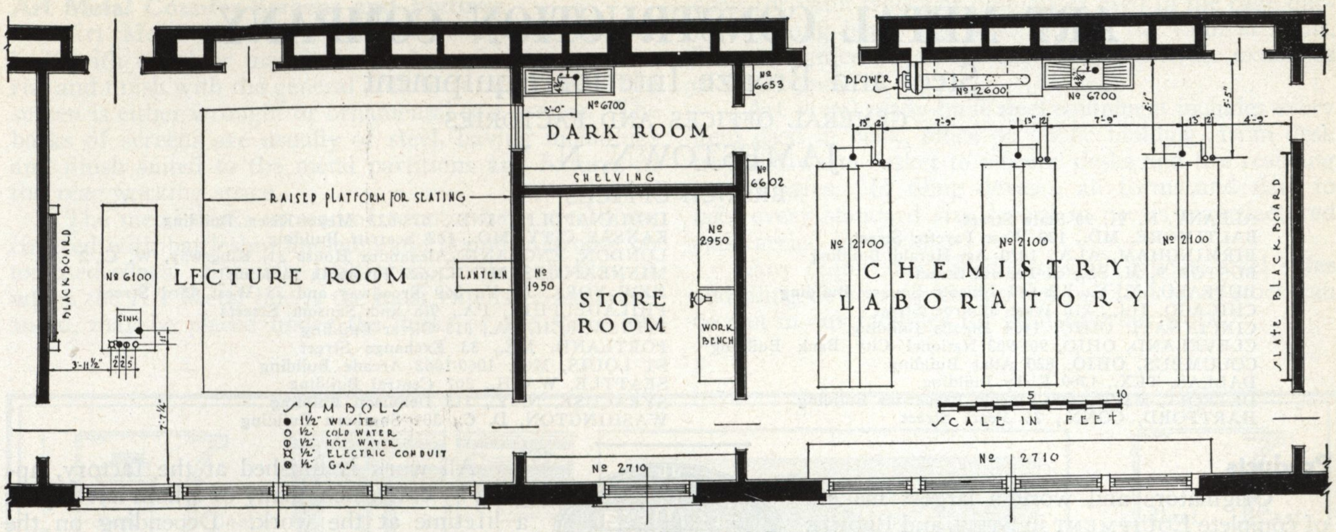
Our complete manufacturing plant located at Manitowoc, Wis., is a center for shipping. Our lumber supply is close at hand. Separate catalogues, descriptive matter and specifications will gladly be sent on request.



No. 2000 Chemistry Desk

12 ft. long, 4 ft. wide and 3 ft. high. Top, birch, ebonacid finish. Body, selected oak
Accommodates 8 students at one time. Has 1 large drawer, 1 small drawer and 1 cupboard for each of 16 students

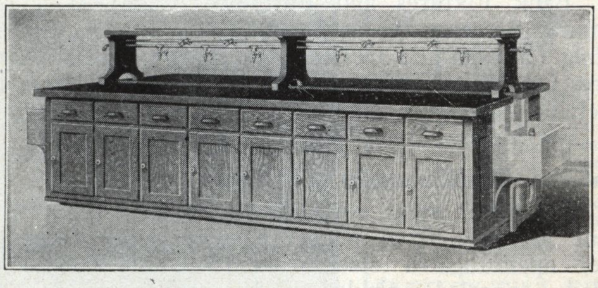
Continued on next page

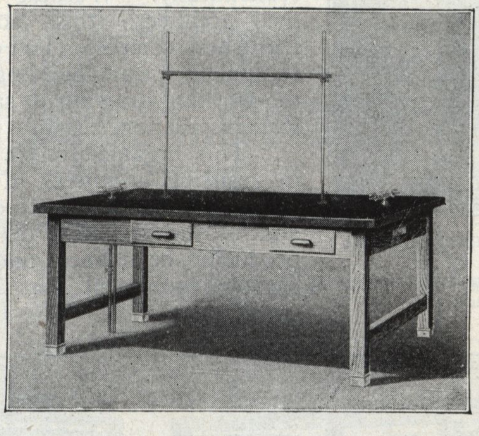

DARK ROOM
Nº 6700
3'-0"
4½"
Nº 6653
SHELVING
Nº 6602
RAISED PLATFORM FOR SEATING
BLACKBOARD
Nº 6100
SINK
LECTURE ROOM
LANTERN
Nº 1950
Nº 2950
STORE ROOM
WORK BENCH
3'-11½"
2 2 5
11"
7'-7¼"
SYMBOLS
● 1½" WASTE
○ ½" COLD WATER
⊕ ½" HOT WATER
⌑ ½" ELECTRIC CONDUIT
⊗ ½" GAS
Nº 2710
BLOWER
Nº 2600
Nº 6700
13" 2" 7'-9" 13" 2" 7'-9" 13" 2" 4'-9"
5'-1"
5'-5"
Nº 2100
Nº 2100
Nº 2100
CHEMISTRY LABORATORY
SLATE BLACKBOARD
5 10
SCALE IN FEET
Nº 2710

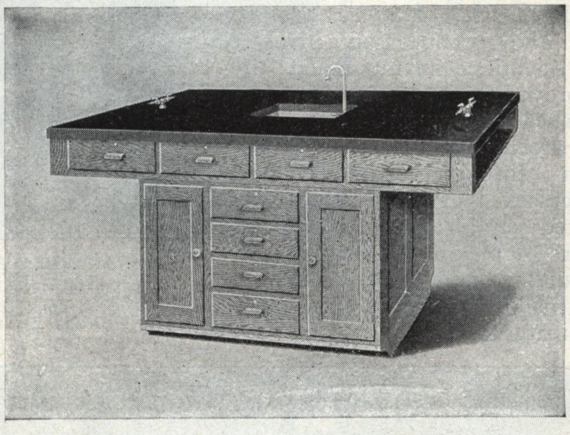
Typical Layout for Chemical Department

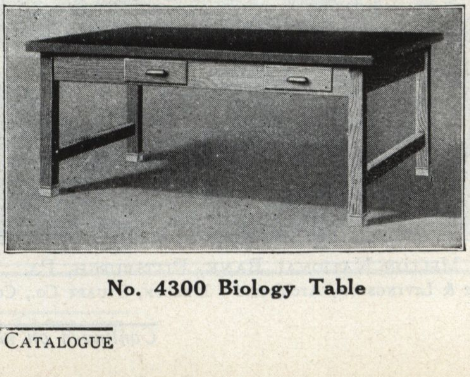
Key to Furniture Numbers Shown Above

1950—Supply case
2100—Students' chemistry desks
2600—Fume hoods
2710—Balance and work shelving
2950—Supply case
6100—Demonstration desk
6602—Notebook case
6653—Key case
6658—Lantern stand
6670—Sliding blackboard
6700—Stone sinks


No. 2100 Chemistry Desk


No. 1200 Physics Table


No. 2500 Combination Physics and Chemistry Desk


No. 4300 Biology Table

Typical Installations of Laboratory Furniture

Wiese laboratory furniture made in Manitowoc, Wis., may be seen in actual use in many of the new educational buildings erected during the past few years.

List of these installations with references gladly sent on request.

Catalogues

Complete catalogues furnished architects on request.

ART METAL CONSTRUCTION COMPANY

Steel and Bronze Interior Equipment

GENERAL OFFICES AND FACTORIES
JAMESTOWN, N. Y.

BRANCH OFFICES

ALBANY, N. Y., 90 State Street
BALTIMORE, MD., 120 West Fayette Street
BIRMINGHAM, ALA., 1020 Age-Herald Building
BOSTON 9, MASS., 69 Federal Street
BUFFALO, N. Y., 638-640 Ellicott Square Building
CHICAGO, ILL., 210 West Monroe Street
CINCINNATI, OHIO, 1404 Ingalls Building
CLEVELAND, OHIO, 901-902 National City Bank Building
COLUMBUS, OHIO, 820 Atlas Building
DALLAS, TEX., 1309 Kirby Building
DETROIT, MICH., 900 Lincoln Properties Building
HARTFORD, CONN., 75 Pearl Street
INDIANAPOLIS, IND., 623-627 Meyer-Kiser Building
KANSAS CITY, MO., 102 Scarritt Building
LONDON, ENGLAND, Alexandra House 31, Kingsway, W. C. 2
MINNEAPOLIS, MINN., 627 Plymouth Building
NEW YORK, N. Y., 369 Broadway and 25 West 43rd Street
PHILADELPHIA, PA., 9th and Sansom Streets
PITTSBURGH, PA., 315 Oliver Building
PORTLAND, ME., 33 Exchange Street
ST LOUIS, MO., 1060-1062 Arcade Building
SEATTLE, WASH., 207 Central Building
SYRACUSE, N. Y., 315 Dennison Building
WASHINGTON, D. C., 301 Southern Building

Products

Originators and world's largest makers of complete EQUIPMENT in STEEL and BRONZE for Banks, Libraries, Public Buildings, Commercial and Insurance Offices designed from architects' details and specifications:

Bank Fixtures and Furniture, Cages, Counter Screens, Desks, Doors, Check Desks, Grilles, Filing Cabinets and Devices, Bookstacks, Library Fixtures, Omnibuses, Partitions, Light Weight Safes, Screen, Shelving, Stairways, Tables, Trim, Vault Fittings, etc.

For Hollow Metal Doors, see pages 829-837.

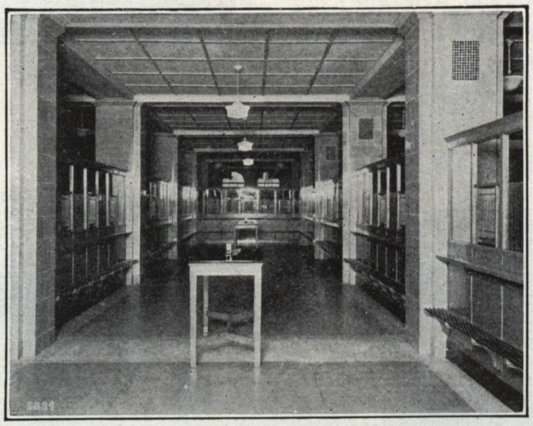
Art Metal
Jamestown, New York
U S A

TRADE-MARK

Material, Workmanship and Finish

Art Metal steel equipment is made from plates of fine, open hearth steel, cold rolled, annealed, pickled and patent leveled. These plates are made especially for this class of work, and are smooth, without scale and free from buckle.

The construction involves a scientific manipulation by improved machinery, the most finished handwork, and a careful assembling by skilled workmen through methods and processes that have been perfected and refined during 35 years of making this equipment. Mouldings and grilles of bronze are made from heavy extra-quality material.



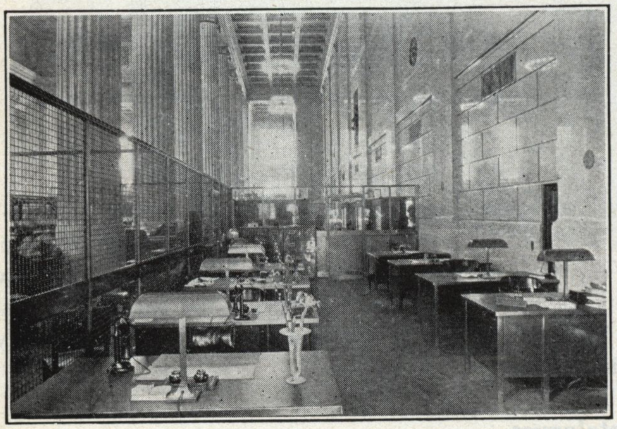
THE COMPLETELY ART METAL EQUIPPED FEDERAL RESERVE BANK, NEW YORK, N. Y.
YORK & SAWYER, Architects
MARC EIDLITZ & SON, Contractors

All work is finished at the factory, applied by craftsmen, many of whom have spent a lifetime at the work. Depending on the product and finish, the parts are rubbed, sanded, imperfections puttied, and the final coat applied by the brush. The graining is nature idealized, and surpasses in beauty woods of the finest selection. Every Art Metal product is finished before being fitted up, so that all surfaces are filled, thus preventing any oxidation. Hardware and trim of solid brass or bronze are suitably electroplated and lacquered.

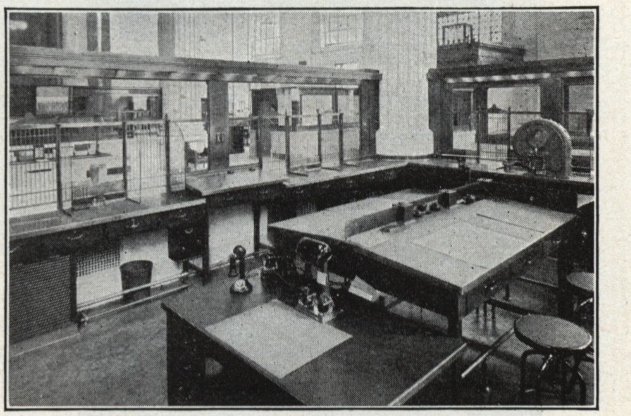
Bank Interiors in Steel, Bronze and Marble

The engineering service of the ART METAL CONSTRUCTION COMPANY is not just to sell so much equipment, but to study the individual needs of banks and recommend methods of handling the work efficiently and economically. Working with the architect, this company furnishes complete interior equipment for any building, from the working drawing to satisfactory installation.

This organization is expert in assisting architects in laying out and handling routine work and in the technical details of producing economical and satisfactory equipment that has no equal.



MELLON NATIONAL BANK, PITTSBURGH, PA.
Auditing Department



MELLON NATIONAL BANK, PITTSBURGH, PA.
TROWBRIDGE & LIVINGSTON, Architects MELLON, STUART CO., Contractors

Continued on next page

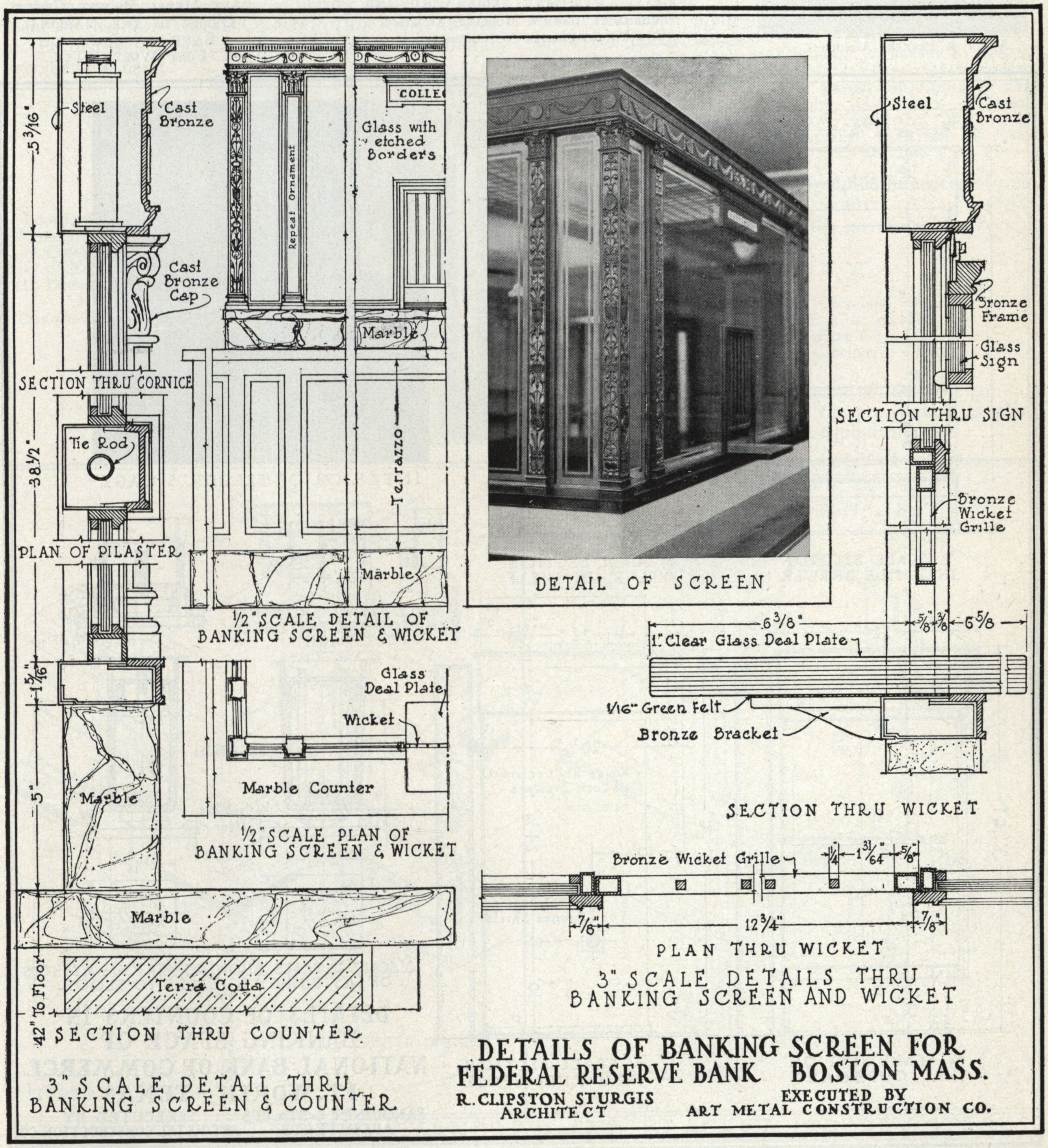
Art Metal Counter Screens and Fixtures

Art Metal counter screens are composite fixtures built with metal or marble front, harmonizing in material and finish with the general architectural scheme. The screen is either wrought or ornamental cast bronze. The backs of screens are usually of steel, having mouldings and finish suited to the metal partitions and fixtures in the rear working space.

The metal desks in rear of counter have steel tops, covered with battleship linoleum and bound in bronze on exposed edges. Specially built or stock filing devices, of which the Art Metal line is the most extensive manufactured, may be placed under the desks or the space left open for vault trucks or omnibuses used in the cage during working hours and wheeled into the vault at night. The cage interiors on the next page illustrate examples of both types.

Art Metal ready-built steel equipment includes every item used in bank, office or public building, from desk tray and waste basket to officers' desks and fire resisting record safes. In filing devices, all forms and sizes to take every standard size record in use is manufactured and carried in stock.

Any requirement in desks, vault trucks, steel safes and filing devices which can not be filled from stock can be met in our facilities for built-to-order work.



Steel
Cast Bronze
5 3/16"
Cast Bronze Cap
SECTION THRU CORNICE
Tie Rod
38 1/2"
PLAN OF PILASTER
1 5/16"
5"
Marble
Marble
Terra Cotta
42" To Floor
SECTION THRU COUNTER
COLLE
Glass with etched Borders
Repeat Ornament
Marble
Terrazzo
Marble
Glass Deal Plate
Wicket
Marble Counter
Steel
Cast Bronze
Bronze Frame
Glass Sign
SECTION THRU SIGN
Bronze Wicket Grille
6 3/8"
5/8"
3/8"
6 5/8
1" Clear Glass Deal Plate
1/16" Green Felt
Bronze Bracket
SECTION THRU WICKET
Bronze Wicket Grille
1/4"
1 31/64"
5/8"
7/8"
12 3/4"
7/8"
PLAN THRU WICKET

3" SCALE DETAIL THRU BANKING SCREEN & COUNTER

1/2" SCALE DETAIL OF BANKING SCREEN & WICKET

DETAIL OF SCREEN

1/2" SCALE PLAN OF BANKING SCREEN & WICKET

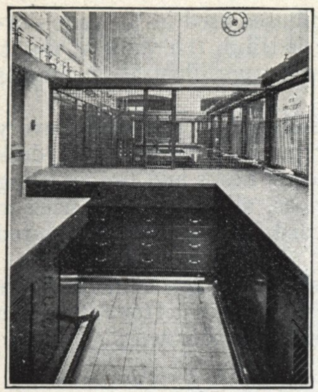
3" SCALE DETAILS THRU BANKING SCREEN AND WICKET

DETAILS OF BANKING SCREEN FOR FEDERAL RESERVE BANK BOSTON MASS.

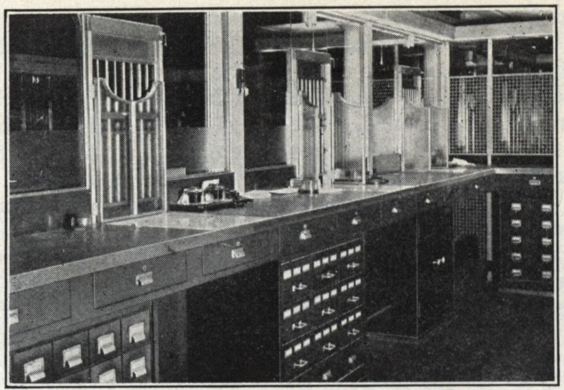
R. CLIPSTON STURGIS ARCHITECT

EXECUTED BY ART METAL CONSTRUCTION CO.

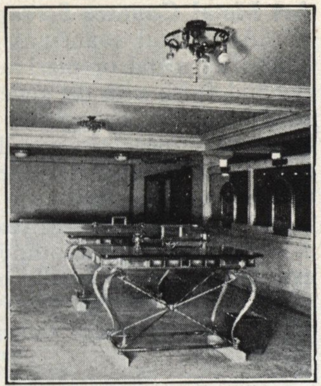
Continued on next page



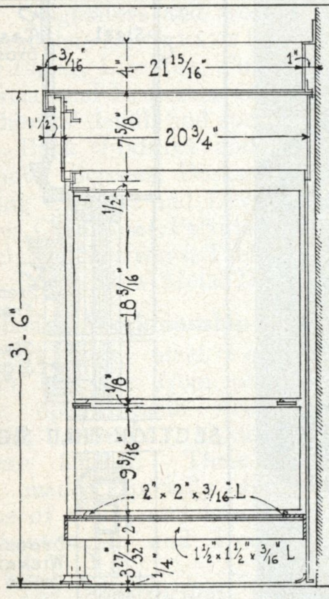
Counter in the Merchants National Bank, New Bedford, Mass.
Alden & Parker, Architects



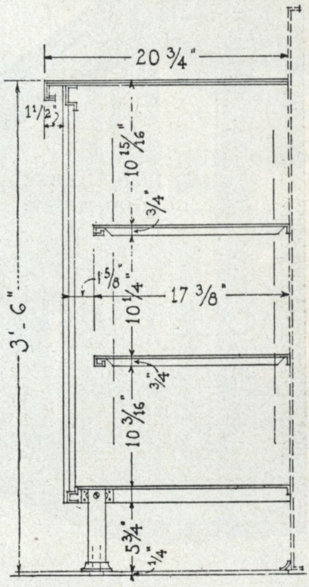
Meyer-Kiser Bank, Indianapolis, Ind.
Vonnegut, Bohn & Mueller, Architects
Taylor-Palmer Co., Contractors



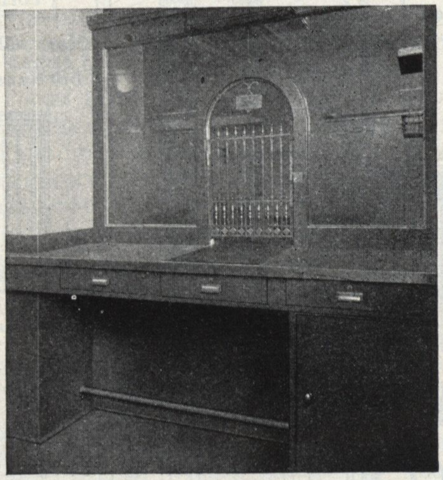
Art Metal Bronze Check Desks in the National Bank of Commerce, Fort Worth, Tex.


3/16"
21 15/16"
1"
4"
1 1/2"
7 5/8
20 3/4"
1/2
3'-6"
18 5/16"
1/8
9 3/16"
2"×2"×3/16" L
2
3 27/32
1 1/2"×1 1/2"×3/16" L
1/4

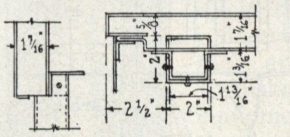
3/4" SCALE SECTION THRU FILE DRAWER


20 3/4"
1 1/2"
10 15/16"
3/4
3'-6"
1 5/8
10 1/4
17 3/8"
10 3/16"
3/4
5 3/4
1/4

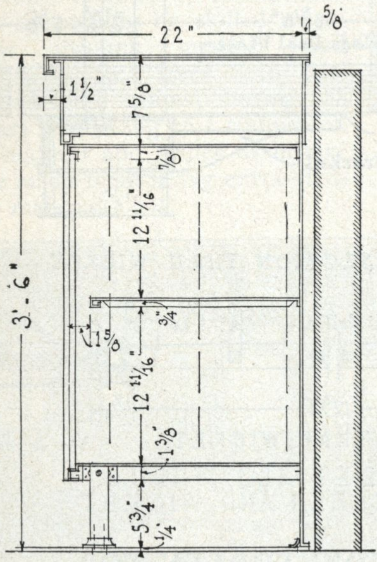
3/4" SCALE SECTION THRU PLAIN SHELF



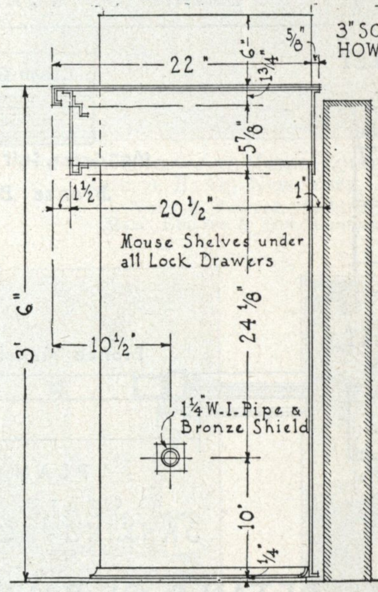
INTERIOR OF TELLER'S CAGE


1 7/16
5/8
1 1/4
2
1 3/16
2 1/2"
2"
1 13/16

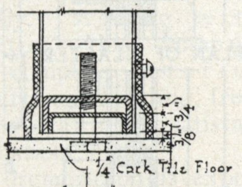
3" SCALE DETAIL SHOWING HOW LEGS ARE FASTENED TO UPRIGHT

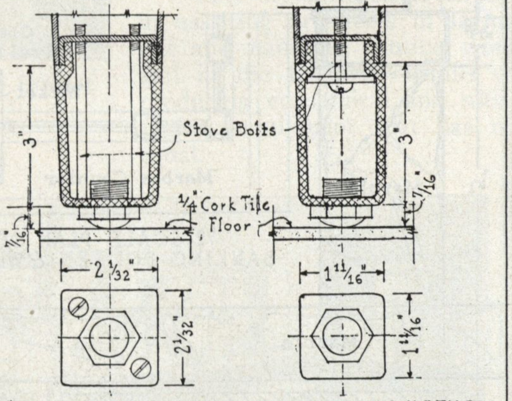

22"
5/8
1/4
1 1/2"
7 5/8
1/8
12 11/16
3'-6"
3/4
1 5/8
12 11/16
1 3/8
5 3/4
1/4

3/4" SCALE SECTION THRU CUPBOARD


22"
6"
5/8"
1 3/4"
5 7/8
1 1/2"
1"
20 1/2"
Mouse Shelves under all Lock Drawers
10 1/2"
3' 6"
24 1/8
1 1/4" W.I. Pipe & Bronze Shield
10"
1/4

3/4" SCALE SECTION THRU KNEE SPACE


3/4
1/8
1/4" Cork Tile Floor


3"
Stove Bolts
3"
1/4" Cork Tile Floor
7/16
7/16
2 1/32"
2 1/32"
1 11/16"
1 11/16"

3" SCALE DETAILS SHOWING VARIOUS METHODS OF FASTENING LEG BASES TO FLOOR

DETAILS OF COUNTERS IN BANKING SPACE OF NATIONAL BANK OF COMMERCE FT. WORTH ~ TEXAS

SANGUINET & STAATS ARCHITECTS

EXECUTED BY ART METAL CONSTRUCTION CO.

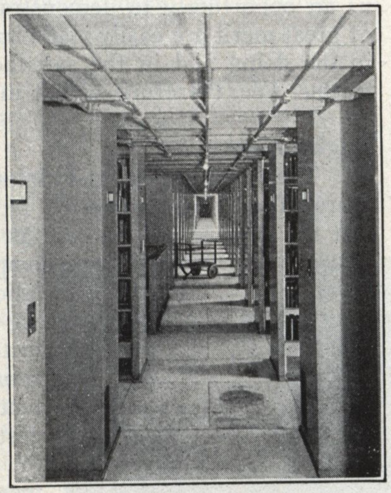
Continued on next page

Library Equipment

The interior equipment and fixtures are made chiefly of fine steel plate built either in plain design or with rich ornamental bronze embellishments. The finish of the steel work is a durable baked-on enamel in any plain color or grain of wood that may be desired. The standard Art Metal olive F finish is often desirable.

Bookstacks are a leading feature of the line and are produced in a number of forms, each to suit the particular requirements of the case. Stacks are adaptable to a wide variety of arrangements to care for volumes of any size, shape and binding in minimum space. They are flexible in construction and permit of re-arrangement to provide for growth of the library.

Each particular case presents its own individual problem and the services of the library planning department of the Art Metal Construction Company are at the disposal of architects in the solution of library problems on hand.



Looking Down an Aisle in Stackroom of Completely Art Metal Equipped Public Library, Detroit, Mich.

Cass Gilbert, Architect

The company solicits an opportunity to present plans and estimates for any library work desired. All work is done in its own plants in Jamestown under the supervision of its library engineers.

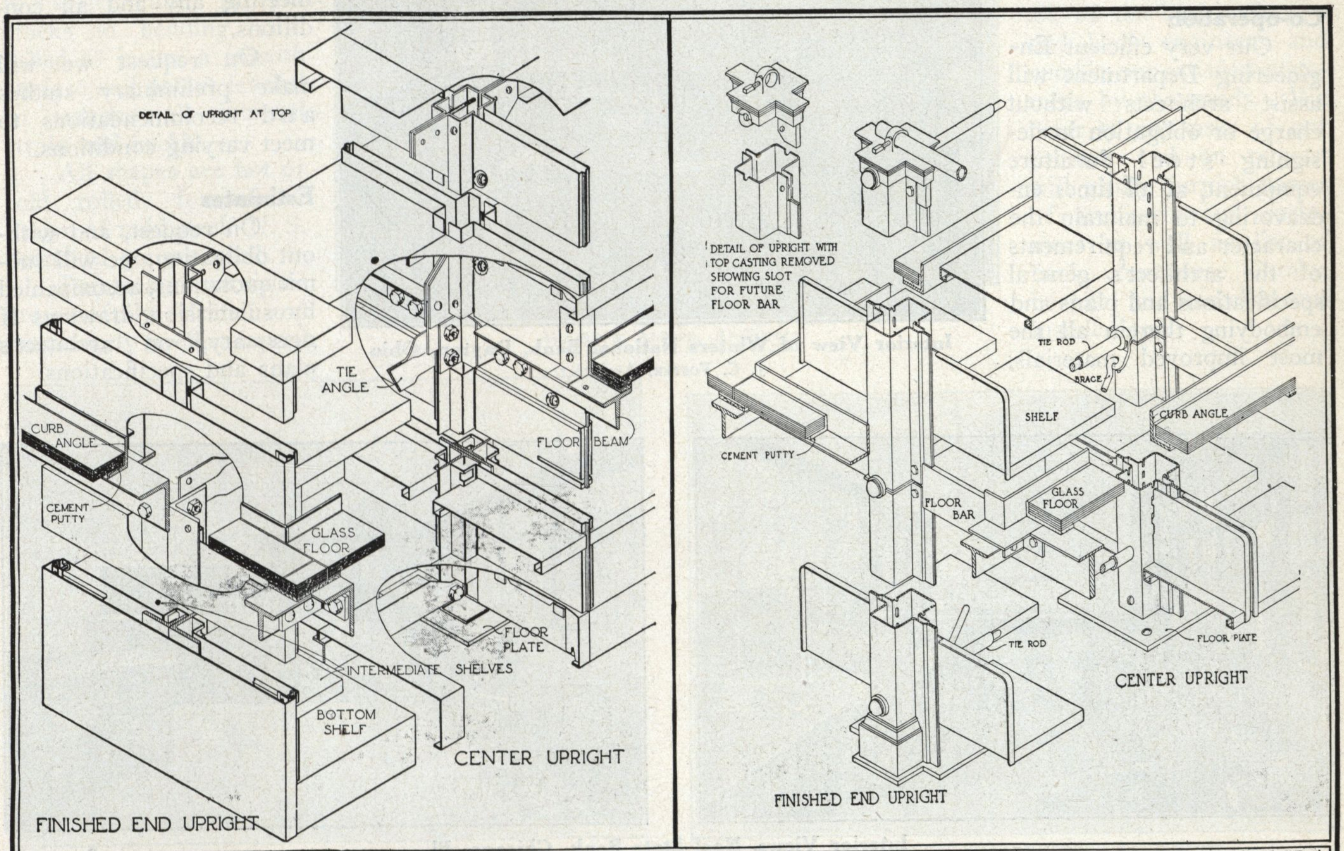
Assembling a Library Stairway, Art Metal Plant, Jamestown, N. Y. Before Shipment to the Glasgow University Library, Glasgow, Scotland, Which Is Completely Equipped in Art Metal

Steel Equipment for Public Buildings

Starting with the empty building, this company will design, build and install the complete interior equipment for public buildings of any size. Since its initial order in 1888 for the Courthouse at Dallas, Tex., Art Metal has been recognized as the standard for such equipment and today it will be found in hundreds of public buildings in all parts of the country. A few installations, in addition to those in the government offices at Washington, are:

Municipal Building, New York, N. Y.
City Hall, Philadelphia, Pa.
Cuyahoga County Courthouse, Cleveland, Ohio
County Building and City Hall, Chicago, Ill.
Jackson County Courthouse, Kansas City, Mo.
Hamilton County Courthouse, Cincinnati, Ohio
Also many State capitols

The engineering department of this company is ready to assist at any time in the preparation of plans and designs for such interior equipment.


DETAIL OF UPRIGHT AT TOP
TIE ANGLE
CURB ANGLE
CEMENT PUTTY
GLASS FLOOR
FLOOR BEAM
FLOOR PLATE
INTERMEDIATE SHELVES
BOTTOM SHELF
CENTER UPRIGHT
FINISHED END UPRIGHT
DETAIL OF UPRIGHT WITH TOP CASTING REMOVED SHOWING SLOT FOR FUTURE FLOOR BAR
TIE ROD
BRACE
SHELF
CURB ANGLE
CEMENT PUTTY
FLOOR BAR
GLASS FLOOR
TIE ROD
FLOOR PLATE
CENTER UPRIGHT
FINISHED END UPRIGHT

DETAILS OF ART METAL STANDARD AND BRACKET LIBRARY STACKS

WATSON MANUFACTURING COMPANY

Metal Office Furniture

EXECUTIVE OFFICE AND FACTORY

JAMESTOWN, N. Y.

QUALITY STEEL EFFICIENCY
TRADE WATSON MARK
FURNITURE
JAMESTOWN NEW YORK

TRADE-MARK

Products

Steel and Bronze Equipment for banks, public buildings and offices, including: Cages, Grilles, Counters, Counter Screens, Partitions, Shelving, Vault Equipment, Doors, Desks, Tables, Omnibuses, etc., from our own standard designs, or designs from the architect's specifications and details.

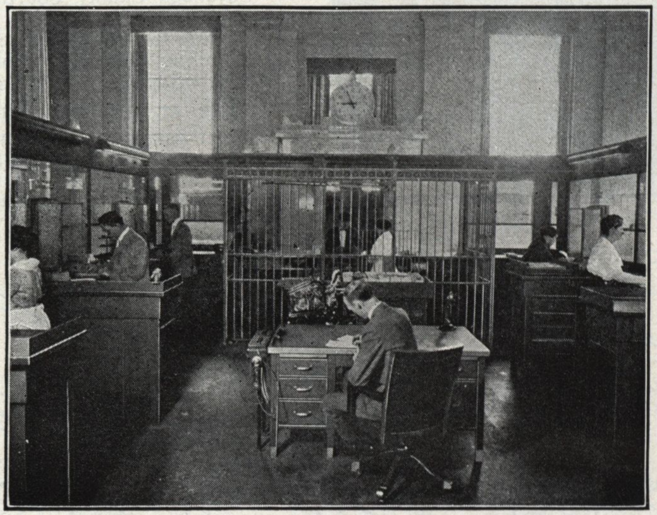
For Insect Screens, see pages 1381-1401.

Experience

Our many years of practical manufacturing experience, a business and manufacturing organization of selected, competent and trained men, a sincere desire to satisfy customers, careful adherence to details and specifications, constant study and improvement, and the use of the most modern designs and manufacturing processes have not only established an enviable reputation for the best in quality and service, but have won the interest, friendship and confidence of our customers.

Co-operation

Our very efficient Engineering Department will assist architects without charge or obligation in designing steel furniture equipment, at all times endeavoring to maintain the character and requirements of the architect's general specifications and plans and embodying therein all the most improved materials, designs, processes and efficient devices best suited for each particular customer's needs.



Interior View of Winters National Bank, Dayton, Ohio
J. C. Foster, Architect

Architects, designers and users of steel office furniture can never know the full measure of satisfaction and assistance that our competent organization can render until by inquiry they give us an opportunity to demonstrate competency. Claims of great merit are easily made but the proof of merit lies in the doing and in the satisfactory execution of contracts. We, therefore, solicit inquiry and investigation.

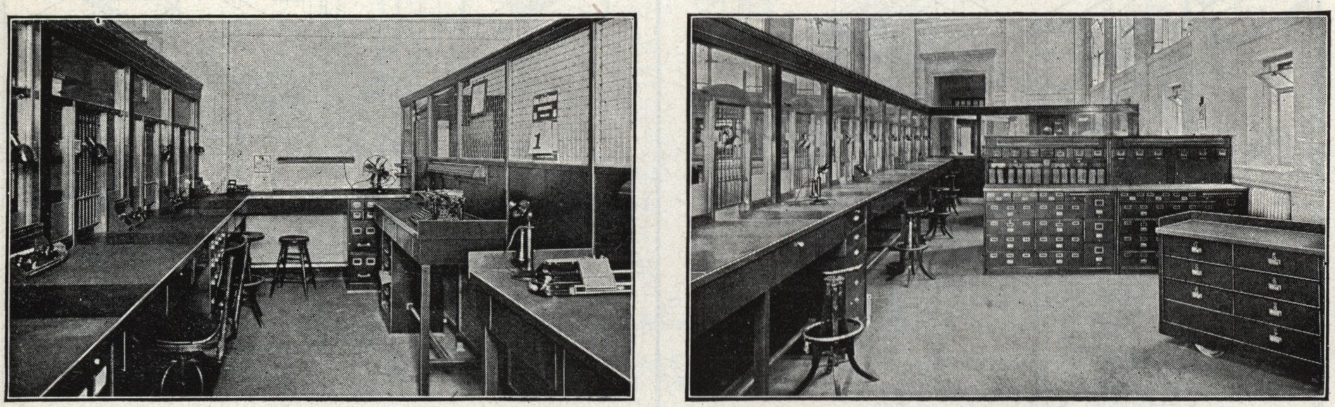
Engineering

The Engineering and Sales Departments, through years of experience derived from having satisfactorily met the demands of unusual as well as ordinary conditions, and the satisfactory completion of many installations by constantly keeping pace with improved materials and methods of construction, are competent to give valuable suggestions and advice as to the best methods of meeting any and all conditions.

On request we will make preliminary studies and recommendations to meet varying conditions.

Estimates

On request, and without obligation, we will submit quotations, accompanied by submission drawings if necessary, on architect's plans and specifications.



Interior Views, Noel State Bank, Chicago, Ill.
Weary & Alford, Architects

Continued on next page

Detailing

After preliminary studies and recommendations have been made, the general plan and details of the work decided on, quotations made, submission drawings approved, and we are awarded the order, we then prepare complete factory details which are submitted for approval before fabrication.

These details show all construction, detailed measurements, assembling units, the character of hardware, the finish and all other details necessary for a complete understanding, all of which is prepared with careful consideration of the architect's requirements and details and original specifications. Fabrication of the work is not begun until all necessary corrections are made and the drawings approved. No subsequent changes are made in the thickness of the steel, or other details of material, construction, or finish, without consent and approval.

Quality

All material used in the fabrication of Watson products is the best of its specific kind, best adapted to the special construction for which it is employed and selected with extreme care in order that Watson products shall be a lasting credit to all concerned. No details are slighted in manufacturing necessary to produce continued best results at as low a price as is consistent with good work.

All steel is of the best open hearth metal furniture stock. This is pickled to remove scale, annealed to soften and prevent cracks in bending, cold rolled to insure a smooth surface and patent leveled to remove all internal strain and buckle.

All shapes are hot or cold rolled, formed or drawn of mild steel. U. S. Standard gauges used.

Paints and varnishes are carefully selected and particularly well adapted for the character of the work and the methods of finishing.

Hardware, such as pulls, label holders, locks, escutcheons, door trim, etc., are solid cast or wrought bronze or brass.

A heavy grade of battleship linoleum is used and all other miscellaneous items are of the best quality obtainable.

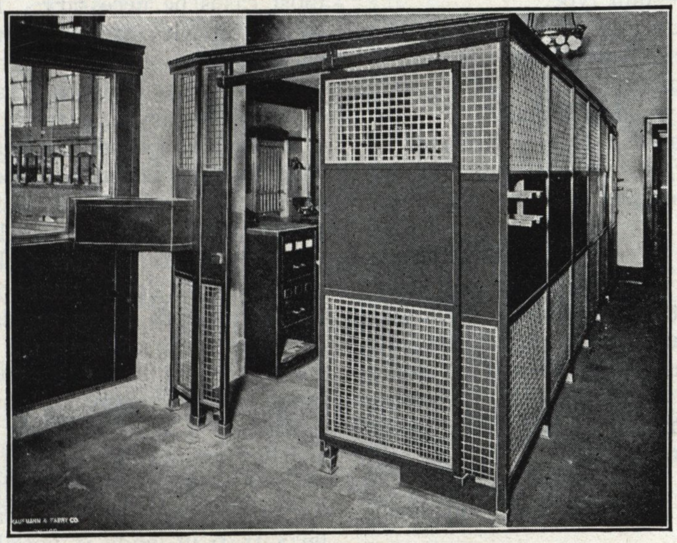
All workmen employed are skilled mechanics in their particular work. The latest processes of electric spot welding and oxy-acetylene gas welding are employed, together with the further assistance of all modern machinery, and a final inspection in each department—these are the principles which combine in preventing errors and insuring the work being properly constructed, finished and shipped.

Location and Facilities

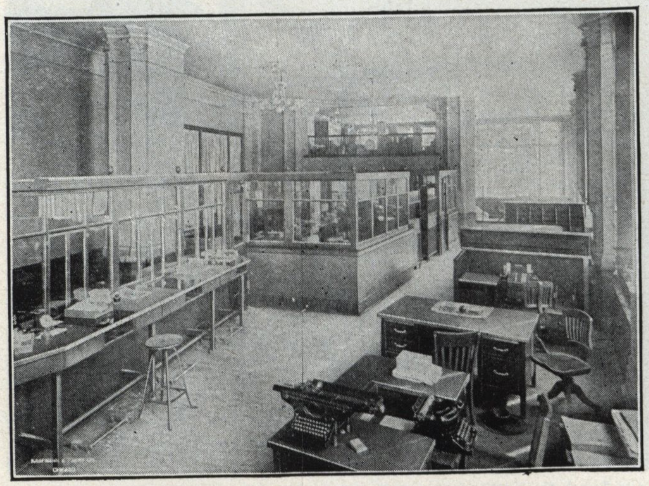
Our central location in the city of Jamestown (where steel furniture originated and has been largely developed) with shipping facilities over the Erie, New York Central and Pennsylvania lines, access to experienced workmen, a fully and conveniently equipped manufacturing plant in which our product is completely fabricated and finished, together with our competent Sales and Engineering Departments, enables us to give unusual quality and service.

References

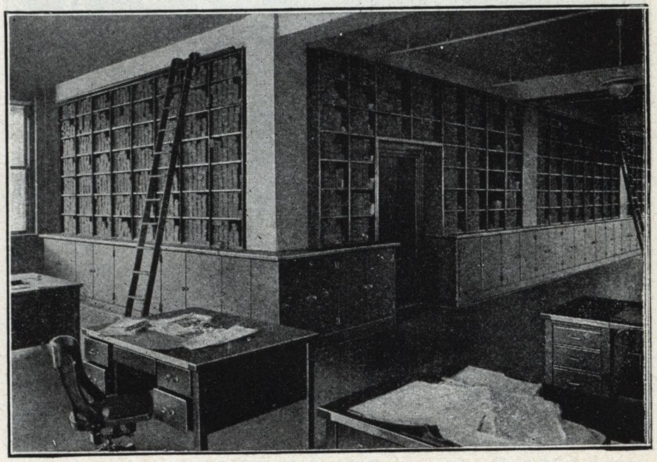
We have executed contracts for many, if not all, of the best architects and bank engineers and number our satisfied customers by thousands. We refer to any user of our product and on request will gladly furnish names of architects and customers as well as list of bank, courthouse, library, hospital and miscellaneous installations.



Interior View of Noel State Bank, Chicago, Ill.
Weary & Alford, Architects



Boulevard Bridge Bank, Chicago, Ill.
Graham, Anderson, Probst & White, Architects



Interior of K. of C. Building, New Haven, Conn.
W. P. Guggolz, Architect

FOUNDED 1876

LIBRARY BUREAU

Manufacturing Distributers of Library, Bank and Office Equipment in Steel and Wood

EXECUTIVE OFFICES
CAMBRIDGE, MASS.

FACTORIES
CAMBRIDGE, MASS. ILION, N. Y. CHICAGO, ILL. NEW YORK, N. Y. LONDON, ENG.

SALES OFFICES
BOSTON, MASS. NEW YORK, N. Y. CHICAGO, ILL. PHILADELPHIA, PA.

Offices in Fifty-four Leading Cities in the United States, Great Britain and France

Products

LIBRARY, BANK and OFFICE EQUIPMENT, which includes the following:

- Bookstacks (steel).
- Storage Shelving in steel—unit type.
- Book Shelving in wood—unit type.
- Museum Cases of bronze and plate glass.
- Card and Filing Cabinets in wood and steel.
- Filing Systems and Cabinets.
- Card Record Desks of wood and steel.
- School Library and Administration Equipment.
- Stock and Special Charging Desks.
- Stock and Specially Designed Library Furniture.

Facilities

The LIBRARY BUREAU steel factory is completely equipped for the manufacture of library bookstack, bronze and plate glass museum cases, unit steel shelving, steel filing cabinets, and bank and office filing equipment.

The wood working factories are completely equipped for the manufacture of card and filing cabinets, and technical library furniture.

Catalogues, describing above products in detail, will be mailed on request.

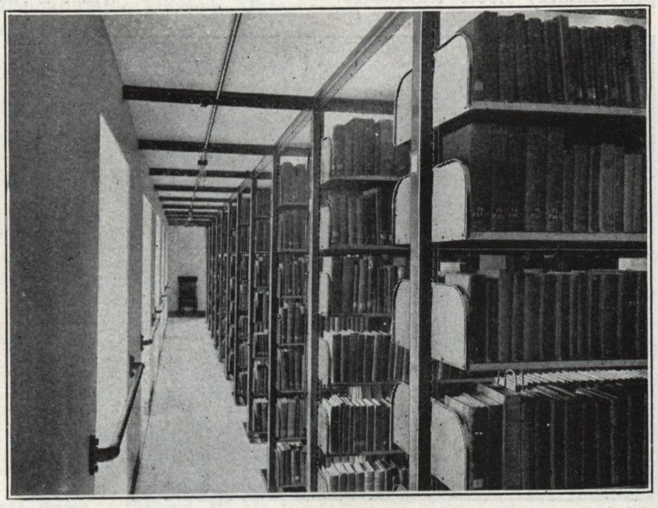
Steel Bookstacks for Libraries

Standards—The following standards give general information in planning stack room installations. As individual conditions, however, must to a certain degree govern such arrangements, specific information will in most cases be necessary. This organization is pleased to consult with architects and librarians and offers the services of an experienced representative. This service will be rendered without charge or obligation.

Single story standard bracket stack is made 7 ft. 6 in. high; multistory stack 7 ft. 6 in. from floor to floor. The floor framing is made of steel angles with either ¾-in. translucent sand-blasted glass or 1¼-in. marble. Double faced ranges with 8-in. shelves are 16 in. face to face. The standard length for shelves is 3 ft. on centers. The standard shelf depths are approximately 8, 10, and 12 in.; the 8-in. depth being regularly furnished as standard.

The width of the main and range aisles of a stack room are controlled somewhat by conditions at the building. For open stack rooms, the ranges are ordinarily set 4 ft. 6 in. apart on centers giving a range aisle of approximately 3 ft. Range aisles may be as narrow as 2 ft. 6 in.; but this is not advisable where the stack room is in general use. Main aisles should be 3 ft. 6 in. wide if possible, and not less than 3 ft.

Specially Designed Delivery Desk and Card Catalogue Cases, Knight Memorial Library, Providence, R. I.



Library Bureau Multistory Standard Bracket Stack, Stack Room, Trenton Public Library, Trenton, N. J.

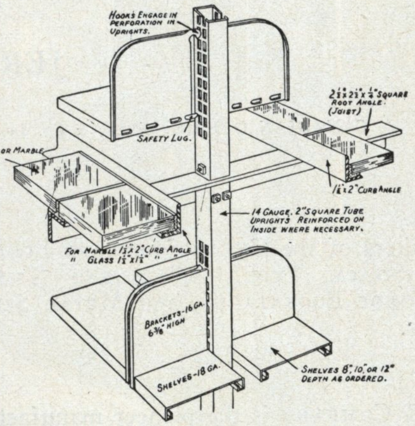
Continued on next page

Shelf Capacity—In figuring the amount of shelving required to accommodate a certain number of volumes, the following schedule will be of assistance:

	Volumes per shelf foot	Volumes per 3-ft. double faced section
Fiction	9	378
General literature	8	336
Reference books	7	294
Law books	5	210

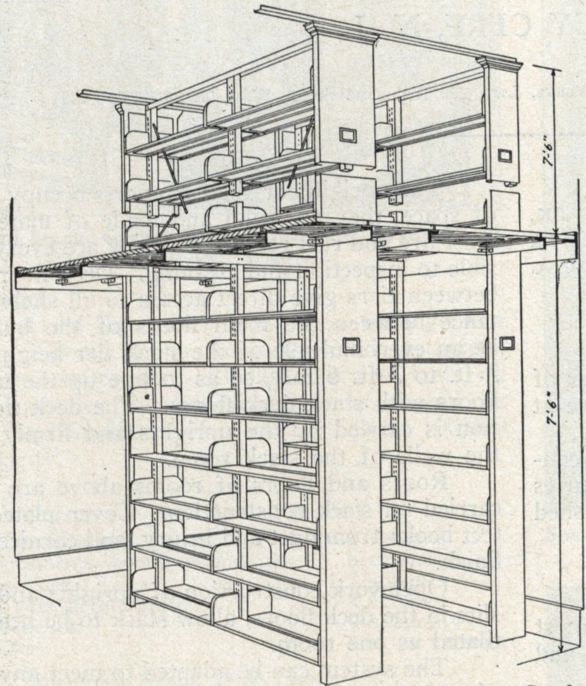
Co-operative Service

Library Bureau offers to all architects its service, based on over 49 years' experience in furnishing equipment for banks, insurance companies, public service buildings and commercial houses. Special representatives will co-operate in planning the interior equipment for such buildings.


Hooks Engage in Perforation in Uprights.
$2\frac{1}{2}$" x $2\frac{1}{2}$" x $\frac{1}{4}$" Square Root Angle. (Joist)
Safety Lug.
Glass or Marble Floor
$1\frac{1}{2}$" x 2" Curb Angle
14 Gauge. 2" Square Tube Uprights Reinforced on Inside Where Necessary.
For Marble $1\frac{1}{2}$" x 2" Curb Angle
" Glass $1\frac{1}{2}$" x $1\frac{1}{2}$" " "
Brackets-16 Ga. $6\frac{3}{8}$" High
Shelves-18 Ga.
Shelves 8", 10" or 12" Depth as Ordered.

Fragment Sketch Showing Floor Construction

Two or More Levels.
Double and Wall.
Plate. Steel Brackets.
Wide Ends.
Stack Floors-Steel & Glass or Marble.



Library Bureau Steel Bookstack No. 17

Planning and Equipping the Library in School Buildings

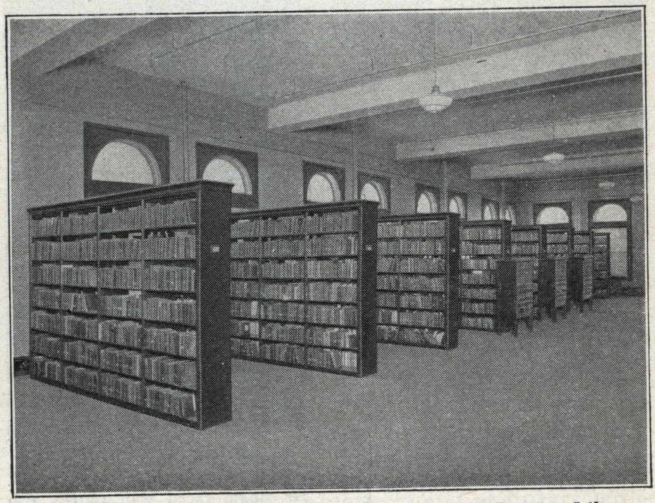
Library Bureau, from its experience of many years in planning libraries and co-operating with the pioneers in school work, has published a book, "School Libraries," containing information of value to all architects who are planning school buildings. This book contains floor plans showing model school library rooms, and gives many suggestions and standards with illustrations of technical equipment.

Catalogues, Booklets and Prints

Steel Bookstack
Library Supplies
Library Furniture
Card and Filing Cabinets in Wood
Card and Filing Cabinets in Steel
Unit Wood Book Shelving
Unit Steel Storage Shelving
Charging Desks
Unit Book Cases
School Libraries
Museum Cases

Any of the above sent on request.

Technical Library Equipment, Schenley High School, Pittsburgh, Pa.



Library Bureau Lock Shelf Steel Bookstack, Cossitt Library, Memphis, Tenn.

FOUNDED IN 1849

SNEAD & COMPANY

Manufacturers of Metal Bookstacks for Libraries

MAIN OFFICE AND WORKS
94 Pine Street
JERSEY CITY, N. J.

CABLE ADDRESS
"Snead, Jersey City"

CANADIAN OFFICE: Snead & Co. Iron Works, Ltd., 250 Richmond Street, West, TORONTO, ONT.

Products

Sole makers of the Snead Standard Bookstack, Snead Bookstack Type "A," Snead Newspaper Stack, Bracket Bookstacks, and Metal Shelving for Libraries.

Facilities

Snead & Company is the pioneer manufacturer of library bookstacks. Experienced stack designers are at the service of architects planning stack installations.

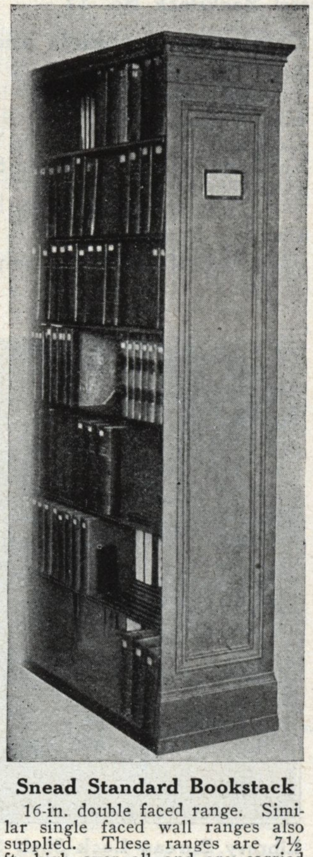
A 271-page catalogue of bookstack and library construction giving many plans and illustrations of libraries sent on request; technical information also furnished free.

Description of Snead Standard Bookstack

The Snead standard stack is installed in the most important libraries throughout the United States and Canada.

The simple construction fits it for use not only in large but also in smaller libraries with but a single or a few stack tiers (stories), and for offices and private libraries requiring only plain wall shelving. The interchangeability of parts and adaptable construction allow the stack, in case of remodeling, to be reset and extended both horizontally and vertically.

Stack consists of solid or openwork cast iron and steel uprights extending full width of ranges, and spaced shelf length apart by fixed shelves at top and bottom. The adjustable shelves are preferably of the special open bar construction, light, strong, resilient, and with dust collecting surfaces reduced to a minimum. Uprights are each the height of one tier, and may be bolted one above the other to obtain a stack of any number of stories.



Snead Standard Bookstack

16-in. double faced range. Similar single faced wall ranges also supplied. These ranges are 7½ ft. high over all and are carried in stock

The uprights or shelf supports occupy the minimum of space, they are solid and made of material which is most fire and rust resisting. They are everywhere accessible to inspection and cleaning. Deck floors or galleries between tiers give direct access to all shelves. The distance between the main floors of the building should be an even multiple of the stack tier height (preferably 7 ft. to 7 ft. 6 in.), so as to line up the main building floors with stack deck floors. The deck floor construction is carried by the uprights and firmly anchored to the walls of the stack room.

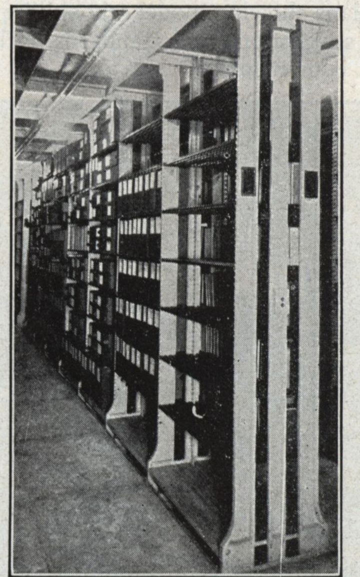
Roofs and floors of rooms above are economically carried on stack construction. Cover plates at top protect books from dust and injury, and cornice gives a neat finish.

Openwork construction of uprights and shelves, and slits in the deck floors, allow stack to be heated and ventilated as one room.

The system can be adapted to meet any requirement of architecturally planned design.

Adjustable shelves are completely finished at shop with baked rubber japan. Fixed metal parts are preferably finished after erection with air drying enamel; baked enamel is unsuitable, as it can not be renewed in place.

Maximum distribution of light is obtained by using openwork construction where possible and finishing fixed parts in light color, usually light gray.



Snead Standard Type "A" Stack, Wilmington (Del.) Institute and Free Library

Edward L. Tilton, Architect

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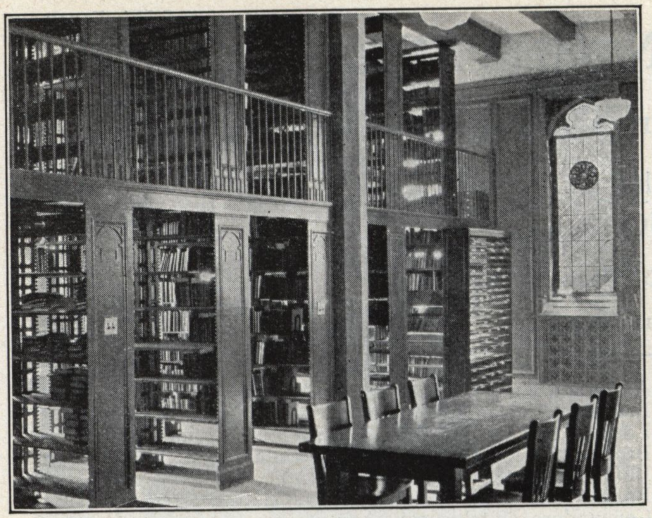


Snead Standard Stack, Garrett Biblical Institute, Evanston, Ill.
HOLABIRD & ROCHE, Architects

Price of Stacks

Cost of stacks depends largely upon arrangement and quantity. Specifications, drawings and estimates furnished free on request. Bookstacks are built on contract. Normally, four or five months should be allowed for the completion of a stack of about 100,000 volumes' capacity.

BOOK CAPACITIES

Average per lineal foot of shelf

U. S. Patent Specifications	2 volumes
Law, public documents, bound periodicals	6 volumes
Medicine and science	7 volumes
Reference and general literature	8 volumes
Economics and fiction	9 volumes
Circulating books	9 to 10 volumes

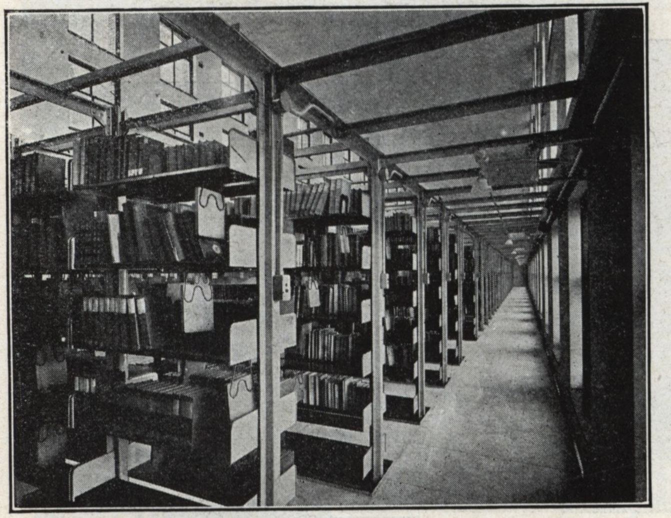
STANDARD STACK DIMENSIONS

Special sizes built to order if quantity warrants

Shelf widths—For books, 8, 9, 10 and 12 in.; newspapers, 18 and 22 in.
Shelf lengths—3 ft. usual—varied to suit conditions
Tier heights—7 ft. to 7 ft. 6 in.
Aisle widths—Main, 2 ft. 6 in. to 5 ft.; minor, about 28 in. minimum, 30 to 36 in. average.

STANDARD STACK WEIGHTS

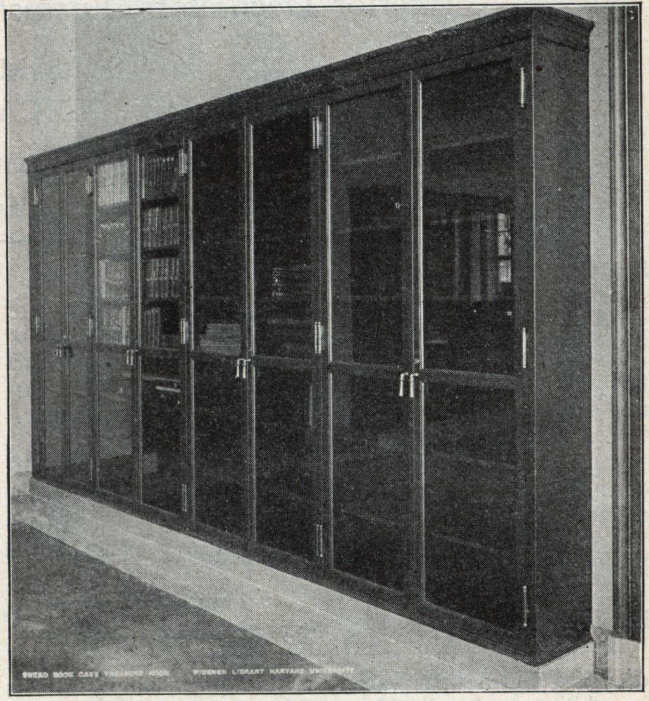
Uprights and shelves	7 to 10 lbs. per cu. ft. of range
Books	20 to 25 lbs. per cu. ft. of range
Deck framing	5 lbs. per sq. ft.
Deck flooring, ¾-in. glass	10 lbs. per sq. ft.
Deck flooring, 1¼-in. marble	18 lbs. per sq. ft.



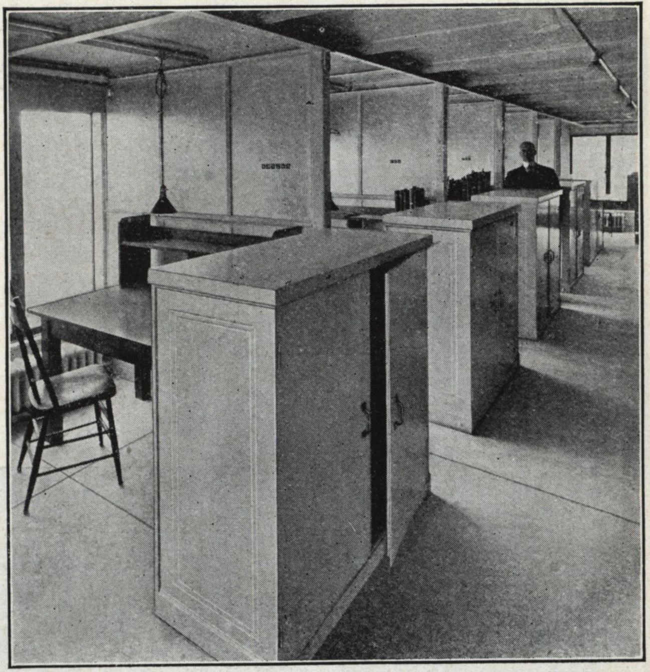
Snead Bracket Stack Prepared to Receive Future Tiers, San Francisco Public Library
GEO. W. KELHAM, Architect

Metal Shelving

Our products cover shelving for special library requirements and conditions, and for all purposes where fireproof storage convenience and durability are essential.


SNEAD BOOK CASE TREASURE ROOM
WIDENER LIBRARY HARVARD UNIVERSITY

Snead Steel Treasure Room Cases, Widener Memorial Library, Harvard University
HORACE TRUMBAUER, Architect



Typical View of Carrells and Low Cases in Stack Room, University of Michigan Library, Ann Arbor, Mich.
ALBERT KAHN, Architect

Architectural Service

The stack construction in most libraries forms an important part of the entire building and should, therefore, be carefully considered when the building is designed or first contemplated.

Our years of experience in bookstack construction has given us an accumulation of valuable information which we offer freely to architects and engineers without charge. Technical information and prices will be furnished promptly on request.

ESTABLISHED 1856

N. J. NELSON, PRESIDENT

W. P. NELSON COMPANY

Interior Decorators, Furnishers and Painting Contractors

TELEPHONE
HARRISON 5073

614 South Michigan Avenue
CHICAGO, ILL.

BRANCH OFFICES
NEW YORK, N. Y., 209-211 West 33rd Street
CLEVELAND, OHIO, 433 Bulkley Building
PITTSBURGH, PA., 1514 Forbes Street

Services

This company is prepared to execute contracts for PAINTING and DECORATING in large Public Buildings, Hotels, Theaters, Clubs, Banks, Office Buildings, Factories, Industrial Buildings, Churches and Residences; also to furnish WALL PAPER, MURALS, SPECIAL FURNITURE and DRAPERIES where desired.

It maintains its own artist studios and solicits consultation in preparing designs and plans for interior decorating and furnishing.

Contracts accepted for work in any part of the United States.

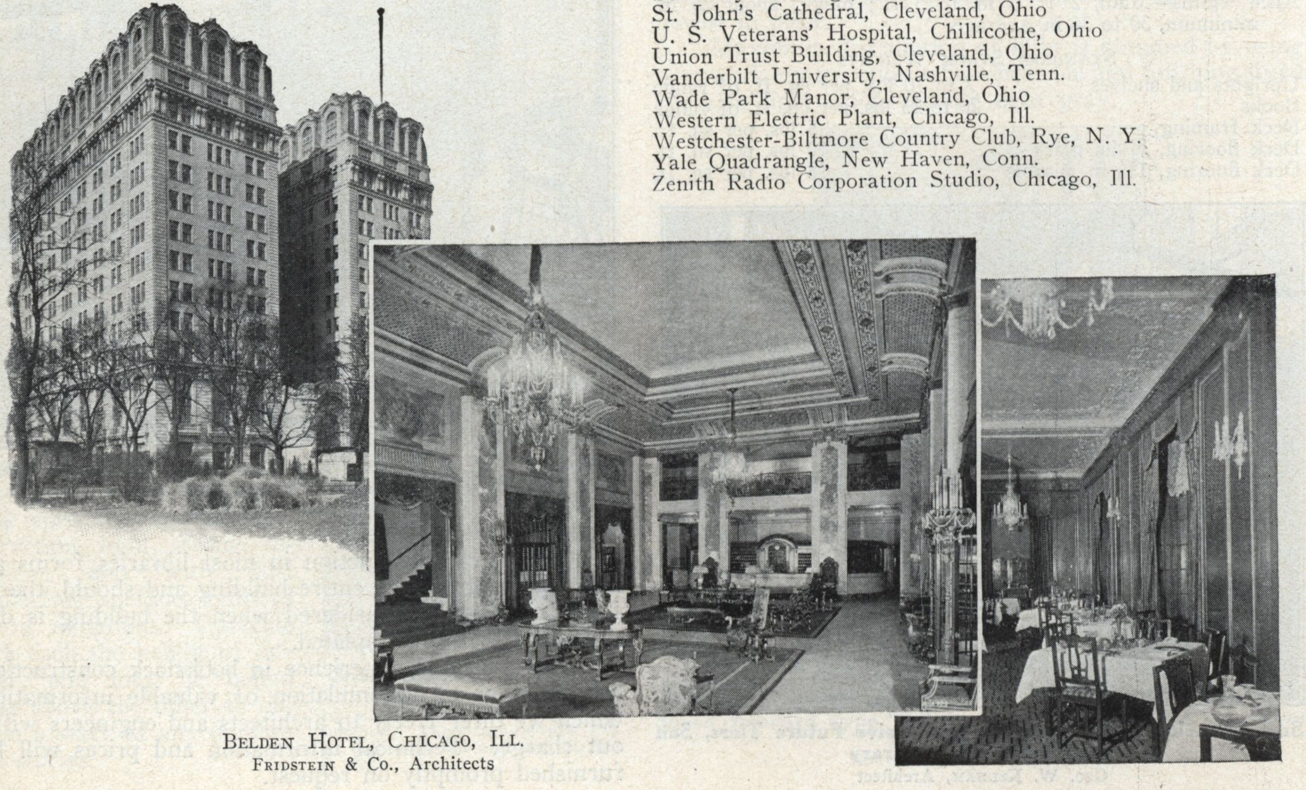
Experience

This firm's vast experience, covering a long period of years and a wide variety of buildings, amply attests its ability to handle thoroughly and competently any type of project.

References

The following is a partial list of buildings in which the painting, decorating or furnishing has been done by this company:

Ambassador Hotel, Atlantic City, N. J.
Arlington Hotel, Hot Springs, Ark.
Allerton Hotel, Chicago, Ill.
Army and Navy Office Building, Washington, D. C.
Brooklyn Edison Co. Building, New York, N. Y.
Edward Ballard Residence, French Lick Springs, Ind.
Brotherhood of Engineers' Bank Building, Cleveland, Ohio
Buffalo Athletic Club, Buffalo, N. Y.
Buffalo City Hospital, Buffalo, N. Y.
Commodore Hotel, New York, N. Y.
Thos. Cusack Company Offices, Chicago, Ill.
Chevrolet Motor Co. Building, Flint, Mich.
Catholic Charities Building, Cleveland, Ohio
Detroit Free Press Building, Detroit, Mich.
Eastman Hotel, Hot Springs, Ark.
Elks' Memorial Building, Chicago, Ill.
General Motors Co. Building, Detroit, Mich.
Grand Reviera Theatre, Detroit, Mich.
Edward N. Hurley Residence, Wheaton, Ill.
Ivanhoe Masonic Temple, Kansas City, Mo.
Jackson Shores Apartments, Chicago, Ill.
Liberty Memorial, Kansas City, Mo.
Liberty Bank Building, Buffalo, N. Y.
Moreland Courts Apartments, Cleveland, Ohio
Pennsylvania Hotel, New York, N. Y.
Penn-Alto Hotel, Altoona, Pa.
Pantheon Theater, Chicago, Ill.
Peabody Demonstration School, Nashville, Tenn.
Peabody Hotel, Memphis, Tenn.
Palmer House, Chicago, Ill.
Ritz-Carlton Hotel, Atlantic City, N. J.
Robert E. Lee Hotel, Winston-Salem, N. C.
Roosevelt Theater, Chicago, Ill.
Rialto Theater, Louisville, Ky.
Riverside Country Club, Lansing, Mich.
Straus Bank Building, New York, N. Y.
Seminary Buildings, St. Mary of the Woods, Area, Ill.
St. John's Cathedral, Cleveland, Ohio
U. S. Veterans' Hospital, Chillicothe, Ohio
Union Trust Building, Cleveland, Ohio
Vanderbilt University, Nashville, Tenn.
Wade Park Manor, Cleveland, Ohio
Western Electric Plant, Chicago, Ill.
Westchester-Biltmore Country Club, Rye, N. Y.
Yale Quadrangle, New Haven, Conn.
Zenith Radio Corporation Studio, Chicago, Ill.



BELDEN HOTEL, CHICAGO, ILL.
FRIDSTEIN & CO., Architects

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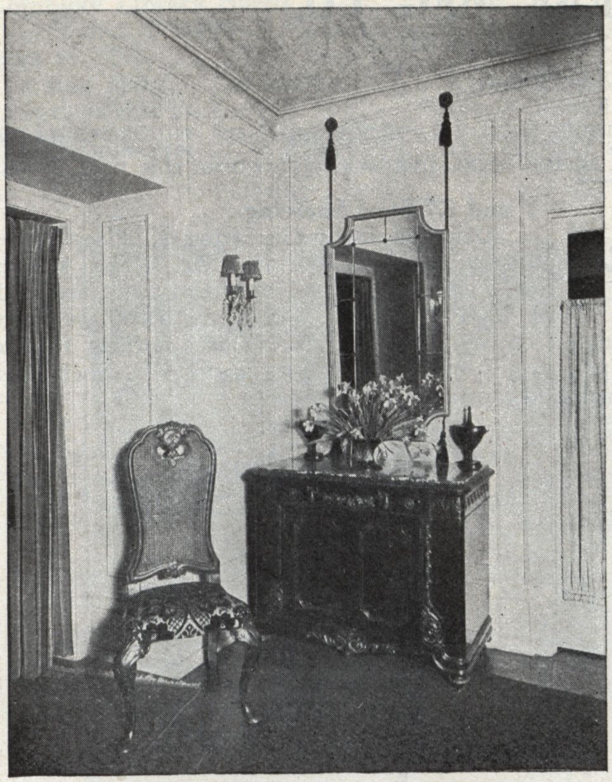
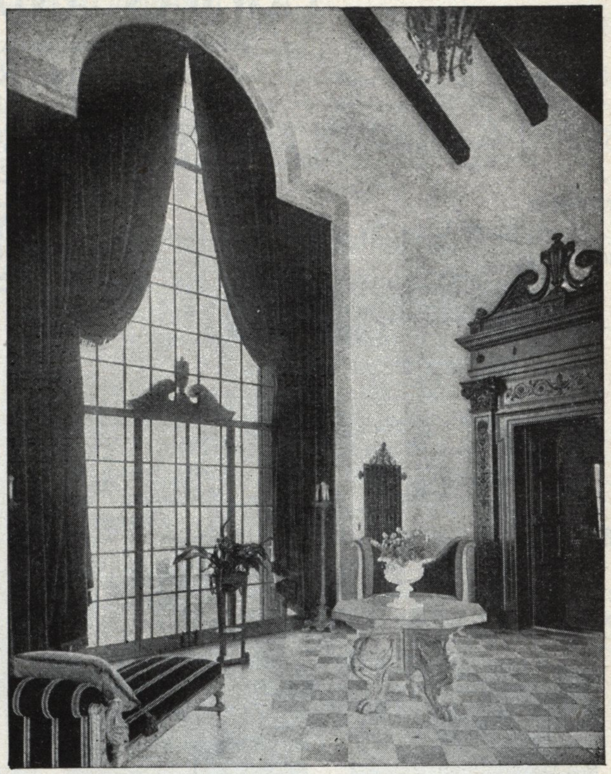
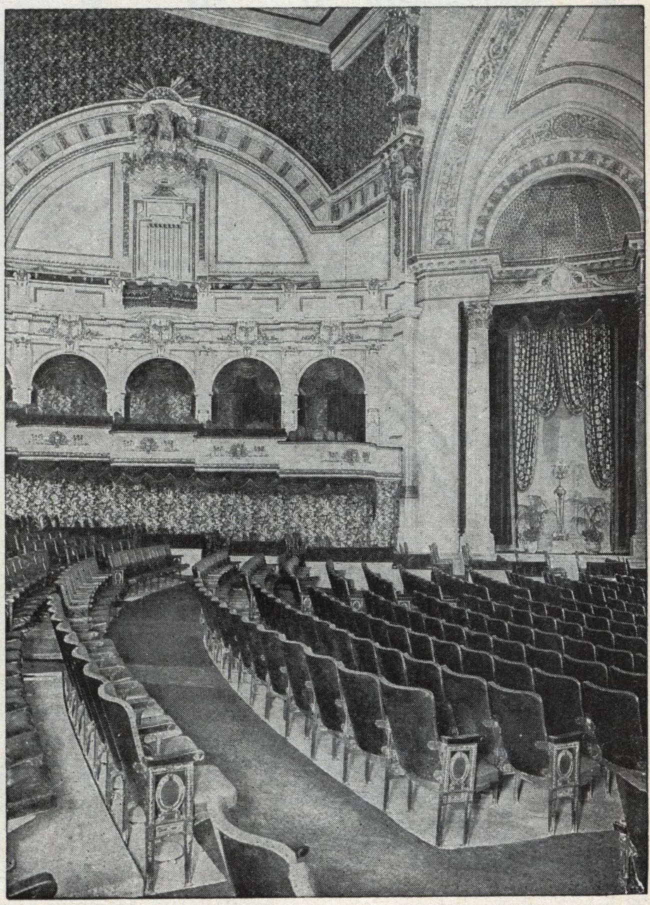


N. J. Nelson Residence, Chicago, Ill.



E. W. Wilson Residence, Peoria, Ill.

St. Barbara's Church, Chicago, Ill.



New York Hippodrome, New York, N. Y.

YAWMAN AND ERBE MFG. CO.

MAIN FACTORIES AND EXECUTIVE OFFICES
647 Jay Street, ROCHESTER, N. Y.

BRANCHES
ALBANY, N. Y. BRIDGEPORT, CONN. CHICAGO, ILL. DETROIT, MICH. NEW YORK, N. Y. PHILADELPHIA, PA.
BOSTON, MASS. BUFFALO, N. Y. CLEVELAND, OHIO LOS ANGELES, CAL. NEWARK, N. J. PITTSBURGH, PA.
ROCHESTER, N. Y. SAN FRANCISCO, CAL. SPRINGFIELD, MASS. SYRACUSE, N. Y. WASHINGTON, D. C.

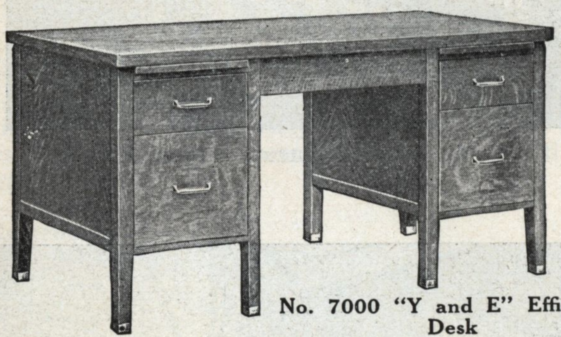
Products

COMPLETE LIBRARY and OFFICE EQUIPMENT, including:

- Efficiency Desks
- Steel Filing Cabinets
- Wood Filing Cabinets
- Underwriters' Safes
- Record Filing Safes
- Steel Shelving
- Blue Print Files
- Library Equipment
- Bank Equipment
- Machine Accounting Equipment
- Office Tables
- Chairs
- Costumers
- Transfer Cases
- Vertical Filing Systems
- Card Record Systems
- Shannon Files

Efficiency Desks

Drawers coast on roller bearing slides. Card and vertical drawers for records and storage. There are six models of Efficiency Desks to choose from.



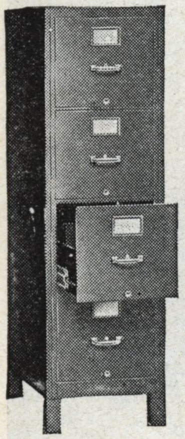
No. 7000 "Y and E" Efficiency Desk

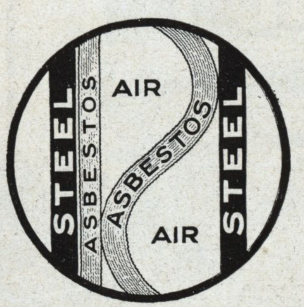
For Executives—
No. 7000. Size of top, 60x34 in.; double pedestal type.
No. 7066. Size of top, 66x34 in.; double pedestal type.
For Salesmen and Clerical Use—
No. 7020. Size of top, 43 13/16x34 in.; single pedestal type.
No. 7021. Size of top, 43 13/16x34 in.; single pedestal type.
For Stenographers and Secretaries—
No. 7000 R.T. Size of top, 60x34 in.; double pedestal type.
No. 7000 L.T. Size of top, 60x34 in.; double pedestal type.

All efficiency desks are 30⅝ in. high and can be furnished in quartered oak or mahogany.

"Y and E" Fire-Wall Steel Files

There is a "Y and E" Fire-Wall File for every kind of business record, furnished in standard upright and counter height sizes.





No. 5804 "Y and E" Fire-Wall Steel File

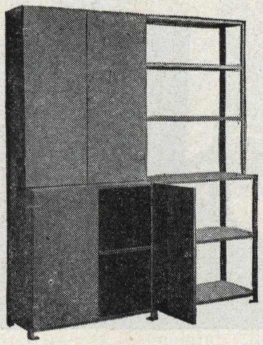
Diagram represents cross section of Fire-Wall method of construction. Note two steel walls, air spaces and double layer of sheet asbestos

"Y and E" Fire-Wall Upright Cabinets are 50¾ in. high without bases and 55¼ in. with bases. Outside depth is 25 1/16 in. Fire-Wall Counter Height Cabinets are 41 3/16 in. high without bases and 45 11/16 in. high with bases. Outside depth is 28 in.

Furnished in olive green and mahogany, or special finish to order.

"Y and E" Steel Shelving

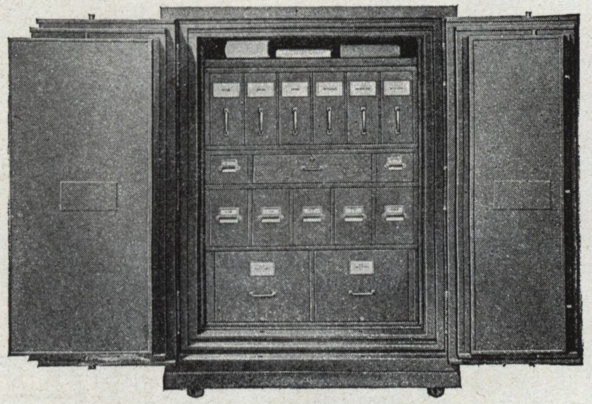
Adaptable for use in factories, offices, stores, garages, gasoline stations, etc. The shelves, doors, backs, partitions, bin fronts, etc., are made of high grade No. 20 gauge furniture steel. Angle iron reinforcements furnished according to load. Uprights are made of No. 14 gauge steel. Shelving is furnished in standard olive green.



This Shows How "Y and E" Steel Shelving Can Be Erected to Meet Varying Needs

"Y and E" Insulated "B" Label Safes

There are five models of "Y and E" Dry Insulated "B" Label Safes to choose from.



No. 2003 "Y and E" Dry Insulated "B" Label Safe

No. 2000—
Exterior: 42¾ in. wide, 72¾ in. high, 29¾ in. deep
Interior: 33⅛ in. wide; 59 in. high, 19 in. deep
No. 2003—
Exterior: 42¾ in. wide, 58¾ in. high, 29¾ in. deep
Interior: 33⅛ in. wide, 45 in. high, 19 in. deep
No. 2012—
Exterior: 42¾ in. wide, 43 11/16 in. high with casters, 29¾ in. deep
43 3/16 in. high without casters
Interior: 33⅛ in. wide, 29 15/16 in. high, 19 in. deep
No. 2013—
Exterior: 26¼ in. wide, 58¾ in. high, 29¾ in. deep
Interior: 16⅝ in. wide, 45 in. high, 19 in. deep
No. 2024—
Exterior: 42¾ in. wide, 65¾ in. high, 37¾ in. deep
Interior: 33⅛ in. wide, 52 in. high, 27 in. deep

Safes are finished in olive green.

Continued on next page

Complete Library Needs

"Y and E" offers a complete line of library equipment as follows:

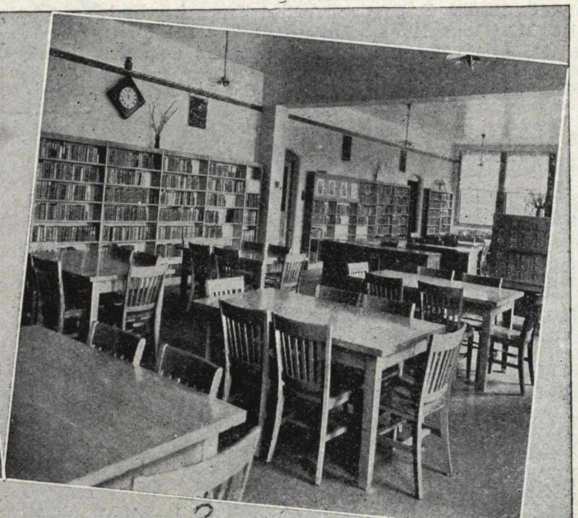
- Charging desks
- Librarians desks
- Tables
- Chairs
- Costumers
- Cards
- Magazine racks
- Newspaper racks
- Shelving
- Dictionary stands
- Bulletin boards
- Filing cabinets
- Filing supplies

Library Planning

The sole function of the "Y and E" Library Service Department is to assist in planning libraries in schools, colleges, institutions and municipalities. This department will gladly work with architects in furnishing complete floor plans.

Write for Library Catalogue.

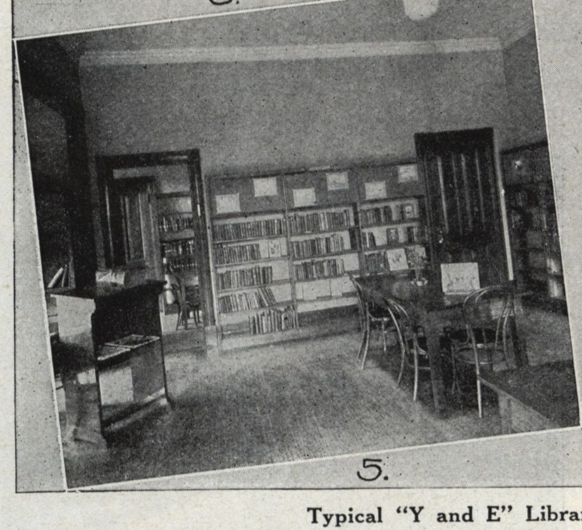
1.



2.

3.

4.



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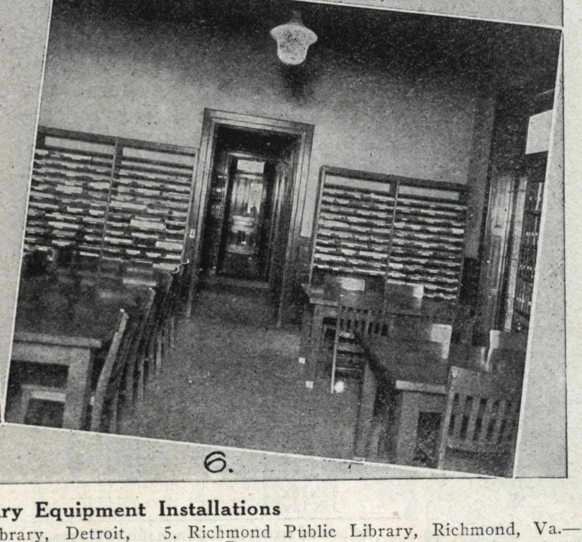


6.

Typical "Y and E" Library Equipment Installations

1. Heughes High School Library, Cincinnati, Ohio
2. Glens Falls High School Library, Glens Falls, N. Y.
3. Moore School Library, Detroit, Mich.
4. Detroit City College Library, Detroit, Mich.
5. Richmond Public Library, Richmond, Va.—Children's Room
6. Richmond Public Library, Richmond, Va.—Periodical Room

DEXTER METAL MFG. CO.

SUCCESSORS TO MERRITT & COMPANY

(Established 1888)

Manufacturers of Steel Lockers and Shelving

10 South 18th Street, PHILADELPHIA, PA.

AGENCIES

AUGUSTA, ME., Brooks E. Carter, c/o Sun Typewriter Exchange Co.
BALTIMORE, MD., John Howard Herrick, 1 East Lee Street
BIRMINGHAM, ALA., Beecroft & Mallory Sales Co., 2022 Fourth Avenue
CAMBRIDGE, MASS., Penn Metal Co., 675 Concord Avenue
NEWARK, N. J., H. G. Walters, 207 Market Street
NEW HAVEN, CONN., A. T. Powell, 341 State Street
PITTSBURGH, PA., Wm. C. Kuhn Sales Agencies, 274 Shady Avenue, E. E.
RICHMOND, VA., Virginia School Supply Co., 1099 First Avenue

Products

Steel Lockers and Shelving.

We also manufacture and install Steel Storage Cabinets, Steel Filing Cabinets, Wire Partitions with Sheet Steel Base, Wire Window and Machinery Guards, Collapsible Steel Gates and Steel Tote Boxes.

Thirty-five Years' Experience at Your Service

We have a competent force of engineers who have had 35 years' experience in the design, fabrication and installation of steel lockers and shelving. They will submit layouts, recommendations and estimates without obligation on your part.

Dexter Steel Lockers

Dexter steel lockers are made of cold rolled steel, in single tier (full height) and double tier (half height), either in banks one row deep or in double rows (back to back).

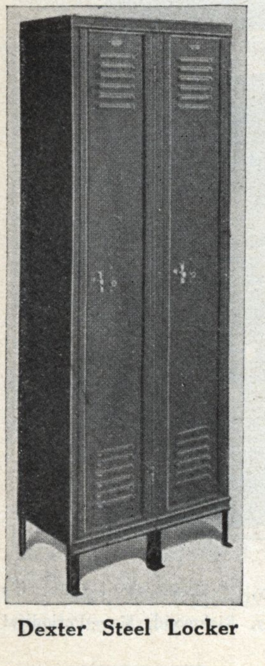
Sides and backs are made of No. 24 gauge steel and reinforced their entire height by 1x1x⅛-in. steel angles. When specified, sides made of expanded metal will be supplied instead of solid sheet steel.

Tops and shelves are made of No. 24 gauge steel. Doors are No. 16 gauge steel, reinforced on all edges, and furnished with either ventilating louvers as illustrated, or with expanded metal.

Bottoms are made of No. 20 gauge steel.

Equipped with top shelf, 3-way locking device, tee handle and master keyed cylinder lock.

Shelf and wall hooks supplied in single tier (full height) lockers; wall hooks only in double tier (half height) lockers.



Dexter Steel Locker

All lockers are regularly supplied with 6-in. legs of 1x1x⅛-in. steel angle. Adjustable shoes permit leveling of lockers on uneven floors.

All Dexter lockers are accurately punched for quickly bolting them together and are regularly finished in olive green baked enamel. Special finishes may be had at additional cost.

STANDARD SIZES OF DEXTER STEEL LOCKERS
(Width x depth x height, in.)

Single Tier	Double Tier
*12x12x60	*12x12x36
*12x15x60	*12x15x36
15x15x60	15x15x36
15x18x60	12x12x42
*12x12x72	12x15x42
*12x15x72	*15x15x42
*15x15x72	....
15x18x72	....
18x18x72	....

*Carried in stock for immediate shipment.

Sizes other than those listed above will be made to order. Write for prices.

Dexter Steel Shelving

A simple, durable, exceptionally strong and fully interchangeable steel shelving that is readily erected by inexperienced workmen with the aid of only a screwdriver. Being quickly disassembled and re-erected, it is readily adapted to changing conditions.

Standard uprights are punched on 1-in. centers for adjustment of shelves, and shelves are punched on 3-in. centers for adjustment of dividers. Standard uprights are 3, 7, 8, 9 and 10 ft. high; 24, 30 and 36 in. wide, and made of No. 20 gauge steel reinforced by 1x⅛-in. flat steel band in front.

Standard shelves are 12, 15, 18 and 24 in. deep, 24, 30 and 36 in. long, and made of No. 16 gauge steel. The 24 and 30-in. widths are used to fill out shelving whose length is not a multiple of 36 in. The nosing of shelves is punched to receive continuous (¾-in. high) card holders.

Backers are flat steel sheets punched for attaching to the rear flanges of the uprights and shelves. They are made in the same heights as the standard uprights and punched at equal distances from top and bottom edges so that they are reversible.

Standard dividers are 6, 9, 12, 15 and 18 in. high by 24, 30 and 36 in. deep. They are made of No. 24 gauge steel, flanged at top, bottom and rear so as to permit bolting to adjoining shelves.

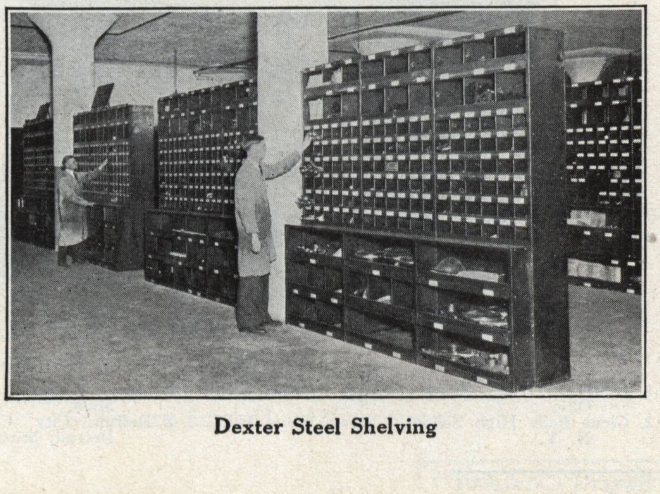
Bin fronts equipped with continuous label holders, when desired, are readily attached to the uprights by means of steel clips.

Counter shelves are also supplied, when desired, as shown in the accompanying illustration.

When specified, we supply hinged doors with locks for any section of shelving.

Standard finish is olive green baked enamel. Special finishes may be had at additional cost.

We also make special steel shelving in accordance with customer's specifications or requirements. Blue prints and estimates submitted on request.



Dexter Steel Shelving

DURABILT STEEL LOCKER CO.

501 Arnold Avenue, AURORA, ILL.

SALES OFFICES IN ALL PRINCIPAL CITIES

Products

Steel Lockers for all purposes.
Steel Storage and Wardrobe Cabinets.
Also Steel Gymnasium Racks.

A complete set of architects drawings showing locker details will be gladly sent upon request.

DURABILT

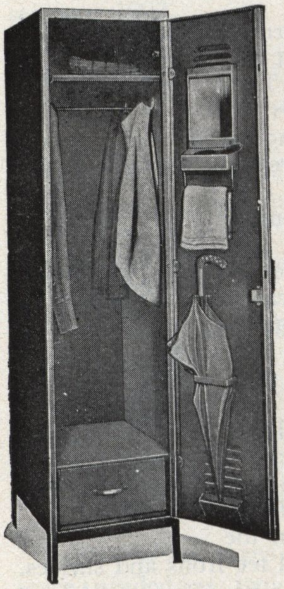
"No Better Built Than Durabilt"

Locker Specifications

Doors—Full cold rolled, patent leveled No. 20 gauge special enameling steel with tubular reinforcement at each vertical edge.

Frames—Uprights, 1x1x⅛-in. hard steel angles; cross members, 1½x¾ in. No. 14 gauge formed steel channels, joined by two $\frac{3}{16}$-in. countersunk rivets at each corner.

Body—Balance of locker made of No. 24 gauge steel.



Durabilt Locker with Mirror and Drawer

Locking Device—Concealed, one-piece type, operated by stamped steel (not cast), straight lift handle, latching automatically when door is closed, 3-point contact on single tier lockers; 2-point on double tier. Padlocking device standard on all lockers.

Locks—Masterkeyed flat key locks with two keys each. Combination locks or padlocks can be furnished when specified.

Hinges—Full looped, 5-knuckle "strap" hinge type.

Legs—Front legs integral with frame. Adjustable feet furnished. Rear legs also adjustable.

Tops—All lockers have flat tops unless sloping tops are specified.

Ventilation—Standard louvre perforations in doors, extra large 6 in. wide, ⅜ in. deep.

Equipment—Single tier, one hat shelf 9 in. from top; double tier, none. 12-in. wide lockers, one double prong ceiling and three single prong side hooks. Wider lockers, one double prong ceiling and four single prong side hooks.

Coat rods, mirrors, comb trays, towel rods, umbrella racks, drip pans, golf ball trays, golf bag chains, drawers and other special equipment to order.

Finish — Standard, olive green baked enamel. Other colors at reasonable extra cost. Coat hooks galvanized. Bolts and nuts parkerized. All outside bolt heads are slotless type.

Number Plates—Polished brass with black filled ½-in. numerals.

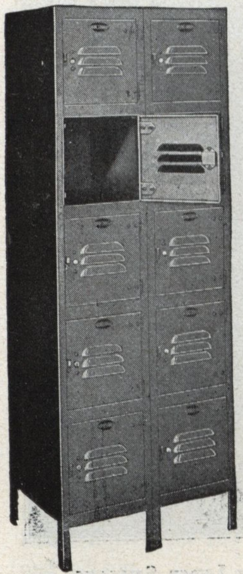
Sizes—Widths: 12, 15, and 18 in.; depths: 12, 15, 18, 21 and 24 in.; heights: 60 and 72 in. single tier; 36 and 42 in. double tier.

Over-all height with standard legs is 6 in. greater than nominal heights given above.

Box Locker Specifications

Box lockers conform in general with specifications of standard locker with following exceptions:

Doors—Full cold rolled, patent leveled No. 16 gauge special enameling steel, flanged on all edges.



Durabilt Box Lockers
12x12x12 in.

Frames—Same as standard lockers with No. 20 gauge intermediate channel cross members between door openings.

Combination Handle and Padlock Attachment—All box lockers are furnished with neatly formed stamped steel (not cast) straight-pull curl handle combined with padlock attachment. When doors are closed, spring clips keep them shut.

Equipment—No hooks or shelves.

Sizes—Widths: 12, 15 and 18 in.; depths: 12, 15, 18, 21 and 24 in.; heights: 12, 15, and 18 in. Usually furnished in tiers four to six high.

Also combinations of lockers and box lockers in all sizes.

Storage and Wardrobe Cabinet Specifications

Doors—Each door formed complete from one piece full cold rolled patent leveled No. 20 gauge enameling steel. Doors have a tubular reinforcement on inside adjacent to each vertical hemmed edge and a right angle flange adjacent to each horizontal hemmed edge.

Frame—A strong, rigid door frame is made by interlocking the top, bottom, and sides. Frame is offset where doors overlap, assuring a close fit, giving dustproof and fire resisting features.

Body—All parts made of No. 20 gauge special enameling steel. Front edge of sides, forming vertical part of door frame, is made of a tubular reinforcement 1½ in. wide by 1 in. deep. This reinforcement is slotted on inside to form front support for shelves. Sides have right angle flanges at rear for bolting to back and a channel formation at upper edge for bolting to top. No bolt heads appear on exterior surface of either sides, top or bottom.

Back—Made of single piece of No. 20 gauge steel having a channel formed at each vertical edge which is slotted to support shelves. Slots are completely protected and covered at rear by 1¼ in. right angle flange of sides extending full height of back.

Top—One piece No. 20 gauge steel formed at front with 3-in. channel offset to form upper part of door frame. Remaining three edges have right angle flange for bolting to back and sides.

Bottom—Formed of one piece No. 20 gauge steel with 4-in. channel at front continuing to floor, making closed base. Bottom serves as lower shelf and is offset at front where doors overlap. Special die formed clips welded on inner surface of sides provide means for attaching bottom. Each of four corners at bottom provided with "dome of silence" so cabinet can be moved easily without scratching or marring floor.

Durabilt Storage Cabinet
No. CS-102. Size, 36x18x72 in.

Locking Device—Special heavy triple action locking mechanism, engaging at 3 points, operated by "safe" type handle. Vertical locking bars are concealed in tubular reinforcement, engaging reinforced holes at top and bottom of door frame. Heavy bolt locks doors at center.

Locks—Combination cabinet lock, grooved key or flat key types with two keys each can be furnished.

Hinges—Three on each door. 2½ in. wide by 4 in. long, 5-knuckle special butt type with edges neatly beveled. Each hinge attached to door by means of reinforcement plate welded to inside. This eliminates conspicuous bolt heads on exterior. The design and arrangement of hinges permit the doors to open all the way back against sides so they do not take up aisle space.

Storage Shelves—Four ordinarily furnished. Made of No. 20 gauge steel with tubular reinforcement full width at front edge and one adjacent to hemmed edge at rear which gives maximum strength and rigidity. Corners at rear and die formed clips at front engage in shelf support slots which permit adjusting on 1-in. centers without use of tools.

Wardrobe Shelf—Made of No. 20 gauge steel with tubular reinforcement full width at front edge and one adjacent to hemmed edge at rear. Left and right ends of shelf have wide right angle flange which in conjunction with flange welded at rear furnishes support for coat rod and hooks. Corners at rear and die formed clips at front engage in shelf support slots and permit adjusting on 1-in. centers.

Wardrobe shelf "assembly" consists of one shelf, coat rod and nine single prong coat hooks. Storage and wardrobe shelves interchangeable and adjustable to any height.

Interior Equipment—Following can be furnished to order: full length vertical partition; narrow adjustable shelves for attaching to same; vertical pigeonhole dividers in 6, 9 and 12-in. heights; bin fronts; sliding trays for printing cuts; all of which are easily adjustable to suit individual requirements for economical storage space.

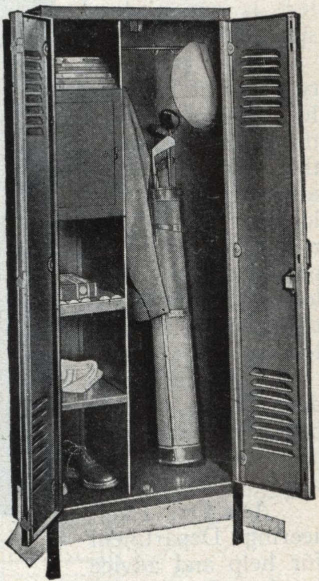
Finish—Our "Satin Texture" olive green baked enamel, a shade that harmonizes with any interior trim. Special colors only when ordered.

Sizes—The standard size is 36 in. wide, 18 in. deep, by 72 in. high (78 in. over all). This size is stocked by factory. Other sizes can be furnished to order, subject to delay in shipment. (All cabinets have closed bases.)

Golf Locker Specifications

In general, the design, construction, material and finish of illustrated type, are same as our standard single tier lockers except the double doors are hinged to swing right and left. Provided with vertical partition, one standard shelf, one golf ball shelf, coat rod, golf bag chain, and one small box compartment fitted with frame and hinged door which can be locked, giving added protection to jewelry and other valuable personal effects.

Golf lockers can be furnished in various sizes and styles with or without special equipment such as—drawer at bottom, extra shelves, vertical dividers, coat rods, mirrors, comb trays, towel rods, umbrella racks, drip pans, golf ball trays, golf bag chains, single or double doors, etc. Special colors furnished when ordered.



Durabilt Golf Locker with Double Doors

FEDERAL STEEL FIXTURE COMPANY

4545 West Homer Street
CHICAGO, ILL.

TELEPHONE
BELMONT 1207

Products

FEDERAL STEEL LOCKERS, STEEL SHELVING and RACKS.

Also manufacturers of Bench Legs, Blue Print Cabinets, Boxes, Bins, Filing Cabinets, Metal Furniture, Hospital Equipment.

Federal Unit Steel Lockers

Simple in design, with all parts thoroughly standardized, interchangeable and uniform. The welded angle steel frame and special overlap door absolutely guarantee against door troubles. The Federal locker has fewer parts, erects more easily and is clean cut, handsome and strong.

Specifications—***Doors***—Full pickled, cold rolled steel, No. 18 U. S. gauge, have edges flanged and reinforced at lock edge with ¾-in. angle steel. The door can not bind.

Locking Device—The locking device is automatic. It operates inside the heavy ⅛-in. angle locker frame, thus removing all moving parts from the door itself. The overlap of the door prevents tampering with this device.

Frames—Locker fronts are hard steel angles, 1x1x⅛ in. electrically welded.

Body—Cold rolled, pickled No. 24 U. S. gauge steel, formed and flanged to reinforce.

Castings—Malleable with rustless finish.

Ventilation—Six embossed louvers 5x¼ in. near top and bottom of doors.

Standard Sizes—Any combination of dimensions as listed:

12 in. wide,	12 in. deep,	36 in. high,	on 6-in. legs
15 in. wide,	15 in. deep,	42 in. high,	on 6-in. legs
18 in. wide,	18 in. deep,	48 in. high,	on 6-in. legs
		60 in. high,	on 6-in. legs
		72 in. high,	on 6-in. legs

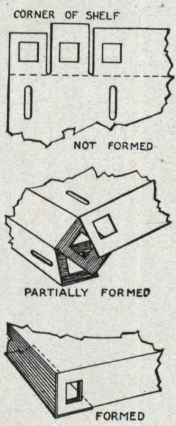
Note: 36-in. and 42-in. sizes made 2 lockers high.

Finish—Two-coat olive green or pigment black enamel baked at a temperature of 300° F.

Federal Adjustable Steel Shelving

Federal steel shelving is designed for "carrying strength." A maximum load; increased capacity; elimination of unnecessary, non-weight carrying rack material.

Strength of Design—Federal steel shelving and racks centralize their carrying strength at the vital points. The verticals have their maximum strength at the shelf corners.



SHELF CORNER CONSTRUCTION
(Patented)

The shelves, specially formed, have triple strength in the front and rear flanges and at the corners. They are locked to the upright members by an ingenious attachment, providing for instant adjustment and increased strength. Shelf adjustment and erection are had with a simple hammer blow.

Our specially formed and locked No. 18 U. S. gauge shelf has a carrying strength in excess of the conventional No. 16 U. S. gauge shelf, lacking our construction.

The intermediate verticals, etc., have no raw, exposed, tearing edges.

The open type rack, the closed shelving, the bin members, the box compartment, or the hinged or sliding door members, all build up from the initial units, consisting of vertical tee irons and shelves.

Specifications—The standard shelving has uprights of 1½x1½x⅛-in. tees, with No. 20 U. S. gauge sheet steel sides, backs and intermediate verticals.

The shelves and bin fronts are of No. 18 U. S. gauge steel.

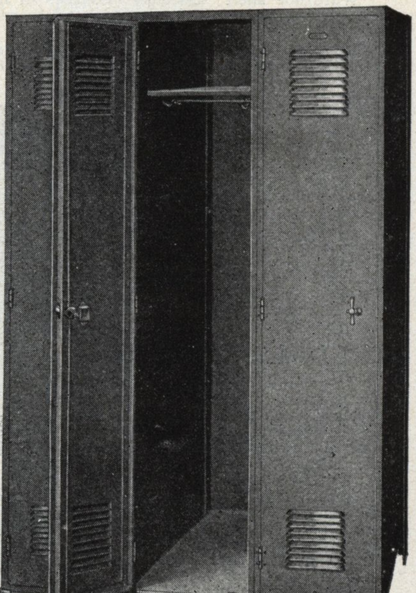
Space Saver Locker

Of particular interest to the architect is our Federal space saver locker.

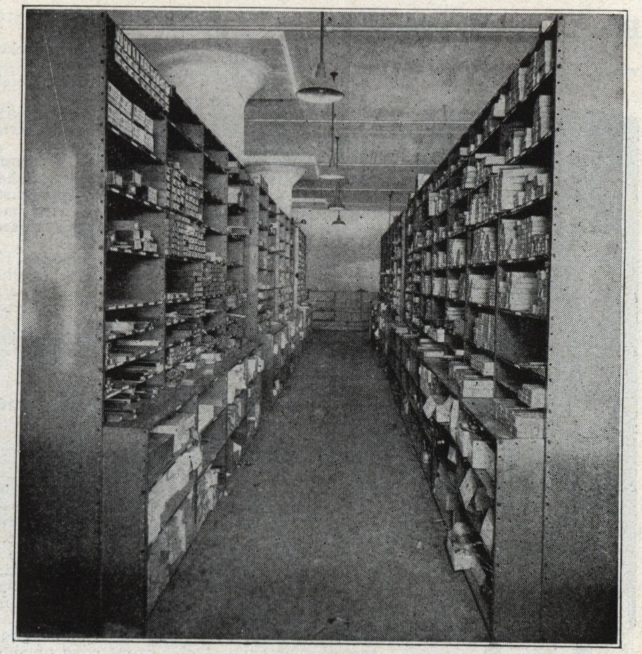
By providing two separately locked hat compartments at the top and dividing the lower section into two separately locked coat compartments, two users are provided with ample locker facilities in the space of a single locker.

An ingenious device locks both the hat and coat compartment with one lock.

Ask Our Engineering Department for help and advice in the planning of locker requirements.



FEDERAL STEEL LOCKERS
Note spacing of malleable screw adjustment legs



STANDARD FEDERAL SHELVING WITH LEDGE SHELVES

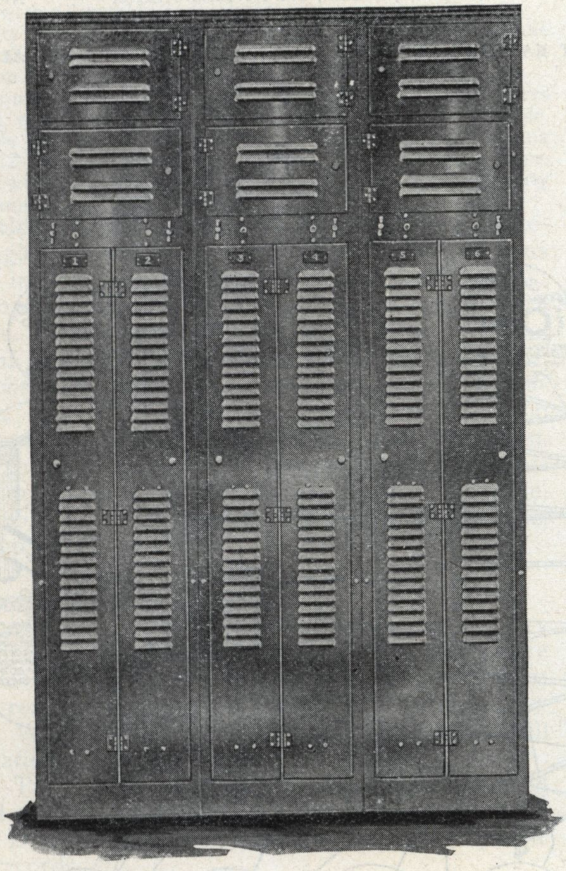
THE HART & HUTCHINSON CO.

Manufacturers of Steel Lockers

NEW BRITAIN, CONN.

BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 501 Fifth Avenue
PHILADELPHIA, PA., Real Estate Trust Building
CHICAGO, ILL., 73 East Lake Street
BOSTON, MASS., 141 Milk Street



Products

STEEL LOCKERS: The Storite.

For Steel Toilet Partitions, see page 1992.

Construction

A new scientifically designed steel locker for the proper storage of clothing using a minimum floor space.

One person uses top box locker and left-hand coat compartment, one locking bar and one lock controlling these two compartments.

The lower box locker and right-hand coat compartment are used by another person with one bar and lock control.

This locker saves 50% of space needed as two persons are served in the space formerly used by one. The Storite occupies 158 sq. in. of floor space per person.

Equipment

Solid brass pin tumbler paracentric key lock, two keys per lock and master keyed. Solid brass handles and number plates. Coat hanger rod, and special shape hooks and coat hanger.

Optional Equipment

An umbrella loop and rustproof drip pan.

Suggested Specifications

Furnish and install as shown on plans approximately ....Storite Units or Combination Steel Lockers of design to accommodate two persons per unit, each unit consisting of two box compartments, each 15 in. wide, 21 in. deep and 9 in. high, both placed above two coat hanging compartments each 7½ in. wide, 21 in. deep, 55 in. high, all inside dimensions. Height over all, 74½ in.

This design provides the upper box compartment and left-hand coat compartment for the effects of one person; the lower box compartment and right-hand coat compartment for the second person.

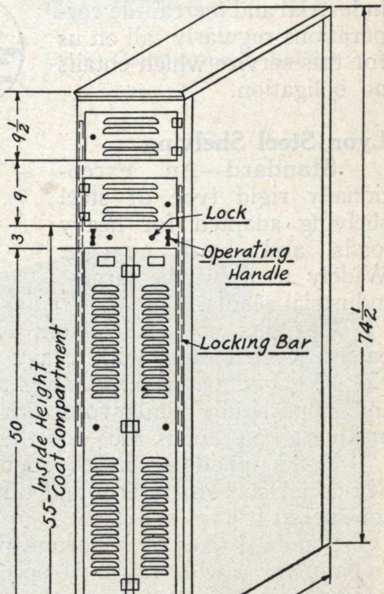
Construction—Front framing for door to be of solid corner construction made by blanking door plates out of solid stock with dies to procure a standard size and shape of door and opening. Both door and frame to be 16 gauge cold rolled steel properly flanged or reinforced for proper stiffness. Balance of locker to be of 22 gauge cold rolled steel also suitably flanged and reinforced. The locking mechanism to consist of two concealed locking bars, one of which shall control and securely fasten at one movement the upper box compartment and left-hand coat hanging compartment; other bar to secure the lower box compartment and right-hand coat compartment. Each locking bar operated by a cam action with solid brass "T" shaped handle riveted thereto and controlled by a solid brass, pin tumbler type, paracentric, spring bolt lock. Two keys to each lock and master keyed. Provide a 3 in. wide frame section between box compartments and coat hanging compartments to carry such cam action, handle and lock.

Equipment—Each coat hanging compartment to be provided with a coat hanger rod and two hooks attached to underside of top. Also provide one wooden coat hanger of design to obtain full use of hanging space. Provide each coat compartment door with a solid brass number plate, numbered as later designated.

Optional Equipment—*Provide on the inside of each coat compartment door an umbrella loop and rustproof drip pan.*

Finish—To be olive green, oven baked enamel, applied after parts have been thoroughly scrubbed and cleaned with benzine.

These "Storite" Units to be made by THE HART & HUTCHINSON COMPANY of New Britain, Connecticut.



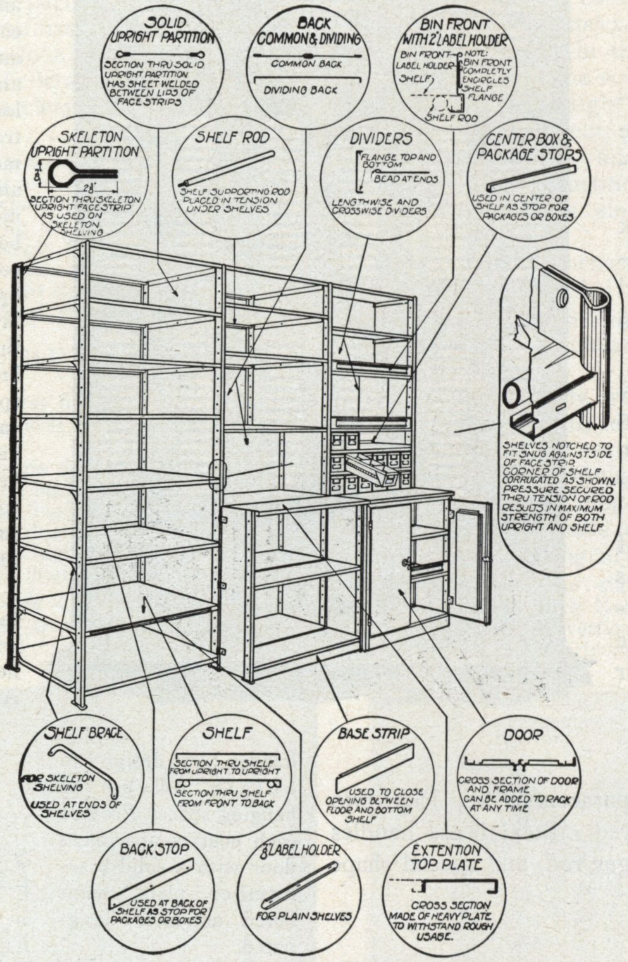
LYON METALLIC MANUFACTURING CO.

Manufacturers of Steel Shelving, Lockers, Boxes, Cabinets and General Steel Equipment

AURORA, ILL.

CHICAGO, ILL., 230 E. Ohio Street
DETROIT, MICH., 1950 Penobscot Building
ROCHESTER, N. Y., 61 South Avenue
PITTSBURGH, PA., 601 Oliver Building
LOS ANGELES, CAL., 337 South Anderson Street
BOSTON, MASS., 161 Devonshire Street
PHILADELPHIA, PA., 519 Bulletin Building
CLEVELAND, OHIO, 923 Guaranty Title Building
NEW YORK, N. Y., 1227 Canadian Pacific Building

DIRECT FACTORY REPRESENTATIVES IN FORTY PRINCIPAL CITIES


SOLID UPRIGHT PARTITION
SECTION THRU SOLID UPRIGHT PARTITION HAS SHEET WELDED BETWEEN LIPS OF FACE STRIPS
BACK COMMON & DIVIDING
COMMON BACK
DIVIDING BACK
BIN FRONT WITH 2" LABELHOLDER
BIN FRONT
LABEL HOLDER
SHELF
NOTE: BIN FRONT COMPLETLY ENCIRCLES SHELF FLANGE
SHELF ROD
SKELETON UPRIGHT PARTITION
7/8"
2 3/8"
SECTION THRU SKELETON UPRIGHT FACE STRIP AS USED ON SKELETON SHELVING
SHELF ROD
SHELF SUPPORTING ROD PLACED IN TENSION UNDER SHELVES
DIVIDERS
FLANGE TOP AND BOTTOM
BEAD AT ENDS
LENGTHWISE AND CROSSWISE DIVIDERS
CENTER BOX & PACKAGE STOPS
USED IN CENTER OF SHELF AS STOP FOR PACKAGES OR BOXES
SHELVES NOTCHED TO FIT SNUG AGAINST SIDE OF FACE STRIP. CORNER OF SHELF CORRUGATED AS SHOWN. PRESSURE SECURED THRU TENSION OF ROD RESULTS IN MAXIMUM STRENGTH OF BOTH UPRIGHT AND SHELF
SHELF BRACE
FOR SKELETON SHELVING
USED AT ENDS OF SHELVES
SHELF
SECTION THRU SHELF FROM UPRIGHT TO UPRIGHT
SECTION THRU SHELF FROM FRONT TO BACK
BASE STRIP
USED TO CLOSE OPENING BETWEEN FLOOR AND BOTTOM SHELF
DOOR
CROSS SECTION OF DOOR AND FRAME CAN BE ADDED TO RACK AT ANY TIME
BACK STOP
USED AT BACK OF SHELF AS STOP FOR PACKAGES OR BOXES
7/8 LABELHOLDER
FOR PLAIN SHELVES
EXTENTION TOP PLATE
CROSS SECTION MADE OF HEAVY PLATE TO WITHSTAND ROUGH USAGE.

Lyon Standard Shelving

The parts illustrated are standard, and more may be added at any time.

Products

Lyon Steel Shelving and Storage Racks; Steel Lockers; Cabinets and general Storage Equipment and the nationally advertised line of Lymetco Steel Cabinets and Tables.

Also manufacturers of Blue Print Cabinets; Steel Boxes, Tool Boxes and Bench Drawers; Steel Benches, Tables, Factory Desks, Steel Enclosure Panels.

Co-operative Service

The District Offices of this company are thoroughly equipped to advise and co-operate with architects and engineers in the layout and design of equipment for economical and efficient operation.

Many of the largest industrial and mercantile corporations regularly call on us for this service which entails no obligation.

Lyon Steel Shelving

Standard—An exceptionally rigid type of steel shelving adapted for heavy loads and hard usage. Widely used by the largest industrial plants.

Uprights are made from No. 20 U.S.S. gauge patent leveled steel with heavy rolled face strips of No. 12 gauge material. Shelves are No. 16 gauge steel and supported by tubular rods with shouldered screw ends, making a continuous tube rod the length of the rack.

Backs, dividers, boxes, doors and a wide variety of special shelves, inserts and other parts are available for special uses.

Standard sizes of important parts are given in next column, for a wide range of special parts is carried in stock for immediate shipment.

A special bulletin covering this product is available on request.

Commercial—Adapted for use where an economical fireproof type of shelving is required for medium or light loads.

In general use by the largest mercantile establishments. Changes in arrangement and position of shelves are easily made and the complete shelving can be erected by unskilled labor, a screwdriver being the only tool used. Uprights are No. 22 U.S.S. gauge patent leveled steel with rolled "tee" face strips, shelves are No. 18 gauge. Sizes of parts are as given below and a large stock is carried. Bulletin on request.

Sizes of Standard Parts of Standard and Commercial Shelving—All sizes in inches:

Upright Partitions—*Heights*—36, 42, 60, 72, 84, 96, 108 and 120.

Depths—12, 15, 18, 24, 30 and 36.

Skeleton Uprights—Same as Upright Partitions.

Shelves—*Widths*—24, 30, 36 and 48.

Depths—12, 15, 28, 24, 30 and 36.

Backs—*Heights*—Same as Upright Partitions.

Widths—24, 30, 36 and 48.

Crosswide Dividers—*Heights*—6, 9, 12, 15, 18, 21, 24 and 27.

Depths—12, 15, 18, 24, 30 and 36.

Lengthwise Dividers—*Heights*—6, 9, 12, 15, 18, 21, 24 and 27.

Lengths—24, 30, 36 and 48.

Bin Fronts—*Widths*—24, 30, 36 and 48.

Heights—1, 2, 3, 4 and 6.

Half Shelves—*Widths*—24, 30, 36 and 48.

Depths—6, 9, 12, 15 and 18.

Dividing Backs—*Heights*—36, 42, 60, 72, 84, 96, 108 and 120.

Widths—24, 30, 36 and 48.

Labelholders—*Lengths*—24, 30, 36 and 48.

Heights—½ and ⅞.

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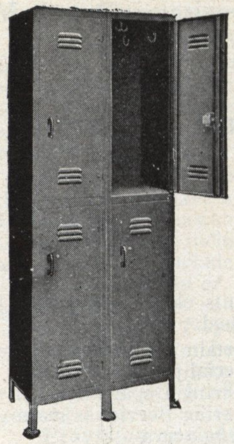
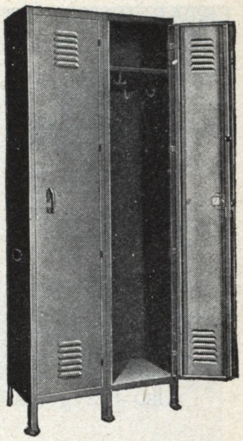


Lyon Double Tier Lockers



Lyon Single Tier Lockers

Lyon Steel Lockers

Lyon steel lockers are built in a wide range of sizes and designs to meet every requirement of the industrial, commercial and institutional fields. Large manufacturing facilities and a well organized erection department insure the prompt and satisfactory handling of installations of any size.

Specifications and Equipment—Doors made from No. 20 U.S.S. gauge furniture steel with double integral channel reinforcement, louvered or round hole ventilation. Door frames are of hard steel angles with full welded corners; front legs are extensions of upright angles used in door frames; each leg equipped with adjustable foot plates.

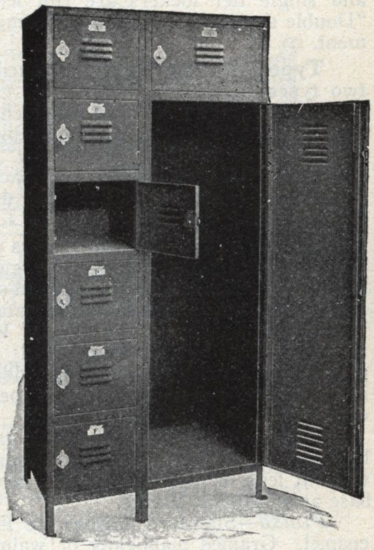
Gravity locking device actuated by straight pull handle equipped with padlock attachment. Locking device engages at top, bottom and center.

Backs and sides are No. 24 U.S.S. gauge steel. All lockers assembled with binder bolts not removable from the outside.

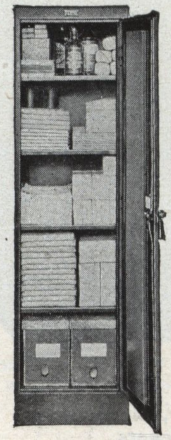
Double prong ball coat hook in all lockers; 2 single prong hooks in 12-in. lockers, 3 in all others. Etched aluminum number plates with black enamel figures. Lockers finished in quality baked enamel.

Sectionizing—Lockers assembled in sections as desired, single row or back to back. In laying out sections allow ¾ in. over nominal length for bolt heads, etc.

Compartment Lockers—Used where locker space is limited. They are especially applicable when the effects of women employees must be provided for. Large door is controlled from inside of any small compartment. Carried in stock equipped with combination or flat key locks. Finish is olive green. Locker is 20 in. deep, 36 in. wide, 78 in. high. Six small compartments 15 in. wide, 20 in. deep, 12 in. high; one 21 in. wide, 20 in. deep, 12 in. high; large compartment 21 in. wide, 20 in. deep, 60 in. high.



Lyon Compartment Locker



Lymetco Won-dor Cabinet

Lymetco Steel Cabinets

Lymetco steel cabinets are designed to meet every storage need of shop, office or home. The shelves are adjustable on 1-in. centers, and extra shelves may be obtained ready for immediate use.

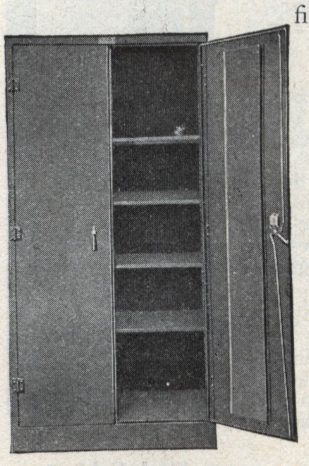
The Won-dor can be used as a wardrobe as well as for stationery or other storage.

The Tu-dor can be fitted with hooks and coat rod and used as a clothes locker.

The Desk-hi is admirably adapted to handle valuable papers, records, etc.

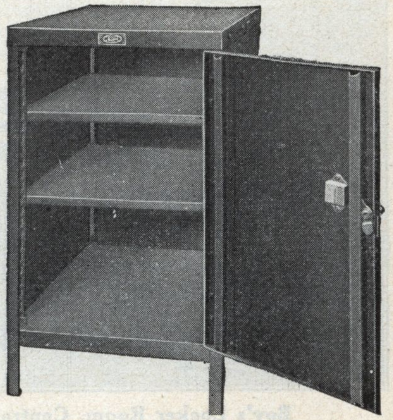
The Lymetco table is a sturdy steel table, adaptable to a great variety of uses. With the exception of the linoleum top, it is made of steel throughout. Its handsome appearance makes it a welcome item in the president's office, the conference or reception room, or wherever a table is required.

All Lymetco steel products can be furnished in Lymetco green, mahogany, oak, walnut or ivory gray finishes.



Lymetco Tu-dor Cabinet

Lymetco Table



Lymetco Desk-hi Cabinet

ESTABLISHED 1873

FRED MEDART MANUFACTURING CO.

Steel Lockers, Steel Shelving, Gymnasium Apparatus and Playground Apparatus

ST. LOUIS, MO.

SALES OFFICES: NEW YORK, N. Y.; CHICAGO, ILL.; SAN FRANCISCO, CAL.

Products

STEEL LOCKERS; STEEL CABINETS; GYMNASIUM APPARATUS; STEEL SHELVING and BOOK RACKS.

Also Playground Apparatus, Racks and Bins.

Medart Steel Lockers

Standard Sizes—Locker dimensions have been standardized to include about 12 sizes, the most popular of which are:

DOUBLE TIER		SINGLE TIER	
12x12x36 in.	12x12x42 in.	12x12x60 in.	12x15x72 in.
12x15x36 in.	12x15x42 in.	12x15x60 in.	12x18x72 in.
		12x18x60 in.	15x15x72 in.

Double tier lockers are half length and single tier lockers are full length. "Double tier locker" means one compartment.

Types—Lockers are furnished in two types:

(1) "Double row" type in which one back serves two lockers, as shown by the illustration below; (2) "Single row" type in which the locker stands with back to the wall or is recessed so that the doors are flush with the wall face.

Specifications—*Metal*—Doors and door frames made of No. 16 U. S. gauge, pickled, re-rolled and patent leveled sheet steel. Balance of locker No. 24 gauge.

Doors, Locking Device and Ventilation—Doors are reinforced and paneled; self-closing locking device. Lockers are either louvered or perforated for ventilation.

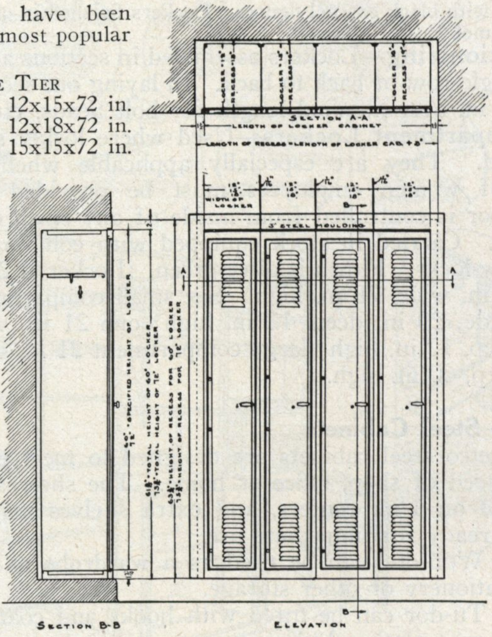
Legs and Base—Lockers ordinarily built with 7-in. legs. Can be furnished without legs or with extra 4-in. cabinet base at additional charge.

Finish—Standard finishes are French gray and olive green enamel. Grained mahogany or walnut can also be furnished.

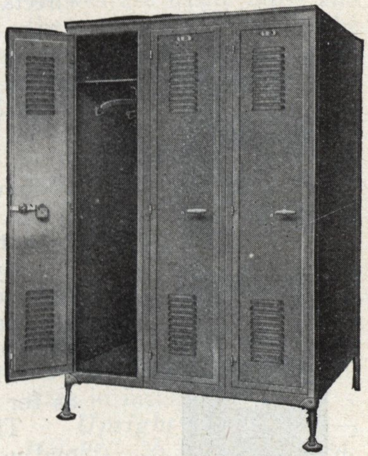
Equipment—Lockers 12 and 15 in. deep have 3 double pronged coat hooks. Lockers more than 15 in. deep have 5 coat hooks. All coat hooks are of malleable iron, galvanized. Single tier lockers are provided with hat shelf. All lockers equipped with brass number plates. Handles made of non-rusting aluminum alloy. All bolts and nuts electro-galvanized. Key or combination locks can be furnished.

Planning Locker Installations—Certain conditions often arise which make it desirable to lay out special plans and in such cases the assistance of the Medart Engineering Department will usually be found helpful. Medart Engineering Service is maintained for the benefit of architects and engineers.

Recessed Lockers—In planning the installation of recessed lockers special precautions must be followed with reference to top, bottom and side clearances—otherwise there is a possibility of allowances not being sufficient to permit proper installation. The elevation shown on this page, in combination with the horizontal and vertical cross sections, will furnish the information generally required for this class of installation.


SECTION A-A
LENGTH OF LOCKER CABINET
LENGTH OF RECESS = LENGTH OF LOCKER CAB. + 3"
WIDTH OF LOCKER
3" STEEL MOULDING
60" 72" "SPECIFIED HEIGHT OF LOCKER
61⅛" TOTAL HEIGHT OF 60" LOCKER
73⅛" TOTAL HEIGHT OF 72" LOCKER
63⅛" HEIGHT OF RECESS FOR 60" LOCKER
75⅛" HEIGHT OF RECESS FOR 72" LOCKER
A
B
SECTION B-B
ELEVATION

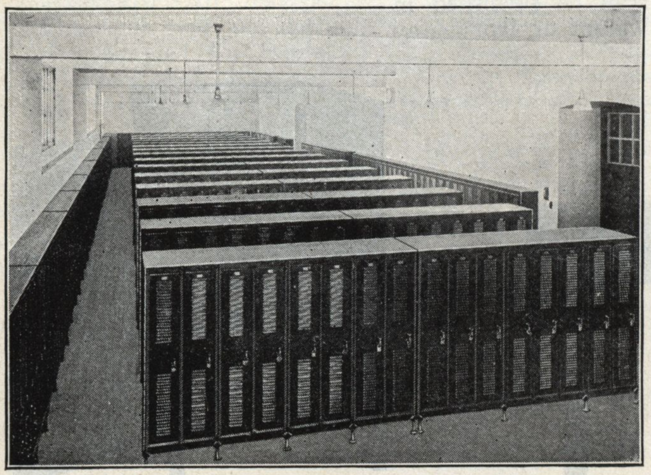
Typical Cabinet of Single Tier Lockers Recessed in Wall



Single Tier, Single Row Lockers

Catalogue—All architects and designing engineers should have a copy of Medart Catalogue "A-9." It is filled with interesting information on Medart steel lockers and locker installation.

Mailed on request to any one interested.



Boy's Locker Room, Central High School, Washington, D. C.

Medart Steel Cabinets

Standard Sizes—*Double Door*—35x18x72 in.; 35x18x60 in.; 35x24x72 in.

Single Door—18x18x60 in.; 24x18x72 in.; 18x24x72 in.

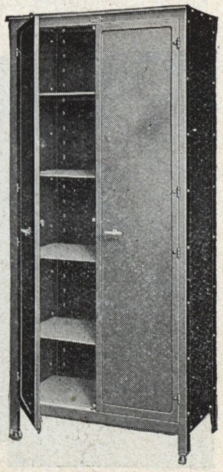
Specifications—Doors and frames No. 16 U. S. gauge, pickled and patent leveled sheet steel; balance of cabinet No. 24 gauge.

Doors are reinforced. All double door cabinets equipped with locking device on one door and handle on both doors. Handles are of aluminum alloy, die cast, dull nickel finish. Legs are adjustable.

Each cabinet is equipped with four shelves.

Finishes—All cabinets finished in two coats of enamel, baked on separately at high temperature. Finished in olive green, French gray, grained mahogany or grained walnut.

Catalogue—Ask for "C-5."



Steel Cabinet

Continued on next page

Medart Gymnasium Plan Service

The Medart Gymnasium Plan Service is maintained specially for architects and engineers. It is not a commercial service but is freely extended to any one who requires it. In some cases, architects and engineers wish information on only specified subjects, while in others we are called on to furnish complete specifications and plans.

Planning a Gymnasium—To further extend the value of this service, we have collected and published all the important features of Gymnasium design under the heading "Planning a Gymnasium," and included it in our Catalogue L-3. "Planning a Gymnasium" includes such important suggestions as these:

Co-ordination of Various Departments—The gymnasium locker room, baths and swimming pool.

Location of Department of Physical Training—A consideration based on health conservation from every angle.

Size and Height of Gymnasium—Considers the general requirements which affect the size, location of running tracks, general dimensional requirements, etc.

Provision for Attachment of Suspended Apparatus—Roof trusses, ceiling fixtures for box trusses, reinforced concrete construction, etc.

Spectators' Galleries—

Auxiliary Gymnasium—Points out the advantages of an auxiliary gymnasium, general practices, location, etc.

Storage Room—A discussion of the space usually provided for storing gymnasium apparatus when it is desired to clear the gymnasium floor.

Lighting, Heating and Ventilation—The various phases on these important subjects are considered from all vital angles. The distribution of light, placing of radiators and ventilator openings, ventilating fans and similar items are discussed in detail.

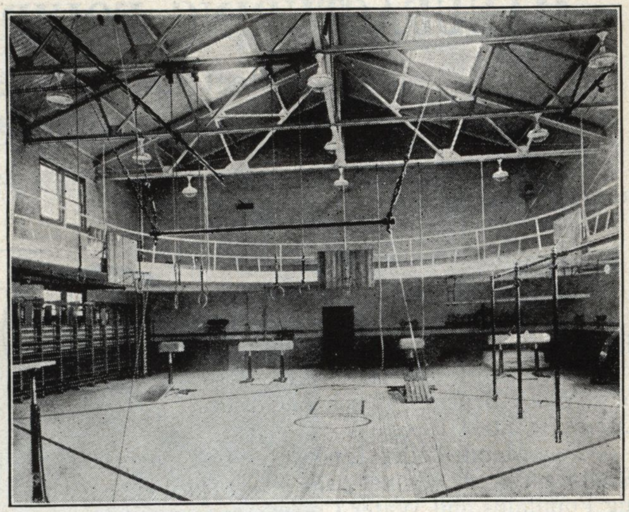
Inside Finish—A discussion of the various wall and floor finishes commonly used.

Running Tracks—Various features of design and construction are outlined, such as planning curvature, banking, etc.

Other Subjects—Aside from the partial outline given above, "Planning a Gymnasium" treats with equal detail every possible phase of gymnasium planning—the various types of apparatus, whether floor, suspended or wall type, nets, mats, special exercise rooms, bathing department, swimming pools, locker rooms, massage rooms, etc.

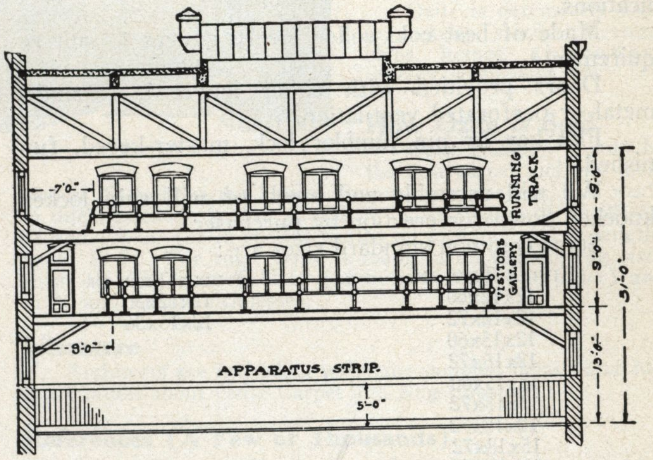
Experience—The Medart Gymnasium Planning Service and the collected data "Planning a Gymnasium" are the result of 50 years of concentrated experience in building gymnasium apparatus and planning adequate gymnasium installations.

Catalogue—Write for "Planning a Gymnasium" and Catalogue "L-3" if interested in gymnasium planning. They will be of wonderful assistance to you.



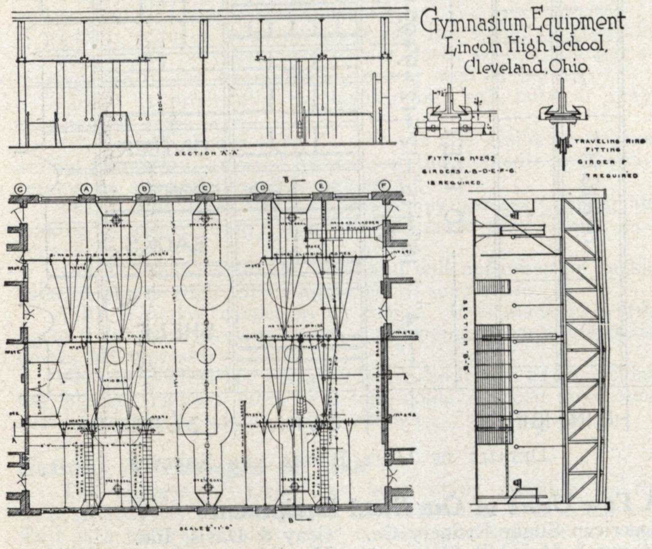
Typical Gymnasium Interior, Showing Apparatus Suspended from Roof Trusses

From "Planning a Gymnasium"



Cross Section Through Y. M. C. A. Gymnasium 60x100 ft., with Visitors' Gallery and Running Track Above

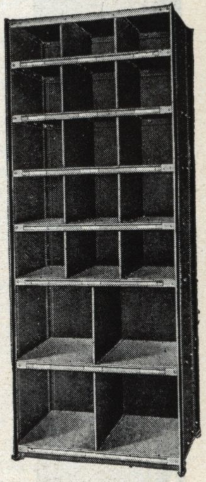
For similar details, see the book "Planning a Gymnasium"



Plan of Apparatus Layout for Gymnasium

One of the many layouts shown in the book "Planning a Gymnasium"

Medart Steel Shelving and Book Racks



Medart steel shelving is made up of standardized units which can be assembled in unlimited variety of storage racks. All units are finished in two coats of enamel, each coat baked on separately at high temperature.

Engineering Service—A special engineering department is maintained to prepare plans and specification for architects and engineers. This service is freely extended to anyone requiring it.

Catalogue—For complete information on Medart steel shelving and book racks, ask for Catalogue S-2, a 100-page bound book profusely illustrated.

MANUFACTURING EQUIPMENT & ENGINEERING CO.

Steel Lockers, Cabinets and Shelving

FRAMINGHAM, MASS.

BRANCHES

BOSTON, MASS.
NEW YORK, N. Y.
PHILADELPHIA, PA.
DETROIT, MICH.
CLEVELAND, OHIO
BUFFALO, N. Y.

Products

Steel Lockers and Cabinets.

Steel Shelving, Racks and Bins.

Also Steel Stools, Chairs, Tables, Work Benches, Bench Legs and Drawers; Steel Boxes.

METAL
MEECO
PRODUCTS
TRADE-MARK

For Metal Toilet Enclosures, see page 1993; for Sanitary Washbowls, see page 2063; for Sanitary Drinking Fountains and Water Coolers, see page 2060.

Steel Lockers

Standard lockers of unusual strength and stability built in a variety of types and sizes to meet all general requirements. Special lockers built to customer's specifications.

Made of best cold rolled steel; gauges to suit requirements.

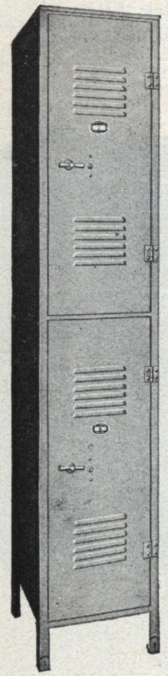
Doors provided with either louvered, expanded metal or perforated ventilation.

Flat key or pin tumbler lock, master-keyed, furnished.

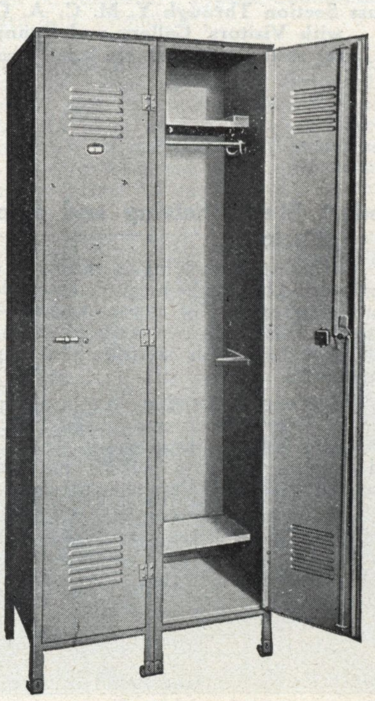
We will assemble and erect, or will ship lockers knocked down for erection by purchaser.

Some common standard sizes are:

Single Tier, in.	Double Tier, in.
12x12x60	12x12x36
12x12x72	12x15x36
12x15x60	
12x15x72	
15x15x60	
15x15x72	
12x18x72	
15x18x72	
18x18x72	



Double Tier Locker



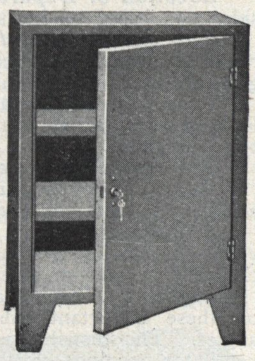
Single Tier Locker
Golf club type

When making inquiries, please state: (1) Size; (2) height; (3) number required; (4) exact arrangement in batteries; (5) color; (6) whether wanted erected by us or shipped knocked down to be erected by purchaser.

Steel Storage Cabinets

Many standard types and sizes carried in stock for all storage purposes.

Special cabinets built to specifications.



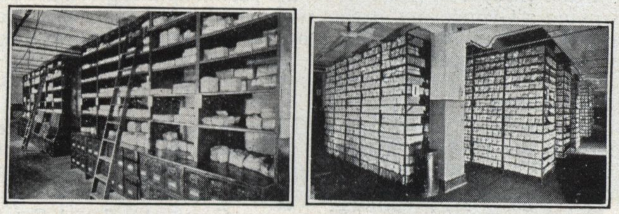
Safety Cabinet
For office or factory. Door reversible, right or left

Steel Shelving, Racks and Bins

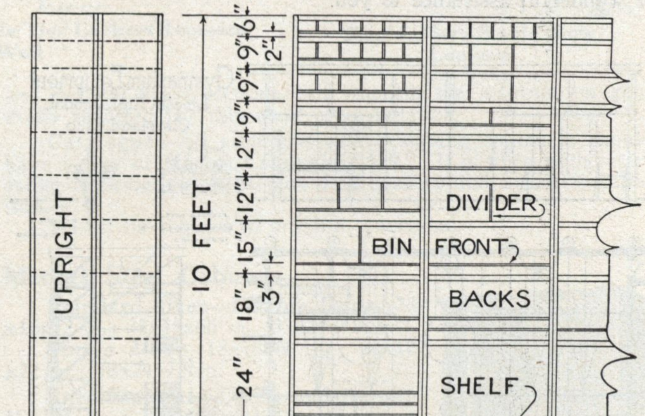
Either standard or special construction for any requirement.

When making inquiries, please give the following information:

(1) The space to be occupied; (2) kind of articles to be stored; (3) weight to be carried per shelf foot; (4) whether to be used from one or both sides; (5) a rough sketch showing special arrangement required.



Typical Installations of Steel Shelving



Details of Unit Racks and Shelves

A Few Users of Our Steel Equipment

American Sugar Refinery Co.
Boston & Maine R. R.
Boston University
Brookline High School
Buick Motor Car Co.
Fisk Rubber Co.
Franklin Motor Car Co.
Gilbert & Barker Mfg. Co.
Gillette Safety Razor Co.
Gray & Davis, Inc.
Hood Rubber Co.
Lehn & Fink, Inc.
Mergenthaler Linotype Co.
New London Shipbuilding Co.
A. Schrader's Son, Inc.
United States Government
Woodland Country Club
Yale & Towne Mfg. Co.

"OZITE" CARPET AND RUG CUSHION

(AMERICAN HAIR FELT CO., MFRS.)

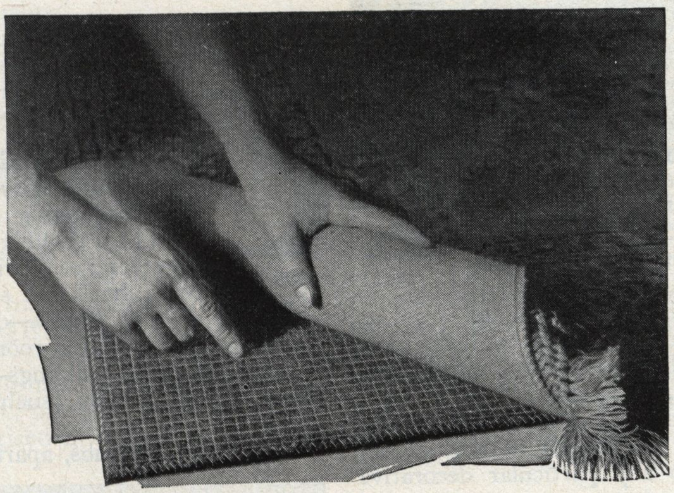
CLINTON CARPET COMPANY

130 North Wells Street, CHICAGO, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 47 West 34th Street

LOS ANGELES, CAL., 1615 McKee Street



What Ozite Cushion Is

Ozite Carpet and Rug Cushion is a product of felted hair which, when laid under carpets and rugs, increases their life by fully 100% and in addition adds greatly to their softness and luxuriousness. Not only does Ozite make possible the greatest economy and an oriental softness even with the least expensive floor coverings, but it is practically everlasting and will not wear out.

Nature of Ozite

Ozite is a felted mat or cushion of fine animal hair subjected to enormous pressure and reinforced with a center web of strong burlap. The selected hair is thoroughly cleaned, washed, sunned, aired, sterilized and "ozonized." It is absolutely clean, odorless, and verminproof.

Ozite is extremely fire resisting—it ignites with difficulty and only on contact with flame; even then it only smolders and quickly dies out. It is amazingly resilient and yields softly to the slightest weight. Ozite will last a lifetime and outwear a succession of carpets and rugs.

Why Architects Should Specify Ozite

(1) It makes carpets and rugs last longer. The soft cushion reduces wear and adds 100% to the life of the carpet.

(2) Carpets and rugs laid over Ozite sink under the tread with a luxurious softness, reminding one of velvet.

(3) It is perfectly sanitary. It is made of virgin animal hair that has been thoroughly cleansed, sterilized, "ozonized" and treated to make it verminproof.

(4) It reduces noise by deadening the sound of footfalls.

(5) It can be taken up and put down without danger of tearing due to the strengthening center web of burlap.

(6) It is practically everlasting and will outwear many carpets and rugs.

(7) It will always keep its softness and resilience because animal hair is not affected by wear or the elements and always retains its strength and "springiness."

(8) It will never mat or form lumps because Ozite in the making is subjected to far greater pressure than is ever possible in actual use.

(9) It clings flat to the floor and will not creep or buckle, even in places where it is subjected to severe use.

(10) It makes carpet-laying easier. It is made in widths up to 9 ft., therefore no seams, overlapping or multiple thicknesses are necessary.

(11) It is ideal for concrete floors, as it acts as an insulating blanket against both heat and cold. It also overcomes slight irregularities in the floor surface.

Natural Advantages of Hair

The success of Ozite has been made possible by the natural qualities of the animal hair of which it is composed. Hair is a natural insulator and cushion, far superior to vegetable fibers, and practically indestructible; neither age nor the elements have any material effect on it.

Architectural Advantages of Ozite

Ozite Carpet and Rug Cushion should be specified because:

It actually doubles the life of floor coverings, a very important factor from an economic viewpoint. It greatly facilitates the creation of an atmosphere of richness and comfort because of the added softness it gives to the carpets.

It is particularly adaptable for use on concrete floors because of its excellent insulating qualities and because it eliminates all surface unevenness. It is the only carpet cushion that is practical for use on ramps or large areas, as it will not slide, creep or bunch up and clings firmly to the floor. It is just as easy to lay as a carpet. It deadens noise and makes possible floors of luxurious softness.

Ozite is extensively used in hotels, stores, theaters, clubs, homes, churches, schools, steamships, etc.

How Ozite Is Sold

Ozite Cushion is sold by the best carpet and rug merchants throughout the United States. For carpets, it is made in thicknesses of ¼, ⅜, ½ and ¾ in., in widths of 27, 36, 54, 72 and 108 in. (or in special widths up to 9 ft.) and in lengths up to 50 ft. For rugs, Ozite is made in all regular rug sizes from 4½x7½ ft. to 9x12 ft. (or in special sizes to order) and in ¼ and ⅜-in. thicknesses.

Literature

Architects are invited to write for samples, details and full information about Ozite Carpet and Rug Cushion.

References (A Few of Thousands)

HOTELS AND CLUBS	
Hotel Pennsylvania	New York, N. Y.
Hotel Benjamin Franklin	Philadelphia, Pa.
Hotel Statler	Buffalo, N. Y.
Edgewater Beach Hotel	Chicago, Ill.
Wade Park Manor	Cleveland, Ohio
Hotel Coronado	St. Louis, Mo.
Hotel Book-Cadillac	Detroit, Mich.
Hotel Francis Marion	Charleston, S. C.
Hotel Mayflower	Washington, D. C.
Hotel Nicollet	Minneapolis, Minn.
Hotel St. Francis	San Francisco, Cal.
Hotel Alexandria	Los Angeles, Cal.
Hotel Fontenelle	Omaha, Neb.
Hotel Wisconsin	Milwaukee, Wis.
Harvard Club	New York, N. Y.
South Shore Country Club	Chicago, Ill.
Indianapolis Athletic Club	Indianapolis, Ind.
THEATERS	
Capitol Theater	New York, N. Y.
Keith's Palace Theater	Cleveland, Ohio
Balaban & Katz Theaters	Chicago, Ill.
West Coast Theater Circuit	Pacific Coast
MISCELLANEOUS	
The Furniture Mart	Chicago, Ill.
Gimbel Bros.	New York, Philadelphia and Milwaukee
Charles A. Stevens & Bro.	Chicago, Ill.
Marshall Field & Co.	Chicago, Ill.
Scottish Rite Cathedral	Miami, Fla.
Wheaton Trinity Church	Wheaton, Ill.
University of Chicago	Chicago, Ill.

Detroit & Cleveland Navigation Company's Boats

The Pullman Company's Cars

KENT-COSTIKYAN

Importers of Antique and Modern Rugs from Persia, India and China, Seamless Carpets in Solid Colors, Rugs Woven to Order in the Orient

TELEPHONE
Murray Hill 0115

485 Fifth Avenue, Sixth Floor
(Opposite Public Library)

NEW YORK, N. Y.

TRADE-MARK

The House of Kent-Costikyan

The firm of Kent-Costikyan is one of the oldest exclusive Oriental Rug Importing Houses in New York today.

Since 1886 we have been fitting the finest homes and institutions of America with hand woven floor coverings. This experience of almost forty years, largely in co-operation with the most artistic men and women in the architectural and decorative professions, qualifies us, as no other firm, to meet the most exacting requirements of service, and to find most expeditiously the rugs or carpets appropriate in design, price and quality to any particular decorative scheme submitted.

Factors Determining the Value of Oriental Rugs

There are several factors in determining the value of an Oriental rug and certain phases in the process of rug making which, if not carefully supervised, result in serious imperfections in the rug. These may not be apparent to the untrained eye on purchase, but may develop six months or a year later.

First is the fineness of the weave—the finer the weave the greater the labor and the value of the rug. Oriental rugs are of course hand woven, the coarse rugs containing as low as 20 knots per sq. in., and the finest pieces up to as high as 1000 knots per sq. in.

The quality and fineness of the material going into a rug is also a factor in its value, i. e., a good rug will have strong yarn properly scoured and evenly spun and a good strong warp. Yarn must be dyed under careful supervision in a variety of colors, rich and decorative. All Kent-Costikyan dyes are fast non-corrosive colors—tested before the wool is dipped.

Another very important factor in determining the value of a rug is artistic merit and color harmony of design. There are good and bad designs on the market and naturally the ones that are most artistic and pleasing to the eye are worth more than those which are not so attractive. Strong demands at times for certain colors and types of designs also govern the market price of rugs in these particular styles.

Kent-Costikyan rugs and carpets are woven on the looms of native weavers in Persia, India and the Far East under the general supervision of our vice-president, who is assisted by a native staff in each country. This staff oversees each piece from the time it goes on the loom until it is packed and shipped to this country. This insures a uniformly satisfactory quality of wool and dyes, perfect execution of design, and careful handling to protect against damage in transportation.

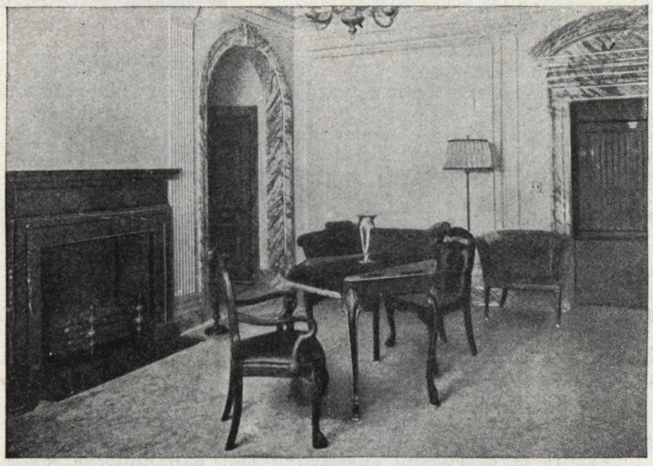
We Have Furnished and Recommended Hand Woven Floor Coverings for the Following Spaces

(1) Private residences—(rooms in order of preference) living room, dining room, bedrooms, halls and stairs.

(2) Banks—directors' rooms, officers' platforms and reception rooms.

(3) Business buildings—reception rooms, executive offices, display rooms (such as between automobiles or pianos).

(4) Hotels, clubs, apartment—lobbies and lounges.



President's Reception Room of The Mellon National Bank, Pittsburgh, Pa. Furnished with Kentshah Plain Carpet
Trowbridge & Livingston, E. P. Mellon (Associate), Architects
P. W. French & Co., Inc., Decorators

Advantages of Hand Woven Floor Coverings

Our Oriental rugs and hand woven plain carpets, while more expensive than machinemade domestic floor coverings, have certain advantages for the spaces enumerated above.

(1) They give a home atmosphere of hospitality that is impossible to get with other floor coverings.

(2) They excel in durability and investment value. It is a fact proven by many rugs sent to us by estates of former clients that a good Oriental will last a lifetime in the home and for ten years at least under conditions of heavy hotel wear; it is also well known that in the liquidation of estates the Oriental rugs bring a larger percent of their original cost than any other property.

(3) They can be readily repaired without detection, native weavers in America simply restoring damaged spots by hand in the original weave.

(4) Their texture is the most attractive and shows no footprints, an objection often raised to chenille and other machinemade carpet.

Continued on next page

Types of Hand Woven Floor Coverings

(1) For ordinary requirements in Orientals in sizes not over 25 ft. long, suitable rugs can usually be found in our stock which contains over 1000 room-size rugs. While it is impossible to give any standard measure of prices because of difference in size, intricacy of design and artistic color of rugs of even the same quality, for purposes of a general estimate an architect can figure from $2.00 to $20.00 per sq. ft. list price on floor space to be covered. We are in constant touch with the rug market and our prices are made to stand favorable comparison with rugs of equal quality.

(2) When very large sizes, sets of rugs or unusual color schemes are desired, we recommend our Kentshah made-to-order rugs (in Persia, China or India); deliveries six months to one year and a half on very large sizes. List prices run about the same as stock rugs per square foot—according to quality, size of rug and intricacy of design.

We loan suitable rugs if required.

(3) Where plain carpets are desired, we carry four grades in seamless rolls 60 ft. long and 9, 12, 15, 18 and 20 ft. wide. Cuts are made from these rolls in the exact sizes desired and fringe added if requested, or the carpet simply bound around.

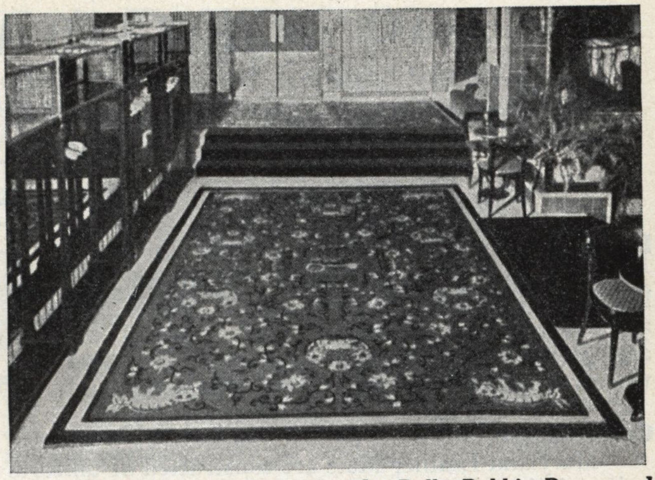
Seamless Scotch Chenille ranges from $13.00 per sq. yd. to $30.00 per sq. yd., and our Kentshah hand woven seamless carpet is priced at $40.00 per sq. yd. (list prices).

We give immediate delivery in a variety of neutral stock shades, and one month's delivery on any special color or on the "Colonial Oriental" hit-or-miss color. Two-tone band border can be added if desired.

(4) For rooms in private residences where the finest in old paintings, tapestries and antique furniture is used, we have a collection of period pieces in the Ispahan and Kuba type which fit perfectly such surroundings.

We can supply photographs of any of these rugs on request.

Complete Service, Designed with a View of Simplifying the Work of Architect or Decorator



Set of Rugs Made to Order for the Della Robbia Room and Adjoining Corridors of the Vanderbilt Hotel, New York, N. Y.

Warren & Wetmore, Architects

If we are supplied with blue prints with spaces designated thereon for which floor coverings are wanted and information as to the woodwork, type or period of decoration to be used in each room, and sample of the predominating color of walls and draperies, and the maximum expenditure desired, we can submit a selection from stock, or suggestions for an order in a manner that will take very little time and give lasting satisfaction.

We are equipped to handle all details—measuring rooms, sending of pieces on approval in the home, laying rugs and cleaning and storage.

Instructive and Helpful Forms, Lists and Booklets Sent on Request

Booklet "A" giving résumé of our departments and example of our work.

Stock List "B" of 1000 large size Oriental Rugs.

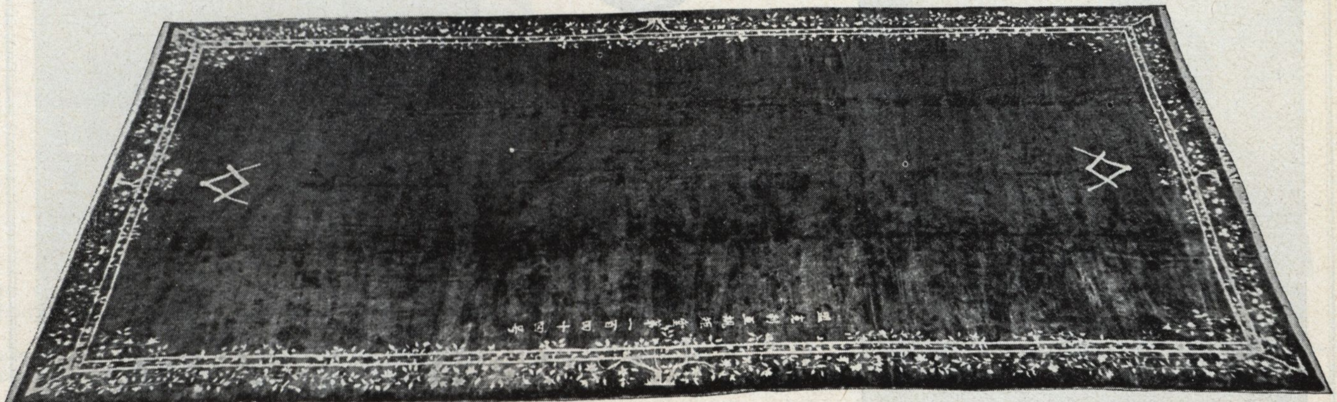
Color Chart "C" giving shades of plain fabrics.

Stock List "Q" of Antique Rugs of the Ispahan and Kuba types on which we can submit photographs later.

4x2 samples of plain fabrics priced $10.00 each (these are useful in alcoves, doorways, etc., after serving their use as samples).

Rug Specification Form "D" for use in simplifying the problem of the architect and decorator in selling floor coverings.

Service Booklet on "How to Care for Your Oriental Rugs" with sample of Du Pont Rug Anchor (for which we are distributors) attached.



Rug 32 ft. Long and 16 ft. Wide, Woven to Order in China by Kent-Costikyan for Room of the Masonic Lodge, Montclair, N. J.

The Masonic Emblem and Lodge Number (in Chinese characters) were Woven into this Rug

MARYLAND MAT COMPANY

16 East 40th Street
NEW YORK, N. Y.

Products

Maryland Leather Mats, for use in office and loft buildings, banks, theaters, hotels, schools, libraries, and public and private institutions; installed in entrances and elevators, kitchens, behind soda fountains and wherever an unusual amount of traffic occurs.

Construction

Maryland Leather Mats are constructed of uniform units of the best *bend sole leather* strung on No. 10 gauge Bessemer spring steel wire, redrawn before galvanized.

They are evenly pressed, securely clinched and reinforced on the sides with solid brass plates and clinchers. They are made with both plain and corrugated surfaces.

Size, Thickness and Weight

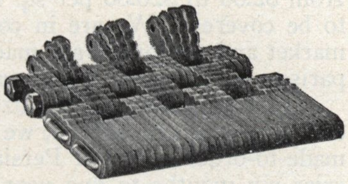
Maryland Leather Mats are made in any length, width or shape desired. The plain surfaced mats are ½ or ⅝ in. thick; the corrugated, ⅝ in. thick. Average weight is 2 lbs. per sq. ft.

Guarantee

Maryland Leather Mats are guaranteed for 5 years against imperfections in materials and workmanship.

Exclusive Patented Features

Two exclusive features of Maryland Leather Mats are the patented double reinforcement *bar* and *border*, see illustration. The *bars*, inserted at intervals of approximately every 28 in. throughout the body of the mats, give them added strength and also insure a flat, even lie at all times. The *border*, made of extra large units, pivoting 3⅛ in. from the end of the mat, has sufficient weight to hug the floor and guarantee a safe approach.



The Patented Bar and Border

These features are protected by United States letters patent No. 1,545,879 granted July 14, 1925.

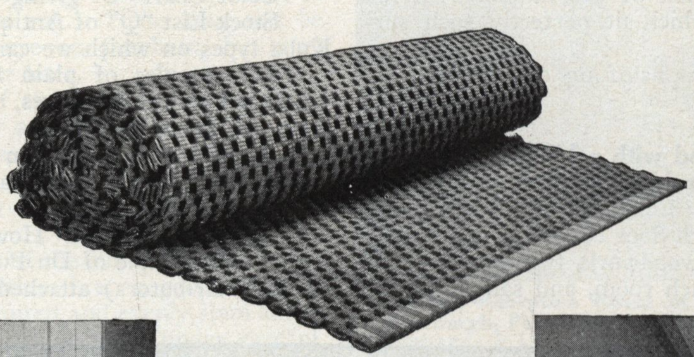
When Ordering

General—When ordering, always specify length, width and whether plain or corrugated. Also state which edges should have the border. Unless otherwise specified, the ⅝-in. corrugated with ½-in. plain unit border will be furnished. This design is recommended to be used, where possible.

Measurements and Patterns—Orders should be accompanied by diagrams showing all necessary measurements. If mats are to be made in several sections, mark where they are to be divided. Individual sections should not exceed 50 sq. ft. For irregularly shaped mats, furnish a carefully prepared pattern.

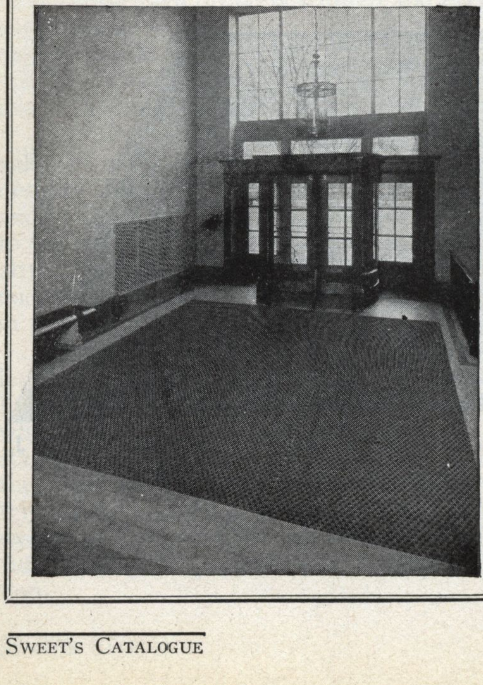
Specification

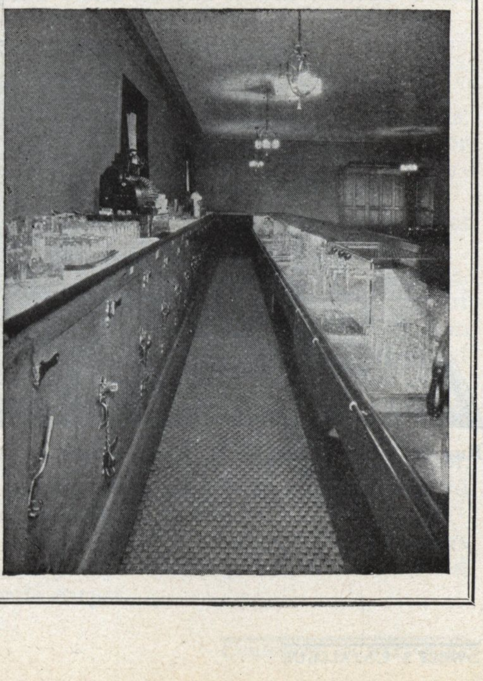
Furnish and install Maryland Leather Mats, as made by the Maryland Mat Company, 16 East 40th Street, New York, N. Y., in halls, elevator floors and all other places, as indicated on plans.



Maryland Leather Mat

Illustrating the ease with which the mats may be rolled up, like a rug, for cleaning





Installation at the Elks Club, Newark, N. J.

Left: The entrance
Right: Refreshment bar
Warren & Wetmore, Architects

NEW YORK BELTING & PACKING CO.

Perforated Rubber Mats, Corrugated and Pyramid Rubber Matting

NEW YORK, 91-93 Chambers Street
CHICAGO, 124-26 West Lake Street
PHILADELPHIA, 821-23 Arch Street
ST. LOUIS, 218-20 Chestnut Street
SAN FRANCISCO, 519 Mission Street
BOSTON, 65 Pearl Street
PITTSBURGH, 420 First Avenue

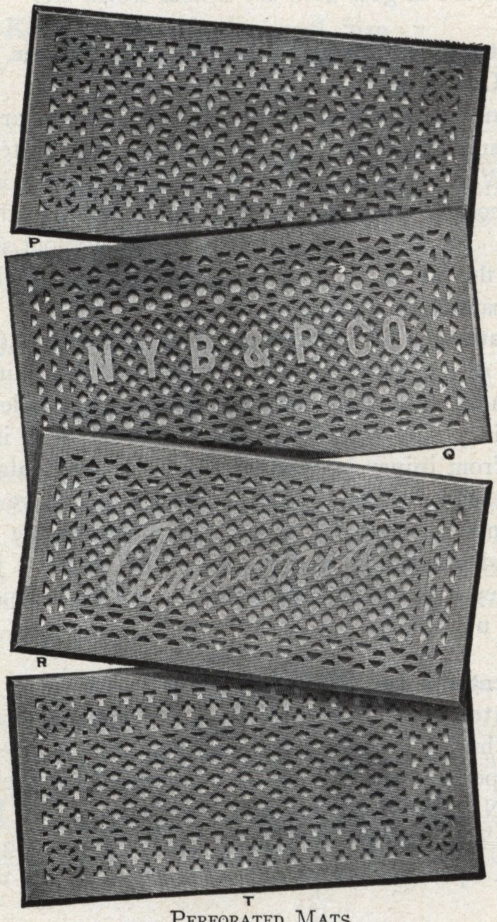
For Rubber Tile Flooring, see page 548

Perforated Rubber Mats

For entrance vestibules, theater lobbies, under revolving doors, and all places where a safe foothold is required, perforated rubber mats are indispensable.

They are soft and yielding, noiseless, safe to walk upon, and give long service. In wet weather, the perforations hold the dirt and moisture, thereby preventing the tracking over finely finished floors.

Description—Perforated rubber mats are made from a fine grade of rubber, compounded to resist the effects of wear and abrasion, and the quality is such that the mats will not become hard or brittle with age. The wearing surface is made corrugated, the corrugations running the long way of the mat. To afford additional strength, a layer of cotton duck is embedded in the rubber. Perforations are clean cut with sharp dies.



Perforated Mats

Styles and Colors—A variety of patterns are furnished to suit every requirement. Any combination of border and body designs shown can be supplied.

Mats are regularly made in the natural or gray color, and are supplied in this color unless ordered otherwise. Can be made in white or red rubber at some extra cost.

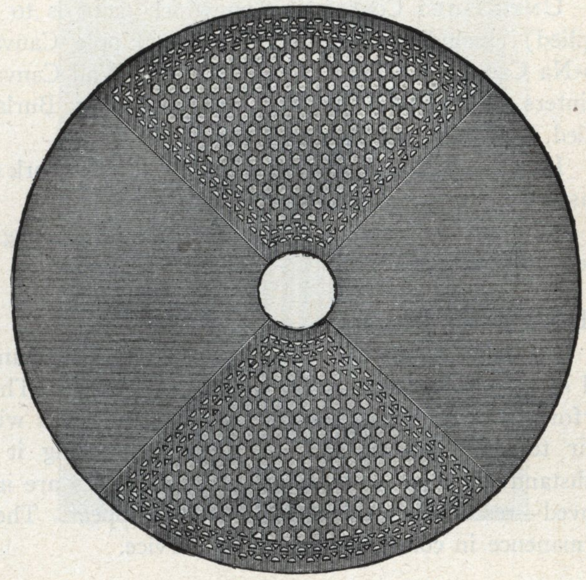
Sizes and Thicknesses—Perforated rubber mats are carried in stock in two sizes: 18x36 in. and 24x36 in.—⅜ in. thick, with all four edges beveled.

Larger sizes or irregularly shaped mats made up on short notice. Large mats should be made in sections not over 25 to 30 sq. ft. This facilitates the handling and reduces the liability of tearing out the meshes.

All perforated rubber mats are made ¼, ⅜ and ½ in. thick.

Lettering—As an advertising feature, names, monograms, numerals, etc., can be inserted in colored rubber. Choice of four colors—red, white, black or blue.

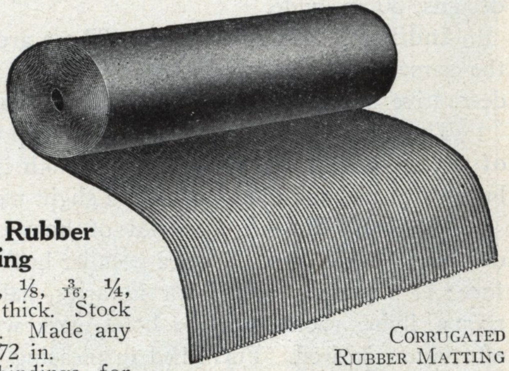
Revolving Door Mats—A very necessary safeguard for use under a revolving door. Made in four sections as shown; front and back sections perforated and two side sections solid. The solid sections give additional weight to the mat and a safe foothold when passing through the door.



Revolving Door Mats

Suggestions for Ordering Rubber Mats

Specify length, width and thickness desired, and if corrugated surface is wanted, the direction the corrugations should run. Also state which edge or edges should be beveled. For irregularly shaped mats, send an exact pattern, specifying which is the "top" side of the pattern. If mat is to be made in sections, indicate how sections should be divided.



Corrugated Rubber Matting

Corrugated Rubber Matting

Made 3/32, ⅛, 3/16, ¼, ⅜ and ½ in. thick. Stock widths, 36 in. Made any width up to 72 in.

Rubber bindings for ends supplied if desired.

Catalogue

A complete descriptive catalogue containing all varieties of rubber mats, rubber stair treads, etc., will be sent on request. Write for catalogue No. 12.

H. B. WIGGIN'S SONS CO.

Manufacturers of Woven Wall Coverings

233 Arch Street
BLOOMFIELD, N. J.

BRANCH OFFICE: 4860 South Halsted Street, CHICAGO, ILL.

Products

FAB-RIK-O-NA WOVEN WALL COVERINGS as follows:

FINISHED COVERINGS, including Dyed Tapestry Burlap, Pearl Ko-Na, Indikloth, Fab-Rik-O-Na Interwovens and Homespun.

UNFINISHED COVERINGS (on which paint is to be applied): including Prepared Canvas, Stipple Canvas, Ko-Na Canvas, Ruftex Canvas, Wiggin's Wall Canvas, Painters Cloth, Shel Ko-Na Burlap, Lining Burlap, Filled, Prepared and Painted Burlap.

KLING-KO-NA, an Undercoating for Paint Work on Plaster; a Size for Hanging Wall Coverings.

(The words Fab-Rik-O-Na and Ko-Na are registered trade-marks.)

Fab-Rik-O-Na Quality

Fab-Rik-O-Na woven wall coverings are the standard of quality in fabric, color and workmanship. They perform a manifold service: beautifying the walls with their texture, pattern and coloring; reinforcing it to withstand vibration without cracking; acoustics are improved—resonance is corrected, echoes disappear. Their permanence in color insures lasting service.

Fab-Rik-O-Na Finished Wall Coverings (Fast to Sunlight)

Fab-Rik-O-Na Interwovens—A material with characteristic horizontal weave, well filled, evenly colored, thoroughly shrunk and prepared for pasting to the wall, may be hung without showing joints. Furnished in a variety of fast-to-light colors and pleasing brocade designs, 30 in. wide.

Indikloth and Homespun—These are made from the same fabric; a fabric whose texture is unusually decorative and whose sturdiness insures long life.

The Homespun is finished in the deep cream shade of the natural fabric, while the Indikloth is finished in browns, grays, and blues showing a slight metallic luster.

Pearl Ko-Na—A material of heavy texture in delicate pastel shades. It has a peculiar brilliancy of surface; is admirably suited for libraries, halls, reception rooms, living rooms and for hotel work where heavier effects are desired. Furnished in pleasing colors, plain or patterned, 36 in. wide.

Dyed Tapestry Burlap—Even in weave and color, fast-to-light, easily hung; universally conceded to be the highest grade wall burlap manufactured. A wide variety of fast-to-light colors are offered 36 in. wide.

Fab-Rik-O-Na Unfinished Wall Coverings (to Be Painted or Calcimined)

In this group are included five grades of canvas in widths varying from 36 to 99 inches each, carefully prepared to hang properly, and to cover easily and evenly with paint. It also includes painters cloth and five varieties of burlap all 36-inch, and some in 54 and 72-inch widths.

These materials give maximum protection to the wall and are largely used for school work, etc.

Advantages of Using Fab-Rik-O-Na Woven Wall Coverings

Finished Colored Materials—(1) Colors are fast to the sunlight. (2) Rich decorative effect of texture. (3) Wall protected from cracking and injury. (4) Acoustic properties of the room are greatly improved. (5) Goods adhere firmly to wall without shrinking at the joints. (6) Goods are easily hung in the same manner as wall paper.

Materials for Painting After Hanging—(1) A surface of uniform suction is produced, saving paint and labor, a surface that does not show where holes and cracks in plaster have been repaired. (2) Wall is protected from injury by peeling or cracking of paint and is not easily defaced. (3) Additional decorative effect of texture is secured. (4) These materials are easily hung, adhere firmly, and do not shrink open at joints. (5) They cover easily with paint, do not show laps, and dry out uniformly.

Specifications for Wall Coverings

Material—All decorative and prepared canvas, muslin, burlap or other fabrics used shall be of the kind below specified and quality of those shown in the Fab-Rik-O-Na line of woven wall coverings of the H. B. WIGGIN'S SONS Co. of Bloomfield, N. J. and Chicago, Ill., and equal to samples of this material on file in this office.

Location—The above wall coverings shall be applied on ceilings and walls of the following..........

Application—After walls have been plastered in accordance with specifications on plastering and are thoroughly dry, they shall be given a coat of Kling-Ko-Na Size manufactured by same Company (or other good wall size approved by architect).

*A good grade of lining paper to be applied over the entire wall and allowed to dry thoroughly.

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*Lining the wall is optional with the architect and unnecessary when applying fabrics which are to be painted.

Continued on next page

The fabrics then to be pasted to the wall with good stiff fresh flour paste, trimming to a sharp smooth edge butting together in actual contact, thoroughly rolled down. Follow all detailed printed instructions packed with the material.

Old walls to be thoroughly cleaned and all cracks to be filled. All edges of cracks and patches to be sandpapered to a smooth level surface. Walls to be made smooth and clean and sized as above described.

Painting—Where Fab-Rik-O-Na prepared goods are used they are to be given .... coats of paint following painting specifications approved by the architect.

Method of Application

All Fab-Rik-O-Na Cloth Wall Coverings are applied to the wall with fresh flour paste.

Details with directions are contained in each roll of goods.

Kling-Ko-Na Undercoating and Size

A white powder prepared for use by adding hot water.

Used in preparing walls for papering, calcimining, painting or enameling. Used on hard finish and sand finish plaster, on wall boards, stucco, concrete and brick. Used over painted or varnished walls before hanging wall coverings and over dyed burlap or raw woodwork before painting.

Samples and Prices

Samples and prices and further information will be freely furnished on request.

Deliveries

Deliveries can be made from our mill at Bloomfield, N. J., or from our warehouse at 4860 South Halsted Street, Chicago, Ill., as well as from stocks of our jobbing distributers in many prominent centers throughout the United States.

Service and Co-operation

Service and co-operation to architects through samples, quotations and practical suggestions will be afforded on request.

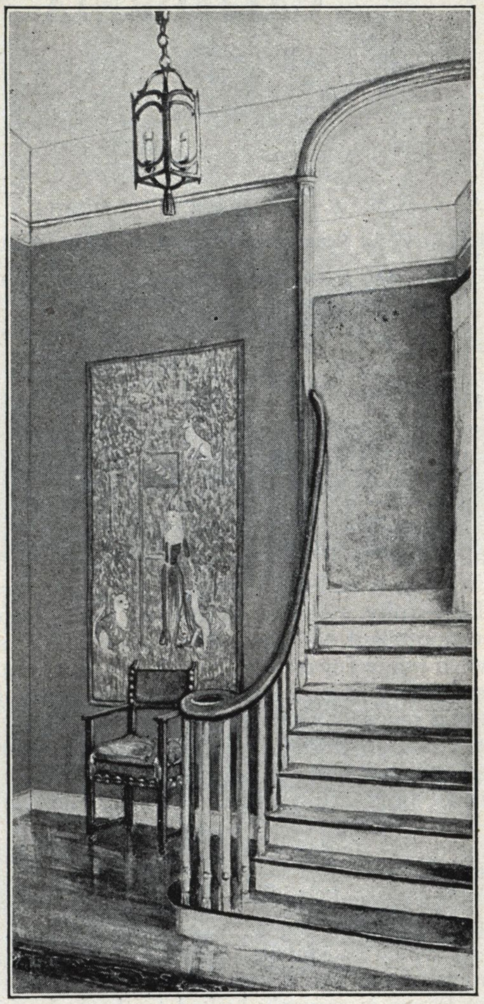
Details regarding items of specification are available in printed form at both our Bloomfield and Chicago offices.

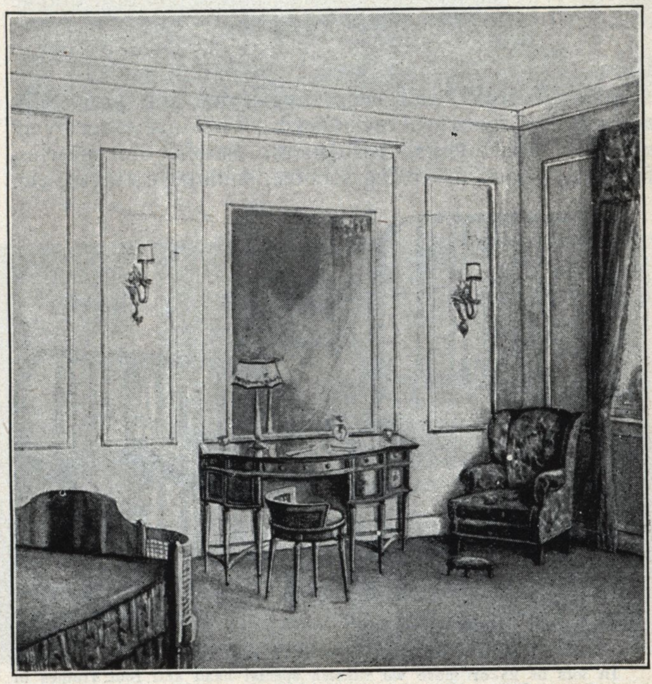
References

We will be glad to furnish references to any architects, boards of education and decorators who have specified, approved and applied these Fab-Rik-O-Na cloth wall coverings for

Residences	Schools
Apartments	Churches
Clubs	Hotels

Public buildings





CALIFORNIA WALL BED COMPANY

359 Sutter Street
SAN FRANCISCO, CAL.
FACTORY: 165 13th Street, OAKLAND, CAL.

REPRESENTATIVES

ATLANTA, GA., V. H. Kriegshaber & Son
LONG BEACH, CAL., Long Beach Sash & Door Co.
LOS ANGELES, CAL., Herzog Sash & Door Co.
MEMPHIS, TENN., Gerber Building Material Co.
MIAMI, FLA., A. H. Ramsey & Sons
MOBILE, ALA., Mobile Building Supply Co.
NEW ORLEANS, LA., North Rampart Lumber & Supply Co.
PORTLAND, ORE., Heacock Sash & Door Co.
ST. PETERSBURG, FLA., Grounds Bros.
SAN ANTONIO, TEX., Stevens Sash & Door Co.
SAN DIEGO, CAL., Klicka Lumber Co.
SEATTLE, WASH., D. E. Fryer & Co.
SPOKANE, WASH., D. E. Fryer & Co.
TACOMA, WASH., D. E. Fryer & Co.
TAMPA, FLA., Southern Lumber & Supply Co.
VANCOUVER, B. C., Wm. N. O'Neil & Co., Ltd.
WEST PALM BEACH, FLA., Palm Beach Mercantile Co.

Product

"California" Disappearing Wall Beds.
"California" Rol-Bed, the Bal-Bed.
The "California" Secret Installation.

Design

"California" wall beds are designed and built to look like ordinary beds and are a credit to the finest surroundings. They fully meet the desires of the architect for artistic concealment and the housewife who wants a bed which when ready for use will match in beauty and finish her finest furnishings. These beds are unexcelled in comfort and mechanical excellence.

There are no unsightly attachments to doors—the bed stands out in room like any other piece of furniture. "California" beds are perfectly balanced—a child can raise or lower them.

Construction

Beds are ruggedly built throughout. Head and foot frames are of 2-in. tubing with electrically welded fillers. Casting on which bed pivots is very heavy. Frame connections are of malleable steel.

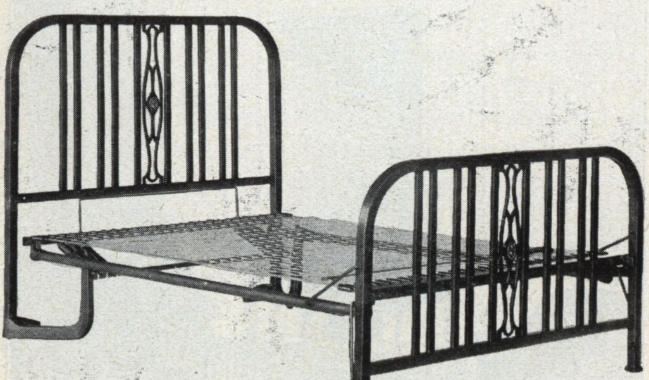
Foot frame is securely locked to the bed with steel bolts.

All beds have a four-coat finish, baked in the ovens twice.

Springs—We furnish with the beds, Simmons link fabric, Way sagless cable fabric, and single and double coil. All springs heavily reinforced.

Uses

"California" wall beds save space and practically add another room wherever used. They are extensively used in apartments, residences, hotels, dormitories, fraternal homes, boarding schools, summer cottages, etc.



"California" Special No. 1977

In lots of 25 or more we furnish special head and foot frames in practically any finish. This model is used at St. Francis Hotel, San Francisco

Special Features

Underslung Pivot Connection—This method of connecting the bed to the head frame casting permits the using of a wide mattress without fear of tearing or damaging it. There is nothing to catch or tear bed clothing.

Locking Bolts—Two steel bolts lock the frame to the bed proper, giving it the strength and appearance of a stationary bed. These bolts are hand fitted and do not rattle or squeak.

Mattress Clamp—All "California" beds are furnished with a clamp for holding mattress in place. The bed covering is tucked around mattress and, in connection with the folding foot frame, holds all bedding securely in place.

Ease of Installation—Beds are made so any man can install them. It is only necessary to attach the head frame and head frame casting to the wall or pivoted door by means of screws.

Types

"California" beds Nos. 9, 10, 11 and 12 are made in 2-in. tubing frames; Nos. 15, 16 and 17 in square tube frames. "California" No. 9 or No. 15 is for center pivot; Nos. 10 and 16 for offset pivot, Nos. 11 and 17 for recess and No. 12 is recess without a head frame.

The Rol-Bed is known as No. 9 with round tube frames and No. 15 with square tube.

Sizes

"California" wall beds are made in two sizes:

Full size, 4 ft. 6 in.; width of opening required, 5 ft.

Twin size, 3 ft. 6 in.; width of opening required, 4 ft. 2 in.

Dimensions given are for finished jambs.

The height of head jambs must be 6 ft. 8½ in. or more.

Closet Space

Minimum closet depth for center pivot: full size bed, 31 in.; twin size bed, 26 in.

Minimum closet depth for offset pivots: full size bed, 24 in.; twin bed, 20 in.

Pivot bed closets, both center and offset may be as deep as desired.

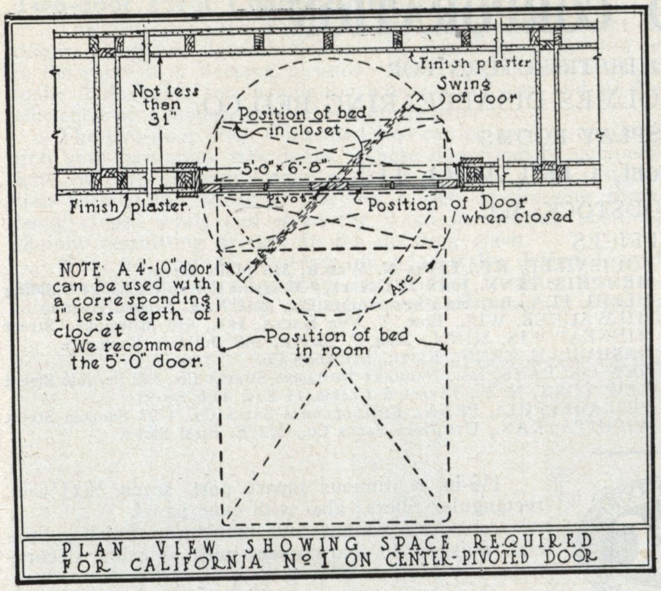
Recess closets should be 18 in. deep.

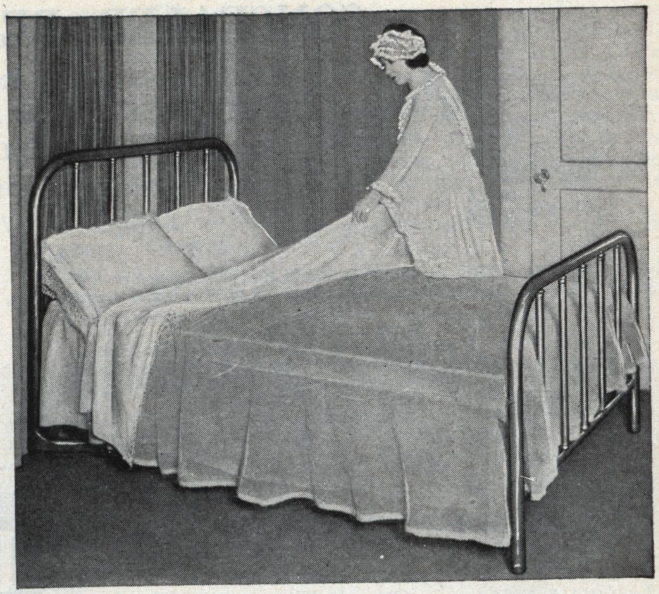
Closets are measured from rear wall to outside plaster.

Secret Installations

We will furnish, free of charge, plans for installing wall beds where no doors are shown, known as the "California" Secret Installation.

Continued on next page

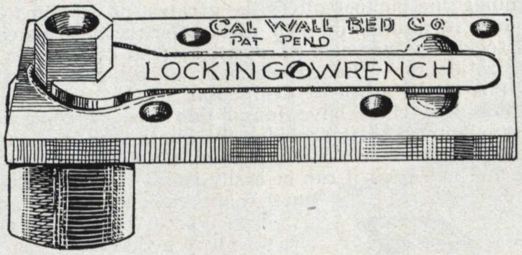

Finish plaster
Swing of door
Not less than 31"
Position of bed in closet
5'-0"×6'-8"
Pivot
Position of Door when closed
Finish plaster
NOTE: A 4'-10" door can be used with a corresponding 1" less depth of closet
We recommend the 5'-0" door.
Arc
Position of bed in room
PLAN VIEW SHOWING SPACE REQUIRED FOR CALIFORNIA No 1 ON CENTER-PIVOTED DOOR



Ready for the Night

"California" No. 9 on Center Pivoted Door

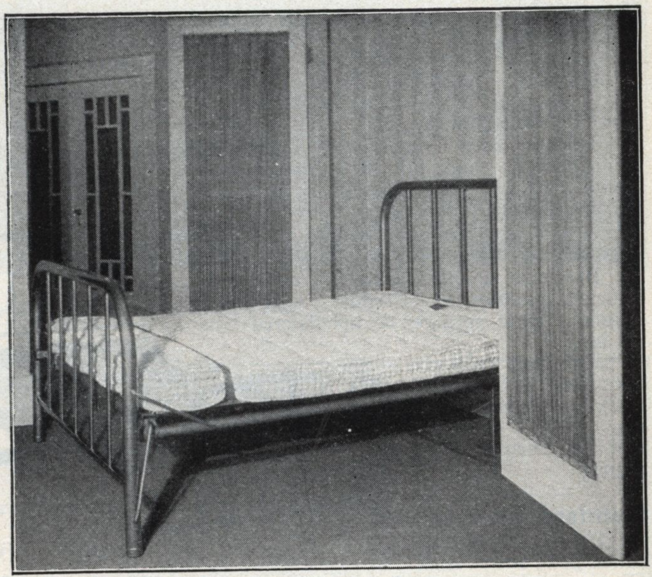
This bed would be No. 15 in 1½-in. square tube


CAL WALL BED Co
PAT PEND
LOCKINGOWRENCH

Pivot

Pivot

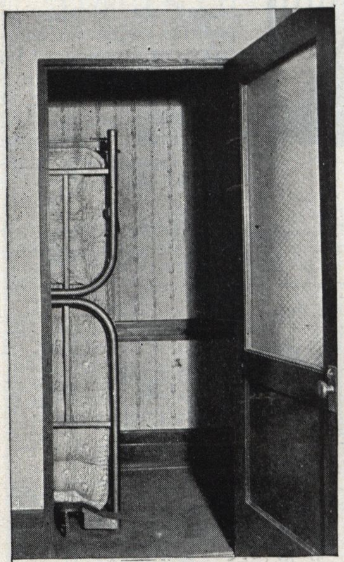
The pivot shown above when placed under a wall bed door permits the door to be adjusted at any time. This takes care of door shrinkage and the settling of buildings. The adjusting wrench is part of every pivot. For the first time in wall bed construction this important adjustment and lock is made possible.



Bed in Position in Room

"California" No. 11 Installed in Recess

Same bed in square tube would be No. 17

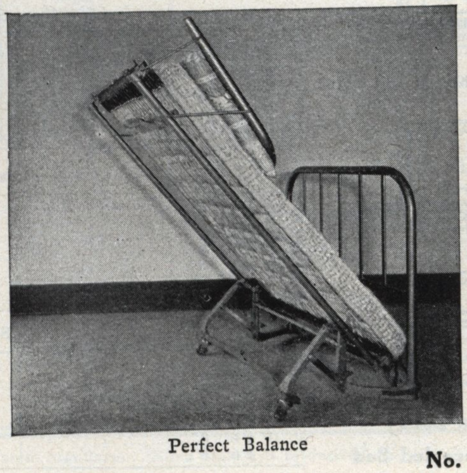


In the Closet

The Rol-Bed

A perfectly balanced bed, changing its own center of gravity when the bed is lowered. Large ball bearing casters, with rubber tired wheels; massive lifetime construction used throughout.

Write for floor plans



Perfect Balance

Down for the Night

No. 9 Rol-Bed

CONCEALED BED CORPORATION

MANUFACTURERS AND DISTRIBUTORS FOR
MARSHALL & STEARNS CO. and HOLMES DISAPPEARING BED CO.
OFFICE AND DISPLAY ROOMS
58 East Washington Street, CHICAGO, ILL.
FACTORY: WOODSTOCK, ILL.

TELEPHONE
CENTRAL {6423
{6424

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CONCEALED BED CORPORATION
CBC
CHICAGO
TRADE-MARK

Products

Space Saving Concealed Beds: Full, Three-quarter and Twin sizes (patented); In-A-Closet (Roller), Two-door Pivot, Oscillating (Ad-A-Room) Center Pivot, Off-center Pivot, Wall, Couch and Recess Beds; The *New* Roll-Out Recess.

Service

Our Service Department will suggest proper locations, estimate costs and possible savings. This service is at the disposal of architects, contractors and builders without expense or obligation.

Special Designs

Twenty years' experience as exclusive Concealed Bed manufacturers and our new modern plant at Woodstock, Illinois, place us in a position to fill special orders where exclusive designs and finishes are required.

Concealed Beds

Beds are equipped with full open constructed retempered Premier wire coil springs, fabric springs, or upholstered box springs.

Estimates will be furnished on Concealed Beds to fit any opening. Our catalogue will be furnished on request.

Standard Designs

1½-in. continuous round post, seven ⅞-in. fillers.

1½-in. continuous square post, seven ½x1½-in. rectangular fillers; also with cane panel.

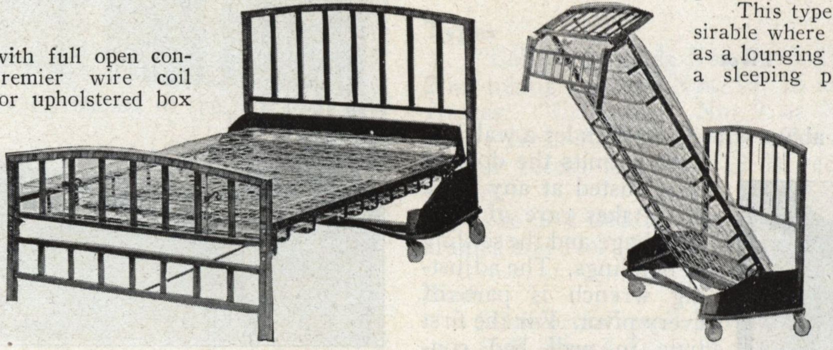
American walnut and mahogany finish. Special finishes to harmonize with interior decorations.

Important Features of the Holmes In-A-Closet (Roller Type)) Concealed Bed

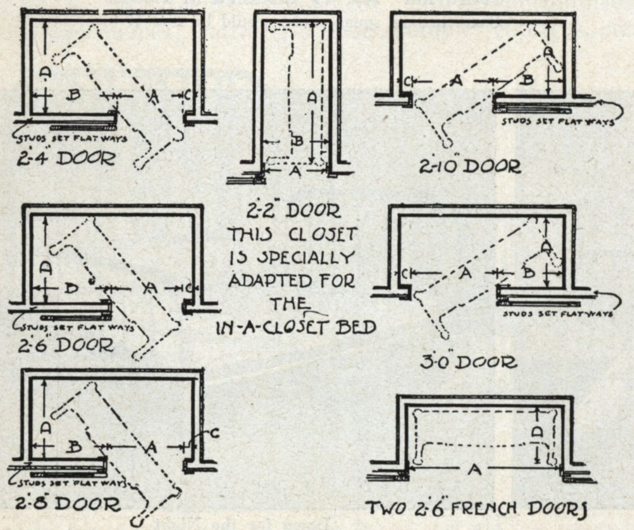
Important features embraced in the construction of this bed are: an automatic locking device which prevents it from jack-knifing; its bumper offers the greatest protection to woodwork and furniture; its ball and roller bearing wheels and swivel sockets assure ease of operation; no castings to break; stock size doors. The concealment of all mechanical parts makes this model a bed of distinction.

Hotels and clubs have found this type of concealed bed most satisfactory, as it provides the guest with a living room during the day. As an auxiliary bed, it effects a large saving in time and money as it can be easily rolled ready for use to the guest room requiring the extra bed.

This type of bed is also very desirable where a sleeping porch is used as a lounging place in the daytime and a sleeping place at night. During the day the bed can be removed to the storage closet, out of sight, and at night it can be placed in a sleeping position with no difficulty or trouble. Its easy moving and protected rollers make it possible to keep the bed in a closet far removed from the sleeping quarters, if desired.



In-A-Closet (Roller Type) Concealed Bed



Closet Plans for In-A-Closet (Roller Type) Concealed Bed

DIMENSIONS IN-A-CLOSET (ROLLER TYPE) CONCEALED BED

A—Door	B	C	D
Full Size Bed			
2′ 2″ x 6′ 8″	2′ 4″	....	5′ 0″
2′ 4″ x 6′ 8″	2′ 11″	5″	3′ 2″
2′ 6″ x 6′ 8″	2′ 9″	5″	2′ 11″
2′ 8″ x 6′ 8″	2′ 7″	5″	2′ 10″
2′ 10″ x 6′ 8″	2′ 5″	5″	2′ 8″
3′ 0″ x 6′ 8″	2′ 3″	5″	2′ 6″
2-2′6″ x 6′ 8″	....	....	2′ 0″
Three-quarter (Small Double)			
2′ 2″ x 6′ 8″	2′ 4″	....	4′ 6″
2′ 4″ x 6′ 8″	2′ 6″	5″	2′ 11″
2′ 6″ x 6′ 8″	2′ 4″	5″	2′ 9″
2′ 8″ x 6′ 8″	2′ 2″	5″	2′ 7″
2′ 10″ x 6′ 8″	2′ 0″	5″	2′ 6″
3′ 0″ x 6′ 8″	1′ 10″	5″	2′ 5″
2-2′5″ x 6′ 8″	....	....	2′ 0″
Single			
2′ 2″ x 6′ 8″	2′ 4″	....	4′ 0″
2′ 4″ x 6′ 8″	2′ 1″	5″	2′ 8″
2′ 6″ x 6′ 8″	1′ 11″	5″	2′ 6″
2′ 8″ x 6′ 8″	1′ 9″	5″	2′ 4″
2′ 10″ x 6′ 8″	1′ 7″	5″	2′ 3″
3′ 0″ x 6′ 8″	1′ 5″	5″	2′ 3″
2-2′2″ x 6′ 8″	....	....	2′ 0″

Continued on next page

Two-door Pivot Concealed Beds

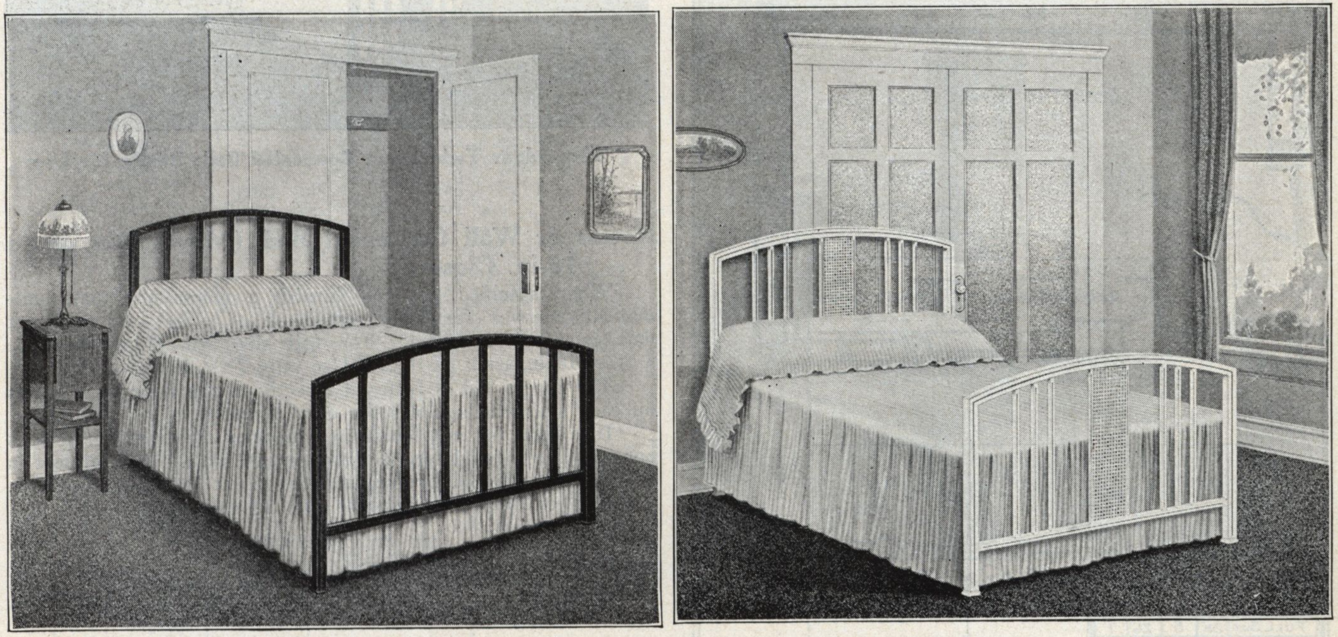
The two-door pivot Concealed Bed swings into a closet or recess, using two doors which can be closed when the bed is in the room in a sleeping position. Several exclusive features make it desirable for installation where a bed can add to the efficiency of a house, a hotel, or an apartment.

The two-door pivot Concealed Bed can be used in conjunction with two stock size doors. These doors can be equipped with mirrors or with leaded glass, if desired. This installation permits the doors of the bed, closet, or dressing room, being closed while bed is in the room in sleeping position, thereby permitting privacy in the dressing room.

Nos. 44 and 45—Operate on a specially designed steel standard which has adjustment in standard to allow for possible settling of building, and eliminates all strain on door or door jamb. This is an exclusive feature with two-door pivot Concealed Beds. Entire weight of bed and pivoting standard, to which door is attached, rests directly on the floor. There is no need for bracing the floor, as this installation will not cause warping or sagging of floor or door. Equipped with a coil or box spring and a foot control device which automatically places the foot legs of the bed in proper position as the bed is being lowered, and holds them in place, making it impossible for the sleeping surface to drop to the floor while it is occupied.

Refer to No. 44 for round post door pivot bed and No. 45 for square post door pivot bed.

Nos. 40 and 41—Mounted directly on a pivoted door and equipped with link fabric springs and have one-piece foot end. In all other respects they operate the same as Nos. 44 and 45.



Two of the Many Styles of Two-door Pivot Concealed Beds

CONCEALED
DOOR BEDS
INSTALLATION

Bed can be installed to swing left or right.

SPECIFICATIONS

DOORS:
Must be 1¾" thick

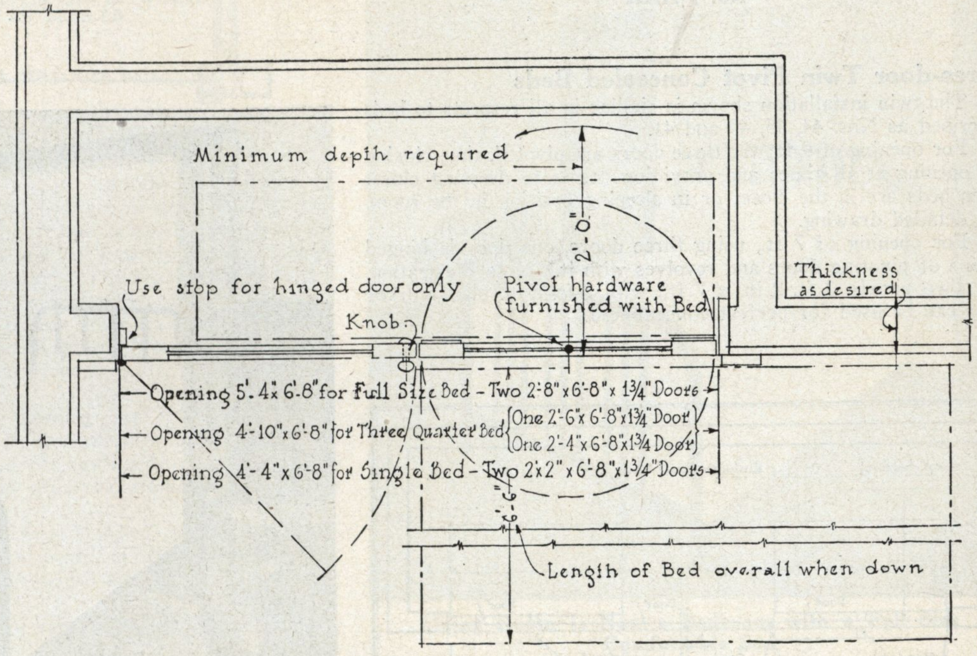
JAMBS:
Use plain jambs, no rabbit

STOPS:
Use stops for hinged doors only.

HARDWARE.
Pivot hardware furnished with bed.

Butts, knobs, locks, friction catches furnished by purchaser

This Installation makes possible concealment of bed in minimum closet depth
Closes opening when bed is in use.


Minimum depth required
2'-0"
Use stop for hinged door only
Knob
Pivot hardware furnished with Bed
Thickness as desired
Opening 5'-4" x 6'-8" for Full Size Bed - Two 2'-8" x 6'-8" x 1¾" Doors
Opening 4'-10" x 6'-8" for Three Quarter Bed {One 2'-6" x 6'-8" x 1¾" Door / One 2'-4" x 6'-8" x 1¾ Door}
Opening 4'-4" x 6'-8" for Single Bed - Two 2' x 2" x 6'-8" x 1¾" Doors
Length of Bed overall when down

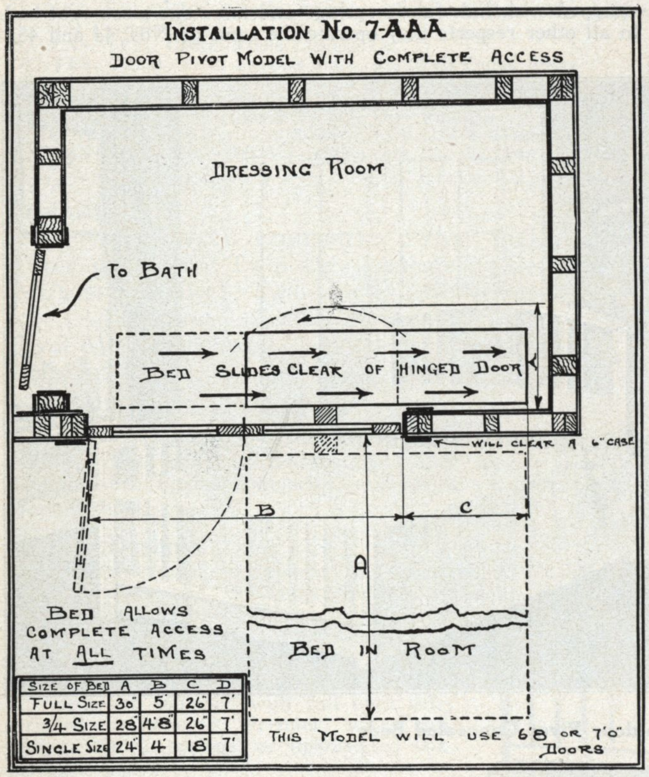
INSTALLATION DETAILS OF
TWO DOOR PIVOT CONCEALED BEDS

This installation does not use steel standard. When standard is desired use two 2 ft. 6 in. doors or 5 ft. opening for three-quarter bed

Continued on next page

Two-door Pivot Concealed Bed No. 7-AAA

This two-door pivot bed requires an opening of 5 ft. using two 2-ft. 6-in. doors, and provides full access to closet or dressing room at all times, through which entrance can be had to bath or adjoining room without moving bed. The hinged door can always be closed, making dressing room absolutely private; should hinged door be left open the bed is not in sight. The *only bed* with perfect concealment. The bed does not hang on door, but door pivots on steel standard. Finished door jamb must not be over 6 in.


INSTALLATION No. 7-AAA
DOOR PIVOT MODEL WITH COMPLETE ACCESS
DRESSING ROOM
TO BATH
BED SLIDES CLEAR OF HINGED DOOR
WILL CLEAR A 6" CASE
B
C
A
BED ALLOWS COMPLETE ACCESS AT ALL TIMES
BED IN ROOM
THIS MODEL WILL USE 6'8 OR 7'0" DOORS

SIZE OF BED	A	B	C	D
FULL SIZE	30"	5'	26"	7'
3/4 SIZE	28"	4'8"	26"	7'
SINGLE SIZE	24"	4'	18"	7'

Installation Details of Two-door Pivot Concealed Bed No. 7-AAA

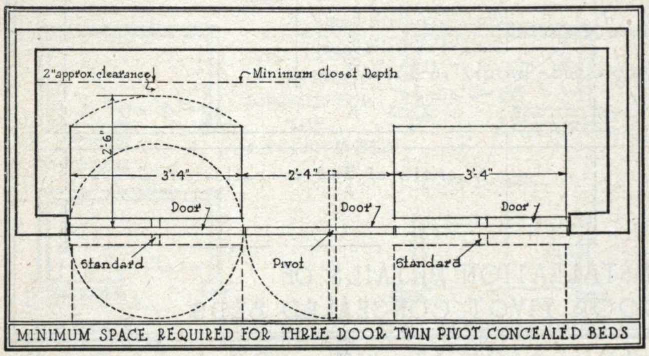
Three-door Twin Pivot Concealed Beds

The twin installation shown is similar in all respects to beds described as Nos. 44, 45, 40 and 41.

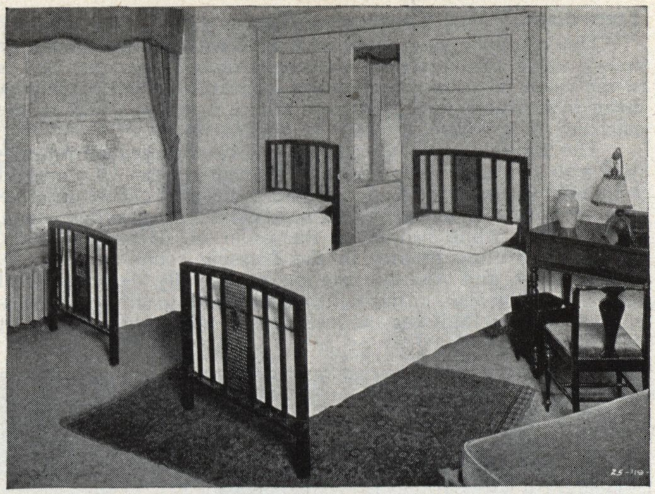
For opening of 9 ft., the three doors are pivoted, thus closing the opening at all times and providing access to dressing closet when beds are in the closet or in sleeping position in the room. See detailed drawing.

For opening of 7 ft., using three doors, one door is hinged to one of pivoting doors and revolves with it. Note illustration.

Two panels, 3 ft. 2 in. x 7 ft., with 2-ft. 8-in. plain mirror door can be used for perfect concealment.


2" approx. clearance
Minimum Closet Depth
2'-6"
3'-4"
2'-4"
3'-4"
Door
Door
Door
Standard
Pivot
Standard

MINIMUM SPACE REQUIRED FOR THREE DOOR TWIN PIVOT CONCEALED BEDS



Three-door Twin Pivot Concealed Beds Ready for Use

Recess or Wall Concealed Bed (Moves Out of an 18-in. Closet)

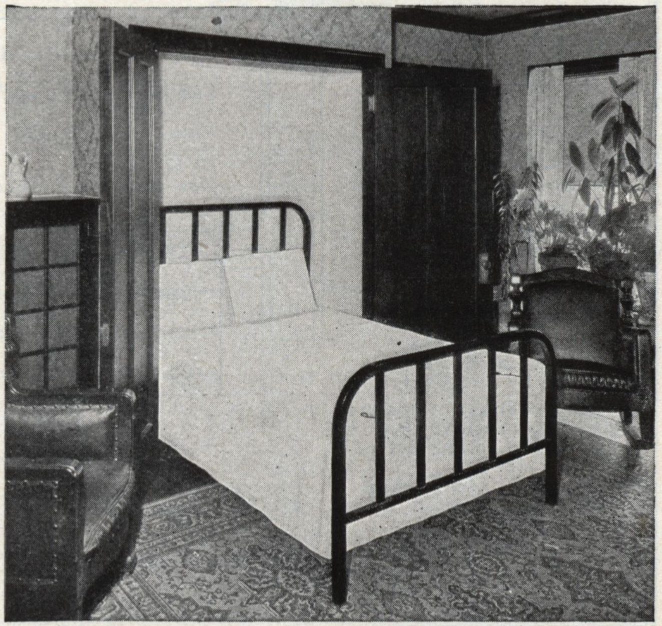
When specified, we can furnish a recess bed that automatically moves forward from back of closet and will not damage floor or carpet. For full size bed, closet must be 5 ft. x 18 in. back of door. Use only 7-ft. doors.

The recess bed is fastened directly to the floor by brackets on each side which allows for easy cleaning.

It is ideal for installation in remodeled buildings where it is not possible to build special closets in the wall. Concealment in this case is effected by building the closet out into the room. Canopies or drapes can also be used effectively.

SCHEDULE FOR RECESS BED CLOSET

Style	Width	Height	Depth
Full size bed	5'0"	6'8½"	1'6"
Three-quarter (small double)	4'6"	6'8½"	1'6"
Single	4'0"	6'8½"	1'6"



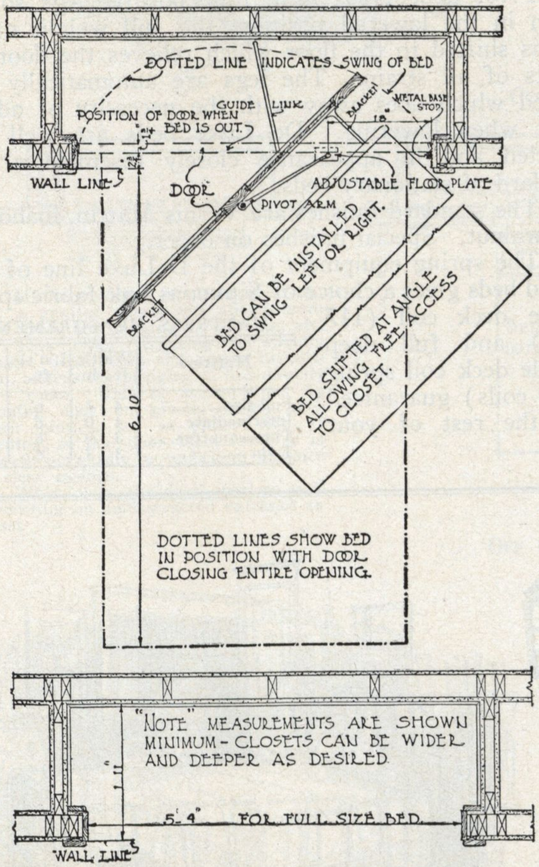
Recess or Wall Concealed Bed Ready for Use

Continued on next page

Oscillating Portal Concealed Beds

Portal concealed beds come in full, double, three-quarter and single sizes. All operate on the famous portal oscillating principle which enables a full size double bed to be revolved in a closet with a minimum depth of 24 in. The door conceals the recess at all times. Instead of folding, the foot end comes into proper position in one piece when bed is lowered. No joints or hinges. The bed is fully made at all times and bedding is firmly held by mattress clamps. A slight lift on the foot rail raises bed, with mattress and bedding, against the door.

Portal beds are finished in American walnut, unless otherwise specified. Regular equipment includes sagless fabric spring. Also equipped with full coil springs, slat fabric springs or box mattress, if desired.


DOTTED LINE INDICATES SWING OF BED
GUIDE LINK
POSITION OF DOOR WHEN BED IS OUT.
BRACKET
METAL BASE STOP
18"
WALL LINE
DOOR
ADJUSTABLE FLOOR PLATE
PIVOT ARM
BED CAN BE INSTALLED TO SWING LEFT OR RIGHT.
BRACKET
BED SHIFTED AT ANGLE ALLOWING FREE ACCESS TO CLOSET.
6' 10"
DOTTED LINES SHOW BED IN POSITION WITH DOOR CLOSING ENTIRE OPENING.
"NOTE" MEASUREMENTS ARE SHOWN MINIMUM - CLOSETS CAN BE WIDER AND DEEPER AS DESIRED
1' 11"
5' 4" FOR FULL SIZE BED.
WALL LINE

Details of Oscillating Portal Wall Bed

Only the finest of materials enter into the construction of a portal wall bed. The head and foot pieces are made of steel tubing, electrically welded. The frame is steel, joined at the corners by pressed steel risers and so securely held that it is practically one piece when fabricated. The brackets with which the bed is screwed to the door are also made of pressed steel—an exclusive feature not found in any other wall bed. The construction gives the bed maximum strength and prevents the twisting and warping that results in loose joints, causing squeaks and rattles.

Specifications—*Opening*—Opening for beds, jambs, and casings around same to be put in by contractor. Use jambs not less than 4 in. in width. Head casings inside of closet to be plain square casings. *Openings must be plumb and true and perfectly square.*

For wide bed the width between finished jambs must be 5 ft. 4 in. For three-quarter bed the width between finished jambs must be 5 ft. For single bed the width between finished jambs must be 4 ft.

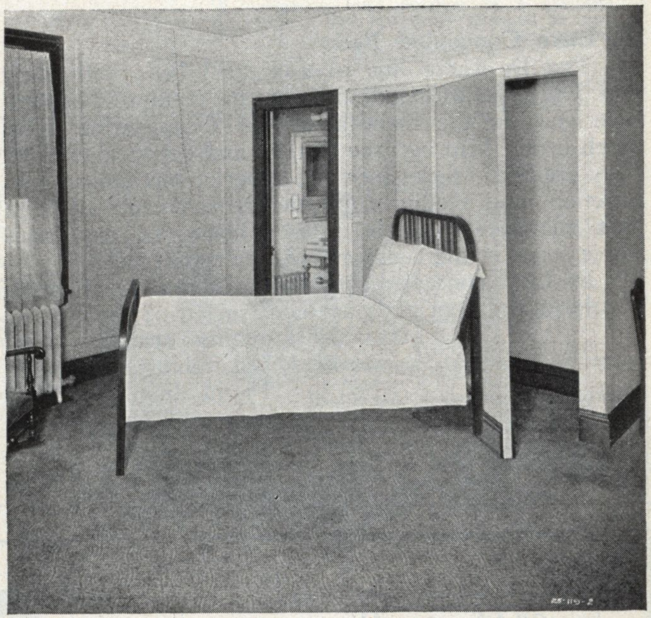
The height of finished head jamb must be 7 ft. ½ in. or 6 ft. 10½ in., or 6 ft. 8½ in.

Closet Door—If furniture is used on front of bed, closet door should be provided. When furniture is not used, closet door may be omitted.

Depth of Closet—The depth of the closet must be 23 in. measuring from the back of the front casing. The bed requires 23 in. but the closet may be as much deeper as desired.

Depth of Closet for Furniture—23-in. closet is required for 1 ft. 1 in. x 4-ft. furniture; 24-in. closet is required for 1 ft. 4 in. x 4-ft. furniture.

Be sure and get our O. K. on width and depth of furniture detail.



Oscillating Portal Wall Bed Turned at an Angle to Permit Access to Closet

Living Room Is Now a Bedroom with a Full Size Comfortable Bed

LOS ANGELES WALL BED CO.

De Luxe Concealed Beds

750-754 Castelar Street
LOS ANGELES, CAL.

Product

De Luxe Concealed Beds.

De Luxe Concealed Beds

The De Luxe line of concealed beds with their variety of types of installations are the result of 14 years' experience in the manufacture of disappearing beds, which bring them into the pioneer and dependable class. They are beds of elegance and superior mechanical construction, and readily fulfil the requirements of high class apartments, hotels, private homes or any place where space in the bedroom is to be conserved.

De Luxe concealed beds are made entirely of metal. The head and foot ends are constructed of the highest quality seamless steel bed tubing obtainable, 1½-in. diam. The filler rods and bars are assembled by electric welding which gives a secure and firm construction. These beds are constructed along very simple mechanical lines with as few moving parts as is consistent with easy and dependable operation.

DE LUXE CLOSET BED

Size of bed	Over all dimensions of carriage or base of bed ft.	in.	x in.
Full size.......	4	10	20½
Intermediate...	4	7	20½
Three-quarter..	4	4	20½
Twin..........	3	7	20½

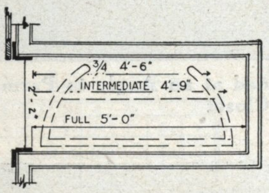
Pivot door types have four positive legs so that when in the lowered position, the full weight of the bed is shifted to the floor which relieves the door and pivots of all strain. The legs are automatically controlled which does away with the necessity of adjustment when lowering. De Luxe beds are well constructed and in appearance closely resemble a high standard of stationary beds.

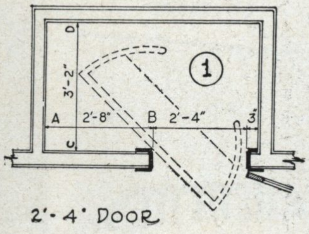
The standard finishes are Vernis Martin, mahogany and walnut. Special finishes on order.

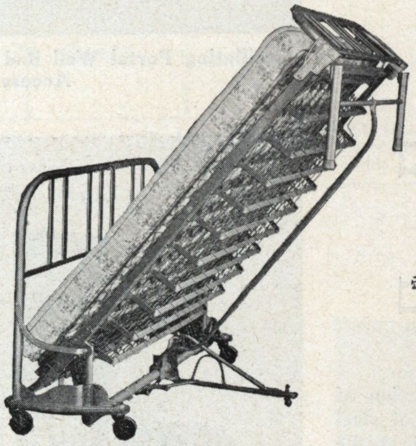
The spring equipment of the DeLuxe line of concealed beds gives a choice of Simmons link fabric spring, single deck coil (117 coils) and full deep double deck coil spring (120 coils) guaranteed for the rest of your life.

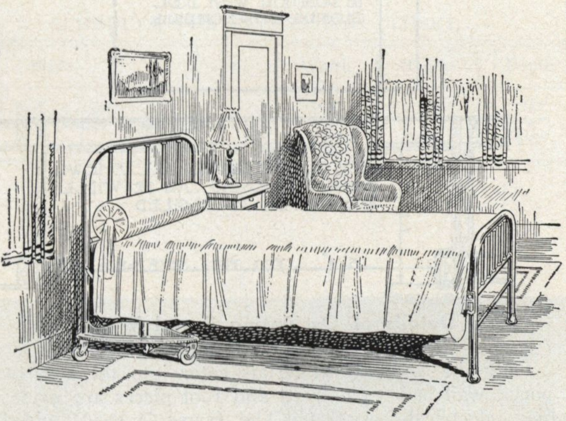
MATTRESS MEASUREMENTS

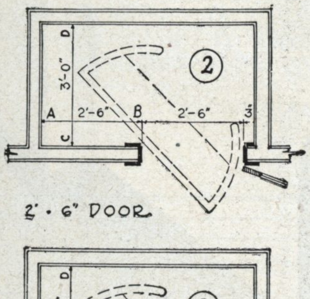
Mattress	Width, ft.	in.	L'n'th, ft.	Wt., lb.
Full size.........	4	3	6	40
Intermediate.....	4	0	6	35
Three-quarter....	3	9	6	35
Twin...........	3	3	6	30









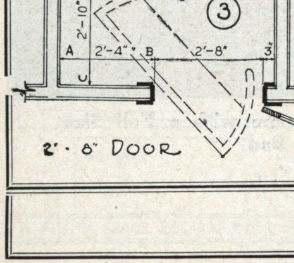


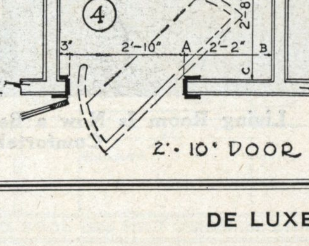
No special planning is necessary as the average size closet will accommodate this bed. Circular construction of carriage is a special feature eliminating all sharp corners and in pivoting around jamb it operates with marvelous ease.

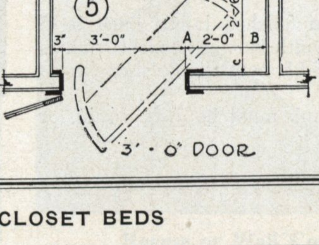
Fulcrum point of spring frame is so arranged that spring, when raised or lowered, swings well within the back line of its carriage; contact part of carriage being fully protected with a felt buffer strip. This special construction positively insures against defacement of walls, interior trim or furniture.

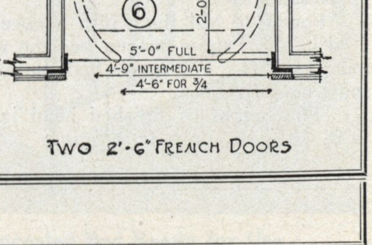
De Luxe closet beds are equipped with automatic leg control which lends stability to bed when in use. Also roller bearing hardwood wheels, with ball bearing swivel plates, which insure quiet and easy operating without damage to finest finished floor.

On plans 1, 2, 3, 4, 5 for intermediate size bed, closet can be 3 in. less between A and B and 1½ in. less between C and D, and for three-quarter size bed closet can be 6 in. less between A and B and 3 in. less between C and D. All doors 6 ft. 8 in. high.



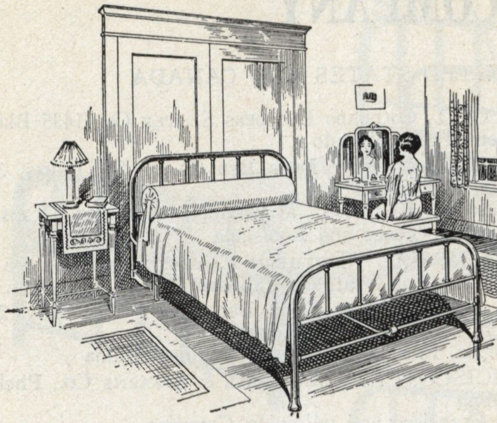


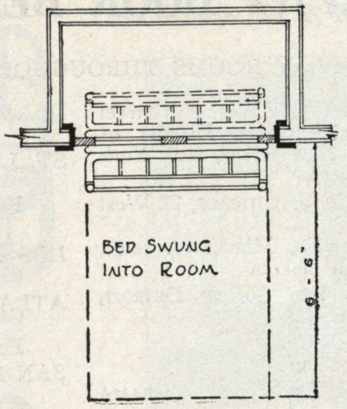


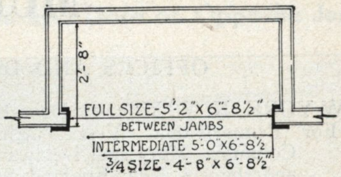


DE LUXE CLOSET BEDS

Continued on next page

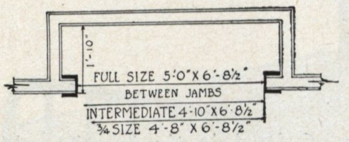


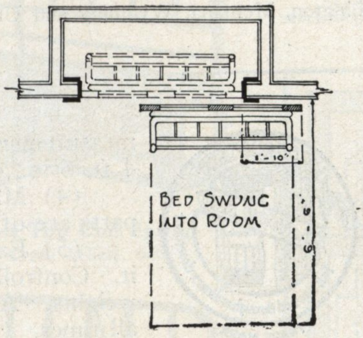

BED SWUNG INTO ROOM
6'-6"

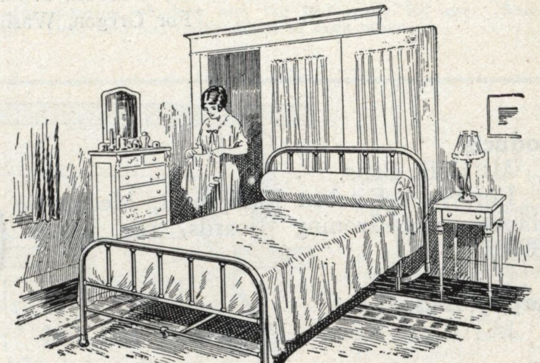

2'-8"
FULL SIZE-5'-2"x6'-8½"
BETWEEN JAMBS
INTERMEDIATE 5'-0"x6'-8½"
¾ SIZE-4'-8"x6'-8½"

Door is centrally pivoted in the opening and revolves in a complete circle, the bed being attached to back of same. If desired, a buffet, writing desk or bookcase may be attached to front side and on basis of full size door; the piece of furniture attached must not exceed 4 ft. in width at a point of projection 18 in.

Center Pivot Type


1'-10"
FULL SIZE 5'-0"x6'-8½"
BETWEEN JAMBS
INTERMEDIATE 4'-10"x6'-8½"
¾ SIZE 4'-8"x6'-8½"


1'-10"
BED SWUNG INTO ROOM
6'-6"

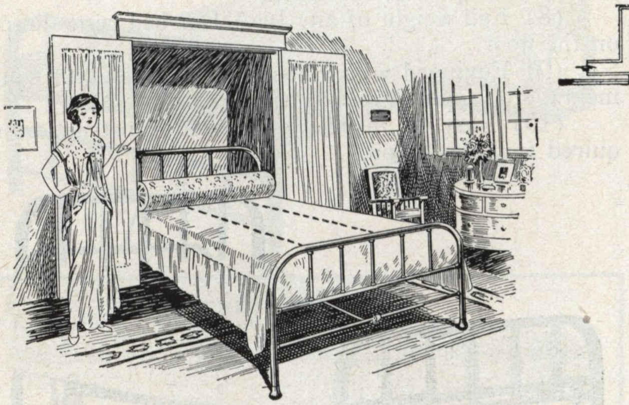


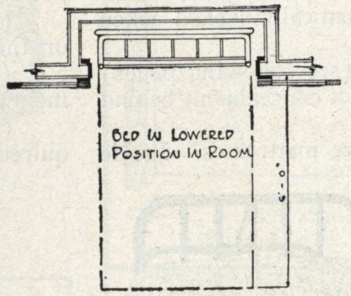
Minimum depth of closet is 22 in., but a greater depth will afford more free space for hanging of clothing, etc.

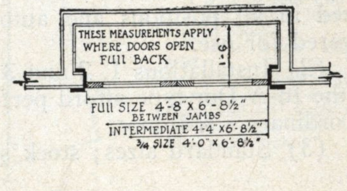
This type, requiring a slightly greater depth than the recess installation, affords the bringing of bed directly into room. This is accomplished by hanging door on pivots, which have offset pintles, set to either side of opening, so that door when reversed is moved outwardly a sufficient distance to clear casings.

When open, the door overlaps wall permitting an unobstructed entrance to closet

Off Center Pivot Type



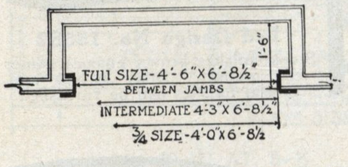

BED IN LOWERED POSITION IN ROOM
6'-0"

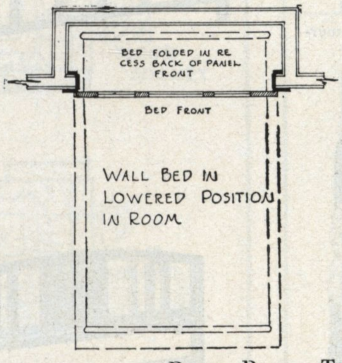

THESE MEASUREMENTS APPLY WHERE DOORS OPEN FULL BACK
1'-6"
FULL SIZE 4'-8"x6'-8½"
BETWEEN JAMBS
INTERMEDIATE 4'-4"x6'-8½"
¾ SIZE 4'-0"x6'-8½"

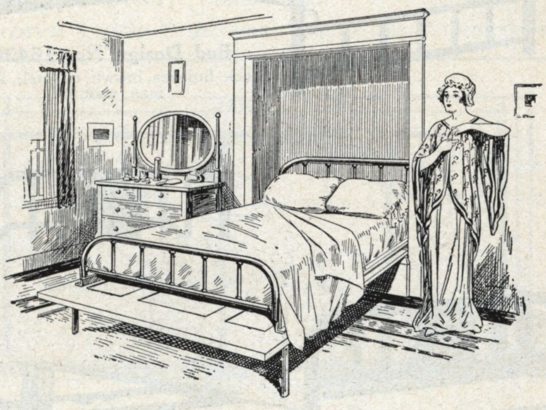
Method of installing is quite simple. Bed is attached to the floor in a recess.

The doors used in concealing the bed are hung on hinges and swing outward when bed is lowered into room. Where floor plan arrangement will not permit opening doors full back, widen the opening to 5 ft. to allow for a good clearance between jambs

Recess Type


1'-6"
FULL SIZE-4'-6"x6'-8½"
BETWEEN JAMBS
INTERMEDIATE 4'-3"x6'-8½"
¾ SIZE-4'-0x6'-8½


BED FOLDED IN RECESS BACK OF PANEL FRONT
BED FRONT
WALL BED IN LOWERED POSITION IN ROOM



Bed is equipped complete with front made of clear vertical grain Oregon pine and three-ply veneer panels with 18x40-in. mirror opening or plain three-panel effect.

The use of a panel recess installation overcomes the condition where space allotted to the bed is not sufficient to permit the use of doors, as the panel that conceals the opening is attached to the bed frame, raising or lowering with the bed as one unit.

Height of recess can be reduced to 6 ft. 6½ in. if desired

Panel Recess Type

DE LUXE CONCEALED BEDS

MURPHY DOOR BED COMPANY

OFFICES AND DISPLAY ROOMS THROUGHOUT UNITED STATES AND CANADA

NEW YORK, N. Y., Murphy Door Bed Co., 19 West 44th Street
For Pennsylvania, West Virginia, Virginia, District of Columbia, Maryland, Delaware, New Jersey, New York and the six New England States

CHICAGO, ILL., Murphy Door Bed Co. of Chicago, 22 West Monroe Street
For Illinois, Indiana, Ohio, Wisconsin, Minnesota, Iowa, Nebraska, North Dakota, South Dakota

DETROIT, MICH., Murphy Wall Bed Co. of Detroit, Kresge Building. For Michigan

SACRAMENTO, CAL., John Breuner Co.
For Sacramento and San Joaquin Counties

NASHVILLE, TENN., Murphy Door Bed Co. of Alabama and Tennessee, 306 North Third Avenue

DENVER, COLO., Colorado Builders Supply Co., 1435 Blake Street. For Colorado

ST. LOUIS, MO., Murphy Door Bed Co. of St. Louis, 315 North 10th Street
For Missouri, Kentucky, Mississippi, Arkansas, Kansas, Oklahoma, Texas and Louisiana

LOS ANGELES, CAL., Southern California Hardwood & Mfg. Co. For Southern California

ATLANTA, GA., Murphy Door Bed Co. of Atlanta, 204 Peach Tree Arcade Building
For Georgia, Florida, North and South Carolina

SAN FRANCISCO, CAL., Marshall & Stearns Co., Phelan Building
For San Francisco and adjoining Counties

SEATTLE, WASH., Murphy Door Bed Co., Terminal Sales Building
For Oregon, Washington, Montana, Wyoming and Utah

Products

Murphy Beds.

For Steel Kitchen Equipment, Medicine Cabinets and Ironing Boards, see pages 2739-2741.

The MURPHY IN-A-DOR BED
Full size bed through ordinary closet door
TRADE MARK

Murphy Beds

In-A-Dor, Recess, Wide-Door and Roller.

Some important facts on Murphy Door Beds:

(1) The outstanding and exclusive feature of Murphy Beds is the patented device by which the bed is balanced in all positions and automatically locked when lowered for use.

(2) Installations 1, 2 and 3 (see following pages) of the In-A-Dor type afford perfect concealment behind an ordinary sized door.

(3) Standard sizes; stock size mattresses. Inside measurements—6 ft. 4 in. in length; width: 4 ft. 6 in., 4 ft., 3 ft. 6 in., 3 ft.

(4) Made of best materials. All working parts are of high test malleable iron.

(5) Easily operated—a child can handle it. Controlled by multiple tension springs, no weights. Adjustable to weight of bedding at all times.

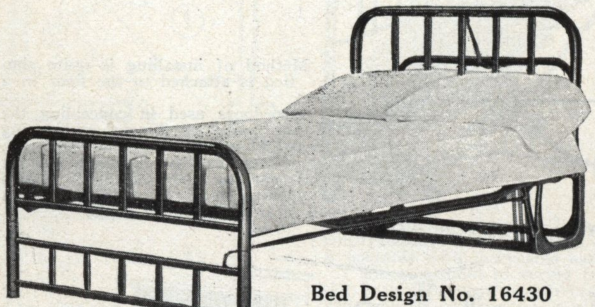
(6) Sanitary. All parts exposed. Bottom always accessible.

(7) Settling of building or shrinking of doors does not affect its perfect operation.

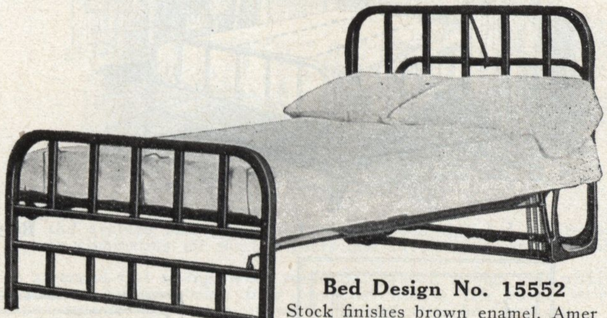
(8) Full weight of any In-A-Dor bed rests directly on the floor.

(9) Equipped with ribbon fabric (standard equipment), soft top coil or box springs.

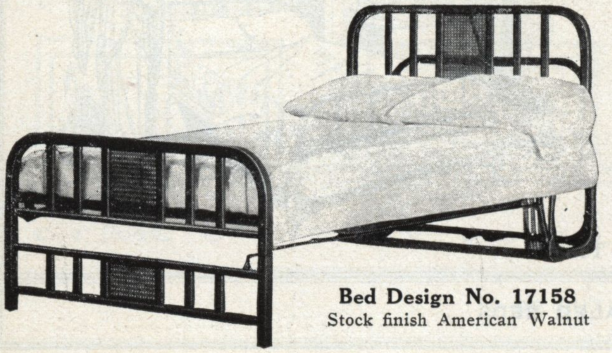
(10) Easy to install; no special construction required for installation.



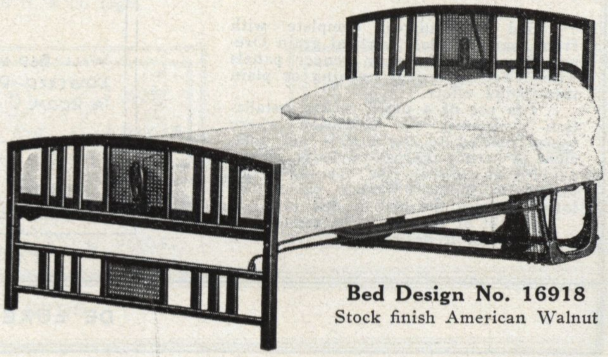
Bed Design No. 16430
Stock finishes brown enamel, American walnut



Bed Design No. 15552
Stock finishes brown enamel, American walnut. Inlay stripes and special finishes can be furnished

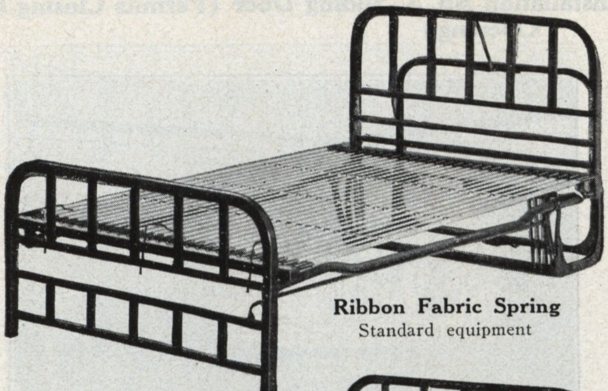


Bed Design No. 17158
Stock finish American Walnut

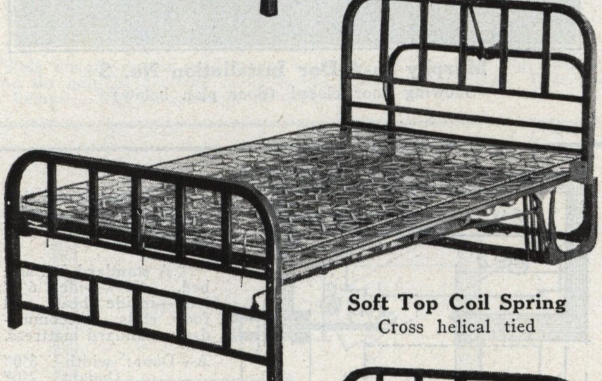


Bed Design No. 16918
Stock finish American Walnut

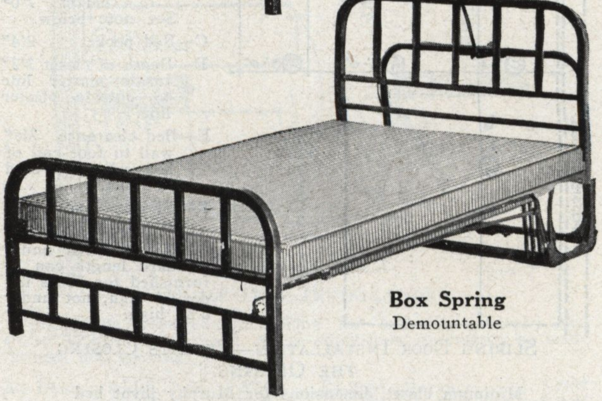
Continued on next page



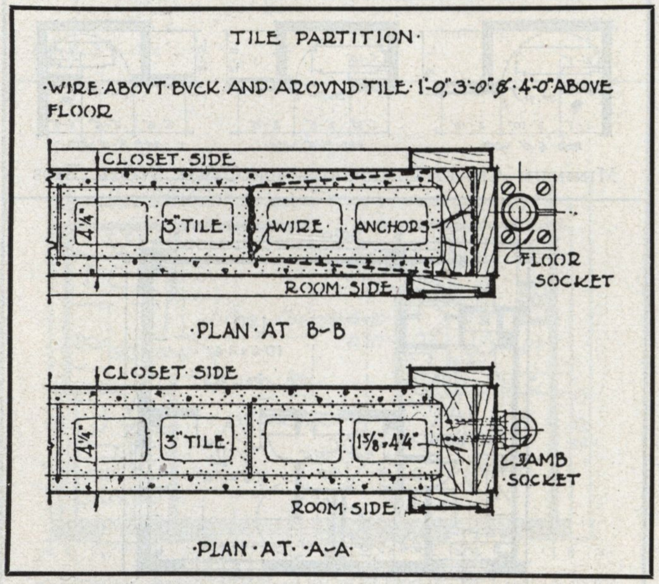
Ribbon Fabric Spring
Standard equipment



Soft Top Coil Spring
Cross helical tied



Box Spring
Demountable


TILE PARTITION
WIRE ABOVT BVCK AND AROVND TILE 1'-0", 3'-0" & 4'-0" ABOVE FLOOR
CLOSET SIDE
4¼"
3" TILE
WIRE
ANCHORS
FLOOR SOCKET
ROOM SIDE
PLAN AT B-B
CLOSET SIDE
4¼"
3" TILE
1⅝"×4¼"
JAMB SOCKET
ROOM SIDE
PLAN AT A-A

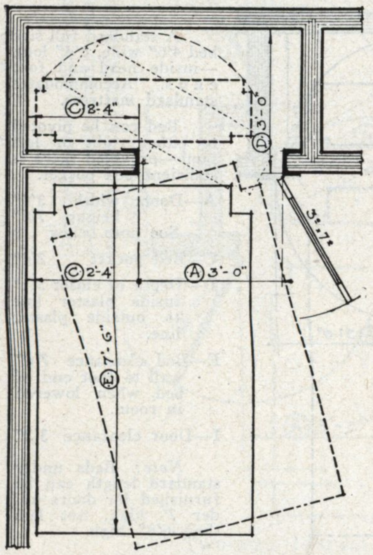
Detail Showing Method of Tying Wood Buck to Tile Partition

For all partitions other than the standard stud partition, the wood buck should be anchored with wire ties to the partition wall as shown on the detail above

Installation No. 1, Bed and Door on Opposite Jambs

Murphy In-A-Dor Installation No. 1

Showing position of door and the bed ready for use. Standard stock door. Door and bed independent of each other


Ⓒ 8'-4"
Ⓓ 3'-0"
3'-7"
Ⓒ 2'-4"
Ⓐ 3'-0"
Ⓔ 7'-6"

A standard full size bed 4'6" wide, 6'4" long —inside head and foot ends. Accommodates standard mattress.

Bed can be pivoted to either right or left jamb—provided there is sufficient bed pocket.

A—Door: width 3'0"
height 7'0"
See note below.

C—Bed pocket 2'4"

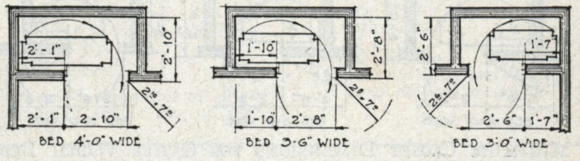
D—Depth of closet 3'0" inside plaster line to outside plaster line.

E—Bed clearance 7'6" wall to foot end of bed when lowered in room.

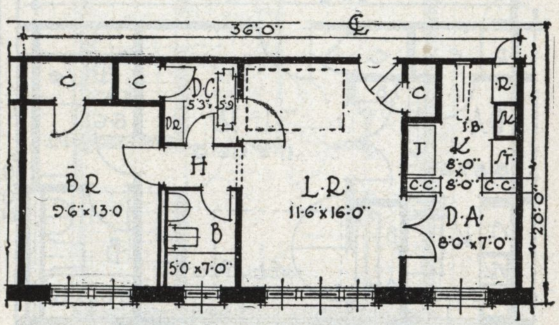
Door knob height 3'0".

Note: Beds under standard length may be furnished for doors under 7' high, not less than 6'8" high.

Bed and Door on Opposite Jambs
Minimum closet dimensions for Murphy pivot bed


2'-1"
2'-10"
2'-1"
2-10"
2⁸⁄₁₀×7⁰
BED 4'-0" WIDE
1'-10"
2'-8"
1'-10"
2'-8"
2⁸×7⁰
BED 3-6" WIDE
2'-6"
1'-7"
2⁶×7⁰
2'-6"
1'-7"
BED 3-0" WIDE

Minimum Closet Dimensions for Other Width Beds

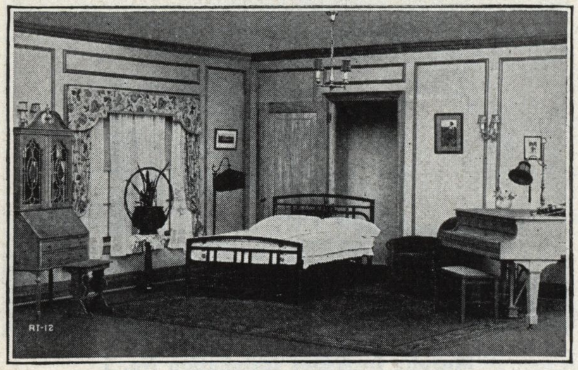

36'-0"
℄
C
C
D.C
5'3"
5'9"
Dr
H
BR
9'6"×13'0"
B
5'0"×7'0"
L.R.
11'6"×16'0"
C
R
S.B
T
K
8'0"×8'0"
St
C.C
C.C
D.A
8'0"×7'0"
20'0"

Practical Application—Bed and Door on Opposite Jambs so Bed Can Be Dropped Down Clear of Wall without Interference from Door

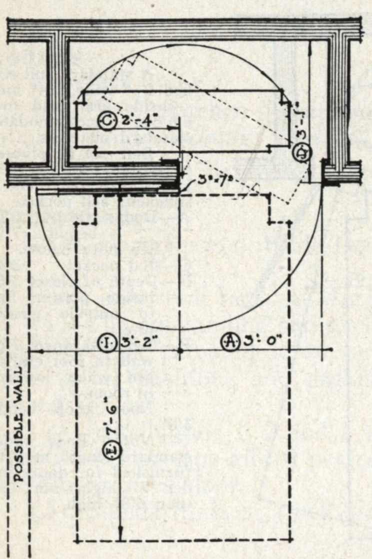
Installation No. 1

Continued on next page

Installation No. 2, Bed and Door on Same Jamb



Murphy In-A-Dor Installation No. 2
Showing position of door (behind bed) and the bed ready for use. Standard stock door. Door and bed independent of each other


2'-4"
3'-1"
3'-7"
3'-2"
3'-0"
7'-6"
POSSIBLE WALL

A standard full size bed 4′6″ wide, 6′4″ long —inside head and foot ends. Accommodates standard mattress.

Bed can be pivoted to either right or left jamb—provided there is sufficient bed pocket.

A—Door: width 3′0″
height 7′0″
See note below

C—Bed pocket 2′4″

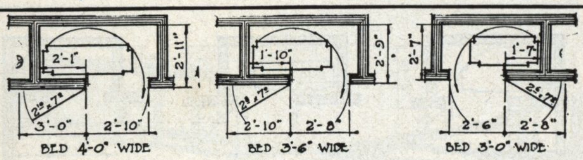
D—Depth of closet 3′1″ inside plaster line to outside plaster line.

E—Bed clearance 7′6″ wall to foot end of bed when lowered in room.

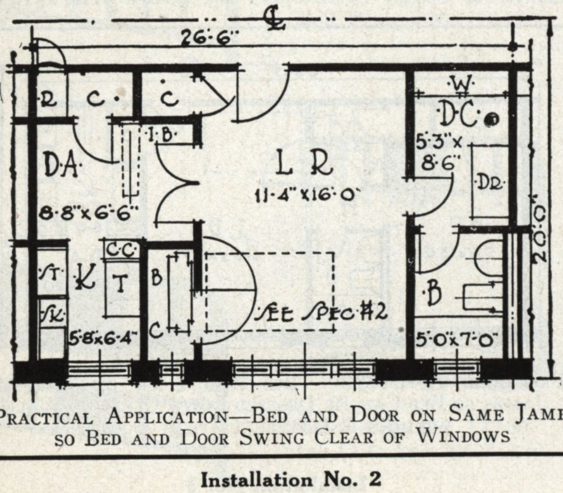
I—Door clearance 3′2″

Note: Beds under standard length can be furnished for doors under 7′ high, not less than 6′8″ high.

BED AND DOOR ON SAME JAMB
Minimum closet dimensions for Murphy pivot bed


2'-1"
2'-11"
3'-0"
2'-10"
BED 4'-0" WIDE
1'-10"
2'-9"
2'-10"
2'-8"
BED 3'-6" WIDE
2'-7"
1'-7"
2'-6"
2'-8"
BED 3'-0" WIDE

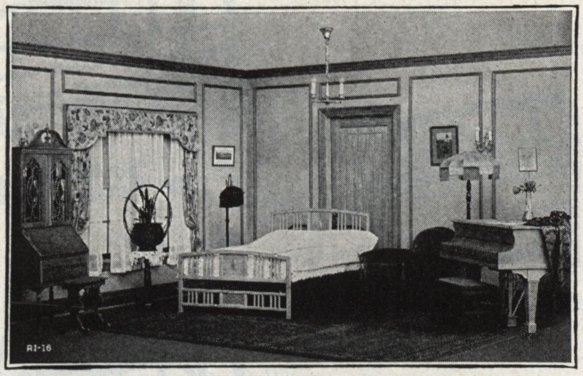
MINIMUM CLOSET DIMENSIONS FOR OTHER WIDTH BEDS


26'-6"
R
C
C
I.B.
W
D.C.
D.A.
8-8"x6-6"
L.R.
11-4"x16-0"
5-3"x8-6"
D.R.
20'-0"
C.C.
K
T
B
C
5-8x6-4"
SEE SPEC #2
B
5-0x7-0"

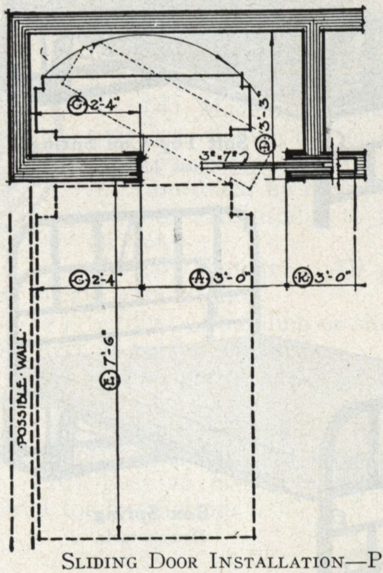
PRACTICAL APPLICATION—BED AND DOOR ON SAME JAMB, SO BED AND DOOR SWING CLEAR OF WINDOWS

Installation No. 2

Installation No. 3, Sliding Door (Permits Closing the Opening)



Murphy In-A-Dor Installation No. 3
Showing door closed (floor plan below)


2'-4"
3'-3"
3'-7"
2'-4"
3'-0"
3'-0"
7'-6"
POSSIBLE WALL

Bed pocket and sliding door pocket must be on opposite sides of opening.

A standard full size bed. 4′6″ wide, 6′4″ long—inside head and foot ends. Accommodates standard mattress.

A—Door: width 3′0″
height 7′0″
See note below.

C—Bed pocket 2′4″

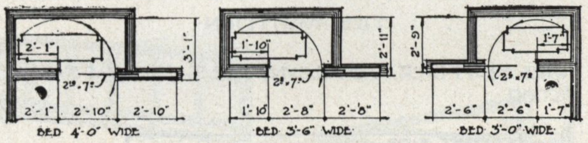
D—Depth of closet 3′3″ inside plaster line to outside plaster line.

E—Bed clearance 7′6″ wall to foot end of bed when lowered in room.

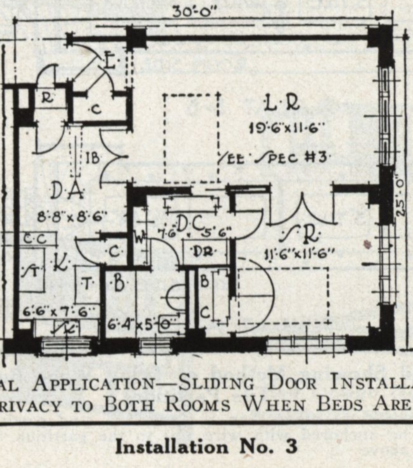
K—Sliding door pocket 3′0″

Note: Beds under standard length can be furnished for doors under 7′ high, not under 6′8″ high.

SLIDING DOOR INSTALLATION—PERMITS CLOSING THE OPENING
Minimum closet dimensions for Murphy pivot bed


2'-1"
3'-1"
2'-7"
2'-1"
2'-10"
2'-10"
BED 4'-0" WIDE
1'-10"
2'-11"
2'-7"
1'-10
2'-8"
2'-8"
BED 3'-6" WIDE
2'-9"
1'-7"
2'-7"
2'-6"
2'-6"
1'-7"
BED 3'-0" WIDE

MINIMUM CLOSET DIMENSIONS FOR OTHER WIDTH BEDS

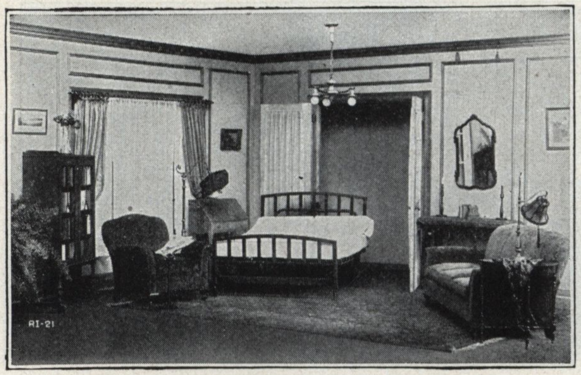

30'-0"
E
R
C
IB
D.A.
8-8"x8-6"
L.R.
19-6"x11-6"
SEE SPEC #3
25'-0"
W
D.C.
7-6"x5-6"
C
D.R.
S.R.
11-6"x11-6"
C.C.
K
T
B
6-6"x7-6"
6-4"x5-0"

PRACTICAL APPLICATION—SLIDING DOOR INSTALLATION TO GIVE PRIVACY TO BOTH ROOMS WHEN BEDS ARE IN USE

Installation No. 3

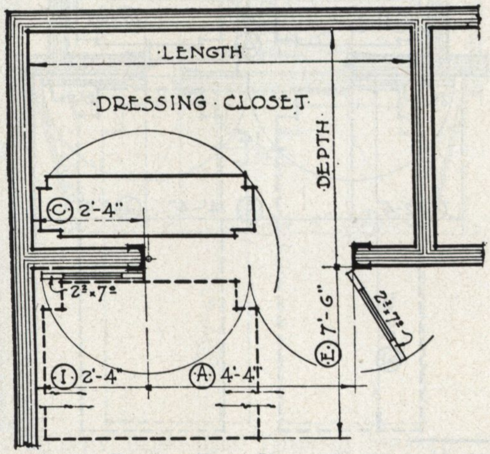
Continued on next page

Installation No. 4, Double Door



Murphy In-A-Dor Installation No. 4

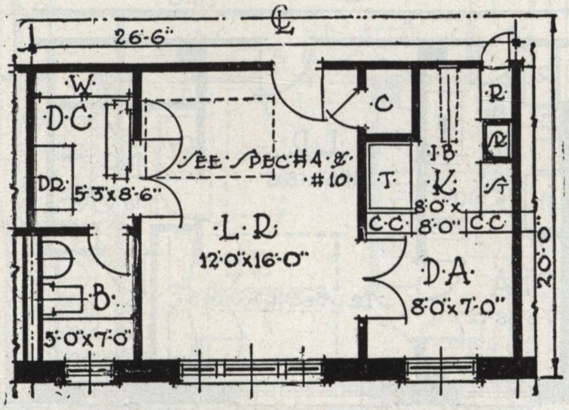
This installation is used where it is essential to have full entrance to and through the dressing closet to the bath or other room. (See floor plan below). Bed independent of doors


·LENGTH
·DRESSING·CLOSET·
DEPTH
Ⓒ 2'-4"
2³x7²
Ⓔ 7'-6"
2³x7²
Ⓘ 2'-4
Ⓐ 4'-4"

Double Door Installation

Minimum required dimensions for full size Murphy bed 4′6″x6′4″ in dressing closet, where entry must necessarily be made through bed opening

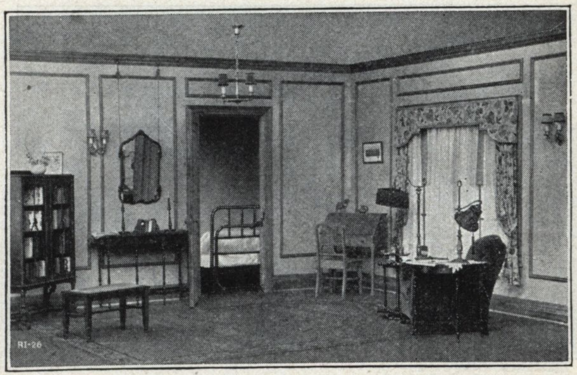
A—Doors: width, two 2′2″
height 7′0″
For 6′8″ door see Note Spec. No. 1
C—Bed pocket 2′4″
E—Bed clearance 7′6″ wall to foot end of bed when lowered in room.
I—Door clearance 2′4″


℄
26·6"
W
D·C
DR
5·3"x8·6"
SEE SPEC #4 & #10
L·R
12·0"x16·0"
C
R
T
I·B
K
8·0"x8·0"
CC
CC
D·A
8·0"x7·0"
20·0"
B
5·0"x7·0"

Practical Application—Double Doors, Where Entry Must Be Made Through Bed Opening to Bathroom

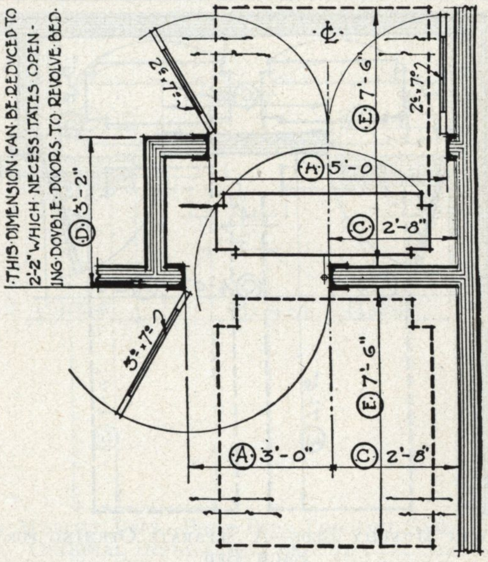
Installation No. 4

Installation No. 5, Two-way Plan Permits Use of Bed in Either of Two Rooms



Murphy In-A-Dor Installation No. 5

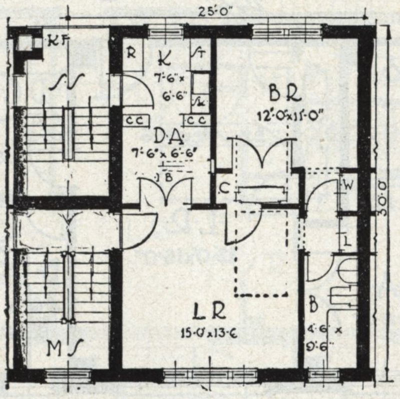
Showing the possibility of one bed being used in either of two rooms. For example: den, sleeping porch


THIS·DIMENSION·CAN·BE·REDUCED TO 2'-2" WHICH·NECESSITATES·OPENING·DOUBLE·DOORS·TO·REVOLVE·BED·
℄
2²x7²
Ⓔ 7'-6"
2²x7²
Ⓗ 5'-0
Ⓓ 3'-2"
Ⓒ 2'-8"
3⁰x7²
Ⓔ 7'-6"
Ⓐ 3'-0"
Ⓒ 2'-8"

Two-way Installation

Minimum closet dimensions for Murphy pivot bed 4′6″x6′4″, where bed may either revolve into room or be lowered into adjoining room or porch.

A—Doors: width, one 3′0″
width, two 2′6″
height 7′0″
For 6′8″ door see Note Spec. No. 1
C—Bed pocket 2′8″
Note relative position of 3′0″ opening to center line of 5′0″ opening.
D—Depth of closet 3′2″ outside plaster line to outside plaster line including both walls.
E—Bed clearance 7′6″ wall to foot end of bed when lowered in room.

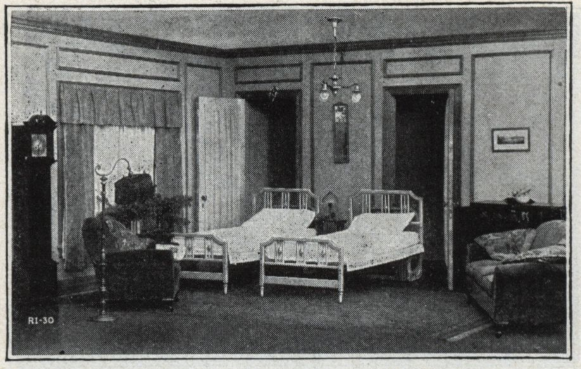

25'0"
KF
R
K
7'6"x
6'6"
ST
SK
CC
CC
BR
12'0"x15'0"
D·A
7'6"x6'6'
IB
C
W
L
30'0
LR
15'0"x13'6
B
4'6"x
9'6"
MS

Practical Application—Method of Using One Murphy Bed in Either of Two Different Rooms

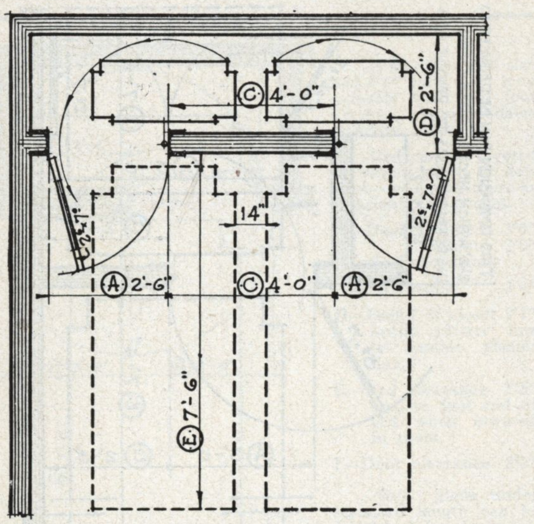
Installation No. 5

Continued on next page

Installation No. 6, Twin Murphy Beds, a Separate Opening for Each Bed



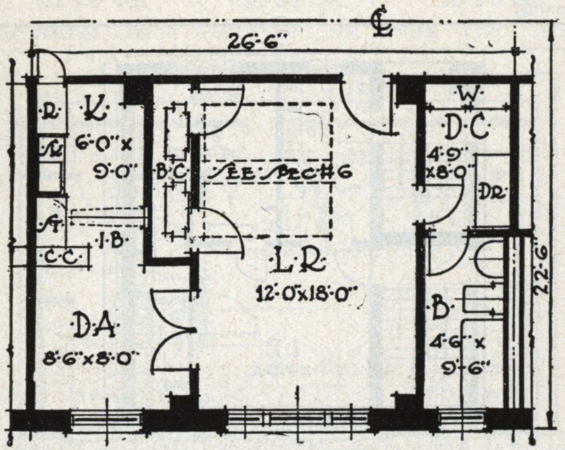
Murphy Twin Bed Installation No. 6
In-A-Dor type with separate opening for each bed


C 4'-0"
D 2'-6"
2'-7"
2'-7"
14"
A 2'-6"
C 4'-0"
A 2'-6"
E 7'-6"

TWIN MURPHY BEDS—A SEPARATE OPENING FOR EACH BED

Minimum closet dimensions for Murphy pivot bed—twin arrangement for standard 3′x6′4″ beds

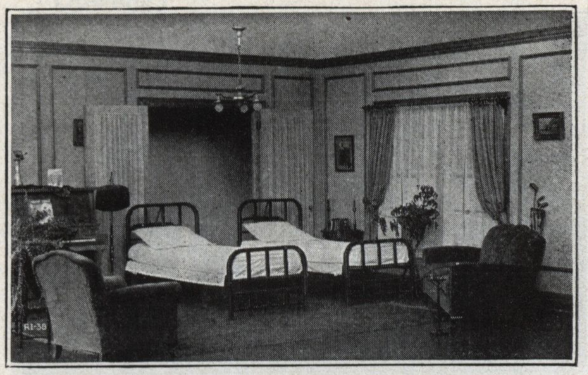
A—Doors: width 2′6″
height 7′0″
For 6′8″ door see Note Spec. No. 1
C—Bed pocket recommended 4′0″
Minimum required 3′0″
D—Depth of closet 2′6″ Inside plaster line to outside plaster line.
E—Bed clearance 7′6″ wall to foot end of bed when lowered in room
Door knob height 3′0″


℄
26'-6"
K
6'-0"x9'-0"
R
S
St
I.B
C.C
B.C
See Spec #6
W
D.C
4'-9"x8'-0"
DR
L.R
12'-0"x18'-0"
D.A
8'-6"x8'-0"
B
4'-6"x9'-6"
22'-6"

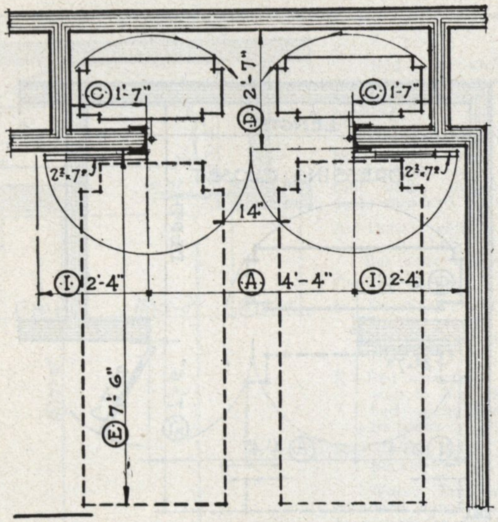
PRACTICAL APPLICATION

Installation No. 6

Installation No. 7, Twin Murphy Beds, Both Beds Through Same Opening



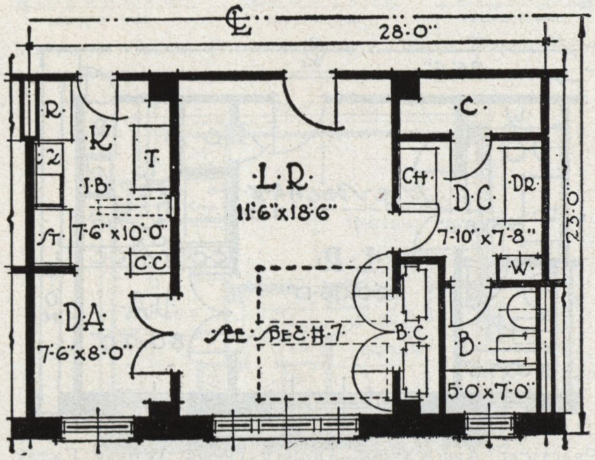
Murphy Twin Bed Installation No. 7
In-A-Dor type. Both beds through same opening. Beds independent of doors


C 1'-7"
D 2'-7"
C 1'-7"
2'-7"
2'-7"
14"
I 2'-4"
A 4'-4"
I 2'-4"
E 7'-6"

TWIN MURPHY BEDS—BOTH BEDS THROUGH SAME OPENING

Minimum closet dimensions for Murphy pivot bed—twin arrangement for standard 3′0″x6′4″ beds

A—Doors: width 2′2″
height 7′0″
For 6′8″ door see Note Spec. No. 1
C—Bed pocket 1′7″
D—Depth of closet 2′7″ inside plaster line to outside plaster line.
E—Bed clearance 7′6″ wall to foot end of bed when lowered in room.
I—Door clearance 2′4″ Doors must swing back against wall.

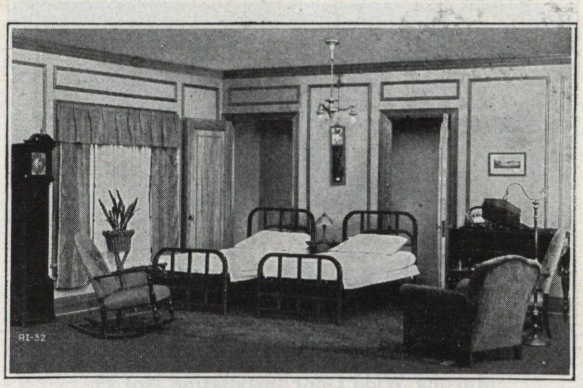

℄
28'-0"
R
K
T
I.B
St
7'-6"x10'-0"
C.C
L.R
11'-6"x18'-6"
C
CH
D.C
7'-10"x7'-8"
DR
W
See Spec #7
B.C
B
5'-0"x7'-0"
D.A
7'-6"x8'-0"
23'-0"

PRACTICAL APPLICATION

Installation No. 7

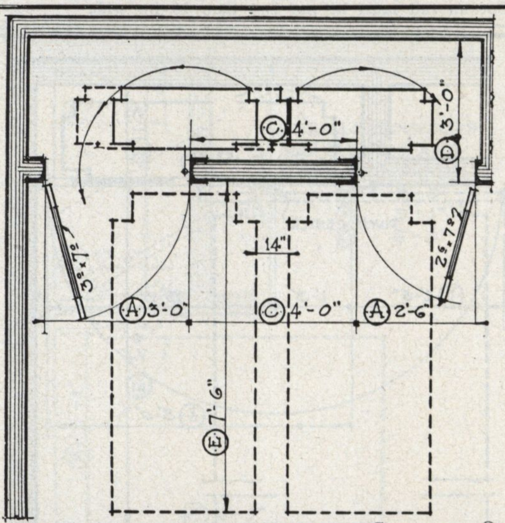
Continued on next page

Installation No. 8, Twin Murphy Beds Through Separate Openings



Murphy Twin Beds, In-A-Dor Installation No. 8

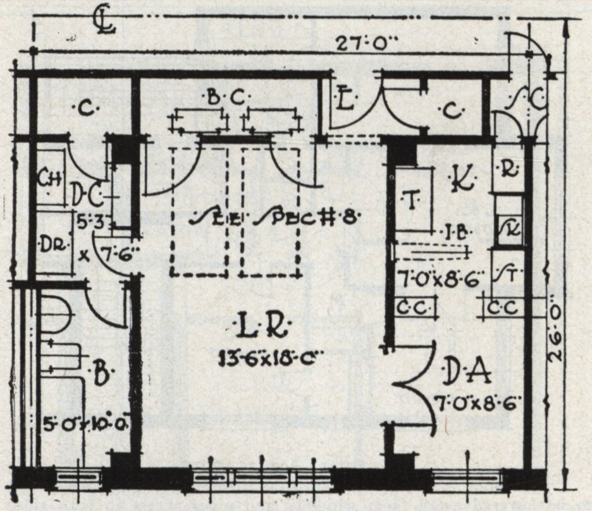
Beds through separate openings. These beds can be lifted from their sockets and replaced with one full size bed in left-hand opening (see detail)


C 4'-0"
D 3'-0"
3⁰×7⁰
2⁶×7⁰
14"
A 3'-0"
C 4'-0"
A 2'-6"
E 7'-6"

Twin Murphy Beds—Beds Through Separate Openings, Optional Installation of One Full Size Bed

Minimum closet dimensions for Murphy pivot beds—twin arrangement, for standard 3'0"x6'4" beds or substitution of one full size 4'6"x6'4" bed

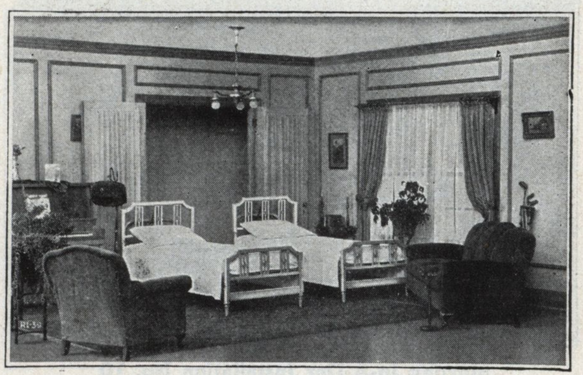
A—Doors: width—one	3'0"
—one	2'6"
height	7'0"
For 6'8" door see Note Spec. No. 1	
C—Bed pocket recommended	4'0"
Minimum required	3'0"
D—Depth of closet Inside plaster line to outside plaster line.	3'0"
E—Bed clearance	7'6"
Door knob height	3'0"


℄
27'-0"
C
B·C
L
C
C
CH
D·C
5·3
DR
7·6
SEE SPEC # 8
T
K
R
I·B
7·0×8·6
CC
CC
L·R
13·6×18·0
D·A
7·0×8·6
B
5·0×10·0
26'·0"

Practical Application

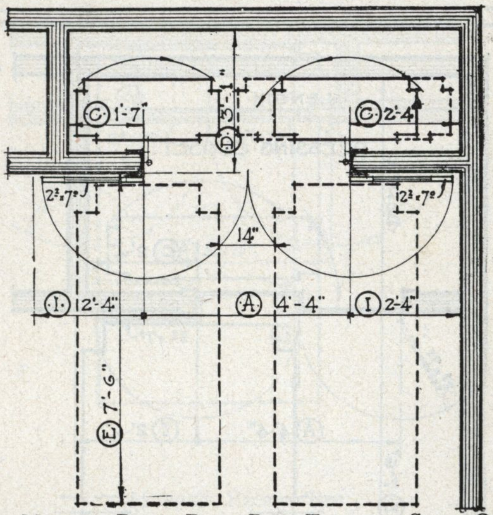
Installation No. 8

Installation No. 9, Twin Murphy Beds Through Two-door Opening



Murphy Twin Beds, In-A-Dor Installation No. 9

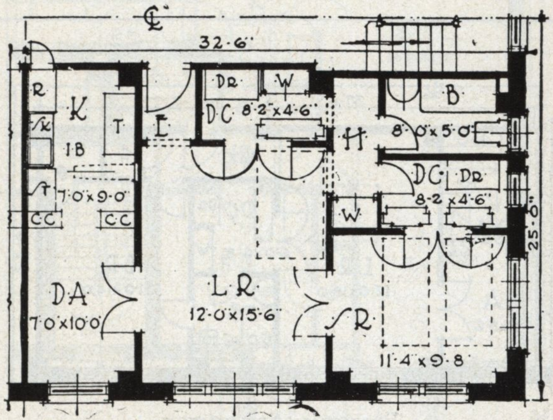
Both beds through same opening. These beds can be lifted from their sockets and replaced with one full size bed on the right-hand side (see detail)


C 1'-7
D 3'-1"
C 2'-4
2²×7⁰
2²×7⁰
14"
I 2'-4"
A 4'-4"
I 2'-4"
E 7'-6"

Twin Murphy Beds—Both Beds Through Same Opening. Optional Installation of One Full Size Bed

Minimum closet dimensions for Murphy pivot beds—twin arrangement, for standard 3'0"x6'4" beds or substitution of one full size 4'6"x6'4" bed

A—Doors: width—two	2'2"
height	7'0"
For 6'8" door see Note Spec. No. 1	
C—Bed pockets—one	2'4"
—one	1'7"
D—Depth of closet inside plaster line to outside plaster line.	3'1"
E—Bed clearance	7'6"
I—Door clearance Doors must swing back against wall.	2'4"


℄
32·6"
R
K
T
L
DR
W
D·C 8·2×4·6
H
B
8·0×5·0
I·B
7·0×9·0
CC
CC
D·C
DR
8·2×4·6
W
25'·0"
D·A
7·0×10·0
L·R
12·0×15·6
S·R
11·4×9·8

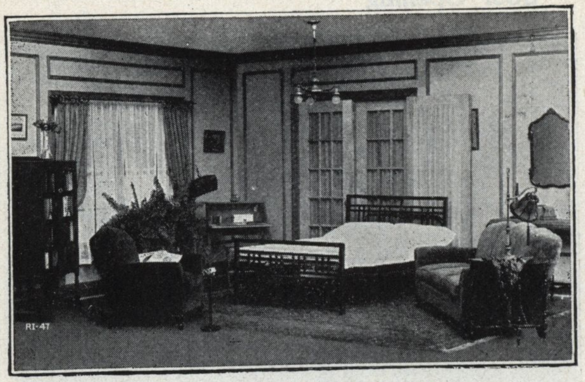
Practical Application

Sun parlor, with twin Murphy beds, serves as sleeping room. Full size Murphy bed in living room. Bath reached from living room through hall and through dressing closet and from sun parlor through dressing closet

Installation No. 9

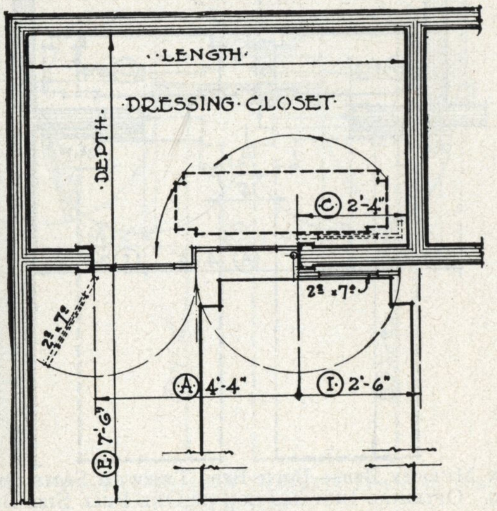
Continued on next page

Installation No. 10, Three-Door Installation



Murphy In-A-Dor Installation No. 10

This installation is used where it is essential to have full entrance to and through the dressing closet to bath or other room. *Full entrance and opening closed when bed is either in the closet or in the room*

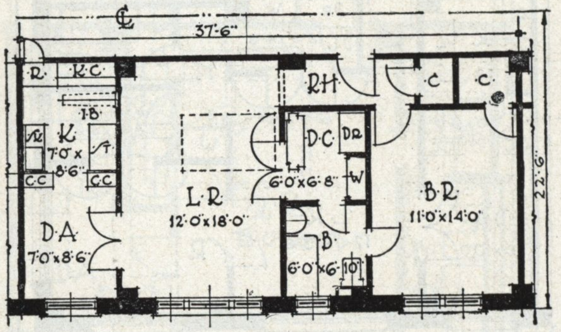

LENGTH
DRESSING CLOSET
DEPTH
Ⓒ 2'-4"
2² x 7º
2² x 7º
Ⓐ 4'-4"
Ⓘ 2'-6"
Ⓔ 7'-6"

THREE-DOOR INSTALLATION

Minimum required dimensions for Murphy pivot bed 4'6"x6'4", in dressing closet where entry must be through bed opening and where opening may be closed while bed is in use

A—Doors: width—three 2'2"
height 7'0"
For 6'8" door, see Note on Spec. No. 1
C—Bed pocket 2'4"

E—Bed clearance 7'6" wall to foot end of bed when lowered in room.
I—Door clearance 2'6"

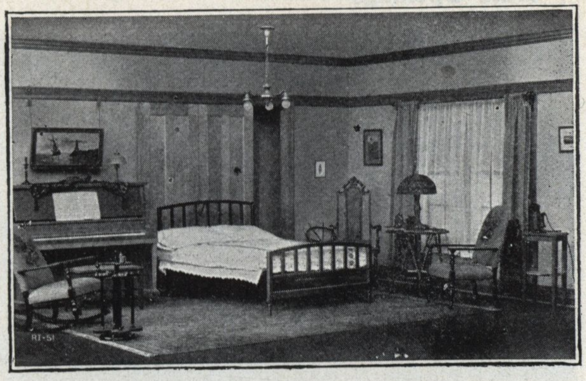

℄
37'-6"
R
K.C
I.B
K
7'0" x 8'6"
ST
C.C
C.C
D.A
7'0"x8'6"
L.R
12'0"x18'0"
RH
D.C
DR
6'0"x6'8"
W
B
6'0"x6'10"
C
C
B.R
11'0"x14'0"
22'6"

PRACTICAL APPLICATION

Bathroom may be reached from living room, through dressing closet while the Murphy bed is in use. The three-door arrangement affords full privacy when livingroom bed and bedroom are both in use

Installation No. 10

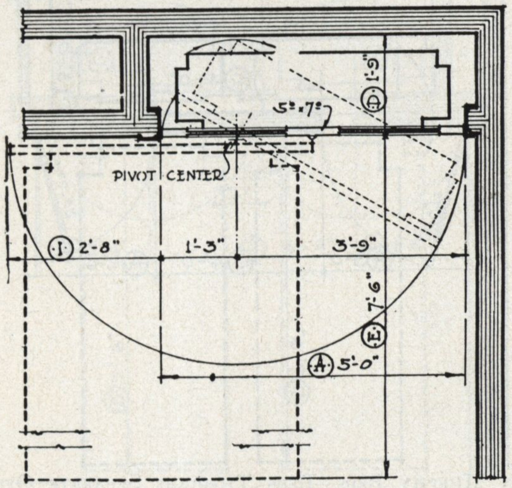
Installation No. 11, Wide Door Off Center Pivot



Murphy Wide Door Installation No. 11

Off-centered as shown throws bed away from the adjacent sidewall when closet is in a corner. If closet is 3 ft. deep, door can be pivoted on the center and will then close the opening.

Note: This bed is fastened to back of door—it is necessary that door be not less than 1¾-in. thick, also that stiles and rails have hardwood cores. Bottom rail must be not less than 13 in. wide

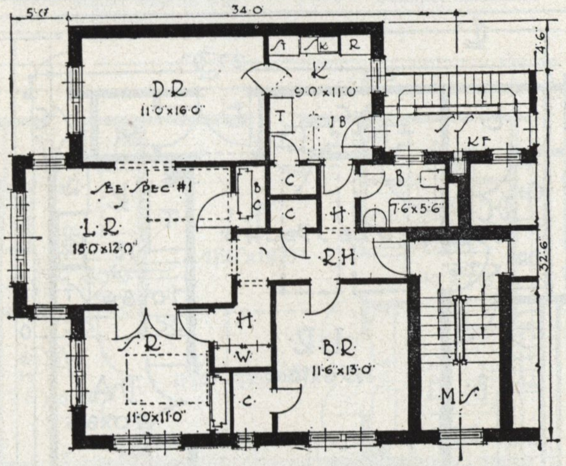

5º x 7º
Ⓓ 1'-9"
PIVOT CENTER
Ⓘ 2'-8"
1'-3"
3'-9"
Ⓔ 7'-6"
Ⓐ 5'-0"

WIDE DOOR OFF CENTER PIVOT INSTALLATION

Minimum closet dimensions for standard full size bed 4'6"x6'4" inside head and foot ends

A—Door: width 5'0"
height 7'0"
For 6'8" door see Note Spec. No. 1
D—Depth of closet 1'9" inside plaster line to outside plaster line.

E—Bed clearance 7'6" wall to foot end of bed when lowered in room.
I—Door clearance 2'8"


5'0"
34.0
4'6"
S
SK
R
K
9'0"x11'0"
D.R
11'0"x16'0"
T
IB
KF
SEE SPEC #1
B
C
C
C
B
7'6"x5'6"
H
L.R
15'0"x12'0"
R.H
H
SR
W
B.R
11'6"x13'0"
C
11'0"x11'0"
MS
32'6"

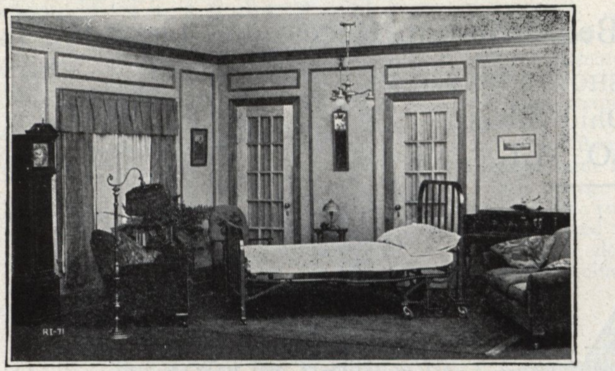
PRACTICAL APPLICATION

The wide door off center pivot installation allows the bed to be lowered away from windows and gives access to both sides of bed

Installation No. 11

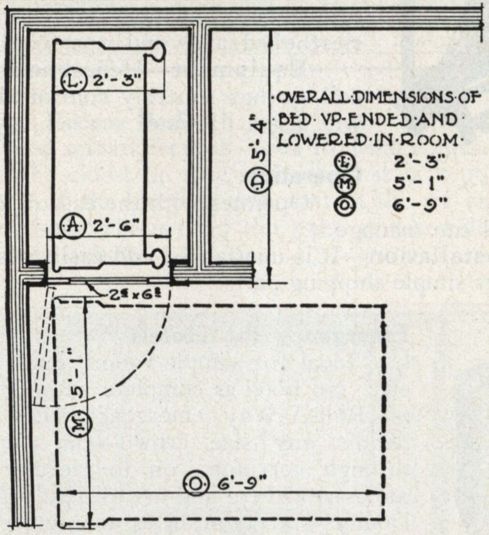
Continued on next page

Installation No. 12, Murphy Roller or Portable Type



Murphy Roller Installation No. 12

Mounted on rubber casters, ball bearing. Can be installed in long, narrow closet or shallow, wide closet


L 2'-3"
OVERALL·DIMENSIONS·OF·BED·UP-ENDED·AND·LOWERED·IN·ROOM·
L 2'-3"
M 5'-1"
O 6'-9"
D 5'-4"
A 2'-6"
2'x6'8"
M 5'-1"
O 6'-9"

Murphy Roller Bed

Minimum closet dimensions for Murphy roller bed

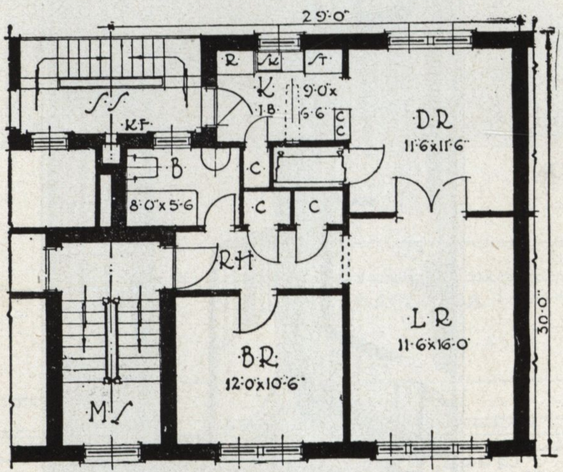
Note: When necessary to install roller bed in recess closet specify—door opening of 5'4" and depth of closet 2'6", inside plaster line to outside plaster line.

A standard full size bed 4'6" wide 6'2" long—inside head and foot ends.

Accommodating standard mattress.

A—Door: width 2'6"
height 6'8"

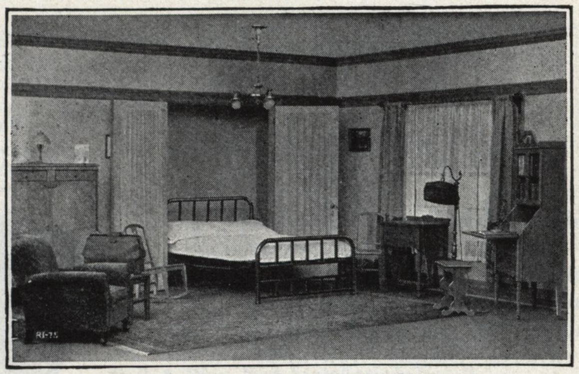
D—Depth of closet inside to outside plaster line. 5'4"


29'-0"
R
K
9'-0"x6'-6"
18
KF
C
B
8'-0"x5'-6"
C
C
C
D.R
11'-6"x11'-6"
RH
L.R
11'-6"x16'-0"
B.R
12'-0"x10'-6"
M
30'-0"

Practical Application—To Fit Roller Bed into a Very Small Closet Space, When Large Recess Space Is Not Available

Installation No. 12

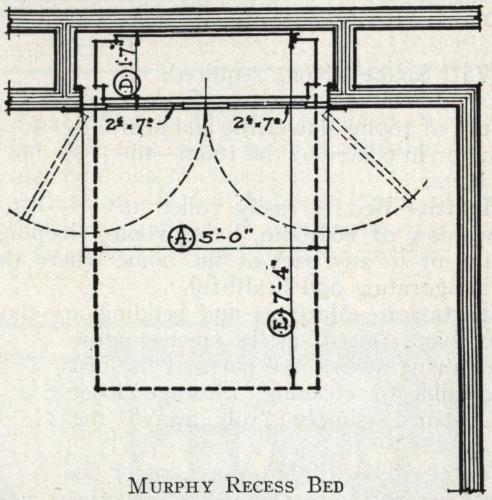
Installation No. 13, Murphy Recess Type



Murphy Recess Installation No. 13

Fastened to floor in shallow recess—lowers straight to floor, does not pivot. When on floor, ready for use, bed is projected forward so head, end is in line with door opening.

Note: When closet can not be provided, a canopy rod can be furnished which permits concealing bed behind draperies.


D 1'-7"
2'x7'
2'x7'
A 5'-0"
E 7'-4"

Murphy Recess Bed

Minimum closet dimensions for standard full size bed 4'6"x6'4"—inside head and foot ends

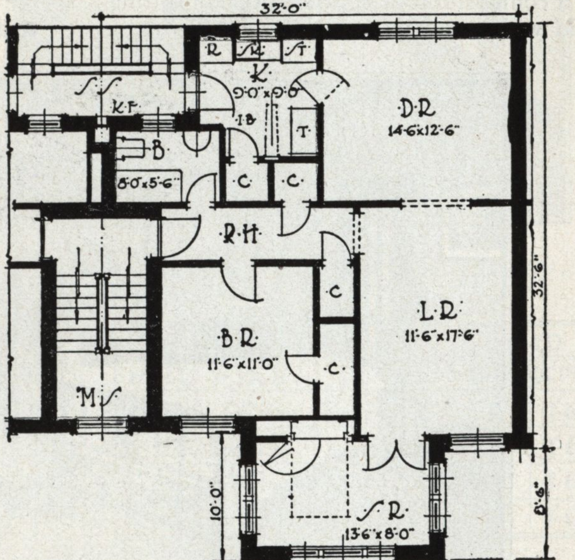
For 4' bed, doors 2'3" wide; 3'6" bed, doors 2'0" wide; 3' bed, doors 1'9" wide

A—Doors: width—two 2'6"
height 7'0"

For 6'8" door see Note Spec. No. 1

D—Depth of closet inside to outside plaster line. 1'7"

E—Bed clearance back of closet to foot end of bed. 7'4"


32'-0"
R
K
9'-0"x9'-0"
T
18
KF
B
8'-0"x5'-6"
C
C
D.R
14'-6"x12'-6"
R.H
C
B.R
11'-6"x11'-0"
C
L.R
11'-6"x17'-6"
32'-6"
M
S.R
13'-6"x8'-0"
10'-0"
8'-6"

Practical Application—To Use Recess Bed in Very Small Closet Space without Reducing Size of Sun Room

Installation No. 13

ROLL-A-WAY BED CORPORATION

Manufacturers of the "Roll-A-Way" Bed, Roll-out, Recess and Door Beds

OFFICES AND SHOW ROOMS
225 West Ohio Street
CHICAGO, ILL.

Roll-A-Way Beds

Application—For the best hotels, apartments, or homes requiring a good comfortable bed. Roll-A-Way rests squarely on the floor—can be rolled anywhere. Simply "roll away" when not in use.

Storage Closets—Can be located anywhere—ofttimes through doorway in the reception hall. (See details on following page.)

Door—Use (one) ordinary stock door.

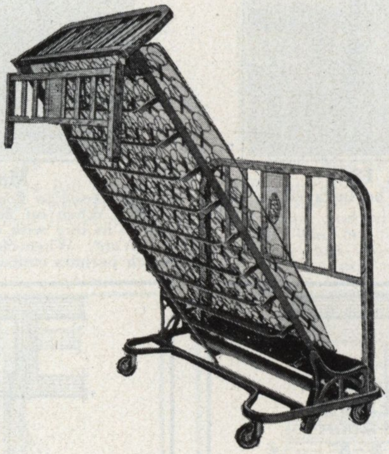
Wall Space—None required. It is not necessary to move or displace furniture of room—lower the bed near window or in center of the room—the air is better.

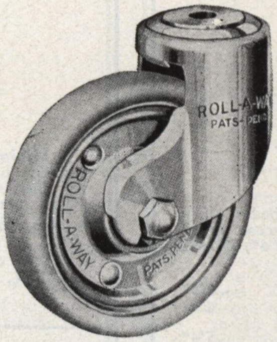
Health—Bed is easily rolled to open window of bedroom, living room, sleeping porch, solarium, or to any part of the home where the air is pure, invigorating and healthful.

Sanitation—Mattress and bedding are thoroughly "sunned" and "aired" at the open window before storing away. All parts of the bed are accessible for cleaning. Storage closet easily cleaned—simply "roll away" the bed.

Caster—The Roll-A-Way caster is without peer on the market, being sold for use on hundreds of articles where high grade casters are required. It is of large diameter and will roll over rugs without disturbing them.

It is made of steel; ball bearing at axis and swivel and has hardened races. The tire is a composition designed to prevent rotting and which will protect the finest floors.


Roll-A-Way Bed



Roll-A-Way Caster

It is easy and noiseless in its operation.

Bed Construction

Frame—Steel throughout. No breakable castings.

Bed Ends—Made of $1\frac{1}{2}$-in. square tubing with ornamental steel (imitation cane) panel and grained in enamel and wood finishes.

Truck—Patented. Felt bound to protect bed, furniture and trim. It carries the bed safely and in perfect balance.

Equipment—Helical tie open box coil springs superbly comfortably and will last a lifetime.

Operation

Operates with the ease of gesture. A child can manage it.

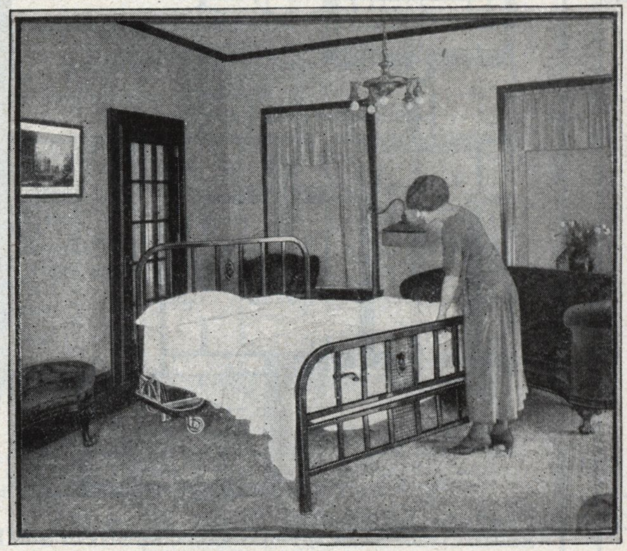
Installation—It is unattached and easily assembled from its simple shipping parts.

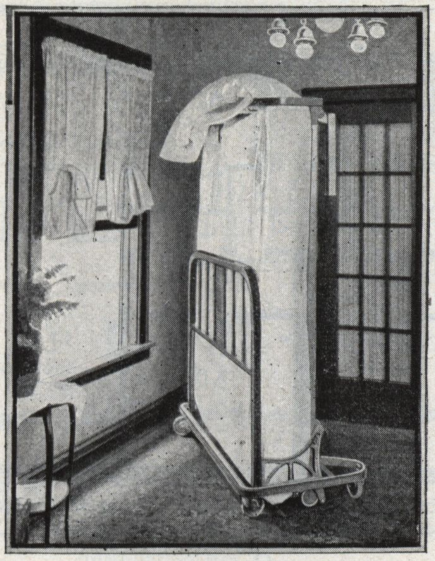
Emergency for Hotels

Ideal for sample rooms, guest rooms, etc. No hotel is complete without a fleet of Roll-A-Way emergency beds. They handle any size crowd—can be rolled through corridors, on to elevators, into rooms anywhere and are all ready for use. Double and twin beds are interchanged instantly—the maid can do it.

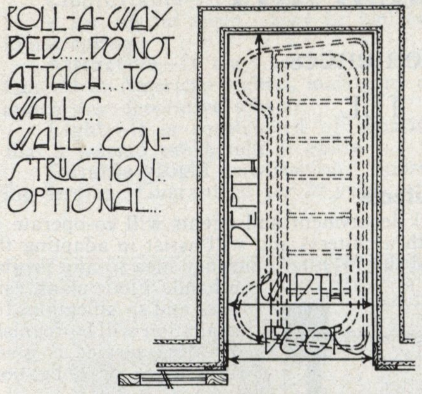
Architects' and Builders' Service

Architects are invited to submit to our technical department the preliminary floor plans for verification of specifications and recommendations.


Bed Easily Rolled to Window or Porch


Bedding "Sunned" and "Aired"

Continued on next page


ROLL-A-WAY BEDS DO NOT ATTACH TO WALLS. WALL CONSTRUCTION OPTIONAL
DEPTH
WIDTH
DOOR

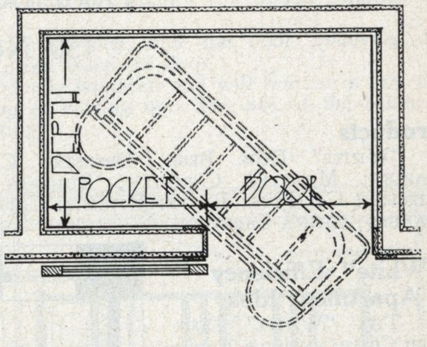
Specifications

All measurements on the page are minimum.

All measurements are computed at baseboard.

All closet floors should be on same level and of same finish as floor in room.

When storage closet door is built in *corner* of the room, the closet door should be hinged to entirely clear door opening, or a door used two inches wider than specified.



Roll-A-Way Bed Installation No. 1

Bed		Door	Closet	
Size	Width		Width	Depth
Double	4′ 6″	2′ 4″ x 6′ 8″	2′ 4″	5′ 0″
Narrow double	4′ 0″	2′ 4″ x 6′ 8″	2′ 4″	4′ 6″
Single	3′ 6″	2′ 4″ x 6′ 8″	2′ 4″	4′ 0″
Twin (one bed)	3′ 0″	2′ 4″ x 6′ 8″	2′ 4″	3′ 6″

Roll-A-Way Bed Installation No. 2

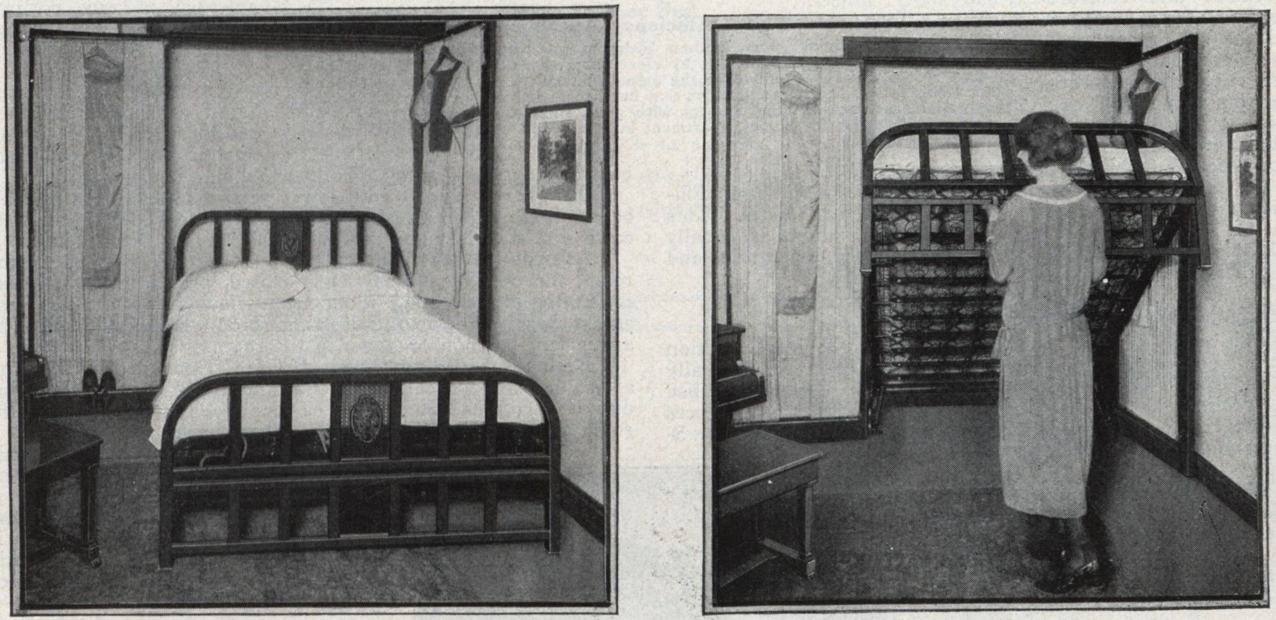
Size of bed	Door 3′ 0″		Door 2′ 10″		Door 2′ 8″		Door 2′ 6″		Door 2′ 4″	
	Pkt.	Dpth.	Pkt.	Dpth.	Pkt.	Dpth.	Pkt.	Dpth.	Pkt.	Dpth.
Double	2′ 3″	2′ 9″	2′ 5″	2′ 11″	2′ 7″	3′ 1″	2′ 9″	3′ 3″	2′ 11″	3′ 5″
Narrow double	1′ 10″	2′ 7″	2′ 0″	2′ 8″	2′ 2″	2′ 10″	2′ 4″	3′ 0″	2′ 6″	3′ 2″
Single	1′ 4″	2′ 4″	1′ 6″	2′ 4″	1′ 8″	2′ 6″	1′ 10″	2′ 8″	2′ 0″	2′ 10″
Twin	0′ 11″	2′ 4″	1′ 1″	2′ 4″	1′ 3″	2′ 4″	1′ 5″	2′ 6″	1′ 7″	2′ 6″

Roll-out Recess Beds

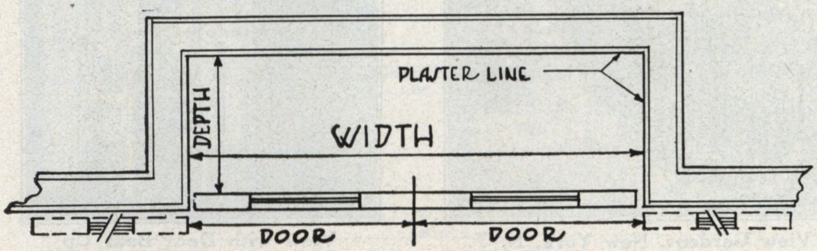
Sleep out of Recess—The Roll-out comes forward out of the closet or recess in which it is kept, placing the head of the sleeping occupant in the air circulation of the room, eliminating the most undesirable feature of stationary beds.

A Space Saver—Highly desirable as a space saver where but one point in the room is available for the bed and its use confined to one room.

Application—It will be noted from specifications below that it is confined to a minimum of recess space and may be enclosed behind doors or curtains.



The Roll-out Bed



ROLL-OUT. OUR RECESS BED			
SIZE OF BED	DOOR	WIDTH	DEPTH
Double 4′6″ WIDE	Two 2′6″×6′8″	5′0″	1′6″
NarrowDble 4′0″	Two 2′4″×6′8″	4′8″	1′6″
Single 3′6″	Two 2′0″×6′8″	4′0″	1′6″
TWIN (ONE BED) 3′0″	Two 1′10″×6′8″	3′8″	1′6″

THE "WHITE" DOOR BED COMPANY

Door Beds and Space Saving Conveniences

130 North Wells Street, CHICAGO, ILL.

SALES AGENTS IN PRINCIPAL CITIES

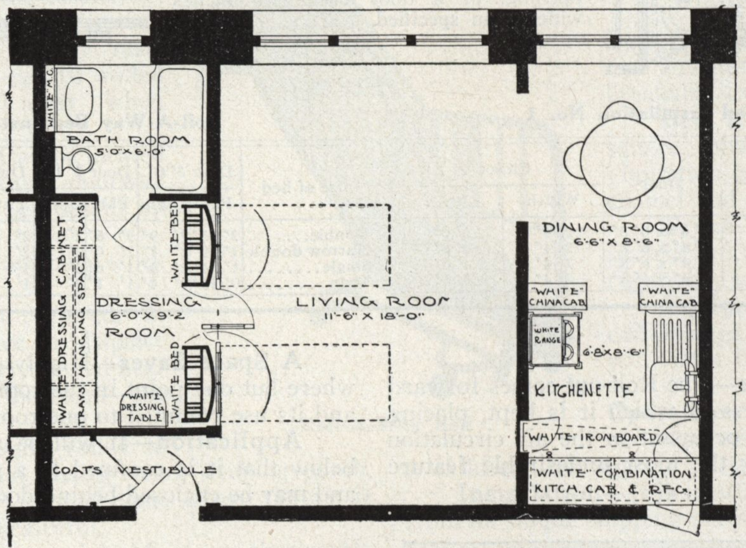
Products

"White" Door Beds; Dressing Cabinets; Dressing Tables; Medicine Cabinets; Built-in Ironing Boards; Kitchen Cabinets; Buffet Kitchen Cabinets; Kitchenette Ranges; China Cabinets.

"White" Efficiency Apartment Idea

The "White" Door Bed Company have something more fundamental to offer than just the sale of various space saving conveniences. A definite plan is offered which strikes the keynote of present day residential construction and which was actually the basic idea behind the development of all "White" products.

This idea, the "White" Efficiency Apartment, is the ideal room arrangement secured by combining "White" Door Beds and Space Saving Conveniences in the most favorable way. It makes provision for convenient and comfortable living in a comparatively small space, efficiently eliminates all that tends to make unnecessary building cost, and makes it possible for the builder to secure maximum revenue from his investment.



"White" Efficiency Apartment

Living room, dining room, kitchen, bedroom and bath, with all the room and convenience one could ask for, yet by clever arrangement and the elimination of unused space, all are contained in the area ordinarily taken by two rooms and a bath. This is a plan of arrangement that has been tried out in many of the finest hotels and apartments in the country with great success. Variations of this plan are also worked out for homes, apartment buildings and other residential buildings

On this page is shown a floor plan of the "White" Efficiency Apartment as applied to the residential hotel. This idea of arrangement with its countless variations is equally applicable to homes, apartment buildings, clubs, dormitories and any other type of residential building.

"White" Efficiency Homes

This new plan of home building offers the ideal solution of the home-builder's problem of how to build economically and yet obtain the greatest possible comfort. Through the use of "White" Door Beds and Space Saving Conveniences advantages of a 6 or 7-room home are obtained in a 4 or 5-room bungalow at a considerably lower cost.

The housewife's labors are materially lessened not only because of the smaller house to care for, but also through the aid of convenient space saving devices that have been designed for her use.

Services to Architects

Our architectural department and agents will co-operate to the fullest extent with architects and will assist in adapting the "White" products and the "White" efficiency idea to any project on hand. Floor plans, estimates and specifications for installation will be furnished. This service is given without fee or obligation.

Description and Advantages of "White" Door Bed

The "White" Door Bed is in every respect a *real* bed, mechanically adjusted to smaller space. In comfort, appearance and durability, it is equalled only by the finer type of stationary beds. Made in standard sizes with regulation height head and foot ends.

Perfectly Balanced—The convolute spring balance, an exclusive feature, balances any weight from 24 to 200 lb. Bed can be released at any position and will not close up or drop.

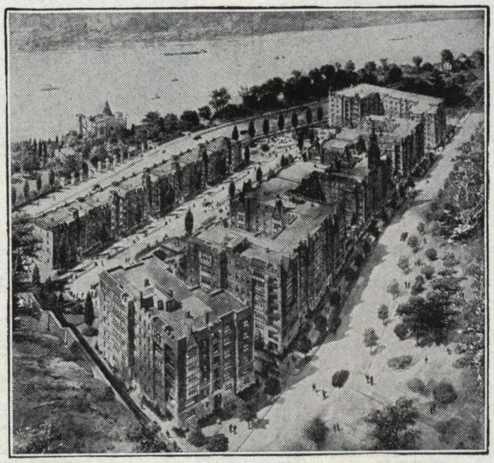
Easy to Operate—It can be raised or lowered with a single effortless motion. No pulling or adjusting of legs or headboard. Legs lock automatically when bed is lowered.

Simple—It is built with fewer parts than has been possible before. No complicated mechanism; no exposed springs to catch dirt and dust; no movable parts to tear the bedding.

Affords Perfect Concealment—When bed is in use in the room, the opening is completely closed, preventing drafts and concealing the dressing room from view at all times. Easy access may be had to the dressing room whether the bed is in an upright position or down in the room.

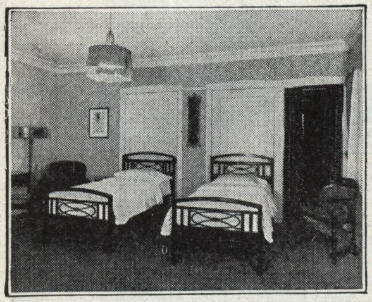
Reduces Building Costs—"White" Door Bed installations afford better room arrangements and allow the straightening out of partitions. Bed requires less space when down in the room as well as less closet space when upright.

Easy to Install—It requires only two small bed plates to be screwed on to the door, upon which the bed is secured by its own weight and from which it may be instantly removed, if desired. Either a full size or a twin size bed may be hung on the same door without any adjustment.



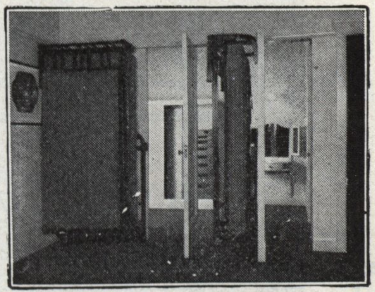
Hudson View Gardens, New York, N. Y.

Geo. F. Pelham, Inc., Architects
Built and sponsored by Dr. Chas. V. Paterno



View in the Living Room with Beds Down

Illustrates the complete concealment of the dressing room



View with Door Beds Up

Shows dressing room behind the beds and illustrates its easy accessibility

Continued on next page

Comfortable—It is regularly equipped with a box spring. Made for restful sleep. May be had also with either coil or fabric spring.

Attractive—It may be had in three distinctive designs, finished in American walnut, mahogany or any enamel color to match any decorative scheme.

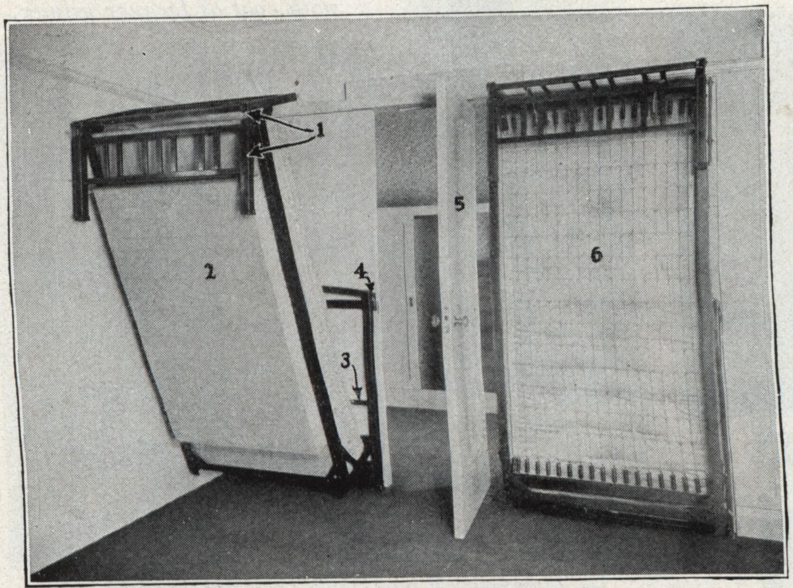
Light—It is constructed of square steel tubing so light that a woman can handle it easily.

Durable—Rigid construction. Substantially built for lasting service. Guaranteed for 20 years.

Convolute Spring Balance—An Exclusive Feature—An entirely new principle in disappearing bed construction has been applied in "White" Door Beds. Powerful convolute spring balances are used which will balance any weight ranging from 24 to 200 lb.

Balances operate parallel with the door, relieving door strain and thus can not warp the door.

The bed is perfectly balanced and will remain in any position without falling or closing up. The life of the balance is practically everlasting.



Exclusive Points of Superiority of the "White" Door Bed

(1) Automatic locking device holds legs rigid and secure. No danger of collapsing. Legs swing automatically into position when bed is raised or lowered. No pulling or adjusting.

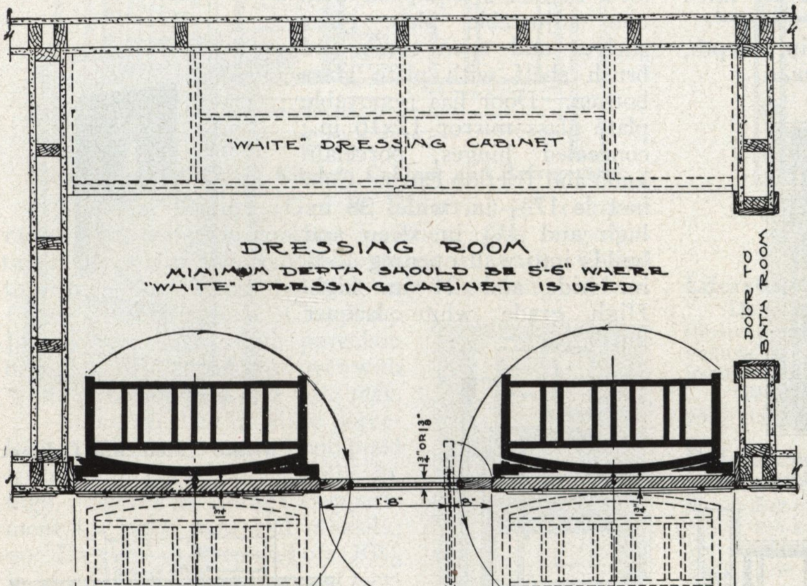
(2) Full box spring, luxurious and comfortable, set in side rail same as standard metal bed. This is standard equipment.

(3) Sliding head board operates on easy moving rollers and holds pillows in position.

(4) Bed is held by its own weight in socket plates on each side of door and may be instantly lifted off door if desired.

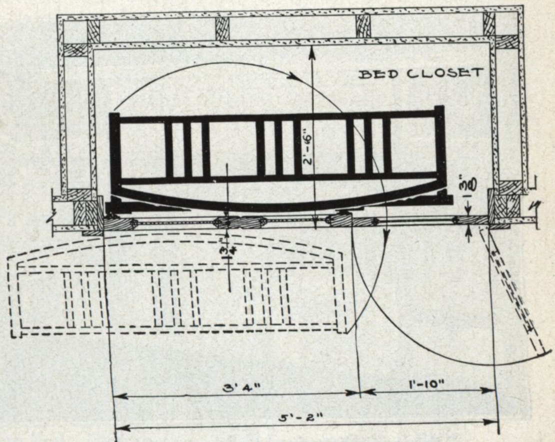
(5) Panel door can be opened or closed when bed is either up or down, allowing entrance to dressing room at all times.

(6) Twenty-year guarantee fabric spring with which bed is equipped if box spring is not desired. Coil spring also may be had.



"White" Twin Bed Installation and Dressing Room

Panel between bed doors gives access to dressing room at all times. Doors should be 6 ft. 11½ in. high. Beds extend 6 ft. 6 in. out into room when down in place

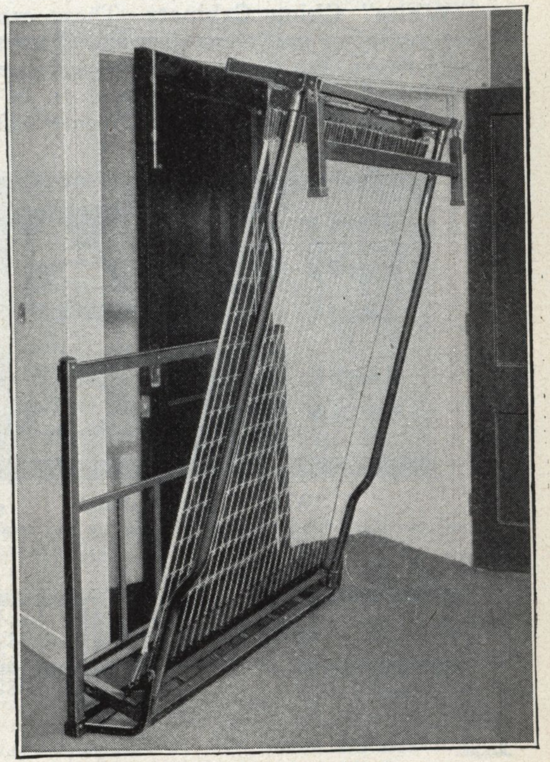


Installation of Full Size "White" Bed
A compact type for small space

"White" Colonial Bed

A more simple type of construction than the "White" Door Bed and lower priced. It operates on a slightly different principle as it has coil springs in each of the head posts. These springs which operate by *compression* rather than expansion enable the bed to be raised and lowered easily, sustain it at any angle in mid-air and assure their long life. It is equipped only with fabric springs.

The installation is similar to the regular "White" Door Bed except that it occupies less space and is used with stock size doors.

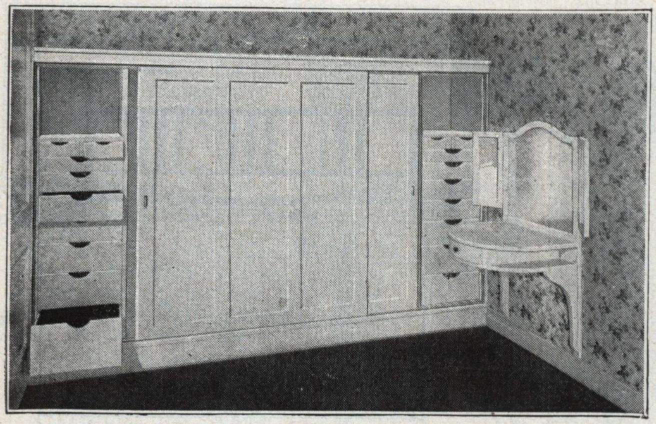


"White" Colonial Bed

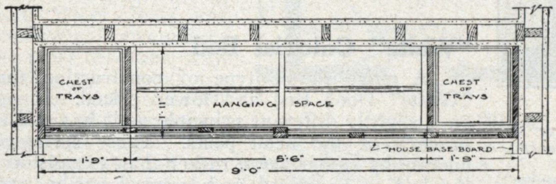
Continued on next page

"White" Space Saving Conveniences

"White" Dressing Cabinet—Combines in one compact unit all the advantages of a closet and a chiffonier. Consists of two hat compartments, 2 tray sections of 9 trays each and a large section for the hanging of clothes. Length over all, 9 ft.; height, 5 ft. 6 in.; depth, 22½ in. Cabinet with one section of trays is 7 ft. long. Can be set up by any carpenter. *Finished with coat of lacquer primer.*



"White" Dressing Cabinet and Dressing Table
Two beautiful and compactly designed space savers

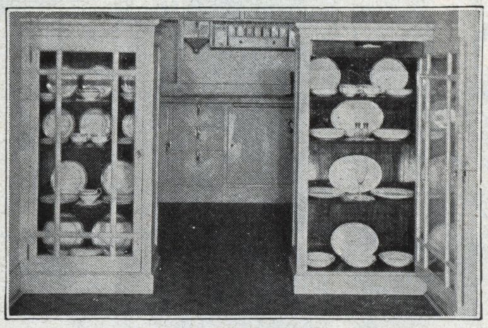

CHEST OF TRAYS
HANGING SPACE
CHEST OF TRAYS
1'-11"
HOUSE BASE BOARD
1'-9"
5'-6"
1'-9"
9'-0"

Floor Plan of "White" Dressing Cabinet

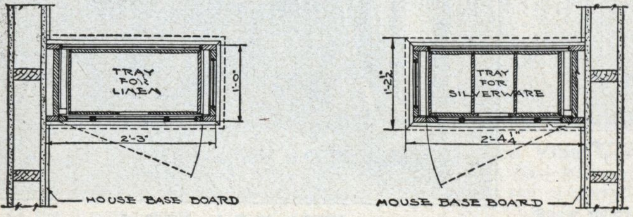
"White" Dressing Table—An attractive space saving fixture with 2 wing mirrors. Attached to the wall. Height, 3 ft. 11 in.; width over all, 3 ft. 4 in.; depth, 1 ft. 8 in. *Finished with coat of lacquer primer.*

"White" China Cabinets—These cabinets have shelves for glass and chinaware and 2 trays for linen and silverware.

Width, 2 ft. 4½ in.; height, 4 ft. 6 in.; depth, 14½ in. *Finished with coat of lacquer primer.*

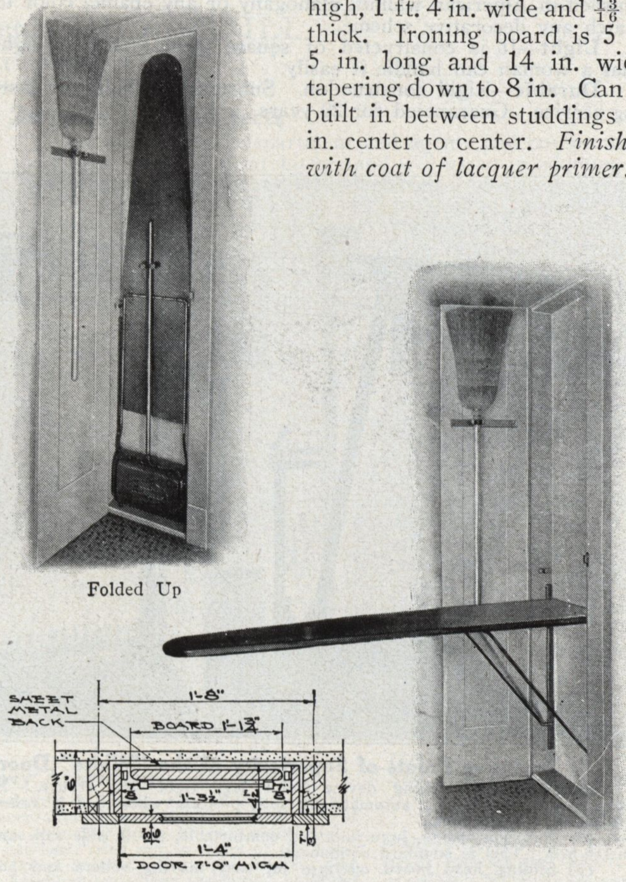


"White" China Cabinets
Form convenient division between kitchenette and breakfast room


TRAY FOR LINEN
1'-0"
2'-3"
HOUSE BASE BOARD
1'-2½"
TRAY FOR SILVERWARE
2'-4¼"
HOUSE BASE BOARD

Floor Plan of "White" China Cabinets

"White" Ironing Board and Cabinet—Compact and very convenient. Folds into cabinet 4½ in. deep and is concealed by door 7 ft. high, 1 ft. 4 in. wide and $\frac{13}{16}$ in. thick. Ironing board is 5 ft. 5 in. long and 14 in. wide, tapering down to 8 in. Can be built in between studdings 20 in. center to center. *Finished with coat of lacquer primer.*


SHEET METAL BACK
1'-8"
BOARD 1'-1¾"
6"
7/8
1'-3½"
7/8
13/16
7/8
1'-4"
DOOR 7'-0" HIGH

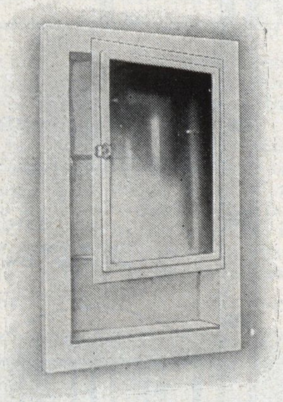
Folded Up

Floor Plan

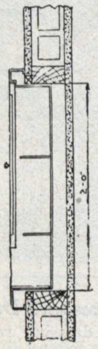
Open for Use

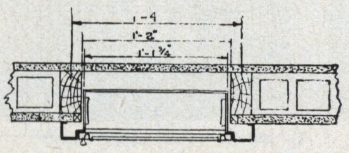
"White" Built-in Ironing Board and Cabinet

"White" Medicine Cabinet—This attractive all-steel cabinet is equipped with two adjustable plate glass shelves and open comb and brush shelf with plate glass bottom. Door has removable plate glass mirror 12x16 in.; concealed hinges, porcelain knob and friction catch. Cabinet is 17¾ in. wide, 28 in. high and 4½ in. deep and builds into wall opening 13¾ in. wide and 24 in. high. High grade white lacquer finish.



"White" Medicine Cabinet

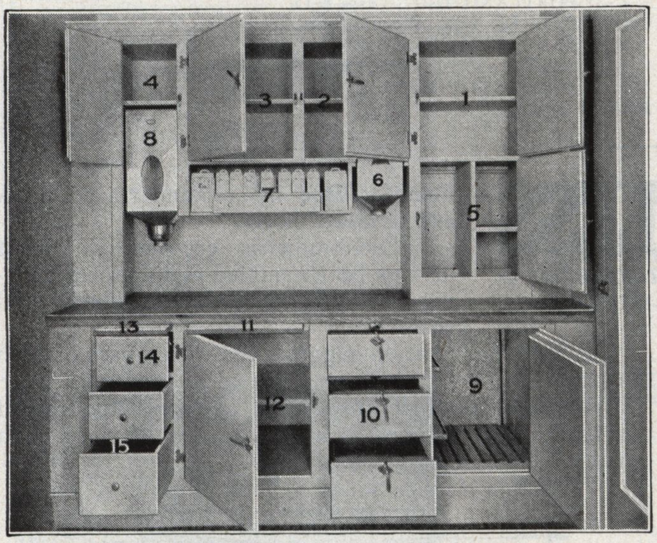




Cross Sectional Plans of "White" Medicine Cabinets

Continued on next page

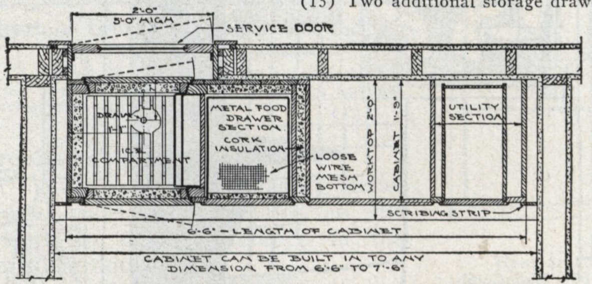
"White" Kitchen Cabinet and Refrigerator—The finest kitchenette fixture made, combining refrigerator, work table and pantry. Has receiving door for delivery of packages from outside, a refrigerator at either right or left side with door for rear or end outside icing, and with the accessories listed under illustration below. Comes in 3 sections ready to be installed. Over-all height, 7 ft.; depth, 24 in.; length, 6 ft. 6 in. adjustable to 7 ft. 6 in. *Finished with one coat of lacquer primer.*


4
3
2
1
8
7
6
5
13
11
14
12
10
9
15

"White" Kitchen Cabinet and Refrigerator

May be had with refrigerator on either right or left side and with either front, side or rear icing door

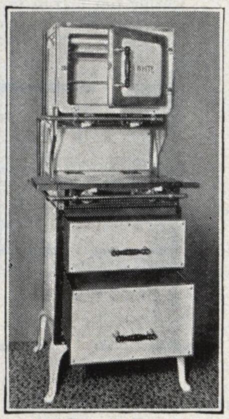
(1, 2, 3 and 4) Storage space
(5) Receiving door compartment
(6) Sugar bin
(7) Coffee, tea and spice jars and drawer for kitchen cutlery
(8) Flour bin with sifter
(9) Cork insulated refrigerator
(10) Food drawers in refrigerator
(11) Dough board
(12) Storage space for pots and utensils
(13) Bread board
(14) Metal bread box with sliding cover
(15) Two additional storage drawers


2'-0"
5'-0" HIGH
SERVICE DOOR
DRAIN
1'-1"
ICE COMPARTMENT
METAL FOOD DRAWER SECTION
CORK INSULATION
LOOSE WIRE MESH BOTTOM
WORKTOP 2'-0"
CABINET 1'-9"
UTILITY SECTION
SCRIBING STRIP
6'-6" - LENGTH OF CABINET
CABINET CAN BE BUILT IN TO ANY DIMENSION FROM 6'-6" TO 7'-6"

Floor Plan of "White" Kitchen Cabinet and Refrigerator

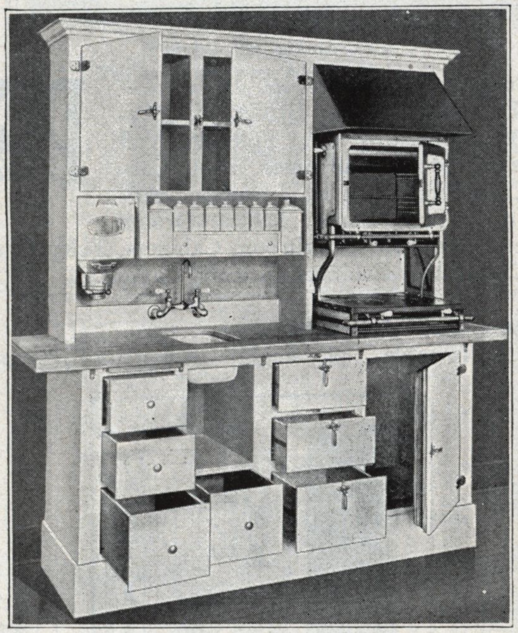
"White" Range (Gas or Electric)—A compact range with complete cooking facilities. Gas range has two burners with two removable plates over each. Closed top except for two air holes at rear of cooking surface. Oven has two burners. Closed top like cooker with white porcelain drip pan. Broiler in top of oven with white porcelain pan and wire tray.

Stand finished in white porcelain with nickel trim and equipped with white porcelain legs 8½ in. high. Serves as storage compartment for pots, pans and utensils; one drawer 7 in. deep and one 10½ in. deep. 19½ in. square. Over-all height, 5 ft. 3½ in.; width, 25½ in.; depth, 23½ in. Electric range has no broiler and is equipped with Edwin Wiegand 1000-watt unit. Approved by the National Board of Underwriters.

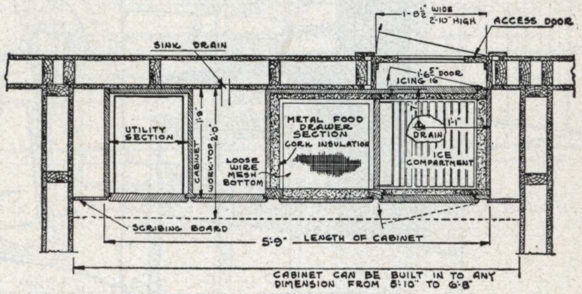


"White" Range

"White" Buffet Cabinet—This deluxe buffet cabinet may be had with either gas or electric range and with range on either side. Besides the range the top section contains flour bin with sifter, coffee, tea and spice jars, cutlery drawer and two storage compartments. The maple work top is 6 ft. 9 in. long and 1 ft. 9 in. wide and may be had either *with or without opening* for 14x20 in. standard sink. The lower section is 1 ft. 9 in. deep and 36 in. high and contains a refrigerator with 100-lb. ice capacity, also refrigerated food compartment with three wire bottom drawers. Refrigerator may be had on either right or left side with front, end or rear icing door. Lower section also contains three drawers and metal bread drawer with sliding cover, also bread board. Built of clear white wood and *finished with one coat of lacquer primer only.* Laminated doors throughout with offset hinges and latches. Complete with scribing boards, baseboard and cap moulding. Over-all height, 7 ft.



"White" Buffet Cabinet


1-8½" WIDE
2-10" HIGH
ACCESS DOOR
SINK DRAIN
1-6⅝" DOOR
ICING 16
UTILITY SECTION
CABINET 1'-9"
WORK-TOP 2'-0"
LOOSE WIRE MESH BOTTOM
METAL FOOD DRAWER SECTION
CORK INSULATION
DRAIN
1'-1"
ICE COMPARTMENT
SCRIBING BOARD
5'-9" LENGTH OF CABINET
CABINET CAN BE BUILT IN TO ANY DIMENSION FROM 5'-10" TO 6'-8"

Floor Plan of "White" Buffet Cabinet

Literature

Descriptive Catalogue "BG97"—Complete details and illustrations of the "White" Door Bed and Space Saving Conveniences. Specifications and floor plans of many types of installations.

"White" Efficiency Homes Book "BG98"—Floor plans with suggested exterior treatments for homes of all types.

References

Hudson View Gardens, New York, N. Y.
Hotel Benjamin Franklin, Philadelphia, Pa.
Hotel Book Cadillac, Detroit, Mich.
Hotel Statler, Buffalo, N. Y.
Park Lane Villa, Cleveland, Ohio
Concourse Plaza, New York, N. Y.
155 East 49th Street, New York, N. Y.
Hotel Aragon, Chicago, Ill.
A. A. Paterno (three buildings), New York, N. Y.
Chicago Theological Seminary, Chicago, Ill.
Park Lane Apartments, Kansas City, Mo.
Gaylord Apartments, Los Angeles, Cal.
Hotel Ponce de Leon, Miami, Fla.

BUILT-IN FIXTURE COMPANY

2608 San Pablo Avenue
BERKELEY, CAL.

REPRESENTATIVES

SAN FRANCISCO, CAL., The Hoosier Store
LOS ANGELES, CAL., Built-in Fixture Co.
OAKLAND, CAL., The Hoosier Store
LONG BEACH, CAL., Deatherage & Lyon
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NEW ORLEANS, LA., Nachary Builders Supply Co., Inc.
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SEATTLE, WASH., Sam Hunter Co.
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HONOLULU, T. H., Allen & Robinson

PEERLESS
Built-in Furniture
TRADE-MARK

Products

Peerless Unit Built-in Furniture, consisting of: Folding Wall Tables, Folding Wall Seats, Table Cabinets, Ironing Boards, Ironing Board Doors, Ironing Board Tables, Broom Closets, Cupboards, Bathroom Cabinets, Telephone Cabinets, Medicine Cabinets, Kitchen Cabinets.

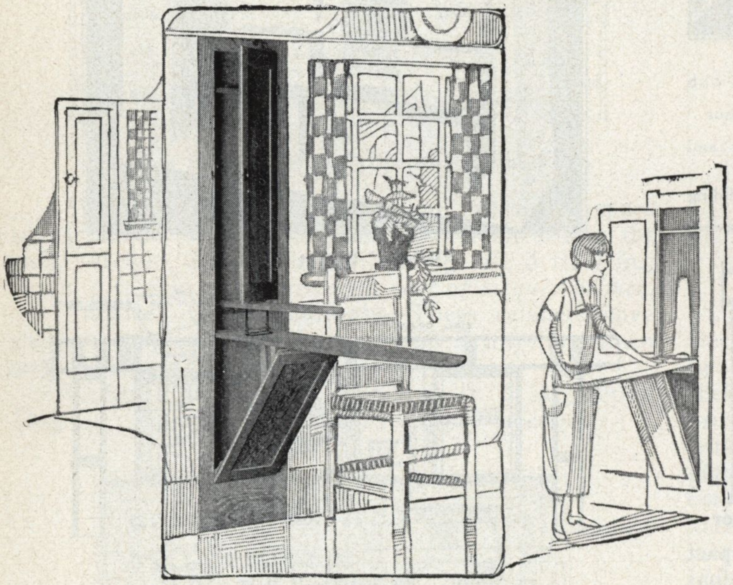
Features and Advantages

Comfortable, pleasingly proportioned furniture manufactured by a standardized process.

Each unit is complete in itself or can be assembled with others making installation flexible, quick and easy.

A little imagination suggests the varied uses of each fixture.

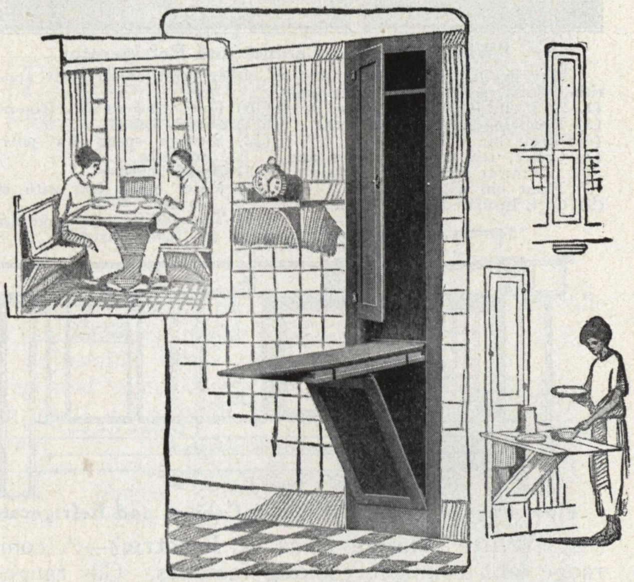
Peerless products are built by specially trained mechanics and cabinet makers and are of very high quality. Fully guaranteed.



Peerless Ironing Board No. 2-14

Lower door forms support. Locks rigidly. Board of special design. Sanded, glued, doweled.

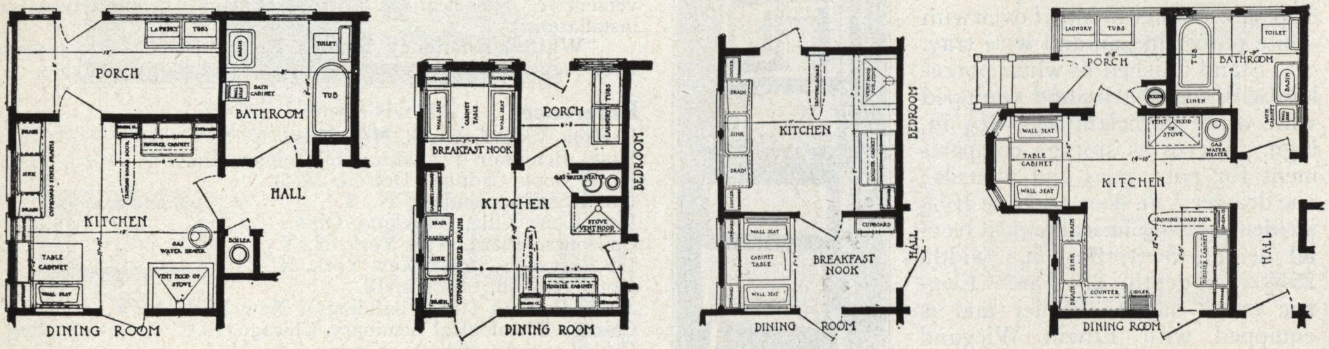
Rough opening, 14x81x3½ in.



Peerless Ironing Board Table No. 3-14

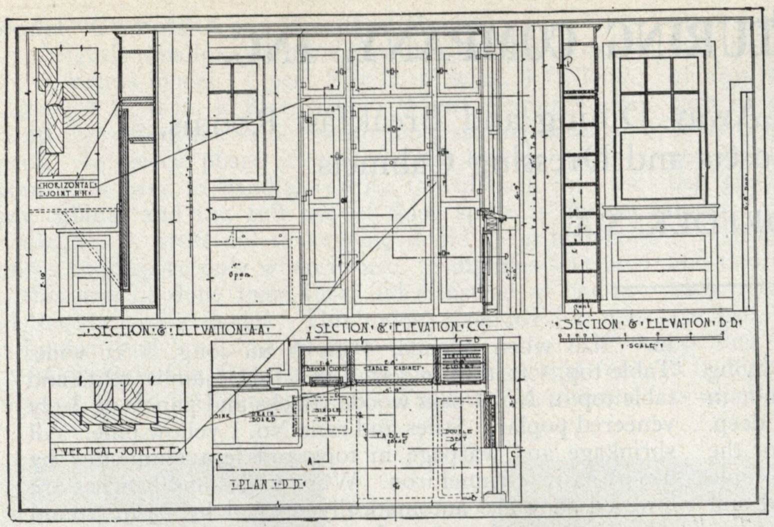
Table folds under board when not in use. Can be used in breakfast nook.

Table top, 22x36 in. Rough opening, 14x81x4½ in.


PORCH
LAUNDRY TUBS
TOILET
BATH CABINET
TUB
BATHROOM
HALL
KITCHEN
TABLE CABINET
WALL SEAT
GAS WATER HEATER
VENT HOOD OF STOVE
DINING ROOM
BREAKFAST NOOK
BEDROOM
STOVE
SINK
DRAIN
CUPBOARD
COUNTER
LINEN

Floor Plans for Various Installations of Peerless Units

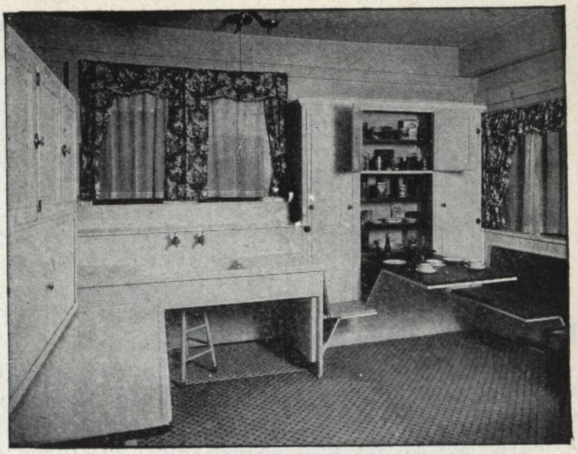
Continued on next page


HORIZONTAL JOINT H-H
Open
SECTION & ELEVATION AA
SECTION & ELEVATION CC
SECTION & ELEVATION DD
SCALE
TABLE CABINET
DOUBLE SEAT
VERTICAL JOINT EE
PLAN DD

Peerless Breakfast Nook Assembly

Peerless units in a breakfast nook. Corner of a rectangular room used without sacrifice of floor space. All fixtures can be right or left handed. Entire assembly attached to wall or built-in.

Note top units in drawing



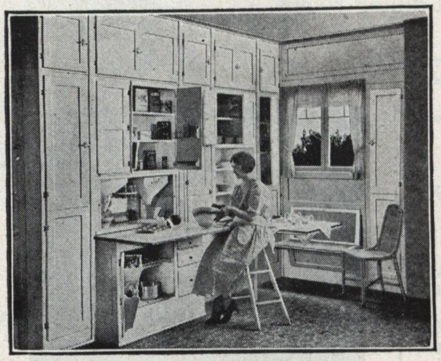
Peerless Breakfast Nook Assembly

The same breakfast nook assembly illustrated above is shown at left except that top units are added in drawing.

Ironing-board door is used with one of side units. It forms closure and contains folding ironing board.

This is one of a variety of breakfast nooks that can be had by assembling different combinations of Peerless units.

Note the double use of wall space and the saving in floor space. When the work is done, table and seats fold into wall leaving floor space clear. Every woman appreciates these conveniences

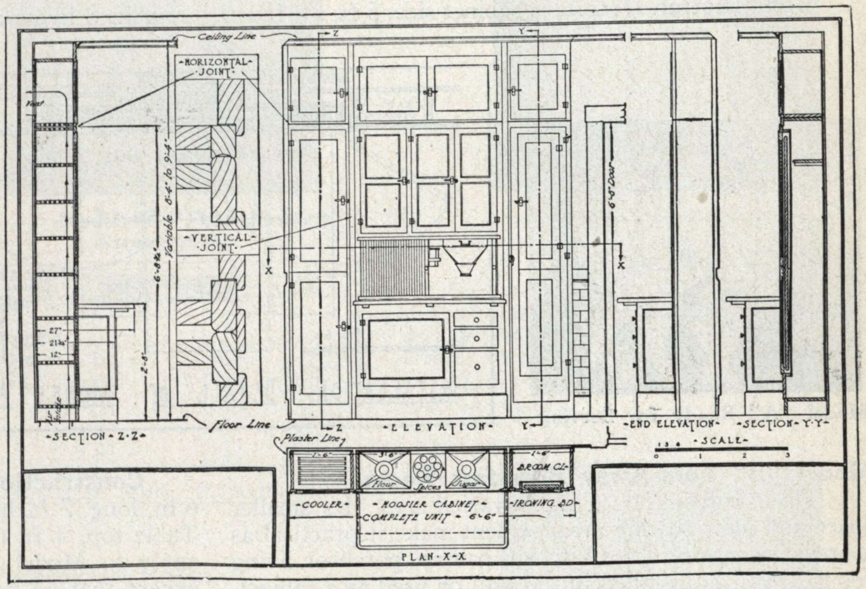


Peerless Units Assembled Around a Hoosier Kitchen Cabinet

A typical Peerless assembly consisting of a corner breakfast nook, Hoosier kitchen cabinet, Peerless side units and top units

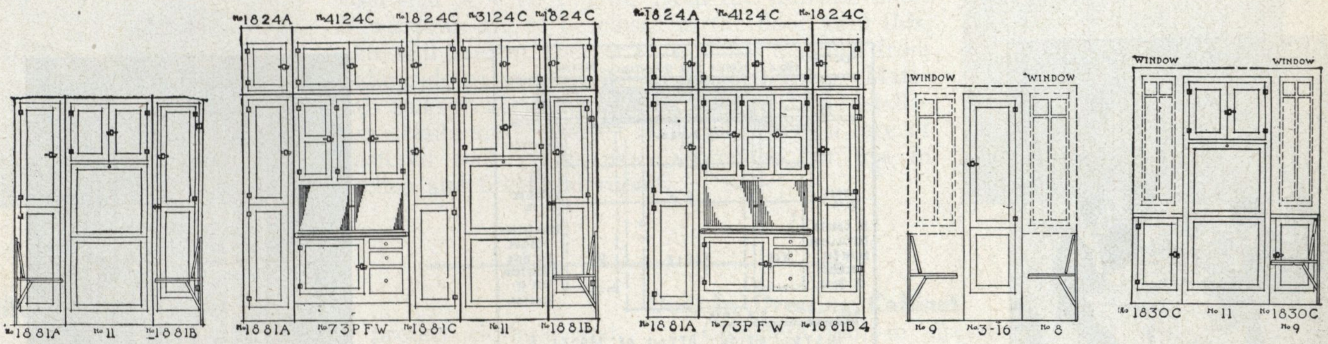
Architects' Handbook

Write for convenient detail sheets and data, compiled in file folder for quick reference in the drafting room.


Ceiling Line
HORIZONTAL JOINT
Variable 8'-4" to 9'-4"
VERTICAL JOINT
6'-8¾"
27"
21¾"
12"
2'-8"
6'-5" Door
Floor Line
SECTION Z-Z
Plaster Line
ELEVATION
END ELEVATION
SECTION Y-Y
SCALE
0 1 2 3
Flour
Spices
Sugar
COOLER
HOOSIER CABINET
COMPLETE UNIT 6'-6"
BROOM CL.
IRONING BD
PLAN X-X

Peerless-Hoosier Assembly

Here are shown details of a Peerless-Hoosier assembly. Peerless furniture is uniform, in dimensions and hardware, with the famous Hoosier kitchen cabinet.


No1881A No11 No1881B
No1824A No4124C No1824C No3124C No1824C
No1881A No73PFW No1881C No11 No1881B
No1824A No4124C No1824C
No1881A No73PFW No1881B4
WINDOW WINDOW
No9 No3-16 No8
WINDOW WINDOW
No1830C No11 No1830C No9

11AB4X Assembly

7311AB4CZH Assembly

73AB4 Assembly

3-16Y Assembly

1130H Assembly

Elevations of a Few of the Many Possible Peerless Assemblies

FAIN MANUFACTURING COMPANY, INC.

Manufacturers of the Fold-Away Dining and Breakfast Rooms,
Built-In Cedar Closets and Dressing Cabinets

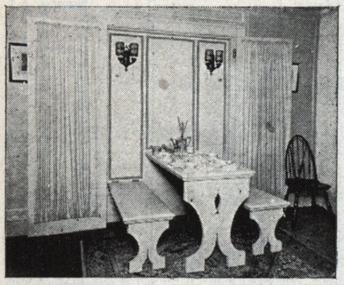
NORFOLK, VA.

Model "A" Fold-Away Dining Room

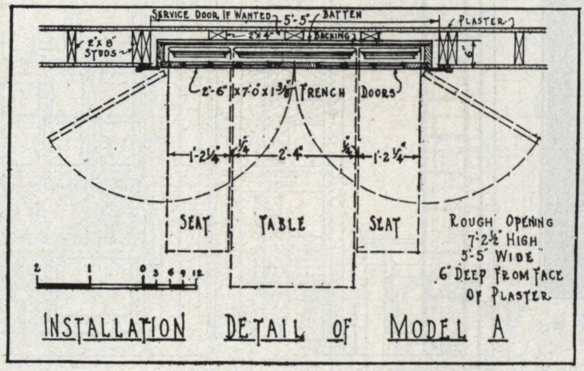
A complete unit that combines the dining and living rooms as one, relieving use of floor space when not in use and folding into its cabinet that is only 6 in. deep. Practical for the modern small roomed apartment or the home where space saving is vital. Seats four people comfortably. Table can be hinged back from end and seat five if necessary.

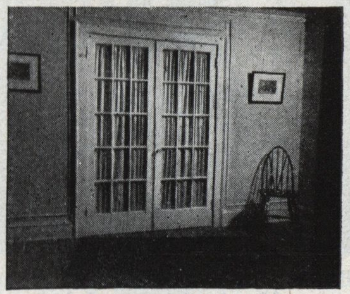
Use and Advantages—Provides greater rental possibilities and assures a greater number of apartments to the same ground space. Ornamental, perfectly balanced and easy to operate. Saves a room and utilizes wall space to the best advantage.

Construction Details—Cabinet size, 5 ft. x 7 ft. x 6 in. Size when opened, 4 ft. 6 in. long, 5 ft wide. Table top, 4 ft. 6 in. x 2 ft. 4 in. Legs, jambs, seats and table top of No. 1 bass wood. Backs and panels of 3-ply veneered poplar. Stiles and rails No. 1 yellow pine. All shrinkage and warpage in tops and legs eliminated by use of 3/8-in. channel iron. When tables and benches are lowered they are automatically opened by 1/2-in. round steel copperized rods. Impossible to lower members without their opening. Rods hold them rigid when opened. Delivered complete, ready to install. Doors, electrical fixtures and casing not furnished. When closed, all members are automatically held in place by friction catches. This model intended for use in the combined living and dining rooms.



Model "A" Ready for Serving


SERVICE DOOR IF WANTED
5'-5"
BATTEN
PLASTER
2"x8" STUDS
2"x4"
BACKING
2'-6" x 7'-0" x 1 3/8" FRENCH DOORS
1'-2 1/4"
1/4"
2'-4"
1/4"
1'-2 1/4"
SEAT
TABLE
SEAT
ROUGH OPENING 7'-2 1/2" HIGH 5'-5" WIDE 6" DEEP FROM FACE OF PLASTER
2
1
0 3 6 9 12
INSTALLATION DETAIL OF MODEL A



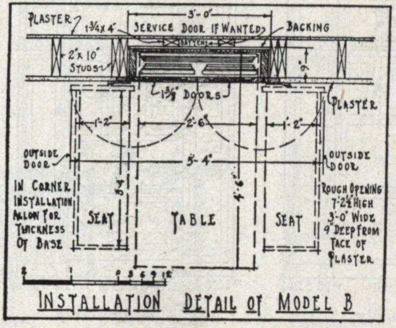
Model "A" with Doors Closed

Model "B" Fold-Away Breakfast Room

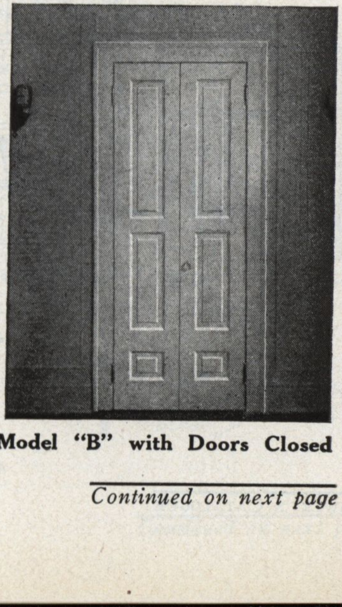
This model offers a more varied use. Its smaller space and ideal seating arrangement make it practical as a breakfast room in the kitchen, pantry, porch or living room. May be installed in the wall or used as a cabinet. When not in use it allows full freedom of floor space. A service door can be placed in the back of either model permitting serving direct from the kitchen.

Construction Details—Open, 5 ft. 4 in. wide, 4 ft. 6 in. long, 7 ft. high. Closed, 2 ft. 10 in. x 7 ft. 8 1/2 in. Table top, 4 ft. 6 in. x 2 ft. 6 in. Same specifications apply to Model "B" as are described for Model "A" except that on breakfast room the doors are furnished and hung, and locks installed. On cabinet model everything is furnished. On recess type only thing not furnished is casing. Shipped complete, ready to install.

Model "B" in Use


PLASTER
1 3/4 x 4"
3'-0"
SERVICE DOOR IF WANTED
BACKING
BATTENS
2"x10" STUDS
9"
1 3/8" DOORS
PLASTER
1'-2"
2'-6"
1'-2"
OUTSIDE DOOR
5'-4"
OUTSIDE DOOR
IN CORNER INSTALLATION ALLOW FOR THICKNESS OF BASE
3'-4"
4'-6"
SEAT
TABLE
SEAT
ROUGH OPENING 7'-2 1/2" HIGH 3'-0" WIDE 9" DEEP FROM FACE OF PLASTER
2
1
0 3 6 9 12
INSTALLATION DETAIL OF MODEL B

Fain Products Protected by American and Canadian Patent Laws



Model "B" with Doors Closed

Continued on next page

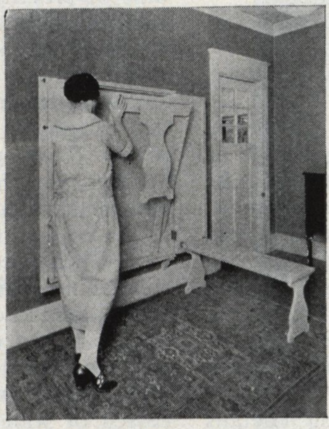
Model "C" Fold-Away Breakfast Room

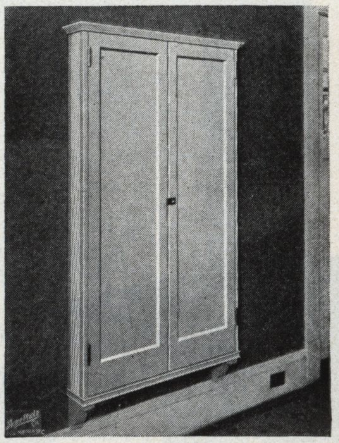
Slightly smaller type that may also be used as cabinet or recess model. Open, 5 ft. 2 in. wide, 4 ft. long. Closed, 4 ft. 6 in. x 2 ft. 6 in. x 4 in. Requires less depth, yet offers the same comfortable seating arrangement. In every phase it lightens the burden of the woman, is easy to handle, readily folded back into its tiny cabinet and the full use of floor space is always available. A great aid to keeping floors clean and requires floor space only when in use. Simplifies serving, as this may be done from three sides instead of one as on the stationary model. This model intended for use in kitchen and breakfast rooms.

Construction Details—Combines all essential features of Model "A" dining room. Table is 6 in. shorter. Seats four or five people comfortably. Main feature is that it can be set in 4-in. stud partition without furring of any nature. There is ½-in. air space left between back of cabinet and plaster on rear wall. Table is so devised that weight is counterbalanced. Benches connected to doors by floating hinge in such a way that the inner leg lifts the bench entirely clear of the door.

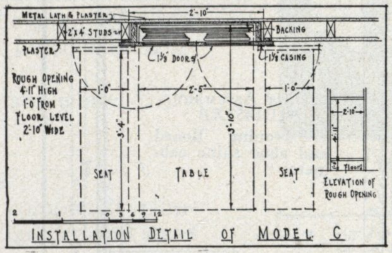
Benches, table and legs of bass wood. Jambs, casing and door stiles of No. 1 yellow pine. Door panels and back of cabinet of 3-ply veneered poplar. When open for use, 5 ft. 2 in. wide and 4 ft. long. Frame rough opening, 1 ft. from finished floor, 2 ft. 9½ in. wide, 5 ft. high, 4 in. deep. When set, the bottom of the door is exactly 14 in. from finished floor.

Model "C" in Use


Model "C" Folding Arrangement

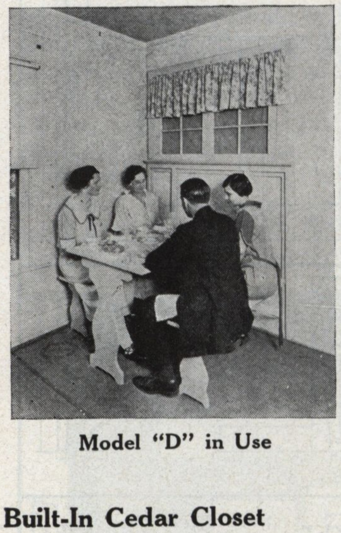

Model "C" Doors Closed

Builders of apartments have found that the Fain "Fold-Away" units are an asset to rental possibilities and provide a greater revenue.



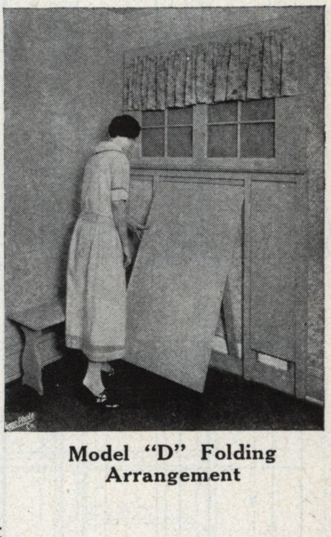
Our Architectural Staff will assist you in drawing plans and show how a greater number of apartments can be secured by using Fain units.

Illustrated folder of complete line sent on request.


Model "D" in Use

Model "D" Breakfast Room

Open, 4 ft. long, 5 ft. 2 in. wide. Closed, 4 ft. x 5 ft. 2 in. x 1¾ in. Stock size tables and benches same as Model "C." This size goes under a window stool that is 4 ft. 1½ in. from the finished floor. If windows are to be closer to the floor than this, table will be 2 in. shorter than actual distance from under side of window sill to finished floor. Materials and specifications same as Model "C." Installation details unnecessary. Nailed directly on face of plastered wall. This model intended for use in kitchen and breakfast rooms.


Model "D" Folding Arrangement

Built-In Cedar Closet

Built of aromatic cedar to protect clothing and woolens. Sets inside ordinary 2 ft. 8 in. x 6 ft. 8 in. door jambs; 21-in. space provides hanging space for twelve suits of clothes. Also includes shoe section and four drawers. Costs less than one garment it protects and to install costs no more than actual cost of plastering, trimming and painting an ordinary closet.

Built-In Dressing Cabinet

Complete built-in dressing cabinet that includes closet, chest of drawers, and wardrobe. Dressing table formed by pulling out sliding table under mirror that covers top of one side. 5 ft. 6 in. wide, 1 ft. 9 in. deep, 5 ft. 6 in. high. Built of gum and bass wood. All details are carefully finished to provide neat appearance. Shipped 90% assembled. Can be installed in short time.

AMERICAN MANUFACTURING COMPANY

Blue Ribbon Line of "Built-in-Furniture"

5810 South Normandie Avenue
LOS ANGELES, CAL.

For Representative's Name in Your Locality, Consult Telephone Directory or Write Us Direct

Products

IRONING BOARD CABINETS, BREAKFAST NOOK SETS, BATHROOM CABINETS, SHOE SHINE CABINETS, WALL SEATS.

A Few Points of Merit

Compact, adaptable, efficient designs, careful workmanship, selected material, superior finish.

Model No. IC1480

A compact combination of ironing board, sleeve board and table.

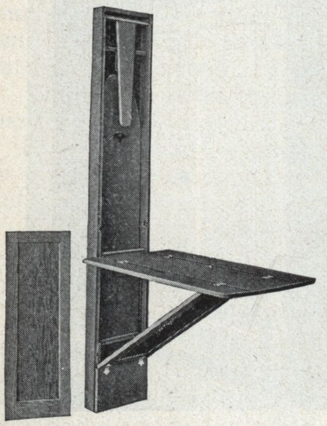
Ironing board size, 11½x55 in.

Sleeve board size, 5½x24 in.

Table size, 23x41 in. A strong and rigid table of standard height that can be used as breakfast table, serving table or auxiliary to kitchen work.

Neither the ironing board nor table interferes or impairs, in any way, the efficiency of the other when in use.

See framing details below.



Model No. IC1480

Unit Assembly ID1453XB

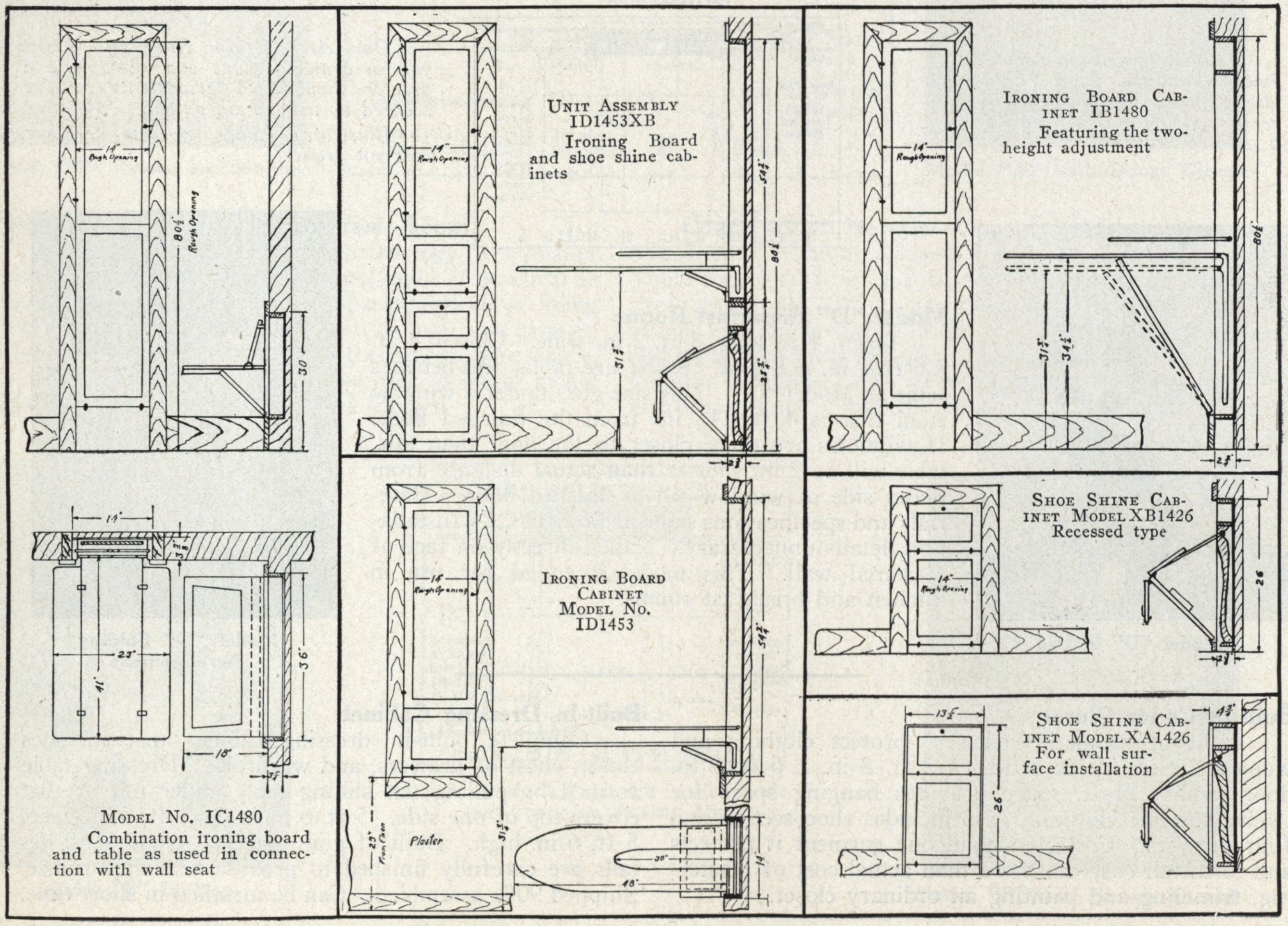
Convenient, durable and compact unit of ironing board and shoe shine cabinet. The last word in neatness and service for the home. No looking for brush or polish.

This cabinet accommodates: 2 bottles of polish, 6 cans of paste, 3 daubers, 2 brushes, polishing cloths, and whisk broom, and all the conveniences of an ironing board cabinet.

When used as an individual unit, shoe shine cabinet is adaptable for installation in kitchen, porch or bathroom of the house or apartment. An advantage even to the office. Manufactured in two models. For either recessed or wall surface installation.

See detail sketches given below.

Unit Assembly ID1453XB



MODEL No. IC1480
Combination ironing board and table as used in connection with wall seat

UNIT ASSEMBLY ID1453XB
Ironing Board and shoe shine cabinets

IRONING BOARD CABINET MODEL No. ID1453

IRONING BOARD CABINET IB1480
Featuring the two-height adjustment

SHOE SHINE CABINET MODEL XB1426
Recessed type

SHOE SHINE CABINET MODEL XA1426
For wall surface installation

CONTINENTAL STEEL PRODUCTS CO.

Manufacturers of Steel Kitchen Equipment
CICERO, ILL.
(Suburb of Chicago)

"Steel-Maid"

Products

Steel Kitchen Equipment: Kitchen Cabinets, Kitchenette Units, Over-the-Sink Cabinets, Under-the-Sink Cabinets, Kitchen Tables, Cabinet Tables, Broom Cabinets and Ironing Board Cabinets.

Steel-Maid Cabinets

Steel-Maid Cabinets are the result of fourteen years' experience in the manufacture of high grade steel kitchen equipment. They are fabricated throughout from full finished, cold rolled furniture steel of electric-welded construction. No bolts or rivets used in assembly.

Steel kitchen equipment has become an accepted standard as it insures permanency and beauty. It is unaffected by the sudden changes of temperature or the increase in humidity to which it is subjected in the kitchen. There are no wood parts to warp or bind and no joints to come apart in the Steel-Maid unit.

Steel-Maid Combination Kitchen No. 742

Designed especially for apartments or bungalows where wall space is at a premium. Upper cases are heavy gauge steel with baked-on enamel finish and contain 28 ft. of shelving space. Refrigerator is three-door type, constructed of oak, white enamel finish, with special porcelain top and can be had with either side or rear icing. Stove is standard with large size oven and broiler and has generous space below for pots and pans.

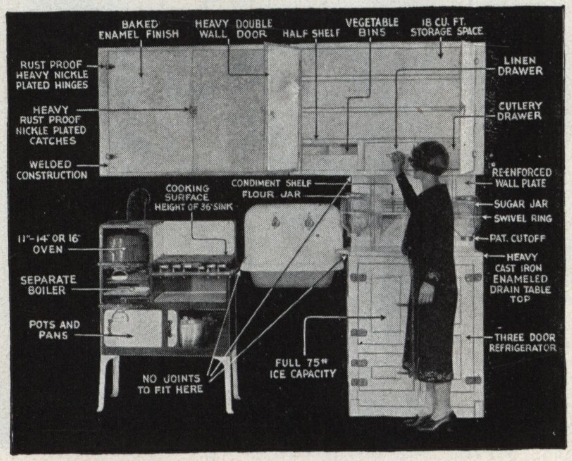
Units are interchangeable and will be sold individually.

Height, 84 in.; width, 84 in. Finish: white, ivory or French gray baked enamel.

No. 162 Steel-Maid Unit Kitchenette

A new idea in steel cabinets that completely eliminates the pantry, saving dollars for the builder and steps for the housewife. All necessary storage spaces are properly proportioned and combine the following units: a full height dish cabinet, a broom and vacuum cleaner cabinet, and a standard kitchen cabinet. Cabinet comes equipped with sliding porcelain table top, size 25x40 in., which may be drawn out when additional working space is desired. Cabinet may be had complete or as individual units.

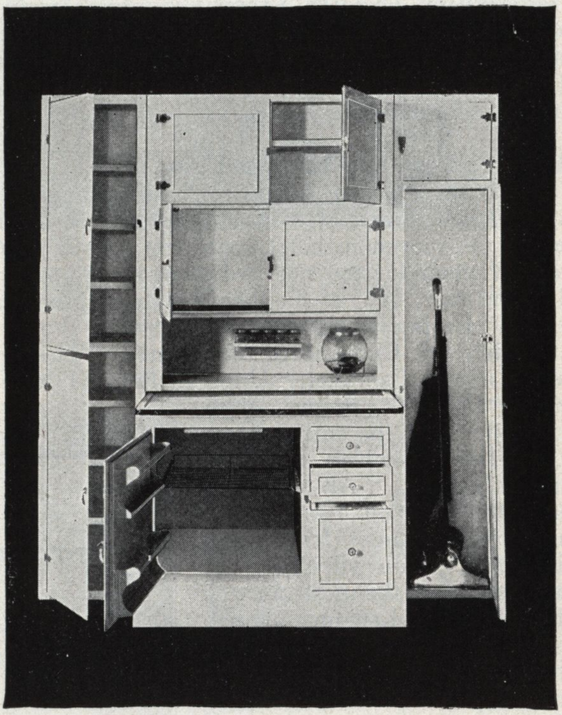
Height, 84 in.; depth of top section center unit and side cabinets, 12 in.; depth of base center unit, 23 in.; width, 72 in. Finish: white, ivory or French gray baked enamel.


BAKED ENAMEL FINISH
HEAVY DOUBLE WALL DOOR
HALF SHELF
VEGETABLE BINS
18 CU. FT. STORAGE SPACE
RUST PROOF HEAVY NICKLE PLATED HINGES
HEAVY RUST PROOF NICKLE PLATED CATCHES
WELDED CONSTRUCTION
LINEN DRAWER
CUTLERY DRAWER
RE-ENFORCED WALL PLATE
COOKING SURFACE HEIGHT OF 36" SINK
CONDIMENT SHELF
FLOUR JAR
SUGAR JAR
SWIVEL RING
PAT. CUTOFF
11"-14" OR 16" OVEN
SEPARATE BOILER
HEAVY CAST IRON ENAMELED DRAIN TABLE TOP
POTS AND PANS
THREE DOOR REFRIGERATOR
FULL 75# ICE CAPACITY
NO JOINTS TO FIT HERE

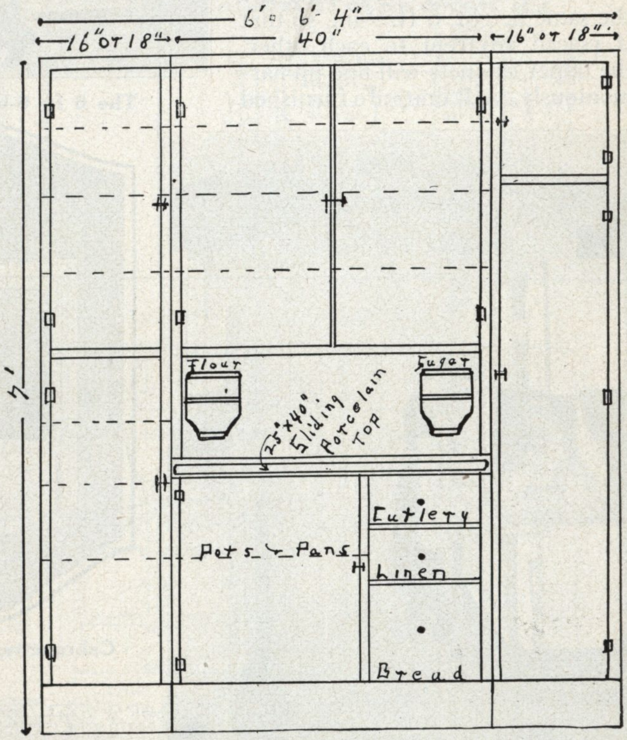
No. 742 Unit Kitchenette Complete

Catalogue

Our catalogue illustrating our line complete will be gladly mailed on request.



No. 162 Steel-Maid Unit Cabinet
All sections interchangeable


6' - 6'-4"
16" or 18"
40"
16" or 18"
7'
Flour
Sugar
25"x40" Sliding Porcelain Top
Cutlery
Pots & Pans
Linen
Bread

Detail of Arrangement of Model No. 162 Steel-Maid Unit Cabinet

CABRANETTE CORPORATION

Makers of Porcelain Kitchen Equipment and Medicine Cases

308 North Michigan Avenue
CHICAGO, ILL.

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Products

Porcelain Enamel Steel Kitchen Units and Alcove Kitchen Units for apartments and homes; Combined Range and Cabinet Units, Refrigerator and Cabinet Units, Kitchen Cabinets, Broom Closets and Medicine Cases.

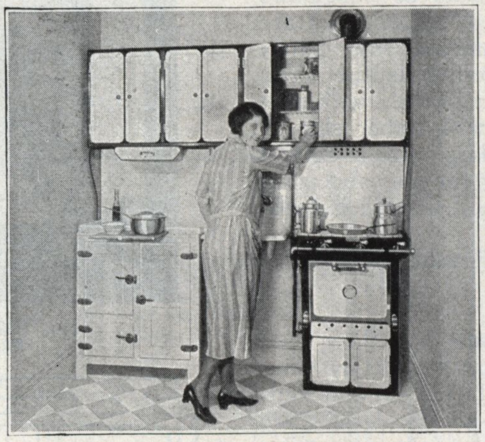
Cabranette Porcelain Kitchen Units

For each type of apartment, different units are recommended. Our 5 ft. 6-in. Alcove Kitchen is adaptable for the one-room hotel apartment, our 6 ft. 6-in. Alcove Kitchen for the two and three-room apartment, and in the four, five, or six-room apartment, our standard "BA" Units are recommended.

Finish of Cabranette Equipment—The entire exterior of all Cabranette Units is finished in *white vitrified porcelain enamel,* with the exception of the refrigerator, the exterior of which is wood, enameled white. All exterior panels are stamped from heavy gauge "Armco Ingot Iron," and their finish, white vitrified porcelain enamel, is the most sanitary and easily cleaned surface known. It is impervious to water, heat, and dirt, and will not chip, burn, rust or discolor. Porcelain enamel is very easily cleaned with a damp cloth.

Adaptability—All units are the same height, 6 ft. 9-in., so that if placed adjacent to each other, the upper cabinets will line up harmoniously. All units are furnished either to the right hand or left hand. When units are used to the other hand than those shown in the sketches, the dimensions are identical, but reversed.

Units are standard with square porcelain enameled Table Tops, but Cabranette cast iron Drainboard tops are supplied when the units adjoin the sink. The refrigerator can be equipped for automatic icing, or with either end or rear icing doors and with package service opening in the cabinet above, if desired. The gas and flue connections of the Range are always accessible. The Units can be assembled in a variety of combinations. Four such combinations together with the roughing-in data and dimensions are given on the opposite page for your guidance. However, a great many other layouts are possible.



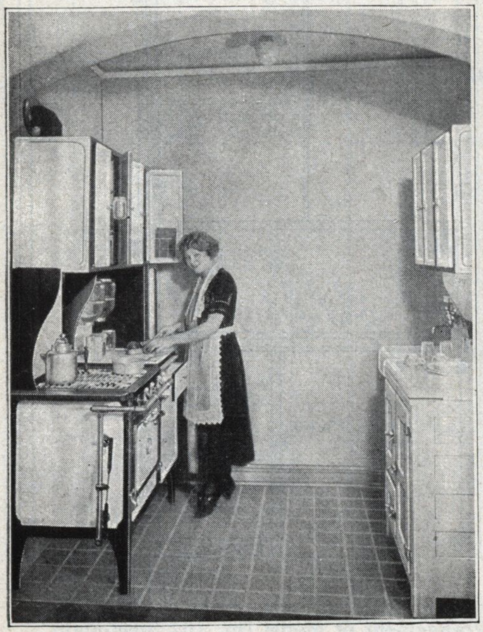
The 6 ft. 6-in. Alcove Kitchen

Cabranette Porcelain Medicine Case

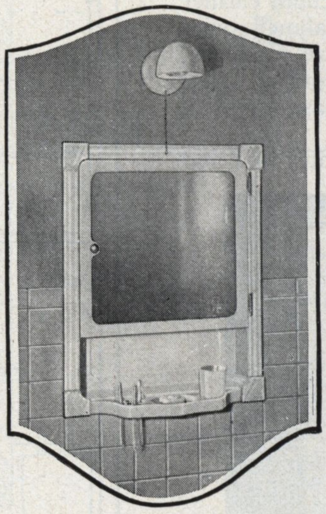
The Cabranette Medicine Case, being finished in *vitrified porcelain enamel* (not baked enamel), gives the same permanence of finish to the medicine case as that used on the bathtub, lavatory, and other fixtures in the bathroom.

Plan Service Department

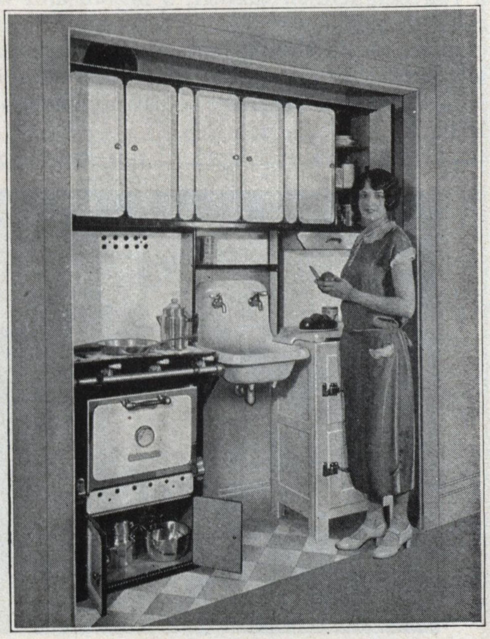
This department is for the purpose of co-operating with the Architects and Builders on problems of kitchen layouts. This service is without obligation.



Cabranette "BA" Units on Opposite Walls



Cabranette Medicine Case

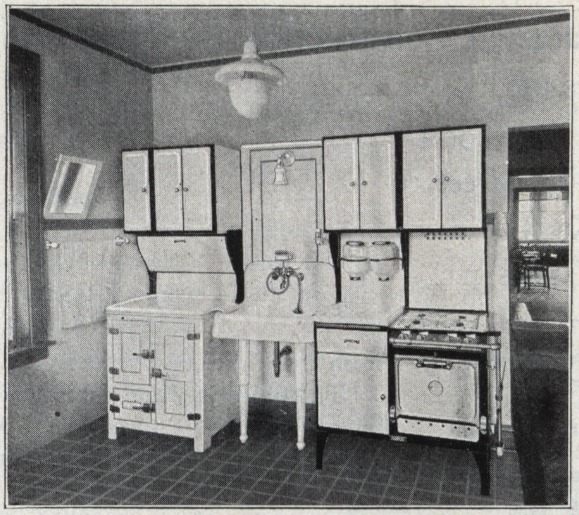


The 5 ft. 6-in. Alcove Kitchen

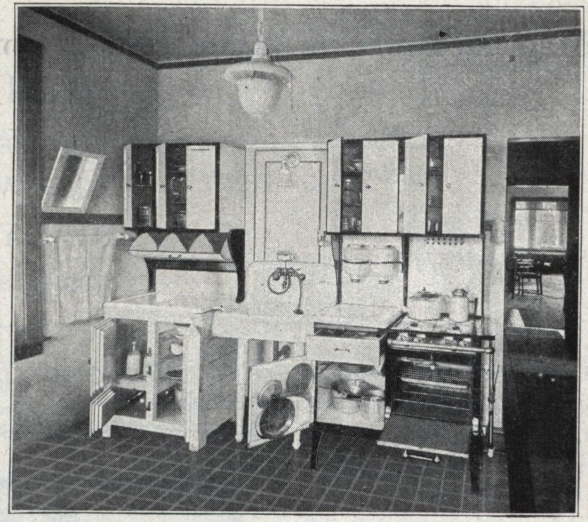
Cabranette

TRADE-MARK

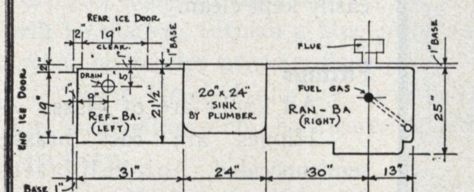
Continued on next page



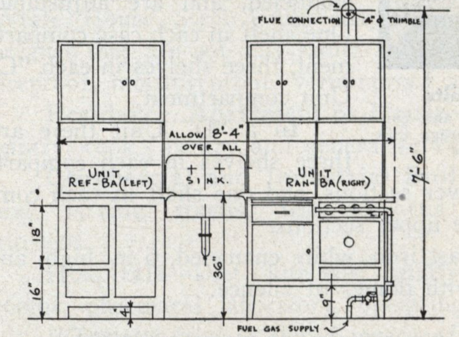
RANGE UNIT RAN-BA (RIGHT) AND REFRIGERATOR UNIT REF-BA (LEFT) USED WITH A SINK ON ONE WALL (PLAN SHOWN BELOW)



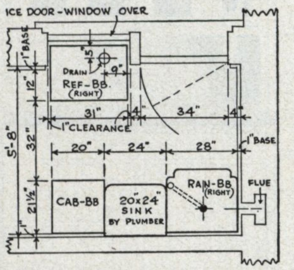
THE ONE WALL ARRANGEMENT OPEN. SHOWING THE DIFFERENT UTILITIES AND THE CABRANETTE DRAIN BOARDS ON EACH UNIT


Rear Ice Door
19"
CLEAR.
Drain
1" Base
End Ice Door
19"
REF-BA. (LEFT)
21½"
20"x 24" SINK BY PLUMBER
FLUE
FUEL GAS
RAN-BA (RIGHT)
25"
31"
24"
30"
13"
Base 1"

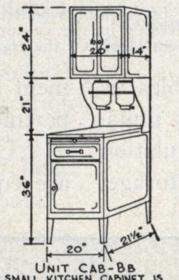
PLAN OF THE RANGE UNIT AND REFRIGERATOR UNIT ON ONE WALL. WITH THIS ARRANGEMENT USED BACK TO BACK IN ADJACENT APARTMENTS A SAVING CAN BE EFFECTED IN THE PLUMBING.


FLUE CONNECTION
4" THIMBLE
ALLOW 8'-4" OVER ALL
UNIT REF-BA (LEFT)
SINK
UNIT RAN-BA (RIGHT)
7'-6"
18"
16"
36"
FUEL GAS SUPPLY

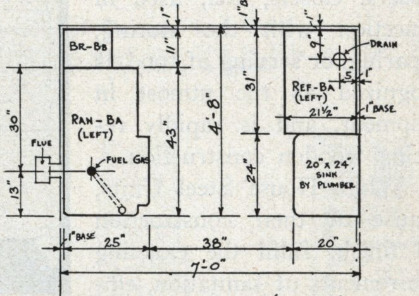
ELEVATION OF THE ONE WALL ARRANGEMENT. DRAIN BOARDS ARE USED IN BOTH UNITS. THE SINK IS SET 36" TO THE TOP OF THE ROLL RIM ABOVE THE FINISHED FLOOR. THE GAS SUPPLY COMES UP THRU THE FLOOR UNDER RANGE


ICE DOOR - WINDOW OVER
BASE
DRAIN
REF-BB. (RIGHT)
31"
34"
1" CLEARANCE
5'-8"
32"
20"
24"
28"
1" BASE
CAB-BB
20x24 SINK BY PLUMBER
RAN-BB (RIGHT)
FLUE
21½"

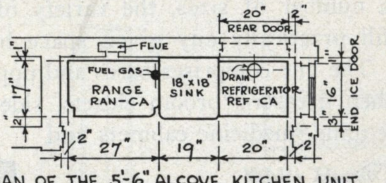
PLAN SHOWING REFRIGERATOR UNIT (REF-BB), WITH SQUARE TABLE TOP AND REAR ICING DOOR, RECESSED INTO THE WALL - THIS UNIT HAS NO CABINET ABOVE THE REFRIGERATOR. CABINET UNIT (CAB-BB) HAS THE DRAIN BOARD TOP.


24"
20"
14"
21"
36"
20"
21½"

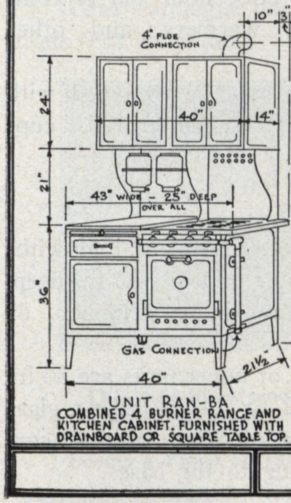
UNIT CAB-BB
SMALL KITCHEN CABINET IS FURNISHED WITH EITHER DRAIN BOARD OR SQUARE TABLE TOP


BR-BB
RAN-BA (LEFT)
FLUE
FUEL GAS
30"
13"
43"
4'-8"
11"
31"
24"
DRAIN
REF-BA (LEFT)
21½"
1" BASE
20" x 24" SINK BY PLUMBER
1" BASE
25"
38"
20"
7'-0"

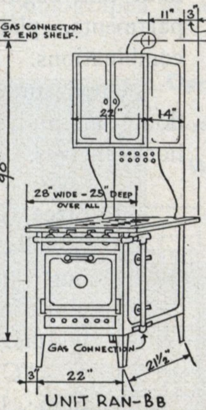
PLAN SHOWING THE RANGE UNIT (RAN-BA) WITH THE BROOM CLOSET (BR-BB) ON ONE WALL. THE REFRIGERATOR UNIT (REF-BA) AND THE SINK ARE ON THE OPPOSITE WALL - THE RANGE HAS A SQUARE TABLE TOP AND THE REFRIGERATOR HAS THE DRAIN BOARD TOP. ILLUSTRATED ON THE OPPOSITE PAGE


20"
REAR DOOR
FLUE
FUEL GAS
DRAIN
RANGE RAN-CA
18"x18" SINK
REFRIGERATOR REF-CA
17"
16"
END ICE DOOR
27"
19"
20"

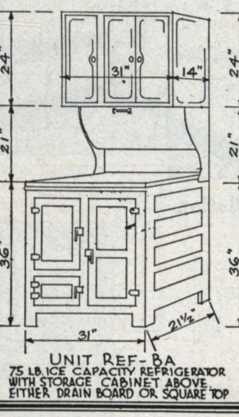
PLAN OF THE 5'-6" ALCOVE KITCHEN UNIT (ILLUSTRATED ON THE OPPOSITE PAGE) THE DIMENSIONS FOR THE 6'-6" ALCOVE KITCHEN ARE SIMILAR EXCEPT A 20"x20" SINK IS USED AND THE REFRIGERATOR IS 31" WIDE


10"
3"
GAS CONNECTION & END SHELF.
4" FLUE CONNECTION
24"
40"
14"
90"
21"
43" WIDE - 25" DEEP OVER ALL
36"
GAS CONNECTION
21½"
40"

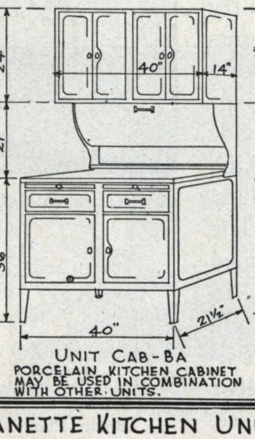
UNIT RAN-BA
COMBINED 4 BURNER RANGE AND KITCHEN CABINET. FURNISHED WITH DRAINBOARD OR SQUARE TABLE TOP.


11"
3"
GAS CONNECTION & END SHELF.
22"
14"
24"
21"
28" WIDE - 25" DEEP OVER ALL
36"
GAS CONNECTION
21½"
3"
22"

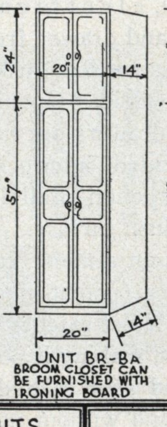
UNIT RAN-BB
4 BURNER RANGE UNIT WITH STORAGE CABINET ABOVE


31"
14"
24"
21"
36"
31"
21½"

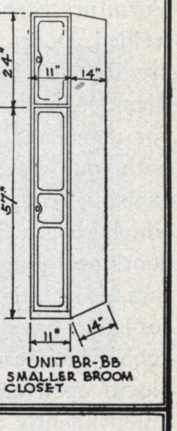
UNIT REF-BA
75 LB. ICE CAPACITY REFRIGERATOR WITH STORAGE CABINET ABOVE. EITHER DRAIN BOARD OR SQUARE TOP


40"
14"
24"
21"
36"
40"
21½"

UNIT CAB-BA
PORCELAIN KITCHEN CABINET MAY BE USED IN COMBINATION WITH OTHER UNITS.


20"
14"
24"
57"
20"
14"

UNIT BR-BA
BROOM CLOSET CAN BE FURNISHED WITH IRONING BOARD


11"
14"
24"
57"
11"
14"

UNIT BR-BB
SMALLER BROOM CLOSET

ROUGHING-IN DATA FOR CABRANETTE KITCHEN UNITS

JANES & KIRTLAND, INC.

Manufacturers of White House Line Patented Construction Sectional Unit Steel Dressers

MAIN OFFICE AND SHOWROOM
133-135 West 44th Street
NEW YORK, N. Y.
FACTORY, ST. CHARLES, ILL.

The White House Line

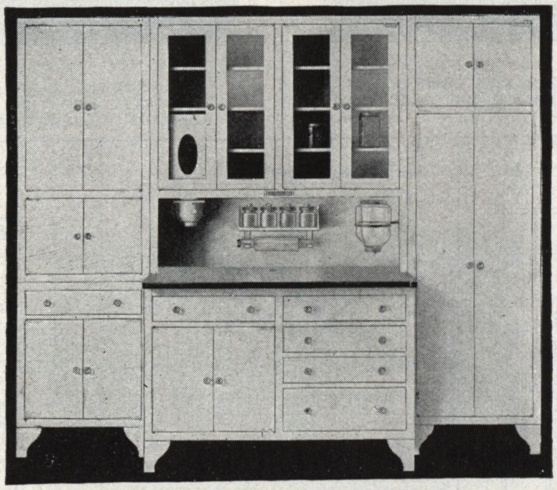
The equipment of the kitchen is now, more than ever before, a matter of first importance, whether in the home, the apartment, commercial and industrial building, hospital diet kitchen, or domestic science department. The use of steel for all cupboards, dressers, closets, etc., used in connection with the storing, preparing, or serving of food, is recognized as the utmost in equipment, and is rapidly replacing wooden construction.

White House Steel Units, because of their construction and finish, fulfil the exacting requirements of sanitation, efficiency and durability.

The White House Line is manufactured in a *unit system* in a number of sizes, the variety of which enables us to fill practically any given space by combining units.

The line comprises bases and upper units, regulation kitchen dressers, broom closets, side units for storage, sink units, medicine cabinets and tables.

The WHITE HOUSE *Line*
TRADE MARK REG. U. S. PAT. OFF.
SECTIONAL UNIT STEEL DRESSERS



Combination of White House Steel Units

Takes the place of built-in wooden cupboards, and consists of a working dresser in the center, with a storage unit on the left and a broom closet on the right. *Complete*

Finish

The finish is white enamel of the highest quality; three-coat work throughout, each coat baked on.

This insures a finish which is very tough and durable and makes a highly polished surface, easily kept clean.

Fittings

All knobs are of glass.

Hinges are cast brass, semiconcealed, nickelplated (patent applied for).

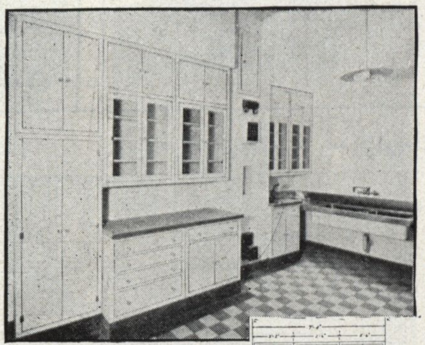
All shelves are steel, white enameled, and are adjustable. One shelf in each case compartment, three shelves in each "C" Unit compartment.

In a "D" Unit there are three shelves in each compartment of the lower sections, and one shelf in each compartment of the upper sections.

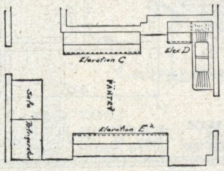
Legs are cast iron, white enameled, 6 in. high, and are equipped with domes of silence.

Construction

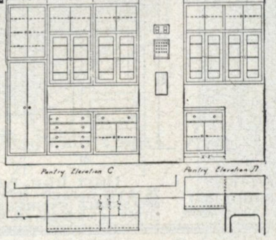
White House Units are manufactured of the famous Armco Furniture Steel, electrically welded. Doors and drawer fronts are double construction, making them perfectly rigid. Openings for doors and drawers are made with our patented interlocking rabbetted construction on all sides, which gives a flush surface. The doors are hung on semiconcealed cast brass hinges (patent applied for) and have bullet catches and rubber bumpers, making it possible to open and shut each door independently and without noise.



An Actual Installation



Floor Plan



Elevation

Arrangement

Arrangement of bases comprises cupboards and drawers, all drawers, flour and sugar bins, flour barrel compartments, plate warmers, and other combinations.

Upper units may be equipped with flour bins and sifters, platter rails, cuphook shelves.

Sizes

Bases are 28½ in. high without counter or legs; 22 in. deep, and made in a number of widths.

"C" or upper units are 36 in. high; 12 or 14 in. deep; glass doors, made in widths corresponding to the bases.

Continued on next page

"D" units are 54 in. high; 12 or 14 in. deep; two sets of doors—lower ones glass, upper ones steel; also made in widths corresponding to the bases.

The counter top of all bases, when set on 6-in. legs or on a 6-in. subbase and with our 1½-in. counter, is 36 in. from the floor, making a very good working height.

Installation

White House Units effect a saving in the cost of installation, especially where the walls are tiled. Each unit being a complete steel case makes it unnecessary to tile in back of the units.

Bases are set on our regular 6-in. legs, or more often are set on a composition base of 6 in. or less, made to take a facing of material to match the flooring.

Units are secured to the wall with bolts, etc., according to the construction of the walls: hollow tile walls, toggle bolts; brick wall, expansion bolts; lath and plaster wall, wood or lag screws in studding.

Our drafting department makes a specialty of preparing sketches of layouts of White House Units. We will be glad to furnish a blue print and estimate on a layout on receipt of your floor plans.

White House Units are furnished complete, ready for installation—no hardware, glazing or painting necessary.

Uses

Our patented construction and unit system make White House Steel Units adaptable for many uses, because they are not only sanitary and durable, but also fireproof, moistureproof, verminproof and odorless.

Residence, Apartment or House—In the kitchen, pantry, cook's pantry and general service wing.

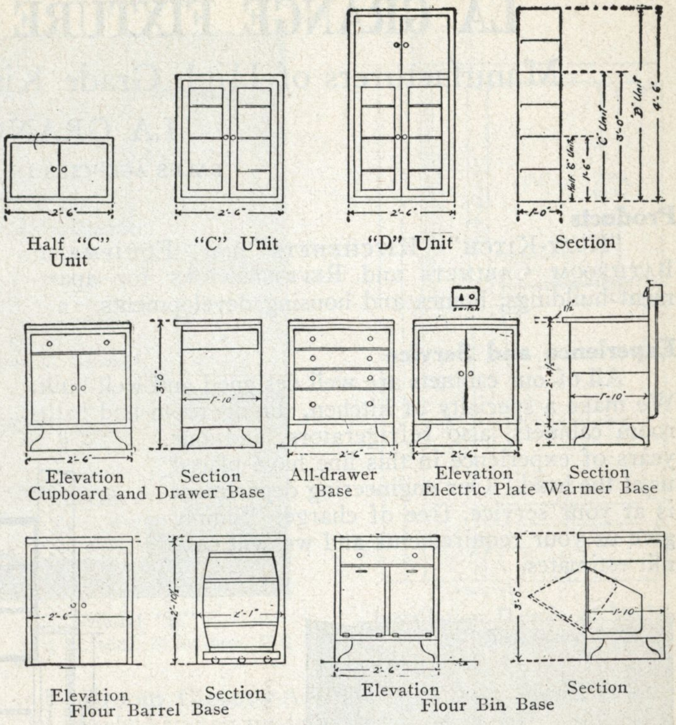
Commercial and Industrial Building—Kitchens and serving rooms, test kitchens, demonstration kitchens.

Hospitals—Diet kitchens, utility rooms, linen rooms, pharmacal laboratory, operating rooms, etc.

Wherever food is stored, prepared or served—use steel.

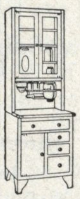
Catalogue

Gray catalogue and photographs of actual installations sent on request.

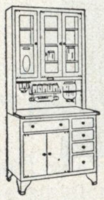


Details of Designs and Sizes

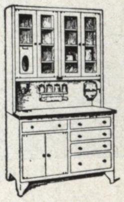
Furnished in a number of sizes, from 14½ to 50½ in. wide. Every upper unit has a base unit corresponding in width



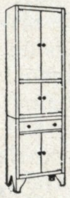
Dresser No. 27
27½ in. wide, 87 in. high



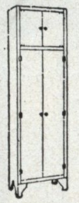
Dresser No. 39
39 in. wide, 87 in. high



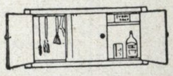
Dresser No. 50
50½ in. wide, 87 in. high



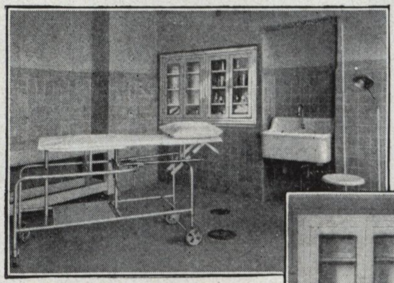
White House Side Unit
26 in. wide, 12 in. deep, 87 in. high on legs



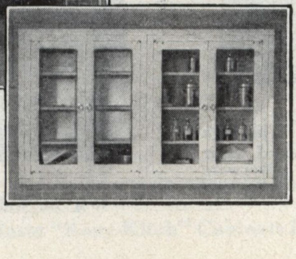
White House Broom Closet
18¾, 26, 30 and 36 in. wide, 12 in. deep, 87 in. high



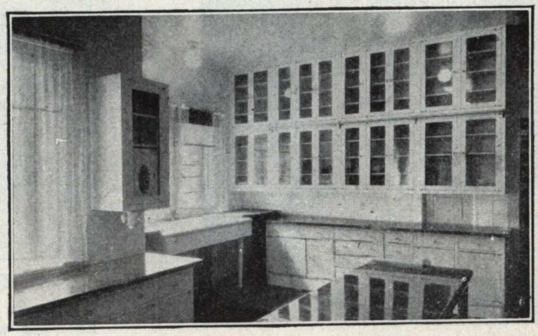
White House Sink Unit
27½, 36, 39 and 50½ in. wide, 6 in. deep, 18 in. high



Operating Room of a Modern Hospital Where White House Units Are Used



The Unit Illustrated Is 12 in. Deep Recessed in Wall, and Forms a Flush Surface



Another Typical Illustration of a Well-planned Kitchen, Showing the Many Uses of White House Steel Units

LA GRANGE FIXTURE SALES CORPORATION

Manufacturers of High Grade Kitchen Cabinets and Refrigerators

LA GRANGE, IND.

SALES AGENCIES IN ALL LARGE CITIES

Products

"Kozy-Kitch" Kitchenets and Equipment, Bathroom Cabinets and Refrigerators for apartment buildings, homes and housing developments.

Experience and Service

All of our cabinets are well designed and well built. We make a specialty of kitchen, dining room and bathroom cabinets, also refrigerators, and our years of experience in this line have placed us at the head. Our engineering department is at your service, free of charge. Simply give us your requirements and we will submit estimates.

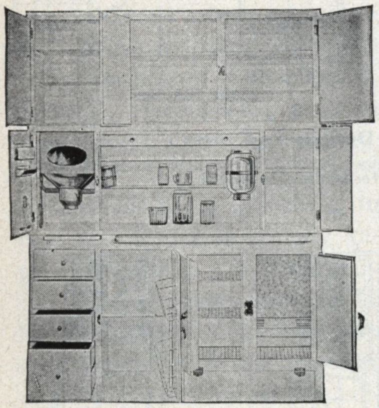
General Construction Features

Our cabinets are manufactured in various styles and sizes to meet the demands of dwellings and apartments, for both ice and mechanical refrigeration. They are made entirely of wood, three and five-ply laminated stock, waterproof glue, flush construction throughout.

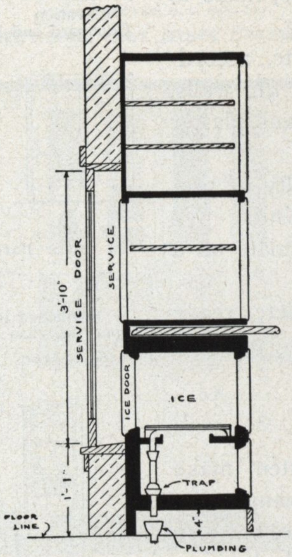
Made in rights and lefts, either rear or end icing, and service.

White enameled inside and out, trimmed with solid brass handsome nickelplated hardware.

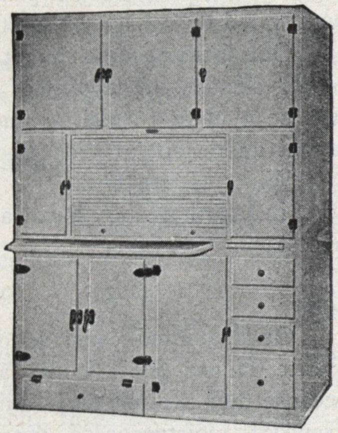
Adapted to any kitchen layout. Convenient, sanitary, maximum efficiency in given space.



Open



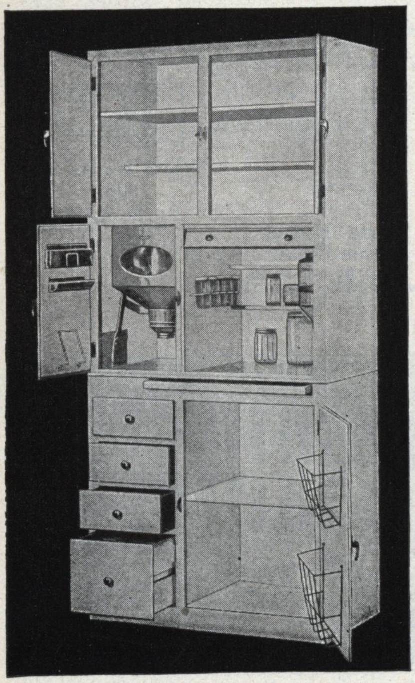
Installation Details



Closed

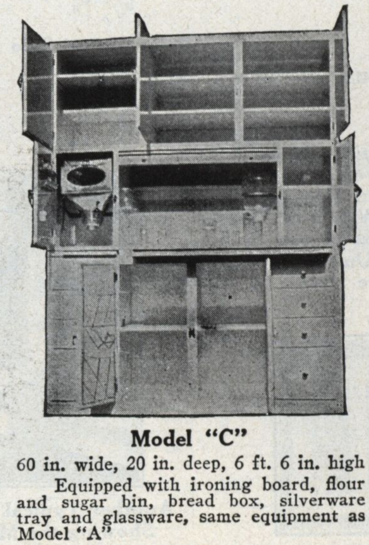
Model "A," Ice Capacity, 75 lb.

5 ft. wide, 20 in. deep, 6 ft. 6 in. high



Model 3

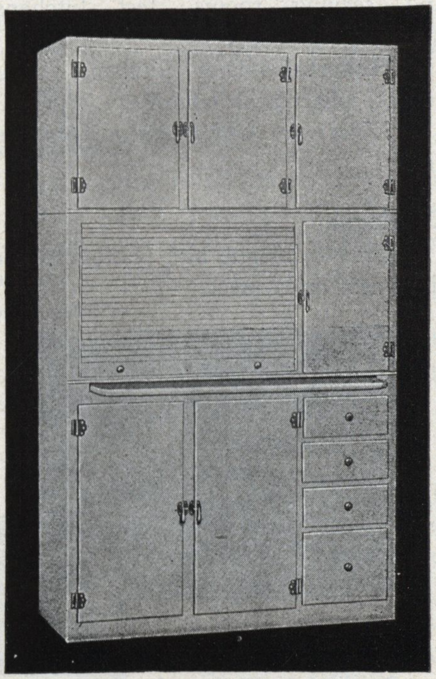
36-in. wide, 20 in. deep, 6 ft. 6 in. high



Model "C"

60 in. wide, 20 in. deep, 6 ft. 6 in. high

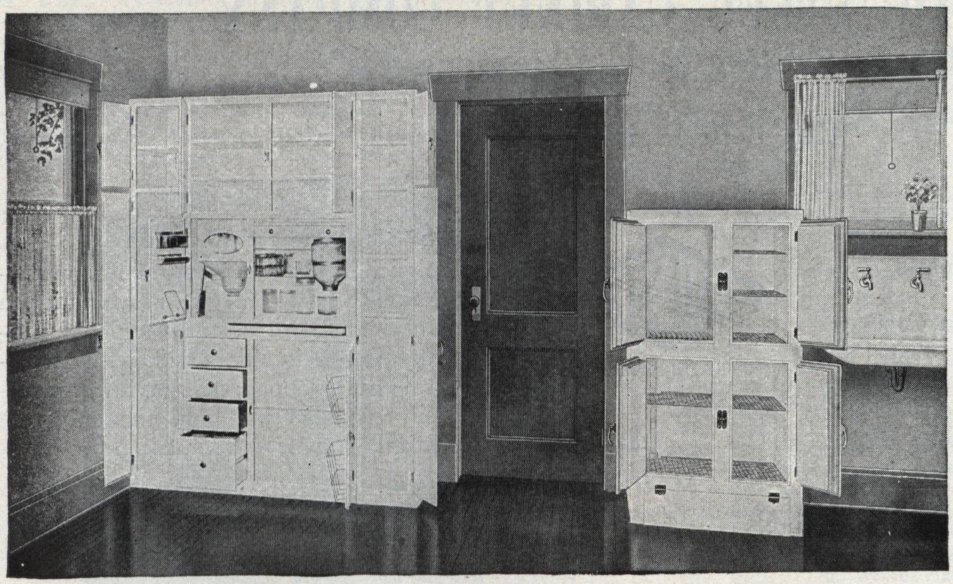
Equipped with ironing board, flour and sugar bin, bread box, silverware tray and glassware, same equipment as Model "A"



Model 4

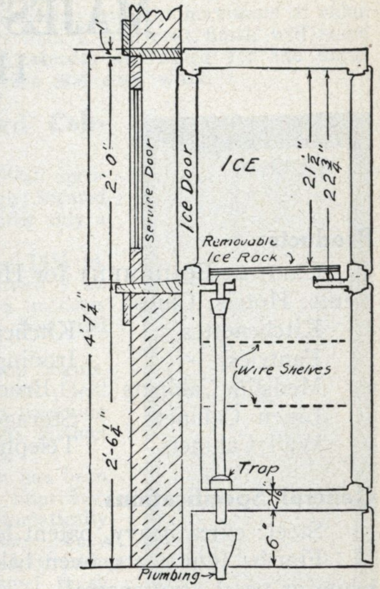
46¼ in. wide, 20 in. deep, 6 ft. 6 in. high

Continued on next page



Model 3 (with Broom and Dish Closet Units)
36 in. wide, 20 in. deep, 6 ft. 6 in. high
Broom and dish closet, each 12 in. wide, 20 in. deep, 6 ft. 6 in. high

Model "R"
30¼ in. wide, 20 in. deep, 55¼ in. high


1"
2'-0"
Service Door
Ice Door
ICE
21½"
22¾"
Removable Ice Rack
4'-7¼"
Wire Shelves
2'-6¼"
Trap
2⅛"
6"
Plumbing

Installation Details of Model "R" Refrigerator

A Few Points of Merit

Refrigerators—Scientifically constructed, circulating dry cold air; mineral wool insulation in all walls; iced from front, rear or end; nickel tinned wire shelves; large sized lift door, easy access to drain. All parts—trap, drain pipe, ice rack and shelves—easily removed for cleaning.

We build refrigerators to meet household demands, including mechanical as well as ice, and will be pleased to quote at any time.

Storage Facilities—Eleven-piece set crystal spice jars; 10-lb. capacity swinging glass sugar bin; 25-lb. capacity flour bin. Spacious drawers for linen, cutlery with silverware tray, bread and cake, and one for miscellaneous use. Compartment for pans, pots and kettles.

Convenient Accessories—Metal receipt holder and change tray. Removable bread or meat board. Disappearing roll curtain. Porcelain pull-out table, 25x40 in., removable to clean. Large ironing board.

Garbage and Package Receivers—Garbage deposited in front, removed by janitor at rear through service doors. Groceries delivered in rear through door, removed by housewife in front.

Doors—Five-ply, laminated, using waterproof glue; flush type construction eliminating dust collecting, which is an objectionable feature in the ordinary panel type.

Broom Closet—As illustrated with Model 3, can be attached to any model either right or left hand.

Sanitation

For reasons of sanitation, efficiency and protection from germs our cabinets are built with the view to making them as near dustproof as possible; all doors and drains are lap type.

Flexibility

All of our cabinets are built sectional and any combination to fill any required space can be had.

Economy

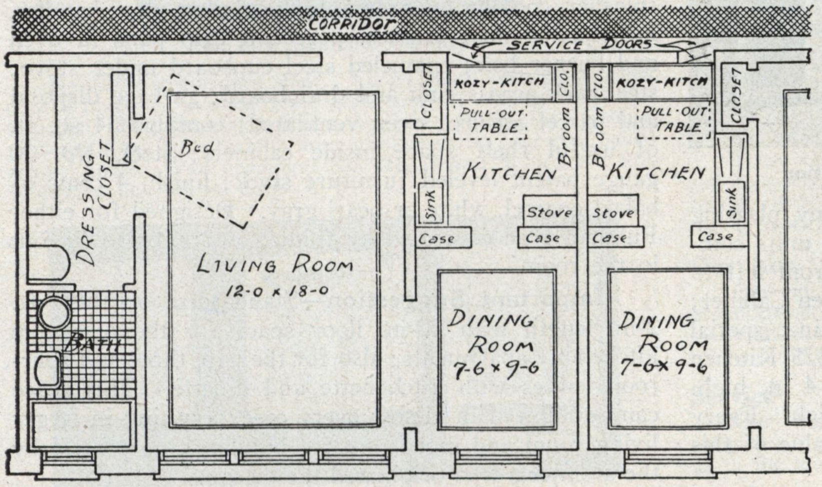
The compactness and efficient arrangement of our kitchen equipment make smaller kitchens possible, thus saving in building construction costs.

Superiority and Adaptability

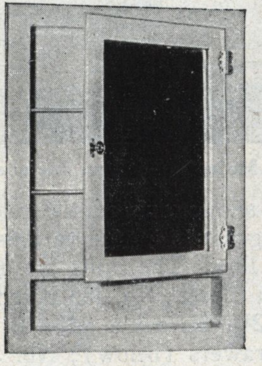
"Kozy-Kitch" cabinets are superior in efficient design, careful workmanship, rugged materials and beautiful finish. Pleasing alike to architect, builder, owner and tenant. "Kozy-Kitch" apartments rent first and stay rented.

The models here shown are adaptable to any style and size of kitchen. A place for everything, everything in its place and the real center of the woman's workshop.

Write for prices and further information.


CORRIDOR
SERVICE DOORS
CLOSET
KOZY-KITCH
CLO.
PULL-OUT TABLE
Broom
KITCHEN
Sink
Stove
Case
KOZY-KITCH
CLO.
PULL-OUT TABLE
Broom
KITCHEN
Stove
Sink
Case
CLOSET
DRESSING CLOSET
Bed
LIVING ROOM
12-0 x 18-0
BATH
DINING ROOM
7-6 x 9-6
DINING ROOM
7-6 x 9-6

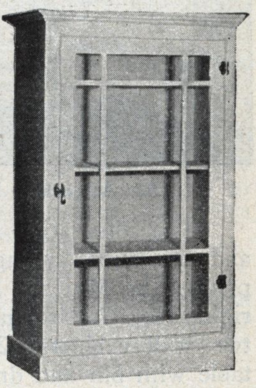
Two Model "A" and Broom Closet "Kozy-Kitch" Cabinets in Apartment Layout



Medicine Cabinet

Wall opening, 19x27½x3½ in. Clear mirror, 13¾x17½ in.

Made of wood with high luster white enamel finish; trimmings, brass nickelplated



China Closet

Made in various styles and sizes to meet demand. Trimmings, brass nickelplated; white enamel throughout; high luster

MAJESTIC STEEL CABINET COMPANY

"Household Steel Cabinet Headquarters"

FACTORY AND GENERAL OFFICE
4231 Belle Plaine Avenue
CHICAGO, ILL.

TRADE-MARK

Products

Cabinet Equipment for Homes, Apartments, Hotels, Clubs:

- Kitchenettes
- Pantries
- Medicine Cabinets
- Linen Cabinets
- Wall Cabinets
- Kitchen Cabinets
- Ironing Board and Broom Cabinets
- Storage Cabinets
- Telephone Niches

General Specifications

Steel: extra heavy, patent leveled, furniture.

Finish: four coats, oven baked, elastic and durable white or pearl gray enamel.

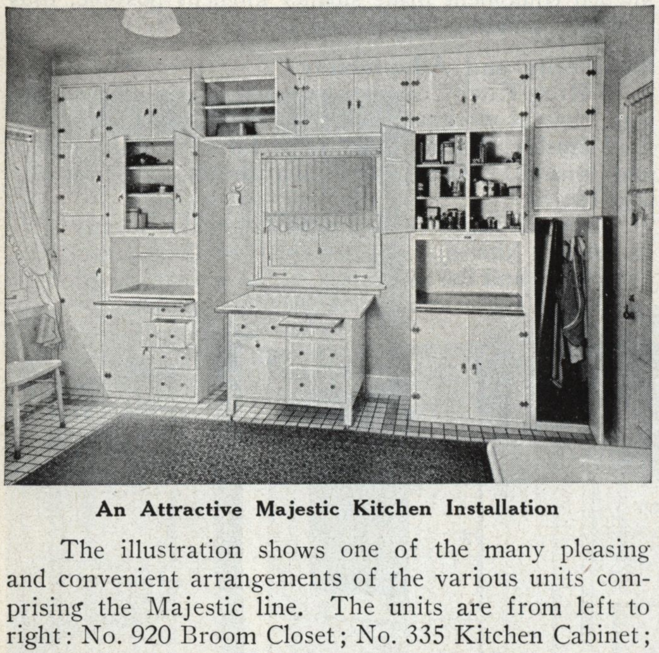
Construction: electrically welded, no rivets, unusually rigid and high grade.

Hardware: brass, heavily nickeled; and steel, coppered, nickeled and lacquered.

Unit System

The Majestic line is built up of standard units so that almost any requirements can be satisfied from widths of 17 in. up.

The units can be used equally well singly or in any of the many combinations possible. This plan enables builders to fill storage space needs with standard units, with economy and greater satisfaction than is possible with wood.

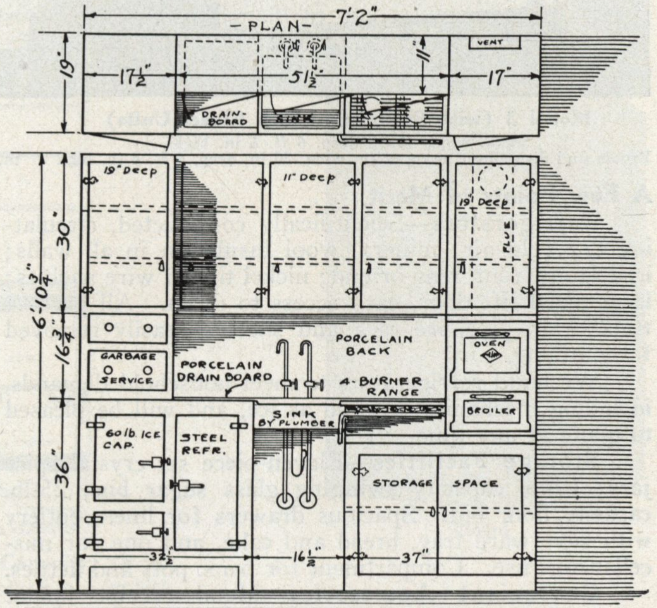


An Attractive Majestic Kitchen Installation

The illustration shows one of the many pleasing and convenient arrangements of the various units comprising the Majestic line. The units are from left to right: No. 920 Broom Closet; No. 335 Kitchen Cabinet; two wall cabinets 32½ in. wide x18x18 in.; special table with bin and drawers (below); No. 325 Kitchen Cabinet; No. 920 Broom Closet; all 8 ft. 4 in. high. These are also furnished 82¾ and 70 in. high. Every architect and builder will realize the sales value of this equipment.

New No. 3000 Majestic Kitchen

Designed by a group of prominent metropolitan architects to fill their need for a satisfactory standard. Every fault of previous kitchenettes is eliminated, with attractive new features added, making an economical, easily installed unit and the only one that is a real practical, complete kitchen.



No. 3000 Majestic Steel Kitchen

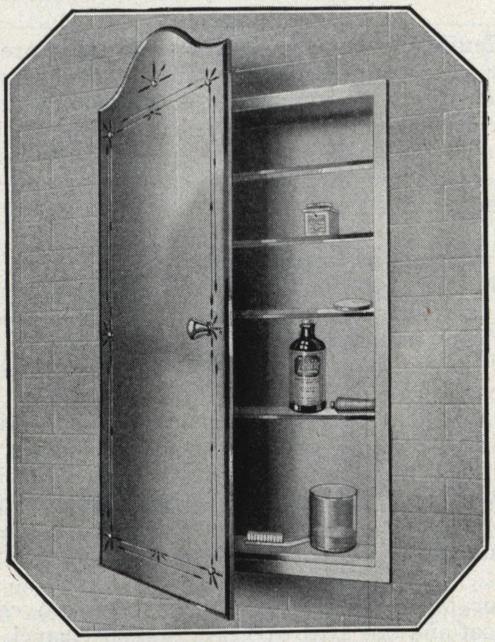
Description—60-lb. steel cased refrigerator insulated with 1½-in. solid cork board (not granulated) with outside icing or fitted for mechanical refrigeration, width 32½ in.; sink furnished through plumber (not included in price); porcelain enameled drainboard on top of refrigerator; four-burner gas range with 14-in. side oven and broiler, porcelain enamel front, side splasher, cooking top frame, back splasher, door handles, nickelplated door frames, porcelain drip pans in oven and burner box; enameled steel cupboard under stove; steel back across sink and drainboard; garbage disposal and parcel service; oven ventilated; contains 34 sq. ft. of useful shelf space inside cabinets; steel, No. 20 gauge patent leveled furniture stock; finish, 4 coats of baked enamel, white or pearl gray. Designed for either Pullman type concealed by folding doors, or to set out in the room.

Important Suggestion—Standardize on the 7-ft. 2-in. length with 20-in. floor space for the one-room kitchenette apartments; also for the two, three and four-room suites with kitchenette and dinette. This space can be allowed in almost every case, resulting in larger living room and more rentable buildings, as proved by the architects who originated the design.

Continued on next page

A Fine Venetian Mirror with Hidden Medicine Cabinet

The utility of a mirror in a medicine cabinet has now been augmented by elegance hitherto unknown in medicine cabinet manufacture. The brilliant mirror shows no evidence of a cabinet behind it, all steel work and hinges being concealed. The steel door mounting is finished in hand rubbed walnut—the case with four coats of baked white enamel.

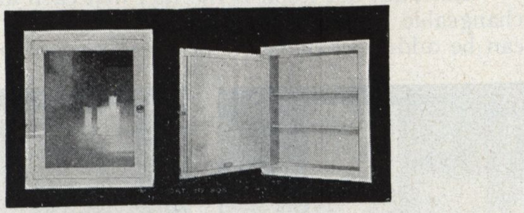


Majestic De Luxe Medicine Cabinet with Mirror "B"

Mirror, 18x30 in.; wall opening, 16x25½x4½ in. Two other mirror designs: "A"—three-line border with flower basket design and rosettes at the corners; "C"—plain, no cutting. Designs cut on back before silvering.

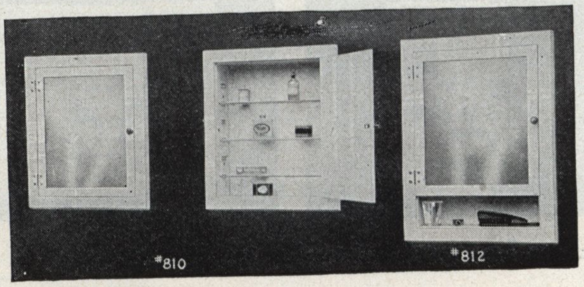
Majestic Standard Medicine Cabinets—Four Models; Two Sizes

No. 805 without open shelf. No. 807 with open shelf below door. 14x18-in. selected plate glass mirror. "Popular" construction; one-piece frame, one-piece door frame, semiconcealed hinges, bullet catch, two glass shelves, four-coat baked enamel finish. Popular priced equipment, suitable for fine hotels and apartments. Wall openings: No. 805, 16¾x24¾; No. 807, 16¾x25¾. 4½ in. deep.



No. 805 Medicine Cabinet

No. 810 without open shelf. No. 812 with open shelf below door. 16x20-in. selected plate glass mirror. "Hi-grade" construction. Highly refined design, one-piece frame, die stamped, rabbeted door; bullet catch; three glass shelves; four-coat baked enamel finish. Wall openings: No. 810, 18¼x22¼ in.; No. 812, 18¼x27¼ in. 4½ in. deep.



Economy—Majestic medicine cabinets are not the cheapest in price, but are offered because they give the maximum of value and economy. Nothing less than a four-coat finish will stand up satisfactorily. Majestic cabinets are noted for the durability of their finish, hardware and steel work.

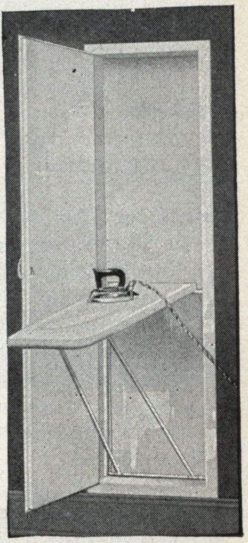
Majestic Ironing Board Cabinets

No. 909 (illustrated). Wall opening, 14¼ in. wide, 5 ft. high; located 9 in. above floor line; requires only a 2½-in. deep recess.

No. 910. Wall opening, 14¼ in. wide, 5 ft. 5 in. high; located 9 in. above floor line; recess, 4½ in. deep. This model has shelf for iron and broom clip on the door.

Steel cabinets with wood boards. Come complete, ready to install. Held in place by six screws. No trimming or fitting. Their use means distinct economy and pleased clients.

The folding mechanism has been entirely redesigned and improved. Unusually light action; automatically locks into operating position. Very rigid—will support 150 lb., 3 ft. from the wall. The white enamel finish brightens the kitchen. Either of these cabinets furnishes an important convenience.



No. 909

No. 801 Majestic Telephone Niche

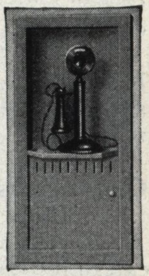
A comparatively new convenience which gets the telephone out of the way, yet keeps it ready for instant use.

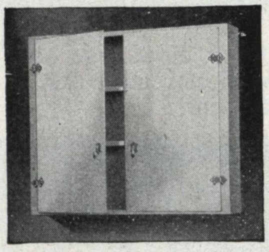
Size: height over all, 28 in.; width, 13 in.; depth, 5 in. Requires a wall opening 25¼x10¼x4½ in.

Finish: standard, walnut or mahogany. Special colors to match your sample can be furnished, or the cabinet can be furnished with rustproof bond coat only.

For Hotels—The telephone niche in the hotel room displaces the old fashioned telephone stand and also the unsightly wall telephone. The niche, being above the zone that receives the hardest wear in the room, will retain its handsome appearance long after the furniture shows signs of use.

For Homes and Apartments—The telephone is always more or less in the way. The Majestic telephone niche provides a logical and convenient place for the instrument.





Wall Cabinets

A series of cabinets for use either singly or in combination with other units.

Widths are 26, 32½, 42 and 50½ in.; heights, 30 and 47½ in.; depth, 11 in.

These cabinets furnish valuable storage space where floor space is not available.

Bulletins for Your Information

No. 20. Majestic Medicine Cabinets.
No. 21. Ironing Boards; Telephone Niches.
No. 22. Condensed Catalogue, with dimensions.
No. 23. Majestic De Luxe Medicine Cabinets.
No. 24. Majestic New No. 3000 Kitchenette.

These bulletins are prepared to give information quickly and concisely. Any one, or all, will be gladly sent to you on receipt of letter, card, telephone call or telegram. List prices and specifications are given for each item.

Our Aim

Our aim is to furnish the best steel cabinets that an efficient organization, modern tools and machinery, and first quality materials can turn out, at a price that means over-all economy to the builder and owner.

Service

Our engineering department is at your service, without obligation, to furnish layouts, information or recommendations as to the most advantageous use of Majestic products.

DOMESTIC SCIENCE BUILT-IN KITCHEN UNITS

MANUFACTURED BY
McDOUGALL COMPANY
FRANKFORT, IND.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

Manufacturers of Domestic Science Built-in Kitchen Units.

Low Cost Due to Quantity Buying, Production and Our Experience

Our enormous facilities in buying raw materials and in manufacturing, enables us to produce these units for a less cost than millwork. And in addition to the higher quality, appearance and construction, ours have convenience usually unobtainable.

We are woodworkers of 35 years' experience and we are putting only the best materials and workmanship in these Units.

Our Service to Architects, Builders, and Owners

We maintain a Service Department to enable every one to obtain the utmost efficiency in the smallest space.

Our office is a clearing house for the most practical ideas of kitchen design, and we invite you to submit plans, so we can assist you to lay out your kitchens.

This service is free and gladly given. Address us, or our representative, and you will be given immediate, careful attention.

The following pages show a few of the many combinations, but our line is in no wise limited to the few sample combinations shown—we can give practically unlimited choice from hundreds of arrangements.

General Description of Domestic Science Kitchen Units

Planning of Kitchens—Kitchens now are being carefully planned beforehand—the same cool, thorough calculation and attention given to them as to the remainder of the building.

Domestic science built-in kitchen units have been responsible for much of this forward movement toward better arranged, less expensive kitchens.

Flexibility of Our Units—The units are scientifically proportioned, built complete ready to set into the kitchen, and are of such variety that no matter what the peculiar demand as regards shape of the kitchen, or position of the doors and other openings, we will work out a suitable complete kitchen equipment and deliver it ready to set in place.

Feature Points of Construction

The material from which these units are made is wood, carefully selected, thoroughly air seasoned, and scientifically kiln dried.

The assembly of these units is done by cabinet makers, not carpenters, but real cabinet makers.

Every joint in any of our units is a mortise and tenon joint, carefully glued and made an integral part of the case which contains it. All shelves are mortised in.

Every base is thoroughly braced with the famous Sampson corner brace construction which is described later on. There are eight of these corner braces in each base.

Our finish consists of three coats: two coats of undercoat and one coat of heavy special enamel. Each coat is sprayed on, sanded, and glazed before the subsequent coat is applied.

All hardware is heavy nickelplated on solid brass.

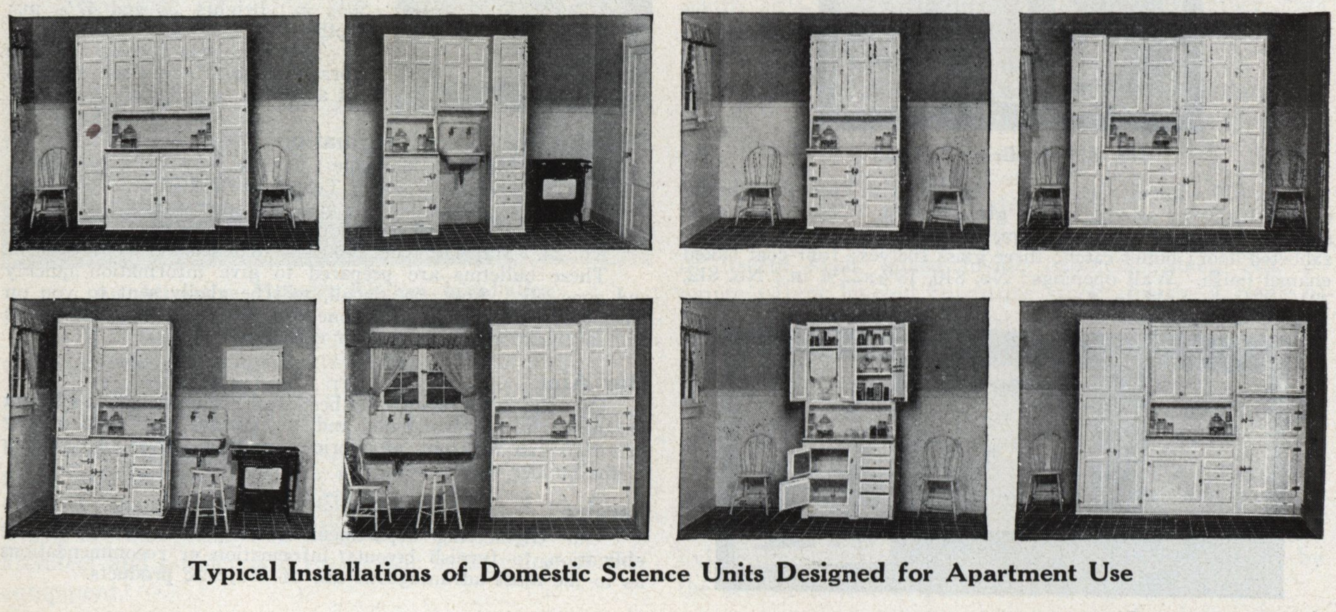
All table tops are of porceliron, guaranteed against chipping, cracking, or staining from the ordinary acids which come in contact with it in the kitchen.

All drawer bottoms are mortised in all the way around and varnished on the inside. All drawers for silver are velvet lined.

All drawers have center guides and crystal glass knobs.

Refrigerators are of heavy corkboard insulation described in detail later on.

Last, but not least, is the fact that each unit is interchangeable with all other units. Additional equipment can be added whenever it becomes necessary.



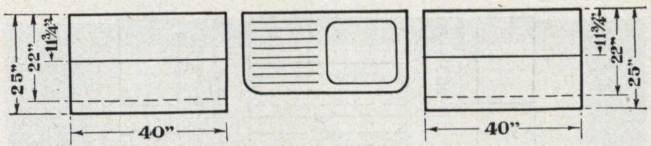
Typical Installations of Domestic Science Units Designed for Apartment Use

Continued on next page

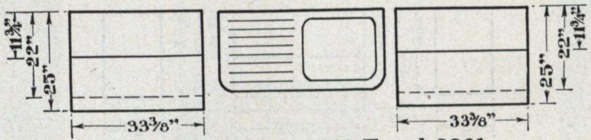
Combination No. 61

Here we show probably the most efficient and compact arrangement which has yet been worked out providing sufficient cupboard storage space and work table top for the average home.

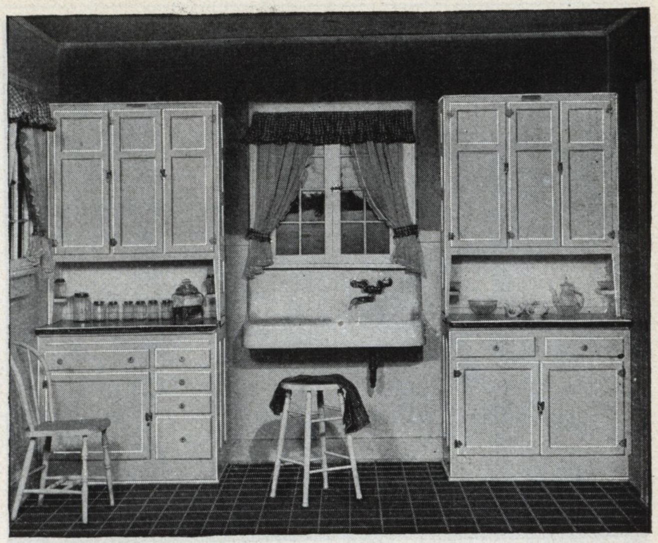
This arrangement can be had in a number of sizes with windows in center and off center and has proven most satisfactory wherever used.



Floor Plan of Illustration



Floor Plan Using 3561-T and 3261



Unit 4560-T Unit 4260

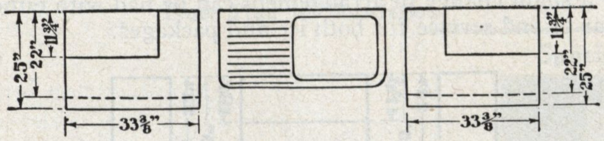
Combination No. 58-A

A very attractive arrangement for those kitchens where a large window over the sink is desired.

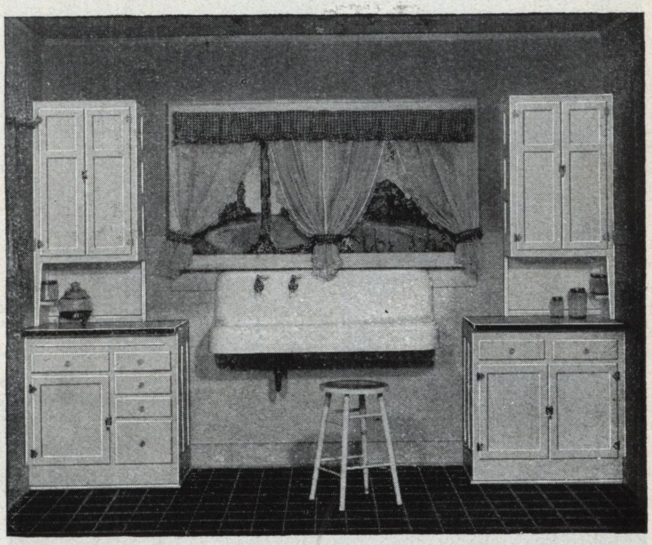
By using a 34-in. base and a 24-in. upper section, we get a very attractive and yet complete equipment.

Note the continuous table top effect across the entire wall. This is a point especially to be desired.

Work may be done on either side of the sink.



Floor Plan of Illustration



Unit 3563-T Unit 3263

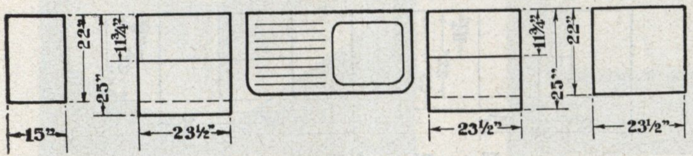
Combination No. 35-B

With this arrangement the entire kitchen equipment, with the exception of the stove, can be placed along one wall. This is very desirable in kitchens where a breakfast nook is immediately adjacent to the kitchen.

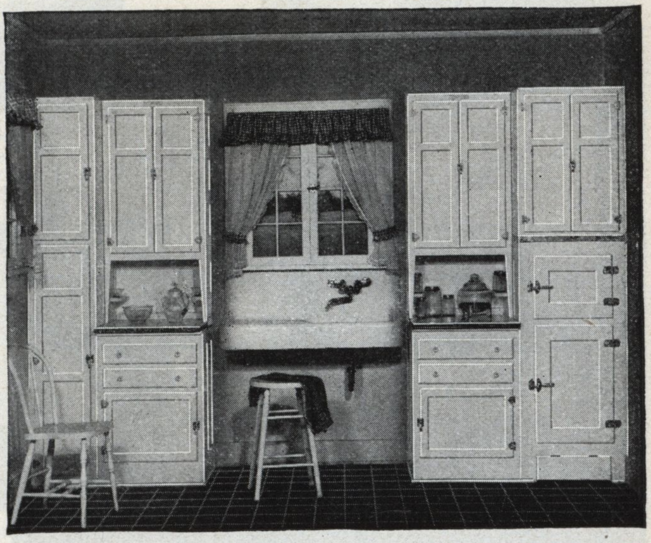
The refrigerator is of 65-lb. ice capacity and may be had with either end or rear service.

If desired, the unit on the left may be either a plate cupboard with 14 sq. ft. of shelf space, or a broom closet large enough for mops, brooms and vacuum cleaner.

This arrangement has proven very popular.



Floor Plan of Illustration



Units 83-2263-T Units 2263-10766

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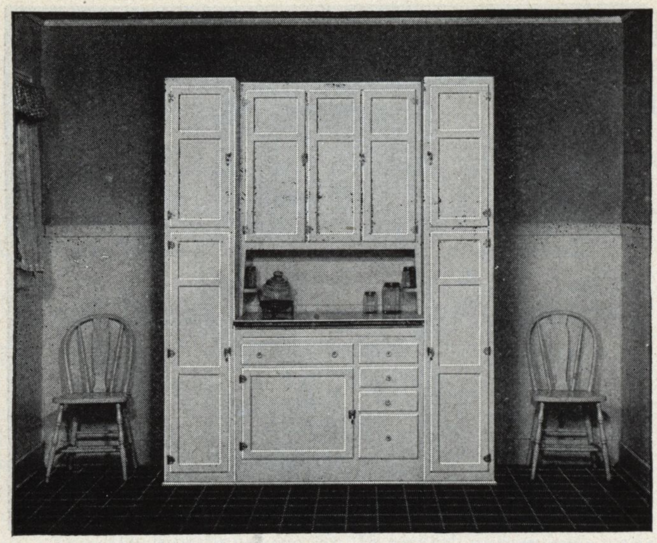


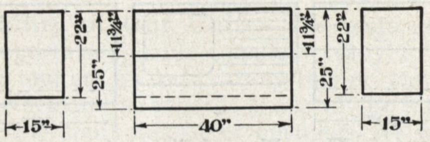
Units 83-4560-T-85

Combination No. 51

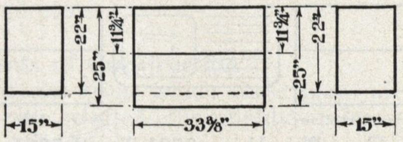
These units provide an abundance of storage space besides a large porceliron working table top.

This arrangement in combination with a stove and sink gives ample storage and work table top space for the average kitchen.

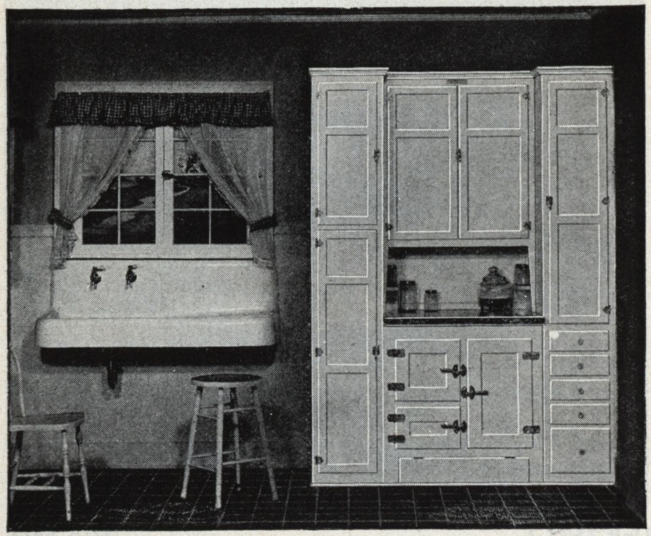
This combination is also available in smaller sizes if desired.



Floor Plan of Illustration



Floor Plan Using 3561-T in Place of 4560-T

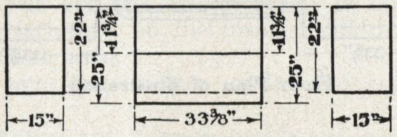


Units 83-10161-T-89

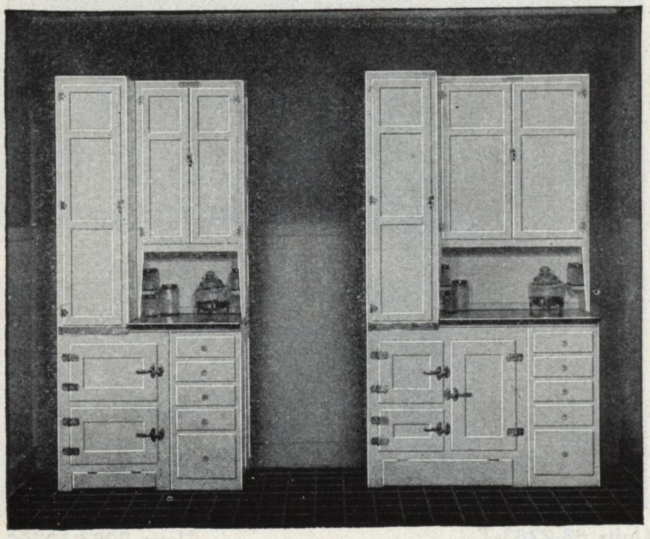
Combination No. 12

One of our most compact, practical and complete apartment kitchen outfits. Please note that this little combination contains a real refrigerator, plenty of drawer space, lots of storage and shelf space, flour bin, cake and bread box, sugar bowl, jars for coffee, tea, and spice, broom closet—in fact, everything needed in the kitchen except stove and sink.

This outfit may be had with rear icing service and by a slight change in arrangement can be had with either rear or end service for both ice and packages.



Floor Plan of Illustration

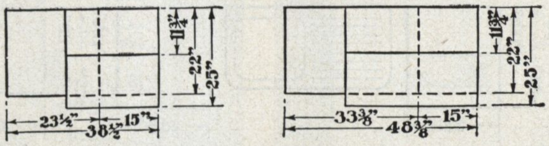


Units 10588-87-63-T Units 10188-87-61-T

Combination No. 105

We here show two combinations which are especially adapted to those very small apartment kitchens. The smaller outfit takes a floor space 3 ft. 2½ in.x22 in. deep. The larger one requires 48½ in.x22 in. Either combination may be had with rear or end icing and package service.

The arrangements which we present here have been a great help to those who wish to get a maximum of equipment in a minimum space.



Floor Plan of Illustration

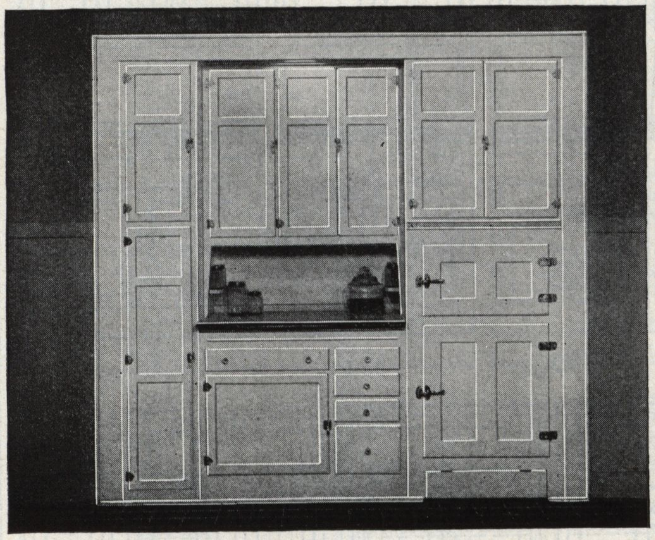
Continued on next page

Combinations No. 24 and 24-X

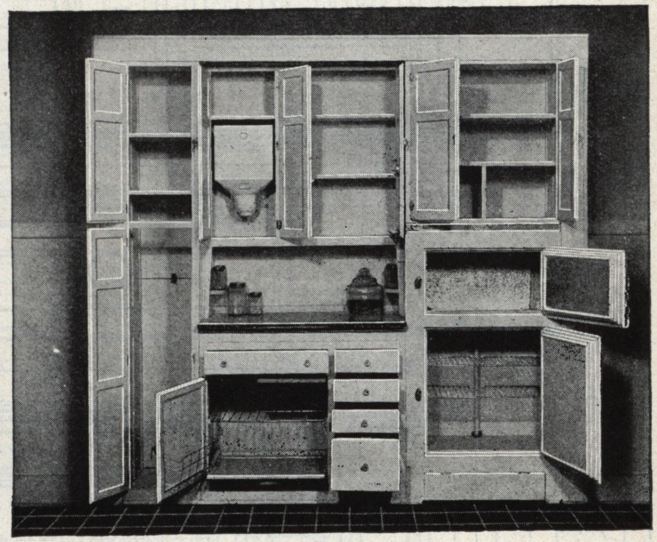
We show below both open and closed views of an arrangement which has been universally acclaimed to be our most valuable combination.

Its outstanding features are the large refrigerator with a 125-lb. ice capacity and ample storage space for foods; a table top 40x25-in.; flour bin, cake box, ample drawer space, broom closets; and, particularly, the abundance of storage space which is provided.

This identical arrangement has been specified many times where it constituted the entire equipment for the kitchen except for stove and sink. For the average family it is sufficient.

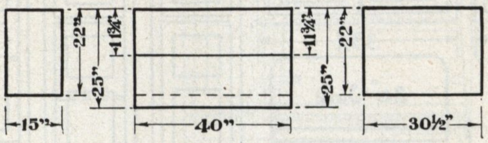


Closed

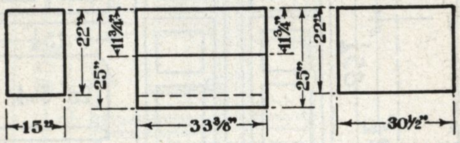


Open

Units 83-4560-T-10364

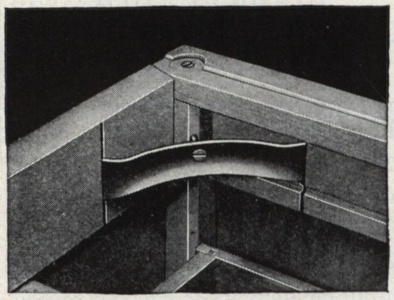


Floor Plan of Illustration



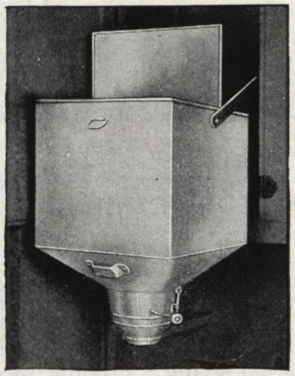
Floor Plan Using 3561-T in Place of 4560-T

Special Features



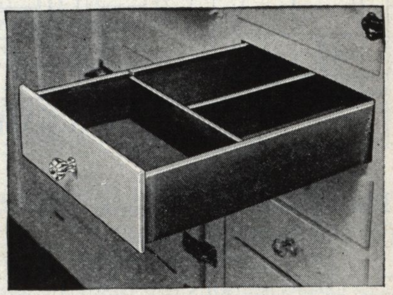
Sampson Corner Braces

Each base contains eight of the famous Sampson corner braces, insuring absolute rigidity and permanent strength



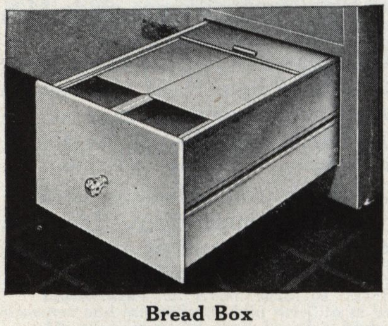
Simplex Flour Bin

Made of non-rusting metal with 24-lb. capacity, sifter attached. It is here shown lowered for filling



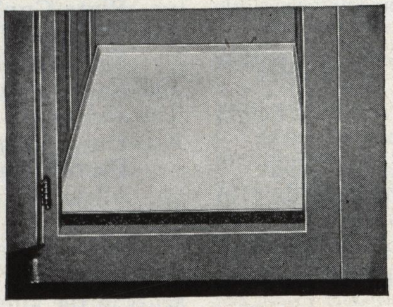
Cutlery Drawer

The cutlery drawer is divided for convenient storing of cutlery. The front section is velvet lined for silverware



Bread Box

Made of non-rusting metal and contains a sliding shelf. It has an automatic arrangement which closes the top of the bread box when the drawer is closed



Tray in Broom Closet

All broom closets are provided with a porceliron tray in the bottom, easily removable for cleaning and dusting, assuring neatness and cleanliness in a closet usually dark and dirty

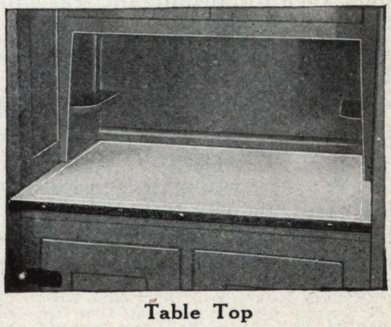


Table Top

Of porceliron, guaranteed against cracking, chipping, or staining from the ordinary acids of the kitchen—an ideal work table top

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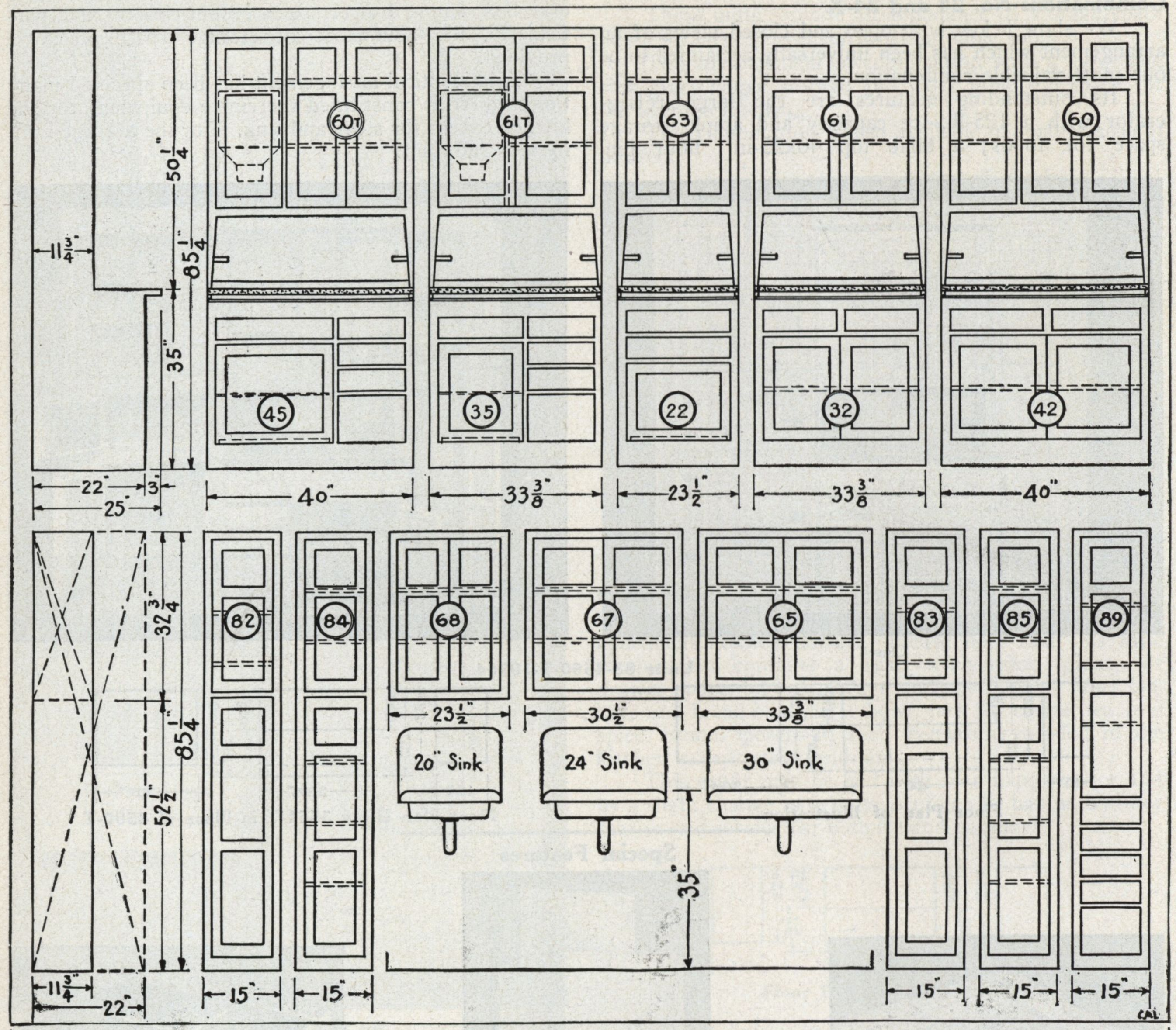


DIAGRAM DRAWINGS OF STANDARD UNITS—SHEET No. 1

Description of Contents and Features of the Units Shown Above

Base Sections—

Base sections are made in widths of 23½, 33⅜ and 40 in., containing two or five drawers and storage space for kitchen utensils.

This storage compartment has a sliding bottom that pulls forward, making the rear storage space as accessible as that in front.

Each base contains eight of the Sampson corner braces described on the preceding page.

All bases are 22 in. deep and have a standard height of 35 in. to the table top.

Upper Sections—

Upper sections are made in sizes corresponding to the bases; namely, 23½, 33⅜, and 40 in. They are made both with and without flour bins and come either with or without glassware and the auxiliary equipment on the doors.

Broom Closets—

Broom closets are all 15 in. wide and are made 11¾ and 22 in. deep. Above the storage compartment for brooms, mops, and vacuum cleaner are 2 shelves providing storage space for cleaning fluids, rags, etc.

The bottoms of these broom closets have porceliron trays assuring absolute cleanliness at all times.

Plate Cupboards—Plate cupboards are made 11¾ and 22 in. deep. They contain 7 shelves.

No. 84 plate cupboard has 7 sq. ft. of shelf space and No. 85 plate cupboard has 14 sq. ft. of shelf space. The shelves are so arranged as to provide storage for the larger utensils used in the kitchen.

Porceliron Table Tops—

All table tops are of porceliron, which is vitrified enamel, baked on steel at a high temperature. It makes an ideal non-porous work surface and is guaranteed against cracking, chipping, or staining from the ordinary acids in the kitchen.

Continued on next page

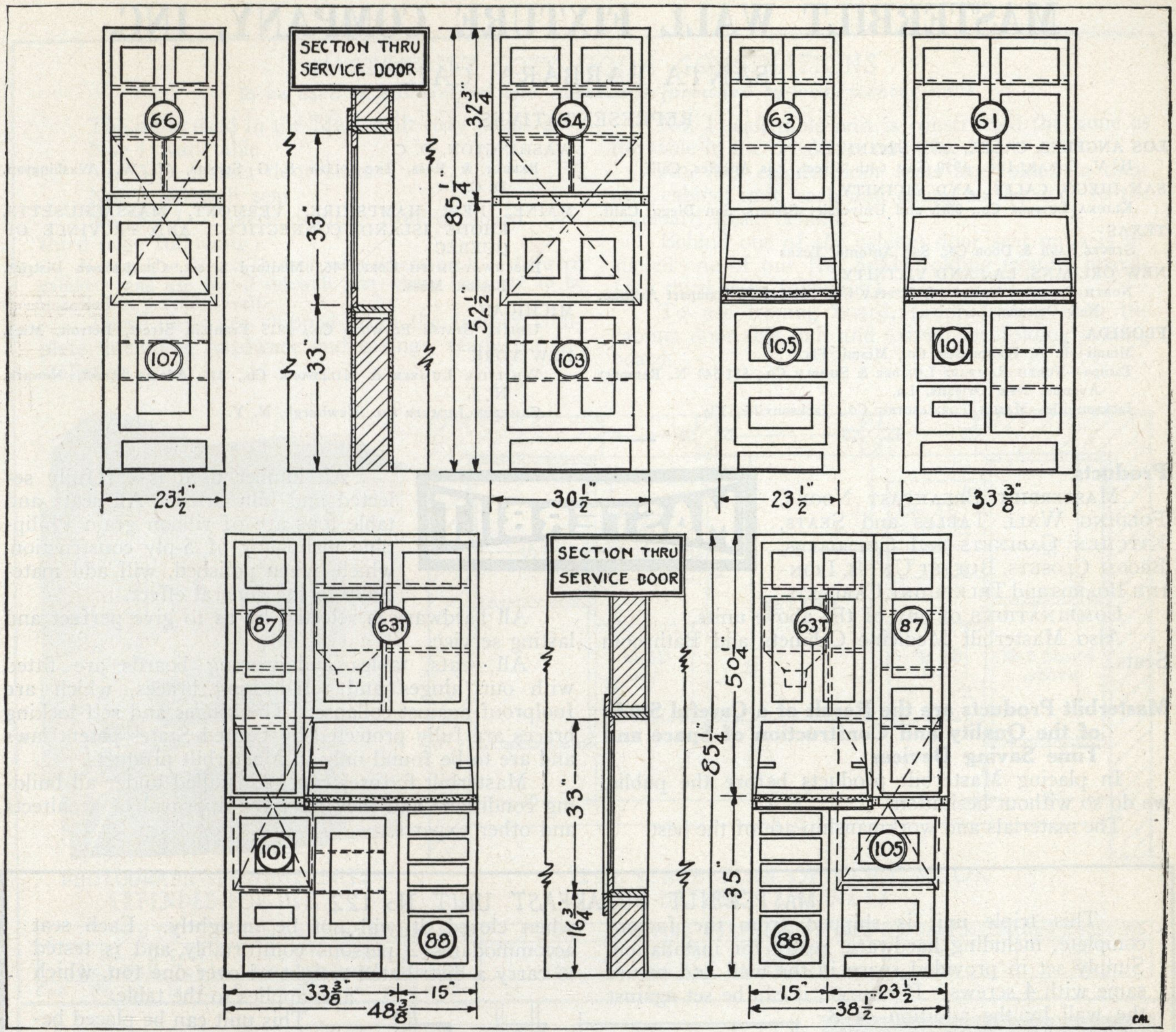


DIAGRAM DRAWINGS OF STANDARD UNITS—SHEET No. 2

Description of Contents and Features of the Refrigerator Unit Combinations Shown Above

Refrigerators—Are designed to fit with other units. The insulation consists of 2 layers of building felt, 1 in. of Nonpareil corkboard and ½ in. confined air space.

Can be furnished with 1½-in. corkboard when so specified.

Refrigerators Nos. 101, 105, and 107 have 65-lb. ice capacity. No. 103 has 125-lb. capacity. They are lined with Toncan metal with white enamel finish. All hardware is heavy cast brass nickelplated. All refrigerators will be furnished with either end or rear service at a slight additional cost.

Nos. 66 and 64 storage sections above Nos. 107 and 103 refrigerators have a capacity of 12 and 15 sq. ft., respectively.

Standard Specification for Use of Architects

Note: The following specification can be copied and inserted in specifications for Carpenter or Millwork.

General—The contractor shall provide and install complete, where shown on the drawings, the following kitchen units and combinations of units. *(Insert here a list of the required units.)*

The above kitchen units or combinations shall be as manufactured by the McDougall Company of Frankfort, Ind., or equal, as may be approved by the architect.

Materials—All wood shall be carefully selected, thoroughly air seasoned and scientifically kiln dried to at least 4½% of moisture content.

All other material shall be of a high standard that may be recommended and guaranteed by the manufacturer.

Workmanship—The assembly of the various units shall be executed by experienced cabinet makers.

Frames—All joints shall be mortised and tenoned and thoroughly glued. All bases shall be reinforced with eight Sampson Kant-Warp steel corner braces. All shelves shall be mortised in.

Panels—All panels, including drawer bottoms, shall be of $\frac{3}{16}$-in. 3-ply laminated wood mortised in all around, and the backs of all units shall be of the same material.

Drawers and Tops—All drawers shall have slide guides.

All drawers for cutlery shall be divided for convenient storing of cutlery. The front sections shall be velvet lined for silverware.

The bread box drawer shall be lined with non-rusting metal and shall contain a sliding shelf. The covers shall be arranged to close automatically when the drawer is closed.

Porcelain Tops—All base or table tops shall be of steel, of ample weight, with high grade porcelain finish and guaranteed against cracking, chipping or staining from the ordinary acids of the kitchen.

Flour Bins—All flour bins shall be the Simplex flour bin made of non-rusting metal, with 24-lb. capacity, with sifter attached and provided with the required hardware for lowering and raising the bin when in use.

Broom Closets—All broom closets shall be equipped with a removable porceliron tray on the bottoms for sanitary purposes.

Finish—All woodwork to be painted shall receive one coat of filler brushed on and rubbed; one coat of lacquer, sanded; and two coats of white undercoat, each coat properly sanded; the final finish shall consist of one coat of high grade white enamel, sprayed on. The final gloss finish shall be applied so as to allow sufficient time for thorough drying and hardening before the units are crated or shipped. The inside of all drawers shall be varnished.

Hardware—All hardware for all units shall be of cast brass polished and heavily nickelplated. All drawer pulls shall be of crystal glass.

Defects and Shipment—All units shall be carefully packed and crated at the factory ready for shipment, and shall be free from all commercial defects.

MASTERBILT WALL FIXTURE COMPANY, INC.

SANTA BARBARA, CAL.

REPRESENTATIVES

LOS ANGELES, CALIF., AND VICINITY
H. V. Cowan, Inc., 1950 East 64th Street, Los Angeles, Calif.

SAN DIEGO, CALIF., AND VICINITY
Klicka Lumber Co., 30th and University Streets, San Diego, Calif.

TEXAS
Steves Sash & Door Co., San Antonio, Texas

NEW ORLEANS, LA., AND VICINITY
North Rampart Lumber & Supply Co., 531-541 N. Rampart Avenue, New Orleans, La.

FLORIDA
Miami—P. A. Henderson Co., Miami, Fla.
Tampa—North Rampart Lumber & Supply Co., 531-541 N. Rampart Avenue, New Orleans, La.
Jacksonville—Mason Forwarding Co., Jacksonville, Fla.

WASHINGTON, D. C.
Barber & Ross, Inc., 11th & G Streets, N. W., Washington, D. C.

MAINE, NEW HAMPSHIRE, VERMONT, MASSACHUSETTS, RHODE ISLAND, CONNECTICUT, AND PROVINCE OF QUEBEC
Brockway-Smith Corp., 465 Medford Street, Charlestown District, Boston, Mass.

MICHIGAN
United States Plywood Co., 1815 Franklin Street, Detroit, Mich.

NEW YORK
Whittier Lumber & Millwork Co., 411 Adams Street, Newark, N. J.
Cameron Lumber Co., Newburgh, N. Y.

Products

Masterbilt Breakfast Nooks, Folding Wall Tables and Seats, Kitchen Cabinets and Cupboards, Broom Closets, Buffet Units, Ironing Boards and Telephone Cabinets.

Combinations of any of the above units.

Also Masterbilt Medicine Cabinets and Bathroom Seats.

Masterbilt Products are the Result of a Careful Study of the Quality and Construction of Space and Time Saving Devices

In placing Masterbilt products before the public, we do so without hesitation.

The materials and workmanship are of the best.

All lumber used is carefully selected and kiln dried. All seats and table tops are of ribbon grain Philippine mahogany of 5-ply construction, which, when polished, will add materially to the general effect.

All hardware is selected by us to give perfect and lasting service.

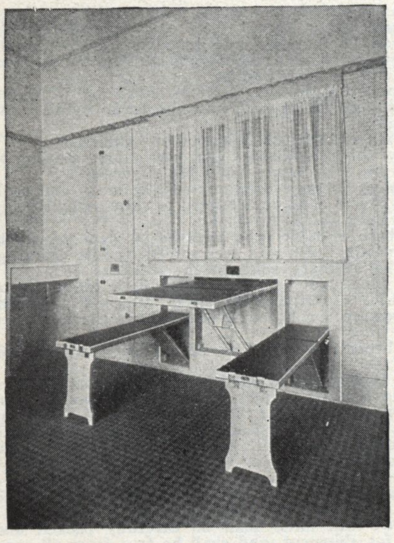
All seats, tables and ironing boards are fitted with our hinges and self-locking braces, which are foolproof against collapse. The hinges and self-locking braces are fully protected by United States patent laws and are to be found only in Masterbilt products.

Masterbilt fixtures can be installed under all building conditions and they have the approval of architects and other experts.

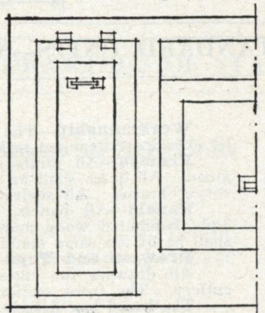
MASTERBILT BREAKFAST UNIT No. 122

This triple unit is shipped from the factory complete, including hardware, ready for installation. Simply set in provided space in the wall and secure same with 4 screws. If desired, it can be set against the wall by the addition of 3 back bands applied by a carpenter. As this fixture only projects 4 in. from the finished wall when closed, it will not be unsightly. Each seat accommodates 2 persons comfortably and is tested to carry a distributed weight of over one ton, which also applies to the table.

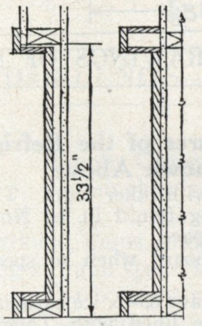
This unit can be placed beneath a group of windows, between cabinets (forming a nook), or in a plain wall surface.



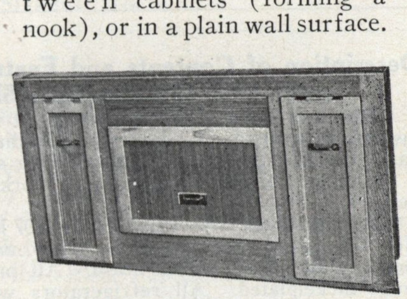
MASTERBILT BREAKFAST UNIT No.122
Installed on plain wall - extended for use



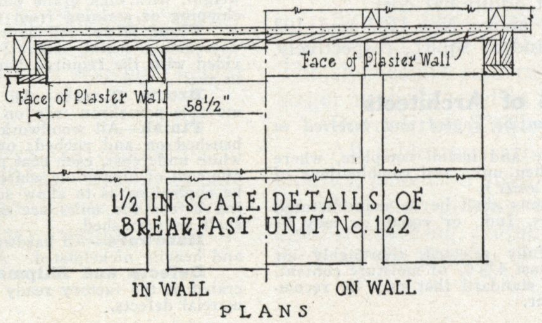
HALF ELEVATION



SECTIONS



MASTERBILT BREAKFAST UNIT No.122 AS SHIPPED FROM FACTORY



1½ IN SCALE DETAILS OF BREAKFAST UNIT No. 122

IN WALL
ON WALL

PLANS

DIMENSIONS AND DATA

Rough Op'ng. Requir'd	58½" x 33½"
Wall Stud, In	4
Shipping Wt., Lbs	128
Size of Table, In.	28 x 38
Size of Seats, In.	12 x 41½
Casing Included	yes
Hardware Included	yes

Continued on next page

MASTERBILT COZY NOOK COMBINATIONS

To be used in connection with cupboards furnished by local planing mills

The units used in the Masterbilt cozy nooks are:

No. 1 wall table

No. 3-D cabinet door seats

No. 3 sidewall seat

No. 5-AD 2-piece folding ironing board (see third page following).

Note: Use No. 3-D door seat where nook is between cabinets, and use No 3 sidewall seat where seats are to be installed in partition wall.

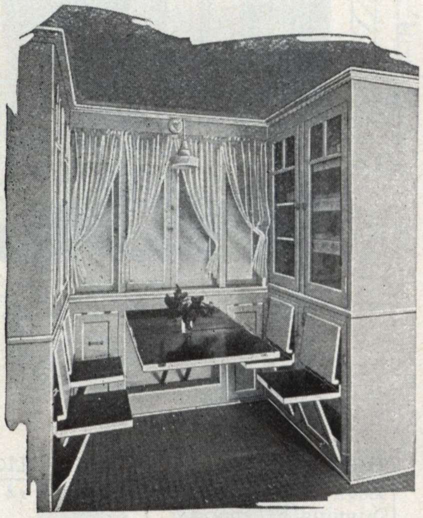
These units are shipped from the factory complete, including hardware and casings, ready for installation.

No. 1 wall table unit is constructed the same as the table in the breakfast unit No. 122.

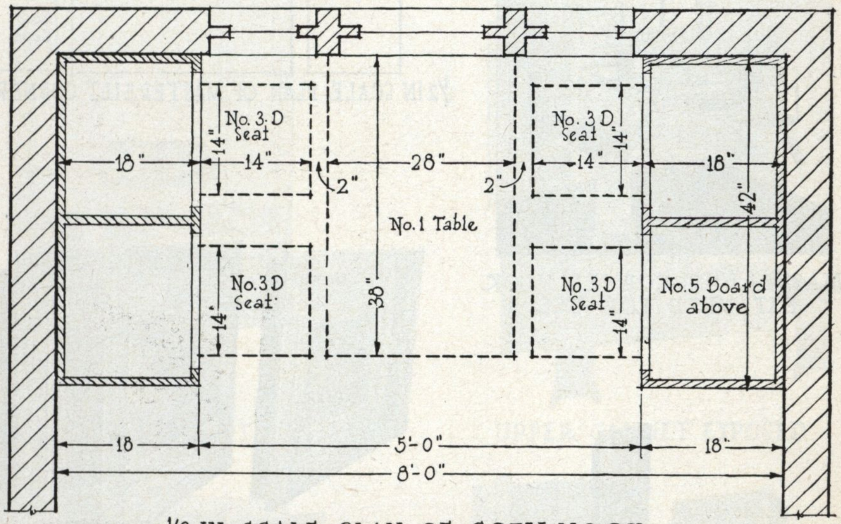
No. 3-D cabinet door seats are folded in their own cabinet unit, each unit acting as the door to the cupboard space behind.

Behind one of the cabinet door seat units is installed one of our No. 5-AD folding ironing boards (see third page following).

To use ironing board, simply swing open the cabinet door seat unit and extend the folding ironing board.



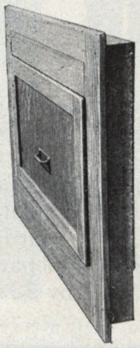
PHOTOGRAPH SHOWING UNITS EXTENDED FOR USE



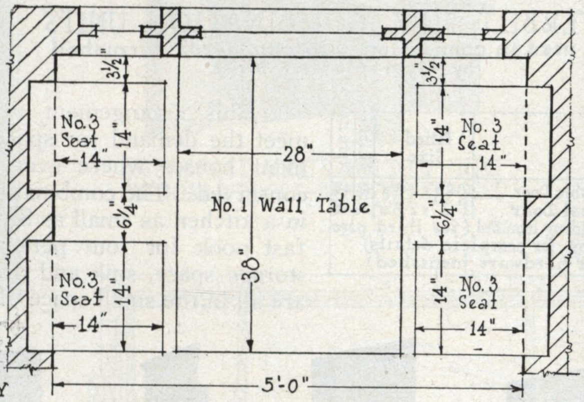
1/2 IN. SCALE PLAN OF COZY NOOK BETWEEN CABINETS

UNIT	ROUGH OPNG REQUIRED IN.	STUD	SHIPPING WGHT	SERVICE SIZE	HRDWARE INCLUD'D	DOOR HINGES INC.
No. 3-D Seat	18 x 32¼ Framing Size	4 in.	34 lbs.	14 x 14 in.	Yes	No.
No. 1 Wall Table	30 x 33½ Rough Opening	4 in.	66 lbs.	28 x 38 in	Yes	No.

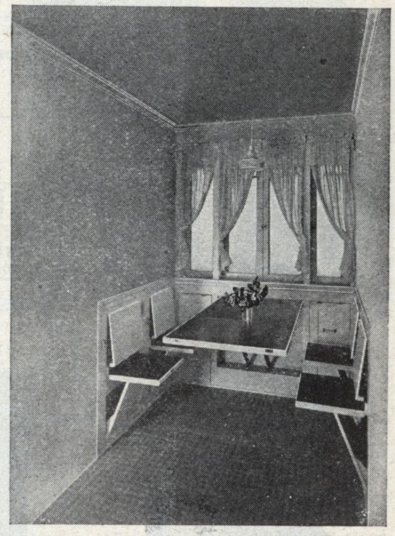
For No. 5 Iron Board see page 5



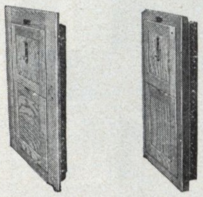
No. 1 WALL TABLE
AS SHIPPED FROM FACTORY



1/2 IN SCALE PLAN OF COZY NOOK BETWEEN WALLS



PHOTOGRAPH SHOWING UNITS EXTENDED FOR USE



No. 3 SEAT No. 3D SEAT
AS SHIPPED FROM THE FACTORY
No.3D has 1/16" hanging stiles - No 3 has casings

UNIT	ROUGH OPNG REQUIRED IN.	SHIP'NG. WT.	SERVICE SIZE	HARDWARE
No. 3 Seat	16 x 33½	34 lbs.	14 x 14 in	Yes
No. 1 Table	30 x 33½ Rough Op'n'g.	66 lbs	28 x 38 in	Yes

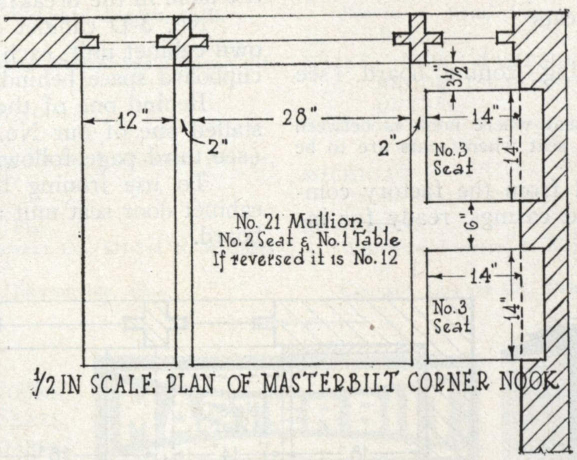
NOTE ~ No door hinges or latches included with Units.

Continued on next page

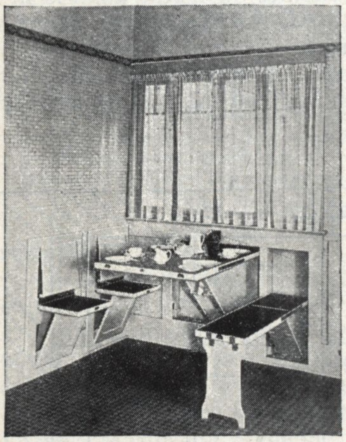
MASTERBILT CORNER NOOK AND SINK NOOK COMBINATIONS

This combination makes a very comfortable and attractive corner condition, by using a mullion No. 21 and two No. 3 sidewall seats.

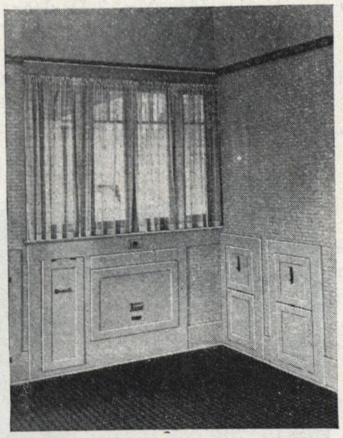
Any corner arrangement can be handled by substituting a No. 12 mullion (table to left of seat) in place of No. 21 shown in illustration.



½ IN SCALE PLAN OF MASTERBILT CORNER NOOK

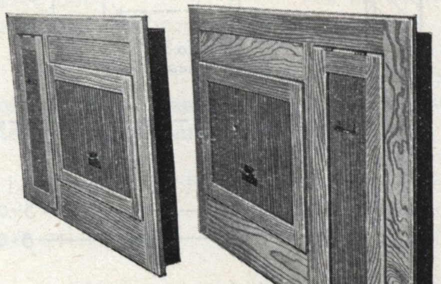


MASTERBILT CORNER NOOK
EXTENDED FOR USE



MASTERBILT CORNER NOOK
FIXTURES FOLDED INTO WALL

MASTERBILT No. 3 SEAT
AS SHIPPED FROM FACTORY



MASTERBILT BREAKFAST MULLIONS
AS SHIPPED FROM THE FACTORY

DIMENSIONS AND DATA ~ No. 21 MULLION

Rough Op'n'g. Required In.	44 x 33½ x 4
Shipping Wt. Pounds	72
Size of Table, Inches	28 x 38
Size of Seat, Inches	14 x 14
Casing Included	Yes
Hardware Included	All

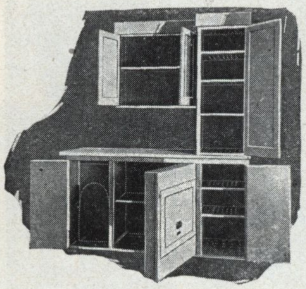
Note ~ Rough for No. 3 Seat 16" x 33½" x 3"

MASTERBILT SINK COMBINATION UNITS

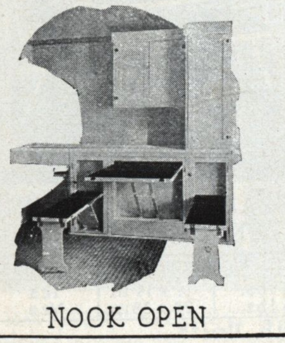
To be used in connection with cupboards furnished by local planing mills

	Fitted Size	Wt. lbs.	Depth in.
No. 1D Table Door	2'-6½" x 2'-8¼"	68	4¾
No. 2D Seat Door	1'-3" x 2'-8¼"	36	4¾
No. 05 Folding Iron. Brd. (See third page following for complete details)			
(No door hardware furnished)			

This arrangement was specially designed to meet the demand for space-saving devices in apartment houses where every inch of space must be conserved. The combination shown works out nicely in a kitchen as small as 8x10 ft. A complete breakfast nook for four persons, ironing board, cooler, storage space, sink and drainboard, cupboards, etc., are all in the small space of 8 ft. wide by 22 in. deep.

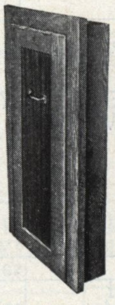


NOOK FOLDED



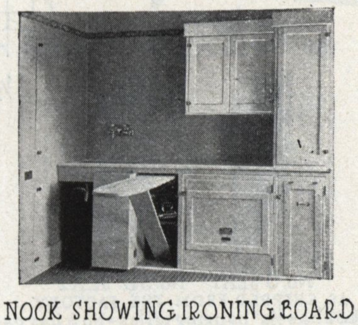
NOOK OPEN

No 1D TABLE



No. 2D SEAT

No 05
IRONING BOARD



NOOK SHOWING IRONING BOARD

Continued on next page

MASTERBILT BUFFET CABINET COMBINATION No. 300

The units used in this combination are:

One No. 2-SD—This unit includes a folding seat No. 2 and above that, a large storage space for electric iron with asbestos and metal covered shelf, and above that a large spice cabinet. This unit has hanging stiles so that the whole unit hangs like a door and swings out, allowing access to broom closet behind.

One No. B Broom Closet—No. 2-SD unit fits into the front of this unit No. B.

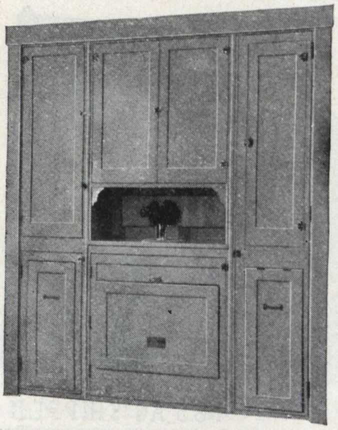
One No. A Buffet Unit—A No. 1-D table fits into the lower part of this unit, making center section of No. 300 when assembled. Furnished with shelving as shown and supplied with or without mirror.

One No. C Cooler Unit—This unit contains a folding ironing board No. O-5 in the lower part. In front of the ironing board a seat No. 2-D is fitted. The upper cooling compartment is equipped with adjustable slatted shelves.

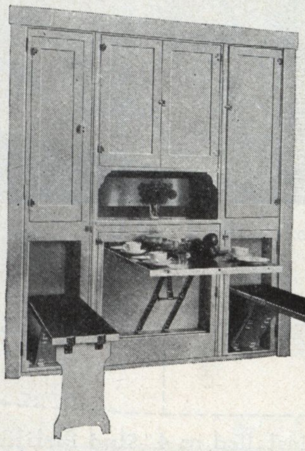
Unit No. B and Unit No. C can be interchanged.

These units are shipped from the factory complete as shown in the illustrations, ready for installation and assembling into a complete cabinet. No door hinges or catches are furnished.

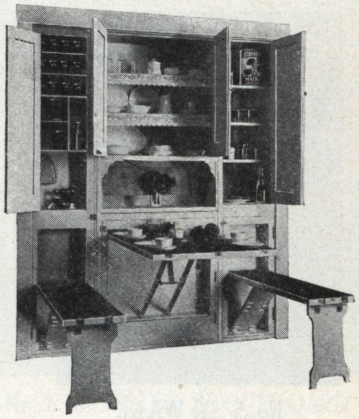
The illustrations clearly show the various features and how they are manipulated.



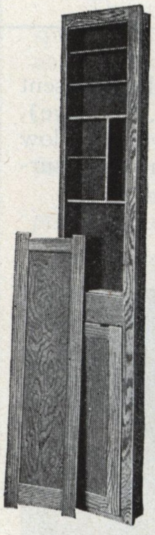
CABINET CLOSED



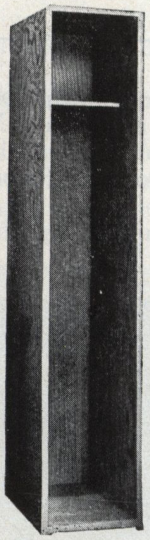
BREAKFAST UNIT SET FOR USE



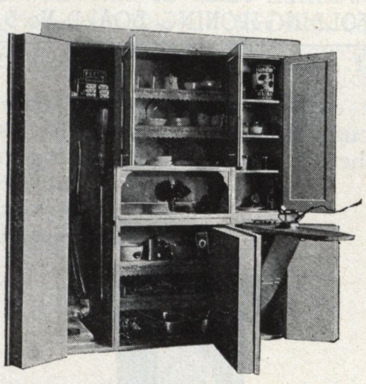
UPPER CABINET EXPOSED



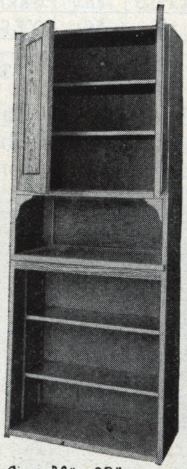
No. 2-SD Size 15" x 79 5/8" Ship. Wt. 48 lbs.



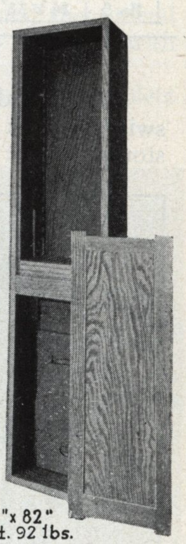
No. B Size 17" x 82" Ship. Wt. 47 lbs.



BREAKFAST UNITS, FOLDED INTO CUPBOARD DOORS—RECESSES EXPOSED

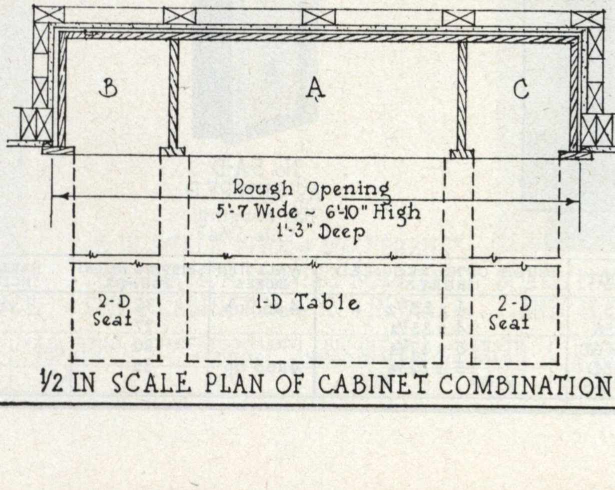


No. A Size 33" x 82" Ship. Wt. 113 lbs.

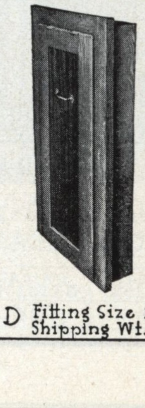


No C Size 17" x 82" Ship. Wt. 92 lbs.

No. 1D Fitting Size 30 1/2" x 32 1/4" Shipping Wt. 68 lbs.



1/2 IN SCALE PLAN OF CABINET COMBINATION



No. 2D Fitting Size 15" x 32 1/4" Shipping Wt. 35 lbs.

Continued on next page

MASTERBILT IRONING BOARDS AND COMBINATIONS

Masterbilt Folding Ironing Board No. 5

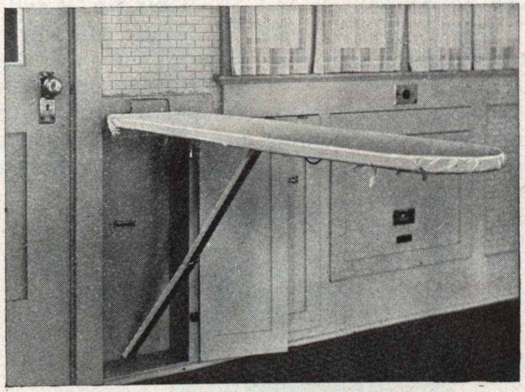
This board in its several forms will fit any regular 4-in. wall, under standard height windows, under counter shelf of kitchen cupboards, under sink case top, in the face of cupboards hung as a door allowing use of space behind, or hinged to swing back inside cupboards, etc.

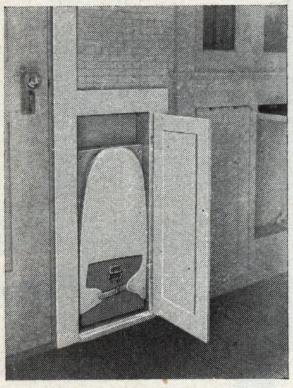
All these models fold up with the ironing pad on (our specially constructed hinge has solved this problem) as well as giving an absolutely smooth flush ironing surface. This is an exclusive Masterbilt feature.

To close board, fold outer flap back, which releases brace lock; touch brace with toe and board drops gently back into its case.

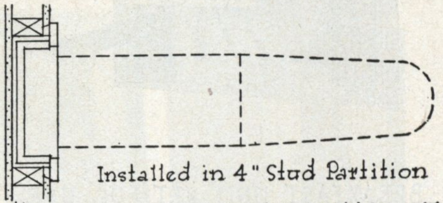
They can be installed wherever they are most serviceable and need not displace any of the wall space needed for other kitchen cupboards.

See dimensions and data at bottom of page.

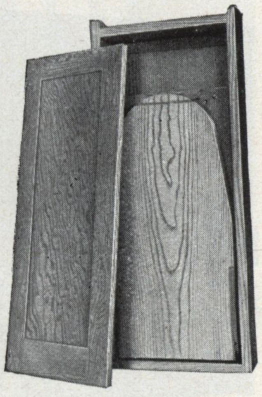

No.5 OPEN IN USE


No.5 IN WALL

UNIT	ROUGH OPENING	WALL STUD	WEIGHT LBS.	HARD-WARE
No. 5	14" x 33"	4"	36	YES



½ IN. SCALE PLAN OF MASTERBILT FOLDING IRONING BOARD No. 5

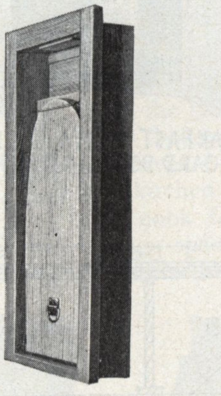

No.5 AS SHIPPED

Masterbilt Folding Ironing Board No. 5-A-D

This model is used to hang inside cupboards, swinging back into cupboard when not in use, leaving storage space for electric iron and other laundry sundries. Pad folds away with board. Present models all have steel brace as shown in No. 5 (above), absolutely rigid and no obstruction above or below board to interfere with ironing. Smooth, flush surface at the joint.

No door hardware furnished.

No. 5-A-D FOLDED


No. 5-A-D AS SHIPPED
Has Hanging Stile 1 1/16"

No. 5-A-D IN USE

UNIT	ROUGH OP'NG. REQUIRED INCHES	WALL STUD INCHES	SHIPPING WEIGHT POUNDS	HARDWARE INCLUDED
No.5	14 x 33½	4 and up	36	YES ALL
No.5A	14 x 33½		27	No
No.5AD	15 x 32¼		30	NO
No.5D	15 x 32¼	4and up	39	YES
No. 0-5				NO

Continued on next page

MASTERBILT IRONING BOARDS AND COMBINATIONS

Masterbilt Folding Ironing Board No 0-5.

This model is for stationary installation inside lower part of cupboards. Simple to install on the job. The distance between the shoulders of the hardwood pivot rod at the top is 12 in. This rod must be hung at least 30 in. above the floor inside the cupboard. This can be done by placing two pieces of lumber 12 in. apart with 1-in. holes bored in each in such a manner that the distance from the floor line to the center of the holes is at least 30 in. The ends of the pivot rods are inserted in these holes and the bottom of the brace is attached to the floor with special clip furnished with the board.

See dimensions and data at bottom of page preceding.

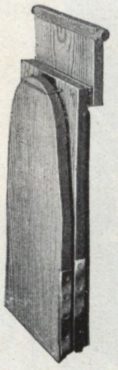
Masterbilt Folding Ironing Board No. 5-D

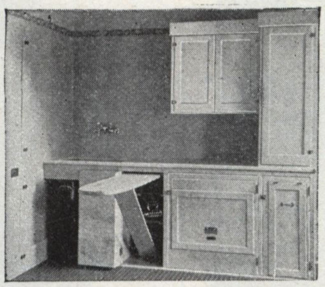
This model, with door included, is for installations on face of lower part of cupboards, the whole unit being hung on the face of the cupboard like an ordinary cupboard door.

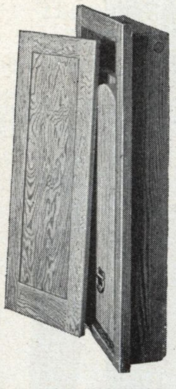
It has $1\frac{1}{16}$-in. hanging stiles and the box is 4 in. deep.

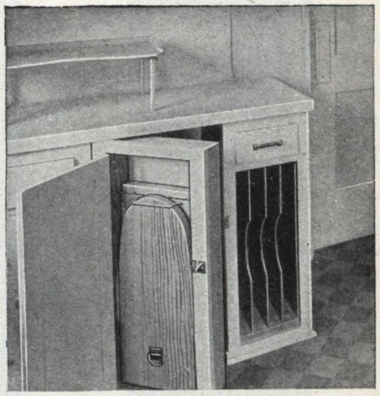
By swinging the box open, the storage space behind is available for use.

See dimensions and data at the bottom of page preceding.


No.05 AS SHIPPED


No.05 INSTALLED IN SINKCASE


No.5D AS SHIPPED


No.5D INSTALLED IN CUPBOARD

MASTERBILT COMBINATION IRONING BOARD AND SPICE CABINET No.6

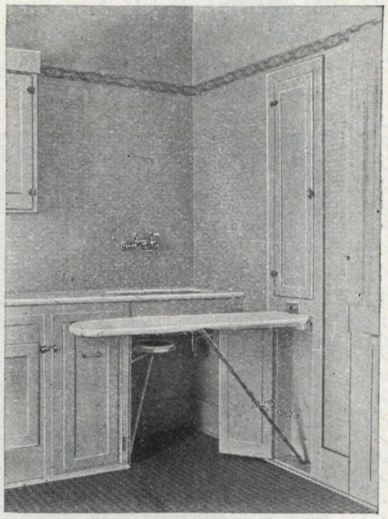
This cabinet contains an ironing board and large spice cabinet in the space usually required for an ordinary board.

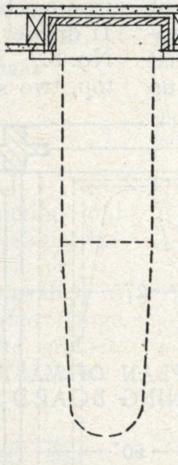
The lower cabinet contains a No. 5 folding ironing board.

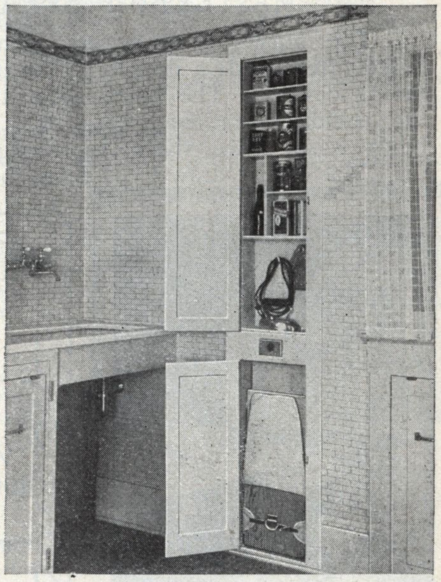
The cross rail between cabinets provides space for wiring the electric plug.

The lower shelf space in the upper compartment provides ample space for storage of an electric iron, the shelf being covered with asbestos and sheet metal for protection. The portion above is equipped with shelving for storage of spices, etc.

This unit is shipped from the factory complete except casing. Door hardware is not furnished.


IRONING BOARD READY FOR USE.


½ IN. SCALE PLAN of MASTERBILT COMBINATION IRONING BOARD AND SPICE CABINET No.6 IN 4 IN. WALL

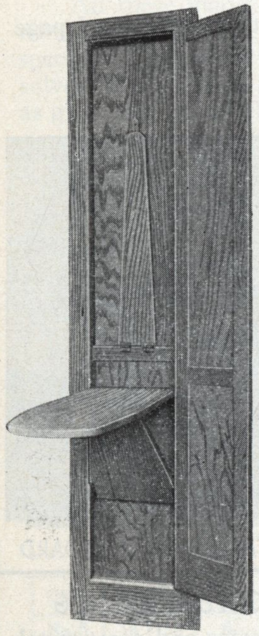

BOARD FOLDED AWAY-SPICE CABINET AND IRON STORAGE EXPOSED

UNIT	ROUGH OPNG REQUIRED INCHES	WALL STUD INCHES	SHIPPING WEIGHT POUNDS	HEIGHT OF BOARD FROM FLOOR	LENGTH OF BOARD	WIDTH OF BOARD	CASING INCLUDED	HARDWARE INCLUDED
No.6	14 x 82	4	48	33½	48 IN.	11¼ IN.	NO	NO

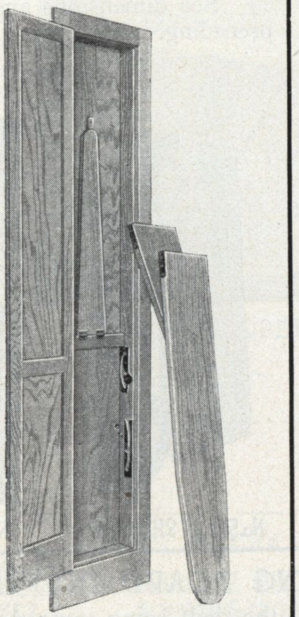
Continued on next page

MASTERBILT IRONING BOARDS

This is our standard type single piece ironing board. All working parts are of metal, will last a lifetime and will not become loose and wobbly. The board can be raised and lowered to two heights to suit the fancy of the user but will not slip of its own accord. It can be removed from the box if desired, a great convenience when one wishes to use the board in another part of the house, or if it becomes necessary to replace a burned or damaged board. Shipped from the factory complete except casing. Door hardware is not furnished unless ordered extra.



OPEN FOR USE



REMOVED FOR USE ELSEWHERE.

UNIT	ROUGH OP'G. REQ'D. IN.	WALL STUD IN.	SHIP WT. LBS.	HT. OF BOARD FROM FLOOR IN.	CASING INCLUDED	DOOR H'DWRE INCLUDED
No. 1A	14 x 82	3	39	32 and 35	NO	NO

MASTERBILT TELEPHONE CABINETS

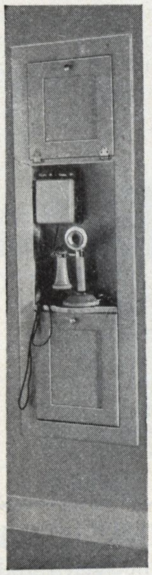
The cabinet contains a seat, telephone shelf, book compartment and writing shelf.

The seat has a comfortable reclining back rest for use in long conversations. The seat is 12x14 in. and 18 in. from the floor. This is our regular No. 4 sidewall seat.

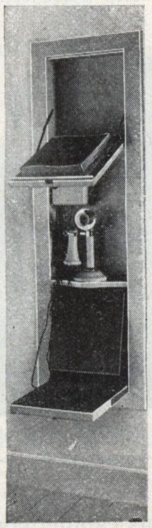
The center compartment allows ample space for the bell box and telephone.

The upper compartment provides for the telephone books and has a sloping writing shelf at a convenient height.

Shipped complete as shown in left-hand illustration, no carpenter work being required. Simply set in provided space in wall and secure same with 4 screws.



CLOSED



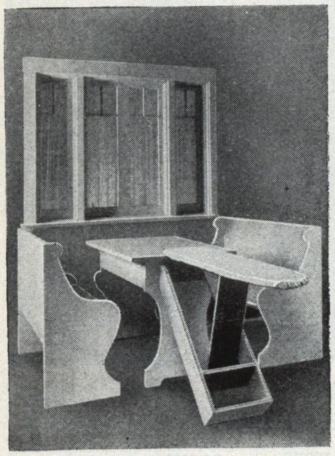
OPEN

UNIT	ROUGH OPNG REQ'D. IN.	WALL STUD IN.	SHIP WT. LBS.	HT. OF SEAT FROM FL. IN.	CASING INCLUDED	HARDWARE INCLUDED
No. 30	14 x 52	3	58	18	YES	YES

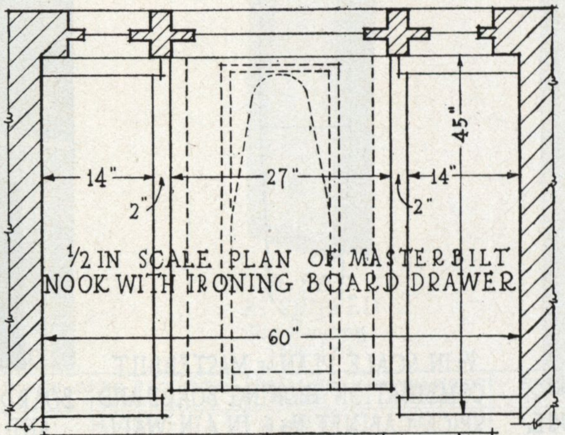
MASTERBILT BREAKFAST NOOK AND DRAWER IRONING BOARD No. 8

The Masterbilt engineers submit this ironing board fitted inside a drawer as the ultimate in space saving devices. The space under the table top of the standard stationary breakfast nook is absolutely waste space, therefore it might be said that the Masterbilt drawer ironing board takes up no space. This is an exclusive Masterbilt feature.

If the complete nook is wanted with the drawer ironing board, specify "Masterbilt Nook No. 85." If drawer only is wanted, specify "Masterbilt Drawer No. 8." Nook No. 85 consists of 6 pieces—one table top, two seat ends, two table legs and drawer No. 8.



MASTERBILT BREAKFAST NOOK No. 85
WITH DRAWER IRONING BOARD No. 8



½ IN SCALE PLAN OF MASTERBILT NOOK WITH IRONING BOARD DRAWER

	Size In.	Ship. Wgt.
Table	27x42	75 lbs.
Benches	14x45	48 "
Ironing Board Drawer	13½ x 5¾	39 "

MASTERBILT BREAKFAST NOOK No. 85
IRONING BOARD No. 8 CLOSED

MURPHY DOOR BED COMPANY

Manufacturers of Kitchen Cabinets and Ironing Boards

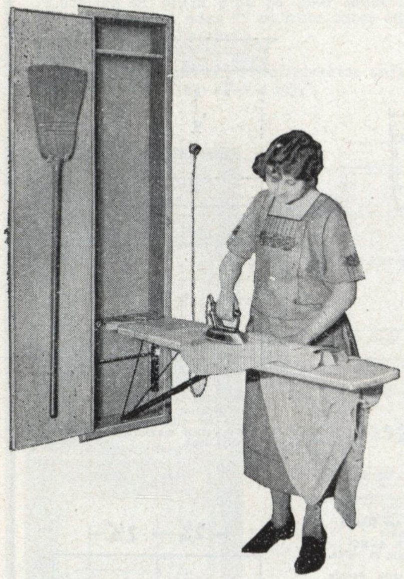
NEW YORK CHICAGO DETROIT NASHVILLE ST. LOUIS ATLANTA SEATTLE

For Local Addresses, see page 2698
For Door Beds, see pages 2698-2705

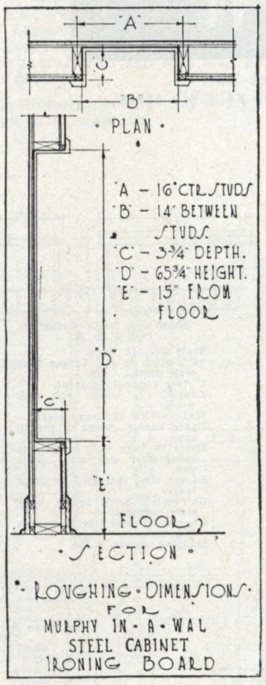
Murphy In-A-Wal Ironing Board and Broom Cabinet (All-steel Except the Board)

This all-steel In-A-Wal ironing board cabinet comes completely assembled with hardware and ready to set in place. The finish is of baked prime enamel, which allows the painter to finish to match woodwork or walls.

By special request, the cabinet can be finished in high luster white or French gray enamel for a small additional cost.



Murphy In-A-Wal Ironing Board and Broom Cabinet
Six screws furnished fasten cabinet to studs

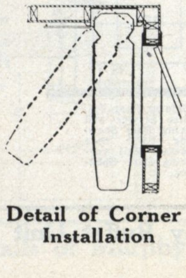

"A"
"C"
"B"
· PLAN ·
"A – 16" CTR STUDS
"B" – 14" BETWEEN STUDS
"C" – 3¾" DEPTH.
"D" – 65¾" HEIGHT.
"E" – 15" FROM FLOOR
"D"
"C"
"E"
FLOOR
· SECTION ·
· ROUGHING · DIMENSIONS · FOR MURPHY IN · A · WAL STEEL CABINET IRONING BOARD

Details

Details show standard partition construction and correct position of and method of fastening cabinet between 16-in. center studding.

The Murphy In-A-Wal cabinet can be installed in either new or old buildings, because a beveled flange projecting 1¾ in. forms the trim around the cabinet. The actual dimensions of the cabinet are 14 in. wide; 65¼ in. high; 4¾ in. deep. For roughing-in dimensions, see detail.

Corner Installation—Because of the very limited wall space in the modern, efficient kitchen of today, it is often necessary to place the cabinet in the corner. Where this condition prevails, the Murphy In-A-Wal Ironing Board will swing away from the wall for either the right or left-handed person. See sketch.

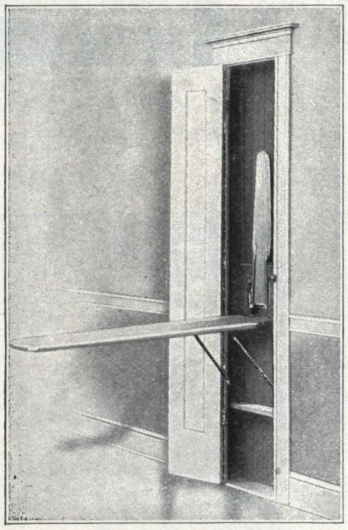


Detail of Corner Installation

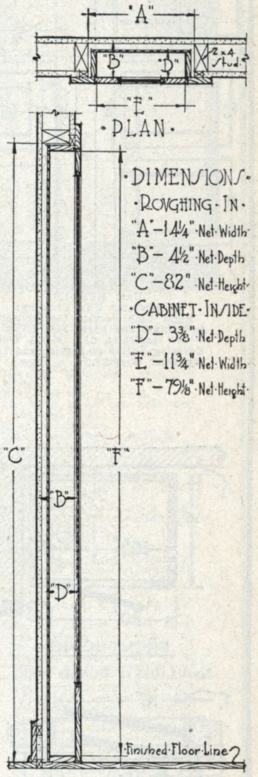
Murphy Wood Ironing Board and Cabinet

Details show standard partition construction and correct position of and method of fastening the Murphy ironing board between the 16-in. center studding. The actual dimensions of the cabinet are 14 in. wide; 6 ft. 9½ in. high; 3¾ in. deep. For roughing-in dimensions, see detail.

The small and large board is assembled in the cabinet in the natural wood only.



Murphy Wood Ironing Board and Cabinet


"A"
"B"
"D"
2×4 Stud
"E"
· PLAN ·
· DIMENSIONS ·
· ROUGHING · IN ·
"A"–14¼" · Net · Width
"B"– 4½" · Net · Depth
"C"–82" · Net · Height
· CABINET · INSIDE ·
"D"– 3⅜" · Net · Depth
"E"–11¾" · Net · Width
"F"–79⅛" · Net · Height
"C"
"F"
"B"
"D"
Finished · Floor · Line

Details

The door is furnished, but not the casing, cap or hardware. A shelf of ample depth is provided for iron.

Murphy Bathroom Cabinets

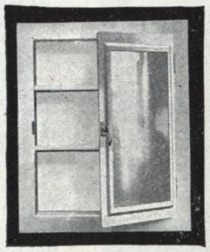
Steel, recessed type, with glass or steel shelves.

Model "A"—One-piece front face and back.

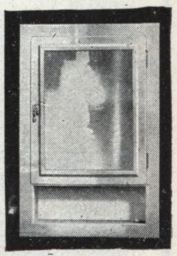
Finish—White or gray—baked permanently hard. Genuine plate glass mirror, cushioned.

All hinges interlocking. Ball tipped.

Dimensions—Height, 24⅝ in.; width, 20½ in.; inside depth, 4½ in.



Model "A"



Model "B"

Mirror exposed surface, 13¼x17¼ in.

Roughing-in Dimensions—Width, 17½ in.; height, 21½ in.; depth, 4 in.

Shipping Weight—45 lbs.

Model "B"—Open bottom shelf.

Finish—White enamel—baked permanently hard. Rust resisting hardware. Strike plate and two buttons prevent door marring body. Cabinet face, one piece.

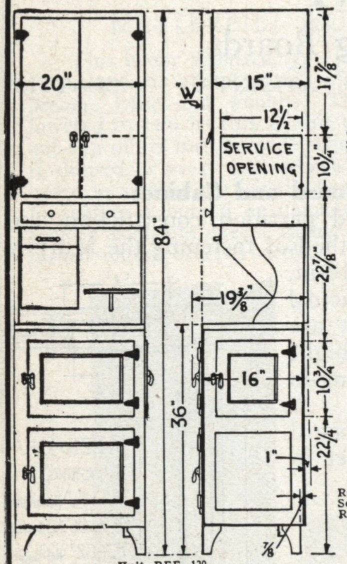
Dimensions—Height (front), 30⅝ in.; width (front), 20½ in.; inside depth, 4½ in.

Mirror exposed surface, 13½x17¼ in.

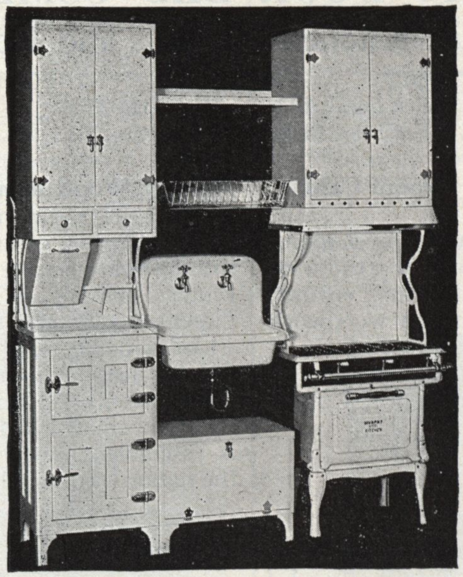
Roughing-in Dimensions—Width, 17½ in.; height, 27½ in.; depth, 4 in.

Shipping Weight—60 lbs.

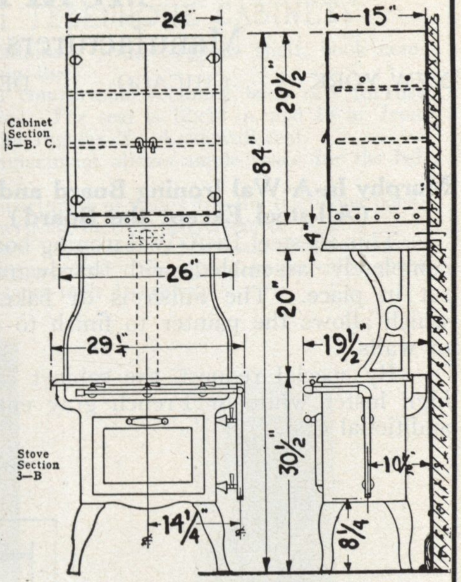
Continued on next page


20"
15"
"W"
12½"
SERVICE OPENING
17⅞"
10¼"
22⅞"
19⅝"
84"
36"
16"
10¾"
22¼"
1"
⅞
Cabinet Section REF—C20
Refrigerator Section REF—20

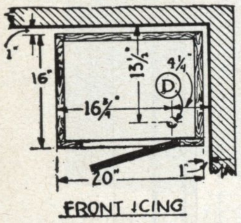
Unit REF—120
Refrigerator Unit Showing:
Right Side Service Compartment in Cabinet and Right Side Icing.
"W" indicates Side Metal Wall Covering Full Size Service and Icing Door Opening.



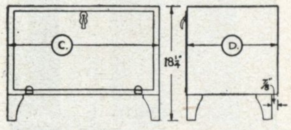
Murphy Buffet Unit
Getting the most out of valuable space.


24"
15"
29½"
84"
4"
26"
20"
29¼"
19½"
30½"
10½"
14¼"
8¼
Cabinet Section 3—B. C.
Stove Section 3—B

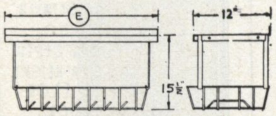
Unit S. T. 30
Three Burner Stove Unit.


1"
16"
13½"
4¼"
D
16¼"
20"
1"
FRONT ICING

Specify right or left hinge doors

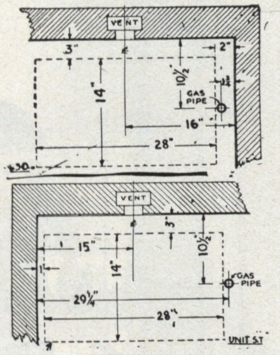


Unit P. C. Pan Cabinet.
Size: For REF—20 Refrigerator; 18¼ high, "D" 15 deep. "C" width is one inch shorter than sink width, not including drain board.
Rust resisted, coppered and nickel-plated hardware.
Double paneled door (muffled).
Baked enamel, white or French gray.
Stretcher leveled, full pickled furniture steel.
This cabinet must clear under sink trap.
Shipping weight, 50 lbs.

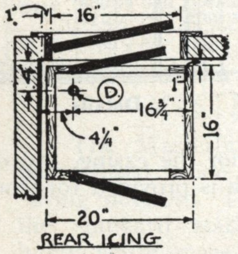


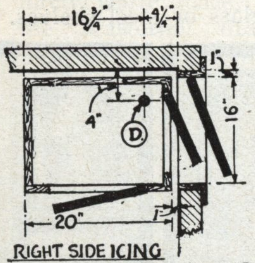
Shelf and Drain Basket.
Unit S. D. B.

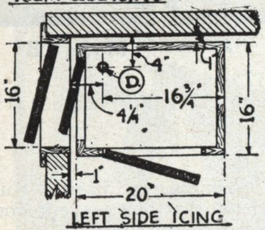
Shelf size, 12 deep.
"E" width is 1½ longer than sink width.
1" face channel in front.
Length, 1½ wider than sink width.
Made of No. 20 Gauge steel.
Baked enamel, white or French gray.
Holes on both ends to bolt to refrigerator and stove cabinet.
Basket size, 18x14x3½ or 21½x14x3½ .
Galvanized, with center wire plate supports.
4 enameled steel 1/8x1/2 basket drop hangers.
Shipping weight, 8 lbs.


VENT
3"
2"
14"
10½"
GAS PIPE
16"
28"
1"
VENT
15"
3"
14"
10½"
GAS PIPE
29¼"
28"
UNIT S.T

Floor plan locating vent center and location of Gas Pipe on stove for either right or left hand corner measurement from plaster line.


1"
16"
D
16¼"
4¼"
16"
20"
REAR ICING

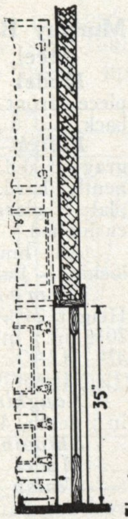

16¾"
4½"
1"
4"
D
16"
20"
1"
RIGHT SIDE ICING


4"
D
16¼"
4¼"
16"
16"
1"
20"
LEFT SIDE ICING

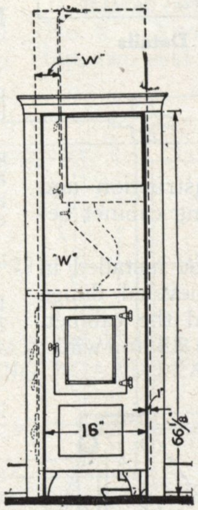
"D" Drain location in Refrigerator only. Location of Drain Pipe in floor must be determined by the design and size of drain Bowl. You can locate Bowl edge 2 in from outer edge of Refrigerator.

Refrigerator Unit
REF—120
Refrigerator Cabinet
SECTION REF—C.20
Size 48 high, 20 wide, 15" deep.
15-lb. flour bin, tin lined.
4x9 spice shelf.
6¼ sq. ft. shelving.
Two double paneled doors (muffled).
Two cutlery drawers on V. F. slides.
Rust resisted, coppered, and nickel-plated hardware.
Baked enamel, white or French gray.
Stretcher leveled, full pickled furniture steel.
Service compartment can be provided in cabinet.
Shipping weight, 115 lbs.
Units are divided between top of work board and bottom of brackets. Unit height, 84 inches.

Refrigerator—Wood
SECTION REF—20
Size 36" high, 20" wide, 16 deep.
50-lb. ice capacity, inner shell heavy galvanized metal.
Side or rear icing.
Porcelain work top, 16x20
Steel pegs.
Wire shelf allows free circulation of air.
Rust resisted, coppered, and nickel-plated hardware.
Nickel-plated latches.
Cast brass, heavily Enameled, white or French gray.
Can be equipped with automatic refrigerator coil.
Floor space, 18 deep, 20 wide. Shipping weight 115 lbs. Total unit shipping weight, 230 lbs.



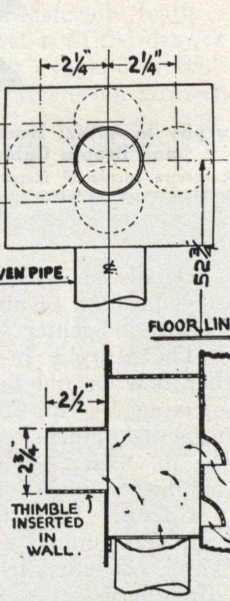
Side or Rear Full Size Icing Door only.



Side or Rear Full Size Service and Icing Door Showing "W" Side Metal Wall covering Door Opening.

Three Burner Range
Cabinet
SECTION 3—BC
Size 29½ high, 24 wide, 15 deep.
4 canopy with double insulating wall between cabinet and bottom of canopy.
Equipped with oven and room vent.
Right or left vent on cabinet not standard.
Nickel-plated trim for white or gray stove.
Baked black enamel trim for black stove.
7¼ sq. ft. shelving.
Rust resisted. coppered and nickel-plated hardware.
Heavy cast iron cabinet support brackets.
Baked enamel, white or French gray.
Stretcher leveled, full pickled furniture steel,
Double paneled doors, (muffled).
Shipping weight 130 lbs.
Units are divided between top of stove and bottom of brackets.
Unit height, 84 inches.

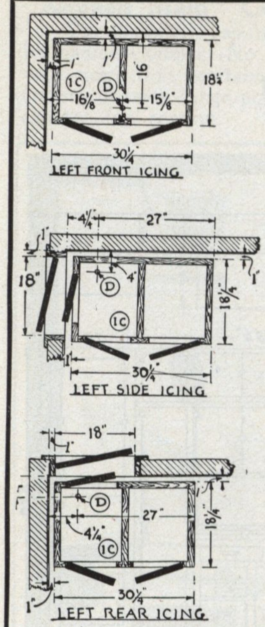
Three Burner Range
SECTION 3—B
Size 30½ high, 28 wide, 14½ deep.
Oven size, 12 high, 12 deep, 18 wide.
Black enameled with white porcelain door panel.
White or gray porcelain enameled range.
Supplied with or without broiler.
Floor space, 20 deep, 30 wide. Shipping weight 93 lbs.

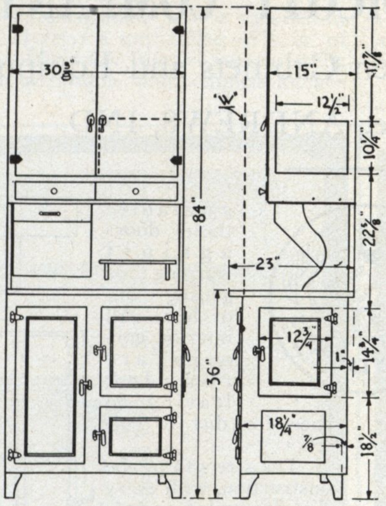

2¼"
2¼"
1⅜
1⅜
52¾
OVEN PIPE
FLOOR LINE.
2½"
2¾"
THIMBLE INSERTED IN WALL.

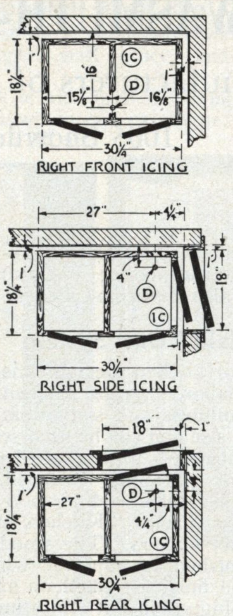
Detail of vent thimble showing the possible range of thimble movement which connects to flue, also showing the louvers which are located under canopy over stove.

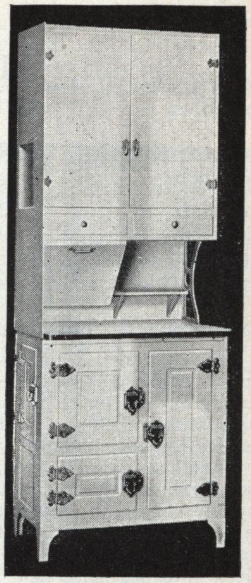
Details of Murphy Buffet Unit

Continued on next page









Unit REF—130

UNIT REF—130
Service compartment and Refrigerator Drain Location.
"W" Side metal wall for full size service and ice door.

Location of drain pipe in floor must be determined by the design and size of drain bowl. You can locate bowl edge 2" in from outer edge of refrigerator.

I. C. (Icing Chamber).

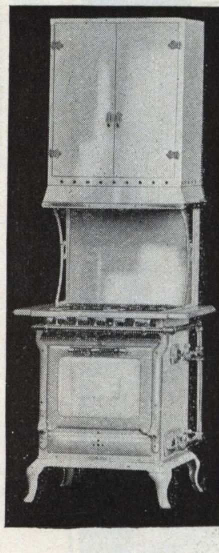
D. (Drain location in Refrigerator only).
Ice Door Opening 12¾" x 14¾".

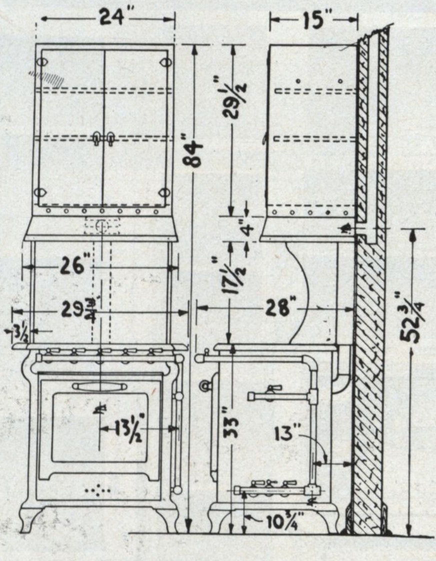
Refrigerator Unit REF—130
Refrigerator Cabinet
Refrigerator Cabinet.
SECTION REF—C. 30

Size: 48" high, 30⅜" wide, 15" deep.
24-lb. flour bin, tin lined.
Tin lined bread and cake box with wire shelf.
10 sq. ft. shelving.
Double panel doors, (muffled).
Two cutlery drawers on V. F. slides.
Rust resisted, coppered and nickel-plated hardware.
Baked enamel, white or French gray.
Stretcher leveled, furniture steel.
If desired, a service compartment can be provided.
Shipping weight, 165 lbs.
Units are divided between top of work board and bottom of brackets. Unit height, 84 inches.

Refrigerator—Wood
SECTION REF—30

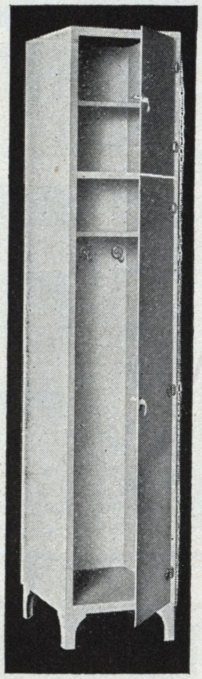
Size: 36" high, 30⅜" wide, 19¼" deep.
75-lb. ice capacity. Cork lined box. Side or rear icing. Can be equipped with automatic refrigerator coil. Inner lining made of heavy galvanized steel joints without any crevice where dirt or impurities might collect. Two galvanized woven wire shelves allow free circulation of air. Wood or porcelain work board. Three heavy cork lined doors. Cast brass, heavily nickel-plated, highly polished latches. Rust resisted, coppered, nickel-plated hinges and screws. Enameled steel legs Enameled steel legs Enameled, white or French gray Each coat baked on separately
Floor space, 30½" wide, 23½" deep
Shipping weight, 195 lbs. Total unit shipping weight, 360 lbs

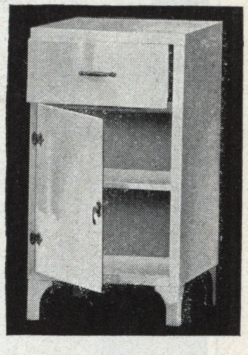




Unit S. T. 40, Four Burner Stove

Note: Showing height of vent and location of Gas Riser.



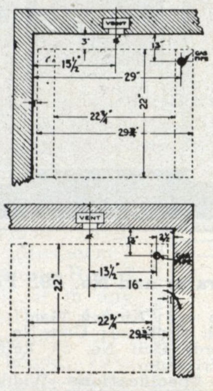


Four Burner Stove
Unit St. 40
Four Burner Stove Cabinet
Four Burner Stove Cabinet
SECTION 4—BC

Size: 29½" high, 24" wide, 15" deep.
4" canopy with double insulating walls, between cabinet and canopy.
Equipped with oven and room vent.
Right, center or left vent as per specications.
Nickel-plated trim for white or gray stove.
Black baked enamel trim for black stove.
7¼ sq. ft. shelving.
Rust resisted, copper-plated hardware.
Baked enamel, white or French gray.
Stretcher leveled, full pickled furniture steel.
Shipping weight, 130 lbs.
Units are divided between top of stove and bottom of brackets.
Unit height, 84 inches.

Four Burner Stove
SECTION 4—B

Size: 33" high, 22¾" wide, 22" deep
Oven size: 12" high, 18" deep, 16" wide.
Black enameled with white porcelain door.
White or Gray porcelain enameled stove.
Supplied with or without broiler, simmer, or automatic lighter
Porcelain rust-resisting oven linings.
Floor space, 28" deep, 32" wide.
Shipping weight, 163 lbs.



Unit B. M.
Broom Cabinet
Broom Cabinet

No. 11 Size: 84" high, 11" wide, 15" deep.
No. 15 size. 84" high, 15" wide, 19¼" deep.
Upper compartment, 19½" high.
Shelf in center of opening.
Lower compartment 58½" high.
Two electric welded steel hooks
Nickel-plated hardware.
Re-inforced door.
Baked enamel, white or French gray
Stretcher leveled, full pickled furniture steel
Shipping weight: No. 11, 108 lbs.—No. 15, 114 lbs.

Drain Board Cabinet
Unit D. B.

Size: 32" high, 19¼" deep, 18½" wide.
One drawer on V. F. Slides.
Double paneled door (muffled).
Rust resisted, coppered and nickel-plated hardware.
Baked enamel, white or French gray.
Stretcher leveled, full pickled furniture steel.
This cabinet is placed under sink drain board.
Shipping weight, 80 lbs.

Details of Murphy Standard Buffet Unit

WASMUTH-ENDICOTT COMPANY

Manufacturers of Kitchen Cabinets and Equipment

1005 Snowden Street, ANDREWS, IND.

Products

Kitchen Cabinets; Refrigerators; Dish Cupboards; Ironing Boards; Pullmanooks; Folding Kitchen Chairs and Tables; also Medicine Cabinets.

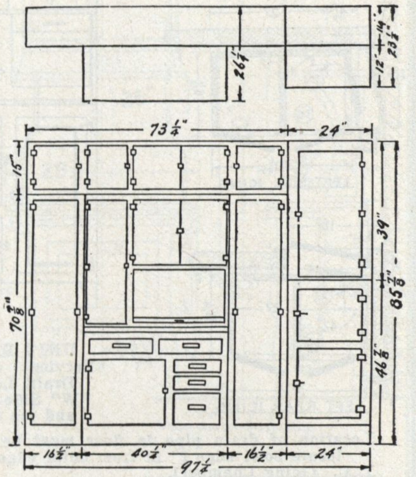
Standardized "Kitchen Maid" Unit System

The "Kitchen Maid" line of kitchen specialties is built to conserve space, save labor, organize kitchen equipment, and make for cleanliness and sanitation. Basic units are standardized in size and can be used separately or grouped to make units of varying sizes to fit allotted wall spaces.

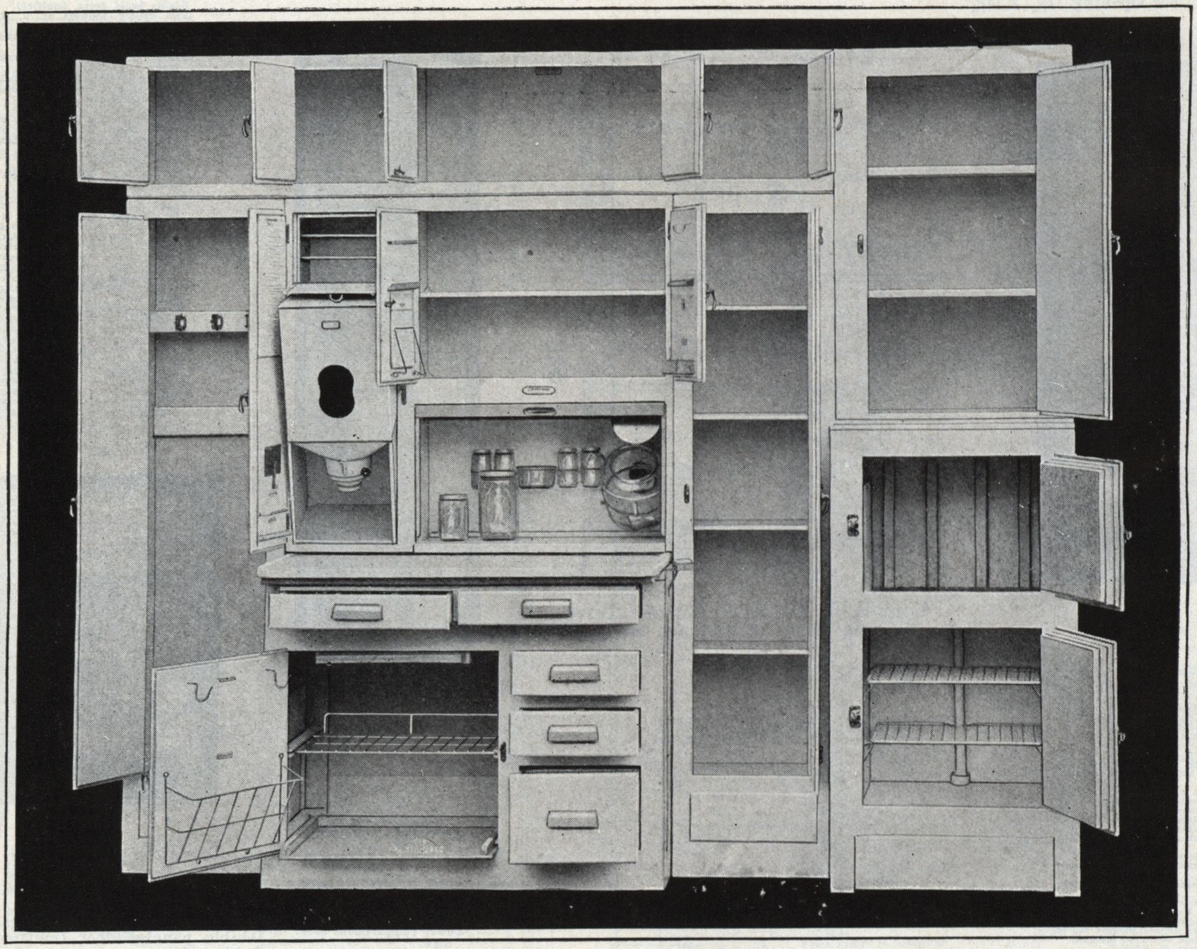
"Kitchen Maid" units are efficiently designed, carefully made, and cost less than the old-fashioned method of having carpenters build in the cupboards, etc. "Kitchen Maid" units are built by experienced cabinet makers. The woods used are thoroughly kiln dried and finished in superior white enamel unless otherwise ordered. The finish is baked on and will not crack or discolor with age. Shipped in flat white undercoat, if desired, instead of complete finish.

"Kitchen Maid" smooth door construction eliminates common panel doors, and our patented construction enables us to guarantee these doors against warping or getting out of line. All interior corners are rounded, leaving no space for dirt to collect.

The strength of the construction, with every joint dovetailed or tenoned, the well-seasoned materials used, and the unusually attractive finish make "Kitchen Maid" units long lived and suitable for any kitchen.



Detail of No. 210X Combination



Combination No. 210X with No. 58 Refrigerator and No. 59S Package Receiver

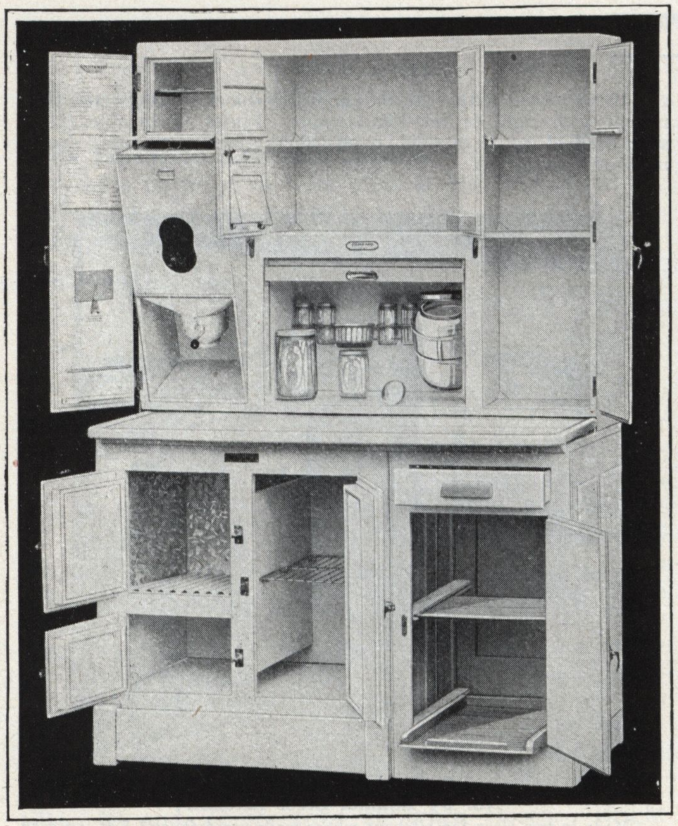
Here are all of the necessary units of kitchen equipment on one wall space, in a complete "Kitchen Maid" combination broom closet, kitchen cabinet, dish cupboards, storage compartment, refrigerator, and a top cupboard which can be used as a package receiver. Many a full sized pantry contains less actual usable space than this. The famous "Kitchen Maid" features of construction, rounded inside corners, and smooth surface no-panel doors are carried out in all units. Included in this combination are "Kitchen Maid" Unit No. 210 Kitchen Cabinet; Unit No. 70 Dish Cupboard; Unit No. 11 Broom Closet; Unit No. 0212 Top Cupboard; Unit No. 58 Refrigerator and Unit No. 59S Cupboard over Refrigerator.

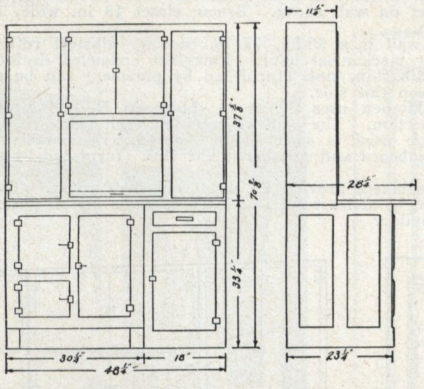
Specifications—Width of complete construction, 97¼ in. Width of refrigerator, 23¼ in.; depth of porcelain top, 26¼ to 34 in.; depth of cabinet top, refrigerator top and side units, 11¼ in. See line drawing

Continued on next page

"Kitchen Maid" Compact No. 256

The completeness of this "Kitchen Maid" unit is signified by its name—Compact No. 256. Here is a unit filling 48¼ in. of wall space that combines the refrigerator, utensil compartment, cutlery drawer, large porcelain work table, and complete kitchen cabinet top section.





Kitchen Maid Compact No. 256

Specifications—Width, 48¼ in.; height, 70⅞ in.; depth base, 23¼ in.; depth of porcelain top, 28¼ to 35 in.; depth of cabinet top section, 11¼ in.

Ironing Board Units

No. 4½S Ironing Board—Completely equipped with electric wall socket, iron holder, heat protector, sleeve board and convenient iron cupboard, and has heavy nickelplated hardware. Has a lower storage compartment.

Specifications—Over-all measurements, including casings: width, 16½ in.; height, 63¾ in.; Wall opening: width, 14¼ in.; height, 61½ in.; depth, 4½ in. (Will provide space for the box and necessary adjustment.)

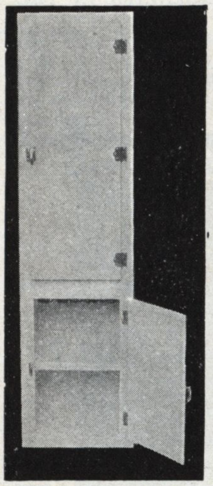
Unit No. 12 Broom Closet and Ironing Board Combined—Here is a unit which will fit in any kitchen or in any cabinet combination—no need for a special opening in the wall, it sets in anywhere.

Specifications—Width 16½ in.; height, 70⅞ in.; depth, 11¼ in. Ironing board extends 48 in. from front of the case.

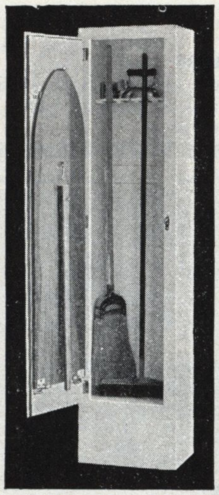
Dish Cupboard Unit No. 70

For use as a single unit which may be placed in a corner or any open wall space, and enclosed in baseboard, and moulding.

No. 70 is also used in combination with any of the kitchen cabinets shown in our catalogue. Height, 70⅞ in.; width, 16½ in.; depth, 11¼ in.

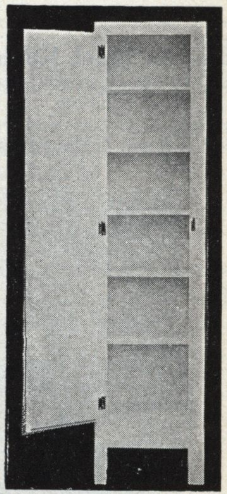


Unit No. 4½S



Unit No. 12

Ironing Board Units



Dish Cupboard Unit No. 70

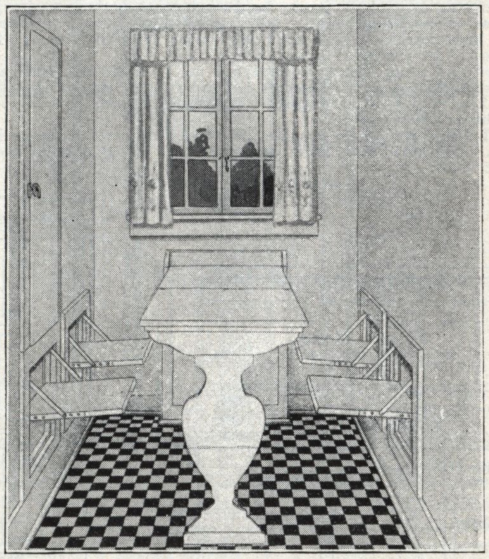
"The Pullmanook" Table and Chairs

Installed in a corner of the kitchen, they provide an attractive breakfast nook. When closed, chairs and table are neat wall cases. A built-in ironing board with seat below can be substituted for one seat.

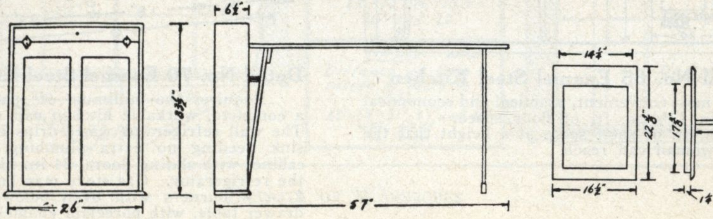
No. 49 table, three No. 16 chairs; No. 4C ironing board.

Pullman Table Unit No. 49—Table top when extended, 23½ in. wide by 57 in. long (from back line of cabinet). Height of table top, 31 in. Depth of cabinet, 6¾ in. (may be set in wall any depth or on outside). Dimensions do not include casings, which are 2 in. wide. Shipping weight, 92 lb.

Pullman Chair Unit No. 16—Shown below. Wall opening: 14⅜ in. wide, 17½ in. high, 1¼ in. deep. Height from floor: to bottom of wall opening, 8 in.; to chair seat, 18 in. Screw anchors furnished if unit is to be set in brick wall. Shipping weight, 30 lb.



"The Pullmanook" Table and Chairs



MILTON C. & DWIGHT POWELL

The Originators of Built-in Steel Kitchens

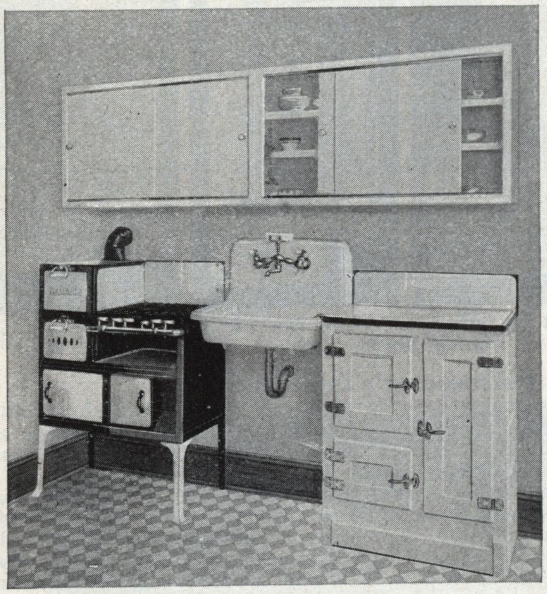
58 East Washington Street, CHICAGO, ILL.

AGENCIES IN THE PRINCIPAL CITIES

Built-In Steel Kitchens

White enameled steel kitchens with sliding doors.

Wall cabinets of various sizes as listed are combined with standard stoves and refrigerators to make complete kitchens for the smallest apartment or the largest home. Refrigerators can be provided with rear or end icing doors. Stoves are furnished with right or left-hand ovens. Finish is durable, pressure applied white enamel, oven-baked after each coat. Send in your blue prints.



No. 65 Enamel Steel Kitchen

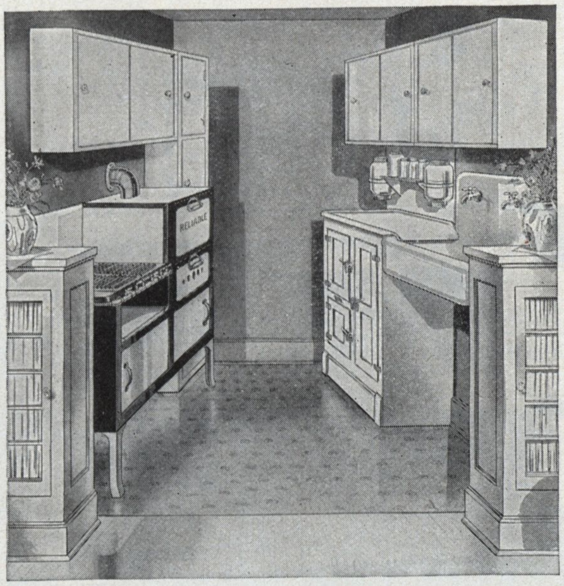
Cabinets built of heavy furniture steel, spot-welded into a permanently rigid unit. Sliding doors are never in the way, are less trouble, and the chance of cracking the head is eliminated. They are the latest improvement in kitchen conveniences.

Finished in baked white or gray enamel applied under pressure. Porcelain enameled doors at small extra cost.

Refrigerator is of high grade hardwood construction, sanitary metal lined, enameled inside and out. 60-lb. ice capacity. Covering the refrigerator is a porcelain enameled work table with drain into sink. Back of this is a porcelain enameled splasher.

Rear or end icing doors, or reversed ice chamber provided at slight additional cost. Stove is of the most modern cabinet type with 4 burners, separate baking and broiling ovens. Below is a compartment for pots and pans. Right or left-hand ovens.

Ground strips should be provided at top of cabinets to make installation easier. Cabinets hung from angles at top. Toggle bolts should be used in tile walls



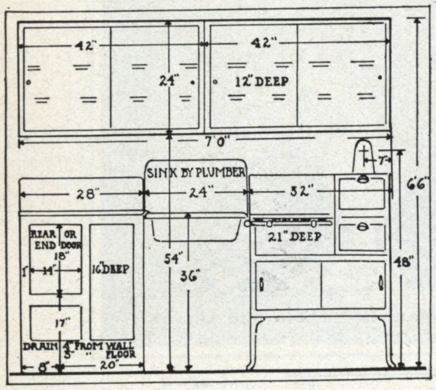
No. 64 Enamel Steel Kitchen

Made in two sizes for kitchens whose walls are 4 ft. and 5 ft. on each side. The 5-ft. kitchen uses a 42-in. full size stove with 18-in. oven. A 42-in. cabinet on wall above. Broom closet 18 in. wide, 12 in. deep and 78 in. high.

On other wall is a 30-in., 75 lb. capacity all-steel refrigerator for end or rear or mechanical icing. Porcelain enameled drainboard work table top. A 30x20-in. sink (furnished by plumber) can be used. Two 30-in. cabinets on this side.

The 4-ft. kitchen uses the stove shown in No. 65 kitchen with a 15-in. broom section. The wall cabinets on each side are 48 in. long. The refrigerator used is same as in No. 65 with porcelain enameled work table drainboard and splasher. The sink (furnished by plumber) is 20x20 in.

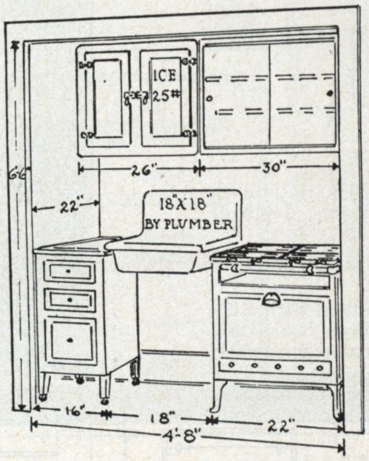
The wall cabinets provide 25 sq. ft. of shelf space. The width of the room should be at least 7 ft. The china cases dividing the rooms are furnished by builder



Detail No. 65 Enamel Steel Kitchen

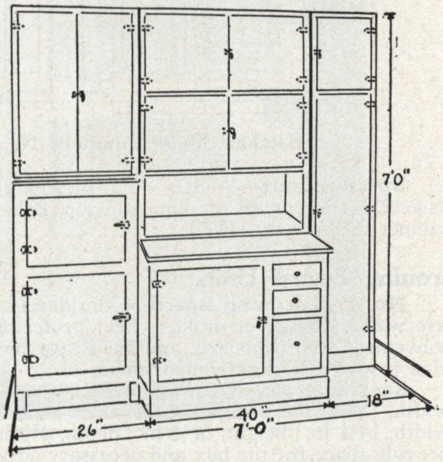
The most convenient, practical and economical kitchen in 12¼-sq. ft. of floor space.

18 sq. ft. of shelf space at a height that the average woman can reach



Detail No. 70 Enamel Steel Kitchen

Requires the minimum of space that a complete, workable kitchen can occupy. The wall refrigerator waste drips into the sink needing no extra plumbing. Wall cabinet with sliding doors, 24 in. high like the refrigerator. Gas stove may be either 2 or 4 burners with oven below. The drawer table, with porcelain enameled top, gives the final touch of convenience



Detail No. 29 Combination Cabinet

The center or cabinet section (sold separately) is 40½ in. wide. Porcelain table top is 27 in. deep.

Broom closet or storage section may be put on either or both sides.

Refrigerator can be fitted for rear or end icing. Ice capacity 100 lb. Package receiving opening in cabinet above

JOHN THOMAS BATTS, INC.

Garment Carriers and Clothes Hangers

GRAND RAPIDS, MICH.

Products

Extension Garment Carriers.
Wishbone Garment Hangers.

Batts Extension Garment Carriers

Batts garment carriers offer a neat and systematic method of hanging garments so as to keep them generally free from wrinkles, to make them readily accessible and to conserve floor or wardrobe space.

A slight pull on the extension rod carries every garment out into the room, greatly facilitating hanging or selection without removing or unnecessarily disturbing unneeded garments.

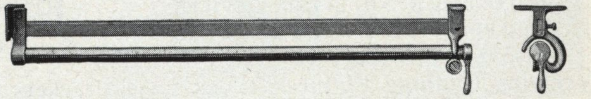
Batts garment carriers have been extensively specified for the past 20 years. They are designed for use wherever clothes are to be hung—private residences, hotels, apartment houses, clubs, dormitories, etc. They are strong, durable and noiseless in action.

Conserve Floor Space—Where homes are planned with new design built-in wardrobes for Batts extension garment carrier installation, considerable valuable space can be saved. More than twice as many garments may be hung in half the space taken up by the old style clothes closet.

Batts garment carriers may also be employed to good advantage in old style closets.

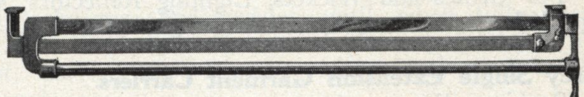
No. A-5 Roller Bearing Carrier for Shallow Wardrobes—Made in stock lengths of 12, 14, 15, 17½, 19 and 22 in. over all when closed. Bright nickel finish.

Note: Due to the construction of the front suspension casting, coat hangers used with this type of carrier must be fitted with special hooks, therefore these carriers are sold complete with hangers. Specify number of hangers desired (from 6 to 8 for every foot of carrier length).



No. A-5 Roller Bearing Extension Carrier

No. B-4 Roller Bearing Carrier for Deep Wardrobes—Made in stock lengths of 24, 28, 30, 36 and 42 in. over all when closed. Bright nickel finish.



No. B-4 Extension Carrier

Wishbone Garment Hangers

No. 1923 Wishbone Hanger

These hangers are shaped like the human shoulder and are the best on the market. Made of hard maple, carefully finished as follows: (1) Natural wood, wax finish; (2) high grade enamel finish in colors to match the decorative scheme.

Four styles and five sizes for men, women and children.

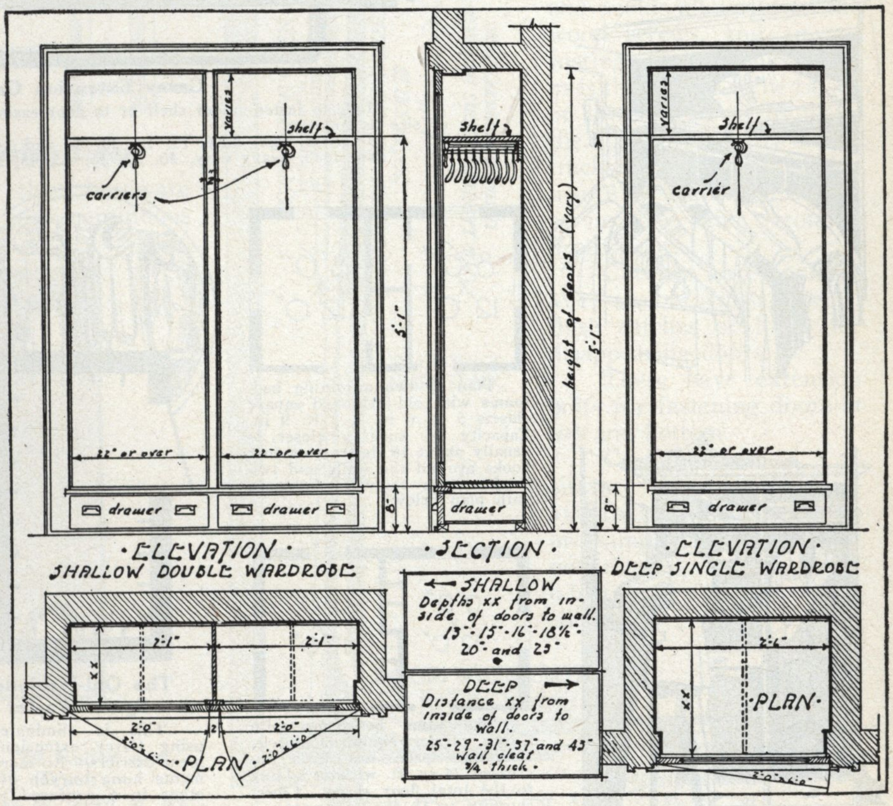
Catalogue and Prices

Write for descriptive booklet and prices.

Wardrobe Equipped with Batts Extension Garment Carriers

Note: The dimensions may vary with the design of the house and the resulting requirements, but the width of the doors should never be less than 22 in. in order to permit the free passage of garments in and out with the carrier. Inside depth of wardrobe compartment may vary from 13 to 43 in.

Shelves should always be made at least 1 in. wider than the length of the carrier to be fastened beneath them, to allow for thickness of hook strip which supports the shelf


varies
shelf
carriers
5'-1"
22" or over
22" or over
drawer
drawer
8"
·ELEVATION·
SHALLOW DOUBLE WARDROBE
shelf
drawer
height of doors (vary)
5'-1"
·SECTION·
varies
shelf
carrier
22" or over
drawer
8"
·ELEVATION·
DEEP SINGLE WARDROBE
2'-1"
2'-1"
xx
2'-0"
2
2'-0"
2'-0"x6'-0"
·PLAN·
2'-0"x6'-0"
← SHALLOW
Depths xx from inside of doors to wall.
13"-15"-16"-18½"-20" and 25"
DEEP →
Distance xx from inside of doors to wall.
25"-29"-31"-37" and 43"
Wall cleat ¾" thick
2'-6"
xx
·PLAN·
2'-0"x6'-0"

Details of Wardrobes

GARDEN CITY PLATING & MFG. CO.

Manufacturers of Garment Carriers, Adjustable Shelving Devices and Disappearing Door Hardware

1430 South Talman Avenue, CHICAGO, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

GARCY

TRADE-MARK

Products

Extension Garment Carriers.
Adjustable Shelving Devices.
Disappearing Door Hardware.

Also Store Fixture Hardware including Revolving Clothing Fixtures, Cloak Case Brackets and Arms, Counter Brackets and Plate Glass Fittings (*write for Store Fixture Bulletin*); Track for doors, screens, etc.; Plain, Axle, Ball Bearing and Roller Bearing Sheaves and Wheels.

For Grilles and Wickets, Lighting Reflectors, see page 762.

Garcy Single Extension Garment Carriers

Service—For perfect, compact, efficient and economical handling of all garments such as coats, suits, gowns, dresses, waists, etc., permitting the construction of orderly wardrobes instead of ordinary inefficient closets.

Advantages—Where the plans include built-in wardrobes with Garcy carriers, a saving of approximately one-half of the closet space otherwise needed is effected. This space may be used to increase the size of the living rooms or to decrease the size of the building, thereby saving materially on construction costs.

Closet capacity is more than doubled. Where an ordinary closet 5 ft. 6 in. x 2 ft. 9 in. would usually contain about 18 destructive coat hooks and one or two shelves, a Garcy carrier equipped closet 5 ft. 6 in. x 1 ft. 9 in. will accommodate 18 to 24 garments on individual hangers, besides having the capacity provided by 11 drawers or shelves.

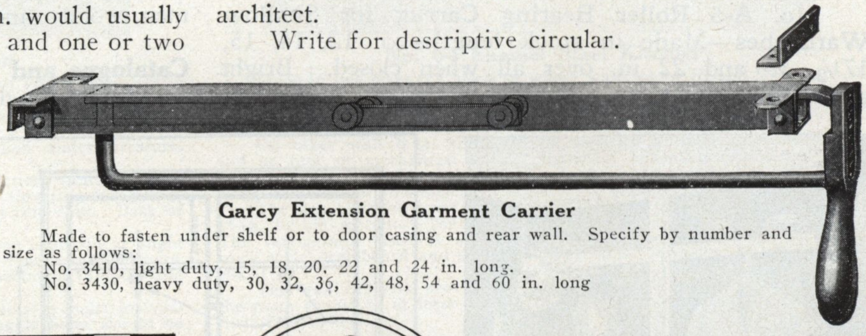
Carriers slide out of closets, allowing the selection of garments in the light and air of the room. Everything is easily accessible from outside the closet. Eliminates wiring for lights. Garments are not crowded, wrinkled or torn on hooks.

Cedar lined closets, affording protection against moths, can be built most economically by the use of Garcy extension garment carriers.

Construction Features—Carriers can be pulled out and pushed back with a touch. Roller bearings cause smooth, silent operation. Made to attach either under shelf or to rear wall and door casing. Fastened with screws. Sturdy and simple throughout. No parts to break or get out of order.

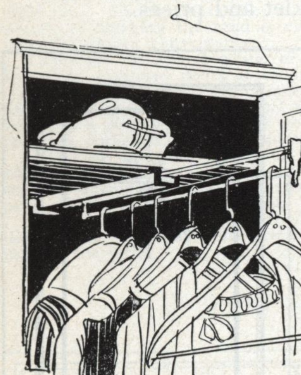
Closet Designs and Floor Plans—Closets may be designed with any number of compartments. Possible combinations of drawers, shelves and carriers, as well as the introduction of other conveniences such as necktie or trouser racks, mirrors, etc., are limited only by the wishes of the client and the ingenuity of the architect.

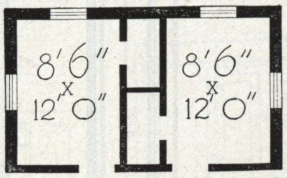
Write for descriptive circular.



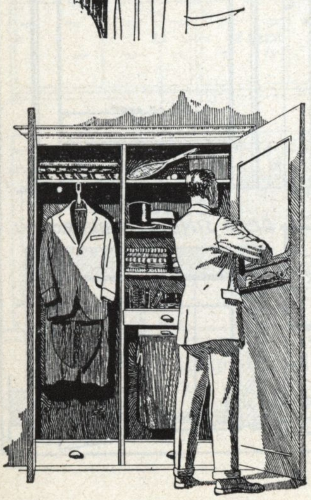
Garcy Extension Garment Carrier

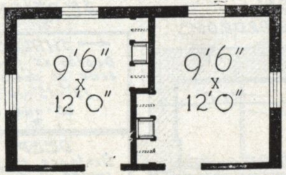
Made to fasten under shelf or to door casing and rear wall. Specify by number and size as follows:
No. 3410, light duty, 15, 18, 20, 22 and 24 in. long.
No. 3430, heavy duty, 30, 32, 36, 42, 48, 54 and 60 in. long



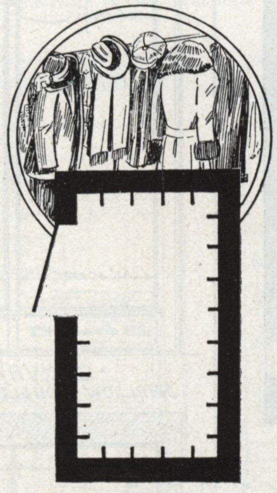


Plan of two adjoining bedrooms with old-fashioned square closets 5 ft. 6 in. x 2 ft. 9 in. Capacity of such a closet is usually about 18 destructive coat hooks around the walls and two hard-to-reach shelves. Compare with plan below



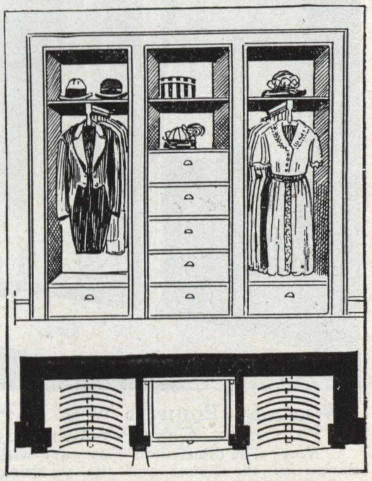


The same bedrooms with Garcy carrier equipped closets. Bedroom space has been increased 24 sq. ft. without adding to the total floor space. Closet capacity is 18 to 24 hangers, 7 drawers and 4 shelves, all easily accessible



The Old-fashioned Space Waster

This is eliminated by using Garcy extension garment carriers. No more garments hung on top of each other in a confused tangle, hard to find, torn and stretched out of shape by hooks



The New Way—A Space Saver

Illustration shows perspective and plan of three-compartment clothes closet. Twice the room of the old fashioned closet in half the space. Order instead of chaos.

Note: Minimum width of opening for extension carrier compartments is 21 inches.

Continued on next page

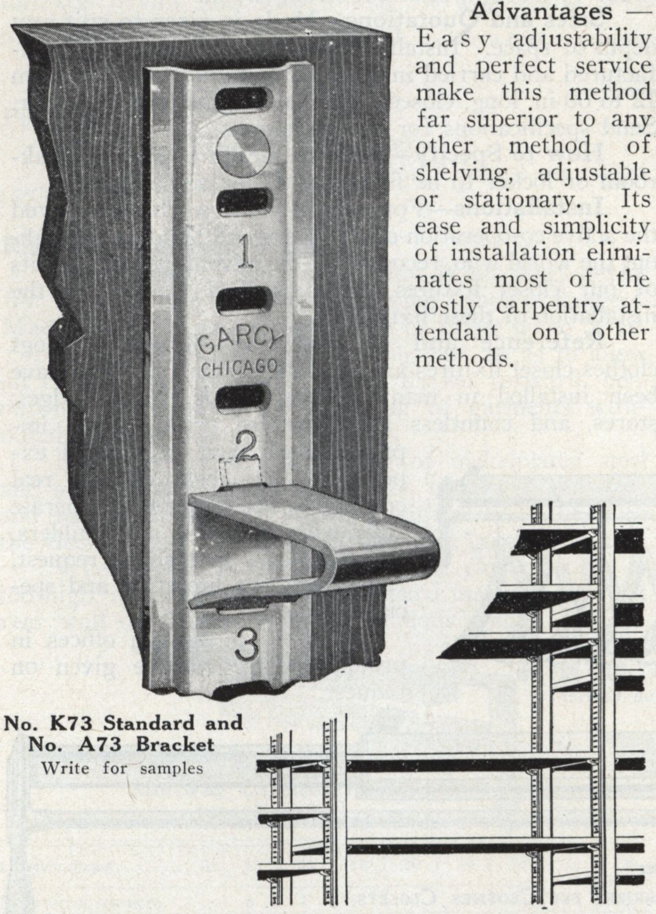
Adjustable Shelving Devices

K73 Standard—⅞ in. wide. Stock lengths, 3, 4, 6 and 12 ft.

A73 Bracket—Easily removed for adjustments. Remains firmly set under any load. Tested up to 600 lb. Adjustable every ½ in.

Finish—Standards and brackets can be furnished nickelplated or our statuary finish.

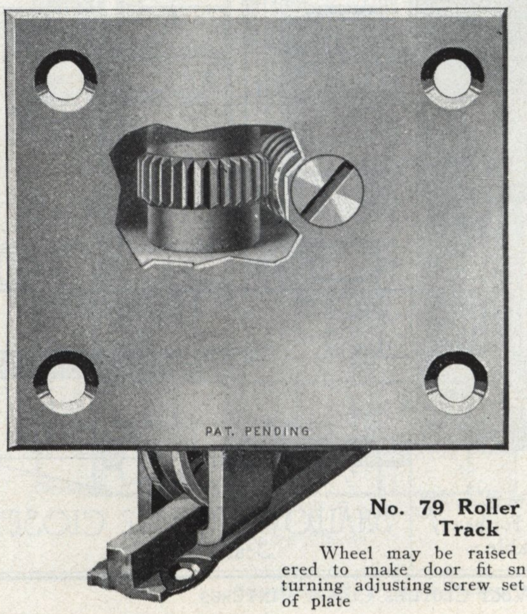
Advantages — Easy adjustability and perfect service make this method far superior to any other method of shelving, adjustable or stationary. Its ease and simplicity of installation eliminates most of the costly carpentry attendant on other methods.


1
GARCY
CHICAGO
2
3

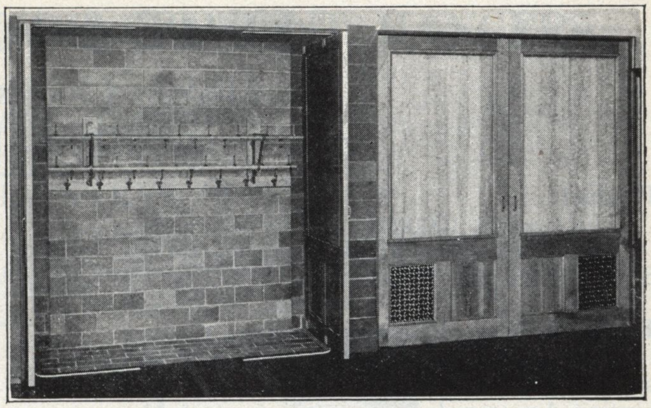
No. K73 Standard and No. A73 Bracket
Write for samples

Rollers and Track for Side Disappearing Doors

Service—Doors equipped with this hardware swing smoothly and silently with an easy continuous motion into the interior of the cabinet. As the door opens, the rear end recedes, until, when fully open, the door is completely out of the way and out of sight, leaving the front opening clear and unobstructed.


PAT. PENDING

No. 79 Roller and Track
Wheel may be raised or lowered to make door fit snugly by turning adjusting screw set in face of plate

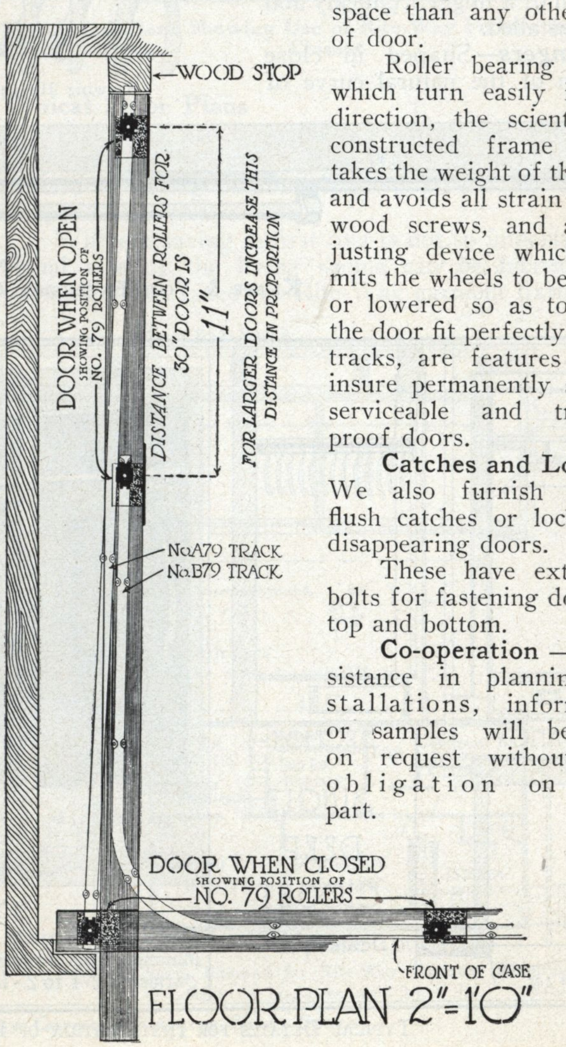


Schoolroom Wardrobe Showing Typical Installation of Disappearing Doors with No. 79 Rollers and Track

Where Used—Used in wardrobes, toilets, telephone booths, washroom and locker room cabinets, clothes closets, bedroom closets, etc.

Advantages—Doors are completely out of the way when open, leaving the front opening free and clear. There are no obstructions to shade the interior or prevent easy access.

The swing of the doors requires less floor space than any other type of door.


WOOD STOP
DOOR WHEN OPEN
SHOWING POSITION OF NO. 79 ROLLERS
DISTANCE BETWEEN ROLLERS FOR 30" DOOR IS 11"
FOR LARGER DOORS INCREASE THIS DISTANCE IN PROPORTION
No.A79 TRACK
No.B79 TRACK
DOOR WHEN CLOSED
SHOWING POSITION OF
NO. 79 ROLLERS
FRONT OF CASE
FLOOR PLAN 2"=1'0"

Roller bearing wheels which turn easily in any direction, the scientifically constructed frame which takes the weight of the door and avoids all strain on the wood screws, and an adjusting device which permits the wheels to be raised or lowered so as to make the door fit perfectly on the tracks, are features which insure permanently strong, serviceable and trouble-proof doors.

Catches and Locks—We also furnish special flush catches or locks for disappearing doors.

These have extension bolts for fastening doors at top and bottom.

Co-operation — Assistance in planning installations, information or samples will be sent on request without any obligation on your part.

KNAPE & VOGT MFG. CO.

Modern Clothes Closet Fixtures

GRAND RAPIDS, MICH.

Product

Extension Carriers for clothes closets.

For Sheaves and Track for sliding doors, also Shelf Supports, see page 1580.

Knape & Vogt Extension Carriers

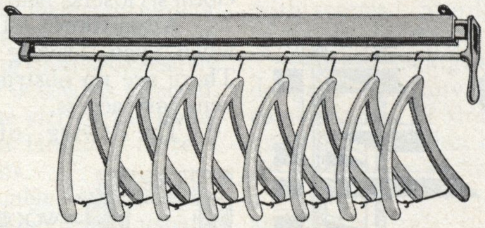
Purpose—For the safe handling of all garments, such as suits, coats, waists, gowns, dresses, etc., where continued neatness of appearance is required.

Where Used—Used in private residences, clubs, schools, lodges, offices, factories, stores and cloakrooms.

Advantages—Materially save closet space, yet provide for better storage of as many garments as could be put in large closets having much waste space. Because fixtures slide in and out, it is possible to pull a whole wardrobe out into the light and air of the room, greatly facilitating selection. This prevents crowding, wrinking, sagging, tearing and soiling.

Construction — *Carriers* — Telescoping, traveling, full nickeled steel carriers run smoothly and noiselessly, without friction, on heavy roller bearings. Can be pulled out and pushed back with the touch of a finger. Quickly and easily installed.

Hangers—Shaped in close imitation of the natural curve of the human shoulders, which keeps clothes in shape. Made of smooth, selected, strong wood.



Showing Hangers on Carrier

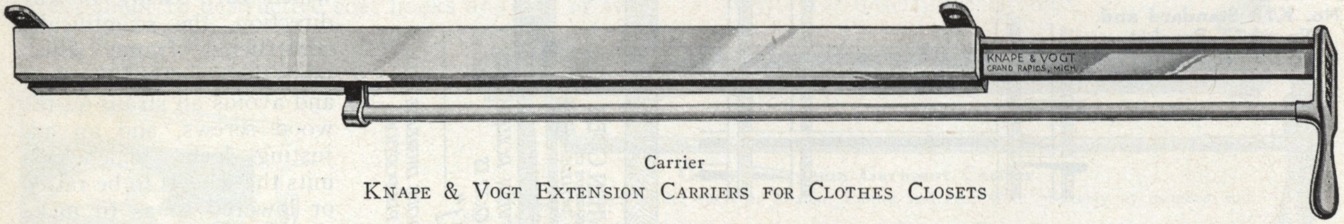
Sizes and Quotations—Made in sizes to suit any depth of space. Installed in new or old closets. Manufactured and carried in stock in multiples of 2 in., from 12 to 60 in. long, closed. Special lengths made to order. Send specifications for our quotations.

How to Specify—Measure depth of closet, cloakroom or locker to be fitted and order accordingly.

Installations—For several years we have enjoyed the active co-operation of architects and builders throughout the world who, recognizing the advantages and merits of our closet fixtures, have specified closets for the installation of these fixtures.

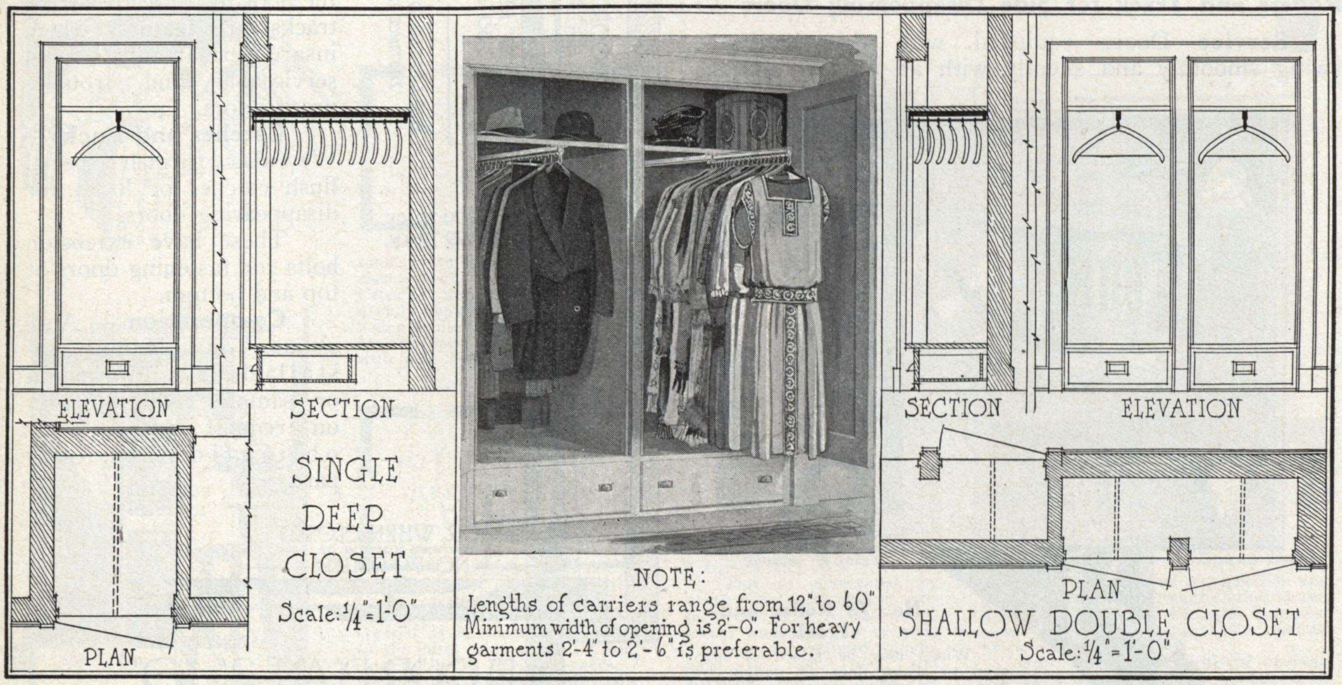
Reference and Co-operation—Knape & Vogt clothes closet fixtures are nationally popular. They have been installed in many leading hotels, clubs, lodges, stores, and countless homes where practical and improved equipment at a small expenditure is regarded as real economy. We desire to co-operate fully with architects and builders, and will gladly furnish, on request, full descriptive literature and special details.

Address of branch offices in principal cities will be given on request.



Carrier

Knape & Vogt Extension Carriers for Clothes Closets


ELEVATION
SECTION
SINGLE
DEEP
CLOSET
Scale: 1/4"=1'-0"
PLAN
NOTE:
Lengths of carriers range from 12" to 60"
Minimum width of opening is 2'-0". For heavy garments 2'-4" to 2'-6" is preferable.
SECTION
ELEVATION
PLAN
SHALLOW DOUBLE CLOSET
Scale: 1/4"=1'-0"

Typical Details for Installation of Knape & Vogt Clothes Closet Fixtures

LAWSON-MILWAUKEE LINE OF GARMENT HANGERS

MANUFACTURED BY

MILWAUKEE STAMPING COMPANY

GENERAL SALES OFFICES AND FACTORY

WEST ALLIS, MILWAUKEE, WIS.

TELEPHONE
West Allis 62

CHICAGO OFFICE AND WAREHOUSE, 230 West Superior Street
Telephone, Superior 6588

NEW YORK OFFICE AND WAREHOUSE, Lanbush-Fisher Co., 416 Broadway
Telephone, Canal 4089

ST. LOUIS OFFICE, F. J. Smalley, 905 Carlton Building
Telephone, Olive 3561

NEW ENGLAND OFFICE, C. E. Harris, 120 Pearl Street, Boston, Mass.
Telephone, Congress 4384

Products

Rite-Way Garment Fixtures.

For Lawson-Milwaukee Spring Hinges, see pages 1575-1577.

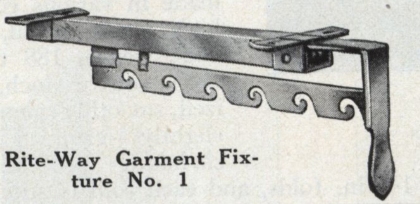
Rite-Way Garment Fixtures

The Rite-Way garment fixture is an ideal device for the purpose of accommodating clothes hangers. Made in lengths to suit any depth of closet up to 36 in.

It is constructed with a sliding bar, so as to allow all clothes hangers to be simply drawn forward, permitting the removal or rehanging of garments without disturbing the other garments.

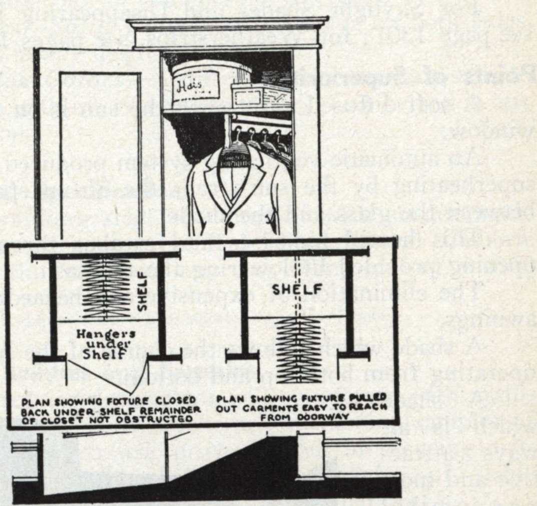
Rite-Way fixtures are made of nickelplated steel and are equipped with fiber rollers, making it noiseless and easy to operate. Furnished with screws. Doubles the closet space and keeps garments in good condition.

Where there is no shelf and the closet ceiling is too high, it can be attached to a board fastened between rear wall of closet and inside of door frame.



Rite-Way Garment Fixture No. 1

Length closed..........in.	12	14	16	20	24	28	32	36
Number of hangers......	6	7	8	10	12	14	16	18

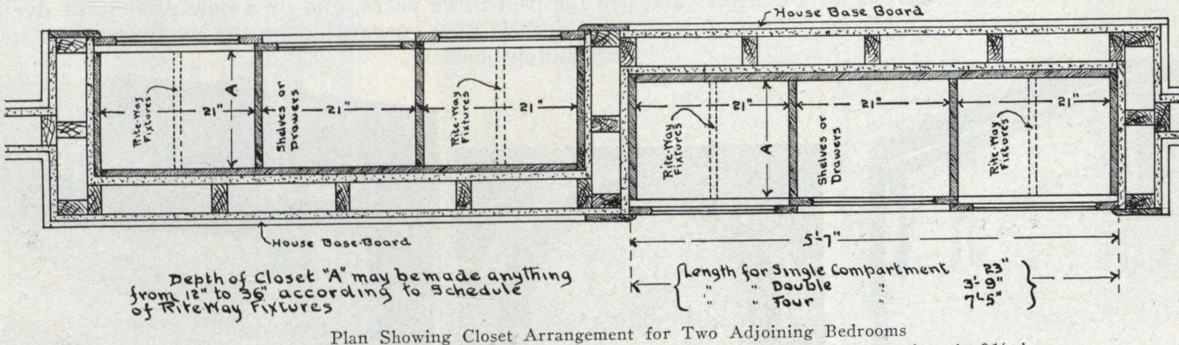

Hats
SHELF
Hangers under Shelf
SHELF
PLAN SHOWING FIXTURE CLOSED BACK UNDER SHELF REMAINDER OF CLOSET NOT OBSTRUCTED
PLAN SHOWING FIXTURE PULLED OUT GARMENTS EASY TO REACH FROM DOORWAY

Sketch and Plans Showing Use of Rite-Way Fixture in Square Closets

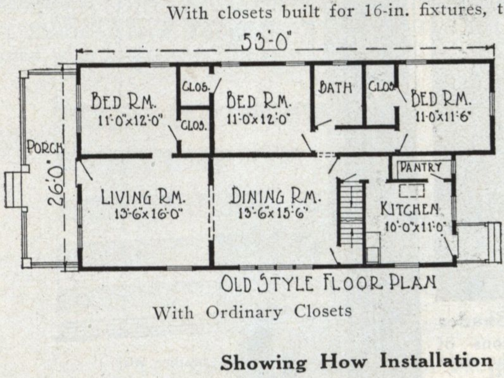
Typical Floor Plans

Following are floor plans showing the advantages of adopting the new Rite-Way garment fixture method of saving building space and reducing building cost.

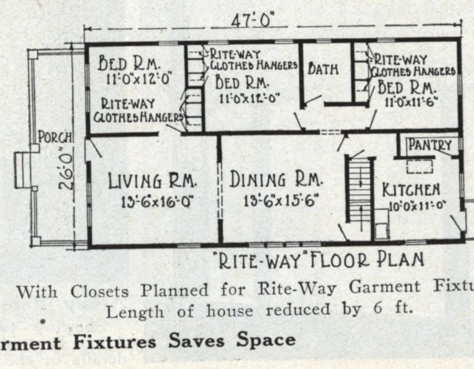
Where a saving in first cost is not so important, the actual size of the living rooms can be increased by planning closet space for Rite-Way garment fixtures.


House Base Board
Rite-Way Fixtures
A
21"
Shelves or Drawers
21"
Rite-Way Fixtures
21"
House Base-Board
Rite-Way Fixtures
21"
A
Shelves or Drawers
21"
Rite-Way Fixtures
21"
5'-7"
Depth of Closet "A" may be made anything from 12" to 36" according to Schedule of Rite-Way Fixtures
Length for Single Compartment 23"
" " Double " 3'-9"
" " Four " 7'-5"

Plan Showing Closet Arrangement for Two Adjoining Bedrooms
With closets built for 16-in. fixtures, the projection of the closets into the room is only 9½ in.


53'-0"
26'-0"
PORCH
BED R.M. 11'-0"x12'-0"
CLOS.
CLOS.
BED R.M. 11'-0"x12'-0"
BATH
CLOS
BED R.M. 11'-0"x11'-6"
PANTRY
LIVING R.M. 13'-6"x16'-0"
DINING R.M. 13'-6"x15'-6"
KITCHEN 10'-0"x11'-0"

OLD STYLE FLOOR PLAN
With Ordinary Closets


47'-0"
26'-0"
PORCH
BED R.M. 11'-0"x12'-0"
RITE-WAY CLOTHES HANGERS
RITE-WAY CLOTHES HANGERS
BED R.M. 11'-0"x12'-0"
BATH
RITE-WAY CLOTHES HANGERS
BED R.M. 11'-0"x11'-6"
PANTRY
LIVING R.M. 13'-6"x16'-0"
DINING R.M. 13'-6"x15'-6"
KITCHEN 10'-0"x11'-0"

"RITE-WAY" FLOOR PLAN
With Closets Planned for Rite-Way Garment Fixtures
Length of house reduced by 6 ft.

Showing How Installation of Rite-Way Garment Fixtures Saves Space

ATHEY COMPANY

Window Shades

6035-6045 West 65th Street, CHICAGO, ILL.
NEW YORK OFFICE: 7 East 42nd Street
IN CANADA: Creswell, McIntosh Co., 270 Seigneurs Street, MONTREAL
BRANCHES AND AGENCIES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA—See Classified Telephone Directories

Products

Athey Perennial Shade for schools, hospitals, office buildings, banks, hotels, shop windows, factories, residences, etc.

For Skylight Shades and Disappearing Partitions, see page 1301; for Weatherstrips, see pages 1412-1413.

Points of Superiority

A soft diffused light when the sun is on the window.

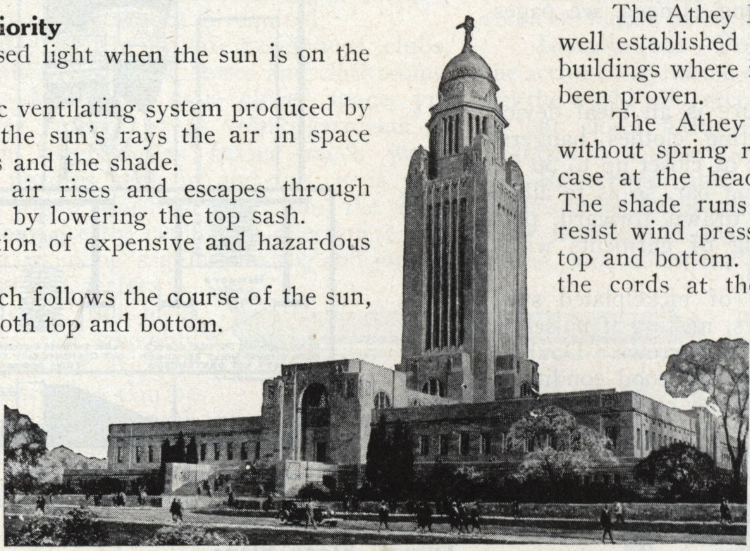
An automatic ventilating system produced by superheating by the sun's rays the air in space between the glass and the shade.

This heated air rises and escapes through opening provided by lowering the top sash.

The elimination of expensive and hazardous awnings.

A shade which follows the course of the sun, operating from both top and bottom.

A shade which is always attractive and most economical because of its years of service.



Nebraska State House, Lincoln, Neb.
Bertram G. Goodhue, Architect
Athey Perennial Window Shades used throughout

Conservation of Eyesight

Impairment of the vision of students due to improper control of light in schoolrooms has received much consideration from educational bureaus and associations. The reports of these investigators recommend as most vital certain adjustable features of light control—all of which are embodied in the Athey Shade.

The United States Bureau of Education puts it tersely in these words:

> "The only entirely satisfactory device is an adjustable fixture whereby any desired part of the window can be covered."

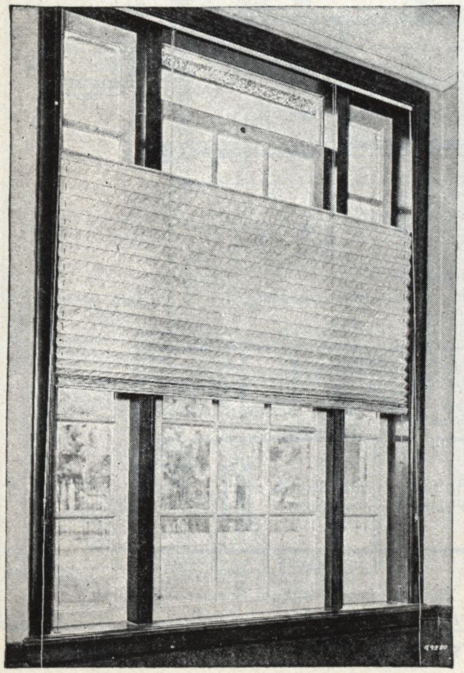
Construction Features

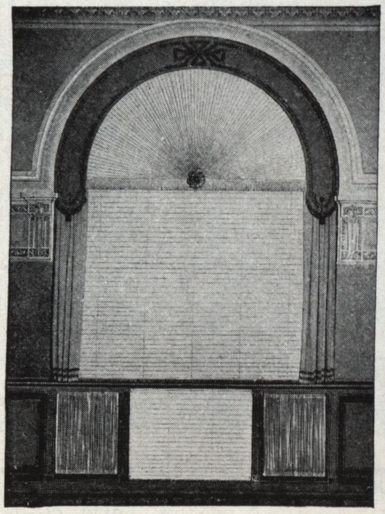
The Athey Perennial Window Shade is now well established in hundreds of America's finest buildings where its durability and perfection have been proven.

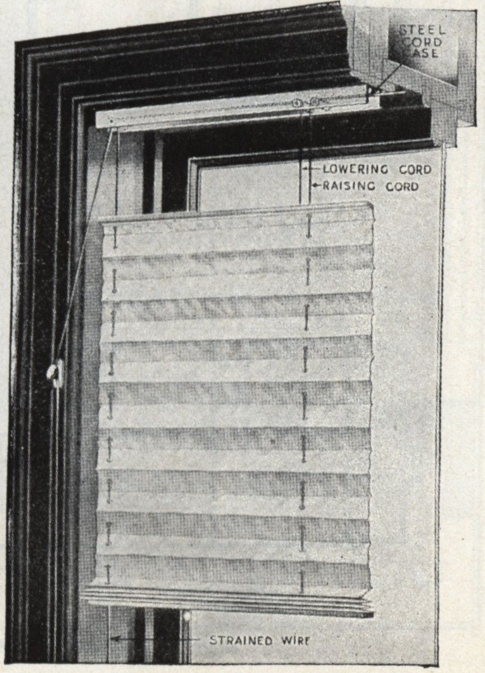
The Athey Perennial is gravity operated without spring roller, pawl or notch. The cord case at the head is an enameled steel channel. The shade runs on strained brass wires which resist wind pressure, and is operated from both top and bottom. It is raised from the bottom by the cords at the right and lowered from the top by those at the left. These cords operate over full length brass rollers located in the cord case, and the shade, therefore, is never touched by the hand. The cloth, made in various colors, is a high grade coutil, herringbone weave, 188 threads to each square inch, mercerized, smoothly calendered and slightly crinkled in the shrinking process. It is pleated to 1⅝-in. folds, and each fold is stitched.

Many Athey installations have been in use for more than eight years and are still giving satisfaction.

The mechanical operation has been much improved in the past three years, and by a new process of dyeing, the cloth is now guaranteed by the manufacturers to be absolutely sunfast.







Athey Perennial Window Shades
Showing two typical adaptations of Athey Perennial Shades and on the right details of the construction features

WINDOW SHADE CLOTH

MANUFACTURED BY

Interstate Shade Cloth Co.
812-820 Jefferson Street, HOBOKEN, N. J.
TELEPHONES, Cortlandt 6874; Hoboken 1848

The Lapsley-Interstate Shade Cloth Co.
BALTIMORE, MD.
TELEPHONE, Plaza 3290

Products

Interstate *"Best by Test"* Unfilled Handmade Trade-marked Window Shade Cloth:

"Sunlite" Hand Tinted Cambric.
"Paragon" Opaque Cambric.
"No-Lite" Triplex Process Shadowless.

Description of Interstate Window Shade Cloth

"Sunlite," "Paragon" and "No-Lite" trade-marked shade cloths are made on the finest cambric cloth, specially woven for window shade purposes. Clay or other fillings are not used in their manufacture.

Rainproof—Cleanable—Sunproof.

"Sunlite"—Lightly Coated—Is translucent in light colors. Semi-opaque in darker colors.

"Paragon"—Heavier Coated—Semi-opaque in light tints. Opaque in darker colors.

"No-Lite"—Triplex Processed—Shadowless and lightproof. Used extensively in auditoriums and X-Ray and hospital laboratories.

When total exclusion of light is desired specify "No-Lite."

Widths—"Sunlite," "Paragon" and "No-Lite" shade cloth can be furnished in any width up to 150 inches in any color or combination of colors.

Colors—***Solid Colors***—Same color on both sides. Furnished in any desired tone.

Duplex Colors—A different color on each side, to harmonize with interior and exterior. Can be had in any combination.

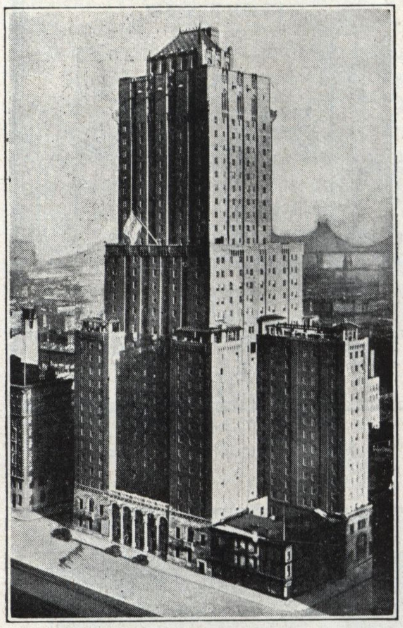
Architects' Specifications

All windows shall be equipped with shades made of Interstate Sunlite Unfilled Hand Tinted Cambric Shade Cloth, free from any clay filling and of a solid color to be selected.

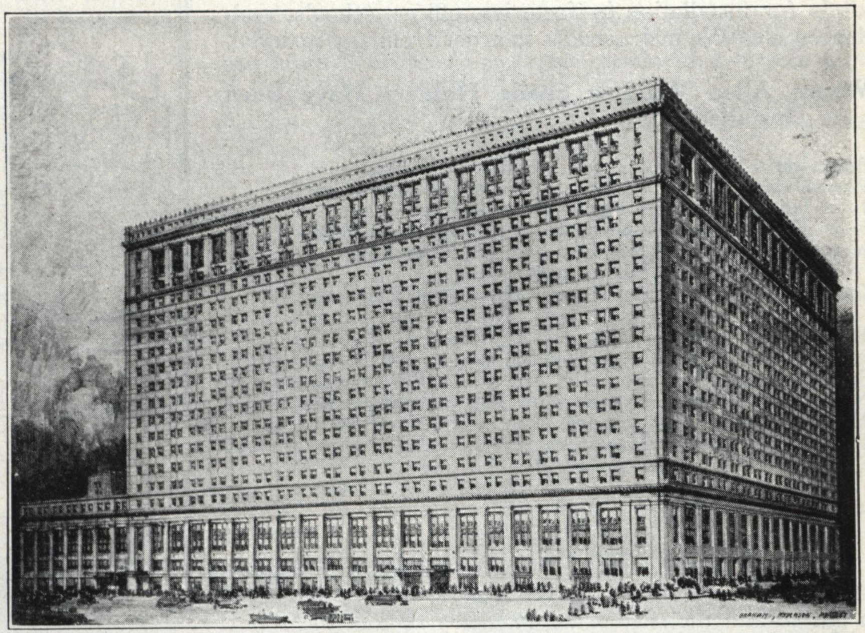
Note: If duplex colors are selected, specify Duplex.

Service Facilities and Samples

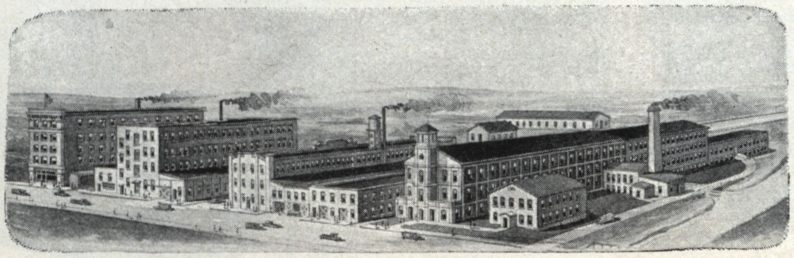
Our service department will co-operate with architects in writing specifications and furnishing samples of shade cloth which will prove helpful in securing estimates. We gladly share our knowledge of shade materials used in various types of installations.



Hotel Shelton, New York, N. Y., Shaded with Interstate "No-Lite"



The Union Trust Building, Cleveland, Ohio, One of the Largest Buildings in the Country, Shaded with Interstate "Sunlite"



Composite View of Our Factories Producing High Grade Window Shade Cloths

ESTABLISHED 1897

THE ALLEN SHADE HOLDER CO., INC.

Manufacturers of the Allen Adjustable Window Shade Holder

46 Cornhill, BOSTON 9, MASS.

Products and Services

ALLEN ADJUSTABLE WINDOW SHADE HOLDERS; STANDARD WINDOW SHADES.

Engineers and Specialists on MOTOR CONTROLLED BLACK SHADES to be used in lecture halls, schools, hospitals, colleges and Government buildings.

TRADE-MARK

Allen Adjustable Window Shade Holder

The Allen Shade Holder fastens at top of window. Rods, 1/4 in. in diameter, extend at sides from top of window to brackets fastened from 18 in. to 24 in. above the window sill.

The holder allows the rollers to be raised or lowered so that shades may be made to cover the whole or any portion of the window. Windows can be left open for ventilation and shade may be used to stop draughts.

New shades or rollers are not required, as this shade holder can be easily applied to any spring roller.

These adjustable shade holders are in general use throughout the country.

Standard Window Shades

We manufacture and deal in window shades of all kinds for installation in factories, offices, schools, residences, etc. We make shades to order from any material.

Where Allen Window Shade Holders Have Been Installed

BOSTON, MASS.

Appraiser's Stores
Army Base
John Hancock Life Insurance Co. Building
New England Telephone & Telegraph Co.'s Buildings
Nutrition Laboratory of the Carnegie Institution
Simmons College
Harvard Dental School

WASHINGTON, D. C.

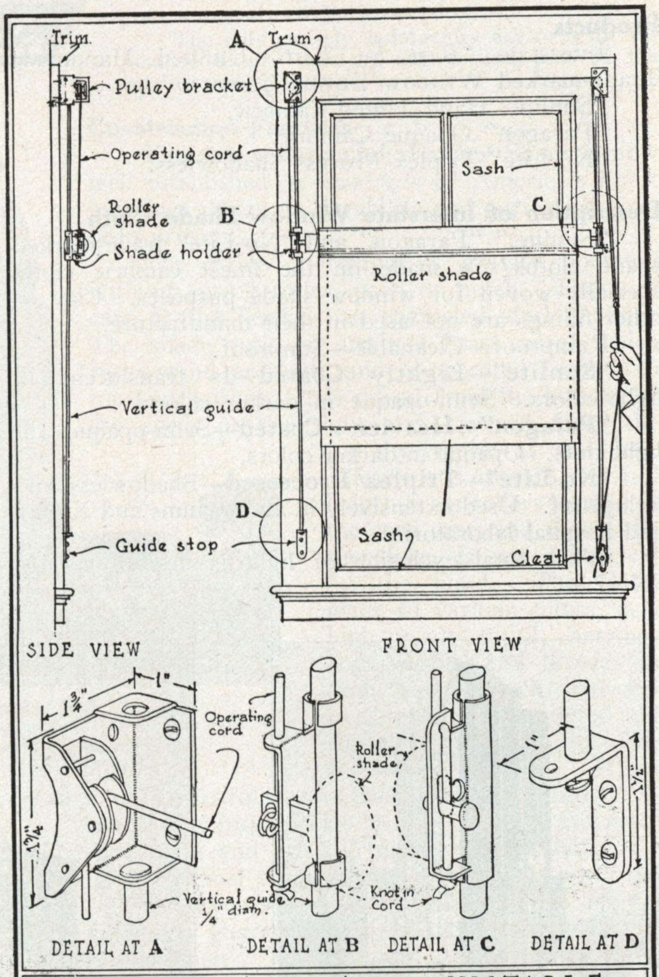
Carnegie Institute and various Government Buildings

NEW YORK, N. Y.

Rockefeller Foundation
Yale Club

SCHOOLS

Springfield, Mass.
New Bedford, Mass.
Malden, Mass.
Bangor, Me.
Portland, Me.
Lewiston, Me.
Concord, N. H.
Manchester, N. H.
Portsmouth, N. H.
New Haven, Conn.
Hartford, Conn.
Bridgeport, Conn.


Trim
A
Trim
Pulley bracket
Operating cord
Sash
Roller shade
B
C
Shade holder
Roller shade
Vertical guide
D
Sash
Guide stop
Cleat
SIDE VIEW
FRONT VIEW
1 3/4"
1"
1 3/4"
Operating cord
Roller shade
1"
1 1/2
Vertical guide 1/4" diam.
Knot in cord
DETAIL AT A
DETAIL AT B
DETAIL AT C
DETAIL AT D

DETAILS OF ALLEN ADJUSTABLE WINDOW SHADE HOLDER

Motor Controlled Shades

Where our Automatic Controlled Shades are installed, if the lecturer desires a dark room, he presses a button and the shades automatically darken the room. When he desires light, he presses a button and the shades automatically open.

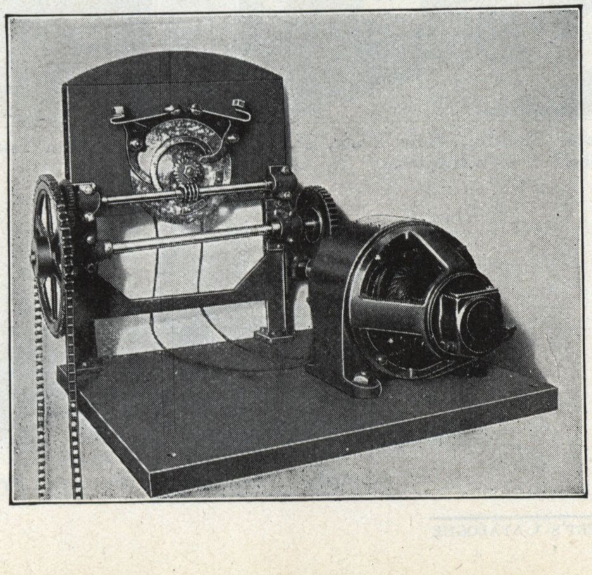
Some of the buildings where Allen Automatic Controlled Shades have been installed:

BOSTON, MASS.

Children's Hospital
Peter Bent Brigham Hospital
Massachusetts Institute of Technology
Boston College

NEW YORK, N. Y.

Rockefeller Foundation



ESTABLISHED 1857

W. W. KIMBALL CO.

Pipe Organ Builders

Kimball Hall, Jackson Boulevard and Wabash Avenue
CHICAGO, ILL.

TELEPHONE
Harrison 4014

FACTORY: W. 26th Street and California Boulevard, CHICAGO, ILL.

PRINCIPAL TECHNICAL REPRESENTATIVES

NEW YORK, N. Y., W. B. Milner, 507 Fifth Avenue (for Eastern territory)
DALLAS, TEX., C. E. Sylvester, 500 N. Peak Avenue
SPOKANE, WASH., H. M. Hansen, 1409 W. Fourth Street
LOS ANGELES, CAL., S. W. Williams, 6243 Fountain Avenue
SAN FRANCISCO, CAL., G. J. Bohen, Box 3324
SEATTLE, WASH., A. D. Longmore, 5731 17th Ave., N. E.

Products

Pipe Organs for churches, lodges, schools, residences, including Soloist or Roll Operated Organs, with music rolls for same; Orchestral Organs and Unit Orchestras for motion picture, vaudeville and other theaters.

Also Grand and Upright Pianos, Player Pianos, Reproducing Pianos, both grand and upright; Kimball Phonographs.

Information—Types of Organs and Data

Space Requirements—Kimball organs are built to order, therefore adaptable to all conditions, and architects are assured full co-operation in planning chambers, openings, etc. Dimensions of parts, weights and other technical data given cheerfully by mail, telephone or personal call. Smallest space in which practicable to install a serviceable pipe organ is 6 ft.x12 ft.x10 ft. high, assuming a chamber is provided. These proportions may vary and the organ may be divided.

Percussion Instruments—Unit orchestras and many orchestral theater organs are provided with the musical percussion instruments, such as harp, marimba, glockenspiel, orchestra bells, xylophone and chimes, and the legitimate orchestra drums and traps.

Residence Organs—Residence organs with the Kimball Soloist are played in the usual way, and by music rolls which give solo and accompaniment throughout the compass of manuals and pedals, with or without automatic control of instrumentation and expression by the rolls, at will of performer. These organs are placed successfully in practically any relation to the music rooms, the Kimball electrical control allowing music desk to be at any distance. No problem too difficult.

Tone Production—All scales determined, all pipes made and voiced, after every condition of acoustics, installation and use is understood. Only ideally correct materials used and the highest skilled labor employed in making Kimball pipes, which are voiced by artists.

Action—In the Kimball action, modern electrical development and adaptation have reached their highest stage, insuring instantaneous response and repetition. High resistance magnets with low current consumption; no sparking at contacts, which are of silver on both sides of circuits; permanent regulation; correct wind pressures and distribution contribute to perfect action, musical tone and prompt speech.

Consoles—Four principal types are available, with modern stop keys or stop knobs, inclined manuals, concave and radiating pedals, and adjustable combinations moving the registers. Compact and highly finished.

List of Installations—Forwarded upon request, facilitating investigation by locality, denomination or other classification of existing Kimball organs. Many of the finest churches, public auditoriums, schools, temples, lodges, mortuary chapels, hotels, theaters, and private residences in this country have Kimball organs.

Prices—Church, lodge and school organs range from $4500 upward. Theater organs, from $6000 upward. Unit Orchestras, from $8000 upward. Residence organs, with Kimball Soloist, operated manually and by music rolls—$14,000 upward.

Specifications—To facilitate correspondence, architects should state requirements and possibilities clearly, sending as nearly as possible:

(1) Sketch or blue print showing size, shape and other particulars of auditorium and organ chamber, and distance apart if more than 1 chamber.

(2) Size and location of tone openings into auditorium.

(3) Materials and acoustical treatment of interior of building.

(4) Position of console (key desk) and distance from organ.

(5) Are swell boxes to be provided by organ builder or will organ be installed in chambers provided by purchaser?

(6) Is organ builder to provide cabinet work case or decorated pipe front, or both? (Modern installations are usually in chambers screened by grilles installed by purchaser.)

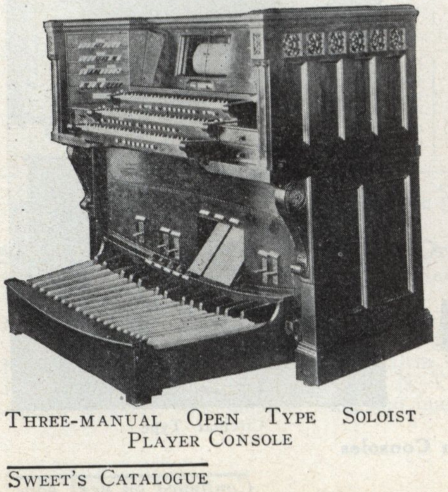
(7) Give dimensions of blower room, location and distance from organ.

(8) Give electric current available for power; stating: if direct current, voltage; if alternating current, voltage, cycles and phase.

(9) State proposed completion date.

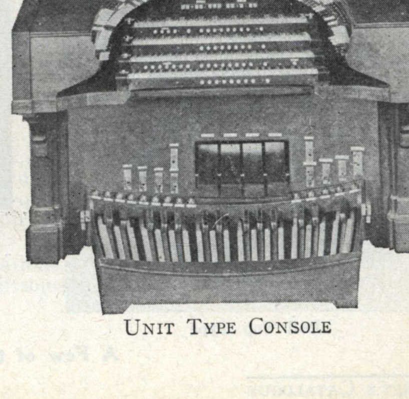
(10) Indicate proposed use of organ, as: in a church, to accompany choir and congregation only, or also for concert purposes; in a theater, for independent use only, or habitually with orchestra.

(11) State approximate sum available for organ.



Three-Manual Open Type Soloist Player Console

Roll Top Console



Unit Type Console

THE MARR & COLTON COMPANY

Organ Builders

GENERAL OFFICES AND FACTORY
WARSAW, N. Y.

EASTERN SALES OFFICE: 437 Fifth Avenue, NEW YORK, N. Y.
WESTERN SALES OFFICE: 906 Merritt Building, LOS ANGELES, CAL.

Products

Pipe Organs for churches, schools, lodges and residences.

Concert and Unit Organs for motion picture, vaudeville and other theaters, with or without roll players.

We Render Valuable Assistance to Architects

Our staff of organ architects has had long and successful experience in designing, building and installing organs of the highest quality. They will render valuable assistance to architects and are always available for the dissemination of thoroughly reliable organ information.

Correspondence is invited.

America's Finest Concert Organ

Tonally and mechanically, Marr & Colton organs have won first place in the esteem of noted organists. Reference to the list of installations on opposite page will indicate the prestige which many years of fine work has created for us.

The flexibility of our organs allows the architect to overcome any structural difficulty. Reliability is assured through simplicity. Accurate points of adjustment are of metal. Each stop is carefully considered, and, with our special scales, high grade materials and highly skilled voicers, the very finest quality of tone is obtained.

Every Marr & Colton organ carries with it an absolute guarantee.

Types of Marr & Colton Organs

Church Organs—Arranged for the accompaniment of a large number of voices, with additional stops for recital work, with or without echo organ.

Concert and Unit Organs—These contain harps, marimbas, chimes, xylophones and other percussion instruments.

Consoles

Three principal types of consoles are available, all with the modern stop key, inclined manuals, concave and radiating pedal board and adjustable combinations moving the registers.

Console elevators (see illustration) can be provided so that console can be lifted from the orchestra pit to the stage or platform for special occasions. Further particulars on request.

Important Points to Be Considered When Making Organ Layouts

The four organs listed in the table on opposite page have been selected as a working basis for the architect when engaged in making layouts for organs, and the following are vital points which will permit him to make an intelligent survey of the questions involved in the installation of organs.

Organ Chamber—All walls and ceiling in the organ chamber should be plastered smooth and a wood floor should be provided regardless of style and construction of the building. Show all breaks and projections in the organ chamber; additional allowance for their size should be made. Avoid all beam projections below ceiling in organ chamber, as this seriously handicaps the tone and hinders the proper placing of the organ pipes.

Steam and water pipes should not be run above the organ chamber, as these cause considerable damage to organs. If impossible to follow these recommendations, all pipes should be heavily insulated to avoid radiation and condensation. Wherever possible, all outside walls should be made dampproof. Dampness in any form should be eliminated from the organ chamber, as this is one of the deadliest enemies that the organ has to contend with.

Access Doors—Standard doors in any desirable location, should be provided in the organ chamber for means of access. A light should be provided at the entrance, also a light with basket protection for working on the organ.

It is optional whether access doors be made fireproof, but it is advisable to make them dustproof.

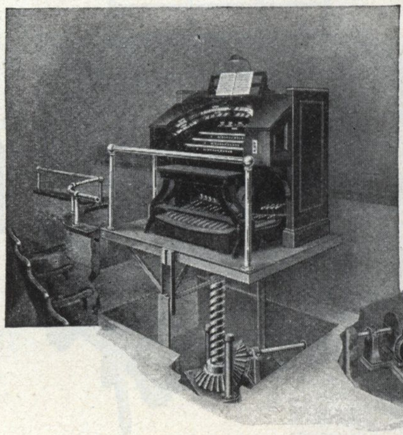
Organ Chamber Openings—These should be as central as possible in the chamber and their area should be calculated at approximately 5% to 7% of the cubic capacity of the organ chamber.

Example: Given a chamber 12 ft. long, 7 ft. deep and 10 ft. high. This chamber contains 840 cu. ft. Seven per cent of 840 equals 60. Therefore opening should be 60 sq. ft., or approximately 10 ft. long by 6 ft. high.

The openings should be at the top of the organ chambers. In churches, the tone should be directed toward the choir.

Organ Blower—The organ blower can be placed in the basement or in any room that is not located too far away from the organ chamber. The room must be dustproof and dampproof, a door should be provided for means of access, and a small grille (12x12 in.) with a fine copper wire mesh screen should be placed in the door.

Roll Top Type



Push Button Controlled Elevator Type

Circular Type

A Few of the Many Types of Marr & Colton Organ Consoles

Continued on next page

Provide remote control for the organ motor; the push button can be placed at the key board of the organ. The wiring for the motor should be brought into the blower room.

A foundation should be provided for the organ blower.

Give accurate plan and elevation of organ blower room, showing position of any breaks in the room and of beams, ducts and plumbing pipes.

Organ Cable Conduit—Sharp bends in the organ cable conduit should be avoided and pull boxes should be provided to allow the organ cable to be pulled through easily.

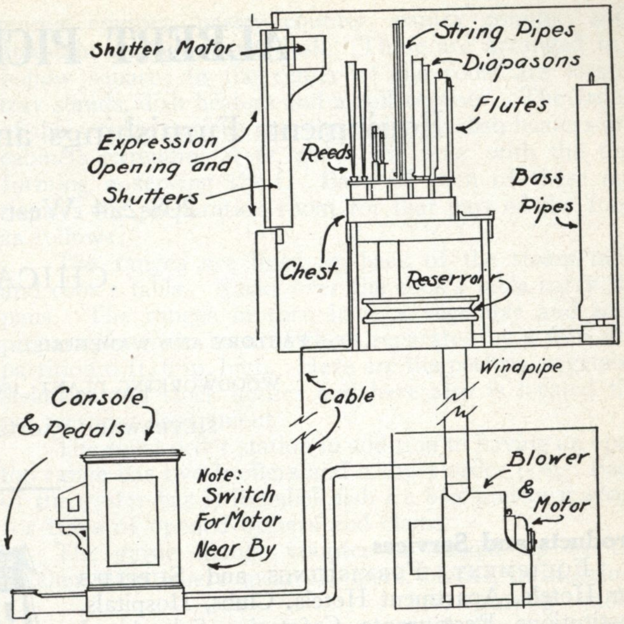
Wind Trunk—Consult the organ builder regarding the position of the wind trunk, which should be placed in the building during construction. The wind trunk must be soldered absolutely airtight and sleeves in the floor should have a ½-in. clearance all around the wind trunking.

Dust Filters—Under certain conditions, dust filters are necessary. Information on request.

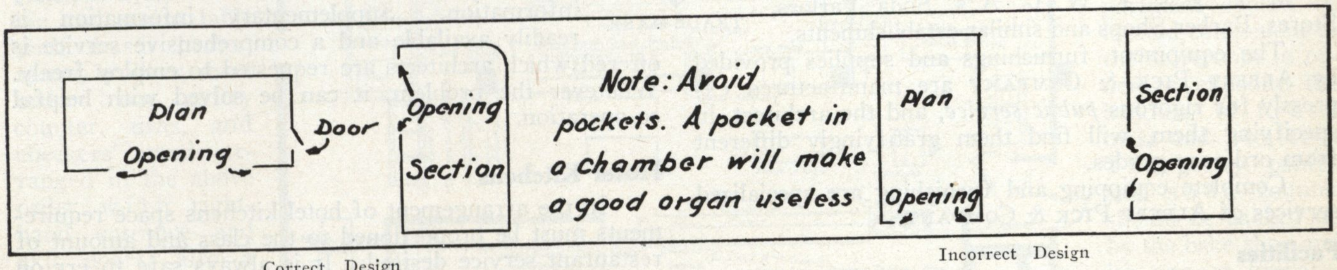
Grille Work—In theaters, auditoriums, hotels, etc., grille work is used; in churches, exposed pipes are used.

If sound is transmitted through grille work, architects should be careful to design the grille so that the area of the grille *openings* shall be as large or larger than the area of the organ chamber openings, so as not to retard the tone from passing through the grille.

Avoid placing draperies in front of grille work, as these absorb and retard the tone from reaching the auditorium. If draperies are to be used, additional allowances should be made in the organ chamber and grille openings, and draperies shall be as light in weight as possible.


Shutter Motor
String Pipes
Diapasons
Flutes
Expression Opening and Shutters
Reeds
Bass Pipes
Chest
Reservoir
Windpipe
Cable
Console & Pedals
Note: Switch For Motor Near By
Blower & Motor

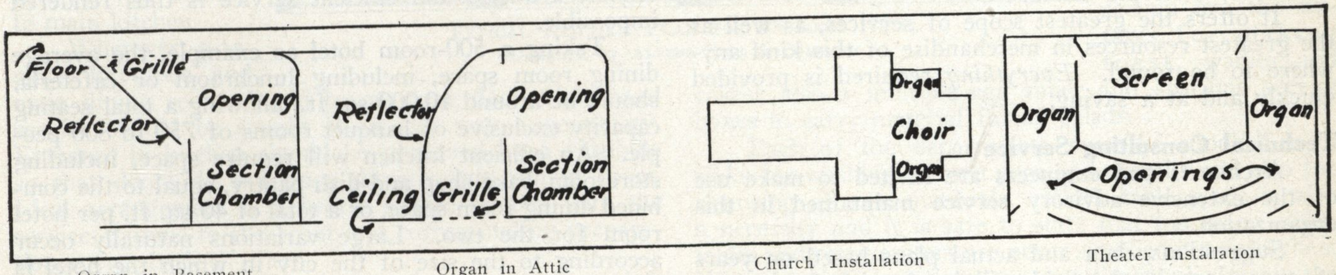
Nomenclature of the Organ


Plan
Opening
Door
Opening
Section
Note: Avoid pockets. A pocket in a chamber will make a good organ useless
Plan
Opening
Section
Opening

Correct Design

Incorrect Design

Correct and Incorrect Designs of Organ Chambers


Floor & Grille
Opening
Reflector
Section
Chamber
Reflector
Opening
Section
Chamber
Ceiling
Grille
Organ
Choir
Organ
Screen
Organ
Organ
Openings

Organ in Basement

Organ in Attic

Church Installation

Theater Installation

Typical Location of Organ Chambers

MARR & COLTON ORGAN DATA

Type of organ	Number of organ chambers used	Minimum dimensions of each organ chamber, ft.-in.			Organ chamber openings, ft.-in.		Minimum blower room sizes, ft.-in.			Blower motor, hp.	Motor wiring and conduit		Windpipe diameter, in.	Approximate weight, tons	Console dimensions, ft.-in.			*Price
		Length	Depth	Height	Length	Height	Length	Depth	Height		Size wire	Size conduit, in.			Length	Depth	Height	
1	1	12-6	6-0	10-6	9-0	6-0	7-0	5-0	7-0	3	12 gauge	¾	6	1¾	5-1	4-2½	4-6½	$ 6,000.00
2	1	16-0	8-0	10-6	12-0	6-0	7-0	5-0	7-0	5	10 gauge	¾	8	2½	5-1	4-4	4-6½	8,000.00
3	1	12-0	10-0	12-6	18-0	8-0	9-0	7-0	7-0	7½	8 gauge	1	10	4	6-9	4-6½	4-9¼	10,000.00
	2	14-0	8-0	12-6	12-0	7-0	9-0	7-0	7-0	7½	8 gauge	1	8	4	6-9	4-6½	4-9¼	
4	1	24-0	14-0	12-6	20-0	8-0	9-0	7-0	7-0	10	6 gauge	1¼	12	6	6-9	4-6½	4-9¼	12,000.00
	2	16-0	10-0	12-6	12-0	7-0	9-0	7-0	7-0	10	6 gauge	1¼	8	6	6-9	4-6½	4-9¼	

Cable from organ to console requires 3-in. conduit.
*With the exception of motor wiring, freight and drayage, prices include installation of organ ready to play.

Some Prominent Marr & Colton Organ Installations

Strand Theater, Niagara Falls, N. Y., Henry Spann, Buffalo, N. Y., Architect
Majestic Theater, Pittsfield, Mass., Eugene DeRosa, New York, N. Y., Architect
North Salem M. E. Church, North Salem, Ind.
Eastman School of Music, Rochester, N. Y.
Apollo Theater, Indianapolis, Ind., and many others
Alician Court Theater, Fullerton, Cal.
Rivoli Theater, Syracuse, N. Y.
Piccadilly Theater, Broadway, New York, N. Y., Lee A. Ochs, Managing Director, Schloss & Orlando, New York, N. Y., Architects
Many other installations throughout the country—Detroit, Philadelphia, Pittsburgh, New York, Chicago and Los Angeles

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The equipment, furnishings and supplies provided by Albert Pick & Company are manufactured expressly for rigorous *public service,* and the architect, in specifying them, will find them gratifyingly different from ordinary grades.

Complete equipping and furnishing are specialized services of Albert Pick & Company.

Facilities

This company is the largest Public Service Equipment House in the world.

It offers the greatest scope of services, as well as the greatest resources in merchandise of this kind anywhere to be found. *Everything* required is provided quickly and at a saving.

Technical Consulting Service

Architects and engineers are invited to make use of the extensive advisory service maintained in this organization.

Suggestions, data and actual plans based on years of experience in the field will be furnished promptly on request.

A department of specialists will assist without charge in the preparation of plans for any type of installation, advising regarding cost, economy of installation, new mechanical devices, approved arrangement, etc.

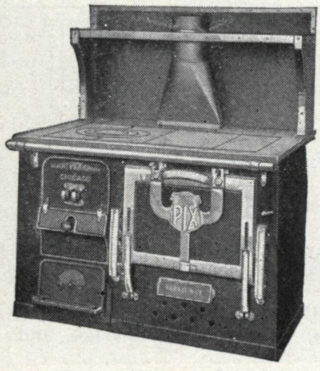
General Information

The salient details of public service installations have been noted here in brief tabloid form. They are necessarily of general application, of chief value to the architect wishing preliminary information. Supplementary information is readily available and a comprehensive service is offered which architects are requested to employ freely. Whatever the problem, it can be solved with helpful co-operation.

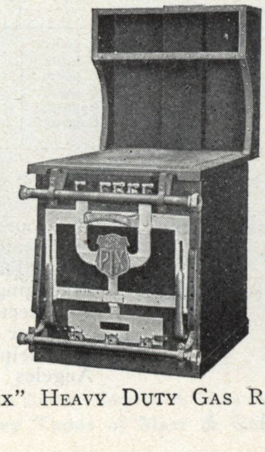
Hotel Kitchens

In the arrangement of hotel kitchens space requirements must be proportioned to the class and amount of restaurant service desired. It is always safe to err on the side of too much space; for the average kitchen is terribly crowded and efficient service is thus rendered impossible.

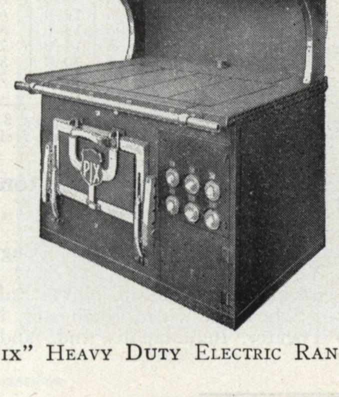
Taking a 500-room hotel as example, the average dining room space, including lunchroom or cafeteria, should be around 10,000 sq. ft., allowing a total seating capacity exclusive of banquet rooms of 750 to 800 people. An efficient kitchen will require space, including storeroom, bake shop and dish pantry, equal to the combined dining room space, or a total of 40 sq. ft. per hotel room for the two. Large variations naturally occur according to the size of the city in which the hotel is located and according to the desire of the proprietor to feature either his rooms or his café service. Instances can be found where the combined dining room and kitchen equal 75 sq. ft. per hotel room instead of 40 sq. ft., and on the other hand some smaller hotels give as little as 15 sq. ft. per room when the dining room is



"Pix" Heavy Duty Coal Range



"Pix" Heavy Duty Gas Range

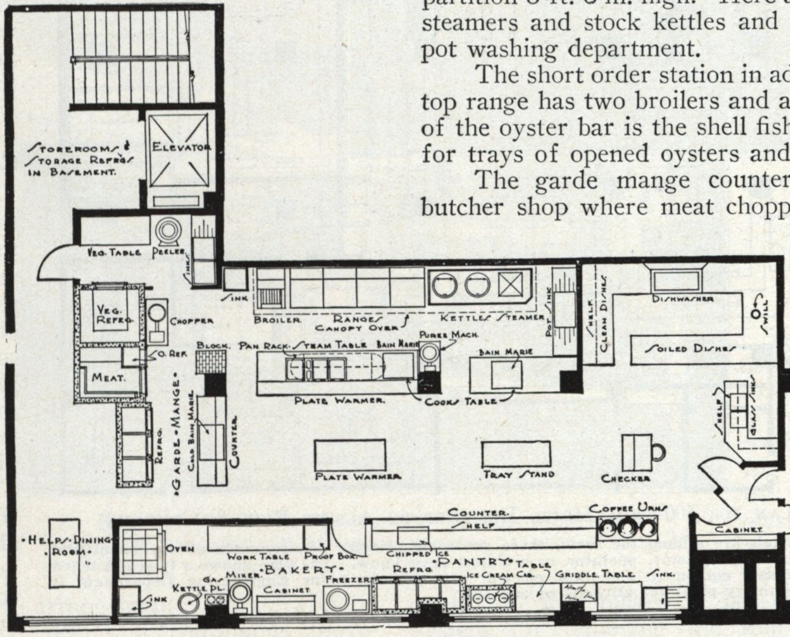


"Pix" Heavy Duty Electric Range

Continued on next page

desired only as a convenience to guests and considered a necessity in order to keep the rooms filled. Entrance of supplies needs first and most careful consideration. Elevators and broad stairways should lead directly to storeroom entrance and main storage refrigerator. Main storage refrigerator should be a 4-compartment box of not less than 400 sq. ft. of floor space for a 500-room house. From this point the equipment should be so arranged as to avoid all unnecessary retracing of steps until it ultimately is delivered to the patron.

Having determined location of supply entrance, the next consideration is given to the entrance to kitchen from main dining room. This should, if possible, be centrally located for both rooms. If the kitchen is on a different floor from the main dining room, space must be taken for a service pantry where short orders, entrees, pastry and coffee are served. This service pantry requires a cook's table and steam table with dish heater, range, broilers, short order box, pastry counter, urns, and checkers' stands arranged in the above order with right-hand entrance and exit doors, also a broad stairway with division rail leading to main kitchen.


Storerooms & Storage Refrgs in Basement.
Elevator
Veg. Table
Peeler
Sink
Sink
Veg. Refrg.
Chopper
Broiler
Ranges Canopy Over
Kettles Steamer
Pot Sink
Shelf
Clean Dishes
Dishwasher
Swill
Soiled Dishes
Puree Mach.
Block.
Pan Rack.
Steam Table
Bain Marie
Bain Marie
O. Ref.
Meat.
Plate Warmer.
Cooks Table
Refrg.
Garde - Mange
Cold Bain Marie
Counter
Shelf
Glass Sinks
Plate Warmer
Tray Stand
Checker
Counter.
Shelf
Coffee Urns
Cabinet
Helps Dining Room
Oven
Work Table
Proof Box.
Chipped Ice
Pantry
Table
Bakery
Refrg.
Ice Cream Cab.
Griddle. Table
Sink.
Gas Mixer.
Kettle Pl.
Sink
Cabinet
Freezer

Typical Kitchen Plan for 200-room Hotel
Designed by Albert Pick & Company

Wherever possible, kitchen and main dining room should be on same floor, right-hand service should be sought if in any way a possibility. Entrance to kitchen should be protected by a vestibule so that doors do not open directly into dining room. Ideal arrangement is a nearly square kitchen with the service stations to the front and corresponding preparation rooms back of them.

The most convenient order of equipment is as follows:

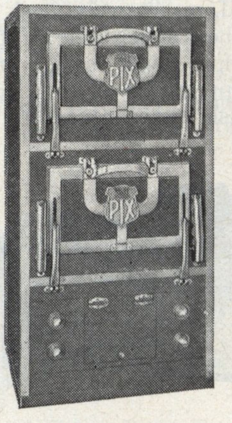
Steam table, short order table, oyster bar, garde mange counter, pastry counter, pantry counter, soda fountain and checker's desk. These are arranged in a hollow square; in the center of the room are located tray stands, dish heaters and a roll warmer. The fronts of the service stations are supplied with dish heaters and cabinets extending 4 ft. above the floor with the tops forming a serving shelf. Back of each of these stations is the preparation room for that part of the food, as follows:

The ranges are lined up back of the steam table and cook's table. Racks over the cook's table carry the pans. The ranges in turn have a vegetable and soup preparation room back of them separated by a 6-in. tile partition 6 ft. 6 in. high. Here are the peelers, vegetable steamers and stock kettles and here also is located the pot washing department.

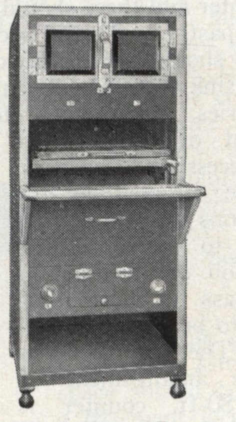
The short order station in addition to having an open top range has two broilers and a short order box. Back of the oyster bar is the shell fish ice box and in it space for trays of opened oysters and clams.

The garde mange counter is backed up by the butcher shop where meat choppers, blocks, meat grinders, cutting tables and slicers facilitate the work. This department should be located convenient to the storeroom in order to expedite the handling of fresh meat and poultry. The pastry pantry and soda counter should be backed up by the bake shop and ice cream preparation rooms. In this section are the fixtures for making toast, waffles and cakes; also a multiple egg timer and spacious service boxes to carry material for all salads.

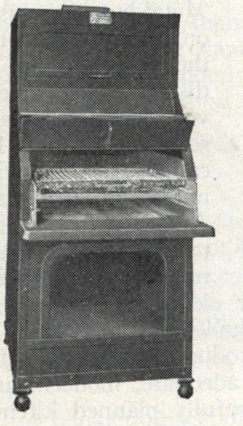
Each of the departments must be supplied with sinks for washing its own pans and utensils and also for cleansing of raw materials. Work table space is also a necessity and it is safe to state that too many sinks, tables and refrigerators are never supplied in any kitchen. Where two dining rooms are directly supplied from the same kitchen, the doors should be located at opposite ends of the room. Since one of the dining rooms will



"Pix" Heavy Duty
Electric Roasting Oven



"Pix" Heavy Duty
Electric Broiler



"Pix" Heavy Duty
Charcoal Broiler

"Pix" Heavy Duty
Gas Broiler

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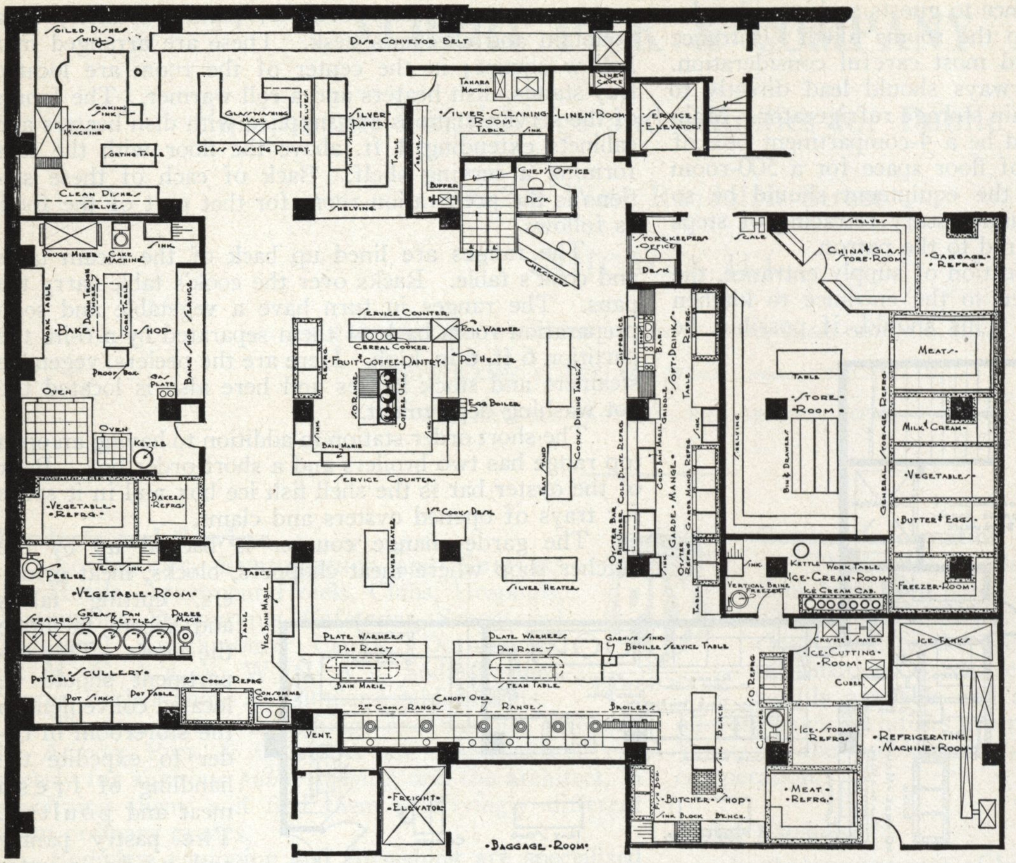
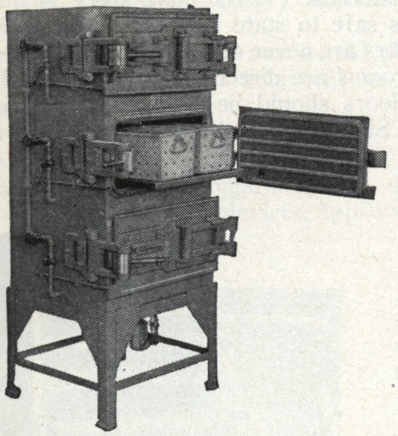

Soiled Dishes
Swill
Dish Conveyor Belt
Soaking Sink
Dishwashing Machine
Sorting Table
Clean Dishes
Shelves
Glasswashing Mach.
Glass Washing Pantry
Shelves
Silver Pantry
Silver Sinks
Table
Shelves
Shelving
Tahara Machine
Silver Cleaning Room
Table
Sink
Buffer
Linen Room
Linen Chute
Service Elevator
Chef's Office
Desk
Checkers
Dough Mixer
Cake Machine
Sink
Work Table
Dough Trough Under
Work Table
Bake Shop
Bake Shop Service
Proof Box
Gas Plate
Oven
Oven
Kettle
Vegetable Refrg.
Bakers Refrg.
Service Counter
Roll Warmer
Cereal Cooker
Refrg.
Fruit & Coffee Pantry
Pot Heater
S.O. Range
Coffee Urns
Egg Boiler
Sink
Sink
Bain Marie
Service Counter
Tray Stand
Cooks Dining Tables
1st Cooks Desk
Silver Heater
Silver Heater
Veg. Sinks
Peeler
Table
Vegetable Room
Table
Veg. Bain Marie
Steamers
Grease Pan
Kettles
Puree Mach.
Scullery
Pot Table
Pot Sinks
Pot Table
2nd Cooks Refrg.
Consomme Cooler
Plate Warmers
Pan Rack
Bain Marie
Plate Warmers
Pan Rack
Steam Table
Garnish Sink
Broiler Service Table
Canopy Over
2nd Cooks Ranges
Ranges
Broilers
Vent.
Freight Elevator
Baggage Room
Storekeepers Office
Desk
Scale
Shelves
China & Glass Store Room
Garbage Refrg.
Chipped Ice
Bar
Soft Drinks
Refrg.
Table
Griddle
Cold Plate Refrg.
Cold Bain Marie
Garde Mange
Garde Mange Refrg.
Sink
Oyster Bar Ice Bin Under
Oyster Refrg.
Sink
Table
Shelving
Table
Store Room
Bin & Drawers
General Storage Refrg.
Meats
Milk & Cream
Vegetables
Butter & Eggs
Sink
Kettle
Work Table
Ice Cream Room
Vertical Brine Freezer
Ice Cream Cab.
Freezer Room
Crusher & Shaver
Ice Cutting Room
Cuber
Ice Tanks
S.O. Refrg.
Chopper
Ice Storage Refrg.
Refrigerating Machine Room
Fish Box
Block Sink Bench
Butcher Shop
Sink Block Bench
Meat Refrg.

Typical Kitchen Plan for 500-room Hotel Designed by Albert Pick & Company

Though the needs of all hotels are seldom the same, there are some primary requirements of equipment and arrangement of kitchens that every proprietor, operator or architect must know. The plan shows a typical kitchen for a 500-room hotel, with necessary equipment and most efficient arrangement. Our Engineering Department is at your disposal in making preliminary plans for kitchens of any size

have a less convenient service and more crossing and retracing of steps than the other, correspondingly wider aisles should be left in the center of the room.

In nearly every modern hotel it has been found advantageous to have all dishes washed in one place with conveyors to bring the dishes from the various serving pantries and return them. Conveyor dishwashing machines are most practical for this type of dish pantry. Metal boxes are used on the conveyor for the transporting of dishes. When conveyors are not used, separate centrally located dish pantries must be provided. Adjacent to the dish pantry is the silver room supplied with lock cabinets, sinks and a silver cleansing machine of suitable size to take care of all hollow-ware.



"Pix" Perfect Vegetable Steamer

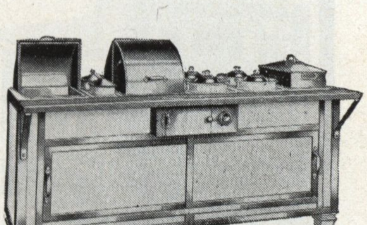
Efficient kitchens can be produced only with efficient equipment. This must be adequate, modern, and above all, durable. Many a carefully planned kitchen has been ruined by improper equipment. The great number of Albert Pick & Company kitchens operating today in every size and type of institution is proof that Albert Pick & Company equipment sets a new standard of excellence for efficiency, economy and durability. Architects, in specifying Albert Pick & Company equipment, are assured for themselves and their clients of securing the equipment that best meets their requirements, with every certainty of long and continuous service.

Commercial Cafeterias

In order to make the cafeteria produce the greatest profit, the seating capacity must be proportioned to the counter capacity and the counter length should be sufficient to give the maximum capacity per hour and build up the highest check average. The maximum capacity for a 40-ft. counter is about 400 people per hour and for an 80-ft. counter about 600 per hour. A counter more than 80 ft. in length has been found not to serve more people or build up a higher check than a counter of this length. Between the lengths of 40 and 80 ft. the number of people served is practically proportionate to the length of the counter.

Cafeteria counters exclusive of tray rail should be 36 in. high and 30-in. wide. In addition to the 30-in. width a 6-in. carving board should be built back of the steam table and a tray slide extending approximately 10 in. in front of the counter should be built along the entire front. Minimum aisle space of 42 in. should be provided back of the counter, between it and the kitchen wall, and 54 in. in front. At least two serving slides should be provided in the kitchen wall between it and the counter and these should be located, respectively, back of the pastry and salad sections. The kitchen side of the wall should be furnished with ample table, refrigerator and sink space for the cutting and preparing of all salads, pastries, fresh fruits, etc. An aisle space of 54 in. in front of the counter is necessary in order to make it possible for persons who do not desire to patronize one section of the counter to pass by those waiting to be served.

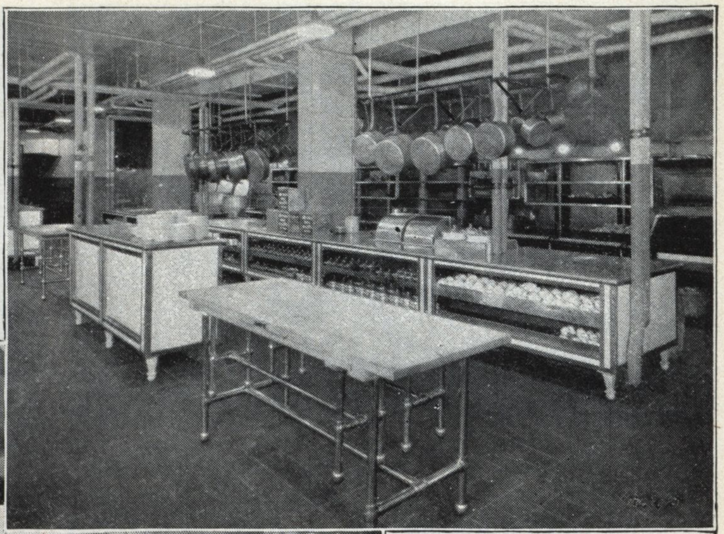
The most profitable arrangement of an 80-ft. counter is as follows: tray, silver and napkin stand,



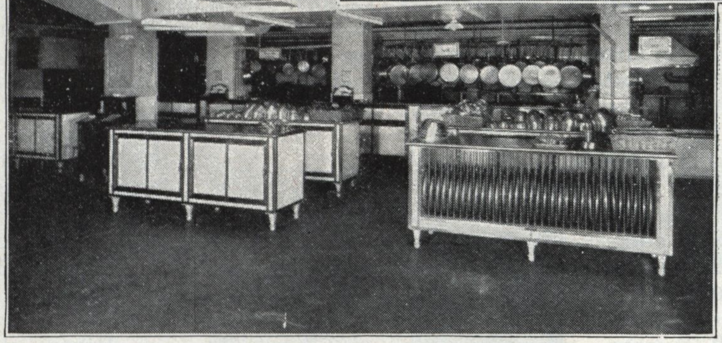
"Pix" Heavy Duty Electric Steam Table

Continued on next page

6 ft.; bread, 6 ft.; salad and cold meats, 16 ft. (with a 12-ft. salad pan included); steam table, 20 ft.; milk and ice cream cabinet, 8 ft.; hot and cold drink serving space, 4 ft.; aisle, 2 ft.; urn stand, 2 ft., set at right angle to counter. Salad section and pastry section have 16 ft. of double elevated shelving and the steam table has a counter protector in front of it. Display shelves should be 18 in. wide with the top shelf 20 in. above the counter. Counter protector should be 8 in. high and 8 in. wide. The reason for placing the salads and cold meats ahead of the steam table is that in this manner two busy places are created during the rush period, and by leaving aisle space sufficiently wide in front of counter for people to pass one another more people can be served in the same time. Besides, it encourages the sale of salads and cold meats by bringing them first to the eye of the customer. It has not been found to be a profitable adventure to add soda fountains, oyster bars and other short order arrangements to a cafeteria counter. Anything that delays a continuous movement forward should be avoided as far as possible. These, however, can be added outside the direct line of service.

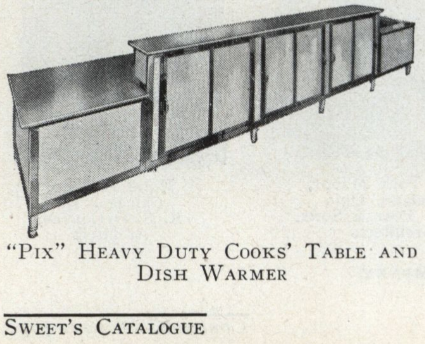


Kitchen of Maillard's Restaurant, Chicago, Ill.
Buchman & Kahn, Architects
Both completely equipped by
Albert Pick & Company



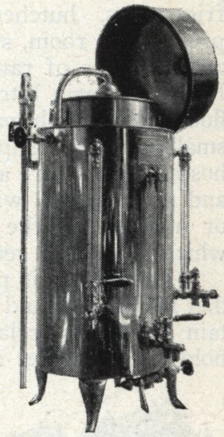
Kitchen of Hotel Mayflower, Washington, D. C.
Robert F. Beresford and Warren & Wetmore, Associated Architects

In order to have the maximum efficiency, the seating capacity should be proportionate to the counter capacity. If 600 people are served in an hour, at least one-third of that number of seats should be offered in any one time as it has been found that the time people actually remain seated in a cafeteria dining room is approximately 20 minutes. In order to offer vacant seats for couples and parties, there should be at least 20% more seats than are required. In other words, a counter 80 ft. long with a capacity of 600 people per hour, requires a dining room seating capacity of 240 to 250 people, allowing 12½ sq. ft. per chair, which gives an easy uncrowded dining room with plenty of aisle space for the customers coming to and going from the counter; and allowing 1000 sq. ft. for the counter and its necessary aisle space, a total of about 4000 sq. ft. exclusive of the kitchen is necessary.



"Pix" Heavy Duty Cooks' Table and Dish Warmer

Where possible, a large portion of the kitchen space should be in a basement located directly under the dining room. This affords ideal conditions for ample storeroom space, dishwashing pantries, cleaning and preparation of vegetables, locker and washrooms for employees and various other requirements of the restaurant. It also makes it possible to use a conveyor system for removing the soiled dishes to the dishwashing pantry and returning the clean ones back of the counter. If such a condition is not possible and separate kitchen and dish pantry have to be furnished on the same floor as the dining room, a minimum of 2000 sq. ft. for each complete service counter as above illustrated is necessary.



"Petersen" Combination Hot Water and Coffee Urn

This description of the cafeteria does not mean that smaller rooms do not pay, but where it is possible from the size of the city or the location of the room to fill a large dining room, the actual overhead is little more than it is on one with one-half the capacity. This description is intended to illustrate a balanced proposition as nearly as possible.

School Cafeterias

Very definite principles of school cafeteria design have been worked out by Albert Pick & Company's technical experts in connection with school architects. The requirements for individual schools, however, are so varied that architects are invited to bring their problems to these experts for suggestions and co-operation.

A booklet on school cafeterias will be sent if desired. Simply ask for Book BG93.

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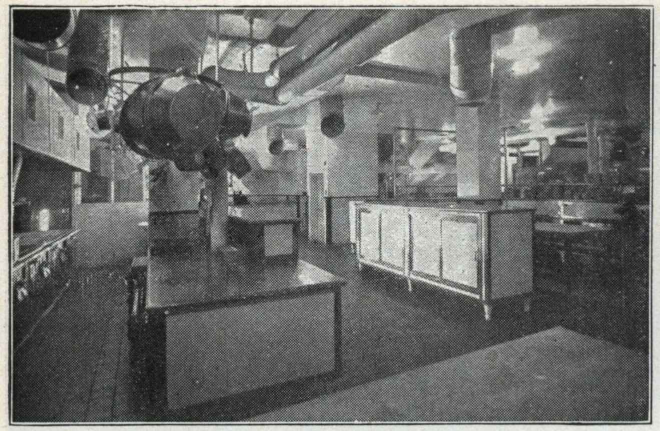
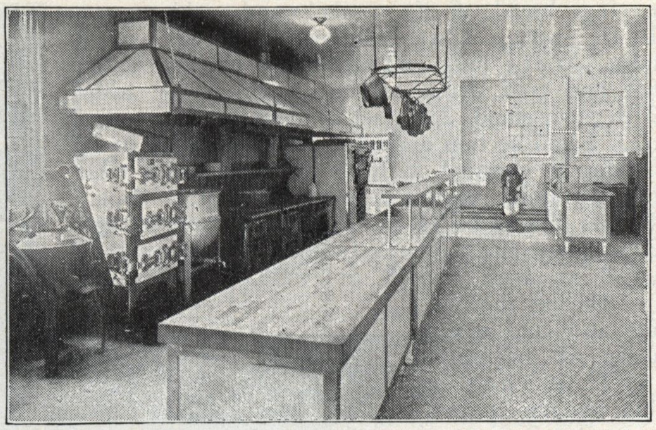


Kitchen of Wade Park Manor, Cleveland, Ohio
George B. Post & Sons, Architects
Equipped complete by Albert Pick & Company



Kitchen of Wisconsin Memorial Hospital, Madison, Wis.
Arthur Peabody, Architect
Equipped complete by Albert Pick & Company

Hospitals and Institutions

Hospital kitchens vary from other types in that their function is to prepare food in quantities for serving with the elimination of service pantries and garde manger counters from the kitchen proper. The problem here is to prepare food for both the sick and the well. For every patient there is one or more attendants and this entire staff must be served, generally on the cafeteria plan in a room which is located adjacent to the main kitchen. The kitchen also prepares the staple articles of food for the patients. Space requirements for this service will average about the same as for a hotel, or a minimum of 20 sq. ft. per hospital room, including store room, bake shop, dish pantry and main preparation kitchen. The main preparation department consists of large storage refrigerators, butcher shop, vegetable preparation room, steamers, bake shop and batteries of ranges with soup kettles and steamers. From the main kitchen the food is transported to each floor and to each ward by a system of dumbwaiters and small elevators supplied with hospital trucks. These hospital trucks are arranged to carry a uniformly shaped and sized utensil with cover marked distinctly with tag or number for the ward from which it comes and to which it is to be returned.

Port Jervis High School, Port Jervis, N. Y.
Equipped complete by Albert Pick & Company

Each ward is provided with a diet kitchen. These diet kitchens should be approximately 14x20 ft. and contain a white porcelain sink, a small refrigerator, household range, a diet steam table with hot plate and dish warmer, in addition to a dish cupboard, work table and kitchen cabinet. Each nurse prepares the diet for her patients in these separate diet kitchens from the staple food brought up from the main kitchen in the conveyors or carriers, and the cook and herself prepare delicacies, toast and eggs in this room.

The dishes are returned to a dishwashing pantry in the kitchen which is provided with a large sterilizing dishwasher and also a system of steam sterilizers for contagious diseases.

The sterilized dishes are returned via conveyors or trucks to each diet kitchen.

Where the hospital occupies a series of buildings generally one central preparation room is selected, which is connected by tunnels with a large diet kitchen in each building, and the small diet kitchens are supplied from this distributing point in order to lessen the amount of travel.

Literature

Publications of special interest to the architect have been prepared and will be sent promptly. They include:

BG 27—General Catalog of Furnishings, Equipment and Supplies.

BG 90—Kitchen Installations.

BG 91—Hotel, Apartment Hotel, Club, Hospital and Institution Installations, picturing complete equipments.

BG 93—School Cafeterias.

BG 61—Industrial Cafeterias, Clubs and Housing Projects.

BG 165—Electric Kitchen Equipment Booklet.

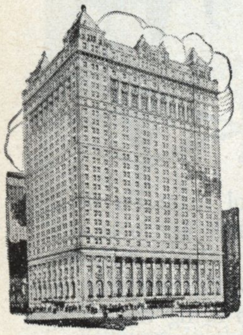
BG 166—"Petersen" Combination Urn Booklet.

BG 167—Perfect Vegetable Steamer Booklet.

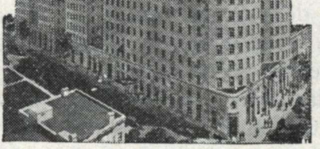
BG 168—Gas Roasting Oven Booklet.

BG 169—"Pix" Heavy Duty Coal Range Booklet.

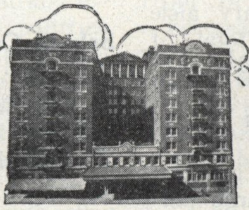
BG 47—Soda Fountains, Equipment and Supplies.



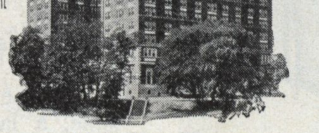
The Book-Cadillac,
Detroit, Mich.
Louis Kamper,
Architect



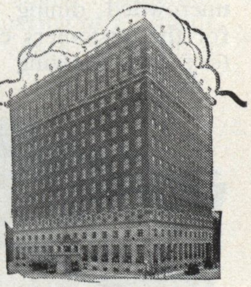
Hotel Mayflower,
Washington, D. C.
Robert F. Beresford and
Warren & Whetmore,
Associated Architects



The Hotel Kansan,
Topeka, Kan.
Shepard & Wiser,
Architects



Wade Park Manor,
Cleveland, Ohio
B. Post & Sons,
Architects



Hotel Pearson,
Chicago, Ill.
R. S. DeGolyer,
Architect

Representative Installations by Albert Pick & Company

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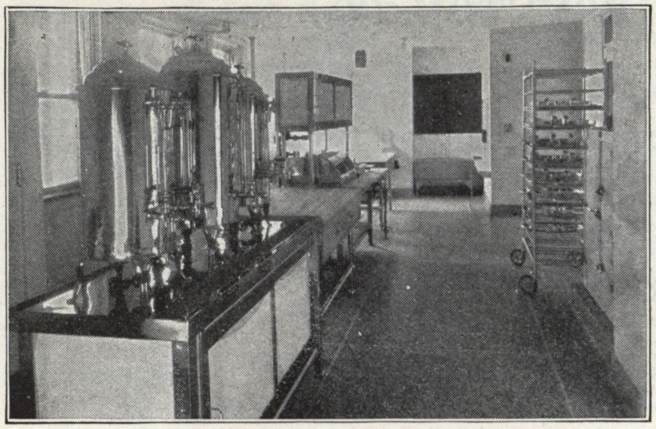
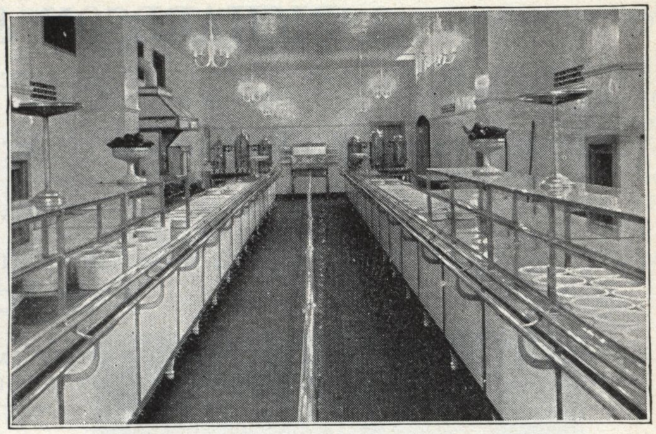


Kitchen of Mercy Hospital, Oshkosh, Wis.
Equipped complete by Albert Pick & Company



Morrison Cafeteria, New Orleans, La.
Equipped complete by Albert Pick & Company

References

The following are among the many prominent installations of Albert Pick & Company:

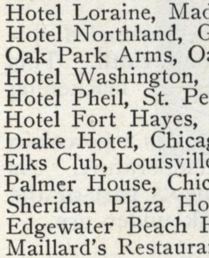
Webster Hall, Detroit, Mich., equipped complete
Fenway Hall, Cleveland, Ohio, equipped complete
Park Lane Villa, Cleveland, Ohio, equipped complete
Hotel Pearson, Chicago, Ill., equipped complete
Chicago Beach Hotel, Chicago, Ill., equipped complete
Hotel Charlotte, Charlotte, N. C., equipped complete
Vernon Manor, Cincinnati, Ohio, equipped complete
Hotel Christie, Los Angeles, Cal., equipped complete
Hotel Monticello, Longview, Wash., equipped complete
Hotel William Penn, Miami, Fla., equipped complete
Hotel Ft. DesMoines, DesMoines, Iowa, equipped complete
Hotel Loraine, Madison, Wis., equipped complete
Hotel Northland, Green Bay, Wis., equipped complete
Oak Park Arms, Oak Park, Ill., equipped complete
Hotel Washington, Shreveport, La., equipped complete
Hotel Pheil, St. Petersburg, Fla., equipped complete
Hotel Fort Hayes, Columbus, Ohio, equipped complete
Drake Hotel, Chicago, Ill., complete kitchen
Elks Club, Louisville, Ky., complete kitchen
Palmer House, Chicago, Ill., complete kitchen
Sheridan Plaza Hotel, Chicago, Ill., complete kitchen
Edgewater Beach Hotel, Chicago, Ill., complete kitchen
Maillard's Restaurant, Chicago, Ill., complete kitchen
Furniture Club, Chicago, Ill., complete kitchen
Indianapolis Athletic Club, Indianapolis, Ind., complete kitchen
Olympia Fields Country Club, Chicago, Ill., cafeteria and kitchen
Illinois Steel Co., Chicago, Ill., cafeteria and kitchen
Eline's, Inc., Milwaukee, Wis., cafeteria and kitchen
Elgin National Watch Co., Elgin, Ill., cafeteria and kitchen
Federal Reserve Bank, Cleveland, Ohio, cafeteria and kitchen
George Peabody College, Nashville, Tenn., cafeteria and kitchen
Teachers College, Warrensboro, Mo., cafeteria and kitchen
Academy High School, Erie, Pa., cafeteria and kitchen
South Side High School, Memphis, Tenn., cafeteria and kitchen
Y. M. C. A., Middletown, Ohio, complete equipment
Mercy Hospital, Toledo, Ohio, complete equipment
Indiana Soldiers Home Hospital, Lafayette, Ind., cafeteria and kitchen
Battle Creek (Mich.), Sanitarium, cafeteria and kitchen
Britling's Cafeteria, Atlanta, Ga., complete equipment
German Deaconess Hospital, Chicago, Ill., complete kitchen

Well-known Products Handled

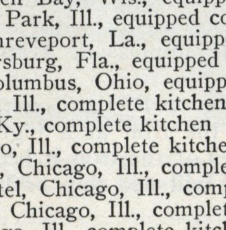
In addition to the equipment manufactured in our own factories, Albert Pick & Company also handle many other standard products of well established merit, of which the following is a partial list:

Smith's Recreation Lunch Room, Milwaukee, Wis.
Equipped complete by Albert Pick & Company

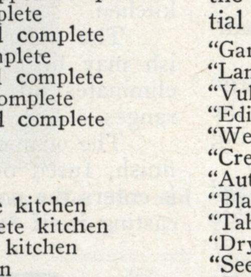
"Garland" Gas Ranges
"Lang" Patent Coal Ranges
"Vulcan" Gas Ranges
"Edison" Electric Equipment
"Wear Ever" Aluminum Equipment
"Crescent" Dishwashers
"Auto-San" Dishwashers
"Blakeslee" Dishwashers
"Tahara" Silver Burnishing Machines
"Dry-Kold" Refrigerators
"Seeger" Refrigerators
"Cherry" Brine Freezers
"Champion" Ice Cream Freezers
"Hubbard" Bake Ovens
"Blodgett" Bake Ovens
"Read" Mixing Machines
"Century" Mixing Machines
"Hobart" Mixing Machines
"Buffalo" Slicing and Chopping Machines
"Sterling" Slicing and Peeling Machines
"U. S." Slicing Machines
"Lyons" Sanitary Milk Urns and Coolers
"Sani Products" Equipment
"Vitrolite"
"Monel Metal"



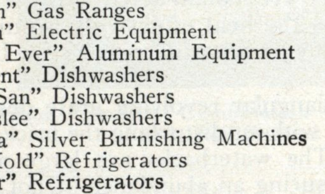
Hotel Francis Marion,
Charleston, S. C.
W. L. Stoddart,
Architect



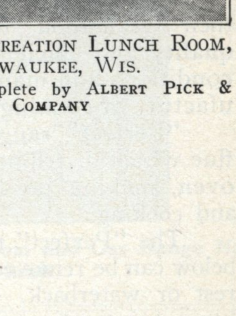
Gaylord Apartments,
Los Angeles, Cal.
Walker & Eisen,
Architects



Hotel Duluth,
Duluth, Minn.
Martin Tullgren & Sons,
Architects



Hotel Franciscan,
Albuquerque, N. M.
Trost & Trost,
Architects



Hotel Roosevelt,
New Orleans, La.
Favrot & Livaudais, Ltd.,
Architects

Representative Installations by Albert Pick & Company

RICHARDSON & BOYNTON CO.

SINCE 1837

Manufacturers of "Richardson" "Perfect" Heating and Cooking Apparatus

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Products

RICHARDSON "PERFECT" COAL and GAS COOKING RANGES.

For Richardson Warm Air Heaters, see pages 2128-2129; for Low Pressure Boilers for Steam, Vapor and Hot Water, also Domestic Hot Water Supply, Tank and Laundry Heaters, see pages 2177-2181; for Richardson Vapor-Vacuum-Pressure System of Heating, see pages 2254-2256.

Richardson "Perfect" Cooking Ranges

The Richardson "Perfect" ranges have attained their reputation through their high standard of quality and efficiency, the result of careful study of conditions and many years of experience in the manufacture of cooking apparatus.

"Perfect" ranges are constructed with a large flue which distributes the heat effectively around the oven, making possible successful results in baking and cooking.

The "Perfect" triangular revolving grate described below can be removed without disturbing the brick, grate rest or waterback. The waterbacks are large and of heavy construction, assuring an abundance of hot water.

Finish—All the coal and combination coal and gas ranges illustrated can be obtained in a full enamel finish or in the standard black finish.

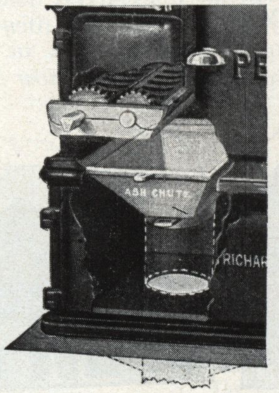
Although the enameled ranges cost slightly more than the standard range, the difference in price is soon made up in the saving of labor and general appearance.

Richardson "Perfect" Grates and Ash Chute

All "Perfect" ranges are fitted with "Perfect" triangular revolving ventilating grate bars (see illustration) for burning coal or wood. They insure a clean fresh fire.

The ash chute can be supplied as illustrated, for all "Perfect" ranges except leg base ranges. The ashes are dropped directly into an ash can or ash pit in the cellar. This does away with the dust and annoyance of ashes in the kitchen.

The attachment consists of ash chute, one damper and two lengths of galvanized pipe. No ash cans supplied. A close fitting top for the can and telescopic section of pipe should be specified to be supplied by sheet metal contractor.



Ash Chute

Can be furnished with the "Perfect" ranges. Ashes dropped directly into receptacle in cellar, avoiding dirt and dust

Richardson "Perfect" Gray Enameled Ranges

One of the greatest advances made in the improvement of cooking ranges has been the development of a satisfactory and practical enamel which will withstand heat and will not craze or chip off.

Probably nothing has added to the comfort and ease of cooking as the clean, bright finish on the enameled range. It does away with the necessity of blacking the range. It is cleaner and insures an absolute saving of labor besides adding to the attractive appearance of the kitchen.

The polished cooking top and the enameled finish may be cleaned easily with a damp cloth. This eliminates all the unpleasant features of blackening ranges.

The enameling on Richardson ranges is a porcelain finish, fused on the iron at a high temperature. As it enters the pores of the iron it becomes a part of the casting itself and will not chip or break under use.

Richardson "Perfect" Grand Range, Full Enamel Finish

Full Enamel Finish—"Perfect" ranges (full enamel models) are finished in gray enamel only. That color has proved to be the best for harmony of decoration and ease of cleaning.

Types and Sizes—The illustration herewith shows but one type of the ranges and how they are finished. In specifying, use the number of the regular range and add that it is to be in full enamel finish.

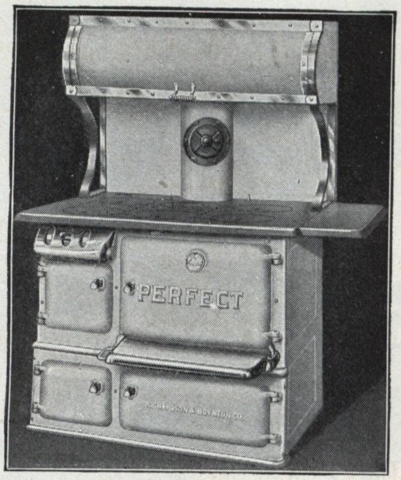
Continued on next page

Richardson "Perfect" Single Oven Coal Range

This range is the highest grade single oven coal range made by this company. As illustrated, it has an upper hot closet besides the large oven. The cooking top is large and has 6 covers.

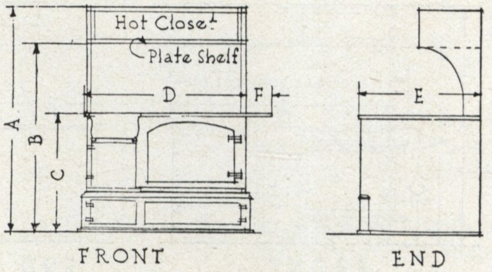
This range can also be obtained with nickel-plated plate shelf and back instead of the upper hot closet if so ordered.

It is supplied with the "Perfect" triangular revolving ventilating grate bar and can be furnished with ash chute and oven thermometer when so ordered. Made with either right or left-hand fire chamber.



Richardson "Perfect" Single Oven Coal Range No. 862 and No. 882, Full Enamel Finish

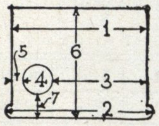
Range No.	882	862
Size of oven, in.	18x18	16½x17
Number of boiler holes	6-8 in.	6-8 in.
Diam. smoke flue, in.	7	6



Dimension Diagram of Nos. 882 and 862

Range No.	A, in.	B, in.	C, in.	D, in.	E, in.	F, in.
882	59	47½	31	39	27	7
862	58	46½	30	36	26	7

LOCATION OF ASH CHUTE FOR RICHARDSON "PERFECT" SINGLE OVEN COAL RANGE

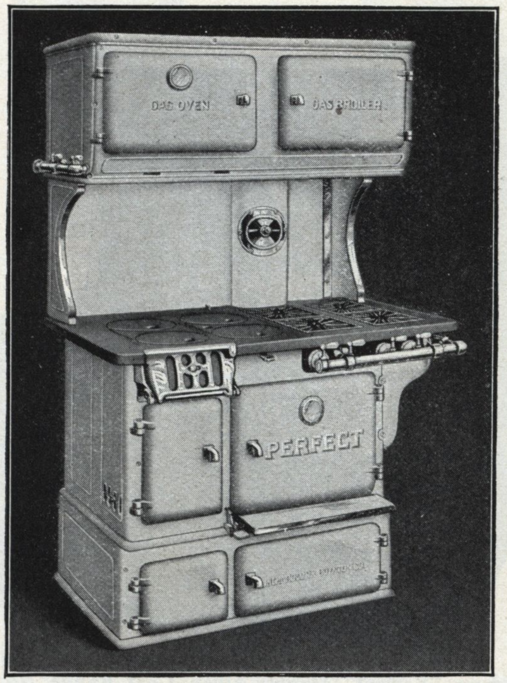


Range No.	1, in.	2, in.	3, in.	4, in.	5, in.	6, in.	7, in.
882	33¼	36½	23½	7¼	2½	25¾	6½
862	30	33¾	20¾	7¼	2	23½	6¼

Richardson "Perfect" Single Oven Combination Coal and Gas Range No. 688

Furnished as illustrated and has all the advantages of a coal and gas range combined. Has a large single oven heated by coal and a large high oven heated by gas. A large gas broiler is on the same level as the gas oven. The coal range has the same grates, etc., as the regular range. Also has hot closet below coal oven.

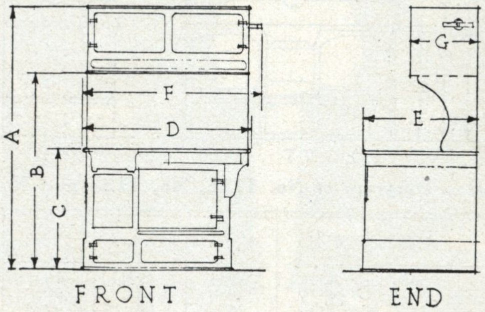
Gas and coal can be used separately or together as desired.



Richardson "Perfect" Combination Coal and Gas Range No. 688, Full Enamel Finish

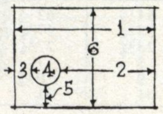
Size of oven, in.		Gas broiler, in.	Coal boiler holes	Gas burners	Smoke pipe, in.	Gas connection, in.
Coal	Gas					
18x18x12	20x16x11	15x11¾x9¼	4-8 in.	4	7	1

1 Simmering burner. 1 Giant burner. 3 Full size burners.
L-waterback for 50-gal. boiler, heated by coal fire only.
Gas oven is supplied with thermometer.
Enameled drip pan, broiler pan and splash back.
Ash chute supplied when ordered.



Dimension Diagram of No. 688

A, in.	B, in.	C, in.	D, in.	E, in.	F, in.	G, in.
63½	47	31	43½	26	48	19



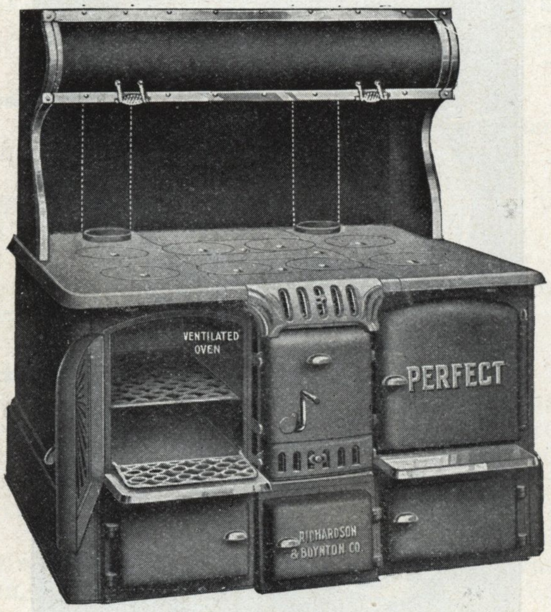
LOCATION OF ASH CHUTE FOR NO. 688

1, in.	2, in.	3, in.	4, in.	5, in.	6, in.
35½	24½	4	7¼	5¾	25

Continued on next page

Richardson "Perfect" Double Oven Coal Range

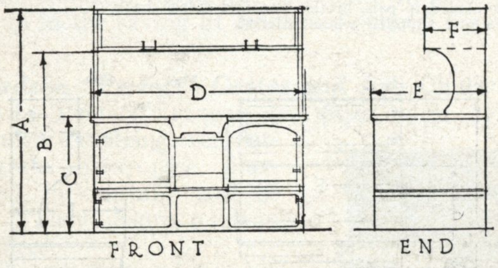
This type of range is the highest quality cast iron double oven range. It is made in three sizes and is fitted with large wrought iron ventilated removable ovens which insure the finest results for roasting or baking. The firebox is of ample size to insure a lasting and economical fire and heat the large waterback. The cooking top has 8 boiler holes—4 over the fire and 2 over each oven. This range can also be supplied with plate shelf and back instead of upper warming closet when so ordered.



Richardson "Perfect" Double Oven Coal Range No. 111E, No. 112E and No. 114E

Range No.	111E	112E	114E
Size of oven, in.	20x12x14	20x13x14	20x16x14
Boiler holes	8-8 in.	8-8 in.	8-9 in.
Smoke flue, diam., in.	7	7	8

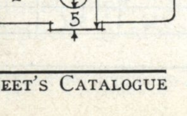
Can be supplied with shelf instead of upper hot closet.
Box waterback will heat 50 to 60 gals.
¾ waterback will heat 60 to 80 gals.
Ash chute supplied when ordered.



Dimension Diagram of No. 111E, No. 112E and No. 114E

Range No.	A, in.	B, in.	C, in.	D, in.	E, in.	F, in.
111E	55½	45½	28½	49½	28	15½
112E	55½	45½	28½	53	30	15½
114E	55½	45½	28½	60	30	15½

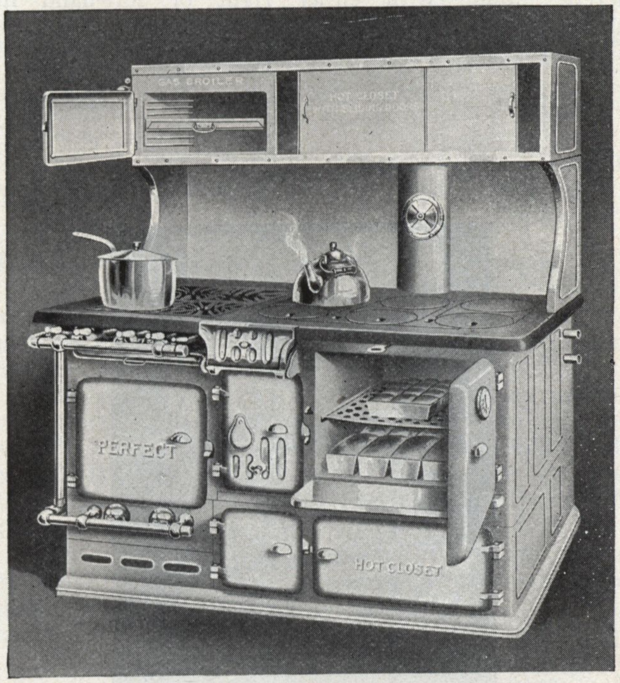
LOCATION OF ASH CHUTE FOR RICHARDSON "PERFECT" DOUBLE OVEN COAL RANGE



Range No.	111E	112E	114E
1, in.	49½	54½	62½
2, in.	21¼	23¾	27¾
3, in.	21¼	23¾	27¾
4, in.	7	7	7
5, in.	9	9	9¼
6, in.	29	31	31

Richardson "Perfect" Double Oven Combination Coal and Gas Range

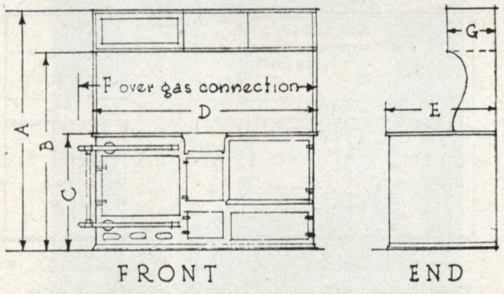
This type of range, as illustrated, combines two ranges in one unit as a double oven type. The feature of this range is that the gas section is as large and will do as much work as the coal section. They may be used separately or together as desired. It can also be supplied without the upper gas broiler if required; having the hot closet only. Waterbacks for 50-gal. capacity on a straight system can be furnished and broiler may be placed at either side of the range.



Richardson "Perfect" Double Oven Combination Coal and Gas Range No. 428, Full Enamel Finish

Range No.	Sizes of ovens, in.		Boiler holes	Gas burners
	Coal	Gas		
428	18 x 16 x 12	18 x 14 x 12	3-7 in., 3-8 in.	4 full size

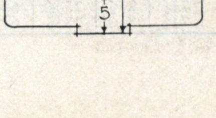
Ash chute supplied when ordered.
Can be supplied with L-waterback for 50-gal. boiler heated by coal fire only.
Gas oven is supplied with thermometer.
Smoke pipe not less than 6-in. diameter.
Gas pipe connections should be 1-in. diameter.



Dimension Diagram of No. 428

Range No.	A	B	C	D	E	F	G
428	60″	46″	30″	46″	28″	49½″	15¼″

LOCATION OF ASH CHUTE FOR RICHARDSON "PERFECT" DOUBLE OVEN COMBINATION COAL AND GAS RANGE No. 428



1, in.	2, in.	3, in.	4, in.	5, in.	6, in.
49½	20¼	22	7¼	5½	25¾

ESTABLISHED 1850

THE THATCHER COMPANY

Coal and Gas Ranges

TELEPHONES
MULBERRY 4480 (Newark)
MURRAY HILL 4072 (New York)

39-41 St. Francis Street, NEWARK, N. J.

PLANTS
NEWARK, N. J.
GARWOOD, N. J.

NEW YORK SALES OFFICE: 21 West 44th Street
WESTERN OFFICE: CHICAGO, 341 North Clark Street

Products

COMBINATION COAL and GAS RANGES; COAL RANGES; GAS RANGES.

For Warm Air Furnaces, see pages 2130-2131; for Steam and Hot Water Boilers, Garage Heaters and Hot Water Supply Boilers, see pages 2189-2191.

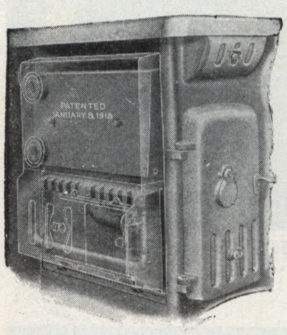
Combination Coal and Gas Ranges

Ranges are furnished in either a black polished finish or with full rich gray porcelain enamel casting finish, and ground and polished top. The casting enamel finish will not chip or crack and never requires blacking or polishing. In the process of manufacture the tops are saturated with oil, so that they will not rust.

"Twin Fire" Range—This is our highest grade combination coal and gas range and comprises the following distinctive features:

Small Space Requirements—Extreme width of range, including hot water heater, is only 40 in. Takes up no more room than a small gas or coal range, while at same time combining the advantages of both.

Easy to Keep Clean—Absence of bolts, door catches and pipes on the front, together with enamel finish throughout and solid oiled top, make cleaning simply a matter of occasionally wiping off range with a cloth. There is no nickel to tarnish.



Combination Coal and Gas Hot Water Heater

Combination Hot Water Heater—Operates with either coal or gas section or both, providing a supply of 30 to 40 gal. of hot water per hour. It saves the expense of the usual standard type copper coil heater.

Double Cooking Capacity—The two large gas ovens in upper works and coal oven in body give double the cooking capacity and assure safety as well—gas and coal sections being independent in action.

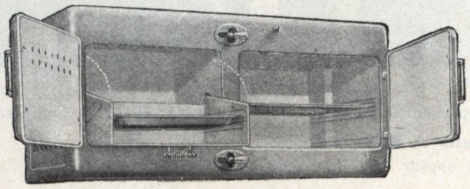
Large Gas Broiler Capacity—This is secured by the 7 rows of flame, controlled by one gas cock, which surround the oven and distribute the heat uniformly instead of concentrating it at one point.

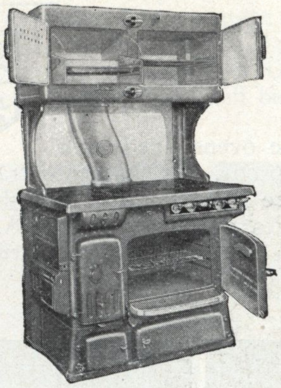
Ventilation and Draft Regulation—The special draft check provides efficient ventilation and draft regulation, and permits passing the heat around the oven before permitting its escape up the flue.

Swing Down Broiler Rack—Permits broiler rack to be swung downward and outward for inspection purposes without danger of burning the fingers.

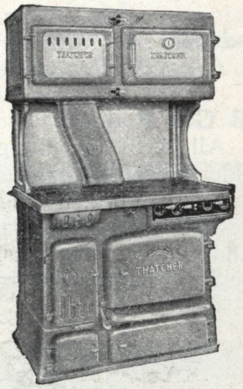
Other Features—Automatic lighter, foot opener for oven door, large low closet and ash pit, a thermometer in each door and a grate arrangement permitting instant and easy removal of grates for replacement.

Swing Down Broiler Rack





No. 100 "Twin Fire" Range



No. 300 Coal and Gas Range

DIMENSIONS FOR NUMBERS 100, 200, 300, 400

Height, in.	Height to cooking top, in.	Cooking top, in.	Gas oven, in.	Gas broiler, in.	Coal oven, in.
67½	33½	40x27¾	19x16x11¼	16¼x12½x10	18½x19x12

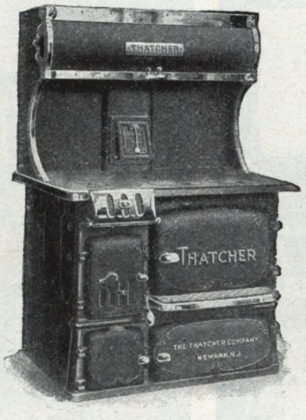
An Approved Range—This range meets all requirements of the "American Gas Association" and those of "Good Housekeeping." To further insure the quality of the individual range, each one is inspected and tested by gas, water and air at the plant.

No. 300 Range—A lower priced range than "Twin Fire," but includes all its distinctive features with exception of combination hot water heater. Ample hot water supply is available for household use when coal section is used. Furnished in rich gray porcelain enamel.

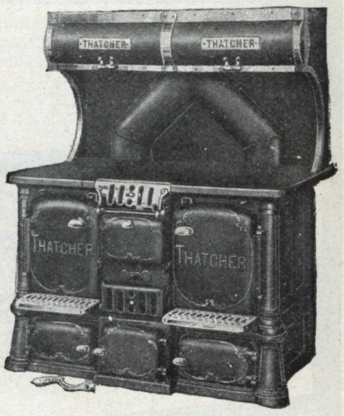
Single and Double Oven Coal Ranges

These ranges are made of the finest grade of gray iron. All sheet metal parts are of Wellsville steel of heavy gauge, and nickel trimmings are heavily plated and buffed to produce a lasting finish.

Waterbacks are large and effective. Upper warming closet is of Wellsville steel, and is large and convenient. Ovens are broad and very roomy. Triangular revolving grates have both bars fitted with shaker shanks for removing ashes. Direct draft damper is operated from outside of range. Range is fitted with sifting grate and large ash pan. Either side of the double range may be used independently.



No. 88 Single Oven Range



No. 18 Double Oven Range

No.	Top, in.	Number of Covers	Covers, in.	Ovens, in.
77	34 x25½	6	7	16 x17x10½
78	36 x25½	6	8	16 x17x10½
88	38 x26½	6	8	18½x19x12
820	40½x28¾	6	8	20 x20x13
920	40½x28¾	6	9	20 x20x13
18	50¾x27¼	8	8	13 x20x14

A-B STOVE COMPANY

Manufacturers of A-B Gas Ranges

BATTLE CREEK, MICH.

Product

A-B Gas Ranges.

A-B Gas Ranges

All A-B Gas Ranges have ovens lined with Wilder metal, guaranteed rustproof. Ovens are extra heavy gauge and in addition are heavily insulated with asbestos. All A-B Gas Ranges are built to A.G.A. Standard Specifications, which are the only standard specifications for gas ranges.

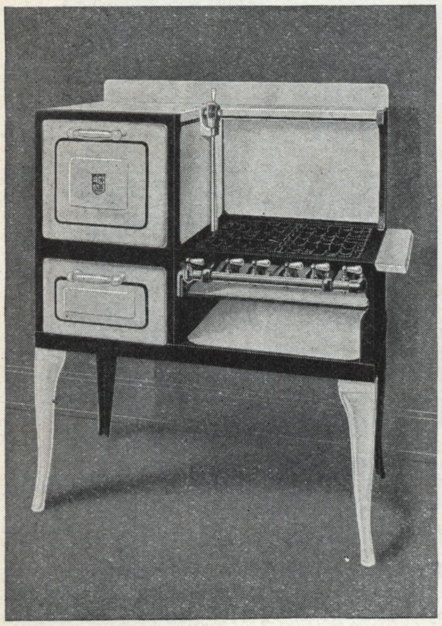
Literature

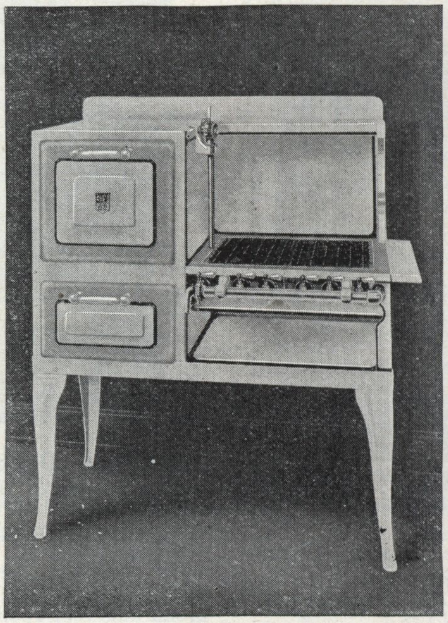
The following literature is available and will be sent on request:

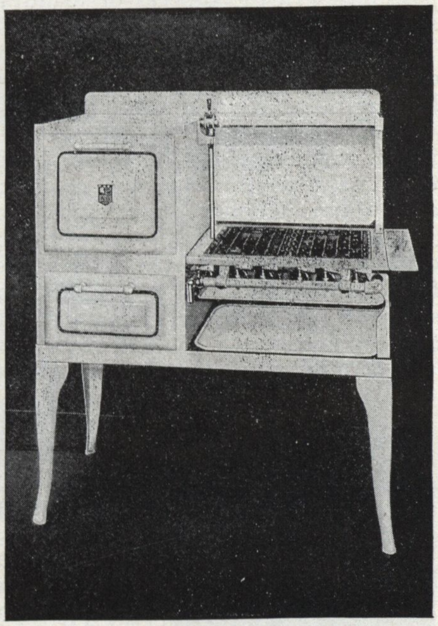
(1) Copy of American Gas Association Specifications.

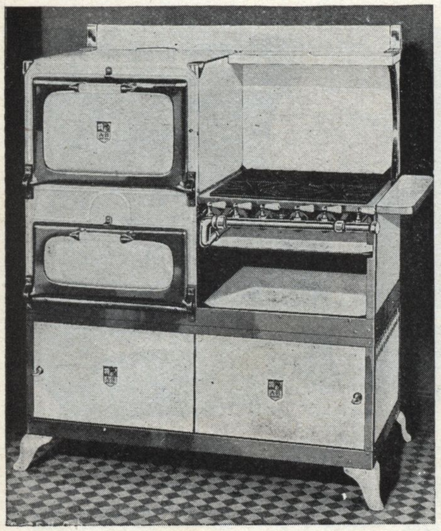
(2) Booklet, "Modern Apartments," showing photographs of apartments, installations in kitchens, cuts of ranges and detail dimensions.

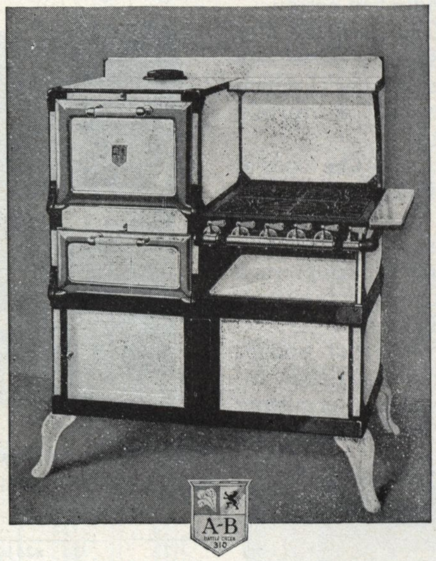
(3) Descriptive booklet showing styles and sizes adapted to apartment house use.


No. 503 A-B Gas Range
Semi-white

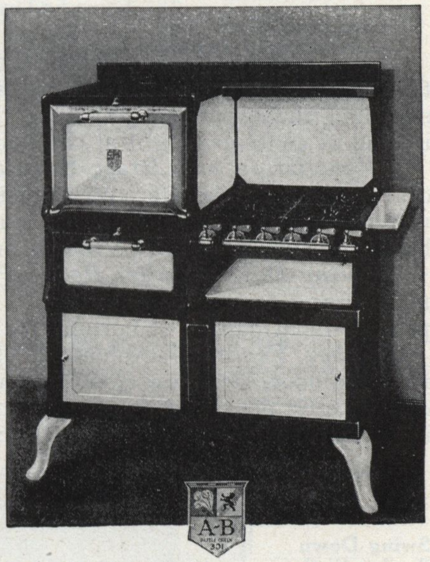

No. 505 A-B Gas Range
White with gray trimmings


No. 506 A-B Gas Range
Snow white


No. 18-29E A-B Compartment Range



No. 310 A-B Compartment Range



No. 301 A-B Compartment Range

A Few Styles from the Famous A-B Aristocrat Line

Detail dimensions of the above stoves appear on the following page

Continued on next page

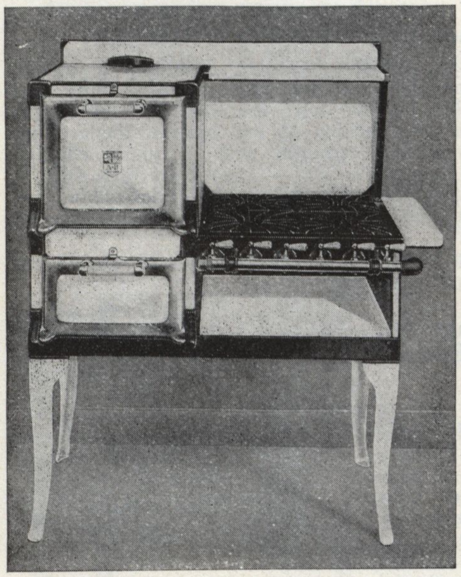
Styles and Finishes

A-B Gas Ranges are made in a wide range of styles, sizes and finishes, but each range is built to conform to the basic specifications of the American Gas Association.

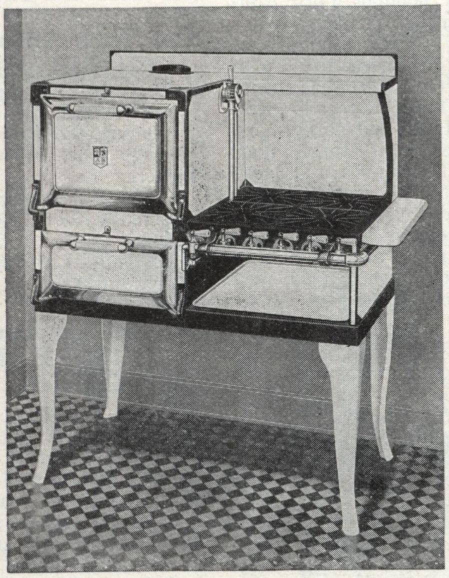
These specifications deal only with the important essentials of construction and should be required when asking for bids on gas ranges. In no other way is it possible to arrive at a correct understanding of value. Space prevents our making a complete showing of all styles and sizes suitable for apartments. Buyers who desire to provide assurance of full utility of space as well as safety, efficiency and beauty in the appliances should request company literature.

Specifications

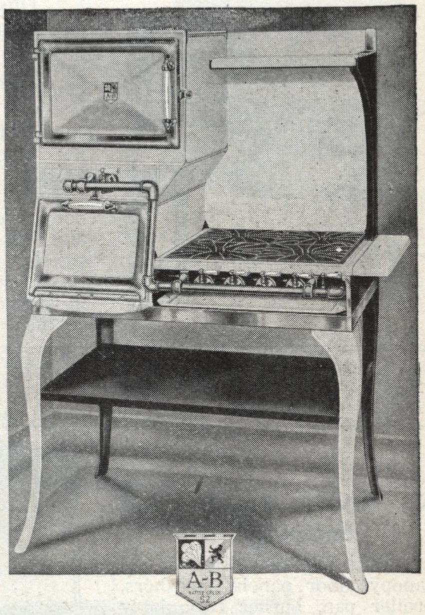
The specifications given below deal chiefly with size, capacity and appearance. Since the basic specifications for construction are quite important, we wish to emphasize that every A-B Gas Range conforms to the specifications of the American Gas Association. A copy of these specifications will be sent on request.



No. 200 A-B Gas Range



No. 300 A-B Gas Range



No. 52 A-B Gas Range

DETAIL DIMENSIONS OF A-B GAS RANGES—INCHES

Range No.	Width	Depth	Height	Cooking top*	Oven size[1]	Finish
503	47	28	53½	21x24	21x16x14	Semi-white—black vitreous
505	47	28	53½	21x24	21x16x14	White with gray doors and top
506	47	28	53½	21x24	21x16x14	All-white—no nickel
200	39	26	48	21x19	20x13x12	White enamel—nickel trim
201	39	26	48	21x19	20x13x12	Black enamel—white splashers, nickel, 4 burners
208	39	26	48	21x19	20x13x12	Semi-white—nickel trim
300	42	26	48	21x19	20x16x12	White enamel—nickel trim
301 Comp.	42	26	50	21x19	20x16x12	Black enamel—white splasher, nickel
308	42	26	48	21x19	20x16x12	Semi-white—nickel trim
18-29 Comp.	45	26	50	21x20	20x18x12	Semi-white—low compartments
310 Comp.	43	26	50	21x19	20x16x12	Black enamel—white splashers, low compartments
52	40	28	57	22x22	18x15x11	
22	31	25	55	16x24	18x16x12	Black—white splashers, 4 burners

*Depth by width. (1) Depth by width by height.

A Few Notable A-B Installations

Building and Location	Number of Ranges
The Villa Norma, New York, N. Y	50
Congress Apartments, New York, N. Y	60
Northland Apartments, New York, N. Y	185
Pickwick Arms Apartments, New York, N. Y	150
Brainard Road Apartments, Boston, Mass	75
New Kilsyth Apartments, Boston, Mass	114
Summit Realty Trust Apartments, Boston, Mass	108
Parkway Sections Apartments, Boston, Mass	100
Gaston Circle Apartments, Boston, Mass	100
Pilgrim Court Apartments, Boston, Mass	117
Modern Realty Trust Co. Apartments, Boston, Mass.	170
Birch & Cadigan Apartments, Boston, Mass	97
Bradford Terrace Apartments, Brookline, Mass	26
Bedford Hall Apartments, Brooklyn, N. Y	35
George Washington Apartments, Brooklyn, N. Y	98

Building and Location	Number of Ranges
Buckingham Apartments, Detroit, Mich	32
Gladstone Apartments, Detroit, Mich	32
Clifford Manor Apartments, Detroit, Mich	128
Grace Harper Apartments, Detroit, Mich	72
Brown Apartments, Detroit, Mich	24
Adair Apartments, Atlanta, Ga	20
Earl Apartments, Atlanta, Ga	10
Bullards Apartments, Atlanta, Ga	12
Walker Apartments, Atlanta, Ga	10
Pershing Point Apartments, Atlanta, Ga	30
Granger Court Apartments, Atlanta, Ga	10
Hotel Windermere East, Chicago, Ill	198
New Aldine Apartments, Milwaukee, Wis	59
Peacock Apartments, Kansas City, Mo	110

ESTABLISHED 1840

ABENDROTH BROTHERS

Manufacturers of Gas Ranges

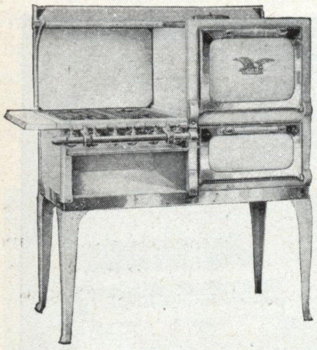
PORT CHESTER, N. Y.

Product

York Abendroth Gas Ranges.
For Heaters, see page 2132.

YORK
ABENDROTH

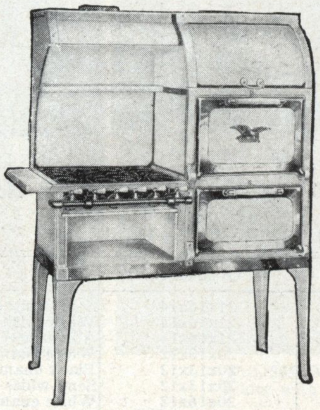
No. 801 E Range (Full Enamel)



This popular York cabinet gas range is made in five finishes: "Full Enamel" as shown; "Semi-enamel" with black front, top and corner post; "Trade Special" with enamel front and corner post but black top frame, door frames, body sides and legs; "Special" with black frames, body sides and back legs; and "Regular" with white panels, pans and splashers. Cast iron parts furnished in either gray or white enamel.

No.	Height, in.	Width, in.	Bake oven, in.	Broil. oven, in.
401 E	47½	35	14x18x11	14x18x8
601 E	48½	44	16x18x12	16x18x8
801 E	51	48	18x18x13	18x18x9

No. 804 E Range (Full Enamel)

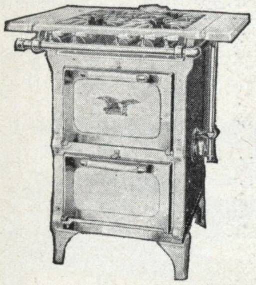


With enamel roll closet and canopy, door panels, splashers, broiler pan, burner tray, body top, high shelf, legs, body sides, burner box bottom, front, top frame and corner post.

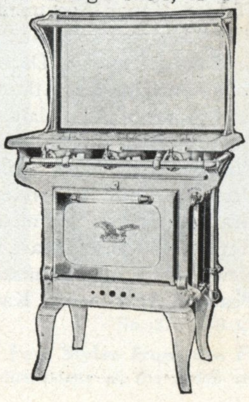
Can also be furnished with a six-burner top and in regular finish, which equipment consists of enamel door panels, splashers, broiler pan and burner tray.

No.	Height, in.	Width, in.	Bake oven, in.	Broil. oven, in.
804	60½	48	18x18x13	18x18x9
804-6	60½	57	18x18x13	18x18x9

No. 239-16 Enamel Range



This extremely attractive double oven range has met with instant approval. Enamel door panels, broiler pan and burner tray, front, top frame, end shelves and legs. Nickel door frames and band iron body frame. Can be furnished with white enamel splasher back and high shelf, if desired. 36 in. high, 32 in. wide with shelves or 24½ in. wide without shelves and with spacious 16-in. ovens. Cast iron parts either gray or white enamel. Can also be furnished in regular finish with enameled panels, burner tray and broiler pan.



No. 8-17 S Range

This desirable cooking unit has three large top burners and spacious 16-in. bake oven with combination broiler. With white enamel door panel, broiler pan and burner tray, gray enamel front and top frame and legs. Nickel door frame and manifold. Automatic safety device permits use of broiling or baking burners separately, but not both at the same time. White enamel splasher and high shelf, if desired. 45 in. high over all; 31 in. high to cooking top; 28 in. wide. Can also be furnished in regular finish with enamel door panel, burner tray and broiler pan.

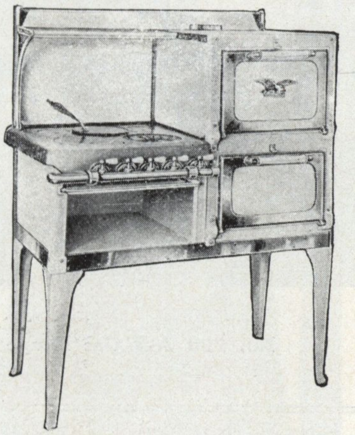
The York Abendroth Sol-Lid-Top (Patented)

Embodies special exclusive features, including a unique nesting of the top grate and lid, thus exposing only one joint between the lid and the top; the lifter slot is closed, preventing the flame from licking up and burning the arm or igniting loose sleeves, and equipped with unusually efficient burners.

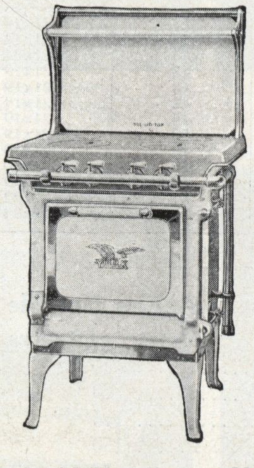
All of the desirable advantages of Sol-Lid-Top cooking are obtained without sacrifice of oven space through our exclusive design.

All Sol-Lid-Top ranges are equipped with automatic top burner lighter.

Sol-Lid-Top Range No. 1801 E (Enamel Cabinet)



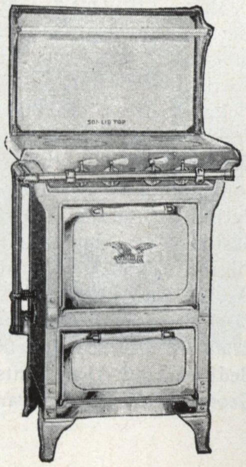
This attractive unit is fully enameled with nickel trim and polished cooking top. 51 in. high; 44 in. wide and large 18-in. ovens. Cast iron parts either gray or white enamel. It can be had in various other finishes, including: "Semi-enamel," "Trade Special," "Special" and "Regular." Can be furnished with ovens on left or right and with oven heat regulator, if desired.



Sol-Lid-Top Range No. 1603 M (Single Oven Enamel)

A highly efficient single oven range with combination oven for baking and broiling. Enamel door panel, pan and tray, legs, front frame, splash back and high shelf with nickel trim. 50 in. high over all; 26 in. wide, and spacious 16-in. oven. Cast iron parts either gray or white enamel. Can also be furnished in regular finish.

Sol-Lid-Top Range No. 1602 M (Double Oven Enamel)



With enamel door panels, broiler pan and burner tray, gray or white front frame and legs, white splasher back and high shelf with nickel trim. Can also be furnished in regular finish, which includes enamel door panels, broiler pan and burner tray. 52½ in. high over all; 26 in. wide, and spacious 16-in. ovens.

On the single oven and the double oven ranges the entire Sol-Lid-Top is heating surface—from tip to tip.

AMERICAN STOVE COMPANY

Gas Ranges

925 Chouteau Avenue

ST. LOUIS, MO.

GEORGE M. CLARK & COMPANY DIVISION, CHICAGO, ILL.
Manufacturers of Clark Jewel Gas Ranges

NATIONAL STOVE COMPANY DIVISION, LORAIN, OHIO
Manufacturers of Direct Action Gas Ranges

RELIABLE STOVE COMPANY DIVISION, CLEVELAND, OHIO
Manufacturers of Reliable Angliron Gas Ranges

QUICK MEAL STOVE COMPANY DIVISION, ST. LOUIS, MO.
Manufacturers of Quick Meal Gas Ranges

NEW PROCESS STOVE COMPANY DIVISION, CLEVELAND, OHIO
Manufacturers of New Process Gas Ranges

DANGLER STOVE COMPANY DIVISION, CLEVELAND, OHIO
Manufacturers of Dangler Gas Ranges

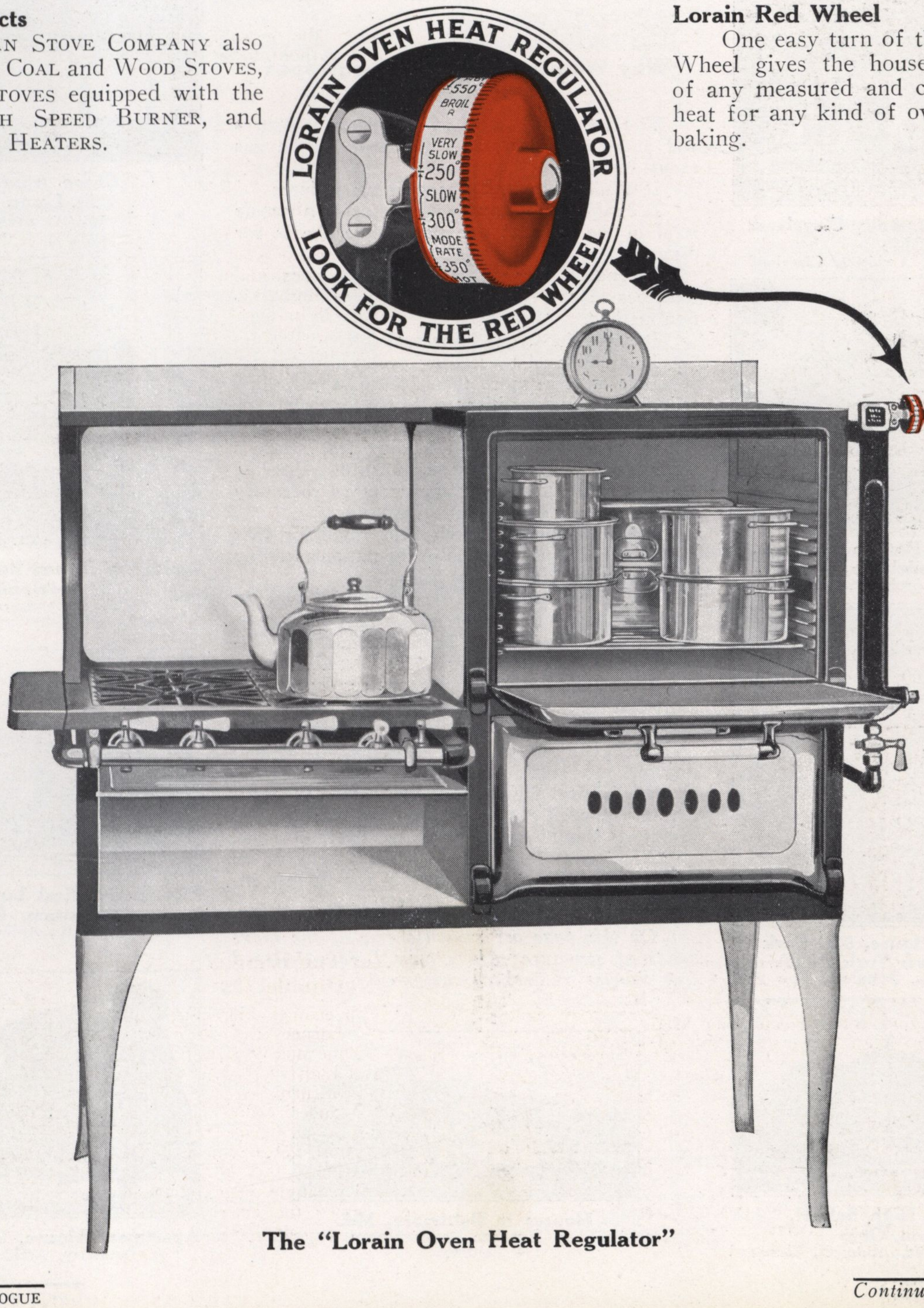
SOLD BY MORE THAN 13,000 GAS COMPANIES, DEPARTMENT STORES AND HARDWARE, FURNITURE AND STOVE DEALERS IN ALL PARTS OF THE UNITED STATES

Other Products

American Stove Company also manufactures Coal and Wood Stoves, Oil Cook Stoves equipped with the Lorain High Speed Burner, and Oil and Gas Heaters.

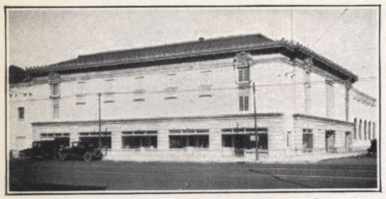
Lorain Red Wheel

One easy turn of the Lorain Red Wheel gives the housewife a choice of any measured and controlled oven heat for any kind of oven cooking or baking.

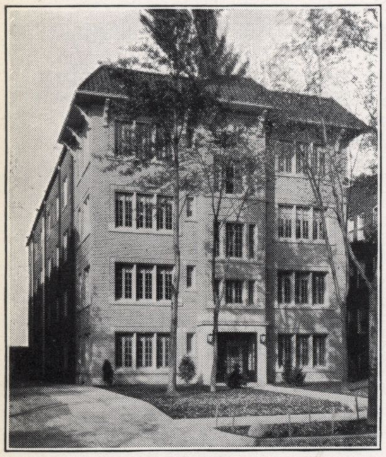


The "Lorain Oven Heat Regulator"

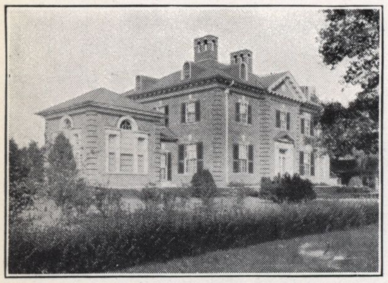
Continued on next page



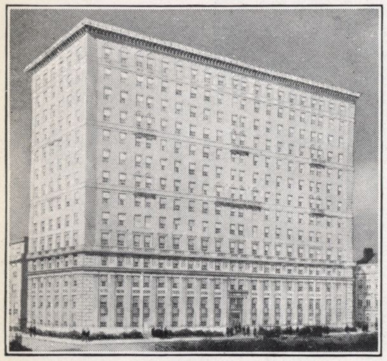
Glenville Masonic Temple, Cleveland, Ohio
The Carter-Richards Co., Architects, Cleveland



Biltmore Apartments, Cleveland, Ohio
A. F. Janowitz, Architect, Cleveland



Residence of Nathan Raidman, W. Philadelphia, Pa.
Simon & Simon, Architects, Philadelphia



Apartment House, 580 Park Avenue, New York, N. Y.
J. E. R. Carpenter, Architect, New York

McKinley High School, Canton, Ohio
George F. Hammond, Architect, Cleveland

Here Is Something of Importance

On the following pages are illustrated only a few of the great number of sizes, styles and finishes of gas ranges manufactured by the American Stove Company, the world's largest manufacturers of cooking appliances.

All ranges illustrated are equipped with the famous Lorain Oven Heat Regulator, a thermostatic device which regulates and automatically controls the temperature of the oven, thereby preventing cooking failures and making possible many unusual cooking processes.

Why Women Want Lorain-equipped Gas Ranges

The Lorain Oven Heat Regulator measures and automatically controls the heat of the gas range oven.

It absolutely eliminates cooking failures.

It enables the housewife to cook a *whole meal* in the oven at one time while she is far distant.

It enables her to can all her fruits and tomatoes in the oven by the approved sterilization method.

It saves food, gas, time and labor.

It is endorsed by leading cookery experts.

It is used in more than 1400 of the leading schools and universities to teach thousands of women the science of cookery.

It is approved by all leading test kitchens including: Good Housekeeping Institute, Priscilla Proving Plant, Forecast Experimental Laboratory and the New York Tribune Institute.

It is the original oven heat regulator that has been heavily advertised in the nation's leading magazines for nearly six years.

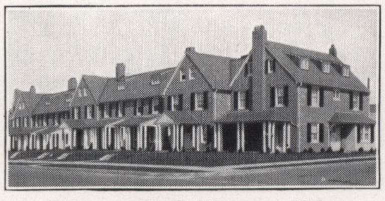
Lorain-equipped Gas Ranges are used in thousands upon thousands of the nation's homes, in churches, apartments, hospitals, industrial institutions and fraternal and lodge buildings.

More than 13,000 gas companies, department stores, furniture, hardware and stove dealers in all parts of the country sell these famous ranges and will gladly explain and demonstrate them to any one interested.

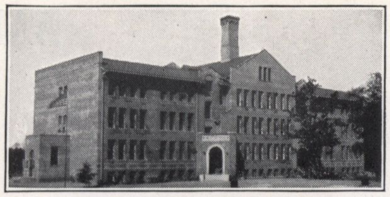
These are the reasons why women want Lorain-equipped gas ranges and the reasons why architects should specify them whenever possible.

Architects are invited to write to any or all of the divisions of the Company for further information, catalogues, prices, etc.

On this page are shown a few of the thousands of structures which have Lorain-equipped Gas Ranges as cookery equipment.

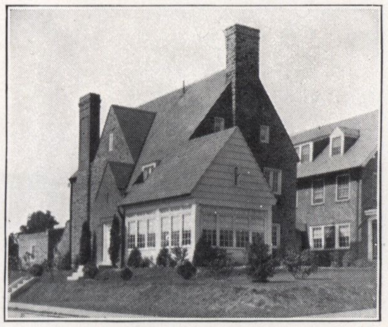


Houses in Baltimore, Md.
Built by Mueller Construction Co., Baltimore



O'Keefe Junior High School, Atlanta, Ga.
Marye, Alger & Marye, Architects, Atlanta

Chase Apartments St. Louis, Mo.
P. J. Bradshaw, Architect, St. Louis

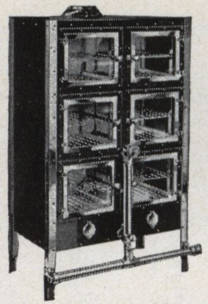


Residence Owned By George Knies, Philadelphia, Pa.
Don Peters, Architect, Philadelphia

First Evangelical Lutheran Church, Lorain, Ohio
George C. Baum, Architect, Philadelphia

Apartment House, Cleveland, Ohio
A. Janowitz, Architect, Cleveland

Continued on next page



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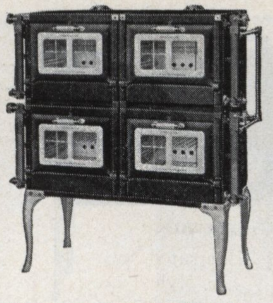

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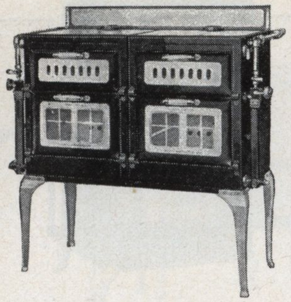

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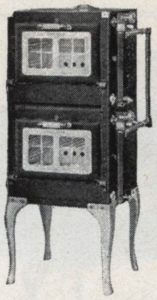

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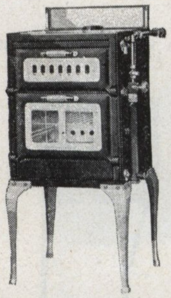

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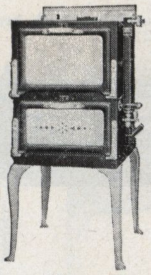
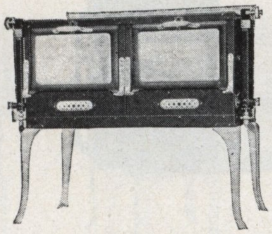


Quick Meal No. 111



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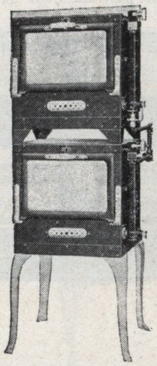

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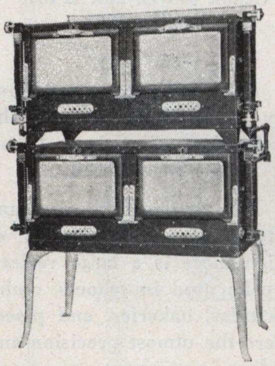

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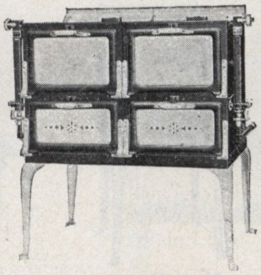

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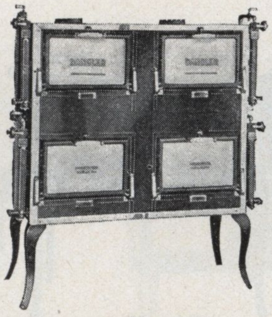
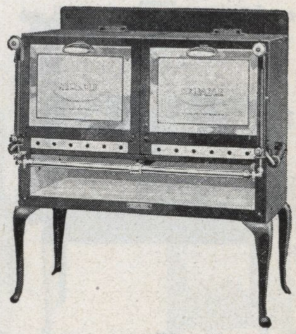


Dangler No. 2004



Reliable No. 950

Special Lorain-equipped Gas Ovens for Schools and Laboratories

The above ovens are especially designed for experimental work and instruction in oven cookery. Any Lorain-equipped gas range is suitable for the same purpose if the cooking-top is required

Table of Dimensions

Stove No.	Broiler			Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
60				9½″	14″	11″	52″	16″	31″
40				12″	18″	18″	58″	25″	55½″
30	7½″	18″	18″	12″	18″	18″	53½″	25″	55½″
20				12″	18″	18″	58″	25″	28″
15	7½″	18″	18″	12″	18″	18″	53½″	25″	28½″
111	9″	21½″	18″	12″	21½″	18″	52″	25″	27″
102				12″	21½″	18″	44″	25″	52″
103				12″	21½″	18″	66″	25″	27″
104				12″	21½″	18″	66″	25″	52″
122	9″	21½″	18″	12″	21½″	18″	52″	25″	52″
2004				12″	18″	18½″	60″	24″	58″
950				14″	18″	18½″	51½″	24¾″	47½″

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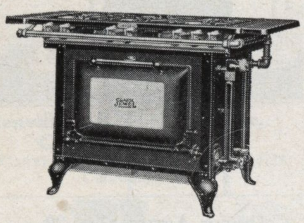
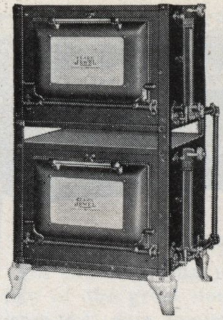
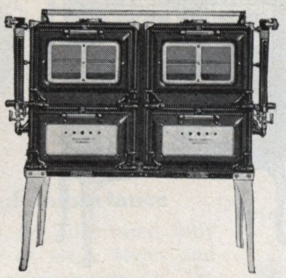


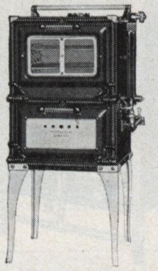
Clark Jewel No. A-456



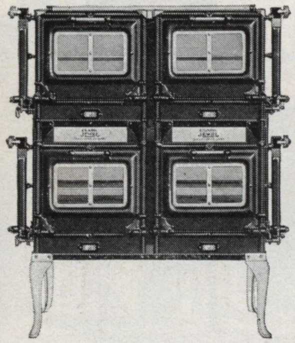
Clark Jewel No. A2-456



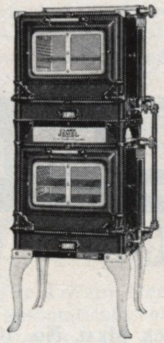
Clark Jewel No. A-238



Clark Jewel No. A-138

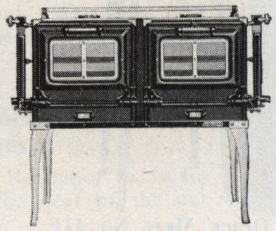


Clark Jewel No. A-284



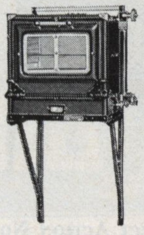
Clark Jewel No. A-182

Also furnished with bracket (No. A-282)

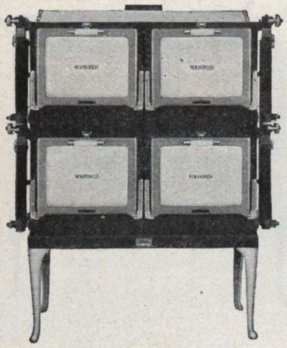


Clark Jewel No. A-282

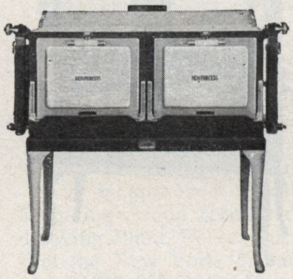
Also furnished with standard legs (No. A-181)



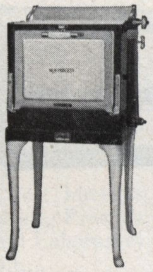
Clark Jewel No. A-181
On Bracket



New Process No. 118-04
Semi-enamel



New Process No. 118-02
Semi-enamel



New Process
No. 118-01
Semi-enamel

NOTICE

Any Lorain equipped stove may be used in schools, the special Domestic Science Ovens not always being used.

All American Stove Company ranges and ovens, of which there is a large variety, may be used in schools, clubs, cafeterias, bakeries, and places where the utmost precision and modern equipment are required.

Special Lorain-equipped Gas Ovens for Schools and Laboratories

The above ovens are especially designed for experimental work and instruction in oven cookery. Any Lorain-equipped gas range is suitable for the same purpose if the cooking-top is required

Table of Dimensions

Stove No.	Broiler			Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
A-456				14″	22″	22½″	32½″	33″	49″
A2-456				14″	22″	22½″	52½″	30″	36″
A-238	10″	20″	18½″	14″	20″	18½″	52½″	26″	56″
A-138	10″	20″	18½″	14″	20″	18½″	52½″	26″	28″
A-284				14″	20″	18½″	64″	29½″	56″
A-182				14″	20″	18½″	64″	29½″	28″
A-282				14″	20″	18½″	44″	26″	56″
118-04				13½″	18½″	18½″	65″	28½″	53½″
118-02				13½″	18½″	18½″	49½″	26½″	53½″
118-01				13½″	18½″	18½″	49½″	26½″	27″
A-181 on brackets				14″	20″	18½″	24″	26″	28″

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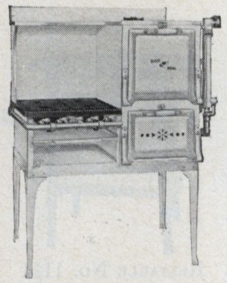
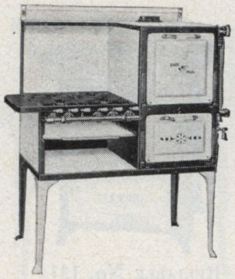
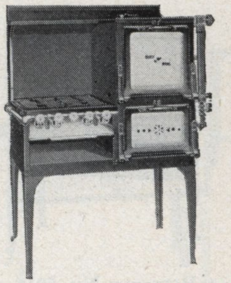


Quick Meal No. 9-604

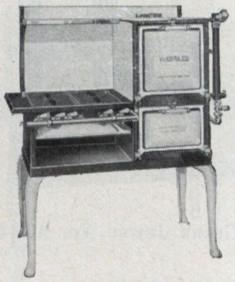
Quick Meal No. 1787-W



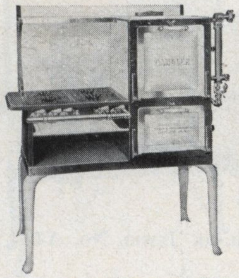
Quick Meal No. 1-414



Quick Meal No. 8-104



Dangler No. 2470-XF



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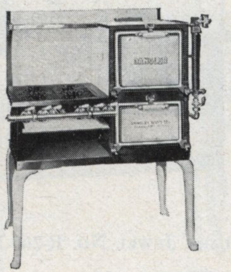
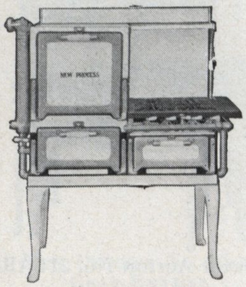


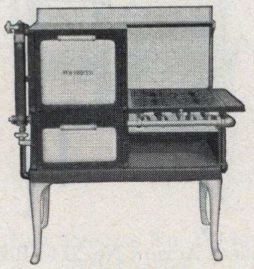
Dangler No. 2477-XF

Dangler No. 2475-EF



New Process No. 4-36
All-enamel

New Process No. 114-36
Semi-enamel



New Process No. 139-16
Semi-enamel

New Process No. 18-81

Special Lorain-equipped Gas Stoves for Small Kitchens

All cabinet ranges can be made with left or right hand ovens

TABLE OF DIMENSIONS

Stove No.	COOKING TOP			BROILER			OVEN			RANGE		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
9-604	32½″	23″	19¾″	9¼″	21″	14″	14″	21″	14″	54″	28½″	44″
1787-W	36″	25½″	25″	9″	18″	18″	12″	18″	18″	36″	26″	36½″
1-414	32½″	21″	20″	9″	20″	14″	14″	20″	14″	52″	27″	47″
8-104	32½″	23″	19¾″	9¼″	21″	14″	14″	21″	14″	54″	28½″	44″
2470-XF	31½″	20½″	22″	8″	19″	14″	14″	19″	14″	51″	27½″	47″
2471-XF	32″	20″	21″	8″	19″	14″	14″	19″	14″	51″	26″	48″
2477-XF	31½″	20½″	19½″	8″	19″	14″	12″	19″	14″	46″	26″	41″
2475-EF	33¼″	22″	20½″	10″	19″	14″	12″	19″	14″	50″	26″	48″
4-36	32″	21½″	20″	8½″	18½″	14½″	14½″	18½″	14½″	52″	27½″	44″
114-36	32″	21½″	20″	8½″	18½″	14½″	14½″	18½″	14½″	52″	27½″	44″
139-16	32″	22″	22″	8½″	18″	16½″	14½″	18″	16½″	50½″	27½″	45½″
18-81	32½″	23¼″	36″				12″	18½″	18½″	34″	29″	36″

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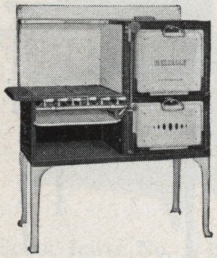
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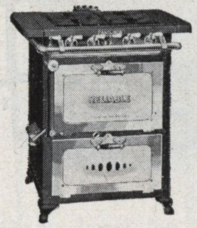
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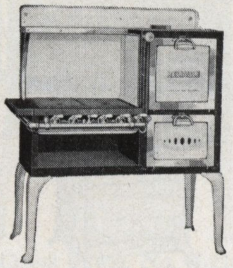
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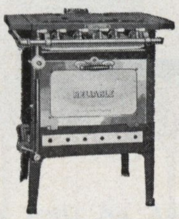
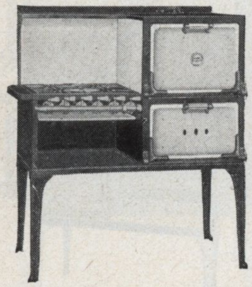
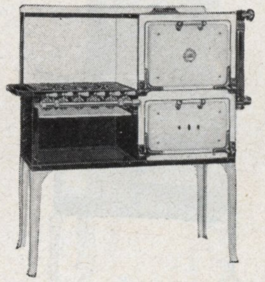
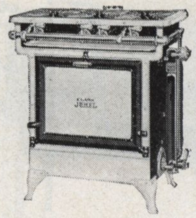
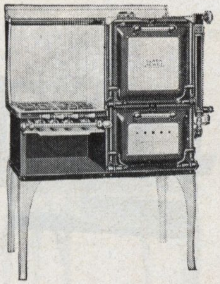
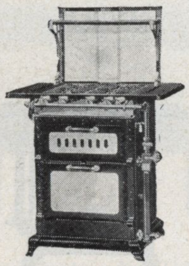

Reliable No. 1124

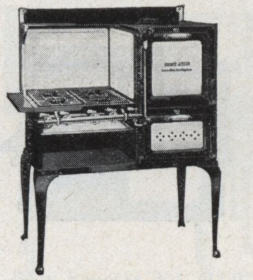

Clark Jewel No. G-160

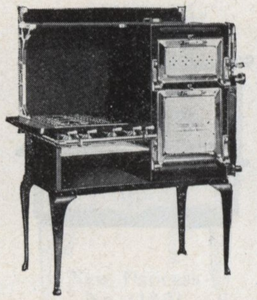

Clark Jewel No. R-260-X

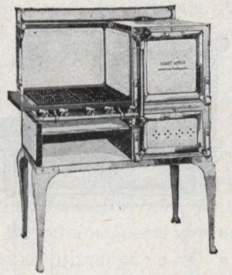

Clark Jewel No. A-234


Clark Jewel No. A-3446


Direct Action No. 130-HR with Back Shelf


Direct Action No. 214-ER-HR


Direct Action No. 314-R-HR


Direct Action No. 214-AR-HR

Special Lorain-equipped Gas Ranges for Small Kitchens

All cabinet ranges can be made with left or right hand ovens

Table of Dimensions

Stove No.	Cooking Top			Broiler			Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
5916	33″	19″	23⅜″	10″	18″	16″	14″	18″	16″	52¼″	25″	43¾″
1314	34⅛″	21¾″	29⅞″	9⅛″	18″	18½″	11″	18″	18½″	34⅛″	29″	29⅞″
5481	30¾″	20½″	25½″	10″	18″	14″	14″	18″	14″	51¾″	24¾″	45″
1124	35″	21¾″	29⅞″				11″	18″	18½″	35″	29″	29⅞″
G-160	32″	19⅛″	20¼″	9¼″	18½″	16½″	12″	18½″	16½″	47¼″	23½″	43″
R-260X	32″	19⅛″	20¼″	9¼″	18½″	16½″	12″	18½″	16½″	47¼″	24″	48″
A-234	34″	13½″	28″				14″	13″	18½″	34″	19½″	30½″
A-3446	32″	23″	17½″	10″	20″	14½″	14″	20″	14½″	52″	29″	41″
130-HR-Shelf	36″	24″	36″	8½″	18″	18″	12″	18″	18″	54½″	24″	36″
214-ER-HR	32½″	21″	24″	8½″	19½″	14″	14″	19½″	14″	51″	26″	42″
314-R-HR	32½″	21″	24″	8½″	19½″	14″	14″	19½″	14″	55″	26″	46½″
214-AR-HR	32½″	21″	24″	8½″	19½″	14″	14″	19½″	14″	51″	26″	42″

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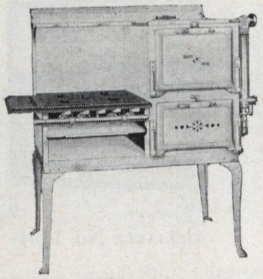
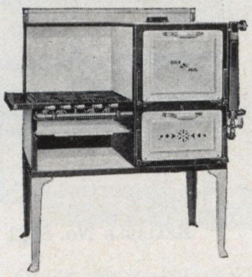
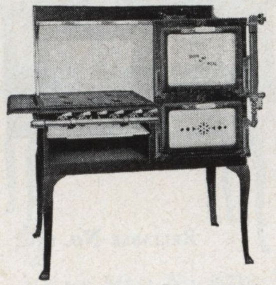

QUICK MEAL No. 9-608


QUICK MEAL No. 1-416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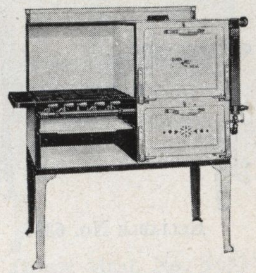
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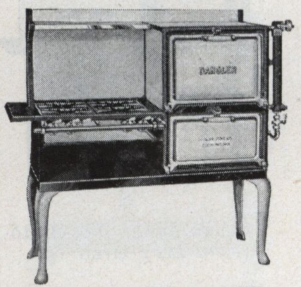
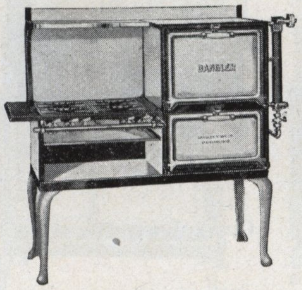
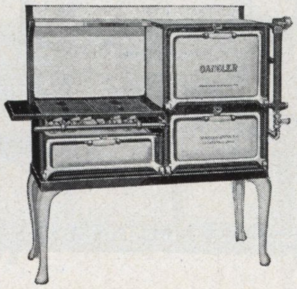

DANGLER No. 2233-XF
SEMI-ENAMEL


DANGLER No. 2233-EF
ALL-ENAMEL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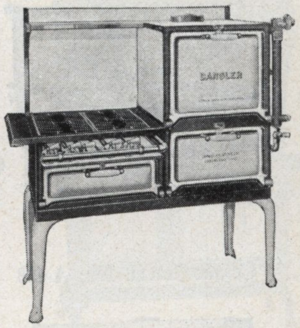
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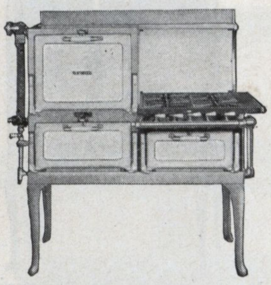
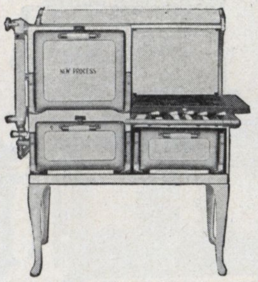
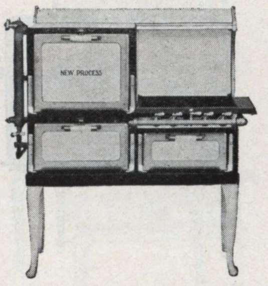

NEW PROCESS No. 28-44
GRAY ENAMEL


NEW PROCESS No. 6-40
ALL-ENAMEL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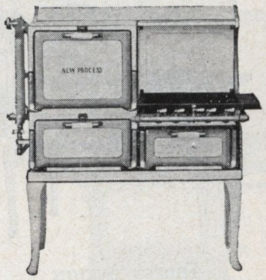
SEMI-ENAMEL


NEW PROCESS No. 8-44
ALL-ENAMEL

Special Lorain-equipped Gas Stoves for Medium Kitchens

All cabinet ranges can be made with left or right hand ovens

TABLE OF DIMENSIONS

Stove No.	COOKING TOP			BROILER			OVEN			RANGE		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
9-608	32″	25″	23″	9″	21″	18″	12″	21″	18″	51½″	28¾″	55½″
1-416	32½″	21″	20″	9″	20″	16″	14″	20″	16″	52″	27″	49″
8-106	32″	25″	23″	9″	21″	16″	12″	21″	16″	50½″	28¾″	49″
1-516	32½″	21″	20″	9″	20″	16″	14″	20″	16″	52″	27″	49″
2233-XF	33″	21″	24½″	10″	19″	18½″	14″	19″	18½″	52″	27½″	55″
2233-EF	33″	21″	24½″	10″	19″	18½″	14″	19″	18½″	52″	27½	55″
2533-XF	33″	21″	24½″	10″	19″	18½″	14″	19″	18½″	52″	27½″	55″
2572-XF	31½″	20½″	22″	8½″	19″	16″	14″	19″	16″	51″	27½″	49″
28-44	33″	21½″	24″	8½″	18½″	18½″	14½″	18½″	18½″	52″	27½″	51½″
6-40	33″	21½″	22″	8½″	18½″	16½″	14½″	18½″	16½″	52″	27½″	47″
118-44	33″	21½″	24″	8½″	18½″	18½″	14½″	18½″	18½″	52″	27½″	51½″
8-44	33″	21½″	24″	8½″	18½″	18½″	14½″	18½″	18½″	52″	27½″	51½″

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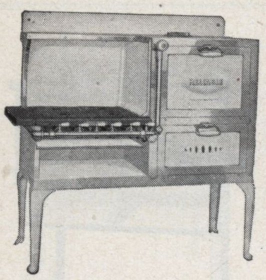
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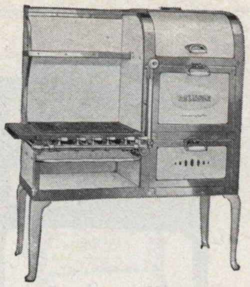
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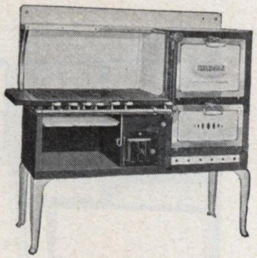
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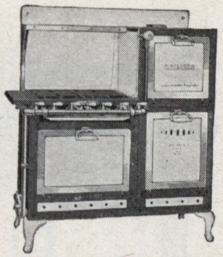
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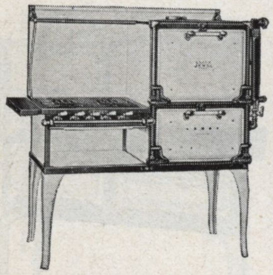
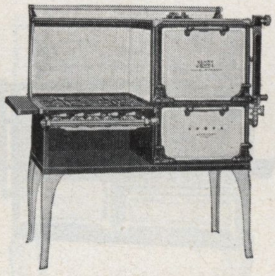

Clark Jewel No. A-638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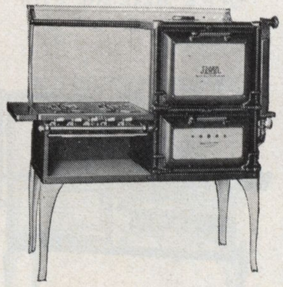
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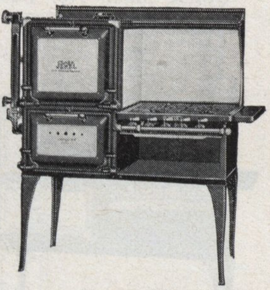
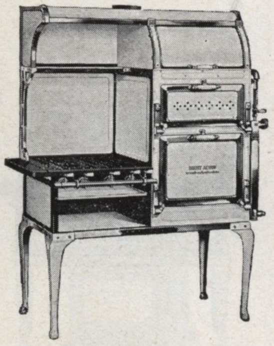
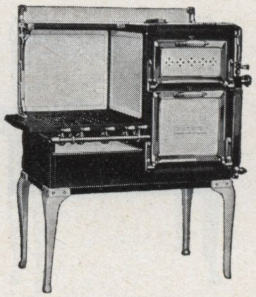

Clark Jewel No. A-316
Left Oven


Direct Action
No. 328-AR-HR-Canopy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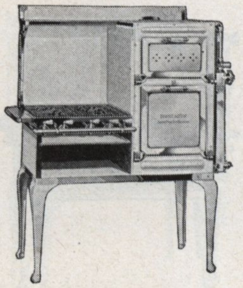
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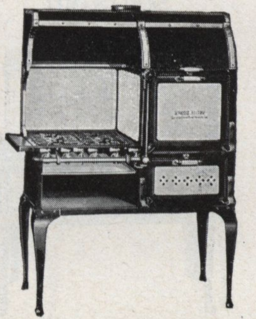
Direct Action No. 226-ER-HR

Special Lorain-equipped Gas Ranges for Medium Kitchens

All cabinet ranges can be made with left or right hand ovens

TABLE OF DIMENSIONS

Stove No.	Cooking Top			Broiler			Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
6381	30¾″	20½″	25½″	10″	18″	18½″	14″	18″	18½″	51¾″	24¾″	49½″
6382	30¾″	20½″	25½″	10″	18″	18½″	14″	18″	18½″	57¼″	24¾″	50¼″
5882	34½″	20½″	34¾″	10″	18″	18½″	14″	18″	18½″	55½″	27¼″	58¾″
5304	34¼″	20½″	25½″	17½″	18″	14″	14″	18″	20″	55″	24½″	47″
A-638	32″	23″	22½″	10″	20″	18½″	14″	20″	18½″	52″	29″	53½″
A-336-S	32″	23″	22½″	10″	20″	16½″	14″	20″	16½″	52″	29″	51½″
A-338	32″	23″	22½″	10″	20″	18½″	14″	20″	18½″	52″	29″	53½″
A-316	32″	23″	22½″	10″	20″	16½″	14″	20″	16½″	52″	29″	51½″
328-AHR-Canopy	32½″	21″	24″	8½″	19½″	18″	14″	19½″	18″	63″	26″	50½″
316-XR-HR	32½″	21″	24″	8½″	19½″	16″	14″	19½″	16″	55″	26″	48½″
314-AR-HR	32½″	21″	24″	8½″	19½″	14″	14″	19½″	14″	55″	26″	46½″
226-ER-HR	32½″	21″	24″	8½″	19½″	16″	14″	19½″	16″	59″	26″	44″

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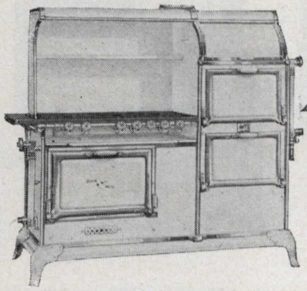

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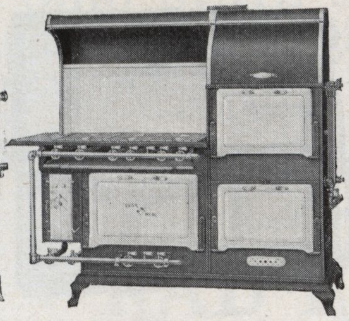

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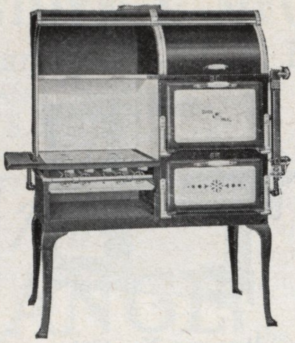

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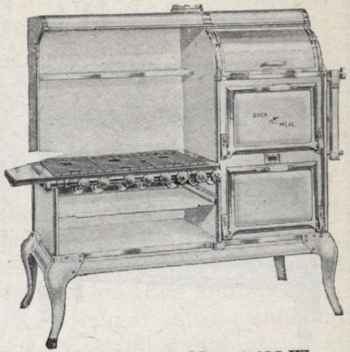

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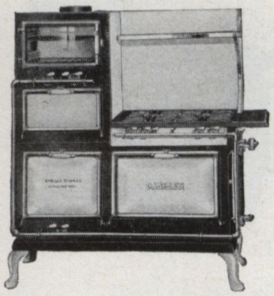

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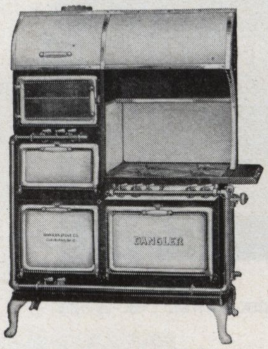

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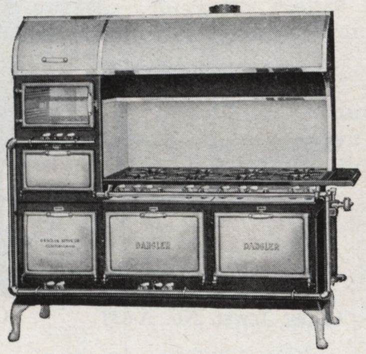

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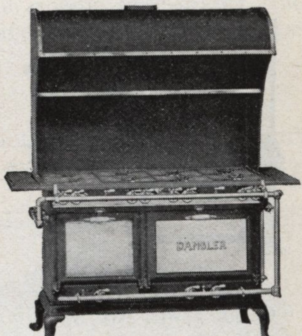

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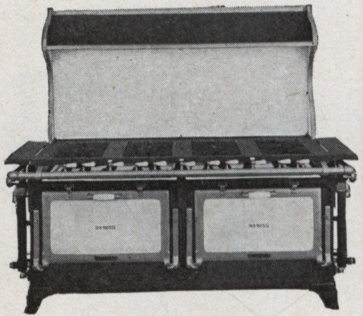
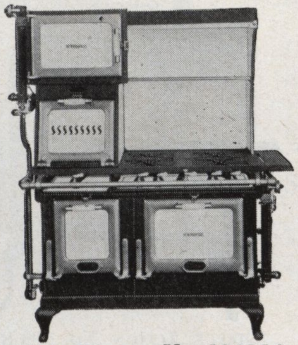


New Process No. 24-97
with Back Shelf



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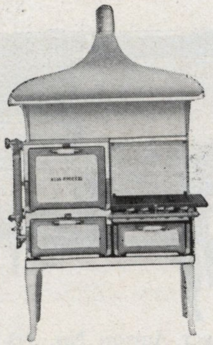
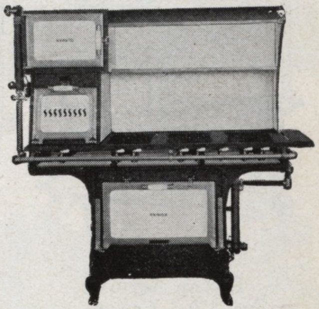


New Process No. 8-44
All Enamel with Dome Hood



New Process No. 24-33-16

Special Lorain-equipped Gas Stoves for Large Kitchens

All cabinet ranges can be made with left or right hand ovens

Table of Dimensions

Stove No.	Cooking Top			Broiler			Large Oven			Small Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
2-218-W	36″	22½″	36″	12″	21″	18″	14″	21″	22″	12″	21″	18″	63″	29½″	67″
8-528	33½″	22″	36″	12″	18″	18″	14″	18″	22″	12″	18″	18″	57″	29½″	71″
8-218	32″	25″	23″	9″	21″	18″	12″	21″	18″				63″	28¾″	56″
4-687-W	30″	22½″	36″	10″	21″	22″	14″	21″	22″				64″	24¾″	73″
2209-EF	34″	24″	27″	9″	16½″	18½″	14″	18½″	22″	10″	18½″	16½″	57″	29″	50″
2205-WF	34″	24″	27″	9″	16½″	18½″	14″	18½″	22″	10″	18½″	16½″	70″	29″	50″
2203-WF	34″	24″	49″	9″	16½″	18½″	14″	18½″	22″	10″	18½″	16½″	70″	29″	72″
2208-F	34″	24″	49″	14″	16½″	18½″	14″	18½″	22″				68″	29″	54″
24-97	30″	26″	67½″				12¾″	18½″	24½″				58½″	33½″	69″
8-44	33″	21½″	24″	8½″	18½″	18½″	14½″	18½″	18½″				80″	27½″	51½″
18-97-16	32½″	25″	32½″	12″	20½″	14″	12″	18½″	18½″	11″	18½″	16½″	63″	32½″	54½″
24-33-16	35″	25″	46½″	12″	20½″	14″	12¾″	18½″	24½″	11″	18½″	16½″	66″	32½″	67½″

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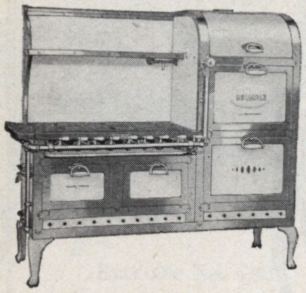
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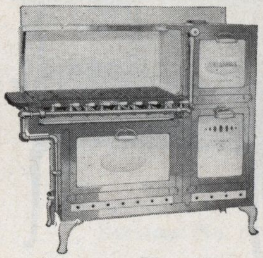
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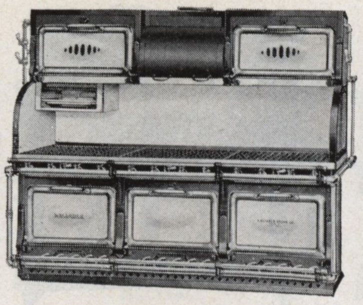
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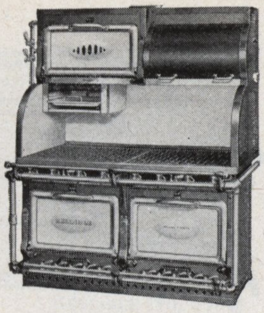
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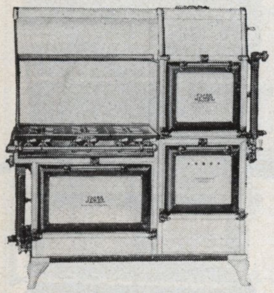
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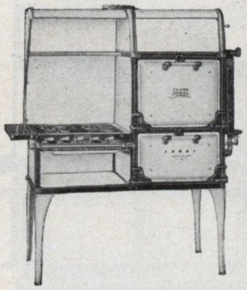
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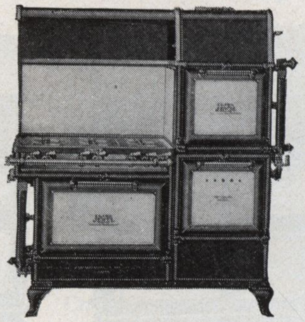
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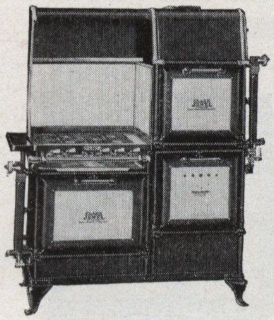
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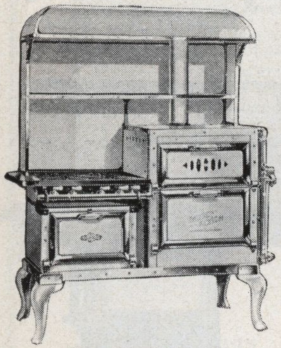
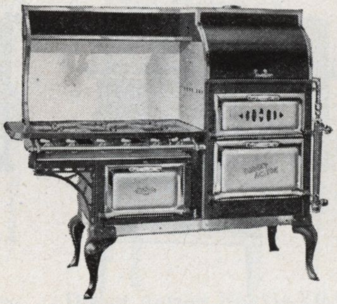

Direct Action
No. 370-A Canopy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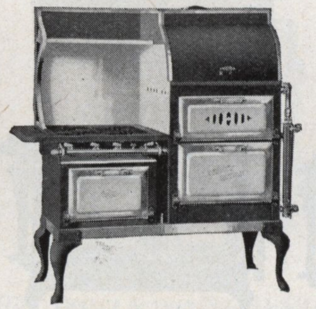
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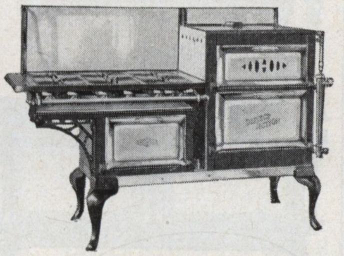
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Special Lorain-equipped Gas Stoves for Large Kitchens

All cabinet ranges can be made with left or right hand ovens

TABLE OF DIMENSIONS

Stove No.	Cooking Top			Broiler			Large Oven			Small Oven			Range		
	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width	Height	Depth	Width
6330	31¾″	20½″	37¾″	14″	18″	20″	14″	18″	20″	8¾″	18″	14″	58″	25″	63¾″
6306	34¼″	20½″	37¾″	17½″	18″	14″	14″	18″	24″	14″	18″	14″	55″	24½″	58″
322	30¼″	26″	73¾″	11½″	14¼″	23½″	14″	20″	22″				66″	36″	80½″
222	30¼″	26″	49″	11½″	14½″	23½″	14″	20″	22″				66″	36″	55½″
A-624	32½″	21½″	31″	14″	19½″	16″	14″	19½″	24″	14″	19½″	16″	60″	28″	57½″
A-639	32″	23″	22½″	10″	20″	18½″	14″	20″	18½″				61½″	29″	53½″
A-524	32½″	21½″	31″	14″	19½″	16″	14″	19½″	24″	14″	19½″	16″	60″	28″	57½″
A-567	32½″	21½″	24″	14″	19½″	16″	14″	19½″	20″	14″	19½″	16″	60″	28″	53″
370-A Canopy	32½″	21½″	29½″	8½″	18″	20″	12″	18″	20″	10″	17″	16″	62″	26″	57″
393-R	32½″	21½″	39½″	8½″	18″	20″	12″	18″	20″	10″	17″	16″	57″	26″	67″
390-R	32½″	21½″	29½″	8½″	18″	20″	12″	18″	20″	10″	17″	16″	57″	26″	57″
373-R	32½″	21½″	39½″	8½″	18″	20″	12″	18″	20″	10″	17″	16″	47″	26″	67″

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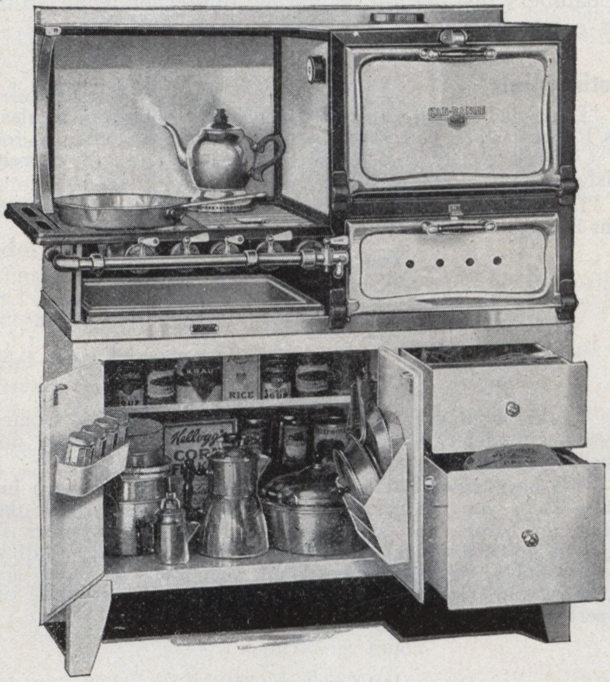
Kab-Range—A Combination Kitchen Cabinet and Gas Range

Architects and builders who are constantly confronted with the problem of utilizing in a practical way the small kitchen space in the modern apartment or home will find a happy solution in the installation of Kab-Range, both from the standpoint of economy and practicability.



The Kab-Range

Patented Jan. 6, 1925. Other patents pending

Combining as it does the Packer gas range and the Packer all-steel kitchen cabinet into one beautiful unit, Kab-Range utilizes in a most practical way the heretofore wasted space beneath the gas range.

It provides a most convenient place to store foodstuffs, pots, pans, utensils, cooking ingredients, etc., right in the range where they are used and needed.

Kab-Range also enhances the salability and rentability of an apartment because women are quick to realize the many time-saving and step-saving advantages of this modern gas range.

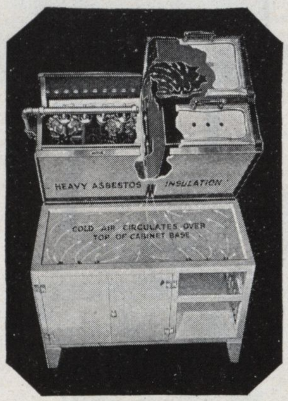
Important Feature

A very important feature (exclusive with Kab-Range) is the patented system of insulation, circulation and ventilation which prevents the lower compartment from warming up, thus foodstuffs may be stored therein without danger of spoiling.

This feature is found only in Kab-Range. Sectional view is shown below.

Send for Catalogue

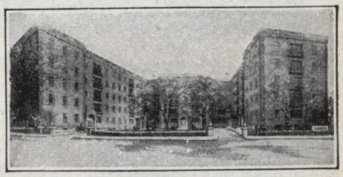
Complete catalogues of Kab-Range and other Packer-built products will be sent on request.


HEAVY ASBESTOS INSULATION
COLD AIR CIRCULATES OVER TOP OF CABINET BASE

Sectional View of Kab-Range

The food compartment can not warm up. Exclusive patented construction features, shown above, prevent this

Lewis Morris Apartments, New York, N. Y.
Raldiris & LaLelle, Architects



The Crossways, Far Rockaway, L. I.
Henry Wilkinson & Maxwell Hyde, Architects
Fredburn Construction Co., Builders

1160 East Broad, Columbus, Ohio
Newest and finest apartment building in Columbus
Miller & Reeves, Architects
E. H. Latham Co., Builders

A Few of the Many Fine Apartment Buildings in Which Kab-Range and Other Packer-built Products Have Been Successfully Installed

DIMENSIONS OF KAB-RANGE

No.	Finish	Over-all dimensions, in.			Cooking top, in.		Oven, in.	Broiler, in.	Weight, lb.
		High	Wide	Deep	High	Size			
14–40	Semi-white	54	*39½	25½	35¾	*22¼ x 20½	12 x 14 x 19	8 x 14 x 19	247
14–50	All-white	54	*39½	25½	35¾	*22¼ x 20½	12 x 14 x 19	8 x 14 x 19	262
16–40	Semi-white	54	*44⅝	25½	35¾	*25⅜ x 20½	12 x 16 x 19	8 x 16 x 19	285
16–50	All-white	54	*44⅝	25½	35¾	*25⅜ x 20½	12 x 16 x 19	8 x 16 x 19	290
18–40	Semi-white	54	*46⅝	25½	35¾	*25⅜ x 20½	12 x 18 x 19	8 x 18 x 19	290
18–50	All-white	54	*46⅝	25½	35¾	*25⅜ x 20½	12 x 18 x 19	8 x 18 x 19	208

*Including 3-in. removable end shelf.

CHAMBERS MANUFACTURING COMPANY

Manufacturers of Fireless Gas Ranges

SHELBYVILLE, INDIANA

Fireless Gas Ranges

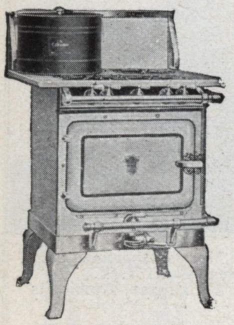
The patented Thermodome and Insulated Oven distinguish the Chambers range from all other modern ranges. It cooks with the heat they waste, and has established a new standard of convenience, efficiency and economy. At the same time, it does everything that any ordinary range can do.

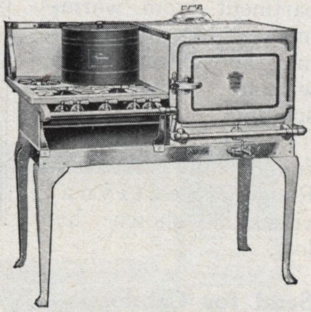
Chambers FIRELESS Gas Range
COOKS *with the* GAS TURNED OFF!
TRADE-MARK

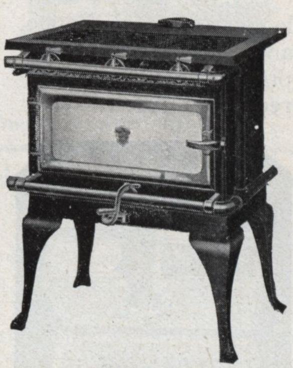
With the Chambers range the gas is only burned to start the cooking process, and is then turned off. An entire meal can be completed in this manner while the housewife is free and away from the kitchen. The saving in gas and time is obvious.

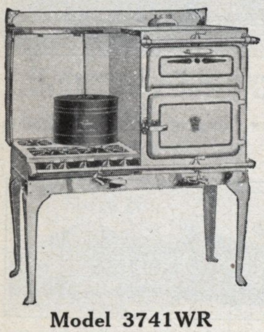
This amounts to a considerable saving in the course of a year where the apartment owner furnishes the gas.

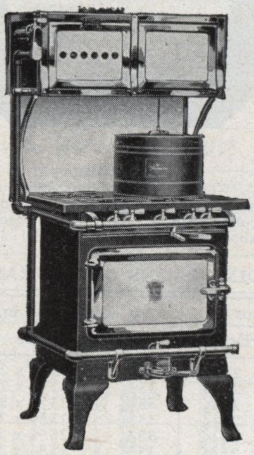
The degree of convenience enjoyed by users makes a Chambers installation profitable altogether aside from this economy.

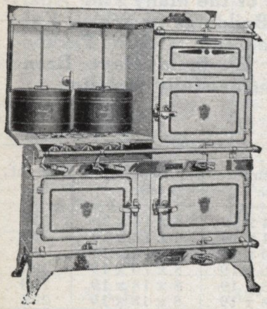

Model 3141W


Model 3241W


Model 3030


Model 3741WR


Model 3541B


Model 3942W

Testimonials

"I am glad to state that the thirty-three Chambers Fireless Gas Ranges which you installed in the Elliot Apartments, for the Chauncy Realty Trust some two years ago are entirely satisfactory.

"I consider them a very valuable addition to our apartment house, and a big asset in the renting of the suites."

Yours very truly,
Chauncy Realty Trust,
Cambridge, Mass.

By *Wm. A. McClean*
Agent

"I started to use your ranges in the University Homes development about three years ago. These homes were designed to furnish the maximum of convenience.

"We have continued to use them, until now we have installed 83 of your ranges. Several times I have brought the matter up before the sales organization as to whether it would be justifiable for us to continue their use or install a cheaper range, but they have been unanimous in their belief that your range was a great assistance in the sale of property."

Yours very truly,
George R. Morris, Real Estate,
Baltimore, Md.

Official Endorsement

The principle of cooking perfected by the Chambers range has been thoroughly tested and approved by the American Gas Association, the New York Tribune Institute, Priscilla Proving Plant, and Good Housekeeping Institute.

CONDENSED SPECIFICATIONS

Model No.	Cooking height, in.	Top size, in.	Oven, in.	Gross dimensions, in.			Shipping weight crated, lb.
				Width	Depth	Height	
3141W	34	29x26	18x16½x12	29	30	44	389
3241W	33	23x26	18x16½x12	47	30	45	412
3741WR	29	23x26	18x16½x12	48	30	57	532
3030	34	20x28	9x21 x12	28	23	35	236
3942W	33	29x26	18x16½x12	53	30	61	754
3541B	34	29x26	18x16½x12	30	32	62	450

Continued on next page

Chambers Ranges Hold Tenants

Consistent national advertising has established the position of the Chambers range. It is recognized everywhere as a big advancement in cooking methods. With a Chambers range installation announced as a feature of your apartment buildings or residences, you associate the element of progress, completeness and quality with your enterprise.

Chambers ranges do hold tenants and permit higher rentals. They make even a small kitchen cool and pleasant by the heavy 2-in. insulation surrounding the Insulated Oven and Thermodome. The variety of attractive models in white porcelain enamel or black and white trim meet every floor plan requirement.

For complete information, and specimens of Chambers installation plans, write or wire Building Equipment Division, Chambers Manufacturing Company, Shelbyville, Indiana.

Model No. 3141-W

All white or black and white. Porcelain enameled; equipped with either one or two Thermodomes. Four top burners and simmer; Insulated Oven. Code, Encumbrance. Black finish: code, Embankment.

Model No. 3241-W

Code, Effigy. Left-hand oven: code, Egret. Same style range also furnished in black and white porcelain enamel finish. Four top burners and simmer; Thermodome; back splasher; Chambers Insulated Oven. Code, Eczema. Left-hand oven: code, Educator.

Model No. 3741-WR

White porcelain enamel. Also finished in black and white. Thermodome; Broiler; Chambers Insulated Oven; four top burners and simmer. Right-hand oven: code, Easement. Left-hand oven: code, Eavesdrop. In black and white: codes, Eagle, right-hand oven; Earing, left-hand oven.

Model No. 3030

Furnished only in black and white. Efficient—fits in small space. Three top burners; Chambers Insulated Oven. Code, Emigrant.

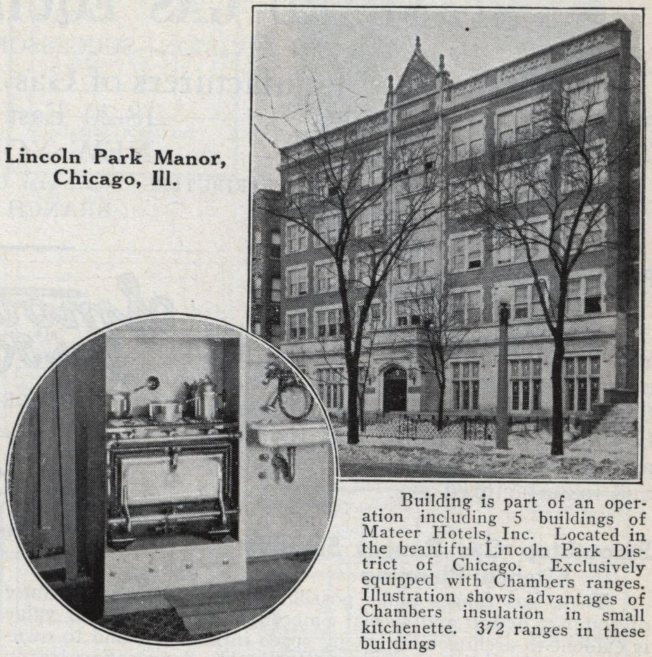
Model No. 3942-W

Handsome range for the larger family. All white porcelain enamel, or black and white. Two Thermodomes; two Chambers Insulated Ovens; large warming closet; broiler; four top burners and simmer. Left-hand oven: code, Eikon. Right-hand oven: code, Eider.

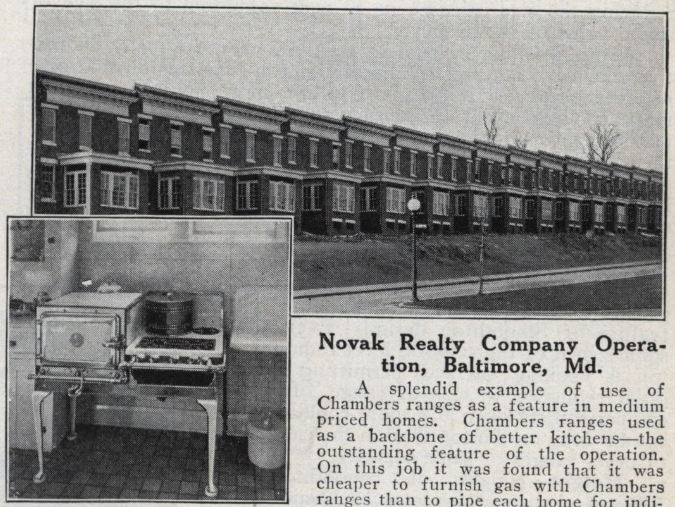
Model No. 3541-B

Efficient in narrow space. Black and white enamel finish, or all-white porcelain enamel finish. One Thermodome; broiler; one Chambers Insulated Oven; four top burners and simmer. Code, Enchantment, black finish. White enamel finish: code, Encroachment.

Lincoln Park Manor, Chicago, Ill.

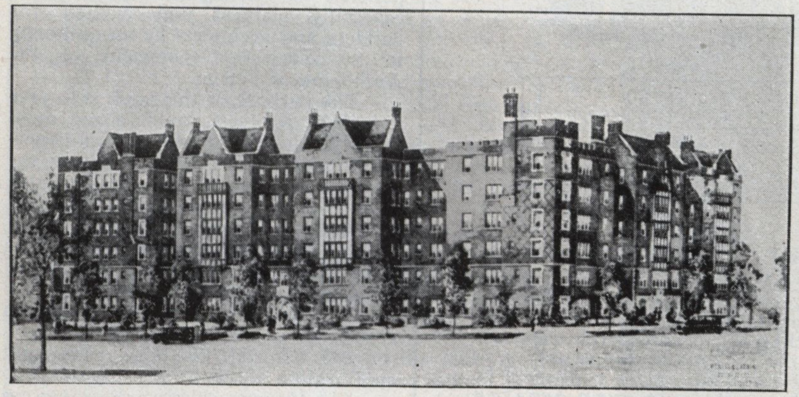


Building is part of an operation including 5 buildings of Mateer Hotels, Inc. Located in the beautiful Lincoln Park District of Chicago. Exclusively equipped with Chambers ranges. Illustration shows advantages of Chambers insulation in small kitchenette. 372 ranges in these buildings



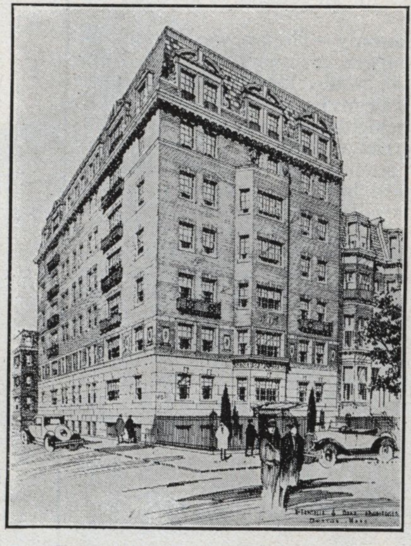
Novak Realty Company Operation, Baltimore, Md.

A splendid example of use of Chambers ranges as a feature in medium priced homes. Chambers ranges used as a backbone of better kitchens—the outstanding feature of the operation. On this job it was found that it was cheaper to furnish gas with Chambers ranges than to pipe each home for individual meter sets. 55 ranges used



Buckingham Hall, Brooklyn, N. Y.

A splendid example of a builder, J. Macher, who furnished his building with Chambers ranges entirely because of tenant-appeal. The builder does not furnish gas. The big saving in fuel was used strictly as a tenant-appeal



Built by Gilbert & Coleman, Boston, Mass.

57 special Chambers ranges give added distinction to the equipment of this fine apartment house

STANDARD GAS EQUIPMENT CORPORATION

VULCAN DIVISION—SUCCESSORS TO WILLIAM M. CRANE CO.

Manufacturers of Gas Ranges and Appliances

18-20 East 41st Street
NEW YORK, N. Y.

FACTORY AND FOUNDRY:
Garfield and Gates Avenues,
JERSEY CITY, N. J.

CABLE ADDRESS
"Vulcan, New York"

PACIFIC COAST DISTRIBUTERS: Northwest Gas & Electric Equipment Co., PORTLAND, ORE.

BRANCH OFFICES
LOS ANGELES, CAL. SAN FRANCISCO, CAL.

Product

Vulcan Gas Ranges.

Also manufacturers of Circulating and Tank Storage Water Heaters, Bakers' Ovens, Doughnut Stoves, Confectioners' Furnaces, Broilers, Toasters, Griddles, Waffle Irons, and Industrial and Illuminating Burners—for natural and manufactured gas.

Smoothtop Gas Ranges
REG. U.S. PAT. OFF.
TRADE-MARK

★U. S. Pats:- 1,342,991, 1,403,814 - 60,756 - 60,757 60,758. Other Pats. Pending. Covered by Canadian and British Patents.

Smoothtop Gas Ranges Simplify Kitchen Planning

These gas ranges make possible smaller kitchens—because of compact design and special Smoothtop feature. Their value is evident to architects in saving space in kitchens, and to owners in not only making available valuable floor space, but in reducing the size of kitchens as well as adding to the sale or rental value of the property.

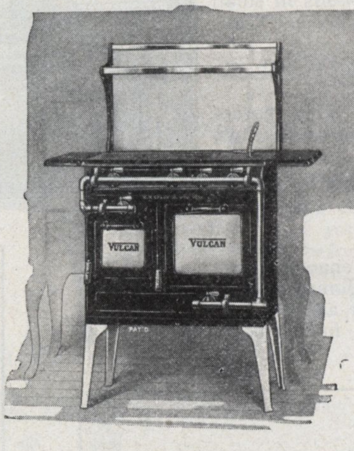
From a selling or renting point of view the many distinctive, exclusive features of the Smoothtop construction that give better cooking facilities, great utility, more conveniences and make cooking easier in every way are readily appreciated by prospective tenants or buyers who, because of the large part of their daily life occupied by this never pleasant task, are certainly going to see that the gas range receives the utmost consideration in equipping the kitchens. Owners, architects and builders of many apartments and residences of all kinds attribute a liberal share of credit in renting or selling to the Smoothtop gas range in their kitchens.

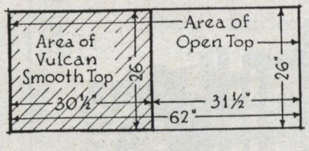
Smooth Top—Makes possible greater cooking utility, the dominating feature of Smoothtop design. Every square inch of the smooth, level roomy top is cooking surface, permitting a great reduction in size of range. By comparison, at least 50% more cooking can be done on the top than in the case of other ranges of same capacity.

Height—Height of Smoothtop (38 in.) eliminates tiresome backbending. This is an important improvement since 75% of all cooking is done on the top.

Economy—The new Smoothtop speed burner assures economy. This burner is a development of the patented Vulcan Economy Hot-top hotel range, which is known as the fastest cooking range on the market. Because of the intense heat generated by this new speed burner, the Smoothtop gas range is not limited by the number of burners. One burner lighted will keep four vessels steaming and will keep food warm on all parts of the top. The amazing cooking speed and economy of Smoothtop ranges equipped with the new speed burner will provide maximum satisfaction to tenants of apartment buildings and dwellings. In the exacting demonstration at the Atlantic City Gas Show the new Smoothtop speed burner showed a saving of 38.3% in cooking time and 38.2% in fuel saving.

Oven Heat Control—The Standard heat control on the new Smoothtop is an accurate, dependable and simple system of oven heat control. All the working parts are enclosed in a tight casing. There are no levers. Flow of gas is controlled by a piston valve.





PLAN
(Not Including End Shelves)

NOTE- A saving of 31½" in width is obtained by use of Smooth Top Ranges.

By making provision for these ranges in kitchen layout, considerable space is available for other equipment.

The range may be recessed to advantage effecting even greater saving of space.

COMPARISON OF OPEN TOP AND SMOOTH TOP RANGE OF SAME COOKING CAPACITY.

This control greatly simplifies oven cooking. Improved results are almost a certainty with it. A permanent attached standard cooking chart is an exclusive new Smoothtop feature and provides the necessary information to secure the best results in the oven. It is made of aluminum and fits into a slot in the end shelf so that it is permanent and is always instantly available. It can not become lost or misplaced.

Oven and Broiler Capacity—The oven capacity of the Smoothtop is equal to that of the open type of range of the same cooking capacity.

Ease of Keeping Clean—Any size vessel may be used and shifted at will and the closed top protects the burners from drippings. The smooth sides, absence of projecting parts and corners, and the superior baked japan finish never needing stove polish, makes cleaning as easy as wiping dust from a table.

Compactness—The compact construction eliminates waste space and provides more convenient arrangement.

Construction—Smoothtop construction, workmanship and finish are superior throughout. Materials are of the highest quality and heavier than ordinarily used in gas ranges.

Sizes—Five sizes, Nos. D-441, D-442, D-444, D-450 and OD-1450W, fit every kitchen and every cooking need. Detailed dimensions are given on following page. Write for catalogue showing models with roll top warming closet.

Specifications—Furnish and set complete with all gas and flue connections (when necessary) Smoothtop Gas Ranges as manufactured by the Standard Gas Equipment Corporation, Vulcan Division, New York, N. Y., in accordance with the following schedule; (here mention type of range and location).

How Sold—Smoothtop cabinet ranges may be ordered through local agents or dealers. In localities where we have no dealer, we will arrange to supply your needs.

A Practical Reference Booklet of Plans and Facts

Have you a copy of "How Kitchen Space Was Saved in Planning"?

New 1925 edition just out—revised and brought up-to-date. It is a practical reference book of Plans and Facts.

This booklet is based on the experience of leading architects. It is especially planned and written for builders and architects by an authority in the Service Department of the Architectural Forum.

The purpose of this book is to provide for architects, builders and owners brief and exact information covering kitchen planning, particularly the selection, marketing and installation of gas cooking equipment for domestic use.

A Few Features—

(1) Explains and illustrates kitchen plans, well-known operations, designed by noted architects.

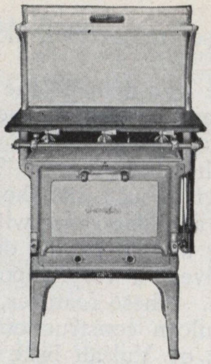
(2) Gives reduced scale drawings ready for immediate tracing.

(3) Affords complete plan and specification sheets.

(4) Permits shifting the range on a plan to find best location.

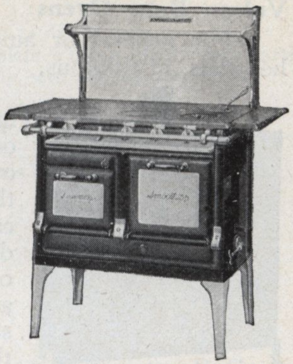
(5) Makes possible maximum economy in space with maximum convenience for housewives and cooks.

Continued on next page



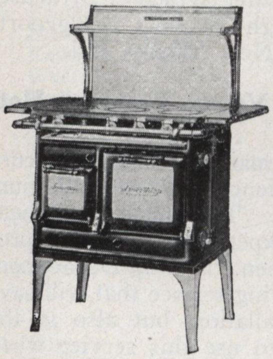
Smoothtop Junior No. D-444SE

For small kitchens. Closed top heated by 3 burners across front (2 regular burners and simmering burner in center). Oven equipped with both baking and broiling burners. Semi-enamel finish. Puts up wonderful appearance. From front looks like full enamel range



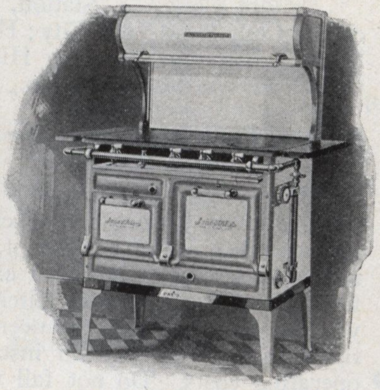
Smoothtop No. D-450

For larger kitchens. Closed top heated by 4 burners (3 speed burners in front and 1 junior burner in back). Top will hold 6 or more vessels. In fact, a whole meal can be cooked with one burner. Separate oven and broiler



Smoothtop No. OD-441

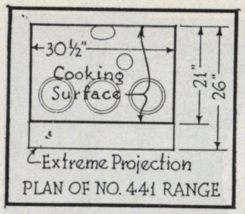
Suitable for average size families. Because of closed top has 50% more top cooking capacity than ordinary ranges. Top heated by 3 speed burners in front and 1 junior burner in back. Separate oven and broiler



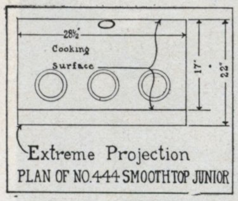
Smoothtop No. OD-145OW

All white enamel range with Standard oven heat control and roll top warming closet. A handsome gas range that will please the most exacting client. Combines beauty, utility, compactness, economy. Separate oven and broiler

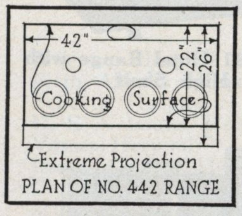
Sizes—Smoothtops are made in five sizes, Nos. D-441, OD-442, D-444, D-450, OD-145OW, to fit every kitchen and cooking need.



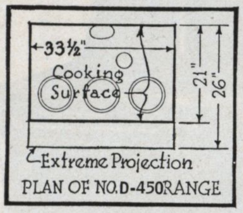
Oven, 14x18x12½ in.
Broiler, 9x18x8½ in.



Oven and broiler 18x12½x12 in.

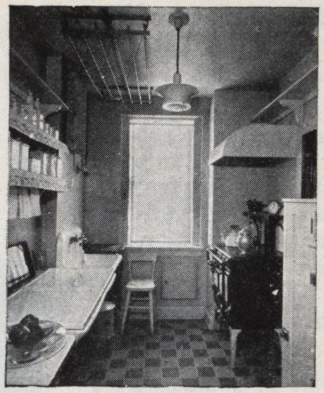


Small oven, 14x18x12½ in.
Large oven, 18x18x12½ in.

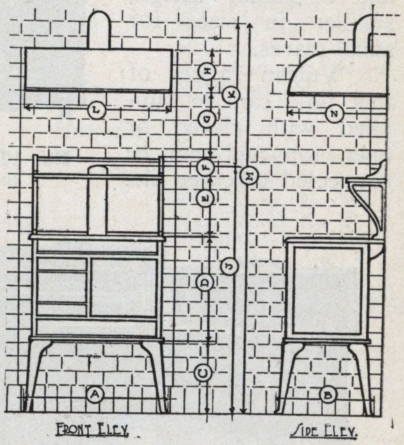


Oven, 16x18x12½ in.
Broiler, 11½x18x9¾ in.

The dimensions of the ranges illustrated on this page and listed in the opposite chart do not include end shelves. When end shelves are supplied, add 10 in. to dimension "A"



A Typical Installation



Dimension Diagram of Ranges

Dimensions	Range Numbers					
	444	442	441	450	1450W	1442W
A	28½	46	34	39	39	46
B	22½	27½	27½	27½	27½	27½
C	13	10	13	12	12	10
D	23	28	25	26	26	28
E	13	13	13	13	13	13
F	3½	3½	3½	6½	6½	6½
G	16	16	16	16	13	13
H	11½	11½	11½	11½	11½	11½
J	50½	52½	52½	52½	52½	52½
K	37½	37½	37½	37½	37½	37½
L	36	45	36	45	45	45
M	90	90	90	90	90	90
N	27	27	27	27	27	27

A Park Avenue Installation

314 Smoothtop gas ranges of Types 442, 444 and 446 are installed in 277 Park Avenue, in keeping with the high quality of material used throughout.

The latest and largest apartment house in the world has recently been completed by McKim, Mead & White in New York on the block bounded by Park Avenue, Lexington Avenue, 47th and 48th Streets. In this gigantic building, first consideration has been given to an efficient layout which would give maximum kitchen service from the smallest possible physical area—in other words, to provide fully equipped and comfortable kitchens without too great an investment in the structural space. Smoothtop gas ranges were selected—first, because of their compact design; and second, because of superior cooking advantages.

Leading architects in all parts of the country have found the Smoothtop gas range ideal for compact, efficient, desirable kitchens in every type of apartment and residence. The model apartment houses built by the Metropolitan Life Insurance Co. at Long Island City are equipped with 2075 Smoothtops, while the famous Queensboro Corporation projects in the Jackson Height development call for over 1000 Smoothtops.

Special Monograph—A special 16-Page monograph which describes this building in detail will be sent to architects on request. Other monographs on notable buildings now in preparation.

277 Park Avenue, New York, Covers Whole Block
McKim, Mead & White, Architects

Continued on next page

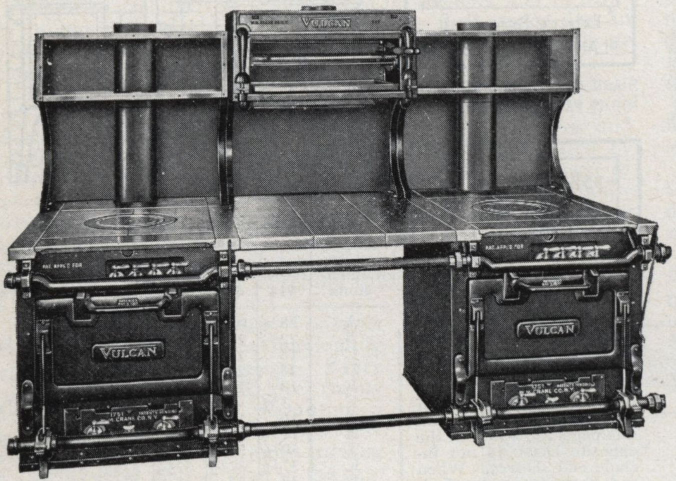
Vulcan Economy Hot-top Hotel Gas Ranges

No. 1751 Hotel Range with High Shelf

Vulcan heavy duty gas ranges are suitable for hotels, hospitals, restaurants, schools, clubs or wherever large quantity cooking is done.

Two types of heavy duty ranges can be supplied—the heavy type for the big hotel restaurant and hospital, and a similar design, smaller in size, for small places.

Vulcan ranges of this type can be supplied with closed or open top and can be connected together like sectional bookcases, in any combination, to meet every cooking need.



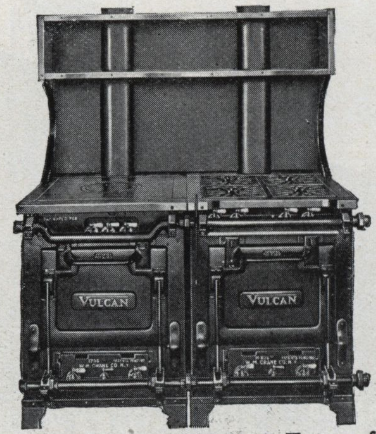
A Combination of Vulcan Ranges and Spreader Plate

7½ ft. of working surface consisting of two No. 1751 ranges, one 30½-in. spreader plate, two No. 784 high shelves and one No. 787 salamander broiler

Herewith is shown two of the innumerable combinations of Vulcan ranges that can be made to fill every cooking need.

Blue prints will be furnished recommending the types and combinations of ranges that will best fill cooking requirements. This service is free.

Attachments—Broilers and high shelves, which are interchangeable, are furnished as required.

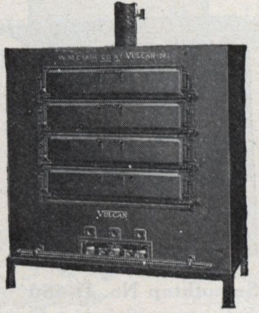


Combination of Various Types of Vulcan Restaurant Gas Ranges

Smaller in size, but constructed upon the same principle as the heavy duty ranges. Restaurants, smaller hotels, hospitals, large private homes and hundreds of other requirements are being satisfactorily served by these ranges

Vulcan Bake Ovens

For general or auxiliary use in bakeries, hotels, hospitals, institutions.



Vulcan Bake Oven

Two sizes: No. 761 has a capacity of 48 1-lb. loaves bread or 24 10-inch pies. No. No. 762 has a capacity of 96 1-lb. loaves bread or 48 10-inch pies

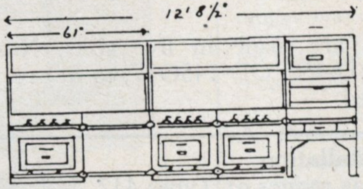
Those who demand the best in results and the utmost in economy are choosing Vulcan bake ovens. They bake evenly. Then their design is such that the chef can open any one door without disturbing what is baking on the other shelves—a very important advantage. These features, plus sturdy Vulcan construction, are the secret of Vulcan bake oven success.

Recent installations include: the Benjamin Franklin Hotel, Philadelphia; Walt Whitman Hotel, Camden, N. J.; Pennsylvania Railroad, Broad St. Station, Philadelphia; Fur Merchants Club, New York City; Hotel Syracuse, Syracuse, N. Y.; Warren Harding High School, Bridgeport, Conn.; F. W. Woolworth Co., New Albany, Ind.

Kitchen Planning Service for Vulcan Economy Hot-top Hotel Ranges

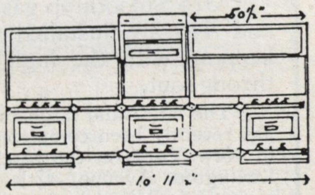
In planning a kitchen the main object is to secure the maximum service and efficiency with the minimum of expenditure for equipment. Too much equipment means unnecessary overhead expense and reduced profits. Through the Vulcan Kitchen Planning Department you can give clients an engineering service that will save them money not only on installation, but also in the operating costs. Do not fail to use this service when any client is considering equipping a new kitchen or renovating one now in use.

Typical gas range layouts planned by our Hotel Department. Each designed after a careful study of cooks' requirements.



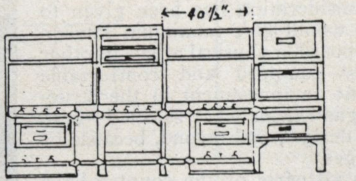
Three Vulcan No. 1751 Ranges

30½-in. spreader plate and Vulcan No. 756 broiler. Space required 12 ft. 8½ in.



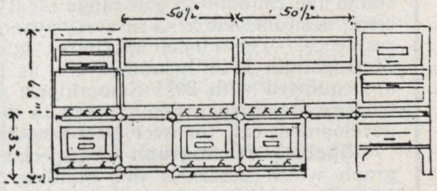
Three Vulcan No. 1751 Ranges

Two 20-in. spreader plates with salamander and high shelves. 10 ft. 11½ in. of cooking surface



Two Vulcan No. 1751 Ranges

No. 1752 skeleton cooking top, two 10-in. spreader plates and a No. 756 Vulcan broiler connected in combination. Space required 11 ft. 10 in.



Three Vulcan No. 1751 Ranges

Salamander broiler, two 20-in. spreader plates, one connected between range and broiler

Typical Combinations of Vulcan Hotel Ranges

Continued on next page

Catalogues

Catalogues covering the complete Vulcan line or any particular Vulcan product will be gladly sent on request.

A Few Well-known Vulcan Installations

Hotels

Ritz-Carlton	New York, N. Y.
The Benjamin Franklin	Philadelphia, Pa.
The New Olympic	Seattle, Wash.
Atlanta Biltmore	Atlanta, Ga.
Hotel Bond	Hartford, Conn.
Brown Palace Hotel	Denver, Colo.
William Penn Hotel	Whittier, Cal.
Du Pont Hotel	Wilmington, Del.
Charleton Apartment Hotel	Washington, D. C.
Granada Apartment Hotel	Miami, Fla.
Hotel Avery	Boston, Mass.
Hotel Wolverine	Detroit, Mich.
Ambassador Hotel Roof Garden	Kansas City, Mo.
Forest Park Hotel	St. Louis, Mo.
Van Curler Hotel	Schenectady, N. Y.
Seville-Biltmore	Havana, Cuba
Regent Palace Hotel	London, England
Hotel Marlboro-Blenheim	Atlantic City, N. J.
Providence-Biltmore	Providence, R. I.
Hamilton Hotel	Washington, D. C.
Embassy Hotel	Chicago, Ill.
West Virginia Hotel	West Palm Beach, Fla.
Mallory Hotel	Portland, Ore.
Hotel St. Regis	Toronto, Ont.
Condado Vanderbilt	Porto Rico
Pennsylvania Apartment Hotel	Philadelphia, Pa.
Hotel Roosevelt	New York, N. Y.
Walt Whitman Hotel	Camden, N. J.
Hotel Syracuse	Syracuse, N. Y.
Brandon Hall Hotel	Boston, Mass.
Hawthorne Hotel	Salem, Mass.

Restaurants

Pierre's	New York, N. Y.
Bunn Bros. Cafeterias	Many installations
Holland Restaurant	Denver, Colo.
Morrison's Cafeteria	Jacksonville, Fla.
Bachelor's Grill	Chicago, Ill.
Thompson's Cafeteria	Kansas City, Mo.
Belmont Cafe	Nashville, Tenn.
Fred Harvey Restaurant	Galveston, Tex.
Curb Exchange Restaurant	New York, N. Y.
Amherst Tavern	Amherst, Mass.
Chas. Weeghman Corp.	Many cities
F. W. Woolworth Co.	Many cities

Clubs

Fraternity Club	New York, N. Y.
Millionaires Club	Portland, Ore.
Union League Club	Brooklyn, N. Y.

Clubs—cont'd.

Chamber of Commerce	Buffalo, N. Y.
Westchester Biltmore	Rye, N. Y.
Scottish Rites Temple	Tacoma, Wash.
Hollywood Writers Club	Hollywood, Cal.
Masonic Clubs	Many cities
Y. W. C. A's. and Y. M. C. A's.	Many cities
Elks Clubs	Many cities
Racquet Club	Chicago, Ill.
Boston City Club	Boston, Mass.

Schools and Colleges

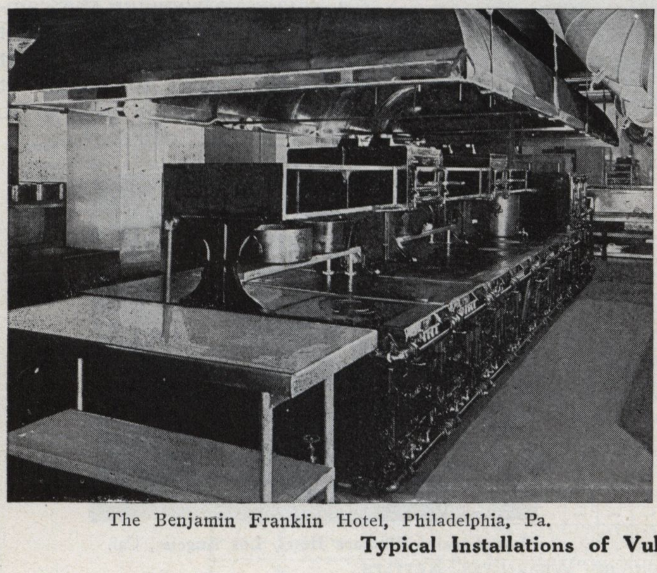
California Institute of Technology	Pasadena, Cal.
Colorado Agricultural College	Fort Collins, Colo.
University of Kansas	Lawrence, Kan.
Harvard College	Cambridge, Mass.
Princeton University	Princeton, N. J.
St. Bonaventure College	Allegany, N. Y.
Staunton Military Academy	Staunton, Va.
Dominican Sisters Convent	San Francisco, Cal.
Delgado Central Trades School	New Orleans, La.
Roosevelt High School	Seattle, Wash.
Smith College	Northhampton, Mass.
George Washington High School	New York, N. Y.

Hospitals

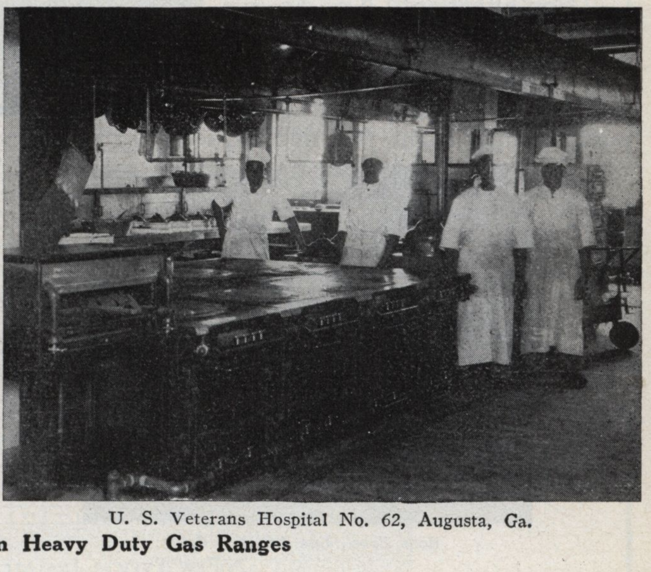
Jefferson Hospital	Philadelphia, Pa.
Fifth Avenue Hospital	New York, N. Y.
Bellevue Hospital	New York, N. Y.
U. S. Veterans' Hospital	New York, N. Y.
Vassar Hospital	Poughkeepsie, N. Y.
Essex County Hospital for Insane	Cedar Grove, N. J.
Children's Hospital	Portland, Me.
Mt. Sinai Hospitals	New York and Philadelphia
Fresno County Hospital	Fresno, Cal.
Old Soldiers Home	Washington, D. C.
St. Luke's Hospital	St. Louis, Mo.
Massachusetts Homeopathic Hospital	Boston, Mass.

Industrial Cafeterias or Restaurants

American Telephone & Telegraph Co.	Newark, N. J.
General Electric Co.	Newark, N. J.
Erie Railroad	Newark, N. J.
Swift & Company	Newark, N. J.
New York Telephone Co. (All exchanges)	Newark, N. J.
Fiske Rubber Company	Newark, N. J.
Prudential Insurance Co.	Newark, N. J.
Standard Oil Company	Newark, N. J.
American Can Company	New York, N. Y.
Bell Telephone Company	New York, N. Y.
Bowery Savings Bank	New York, N. Y.
Campbell Soup Company	Camden, N. J.
Pierce-Arrow Motor Car Co.	New York, N. Y.
Victor Talking Machine Co.	Camden, N. J.
Hamilton Watch Co.	Lancaster, Pa.
Phoenix Silk Co.	Allentown, Pa.
Crown Cork & Seal Co.	Baltimore, Md.



The Benjamin Franklin Hotel, Philadelphia, Pa.



U. S. Veterans Hospital No. 62, Augusta, Ga.

Typical Installations of Vulcan Heavy Duty Gas Ranges

THE ALUMINUM COOKING UTENSIL CO.

NEW KENSINGTON, PA.

BRANCH OFFICES

BALTIMORE, MD., 806 Lexington Building
BOSTON 9, MASS., 115 Federal Street
CHICAGO, ILL., 111 West Washington Street
CINCINNATI, OHIO, 2310 Union Central Building
DALLAS, TEX., 1211 Southwestern Life Building
DETROIT, MICH., 707 Barlum Building
EAST ST. LOUIS, ILL., 33rd Street and Missouri Avenue
MINNEAPOLIS, MINN., 809 First National-Soo Line Building
NEW YORK, N. Y., 47 West 34th Street
OAKLAND, CAL., 45th and Adeline Streets
PHILADELPHIA, PA., 1309 Commonwealth Title & Trust Co. Building
PORTLAND, ORE., 603 Title & Trust Building
TORONTO, ONT., Sterling Road

CANADIAN MANUFACTURERS: Northern Aluminum Co., Ltd., TORONTO, ONT.

WEAR-EVER
T.A.C. ALUMINUM U.C.O.
TRADE MARK
Reg. U. S. Pat. Off.

Products

"Wear-Ever" Aluminum Steam Jacketed Kettles and Urns.

The Company and Its Products

For more than 20 years The Aluminum Cooking Utensil Co. has manufactured and distributed "Wear-Ever" aluminum cooking utensils for use not only in homes, hospitals, hotels and on shipboard, but everywhere that cooking is done.

Constant advertising during these years has brought a recognition of the value of aluminum from housekeepers, chefs and stewards. Each year it has also secured the approval of an increasing number of architects.

Advantages of Aluminum for Cooking Utensils

Lightness—Bulk for bulk, the weight of aluminum is about one-third that of iron or tin, three-tenths that of copper and one-quarter that of silver. This difference in weight means much in the hot, hurried conditions of some kitchens.

Heat Conductivity and Specific Heat—In heat conductivity, aluminum ranks twice as high as tin and three times as high as iron. In specific heat (heat retaining ability) aluminum outranks all metals by a large margin. The combination of these two characteristics makes aluminum pre-eminently suitable for cooking. By its use an even cooking temperature is easily maintained. Aluminum vessels cook not only from the point under which heat is applied, but also from every other point where the utensil is in contact with the food.

Non-effect of Acids on Aluminum—Aluminum is not affected by food acids. Theoretically there is some action—practically, there is none. Most important of all is the fact that any such action that could possibly take place would not produce a combination that would be poisonous.

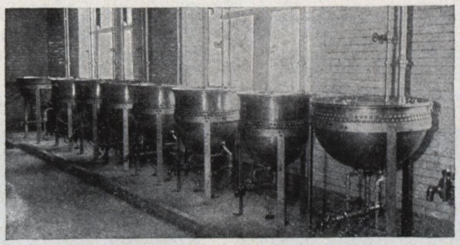
Aluminum never forms a poisonous compound with any food. It is therefore unnecessary to tin the surface of an aluminum utensil as is the case with other metals such as copper.

Economy and Durability—"Wear-Ever" utensils are good for years of continuous service. They are decidedly economical, for not only is there no tinning expense, but there is no time lost in sending out the utensils to be tinned. One large nationally known hotel put in a complete equipment of "Wear-Ever" at a total cost of $2300, and, according to their own statement, have saved $100 in tinning bills every month since the equipment was installed.

Sanitary Qualities and Non-absorption of the Surface—The metal used in "Wear-Ever" equipment is rolled under tremendous pressure, giving a sheet that is hard, dense, and smooth. It is easy to clean, and because of its density, food will not penetrate the pores of the metal and later contaminate other foods cooked therein.

Special Consultation Services to Architects

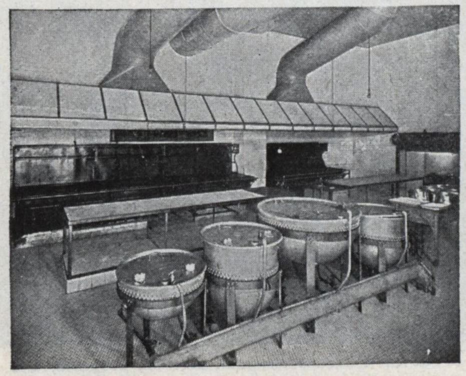
At each of the branch offices listed above, there is a man who, through years of training and experience is able to render valuable assistance to an architect in laying out kitchen equipments and in writing specifications. These men are glad to render assistance when asked to do so.



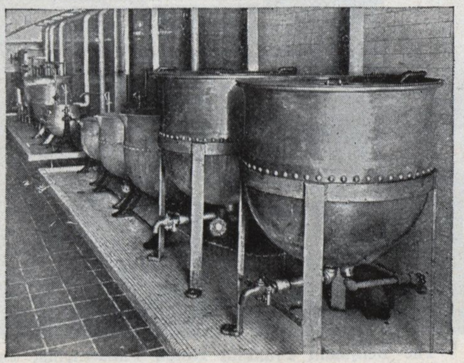
Cook County Hospital, Chicago, Ill.

Catalogue

A catalogue showing the complete line of jacketed equipment and range utensils will be sent promptly in answer to a request sent either to the home office or to any of the branch offices.



Boos Bros., Los Angeles, Cal.



Los Angeles Biltmore Hotel, Los Angeles, Cal.

A Few Typical Installations of "Wear-Ever" Kettles

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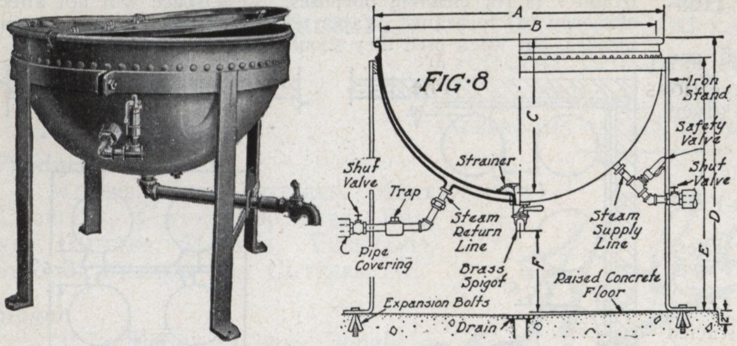
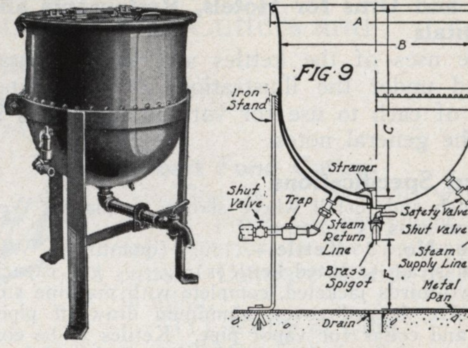

FIG·8
A
B
C
D
E
F
Iron Stand
Safety Valve
Shut Valve
Strainer
Shut Valve
Trap
Steam Return Line
Steam Supply Line
Pipe Covering
Brass Spigot
Raised Concrete Floor
Expansion Bolts
Drain


FIG·9
A
B
C
D
E
F
Iron Stand
Strainer
Shut Valve
Trap
Steam Return Line
Safety Valve
Shut Valve
Steam Supply Line
Brass Spigot
Metal Pan
Drain

STEAM JACKETED KETTLE TYPE 1

This kettle is jacketed to the top, insuring maximum results. Its uses are many and varied—roasting meat, canning and preserving fruits, etc. Being shallow and broad, it is ideal for cooking cereals of all kinds and dried fruits. The fruit is not crushed by its own weight as it would be in a deeper, narrower kettle

STEAM JACKETED KETTLE TYPE 3

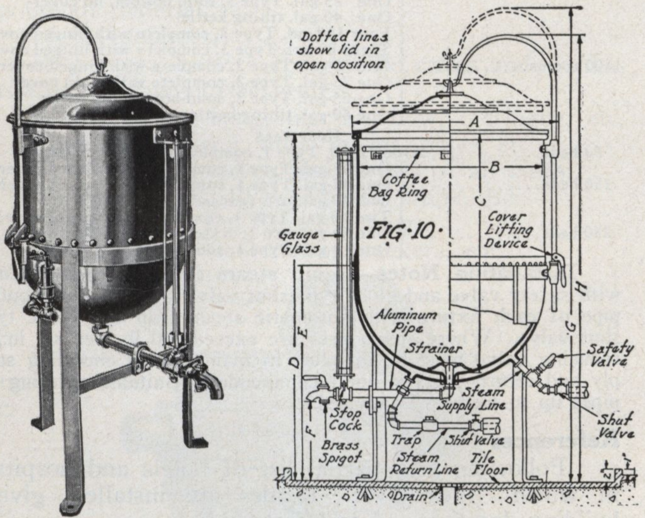
This kettle is jacketed two-thirds of the way up and offers maximum cooking capacity for the floor space occupied. It is particularly recommended for cooking delicate foods. Scorching is prevented by the evenness of the heat distribution and the ease in controlling the amount used. Foods and meat allowed to stand in "Wear-Ever" steam jacketed kettles will not darken

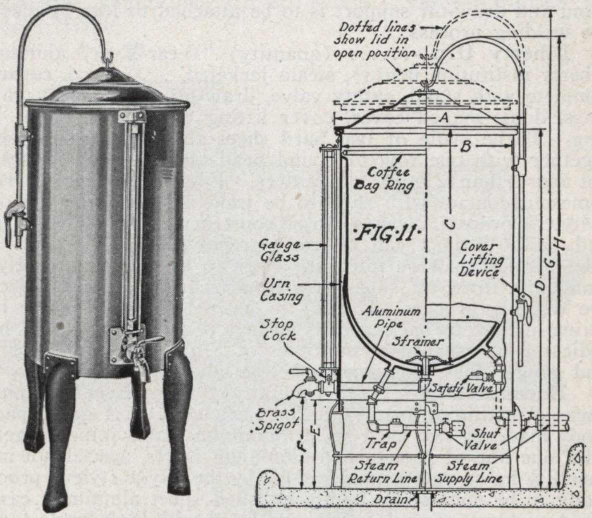
·DIMENSIONS·OF·TYPE·NO·1·STEAM·JACKETED·KETTLES·

·CAPACITY·IN·GALLONS·	5	10	15	20	25	40	50	60	75	100	125	150
·A·	18⅜"	22⅜"	25½"	27½"	29½"	33⅝"	37⅝"	39⅝"	41⅝"	44"	50⅛"	52¼"
·B·	17"	21"	24"	26"	28"	32"	36"	38"	40"	42"	48"	50"
·C·	8½"	10½"	12"	13¼"	14½"	17"	18"	19"	21"	24"	24"	26"
·D·	30⅜"	31⅜"	32⅜"	33⅜"	34⅜"	37⅜"	38¾"	39⅜"	41⅜"	42⅜"	43⅜"	45⅜"
·E·	26"	27"	28"	29"	30"	33"	34⅜"	35"	37"	38"	39"	41"
·NUMBER·OF·LEGS·	3	3	3	3	3	3	3	3	4	4	4	4
·NO·OF·TUBULAR·STAYS·	—	—	—	—	—	—	—	3	3	3	3	3
·STEAM·INLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"
·STEAM·OUTLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"
·SAFETY·VALVE·SIZE·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"
·TANK·OUTLET·DIAM·	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1½"	1½"	1½"	1½"	2"	2"
·VAPOR·COLLAR·DIAM·	1½"	1½"	1½"	1½"	1½"	2"	2"	2"	2"	2"	3"	3"
·F·	14⅛"	13⅛"	12⅞"	12⅞"	13½"	14"	13½"	13⅛"	13⅛"	11⅛"	11"	11"

·DIMENSIONS·OF·TYPE·NO·3·STEAM·JACKETED·KETTLES·

·CAPACITY·IN·GALLONS·	5	10	15	20	25	30	40	50	60	75	80	100	125	150	200	250
·A·	15 11/16"	18"	20 5/32"	22¾"	23½"	23½"	26½"	28 7/16"	30¾"	33⅝"	33⅝"	36¾"	43 13/16"	46"	55¾"	57¾"
·B·	14"	16"	18"	20¼"	21"	21"	24"	26"	28"	30"	30"	33"	40"	44"	52"	54"
·C·	10"	15"	18"	18¾"	21"	24"	25½"	26"	28"	30"	32"	33"	30 3/16"	32½"	31"	34½"
·D·	32¾"	36⅞"	36 15/16"	37 15/16"	41 7/16"	44 7/16"	45¼"	45 11/16"	48½"	50 5/16"	52½"	52 7/16"	50 9/16"	52 7/16"	51⅜"	54⅞"
·E·	29⅛"	29½"	28"	31"	31"	31"	33¼"	34"	35¾"	36½"	36½"	36½"	38"	38 11/16"	42⅝"	43⅜"
·NUMBER·OF·LEGS·	3	3	3	3	3	3	3	3	3	4	4	4	4	4	5	5
·NO·OF·TUBULAR·STAYS·	—	—	—	—	—	—	—	—				3	3	3	5	6
·STEAM·INLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"	1"	1"
·STEAM·OUTLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"	1"	1"
·SAFETY·VALVE·SIZE·	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"	1"	1"	1"
·TANK·OUTLET·DIAM·	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1½"	1½"	1½"	1½"	1½"	2"	2"	2"	2"
·VAPOR·COLLAR·DIAM·	1½"	1½"	1½"	1½"	1½"	1½"	2"	2"	2"	2"	2"	2"	3"	3"	3"	3"
·F·	16⅜"	15½"	12 9/16"	12⅞"	14 1/16"	14 1/16"	13 7/16"	12½"	13¼"	13⅛"	13⅛"	12¼"	12"	11½"	12"	12"


Dotted lines show lid in open position
A
B
C
D
E
F
G
H
·FIG·10·
Coffee Bag Ring
Gauge Glass
Cover Lifting Device
Aluminum Pipe
Strainer
Safety Valve
Steam Supply Line
Stop Cock
Brass Spigot
Trap
Shut Valve
Steam Return Line
Tile Floor
Shut Valve
Drain


Dotted lines show lid in open position
A
B
C
D
E
F
G
H
Coffee Bag Ring
·FIG·11·
Gauge Glass
Urn Casing
Cover Lifting Device
Aluminum Pipe
Stop Cock
Strainer
Safety Valve
Brass Spigot
Trap
Shut Valve
Steam Return Line
Steam Supply Line
Drain

LIBERTY URN

The Liberty urn is an outgrowth of the United States Government's need for a plain urn that could be produced quickly in large quantities. Like all other "Wear-Ever" equipment, it requires no tinning, and, because of its shape, is easily and quickly cleaned. Its entire surface, inside and outside, is readily accessible. Because of the simplicity of its construction, the cost of the labor and material to make it is comparatively small. The selling price is, therefore, quite reasonable

ENCASED URN

The encased urn is more beautiful than the Liberty urn and consequently is preferable if appearance is of greater importance than utility or price. Both this urn and the Liberty urn are fitted with covers, cover lifting device, stand, gauge glass protected by aluminum tube which also forms an indicator showing the contents of the urn in gallons, 1-in. spigot, steam inlet and outlet and ring for coffee bag (coffee bags not supplied). The 20 and 25-gal. sizes can be furnished either with or without cover lifting device

·DIMENSIONS·OF·LIBERTY·URNS·

·CAPACITY·IN·GALLONS·	20	30	40	50	60	70	80	90	100	125	150
·A·	22"	25"	25"	28"	30"	30"	34"	34"	34"	37"	37"
·B·	18"	21"	21"	24"	26"	26"	30"	30"	30"	33"	33"
·C·	24"	24⅜"	31"	30⅛"	30⅜"	34¾"	31¾"	35"	38¼"	38¾"	45½"
·D·	46"	44½"	51"	49⅜"	49⅜"	53"	50½"	54"	56"	59"	65⅝"
·E·	33"	31"	31"	33"	34"	34"	35⅜"	35⅜"	35⅜"	36½"	36½"
·NUMBER·OF·LEGS·	3	3	3	3	3	3	4	4	4	4	4
·NO·OF·TUBULAR·STAYS·	—	—	—	—	—	—	3	3	3	3	3
·STEAM INLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·STEAM·OUTLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·SAFETY·VALVE·SIZE·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·TANK·OUTLET·DIAM·	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"
·VAPOR·COLLAR·DIAM·	—	—	—	—	—	—	—	—	—	—	—
·F·	16 3/16"	16 3/16"	16 3/16"	12 11/16"	13 5/16"	13 5/16"	13 11/16"	13 11/16"	13 11/16"	12 11/16"	14 5/16"
·G·	59"	58⅞"	65⅜"	65⅜"	66⅞"	71¼"	68¾"	71¾"	74¼"	80"	86⅝"
·H·	58"	57⅞"	64⅜"	64⅜"	65⅞"	70¼"	67¾"	70¾"	73¼"	79"	85⅝"

·DIMENSIONS·OF·ENCASED·URNS·

·CAPACITY·IN·GALLONS·	20	30	40	50	60	70	80	90	100	125	150
·A·	22¾"	25⅛"	25⅛"	28¼"	30¼"	30¼"	34¼"	34¼"	34¼"	37¼"	37¼"
·B·	18"	21"	21"	24"	26"	26"	30"	30"	30"	33"	33"
·C·	28"	27½"	34⅛"	33"	33½"	37¾"	34¼"	37½"	40¾"	43"	49½"
·D·	54¼"	53¾"	64⅝"	63½"	64"	68¼"	64¾"	59"	62¼"	64½"	71"
·E·	20"	20"	24 7/16"	24 7/16"	24 7/16"	24 7/16"	24 7/16"	15⅜"	15⅜"	15⅜"	15⅜"
·NUMBER·OF·LEGS·	4	4	4	4	4	4	4	4	4	4	4
·NO·OF·TUBULAR·STAYS·	—	—	—	—	—	—	3	3	3	3	3
·STEAM INLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·STEAM·OUTLET·DIAM·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·SAFETY·VALVE·SIZE·	½"	½"	½"	½"	½"	½"	½"	½"	½"	¾"	¾"
·TANK·OUTLET·DIAM·	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"
·VAPOR·COLLAR·DIAM·	—	—	—	—	—	—	—	—	—	—	—
·F·	20 7/16"	20 7/16"	24 11/16"	24 11/16"	24 11/16"	24 11/16"	24 11/16"	15 11/16"	15 11/16"	15 11/16"	15 11/16"
·G·	64¼"	67⅛"	77⅞"	78½"	80"	85"	82"	76¼"	79½"	83¼"	88¾"
·H·	63¼"	66⅛"	76⅞"	77½"	79"	84"	81"	75¼"	78½"	82¼"	87¾"

Continued on next page

Kettles and Urns for Hotels, Restaurants and Hospitals

The uses of the kettles and urns illustrated are described under the illustrations of each type. The number of each to use for various conditions is given under the general notes.

Standard Specifications

Furnish and install where shown on plans, "Wear-Ever" kettles and urns as follows.

Type No. 3 Kettle—...... (quantity) "Wear-Ever" aluminum steam jacketed kettle(s), ... gal. capacity, Type No. 3, two-thirds jacketed, complete with machine steel stand, safety valve, hinged cover, aluminum draw-off pipe, faucet, strainer and collar for vapor pipe. Kettles to be constructed so that steam inlet and outlet fittings can be easily removed. Baffle plate and inlet fitting shall be integral. Both shell and jacket to be made from cold rolled, hard, thick sheet aluminum, and joined together by a line of rivets spaced not more than 2½ in. on centers. Edge of jacket where it comes in contact with shell to be welded to the shell by the oxy-acetylene process. (Kettles 60 gal. and larger shall have shell and jacket stayed with 3 tubular stays.) Legs of the stand to be welded securely to the stand and draw-off support to be attached to legs by the electric arc welding process.

Type No. 1 Kettle—...... (quantity) "Wear-Ever" aluminum steam jacketed kettle(s), ... gal. capacity, Type No. 1, full jacketed, complete with machine steel stand, safety valve, hinged cover, aluminum draw-off pipe, faucet, strainer and collar for vapor pipe. Kettle(s) to be constructed so that steam inlet and outlet fittings can be easily removed. Baffle plate and inlet fitting shall be integral. Both shell and jacket to be made from cold rolled, hard, thick sheet aluminum and joined together by a line of rivets spaced not more than 2½ in. on centers. Edge of jacket where it comes in contact with shell to be welded to shell by oxy-acetylene weld. (Kettles 60 gal. and larger shall have shell and jacket stayed with 3 tubular stays.) Legs of the stand to be welded securely to the stand and draw-off support is to be attached to legs by electric arc welding process.

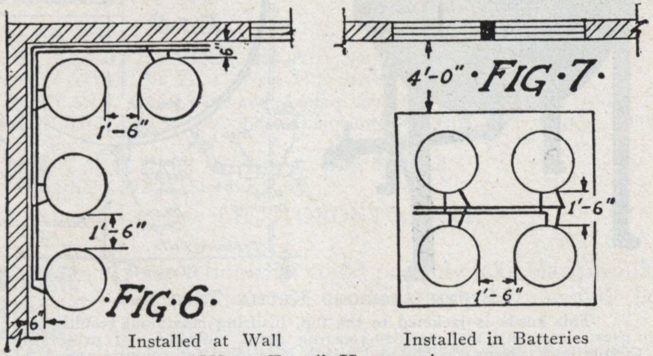
Liberty Urn—...... (quantity) "Wear-Ever" aluminum Liberty institution urn(s), steam jacketed, ... gal. capacity, complete with stand, safety valve, draw-off pipe, faucet, gauge glass, dome-shaped cover, cover lifting device and coffee bag ring. To be made of two hard sheet aluminum plates joined together with one row of round head aluminum rivets spaced not more than 2½ in. on centers. Edge of jacket where it comes in contact with shell to be welded to shell by the oxy-acetylene process. Urn(s) to be constructed so that steam inlet and outlet fittings can be easily removed. Baffle plate and inlet fittings shall be integral. Legs to be welded securely to stand and draw-off support to be attached to legs by electric arc welding process. Urn(s) to have ¾-in. cold water inlet fitting placed in back and as near top as possible. To have indicator bar spaced in multiples of 5 gal., said indicator bar and gauge glass protector to be one and the same.

Encased Urn—...... (quantity) "Wear-Ever" aluminum encased institution urn(s), steam jacketed, ... gal. capacity. Body made of two hard sheet aluminum plates joined together with one line of round head aluminum rivets, spaced not more than 2½ in. on centers and welded by the oxy-acetylene process. Body to be encased in highly polished sheet aluminum casing, fitted on black enameled legs, and fitted with high grade faucet, dome-shaped cover, cover lifting device and coffee ring bag. Urn(s) to be constructed so that steam inlet and outlet fittings can be easily removed. Baffle plate and inlet fittings shall be integral. Urn(s) to have ¾-in. cold water inlet fittings placed in back and as near top as possible. To have indicator bar spaced in multiples of 5 gal., said indicator bar and gauge glass protector to be one and the same. All connections of steam pipe, etc., will be made under another contract.

General Notes—*Kitchen Location*—Space and design permitting, kitchen should be a one-story wing with windows on opposite sides and monitor roof to provide maximum ventilation. Avoid locating kitchen in basement. In hotels, group the dining rooms with service pantries around kitchen. General hospitals require a different arrangement, as general diet is cooked in main kitchen and distributed to ward dining rooms by dumbwaiters or trucks on elevators.

Kitchen Construction—Experts recommend quarry tile, enameled brick, glazed or matt tile or concrete for floor finish in the order named; for walls, a wainscot 6 ft. high of enameled brick or tile.

Kitchen Arrangement—Jacketed kettles are best arranged in batteries away from walls and directly under monitor skylight or hood to carry off vapors. Minimum space given in Figs. 6 and 7 is for cleaning purposes. Less space will not affect efficiency of apparatus. Vapor exhaust pipes are not recommended, but when used they should be of Monel metal.



·FIG·6·

Installed at Wall

·FIG·7·

Installed in Batteries

TYPICAL "WEAR-EVER" KETTLE ARRANGEMENT

Steam Mains—2-in. for 20 kettles or less, when kettles are near boiler and steam main properly insulated; 3-in. when pipes have many turns or valves, are not insulated or kettles are a great distance from boiler.

Aisle Space—Should be ample to insure efficient serving. Where trucks are used, minimum aisle width is 4 ft.

Kettle Sizes—Depend on number of persons served and time allowed for it. The following figures will serve as a guide for the number, type and size required.

HOTELS

100 rooms	One 40-gal. Type 3, complete with hinged cover
200 rooms	One 50-gal. Type 3, complete with hinged cover One 25-gal. Type 3, complete with hinged cover One 10-gal. Type 3, solid bottom, no cover
500 rooms	One 75-gal. Type 3, complete with hinged cover Three 60-gal. Type 3, complete with hinged cover One 20-gal. Type 3, solid bottom, no cover
800 rooms	Two 100-gal. Type 3, complete with hinged cover Two 75-gal. Type 3, complete with hinged cover One 60-gal. Type 3, complete with hinged cover One 25-gal. Type 3, solid bottom, no cover One 40-gal. tilting kettle
1000 rooms	Four 100-gal. Type 3, complete with hinged cover Three 80-gal. Type 3, complete with hinged cover One 60-gal. Type 3, complete with hinged cover One 25-gal. Type 3, complete with plain cover One-25-gal. Type 3, solid bottom, no cover One 60-gal. tilting kettle

HOSPITALS

50 beds	One 25-gal. Type 1, complete with hinged cover
150 beds	One 25-gal. Type 1, complete with hinged cover One 40-gal. Type 1, complete with hinged cover One 30-gal. urn (encased or Liberty)
250 beds	Two 60-gal. Type 1, complete with hinged cover One 50-gal. urn (encased or Liberty) One 10-gal. Type 1, solid bottom, no cover

Installation Notes—Equip steam inlet of each fixture with safety valve and globe type shut valve. Equip steam outlet pipe of each fixture with automatic steam trap and globe type shut valve. Where steam pressure exceeds 40 lb. per sq. in., a reducing valve must be installed in main line. Concealing supply and return pipes is not recommended. Suitable covering of pipes up to fixtures is advised.

References

Following is a partial list of hotels and hospitals in which "Wear-Ever" Kettles are installed, giving building, location and architect.

HOTELS

St. Francis, San Francisco, Cal., Bliss & Faville, San Francisco
Los Angeles Biltmore, Los Angeles, Cal., Schultz & Weaver, New York, N. Y.
Ambassador, Los Angeles, Cal., Myron Hunt, Los Angeles, Cal.
Raddison, Minneapolis, Minn., Long, Lamoreaux & Long
Miami, Dayton, Ohio, H. L. Stevens Co., Chicago, Ill.
Hollenden, Cleveland, Ohio, Watson Co., Cleveland, Ohio
Washington (D. C.), Carrere & Hastings, New York, N. Y.
Monticello, Norfolk, Va., Peebles & Ferguson, Norfolk, Va.
Sylvania, Philadelphia, Pa., Leroy B. Rothschild, Philadelphia
Battery Park, Asheville, N. C., W. L. Stoddart, New York, N.Y.
Robert Treat, Newark, N. J., Guilbert & Betelle, Newark, N. J.
The Kimball, Springfield, Mass., S. M. Green Co., Springfield
Edgewater Beach, Chicago, Ill., Fugard & Knapp, Chicago, Ill.
Grand Canyon Hotel, Yellowstone Park, R. C. Reamer, Seattle

HOSPITALS

St. Mary's, Rochester, Minn., C. H. Johnston, St. Paul, Minn.
Lakeside, Cleveland, Ohio, Coolidge & Shattuck, Boston, Mass.
Christ, Cincinnati, Ohio, Teitig & Lee, Cincinnati, Ohio
Brooklyn, Brooklyn, N. Y., Lord & Hewlett, New York, N. Y.
Cook Co., Chicago, Ill., Paul Gerhardt, Chicago, Ill.
Barnes, St. Louis, Mo., Trueblood & Graf, St. Louis, Mo.

THE HOBART MANUFACTURING CO.

Manufacturers of Mixers, Food Cutters, Meat Cutters and General Kitchen Machines

TROY, OHIO

SALESROOMS IN ALL PRINCIPAL CITIES

Products

Mixers, Food Cutters, Meat Choppers, Coffee Grinders, Peanut Butter Makers, Vegetable Slicers, French Fry Cutters, etc.

Slogan

"It is Better to have Bought a Hobart than to *wish* You Had!"

Hobart Mixers

Hobart Mixers are built in the largest factory of its kind in the world, by an organization working with every advantage of complete modern equipment. The materials are the best that science can select. The workmanship is accurate and the finish most attractive. Hobart devices have been adopted as standard in the majority of the larger as well as the smaller hotel restaurants and institutional kitchens in the country.

Sizes—5, 10, 15, 20, 30 and 80-qt. capacities, with motors from $\frac{1}{10}$ to 2 h.p.

What a Hobart Mixer Will Do—

Mix—bread, rolls, cake and all pastry dough; cheese, mince meat and all kinds of pie fillers, etc.; very successful in mixing and beating mayonnaise and other dressings.

Gets more product and better quality from the same amount of material.

Mash—potatoes.

Beat—eggs, batters for griddle cakes and waffles, custards, anything to be beaten.

Whip—cream, icing, marshmallow, meringue, etc.

Chop—meat, fruit, nuts, raisins, dates, etc.

Grind—coffee, spices, and cereals of all kinds.

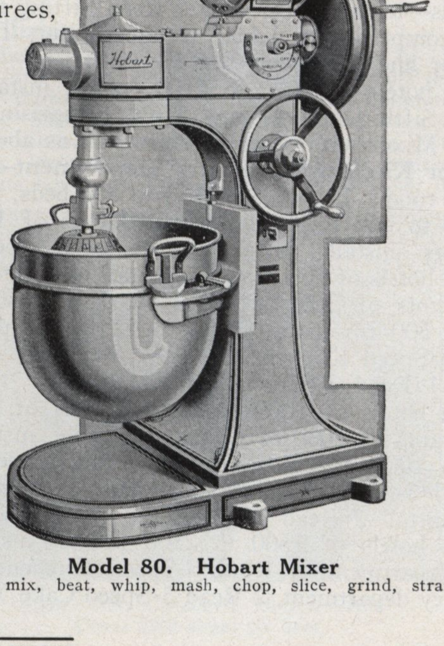
Slice—potatoes, all vegetables, fruits, etc.

Cut—potatoes for French frying.

Crumb—dry bread, cakes, crackers, etc.

Sieve—fruit, sauces, pumpkin, cottage cheese, etc.

Strain—soups, purees, etc.



Model 80. Hobart Mixer

Built to mix, beat, whip, mash, chop, slice, grind, strain, sieve, crumb, etc.

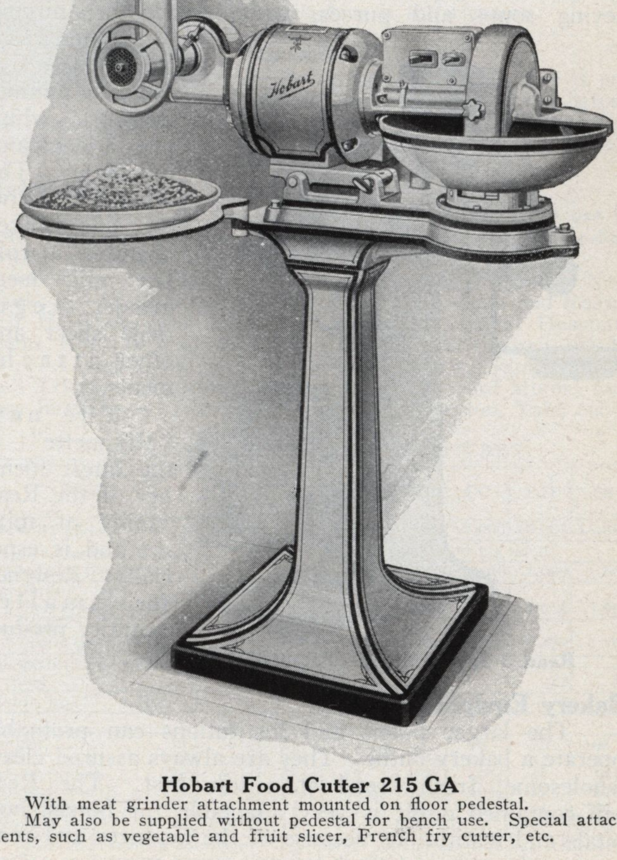
Hobart Food Cutter

This is a modern well engineered piece of equipment that is far superior to the ordinary silent cutter. Compare it with these points in mind.

(1) Range of work.
(2) Quality of work.
(3) Time required.
(4) Convenience and safety to operator.
(5) Ease in cleaning.
(6) Bench or floor space required.

Following are a few of the many things a Hobart cutter will cut. (There are too many to mention them all here.)

Vegetables—for soup; potatoes for au gratin and hash brown; cabbage for stuffing; fruit for salad; apples, oranges, lemons, bananas, peaches (canned or fresh), fresh pineapple, strawberries, cocoanut, citron; candied orange and lemon peel; candied or Maraschino cherries; nuts; sweet relish; ingredients for Thousand Island Dressing; boiled eggs; mince meat; deviled or minced ham; cooked sausage meat; liverwurst; Schmierwurst; Philadelphia scrapple; souse, etc. Slice—fruits of all kinds; potatoes, cabbage and vegetables of all kinds. Cut—potatoes for French fries.



Hobart Food Cutter 215 GA

With meat grinder attachment mounted on floor pedestal. May also be supplied without pedestal for bench use. Special attachments, such as vegetable and fruit slicer, French fry cutter, etc.

READ MACHINERY COMPANY

Manufacturers of Bakery Machinery

YORK, PA.

SALES AGENCIES

NEW YORK, N. Y.
PHILADELPHIA, PA.
CHICAGO, ILL.
LONDON, ENG.
ST. LOUIS. MO.
PARIS, FRANCE
SAN FRANCISCO, CAL.
HAVANA, CUBA
MINNEAPOLIS, MINN.
BOSTON, MASS.

TRADE-MARK

Products

COMPLETE EQUIPMENT for the BAKERY: 3-Speed Mixers, Double and Single-Arm Dough Mixers, Automatic Sifting and Flour Handling Outfits, Automatic Proofers, Bakery Equipment and Mixing Machines for hotels, hospitals, restaurants and institutions.

Service Department

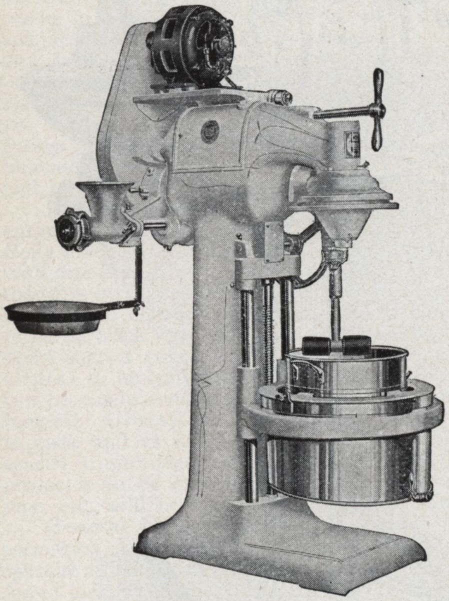
A wide experience of many years gives to this company a fund of information that is invaluable to the architect. This service is offered to all architects and they are asked to use it freely and at all times. This company has been co-operating with architects for many years and its equipment has been specified for America's leading bakeries, hotels, hospitals, restaurants and institutions.

Layouts and data sheets supplied on request. General catalogues, photographs, standard specifications and preliminary drawings are part of the service offered by this company.

Kitchen Equipment

To obtain a uniform and low-cost production, it is necessary to install in the kitchen a Read 3-Speed Mixer because of its all around usefulness and practical application to many kitchen and bakery duties. It is used for mixing bread and roll doughs, cake batches, pastry, mashing potatoes, crushing fruit and vegetables, sieving soups and purees, whipping cream; mixing mayonnaise and many other mixing, beating, whipping and creaming duties. The auxiliary drive on this mixer operates a coffee mill, meat grinder, vegetable slicer and other attachments.

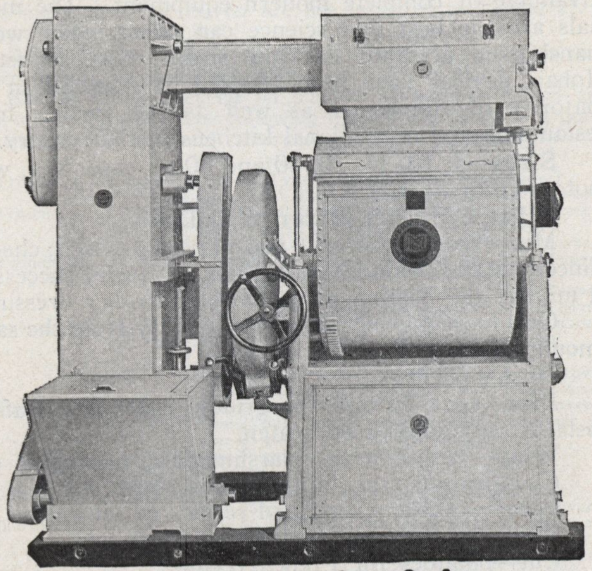
The new "Mixonette" is the latest member of the Read family of mixers and is especially designed for smaller quantity production.



Read 3-Speed Mixer (Patented)

Bakery Equipment

The larger hotels and institutions can profitably operate a bakery outfit. They are always assured clean, wholesome, fresh bread at a low cost. The Read self-contained outfit is very adaptable for hotels, hospitals and institutions because of the neatness and compactness of its design. The flour is automatically carried from the dump bin to the cone sifter where it is thoroughly cleaned and aerated and then deposited into the mixer. Doughs are rapidly and thoroughly mixed in the single-arm dough mixer. Read Automatic Bakery Outfits are now in active service in many of America's leading hotels, hospitals, institutions and in hundreds of bakeries. Standard layout sheets are supplied, showing weights and dimensions for this equipment.



Read Automatic Bakery Outfit

Specifications

For Bakery—In hotels of 500 to 1000 rooms, hospitals of 500 rooms and upwards, restaurants of 1000 meals or more daily, institutions of 500 residents and upwards—install a 1-bbl. No. 5 Read Sifting and Mixing Unit, comprising a 1-bbl. Dough Mixer, Dump Bin, Elevator and Conveyor, and Cone Sifter.

In hotels of 1000 to 2500 rooms, install a 2-bbl. No. 5 Sifting and Mixing Unit, comprising a 2-bbl. Dough Mixer with other specifications as above.

For Kitchen and Pastry Department—In hotels of 250 rooms, hospitals of 150 to 500 beds, restaurants of 100 to 250 meals daily, institutions of 100 to 250 residents—install 1 Kitchen Machine (3-Speed Mixer).

In hotels of 500 rooms, hospitals of 500 to 750 beds, restaurants of 250 to 500 meals daily, institutions of 250 to 500 residents—install in kitchen department, 2 Read 3-Speed Kitchen Machines; in pastry department install 1 Read 3-Speed Cake Machine.

In hotels of 1000 rooms, hospitals of 1000 beds, restaurants of 1000 to 1500 meals daily, institutions of 750 to 1000 residents—install in kitchen department, 3 Read 3-Speed Kitchen Machines; in pastry department install 2 Read 3-Speed Cake Machines.

In hotels of 1500 to 2500 rooms—install in kitchen department, 4 Read 3-Speed Kitchen Machines; in pastry department, 2 Read 3-Speed Cake Machines.

CRESCENT WASHING MACHINE COMPANY

Manufacturers of Dishwashing Machinery

CHICAGO OFFICE
136 W. Lake Street

218 Second Avenue
NEW ROCHELLE, N. Y.

Product

Crescent Electric Dishwashers for washing china, glassware and silver in hotels, restaurants, hospitals, institutions, cafeterias, lunchrooms, clubs, soda fountains, boarding houses, residences, etc.

Crescent Electric Dishwashers

Crescent electric dishwashers are made in 7 sizes—for all eating places. They are neat in appearance, compact and durable. Usually built of heavy, galvanized iron, finished in an attractive gray. Also furnished in 48-oz. copper or No. 16 gauge Monel metal.

Operation

No experience is necessary to get perfect results with a Crescent. Dishes are placed in racks—open top and bottom—holding the dishes apart so as to prevent breakage and to allow the water to reach every surface.

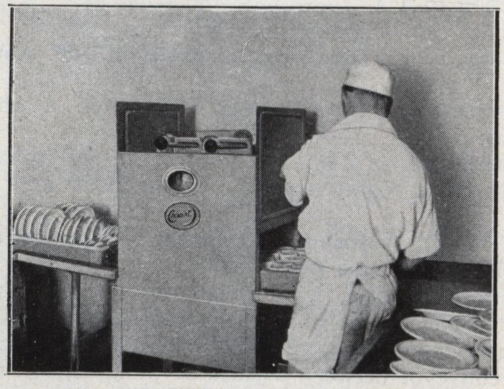
Patented Double Revolving Wash

The *double revolving wash*—the most effective cleaning action known—is a patented feature found only in the Crescent. The rack of dishes slides between two sets of revolving arms—one set above the dishes and the other set below. These arms turn around and around, about 20 times in the 20 seconds required for thorough washing. Thus every surface of every dish is washed and rewashed twenty times with heavy streams of hot soapy water discharged under pressure. None of this water is wasted. It is pumped over the dishes again and again.

The whirling streams strike the dishes from above, below and every angle, quickly removing all grease and food particles—without injuring the most delicate china.

Fresh Sterilizing Rinse

The dishes are rinsed by a scalding shower of clean hot water, used only once. Whirling sprayers distribute this water so well that thorough rinsing is assured with minimum water consumption. The heat of the wash and rinse water dries the dishes a few seconds after they leave the machine. The Crescent not only cleans dishes more thoroughly, but assures sanitation, and cuts labor and dish breakage by reducing handling.

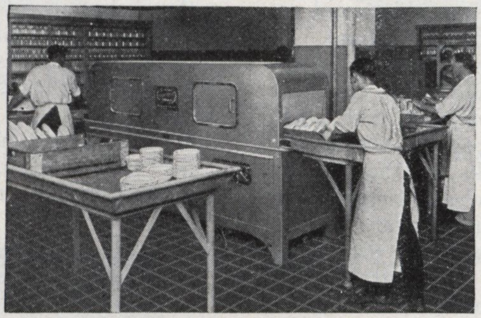


Model AA, Crescent Dishwasher
Cleans 5000 dishes per hour

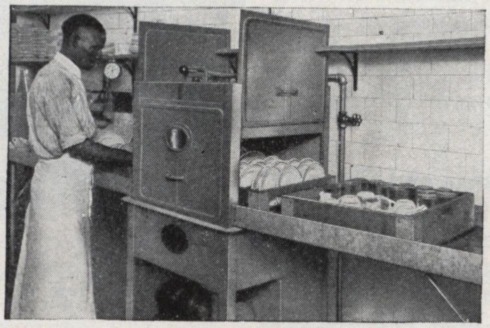
The Crescent Saves Time, Dishes and Labor

With a Crescent one girl can wash more dishes and wash them more thoroughly than three or four men can wash by hand.

And at the same time—without extra work—the dishes are sterilized and dried without the use of towels.



Model FF, Crescent Dishwasher
Cleans 18,000 dishes per hour



Model MM, Crescent Dishwasher
Cleans 3000 dishes per hour

Installation Data

The smaller Crescents require the same amount of space as the average sink. The larger Crescents, too, are unusually compact. With power and plumbing connections made, the machine is ready for use. The Crescent is watertight and eliminates wet sloppy floors and unhealthy conditions.

Blue prints, floor plans, etc., on request. Write for booklet "Planning the Dishwashing Pantry."

Tables

Tables for soiled and clean dishes are made in standard lengths of 40 and 60 in. Tables of special length can be supplied also. The great convenience of having tables at both sides of machine fully justifies their small cost.

Disposal of Grease and Refuse

The grease from the dishes is disposed of automatically. Refuse is caught by removable strainer pans. The soapy water which is used again and again is cleansed through surface decantation each time a rack of dishes is washed. The machine is self-cleaning.

Guarantee

Every Crescent dishwasher is put through a practical working test before it leaves the factory. It is fully guaranteed against all mechanical defects for a period of 1 year.

References

More than 16,000 Crescent dishwashers are in daily use in leading hotels, restaurants, hospitals and institutions. The following are just a few of our satisfied users:

Commodore, Waldorf-Astoria and Vanderbilt Hotels, New York; 310 U. S. Government Hospitals; Mt. Sinai and Roosevelt Hospitals, New York; San Francisco General Hospital; Johns Hopkins Medical College Hospital, Baltimore; 200 Y. M. C. A. and Y. W. C. A. Branches; Huyler's; Schrafft's; 150 Bell Telephone Lunchrooms; Dupont and General Motors factory lunchrooms; Columbia University, Princeton, Yale, etc.

A CRESCENT FOR EVERY SIZE KITCHEN

Model	K	MM	The new AA	BB	CC	DD	FF
Capacity (pieces per hr.)	1,500	3,000	5,000	7,000	8,000	10,000	18,000
	Persons accommodated per meal						
Hotel, restaurant or club: 10 dishes per person...	150	300	500	700	800	1,000	1,800
Cafeteria: 6 dishes per person...	200	500	833	1,166	1,333	1,666	3,000
Hospital: 7 dishes per person...	214	428	714	1,000	1,143	1,428	2,591
Racks furnished with machine..............	3	4	6	8	10	12	15
Motor, hp............	¼	½	¾	1½	2	3	5
	Dimensions						
Length..............in.	26¼	27	31	58	58	75	108
Width..............in.	25½	28½	30¾	30 5/16	32	31	33
Height (open).......in.	62¼	68½	69	60¾	60¾	57	59½
Height (closed)......in.	49¾	58½	60¼	60¾	60¾	57	59½
Table height.........in.	32	34	34	34	34	34	34
Shipping weight.....lb.	410	510	685	1050	1350	1900	2250

Standard heating equipment: gas burner and steam injector. Electric, gasoline or kerosene heaters furnished at slight additional cost.

COLT'S PATENT FIRE ARMS MANUFACTURING CO.

Manufacturers of Dish, Silver and Glass Cleaning Machines

HARTFORD, CONN.

AUTOSAN DISH AND SILVER CLEANING MACHINE

TRADE MARK REGISTERED U.S. PAT. OFFICE

Product

Electric Dishwashers.

Why the Autosan is the Most Efficient Dishwasher Made

Autosan dishwashers save at least half of the labor required by other methods by eliminating the packing of tableware into baskets or racks before washing and removing it from the baskets or racks after washing.

In Autosan machines, the operator simply places soiled tableware directly on a fiber cushioned conveyor at one end of the machine (without packing in baskets) and removes them from the opposite end, thoroughly cleansed and sterilized. Knives, forks and spoons are washed in wire bottom trays; cups and glasses in strong retainers and coffee pots on strong wire racks.

By thus reducing the number of times that tableware is handled in washing and by concentrating the labor so that it functions with maximum efficiency, the elimination of from one to three dishwashing laborers commonly follows the installation of Autosan equipment.

The workmanship and quality of materials entering into the construction of Autosan machines are of the highest possible grade. All Autosan machines are built of metals that guarantee long life—hard drawn copper tanks and brass conveyor, fibered to protect chinaware—assuring slow depreciation and years of wear.

Autosan Dishwashers Prevent Breakage and Chipping

The reduction in handling described above also effects substantial savings in breakage, which is further reduced by the fiber cushions on the surface of the Autosan conveyor, a patented feature found in no other dishwashing appliances. This feature also prevents the blackening of chinaware, etc., which would otherwise result from contact with metal.

The installations of Autosan dishwashers have not only materially reduced the payrolls of hotels, restaurants, clubs and institutions everywhere, but have also reduced breakage 60% and more.

Model "CD-3" Autosan Dishwasher (Capacity up to 3500 Persons per Meal)

This model is of the horizontal straightaway conveyor type. Dishes are carried on the cushioned brass conveyor between 3 pairs of pump driven sprays (one above and one below the conveyor) connected with three separate tanks, where they are successively washed, rewashed and rinsed. A fourth pair of sprays, directly connected to steam and clean hot water supply, finally sterilizes them.

A mixer is provided by which water can be heated through a direct application of steam.

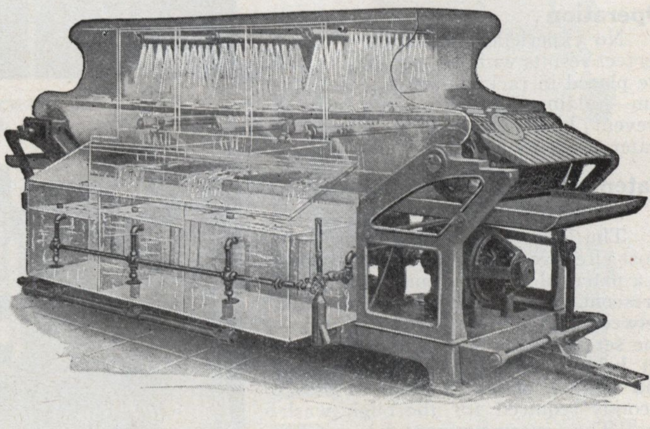
An electric motor operates the conveyor and drives the pumps which force the water from the tanks through the sprays. Conveyor is controlled independently of the pumps, so that while pump operates continuously with the motor, the conveyor is started and stopped by a foot treadle at the clean dish end. The final spray operates with the conveyor so that when the latter stops, water is shut off from the spray, resulting in the use of a minimum amount of water.

Water leaving the dishes falls upon a sluice pan directly beneath the conveyor, which guides it to one side where there is only a slight fall to the scrap trays. This eliminates the fall of refuse into the water tanks.

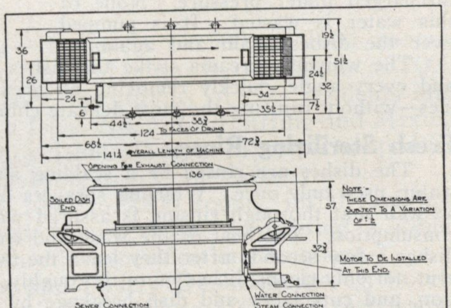
Before reaching the pumps and again being sprayed on the dishes, the water passes through a filter, which precludes the possibility of clogging.

All parts necessary to be cleaned are easily accessible. Scrap trays can be cleaned without stopping the machine.

Casing and tanks are made of 40-oz. hard rolled copper with 3 separate tanks valved to permit filling either collectively or independently, and equipped with standpipes to maintain correct water level without undue waste of water or solution.



Phantom View of Model "CD-3" Autosan Dishwasher


36
26
24
6
44½
38¾
124 To Faces Of Drums
68½
72¾
141¼ Overall Length of Machine
19½
51½
24½
32
34
35½
7½
Opening For Exhaust Connection
136
Soiled Dish End
57
32¾
Note - These Dimensions Are Subject To A Variation Of ± ½
Motor To Be Installed At This End.
Sewer Connection 2" Pipe.
Water Connection
Steam Connection
½-Pipe.
COLT AUTOSAN CD-3 DISH AND SILVER CLEANING MACHINE
M-19 D-479

Dimensions of Model "CD-3" Autosan

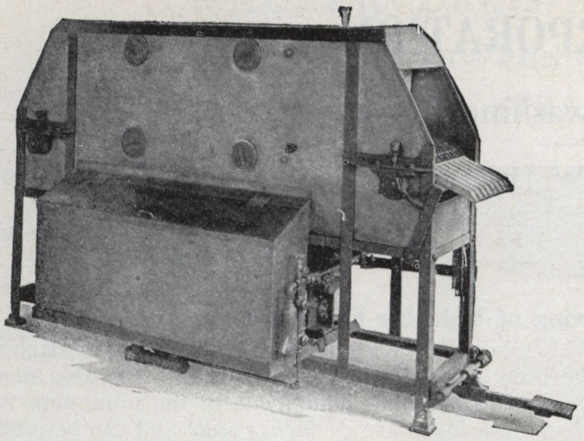
Pump is of new design, with extra large stuffing boxes and outboard ball bearings, reducing friction to a minimum and ensuring long life. Pump shaft is protected from contact with water or washing solutions.

Operated by a 3-hp. motor—current and voltage to suit customer's requirements. Weight, 3000 lb.

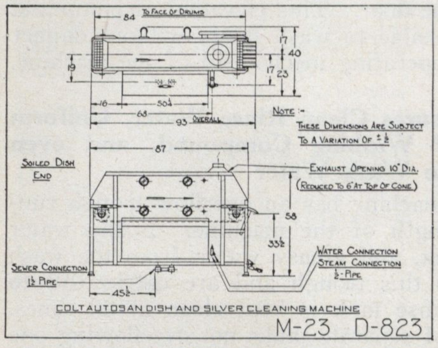
Model "C-2" Autosan Dishwasher (Capacity up to 1500 Persons per Meal)

A medium size, light weight and compact model similar in construction and operation to Model "CD-3" previously described, except that soiled dishes are carried by the conveyor between 2 pairs of pump driven sprays (instead of 3 pairs as in Model "CD-3") connected with

Continued on next page



Model "C-2" Autosan Dishwasher


84 To Face Of Drums
17
40
19
17
23
16
50¼
68
93 Overall
Note :-
These Dimensions Are Subject To A Variation Of ± ½
87
Soiled Dish End
Exhaust Opening 10" Dia.
(Reduced To 6" At Top Of Cone)
58
33½
Water Connection
Steam Connection
½-Pipe
Sewer Connection
1½ Pipe
45½
COLT AUTOSAN DISH AND SILVER CLEANING MACHINE
M-23 D-823

Dimensions of Model "C-2" Autosan

2 separate tanks, which successively wash and rinse them. A third spray directly connected to steam and hot water supply finally sterilizes them.

Casing and tank made of 32-oz. hard rolled copper. Other structural features same as Model "CD-3." Operated by a 2-hp. motor, current and voltage to suit customer's requirements (other makes furnished at additional charge). Weight, 1425 lb.

Model "C-22," an Oversize "C-2" for Heavier Duty—A complete automatic unit which, like the "C-2," is most economical of floor space. By widening the conveyor and enlarging the tanks, approximately 30% additional capacity has been gained with the identical labor-saving features of the "C-2."

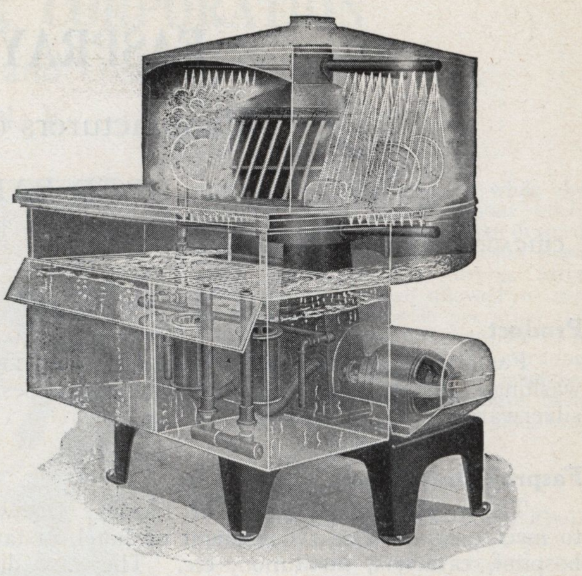
Model "B" Autosan Dishwasher (Capacity up to 1000 Persons per Meal)

This model has a rotating conveyor 45 in. in diameter, driven at a speed of 2 r.p.m. by an electric motor. Conveyor and rack are cushioned with fiber strips and tubes so that dishes will not come in contact with metal, thus precluding the possibility of breakage and chipping.

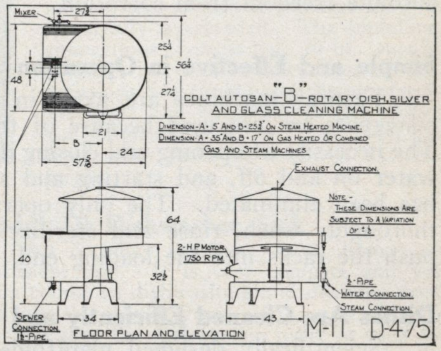
The motor also drives the 2-compartment centrifugal pumps which force water from the 2 tanks through the spray pipes. The revolving conveyor carries the tableware between 3 pairs of sprays (one above and one below the conveyor.) The first pair of sprays washes the tableware with hot solution, the second pair rinses with hot water and the third pair sterilizes with clean boiling water and live steam.

Water from sprays falls into a sluice pan beneath the revolving conveyor, flows to one side of the sprays and falls into the scrap tray, consequently refuse is never forced into the tanks. Refuse is easily removed from scrap trays while machine is in operation. Before passing back into pump, water is filtered.

Conveyor is easily held stationary while motor and pumps remain in operation, preventing breakage of tableware or injury to the machine.



Phantom View of Model "B" Autosan Dishwasher


Mixer
27½
25¼
56¼
A
48
27¼
"B"
COLT AUTOSAN—B—ROTARY DISH, SILVER AND GLASS CLEANING MACHINE
Dimension-A = 5" And B = 25¾" On Steam Heated Machine.
Dimension-A = 35" And B = 17" On Gas Heated Or Combined Gas And Steam Machines
21
B
24
57 5/16
Exhaust Connection.
Note -
These Dimensions Are Subject To A Variation Of ± ½
64
40
2-H P Motor 1750 R P M.
32½
½-Pipe
Water Connection.
Steam Connection.
Sewer Connection 1½-Pipe.
34
43
FLOOR PLAN AND ELEVATION
M-11 D-475

Dimensions of Model "B" Autosan

Casing and tanks are made of 40-oz. hard rolled copper with all joints reinforced, riveted and soldered.

Operated by 2-hp. motor; current and voltage to suit customer's requirements. Weight, 1425 lb.

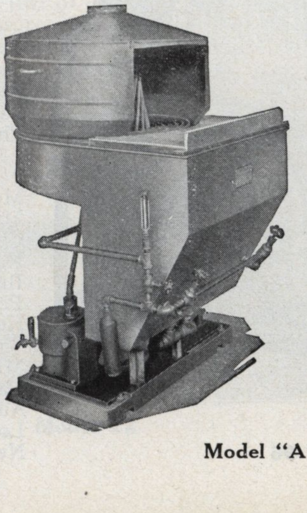
Model "A" Autosan Dishwasher (Capacity up to 500 Persons per Meal)

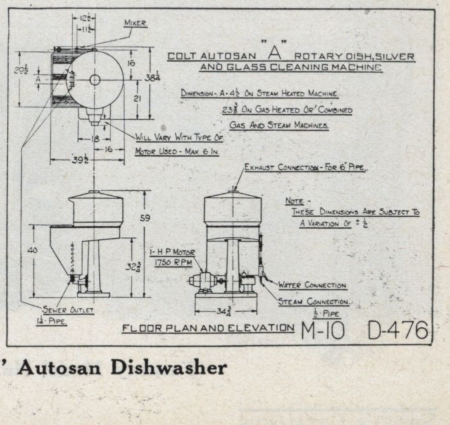
This model is similar in design to Model "B," but is smaller. Table diameter, 30 in. Can be advantageously used as a glass washing machine to supplement Models "CD-3" or "C-2."

Operated by a 1-hp. motor; current and voltage to suit requirements. Weight, 725 lb.

Catalogues

Write for Architect's Pack containing illustrated catalogues, prices, blue prints, and detailed information on the various models.




12½
11½
Mixer.
"A"
COLT AUTOSAN A ROTARY DISH, SILVER AND GLASS CLEANING MACHINE
29½
A
16
38¼
21
Dimension - A = 4½ On Steam Heated Machine.
23⅜ On Gas Heated Or Combined Gas And Steam Machines.
18
16
39½
Will Vary With Type Of Motor Used - Max 6 In.
Exhaust Connection - For 6" Pipe.
Note -
These Dimensions Are Subject To A Variation Of ± ½
59
40
1-H P Motor 1750 RPM
32¾
Water Connection
Steam Connection.
½-Pipe
Sewer Outlet 1¼-Pipe.
34¾
FLOOR PLAN AND ELEVATION
M-10 D-476

Model "A" Autosan Dishwasher

FASPRAY CORPORATION

Manufacturers of Dishwashing Machines

RED BANK, NEW JERSEY

CHICAGO OFFICE, 123 W. Madison Street

SAN FRANCISCO OFFICE, 18 Montgomery Street

Product

Faspray Electric Dishwashing Machinery for washing, rinsing, and sterilizing dishes, glasses, and silverware.

Faspray Dishwashers

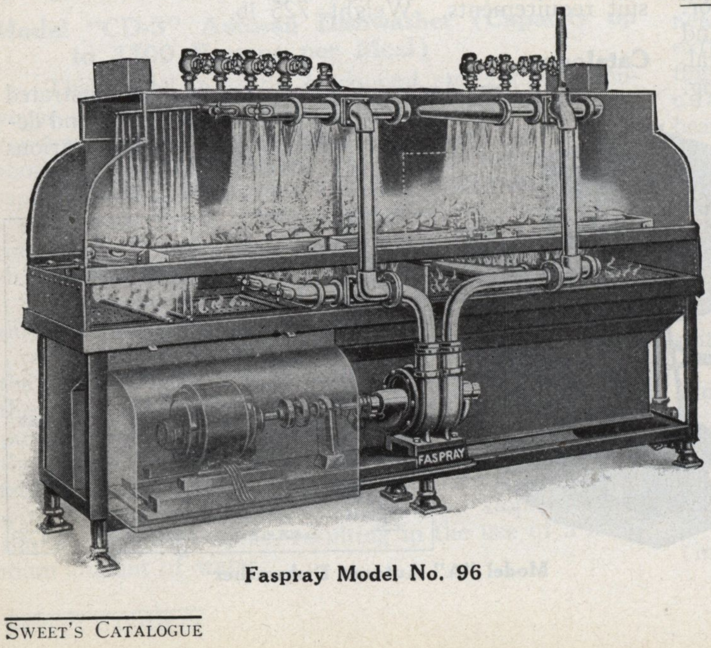
There is a special model of Faspray Dishwasher to meet every service requirement of hotel, restaurant, hospital, cafeteria, institution, etc. They are durably constructed—all metal parts are of *copper, bronze,* or *brass.* These long wearing metals assure long life, and absolute freedom from corrosion.

Simple and Effective in Operation

Faspray machines are made in the basket type—conveyors are not used because of their disadvantages. The necessity of opening and closing doors, turning rinse water on and off, and starting and stopping conveyors has been eliminated. The only operation necessary to thoroughly wash, rinse and sterilize dishes, etc., is to push the racks into the loading end.

Dishes Are Cleaned Efficiently and Quickly

Scientifically designed manifolds spray the dishes thoroughly from both top and bottom, quickly removing every trace of grease and soil. The final sterilizing spray is controlled by a special trigger at the loading end; it starts automatically as the rack enters the machine, and automatically shuts off after the necessary spraying operation is completed. This method insures complete rinsing of dishes with hot water and sterilizing steam before they leave the machine. It insures against waste of rinse water when racks are not being fed into the dishwasher.



Faspray Model No. 96

Saving of Valuable Floor Space

Kitchen floor space is invaluable. Faspray machines have been especially designed to reduce the area necessary for dishwashing equipment to the minimum. All Faspray machines are *24 inches wide* and can be readily installed against a wall. Motor, pump, and cleaning door are at the front of the machine, with a clearance of 8 inches from the floor. This elevation of pump and motor makes it possible to wash floors without danger of damage to the operating mechanism of the machine.

Special Design Insures Clean Rinse Water, Uniform Strength of Washing Compound, and even Temperature Wash Water

The Faspray machine has an overflow trough running the entire length of the machine. Soapy water from the rinse tank, and greasy water from the wash tank overflow into this trough and are carried off to the sewer. The rinse tank is kept clean at all times. This construction of separate tanks not overflowing one into the other is an exclusive Faspray feature. Washing solution is kept at uniform strength, and the temperature of the wash tank is maintained at the desirable temperature of 130° F. or lower. The water in the rinse tank is kept at 200° F.

FULL DATA ON FASPRAY MODELS

	Model 26	Model 48	Model 60	Model 96
Capacity, pieces per hour	4000	7000	10,000	20,000
Floor space:				
Length, in	28	48	60	96
Width, in	24	24	24	24
Height, in	56	56	56	56
Motor:				
Horsepower	¾	1	2	3
R.p.m	1725	1725	1725	1725
Approx. shipping weight, lb	600	825	1250	1750
Tanks:				
Number	1	2	2	2
Capacity of each, gal	28	28	35	42
Steam and water connection, in	½	½	½	½

All models can be furnished for right or left-hand feed.

A Few of the Many Faspray Installations

New York, N. Y.—Hotel Astor; Schrafft's; Maillard's; Horn & Hardart Co.; Exchange Buffet; College of St. Francis Xavier
Brooklyn, N. Y.—Abraham & Straus; Hotel St. George
Ossining, N. Y.—Sing Sing Prison
Atlantic City, N. J.—Hotel Shelbourne; Hotel Traymore
Lakewood, N. J.—Laurel-in-the-Pines
Philadelphia, Pa.—Ritz-Carlton Hotel; Adelphia Hotel; Pennsylvania Hotel; John Wanamaker Store; Gimbel Bros.; Houston Club
Mercersburg, Pa.—Mercersburg Academy
Miami, Fla.—Pancoast Hotel
Chicago, Ill.—Horn & Hardart Co.
Nassau, Bahama Islands—New Colonial Hotel
Buenos Aires, Argentina—Plaza Hotel
Ponca City, Okla.—Jens-Marie Hotel
Kenilworth, Ill.—New Trier High School
Sidney, Va.—Hampden-Sidney College
Middletown, Conn.—Connecticut State Hospital
Lawrence, Mass.—Lawrence High School
Augusta, Ga.—Bon Air Hotel
Long Beach, N. Y.—Hotel Trouville
Newark, N. J.—Young Women's Christian Association

WALKER DISHWASHER CORPORATION

Manufacturers of Dishwashers and Dishwasher Sinks

SYRACUSE, N. Y.

Products

Walker Electric Dishwasher.

Walker Electric Dishwasher Sinks.

Description

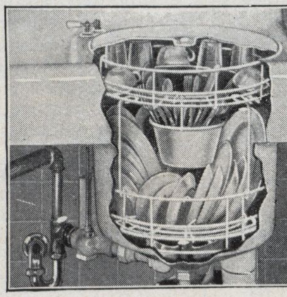
The new models of the Walker Electric Dishwasher are already in use in thousands of homes and apartments about the country. Their mechanical simplicity and efficiency have won the approval of Good Housekeeping Institute, Modern Priscilla Testing Home, New York Tribune Institute and dozens of leading domestic science experts, architects and engineers. The Walker principle is the result of over ten years of painstaking experimentation and development in an effort to provide a dishwashing unit that would fulfill the requirements of the most exacting housekeeper. The Walker is furnished in a variety of sizes ranging from separate models to combinations with sink and drainboard.

Typical Installation

Construction

Models 10, 11 and 12 are built of the highest grade porcelain enameled iron. They are gleaming white and extremely sanitary in appearance. The principle of operation consists of a revolving dasher in the cone bottom of the machine which hurls a stripping, cleansing column of hot water over every piece of china, glass and silverware in the container. This dasher is driven through a reducing gear by a ¼ hp. motor. The dishes are placed in light, strong trays covered with a special white Viscolac product which prevents any metal contact with the dishes. These trays do not move. Many little refinements such as the non-leakable dasher shaft assembly and the foolproof overflow valve all add to the sturdy simplicity of the Walker. A float indicator tells when the proper amount of water is in the machine and the drain is operated by a handle on top of the sink. A single trap serves sink and dishwasher. A strainer prevents particles of food from going down the drain.

Baskets are spot-welded.



Sectional View

Operation

Instead of dishes accumulating in the sink, they are placed in the dishwasher container as they are brought from the table. When the machine is full, whether after each meal or once a day, a few quarts of hot water, with a teaspoonful or two of soap powder, are introduced into the machine. A pressure of the switch starts the dasher in operation and it is allowed to operate about five minutes while the operator busies herself about other tasks. The soiled water is then drained from the machine and fresh, clean water introduced for rinsing, after which the dishes are allowed to dry themselves. The whole operation for a day's dishes does not consume over fifteen minutes. Complete operating instructions go with every machine. Women by the thousands have been amazed at the efficiency and simplicity of the Walker.

Installation

Plumbing and Electrical Connections—General roughing-in dimensions are available upon request. An extension cord from the motor can be connected to any convenient electrical outlet on the lighting circuit. A 15-ampere fuse is sufficient unless the line is already overloaded. The plumbing connections consist of ½-in. supply and 1½-in. drain connections, all dimensions for roughing-in being standard with the exception of the outlet for the drain, which is 12 in. from the floor when the sink is set at a 36-in. height.

Model 10 Dishwasher Sink

This is the standard new home or apartment unit. It is very compact and yet has a combined dishwashing and draining area equivalent to the average 74-in. sink, due to the fact that the dishwasher itself is used to wash and drain the dishes. Capacity ample for average family. Size 42 in. long, 22 in. deep; height adjustable from 32 to 36 in. Furnished complete, less faucets, trap and drain connection.

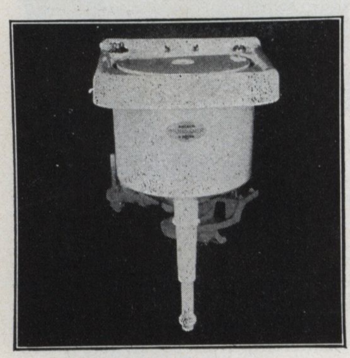
Model 11 Dishwasher

Where it is more convenient to use a separate dishwasher in the butler's pantry or in some place in the kitchen remote from the sink, the separate Model 11 is most successful.

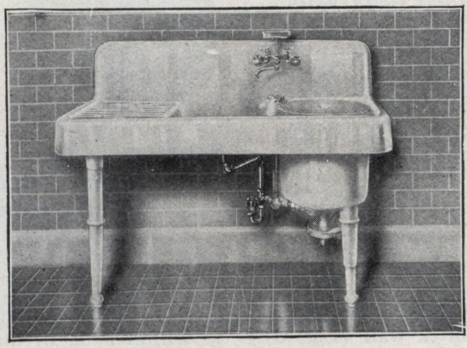
It is particularly adaptable to alteration work where possibly the existing sink is to be maintained. Ample capacity for six or more people. Size, 24x24 in.; adjustable in height.

Model 12 Dishwasher Sink

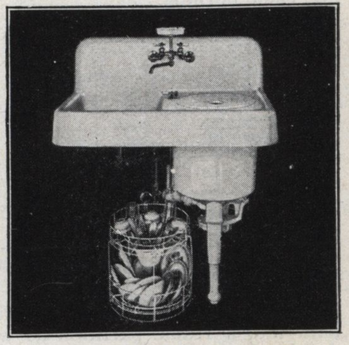
This unit consists of drainboard, sink and dishwasher combined and is available for better class homes and apartments where a slightly larger sink and dishwasher than is available in Model 10 is necessary. Size, 60x24 in.; height adjustable from 32 to 36 in.



Model 11



Model 12



Model 10

BUFFALO CO-OPERATIVE STOVE CO.

Manufacturers of Incinerators, Stoves and Warm Air Furnaces

Amherst Street
BUFFALO, N. Y.

Products

HOUSEHOLD, APARTMENT HOUSE and HOSPITAL INCINERATORS. Also Amherst Stoves and Warm Air Furnaces.

Manufacturing Facilities

We manufacture a complete line of incinerators for any purpose up to a maximum capacity of 24 bushels per 24-hour day. Made in any type or style and equipped to burn coal, coke, wood or gas.

New Amherst Household Incinerator

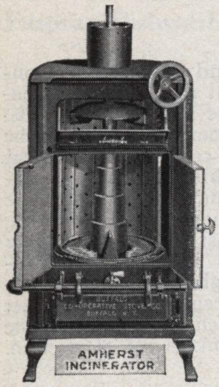


FIG. A. INTERIOR OF AMHERST INCINERATOR SHOWING NEW PRINCIPLE OF DESIGN (Patented)

The result of nine years' effort to produce an absolutely odorless and efficient incinerator. At no time, if the machine is properly operated, will there be odors during burning, either in the building or outside.

Construction and Operation—Gray iron castings throughout assure maximum durability and freedom from repairs.

The principle of gravity applies in the operation of the Amherst incinerator, a radical departure from former methods. The gas comes up through the telescope, igniting at the top under the baffle plate which has radial flanges that rest on the garbage. This provides adequate air space for complete combustion. Top sections of the telescope are perforated to supply additional gas. The weight of the telescope and baffle plate gradually forces the garbage down as it is consumed, effecting a decided saving in gas. One section of the telescope drops into the next until it is entirely collapsed when the full charge is consumed. A patented mechanical valve automatically shuts off the gas when the bottom is reached, a feature of safety and convenience. The wheel at the top right of the machine operates the baffle plate. A ratchet which extends 19 in. above the flue collar (Fig. B) when the telescope is fully extended raises the baffle plate clear of the charge opening when garbage is dumped in.

The open door arrangement is important, for by opening the large front doors and removing the front section of the fire pot, the entire interior is accessible. The entire apparatus is sterilized by the intense heat generated during each burning.

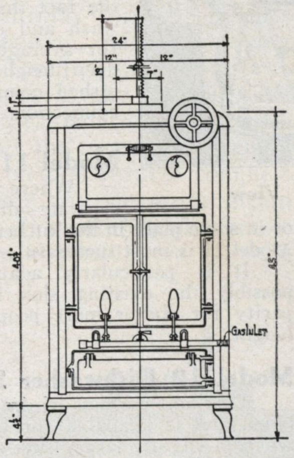


FIG. B. FRONT ELEVATION OF PORTABLE TYPE NO. 30 AMHERST INCINERATOR

DIMENSIONS AND CAPACITIES OF AMHERST INCINERATOR

No.	Type	Capacity, bushels	Height, in.	Floor space, in.	Weight, lb.
20	Portable	1¼	43	22x22	375
	Built-in	1¼	49	24x24	390
30	Portable	2	45	24x24	450
	Built-in	2	51	26x26	465
40	Portable	3	46	30x30	600
	Built-in	3	52	32x32	625

Note: Blue print showing complete roughing-in dimensions is available to the architect.

Built-in Wall Type—Thoroughly insulated and can be built into a frame partition as well as a brick wall (Fig. C). A 7-in. diameter smoke pipe can be connected to the flue direct.

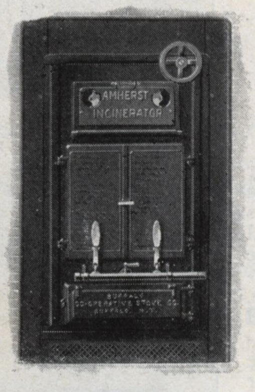


FIG. C. FRONT VIEW OF BUILT-IN WALL TYPE AMHERST INCINERATOR

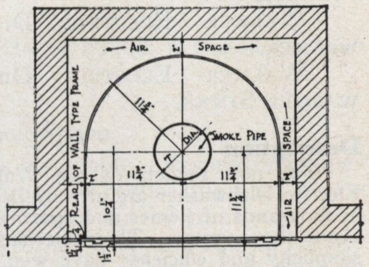


FIG. D. PLAN OF NO. 30 BUILT-IN WALL TYPE

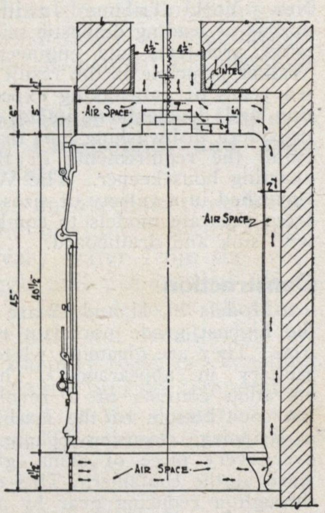


FIG. E. RIGHT SIDE VIEW SECTION OF NO. 30 BUILT-IN WALL TYPE AMHERST INCINERATOR

Note space completely surrounding apparatus for circulation of air current

Isolator Hospital Type

Constructed to receive and dispose of liquid in quantity—an exclusive feature of our gas operated waste consumers. Particularly suitable for hospitals and sanitariums for disposition of sputum cups, and in operating rooms for destroying liquid human material, dressings, gauzes, bandages, etc. A special feature is the tilting pot which enables the ash to be dumped into the ash pan, thereby cleaning pot of ashes after each burning. The Isolator is now used by a great many hospitals and institutions in the United States and in foreign countries.

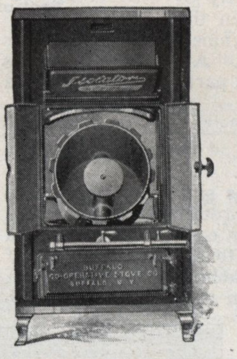


FIG. F. INTERIOR CONSTRUCTION ISOLATOR HOSPITAL TYPE

Sanotype No. 10 Apartment House Type

Can be furnished in 1, 2, 3 or 4 sections. Single section has 6-bushel capacity. Constructed of heavy cast iron; equipped with patented combination gas burner, shaking and dumping grate, consisting of three grate bars. Non-explosive flues extend from bottom of grates to within 3 in. of main top. Efficient, well constructed, economical outfit.

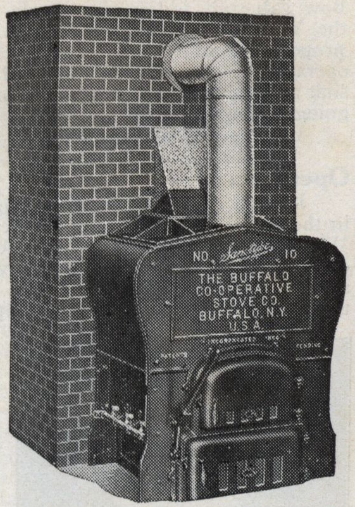


FIG. G. SANOTYPE NO. 10 APARTMENT INSTALLATION

GODER INCINERATOR CORPORATION

323 North Michigan Boulevard
CHICAGO, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

Product

A complete line of INCINERATORS, or GARBAGE and REFUSE DISPOSAL BURNERS, for residences, apartments, hotels, clubs, restaurants, hospitals, industrial plants, and municipalities, for inside and outside installation.

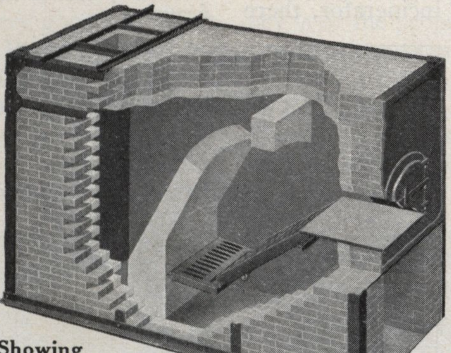
Superior Features

While operated precisely as other incinerators, Goder Incinerators are designed on scientific combustion engineering principles. By introducing the draft through the grates (an exclusive Goder feature made possible by our step-grates), a higher temperature is developed, resulting in more thorough combustion and the complete absence of odors.

Drying arches are not necessary as wet garbage or refuse is quickly burned without drying.

The design of Goder Incinerators, as shown in the illustration, affords the use of a smaller incinerator to burn a given quantity of garbage and refuse which, together with the elimination of drying arches, creates a considerable saving in brickwork and requires less space to install.

Other features are fully explained in our catalogue.



Showing Goder Superiority Step Grates as used in Model 7 Furnace

Practical Adaptation

The successful adaptation of a Goder Incinerator to a particular building or condition is a simple matter. The table below provides preliminary details for this purpose, but every architect should have our catalogue in his reference file, and submit special layouts to us. Special conditions require special thought, especially for installations in other than apartments and residences. We furnish layouts and suggestions to the architect whenever necessary, and are always glad to render our service in the selection and adaptation of a Goder Incinerator which will best answer requirements in a given case.

Guaranteed Satisfaction

That Goder Incinerators provide economical, efficient disposal of garbage and refuse is best attested by our many installations operating under widely varying conditions. The approval of leading architects and engineers, and the recommendations of our users, warrant our assertion that there is not a garbage and refuse disposal problem which can not be solved by some one type of Goder Incinerator. General satisfaction assures that *the service we are rendering to others is our best recommendation to you.*

TABLES OF MODELS AND CAPACITIES

Recommended use	Model No.	Capacity per hour, lb.		Style of feed	Over-all dimensions						Approx. Number of bricks		Flue or breeching		REMARKS
		Wet	Dry		Height, ft.	in.	Width, ft.	in.	Length, ft.	in.	Common	Fire	Size, in.	Material	
Chimney-fed for residences, apartments, small hotels, small hospitals, stores and outside uses	C1	Res. and two flats		All of these models are chimney-fed through intakes at each floor level	6	0	3	5	4	0	900	300	12x12	Brick, lined with fire brick or burnt clay flue tile	Straight front
	C2	Large res. and apartments from 3 to 16 families			5	7	3	11	4	7½	1100	350	14x14		Straight front
	C2F				5	7	3	11	4	7½	1100	350	14x14		Steel frame
	C3	For apartment buildings from 17 to 40 families			6	0	4	3	4	7½	1300	400	16x16		Straight front
	C3F				6	0	4	3	4	7½	1300	400	16x16		Steel frame
	C3IF				6	0	4	3	4	7½	1300	400	16x16		Inclined front
	C4	For apartment buildings of 40 or more families			6	10	4	3	5	10½	1500	525	20x20		Straight front
	C4F				6	10	4	3	5	10½	1500	525	20x20		Steel front
	C4IF				6	10	4	3	5	10½	1500	525	20x20		Inclined front
Assembled type, various uses	Garbage hog	90		Front door	5	0	3	1	3	8	None	None	Diam. 12	Steel	Can be furnished with hot water heater
Where top and front feed is needed	1A	300	500	Top and front feed	7	6	5	3	10	0	Brickwork on these sizes varies. Complete data can be had by writing to our office		14x14	Chimneys or breeching are made of brick, or steel lined with fire-brick or suitable flue lining	The correct use of any of these furnaces is determined by conditions. Where one is not adaptable to a given condition, another type will take care of requirements
	1B	400	750		8	0	5	7	11	0			16x16		
	1C	500	1000		8	10	6	7	12	10			20x20		
For excessively wet material	3A	300	500	Top and front feed	8	0	5	3	10	6			14x14		
	3B	400	700		8	0	5	7	11	0			18x18		
	3C	500	900		8	4	6	7	11	0			22x22		
Standard front shovel feed	7A	90	175	Front feed only	6	1	4	4	9	3			14x14		
	7B	110	200		6	6	4	9	9	8			16x16		
	7C	250	500		6	9	5	6	11	6			18x18		
	7D	300	600		7	9	6	7	12	10			22x22		
For unusual conditions	Type 4	Type 4, built in various sizes, is specially designed to fit in places where one of our other models can not be used													Adapted to buildings in operation
Inclined fronts for dumping from cans	5A	160	350	Front feed only	6	9	5	3	10	9	See note above regarding bricks		14x14		Especially adaptable for hotels, restaurants and cafeterias
	5B	225	400		6	9	5	7	10	9			16x16		
	5C	300	500		6	9	5	11	10	9			20x20		
Forced draft type where natural draft is insufficient	30	1000		Top feed	9	8	8	11	14	8			18x22 or 24x30		For use where large quantities of waste is to be burned
	30A			Top & side	9	8	8	11	13	2					
	31			Double frt.	8	7	10	2	13	2					

GRAVER MANUFACTURING COMPANY

Manufacturers and Designers of Incinerators

CLEVELAND, OHIO

BRANCHES IN PRINCIPAL CITIES

Graver Incinerators

The Graver incinerator consists of a brick combustion chamber (lined with fire brick and built at the base of the chimney) into which is built a grate arrangement for holding, drying and burning garbage and rubbish. Receiving hoppers are built into the chimney, one hopper in or near the kitchen in residences and one or more on each floor of apartment houses.

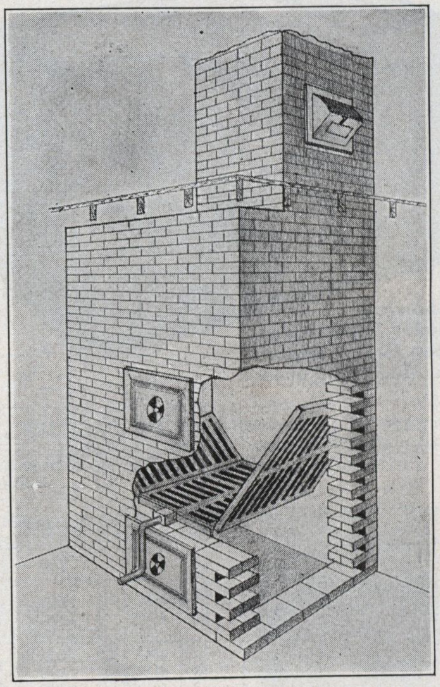
The same flue that is used for the kitchen range and heating plant can be used for the incinerator and receiving hoppers, except in large apartment houses, where the heating boiler should be connected to a separate flue.

Method of Operation—Where garbage and rubbish both are deposited in the Graver incinerator, there is no additional fuel required. The heat from burning rubbish such as paper, excelsior, etc., is sufficient to dry any garbage that may be present. Drying of garbage is further effected by the constant circulation of air which is ever pressing up through the mass, rendering the garbage dry and combustible.

Bottles, tin cans and the like can be deposited in the Graver incinerator. These can be made sterile during burning and dumped into the ash pit when the process of incineration is complete.

In special cases where garbage only is to be burned, gas burners are furnished which dry and burn the garbage very rapidly to a fine ash at an insignificant cost. By this method a bushel of garbage is converted to a pint of ash in about 45 minutes.

Perfect Combustion—The design of the combustion chamber with the inclined side grates as shown in the illustration increases the natural draft in the chimney, allowing a maximum amount of air to pass through the garbage assuring efficient drying and subsequent combustion. This accounts for the fact that the Graver incinerator does not emit smoke or foul odors.



Interior View of Graver Incinerator Showing Side Grate Construction

Grates—The grates are of heavy construction, made to withstand long and severe usage. They rest on a heavy steel frame which is very simple to install and can not be broken. All grates are readily removed through the fire door.

Smoke-Tite Hopper Doors—This exclusive door is noiseless in operation and designed to prevent stuffing of the flue and to prevent smoke and odor from entering the room.

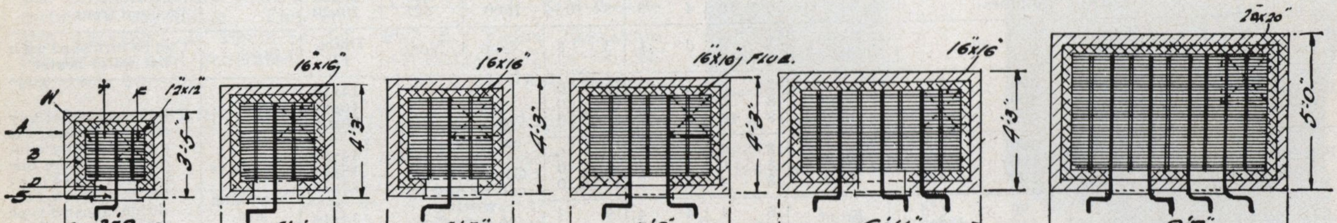
Specification—*General*—The incinerator shall be as designed and manufactured by the Graver Manufacturing Company, Cleveland, Ohio, according to their plans and specifications.

Incinerator Equipment—The contractor shall [owner will] furnish all the incinerator equipment and the contractor shall provide all material and labor necessary to erect complete, according to the drawings and specifications, the incinerator combustion chamber and chimney flue, including the setting of all incinerator parts according to blue prints furnished by the Graver Manufacturing Company.

Graver Destructor

The Graver destructor has been designed to fulfill the needs of large institutions and hotels. It is especially constructed in each case to consume a large volume of garbage and wet matter both economically and quickly. It is guaranteed to totally consume garbage without odor or any trace of smoke in the building.

Each destructor is designed carefully to meet the needs of the institution at hand. It will totally consume any kind of wet matter. Estimates and data will be cheerfully submitted on request. There is a Graver destructor for every type of institution which has a real garbage problem.



Model H
For Residences and Duplex Homes

Model T
For 3 to 5 Suite Apartments

Model A
For 6 to 10 Suite Apartments

Model B
For 10 to 20 Suite Apartments

Model C
For 20 to 40 Suite Apartments

Model D
For Apartments Having More Than 40 Suites

Graver Incinerator Layouts

Each of the layouts shown can be located in any position desired—that is, the flue openings can be located over any one of the four corners of the combustion chamber, but the fire and ash pit doors must be located in either of the two walls opposite the flue opening.

Interior walls and ceiling of combustion chamber must be lined with fire brick at least 4 in. thick, starting from one course below the grate.

The chimney must continue in a straight line from the point where it leaves the combustion chamber to its highest point.

Where round flue linings are substituted for rectangular linings, their cross-sectional area must be equivalent to that of the rectangular lining. Flue sizes listed over each layout above are inside dimensions

INCINERATOR SALES COMPANY

Distributers of the Radial Incinerator

336 Endicott Building
ST. PAUL, MINN.

Radial Incinerator

INCIN RADIAL RATOR
TRADE MARK
"THE MODERN GARBAGE DESTROYER"
Requires No Fuel

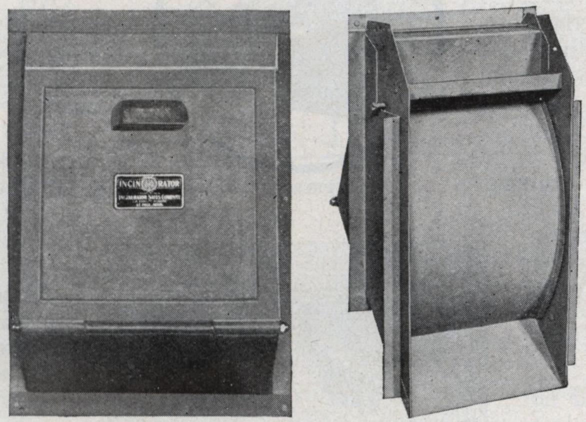
Modern sanitary engineering practice is insisting more and more on the provision of incinerators in homes and apartments as well as in hospitals, hotels, and office buildings. It is generally conceded that the incinerator provides the most sanitary, convenient, and economical method of destroying waste and garbage.

One can not simply specify "incinerator" if clients are to be permanently satisfied, for incinerators are much like the little girl of Mother Goose rhymes: "when she was good she was very, very good and when she was bad she was horrid." The Radial Incinerator has been painstakingly designed to eliminate faults of the old style incinerators which have been so provoking.

The Radial receiving doors are always closed, prevent gas, smoke or dust escaping, and permit constant use whether the incinerator is fired or not. The objectionable features of the old style receiving door are eliminated. This door is pictured in detail.

Direct draft provides rapid, and odorless combustion.

United States patents pending.



Front View
Rear View
Receiving Door

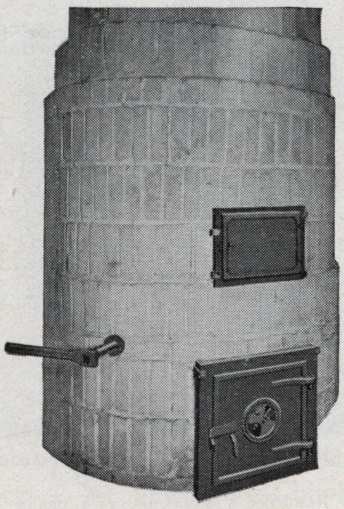
Description

The Radial Incinerator is designed to follow the most successful and oldest heating devices. Its simplicity of construction creates a powerful direct draft, which makes possible the use of comparatively small grate surface.

No fuel is required to dispose of the garbage or waste.

The Radial Incinerator is built as part of the chimney, with the combustion chamber located at the base. The chimney may be placed wherever it is most convenient.

The refuse is deposited at any floor, through the package or receiving doors, and passes to the combustion chamber where as often as is required it may be destroyed in a few minutes by touching a match to the paper in which it is wrapped.



Radial Incinerator

All garbage or waste matter must be wrapped before it is placed in the receiving doors. The Radial Incinerator is designed to accommodate water coils with auxiliary gas burners so that the burning of garbage will supply hot water without expense, provided the amount of garbage is reasonably constant. When not in use as a destroyer of garbage the auxiliary burners may be used.

Construction

The Radial Incinerator is built round in shape according to working drawings furnished by us. It is absolutely fireproof. The wire screen on top of the chimney is of the proper size mesh to guard against fire losses to adjacent property, which may occur where the screens are improperly designed.

Because the Radial Incinerator is round, it is free from all air pockets, a very important point and a long step in advance of other types. It may be used with either rectangular or round chimneys.

The Radial Incinerator should be installed while the building is being constructed. It may be installed in existing buildings where the construction will allow, but at an increased cost.

Heating and other pipes connected to the same flue will not interfere with its operation.

Guarantee

If the incinerator for any reason is not satisfactory we will refund the purchase price upon its return.

Shipment

Promptly from St. Paul stock.

When Ordering

Order by number or size of building from the following schedule.

Size O 1. Fire place type
Size O 2. Single residence
Size O 3. Duplex apartment
Size O 4. Four-apartment building
Size O 5. Four to twenty-four apartment building
Size O 6. Twenty-four to sixty apartment building.
Size O 7. Sixty to eighty apartments, schools, hotels, hospitals, etc.
Size O 8. Refuse disposal systems.

Special types designed to fit architect's drawings without charge. Send us inquiries and sketches.

KERNER INCINERATOR COMPANY

701 East Water Street

MILWAUKEE, WIS.

BRANCH OFFICES AND AGENCIES

ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DETROIT, MICH.
HUNTINGTON, W. VA.
INDIANAPOLIS, IND.
KANSAS CITY, MO.
MINNEAPOLIS, MINN.
MONTREAL, QUE.
NEW YORK, N. Y.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ROCHESTER, N. Y.
ST. LOUIS, MO.
ST. PAUL, MINN.

Product

The KERNERATOR: a Sanitary Equipment for the destruction, by burning, without cost, of garbage and waste in residences, apartment buildings, schools and hospitals. Patented Aug. 25, 1914 and March 18, 1919.

KERNERATOR
Built-in-the-Chimney
TRADE-MARK
(Reg. U. S. Pat. Off.)

Description

The Kernerator consists of hopper doors (see illustrations) located in the regular chimney on the different floors, and a brick enlargement of the chimney in the basement into which is built a special arrangement of grates.

The Kernerator combines the three recognized desirable features: first, destroying refuse where it originates; second, destroying by burning; third, burning without cost.

The incinerator is constructed in accordance with detailed working drawings which are furnished with the parts. The drawings are clear and the construction so simple that the mason has no difficulty in building it.

Five Distinctive Features of the Kernerator

(1) It is built of brick and not of iron. Hence, there is no replacement of parts.

The grates are of extra heavy construction and do not come into direct contact with the flames.

(2) It does not cost one penny to operate. The waste deposited is the only one fuel required.

Experience has demonstrated that the heat from the burning of the dry combustible waste that accumulates in the home is amply sufficient to dry out and eventually consume the garbage.

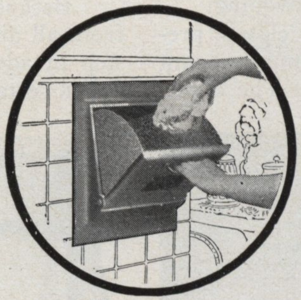
(3) The Kernerator handles all waste—not only garbage, but tin cans, broken crockery, bottles—in fact, everything but liquids.

(4) It occupies no space in the kitchen.

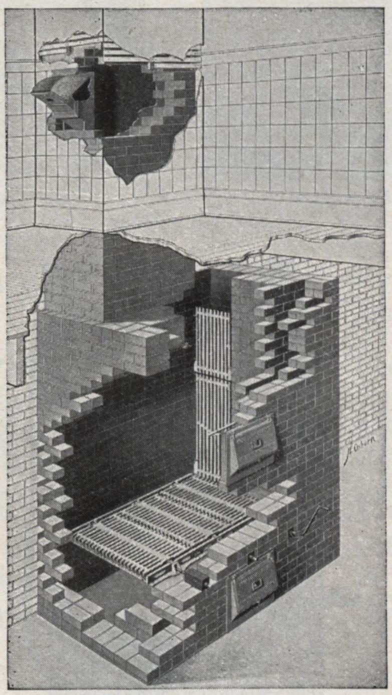
Although the material is deposited from the kitchen or some point convenient to the kitchen, the incinerator itself is in the basement where space is not so valuable.

(5) Practically no odor during burnings.

The patented by-pass flow is so arranged that the fire is always on top of the material to be burned. As the seat of the fire approaches the garbage, all offensive gases liberated by the heat must pass up through the flames and so be deodorized.



Hopper Door



Model of Kernerator for Large Apartment House
Residence size is very much smaller

Built in the Chimney

The same flue that is used for ranges, laundry stoves or house heaters can be used for the incinerator.

Over 50% of the installations in operation use a flue common to other heating devices in the building.

Guaranty

Every incinerator is sold with a money-back guaranty if the operation is not satisfactory to the purchaser after 6 month's trial. *There has never been an incinerator returned.*

How to Specify the Kernerator

First—Select correct sized model for the building under consideration from information as to correct sizes in description of each model.

Second—Select the arrangement of the model which best meets basement conditions.

Third—Let us know the model and number of arrangement selected and we will immediately forward to you ½-in. scale detailed working drawings and specifications of this arrangement which will show exactly how the Kernerator will work into the plans.

Fourth—Where none of the arrangements meet basement conditions, send in a sketch of the conditions surrounding the flue to be used (basement and typical floor plan) together with basement height in the clear, and our drafting department will prepare special drawings to fit these conditions.

Note: Please observe carefully notes on flue sizes required. "General Information" and "Construction" notes on plans opposite should be read before specifying the Kernerator.

Continued on next page

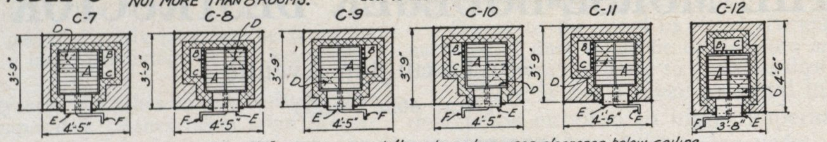
INDEX TO PARTS AND MATERIALS

A-Dump grate
B-Vertical grate
C-Bye-pass flue
D-Chimney flue
E-Fire and ash doors
F-Dumping lever
Common brick ▨
Fire brick ▩

SCALE ¼ INCH = 1 FOOT

MODEL-C FOR RESIDENCES OF NOT MORE THAN 8 ROOMS.

FLUE SIZE must not be less than 12"×12" (inside) If an additional receiving door is desired on the second floor, flue must be at least 16"×16" (inside).



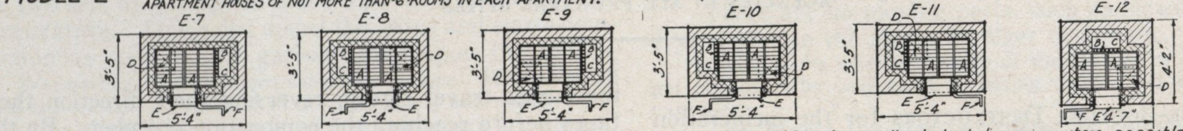
HEIGHTH OF INCINERATOR can be 6'-2" or 6'-8" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

SUGGESTED INSERT FOR ARCHITECTS SPECIFICATIONS The Contractor will furnish all Incinerator parts and will furnish labor and materials neccesary to install where shown on plan ( ) KERNERATOR-Arrangement ( ) according to plans and specifications furnished by the KERNER INCINERATOR Co.

All work to be done in a neat and workmanlike manner and all materials are to be of the best of their respective kinds.

MODEL-E FOR RESIDENCES OF NOT MORE THAN-12-ROOMS. FOR TWO FAMILY APARTMENT HOUSES OF NOT MORE THAN-6-ROOMS IN EACH APARTMENT.

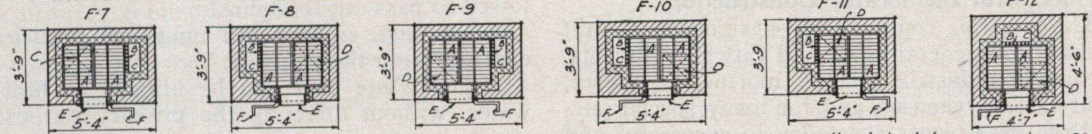
FLUE SIZE must not be less than 12"×12" (inside) where used in residences with one receiving door on the first floor. In Duplex apartments and where second floor receiving doors are desired, Flue must be at least 16"×16" (inside).



HEIGHTH OF INCINERATOR can be 6'-2" or 6'-8" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

MODEL-F FOR RESIDENCES OF NOT MORE THAN-15-ROOMS. FOR THREE-FAMILY APARTMENT HOUSES OF NOT MORE THAN-6-ROOMS IN EACH APARTMENT.

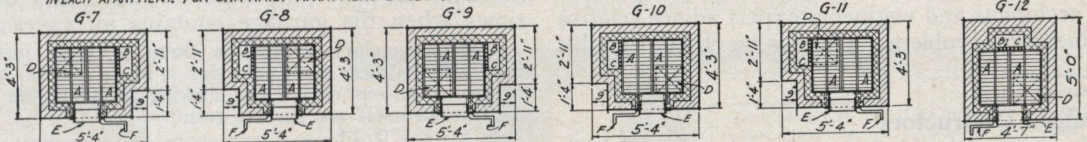
FLUE SIZE must not be less than 16"×16" (inside) except in residences with only one receiving door on the first floor. where a 12"×12" (inside) flue may be used.



HEIGHTH OF INCINERATOR can be 6'-2" or 6'-8" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

MODEL-G FOR RESIDENCES OF NOT MORE THAN-18-ROOMS. FOR THREE-FAMILY APARTMENT BUILDINGS OF NOT MORE THAN-12-ROOMS IN EACH APARTMENT. FOR SIX-FAMILY APARTMENT BUILDINGS OF NOT MORE THAN-6-ROOMS IN EACH APARTMENT.

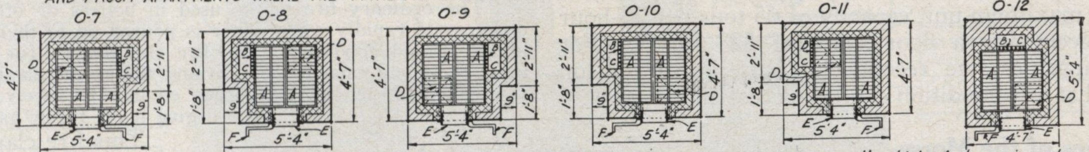
FLUE SIZE must not be less than 16"×16" (inside) in all cases.



HEIGHTH OF INCINERATOR can be 6'-2", 6'-8" or 7'-2" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

MODEL-O FOR SIX FAMILY APARTMENT BUILDINGS OF NOT MORE THAN-8-ROOMS EACH. FOR APARTMENT BUILDINGS HAVING-2, 3, AND 4 ROOM APARTMENTS WHERE THE TOTAL NUMBER OF ROOMS DOES NOT EXCEED-64.

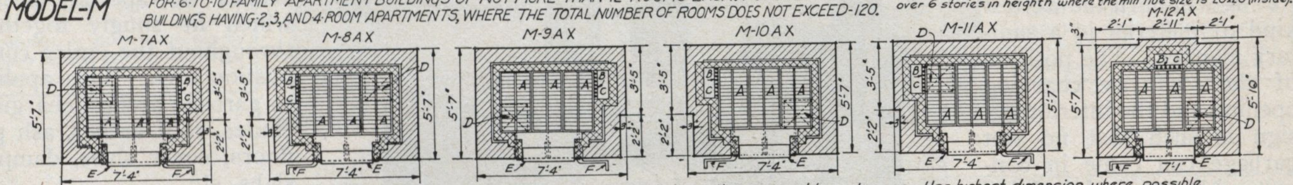
FLUE SIZE must not be less than 16"×16" (inside) in all cases.



HEIGHTH OF INCINERATOR can be 6'-2", 6'-8" or 7'-2" above basement floor depending upon clearance below ceiling required by ordinance Use highest dimension where possible.

MODEL-M FOR-6-TO-10 FAMILY APARTMENT BUILDINGS OF NOT MORE THAN-12-ROOMS EACH. FOR APARTMENT BUILDINGS HAVING-2, 3, AND 4-ROOM APARTMENTS, WHERE THE TOTAL NUMBER OF ROOMS DOES NOT EXCEED-120.

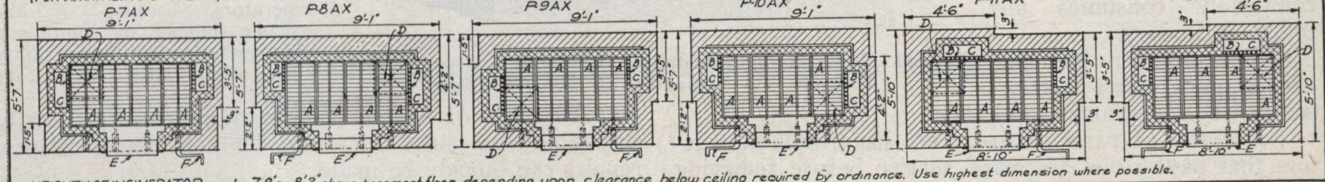
FLUE SIZE must not be less than 16"×16" (inside) except for buildings over 6 stories in heighth where the min flue size is 20"×20" (inside).



HEIGHTH OF INCINERATOR can be 7'-2", 7'-8" or 8'-2" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

MODEL-P FOR-11-TO-20-FAMILY APARTMENT BUILDINGS OF NOT MORE THAN-12-ROOMS EACH. FOR APARTMENT BUILDINGS HAVING-2, 3, AND-4-ROOM APARTMENTS, WHERE THE TOTAL NUMBER OF ROOMS DOES NOT EXCEED 250.
(FOR APARTMENTS OF A LARGER NUMBER OF ROOMS, SPECIAL ARRANGEMENT AND LAYOUTS WILL BE FURNISHED UPON REQUEST.)

FLUE SIZE must not be less than 20"×20" (inside) (See note on round flues above).



HEIGHTH OF INCINERATOR can be 7'-8" or 8'-2" above basement floor depending upon clearance below ceiling required by ordinance. Use highest dimension where possible.

GENERAL INFORMATION

The Kernerator becomes a permanent part of the building in which it is installed. It should therefore be incorporated in the building plans to avoid the necessity of later changing the plans and figuring the brickwork for the Incinerator as an extra.

The layouts of the various models can be placed in any position using the flue as a pivot.

Each of the layouts shown on this sheet has a corresponding detailed installation drawing which will be furnished together with specifications any time before installation.

The clear basement height determines the height of the incinerator. This is made flexible by the use of vertical grates of different lengths.

Boilers, water heaters, laundry and kitchen stoves can use the same flue that serves the Kernerator except in the larger apartment buildings, where a separate flue should be provided for the main boiler. If desired grates may be dumped from side opposite that shown.

CONSTRUCTION

Footings for incinerator should extend 6 in. beyond outer edges of incinerator walls. Top of footings should be 4 in. below floor level.

The chamber is lined with fire brick from one course below the grate level, up to and including the inner course of the top. Brick or concrete can be used for the outer portion of the incinerator walls. If concrete is used, an opening should be provided at the front, large enough to permit setting the operating parts into brickwork.

Flue sizes indicated are based on the standard flue lining dimensions. Where 20x20 in. (inside) flues are called for they are to be built of brick from the top of incinerator to a point about 20 ft. above. The walls of the flue for this 20 ft. must be at least 9 in. thick, 4 in. of which must be fire brick. 20 in. circular flue lining may then be used from this point up, or flue may be continued up square and built of common brick. Round flue linings can be substituted for square in all cases, provided inside diameter is not less than inside dimensions of the square.

Flues must continue up *straight* from the incinerator chamber to the topmost hopper door, without offsets or slopes. Chimney top must be high enough above any roof obstructions to avoid interference with draft.

Standard Layouts of the Built-in-the-Chimney Kernerator

*THE MORSE-BOULGER DESTRUCTOR CO.

467 Lexington Avenue
(Near 46th Street)
NEW YORK, N. Y.

AGENCIES IN ALL PRINCIPAL CITIES

Product

Morse-Boulger Destructors for the incineration of garbage and other waste matter.

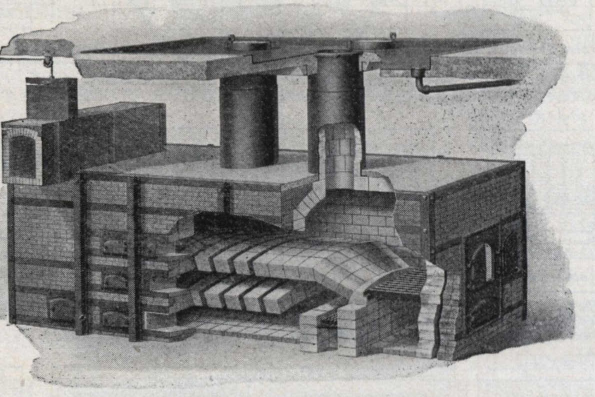
Years of Successful Incinerator Construction

For 22 years this company has designed and built complete plants for Federal, State and City governments, hotels, hospitals, industrial plants, mortuaries, stores, railroad stations, warehouses, and for many special purposes. All of these plants are today in successful and economical operation.

Through our long experience we are in a position to furnish architects and engineers expert advice relative to any incineration problem. There is no charge for this service.

Morse-Boulger Destructors

We design and build destructors to suit the individual needs of each problem. Minimum unit capacities from 62 lb. per hour and occupying a floor space of 36 sq. ft. to a maximum unit capacity of 65 tons per 24-hour day and occupying a floor space of 528 sq. ft. For greater capacities, we recommend batteries of 65-ton units, so that any condition can be successfully met.



Typical Morse-Boulger Installed in Hotel Roosevelt, New York, N. Y.—Capacity, 15 Tons Per Day

Advantages of the Morse-Boulger Destructor

It will burn the wettest kind of material in a sanitary manner. The position of the refuse charging opening and the interior design is such that no wet garbage can come in contact with the fuel bed before being dried.

The high temperature completely consumes all smoke and odors.

The interior has no iron or metal parts in contact with the flames and heat.

Renewal of parts is rare. We have built destructors that have stood 14 years' service before requiring any repairs other than refuse grates once or twice during that time. The replacement of these grates is a simple and inexpensive matter not affecting the other parts of the destructor.

The Morse-Boulger destructor can be operated with coal, oil or gas.

Where the percentage of combustible rubbish, wood and refuse is large, practically no commercial fuel is necessary after the unit is in operation.

All fire brick used in destructors, chutes and flues is made of a special fire clay mixture, moulded into blocks to fit snugly together, for the larger size units.

The position of the fire brick refuse grates, which are placed horizontally one set under the other, makes the flames travel zigzag, reversing their direction three times before reaching the combustion chamber. By this arrangement (exclusive to Morse-Boulger) the full heat is brought to bear on the burning material and not allowed to pass out too quickly.

No dust, cinders and unburned particles are discharged from the chimney.

The waste heat can be utilized to heat or distill water, without affecting the primary purpose of completely burning the refuse.

Morse-Boulger destructors are designed to meet most unfavorable conditions, such as heavy overloads or times when the garbage contains an excess of water.

The secondary firebox is there to meet just such contingencies. Unless some provision is made to meet these unusual situations serious delays and choking all along the line back to the kitchen itself are sure to result.

Morse-Boulger destructors are lined with fire clay shapes made from a special fire clay formula developed after years of experience.

The ordinary fire bricks used in boilers or other furnaces disintegrate rapidly when water is poured on to them when in a highly heated condition. The fire clay shapes for incineration must be strong enough to withstand the severe strain of expansion and contraction, yet porous enough to receive water and give it off freely as steam.

This fire clay is moulded into large blocks and shapes to special design which fit snugly together throughout the entire combustion area. This applies to garbage arches, charging chutes, roof arches, ash pit floors, cover slabs, damper slabs, etc.

The use of standard fire brick sizes is bad practice in large high temperature incinerators, because of the greater number of joints and consequent greater vulnerability than where large blocks are used.

All parts of Morse-Boulger destructors are easily accessible and since they are built to exact shapes, repairs can quickly be made.

Eventually all high temperature furnaces need repairs and the convenience of making them is an important item.

Primary and secondary fuel burning grates are located so that garbage is not deposited on the fire. This means constant and controllable heat production.

Where garbage is deposited directly on the primary fire, moisture can drip through and the heat production is smothered and reduced at a time when it is most needed.

Garbage is dumped into the destructor on to the fire clay arches through charging chutes from above.

Garbage is heavy and nasty material to work with—it is a mistake to design an incinerator so that garbage has to be shoveled into the incinerator from the side.

The three-way travel of heat allows a large surface area of garbage to be spread out thinly and ex-

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*Recently consolidated with the Kerner Incinerator Co.

Continued on next page

posed to the flames and heat. The three-way travel of heat ensures full value from the heat.

If the flames and heat passed directly into the flue from the top tier of garbage arches, a large percentage of the heat developed would be wasted.

The heat passes directly over the ashes so any moisture that drips on to the ashes is evaporated. Ashes taken from Morse-Boulger destructors are always dry and odorless.

The three-way passage of heat over and then under the two sets of garbage arches keeps them at a very high temperature. This helps dispel the gases and starts combustion as soon as the garbage falls upon the arches.

Wet garbage is a stubborn substance to burn. Heat from all sides is necessary to accomplish it economically and quickly.

The three-way passage of heat provides a long trip for the gases produced by the burning garbage. It enables the gases to be consumed and purified before leaving the primary combustion chamber.

Unless provision is made for subjecting these garbage-burning gases to high temperatures over a reasonable period of time they are pulled into the flue before being entirely consumed and cause noxious garbage-burning odors at the chimney top.

The secondary combustion chamber provides further opportunity for the gases to be entirely consumed after leaving the primary combustion chamber and before entering the flue. It also acts as a settling chamber for the collection of any dust.

Owing to the speed of the draft, unburned gases and light particles of dust would be carried into and up the flue if some provision were not made to guard against it.

There is not a piece of metal in the Morse-Boulger destructor exposed to high temperatures.

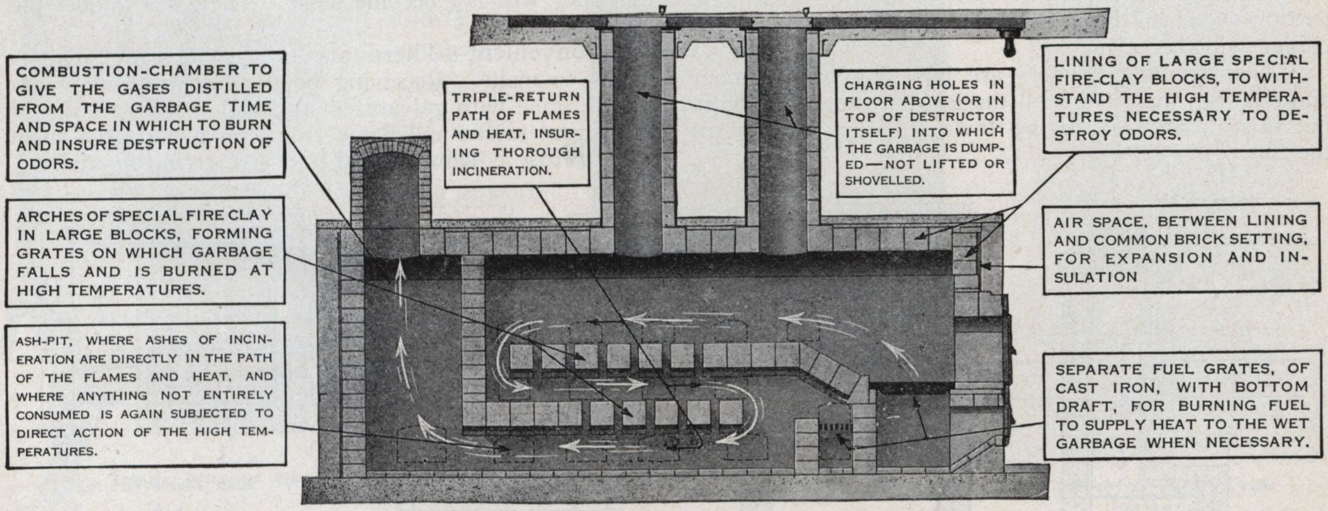
Metal quickly disintegrates under the high temperature necessary for odorless incineration. Furthermore, gases produced by burning garbage are corrosive.

There are no moving parts, such as blowers, rotary dryers, etc., in the Morse-Boulger destructor.

Moving parts whether outside of the furnace or inside of it get out of order and cause irritating delays and considerable expense.

The Morse-Boulger destructor is compact and of sturdy construction. A large grate area is available in a limited space through the use of the three-way passage of heat principle. Structural steel settings with buckstays and angle braces in proper position are designed to resist arch thrusts and other stresses.

Basement space is often very valuable, so a destructor which will function properly in a limited area is highly desirable. Where large masses of material, such as fire brick, are heated to high temperature there is a great deal of expansion and contraction. To meet this, strong structural steel bracing must be located at the right points.


COMBUSTION-CHAMBER TO GIVE THE GASES DISTILLED FROM THE GARBAGE TIME AND SPACE IN WHICH TO BURN AND INSURE DESTRUCTION OF ODORS.
TRIPLE-RETURN PATH OF FLAMES AND HEAT, INSURING THOROUGH INCINERATION.
CHARGING HOLES IN FLOOR ABOVE (OR IN TOP OF DESTRUCTOR ITSELF) INTO WHICH THE GARBAGE IS DUMPED—NOT LIFTED OR SHOVELLED.
LINING OF LARGE SPECIAL FIRE-CLAY BLOCKS, TO WITHSTAND THE HIGH TEMPERATURES NECESSARY TO DESTROY ODORS.
ARCHES OF SPECIAL FIRE CLAY IN LARGE BLOCKS, FORMING GRATES ON WHICH GARBAGE FALLS AND IS BURNED AT HIGH TEMPERATURES.
AIR SPACE, BETWEEN LINING AND COMMON BRICK SETTING, FOR EXPANSION AND INSULATION
ASH-PIT, WHERE ASHES OF INCINERATION ARE DIRECTLY IN THE PATH OF THE FLAMES AND HEAT, AND WHERE ANYTHING NOT ENTIRELY CONSUMED IS AGAIN SUBJECTED TO DIRECT ACTION OF THE HIGH TEMPERATURES.
SEPARATE FUEL GRATES, OF CAST IRON, WITH BOTTOM DRAFT, FOR BURNING FUEL TO SUPPLY HEAT TO THE WET GARBAGE WHEN NECESSARY.

SIZES AND CAPACITIES OF MORSE-BOULGER DESTRUCTORS

No.	Capacity		Dimensions, ft.-in.			No.	Capacity		Dimensions, ft.-in.			No.	Capacity		Dimensions, ft.-in.		
	Lb. per hr.	Tons per day	Length	Width	Height		Lb. per hr.	Tons per day	Length	Width	Height		Lb. per hr.	Tons per day	Length	Width	Height
0 -G	62	0.7	6-6	4-0	4-3	2½-G	260	3.1	11-10	5-6	6-6	5 -G	513	6.2	15-6	6-0	7-0
½-G	92	1.1	8-4	4-0	4-3	3 -G	300	3.6	13- 0	6-0	6-7	5½-G	584	7.0	16-0	6-0	7-0
1½-G	157	1.9	9-0	4-7	5-0	3½-G	383	4.6	14- 0	6-0	6-7	6½-G	684	8.2	17-0	6-0	7-3
2 -G	210	2.5	11-0	4-4	5-0	4 -G	416	5.0	15- 0	6-0	7-0	8 -G	820	9.8	18-0	6-6	7-3

A Few Prominent Installations of Morse-Boulger Destructors

Hotels, Clubs, and Institutions

Ritz-Carlton, New York, N. Y.
Astor, New York, N. Y.
Plaza, New York, N. Y.
McAlpin, New York, N. Y.
Pennsylvania, New York, N. Y.
Bellevue-Stratford, Philadelphia, Pa.
Taft, New Haven, Conn.
Copley-Plaza, Boston, Mass.
Royal Poinciana, Palm Beach, Fla.
Ritz-Carlton, Montreal, Que.
Fontenelle, Omaha, Neb.
William Penn, Pittsburgh, Pa.
Bolivar, Peru, S. A.
Atlanta-Biltmore, Atlanta, Ga.
Yale Club, New York, N. Y.
Harvard Club, New York, N. Y.
N. Y. Athletic Club, Travers Island, N. Y.
Manufacturers' Country Club, Philadelphia, Pa.
Kirtland Country Club, Cleveland, Ohio
Huron Mountain Country Club, Big Bay, Mich.

Hospitals

Boston City Hospitals, Boston, Mass.
Jefferson Medical College, Philadelphia, Pa.
Fifth Avenue, New York, N. Y.
Bellevue, New York, N. Y.
Mt. Sinai, New York, N. Y.
St. Francis, New York, N. Y.
Rockefeller, New York, N. Y.
Montefiore, Bronx, N. Y.
Misericordia, New York, N. Y.
Pennsylvania, Philadelphia, Pa.
Samaritan, Philadelphia, Pa.
Mexico City, Mexico
Arzobispo Loayza, Peru, S. A.
Johns-Hopkins, Baltimore, Md.
Danbury, Conn.
San Leandro, Cal.
Glockner Sanitorium, Colorado
Havana City, Cuba
Union Medical College, Peking, China
St. Luke's, Chicago, Ill.

Cities and Miscellaneous

Erie, Pa.
Butler, Pa.
Guatemala City, Guatemala
Easton, Pa.
Amsterdam, N. Y.
Brookline, Mass.
Keansburg, N. J.
Hull, Mass.
Sewickley, Pa.
New Rochelle, N. Y.
Greensburg, Pa.
Monessen, Pa.
C. M. Schwab Estate, Loretto, Pa.
Graceland Cemetery, Chicago, Ill.
Homewood Cemetery, Pittsburgh, Pa.
Walker Building, Boston Tech., Boston, Mass.
Stein Public Market, Chicago, Ill.
University of Michigan, Ann Arbor, Mich.

KRAUSE IRON CONSTRUCTION

MANUFACTURERS OF
The Krause Incinerator
3589 East 93rd Street
CLEVELAND, OHIO
GENERAL SALES AGENTS
THE DUPLEX HANGER CO., 1290 East 53rd Street, CLEVELAND, OHIO

Product

WALL TYPE GARBAGE INCINERATORS.

There Is a Krause Incinerator for Every Type of Building

Krause incinerators are made in various sizes suitable for large and small residences, apartment houses, hotels, hospitals and other institutions.

Krause Incinerator Construction

The Krause incinerator consists of as many receiving hoppers as are required, one or more grates according to the size of the incinerator, and a fire brick combustion chamber, the latter being an enlargement of the chimney in the cellar.

The receiving hoppers are built into the chimney and may be connected with the kitchen range flue without in any way decreasing their efficiency or that of the flue.

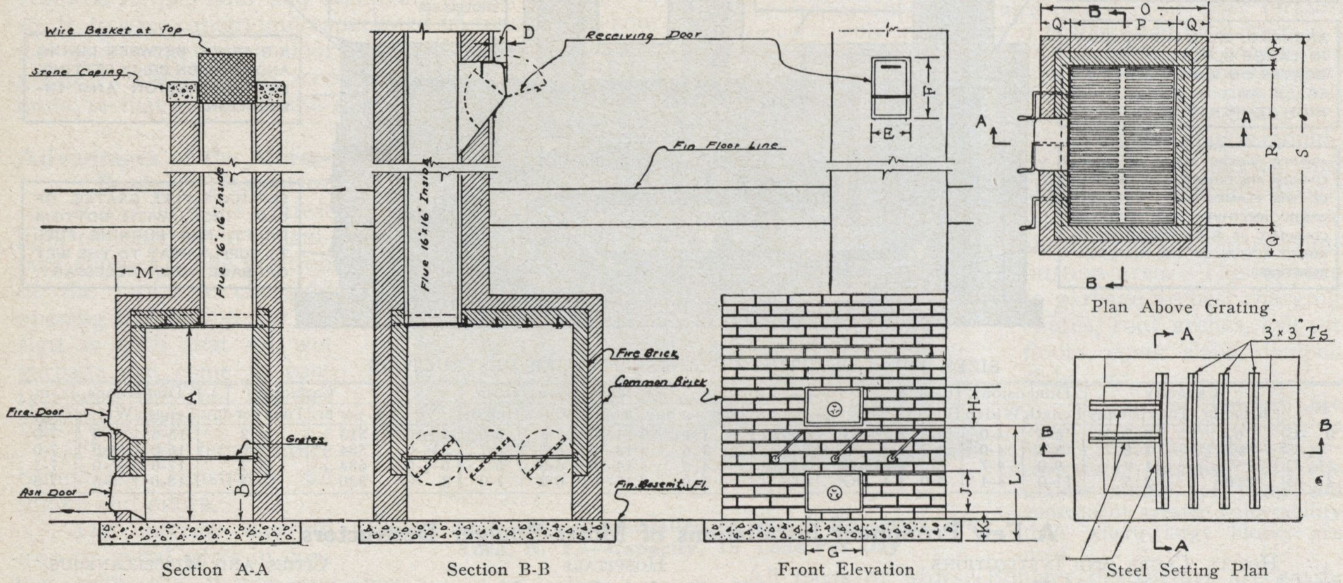
Outstanding Features of the Krause Incinerator

Incinerates without Expense—A liberal quantity of waste paper is deposited in the combustion chamber and all garbage is well wrapped in paper before being deposited in the receiving hopper. The waste material, therefore, is the only fuel required for complete incineration and there is absolutely no operating expense.

Handles All Waste—Not only garbage, but broken crockery, bottles and even tin cans may be deposited in the Krause incinerator.

Built to Last—Grates fire doors, clean-out doors, bearing frames, handles, shakers and receiving hoppers are made of high grade gray iron and are so constructed that they will not become loose. They will outlast the building.

Convenient—There are no bothersome adjustments to make. Receiving hoppers are positively adjusted, lined with galvanized iron and specially designed to prevent smoke and flame from coming into the room while refuse is being placed in the receiving hopper.



Section A-A

Section B-B

Front Elevation

Plan Above Grating

Steel Setting Plan

Krause Incinerators

Type	Suitable for	Height of flue from grate, ft.	Size flue, in.	Approximate weight lb.	*Equipment furnished: Grate frames	Receiving §hoppers	Clean-out doors	Lighting doors	Chimney screens	Shakers	Handles	Dimensions, ft.-in.: A	B	D	E	F	G	H	J	K	L	M	O	P	Q	R	S
S (Single grate)	1, 2 or 3 family houses	35 to 38	12x12	275	1	1	1	1	1	1	1	5-2	1-8	0-4	0-10	1-3	1-5	0-11	0-11	0-8	2-10	0-9	3-6	2-0	0-9	2-0	3-6
D (Double grate)	4 to 8 suite apartments	40 to 45	16x16	500	2	2	1	1	1	3	1	5-2	1-8	0-4	0-10	1-3	1-5	0-11	0-11	0-8	2-10	1-6	4-4½	2-10½	0-9	2-10½	4-4½
T (Triple grate)	8 to 16 suite apartments	50 to 55	16x16	600	3	3	1	1	1	3	1	5-2	1-8	0-4	0-10	1-3	1-5	0-11	0-11	0-8	2-10	1-6	4-4½	2-10½	0-9	4-4	5-10
F (Quadruple grate)	16 to 30 suite apartments	50 to 55	20x20	820	4	4	1	1	1	4	2	5-2	1-8	0-5	0-10	1-3	1-5	0-11	0-11	0-8	2-10	1-6	4-10½	2-10½	1-0	5-9	7-9

*Including miscellaneous iron.
§Any number of additional receiving hoppers can be furnished, also special hoppers and grates.

PITTSBURGH INCINERATOR MFG. CO., INC.

229 First Avenue
PITTSBURGH, PA.

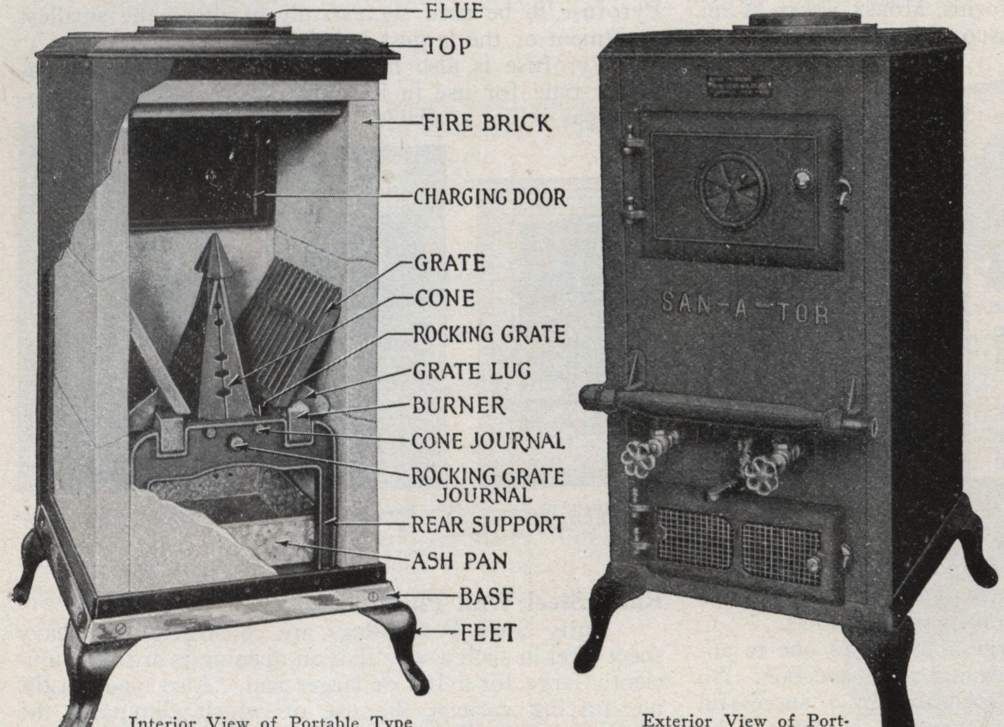
San-a-tor Incinerator for the Home

Combustion chamber is constructed without bolt or screw. Each part interlocks one with the other. All parts can be removed and replaced through the door opening—an economic feature should replacement be necessary after years of service. A new part may be ordered by number, sent direct by parcel post and inserted without the services of a mechanic.

Insulated with 2 in. of fire brick. The space between this fire wall and outside steel jacket provides air circulation and minimum heat radiation. The combustion chamber is equipped with a perforated combustion cone which permits ignition of gases arising while burning, thus obviating odors.

Finished in all black, black with heavily nickelplated trim, and aluminum with heavily nickelplated trim. Made in portable, wall type, and wall type with automatic ash fall to basement. Operated either with natural or artificial gas. Defective parts replaced within one year.

Made in 3 sizes: 1, 2 and 4-bushel capacity. Can be installed in kitchen or basement of private homes with hopper in kitchen, and with 12x12-in. flue to ceiling line of kitchen and a 7x7-in. flue above ceiling line.

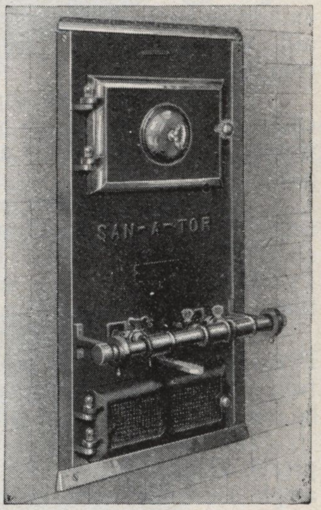


Interior View of Portable Type

Exterior View of Portable Type

San-a-tor Portable Incinerators

Portable incinerators can be connected to the same chimney as the furnaces, boilers, ranges and hot water heaters



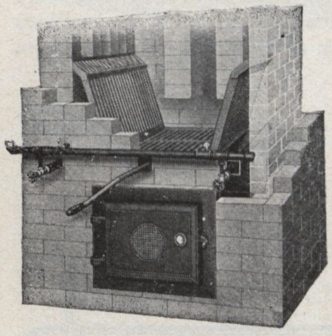
San-a-tor Wall Type Incinerator

Pittsburgh Built-in-the-Chimney Apartment House Incinerator

Consists of a brick chamber built in the chimney at its base for disposing of waste deposited through charging inlet hopper doors on floors above.

Hopper doors, as well as fire and ash doors in basement, may be located on either side of the chimney.

Three extra heavy interlocking grates are used in this system, each removable and replaceable through fire door in basement.



Combustion Chamber of Apartment House Incinerator

Installed in the basement

A strong, unobstructed draft is essential. The falling waste matter cuts down the draft, hence the necessity for an adequate flue area.

A 1-floor equipment with a feed hopper in kitchen, should have at least 12x12-in. flue area; from 2 to 4 floors, with 1 feed hopper or more, 16x16-in. flue; from 5 to 6 floors, with from 3 to 5 hoppers or more, 20x20-in. flue (or larger); from 7 to 9 floors, using from 7 to 9 feed hoppers, 24x24-in. flue (or larger).

Gas is used as a primer.

Ignition is practically automatic.

Any competent bricklayer can install this type of incinerator.

Fire brick must extend up to the first charging door and balance of chimney may be lined with tile.

Pittsburgh Coal Fired Incinerator

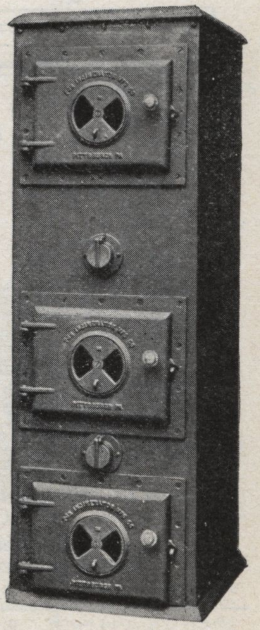
Coal, wood or charcoal is used as fuel in this incinerator.

Has cast iron top, base and doors, and sheet steel casing.

Height, 52 in.
Width, 16½ in.
Floor space, 18x18 in.
Garbage chamber, 12x12x18 in.
Fire box, 12x12x14 in.
Ash pit, 12x12x12 in.
Garbage door, fire door and ash door, 9x12 in.
Weight, 600 lb.
Capacity, 1 bushel.

Interior lined with 2-in. Benezet fire brick (made under 3000 degrees of heat.)

Flue connection, 9 in. (reduced to 7 in. for basement flue connection.)



Pittsburgh Coal Fired Incinerator

J. B. PRESCOTT & SON

Manufacturers of Garbage Incinerators and Building Specialties

WEBSTER, MASS.

AGENCIES IN ALL PRINCIPAL CITIES

Product

Pyrofuse, Sanitary and Original Destroyer of Waste and Garbage at its point of origin.

The original all-steel line of Building Specialties, comprising Rutty Metal Wall Plugs in two forms, Morse Steel Wall Ties in three styles, and Prescott Corner Bead.

Pyrofuse

TRADE MARK

TRADE-MARK
(Registered)

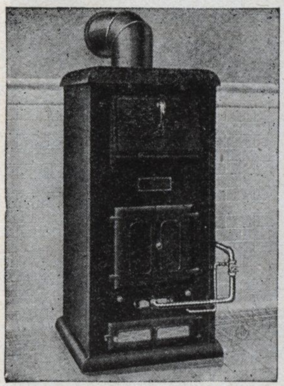
Special Features—The *corner combustion flues*—exclusive features in Pyrofuse design—were developed after extensive experiments as an aid to maintaining perfect combustion.

The *air mixer* is especially designed to secure the proper proportion of air and gas.

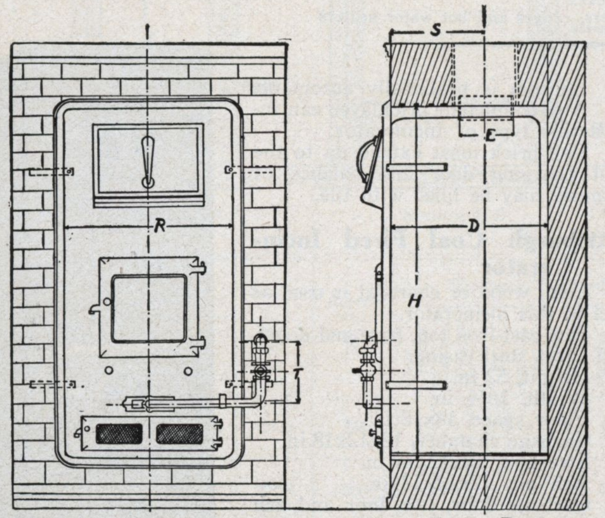
The *screen doors* not only act as a dryer and evaporator for the material within the Pyrofuse, but also as a ventilator for the apartment.

The *grate system* of the Pyrofuse is unique and perfect and has proven wonderfully efficient. Each unit is heavily constructed and can be removed and replaced without the use of tools.

The *clean-out door* is large and enables one to approach all interior parts for cleaning and inspection. An ample clean-out door is indispensable in a successful garbage incinerator. Our construction is covered by five United States patents.



Pyrofuse Portable Type "U"



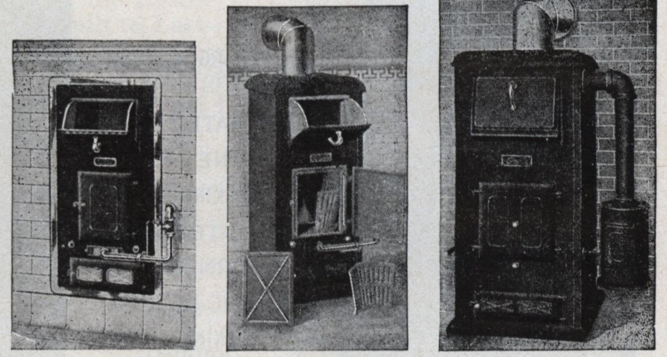
Method of Installing Pyrofuse Wall Types Direct in Chimney Stack

Dimensions in Inches

Type	R	T	H	D	E	S
C	14	9	33	13	6	7
G	15½	9	33	14	6	10½
L	18	9	39	17	7	11
X	26	9	52	22½	8	13¾

Types and Sizes—Pyrofuse is made in two types, the wall or flush type for new construction, and the portable type for any installation. Pyrofuse is made in four sizes, ranging from ⅝ to 4-bu. capacity. This enables Pyrofuse to be used successfully in either the smallest apartment or the largest hospital.

Pyrofuse is also manufactured in a gasoline generator type for use in locations where natural or artificial gas is not available.



Wall Types "C"—"G"—"L"—"X"

Portable Types "B"—"F"—"K"

Gasoline Generator Types "M"—"V"

Types of Pyrofuse

Rutty Steel Wall Plugs

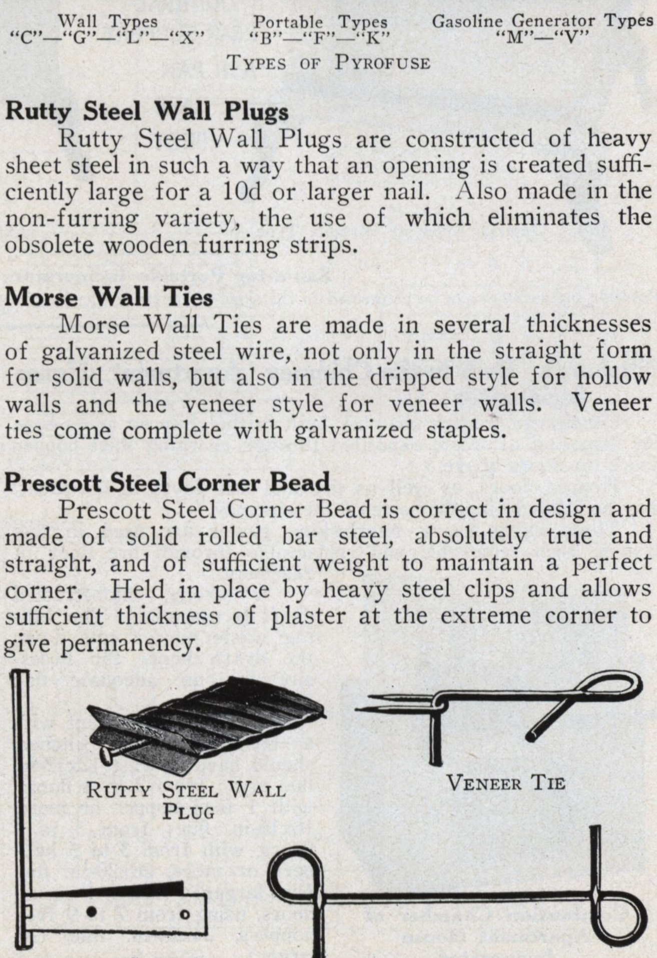
Rutty Steel Wall Plugs are constructed of heavy sheet steel in such a way that an opening is created sufficiently large for a 10d or larger nail. Also made in the non-furring variety, the use of which eliminates the obsolete wooden furring strips.

Morse Wall Ties

Morse Wall Ties are made in several thicknesses of galvanized steel wire, not only in the straight form for solid walls, but also in the dripped style for hollow walls and the veneer style for veneer walls. Veneer ties come complete with galvanized staples.

Prescott Steel Corner Bead

Prescott Steel Corner Bead is correct in design and made of solid rolled bar steel, absolutely true and straight, and of sufficient weight to maintain a perfect corner. Held in place by heavy steel clips and allows sufficient thickness of plaster at the extreme corner to give permanency.



Rutty Steel Wall Plug

Veneer Tie

Prescott Steel Corner Bead

Morse Steel Wall Tie

THE AMERICAN LAUNDRY MACHINERY CO.

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NEW YORK, N. Y.

SOUTHERN SALES DIVISION
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CINCINNATI, OHIO

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ST. LOUIS, MO.
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WASHINGTON, D. C.
KANSAS CITY, MO.
ROCHESTER, N. Y.
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SPECIALTY DEPARTMENT, NORWOOD STATION, CINCINNATI, OHIO
FOREIGN SALES DEPARTMENT, NORWOOD STATION, CINCINNATI, OHIO

CANADIAN FACTORY

THE CANADIAN LAUNDRY MACHINERY CO., LTD., 47-93 Sterling Road, TORONTO, ONT.

AGENTS

BRITISH-AMERICAN LAUNDRY MACHINERY CO., LTD., Underhill Street, Camden Town, LONDON, N. W.-1, ENGLAND

Products

LAUNDRY MACHINERY of every description; TAHARA AUTOMATIC SILVER BURNISHING MACHINES for hotels, clubs, restaurants, etc.

Also manufacturers of a complete line of Machinery for Cleaners and Dyers.

TRADE-MARK

Laundry Machinery (Steam and Electrically Heated)

This line includes plants for special work such as hospitals, hotels, institutions of all kinds, as well as for commercial laundries.

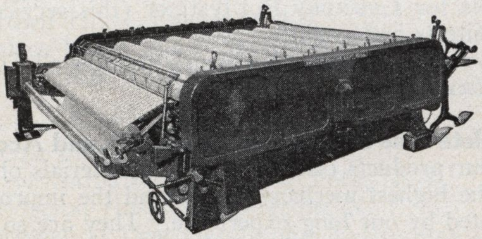
Special laundry equipment is furnished for textile, mill villages and industrial plants.

Service

The Engineering Department will furnish, promptly, complete plans, specifications and estimates. Catalogue, or a complete set of specifications covering all "American" laundry machinery, will be sent to any architect on request.

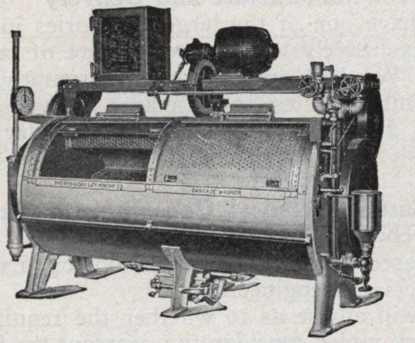
Facilities

THE AMERICAN LAUNDRY MACHINERY CO.'s experience in manufacturing laundry equipment extends over a period of nearly thirty years and it has every facility for turning out high grade work, including the smaller as well as the larger equipment for the modern and efficient laundry.



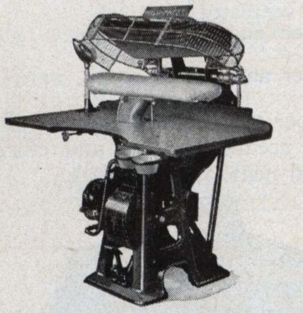
AMERICAN 8-ROLL IRONER

A chest and roll type of ironing machine which can be furnished either with standard rolls and pressure springs, for the purpose of ironing flat work only, or with the "floating roll" device, which permits the ironing of wearing apparel in addition. Either "standard" or "floating roll" types are in use in the majority of the prominent hospitals and institutions of this country. Hotels favor the "standard" type, as they usually iron only flat work on these machines. This ironer is furnished with 2, 4, 6 or 8 rolls, the 2-roll being furnished also in a return apron machine



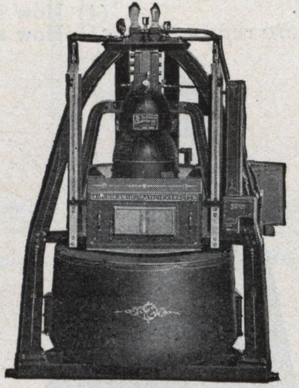
AMERICAN CASCADE WASHER

Made with monel cylinder, and monel outer case; cylinder, 32, 36 or 42 in. in diameter, and either 30, 36, 54, 64, 72 or 84 in. in length; has capacity of 4 ordinary washers and particularly adapted for use in hotels, hospitals and institutions



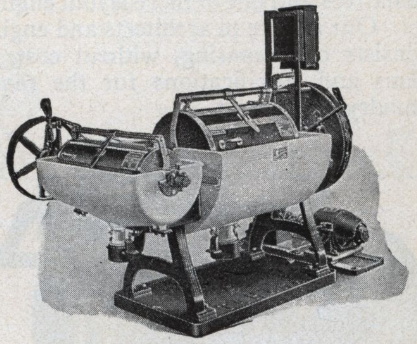
AMERICAN PRIM PRESS

The latest development in machinery especially designed for the ironing of wearing apparel. Driven by a small electric motor, it obviates all physical effort on the part of the operator. A simple movement of a small handle causes the head to lift or lower. It is adequately protected with an automatic fingerguard. These favorable features have popularized this machine with not only the superintendents and managers, but the employees as well



AMERICAN HUMATIC EXTRACTOR WITH AUTOMATIC SAFETY COVER

Inner basket revolving rapidly removes moisture by centrifugal force. Smooth running. Highly efficient. The almost human machine of the laundry industry. Safety cover. Automatic starting and stopping. Predetermined extracting time. Diameter, 40 and 48 in.



TAHARA AUTOMATIC SILVER BURNISHING MACHINE

A machine for burnishing or polishing silverware without the use of injurious abrasive methods. Keeps the silverware sanitary, in good condition, and does not remove the plating. Made in a number of sizes

TROY LAUNDRY MACHINERY CO., LTD.

Consulting Engineers, and Manufacturers of Complete Laundry Equipment

FACTORIES
EAST MOLINE, ILL.

SALES OFFICES
BOSTON, MASS., 514 Atlantic Avenue
CHICAGO, ILL., 822 So. Michigan Avenue
LOS ANGELES, CAL., 450 East Third Street
NEW YORK, N. Y., 409-412 Pershing Square Building
SAN FRANCISCO, CAL., 954-56 Mission Street
SEATTLE, WASH., 107 Jackson Street
EUROPEAN AGENTS: JAMES ARMSTRONG & CO., Ltd.
LONDON PARIS AMSTERDAM CHRISTIANIA

Products and Service

Manufacturers of a complete line of LAUNDRY MACHINERY and ACCESSORIES.

CONSULTING ENGINEERS and DESIGNERS of INSTALLATIONS for LAUNDRY EQUIPMENT (this service is free to architects and engineers).

We will Contract to Furnish and Install COMPLETE LAUNDRY EQUIPMENTS.

Complete Line of Laundry Machinery and Accessories

Our products combine the best materials obtainable with the highest mechanical skill and the improvements suggested by our long experience. They are so built as to give many years of service and do a large amount of work of the highest quality.

They are ideal for laundries of any size for hotels, hospitals, private institutions, charitable institutions such as old people's homes, orphan homes, poor farms, etc.

Facilities for Manufacture and Delivery

We have one of the largest factories in the world devoted exclusively to the manufacture of laundry machinery. We can execute orders promptly anywhere in the United States and Canada, as well as foreign countries, and can furnish a small laundry device or can furnish and install a complete plant.

An Unbiased Technical Consulting Service Free to Architects and Engineers

Unbiased advice is the prime object of our service to architects and engineers.

We will advise as to whether the requirements of the problem under consideration warrant the installation of a laundry.

We will also advise as to whether the proposed laundry equipment devised by the architect, engineer or owner is adequate for the results desired.

In each of our branches we have one or more representatives and one or more layout engineers.

Our service to architects and engineers consists of preparing, without cost, floor plans and specifications for the required laundry equipment.

May we suggest that architects and engineers request our representative to call for consultation. Each and every one of our representatives is a practical laundryman. He is equipped to give some good pointers on the merits or demerits of a laundry for the particular case in question and, when the case warrants, will inform the architect or engineer that the institution is too small to support a laundry economically. If the institution justifies a laundry, in many cases our representative is equipped to give the architect or engineer practically all of the information that he needs without the preparation of plans and layouts. In addition to this service our layout engineers will prepare, without cost, complete floor plans and specifications for the required laundry equipment.

Considerable Economy Can Be Effected by the Installation of Own Laundry Equipment

Where it has been decided that the size of the building or institution justifies the installation of its own laundry equipment, a definite financial saving can be shown and will be realized.

Hospitals having 35 or more beds, hotels of 100 or more rooms can, as a rule, effect considerable economy by the installation of their own laundry equipment.

Last, but not least, it is our desire to co-operate with architects and engineers to the end that every laundry shall have modern equipment with ample capacity and with the initial cost of such equipment kept at a minimum.

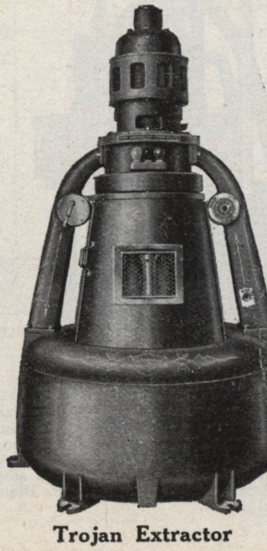
Vital Points Which Should Receive Special Attention When Designing Laundries

We will gladly give the following information to architects and engineers, after the actual requirements have been mutually agreed upon:

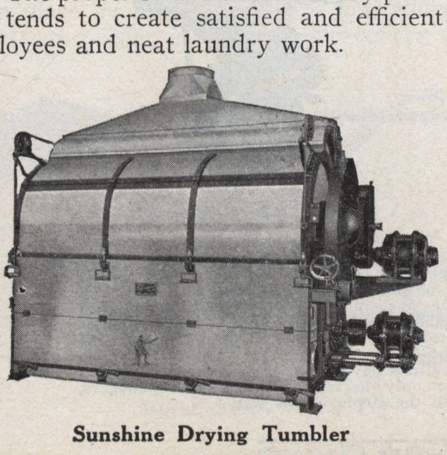
(1) Approximate number of square feet of floor space.
(2) Height of ceiling.
(3) Size of openings to laundry room.
(4) How space should be lighted.
(5) How space should be ventilated.
(6) Number and size of electric power outlets.
(7) Number and size of steam, water and waste outlets.

The proper solution of a laundry problem tends to create satisfied and efficient employees and neat laundry work.

Trojan Washer



Trojan Extractor



Sunshine Drying Tumbler

Continued on next page

Laundry Layouts and Equipment for Hotels

The many advantages that accrue to a hotel or institution having a well equipped and well conducted laundry department are well known. Briefly stated, the principal advantages are four: (1) the ability to keep down costs; (2) the ability to get quick and dependable service of the quality desired; (3) the ability to function with a minimum supply of linen; (4) the ability to control the process and thus insure that the life of the goods will not be unreasonably shortened by injurious methods. This latter advantage is of extreme importance, but, nevertheless, it is seldom taken into consideration.

In the arrangement of hotel laundries space requirements must be proportioned to the class and amount of laundry service desired. Is it always safe to err on the side of too much space; for the average laundry is usually crowded and efficient service is thus rendered impossible.

Taking a 300-room hotel as an example, an efficient laundry department will require, approximately, 2500 sq. ft. including linen storage room. Door openings should be large; if these are small, it may be necessary to knock down and reassemble equipment in the laundry room, which would be a serious matter, because such work can not be done as well on the job as at the factory. The ceilings should be high and windows large with provisions for ventilation at the top to permit the escape of the ascending humid air. The floor of the washroom should be of concrete, suitably surfaced, with proper gutters and drains for the machines.

The salient details of a hotel laundry installation have been noted here in brief form. They are necessarily of general application, of chief value to the architect wishing preliminary information. Supplementary information is readily available and a comprehensive service is offered which architects are requested to employ freely. Whatever the problem, it can be solved with helpful co-operation.

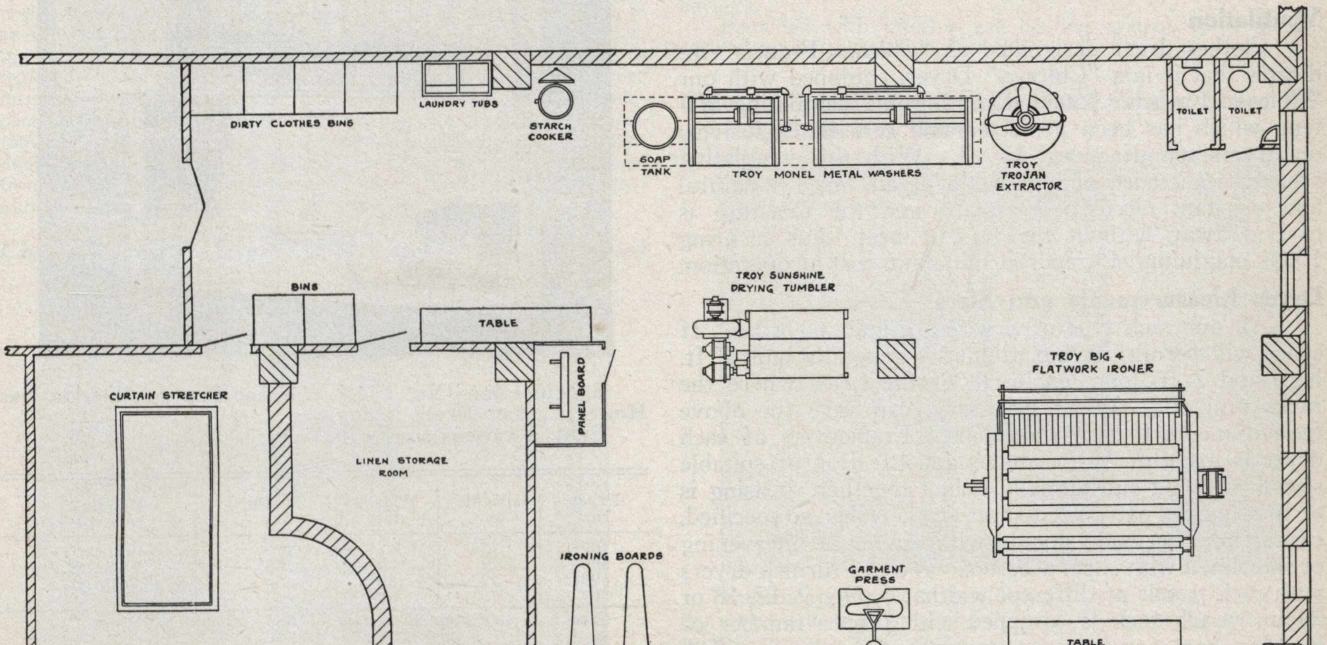
Partial List of References

HOTELS

Hotel Statler, Buffalo, N. Y.
Ambassador Hotel, Atlantic City, N. J.
Hotel Commodore, New York, N. Y.
Chicago Beach Hotel, Chicago, Ill.
Chase Hotel, St. Louis, Mo.
Brown Hotel, Louisville, Ky.
Palace Hotel, San Francisco, Cal.
St. Francis Hotel, San Francisco, Cal.

INSTITUTIONS

House of Mercy, Pittsfield, Mass.
Misericordia Hospital, New York, N. Y.
Bridgeton Hospital, Bridgeton, N. J.
Evangelical Deaconess Home & Hospital, Chicago, Ill.
City Hospital, Cleveland, Ohio
Jewish Hospital, St. Louis, Mo.
Municipal Hospital, San Francisco, Cal.
Alameda County Infirmary, San Leandro, Cal.



Typical Layout for a 300-Room Hotel

CHICAGO DRYER COMPANY

Laundry Room Equipment

2210-2220 North Crawford Avenue
CHICAGO, ILL.
Name of Nearest Representative Furnished on Request

TELEPHONE
Belmont 0297

CHICAGO
TRADE-MARK
(Registered U. S. Pat. Off.)

Products

- Chicago Clothes Dryers.
- Chicago-Francis Dryers.
- Chicago Electric Washers.
- Chicago Ironing Machines.
- Chicago Ironing Boards.
- Also Chicago Lawn Dryers.

Scope of Use

Especially adapted for use in residences, apartment buildings, schools, clubs, colleges, gymnasiums, hotels, hospitals, sanitariums and institutions of all kinds.

Co-operative Service

Individual machines or complete outfits furnished as may be desired. Send a plan of the laundry room, and blue prints will be furnished showing how the various appliances may be installed and the space each device will occupy. All plans and blue prints, including estimate, furnished free without any obligations whatsoever. The successful laundries of many well-known private residences, small institutions and clubs are the result of our service department co-operating with the architect in the early layout stages of the buildings.

Ventilation

Clothes dryer designated as "Chicago-Francis" indicates that it is a "Chicago" Dryer, equipped with our "Chicago-Francis" patented heating and ventilating system, which has been perfected and is used exclusively on dryers manufactured by us. With this ventilating system, we secure and maintain at all times a natural and constant circulation of air, and the moisture is carried away without the loss of heat, thus insuring 100% maximum efficiency at minimum cost of operation.

Dryer Measurements and Sizes

All our rack type of dryers are built to order. If space will permit, drying cabinet is generally built 7 ft. high and 7 ft. long, exclusive of the space where the racks pull out. When necessary, can vary the above measurements to suit conditions. Framework of each dryer is made of ⅛-in. angles and bar iron of suitable size firmly and substantially bolted together. Casing is of best quality galvanized sheet steel. When so specified, casing may be made double with air space intervening or interlined with sheet asbestos. We can furnish dryers with rack panels of different widths: 6, 7½, 9, 12, 18 or 24 in. Each rack is equipped with proper number of hanging bars for best service, or as may be specified.

The following table gives the width of dryers containing 2 to 8 racks, inclusive. Measurements of larger sizes furnished on request.

WIDTH OF DRYERS

Number of racks or draws	Type "W"	Type "A"	Type "B"	Type "C"
	Racks 6 in. wide each	Racks 7½ in. wide each	Racks 9 in. wide each	Racks 12 in. wide each
2	19 in.	22 in.	25 in.	31 in.
3	25 in.	29½ in.	34 in.	43 in.
4	31 in.	37 in.	43 in.	55 in.
5	37 in.	44½ in.	52 in.	67 in.
6	43 in.	52 in.	61 in.	82 in.
7	49 in.	59½ in.	70 in.	94 in.
8	55 in.	67 in.	82 in.	106 in.

Above measurements are exclusive of laundry stove.

Efficiency

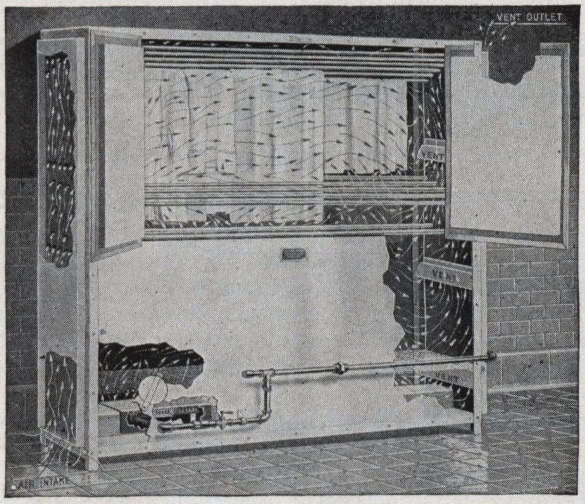
Leading architects have for years been specifying our clothes dryers equipped with "Chicago-Francis" patented heating and ventilating systems after becoming convinced by tests and experience of the unequaled efficiency in both fuel consumption and safety of material being dried.

Chicago-Francis Interior Gas Heated Cabinet Dryer Equipped with Indirect Gas Heating System

May be operated either with or without flue connection. Also made for electric heat, when so specified.

Our dryers are all equipped with ventilated hanging bars, so as to prevent overheating or injury to the most delicate fabric.

Adapted for use in residences, apartment buildings, schools, clubs, etc.



Specification—No. ...... Chicago-Francis Interior Gas Heated Cabinet Dryer.

Built in various sizes as follows:

Dryer No.	Height, in.	Width, in.	Depth, in.	Hanging capacity
209	72	62	20½	60 lin. ft.
309	72	80	20½	85 lin. ft.
409	72	80	26	117 lin. ft.
509	78	80	26	*

*See last paragraph at bottom of this column.

Description—Gas burner is contained in an interior drum. No flame exposed. No fumes or odors can possibly come in contact with the clothes. Complete air circulating system. Moisture carried away without loss of heat. Equipped with ventilated hanging bars, which prevent scorching or injury to the most delicate fabric.

Efficiency fully 100% over and above similar dryers offered by other concerns.

Suitable for operating on artificial or natural gas, as may be ordered.

When used in apartment buildings, it is customary to provide one No. 209 or 309 size with each set of tubs. For residences, we recommend using the No. 309 or 409 size.

*The No. 509 is designed for special purposes such as drying golf toggery, firemen's clothing, baseball uniforms, caps, coats, shoes, etc. The interior hanging bar arrangement is suitably designed for the kind of wearing apparel to be dried.

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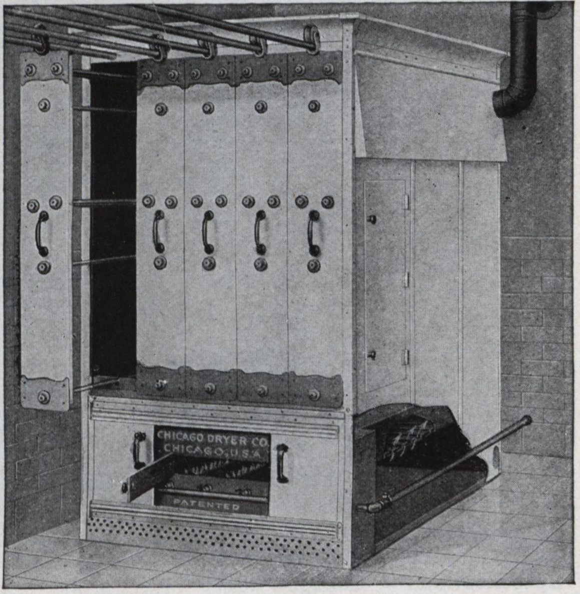
Chicago-Francis Interior Gas Heater Dryer No. 5909

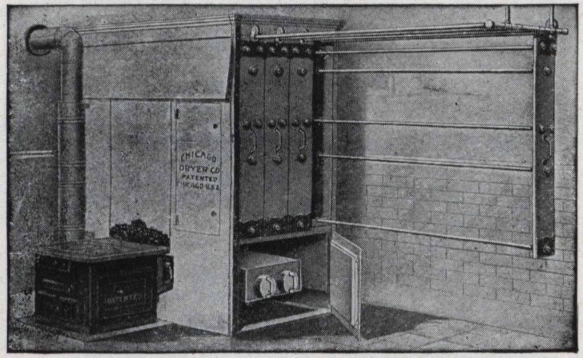


Specification—"Chicago-Francis Interior Gas Heated Dryer containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Built in various sizes containing 2, 3, 4, 5, 6, 7, 8 or more racks or draws, as may be specified. Each rack measures 9 in. wide. Vent outlet from dryer, 5 in. in diameter.

Uses and Descriptions—Adapted for use in residences, apartment buildings and institutions of all kinds. Equipped with indirect gas heating system. Gas burners are contained in an interior heat retaining galvanized sheet steel drum, thus heating the dryer with minimum gas consumption. No flame is exposed. Only pure and clean heat. Provided with one or more burners, depending on size. Each burner provided with independent shut-off valve so that the heat in the dryer can be regulated to suit conditions. Base provided with independent vent ducts so that moisture is carried away by natural air circulation without the loss of heat. Efficiency fully 100% over and above similar dryers offered by other manufacturers.

Chicago-Francis Dryer with Coal Stove Attached No. 4910

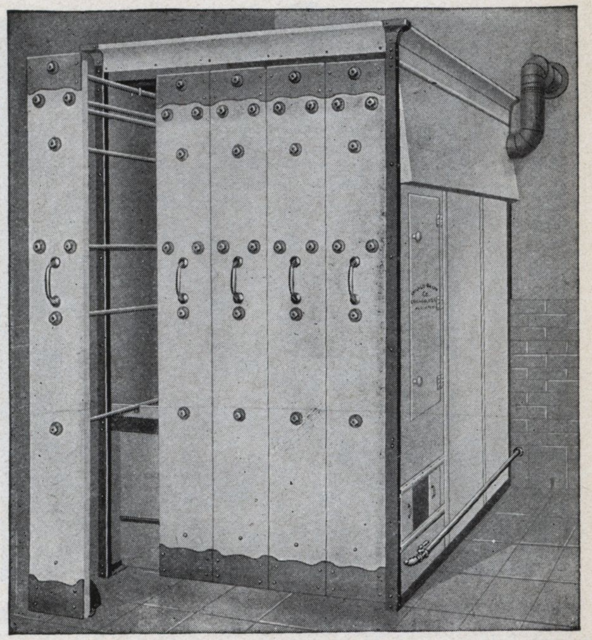


Specification—"Chicago-Francis Dryer with No. 10 Laundry Stove attached containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Built in various sizes containing 3, 4, 5, 6, 7, 8 racks or draws, as may be specified. Each rack measures 9 in. wide.

Description—Stove is of cast iron throughout and equipped with triplex shaking grate; plain linings unless otherwise specified. When specified stove has waterback suitable for heating 40-gal. storage tank. Stove may be used for ordinary laundry requirements. Waste heat from stove heats the drying cabinet and dries the clothes. Stove is adapted for burning coal or wood. Only one flue is required for both smoke and ventilating pipe. Pipe leading to flue measures 7 in. in diameter. On this particular type of dryer it is important that a chimney be provided with at least normal draft for operating a stove burning coal or wood for fuel. Stove occupies space of 27x30 in.

Chicago-Francis Interior Gas Heated Dryer with Floor Carriage Racks No. 5999



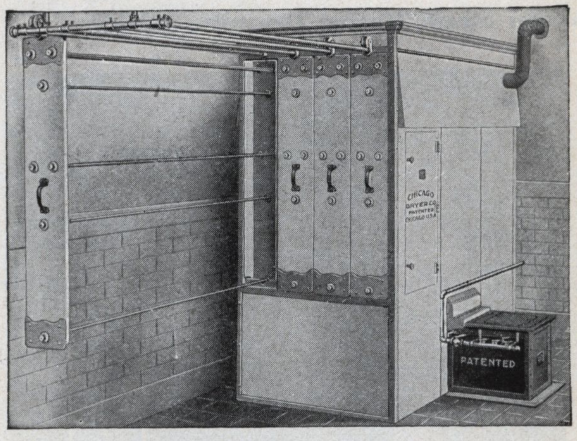
Specification—"Chicago-Francis Interior Gas Heated Dryer with Floor Carriage Racks, containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Various, containing 2, 3, 4, 5, 6, 7, 8 or more racks or draws, as may be specified.

Equipped with sliding door on side for lighting burners.

Provided with interior gas heating system, same as described under illustration No. 5909.

Chicago-Francis Dryer with Gas Laundry Stove Attached No. 4906



Specification—"Chicago-Francis Dryer with Gas Laundry Stove attached containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Various, containing 2, 3, 4, 5 or 6 racks or draws, as may be specified. Vent outlet from dryer, 5 in. in diameter.

Fuel—Artificial or natural gas, as may be ordered.

Uses and Operating Cost—Used in residences, apartment buildings, schools and institutions of all kinds. Stove may be used for boiling clothes or heating flat irons—waste heat heats drying cabinet and dries the clothes. Cost of operating stove 2 to 3½ cents per hour, figuring gas at $1.00 per 1000 cu. ft.

For apartment buildings, it is customary to provide one dryer containing 2 or 3 racks with each set of tubs. For residences we recommend dryers containing 3, 4 or 5 racks. The most efficient and economically operated dryer of its kind obtainable.

May be equipped with floor carriage racks, same as shown in illustration No. 5999, when so specified.

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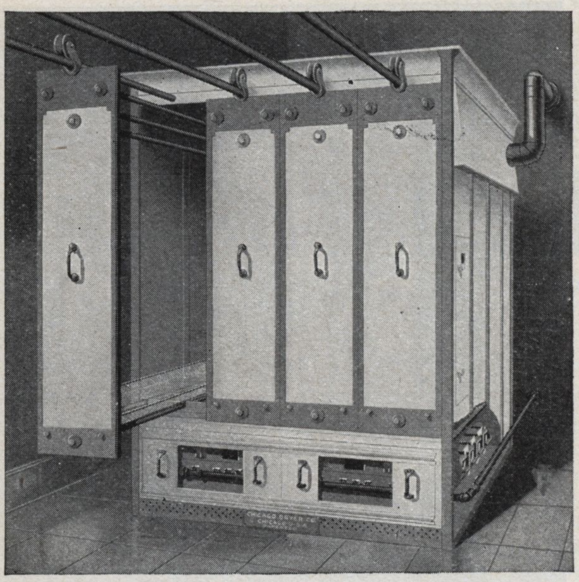
Chicago-Francis Extra Heavily Constructed Interior Gas Heated Garment Dryer No. 41809



Specifications—"Chicago-Francis Extra Heavily Constructed Interior Gas Heated Garment Dryer containing...... Racks or Draws. Each rack to measure 18 in. wide."

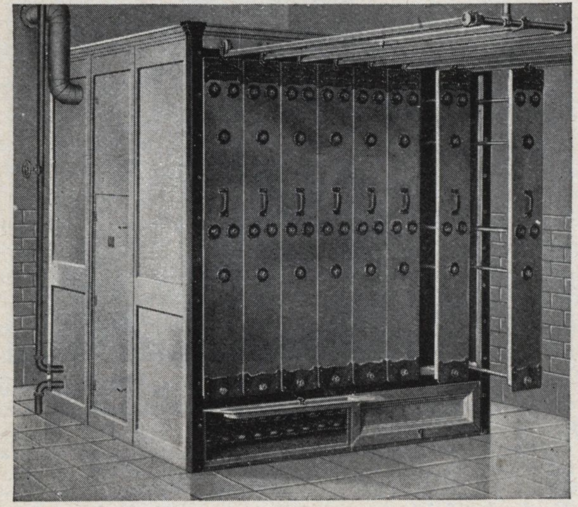
Sizes—Built in various sizes containing 2, 3, 4 or more racks or draws as may be specified. Each rack measures 18 in. wide. Also made with racks 24 in. wide.

Description—Equipped with indirect gas heating system. Gas burners are contained in an interior drum.

Usage—May be advantageously used for drying garments and wearing apparel. Especially suited for use in golf club buildings.

May be heated by means of steam or electricity in lieu of gas heat, when so ordered.

Chicago Steam Heated Dryer No. 8990



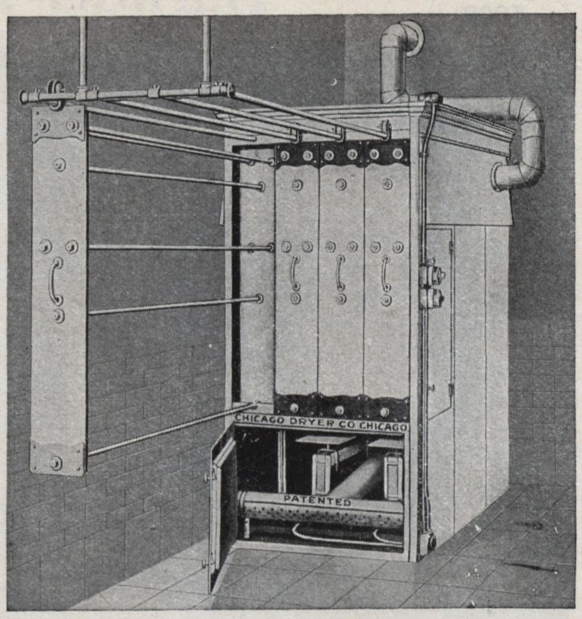
Specification—"Chicago-Steam Heated Dryer containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Built in various sizes containing 2, 3, 4, 5, 6, 7, 8 or more racks or draws, as may be specified. Heating coil contains 20 sq. ft. of radiation for each rack or draw.

Vent pipe on dryers containing 5 or less racks measure 5 in. in diameter. On larger sizes vent pipe measures 6 in. in diameter.

Steam Coils—Heating coils are of 1½ in. pipes, headers and return bends of 4-tier construction. Heating coils contain approximately 20 sq. ft. of radiation for each 9-in. rack. No. 8990 Dryer would contain about 160 sq. ft. of radiation.

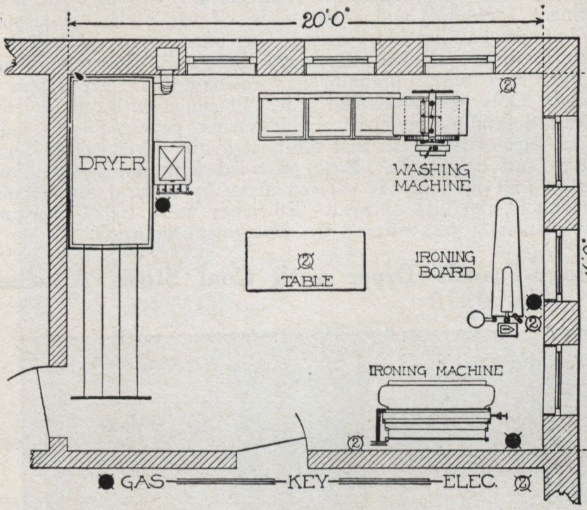
Chicago-Francis Electrically Heated Dryer No. E49



Specifications—"Chicago-Francis Electrically Heated Dryer containing .... Racks or Draws. Each rack to measure 9 in. wide."

Sizes—Built in various sizes containing 2, 3, 4, 5, 6, 7, 8 or more racks or draws as may be specified.

Description—Equipped with electric heaters suitable for operating on 110 or 220-volt current as may be ordered. Approximate current consumption is 1½ kw. for each rack or draw.



Floor Plan of Modern and Up-to-date Residence Laundry Room

Showing installation of the following Chicago laundry appliances:

One No. 314 Chicago electric washer and safety wringer.

One Chicago-Francis dryer with gas laundry stove attached, containing 4 racks or draws. Each rack to measure 9 in. wide.

One No. 3-50 in. Chicago three-roll gas heated ironing machine with motor attached.

One No. 302 Chicago ironing board and stand with electric attachment, including electrically heated 6-lb. flatiron

Above appliances may be had in smaller or larger sizes, thus enabling us to provide suitable appliances from the smallest to the largest residence. Larger sizes are adapted for small institutions.

Experience

The personnel of our Company have devoted more than 30 years to this line of work. We are producing exclusively high grade appliances and have no hesitancy in stating that we offer the best, most efficient and economically operated laundry room equipments obtainable.

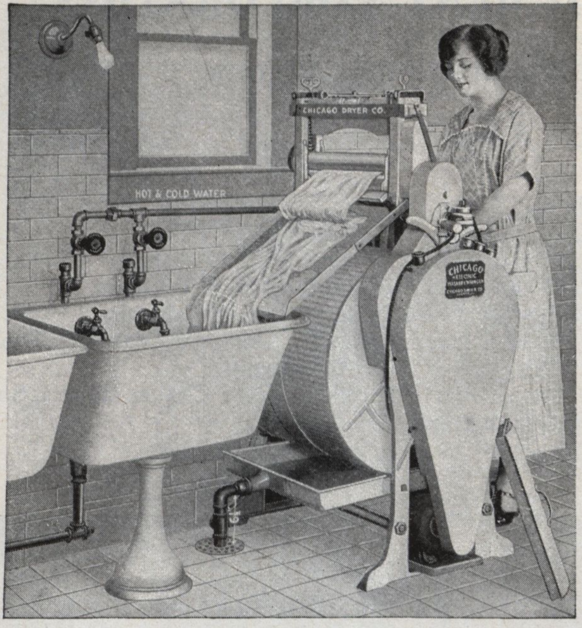
Catalogue

Write for catalogue S which shows our complete line and contains useful information.

Mailed free on request.

Continued on next page

*Chicago Electric Washer and Safety Wringer



Especially suited for use in residences and small institutions.

Only machine on the market with wringer equipped with automatic conveyor, for conveying clothes into rolls, and automatic safety stop, which prevents tearing of clothes, and insures absolute protection against possible accidents to operator, when wringing clothes.

Washer tub made of copper with nickeloid plating on inside. Framework is of heavy iron. Outside of washer tub, including framework, finished in white enamel. Provided with water inlet for stationary water and drain connections.

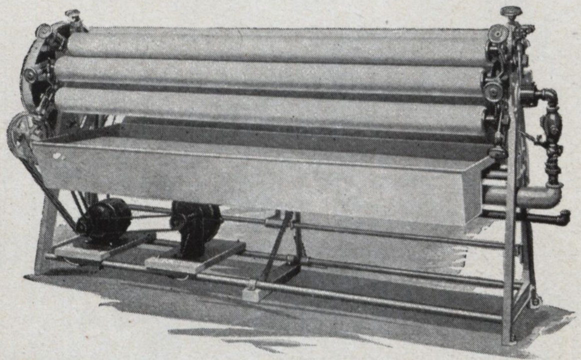
Will wash clothes thoroughly clean and without injury in 10 to 15 minutes. Equipped with ¼ hp. motor, which may be connected to any lighting circuit. When planning, recommend washing machine being placed at either right or left end of stationary laundry tubs as shown in illustration.

Made in the following sizes:

No.	Capacity	Wringer	Motor
212	9 sheets	12 in.	¼ hp.
214	9 sheets	14 in.	¼ hp.
314	12 sheets	14 in.	¼ hp.
414	15 sheets	14 in.	¼ hp.

*Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine."

Chicago Six-roll Gas Heated Ironer with Motor Attached



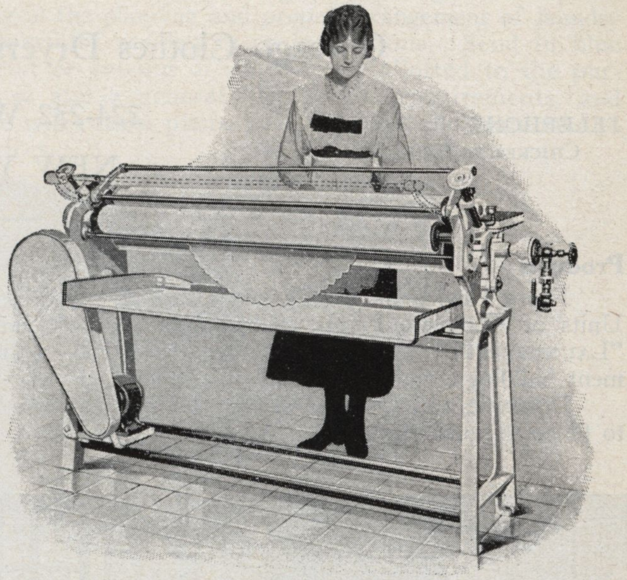
Especially suited for use in hotels, hospitals and institutions. Suitable for ironing all kinds of flat work such as sheets, towels, table linens, etc. Equipped with six rolls consisting of one gas heated roll, which measures 10½ in. in diameter and five padded compression rolls. All the rolls revolve. No wear on linens. Two speeds. Linens taken direct from extractor may be dried and ironed by running through the machine once at a speed of 9 or 16 lineal feet per minute. The padded compression rolls are compressed and released from heated roll by means of foot control.

Exclusively high grade. Built in following sizes:

No. 6-60 in. contains 6 rolls, each 60 in. long.
No. 6-80 in. contains 6 rolls, each 80 in. long.
No. 6-100 in. contains 6 rolls, each 100 in. long.

Write for special bulletin No. 26 pertaining to our Chicago-Ironers.

*Chicago Three-roll Gas Heated Ironer with Motor Attached



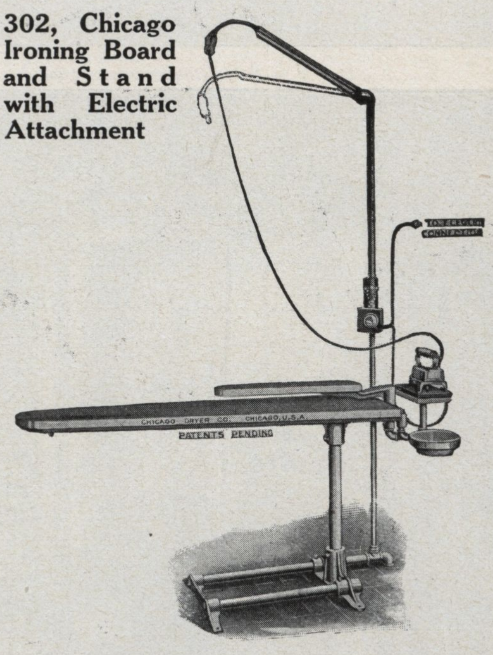
Suitable for ironing all kinds of flat work, such as sheets, pillow cases, towels, table linens, etc. Adapted for use in residences, apartment buildings and small institutions. Equipped with three rolls, consisting of one heated and two compression rolls. All the rolls revolve. No wear on linens. Heated by means of gas or gasoline. Equipped with ¼ hp. electric motor which may be operated from any lighting circuit.

Made in the following sizes:

No. 3-50 in. contains 3 rolls each, 50 in. long.
No. 3-60 in. contains 3 rolls each, 60 in. long.
No. 3-75 in. contains 3 rolls each, 75 in. long.

*Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine."

*No. 302, Chicago Ironing Board and Stand with Electric Attachment



Equipped with pipe standard, snap switch, pilot light, suspension arm and connector cord. Furnished either with or without electric iron, as may be ordered, suitable for operating on 110 or 115-volt current only.

Ironing board measures 60 in. long by 1¾ in. thick. Large end measures 16 in. wide and tapers to 10 in. at small end. Underside of board provided with patented attachment for holding padding. Base and stand finished in white enamel. Stand is self-contained and need not be fastened to floor.

*Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine."

DOMESTIC LAUNDRY EQUIPMENT CORPORATION

Chicago Clothes Dryers; American Clothes Dryers

TELEPHONE
CHICKERING 2240

224-232 West 26th Street
NEW YORK, N. Y.

Products

Every Device for the Domestic Laundry in Single Units or Complete Plants. COMPLETE LAUNDRY and "LAUNDRYETTE" EQUIPMENTS for the home, apartment buildings, clubs and small institutions.

Domestic and Chicago Clothes Dryers constructed to fit any requirements.

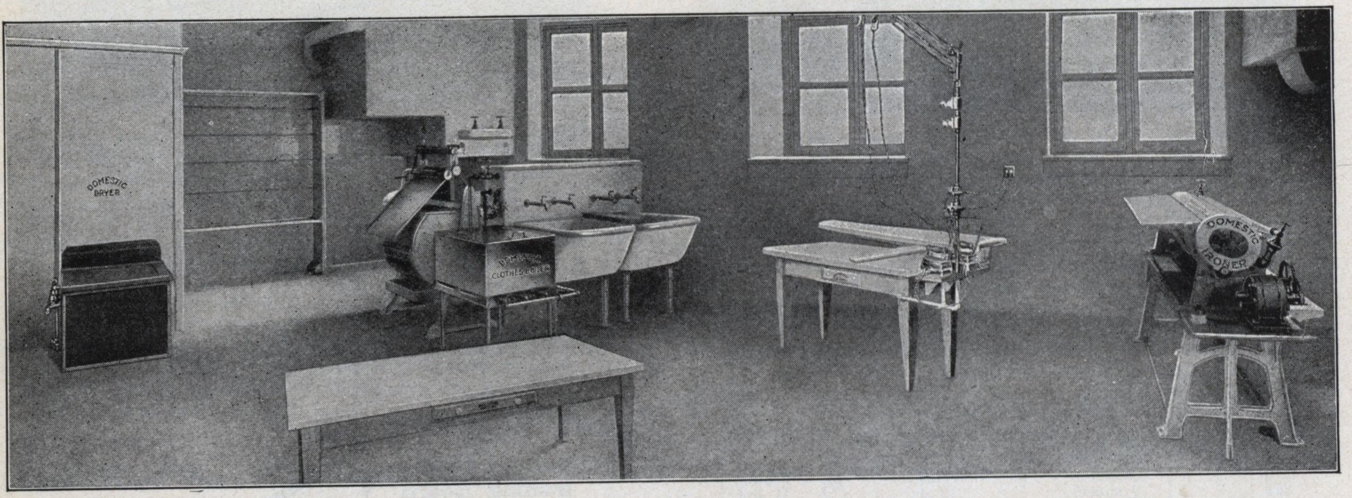
Domestic and Chicago Clothes Washers.

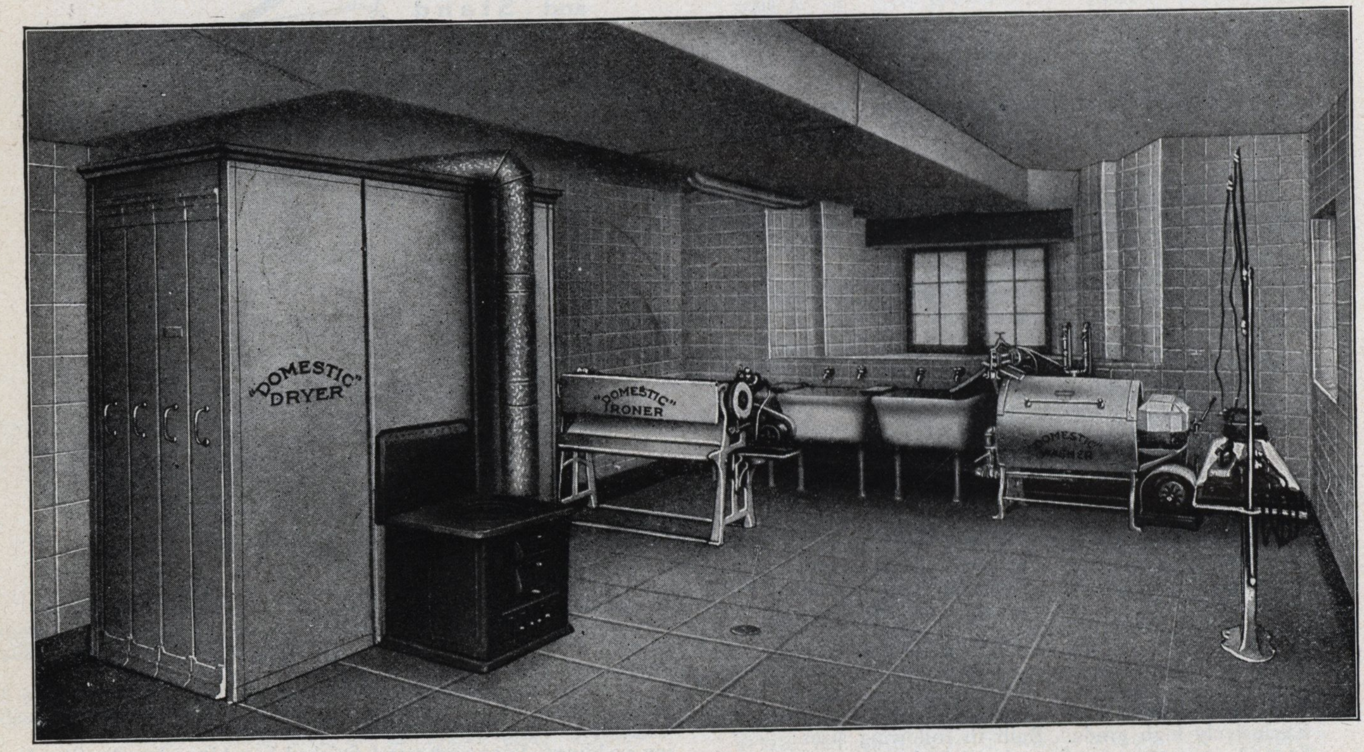
Domestic and Chicago Ironing Machines.

Special made Laundry, Skirt and Valeting Tables with Electric or Gas Equipment.

Gas, Steam or Electric Heated Clothes Boilers, Soap Tanks and Starch Cookers.

Laundry Supply and Linen Cabinets.





ILLUSTRATING MODERN LAUNDRY ROOM EQUIPMENT

"Domestic" laundry equipments for residences, built and designed in all sizes to suit individual requirements. If plan of room and number of people to be provided for is received, suggestions and quotations covering appropriate installation will be forwarded

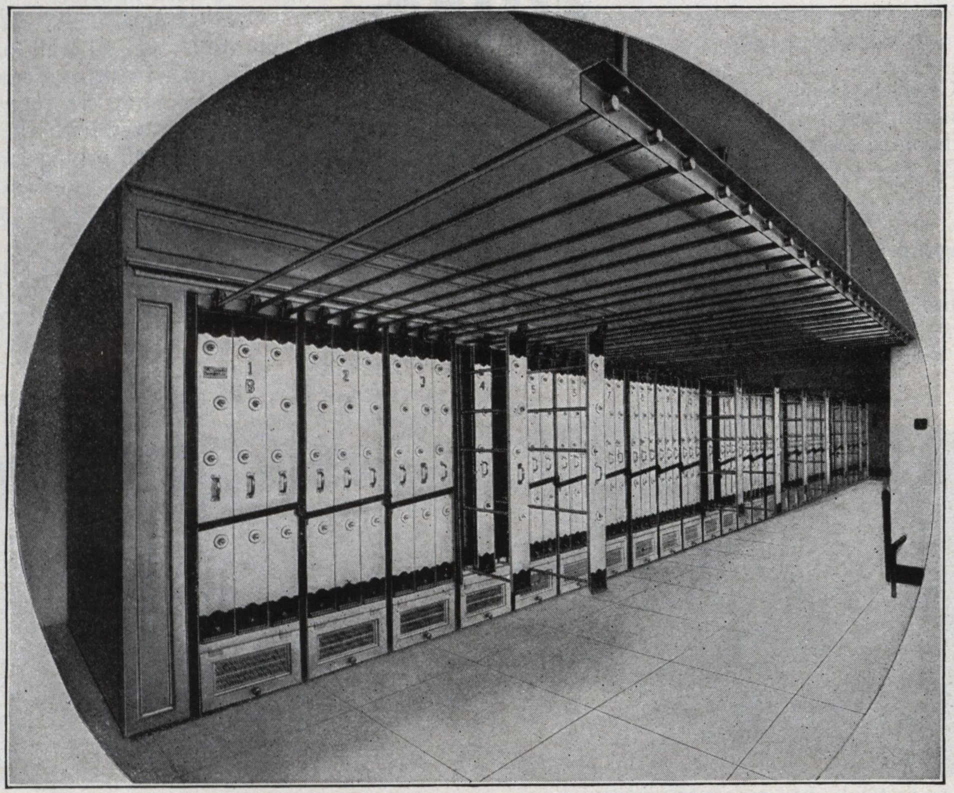
Continued on next page

Experience

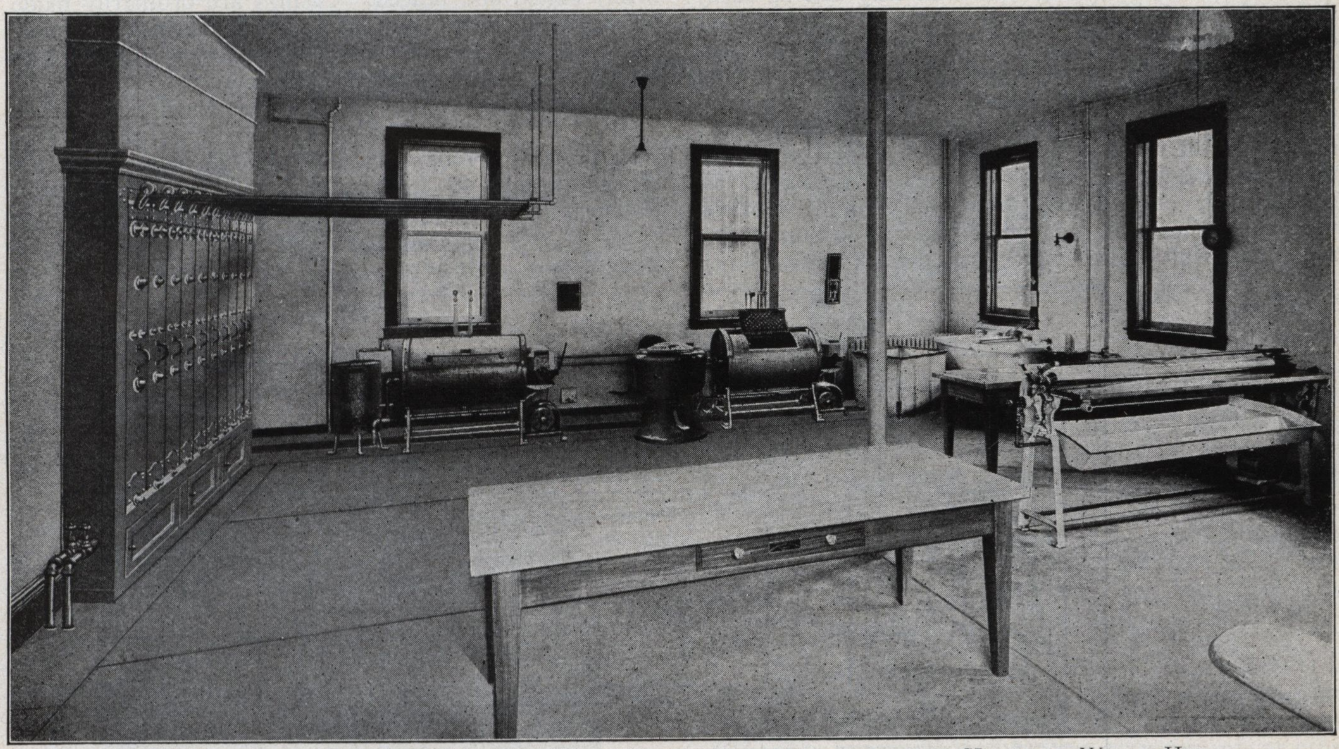
Over thirty years of actual knowledge of, and experience with, the requirements in this line have caused us to create and develop the most efficient and highest type of laundry devices for the domestic service, and our many complete equipment installations in the finest homes have won for us the distinction of being specialists in this field.

Note to Architects

We solicit the privilege of assisting and co-operating in the planning and proper arrangement of laundry rooms for residences or institutions. Send in blue print or tracing of space to be allotted to the purpose and a general idea of the requirements, and we will return plans, specifications, illustrations and prices.



Sectional Dryers for Apartment House Use
Built of sizes to suit number of families to be accommodated, with compartments of 2 or 3 racks, separately locked and numbered. Steam or gas heated



A Comprehensive "Domestic" Laundry Plant, Designed for Institutions or Hospitals Where High Pressure Steam Is Not Available

HILL CLOTHES DRYER COMPANY

58 Central Street
WORCESTER, MASS.

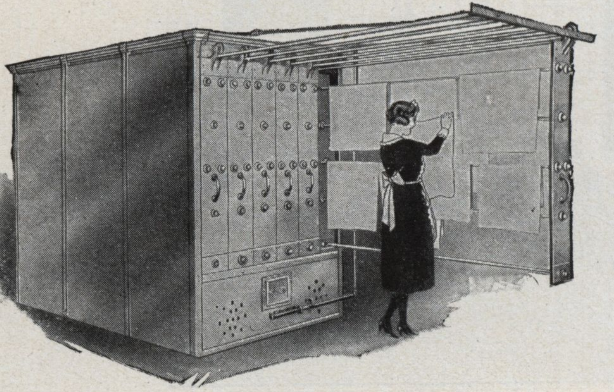
HILL
REG. U. S. PAT. OFF.
TRADE-MARK

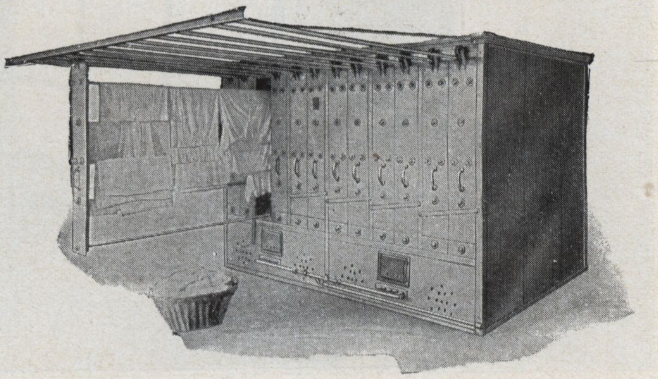
Product
Clothes Drying Apparatus, Outdoor and Indoor Types.

Types
(1) Hill Clothes Drying Cabinets Operated by artificial heat for use in residences, clubs, schools, hospitals, institutions and apartment houses. (2) The famous Hill Clothes Dryers for outdoor use.

Hill Clothes Drying Cabinets

Consists of a series of three or more movable clothes racks mounted on overhead carriers and enclosed in a metal cabinet, which is provided with a modern scientific heating and ventilation system.


Gas Heated Clothes Drying Cabinet


Gas Heated Cabinet for Apartment Houses

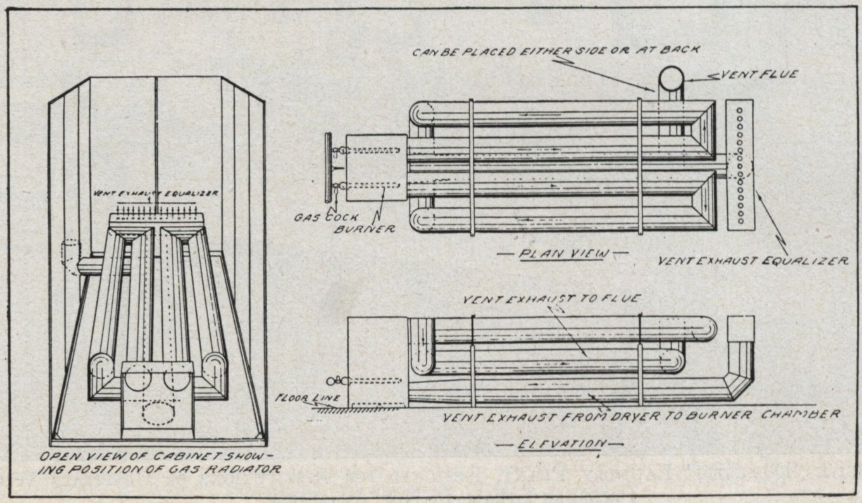
The racks are arranged so that they can be easily drawn from the cabinet for loading, and inserted for drying purposes.

System—The dryer is built on the principle that while wash dries more quickly in summer than in winter, heat is not the only element necessary for satisfactory drying. Heat alone dries clothes yellow and retains in them a laundry odor. When proper circulation of air is obtained, clothes are dried white and odorless. Colored clothes that fade when exposed to sun drying retain their full brilliancy when dried within this cabinet, because the drying process is performed within a dark interior.

The circulation is established by the application of a well-known principle. Briefly, the fresh air enters the cabinet through openings in the front and as it comes in contact with the radiators, it is heated and rises to the top, absorbing moisture from the clothes. As it becomes heavy, it falls to the ventilating duct in the back of the cabinet and over the flame, where this vapor is converted into heated air and discharged through the exhaust pipe. Thus a change of heated fresh air is constantly passing through the clothes.

Construction of Cabinets—***Casings***—The casing, or body, is of heavy galvanized sheet steel, finished with an ornamental metal cornice, secured to a substantial framework 3x3x$\frac{3}{16}$-in. and 2x2x1/8-in. rolled steel angles, firmly bolted and braced. Casings are ordinarily made of single thickness, but may also be furnished double thickness with an intervening air space, or double with an asbestos core between the plates.

Racks—Racks or draws are furnished either 7, 9 or 12 in. wide, and 6 ft. 8 in. long. Each 9-in. rack contains 6 rods upon which the clothes are placed, making nearly 40 ft. of drying space in each rack. Cabinets are furnished with as many draws or racks as may be required. The racks are constructed with heavy galvanized steel ends, 1-in. angles on


VENT EXHAUST EQUALIZER
OPEN VIEW OF CABINET SHOWING POSITION OF GAS RADIATOR
CAN BE PLACED EITHER SIDE OR AT BACK
VENT FLUE
GAS COCK
BURNER
PLAN VIEW
VENT EXHAUST EQUALIZER
VENT EXHAUST TO FLUE
FLOOR LINE
VENT EXHAUST FROM DRYER TO BURNER CHAMBER
ELEVATION

Details of Gas Heated Cabinet

Continued on next page

edges, one end acting as a door to close the cabinet. They are fitted with solid brass handles, and special ventilated hanging bars correctly spaced and arranged to hold the clothes. Each rack is hung to an overhead hanging rod secured to the framework of the cabinet at the back and supported in front by Hill patent truss rods. The racks run out and in on steel rollers with frictionless ball bearings. The rack is guided in and out at the bottom by the Hill patent adjustable ball bearing guide roller.

Radiators—Radiators are of heavy galvanized sheet steel separated from the drying cabinet by a heavy wire screen and supported on substantial standards.

Ventilating Pipes—Ventilating pipes are of heavy galvanized sheet steel.

Burner Box—Burner box and plate which separates the burner box from the cabinet interior are constructed of heavy sheet steel.

Heating System—***Gas***—In the gas heated cabinet, the flame is confined within an airtight burner box. Gas fumes or combustion odors can not escape into the clothes.

Steam Heated Cabinet—Cabinets are also made for drying by the use of steam heated coils.

Laundry Stove—Cabinets are heated by specially constructed laundry stoves, with which clothes can be boiled and irons heated.

Sizes—Hill Clothes Drying Cabinets are made in standard sizes. The standard size of the Drying Cabinet is 7 ft. high and 7 ft. long, exclusive of the space where the racks pull out. This requires a floor space of 14 ft.—allowing the same amount of space in front of dryer as the length or depth of cabinet. Width varies according to the number of racks specified. Racks are 7, 9 and 12 in. wide.

Special sizes to meet unusual conditions can be furnished.

WIDTH OF DRYERS, NUMBER OF RACKS AND DIMENSIONS

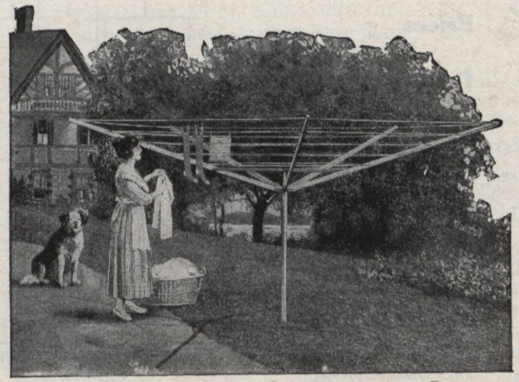
Width of racks, in.	Number of racks or draws							
	3	4	5	6	7	8	9	10
	Total width in inches							
7	27	34	41	48	55	62	69	76
9	33	42	51	60	69	78	87	96
12	42	54	66	78	100	112	124	136

Widths are exclusive of laundry stove, which is 27 in. wide and 30 in. deep. Measurements of wider racks and larger size cabinets will be furnished on request.

Hill Outdoor Dryers

Hill's Champion Lawn Dryer—Consists of a standard (with wood post painted or steel tubing post galvanized), set in a socket in the ground. The socket has a galvanized pressed steel cap and cover to prevent dirt from entering when post is removed.

The top or reel which sets on the post, is of clear No. 1 spruce, painted with two coats of paint, strung with high grade cotton thread line. The top is locked to the post by a patented device that makes it impossible to be blown off. When not in use the top can be removed from the post and placed in some spot away from dust and dirt, thus keeping the lines clean. The post or standard is also easily removed from the socket which is closed by the cap. All castings are of malleable iron, heavily galvanized.



Hill's Champion Clothes Dryer for Lawns

Sizes—As follows:

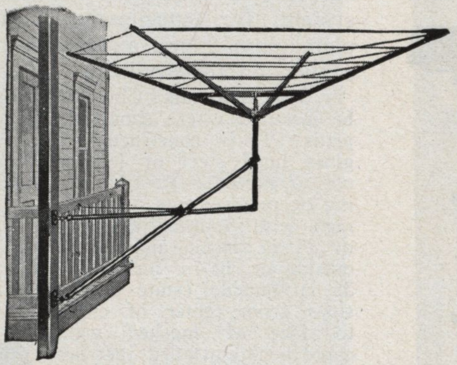
No. 1. 4 arms 6 ft. long, 100-ft. line
No. 2. 5 arms 6 ft. long, 115-ft. line
No. 3. 5 arms 7 ft. long, 150-ft. line

This dryer has been tested and approved by Good Housekeeping Institute and the Modern Priscilla Proving Plant.

Hill Balcony Dryers

Made in various styles to suit requirements. Reels are similar to those for lawn dryer, are detachable and collapsible, and have the same locking and unlocking arrangements. The crane or swing arm is 1⅛-in. steel rod. Castings are malleable iron.

Style H—For hanging to piazza or veranda posts or from sides of buildings, to swing in for easy filling of the line and to swing out clear of veranda, fire escape or window when filled.



Hill's Balcony Dryer, Style H

Style D—To meet the demand for a dryer to swing out over walks and driveways where the underbracket dryer can not be used. This dryer is swung by a handle with ratchet.

Sizes—Regular balcony dryers have 4 arms, 5 ft., 6 in. long and hold 110 ft. of line. Extreme distance of spread is 11 ft.

Hill's Roof Clothes Dryers

For flat and apartment houses. Framework is of steel tubing secured to roof by an approved device arranged to fit the slope of any roof. Reels have same collapsible, removable and locking arrangements as other dryers.

THE PFAUDLER CO.

Glass Enameled Steel Laundry Chutes and Containers

ROCHESTER, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., Room 1103, 8 West 40th Street
CHICAGO, ILL., 1442 Conway Building

FACTORIES, ROCHESTER, N. Y., and ELYRIA, OHIO

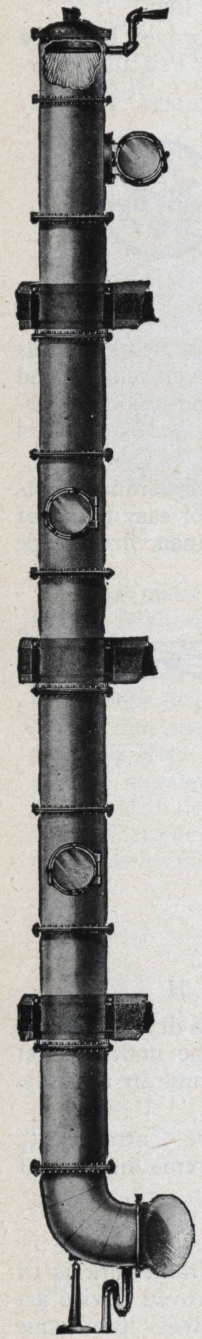
FOREIGN AGENCIES

LONDON, W. C. 2, ENGLAND, Enamelled Metal Products Corp., Ltd., 56 Kingsway
SYDNEY, N. S. W., AUSTRALIA, Mauri Bros. & Thomson, 121-123 Castlereagh Street

Products

Glass Lined Steel Laundry Chute for hospitals, hotels, apartment houses, large residences, etc.; Unenameled Dust and Rubbish Chute.

Glass Lined Water Cooling Tank and General Glass Lined Steel Containers.



Laundry Chute

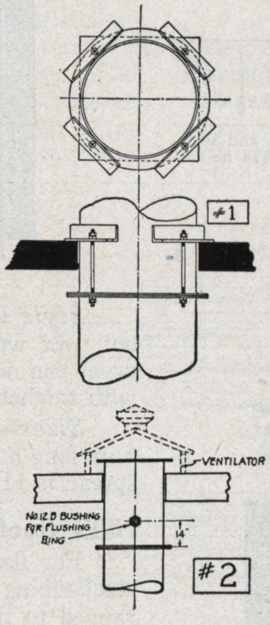
Pfaudler Glass Lined Steel Laundry Chute

This chute is the conception of a hospital executive and was designed by a hospital architect to provide positive sanitation in disposing of soiled linen and laundry. It has been rapidly adopted by the general hospital field and we offer a pretentious list of hospitals and other institutions using this chute. The initial expense of installing represents the only cost, and because of its construction it will outlast any other chute on the market. The Pfaudler chute is made of heavy open-hearth plate steel, lined with a coating of high-quality glass which is fused directly into the metal at high temperature, making it an integral part thereof. The chute is built in flanged sections which can be bolted together and adapted to a building of any height. Equipped with a flushing system for sterilization, watertight plate glass doors, air vent and sewer connection for drainage.

Specifications—Chute to be installed where shown on plans. To be constructed of glass lined steel of lengths not to exceed 6 ft. (depending on requirements of building) with optional diameter of 24 in. inside and 29 in. outside or 30 in. inside and 35 in. outside (state dimensions from center of chute to face of finished wall, chute being installed just before floors and walls are finished). Glass lining of chute to extend well beyond inner edges of gaskets and to outer edges of door throats and facings. Top section to be provided with a 1½-in. nickelplated brass pipe flushing ring with 1½-in. standard pipe bushing for connection to water service pipe. Top head to have suitable connections for 3-in. ventilator pipe (see drawing No. 3) or designed for air ventilator (see drawing No. 2).

At a distance of 47 in. above level of each floor will be a german silver door furnished with either plate glass or polished wire glass; door to close watertight against a tubular rubber cushion and secured by german silver clamp of refrigerator type. Throat to which door is attached to be integral with chute proper, 22-in. inside diameter and of length to bring its outer edge flush with face of finished wall (dimensions from center of chute to face of finished wall necessary). Bottom of chute to be an elbow, closed watertight with a steel door, interior surface of which is coated with glass and which is fitted with firmly closing clamp; chute to have 2-in. standard pipe outlet, threaded for drain connection (no other fittings furnished). Chute to be supported by one cast iron leg at bottom and by three ⅝-in. tie rods at each floor, connected to angle irons set in steelwork of floor construction. Can be embedded in concrete floor or fastened to ordinary wood (see drawing No. 1).

Note: Floor openings and plumbing connections to be provided by owners.



Details of Laundry Chute

Steel Dust Chute

We also manufacture a plain, unenameled steel dust chute. Details on request.

Water Cooling Tank and General Glass Lined Steel Containers

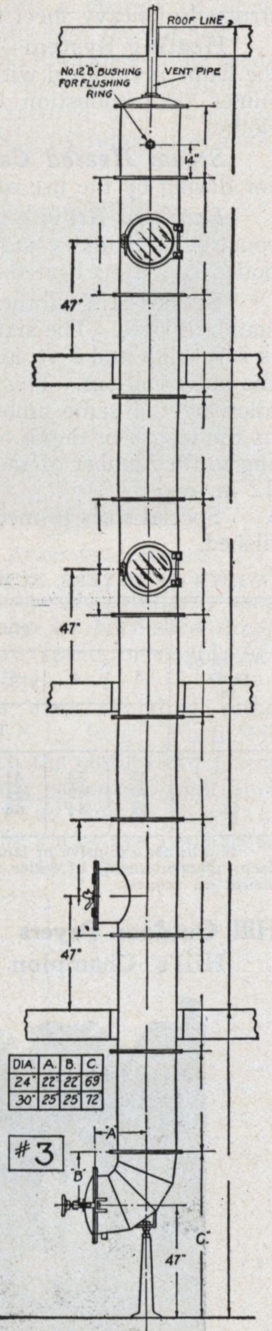
For use in hotel, residence and public building water cooling systems, we manufacture a glass lined water cooling tank. Some recent installations are:

Hotel Statler, Buffalo Athletic Club, Buffalo, N. Y.; Everett Building, New York, N. Y.; Bulletin Building, Philadelphia, Pa.; Maryland Casualty Building, Baltimore, Md.; Trowbridge Residence, Noroton, Conn.; Dommerich Residence, Wagner Residence, Greenwich, Conn.; Federal Reserve Bank, Richmond, Va.

Complete data on this unit, as well as on our glass lined storage tanks, mixers, stills, etc., sent on request.

Prices

Prices will be furnished on receipt of architect's specifications. We shall be glad to place the services of our engineering department at your disposal in the writing of specifications for the Pfaudler chute or Pfaudler general equipment. No obligation.



DIA.	A.	B.	C.
24"	22"	22"	69"
30"	25"	25"	72"

Details of Laundry Chute

AMERICAN MAILING DEVICE CORPORATION

GENERAL OFFICES AND FACTORY

203 East 12th Street, NEW YORK, N. Y.

TELEPHONE
Stuyvesant 5162, 5163

BRANCH OFFICES

ATLANTA, 227 Peachtree Street
BIRMINGHAM, 2022 Fourth Avenue
BOSTON, 12 Pearl Street
CHARLESTON, W. VA., Kanawha Banking & Trust Building
CHICAGO, Tribune Tower Building
CINCINNATI, 206 West Court Street
CLEVELAND, Insurance Center Building
COLUMBIA, 705 Lady Street
DALLAS, Slaughter Building
DAYTON, 262 Fourth Street Arcade
DENVER, 1534 Blake Street
DES MOINES, Hubbell Building
DETROIT, Penobscot Building
EL PASO, First National Bank Building
HELENA, Power Block Annex
HOUSTON, 3112 Harrisburg Boulevard
HUNTINGTON, 202 Elm Street
INDIANAPOLIS, 114 East Washington Street
KANSAS CITY, 1532 Cherry Street
LITTLE ROCK, Southern Trust Co. Building
LOS ANGELES, Hibernian Building
LOUISVILLE, 114 South Fourth Street
MEMPHIS, Goodwyn Institute Building
MIAMI, First National Bank Building
MINNEAPOLIS, Metropolitan Bank Building
NEW ORLEANS, 423 Carondelet Street
NORFOLK, 24th Street and Colonial Avenue
OMAHA, Sunderland Building
OKLAHOMA CITY, First National Bank Building
PHILADELPHIA, 20 South 15th Street
PITTSBURGH, Ferguson Building
PORTLAND, 61 Albina Avenue
RICHMOND, Real Estate Exchange Building
ROANOKE, MacBain Building
ST. LOUIS, 16th and O'Fallon Streets
SALT LAKE CITY, Dooly Building
SAN ANTONIO, Calcasieu Building
SAN FRANCISCO, 523 Market Street
SCRANTON, Cedar Avenue
SEATTLE, Douglas Building
TAMPA, Krause Building
WICHITA, Beacon Building

Product and Service

Manufacturing and Installation of the American Mailing System: Type "L" Mail Chute and Receiving Boxes for United States Free Collection Service.

Authorization

This company is owner of United States patents for its product, which is authorized by special Act of Congress under Regulations of the Post Office Department.

Specifications

Following is a complete specification for the furnishing and installation of the American Mailing System, Standard Finish. We would call attention that any special requirements be specifically provided for:

Note: Provisions should be made elsewhere in the specifications under proper headings for rough openings through floors and the general patching and repairing of plaster, not included in the specifications given below.

Furnish and install where shown on the drawings and as hereinafter specified, the American Mailing System as manufactured by the American Mailing Device Corporation, New York, N. Y.

Prepare the building to receive the mail chute equipment by finishing openings in the floors to iron thimbles or sleeves. Furnish and erect (..) (a) frame(s) of 2x2x¼ in. steel angles, securely fastened, extending from the top of the mail box(es) in the (first or ground) story to a point four feet nine inches (4 ft. 9 in.) above the finished floor in the ...... (top) story, and there finished by neatly mitering and returning the angles across the top. Frame(s) to be plumb and flush in all stories and sufficiently rigid to form suitable support for the mail chute(s). Finish to be two coats of lead and oil, dead black, or as directed.

Erect on the steel frame(s) above described the American Mailing System, consisting of ...... Type "L" mail chute(s) of latest improved design and ...... U. S. Mail box(es). The mail box(es) to be located in the (first or ground) story and the mail chute(s) shall be properly connected with and extend from the top of the box(es), through ...... stories to a point four feet eight inches (4 ft. 8 in.) into the ...... (top) story, there finished with a neat bronze cap plate. Openings are to be provided for mail in each of these stories.

The mail chute(s) to be constructed of No. 20 U. S. gauge cold rolled steel, formed in channels, with removable panels of plate glass set in frames of bronze and secured in place by special U. S. Mail Chute Locks with keys in the hands of the Post Office Authorities.

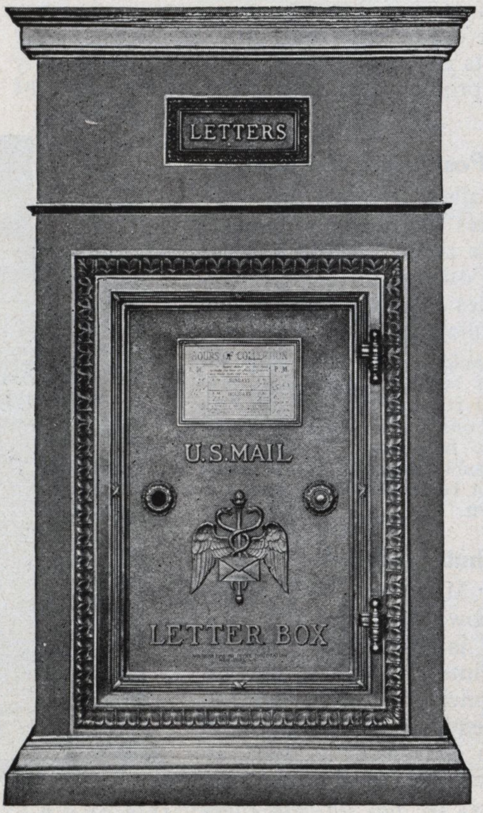
Mail box(es) to be of American Mailing Device Corporation design No. 1412, size 36x21½x11¼ in. over all, duplex electro-bronze plated (or all solid bronze). Finish of mail chute(s) in all stories is to be standard, steel channels and neck pieces and cast iron subbases in rustless black enamel, with front fittings in bronze. All bronze surfaces to be finished slightly oxidized or "statuary" bronze color and lacquered.

The entire work to be done to the satisfaction and acceptance of the architect, in strict accordance with the regulations of the Post Office Department and installed with the approval of the Postmaster of .... Any and all defects in workmanship or material developing within one year from the date of completion to be made good without charge.

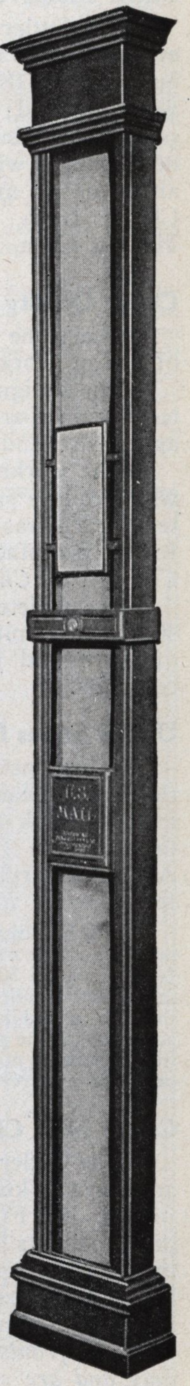
United States Post Office Regulations

Special requirements of the Post Office Department affecting architects are as follows:

The mail box must not be located more than 100 ft. from main entrance of building. Mail chute must extend through space freely accessible to the public and post office authorities. Mail chute must not extend behind a partition or elevator screen.



No. 1412
Standard Receiving Box



Type "L"
Mail Chute

ESTABLISHED 1883

INCORPORATED 1909

CUTLER MAIL CHUTE COMPANY

GENERAL OFFICES
Cutler Building
ROCHESTER, N. Y.
(Where All Correspondence Should Be Addressed)

NEW YORK OFFICE
345 Madison Avenue

FACTORY
ROCHESTER, N. Y.

AGENCIES IN PRINCIPAL CITIES

Copyright, 1925, by Cutler Mail Chute Company

Product and Service

The manufacture and installation of the Cutler Mail Chute.

Cutler Achievement

The Cutler brothers invented and patented the modern method of mailing letters from the upper stories of buildings in 1883. In 1884 four Cutler Mail Chutes were installed; at the present time there are few important high buildings in the United States which are not equipped with Cutler Mail Chutes. In addition they are in use in many foreign countries, including: Japan, China, India, Transvaal, South Africa, Australia, Mexico, Cuba, Brazil and Argentina.

Cutler Quality

The name "Cutler" stands for the highest quality of design, workmanship and service.

The design is simple, substantial and elegant, and has a refined architectural and official character which is appreciated and much commended by architects.

The workmanship is the highest class metal work which can be produced. The Cutler factory at Rochester, N. Y., was designed, built and equipped exclusively for the manufacture of the company's *one* product—*The Cutler Mail Chute.*

A complete organization and an experience of over 40 years permits the maintenance of the Cutler quality of work and prompt and satisfactory completion of contracts.

United States Post Office Requirements

When installed in connection with the United States Free Collection Service, this work is subject to the Regulations of the Post Office Department. Among the rules most affecting architects are the following:

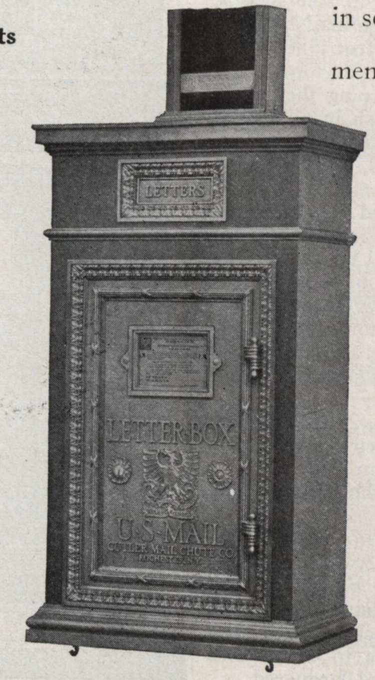
> Mail box should be placed as near the main entrance of building as possible, preferably within 50 ft.; not to exceed 100 ft. under any conditions. Mail chute must run through a public hall, or premises freely accessible to the public and post office authorities. It must not be run behind a partition or elevator screen.

Cutler Mail Chute (Model F)

The Cutler Mail Chute in its standard form is known as Model F.

Model F is substantial, simple, practical. Its interior (under government lock) is quickly and easily accessible to authorized persons, as the front is removable in convenient sections.

The fronts are secured at the ends only and are set in, not on, the chute channel, so that the joint is covered, and the panels can not be pried open. The removal and particularly the replacement of the fronts is, therefore, not complicated; by turning the key in any one of the locks, the two adjoining panels are released and either or both of them can be removed and replaced as desired. This, in a story of ordinary height, permits a person standing on the floor to remove the entire front.



U. S. Mail Box, Design No. 1165
Furnished with standard equipment

Standard Finish—Consists of steel chute channels (sides and back of chute) in dead black baked enamel; caps, bases, mailing pockets and frames of glass fronts are in bronze, slightly oxidized or statuary bronze color.

Bronze Finish—Model F is also made with all exposed parts in bronze. In this construction the sides of the chute channels are covered with sheet bronze. It is not unusual to use this finish in the first story, combined with the standard finish in the upper stories.

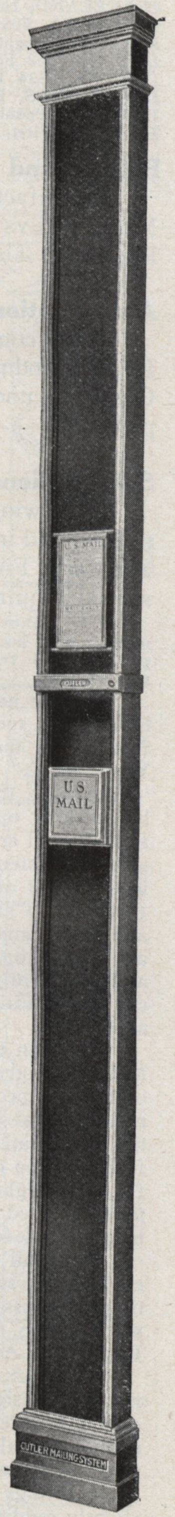
Mail Boxes—The mail box furnished with the standard finish is, for buildings of moderate size, the No. 1165 (see illustration) made of heavy cold rolled steel, duplex electrobronze plated, with solid bronze mouldings where the most wear comes.

No. 1165 is also furnished in solid bronze.

Stock boxes are recommended where it is necessary to have a low figure. Special and semispecial designs can also be furnished. In the semispecial designs stock models and patterns are used in combination with new details as may be necessary to complete a consistent design.

Installation

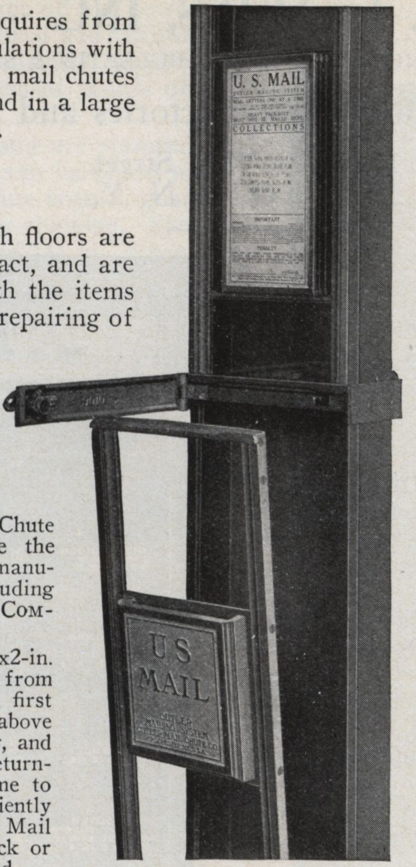
The Cutler Mail Chute Company erects its work complete, including steel angle supports, but *not* including openings through floors and the repairing and finishing of plaster and other materials coming in contact with the chute.



Model F
Full story

Continued on next page

The Post Office Department requires from us scrupulous observance of its regulations with regard to the installation and use of mail chutes in buildings, and we are under a bond in a large penal sum to secure such observance.


U. S. MAIL
COLLECTIONS
U S
MAIL

Detail of Model F Type
Unlocked, panels released, and lower panel removed

Specifications

Note: Rough openings through floors are not included in the mail chute contract, and are otherwise provided for together with the items of general cutting and patching and repairing of plaster.

When concrete construction is used, openings should be formed by setting centers or curb boxes (6x12 in.) when concrete is poured.

(1) **Mail Chute Equipment**—Mail Chute where indicated on drawings shall be the Cutler Mail Chute Equipment. To be manufactured and installed complete, including supports, by the Cutler Mail Chute Company, Rochester, N. Y., as follows:

(2) Supporting frame to be of 2x2-in. steel angles, securely fastened, extending from the floor or top of the mail box in the first (ground) story to a point 4 ft. 8 in. above the finished floor in the .... (top) story, and there finished by neatly mitering and returning the angle across the top. This frame to be plumb and flush in all stories, and sufficiently rigid to form a suitable support for the Mail Chute. Finish to be 2 coats of dead black or color to match elevator screen, as directed.

(3) Furnish and erect on the steel frame described above (one) Cutler Mail Chute, Model F, and (one) (special) U. S. Mail Box. The Mail Box to be located in the first (ground) story, and the Mail Chute, properly connected with and extending from the top of the Mail Box through .... stories and 4 ft. 7 in. into the .... (top) story, with openings for mail in each of these stories.

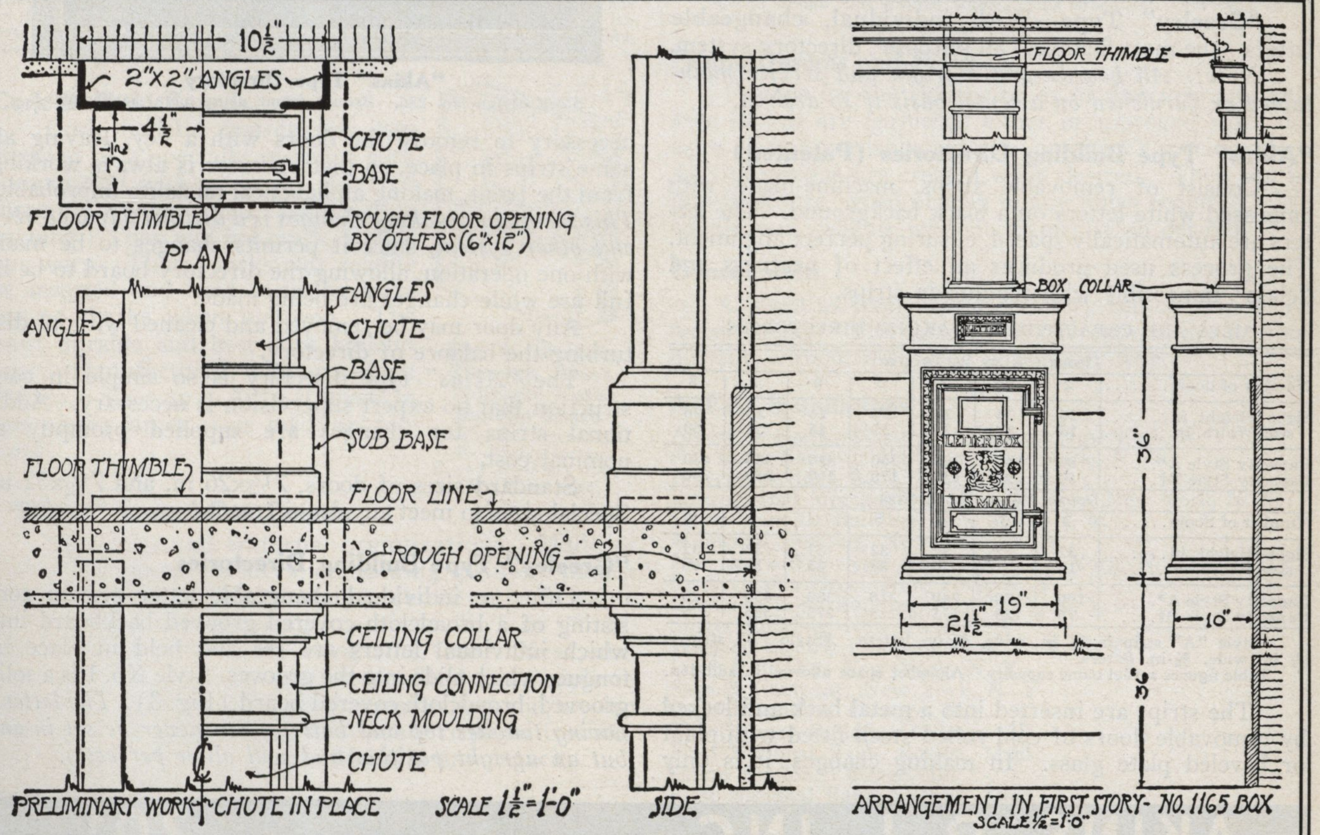
(4) Mail Chute to be constructed of No. 20 U. S. gauge cold rolled steel formed in channels with removable panels of plate glass, set in frames of bronze and secured in place by the standard Cutler U. S. Mail Chute locks with keys in the hands of the Post Office authorities.

(5) Mail Box to be of design No. 1165, 36x21½x11¼ in. over all, electrobronze plated, with mouldings of bronze. Finish of Mail Chute in all stories to be standard, steel chute channels in dead black baked enamel with fittings in bronze. All bronze surfaces to be finished slightly oxidized or statuary bronze color and lacquered.

(6) Work to be done to the satisfaction and acceptance of the architects, ...; in strict accordance with the regulations of the Post Office Department, and installed with the approval of the Postmaster of .... Any and all defects in workmanship or material developing within 1 year from date of completion, to be made good without charge.

Note: If bronze finish is desired in the first story, substitute the following paragraph for paragraph (5) above:

Mail Box to be of bronze from design No. 1165, ... Exposed parts of Mail Chute and supporting angles in first story to be of bronze, construction and finish of Mail Chute in upper stories to be standard, steel chute channels in dull black enamel with fittings in bronze. All bronze surfaces to be finished slightly oxidized or statuary bronze color and lacquered.


10½"
2"x2" ANGLES
4½"
3½"
CHUTE
BASE
FLOOR THIMBLE
ROUGH FLOOR OPENING BY OTHERS (6"x12")
PLAN
ANGLE
ANGLES
CHUTE
BASE
SUB BASE
FLOOR THIMBLE
FLOOR LINE
ROUGH OPENING
CEILING COLLAR
CEILING CONNECTION
NECK MOULDING
CHUTE
℄
PRELIMINARY WORK
CHUTE IN PLACE
SCALE 1½"=1'-0"
SIDE
FLOOR THIMBLE
BOX COLLAR
LETTERS
LETTER BOX
U.S.MAIL
36"
19"
21½"
10"
36"
ARRANGEMENT IN FIRST STORY- NO. 1165 BOX
SCALE ½"=1'-0"

General Installation Details of Cutler Mail Chute

B. L. AKINS, INC.

FORMERLY BUILDING DIRECTORIES, BULLETIN & SIGN CO., INC.

Manufacturers of Building Directories and Bulletin Boards

TELEPHONE
Bryant 2828-2829

118 West 43rd Street
NEW YORK, N. Y.

Products

Building Directories; "Miller" In-and-Out Boards; Cork Bulletin Boards; Announcement Boards; Key Cabinets.

Bronze Signs, Bronze Name Plates, Reflectolite Electric Signs, Architectural Bronze Letters.

A Multitude of Uses

Building Directories and Floor Directories—For office buildings, banks, hotels, clubs and fraternal organizations, department stores, hospitals, schools and colleges, business departments, post offices and other public buildings.

Bulletin and Announcement Boards—For railroad and steamship schedules, churches, theater ticket agencies, rosters, menus, programmes.

Statistical Boards—Sales record tabulations, factory production records, hospital and institutional census records, fire department calls, competitive records, stock quotations.

Club Boards—In-and-out, changeable letter bulletin board, and cork back for thumb-tack notices.

Types of Building Directories

"Akins" Type—With improved changeable name strips—the "scientific" directory board.

"Greeley" Type—With individual, changeable letters—the most flexible, "all purpose" directory system.

Note: All boards sold outright and service maintained or furnished on a rental basis if so desired.

"Akins" Type Building Directories (Patented)

Consist of removable strips, machine-made with embossed white letters on a black background. The letters are automatically spaced, ensuring perfect alignment. The process used produces an effect of neatness and "class" impossible with handmade strips.

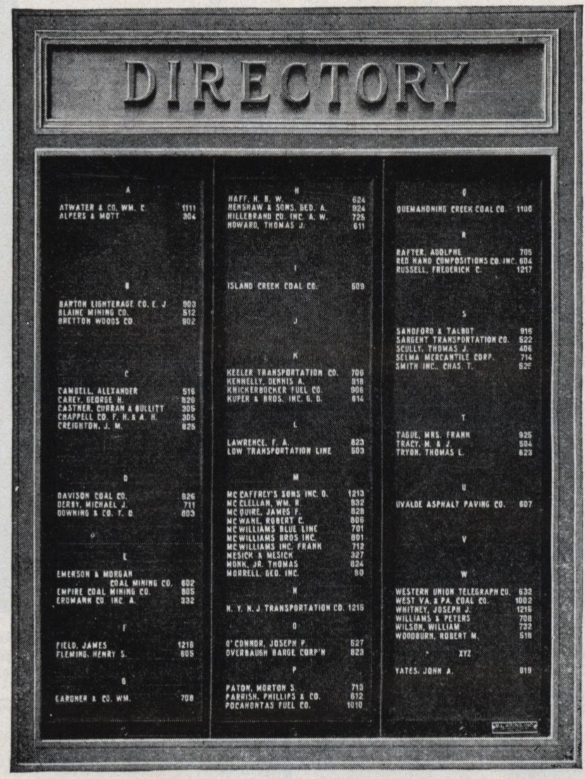
SIZES AND CAPACITIES OF "AKINS" DIRECTORIES

	Doors 7½ by 26 Inches						
Number of doors	2	3	4	5	6	7	8
Sight size Height, in.	26	26	26	26	26	26	26
Sight size Width, in.	15	22½	30	37½	45	52½	60
Capacity Style A*	80	140	200	260	320	380	440
Capacity Style B†	50	90	130	170	210	250	290
	Doors 7½ by 32 Inches						
Number of doors	2	3	4	5	6	7	8
Sight size Height, in.	32	32	32	32	32	32	32
Sight size Width, in.	15	22½	30	37½	45	52½	60
Capacity Style A*	100	170	240	310	380	450	520
Capacity Style B†	75	125	175	225	275	325	375

*Style "A" strip is ⅜ in. wide, ¼-in. letters. †Style "B" strip is $\frac{9}{16}$ in. wide, ⅜-in. letters.

Table figures actual name capacity. Alphabet space allowed in addition.

The strips are inserted into a metal back and locked by removable doors of cold rolled steel, fitted with plain or beveled plate glass. In making changes, it is only necessary to remove the doors with a key, leaving all name strips in place, so that operator is always working from the front, making alphabetical mistakes improbable. *This method of making changes is a distinct advance over any other system,* since it permits changes to be made with one operation, allowing the directory board to be in full use while changes are being made.



"Akins" Type Directory

Stock design No. 256. Bronze frame using metal backboards

Any door may be removed and cleaned without disturbing the balance of directory.

The *"Akins"* type directory is so simple in construction that no expert supervision is necessary. Additional strips for changes are supplied promptly at nominal cost.

Standard sizes of doors, 7½x26 in. and 7½x32 in. Special sizes to meet any requirements.

"Greeley" Type Building Directories

Offer an individual changeable letter system consisting of a broadcloth covered grooved backboard into which individual letters are set and held in place by tongues which slide into the grooves. Style No. 1 is a solid grooved, broadcloth covered board (Fig. 3). *The letters, having tongues top and bottom, can never be set in any but an upright position and will align perfectly.*

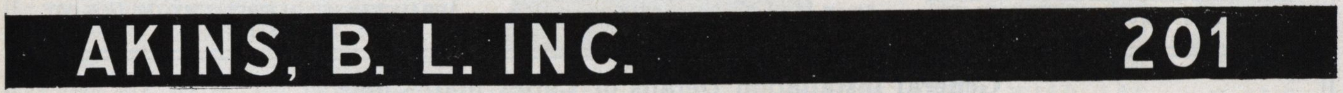


Fig. 2. Strip for "Akins" Directory, Style A, Exact Size

Continued on next page

Greeley type backboards are made of well seasoned kiln dried wood free from knots, ribbed and reinforced in an improved manner to prevent warping. Especially adapted for directory and announcement boards of all kinds.

The letters are convex faced and are stamped in one piece (including the tongues) from half-hard brass and covered with a special ivory white enamel, guaranteed against discoloration, cracking or chipping. Special colors to order. Sizes, ¼, ½, ¾, 1 and 1½ in. When arranged on a directory or bulletin board, these raised letters stand out with the clearness of an electric sign and present a most pleasing appearance. Samples on request.

The broadcloth used is of fine, durable quality, all wool; supplied in black, blue, green or special colors.

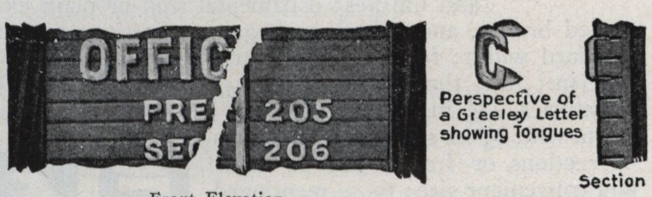

OFFIC
PRE
SEC
205
206
Perspective of a Greeley Letter showing Tongues
Section
Front Elevation

Fig. 3. Elevation and Section of Style No. 1 "Greeley" Directory Backboard

Sight size, in	Size of letters, in.	Capacity of names	Columns
*10x22	¼	40	1
	½	25	1
20x30	¼	75	2
	½	50	2
	¾	25	1
30x36	¼	200	4
	½	100	3
	¾	50	2
30x50	¼	300	4
	½	150	3
	¾	75	2
40x54	¼	400	5
	½	250	4
	¾	125	3
50x62	¼	600	6
	½	350	5
	¾	150	3

*No alphabet is allowed for this and smaller sizes.

In the 20x30-in. size, allowance has been made for title of building in ¾ or 1-in. letters. Size 30x36 in. includes space for title in 1-in. letters and full alphabet up to ¾-in. letters. The larger sizes provide for full alphabet in letters up to 1-in. and title of building in 1½-in. letters. Smaller size directories can be fitted in appropriate size letters, when required.

Cork Bulletin Boards

Cork bulletin boards are constructed of a specially resistant cork composition with a special veneered three-ply wood and composition backing. They will not crack, buckle nor warp. Thumb tacks may readily be inserted and hold securely, leaving no marks when removed. The most durable and best cork bulletin boards manufactured, with or without frames. Sizes up to 4x14 ft. made in one piece; larger sizes made in sections.

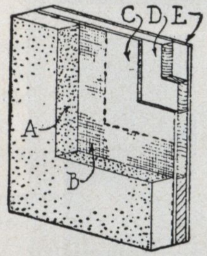


Fig. 4. Section Through Akins Multi-ply Cork Bulletin Board

A—Cork composition.
B—Burlap binder.
C and E—Fiber board.
D—Wood core

"Miller" In-and-Out Boards

For clubs and fraternal organizations. Made of individual metal holders containing printed names protected by celluloid strips (holders removable by special tool) showing members "in" or "out," letters, telephone calls, telegrams, etc. Neat and compact. Mechanically perfect, practical and simple in operation. Sold outright, service maintained and involve practically no upkeep cost. Wall space required for 500-name board, only 3½ sq. ft. Made in any capacity.

Key Cabinets

Made in any size for all types of keys to offices, apartments, rooms, etc. Hinged glass door is equipped with lock. Finished in walnut, oak or mahogany.

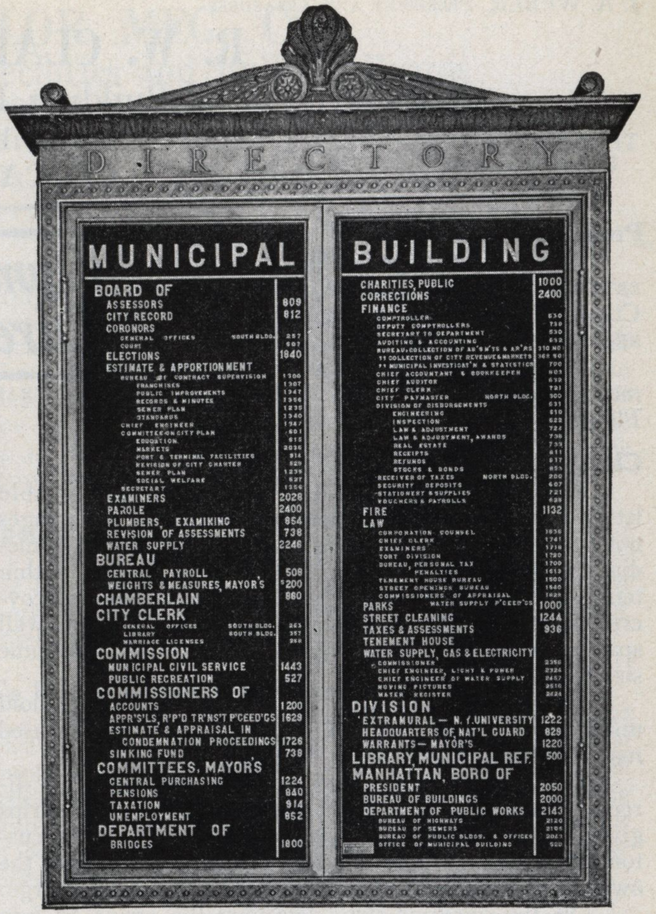

DIRECTORY
MUNICIPAL
BUILDING
BOARD OF
ASSESSORS 809
CITY RECORD 812
CORONORS
ELECTIONS 1840
ESTIMATE & APPORTIONMENT
EXAMINERS 2028
PAROLE 2400
PLUMBERS, EXAMINING 854
REVISION OF ASSESSMENTS 738
WATER SUPPLY 2246
BUREAU
CENTRAL PAYROLL 508
WEIGHTS & MEASURES, MAYOR'S 200
CHAMBERLAIN 860
CITY CLERK
COMMISSION
MUNICIPAL CIVIL SERVICE 1443
PUBLIC RECREATION 527
COMMISSIONERS OF
ACCOUNTS 1200
APPR'S'LS, R'P'D TR'NS'T P'CEED'GS 1629
ESTIMATE & APPRAISAL IN CONDEMNATION PROCEEDINGS 1726
SINKING FUND 738
COMMITTEES, MAYOR'S
CENTRAL PURCHASING 1224
PENSIONS 840
TAXATION 914
UNEMPLOYMENT 852
DEPARTMENT OF
BRIDGES 1800
CHARITIES, PUBLIC 1000
CORRECTIONS 2400
FINANCE
FIRE 1132
LAW
PARKS 1000
STREET CLEANING 1244
TAXES & ASSESSMENTS 936
TENEMENT HOUSE
WATER SUPPLY, GAS & ELECTRICITY
DIVISION
EXTRAMURAL — N. Y. UNIVERSITY 1222
HEADQUARTERS OF NAT'L GUARD 628
WARRANTS — MAYOR'S 1220
LIBRARY, MUNICIPAL REF. 500
MANHATTAN, BORO OF
PRESIDENT 2050
BUREAU OF BUILDINGS 2000
DEPARTMENT OF PUBLIC WORKS 2143

Fig. 7. "Greeley" Type Directory Installed in Municipal Building, New York, N. Y.

Special design cast bronze frame, using broadcloth covered grooved backboard No. 1

Frame Designs and Finishes

Frames for the various types of directory and bulletin boards are furnished either in approved stock designs or in accordance with the architect's specifications. Special designs are created when desired. They can be had in bronze, wood or iron in any finish required. We supply our systems without frames if so desired.

Consultation

Consult us freely about directory and bulletin board requirements. The services of our experts are at your disposal without obligating you in any way.

A Few Installations

American Railway Express Company, New York, N. Y.
American Radiator Building, New York, N. Y.
Bowery Savings Bank, New York, N. Y.
International Mercantile Marine Building, New York, N. Y.
Johns-Manville Building, New York, N. Y.
Municipal Building, New York, N. Y.
New York Telephone Company, New York, N. Y.
Pennsylvania Hotel, New York, N. Y.
Prudence Bond Building, New York, N. Y.
Singer Building, New York, N. Y.
Western Electric Company, New York, N. Y.
Lord & Taylor, New York, N. Y.
Saks & Company, New York, N. Y.
Capitol Building, Chicago, Ill.
The Strauss Building, Chicago, Ill.
First National Bank, Boston, Mass.
Union Station, Chicago, Ill.
First National Bank, Detroit, Mich.
Michigan-Lafayette Building, Detroit, Mich.
Pittsburgh Fire Department, Pittsburgh, Pa.
Statler Hotels
United Hotels

Our reputation for quality is known.

J. A. WEBER, PRESIDENT AND TREASURER
R. G. MOLITOR, VICE-PRESIDENT AND SECRETARY

R. W. CLARK MFG. CO.

Manufacturers of Building Directories and Bulletin Boards

TELEPHONE
RAVENSWOOD 4455

1774 Wilson Avenue
CHICAGO, ILL.

ESTABLISHED 1913

Own Your Directory
TRADE-MARK

Products

BUILDING DIRECTORIES: CLARK LIBERTY (CHANGEABLE LETTER) DIRECTORIES, CLARK CHANGEABLE GUMMED-STRIP DIRECTORIES.

Also Rosters, Bulletin and Announcement Boards, Desk and Teller Name Plates.

Clark Directories

The Clark Liberty Directory—This changeable letter directory gives the owner the following advantages not heretofore offered: little or no up-keep cost; immediate service to tenant—the name can be placed within ten minutes after tenant signs contract; letters and covered strips can be re-used; practically the same wall space is required as for the gummed-strip using the same size letter.

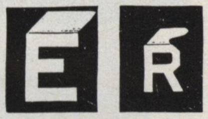
The letters are made of the best white celluloid under the Clark patent. With care they can be re-used many times and will serve for many years.

The Regular Gummed-strip Directory—This directory can also be supplied and a service on strips given. The service costs approximately 15% of the customary rental. We do not rent directories, but save the owner this difference—about 85% of such rental charge.

On the gummed-strip directory the strips fit into a groove and are held in position with a felt covered back, making insertion of new strips a very simple matter.

Styles and Sizes

This company is equipped to furnish directories and boards in all sizes, styles and finishes: ornamental iron or plain extruded bronze, and oak or mahogany. Sections are of standard width: for changeable strip (gummed letters) 7½ in.; for the Clark Liberty (changeable letter) directories, 7½ in. when ¼-in. size letters are used and 12 in. with ⅜-in. size letter. Heights of sections or frames can be made any convenient size; those mentioned in tables below are standard. These directories also made with 15-in. wide sections for ½-in. letters.

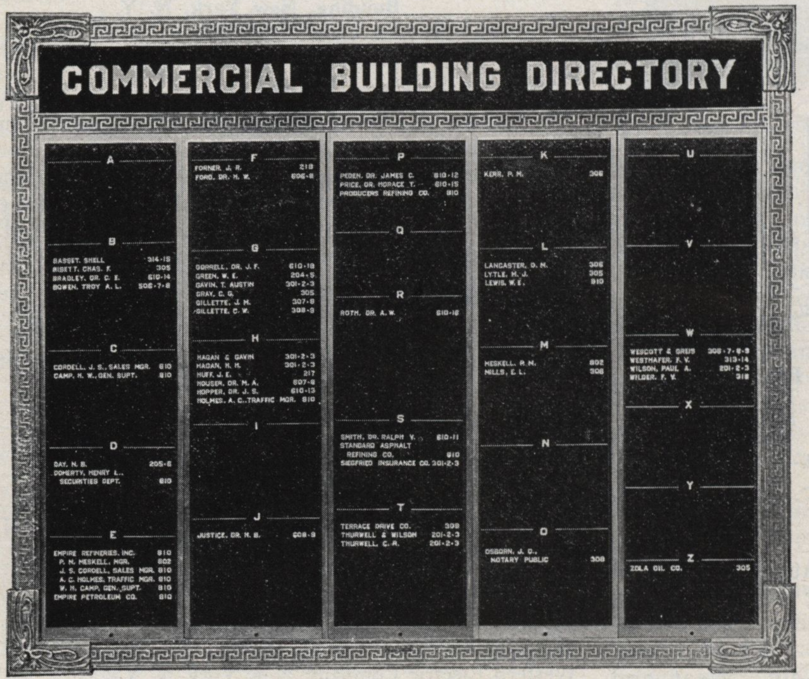


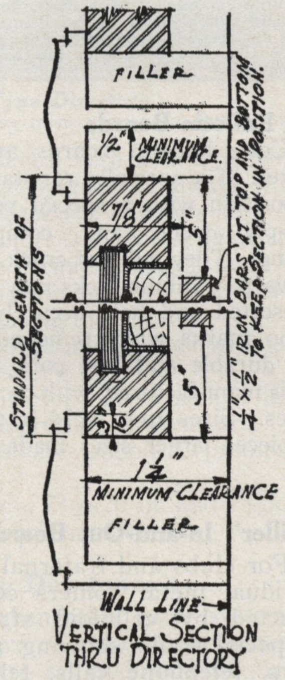
LETTER STYLES
Pat. Dec. 12, 1916

Estimates

For all ordinary buildings two names to the room will be the approximate capacity of directory required. In the case of special buildings, more or less, according to purpose of the building.

In writing for estimates, state total number of names board must hold; material; style; finish; and, particularly, available wall space.


COMMERCIAL BUILDING DIRECTORY
A
B
BASSET, SHELL 314-15
RISETT, CHAS. F. 305
BRADLEY, DR. C. E. 610-14
BOWEN, TROY A. L. 506-7-8
C
CORDELL, J. S., SALES MGR. 810
CAMP, H. W., GEN. SUPT. 810
D
DAY, N. B. 205-6
DOHERTY, HENRY L., SECURITIES DEPT. 810
E
EMPIRE REFINERIES, INC. 810
P. M. MESKELL, MGR. 802
J. S. CORDELL, SALES MGR. 810
A. C. HOLMES, TRAFFIC MGR. 810
W. H. CAMP, GEN. SUPT. 810
EMPIRE PETROLEUM CO. 810
F
FORNER, J. R. 218
FORD, DR. H. W. 606-8
G
GORRELL, DR. J. F. 610-18
GREEN, W. E. 204-5
GAVIN, T. AUSTIN 301-2-3
GRAY, C. G. 305
GILLETTE, J. M. 307-8
GILLETTE, C. W. 308-9
H
HAGAN & GAVIN 301-2-3
HAGAN, H. H. 301-2-3
HUFF, J. E. 217
HOUSER, DR. M. A. 607-8
HOPPER, DR. J. S. 610-13
HOLMES, A. C., TRAFFIC MGR. 810
I
J
JUSTICE, DR. H. B. 608-9
P
PEDEN, DR. JAMES C. 610-12
PRICE, DR. HORACE T. 610-15
PRODUCERS REFINING CO. 810
Q
R
ROTH, DR. A. W. 610-16
S
SMITH, DR. RALPH V. 610-11
STANDARD ASPHALT REFINING CO. 810
SIEGFRIED INSURANCE CO. 301-2-3
T
TERRACE DRIVE CO. 308
THURWELL & WILSON 201-2-3
THURWELL, C. R. 201-2-3
K
KERR, P. M. 306
L
LANCASTER, D. M. 306
LYTLE, M. J. 305
LEWIS, W. E. 810
M
MESKELL, P. M. 802
MILLS, E. L. 308
N
O
OSBORN, J. D., NOTARY PUBLIC 308
U
V
W
WESCOTT & GREUS 306-7-8-9
WESTHAFER, F. V. 313-14
WILSON, PAUL A. 201-2-3
WILDER, F. V. 318
X
Y
Z
ZOLA OIL CO. 305


FILLER
½" MINIMUM CLEARANCE.
⅞"
5"
5"
3/16
1¼"
MINIMUM CLEARANCE
FILLER
STANDARD LENGTH OF SECTIONS
¼" × ½" IRON BARS AT TOP AND BOTTOM TO KEEP SECTION IN POSITION.
WALL LINE
VERTICAL SECTION THRU DIRECTORY

CLARK OFFICE BUILDING DIRECTORY AND DETAILS OF CONSTRUCTION

CLARK LIBERTY (CHANGEABLE LETTER)
Vertical sight opening of frame 30⅝ in.

Number of sections	1	2	3	4	5	6	Double 4
Height of directory, in.	38	38	38	38	38	38	63
Width of directory, in.	15	27	39	51	63	75	51
Strip capacity	50	100	150	200	250	300	400

CLARK GUMMED STRIP
Vertical sight opening of frame 26 in.

Number of sections	2	3	4	5	6	7	8
Height of directory, in.	34	34	34	34	34	34	34
Width of directory, in.	18	25½	33	40½	48	55½	63
Strip capacity	130	195	260	325	390	455	520

Total strip capacity mentioned. Deduct 26 for name capacity where alphabet strips are wanted. Any size can be built. Clark Liberty Directory 7½-in. section—size same as Gummed Strip; capacity per section 50.

DAVENPORT-TAYLOR MFG. CO.

Manufacturers of Building Directories and Bulletin Boards

GENERAL OFFICE
412 Orleans Street
CHICAGO, ILL.

TELEPHONE
Franklin 4134, 4135

BRANCH OFFICES

NEW YORK, N. Y., 101 West 42nd Street
Telephone, Bryant 7999

SAN FRANCISCO, CAL., 693 Mission Street
Telephone, Kearney 5460

BOSTON, MASS., 318 Little Building—Telephone, Beach 2584
AGENCIES IN ALL PRINCIPAL CITIES

Products

Davenport-Taylor Alphabetical and Changeable Building Directories for every type of building. Also "In and Out" Directories for clubs.

Quality

The name Davenport-Taylor stands for the highest quality of design, workmanship, and service. A complete organization and twenty years' experience assures the maintenance of the Davenport-Taylor quality of work and prompt and satisfactory completion of contracts.

Sold Outright

Davenport-Taylor Directories are sold outright, doing away with the old-fashion system of yearly rent so distasteful to the owner.

Service

When a Davenport-Taylor Directory is received at a building it contains all the names of tenants who have already signed leases for office space. This detail is arranged by the company through the owner or renting agent. *Subsequent* name strips are furnished by the company as needed or the owner can purchase supplies and letter the names.

Construction

Full size detail will be furnished on request. Frames are cast bronze, drawn bronze, iron, steel, metal covered wood or wood in any finish. Heading may be in cast letters or white letters on a black card. Removable sections or units to hold the names are provided in numbers sufficient to accommodate the names required. Units or sections are fitted with plain or beveled plate glass to protect the names. Names are lettered with our die-cut white paper letters on black cards which slide up or down in the holder to permit insertion of new strips in alphabetical order.

Special Designs

We are equipped to complete special designs requiring the greatest skill. Our workmen are aritsts in the work. We also supply our system for frames made by others according to our details.

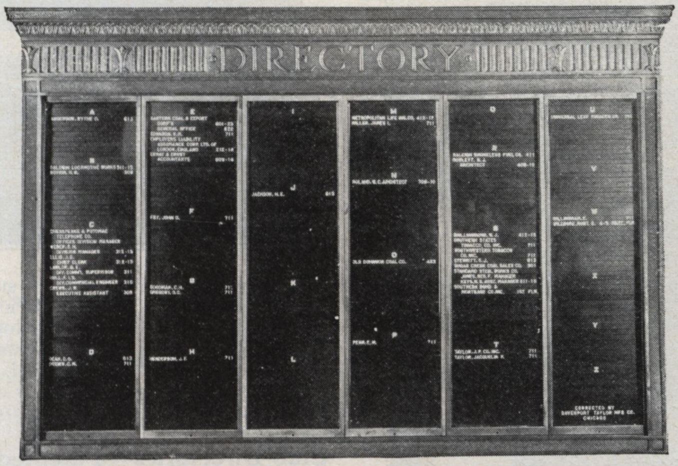
To Figure Capacity and Size

The capacity should be figured on a basis of at least two names to each individual office to insure against future renting arrangements. Reference to the detailed schedule shows the approximate over-all size, varying with the design. If no wall space is available, single or double face directories on standards should be provided.

STEEL FRAME AND UNITS, "D & T" DIRECTORIES

Number of names	Number of units	Size of units, in.	Sight opening of frame, in.	Outside size stock frames, in.
50	2	7½x26⅜	14⅞x26	18½x34½
100	3	7½x26⅜	22⅜x26	25½x34½
150	3	7½x32⅞	22⅜x32½	25½x41
	4	7½x26⅜	29⅞x26	33 x34½
200	4	7½x32⅞	29⅞x32½	33 x41
	5	7½x26⅜	37⅜x26	40½x34½
250	5	7½x32⅞	37⅜x32½	40½x41
	6	7½x26⅜	44⅞x26	48 x34
300	6	7½x32⅞	44⅞x32½	48 x41
	7	7½x26⅜	52⅜x26	55½x34½
400	7	7½x32⅞	52⅜x32½	55½x41
	9	7½x26⅜	67⅜x26	70½x34½
500	8	7½x32⅞	59⅞x32½	63 x41

Installed in
Richmond Trust Building
Richmond, Va.



Starrett & Van Vleck
Architects
New York, N. Y.

Cast Bronze Directory, Capacity 250 Names

MAXWELL, H.R. & CO. 360

Name Strip "D & T" Building Directory
Actual size of letters used; strip is 7x⅜-in.

HAMILTON & CORD CO.

Individual Bronze Name Plate Directories and Special Bulletin Boards

4753 Broadway
CHICAGO, ILL.

Products

H & C Patented Bronze Name Plate Directories, wall and free-standing styles.

H & C Club Directories with patented all-bronze "In and Out" indicating system.

Artistically designed H & C Bulletin Boards, with individual cast aluminum letters, faced with white enamel.

Also manufacturers of H & C Memorial Tablets with interchangeable bronze name plates or cast solid; H & C Bronze Desk and Wicket Signs; Cast Bronze Signs and Specialties.

Directories

Advantages—Own your own directory—why rent permanent equipment?

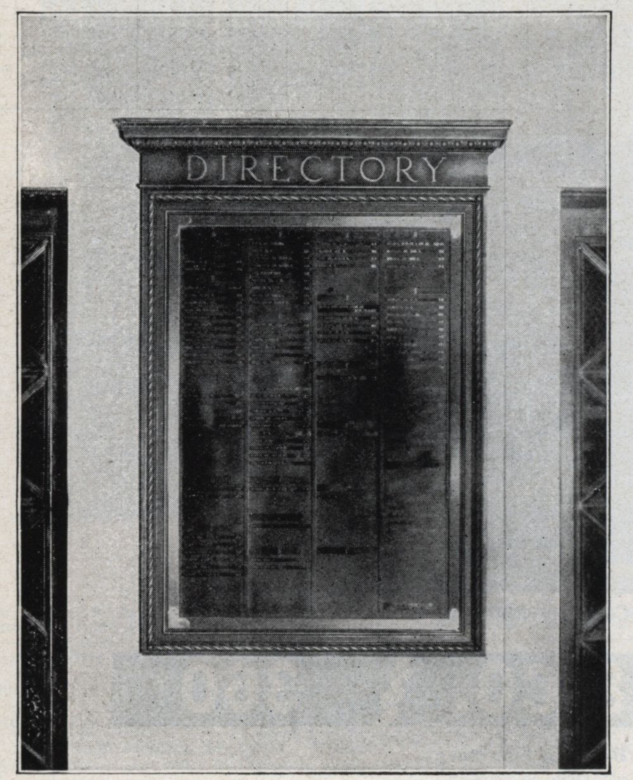
The only expense of maintenance is name plates required. No blank strips used. Plates are installed instantly, eliminating outside service. All plates ordered by mail receive two-day service.

Name plates are embossed on metal by machinery, insuring perfect spacing and alignment, allowing greater capacity in a given area.

The beauty and dignity of an H & C Bronze Directory—eliminating unnecessary contrast of black and white paper strips—make it a permanent asset to the high grade building.

Patented System—The backboard is one piece of bronze. ½-in. bronze vertical retaining strips (invisibly attached on face of backboard) are placed to receive standard 4, 6½ and 8½-in. length name plates.

Name plates are installed instantly from the front without necessity of removing or handling any part of the system. Plates of ⅜-in. width, or multiples thereof, can be placed anywhere in any combination and remain in place without use of blank strips. Door is plate glass set in 1-in. bronze frame of special construction equipped with concealed pivot hinges and lock.



Frame Designs—Catalogue sent on request.

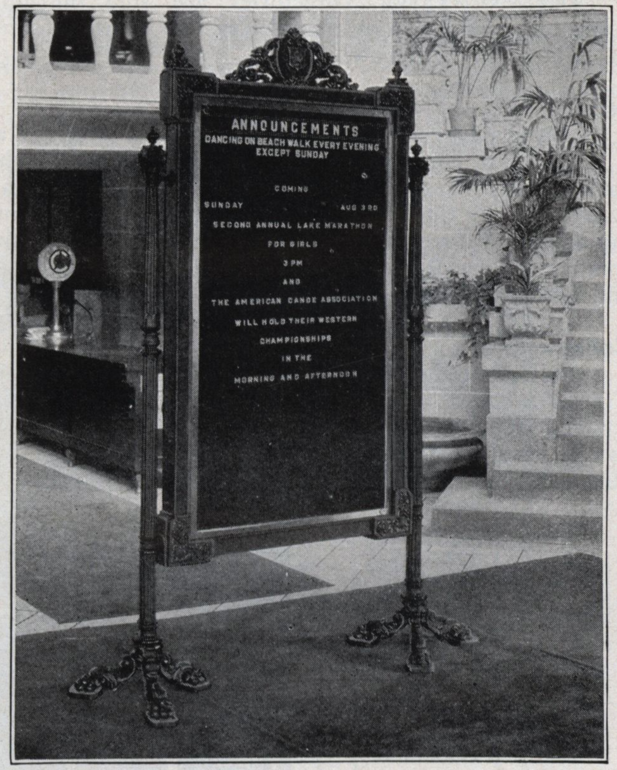
Our stock design No. 3 (Fig. 2 on following page) in bronze, forms the base for other stock designs by applying cast bronze ornamentation in recessed channel. Permits special ornamentation to architect's design at small pattern expense. Corner ornaments optional.

Other stock designs in iron, kalamein and wood; also free standing styles with single pedestal or standards.

Special designs in frames executed from architect's drawings or will submit sketches and suggestion if desired.

Bulletin Boards

We specialize in designing bulletin boards suitable for the finest hotels, clubs, universities, banks, churches, etc. (See example below.)



Suggestions and sketches submitted on request. Wall and single pedestal styles also furnished in bronze, kalamein, iron and wood in any finish. Catalogue on request.

Equipped with either standard ¼-in. grooved, felt covered or cork composition backboard. Color as desired.

We recommend use of our cast aluminum raised letter with white enamel face. Other kinds of letters, if desired.

Club Directories—Patented "In and Out" System

For clubs we have designed and patented an extremely practical "In and Out" indicating system for use with our bronze name plate directories, containing membership list in club entrance.

This system enables the door attendant to register instantly members entering or leaving the club, and is far superior to the old "hole and peg" or "printed list and tack" methods of control.

Continued on next page

Standard Directory Sizes and Measurements

The following tables show actual measurements necessary for various capacities, based on standard ⅜x6½-in. name plates. Note cross section (Fig. 1) showing point where backboard measurement is taken. Over-all measurements based on stock design No. 3 frame, illustrated in Figs. 1 and 2. From these measurements, capacity possible in any given area may be determined.

Capacity of ⅜x6½ in. plates	Overall measurement, width–height	Backboard measurement, width–height	No. of rows	Plates per row
Sizes in One Panel with One Door, in.				
50	19⅞ x 16⅜	13⅞ x 10⅜	2	25
100	19⅞ x 25¾	13⅞ x 19¾	2	50
150	26⅝ x 25¾	20⅝ x 19¾	3	50
200	33¼ x 25¾	27¼ x 19¾	4	50
250	40 x 25¾	34 x 19¾	5	50
300	40 x 29½	34 x 23¼	5	60
400	40 x 37½	34 x 31½	5	80
500	46⅝ x 39	40⅝ x 33	6	85
600	46⅝ x 44½	40⅝ x 38½	6	100
700	53½ x 44½	47½ x 38½	7	100
Sizes in Two Panels with Two Doors, in. (Backboard measurements given for one panel only)				
800	61¾ x 44½	27¼ x 38½	8	100
900	61¾ x 50	27¼ x 44	8	115
1000	75¼ x 44½	34 x 38½	10	100
1100	75¼ x 49	34 x 43	10	110
1200	75¼ x 52	34 x 46	10	120
1300	75¼ x 57	34 x 51	10	130
1400	88½ x 52	40⅝ x 46	12	120
1500	88½ x 52	40⅝ x 48	12	125
2000	88½ x 68⅞	40⅝ x 62⅞	12	165

Special Directory Sizes and Measurements

To obtain measurements in other proportions on any capacity, take width measurements shown opposite number of rows desired and height measurements opposite desired plates per row.

For Example: 500 capacity in 5 rows of 100 plates each; 40 in. wide x 44½ in. high over all. If 8½-in. plates are to be used add to width measurements 2 in. for each row. If 4-in. plates are to be used deduct from width measurements 2½ in. for each row.

Note that measurements given in table for capacity of 500 ⅜x6½-in. plates would be just the same for a capacity of 250 ¾x6½-in. plates. However, if directory is made to accommodate plates of 6½-in. length, plates of that length, but of either ⅜, ¾ or 1½-in. width, may be used in any combination.

Construction Detail

H & C Directory is all-bronze, except felt dust pad and plate glass in door. Bronze door is equipped with our specially designed invisible pivot type hinge. See clean straight lines of door frame shown in Fig. 2.

Cross section (Fig. 1) shows simplicity construction. Stock design bronze frame 3 in. over all, 2½-in. face width. Note recessed channel designed to receive cast bronze ornamental panels. Depth of frame 2 in. can be cut to 1⅝ in.

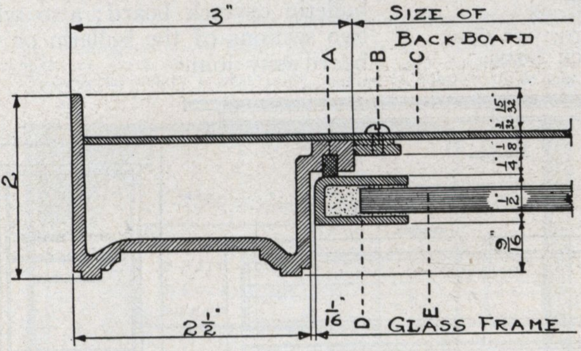

3"
SIZE OF
BACK BOARD
A
B
C
2"
2½"
1/16"
D
E
GLASS FRAME

Fig. 1

"A" is felt dust pad. "B" is patented ½-in. bronze retaining strips ⅛ in. thick with invisible vertical shoulder grooves and transverse grooves ⅜ in. apart to receive tongues on name plates. See Fig. 2. Retaining strips may be placed in any position on backboard permitting system to be paneled in any desired size. "C" is solid bronze backboard 3/32 in. thick. Note in tables above backboard measurements are taken from the outside of extreme right and left retaining strips. "D" is 1-in. bronze door frame. "E" is ¼-in. polished plate glass.

Note: Vertical retaining strips are exactly ½ in. wide. Actual clearance between retaining strips is 5/16 in. less than the name plate lengths shown in table

Individual Embossed Bronze Name Plates

Method of Installation—Illustration below with phantom view of invisible grooves in the vertical retaining strip, shows proper method of installing name plates.

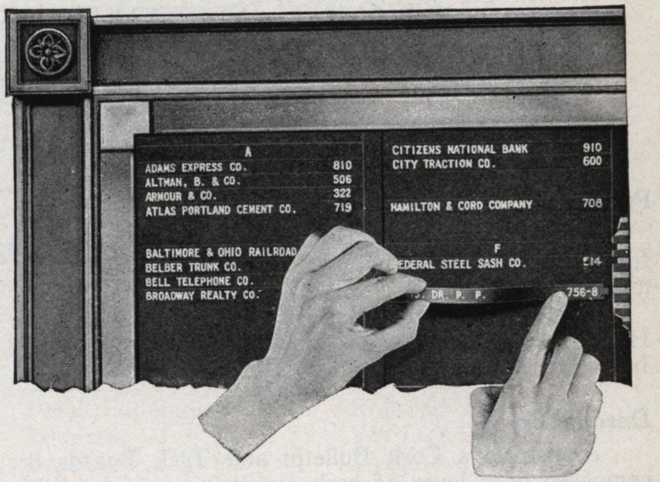
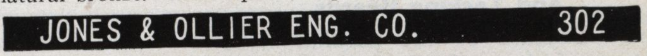

A
ADAMS EXPRESS CO. 810
ALTMAN, B. & CO. 506
ARMOUR & CO. 322
ATLAS PORTLAND CEMENT CO. 719
BALTIMORE & OHIO RAILROAD
BELBER TRUNK CO.
BELL TELEPHONE CO.
BROADWAY REALTY CO.
CITIZENS NATIONAL BANK 910
CITY TRACTION CO. 600
HAMILTON & CORD COMPANY 708
F
FEDERAL STEEL SASH CO. 514
DR. P. P. 756-8

Fig. 2

Insert either end of plate in position desired and flex center of plate outward sufficiently to allow the other end to spring into opposite groove when released.

Finish of Name Plates—These flexible bronze metal name plates have background finished dark statuary to match backboard. The faces of the raised letters are highly polished natural bronze. Entire plate lacquered.


JONES & OLLIER ENG. CO. 302

Style "A"—1 Line, ¼-in. Letters

SCOTT - BANCROFT - MARTIN
INSURANCE 412

Style "B"—2 Lines, ¼-in. Letters

SEARS IRON CO. 510

Style "C"—1 Line, ½-in. Letters

DULGARIAN & CASE
ARCHITECTS
ENGINEERS
724

Style "D"—1 Line, ½-in. and 2 Lines, ¼-in. Letters

LONGACRE, GEO. B.
REAL ESTATE 601

Style "E"—2 Lines, ½-in. Letters

Name Plate Styles and Sizes

Styles	Size, in.		
"A"	⅜ x 4	⅜ x 6½	⅜ x 8½
"B"-"C"	¾ x 4	¾ x 6½	¾ x 8½
"D"-"E"	1½ x 4	1½ x 6½	1½ x 8½

PLATE CAPACITIES

Plates Size, in.	Letters		Plates Size, in.	Letters	
	Number per line	Size, in.		Number per line	Size, in.
4	20	¼	6½	18	½
4	10	½	8½	44	¼
6½	34	¼	8½	22	½

HAMILTON & CORD CO. 1407

Embossed Bronze Name Plate, ⅜x6½ in., with 34-letter Capacity

ARMSTRONG CORK COMPANY

Manufacturers of Cork Bulletin and Tack Boards

125 Twenty-third Street
PITTSBURGH, PA.

BRANCHES

BOSTON, MASS., 84 North Street, Station 16
BALTIMORE, MD., 21 South Charles Street
CINCINNATI, OHIO, 1017 Broadway
PHILADELPHIA, PA., 408 North Third Street
CHICAGO, ILL., 320 West Randolph Street
ST. LOUIS, MO., 204 South Third Street
NEW YORK, N. Y., 50 Church Street

Product

Armstrong's Cork Bulletin and Tack Boards for schools, colleges, hotels, lodge rooms, offices, factories, etc.

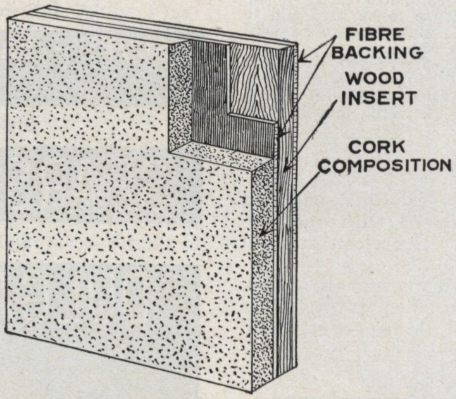
For Linotile and Cork Tile, see pages 560-561; for House Insulation, see pages 1350-1351; for Cold Storage Insulation and Pipe Coverings, see pages 2354-2355.

Description

Armstrong's Cork Bulletin and Tack Boards are composed of a layer of cork composition, ¼-in. thick, cemented securely to a backing of ¼-in., 3-ply wood insert compo board. The finished boards will not warp, curl, nor buckle, and meet every requirement fully.

Particular Advantages of Armstrong's Cork Bulletin and Tacking Boards

Because of the peculiar texture of the cork composition used in their construction, Armstrong's Bulletin and Tack Boards are far more satisfactory than wooden ones. Thumbtacks can be pushed easily into the cork. They are held securely and can be removed readily without the use of a tack puller or knife, and without damage to the finger nails. Furthermore, due to the resiliency of the cork, the tendency of the tack holes is to close up gradually. Hence, Armstrong's Cork Bulletin and Tack Boards are not marred by unsightly splinters and retain a much smoother surface than wooden ones. When soiled, the boards can be easily cleaned with soap and water.



Sectional View, Armstrong's Cork Bulletin and Tack Board

Sizes

Standard panels, 4x 6 ft.x½ in. thick. Boards or strips of smaller sizes can be easily sawed on the job from standard panels, or will be supplied by the factory. Larger sizes are furnished in sections.

Installation

Can be easily installed by any carpenter. For directions and proper provisions for installing, see specifications following.

Specifications

The following paragraphs should be included in the carpentry section of the general specifications:

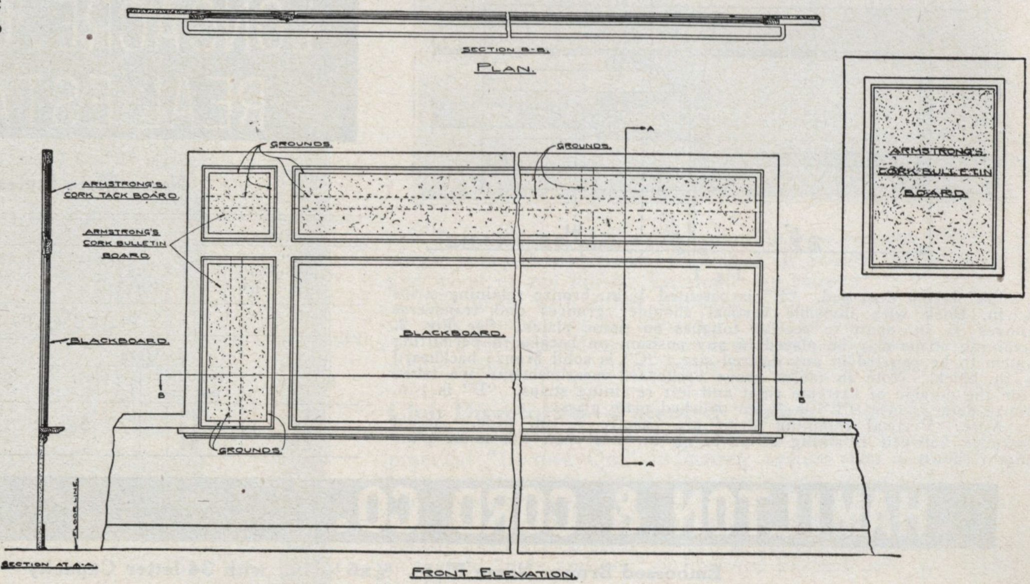
Cork Bulletin (Tacking or Exhibition) Boards—Provide and install Armstrong's Cork Bulletin [Tacking] [Exhibition] Boards where indicated on the drawings or herein specified. (State here where they are required and sizes.)

All tacking spaces of bulletin or tacking boards shall be "Armstrong's" Cork Bulletin Board material as made by the Armstrong Cork Company, Pittsburgh, Pa. (This material to be ½ in. thick consisting of one ¼-in. thick layer of cork composition reinforced with burlap and securely cemented to a 3-ply backing of compo board with wood core.)

All frames to be of same finish and material to match trim and to have loose cover mould as detailed around all cork bulletin boards. All cork bulletin board to be securely nailed along all edges before placing cover mould in position.

Grounds—(Paragraph to be included under "Grounds" in Carpentry).

Set 2-in.x⅞-in. thick (thickness will depend on adjoining trim, etc.) wood grounds to receive Armstrong's Cork Bulletin Boards and Tack Boards when these are called for on drawings, or specified. All grounds shall be set straight and leveled for all edges and in the middle, running the long way of each bulletin or tack board; also where two sections of the bulletin or tack board may join.



Method of Installing Armstrong's Cork Bulletin Board

THE BLASTEEL MANUFACTURING COMPANY

Blasteel Metalback Composition Cushion Tack Strip

GENERAL OFFICE
KANSAS CITY, MO.
REPRESENTATIVES IN PRINCIPAL CITIES

For Concrete Floor Devices, see page 74

BLASTEEL
TRADE-MARK

Blasteel Metalback Cushion Cork Tack Strip and Bulletin Board

Made of cushion cork, scientifically attached to metal backing. No paper, fiber, felt or wood strips between the cushion cork and the metal to split apart or come loose.

Practical, Durable, Non-warping—Being backed by steel, they will not warp from damp atmosphere or exposure and when properly installed they will not buckle or bulge.

Thumb tacks are easily inserted in the cushion cork and hold display examples, mechanical drawings and kindred subjects securely. The tacks are easily removed and perforations immediately close, due to the resiliency of the cork composition.

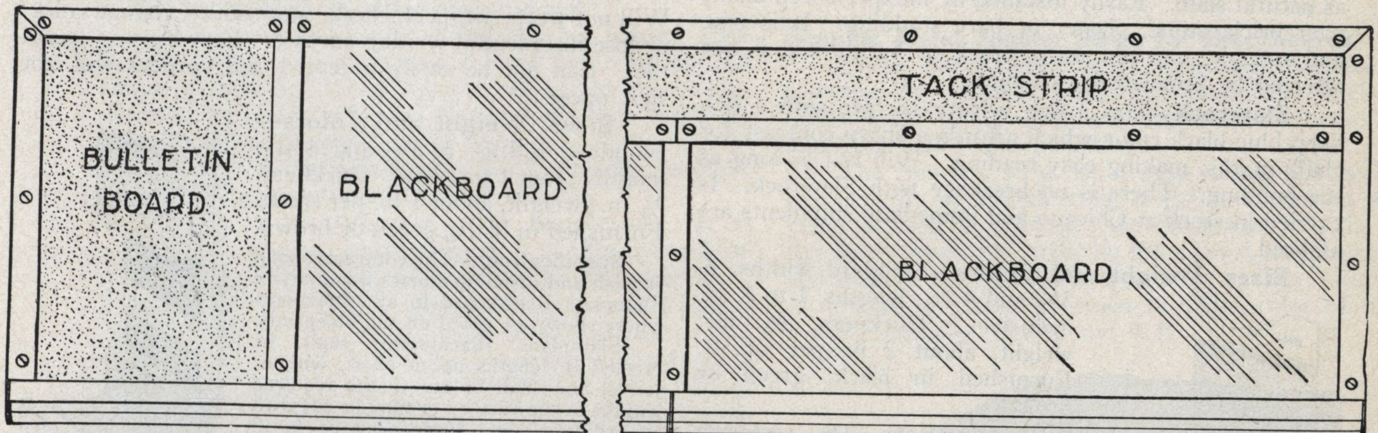
Uses of Bulletin Boards—For all places where display notices are to be posted such as:

- Schools
- Churches
- Colleges
- Public buildings
- Libraries
- Department stores
- Offices
- Stores
- Factories
- Railroad stations
- Yard offices
- Lodgerooms

Note: Blasteel Metalback Bulletin Boards can be installed, glass enclosed with hinged door, for use in corridors, entrances, elevator landings and public buildings.

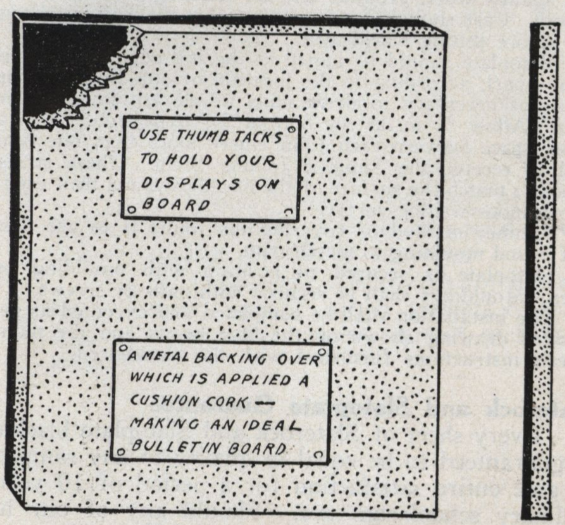
Samples and Prices—Blasteel Metalback Bulletin Board and Tack Strips are furnished $\frac{5}{16}$-in. thick and can be cut to any desired size.

Samples and prices submitted on request.


BULLETIN BOARD
BLACKBOARD
TACK STRIP
BLACKBOARD

Two Methods of Mounting Blasteel Metalback Tack Strips with Blackboards

The illustrations above show two methods of mounting Blasteel Metalback Tack Strip with blackboards. Being substantially same thickness as blackboard no extra filling necessary to bring both materials to an even surface; therefore, no special detail in blackboard trim required. The material makes a neat joint, making it possible to fit any spaces desired


USE THUMB TACKS TO HOLD YOUR DISPLAYS ON BOARD
A METAL BACKING OVER WHICH IS APPLIED A CUSHION CORK — MAKING AN IDEAL BULLETIN BOARD

Unframed Bulletin Board
(Patented May 20, 1924)
$\frac{5}{16}$ in. thick. Cut to any size

BLASTEEL
METAL BACK-CUSHION CORK
BULLETIN BOARDS

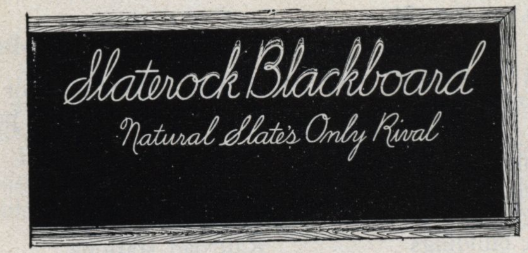
Framed Bulletin Boards

BECKLEY-CARDY COMPANY

Manufacturers of Blackboards, Window Shades and School Supplies

17-21 East Twenty-third Street
CHICAGO, ILL.

Slaterock Blackboard

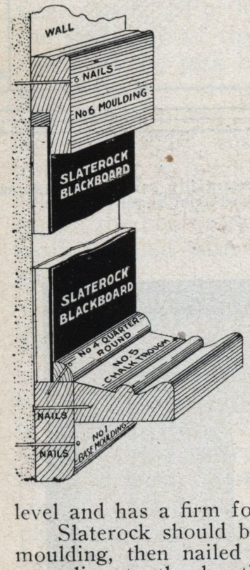


Consists of a core of pure gypsum rock compressed between two sheets of tough mineralized fiber boards. Hard, velvety writing surface of dull black color uniform throughout surface of the board. Long wearing and easy writing; does not reflect light and contains a sufficient amount of grit to insure rapid legible writing.

Weighs about one-third and costs one-half as much as natural slate. Easily installed by inexperienced labor, over brick, stone, plaster or bare studding. It is true and straight, can not warp, crack or buckle and is not affected by atmospheric changes.

Slaterock—Has a fine velvety surface with a rich deep blue-black color which affords a sharp contrast for chalk marks, making easy reading. Will last as long as the building. There is no breakage with Slaterock. Is carried in stock at Chicago and immediate shipments are assured.

Sizes, Weight and Colors—Standard widths, 3, 3½ and 4 ft.; lengths, 1 to 8 ft., inclusive. Thickness, ⅜ in.; weight, about 2 lb. per sq. ft. Furnished in black, green or brown.



Specifications—The contractor shall furnish and install genuine trade-marked Slaterock Blackboard in all classrooms where shown or noted on blueprints.

Slaterock Blackboard shall be erected in lengths up to 8 ft. without joints and shall be cut to the required lengths at the factory or may be cut with an ordinary saw. For spaces up to 8 ft. use one piece; over 8 ft. and up to 16 ft., 2 pieces; over 16 ft. and up to 24 ft., 3 pieces, etc.

All blackboards shall be set in position against wood grounds and all abutting edges shall be cut smooth. Care should be taken to see that the wall back of all joints is perfectly level and has a firm foundation.

Slaterock should be set in position on lower chalk trough moulding, then nailed at the top edge 24 in. to 36 in. apart according to the location of studding or grounds. It is not necessary to drive nails at the bottom edge or at the sides.

Allow ¼ in. at top of board for slight expansion. Also allow ¼ in. space between each joint where more than one board is used to receive the Simplex Joining Strip. These strips are coated to match the surface of the blackboard and their use forms a continuous writing surface.

Slaterock is secured in position with mouldings on all sides. Mouldings shall be secured with nails or screws.

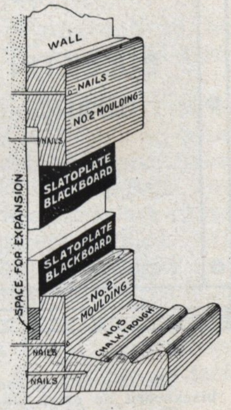
The installation shall be completed and executed as per the detailed drawing shown on blueprints and the manufacturer's instructions furnished with the blackboard.

Slatoplate Blackboard

Slatoplate
The Perfect Blackboard

A wood pulp composition blackboard—less expensive than Slaterock. Made of new, pure wood fibers, hardened and toughened by special processes, kiln dried, waterproofed and surface filled. Stiffer, harder and stronger than most composition blackboards. Writing surface is hard, close grained, uniform in color and has enough bite to cut crayon noiselessly. Makes clear, legible mark.

Applied over brick, stone, plaster or bare studding. Will not warp, pit, peel, check, wear shiny, change color, or lose its splendid writing surface. Easy erasing qualities. Can not be easily indented and corners will not split open.



Sizes, Weight and Colors—Standard widths, 3, 3½ and 4 ft.; lengths from 1 to 12 ft. Thickness, ¼ in.; weight, about 1 lb. per sq. ft. Furnished in black, green or brown.

Specifications—The contractor shall furnish and install genuine trade-marked Slatoplate Blackboard in all classrooms where shown or noted on the blueprints.

Slatoplate Blackboard shall be erected in lengths up to 12 ft. without joints, and shall be cut to the required lengths at the factory or may be cut with an ordinary saw. For spaces up to 12 ft. 1 piece is used; over 12 ft. and up to 24 ft., 2 pieces; 24 ft. and up to 36 ft., 3 pieces, etc.

All blackboards shall be set in position against wood grounds and all abutting edges shall be cut smooth. Care should be taken to see that the wall is thoroughly dry before setting blackboard.

Slatoplate should be nailed at the top edge about 24 in. to 36 in. apart, according to the location of studding or grounds. It is not necessary to drive nails at the bottom edge or the sides. Allow ⅜ in. at the bottom for expansion. Also allow ¼ in. space between each joint where more than one board is used to receive the Simplex Joining Strip. These strips are coated to match the surface of the blackboard and their use forms a continuous writing surface.

Another method of covering the joints is to use ¼x1 in. half round moulding to match trim.

Slatoplate is secured in position with moulding on all sides. Mouldings shall be secured with nails or screws.

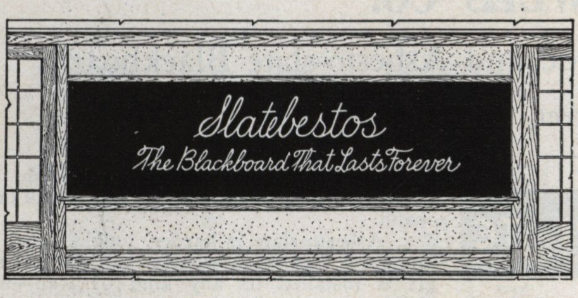
The installation shall be completed and executed as per the detailed drawing shown on the blue prints and the manufacturer's instructions furnished with the blackboard.

Slaterock and Slatoplate Guarantee

Every sheet of Slaterock and Slatoplate blackboard is guaranteed to be equal in quality to any sample and to give entire satisfaction for a period of 10 years of ordinary schoolroom use. Should any of our blackboards be found lacking in any respect, we agree to replace it free of all charges. Samples on request.

Continued on next page

Slatebestos Blackboard

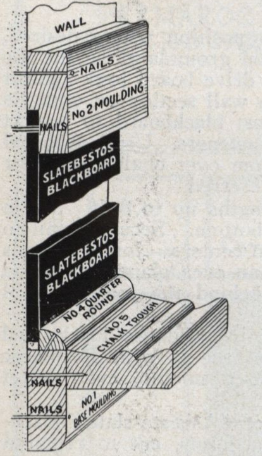

Slatebestos
The Blackboard That Lasts Forever

Slatebestos established a new standard of excellence for blackboard use. It is as hard as rock and as black as coal—a solid black all the way through. It is made of asbestos fiber, hard minerals and cement. The life of the building is the life of Slatebestos.

Slatebestos may be installed in any kind of wall—stone, brick, plaster, or directly over the bare studding.

The writing surface is produced through a series of liquid blackboard surfacing coats—each applied and then rubbed down. It is non-reflecting, dense, uniform, velvet-smooth, takes either chalk or chalk crayons, and produces a clear, white mark against a perfectly black background, easily erased or washed off. It is built black and will always be black—not gray or any other color—throughout its full $\frac{3}{16}$-in. thickness.

Slatebestos is equally as durable as natural slate and less subject to breakage; is more fire resisting and improves with age, becoming tougher and harder in use. It costs less, has extreme density with practically no expansion and is more easily installed. Joints can be made secure so that writing over them is always possible, thus forming a continuous writing surface.



There is no breakage with Slatebestos. It is carried in stock at Chicago and immediate shipments are assured.

Sizes, Weight and Color—Made in standard widths of 3½ and 4 ft. and in any desired length up to and including 8 ft. Thickness $\frac{3}{16}$ in., weighs about 2¼ lb. per sq. ft. Furnished in black only.

Mouldings Used with Slatebestos—

No. 1. Base mouldings for use at bottom of blackboard; forms a support for No. 5 chalk trough; 2 in. wide.

No. 2. Rabetted moulding used for top and ends or for frame all around; 2 in. wide.

No. 4. Quarter-round moulding used at base of blackboard to hold it in place, also used in corners and against window casings; ⅝ in. wide.

No. 5. Improved chalk trough for use with mouldings. Center "hump" corner pockets collect and hold dust. Crayons and erasers cannot pick it up; 2 in. wide.

Specifications—The contractor shall furnish and install genuine trade-marked Slatebestos Blackboard in all classrooms where shown or noted on the blueprints.

Slatebestos shall be erected in lengths up to 8 ft. without joints and shall be cut to the required lengths at the factory or may be cut with an ordinary saw. For spaces up to 8 ft. use 1 piece; over 8 ft. and up to 16 ft., use 2 pieces; over 24 ft. and up to 36 ft., 3 pieces, etc.

All blackboards shall be set in position against wood grounds and all abutting edges shall be cut or ground smooth. Care should be taken to see that the wall back of all joints is perfectly level and has a firm foundation.

Slatebestos should be drilled for nail holes along the top edge from 16 in. to 24 in. apart according to the location of studding or grounds and then nailed into position.

Allow ¼ in. at the bottom of the board for slight expansion. Also allow ¼ in. space between each joint where more than one board is used, to receive the Simplex Joining strip. These strips are coated to match the surface of the blackboard and their use forms a continuous writing surface.

Slatebestos Blackboard is secured in position with mouldings on all sides. Mouldings shall be secured with nails or screws.

The installation shall be completed and executed as per the detailed drawing shown on the blueprints and the manufacturer's instructions furnished with the blackboard.

Slatebestos Guarantee

We guarantee Slatebestos Blackboard when properly installed and ordinarily cared for, to give satisfactory service during the life of the school building; never to pit, chip, crack or grow gray in age; always to retain its splendid writing qualities.

Simplex Metal Joining Strips for Blackboards

These heavy sheet metal strips are suitable for covering the joints of Slaterock, Slatoplate Slatebestos blackboards. They eliminate the unsightly hump produced by half-round mouldings.

The Simplex strip has a stem which sets between two lengths of blackboards, a $\frac{1}{16}$-in. expansion space being left on both sides (see illustration). The two flat wings cover the joint, lie flat against the blackboard and make a continuous level writing surface. Finished in dull black, green or brown to match color of blackboard. Lengths, 3, 3½ and 4 ft.

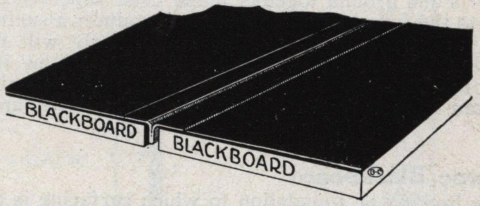


Illustration Shows How Simplex Joining Strips are Fitted to the Blackboard

Blackboard Surfacer and Slating

Two grades of liquid slating—Slatoplate Blackboard Surfacer and B-C DedBlack Liquid Slating—the latter being a less expensive grade than the former. Both make a smooth yet hard and abrasive velvety writing surface that will not crack, blister, nor become greasy or shiny. Both grades can be applied to old blackboards, hard plaster and composition or wood boards. One gallon covers above 600 sq. ft., one coat. Packed in pint, quart, half-gallon and gallon cans.

E. W. A. ROWLES CO.

Manufacturers of Duroplate, Permaroc and Asbesto-slate Blackboards

2345-2351 South LaSalle Street, CHICAGO, ILL.

Products

Duroplate Blackboard, Permaroc Blackboard, Asbesto-slate Blackboard.

Also manufacturers of Cork Bulletin Boards, Rowles Tack Board, School Furniture and Window Shades.

General Comparison of the Three Types of Blackboard, Duroplate, Permaroc and Asbesto-slate

Duroplate is one of the oldest wood pulp blackboards manufactured. It is low priced and recommended for schools with limited funds. Permaroc and Asbesto-slate are used in the most modern schools where the best is desired. The surfaces on Permaroc and Asbesto-slate are the same; they differ only in the backing used. Costs are approximately, as follows: Duroplate one-third, Permaroc one-half, Asbesto-slate two-thirds the cost of natural slate.

Always specify a strip of Rowles Tack Board, in either 12 or 18-in. width, for bulletins above blackboard. See details on following page.

DUROPLATE
THE GUARANTEED BLACKBOARD

TRADE-MARK

LIKE OLD GIBRALTAR
PERMAROC ENDURES

TRADE-MARK

ASBESTO-SLATE
—EVERLASTING—
TRADE MARK

TRADE-MARK

Duroplate Blackboard

Duroplate blackboard consists of a backing or foundation to which a special surfacer is applied. The foundation is made of specially selected, long, wiry wood fibers scientifically kiln cured and waterproofed; no wax or non-drying oils which cause the surface to crack, blister or peel are used.

The surfacer consists of selected ground slate, carborundum, coloring, flat liquid binder and other ingredients, mixed by experts and ground together under close supervision. When applied to the foundation, this mixture produces a surface which is hard and exceedingly tough. It positively will not crack or peel and because of its non-reflective qualities it is very restful to the eyes. It has just enough bite so that chalk marks can be easily and quickly made and instantly and cleanly erased.

Permaroc Blackboard

The backing or foundation to which surfacing is applied is made of gypsum rock, which, after being carefully ground and treated, is pressed between two layers of mineralized fiber boards into uniform sheets ⅜ in. in thickness.

The surfacing is made from natural slate flour (finely ground natural slate) mixed with carborundum and permanent coloring. This mixture produces a writing surface which for writing qualities has never been surpassed. The ground slate gives every desirable quality of the natural slate board, carborundum adds wearing qualities and the blue-black provides a uniform color the entire thickness of the surface and over the whole blackboard area. The surface is entirely free from cloudy effects, streaks, spider checks and hard and soft spots. The surfacing is applied to the gypsum rock foundation by means of large steel trowels; then, after being thoroughly seasoned in large ovens or drying rooms, it is rubbed down by electrically driven rubbing stones until a smooth, velvety surface is produced.

Asbesto-slate Blackboard

In manufacture, Asbesto-slate is made of Asbestos fiber and portland cement thoroughly mixed and united under tremendous pressure. It grows harder and more durable with age—in fact, is everlasting. The sheets are built up of the finest long fiber South African asbestos until the desired thickness is obtained. Asbesto-slate is made in panels ¼ in. thick and each panel is uniform in thickness, surface, and finish. It is fireproof, moistureproof, will not shrink or expand.

Asbesto-slate is harder, tougher, and considerably lighter in weight than natural slate. It is installed on any kind of wall—wood, brick, stone or concrete.

The writing surface is unexcelled; see detailed description of surface on Permaroc. The difference between Permaroc and Asbesto-slate is in the backing or foundation; writing surfaces on these boards are alike. The ground slate in Asbesto-slate gives every desirable quality of the natural slate board itself. Carborundum adds wearing qualities, and the colors mixed with slate and carborundum provide a uniform blue-black color the entire thickness of the surface. Asbesto-slate surface wears indefinitely and for writing qualities it has no equal.

Weights and Sizes

Duroplate is ¼ in., Permaroc is ⅜ in., and Asbesto-slate is ¼ in. thick.

Duroplate may be had in any length up to 12 ft., Permaroc up to 8 ft., and Asbesto-slate in 6 and 8-ft. lengths.

Duroplate and Permaroc come in 3, 3½ and 4 ft. widths; Asbesto-slate comes in 3½ and 4-ft. widths.

Heights

Nearly all of the States and many of the larger cities have adopted rules governing the height of blackboards from the floor, also the width of board and area required for different departments. *Write for complete table of wall areas required for various classrooms.*

Specifications

Duroplate—Erect "Duroplate" in position where desired, nailing securely to studs, walls or wood grounds along the top edge. At intermediate points securely drive board back against wall over clincher fasteners shown on wall section on opposite page. Use a felt covered block against blackboard to protect surface when driving against clincher fasteners. Use a rabbeted head and side casing and stop at bottom over chalk trough or entirely stop in around all sides as preferred.

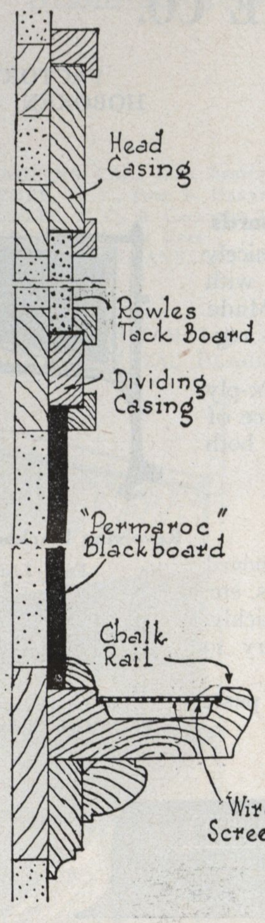
Permaroc—Erect Permaroc in lengths up to 8 ft. Set in position with room for expansion at bottom. Securely nail to studding or to wood grounds 16 in. on centers. Joints at ends of boards to be cemented, brought to an even plane with wood grounds or suitable cement backing behind the joint to hold it rigid.

Color the cement used in the joint a dense black, and after the cemented joint has set, surface it with Permaroc Slating Preparation and rub down to a smooth, even velvet surface.

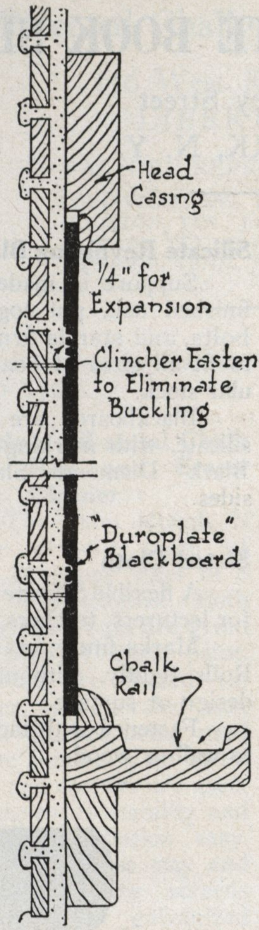
Asbesto-slate—Provide and erect (Asbesto-slate) blackboards in lengths up to 8 ft. without joints, cut to required length at factory. For surfaces over 8 ft. use one or more joints as needed. All blackboards to be set in position against wood grounds, all abutting edges to be cut or ground smooth, making a perfect joint when set. All joints to be set in manufactured slate cement against a wood ground which has been slightly wedged out in the center, so that joints will be drawn back tight at bottom and top forming a rigid joint free from springiness. Plaster of paris or ordinary cement may be spotted back of joints, to bring face edges of manufactured slate in true alignment, if preferred to wedging the grounds out. Secure rigidly in position with a wood or metal moulding on all sides of blackboard. Mouldings to be secured with nails or screws. Before setting mouldings, manufactured slate should be drilled along the top edge from 16 to 24 in. apart according to location of studding or grounds, then nailed in position.

When joints are filled with cement, wipe off the surface cement from the face of the manufactured slate, thus leaving a continuous writing surface.

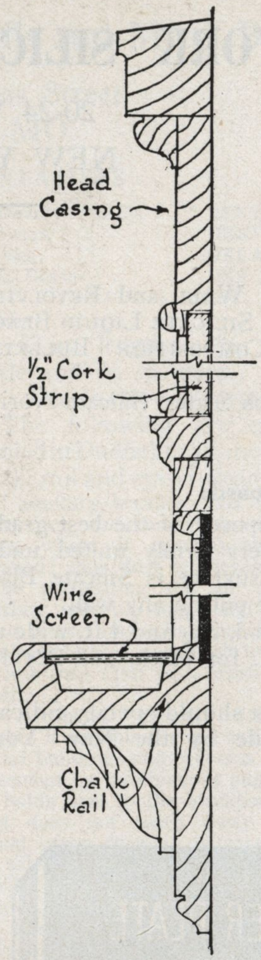
Continued on next page


Head Casing
Rowles Tack Board
Dividing Casing
"Permaroc" Blackboard
Chalk Rail
Wire Screen

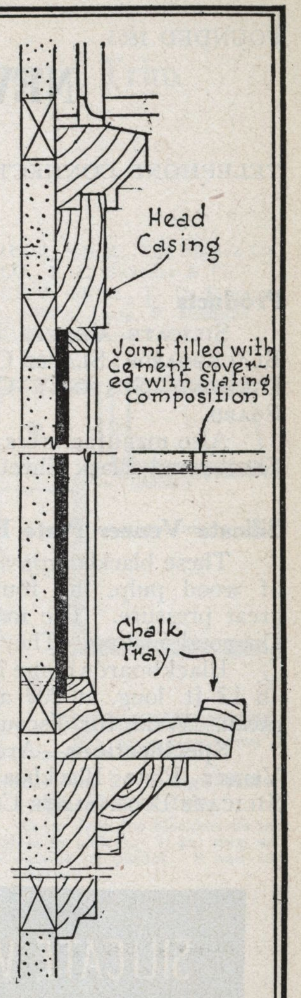
"PERMAROC"
BLACKBOARD


Head Casing
1/4" for Expansion
Clincher Fastener to Eliminate Buckling
"Duroplate" Blackboard
Chalk Rail

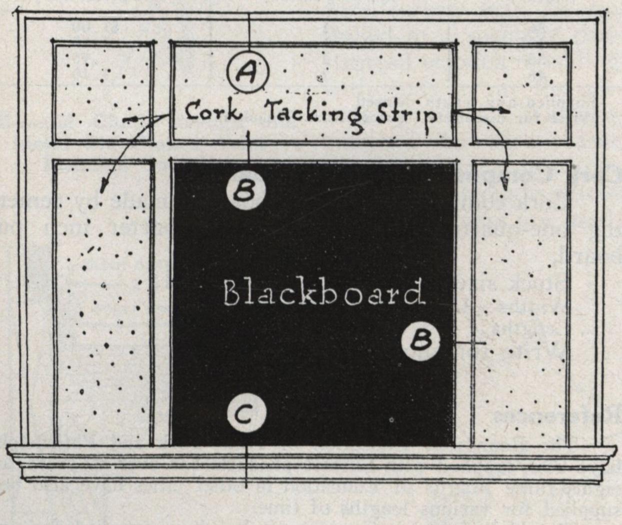
"DUROPLATE"
BLACKBOARD


Head Casing
1/2" Cork Strip
Wire Screen
Chalk Rail

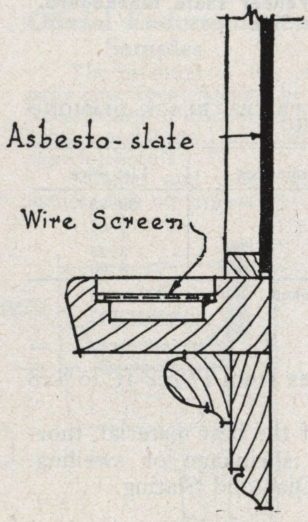
"ASBESTO-SLATE"
BLACKBOARD


Head Casing
Joint filled with Cement covered with Slating Composition
Chalk Tray

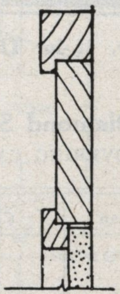
"ASBESTOSLATE"
BLACKBOARD


A
Cork Tacking Strip
B
Blackboard
B
C

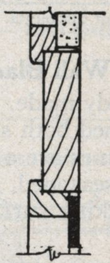
•ELEVATION•
Scale 1/2"=1'


Asbesto-slate
Wire Screen

•SECTION•C•



•SECTION•A•



•SECTION•B•

E.W.A. ROWLES COMPANY CHICAGO, ILL.	"DUROPLATE", "PERMAROC" & "ASBESTOSLATE" BLACKBOARDS AND BULLETIN BOARDS	DRAWING NO. 1 SCALE 3 IN. EQUALS 1 FT.

FOUNDED 1865

NEW YORK SILICATE BOOK SLATE CO.

TELEPHONE CONNECTION

20-24 Vesey Street
NEW YORK, N. Y.

FACTORY
HOBOKEN, N. J.

Products

Silicate Veneer Plate, Wall and Revolving Blackboards; Slated Cloth; Silicate Liquid Black Diamond Slating; Cork Composition Bulletin Board.

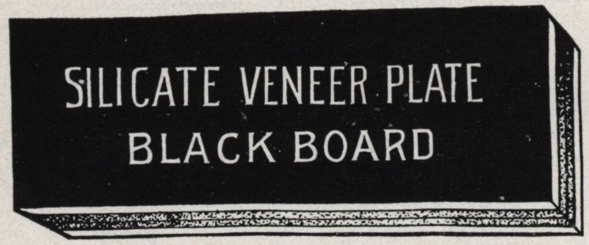
Also manufacturers of Book Slates, Silicate Ivorine Sheets, and Black Sheets.

Silicate Veneer Plate Blackboards

These blackboards are composed of the best grades of wood pulp, the four veneers firmly united under great pressure. The marking surface is Silicate Black Diamond Slating. They can be put on any wall.

Blackboards come in sizes 3, 3½ and 4 ft. wide up to 12 ft. long, at 20¢ a sq. ft. for black, and 22¢ for green. Write for discounts.

Specifications—Architects should specify Silicate Veneer Plate Blackboard made by the New York Silicate Book Slate Co.



Four-ply, ¼-in. Thick Silicate Veneer Plate Blackboard, Surfaced One Side

Black Diamond Slating

SIZES, COVERING CAPACITY, AND PRICES, BLACK DIAMOND SLATING

Size of can	Covering capacity, one coat	List price
½ pt.	25 sq. ft.	$0.75
1 pt.	50 sq. ft.	1.25
1 qt.	100 sq. ft.	1.75
½ gal.	200 sq. ft.	3.25
1 gal.	400 sq. ft.	6.00

Write for discounts. Prices f.o.b. Hoboken.

Silicate Wall Blackboards

Ready made. Standard sizes from 1½x2 ft. to 4x8 ft., finished both sides.

Frames are of oak, made of the best material, thoroughly seasoned, allowing for shrinkage or swelling. The marking surface is Black Diamond Slating.

DIMENSIONS AND PRICES, WALL BLACKBOARDS

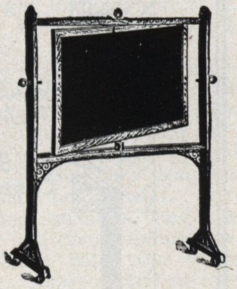
No.	Feet	List price	No.	Feet	List price
0	1½x2	$ 3.25	5	3½x4½	$12.00
½	1⅔x2½	4.00	6	3 x6	14.00
1	2 x3	5.50	7	4 x5	15.50
2	2½x3½	7.00	8	4 x6	17.50
3	3 x4	9.50	9	4 x7	23.00
4	3 x5	11.50	10	4 x8	26.25

Write for discounts. Prices f.o.b. Hoboken.

Silicate Revolving Blackboards

Support is made of nicely finished oak, put together with bolts, and stands firmly. Made to fit all sizes of boards in regular stock.

Blackboards are of six-ply silicate, with marking surface of Black Diamond Slating both sides.



Revolving Blackboard

No.	Feet	List Price
00½	2 x3	$16.00
0½	2½x3½	18.50
1½	3 x4	21.00
2½	3 x5	23.50
3½	3 x6	26.00
4½	4 x5	27.50
5½	4 x6	30.50

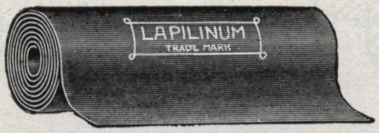
Write for discounts.
Prices f.o.b. Hoboken

Slated Cloth

A flexible Silicate blackboard for lecturers, teachers, stores, etc.

Marks finely, erases quickly. Rolls tightly, without injury to design or surface.

Fastened with tacks or paste to wall or wood.



Slated Cloth

DIMENSIONS AND PRICES, SLATED CLOTH
Rolls of 12 yards

Width, in.	Marking surface	List price, lin. yd.
36	1	$1.00
48	1	1.15
36	2	.95
48	2	1.10

Supplied any length desired.
Write for discounts. Prices f.o.b. Hoboken.

Cork Composition Bulletin Board

Cork composition bulletin board is made by cementing one-quarter inch cork on one-quarter inch pulp board.

Stock sizes cork composition board:
Widths: 12, 18, 24, 36, 42 and 48 in.
Lengths: 4, 5, 6, 7, 8, 9, 10 and 12 ft.
Write for quotations.

References

The Boards of Education of New York and Philadelphia have been supplied with Silicate products for over 40 years, and eighty-three Boards of Education in other cities have also been supplied for various lengths of time.

The United States Government has been supplied for over 40 years.

Many of the schools in Havana, Cuba, and Porto Rico, and Manila in the Philippines have also been supplied.

Bainbridge, Kimpton & Haupt, Inc., 218 Greenwich Street, New York, N. Y.

A. L. Salomon and Company, 546-548 Broadway, New York, N. Y.

American News Co., Inc., 9-15 Park Place, New York, N. Y.

Goods have been shipped to all parts of the world.

DUDFIELD MANUFACTURING CO.

Manufacturers of Patented Chalk Rails and Metal Blackboard Trim

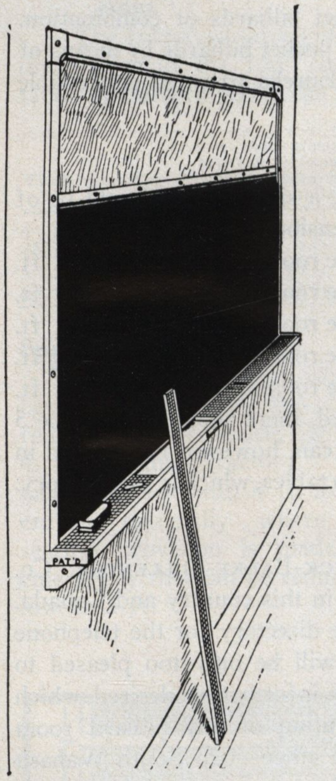
116 West Kansas Street
LIBERTY, MO.

FACTORY REPRESENTATIVES

LOS ANGELES, CAL., Emil Brown & Co.
NEW YORK, N. Y., Ford B. Hanna
CHARLOTTE, N. C., R. Galloway Ross
ATLANTA, GA., Allen Deas
LOUISVILLE, KY., The Hebblewhite Co.
HOUSTON, TEX., J. C. Nowlin
EL PASO, TEX., C. C. Gaines
MEMPHIS, TENN., John D. Gerber
BENTON HARBOR, MICH., The Mamer Co.
DENVER, COLO., F. C. Sanders & Co.
OKLAHOMA CITY, OKLA., E. D. Edwards
DES MOINES, IOWA, Chas. P. Massard
NEW ORLEANS, LA., Southern Builders Material Co.
BILLINGS, MONT., Frank W. Richardson, Inc.

Products

Dustless All-metal Chalk Rails with Eraser Cleaner and Metal Blackboard Trim.



All-metal Chalk Trough and Metal Blackboard Trim Installed Complete

Dustless All-metal Chalk Rail and Eraser Cleaner

The main trough is made of one piece of No. 24 gauge steel in 8 and 10-ft. lengths. Both trough and trim are given one coat of metal paint. Sections are butted together, a concealed cast metal bracket being used at the joints. Cast metal ends and corners are used, adding to its stability and making installation easy. Removable dust tray and removable wire screens are made of galvanized material in 47-in. lengths for easy handling in cleaning. Metal parts have prime coating of brown paint.

The dust tray and wire screen may be installed in a specially constructed wooden moulding with ends as in the all-metal product. We recommend the wire eraser cleaner without dust tray for use in all troughs where vacuum cleaners are used, in 47-in. lengths, 2⅜ in. wide and ⅜ in. deep.

Distinctive Features—The following are embodied in Dudfield's all-metal chalk rail and eraser cleaner.

Sanitary, because chalk dust falls into the removable dust tray, where it remains until cleaned; thus dust is prevented from permeating the air and settling into the lungs and on floor or clothing. In general, it is cleaned about once each week in less time than with brush or cloth.

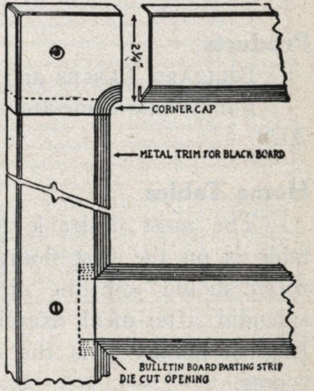
All-metal construction makes it suitable for use in fireproof buildings and prevents defacement by mischievous pupils. It holds firm to the blackboard and does not warp away as wood often does, is adjustable to all blackboards and is very easily installed. No nails are visible. Eraser cleaner, made of No. 18 gauge, ⅜-in. mesh galvanized wire, holds eraser and crayon out of the chalk dust. Erasers may be cleaned as often as used.

Blackboard trim made of No. 20 gauge metal insures the most sanitary equipment.

Official Endorsement and Samples

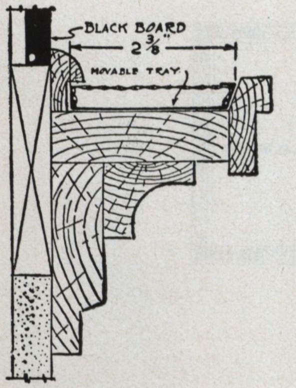
The products of this company have been endorsed by the State Board of Health of Missouri, architects and school superintendents.

Samples and other information sent on request.

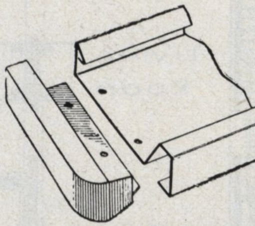


Details No. 20 Gauge Metal Blackboard Trim

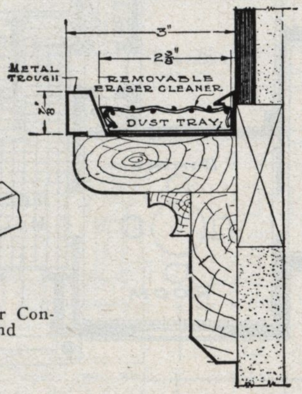
⅜-in. deep for blackboards set flush with plaster. 1⅛-in. deep set on outside of plaster. 8 and 10-ft. lengths



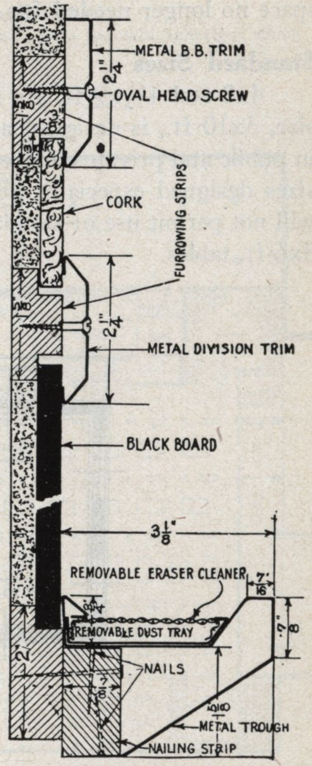
No. 351. Metal Dust Tray and Wire Screen in 4-ft. Sections with Ends



No. 352. Showing Return Corner Connections Right and Left Hand



No. 352. Metal Trough for New or Remodeling Work



No. 350. Detail of All-metal Trough Installation

Sectional Views of Dudfield's Dustless Chalk Rails

Only metal parts are furnished by manufacturer. Metal trough, metal trays and metal blackboard trim cut to exact lengths when ordered; give outside measurements of blackboards over all

THE BRUNSWICK-BALKE-COLLENDER CO.

Manufacturers of Billiard Tables and Bowling Alleys

GENERAL OFFICE
623-633 South Wabash Avenue
CHICAGO, ILL.
BRANCHES IN PRINCIPAL CITIES

TELEPHONE
Wabash 7060

Products

Billiard Tables and Bowling Alleys.

For Whale-Bone-Ite Toilet Seats, see pages 2028-2029.

Home Tables

The most desirable location for a home billiard table is on the first floor, and if possible the billiard room should join the dining room, as billiards is a splendid after-meal exercise. In many of the better English homes it is the custom to so locate billiard rooms.

There is much enjoyment to be derived from the game of billiards after dinner, or with neighbors or friends at a later hour, and for this reason, it is essential that the table be located most conveniently and most accessibly.

Since the development of oil burners many of the smaller houses are providing basement billiard rooms in space no longer needed for coal bins, etc.

Standard Sizes

4x8 and 4½x9 ft. are standard sizes. Professional size, 5x10 ft., is designed and adapted for standard use in public and private club recreation rooms. Other small sizes designed especially for private homes where space will not permit use of standard sizes, namely: 3½x7 and 3x6-ft. tables.

Styles

All models of standard sized tables furnished in three types—carom billiards, pocket billiards or combination.

Combination carom and pocket billiards by means of interchangeable cushions or Eureka patented convertible rails can also be furnished.

Space Required

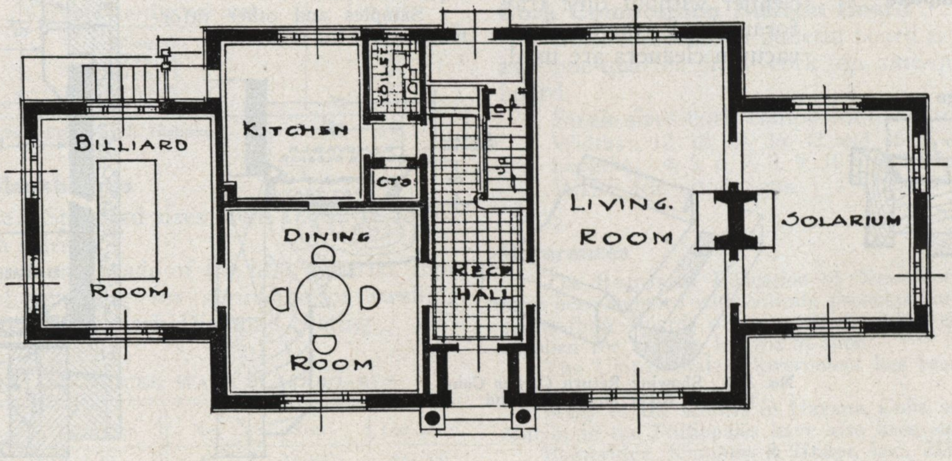
A room to accommodate a single table should be of the following minimum dimensions:

For a table 3 x6 ft. the room should be 11x14 ft.
For a table 3½x7 ft. the room should be 12x15 ft.
For a table 4 x8 ft. the room should be 13x17 ft.
For a table 4½x9 ft. the room should be 14x18½ ft.
For a table 5 x10 ft. the room should be 15x20 ft.

If two tables are installed, there should at least be 5 ft. between the tables. This can, however, be reduced in an emergency to 4 ft. between tables, which is satisfactory.

Co-operative Service

There is a Brunswick-Balke-Collender Co. branch in all principal cities in this country and Canada. Kindly refer to the telephone directory for the telephone number or address. They will be only too pleased to furnish, without charge, any information desired which might assist you in the solution of any billiard room problem. Or write the main office—*623 South Wabash* Avenue, Chicago, Ill.



FIRST FLOOR PLAN
SCALE $\frac{1}{16}$"=1'-0"

Continued on next page

Tables for Recreation Centers and Commercial Establishments

For commercial establishments or recreation centers, upper floors or basements may be utilized to advantage for billiard rooms and bowling alleys.

We have illustrated on this page two installations, one utilizing the basement and the other the fifth floor of a building. For installations of all kinds, correspondence is invited.

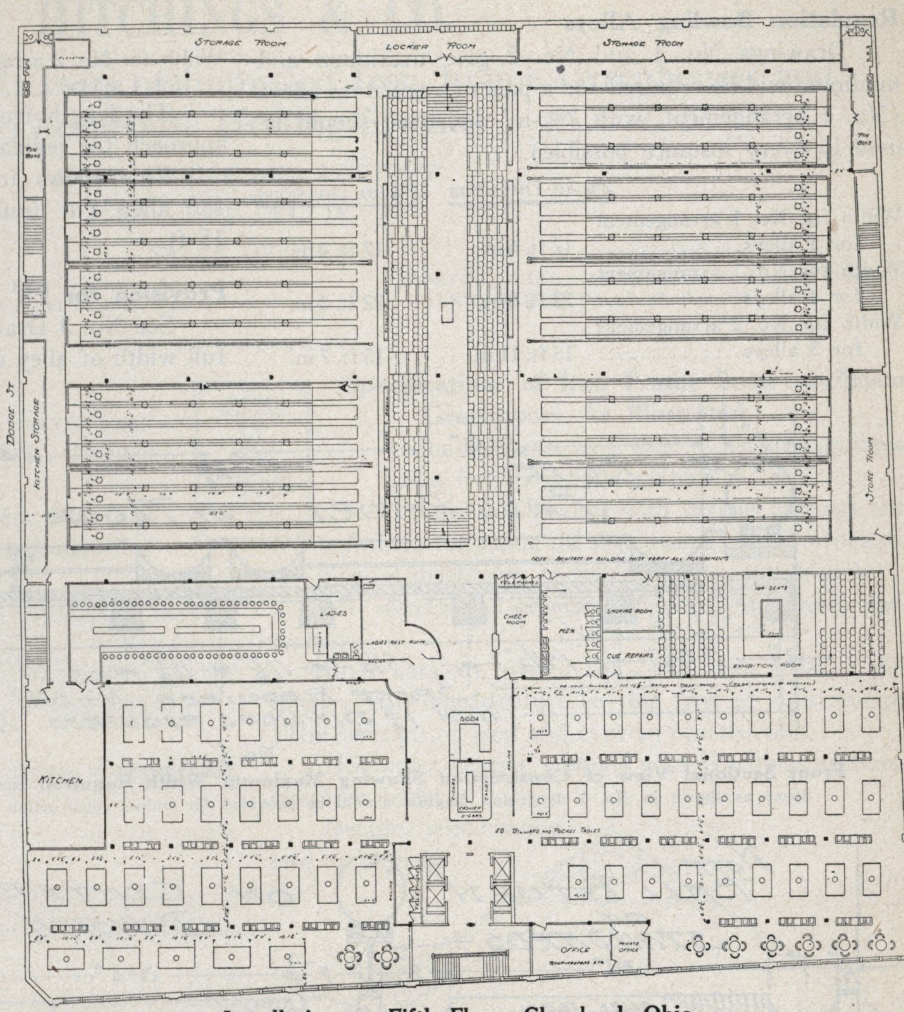
Trade Table Sizes and Dimensions

The following table gives the dimensions of the four sizes of tables manufactured for the trade.

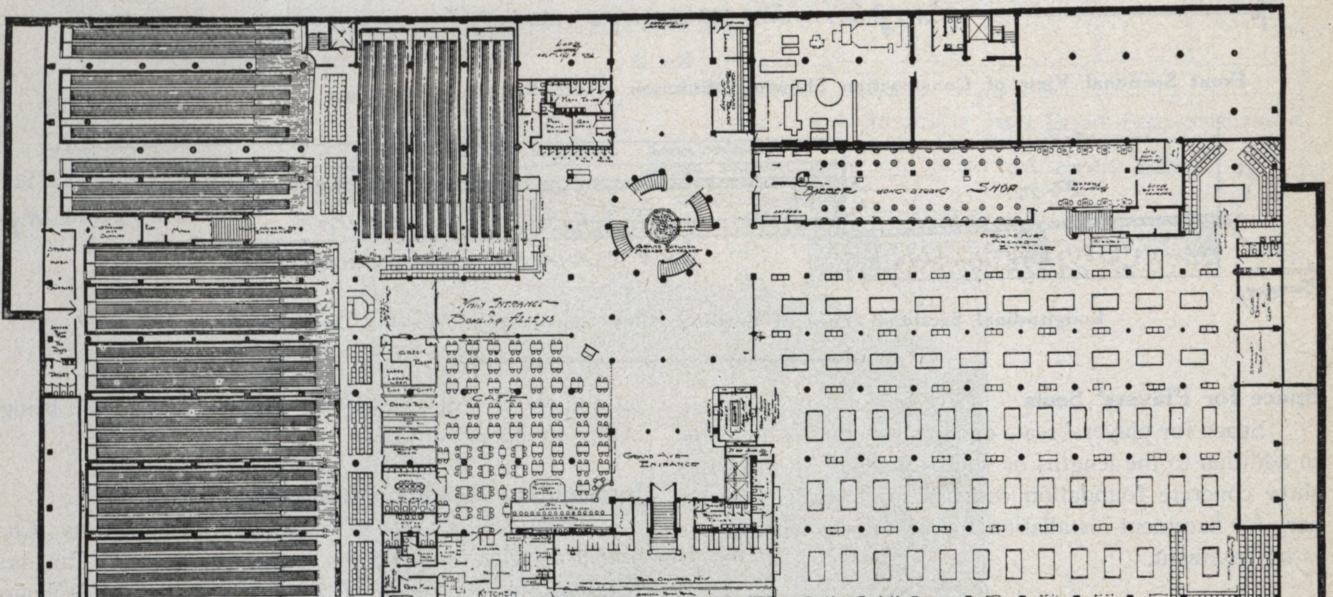
Trade sizes	Actual measurements between extreme outside edges of opposite rails
4 x 8 ft.	4 ft. 7½ in. x 8 ft. 5½ in.
4½x 9 ft.	4 ft. 11½ in. x 9 ft. 1½ in.
5 x10 ft.	5 ft. 5½ in. x 10 ft. 1½ in.
6 x12 ft.	6 ft. 8 in. x 12 ft. 5½ in.

Space Between Tables

Five feet between tables is best. In emergency this can be reduced to lesser space, but below 4 ft. is unsatisfactory. From table edge to walls, 6 ft. is preferable, especially where wall seating provision is made. In emergency this can be reduced as low as 5 ft.


Storage Room
Locker Room
Storage Room
Dodge St
Kitchen Storage
Store Room
Ladies
Check Room
Men
Cue Repairs
Exhibition Room
Soda
58 Billiard and Pocket Tables
Kitchen
Office

Installation on Fifth Floor, Cleveland, Ohio
Equipment consists of 58 billiard tables, 40 bowling alleys, restaurant, soda fountain and cigar stands


Barber Shop
Main Entrance Bowling Alleys
Cafe
Grand Ave Entrance
Kitchen

Billiard Table and Bowling Alley Installation in a Basement, Milwaukee, Wis.
Equipment consists of 60 billiard tables, 37 bowling alleys, cafeteria, barber shop, soda fountain, etc.

Continued on next page

Regulation Bowling Alleys

Drawings No. 1 and No. 2 give maximum and minimum widths required for a pair of regulation alleys (No. 1 arrangement, with 2¾-in. divisions, should be used in every instance possible).

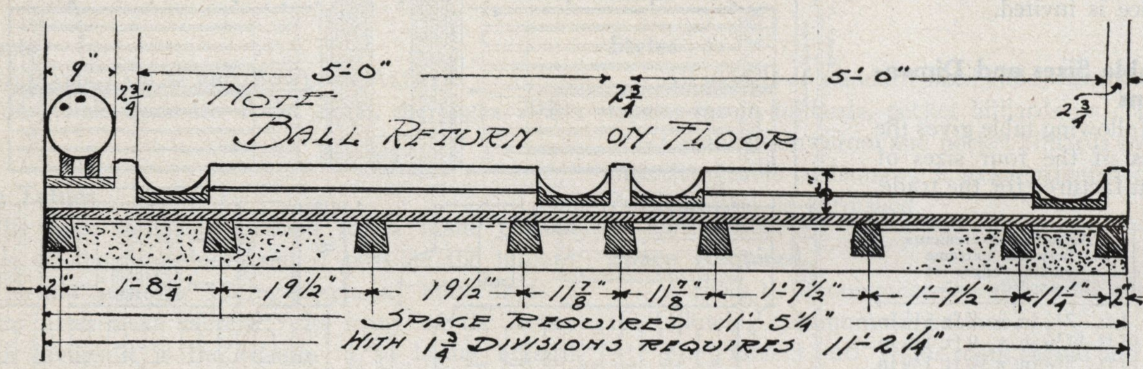
	2¾-in. Divisions	1¾-in. Divisions
Width for No. 1 arrangement for 3 alleys	17 ft. 6 in.	17 ft. 2 in.
Width for No. 1 arrangement for 4 alleys	22 ft. 8 in.	22 ft. 3 in.
Width for No. 2 arrangement for 3 alleys	15 ft. 11 in.	15 ft. 7 in.
Width for No. 2 arrangement for 4 alleys	21 ft. 1¾ in.	20 ft. 8¾ in.

The length from the back wall to the front of the approach for regulation alley is 82 ft.

This allows for pit and swinging cushion 4 ft., for alley (to foul line) 63 ft., and for approach 15 ft.

Provision for Pit

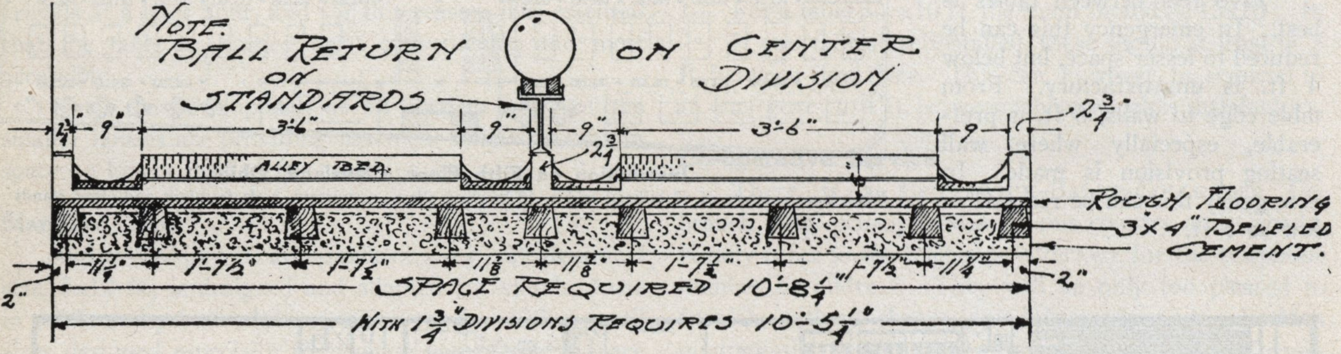
See No. 3 Drawing for pit provisions—pit extends full width of alley units installed.


9"
2 3/4"
5'-0"
NOTE
BALL RETURN ON FLOOR
2 3/4
5'-0"
2 3/4
2"
1'-8 1/4"
19 1/2"
19 1/2"
11 7/8"
11 7/8"
1'-7 1/2"
1'-7 1/2"
11 1/4"
2"
SPACE REQUIRED 11'-5 1/4"
WITH 1 3/4 DIVISIONS REQUIRES 11'-2 1/4"

No. 1

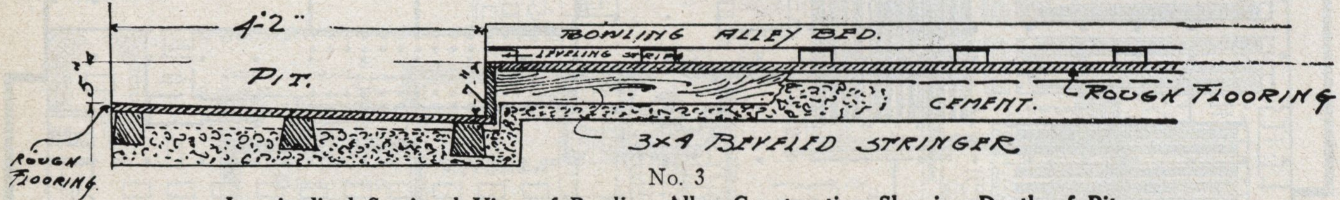
Front Sectional View of Construction Showing Maximum Width Required for Single Pair of Bowling Alleys

Space as shown in No. 1 dimension diagram should be provided for unless construction reasons make reductions imperative


NOTE
BALL RETURN ON STANDARDS
ON CENTER DIVISION
2 3/4"
9"
3'-6"
9"
9"
2 3/4
3'-6"
9
2 3/4
ALLEY BED
ROUGH FLOORING
3x4" BEVELED
CEMENT
11 1/4"
1'-7 1/2"
1'-7 1/2"
11 7/8
11 7/8"
1'-7 1/2"
1'-7 1/2
11 1/4"
2"
2"
SPACE REQUIRED 10'-8 1/4"
WITH 1 3/4" DIVISIONS REQUIRES 10'-5 1/4"

No. 2

Front Sectional View of Construction Showing Minimum Width Required for Single Pair of Bowling Alleys


4'-2"
BOWLING ALLEY BED
LEVELING STRIP
5
PIT
CEMENT
ROUGH FLOORING
3x4 BEVELED STRINGER
ROUGH FLOORING

No. 3

Longitudinal Sectional View of Bowling Alley Construction Showing Depth of Pit

Space for Players' Seats

Space for players' seats or for spectators is desirable in addition to the lengths or widths given. All drawings show concrete foundation construction, which is necessary for basement installation and first floors where there is no basement.

Special Subfoundations

We offer special subfoundations for upper floor installations.

This is done in order to afford sufficient depth for pit and to prevent as much as possible noise from being heard on floor below.

Information Readily Obtainable

There is a Brunswick-Balke-Collender Co. branch in all principal cities in this country and Canada. Kindly refer to telephone directory for the telephone number or address, or write main office. They will be only too pleased to furnish, without charge, any information desired which might assist you in the solution of any bowling alley problem.

HITCHINGS & CO.

Manufacturers and Erectors of Improved Iron Frame Greenhouses and Greenhouse Heating Systems

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ELIZABETH, N. J.

SALES OFFICES

NEW YORK, N. Y., Architects Building, 101 Park Avenue
PHILADELPHIA, PA., Empire Building, 13th and Walnut Streets
BOSTON, MASS., 161 Massachusetts Avenue, Room 307
WILKES-BARRE, PA., P. O. Box 218

SAMPLES DISPLAYED WITH
ARCHITECTS SAMPLES CORPORATION
NEW YORK, N.Y.
EST. 1912

Products and Services

Curved Eave and Straight Eave Flat Rafter Iron Frame Greenhouses, Original "U" Bar Construction.

Also manufacturers of Swimming Pool Enclosures, Conservatories, Sun Rooms, Sludge Bed Enclosures.

All work of special nature given attention by experts with many years' experience.

Plans and estimates cheerfully furnished.

For Sash Operating Devices, see page 1016.

Hitchings Iron Frame Semi-curvilinear Greenhouse Construction

Opposite is a typical cross section of an iron frame semi-curvilinear greenhouse.

Following is a table of measurements applying to the three standard widths. Other widths may be had if desired.

	Width 10-ft.	Width 18-ft.	Width 25-ft.
A—Height of gutter	4′ 9″	4′ 9″	4′ 9″
B—Height from sill to gutter	2′ 5″	2′ 5″	2′ 5″
C—Height from grade to ridge	9′ 1″	11′ 7″	12′ 7″
D—Width of bench	2′ 9″	2′ 9″	2′ 9″
E—Width of bench	....	5′ 6″	5′ 3″
F—Width of walks	2′ 6″	2′ 6″	2′ 6″
G—Height of walls	2′ 4″	2′ 4″	2′ 4″
H—Thickness of walls	8″	8″	8″
I—Radius of curve	24″	24″	24″

Specifications of Iron Frame Semi-curvilinear Greenhouse As Illustrated

Nine-inch cast iron sills. Cast iron gutters.

Flat iron posts and rafters.

Angle iron purlins with various castings and fittings constitute the iron frame of the structure.

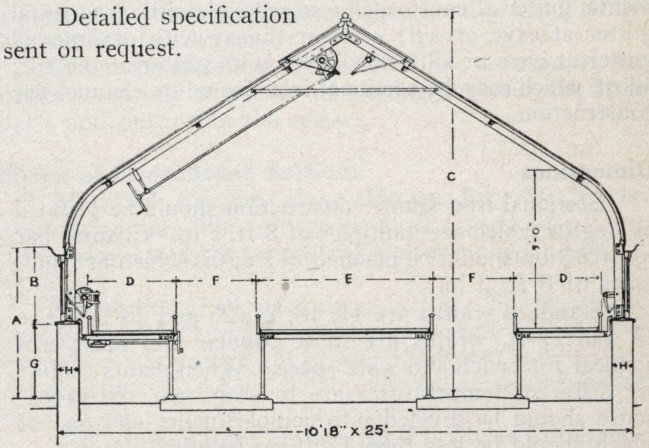
Special machinery operates the ventilating sash.

All woodwork consists of clear, air-dried tank cypress.

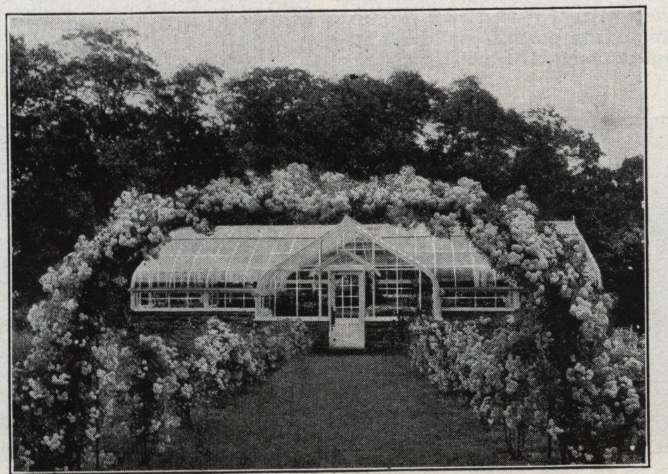
Roof bars are spaced for 24-in. wide glass, a distinctive Hitchings feature on this type of construction. Plant benches of iron and cypress construction.

Hot water heating systems with Hitchings sectional cast iron boilers.

Detailed specification sent on request.



Typical Cross Section of Iron Frame Semi-curvilinear Greenhouse
Made in 10, 18 and 25-ft. standard widths



Hitchings Improved Iron Frame Greenhouse

ESTABLISHED 1902

KING CONSTRUCTION COMPANY

Designers, Manufacturers, and Erectors of Glass Construction of Every Description

GENERAL OFFICES AND FACTORY
NORTH TONAWANDA, N. Y.

SALES OFFICES
NEW YORK, N. Y., 1674 Broadway
BOSTON, MASS., 25 Huntington Avenue
SCRANTON, PA., 307 North Irving Avenue
CLEVELAND, OHIO, Hippodrome Building
PHILADELPHIA, PA., 14 No. Sixtieth Street

Products

King Commercial and Private Greenhouses and Conservatories.

Also Sun Parlors, Swimming Pool Enclosures and Roofs; Greenhouse Supplies and Accessories, King Sash Operators for greenhouses and factories; Boiler and Heating Equipment for greenhouses.

Designs, Workmanship and Materials

Designs are the result of more than twenty years' experience in greenhouse construction. Workmanship is in a modern daylight factory and is under the supervision of skilled engineers. Materials are of first quality, guaranteed to be free from defects and suitable for the use intended.

Styles of Design and Types of Construction

Greenhouses can be built straight eave with ornamental gutter at eave or sill; curved eave with ornamental gutter at eave or sill; semicurvilinear with ornamental gutter at eave or sill; curvilinear with gutter at the sill; all of which may be sectional iron frame or channel bar construction.

Dimensions

Sectional iron frame construction should be planned in lengths which are multiples of 8 ft. 5 in. Channel bar construction should be planned in lengths which are multiples of 8 ft. 3 in.

Standard widths are 11, 18, 21, 25 and 28 ft. The 18 and 25-ft. widths are most popular and most economical for bench and walk space. When plants requiring different temperatures are to be grown, the greenhouse should be divided into compartments—no one of which should be less than 17 ft. in length.

General Specifications

Ironwork—The superstructure consists of cast iron sills capping the masonry walls, flat steel rafters spaced on 8 ft. 5 in. centers, malleable ridge plates, angle iron purlins, malleable fittings, etc., necessary for the complete erection of the framework.

Woodwork—Wood members consist of sash bars, ridge, ridge cap, rafter caps, gable rafters, ventilating sash, doors and door frames, all of which are made of straight-grained, clear, air-dried, heart, California redwood. Sash bars are spaced for 16-in. wide glass.

Painting and Glazing—Framework will be painted 1 coat before shipment, 1 coat after erection and 1 coat after glass is set, with best quality greenhouse paint made according to our own formula. Grade "A" American window glass bedded in special greenhouse putty and held with zinc glazing points is used for glazing.

Benches and Watering System—Benches will be constructed with galvanized iron frames and cypress sides and bottom. Hose valves are placed at convenient points for watering plants.

Heating—A gravity hot water system circulating through 2-in. pipe coils is used. Coils are connected to a King sectional cast iron boiler with ample excess capacity over actual requirements.

Co-operative Service

The King Engineering Department is maintained to work out the architect's ideas and to assist him with all matters relative to glass construction. Bulletins, blue prints, specifications and other useful information may be had from any of the above listed offices.

Prominent Installations and References

James E. Williams, Glastonbury, Conn.
Yale University, New Haven, Conn.
Eugene duPont, Greenville, Del.
Mrs. Okle Painter Williams, Jacksonville, Fla.
Wm. Candler, Atlanta, Ga.
R. T. Crane, Jr., Ipswich, Mass.
Walter Hunnewell, Wellesley, Mass.
John S. Newberry, Grosse Pointe, Mich.
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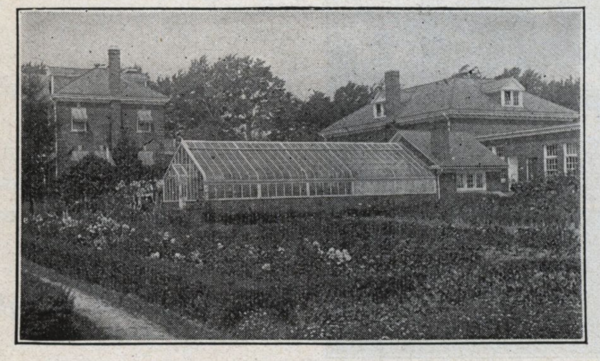
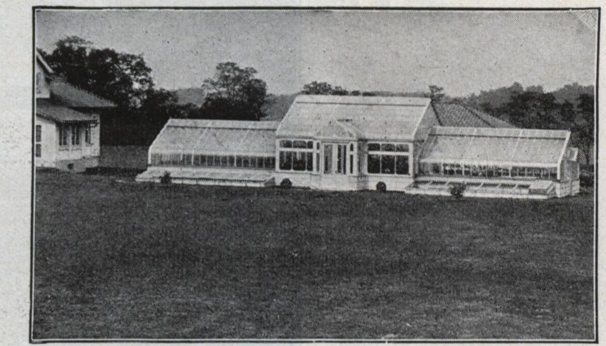
New York Botanical Gardens, New York, N. Y.
F. A. Seiberling, Akron, Ohio.
A. S. Kreider, Annville, Pa.
J. B. Stetson Estate, Elkins Park, Pa.
University of Pennsylvania, Philadelphia, Pa.
City of Providence, R. I.
L. R. Munger, Dallas, Tex.
J. P. Weyerhauser, Tacoma, Wash.



Greenhouse with Curved Eave
The gutter is at the eave



Palm House with Two Wings
Curved eave construction, with gutter at the sill

LORD & BURNHAM CO.

Greenhouse Designers and Manufacturers

FACTORIES

IRVINGTON, N. Y. DES PLAINES, ILL. ST. CATHARINES, CANADA

SALES OFFICES

IRVINGTON, N. Y. CLEVELAND, OHIO BUFFALO, N. Y. DENVER, COLO. GREENSBORO, N. C.
NEW YORK, N. Y. BOSTON, MASS. KANSAS CITY, MO. ST. LOUIS, MO. MONTREAL, QUE.
PHILADELPHIA, PA. CHICAGO, ILL. ST. CATHARINES, ONT.

Products

Sectional Iron Frame, having cypress roof bars, U-Shape Bar and V-Shape Bar Greenhouses, and their full equipment, including Heating.

Also Conservatories, Sun Parlors, Graperies and Swimming Pools.

For Sash Operating Apparatus, see page 1020.

Quality and Facilities

Back of our greenhouses, as built today, is our over three-score years' experience as specialists in designing and manufacturing greenhouses. We thoroughly understand plant requirements and the best way to construct houses to meet these requirements.

We will furnish materials and erect houses or furnish material only.

Co-operation

In order to co-operate closely with architects, thirteen offices, eleven in the United States and two in Canada, have been established. At any one of these offices, our greenhouse experts can be consulted at any time.

General Construction

Sectional Iron Frame—A section is formed by setting up two spans of rafters, 8 ft. 4 in. apart at each end of two lengths of cast iron sills. The gutters at the eaves, and the purlins between the eaves and ridge, form the cross framing between the two spans. The purlins are placed the proper distance apart to carry the cypress roof bars.

A section can be easily added by setting up another span 8 ft. 4 in. away from either end and constructing cross frame in same manner as first section. Greenhouse can be made any desired length by adding as many of these standard sections as necessary.

U-Shape Bar Construction—The cypress glazing bars are enclosed in galvanized steel U-Shape Bars. Glass is embedded in putty and secured to the cypress cores and does not come in contact with the metal, eliminating breakage incident to such usual causes. The core bar is provided with a drip gutter which carries off all condensation. Glass is 24 in. wide and of standard greenhouse quality.

V-Shape Bar Construction—The V-Shape Bar differs from the U-Shape Bar, mainly in the shape of the galvanized steel.

The core bar, a portion of which is exposed inside the house, has a drip gutter which effectively carries off all condensation.

The glass used is 24 in. wide, and of standard greenhouse quality.

Lightness

While attaining durability in these three constructions the light has been increased many fold, as each framework member is but a fraction of the size of its corresponding member in an all-wooden house and casts correspondingly less shade.

All unnecessary members are eliminated to admit all possible light.

Attractiveness

Each construction member is designed with attention to good proportion, and general shapeliness of contour; the keynote being simplicity of lines.

The rafter caps and pilasters in the sectional iron frame are larger than the glazing bars. Each bay of 8 ft. 4 in. is accented, giving an effect of broad spacing throughout the entire roof and sides, not obtainable where the glazing bars are of one size and rafters are not used.

Quick Erection

Our greenhouse constructions have been worked out so systematically that the labor erecting is reduced to a minimum. Each part of the entire frame is passed through a line of machines in the factory, where it is cut, shaped, punched, fitted and then hand primed, ready for immediate erection.

When the materials are received, the erection of the house is mainly a matter of bolting together the iron parts and putting in the screws.

Styles of Greenhouse Sections

Modified Curved Eave House for All Three Constructions—The gutter is at the bottom of the curved eave, and the ventilating sash are hinged directly to it.

The radius of the eave curve is 2 ft. This increases the height of the curved portion over that of the old style curved eave house, giving greater headroom for the side bench plants. We consider this the most practical house built. (Fig. 1 on second page following.)

Curvilinear Roof House for All Three Constructions—The roof of the curvilinear roof house is curved from the eave line to the ridge. Gutter is at the eave. (Fig. 2 on second page following.)

Straight Roof House for Sectional Iron Frame Only—Roof is straight from eave to ridge. Gutter is at the eave. (Fig. 3 on second page following.)

Heating

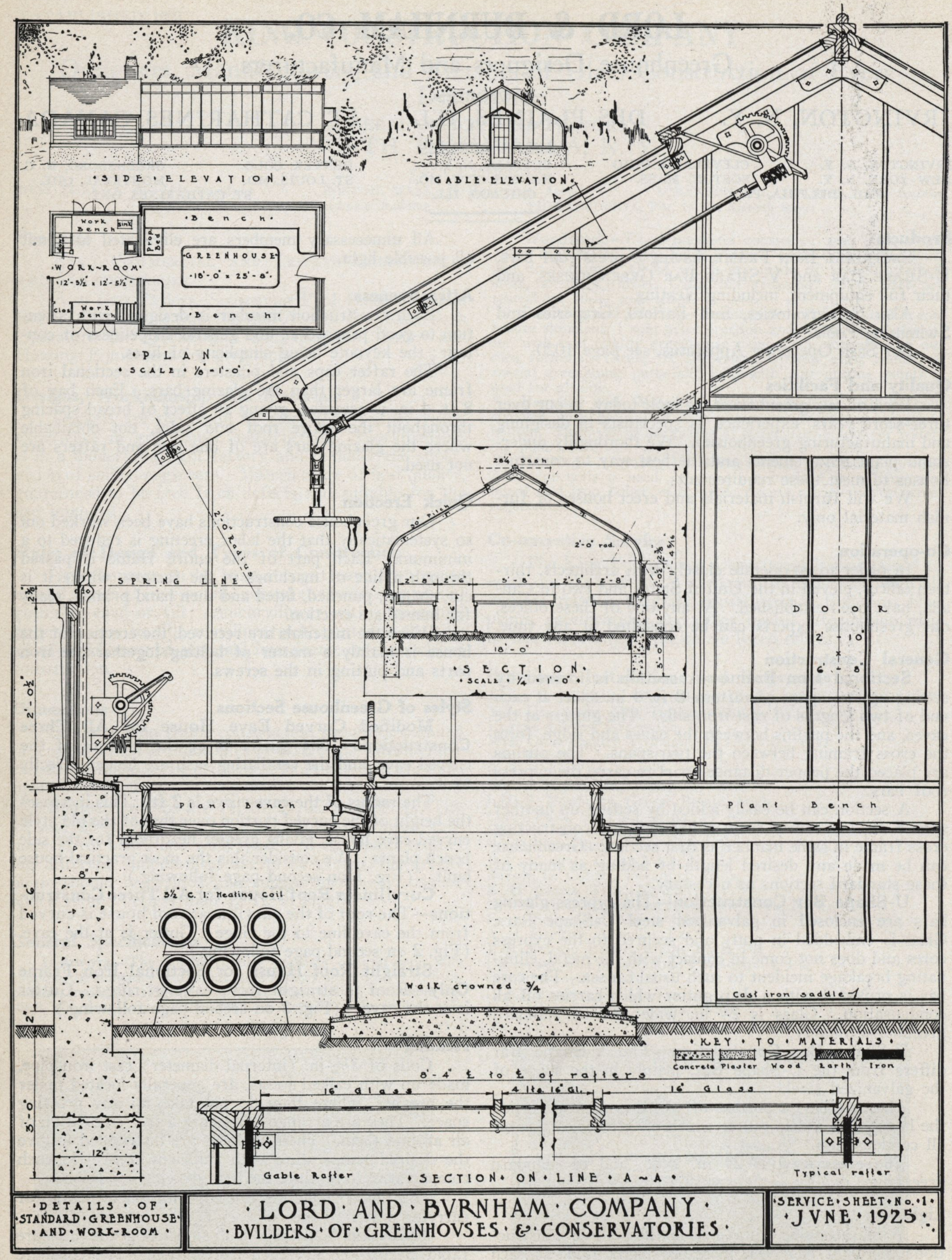
Coils of 3½-in. (internal diameter) cast iron pipe, made up with calked joints, are generally located under the benches, where they do not take up any growing space. They are arranged to secure a free circulation of air around them. Their surfaces are distributed to give the desired temperature with sufficient control in each compartment to produce the best growing conditions.

"Burnham" boilers are used, with ample mains for carrying water to the coils.

The system is installed with sufficient grade to insure rapid circulation and even distribution. The coils are equipped with automatic air headers to prevent all air locks.

The cellar should be of a depth that will allow at least 2 ft. above top of boiler. The average cellar depth is 8 ft.

Continued on next page


·SIDE·ELEVATION·
·GABLE·ELEVATION·
Work Bench
Sink
Prop. Bed
·Bench·
·GREENHOUSE·
·18'-0" x 25'-8"·
·WORK~ROOM·
·12'-5½" x 12'-5½"·
Clos
Work Bench
·Bench·
·PLAN·
·SCALE·⅛"-1'-0"·
A
A
2'-0" Radius
SPRING LINE
2⅞
2'-0½
28¼" Sash
20° Pitch
2'-0" rad.
2'-8"
2'-6"
5'-8"
2'-6"
2'-8"
2'-6"
11'-4 5/16
2'-0½
2'-6"
3'-0"
18'-0"
·SECTION·
·SCALE·¼"=1'-0"·
DOOR
2'-10 x 6'-8
Plant Bench
Plant Bench
3½ C. I. Heating Coil
8"
2'-6
2'-6
2"
3'-0"
12"
Walk crowned ¾
Cast iron saddle
·KEY·TO·MATERIALS·
Concrete
Plaster
Wood
Earth
Iron
8'-4" ℄ to ℄ of rafters
16" Glass
4 lts 16" Gl.
16" Glass
Gable Rafter
·SECTION·ON·LINE·A~A·
Typical rafter
·DETAILS·OF·STANDARD·GREENHOUSE·AND·WORK-ROOM·
·LORD·AND·BVRNHAM·COMPANY·
·BVILDERS·OF·GREENHOVSES·&·CONSERVATORIES·
·SERVICE·SHEET·No.·1·
·JVNE·1925·

Note: Glad to send you this Service Sheet, drawn to scale for drafting use. On its back is a gable exterior elevation and a complete specification.

We also issue a series of greenhouse studies done in lithograph by Vahan Hagopian, to which you are welcome. Each study contains a plan, section, elevation of interior and a complete description.

Continued on next page

Beds and Tables

Several kinds of construction are employed in the regular stock beds and tables:

Beds—(1) Galvanized iron frames with cypress bottoms and sides. (2) Galvanized iron frames with tile bottoms and cypress or slate sides.

Tables—(1) Galvanized iron frames with ¾-in. planed slate bottoms. (2) Galvanized iron frames with cypress bottoms.

How to Specify

The following may serve as a suggestive guide in making specifications:

Frame—The greenhouse to be built with a framework consisting of cast iron sills capping the masonry walls, steel rafters and purlins, and non-freezable cast iron gutters. Rafters to be spaced about 8 ft. 4 in. centers. All sills and gutters to be cast in lengths of about 8 ft. 4 in.

Wood Members—All wood used throughout to be of clear Gulf cypress, neatly milled and free from all defects. The structure to be furnished with the necessary ridge, mouldings, etc. All members to be properly moulded and secured to the steel frame with screws, lugs, etc.

Gables and Partitions—The house to be furnished with ...... glass gables and ...... glass partitions. These to be constructed in a manner similar to the other parts of superstructure.

Ventilation—A run of ventilating sash, constructed of cypress, to be placed on each side of ridge, hinged to same. A line of ventilating sash to be placed on each vertical side hinged to underside of gutter of modified curved eave house (Fig. 1) and in straight eave house (Fig. 3). All to be operated with LORD & BURNHAM Co.'s special ventilating machinery.

Painting and Glazing—All cast iron and steel work, entering into the superstructure, to receive 1 coat of red lead before shipment. All wood work, 1 coat of pure white lead and linseed oil. After the frame is erected, 1 coat of white paint. After glazing, a finishing coat of white.

Plant Beds—Plant beds, constructed with steel frames, cypress sides and bottoms, to be placed in each compartment, constructed and arranged in manner to best serve the various plants intended to be grown.

Heat—Hot water system. Place a sufficient number of 3½-in. internal diameter cast iron pipes, so as to maintain desired temperature when the thermometer registers zero outside. Connect heating system to a Burnham cast iron boiler having sufficient capacity to maintain the temperatures specified.

Dimensions—House to be .... ft. long by .... ft. wide.

Co-operation

A greenhouse or conservatory, to insure the complete satisfaction of its owner, combines architectural attractiveness with practicability for growing things.

With our architects' service department, our accumulated experience of over half a century, spent in the building of glass enclosed structures, combined with an exact knowledge of the rather inelastic demands of plant life, is placed at the disposal of architects.

References

Miss Paula Uihlein, Milwaukee, Wis.; George W. Perkins, Riverdale, N. Y., Robert M. Byers, Architect; DeLamar Estate, Glen Cove, N. Y., C. P. H. Gilbert, Architect; Larz Anderson, Brookline, Mass., Fox & Gale, Architects; P. A. B. Widener Estate, Ogontz, Pa., Horace Trumbauer, Architect; Chas. S. Walton, St. Davids, Pa., D. Knickerbacker Boyd, Architect.

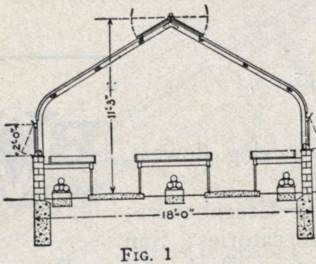


FIG. 1

MODIFIED CURVED EAVE HOUSE

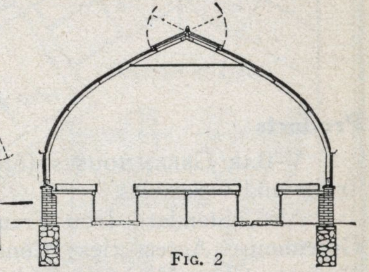


FIG. 2

CURVILINEAR ROOF HOUSE

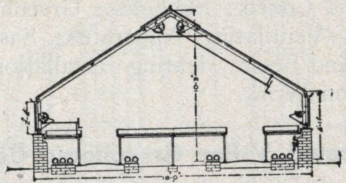
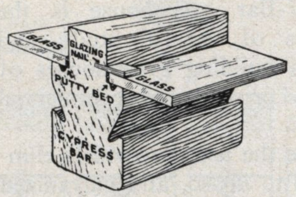


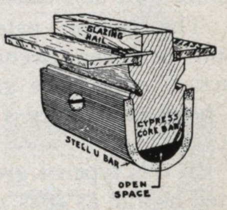
FIG. 3

STRAIGHT ROOF HOUSE



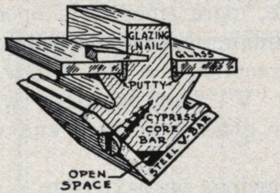
STANDARD CYPRESS ROOF BAR

Used on the sectional iron frame construction



U-SHAPE BAR USED ON U-BAR CONSTRUCTION

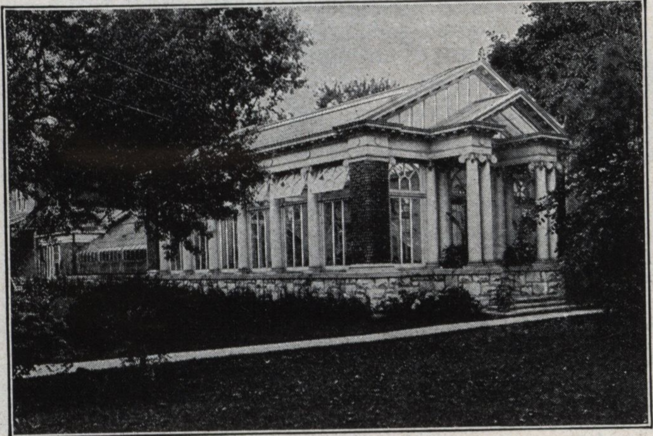
Metal portion is galvanized. Core is cypress, with drip gutter



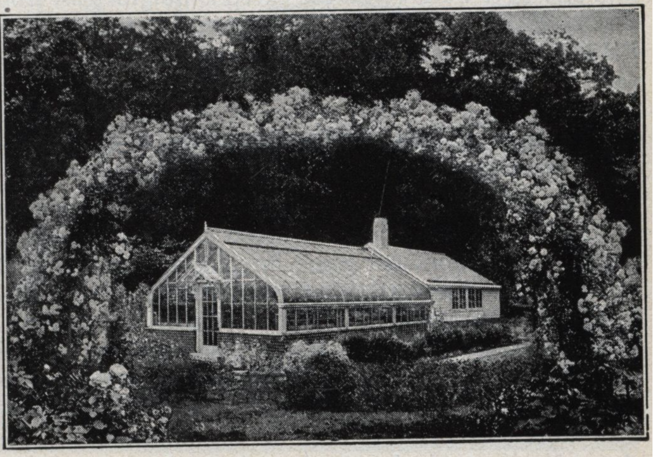
V-SHAPE BAR CONSTRUCTION

It is but a modified U-Bar with drip-guttered cypress core bar

SAMPLES DISPLAYED WITH
ARCHITECTS' SAMPLES CORPORATION
NEW YORK, N.Y.



ADAPTATION OF IRON FRAME CONSTRUCTION TO A CLASSIC PALM HOUSE



THE SIMPLEST TYPE OF IRON FRAME CURVED EAVE HOUSE

WILLIAM H. LUTTON COMPANY

Designers and Builders of Patented V-Bar Greenhouses

TELEPHONE
Bergen 2416

GENERAL OFFICE AND WORKS

JERSEY CITY, N. J.

Products

V-Bar Greenhouses for raising flowers, fruits and vegetables.

Also, Standard Iron Frame Greenhouses; Greenhouse Accessories; Conservatories; Sun Parlors; Glass Enclosed Swimming Pools; Glass Enclosed Tennis Courts; Skylights; Greenhouse Benches and Tables; Ventilating Apparatus; Sash Operators; Hot Water and Steam Heating Installations; Structural Steel and Iron Work.

Lutton Patented V-Bar Greenhouse Construction

We are the originators of the V-Bar construction and we own and control all patents covering same.

The Lutton patented V-Bar greenhouse is the result of over twenty years of careful study and practical experience gained in building greenhouses of all types and sizes for both private and commercial use.

In this type of greenhouse the use of wood is eliminated as far as it is practical to do so, and galvanized steel roof bars, which are smaller in size but much stronger, are used in place of the wood.

This produces a greenhouse that is far more attractive in appearance, more efficient in operation and less expensive to maintain than the standard painted iron frame type of greenhouse. The V-Bars consist of a galvanized steel "V" bar on edge with a cypress core to which the glass is secured and which forms a cushion.

See detail drawings on next page.

Not only are the V-Bars galvanized by the hot process after being completely fabricated, but the entire iron and steel work (with the exception of the cast iron sills and the cast iron wall ventilating panels), thus eliminating unsightly rust streaks so prevalent in ordinary painted steel greenhouse frames.

Advantages of the Lutton Patented V-Bar Construction

(1) The galvanized V-Bar is fitted with a cypress core, and the glass rests on a wood cushion and elastic putty bed and does not come in contact with the steel bar as is the case with other steel constructions. This eliminates the breakage of glass caused by the contraction and expansion of the steel frame.

(2) There is a continuous and unobstructed gutter on each side of the V-Bar which carries off the condensation water and drip forming on the underside of the glass adjacent to the bar.

BVR
TRADE MARK REG. U.S. PAT. OFF.
GREEN HOUSES
PAT. JAN. 2.1917

On account of the fact that the steel V-Bar does not touch the cold glass but is insulated from the outside temperature by the wood core, practically no condensation forms on the bar itself and there is no drip. Other constructions, without drip gutters, which depend entirely on the theory of capillary attraction to make the condensation water follow the bar down the roof are not reliable, because when the water meets the slightest projection or obstruction it drops off. The Lutton patented V-Bar system is practically the only steel greenhouse construction eliminating drip. In all greenhouses constructed with wood bars the bars are always provided with gutters on each side which demonstrates clearly that gutters are necessary.

(3) The V-Bar construction is architecturally more unique and imposing and lighter in appearance, on account of the shape and size of the steel section, than any other greenhouse construction.

On account of the small area of the V-Bar in comparison with other steel bar constructions, it casts much less shadow (approximately 50% less) on account of its deflecting sides and shallower section.

(4) The V-Bar core will always remain in its proper position for the reason that it is held tightly in place by the wedge-shape metal bar to which it is secured by brass screws, while in other constructions the core bar is only suspended, allowing leeway for movement in case of shrinkage which is liable to break the glass and misplace the core bar.

(5) The V-Bar construction does not require columns for supporting the roof (excepting for spans over 30 ft. wide).

Columns in narrow width greenhouses are unsightly and cause shadows, besides occupying space which can be used for plants. The V-Bar construction is held rigid and firm by means of strong light flat steel rafters spaced about 8 ft. 2⅝ in. center to center and spanning the width leaving the center of the greenhouse unobstructed.

Owing to the much greater strength of the steel V-Bar as compared with the ordinary wood bar, the purlins can be spaced further apart, thus lightening the appearance of the superstructure.

Service Department

Our Service department will be pleased to co-operate with architects and engineers and submit sketches, working drawings, detail specifications and estimates designed to meet the requirements of any particular case in the most practical and economical manner.

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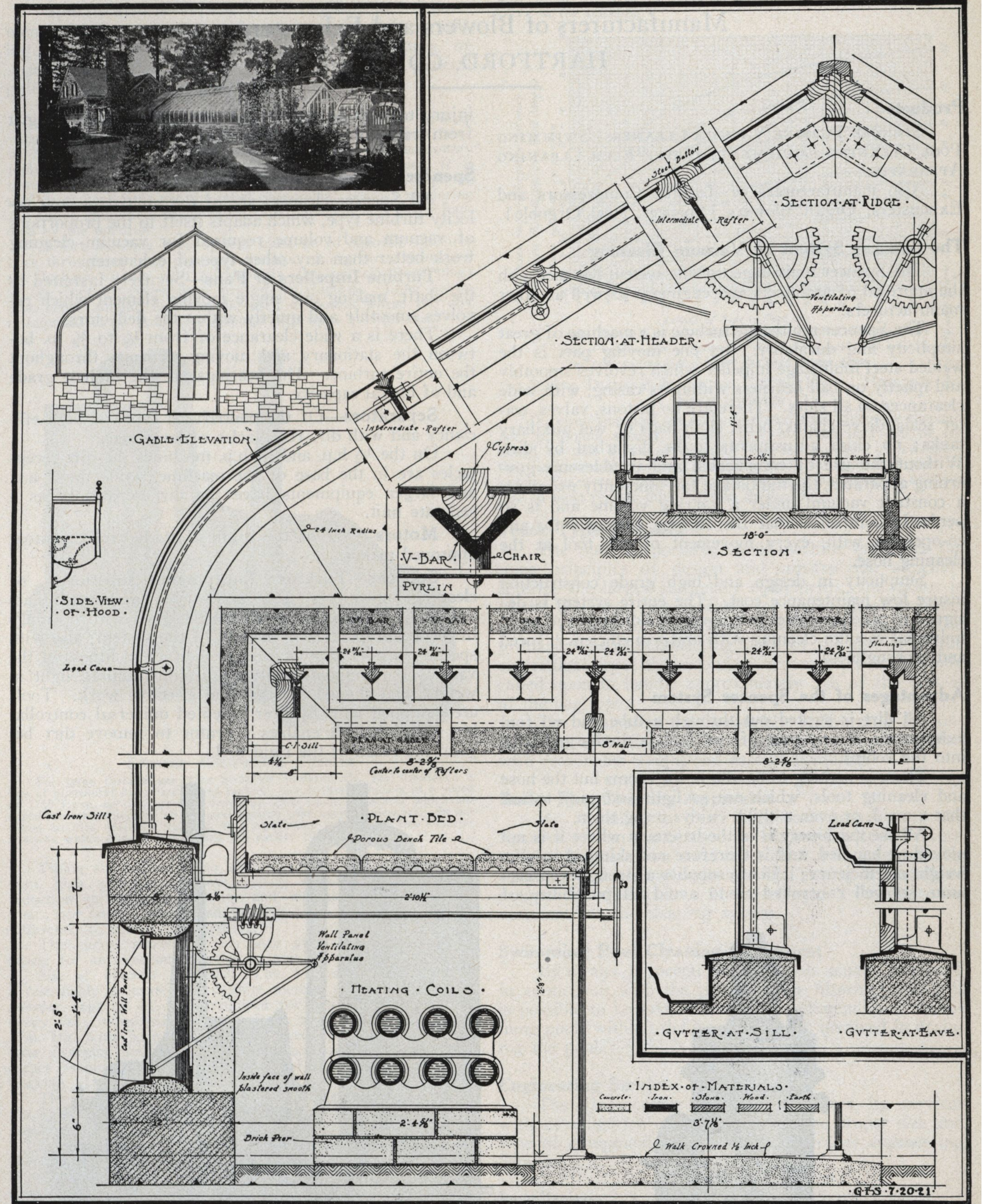

·Section·at·Ridge·
Steel Batten
Intermediate Rafter
Ventilating Apparatus
·Section·at·Header·
11'-4"
2'-10½"
2'-7⅛"
5'-0½"
18'-0"
·Section·
·Gable·Elevation·
·Side·View·of·Hood·
Cypress
24 Inch Radius
·V-Bar·
Chair
Purlin
V-Bar
Partition
24 21/32"
Flashing
C·I·Sill
Plan at Gable
8" Wall
Plan of Connection
4¼"
8"
8'-2⅝"
Center to center of Rafters
2"
Lead Cane
Cast Iron Sill
·Plant·Bed·
Slate
Porous Bench Tile
7"
4½"
2'-10½"
Wall Panel Ventilating Apparatus
Cast Iron Wall Panel
2'-5"
1'-4"
6"
12"
2'-8"
·Heating·Coils·
Inside face of wall plastered smooth
Brick Pier
2'-4⅝"
3'-7½"
Walk Crowned ½ Inch
·Gutter·at·Sill·
·Gutter·at·Eave·
·Index·of·Materials·
Concrete
Iron
Stone
Wood
Earth
G·F·S·7·20·21·

·V-BAR GREENHOUSE·
·MEASURED·DETAILS·
·WALL·PANEL·TYPE·

BVR GREENHOUSES SERVICE

·GARAGE·SERVICE·B'LD'G·&·GREENHOUSE·
·FOR RUFUS·W·SCOTT·ESQ·GERMANTOWN·PA·
DUHRING·OKIE·&·ZIEGLER·ARCHTS·PHILA·PA·

BVR GREENHOUSES QUALITY

·DRAWING·NO·1A·
·W·H·LUTTON·CO·INC·
·512·FIFTH·AVE·N·Y·
·ESTABLISHED·1905·

THE SPENCER TURBINE CO.

Manufacturers of Blowers and Exhausters

HARTFORD, CONN.

Products

Spencer Turbine Vacuum Cleaners; Swimming Pool Cleaning Equipment; Boiler Flue Cleaning Apparatus.

Also manufacturers of Turbine Compressors and Exhausters, Organ Blowers (Spencer Steel Orgoblo).

The Spencer System of Vacuum Cleaning

The Spencer multistage turbine system has met with the approval of architects and engineers as well as other manufacturers.

The Spencer multistage turbine is a machine of great simplicity and durability. Its one moving part is the welded steel multistage impeller which revolves smoothly and quietly on ball bearings within its casing, with wide clearances on all sides. There are no pistons, valves, water seals, drive chains, belts, cloth bags or wet auxiliary tanks; no close adjustments to be disturbed by dirt. Without the use of complicated and troublesome governing apparatus, the multistage fan inherently maintains a constant vacuum under a varying volume and is so perfectly controlled that the turbine responds to, and co-operates with, every movement of the tool at the cleaning hose.

Simplicity in design and high grade construction insure low maintenance cost. The entire system is designed to produce correct air stream conditions, and to do universal vacuum cleaning with uniform efficiency, speed and thoroughness.

Advantages of the Spencer System

All dirt is sucked out through a tube and no foul exhaust air or any part of the dust is discharged back into the rooms.

There is nothing to handle in the rooms but the hose and cleaning tools, which are so light and easy to use that a maid, or even a child, enjoys using them.

All the machinery is in the basement where it is not moved or handled, and is therefore not skimped in size, weight or efficiency; it hence supplies a strong, even vacuum, so well controlled as to avoid all possibility of injury to rugs or fabric, and removes all dust and grit from cracks or pores of bare floors,

Spencer Turbine Vacuum Cleaners

All Spencer cleaners are of the multistage low velocity turbine type, which adapts itself to the proportions of vacuum and volume required for vacuum cleaning work better than any other type of exhauster.

Turbine Impellers or Fans—Securely fastened to the shaft, making one single moving element which revolves smoothly and quietly within the deflectors,

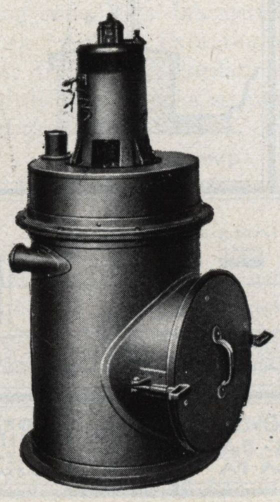
There is a wide clearance of from 1/8 to 3/8 in. between the stationary and moving elements throughout the entire turbine. The bearings are the highest grade and of liberal capacity.

Separators—Of the centrifugal type, of high efficiency and with dirt receptacles of large size.

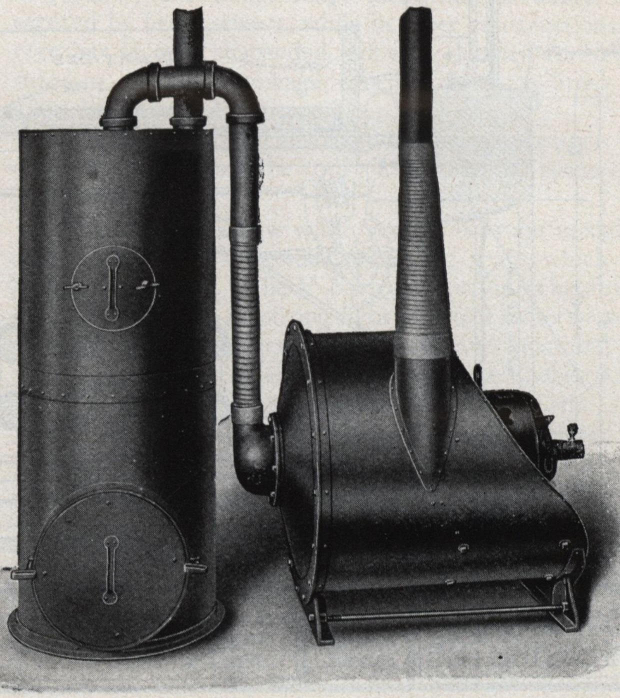
On the 1/2 h.p. and 3/4 h.p. machines the dirt receptacles are in the base of the machine, while the 2 h.p. and larger equipments have the dirt separators as a separate unit.

Motors—Are of the highest grade and the most approved makes.

Spencer Turbine Equipment—Superiority of cleaning implements and accessories universally acknowledged. Spencer tools are designed with openings in correct proportion to the rest of the system; also with special consideration as to convenience and fitness of the various requirements. Strong in construction, light in weight, and shaped for fast and effective work. Tools are equipped with Spencer patented universal controllable swivel, which enables operator to remove dirt beyond the reach of the rigid tool.



No. 411—3/4 H.P. Vertical



5 H.P. Horizontal

Types of Spencer Turbines

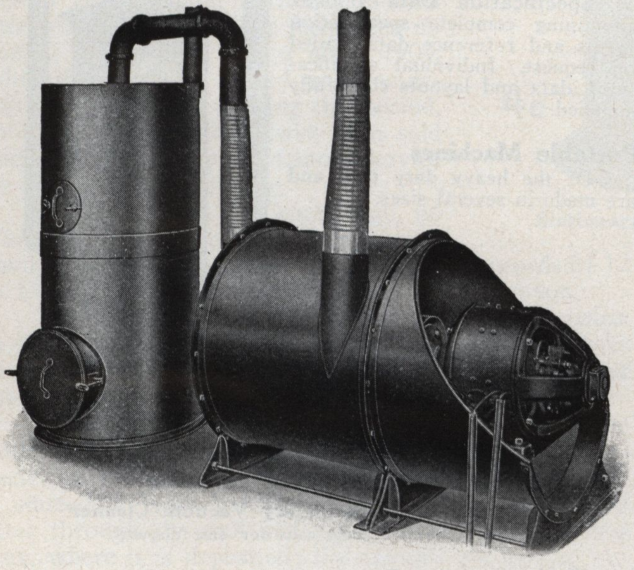
Continued on next page

All wearing surfaces are renewable. Tools are attached to handle by means of steel locking chuck.

Specifications—While our engineering department prefers to examine each particular job before making definite recommendations regarding layouts or specifications, the following may serve as a general guide when this is not possible:

Piping System—Inasmuch as the hose causes greater vacuum loss than any other part of the system, requires labor in handling, and eventually wears out, while the stationary piping system possesses none of these characteristics, it is obvious that to secure permanent efficiency plenty of piping and short hose runs are the most economical, besides rendering the entire equipment much more rapid, efficient and easily handled by the operator.

A dirt handling pipe system must be of smooth, uniform bore throughout both pipe and fittings. Long turn "drainage" or Durham fittings with horizontally disposed clean-out plugs at the foot of risers have proved satisfactory. Long sweep pipe bends should, however, be used at points where the dirt is required to go from a horizontal pipe up a vertical one.



Spencer Horizontal Turbine

For large installations The Spencer Turbine Co. has developed a line of horizontal direct connected turbine equipments operating at a speed of 1750 r.p.m. as distinguished from the 3500 r.p.m. apparatus which has heretofore characterized all fan and turbine type vacuum cleaners. In addition to this desirable feature, this equipment retains all the superior features which have characterized the earlier Spencer models

Piping should not be so small as to require too high vacuum, high velocity and low density with the accompanying reduction in carrying capacity and increase in "sand blast" wear; nor on the other hand so large as to reduce the velocity sufficiently to permit "dirt settling."

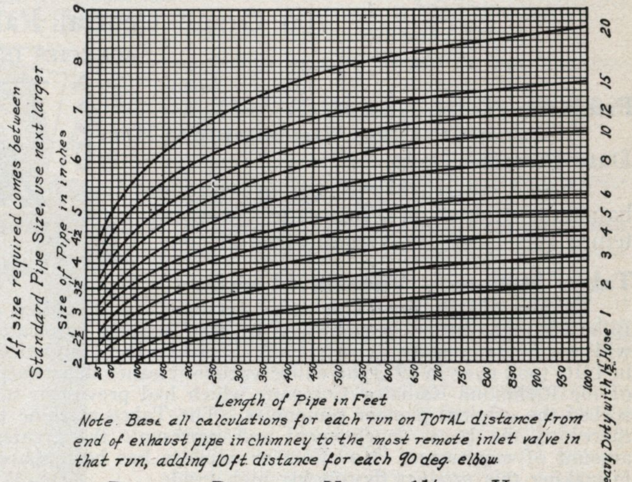
The curves shown on this page give the correct size of piping for any vacuum cleaning system.

Size of Machine to Install—The following rules afford a reasonably accurate and definite method of determining the sweeper capacity of plant required for any given building, if *heavy duty standards* are used, i. e., a minimum vacuum of 2 in. Hg. with ⅞-in. round sharp edged open orifice for bare floor sweeping and 3-in. Hg. with a similar ⅝-in. orifice for carpet cleaning, both at end of 50 ft. of hose with all sweepers working. Use following formula:

The square foot floor or carpet area divided by 7500 times the available hours for each cleaning equals the number of sweepers required.

Capacity Test—For heavy duty work specification should provide that the plant shall maintain a minimum vacuum of at least 2 in. Hg. in back of each of as many ⅞-in. round sharp edged orifices as the system is designed to operate simultaneously, and a vacuum of not less than 3 in. Hg. in back of each of as many ⅝-in. round sharp edged orifices as the system is designed to operate simultaneously. This test to be made at the end of 50 ft. of hose.

Rules for Determining Pipe Sizes—Size of pipe used for any vacuum cleaner installation should be that given at left of diagram, horizontally opposite the intersection of curve for the total number of sweepers to be operated simultaneously with vertical line above the number corresponding to total length of pipe from the end of exhaust pipe to the most remote inlet valve in the building.



Piping Diagram Based on Use of 1½-in. Hose for Each Sweeper

If fewer sweepers are to be operated simultaneously through part of piping system, the size pipe for such part can be reduced to that given in diagram for the number of sweepers that will actually be used simultaneously through that part of piping, based on same total length of pipe from end of exhaust pipe to most remote inlet valve in the building.

Truck Type Cleaners

The Spencer portable truck machine embodies the same principles of design and construction as characterize the larger stationary equipments; the motor is of the Universal type suitable for either direct or alternating current of 60-cycle or lower frequencies. The primary separator collecting 95% of the dirt is of the centrifugal type; the secondary separator, which is only called upon to handle approximately 5% of the dirt, is of the bag type.

The equipment is thoroughly high grade in construction and offers the maximum of power consistent with reasonable weight and ease of handling.

Boiler Flue Cleaning Apparatus

By installing a few additional attachments the Spencer system can be used in cleaning horizontal return tubular and cast iron sectional boilers with a remarkable economy in fuel consumption. The saving in fuel alone frequently amounts to a liberal return on the entire investment for the cleaning system.

Swimming Pool Cleaning Equipment

By means of special cleaning tools usually employed in connection with the pump on the filtering system it is possible to remove accumulated sediment from swimming pools without the waste of water involved in draining the pool.

Engineering Service

The Engineering Department offers its services without obligation in recommending the proper size and type of equipment, piping layout, or other engineering details.

Installations

The Spencer system is installed in a very large number of the best buildings of all types throughout the United States and Canada. Lack of space prevents mentioning any of these particular buildings but full information will be gladly furnished on inquiry.

ALLEN & BILLMYRE COMPANY, INC.

Stationary and Portable Vacuum Cleaners
706 Grand Central Palace, NEW YORK, N. Y.
AGENCIES IN PRINCIPAL CITIES

FACTORY
PORT CHESTER, N. Y.

TABCO
TRADE MARK

Products

Vacuum Cleaners, Stationary, and Heavy Duty Portable Types.

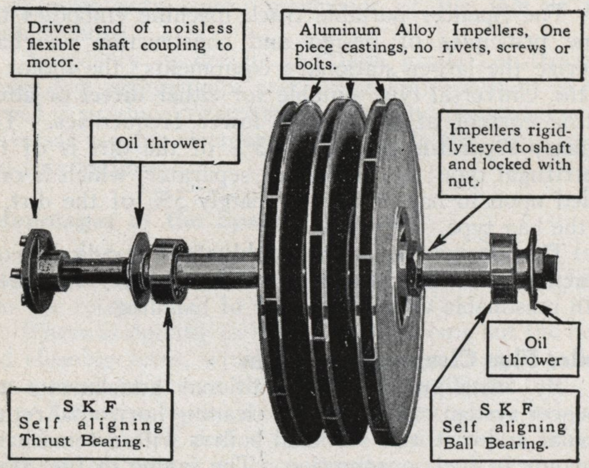
Also Centrifugal Air Compressors and Exhausters; Industrial Pneumatic Sweeping Systems; Gas Boosters, Organ Blowers, etc.

Tabco Stationary Vacuum Cleaners

Origin and Policy—The entire personnel of the Allen & Billmyre organization is composed of men actively associated with the industry since its inception. This company, organized in 1916, took over in 1913 the entire vacuum cleaner department of the Richmond Radiator Company which had previously absorbed the original pioneer companies. The Tabco machine is, therefore, the latest development and represents the greatest amount of experience. No effort or expense has been spared in making this product thoroughly high grade.

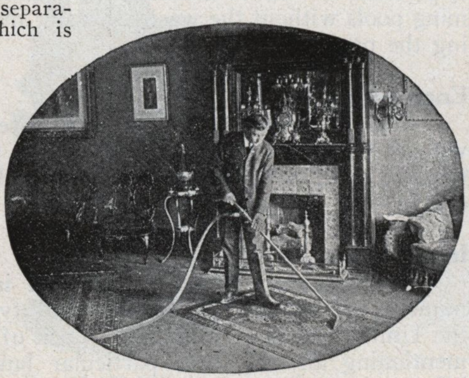
Type and Performance—All Tabco Vacuum Cleaners are of the horizontal turbine or, more properly speaking, the multi-stage centrifugal type. They have the ideal characteristic of being inherently self-governing both as to power consumption and degree of vacuum maintained. The power used varies with the number of sweepers in actual use. No safety valves or regulating valves of any kind are required.

Vacuum Producer Construction—Heavy cast iron sectional construction; each machine mounted on a heavy cast iron base; oversize SKF ball bearings at both ends of housing; noiseless flexible shaft coupling; impellers are one-piece aluminum castings accurately balanced and finished; liberal clearances throughout. Operation quiet and without vibration. "One working part—no wearing parts." Built for a lifetime of dependable service.


Driven end of noisless flexible shaft coupling to motor.
Aluminum Alloy Impellers, One piece castings, no rivets, screws or bolts.
Oil thrower
Impellers rigidly keyed to shaft and locked with nut.
Oil thrower
SKF Self aligning Thrust Bearing.
SKF Self aligning Ball Bearing.

The Rotating Element of Tabco Vacuum Producer—The Only Working Part

Dust Separators—Made in a variety of sizes and types. Practically 100% separation obtained, which is highly desirable for sanitary reasons. Plain centrifugal separators supplied when preferred but filtration types always recommended. A dust bucket is affixed to lower part of dust separator. A slight turn releases the bucket for convenient emptying without shoveling, handling or scattering the dust.



Tabco Tools—Convenient and Easy to Handle

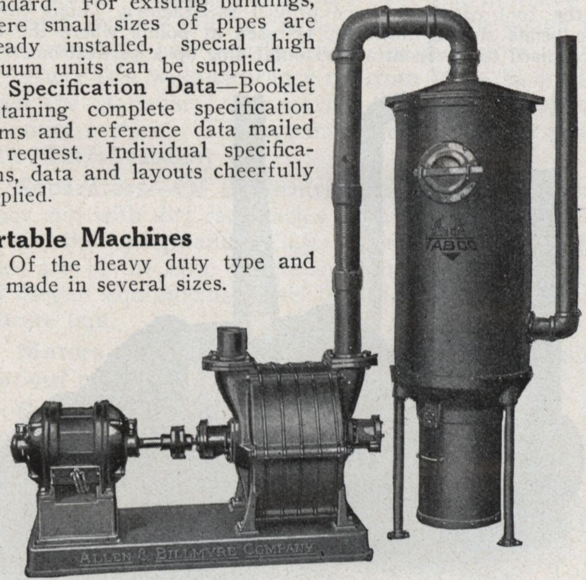
Accessories—Tabco nozzles, hose inlet valves, hose and hose couplings represent the latest types. Designed for ease in handling with maximum degree of efficiency and service.

Sizes and Capacities—All sizes, ranging from ½ to 50 hp. units. Machines are rated by their "sweeper capacity," i.e., the maximum number of sweeping nozzles they are to operate simultaneously. Standard rating machines provide 2½ motor horsepower per sweeper capacity. Machines of smaller horsepower are rated as substandard. For existing buildings, where small sizes of pipes are already installed, special high vacuum units can be supplied.

Specification Data—Booklet containing complete specification forms and reference data mailed on request. Individual specifications, data and layouts cheerfully supplied.

Portable Machines

Of the heavy duty type and are made in several sizes.



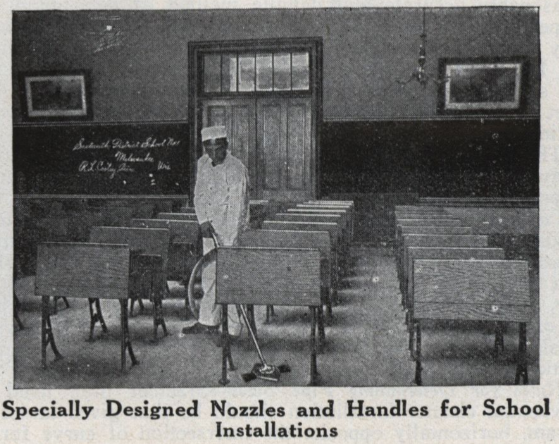
A Typical Tabco Stationary Vacuum Cleaner
Note convenient dust cans for dust disposal

Installations

Tabco machines are widely used and known throughout the United States as well as in many foreign countries. Typical installations are:

Hotel Traymore, Atlantic City, N. J.; Bellevue-Stratford Hotel, Philadelphia, Pa.; New York Edison Co., New York, N. Y.; Alexander Hamilton Hotel, Paterson, N. J.; Hotel Wisconsin, Milwaukee, Wis.; Abe Lincoln Hotel, Springfield, Ill.; J. L. Hudson Co. (Dept. Store), Detroit, Mich.; Willard Storage Battery Co., Cleveland, Ohio; B. F. Goodrich Co., Akron, Ohio.

Many public school buildings in Easton, Pa., Bethlehem, Pa., Philadelphia, Pa., Baltimore, Md., Detroit, Mich., and other cities.



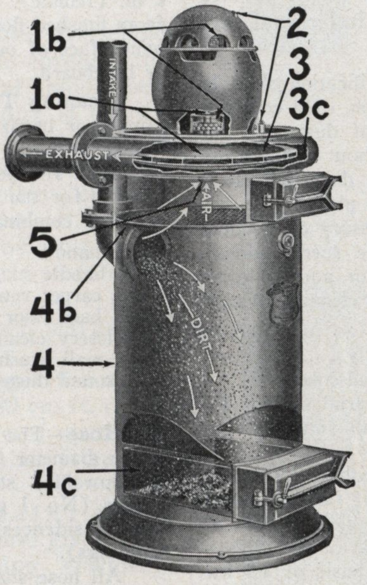
Specially Designed Nozzles and Handles for School Installations

THE UNITED ELECTRIC COMPANY

Tuec Installed and Truck Type Vacuum Cleaning Systems

FACTORY AND GENERAL OFFICES
CANTON, OHIO

CABLE ADDRESS
"Tuec, Canton"



Stationary Type Tuec

Products

Tuec Stationary Vacuum Cleaning Systems and Equipment for every type of building; Tuec Truck Type Vacuum Cleaner and Tuec Swimming Pool Cleaners.

Also Ohio Portable Electric Cleaner.

Tuec Vacuum Cleaning System

Tuec Systems will satisfactorily and efficiently handle the cleaning problems of any building from the small residence to the large commercial structure.

The inherent soundness of Tuec design and cleaning efficiency is well attested by the fact there have been no radical changes in design since 1909, when this company started manufacturing Tuec Systems. During this period, thousands of machines have been sold and have given very satisfactory service in every type of building.

To the best of our knowledge, no Tuec has ever worn out. Our regular check on Tuec installations has shown that records of 12 to 15 years' satisfactory service are not uncommon.

The machine itself, placed in a convenient location in the basement, is connected to outlets in various parts of the building by riser and lateral piping. The exhaust from the machine is piped to any convenient flue.

The light weight hose is connected to one of the outlets, and the handle with proper cleaning tool connected to the other end of the hose. When the motor is started, a large volume of air carries the dirt and litter through the tool and piping, into the separating tank, where it is deposited; the exhaust air passing out the flue. This volume of air is more than enough to take care of every cleaning problem.

Features and Advantages of the Tuec System

1 One Moving Part—

(a) Motor armature connected directly to the fan, with no intermediate connections or couplings.

(b) Armature mounted on self-aligning ball bearings, running in a constant oil bath.

(c) Power efficiency is high, and friction losses are reduced to a minimum, through this type of construction.

(d) Entire motor and fan assembly can be quickly and easily removed, if ever necessary, by removing a few screws.

2 Oiling—

(a) There are only two points that require oil, and these need attention only twice a year.

3 The Fan—

(a) Made of heavy gauge sheet steel.

(b) The unusually large volume of air handled by the Tuec, which is largely responsible for its cleaning efficiency, is due to the special design of the fan. The sides of the Tuec fan are "dished," instead of being parallel to each other, so that air is delivered at the rim at the same constant rate that it is taken in at the center. Thus back pressure, friction, and other ordinary fan losses are minimized.

(c) Ample clearances in fan case prevent accumulation of material that would cause wear on moving part.

4 The Separating Tank—

(a) Made of heavy gauge sheet steel.

(b) Easily cleaned separating screen, placed above the intake pipe, prevents heavy dirt from passing through the fan.

(c) Dirt falls into large capacity, easily removable drawer in base of tank.

(d) No cloth bags or baffle plates to interfere with the continuous passage of air through the machine.

5 The Patented Automatic Air Throttle—

(a) This device controls the amount of air handled by the fan and thus prevents overloading of the motor.

6 Cleaning Efficiency, Compactness and Simplicity of Design and Low Cost of Operation—

(a) Because larger volume of air is moved, larger tools can be used, giving quicker and more thorough cleaning. Tools are well designed and easy to handle.

(b) Motor and fan unit mounted directly on the separating tank, makes the Tuec very compact. The floor space occupied is very small; from 20 to 40 in. in diameter according to sweeper capacity of machine. Only one moving part; sturdy construction throughout.

(c) Through the use of only one fan power consumption and operating costs are lower per sweeper. Machine does not require skilled mechanic's attention—just 2 oilings a year and occasional cleaning of screen.

7 Tuec Tools and Hose—

(a) Standard tools furnished with Tuec installations are light in weight and built to stand up under hard service. There is a tool for every cleaning purpose.

(b) Tuec hose is made in 6 types, to cover every individual requirement.

BRIEF SPECIFICATIONS OF STANDARD TUEC CLEANERS

Model No.	Capacity	Size of motor, hp.	Speed of motor. r. p. m.	Distance floor to center intake, in.	Distance floor to center exhaust, in.	Over-all dimensions, in.	Size of intake, in.	Size of exhaust, in.	Shipping weight, lb.
260	1-sweeper	¾	5000	24	30¾	17x46	2½	2½	280
*260	1-sweeper	¾	5000	....	....	†	1¾	2½	350
300	1-sweeper	2½	3500	33¼	47¾	26x72	4	4	950
400	2-sweeper	3½	3500	39¼	53¾	26x76	4	4	1050
600	3-sweeper	5	3500	39¼	54½	30x80	5	5	1250
800	4-sweeper	6½	3500	39¼	54½	30x80	5	5	1250
1200	6-sweeper	10	3500	39¼	54½	30x80	5	5	1250

*Truck. †30x36x48 in.

Tuec—the Grand Prize Cleaning System

At the Panama-Pacific International Exposition in San Francisco, 1915, the Tuec won The "Highest Award"—The "Grand Prize." It has won first place in all open competitive engineering tests.

Engineering Service and File Data Folders

The services of our trained engineers are readily available at no cost or obligation, to assist in solving cleaning problems.

Complete technical and descriptive information is contained in our Standard A.I.A. File Data Folders covering various Tuec uses.

Representative Installations and Their Architects

Bureau of Standards, Washington, D. C., Wood, Donn & Deming
Public Museum, Milwaukee, Wis., Ferry & Clas
A. R. Kuhlman, Toledo, Ohio, Bates & Gamble
Pres. R. L. Wilbur, Leland-Stanford University, L. C. Mullgardt
High School, New Kensington, Pa., Chas. J. Reiger
Waite High School, Toledo, Ohio, Edwin M. Gee
High School, Santa Monica, Cal., Allison & Allison
Old Towne Canoe Company, Old Town, Me.
Deuber-Hampden Watch Works, Canton, Ohio
Fourth Church of Christ, Scientist, Chicago, Ill., S. S. Beman
St. John's Church, Indianapolis, Ind., D. A. Bohlen & Son
Scottish Rite Cathedral, Dallas, Tex., Herbert M. Greene Co.
Detroit Athletic Club, Detroit, Mich., Albert Kahn, Inc.
Onondaga Sanatorium, Syracuse, N. Y., Taylor & Bouta
Muirdale Sanatorium, Wauwatosa, Wis., Robert Messmer & Bro.
Washington Theater, Detroit, Mich.
Golden Gate Theater, San Francisco, Cal., G. A. Lansburgh
Robert E. Lee Hotel, Winston-Salem, N. C., Stephens Company
Wm. Penn Hotel, Harrisburg, Pa., Frank G. Fahnestock
Woodmen of World Building, Omaha, Neb., Holabird & Roche
Kresge Building, Detroit, Mich., Albert Kahn, Inc.
Federal Reserve Bank, Richmond, Va.

Continued on next page

Model Specifications for Tuec Stationary Vacuum Cleaning System

The following will serve as a general guide to installed vacuum cleaner specifications. Our engineering department would appreciate the opportunity of examining each particular job, as we can be of much service to the architect in working out definite individual layouts and specifications.

General—The work included in this specification shall be the furnishing and installing, ready for operation, of a complete suction air cleaning system for the removal of dust, dirt and other litter from all exposed surfaces throughout the interior of the building, and for conveying said dirt, dust, etc., to a suitable receptacle located as indicated upon the plans.

The complete system shall include all necessary connections to the piping and wiring (covered by separate specifications), cleaning tools, hose, separator, exhauster, motor and all other appurtenances required to make a complete air cleaning system.

Machine—The vacuum producer, located as indicated on plans, shall be capable of operating simultaneously .... sweepers, and shall operate without overload, under full load conditions.

The machine shall be made of the best material suitable for the purpose, so constructed as to handle the full volume of air required, with the least possible friction loss.

It shall be of the centrifugal fan type, with impeller fan, directly connected to motor. The construction of fan and casing shall be so proportioned as to allow sufficient clearance in all parts, to prevent clogging and choking from dust or dirt.

Power imput shall be computed upon the basis of 1.9 kw. per sweeper, when operating under full load conditions.

The power, when all inlets of the system are closed, shall not exceed 60% of that of full load.

No auxiliary governing devices of any kind whatsoever will be permitted. The vacuum maintained shall be constant under all conditions.

Motor—To comply with the standard requirements of the American Institute of Electrical Engineers and the National Electrical Code, the motor shall be of such size that when operating under test conditions it will not be under less than three-fourths, nor more than full load conditions, and shall operate continuously without undue heating. The maximum rise in temperature shall not exceed 40° C., above the room temperature under full load conditions.

Separator—But 1 separator shall be used, which shall be of the dry type; made of steel, rigidly supported and an integral part of the complete machine. A screen, if used, is to be so placed that nothing but the lightest dust may lodge thereon. Gravity to be the only means of separation. No cloth bags or other appliance liable to rupture shall be employed.

Separator to have a clean-out door and handhole to give access to the interior, to allow for the easy removal of the accumulated dirt.

Inlet Valves—The inlet valves of approved design shall be so located, in accordance with the piping layout for the building, that any point may be reached with not more than 50 ft. of hose. Furnish .... concealed inlet valves, ... exposed pipe inlet valves, ... floor valves.

Piping—All pipe shall be standard black mild steel or wrought iron, without burrs, properly reamed and fully threaded.

All fittings shall be of the recessed drainage type of long-turn pattern, or Tuec Special Fittings.

All pipe lines to conform to the piping diagram, as indicated on plans, and shall be installed in a neat, workmanlike manner without staining or tool marks if exposed. When exposed pipes pass through any wall, floor or ceiling, they shall be fitted with escutcheons securely fastened to the pipes or the building.

All pipes shall be screwed "home" in the fittings, and all joints in pipe lines shall be made by long screws and locknuts or flanged unions, to insure a perfectly smooth and uniform interior surface.

Easily accessible, horizontal, clean-out plugs shall be placed at the bottom of all risers, and at every turn of the piping where possible; so placed that the flow of air is never directly into them.

All pipe lines shall be supported on, or stayed by, iron strap hangers, securely anchored to the building and spaced not over 10 ft. apart.

No pipe shall be less than 2½-in. inside diameter, except for short runs, to single outlet, which may be 2 in. Outlets to be 2 in. (female). Height of outlet, to center not less than 3 in. from finished floor line or at such height as architect may determine; face of outlet to be within ½ to 1½ in. of finished wall or baseboard.

Cleaning Tools—All sweeping tools shall be made of aluminum or bronze. All handles shall be made of brass or steel tubing, properly finished, not less than 1½-in. diameter.

Each sweeper shall be provided with complete set of tools suitable for the particular work to be done.

Any combination of the following tools may be used:

Floor handle
Wall handle
15-in. carpet renovator
15-in. bare floor tool
Upholstery cleaner
10-in. wall brush
5-in. round duster brush
15-in. special bare floor tool with handle and swivel complete
Carpet brush tool
Library brush
Clothes brush
Radiator cleaner
Tuft cleaner

Hose—The hose furnished shall not be less than 1¾-in. inside diameter (except in residence installations where 1½ in. is allowable) steel reinforced, fitted with tapered metal terminals (No. 1 grade for medium sized residences, No. 2 for large residences, No. 3 for schools, churches and all public buildings).

All hose shall be the best quality rubber vacuum hose of a grade suitable to the class of work to be performed, reinforced in an approved manner, and sufficiently strong to prevent collapse of the hose under the highest vacuum or collapse or distortion if stepped upon, with couplings of smooth bore.

Test—Contractor will make regular cleaning test, and if desired by architect, orifice test to determine a vacuum of not less than 1 in. (Hg.) behind a ⅞-in. orifice at the end of a 50-ft. length of hose attached to the farthest outlet from the vacuum producer. This vacuum, with piping and tools according to foregoing specifications, will produce the necessary volume of air for highly efficient cleaning.

Capacity of Machines and Pipe

The following data shows the relation between proper sized pipe and a machine of given capacity.

CAPACITIES OF MACHINES

Model No....................	260	300	400	600	800	1200
Capacity by sweepers..........	1	1-H.D.	2	3	4	6
Free air displacement.........	60	80	160	240	320	480
Maximum length of hose in feet	35	50	50	50	50	50
Diameter of hose.............	1½″	1¾″	1¾″	1¾″	1¾″	1¾″

The distance from the machine to the farthest inlet always determines the size of pipe to be used. The Model 260 requires 2½″ laterals and 2″ risers. 90° elbows are counted as equivalent to 6 ft. of pipe and 45° elbows 3 ft. of pipe. Diameters of lateral piping are gradually reduced as laterals near inlets.

The following schedule is a guide in determining proper sizes for laterals and risers where high duty machines are specified.

CAPACITY OF PIPES

Pipe carrying one sweeper, to be 2½ inches
Pipe carrying one sweeper, more than 150 ft., 3 inches
Pipe carrying two sweepers, less than 100 ft., 3 inches
Pipe carrying two sweepers, more than 100 ft., 4 inches
Pipe carrying three sweepers, to be 4 inches
Pipe carrying four sweepers, less than 100 ft., 4 inches
Pipe carrying four sweepers, more than 100 ft., 5 inches
Pipe carrying five or six sweepers, to be 5 inches.

When 2 or more sweepers are used on the same riser the minimum size should be 3 inches and increased according to the number of sweepers used.

Continued on next page

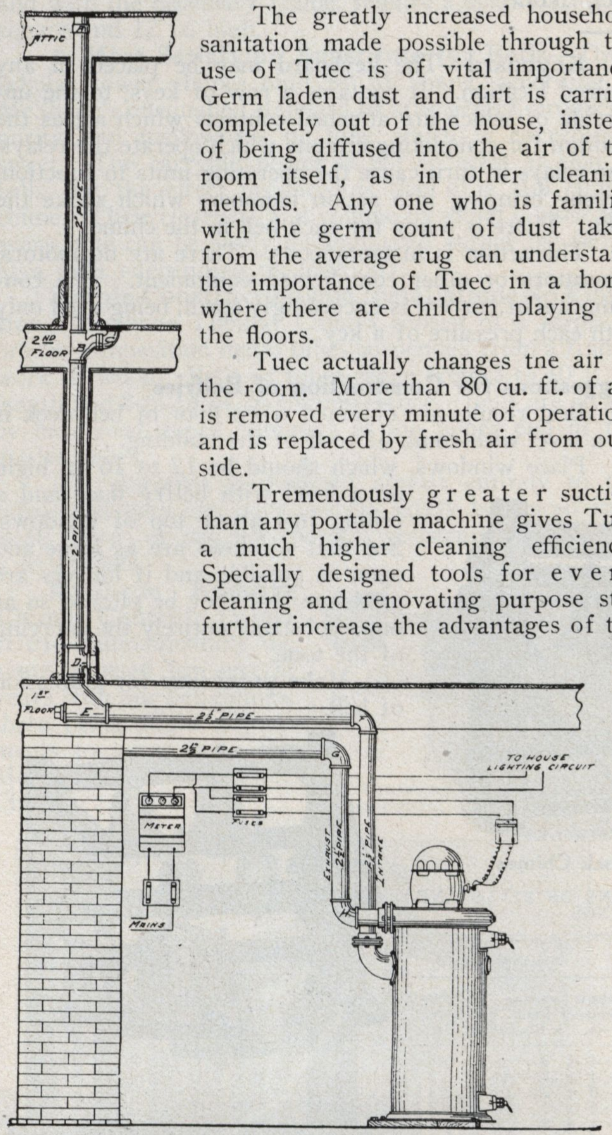
Tuec Installed Systems for Residences

Installed vacuum cleaning systems for the better class residences are coming more and more into demand. This is due to the fact that such systems as Tuec offer features and advantages of great interest to the home owner or builder.

The greatly increased household sanitation made possible through the use of Tuec is of vital importance. Germ laden dust and dirt is carried completely out of the house, instead of being diffused into the air of the room itself, as in other cleaning methods. Any one who is familiar with the germ count of dust taken from the average rug can understand the importance of Tuec in a home where there are children playing on the floors.

Tuec actually changes tne air in the room. More than 80 cu. ft. of air is removed every minute of operation, and is replaced by fresh air from outside.

Tremendously greater suction than any portable machine gives Tuec a much higher cleaning efficiency. Specially designed tools for every cleaning and renovating purpose still further increase the advantages of the Tuec System over the portable type. When it is considered that the hose, handle and tools of the Tuec weigh less than a portable cleaner, it is easily understood why this system of cleaning is so popular with its users.



Typical Piping Installation (Residence)

Code to fittings: "A"—2-in. couplings. "B"—2-in. Y Branch. "C"—2-in. long turn ell. "D"—2x2-in. tee. "E"—2½-in. long turn ell. Both floor and baseboard type inlets are illustrated

Tuec Systems have paid for themselves in less than a year by the saving of rugs, drapes, etc., from damage by moths. Tuec suction is so great that moth eggs and larvae are completely removed. Proof of this is to be found in an examination of the separating tank during the moth season.

Architects for over fifteen years have given their clients a real service in specifying Tuec installations. The continued satisfaction of Tuec owners, not only with the mechanical side of the installation, but also with the many cleaning advantages, indicates the worth of the Tuec System to any one building a modern home.

Tuec Swimming Pool Cleaner

With the Tuec pool cleaner, cleaning and water heating costs can be cut 90%, and the pool will be cleaner and more sanitary.

Tuec Swimming Pool Cleaner in Operation

It is no longer necessary to drain off 40,000 to 50,000 and more gallons of water, scrub down the sides and bottom of the pool, and heat the fresh water, in order to keep swimming pools clean. All the heavier matter that settles on the bottom of the tank and can not be removed by the refiltering process is easily and cheaply removed by the Tuec swimming pool cleaner.

Operation—The Tuec tool is connected to the same pump used in emptying and filling the pool, by means of hose and piping. Water is sucked in, carrying with it the foreign matter loosened by the stiff bristled brush. This water is ejected into the sewer through simple pipe connections.

The tool itself, made of phosphor bronze, has a swivel connection, permitting movement in any direction. The stiff bristled brush, 15-in. long, with an opening on each end, loosens all the fine matter on the floor and walls. Strong suction ejects this foreign matter into the sewer. A total length of 16 ft. is provided for by extension handles on the tool. 50 ft. of hose is furnished as standard, and additional lengths can be had if desired. The equipment is adapted to either the piston or centrifugal type pump used in refiltering, and the piping connections are very easily installed.

Tuec Truck Type Cleaning Equipment

This machine is used to a great extent in existing buildings where there is no piping, and where none can be installed. The truck has practically all of the advantages of the installed machine, and can be easily moved from building to building or floor to floor. It is of such size as to pass easily through doorways and on to small elevators—30 in. wide, 38 in. deep and 48 in. high.

Constructional Features—The truck is very similar to the standard Tuec Stationary machine design. Air is exhausted through two large capacity dust bags. The separating chamber is somewhat smaller than on our Model No. 260 stationary machine. It is easily handled, yet so sturdy that it will stand up under years of rough usage.

Its Many Uses—The varied cleaning which may be accomplished with the new model Tuec No. 260 truck is similar in scope with the service obtained from the stationary type Tuec, and far superior to the work accomplished by small portable cleaners.

Public buildings, garages, factories, hospitals, schools, office buildings, banks, and other existing structures will find the new Tuec No. 260 truck a decided convenience and labor saver. Sturdy lightweight tools are furnished, and every variety of cleaning and renovating can be more economically done.

McSHANE BELL FOUNDRY CO.

ESTABLISHED 1856
BY HENRY McSHANE

INCORPORATED 1904

MAIN OFFICE AND FOUNDRY
Harford Avenue and B. & O. R. R.
BALTIMORE, MD.

Products

Founders of Church Bells, Chimes, Peal and Chapel Bells; Fire Alarm, Courthouse and Tower Clock Bells; also Westminster Clock Chimes, and Schoolhouse Bells.

McShane Tubular Tower Chimes, operated electrically from a standard keyboard.

This company specializes in the building of Musical Bells of the highest standard, Chimes for churches and Tower Clocks.

McShane Electric Chiming Action

Designed to operate on 220-volt 60-cycle alternating or 220-volt direct current, and consists of three parts.

Operating Units (Solenoids)—These are mounted on a plank and occupy space in the hand chiming stand between the levers and floor, and require no additional floor space. There is an operating unit for each bell in the chime.

Relay Panel—This is enclosed in a steel cabinet and is usually placed in the room of tower containing the operating units. There is a relay for each bell in the chime.

Keyboard—The keyboard may be placed in any desired location. It contains a row of keys, to the underside of which are attached contacts which act as the medium for completing circuits which operate the relays. The relays in turn cause the operating units to function, thereby bringing into action hammers which strike the bells. There is a key for each bell in the chime.

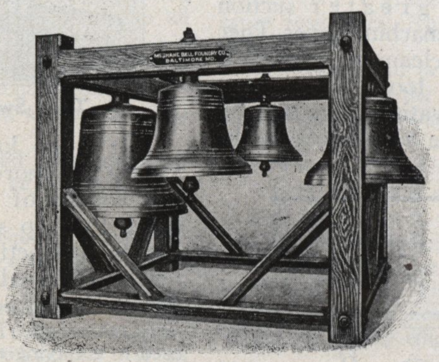
The action is instantaneous. There are no motors, generators or other complicated equipment. The consumption of current is exceedingly small, being used only with each pressure of a key.

Suggestions for Construction of Belfries

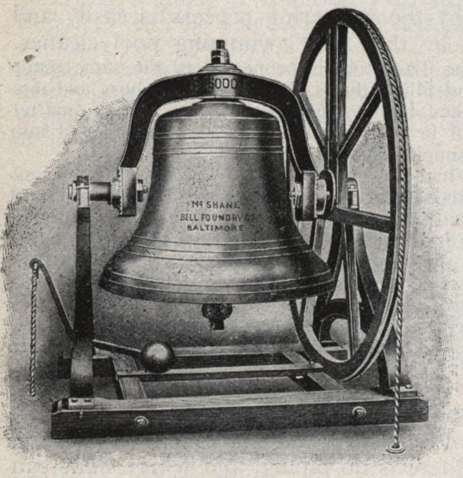
Best results are obtained when floor of bell deck is on a level with comb of roof of the building.

Place windows, which should be 12 to 16 ft. high, on a level with belfry floor and a ceiling just above top of windows. See that windows are as large and open as possible and if louvers are used, see that they be pitched so as not to obstruct entirely the carrying of the tone.

Make provisions for admission of bell.



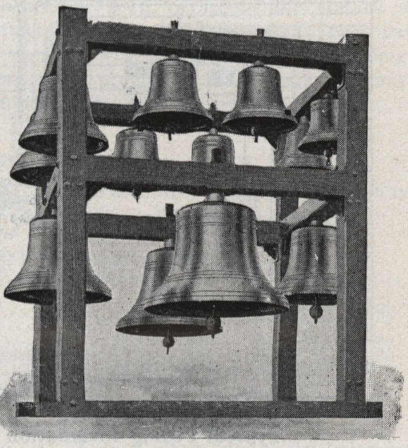
Westminster Clock Chimes



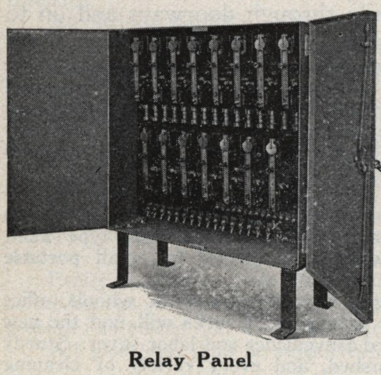
Church Bell

DETAIL SPECIFICATIONS OF BELLS AND MOUNTINGS

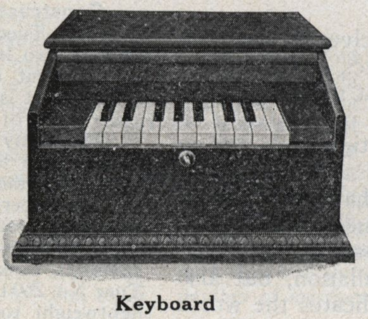
Bell			Mountings	
Weight, lb.	Tone	Diameter, in.	Outside measurements of frame, ft.—in. x ft.—in.	Diameter of wheel, ft.—in.
300	D	25	3 — 4 x 2 — 8	2 —10
400	C#	27	3 — 4 x 2 — 10	3 — 6
500	C	29	4 — 0 x 2 — 10	4 — 4
600	B	31	4 — 0 x 2 — 10	4 — 4
700	Bb	33	4 — 5 x 3 — 3	4 — 9
800	A	34	4 — 5 x 3 — 3	4 — 9
1000	G#	36	4 — 9 x 3 — 4	5 — 6
1200	G	38	4 — 9 x 3 — 7	5 — 6
1500	F#	41	5 — 0 x 3 — 10	6 — 3
1800	F	44	5 — 4 x 4 — 0	6 — 3
2000	E	46	5 — 8 x 4 — 6	7 — 0
2500	Eb	50	6 — 1 x 4 — 6	7 — 0
3000	D	54	6 — 8 x 5 — 0	7 — 6
3400	C#	55	6 — 8 x 5 — 0	7 — 6
4200	C	59	7 — 0 x 6 — 0	8 — 0
5000	B	62	7 — 6 x 6 — 0	8 — 0
6200	Bb	66	7 — 6 x 6 — 0	8 — 6
7000	A	72	8 — 0 x 7 — 0	8 — 6



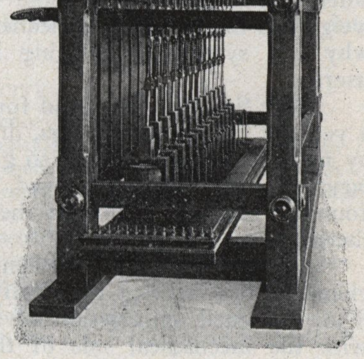
Chime Bells



Relay Panel
Same as used with our Tubular Chimes



Keyboard
Same as used with our Tubular Chimes



Hand Console with Electric Attachment

McShane Tubular Tower Chimes

Cost Less and Require Less Space Than Bell Chimes—McShane Tubular Tower Chimes cost about one-third as much as the regular bell chime and require less space and lighter tower construction.

They are built in standard sets of 15, 16 and 20 tones and with the necessary frame, require a space only 8 ft. square and 12 ft. high.

A Most Satisfying Substitute for Bells—These tubular tower chimes built by McShane, according to McShane's unequalled standard of attunement, produce a purity and mellowness of tone which is exceedingly sweet. The carrying power is not so great as that of bells, but the effect produced is that of a full church chime. Their clearness and volume of sound is such that every note can be easily distinguished within the radius of a mile (depending on location).

Simple Construction and Installation; No Vibration—McShane Tubular Chimes consist of a series of bronze composition metal tubes suspended from a framework of wood. Bells or tubes range from 5 to 10 ft. in length and 8 to 14 in. in circumference. Bells are struck by hardwood-tipped hammers at the upper end of the graded tubes.

The vibration is confined almost entirely to the tubes, and they can with perfect safety be placed in a weak tower, or one not specially constructed to receive a set of bells.

McShane Remote Chime Control (Electric)—Fundamentally the same as used for several years with our bell chimes, there being slight adjustments to adapt it to the McShane Tubular Tower Chimes.

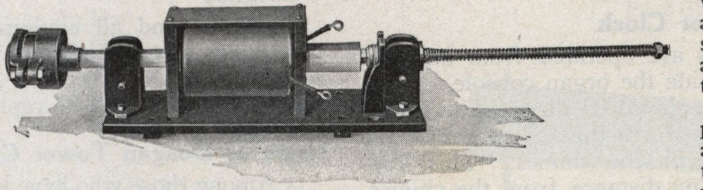
Consists of three parts: operating units (solenoids), relay panel and keyboard designed to operate on 220-volt 60-cycle alternating, or 220-volt direct current. It is instantaneous in action and absolutely dependable so long as current is supplied. There are no motors, motor generators, compressors or complicated parts of any kind. The wiring is such that it can not cause short circuiting. The McShane Electric Chiming Action is guaranteed against original defects for 5 years from date of installation.

Operating Units (Solenoids)—Securely fastened in upper part of frame, consist of solenoid, the plunger with special striking hammer attached, and spring control. These units, one for each tone, are connected by necessary wires to both relay panel and keyboard. The coils are machine wound and waterproof, thereby preventing short circuiting due to moisture. In fact, they could become entirely watersoaked and not be injured, and still continue to operate perfectly. These coils, designed after the accepted principles of electrical engineering, should last a lifetime.

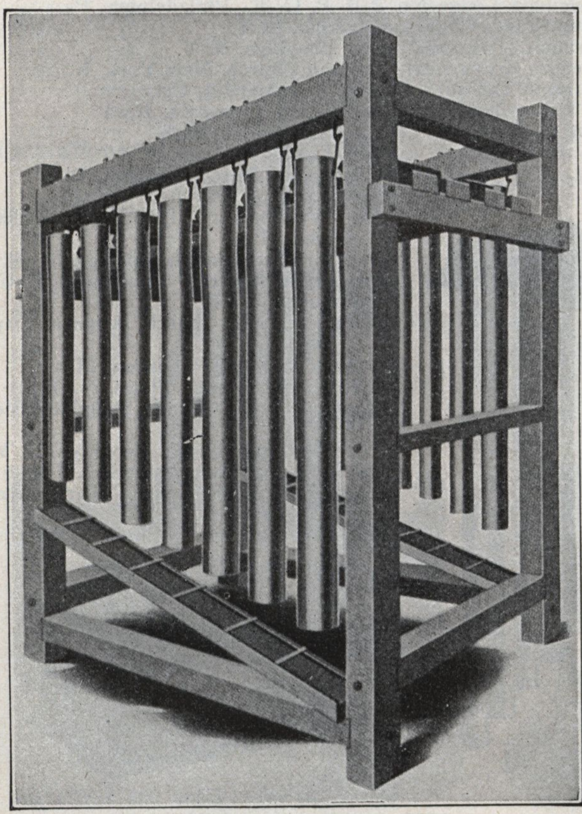
Relay Panel—The relays, one for each contact on each key of the keyboard, are mounted on a slate panel. The contact points, which complete the circuit, are a special composition which can not be injured by the arc, caused by the parting of the contacts. By an ingenious device which tends to destroy the arc, it has been reduced to a minimum, assuring an indefinite period of service. The terminals are securely fastened and soldered to binding posts. A steel cabinet housing covers the entire relay mechanism, making accessible all operating parts. The cabinet is placed in the lower part of the frame in the belfry.

Keyboard—Consists of a section of a standard organ keyboard, placed in a specially constructed cabinet of quartered oak, though it may be finished to match the organ console or the interior woodwork of the building. The necessary contacts, which operate the relays, are attached to the undersides of the keys, there being a key and a contact for each tone.

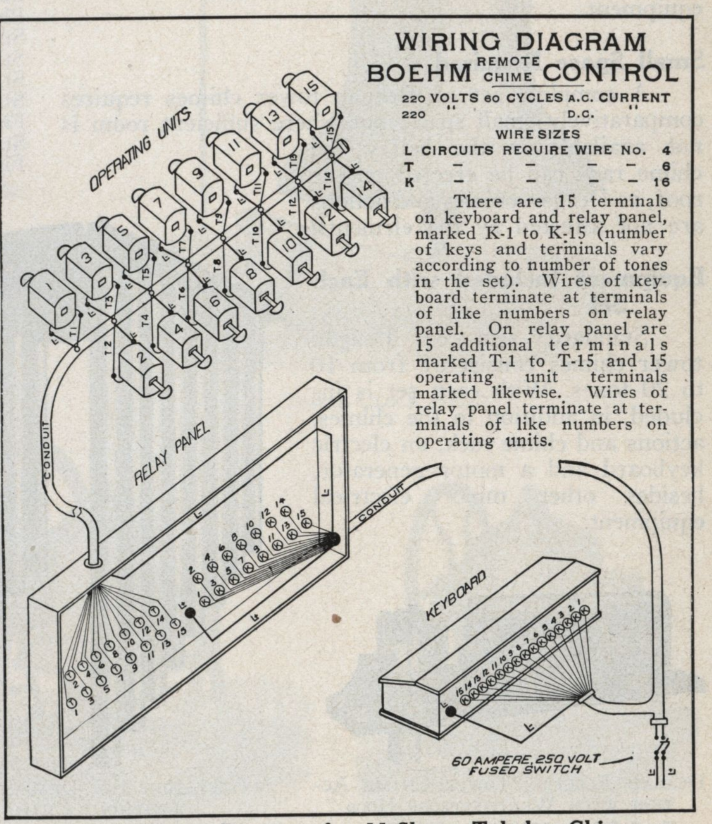
This keyboard is usually placed near the organ console and played by the organist, though it may be placed elsewhere and played by any one with a slight knowledge of music.



Operating Units
Consisting of solenoid, plunger with striking hammer attached, and spring control. Over-all dimensions: width, 5 in.; height, 6 in.; length, 36 in.



McShane Tubular Tower Chimes
Showing frame and tubes assembled. Standard sets: 15, 16 and 20 tones. Over-all dimensions, 8 ft. square, 12 ft. high



WIRING DIAGRAM
BOEHM REMOTE CHIME CONTROL
220 VOLTS 60 CYCLES A.C. CURRENT
220 " D.C. "

WIRE SIZES
L CIRCUITS REQUIRE WIRE No. 4
T — — — — 6
K — — — — 16

There are 15 terminals on keyboard and relay panel, marked K-1 to K-15 (number of keys and terminals vary according to number of tones in the set). Wires of keyboard terminate at terminals of like numbers on relay panel. On relay panel are 15 additional terminals marked T-1 to T-15 and 15 operating unit terminals marked likewise. Wires of relay panel terminate at terminals of like numbers on operating units.

Typical Wiring Diagram for McShane Tubular Chimes

ESTABLISHED 1880

J. C. DEAGAN, INC.

Manufacturers of Tower Chimes

TELEPHONE
Lake View 4364
Private Exchange
All Departments

MAIN OFFICE AND FACTORY
Deagan Building, 1770 Berteau Avenue
CHICAGO, ILL.

Products

Tubular Tower Chimes, electrically operated, for churches, public buildings, schools, colleges, cemeteries, mausoleums, country estates, etc.

Also manufacturers of Percussion Musical Instruments for hand playing and organ use; Dinner Chimes, Altar Chimes, Electric Una-Fon, etc.

Deagan Tower Chimes

Deagan tower chimes are much more than mere substitutes for the old-fashioned church bell. The form and method of construction of Deagan chimes make possible extreme accuracy of tuning and even intonation. Deagan chimes, made of an exceptionally fine quality bell metal, are uniform in volume, carrying capacity, and tonal characteristics throughout their entire register. They are noted for their beautiful tone.

Played from Keyboard or Clock

Deagan tower chimes are operated from an electrical keyboard located beside the organ console. Complete musical selections are played on them. The slightest touch of a finger brings forth the full power of the magnificently sweet tones of the chimes. This keyboard may be located at any distance from the chimes. Chiming device, 12½x39x73 in., which automatically sounds the Westminster peal, is also supplied as special equipment.

Small Space Required

A complete set of Deagan tower chimes requires comparatively small space, but where sufficient room is not available in the belfry the chime rack can be erected on the roof, as Deagan chimes and actions are not affected by the elements.

Equipment Included with Each Set

Standard sets of Deagan tower chimes consist of from 10 to 20 tones. With each set is included, in addition to the chimes, actions and chime rack, an electric keyboard and a motor generator, besides other minor electrical equipment.

Electric Chime Action

The Deagan electric chime action (patented) is very efficient and takes very little current.

Motor Generator

Electrical energy for operating the chime actions is supplied by a motor generator which is manufactured especially for this purpose. The motor is furnished to meet the standard requirements of city current available, as it can be operated from either lighting or power circuit. The generator supplies direct current of the proper voltage for the chime actions.

Installation

Deagan tower chimes are installed and connected up by our own erectors, thus insuring perfect results.

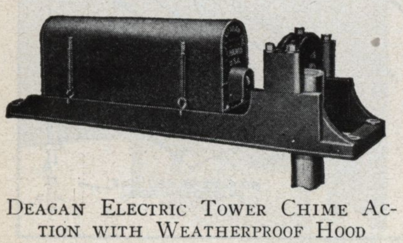
Guarantee

Chimes and all equipment are guaranteed against any defect in material and workmanship for five years from date of installation. Any part proving defective within that time will be replaced free of charge.

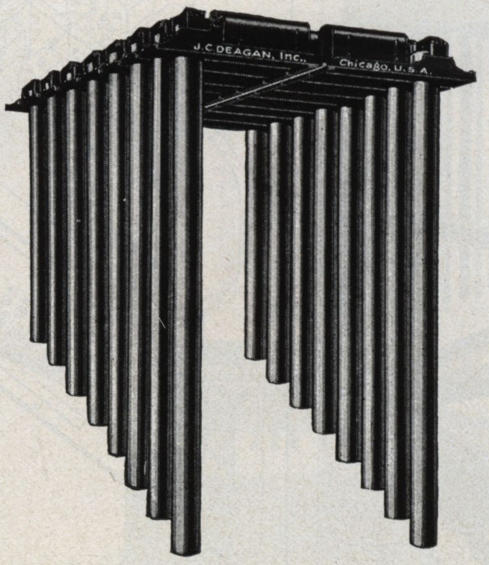
Users of Deagan Tower Chimes

Among those who have installed Deagan Chimes are:

Victor Talking Machine Co., Camden, N. J.
California Palace of Legion of Honor, San Francisco, Cal.
Central Union Church, Honolulu, Hawaii
Philadelphia Lodge No. 2 B. P. O. E., Philadelphia, Pa.
St. Augustine's Church, Brooklyn, N. Y.
St. Francis of Assisi Church, Brooklyn, N. Y.
St. Peter's Evangelical Lutheran Church, New York, N. Y.
St. Vincent DePaul's Church, Los Angeles, Cal.
First Evangelical Lutheran Church, Ottumwa, Iowa
St. Luke's Episcopal Church, Kalamazoo, Mich.
First M. E. Church (White Temple), Miami, Fla.
St. Ignatius Church, Chicago, Ill.
Palmer School, Davenport, Iowa
John Wanamaker Mausoleum, Philadelphia, Pa.
First Christian Church, Springfield, Ill.
First Baptist Church, Vancouver, B. C., Canada
St. Paul's M. E. Church, Atlantic City, N. J.
St. Mary's Church, Taunton, Mass.
St. Joseph's Church, Albion, N. Y.
Reformed Dutch Church, Poughkeepsie, N. Y.
Holy Innocents Church, Brooklyn, N. Y.
First M. E. Church, Lancaster, Pa.
Sleepy Hollow Cemetery, Tarrytown, N. Y.
Zion Lutheran Church, Sunbury, Pa.



Deagan Electric Tower Chime Action with Weatherproof Hood
Total height, 11½ in., width, 9 in., length, 42 in.



Sixteen-tone Set Deagan Tower Chimes (without Chime Rack)
Electrically operated. Floor space required 7 ft. 6 in. x 7 ft. 6 in.; height 15 ft. 6 in.

Electric Keyboard for Operating Chimes
Dimensions closed, 19x13x6 in.

MENEELY BELL CO.

220 Broadway
NEW YORK, N. Y.
TELEPHONE, CORTLANDT 1749

22-28 River Street
TROY, N. Y.
TELEPHONE, TROY 525

Products

Manufacturers of BELLS:

Church, Chime, Peal, Angelus, School, Tower Clock, Westminster, Fire Alarm, Fog Signal, Ship, Farm, and other Bells.

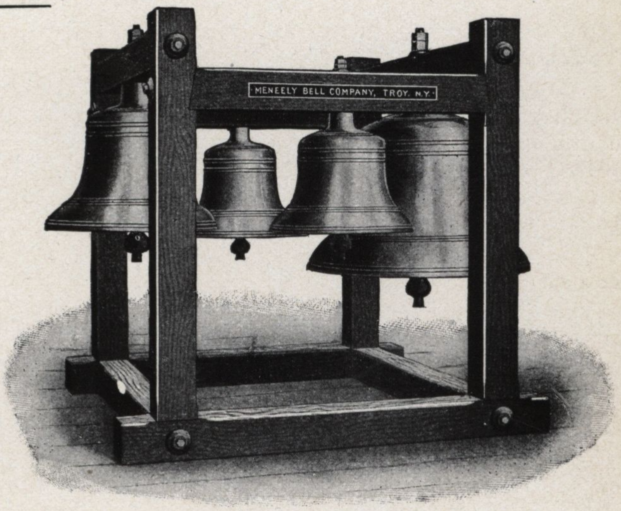
Details of Church Bells

WEIGHTS, TONES AND SIZES OF CHURCH BELLS

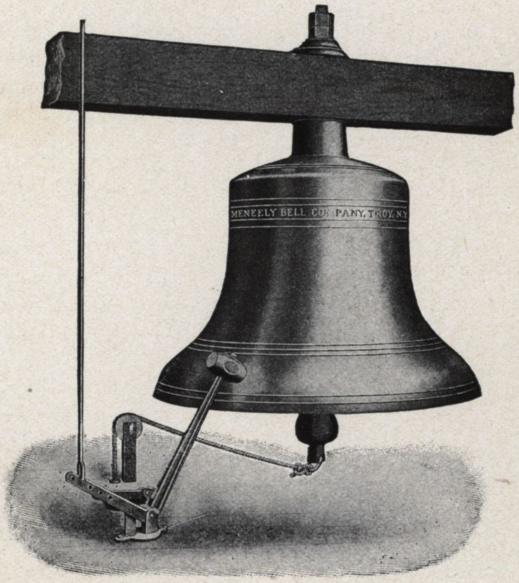
BELL			MOUNTINGS	
Weight, lbs.	Medium tone	Diameter, in.	Size of frame outside ft. in. ft. in.	Diameter of wheel ft. in.
400	D	27	3 5x3 5	4 4
450	C sharp	28	3 5x3 5	4 4
500	C	29	3 5x3 5	4 4
600	B	31	3 8x3 11	4 9
700	B	33	3 11x4 2	4 9
800	B flat	34	3 11x4 2	5 6
900	A	36	4 2x4 6	5 9
1000	A	37	4 2x4 6	5 9
1200	A flat	39	4 9x4 9	6 3
1500	G	42	4 10x4 10	6 6
1800	F sharp	45	5 5x5 7	7 0
2000	F	46	5 5x5 7	7 0
2500	E	50	5 5x5 9	7 6
3000	E flat	53	6 2x6 6	8 0
3500	D	56	6 2x6 6	8 6
4000	C sharp	58	6 6x6 9	8 6
4500	C	61	6 6x6 9	9 0
5000	C	63	7 0x7 0	9 0
6000	B	67	7 0x7 0	9 6
7000	B flat	69	7 6x8 5	9 6

Illustrations

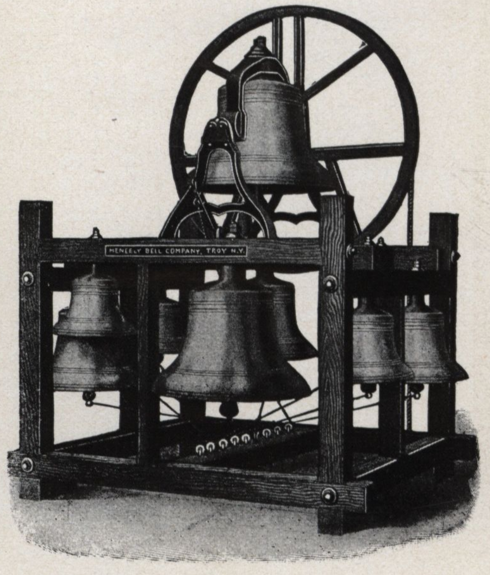
The accompanying illustrations show a few of the principal bells manufactured by this company.


MENEELY BELL COMPANY, TROY, N.Y.

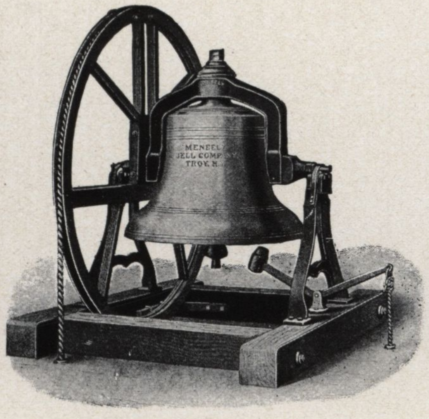
PEAL BELLS


MENEELY BELL COMPANY, TROY, N.Y.

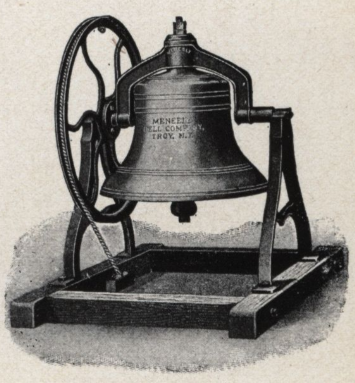
TOWER CLOCK BELL


MENEELY BELL COMPANY, TROY N.Y.

CHIME BELLS



CHURCH BELL



SCHOOL BELL

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